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January 17, 2014

Mr. Mark Goodman
Hydrogen Energy California, LLC
9591 Landfall Drive
Huntington Beach, CA 92646

Dear Mr. Goodman:

Re: Q1000 HECA SCS Project
Cluster 6 Phase I Interconnection Study

Attached is the Cluster 6 Phase I Interconnection Study Report for the interconnection of the proposed HECA SCS Project to the CAISO Controlled Grid. The CAISO and PG&E performed the Phase I Interconnection Study in accordance with the CAISO's Generator Interconnection and Deliverability Allocation Procedures (GIDAP) tariff.

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

Sincerely,

J.E. (Jeff) Billinton
Manager, Regional Transmission – North

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Queue Cluster 6 Phase I Interconnection Study Report

PG&E Kern Area Interconnection Study Report

Final Report



January 17, 2014

This study has been completed in coordination with Pacific Gas & Electric per CAISO Tariff Generator Interconnection and Deliverability Allocation Procedures (GIDAP) Appendix DD

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1 Introduction

In accordance with the California Independent System Operator (CAISO) Generator Interconnection and Deliverability Allocation Procedures (GIDAP) Tariff Appendix DD, this Queue Cluster 6 Phase I Study was performed to determine the combined impact of all the Cluster 6 Phase I projects on the CAISO Controlled Grid.

There were 29 Cluster 6 Phase I generation projects in the PG&E's service territory modeled in the Phase I Study. Of these generation projects, four (4) were PG&E Wholesale Distribution Tariff (WDT) generation projects that are seeking Full Capacity (FC) Deliverability Status. Three (3) general interconnection areas were formed based on the electrical impact among the generation projects: Fresno, Kern and North Interconnection Areas. This PG&E Kern Interconnection Area study report provides the following:

- Transmission system impacts caused by the addition of QC6 projects requesting interconnection in the Kern Area,
- A list of Local Delivery Network Upgrades (LDNUs) and Reliability Network Upgrades (RNUs) needed to address the impacts on the CAISO Controlled Grid of the QC6 projects in the Kern Area,
- A list of Interconnection Facilities required to interconnect the QC6 projects,
- Assessment of the Point of Interconnection selected by each Interconnection Customer and potential alternatives to potentially improve efficiencies in overall transmission upgrade costs,
- The maximum cost responsibility for LDNUs and RNUs assigned to each Interconnection Request,
- A good faith estimate of the cost of Interconnection Facilities for each Interconnection Request, and
- A cost estimate of Area Delivery Network Upgrades (ADNUs) for each Interconnection Request.

To determine the system impacts caused by Cluster 6 Phase I projects, the following studies were performed:

- Steady State Power Flow Analyses
- Short Circuit Duty Analyses
- Transient Stability Analyses
- Reactive Power Deficiency Analyses
- Deliverability Assessment

1.1 Cluster 6 Phase I Generation Project Interconnection Information

Nine (9) generation projects totaling a maximum output of 725.642 MW were included in the Cluster 6 Phase I study in the PG&E Kern Interconnection Area. Table 2-1 lists all the generator projects in the PG&E Kern Interconnection Area with essential data obtained from the CAISO Generation Queue or the PG&E WDT Generation Queue.

Table 2-1: PG&E Kern Area Interconnection Projects

Queue Number	Point of Interconnection	Deliverability Status	Fuel	Max MW	Proposed COD
Q943	Lerdo 115 kV Substation	FC	Solar PV	50	12/1/2015
Q946	Midway-Wheeler Ridge #2 230 kV Line	FC	Solar PV	100	12/31/2015
Q947	Olive Switching Station	FC	Solar PV	120	12/1/2017
Q964	Arco-Twisselman 70 kV Line	FC	Natural Gas	47.821	3/31/2017
Q966	Midway-Midsun 115 kV Line	FC	Natural Gas	47.821	3/31/2017
Q972	Midway-Temblor 115 kV Line	FC	Solar PV	20	12/31/2016
Q987	San Luis Obispo-Oceano 115 kV Line	FC	Solar PV	20	8/1/2015
Q988	Maricopa-Copus 70 kV Line	FC	Solar PV	20	8/1/2015
Q1000	Midway-Wheeler Ridge #1 and #2 230 kV Lines	FC	Hydrogen	300	1/1/2019
Total				725.642	

1.2 Study Objectives

This Cluster 6 Phase I Interconnection study was performed in accordance with Section 6.2 of Appendix DD of the CAISO Tariff, which states:

> The Phase I Interconnection Study shall:
>
> (i) Evaluate the impact of all Interconnection Requests received during the Cluster Application Window for a particular year on the CAISO Controlled Grid,
>
> (ii) Preliminary identify all LDNU, ADNU and RNU needed to address the impacts on the CAISO Controlled Grid of the Interconnection Requests,

(iii) Preliminary 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 LDNUs and RNUs assigned to each Interconnection Request, until the issuance of the Phase II Interconnection Study report,

(vi) Provide a good faith estimate of the cost of Interconnection Facilities for each Interconnection Request, and

(vii) Provide a cost estimate of ADNUs for each Generating Facility in a Queue Cluster Group Study.

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 Deliverability Assessment (and Off-Peak Deliverability Assessment which will be for informational purposes only) for the purpose of identifying LDNUs and estimating the cost of ADNUs, as applicable.
>
> 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 RNUs and LDNUs to the CAISO Controlled Grid that are preliminarily identified as 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, the estimated costs of ADNUs, if applicable and an estimate of any other financial impacts (i.e., on Local Furnishing Bonds)."

The Phase I Study analysis was performed to identify the conceptual Interconnection Facilities, Plan of Service Reliability Network Upgrades, Reliability Network Upgrades, Local Delivery Network Upgrades, incremental Area Delivery Network Upgrades, and Distribution Upgrades necessary to safely and reliably interconnect the QC6 projects. An estimated cost and construction schedule for these facilities is provided in this report.

2 Study Assumptions

2.1 Load and Intertie Flows

The 2018 summer peak reliability cases modeled 28,719 MW load (1-in-10 load forecast). The 2018 summer off peak reliability cases modeled 14,778 MW, approximately 50% of summer peak load.

The Deliverability Assessment On-Peak case modeled a 28,028 MW load (1-in-5 load forecast) in the PG&E system with an import target as shown in Table B-1 of Appendix B.

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 study group area.

2.2 Generation Dispatch Assumptions

Generation assumptions for PG&E Kern Interconnection Area are shown in the tables[1] provided in Appendix B.

Generation dispatch assumptions in Deliverability Assessment can be found at http://www.caiso.com/1c44/1c44b5c31cce0.html. In the on-peak Deliverability Assessment, the Summer Peak Qualified Capacity (QC) for proposed Full Capacity generation projects is set to 52% 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 28% of the requested PMax for wind generation and 85% for solar generation if a mix of different fuel type generations is identified in the Deliverability Assessment as the 5% DFAX group for a transmission limitation. In the off-peak Deliverability Assessment, the proposed Full Capacity wind generation is dispatched at its maximum nameplate output and solar generation at 85% of its nameplate output.

In the on-peak Reliability Assessment, all generation is dispatched at 100%. In the off-peak Reliability Assessment, fossil fuel plants are off-line or at minimum required dispatch, solar generation is dispatched at 85% of Pmax and all other renewables are dispatched at 100% of Pmax.

2.3 Transmission System Assumptions

All CAISO approved transmission projects in the PG&E service territory were modeled in the power flow cases as show in Table B-4 of Appendix B.

All the CAISO Pre-Cluster 6 generation projects and their associated Network Upgrades modeled are as shown in Table B-5 of Appendix B.

[1] These tables reflect the latest project information at the time the study was performed and may not reflect the numerous changes to the queue (i.e. withdraws, project size reductions, etc.) that have taken place during the course of the study.

2.4 Special Protection Systems

All existing PG&E SPS/RAS are modeled including but not limited to Path 15 IRAS, Path 26 RAS, Helms RAS and all bulk system load/generation dropping RAS for 500 kV outages. The list is provided in Table B-6 of Appendix B.

2.4.1 Operating Procedures

Operating procedures, which may include curtailing the output of the QC6 Phase I 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.

2.5 Pre-Cluster 6 Affected System Transmission Upgrades

The Cluster 6 Phase I Study modeled the Pre-Cluster 6 transmission upgrades as submitted by Affected Systems.

2.6 Power Flow Base Cases

The Cluster 6 Phase I Study power flow cases were developed from the WECC base case and PTO's transmission expansion base case series representing summer peak and summer off peak load conditions. The Cluster 6 Phase I studies were based on a 2018 load forecast. These power flow cases included all CAISO approved transmission projects, as well as earlier queued Serial Group and cluster generation projects with associated Network Upgrades and Special Protection Systems.

2.6.1 2018 Base Cases

The following power flow cases were used for the analysis in the PG&E Kern Interconnection Area Cluster 6 Phase 1 Study:

2018 Summer Peak Full Loop Power Flow Case:

Power flow analyses were performed using PG&E's 2018 summer peak full loop power flow case (in General Electric Power Flow format). This power flow case was developed from the 2012/2013 CAISO Transmission Planning cycle base cases. This power flow case has a 1-in-10 year adverse weather load level for the Kern Interconnection Area in the PG&E service territory.

2018 Summer Off Peak Full Loop Power Flow Case:

Power flow analyses were also performed using PG&E's 2018 summer off peak full loop power flow case in order to evaluate system performance due to the addition of the Phase I generation projects during light load conditions. The off peak load was modeled at about 50% of the summer load level.

The power flow cases modeled all CAISO approved PG&E transmission projects, regardless of their proposed in-service date. The power flow cases also modeled all Pre-Cluster 6 generation projects regardless of their proposed COD. These generation projects were modeled along with their identified transmission upgrades necessary for their interconnection and/or delivery.

2.7 Deliverability Base Cases

2.7.1 Master Deliverability Assessment Base Case

A master base case was developed for the Cluster 6 on-peak deliverability assessment which modeled all the Pre-Cluster 6 and Cluster 6 Phase I generation projects. The resources in the master base case are dispatched as follows:

- Existing capacity resources are dispatched at 80% of their summer peak Net Qualified Capacity (NQC).
- Proposed full capacity resources are dispatched to balance load and maintain expected imports, but not exceeding 80% of their summer peak NQC.
- Energy-Only (EO) resources are considered off-line.
- Imports are at the maximum summer peak simultaneous historical level by branch group as shown in Table B-1 of Appendix B.
- Non-pump load is at the 1-in-5 peak load level for CAISO.
- Pump load is dispatched within expected range for summer peak load hours.

2.7.2 PG&E Kern Interconnection Area Deliverability Assessment Base Case

The PG&E Kern Interconnection Area deliverability assessment base case was developed from the master base case by dispatching all proposed full capacity resources in the Kern Interconnection Area to 80% of their NQC.

3 Reliability Standards, Criteria and Methodology

3.1 Reliability Standards and Criteria

The generator interconnection studies were conducted to ensure the CAISO Controlled Grid is in compliance with the North American Electric Reliability Corporation (NERC) reliability standards, WECC regional criteria, and the CAISO planning standards.

3.1.1 NERC Reliability Standards

The CAISO analyzed the need for transmission upgrades and additions in accordance with NERC reliability standards. These standards set forth criteria for system performance requirements that must be met under specific set of operating conditions. The following NERC reliability standards are applicable to the CAISO, as a registered NERC Planning Authority, and the PTOs, as Transmission Planners, and are the primary standards for the interconnection of new facilities and system performance[2]:

- FAC-001: Facility Connection Requirements[3]
- FAC-002: Coordination of Plans for New Facilities
- TPL-001: System Performance Under Normal Conditions (category A)

[2] http://www.nerc.com/page.php?cid=2%7C20

[3] http://www.nerc.com/files/FAC-001-1.pdf; FAC-001 is applicable to PTOs, but not to the ISO

- TPL-002: System Performance Following Loss of a Single Bulk Electric System (BES) Element (category B)
- TPL-003: System Performance Following Loss of Two or More BES Elements (category C).

3.1.2 WECC Regional Criteria

The WECC TPL system performance criteria are applicable to the CAISO as a Planning Authority and set forth additional requirements that must be met under a varied but specific set of operating conditions.[4]

3.1.3 California ISO Planning Standards

The California ISO Planning Standards specify the grid planning criteria to be used in the planning of CAISO transmission facilities.[5] These standards cover the following:

- Address specifics not covered in the NERC reliability standards and WECC regional criteria;
- Provide interpretations of the NERC reliability standards and WECC regional criteria specific to the CAISO Controlled Grid; and
- Identify whether specific criteria should be adopted that are more stringent than the NERC standards or WECC regional criteria.

3.1.4 Contingencies

The system performance with the addition of the generation projects were evaluated under normal conditions and following loss of single or multiple BES elements as defined by the applicable reliability standards and criteria.

Table 3-1 summarizes the contingencies per NERC Reliability Standards, WECC Regional Criteria and CAISO Planning Standards.

[4] http://www.wecc.biz/standards/development/wecc-0071/default.aspx

[5] http://www.caiso.com/Documents/TransmissionPlanningStandards.pdf

Table 3-1: Contingencies

Contingencies	Description
NERC TPL-001 NERC Category A (No contingency)	All facilities in service – Normal Conditions
NERC TPL-002 Category B	B1 – SLG or 3Φ Fault, with Normal Clearing: single generator outage B2 – SLG or 3Φ Fault, with Normal Clearing: single transmission circuit outage B3 – SLG or 3Φ Fault, with Normal Clearing: single transformer outage B4 – Single Pole Block, with Normal Clearing: single pole (dc) line outage
CAISO Planning Standard Category B	II.2. – Selected overlapping single generator and transmission circuit outages II.5. – Loss of combined cycle power plant module
NERC TPL-003 Category C	C1 – SLG Fault, with Normal Clearing: Bus outages C2 – SLG Fault, with Normal Clearing: Breaker failures C3 – SLG or 3Φ Fault, Combination of any two-generator/transmission line/transformer outages except these in CAISO Category B C4 – Bipolar Block, with Normal Clearing: Bipolar (dc) Line C5 – Outages of double circuit tower lines C6 – SLG Fault, with Delayed Clearing: Generator C7 – SLG Fault, with Delayed Clearing: Transformer C8 – SLG Fault, with Delayed Clearing: Transmission Circuit C9 – SLG Fault, with Delayed Clearing: Bus Section
WECC Business Practice TPL-001-WECC-RBP-2 Category C	WR1.1 – SLG Fault, with Normal Clearing: two adjacent transmission circuits (greater than 300 kV) on separate towers

In the Phase I Study, all NERC Category B, WECC WR1.1, as well as the worst Category C1 through C9 outages, in the electrical vicinity of the general study area were analyzed. The worst Category C contingencies were selected by taking into account the following factors:

- Amount of generation lost immediately following the outage
- Normal condition loading of a transmission facility
- Bus outages and breaker failures that cause disconnection of the entire bus during the transient period

Category C3 outages were limited to double contingencies that resulted in loss of generation greater than half the amount for the largest double contingency in the PG&E service territory.

3.2 Steady State Study Criteria

3.2.1 Normal Overloads

Normal overloads are those that exceed 100 percent of normal facility rating under NERC Category A conditions (no contingency). Normal overloads are identified in Deliverability Assessment and Reliability Study power flow analyses in accordance with the Reliability Standard TPL-001. It is required that loading of all transmission system facilities be within their normal ratings under NERC Category A conditions.

3.2.2 Emergency Overloads

Emergency overloads are those that exceed 100 percent of emergency ratings under NERC/WECC/ CAISO Category B and Category C contingency conditions. Emergency overloads are identified in the Deliverability Assessment and Reliability Study power flow analyses in accordance with Reliability Standards TPL-002 and TPL-003. It is required that loading of all transmission system facilities be within their emergency ratings under the Category B and Category C contingency conditions.

3.2.3 Voltage Criteria

A voltage criteria violation occurs if a bus within the CAISO Controlled Grid fails to meet the requirements defined in Table 3-2.

Table 3-2: Voltage Criteria
(Bus voltages are relative to the nominal bus voltages of the system under study)

Voltage level	Normal Conditions (TPL-001)		Contingency Conditions (TPL-002 & TPL-003)		Voltage Deviation	
	Vmin (pu)	Vmax (pu)	Vmin (pu)	Vmax (pu)	TPL-002	TPL-003
≤ 200 kV	0.95	1.05	0.90	1.1	≤5%	≤10%
≥ 200 kV	0.95	1.05	0.90	1.1	≤5%	≤10%
≥ 500 kV*	1.0	1.05	0.90	1.1	≤5%	≤10%

*Most of the 500 kV buses have specific requirements.

3.3 Transient Stability Criteria

Transient stability analysis is a time-domain simulation that assesses the performance of the power system during (and shortly following) a system disturbance. Transient stability studies are performed to ensure system stability following severe system disturbances.

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

- 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);
- A stability simulation will be deemed to exhibit positive damping if a curve defined by the peaks of the machine relative rotor angle swing curves tends to intersect a second curve defined by the valleys of the relative rotor angle swing curves with the

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

- Duration of a stability simulation run will be ten (10) seconds unless a longer time is required to ascertain damping;
- The transient performance analysis will start two (2) cycles after the fault clearing and conclude at the end of the simulation and;
- 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 NERC Reliability Standards and WECC Regional Criteria. NERC TPL-001, TPL-002 and TPL-003 require no loss of demand or curtailed firm transfers under Category A and Category B conditions, and planned/controlled loss of demand or curtailed firm transfers under Category C contingencies. Category A, B and C contingencies should not result in cascading outages.

Table 3-3 illustrates the WECC reliability criteria. The reliability and performance criteria are applied to the entire WECC transmission system.

Table 3-3: WECC Disturbance-Performance Table of Allowable Effects on Other Systems (In addition to the NERC requirements)

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (Outage/Year)	Transient Voltage Dip Standard	Minimum Transient Frequency Standard	Post-Transient Voltage Deviation Standard (See Note 1)
A	Not Applicable	Nothing in Addition to NERC		
B	≥ 0.33	Not to exceed 25% at load buses or 30% at non-load buses. Not to exceed 20% for more than 20 cycles at load buses.	Not below 59.6 Hz for 6 cycles or more at a load bus	Not to exceed 5% at any bus
C	0.033 – 0.33	Not to exceed 30% at any bus. Not to exceed 20% for more than 40 cycles at load buses.	Not below 59.0 Hz for 6 cycles or more at a load bus	Not to exceed 10% at any bus
D	< 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.

3.4 Post-Transient Voltage Stability Criteria

The last column of Table 3-3 describes the post-transient voltage stability criteria. The governor power flow is utilized to test for the post-transient voltage deviation criteria.

3.5 Reactive Margin Criteria

Table 3-4 summarizes the voltage support and reactive power criteria of requirement R3 of the WECC Regional Criterion TPL-001-WECC-CRT-2. The system performance will be evaluated accordingly.

Table 3-4: Reactive Margin Analysis Criteria Summary

Contingency Category	Reactive Power Criteria
B	Voltage stability is required at 105% of load level or transfer path rating
C	Voltage stability is required at 102.5% of load level or transfer path rating

3.6 Power Factor Criteria

Table 3-5 summarizes the power factor criteria per the CAISO tariff for the projects.

Table 3-5: CAISO Tariff Power Factor Analysis Criteria Summary

Generation Type	Power Factor Criteria
Asynchronous Generator	0.95 lagging to 0.95 leading at the POI[6]
Synchronous Generator	0.90 lagging to 0.95 leading at generator terminals

3.7 Short Circuit Criteria

The short circuit analysis will be performed by simulating single-line-to-ground (1LG) and three-phase (3LG) bus faults as the worst case in a study area, which represents the worst-case conditions to determine the maximum available fault current. The bus fault duty is used to determine an approximate level of overstress. When the bus fault duty is greater than the

[6] The CAISO Tariff requires that projects be able to meet power factor requirements of 0.95 lagging and 0.95 leading at the POI, if studies identify the need based on meeting reliability and safety requirements.

interrupting rating, a more detailed study is required to determine the worst case fault current interrupted by the breaker.

The responsibility to finance short circuit related Reliability Network Upgrades identified shall be assigned to all contributing Interconnection Requests (projects) pro rata based on their short-circuit duty contribution. Furthermore, if a proposed network upgrade triggers an adverse short circuit impact, the responsibility to finance such short circuit related RNU shall be assigned to the projects contributing to the network upgrade based on the same factors used to allocate the proposed network upgrade cost. The pro rata contribution corresponding to each Cluster 6 project, if any, is provided in each individual report (Appendix A).

3.8 Deliverability Methodology

The Deliverability Assessment comprises of On-Peak and Off-Peak Deliverability Assessments. The ISO Balancing Authority Area (BAA) including the bulk system was monitored for any adverse impacts.

3.8.1 On-Peak Deliverability Assessment Methodology

The assessment was performed following the on-peak Deliverability Assessment methodology (http://www.caiso.com/23d7/23d7e41c14580.pdf). The main steps of the on-peak deliverability assessment are described below.

Screening for Potential Deliverability Problems Using DC Power Flow Tool

A DC transfer capability/contingency analysis tool was used to identify potential deliverability problems. For each analyzed facility, an electrical circle was drawn which includes all generating units including unused Existing Transmission Contract (ETC) injections that have a 5% or greater:

- Distribution factor (DFAX) = (Δ flow on the analyzed facility / Δ output of the generating unit) *100%, or
- Flow impact = (DFAX * NQC / Applicable rating of the analyzed facility) *100%.

Load flow simulations were performed, which study the worst-case combination of generator output within each 5% Circle.

Verifying and Refining the Analysis Using AC Power Flow Tool

The outputs of capacity units in the 5% Circle were increased starting with units with the largest impact on the transmission facility. No more than twenty units were increased to their maximum output. In addition, no more than 1500 MW of generation was increased. All remaining generation within the Control Area was proportionally displaced, to maintain a load and resource balance.

When the 20 units with the highest impact on the facility can be increased more than 1500 MW, the impact of the remaining amount of generation to be increased was considered using a Facility Loading Adder. The Facility Loading Adder was calculated by taking the remaining MW amount available from the 20 units with the highest impact times the DFAX for each unit. An equivalent MW amount of generation with negative DFAXs was also included in the Facility Loading Adder, up to 20 units. If the net impact from the Facility Loading Adders was negative, the impact was set to zero and the flow on the analyzed facility without applying Facility Loading Adders was reported.

3.8.2 Local Deliverability Constraints and Area Deliverability Constraints

The Phase I study includes two rounds of deliverability assessments: First, to identify any transmission system operating limits that constrain the deliverability of the modeled generators, and second, determine LDNUs and ADNUs to relieve those constraints. The first round of the deliverability assessment modeled all the generation projects requesting Full Capacity or Partial Capacity Deliverability Status, if any, in accordance with the On-Peak Deliverability Assessment Methodology. The transmission system operating limits identified during the assessment are divided into two categories: local deliverability constraints and area deliverability constraints.

Local deliverability constraints tend to have the following characteristics:

- The generators whose deliverability they constrain (generators inside the 5% DFAX circle) are all located on a few buses electrically close to each other.
- Relieving these constraints does not trigger high cost upgrades.

Area Deliverability Constraints tend to have the following characteristics:

- The generators whose deliverability they constrain (generators inside the 5% DFAX circle) are spread over at least one and possibly more grid study areas or resource areas identified in a resource portfolio used in the TPP.
- In the first round of the Phase I deliverability assessment, relieving these constraints may trigger high cost upgrades, driven by excessively large MW amounts of new generation behind the area deliverability constraint.
- In some potential situations the ISO may classify as an area deliverability constraint a constraint that constrains the deliverability of generators electrically close to each other and is triggered by an exceptionally large volume of generation. This could occur, for example, when there is an exceptionally large volume of Interconnection Requests in a relatively smaller local sub-area within one of the resource development areas identified in the TPP portfolios and relieving the constraint requires expensive upgrades. This potential situation was raised as a concern by some stakeholders, and we determined that in such cases, if they occur, the appropriate remedy would be to reclassify the constraint as an area deliverability constraint based on the recognition that it would serve a substantial volume of generation projects within the study area.

The categorization of ADNU versus LDNU is based on the deliverability constraint that triggers the need of the DNU. With the exception of SPS mitigating deliverability constraints, ADNUs are transmission upgrades or additions to relieve Area Deliverability Constraints and LDNUs are to relieve Local Deliverability Constraints.

3.8.3 Identification of Area Delivery Network Upgrades

The CAISO performs a second round of the deliverability assessment to identify facilities necessary to provide incremental deliverability between the level of Transmission Plan (TP) Deliverability and additional amount necessary for the MW capacity amount of generation targeted in the Cluster 6 Phase I Study. The additional amount is referred to as Phase I Incremental MW in the report. In other words, the second round (round 2) deliverability assessment identifies facilities necessary to provide deliverability for Option (B) projects beyond the level of Transmission Plan (TP) Deliverability for each Area Deliverability Constraint.

For each Area Deliverability Constraint, a base case is to be developed such that the TP Deliverability is fully utilized. Then the Phase I Incremental MW is added. The ADNUs are then identified to support the deliverability of the Phase II Incremental MW.

The study did not identify any Area Deliverability Constraints within the PG&E Kern area Interconnection.

4 Reliability Assessment

The reliability assessment is comprised of Power Flow Analysis, Reactive Power Deficiency Analysis and Post-Transient Voltage Stability Analysis.

Power flow analysis, reactive power deficiency analysis and post-transient voltage stability analysis were performed to ensure that CAISO Controlled Grid remains in full compliance with NERC reliability standards TPL-001, 002, and 003 as well as other WECC Regional Criteria with the proposed interconnection. The results of these analyses will serve as documentation that an evaluation of the reliability impact of new facilities and their connections on interconnected transmission systems is performed.

The study results for this interconnection will be communicated to neighboring entities (Affected Systems) that may be impacted, for coordination and incorporation of its transmission assessments. Inputs from neighboring entities are solicited to ensure coordination of transmission systems.

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 study group area. The CAISO and PG&E cannot guarantee that the Cluster 6 generation projects can operate at maximum rated output, 24 hours a day, year round, without adverse system impacts, nor can the CAISO and PG&E guarantee that these projects would not have adverse system impacts during the times and seasons not studied in this Phase 1 study.

4.1 Reliability Thermal Loading Assessment

The reliability analysis was performed on power flow cases that include all Energy-Only and Full Capacity projects dispatched to maximum values for each power flow case. Energy-Only projects often do not have transmission capacity upgrades and rely upon CAISO Congestion Management to manage thermal loading in the PG&E transmission system. Optimal Power Flow (OPF) and Security Constrained Optimal Power Flow (SCOPF) tools in PowerWorld software were used to curtail generation in the reliability cases to mitigate any thermal overloads that were caused by generation dispatch. Existing and pre-cluster 6 generation units were curtailed as necessary to achieve power flow cases that do not result in thermal overloads that remain even with all the Delivery Network Upgrades and Reliability Network Upgrades modeled. The most effective generators are curtailed first to minimize the curtailment. Only after the generation caused thermal overloads have been mitigated through generation curtailment are the voltage, reactive power and transient stability analyses performed.

4.1.1 2018 Reliability Thermal Analysis Results

The complete 2018 reliability assessment results are provided in Appendix E.

4.2 Reliability Voltage Assessment

All Cluster 6 asynchronous projects were modeled with reactive capabilities to meet 0.95 leading to 0.95 lagging power factor at the Point of Interconnection (POI). More detailed reactive power analysis will be performed in the Cluster 6 Phase II study to determine the need for meeting any reactive power requirements.

The voltage and reactive power analysis results in the post-project power flow cases were compared to the voltage and reactive power analysis results in the pre-project power flow cases.

4.2.1 Steady-State Voltage Results

There were no steady-state voltage violations identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.2.2 Post-Transient Voltage Stability Results

There were no post-transient voltage stability violations identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.2.3 Reactive Power Deficiency Results

There were no reactive power deficiencies identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.3 Transient Stability Analysis

Transient stability analysis was conducted using the summer peak full loop power flow bases cases to ensure that the transmission system remains stable with the addition of Cluster 6 generation projects. The generator dynamic data used for the study is confidential in nature and is provided with each individual project report (Appendix A).

Disturbance simulations were performed for a study period of ten (10) seconds to determine whether the Cluster 6 Phase I projects will create any system instability during a variety of line and generator outages. For the PG&E Kern Interconnection Area, a number of selected line, transformer and generator outages within the PG&E system were evaluated. The outages were consistent with Category B and Category C requirements (single element and multiple element outages).

NERC Category B (line or transformer) outages were selected to include major lines or transformers going from the project to the neighboring substations. If the project taps into a line, the line is selected along with adjacent line sections up to the first breaker encountered. For projects directly connected to a substation, individual lines connected to this substation were selected for line side fault simulations. NERC Category C bus outages were selected according to the major substations closest to the project. If the project connects directly to a substation the substation itself is selected for a bus fault simulation. In addition, some relevant double-line (L-2) outages were simulated for some projects. The complete contingency list is provided in Appendix C.

If a proposed network upgrade causes transient stability concerns, the responsibility to finance such stability related mitigation (RNU) shall be assigned to the projects contributing to the network upgrade based on the same factors used to allocate the proposed network upgrade cost.

The Cluster 6 Phase I transient stability analysis concluded that the addition of the projects in the PG&E Kern Interconnection Area would not cause transmission system instability. The transmission system remained stable and met WECC Disturbance-Performance Criteria. Transient stability plots for selected bulk system outages for the Kern Interconnection Area are included in Appendix F.

There were some potential WECC performance criteria violations observed in the post-Cluster 6 scenarios that could be caused by possible modeling discrepancies in IC provided dynamic data. There is no mitigation proposed for this Cluster 6 Phase I study. Further investigation will be required in the Cluster 6 Phase II study.

There were also some potential WECC performance criteria violations observed in both the pre and post-project Cluster 6 scenarios that do not require mitigation for this Cluster 6 Phase I study. Further investigation is required to ascertain the cause of the response but the scope of this work lies outside of this Cluster 6 Phase I study.

Transient stability results and mitigation relating to each individual project are discussed in detail in the corresponding Appendix A - Individual Project Reports.

4.4 Short Circuit Duty Assessment

Short circuit studies were performed to determine the impact of adding the Cluster 6 Phase I PG&E Kern Interconnection Area projects to the transmission system. These studies are also needed to perform relay coordination among adjacent substations. The fault duties were calculated before and after the Cluster 6 Phase I projects to identify any equipment overstress conditions. The fault duties were calculated once again after the mitigation plan was added in the short circuit base case.

Pre-Cluster 6 scenario includes the following assumptions

- Adjacent system pre-Cluster 6 equivalent models
- All the active pre-Cluster 6 generator interconnection projects in the CAISO Queue and their corresponding Network Upgrades
- Selected approved Transmission Planning Process projects through the 2012/2013 cycle

Post-Cluster 6 scenario includes the following assumptions:

- Adjacent system post-Cluster 6 equivalent models
- All the active pre-Cluster 6 and Cluster 6 generator interconnection projects in the CAISO Queue and their corresponding Network Upgrades
- Same selected approved Transmission Planning Process projects through the 2012/2013 cycle

Three-phase (3PH) and single line-to-ground (SLG) faults were simulated for both scenarios.

The short circuit duty assessment found that the addition of Cluster 6 projects in the PG&E Kern Interconnection did not result in any short circuit duty violations on the system. Refer to Appendix H for the results of the Short Circuit Duty Assessment.

5 Deliverability Assessment

The Deliverability Assessment comprises of on-peak and off-peak deliverability assessments. The ISO Balancing Authority Area (BAA) including the bulk system was monitored for any adverse impacts.

5.1 On-Peak Deliverability Assessment Results

The Cluster 6 Phase I projects contributed to overloads in the on-peak deliverability assessment. The deliverability assessment results are provided in Appendix I.

5.1.1 Deliverability Constraints to be Mitigated by SPS

The deliverability assessment did not identify any deliverability constraints for which SPS were identified as the solution.

5.1.2 Local Deliverability Constraints and LDNUs

The list of Local Delivery Network Upgrades is provided in Section 6.3 as well as Appendix I of this study report..

5.1.3 Area Deliverability Constraints and ADNUs

There were no identified Area Deliverability Constraints and Area Delivery Network Upgrades.

5.2 Off-Peak Deliverability Assessment

Consistent with the ISO Tariff, the results of the Off-Peak Deliverability Assessment is for information only. In accordance with the ISO off-peak deliverability assessment methodology, no off-peak deliverability assessment was performed for the Cluster 6 Phase I PG&E Kern Area Interconnection as there were no generators with fuel source that substantially occurs during off-peak conditions in this area.

6 Scope of Network Upgrades

The mitigation requirements triggered by Cluster 6 Phase I projects, based on the results described in Sections above, are as follows:

6.1 Plan of Service Reliability Network Upgrades

Plan of Service Reliability Network Upgrades for Cluster 6 Phase I projects in the PG&E Kern Interconnection Area are discussed in detail in each individual project report (Appendix A).

6.2 Reliability Network Upgrades

The assumed scope of Reliability Network Upgrades identified in the Voltage, Transient Stability or Short Circuit reliability analyses for the PG&E Kern Interconnection Area are provided below.

6.2.1 Replace Gates 230 kV CB222

Replace Gates 230 kV CB222 with new circuit breaker with 63 kA interrupting capability.

6.3 Local Delivery Network Upgrades

The list of the Local Delivery Network Upgrades (LDNU) identified and assigned to the Cluster 6 Phase I projects in the PG&E Kern Area Interconnection are provided in Appendix I.

6.3.1 Reconductor Maricopa-Copus 70 kV Line (Gardner Tap-Q620 Tap)

Re-conductor 1.75 mi 3/0 AAC with 397.5 AAC conductor and upgrade any associated equipment.

6.3.2 Reconductor Maricopa-Copus 70 kV Line (Maricopa-Gardner Tap)

Re-conductor 2.99 mi 3/0 AAC with 397.5 AAC conductor and upgrade any associated equipment.

6.3.3 Reconductor Fellows-Taft 115 kV Line (Fellows-Morgan)

Re-conductor 0.36 mi 397.5 AAC and 0.14 715 AAC with 975 ACSR conductor and upgrade any associated equipment.

6.3.4 Reconductor Fellows-Taft 115 kV Line (Morgan-Midset)

Re-conductor 0.14 715 AAC and 0.8 mi 397.5 ACSR with 975 ACSR conductor and upgrade any associated equipment.

6.3.5 Reconductor Midway-Q966 Switching Station (Midway-Cymric)

Re-conductor 13 mi 715 AAC with 1113 AAC conductor and upgrade any associated equipment.

6.3.6 Reconductor Midway-Q966 Switching Station (Cymric-Q966 SS)

Re-conductor 0.79 mi 715 AAC with 1113 AAC conductor and upgrade any associated equipment.

6.3.7 Reconductor Q479 Switching Station-Smyrna 115 kV Line (Q340 Tap-Q479 SS)

Re-conductor 4.5 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.3.8 Reconductor Q479 Switching Station-Smyrna 115 kV Line (Q340 Tap-Smyrna)

Re-conductor 7.0 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.3.9 Reconductor Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)

Re-conductor 6.86 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.3.10 Reconductor Smyrna-Semitropic-Midway 115 kV Line (McKibben-Semitropic Jct)

Re-conductor 2.11 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.3.11 Reconductor Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Ganso)

Re-conductor 2.11 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.3.12 Reconductor Smyrna-Semitropic-Midway 115 kV Line (Smyrna-McKibben)

Re-conductor 6.06 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.

6.4 Area Delivery Network Upgrades

There were no Area Delivery Network Upgrades identified for the PG&E Kern Interconnection Area.

7 Cost and Construction Duration Estimates for Upgrades

The cost estimates 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 may include: anticipated purchase of land rights, licensing, environmental mitigation, looping lines into substations, new switchyards, substation upgrades not included in unit costs, and PG&E's Interconnection Facilities.

Regardless of the requested Commercial Operating Date, the actual Commercial Operation Dates of the generation projects in the Cluster 6 Phase I are dependent on the completed construction and energizing of the identified Network Upgrades. Without these upgrades, the new generators may be subject to CAISO's congestion management, including generation tripping. Based on the needed time for permitting, design, and construction, it may not be feasible to complete all the upgrades needed for this cluster before the requested Commercial Operation Dates.

Costs for each generation project are confidential and are not published in the main body of this report. Each IC is receiving a separate Appendix A report, specific only to that generation project, containing the details of the IC's cost responsibilities.

The estimated cost of **Reliability Network Upgrades** identified in this Group Study, if any, 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 and associated proposed Network Upgrades, (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. **Plan of Service Reliability Upgrades** are 100% allocated to the particular IC and are detailed in each IC's Appendix A report.

The estimated cost of all **Local Delivery Network Upgrades** identified in the Deliverability Assessment are assigned to all Interconnection Requests selecting Full or Partial 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 an **Area Delivery Network Upgrade** divided by the Phase I Incremental MW for the Area Deliverability Constraint establishes the ADNU cost rate for the Cluster 6 Phase I projects whose deliverability are constrained by the Area Deliverability Constraint.

The estimated cost of all **Interconnection Facilities** is assigned to each Interconnection Request individually. The cost estimates for the Interconnection Facilities are all site specific and details are provided in each individual project report.

Table 7-1 Reliability Upgrades, Estimated Costs, and Estimated Time to Construct Time Summary

Reliability Upgrade	**Estimated Cost x 1,000 Constant Dollars (2013)**	**Estimated Cost x 1,000 Constant Dollars (Operational Year)** *Note 1*	**Estimated Time to Construct** (Months) *Note 2*
None			
Total	**-**	**-**	

Table 7-2 Local Delivery Network Upgrades, Estimated Costs, and Estimated Time to Construct Time Summary

Local Delivery Network Upgrade	**Estimated Cost x 1,000 Constant Dollars (2013)**	**Estimated Cost x 1,000 Constant Dollars (Operational Year)** *Note 1*	**Estimated Time to Construct** (Months) *Note 2*
Reconductor Maricopa-Copus 70 kV Line (Gardner Tap-S620 Tap)	$1,998	$2,215	27
Reconductor Maricopa-Copus 70 kV Line (Maricopa-Gardner Tap)	$3,389	$3,758	27
Reconductor Fellows-Taft 115 kV Line (Fellows-Morgan)	$696	$772	42
Reconductor Fellows-Taft 115 kV Line (Morgan-Midset)	$1,266	$1,404	42
Reconductor Midway-Q966SS 115 kV Line (Midway-Cymric)	$7,190	$7,972	42
Reconductor Midway-Q966SS 115 kV Line (Cymric-Q966SS)	$1,072	$1,222	42
Reconductor Q479SS-Smyrna 115 kV Line (Q340 Tap-Q479SS)	$12,931	$15,153	87
Reconductor Q479SS-Smyrna 115 kV Line (Q340 Tap-Smyrna)	$13,093	$15,757	87
Reconductor Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)	$13,811	$17,070	87
Reconductor Smyrna-Semitropic-Midway 115 kV Line (McKibben-Semitropic Jct.)	$6,101	$7,342	87
Reconductor Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct.-Ganso)	$13,871	$17,607	87
Reconductor Smyrna-Semitropic-Midway 115 kV Line (Smyrna-McKibben)	$12,205	$13,533	87
Total	**$87,623**	**$103,805**	

Table 7-3 Area Delivery Network Upgrades, Estimated Costs, and Estimated Time to Construct Time Summary

Area Delivery Upgrade	Estimated Cost x 1,000 Constant Dollars (2013)	Estimated Cost x 1,000 Constant Dollars (Operational Year) *Note 1*	Estimated Time to Construct (Months) *Note 2*
None			
Total	**-**	**-**	

Note 1: *The escalation factors to convert the estimated cost (in 2013 dollars) to the operational year are found in the published per unit table in CAISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx*

Note 2: *The Estimated Time to Construct is the schedule for the PTO to complete only the construction activities for the specified facility assuming an estimated construction start date of September 1, 2015. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.*

8 Affected Systems Coordination

The CAISO Generator Interconnection and Deliverability Allocation Procedures (GIDAP) tariff Appendix DD section 3.7 requires that as part of the generator interconnection process, the ISO must regularly coordinate with adjacent electric systems in order to facilitate studies of potential reliability concerns caused by the interconnection of generation in the ISO queue to the ISO controlled grid. Similarly, generators interconnecting to the facilities of transmission owners in adjacent electric systems may cause potential reliability concerns on the ISO controlled grid.

The ISO tariff defines an “affected system” as an electric system other than the ISO controlled grid that may be affected by the proposed interconnection, and an “affected system operator” as the entity operating an affected system. The ISO tariff provides a general framework for addressing the impact on affected systems of generation projects in the ISO interconnection queue. The tariff states that, in the initial project study stages, the ISO will:

- Notify potential affected system operators that could be impacted by a generator interconnection;
- Coordinate the conduct of studies to determine possible impacts; and
- Include potential affected system operators in all customer meetings.

However, the ISO does not comprehensively study the impacts of generator interconnections on affected systems, for several reasons. First, the ISO does not have detailed information about affected systems on a transmission-element level, nor does the ISO know the details of the various reliability and operating criteria applicable to the affected systems. Second, because the

operation of transmission systems changes over time along with NERC reliability standards, the ISO cannot presume to know all of the impacts of these changes on affected systems. Consequently, the interconnection customer is responsible for:

- Cooperating with the ISO in all matters related to the affected system studies;
- Signing a separate study agreement with the affected system operator so that potential impacts on the affected system can be evaluated; and
- Paying for necessary studies and any upgrades necessary to mitigate the impacts of their interconnection on the affected system.

Further, the affected system operator is required to cooperate with the ISO on all matters related to the conduct of studies and modifications to the affected system.
The interconnection customer is obligated by the terms of the ISO's relevant generator interconnection agreement (large or small) to enter into an agreement with the affected system operator, which must specify the terms governing payments for studies and mitigation, if required, to be made by the customer to the affected system owner, and repayment by the affected system operator.

The ISO has advised the interconnection customer as to which systems their interconnection is potentially affecting. Prior to its generating unit in-service date, an interconnection customer must provide documentation to the ISO confirming that the affected system operators have been contacted, that any system reliability impacts have been addressed (or that there are no system impacts), or that the interconnection customer has taken all reasonable steps to address potential reliability system impacts with the affected system operator but has been unsuccessful.

Also, as part of PG&E's obligations to NERC as the registered Transmission Owner for the PG&E transmission system, the study results of this interconnection will be communicated to the neighboring entities that may be impacted for purposes of coordination and incorporation in the neighboring entity's transmission assessments. Input from the CAISO and other neighboring entities are solicited to ensure coordination of transmission systems.

In addition, the interconnection of the Cluster 6 Phase I projects should not adversely affect the ability of PG&E to honor its Encumbrances, including under the Owners Coordinated Operation Agreement (OCOA). For example, the OCOA requires avoidance of system changes that would adversely impact existing California/Oregon Intertie (COI) transfers; reduce the rated system transfer capacity (RSTC) or available system transfer capacity (ASTC) of the Pacific AC Intertie between Malin and Tesla (PACI) and/or the California Oregon Transmission Project (COTP); or cause increased risk of curtailments of the PACI and/or COTP.

Likewise, for any Cluster 6 Phase I project that has initiated WECC path rating studies for COI, if these studies indicate system performance deficiencies that adversely affect maintaining the existing transfer levels at COI, PACI, or COTP, then it is the responsibility of the IC to mitigate the system performance deficiencies by curtailing of the output of the IC generation so that PG&E's OCOA Encumbrances are honored.

8.1 Maintenance of Encumbrances

Per CAISO Tariff Section 25.3, new generating facilities shall not adversely impact PG&E's ability to honor its existing Encumbrances. PG&E, in consultation with the CAISO, will identify any adverse effects on its Encumbrances in the interconnection studies. To the extent that PG&E determines that the interconnection of the new generating facility will have an adverse effect on Encumbrances, the study results herein include mitigation for such adverse effect.

8.2 Affected Systems

Affected System overloaded facilities, if any identified, are listed in Appendix E.

9 Technical Requirements

The PG&E Interconnection Handbook explains the technical requirements for interconnection of loads and generators to PG&E's transmission system. The Interconnection Handbook documents facility connection requirements to the PG&E system as required in NERC Standard FAC-001-0. They are based on applicable FERC and CPUC rules and tariffs (e.g., Electric Rules 2, 21 and 22), as well as accepted industry practices and standards. In addition to providing reliability, these technical requirements are consistent with safety for PG&E workers and the public.

The PG&E Interconnection Handbook applies to Retail and Wholesale Entities, which own or operate generation, transmission, and end user facilities that are physically connected to, or desire to physically connect to PG&E's electric system. All technical requirements described or referred to in the Handbook apply to new or re-commissioned Generation Facilities. The Generation Interconnection Handbook comprising sections G-1 through G-6 applies to Generation Entities.

PG&E has established standard operating, metering and equipment protection requirements for loads and generators. The Interconnection Handbook covers such requirements for all transmission-level load and generation entities wishing to interconnect with PG&E's electric system. Additional, project-specific requirements may apply and are documented in this report.

The PG&E Interconnection Handbook includes, but is not limited to such operating requirements as the following:

- The Project must be able to meet the power factor requirements7.
- The Project must have Automatic Voltage Regulation (AVR) and be able to maintain the generator voltage under steady-state conditions within ±0.5 percent of any voltage level between 95 percent and 105 percent of the rated generator voltage.

Generators must also meet all applicable CAISO, NERC, and Western Electric Coordinating Council (WECC) standards. NERC and WECC standards include, but are not limited to such requirements as the following:

- The Project must be able to remain on line during voltage disturbances up to the time periods and associated voltage levels as required by the WECC Low Voltage Ride Through (LVRT) standards that are in-line with FERC Order No. 661-A. PRC-024-WECC-RBP-0.1 WECC Low Voltage Ride Through Regional Business Practice Effective Date 4-8-2005 is available on the WECC web site at:

  http://www.wecc.biz/library/Documentation%20Categorization%20Files/Regional%20Business%20Practices/PRC-024-WECC-RBP-0.1.pdf

- Currently NERC is working on a Voltage Ride Through standard, PRC-024-1, that would be applicable to all generators interconnecting to the transmission grid. Until PRC-024-1

[7] The CAISO Tariff requires that asynchronous generation projects be able to meet power factor requirements of 0.95 lagging and 0.95 leading, if studies identify the need based on meeting reliability and safety requirements.

is effective, PG&E and the CAISO will require that all generators comply with the existing WECC LVRT requirements. The PRC-024-1 standard Draft 1 can be found on the NERC web site at

http://www.nerc.com/docs/standards/sar/PRC-024-1_Draft1_2009Feb17.pdf

All generators must satisfy the requirements of the PG&E's Interconnection Handbook and meet all applicable CAISO, NERC, and WECC standards. PG&E will not agree to interconnect any new generators unless all technical and contractual requirements are met.

The IC should be aware that the information in the PG&E Interconnection Handbook is subject to change. Parties interconnecting to the PG&E electric system should verify with their PG&E representative that they have the latest versions. The PG&E Interconnection Handbook is available on the PG&E web site at: http://www.pge.com/about/rates/tariffbook/ferc/tih/

10 Environmental Evaluation / Permitting

10.1 CPUC General Order 131-D

The California Public Utilities Commission's (CPUC) General Order 131-D (GO 131-D) sets for the permitting requirements for certain electrical and generation facilities. GO 131-D was established by the CPUC to be responsive to: the requirements of the California Environmental Quality Act (CEQA); the need for public notice and the opportunity for affected parties to be heard by the CPUC; and the obligations of the utilities to serve their customers in a timely and efficient manner.

Electric facilities between 50 and 200 kV are subject to the CPUC's Permit to Construct (PTC) review specified in GO 131-D, Section III.B. For facilities subject to PTC review, or for over 200 kV electric facilities subject to Certificate of Public Convenience and Necessity (CPCN) requirements specified in GO 131-D, Section III.A, the CPUC reviews utility PTC or CPCN applications pursuant to CEQA and serves as Lead Agency under CEQA. Section IX of GO 131-D discusses the requirements for PTC and CPCN applications.

Generally, PG&E takes approximately a minimum of 6-18 months to assemble a CPCN or PTC application, the majority of which time involves developing the required Proponent's Environmental Assessment (PEA). The CPUC review of such applications may take anywhere from 8 – 36 months depending on the specific project.

10.2 CPUC General Order 131-D – Permit to Construct/Exemptions

GO 131-D provides for certain exemptions from the CPUC PTC requirements for facilities between 50 and 200 kV. For example, Exemption f of GO 131-D (Section III.B.1.f) exempts from CPUC PTC permitting requirements power lines or substations between 50 - 200 kV to be constructed or relocated that have undergone environmental review pursuant to CEQA as part of a larger project, and for which the final CEQA document (Environmental Impact Report or Negative Declaration) finds no significant unavoidable environmental impacts caused by the proposed line or substation. Note, GO 131-D, Section III.B.2, discusses the conditions under which PTC exemption shall not apply (consistent with CEQA Guidelines).

After lead agency approval of the final CEQA document which confirms there are no significant environmental impacts associated with the PG&E scope of work, PG&E may be eligible to use Exemption f, and in doing so would follow certain limited public noticing requirements, including filing an informational Advice Letter at the CPUC, posting the project site/route, providing notice

to the local jurisdiction(s) planning director and the executive director of the California Energy Commission (CEC), and advertising the project notice, for once a week for two weeks successively in a local newspaper. As part of an agreement with the CPUC Energy Division, PG&E informally provides a copy of the final CEQA document to the CPUC Energy Division for reference when the Advice Letter is pending before the CPUC.

Note, the CPUC rules for Advice Letters consider an Advice Letter to be in effect on 30th calendar day after the date filed, and GO 131-D specifies a minimum period of 45-days between advertising the notice for the project and when construction can occur.

Typically, PG&E may proceed with construction 45-days after it has filed its Advice Letter and has posted and advertised the project notice unless a protest is filed and/or CPUC staffs suspend the Advice Letter. If protests are filed, they must address whether PG&E has properly claimed the exemption. PG&E has 5 business days to respond to the protest and the CPUC will typically take a minimum of 30 days to review the protest and PG&E's response, and either dismiss the protests or require PG&E to file a Permit to Construct. PG&E has no control over the time it takes the CPUC to respond when issues arise. If the protest is granted, PG&E may then need to apply for a formal permit to construct the project (i.e., Permit to Construct).

If PG&E facilities are not included in the larger project's CEQA review, or if the project does not qualify for the exemption due to significant, unavoidable environmental impacts, or if the exemption is subject to the "override" provision in GO 131-D, Section III.B.2, PG&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., Mitigated Negative Declaration or Environmental Impact Report).

Note, for projects undergoing no CEQA review but instead only undergoing a review under the National Environmental Policy Act (NEPA) due to the lead agency being a federal agency (such as the BLM), GO 131-D technically does not allow for the use of Exemption f when the environmental review is conducted only pursuant to NEPA and does not have a CEQA component. As such, PG&E would need to review such projects on a case-by-case basis with the CPUC to determine if the CPUC would allow the project to proceed under Exemption f or instead allow PG&E to proceed under an "expedited" PTC application by attaching the NEPA document in lieu of a PEA.

For projects that are not eligible for Exemption f, but have already undergone CEQA or NEPA review, PG&E may be able to file an "expedited" PTC application, which typically takes the CPUC approximately 4-6 months to process.

10.3 CPUC General Order 131-D – Certificate of Public Convenience & Necessity (CPCN) Exceptions

When PG&E's transmission lines are designed for immediate or eventual operation at 200 kV or more, GO 131-D requires PG&E to obtain a Certificate of Pubic Convenience and Necessity (CPCN) from the CPUC unless one of the following exceptions 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.

Unlike Exemption f relating to the exemptions allowed from a Permit to Construct for electric facilities between 50 – and 200 kV, no such exemption exists for electric facilities over 200 kV transmission lines that have undergone environmental review pursuant to CEQA as part of a

larger project, and for which the final CEQA document finds no significant unavoidable environmental impacts caused by the proposed line or substation. Accordingly, PG&E would need to consult on a case-by-case basis with the CPUC for such projects CPUC would allow the project to proceed "exempt" or instead allow PG&E to proceed under an "expedited" CPCN application by attaching the final CEQA document in lieu of a PG&E Proponent's Environmental Assessment. Such an expedited CPCN with the environmental review already completed by the lead agency that permitted the Interconnection Customer's generator project, typically may take from only 4-6 months for the CPUC to process.

10.4 CPUC General Order 131-D – General Comments Relating to Environmental Review of PG&E Scope of Work as Part of the Larger Generator Project

For the benefits and reasons stated above, It is assumed that the Interconnection Customer will include PG&E's Interconnection Facilities and Network Upgrades work scope (including facilities to be constructed by others and deeded to PG&E) in the Interconnection Customer's environmental reports/applications submitted to the lead agency permitting the Interconnection Customer's larger generator project (e.g., California Energy Commission or applicable local, state or federal permitting agency, such as the Bureau of Land Management), and that such agencies will review the potential environmental impacts associated with PG&E's work scope in any environmental document issued. This may enable PG&E to proceed "exempt" from CPUC permitting requirements or under an "expedited" PTC or CPCN. However, depending on certain circumstances, the CPUC may still require PG&E to undergo a standard PTC or CPCN for the generator tie line and Network Upgrades work associated with the Interconnection Customer's Project. PG&E may also be required to obtain other authorizations for its interconnection facilities and network upgrades. Hence, the PG&E's facilities needed for the project interconnection could require an additional two years, or more, to license and permit. The cost for obtaining any of this type of permitting is not included in the cost estimates.

Please see 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

10.5 CPUC Section 851

Because PG&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 PG&E to obtain CPUC approval of leases and licenses to use PG&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, and requires compliance with the California Environmental Quality Act (CEQA). PG&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, PG&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.

10.6 PG&E scope of work NOT subject to CPUC General Order 131-D

Certain PG&E facilities and scope of work may not be subject to CPUC's GO 131D. In such instances, PG&E will follow the requirements of all applicable environmental laws and regulations and issue an in-house Environmental Clearance before commencement of construction activities.

11 Items Not Covered in this Report

11.1 Conceptual Plan of Service

The results provided in this study are based on conceptual engineering and a preliminary plan of service and are not sufficient for permitting of facilities. The Plan of Service is subject to change as part of the Final Engineering and Design.

11.2 Customer's Technical Data

The study accuracy and results for the QC6 Phase I Study are contingent upon the accuracy of the technical data provided by the Interconnection Customer. Any changes from the data provided could void the Study results.

11.3 Study Impacts on Neighboring Utilities

Results or consequences of this QC6 Phase I Study and/or to-be-performed Phase I Interconnection Study may require additional studies, facility additions, and/or operating procedures to address impacts to neighboring utilities and/or regional forums. For example, impacts may include but are not limited to WECC Path Ratings, short circuit duties outside of the CAISO Controlled Grid, etc.

11.4 Use of Participating TO Facilities

The Interconnection Customer is responsible for acquiring all property rights necessary for the Interconnection Customer's Interconnection Facilities, including those required to cross PTO facilities and property. This Interconnection Study does not include the method or estimated cost to the Interconnection Customer of PTO mitigation measures that may be required to accommodate any proposed crossing of PTO facilities. The crossing of PTO property rights shall only be permitted upon written agreement between PTO and the Interconnection Customer at PTO's sole determination. Any proposed crossing of PTO property rights will require a separate study and/or evaluation, at the Interconnection Customer's expense, to determine whether such use may be accommodated.

11.5 Participating Transmission Owner Interconnection Handbook

The Interconnection Customer shall be required to adhere to all applicable requirements in the PTO Interconnection Handbook. These include, but are not limited to, all applicable protection, voltage regulation, VAR correction, harmonics, switching and tagging, and metering requirements.

11.6 Western Electricity Coordinating Council (WECC) Policies

The Interconnection Customer shall be required to adhere to all applicable WECC policies including, but not limited to, the WECC Generating Unit Model Validation Policy.

11.7 System Protection Coordination

Adequate Protection coordination will be required between PTO-owned protection and Interconnection Customer-owned protection. If adequate protection coordination cannot be achieved, then modifications to the Interconnection Customer-owned facilities (i.e., Generation-tie or Substation modifications) may be required to allow for ample protection coordination.

11.8 Standby Power and Temporary Construction Power

The QC6 Phase I Study does not address any requirements for standby power or temporary construction power that the Project may require prior to the in-service date of the Interconnection Facilities. Should the Project require standby power or temporary construction power from Participating TO prior to the in-service date of the Interconnection Facilities, the IC is responsible to make appropriate arrangements with Participating TO to receive and pay for such retail.

11.9 Construction Schedule

The estimated time to construct (ETC) is for a typical project; schedules and duration may change due to number of projects approved and release dates. Stacked projects impact resources, system outage availability, and environmental windows of construction. The assumption is that the PTO 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.

It is assumed that the IC will include the PG&E's Interconnection Facilities and Network Upgrades work scope, as they apply to work within public domains, in its environmental impact report to the CPUC. However, note that CPUC may still require the PG&E to obtain a Permit to Construct (PTC) or a Certificate of Public Convenience and Necessity (CPCN) for the generator tie line and Network Upgrades work associated with the Project. Hence, the facilities needed for the project interconnection could require an additional two to three years to complete. The cost for obtaining any of this type of permitting is not included in the above estimates.

11.10 Network/Non-Network Classification of Telecommunication Facilities

The cost for telecommunication facilities that were identified as part of the IC's Interconnection Facilities was based on an assumption that these facilities would be sited, licensed, and constructed by the IC. The IC will own, operate, maintain, and construct diverse telecommunication paths associated with the IC's gen tie, excluding terminal equipment at both ends. In addition, the telecommunication requirements for SPS were assumed based on tripping of the generator breaker as opposed to tripping the circuit breakers at the PTO substation. Due to uncertainties related to telecommunication upgrades for the numerous projects in queue ahead of QC6 Phase I, telecommunication upgrades for higher queued projects were not considered in this study. Depending on the outcome of interconnection studies for higher queued projects, the telecommunication upgrades identified for QC6 Phase I may be reduced. Any changes in these assumptions may affect the cost and schedule for the identified telecommunication facilities.

11.11 Ground Grid Analysis

A detailed ground grid analysis may be required as part of the final engineering for the project at the PTO substations whose ground grids were been flagged with duty concerns in Section G of this report.

11.12 Applicability

This document has been prepared to identify the impact(s) contributions of the Project on the PTO electrical system; as well as establish the technical requirements to interconnect the Project to the Point of Interconnection that was evaluated in the QC6 Phase I study for the Project. Nothing in this report is intended to supersede or establish terms/ conditions specified in interconnection agreements agreed to by PTO, CAISO and the Interconnection Customer.

12 Definitions

ADNU	Area Delivery Network Upgrade
BES	Bulk Electric System
CAISO	California Independent System Operator Corporation
CCSF	City and County of San Francisco
CDWR	California Department of Water Resources
COD	Commercial Operation Date
Deliverability Assessment	CAISO's Deliverability Assessment
EO	Energy-Only Deliverability Status
FC	Full Capacity Deliverability Status
FERC	Federal Energy Regulatory Commission
GIP	Generator Interconnection Procedures
GIDAP	Generator Interconnection and Deliverability Allocation Procedures
IC	Interconnection Customer
IID	Imperial Irrigation District
LDNU	Local Delivery Network Upgrade
LFBs	Local Furnishing Bonds
LGIA	Large Generator Interconnection Agreement
LMUD	Lassen Municipal Utility District
MeID	Merced Irrigation District
MID	Modesto Irrigation District
NCPA	Northern California Power Agency
NERC	North American Electric Reliability Corporation
NQC	Net Qualifying Capacity as modeled in the Deliverability Assessment:
PG&E	Pacific Gas and Electric Company
PMax	Maximum generation output
PTO	Participating Transmission Owner
RAS	Remedial Action Scheme (also known as SPS)
POI	Point of Interconnection
POS	Plan of Service
PSREC	Plumas Sierra Rural Electric Cooperative
RNU	Reliability Network Upgrade
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
SMUD	Sacramento Municipal Utility District
SPS	Special Protection System (also known as RAS)
SVC	Static VAr Compensator
SVP	Silicon Valley Power
TANC	Transmission Agency of Northern California
TID	Turlock Irrigation District
TPP	CAISO's Transmission Planning Process
TPD	Transmission Plan Deliverability. Deliverability supported by the CAISO's Transmission Plan
WAPA	Western Area Power Administration
WDT	Wholesale Distribution Tariff
WECC	Western Electricity Coordinating Council

Appendix A – Q1000

Hydrogen Energy California, LLC

HECA SCS

Queue Cluster 6 Phase I Study

Final Report



January 17, 2014

This study has been completed in coordination with Pacific Gas and Electric per CAISO Tariff Generator Interconnection and Deliverability Allocation Procedures (GIDAP) Appendix DD

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Attachments:

1. **Not Used**
2. **Not Used**
3. **Not Used**
4. **Short Circuit Calculation Study Results (Refer to Appendix H of the PG&E Kern Area Interconnection Study Report)**
5. **Deliverability Assessment Results (Refer to Appendix I of the PG&E Kern Area Interconnection Study Report)**
6. **Generator Machine Dynamic Data**
7. **Transient Stability Plots**
8. **Preliminary Protection Requirements**
9. **Not Used**
10. **Substation Work Scope**

1. Introduction

Hydrogen Energy California, LLC, the Interconnection Customer (IC), has submitted a completed Interconnection Request (IR) to the California Independent System Operator Corporation (CAISO) for their proposed HECA SCS (Project), interconnecting to the CAISO Controlled Grid. The Project is a combined cycle plant with a total rated output of 300 MW to the Pacific Gas and Electric Company's (PG&E's) Midway-Wheeler Ridge 230kV line in Kern County, CA. The customer has requested Full Capacity Deliverability Status, a proposed in-service date of January 1, 2018 and a proposed Commercial Operation Date (COD) of January 1, 2019. The Project occupies Queue Position Q1000 of the CAISO Queue.

In accordance with Federal Energy Regulatory Commission (FERC) approved CAISO Tariff Generator Interconnection and Deliverability Allocation Procedures (GIDAP) Appendix DD, the Project was grouped with Queue Cluster 6 (QC6) Phase I Study projects to determine the impacts of the group as well as impacts of the Project on the CAISO Controlled Grid.

The PG&E Kern Area Interconnection Study report has been prepared separately identifying the combined impacts of all projects in the group on the CAISO Controlled Grid. This report focuses only on the impacts or impact contributions of this Project, and it is not intended to supersede any contractual terms or conditions specified in an interconnection agreement.

The report provides the following:

1. Transmission system impacts caused by the Project,
2. System reinforcements necessary to mitigate the adverse impacts caused by the Project under various system conditions, and
3. A list of required facilities and a non-binding, good faith estimate of the Project's cost responsibility and time to construct these facilities.

Table 1-1 provides general information about the Project, as modeled in the Phase I study based on the IC provided IR.

Table 1-1: Project General Information as Modeled

Project Parameters	Project Specific Data
Project Location	Buttonwillow, Kern County, CA GPS Coordinates: 35.340309 N, 119.376727 W
Participating TO's Planning Area	Kern
Number and Type of Generators	1 x 406.8 MW MHI Synchronous Unit
Interconnection Voltage	230 kV
Maximum Generator Output at generator Terminal	405 MW
Generator Auxiliary Load	105 MW
Maximum Net Output	300 MW
Power Factor Range	0.95 leading to 0.90 lagging
Step-up Transformer(s)	three-phase 238/21, rated for 270/360/450 MVA with Z=9% at 270 MVA
Point of Interconnection	Midway - Wheeler Ridge 230kV Bus
Interconnection Customer Requested Commercial Operation Date	January 1, 2019

Figure 1-1 provides a map of the project location and transmission facilities in the vicinity. Figure 1-2 shows the conceptual single line diagram of the Project as modeled in the study.

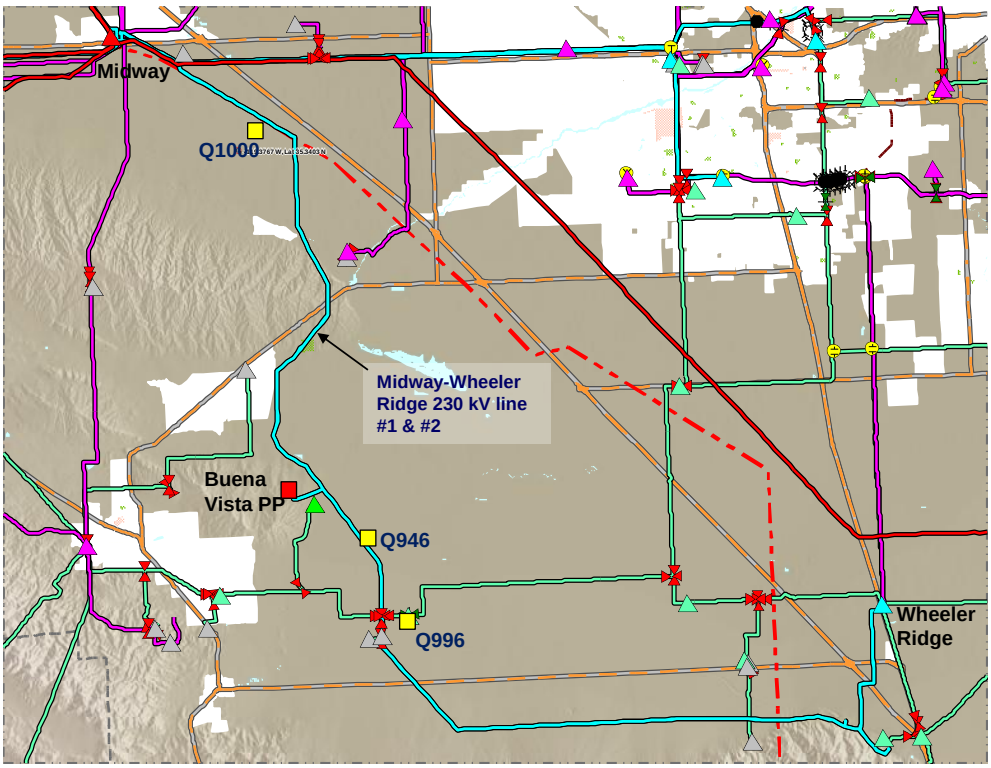


Figure 1-1: Project Vicinity Map

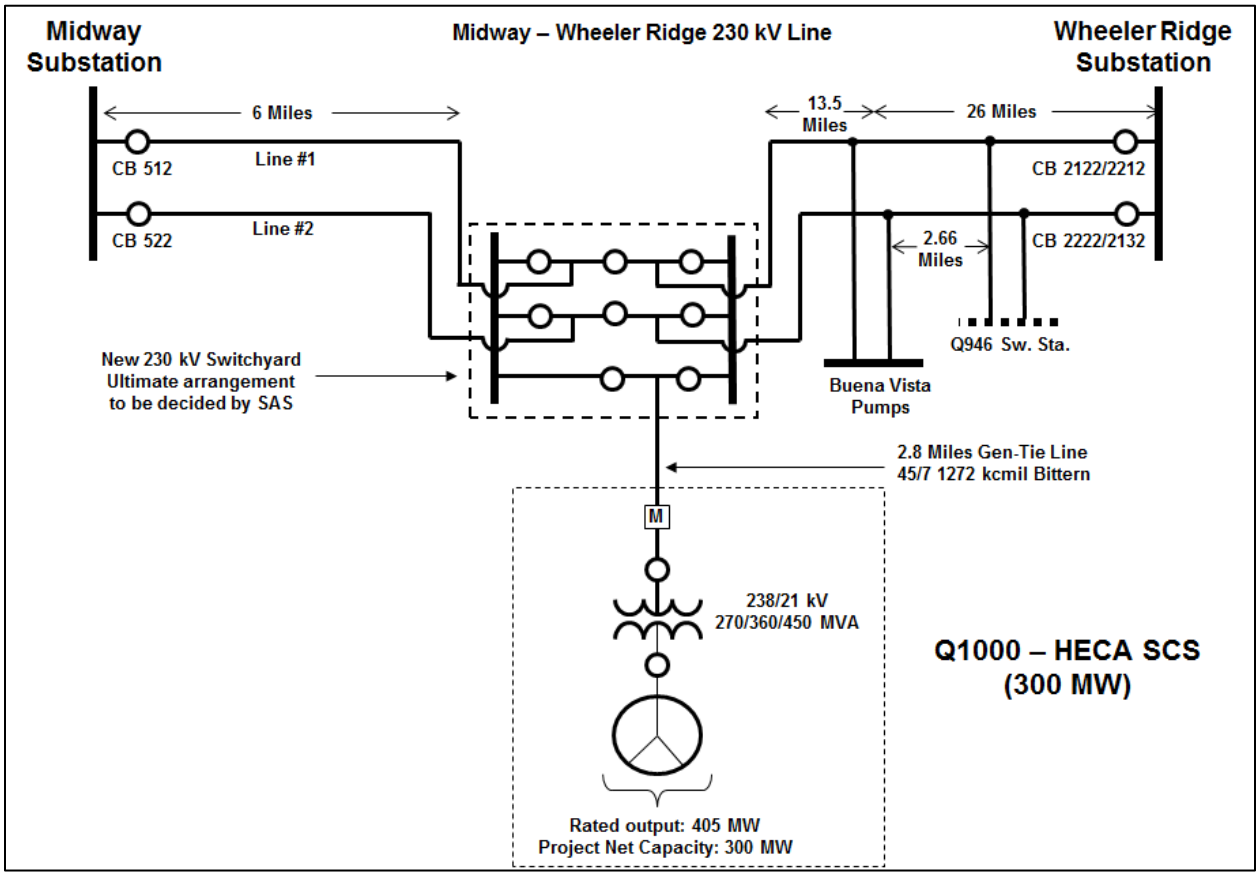


Figure 1-2: Proposed Single-Line Diagram

2. Study Assumptions

For detailed assumptions, please refer to Section 2 of the PG&E Kern Area Interconnection Study report.

The following assumptions are only specific to the Project:

1. The IC will engineer, procure, construct, own, operate and maintain its project facility, including the generator tie line.

2. PG&E will engineer, procure, construct, own, operate and maintain the new 230 kV loop lines that will interconnect the new 230 kV switching station to the Midway Wheeler Ridge 230 kV Line.

3. Reliability Standards, Study Criteria and Methodology

The generator interconnection studies will be conducted to ensure the CAISO-controlled-grid is in compliance with the North American Electric Reliability Corporation (NERC) reliability standards, WECC regional criteria, and the CAISO planning standards. Refer to Section 3 of the PG&E Kern Area Interconnection Study report for details of the applicable reliability standards, study criteria and methodology.

4. Reliability Assessment Results

Refer to the PG&E Kern Area Interconnection Study Report for details of the Reliability Assessment.

4.1 Steady State Reliability Thermal Loading Assessment Results

The complete reliability thermal assessment results are provided in Appendix E of the Kern Area Interconnection Study Report.

4.1.1 Mitigation

The reliability thermal loading assessment did not identify any Reliability Network Upgrades (RNU) for this Project.

4.2 Reliability Voltage Assessment Results

The voltage and reactive power analysis results in the post-project power flow cases were compared to the voltage and reactive power analysis results in the pre-project power flow cases.

4.2.1 Steady-State Voltage Results

There were no steady-state voltage violations identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.2.2 Post-Transient Voltage Stability Results

There were no post-transient voltage stability violations identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.2.3 Reactive Power Deficiency Results

There were no reactive power deficiency results identified in the reliability analysis for the PG&E Kern Interconnection Area.

4.2.4 Mitigation

The reliability voltage assessment did not identify any Reliability Network Upgrades for this Project.

4.3 Short Circuit Analysis

Short circuit studies were performed to determine the impact of adding the Cluster 6 Phase I PG&E Kern Interconnection Area projects to the transmission system. These studies are also needed to perform relay coordination among adjacent substations. The fault duties were calculated before and after the Cluster 6 Phase I projects to identify any equipment overstress conditions. The fault duties were calculated once again after the mitigation plan was added in the short circuit base case. For circuit breakers identified as overstressed, the upgrade cost was allocated based on the criteria described in Section 3.7 of the PG&E Kern Area Interconnection report.

4.3.1 Short-Circuit Analysis Input Data

- X"1 = 0.196 pu
- X2 = 0.192 pu
- X0 = 0.11 pu

Generation Step-up Transformer

The transformer is three-phase, 238/21 kV (Yg-Δ), for 270/360/450 MVA OAN/OAF/OAF @ 55/55/65° C temperature rise with impedance values of 9.0% @ 270 MVA base.

Generation Tie Line

The generation tie line was assumed to be 2.8 miles of 45/7 1272 Kcmil ACSR conductor with the following impedance information:

- Z1 = 0.000440 + j0.003993 p.u.
- Z0 = 0.002822 + j0.011027 p.u.
- B/2 = 0.00424 p.u.

4.3.2 Short-Circuit Analysis Results

The short circuit duty (SCD) assessment did not find any SCD violations on the system due to the addition of this Project. The SCD assessment results are provided in Appendix H of the PG&E Kern Area Interconnection Study Report.

4.3.3 Mitigation

No short circuit duty mitigations are required for the Project.

4.3.4 Preliminary Protection Requirements

Per Section G2.1 of the PG&E Interconnection Handbook[1], PG&E protection requirements are designed and intended to protect PG&E's system only. The applicant is responsible for the protection of its own system and equipment and must meet the requirements in the PG&E Interconnection Handbook.

The preliminary protection requirements were based upon the interconnection plan as shown in Figure 1-2. The preliminary protection requirements are detailed in Attachment 8.

Protection requirements may include but are not limited to Direct Transfer Trip (DTT) schemes installed at PG&E and IC facilities. The IC is responsible for installing the leased lines used for DTT communication and the necessary DTT transmitters. As of 2012, third parties were having significant problems obtaining appropriate traditional metallic (4 wire) Class A TELCOM circuits for new generation. A Bulletin is included in Appendix "F" of PG&E's Generation Interconnection Handbook describing three options for providing acceptable performance related to Transfer Trip (TT) applications. After the Generator Interconnection Agreement is executed, the IC must work with the assigned PG&E Electric Generation Interconnection (EGI) representative to finalize the option selected.

4.4 Transient Stability Analysis

Limited transient stability analysis was conducted using the summer peak full loop base cases to ensure that the transmission system remains stable and meets the WECC Disturbance Performance Criteria. The generator dynamic data used in the study for the Project is shown in Attachment 6.

4.4.1 Transient Stability Study Scenarios

Disturbance simulations were performed for a study period of 10 seconds for selected Category B (loss of single element) and Category C (loss of multiple elements) outages. For this Project, the following outages were evaluated:

- **Category "B" Contingencies**

    1. A three-phase fault on the Midway 500/230 kV Transformer #11 at the Midway 230 kV bus with normal clearing time followed by loss of the Midway 500/230 kV Transformer #11.
    2. A three-phase fault on the Midway 500/230 kV Transformer #12 at the Midway 230 kV bus with normal clearing time followed by loss of the Midway 500/230 kV Transformer #12.
    3. A three-phase fault on the Midway 500/230 kV Transformer #13 at the Midway 230 kV bus with normal clearing time followed by loss of the Midway 500/230 kV Transformer #13.
    4. A three-phase close-in fault on the Midway-Q1000 #1 230 kV Line at Midway with

[1] The PG&E Interconnection Handbook is available on the PG&E website at http://www.pge.com/about/rates/tariffbook/ferc/tih/.

normal clearing times followed by loss of the Midway -Q1000 #1 230 kV Line.

5. A three-phase close-in fault on the Midway-Q1000 #1 230 kV Line at Q1000 with normal clearing times followed by loss of the Midway -Q1000 #1 230 kV Line.
6. A three-phase close-in fault on the Midway-Q1000 #2 230 kV Line at Midway with normal clearing times followed by loss of the Midway -Q1000 #2 230 kV Line.
7. A three-phase close-in fault on the Midway-Q1000 #2 230 kV Line at Q1000 with normal clearing times followed by loss of the Midway -Q1000 #2 230 kV Line.
8. A three-phase close-in fault on the Q946 SS-Q1000 SS 230 kV Line at Q946 SS with normal clearing times followed by loss of the Q946 SS-Q1000 SS 230 kV Line.
9. A three-phase close-in fault on the Q946 SS-Wheeler Ridge 230 kV Line at Q946 normal clearing times followed by loss of the Q946 SS-Wheeler Ridge 230 kV Line.
10. A three-phase close-in fault on the Q1000 SS-Wheeler Ridge 230 kV Line at Q1000 SS with normal clearing times followed by loss of the Q1000 SS-Wheeler Ridge 230 kV Line.
11. A three-phase close-in fault on the Q946 Generator Tie at the Q946 with normal clearing times followed by loss of the Q946 Generator Tie.
12. A three-phase close-in fault on the Q1000 Gen Tie Line at Q1000 SS 230 kV end with normal clearing times followed by loss of the Q1000 Generator Tie
13. Full Load Rejection of Project with no fault applied.

- **Category "C" Contingencies**

1) A three-phase fault at the Midway 230 kV bus section 1D with normal clearing time followed by loss of the Midway 230 kV bus section 1D.
2) A three-phase fault at the Midway 230 kV bus section 1E with normal clearing time followed by loss of Midway 230 kV bus section 1E.
3) A three-phase fault at the Midway 230 kV bus section 1F with normal clearing time followed by loss of Midway 230 kV bus section 1F.
4) A three-phase fault at the Midway 230 kV bus section 2D with normal clearing time followed by loss of Midway 230 kV bus section 2.
5) A three-phase fault at the Midway 230 kV bus section 2E with normal clearing time followed by loss of Midway 230 kV bus section 2E.
6) A three-phase fault at the Midway 230 kV bus section 2F with normal clearing time followed by loss of Midway 230 kV bus section 2F.
7) A three-phase close-in fault on the Midway -La Paloma #1 and #2 230 kV Lines at Midway with normal clearing times followed by loss of the Midway -La Paloma #1 and #2 230 kV Lines.
8) A three-phase close-in fault on the Midway -Q1000 #1 and #2 230 kV Lines at Midway with normal clearing times followed by loss of the Midway -Q1000 230kV #1 and #2 Lines.
9) A three-phase close-in fault on the 6C1000SS-Wheeler Ridge #1 and Q1000 SS-Q946 SS #2 230 kV Lines at Q1000 SS with normal clearing times followed by loss of the Q1000 SS-Wheeler Ridge #1 and Q1000 SS-Q946 SS #2 230 kV Lines.

10) A three-phase close-in fault on the Q1000 SS-Wheeler Ridge #1 and Q946 SS-Wheeler Ridge #2 230 kV Lines at Q1000 SS with normal clearing times followed by loss of the Q1000 SS-Wheeler Ridge #1 and Q0946 SS-Wheeler Ridge #2 230 kV Lines.

4.4.2 Transient Stability Analysis Results

The transient stability analysis showed that the transmission system remained stable and met WECC Disturbance-Performance Criteria for all of the simulated outages. The results of the study are provided in the form of plots in Attachment 7.

4.4.3 Mitigation

The transient stability analysis did not identify any mitigation for this Project.

5. Deliverability Assessment Results

Refer to Section 5 of the PG&E Kern Area Interconnection Study Report for information about the Deliverability Assessment and methodology.

5.1 On-Peak Deliverability Assessment

The On-Peak Deliverability Assessment did not identify any deliverability constraints on the system due to the addition of the Project.

5.2 Off-Peak Deliverability Assessment – For Information Only

The Off-Peak Deliverability Assessment, if performed, is “For Information Only.” In accordance with the ISO off-peak deliverability assessment methodology, no off-peak deliverability assessment was performed for the Cluster 6 Phase I PG&E Kern Area Interconnection as there were no generators with fuel source that substantially occurs during off-peak conditions in this area.

5.3 Required Mitigation

The Deliverability Assessment did not identify any deliverability constraints on the system due to the addition of Project. Hence, no Delivery Network Upgrades (DNU) were required for the Project.

6. Scope of Upgrades – Interconnection Facilities and Network Upgrades

Refer to Tables 7-1 through 7-4 for the scope of the required upgrades.

7. Interconnection Facilities, Network Upgrades and their Cost and Construction Duration Estimates

The Participating Transmission Owner's (PTO) Interconnection Facilities and Network Upgrades described in this section are based on the Participating Transmission Owner's (PTO) preliminary engineering and design. Such descriptions are subject to modification to reflect the actual facilities constructed and installed following the PTO's final engineering and design, identification of field conditions, and compliance with applicable environmental and permitting requirements.

To determine the cost responsibility of each generation project in the Cluster 6 Phase I Study, the CAISO developed cost allocation factors based on the individual contribution of each project (Attachment 1). Tables 7-1 through 7-4 below provide the cost in 2013 dollars and their cost escalated to the estimated operating year for Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades (LDNU and ADNU). For the Cluster 6 Phase I study, the estimated operating date is derived by assuming the duration of the work element will begin in September 2015.

The non-binding construction schedule to engineer and construct the facilities is based on the assumptions outlined in Section 2 of this report and is applicable from the signing of the Generator Interconnection Agreement (GIA). This is also based upon the assumption that the environmental permitting obtained by the IC is adequate for permitting all PG&E activities.

It is assumed that the IC will include the PG&E's Interconnection Facilities and Network Upgrades work scope, as they apply to work within public domains, in its environmental impact report to the CPUC. However, note that CPUC may still require the PG&E to obtain a Permit to Construct (PTC) or a Certificate of Public Convenience and Necessity (CPCN) for the generator tie line and Network Upgrades work associated with the Project. Hence, the facilities needed for the project interconnection could require an additional two to three years to complete. The cost for obtaining any of this type of permitting is not included in the above estimates.

Each Upgrade category may contain multiple scope durations. The longest duration is shown under the Estimated Time to Construct.

The non-binding construction schedule to license, engineer and construct the PTO's Interconnection Facilities and Reliability Network Upgrades is approximately 46 months from the signing of the Generator Interconnection Agreement (GIA) and receipt of financial posting.

7.1 Interconnection Facilities

Table 7-1: Escalated Cost and Time to Construct for Interconnection Facilities - IF

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Costs x 1,000	Estimated Time (Months) to Construct (Note 1)
PTO's Interconnection Facilities *(Note 2)*	New Switching Station:	• Gen-tie line relays, dead-end, 3-phase CCVTs and disconnect switch	100.00%	$1,100	$1,254	46
	Generation Site:	• Engineering reviews, metering, pre-parallel inspection, and project management • RTU and ISTS testing	100.00%	$349	$398	46
	Transmission Line Work	• Transmission Line: Install (1) span of conductor & (1) single-circuit TSP, and PG&E review	100.00%	$230	$262	46
			Total	**$1,679**	**$1,914**	

Note 1: The Estimated Time to Construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2013 dollars) to the operating year is found in the published per unit table in CAISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

Note 2: The Interconnection Customer is obligated to fund these upgrades and will not be reimbursed.

7.2 Network Upgrade

The maximum cost responsibility for the Network Upgrades[1] to interconnect the Project as shown in Tables 7-2 through 7-4 is **$29.81 Million**.

7.2.1 Reliability Network Upgrades - RNU

The maximum cost responsibility for the Network Upgrades[2] to interconnect the Project as shown in Tables 7-2 is **$29.81 Million**.

Table 7-2: Escalated Cost and Time to Construct for Reliability Network Upgrades (RNU)

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Costs x 1,000	Estimated Time (Months) to Construct (Note 1)
Reliability Network Upgrade	New Switching Station:	• 8CB BAAH • ISTS for SCADA/Fiber/Microwave	100.00%	$20,000	$22,801	46
	Midway Substation:	• New line relay packages (2) • ISTS for fiber termination	100.00%	$1,200	$1,368	46
	Q946 Switching Station:	• New line relay settings	100.00%	$50	$57	46
	Transmission Line:	• Install (3) double & (4) single-circuit TSPs and (10) spans of transmission line conductors	100.00%	$1,900	$2,166	46
	New Fiber Network Upgrades	• Install 6 miles fiber between Midway Substation and new switching station	100.00%	$3,000	$3,420	46
			Total	**$26,150**	**$29,813**	

Note 1: The Estimated Time to Construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals;

[1] The transmission facilities, other than Interconnection Facilities, beyond the point of interconnection necessary to physically and electrically interconnect the Project safely and reliably to the CAISO controlled-grid.

[2] The transmission facilities, other than Interconnection Facilities, beyond the point of interconnection necessary to physically and electrically interconnect the Project safely and reliably to the CAISO controlled-grid.

construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2013 dollars) to the operating year is found in the published per unit table in CAISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

7.2.2 Local Delivery Network Upgrades - LDNU

Table 7-3: Escalated Cost and Time to Construct for Local Delivery Network Upgrades (LDNU)

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Costs x 1,000	Estimated Time (Months) to Construct (Note 1)
Local Delivery Network Upgrade	None					
			Total			

Note 1: The Estimated Time to Construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2013 dollars) to the operating year is found in the published per unit table in CAISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

7.2.3 Area Delivery Network Upgrades – ADNU

Table 7-4: Escalated Cost and Time to Construct for Area Delivery Network Upgrades (ADNU)

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Costs x 1,000	Estimated Time (Months) to Construct (Note 1)
Area Delivery Network Upgrade	None					
			Total			

Note 1: The Estimated Time to Construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2013 dollars) to the operating year is found in the published per unit table in CAISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

8. PG&E Technical Requirements

Refer to Section 9 of the Cluster 6 Phase I PG&E Kern Area Interconnection Study Report.

9. Environmental Evaluation / Permitting Requirements

Refer to Section 10 of the Cluster 6 Phase I PG&E Kern Area Interconnection Study Report.

10. Items Not Covered in this Report

Refer to Section 11 of the PG&E Kern Area Interconnection Study Report for the list of items that are not covered in this study.

11. Definitions

ADNU	Area Delivery Network Upgrade
BES	Bulk Electric System
CAISO	California Independent System Operator Corporation
CCSF	City and County of San Francisco
CDWR	California Department of Water Resources
COD	Commercial Operation Date
Deliverability Assessment	CAISO's Deliverability Assessment
EO	Energy-Only Deliverability Status
FC	Full Capacity Deliverability Status
FERC	Federal Energy Regulatory Commission
GIP	Generator Interconnection Procedures
GIDAP	Generator Interconnection and Deliverability Allocation Procedures
IC	Interconnection Customer
IID	Imperial Irrigation District
LDNU	Local Delivery Network Upgrade
LFBs	Local Furnishing Bonds
LGIA	Large Generator Interconnection Agreement
LMUD	Lassen Municipal Utility District
MeID	Merced Irrigation District
MID	Modesto Irrigation District
NCPA	Northern California Power Agency
NERC	North American Electric Reliability Corporation
NQC	Net Qualifying Capacity as modeled in the Deliverability Assessment:
PG&E	Pacific Gas and Electric Company
PMax	Maximum generation output
PTO	Participating Transmission Owner
RAS	Remedial Action Scheme (also known as SPS)
POI	Point of Interconnection
POS	Plan of Service
PSREC	Plumas Sierra Rural Electric Cooperative
RNU	Reliability Network Upgrade

SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
SMUD	Sacramento Municipal Utility District
SPS	Special Protection System (also known as RAS)
SVC	Static VAr Compensator
SVP	Silicon Valley Power
TANC	Transmission Agency of Northern California
TID	Turlock Irrigation District
TPP	CAISO's Transmission Planning Process
TPD	Transmission Plan Deliverability - Deliverability supported by the CAISO's Transmission Plan
WAPA	Western Area Power Administration
WDT	Wholesale Distribution Tariff
WECC	Western Electricity Coordinating Council

Cluster 6 Phase I

Appendix B

System Assumptions

Table B-1: On-Peak Deliverability Assessment Import Target

Branch Group Name	Direction	Net Import MW	Import Unused ETC & TOR MW
Lugo-Victorville-BG	N-S	1432	141
COI_BG	N-S	3770	548
BLYTHE_BG	E-W	45	0
CASCADE_BG	N-S	36	0
CFE_BG	S-N	-119	0
ELDORADO_MSL	E-W	1213	0
IID-PG&E_BG	E-W	1000	0
IID-SDGE_BG	E-W	500	0
LAUGHLIN_BG	E-W	-38	0
MCCULLGH_MSL	E-W	7	316
MEAD_MSL	E-W	938	455
NGILABK4_BG	E-W	-131	168
NOB_BG	N-S	1208	0
PALOVRDE_MSL	E-W	2872	168
PARKER_BG	E-W	126	28
SILVERPK_BG	E-W	0	0
SUMMIT_BG	E-W	6	0
SYLMAR-AC_MSL	E-W	-164	368

Table B-2: Pre-Cluster 6 Generation Projects in the PG&E Area

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
2	Pre-AMEND 39	Contra Costa PP 230 kV Bus		Natural Gas	590	PG&E North	In-Service
12	AMEND 39	Birds Landing 230 kV Bus		Wind	150	PG&E North	In-Service
21	AMEND 39	Windmaster/Buena Vista Sub		Wind	37.55	PG&E North	In-Service
22	AMEND 39	Birds Landing Sub 230 kV Bus		Wind	38	PG&E North	In-Service
24	AMEND 39	High Winds/Contra Costa PP		Wind	150	PG&E North	In-Service
38	AMEND 39	Humboldt Power Plant Substation		Natural Gas	146.4	PG&E North	In-Service
39	AMEND 39	Birds Landing Switching Station 230kV		Wind	200	PG&E North	In-Service
45	AMEND 39	Eastshore Substation 230kV		Natural Gas	361	PG&E North	In-Service
51	AMEND 39	Kerman-Helm 70kV line		Natural Gas	0.55	PG&E Fresno	In-Service
52	Serial	Panoche Substation		Natural Gas	401	PG&E Fresno	In-Service
54	Serial	Panoche Substation		Natural Gas	119.9	PG&E Fresno	In-Service
57	AMEND 39	Between Cottonwood and Vaca-Dixon		Natural Gas	715	PG&E North	In-Service
61	AMEND 39	Helm-Kerman 70kV line		Natural Gas	73.27	PG&E Fresno	In-Service

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
67	AMEND 39	Eastshore Substation 230kV		Natural Gas	245	PG&E North	In-Service
70	AMEND 39	Hillsdale Junction-Half Moon Bay 60 kV line		Biomass	12.6	PG&E North	In-Service
74	Serial	Pit #3-Round Mountain 230kV Line		Wind	102	PG&E North	In-Service
75	AMEND 39	Le Grand-Chowcilla 115 kV		Biomass	10.5	PG&E Fresno	In-Service
76	AMEND 39	Merced #1 70 kV circuit		Biomass	10.5	PG&E Fresno	In-Service
81	Serial	Geysers #17 - Fulton 230kV Line		Geothermal	55	PG&E North	In-Service
98	Serial	Diablo Canyon Substation		Nuclear	37	PG&E Kern	In-Service
99	Serial	Diablo Canyon Substation		Nuclear	45	PG&E Kern	In-Service
108	Serial	Lambie-Contra Costa 230 kV		Wind	128	PG&E North	In-Service
111	AMEND 39	Tap of Chevron 70kv tran line		Biomass	16	PG&E Kern	12/31/2016
113	Serial	Birds Landing Switching Station 230kV bus		Wind	30	PG&E North	12/31/2014
166	Serial	Midway-Morro Bay 230kV line		Solar	210	PG&E Kern	In-Service
172	Serial	Tesla-Bellota 230kV lines		Natural Gas	508	PG&E North	5/1/2014
194	Serial	Morro Bay-Midway #1 & #2 lines 230kV		Solar	190	PG&E Kern	6/30/2014
222	TC	Birds Landing 230 kV Substation	FC	Wind	78	PG&E North	In-Service
239	TC	Midway-Morro Bay 230kV line	FC	Solar	250	PG&E Kern	12/26/2013

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
242	TC	Morro Bay-Midway 230kV line	FC	Solar	150	PG&E Kern	6/30/2014
248	Serial	Tesla-Bellota 230kV line		Natural Gas	67	PG&E North	5/1/2014
254	TC	Gates Substation 230kV bus	FC	Natural Gas	600	PG&E Fresno	6/1/2014
258	TC	Contra Costa Substation 230kV bus	FC	Natural Gas	651	PG&E North	4/1/2014
261A	AMEND 39	Mendota-San Joaquin-Helm 70 kV Line		Solar	5	PG&E Fresno	In-Service
267	Serial	Gold Hill-Eight Mile 230kV lines		Natural Gas	280	PG&E North	In-Service
268	Serial	Tesla-Manteca 115kV line via Schulte Switchyard		Natural Gas	145	PG&E North	In-Service
272	TC	Henrietta Substation 70kV bus	FC	Solar	125	PG&E Fresno	5/31/2013
282	TC	Tap Dairyland-Mendota 115 kV line	FC	Biomass	8	PG&E Fresno	6/30/2011
304	TC	Smyrna-Alpaugh 115kV line	FC	Solar	50	PG&E Kern	In-Service
320	TC	Contra Costa Substation 230kV switchyard	FC	Natural Gas	100	PG&E North	In-Service
334	TC	Kelso Substation 230kV bus	FC	Natural Gas	195.9	PG&E North	In-Service
340	SGIP	Smyrna-Alpaugh 115kV line	FC	Solar	20	PG&E Kern	In-Service
356	TC	Taft-Cuyama #1 70kV line	FC	Solar	40	PG&E Kern	3/30/2015
372	SGIP	Jacobs Corner Substation 70kV bus	EO	Solar	20	PG&E Fresno	4/2/2012
378	TC	Los Esteros Substation 115kV bus	FC	Natural Gas	120	PG&E North	6/1/2013

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
417	TC	Pittsburg-Tesla 230kV line	FC	Wind	14	PG&E North	5/30/1015
470	SGIP	Jacobs Corner Substation 70kV bus	EO	Solar	20	PG&E Fresno	5/1/2012
471	SGIP	Jacobs Corner Substation 70kV bus	EO	Solar	20	PG&E Fresno	6/1/2012
472	SGIP	Blue lake Tap 60 kV	FC	Biomass	11	PG&E North	In-Service
473	SGIP	Smyrna-Alpaugh 115kV line	FC	Solar	20	PG&E Kern	In-Service
476	SGIP	Lakeville #2 60 kV line	EO	Landfill Gas	9.9	PG&E North	7/15/2014
477	SGIP	Centerville-Table Mountain 60kV line	EO	Landfill Gas	4	PG&E North	In-Service
478	SGIP	Corcoran-Kingsburg 115kV #2 line	FC	Solar	20	PG&E Kern	In-Service
479	SGIP	Smyrna-Alpaugh 115kV line	FC	Solar	20	PG&E Kern	In-Service
481	SGIP	Valley Springs-Martel #2 60kV line	EO	Biomass	18.4	PG&E North	In-Service
482	SGIP	Smyrna-Alpaugh 115kV line	FC	Solar	20	PG&E Kern	4/1/2014
484	SGIP	Arco-Carneras 70 kV Line	FC	Solar	20	PG&E Kern	11/30/2014
495	C1	Tulloch 115kV tap	FC	Water	7.2	PG&E North	In-Service
514	SGIP	Arco Substation 69kV bus	EO	Solar	20	PG&E Kern	12/1/2014
517	SGIP	Kern-Old River #1 70kV line	FC	Solar	20	PG&E Kern	12/31/2014
526	SGIP	Schindler-Coalinga #2 70kV line	EO	Solar	20	PG&E Fresno	6/1/2015

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
529	SGIP	Corcoran- Kingsburg #1 115kV line	EO	Solar	20	PG&E Fresno	6/1/2015
529A	SGIP	Helm-Kerman 70kV line	EO	Natural Gas	14.5	PG&E Fresno	6/15/2014
532	SGIP	Schindler-Huron-Gates 70kV line	EO	Solar	20	PG&E Fresno	12/31/2015
539	SGIP	Salado-Newman #1 60kV line	EO	Solar	20	PG&E North	10/31/2012
541	SGIP-TC	Panoche-Oro Loma 115kV Line	EO	Solar	20	PG&E Fresno	8/15/2015
542	SGIP	Schindler Sub 115kV bus	EO	Solar	20	PG&E Fresno	12/1/2016
548	SGIP	Mercy Springs Substation 70kV	EO	Solar	20	PG&E Fresno	10/31/2014
550	SGIP	Merced #1 70 kV	EO	Solar	20	PG&E Fresno	5/31/2016
557	C2	Smyrna-Alpaugh 115kV line	FC	Solar	19.75	PG&E Kern	4/1/2013
558	C2	Corcoran-Kingsburg #2 115kV	FC	Solar	19.75	PG&E Fresno	7/1/2015
559	C2	Wheeler Ridge-Lamont 115kV	FC	Solar	67.5	PG&E Kern	6/1/2014
560	C2	Los Banos-Dos Amigos 230kV	FC	Solar	100	PG&E Fresno	3/31/2013
568	C2	Eastshore Substation 230kV Bus	FC	Natural Gas	25	PG&E North	In-Service
569	C2	Table Mountain-Tesla 500kV	FC	Natural Gas	600	PG&E North	5/1/2018
577	C2	Los Banos-Westley 230kV	FC	Solar	110	PG&E Fresno	4/30/2015
581	C2	Henrietta-GWF 115 kV Line	FC	Solar	100	PG&E Fresno	12/1/2015

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
586	C2	Geysers #17-Fulton 230kV	FC	Geothermal	42	PG&E North	7/1/2017
606	C2	Schulte Switching Station 115kV bus	FC	Natural Gas	20	PG&E North	6/1/2012
607	C2	Mendota Substation 115 kV bus	FC	Solar	60	PG&E Fresno	11/14/2014
612	SGIP	Panoche-Schindler #2 115kV Line	EO	Solar	13	PG&E Fresno	12/1/2015
613	SGIP	Helm 70kV bus	EO	Solar	20	PG&E Fresno	4/1/2015
614	SGIP	Merced-Madera 70kV	EO	Solar	20	PG&E Fresno	12/15/2014
617	SGIP	Tesla-Tracy 115kV	EO	Solar	20	PG&E North	5/1/2016
620	SGIP	Copus Road Sub 70kV bus	FC	Solar	20	PG&E Kern	12/31/2014
620A	SGIP	Lakeview Sub 70kV bus	EO	Solar	20	PG&E Kern	12/31/2014
621A	SGIP	Weedpatch - San Bernard 70 KV line	FC	Solar	20	PG&E Kern	2/20/2014
622B	SGIP	Wheeler Ridge Sub 115kV Bus	FC	Solar	20	PG&E Kern	10/31/2013
625	SGIP	Henrietta-Tulare Lake 70kV	EO	Solar	20	PG&E Fresno	7/31/2014
626	SGIP	Henrietta-Guernsey 70kV	EO	Solar	20	PG&E Fresno	4/30/2015
631	SGIP	Stroud SW Station 70kV	EO	Solar	20	PG&E Fresno	12/31/2014
632	SGIP	Wesix 70kV Tap	EO	Solar	19	PG&E Fresno	12/1/2012
632B	SGIP-TC	Stroud SW Station 70 kV	FC	Solar	20	PG&E Fresno	7/1/2017

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
632C	SGIP-TC	Stroud SW Station 70kV	FC	Solar	20	PG&E Fresno	12/1/2012
633	SGIP	Gates-Coalinga 70 kV Line #1	EO	Solar	20	PG&E Fresno	2/1/2014
634	SGIP	Camden Junction-Lemoore Tap 70kV	EO	Solar	20	PG&E Fresno	12/15/2015
636	SGIP	Leprino Food (Lemoore) 115 kV Tap Line	FC	Solar	20	PG&E Fresno	12/31/2015
637	SGIP	Henrietta-Jacobs Corner 70kV	EO	Solar	20	PG&E Fresno	In-Service
638	SGIP	Coalinga 1-Gates 70kV	EO	Solar	10	PG&E Fresno	12/31/2014
643G	C3	Cascade-Cottonwood 115 kV	FC	Biomass	27.15	PG&E North	6/1/2013
643J	C3	Coalinga #2-Schindler 70 kV	FC	Solar	1	PG&E Fresno	4/1/2017
643W	C3	Gates-Gregg 230 kV and Gates-McCall 230 kV	FC	Solar	100	PG&E Fresno	12/31/2015
643X	C3	Helm-Panoche 230 kV and Panoche-Kearney 230kV	FC	Solar	200	PG&E Fresno	6/30/2014
644	SGIP-TC	Dairyland - Legrand 115 kV	EO	Solar	20	PG&E Fresno	11/1/2014
645A	SGIP-TC	Weedpatch-Wheeler Ridge 70kV	FC	Solar	20	PG&E Kern	12/1/2012
648	SGIP-TC	Panoche-Oro Loma 115kV Tap	FC	Solar	20	PG&E Fresno	4/30/2012
650AB	SGIP-TC	Henrietta-Tulare Lake 70kV	EO	Solar	20	PG&E Fresno	12/31/2012
653B	SGIP-TC	Belridge - Temblor 115 kV	FC	Solar	20	PG&E Kern	11/28/2014

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
653F	SGIP-TC	Woodland-Davis 115 kV	FC	Solar	12	PG&E North	5/1/2012
653EA	SGIP-TC	Copus-Old River 70 kV	EO	Solar	20	PG&E Kern	12/30/2014
654	SGIP-TC	Semitropic-Midway #2 115kV	FC	Solar	20	PG&E Kern	11/28/2014
678	C4	Panoche-Schindler #1 & #2 115kV	FC	Solar	60	PG&E Fresno	9/5/2013
679	C4	Giffen substation 70 KV	FC	Solar	20	PG&E Fresno	9/5/2013
687	C4	Pittsburg - Kirker - Columbia Steel 115 KV	FC	Solar	20	PG&E North	11/7/2014
705	C4	Blackwell Substation 70 KV	FC	Solar	20	PG&E Kern	9/20/2013
709	C4	Tesla Sub 115 KV	FC	Wind	36	PG&E North	12/31/2013
720	C4	Volta - South 60 KV	EO	WTR	4.5	PG&E North	3/30/2015
723	C4	Borden Sub 70 KV Bus	FC	Solar	50	PG&E Fresno	7/1/2014
744	C4	Lamont Sub 115 KV Bus	FC	Solar	90	PG&E Kern	5/15/2015
752	C4	Guernsey - Henrietta 70 KV	FC	Solar	12	PG&E Fresno	12/31/2013
775	C4	Arco-Twisselman 70 KV	FC	Solar	15	PG&E Kern	7/10/2014
779	C4	Los Banos-Panoche #1 230kV	FC	Solar	200	PG&E Fresno	1/6/2014
799	C4	Mendota-San Joaquin-Helm 70kV	FC	Solar	20	PG&E Fresno	12/31/2014
800	C4	Mendota-San Joaquin-Helm 70kV	FC	Solar	20	PG&E Fresno	12/31/2014

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
805	C4	Mendota-San Joaquin-Helm 69K	FC	Solar	20	PG&E Fresno	12/31/2014
806	C4	Mendota-San Joaquin-Helm 70 KV	FC	Solar	20	PG&E Fresno	12/31/2014
809	C4	Stroud 70 KV	FC	Solar	40	PG&E Fresno	12/31/2014
814	C4	Stroud Substation 70kV Bus	FC	Solar	20	PG&E Fresno	12/31/2014
815	C4	Stroud Substation 70kV Bus	FC	Solar	20	PG&E Fresno	12/31/2014
816	C4	Stroud Substation 70kV Bus	FC	Solar	20	PG&E Fresno	12/31/2014
820	C4	Mendota Sub 115KV Bus	FC	Solar	60	PG&E Fresno	12/31/2014
823	C4	Oro Loma - Panoche 115 KV	FC	Solar	90	PG&E Fresno	12/31/2014
824	C4	Mendota Sub 115 KV Bus	EO	Solar	20	PG&E Fresno	12/31/2014
825	C4	Mendota Sub 115 KV Bus	EO	Solar	20	PG&E Fresno	12/31/2014
829	C4	Moss-Panoche and Coburn-Panoche 230 KV	FC	Solar	240	PG&E Fresno	12/15/2015
860	ISP	Lone Tree-Cayetano 230 kV Line at Jackson Sub	FC	Wind	3.1	PG&E North	12/1/2011
869	C5	Helm Substation 70kV Bus	FC	Solar	23	PG&E Fresno	12/1/2015
877	C5	Morro-Gates 230kV line	FC	Solar	280	PG&E Fresno	11/1/2016
885	C5	Copus-Old River 70 kV line	FC	Solar	12	PG&E Kern	10/1/2014
900	C5	Midway Temblor 115 kV line	FC	Solar	20	PG&E Kern	9/30/2015

CAISO Queue Number	Study Process	Point of Interconnection	Deliverability Status	Fuel Type	Max MW	Area	Commercial Operation Date
901	C5	Semitropic-Midway 115 kV line	FC	Solar	15	PG&E Kern	9/30/2015
928	C5	Birds Landing-Peabody 230kV line	FC	Wind	175	PG&E North	12/31/2015

Table B-3: Pre-Cluster 6 PG&E Wholesale Distribution Generation Projects

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0001-WD	WDT-SGIP	KIRKER BANK 1 115 kV	EO	Reciprocating Engine	3.85	PG&E North	In Service
0003-WD	WDT-SGIP	PLACERVILLE BANK 2 115 kV	EO	Hydro	0.38	PG&E North	In Service
0004-WD	WDT-SGIP	PLACERVILLE BANK 2 115 kV	EO	Hydro	0.58	PG&E North	In Service
0005-WD	WDT-SGIP	WHEATLAND BANK 1 60 kV	EO	Reciprocating Engine	1.6	PG&E North	In Service
0006-WD	WDT-SGIP	OAKLAND L BANK 1 115 kV	EO	Gas Turbine	4.5	PG&E North	9/13/2011
0009-WD	WDT-SGIP	PAUL SWEET BANK 3 115 kV	EO	Synchronous Generator	1.6	PG&E Fresno	In Service
0011-WD	WDT-SGIP	CASTROVILLE BANK 1 115 kV	EO	Cogeneration	1.43	PG&E Fresno	7/8/2009
0014-WD	WDT-SGIP	GONZALES BANK 3 60 kV	EO	Reciprocating Engine	1.43	PG&E Fresno	12/21/2012
0015-WD	WDT-SGIP	EL CAPITAN BANK 1 115 kV	EO	Reciprocating Engine	0.75	PG&E Fresno	In Service
0017-WD	WDT-SGIP	SISQUOC BANK 2 115 kV	EO	Solar PV	1.43	PG&E Kern	In Service
0018-WD	WDT-SGIP	VACA DIXON BANK 6 115 kV	FC	Solar PV	2.5	PG&E North	In Service
0020-WD	WDT-SGIP	METTLER BANK 3 60 kV	EO	Reciprocating Engine	0.3	PG&E North	In Service
0021-WD	WDT-SGIP	MARTIN BANK 2 115 kV	EO	Solar PV	4.5	PG&E North	In Service
0023-WD	WDT-SGIP	BLACKWELL BANK 1 70 kV	FC	Solar PV	12	PG&E Kern	12/1/2013
0024-WD	WDT-SGIP	HIGGINS BANK 3 115 kV	EO	Reciprocating Engine	0.04	PG&E North	6/8/2010
0025-WD	WDT-SGIP	HIGGINS BANK 2 115 kV	EO	Hydro	0.52	PG&E North	In Service
0026-WD	WDT-SGIP	WHEATLAND BANK 2 60 kV	EO	Reciprocating Engine	1.6	PG&E North	7/15/2013
0028-WD	WDT-SGIP	PEABODY BANK 2 230 kV	EO	Reciprocating Engine	1.5	PG&E North	5/2/2013
0029-WD	WDT-SGIP	AVENAL 70 KV TAP LINE	EO	Solar PV	6	PG&E Fresno	In Service
0032-WD	WDT-SGIP	GOOSE LAKE BANK 1 115 kV	FC	Solar PV	15	PG&E Kern	10/31/2014
0035-WD	WDT-SGIP	AVENAL 70 KV TAP LINE	EO	Solar PV	6	PG&E Fresno	In Service
0036-WD	WDT-SGIP	AVENAL 70 KV TAP LINE	EO	Solar PV	6	PG&E Fresno	In Service
0037-WD	WDT-SGIP	NEWARK BANK 4 115 kV	EO	Reciprocating Engine	3.2	PG&E North	2/6/2016
0039-WD	WDT-SGIP	SMYRNA BANK 1 115 kV	FC	Solar PV	10	PG&E Kern	10/31/2015
0040-WD	WDT-SGIP	TWISSELMAN BANK 1 70 kV	EO	Solar PV	20	PG&E Kern	4/29/2015
0041-WD	WDT-SGIP	TUPMAN BANK 1 115 kV	EO	Biomass	0.6	PG&E Kern	7/6/2012
0046-WD	WDT-SGIP	ELK HILLS BANK 1 70 kV	FC	Solar PV	7	PG&E Kern	10/31/2014

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0047-WD	WDT-SGIP	FIREBAUGH BANK 1 115 kV	EO	Solar PV	10	PG&E Fresno	12/31/2016
0055-WD	WDT-SGIP	ORO LOMA BANK 1 70 kV	EO	Solar PV	20	PG&E Fresno	10/9/2015
0060-WD	WDT-SGIP	ORO LOMA BANK 1 70 kV	EO	Solar PV	17	PG&E Fresno	11/15/2014
0065-WD	WDT-SGIP	GIFFEN BANK 1 70 kV	FC	Solar PV	20	PG&E Fresno	7/2/2012
0066-WD	WDT-SGIP	SCHINDLER BANK 2 115 kV	FC	Solar PV	15	PG&E Fresno	9/26/2011
0067-WD	WDT-SGIP	SCHINDLER BANK 2 115 kV	FC	Solar PV	15	PG&E Fresno	9/26/2011
0074-WD	WDT-SGIP	HURON BANK 1 70 kV	FC	Solar PV	20	PG&E Fresno	6/28/2012
0075-WD	WDT-SGIP	GATES BANK 4 230 kV	FC	Solar PV	20	PG&E Fresno	12/31/2012
0078-WD	WDT-SGIP	CANTUA BANK 1 115 kV	FC	Solar PV	20	PG&E Fresno	6/19/2012
0079-WD	WDT-SGIP	STROUD BANK 1 70 kV	FC	Solar PV	20	PG&E Fresno	9/26/2011
0094-WD	WDT-SGIP	CORCORAN BANK 4 115 kV	FC	Solar PV	12	PG&E Fresno	10/31/2014
0095-WD	WDT-SGIP	CORCORAN BANK 3 115 kV	FC	Solar PV	20	PG&E Fresno	10/31/2014
0096-WD	WDT-SGIP	7TH STANDARD BANK 1 115 kV	FC	Solar PV	20	PG&E Kern	4/1/2014
0097-WD	WDT-SGIP	SARATOGA BANK 1 230 kV	EO	Hydro	0.11	PG&E North	In Service
0098-WD	WDT-SGIP	OLEMA BANK 1 60 kV	EO	Reciprocating Engine	0.08	PG&E North	In Service
0102-WD	WDT-SGIP	TWISSELMAN BANK 2 70 kV	EO	Solar PV	1.5	PG&E Kern	8/24/2012
0105-WD	WDT-SGIP	JESSUP BANK 1 115 kV	FC	Biomass	5.5	PG&E North	6/30/2012
0120-WD	WDT-SGIP	GATES BANK 4 230 kV	EO	Solar PV	10	PG&E Fresno	12/31/2012
0124-WD	WDT-SGIP	AVENAL BANK 1 70 kV	EO	Solar PV	15.8	PG&E Fresno	2/9/2016
0127-WD	WDT-SGIP	LAKEVIEW BANK 1 70 kV	EO	Solar PV	20	PG&E Kern	12/31/2014
0128-WD	WDT-SGIP	CASTRO VALLEY BANK 1 230 kV	EO	Fuel Cell	1.4	PG&E North	8/17/2011
0129-WD	WDT-SGIP	DALY CITY BANK 1 115 kV	EO	Fuel Cell	1.6	PG&E North	7/29/2011
0136-WD	WDT-SGIP	GUERNSEY BANK 1 70 kV	FC	Solar PV	20	PG&E Fresno	12/1/2012
0141-WD	WDT-SGIP	PUTAH CREEK BANK 1 115 kV	EO	Solar PV	2	PG&E North	2/1/2015
0157-WD	WDT-SGIP	MCFARLAND BANK 1 70 kV	EO	Solar PV	18.3	PG&E Kern	12/14/2012
0162-WD	WDT-SGIP	CAYETANO BANK 3 230 kV	FC	Reciprocating Engine	4.31	PG&E North	1/30/2013
0168-WD	WDT-SGIP	WEST FRESNO BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	9/13/2012
0169-WD	WDT-SGIP	CORRAL BANK 1 60 kV	EO	Reciprocating Engine	5	PG&E North	1/30/2013
0170-WD	WDT-SGIP	FIGARDEN BANK 1 230 kV	EO	Solar PV	3	PG&E Fresno	1/30/2013
0181-WD	WDT-SGIP	PEABODY BANK 3 230 kV	FC	Solar PV	14	PG&E North	1/30/2013

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0189-WD	WDT-SGIP	REEDLEY BANK 3 115 kV	EO	Solar PV	9	PG&E Fresno	1/30/2013
0190-WD	WDT-SGIP	GUSTINE BANK 2 60 kV	EO	Solar PV	20	PG&E North	1/30/2013
0191-WD	WDT-SGIP	GOOSE LAKE BANK 2 115 kV	EO	Solar PV	9	PG&E Kern	1/12/2013
0224-WD	WDT-SGIP	WOODWARD BANK 3 115 kV	EO	Hydro	8	PG&E Fresno	12/24/2011
0225-WD	WDT-SGIP	REEDLEY BANK 3 115 kV	EO	Solar PV	3	PG&E Fresno	12/14/2012
0227-WD	WDT-SGIP	WEBER BANK 5 230 kV	FC	Reciprocating Engine	4.2	PG&E North	8/30/2011
0233-WD	WDT-GIP	RIVERBANK BANK 1 115 kV	EO	Biomass	1	PG&E North	10/1/2012
0248-WD	WDT-SGIP	OLD RIVER BANK 2 70 kV	EO	Biogas	3	PG&E Kern	1/21/2013
0251-WD	WDT-GIP	CHARCA BANK 1 115 kV	EO	Solar PV	2	PG&E Kern	3/1/2013
0252-WD	WDT-GIP	WASCO BANK 1 70 kV	EO	Solar PV	2	PG&E Kern	3/1/2013
0271-WD	WDT-GIP	WYANDOTTE BANK 1 115 kV	EO	Solar PV	1	PG&E North	4/15/2014
0272-WD	WDT-GIP	HOLLISTER BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	3/31/2013
0273-WD	WDT-GIP	GERBER BANK 1 60 kV	EO	Solar PV	1.5	PG&E North	5/30/2014
0288-WD	WDT-GIP	LOCKEFORD BANK 4 115 kV	EO	Solar PV	2.5	PG&E North	9/1/2013
0305-WD	WDT-GIP	AVENA BANK 1 115 kV	EO	Solar PV	2	PG&E North	4/1/2014
0311-WD	WDT-GIP	CALISTOGA BANK 1 60 kV	EO	Reciprocating Engine	0.85	PG&E North	1/2/2013
0336-WD	WDT-GIP	PEABODY BANK 2 230 kV	FC	Landfill Gas	9.6	PG&E North	3/31/2015
0342-WD	WDT-GIP	GIFFEN BANK 1 70 kV	EO	Solar PV	9	PG&E Fresno	12/31/2013
0343-WD	WDT-GIP	MENDOTA BANK 2 115 kV	EO	Solar PV	5	PG&E Fresno	12/31/2013
0349-WD	WDT-GIP	WHITMORE BANK 1 60 kV	EO	Hydro	0.52	PG&E North	4/2/2012
0354-WD	WDT-GIP	CONTRA COSTA SUB BANK 9 230 kV	EO	Solar PV	1.5	PG&E North	4/26/2013
0358-WD	WDT-GIP	RED BLUFF BANK 1 60 kV	EO	Solar PV	0.5	PG&E North	7/9/2013
0360-WD	WDT-GIP	REEDLEY BANK 1 70 kV	EO	Solar PV	1.25	PG&E Fresno	8/30/2013
0361-WD	WDT-GIP	MCCALL BANK 4 12.47 kV	EO	Solar PV	1	PG&E Fresno	8/30/2013
0369-WD	WDT-GIP	GERBER BANK 1 60 kV	EO	Solar PV	0.25	PG&E North	6/21/2013
0374-WD	WDT-GIP	SAN LUIS OBISPO BANK 6 115 kV	EO	Landfill Gas	1.5	PG&E Kern	3/22/2013
0376-WD	WDT-GIP	TYLER BANK 1 60 kV	EO	Solar PV	0.25	PG&E North	3/1/2014
0378-WD	WDT-GIP	WYANDOTTE BANK 2 115 kV	EO	Solar PV	0.5	PG&E North	2/10/2014
0384-WD	WDT-GIP	TEMPLETON BANK 3 230 kV	EO	Solar PV	1.5	PG&E Kern	1/5/2013
0385-WD	WDT-GIP	LOCKEFORD BANK 4 115 kV	EO	Solar PV	1	PG&E North	1/5/2013

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0393-WD	WDT-GIP	OLIVEHURST BANK 2 115 kV	EO	Solar PV	0.5	PG&E North	7/15/2013
0394-WD	WDT-GIP	PASO ROBLES BANK 2 70 kV	EO	Solar PV	1	PG&E Kern	8/30/2013
0397-WD	WDT-GIP	TEMPLETON BANK 2 230 kV	EO	Solar PV	0.75	PG&E Kern	8/30/2013
0400-WD	WDT-GIP	PIT #1 PH BANK 1 60 kV	EO	Solar PV	1.5	PG&E North	3/1/2014
0401-WD	WDT-GIP	DIXON LANDING BANK 1 115 kV	EO	Landfill Gas	6.4	PG&E North	10/1/2012
0406-WD	WDT-GIP	DOS PALOS BANK 1 70 kV	EO	Solar PV	2	PG&E Fresno	3/31/2014
0411-WD	WDT-GIP	MCARTHUR BANK 1 60 kV	EO	Solar PV	1.5	PG&E North	3/1/2014
0412-WD	WDT-GIP	PEASE BANK 3 115 kV	EO	Solar PV	0.5	PG&E North	1/21/2013
0419-WD	WDT-GIP	MERCED BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	10/13/2014
0420-WD	WDT-GIP	MERCED BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	10/13/2014
0433-WD	WDT-GIP	DAVIS BANK 2 115 kV	EO	Solar PV	1	PG&E North	6/30/2012
0438-WD	WDT-GIP	DAVIS BANK 2 115 kV	EO	Solar PV	1	PG&E North	6/30/2012
0443-WD	WDT-GIP	TEMPLETON BANK 2 230 kV	EO	Solar PV	0.5	PG&E Kern	11/15/2012
0444-WD	WDT-GIP	KINGSBURG BANK 3 115 kV	EO	Solar PV	1.5	PG&E Fresno	9/16/2013
0446-WD	WDT-GIP	KINGSBURG BANK 3 115 kV	EO	Solar PV	1.5	PG&E Fresno	9/16/2013
0448-WD	WDT-GIP	KINGSBURG BANK 3 115 kV	EO	Solar PV	0.75	PG&E Fresno	9/16/2013
0455-WD	WDT-GIP	LOS MOLINOS BANK 1 60 kV	EO	Solar PV	2	PG&E North	3/28/2013
0458-WD	WDT-GIP	PANORAMA BANK 1 115 kV	EO	Solar PV	1.25	PG&E North	1/28/2013
0467-WD	WDT-GIP	LAS GALLINAS BANK 1 115 kV	EO	Solar PV	0.97	PG&E North	7/31/2012
0474-WD	WDT-GIP	PLEASANT GROVE BANK 3 115 kV	EO	Reciprocating Engine	5.04	PG&E North	6/12/2013
0530-WD	WDT-GIP	MARTIN BANK 2 115 kV	EO	Hydro	0.24	PG&E North	3/2/2015
0542-WD	WDT-GIP	DUNNIGAN BANK 1 60 kV	EO	Solar PV	1	PG&E North	7/28/2014
0543-WD	WDT-GIP	ATWATER BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	7/28/2014
0546-WD	WDT-GIP	PEORIA BANK 2 115 kV	EO	Solar PV	1.5	PG&E North	11/18/2013
0564-WD	WDT-GIP	TAFT BANK 3 115 kV	EO	Solar PV	0.5	PG&E Kern	7/15/2014
0567-WD	WDT-GIP	NORD BANK 1 115 kV	EO	Solar PV	1.5	PG&E North	
0581-WD	WDT-GIP	CLOVERDALE BANK 1 115 kV	EO	Solar PV	1.49	PG&E North	
0587-WD	WDT-GIP	SMYRNA BANK 1 115 kV	EO	Solar PV	2	PG&E Kern	
0629-WD	WDT-GIP	MAGUNDEN BANK 3 115 kV	EO	Solar PV	1.5	PG&E Kern	7/15/2014
0630-WD	WDT-GIP	MAGUNDEN BANK 3 115 kV	EO	Solar PV	1.5	PG&E Kern	7/15/2014

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0632-WD	WDT-GIP	AUBERRY BANK 1 70 kV	EO	Solar PV	1.75	PG&E Fresno	
0633-WD	WDT-GIP	MARTELL BANK 1 60 kV	EO	Solar PV	0.5	PG&E North	6/1/2014
0641-WD	WDT-GIP	CANAL BANK 2 70 kV	EO	Solar PV	2	PG&E Fresno	
0644-WD	WDT-GIP	MERCED BANK 3 115 kV	EO	Solar PV	1.3	PG&E Fresno	
0645-WD	WDT-GIP	MERCED BANK 3 115 kV	EO	Solar PV	1	PG&E Fresno	
0653-WD	WDT-GIP	BOGUE BANK 1 115 kV	EO	Solar PV	1.5	PG&E North	
0654-WD	WDT-GIP	BOGUE BANK 1 115 kV	EO	Solar PV	1.5	PG&E North	
0663-RD	Rule 21	MIRABEL BANK 1 60 kV	EO	Cogeneration	0.03	PG&E North	
0666-WD	WDT-GIP	AUBERRY BANK 2 70 kV	EO	Solar PV	1.33	PG&E Fresno	
0667-RD	Rule 21	MISSION BANK 1 115 kV	EO	Solar PV	0.017	PG&E North	
0668-WD	WDT-GIP	OILFIELDS BANK 2 60 kV	FC	Solar PV	6	PG&E Fresno	
0670-RD	Rule 21	JAMESON BANK 2 115 kV	EO	Solar PV	1.135	PG&E North	
0675-RD	Rule 21	EAST GRAND BANK 1 115 kV	EO	Solar PV	0.7	PG&E North	In Service
0680-RD	Rule 21	OCEANO BANK 1 115 kV	EO	Battery	0.006	PG&E Kern	.
0681-RD	Rule 21	POTRERO BANK 1 115 kV	EO	Battery	0.006	PG&E North	
0682-RD	Rule 21	TEJON BANK 1 70 kV	EO	Battery	0.25	PG&E Kern	
0683-RD	Rule 21	RIVERBANK BANK 1 115 kV	EO	Solar PV	1	PG&E North	
0684-RD	Rule 21	JOLON BANK 1 60 kV	EO	Solar PV	1	PG&E Fresno	
0685-WD	WDT-GIPREV	REEDLEY BANK 1 70 kV	EO	Solar PV	0.75	PG&E Fresno	
0686-WD	WDT-GIPREV	HOLLISTER BANK 1 115 kV	EO	Solar PV	1.5	PG&E Fresno	
0687-WD	WDT-GIPREV	REEDLEY BANK 3 115 kV	FC	Solar PV	1.5	PG&E Fresno	
0688-RD	Rule 21	CHICO B BANK 1 115 kV	EO	Solar PV	0.362	PG&E North	
0689-RD	Rule 21	LARKIN BANK 1 12 kV	EO	Battery	0.015	PG&E North	
0691-WD	WDT-GIPREV	DIXON LANDING BANK 1 115 kV	FC	Biomass	1.4	PG&E North	11/22/2015
0693-RD	Rule 21	CUYAMA BANK 1 70 kV	EO	Solar PV	1.5	PG&E Kern	8/105/2015
0694-WD	WDT-GIPREV	LOCKEFORD BANK 4 115 kV	EO	Solar PV	1	PG&E North	
0697-WD	WDT-GIPREV	HENRIETTA BANK 5 70 kV	EO	Solar PV	2	PG&E Fresno	
0699-RD	Rule 21	MISSION BANK 1 115 kV	EO	Wind	0.005	PG&E North	
0700-WD	WDT-GIPREV	DEL MAR BANK 3 60 kV	EO	Hydro	0.32	PG&E North	
0705-RD	Rule 21	SAN JOAQUIN BANK 1 70 kV	EO	Gas Turbine	3	PG&E Fresno	

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0706-RD	Rule 21	KERMAN BANK 1 70 kV	EO	Gas Turbine	3	PG&E Fresno	
0707-RD	Rule 21	STROUD BANK 1 70 kV	EO	Gas Turbine	3	PG&E Fresno	
0708-RD	Rule 21	SAN JOAQUIN BANK 1 70 kV	EO	Gas Turbine	3	PG&E Fresno	
0709-RD	Rule 21	KERMAN BANK 1 70 kV	EO	Gas Turbine	3	PG&E Fresno	
0710-WD	WDT-GIPREV	CANAL BANK 2 70 kV	EO	Solar PV	2	PG&E Fresno	
0711-RD	Rule 21	EDES BANK 3 115 kV	EO	Cogeneration	1	PG&E North	
0712-RD	Rule 21	LOS ALTOS BANK 1 60 kV	EO	Solar PV	0.04	PG&E North	
0713-RD	Rule 21	JAMESON BANK 1 115 kV	EO	Solar PV	0.5	PG&E North	
0714-WD	WDT-GIPREV	CHARCA BANK 2 115 kV	EO	Solar PV	2	PG&E Kern	
0715-WD	WDT-GIPREV	SANTA RITA BANK 1 70 kV	EO	Biomass	0.25	PG&E Fresno	
0716-WD	WDT-GIPREV	CLOVERDALE BANK 1 115 kV	EO	Solar PV	1	PG&E North	
0717-WD	WDT-GIPREV	MILPITAS BANK 3 115 kV	EO	Hydro	0.15	PG&E North	
0718-WD	WDT-GIPREV	SANTA RITA BANK 1 70 kV	EO	Solar PV	1.5	PG&E Fresno	
0719-WD	WDT-GIPREV	TWISSELMAN BANK 1 70 kV	EO	Solar PV	3	PG&E Kern	
0720-WD	WDT-GIPREV	WASCO BANK 1 70 kV	EO	Solar PV	2	PG&E Kern	
0721-WD	WDT-GIPREV	JACOBS CORNER BANK 1 70 kV	FC	Solar PV	3	PG&E Fresno	
0725-WD	WDT-GIPREV	CLEAR LAKE BANK 1 60 kV	EO	Solar PV	1.99	PG&E North	
0727-WD	WDT-GIPREV	PUTAH CREEK BANK 2 115 kV	EO	Solar PV	0.5	PG&E North	
0728-RD	Rule 21	NEWARK BANK 3 115 kV	EO	Solar PV	1	PG&E North	
0729-RD	Rule 21	PAUL SWEET BANK 1 115 kV	EO	Solar PV	2.6	PG&E Fresno	
0730-WD	WDT-GIPREV	NOVATO BANK 2 60 kV	EO	Solar PV	0.72	PG&E North	
0731-WD	WDT-GIPREV	MISSION BANK 1 115 kV	EO	Solar PV	0.48	PG&E North	
0732-WD	WDT-GIPREV	MISSION BANK 1 115 kV	EO	Solar PV	0.48	PG&E North	
0733-RD	Rule 21	MADERA BANK 1 70 kV	EO	Cogeneration	0.085	PG&E Fresno	
0734-RD	Rule 21	POTRERO BANK 1 115 kV	EO	Solar PV	0.087	PG&E North	
0735-RD	Rule 21	LLAGAS BANK 1 115 kV	EO	Solar PV	1.84	PG&E North	
0737-RD	Rule 21	ORLAND B BANK 2 60 kV	EO	Solar PV	1.52	PG&E North	
0738-RD	Rule 21	LOCKEFORD BANK 4 115 kV	EO	Solar PV	1.82	PG&E North	
0739-RD	Rule 21	REEDLEY BANK 1 70 kV	EO	Solar PV	1.04	PG&E Fresno	
0740-RD	Rule 21	JACOBS CORNER BANK 2 70 kV	EO	Solar PV	1.88	PG&E Fresno	

PG&E Queue Number	Study Process	Point of Interconnection	Deliverability Status	Generation Type	Max MW	Area	Commercial Operation Date
0741-RD	Rule 21	JACOBS CORNER BANK 1 70 kV	EO	Hydro	0.12	PG&E Fresno	
0742-WD	WDT-GIPREV	PEACHTON BANK 1 60 kV	EO	Solar PV	0.25	PG&E North	
0744-RD	Rule 21	RICHMOND 115 BANK 2 115 kV	EO	Solar PV	8	PG&E North	
0745-WD	WDT-GIPREV	GUSTINE BANK 2 60 kV	EO	Solar PV	2	PG&E North	
0746-RD	Rule 21	CURTIS BANK 1 115 kV	EO	Solar PV	0.003	PG&E North	
0751-RD	Rule 21	EL PATIO BANK 1 115 kV	EO	Solar PV	0.1	PG&E North	
0753-RD	Rule 21	PEABODY BANK 2 230 kV	EO	Solar PV	2.1	PG&E North	

Table B-4: Approved System Additions and Upgrades in the PG&E Service Territory

Transmission Project	Area	In-Service Date
Ashlan-Gregg and Ashlan-Herndon 230 kV Line Reconductor	PG&E Fresno	May-17
Bay Meadows 115 kV Reconductoring	PG&E North	December-15
Borden 230 kV Voltage Support	PG&E Fresno	May-17
Caruthers – Kingsburg 70 kV Line Reconductor	PG&E Fresno	May-15
Cascade 115/60 kV No.2 Transformer Project and Cascade - Benton 60 kV Line Project	PG&E North	May-17
Cayucos 70 kV Shunt Capacitor	PG&E Kern	May-15
Clear Lake 60 kV System Reinforcement	PG&E North	May-17
Contra Costa – Moraga 230 kV Line Reconductoring	PG&E North	December-14
Cooley Landing - Los Altos 60 kV Line Reconductor	PG&E North	May-16
Cooley Landing 115/60 kV Transformer Capacity Upgrade	PG&E North	May-16
Corcoran 115/70 kV Transformer Replacement Project	PG&E Fresno	April-13
Cortina 60 kV Reliability	PG&E North	March-14
Cortina No.3 60 kV Line Reconductoring Project	PG&E North	May-16
Cottonwood-Red Bluff No. 2 60 kV Line Project and Red Bluff Area 230/60 kV Substation Project	PG&E North	May-18
Crazy Horse (Central Coast) Switching Station	PG&E Fresno	May-15
Cressey - North Merced 115 kV Line Addition	PG&E Fresno	May-16
Daily City Bus Reconfiguration	PG&E North	In-Service
Del Monte - Fort Ord 60 kV Reinforcement Project	PG&E Fresno	Phase 1 - In-Service Phase 2 - May 2018
Divide Transmission	PG&E Kern	In-Service
East Nicolaus 115 kV Area Reinforcement	PG&E North	October-14
East Shore-Oakland J 115 kV Reconductoring Project	PG&E North	May-16
Embarcadero-Potrero 230 kV Transmission Project	PG&E North	December-15
Evergreen-Mabury 60 to 115 kV Conversion	PG&E North	May-17
Fresno Reliability Transmission Projects	PG&E Fresno	May-15
Fulton 230/115 kV Transformer	PG&E North	December-16
Fulton-Fitch Mountain 60 kV Line Reconductor	PG&E North	May-16
Garberville Reactive Support	PG&E North	June-13
Geyser #3 - Cloverdale 115 kV Line Switch Upgrades	PG&E North	May-16
Gill Ranch Gas Storge 115 kV Interconnection	PG&E Fresno	In-Service

Transmission Project	Area	In-Service Date
Glenn #1 60 kV Reconductoring	PG&E North	May-15
Gold Hill-Horseshoe 115 kV Reinforcement	PG&E North	June-13
Half Moon Bay Reactive Support	PG&E North	May-13
Hammer – Country Club 60 kV Switch Replacement	PG&E North	In-Service
Helm-Kerman 70 kV Line Reconductor	PG&E Fresno	May-16
Herndon 230/115 kV Transformer Project	PG&E Fresno	May-13
Hollister 115 kV Reconductoring	PG&E Fresno	July-13
Humboldt - Eureka 60 kV Line Capacity Increase	PG&E North	May-16
Humboldt 115/60 kV Transformer Replacements	PG&E North	September-13
Ignacio - Alto 60 kV Line Voltage Conversion	PG&E North	May-18
Jefferson-Stanford #2 60 kV Line	PG&E North	May-17
Kerchhoff PH #2 - Oakhurst 115 kV Line	PG&E Fresno	May-18
Kern - Old River 70 kV Line Reconductor Project	PG&E Kern	May-14
Kern PP 115 kV Area Reinforcement	PG&E Kern	May-17
Kern PP 230 kV Area Reinforcement	PG&E Kern	May-18
Lakeville – Ignacio #2 230 kV Line Project	PG&E North	In-Service
Lemoore 70 kV Disconnect Switches Replacement	PG&E Fresno	May-15
Maple Creek Reactive Support	PG&E North	December-15
Mare Island - Ignacio 115 kV Reconductoring Project	PG&E North	May-16
Mendocino Coast Reactive Support	PG&E North	December-14
Menlo Area 60 kV System Upgrade	PG&E North	May-15
Mesa-Sisquoc 115 kV Line Reconductoring	PG&E Kern	May-16
Metcalf-Evergreen 115 kV line reconductoring	PG&E North	May-18
Metcalf-Piercy & Swift and Newark-Dixon Landing 115 kV Upgrade	PG&E North	May-18
Midway-Kern PP Nos. 1,3 and 4 230 kV Lines Capacity Increase	PG&E Kern	May-15
Midway-Renfro 115 kV Reconductor	PG&E Kern	In-Service
Missouri Flat - Gold Hill 115 kV Line	PG&E North	June-17
Monta Vista - Los Altos 60 kV Reconductoring	PG&E North	May-18
Monta Vista - Los Gatos - Evergreen 60 kV Project	PG&E North	May-16
Moraga Transformer Capacity Increase	PG&E North	December-15
Moraga-Castro Valley 230 kV Line Capacity Increase Project	PG&E North	December-15
Moraga-Oakland "J" SPS Project	PG&E North	May-16

Transmission Project	Area	In-Service Date
Morro Bay 230/115 kV Transformer Addition Project	PG&E Kern	May-16
Mountain View/Whisman-Monta Vista 115 kV Reconductoring	PG&E North	May-18
Napa - Tulucay No. 1 60 kV Line Upgrades	PG&E North	May-16
Navidad Substation Interconnection	PG&E Fresno	May-16
New Bridgeville - Garberville No.2 115 kV Line	PG&E North	December-18
Newark – Ravenswood 230 kV Line	PG&E North	May-15
North Tower 115 kV Looping Project	PG&E North	May-16
Oakhurst/Coarsegold UVLS	PG&E Fresno	May-16
Occidental of Elk Hills 230 kV Interconnection Project	PG&E Kern	In-Service
Oro Loma - Mendota 115 kV Conversion Project	PG&E Fresno	May-17
Oro Loma 70 kV Area Reinforcement	PG&E Fresno	May-18
Oxy 115 kV Kern Front - Load Interconnection	PG&E Kern	In-Service
Palermo – Rio Oso 115 kV Line Reconductoring	PG&E North	December-13
Pease-Marysville #2 60 kV Line	PG&E North	December-18
Pittsburg – Tesla 230 kV Reconductoring	PG&E North	October-15
Pittsburg 230/115 kV Transformer Capacity Increase	PG&E North	May-16
Pittsburg-Lakewood SPS Project	PG&E North	July-14
Ravenswood - Cooley Landing 115 kV Line Reconductor	PG&E North	May-16
Reedley 70 kV Reinforcement	PG&E Fresno	May-17
Reedley-Dinuba 70 kV Line Reconductor	PG&E Fresno	May-16
Reedley-Orosi 70 kV Line Reconductor	PG&E Fresno	May-16
Rio Oso - Atlantic 230 kV Line Project	PG&E North	May-18
Rio Oso 230/115 kV Transformer Upgrades	PG&E North	December-17
Rio Oso Area 230 kV Voltage Support	PG&E North	December-17
San Benito Substation Interconnection (Approved as San Justo)	PG&E Fresno	In-Service
San Mateo - Bair 60 kV Line Reconductor	PG&E North	May-16
Sanger - California 70 kV to 115 kV Voltage Conversion	PG&E Fresno	In-Service
Sanger-Reedley 70 kV to 115 kV Conversion Project	PG&E Fresno	In-Service
Santa Cruz 115 kV Reinforcement	PG&E Fresno	December-15
Semitropic - Midway 115 kV Line Reconductor	PG&E Kern	May-17
Shepherd Substation	PG&E Fresno	May-15
Soledad 115/60 kV Transformer Capacity	PG&E Fresno	May-18

Transmission Project	Area	In-Service Date
South of Palermo 115 kV Reinforcement Project	PG&E North	May-17
South of San Mateo Capacity Increase	PG&E North	May-18
Stagg – Hammer 60 kV Line	PG&E North	May-16
Stockton 'A' -Weber 60 kV Line Nos. 1 and 2 Reconductor	PG&E North	April-14
Table Mountain – Rio Oso 230 kV Line Reconductor and Tower Raises	PG&E North	In-Service
Table Mountain – Sycamore 115 kV Line	PG&E North	May-17
Taft 115/70 kV Transformer #2 Replacement	PG&E Kern	May-16
Tesla 115 kV Capacity Increase	PG&E North	October-14
Tesla-Newark 230 kV Path Upgrade	PG&E North	May-16
Texaco BV Hills 115 kV - Load Interconnection	PG&E Kern	In-Service
Tulucay 230/60 kV Transformer No. 1 Capacity Increase	PG&E North	May-16
Vaca – Davis Voltage Conversion Project	PG&E North	May-18
Vaca Dixon - Lakeville 230 kV Reconductoring	PG&E North	June-17
Valley Spring 230/60 kV Transmission Addition:	PG&E North	October-13
Vierra 115 kV Looping Project	PG&E North	May-16
Watsonville Voltage Conversion	PG&E North	May-18
Weber 230/60 kV Transformer Nos. 2 and 2A Replacement	PG&E North	May-14
West Coast Recycling - Load Interconnection	PG&E North	March-14
West Point – Valley Springs 60 kV Line (Reconductor)	PG&E North	December-18
West Point - Valley Springs 60 kV Line Project (Second Line)	PG&E North	May-17
Wheeler Ridge 230/70 kV Transformer	PG&E Kern	April-13
Wheeler Ridge Voltage Support	PG&E Kern	May-16
Wilson 115 kV Area Reinforcement	PG&E Fresno	May-18
Woodward 115 kV Reinforcement	PG&E Fresno	December-16
Lockheed No.1 115 kV Tap Reconductor	PG&E North	May-16
Monta Vista 230 kV Bus Upgrade	PG&E North	May-16
Monta Vista-Wolfe 115 kV Substation Equipment Upgrade	PG&E North	May-15
NRS-Scott No. 1 115 kV Line Reconductor	PG&E North	May-16
Contra Costa Sub 230 kV Switch Replacement	PG&E North	May-15
Gates #2 500/230 kV Transformer Addition	PG&E Fresno	December-17
Gates-Gregg 230 kV Line	PG&E Fresno	December-22
Gregg-Herndon #2 230 kV Line Circuit Breaker Upgrade	PG&E Fresno	May-15

Transmission Project	Area	In-Service Date
Kearney - Hearndon 230 kV Line Reconductoring	PG&E Fresno	December-17
Kearney-Caruthers 70 kV Line Reconductor	PG&E Fresno	May-16
Northern Fresno 115 kV Reinforcement	PG&E Fresno	May-18
Midway-Temblor 115 kV Line Reconductor and Voltage Support	PG&E Kern	May-18
Diablo Canyon Voltage Support Project	PG&E Kern	May-16
Midway-Andrew 230 kV Project	PG&E Kern	December-19
Amazon A100 Data Center	PG&E North	May-13
Newark-Applied Materials 115 kV Substation Equipment Upgrade	PG&E North	May-16
Windsor Substation Interconnection	PG&E North	May-15
Almaden 60 kV Shunt Capacitor	PG&E North	May-15
Los Esteros-Montague 115 kV Substation Equipment Upgrade	PG&E North	May-16
Stone 115 kV Back-tie Reconductor	PG&E North	May-16
Potrero 115 kV Bus Upgrade	PG&E North	May-17
Atlantic-Placer 115 kV Line	PG&E North	May-17
Pease 115/60 kV Transformer Addition and Bus Upgrade	PG&E North	May-17
Kasson SPS	PG&E North	May-15
Lockeford-Lodi Area 230 kV Development	PG&E North	May-17
Los Banos-Livingston Jct-Canal 70 kV Switch Replacement	PG&E Fresno	May-15
Series Reactor on Warnerville-Wilson 230 kV Line	PG&E Fresno	December-17
Warnerville-Bellota 230 kV line reconductoring	PG&E Fresno	December-17
Wilson-Le Grand 115 kV line reconductoring	PG&E Fresno	December-20
Ripon 115 kV Line	PG&E North	May-15
Salado 115/60 kV Transformer Addition	PG&E North	December-14
Arco #2 230/70 kV Transformer	PG&E Kern	December-13
Christie 115/60 kV Transformer No. 2	PG&E North	December-14
Cressey - Gallo 115 kV Line	PG&E Fresno	December-13
Kearney #2 230/70 kV Transformer	PG&E Fresno	December-15
Antelope-Whirlwind 500 kV T/L (TRTP)	SCE	In-service
Antelope-Vincent No.2 single-circuit 500 kV T/L(TRTP)	SCE	In-service
Vincent-Rio Hondo No.2 500 kV T/L (TRTP)	SCE	2014
Vincent-Mira Loma 500 kV T/L (Vincent-Mesa Area)-TRTP	SCE	2014
Vincent-Mira Loma 500 kV T/L (Mesa Area-Mira Loma)-TRTP	SCE	2016

Transmission Project	Area	In-Service Date
New 500/220 kV Whirlwind Substation.(TRTP)	SCE	In-service
Whirlwind - Windhub 500 kV T/L (TRTP)	SCE	In-service
Vincent-Mesa (via Gould) 500/220 kV T/L (TRTP)	SCE	2015

Table B-5: CAISO Pre-Cluster 6 Delivery and Reliability Network Upgrades

Pre-Cluster 6 Project	Description of the Associated Pre-Cluster 6 Network Upgrade	Area	In-Service Date
Q045/Q067	Reconductor East Shore-San Mateo #1 230 kV Line 12.5 mi with 954 ACSS	PG&E North	In-Service
Q045/Q067	Re-conductor East Shore-Dumbarton 115 kV line 6.83 miles of 2-477 ACSS	PG&E North	In-Service
Q045/Q067	East Shore 230/115 kV bank 2 with 420 MVA bank	PG&E North	In-Service
Q074	SPS to trip for Carberry-Round Mountain and Pit #1-Cottonwood 230 kV line outages	PG&E North	In-Service
Q075	Reconductor Certainteed 115 kV tap between Chowchilla Junction -Certainteed Junction and Chowchilla Cogen Jct-Chowchilla Cogen with 397 AAC	PG&E Fresno	In-Service
Q172/Q248	Replace Weber 230 kV CB242	PG&E North	2/1/2017
Q268	Re-conductor 2.5 miles of the line section from Cross Road Jct-Kasson Jct 2 with 477 ACSS on the Vierra-Kasson-Tracy 115 kV Line	PG&E North	In-Service
Q268	SPS to reduce Q268 output for an overload on the Schulte SW ST-Kasson-Manteca 115 kV Line (Kasson Jct 1 - Schulte) due to the loss of the Schulte Sw Sta-Lammers 115 kV Line	PG&E North	In-Service
Q372/Q470/Q471	SPS to trip Q372/Q470/Q471 for overload on Kingsburg-Lemoore 70 kV Line for Henrietta 230 kV Bus Outage	PG&E Fresno	1/2/2017
Q550	SPS to trip Q550 for overloads on Merced Falls-Exchequer 70 kV and Exchequer-LeGrand 115 kV Lines due to loss of Merced 115/70 kV Transformer Bank 2	PG&E Fresno	4/1/2016
Transition Cluster	Re-conductor the GWF Henrietta Henrietta 70 kV Line (~0.12 miles) with 2-477 ACSS	PG&E Fresno	6/1/2016
Transition Cluster	Re-conductor Borden-Gregg 230 kV Line with 795 ACSS	PG&E Fresno	6/1/2017
Transition Cluster	Upgrade limiting elements of Atascadero-San Luis Obispo 70 kV Line to utilized ratings of new conductors (re-conductored as part of maintenance project)	PG&E Kern	3/30/2015
Transition Cluster	Re-conductor the Caliente SS-Midway #1 230 kV Line with 954 ACSS 26 miles	PG&E Kern	In-Service
Transition Cluster	Re-conductor the Caliente SS-Midway #2 230 kV Line with 954 ACSS 26 miles	PG&E Kern	In-Service
Transition Cluster	Re-conductor the Solar SS-Caliente SS #1 230 kV Line with 954 ACSS 9 miles	PG&E Kern	In-Service
Transition Cluster	Re-conductor the Solar SS-Caliente SS #2 230 kV Line with 954 ACSS 9 miles	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS due to Caliente SS-Midway #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Midway-Temblor 115 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Midway-Temblor 115 kV Line due to Morro Bay-Gates and Templeton-Gates 230 kV double line outage	PG&E Kern	In-Service

Pre-Cluster 6 Project	Description of the Associated Pre-Cluster 6 Network Upgrade	Area	In-Service Date
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Midway-Temblor 115 kV Line due to Morro Bay-Gates and Templeton 230 kV Bus F Trip	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Midway-Temblor 115 kV Line due to Morro Bay-Gates and Templeton Bank 1 Trip	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Templeton-Gates 230 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Morro Bay-Gates 230 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Morro Bay-Solar SS #1 230 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Morro Bay-Solar SS #2 230 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Morro Bay-Templeton 230 kV Line due to Solar SS-Caliente SS #1 and #2 230 kV double line outage	PG&E Kern	In-Service
Transition Cluster	Q166/Q194/Q239/Q242 projects tripped by Carrizo SPS for overload on Morro Bay-Templeton 230 kV Line due to Morro Bay 230 kV Bus Section 2D outage	PG&E Kern	In-Service
Transition Cluster	SPS to trip Q356 for Taft-Maricopa and Maricopa-Old River 70 kV Line overloads due to Midway-Taft and Fellows-Taft 115 kV double line outage	PG&E Kern	3/30/2015
Transition Cluster	Re-conductor Contra Costa PP-Delta Pumps 230 kV Line (Contra Costa-Windmaster) with 954 ACSS 16.5 miles	PG&E North	3/31/2017
Transition Cluster	Re-conductor Contra Costa PP-Delta Pumps 230 kV Line (Windmaster-Delta Pumps) with 954 ACSS 1.8 miles	PG&E North	1/1/2015
Transition Cluster	Re-conductor Kelso-Tesla 230 kV Line (Kelso-USWP Ralph) with 954 ACSS 3.3 miles	PG&E North	1/1/2015
Transition Cluster	Re-conductor Las Positas-Newark 230 kV Line with 795 ACSS 21 miles	PG&E North	1/1/2015
Transition Cluster	SPS to trip Q258 for overloads on Contra Costa PP-Contra Costa Sub 230 kV Line	PG&E North	8/31/2015
Transition Cluster	SPS to trip Q258 for overloads on Birds Landing-Contra Costa 230 kV Line	PG&E North	8/31/2015
Transition Cluster	SPS to trip Q258 for overloads on Vaca-Lambie 230 kV Line	PG&E North	8/31/2015
Transition Cluster	SPS to trip Q258 for overloads on Lambie-Birds Landing 230 kV Line	PG&E North	8/31/2015
Clusters 1 and 2	All Fresno/Kern Interconnection Area cluster 1, cluster 2, and SGIP transition projects must meet +/- 0.95 power factor at POI	PG&E Fresno and PG&E Kern	N/A
Clusters 1 and 2	Re-conductor Q577-Westley with super bundled 795 ACSS 28.7 mi	PG&E Fresno	4/7/2014
Clusters 1 and 2	Table Mountain-Q569/Q569-Tesla 500 kV series capacitor upgrades/re-configuration	PG&E North	5/1/2018
Clusters 3 and 4	Re-conductor Los Banos-4C779 #1 230 kV Line (Los Banos to Pole #90/406)	PG&E Fresno	3/1/2016

Pre-Cluster 6 Project	Description of the Associated Pre-Cluster 6 Network Upgrade	Area	In-Service Date
Clusters 3 and 4	Add two Helm 230/70 kV transformer banks	PG&E Fresno	12/1/2018
Clusters 3 and 4	Re-conductor Helm-Stroud Sw Sta 70 kV Line	PG&E Fresno	12/1/2018
Clusters 3 and 4	Re-conductor Giffen-San Joaquin-Helm 70 kV Line (Helm-San Joaquin Jct)	PG&E Fresno	12/1/2018
Clusters 3 and 4	Re-conductor Giffen-San Joaquin-Helm 70 kV Line (San Joaquin Jct-4C799 Tap, i.e., San Joaquin Jct. to Pole #9/12)	PG&E Fresno	12/1/2018
Clusters 3 and 4	Re-conductor Giffen-San Joaquin-Helm 70 kV Line (4C799 Tap-Giffen Jct) (Giffen Jct. to Pole #9/12)	PG&E Fresno	12/1/2018
Clusters 3 and 4	Re-conductor/new double circuit Giffen-San Joaquin-Helm 70 kV Line (Giffen Jct-Giffen) (Giffen Tap Line)	PG&E Fresno	4/1/2019
Clusters 3 and 4	Re-conductor S648SS-Oro Loma 115 kV Line (Oro Loma to Pole #15/1)	PG&E Fresno	3/1/2016
Clusters 3 and 4	Re-conductor Wilson-Oro Loma 115 kV Line (Oro Loma-El Nido)	PG&E Fresno	10/1/2019
Clusters 3 and 4	Replace Oro Loma 115/70 kV transformer bank 2	PG&E Fresno	10/1/2019
Clusters 3 and 4	Re-conductor Coalinga1-Coalinga2 70 kV Line (Tornado Jct-Penn Zier Jct)	PG&E Fresno	10/1/2016
Clusters 3 and 4	QC3QC4 SPS3 for Panoche-S648 115 kV line overloads	PG&E Fresno	3/1/2015
Clusters 3 and 4	Re-conductor Arco-Carneras 70 kV Line (Arco-Twisselman Jct 2)	PG&E Kern	3/1/2015
Clusters 3 and 4	Re-conductor Arco-Carneras 70 kV Line (Twisselman Jct 2-Paramount Farms Tap)	PG&E Kern	2/1/2016
Clusters 3 and 4	Re-conductor Arco-Carneras 70 kV Line (Paramount Farms Tap-S484 Tap) (Paramount Farms tap to Pole #011/007)	PG&E Kern	3/1/2015
Clusters 3 and 4	Re-conductor Kern-Tevis-Lamont 115 kV Line (Arvin Jct 2-Grimway Jct)	PG&E Kern	12/1/2018
Clusters 3 and 4	Re-conductor Kern-Tevis-Lamont 115 kV Line (Grimway Jct-Lamont)	PG&E Kern	12/1/2014
Cluster 5	QC5P2-SPS01 Trip Q869 for Helm 230/70 kV Transformer Bank 2 and 3 Outages/Overloads	PG&E Fresno	12/1/2018

Table B-6: Existing SPS/RAS

SPS/RAS Name	Area
Mesa and Santa Maria Undervoltage SPS	PG&E Kern
Divide Undervoltage SPS	PG&E Kern
Temblor-San Luis Obispo 115 kV Overload Scheme (TBD)	PG&E Kern
COI RAS	Bulk System
Colusa SPS	PG&E North
Diablo Canyon SPS	Bulk System
Path 15 IRAS	Bulk System
Path 26 RAS North to South	Bulk System
Path 26 RAS South to North	Bulk System
Table Mt 500/230 kV Bank #1 SPS	Bulk System
Drum (Sierra Pacific) Overload Scheme (Path 24)	PG&E North
Stanislaus – Manteca 115 kV Line Load Limit Scheme	PG&E North
Vaca-Suisun 115 kV Lines Thermal Overload Scheme	PG&E North
West Sacramento 115 kV Overload Scheme	PG&E North
West Sacramento Double Line Outage Load Shedding SPS Scheme	PG&E North
Ashlan SPS	PG&E Fresno
Atwater SPS	PG&E Fresno
Gates Bank 11 SPS	PG&E Fresno
Helms HTT RAS	PG&E Fresno
Helms RAS	PG&E Fresno
Henrietta RAS	PG&E Fresno
Herndon-Bullard SPS	PG&E Fresno
Kerckhoff 2 RAS	PG&E Fresno
Midway 500/230kV Bank Overload Scheme	PG&E Kern
Reedley SPS	PG&E Fresno
Metcalf SPS	PG&E North
SF RAS	PG&E North
South of San Mateo SPS	PG&E North
Metcalf-Monta Vista 230kV OL SPS	PG&E North
San Mateo-Bay Meadows 115kV line OL	PG&E North
Moraga-Oakland J 115kV line OL RAS	PG&E North
Grant 115kV OL SPS	PG&E North
Oakland 115 kV C-X Cable OL RAS	PG&E North
Oakland 115kV D-L Cable OL RAS	PG&E North
Sobrante-Standard Oil #1 & #2-115kV line	PG&E North
Gilroy SPS	PG&E North
Transbay Cable Run Back Scheme	PG&E North
Humboldt – Trinity 115kV Thermal Overload Scheme	PG&E North
Caribou Generation 230 kV SPS Scheme #1	PG&E North
Caribou Generation 230 kV SPS Scheme #2	PG&E North
Cascade Thermal Overload Scheme	PG&E North
Hatchet Ridge Thermal Overload Scheme	PG&E North
Coleman Thermal Overload Scheme	PG&E North

Cluster 6 Phase I

PG&E Kern Interconnection Area

Appendix C

Contingency Lists For Outages

PG&E Kern Interconnection Area - Bulk System Transient Stability Outages	
Outage Description	Category
Three-phase close-in fault at the Round Mountain 500 kV bus with normal clearing time of the Malin-Round Mountain #1 500 kV line	B
Three-phase close-in fault at the Round Mountain 500 kV bus with normal clearing time of the Malin-Round Mountain #2 500 kV line	B
Three-phase close-in fault at the Round Mountain 500 kV bus with normal clearing time of the Round Mountain-Table Mountain #1 500 kV line	B
Three-phase close-in fault at the Round Mountain 500 kV bus with normal clearing time of the Round Mountain-Table Mountain #2 500 kV line	B
Three-phase close-in fault at the Table Mountain 500 kV bus with normal clearing time of the Table Mountain-Q569SS 500 kV line	B
Three-phase close-in fault at the Tesla 500 kV bus with normal clearing time of the Q569SS-Tesla 500 kV line	B
Three-phase close-in fault at the Table Mountain 500 kV bus with normal clearing time of the Table Mountain-VacaDixon 500 kV line	B
Three-phase close-in fault at the Captain Jack 500 kV bus with normal clearing time of the Captain Jack-Olinda 500 kV line	B
Three-phase close-in fault at the Olinda 500 kV bus with normal clearing time of the Olinda-Tracy 500 kV line	B
Three-phase close-in fault at the Vaca Dixon 500 kV bus with normal clearing time of the Vaca Dixon-Tesla 500 kV line	B
Three-phase close-in fault at the Tesla 500 kV bus with normal clearing time of the Tesla-Metcalf 500 kV line	B
Three-phase close-in fault at the Tesla 500 kV bus with normal clearing time of the Tesla-Los Banos 500 kV line	B
Three-phase close-in fault at the Tracy 500 kV bus with normal clearing time of the Tracy-Tesla 500 kV line	B
Three-phase close-in fault at the Tracy 500 kV bus with normal clearing time of the Tracy-Los Banos 500 kV line	B
Three-phase close-in fault at the Metcalf 500 kV bus with normal clearing time of the Metcalf-Moss Landing 500 kV line	B
Three-phase close-in fault at the Moss Landing 500 kV bus with normal clearing time of the Moss Landing-Los Banos 500 kV line	B
Three-phase close-in fault at the Los Banos 500 kV bus with normal clearing time of the Los Banos-Gates #1 500 kV line	B
Three-phase close-in fault at the Los Banos 500 kV bus with normal clearing time of the Los Banos-Gates #3 500 kV line	B
Three-phase close-in fault at the Los Banos 500 kV bus with normal clearing time of the Los Banos-Midway 500 kV line	B
Three-phase close-in fault at the Gates 500 kV bus with normal clearing time of the Gates-Midway 500 kV line	B
Three-phase close-in fault at the Diablo 500 kV bus with normal clearing time of the Diablo-Gates 500 kV line	B
Three-phase close-in fault at the Diablo 500 kV bus with normal clearing time of the Diablo-Midway #2 500 kV line	B
Three-phase close-in fault at the Diablo 500 kV bus with normal clearing time of the Diablo-Midway #3 500 kV line	B
Three-phase close-in fault at the Midway 500 kV bus with normal clearing time of the Midway-Vincent #1 500 kV line	B
Three-phase close-in fault at the Midway 500 kV bus with normal clearing time of the Midway-Vincent #2 500 kV line	B
Three-phase close-in fault at the Midway 500 kV bus with normal clearing time of the Midway-Whirlwind #3 500 kV line	B
Three-phase close-in fault at the Table Mountain 500 kV bus with normal clearing time of the Table Mountain-Vaca Dixon 500 kV line	B
Three-phase close-in fault at the Metcalf 500 kV bus with normal clearing time of the Metcalf-Moss Land ing 500 kV line	B
Three-phase close-in fault at the Malin 500 kV bus with normal clearing time of the Malin-Round Mountain #1 and #2 500 kV lines	C
Three-phase close-in fault at the Round Mountain 500 kV bus with normal clearing time of the Round Mountain-Table Mountain #1 and #2 500 kV lines	C
Three-phase close-in fault at the Table Mountain 500 kV bus with normal clearing time of the Table Mountain-2C569SS and Table Mountain-Vaca Dixon 500 kV lines	C
Three-phase close-in fault at the Tesla 500 kV bus with normal clearing time of the 2C569SS-Tesla and Vaca Dixon-Tesla 500 kV lines	C
Three-phase close-in fault at the Tracy 500 kV bus with normal clearing time of the Tesla-Tracy and Tracy-Los Banos 500 kV lines	C
Three-phase close-in fault at the Los Banos 500 kV bus with normal clearing time of the Tesla-Los Banos 500 kV and Tracy-Los Banos 500 kV lines	C
Three-phase close-in fault at the Los Banos 500 kV bus with normal clearing time of the Los Banos-Midway 500 kV and Los Banos-Gates #1 500 kV lines	C
Three-phase close-in fault at the Midway 500 kV bus with normal clearing time of the Los Banos-Midway 500 kV and Gates-Midway 500 kV lines	C
Three-phase close-in fault at the Midway 500 kV bus with normal clearing time of the Midway-Vincent #1 and #2 500 kV lines	C
Loss of PDCI Bipole	C
Single-line-to-ground close-in fault at the Round Mountain 500 kV bus on the Malin-Round Mountain #2 500 kV line and Round Mountain CB 632 fails to operate.	C
Single-line-to-ground close-in fault at the Table Mountain 500 kV bus on the Round Mountain-Table Mountain #1 500 kV line and Table Mountain CB 712 fails to operate.	C
Single-line-to-ground close-in fault at the Tesla 500 kV bus on the Tesla-Tracy 500 kV line and Tesla CB 612 fails to operate.	C
Single-line-to-ground close-in fault at the Vaca Dixon 500 kV bus on the Vaca Dixon 500/230 kV #11 Transformer and Vaca Dixon CB 732 fails to operate.	C
Single-line-to-ground close-in fault at the Metcalf 500 kV bus on the Moss Landing-Metcalf 500 kV line and Metcalf CB 822 fails to operate.	C
Single-line-to-ground close-in fault at the Los Banos 500 kV bus on the Los Banos-Gates #1 500 kV line and Los Banos CB 832 fails to operate.	C
Single-line-to-ground close-in fault at the Gates 500 kV bus on the Los Banos-Gates #3 500 kV line and Gates CB 652 fails to operate.	C
Single-line-to-ground close-in fault at the Midway 500 kV bus on the Gates-Midway 500 kV line and Midway CB 812 fails to operate.	C
Single-line-to-ground close-in fault at the Moss Landing 500 kV bus on the Moss Landing-Los Banos 500 kV line and Moss Landing CB 722 fails to operate.	C
Single-line-to-ground close-in fault at the Gregg 230 kV bus on the Borden-Gregg 230 kV line and Gregg CB 512 fails to operate.	C
Single-line-to-ground close-in fault at the Gregg 230 kV bus on the Helms-Gregg #1 230 kV line and Gregg CB 332 fails to operate.	C
Single-line-to-ground close-in fault at the Herndon 230 kV bus on the Herndon 230/115 kV #1 Transformer and Herndon CB 272 fails to operate.	C
Single-line-to-ground close-in fault at the Kern 230 kV bus on the Kern 230/115 kV #5 Transformer and Kern CB 572 fails to operate.	C
Single-line-to-ground close-in fault at the Mc Call 230 kV bus 1 and Mc Call CB 202 fails to operate.	C
Single-line-to-ground close-in fault at the Mc Call 230 kV bus on the Haas-Mc Call 230 kV line and Mc Call CB 262 fails to operate.	C
Single-line-to-ground close-in fault at the Midway 500 kV bus on the Midway 500/230 kV #11 Transformer and CB 732 fails to operate.	C
Single-line-to-ground close-in fault at the Midway 230 kV bus 1D and Midway CB 632 fails to operate.	C
Single-line-to-ground close-in high-impedance fault at the Diablo Canyon Unit #1 and Diablo Canyon CB 632 fails to operate.	C
Single-line-to-ground close-in high-impedance fault at the Helms PGP Unit #1 and Helms CB 270 fails to operate.	C
Single-line-to-ground close-in high-impedance fault at the Pine Flats PH and Pine Flats CB 760 fails to operate.	C
Single-line-to-ground close-in fault at the Templeton 230 kV bus on the Templeton 230/70 kV Transformer and Templeton CB 272 fails to operate.	C
Single-line-to-ground close-in fault at the Moss Landing 230 kV bus 1D on the Moss Landing 500/230 kV #9 Transformer and Moss Landing CB 680 fails to operate.	C
Single-line-to-ground close-in fault at the Moss Landing 115 kV bus on the Moss Landing-Green Valley #1 115 kV line and Moss Landing CB 450 fails to operate.	C
Trip two Diablo Canyon Units	D
Trip two Palo Verde Units	D

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# PG&E qc6p1 kern 2018 main year category b contingency list r8a
# Yosemite, Fresno, Kern, and Los Padres Divisions Zones (313, 314, 315, and 320)
# plus selected MID/TID/CCSF outages


# 2018 main year category b contingency list
# Yosemite Division Zone 313
#

CATB-1001-B2 "Bellota-Cottle 230 kV Line"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
0

CATB-1002-B2 "Cottle-Melones 230 kV Line"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
0

CATB-1003-B2 "Melones-North Merced 230 kV Line"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
0

CATB-1004-B2 "North Merced-Wilson 230 kV Line"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
0

CATB-1005-B2 "Bellota-Warnerville 230 kV Line"
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
0

CATB-1006-B2 "Warnerville-Wilson 230 kV Line"
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
0

CATB-1007-B2 "Wilson-Borden #1 230 kV Line"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
0

CATB-1008-B2 "Wilson-Borden #2 230 kV Line"
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
0

CATB-1009-B2 "Borden-Gregg #1 230 kV Line"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
0

CATB-1010-B2 "Borden-Gregg #2 230 kV Line"
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
0

CATB-1011-B2 "Westley-2C577 230 kV Line"
 line     30670  30763  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  2C577SS      230.00
0

CATB-1012-B2 "2C577 230 kV gen tie line"
 line     30763  30764  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  2C577        230.00
0

CATB-1013-B2 "2C577SS-Los Banos 230 kV Line"
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
0

CATB-1014-B2 "Los Banos-2C560SS 230 kV Line"
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
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0

CATB-1015-B2 "2C560SS-Dos Amigos PP 230 kV Line"
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
0

CATB-1016-B2 "2C560 230 kV gen tie line"
 line     30792  30794  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  2C560        230.00
0

CATB-1017-B2 "Los Banos-San Luis PGP #1 230 kV Line"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
0

CATB-1018-B2 "Los Banos-San Luis PGP #2 230 kV Line"
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
0

CATB-1019-B2 "Los Banos-4C779SS #1 230 kV Line"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
0

CATB-1020-B2 "4C779SS-Mercy Springs #1 230 kV Line"
 line     39717  34147  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  MERCY S1     230.00
0

CATB-1021-B2 "Mercy Springs-Panoche #1 230 kV Line"
 line     34147  30790  "2 " 1     0     # line   from  MERCY S1     230.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1022-B2 "Los Banos-Panoche #2 230 kV Line"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1023-B2 "Dos Amigos PP-Panoche #3 230 kV Line"
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1024-B2 "Panoche-Panoche Energy Center 230 kV Line"
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  PANO_EC      230.00
0

CATB-1025-B2 "Panoche-Gates #1 230 kV Line"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
0

CATB-1026-B2 "Panoche-Gates #2 230 kV Line"
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
0

CATB-1027-B2 "Panoche-3C643XSS #1 230 kV Line"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
0

CATB-1028-B2 "Panoche-3C643XSS #2 230 kV Line"
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
0

CATB-1029-B2 "3C643XSS-Helm 230 kV Line"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
0

CATB-1030-B2 "3C643XSS-Kearney #2 230 kV Line"
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY      230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
0

CATB-1031-B2 "Moss Landing-4C829SS #2 230 kV Line"
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
0

CATB-1032-B2 "Coburn-4C829SS #1 230 kV Line"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
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0

CATB-1033-B2 "4C829SS-Panoche #1 230 kV Line"
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1034-B2 "4C829SS-Panoche #2 230 kV Line"
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1035-B2 "LeGrand-Chowchilla 115 kV Line"
 line     34100  34101  "1 " 1     0     # line   from  CHWCHLLA     115.00  BRKR to (3)   CERTAN T     115.00
 line     34101  34116  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to BRKR  LE GRAND     115.00
 line     34101  34107  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to (2)   CERTANJ2     115.00
 line     34107  34103  "1 " 1     0     # line   from  CERTANJ2     115.00   (2) to (3)   CHWCGNJT     115.00
 line     34103  34102  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (1)   CERTTEED     115.00
 line     34103  34109  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (3)   CHWCGN       115.00
 line     34109  34111  "1 " 1     0     # line   from  CHWCGN       115.00   (3) to (2)   CHWCHLA2     115.00
 tran     34109  34301  "1 "       0     # tran   from  CHWCGN       115.00   (3) to (1)   CHOWCOGN      13.80
 tran     34111  34305  "1 "       0     # tran   from  CHWCHLA2     115.00   (2) to (1)   CHWCHLA2      13.80
#-#-# load     34102  "1 "    0              # load         CERTTEED     115.00  LOAD==8.98(6.03)
#-#-# load     34102  "E1"    0              # load         CERTTEED     115.00  LOAD==-0.12(0.00)
#-#-# load     34305  "ss"    0              # load         CHWCHLA2      13.80  LOAD==2.33(1.29)
#-#-# gen      34301  "1 "    0              # gen          CHOWCOGN      13.80  GEN ==48.00(10.22)
#-#-# gen      34305  "1 "    0              # gen          CHWCHLA2      13.80  GEN ==12.50(7.35)
0

CATB-1036-B2 "Atwater-El Capitan 115 kV Line"
 line     34104  34106  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (2)   CASTLE       115.00
 line     34106  34138  "1 " 1     0     # line   from  CASTLE       115.00   (2) to BRKR  EL CAPTN     115.00
0

CATB-1037-B2 "Atwater-Merced 115 kV Line"
 line     34104  34110  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   ATWATR J     115.00
 line     34110  34130  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  LIVNGSTN     115.00
 line     34110  34144  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  MERCED       115.00
0

CATB-1038-B2 "Atwater-Cressey 115 kV Line"
 line     34104  34114  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   JRWD GEN     115.00
 line     34114  34124  "1 " 1     0     # line   from  JRWD GEN     115.00   (3) to (2)   JR WOOD      115.00
 tran     34114  34332  "1 "       0     # tran   from  JRWD GEN     115.00   (3) to (1)   JRWCOGEN       9.11
 line     34124  34140  "1 " 1     0     # line   from  JR WOOD      115.00   (2) to BRKR  CRESSEY      115.00
#-#-# load     34124  "1 "    0              # load         JR WOOD      115.00  LOAD==11.95(10.54)
#-#-# load     34124  "E1"    0              # load         JR WOOD      115.00  LOAD==-0.15(0.00)
0

CATB-1039-B2 "Chowchilla-Kerckhoff #2 115 kV Line"
 line     34105  34100  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to BRKR  CHWCHLLA     115.00
 line     34105  34121  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to (3)   SHARON T     115.00
 line     34121  34120  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (1)   SHARON       115.00
 line     34121  34128  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (3)   OAKH_JCT     115.00
 line     34128  34126  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to BRKR  CORSGOLD     115.00
 line     34128  34123  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to (3)   K1-JCT       115.00
 line     34123  34122  "1 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  OAKHURST     115.00
 line     34123  34358  "2 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  KERCKHF2     115.00
#-#-# load     34120  "1 "    0              # load         SHARON       115.00  LOAD==6.64(4.63)
#-#-# load     34120  "E1"    0              # load         SHARON       115.00  LOAD==-0.08(0.00)
0

CATB-1040-B2 "Los Banos-S548SS 70 kV Line"
 line     34108  34272  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   WRGHT PP      70.00
 line     34108  34113  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (3)   ARBURU T      70.00
 line     34108  34231  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   PCHCOWND      70.00
 tran     34272  34207  "1 "       0     # tran   from  WRGHT PP      70.00   (2) to (1)   WRIGHT D      12.47
 line     34113  34224  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to (1)   ARBURUA       70.00
 line     34113  39079  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to BRKR  S548SS        70.00
 line     34231  34214  "1 " 1     0     # line   from  PCHCOWND      70.00   (2) to BRKR  LOS BANS      70.00
#-#-# load     34207  "3 "    0              # load         WRIGHT D      12.47  LOAD==10.43(1.48)
#-#-# load     34207  "E3"    0              # load         WRIGHT D      12.47  LOAD==-0.10(0.00)
#-#-# load     34224  "1 "    0              # load         ARBURUA       70.00  LOAD==3.01(1.45)
#-#-# load     34224  "E1"    0              # load         ARBURUA       70.00  LOAD==-0.05(0.00)
#-#-# gen      34207  "QF"    0              # gen          WRIGHT D      12.47  GEN ==0.53(0.32)
0
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CATB-1041-B2 "Exchequer-LeGrand 115 kV Line w/ Mariposa SPS"
 line     34112  34116  "1 " 1     0     # line   from  EXCHEQUR     115.00  BRKR to BRKR  LE GRAND     115.00
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
  load     34228  "1 "    0              # Trip Load 1 at Mariposa 70 kV due to voltage < 64 kV
  load     34228  "2 "    0              # Trip Load 2 at Mariposa 70 kV due to voltage < 64 kV
0

CATB-1042-B2 "Exchequer-LeGrand 115 kV Line w/o Mariposa SPS"
 line     34112  34116  "1 " 1     0     # line   from  EXCHEQUR     115.00  BRKR to BRKR  LE GRAND     115.00
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
0

CATB-1043-B2 "Wilson-LeGrand 115 kV Line"
 line     34116  34134  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  WILSON A     115.00
0

CATB-1044-B2 "LeGrand-S644SS 115 kV Line"
 line     34116  39186  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  S644SS       115.00
0

CATB-1045-B2 "S644SS-Dairyland 115 kV Line"
 line     39186  34154  "1 " 1     0     # line   from  S644SS       115.00  BRKR to BRKR  DAIRYLND     115.00
0

CATB-1046-B2 "Wilson-Oro Loma 115 kV Line"
 line     34118  34136  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to BRKR  WILSON B     115.00
 line     34118  34168  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to (2)   EL NIDO      115.00
 line     34168  34162  "1 " 1     0     # line   from  EL NIDO      115.00   (2) to BRKR  ORO LOMA     115.00
#-#-# load     34168  "1 "    0              # load         EL NIDO      115.00  LOAD==12.57(1.79)
#-#-# load     34168  "2 "    0              # load         EL NIDO      115.00  LOAD==11.18(1.60)
#-#-# load     34168  "E1"    0              # load         EL NIDO      115.00  LOAD==-0.12(0.00)
#-#-# load     34168  "E2"    0              # load         EL NIDO      115.00  LOAD==-0.14(0.00)
0

CATB-1047-B2 "Oakhurst-Coarse Gold 115 kV Line"
 line     34122  34126  "1 " 1     0     # line   from  OAKHURST     115.00  BRKR to BRKR  CORSGOLD     115.00
0

CATB-1048-B2 "Biola-Glass-Madera 70 kV Line"
 line     34127  34466  "1 " 1     0     # line   from  ELPECO T      70.00   (3) to BRKR  BIOLA         70.00
 line     34127  34254  "1 " 1     0     # line   from  ELPECO T      70.00   (3) to (3)   TRIGO        70.00
 line     34127  34264  "1 " 1     0     # line   from  ELPECO T      70.00   (3) to (1)   EL PECO      70.00
 line     34254  34252  "1 " 1     0     # line   from  TRIGO         70.00   (3) to BRKR  MADERA       70.00
 line     34254  34255  "1 " 1     0     # line   from  TRIGO         70.00   (3) to (3)   TRIGO J      70.00
 line     34255  34237  "1 " 1     0     # line   from  TRIGO J       70.00   (3) to (2)   CANANDGA     70.00
 line     34255  34125  "1 " 1     0     # line   from  TRIGO J       70.00   (3) to (3)   BONITA T     70.00
 line     34237  34240  "1 " 1     0     # line   from  CANANDGA      70.00   (2) to BRKR  GLASS        70.00
#-#-#  line     34125  34238  "1 " 1     0     # line   from  BONITA T      70.00   (3) to BRKR  BONITA        70.00
#-#-#  line     34125  39113  "1 " 1     0     # line   from  BONITA T      70.00   (3) to (2)   S614TP        70.00
 line     39113  34245  "1 " 1     0     # line   from  S614TP        70.00   (2) to (2)   S614          70.00
 tran     34245  34304  "1 "       0     # tran   from  S614          70.00   (2) to (1)   S614          21.00
#-#-# load     34466  "1 "    0              # load         BIOLA         70.00  LOAD==15.38(2.19)
#-#-# load     34466  "E1"    0              # load         BIOLA         70.00  LOAD==-0.19(0.00)
#-#-# load     34264  "1 "    0              # load         EL PECO       70.00  LOAD==7.14(1.02)
#-#-# load     34264  "2 "    0              # load         EL PECO       70.00  LOAD==9.47(1.35)
#-#-# load     34264  "E1"    0              # load         EL PECO       70.00  LOAD==-0.08(0.00)
#-#-# load     34264  "E2"    0              # load         EL PECO       70.00  LOAD==-0.13(0.00)
#-#-# load     34237  "1 "    0              # load         CANANDGA      70.00  LOAD==8.64(5.83)
#-#-# load     34237  "E1"    0              # load         CANANDGA      70.00  LOAD==-0.11(0.00)
#-#-# load     34238  "1 "    0              # load         BONITA        70.00  LOAD==10.25(1.46)
#-#-# load     34238  "E1"    0              # load         BONITA        70.00  LOAD==-0.13(0.00)
#-#-# gen      34304  "E "    0              # gen          S614          21.00  GEN ==20.00(-2.77)
#-#-#   line     34125  34238  "1 " 1     1     # Close line from BONITA T to BONITA for Glass-Bonita 70 kV Line
outage
#-#-#   line     34125  39113  "1 " 1     1     # Close line from BONITA T to S614TP for Glass-Bonita 70 kV Line
outage
  line     34236  39113  "1 " 1     1     # Close line from POSO J2 to S614TP for Glass-Bonita 70 kV Line outage
  #-#-# load     34238  "1 "    1              # Restore load 1 at BONITA 70.00 for Glass-Bonita 70 kV Line outage
  #-#-# load     34238  "E1"    1              # Restore load E1 at BONITA 70.00 for Glass-Bonita 70 kV Line outage
0

CATB-1049-B2 "Livingston-Gallo 115 kV Line"
 line     34130  34132  "1 " 1     0     # line   from  LIVNGSTN     115.00  BRKR to BRKR  GALLO        115.00
0
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CATB-1050-B2 "Cressey-Gallo 115 kV Line"
 line     34132  34140  "1 " 1     0     # line   from  GALLO        115.00  BRKR to BRKR  CRESSEY      115.00
0

CATB-1051-B2 "Wilson-Atwater #2 115 kV Line"
 line     34134  34104  "1 " 1     0     # line   from  WILSON A     115.00  BRKR to BRKR  ATWATER      115.00
0

CATB-1052-B2 "Wilson-Merced #1 115 kV Line"
 line     34134  34144  "1 " 1     0     # line   from  WILSON A     115.00  BRKR to BRKR  MERCED       115.00
0

CATB-1053-B2 "El Capitan-Wilson 115 kV Line"
 line     34136  34138  "1 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  EL CAPTN     115.00
0

CATB-1054-B2 "Wilson-Merced #2 115 kV Line"
 line     34136  34144  "2 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  MERCED       115.00
0

CATB-1055-B2 "Panoche-4C678 #1 115 kV Line"
 line     34155  34350  "1 " 1     0     # line   from  PANOCHE1     115.00  BRKR to (2)   KAMM         115.00
 line     34350  34352  "1 " 1     0     # line   from  KAMM         115.00   (2) to (3)   CANTUA       115.00
 line     34352  34432  "1 " 1     0     # line   from  CANTUA       115.00   (3) to (2)   WESTLNDS     115.00
 line     34352  90078  "1 " 1     0     # line   from  CANTUA       115.00   (3) to (1)   0078-WD      115.00
 line     34432  39777  "1 " 1     0     # line   from  WESTLNDS     115.00   (2) to BRKR  4C678S1     115.00
#-#-# load     34350  "1 "    0              # load         KAMM         115.00  LOAD==3.55(1.63)
#-#-# load     34350  "E1"    0              # load         KAMM         115.00  LOAD==-0.05(0.00)
#-#-# load     34352  "1 "    0              # load         CANTUA       115.00  LOAD==19.39(2.76)
#-#-# load     34352  "E1"    0              # load         CANTUA       115.00  LOAD==-0.13(0.00)
#-#-# load     34432  "16"    0              # load         WESTLNDS     115.00  LOAD==0.90(0.22)
#-#-# load     34432  "18"    0              # load         WESTLNDS     115.00  LOAD==1.20(0.32)
#-#-# load     34432  "E1"    0              # load         WESTLNDS     115.00  LOAD==-0.01(0.00)
#-#-# load     34432  "E2"    0              # load         WESTLNDS     115.00  LOAD==-0.01(0.00)
#-#-# gen      90078  "FW"    0              # gen          0078-WD      115.00  GEN ==20.00(0.00)
0

CATB-1056-B2 "Panoche-4C678SS #2 115 kV Line"
 line     34141  34148  "1 " 1     0     # line   from  PAN2_TAP     115.00   (2) to (2)   CHENY        115.00
 tran     34141  34142  "1 "       0     # tran   from  PAN2_TAP     115.00   (2) to (1)   WHD_PAN2      13.80
 line     34148  34149  "1 " 1     0     # line   from  CHENY        115.00   (2) to (3)   CHENYT       115.00
 line     34149  34151  "1 " 1     0     # line   from  CHENYT       115.00   (3) to (3)   S612TP       115.00
 line     34149  34158  "1 " 1     0     # line   from  CHENYT       115.00   (3) to BRKR  PANOCHE2     115.00
 line     34151  39081  "1 " 1     0     # line   from  S612TP       115.00   (3) to (2)   S612         115.00
 line     34151  39778  "2 " 1     0     # line   from  S612TP       115.00   (3) to BRKR  4C678S2     115.00
 tran     39081  34303  "1 "       0     # tran   from  S612         115.00   (2) to (1)   S612          13.80
#-#-# load     34148  "1 "    0              # load         CHENY        115.00  LOAD==16.10(2.29)
#-#-# load     34148  "E1"    0              # load         CHENY        115.00  LOAD==-0.15(0.00)
#-#-# gen      34142  "1 "    0              # gen          WHD_PAN2      13.80  GEN ==49.97(-9.19)
#-#-# gen      34303  "E "    0              # gen          S612          13.80  GEN ==13.00(-1.51)
0

CATB-1057-B2 "Dairyland-Mendota 115 kV Line"
 line     34150  34154  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to BRKR  DAIRYLND     115.00
 line     34150  34178  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to (3)   MADERAPR     115.00
 line     34178  34153  "1 " 1     0     # line   from  MADERAPR     115.00   (3) to (3)   GILLTAP      115.00
 tran     34178  34179  "1 "       0     # tran   from  MADERAPR     115.00   (3) to (1)   MADERA_G      13.80
 line     34153  34152  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to (1)   GILLRAN      115.00
 line     34153  34156  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to BRKR  MENDOTA      115.00
#-#-# load     34150  "2 "    0              # load         NEWHALL      115.00  LOAD==9.39(1.34)
#-#-# load     34150  "3 "    0              # load         NEWHALL      115.00  LOAD==8.26(1.18)
#-#-# load     34150  "E2"    0              # load         NEWHALL      115.00  LOAD==-0.10(0.00)
#-#-# load     34150  "E3"    0              # load         NEWHALL      115.00  LOAD==-0.08(0.00)
#-#-# load     34179  "SG"    0              # load         MADERA_G      13.80  LOAD==3.82(0.91)
#-#-# load     34152  "1 "    0              # load         GILLRAN      115.00  LOAD==11.75(3.56)
#-#-# load     34152  "E1"    0              # load         GILLRAN      115.00  LOAD==-0.27(0.00)
#-#-# gen      34179  "1 "    0              # gen          MADERA_G      13.80  GEN ==33.00(5.09)
0

CATB-1058-B2 "Panoche-CalPeak-Starwood 115 kV Line"
 line     34155  34189  "1 " 1     0     # line   from  PANOCHE1     115.00  BRKR to (3)   STAR_PAN     115.00
 tran     34189  34328  "1 "       0     # tran   from  STAR_PAN     115.00   (3) to (1)   STAR_GT1      13.80
 tran     34189  34329  "1 "       0     # tran   from  STAR_PAN     115.00   (3) to (1)   STAR_GT2      13.80
#-#-# load     34328  "SG"    0              # load         STAR_GT1      13.80  LOAD==0.69(0.38)
#-#-# load     34329  "SG"    0              # load         STAR_GT2      13.80  LOAD==0.69(0.38)
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#-#-# gen      34328  "1 "    0              # gen          STAR_GT1      13.80  GEN ==60.94(23.77)
#-#-# gen      34329  "2 "    0              # gen          STAR_GT2      13.80  GEN ==60.94(23.77)
  gen      34186  "1 "    0             # DG_PAN Unit will trip for Panoche-CalPeak-Starwood 115 kV Line Outage
0

CATB-1059-B2 "Panoche-Mendota 115 kV Line"
 line     34157  34155  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  PANOCHE1     115.00
 line     34157  34156  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  MENDOTA      115.00
0

CATB-1060-B2 "Panoche-S648SS 115 kV Line"
 line     34159  34158  "1 " 1     0     # line   from  PANOCHEJ     115.00   (3) to BRKR  PANOCHE2     115.00
 line     34159  34160  "1 " 1     0     # line   from  PANOCHEJ     115.00   (3) to (2)   HAMMONDS     115.00
 line     34159  34180  "1 " 1     0     # line   from  PANOCHEJ     115.00   (3) to (3)   OXFRDJCT     115.00
 line     34160  39886  "1 " 1     0     # line   from  HAMMONDS     115.00   (2) to (3)   S541TP       115.00
 line     39886  34161  "1 " 1     0     # line   from  S541TP       115.00   (3) to (3)   DFSTP        115.00
 line     39886  39887  "1 " 1     0     # line   from  S541TP       115.00   (3) to (2)   S541         115.00
 line     34161  34164  "1 " 1     0     # line   from  DFSTP        115.00   (3) to (1)   DFS          115.00
 line     34161  39150  "1 " 1     0     # line   from  DFSTP        115.00   (3) to BRKR  S648SS       115.00
 tran     39887  39888  "1 "       0     # tran   from  S541         115.00   (2) to (1)   S541          13.80
 line     34180  34166  "1 " 1     0     # line   from  OXFRDJCT     115.00   (3) to (1)   OXFORD       115.00
 line     34180  34181  "1 " 1     0     # line   from  OXFRDJCT     115.00   (3) to (3)   WSTLDJCT     115.00
 line     34181  34182  "1 " 1     0     # line   from  WSTLDJCT     115.00   (3) to (1)   WSTLD1RA     115.00
 line     34181  34183  "1 " 1     0     # line   from  WSTLDJCT     115.00   (3) to (3)   LUISJCT      115.00
 line     34183  34163  "1 " 1     0     # line   from  LUISJCT      115.00   (3) to (1)   LUIS_#3      115.00
 line     34183  34165  "1 " 1     0     # line   from  LUISJCT      115.00   (3) to (1)   LUIS_#5      115.00
#-#-# load     34160  "1 "    0              # load         HAMMONDS     115.00  LOAD==11.69(1.66)
#-#-# load     34160  "E1"    0              # load         HAMMONDS     115.00  LOAD==-0.13(0.00)
#-#-# load     34164  "1 "    0              # load         DFS          115.00  LOAD==2.80(2.21)
#-#-# load     34164  "E1"    0              # load         DFS          115.00  LOAD==-0.01(0.00)
#-#-# load     34166  "1 "    0              # load         OXFORD       115.00  LOAD==1.95(0.89)
#-#-# load     34166  "E1"    0              # load         OXFORD       115.00  LOAD==-0.04(0.00)
#-#-# load     34182  "1 "    0              # load         WSTLD1RA     115.00  LOAD==3.10(0.74)
#-#-# load     34182  "E1"    0              # load         WSTLD1RA     115.00  LOAD==-0.04(0.00)
#-#-# load     34163  "1 "    0              # load         LUIS_#3      115.00  LOAD==2.00(0.47)
#-#-# load     34163  "E1"    0              # load         LUIS_#3      115.00  LOAD==-0.02(0.00)
#-#-# load     34165  "1 "    0              # load         LUIS_#5      115.00  LOAD==2.30(0.55)
#-#-# load     34165  "E1"    0              # load         LUIS_#5      115.00  LOAD==-0.03(0.00)
#-#-# gen      39888  "ET"    0              # gen          S541          13.80  GEN ==20.00(1.38)
0

CATB-1061-B2 "Oro Loma-Firebaugh 115 kV Line"
 line     34162  34234  "1 " 1     0     # line   from  ORO LOMA     115.00  BRKR to (2)   POSO J1      115.00
 line     34234  34266  "1 " 1     0     # line   from  POSO J1      115.00   (2) to BRKR  FIREBAGH     115.00
0

CATB-1062-B2 "S648SS-Oro Loma 115 kV Line w/ QC3QC4-FRESNO-SPS03"
 line     34162  39150  "1 " 1     0     # line   from  ORO LOMA     115.00  BRKR to BRKR  S648SS       115.00
# QC3QC4-FRESNO-SPS03
 gen      39716  "F "    0              # gen          4C823          0.31  GEN ==90.00(4.80)
0

CATB-1063-B2 "S648SS-Oro Loma 115 kV Line w/o QC3QC4-FRESNO-SPS03"
 line     34162  39150  "1 " 1     0     # line   from  ORO LOMA     115.00  BRKR to BRKR  S648SS       115.00
0

CATB-1064-B2 "Mendota-Giffen 70 kV Line"
 line     34172  34170  "1 " 1     0     # line   from  WESTLAND      70.00   (2) to (1)   WESIX         70.00
 line     34172  34271  "1 " 1     0     # line   from  WESTLAND      70.00   (2) to (3)   WSTLDJCT      70.00
 line     34271  34469  "1 " 1     0     # line   from  WSTLDJCT      70.00   (3) to BRKR  GFFNJCT       70.00
 line     34271  39160  "1 " 1     0     # line   from  WSTLDJCT      70.00   (3) to (3)   S632TP        70.00
 line     39160  34269  "1 " 1     0     # line   from  S632TP        70.00   (3) to (2)   BIOMSJCT      70.00
 line     39160  39161  "1 " 1     0     # line   from  S632TP        70.00   (3) to (2)   S632          70.00
 line     34269  34270  "1 " 1     0     # line   from  BIOMSJCT      70.00   (2) to (3)   BIOMASS       70.00
 line     34270  34273  "1 " 1     0     # line   from  BIOMASS       70.00   (3) to (2)   CALRENEW      70.00
 tran     34270  34334  "1 "       0     # tran   from  BIOMASS       70.00   (3) to (1)   BIO PWR        9.11
 tran     34273  34339  "1 "       0     # tran   from  CALRENEW      70.00   (2) to (1)   CALRENEW      12.50
 tran     39161  39162  "1 "       0     # tran   from  S632          70.00   (2) to (1)   S632          12.47
#-#-# load     34172  "1 "    0              # load         WESTLAND      70.00  LOAD==3.20(0.76)
#-#-# load     34172  "E1"    0              # load         WESTLAND      70.00  LOAD==-0.04(0.00)
#-#-# load     34170  "1 "    0              # load         WESIX         70.00  LOAD==1.80(0.43)
#-#-# load     34170  "E1"    0              # load         WESIX         70.00  LOAD==-0.02(0.00)
#-#-# gen      34334  "1 "    0              # gen          BIO PWR        9.11  GEN ==22.70(0.57)
#-#-# gen      34339  "1 "    0              # gen          CALRENEW      12.50  GEN ==5.00(-0.70)
#-#-# gen      39162  "E "    0              # gen          S632          12.47  GEN ==19.00(2.27)
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0

CATB-1065-B2 "North Merced-El Capitan #1 115 kV Line"
 line     34190  34138  "1 " 1     0     # line   from  NMERCED2     115.00  BRKR to BRKR  EL CAPTN     115.00
0

CATB-1066-B2 "North Merced-El Capitan #2 115 kV Line"
 line     34190  34138  "2 " 1     0     # line   from  NMERCED2     115.00  BRKR to BRKR  EL CAPTN     115.00
0

CATB-1067-B2 "North Merced-Cressey 115 kV Line"
 line     34190  34140  "1 " 1     0     # line   from  NMERCED2     115.00  BRKR to BRKR  CRESSEY      115.00
0

CATB-1068-B2 "Oro Loma-Santa Rita 70 kV Line"
 line     34200  34218  "1 " 1     0     # line   from  ORO LOMA      70.00  BRKR to (2)   DOS PALS      70.00
 line     34218  34216  "1 " 1     0     # line   from  DOS PALS      70.00   (2) to BRKR  SNTA RTA      70.00
#-#-# load     34218  "1 "    0              # load         DOS PALS      70.00  LOAD==10.16(1.45)
#-#-# load     34218  "E1"    0              # load         DOS PALS      70.00  LOAD==-0.10(0.00)
0

CATB-1069-B2 "Oro Loma-Mercy Springs 70 kV Line"
 line     34200  34222  "1 " 1     0     # line   from  ORO LOMA      70.00  BRKR to BRKR  MRCYSPRS      70.00
0

CATB-1070-B2 "Merced #1 70 kV Line"
 line     34202  34203  "1 " 1     0     # line   from  MERCED        70.00  BRKR to (3)   ELNIDOTP      70.00
 line     34203  34205  "1 " 1     0     # line   from  ELNIDOTP      70.00   (3) to (2)   ELNIDO        70.00
 line     34203  39010  "1 " 1     0     # line   from  ELNIDOTP      70.00   (3) to (3)   S550TP        70.00
 tran     34205  34330  "1 "       0     # tran   from  ELNIDO        70.00   (2) to (1)   ELNIDO        13.80
 line     39010  34236  "1 " 1     0     # line   from  S550TP        70.00   (3) to (1)   POSO J2       70.00
 line     39010  39011  "1 " 1     0     # line   from  S550TP        70.00   (3) to (2)   S550          70.00
 tran     39011  34345  "1 "       0     # tran   from  S550          70.00   (2) to (1)   S550          34.50
#-#-# load     34330  "ss"    0              # load         ELNIDO        13.80  LOAD==1.87(1.04)
#-#-# load     34345  "SS"    0              # load         S550          34.50  LOAD==0.10(0.06)
#-#-# gen      34330  "1 "    0              # gen          ELNIDO        13.80  GEN ==12.50(3.90)
#-#-# gen      34345  "E "    0              # gen          S550          34.50  GEN ==20.00(-1.90)
0

CATB-1071-B2 "Merced-Merced Falls 70 kV Line"
 line     34202  34230  "1 " 1     0     # line   from  MERCED        70.00  BRKR to BRKR  MRCDFLLS      70.00
0

CATB-1072-B2 "Livingston Jct-Livingston 70 kV Line"
 line     34204  34212  "1 " 1     0     # line   from  LIVNGSTN      70.00   (1) to BRKR  LVNGSTNT      70.00
#-#-# load     34204  "2 "    0              # load         LIVNGSTN      70.00  LOAD==5.54(0.79)
#-#-# load     34204  "E2"    0              # load         LIVNGSTN      70.00  LOAD==-0.06(0.00)
0

CATB-1073-B2 "Livingston Jct-Canal 70 kV Line"
 line     34206  34212  "1 " 1     0     # line   from  CANAL         70.00  BRKR to BRKR  LVNGSTNT      70.00
0

CATB-1074-B2 "Canal-Santa Rita 70 kV Line"
 line     34206  34216  "1 " 1     0     # line   from  CANAL         70.00  BRKR to BRKR  SNTA RTA      70.00
0

CATB-1075-B2 "Canal-Ortiga-Mercy Springs #1 70 kV Line"
 line     34206  34220  "1 " 1     0     # line   from  CANAL         70.00  BRKR to (2)   ORTIGA        70.00
 line     34220  34222  "1 " 1     0     # line   from  ORTIGA        70.00   (2) to BRKR  MRCYSPRS      70.00
#-#-# load     34220  "2 "    0              # load         ORTIGA        70.00  LOAD==6.80(0.97)
#-#-# load     34220  "E2"    0              # load         ORTIGA        70.00  LOAD==-0.09(0.00)
0

CATB-1076-B2 "Los Banos-Livingston Jct-Canal 70 kV Line"
 line     34208  34210  "1 " 1     0     # line   from  CHEVPIPE      70.00   (2) to (2)   SNTA NLA      70.00
 line     34208  34214  "1 " 1     0     # line   from  CHEVPIPE      70.00   (2) to BRKR  LOS BANS      70.00
 line     34210  34212  "1 " 1     0     # line   from  SNTA NLA      70.00   (2) to (3)   LVNGSTNT      70.00
 line     34212  34204  "1 " 1     0     # line   from  LVNGSTNT      70.00  BRKR to (1)   LIVNGSTN      70.00
 line     34212  34206  "1 " 1     0     # line   from  LVNGSTNT      70.00  BRKR to BRKR  CANAL         70.00
#-#-# load     34208  "1 "    0              # load         CHEVPIPE      70.00  LOAD==0.82(0.55)
#-#-# load     34208  "E1"    0              # load         CHEVPIPE      70.00  LOAD==-0.02(0.00)
#-#-# load     34210  "1 "    0              # load         SNTA NLA      70.00  LOAD==9.68(1.38)
#-#-# load     34210  "2 "    0              # load         SNTA NLA      70.00  LOAD==8.29(1.18)
#-#-# load     34210  "E1"    0              # load         SNTA NLA      70.00  LOAD==-0.07(0.00)
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#-#-# load     34210  "E2"    0              # load         SNTA NLA      70.00  LOAD==-0.10(0.00)
#-#-# load     34204  "2 "    0              # load         LIVNGSTN      70.00  LOAD==5.54(0.79)
#-#-# load     34204  "E2"    0              # load         LIVNGSTN      70.00  LOAD==-0.06(0.00)
0

CATB-1077-B2 "Los Banos-ONeil PGP 70 kV Line"
 line     34214  34233  "1 " 1     0     # line   from  LOS BANS      70.00  BRKR to (2)   MCCABEJ1      70.00
 line     34233  34282  "1 " 1     0     # line   from  MCCABEJ1      70.00   (2) to (2)   ONLL PMP      69.00
 tran     34282  34316  "1 "       0     # tran   from  ONLL PMP      69.00   (2) to (1)   ONEILPMP       9.11
#-#-# load     34282  "1 "    0              # load         ONLL PMP      69.00  LOAD==5.93(1.19)
#-#-# gen      34316  "1 "    0              # gen          ONEILPMP       9.11  GEN ==-6.50(0.00)
0

CATB-1078-B2 "Los Banos-Pacheco 70 kV Line"
 line     34214  34235  "1 " 1     0     # line   from  LOS BANS      70.00  BRKR to (2)   MCCABEJ2      70.00
 line     34235  34239  "1 " 1     0     # line   from  MCCABEJ2      70.00   (2) to (3)   DINO JCT      70.00
 line     34239  34278  "1 " 1     0     # line   from  DINO JCT      70.00   (3) to (1)   PCHCO PP      70.00
 line     34239  34280  "1 " 1     0     # line   from  DINO JCT      70.00   (3) to (2)   INTL TUR      70.00
 tran     34280  34342  "1 "       0     # tran   from  INTL TUR      70.00   (2) to (1)   INT.TURB       9.11
#-#-# load     34278  "1 "    0              # load         PCHCO PP      70.00  LOAD==18.00(4.10)
#-#-# load     34278  "E1"    0              # load         PCHCO PP      70.00  LOAD==-0.22(0.00)
#-#-# gen      34342  "1 "    0              # gen          INT.TURB       9.11  GEN ==4.54(0.00)
0

CATB-1079-B2 "Canal-Mercy Springs #2 70 kV Line"
 line     34222  34206  "2 " 1     0     # line   from  MRCYSPRS      70.00  BRKR to BRKR  CANAL         70.00
0

CATB-1080-B2 "S548SS-Mercy Springs 70 kV Line"
 line     34222  39079  "1 " 1     0     # line   from  MRCYSPRS      70.00  BRKR to BRKR  S548SS        70.00
0

CATB-1081-B2 "Exchequer-Mariposa 70 kV Line"
 line     34228  34232  "1 " 1     0     # line   from  MARIPOS2      70.00   (1) to BRKR  EXCHEQUR      70.00
#-#-# load     34228  "1 "    0              # load         MARIPOS2      70.00  LOAD==7.58(1.08)
#-#-# load     34228  "2 "    0              # load         MARIPOS2      70.00  LOAD==7.23(1.03)
#-#-# load     34228  "E1"    0              # load         MARIPOS2      70.00  LOAD==-0.08(0.00)
#-#-# load     34228  "E2"    0              # load         MARIPOS2      70.00  LOAD==-0.08(0.00)
  line     34228  34244  "1 " 1     1     # Switches in Mariposa SW 39 to transfer load
  #-#-# load     34228  "1 "    1              # Restore Load 1 at Mariposa
  #-#-# load     34228  "E1"    1              # Restore Load E1 at Mariposa
  #-#-# load     34228  "2 "    1              # Restore Load 2 at Mariposa
  #-#-# load     34228  "E2"    1              # Restore Load E2 at Mariposa
0

CATB-1082-B2 "Exchequer-Yosemite 70 kV Line"
 line     34232  34242  "1 " 1     0     # line   from  EXCHEQUR      70.00  BRKR to (2)   BER VLLY      70.00
 line     34242  34244  "1 " 1     0     # line   from  BER VLLY      70.00   (2) to (2)   BRCEBG J      70.00
 line     34244  34246  "1 " 1     0     # line   from  BRCEBG J      70.00   (2) to (3)   SAXONCRK      70.00
 line     34246  34248  "1 " 1     0     # line   from  SAXONCRK      70.00   (3) to (2)   INDN FLT      70.00
 tran     34246  34346  "1 "       0     # tran   from  SAXONCRK      70.00   (3) to (1)   SAXNCK L       4.16
 line     34248  34250  "1 " 1     0     # line   from  INDN FLT      70.00   (2) to (1)   YOSEMITE      70.00
#-#-# load     34242  "1 "    0              # load         BER VLLY      70.00  LOAD==3.48(0.49)
#-#-# load     34242  "E1"    0              # load         BER VLLY      70.00  LOAD==-0.04(0.00)
#-#-# load     34246  "1 "    0              # load         SAXONCRK      70.00  LOAD==0.78(0.78)
#-#-# load     34246  "E1"    0              # load         SAXONCRK      70.00  LOAD==-0.02(0.00)
#-#-# load     34248  "1 "    0              # load         INDN FLT      70.00  LOAD==2.01(0.28)
#-#-# load     34248  "E1"    0              # load         INDN FLT      70.00  LOAD==-0.02(0.00)
#-#-# load     34250  "1 "    0              # load         YOSEMITE      70.00  LOAD==2.71(0.00)
#-#-# load     34250  "E1"    0              # load         YOSEMITE      70.00  LOAD==-0.04(0.00)
0

CATB-1083-B2 "Glass-Borden 70 kV Line"
 line     34240  34256  "1 " 1     0     # line   from  GLASS         70.00  BRKR to BRKR  BORDEN        70.00
0

CATB-1084-B2 "Borden-Madera #2 70 kV Line"
 line     34252  34256  "2 " 1     0     # line   from  MADERA        70.00  BRKR to BRKR  BORDEN        70.00
0

CATB-1085-B2 "Borden-Madera #1 70 kV Line"
 line     34256  34252  "1 " 1     0     # line   from  BORDEN        70.00  BRKR to BRKR  MADERA        70.00
0

CATB-1086-B2 "Borden-Coppermine 70 kV Line"
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```
 line     34256  34262  "1 " 1     0     # line   from  BORDEN        70.00  BRKR to (2)   CASSIDY       70.00
 line     34262  34145  "1 " 1     0     # line   from  CASSIDY       70.00   (2) to (3)   RVRRCK T      70.00
 line     34145  34464  "1 " 1     0     # line   from  RVRRCK T      70.00   (3) to BRKR  COPPRMNE      70.00
 line     34145  34454  "1 " 1     0     # line   from  RVRRCK T      70.00   (3) to (1)   RIVERROC      70.00
#-#-# load     34262  "2 "    0              # load         CASSIDY       70.00  LOAD==12.61(1.80)
#-#-# load     34262  "E2"    0              # load         CASSIDY       70.00  LOAD==-0.12(0.00)
#-#-# load     34454  "1 "    0              # load         RIVERROC      70.00  LOAD==4.31(0.61)
#-#-# load     34454  "E1"    0              # load         RIVERROC      70.00  LOAD==-0.03(0.00)
0

CATB-1087-B2 "Wishon-SJ #3 PH"
 line     34259  34261  "1 " 1     0     # line   from  NRTHFORK      70.00   (2) to (3)   SJNO3         70.00
 line     34259  34260  "1 " 1     0     # line   from  NRTHFORK      70.00   (2) to (3)   SJNO2         70.00
 tran     34261  34633  "1 "       0     # tran   from  SJNO3         70.00   (3) to (1)   SJ3GEN         9.11
 tran     34261  34634  "1 "       0     # tran   from  SJNO3         70.00   (3) to (1)   CRANEVLY      12.00
 line     34260  34452  "1 " 1     0     # line   from  SJNO2         70.00   (3) to BRKR  WISHON        70.00
 tran     34260  34631  "1 "       0     # tran   from  SJNO2         70.00   (3) to (1)   SJ2GEN         9.11
#-#-# load     34261  "2 "    0              # load         SJNO3         70.00  LOAD==3.66(0.52)
#-#-# load     34261  "E2"    0              # load         SJNO3         70.00  LOAD==-0.04(0.00)
#-#-# load     34260  "2 "    0              # load         SJNO2         70.00  LOAD==2.14(0.31)
#-#-# load     34260  "E2"    0              # load         SJNO2         70.00  LOAD==-0.03(0.00)
#-#-# gen      34633  "1 "    0              # gen          SJ3GEN         9.11  GEN ==4.20(0.00)
#-#-# gen      34634  "1 "    0              # gen          CRANEVLY      12.00  GEN ==0.84(0.10)
#-#-# gen      34631  "1 "    0              # gen          SJ2GEN         9.11  GEN ==3.20(0.00)
0

CATB-1088-B2 "Firebaugh-Mendota 115 kV Line"
 line     34266  34267  "1 " 1     0     # line   from  FIREBAGH     115.00  BRKR to (2)   TOMATAK      115.00
 line     34267  34156  "1 " 1     0     # line   from  TOMATAK      115.00   (2) to BRKR  MENDOTA      115.00
#-#-# load     34267  "1 "    0              # load         TOMATAK      115.00  LOAD==7.23(7.05)
#-#-# load     34267  "E1"    0              # load         TOMATAK      115.00  LOAD==-0.19(0.00)
0

CATB-1089-B2 "Merced Falls-Exchequer 70 kV Line"
 line     34321  34226  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to (2)   MC SWAIN      70.00
 line     34321  34230  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  MRCDFLLS      70.00
 line     34321  34232  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  EXCHEQUR      70.00
 tran     34226  34320  "1 "       0     # tran   from  MC SWAIN      70.00   (2) to (1)   MCSWAIN         9.11
#-#-# gen      34320  "1 "    0              # gen          MCSWAIN        9.11  GEN ==7.47(2.00)
0

CATB-1090-B2 "2C607-Mendota 115 kV Line"
 line     39035  34156  "1 " 1     0     # line   from  2C607        115.00   (3) to BRKR  MENDOTA      115.00
 tran     39035  34309  "1 "       0     # tran   from  2C607        115.00   (3) to (3)   2C607         34.50
 tran     39035  34309  "2 "       0     # tran   from  2C607        115.00   (3) to (3)   2C607         34.50
 tran     34309  34311  "1 "       0     # tran   from  2C607         34.50   (3) to (1)   2C607          0.20
#-#-# gen      34311  "F "    0              # gen          2C607          0.20  GEN ==60.00(1.34)
0

CATB-1091-B2 "3C643X 230 kV gen tie line"
 line     39131  39130  "1 " 1     0     # line   from  3C643X       230.00  BRKR to BRKR  3C643XS2     230.00
0

CATB-1092-B2 "S648 115 kV gen tie line"
 line     39148  39150  "1 " 1     0     # line   from  S648         115.00   (2) to BRKR  S648SS       115.00
 tran     39148  39889  "1 "       0     # tran   from  S648         115.00   (2) to (1)   S648          34.50
#-#-# load     39889  "SS"    0              # load         S648          34.50  LOAD==0.19(0.10)
#-#-# gen      39889  "FT"    0              # gen          S648          34.50  GEN ==20.00(0.15)
0

CATB-1093-B2 "S644 115 kV gen tie line"
 line     39186  39187  "1 " 1     0     # line   from  S644SS       115.00  BRKR to (2)   S644          115.00
 tran     39187  39188  "1 "       0     # tran   from  S644         115.00   (2) to (2)   S644C1        13.80
 line     39188  39189  "1 " 1     0     # line   from  S644C1        13.80   (2) to (2)   S644C2        13.80
 tran     39189  39190  "1 "       0     # tran   from  S644C2        13.80   (2) to (1)   S644           0.48
#-#-# gen      39190  "ET"    0              # gen          S644           0.48  GEN ==20.00(3.24)
0

CATB-1094-B2 "4C820-Mendota 115 kV Line"
 line     39595  34156  "1 " 1     0     # line   from  4C820        115.00   (4) to BRKR  MENDOTA      115.00
 tran     39595  39596  "1 "       0     # tran   from  4C820        115.00   (4) to (2)   4C820EQ1      34.50
 tran     39595  39599  "1 "       0     # tran   from  4C820        115.00   (4) to (2)   4C824EQ1      34.50
 tran     39595  39610  "1 "       0     # tran   from  4C820        115.00   (4) to (2)   4C825EQ1      34.50
 line     39596  39597  "1 " 1     0     # line   from  4C820EQ1      34.50   (2) to (2)   4C820EQ2      34.50
 tran     39597  39598  "1 "       0     # tran   from  4C820EQ2      34.50   (2) to (1)   4C820          0.31
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 line     39599  39600  "1 " 1     0     # line   from  4C824EQ1      34.50   (2) to (2)   4C824EQ2      34.50
 tran     39600  39609  "1 "       0     # tran   from  4C824EQ2      34.50   (2) to (1)   4C824          0.31
 line     39610  39603  "1 " 1     0     # line   from  4C825EQ1      34.50   (2) to (2)   4C825EQ2      34.50
 tran     39603  39604  "1 "       0     # tran   from  4C825EQ2      34.50   (2) to (1)   4C825          0.31
#-#-# gen      39598  "F "    0              # gen          4C820          0.31  GEN ==60.00(3.46)
#-#-# gen      39609  "E "    0              # gen          4C824          0.31  GEN ==20.00(1.56)
#-#-# gen      39604  "E "    0              # gen          4C825          0.31  GEN ==20.00(1.56)
0

CATB-1095-B2 "4C823-S648SS 115 kV Line"
 line     39713  39150  "1 " 1     0     # line   from  4C823        115.00   (2) to BRKR  S648SS       115.00
 tran     39713  39714  "1 "       0     # tran   from  4C823        115.00   (2) to (2)   4C823EQ1      34.50
 line     39714  39715  "1 " 1     0     # line   from  4C823EQ1      34.50   (2) to (2)   4C823EQ2      34.50
 tran     39715  39716  "1 "       0     # tran   from  4C823EQ2      34.50   (2) to (1)   4C823          0.31
#-#-# gen      39716  "F "    0              # gen          4C823          0.31  GEN ==90.00(4.80)
0

CATB-1096-B2 "4C779 230 kV gen tie line"
 line     39717  39718  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  4C779        230.00
0

CATB-1097-B2 "4C723-Borden 70 kV Line"
 line     39731  34256  "1 " 1     0     # line   from  4C723         70.00   (2) to BRKR  BORDEN         70.00
 tran     39731  39732  "1 "       0     # tran   from  4C723         70.00   (2) to (2)   4C723EQ1      34.50
 line     39732  39733  "1 " 1     0     # line   from  4C723EQ1      34.50   (2) to (2)   4C723EQ2      34.50
 tran     39733  39734  "1 "       0     # tran   from  4C723EQ2      34.50   (2) to (1)   4C723          0.31
#-#-# gen      39734  "F "    0              # gen          4C723          0.31  GEN ==50.00(1.71)
0

CATB-1098-B2 "4C678-Schindler #1 115 kV Line"
 line     39777  34354  "1 " 1     0     # line   from  4C678S1      115.00  BRKR to BRKR  SCHINDLR      115.00
0

CATB-1099-B2 "4C678-Schindler #2 115 kV Line"
 line     39778  34354  "2 " 1     0     # line   from  4C678S2      115.00  BRKR to BRKR  SCHINDLR      115.00
0

CATB-1100-B2 "4C678 115 kV gen tie line"
 line     39779  39778  "1 " 1     0     # line   from  4C678        115.00   (2) to BRKR  4C678S2      115.00
 tran     39779  39780  "1 "       0     # tran   from  4C678        115.00   (2) to (2)   4C678EQ1      34.50
 line     39780  39781  "1 " 1     0     # line   from  4C678EQ1      34.50   (2) to (2)   4C678EQ2      34.50
 tran     39781  39782  "1 "       0     # tran   from  4C678EQ2      34.50   (2) to (1)   4C678          0.48
#-#-# gen      39782  "F "    0              # gen          4C678          0.48  GEN ==60.00(7.13)
0

CATB-1101-B3 "Los Banos 500/230 kV Transformer Bank 1"
 tran     30765  30050  "1 "       0     # tran   from  LOSBANOS     230.00  BRKR to (1)   LOSBANOS     500.00
0

CATB-1102-B3 "Exchequer 115/70 kV Transformer Bank 1"
 tran     34112  34232  "1 "       0     # tran   from  EXCHEQUR     115.00  BRKR to (4)   EXCHEQUR      70.00
 line     34232  34228  "1 " 1     0     # line   from  EXCHEQUR      70.00  BRKR to (1)   MARIPOS2      70.00
 line     34232  34242  "1 " 1     0     # line   from  EXCHEQUR      70.00  BRKR to (1)   BER VLLY      70.00
 line     34232  34321  "1 " 1     0     # line   from  EXCHEQUR      70.00  BRKR to (1)   MCSWAINJ      70.00
#-#-# load     34228  "1 "    0              # load         MARIPOS2      70.00  LOAD==7.58(1.08)
#-#-# load     34228  "2 "    0              # load         MARIPOS2      70.00  LOAD==7.23(1.03)
#-#-# load     34228  "E1"    0              # load         MARIPOS2      70.00  LOAD==-0.08(0.00)
#-#-# load     34228  "E2"    0              # load         MARIPOS2      70.00  LOAD==-0.08(0.00)
  line     34228  34244  "1 " 1     1     # Switches in Mariposa SW 39 to transfer load
  #-#-# load     34228  "1 "    1              # Restore Load 1 at Mariposa
  #-#-# load     34228  "E1"    1              # Restore Load E1 at Mariposa
  #-#-# load     34228  "2 "    1              # Restore Load 2 at Mariposa
  #-#-# load     34228  "E2"    1              # Restore Load E2 at Mariposa
 tran     34112  34306  "1 "       0     # Outage includes Exchequer temporary GSU
 gens     34306         "1 "       0     # Outage includes Exchequer temporary GSU
0

CATB-1103-B3 "Exchequer 115/13.8 kV GSU"
 tran     34112  34306  "1 "       0     # tran   from  EXCHEQUR     115.00  BRKR to (1)   EXCHQUER      13.80
#-#-# gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(5.94)
0

CATB-1104-B3 "Wilson 230/115 kV Transformer Bank 1"
 tran     34134  30800  "1 "       0     # tran   from  WILSON A     115.00  BRKR to BRKR  WILSON       230.00
0
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CATB-1105-B3 "Wilson 230/115 kV Transformer Bank 2"
 tran     34136  30800  "2 "       0     # tran   from  WILSON B     115.00  BRKR to BRKR  WILSON       230.00
0

CATB-1106-B3 "Merced 115/70 kV Transformer Bank 2 w/ S550 SPS"
 tran     34144  34202  "2 "       0     # tran   from  MERCED       115.00  BRKR to (1)   MERCED        70.00
# SPS to trip S550 (Q550)
 gen      34345  "E "    0              # gen          S550          34.50  GEN ==20.00(-2.42)
0

CATB-1107-B3 "Merced 115/70 kV Transformer Bank 2 w/o S550 SPS"
 tran     34144  34202  "2 "       0     # tran   from  MERCED       115.00  BRKR to (1)   MERCED        70.00
0

CATB-1108-B3 "Panoche 230/115 kV Transformer Bank 1"
 tran     34155  30790  "1 "       0     # tran   from  PANOCHE1     115.00  BRKR to (1)   PANOCHE      230.00
0

CATB-1109-B3 "Panoche 230/115 kV Transformer Bank 2"
 tran     34158  30790  "2 "       0     # tran   from  PANOCHE2     115.00  BRKR to BRKR  PANOCHE      230.00
0

CATB-1110-B3 "North Merced 230/115 kV Transformer Bank 1"
 tran     34190  30803  "1 "       0     # tran   from  NMERCED2     115.00  BRKR to BRKR  NMERCED      230.00
0

CATB-1111-B3 "Oro Loma 115/70 kV Transformer Bank 2"
 tran     34200  34162  "2 "       0     # tran   from  ORO LOMA      70.00  BRKR to BRKR  ORO LOMA     115.00
0

CATB-1112-B3 "Los Banos 230/70 kV Transformer Bank 3"
 tran     34214  30765  "3 "       0     # tran   from  LOS BANS      70.00  BRKR to BRKR  LOSBANOS     230.00
0

CATB-1113-B3 "Los Banos 230/70 kV Transformer Bank 4"
 tran     34214  30765  "4 "       0     # tran   from  LOS BANS      70.00  BRKR to BRKR  LOSBANOS     230.00
0

CATB-1114-B3 "Mercy Springs 230/70 kV Transformer Bank 1"
 tran     34222  34147  "1 "       0     # tran   from  MRCYSPRS      70.00  BRKR to BRKR  MERCY S1     230.00
0

CATB-1115-B3 "Borden 230/12 kV Transformer Bank 2"
 tran     34253  30805  "2 "       0     # tran   from  BORDEN D      12.47   (1) to BRKR  BORDEN       230.00
#-#-# load     34253  "2 "    0              # load         BORDEN D      12.47  LOAD==20.91(2.98)
#-#-# load     34253  "E2"    0              # load         BORDEN D      12.47  LOAD==-0.24(0.00)
#-#-# gen      34253  "QF"    0              # gen          BORDEN D      12.47  GEN ==0.68(1.40)
0

CATB-1116-B3 "Borden 230/70 kV Transformer Bank 1"
 tran     34256  30805  "1 "       0     # tran   from  BORDEN        70.00  BRKR to BRKR  BORDEN       230.00
0

CATB-1117-B3 "Borden 230/70 kV Transformer Bank 4"
 tran     34256  30805  "2 "       0     # tran   from  BORDEN        70.00  BRKR to BRKR  BORDEN       230.00
0

CATB-1118-B3 "Mendota 115/70 kV Transformer Bank 1"
 tran     34268  34156  "1 "       0     # tran   from  MENDOTA       70.00  BRKR to BRKR  MENDOTA      115.00
0

CATB-1119-B3 "Panoche EC 230/13.8 kV Transformer Bank 1"
 tran     34326  30793  "1 "       0     # tran   from  PANO_BS1      13.80   (1) to BRKR  PANO_EC       230.00
#-#-# load     34326  "SG"    0              # load         PANO_BS1      13.80  LOAD==3.46(1.91)
#-#-# gen      34326  "1 "    0              # gen          PANO_BS1      13.80  GEN ==102.50(37.98)
#-#-# gen      34326  "2 "    0              # gen          PANO_BS1      13.80  GEN ==102.50(37.98)
0

CATB-1120-B3 "Panoche EC 230/13.8 kV Transformer Bank 2"
 tran     34327  30793  "1 "       0     # tran   from  PANO_BS2      13.80   (1) to BRKR  PANO_EC       230.00
#-#-# load     34327  "SG"    0              # load         PANO_BS2      13.80  LOAD==3.46(1.91)
#-#-# gen      34327  "3 "    0              # gen          PANO_BS2      13.80  GEN ==102.50(37.98)
#-#-# gen      34327  "4 "    0              # gen          PANO_BS2      13.80  GEN ==102.50(37.98)
0
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```
CATB-1121-B1 "WHD_PAN2      13.80 Unit ID 1"
 gen      34142  "1 "    0              # gen          WHD_PAN2      13.80  GEN ==40.00(-12.77)
0

CATB-1122-B1 "MADERA_G      13.80 Unit ID 1"
 gen      34179  "1 "    0              # gen          MADERA_G      13.80  GEN ==17.00(11.09)
0

CATB-1123-B1 "DG_PAN1       13.80 Unit ID 1"
 gen      34186  "1 "    0              # gen          DG_PAN1       13.80  GEN ==42.78(-10.11)
0

CATB-1124-B1 "WRIGHT D      12.47 Unit ID QF"
 gen      34207  "QF"    0              # gen          WRIGHT D      12.47  GEN ==0.53(0.32)
0

CATB-1125-B1 "STOREY D      12.47 Unit ID 1"
 gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(0.28)
0

CATB-1126-B1 "BORDEN D      12.47 Unit ID QF"
 gen      34253  "QF"    0              # gen          BORDEN D      12.47  GEN ==0.68(1.40)
0

CATB-1127-B1 "CHOWCOGN      13.80 Unit ID 1"
 gen      34301  "1 "    0              # gen          CHOWCOGN      13.80  GEN ==48.00(2.17)
0

CATB-1128-B1 "CHWCHLA2      13.80 Unit ID 1"
 gen      34305  "1 "    0              # gen          CHWCHLA2      13.80  GEN ==5.76(6.37)
0

CATB-1129-B1 "EXCHQUER      13.80 Unit ID 1"
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1130-B1 "ONEILPMP       9.11 Unit ID 1"
 gen      34316  "1 "    0              # gen          ONEILPMP       9.11  GEN ==0.53(0.00)
0

CATB-1131-B1 "MCSWAIN        9.11 Unit ID 1"
 gen      34320  "1 "    0              # gen          MCSWAIN        9.11  GEN ==4.57(2.00)
0

CATB-1132-B1 "MERCEDFL       9.11 Unit ID 1"
 gen      34322  "1 "    0              # gen          MERCEDFL       9.11  GEN ==2.03(2.00)
0

CATB-1133-B1 "PANO_BS1      13.80 Unit ID 1"
 gen      34326  "1 "    0              # gen          PANO_BS1      13.80  GEN ==95.24(23.75)
0

CATB-1134-B1 "PANO_BS1      13.80 Unit ID 2"
 gen      34326  "2 "    0              # gen          PANO_BS1      13.80  GEN ==95.24(23.75)
0

CATB-1135-B1 "PANO_BS2      13.80 Unit ID 3"
 gen      34327  "3 "    0              # gen          PANO_BS2      13.80  GEN ==95.24(23.75)
0

CATB-1136-B1 "PANO_BS2      13.80 Unit ID 4"
 gen      34327  "4 "    0              # gen          PANO_BS2      13.80  GEN ==95.24(23.75)
0

CATB-1137-B1 "STAR_GT1      13.80 Unit ID 1"
 gen      34328  "1 "    0              # gen          STAR_GT1      13.80  GEN ==55.58(26.23)
0

CATB-1138-B1 "STAR_GT2      13.80 Unit ID 2"
 gen      34329  "2 "    0              # gen          STAR_GT2      13.80  GEN ==55.58(26.23)
0

CATB-1139-B1 "ELNIDO        13.80 Unit ID 1"
 gen      34330  "1 "    0              # gen          ELNIDO        13.80  GEN ==5.56(3.92)
```

```
0

CATB-1140-B1 "JRWCOGEN       9.11 Unit ID 1"
 gen      34332  "1 "    0              # gen          JRWCOGEN       9.11  GEN ==3.68(-3.50)
0

CATB-1141-B1 "BIO PWR        9.11 Unit ID 1"
 gen      34334  "1 "    0              # gen          BIO PWR        9.11  GEN ==21.61(-3.61)
0

CATB-1142-B1 "CALRENEW      12.50 Unit ID 1"
 gen      34339  "1 "    0              # gen          CALRENEW      12.50  GEN ==5.00(-0.70)
0

CATB-1143-B1 "INT.TURB       9.11 Unit ID 1"
 gen      34342  "1 "    0              # gen          INT.TURB       9.11  GEN ==1.63(0.00)
0

CATB-1144-B1 "CRANEVLY      12.00 Unit ID 1"
 gen      34634  "1 "    0              # gen          CRANEVLY      12.00  GEN ==0.71(0.10)
0

CATB-1145-B1 "S541          13.80 Unit ID ET"
 gen      39888  "ET"    0              # gen          S541          13.80  GEN ==20.00(1.38)
0

CATB-1146-B1 "S548          34.50 Unit ID E"
 gen      39080  "E "    0              # gen          S548          34.50  GEN ==20.00(3.44)
0

CATB-1147-B1 "S550          34.50 Unit ID E"
 gen      34345  "E "    0              # gen          S550          34.50  GEN ==20.00(-1.90)
0

CATB-1148-B1 "S612          13.80 Unit ID E"
 gen      34303  "E "    0              # gen          S612          13.80  GEN ==13.00(-1.51)
0

CATB-1149-B1 "S614          21.00 Unit ID E"
 gen      34304  "E "    0              # gen          S614          21.00  GEN ==20.00(-2.77)
0

CATB-1150-B1 "S632          12.47 Unit ID E"
 gen      39162  "E "    0              # gen          S632          12.47  GEN ==19.00(2.27)
0

CATB-1151-B1 "S644           0.48 Unit ID ET"
 gen      39190  "ET"    0              # gen          S644           0.48  GEN ==20.00(3.24)
0

CATB-1152-B1 "S648          34.50 Unit ID FT"
 gen      39889  "FT"    0              # gen          S648          34.50  GEN ==20.00(0.15)
0

CATB-1153-B1 "2C607          0.20 Unit ID F"
 gen      34311  "F "    0              # gen          2C607          0.20  GEN ==60.00(1.34)
0

CATB-1154-B1 "2C560          0.48 Unit ID F"
 gen      34319  "F "    0              # gen          2C560          0.48  GEN ==104.50(6.50)
0

CATB-1155-B1 "2C577          0.34 Unit ID F"
 gen      34324  "F "    0              # gen          2C577          0.34  GEN ==111.00(12.86)
0

CATB-1156-B1 "3C643X         0.80 Unit ID F"
 gen      39133  "F "    0              # gen          3C643X         0.80  GEN ==200.00(57.92)
0

CATB-1157-B1 "4C678          0.48 Unit ID F"
 gen      39782  "F "    0              # gen          4C678          0.48  GEN ==60.00(7.13)
0

CATB-1158-B1 "4C723          0.31 Unit ID F"
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 gen      39734  "F "    0              # gen          4C723          0.31  GEN ==50.00(1.71)
0

CATB-1159-B1 "4C779          0.48 Unit ID F"
 gen      39721  "F "    0              # gen          4C779          0.48  GEN ==200.00(49.67)
0

CATB-1160-B1 "4C820          0.31 Unit ID F"
 gen      39598  "F "    0              # gen          4C820          0.31  GEN ==60.00(3.46)
0

CATB-1161-B1 "4C823          0.31 Unit ID F"
 gen      39716  "F "    0              # gen          4C823          0.31  GEN ==90.00(4.80)
0

CATB-1162-B1 "4C824          0.31 Unit ID E"
 gen      39609  "E "    0              # gen          4C824          0.31  GEN ==20.00(1.56)
0

CATB-1163-B1 "4C825          0.31 Unit ID E"
 gen      39604  "E "    0              # gen          4C825          0.31  GEN ==20.00(1.56)
0

CATB-1164-B1 "4C829          0.31 Unit ID F"
 gen      39706  "F "    0              # gen          4C829          0.31  GEN ==240.00(37.35)
0

CATB-1165-B1 "0015-WD      115.00 Unit ID EW"
 gen      90015  "EW"    0              # gen          0015-WD      115.00  GEN ==0.75(0.00)
0

CATB-1166-B1 "0047-WD      115.00 Unit ID EW"
 gen      90047  "EW"    0              # gen          0047-WD      115.00  GEN ==10.00(0.00)
0

CATB-1167-B1 "0055-WD       70.00 Unit ID EW"
 gen      90055  "EW"    0              # gen          0055-WD       70.00  GEN ==20.00(0.00)
0

CATB-1168-B1 "0060-WD       70.00 Unit ID EW"
 gen      90060  "EW"    0              # gen          0060-WD       70.00  GEN ==17.00(0.00)
0

CATB-1169-B1 "0343-WD      115.00 Unit ID EW"
 gen      90343  "EW"    0              # gen          0343-WD      115.00  GEN ==5.00(0.00)
0

CATB-1170-B1 "0343-WD      115.00 Unit ID EW"
 gen      90343  "EW"    0              # gen          0343-WD      115.00  GEN ==5.00(0.00)
0

CATB-1171-B1 "0406-WD       70.00 Unit ID EW"
 gen      90406  "EW"    0              # gen          0406-WD       70.00  GEN ==2.00(0.00)
0

CATB-1172-B1 "0419-WD      115.00 Unit ID EW"
 gen      90419  "EW"    0              # gen          0419-WD      115.00  GEN ==1.50(0.00)
0

CATB-1173-B1 "0420-WD      115.00 Unit ID EW"
 gen      90420  "EW"    0              # gen          0420-WD      115.00  GEN ==1.50(0.00)
0

CATB-1174-B1 "0543-WD      115.00 Unit ID EW"
 gen      90543  "EW"    0              # gen          0543-WD      115.00  GEN ==1.50(0.00)
0

CATB-1175-B1 "0641-WD       70.00 Unit ID EW"
 gen      90641  "EW"    0              # gen          0641-WD       70.00  GEN ==2.00(0.00)
0

CATB-1176-B1 "0644-WD      115.00 Unit ID EW"
 gen      90644  "EW"    0              # gen          0644-WD      115.00  GEN ==1.30(0.00)
0
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CATB-1177-B1 "0645-WD      115.00 Unit ID EW"
 gen      90645  "EW"    0               # gen          0645-WD      115.00  GEN ==1.00(0.00)
0

CATB-1178-B1 "0710-WD       70.00 Unit ID EW"
 gen      90710  "EW"    0               # gen          0710-WD       70.00  GEN ==2.00(0.00)
0

CATB-1179-B1 "0715-WD       70.00 Unit ID EW"
 gen      90715  "EW"    0               # gen          0715-WD       70.00  GEN ==0.25(0.00)
0

CATB-1180-B1 "0718-WD       70.00 Unit ID EW"
 gen      90718  "EW"    0               # gen          0718-WD       70.00  GEN ==1.50(0.00)
0

CATB-1181-B1 "0733-RD       70.00 Unit ID ER"
 gen      90733  "ER"    0               # gen          0733-RD       70.00  GEN ==0.09(0.00)
0

### L-1/G-1

CATB-1182-B1B2 "Atwater-El Capitan 115 kV Line and JR Wood Cogen"
 line     34104  34106  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (2)   CASTLE       115.00
 line     34106  34138  "1 " 1     0     # line   from  CASTLE       115.00   (2) to BRKR  EL CAPTN     115.00
#
 gen      34332  "1 "    0               # gen          JRWCOGEN       9.11  GEN ==0.00(-3.50)
0

CATB-1183-B1B2 "Wilson-Atwater #2 115 kV Line and JR Wood Cogen"
 line     34134  34104  "1 " 1     0     # line   from  WILSON A     115.00  BRKR to BRKR  ATWATER      115.00
#
 gen      34332  "1 "    0               # gen          JRWCOGEN       9.11  GEN ==0.00(-3.50)
0

CATB-1184-B1B2 "LeGrand-Chowchilla 115 kV Line and Exchequer"
 line     34100  34101  "1 " 1     0     # line   from  CHWCHLLA     115.00  BRKR to (3)   CERTAN T     115.00
 line     34101  34116  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to BRKR  LE GRAND     115.00
 line     34101  34107  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to (2)   CERTANJ2     115.00
 line     34107  34103  "1 " 1     0     # line   from  CERTANJ2     115.00   (2) to (3)   CHWCGNJT     115.00
 line     34103  34102  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (1)   CERTTEED     115.00
 line     34103  34109  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (3)   CHWCGN       115.00
 line     34109  34111  "1 " 1     0     # line   from  CHWCGN       115.00   (3) to (2)   CHWCHLA2     115.00
 tran     34109  34301  "1 "       0     # tran   from  CHWCGN       115.00   (3) to (1)   CHOWCOGN      13.80
 tran     34111  34305  "1 "       0     # tran   from  CHWCHLA2     115.00   (2) to (1)   CHWCHLA2      13.80
#-#-# load     34102  "1 "    0              # load         CERTTEED     115.00  LOAD==8.98(6.03)
#-#-# load     34102  "E1"    0              # load         CERTTEED     115.00  LOAD==-0.12(0.00)
#-#-# load     34305  "ss"    0              # load         CHWCHLA2      13.80  LOAD==2.33(1.29)
#-#-# gen      34301  "1 "    0              # gen          CHOWCOGN      13.80  GEN ==48.00(10.22)
#-#-# gen      34305  "1 "    0              # gen          CHWCHLA2      13.80  GEN ==12.50(7.35)
#
 gen      34306  "1 "    0               # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1185-B1B2 "Atwater-El Capitan 115 kV Line and Exchequer"
 line     34104  34106  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (2)   CASTLE       115.00
 line     34106  34138  "1 " 1     0     # line   from  CASTLE       115.00   (2) to BRKR  EL CAPTN     115.00
#
 gen      34306  "1 "    0               # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1186-B1B2 "Atwater-Merced 115 kV Line and Exchequer"
 line     34104  34110  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   ATWATR J     115.00
 line     34110  34130  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  LIVNGSTN     115.00
 line     34110  34144  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  MERCED       115.00
#
 gen      34306  "1 "    0               # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1187-B1B2 "Atwater-Cressey 115 kV Line and Exchequer"
 line     34104  34114  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   JRWD GEN     115.00
 line     34114  34124  "1 " 1     0     # line   from  JRWD GEN     115.00   (3) to (2)   JR WOOD      115.00
 tran     34114  34332  "1 "       0     # tran   from  JRWD GEN     115.00   (3) to (1)   JRWCOGEN       9.11
 line     34124  34140  "1 " 1     0     # line   from  JR WOOD      115.00   (2) to BRKR  CRESSEY      115.00
#-#-# load     34124  "1 "    0              # load         JR WOOD      115.00  LOAD==11.95(10.54)
```

```
#-#-# load     34124  "E1"    0              # load         JR WOOD      115.00  LOAD==-0.15(0.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1188-B1B2 "Chowchilla-Kerckhoff #2 115 kV Line and Exchequer"
 line     34105  34100  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to BRKR  CHWCHLLA     115.00
 line     34105  34121  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to (3)   SHARON T     115.00
 line     34121  34120  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (1)   SHARON       115.00
 line     34121  34128  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (3)   OAKH_JCT     115.00
 line     34128  34126  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to BRKR  CORSGOLD     115.00
 line     34128  34123  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to (3)   K1-JCT       115.00
 line     34123  34122  "1 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  OAKHURST     115.00
 line     34123  34358  "2 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  KERCKHF2     115.00
#-#-# load     34120  "1 "    0              # load         SHARON       115.00  LOAD==6.64(4.63)
#-#-# load     34120  "E1"    0              # load         SHARON       115.00  LOAD==-0.08(0.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1189-B1B2 "Wilson-LeGrand 115 kV Line and Exchequer"
 line     34116  34134  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  WILSON A     115.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1190-B1B2 "LeGrand-S644SS 115 kV Line and Exchequer"
 line     34116  39186  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  S644SS       115.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1191-B1B2 "S644SS-Dairyland 115 kV Line and Exchequer"
 line     39186  34154  "1 " 1     0     # line   from  S644SS       115.00  BRKR to BRKR  DAIRYLND     115.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1192-B1B2 "Wilson-Oro Loma 115 kV Line and Exchequer"
 line     34118  34136  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to BRKR  WILSON B     115.00
 line     34118  34168  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to (2)   EL NIDO      115.00
 line     34168  34162  "1 " 1     0     # line   from  EL NIDO      115.00   (2) to BRKR  ORO LOMA     115.00
#-#-# load     34168  "1 "    0              # load         EL NIDO       115.00  LOAD==12.57(1.79)
#-#-# load     34168  "2 "    0              # load         EL NIDO       115.00  LOAD==11.18(1.60)
#-#-# load     34168  "E1"    0              # load         EL NIDO       115.00  LOAD==-0.12(0.00)
#-#-# load     34168  "E2"    0              # load         EL NIDO       115.00  LOAD==-0.14(0.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1193-B1B2 "El Capitan-Wilson 115 kV Line and Exchequer"
 line     34136  34138  "1 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  EL CAPTN     115.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1194-B1B2 "Dairyland-Mendota 115 kV Line and Exchequer"
 line     34150  34154  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to BRKR  DAIRYLND     115.00
 line     34150  34178  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to (3)   MADERAPR     115.00
 line     34178  34153  "1 " 1     0     # line   from  MADERAPR     115.00   (3) to (3)   GILLTAP      115.00
 tran     34178  34179  "1 "       0     # tran   from  MADERAPR     115.00   (3) to (1)   MADERA_G      13.80
 line     34153  34152  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to (1)   GILLRAN      115.00
 line     34153  34156  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to BRKR  MENDOTA     115.00
#-#-# load     34150  "2 "    0              # load         NEWHALL       115.00  LOAD==9.39(1.34)
#-#-# load     34150  "3 "    0              # load         NEWHALL       115.00  LOAD==8.26(1.18)
#-#-# load     34150  "E2"    0              # load         NEWHALL       115.00  LOAD==-0.10(0.00)
#-#-# load     34150  "E3"    0              # load         NEWHALL       115.00  LOAD==-0.08(0.00)
#-#-# load     34179  "SG"    0              # load         MADERA_G       13.80  LOAD==3.82(0.91)
#-#-# load     34152  "1 "    0              # load         GILLRAN       115.00  LOAD==11.75(3.56)
#-#-# load     34152  "E1"    0              # load         GILLRAN       115.00  LOAD==-0.27(0.00)
#-#-# gen      34179  "1 "    0              # gen          MADERA_G       13.80  GEN ==33.00(5.09)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0
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CATB-1195-B1B2 "Panoche-Mendota 115 kV Line and Exchequer"
 line     34157  34155  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  PANOCHE1     115.00
 line     34157  34156  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  MENDOTA      115.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1196-B1B2 "Los Banos-S548SS 70 kV Line and Exchequer"
 line     34108  34272  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   WRGHT PP      70.00
 line     34108  34113  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (3)   ARBURU T      70.00
 line     34108  34231  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   PCHCOWND      70.00
 tran     34272  34207  "1 "       0     # tran   from  WRGHT PP      70.00   (2) to (1)   WRIGHT D      12.47
 line     34113  34224  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to (1)   ARBURUA       70.00
 line     34113  39079  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to BRKR  S548SS       70.00
 line     34231  34214  "1 " 1     0     # line   from  PCHCOWND      70.00   (2) to BRKR  LOS BANS      70.00
#-#-# load     34207  "3 "    0              # load         WRIGHT D      12.47  LOAD==10.43(1.48)
#-#-# load     34207  "E3"    0              # load         WRIGHT D      12.47  LOAD==-0.10(0.00)
#-#-# load     34224  "1 "    0              # load         ARBURUA       70.00  LOAD==3.01(1.45)
#-#-# load     34224  "E1"    0              # load         ARBURUA       70.00  LOAD==-0.05(0.00)
#-#-# gen      34207  "QF"    0              # gen          WRIGHT D      12.47  GEN ==0.53(0.32)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1197-B1B2 "Merced Falls-Exchequer 70 kV Line and Exchequer"
 line     34321  34226  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to (2)   MC SWAIN      70.00
 line     34321  34230  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  MRCDFLLS      70.00
 line     34321  34232  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  EXCHEQUR      70.00
 tran     34226  34320  "1 "       0     # tran   from  MC SWAIN      70.00   (2) to (1)   MCSWAIN        9.11
#-#-# gen      34320  "1 "    0              # gen          MCSWAIN        9.11  GEN ==7.47(2.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1198-B1B2 "LeGrand-Chowchilla 115 kV Line and Kerckhoff 1"
 line     34100  34101  "1 " 1     0     # line   from  CHWCHLLA     115.00  BRKR to (3)   CERTAN T      115.00
 line     34101  34116  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to BRKR  LE GRAND      115.00
 line     34101  34107  "1 " 1     0     # line   from  CERTAN T     115.00   (3) to (2)   CERTANJ2      115.00
 line     34107  34103  "1 " 1     0     # line   from  CERTANJ2     115.00   (2) to (3)   CHWCGNJT      115.00
 line     34103  34102  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (1)   CERTTEED      115.00
 line     34103  34109  "1 " 1     0     # line   from  CHWCGNJT     115.00   (3) to (3)   CHWCGN        115.00
 line     34109  34111  "1 " 1     0     # line   from  CHWCGN       115.00   (3) to (2)   CHWCHLA2      115.00
 tran     34109  34301  "1 "       0     # tran   from  CHWCGN       115.00   (3) to (1)   CHOWCOGN       13.80
 tran     34111  34305  "1 "       0     # tran   from  CHWCHLA2     115.00   (2) to (1)   CHWCHLA2       13.80
#-#-# load     34102  "1 "    0              # load         CERTTEED     115.00  LOAD==8.98(6.03)
#-#-# load     34102  "E1"    0              # load         CERTTEED     115.00  LOAD==-0.12(0.00)
#-#-# load     34305  "ss"    0              # load         CHWCHLA2      13.80  LOAD==2.33(1.29)
#-#-# gen      34301  "1 "    0              # gen          CHOWCOGN      13.80  GEN ==48.00(10.22)
#-#-# gen      34305  "1 "    0              # gen          CHWCHLA2      13.80  GEN ==12.50(7.35)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1199-B1B2 "Atwater-El Capitan 115 kV Line and Kerckhoff 1"
 line     34104  34106  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (2)   CASTLE        115.00
 line     34106  34138  "1 " 1     0     # line   from  CASTLE       115.00   (2) to BRKR  EL CAPTN      115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1200-B1B2 "Atwater-Merced 115 kV Line and Kerckhoff 1"
 line     34104  34110  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   ATWATR J      115.00
 line     34110  34130  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  LIVNGSTN      115.00
 line     34110  34144  "1 " 1     0     # line   from  ATWATR J     115.00   (3) to BRKR  MERCED       115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1201-B1B2 "Atwater-Cressey 115 kV Line and Kerckhoff 1"
 line     34104  34114  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (3)   JRWD GEN      115.00
 line     34114  34124  "1 " 1     0     # line   from  JRWD GEN     115.00   (3) to (2)   JR WOOD       115.00
 tran     34114  34332  "1 "       0     # tran   from  JRWD GEN     115.00   (3) to (1)   JRWCOGEN        9.11
 line     34124  34140  "1 " 1     0     # line   from  JR WOOD      115.00   (2) to BRKR  CRESSEY      115.00
#-#-# load     34124  "1 "    0              # load         JR WOOD      115.00  LOAD==11.95(10.54)
#-#-# load     34124  "E1"    0              # load         JR WOOD      115.00  LOAD==-0.15(0.00)
```

```
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1202-B1B2 "Chowchilla-Kerckhoff #2 115 kV Line and Kerckhoff 1"
 line     34105  34100  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to BRKR  CHWCHLLA     115.00
 line     34105  34121  "1 " 1     0     # line   from  CERTANJ1     115.00   (2) to (3)   SHARON T     115.00
 line     34121  34120  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (1)   SHARON       115.00
 line     34121  34128  "1 " 1     0     # line   from  SHARON T     115.00   (3) to (3)   OAKH_JCT     115.00
 line     34128  34126  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to BRKR  CORSGOLD     115.00
 line     34128  34123  "1 " 1     0     # line   from  OAKH_JCT     115.00   (3) to (3)   K1-JCT       115.00
 line     34123  34122  "1 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  OAKHURST     115.00
 line     34123  34358  "2 " 1     0     # line   from  K1-JCT       115.00   (3) to BRKR  KERCKHF2     115.00
#-#-# load     34120  "1 "    0              # load         SHARON       115.00  LOAD==6.64(4.63)
#-#-# load     34120  "E1"    0              # load         SHARON       115.00  LOAD==-0.08(0.00)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1203-B1B2 "Wilson-LeGrand 115 kV Line and Kerckhoff 1"
 line     34116  34134  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  WILSON A     115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1204-B1B2 "LeGrand-S644SS 115 kV Line and Kerckhoff 1"
 line     34116  39186  "1 " 1     0     # line   from  LE GRAND     115.00  BRKR to BRKR  S644SS       115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1205-B1B2 "S644SS-Dairyland 115 kV Line and Kerckhoff 1"
 line     39186  34154  "1 " 1     0     # line   from  S644SS       115.00  BRKR to BRKR  DAIRYLND     115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1206-B1B2 "Wilson-Oro Loma 115 kV Line and Kerckhoff 1"
 line     34118  34136  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to BRKR  WILSON B     115.00
 line     34118  34168  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to (2)   EL NIDO      115.00
 line     34168  34162  "1 " 1     0     # line   from  EL NIDO      115.00   (2) to BRKR  ORO LOMA     115.00
#-#-# load     34168  "1 "    0              # load         EL NIDO       115.00  LOAD==12.57(1.79)
#-#-# load     34168  "2 "    0              # load         EL NIDO       115.00  LOAD==11.18(1.60)
#-#-# load     34168  "E1"    0              # load         EL NIDO       115.00  LOAD==-0.12(0.00)
#-#-# load     34168  "E2"    0              # load         EL NIDO       115.00  LOAD==-0.14(0.00)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1207-B1B2 "El Capitan-Wilson 115 kV Line and Kerckhoff 1"
 line     34136  34138  "1 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  EL CAPTN     115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1208-B1B2 "Dairyland-Mendota 115 kV Line and Kerckhoff 1"
 line     34150  34154  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to BRKR  DAIRYLND     115.00
 line     34150  34178  "1 " 1     0     # line   from  NEWHALL      115.00   (2) to (3)   MADERAPR     115.00
 line     34178  34153  "1 " 1     0     # line   from  MADERAPR     115.00   (3) to (3)   GILLTAP      115.00
 tran     34178  34179  "1 "       0     # tran   from  MADERAPR     115.00   (3) to (1)   MADERA_G      13.80
 line     34153  34152  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to (1)   GILLRAN      115.00
 line     34153  34156  "1 " 1     0     # line   from  GILLTAP      115.00   (3) to BRKR  MENDOTA      115.00
#-#-# load     34150  "2 "    0              # load         NEWHALL       115.00  LOAD==9.39(1.34)
#-#-# load     34150  "3 "    0              # load         NEWHALL       115.00  LOAD==8.26(1.18)
#-#-# load     34150  "E2"    0              # load         NEWHALL       115.00  LOAD==-0.10(0.00)
#-#-# load     34150  "E3"    0              # load         NEWHALL       115.00  LOAD==-0.08(0.00)
#-#-# load     34179  "SG"    0              # load         MADERA_G       13.80  LOAD==3.82(0.91)
#-#-# load     34152  "1 "    0              # load         GILLRAN       115.00  LOAD==11.75(3.56)
#-#-# load     34152  "E1"    0              # load         GILLRAN       115.00  LOAD==-0.27(0.00)
#-#-# gen      34179  "1 "    0              # gen          MADERA_G       13.80  GEN ==33.00(5.09)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1209-B1B2 "Panoche-Mendota 115 kV Line and Kerckhoff 1"
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```
 line     34157  34155  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  PANOCHE1     115.00
 line     34157  34156  "1 " 1     0     # line   from  PANOCHET     115.00   (2) to BRKR  MENDOTA      115.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1210-B1B2 "Los Banos-S548SS 70 kV Line and Kerckhoff 1"
 line     34108  34272  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   WRGHT PP      70.00
 line     34108  34113  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (3)   ARBURU T      70.00
 line     34108  34231  "1 " 1     0     # line   from  WRIGHT T      70.00   (3) to (2)   PCHCOWND      70.00
 tran     34272  34207  "1 "       0     # tran   from  WRGHT PP      70.00   (2) to (1)   WRIGHT D      12.47
 line     34113  34224  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to (1)   ARBURUA       70.00
 line     34113  39079  "1 " 1     0     # line   from  ARBURU T      70.00   (3) to BRKR  S548SS        70.00
 line     34231  34214  "1 " 1     0     # line   from  PCHCOWND      70.00   (2) to BRKR  LOS BANS      70.00
#-#-# load     34207  "3 "    0             # load         WRIGHT D      12.47  LOAD==10.43(1.48)
#-#-# load     34207  "E3"    0             # load         WRIGHT D      12.47  LOAD==-0.10(0.00)
#-#-# load     34224  "1 "    0             # load         ARBURUA       70.00  LOAD==3.01(1.45)
#-#-# load     34224  "E1"    0             # load         ARBURUA       70.00  LOAD==-0.05(0.00)
#-#-# gen      34207  "QF"    0             # gen          WRIGHT D      12.47  GEN ==0.53(0.32)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1211-B1B2 "Merced Falls-Exchequer 70 kV Line and Kerckhoff 1"
 line     34321  34226  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to (2)   MC SWAIN      70.00
 line     34321  34230  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  MRCDFLLS      70.00
 line     34321  34232  "1 " 1     0     # line   from  MCSWAINJ      70.00   (3) to BRKR  EXCHEQUR      70.00
 tran     34226  34320  "1 "       0     # tran   from  MC SWAIN      70.00   (2) to (1)   MCSWAIN        9.11
#-#-# gen      34320  "1 "    0             # gen          MCSWAIN       9.11  GEN ==7.47(2.00)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1212-B1B2 "Exchequer-LeGrand 115 kV Line w/ Mariposa SPS and Kerckhoff 1"
 line     34112  34116  "1 " 1     0     # line   from  EXCHEQUR     115.00  BRKR to BRKR  LE GRAND     115.00
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
  load     34228  "1 "    0              # Trip Load 1 at Mariposa 70 kV due to voltage < 64 kV
  load     34228  "2 "    0              # Trip Load 2 at Mariposa 70 kV due to voltage < 64 kV
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1213-B1B2 "Exchequer-LeGrand 115 kV Line w/o Mariposa SPS and Kerckhoff 1"
 line     34112  34116  "1 " 1     0     # line   from  EXCHEQUR     115.00  BRKR to BRKR  LE GRAND     115.00
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1214-B1B2 "Bellota-Cottle 230 kV Line and Exchequer"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1215-B1B2 "Cottle-Melones 230 kV Line and Exchequer"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1216-B1B2 "Melones-North Merced 230 kV Line and Exchequer"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1217-B1B2 "North Merced-Wilson 230 kV Line and Exchequer"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1218-B1B2 "Bellota-Warnerville 230 kV Line and Exchequer"
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
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```
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1219-B1B2 "Warnerville-Wilson 230 kV Line and Exchequer"
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1220-B1B2 "Wilson-Borden #1 230 kV Line and Exchequer"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1221-B1B2 "Wilson-Borden #2 230 kV Line and Exchequer"
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1222-B1B2 "Borden-Gregg #1 230 kV Line and Exchequer"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1223-B1B2 "Borden-Gregg #2 230 kV Line and Exchequer"
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1224-B1B2 "Westley-2C577 230 kV Line and Exchequer"
 line     30670  30763  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  2C577SS      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1225-B1B2 "2C577SS-Los Banos 230 kV Line and Exchequer"
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1226-B1B2 "Los Banos-2C560SS 230 kV Line and Exchequer"
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1227-B1B2 "2C560SS-Dos Amigos PP 230 kV Line and Exchequer"
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1228-B1B2 "Los Banos-San Luis PGP #1 230 kV Line and Exchequer"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0
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CATB-1229-B1B2 "Los Banos-San Luis PGP #2 230 kV Line and Exchequer"
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1230-B1B2 "Los Banos-4C779SS #1 230 kV Line and Exchequer"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1231-B1B2 "4C779SS-Mercy Springs #1 230 kV Line and Exchequer"
 line     39717  34147  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  MERCY S1     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1232-B1B2 "Mercy Springs-Panoche #1 230 kV Line and Exchequer"
 line     34147  30790  "2 " 1     0     # line   from  MERCY S1     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1233-B1B2 "Los Banos-Panoche #2 230 kV Line and Exchequer"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1234-B1B2 "Dos Amigos PP-Panoche #3 230 kV Line and Exchequer"
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1235-B1B2 "Panoche-Panoche Energy Center 230 kV Line and Exchequer"
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  PANO_EC      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1236-B1B2 "Panoche-Gates #1 230 kV Line and Exchequer"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1237-B1B2 "Panoche-Gates #2 230 kV Line and Exchequer"
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1238-B1B2 "Panoche-3C643XSS #1 230 kV Line and Exchequer"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1239-B1B2 "Panoche-3C643XSS #2 230 kV Line and Exchequer"
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1240-B1B2 "3C643XSS-Helm 230 kV Line and Exchequer"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1241-B1B2 "3C643XSS-Kearney #2 230 kV Line and Exchequer"
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY      230.00
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#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1242-B1B2 "Moss Landing-4C829SS #2 230 kV Line and Exchequer"
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1243-B1B2 "Coburn-4C829SS #1 230 kV Line and Exchequer"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1244-B1B2 "4C829SS-Panoche #1 230 kV Line and Exchequer"
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1245-B1B2 "4C829SS-Panoche #2 230 kV Line and Exchequer"
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==71.08(9.68)
0

CATB-1246-B1B2 "Bellota-Cottle 230 kV Line and Kerckhoff 1"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1247-B1B2 "Cottle-Melones 230 kV Line and Kerckhoff 1"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1248-B1B2 "Melones-North Merced 230 kV Line and Kerckhoff 1"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1249-B1B2 "North Merced-Wilson 230 kV Line and Kerckhoff 1"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1250-B1B2 "Bellota-Warnerville 230 kV Line and Kerckhoff 1"
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1251-B1B2 "Warnerville-Wilson 230 kV Line and Kerckhoff 1"
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1252-B1B2 "Wilson-Borden #1 230 kV Line and Kerckhoff 1"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0
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CATB-1253-B1B2 "Wilson-Borden #2 230 kV Line and Kerckhoff 1"
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1254-B1B2 "Borden-Gregg #1 230 kV Line and Kerckhoff 1"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1255-B1B2 "Borden-Gregg #2 230 kV Line and Kerckhoff 1"
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1256-B1B2 "Westley-2C577 230 kV Line and Kerckhoff 1"
 line     30670  30763  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  2C577SS      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1257-B1B2 "2C577SS-Los Banos 230 kV Line and Kerckhoff 1"
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1258-B1B2 "Los Banos-2C560SS 230 kV Line and Kerckhoff 1"
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1259-B1B2 "2C560SS-Dos Amigos PP 230 kV Line and Kerckhoff 1"
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1260-B1B2 "Los Banos-San Luis PGP #1 230 kV Line and Kerckhoff 1"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1261-B1B2 "Los Banos-San Luis PGP #2 230 kV Line and Kerckhoff 1"
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1262-B1B2 "Los Banos-4C779SS #1 230 kV Line and Kerckhoff 1"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1263-B1B2 "4C779SS-Mercy Springs #1 230 kV Line and Kerckhoff 1"
 line     39717  34147  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  MERCY S1     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1264-B1B2 "Mercy Springs-Panoche #1 230 kV Line and Kerckhoff 1"
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```
 line     34147  30790  "2 " 1     0     # line   from  MERCY S1     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1265-B1B2 "Los Banos-Panoche #2 230 kV Line and Kerckhoff 1"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1266-B1B2 "Dos Amigos PP-Panoche #3 230 kV Line and Kerckhoff 1"
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1267-B1B2 "Panoche-Panoche Energy Center 230 kV Line and Kerckhoff 1"
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  PANO_EC      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1268-B1B2 "Panoche-Gates #1 230 kV Line and Kerckhoff 1"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1269-B1B2 "Panoche-Gates #2 230 kV Line and Kerckhoff 1"
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1270-B1B2 "Panoche-3C643XSS #1 230 kV Line and Kerckhoff 1"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1271-B1B2 "Panoche-3C643XSS #2 230 kV Line and Kerckhoff 1"
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1272-B1B2 "3C643XSS-Helm 230 kV Line and Kerckhoff 1"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1273-B1B2 "3C643XSS-Kearney #2 230 kV Line and Kerckhoff 1"
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY       230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1274-B1B2 "Moss Landing-4C829SS #2 230 kV Line and Kerckhoff 1"
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1275-B1B2 "Coburn-4C829SS #1 230 kV Line and Kerckhoff 1"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1276-B1B2 "4C829SS-Panoche #1 230 kV Line and Kerckhoff 1"
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```
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1277-B1B2 "4C829SS-Panoche #2 230 kV Line and Kerckhoff 1"
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1278-B1B2 "Bellota-Cottle 230 kV Line and Melones 2"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1279-B1B2 "Cottle-Melones 230 kV Line and Melones 2"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1280-B1B2 "Melones-North Merced 230 kV Line and Melones 2"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1281-B1B2 "North Merced-Wilson 230 kV Line and Melones 2"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1282-B1B2 "Bellota-Warnerville 230 kV Line and Melones 2"
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1283-B1B2 "Warnerville-Wilson 230 kV Line and Melones 2"
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1284-B1B2 "Wilson-Borden #1 230 kV Line and Melones 2"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1285-B1B2 "Wilson-Borden #2 230 kV Line and Melones 2"
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1286-B1B2 "Borden-Gregg #1 230 kV Line and Melones 2"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0
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CATB-1287-B1B2 "Borden-Gregg #2 230 kV Line and Melones 2"
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1288-B1B2 "Westley-2C577 230 kV Line and Melones 2"
 line     30670  30763  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  2C577SS      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1289-B1B2 "2C577SS-Los Banos 230 kV Line and Melones 2"
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1290-B1B2 "Los Banos-2C560SS 230 kV Line and Melones 2"
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1291-B1B2 "2C560SS-Dos Amigos PP 230 kV Line and Melones 2"
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1292-B1B2 "Los Banos-San Luis PGP #1 230 kV Line and Melones 2"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1293-B1B2 "Los Banos-San Luis PGP #2 230 kV Line and Melones 2"
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1294-B1B2 "Los Banos-4C779SS #1 230 kV Line and Melones 2"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1295-B1B2 "4C779SS-Mercy Springs #1 230 kV Line and Melones 2"
 line     39717  34147  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  MERCY S1     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1296-B1B2 "Mercy Springs-Panoche #1 230 kV Line and Melones 2"
 line     34147  30790  "2 " 1     0     # line   from  MERCY S1     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1297-B1B2 "Los Banos-Panoche #2 230 kV Line and Melones 2"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1298-B1B2 "Dos Amigos PP-Panoche #3 230 kV Line and Melones 2"
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1299-B1B2 "Panoche-Panoche Energy Center 230 kV Line and Melones 2"
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  PANO_EC      230.00
```

```
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1300-B1B2 "Panoche-Gates #1 230 kV Line and Melones 2"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1301-B1B2 "Panoche-Gates #2 230 kV Line and Melones 2"
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1302-B1B2 "Panoche-3C643XSS #1 230 kV Line and Melones 2"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1303-B1B2 "Panoche-3C643XSS #2 230 kV Line and Melones 2"
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1304-B1B2 "3C643XSS-Helm 230 kV Line and Melones 2"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1305-B1B2 "3C643XSS-Kearney #2 230 kV Line and Melones 2"
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY      230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1306-B1B2 "Moss Landing-4C829SS #2 230 kV Line and Melones 2"
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1307-B1B2 "Coburn-4C829SS #1 230 kV Line and Melones 2"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1308-B1B2 "4C829SS-Panoche #1 230 kV Line and Melones 2"
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1309-B1B2 "4C829SS-Panoche #2 230 kV Line and Melones 2"
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1310-B1B2 "Bellota-Cottle 230 kV Line and Helms 1"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1311-B1B2 "Cottle-Melones 230 kV Line and Helms 1"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
```

```
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1312-B1B2 "Melones-North Merced 230 kV Line and Helms 1"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1313-B1B2 "North Merced-Wilson 230 kV Line and Helms 1"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1314-B1B2 "Bellota-Warnerville 230 kV Line and Helms 1"
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1315-B1B2 "Warnerville-Wilson 230 kV Line and Helms 1"
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1316-B1B2 "Wilson-Borden #1 230 kV Line and Helms 1"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1317-B1B2 "Wilson-Borden #2 230 kV Line and Helms 1"
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1318-B1B2 "Borden-Gregg #1 230 kV Line and Helms 1"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1319-B1B2 "Borden-Gregg #2 230 kV Line and Helms 1"
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1320-B1B2 "Westley-2C577 230 kV Line and Helms 1"
 line     30670  30763  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  2C577SS      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1321-B1B2 "2C577SS-Los Banos 230 kV Line and Helms 1"
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0
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CATB-1322-B1B2 "Los Banos-2C560SS 230 kV Line and Helms 1"
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1323-B1B2 "2C560SS-Dos Amigos PP 230 kV Line and Helms 1"
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1324-B1B2 "Los Banos-San Luis PGP #1 230 kV Line and Helms 1"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1325-B1B2 "Los Banos-San Luis PGP #2 230 kV Line and Helms 1"
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1326-B1B2 "Los Banos-4C779SS #1 230 kV Line and Helms 1"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1327-B1B2 "4C779SS-Mercy Springs #1 230 kV Line and Helms 1"
 line     39717  34147  "1 " 1     0     # line   from  4C779SS      230.00  BRKR to BRKR  MERCY S1     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1328-B1B2 "Mercy Springs-Panoche #1 230 kV Line and Helms 1"
 line     34147  30790  "2 " 1     0     # line   from  MERCY S1     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1329-B1B2 "Los Banos-Panoche #2 230 kV Line and Helms 1"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1330-B1B2 "Dos Amigos PP-Panoche #3 230 kV Line and Helms 1"
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1331-B1B2 "Panoche-Panoche Energy Center 230 kV Line and Helms 1"
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  PANO_EC      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1332-B1B2 "Panoche-Gates #1 230 kV Line and Helms 1"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1333-B1B2 "Panoche-Gates #2 230 kV Line and Helms 1"
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1334-B1B2 "Panoche-3C643XSS #1 230 kV Line and Helms 1"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
#
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```
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1335-B1B2 "Panoche-3C643XSS #2 230 kV Line and Helms 1"
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1336-B1B2 "3C643XSS-Helm 230 kV Line and Helms 1"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1337-B1B2 "3C643XSS-Kearney #2 230 kV Line and Helms 1"
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY      230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1338-B1B2 "Moss Landing-4C829SS #2 230 kV Line and Helms 1"
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1339-B1B2 "Coburn-4C829SS #1 230 kV Line and Helms 1"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1340-B1B2 "4C829SS-Panoche #1 230 kV Line and Helms 1"
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1341-B1B2 "4C829SS-Panoche #2 230 kV Line and Helms 1"
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

# 2018 main year category b contingency list
# Fresno Division Zone 314
#

CATB-1342-B2 "Gregg-Herndon #1 230 kV Line"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
0

CATB-1343-B2 "Gregg-Herndon #2 230 kV Line"
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
0

CATB-1344-B2 "Gregg-Ashlan 230 kV Line"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
```

```
0

CATB-1345-B2 "Gregg-3C643WSS #1 230 kV Line"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
0

CATB-1346-B2 "Gregg-Gates #2 230 kV Line"
 line     30810  30900  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  GATES        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of new Gregg-Gates #2 230 kV Line
0

CATB-1347-B2 "E1-Gregg #1 230 kV Line"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
0

CATB-1348-B2 "E1-Gregg #2 230 kV Line"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
0

CATB-1349-B2 "Helms PP-E1 #1 230 kV Line"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
0

CATB-1350-B2 "Helms PP-E1 #2 230 kV Line"
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
0

CATB-1351-B2 "Herndon-Kearney 230 kV Line"
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON      230.00
0

CATB-1352-B2 "Herndon-Ashlan 230 kV Line"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
0

CATB-1353-B2 "Haas-McCall 230 kV Line"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP     230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS          13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL      230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3     230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70       70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK      70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3      13.80
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
0

CATB-1354-B2 "Balch-McCall 230 kV Line"
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT     230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2      13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL      230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT      13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
0
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CATB-1355-B2 "Helm-McCall 230 kV Line"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
0

CATB-1356-B2 "3C643W-McCall #2 230 kV Line"
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
0

CATB-1357-B2 "Templeton-Gates 230 kV Line"
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
0

CATB-1358-B2 "Gates-6C0974SS 230 kV Line"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
0

CATB-1359-B2 "6C0974SS-5C877SS 230 kV Line"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
0

CATB-1360-B2 "5C877SS-Morro Bay 230 kV Line"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
0

CATB-1361-B2 "Gates-Arco 230 kV Line"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
0

CATB-1362-B2 "Gates-Midway 230 kV Line"
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1363-B2 "3C643WSS-Gates #1 230 kV Line"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
0

CATB-1364-B2 "3C643WSS-Gates #2 230 kV Line"
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
0

CATB-1365-B2 "T254-Gates 230 kV Line"
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
 tran     30902  34688  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT1       18.00
 tran     30902  34689  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT2       18.00
 tran     30902  34690  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254ST1       18.00
#-#-# load     34688  "SS"    0              # load         T254CT1       18.00  LOAD==11.87(6.57)
#-#-# load     34689  "SS"    0              # load         T254CT2       18.00  LOAD==11.87(6.57)
#-#-# load     34690  "SS"    0              # load         T254ST1       18.00  LOAD==11.87(6.57)
#-#-# gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
#-#-# gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
#-#-# gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
0

CATB-1366-B2 "Gates-Tulare Lake 70 kV Line"
 line     34115  34117  "1 " 1     0     # line   from  AVENAL T      70.00   (3) to (3)   KETLMN T      70.00
 line     34115  34119  "1 " 1     0     # line   from  AVENAL T      70.00   (3) to (2)   CHEVPL T      70.00
 line     34115  34249  "1 " 1     0     # line   from  AVENAL T      70.00   (3) to (3)   AVNLPARK      70.00
 line     34117  34552  "1 " 1     0     # line   from  KETLMN T      70.00   (3) to BRKR  GATES         70.00
 line     34117  34548  "1 " 1     0     # line   from  KETLMN T      70.00   (3) to (1)   KETTLEMN      70.00
 line     34119  34550  "1 " 1     0     # line   from  CHEVPL T      70.00   (2) to (1)   CHEVPLIN      70.00
 line     34249  34251  "1 " 1     0     # line   from  AVNLPARK      70.00   (3) to (4)   SUN CITY      70.00
 tran     34249  34265  "1 "       0     # tran   from  AVNLPARK      70.00   (3) to (1)   0029-WD       12.00
 line     34251  34546  "1 " 1     0     # line   from  SUN CITY      70.00   (4) to (3)   AVENAL        70.00
 tran     34251  34257  "1 "       0     # tran   from  SUN CITY      70.00   (4) to (1)   0035-WD       12.00
 tran     34251  34263  "1 "       0     # tran   from  SUN CITY      70.00   (4) to (1)   0036-WD       12.00
 line     34546  90124  "1 " 1     0     # line   from  AVENAL        70.00   (3) to (1)   0124-WD       70.00
#-#-# load     34548  "1 "    0              # load         KETTLEMN      70.00  LOAD==11.79(1.68)
#-#-# load     34548  "E1"    0              # load         KETTLEMN      70.00  LOAD==-0.06(0.00)
#-#-# load     34550  "1 "    0              # load         CHEVPLIN      70.00  LOAD==1.79(1.47)
#-#-# load     34550  "E1"    0              # load         CHEVPLIN      70.00  LOAD==-0.02(0.00)
#-#-# load     34546  "1 "    0              # load         AVENAL        70.00  LOAD==15.17(2.16)
#-#-# load     34546  "E1"    0              # load         AVENAL        70.00  LOAD==-0.13(0.00)
#-#-# gen      34265  "EW"    0              # gen          0029-WD       12.00  GEN ==6.00(-1.29)
#-#-# gen      34257  "EW"    0              # gen          0035-WD       12.00  GEN ==20.00(4.53)
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#-#-# gen      34263  "EW"    0              # gen          0036-WD       12.00  GEN ==19.00(4.42)
#-#-# gen      90124  "EW"    0              # gen          0124-WD       70.00  GEN ==15.80(0.00)
0

CATB-1367-B2 "Coalinga1-Coalinga2 70 kV Line"
 line     34169  34174  "1 " 1     0     # line   from  TORNDO J      70.00   (3) to (3)   PENZIR J      70.00
 line     34169  34574  "1 " 1     0     # line   from  TORNDO J      70.00   (3) to BRKR  COLNGA 1      70.00
 line     34169  34171  "1 " 1     0     # line   from  TORNDO J      70.00   (3) to (3)   TORNDO T      70.00
 line     34174  34175  "1 " 1     0     # line   from  PENZIR J      70.00   (3) to (3)   DERRCK T      70.00
 line     34174  34570  "1 " 1     0     # line   from  PENZIR J      70.00   (3) to BRKR  COLNGA 2      70.00
 line     34171  34173  "1 " 1     0     # line   from  TORNDO T      70.00   (3) to (2)   COLCGN T      70.00
 line     34171  34572  "1 " 1     0     # line   from  TORNDO T      70.00   (3) to (1)   TORNADO       70.00
 tran     34173  34654  "1 "       0     # tran   from  COLCGN T      70.00   (2) to (1)   COLNGAGN       9.11
 line     34175  34177  "1 " 1     0     # line   from  DERRCK T      70.00   (3) to (2)   OIL CITYT     70.00
 line     34175  34571  "1 " 1     0     # line   from  DERRCK T      70.00   (3) to (2)   DERRICK       70.00
 line     34177  34185  "1 " 1     0     # line   from  OIL CITYT     70.00   (2) to (1)   PENNZIER      70.00
 tran     34571  34652  "1 "       0     # tran   from  DERRICK       70.00   (2) to (1)   CHV.COAL       9.11
#-#-# load     34572  "1 "    0              # load         TORNADO       70.00  LOAD==3.57(2.96)
#-#-# load     34572  "E1"    0              # load         TORNADO       70.00  LOAD==-0.02(0.00)
#-#-# load     34654  "SG"    0              # load         COLNGAGN       9.11  LOAD==0.71(0.17)
#-#-# load     34652  "S1"    0              # load         CHV.COAL       9.11  LOAD==1.94(0.41)
#-#-# load     34652  "SG"    0              # load         CHV.COAL       9.11  LOAD==1.75(0.24)
#-#-# gen      34654  "1 "    0              # gen          COLNGAGN       9.11  GEN ==38.50(6.20)
#-#-# gen      34652  "1 "    0              # gen          CHV.COAL       9.11  GEN ==4.55(4.73)
#-#-# gen      34652  "2 "    0              # gen          CHV.COAL       9.11  GEN ==2.35(4.00)
0

CATB-1368-B2 "Gates-Coalinga2 70 kV Line"
 line     34184  34570  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  COLNGA 2      70.00
 line     34184  34552  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  GATES         70.00
 tran     34184  34553  "1 "       0     # tran   from  GATS2_TP      70.00   (3) to (1)   WHD_GAT2      13.80
#-#-# load     34553  "SG"    0              # load         WHD_GAT2      13.80  LOAD==0.59(0.13)
0

CATB-1369-B2 "E2-Shepherd 115 kV Line"
 line     34348  34998  "1 " 1     0     # line   from  SHEPHERD     115.00  BRKR to BRKR  E2           115.00
0

CATB-1370-B2 "Schindler-S542 115 kV Line"
 line     34354  34439  "1 " 1     0     # line   from  SCHINDLR     115.00  BRKR to (2)   S542         115.00
 tran     34439  34699  "1 "       0     # tran   from  S542         115.00   (2) to (1)   S542          13.80
#-#-# gen      34699  "E "    0              # gen          S542          13.80  GEN ==20.00(-0.68)
0

CATB-1371-B2 "Kerckhoff 1-Kerckhoff 2 115 kV Line"
 line     34356  34358  "1 " 1     0     # line   from  KERCKHF1     115.00  BRKR to BRKR  KERCKHF2     115.00
0

CATB-1372-B2 "Manchester-Airways-Sanger 115 kV Line"
 line     34357  34355  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (1)   AIRWAYS2     115.00
 line     34357  34368  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (2)   LASPALMS     115.00
 line     34357  34410  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to BRKR  MANCHSTR     115.00
 line     34368  34366  "1 " 1     0     # line   from  LASPALMS     115.00   (2) to BRKR  SANGER       115.00
#-#-# load     34355  "2 "    0              # load         AIRWAYS2     115.00  LOAD==13.72(1.96)
#-#-# load     34368  "1 "    0              # load         LASPALMS     115.00  LOAD==15.54(12.63)
#-#-# load     34368  "E1"    0              # load         LASPALMS     115.00  LOAD==-0.17(0.00)
  line     34361  34355  "1 " 1     1     # Switches in Airways Bus Tie
  #-#-# load     34355  "2 "    1              # Restore load 2 at Airways 2
  #-#-# load     34355  "E2"    1              # Restore load E2 at Airways 2
0

CATB-1373-B2 "Barton-Airways-Sanger 115 kV Line"
 line     34359  34361  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to (1)   AIRWAYS      115.00
 line     34359  34408  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to BRKR  BARTON       115.00
 line     34359  34366  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to BRKR  SANGER       115.00
#-#-# load     34361  "1 "    0              # load         AIRWAYS      115.00  LOAD==28.77(4.10)
#-#-# load     34361  "E1"    0              # load         AIRWAYS      115.00  LOAD==-0.30(0.00)
  line     34361  34355  "1 " 1     1     # Switches in Airways Bus Tie
  #-#-# load     34361  "1 "    1              # Restore load 1 at Airways
  #-#-# load     34361  "E1"    1              # Restore load E1 at Airways
0

CATB-1374-B2 "E2-Clovis-Sanger #1 115 kV Line"
 line     34362  34363  "1 " 1     0     # line   from  CLOVIS-1     115.00  BRKR to (3)   CLOVISJ1     115.00
 line     34363  34366  "1 " 1     0     # line   from  CLOVISJ1     115.00   (3) to BRKR  SANGER       115.00
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 line     34363  34998  "1 " 1     0     # line   from  CLOVISJ1     115.00   (3) to BRKR  E2           115.00
#-#-# load     34362  "1 "    0              # load         CLOVIS-1     115.00  LOAD==37.92(5.40)
#-#-# load     34362  "E1"    0              # load         CLOVIS-1     115.00  LOAD==-0.38(0.00)
  line     34364  34362  "1 " 1     1     # Switches in Clovis SW 387 to transfer load
  #-#-# load     34362  "1 "    1              # Restore Load 1 at Clovis 1
  #-#-# load     34362  "E1"    1              # Restore Load E1 at Clovis 1
0

CATB-1375-B2 "E2-Clovis-Sanger #2 115 kV Line"
 line     34364  34365  "1 " 1     0     # line   from  CLOVIS-2     115.00  BRKR to (3)   CLOVISJ2     115.00
 line     34365  34366  "1 " 1     0     # line   from  CLOVISJ2     115.00   (3) to BRKR  SANGER       115.00
 line     34365  34998  "1 " 1     0     # line   from  CLOVISJ2     115.00   (3) to BRKR  E2           115.00
#-#-# load     34364  "2 "    0              # load         CLOVIS-2     115.00  LOAD==42.94(6.12)
#-#-# load     34364  "3 "    0              # load         CLOVIS-2     115.00  LOAD==43.19(6.15)
#-#-# load     34364  "E2"    0              # load         CLOVIS-2     115.00  LOAD==-0.39(0.00)
#-#-# load     34364  "E3"    0              # load         CLOVIS-2     115.00  LOAD==-0.38(0.00)
  line     34364  34362  "1 " 1     1     # Switches in Clovis SW 387 to transfer load
  #-#-# load     34364  "2 "    1              # Restore Load 2 at Clovis 2
  #-#-# load     34364  "3 "    1              # Restore Load 3 at Clovis 2
  #-#-# load     34364  "E2"    1              # Restore Load E2 at Clovis 2
  #-#-# load     34364  "E3"    1              # Restore Load E3 at Clovis 2
0

CATB-1376-B2 "McCall-Sanger #1 115 kV Line"
 line     34366  34370  "1 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
0

CATB-1377-B2 "McCall-Sanger #2 115 kV Line"
 line     34366  34370  "2 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
0

CATB-1378-B2 "McCall-Sanger #3 115 kV Line"
 line     34366  34370  "3 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
0

CATB-1379-B2 "Sanger-Malaga 115 kV Line"
 line     34366  34372  "1 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MALAGA       115.00
0

CATB-1380-B2 "Kings River-Sanger-Reedley 115 kV Line"
 line     34366  34389  "1 " 1     0     # line   from  SANGER       115.00  BRKR to (3)   RAINBWTP     115.00
 line     34389  34388  "1 " 1     0     # line   from  RAINBWTP     115.00   (3) to (1)   RAINBW       115.00
 line     34389  34394  "1 " 1     0     # line   from  RAINBWTP     115.00   (3) to (3)   PIEDRA 1     115.00
 line     34394  34380  "1 " 1     0     # line   from  PIEDRA 1     115.00   (3) to BRKR  REEDLEY     115.00
 line     34394  34400  "1 " 1     0     # line   from  PIEDRA 1     115.00   (3) to BRKR  KNGSRVR1     115.00
#-#-# load     34388  "1 "    0              # load         RAINBW       115.00  LOAD==16.38(2.34)
#-#-# load     34388  "E1"    0              # load         RAINBW       115.00  LOAD==-0.16(0.00)
0

CATB-1381-B2 "Balch-Sanger 115 kV Line"
 line     34366  34396  "1 " 1     0     # line   from  SANGER       115.00  BRKR to (2)   PIEDRA 2     115.00
 line     34396  34398  "1 " 1     0     # line   from  PIEDRA 2     115.00   (2) to (2)   BALCH        115.00
 tran     34398  34624  "1 "       0     # tran   from  BALCH        115.00   (2) to (1)   BALCH 1       13.20
#-#-# load     34624  "1 "    0              # load         BALCH 1       13.20  LOAD==0.23(0.03)
#-#-# load     34624  "E1"    0              # load         BALCH 1       13.20  LOAD==-0.00(0.00)
#-#-# load     34624  "E2"    0              # load         BALCH 1       13.20  LOAD==-0.01(0.00)
#-#-# gen      34624  "1 "    0              # gen          BALCH 1       13.20  GEN ==33.00(2.04)
0

CATB-1382-B2 "Sanger-Reedley 115 kV Line"
 line     34366  34487  "1 " 1     0     # line   from  SANGER       115.00  BRKR to (3)   SNGRJCT      115.00
 line     34487  34489  "1 " 1     0     # line   from  SNGRJCT      115.00   (3) to (2)   SNGRCOGN     115.00
 line     34487  34490  "1 " 1     0     # line   from  SNGRJCT      115.00   (3) to (2)   PARLIER      115.00
 tran     34489  34646  "1 "       0     # tran   from  SNGRCOGN     115.00   (2) to (1)   SANGERCO     13.80
 line     34490  34380  "1 " 1     0     # line   from  PARLIER      115.00   (2) to BRKR  REEDLEY     115.00
#-#-# load     34490  "2 "    0              # load         PARLIER      115.00  LOAD==19.57(2.79)
#-#-# load     34490  "E2"    0              # load         PARLIER      115.00  LOAD==-0.17(0.00)
#-#-# load     34646  "SG"    0              # load         SANGERCO      13.80  LOAD==1.04(0.24)
#-#-# gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
#-#-# gen      34646  "2 "    0              # gen          SANGERCO      13.80  GEN ==8(0.00)
0

CATB-1383-B2 "McCall-Wahtoke 115 kV Line"
 line     34370  34382  "1 " 1     0     # line   from  MC CALL      115.00  BRKR to BRKR  WAHTOKE      115.00
0
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CATB-1384-B2 "McCall-Kingsburg #1 115 kV Line"
 line     34370  34385  "1 " 1     0     # line   from  MC CALL      115.00  BRKR to (3)   KINGS J1     115.00
 line     34385  34417  "1 " 1     0     # line   from  KINGS J1     115.00   (3) to (2)   KINGS J2     115.00
 line     34385  34425  "1 " 1     0     # line   from  KINGS J1     115.00   (3) to (3)   KCOGNJCT     115.00
 line     34417  34418  "1 " 1     0     # line   from  KINGS J2     115.00   (2) to BRKR  KINGSBRG     115.00
 line     34425  34387  "1 " 1     0     # line   from  KCOGNJCT     115.00   (3) to (1)   SUNMAID      115.00
 line     34425  34427  "1 " 1     0     # line   from  KCOGNJCT     115.00   (3) to (2)   GRDNGLS2     115.00
 line     34427  34386  "1 " 1     0     # line   from  GRDNGLS2     115.00   (2) to (2)   KNGSCOGN     115.00
 tran     34386  34642  "1 "       0     # tran   from  KNGSCOGN     115.00   (2) to BRKR  KINGSBUR       9.11
#-#-# load     34387  "1 "    0              # load         SUNMAID      115.00  LOAD==3.65(3.55)
#-#-# load     34387  "E1"    0              # load         SUNMAID      115.00  LOAD==-0.04(0.00)
#-#-# load     34642  "SG"    0              # load         KINGSBUR       9.11  LOAD==0.35(0.08)
#-#-# gen      34642  "1 "    0              # gen          KINGSBUR       9.11  GEN ==25.35(13.86)
0

CATB-1385-B2 "Malaga-PPG 115 kV Tap"
 line     34372  34376  "1 " 1     0     # line   from  MALAGA       115.00  BRKR to (1)   PPG          115.00
#-#-# load     34376  "1 "    0              # load         PPG          115.00  LOAD==1.40(1.00)
#-#-# load     34376  "E1"    0              # load         PPG          115.00  LOAD==-0.06(0.00)
0

CATB-1386-B2 "McCall-Malaga 115 kV Line"
 line     34372  34379  "1 " 1     0     # line   from  MALAGA       115.00  BRKR to (3)   MALAGATP     115.00
 line     34379  34373  "1 " 1     0     # line   from  MALAGATP     115.00   (3) to (3)   SCWAXJCT     115.00
 line     34379  34375  "1 " 1     0     # line   from  MALAGATP     115.00   (3) to (3)   ULTPWRJ      115.00
 line     34373  34371  "1 " 1     0     # line   from  SCWAXJCT     115.00   (3) to (1)   SCWAX        115.00
 line     34373  34374  "1 " 1     0     # line   from  SCWAXJCT     115.00   (3) to (1)   RANCHRS      115.00
 line     34375  34377  "1 " 1     0     # line   from  ULTPWRJ      115.00   (3) to (2)   AIRPROD      115.00
 tran     34375  34640  "1 "       0     # tran   from  ULTPWRJ      115.00   (3) to (1)   ULTR.PWR       9.11
 line     34377  34370  "1 " 1     0     # line   from  AIRPROD      115.00   (2) to BRKR  MC CALL      115.00
#-#-# load     34371  "1 "    0              # load         SCWAX        115.00  LOAD==2.59(1.57)
#-#-# load     34371  "E1"    0              # load         SCWAX        115.00  LOAD==-0.03(0.00)
#-#-# load     34374  "1 "    0              # load         RANCHRS      115.00  LOAD==7.58(1.08)
#-#-# load     34374  "E1"    0              # load         RANCHRS      115.00  LOAD==-0.07(0.00)
#-#-# load     34377  "1 "    0              # load         AIRPROD      115.00  LOAD==5.21(2.04)
#-#-# load     34377  "E1"    0              # load         AIRPROD      115.00  LOAD==-0.06(0.00)
#-#-# gen      34640  "1 "    0              # gen          ULTR.PWR       9.11  GEN ==23.38(13.00)
0

CATB-1387-B2 "Malaga-KRCD 115 kV Tap"
 line     34372  34381  "1 " 1     0     # line   from  MALAGA       115.00  BRKR to (3)   KRCDP        115.00
 tran     34381  34671  "1 "       0     # tran   from  KRCDP        115.00   (3) to (1)   KRCDPCT1      13.80
 tran     34381  34672  "1 "       0     # tran   from  KRCDP        115.00   (3) to (1)   KRCDPCT2      13.80
#-#-# load     34671  "ss"    0              # load         KRCDPCT1      13.80  LOAD==0.52(0.12)
#-#-# load     34672  "ss"    0              # load         KRCDPCT2      13.80  LOAD==0.52(0.12)
#-#-# gen      34671  "1 "    0              # gen          KRCDPCT1      13.80  GEN ==48.00(-2.17)
#-#-# gen      34672  "1 "    0              # gen          KRCDPCT2      13.80  GEN ==48.00(-2.17)
0

CATB-1388-B2 "Reedley-Wahtoke 115 kV Line"
 line     34382  34380  "1 " 1     0     # line   from  WAHTOKE      115.00  BRKR to BRKR  REEDLEY      115.00
0

CATB-1389-B2 "McCall-California Ave 115 kV Line "
 line     34390  34370  "1 " 1     0     # line   from  DANISHCM     115.00   (2) to BRKR  MC CALL      115.00
 line     34390  34402  "1 " 1     0     # line   from  DANISHCM     115.00   (2) to BRKR  CAL AVE      115.00
#-#-# load     34390  "1 "    0              # load         DANISHCM     115.00  LOAD==4.23(3.51)
#-#-# load     34390  "E1"    0              # load         DANISHCM     115.00  LOAD==-0.05(0.00)
0

CATB-1390-B2 "California Ave-Sanger 115 kV Line"
 line     34402  34366  "1 " 1     0     # line   from  CAL AVE      115.00  BRKR to BRKR  SANGER       115.00
0

CATB-1391-B2 "California Ave-West Fresno 115 kV Line"
 line     34402  34404  "1 " 1     0     # line   from  CAL AVE      115.00  BRKR to BRKR  WST FRSO     115.00
0

CATB-1392-B2 "McCall-West Fresno 115 kV Line"
 line     34404  34370  "1 " 1     0     # line   from  WST FRSO     115.00  BRKR to BRKR  MC CALL      115.00
0

CATB-1393-B2 "Herndon-Barton 115 kV Line"
 line     34408  34412  "1 " 1     0     # line   from  BARTON       115.00  BRKR to BRKR  HERNDON      115.00
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0

CATB-1394-B2 "Herndon-Bullard #1 115 kV Line"
 line     34409  34415  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to (1)   PNEDLE2      115.00
 line     34409  34416  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to BRKR  BULLARD      115.00
 line     34409  34412  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to BRKR  HERNDON      115.00
#-#-# load     34415  "3 "    0              # load         PNEDLE2      115.00  LOAD==43.41(6.19)
#-#-# load     34415  "E3"    0              # load         PNEDLE2      115.00  LOAD==-0.35(0.00)
  line     34415  34413  "1 " 1     1     # Switches in Pinedale Bus Tie
  #-#-# load     34415  "3 "    1              # Restore load 3 at Pinedale 2
  #-#-# load     34415  "E3"    1              # Restore load E3 at Pinedale 2
0

CATB-1395-B2 "Herndon-Manchester 115 kV Line"
 line     34410  34412  "1 " 1     0     # line   from  MANCHSTR     115.00  BRKR to BRKR  HERNDON      115.00
0

CATB-1396-B2 "Herndon-Bullard #2 115 kV Line"
 line     34411  34413  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  PNEDLE       115.00
 line     34411  34416  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  BULLARD      115.00
 line     34411  34412  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  HERNDON      115.00
#-#-# load     34413  "1 "    0              # load         PNEDLE       115.00  LOAD==29.39(4.19)
#-#-# load     34413  "2 "    0              # load         PNEDLE       115.00  LOAD==44.76(6.38)
#-#-# load     34413  "E1"    0              # load         PNEDLE       115.00  LOAD==-0.15(0.00)
#-#-# load     34413  "E2"    0              # load         PNEDLE       115.00  LOAD==-0.38(0.00)
  line     34415  34413  "1 " 1     1     # Switches in Pinedale Bus Tie
  #-#-# load     34413  "1 "    1              # Restore load 1 at Pinedale
  #-#-# load     34413  "2 "    1              # Restore load 2 at Pinedale
  #-#-# load     34413  "E1"    1              # Restore load E1 at Pinedale
  #-#-# load     34413  "E2"    1              # Restore load E2 at Pinedale
0

CATB-1397-B2 "Herndon-Woodward 115 kV Line"
 line     34412  34422  "1 " 1     0     # line   from  HERNDON      115.00  BRKR to (2)   CHLDHOSP     115.00
 line     34422  34414  "1 " 1     0     # line   from  CHLDHOSP     115.00   (2) to BRKR  WOODWARD     115.00
#-#-# load     34422  "1 "    0              # load         CHLDHOSP     115.00  LOAD==4.09(1.71)
#-#-# load     34422  "E1"    0              # load         CHLDHOSP     115.00  LOAD==-0.05(0.00)
0

CATB-1398-B2 "Woodward-Shepherd 115 kV Line"
 line     34414  34348  "1 " 1     0     # line   from  WOODWARD     115.00  BRKR to BRKR  SHEPHERD     115.00
0

CATB-1399-B2 "McCall-Kingsburg #2 115 kV Line"
 line     34418  34423  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (3)   GAURD J1     115.00
 line     34423  34370  "1 " 1     0     # line   from  GAURD J1     115.00   (3) to BRKR  MC CALL     115.00
 line     34423  34421  "1 " 1     0     # line   from  GAURD J1     115.00   (3) to (2)   GAURD J2     115.00
 line     34421  34424  "1 " 1     0     # line   from  GAURD J2     115.00   (2) to (1)   GRDN GLS     115.00
#-#-# load     34424  "1 "    0              # load         GRDN GLS     115.00  LOAD==5.88(1.93)
#-#-# load     34424  "E1"    0              # load         GRDN GLS     115.00  LOAD==-0.14(0.00)
0

CATB-1400-B2 "GWF-Kingsburg 115 kV Line"
 line     34418  34428  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (2)   CONTADNA     115.00
 line     34428  34429  "1 " 1     0     # line   from  CONTADNA     115.00   (2) to BRKR  GWF_HEP     115.00
#-#-# load     34428  "1 "    0              # load         CONTADNA     115.00  LOAD==7.69(5.91)
#-#-# load     34428  "E1"    0              # load         CONTADNA     115.00  LOAD==-0.11(0.00)
0

CATB-1401-B2 "Kingsburg-S478SS #2 115 kV Line"
 line     34418  34434  "2 " 1     0     # line   from  KINGSBRG     115.00  BRKR to BRKR  S478SS       115.00
0

CATB-1402-B2 "Kingsburg-Corcoran #1 115 kV Line"
 line     34418  34436  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (3)   S529TP       115.00
 line     34436  34420  "1 " 1     0     # line   from  S529TP       115.00   (3) to BRKR  CORCORAN     115.00
 line     34436  34437  "1 " 1     0     # line   from  S529TP       115.00   (3) to (2)   S529         115.00
 tran     34437  34697  "1 "       0     # tran   from  S529         115.00   (2) to (1)   S529          21.00
#-#-# gen      34697  "E "    0              # gen          S529          21.00  GEN ==20.00(0.09)
0

CATB-1403-B2 "Henrietta-Leprino Jct SS 115 kV Line"
 line     34430  34519  "1 " 1     0     # line   from  HENRETTA     115.00  BRKR to BRKR  LPRN JCT     115.00
0
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CATB-1404-B2 "S478SS-Corcoran #2 115 kV Line"
 line     34434  34420  "2 " 1     0     # line   from  S478SS       115.00  BRKR to BRKR  CORCORAN     115.00
0

CATB-1405-B2 "S478 115 kV gen tie line"
 line     34434  34435  "1 " 1     0     # line   from  S478SS       115.00  BRKR to (3)   S478         115.00
 line     34435  34440  "1 " 1     0     # line   from  S478          115.00   (3) to (2)   2C558        115.00
 tran     34435  34696  "1 "       0     # tran   from  S478          115.00   (3) to (1)   S478          21.00
 tran     34440  34677  "1 "       0     # tran   from  2C558         115.00   (2) to (1)   2C558         21.00
#-#-# gen      34696  "F "    0              # gen          S478          21.00  GEN ==20.00(-2.24)
#-#-# gen      34677  "F "    0              # gen          2C558         21.00  GEN ==19.75(2.02)
0

CATB-1406-B2 "Leprino Jct SS-Leprino Food 115 kV Line"
 line     34441  34442  "1 " 1     0     # line   from  S636TP       115.00   (3) to (2)   S636         115.00
 line     34441  34521  "1 " 1     0     # line   from  S636TP       115.00   (3) to (1)   LEPRNOFD     115.00
 line     34441  34519  "1 " 1     0     # line   from  S636TP       115.00   (3) to BRKR  LPRN JCT     115.00
 tran     34442  34680  "1 "       0     # tran   from  S636          115.00   (2) to (1)   S636          12.47
#-#-# load     34521  "1 "    0              # load         LEPRNOFD     115.00  LOAD==24.73(14.02)
#-#-# load     34521  "E1"    0              # load         LEPRNOFD     115.00  LOAD==-0.20(0.00)
#-#-# gen      34680  "F "    0              # gen          S636          12.47  GEN ==20.00(3.70)
0

CATB-1407-B2 "S626SS-Jacobs Corner 70 kV Line"
 line     34450  34451  "1 " 1     0     # line   from  S637TP        70.00   (3) to (3)   S637          70.00
 line     34450  34542  "1 " 1     0     # line   from  S637TP        70.00   (3) to BRKR  JCBSCRNR      70.00
 line     34450  34457  "1 " 1     0     # line   from  S637TP        70.00   (3) to BRKR  S626SS        70.00
 line     34451  39792  "1 " 1     0     # line   from  S637          70.00   (3) to (2)   4C752         70.00
 tran     34451  34666  "1 "       0     # tran   from  S637          70.00   (3) to (1)   S637          12.47
 tran     39792  39793  "1 "       0     # tran   from  4C752         70.00   (2) to (2)   4C752EQ1      12.50
 line     39793  39794  "1 " 1     0     # line   from  4C752EQ1      12.50   (2) to (2)   4C752EQ2      12.50
 tran     39794  39795  "1 "       0     # tran   from  4C752EQ2      12.50   (2) to (1)   4C752          0.80
#-#-# gen      34666  "E "    0              # gen          S637          12.47  GEN ==20.00(3.55)
#-#-# gen      39795  "F "    0              # gen          4C752          0.80  GEN ==12.00(0.76)
0

CATB-1408-B2 "Coppermine-Wishon 70 kV Line"
 line     34452  34491  "1 " 1     0     # line   from  WISHON        70.00  BRKR to (3)   AUBRYTP       70.00
 line     34491  34464  "1 " 1     0     # line   from  AUBRYTP       70.00   (3) to BRKR  COPPRMNE      70.00
 line     34491  34493  "1 " 1     0     # line   from  AUBRYTP       70.00   (3) to (1)   AUBERRY       70.00
#-#-# load     34493  "1 "    0              # load         AUBERRY       70.00  LOAD==5.50(0.78)
#-#-# load     34493  "2 "    0              # load         AUBERRY       70.00  LOAD==6.82(0.97)
#-#-# load     34493  "E1"    0              # load         AUBERRY       70.00  LOAD==-0.06(0.00)
#-#-# load     34493  "E2"    0              # load         AUBERRY       70.00  LOAD==-0.07(0.00)
0

CATB-1409-B2 "S650ABSS-S625 70 kV Line"
 line     34453  34455  "1 " 1     0     # line   from  S625TP        70.00   (2) to (2)   S625          70.00
 line     34453  39217  "1 " 1     0     # line   from  S625TP        70.00   (2) to BRKR  S650ABS       70.00
 tran     34455  34627  "1 "       0     # tran   from  S625          70.00   (2) to (1)   S625          34.50
#-#-# gen      34627  "E "    0              # gen          S625          34.50  GEN ==20.00(1.37)
0

CATB-1410-B2 "Kingsburg-Lemoore 70 kV Line"
 line     34456  34458  "1 " 1     0     # line   from  HRDWK TP      70.00   (3) to (1)   HARDWICK      70.00
 line     34456  34522  "1 " 1     0     # line   from  HRDWK TP      70.00   (3) to (1)   HNFRD SW      70.00
 line     34456  34576  "1 " 1     0     # line   from  HRDWK TP      70.00   (3) to BRKR  KNGLOBUS      70.00
#-#-# load     34458  "1 "    0              # load         HARDWICK      70.00  LOAD==13.76(1.96)
#-#-# load     34458  "E1"    0              # load         HARDWICK      70.00  LOAD==-0.12(0.00)
0

CATB-1411-B2 "Guernsey-Jacobs Corner SS 70 kV Line"
 line     34460  34462  "1 " 1     0     # line   from  GUERNSEY      70.00  BRKR to (3)   GUR3TPT       70.00
 line     34462  34542  "1 " 1     0     # line   from  GUR3TPT       70.00   (3) to BRKR  JCBSCRNR      70.00
 line     34462  34554  "1 " 1     0     # line   from  GUR3TPT       70.00   (3) to BRKR  AMSTG SW      70.00
0

CATB-1412-B2 "S631-Stroud Sw Sta 70 kV Line"
 line     34461  34556  "1 " 1     0     # line   from  S631          70.00   (2) to BRKR  STRD JCT      70.00
 tran     34461  34629  "1 "       0     # tran   from  S631          70.00   (2) to (1)   S631          12.47
#-#-# gen      34629  "E "    0              # gen          S631          12.47  GEN ==20.00(3.80)
0

CATB-1413-B2 "Caruthers-Camden-Henrietta 70 kV Line"
 line     34463  34465  "1 " 1     0     # line   from  S634TP        70.00   (3) to (2)   S634          70.00
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 line     34463  34511  "1 " 1     0     # line   from  S634TP        70.00   (3) to (2)   LMOR_TAP      70.00
 line     34463  34510  "1 " 1     0     # line   from  S634TP        70.00   (3) to (2)   CMDN JCT      70.00
 tran     34465  34617  "1 "       0     # tran   from  S634          70.00   (2) to (1)   S634          12.47
 line     34511  34540  "1 " 1     0     # line   from  LMOR_TAP      70.00   (2) to BRKR  HENRITTA      70.00
 line     34510  34508  "1 " 1     0     # line   from  CMDN JCT      70.00   (2) to (1)   CAMDEN        70.00
#-#-# load     34508  "1 "    0              # load         CAMDEN        70.00  LOAD==18.67(2.66)
#-#-# load     34508  "2 "    0              # load         CAMDEN        70.00  LOAD==6.22(0.88)
#-#-# load     34508  "E1"    0              # load         CAMDEN        70.00  LOAD==-0.18(0.00)
#-#-# load     34508  "E2"    0              # load         CAMDEN        70.00  LOAD==-0.07(0.00)
#-#-# gen      34617  "E "    0              # gen          S634          12.47  GEN ==20.00(2.61)
  line     34508  34576  "1 " 1     1     # Switches in Camden CB 22
  #-#-# load     34508  "1 "    1              # Restore load 1 at Camden
  #-#-# load     34508  "2 "    1              # Restore load 2 at Camden
  #-#-# load     34508  "E1"    1              # Restore load E1 at Camden
  #-#-# load     34508  "E2"    1              # Restore load E2 at Camden
0

CATB-1414-B2 "Coppermine-Friant 70 kV Line"
 line     34464  34638  "1 " 1     0     # line   from  COPPRMNE      70.00  BRKR to (2)   FRANTDM       70.00
 tran     34638  34636  "1 "       0     # tran   from  FRANTDM       70.00   (2) to (1)   FRIANTDM       6.60
#-#-# gen      34636  "2 "    0              # gen          FRIANTDM       6.60  GEN ==16.30(-0.20)
#-#-# gen      34636  "3 "    0              # gen          FRIANTDM       6.60  GEN ==8.70(-0.20)
#-#-# gen      34636  "4 "    0              # gen          FRIANTDM       6.60  GEN ==2.30(-0.20)
0

CATB-1415-B2 "Kearney-Bowles 70 kV Line"
 line     34468  34480  "1 " 1     0     # line   from  BOWLES        70.00   (1) to BRKR  KEARNEY       70.00
#-#-# load     34468  "1 "    0              # load         BOWLES        70.00  LOAD==18.63(2.66)
#-#-# load     34468  "E1"    0              # load         BOWLES        70.00  LOAD==-0.15(0.00)
0

CATB-1416-B2 "Giffen-San Joaquin-Helm 70 kV Line"
 line     34471  39845  "1 " 1     0     # line   from  SNJQJCT       70.00   (2) to (3)   4C799TP       70.00
 line     34471  34474  "1 " 1     0     # line   from  SNJQJCT       70.00   (2) to BRKR  HELM          70.00
 line     39845  34469  "1 " 1     0     # line   from  4C799TP       70.00   (3) to BRKR  GFFNJCT       70.00
 line     39845  39846  "1 " 1     0     # line   from  4C799TP       70.00   (3) to (5)   4C799         70.00
 tran     39846  39847  "1 "       0     # tran   from  4C799         70.00   (5) to (2)   4C799EQ1      34.50
 tran     39846  39852  "1 "       0     # tran   from  4C799         70.00   (5) to (2)   4C800EQ1      34.50
 tran     39846  39857  "1 "       0     # tran   from  4C799         70.00   (5) to (2)   4C805EQ1      34.50
 tran     39846  39862  "1 "       0     # tran   from  4C799         70.00   (5) to (2)   4C806EQ1      34.50
 line     39847  39848  "1 " 1     0     # line   from  4C799EQ1      34.50   (2) to (2)   4C799EQ2      34.50
 tran     39848  39849  "1 "       0     # tran   from  4C799EQ2      34.50   (2) to (1)   4C799          0.31
 line     39852  39853  "1 " 1     0     # line   from  4C800EQ1      34.50   (2) to (2)   4C800EQ2      34.50
 tran     39853  39854  "1 "       0     # tran   from  4C800EQ2      34.50   (2) to (1)   4C800          0.31
 line     39857  39858  "1 " 1     0     # line   from  4C805EQ1      34.50   (2) to (2)   4C805EQ2      34.50
 tran     39858  39859  "1 "       0     # tran   from  4C805EQ2      34.50   (2) to (1)   4C805          0.31
 line     39862  39863  "1 " 1     0     # line   from  4C806EQ1      34.50   (2) to (2)   4C806EQ2      34.50
 tran     39863  39864  "1 "       0     # tran   from  4C806EQ2      34.50   (2) to (1)   4C806          0.31
#-#-# gen      39849  "F "    0              # gen          4C799          0.31  GEN ==20.00(1.92)
#-#-# gen      39854  "F "    0              # gen          4C800          0.31  GEN ==20.00(3.23)
#-#-# gen      39859  "F "    0              # gen          4C805          0.31  GEN ==20.00(2.50)
#-#-# gen      39864  "F "    0              # gen          4C806          0.31  GEN ==20.00(3.63)
0

CATB-1417-B2 "Helm-Kerman 70 kV Line"
 line     34473  34472  "1 " 1     0     # line   from  SNJQTP        70.00   (3) to BRKR  SAN JOQN      70.00
 line     34473  34477  "1 " 1     0     # line   from  SNJQTP        70.00   (3) to (3)   S529ATP       70.00
 line     34473  34474  "1 " 1     0     # line   from  SNJQTP        70.00   (3) to BRKR  HELM          70.00
 line     34477  34475  "1 " 1     0     # line   from  S529ATP       70.00   (3) to (3)   AGRCJCT       70.00
 line     34477  34479  "1 " 1     0     # line   from  S529ATP       70.00   (3) to (2)   S529A         70.00
 line     34475  34476  "1 " 1     0     # line   from  AGRCJCT       70.00   (3) to (2)   AGRICO        70.00
 line     34475  34484  "1 " 1     0     # line   from  AGRCJCT       70.00   (3) to BRKR  KERMAN1       70.00
 tran     34476  34608  "1 "       0     # tran   from  AGRICO        70.00   (2) to (1)   AGRICO        13.80
 tran     34479  34668  "1 "       0     # tran   from  S529A         70.00   (2) to (3)   S529A         12.00
 tran     34668  34669  "1 "       0     # tran   from  S529A         12.00   (3) to (1)   S529A          4.16
 tran     34668  34670  "1 "       0     # tran   from  S529A         12.00   (3) to (1)   S529A          0.48
#-#-# load     34472  "1 "    0              # load         SAN JOQN       70.00  LOAD==7.56(1.07)
#-#-# load     34472  "2 "    0              # load         SAN JOQN       70.00  LOAD==4.26(0.61)
#-#-# load     34472  "E1"    0              # load         SAN JOQN       70.00  LOAD==-0.07(0.00)
#-#-# load     34472  "E2"    0              # load         SAN JOQN       70.00  LOAD==-0.05(0.00)
#-#-# load     34484  "1 "    0              # load         KERMAN1        70.00  LOAD==25.93(3.70)
#-#-# load     34484  "E1"    0              # load         KERMAN1        70.00  LOAD==-0.21(0.00)
#-#-# load     34608  "SG"    0              # load         AGRICO         13.80  LOAD==1.01(0.23)
#-#-# load     34669  "SS"    0              # load         S529A           4.16  LOAD==0.10(0.06)
#-#-# gen      34608  "2 "    0              # gen          AGRICO         13.80  GEN ==7.70(7.00)
```

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#-#-# gen      34608  "3 "    0              # gen          AGRICO        13.80  GEN ==18.90(10.85)
#-#-# gen      34608  "4 "    0              # gen          AGRICO        13.80  GEN ==42.80(10.85)
#-#-# gen      34669  "E1"    0              # gen          S529A          4.16  GEN ==6.60(1.53)
#-#-# gen      34670  "E2"    0              # gen          S529A          0.48  GEN ==8.00(3.87)
  line     34471  34472  "1 " 1     1     # Switches in San Joaquin CB22 to transfer load
  #-#-# load     34472  "1 "    1              # Restore Load 1 at San Joaquin
  #-#-# load     34472  "2 "    1              # Restore Load 2 at San Joaquin
  #-#-# load     34472  "E1 "    1             # Restore Load E1 at San Joaquin
  #-#-# load     34472  "E2 "    1             # Restore Load E2 at San Joaquin
0

CATB-1418-B2 "Helm-Stroud Sw Station 70 kV Line"
 line     34474  34556  "1 " 1     0     # line   from  HELM          70.00  BRKR to BRKR  STRD JCT      70.00
0

CATB-1419-B2 "Tivy Valley-Reedley 70 kV Line"
 line     34478  34492  "1 " 1     0     # line   from  TVY VLLY      70.00  BRKR to BRKR  REEDLEY       70.00
#-#-# load     34478  "1 "    0              # load         TVY VLLY      70.00  LOAD==8.08(1.15)
#-#-# load     34478  "E1"    0              # load         TVY VLLY      70.00  LOAD==-0.07(0.00)
0

CATB-1420-B2 "Kearney-Kerman 70 kV Line"
 line     34480  34481  "1 " 1     0     # line   from  KEARNEY       70.00  BRKR to (4)   FRWWTAP       70.00
 line     34481  34483  "1 " 1     0     # line   from  FRWWTAP       70.00   (4) to (3)   FRESNOWW      70.00
 line     34481  34483  "2 " 1     0     # line   from  FRWWTAP       70.00   (4) to (3)   FRESNOWW      70.00
 line     34481  34486  "1 " 1     0     # line   from  FRWWTAP       70.00   (4) to BRKR  KERMAN2       70.00
 tran     34483  34485  "1 "       0     # tran   from  FRESNOWW      70.00   (3) to (1)   FRESNOWW      12.47
#-#-# load     34486  "2 "    0              # load         KERMAN2       70.00  LOAD==19.87(2.83)
#-#-# load     34486  "E2"    0              # load         KERMAN2       70.00  LOAD==-0.09(0.00)
#-#-# load     34485  "SG"    0              # load         FRESNOWW      12.47  LOAD==6.71(1.77)
#-#-# gen      34485  "1 "    0              # gen          FRESNOWW      12.47  GEN ==4.00(0.00)
#-#-# gen      34485  "2 "    0              # gen          FRESNOWW      12.47  GEN ==4.00(0.00)
#-#-# gen      34485  "3 "    0              # gen          FRESNOWW      12.47  GEN ==1.00(0.00)
0

CATB-1421-B2 "Kearney-Caruthers 70 kV Line"
 line     34480  34512  "1 " 1     0     # line   from  KEARNEY       70.00  BRKR to BRKR  CARUTHRS      70.00
#-#-# load     34512  "1 "    0              # load         CARUTHRS      70.00  LOAD==11.28(1.61)
#-#-# load     34512  "2 "    0              # load         CARUTHRS      70.00  LOAD==18.09(2.58)
#-#-# load     34512  "E1"    0              # load         CARUTHRS      70.00  LOAD==-0.17(0.00)
0

CATB-1422-B2 "Reedley-Dinuba 70 kV Line"
 line     34492  34497  "1 " 1     0     # line   from  REEDLEY       70.00  BRKR to (3)   DNUBAJCT      70.00
 line     34497  34499  "1 " 1     0     # line   from  DNUBAJCT      70.00   (3) to (2)   DNUBAEGY      70.00
 line     34497  34500  "1 " 1     0     # line   from  DNUBAJCT      70.00   (3) to BRKR  DINUBA        70.00
 tran     34499  34648  "1 "       0     # tran   from  DNUBAEGY      70.00   (2) to (1)   DINUBA E      13.80
#-#-# load     34648  "ss"    0              # load         DINUBA E      13.80  LOAD==0.45(0.39)
#-#-# gen      34648  "1 "    0              # gen          DINUBA E      13.80  GEN ==9.87(6.93)
0

CATB-1423-B2 "Reedley-Orosi 70 kV Line"
 line     34492  34526  "1 " 1     0     # line   from  REEDLEY       70.00  BRKR to (3)   ORSI JCT      70.00
 line     34526  34495  "1 " 1     0     # line   from  ORSI JCT      70.00   (3) to (2)   SANDCRK       70.00
 line     34526  34502  "1 " 1     0     # line   from  ORSI JCT      70.00   (3) to BRKR  OROSI         70.00
 line     34495  34494  "1 " 1     0     # line   from  SANDCRK       70.00   (2) to (1)   DUNLAP        70.00
#-#-# load     34495  "1 "    0              # load         SANDCRK       70.00  LOAD==4.03(0.57)
#-#-# load     34495  "E1"    0              # load         SANDCRK       70.00  LOAD==-0.04(0.00)
#-#-# load     34494  "1 "    0              # load         DUNLAP        70.00  LOAD==3.63(0.52)
#-#-# load     34494  "E1"    0              # load         DUNLAP        70.00  LOAD==-0.04(0.00)
0

CATB-1424-B2 "Dinuba-Orosi 70 kV Line"
 line     34496  34498  "1 " 1     0     # line   from  STCRRL J      70.00   (3) to (1)   STONCRRL      70.00
 line     34496  34500  "1 " 1     0     # line   from  STCRRL J      70.00   (3) to BRKR  DINUBA        70.00
 line     34496  34502  "1 " 1     0     # line   from  STCRRL J      70.00   (3) to (2)   OROSI         70.00
 line     34502  34526  "1 " 1     0     # line   from  OROSI          70.00  BRKR to (1)   ORSI JCT      70.00
#-#-# load     34498  "2 "    0              # load         STONCRRL      70.00  LOAD==3.49(0.49)
#-#-# load     34498  "3 "    0              # load         STONCRRL      70.00  LOAD==3.40(0.48)
#-#-# load     34498  "E2"    0              # load         STONCRRL      70.00  LOAD==-0.03(0.00)
#-#-# load     34498  "E3"    0              # load         STONCRRL      70.00  LOAD==-0.03(0.00)
#-#-# load     34502  "1 "    0              # load         OROSI         70.00  LOAD==10.38(1.48)
#-#-# load     34502  "2 "    0              # load         OROSI         70.00  LOAD==7.34(1.05)
#-#-# load     34502  "E1"    0              # load         OROSI         70.00  LOAD==-0.09(0.00)
#-#-# load     34502  "E2"    0              # load         OROSI         70.00  LOAD==-0.07(0.00)
```

```
0

CATB-1425-B2 "Henrietta-Lemoore NAS 70 kV Line"
 line     34514  34540  "1 " 1     0     # line   from  LEMORNAS      70.00   (1) to BRKR  HENRITTA      70.00
#-#-# load     34514  "1 "    0              # load         LEMORNAS      70.00  LOAD==22.00(13.63)
#-#-# load     34514  "E1"    0              # load         LEMORNAS      70.00  LOAD==-0.27(0.00)
0

CATB-1426-B2 "Henrietta-Lemoore 70 kV Line"
 line     34516  34520  "1 " 1     0     # line   from  LEPRINO       70.00   (1) to (4)   LPRNO TP      70.00
 line     34520  34518  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to BRKR  LEMOORE       70.00
 line     34520  34524  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to (1)   CANDLEWK      70.00
 line     34520  34540  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to BRKR  HENRITTA      70.00
#-#-# load     34516  "1 "    0              # load         LEPRINO       70.00  LOAD==7.11(4.31)
#-#-# load     34516  "E1"    0              # load         LEPRINO       70.00  LOAD==-0.08(0.00)
#-#-# load     34518  "1 "    0              # load         LEMOORE       70.00  LOAD==19.53(2.78)
#-#-# load     34518  "2 "    0              # load         LEMOORE       70.00  LOAD==28.18(4.02)
#-#-# load     34518  "E1"    0              # load         LEMOORE       70.00  LOAD==-0.22(0.00)
#-#-# load     34518  "E2"    0              # load         LEMOORE       70.00  LOAD==-0.25(0.00)
0

CATB-1427-B2 "Leprino Jct SS-GWF 115 kV Line"
 line     34519  34429  "1 " 1     0     # line   from  LPRN JCT     115.00  BRKR to BRKR  GWF_HEP      115.00
0

CATB-1428-B2 "Corcoran-Angiola 70 kV Line"
 line     34528  34530  "1 " 1     0     # line   from  CORCORAN      70.00  BRKR to (3)   BSWLL TP      70.00
 line     34530  34531  "1 " 1     0     # line   from  BSWLL TP      70.00   (3) to (3)   JGBSWLL       70.00
 line     34530  34538  "1 " 1     0     # line   from  BSWLL TP      70.00   (3) to (1)   BOSWELL       70.00
 line     34531  34536  "1 " 1     0     # line   from  JGBSWLL       70.00   (3) to (1)   ANGIOLA       70.00
#-#-# load     34538  "1 "    0              # load         BOSWELL       70.00  LOAD==3.94(2.45)
#-#-# load     34538  "E1"    0              # load         BOSWELL       70.00  LOAD==-0.03(0.00)
#-#-# load     34536  "1 "    0              # load         ANGIOLA       70.00  LOAD==15.07(2.15)
#-#-# load     34536  "E1"    0              # load         ANGIOLA       70.00  LOAD==-0.11(0.00)
0

CATB-1429-B2 "Armstrong 70 kV Tap"
 line     34532  34554  "1 " 1     0     # line   from  ARMSTRNG      70.00   (1) to (3)   AMSTG SW      70.00
 line     34554  34462  "1 " 1     0     # line   from  AMSTG SW      70.00  BRKR to (1)   GUR3TPT       70.00
 line     34554  34534  "1 " 1     0     # line   from  AMSTG SW      70.00   (3) to (1)   RESERVE       70.00
#-#-# load     34534  "1 "    0              # load         RESERVE       70.00  LOAD==1.92(0.28)
#-#-# load     34534  "E1"    0              # load         RESERVE       70.00  LOAD==-0.03(0.00)
0

CATB-1430-B2 "Henrietta-GWF Henrietta 70 kV Line"
 line     34537  34540  "1 " 1     0     # line   from  GWF_HENR      70.00   (4) to BRKR  HENRITTA      70.00
 tran     34537  34539  "1 "       0     # tran   from  GWF_HENR      70.00   (4) to (1)   GWF_GT1       13.80
 tran     34537  34541  "1 "       0     # tran   from  GWF_HENR      70.00   (4) to (1)   GWF_GT2       13.80
 tran     34537  34692  "1 "       0     # tran   from  GWF_HENR      70.00   (4) to (1)   T272PV        34.50
#-#-# load     34539  "ss"    0              # load         GWF_GT1       13.80  LOAD==1.01(0.65)
#-#-# load     34541  "ss"    0              # load         GWF_GT2       13.80  LOAD==1.01(0.67)
#-#-# gen      34539  "1 "    0              # gen          GWF_GT1       13.80  GEN ==45.33(14.67)
#-#-# gen      34541  "1 "    0              # gen          GWF_GT2       13.80  GEN ==45.23(14.68)
#-#-# gen      34692  "1 "    0              # gen          T272PV        34.50  GEN ==123.00(0.00)
0

CATB-1431-B2 "Henrietta-S626SS 70 kV Line"
 line     34540  34457  "1 " 1     0     # line   from  HENRITTA      70.00  BRKR to BRKR  S626SS        70.00
0

CATB-1432-B2 "Henrietta-S650ABSS 70 kV Line"
 line     34540  39217  "1 " 1     0     # line   from  HENRITTA      70.00  BRKR to BRKR  S650ABS       70.00
0

CATB-1433-B2 "Jacobs Corner-S372 70 kV Line"
 line     34543  34542  "1 " 1     0     # line   from  S372          70.00  BRKR to BRKR  JCBSCRNR      70.00
0

CATB-1434-B2 "S372-S470 70 kV Line"
 line     34545  34543  "1 " 1     0     # line   from  S470          70.00  BRKR to BRKR  S372          70.00
0

CATB-1435-B2 "S372-S471 70 kV Line"
 line     34547  34543  "1 " 1     0     # line   from  S471          70.00  BRKR to BRKR  S372          70.00
0
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CATB-1436-B2 "Gates-Huron 70 kV Line"
 line     34552  34558  "1 " 1     0     # line   from  GATES         70.00  BRKR to BRKR  HURON         70.00
0

CATB-1437-B2 "S532SS-Huron-Gates 70 kV Line"
 line     34552  34559  "2 " 1     0     # line   from  GATES         70.00  BRKR to (3)   HURONJ        70.00
 line     34559  34558  "1 " 1     0     # line   from  HURONJ        70.00   (3) to BRKR  HURON         70.00
 line     34559  34560  "1 " 1     0     # line   from  HURONJ        70.00   (3) to (2)   CALFLAX       70.00
 line     34560  34567  "1 " 1     0     # line   from  CALFLAX       70.00   (2) to BRKR  S532SS        70.00
#-#-# load     34560  "1 "    0              # load         CALFLAX       70.00  LOAD==8.21(1.17)
#-#-# load     34560  "E1"    0              # load         CALFLAX       70.00  LOAD==-0.11(0.00)
0

CATB-1438-B2 "Gates-S633SS 70 kV Line"
 line     34552  39000  "1 " 1     0     # line   from  GATES         70.00  BRKR to BRKR  S633SS        70.00
0

CATB-1439-B2 "Stroud-Stroud Sw Station 70 kV Line"
 line     34556  34564  "1 " 1     0     # line   from  STRD JCT      70.00  BRKR to BRKR  STROUD        70.00
0

CATB-1440-B2 "Schindler-Coalinga2 70 kV Line"
 line     34561  34563  "1 " 1     0     # line   from  S526TP        70.00   (3) to (2)   S526          70.00
 line     34561  34562  "1 " 1     0     # line   from  S526TP        70.00   (3) to BRKR  SCHLNDLR      70.00
 line     34561  39059  "1 " 1     0     # line   from  S526TP        70.00   (3) to BRKR  3C643JSS      70.00
 tran     34563  34659  "1 "       0     # tran   from  S526          70.00   (2) to (1)   S526          33.00
#-#-# gen      34659  "E "    0              # gen          S526          33.00  GEN ==20.00(-1.36)
0

CATB-1441-B2 "Schindler-S532SS 70 kV Line"
 line     34562  34567  "1 " 1     0     # line   from  SCHLNDLR      70.00  BRKR to BRKR  S532SS        70.00
0

CATB-1442-B2 "3C643JSS-Coalinga2 70 kV Line"
 line     34566  34570  "1 " 1     0     # line   from  PLSNTVLY      70.00   (2) to BRKR  COLNGA 2      70.00
 line     34566  39059  "1 " 1     0     # line   from  PLSNTVLY      70.00   (2) to BRKR  3C643JSS      70.00
#-#-# load     34566  "1 "    0              # load         PLSNTVLY      70.00  LOAD==13.70(3.43)
#-#-# load     34566  "E1"    0              # load         PLSNTVLY      70.00  LOAD==-0.17(0.00)
0

CATB-1443-B2 "S532 70 kV gen tie line"
 line     34567  34568  "1 " 1     0     # line   from  S532SS        70.00  BRKR to (2)   S532          70.00
 tran     34568  34660  "1 "       0     # tran   from  S532          70.00   (2) to (1)   S532          13.80
#-#-# gen      34660  "E "    0              # gen          S532          13.80  GEN ==20.00(1.37)
0

CATB-1444-B2 "S633SS-Coalinga1 70 kV Line"
 line     34574  39005  "1 " 1     0     # line   from  COLNGA 1      70.00  BRKR to (3)   S638TP        70.00
 line     39005  34578  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   JACALITO      70.00
 line     39005  39006  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   S638          70.00
 line     34578  39000  "1 " 1     0     # line   from  JACALITO      70.00   (2) to BRKR  S633SS        70.00
 tran     39006  39007  "1 "       0     # tran   from  S638          70.00   (2) to (2)   S638          12.50
 tran     39007  39008  "1 "       0     # tran   from  S638          12.50   (2) to (1)   S638           0.48
#-#-# load     34578  "1 "    0              # load         JACALITO      70.00  LOAD==3.63(2.51)
#-#-# load     34578  "E1"    0              # load         JACALITO      70.00  LOAD==-0.05(0.00)
#-#-# gen      39008  "E "    0              # gen          S638           0.48  GEN ==10.00(3.44)
0

CATB-1445-B2 "Kerckhoff-E2 #1 115 kV Line"
 line     34998  34358  "1 " 1     0     # line   from  E2          115.00  BRKR to BRKR  KERCKHF2     115.00
0

CATB-1446-B2 "Kerckhoff-E2 #2 115 kV Line"
 line     34998  34358  "2 " 1     0     # line   from  E2          115.00  BRKR to BRKR  KERCKHF2     115.00
0

CATB-1447-B2 "Coalinga1-San Miguel 70 kV Line"
 line     36354  34574  "1 " 1     0     # line   from  SAN MIGL      70.00  BRKR to BRKR  COLNGA 1      70.00
0

CATB-1448-B2 "S633 70 kV gen tie line"
 line     39000  39001  "1 " 1     0     # line   from  S633SS        70.00  BRKR to (2)   S633          70.00
 tran     39001  39002  "1 "       0     # tran   from  S633          70.00   (2) to (2)   S633C1        34.50
 line     39002  39003  "1 " 1     0     # line   from  S633C1        34.50   (2) to (2)   S633C2        34.50
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 tran     39003  39004  "1 "       0     # tran   from  S633C2        34.50   (2) to (1)   S633           0.48
#-#-# gen      39004  "E "    0              # gen          S633           0.48  GEN ==18.00(3.39)
0

CATB-1449-B2 "S632B-Stroud Sw Sta 70 kV Line"
 line     39013  34556  "1 " 1     0     # line   from  S632B         70.00   (2) to BRKR  STRD JCT      70.00
 tran     39013  39014  "1 "       0     # tran   from  S632B         70.00   (2) to (1)   S632B         34.50
#-#-# gen      39014  "FT"    0              # gen          S632B         34.50  GEN ==20.00(4.32)
0

CATB-1450-B2 "S632C-Stroud Sw Sta 70 kV Line"
 line     39016  34556  "1 " 1     0     # line   from  S632C         70.00   (2) to BRKR  STRD JCT      70.00
0

CATB-1451-B2 "3C643J 70 kV gen tie line"
 line     39060  39059  "1 " 1     0     # line   from  3C643J        70.00  BRKR to BRKR  3C643JSS      70.00
0

CATB-1452-B2 "S613-Helm 70 kV Line"
 line     39097  34474  "1 " 1     0     # line   from  S613          70.00   (2) to BRKR  HELM          70.00
 tran     39097  39098  "1 "       0     # tran   from  S613          70.00   (2) to (1)   S613          13.80
#-#-# gen      39098  "E "    0              # gen          S613          13.80  GEN ==20.00(9.69)
0

CATB-1453-B2 "3C643W 230 kV gen tie line"
 line     39123  39122  "1 " 1     0     # line   from  3C643W       230.00  BRKR to BRKR  3C643WS2     230.00
0

CATB-1454-B2 "2C581-Leprino Jct SS 115 kV Line"
 line     39153  34519  "1 " 1     0     # line   from  2C581        115.00   (2) to BRKR  LPRN JCT     115.00
 tran     39153  34678  "1 "       0     # tran   from  2C581        115.00   (2) to (2)   2C581         34.50
 tran     34678  34679  "1 "       0     # tran   from  2C581         34.50   (2) to (1)   2C581          0.34
#-#-# load     34679  "SS"    0              # load         2C581          0.34  LOAD==0.55(0.30)
#-#-# gen      34679  "F "    0              # gen          2C581          0.34  GEN ==101.70(7.60)
0

CATB-1455-B2 "S650ABSS-S650AB 70 kV gen tie line"
 line     39217  39218  "1 " 1     0     # line   from  S650ABS       70.00  BRKR to (2)   S650AB        70.00
 tran     39218  39219  "1 "       0     # tran   from  S650AB        70.00   (2) to (2)   S650AB        12.47
 tran     39219  39220  "1 "       0     # tran   from  S650AB        12.47   (2) to (1)   S650AB         0.80
#-#-# gen      39220  "ET"    0              # gen          S650AB         0.80  GEN ==20.00(2.48)
0

CATB-1456-B2 "4C809-Stroud Sw Sta 70 kV Line"
 line     39582  34556  "1 " 1     0     # line   from  4C809         70.00   (5) to BRKR  STRD JCT      70.00
 tran     39582  39583  "1 "       0     # tran   from  4C809         70.00   (5) to (2)   4C809EQ1      34.50
 tran     39582  39586  "1 "       0     # tran   from  4C809         70.00   (5) to (2)   4C814EQ1      34.50
 tran     39582  39589  "1 "       0     # tran   from  4C809         70.00   (5) to (2)   4C815EQ1      34.50
 tran     39582  39592  "1 "       0     # tran   from  4C809         70.00   (5) to (2)   4C816EQ1      34.50
 line     39583  39584  "1 " 1     0     # line   from  4C809EQ1      34.50   (2) to (2)   4C809EQ2      34.50
 tran     39584  39585  "1 "       0     # tran   from  4C809EQ2      34.50   (2) to (1)   4C809          0.31
 line     39586  39587  "1 " 1     0     # line   from  4C814EQ1      34.50   (2) to (2)   4C814EQ2      34.50
 tran     39587  39588  "1 "       0     # tran   from  4C814EQ2      34.50   (2) to (1)   4C814          0.31
 line     39589  39590  "1 " 1     0     # line   from  4C815EQ1      34.50   (2) to (2)   4C815EQ2      34.50
 tran     39590  39591  "1 "       0     # tran   from  4C815EQ2      34.50   (2) to (1)   4C815          0.31
 line     39592  39593  "1 " 1     0     # line   from  4C816EQ1      34.50   (2) to (2)   4C816EQ2      34.50
 tran     39593  39594  "1 "       0     # tran   from  4C816EQ2      34.50   (2) to (1)   4C816          0.31
#-#-# load     39584  "SS"    0              # load         4C809EQ2      34.50  LOAD==1.44(0.79)
#-#-# gen      39585  "F "    0              # gen          4C809          0.31  GEN ==42.50(8.46)
#-#-# gen      39588  "F "    0              # gen          4C814          0.31  GEN ==20.00(3.86)
#-#-# gen      39591  "F "    0              # gen          4C815          0.31  GEN ==20.00(3.86)
#-#-# gen      39594  "F "    0              # gen          4C816          0.31  GEN ==20.00(3.86)
0

CATB-1457-B2 "6C0954 230 kV gen tie line"
 line     39271  30900  "1 " 1     0     # line   from  6C0954       230.00  BRKR to BRKR  GATES        230.00
0

CATB-1458-B2 "6C0965 115 kV gen tie line"
 line     39284  34519  "1 " 1     0     # line   from  6C0965       115.00  BRKR to BRKR  LPRN JCT     115.00
0

CATB-1459-B2 "6C0974 230 kV gen tie line"
 line     39296  39295  "1 " 1     0     # line   from  6C0974       230.00  BRKR to BRKR  6C0974SS     230.00
0
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CATB-1460-B2 "6C1001 115 kV gen tie line"
 line     39340  34519  "1 " 1     0     # line   from  6C1001       115.00  BRKR to BRKR  LPRN JCT     115.00
0

CATB-1461-B3 "Kearney 230/70 kV Transformer Bank 4"
 tran     30830  34480  "4 "       0     # tran   from  KEARNEY      230.00  BRKR to BRKR  KEARNEY       70.00
0

CATB-1462-B3 "Herndon 230/115 kV Transformer Bank 1"
 tran     30835  34412  "1 "       0     # tran   from  HERNDON      230.00  BRKR to (1)   HERNDON      115.00
0

CATB-1463-B3 "Herndon 230/115 kV Transformer Bank 2"
 tran     30835  34412  "2 "       0     # tran   from  HERNDON      230.00  BRKR to (1)   HERNDON      115.00
0

CATB-1464-B3 "McCall 230/115 kV Transformer Bank 1"
 tran     30875  34370  "1 "       0     # tran   from  MC CALL      230.00  BRKR to (1)   MC CALL      115.00
0

CATB-1465-B3 "McCall 230/115 kV Transformer Bank 2"
 tran     30875  34370  "2 "       0     # tran   from  MC CALL      230.00  BRKR to (1)   MC CALL      115.00
0

CATB-1466-B3 "McCall 230/115 kV Transformer Bank 3"
 tran     30875  34370  "3 "       0     # tran   from  MC CALL      230.00  BRKR to (1)   MC CALL      115.00
0

CATB-1467-B3 "Gates 500/230 kV Transformer Bank 11"
 tran     30900  30055  "11"       0     # tran   from  GATES        230.00  BRKR to (1)   GATES        500.00
0

CATB-1468-B3 "Gates 500/230 kV Transformer Bank 12"
 tran     30900  30055  "12"       0     # tran   from  GATES        230.00  BRKR to (1)   GATES        500.00
0

CATB-1469-B3 "Gates 230/115 kV Transformer Bank 1"
 tran     30900  30901  "1 "       0     # tran   from  GATES        230.00  BRKR to (3)   GATES 1M     230.00
 tran     30901  34378  "1 "       0     # tran   from  GATES 1M     230.00   (3) to BRKR  GATES        115.00
 tran     30901  34622  "1 "       0     # tran   from  GATES 1M     230.00   (3) to (1)   GATES 1T      13.20
#-#-# load     34378  "3 "    0              # load         GATES        115.00  LOAD==15.85(2.26)
#-#-# load     34378  "E3"    0              # load         GATES        115.00  LOAD==-0.13(0.00)
0

CATB-1470-B3 "Bullard 115 kV Load Bank 1"
 tran     34211  34416  "1 "       0     # tran   from  BULLD 21      21.60   (1) to BRKR  BULLARD      115.00
#-#-# load     34211  "1 "    0              # load         BULLD 21      21.60  LOAD==40.05(5.70)
#-#-# load     34211  "E1"    0              # load         BULLD 21      21.60  LOAD==-0.36(0.00)
0

CATB-1471-B3 "Bullard 115 kV Load Banks 2 and 3"
 tran     34213  34416  "2 "       0     # tran   from  BULLD 12      12.47   (2) to BRKR  BULLARD      115.00
 tran     34213  34416  "3 "       0     # tran   from  BULLD 12      12.47   (2) to BRKR  BULLARD      115.00
#-#-# load     34213  "2 "    0              # load         BULLD 12      12.47  LOAD==38.36(5.47)
#-#-# load     34213  "3 "    0              # load         BULLD 12      12.47  LOAD==40.73(5.80)
#-#-# load     34213  "E2"    0              # load         BULLD 12      12.47  LOAD==-0.41(0.00)
#-#-# load     34213  "E3"    0              # load         BULLD 12      12.47  LOAD==-0.36(0.00)
#-#-# svd      34213  "v "    0              # svd          BULLD 12      12.47
0

CATB-1472-B3 "McCall 115 kV Load Bank 4"
 tran     34219  34370  "4 "       0     # tran   from  MCCALL 4      12.47   (1) to BRKR  MC CALL      115.00
#-#-# load     34219  "4 "    0              # load         MCCALL 4      12.47  LOAD==27.32(3.90)
#-#-# load     34219  "E4"    0              # load         MCCALL 4      12.47  LOAD==-0.19(0.00)
#-#-# gen      34219  "QF"    0              # gen          MCCALL 4      12.47  GEN ==2.50(0.32)
0

CATB-1473-B3 "McCall 115 kV Load Bank 5"
 tran     34221  34370  "5 "       0     # tran   from  MCCALL 5      12.47   (1) to BRKR  MC CALL      115.00
#-#-# load     34221  "5 "    0              # load         MCCALL 5      12.47  LOAD==28.31(4.03)
#-#-# load     34221  "E5"    0              # load         MCCALL 5      12.47  LOAD==-0.29(0.00)
0

CATB-1474-B3 "Kerkchoff 115/6.6 kV GSU 1"
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 tran     34356  34344  "1 "       0     # tran   from  KERCKHF1     115.00  BRKR to (1)   KERCKHOF       6.60
#-#-# load     34344  "4 "    0              # load         KERCKHOF       6.60  LOAD==2.95(0.42)
#-#-# load     34344  "E4"    0              # load         KERCKHOF       6.60  LOAD==-0.03(0.00)
#-#-# gen      34344  "1 "    0              # gen          KERCKHOF       6.60  GEN ==13.00(-2.00)
#-#-# gen      34344  "2 "    0              # gen          KERCKHOF       6.60  GEN ==13.00(-2.00)
#-#-# gen      34344  "3 "    0              # gen          KERCKHOF       6.60  GEN ==13.00(-2.00)
0

CATB-1475-B3 "Herndon 230/115 kV Transformer Bank 3"
 tran     34412  30835  "3 "       0     # tran   from  HERNDON      115.00  BRKR to BRKR  HERNDON      230.00
0

CATB-1476-B3 "Kingsburg 115/70 kV Transformer Bank 2 "
 tran     34418  34576  "2 "       0     # tran   from  KINGSBRG     115.00  BRKR to BRKR  KNGLOBUS      70.00
0

CATB-1477-B3 "Henrietta 230/115 kV Transformer Bank 3"
 tran     34430  30881  "3 "       0     # tran   from  HENRETTA     115.00  BRKR to BRKR  HENRIETA     230.00
0

CATB-1478-B3 "Helm 230/70 kV Transformer Bank 1"
 tran     34474  30873  "1 "       0     # tran   from  HELM          70.00  BRKR to BRKR  HELM         230.00
0

CATB-1479-B3 "Helm 230/70 kV Transformer Bank 2 w/ QC5P2-SPS01"
 tran     34474  30873  "2 "       0     # tran   from  HELM          70.00  BRKR to BRKR  HELM         230.00
#
 gen      39898  "F "    0              # gen          5C869          0.20  GEN ==23.00(-2.89)
0

CATB-1480-B3 "Helm 230/70 kV Transformer Bank 2 w/o QC5P2-SPS01"
 tran     34474  30873  "2 "       0     # tran   from  HELM          70.00  BRKR to BRKR  HELM         230.00
0

CATB-1481-B3 "Helm 230/70 kV Transformer Bank 3 w/ QC5P2-SPS01"
 tran     34474  30873  "3 "       0     # tran   from  HELM          70.00  BRKR to BRKR  HELM         230.00
#
 gen      39898  "F "    0              # gen          5C869          0.20  GEN ==23.00(-2.89)
0

CATB-1482-B3 "Helm 230/70 kV Transformer Bank 3 w/o QC5P2-SPS01"
 tran     34474  30873  "3 "       0     # tran   from  HELM          70.00  BRKR to BRKR  HELM         230.00
0

CATB-1483-B3 "Kearney 230/70 kV Transformer Bank 2"
 tran     34480  30830  "2 "       0     # tran   from  KEARNEY       70.00  BRKR to BRKR  KEARNEY      230.00
0

CATB-1484-B3 "Reedley 115/70 kV Transformer Bank 2"
 tran     34492  34380  "2 "       0     # tran   from  REEDLEY       70.00  BRKR to BRKR  REEDLEY      115.00
0

CATB-1485-B3 "Reedley 115/70 kV Transformer Bank 4"
 tran     34492  34380  "4 "       0     # tran   from  REEDLEY       70.00  BRKR to BRKR  REEDLEY      115.00
0

CATB-1486-B3 "Corcoran 115/70 kV Transformer Bank 1"
 tran     34528  34420  "1 "       0     # tran   from  CORCORAN      70.00  BRKR to BRKR  CORCORAN     115.00
0

CATB-1487-B3 "Henrietta 230/70 kV Transformer Bank 4"
 tran     34540  30881  "4 "       0     # tran   from  HENRITTA      70.00  BRKR to BRKR  HENRIETA     230.00
0

CATB-1488-B3 "Gates 230/70 kV Transformer Bank 5"
 tran     34552  30900  "5 "       0     # tran   from  GATES         70.00  BRKR to BRKR  GATES        230.00
0

CATB-1489-B3 "Schindler 115/70 kV Transformer Bank 1"
 tran     34562  34354  "1 "       0     # tran   from  SCHLNDLR      70.00  BRKR to BRKR  SCHINDLR     115.00
0

CATB-1490-B3 "E1-E2 230/115 kV Transformer Bank 1"
 tran     34998  34997  "1 "       0     # tran   from  E2           115.00  BRKR to BRKR  E1           230.00
0
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CATB-1491-B3 "E1-E2 230/115 kV Transformer Bank 2"
 tran     34998  34997  "2 "       0     # tran   from  E2           115.00  BRKR to BRKR  E1           230.00
0

CATB-1492-B1 "MCCALL 4      12.47 Unit ID QF"
 gen      34219  "QF"    0              # gen          MCCALL 4      12.47  GEN ==2.50(0.32)
0

CATB-1493-B1 "KERCKHOF      13.80 Unit ID 1"
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==153.90(56.00)
0

CATB-1494-B1 "KERCKHOF       6.60 Unit ID 1"
 gen      34344  "1 "    0              # gen          KERCKHOF       6.60  GEN ==13.00(-3.70)
0

CATB-1495-B1 "KERCKHOF       6.60 Unit ID 2"
 gen      34344  "2 "    0              # gen          KERCKHOF       6.60  GEN ==8.50(-4.00)
0

CATB-1496-B1 "KERCKHOF       6.60 Unit ID 3"
 gen      34344  "3 "    0              # gen          KERCKHOF       6.60  GEN ==12.80(-4.60)
0

CATB-1497-B1 "GWF_HEP1      13.80 Unit ID 1"
 gen      34431  "1 "    0              # gen          GWF_HEP1      13.80  GEN ==42.20(14.95)
0

CATB-1498-B1 "GWF_HEP2      13.80 Unit ID 1"
 gen      34433  "1 "    0              # gen          GWF_HEP2      13.80  GEN ==42.20(14.95)
0

CATB-1499-B1 "FRESNOWW      12.47 Unit ID 1"
 gen      34485  "1 "    0              # gen          FRESNOWW      12.47  GEN ==4.00(0.00)
0

CATB-1500-B1 "FRESNOWW      12.47 Unit ID 2"
 gen      34485  "2 "    0              # gen          FRESNOWW      12.47  GEN ==4.00(0.00)
0

CATB-1501-B1 "FRESNOWW      12.47 Unit ID 3"
 gen      34485  "3 "    0              # gen          FRESNOWW      12.47  GEN ==1.00(0.00)
0

CATB-1502-B1 "GWF_GT1       13.80 Unit ID 1"
 gen      34539  "1 "    0              # gen          GWF_GT1       13.80  GEN ==45.33(5.91)
0

CATB-1503-B1 "GWF_GT2       13.80 Unit ID 1"
 gen      34541  "1 "    0              # gen          GWF_GT2       13.80  GEN ==45.23(5.91)
0

CATB-1504-B1 "WHD_GAT2      13.80 Unit ID 1"
 gen      34553  "1 "    0              # gen          WHD_GAT2      13.80  GEN ==41.50(8.98)
0

CATB-1505-B1 "HELMS 1       18.00 Unit ID 1"
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1506-B1 "HELMS 2       18.00 Unit ID 1"
 gen      34602  "1 "    0              # gen          HELMS 2       18.00  GEN ==340.00(90.76)
0

CATB-1507-B1 "JGBSWLT       12.47 Unit ID ST"
 gen      34603  "ST"    0              # gen          JGBSWLT       12.47  GEN ==2.90(2.20)
0

CATB-1508-B1 "HELMS 3       18.00 Unit ID 1"
 gen      34604  "1 "    0              # gen          HELMS 3       18.00  GEN ==404.00(97.44)
0

CATB-1509-B1 "AGRICO        13.80 Unit ID 2"
 gen      34608  "2 "    0              # gen          AGRICO        13.80  GEN ==8.00(1.56)
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0

CATB-1510-B1 "AGRICO        13.80 Unit ID 3"
 gen      34608  "3 "    0              # gen          AGRICO        13.80  GEN ==8.00(1.56)
0

CATB-1511-B1 "AGRICO        13.80 Unit ID 4"
 gen      34608  "4 "    0              # gen          AGRICO        13.80  GEN ==50.50(1.56)
0

CATB-1512-B1 "HAAS          13.80 Unit ID 1"
 gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==68.15(3.02)
0

CATB-1513-B1 "HAAS          13.80 Unit ID 2"
 gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==68.15(3.02)
0

CATB-1514-B1 "BLCH 2-2      13.80 Unit ID 1"
 gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(1.73)
0

CATB-1515-B1 "BLCH 2-3      13.80 Unit ID 1"
 gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(2.71)
0

CATB-1516-B1 "KINGSRIV      13.80 Unit ID 1"
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1517-B1 "MCCALL1T      13.20 Unit ID 1"
 gen      34618  "1 "    0              # gen          MCCALL1T      13.20  GEN ==0.00(48.00)
0

CATB-1518-B1 "MCCALL3T      13.20 Unit ID 1"
 gen      34621  "1 "    0              # gen          MCCALL3T      13.20  GEN ==0.00(16.59)
0

CATB-1519-B1 "BALCH 1       13.20 Unit ID 1"
 gen      34624  "1 "    0              # gen          BALCH 1       13.20  GEN ==32.00(0.08)
0

CATB-1520-B1 "HERNDN1T      13.20 Unit ID 1"
 gen      34630  "1 "    0              # gen          HERNDN1T      13.20  GEN ==0.00(26.84)
0

CATB-1521-B1 "HERNDN2T      13.20 Unit ID 1"
 gen      34632  "1 "    0              # gen          HERNDN2T      13.20  GEN ==0.00(23.21)
0

CATB-1522-B1 "FRIANTDM       6.60 Unit ID 2"
 gen      34636  "2 "    0              # gen          FRIANTDM       6.60  GEN ==5.23(1.70)
0

CATB-1523-B1 "FRIANTDM       6.60 Unit ID 3"
 gen      34636  "3 "    0              # gen          FRIANTDM       6.60  GEN ==2.75(1.70)
0

CATB-1524-B1 "FRIANTDM       6.60 Unit ID 4"
 gen      34636  "4 "    0              # gen          FRIANTDM       6.60  GEN ==0.89(1.00)
0

CATB-1525-B1 "ULTR.PWR       9.11 Unit ID 1"
 gen      34640  "1 "    0              # gen          ULTR.PWR       9.11  GEN ==17.30(9.07)
0

CATB-1526-B1 "KINGSBUR       9.11 Unit ID 1"
 gen      34642  "1 "    0              # gen          KINGSBUR       9.11  GEN ==23.31(10.18)
0

CATB-1527-B1 "SANGERCO      13.80 Unit ID 1"
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1528-B1 "SANGERCO      13.80 Unit ID 2"
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 gen      34646  "2 "    0              # gen          SANGERCO      13.80  GEN ==8(0.00)
0

CATB-1529-B1 "DINUBA E      13.80 Unit ID 1"
 gen      34648  "1 "    0              # gen          DINUBA E      13.80  GEN ==9.87(7.00)
0

CATB-1530-B1 "CHV.COAL       9.11 Unit ID 1"
 gen      34652  "1 "    0              # gen          CHV.COAL       9.11  GEN ==7.69(3.01)
0

CATB-1531-B1 "CHV.COAL       9.11 Unit ID 2"
 gen      34652  "2 "    0              # gen          CHV.COAL       9.11  GEN ==1.62(3.01)
0

CATB-1532-B1 "COLNGAGN       9.11 Unit ID 1"
 gen      34654  "1 "    0              # gen          COLNGAGN       9.11  GEN ==35.57(3.51)
0

CATB-1533-B1 "KRCDPCT1      13.80 Unit ID 1"
 gen      34671  "1 "    0              # gen          KRCDPCT1      13.80  GEN ==48.00(-5.22)
0

CATB-1534-B1 "KRCDPCT2      13.80 Unit ID 1"
 gen      34672  "1 "    0              # gen          KRCDPCT2      13.80  GEN ==48.00(-5.22)
0

CATB-1535-B1 "PINE FLT      13.80 Unit ID 1"
 gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==33.12(1.36)
0

CATB-1536-B1 "PINE FLT      13.80 Unit ID 2"
 gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==33.12(1.36)
0

CATB-1537-B1 "PINE FLT      13.80 Unit ID 3"
 gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==33.12(1.36)
0

CATB-1538-B1 "T254CT1       18.00 Unit ID F1"
 gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
0

CATB-1539-B1 "T254CT2       18.00 Unit ID F2"
 gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
0

CATB-1540-B1 "T254ST1       18.00 Unit ID F3"
 gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
0

CATB-1541-B1 "T272PV        34.50 Unit ID 1"
 gen      34692  "1 "    0              # gen          T272PV        34.50  GEN ==123.00(0.00)
0

CATB-1542-B1 "S372          34.50 Unit ID E"
 gen      34673  "E "    0              # gen          S372          34.50  GEN ==20.50(0.14)
0

CATB-1543-B1 "S470          34.50 Unit ID E"
 gen      34674  "E "    0              # gen          S470          34.50  GEN ==20.50(0.10)
0

CATB-1544-B1 "S471          34.50 Unit ID E"
 gen      34675  "E "    0              # gen          S471          34.50  GEN ==20.50(0.06)
0

CATB-1545-B1 "S526          33.00 Unit ID E"
 gen      34659  "E "    0              # gen          S526          33.00  GEN ==20.00(-1.36)
0

CATB-1546-B1 "S529          21.00 Unit ID E"
 gen      34697  "E "    0              # gen          S529          21.00  GEN ==20.00(0.09)
0
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CATB-1547-B1 "S529A          4.16 Unit ID E1"
 gen      34669  "E1"    0              # gen          S529A          4.16  GEN ==6.60(1.53)
0

CATB-1548-B1 "S529A          0.48 Unit ID E2"
 gen      34670  "E2"    0              # gen          S529A          0.48  GEN ==8.00(3.87)
0

CATB-1549-B1 "S532          13.80 Unit ID E"
 gen      34660  "E "    0              # gen          S532          13.80  GEN ==20.00(1.37)
0

CATB-1550-B1 "S625          34.50 Unit ID E"
 gen      34627  "E "    0              # gen          S625          34.50  GEN ==20.00(1.37)
0

CATB-1551-B1 "S626          34.50 Unit ID E"
 gen      34628  "E "    0              # gen          S626          34.50  GEN ==20.00(3.84)
0

CATB-1552-B1 "S631          12.47 Unit ID E"
 gen      34629  "E "    0              # gen          S631          12.47  GEN ==20.00(3.80)
0

CATB-1553-B1 "S634          12.47 Unit ID E"
 gen      34617  "E "    0              # gen          S634          12.47  GEN ==20.00(2.61)
0

CATB-1554-B1 "S636          12.47 Unit ID F"
 gen      34680  "F "    0              # gen          S636          12.47  GEN ==20.00(3.70)
0

CATB-1555-B1 "S637          12.47 Unit ID E"
 gen      34666  "E "    0              # gen          S637          12.47  GEN ==20.00(3.55)
0

CATB-1556-B1 "S542          13.80 Unit ID E"
 gen      34699  "E "    0              # gen          S542          13.80  GEN ==20.00(-0.68)
0

CATB-1557-B1 "S613          13.80 Unit ID E"
 gen      39098  "E "    0              # gen          S613          13.80  GEN ==20.00(9.69)
0

CATB-1558-B1 "S632B         34.50 Unit ID FT"
 gen      39014  "FT"    0              # gen          S632B         34.50  GEN ==20.00(4.32)
0

CATB-1559-B1 "S632C         34.50 Unit ID FT"
 gen      39017  "FT"    0              # gen          S632C         34.50  GEN ==20.00(4.32)
0

CATB-1560-B1 "S633           0.48 Unit ID E"
 gen      39004  "E "    0              # gen          S633           0.48  GEN ==18.00(3.39)
0

CATB-1561-B1 "S638           0.48 Unit ID E"
 gen      39008  "E "    0              # gen          S638           0.48  GEN ==10.00(3.44)
0

CATB-1562-B1 "S650AB         0.80 Unit ID ET"
 gen      39220  "ET"    0              # gen          S650AB         0.80  GEN ==20.00(2.48)
0

CATB-1563-B1 "2C558         21.00 Unit ID F"
 gen      34677  "F "    0              # gen          2C558         21.00  GEN ==19.75(0.92)
0

CATB-1564-B1 "2C581          0.34 Unit ID F"
 gen      34679  "F "    0              # gen          2C581          0.34  GEN ==101.70(7.60)
0

CATB-1565-B1 "3C643J         0.20 Unit ID F"
 gen      39062  "F "    0              # gen          3C643J         0.20  GEN ==1.00(0.12)
0
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CATB-1566-B1 "3C643W         0.80 Unit ID F"
 gen      39125  "F "    0              # gen          3C643W         0.80  GEN ==100.00(33.79)
0

CATB-1567-B1 "4C679          0.48 Unit ID F"
 gen      39625  "F "    0              # gen          4C679          0.48  GEN ==20.00(0.91)
0

CATB-1568-B1 "4C752          0.80 Unit ID F"
 gen      39795  "F "    0              # gen          4C752          0.80  GEN ==12.00(0.76)
0

CATB-1569-B1 "4C799          0.31 Unit ID F"
 gen      39849  "F "    0              # gen          4C799          0.31  GEN ==20.00(1.92)
0

CATB-1570-B1 "4C800          0.31 Unit ID F"
 gen      39854  "F "    0              # gen          4C800          0.31  GEN ==20.00(3.23)
0

CATB-1571-B1 "4C805          0.31 Unit ID F"
 gen      39859  "F "    0              # gen          4C805          0.31  GEN ==20.00(2.50)
0

CATB-1572-B1 "4C806          0.31 Unit ID F"
 gen      39864  "F "    0              # gen          4C806          0.31  GEN ==20.00(3.63)
0

CATB-1573-B1 "4C809          0.31 Unit ID F"
 gen      39585  "F "    0              # gen          4C809          0.31  GEN ==42.50(8.46)
0

CATB-1574-B1 "4C814          0.31 Unit ID F"
 gen      39588  "F "    0              # gen          4C814          0.31  GEN ==20.00(3.86)
0

CATB-1575-B1 "4C815          0.31 Unit ID F"
 gen      39591  "F "    0              # gen          4C815          0.31  GEN ==20.00(3.86)
0

CATB-1576-B1 "4C816          0.31 Unit ID F"
 gen      39594  "F "    0              # gen          4C816          0.31  GEN ==20.00(3.86)
0

CATB-1577-B1 "0065-WD       70.00 Unit ID FW"
 gen      90065  "FW"    0              # gen          0065-WD       70.00  GEN ==20.00(0.00)
0

CATB-1578-B1 "0066-WD      115.00 Unit ID FW"
 gen      90066  "FW"    0              # gen          0066-WD      115.00  GEN ==15.00(0.00)
0

CATB-1579-B1 "0067-WD      115.00 Unit ID FW"
 gen      90067  "FW"    0              # gen          0067-WD      115.00  GEN ==15.00(0.00)
0

CATB-1580-B1 "0074-WD       70.00 Unit ID FW"
 gen      90074  "FW"    0              # gen          0074-WD       70.00  GEN ==20.00(0.00)
0

CATB-1581-B1 "0075-WD      230.00 Unit ID FW"
 gen      90075  "FW"    0              # gen          0075-WD      230.00  GEN ==20.00(0.00)
0

CATB-1582-B1 "0078-WD      115.00 Unit ID FW"
 gen      90078  "FW"    0              # gen          0078-WD      115.00  GEN ==20.00(0.00)
0

CATB-1583-B1 "0079-WD       70.00 Unit ID FW"
 gen      90079  "FW"    0              # gen          0079-WD       70.00  GEN ==20.00(0.00)
0

CATB-1584-B1 "0094-WD      115.00 Unit ID FW"
 gen      90094  "FW"    0              # gen          0094-WD      115.00  GEN ==12.00(0.00)
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0

CATB-1585-B1 "0095-WD      115.00 Unit ID FW"
 gen      90095  "FW"    0              # gen          0095-WD      115.00  GEN ==20.00(0.00)
0

CATB-1586-B1 "0120-WD      230.00 Unit ID EW"
 gen      90120  "EW"    0              # gen          0120-WD      230.00  GEN ==10.00(0.00)
0

CATB-1587-B1 "0124-WD       70.00 Unit ID EW"
 gen      90124  "EW"    0              # gen          0124-WD       70.00  GEN ==15.80(0.00)
0

CATB-1588-B1 "0136-WD       70.00 Unit ID FW"
 gen      90136  "FW"    0              # gen          0136-WD       70.00  GEN ==20.00(0.00)
0

CATB-1589-B1 "0168-WD      115.00 Unit ID EW"
 gen      90168  "EW"    0              # gen          0168-WD      115.00  GEN ==1.50(0.00)
0

CATB-1590-B1 "0170-WD      230.00 Unit ID EW"
 gen      90170  "EW"    0              # gen          0170-WD      230.00  GEN ==3.00(0.00)
0

CATB-1591-B1 "0189-WD      115.00 Unit ID EW"
 gen      90189  "EW"    0              # gen          0189-WD      115.00  GEN ==9.00(0.00)
0

CATB-1592-B1 "0224-WD      115.00 Unit ID EW"
 gen      90224  "EW"    0              # gen          0224-WD      115.00  GEN ==8.00(0.00)
0

CATB-1593-B1 "0225-WD      115.00 Unit ID EW"
 gen      90225  "EW"    0              # gen          0225-WD      115.00  GEN ==3.00(0.00)
0

CATB-1594-B1 "0342-WD       70.00 Unit ID EW"
 gen      90342  "EW"    0              # gen          0342-WD       70.00  GEN ==9.00(0.00)
0

CATB-1595-B1 "0360-WD       70.00 Unit ID EW"
 gen      90360  "EW"    0              # gen          0360-WD       70.00  GEN ==1.25(0.00)
0

CATB-1596-B1 "0361-WD       12.47 Unit ID EW"
 gen      90361  "EW"    0              # gen          0361-WD       12.47  GEN ==1.00(0.00)
0

CATB-1597-B1 "0444-WD      115.00 Unit ID EW"
 gen      90444  "EW"    0              # gen          0444-WD      115.00  GEN ==1.50(0.00)
0

CATB-1598-B1 "0446-WD      115.00 Unit ID EW"
 gen      90446  "EW"    0              # gen          0446-WD      115.00  GEN ==1.50(0.00)
0

CATB-1599-B1 "0448-WD      115.00 Unit ID EW"
 gen      90448  "EW"    0              # gen          0448-WD      115.00  GEN ==0.75(0.00)
0

CATB-1600-B1 "5C869          0.20 Unit ID F"
 gen      39898  "F "    0              # gen          5C869          0.20  GEN ==23.00(-2.89)
0

CATB-1601-B1 "5C877          0.42 Unit ID F"
 gen      39945  "F "    0              # gen          5C877          0.42  GEN ==282.00(35.31)
0

CATB-1602-B1 "0632-WD       70.00 Unit ID EW"
 gen      90632  "EW"    0              # gen          0632-WD       70.00  GEN ==1.75(0.00)
0

CATB-1603-B1 "0666-WD       70.00 Unit ID EW"
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```
 gen      90666  "EW"    0              # gen          0666-WD       70.00  GEN ==1.33(0.00)
0

CATB-1604-B1 "0685-WD       70.00 Unit ID EW"
 gen      90685  "EW"    0              # gen          0685-WD       70.00  GEN ==0.75(0.00)
0

CATB-1605-B1 "0687-WD      115.00 Unit ID FW"
 gen      90687  "FW"    0              # gen          0687-WD      115.00  GEN ==1.50(0.00)
0

CATB-1606-B1 "0697-WD       70.00 Unit ID EW"
 gen      90697  "EW"    0              # gen          0697-WD       70.00  GEN ==2.00(0.00)
0

CATB-1607-B1 "0705-RD       70.00 Unit ID ER"
 gen      90705  "ER"    0              # gen          0705-RD       70.00  GEN ==3.00(0.00)
0

CATB-1608-B1 "0706-RD       70.00 Unit ID ER"
 gen      90706  "ER"    0              # gen          0706-RD       70.00  GEN ==3.00(0.00)
0

CATB-1609-B1 "0707-RD       70.00 Unit ID ER"
 gen      90707  "ER"    0              # gen          0707-RD       70.00  GEN ==3.00(0.00)
0

CATB-1610-B1 "0708-RD       70.00 Unit ID ER"
 gen      90708  "ER"    0              # gen          0708-RD       70.00  GEN ==3.00(0.00)
0

CATB-1611-B1 "0709-RD       70.00 Unit ID ER"
 gen      90709  "ER"    0              # gen          0709-RD       70.00  GEN ==3.00(0.00)
0

CATB-1612-B1 "0721-WD       70.00 Unit ID FW"
 gen      90721  "FW"    0              # gen          0721-WD       70.00  GEN ==3.00(0.00)
0

CATB-1613-B1 "0739-RD       70.00 Unit ID ER"
 gen      90739  "ER"    0              # gen          0739-RD       70.00  GEN ==1.04(0.00)
0

CATB-1614-B1 "0740-RD       70.00 Unit ID ER"
 gen      90740  "ER"    0              # gen          0740-RD       70.00  GEN ==1.88(0.00)
0

CATB-1615-B1 "0741-RD       70.00 Unit ID ER"
 gen      90741  "ER"    0              # gen          0741-RD       70.00  GEN ==0.12(0.00)
0

CATB-1616-B1 "6C0954         0.27 Unit ID F"
 gen      39274  "F "    0              # gen          6C0954         0.27  GEN ==150.50(28.17)
0

CATB-1617-B1 "6C0965         0.34 Unit ID F"
 gen      39287  "F "    0              # gen          6C0965         0.34  GEN ==21.00(-1.42)
0

CATB-1618-B1 "6C0974         0.66 Unit ID F"
 gen      39299  "F "    0              # gen          6C0974         0.66  GEN ==153.60(39.22)
0

CATB-1619-B1 "6C1001         0.34 Unit ID F"
 gen      39343  "F "    0              # gen          6C1001         0.34  GEN ==21.00(-1.42)
0

## L-1/G-1

CATB-1620-B1B2 "Gates-Coalinga2 70 kV Line and Chevron Coalinga Unit 1"
 line     34184  34570  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  COLNGA 2      70.00
 line     34184  34552  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  GATES         70.00
 tran     34184  34553  "1 "       0     # tran   from  GATS2_TP      70.00   (3) to (1)   WHD_GAT2      13.80
#-#-# load     34553  "SG"    0              # load         WHD_GAT2      13.80  LOAD==0.59(0.13)
#
```

```
 gen      34652  "1 "    0              # gen          CHV.COAL       9.11  GEN ==7.69(3.01)
0

CATB-1621-B1B2 "Gates-S633SS 70 kV Line and Chevron Coalinga Unit 1"
 line     34552  39000  "1 " 1     0     # line   from  GATES         70.00  BRKR to BRKR  S633SS        70.00
#
 gen      34652  "1 "    0              # gen          CHV.COAL       9.11  GEN ==7.69(3.01)
0

CATB-1622-B1B2 "S633SS-Coalinga1 70 kV Line and Chevron Coalinga Unit 1"
 line     34574  39005  "1 " 1     0     # line   from  COLNGA 1      70.00  BRKR to (3)   S638TP        70.00
 line     39005  34578  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   JACALITO      70.00
 line     39005  39006  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   S638          70.00
 line     34578  39000  "1 " 1     0     # line   from  JACALITO      70.00   (2) to BRKR  S633SS        70.00
 tran     39006  39007  "1 "       0     # tran   from  S638          70.00   (2) to (2)   S638          12.50
 tran     39007  39008  "1 "       0     # tran   from  S638          12.50   (2) to (1)   S638           0.48
#-#-# load     34578  "1 "    0              # load         JACALITO      70.00  LOAD==3.63(2.51)
#-#-# load     34578  "E1"    0              # load         JACALITO      70.00  LOAD==-0.05(0.00)
#-#-# gen      39008  "E "    0              # gen          S638           0.48  GEN ==10.00(3.44)
#
 gen      34652  "1 "    0              # gen          CHV.COAL       9.11  GEN ==7.69(3.01)
0

CATB-1623-B1B2 "Gates-Coalinga2 70 kV Line and Coalinga Cogen"
 line     34184  34570  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  COLNGA 2      70.00
 line     34184  34552  "1 " 1     0     # line   from  GATS2_TP      70.00   (3) to BRKR  GATES         70.00
 tran     34184  34553  "1 "       0     # tran   from  GATS2_TP      70.00   (3) to (1)   WHD_GAT2      13.80
#-#-# load     34553  "SG"    0              # load         WHD_GAT2      13.80  LOAD==0.59(0.13)
#
 gen      34654  "1 "    0              # gen          COLNGAGN       9.11  GEN ==35.57(3.51)
0

CATB-1624-B1B2 "Gates-S633SS 70 kV Line and Coalinga Cogen"
 line     34552  39000  "1 " 1     0     # line   from  GATES         70.00  BRKR to BRKR  S633SS        70.00
#
 gen      34654  "1 "    0              # gen          COLNGAGN       9.11  GEN ==35.57(3.51)
0

CATB-1625-B1B2 "S633SS-Coalinga1 70 kV Line and Coalinga Cogen"
 line     34574  39005  "1 " 1     0     # line   from  COLNGA 1      70.00  BRKR to (3)   S638TP        70.00
 line     39005  34578  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   JACALITO      70.00
 line     39005  39006  "1 " 1     0     # line   from  S638TP        70.00   (3) to (2)   S638          70.00
 line     34578  39000  "1 " 1     0     # line   from  JACALITO      70.00   (2) to BRKR  S633SS        70.00
 tran     39006  39007  "1 "       0     # tran   from  S638          70.00   (2) to (2)   S638          12.50
 tran     39007  39008  "1 "       0     # tran   from  S638          12.50   (2) to (1)   S638           0.48
#-#-# load     34578  "1 "    0              # load         JACALITO      70.00  LOAD==3.63(2.51)
#-#-# load     34578  "E1"    0              # load         JACALITO      70.00  LOAD==-0.05(0.00)
#-#-# gen      39008  "E "    0              # gen          S638           0.48  GEN ==10.00(3.44)
#
 gen      34654  "1 "    0              # gen          COLNGAGN       9.11  GEN ==35.57(3.51)
0

CATB-1626-B1B2 "Borden-Coppermine 70 kV Line and Friant PP Unit 2"
 line     34256  34262  "1 " 1     0     # line   from  BORDEN        70.00  BRKR to (2)   CASSIDY       70.00
 line     34262  34145  "1 " 1     0     # line   from  CASSIDY       70.00   (2) to (3)   RVRRCK T      70.00
 line     34145  34464  "1 " 1     0     # line   from  RVRRCK T      70.00   (3) to BRKR  COPPRMNE      70.00
 line     34145  34454  "1 " 1     0     # line   from  RVRRCK T      70.00   (3) to (1)   RIVERROC      70.00
#-#-# load     34262  "2 "    0              # load         CASSIDY       70.00  LOAD==12.61(1.80)
#-#-# load     34262  "E2"    0              # load         CASSIDY       70.00  LOAD==-0.12(0.00)
#-#-# load     34454  "1 "    0              # load         RIVERROC      70.00  LOAD==4.31(0.61)
#-#-# load     34454  "E1"    0              # load         RIVERROC      70.00  LOAD==-0.03(0.00)
#
 gen      34636  "2 "    0              # gen          FRIANTDM       6.60  GEN ==5.23(1.70)
0

CATB-1627-B1B2 "Tivy Valley-Reedley 70 kV Line and Friant PP Unit 2"
 line     34478  34492  "1 " 1     0     # line   from  TVY VLLY      70.00  BRKR to BRKR  REEDLEY       70.00
#-#-# load     34478  "1 "    0              # load         TVY VLLY      70.00  LOAD==8.08(1.15)
#-#-# load     34478  "E1"    0              # load         TVY VLLY      70.00  LOAD==-0.07(0.00)
#
 gen      34636  "2 "    0              # gen          FRIANTDM       6.60  GEN ==5.23(1.70)
0

CATB-1628-B1B2 "Henrietta-Lemoore 70 kV Line and GWF Henrietta Unit 1"
 line     34516  34520  "1 " 1     0     # line   from  LEPRINO       70.00   (1) to (4)   LPRNO TP      70.00
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 line     34520  34518  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to BRKR  LEMOORE       70.00
 line     34520  34524  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to (1)   CANDLEWK      70.00
 line     34520  34540  "1 " 1     0     # line   from  LPRNO TP      70.00   (4) to BRKR  HENRITTA      70.00
#-#-# load     34516  "1 "    0              # load         LEPRINO       70.00  LOAD==7.11(4.31)
#-#-# load     34516  "E1"    0              # load         LEPRINO       70.00  LOAD==-0.08(0.00)
#-#-# load     34518  "1 "    0              # load         LEMOORE       70.00  LOAD==19.53(2.78)
#-#-# load     34518  "2 "    0              # load         LEMOORE       70.00  LOAD==28.18(4.02)
#-#-# load     34518  "E1"    0              # load         LEMOORE       70.00  LOAD==-0.22(0.00)
#-#-# load     34518  "E2"    0              # load         LEMOORE       70.00  LOAD==-0.25(0.00)
#
 gen      34539  "1 "    0              # gen          GWF_GT1       13.80  GEN ==45.33(5.91)
0

CATB-1629-B1B2 "McCall-Wahtoke 115 kV Line and Sanger Cogen"
 line     34370  34382  "1 " 1     0     # line   from  MC CALL      115.00  BRKR to BRKR  WAHTOKE      115.00
#
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1630-B1B2 "McCall-Wahtoke 115 kV Line and Kings River PH"
 line     34370  34382  "1 " 1     0     # line   from  MC CALL      115.00  BRKR to BRKR  WAHTOKE      115.00
#
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1631-B1B2 "Reedley-Wahtoke 115 kV Line and Sanger Cogen"
 line     34382  34380  "1 " 1     0     # line   from  WAHTOKE      115.00  BRKR to BRKR  REEDLEY      115.00
#
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1632-B1B2 "Reedley-Wahtoke 115 kV Line and Kings River PH"
 line     34382  34380  "1 " 1     0     # line   from  WAHTOKE      115.00  BRKR to BRKR  REEDLEY      115.00
#
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1633-B1B2 "McCall-Sanger #1 115 kV Line and Sanger Cogen"
 line     34366  34370  "1 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1634-B1B2 "McCall-Sanger #1 115 kV Line and Kings River PH"
 line     34366  34370  "1 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1635-B1B2 "McCall-Sanger #2 115 kV Line and Sanger Cogen"
 line     34366  34370  "2 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1636-B1B2 "McCall-Sanger #2 115 kV Line and Kings River PH"
 line     34366  34370  "2 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1637-B1B2 "McCall-Sanger #3 115 kV Line and Sanger Cogen"
 line     34366  34370  "3 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34646  "1 "    0              # gen          SANGERCO      13.80  GEN ==42(0.00)
0

CATB-1638-B1B2 "McCall-Sanger #3 115 kV Line and Kings River PHe"
 line     34366  34370  "3 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 gen      34616  "1 "    0              # gen          KINGSRIV      13.80  GEN ==47.00(7.16)
0

CATB-1639-B1B2 "Gregg-Herndon #1 230 kV Line and Exchequer"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
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  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1640-B1B2 "Gregg-Herndon #2 230 kV Line and Exchequer"
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1641-B1B2 "Gregg-Ashlan 230 kV Line and Exchequer"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1642-B1B2 "Gregg-3C643WSS #1 230 kV Line and Exchequer"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1643-B1B2 "Gregg-Gates #2 230 kV Line and Exchequer"
 line     30810  30900  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  GATES        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of new Gregg-Gates #2 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1644-B1B2 "E1-Gregg #1 230 kV Line and Exchequer"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1645-B1B2 "E1-Gregg #2 230 kV Line and Exchequer"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1646-B1B2 "Helms PP-E1 #1 230 kV Line and Exchequer"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1647-B1B2 "Helms PP-E1 #2 230 kV Line and Exchequer"
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1648-B1B2 "Herndon-Kearney 230 kV Line and Exchequer"
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```
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1649-B1B2 "Herndon-Ashlan 230 kV Line and Exchequer"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1650-B1B2 "Haas-McCall 230 kV Line and Exchequer"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP     230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS          13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL      230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3     230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70       70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK      70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3      13.80
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1651-B1B2 "Balch-McCall 230 kV Line and Exchequer"
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT     230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2      13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL      230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT      13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1652-B1B2 "Helm-McCall 230 kV Line and Exchequer"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1653-B1B2 "3C643W-McCall #2 230 kV Line and Exchequer"
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1654-B1B2 "Templeton-Gates 230 kV Line and Exchequer"
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1655-B1B2 "Gates-6C0974SS 230 kV Line and Exchequer"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1656-B1B2 "6C0974SS-5C877SS 230 kV Line and Exchequer"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
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```
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1657-B1B2 "5C877SS-Morro Bay 230 kV Line and Exchequer"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1658-B1B2 "Gates-Arco 230 kV Line and Exchequer"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1659-B1B2 "Gates-Midway 230 kV Line and Exchequer"
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1660-B1B2 "3C643WSS-Gates #1 230 kV Line and Exchequer"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1661-B1B2 "3C643WSS-Gates #2 230 kV Line and Exchequer"
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1662-B1B2 "T254-Gates 230 kV Line and Exchequer"
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
 tran     30902  34688  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT1       18.00
 tran     30902  34689  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT2       18.00
 tran     30902  34690  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254ST1       18.00
#-#-# load     34688  "SS"    0              # load         T254CT1       18.00  LOAD==11.87(6.57)
#-#-# load     34689  "SS"    0              # load         T254CT2       18.00  LOAD==11.87(6.57)
#-#-# load     34690  "SS"    0              # load         T254ST1       18.00  LOAD==11.87(6.57)
#-#-# gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
#-#-# gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
#-#-# gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
#
 gen      34306  "1 "    0              # gen          EXCHQUER      13.80  GEN ==61.77(-15.41)
0

CATB-1663-B1B2 "Gregg-Herndon #1 230 kV Line and Kerckhoff 1"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1664-B1B2 "Gregg-Herndon #2 230 kV Line and Kerckhoff 1"
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1665-B1B2 "Gregg-Ashlan 230 kV Line and Kerckhoff 1"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
```

```
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1666-B1B2 "Gregg-3C643WSS #1 230 kV Line and Kerckhoff 1"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1667-B1B2 "Gregg-Gates #2 230 kV Line and Kerckhoff 1"
 line     30810  30900  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  GATES        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of new Gregg-Gates #2 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1668-B1B2 "E1-Gregg #1 230 kV Line and Kerckhoff 1"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1669-B1B2 "E1-Gregg #2 230 kV Line and Kerckhoff 1"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1670-B1B2 "Helms PP-E1 #1 230 kV Line and Kerckhoff 1"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1671-B1B2 "Helms PP-E1 #2 230 kV Line and Kerckhoff 1"
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1672-B1B2 "Herndon-Kearney 230 kV Line and Kerckhoff 1"
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1673-B1B2 "Herndon-Ashlan 230 kV Line and Kerckhoff 1"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1674-B1B2 "Haas-McCall 230 kV Line and Kerckhoff 1"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP     230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS          13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL      230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3     230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70       70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK      70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3      13.80
```

```
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1675-B1B2 "Balch-McCall 230 kV Line and Kerckhoff 1"
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT     230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2      13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL     230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT      13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1676-B1B2 "Helm-McCall 230 kV Line and Kerckhoff 1"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1677-B1B2 "3C643W-McCall #2 230 kV Line and Kerckhoff 1"
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1678-B1B2 "Templeton-Gates 230 kV Line and Kerckhoff 1"
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1679-B1B2 "Gates-6C0974SS 230 kV Line and Kerckhoff 1"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1680-B1B2 "6C0974SS-5C877SS 230 kV Line and Kerckhoff 1"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1681-B1B2 "5C877SS-Morro Bay 230 kV Line and Kerckhoff 1"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1682-B1B2 "Gates-Arco 230 kV Line and Kerckhoff 1"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1683-B1B2 "Gates-Midway 230 kV Line and Kerckhoff 1"
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1684-B1B2 "3C643WSS-Gates #1 230 kV Line and Kerckhoff 1"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
```

```
0

CATB-1685-B1B2 "3C643WSS-Gates #2 230 kV Line and Kerckhoff 1"
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1686-B1B2 "T254-Gates 230 kV Line and Kerckhoff 1"
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
 tran     30902  34688  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT1       18.00
 tran     30902  34689  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT2       18.00
 tran     30902  34690  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254ST1       18.00
#-#-# load     34688  "SS"    0              # load         T254CT1       18.00  LOAD==11.87(6.57)
#-#-# load     34689  "SS"    0              # load         T254CT2       18.00  LOAD==11.87(6.57)
#-#-# load     34690  "SS"    0              # load         T254ST1       18.00  LOAD==11.87(6.57)
#-#-# gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
#-#-# gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
#-#-# gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
#
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATB-1687-B1B2 "Gregg-Herndon #1 230 kV Line and Melones 2"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1688-B1B2 "Gregg-Herndon #2 230 kV Line and Melones 2"
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1689-B1B2 "Gregg-Ashlan 230 kV Line and Melones 2"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1690-B1B2 "Gregg-3C643WSS #1 230 kV Line and Melones 2"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1691-B1B2 "Gregg-Gates #2 230 kV Line and Melones 2"
 line     30810  30900  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  GATES        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of new Gregg-Gates #2 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1692-B1B2 "E1-Gregg #1 230 kV Line and Melones 2"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
#
```

```
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1693-B1B2 "E1-Gregg #2 230 kV Line and Melones 2"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1          230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1694-B1B2 "Helms PP-E1 #1 230 kV Line and Melones 2"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1          230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1695-B1B2 "Helms PP-E1 #2 230 kV Line and Melones 2"
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1          230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1696-B1B2 "Herndon-Kearney 230 kV Line and Melones 2"
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1697-B1B2 "Herndon-Ashlan 230 kV Line and Melones 2"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1    230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1    230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN      230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1698-B1B2 "Haas-McCall 230 kV Line and Melones 2"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP    230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS         13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL     230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3    230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70      70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK     70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3     13.80
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1699-B1B2 "Balch-McCall 230 kV Line and Melones 2"
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT    230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2     13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL     230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT     13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1700-B1B2 "Helm-McCall 230 kV Line and Melones 2"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL     230.00
#
```

```
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1701-B1B2 "3C643W-McCall #2 230 kV Line and Melones 2"
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1702-B1B2 "Templeton-Gates 230 kV Line and Melones 2"
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1703-B1B2 "Gates-6C0974SS 230 kV Line and Melones 2"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1704-B1B2 "6C0974SS-5C877SS 230 kV Line and Melones 2"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1705-B1B2 "5C877SS-Morro Bay 230 kV Line and Melones 2"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1706-B1B2 "Gates-Arco 230 kV Line and Melones 2"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1707-B1B2 "Gates-Midway 230 kV Line and Melones 2"
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1708-B1B2 "3C643WSS-Gates #1 230 kV Line and Melones 2"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1709-B1B2 "3C643WSS-Gates #2 230 kV Line and Melones 2"
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1710-B1B2 "T254-Gates 230 kV Line and Melones 2"
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
 tran     30902  34688  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT1       18.00
 tran     30902  34689  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT2       18.00
 tran     30902  34690  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254ST1       18.00
#-#-# load     34688  "SS"    0              # load         T254CT1       18.00  LOAD==11.87(6.57)
#-#-# load     34689  "SS"    0              # load         T254CT2       18.00  LOAD==11.87(6.57)
#-#-# load     34690  "SS"    0              # load         T254ST1       18.00  LOAD==11.87(6.57)
#-#-# gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
#-#-# gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
#-#-# gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
#
 gen      37562  "2 "    0              # gen          MELONE2       13.80  GEN ==150.00(-2.08)
0

CATB-1711-B1B2 "Gregg-Herndon #1 230 kV Line and Helms 1"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
```

```
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1712-B1B2 "Gregg-Herndon #2 230 kV Line and Helms 1"
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1713-B1B2 "Gregg-Ashlan 230 kV Line and Helms 1"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1714-B1B2 "Gregg-3C643WSS #1 230 kV Line and Helms 1"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1715-B1B2 "Gregg-Gates #2 230 kV Line and Helms 1"
 line     30810  30900  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  GATES        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of new Gregg-Gates #2 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1716-B1B2 "E1-Gregg #1 230 kV Line and Helms 1"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1717-B1B2 "E1-Gregg #2 230 kV Line and Helms 1"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1718-B1B2 "Helms PP-E1 #1 230 kV Line and Helms 3"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
#
 gen      34604  "1 "    0              # gen          HELMS 3       18.00  GEN ==404.00(97.44)
0

CATB-1719-B1B2 "Helms PP-E1 #2 230 kV Line and Helms 1"
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1720-B1B2 "Herndon-Kearney 230 kV Line and Helms 1"
```

```
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1721-B1B2 "Herndon-Ashlan 230 kV Line and Helms 1"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1722-B1B2 "Haas-McCall 230 kV Line and Helms 1"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP     230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS          13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL      230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3     230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70       70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK      70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3      13.80
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1723-B1B2 "Balch-McCall 230 kV Line and Helms 1"
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT     230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2      13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL      230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT      13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1724-B1B2 "Helm-McCall 230 kV Line and Helms 1"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1725-B1B2 "3C643W-McCall #2 230 kV Line and Helms 1"
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1726-B1B2 "Templeton-Gates 230 kV Line and Helms 1"
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1727-B1B2 "Gates-6C0974SS 230 kV Line and Helms 1"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1728-B1B2 "6C0974SS-5C877SS 230 kV Line and Helms 1"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
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 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1729-B1B2 "5C877SS-Morro Bay 230 kV Line and Helms 1"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1730-B1B2 "Gates-Arco 230 kV Line and Helms 1"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1731-B1B2 "Gates-Midway 230 kV Line and Helms 1"
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1732-B1B2 "3C643WSS-Gates #1 230 kV Line and Helms 1"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1733-B1B2 "3C643WSS-Gates #2 230 kV Line and Helms 1"
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

CATB-1734-B1B2 "T254-Gates 230 kV Line and Helms 1"
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
 tran     30902  34688  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT1       18.00
 tran     30902  34689  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254CT2       18.00
 tran     30902  34690  "1 "       0     # tran   from  T254         230.00   (4) to (1)   T254ST1       18.00
#-#-# load     34688  "SS"    0              # load         T254CT1       18.00  LOAD==11.87(6.57)
#-#-# load     34689  "SS"    0              # load         T254CT2       18.00  LOAD==11.87(6.57)
#-#-# load     34690  "SS"    0              # load         T254ST1       18.00  LOAD==11.87(6.57)
#-#-# gen      34688  "F1"    0              # gen          T254CT1       18.00  GEN ==172.40(35.25)
#-#-# gen      34689  "F2"    0              # gen          T254CT2       18.00  GEN ==172.40(35.25)
#-#-# gen      34690  "F3"    0              # gen          T254ST1       18.00  GEN ==290.80(56.87)
#
 gen      34600  "1 "    0              # gen          HELMS 1       18.00  GEN ==404.00(97.26)
0

# 2018 main year category b contingency list
# Kern Division Zone 315
#

CATB-1735-B2 "Caliente SS-Midway #1 230 kV Line"
 line     30918  30970  "1 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1736-B2 "Caliente SS-Midway #2 230 kV Line"
 line     30918  30970  "2 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1737-B2 "Arco-Midway 230 kV Line"
 line     30935  30970  "1 " 1     0     # line   from  ARCO         230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1738-B2 "Midway-Kern #1 230 kV Line"
 line     30940  30942  "1 " 1     0     # line   from  STCKDLEA     230.00  BRKR to (4)   STCKDLJ1     230.00
 line     30942  30945  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  KERN PP      230.00
 line     30942  30950  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to (1)   BKRSFLDA     230.00
 line     30942  30970  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  MIDWAY       230.00
#-#-# load     30940  "2 "    0              # load         STCKDLEA     230.00  LOAD==51.04(7.27)
#-#-# load     30940  "6 "    0              # load         STCKDLEA     230.00  LOAD==57.64(8.21)
#-#-# load     30940  "E2"    0              # load         STCKDLEA     230.00  LOAD==-0.60(0.00)
#-#-# load     30940  "E6"    0              # load         STCKDLEA     230.00  LOAD==-0.61(0.00)
#-#-# load     30950  "3 "    0              # load         BKRSFLDA     230.00  LOAD==46.51(6.62)
#-#-# load     30950  "E3"    0              # load         BKRSFLDA     230.00  LOAD==-0.61(0.00)
```

```
  line     30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
  #-#-# load     30950  "3 "    1              # Restore Load 3 at Bakersfield 1
  #-#-# load     30950  "E3"    1              # Restore Load E3 at Bakersfield 1
 line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30940  "2 "    1              # Restore Load 2 at Stockdale 1
 #-#-# load      30940  "6 "    1              # Restore Load 6 at Stockdale 1
 #-#-# load      30940  "E2"    1              # Restore Load E2 at Stockdale 1
 #-#-# load      30940  "E6"    1              # Restore Load E6 at Stockdale 1
0

CATB-1739-B2 "Midway-Kern #3 230 kV Line"
 line     30941  30943  "1 " 1     0     # line   from  STCKDLEB     230.00   (1) to (3)   STCKDLJ2     230.00
 line     30943  30945  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  KERN PP      230.00
 line     30943  30970  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  MIDWAY      230.00
#-#-# load     30941  "3 "    0              # load         STCKDLEB     230.00  LOAD==53.58(7.63)
#-#-# load     30941  "E3"    0              # load         STCKDLEB     230.00  LOAD==-0.56(0.00)
 line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30941  "3 "    1              # Restore Load 3 at Stockdale  2
 #-#-# load      30941  "E3"    1              # Restore Load E3 at Stockdale  2
0

CATB-1740-B2 "Midway-Kern #4 230 kV Line"
 line     30945  30944  "1 " 1     0     # line   from  KERN PP      230.00  BRKR to (3)   BKRSFDJ2     230.00
 line     30944  30951  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to (1)   BKRSFLDB     230.00
 line     30944  30970  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to BRKR  MIDWAY      230.00
#-#-# load     30951  "2 "    0              # load         BKRSFLDB     230.00  LOAD==46.19(6.58)
#-#-# load     30951  "E2"    0              # load         BKRSFLDB     230.00  LOAD==-0.52(0.00)
 line      30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
 #-#-# load      30951  "2 "    1              # Restore Load 2 at Bakersfield 2
 #-#-# load      30951  "E2"    1              # Restore Load E2 at Bakersfield 2
0

CATB-1741-B2 "LaPaloma-Sunrise #1 230 kV Line"
 line     30946  30947  "1 " 1     0     # line   from  LAPALOMA     230.00  BRKR to BRKR  TEX_SUN      230.00
0

CATB-1742-B2 "LaPaloma-Sunrise #2 230 kV Line"
 line     30946  30947  "2 " 1     0     # line   from  LAPALOMA     230.00  BRKR to BRKR  TEX_SUN      230.00
0

CATB-1743-B2 "Midway-Elk Hills #1 230 kV Line"
 line     30948  30970  "1 " 1     0     # line   from  ELKHIL_G     230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1744-B2 "Midway-Elk Hills #2 230 kV Line"
 line     30948  30970  "2 " 1     0     # line   from  ELKHIL_G     230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1745-B2 "Elk Hills-Oxy Elk Hills 230 kV Line"
 line     30948  34817  "1 " 1     0     # line   from  ELKHIL_G     230.00  BRKR to (3)   OXY_230      230.00
 tran     34817  35064  "1 "       0     # tran   from  OXY_230      230.00   (3) to (2)   NAVY 35R       9.11
 tran     34817  35064  "2 "       0     # tran   from  OXY_230      230.00   (3) to (2)   NAVY 35R       9.11
#-#-# load     34817  "SG"    0              # load         OXY_230      230.00  LOAD==80.18(51.79)
0

CATB-1746-B2 "Midway-LaPaloma #1 230 kV Line"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  LAPALOMA     230.00
0

CATB-1747-B2 "Midway-LaPaloma #2 230 kV Line"
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  LAPALOMA     230.00
0

CATB-1748-B2 "Midway-Sunset 230 kV Line"
 line     30970  30973  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to (2)   SUNST        230.00
 tran     30973  35004  "1 "       0     # tran   from  SUNST        230.00   (2) to (1)   SUNSET G      13.80
#-#-# load     30973  "SG"    0              # load         SUNST        230.00  LOAD==10.82(3.93)
#-#-# gen      35004  "1 "    0              # gen          SUNSET G      13.80  GEN ==60.12(-11.96)
#-#-# gen      35004  "2 "    0              # gen          SUNSET G      13.80  GEN ==60.12(-11.96)
#-#-# gen      35004  "3 "    0              # gen          SUNSET G      13.80  GEN ==60.12(-11.96)
0

CATB-1749-B2 "Arco-Tulare Lake 70 kV Line"
 line     34135  34133  "1 " 1     0     # line   from  BDGRHL T      70.00   (3) to (3)   LOSTHL T      70.00
 line     34135  34544  "1 " 1     0     # line   from  BDGRHL T      70.00   (3) to BRKR  TLRE LKE      70.00
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 line     34135  34580  "1 " 1     0     # line   from  BDGRHL T      70.00   (3) to (1)   BDGR HLL      70.00
 line     34133  34582  "1 " 1     0     # line   from  LOSTHL T      70.00   (3) to BRKR  ARCO          70.00
 line     34133  34942  "1 " 1     0     # line   from  LOSTHL T      70.00   (3) to (1)   LST HLLS      70.00
#-#-# load     34544  "1 "    0              # load         TLRE LKE      70.00  LOAD==4.07(0.58)
#-#-# load     34544  "2 "    0              # load         TLRE LKE      70.00  LOAD==8.94(1.27)
#-#-# load     34544  "E1"    0              # load         TLRE LKE      70.00  LOAD==-0.09(0.00)
#-#-# load     34580  "1 "    0              # load         BDGR HLL      70.00  LOAD==7.53(1.89)
#-#-# load     34580  "2 "    0              # load         BDGR HLL      70.00  LOAD==2.73(0.68)
#-#-# load     34580  "E1"    0              # load         BDGR HLL      70.00  LOAD==-0.09(0.00)
#-#-# load     34580  "E2"    0              # load         BDGR HLL      70.00  LOAD==-0.03(0.00)
#-#-# load     34942  "1 "    0              # load         LST HLLS      70.00  LOAD==2.35(0.77)
#-#-# load     34942  "E1"    0              # load         LST HLLS      70.00  LOAD==-0.03(0.00)
  line     34544  34119  "1 " 1     1     # Switches in Tulare Lake CB 42
  #-#-# load     34544  "1 "    1              # Restore load 1 at Tulare Lake
  #-#-# load     34544  "2 "    1              # Restore load 2 at Tulare Lake
  #-#-# load     34544  "E1"    1              # Restore load E1 at Tulare Lake
0

CATB-1750-B2 "Kern-Panama 70 kV Line"
 line     34137  34918  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to BRKR  KERN PW2      70.00
 line     34137  34906  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to BRKR  PANAMA       70.00
 line     34137  34908  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to (1)   CARNATIO      70.00
#-#-# load     34908  "1 "    0              # load         CARNATIO      70.00  LOAD==12.27(9.07)
#-#-# load     34908  "E1"    0              # load         CARNATIO      70.00  LOAD==-0.07(0.00)
0

CATB-1751-B2 "Weedpatch-Wellfield 70 kV Line"
 line     34188  34909  "1 " 1     0     # line   from  GRMMWY T      70.00   (3) to (1)   GRMWY_SM      70.00
 line     34188  34910  "1 " 1     0     # line   from  GRMMWY T      70.00   (3) to (1)   WELLFILD      70.00
 line     34188  34890  "1 " 1     0     # line   from  GRMMWY T      70.00   (3) to BRKR  WEEDPTCH      70.00
#-#-# load     34909  "1 "    0              # load         GRMWY_SM      70.00  LOAD==6.44(2.86)
#-#-# load     34909  "E1"    0              # load         GRMWY_SM      70.00  LOAD==-0.07(0.00)
#-#-# load     34910  "1 "    0              # load         WELLFILD      70.00  LOAD==6.30(0.90)
#-#-# load     34910  "2 "    0              # load         WELLFILD      70.00  LOAD==4.15(0.59)
#-#-# load     34910  "E1"    0              # load         WELLFILD      70.00  LOAD==-0.10(0.00)
#-#-# load     34910  "E2"    0              # load         WELLFILD      70.00  LOAD==-0.05(0.00)
0

CATB-1752-B2 "Midway-Temblor 115 kV Line"
 line     34225  34774  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to BRKR  MIDWAY       115.00
 line     34225  39172  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to (3)   S653BTP      115.00
 line     34225  34794  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to BRKR  TEMBLOR      115.00
 line     39172  34227  "1 " 1     0     # line   from  S653BTP      115.00   (3) to (3)   BELRDG T     115.00
 line     39172  39173  "1 " 1     0     # line   from  S653BTP      115.00   (3) to (2)   S653B        115.00
 line     34227  34229  "1 " 1     0     # line   from  BELRDG T     115.00   (3) to (1)   BELRDG B     115.00
 line     34227  34804  "1 " 1     0     # line   from  BELRDG T     115.00   (3) to (1)   BELRIDGE     115.00
 tran     39173  39174  "1 "       0     # tran   from  S653B        115.00   (2) to (2)   S653B         34.50
 tran     39174  39175  "1 "       0     # tran   from  S653B         34.50   (2) to (1)   S653B          0.48
#-#-# load     34804  "1 "    0              # load         BELRIDGE     115.00  LOAD==9.50(2.38)
#-#-# load     34804  "E1"    0              # load         BELRIDGE     115.00  LOAD==-0.04(0.00)
#-#-# gen      39175  "FT"    0              # gen          S653B          0.48  GEN ==20.00(1.62)
 line     34794  34223  "1 " 1     0     # Open line from TEMBLOR to PSE MCKT for Midway-Temblor 115 kV line outage
0

CATB-1753-B2 "Arco-Twisselman 70 kV Line"
 line     34241  39613  "1 " 1     0     # line   from  TWSL J1       70.00   (2) to (3)   4C775TP       70.00
 line     34241  34582  "1 " 1     0     # line   from  TWSL J1       70.00   (2) to BRKR  ARCO          70.00
 line     39613  34968  "1 " 1     0     # line   from  4C775TP       70.00   (3) to (4)   TWISSLMN      70.00
 line     39613  39614  "1 " 1     0     # line   from  4C775TP       70.00   (3) to (2)   4C775         70.00
 line     34968  34970  "1 " 1     0     # line   from  TWISSLMN      70.00   (4) to (2)   TX_LOSHL      70.00
 line     34968  90040  "1 " 1     0     # line   from  TWISSLMN      70.00   (4) to (1)   0040-WD       70.00
 line     34968  90102  "1 " 1     0     # line   from  TWISSLMN      70.00   (4) to (1)   0102-WD       70.00
 line     34970  39040  "1 " 1     0     # line   from  TX_LOSHL      70.00   (2) to (4)   Q111TP        70.00
 line     39040  34971  "1 " 1     0     # line   from  Q111TP        70.00   (4) to (2)   NTPTRL        70.00
 tran     39040  34973  "1 "       0     # tran   from  Q111TP        70.00   (4) to (2)   Q111           4.16
 tran     39040  34973  "2 "       0     # tran   from  Q111TP        70.00   (4) to (2)   Q111           4.16
 line     34971  34972  "1 " 1     0     # line   from  NTPTRL        70.00   (2) to (1)   CHEVLHLS      70.00
 tran     39614  39615  "1 "       0     # tran   from  4C775         70.00   (2) to (2)   4C775EQ1      35.00
 line     39615  39616  "1 " 1     0     # line   from  4C775EQ1      35.00   (2) to (2)   4C775EQ2      35.00
 tran     39616  39617  "1 "       0     # tran   from  4C775EQ2      35.00   (2) to (1)   4C775          0.20
#-#-# load     34968  "1 "    0              # load         TWISSLMN      70.00  LOAD==5.21(0.74)
#-#-# load     34968  "2 "    0              # load         TWISSLMN      70.00  LOAD==4.12(0.59)
#-#-# load     34968  "E1"    0              # load         TWISSLMN      70.00  LOAD==-0.06(0.00)
#-#-# load     34968  "E2"    0              # load         TWISSLMN      70.00  LOAD==-0.08(0.00)
#-#-# load     34971  "1 "    0              # load         NTPTRL        70.00  LOAD==9.88(6.12)
```

```
#-#-# load     34971  "E1"    0              # load         NTPTRL        70.00  LOAD==-0.12(0.00)
#-#-# load     34973  "SS"    0              # load         Q111           4.16  LOAD==6.00(3.32)
#-#-# load     34972  "1 "    0              # load         CHEVLHLS      70.00  LOAD==13.63(8.12)
#-#-# load     34972  "E1"    0              # load         CHEVLHLS      70.00  LOAD==-0.17(0.00)
#-#-# load     39617  "SS"    0              # load         4C775          0.20  LOAD==0.10(0.06)
#-#-# gen      90040  "EW"    0              # gen          0040-WD       70.00  GEN ==20.00(0.00)
#-#-# gen      90102  "EW"    0              # gen          0102-WD       70.00  GEN ==1.50(0.00)
#-#-# gen      34973  "1 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
#-#-# gen      34973  "2 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
#-#-# gen      34973  "3 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
#-#-# gen      39617  "F "    0              # gen          4C775          0.20  GEN ==15.00(0.00)
0

CATB-1754-B2 "Arco-Blackwell 70 kV Line"
 line     34243  34859  "1 " 1     0     # line   from  TWSL J2       70.00   (2) to (3)   PRMTFMTP      70.00
 line     34243  34582  "1 " 1     0     # line   from  TWSL J2       70.00   (2) to BRKR  ARCO          70.00
 line     34859  39094  "1 " 1     0     # line   from  PRMTFMTP      70.00   (3) to (3)   S484TP        70.00
 tran     34859  35067  "1 "       0     # tran   from  PRMTFMTP      70.00   (3) to (1)   PRMTFARM      21.00
 line     39094  34850  "1 " 1     0     # line   from  S484TP        70.00   (3) to (3)   BLACKWLL      70.00
 line     39094  39095  "1 " 1     0     # line   from  S484TP        70.00   (3) to (2)   S484          70.00
 line     34850  39626  "1 " 1     0     # line   from  BLACKWLL      70.00   (3) to (2)   4C705         70.00
 line     34850  90023  "1 " 1     0     # line   from  BLACKWLL      70.00   (3) to (1)   0023-WD       70.00
 tran     39626  39627  "1 "       0     # tran   from  4C705         70.00   (2) to (2)   4C705EQ1      34.50
 line     39627  39628  "1 " 1     0     # line   from  4C705EQ1      34.50   (2) to (2)   4C705EQ2      34.50
 tran     39628  39629  "1 "       0     # tran   from  4C705EQ2      34.50   (2) to (1)   4C705          0.48
 tran     39095  39096  "1 "       0     # tran   from  S484          70.00   (2) to (1)   S484          34.50
#-#-# load     35067  "1 "    0              # load         PRMTFARM      21.00  LOAD==17.47(8.76)
#-#-# load     35067  "E1"    0              # load         PRMTFARM      21.00  LOAD==-0.01(0.00)
#-#-# load     34850  "1 "    0              # load         BLACKWLL      70.00  LOAD==2.44(0.35)
#-#-# load     34850  "E1"    0              # load         BLACKWLL      70.00  LOAD==-0.04(0.00)
#-#-# load     39096  "SS"    0              # load         S484          34.50  LOAD==0.08(0.04)
#-#-# gen      35067  "PV"    0              # gen          PRMTFARM      21.00  GEN ==1.00(0.00)
#-#-# gen      90023  "FW"    0              # gen          0023-WD       70.00  GEN ==12.00(0.00)
#-#-# gen      39629  "F "    0              # gen          4C705          0.48  GEN ==20.00(-1.49)
#-#-# gen      39096  "F "    0              # gen          S484          34.50  GEN ==20.00(-4.80)
0

CATB-1755-B2 "Kern-Kern Front PSE 115 kV Line"
 line     34281  34283  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (3)   BDGRCRKJ     115.00
 line     34281  34730  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (2)   PSE-3        115.00
 line     34281  34752  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to BRKR  KERN PWR     115.00
 tran     34281  35023  "1 "       0     # tran   from  DOUBLECJ     115.00   (4) to (1)   DOUBLE C      13.80
 line     34283  34285  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   HIGHSRA      115.00
 line     34283  34287  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   BDGRCRKP     115.00
 tran     34730  35026  "1 "       0     # tran   from  PSE-3        115.00   (2) to (1)   KERNFRNT       9.11
 tran     34285  35027  "1 "       0     # tran   from  HIGHSRA      115.00   (2) to (1)   HISIERRA      13.80
 tran     34287  35029  "1 "       0     # tran   from  BDGRCRKP     115.00   (2) to (1)   BADGERCK      13.80
#-#-# load     35023  "SG"    0              # load         DOUBLE C      13.80  LOAD==0.35(0.05)
#-#-# load     35026  "SG"    0              # load         KERNFRNT       9.11  LOAD==1.01(0.49)
#-#-# load     35027  "SG"    0              # load         HISIERRA      13.80  LOAD==0.94(0.13)
#-#-# load     35029  "SG"    0              # load         BADGERCK      13.80  LOAD==0.52(0.07)
#-#-# gen      35023  "1 "    0              # gen          DOUBLE C      13.80  GEN ==47.00(2.64)
#-#-# gen      35026  "1 "    0              # gen          KERNFRNT       9.11  GEN ==47.00(-12.00)
#-#-# gen      35027  "1 "    0              # gen          HISIERRA      13.80  GEN ==47.00(2.48)
#-#-# gen      35029  "1 "    0              # gen          BADGERCK      13.80  GEN ==45.77(2.27)
0

CATB-1756-B2 "Alpaugh-S479SS 115 kV Line"
 line     34426  34707  "1 " 1     0     # line   from  ALPAUGH      115.00  BRKR to (4)   T304TAP      115.00
 line     34707  34711  "1 " 1     0     # line   from  T304TAP      115.00   (4) to (3)   T304         115.00
 line     34707  34725  "1 " 1     0     # line   from  T304TAP      115.00   (4) to (2)   S473         115.00
 line     34707  34745  "1 " 1     0     # line   from  T304TAP      115.00   (4) to BRKR  S479SS       115.00
 tran     34711  35001  "1 "       0     # tran   from  T304         115.00   (3) to (2)   T304          21.00
 tran     34711  35001  "2 "       0     # tran   from  T304         115.00   (3) to (2)   T304          21.00
 tran     34725  35012  "1 "       0     # tran   from  S473         115.00   (2) to (1)   S473          34.50
#-#-# gen      35001  "1 "    0              # gen          T304          21.00  GEN ==50.00(0.00)
#-#-# gen      35012  "F "    0              # gen          S473          34.50  GEN ==20.00(-0.45)
0

CATB-1757-B2 "Arco-Cholame 70 kV Line"
 line     34582  34584  "1 " 1     0     # line   from  ARCO          70.00  BRKR to (2)   DEVLS DN      70.00
 line     34584  36352  "1 " 1     0     # line   from  DEVLS DN      70.00   (2) to (3)   CHLME JT      70.00
 line     36352  36350  "1 " 1     0     # line   from  CHLME JT      70.00   (3) to BRKR  CHOLAME       70.00
 line     36352  34964  "1 " 1     0     # line   from  CHLME JT      70.00   (3) to (2)   BRRNDA A      70.00
 line     34964  34965  "1 " 1     0     # line   from  BRRNDA A      70.00   (2) to (3)   ANTLP JC      70.00
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 line     34965  34962  "1 " 1     0     # line   from  ANTLP JC      70.00   (3) to (1)   BRRNDA C      70.00
 line     34965  34966  "1 " 1     0     # line   from  ANTLP JC      70.00   (3) to (1)   ANTELOPE      70.00
#-#-# load     34584  "1 "    0              # load         DEVLS DN      70.00  LOAD==5.01(0.72)
#-#-# load     34584  "E1"    0              # load         DEVLS DN      70.00  LOAD==-0.03(0.00)
#-#-# load     36350  "1 "    0              # load         CHOLAME       70.00  LOAD==5.26(0.75)
#-#-# load     36350  "2 "    0              # load         CHOLAME       70.00  LOAD==4.91(0.70)
#-#-# load     36350  "E1"    0              # load         CHOLAME       70.00  LOAD==-0.05(0.00)
#-#-# load     36350  "E2"    0              # load         CHOLAME       70.00  LOAD==-0.03(0.00)
#-#-# load     34964  "1 "    0              # load         BRRNDA A      70.00  LOAD==7.37(1.05)
#-#-# load     34964  "E1"    0              # load         BRRNDA A      70.00  LOAD==-0.07(0.00)
#-#-# load     34962  "1 "    0              # load         BRRNDA C      70.00  LOAD==0.49(0.14)
#-#-# load     34962  "E1"    0              # load         BRRNDA C      70.00  LOAD==-0.00(0.00)
#-#-# load     34966  "1 "    0              # load         ANTELOPE      70.00  LOAD==4.44(0.63)
#-#-# load     34966  "E1"    0              # load         ANTELOPE      70.00  LOAD==-0.05(0.00)
0

CATB-1758-B2 "Arco-Polonio Pass PP 70 kV Line"
 line     34582  34851  "1 " 1     0     # line   from  ARCO          70.00  BRKR to (2)   DEVLDNPP      70.00
 line     34851  34853  "1 " 1     0     # line   from  DEVLDNPP      70.00   (2) to (2)   BLUSTNPP      70.00
 line     34853  34855  "1 " 1     0     # line   from  BLUSTNPP      70.00   (2) to (1)   POLPASPP      70.00
#-#-# load     34851  "1 "    0              # load         DEVLDNPP      70.00  LOAD==8.28(1.68)
#-#-# load     34851  "E1"    0              # load         DEVLDNPP      70.00  LOAD==-0.10(0.00)
#-#-# load     34853  "1 "    0              # load         BLUSTNPP      70.00  LOAD==8.28(1.68)
#-#-# load     34853  "E1"    0              # load         BLUSTNPP      70.00  LOAD==-0.10(0.00)
#-#-# load     34855  "1 "    0              # load         POLPASPP      70.00  LOAD==8.28(1.68)
#-#-# load     34855  "E1"    0              # load         POLPASPP      70.00  LOAD==-0.10(0.00)
0

CATB-1759-B2 "Smyrna-Semitropic-Midway 115 kV Line"
 line     34700  34708  "1 " 1     0     # line   from  SMYRNA       115.00  BRKR to (2)   MCKIBBEN     115.00
 line     34708  34742  "1 " 1     0     # line   from  MCKIBBEN     115.00   (2) to (3)   SEMITRPJ     115.00
 line     34742  34704  "1 " 1     0     # line   from  SEMITRPJ     115.00   (3) to BRKR  SEMITRPC     115.00
 line     34742  34746  "1 " 1     0     # line   from  SEMITRPJ     115.00   (3) to (2)   GANSO        115.00
 line     34746  34774  "1 " 1     0     # line   from  GANSO        115.00   (2) to BRKR  MIDWAY      115.00
#-#-# load     34746  "1 "    0              # load         GANSO        115.00  LOAD==9.39(1.34)
#-#-# load     34746  "E1"    0              # load         GANSO        115.00  LOAD==-0.11(0.00)
0

CATB-1760-B2 "Semitropic-S654SS 115 kV Line"
 line     34701  34704  "1 " 1     0     # line   from  SEMI_TAP     115.00   (2) to BRKR  SEMITRPC     115.00
 line     34701  34703  "1 " 1     0     # line   from  SEMI_TAP     115.00   (2) to (2)   SMTRPCWS     115.00
 line     34703  39180  "1 " 1     0     # line   from  SMTRPCWS     115.00   (2) to BRKR  S654SS       115.00
#-#-# load     34703  "1 "    0              # load         SMTRPCWS     115.00  LOAD==13.49(8.00)
#-#-# load     34703  "E1"    0              # load         SMTRPCWS     115.00  LOAD==-0.18(0.00)
0

CATB-1761-B2 "S654SS-Goose Lake 115 kV Line"
 line     34702  39180  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to BRKR  S654SS       115.00
 line     34702  90032  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to (1)   0032-WD      115.00
 line     34702  90191  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to (1)   0191-WD      115.00
#-#-# load     34702  "1 "    0              # load         GOSE LKE     115.00  LOAD==9.03(1.29)
#-#-# load     34702  "2 "    0              # load         GOSE LKE     115.00  LOAD==3.07(0.44)
#-#-# load     34702  "E1"    0              # load         GOSE LKE     115.00  LOAD==-0.05(0.00)
#-#-# load     34702  "E2"    0              # load         GOSE LKE     115.00  LOAD==-0.03(0.00)
#-#-# gen      90032  "FW"    0              # gen          0032-WD      115.00  GEN ==15.00(0.00)
#-#-# gen      90191  "EW"    0              # gen          0191-WD      115.00  GEN ==9.00(0.00)
0

CATB-1762-B2 "Semitropic-Famoso 115 kV Line"
 line     34704  34705  "1 " 1     0     # line   from  SEMITRPC     115.00  BRKR to (2)   WSCOPRSN     115.00
 line     34705  34710  "1 " 1     0     # line   from  WSCOPRSN     115.00   (2) to BRKR  CHARKA       115.00
#-#-# load     34705  "1 "    0              # load         WSCOPRSN     115.00  LOAD==3.83(2.46)
#-#-# load     34705  "E1"    0              # load         WSCOPRSN     115.00  LOAD==-0.08(0.00)
0

CATB-1763-B2 "Semitropic-Midway #1 115 kV Line"
 line     34704  34774  "1 " 1     0     # line   from  SEMITRPC     115.00  BRKR to BRKR  MIDWAY       115.00
0

CATB-1764-B2 "Westpark-Magunden 115 kV Line"
 line     34706  34734  "1 " 1     0     # line   from  WESTPARK     115.00  BRKR to (3)   BEAR TAP     115.00
 line     34734  34732  "1 " 1     0     # line   from  BEAR TAP     115.00   (3) to BRKR  COLUMBUS     115.00
 line     34734  34731  "1 " 1     0     # line   from  BEAR TAP     115.00   (3) to (3)   CALWTRTP     115.00
 line     34731  34729  "1 " 1     0     # line   from  CALWTRTP     115.00   (3) to (1)   CALWATER     115.00
 line     34731  34733  "1 " 1     0     # line   from  CALWTRTP     115.00   (3) to (2)   BEAR MTN     115.00
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 tran     34733  35066  "1 "       0     # tran   from  BEAR MTN     115.00   (2) to (1)   PSE-BEAR       9.11
#-#-# load     34729  "1 "    0              # load         CALWATER     115.00  LOAD==9.53(1.36)
#-#-# load     34729  "E1"    0              # load         CALWATER     115.00  LOAD==-0.14(0.00)
#-#-# gen      35066  "1 "    0              # gen          PSE-BEAR       9.11  GEN ==47.01(5.08)
0

CATB-1765-B2 "Kern PP-Westpark #1 115 kV Line"
 line     34706  34752  "1 " 1     0     # line   from  WESTPARK     115.00  BRKR to BRKR  KERN PWR     115.00
0

CATB-1766-B2 "Kern PP-Westpark #2 115 kV Line"
 line     34706  34752  "2 " 1     0     # line   from  WESTPARK     115.00  BRKR to BRKR  KERN PWR     115.00
0

CATB-1767-B2 "Kern PP-Seventh Standard 115 kV Line"
 line     34709  34752  "1 " 1     0     # line   from  7STNDRD      115.00  BRKR to BRKR  KERN PWR     115.00
0

CATB-1768-B2 "Lerdo-Famoso 115 kV Line"
 line     34712  34784  "1 " 1     0     # line   from  FAMOSO       115.00  BRKR to (2)   CAWELO C     115.00
 line     34784  34715  "1 " 1     0     # line   from  CAWELO C     115.00   (2) to (3)   OGLE JCT     115.00
 line     34715  34713  "1 " 1     0     # line   from  OGLE JCT     115.00   (3) to (3)   OGLE TAP     115.00
 line     34715  34714  "1 " 1     0     # line   from  OGLE JCT     115.00   (3) to BRKR  LERDO        115.00
 tran     34713  35035  "1 "       0     # tran   from  OGLE TAP     115.00   (3) to (1)   ULTR PWR      13.20
 tran     34713  35036  "1 "       0     # tran   from  OGLE TAP     115.00   (3) to (1)   MT POSO       13.80
#-#-# load     34712  "1 "    0              # load         FAMOSO       115.00  LOAD==12.39(1.77)
#-#-# load     34712  "E1"    0              # load         FAMOSO       115.00  LOAD==-0.20(0.00)
#-#-# load     34784  "1 "    0              # load         CAWELO C     115.00  LOAD==4.33(0.62)
#-#-# load     34784  "E1"    0              # load         CAWELO C     115.00  LOAD==-0.05(0.00)
#-#-# load     35036  "ss"    0              # load         MT POSO       13.80  LOAD==3.60(1.74)
#-#-# gen      35035  "1 "    0              # gen          ULTR PWR      13.20  GEN ==35.12(9.87)
#-#-# gen      35036  "1 "    0              # gen          MT POSO       13.80  GEN ==45.22(11.57)
0

CATB-1769-B2 "7th Standard-Lerdo-Kern Oil 115 kV Line"
 line     34714  34716  "1 " 1     0     # line   from  LERDO        115.00  BRKR to (3)   LRDO JCT     115.00
 line     34716  34709  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  7STNDRD     115.00
 line     34716  34718  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  KERN OIL     115.00
0

CATB-1770-B2 "Kern Oil-Dexel 115 kV Line"
 line     34718  34717  "1 " 1     0     # line   from  KERN OIL     115.00  BRKR to (2)   DEXZEL       115.00
 tran     34717  35024  "1 "       0     # tran   from  DEXZEL       115.00   (2) to (1)   DEXEL +       13.80
#-#-# load     35024  "SG"    0              # load         DEXEL +       13.80  LOAD==0.29(0.07)
#-#-# gen      35024  "1 "    0              # gen          DEXEL +       13.80  GEN ==28.25(16.50)
0

CATB-1771-B2 "Kern Oil-Witco 115 kV Line"
 line     34718  34720  "1 " 1     0     # line   from  KERN OIL     115.00  BRKR to (3)   DSCVRYTP     115.00
 line     34720  34721  "1 " 1     0     # line   from  DSCVRYTP     115.00   (3) to (3)   RASMSNTP     115.00
 line     34720  34744  "1 " 1     0     # line   from  DSCVRYTP     115.00   (3) to BRKR  GODN_BER     115.00
 line     34721  34722  "1 " 1     0     # line   from  RASMSNTP     115.00   (3) to (2)   RASMUSEN     115.00
 line     34721  34723  "1 " 1     0     # line   from  RASMSNTP     115.00   (3) to (2)   DISCOVER     115.00
 tran     34722  35046  "1 "       0     # tran   from  RASMUSEN     115.00   (2) to (1)   SEKR           9.11
 tran     34723  35062  "1 "       0     # tran   from  DISCOVER     115.00   (2) to (1)   DISCOVRY      13.80
#-#-# load     34722  "1 "    0              # load         RASMUSEN     115.00  LOAD==6.65(0.95)
#-#-# load     34722  "E1"    0              # load         RASMUSEN     115.00  LOAD==-0.15(0.00)
#-#-# load     35046  "SG"    0              # load         SEKR           9.11  LOAD==1.04(0.26)
#-#-# load     35062  "SG"    0              # load         DISCOVRY      13.80  LOAD==12.61(6.46)
#-#-# gen      35046  "1 "    0              # gen          SEKR           9.11  GEN ==18.04(-7.19)
#-#-# gen      35062  "1 "    0              # gen          DISCOVRY      13.80  GEN ==5.87(22.00)
0

CATB-1772-B2 "Petrol Jct-Kern Oil 115 kV Line"
 line     34719  34718  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to BRKR  KERN OIL     115.00
 line     34719  34782  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to (3)   KRNFRNTT     115.00
 line     34719  34726  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to BRKR  PTRL JCT     115.00
 line     34782  34785  "1 " 1     0     # line   from  KRNFRNTT     115.00   (3) to (1)   KERNFRNT     115.00
 line     34782  34810  "1 " 1     0     # line   from  KRNFRNTT     115.00   (3) to (2)   POSO MT      115.00
 line     34810  34812  "1 " 1     0     # line   from  POSO MT      115.00   (2) to (1)   VEDDER       115.00
#-#-# load     34785  "1 "    0              # load         KERNFRNT     115.00  LOAD==19.00(11.22)
#-#-# load     34810  "1 "    0              # load         POSO MT      115.00  LOAD==10.66(1.52)
#-#-# load     34810  "E1"    0              # load         POSO MT      115.00  LOAD==-0.13(0.00)
#-#-# load     34812  "1 "    0              # load         VEDDER       115.00  LOAD==1.21(0.29)
#-#-# load     34812  "E1"    0              # load         VEDDER       115.00  LOAD==-0.01(0.00)
```

```
0

CATB-1773-B2 "Kern-Magunden-Witco 115 kV Line"
 line     34724  34744  "1 " 1     0     # line   from  KRN OL J     115.00   (2) to BRKR  GODN_BER     115.00
 line     34724  34798  "1 " 1     0     # line   from  KRN OL J     115.00   (2) to (2)   KERNWATR     115.00
 line     34798  34752  "1 " 1     0     # line   from  KERNWATR     115.00   (2) to BRKR  KERN PWR     115.00
#-#-# load     34798  "1 "    0              # load         KERNWATR     115.00  LOAD==4.66(3.62)
#-#-# load     34798  "E1"    0              # load         KERNWATR     115.00  LOAD==-0.11(0.00)
 load      34744  "1 "    0              # Drop Golden Bear Load 1 for Kern-Magunden-Witco 115 kV Line ouage
 load      34744  "E1"    0              # Drop Golden Bear Load E1 for Kern-Magunden-Witco 115 kV Line ouage
0

CATB-1774-B2 "Petrol Jct-Live Oak 115 kV Line"
 line     34726  34728  "1 " 1     0     # line   from  PTRL JCT     115.00  BRKR to BRKR  LIVE OAK     115.00
0

CATB-1775-B2 "S479SS-Smyrna 115 kV Line"
 line     34727  34700  "1 " 1     0     # line   from  S340TP       115.00   (4) to BRKR  SMYRNA       115.00
 line     34727  34745  "1 " 1     0     # line   from  S340TP       115.00   (4) to BRKR  S479SS       115.00
 tran     34727  35000  "1 "       0     # tran   from  S340TP       115.00   (4) to (1)   S340          21.00
 tran     34727  35014  "1 "       0     # tran   from  S340TP       115.00   (4) to (1)   S482          21.00
#-#-# gen      35000  "F "    0              # gen          S340          21.00  GEN ==20.00(0.53)
#-#-# gen      35014  "F "    0              # gen          S482          21.00  GEN ==20.00(2.80)
0

CATB-1776-B2 "Kern-Live Oak 115 kV Line"
 line     34728  34752  "1 " 1     0     # line   from  LIVE OAK     115.00  BRKR to BRKR  KERN PWR     115.00
0

CATB-1777-B2 "Columbus-Magunden 115 kV Line"
 line     34732  34735  "1 " 1     0     # line   from  COLUMBUS     115.00  BRKR to (3)   MAGUDN J     115.00
 line     34735  34736  "1 " 1     0     # line   from  MAGUDN J     115.00   (3) to BRKR  MAGUNDEN     115.00
 line     34735  34738  "1 " 1     0     # line   from  MAGUDN J     115.00   (3) to (1)   BOLTHSE     115.00
#-#-# load     34736  "1 "    0              # load         MAGUNDEN     115.00  LOAD==26.76(3.81)
#-#-# load     34736  "3 "    0              # load         MAGUNDEN     115.00  LOAD==34.71(4.95)
#-#-# load     34736  "E1"    0              # load         MAGUNDEN     115.00  LOAD==-0.36(0.00)
#-#-# load     34736  "E3"    0              # load         MAGUNDEN     115.00  LOAD==-0.29(0.00)
#-#-# load     34738  "1 "    0              # load         BOLTHSE      115.00  LOAD==10.04(8.08)
#-#-# load     34738  "E1"    0              # load         BOLTHSE      115.00  LOAD==-0.12(0.00)
 gen       35066  "1 "    0              # Drop PSE-BEAR for Columbus-Magunden 115 kV line outage
0

CATB-1778-B2 "Kern-Lamont 115 kV Line"
 line     34737  34739  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (1)   GRIMWAY      115.00
 line     34737  34758  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to BRKR  LAMONT       115.00
 line     34737  34807  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (3)   ARVINJ2      115.00
 line     34807  34741  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (2)   STCKDLJ      115.00
 line     34807  34806  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (1)   ARVIN_ED     115.00
 line     34741  34755  "1 " 1     0     # line   from  STCKDLJ      115.00   (2) to (3)   TEVISJ2      115.00
 line     34755  34752  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to BRKR  KERN PWR     115.00
 line     34755  34757  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to (1)   TEVIS2       115.00
#-#-# load     34739  "1 "    0              # load         GRIMWAY      115.00  LOAD==13.58(8.59)
#-#-# load     34739  "E1"    0              # load         GRIMWAY      115.00  LOAD==-0.07(0.00)
#-#-# load     34806  "1 "    0              # load         ARVIN_ED     115.00  LOAD==24.00(6.01)
#-#-# load     34806  "E1"    0              # load         ARVIN_ED     115.00  LOAD==-0.30(0.00)
#-#-# load     34757  "2 "    0              # load         TEVIS2       115.00  LOAD==28.22(4.02)
#-#-# load     34757  "E2"    0              # load         TEVIS2       115.00  LOAD==-0.36(0.00)
 line      34757  34754  "1 " 1      1    # Switches in Tevis CB 116 to transfer load 2
 #-#-# load      34757  "2 "    1              # Restore Load 2 at Tevis 2
 #-#-# load      34757  "E2"    1              # Restore Load E2 at Tevis 2
0

CATB-1779-B2 "S479SS-S479 115 kV Line"
 line     34745  34747  "1 " 1     0     # line   from  S479SS       115.00  BRKR to (3)   S479         115.00
 line     34747  34748  "1 " 1     0     # line   from  S479         115.00   (3) to BRKR  2C557        115.00
 tran     34747  35013  "1 "       0     # tran   from  S479         115.00   (3) to (1)   S479          21.00
#-#-# gen      35013  "F "    0              # gen          S479          21.00  GEN ==20.00(-1.89)
0

CATB-1780-B2 "Midway-Tupman-Renfro 115 kV Line"
 line     34749  34750  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to BRKR  TUPMAN       115.00
 line     34749  34761  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to (2)   RNFROTP1     115.00
 line     34749  34774  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to BRKR  MIDWAY       115.00
 line     34761  34762  "1 " 1     0     # line   from  RNFROTP1     115.00   (2) to BRKR  RENFRO       115.00
#-#-# load     34762  "1 "    0              # load         RENFRO       115.00  LOAD==26.67(3.80)
```

```
#-#-# load     34762  "E1"    0              # load         RENFRO       115.00  LOAD==-0.33(0.00)
 line      34762  34767  "1 " 1      1    # Switches in Renfro CB 136
 #-#-# load      34762  "1 "    1              # Restore Load 1 at Renfro
 #-#-# load      34762  "E1"    1              # Restore Load E1 at Renfro
0

CATB-1781-B2 "Tupman-Norco 115 kV Line"
 line     34750  34787  "1 " 1     0     # line   from  TUPMAN       115.00  BRKR to (3)   NORCO_TA     115.00
 line     34787  34790  "1 " 1     0     # line   from  NORCO_TA     115.00   (3) to (1)   INERGY       115.00
 line     34787  34788  "1 " 1     0     # line   from  NORCO_TA     115.00   (3) to (1)   NORCO        115.00
#-#-# load     34790  "1 "    0              # load         INERGY       115.00  LOAD==6.19(4.64)
#-#-# load     34790  "E1"    0              # load         INERGY       115.00  LOAD==-0.09(0.00)
#-#-# load     34788  "1 "    0              # load         NORCO        115.00  LOAD==2.21(0.32)
#-#-# load     34788  "E1"    0              # load         NORCO        115.00  LOAD==-0.11(0.00)
0

CATB-1782-B2 "Midway-Tupman-Renfro-Rio Bravo 115 kV Line"
 line     34751  34750  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to BRKR  TUPMAN       115.00
 line     34751  34775  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to (3)   RENFRJCT     115.00
 line     34751  34813  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to (3)   FRTLYTP      115.00
 line     34775  34760  "1 " 1     0     # line   from  RENFRJCT     115.00   (3) to BRKR  RIO BRVO     115.00
 line     34775  34763  "1 " 1     0     # line   from  RENFRJCT     115.00   (3) to (2)   RNFROTP2     115.00
 line     34763  34767  "1 " 1     0     # line   from  RNFROTP2     115.00   (2) to (1)   RENFRO2      115.00
 line     34813  34811  "1 " 1     0     # line   from  FRTLYTP      115.00   (3) to (2)   RIOBRVTM     115.00
 line     34813  34814  "1 " 1     0     # line   from  FRTLYTP      115.00   (3) to (3)   FRITO LY     115.00
 line     34811  34774  "1 " 1     0     # line   from  RIOBRVTM     115.00   (2) to BRKR  MIDWAY      115.00
 line     34814  34815  "1 " 1     0     # line   from  FRITO LY     115.00   (3) to (1)   WESTPLAT     115.00
 tran     34814  35048  "1 "       0     # tran   from  FRITO LY     115.00   (3) to (1)   FRITOLAY       9.11
#-#-# load     34767  "2 "    0              # load         RENFRO2      115.00  LOAD==13.38(1.90)
#-#-# load     34767  "E2"    0              # load         RENFRO2      115.00  LOAD==-0.42(0.00)
#-#-# load     34811  "1 "    0              # load         RIOBRVTM     115.00  LOAD==4.60(3.92)
#-#-# load     34811  "E1"    0              # load         RIOBRVTM     115.00  LOAD==-0.10(0.00)
#-#-# load     34815  "1 "    0              # load         WESTPLAT     115.00  LOAD==5.12(4.11)
#-#-# load     34815  "E1"    0              # load         WESTPLAT     115.00  LOAD==-0.06(0.00)
#-#-# load     35048  "SG"    0              # load         FRITOLAY       9.11  LOAD==2.42(0.97)
#-#-# gen      35048  "1 "    0              # gen          FRITOLAY       9.11  GEN ==0.09(-2.50)
 line      34762  34767  "1 " 1      1    # Switches in Renfro CB 136 to transfer load No. 2
 #-#-# load      34767  "2 "    1              # Restore Load 2 at Renfro 2
 #-#-# load      34767  "E2"    1              # Restore Load E2 at Renfro 2
0

CATB-1783-B2 "Kern-Stockdale 115 kV Line"
 line     34752  34753  "1 " 1     0     # line   from  KERN PWR     115.00  BRKR to (3)   TEVISJ1      115.00
 line     34753  34740  "1 " 1     0     # line   from  TEVISJ1      115.00   (3) to BRKR  STOCKDLE     115.00
 line     34753  34754  "1 " 1     0     # line   from  TEVISJ1      115.00   (3) to (1)   TEVIS        115.00
#-#-# load     34740  "1 "    0              # load         STOCKDLE     115.00  LOAD==20.20(2.88)
#-#-# load     34740  "E1"    0              # load         STOCKDLE     115.00  LOAD==-0.23(0.00)
#-#-# load     34754  "1 "    0              # load         TEVIS        115.00  LOAD==28.73(4.10)
#-#-# load     34754  "E1"    0              # load         TEVIS        115.00  LOAD==-0.33(0.00)
 line      34757  34754  "1 " 1      1    # Switches in Tevis CB 116 to transfer load 1
 #-#-# load      34754  "1 "    1              # Restore Load 1 at Tevis
 #-#-# load      34754  "E1"    1              # Restore Load 1 at Tevis
0

CATB-1784-B2 "Kern-Rosedale 115 kV Line"
 line     34752  34808  "1 " 1     0     # line   from  KERN PWR     115.00  BRKR to (2)   ROSEDAL      115.00
 line     34808  34809  "1 " 1     0     # line   from  ROSEDAL      115.00   (2) to (1)   TX_ROSDL     115.00
#-#-# load     34808  "1 "    0              # load         ROSEDAL      115.00  LOAD==20.74(2.96)
#-#-# load     34808  "E1"    0              # load         ROSEDAL      115.00  LOAD==-0.25(0.00)
#-#-# load     34809  "1 "    0              # load         TX_ROSDL     115.00  LOAD==5.94(1.49)
#-#-# load     34809  "E1"    0              # load         TX_ROSDL     115.00  LOAD==-0.28(0.00)
0

CATB-1785-B2 "Wheeler Ridge-Lamont 115 kV Line"
 line     34758  34805  "1 " 1     0     # line   from  LAMONT       115.00  BRKR to (2)   ARVINJ1      115.00
 line     34805  34764  "1 " 1     0     # line   from  ARVINJ1      115.00   (2) to BRKR  S622BSS      115.00
0

CATB-1786-B2 "Shafter-Rio Bravo 115 kV Line"
 line     34760  34766  "1 " 1     0     # line   from  RIO BRVO     115.00  BRKR to BRKR  SHAFTER      115.00
0

CATB-1787-B2 "Midway-Shafter 115 kV Line"
 line     34766  34774  "1 " 1     0     # line   from  SHAFTER      115.00  BRKR to BRKR  MIDWAY       115.00
0
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CATB-1788-B2 "2C559-Lamont 115 kV Line"
 line     34771  34758  "1 " 1     0     # line   from  2C559        115.00   (2) to BRKR  LAMONT       115.00
 tran     34771  35016  "1 "       0     # tran   from  2C559        115.00   (2) to (2)   2C559EQ1      34.50
 line     35016  35017  "1 " 1     0     # line   from  2C559EQ1      34.50   (2) to (2)   2C559EQ2      34.50
 tran     35017  35019  "1 "       0     # tran   from  2C559EQ2      34.50   (2) to (1)   2C559          0.48
#-#-# gen      35019  "F "    0              # gen          2C559          0.48  GEN ==67.50(8.07)
0

CATB-1789-B2 "Midway-6C0966SS 115 kV Line"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   CYMRIC       115.00
 line     34780  39288  "1 " 1     0     # line   from  CYMRIC       115.00   (3) to BRKR  6C0966SS     115.00
 tran     34780  35032  "1 "       0     # tran   from  CYMRIC       115.00   (3) to (1)   CHV-CYMR       9.11
#-#-# load     35032  "SG"    0              # load         CHV-CYMR       9.11  LOAD==3.09(0.44)
#-#-# gen      35032  "1 "    0              # gen          CHV-CYMR       9.11  GEN ==6.81(-1.77)
0

CATB-1790-B2 "6C0966SS-Midsun 115 kV Line"
 line     34781  34779  "1 " 1     0     # line   from  TEXCO_NM     115.00   (4) to BRKR  MIDSUN       115.00
 line     34781  39288  "1 " 1     0     # line   from  TEXCO_NM     115.00   (4) to BRKR  6C0966SS     115.00
 tran     34781  34783  "1 "       0     # tran   from  TEXCO_NM     115.00   (4) to (2)   TEXCO_NM       9.11
 tran     34781  34783  "2 "       0     # tran   from  TEXCO_NM     115.00   (4) to (2)   TEXCO_NM       9.11
#-#-# load     34781  "1 "    0              # load         TEXCO_NM     115.00  LOAD==15.00(9.02)
#-#-# gen      34783  "1 "    0              # gen          TEXCO_NM       9.11  GEN ==4.12(-3.60)
#-#-# gen      34783  "2 "    0              # gen          TEXCO_NM       9.11  GEN ==0.01(-3.00)
0

CATB-1791-B2 "Midway-Taft 115 kV Line"
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   OXYBVHTP     115.00
 line     39145  34776  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to BRKR  TAFT         115.00
 line     39145  39146  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to (1)   OXYBVH       115.00
#-#-# load     39146  "1 "    0              # load         OXYBVH       115.00  LOAD==30.00(22.50)
#-#-# load     39146  "E1"    0              # load         OXYBVH       115.00  LOAD==-0.89(0.00)
0

CATB-1792-B2 "Taft-Chalk Cliff 115 kV Line"
 line     34776  34786  "1 " 1     0     # line   from  TAFT         115.00  BRKR to (3)   UNIVRSTY     115.00
 tran     34786  35037  "1 "       0     # tran   from  UNIVRSTY     115.00   (3) to (1)   UNIVRSTY       9.11
 tran     34786  35038  "1 "       0     # tran   from  UNIVRSTY     115.00   (3) to (1)   CHLKCLF+       9.11
#-#-# load     35038  "SG"    0              # load         CHLKCLF+       9.11  LOAD==0.52(0.13)
#-#-# gen      35037  "1 "    0              # gen          UNIVRSTY       9.11  GEN ==35.85(8.00)
#-#-# gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==44.58(24.00)
0

CATB-1793-B2 "Fellows-Taft 115 kV Line"
 line     34777  34800  "1 " 1     0     # line   from  FELLOWSG     115.00  BRKR to (2)   MORGAN       115.00
 line     34800  34802  "1 " 1     0     # line   from  MORGAN       115.00   (2) to (3)   MIDSET       115.00
 line     34802  34776  "1 " 1     0     # line   from  MIDSET       115.00   (3) to BRKR  TAFT         115.00
 tran     34802  35044  "1 "       0     # tran   from  MIDSET       115.00   (3) to (1)   TX MIDST       9.11
#-#-# load     34800  "1 "    0              # load         MORGAN       115.00  LOAD==1.05(1.68)
#-#-# load     34800  "E1"    0              # load         MORGAN       115.00  LOAD==-0.01(0.00)
#-#-# load     34802  "SG"    0              # load         MIDSET       115.00  LOAD==0.52(0.25)
#-#-# gen      35044  "1 "    0              # gen          TX MIDST       9.11  GEN ==35.00(-3.21)
0

CATB-1794-B2 "Fellows-Midsun 115 kV Line"
 line     34779  34777  "1 " 1     0     # line   from  MIDSUN       115.00  BRKR to BRKR  FELLOWSG     115.00
0

CATB-1795-B2 "Temblor-Kernridge 115 kV Line"
 line     34792  34794  "1 " 1     0     # line   from  KERNRDGE     115.00   (3) to BRKR  TEMBLOR      115.00
 tran     34792  34793  "1 "       0     # tran   from  KERNRDGE     115.00   (3) to (2)   TX-LOST       69.00
 tran     34792  35040  "1 "       0     # tran   from  KERNRDGE     115.00   (3) to (1)   KERNRDGE       9.11
 tran     34793  35056  "1 "       0     # tran   from  TX-LOST       69.00   (2) to (1)   TX-LOSTH       4.16
#-#-# load     34792  "SG"    0              # load         KERNRDGE     115.00  LOAD==50.90(10.34)
#-#-# gen      35040  "1 "    0              # gen          KERNRDGE       9.11  GEN ==45.00(-8.00)
#-#-# gen      35040  "2 "    0              # gen          KERNRDGE       9.11  GEN ==8.00(-3.30)
#-#-# gen      35056  "1 "    0              # gen          TX-LOSTH       4.16  GEN ==6.11(0.99)
0

CATB-1796-B2 "Temblor-PSE McKittrick 115 kV Line"
 line     34794  34223  "1 " 1     0     # line   from  TEMBLOR      115.00  BRKR to (2)   PSE MCKT     115.00
 tran     34223  35060  "1 "       0     # tran   from  PSE MCKT     115.00   (2) to (1)   PSEMCKIT       9.11
#-#-# load     35060  "SG"    0              # load         PSEMCKIT       9.11  LOAD==0.52(0.12)
#-#-# gen      35060  "1 "    0              # gen          PSEMCKIT       9.11  GEN ==45.29(16.62)
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0

CATB-1797-B2 "Temblor-San Luis Obispo 115 kV Line"
 line     34794  34796  "1 " 1     0     # line   from  TEMBLOR      115.00  BRKR to (2)   CARRIZO      115.00
 line     34796  36254  "1 " 1     0     # line   from  CARRIZO      115.00   (2) to BRKR  SN LS OB     115.00
#-#-# load     34796  "1 "    0              # load         CARRIZO      115.00  LOAD==0.66(0.10)
#-#-# load     34796  "E1"    0              # load         CARRIZO      115.00  LOAD==-0.01(0.00)
0

CATB-1798-B2 "Carneras-Taft 70 kV Line"
 line     34852  34947  "1 " 1     0     # line   from  CARNERAS      70.00  BRKR to (2)   CELERON       70.00
 line     34947  34946  "1 " 1     0     # line   from  CELERON       70.00   (2) to (2)   KNG_ELIS      70.00
 line     34946  34870  "1 " 1     0     # line   from  KNG_ELIS      70.00   (2) to (2)   TEMBLOR       70.00
 line     34870  34854  "1 " 1     0     # line   from  TEMBLOR       70.00   (2) to (2)   MCKTTRCK      70.00
 line     34854  34856  "1 " 1     0     # line   from  MCKTTRCK      70.00   (2) to (2)   NORTHMWY      70.00
 line     34856  34858  "1 " 1     0     # line   from  NORTHMWY      70.00   (2) to (2)   MDWY_P_S      70.00
 line     34858  34860  "1 " 1     0     # line   from  MDWY_P_S      70.00   (2) to BRKR  TAFT A        70.00
#-#-# load     34852  "1 "    0              # load         CARNERAS      70.00  LOAD==7.20(1.03)
#-#-# load     34852  "E1"    0              # load         CARNERAS      70.00  LOAD==-0.12(0.00)
#-#-# load     34947  "EE"    0              # load         CELERON       70.00  LOAD==-0.02(0.00)
#-#-# load     34947  "EP"    0              # load         CELERON       70.00  LOAD==-0.01(0.00)
#-#-# load     34947  "EX"    0              # load         CELERON       70.00  LOAD==2.67(0.78)
#-#-# load     34947  "PM"    0              # load         CELERON       70.00  LOAD==1.15(0.75)
#-#-# load     34854  "1 "    0              # load         MCKTTRCK      70.00  LOAD==7.92(1.13)
#-#-# load     34858  "1 "    0              # load         MDWY_P_S      70.00  LOAD==1.08(0.62)
#-#-# load     34858  "E1"    0              # load         MDWY_P_S      70.00  LOAD==-0.02(0.00)
 line 34850 34852 "1 " 1 1      # Close Carneras CB 32 for Carneras-Taft 70 kV Line Outage
 #-#-# load 34852 "1 " 1             # Restore Carneras load 1 for Carneras-Taft 70 kV Line Outage
 #-#-# load 34852 "E1" 1             # Restore Carneras load E1 for Carneras-Taft 70 kV Line Outage
0

CATB-1799-B2 "Taft-Maricopa 70 kV Line"
 line     34860  34861  "1 " 1     0     # line   from  TAFT A        70.00  BRKR to (3)   TAFT A_J      70.00
 line     34861  34863  "1 " 1     0     # line   from  TAFT A_J      70.00   (3) to (4)   MOCO_JCT      70.00
 line     34861  34865  "1 " 1     0     # line   from  TAFT A_J      70.00   (3) to (2)   BRY_PTLM      70.00
 line     34863  34862  "1 " 1     0     # line   from  MOCO_JCT      70.00   (4) to BRKR  MARICOPA      70.00
 line     34863  34915  "1 " 1     0     # line   from  MOCO_JCT      70.00   (4) to (1)   MOCO          70.00
 line     34863  34916  "1 " 1     0     # line   from  MOCO_JCT      70.00   (4) to BRKR  CADET        70.00
 line     34865  35051  "1 " 1     0     # line   from  BRY_PTLM      70.00   (2) to (2)   SLR_TANH      70.00
 tran     35051  35050  "1 "       0     # tran   from  SLR_TANH      70.00   (2) to (1)   SLR-TANN       9.11
#-#-# load     34865  "1 "    0              # load         BRY_PTLM      70.00  LOAD==3.11(0.78)
#-#-# load     34865  "E1"    0              # load         BRY_PTLM      70.00  LOAD==-0.05(0.00)
#-#-# load     34915  "1 "    0              # load         MOCO          70.00  LOAD==8.12(7.49)
#-#-# load     34915  "E1"    0              # load         MOCO          70.00  LOAD==-0.11(0.00)
#-#-# load     35050  "SG"    0              # load         SLR-TANN       9.11  LOAD==2.84(6.03)
#-#-# gen      35050  "1 "    0              # gen          SLR-TANN       9.11  GEN ==9.50(8.50)
0

CATB-1800-B2 "Taft-Elk Hills 70 kV Line"
 line     34860  34919  "1 " 1     0     # line   from  TAFT A        70.00  BRKR to (2)   TX_BV_HL      70.00
 line     34919  34920  "1 " 1     0     # line   from  TX_BV_HL      70.00   (2) to (2)   ELK HLLS      70.00
 line     34920  90046  "1 " 1     0     # line   from  ELK HLLS      70.00   (2) to (1)   0046-WD       70.00
#-#-# load     34919  "1 "    0              # load         TX_BV_HL      70.00  LOAD==6.47(0.71)
#-#-# load     34919  "E1"    0              # load         TX_BV_HL      70.00  LOAD==-0.03(0.00)
#-#-# load     34920  "1 "    0              # load         ELK HLLS      70.00  LOAD==3.51(0.50)
#-#-# load     34920  "E1"    0              # load         ELK HLLS      70.00  LOAD==-0.05(0.00)
#-#-# gen      90046  "FW"    0              # gen          0046-WD       70.00  GEN ==7.00(0.00)
0

CATB-1801-B2 "Taft-Cuyama #2 70 kV Line"
 line     34860  34935  "1 " 1     0     # line   from  TAFT A        70.00  BRKR to (1)   CUYAMA2       70.00
#-#-# load     34935  "2 "    0              # load         CUYAMA2       70.00  LOAD==10.36(1.47)
#-#-# load     34935  "E2"    0              # load         CUYAMA2       70.00  LOAD==-0.06(0.00)
0

CATB-1802-B2 "Taft-Cuyama #1 70 kV Line"
 line     34860  34943  "1 " 1     0     # line   from  TAFT A        70.00  BRKR to (3)   T356TAP       70.00
 line     34943  34936  "1 " 1     0     # line   from  T356TAP       70.00   (3) to (1)   CUYAMA        70.00
 line     34943  34945  "1 " 1     0     # line   from  T356TAP       70.00   (3) to (2)   T356          70.00
 tran     34945  35011  "1 "       0     # tran   from  T356          70.00   (2) to (1)   T356          34.50
#-#-# load     34936  "1 "    0              # load         CUYAMA        70.00  LOAD==9.49(1.35)
#-#-# load     34936  "E1"    0              # load         CUYAMA        70.00  LOAD==-0.08(0.00)
#-#-# gen      35011  "1 "    0              # gen          T356          34.50  GEN ==40.00(-4.65)
0
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CATB-1803-B2 "Maricopa-Copus 70 kV Line"
 line     34862  34867  "1 " 1     0     # line   from  MARICOPA      70.00  BRKR to (3)   GARDNR T      70.00
 line     34867  34864  "1 " 1     0     # line   from  GARDNR T      70.00   (3) to (1)   GARDNER       70.00
 line     34867  34875  "1 " 1     0     # line   from  GARDNR T      70.00   (3) to (3)   S620TP        70.00
 line     34875  34139  "1 " 1     0     # line   from  S620TP        70.00   (3) to (2)   BSCSCH T      70.00
 line     34875  34877  "1 " 1     0     # line   from  S620TP        70.00   (3) to (2)   S620          70.00
 line     34139  34866  "1 " 1     0     # line   from  BSCSCH T      70.00   (2) to (1)   BSCL_PLD      70.00
 tran     34877  35009  "1 "       0     # tran   from  S620          70.00   (2) to (1)   S620          34.50
#-#-# load     34864  "1 "    0              # load         GARDNER       70.00  LOAD==1.25(0.79)
#-#-# load     34864  "E1"    0              # load         GARDNER       70.00  LOAD==-0.02(0.00)
#-#-# load     34866  "1 "    0              # load         BSCL_PLD      70.00  LOAD==0.79(0.66)
#-#-# load     34866  "E1"    0              # load         BSCL_PLD      70.00  LOAD==-0.01(0.00)
#-#-# gen      35009  "F "    0              # gen          S620          34.50  GEN ==20.00(-2.26)
0

CATB-1804-B2 "Copus-Lakeview 70 kV Line"
 line     34868  39198  "1 " 1     0     # line   from  COPUS         70.00   (2) to (3)   S653EATP      70.00
 line     39198  34882  "1 " 1     0     # line   from  S653EATP      70.00   (3) to (2)   SAN EMDO      70.00
 line     39198  39199  "1 " 1     0     # line   from  S653EATP      70.00   (3) to (2)   S653EA        70.00
 line     34882  34872  "1 " 1     0     # line   from  SAN EMDO      70.00   (2) to BRKR  LAKEVIEW      70.00
 tran     39199  39200  "1 "       0     # tran   from  S653EA        70.00   (2) to (2)   S653EA        34.50
 tran     39200  39201  "1 "       0     # tran   from  S653EA        34.50   (2) to (1)   S653EA         0.48
#-#-# load     34868  "1 "    0              # load         COPUS         70.00  LOAD==3.56(0.51)
#-#-# load     34868  "2 "    0              # load         COPUS         70.00  LOAD==6.79(0.96)
#-#-# load     34868  "E1"    0              # load         COPUS         70.00  LOAD==-0.04(0.00)
#-#-# load     34868  "E2"    0              # load         COPUS         70.00  LOAD==-0.06(0.00)
#-#-# gen      39201  "ET"    0              # gen          S653EA         0.48  GEN ==20.00(-0.12)
0

CATB-1805-B2 "Arco-S514 70 kV Line"
 line     34871  34582  "1 " 1     0     # line   from  S514          70.00   (2) to BRKR  ARCO          70.00
 tran     34871  35069  "1 "       0     # tran   from  S514          70.00   (2) to (1)   S514          34.50
#-#-# gen      35069  "E "    0              # gen          S514          34.50  GEN ==20.00(0.80)
0

CATB-1806-B2 "Wheeler Ridge-Lakeview 70 kV Line"
 line     34872  34954  "1 " 1     0     # line   from  LAKEVIEW      70.00  BRKR to (3)   EMDO JCT      70.00
 line     34954  34874  "1 " 1     0     # line   from  EMDO JCT      70.00   (3) to BRKR  WHEELER       70.00
 line     34954  34939  "1 " 1     0     # line   from  EMDO JCT      70.00   (3) to (2)   VALPREDO      70.00
 line     34939  34938  "1 " 1     0     # line   from  VALPREDO      70.00   (2) to (2)   3EMIDIO       70.00
 line     34938  34958  "1 " 1     0     # line   from  3EMIDIO       70.00   (2) to (1)   KELLEY        70.00
#-#-# load     34938  "EE"    0              # load         3EMIDIO       70.00  LOAD==-0.01(0.00)
#-#-# load     34938  "EM"    0              # load         3EMIDIO       70.00  LOAD==-0.03(0.00)
#-#-# load     34938  "EP"    0              # load         3EMIDIO       70.00  LOAD==-0.02(0.00)
#-#-# load     34938  "EQ"    0              # load         3EMIDIO       70.00  LOAD==0.49(0.33)
#-#-# load     34938  "MO"    0              # load         3EMIDIO       70.00  LOAD==2.05(1.22)
#-#-# load     34938  "PP"    0              # load         3EMIDIO       70.00  LOAD==3.30(1.27)
#-#-# load     34958  "1 "    0              # load         KELLEY        70.00  LOAD==3.53(1.73)
#-#-# load     34958  "E1"    0              # load         KELLEY        70.00  LOAD==-0.03(0.00)
0

CATB-1807-B2 "S620A-Lakeview 70 kV Line"
 line     34872  39018  "1 " 1     0     # line   from  LAKEVIEW      70.00  BRKR to (2)   S620A         70.00
 tran     39018  39019  "1 "       0     # tran   from  S620A         70.00   (2) to (2)   S620A         34.50
 tran     39019  39020  "1 "       0     # tran   from  S620A         34.50   (2) to (1)   S620A          0.42
#-#-# gen      39020  "E "    0              # gen          S620A          0.42  GEN ==20.00(1.35)
0

CATB-1808-B2 "Wheeler Ridge-Tejon 70 kV Line"
 line     34874  34143  "1 " 1     0     # line   from  WHEELER       70.00  BRKR to (3)   TECUYA T      70.00
 line     34143  34876  "1 " 1     0     # line   from  TECUYA T      70.00   (3) to BRKR  TEJON         70.00
 line     34143  34944  "1 " 1     0     # line   from  TECUYA T      70.00   (3) to (1)   TECUYA        70.00
#-#-# load     34944  "1 "    0              # load         TECUYA        70.00  LOAD==3.13(1.62)
#-#-# load     34944  "E1"    0              # load         TECUYA        70.00  LOAD==-0.03(0.00)
0

CATB-1809-B2 "Wheeler Ridge-San Bernard 70 kV Line"
 line     34874  34880  "1 " 1     0     # line   from  WHEELER       70.00  BRKR to BRKR  SN BRNRD      70.00
0

CATB-1810-B2 "Wheeler Ridge-S645ASS 70 kV Line"
 line     34874  39191  "1 " 1     0     # line   from  WHEELER       70.00  BRKR to BRKR  S645ASS       70.00
0

CATB-1811-B2 "San Bernard-Tejon 70 kV Line"
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 line     34876  34880  "1 " 1     0     # line   from  TEJON         70.00  BRKR to BRKR  SN BRNRD      70.00
0

CATB-1812-B2 "Tejon-Lebec 70 kV Line"
 line     34876  34940  "1 " 1     0     # line   from  TEJON         70.00  BRKR to (2)   ROSE          70.00
 line     34940  34941  "1 " 1     0     # line   from  ROSE          70.00   (2) to (2)   PACI_PIP      70.00
 line     34941  34948  "1 " 1     0     # line   from  PACI_PIP      70.00   (2) to (2)   GRAPEVNE      70.00
 line     34948  34956  "1 " 1     0     # line   from  GRAPEVNE      70.00   (2) to (2)   CASTAC        70.00
 line     34956  34952  "1 " 1     0     # line   from  CASTAC        70.00   (2) to (1)   LEBEC         70.00
#-#-# load     34940  "1 "    0              # load         ROSE          70.00  LOAD==0.56(0.59)
#-#-# load     34940  "E1"    0              # load         ROSE          70.00  LOAD==-0.01(0.00)
#-#-# load     34941  "1 "    0              # load         PACI_PIP      70.00  LOAD==2.96(0.86)
#-#-# load     34941  "E1"    0              # load         PACI_PIP      70.00  LOAD==-0.03(0.00)
#-#-# load     34948  "1 "    0              # load         GRAPEVNE      70.00  LOAD==1.09(0.66)
#-#-# load     34948  "E1"    0              # load         GRAPEVNE      70.00  LOAD==-0.01(0.00)
#-#-# load     34956  "1 "    0              # load         CASTAC        70.00  LOAD==1.41(0.20)
#-#-# load     34956  "E1"    0              # load         CASTAC        70.00  LOAD==-0.02(0.00)
#-#-# load     34952  "1 "    0              # load         LEBEC         70.00  LOAD==2.29(1.31)
#-#-# load     34952  "E1"    0              # load         LEBEC         70.00  LOAD==-0.03(0.00)
0

CATB-1813-B2 "Weedpatch-San Bernard 70 kV Line"
 line     34880  34951  "1 " 1     0     # line   from  SN BRNRD      70.00  BRKR to (3)   STALIONJ      70.00
 line     34951  34950  "1 " 1     0     # line   from  STALIONJ      70.00   (3) to (1)   STALLION      70.00
 line     34951  39021  "1 " 1     0     # line   from  STALIONJ      70.00   (3) to (3)   S621ATP       70.00
 line     39021  34888  "1 " 1     0     # line   from  S621ATP       70.00   (3) to (1)   ARVIN         70.00
 line     39021  39022  "1 " 1     0     # line   from  S621ATP       70.00   (3) to (2)   S621A         70.00
 tran     39022  39023  "1 "       0     # tran   from  S621A         70.00   (2) to (2)   S621AC1       34.50
 line     39023  39024  "1 " 1     0     # line   from  S621AC1       34.50   (2) to (2)   S621AC2       34.50
 tran     39024  39025  "1 "       0     # tran   from  S621AC2       34.50   (2) to (1)   S621A          0.44
#-#-# load     34888  "1 "    0              # load         ARVIN         70.00  LOAD==6.13(0.87)
#-#-# load     34888  "E1"    0              # load         ARVIN         70.00  LOAD==-0.06(0.00)
#-#-# gen      39025  "F "    0              # gen          S621A          0.44  GEN ==20.00(-0.41)
0

CATB-1814-B2 "Kern Canyon-Magunden-Weedpatch 70 kV Line"
 line     34890  34886  "1 " 1     0     # line   from  WEEDPTCH      70.00  BRKR to (2)   MAGNDN J      70.00
 line     34886  34896  "1 " 1     0     # line   from  MAGNDN J      70.00   (2) to (3)   RIOBRVQF      70.00
 line     34896  34894  "1 " 1     0     # line   from  RIOBRVQF      70.00   (3) to (2)   KRN CNYN      70.00
 tran     34896  35020  "1 "       0     # tran   from  RIOBRVQF      70.00   (3) to (1)   RIOBRAVO       9.11
 tran     34894  35018  "1 "       0     # tran   from  KRN CNYN      70.00   (2) to (1)   KERNCNYN       9.11
#-#-# gen      35020  "1 "    0              # gen          RIOBRAVO       9.11  GEN ==8.43(3.00)
#-#-# gen      35018  "1 "    0              # gen          KERNCNYN       9.11  GEN ==5.99(2.76)
0

CATB-1815-B2 "Kern-Magunden 70 kV Line"
 line     34897  34918  "1 " 1     0     # line   from  FRUITTAP      70.00   (2) to BRKR  KERN PW2      70.00
 line     34897  34898  "1 " 1     0     # line   from  FRUITTAP      70.00   (2) to (3)   BAKRSFLD      70.00
 line     34898  34899  "1 " 1     0     # line   from  BAKRSFLD      70.00   (3) to (2)   EISENTP       70.00
 line     34898  34902  "1 " 1     0     # line   from  BAKRSFLD      70.00   (3) to BRKR  MAGUNDEN      70.00
 line     34899  34900  "1 " 1     0     # line   from  EISENTP       70.00   (2) to (1)   EISEN         70.00
#-#-# load     34900  "1 "    0              # load         EISEN         70.00  LOAD==6.38(5.07)
#-#-# load     34900  "E1"    0              # load         EISEN         70.00  LOAD==-0.08(0.00)
0

CATB-1816-B2 "Kern-Old River #1 70 kV Line"
 line     34904  34975  "1 " 1     0     # line   from  OLD RIVR      70.00  BRKR to (3)   S517TP        70.00
 line     34975  34914  "1 " 1     0     # line   from  S517TP        70.00   (3) to BRKR  KERN PW1      70.00
 line     34975  34976  "1 " 1     0     # line   from  S517TP        70.00   (3) to (2)   S517          70.00
 tran     34976  35091  "1 "       0     # tran   from  S517          70.00   (2) to (1)   S517          12.47
#-#-# gen      35091  "F "    0              # gen          S517          12.47  GEN ==20.00(-2.67)
0

CATB-1817-B2 "Panama-Old River #2 70 kV Line"
 line     34905  34904  "1 " 1     0     # line   from  UNIONJCT      70.00   (2) to BRKR  OLD RIVR      70.00
 line     34905  34906  "1 " 1     0     # line   from  UNIONJCT      70.00   (2) to BRKR  PANAMA        70.00
0

CATB-1818-B2 "Kern-Fruitvale 70 kV Line"
 line     34914  34911  "1 " 1     0     # line   from  KERN PW1      70.00  BRKR to (1)   FRUITVLE      70.00
#-#-# load     34911  "1 "    0              # load         FRUITVLE      70.00  LOAD==7.76(1.11)
#-#-# load     34911  "2 "    0              # load         FRUITVLE      70.00  LOAD==20.66(2.95)
#-#-# load     34911  "E1"    0              # load         FRUITVLE      70.00  LOAD==-0.10(0.00)
#-#-# load     34911  "E2"    0              # load         FRUITVLE      70.00  LOAD==-0.22(0.00)
0
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CATB-1819-B2 "Kern-Kern Oil-Famoso 70 kV Line"
 line     34918  34922  "1 " 1     0     # line   from  KERN PW2      70.00  BRKR to (2)   KRN OL J      70.00
 line     34922  34131  "1 " 1     0     # line   from  KRN OL J      70.00   (2) to (3)   CAWLOB T      70.00
 line     34131  34926  "1 " 1     0     # line   from  CAWLOB T      70.00   (3) to BRKR  FAMOSO        70.00
 line     34131  34928  "1 " 1     0     # line   from  CAWLOB T      70.00   (3) to (1)   CAWELO B      70.00
#-#-# load     34928  "1 "    0              # load         CAWELO B      70.00  LOAD==2.54(1.23)
#-#-# load     34928  "E1"    0              # load         CAWELO B      70.00  LOAD==-0.03(0.00)
0

CATB-1820-B2 "Wasco-Famoso 70 kV Line"
 line     34926  34129  "1 " 1     0     # line   from  FAMOSO        70.00  BRKR to (2)   MCFRLD T      70.00
 line     34129  34930  "1 " 1     0     # line   from  MCFRLD T      70.00   (2) to (2)   MC FRLND      70.00
 line     34930  90157  "1 " 1     0     # line   from  MC FRLND      70.00   (2) to (1)   0157-WD       70.00
#-#-# load     34930  "1 "    0              # load         MC FRLND      70.00  LOAD==13.26(1.89)
#-#-# load     34930  "2 "    0              # load         MC FRLND      70.00  LOAD==4.35(0.62)
#-#-# load     34930  "E1"    0              # load         MC FRLND      70.00  LOAD==-0.11(0.00)
#-#-# gen      90157  "EW"    0              # gen          0157-WD       70.00  GEN ==18.30(0.00)
0

CATB-1821-B2 "Semitropic-Wasco 70 kV Line "
 line     34932  34934  "1 " 1     0     # line   from  WASCO         70.00  BRKR to BRKR  SEMITRPC      70.00
0

CATB-1822-B2 "Andrew-Midway 230 kV Line"
 line     36265  30970  "1 " 1     0     # line   from  ANDREW       230.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1823-B2 "Midway-6C1000SS #1 230 kV Line"
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  6C1000S1     230.00
0

CATB-1824-B2 "6C1000SS-Wheeler Ridge #1 230 kV Line"
 line     38600  38601  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  BUENAVT1     230.00
 line     38600  38640  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to (3)   WHLR RJ1      230.00
 line     38600  39336  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  6C1000S1     230.00
 line     38640  38641  "1 " 1     0     # line   from  WHLR RJ1      230.00   (3) to BRKR  WHLR RT1      230.00
 line     38640  38650  "1 " 1     0     # line   from  WHLR RJ1      230.00   (3) to (3)   WND GPJ1      230.00
 line     38650  30994  "1 " 1     0     # line   from  WND GPJ1      230.00   (3) to BRKR  WHEELER      230.00
 line     38650  38651  "1 " 1     0     # line   from  WND GPJ1      230.00   (3) to BRKR  WND GPT1      230.00
0

CATB-1825-B2 "Midway-6C1000SS #2 230 kV Line"
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  6C1000S2     230.00
0

CATB-1826-B2 "6C1000SS-6C0946SS #2 230 kV Line"
 line     38605  38606  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  BUENAVT2     230.00
 line     38605  39257  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  6C0946SS     230.00
 line     38605  39337  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  6C1000S2     230.00
0

CATB-1827-B2 "6C0946SS-Wheeler Ridge #2 230 kV Line"
 line     38645  38646  "1 " 1     0     # line   from  WHLR RJ2      230.00   (3) to BRKR  WHLR RT2      230.00
 line     38645  38655  "1 " 1     0     # line   from  WHLR RJ2      230.00   (3) to (3)   WND GPJ2      230.00
 line     38645  39257  "1 " 1     0     # line   from  WHLR RJ2      230.00   (3) to BRKR  6C0946SS     230.00
 line     38655  30994  "1 " 1     0     # line   from  WND GPJ2      230.00   (3) to BRKR  WHEELER      230.00
 line     38655  38656  "1 " 1     0     # line   from  WND GPJ2      230.00   (3) to BRKR  WND GPT2      230.00
0

CATB-1828-B2 "S645ASS-Weedpatch 70 kV Line"
 line     39191  34890  "1 " 1     0     # line   from  S645ASS       70.00  BRKR to BRKR  WEEDPTCH      70.00
0

CATB-1829-B2 "S645A 70 kV gen tie line"
 line     39191  39192  "1 " 1     0     # line   from  S645ASS       70.00  BRKR to (2)   S645A         70.00
 tran     39192  39193  "1 "       0     # tran   from  S645A         70.00   (2) to (1)   S645A         34.50
#-#-# gen      39193  "FT"    0              # gen          S645A         34.50  GEN ==20.00(0.57)
0

CATB-1830-B2 "4C744-Lamont 115 kV Line"
 line     39566  34758  "1 " 1     0     # line   from  4C744        115.00   (2) to BRKR  LAMONT       115.00
 tran     39566  39567  "1 "       0     # tran   from  4C744        115.00   (2) to (2)   4C744EQ1      34.50
 line     39567  39568  "1 " 1     0     # line   from  4C744EQ1      34.50   (2) to (2)   4C744EQ2      34.50
 tran     39568  39569  "1 "       0     # tran   from  4C744EQ2      34.50   (2) to (1)   4C744          0.31
```

```
#-#-# gen      39569  "F "    0              # gen          4C744          0.31  GEN ==90.00(0.00)
0

CATB-1831-B2 "6C0943 115 kV gen tie line"
 line     39253  34714  "1 " 1     0     # line   from  6C0943       115.00  BRKR to BRKR  LERDO        115.00
0

CATB-1832-B2 "6C0946 230 kV gen tie line"
 line     39259  39257  "1 " 1     0     # line   from  6C0946       230.00  BRKR to BRKR  6C0946SS     230.00
0

CATB-1833-B2 "6C0947 115 kV gen tie line"
 line     39263  34745  "1 " 1     0     # line   from  6C0947       115.00  BRKR to BRKR  S479SS       115.00
0

CATB-1834-B2 "6C0966 115 kV gen tie line"
 line     39289  39288  "1 " 1     0     # line   from  6C0966       115.00  BRKR to BRKR  6C0966SS     115.00
0

CATB-1835-B2 "6C0999 230 kV gen tie line"
 line     39332  30918  "1 " 1     0     # line   from  6C0999       230.00  BRKR to BRKR  CALNTESS     230.00
0

CATB-1836-B2 "6C1000 230 kV gen tie line"
 line     39338  39336  "1 " 1     0     # line   from  6C1000       230.00  BRKR to BRKR  6C1000S1     230.00
0

CATB-1837-B3 "Midway 500/230 kV Transformer Bank 11 w/ Elk Hills/Sunrise SPS"
 tran     30970  30060  "11"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATB-1838-B3 "Midway 500/230 kV Transformer Bank 12 w/ Elk Hills/Sunrise SPS"
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00  BRKR to BRKR  MIDWAY       500.00
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATB-1839-B3 "Midway 500/230 kV Transformer Bank 13 w/ Elk Hills/Sunrise SPS"
 tran     30970  30060  "13"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATB-1840-B3 "Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS"
 tran     30970  30060  "11"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
0

CATB-1841-B3 "Midway 500/230 kV Transformer Bank 12 w/o Elk Hills/Sunrise SPS"
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00  BRKR to BRKR  MIDWAY       500.00
0

CATB-1842-B3 "Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS"
 tran     30970  30060  "13"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
0

CATB-1843-B3 "Temblor 115/12 kV Transformer Bank 1"
 tran     34201  34794  "1 "       0     # tran   from  TEMBLORD      12.47   (1) to BRKR  TEMBLOR      115.00
#-#-# load     34201  "1 "    0              # load         TEMBLORD      12.47  LOAD==11.99(1.71)
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#-#-# load     34201  "E1"    0              # load         TEMBLORD      12.47  LOAD==-0.13(0.00)
#-#-# gen      34201  "WP"    0              # gen          TEMBLORD      12.47  GEN ==0.30(0.00)
0

CATB-1844-B3 "Midway 115/12 kV Transformer Bank 7"
 tran     34215  34774  "7 "       0     # tran   from  MIDWY D7      12.47   (1) to BRKR  MIDWAY       115.00
#-#-# load     34215  "7 "    0              # load         MIDWY D7      12.47  LOAD==2.44(0.35)
#-#-# load     34215  "E7"    0              # load         MIDWY D7      12.47  LOAD==-0.05(0.00)
#-#-# gen      34215  "QF"    0              # gen          MIDWY D7      12.47  GEN ==0.03(0.15)
0

CATB-1845-B3 "Midway 115/12 kV Transformer Bank 8"
 tran     34217  34774  "1 "       0     # tran   from  MIDWY D8      12.47   (1) to BRKR  MIDWAY       115.00
#-#-# load     34217  "8 "    0              # load         MIDWY D8      12.47  LOAD==4.04(0.57)
#-#-# load     34217  "E8"    0              # load         MIDWY D8      12.47  LOAD==-0.07(0.00)
0

CATB-1846-B3 "Arco 230/70 kV Transformer Bank 1"
 tran     34582  30935  "1 "       0     # tran   from  ARCO          70.00  BRKR to BRKR  ARCO         230.00
0

CATB-1847-B3 "Arco 230/70 kV Transformer Bank 2"
 tran     34582  30935  "2 "       0     # tran   from  ARCO          70.00  BRKR to BRKR  ARCO         230.00
0

CATB-1848-B3 "Kern PP 230/115 kV Transformer Bank 3"
 tran     34752  30945  "3 "       0     # tran   from  KERN PWR     115.00  BRKR to BRKR  KERN PP      230.00
0

CATB-1849-B3 "Kern PP 230/115 kV Transformer Bank 4"
 tran     34752  30945  "4 "       0     # tran   from  KERN PWR     115.00  BRKR to BRKR  KERN PP      230.00
0

CATB-1850-B3 "Kern PP 230/115 kV Transformer Bank 5"
 tran     34752  30945  "5 "       0     # tran   from  KERN PWR     115.00  BRKR to BRKR  KERN PP      230.00
0

CATB-1851-B3 "Midway 230/115 kV Transformer Bank 1"
 tran     34774  30970  "1 "       0     # tran   from  MIDWAY       115.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1852-B3 "Midway 230/115 kV Transformer Bank 2"
 tran     34774  30970  "2 "       0     # tran   from  MIDWAY       115.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1853-B3 "Midway 230/115 kV Transformer Bank 3"
 tran     34774  30970  "3 "       0     # tran   from  MIDWAY       115.00  BRKR to BRKR  MIDWAY       230.00
0

CATB-1854-B3 "Taft 115/70 kV Transformer Bank 1"
 tran     34776  34860  "1 "       0     # tran   from  TAFT         115.00  BRKR to BRKR  TAFT A        70.00
0

CATB-1855-B3 "Taft 115/70 kV Transformer Bank 2"
 tran     34776  34860  "2 "       0     # tran   from  TAFT         115.00  BRKR to BRKR  TAFT A        70.00
0

CATB-1856-B3 "Fellows 115/21 kV Transformer Bank 1"
 tran     34778  34777  "1 "       0     # tran   from  FELLOWS       21.00  BRKR to BRKR  FELLOWSG     115.00
0

CATB-1857-B3 "Fellows 115/21 kV Transformer Bank 2"
 tran     34778  34777  "2 "       0     # tran   from  FELLOWS       21.00  BRKR to BRKR  FELLOWSG     115.00
0

CATB-1858-B3 "Wheeler Ridge 230/70 kV Transformer Bank 5"
 tran     34874  30994  "5 "       0     # tran   from  WHEELER       70.00  BRKR to BRKR  WHEELER      230.00
0

CATB-1859-B3 "Wheeler Ridge 115/70 kV Transformer Bank 2"
 tran     34874  34756  "2 "       0     # tran   from  WHEELER       70.00  BRKR to BRKR  WHEELER      115.00
0

CATB-1860-B3 "Kern PP 115/70 kV Transformer Bank 1"
 tran     34914  34752  "1 "       0     # tran   from  KERN PW1      70.00  BRKR to (1)   KERN PWR     115.00
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0

CATB-1861-B3 "Kern PP 115/70 kV Transformer Bank 2"
 tran     34918  34752  "1 "       0     # tran   from  KERN PW2      70.00  BRKR to (1)   KERN PWR     115.00
0

CATB-1862-B3 "Semitropic 115/70 kV Transformer Bank 2"
 tran     34934  34704  "2 "       0     # tran   from  SEMITRPC      70.00   (2) to BRKR  SEMITRPC     115.00
 line     34934  34932  "1 " 1     0     # line   from  SEMITRPC      70.00  BRKR to BRKR  WASCO         70.00
0

CATB-1863-B3 "Chevron USA 70/9.11 GSU"
 tran     35052  34916  "1 "       0     # tran   from  CHEV.USA       9.11   (1) to BRKR  CADET         70.00
#-#-# load     35052  "ES"    0              # load         CHEV.USA       9.11  LOAD==-0.04(0.00)
#-#-# load     35052  "SG"    0              # load         CHEV.USA       9.11  LOAD==3.21(0.94)
#-#-# gen      35052  "1 "    0              # gen          CHEV.USA       9.11  GEN ==3.42(-3.00)
0

CATB-1864-B3 "LaPaloma 230/21 kV GSU #1"
 tran     35070  30946  "1 "       0     # tran   from  LAPLM_G1      21.00  BRKR to BRKR  LAPALOMA     230.00
#-#-# load     35070  "ss"    0              # load         LAPLM_G1      21.00  LOAD==4.46(0.64)
#-#-# gen      35070  "1 "    0              # gen          LAPLM_G1      21.00  GEN ==259.80(106.00)
0

CATB-1865-B3 "Buena Vista PP 230/13.2 kV Transformer Bank 1"
 tran     38601  38775  "1 "       0     # tran   from  BUENAVT1     230.00  BRKR to (1)   BUENAVS1      13.20
#-#-# gen      38775  "1 "    0              # gen          BUENAVS1      13.20  GEN ==-4.00(0.00)
#-#-# gen      38775  "2 "    0              # gen          BUENAVS1      13.20  GEN ==-4.00(0.00)
#-#-# gen      38775  "3 "    0              # gen          BUENAVS1      13.20  GEN ==-4.00(0.00)
#-#-# gen      38775  "4 "    0              # gen          BUENAVS1      13.20  GEN ==-11.00(0.00)
#-#-# gen      38775  "5 "    0              # gen          BUENAVS1      13.20  GEN ==-10.00(0.00)
#-#-# gen      38775  "6 "    0              # gen          BUENAVS1      13.20  GEN ==-10.00(0.00)
0

CATB-1866-B3 "Buena Vista PP 230/13.2 kV Transformer Bank 2"
 tran     38606  38780  "1 "       0     # tran   from  BUENAVT2     230.00  BRKR to (1)   BUENAVS2      13.20
#-#-# gen      38780  "1 "    0              # gen          BUENAVS2      13.20  GEN ==-10.00(0.00)
#-#-# gen      38780  "2 "    0              # gen          BUENAVS2      13.20  GEN ==-10.00(0.00)
#-#-# gen      38780  "3 "    0              # gen          BUENAVS2      13.20  GEN ==-10.00(0.00)
#-#-# gen      38780  "4 "    0              # gen          BUENAVS2      13.20  GEN ==-10.00(0.00)
0

CATB-1867-B3 "Wheeler Ridge PP 230/13.2 kV Transformer Bank 1"
 tran     38641  38785  "1 "       0     # tran   from  WHLR RT1     230.00  BRKR to (1)   WHLR RD1      13.20
#-#-# gen      38785  "1 "    0              # gen          WHLR RD1      13.20  GEN ==-5.00(0.00)
#-#-# gen      38785  "2 "    0              # gen          WHLR RD1      13.20  GEN ==-5.00(0.00)
#-#-# gen      38785  "3 "    0              # gen          WHLR RD1      13.20  GEN ==-5.00(0.00)
#-#-# gen      38785  "4 "    0              # gen          WHLR RD1      13.20  GEN ==-12.00(0.00)
#-#-# gen      38785  "5 "    0              # gen          WHLR RD1      13.20  GEN ==-12.00(0.00)
0

CATB-1868-B3 "Wheeler Ridge PP 230/13.2 kV Transformer Bank 2"
 tran     38646  38790  "1 "       0     # tran   from  WHLR RT2     230.00  BRKR to (1)   WHLR RD2      13.20
#-#-# gen      38790  "1 "    0              # gen          WHLR RD2      13.20  GEN ==-12.00(0.00)
#-#-# gen      38790  "2 "    0              # gen          WHLR RD2      13.20  GEN ==-12.00(0.00)
#-#-# gen      38790  "3 "    0              # gen          WHLR RD2      13.20  GEN ==-13.00(0.00)
#-#-# gen      38790  "4 "    0              # gen          WHLR RD2      13.20  GEN ==-13.00(0.00)
0

CATB-1869-B3 "Wind Gap PP 230/13.2 kV Transformer Bank 1"
 tran     38651  38795  "1 "       0     # tran   from  WND GPT1     230.00  BRKR to (1)   WINDGAP1      13.20
#-#-# gen      38795  "1 "    0              # gen          WINDGAP1      13.20  GEN ==-15.00(0.00)
#-#-# gen      38795  "2 "    0              # gen          WINDGAP1      13.20  GEN ==-15.00(0.00)
#-#-# gen      38795  "3 "    0              # gen          WINDGAP1      13.20  GEN ==-15.00(0.00)
0

CATB-1870-B3 "Wind Gap PP 230/13.2 kV Transformer Bank 2"
 tran     38651  38800  "1 "       0     # tran   from  WND GPT1     230.00  BRKR to (1)   WINDGAP2      13.20
#-#-# gen      38800  "1 "    0              # gen          WINDGAP2      13.20  GEN ==-27.00(0.00)
#-#-# gen      38800  "2 "    0              # gen          WINDGAP2      13.20  GEN ==-27.00(0.00)
0

CATB-1871-B3 "Wind Gap PP 230/13.2 kV Transformer Bank 3"
 tran     38656  38805  "1 "       0     # tran   from  WND GPT2     230.00  BRKR to (1)   WINDGAP3      13.20
#-#-# gen      38805  "1 "    0              # gen          WINDGAP3      13.20  GEN ==-27.00(0.00)
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#-#-# gen      38805  "2 "    0              # gen          WINDGAP3      13.20  GEN ==-27.00(0.00)
0

CATB-1872-B3 "Wind Gap PP 230/13.2 kV Transformer Bank 4"
 tran     38656  38810  "1 "       0     # tran   from  WND GPT2     230.00  BRKR to (1)   WINDGAP4      13.20
#-#-# gen      38810  "1 "    0              # gen          WINDGAP4      13.20  GEN ==-27.00(0.00)
#-#-# gen      38810  "2 "    0              # gen          WINDGAP4      13.20  GEN ==-27.00(0.00)
0

CATB-1873-B1 "TEMBLORD      12.47 Unit ID WP"
 gen      34201  "WP"    0              # gen          TEMBLORD      12.47  GEN ==0.30(0.00)
0

CATB-1874-B1 "MIDWY D7      12.47 Unit ID QF"
 gen      34215  "QF"    0              # gen          MIDWY D7      12.47  GEN ==0.03(0.15)
0

CATB-1875-B1 "FELLOWS       21.00 Unit ID QF"
 gen      34778  "QF"    0              # gen          FELLOWS       21.00  GEN ==1.28(-2.30)
0

CATB-1876-B1 "TEXCO_NM       9.11 Unit ID 1"
 gen      34783  "1 "    0              # gen          TEXCO_NM       9.11  GEN ==4.12(-3.60)
0

CATB-1877-B1 "TEXCO_NM       9.11 Unit ID 2"
 gen      34783  "2 "    0              # gen          TEXCO_NM       9.11  GEN ==0.01(-3.00)
0

CATB-1878-B1 "SUNSET G      13.80 Unit ID 1"
 gen      35004  "1 "    0              # gen          SUNSET G      13.80  GEN ==68.10(-20.00)
0

CATB-1879-B1 "SUNSET G      13.80 Unit ID 2"
 gen      35004  "2 "    0              # gen          SUNSET G      13.80  GEN ==68.10(-20.00)
0

CATB-1880-B1 "SUNSET G      13.80 Unit ID 3"
 gen      35004  "3 "    0              # gen          SUNSET G      13.80  GEN ==68.10(-20.00)
0

CATB-1881-B1 "KERNCNYN       9.11 Unit ID 1"
 gen      35018  "1 "    0              # gen          KERNCNYN       9.11  GEN ==9.38(0.94)
0

CATB-1882-B1 "RIOBRAVO       9.11 Unit ID 1"
 gen      35020  "1 "    0              # gen          RIOBRAVO       9.11  GEN ==6.50(1.39)
0

CATB-1883-B1 "DOUBLE C      13.80 Unit ID 1"
 gen      35023  "1 "    0              # gen          DOUBLE C      13.80  GEN ==37.59(-1.57)
0

CATB-1884-B1 "DEXEL +       13.80 Unit ID 1"
 gen      35024  "1 "    0              # gen          DEXEL +       13.80  GEN ==28.24(11.26)
0

CATB-1885-B1 "KERNFRNT       9.11 Unit ID 1"
 gen      35026  "1 "    0              # gen          KERNFRNT       9.11  GEN ==37.60(-12.00)
0

CATB-1886-B1 "HISIERRA      13.80 Unit ID 1"
 gen      35027  "1 "    0              # gen          HISIERRA      13.80  GEN ==42.98(-0.76)
0

CATB-1887-B1 "OILDALE        9.11 Unit ID 1"
 gen      35028  "1 "    0              # gen          OILDALE        9.11  GEN ==32.00(-8.45)
0

CATB-1888-B1 "BADGERCK      13.80 Unit ID 1"
 gen      35029  "1 "    0              # gen          BADGERCK      13.80  GEN ==42.21(-0.88)
0

CATB-1889-B1 "CHV-CYMR       9.11 Unit ID 1"
 gen      35032  "1 "    0              # gen          CHV-CYMR       9.11  GEN ==5.24(-4.92)
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0

CATB-1890-B1 "ULTR PWR      13.20 Unit ID 1"
 gen      35035  "1 "    0              # gen          ULTR PWR      13.20  GEN ==34.70(15.00)
0

CATB-1891-B1 "MT POSO       13.80 Unit ID 1"
 gen      35036  "1 "    0              # gen          MT POSO       13.80  GEN ==43.39(20.00)
0

CATB-1892-B1 "UNIVRSTY       9.11 Unit ID 1"
 gen      35037  "1 "    0              # gen          UNIVRSTY       9.11  GEN ==31.66(8.00)
0

CATB-1893-B1 "CHLKCLF+       9.11 Unit ID 1"
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-1894-B1 "KERNRDGE       9.11 Unit ID 1"
 gen      35040  "1 "    0              # gen          KERNRDGE       9.11  GEN ==43.00(-8.00)
0

CATB-1895-B1 "KERNRDGE       9.11 Unit ID 2"
 gen      35040  "2 "    0              # gen          KERNRDGE       9.11  GEN ==1.02(-3.30)
0

CATB-1896-B1 "TX MIDST       9.11 Unit ID 1"
 gen      35044  "1 "    0              # gen          TX MIDST       9.11  GEN ==33.56(-7.85)
0

CATB-1897-B1 "SEKR           9.11 Unit ID 1"
 gen      35046  "1 "    0              # gen          SEKR           9.11  GEN ==8.01(-8.00)
0

CATB-1898-B1 "FRITOLAY       9.11 Unit ID 1"
 gen      35048  "1 "    0              # gen          FRITOLAY       9.11  GEN ==0.09(-2.50)
0

CATB-1899-B1 "SLR-TANN       9.11 Unit ID 1"
 gen      35050  "1 "    0              # gen          SLR-TANN       9.11  GEN ==9.79(6.45)
0

CATB-1900-B1 "CHEV.USA       9.11 Unit ID 1"
 gen      35052  "1 "    0              # gen          CHEV.USA       9.11  GEN ==1.27(-2.02)
0

CATB-1901-B1 "TX-LOSTH       4.16 Unit ID 1"
 gen      35056  "1 "    0              # gen          TX-LOSTH       4.16  GEN ==6.11(0.78)
0

CATB-1902-B1 "PSE-LVOK       9.11 Unit ID 1"
 gen      35058  "1 "    0              # gen          PSE-LVOK       9.11  GEN ==44.40(-9.91)
0

CATB-1903-B1 "PSEMCKIT       9.11 Unit ID 1"
 gen      35060  "1 "    0              # gen          PSEMCKIT       9.11  GEN ==43.07(13.62)
0

CATB-1904-B1 "DISCOVRY      13.80 Unit ID 1"
 gen      35062  "1 "    0              # gen          DISCOVRY      13.80  GEN ==1.70(22.00)
0

CATB-1905-B1 "NAVY 35R       9.11 Unit ID 1"
 gen      35064  "1 "    0              # gen          NAVY 35R       9.11  GEN ==0.00(-2.17)
0

CATB-1906-B1 "NAVY 35R       9.11 Unit ID 2"
 gen      35064  "2 "    0              # gen          NAVY 35R       9.11  GEN ==0.00(-2.17)
0

CATB-1907-B1 "PSE-BEAR       9.11 Unit ID 1"
 gen      35066  "1 "    0              # gen          PSE-BEAR       9.11  GEN ==45.79(-4.06)
0

CATB-1908-B1 "PRMTFARM      21.00 Unit ID PV"
```

```
 gen      35067  "PV"    0              # gen          PRMTFARM      21.00  GEN ==1.00(0.00)
0

CATB-1909-B1 "LAPLM_G1      21.00 Unit ID 1"
 gen      35070  "1 "    0              # gen          LAPLM_G1      21.00  GEN ==259.80(106.00)
0

CATB-1910-B1 "LAPLM_G2      21.00 Unit ID 1"
 gen      35071  "1 "    0              # gen          LAPLM_G2      21.00  GEN ==260.20(108.00)
0

CATB-1911-B1 "LAPLM_G3      21.00 Unit ID 1"
 gen      35072  "1 "    0              # gen          LAPLM_G3      21.00  GEN ==256.15(115.00)
0

CATB-1912-B1 "LAPLM_G4      21.00 Unit ID 1"
 gen      35073  "1 "    0              # gen          LAPLM_G4      21.00  GEN ==259.54(111.00)
0

CATB-1913-B1 "TEXSUN1G      18.00 Unit ID 1"
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.88(-10.35)
0

CATB-1914-B1 "TEXSUN2G      18.00 Unit ID 1"
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.88(-10.35)
0

CATB-1915-B1 "ELKHIL1G      18.00 Unit ID 1"
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==165.00(37.70)
0

CATB-1916-B1 "ELKHIL2G      18.00 Unit ID 1"
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==165.00(37.70)
0

CATB-1917-B1 "ELKHIL3G      18.00 Unit ID 1"
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==220.00(42.28)
0

CATB-1918-B1 "TEXSUNST      18.00 Unit ID 1"
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==240.24(26.55)
0

CATB-1919-B1 "BUENAVS1      13.20 Unit ID 1"
 gen      38775  "1 "    0              # gen          BUENAVS1      13.20  GEN ==-5.00(0.00)
0

CATB-1920-B1 "BUENAVS1      13.20 Unit ID 2"
 gen      38775  "2 "    0              # gen          BUENAVS1      13.20  GEN ==-5.00(0.00)
0

CATB-1921-B1 "BUENAVS1      13.20 Unit ID 3"
 gen      38775  "3 "    0              # gen          BUENAVS1      13.20  GEN ==-6.00(0.00)
0

CATB-1922-B1 "BUENAVS1      13.20 Unit ID 4"
 gen      38775  "4 "    0              # gen          BUENAVS1      13.20  GEN ==-11.00(0.00)
0

CATB-1923-B1 "BUENAVS1      13.20 Unit ID 5"
 gen      38775  "5 "    0              # gen          BUENAVS1      13.20  GEN ==-11.00(0.00)
0

CATB-1924-B1 "BUENAVS1      13.20 Unit ID 6"
 gen      38775  "6 "    0              # gen          BUENAVS1      13.20  GEN ==-11.00(0.00)
0

CATB-1925-B1 "BUENAVS2      13.20 Unit ID 1"
 gen      38780  "1 "    0              # gen          BUENAVS2      13.20  GEN ==-11.00(0.00)
0

CATB-1926-B1 "BUENAVS2      13.20 Unit ID 2"
 gen      38780  "2 "    0              # gen          BUENAVS2      13.20  GEN ==-11.00(0.00)
0
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CATB-1927-B1 "BUENAVS2     13.20 Unit ID 3"
 gen      38780  "3 "    0              # gen          BUENAVS2      13.20  GEN ==-11.00(0.00)
0

CATB-1928-B1 "BUENAVS2     13.20 Unit ID 4"
 gen      38780  "4 "    0              # gen          BUENAVS2      13.20  GEN ==-11.00(0.00)
0

CATB-1929-B1 "WHLR RD1     13.20 Unit ID 1"
 gen      38785  "1 "    0              # gen          WHLR RD1      13.20  GEN ==-6.00(0.00)
0

CATB-1930-B1 "WHLR RD1     13.20 Unit ID 2"
 gen      38785  "2 "    0              # gen          WHLR RD1      13.20  GEN ==-6.00(0.00)
0

CATB-1931-B1 "WHLR RD1     13.20 Unit ID 3"
 gen      38785  "3 "    0              # gen          WHLR RD1      13.20  GEN ==-6.00(0.00)
0

CATB-1932-B1 "WHLR RD1     13.20 Unit ID 4"
 gen      38785  "4 "    0              # gen          WHLR RD1      13.20  GEN ==-14.00(0.00)
0

CATB-1933-B1 "WHLR RD1     13.20 Unit ID 5"
 gen      38785  "5 "    0              # gen          WHLR RD1      13.20  GEN ==-14.00(0.00)
0

CATB-1934-B1 "WHLR RD2     13.20 Unit ID 1"
 gen      38790  "1 "    0              # gen          WHLR RD2      13.20  GEN ==-14.00(0.00)
0

CATB-1935-B1 "WHLR RD2     13.20 Unit ID 2"
 gen      38790  "2 "    0              # gen          WHLR RD2      13.20  GEN ==-14.00(0.00)
0

CATB-1936-B1 "WHLR RD2     13.20 Unit ID 3"
 gen      38790  "3 "    0              # gen          WHLR RD2      13.20  GEN ==-14.00(0.00)
0

CATB-1937-B1 "WHLR RD2     13.20 Unit ID 4"
 gen      38790  "4 "    0              # gen          WHLR RD2      13.20  GEN ==-14.00(0.00)
0

CATB-1938-B1 "WINDGAP1     13.20 Unit ID 1"
 gen      38795  "1 "    0              # gen          WINDGAP1      13.20  GEN ==-11.00(0.00)
0

CATB-1939-B1 "WINDGAP1     13.20 Unit ID 2"
 gen      38795  "2 "    0              # gen          WINDGAP1      13.20  GEN ==-13.00(0.00)
0

CATB-1940-B1 "WINDGAP1     13.20 Unit ID 3"
 gen      38795  "3 "    0              # gen          WINDGAP1      13.20  GEN ==-13.00(0.00)
0

CATB-1941-B1 "WINDGAP2     13.20 Unit ID 1"
 gen      38800  "1 "    0              # gen          WINDGAP2      13.20  GEN ==-30.00(0.00)
0

CATB-1942-B1 "WINDGAP2     13.20 Unit ID 2"
 gen      38800  "2 "    0              # gen          WINDGAP2      13.20  GEN ==-30.00(0.00)
0

CATB-1943-B1 "WINDGAP3     13.20 Unit ID 1"
 gen      38805  "1 "    0              # gen          WINDGAP3      13.20  GEN ==-30.00(0.00)
0

CATB-1944-B1 "WINDGAP3     13.20 Unit ID 2"
 gen      38805  "2 "    0              # gen          WINDGAP3      13.20  GEN ==-30.00(0.00)
0

CATB-1945-B1 "WINDGAP4     13.20 Unit ID 1"
 gen      38810  "1 "    0              # gen          WINDGAP4      13.20  GEN ==-30.00(0.00)
0
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CATB-1946-B1 "WINDGAP4      13.20 Unit ID 2"
 gen      38810  "2 "    0              # gen          WINDGAP4      13.20  GEN ==-30.00(0.00)
0

CATB-1947-B1 "Q111           4.16 Unit ID 1"
 gen      34973  "1 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
0

CATB-1948-B1 "Q111           4.16 Unit ID 2"
 gen      34973  "2 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
0

CATB-1949-B1 "Q111           4.16 Unit ID 3"
 gen      34973  "3 "    0              # gen          Q111           4.16  GEN ==6.50(0.17)
0

CATB-1950-B1 "T304          21.00 Unit ID 1"
 gen      35001  "1 "    0              # gen          T304          21.00  GEN ==50.00(0.00)
0

CATB-1951-B1 "T356          34.50 Unit ID 1"
 gen      35011  "1 "    0              # gen          T356          34.50  GEN ==40.00(-4.65)
0

CATB-1952-B1 "S340          21.00 Unit ID F"
 gen      35000  "F "    0              # gen          S340          21.00  GEN ==20.00(0.53)
0

CATB-1953-B1 "S473          34.50 Unit ID F"
 gen      35012  "F "    0              # gen          S473          34.50  GEN ==20.00(-0.45)
0

CATB-1954-B1 "S479          21.00 Unit ID F"
 gen      35013  "F "    0              # gen          S479          21.00  GEN ==20.00(-1.89)
0

CATB-1955-B1 "S482          21.00 Unit ID F"
 gen      35014  "F "    0              # gen          S482          21.00  GEN ==20.00(2.80)
0

CATB-1956-B1 "S484          34.50 Unit ID F"
 gen      39096  "F "    0              # gen          S484          34.50  GEN ==20.00(-4.80)
0

CATB-1957-B1 "S514          34.50 Unit ID E"
 gen      35069  "E "    0              # gen          S514          34.50  GEN ==20.00(0.80)
0

CATB-1958-B1 "S517          12.47 Unit ID F"
 gen      35091  "F "    0              # gen          S517          12.47  GEN ==20.00(-2.67)
0

CATB-1959-B1 "S620          34.50 Unit ID F"
 gen      35009  "F "    0              # gen          S620          34.50  GEN ==20.00(-2.26)
0

CATB-1960-B1 "S620A          0.42 Unit ID E"
 gen      39020  "E "    0              # gen          S620A          0.42  GEN ==20.00(1.35)
0

CATB-1961-B1 "S621A          0.44 Unit ID F"
 gen      39025  "F "    0              # gen          S621A          0.44  GEN ==20.00(-0.41)
0

CATB-1962-B1 "S622B         34.50 Unit ID F"
 gen      35021  "F "    0              # gen          S622B         34.50  GEN ==20.00(0.94)
0

CATB-1963-B1 "S645A         34.50 Unit ID FT"
 gen      39193  "FT"    0              # gen          S645A         34.50  GEN ==20.00(0.57)
0

CATB-1964-B1 "S653B          0.48 Unit ID FT"
 gen      39175  "FT"    0              # gen          S653B          0.48  GEN ==20.00(1.62)
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0

CATB-1965-B1 "S653EA         0.48 Unit ID ET"
 gen      39201  "ET"    0              # gen          S653EA         0.48  GEN ==20.00(-0.12)
0

CATB-1966-B1 "S654           0.32 Unit ID FT"
 gen      39182  "FT"    0              # gen          S654           0.32  GEN ==20.00(2.80)
0

CATB-1967-B1 "2C557         21.00 Unit ID F"
 gen      35015  "F "    0              # gen          2C557         21.00  GEN ==19.75(-1.98)
0

CATB-1968-B1 "2C559          0.48 Unit ID F"
 gen      35019  "F "    0              # gen          2C559          0.48  GEN ==67.50(4.72)
0

CATB-1969-B1 "4C705          0.48 Unit ID F"
 gen      39629  "F "    0              # gen          4C705          0.48  GEN ==20.00(-1.49)
0

CATB-1970-B1 "4C744          0.31 Unit ID F"
 gen      39569  "F "    0              # gen          4C744          0.31  GEN ==90.00(0.00)
0

CATB-1971-B1 "4C775          0.20 Unit ID F"
 gen      39617  "F "    0              # gen          4C775          0.20  GEN ==15.00(0.00)
0

CATB-1972-B1 "0023-WD       70.00 Unit ID FW"
 gen      90023  "FW"    0              # gen          0023-WD       70.00  GEN ==12.00(0.00)
0

CATB-1973-B1 "0032-WD      115.00 Unit ID FW"
 gen      90032  "FW"    0              # gen          0032-WD      115.00  GEN ==15.00(0.00)
0

CATB-1974-B1 "0039-WD      115.00 Unit ID FW"
 gen      90039  "FW"    0              # gen          0039-WD      115.00  GEN ==10.00(0.00)
0

CATB-1975-B1 "0040-WD       70.00 Unit ID EW"
 gen      90040  "EW"    0              # gen          0040-WD       70.00  GEN ==20.00(0.00)
0

CATB-1976-B1 "0041-WD      115.00 Unit ID EW"
 gen      90041  "EW"    0              # gen          0041-WD      115.00  GEN ==0.60(0.00)
0

CATB-1977-B1 "0046-WD       70.00 Unit ID FW"
 gen      90046  "FW"    0              # gen          0046-WD       70.00  GEN ==7.00(0.00)
0

CATB-1978-B1 "0096-WD      115.00 Unit ID FW"
 gen      90096  "FW"    0              # gen          0096-WD      115.00  GEN ==20.00(0.00)
0

CATB-1979-B1 "0102-WD       70.00 Unit ID EW"
 gen      90102  "EW"    0              # gen          0102-WD       70.00  GEN ==1.50(0.00)
0

CATB-1980-B1 "0127-WD       70.00 Unit ID EW"
 gen      90127  "EW"    0              # gen          0127-WD       70.00  GEN ==20.00(0.00)
0

CATB-1981-B1 "0157-WD       70.00 Unit ID EW"
 gen      90157  "EW"    0              # gen          0157-WD       70.00  GEN ==18.30(0.00)
0

CATB-1982-B1 "0191-WD      115.00 Unit ID EW"
 gen      90191  "EW"    0              # gen          0191-WD      115.00  GEN ==9.00(0.00)
0

CATB-1983-B1 "0248-WD       70.00 Unit ID EW"
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 gen      90248  "EW"    0              # gen          0248-WD       70.00  GEN ==3.00(0.00)
0

CATB-1984-B1 "0251-WD      115.00 Unit ID EW"
 gen      90251  "EW"    0              # gen          0251-WD      115.00  GEN ==2.00(0.00)
0

CATB-1985-B1 "0252-WD       70.00 Unit ID EW"
 gen      90252  "EW"    0              # gen          0252-WD       70.00  GEN ==2.00(0.00)
0

CATB-1986-B1 "5C885          0.42 Unit ID F"
 gen      39924  "F "    0              # gen          5C885          0.42  GEN ==12.00(0.00)
0

CATB-1987-B1 "5C900          0.43 Unit ID F"
 gen      39953  "F "    0              # gen          5C900          0.43  GEN ==40.00(0.00)
0

CATB-1988-B1 "5C901          0.43 Unit ID F"
 gen      39957  "F "    0              # gen          5C901          0.43  GEN ==15.00(0.00)
0

CATB-1989-B1 "0564-WD      115.00 Unit ID EW"
 gen      90564  "EW"    0              # gen          0564-WD      115.00  GEN ==0.50(0.00)
0

CATB-1990-B1 "0587-WD      115.00 Unit ID EW"
 gen      90587  "EW"    0              # gen          0587-WD      115.00  GEN ==2.00(0.00)
0

CATB-1991-B1 "0629-WD      115.00 Unit ID EW"
 gen      90629  "EW"    0              # gen          0629-WD      115.00  GEN ==1.50(0.00)
0

CATB-1992-B1 "0630-WD      115.00 Unit ID EW"
 gen      90630  "EW"    0              # gen          0630-WD      115.00  GEN ==1.50(0.00)
0

CATB-1993-B1 "0682-RD       70.00 Unit ID ER"
 gen      90682  "ER"    0              # gen          0682-RD       70.00  GEN ==0.25(0.00)
0

CATB-1994-B1 "0693-RD       70.00 Unit ID ER"
 gen      90693  "ER"    0              # gen          0693-RD       70.00  GEN ==1.50(0.00)
0

CATB-1995-B1 "0714-WD      115.00 Unit ID EW"
 gen      90714  "EW"    0              # gen          0714-WD      115.00  GEN ==2.00(0.00)
0

CATB-1996-B1 "0719-WD       70.00 Unit ID EW"
 gen      90719  "EW"    0              # gen          0719-WD       70.00  GEN ==3.00(0.00)
0

CATB-1997-B1 "0720-WD       70.00 Unit ID EW"
 gen      90720  "EW"    0              # gen          0720-WD       70.00  GEN ==2.00(0.00)
0

CATB-1998-B1 "6C0943         0.27 Unit ID F"
 gen      39256  "F "    0              # gen          6C0943         0.27  GEN ==50.50(4.58)
0

CATB-1999-B1 "6C0946         0.27 Unit ID F"
 gen      39262  "F "    0              # gen          6C0946         0.27  GEN ==100.50(13.28)
0

CATB-2000-B1 "6C0947         0.48 Unit ID F"
 gen      39266  "F "    0              # gen          6C0947         0.48  GEN ==120.00(0.93)
0

CATB-2001-B1 "6C0964        13.80 Unit ID F"
 gen      39283  "F "    0              # gen          6C0964        13.80  GEN ==48.60(8.72)
0
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CATB-2002-B1 "6C0966        13.80 Unit ID F"
 gen      39290  "F "    0              # gen          6C0966        13.80  GEN ==48.60(11.75)
0

CATB-2003-B1 "6C0972         0.48 Unit ID F"
 gen      39294  "F "    0              # gen          6C0972         0.48  GEN ==21.00(1.83)
0

CATB-2004-B1 "6C0988         0.27 Unit ID F"
 gen      39317  "F "    0              # gen          6C0988         0.27  GEN ==20.50(0.55)
0

CATB-2005-B1 "6C0999         0.69 Unit ID F"
 gen      39335  "F "    0              # gen          6C0999         0.69  GEN ==253.00(53.68)
0

CATB-2006-B1 "6C1000        21.00 Unit ID F"
 gen      39339  "F "    0              # gen          6C1000        21.00  GEN ==405.00(68.98)
0

CATB-2007-B1B2 "Midway-6C0966SS 115 kV Line and Chalk Cliff"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   CYMRIC       115.00
 line     34780  39288  "1 " 1     0     # line   from  CYMRIC       115.00   (3) to BRKR  6C0966SS     115.00
 tran     34780  35032  "1 "       0     # tran   from  CYMRIC       115.00   (3) to (1)   CHV-CYMR       9.11
#-#-# load     35032  "SG"    0              # load         CHV-CYMR       9.11  LOAD==3.09(0.44)
#-#-# gen      35032  "1 "    0              # gen          CHV-CYMR       9.11  GEN ==6.81(-1.77)
#
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-2008-B1B2 "6C0966SS-Midsun 115 kV Line and Chalk Cliff"
 line     34781  34779  "1 " 1     0     # line   from  TEXCO_NM     115.00   (4) to BRKR  MIDSUN       115.00
 line     34781  39288  "1 " 1     0     # line   from  TEXCO_NM     115.00   (4) to BRKR  6C0966SS     115.00
 tran     34781  34783  "1 "       0     # tran   from  TEXCO_NM     115.00   (4) to (2)   TEXCO_NM       9.11
 tran     34781  34783  "2 "       0     # tran   from  TEXCO_NM     115.00   (4) to (2)   TEXCO_NM       9.11
#-#-# load     34781  "1 "    0              # load         TEXCO_NM     115.00  LOAD==15.00(9.02)
#-#-# gen      34783  "1 "    0              # gen          TEXCO_NM       9.11  GEN ==4.12(-3.60)
#-#-# gen      34783  "2 "    0              # gen          TEXCO_NM       9.11  GEN ==0.01(-3.00)
#
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-2009-B1B2 "Midway-Taft 115 kV Line and Chalk Cliff"
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   OXYBVHTP     115.00
 line     39145  34776  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to BRKR  TAFT         115.00
 line     39145  39146  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to (1)   OXYBVH       115.00
#-#-# load     39146  "1 "    0              # load         OXYBVH       115.00  LOAD==30.00(22.50)
#-#-# load     39146  "E1"    0              # load         OXYBVH       115.00  LOAD==-0.89(0.00)
#
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-2010-B1B2 "Fellows-Taft 115 kV Line and Chalk Cliff"
 line     34777  34800  "1 " 1     0     # line   from  FELLOWSG     115.00  BRKR to (2)   MORGAN       115.00
 line     34800  34802  "1 " 1     0     # line   from  MORGAN       115.00   (2) to (3)   MIDSET       115.00
 line     34802  34776  "1 " 1     0     # line   from  MIDSET       115.00   (3) to BRKR  TAFT         115.00
 tran     34802  35044  "1 "       0     # tran   from  MIDSET       115.00   (3) to (1)   TX MIDST       9.11
#-#-# load     34800  "1 "    0              # load         MORGAN       115.00  LOAD==1.05(1.68)
#-#-# load     34800  "E1"    0              # load         MORGAN       115.00  LOAD==-0.01(0.00)
#-#-# load     34802  "SG"    0              # load         MIDSET       115.00  LOAD==0.52(0.25)
#-#-# gen      35044  "1 "    0              # gen          TX MIDST       9.11  GEN ==35.00(-3.21)
#
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-2011-B1B2 "Fellows-Midsun 115 kV Line and Chalk Cliff"
 line     34779  34777  "1 " 1     0     # line   from  MIDSUN       115.00  BRKR to BRKR  FELLOWSG     115.00
#
 gen      35038  "1 "    0              # gen          CHLKCLF+       9.11  GEN ==45.27(24.00)
0

CATB-2012-B1B2 "Semitropic-Midway #1 115 kV Line and Mt Poso"
 line     34704  34774  "1 " 1     0     # line   from  SEMITRPC     115.00  BRKR to BRKR  MIDWAY       115.00
#
 gen      35036  "1 "    0              # gen          MT POSO       13.80  GEN ==43.39(20.00)
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0

CATB-2013-B1B2 "7th Standard-Lerdo-Kern Oil 115 kV Line and Mt Poso"
 line     34714  34716  "1 " 1     0     # line   from  LERDO        115.00  BRKR to (3)   LRDO JCT     115.00
 line     34716  34709  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  7STNDRD     115.00
 line     34716  34718  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  KERN OIL     115.00
#
 gen      35036  "1 "    0              # gen          MT POSO       13.80  GEN ==43.39(20.00)
0

CATB-2014-B1B2 "Kern-Kern Front PSE 115 kV Line and Dexzel"
 line     34281  34283  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (3)   BDGRCRKJ     115.00
 line     34281  34730  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (2)   PSE-3        115.00
 line     34281  34752  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to BRKR  KERN PWR     115.00
 tran     34281  35023  "1 "       0     # tran   from  DOUBLECJ     115.00   (4) to (1)   DOUBLE C      13.80
 line     34283  34285  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   HIGHSRA      115.00
 line     34283  34287  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   BDGRCRKP     115.00
 tran     34730  35026  "1 "       0     # tran   from  PSE-3        115.00   (2) to (1)   KERNFRNT       9.11
 tran     34285  35027  "1 "       0     # tran   from  HIGHSRA      115.00   (2) to (1)   HISIERRA      13.80
 tran     34287  35029  "1 "       0     # tran   from  BDGRCRKP     115.00   (2) to (1)   BADGERCK      13.80
#-#-# load     35023  "SG"    0              # load         DOUBLE C      13.80  LOAD==0.35(0.05)
#-#-# load     35026  "SG"    0              # load         KERNFRNT       9.11  LOAD==1.01(0.49)
#-#-# load     35027  "SG"    0              # load         HISIERRA      13.80  LOAD==0.94(0.13)
#-#-# load     35029  "SG"    0              # load         BADGERCK      13.80  LOAD==0.52(0.07)
#-#-# gen      35023  "1 "    0              # gen          DOUBLE C      13.80  GEN ==47.00(2.64)
#-#-# gen      35026  "1 "    0              # gen          KERNFRNT       9.11  GEN ==47.00(-12.00)
#-#-# gen      35027  "1 "    0              # gen          HISIERRA      13.80  GEN ==47.00(2.48)
#-#-# gen      35029  "1 "    0              # gen          BADGERCK      13.80  GEN ==45.77(2.27)
#
 gen      35024  "1 "    0              # gen          DEXEL +       13.80  GEN ==28.24(11.26)
0

CATB-2015-B1B2 "Kern-Kern Front PSE 115 kV Line and PSE Live Oak Cogen"
 line     34281  34283  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (3)   BDGRCRKJ     115.00
 line     34281  34730  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (2)   PSE-3        115.00
 line     34281  34752  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to BRKR  KERN PWR     115.00
 tran     34281  35023  "1 "       0     # tran   from  DOUBLECJ     115.00   (4) to (1)   DOUBLE C      13.80
 line     34283  34285  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   HIGHSRA      115.00
 line     34283  34287  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   BDGRCRKP     115.00
 tran     34730  35026  "1 "       0     # tran   from  PSE-3        115.00   (2) to (1)   KERNFRNT       9.11
 tran     34285  35027  "1 "       0     # tran   from  HIGHSRA      115.00   (2) to (1)   HISIERRA      13.80
 tran     34287  35029  "1 "       0     # tran   from  BDGRCRKP     115.00   (2) to (1)   BADGERCK      13.80
#-#-# load     35023  "SG"    0              # load         DOUBLE C      13.80  LOAD==0.35(0.05)
#-#-# load     35026  "SG"    0              # load         KERNFRNT       9.11  LOAD==1.01(0.49)
#-#-# load     35027  "SG"    0              # load         HISIERRA      13.80  LOAD==0.94(0.13)
#-#-# load     35029  "SG"    0              # load         BADGERCK      13.80  LOAD==0.52(0.07)
#-#-# gen      35023  "1 "    0              # gen          DOUBLE C      13.80  GEN ==47.00(2.64)
#-#-# gen      35026  "1 "    0              # gen          KERNFRNT       9.11  GEN ==47.00(-12.00)
#-#-# gen      35027  "1 "    0              # gen          HISIERRA      13.80  GEN ==47.00(2.48)
#-#-# gen      35029  "1 "    0              # gen          BADGERCK      13.80  GEN ==45.77(2.27)
#
 gen      35058  "1 "    0              # gen          PSE-LVOK       9.11  GEN ==44.40(-9.91)
0

CATB-2016-B1B2 "Kern-Kern Front PSE 115 kV Line and PSE Bear Mountain Cogen"
 line     34281  34283  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (3)   BDGRCRKJ     115.00
 line     34281  34730  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to (2)   PSE-3        115.00
 line     34281  34752  "1 " 1     0     # line   from  DOUBLECJ     115.00   (4) to BRKR  KERN PWR     115.00
 tran     34281  35023  "1 "       0     # tran   from  DOUBLECJ     115.00   (4) to (1)   DOUBLE C      13.80
 line     34283  34285  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   HIGHSRA      115.00
 line     34283  34287  "1 " 1     0     # line   from  BDGRCRKJ     115.00   (3) to (2)   BDGRCRKP     115.00
 tran     34730  35026  "1 "       0     # tran   from  PSE-3        115.00   (2) to (1)   KERNFRNT       9.11
 tran     34285  35027  "1 "       0     # tran   from  HIGHSRA      115.00   (2) to (1)   HISIERRA      13.80
 tran     34287  35029  "1 "       0     # tran   from  BDGRCRKP     115.00   (2) to (1)   BADGERCK      13.80
#-#-# load     35023  "SG"    0              # load         DOUBLE C      13.80  LOAD==0.35(0.05)
#-#-# load     35026  "SG"    0              # load         KERNFRNT       9.11  LOAD==1.01(0.49)
#-#-# load     35027  "SG"    0              # load         HISIERRA      13.80  LOAD==0.94(0.13)
#-#-# load     35029  "SG"    0              # load         BADGERCK      13.80  LOAD==0.52(0.07)
#-#-# gen      35023  "1 "    0              # gen          DOUBLE C      13.80  GEN ==47.00(2.64)
#-#-# gen      35026  "1 "    0              # gen          KERNFRNT       9.11  GEN ==47.00(-12.00)
#-#-# gen      35027  "1 "    0              # gen          HISIERRA      13.80  GEN ==47.00(2.48)
#-#-# gen      35029  "1 "    0              # gen          BADGERCK      13.80  GEN ==45.77(2.27)
#
 gen      35066  "1 "    0              # gen          PSE-BEAR       9.11  GEN ==45.79(-4.06)
0
```

```
# 2018 main year category b contingency list
# Los Padres Division Zone 320
#

CATB-2017-B2 "Morro Bay-Templeton 230 kV Line"
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00  BRKR to BRKR  MORROBAY     230.00
0

CATB-2018-B2 "Morro Bay-Solar SS #1 230 kV Line"
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
0

CATB-2019-B2 "Morro Bay-Solar SS #2 230 kV Line"
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
0

CATB-2020-B2 "Morro Bay-Diablo 230 kV Line"
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  DIABLOCN     230.00
0

CATB-2021-B2 "Morro Bay-Mesa 230 kV Line"
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  MESA PGE     230.00
0

CATB-2022-B2 "Solar SS-Caliente SS #1 230 kV Line"
 line     30916  30918  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
0

CATB-2023-B2 "Solar SS-Caliente SS #2 230 kV Line"
 line     30916  30918  "2 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
0

CATB-2024-B2 "Diablo-Mesa 230 kV Line"
 line     30925  30930  "1 " 1     0     # line   from  DIABLOCN     230.00  BRKR to BRKR  MESA PGE     230.00
0

CATB-2025-B2 "Solar SS-Topaz #1 230 kV Line"
 line     30916  30921  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to (2)   TOPAZ1       230.00
 tran     30921  36427  "1 "       0     # tran   from  TOPAZ1       230.00   (2) to (3)   TOPAZC1       34.50
 line     36427  36429  "1 " 1     0     # line   from  TOPAZC1       34.50   (3) to (2)   Q166C         34.50
 line     36427  36431  "1 " 1     0     # line   from  TOPAZC1       34.50   (3) to (2)   Q194C1        34.50
 tran     36429  36430  "1 "       0     # tran   from  Q166C         34.50   (2) to (1)   Q166G          0.32
 tran     36431  36432  "1 "       0     # tran   from  Q194C1        34.50   (2) to (1)   Q194G1         0.32
#-#-# gen      36430  "1 "    0              # gen          Q166G          0.32  GEN ==215.00(5.58)
#-#-# gen      36432  "1 "    0              # gen          Q194G1         0.32  GEN ==65.00(5.58)
0

CATB-2026-B2 "Solar SS-Topaz #2 230 kV Line"
 line     30916  30922  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to (2)   TOPAZ2       230.00
 tran     30922  36428  "1 "       0     # tran   from  TOPAZ2       230.00   (2) to (3)   TOPAZC2       34.50
 line     36428  36433  "1 " 1     0     # line   from  TOPAZC2       34.50   (3) to (2)   Q194C2        34.50
 line     36428  36435  "1 " 1     0     # line   from  TOPAZC2       34.50   (3) to (2)   T242C         34.50
 tran     36433  36434  "1 "       0     # tran   from  Q194C2        34.50   (2) to (1)   Q194G2         0.32
 tran     36435  36436  "1 "       0     # tran   from  T242C         34.50   (2) to (1)   T242G          0.32
#-#-# gen      36434  "1 "    0              # gen          Q194G2         0.32  GEN ==125.00(5.57)
#-#-# gen      36436  "1 "    0              # gen          T242G          0.32  GEN ==155.00(5.57)
0

CATB-2027-B2 "Caliente SS-T239 230 kV Line"
 line     30918  30919  "1 " 1     0     # line   from  CALNTESS     230.00  BRKR to (3)   T239         230.00
 tran     30919  36425  "1 "       0     # tran   from  T239         230.00   (3) to (3)   T239          34.50
 tran     30919  36425  "2 "       0     # tran   from  T239         230.00   (3) to (3)   T239          34.50
 tran     36425  36426  "1 "       0     # tran   from  T239          34.50   (3) to (1)   T239           0.40
#-#-# load     36426  "ss"    0              # load         T239           0.40  LOAD==0.88(0.49)
#-#-# gen      36426  "1 "    0              # gen          T239           0.40  GEN ==254.00(48.05)
0

CATB-2028-B2 "Morro Bay-San Luis Obispo #1 115 kV Line"
 line     36251  36254  "1 " 1     0     # line   from  FTHILTP2     115.00   (2) to BRKR  SN LS OB     115.00
 line     36251  36303  "1 " 1     0     # line   from  FTHILTP2     115.00   (2) to (3)   GLDTRJC1     115.00
 line     36303  36252  "1 " 1     0     # line   from  GLDTRJC1     115.00   (3) to BRKR  MORRO BY     115.00
 line     36303  36302  "1 " 1     0     # line   from  GLDTRJC1     115.00   (3) to (1)   GOLDTREE     115.00
#-#-# load     36302  "1 "    0              # load         GOLDTREE     115.00  LOAD==8.01(1.14)
#-#-# load     36302  "E1"    0              # load         GOLDTREE     115.00  LOAD==-0.13(0.00)
```

```
#-#-# load     36302  "EM"    0              # load         GOLDTREE     115.00  LOAD==-0.06(0.00)
#-#-# load     36302  "MC"    0              # load         GOLDTREE     115.00  LOAD==2.80(2.10)
0

CATB-2029-B2 "Morro Bay-San Luis Obispo #2 115 kV Line"
 line     36252  36304  "1 " 1     0     # line   from  MORRO BY     115.00  BRKR to (2)   GLDTRJC2     115.00
 line     36304  36253  "1 " 1     0     # line   from  GLDTRJC2     115.00   (2) to (3)   FTHILTP1     115.00
 line     36253  36250  "1 " 1     0     # line   from  FTHILTP1     115.00   (3) to (1)   FOOTHILL     115.00
 line     36253  36254  "1 " 1     0     # line   from  FTHILTP1     115.00   (3) to BRKR  SN LS OB     115.00
#-#-# load     36250  "1 "    0             # load         FOOTHILL     115.00  LOAD==9.29(1.32)
#-#-# load     36250  "E1"    0             # load         FOOTHILL     115.00  LOAD==-0.08(0.00)
 line  36251 36250  "1 " 1     1      # Switches in Foothill SW165 to transfer load
 #-#-# load  36250        "1 "    1      # Restore Load 1 at Foothill
 #-#-# load  36250        "E1"    1      # Restore Load E1 at Foothill
0

CATB-2030-B2 "San Luis Obispo-Santa Maria 115 kV Line"
 line     36254  36266  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  SNTA MRA     115.00
0

CATB-2031-B2 "San Luis Obispo-6C0987SS 115 kV Line"
 line     36254  39309  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  6C0987SS     115.00
0

CATB-2032-B2 "6C0987SS-Oceano 115 kV Line"
 line     39309  36278  "1 " 1     0     # line   from  6C0987SS     115.00  BRKR to BRKR  OCEANO       115.00
0

CATB-2033-B2 "Andrew-Sisquoc #1 115 kV Line"
 line     36255  36260  "1 " 1     0     # line   from  ANDREW       115.00  BRKR to BRKR  SISQUOC      115.00
0

CATB-2034-B2 "Andrew-Sisquoc #2 115 kV Line"
 line     36255  36260  "2 " 1     0     # line   from  ANDREW       115.00  BRKR to BRKR  SISQUOC      115.00
0

CATB-2035-B2 "Andrew-Divide 115 kV Line"
 line     36255  36268  "1 " 1     0     # line   from  ANDREW       115.00  BRKR to BRKR  DIVVIDE      115.00
0

CATB-2036-B2 "Mesa-Andrew 115 kV Line"
 line     36256  36258  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to (3)   S.M.ASSO     115.00
 line     36258  36255  "1 " 1     0     # line   from  S.M.ASSO     115.00   (3) to BRKR  ANDREW       115.00
 tran     36258  36416  "1 "       0     # tran   from  S.M.ASSO     115.00   (3) to (1)   ST MARIA       9.11
0

CATB-2037-B2 "Mesa-Santa Maria 115 kV Line"
 line     36256  36267  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to (3)   SNTAMRTP     115.00
 line     36267  36266  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to BRKR  SNTA MRA     115.00
 line     36267  36270  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to (1)   FAIRWAY      115.00
#-#-# load     36270  "1 "    0             # load         FAIRWAY      115.00  LOAD==16.41(2.34)
#-#-# load     36270  "2 "    0             # load         FAIRWAY      115.00  LOAD==27.21(3.87)
#-#-# load     36270  "E1"    0             # load         FAIRWAY      115.00  LOAD==-0.17(0.00)
#-#-# load     36270  "E2"    0             # load         FAIRWAY      115.00  LOAD==-0.25(0.00)
 line  36270 36269  "1 " 1     1      # Switch in Fairway SW 145 to transfer load
 #-#-# load  36270        "1 "    1      # Restore Load 1 at Fairway
 #-#-# load  36270        "2 "    1      # Restore Load 2 at Fairway
 #-#-# load  36270        "E1"    1      # Restore Load E1 at Fairway
 #-#-# load  36270        "E2"    1      # Restore Load E2 at Fairway
0

CATB-2038-B2 "Mesa-Divide #1 115 kV Line"
 line     36256  36268  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
0

CATB-2039-B2 "Mesa-Divide #2 115 kV Line"
 line     36256  36268  "2 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
0

CATB-2040-B2 "Callender Sw Sta-Mesa 115 kV Line"
 line     36256  36280  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  UNION OL     115.00
0

CATB-2041-B2 "Sisquoc-Garey 115 kV Line "
 line     36260  36262  "1 " 1     0     # line   from  SISQUOC      115.00  BRKR to (2)   GAREY        115.00
```

```
 tran     36262  36418  "1 "       0     # tran   from  GAREY        115.00   (2) to (1)   GAREY          4.00
#-#-# load     36418  "1 "    0              # load         GAREY          4.00  LOAD==0.92(0.79)
#-#-# load     36418  "E1"    0              # load         GAREY          4.00  LOAD==-0.01(0.00)
0

CATB-2042-B2 "Sisquoc-Santa Ynez Sw.Sta. 115 kV Line"
 line     36260  36286  "1 " 1     0     # line   from  SISQUOC      115.00  BRKR to (2)   PALMR        115.00
 line     36286  36288  "1 " 1     0     # line   from  PALMR        115.00   (2) to (2)   ZACA         115.00
 line     36288  36264  "1 " 1     0     # line   from  ZACA         115.00   (2) to BRKR  S.YNZ JT     115.00
#-#-# load     36286  "1 "    0              # load         PALMR        115.00  LOAD==2.20(0.31)
#-#-# load     36286  "E1"    0              # load         PALMR        115.00  LOAD==-0.01(0.00)
#-#-# load     36288  "1 "    0              # load         ZACA         115.00  LOAD==8.04(1.14)
#-#-# load     36288  "E1"    0              # load         ZACA         115.00  LOAD==-0.07(0.00)
0

CATB-2043-B2 "Buellton 115 kV Tap"
 line     36264  36274  "1 " 1     0     # line   from  S.YNZ JT     115.00  BRKR to (1)   BUELLTON     115.00
#-#-# load     36274  "1 "    0              # load         BUELLTON     115.00  LOAD==8.71(1.24)
#-#-# load     36274  "2 "    0              # load         BUELLTON     115.00  LOAD==6.96(0.99)
#-#-# load     36274  "E1"    0              # load         BUELLTON     115.00  LOAD==-0.09(0.00)
#-#-# load     36274  "E2"    0              # load         BUELLTON     115.00  LOAD==-0.11(0.00)
 line  36264 36294  "1 " 1     1      # This outage will also open the Santa Ynez Jct-Cabrillo 115 kV line
0

CATB-2044-B2 "Santa Ynez 115 kV Tap"
 line     36264  36290  "1 " 1     0     # line   from  S.YNZ JT     115.00  BRKR to (1)   SNTA YNZ     115.00
#-#-# load     36290  "1 "    0              # load         SNTA YNZ     115.00  LOAD==7.84(1.12)
#-#-# load     36290  "2 "    0              # load         SNTA YNZ     115.00  LOAD==13.27(1.89)
#-#-# load     36290  "E1"    0              # load         SNTA YNZ     115.00  LOAD==-0.09(0.00)
#-#-# load     36290  "E2"    0              # load         SNTA YNZ     115.00  LOAD==-0.10(0.00)
 line  36264 36288  "1 " 1     1      # This outage will also open the Santa Ynez Jct-Zaca 115 kV line
0

CATB-2045-B2 "Cabrillo-Santa Ynez Sw. Sta. 115 kV Line"
 line     36264  36294  "1 " 1     0     # line   from  S.YNZ JT     115.00  BRKR to BRKR  CABRILLO     115.00
0

CATB-2046-B2 "Santa Maria-Andrew 115 kV Line"
 line     36266  36269  "1 " 1     0     # line   from  SNTA MRA     115.00  BRKR to (2)   FRWAYTP      115.00
 line     36269  36255  "1 " 1     0     # line   from  FRWAYTP      115.00   (2) to BRKR  ANDREW       115.00
0

CATB-2047-B2 "Divide-Cabrillo #2 115 kV Line"
 line     36268  36296  "1 " 1     0     # line   from  DIVVIDE      115.00  BRKR to (3)   PURSMAJ1     115.00
 line     36296  36276  "1 " 1     0     # line   from  PURSMAJ1     115.00   (3) to (3)   LOMPCJ2      115.00
 line     36296  36298  "1 " 1     0     # line   from  PURSMAJ1     115.00   (3) to (1)   PURISIMA     115.00
 line     36276  36292  "1 " 1     0     # line   from  LOMPCJ2      115.00   (3) to (1)   MANVILLE     115.00
 line     36276  38030  "1 " 1     0     # line   from  LOMPCJ2      115.00   (3) to BRKR  LMPC-CTY     115.00
#-#-# load     36298  "1 "    0              # load         PURISIMA     115.00  LOAD==8.39(1.19)
#-#-# load     36298  "E1"    0              # load         PURISIMA     115.00  LOAD==-0.12(0.00)
#-#-# load     36292  "1 "    0              # load         MANVILLE     115.00  LOAD==10.00(6.46)
#-#-# load     36292  "E1"    0              # load         MANVILLE     115.00  LOAD==-0.25(0.00)
#-#-# load     38030  "1 "    0              # load         LMPC-CTY     115.00  LOAD==24.20(7.64)
 line  38030 38031  "1 " 1     1      # Switches in Lompoc City CB143 to transfer load
 load  38030        "1 "    1      # Restore Load 1 at Lompoc City
0

CATB-2048-B2 "Divide-Cabrillo #1 115 kV Line"
 line     36268  36300  "1 " 1     0     # line   from  DIVVIDE      115.00  BRKR to (2)   PURSMAJ2     115.00
 line     36300  36282  "1 " 1     0     # line   from  PURSMAJ2     115.00   (2) to (3)   SURF JCT     115.00
 line     36282  36284  "1 " 1     0     # line   from  SURF JCT     115.00   (3) to (1)   SURF         115.00
 line     36282  38031  "1 " 1     0     # line   from  SURF JCT     115.00   (3) to (2)   LOMPCJ1      115.00
 line     38031  36294  "1 " 1     0     # line   from  LOMPCJ1      115.00   (2) to BRKR  CABRILLO     115.00
#-#-# load     36284  "1 "    0              # load         SURF         115.00  LOAD==10.00(6.98)
#-#-# load     36284  "E1"    0              # load         SURF         115.00  LOAD==-0.12(0.00)
0

CATB-2049-B2 "Oceano-Callender Sw. Sta 115 kV Line"
 line     36278  36280  "1 " 1     0     # line   from  OCEANO       115.00  BRKR to BRKR  UNION OL     115.00
0

CATB-2050-B2 "Paso Robles-Templeton 70 kV Line"
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J       70.00
 line     36315  36356  "1 " 1     0     # line   from  TEMPL J       70.00   (2) to BRKR  PSA RBLS      70.00
 load  36356        "1 "    0      # UVLS will drop Paso Robles Bk 1 if this outage occurs
```

```
 load  36356        "2 "    0      # UVLS will drop Paso Robles Bk 2 if this outage occurs
 load  36356        "3 "    0      # UVLS will drop Paso Robles Bk 3 if this outage occurs
 load  36356        "E1"    0      # UVLS will drop Paso Robles Bk E1 if this outage occurs
 load  36356        "E2"    0      # UVLS will drop Paso Robles Bk E2 if this outage occurs
 load  36356        "E3"    0      # UVLS will drop Paso Robles Bk E3 if this outage occurs
0

CATB-2051-B2 "Templeton-Atascadero 70 kV Line"
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J2      70.00
 line     36316  36358  "1 " 1     0     # line   from  TEMPL J2      70.00   (2) to BRKR  ATASCDRO      70.00
0

CATB-2052-B2 "San Miguel-Paso Robles 70 kV Line"
 line     36354  36356  "1 " 1     0     # line   from  SAN MIGL      70.00  BRKR to BRKR  PSA RBLS      70.00
0

CATB-2053-B2 "Atascadero-Cayucos 70 kV Line"
 line     36358  36362  "1 " 1     0     # line   from  ATASCDRO      70.00  BRKR to (2)   CACOS J2      70.00
 line     36362  36364  "1 " 1     0     # line   from  CACOS J2      70.00   (2) to BRKR  CAYUCOS       70.00
0

CATB-2054-B2 "Atascadero-San Luis Obispo 70 kV Line"
 line     36358  36376  "1 " 1     0     # line   from  ATASCDRO      70.00  BRKR to BRKR  SN LS OB      70.00
0

CATB-2055-B2 "Cayucos-Cambria 70 kV Line"
 line     36360  36364  "1 " 1     0     # line   from  CACOS J1      70.00   (2) to BRKR  CAYUCOS       70.00
 line     36360  36366  "1 " 1     0     # line   from  CACOS J1      70.00   (2) to (2)   PERRY         70.00
 line     36366  36368  "1 " 1     0     # line   from  PERRY         70.00  BRKR to (1)   CAMBRIA       70.00
#-#-# load     36366  "2 "    0              # load         PERRY         70.00  LOAD==3.67(0.52)
#-#-# load     36366  "E2"    0              # load         PERRY         70.00  LOAD==-0.04(0.00)
#-#-# load     36368  "1 "    0              # load         CAMBRIA       70.00  LOAD==1.78(0.26)
#-#-# load     36368  "E1"    0              # load         CAMBRIA       70.00  LOAD==-0.02(0.00)
0

CATB-2056-B2 "Baywood-Cayucos 70 kV Line section"
 line     36364  36370  "1 " 1     0     # line   from  CAYUCOS       70.00  BRKR to BRKR  BAYWOOD       70.00
0

CATB-2057-B2 "Perry-Cambria 70 kV Line section"
 line     36366  36368  "1 " 1     0     # line   from  PERRY         70.00  BRKR to (1)   CAMBRIA       70.00
#-#-# load     36368  "1 "    0              # load         CAMBRIA       70.00  LOAD==1.78(0.26)
#-#-# load     36368  "E1"    0              # load         CAMBRIA       70.00  LOAD==-0.02(0.00)
0

CATB-2058-B2 "San Luis Obispo-Cayucos 70 kV Line"
 line     36370  36372  "1 " 1     0     # line   from  BAYWOOD       70.00   (2) to (3)   MUSTNG J      70.00
 line     36370  36364  "1 " 1     0     # line   from  BAYWOOD       70.00  BRKR to BRKR  CAYUCOS       70.00
 line     36372  36374  "1 " 1     0     # line   from  MUSTNG J      70.00   (3) to (1)   MUSTANG       70.00
 line     36372  36376  "1 " 1     0     # line   from  MUSTNG J      70.00   (3) to BRKR  SN LS OB      70.00
#-#-# load     36370  "1 "    0              # load         BAYWOOD       70.00  LOAD==3.75(0.54)
#-#-# load     36370  "E1"    0              # load         BAYWOOD       70.00  LOAD==-0.04(0.00)
#-#-# load     36374  "1 "    0              # load         MUSTANG       70.00  LOAD==7.05(4.18)
#-#-# load     36374  "E1"    0              # load         MUSTANG       70.00  LOAD==-0.09(0.00)
0

CATB-2059-B2 "Divide-Vandenberg #1 70 kV Line"
 line     36378  36380  "1 " 1     0     # line   from  DIVIDE        70.00  BRKR to BRKR  VAFB SSA      70.00
0

CATB-2060-B2 "Divide-Vandenberg #2 70 kV Line"
 line     36378  36382  "2 " 1     0     # line   from  DIVIDE        70.00  BRKR to BRKR  VAFB SSB      70.00
0

CATB-2061-B2 "Vandenberg Air Force Base"
 line     36380  36384  "1 " 1     0     # line   from  VAFB SSA      70.00  BRKR to (4)   VAFB A-N      70.00
 line     36384  36382  "1 " 1     0     # line   from  VAFB A-N      70.00   (4) to BRKR  VAFB SSB      70.00
 tran     36384  36414  "1 "       0     # tran   from  VAFB A-N      70.00   (4) to (2)   SO VAFB       12.47
 tran     36384  36414  "2 "       0     # tran   from  VAFB A-N      70.00   (4) to (2)   SO VAFB       12.47
0

CATB-2062-B3 "Morro Bay 230/115 kV Transformer Bank 6"
 tran     36252  30915  "6 "       0     # tran   from  MORRO BY     115.00  BRKR to BRKR  MORROBAY     230.00
0
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CATB-2063-B3 "Morro Bay 230/115 kV Transformer Bank 7"
 tran     36252  30915  "7 "       0     # tran   from  MORRO BY     115.00  BRKR to BRKR  MORROBAY     230.00
0

CATB-2064-B3 "Mesa 230/115 kV Transformer Bank 2"
 tran     36256  30930  "2 "       0     # tran   from  MESA_PGE     115.00  BRKR to BRKR  MESA PGE     230.00
0

CATB-2065-B3 "Mesa 230/115 kV Transformer Bank 3"
 tran     36256  30930  "3 "       0     # tran   from  MESA_PGE     115.00  BRKR to BRKR  MESA PGE     230.00
0

CATB-2066-B3 "Andrew 230/115 kV Transformer Bank 1"
 tran     36265  36255  "1 "       0     # tran   from  ANDREW       230.00  BRKR to BRKR  ANDREW       115.00
0

CATB-2067-B3 "Union Oil(Tosco) GSU Transformer"
 tran     36280  36413  "1 "       0     # tran   from  UNION OL     115.00  BRKR to (1)   UNION OL      13.80
#-#-# gen      36413  "1 "    0              # gen          UNION OL      13.80  GEN ==5.30(2.80)
0

CATB-2068-B3 "Templeton 230/70 kV Transformer"
 tran     36310  30905  "1 "       0     # tran   from  TEMPLT7       70.00   (3) to BRKR  TEMPLETN     230.00
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J       70.00
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J2      70.00
 load  36356        "1 "    0      # UVLS will drop Paso Robles Bk 1 if this outage occurs
 load  36356        "2 "    0      # UVLS will drop Paso Robles Bk 2 if this outage occurs
 load  36356        "3 "    0      # UVLS will drop Paso Robles Bk 3 if this outage occurs
 load  36356        "E1"    0      # UVLS will drop Paso Robles Bk E1 if this outage occurs
 load  36356        "E2"    0      # UVLS will drop Paso Robles Bk E2 if this outage occurs
 load  36356        "E3"    0      # UVLS will drop Paso Robles Bk E3 if this outage occurs
 line  30905 30915  "1 " 1     0      # Must include the Templeton-MorroBay 230 kV (Templeton CB 272) in this outage
0

CATB-2069-B3 "San Luis Obispo 115/70 kV Transformer Bank 3"
 tran     36376  36254  "3 "       0     # tran   from  SN LS OB      70.00  BRKR to BRKR  SN LS OB     115.00
0

CATB-2070-B3 "Divide 115/70 Transformer Bank 1"
 tran     36378  36268  "1 "       0     # tran   from  DIVIDE        70.00  BRKR to BRKR  DIVVIDE      115.00
0

CATB-2071-B3 "Divide 115/70 Transformer Bank 2"
 tran     36378  36268  "2 "       0     # tran   from  DIVIDE        70.00  BRKR to BRKR  DIVVIDE      115.00
0

CATB-2072-B3 "Morro Bay PP Unit 3 GSU Transformer"
 tran     36409  30915  "1 "       0     # tran   from  MORRO 3       18.00   (2) to BRKR  MORROBAY     230.00
 tran     36409  30915  "2 "       0     # tran   from  MORRO 3       18.00   (2) to BRKR  MORROBAY     230.00
#-#-# load     36409  "ss"    0              # load         MORRO 3       18.00  LOAD==7.00(3.59)
#-#-# gen      36409  "1 "    0              # gen          MORRO 3       18.00  GEN ==325.00(-0.07)
0

CATB-2073-B3 "Morro Bay PP Unit 4 GSU Transformer"
 tran     36410  30915  "1 "       0     # tran   from  MORRO 4       18.00   (2) to BRKR  MORROBAY     230.00
 tran     36410  30915  "2 "       0     # tran   from  MORRO 4       18.00   (2) to BRKR  MORROBAY     230.00
#-#-# load     36410  "ss"    0              # load         MORRO 4       18.00  LOAD==7.00(3.59)
#-#-# gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-3.12)
0

CATB-2074-B1 "MORRO 3       18.00 Unit ID 1"
 gen      36409  "1 "    0              # gen          MORRO 3       18.00  GEN ==325.00(-19.73)
0

CATB-2075-B1 "MORRO 4       18.00 Unit ID 1"
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2076-B1 "DIABLO 1      25.00 Unit ID 1"
 gen      36411  "1 "    0              # gen          DIABLO 1      25.00  GEN ==1200.00(4.21)
0

CATB-2077-B1 "DIABLO 2      25.00 Unit ID 1"
 gen      36412  "1 "    0              # gen          DIABLO 2      25.00  GEN ==1200.00(15.84)
0
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CATB-2078-B1 "UNION OL      13.80 Unit ID 1"
 gen      36413  "1 "    0              # gen          UNION OL      13.80  GEN ==3.11(2.59)
0

CATB-2079-B1 "DIABLOCN     230.00 Unit ID 1"
 gen      30925  "1 "    0              # gen          DIABLOCN     230.00  GEN ==0.00(60.70)
0

CATB-2080-B1 "Q166G          0.32 Unit ID 1"
 gen      36430  "1 "    0              # gen          Q166G          0.32  GEN ==215.00(5.58)
0

CATB-2081-B1 "Q194G1         0.32 Unit ID 1"
 gen      36432  "1 "    0              # gen          Q194G1         0.32  GEN ==65.00(5.58)
0

CATB-2082-B1 "Q194G2         0.32 Unit ID 1"
 gen      36434  "1 "    0              # gen          Q194G2         0.32  GEN ==125.00(5.57)
0

CATB-2083-B1 "T239           0.40 Unit ID 1"
 gen      36426  "1 "    0              # gen          T239           0.40  GEN ==254.00(48.05)
0

CATB-2084-B1 "T242G          0.32 Unit ID 1"
 gen      36436  "1 "    0              # gen          T242G          0.32  GEN ==155.00(5.57)
0

CATB-2085-B1 "0017-WD      115.00 Unit ID EW"
 gen      90017  "EW"    0              # gen          0017-WD      115.00  GEN ==1.43(0.00)
0

CATB-2086-B1 "0374-WD      115.00 Unit ID EW"
 gen      90374  "EW"    0              # gen          0374-WD      115.00  GEN ==1.50(0.00)
0

CATB-2087-B1 "0384-WD      230.00 Unit ID EW"
 gen      90384  "EW"    0              # gen          0384-WD      230.00  GEN ==1.50(0.00)
0

CATB-2088-B1 "0394-WD       70.00 Unit ID EW"
 gen      90394  "EW"    0              # gen          0394-WD       70.00  GEN ==1.00(0.00)
0

CATB-2089-B1 "0397-WD      230.00 Unit ID EW"
 gen      90397  "EW"    0              # gen          0397-WD      230.00  GEN ==0.75(0.00)
0

CATB-2090-B1 "0443-WD      230.00 Unit ID EW"
 gen      90443  "EW"    0              # gen          0443-WD      230.00  GEN ==0.50(0.00)
0

CATB-2091-B1 "0680-RD      115.00 Unit ID ER"
 gen      90680  "ER"    0              # gen          0680-RD      115.00  GEN ==0.01(0.00)
0

CATB-2092-B1 "6C0987         0.27 Unit ID F"
 gen      39313  "F "    0              # gen          6C0987         0.27  GEN ==20.50(2.60)
0

## L-1/G-1


CATB-2093-B1B2 "Morro Bay-Templeton 230 kV Line and Morro Bay 4"
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00  BRKR to BRKR  MORROBAY     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2094-B1B2 "Morro Bay-Solar SS #1 230 kV Line and Morro Bay 4"
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0
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CATB-2095-B1B2 "Morro Bay-Solar SS #2 230 kV Line and Morro Bay 4"
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2096-B1B2 "Morro Bay-Diablo 230 kV Line and Morro Bay 4"
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  DIABLOCN     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2097-B1B2 "Morro Bay-Mesa 230 kV Line and Morro Bay 4"
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  MESA PGE     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2098-B1B2 "Solar SS-Caliente SS #1 230 kV Line and Morro Bay 4"
 line     30916  30918  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2099-B1B2 "Solar SS-Caliente SS #2 230 kV Line and Morro Bay 4"
 line     30916  30918  "2 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2100-B1B2 "Solar SS-Topaz Solar #1 230 kV Line and Morro Bay 4"
 line     30916  30921  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  TOPAZ1       230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2101-B1B2 "Solar SS-Topaz Solar #2 230 kV Line and Morro Bay 4"
 line     30916  30922  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  TOPAZ2       230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2102-B1B2 "Caliente SS-T239 230 kV Line and Morro Bay 4"
 line     30918  30919  "1 " 1     0     # line   from  CALNTESS     230.00  BRKR to (3)   T239         230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2103-B1B2 "Diablo-Mesa 230 kV Line and Morro Bay 4"
 line     30925  30930  "1 " 1     0     # line   from  DIABLOCN     230.00  BRKR to BRKR  MESA PGE     230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0

CATB-2104-B1B2 "Andrew-Midway 230 kV Line and Morro Bay 4"
 line     36265  30970  "1 " 1     0     # line   from  ANDREW       230.00  BRKR to BRKR  MIDWAY       230.00
#
 gen      36410  "1 "    0              # gen          MORRO 4       18.00  GEN ==325.00(-23.01)
0


# 2018 main year category b contingency list
# MID/TID/CCSF outages Zones 323/324/357
#

# MID Zone 323

CATB-2105-B2 "Rosemore-Westley #1 230 kV Line (MID)"
 line     30670  38257  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  ROSEMRE      230.00
0

CATB-2106-B2 "Rosemore-Westley #2 230 kV Line (MID)"
 line     30670  38257  "2 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  ROSEMRE      230.00
0
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CATB-2107-B2 "Tracy-Westley #1 230 kV Line(MID)"
 line     37585  30670  "1 " 1     0     # line   from  TRCY PMP     230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2108-B2 "Parker-Westley 230 kV Line(MID)"
 line     38204  30670  "1 " 1     0     # line   from  PRKR MID     230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2109-B2 "Parker 230/69 kV Transformer Bank 2(MID)"
 line     38204  38202  "1 " 1     0     # line   from  PRKR MID     230.00  BRKR to (3)   PARKER2M     230.00
 tran     38202  38205  "1 "       0     # tran   from  PARKER2M     230.00   (3) to BRKR  PARKER_2      69.00
 tran     38202  38360  "1 "       0     # tran   from  PARKER2M     230.00   (3) to (1)   PARKER2T      12.00
0

CATB-2110-B2 "Parker 230/69 kV Transformer Bank 1(MID)"
 line     38204  38210  "1 " 1     0     # line   from  PRKR MID     230.00  BRKR to (3)   PARKER1M     230.00
 tran     38210  38250  "1 "       0     # tran   from  PARKER1M     230.00   (3) to BRKR  PARKER        69.00
 tran     38210  38358  "1 "       0     # tran   from  PARKER1M     230.00   (3) to (1)   PARKER1T      12.00
#-#-# shunt    38358  "b "    0              # shunt        PARKER1T      12.00
0

CATB-2111-B2 "Parker-Walnut 230 kV Line(MID)"
 line     38204  38400  "1 " 1     0     # line   from  PRKR MID     230.00  BRKR to BRKR  WALNT        230.00
0

CATB-2112-B3 "Rosemore 230/69 kV Transformer Bank 1(MID)"
 tran     38256  38257  "1 "       0     # tran   from  ROSEMORE      69.00  BRKR to BRKR  ROSEMRE      230.00
0

CATB-2113-B3 "Rosemore 230/69 kV Transformer Bank 2(MID)"
 tran     38256  38257  "2 "       0     # tran   from  ROSEMORE      69.00  BRKR to BRKR  ROSEMRE      230.00
0

# TID Zone 324

CATB-2114-B2 "Tesla-Westley 230 kV Line (TID)"
 line     30624  30670  "1 " 1     0     # line   from  TESLA E      230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2115-B2 "Tracy-Westley #1 230 kV Line (TID)"
 line     37585  30670  "1 " 1     0     # line   from  TRCY PMP     230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2116-B2 "Tracy-Westley #2 230 kV Line (TID)"
 line     37585  30670  "2 " 1     0     # line   from  TRCY PMP     230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2117-B2 "Walnut-Westley 230 kV Line (TID)"
 line     38400  30670  "1 " 1     0     # line   from  WALNT        230.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2118-B3 "Westley 230/115 kV Transformer Bank 1 (TID)"
 tran     38410  30670  "1 "       0     # tran   from  WESTL115     115.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2119-B3 "Westley 230/115 kV Transformer Bank 2 (TID)"
 tran     38410  30670  "2 "       0     # tran   from  WESTL115     115.00  BRKR to BRKR  WESTLEY      230.00
0

CATB-2120-B3 "Walnut 230/115 kV Transformer Bank 1 (TID)"
 tran     38436  38400  "1 "       0     # tran   from  WALNT115     115.00  BRKR to BRKR  WALNT        230.00
0

CATB-2121-B3 "Walnut 230/69 kV Transformer Bank 1N (TID)"
 tran     38490  38400  "1 "       0     # tran   from  WAL69-N       69.00  BRKR to BRKR  WALNT        230.00
0

CATB-2122-B3 "Walnut 230/69 kV Transformer Bank 1S (TID)"
 tran     38491  38400  "1 "       0     # tran   from  WAL69-S       69.00  BRKR to BRKR  WALNT        230.00
0

# CCSF Zone 357

CATB-2123-B2 "Warnerville-Standiford #7 115 kV Line (CCSF)"
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 line     36964  38230  "7 " 1     0     # line   from  WRNRVLLE     115.00  BRKR to BRKR  STANDFRD     115.00
0

CATB-2124-B2 "Warnerville-Standiford #8 115 kV Line (CCSF)"
 line     36964  36998  "8 " 1     0     # line   from  WRNRVLLE     115.00  BRKR to BRKR  HW_TAP       115.00
 line     36998  36975  "8 " 1     0     # line   from  HW_TAP       115.00  BRKR to BRKR  RB_TAP8      115.00
 line     36975  38230  "8 " 1     0     # line   from  RB_TAP8      115.00  BRKR to BRKR  STANDFRD     115.00
0

CATB-2125-B3 "Warnerville 230/115 kV Bank 1 (CCSF)"
 tran     36964  30515  "1 "       0     # tran   from  WRNRVLLE     115.00  BRKR to BRKR  WARNERVL     230.00
0

CATB-2126-B3 "Warnerville 230/115 kV Bank 2 (CCSF)"
 tran     36964  30515  "2 "       0     # tran   from  WRNRVLLE     115.00  BRKR to BRKR  WARNERVL     230.00
0

CATB-2127-B3 "Warnerville 230/115 kV Bank 3 (CCSF)"
 tran     36964  30515  "3 "       0     # tran   from  WRNRVLLE     115.00  BRKR to BRKR  WARNERVL     230.00
0

CATB-2128-B2 "Semitropic-Midway #2 115 kV Line"
 line     34701  34704  "1 " 1     0     # line   from  SEMI_TAP     115.00   (2) to BRKR  SEMITRPC     115.00
 line     34701  34703  "1 " 1     0     # line   from  SEMI_TAP     115.00   (2) to (2)   SMTRPCWS     115.00
 line     34703  39180  "1 " 1     0     # line   from  SMTRPCWS     115.00   (2) to BRKR  S654SS       115.00
#-#-# load     34703  "1 "    0              # load         SMTRPCWS     115.00  LOAD==13.49(8.00)
#-#-# load     34703  "E1"    0              # load         SMTRPCWS     115.00  LOAD==-0.18(0.00)
 line     34702  39180  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to BRKR  S654SS       115.00
 line     34702  90032  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to (1)   0032-WD      115.00
 line     34702  90191  "1 " 1     0     # line   from  GOSE LKE     115.00   (3) to (1)   0191-WD      115.00
#-#-# load     34702  "1 "    0              # load         GOSE LKE     115.00  LOAD==9.03(1.29)
#-#-# load     34702  "2 "    0              # load         GOSE LKE     115.00  LOAD==3.07(0.44)
#-#-# load     34702  "E1"    0              # load         GOSE LKE     115.00  LOAD==-0.05(0.00)
#-#-# load     34702  "E2"    0              # load         GOSE LKE     115.00  LOAD==-0.03(0.00)
#-#-# gen      90032  "FW"    0              # gen          0032-WD      115.00  GEN ==15.00(0.00)
#-#-# gen      90191  "EW"    0              # gen          0191-WD      115.00  GEN ==9.00(0.00)
0



end
```

```
# PG&E qc6p1 kern 2018 main year category c contingency list (selected category c multiple element outages) r8a
# Yosemite, Fresno, Kern, and Los Padres Divisions Zones (313, 314, 315, and 320)
# plus selected MID/TID/CCSF outages


# 2018 main year category c contingency list (selected category c multiple element outages)
# Yosemite Division Zone 313
#


CATC-1001-C1 "Los Banos 230 kV Bus Section 1"
 line     30765  30670  "1 " 1     0     # line   from  LOSBANOS     230.00 to WESTLEY      230.00
 line     30765  30763  "1 " 1     0     # line   from  LOSBANOS     230.00 to 2C577SS      230.00
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00 to SN LS PP     230.00
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00 to SN LS PP     230.00
 tran     30765  34214  "3 "       0     # tran   from  LOSBANOS     230.00 to LOS BANS      70.00
 svd      30765  "v "    0             # svd          LOSBANOS     230.00
0

CATC-1002-C1 "Los Banos 230 kV Bus Section 2"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00 to PANOCHE      230.00
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00 to 2C560SS      230.00
 line     30765  34147  "1 " 1     0     # line   from  LOSBANOS     230.00 to MERCY S1     230.00
 line     30765  38615  "1 " 1     0     # line   from  LOSBANOS     230.00 to DS AMIGO     230.00
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00 to 4C779SS      230.00
 tran     30765  34214  "4 "       0     # tran   from  LOSBANOS     230.00 to LOS BANS      70.00
0

CATC-1003-C2 "Los Banos 230 kV CB272 Failure"
 line     30765  30670  "1 " 1     0     # line   from  LOSBANOS     230.00 to WESTLEY      230.00
 line     30765  30763  "1 " 1     0     # line   from  LOSBANOS     230.00 to 2C577SS      230.00
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00 to SN LS PP     230.00
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00 to SN LS PP     230.00
 tran     30765  34214  "3 "       0     # tran   from  LOSBANOS     230.00 to LOS BANS      70.00
 svd      30765  "v "    0             # svd          LOSBANOS     230.00
 tran     30765  30069  "1 "       0     # tran   from  LOSBANOS     230.00 to L.BANS M     500.00
0

CATC-1004-C2 "Los Banos 230 kV CB282 Failure"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00 to PANOCHE      230.00
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00 to 2C560SS      230.00
 line     30765  34147  "1 " 1     0     # line   from  LOSBANOS     230.00 to MERCY S1     230.00
 line     30765  38615  "1 " 1     0     # line   from  LOSBANOS     230.00 to DS AMIGO     230.00
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00 to 4C779SS      230.00
 tran     30765  34214  "4 "       0     # tran   from  LOSBANOS     230.00 to LOS BANS      70.00
 tran     30765  30069  "1 "       0     # tran   from  LOSBANOS     230.00 to L.BANS M     500.00
0

CATC-1005-C1 "Panoche 230 kV Bus Section 1D"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  30873  "1 " 1     0     # line   from  PANOCHE      230.00 to HELM         230.00
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS1     230.00
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00 to PANO_EC      230.00
0

CATC-1006-C1 "Panoche 230 kV Bus Section 1E"
 line     30790  30760  "1 " 1     0     # line   from  PANOCHE      230.00 to COBURN       230.00
 line     30790  39701  "1 " 1     0     # line   from  PANOCHE      230.00 to 4C829S1      230.00
 line     30790  34147  "2 " 1     0     # line   from  PANOCHE      230.00 to MERCY S1     230.00
 tran     30790  30791  "1 "       0     # tran   from  PANOCHE      230.00 to PNCHE 1M     230.00
0

CATC-1007-C2 "Panoche 230 kV CB422 Failure (1D and 1E)"
 line     30790  30760  "1 " 1     0     # line   from  PANOCHE      230.00 to COBURN       230.00
 line     30790  39701  "1 " 1     0     # line   from  PANOCHE      230.00 to 4C829S1      230.00
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00 to PANO_EC      230.00
 line     30790  30873  "1 " 1     0     # line   from  PANOCHE      230.00 to HELM         230.00
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS1     230.00
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  34147  "2 " 1     0     # line   from  PANOCHE      230.00 to MERCY S1     230.00
 tran     30790  30791  "1 "       0     # tran   from  PANOCHE      230.00 to PNCHE 1M     230.00
0

CATC-1008-C1 "Panoche 230 kV Bus Section 2D"
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 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  30825  "1 " 1     0     # line   from  PANOCHE      230.00 to MCMULLN1     230.00
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS2     230.00
 tran     30790  34158  "2 "       0     # tran   from  PANOCHE      230.00 to PANOCHE2     115.00
0

CATC-1009-C1 "Panoche 230 kV Bus Section 2E"
 line     30790  30750  "1 " 1     0     # line   from  PANOCHE      230.00 to MOSSLND2     230.00
 line     30790  39702  "2 " 1     0     # line   from  PANOCHE      230.00 to 4C829S2      230.00
 line     30790  30765  "2 " 1     0     # line   from  PANOCHE      230.00 to LOSBANOS     230.00
 line     30790  38615  "1 " 1     0     # line   from  PANOCHE      230.00 to DS AMIGO     230.00
0

CATC-1010-C2 "Panoche 230 kV CB412 Failure (2D and 2E)"
 line     30790  30750  "1 " 1     0     # line   from  PANOCHE      230.00 to MOSSLND2     230.00
 line     30790  39702  "2 " 1     0     # line   from  PANOCHE      230.00 to 4C829S2      230.00
 line     30790  30765  "2 " 1     0     # line   from  PANOCHE      230.00 to LOSBANOS     230.00
 line     30790  30825  "1 " 1     0     # line   from  PANOCHE      230.00 to MCMULLN1     230.00
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS2     230.00
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  38615  "1 " 1     0     # line   from  PANOCHE      230.00 to DS AMIGO     230.00
 tran     30790  34158  "2 "       0     # tran   from  PANOCHE      230.00 to PANOCHE2     115.00
0

CATC-1011-C2 "Panoche 230 kV CB302 Failure (1D and 2D)"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  30873  "1 " 1     0     # line   from  PANOCHE      230.00 to HELM         230.00
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS1     230.00
 line     30790  30793  "1 " 1     0     # line   from  PANOCHE      230.00 to PANO_EC      230.00
#
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00 to GATES        230.00
 line     30790  30825  "1 " 1     0     # line   from  PANOCHE      230.00 to MCMULLN1     230.00
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00 to 3C643XS2     230.00
 tran     30790  34158  "2 "       0     # tran   from  PANOCHE      230.00 to PANOCHE2     115.00
0

CATC-1012-C2 "Panoche 230 kV CB202 Failure (1E and 2E)"
 line     30790  30760  "1 " 1     0     # line   from  PANOCHE      230.00 to COBURN       230.00
 line     30790  39701  "1 " 1     0     # line   from  PANOCHE      230.00 to 4C829S1      230.00
 line     30790  34147  "2 " 1     0     # line   from  PANOCHE      230.00 to MERCY S1     230.00
 tran     30790  30791  "1 "       0     # tran   from  PANOCHE      230.00 to PNCHE 1M     230.00
#
 line     30790  30750  "1 " 1     0     # line   from  PANOCHE      230.00 to MOSSLND2     230.00
 line     30790  39702  "2 " 1     0     # line   from  PANOCHE      230.00 to 4C829S2      230.00
 line     30790  30765  "2 " 1     0     # line   from  PANOCHE      230.00 to LOSBANOS     230.00
 line     30790  38615  "1 " 1     0     # line   from  PANOCHE      230.00 to DS AMIGO     230.00
0

CATC-1013-C2 "Wilson 230 kV CB2212 Failure"
 line     30800  30515  "1 " 1     0     # line   from  WILSON       230.00 to WARNERVL     230.00
 tran     30800  34134  "1 "       0     # tran   from  WILSON       230.00 to WILSON A     115.00
0

CATC-1014-C2 "Wilson 230 kV CB2222 Failure"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00 to NMERCED      230.00
 tran     30800  34134  "1 "       0     # tran   from  WILSON       230.00 to WILSON A     115.00
0

CATC-1015-C2 "Wilson 230 kV CB2232 Failure"
 line     30800  30795  "1 " 1     0     # line   from  WILSON       230.00 to STOREY 2     230.00
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00 to NMERCED      230.00
0

CATC-1016-C2 "Wilson 230 kV CB2312 Failure"
 line     30800  30515  "1 " 1     0     # line   from  WILSON       230.00 to WARNERVL     230.00
 line     30800  30796  "1 " 1     0     # line   from  WILSON       230.00 to STOREY 1     230.00
0

CATC-1017-C2 "Wilson 230 kV CB2322 Failure"
 line     30800  30796  "1 " 1     0     # line   from  WILSON       230.00 to STOREY 1     230.00
 tran     30800  34136  "2 "       0     # tran   from  WILSON       230.00 to WILSON B     115.00
0

CATC-1018-C2 "Wilson 230 kV CB2332 Failure"
 line     30800  30795  "1 " 1     0     # line   from  WILSON       230.00 to STOREY 2     230.00
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 tran     30800  34136  "2 "       0     # tran   from  WILSON       230.00 to WILSON B     115.00
0

CATC-1019-C1 "Borden 230 kV CB322 Failure"
 line     30805  30795  "1 " 1     0     # line   from  BORDEN       230.00 to STOREY 2     230.00
 tran     30805  34256  "1 "       0     # tran   from  BORDEN       230.00 to BORDEN        70.00
0

CATC-1020-C1 "Borden 230 kV CB342 Failure"
 tran     30805  34256  "2 "       0     # tran   from  BORDEN       230.00 to BORDEN        70.00
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00 to GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
0

CATC-1021-C1 "Chowchilla 115 kV Bus"
 isol     34100                          # BUS FAULT AT  34100 CHWCHLLA     115.00
0

CATC-1022-C1 "Exchequer 115 kV Bus"
 isol     34112                          # BUS FAULT AT  34112 EXCHEQUR     115.00
0

CATC-1023-C1 "LeGrand 115 kV Bus w/ Exchequer SPS"
 isol     34116                          # BUS FAULT AT  34116 LE GRAND     115.00
#
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
0

CATC-1024-C1 "LeGrand 115 kV Bus w/o Exchequer SPS"
 isol     34116                          # BUS FAULT AT  34116 LE GRAND     115.00
0

CATC-1025-C1 "Oakhurst 115 kV Bus"
 isol     34122                          # BUS FAULT AT  34122 OAKHURST     115.00
0

CATC-1026-C1 "Coarsegold 115 kV Bus"
 isol     34126                          # BUS FAULT AT  34126 CORSGOLD     115.00
0

CATC-1027-C1 "Livingston 115 kV Bus"
 isol     34130                          # BUS FAULT AT  34130 LIVNGSTN     115.00
0

CATC-1028-C1 "Gallo 115 kV Bus"
 isol     34132                          # BUS FAULT AT  34132 GALLO        115.00
0

CATC-1029-C1 "Wilson 115 kV Bus Section 1"
 isol     34134                          # BUS FAULT AT  34134 WILSON A     115.00
0

CATC-1030-C1 "Wilson 115 kV Bus Section 2"
 isol     34136                          # BUS FAULT AT  34136 WILSON B     115.00
0

CATC-1031-C2 "Wilson 115 kV CB102 Failure w/ Exchequer SPS"
 isol     34134                          # BUS FAULT AT  34134 WILSON A     115.00
 isol     34136                          # BUS FAULT AT  34136 WILSON B     115.00
#
  gen      34306  "1 "    0              # Exchequer Unit will trip for Exchequer-Legrand 115 kV Line outage
0

CATC-1032-C2 "Wilson 115 kV CB102 Failure w/o Exchequer SPS"
 isol     34134                          # BUS FAULT AT  34134 WILSON A     115.00
 isol     34136                          # BUS FAULT AT  34136 WILSON B     115.00
0

CATC-1033-C1 "El Capitan 115 kV Bus"
 isol     34138                          # BUS FAULT AT  34138 EL CAPTN     115.00
0

CATC-1034-C1 "Cressey 115 kV Bus"
 isol     34140                          # BUS FAULT AT  34140 CRESSEY      115.00
0
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CATC-1035-C1 "Merced 115 kV Bus w/ S550 SPS"
 isol     34144                          # BUS FAULT AT  34144 MERCED       115.00
# SPS to trip S550 (Q550)
 gen      34345  "E "    0               # gen          S550          34.50  GEN ==20.00(-2.42)
0

CATC-1036-C1 "Merced 115 kV Bus w/o S550 SPS"
 isol     34144                          # BUS FAULT AT  34144 MERCED       115.00
0

CATC-1037-C1 "Dairyland 115 kV Bus"
 isol     34154                          # BUS FAULT AT  34154 DAIRYLND     115.00
0

CATC-1038-C1 "Panoche 115 kV Bus Section 1"
 isol     34155                          # BUS FAULT AT  34155 PANOCHE1     115.00
0

CATC-1039-C1 "Panoche 115 kV Bus Section 2"
 isol     34158                          # BUS FAULT AT  34158 PANOCHE2     115.00
0

CATC-1040-C2 "Panoche 115 kV CB102 Failure"
 isol     34155                          # BUS FAULT AT  34155 PANOCHE1     115.00
 isol     34158                          # BUS FAULT AT  34158 PANOCHE2     115.00
0

CATC-1041-C1 "Oro Loma 115 kV Bus"
 isol     34162                          # BUS FAULT AT  34162 ORO LOMA     115.00
0

CATC-1042-C1 "Oro Loma 70 kV Bus"
 isol     34200                          # BUS FAULT AT  34200 ORO LOMA      70.00
0

CATC-1043-C1 "Merced 70 kV Bus"
 isol     34202                          # BUS FAULT AT  34202 MERCED        70.00
0

CATC-1044-C1 "Canal 70 kV Bus"
 isol     34206                          # BUS FAULT AT  34206 CANAL         70.00
0

CATC-1045-C1 "Los Banos 70 kV Bus"
 isol     34214                          # BUS FAULT AT  34214 LOS BANS      70.00
0

CATC-1046-C1 "Santa Rita 70 kV Bus"
 isol     34216                          # BUS FAULT AT  34216 SNTA RTA      70.00
0

CATC-1047-C1 "Merced Falls 70 kV Bus"
 isol     34230                          # BUS FAULT AT  34230 MRCDFLLS      70.00
0

CATC-1048-C1 "Bonita 70 kV Bus"
 isol     34238                          # BUS FAULT AT  34238 BONITA        70.00
0

CATC-1049-C1 "Glass 70 kV Bus"
 isol     34240                          # BUS FAULT AT  34240 GLASS         70.00
0

CATC-1050-C2 "Madera 70 kV CB6012 Failure"
 line     34252  34256  "1 " 1     0     # line   from  MADERA        70.00 to BORDEN        70.00
 load     34252  "1 "    0              # load         MADERA        70.00  LOAD==10.58(1.51)
 load     34252  "E1"    0              # load         MADERA        70.00  LOAD==-0.18(0.00)
0

CATC-1051-C2 "Madera 70 kV CB6022 Failure"
 line     34252  34256  "1 " 1     0     # line   from  MADERA        70.00 to BORDEN        70.00
 load     34252  "2 "    0              # load         MADERA        70.00  LOAD==11.56(1.26)
 load     34252  "E2"    0              # load         MADERA        70.00  LOAD==-0.15(0.00)
0
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CATC-1052-C2 "Madera 70 kV CB6032 Failure"
 line     34252  34256  "2 " 1     0     # line   from  MADERA        70.00 to BORDEN        70.00
 load     34252  "2 "    0              # load         MADERA        70.00  LOAD==11.56(1.26)
 load     34252  "E2"    0              # load         MADERA        70.00  LOAD==-0.15(0.00)
0

CATC-1053-C2 "Madera 70 kV CB6042 Failure"
 line     34252  34256  "2 " 1     0     # line   from  MADERA        70.00 to BORDEN        70.00
 load     34252  "3 "    0              # load         MADERA        70.00  LOAD==13.01(1.85)
 load     34252  "E3"    0              # load         MADERA        70.00  LOAD==0.0(0.0)
0

CATC-1054-C2 "Madera 70 kV CB6052 Failure"
 line     34252  34254  "1 " 1     0     # line   from  MADERA        70.00 to TRIGO         70.00
 load     34252  "3 "    0              # load         MADERA        70.00  LOAD==13.01(1.85)
 load     34252  "E3"    0              # load         MADERA        70.00  LOAD==0.0(0.0)
0

CATC-1055-C2 "Madera 70 kV CB6062 Failure"
 line     34252  34254  "1 " 1     0     # line   from  MADERA        70.00 to TRIGO         70.00
 load     34252  "1 "    0              # load         MADERA        70.00  LOAD==10.58(1.51)
 load     34252  "E1"    0              # load         MADERA        70.00  LOAD==-0.18(0.00)
0

CATC-1056-C2 "Borden 70 kV CB62 Failure"
 isol     34256                         # BUS FAULT AT  34256 BORDEN        70.00
0

CATC-1057-C1 "Firebaugh 115 kV Bus"
 isol     34266                         # BUS FAULT AT  34266 FIREBAGH     115.00
0

CATC-1058-C1 "Mendota 70 kV Bus"
 isol     34268                         # BUS FAULT AT  34268 MENDOTA       70.00
0

CATC-1059-C5 "Borden-Madera #2 and Glass-Borden 70 kV Lines w/ Madera SPS"
 line     34252  34256  "2 " 1     0     # line   from  MADERA        70.00  BRKR to BRKR  BORDEN        70.00
#
 line     34240  34256  "1 " 1     0     # line   from  GLASS         70.00  BRKR to BRKR  BORDEN        70.00
# Madera SPS trip load bank 3 to eliminate thermal overload
 load     34252  "3 "    0              # load         MADERA        70.00  LOAD==13.01(1.85)
 load     34252  "E3"    0              # load         MADERA        70.00  LOAD==0.0(0.0)
0

CATC-1060-C5 "Borden-Madera #2 and Glass-Borden 70 kV Lines w/o Madera SPS"
 line     34252  34256  "2 " 1     0     # line   from  MADERA        70.00  BRKR to BRKR  BORDEN        70.00
#
 line     34240  34256  "1 " 1     0     # line   from  GLASS         70.00  BRKR to BRKR  BORDEN        70.00
0

CATC-1061-C5 "Wilson-Atwater #2 and Atwater-El Capitan 115 kV Lines w/ Atwater SPS"
 line     34134  34104  "1 " 1     0     # line   from  WILSON A     115.00  BRKR to BRKR  ATWATER      115.00
#
 line     34136  34138  "1 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  EL CAPTN     115.00
# Atwater SPS to open Atwater CBs 1222 and 1232 Atwater-El Capitan line section
 line     34104  34106  "1 " 1     0     # line   from  ATWATER      115.00  BRKR to (2)   CASTLE       115.00
0

CATC-1062-C5 "Wilson-Atwater #2 and Atwater-El Capitan 115 kV Lines w/o Atwater SPS"
 line     34134  34104  "1 " 1     0     # line   from  WILSON A     115.00  BRKR to BRKR  ATWATER      115.00
#
 line     34136  34138  "1 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  EL CAPTN     115.00
0

CATC-1063-C5 "Wilson-Merced #2 and Wilson-Oro Loma 115 kV Lines"
 line     34136  34144  "2 " 1     0     # line   from  WILSON B     115.00  BRKR to BRKR  MERCED       115.00
#
 line     34118  34136  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to BRKR  WILSON B     115.00
 line     34118  34168  "1 " 1     0     # line   from  LE GRNDJ     115.00   (2) to (2)   EL NIDO      115.00
 line     34168  34162  "1 " 1     0     # line   from  EL NIDO      115.00   (2) to BRKR  ORO LOMA     115.00
#-#-# load     34168  "1 "    0              # load         EL NIDO      115.00  LOAD==12.57(1.79)
#-#-# load     34168  "2 "    0              # load         EL NIDO      115.00  LOAD==11.18(1.60)
#-#-# load     34168  "E1"    0              # load         EL NIDO      115.00  LOAD==-0.12(0.00)
```

```
#-#-# load     34168  "E2"    0              # load         EL NIDO      115.00  LOAD==-0.14(0.00)
0

CATC-1064-C5 "North Merced-El Capitan #1 115 kV Line"
 line     34190  34138  "1 " 1     0     # line   from  NMERCED      115.00  BRKR to BRKR  EL CAPTN     115.00
#
 line     34190  34138  "2 " 1     0     # line   from  NMERCED      115.00  BRKR to BRKR  EL CAPTN     115.00
0

CATC-1065-C5 "Panoche-4C678 #1 and #2 115 kV Lines"
 line     34155  34350  "1 " 1     0     # line   from  PANOCHE1     115.00  BRKR to (2)   KAMM         115.00
 line     34350  34352  "1 " 1     0     # line   from  KAMM         115.00   (2) to (3)   CANTUA       115.00
 line     34352  34432  "1 " 1     0     # line   from  CANTUA       115.00   (3) to (2)   WESTLNDS     115.00
 line     34352  90078  "1 " 1     0     # line   from  CANTUA       115.00   (3) to (1)   0078-WD      115.00
 line     34432  39777  "1 " 1     0     # line   from  WESTLNDS     115.00   (2) to BRKR  4C678S1     115.00
#-#-# load     34350  "1 "    0              # load         KAMM         115.00  LOAD==3.55(1.63)
#-#-# load     34350  "E1"    0              # load         KAMM         115.00  LOAD==-0.05(0.00)
#-#-# load     34352  "1 "    0              # load         CANTUA       115.00  LOAD==19.39(2.76)
#-#-# load     34352  "E1"    0              # load         CANTUA       115.00  LOAD==-0.13(0.00)
#-#-# load     34432  "16"    0              # load         WESTLNDS     115.00  LOAD==0.90(0.22)
#-#-# load     34432  "18"    0              # load         WESTLNDS     115.00  LOAD==1.20(0.32)
#-#-# load     34432  "E1"    0              # load         WESTLNDS     115.00  LOAD==-0.01(0.00)
#-#-# load     34432  "E2"    0              # load         WESTLNDS     115.00  LOAD==-0.01(0.00)
#-#-# gen      90078  "FW"    0              # gen          0078-WD      115.00  GEN ==20.00(0.00)
#
 line     34141  34148  "1 " 1     0     # line   from  PAN2_TAP     115.00   (2) to (2)   CHENY        115.00
 tran     34141  34142  "1 "       0     # tran   from  PAN2_TAP     115.00   (2) to (1)   WHD_PAN2      13.80
 line     34148  34149  "1 " 1     0     # line   from  CHENY        115.00   (2) to (3)   CHENYT       115.00
 line     34149  34151  "1 " 1     0     # line   from  CHENYT       115.00   (3) to (3)   S612TP       115.00
 line     34149  34158  "1 " 1     0     # line   from  CHENYT       115.00   (3) to BRKR  PANOCHE2     115.00
 line     34151  39081  "1 " 1     0     # line   from  S612TP       115.00   (3) to (2)   S612         115.00
 line     34151  39778  "2 " 1     0     # line   from  S612TP       115.00   (3) to BRKR  4C678S2     115.00
 tran     39081  34303  "1 "       0     # tran   from  S612         115.00   (2) to (1)   S612          13.80
#-#-# load     34148  "1 "    0              # load         CHENY        115.00  LOAD==16.10(2.29)
#-#-# load     34148  "E1"    0              # load         CHENY        115.00  LOAD==-0.15(0.00)
#-#-# gen      34142  "1 "    0              # gen          WHD_PAN2      13.80  GEN ==49.97(-9.19)
#-#-# gen      34303  "E "    0              # gen          S612          13.80  GEN ==13.00(-1.51)
0

CATC-1066-C5 "4C678-Schindler #1 and #2 115 kV Lines"
 line     39777  34354  "1 " 1     0     # line   from  4C678S1      115.00  BRKR to BRKR  SCHINDLR     115.00
#
 line     39778  34354  "2 " 1     0     # line   from  4C678S2      115.00  BRKR to BRKR  SCHINDLR     115.00
0

CATC-1067-C5 "Los Banos-4C779 #1 and 2C577-Los Banos 230 kV Lines"
 line     30765  39717  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  4C779SS      230.00
#
 line     30763  30765  "1 " 1     0     # line   from  2C577SS      230.00  BRKR to BRKR  LOSBANOS     230.00
0

CATC-1068-C5 "Los Banos-Panoche #2 and Los Banos-2C560 230 kV Lines"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 line     30765  30792  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  2C560SS      230.00
0

CATC-1069-C5 "Los Banos-Panoche #2 and 2C560-Dos Amigos PP 230 kV Lines"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 line     30792  38615  "1 " 1     0     # line   from  2C560SS      230.00  BRKR to BRKR  DS AMIGO     230.00
0

CATC-1070-C5 "Los Banos-Panoche #2 and Dos Amigos PP-Panoche #3 230 kV Lines"
 line     30765  30790  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  PANOCHE      230.00
#
 line     38615  30790  "1 " 1     0     # line   from  DS AMIGO     230.00  BRKR to BRKR  PANOCHE      230.00
0

CATC-1071-C5 "Los Banos-San Luis PGP #1 and #2 230 kV Lines"
 line     30765  38625  "1 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
#
 line     30765  38625  "2 " 1     0     # line   from  LOSBANOS     230.00  BRKR to BRKR  SN LS PP     230.00
0
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CATC-1072-C5 "Panoche-Gates #1 and #2 230 kV Lines"
 line     30790  30900  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
#
 line     30790  30900  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  GATES        230.00
0

CATC-1073-C5 "Panoche-3C643X #1 and #2 230 kV Lines"
 line     30790  39129  "1 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS1     230.00
#
 line     30790  39130  "2 " 1     0     # line   from  PANOCHE      230.00  BRKR to BRKR  3C643XS2     230.00
0

CATC-1074-C5 "3C643X-Helm #1 and 3C643X-Kearney #2 230 kV Lines"
 line     39129  30873  "1 " 1     0     # line   from  3C643XS1     230.00  BRKR to BRKR  HELM         230.00
#
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY     230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
0

CATC-1075-C5 "Helm-McCall and 3C643X-Kearney #2 230 kV Lines"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
#
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY     230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
0

CATC-1076-C5 "3C643W-Gregg #1 and 3C643X-Kearney #2 230 kV Lines"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 line     39130  30825  "2 " 1     0     # line   from  3C643XS2     230.00  BRKR to (2)   MCMULLN1     230.00
 line     30825  30830  "1 " 1     0     # line   from  MCMULLN1     230.00   (2) to BRKR  KEARNEY     230.00
#-#-# load     30825  "1 "    0              # load         MCMULLN1     230.00  LOAD==28.95(4.12)
#-#-# load     30825  "E1"    0              # load         MCMULLN1     230.00  LOAD==-0.26(0.00)
0

CATC-1077-C5 "Coburn-4C829 #1 and Moss Landing-4C829 #2 230 kV Lines"
 line     30760  39701  "1 " 1     0     # line   from  COBURN       230.00  BRKR to BRKR  4C829S1      230.00
#
 line     30750  39702  "2 " 1     0     # line   from  MOSSLND2     230.00  BRKR to BRKR  4C829S2      230.00
0

CATC-1078-C5 "4C829-Panoche #1 and #2 230 kV Lines"
 line     39701  30790  "1 " 1     0     # line   from  4C829S1      230.00  BRKR to BRKR  PANOCHE      230.00
#
 line     39702  30790  "2 " 1     0     # line   from  4C829S2      230.00  BRKR to BRKR  PANOCHE      230.00
0

CATC-1079-C5 "Bellota-Cottle and Bellota-Warnerville 230 kV Lines"
 line     30500  38206  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  COTTLE       230.00
#
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
0

CATC-1080-C5 "Cottle-Melones and Bellota-Warnerville 230 kV Lines"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
#
 line     30500  30515  "1 " 1     0     # line   from  BELLOTA      230.00  BRKR to BRKR  WARNERVL     230.00
0

CATC-1081-C5 "Cottle-Melones and Warnerville-Wilson 230 kV Lines"
 line     38206  37563  "1 " 1     0     # line   from  COTTLE       230.00  BRKR to BRKR  MELONES      230.00
#
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
0

CATC-1082-C5 "Melones-North Merced and Warnerville-Wilson 230 kV Lines"
 line     37563  30803  "1 " 1     0     # line   from  MELONES      230.00  BRKR to BRKR  NMERCED      230.00
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#
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
0

CATC-1083-C5 "North Merced-Wilson and Warnerville-Wilson 230 kV Lines"
 line     30800  30803  "1 " 1     0     # line   from  WILSON       230.00  BRKR to BRKR  NMERCED      230.00
#
 line     30515  30800  "1 " 1     0     # line   from  WARNERVL     230.00  BRKR to BRKR  WILSON       230.00
0

CATC-1084-C5 "Wilson-Borden #1 and #2 230 kV Lines"
 line     30795  30805  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  BORDEN       230.00
 line     30795  30800  "1 " 1     0     # line   from  STOREY 2     230.00   (2) to BRKR  WILSON       230.00
#-#-# load     30795  "2 "    0              # load         STOREY 2     230.00  LOAD==32.81(4.68)
#-#-# load     30795  "E2"    0              # load         STOREY 2     230.00  LOAD==-0.37(0.00)
#
 line     30796  30800  "1 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  WILSON       230.00
 line     30796  30805  "2 " 1     0     # line   from  STOREY 1     230.00   (3) to BRKR  BORDEN       230.00
 tran     30796  34209  "1 "       0     # tran   from  STOREY 1     230.00   (3) to (1)   STOREY D      12.47
#-#-# load     34209  "1 "    0              # load         STOREY D      12.47  LOAD==26.03(3.71)
#-#-# load     34209  "E1"    0              # load         STOREY D      12.47  LOAD==-0.31(0.00)
#-#-# gen      34209  "1 "    0              # gen          STOREY D      12.47  GEN ==0.88(1.90)
#-#-# svd      34209  "v "    0              # svd          STOREY D      12.47
0

CATC-1085-C5 "Borden-Gregg #1 and #2 230 kV Lines"
 line     30805  30810  "1 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
#
 line     30805  30810  "2 " 1     0     # line   from  BORDEN       230.00  BRKR to BRKR  GREGG        230.00
#  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
0




# 2018 main year category c contingency list (selected category c multiple element outages)
# Fresno Division Zone 314
#


CATC-1086-C2 "Gregg 230 kV CB412 Failure"
 line     30810  30805  "1 " 1     0     # line   from  GREGG        230.00 to BORDEN       230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #1 230 kV Line
 line     30810  30805  "2 " 1     0     # line   from  GREGG        230.00 to BORDEN       230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Borden-Gregg #2 230 kV Line
0

CATC-1087-C2 "Gregg 230 kV CB432 Failure"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00 to E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00 to HERNDON      230.00
0

CATC-1088-C2 "Gregg 230 kV CB442 Failure"
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00 to E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00 to HERNDON      230.00
0

CATC-1089-C2 "Gregg 230 kV CB452 Failure"
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00 to FGRDN T2     230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00 to HENTAP1      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg 230 kV Line
0

CATC-1090-C2 "Gregg 230 kV CB472 Failure"
 svd      30810  "v "    0              # svd          GREGG        230.00
0

CATC-1091-C2 "Kearney 230 kV CB1XXX Failure"
 line     30830  30825  "1 " 1     0     # line   from  KEARNEY      230.00 to MCMULLN1     230.00
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00 to HERNDON      230.00
0
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CATC-1092-C2 "Kearney 230 kV CB2XXX Failure"
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00 to HERNDON      230.00
 tran     30830  34480  "4 "       0     # tran   from  KEARNEY      230.00 to KEARNEY       70.00
0

CATC-1093-C2 "Kearney 230 kV CB3XXX Failure"
 tran     30830  34480  "2 "       0     # tran   from  KEARNEY      230.00 to KEARNEY       70.00
 tran     30830  34480  "4 "       0     # tran   from  KEARNEY      230.00 to KEARNEY       70.00
0

CATC-1094-C2 "Kearney 230 kV CB4XXX Failure"
 line     30830  30825  "1 " 1     0     # line   from  KEARNEY      230.00 to MCMULLN1     230.00
 tran     30830  34480  "2 "       0     # tran   from  KEARNEY      230.00 to KEARNEY       70.00
0

CATC-1095-C1 "Herndon 230 kV Bus Section 1"
 line     30835  30810  "1 " 1     0     # line   from  HERNDON      230.00 to GREGG        230.00
 line     30835  30830  "1 " 1     0     # line   from  HERNDON      230.00 to KEARNEY      230.00
 tran     30835  34412  "3 "       0     # tran   from  HERNDON      230.00 to HERNDON      115.00
 tran     30835  30882  "1 "       4     # tran   from  HERNDON      230.00 to HERNDN1M     115.00
0

CATC-1096-C1 "Herndon 230 kV Bus Section 2"
 line     30835  30810  "2 " 1     0     # line   from  HERNDON      230.00 to GREGG        230.00
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00 to FGRDN T1     230.00
 tran     30835  34412  "3 "       0     # tran   from  HERNDON      230.00 to HERNDON      115.00
 tran     30835  30883  "2 "       4     # tran   from  HERNDON      230.00 to HERNDN2M     115.00
0

CATC-1097-C2 "Herndon 230 kV CB202 Failure"
 isol     30835                         # BUS FAULT AT  30835 HERNDON      230.00
0

CATC-1098-C1 "Figarden 230 kV CB232 Failure"
 isol     30841                         # BUS FAULT AT  30841 FIGRDN 1     230.00
0

CATC-1099-C2 "Figarden 230 kV CB262 Failure"
 isol     30846                         # BUS FAULT AT  30846 FIGRDN 2     230.00
0

CATC-1100-C1 "Ashlan 230 kV Bus"
 isol     30850                         # BUS FAULT AT  30850 ASHLAN       230.00
0

CATC-1101-C1 "Helm 230 kV Bus"
 isol     30873                         # BUS FAULT AT  30873 HELM         230.00
0

CATC-1102-C1 "McCall 230 kV Bus Section 1"
 line     30875  30860  "1 " 1     0     # line   from  MC CALL      230.00 to BALCH3TP     230.00
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00 to HENTAP2      230.00
 tran     30875  30877  "2 "       4     # tran   from  MC CALL      230.00 to MCCALL2M     115.00
 svd      30875  "v "    0              # svd          MC CALL      230.00
0

CATC-1103-C1 "McCall 230 kV Bus Section 2"
 line     30875  30870  "1 " 1     0     # line   from  MC CALL      230.00 to PINE FLT     230.00
 line     30875  30873  "1 " 1     0     # line   from  MC CALL      230.00 to HELM         230.00
 tran     30875  30876  "1 "       4     # tran   from  MC CALL      230.00 to MCCALL1M     115.00
 tran     30875  30878  "3 "       4     # tran   from  MC CALL      230.00 to MCCALL3M     115.00
0

CATC-1104-C2 "McCall 230 kV CB202 Failure"
 isol     30875                         # BUS FAULT AT  30875 MC CALL      230.00
0

CATC-1105-C2 "Henrietta 230 kV CB252 Failure"
 line     30881  30879  "1 " 1     0     # line   from  HENRIETA     230.00 to HENTAP1      230.00
 tran     30881  34540  "2 "       0     # tran   from  HENRIETA     230.00 to HENRITTA      70.00
 tran     30881  34540  "4 "       0     # tran   from  HENRIETA     230.00 to HENRITTA      70.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
0
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CATC-1106-C2 "Henrietta 230 kV CB232 Failure"
 line     30881  30880  "1 " 1     0     # line   from  HENRIETA     230.00 to HENTAP2      230.00
 tran     30881  34430  "3 "       0     # tran   from  HENRIETA     230.00 to HENRETTA     115.00
 tran     30881  34540  "2 "       0     # tran   from  HENRIETA     230.00 to HENRITTA      70.00
0

CATC-1107-C1 "Gates 230 kV Bus Section 1D"
 line     30900  30790  "2 " 1     0     # line   from  GATES        230.00 to PANOCHE      230.00
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00 to TEMPLETN     230.00
 tran     30900  30901  "1 "       0     # tran   from  GATES        230.00 to GATES 1M     230.00
 tran     30900  34552  "5 "       0     # tran   from  GATES        230.00 to GATES         70.00
 svd      30900  "v "    0               # svd          GATES        230.00
 0

CATC-1108-C1 "Gates 230 kV Bus Section 1E"
 line     30900  30879  "1 " 1     0     # line   from  GATES        230.00 to HENTAP1      230.00
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00 to 3C643WS1     230.00
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00 to ARCO         230.00
0

CATC-1109-C2 "Gates 230 kV CB312 Failure"
 line     30900  30790  "2 " 1     0     # line   from  GATES        230.00 to PANOCHE      230.00
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00 to TEMPLETN     230.00
 tran     30900  30901  "1 "       0     # tran   from  GATES        230.00 to GATES 1M     230.00
 tran     30900  34552  "5 "       0     # tran   from  GATES        230.00 to GATES         70.00
 svd      30900  "v "    0               # svd          GATES        230.00
 line     30900  30879  "1 " 1     0     # line   from  GATES        230.00 to HENTAP1      230.00
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00 to 3C643WS1     230.00
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00 to ARCO         230.00
0

CATC-1110-C2 "Gates 230 kV CB472 Failure"
 line     30900  30790  "2 " 1     0     # line   from  GATES        230.00 to PANOCHE      230.00
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00 to TEMPLETN     230.00
 svd      30900  "v "    0               # svd          GATES        230.00
 tran     30900  34607  "11"       0     # tran   from  GATES        230.00 to GATES11M      13.80
0

CATC-1111-C1 "Gates 230 kV Bus Section 2D"
 line     30900  30790  "1 " 1     0     # line   from  GATES        230.00 to PANOCHE      230.00
 line     30900  30915  "1 " 1     0     # line   from  GATES        230.00 to MORROBAY     230.00
 line     30900  39941  "1 " 1     0     # line   from  GATES        230.00 to 5C877SS      230.00
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00 to 6C0974SS     230.00
 load     30900  "4 "    0               # load         GATES        230.00  LOAD==12.43(1.77)
 load     30900  "E4"    0               # load         GATES        230.00  LOAD==-0.07(0.00)
 line     30900  90075  "1 " 1     0     # line   from  GATES        230.00 to 0075-WD      230.00
 line     30900  90120  "1 " 1     0     # line   from  GATES        230.00 to 0120-WD      230.00
0

CATC-1112-C1 "Gates 230 kV Bus Section 2E"
 line     30900  30880  "1 " 1     0     # line   from  GATES        230.00 to HENTAP2      230.00
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00 to 3C643WS2     230.00
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00 to MIDWAY       230.00
0

CATC-1113-C2 "Gates 230 kV CB322 Failure"
 line     30900  30790  "1 " 1     0     # line   from  GATES        230.00 to PANOCHE      230.00
 line     30900  30915  "1 " 1     0     # line   from  GATES        230.00 to MORROBAY     230.00
 line     30900  39941  "1 " 1     0     # line   from  GATES        230.00 to 5C877SS      230.00
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00 to 6C0974SS     230.00
 load     30900  "4 "    0               # load         GATES        230.00  LOAD==12.43(1.77)
 load     30900  "E4"    0               # load         GATES        230.00  LOAD==-0.07(0.00)
 line     30900  90075  "1 " 1     0     # line   from  GATES        230.00 to 0075-WD      230.00
 line     30900  90120  "1 " 1     0     # line   from  GATES        230.00 to 0120-WD      230.00
 line     30900  30880  "1 " 1     0     # line   from  GATES        230.00 to HENTAP2      230.00
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00 to 3C643WS2     230.00
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00 to MIDWAY       230.00
0

CATC-1114-C2 "Gates 230 kV CB482 Failure"
 line     30900  30880  "1 " 1     0     # line   from  GATES        230.00 to HENTAP2      230.00
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00 to 3C643WS2     230.00
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00 to MIDWAY       230.00
 tran     30900  34607  "11"       0     # tran   from  GATES        230.00 to GATES11M      13.80
0
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CATC-1115-C1 "Shepherd 115 kV Bus"
 isol     34348                          # BUS FAULT AT  34348 SHEPHERD     115.00
0

CATC-1116-C2 "Schindler 115 kV CB1012 Failure"
 line     34354  34149  "1 " 1     0     # line   from  SCHINDLR     115.00 to CHENYT       115.00
 line     34354  34151  "1 " 1     0     # line   from  SCHINDLR     115.00 to S612TP       115.00
 line     34354  39778  "2 " 1     0     # line   from  SCHINDLR     115.00 to 4C678S2      115.00
 load     34354  "2 "    0              # load         SCHINDLR     115.00  LOAD==14.71(2.10)
 load     34354  "E2"    0              # load         SCHINDLR     115.00  LOAD==-0.16(0.00)
 line     34354  90066  "1 " 1     0     # line   from  SCHINDLR     115.00 to 0066-WD      115.00
 line     34354  90067  "1 " 1     0     # line   from  SCHINDLR     115.00 to 0067-WD      115.00
0

CATC-1117-C2 "Schindler 115 kV CB1022 Failure"
 line     34354  34432  "1 " 1     0     # line   from  SCHINDLR     115.00 to WESTLNDS     115.00
 line     34354  39777  "1 " 1     0     # line   from  SCHINDLR     115.00 to 4C678S1      115.00
 load     34354  "2 "    0              # load         SCHINDLR     115.00  LOAD==14.71(2.10)
 load     34354  "E2"    0              # load         SCHINDLR     115.00  LOAD==-0.16(0.00)
 line     34354  90066  "1 " 1     0     # line   from  SCHINDLR     115.00 to 0066-WD      115.00
 line     34354  90067  "1 " 1     0     # line   from  SCHINDLR     115.00 to 0067-WD      115.00
0

CATC-1118-C2 "Schindler 115 kV CB1042 Failure"
 line     34354  34432  "1 " 1     0     # line   from  SCHINDLR     115.00 to WESTLNDS     115.00
 line     34354  39777  "1 " 1     0     # line   from  SCHINDLR     115.00 to 4C678S1      115.00
 tran     34354  34562  "1 "       0     # tran   from  SCHINDLR     115.00 to SCHLNDLR      70.00
0

CATC-1119-C2 "Schindler 115 kV CB1052 Failure"
 line     34354  34149  "1 " 1     0     # line   from  SCHINDLR     115.00 to CHENYT       115.00
 line     34354  34151  "1 " 1     0     # line   from  SCHINDLR     115.00 to S612TP       115.00
 line     34354  39778  "2 " 1     0     # line   from  SCHINDLR     115.00 to 4C678S2      115.00
 tran     34354  34562  "1 "       0     # tran   from  SCHINDLR     115.00 to SCHLNDLR      70.00
0

CATC-1120-C1 "Kerckhoff 115 kV Bus Section 1"
 isol     34356                          # BUS FAULT AT  34356 KERCKHF1     115.00
0

CATC-1121-C1 "Kerckhoff 115 kV Bus Section 2"
 isol     34358                          # BUS FAULT AT  34358 KERCKHF2     115.00
0

CATC-1122-C1 "Clovis 115 kV Bus Section D"
 isol     34362                          # BUS FAULT AT  34362 CLOVIS-1     115.00
0

CATC-1123-C1 "Clovis 115 kV Bus Sections E and F"
 isol     34364                          # BUS FAULT AT  34364 CLOVIS-2     115.00
0

CATC-1124-C1 "Sanger 115 kV Bus Section 1"
 line     34366  34363  "1 " 1     0     # line   from  SANGER       115.00 to CLOVISJ1     115.00
 line     34366  34365  "1 " 1     0     # line   from  SANGER       115.00 to CLOVISJ2     115.00
 line     34366  34370  "1 " 1     0     # line   from  SANGER       115.00 to MC CALL      115.00
 line     34366  34487  "1 " 1     0     # line   from  SANGER       115.00 to SNGRJCT      115.00
 line     34366  34402  "1 " 1     0     # line   from  SANGER       115.00 to CAL AVE      115.00
 load     34366  "1 "    0              # load         SANGER       115.00  LOAD==26.04(3.71)
 load     34366  "E1"    0              # load         SANGER       115.00  LOAD==-0.25(0.00)
0

CATC-1125-C1 "Sanger 115 kV Bus Section 2"
 line     34366  34359  "1 " 1     0     # line   from  SANGER       115.00 to AIRWAYJ2     115.00
 line     34366  34368  "1 " 1     0     # line   from  SANGER       115.00 to LASPALMS     115.00
 line     34366  34370  "2 " 1     0     # line   from  SANGER       115.00 to MC CALL      115.00
 line     34366  34370  "3 " 1     0     # line   from  SANGER       115.00 to MC CALL      115.00
 line     34366  34372  "1 " 1     0     # line   from  SANGER       115.00 to MALAGA       115.00
 line     34366  34389  "1 " 1     0     # line   from  SANGER       115.00 to RAINBWTP     115.00
 line     34366  34396  "1 " 1     0     # line   from  SANGER       115.00 to PIEDRA 2     115.00
 load     34366  "3 "    0              # load         SANGER       115.00  LOAD==20.26(2.89)
 load     34366  "E3"    0              # load         SANGER       115.00  LOAD==-0.18(0.00)
0
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CATC-1126-C2 "Sanger 115 kV CB400 Failure"
 isol     34366                        # BUS FAULT AT  34366 SANGER       115.00
0

CATC-1127-C2 "McCall 115 kV CB1122 Failure"
 line     34370  34377  "1 " 1     0     # line   from  MC CALL      115.00 to AIRPROD      115.00
 line     34370  34366  "3 " 1     0     # line   from  MC CALL      115.00 to SANGER       115.00
0

CATC-1128-C2 "McCall 115 kV CB1222 Failure"
 line     34370  34382  "1 " 1     0     # line   from  MC CALL      115.00 to WAHTOKE      115.00
 line     34370  34366  "2 " 1     0     # line   from  MC CALL      115.00 to SANGER       115.00
0

CATC-1129-C2 "McCall 115 kV CB1322 Failure"
 line     34370  34366  "1 " 1     0     # line   from  MC CALL      115.00 to SANGER       115.00
 tran     34370  30876  "1 "       0     # tran   from  MC CALL      115.00 to MCCALL1M     115.00
0

CATC-1130-C2 "McCall 115 kV CB1422 Failure"
 line     34370  34423  "1 " 1     0     # line   from  MC CALL      115.00 to GAURD J1     115.00
 tran     34370  30877  "2 "       0     # tran   from  MC CALL      115.00 to MCCALL2M     115.00
0

CATC-1131-C2 "McCall 115 kV CB1522 Failure"
 line     34370  34385  "1 " 1     0     # line   from  MC CALL      115.00 to KINGS J1     115.00
 line     34370  34404  "1 " 1     0     # line   from  MC CALL      115.00 to WST FRSO     115.00
0

CATC-1132-C2 "McCall 115 kV CB1622 Failure"
 tran     34370  34219  "4 "       0     # tran   from  MC CALL      115.00 to MCCALL 4      12.47
 tran     34370  34221  "5 "       0     # tran   from  MC CALL      115.00 to MCCALL 5      12.47
0

CATC-1133-C2 "McCall 115 kV CB1722 Failure"
 line     34370  34390  "1 " 1     0     # line   from  MC CALL      115.00 to DANISHCM     115.00
 tran     34370  30878  "3 "       0     # tran   from  MC CALL      115.00 to MCCALL3M     115.00
0

CATC-1134-C2 "Malaga 115 kV CB142 Failure"
 line     34372  34376  "1 " 1     0     # line   from  MALAGA       115.00 to PPG          115.00
 line     34372  34381  "1 " 1     0     # line   from  MALAGA       115.00 to KRCDP        115.00
 line     34372  34379  "1 " 1     0     # line   from  MALAGA       115.00 to MALAGATP     115.00
 load     34372  "2 "    0               # load         MALAGA       115.00  LOAD==22.23(3.17)
 load     34372  "3 "    0               # load         MALAGA       115.00  LOAD==31.25(4.45)
 load     34372  "E2"    0               # load         MALAGA       115.00  LOAD==-0.24(0.00)
 load     34372  "E3"    0               # load         MALAGA       115.00  LOAD==-0.29(0.00)
0

CATC-1135-C2 "Malaga 115 kV CB152 Failure"
 line     34372  34366  "1 " 1     0     # line   from  MALAGA       115.00 to SANGER       115.00
 line     34372  34381  "1 " 1     0     # line   from  MALAGA       115.00 to KRCDP        115.00
 load     34372  "1 "    0               # load         MALAGA       115.00  LOAD==28.18(4.02)
 load     34372  "2 "    0               # load         MALAGA       115.00  LOAD==22.23(3.17)
 load     34372  "E1"    0               # load         MALAGA       115.00  LOAD==-0.26(0.00)
 load     34372  "E2"    0               # load         MALAGA       115.00  LOAD==-0.24(0.00)
0

CATC-1136-C1 "Gates 115 kV Bus"
 tran     34378  30901  "1 "       0     # tran   from  GATES        115.00 to GATES 1M     230.00
 load     34378  "3 "    0               # load         GATES        115.00  LOAD==15.85(2.26)
 load     34378  "E3"    0               # load         GATES        115.00  LOAD==-0.13(0.00)
0

CATC-1137-C2 "Reedley 115 kV CB1122 Failure"
 line     34380  34382  "1 " 1     0     # line   from  REEDLEY      115.00 to WAHTOKE      115.00
 tran     34380  34492  "2 "       0     # tran   from  REEDLEY      115.00 to REEDLEY       70.00
0

CATC-1138-C2 "Reedley 115 kV CB1212 Failure"
 line     34380  34394  "1 " 1     0     # line   from  REEDLEY      115.00 to PIEDRA 1     115.00
 tran     34380  34492  "2 "       0     # tran   from  REEDLEY      115.00 to REEDLEY       70.00
0

CATC-1139-C2 "Reedley 115 kV CB1312 Failure"
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 line     34380  34394  "1 " 1     0     # line   from  REEDLEY      115.00 to PIEDRA 1     115.00
 tran     34380  34492  "4 "       0     # tran   from  REEDLEY      115.00 to REEDLEY       70.00
0

CATC-1140-C2 "Reedley 115 kV CB1412 Failure"
 tran     34380  34492  "4 "       0     # tran   from  REEDLEY      115.00 to REEDLEY       70.00
 load     34380  "3 "    0              # load         REEDLEY      115.00  LOAD==27.91(3.97)
 load     34380  "E3"    0              # load         REEDLEY      115.00  LOAD==-0.27(0.00)
 line     34380  90189  "1 " 1     0     # line   from  REEDLEY      115.00 to 0189-WD      115.00
 line     34380  90225  "1 " 1     0     # line   from  REEDLEY      115.00 to 0225-WD      115.00
0

CATC-1141-C1 "Wahtoke 115 kV Bus"
 isol     34382                         # BUS FAULT AT  34382 WAHTOKE      115.00
0

CATC-1142-C1 "Kings River 115 kV Bus"
 line     34400  34394  "1 " 1     0     # line   from  KNGSRVR1     115.00 to PIEDRA 1     115.00
 tran     34400  34616  "1 "       0     # tran   from  KNGSRVR1     115.00 to KINGSRIV      13.80
0

CATC-1143-C2 "California Avenue 115 kV CS177 Failure"
 line     34402  34366  "1 " 1     0     # line   from  CAL AVE      115.00 to SANGER       115.00
 line     34402  34390  "1 " 1     0     # line   from  CAL AVE      115.00 to DANISHCM     115.00
 load     34402  "1 "    0              # load         CAL AVE      115.00  LOAD==33.40(4.76)
 load     34402  "2 "    0              # load         CAL AVE      115.00  LOAD==32.57(4.64)
 load     34402  "E1"    0              # load         CAL AVE      115.00  LOAD==-0.31(0.00)
 load     34402  "E2"    0              # load         CAL AVE      115.00  LOAD==-0.31(0.00)
0

CATC-1144-C2 "California Avenue 115 kV CS187 Failure"
 line     34402  34366  "1 " 1     0     # line   from  CAL AVE      115.00 to SANGER       115.00
 line     34402  34404  "1 " 1     0     # line   from  CAL AVE      115.00 to WST FRSO     115.00
 load     34402  "2 "    0              # load         CAL AVE      115.00  LOAD==32.57(4.64)
 load     34402  "3 "    0              # load         CAL AVE      115.00  LOAD==25.51(3.64)
 load     34402  "E2"    0              # load         CAL AVE      115.00  LOAD==-0.31(0.00)
 load     34402  "E3"    0              # load         CAL AVE      115.00  LOAD==-0.24(0.00)
0

CATC-1145-C1 "West Fresno 115 kV Bus"
 isol     34404                         # BUS FAULT AT  34404 WST FRSO     115.00
0

CATC-1146-C2 "Barton 115 kV CS176 Failure"
 line     34408  34412  "1 " 1     0     # line   from  BARTON       115.00 to HERNDON      115.00
 load     34408  "1 "    0              # load         BARTON       115.00  LOAD==42.23(6.02)
 load     34408  "2 "    0              # load         BARTON       115.00  LOAD==35.03(4.99)
 load     34408  "E1"    0              # load         BARTON       115.00  LOAD==-0.39(0.00)
 load     34408  "E2"    0              # load         BARTON       115.00  LOAD==-0.32(0.00)
 svd      34408  "v "    0              # svd          BARTON       115.00
0

CATC-1147-C2 "Barton 115 kV CS186 Failure"
 line     34408  34359  "1 " 1     0     # line   from  BARTON       115.00 to AIRWAYJ2     115.00
 line     34408  34412  "1 " 1     0     # line   from  BARTON       115.00 to HERNDON      115.00
 load     34408  "2 "    0              # load         BARTON       115.00  LOAD==35.03(4.99)
 load     34408  "3 "    0              # load         BARTON       115.00  LOAD==26.55(3.78)
 load     34408  "E2"    0              # load         BARTON       115.00  LOAD==-0.32(0.00)
 load     34408  "E3"    0              # load         BARTON       115.00  LOAD==-0.24(0.00)
 svd      34408  "v "    0              # svd          BARTON       115.00
0

CATC-1148-C1 "Manchester 115 kV Bus"
 isol     34410                         # BUS FAULT AT  34410 MANCHSTR     115.00
0

CATC-1149-C1 "Herndon 115 kV Bus Section 1"
 line     34412  34408  "1 " 1     0     # line   from  HERNDON      115.00 to BARTON       115.00
 line     34412  34409  "1 " 1     0     # line   from  HERNDON      115.00 to PNDLJ2       115.00
0

CATC-1150-C1 "Herndon 115 kV Bus Section 2"
 line     34412  34410  "1 " 1     0     # line   from  HERNDON      115.00 to MANCHSTR     115.00
 line     34412  34411  "1 " 1     0     # line   from  HERNDON      115.00 to PNDLJ1       115.00
 line     34412  34422  "1 " 1     0     # line   from  HERNDON      115.00 to CHLDHOSP     115.00
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 tran     34412  30835  "3 "       0     # tran   from  HERNDON      115.00 to HERNDON      230.00
 tran     34412  30882  "1 "       0     # tran   from  HERNDON      115.00 to HERNDN1M     115.00
 tran     34412  30883  "2 "       0     # tran   from  HERNDON      115.00 to HERNDN2M     115.00
0

CATC-1151-C2 "Herndon 115 kV CB102 Failure"
 isol     34412                          # BUS FAULT AT  34412 HERNDON      115.00
0

CATC-1152-C2 "Pinedale 115 kV CB152 Failure"
 isol     34413                          # BUS FAULT AT  34413 PNEDLE       115.00
0

CATC-1153-C2 "Woodward 115 kV CS176 Failure"
 isol     34414                          # BUS FAULT AT  34414 WOODWARD     115.00
0

CATC-1154-C1 "Bullard 115 kV Bus"
 isol     34416                          # BUS FAULT AT  34416 BULLARD      115.00
0

CATC-1155-C1 "Kingsburg 115 kV CB152 Failure"
 isol     34418                          # BUS FAULT AT  34418 KINGSBRG     115.00
0

CATC-1156-C1 "Corcoran 115 kV Bus"
 isol     34420                          # BUS FAULT AT  34420 CORCORAN     115.00
0

CATC-1157-C1 "Henrietta 115 kV Bus"
 isol     34430                          # BUS FAULT AT  34430 HENRETTA     115.00
0

CATC-1158-C1 "Wishon 70 kV Bus"
 isol     34452                          # BUS FAULT AT  34452 WISHON        70.00
0

CATC-1159-C1 "Guernsey 70 kV Bus"
 isol     34460                          # BUS FAULT AT  34460 GUERNSEY      70.00
0

CATC-1160-C1 "Coppermine 70 kV Bus"
 isol     34464                          # BUS FAULT AT  34464 COPPRMNE      70.00
0

CATC-1161-C1 "Biola 70 kV Bus"
 isol     34466                          # BUS FAULT AT  34466 BIOLA         70.00
0

CATC-1162-C1 "San Joaquin 70 kV Bus"
 isol     34472                          # BUS FAULT AT  34472 SAN JOQN      70.00
0

CATC-1163-C1 "Helm 70 kV Bus"
 isol     34474                          # BUS FAULT AT  34474 HELM          70.00
0

CATC-1164-C1 "Tivy Valley 70 kV Bus"
 isol     34478                          # BUS FAULT AT  34478 TVY VLLY      70.00
0

CATC-1165-C2 "Kearney 70 kV Bus Section 1"
 line     34480  34468  "1 " 1     0     # line   from  KEARNEY       70.00 to BOWLES        70.00
 line     34480  34481  "1 " 1     0     # line   from  KEARNEY       70.00 to FRWWTAP       70.00
 line     34480  34512  "1 " 1     0     # line   from  KEARNEY       70.00 to CARUTHRS      70.00
 tran     34480  30830  "2 "       0     # tran   from  KEARNEY       70.00 to KEARNEY      230.00
 load     34480  "3 "    0              # load         KEARNEY       70.00  LOAD==7.86(1.12)
 load     34480  "E3"    0              # load         KEARNEY       70.00  LOAD==-0.09(0.00)
0

CATC-1166-C2 "Kearney 70 kV Bus Section 2"
 line     34480  34466  "1 " 1     0     # line   from  KEARNEY       70.00 to BIOLA         70.00
 tran     34480  30830  "4 "       0     # tran   from  KEARNEY       70.00 to KEARNEY      230.00
 load     34480  "1 "    0              # load         KEARNEY       70.00  LOAD==7.61(1.73)
 load     34480  "E1"    0              # load         KEARNEY       70.00  LOAD==-0.18(0.00)
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0

CATC-1167-C2 "Kearney 70 kV Bus Tie CB Failure"
 isol     34480                          # BUS FAULT AT  34480 KEARNEY       70.00
0

CATC-1168-C1 "Kerman 70 kV Bus Section 1"
 isol     34484                          # BUS FAULT AT  34484 KERMAN1       70.00
0

CATC-1169-C1 "Kerman 70 kV Bus Section 2"
 isol     34486                          # BUS FAULT AT  34486 KERMAN2       70.00
0

CATC-1170-C1 "Reedley 70 kV Bus"
 isol     34492                          # BUS FAULT AT  34492 REEDLEY       70.00
0

CATC-1171-C1 "Dinuba 70 kV Bus"
 isol     34500                          # BUS FAULT AT  34500 DINUBA        70.00
0

CATC-1172-C1 "Caruthers 70 kV Bus"
 isol     34512                          # BUS FAULT AT  34512 CARUTHRS      70.00
0

CATC-1173-C1 "Lemoore 70 kV Bus"
 isol     34518                          # BUS FAULT AT  34518 LEMOORE       70.00
0

CATC-1174-C1 "Corcoran 70 kV Bus"
 isol     34528                          # BUS FAULT AT  34528 CORCORAN      70.00
0

CATC-1175-C1 "Henrietta 70 kV Bus Section D"
 line     34540  34542  "1 " 1     0     # line   from  HENRITTA      70.00 to JCBSCRNR      70.00
 line     34540  34537  "1 " 1     0     # line   from  HENRITTA      70.00 to GWF_HENR      70.00
 line     34540  34457  "1 " 1     0     # line   from  HENRITTA      70.00 to S626SS        70.00
 line     34540  39217  "1 " 1     0     # line   from  HENRITTA      70.00 to S650ABS       70.00
 line     34540  34453  "1 " 1     0     # line   from  HENRITTA      70.00 to S625TP        70.00
 tran     34540  30881  "2 "       0     # tran   from  HENRITTA      70.00 to HENRIETA     230.00
 load     34540  "1 "    0              # load         HENRITTA      70.00  LOAD==10.43(1.49)
 load     34540  "E1"    0              # load         HENRITTA      70.00  LOAD==-0.09(0.00)
0

CATC-1176-C1 "Henrietta 70 kV Bus Section E"
 line     34540  34514  "1 " 1     0     # line   from  HENRITTA      70.00 to LEMORNAS      70.00
 line     34540  34520  "1 " 1     0     # line   from  HENRITTA      70.00 to LPRNO TP      70.00
 line     34540  34511  "1 " 1     0     # line   from  HENRITTA      70.00 to LMOR_TAP      70.00
 tran     34540  30881  "4 "       0     # tran   from  HENRITTA      70.00 to HENRIETA     230.00
 load     34540  "5 "    0              # load         HENRITTA      70.00  LOAD==4.10(0.59)
 load     34540  "E5"    0              # load         HENRITTA      70.00  LOAD==-0.16(0.00)
0

CATC-1177-C2 "Henrietta 70 kV CB902 Failure"
 isol     34540                          # BUS FAULT AT  34540 HENRITTA      70.00
0

CATC-1178-C1 "Tulare Lake 70 kV Bus"
 isol     34544                          # BUS FAULT AT  34544 TLRE LKE      70.00
0

CATC-1179-C1 "Gates 70 kV Bus"
 isol     34552                          # BUS FAULT AT  34552 GATES         70.00
0

CATC-1180-C1 "Huron 70 kV Bus"
 isol     34558                          # BUS FAULT AT  34558 HURON         70.00
0

CATC-1181-C1 "Schindler 70 kV Bus"
isol     34562                         # BUS FAULT AT  34562 SCHLNDLR      70.00
0

CATC-1182-C1 "Stroud 70 kV Bus"
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 isol     34564                          # BUS FAULT AT  34564 STROUD        70.00
0

CATC-1183-C1 "Coalinga2 70 kV Bus"
 isol     34570                          # BUS FAULT AT  34570 COLNGA 2      70.00
0

CATC-1184-C1 "Coalinga1 70 kV Bus"
 isol     34574                          # BUS FAULT AT  34574 COLNGA 1      70.00
0

CATC-1185-C1 "Kingsburg 70 kV Bus"
 isol     34576                          # BUS FAULT AT  34576 KNGLOBUS      70.00
0


CATC-1186-C5 "S532SS-Huron-Gates and Gates-Huron 70 kV Line"
 line     34552  34559  "2 " 1     0     # line   from  GATES         70.00  BRKR to (3)   HURONJ        70.00
 line     34559  34558  "1 " 1     0     # line   from  HURONJ        70.00   (3) to BRKR  HURON         70.00
 line     34559  34560  "1 " 1     0     # line   from  HURONJ        70.00   (3) to (2)   CALFLAX       70.00
 line     34560  34567  "1 " 1     0     # line   from  CALFLAX       70.00   (2) to BRKR  S532SS        70.00
#-#-# load     34560  "1 "    0              # load         CALFLAX       70.00  LOAD==8.21(1.17)
#-#-# load     34560  "E1"    0              # load         CALFLAX       70.00  LOAD==-0.11(0.00)
#
 line     34552  34558  "1 " 1     0     # line   from  GATES         70.00  BRKR to BRKR  HURON         70.00
0

CATC-1187-C5 "Manchester-Airways-Sanger and Barton-Airways-Sanger 115 kV Lines"
 line     34357  34355  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (1)   AIRWAYS2     115.00
 line     34357  34368  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (2)   LASPALMS     115.00
 line     34357  34410  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to BRKR  MANCHSTR     115.00
 line     34368  34366  "1 " 1     0     # line   from  LASPALMS     115.00   (2) to BRKR  SANGER       115.00
#-#-# load     34355  "2 "    0              # load         AIRWAYS2     115.00  LOAD==13.72(1.96)
#-#-# load     34368  "1 "    0              # load         LASPALMS     115.00  LOAD==15.54(12.63)
#-#-# load     34368  "E1"    0              # load         LASPALMS     115.00  LOAD==-0.17(0.00)
  #-#-# load     34355  "2 "    1                # Restore load 2 at Airways 2
  #-#-# load     34355  "E2"    1                # Restore load E2 at Airways 2
#
 line     34359  34361  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to (1)   AIRWAYS      115.00
 line     34359  34408  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to BRKR  BARTON       115.00
 line     34359  34366  "1 " 1     0     # line   from  AIRWAYJ2     115.00   (3) to BRKR  SANGER       115.00
#-#-# load     34361  "1 "    0              # load         AIRWAYS      115.00  LOAD==28.77(4.10)
#-#-# load     34361  "E1"    0              # load         AIRWAYS      115.00  LOAD==-0.30(0.00)
  #-#-# load     34361  "1 "    1                # Restore load 1 at Airways
  #-#-# load     34361  "E1"    1                # Restore load E1 at Airways
0

CATC-1188-C5 "Manchester-Airways-Sanger and Herndon-Barton 115 kV Lines"
 line     34357  34355  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (1)   AIRWAYS2     115.00
 line     34357  34368  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to (2)   LASPALMS     115.00
 line     34357  34410  "1 " 1     0     # line   from  AIRWAYJ1     115.00   (3) to BRKR  MANCHSTR     115.00
 line     34368  34366  "1 " 1     0     # line   from  LASPALMS     115.00   (2) to BRKR  SANGER       115.00
#-#-# load     34355  "2 "    0              # load         AIRWAYS2     115.00  LOAD==13.72(1.96)
#-#-# load     34368  "1 "    0              # load         LASPALMS     115.00  LOAD==15.54(12.63)
#-#-# load     34368  "E1"    0              # load         LASPALMS     115.00  LOAD==-0.17(0.00)
  line     34361  34355  "1 " 1     1     # Switches in Airways Bus Tie
  #-#-# load     34355  "2 "    1              # Restore load 2 at Airways 2
  #-#-# load     34355  "E2"    1              # Restore load E2 at Airways 2
#
 line     34408  34412  "1 " 1     0     # line   from  BARTON       115.00  BRKR to BRKR  HERNDON       115.00
0

CATC-1189-C5 "Herndon-Manchester and Herndon-Barton 115 kV Lines"
 line     34410  34412  "1 " 1     0     # line   from  MANCHSTR     115.00  BRKR to BRKR  HERNDON       115.00
#
 line     34408  34412  "1 " 1     0     # line   from  BARTON       115.00  BRKR to BRKR  HERNDON       115.00
0

CATC-1190-C5 "Herndon-Bullard #1 and #2 115 kV Lines"
 line     34409  34415  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to (1)   PNEDLE2      115.00
 line     34409  34416  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to BRKR  BULLARD      115.00
 line     34409  34412  "1 " 1     0     # line   from  PNDLJ2       115.00   (3) to BRKR  HERNDON      115.00
#-#-# load     34415  "3 "    0              # load         PNEDLE2      115.00  LOAD==43.41(6.19)
#-#-# load     34415  "E3"    0              # load         PNEDLE2      115.00  LOAD==-0.35(0.00)
  #-#-# load     34415  "3 "    1                # Restore load 3 at Pinedale 2
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  #-#-# load     34415  "E3"    1              # Restore load E3 at Pinedale 2
#
 line     34411  34413  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  PNEDLE       115.00
 line     34411  34416  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  BULLARD     115.00
 line     34411  34412  "1 " 1     0     # line   from  PNDLJ1       115.00   (3) to BRKR  HERNDON     115.00
#-#-# load     34413  "1 "    0             # load         PNEDLE       115.00  LOAD==29.39(4.19)
#-#-# load     34413  "2 "    0             # load         PNEDLE       115.00  LOAD==44.76(6.38)
#-#-# load     34413  "E1"    0             # load         PNEDLE       115.00  LOAD==-0.15(0.00)
#-#-# load     34413  "E2"    0             # load         PNEDLE       115.00  LOAD==-0.38(0.00)
  #-#-# load     34413  "1 "    1             # Restore load 1 at Pinedale
  #-#-# load     34413  "2 "    1             # Restore load 2 at Pinedale
  #-#-# load     34413  "E1"    1             # Restore load E1 at Pinedale
  #-#-# load     34413  "E2"    1             # Restore load E2 at Pinedale
0

CATC-1191-C5 "Kerckhoff-E2 #1 and #2 115 kV Lines w/ Kerckhoff SPS"
 line     34998  34358  "1 " 1     0     # line   from  E2           115.00  BRKR to BRKR  KERCKHF2     115.00
#
 line     34998  34358  "2 " 1     0     # line   from  E2           115.00  BRKR to BRKR  KERCKHF2     115.00
# Trip Kerckhoff CB 172 tripping Kerckhoff #2
 gen      34308  "1 "    0              # gen          KERCKHOF      13.80  GEN ==129.00(56.00)
0

CATC-1192-C5 "Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS"
 line     34998  34358  "1 " 1     0     # line   from  E2           115.00  BRKR to BRKR  KERCKHF2     115.00
#
 line     34998  34358  "2 " 1     0     # line   from  E2           115.00  BRKR to BRKR  KERCKHF2     115.00
0

CATC-1193-C5 "E2-Clovis-Sanger #1 and #2 115 kV Lines"
 line     34362  34363  "1 " 1     0     # line   from  CLOVIS-1     115.00  BRKR to (3)   CLOVISJ1     115.00
 line     34363  34366  "1 " 1     0     # line   from  CLOVISJ1     115.00   (3) to BRKR  SANGER      115.00
 line     34363  34998  "1 " 1     0     # line   from  CLOVISJ1     115.00   (3) to BRKR  E2          115.00
#-#-# load     34362  "1 "    0             # load         CLOVIS-1     115.00  LOAD==37.92(5.40)
#-#-# load     34362  "E1"    0             # load         CLOVIS-1     115.00  LOAD==-0.38(0.00)
  #-#-# load     34362  "1 "    1             # Restore Load 1 at Clovis 1
  #-#-# load     34362  "E1"    1             # Restore Load E1 at Clovis 1
#
 line     34364  34365  "1 " 1     0     # line   from  CLOVIS-2     115.00  BRKR to (3)   CLOVISJ2     115.00
 line     34365  34366  "1 " 1     0     # line   from  CLOVISJ2     115.00   (3) to BRKR  SANGER      115.00
 line     34365  34998  "1 " 1     0     # line   from  CLOVISJ2     115.00   (3) to BRKR  E2          115.00
#-#-# load     34364  "2 "    0             # load         CLOVIS-2     115.00  LOAD==42.94(6.12)
#-#-# load     34364  "3 "    0             # load         CLOVIS-2     115.00  LOAD==43.19(6.15)
#-#-# load     34364  "E2"    0             # load         CLOVIS-2     115.00  LOAD==-0.39(0.00)
#-#-# load     34364  "E3"    0             # load         CLOVIS-2     115.00  LOAD==-0.38(0.00)
  #-#-# load     34364  "2 "    1             # Restore Load 2 at Clovis 2
  #-#-# load     34364  "3 "    1             # Restore Load 3 at Clovis 2
  #-#-# load     34364  "E2"    1             # Restore Load E2 at Clovis 2
  #-#-# load     34364  "E3"    1             # Restore Load E3 at Clovis 2
0

CATC-1194-C5 "Kingsburg-Corcoran #1 and Kingsburg-S478SS #2 115 kV Lines"
 line     34418  34436  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (3)   S529TP       115.00
 line     34436  34420  "1 " 1     0     # line   from  S529TP       115.00   (3) to BRKR  CORCORAN     115.00
 line     34436  34437  "1 " 1     0     # line   from  S529TP       115.00   (3) to (2)   S529         115.00
 tran     34437  34697  "1 "       0     # tran   from  S529         115.00   (2) to (1)   S529          21.00
#-#-# gen      34697  "E "    0             # gen          S529          21.00  GEN ==20.00(0.09)
#
 line     34418  34434  "2 " 1     0     # line   from  KINGSBRG     115.00  BRKR to BRKR  S478SS       115.00
#
 line     34391  34420  "1 " 1     1     # close Corcoran 115 kV CB42 to Alpaugh
0

CATC-1195-C5 "Kingsburg-Corcoran #1 and S478SS-Corcoran #2 115 kV Lines"
 line     34418  34436  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (3)   S529TP       115.00
 line     34436  34420  "1 " 1     0     # line   from  S529TP       115.00   (3) to BRKR  CORCORAN     115.00
 line     34436  34437  "1 " 1     0     # line   from  S529TP       115.00   (3) to (2)   S529         115.00
 tran     34437  34697  "1 "       0     # tran   from  S529         115.00   (2) to (1)   S529          21.00
#-#-# gen      34697  "E "    0             # gen          S529          21.00  GEN ==20.00(0.09)
#
 line     34434  34420  "2 " 1     0     # line   from  S478SS       115.00  BRKR to BRKR  CORCORAN     115.00
#
 line     34391  34420  "1 " 1     1     # close Corcoran 115 kV CB42 to Alpaugh
0
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CATC-1196-C5 "Kings River-Sanger-Reedley and Balch-Sanger 115 kV Lines"
 line     34366  34389  "1 " 1     0     # line   from  SANGER       115.00  BRKR to (3)   RAINBWTP     115.00
 line     34389  34388  "1 " 1     0     # line   from  RAINBWTP     115.00   (3) to (1)   RAINBW       115.00
 line     34389  34394  "1 " 1     0     # line   from  RAINBWTP     115.00   (3) to (3)   PIEDRA 1     115.00
 line     34394  34380  "1 " 1     0     # line   from  PIEDRA 1     115.00   (3) to BRKR  REEDLEY      115.00
 line     34394  34400  "1 " 1     0     # line   from  PIEDRA 1     115.00   (3) to BRKR  KNGSRVR1     115.00
#-#-# load     34388  "1 "    0              # load         RAINBW       115.00  LOAD==16.38(2.34)
#-#-# load     34388  "E1"    0              # load         RAINBW       115.00  LOAD==-0.16(0.00)
#
 line     34366  34396  "1 " 1     0     # line   from  SANGER       115.00  BRKR to (2)   PIEDRA 2     115.00
 line     34396  34398  "1 " 1     0     # line   from  PIEDRA 2     115.00   (2) to (2)   BALCH        115.00
 tran     34398  34624  "1 "       0     # tran   from  BALCH        115.00   (2) to (1)   BALCH 1       13.20
#-#-# load     34624  "1 "    0              # load         BALCH 1       13.20  LOAD==0.23(0.03)
#-#-# load     34624  "E1"    0              # load         BALCH 1       13.20  LOAD==-0.00(0.00)
#-#-# load     34624  "E2"    0              # load         BALCH 1       13.20  LOAD==-0.01(0.00)
#-#-# gen      34624  "1 "    0              # gen          BALCH 1       13.20  GEN ==33.00(2.04)
0

CATC-1197-C5 "McCall-Kingsburg #1 and #2 115 kV Lines"
 line     34370  34385  "1 " 1     0     # line   from  MC CALL      115.00  BRKR to (3)   KINGS J1     115.00
 line     34385  34417  "1 " 1     0     # line   from  KINGS J1     115.00   (3) to (2)   KINGS J2     115.00
 line     34385  34425  "1 " 1     0     # line   from  KINGS J1     115.00   (3) to (3)   KCOGNJCT     115.00
 line     34417  34418  "1 " 1     0     # line   from  KINGS J2     115.00   (2) to BRKR  KINGSBRG     115.00
 line     34425  34387  "1 " 1     0     # line   from  KCOGNJCT     115.00   (3) to (1)   SUNMAID      115.00
 line     34425  34427  "1 " 1     0     # line   from  KCOGNJCT     115.00   (3) to (2)   GRDNGLS2     115.00
 line     34427  34386  "1 " 1     0     # line   from  GRDNGLS2     115.00   (2) to (2)   KNGSCOGN     115.00
 tran     34386  34642  "1 "       0     # tran   from  KNGSCOGN     115.00   (2) to BRKR  KINGSBUR       9.11
#-#-# load     34387  "1 "    0              # load         SUNMAID      115.00  LOAD==3.65(3.55)
#-#-# load     34387  "E1"    0              # load         SUNMAID      115.00  LOAD==-0.04(0.00)
#-#-# load     34642  "SG"    0              # load         KINGSBUR       9.11  LOAD==0.35(0.08)
#-#-# gen      34642  "1 "    0              # gen          KINGSBUR       9.11  GEN ==25.35(13.86)
#
 line     34418  34423  "1 " 1     0     # line   from  KINGSBRG     115.00  BRKR to (3)   GAURD J1     115.00
 line     34423  34370  "1 " 1     0     # line   from  GAURD J1     115.00   (3) to BRKR  MC CALL     115.00
 line     34423  34421  "1 " 1     0     # line   from  GAURD J1     115.00   (3) to (2)   GAURD J2     115.00
 line     34421  34424  "1 " 1     0     # line   from  GAURD J2     115.00   (2) to (1)   GRDN GLS     115.00
#-#-# load     34424  "1 "    0              # load         GRDN GLS     115.00  LOAD==5.88(1.93)
#-#-# load     34424  "E1"    0              # load         GRDN GLS     115.00  LOAD==-0.14(0.00)
0

CATC-1198-C5 "McCall-Sanger #1 and #2 115 kV Lines"
 line     34366  34370  "1 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
#
 line     34366  34370  "2 " 1     0     # line   from  SANGER       115.00  BRKR to BRKR  MC CALL      115.00
0

CATC-1199-C5 "McCall-West Fresno and California Ave-West Fresno 115 kV Lines"
 line     34404  34370  "1 " 1     0     # line   from  WST FRSO     115.00  BRKR to BRKR  MC CALL      115.00
#
 line     34402  34404  "1 " 1     0     # line   from  CAL AVE      115.00  BRKR to BRKR  WST FRSO     115.00
0

CATC-1200-C5 "McCall-West Fresno and McCall-California Ave 115 kV Lines"
 line     34404  34370  "1 " 1     0     # line   from  WST FRSO     115.00  BRKR to BRKR  MC CALL      115.00
#
 line     34390  34370  "1 " 1     0     # line   from  DANISHCM     115.00   (2) to BRKR  MC CALL      115.00
 line     34390  34402  "1 " 1     0     # line   from  DANISHCM     115.00   (2) to BRKR  CAL AVE      115.00
#-#-# load     34390  "1 "    0              # load         DANISHCM     115.00  LOAD==4.23(3.51)
#-#-# load     34390  "E1"    0              # load         DANISHCM     115.00  LOAD==-0.05(0.00)
0

CATC-1201-C5 "3C643W-Gates #1 and #2 230 kV Lines"
 line     30900  39121  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS1     230.00
#
 line     30900  39122  "2 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  3C643WS2     230.00
0

CATC-1202-C5 "3C643W-Gregg #1 and 3C643W-McCall #2 230 kV Lines w/o Henrietta SPS"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
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 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
0

CATC-1203-C5 "3C643W-Gregg #1 and 3C643W-McCall #2 230 kV Lines w/ Henrietta SPS"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg 230 kV Line
#
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
# Open Henrietta CB 112 Henrietta 230/115 kV Bank #3
 tran     34430  30881  "3 "       0     # tran   from  HENRETTA     115.00  BRKR to BRKR  HENRIETA     230.00
0

CATC-1204-C5 "Helm-McCall and 3C643W-McCall #2 230 kV Lines"
 line     30873  30875  "1 " 1     0     # line   from  HELM         230.00  BRKR to BRKR  MC CALL      230.00
#
 line     30875  30880  "1 " 1     0     # line   from  MC CALL      230.00  BRKR to (2)   HENTAP2      230.00
 line     30880  39122  "2 " 1     0     # line   from  HENTAP2      230.00   (2) to BRKR  3C643WS2     230.00
0

CATC-1205-C5 "Helms PP-E1 #1 and #2 230 kV Lines"
 line     30820  34997  "1 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34600  "1 "    0              # Drop Helms 1 with loss of Helms PP-E1 #1 230 kV Line
#
 line     30820  34997  "2 " 1     0     # line   from  HELMS PP     230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Helms PP-E1 #2 230 kV Line
0

CATC-1206-C5 "E1-Gregg #1 and #2 230 kV Lines"
 line     30810  34997  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #1 230 kV Line
#
 line     30810  34997  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  E1           230.00
#  gen      34604  "1 "    0              # Drop Helms 3 with loss of E1-Gregg #2 230 kV Line
0

CATC-1207-C5 "Gregg-Herndon #1 and #2 230 kV Lines"
 line     30810  30835  "1 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #1 230 kV Line
#
 line     30810  30835  "2 " 1     0     # line   from  GREGG        230.00  BRKR to BRKR  HERNDON      230.00
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Herndon #2 230 kV Line
0

CATC-1208-C5 "Herndon-Kearney and Herndon-Ashlan 230 kV Lines"
 line     30830  30835  "1 " 1     0     # line   from  KEARNEY      230.00  BRKR to BRKR  HERNDON      230.00
#
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
0

CATC-1209-C5 "Gregg-3C643W #1 and Gregg-Ashlan 230 kV Lines"
 line     30810  30879  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   HENTAP1      230.00
 line     30879  30881  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  HENRIETA     230.00
 line     30879  39121  "1 " 1     0     # line   from  HENTAP1      230.00   (3) to BRKR  3C643WS1     230.00
  line     30880  30881  "1 " 1     1     # Henrietta flip flop (Henrietta CB 222)
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gates-Gregg #1 230 kV Line
#
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
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  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
#  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
0

CATC-1210-C5 "Herndon-Ashlan and Gregg-Ashlan 230 kV Lines"
 line     30835  30840  "1 " 1     0     # line   from  HERNDON      230.00  BRKR to (3)   FGRDN T1     230.00
 line     30840  30841  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  FIGRDN 1     230.00
 line     30840  30850  "1 " 1     0     # line   from  FGRDN T1     230.00   (3) to BRKR  ASHLAN       230.00
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30841  "1 "    1              # Restore Load 1 at Figarden 1
  #-#-# load     30841  "E1"    1              # Restore Load E1 at Figarden 1
  #-#-# svd      30841  "v "    1              # Restore capacitor at Figarden 1
#
 line     30810  30845  "1 " 1     0     # line   from  GREGG        230.00  BRKR to (3)   FGRDN T2     230.00
 line     30845  30846  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  FIGRDN 2     230.00
 line     30845  30850  "1 " 1     0     # line   from  FGRDN T2     230.00   (3) to BRKR  ASHLAN       230.00
#-#-# load     30846  "2 "    0              # load         FIGRDN 2     230.00  LOAD==53.44(7.62)
#-#-# load     30846  "3 "    0              # load         FIGRDN 2     230.00  LOAD==33.45(4.77)
#-#-# load     30846  "E2"    0              # load         FIGRDN 2     230.00  LOAD==-0.61(0.00)
  line     30841  30846  "1 " 1     1     # Switches in Figarden SW 286 to transfer load
  #-#-# load     30846  "2 "    1              # Restore Load 2 at Figarden 2
  #-#-# load     30846  "3 "    1              # Restore Load 3 at Figarden 2
  #-#-# load     30846  "E2"    1              # Restore Load E2 at Figarden 2
  #-#-# load     30846  "E3"    1              # Restore Load E3 at Figarden 2
  gen      34604  "1 "    0              # Drop Helms 3 with loss of Gregg-Ashlan 230 kV Line
0

CATC-1211-C5 "Haas-McCall and Balch-McCall 230 kV Lines"
 line     30855  30860  "1 " 1     0     # line   from  HAAS         230.00   (2) to (3)   BALCH3TP     230.00
 tran     30855  34610  "1 "       0     # tran   from  HAAS         230.00   (2) to (2)   HAAS          13.80
 line     30860  30875  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to BRKR  MC CALL      230.00
 line     30860  30861  "1 " 1     0     # line   from  BALCH3TP     230.00   (3) to (2)   BALCH2-3     230.00
 tran     34610  34611  "1 "       0     # tran   from  HAAS          13.80   (2) to (2)   HAAS_70       70.00
 line     34611  34609  "1 " 1     0     # line   from  HAAS_70       70.00   (2) to (1)   WOODCHUK      70.00
 tran     30861  34614  "1 "       0     # tran   from  BALCH2-3     230.00   (2) to (1)   BLCH 2-3      13.80
#-#-# load     34609  "1 "    0              # load         WOODCHUK      70.00  LOAD==1.98(0.29)
#-#-# load     34609  "E1"    0              # load         WOODCHUK      70.00  LOAD==-0.01(0.00)
#-#-# gen      34610  "1 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34610  "2 "    0              # gen          HAAS          13.80  GEN ==71.45(7.54)
#-#-# gen      34614  "1 "    0              # gen          BLCH 2-3      13.80  GEN ==52.50(5.81)
#
 line     30865  30870  "1 " 1     0     # line   from  BALCH2-2     230.00   (2) to (3)   PINE FLT     230.00
 tran     30865  34612  "1 "       0     # tran   from  BALCH2-2     230.00   (2) to (1)   BLCH 2-2      13.80
 line     30870  30875  "1 " 1     0     # line   from  PINE FLT     230.00   (3) to BRKR  MC CALL      230.00
 tran     30870  38720  "1 "       0     # tran   from  PINE FLT     230.00   (3) to (1)   PINE FLT      13.80
#-#-# gen      34612  "1 "    0              # gen          BLCH 2-2      13.80  GEN ==52.50(4.70)
#-#-# gen      38720  "1 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "2 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
#-#-# gen      38720  "3 "    0              # gen          PINE FLT      13.80  GEN ==50.01(6.99)
0

CATC-1212-C5 "Gates-6C0974SS and Templeton-Gates 230 kV Lines w/ Topaz & CVSR SPS"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
# trip half of Topaz generation (block 1)
 gen      36434  "1 "    0              # gen          Q194G2          0.32  GEN ==125.00(21.61)
 gen      36436  "1 "    0              # gen          T242G           0.32  GEN ==155.00(21.61)
# trip CVSR (block 2)
 load     36426  "ss"    0              # load         T239            0.40  LOAD==1.10(0.61)
 gen      36426  "1 "    0              # gen          T239            0.40  GEN ==254.00(36.08)
# trip half of Topaz generation (block 3)
 gen      36430  "1 "    0              # gen          Q166G           0.32  GEN ==215.00(21.68)
 gen      36432  "1 "    0              # gen          Q194G1          0.32  GEN ==65.00(21.68)
0

CATC-1213-C5 "6C0974SS-5C877SS and Templeton-Gates 230 kV Lines w/ Topaz & CVSR SPS"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
# trip half of Topaz generation (block 1)
 gen      36434  "1 "    0              # gen          Q194G2          0.32  GEN ==125.00(21.61)
 gen      36436  "1 "    0              # gen          T242G           0.32  GEN ==155.00(21.61)
# trip CVSR (block 2)
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```
 load     36426  "ss"    0               # load         T239           0.40  LOAD==1.10(0.61)
 gen      36426  "1 "    0               # gen          T239           0.40  GEN ==254.00(36.08)
# trip half of Topaz generation (block 3)
 gen      36430  "1 "    0               # gen          Q166G          0.32  GEN ==215.00(21.68)
 gen      36432  "1 "    0               # gen          Q194G1         0.32  GEN ==65.00(21.68)
0

CATC-1214-C5 "5C877SS-Morro Bay and Templeton-Gates 230 kV Lines w/ Topaz & CVSR SPS"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
# trip half of Topaz generation (block 1)
 gen      36434  "1 "    0               # gen          Q194G2         0.32  GEN ==125.00(21.61)
 gen      36436  "1 "    0               # gen          T242G          0.32  GEN ==155.00(21.61)
# trip CVSR (block 2)
 load     36426  "ss"    0               # load         T239           0.40  LOAD==1.10(0.61)
 gen      36426  "1 "    0               # gen          T239           0.40  GEN ==254.00(36.08)
# trip half of Topaz generation (block 3)
 gen      36430  "1 "    0               # gen          Q166G          0.32  GEN ==215.00(21.68)
 gen      36432  "1 "    0               # gen          Q194G1         0.32  GEN ==65.00(21.68)
0

CATC-1215-C5 "Gates-6C0974SS and Templeton-Gates 230 kV Lines w/o Topaz & CVSR SPS"
 line     30900  39295  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  6C0974SS     230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
0

CATC-1216-C5 "6C0974SS-5C877SS and Templeton-Gates 230 kV Lines w/o Topaz & CVSR SPS"
 line     39295  39941  "1 " 1     0     # line   from  6C0974SS     230.00  BRKR to BRKR  5C877SS      230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
0

CATC-1217-C5 "5C877SS-Morro Bay and Templeton-Gates 230 kV Lines w/o Topaz & CVSR SPS"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 line     30900  30905  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  TEMPLETN     230.00
0

CATC-1218-C5 "Gates-Arco and Gates-Midway 230 kV Lines"
 line     30900  30935  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  ARCO         230.00
#
 line     30900  30970  "1 " 1     0     # line   from  GATES        230.00  BRKR to BRKR  MIDWAY       230.00
0

# 2018 main year category c contingency list (selected category c multiple element outages)
# Kern Division Zone 315
#


CATC-1219-C2 "Arco 230 kV CB2222 Failure"
 line     30935  30900  "1 " 1     0     # line   from  ARCO         230.00 to GATES        230.00
 tran     30935  34582  "2 "       0     # tran   from  ARCO         230.00 to ARCO          70.00
0

CATC-1220-C2 "Arco 230 kV CB2122 Failure"
 line     30935  30970  "1 " 1     0     # line   from  ARCO         230.00 to MIDWAY       230.00
 tran     30935  34582  "1 "       0     # tran   from  ARCO         230.00 to ARCO          70.00
0

CATC-1221-C2 "Stockdale 230 kV CS216 Failure"
 isol     30940                          # BUS FAULT AT  30940 STCKDLEA     230.00
0

CATC-1222-C1 "Kern PP 230 kV Bus Section 1"
 line     30945  30943  "1 " 1     0     # line   from  KERN PP      230.00 to STCKDLJ2     230.00
 line     30945  30944  "1 " 1     0     # line   from  KERN PP      230.00 to BKRSFDJ2     230.00
 tran     30945  34752  "3 "       0     # tran   from  KERN PP      230.00 to KERN PWR     115.00
 tran     30945  34752  "4 "       0     # tran   from  KERN PP      230.00 to KERN PWR     115.00
0

CATC-1223-C1 "Kern PP 230 kV Bus Section 2"
 line     30945  30942  "1 " 1     0     # line   from  KERN PP      230.00 to STCKDLJ1     230.00
 line     30945  30944  "1 " 1     0     # line   from  KERN PP      230.00 to BKRSFDJ2     230.00
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 tran     30945  34752  "5 "       0     # tran   from  KERN PP      230.00 to KERN PWR     115.00
0

CATC-1224-C2 "Kern PP 230 kV CB402 Failure"
 isol     30945                          # BUS FAULT AT  30945 KERN PP      230.00
0

CATC-1225-C1 "LaPaloma 230 kV Bus Section 1"
 tran     30946  35070  "1 "       0     # tran   from  LAPALOMA     230.00 to LAPLM_G1      21.00
 tran     30946  35071  "1 "       0     # tran   from  LAPALOMA     230.00 to LAPLM_G2      21.00
0

CATC-1226-C1 "LaPaloma 230 kV Bus Section 2"
 tran     30946  35072  "1 "       0     # tran   from  LAPALOMA     230.00 to LAPLM_G3      21.00
 tran     30946  35073  "1 "       0     # tran   from  LAPALOMA     230.00 to LAPLM_G4      21.00
0

CATC-1227-C2 "Elk Hills 230 kV CB52-5 Failure"
 tran     30948  35076  "1 "       0     # tran   from  ELKHIL_G     230.00 to ELKHIL1G      18.00
 tran     30948  35078  "1 "       0     # tran   from  ELKHIL_G     230.00 to ELKHIL3G      18.00
0

CATC-1228-C1 "Midway 230 kV Bus Section 1D"
 line     30970  30918  "1 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30943  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ2     230.00
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  38600  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ1     230.00
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S1     230.00
 tran     30970  34774  "1 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
0

CATC-1229-C1 "Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30918  "1 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30943  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ2     230.00
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  38600  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ1     230.00
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S1     230.00
 tran     30970  34774  "1 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00 to MIDWAY       500.00
0

CATC-1230-C1 "Midway 230 kV CB552 Failure w/ Elk Hills/Sunrise SPS"
 line     30970  30918  "1 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30943  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ2     230.00
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  38600  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ1     230.00
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S1     230.00
 tran     30970  34774  "1 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00 to MIDWAY       500.00
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1231-C1 "Midway 230 kV Bus Section 1E"
 line     30970  30935  "1 " 1     0     # line   from  MIDWAY       230.00 to ARCO         230.00
 tran     30970  34774  "3 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
0

CATC-1232-C2 "Midway 230 kV CB252 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30935  "1 " 1     0     # line   from  MIDWAY       230.00 to ARCO         230.00
 tran     30970  34774  "3 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  35003  "11"       0     # tran   from  MIDWAY       230.00 to MDWY 11M      13.80
0

CATC-1233-C2 "Midway 230 kV CB252 Failure w/ Elk Hills/Sunrise SPS"
 line     30970  30935  "1 " 1     0     # line   from  MIDWAY       230.00 to ARCO         230.00
 tran     30970  34774  "3 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  35003  "11"       0     # tran   from  MIDWAY       230.00 to MDWY 11M      13.80
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
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 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1234-C1 "Midway 230 kV Bus Section 1F"
 line     30970  30900  "1 " 1     0     # line   from  MIDWAY       230.00 to GATES        230.00
 line     30970  30948  "1 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 line     30970  30948  "2 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
0

CATC-1235-C2 "Midway 230 kV CB682 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30900  "1 " 1     0     # line   from  MIDWAY       230.00 to GATES        230.00
 line     30970  30948  "1 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 line     30970  30948  "2 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 tran     30970  35007  "13"       0     # tran   from  MIDWAY       230.00 to MDWY 13M      13.80
0

CATC-1236-C2 "Midway 230 kV CB682 Failure w Elk Hills/Sunrise SPS"
 line     30970  30900  "1 " 1     0     # line   from  MIDWAY       230.00 to GATES        230.00
 line     30970  30948  "1 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 line     30970  30948  "2 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 tran     30970  35007  "13"       0     # tran   from  MIDWAY       230.00 to MDWY 13M      13.80
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1237-C2 "Midway 230 kV CB632 Failure"
 line     30970  30918  "1 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30943  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ2     230.00
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  38600  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ1     230.00
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S1     230.00
 tran     30970  34774  "1 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 line     30970  30935  "1 " 1     0     # line   from  MIDWAY       230.00 to ARCO         230.00
 tran     30970  34774  "3 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
0

CATC-1238-C2 "Midway 230 kV CB652 Failure"
 line     30970  30935  "1 " 1     0     # line   from  MIDWAY       230.00 to ARCO         230.00
 tran     30970  34774  "3 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 line     30970  30900  "1 " 1     0     # line   from  MIDWAY       230.00 to GATES        230.00
 line     30970  30948  "1 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
 line     30970  30948  "2 " 1     0     # line   from  MIDWAY       230.00 to ELKHIL_G     230.00
0

CATC-1239-C1 "Midway 230 kV Bus Section 2D"
 line     30970  30918  "2 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30973  "1 " 1     0     # line   from  MIDWAY       230.00 to SUNST        230.00
 line     30970  38605  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ2     230.00
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S2     230.00
 tran     30970  34774  "2 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
0

CATC-1240-C2 "Midway 230 kV CB562 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30918  "2 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30973  "1 " 1     0     # line   from  MIDWAY       230.00 to SUNST        230.00
 line     30970  38605  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ2     230.00
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S2     230.00
 tran     30970  34774  "2 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00 to MIDWAY       500.00
0

CATC-1241-C2 "Midway 230 kV CB562 Failure w/ Elk Hills/Sunrise SPS"
 line     30970  30918  "2 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30973  "1 " 1     0     # line   from  MIDWAY       230.00 to SUNST        230.00
 line     30970  38605  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ2     230.00
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S2     230.00
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 tran     30970  34774  "2 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00 to MIDWAY       500.00
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1242-C1 "Midway 230 kV Bus Section 2E"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  30944  "1 " 1     0     # line   from  MIDWAY       230.00 to BKRSFDJ2     230.00
0

CATC-1243-C2 "Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  30944  "1 " 1     0     # line   from  MIDWAY       230.00 to BKRSFDJ2     230.00
 tran     30970  35003  "11"       0     # tran   from  MIDWAY       230.00 to MDWY 11M      13.80
0

CATC-1244-C2 "Midway 230 kV CB262 Failure w/ Elk Hills/Sunrise SPS"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  30944  "1 " 1     0     # line   from  MIDWAY       230.00 to BKRSFDJ2     230.00
 tran     30970  35003  "11"       0     # tran   from  MIDWAY       230.00 to MDWY 11M      13.80
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1245-C1 "Midway 230 kV Bus Section 2F"
 line     30970  30942  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ1     230.00
0

CATC-1246-C2 "Midway 230 kV CB692 Failure w/o Elk Hills/Sunrise SPS"
 line     30970  30942  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ1     230.00
 tran     30970  35007  "13"       0     # tran   from  MIDWAY       230.00 to MDWY 13M      13.80
0

CATC-1247-C2 "Midway 230 kV CB692 Failure Elk Hills/Sunrise SPS"
 line     30970  30942  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ1     230.00
 tran     30970  35007  "13"       0     # tran   from  MIDWAY       230.00 to MDWY 13M      13.80
#
 gen      35074  "1 "    0              # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0              # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0              # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0              # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0              # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0              # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
0

CATC-1248-C2 "Midway 230 kV CB642 Failure"
 line     30970  30918  "2 " 1     0     # line   from  MIDWAY       230.00 to CALNTESS     230.00
 line     30970  30973  "1 " 1     0     # line   from  MIDWAY       230.00 to SUNST        230.00
 line     30970  38605  "1 " 1     0     # line   from  MIDWAY       230.00 to BUENAVJ2     230.00
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00 to 6C1000S2     230.00
 tran     30970  34774  "2 "       0     # tran   from  MIDWAY       230.00 to MIDWAY       115.00
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  30944  "1 " 1     0     # line   from  MIDWAY       230.00 to BKRSFDJ2     230.00
0

CATC-1249-C2 "Midway 230 kV CB662 Failure"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00 to LAPALOMA     230.00
 line     30970  30944  "1 " 1     0     # line   from  MIDWAY       230.00 to BKRSFDJ2     230.00
 line     30970  30942  "1 " 1     0     # line   from  MIDWAY       230.00 to STCKDLJ1     230.00
0

CATC-1250-C1 "Wheeler Ridge 230 kV Bus"
 isol     30994                         # BUS FAULT AT  30994 WHEELER      230.00
0
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CATC-1251-C1 "Arco 70 kV Bus"
 isol     34582                          # BUS FAULT AT  34582 ARCO          70.00
0

CATC-1252-C1 "Smyrna 115 kV Bus"
 isol     34700                          # BUS FAULT AT  34700 SMYRNA       115.00
0

CATC-1253-C2 "Semitropic 115 kV CB152 Failure"
 isol     34704                          # BUS FAULT AT  34704 SEMITRPC     115.00
0

CATC-1254-C2 "Westpark 115 kV CS177 Failure"
 line     34706  34752  "1 " 1     0     # line   from  WESTPARK     115.00 to KERN PWR     115.00
 line     34706  34752  "2 " 1     0     # line   from  WESTPARK     115.00 to KERN PWR     115.00
 load     34706  "1 "    0              # load         WESTPARK     115.00  LOAD==19.36(2.76)
 load     34706  "2 "    0              # load         WESTPARK     115.00  LOAD==24.16(3.44)
 load     34706  "E1"    0              # load         WESTPARK     115.00  LOAD==-0.32(0.00)
 load     34706  "E2"    0              # load         WESTPARK     115.00  LOAD==-0.29(0.00)
0

CATC-1255-C2 "Westpark 115 kV CS187 Failure"
 line     34706  34734  "1 " 1     0     # line   from  WESTPARK     115.00 to BEAR TAP     115.00
 line     34706  34752  "2 " 1     0     # line   from  WESTPARK     115.00 to KERN PWR     115.00
 load     34706  "2 "    0              # load         WESTPARK     115.00  LOAD==24.16(3.44)
 load     34706  "3 "    0              # load         WESTPARK     115.00  LOAD==19.91(2.84)
 load     34706  "E2"    0              # load         WESTPARK     115.00  LOAD==-0.29(0.00)
 load     34706  "E3"    0              # load         WESTPARK     115.00  LOAD==-0.24(0.00)
0

CATC-1256-C2 "7th Standard 115 kV CB1012 Failure"
 line     34709  34752  "1 " 1     0     # line   from  7STNDRD      115.00 to KERN PWR     115.00
 load     34709  "1 "    0              # load         7STNDRD      115.00  LOAD==22.35(3.18)
 load     34709  "E1"    0              # load         7STNDRD      115.00  LOAD==-0.33(0.00)
 line     34709  90096  "1 " 1     0     # line   from  7STNDRD      115.00 to 0096-WD      115.00
0

CATC-1257-C2 "7th Standard 115 kV CB1062 Failure"
 line     34709  34716  "1 " 1     0     # line   from  7STNDRD      115.00 to LRDO JCT     115.00
 load     34709  "1 "    0              # load         7STNDRD      115.00  LOAD==22.35(3.18)
 load     34709  "E1"    0              # load         7STNDRD      115.00  LOAD==-0.33(0.00)
 line     34709  90096  "1 " 1     0     # line   from  7STNDRD      115.00 to 0096-WD      115.00
0

CATC-1258-C2 "Charca 115 kV CB142 Failure"
 isol     34710                          # BUS FAULT AT  34710 CHARKA       115.00
0

CATC-1259-C1 "Famoso 115 kV Bus"
 isol     34712                          # BUS FAULT AT  34712 FAMOSO       115.00
0

CATC-1260-C1 "Lerdo 115 kV Bus"
 isol     34714                          # BUS FAULT AT  34714 LERDO        115.00
0

CATC-1261-C2 "Kern Oil 115 kV CB162 Failure"
 isol     34718                          # BUS FAULT AT  34718 KERN OIL     115.00
0

CATC-1262-C1 "Petrol Jct 115 kV Bus"
 isol     34726                          # BUS FAULT AT  34726 PTRL JCT     115.00
0

CATC-1263-C1 "Live Oak 115 kV Bus"
 isol     34728                          # BUS FAULT AT  34728 LIVE OAK     115.00
0

CATC-1264-C1 "Columbus 115 kV Bus"
 isol     34732                          # BUS FAULT AT  34732 COLUMBUS     115.00
0

CATC-1265-C2 "Magunden 115 kV CS176 Failure"
 line     34736  34735  "1 " 1     0     # line   from  MAGUNDEN     115.00 to MAGUDN J     115.00
```

```
 load     34736  "1 "    0              # load         MAGUNDEN     115.00  LOAD==26.76(3.81)
 load     34736  "E1"    0              # load         MAGUNDEN     115.00  LOAD==-0.36(0.00)
0

CATC-1266-C1 "Magunden 115 kV CS186 Failure"
 line     34736  34724  "1 " 1     0     # line   from  MAGUNDEN     115.00 to KRN OL J     115.00
 load     34736  "1 "    0              # load         MAGUNDEN     115.00  LOAD==26.76(3.81)
 load     34736  "3 "    0              # load         MAGUNDEN     115.00  LOAD==34.71(4.95)
 load     34736  "E1"    0              # load         MAGUNDEN     115.00  LOAD==-0.36(0.00)
 load     34736  "E3"    0              # load         MAGUNDEN     115.00  LOAD==-0.29(0.00)
0

CATC-1267-C1 "Stockdale 115 kV Bus"
 isol     34740                         # BUS FAULT AT  34740 STOCKDLE     115.00
0

CATC-1268-C1 "Golden Bear 115 kV Bus"
 isol     34744                         # BUS FAULT AT  34744 GODN_BER     115.00
0

CATC-1269-C1 "Tupman 115 kV Bus"
 isol     34750                         # BUS FAULT AT  34750 TUPMAN       115.00
0

CATC-1270-C1 "Kern PP 115 kV Bus Section 1"
 line     34752  34706  "1 " 1     0     # line   from  KERN PWR     115.00 to WESTPARK     115.00
 line     34752  34753  "1 " 1     0     # line   from  KERN PWR     115.00 to TEVISJ1      115.00
 line     34752  34808  "1 " 1     0     # line   from  KERN PWR     115.00 to ROSEDAL      115.00
 tran     34752  30945  "5 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 tran     34752  34768  "1 "       0     # tran   from  KERN PWR     115.00 to KERN1 M       13.20
 load     34752  "7 "    0              # load         KERN PWR     115.00  LOAD==28.79(4.10)
 load     34752  "E7"    0              # load         KERN PWR     115.00  LOAD==-0.34(0.00)
0

CATC-1271-C1 "Kern PP 115 kV Bus Section 2D"
 line     34752  34709  "1 " 1     0     # line   from  KERN PWR     115.00 to 7STNDRD      115.00
 line     34752  34281  "1 " 1     0     # line   from  KERN PWR     115.00 to DOUBLECJ     115.00
 line     34752  34755  "1 " 1     0     # line   from  KERN PWR     115.00 to TEVISJ2      115.00
 tran     34752  30945  "4 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 load     34752  "6 "    0              # load         KERN PWR     115.00  LOAD==27.52(3.92)
 load     34752  "E6"    0              # load         KERN PWR     115.00  LOAD==-0.32(0.00)
0

CATC-1272-C1 "Kern PP 115 kV Bus Section 2E"
 line     34752  34706  "2 " 1     0     # line   from  KERN PWR     115.00 to WESTPARK     115.00
 line     34752  34728  "1 " 1     0     # line   from  KERN PWR     115.00 to LIVE OAK     115.00
 line     34752  34798  "1 " 1     0     # line   from  KERN PWR     115.00 to KERNWATR     115.00
 tran     34752  30945  "3 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 tran     34752  34770  "1 "       0     # tran   from  KERN PWR     115.00 to KERN2 M       13.20
0

CATC-1273-C2 "Kern PP 115 kV CB262 Failure"
 line     34752  34709  "1 " 1     0     # line   from  KERN PWR     115.00 to 7STNDRD      115.00
 line     34752  34281  "1 " 1     0     # line   from  KERN PWR     115.00 to DOUBLECJ     115.00
 line     34752  34755  "1 " 1     0     # line   from  KERN PWR     115.00 to TEVISJ2      115.00
 tran     34752  30945  "4 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 load     34752  "6 "    0              # load         KERN PWR     115.00  LOAD==27.52(3.92)
 load     34752  "E6"    0              # load         KERN PWR     115.00  LOAD==-0.32(0.00)
 line     34752  34706  "2 " 1     0     # line   from  KERN PWR     115.00 to WESTPARK     115.00
 line     34752  34728  "1 " 1     0     # line   from  KERN PWR     115.00 to LIVE OAK     115.00
 line     34752  34798  "1 " 1     0     # line   from  KERN PWR     115.00 to KERNWATR     115.00
 tran     34752  30945  "3 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 tran     34752  34770  "1 "       0     # tran   from  KERN PWR     115.00 to KERN2 M       13.20
0

CATC-1274-C2 "Kern PP 115 kV CB102 Failure"
 line     34752  34706  "1 " 1     0     # line   from  KERN PWR     115.00 to WESTPARK     115.00
 line     34752  34753  "1 " 1     0     # line   from  KERN PWR     115.00 to TEVISJ1      115.00
 line     34752  34808  "1 " 1     0     # line   from  KERN PWR     115.00 to ROSEDAL      115.00
 tran     34752  30945  "5 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 tran     34752  34768  "1 "       0     # tran   from  KERN PWR     115.00 to KERN1 M       13.20
 load     34752  "7 "    0              # load         KERN PWR     115.00  LOAD==28.79(4.10)
 load     34752  "E7"    0              # load         KERN PWR     115.00  LOAD==-0.34(0.00)
 line     34752  34709  "1 " 1     0     # line   from  KERN PWR     115.00 to 7STNDRD      115.00
 line     34752  34281  "1 " 1     0     # line   from  KERN PWR     115.00 to DOUBLECJ     115.00
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 line     34752  34755  "1 " 1     0     # line   from  KERN PWR     115.00 to TEVISJ2      115.00
 tran     34752  30945  "4 "       0     # tran   from  KERN PWR     115.00 to KERN PP      230.00
 load     34752  "6 "    0              # load         KERN PWR     115.00  LOAD==27.52(3.92)
 load     34752  "E6"    0              # load         KERN PWR     115.00  LOAD==-0.32(0.00)
0

CATC-1275-C1 "Wheeler Ridge 115 kV Bus"
 isol     34756                         # BUS FAULT AT  34756 WHEELER      115.00
0

CATC-1276-C1 "Lamont 115 kV Bus"
 isol     34758                         # BUS FAULT AT  34758 LAMONT       115.00
0

CATC-1277-C2 "Rio Bravo 115 kV CS196 Failure"
 isol     34760                         # BUS FAULT AT  34760 RIO BRVO     115.00
0

CATC-1278-C2 "Renfro 115 kV CS136 Failure"
 isol     34762                         # BUS FAULT AT  34762 RENFRO       115.00
0

CATC-1279-C1 "Shafter 115 kV Bus"
 isol     34766                         # BUS FAULT AT  34766 SHAFTER      115.00
0

CATC-1280-C1 "Midway 115 kV Bus Section 1D"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00 to CYMRIC       115.00
 line     34774  34811  "1 " 1     0     # line   from  MIDWAY       115.00 to RIOBRVTM     115.00
 tran     34774  30970  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
 tran     34774  34215  "7 "       0     # tran   from  MIDWAY       115.00 to MIDWY D7      12.47
 tran     34774  34217  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWY D8      12.47
0

CATC-1281-C1 "Midway 115 kV Bus Section 2D"
 line     34774  34749  "1 " 1     0     # line   from  MIDWAY       115.00 to TPMNTP1      115.00
 line     34774  34225  "1 " 1     0     # line   from  MIDWAY       115.00 to BELRDG J     115.00
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00 to OXYBVHTP     115.00
 tran     34774  30970  "2 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
0

CATC-1282-C1 "Midway 115 kV Bus Section 1E"
 line     34774  34704  "1 " 1     0     # line   from  MIDWAY       115.00 to SEMITRPC     115.00
0

CATC-1283-C1 "Midway 115 kV Bus Section 2E"
 line     34774  34746  "1 " 1     0     # line   from  MIDWAY       115.00 to GANSO        115.00
 line     34774  34766  "1 " 1     0     # line   from  MIDWAY       115.00 to SHAFTER      115.00
 tran     34774  30970  "3 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
0

CATC-1284-C2 "Midway 115 kV CB172 Failure"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00 to CYMRIC       115.00
 line     34774  34811  "1 " 1     0     # line   from  MIDWAY       115.00 to RIOBRVTM     115.00
 tran     34774  30970  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
 tran     34774  34215  "7 "       0     # tran   from  MIDWAY       115.00 to MIDWY D7      12.47
 tran     34774  34217  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWY D8      12.47
 line     34774  34704  "1 " 1     0     # line   from  MIDWAY       115.00 to SEMITRPC     115.00
0

CATC-1285-C1 "Midway 115 kV CB182 Failure"
 line     34774  34749  "1 " 1     0     # line   from  MIDWAY       115.00 to TPMNTP1      115.00
 line     34774  34225  "1 " 1     0     # line   from  MIDWAY       115.00 to BELRDG J     115.00
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00 to OXYBVHTP     115.00
 tran     34774  30970  "2 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
 line     34774  34746  "1 " 1     0     # line   from  MIDWAY       115.00 to GANSO        115.00
 line     34774  34766  "1 " 1     0     # line   from  MIDWAY       115.00 to SHAFTER      115.00
 tran     34774  30970  "3 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
0

CATC-1286-C2 "Midway 115 kV CB302 Failure"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00 to CYMRIC       115.00
 line     34774  34811  "1 " 1     0     # line   from  MIDWAY       115.00 to RIOBRVTM     115.00
 tran     34774  30970  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
 tran     34774  34215  "7 "       0     # tran   from  MIDWAY       115.00 to MIDWY D7      12.47
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 tran     34774  34217  "1 "       0     # tran   from  MIDWAY       115.00 to MIDWY D8      12.47
 line     34774  34749  "1 " 1     0     # line   from  MIDWAY       115.00 to TPMNTP1      115.00
 line     34774  34225  "1 " 1     0     # line   from  MIDWAY       115.00 to BELRDG J     115.00
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00 to OXYBVHTP     115.00
 tran     34774  30970  "2 "       0     # tran   from  MIDWAY       115.00 to MIDWAY       230.00
0

CATC-1287-C2 "Taft 115 kV CB102 Failure"
 tran     34776  34860  "1 "       0     # tran   from  TAFT         115.00 to TAFT A        70.00
 load     34776  "4 "    0               # load         TAFT         115.00  LOAD==10.18(1.45)
 load     34776  "E4"    0               # load         TAFT         115.00  LOAD==-0.12(0.00)
0

CATC-1288-C2 "Taft 115 kV CB142 Failure"
 line     34776  34786  "1 " 1     0     # line   from  TAFT         115.00 to UNIVRSTY     115.00
 line     34776  34802  "1 " 1     0     # line   from  TAFT         115.00 to MIDSET       115.00
0

CATC-1289-C2 "Taft 115 kV CB152 Failure"
 line     34776  39145  "1 " 1     0     # line   from  TAFT         115.00 to OXYBVHTP     115.00
 load     34776  "3 "    0               # load         TAFT         115.00  LOAD==6.79(0.96)
 load     34776  "E3"    0               # load         TAFT         115.00  LOAD==-0.07(0.00)
0

CATC-1290-C2 "Taft 115 kV CB172 Failure"
 line     34776  34786  "1 " 1     0     # line   from  TAFT         115.00 to UNIVRSTY     115.00
 tran     34776  34860  "1 "       0     # tran   from  TAFT         115.00 to TAFT A        70.00
0

CATC-1291-C2 "Taft 115 kV CB182 Failure"
 line     34776  34802  "1 " 1     0     # line   from  TAFT         115.00 to MIDSET       115.00
 tran     34776  34860  "2 "       0     # tran   from  TAFT         115.00 to TAFT A        70.00
0

CATC-1292-C2 "Taft 115 kV CB192 Failure"
 line     34776  39145  "1 " 1     0     # line   from  TAFT         115.00 to OXYBVHTP     115.00
 tran     34776  34860  "2 "       0     # tran   from  TAFT         115.00 to TAFT A        70.00
0

CATC-1293-C1 "Fellows 115 kV Bus"
 isol     34777                         # BUS FAULT AT  34777 FELLOWSG     115.00
0

CATC-1294-C1 "Midsun 115 kV Bus"
 isol     34779                         # BUS FAULT AT  34779 MIDSUN       115.00
0

CATC-1295-C1 "Temblor 115 kV Bus"
 isol     34794                         # BUS FAULT AT  34794 TEMBLOR      115.00
0

CATC-1296-C1 "Carneras 70 kV Bus"
 isol     34852                         # BUS FAULT AT  34852 CARNERAS      70.00
0

CATC-1297-C1 "Taft 70 kV Bus"
 isol     34860                         # BUS FAULT AT  34860 TAFT A        70.00
0

CATC-1298-C1 "Maricopa 70 kV Bus"
 isol     34862                         # BUS FAULT AT  34862 MARICOPA      70.00
0

CATC-1299-C1 "Lakeview 70 kV Bus"
 isol     34872                         # BUS FAULT AT  34872 LAKEVIEW      70.00
0

CATC-1300-C1 "Wheeler Ridge 70 kV Bus"
 isol     34874                         # BUS FAULT AT  34874 WHEELER       70.00
0

CATC-1301-C2 "Tejon 70 kV CB32 Failure"
 isol     34876                         # BUS FAULT AT  34876 TEJON         70.00
0
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CATC-1302-C1 "San Bernard 70 kV Bus"
 isol     34880                          # BUS FAULT AT  34880 SN BRNRD      70.00
0

CATC-1303-C1 "Weedpatch 70 kV Bus"
 isol     34890                          # BUS FAULT AT  34890 WEEDPTCH      70.00
0

CATC-1304-C1 "Old River 70 kV Bus"
 isol     34904                          # BUS FAULT AT  34904 OLD RIVR      70.00
0

CATC-1305-C1 "Panama 70 kV Bus"
 isol     34906                          # BUS FAULT AT  34906 PANAMA        70.00
0

CATC-1306-C1 "Kern PP 70 kV Bus Section 1"
 isol     34914                          # BUS FAULT AT  34914 KERN PW1      70.00
0

CATC-1307-C1 "Kern PP kV Bus Section 2"
 isol     34918                          # BUS FAULT AT  34918 KERN PW2      70.00
0

CATC-1308-C2 "Kern PP 70 kV CB62 Failure"
 isol     34914                          # BUS FAULT AT  34914 KERN PW1      70.00
 isol     34918                          # BUS FAULT AT  34918 KERN PW2      70.00
0

CATC-1309-C1 "Cadet 70 kV Bus"
 isol     34916                          # BUS FAULT AT  34916 CADET         70.00
0

CATC-1310-C1 "Famoso 70 kV Bus"
 isol     34926                          # BUS FAULT AT  34926 FAMOSO        70.00
0

CATC-1311-C1 "Wasco 70 kV Bus"
 isol     34932                          # BUS FAULT AT  34932 WASCO         70.00
0

CATC-1312-C1 "Buena Vista PP 230 kV Bus 1"
 isol     38601                          # BUS FAULT AT  38601 BUENAVT1     230.00
0

CATC-1313-C1 "Buena Vista PP 230 kV Bus 2"
 isol     38606                          # BUS FAULT AT  38606 BUENAVT2     230.00
0

CATC-1314-C1 "Wheeler Ridge PP 230 kV Bus 1"
 isol     38641                          # BUS FAULT AT  38641 WHLR RT1     230.00
0

CATC-1315-C1 "Wheeler Ridge PP 230 kV Bus 2"
 isol     38646                          # BUS FAULT AT  38646 WHLR RT2     230.00
0

CATC-1316-C1 "Wind Gap PP 230 kV Bus 1"
 isol     38651                          # BUS FAULT AT  38651 WND GPT1     230.00
0

CATC-1317-C1 "Wind Gap PP 230 kV Bus 2"
 isol     38656                          # BUS FAULT AT  38656 WND GPT2     230.00
0

CATC-1318-C1 "Alpaugh 115 kV Bus"
 isol     34426                          # BUS FAULT AT  34426 ALPAUGH      115.00
0

CATC-1319-C5 "Kern-Old River #1 and Kern-Panama 70 kV Lines"
 line     34904  34975  "1 " 1     0     # line   from  OLD RIVR      70.00  BRKR to (3)   S517TP        70.00
 line     34975  34914  "1 " 1     0     # line   from  S517TP        70.00   (3) to BRKR  KERN PW1      70.00
 line     34975  34976  "1 " 1     0     # line   from  S517TP        70.00   (3) to (2)   S517          70.00
 tran     34976  35091  "1 "       0     # tran   from  S517          70.00   (2) to (1)   S517          12.47
#-#-# gen      35091  "F "    0              # gen          S517          12.47  GEN ==20.00(-2.67)
```

```
#
 line     34137  34918  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to BRKR  KERN PW2      70.00
 line     34137  34906  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to BRKR  PANAMA       70.00
 line     34137  34908  "1 " 1     0     # line   from  CARNAT T      70.00   (3) to (1)   CARNATIO      70.00
#-#-# load     34908  "1 "    0              # load         CARNATIO      70.00  LOAD==12.27(9.07)
#-#-# load     34908  "E1"    0              # load         CARNATIO      70.00  LOAD==-0.07(0.00)
0

CATC-1320-C5 "Petrol Jct-Kern Oil and Lerdo-Kern Oil-7th Standard 115 kV Lines"
 line     34719  34718  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to BRKR  KERN OIL     115.00
 line     34719  34782  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to (3)   KRNFRNTT     115.00
 line     34719  34726  "1 " 1     0     # line   from  POSOMTJT     115.00   (3) to BRKR  PTRL JCT     115.00
 line     34782  34785  "1 " 1     0     # line   from  KRNFRNTT     115.00   (3) to (1)   KERNFRNT     115.00
 line     34782  34810  "1 " 1     0     # line   from  KRNFRNTT     115.00   (3) to (2)   POSO MT      115.00
 line     34810  34812  "1 " 1     0     # line   from  POSO MT      115.00   (2) to (1)   VEDDER       115.00
#-#-# load     34785  "1 "    0              # load         KERNFRNT     115.00  LOAD==19.00(11.22)
#-#-# load     34810  "1 "    0              # load         POSO MT      115.00  LOAD==10.66(1.52)
#-#-# load     34810  "E1"    0              # load         POSO MT      115.00  LOAD==-0.13(0.00)
#-#-# load     34812  "1 "    0              # load         VEDDER       115.00  LOAD==1.21(0.29)
#-#-# load     34812  "E1"    0              # load         VEDDER       115.00  LOAD==-0.01(0.00)
#
 line     34714  34716  "1 " 1     0     # line   from  LERDO        115.00  BRKR to (3)   LRDO JCT     115.00
 line     34716  34709  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  7STNDRD     115.00
 line     34716  34718  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  KERN OIL     115.00
0

CATC-1321-C5 "Petrol Jct-Live Oak and Lerdo-Kern Oil-7th Standard 115 kV Lines"
 line     34726  34728  "1 " 1     0     # line   from  PTRL JCT     115.00  BRKR to BRKR  LIVE OAK     115.00
#
 line     34714  34716  "1 " 1     0     # line   from  LERDO        115.00  BRKR to (3)   LRDO JCT     115.00
 line     34716  34709  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  7STNDRD     115.00
 line     34716  34718  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  KERN OIL     115.00
0

CATC-1322-C5 "Kern-Live Oak and Lerdo-Kern Oil-7th Standard 115 kV Lines"
 line     34728  34752  "1 " 1     0     # line   from  LIVE OAK     115.00  BRKR to BRKR  KERN PWR     115.00
#
 line     34714  34716  "1 " 1     0     # line   from  LERDO        115.00  BRKR to (3)   LRDO JCT     115.00
 line     34716  34709  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  7STNDRD     115.00
 line     34716  34718  "1 " 1     0     # line   from  LRDO JCT     115.00   (3) to BRKR  KERN OIL     115.00
0

CATC-1323-C5 "Kern-Magunden-Witco and Westpark-Magunden 115 kV Lines"
 line     34724  34744  "1 " 1     0     # line   from  KRN OL J     115.00   (2) to BRKR  GODN_BER     115.00
 line     34724  34798  "1 " 1     0     # line   from  KRN OL J     115.00   (2) to (2)   KERNWATR     115.00
 line     34798  34752  "1 " 1     0     # line   from  KERNWATR     115.00   (2) to BRKR  KERN PWR     115.00
#-#-# load     34798  "1 "    0              # load         KERNWATR     115.00  LOAD==4.66(3.62)
#-#-# load     34798  "E1"    0              # load         KERNWATR     115.00  LOAD==-0.11(0.00)
 load      34744  "1 "    0              # Drop Golden Bear Load 1 for Kern-Magunden-Witco 115 kV Line ouage
 load      34744  "E1"    0              # Drop Golden Bear Load E1 for Kern-Magunden-Witco 115 kV Line ouage
#
 line     34706  34734  "1 " 1     0     # line   from  WESTPARK     115.00  BRKR to (3)   BEAR TAP     115.00
 line     34734  34732  "1 " 1     0     # line   from  BEAR TAP     115.00   (3) to BRKR  COLUMBUS     115.00
 line     34734  34731  "1 " 1     0     # line   from  BEAR TAP     115.00   (3) to (3)   CALWTRTP     115.00
 line     34731  34729  "1 " 1     0     # line   from  CALWTRTP     115.00   (3) to (1)   CALWATER     115.00
 line     34731  34733  "1 " 1     0     # line   from  CALWTRTP     115.00   (3) to (2)   BEAR MTN     115.00
 tran     34733  35066  "1 "       0     # tran   from  BEAR MTN     115.00   (2) to (1)   PSE-BEAR       9.11
#-#-# load     34729  "1 "    0              # load         CALWATER     115.00  LOAD==9.53(1.36)
#-#-# load     34729  "E1"    0              # load         CALWATER     115.00  LOAD==-0.14(0.00)
#-#-# gen      35066  "1 "    0              # gen          PSE-BEAR       9.11  GEN ==47.01(5.08)
0

CATC-1324-C5 "Kern-Lamont and Wheeler Ridge-Lamont 115 kV Lines"
 line     34737  34739  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (1)   GRIMWAY      115.00
 line     34737  34758  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to BRKR  LAMONT      115.00
 line     34737  34807  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (3)   ARVINJ2      115.00
 line     34807  34741  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (2)   STCKDLJ      115.00
 line     34807  34806  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (1)   ARVIN_ED     115.00
 line     34741  34755  "1 " 1     0     # line   from  STCKDLJ      115.00   (2) to (3)   TEVISJ2      115.00
 line     34755  34752  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to BRKR  KERN PWR     115.00
 line     34755  34757  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to (1)   TEVIS2       115.00
#-#-# load     34739  "1 "    0              # load         GRIMWAY      115.00  LOAD==13.58(8.59)
#-#-# load     34739  "E1"    0              # load         GRIMWAY      115.00  LOAD==-0.07(0.00)
#-#-# load     34806  "1 "    0              # load         ARVIN_ED     115.00  LOAD==24.00(6.01)
#-#-# load     34806  "E1"    0              # load         ARVIN_ED     115.00  LOAD==-0.30(0.00)
```

```
#-#-# load     34757  "2 "    0              # load         TEVIS2       115.00  LOAD==28.22(4.02)
#-#-# load     34757  "E2"    0              # load         TEVIS2       115.00  LOAD==-0.36(0.00)
 line      34757  34754  "1 " 1      1    # Switches in Tevis CB 116 to transfer load 2
 #-#-# load      34757  "2 "    1              # Restore Load 2 at Tevis 2
 #-#-# load      34757  "E2"    1              # Restore Load E2 at Tevis 2
#
 line     34758  34805  "1 " 1     0     # line   from  LAMONT       115.00  BRKR to (2)   ARVINJ1      115.00
 line     34805  34764  "1 " 1     0     # line   from  ARVINJ1      115.00   (2) to BRKR  S622BSS      115.00
0

CATC-1325-C5 "Kern-Lamont and Kern-Stockdale 115 kV Lines"
 line     34737  34739  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (1)   GRIMWAY      115.00
 line     34737  34758  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to BRKR  LAMONT      115.00
 line     34737  34807  "1 " 1     0     # line   from  GRIMWAYJ     115.00   (3) to (3)   ARVINJ2      115.00
 line     34807  34741  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (2)   STCKDLJ      115.00
 line     34807  34806  "1 " 1     0     # line   from  ARVINJ2      115.00   (3) to (1)   ARVIN_ED     115.00
 line     34741  34755  "1 " 1     0     # line   from  STCKDLJ      115.00   (2) to (3)   TEVISJ2      115.00
 line     34755  34752  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to BRKR  KERN PWR     115.00
 line     34755  34757  "1 " 1     0     # line   from  TEVISJ2      115.00   (3) to (1)   TEVIS2       115.00
#-#-# load     34739  "1 "    0              # load         GRIMWAY      115.00  LOAD==13.58(8.59)
#-#-# load     34739  "E1"    0              # load         GRIMWAY      115.00  LOAD==-0.07(0.00)
#-#-# load     34806  "1 "    0              # load         ARVIN_ED     115.00  LOAD==24.00(6.01)
#-#-# load     34806  "E1"    0              # load         ARVIN_ED     115.00  LOAD==-0.30(0.00)
#-#-# load     34757  "2 "    0              # load         TEVIS2       115.00  LOAD==28.22(4.02)
#-#-# load     34757  "E2"    0              # load         TEVIS2       115.00  LOAD==-0.36(0.00)
 line      34757  34754  "1 " 1      1    # Switches in Tevis CB 116 to transfer load 2
 #-#-# load      34757  "2 "    1              # Restore Load 2 at Tevis 2
 #-#-# load      34757  "E2"    1              # Restore Load E2 at Tevis 2
#
 line     34752  34753  "1 " 1     0     # line   from  KERN PWR     115.00  BRKR to (3)   TEVISJ1      115.00
 line     34753  34740  "1 " 1     0     # line   from  TEVISJ1      115.00   (3) to BRKR  STOCKDLE     115.00
 line     34753  34754  "1 " 1     0     # line   from  TEVISJ1      115.00   (3) to (1)   TEVIS        115.00
#-#-# load     34740  "1 "    0              # load         STOCKDLE     115.00  LOAD==20.20(2.88)
#-#-# load     34740  "E1"    0              # load         STOCKDLE     115.00  LOAD==-0.23(0.00)
#-#-# load     34754  "1 "    0              # load         TEVIS        115.00  LOAD==28.73(4.10)
#-#-# load     34754  "E1"    0              # load         TEVIS        115.00  LOAD==-0.33(0.00)
# line      34757  34754  "1 " 1      1    # Switches in Tevis CB 116 to transfer load 1
 #-#-# load      34754  "1 "    1              # Restore Load 1 at Tevis
 #-#-# load      34754  "E1"    1              # Restore Load 1 at Tevis
0

CATC-1326-C5 "Kern PP-Westpark #1 and #2 115 kV Lines"
 line     34706  34752  "1 " 1     0     # line   from  WESTPARK     115.00  BRKR to BRKR  KERN PWR     115.00
#
 line     34706  34752  "2 " 1     0     # line   from  WESTPARK     115.00  BRKR to BRKR  KERN PWR     115.00
0

CATC-1327-C5 "Midway-Tupman-Renfro and Midway-Tupman-Rio Bravo-Renfro 115 kV Lines"
 line     34749  34750  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to BRKR  TUPMAN       115.00
 line     34749  34761  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to (2)   RNFROTP1     115.00
 line     34749  34774  "1 " 1     0     # line   from  TPMNTP1      115.00   (3) to BRKR  MIDWAY       115.00
 line     34761  34762  "1 " 1     0     # line   from  RNFROTP1     115.00   (2) to BRKR  RENFRO       115.00
#-#-# load     34762  "1 "    0              # load         RENFRO       115.00  LOAD==26.67(3.80)
#-#-# load     34762  "E1"    0              # load         RENFRO       115.00  LOAD==-0.33(0.00)
 line      34762  34767  "1 " 1      1    # Switches in Renfro CB 136
 #-#-# load      34762  "1 "    1              # Restore Load 1 at Renfro
 #-#-# load      34762  "E1"    1              # Restore Load E1 at Renfro
#
 line     34751  34750  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to BRKR  TUPMAN       115.00
 line     34751  34775  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to (3)   RENFRJCT     115.00
 line     34751  34813  "1 " 1     0     # line   from  TPMNTP2      115.00   (3) to (3)   FRTLYTP      115.00
 line     34775  34760  "1 " 1     0     # line   from  RENFRJCT     115.00   (3) to BRKR  RIO BRVO     115.00
 line     34775  34763  "1 " 1     0     # line   from  RENFRJCT     115.00   (3) to (2)   RNFROTP2     115.00
 line     34763  34767  "1 " 1     0     # line   from  RNFROTP2     115.00   (2) to (1)   RENFRO2      115.00
 line     34813  34811  "1 " 1     0     # line   from  FRTLYTP      115.00   (3) to (2)   RIOBRVTM     115.00
 line     34813  34814  "1 " 1     0     # line   from  FRTLYTP      115.00   (3) to (3)   FRITO LY     115.00
 line     34811  34774  "1 " 1     0     # line   from  RIOBRVTM     115.00   (2) to BRKR  MIDWAY       115.00
 line     34814  34815  "1 " 1     0     # line   from  FRITO LY     115.00   (3) to (1)   WESTPLAT     115.00
 tran     34814  35048  "1 "       0     # tran   from  FRITO LY     115.00   (3) to (1)   FRITOLAY       9.11
#-#-# load     34767  "2 "    0              # load         RENFRO2      115.00  LOAD==13.38(1.90)
#-#-# load     34767  "E2"    0              # load         RENFRO2      115.00  LOAD==-0.42(0.00)
#-#-# load     34811  "1 "    0              # load         RIOBRVTM     115.00  LOAD==4.60(3.92)
#-#-# load     34811  "E1"    0              # load         RIOBRVTM     115.00  LOAD==-0.10(0.00)
#-#-# load     34815  "1 "    0              # load         WESTPLAT     115.00  LOAD==5.12(4.11)
#-#-# load     34815  "E1"    0              # load         WESTPLAT     115.00  LOAD==-0.06(0.00)
```

```
#-#-# load     35048  "SG"    0              # load         FRITOLAY       9.11  LOAD==2.42(0.97)
#-#-# gen      35048  "1 "    0              # gen          FRITOLAY       9.11  GEN ==0.09(-2.50)
# line      34762  34767  "1 " 1      1    # Switches in Renfro CB 136 to transfer load No. 2
 #-#-# load      34767  "2 "    1              # Restore Load 2 at Renfro 2
 #-#-# load      34767  "E2"    1              # Restore Load E2 at Renfro 2
0

CATC-1328-C5 "Midway-Taft and Fellows-Taft 115 kV Lines"
 line     34774  39145  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   OXYBVHTP     115.00
 line     39145  34776  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to BRKR  TAFT         115.00
 line     39145  39146  "1 " 1     0     # line   from  OXYBVHTP     115.00   (3) to (1)   OXYBVH       115.00
#-#-# load     39146  "1 "    0              # load         OXYBVH       115.00  LOAD==30.00(22.50)
#-#-# load     39146  "E1"    0              # load         OXYBVH       115.00  LOAD==-0.89(0.00)
#
 line     34777  34800  "1 " 1     0     # line   from  FELLOWSG     115.00  BRKR to (2)   MORGAN       115.00
 line     34800  34802  "1 " 1     0     # line   from  MORGAN       115.00   (2) to (3)   MIDSET       115.00
 line     34802  34776  "1 " 1     0     # line   from  MIDSET       115.00   (3) to BRKR  TAFT         115.00
 tran     34802  35044  "1 "       0     # tran   from  MIDSET       115.00   (3) to (1)   TX MIDST       9.11
#-#-# load     34800  "1 "    0              # load         MORGAN       115.00  LOAD==1.05(1.68)
#-#-# load     34800  "E1"    0              # load         MORGAN       115.00  LOAD==-0.01(0.00)
#-#-# load     34802  "SG"    0              # load         MIDSET       115.00  LOAD==0.52(0.25)
#-#-# gen      35044  "1 "    0              # gen          TX MIDST       9.11  GEN ==35.00(-3.21)
0

CATC-1329-C5 "Midway-6C0966SS and Midway-Temblor 115 kV Lines"
 line     34774  34780  "1 " 1     0     # line   from  MIDWAY       115.00  BRKR to (3)   CYMRIC       115.00
 line     34780  39288  "1 " 1     0     # line   from  CYMRIC       115.00   (3) to BRKR  6C0966SS     115.00
 tran     34780  35032  "1 "       0     # tran   from  CYMRIC       115.00   (3) to (1)   CHV-CYMR       9.11
#-#-# load     35032  "SG"    0              # load         CHV-CYMR       9.11  LOAD==3.09(0.44)
#-#-# gen      35032  "1 "    0              # gen          CHV-CYMR       9.11  GEN ==6.81(-1.77)
#
 line     34225  34774  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to BRKR  MIDWAY       115.00
 line     34225  39172  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to (3)   S653BTP      115.00
 line     34225  34794  "1 " 1     0     # line   from  BELRDG J     115.00   (3) to BRKR  TEMBLOR      115.00
 line     39172  34227  "1 " 1     0     # line   from  S653BTP      115.00   (3) to (3)   BELRDG T     115.00
 line     39172  39173  "1 " 1     0     # line   from  S653BTP      115.00   (3) to (2)   S653B        115.00
 line     34227  34229  "1 " 1     0     # line   from  BELRDG T     115.00   (3) to (1)   BELRDG B     115.00
 line     34227  34804  "1 " 1     0     # line   from  BELRDG T     115.00   (3) to (1)   BELRIDGE     115.00
 tran     39173  39174  "1 "       0     # tran   from  S653B        115.00   (2) to (2)   S653B         34.50
 tran     39174  39175  "1 "       0     # tran   from  S653B         34.50   (2) to (1)   S653B          0.48
#-#-# load     34804  "1 "    0              # load         BELRIDGE     115.00  LOAD==9.50(2.38)
#-#-# load     34804  "E1"    0              # load         BELRIDGE     115.00  LOAD==-0.04(0.00)
#-#-# gen      39175  "FT"    0              # gen          S653B          0.48  GEN ==20.00(1.62)
 line     34794  34223  "1 " 1     0     # Open line from TEMBLOR to PSE MCKT for Midway-Temblor 115 kV line outage
0

CATC-1330-C5 "Midway-Kern #1 and #3 230 kV Lines"
 line     30940  30942  "1 " 1     0     # line   from  STCKDLEA     230.00  BRKR to (4)   STCKDLJ1     230.00
 line     30942  30945  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  KERN PP      230.00
 line     30942  30950  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to (1)   BKRSFLDA     230.00
 line     30942  30970  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  MIDWAY      230.00
#-#-# load     30940  "2 "    0              # load         STCKDLEA     230.00  LOAD==51.04(7.27)
#-#-# load     30940  "6 "    0              # load         STCKDLEA     230.00  LOAD==57.64(8.21)
#-#-# load     30940  "E2"    0              # load         STCKDLEA     230.00  LOAD==-0.60(0.00)
#-#-# load     30940  "E6"    0              # load         STCKDLEA     230.00  LOAD==-0.61(0.00)
#-#-# load     30950  "3 "    0              # load         BKRSFLDA     230.00  LOAD==46.51(6.62)
#-#-# load     30950  "E3"    0              # load         BKRSFLDA     230.00  LOAD==-0.61(0.00)
  line     30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
  #-#-# load     30950  "3 "    1              # Restore Load 3 at Bakersfield 1
  #-#-# load     30950  "E3"    1              # Restore Load E3 at Bakersfield 1
 line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30940  "2 "    1              # Restore Load 2 at Stockdale 1
 #-#-# load      30940  "6 "    1              # Restore Load 6 at Stockdale 1
 #-#-# load      30940  "E2"    1              # Restore Load E2 at Stockdale 1
 #-#-# load      30940  "E6"    1              # Restore Load E6 at Stockdale 1
#
 line     30941  30943  "1 " 1     0     # line   from  STCKDLEB     230.00   (1) to (3)   STCKDLJ2     230.00
 line     30943  30945  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  KERN PP      230.00
 line     30943  30970  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  MIDWAY      230.00
#-#-# load     30941  "3 "    0              # load         STCKDLEB     230.00  LOAD==53.58(7.63)
#-#-# load     30941  "E3"    0              # load         STCKDLEB     230.00  LOAD==-0.56(0.00)
# line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30941  "3 "    1              # Restore Load 3 at Stockdale  2
 #-#-# load      30941  "E3"    1              # Restore Load E3 at Stockdale  2
0
```

```
CATC-1331-C5 "Midway-Kern #1 and #4 230 kV Lines"
 line     30940  30942  "1 " 1     0     # line   from  STCKDLEA     230.00  BRKR to (4)   STCKDLJ1     230.00
 line     30942  30945  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  KERN PP      230.00
 line     30942  30950  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to (1)   BKRSFLDA     230.00
 line     30942  30970  "1 " 1     0     # line   from  STCKDLJ1     230.00   (4) to BRKR  MIDWAY       230.00
#-#-# load     30940  "2 "    0              # load         STCKDLEA     230.00  LOAD==51.04(7.27)
#-#-# load     30940  "6 "    0              # load         STCKDLEA     230.00  LOAD==57.64(8.21)
#-#-# load     30940  "E2"    0              # load         STCKDLEA     230.00  LOAD==-0.60(0.00)
#-#-# load     30940  "E6"    0              # load         STCKDLEA     230.00  LOAD==-0.61(0.00)
#-#-# load     30950  "3 "    0              # load         BKRSFLDA     230.00  LOAD==46.51(6.62)
#-#-# load     30950  "E3"    0              # load         BKRSFLDA     230.00  LOAD==-0.61(0.00)
  line     30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
  #-#-# load     30950  "3 "    1              # Restore Load 3 at Bakersfield 1
  #-#-# load     30950  "E3"    1              # Restore Load E3 at Bakersfield 1
 line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30940  "2 "    1              # Restore Load 2 at Stockdale 1
 #-#-# load      30940  "6 "    1              # Restore Load 6 at Stockdale 1
 #-#-# load      30940  "E2"    1              # Restore Load E2 at Stockdale 1
 #-#-# load      30940  "E6"    1              # Restore Load E6 at Stockdale 1
#
 line     30945  30944  "1 " 1     0     # line   from  KERN PP      230.00  BRKR to (3)   BKRSFDJ2     230.00
 line     30944  30951  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to (1)   BKRSFLDB     230.00
 line     30944  30970  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to BRKR  MIDWAY       230.00
#-#-# load     30951  "2 "    0              # load         BKRSFLDB     230.00  LOAD==46.19(6.58)
#-#-# load     30951  "E2"    0              # load         BKRSFLDB     230.00  LOAD==-0.52(0.00)
# line      30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
 #-#-# load      30951  "2 "    1              # Restore Load 2 at Bakersfield 2
 #-#-# load      30951  "E2"    1              # Restore Load E2 at Bakersfield 2
0

CATC-1332-C5 "Midway-Kern #3 and #4 230 kV Lines"
 line     30941  30943  "1 " 1     0     # line   from  STCKDLEB     230.00   (1) to (3)   STCKDLJ2     230.00
 line     30943  30945  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  KERN PP      230.00
 line     30943  30970  "1 " 1     0     # line   from  STCKDLJ2     230.00   (3) to BRKR  MIDWAY       230.00
#-#-# load     30941  "3 "    0              # load         STCKDLEB     230.00  LOAD==53.58(7.63)
#-#-# load     30941  "E3"    0              # load         STCKDLEB     230.00  LOAD==-0.56(0.00)
 line      30940  30941  "1 " 1     1     # Switches in Stockdale SW 266 to transfer load
 #-#-# load      30941  "3 "    1              # Restore Load 3 at Stockdale  2
 #-#-# load      30941  "E3"    1              # Restore Load E3 at Stockdale  2
#
 line     30945  30944  "1 " 1     0     # line   from  KERN PP      230.00  BRKR to (3)   BKRSFDJ2     230.00
 line     30944  30951  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to (1)   BKRSFLDB     230.00
 line     30944  30970  "1 " 1     0     # line   from  BKRSFDJ2     230.00   (3) to BRKR  MIDWAY       230.00
#-#-# load     30951  "2 "    0              # load         BKRSFLDB     230.00  LOAD==46.19(6.58)
#-#-# load     30951  "E2"    0              # load         BKRSFLDB     230.00  LOAD==-0.52(0.00)
 line      30950  30951  "1 " 1     1     # Switches in Bakersfield SW 256 to transfer load
 #-#-# load      30951  "2 "    1              # Restore Load 2 at Bakersfield 2
 #-#-# load      30951  "E2"    1              # Restore Load E2 at Bakersfield 2
0

CATC-1333-C5 "Midway-LaPaloma #1 and #2 230 kV Lines"
 line     30970  30946  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  LAPALOMA     230.00
#
 line     30970  30946  "2 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  LAPALOMA     230.00
0

CATC-1334-C5 "Caliente SS-Midway #1 and #2 230 kV Lines w/o Topaz & CVSR SPS"
 line     30918  30970  "1 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
#
 line     30918  30970  "2 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
0

CATC-1335-C5 "Caliente SS-Midway #1 and #2 230 kV Lines w/ Topaz & CVSR SPS"
 line     30918  30970  "1 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
#
 line     30918  30970  "2 " 1     0     # line   from  CALNTESS     230.00  BRKR to BRKR  MIDWAY       230.00
# trip half of Topaz generation (block 1)
 gen      36434  "1 "    0              # gen          Q194G2         0.32  GEN ==125.00(21.61)
 gen      36436  "1 "    0              # gen          T242G          0.32  GEN ==155.00(21.61)
# trip CVSR (block 2)
 load     36426  "ss"    0              # load         T239           0.40  LOAD==1.10(0.61)
 gen      36426  "1 "    0              # gen          T239           0.40  GEN ==254.00(36.08)
# trip half of Topaz generation (block 3)
 gen      36430  "1 "    0              # gen          Q166G          0.32  GEN ==215.00(21.68)
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 gen      36432  "1 "    0              # gen          Q194G1         0.32  GEN ==65.00(21.68)
0

CATC-1336-C5 "Midway-6C1000SS #1 and #2 230 kV Lines"
 line     30970  39336  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  6C1000S1     230.00
#
 line     30970  39337  "1 " 1     0     # line   from  MIDWAY       230.00  BRKR to BRKR  6C1000S2     230.00
0

CATC-1337-C5 "6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines"
 line     38600  38601  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  BUENAVT1     230.00
 line     38600  38640  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to (3)   WHLR RJ1     230.00
 line     38600  39336  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  6C1000S1     230.00
 line     38640  38641  "1 " 1     0     # line   from  WHLR RJ1     230.00   (3) to BRKR  WHLR RT1     230.00
 line     38640  38650  "1 " 1     0     # line   from  WHLR RJ1     230.00   (3) to (3)   WND GPJ1     230.00
 line     38650  30994  "1 " 1     0     # line   from  WND GPJ1     230.00   (3) to BRKR  WHEELER      230.00
 line     38650  38651  "1 " 1     0     # line   from  WND GPJ1     230.00   (3) to BRKR  WND GPT1     230.00
#
 line     38605  38606  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  BUENAVT2     230.00
 line     38605  39257  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  6C0946SS     230.00
 line     38605  39337  "1 " 1     0     # line   from  BUENAVJ2     230.00   (3) to BRKR  6C1000S2     230.00
0

CATC-1338-C5 "6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Lines"
 line     38600  38601  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  BUENAVT1     230.00
 line     38600  38640  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to (3)   WHLR RJ1     230.00
 line     38600  39336  "1 " 1     0     # line   from  BUENAVJ1     230.00   (3) to BRKR  6C1000S1     230.00
 line     38640  38641  "1 " 1     0     # line   from  WHLR RJ1     230.00   (3) to BRKR  WHLR RT1     230.00
 line     38640  38650  "1 " 1     0     # line   from  WHLR RJ1     230.00   (3) to (3)   WND GPJ1     230.00
 line     38650  30994  "1 " 1     0     # line   from  WND GPJ1     230.00   (3) to BRKR  WHEELER      230.00
 line     38650  38651  "1 " 1     0     # line   from  WND GPJ1     230.00   (3) to BRKR  WND GPT1     230.00
#
 line     38645  38646  "1 " 1     0     # line   from  WHLR RJ2     230.00   (3) to BRKR  WHLR RT2     230.00
 line     38645  38655  "1 " 1     0     # line   from  WHLR RJ2     230.00   (3) to (3)   WND GPJ2     230.00
 line     38645  39257  "1 " 1     0     # line   from  WHLR RJ2     230.00   (3) to BRKR  6C0946SS     230.00
 line     38655  30994  "1 " 1     0     # line   from  WND GPJ2     230.00   (3) to BRKR  WHEELER      230.00
 line     38655  38656  "1 " 1     0     # line   from  WND GPJ2     230.00   (3) to BRKR  WND GPT2     230.00
0


# 2018 main year category c contingency list (selected category c multiple element outages)
# Los Padres Division Zone 319
#


CATC-1339-C1 "Templeton 230 kV Bus Sections D and E w/o Paso Robles UVLS"
 line     30905  30900  "1 " 1     0     # line   from  TEMPLETN     230.00 to GATES        230.00
 tran     30905  36310  "1 "       0     # tran   from  TEMPLETN     230.00 to TEMPLT7       70.00
 load     30905  "2 "    0              # load         TEMPLETN     230.00  LOAD==33.71(4.80)
 load     30905  "3 "    0              # load         TEMPLETN     230.00  LOAD==30.38(4.33)
 load     30905  "E2"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
 load     30905  "E3"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
0

CATC-1340-C1 "Templeton 230 kV Bus Section F w/ Paso Roble UVLS"
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00 to MORROBAY     230.00
 tran     30905  36310  "1 "       0     # tran   from  TEMPLETN     230.00 to TEMPLT7       70.00
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J       70.00
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J2      70.00
 load  36356        "1 "    0      # UVLS will drop Paso Robles Bk 1 if this outage occurs
 load  36356        "2 "    0      # UVLS will drop Paso Robles Bk 2 if this outage occurs
 load  36356        "3 "    0      # UVLS will drop Paso Robles Bk 3 if this outage occurs
 load  36356        "E1"    0      # UVLS will drop Paso Robles Bk E1 if this outage occurs
 load  36356        "E2"    0      # UVLS will drop Paso Robles Bk E2 if this outage occurs
 load  36356        "E3"    0      # UVLS will drop Paso Robles Bk E3 if this outage occurs
0

CATC-1341-C1 "Templeton 230 kV Bus Section F w/o Paso Roble UVLS"
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00 to MORROBAY     230.00
 tran     30905  36310  "1 "       0     # tran   from  TEMPLETN     230.00 to TEMPLT7       70.00
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J       70.00
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J2      70.00
0

CATC-1342-C2 "Templeton 230 kV CB282 Failure w/ Paso Robles UVLS"
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```
 line     30905  30900  "1 " 1     0     # line   from  TEMPLETN     230.00 to GATES        230.00
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00 to MORROBAY     230.00
 tran     30905  36310  "1 "       0     # tran   from  TEMPLETN     230.00 to TEMPLT7       70.00
 load     30905  "2 "    0              # load         TEMPLETN     230.00  LOAD==33.71(4.80)
 load     30905  "3 "    0              # load         TEMPLETN     230.00  LOAD==30.38(4.33)
 load     30905  "E2"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
 load     30905  "E3"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J       70.00
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J2      70.00
 load  36356        "1 "    0      # UVLS will drop Paso Robles Bk 1 if this outage occurs
 load  36356        "2 "    0      # UVLS will drop Paso Robles Bk 2 if this outage occurs
 load  36356        "3 "    0      # UVLS will drop Paso Robles Bk 3 if this outage occurs
 load  36356        "E1"    0      # UVLS will drop Paso Robles Bk E1 if this outage occurs
 load  36356        "E2"    0      # UVLS will drop Paso Robles Bk E2 if this outage occurs
 load  36356        "E3"    0      # UVLS will drop Paso Robles Bk E3 if this outage occurs
0

CATC-1343-C2 "Templeton 230 kV CB282 Failure w/o Paso Robles UVLS"
 line     30905  30900  "1 " 1     0     # line   from  TEMPLETN     230.00 to GATES        230.00
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00 to MORROBAY     230.00
 tran     30905  36310  "1 "       0     # tran   from  TEMPLETN     230.00 to TEMPLT7       70.00
 load     30905  "2 "    0              # load         TEMPLETN     230.00  LOAD==33.71(4.80)
 load     30905  "3 "    0              # load         TEMPLETN     230.00  LOAD==30.38(4.33)
 load     30905  "E2"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
 load     30905  "E3"    0              # load         TEMPLETN     230.00  LOAD==-0.31(0.00)
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J       70.00
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (1)   TEMPL J2      70.00
0

CATC-1344-C1 "Morro Bay 230 kV Bus Section 1D"
 line     30915  30905  "1 " 1     0     # line   from  MORROBAY     230.00 to TEMPLETN     230.00
 tran     30915  36407  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 1       18.00
0

CATC-1345-C1 "Morro Bay 230 kV Bus Section 1E"
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00 to DIABLOCN     230.00
 tran     30915  36409  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
 tran     30915  36409  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
0

CATC-1346-C2 "Morro Bay 230 kV CB612 Failure"
 line     30915  30905  "1 " 1     0     # line   from  MORROBAY     230.00 to TEMPLETN     230.00
 tran     30915  36407  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 1       18.00
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00 to DIABLOCN     230.00
 tran     30915  36409  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
 tran     30915  36409  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
0

CATC-1347-C1 "Morro Bay 230 kV Bus Section 2D"
 line     30915  30900  "1 " 1     0     # line   from  MORROBAY     230.00 to GATES        230.00
 line     30915  39941  "1 " 1     0     # line   from  MORROBAY     230.00 to 5C877SS      230.00
 tran     30915  36252  "6 "       0     # tran   from  MORROBAY     230.00 to MORRO BY     115.00
 tran     30915  36408  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 2       18.00
0

CATC-1348-C1 "Morro Bay 230 kV Bus Section 2E"
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00 to MESA PGE     230.00
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 tran     30915  36410  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
 tran     30915  36410  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
0

CATC-1349-C1 "Morro Bay 230 kV CB622 Failure"
 line     30915  30900  "1 " 1     0     # line   from  MORROBAY     230.00 to GATES        230.00
 line     30915  39941  "1 " 1     0     # line   from  MORROBAY     230.00 to 5C877SS      230.00
 tran     30915  36252  "6 "       0     # tran   from  MORROBAY     230.00 to MORRO BY     115.00
 tran     30915  36408  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 2       18.00
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00 to MESA PGE     230.00
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 tran     30915  36410  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
 tran     30915  36410  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
0
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CATC-1350-C2 "Morro Bay 230 kV CB402 Failure"
 line     30915  30905  "1 " 1     0     # line   from  MORROBAY     230.00 to TEMPLETN     230.00
 tran     30915  36407  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 1       18.00
 line     30915  30900  "1 " 1     0     # line   from  MORROBAY     230.00 to GATES        230.00
 line     30915  39941  "1 " 1     0     # line   from  MORROBAY     230.00 to 5C877SS      230.00
 tran     30915  36252  "6 "       0     # tran   from  MORROBAY     230.00 to MORRO BY     115.00
 tran     30915  36408  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 2       18.00
0

CATC-1351-C2 "Morro Bay 230 kV CB502 Failure"
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00 to DIABLOCN     230.00
 tran     30915  36409  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
 tran     30915  36409  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 3       18.00
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00 to MESA PGE     230.00
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00 to SOLARSS      230.00
 tran     30915  36410  "1 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
 tran     30915  36410  "2 "       0     # tran   from  MORROBAY     230.00 to MORRO 4       18.00
0

CATC-1352-C2 "Solar Sw Station 230 kV CB2122 Failure"
 line     30916  30921  "1 " 1     0     # line   from  SOLARSS      230.00 to TOPAZ1       230.00
 line     30916  30922  "1 " 1     0     # line   from  SOLARSS      230.00 to TOPAZ2       230.00
0

CATC-1353-C2 "Solar Sw Station 230 kV CB2222 Failure"
 line     30916  30915  "2 " 1     0     # line   from  SOLARSS      230.00 to MORROBAY     230.00
 line     30916  30918  "2 " 1     0     # line   from  SOLARSS      230.00 to CALNTESS     230.00
0

CATC-1354-C2 "Solar Sw Station 230 kV CB2322 Failure"
 line     30916  30915  "1 " 1     0     # line   from  SOLARSS      230.00 to MORROBAY     230.00
 line     30916  30918  "1 " 1     0     # line   from  SOLARSS      230.00 to CALNTESS     230.00
0

CATC-1355-C1 "Diablo Canyon 230 kV Bus"
 isol     30925                          # BUS FAULT AT  30925 DIABLOCN     230.00
0

CATC-1356-C1 "Mesa 230 kV CB2222 Failure"
 line     30930  30925  "1 " 1     0     # line   from  MESA PGE     230.00 to DIABLOCN     230.00
 tran     30930  36256  "2 "       0     # tran   from  MESA PGE     230.00 to MESA_PGE     115.00
0

CATC-1357-C1 "Mesa 230 kV CB2322 Failure"
 line     30930  30915  "1 " 1     0     # line   from  MESA PGE     230.00 to MORROBAY     230.00
 tran     30930  36256  "3 "       0     # tran   from  MESA PGE     230.00 to MESA_PGE     115.00
0

CATC-1358-C1 "Morro Bay 115 kV Bus"
 isol     36252                          # BUS FAULT AT  36252 MORRO BY     115.00
0

CATC-1359-C1 "San Luis Obispo 115 kV Bus"
 isol     36254                          # BUS FAULT AT  36254 SN LS OB     115.00
0

CATC-1360-C1 "Mesa 115 kV Bus Section 1"
 line     36256  36258  "1 " 1     0     # line   from  MESA_PGE     115.00 to S.M.ASSO     115.00
 line     36256  36268  "1 " 1     0     # line   from  MESA_PGE     115.00 to DIVVIDE      115.00
 line     36256  36280  "1 " 1     0     # line   from  MESA_PGE     115.00 to UNION OL     115.00
 tran     36256  30930  "2 "       0     # tran   from  MESA_PGE     115.00 to MESA PGE     230.00
 svd      36256  "v "    0              # svd          MESA_PGE     115.00
0

CATC-1361-C1 "Mesa 115 kV Bus Section 2"
 line     36256  36267  "1 " 1     0     # line   from  MESA_PGE     115.00 to SNTAMRTP     115.00
 line     36256  36268  "2 " 1     0     # line   from  MESA_PGE     115.00 to DIVVIDE      115.00
 tran     36256  30930  "3 "       0     # tran   from  MESA_PGE     115.00 to MESA PGE     230.00
0

CATC-1362-C2 "Mesa 115 kV CB102 Failure"
 isol     36256                          # BUS FAULT AT  36256 MESA_PGE     115.00
0
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CATC-1363-C2 "Sisquoc 115 kV CB122 Failure"
 isol     36260                          # BUS FAULT AT  36260 SISQUOC      115.00
0

CATC-1364-C1 "Santa Ynez Jct 115 kV Bus"
 isol     36264                          # BUS FAULT AT  36264 S.YNZ JT     115.00
0

CATC-1365-C1 "Santa Maria 115 kV Bus"
 isol     36266                          # BUS FAULT AT  36266 SNTA MRA     115.00
0

CATC-1366-C1 "Divide 115 kV Bus w/ Divide SPS"
 isol     36268                          # BUS FAULT AT  36268 DIVVIDE      115.00
# Divide SPS
 line     38031  36294  "1 " 1     0     # line   from  LOMPCJ1      115.00   (2) to BRKR  CABRILLO     115.00
0

CATC-1367-C1 "Divide 115 kV Bus w/o Divide SPS"
 isol     36268                          # BUS FAULT AT  36268 DIVVIDE      115.00
# Divide SPS
 line     38031  36294  "1 " 1     0     # line   from  LOMPCJ1      115.00   (2) to BRKR  CABRILLO     115.00
0

CATC-1368-C2 "Oceano 115 kV CS376 Failure"
 isol     36278                          # BUS FAULT AT  36278 OCEANO       115.00
0

CATC-1369-C1 "Callendar Sw Sta 115 kV Bus"
 isol     36280                          # BUS FAULT AT  36280 UNION OL     115.00
0

CATC-1370-C1 "Cabrillo 115 kV Bus"
 isol     36294                          # BUS FAULT AT  36294 CABRILLO     115.00
0

CATC-1371-C1 "San Miguel 70 kV Bus"
 isol     36354                          # BUS FAULT AT  36354 SAN MIGL      70.00
0

CATC-1372-C1 "Paso Robles 70 kV Bus"
 isol     36356                          # BUS FAULT AT  36356 PSA RBLS      70.00
0

CATC-1373-C1 "Atascadero 70 kV Bus"
 isol     36358                          # BUS FAULT AT  36358 ATASCDRO      70.00
0

CATC-1374-C1 "Cayucos 70 kV Bus"
 isol     36364                          # BUS FAULT AT  36364 CAYUCOS       70.00
0

CATC-1375-C1 "San Luis Obispo 70 kV Bus"
 isol     36376                          # BUS FAULT AT  36376 SN LS OB      70.00
0

CATC-1376-C1 "Divide 70 kV Bus"
 isol     36378                          # BUS FAULT AT  36378 DIVIDE        70.00
0

CATC-1377-C1 "Lompoc City 115 kV Bus"
 isol     38030                          # BUS FAULT AT  38030 LMPC-CTY     115.00
0


CATC-1378-C5 "San Luis Obispo-Cayucos and San Luis Obispo-Atascadero 70 kV Lines"
 line     36370  36372  "1 " 1     0     # line   from  BAYWOOD       70.00   (2) to (3)   MUSTNG J      70.00
 line     36370  36364  "1 " 1     0     # line   from  BAYWOOD       70.00  BRKR to BRKR  CAYUCOS       70.00
 line     36372  36374  "1 " 1     0     # line   from  MUSTNG J      70.00   (3) to (1)   MUSTANG       70.00
 line     36372  36376  "1 " 1     0     # line   from  MUSTNG J      70.00   (3) to BRKR  SN LS OB      70.00
#-#-# load     36370  "1 "    0              # load         BAYWOOD       70.00  LOAD==3.75(0.54)
#-#-# load     36370  "E1"    0              # load         BAYWOOD       70.00  LOAD==-0.04(0.00)
#-#-# load     36374  "1 "    0              # load         MUSTANG       70.00  LOAD==7.05(4.18)
#-#-# load     36374  "E1"    0              # load         MUSTANG       70.00  LOAD==-0.09(0.00)
#
```

```
 line     36358  36376  "1 " 1     0     # line   from  ATASCDRO      70.00  BRKR to BRKR  SN LS OB      70.00
0

CATC-1379-C5 "Templeton-Atascadero and Paso Robles-Templeton 70 kV Lines w/ Paso Robles UVLS"
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J2      70.00
 line     36316  36358  "1 " 1     0     # line   from  TEMPL J2      70.00   (2) to BRKR  ATASCDRO      70.00
#
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J       70.00
 line     36315  36356  "1 " 1     0     # line   from  TEMPL J       70.00   (2) to BRKR  PSA RBLS      70.00
 load  36356        "1 "    0      # UVLS will drop Paso Robles Bk 1 if this outage occurs
 load  36356        "2 "    0      # UVLS will drop Paso Robles Bk 2 if this outage occurs
 load  36356        "3 "    0      # UVLS will drop Paso Robles Bk 3 if this outage occurs
 load  36356        "E1"    0      # UVLS will drop Paso Robles Bk E1 if this outage occurs
 load  36356        "E2"    0      # UVLS will drop Paso Robles Bk E2 if this outage occurs
 load  36356        "E3"    0      # UVLS will drop Paso Robles Bk E3 if this outage occurs
0

CATC-1380-C5 "Templeton-Atascadero and Paso Robles-Templeton 70 kV Lines w/o Paso Robles UVLS"
 line     36310  36316  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J2      70.00
 line     36316  36358  "1 " 1     0     # line   from  TEMPL J2      70.00   (2) to BRKR  ATASCDRO      70.00
#
 line     36310  36315  "1 " 1     0     # line   from  TEMPLT7       70.00  BRKR to (2)   TEMPL J       70.00
 line     36315  36356  "1 " 1     0     # line   from  TEMPL J       70.00   (2) to BRKR  PSA RBLS      70.00
0

CATC-1381-C5 "San Luis Obispo-6C0987SS and San Luis Obispo-Santa Maria 115 kV Lines"
 line     36254  39309  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  6C0987SS     115.00
#
 line     36254  36266  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  SNTA MRA     115.00
0

CATC-1382-C5 "6C0987SS-Oceano and San Luis Obispo-Santa Maria 115 kV Lines"
 line     36254  39309  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  6C0987SS     115.00
#
 line     39309  36278  "1 " 1     0     # line   from  6C0987SS     115.00  BRKR to BRKR  OCEANO       115.00
0

CATC-1383-C5 "Callendar Sw Sta-Mesa and San Luis Obispo-Santa Maria 115 kV Lines"
 line     36256  36280  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  UNION OL     115.00
#
 line     36254  36266  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  SNTA MRA     115.00
0

CATC-1384-C5 "Divide-Cabrillo #1 and #2 115 kV Lines"
 line     36268  36300  "1 " 1     0     # line   from  DIVVIDE      115.00  BRKR to (2)   PURSMAJ2     115.00
 line     36300  36282  "1 " 1     0     # line   from  PURSMAJ2     115.00   (2) to (3)   SURF JCT     115.00
 line     36282  36284  "1 " 1     0     # line   from  SURF JCT     115.00   (3) to (1)   SURF         115.00
 line     36282  38031  "1 " 1     0     # line   from  SURF JCT     115.00   (3) to (2)   LOMPCJ1      115.00
 line     38031  36294  "1 " 1     0     # line   from  LOMPCJ1      115.00   (2) to BRKR  CABRILLO     115.00
#-#-# load     36284  "1 "    0              # load         SURF         115.00  LOAD==10.00(6.98)
#-#-# load     36284  "E1"    0              # load         SURF         115.00  LOAD==-0.12(0.00)
#
 line     36268  36296  "1 " 1     0     # line   from  DIVVIDE      115.00  BRKR to (3)   PURSMAJ1     115.00
 line     36296  36276  "1 " 1     0     # line   from  PURSMAJ1     115.00   (3) to (3)   LOMPCJ2      115.00
 line     36296  36298  "1 " 1     0     # line   from  PURSMAJ1     115.00   (3) to (1)   PURISIMA     115.00
 line     36276  36292  "1 " 1     0     # line   from  LOMPCJ2      115.00   (3) to (1)   MANVILLE     115.00
 line     36276  38030  "1 " 1     0     # line   from  LOMPCJ2      115.00   (3) to BRKR  LMPC-CTY     115.00
#-#-# load     36298  "1 "    0              # load         PURISIMA     115.00  LOAD==8.39(1.19)
#-#-# load     36298  "E1"    0              # load         PURISIMA     115.00  LOAD==-0.12(0.00)
#-#-# load     36292  "1 "    0              # load         MANVILLE     115.00  LOAD==10.00(6.46)
#-#-# load     36292  "E1"    0              # load         MANVILLE     115.00  LOAD==-0.25(0.00)
#-#-# load     38030  "1 "    0              # load         LMPC-CTY     115.00  LOAD==24.20(7.64)
 line  38030 38031  "1 " 1     1      # Switches in Lompoc City CB143 to transfer load
 load  38030        "1 "    1      # Restore Load 1 at Lompoc City
0

CATC-1385-C5 "Mesa-Divide #1 and #2 115 kV Lines w/ Divide SPS"
 line     36256  36268  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
#
 line     36256  36268  "2 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
# Divide SPS
 line     38031  36294  "1 " 1     0     # line   from  LOMPCJ1      115.00   (2) to BRKR  CABRILLO     115.00
0

CATC-1386-C5 "Mesa-Divide #1 and #2 115 kV Lines w/out Divide SPS"
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```
 line     36256  36268  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
#
 line     36256  36268  "2 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  DIVVIDE      115.00
0

CATC-1387-C5 "Mesa-Santa Maria and Santa Maria-Andrew 115 kV Lines"
 line     36256  36267  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to (3)   SNTAMRTP     115.00
 line     36267  36266  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to BRKR  SNTA MRA     115.00
 line     36267  36270  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to (1)   FAIRWAY      115.00
#-#-# load     36270  "1 "    0              # load         FAIRWAY      115.00  LOAD==16.41(2.34)
#-#-# load     36270  "2 "    0              # load         FAIRWAY      115.00  LOAD==27.21(3.87)
#-#-# load     36270  "E1"    0              # load         FAIRWAY      115.00  LOAD==-0.17(0.00)
#-#-# load     36270  "E2"    0              # load         FAIRWAY      115.00  LOAD==-0.25(0.00)
 line  36270 36269  "1 " 1     1      # Switch in Fairway SW 145 to transfer load
 #-#-# load  36270        "1 "    1      # Restore Load 1 at Fairway
 #-#-# load  36270        "2 "    1      # Restore Load 2 at Fairway
 #-#-# load  36270        "E1"    1      # Restore Load E1 at Fairway
 #-#-# load  36270        "E2"    1      # Restore Load E2 at Fairway
#
 line     36266  36269  "1 " 1     0     # line   from  SNTA MRA     115.00  BRKR to (2)   FRWAYTP      115.00
 line     36269  36255  "1 " 1     0     # line   from  FRWAYTP      115.00   (2) to BRKR  ANDREW       115.00
0

CATC-1388-C5 "Mesa-Santa Maria and San Luis Obispo-Santa Maria 115 kV Lines"
 line     36256  36267  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to (3)   SNTAMRTP     115.00
 line     36267  36266  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to BRKR  SNTA MRA     115.00
 line     36267  36270  "1 " 1     0     # line   from  SNTAMRTP     115.00   (3) to (1)   FAIRWAY      115.00
#-#-# load     36270  "1 "    0              # load         FAIRWAY      115.00  LOAD==16.41(2.34)
#-#-# load     36270  "2 "    0              # load         FAIRWAY      115.00  LOAD==27.21(3.87)
#-#-# load     36270  "E1"    0              # load         FAIRWAY      115.00  LOAD==-0.17(0.00)
#-#-# load     36270  "E2"    0              # load         FAIRWAY      115.00  LOAD==-0.25(0.00)
 line  36270 36269  "1 " 1     1      # Switch in Fairway SW 145 to transfer load
 #-#-# load  36270        "1 "    1      # Restore Load 1 at Fairway
 #-#-# load  36270        "2 "    1      # Restore Load 2 at Fairway
 #-#-# load  36270        "E1"    1      # Restore Load E1 at Fairway
 #-#-# load  36270        "E2"    1      # Restore Load E2 at Fairway
#
 line     36254  36266  "1 " 1     0     # line   from  SN LS OB     115.00  BRKR to BRKR  SNTA MRA     115.00
0

CATC-1389-C5 "Mesa-Andrew and Callender Sw Sta-Mesa 115 kV Lines"
 line     36256  36258  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to (3)   S.M.ASSO     115.00
 line     36258  36255  "1 " 1     0     # line   from  S.M.ASSO     115.00   (3) to BRKR  ANDREW       115.00
 tran     36258  36416  "1 "       0     # tran   from  S.M.ASSO     115.00   (3) to (1)   ST MARIA       9.11
#
 line     36256  36280  "1 " 1     0     # line   from  MESA_PGE     115.00  BRKR to BRKR  UNION OL     115.00
0

CATC-1390-C5 "Morro Bay-San Luis Obispo #1 and #2 115 kV Lines"
 line     36251  36254  "1 " 1     0     # line   from  FTHILTP2     115.00   (2) to BRKR  SN LS OB     115.00
 line     36251  36303  "1 " 1     0     # line   from  FTHILTP2     115.00   (2) to (3)   GLDTRJC1     115.00
 line     36303  36252  "1 " 1     0     # line   from  GLDTRJC1     115.00   (3) to BRKR  MORRO BY     115.00
 line     36303  36302  "1 " 1     0     # line   from  GLDTRJC1     115.00   (3) to (1)   GOLDTREE     115.00
#-#-# load     36302  "1 "    0              # load         GOLDTREE     115.00  LOAD==8.01(1.14)
#-#-# load     36302  "E1"    0              # load         GOLDTREE     115.00  LOAD==-0.13(0.00)
#-#-# load     36302  "EM"    0              # load         GOLDTREE     115.00  LOAD==-0.06(0.00)
#-#-# load     36302  "MC"    0              # load         GOLDTREE     115.00  LOAD==2.80(2.10)
#
 line     36252  36304  "1 " 1     0     # line   from  MORRO BY     115.00  BRKR to (2)   GLDTRJC2     115.00
 line     36304  36253  "1 " 1     0     # line   from  GLDTRJC2     115.00   (2) to (3)   FTHILTP1     115.00
 line     36253  36250  "1 " 1     0     # line   from  FTHILTP1     115.00   (3) to (1)   FOOTHILL     115.00
 line     36253  36254  "1 " 1     0     # line   from  FTHILTP1     115.00   (3) to BRKR  SN LS OB     115.00
#-#-# load     36250  "1 "    0              # load         FOOTHILL     115.00  LOAD==9.29(1.32)
#-#-# load     36250  "E1"    0              # load         FOOTHILL     115.00  LOAD==-0.08(0.00)
 line  36251 36250  "1 " 1     1      # Switches in Foothill SW165 to transfer load
 #-#-# load  36250        "1 "    1      # Restore Load 1 at Foothill
 #-#-# load  36250        "E1"    1      # Restore Load E1 at Foothill
0

CATC-1391-C5 "Morro Bay-Mesa and Morro Bay-Diablo Canyon 230 kV Lines"
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  MESA PGE     230.00
#
 line     30915  30925  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  DIABLOCN     230.00
0
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CATC-1392-C5 "Morro Bay-Mesa and Diablo Canyon-Mesa 230 kV Lines"
 line     30915  30930  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  MESA PGE     230.00
#
 line     30925  30930  "1 " 1     0     # line   from  DIABLOCN     230.00  BRKR to BRKR  MESA PGE     230.00
0

CATC-1393-C5 "5C877SS-Morro Bay and Morro Bay-Templeton 230 kV Lines"
 line     39941  30915  "1 " 1     0     # line   from  5C877SS      230.00  BRKR to BRKR  MORROBAY     230.00
#
 line     30905  30915  "1 " 1     0     # line   from  TEMPLETN     230.00  BRKR to BRKR  MORROBAY     230.00
0

CATC-1394-C5 "Morro Bay-Solar SS #1 and #2 230 kV Lines"
 line     30915  30916  "1 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
#
 line     30915  30916  "2 " 1     0     # line   from  MORROBAY     230.00  BRKR to BRKR  SOLARSS      230.00
0

CATC-1395-C5 "Solar SS-Caliente SS #1 and #2 230 kV Lines w/o Topaz & CVSR SPS"
 line     30916  30918  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
#
 line     30916  30918  "2 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
0

CATC-1396-C5 "Solar SS-Caliente SS #1 and #2 230 kV Lines w/ Topaz & CVSR SPS"
 line     30916  30918  "1 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
#
 line     30916  30918  "2 " 1     0     # line   from  SOLARSS      230.00  BRKR to BRKR  CALNTESS     230.00
# trip half of Topaz generation (block 1)
 gen      36434  "1 "    0              # gen          Q194G2         0.32  GEN ==125.00(21.61)
 gen      36436  "1 "    0              # gen          T242G          0.32  GEN ==155.00(21.61)
# trip CVSR (block 2)
 load     36426  "ss"    0              # load         T239           0.40  LOAD==1.10(0.61)
 gen      36426  "1 "    0              # gen          T239           0.40  GEN ==254.00(36.08)
# trip half of Topaz generation (block 3)
 gen      36430  "1 "    0              # gen          Q166G          0.32  GEN ==215.00(21.68)
 gen      36432  "1 "    0              # gen          Q194G1         0.32  GEN ==65.00(21.68)
0


# 2018 main year category c contingency list
# MID/TID/CCSF outages Zones 323/324/357
#

CATC-1397-C5 "Tracy-Westley #1 and #2 230 kV Lines"
 line     37585  30670  "1 " 1     0     # line   from  TRCY PMP     230.00  BRKR to BRKR  WESTLEY      230.00
#
 line     37585  30670  "2 " 1     0     # line   from  TRCY PMP     230.00  BRKR to BRKR  WESTLEY      230.00
0

CATC-1398-C5 "Walnut-Parker and Westley-Walnut 230 kV Lines"
 line     38400  38204  "1 " 1     0     # line   from  WLNT         230.00  BRKR to BRKR  PRKR MID     230.00
#
 line     30670  38400  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  WLNT         230.00
0

CATC-1399-C5 "Walnut-Parker and Westley-Parker 230 kV Lines"
 line     38400  38204  "1 " 1     0     # line   from  WLNT         230.00  BRKR to BRKR  PRKR MID     230.00
#
 line     30670  38204  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  PRKR MID     230.00
0

CATC-1400-C5 "Westley-Parker and Westley-Walnut 230 kV Lines"
 line     30670  38204  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  PRKR MID     230.00
#
 line     30670  38400  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  WLNT         230.00
0

CATC-1401-C5 "Westley-Rosemore #1 and #2 230 kV Lines"
 line     30670  38257  "1 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  ROSEMRE      230.00
#
 line     30670  38257  "2 " 1     0     # line   from  WESTLEY      230.00  BRKR to BRKR  ROSEMRE      230.00
0

CATC-1402-C5 "Warnerville-Standiford #7 and #8 115 kV Lines"
```

```
 line     36964  38230  "7 " 1     0     # line   from  WRNRVLLE     115.00  BRKR to BRKR  STANDFRD     115.00
#
 line     36964  36998  "8 " 1     0     # line   from  WRNRVLLE     115.00  BRKR to BRKR  HW_TAP       115.00
 line     36998  36975  "8 " 1     0     # line   from  HW_TAP       115.00  BRKR to BRKR  RB_TAP8      115.00
 line     36975  38230  "8 " 1     0     # line   from  RB_TAP8      115.00  BRKR to BRKR  STANDFRD     115.00
0

# selected C3 outages FSNO
# Moss Landing 6, Moss Landing 7, T254 gen tie line

CATC-1403-C3 "Moss Landing Unit 6 and Gates-T254 230 kV Line"
 gen      36405  "1 "    0               # gen          MOSSLND6      22.00  GEN ==754.33(68.34)
#
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
0

CATC-1404-C3 "Moss Landing Unit 7 and Gates-T254 230 kV Line"
 gen      36406  "1 "    0               # gen          MOSSLND7      22.00  GEN ==755.70(68.80)
#
 line     30902  30900  "1 " 1     0     # line   from  T254         230.00   (4) to BRKR  GATES        230.00
0

CATC-1405-C3 "Moss Landing Units 6 and 7"
 gen      36405  "1 "    0               # gen          MOSSLND6      22.00  GEN ==754.33(68.34)
#
 gen      36406  "1 "    0               # gen          MOSSLND7      22.00  GEN ==755.70(68.80)
0

# selected C3 outages KERN
# Diablo Canyon NCPP Unit 1, Diablo Canyon NCPP Unit 2, Midway 500/230 kV Transformer Bank 11 with SPS,
# Midway 500/230 kV Transformer Bank 12 with SPS, Midway 500/230 kV Transformer Bank 13 with SPS,

CATC-1406-C3 "Diablo Canyon NCPP Units 1 and 2"
 gen      36411  "1 "    0               # gen          DIABLO 1      25.00  GEN ==1200.00(4.21)
#
 gen      36412  "1 "    0               # gen          DIABLO 2      25.00  GEN ==1200.00(15.84)
0

CATC-1407-C3 "Midway 500/230 kV Transformer Bank 11 w/ Elk Hills/Sunrise SPS and Diablo Canyon NCPP Unit 1"
 tran     30970  30060  "11"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
#
 gen      35074  "1 "    0               # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0               # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0               # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0               # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0               # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0               # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
#
 gen      36411  "1 "    0               # gen          DIABLO 1      25.00  GEN ==1200.00(4.21)
0

CATC-1408-C3 "Midway 500/230 kV Transformer Bank 12 w/ Elk Hills/Sunrise SPS and Diablo Canyon NCPP Unit 1"
 tran     30970  30060  "12"       0     # tran   from  MIDWAY       230.00  BRKR to BRKR  MIDWAY       500.00
#
 gen      35074  "1 "    0               # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0               # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0               # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0               # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0               # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0               # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
#
 gen      36411  "1 "    0               # gen          DIABLO 1      25.00  GEN ==1200.00(4.21)
0

CATC-1409-C3 "Midway 500/230 kV Transformer Bank 13 w/ Elk Hills/Sunrise SPS and Diablo Canyon NCPP Unit 1"
 tran     30970  30060  "13"       0     # tran   from  MIDWAY       230.00  BRKR to (1)   MIDWAY       500.00
#
 gen      35074  "1 "    0               # gen          TEXSUN1G      18.00  GEN ==169.00(-12.04)
 gen      35075  "1 "    0               # gen          TEXSUN2G      18.00  GEN ==169.00(-11.95)
 gen      35079  "1 "    0               # gen          TEXSUNST      18.00  GEN ==222.00(22.22)
 gen      35076  "1 "    0               # gen          ELKHIL1G      18.00  GEN ==166.80(32.76)
 gen      35077  "1 "    0               # gen          ELKHIL2G      18.00  GEN ==166.80(32.76)
 gen      35078  "1 "    0               # gen          ELKHIL3G      18.00  GEN ==225.50(37.86)
#
 gen      36411  "1 "    0               # gen          DIABLO 1      25.00  GEN ==1200.00(4.21)
```

```
0

end
```

Cluster 6 Phase I

PG&E Kern Interconnection Area

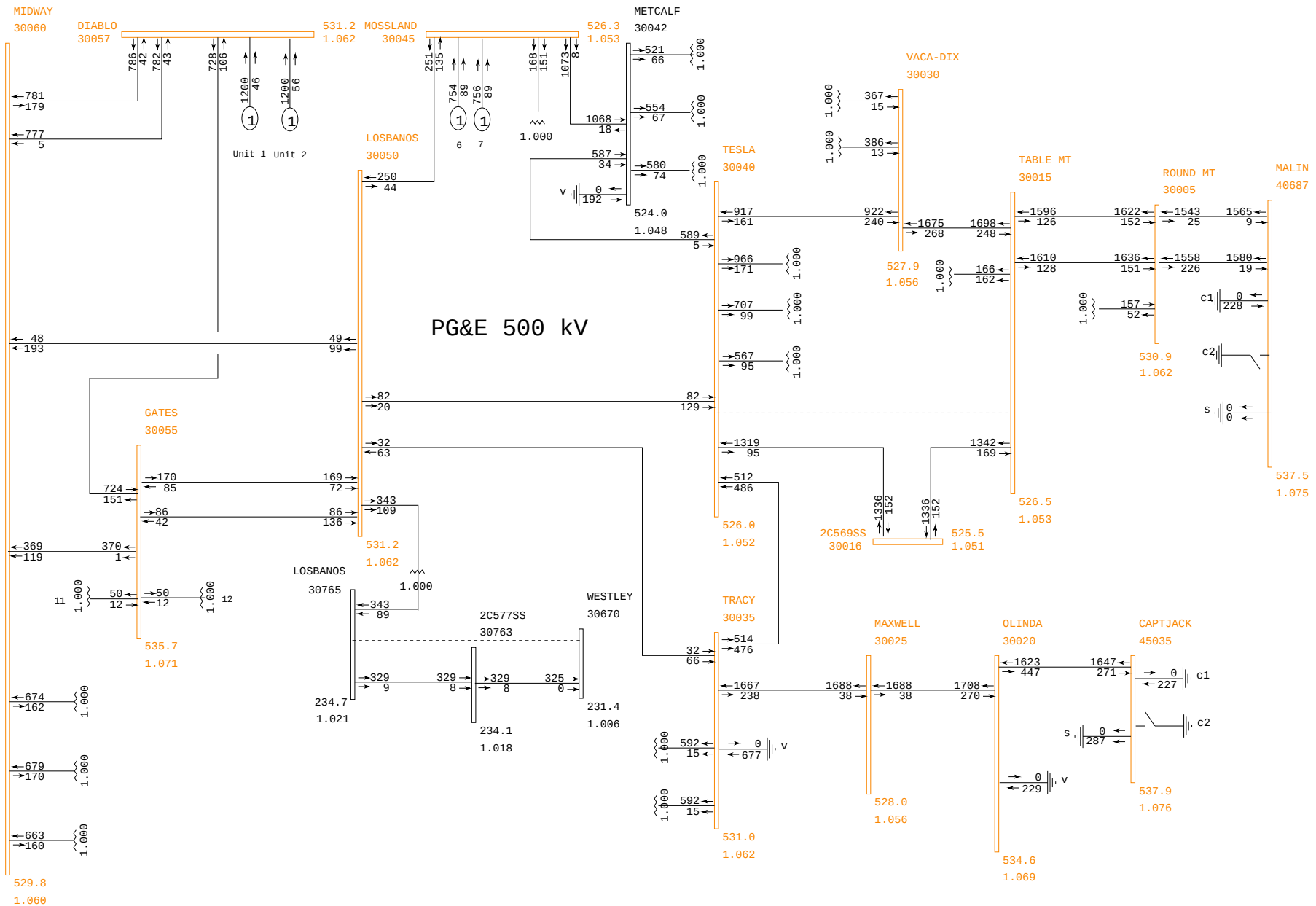
Appendix D

Power Flow Plots

Cluster 6 Phase I Kern Interconnection Area Power Flow Plots

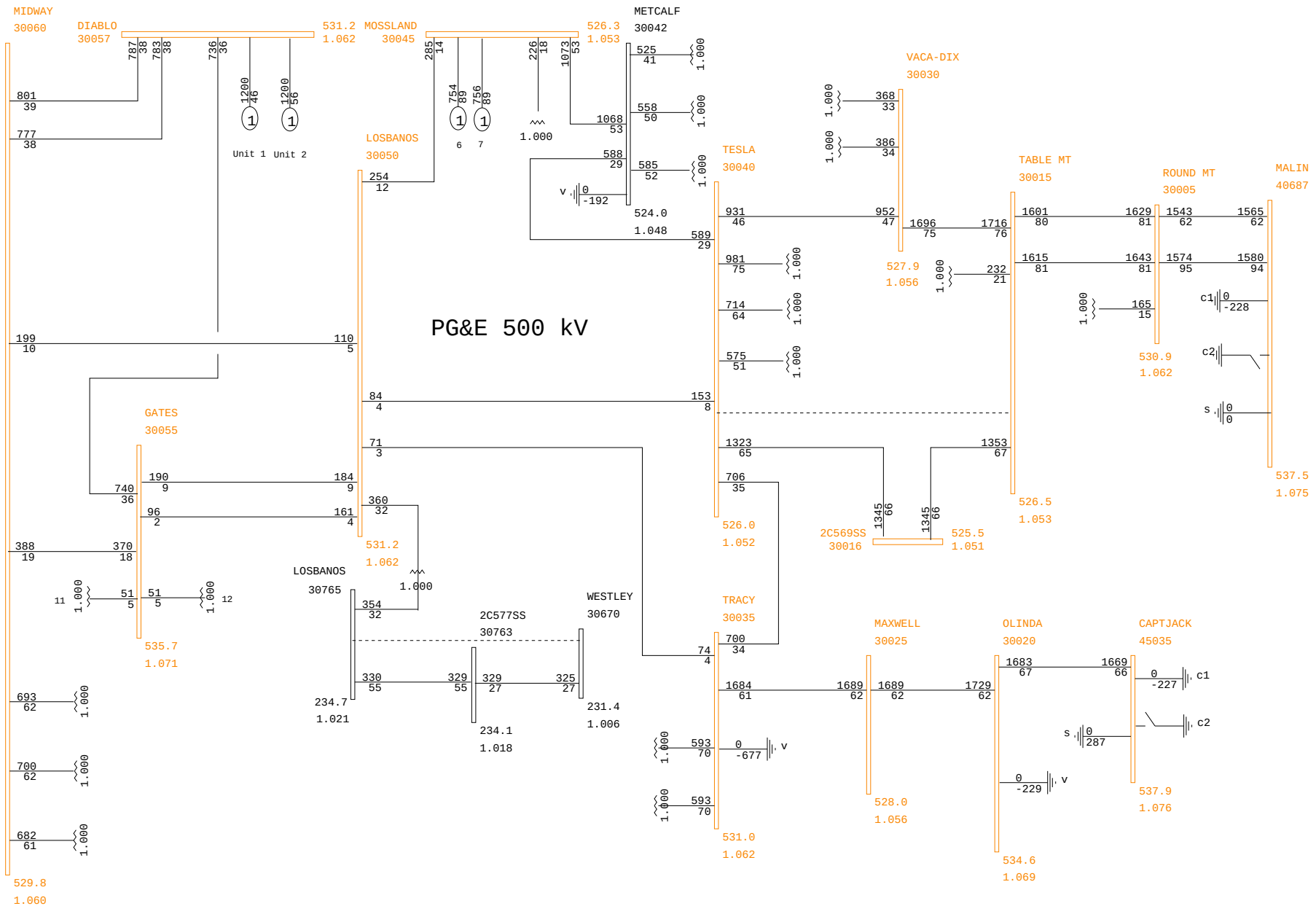
Plot	Description
Plot #101	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - PG&E 500 kV (MW/MVAr)
Plot #102	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - PG&E 500 kV (MVA/% Rate)
Plot #103	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Arco 70 kV (MW/MVAr)
Plot #104	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Arco 70 kV(MVA/% Rate)
Plot #105	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Kern Oil 115 kV (MW/MVAr)
Plot #106	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Kern Oil 115 kV (MVA/% Rate)
Plot #107	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Los Padres Area (MW/MVAr)
Plot #108	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Los Padres Area (MVA/% Rate)
Plot #109	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MW/MVAr)
Plot #110	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MVA/% Rate)
Plot #111	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Taft Area (MW/MVAr)
Plot #112	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Taft Area (MVA/% Rate)
Plot #113	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MW/MVAr)
Plot #114	2018 Summer Peak Kern Area Pre-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MVA/% Rate)
Plot #115	2018 Summer Peak Kern Area Post-Project: Base Case Condition - PG&E 500 kV (MW/MVAr)
Plot #116	2018 Summer Peak Kern Area Post-Project: Base Case Condition - PG&E 500 kV (MVA/% Rate)
Plot #117	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Arco 70 kV (MW/MVAr)
Plot #118	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Arco 70 kV(MVA/% Rate)
Plot #119	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Kern Oil 115 kV (MW/MVAr)
Plot #120	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Kern Oil 115 kV (MVA/% Rate)
Plot #121	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Los Padres Area (MW/MVAr)
Plot #122	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Los Padres Area (MVA/% Rate)
Plot #123	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MW/MVAr)
Plot #124	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MVA/% Rate)
Plot #125	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Taft Area (MW/MVAr)
Plot #126	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Taft Area (MVA/% Rate)
Plot #127	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MW/MVAr)
Plot #128	2018 Summer Peak Kern Area Post-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MVA/% Rate)
Plot #129	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - PG&E 500 kV (MW/MVAr)
Plot #130	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - PG&E 500 kV (MVA/% Rate)
Plot #131	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Arco 70 kV (MW/MVAr)
Plot #132	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Arco 70 kV(MVA/% Rate)

Plot	Description
Plot #133	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Kern Oil 115 kV (MW/MVAr)
Plot #134	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Kern Oil 115 kV (MVA/% Rate)
Plot #135	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Los Padres Area (MW/MVAr)
Plot #136	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Los Padres Area (MVA/% Rate)
Plot #137	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MW/MVAr)
Plot #138	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MVA/% Rate)
Plot #139	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Taft Area (MW/MVAr)
Plot #140	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Taft Area (MVA/% Rate)
Plot #141	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MW/MVAr)
Plot #142	2018 Summer Off Peak Kern Area Pre-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MVA/% Rate)
Plot #143	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - PG&E 500 kV (MW/MVAr)
Plot #144	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - PG&E 500 kV (MVA/% Rate)
Plot #145	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Arco 70 kV (MW/MVAr)
Plot #146	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Arco 70 kV(MVA/% Rate)
Plot #147	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Kern Oil 115 kV (MW/MVAr)
Plot #148	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Kern Oil 115 kV (MVA/% Rate)
Plot #149	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Los Padres Area (MW/MVAr)
Plot #150	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Los Padres Area (MVA/% Rate)
Plot #151	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MW/MVAr)
Plot #152	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Midway/Wheeler Ridge 230 kV (MVA/% Rate)
Plot #153	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Taft Area (MW/MVAr)
Plot #154	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Taft Area (MVA/% Rate)
Plot #155	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MW/MVAr)
Plot #156	2018 Summer Off Peak Kern Area Post-Project: Base Case Condition - Kingsburg/Alpaugh 115 kV (MVA/% Rate)



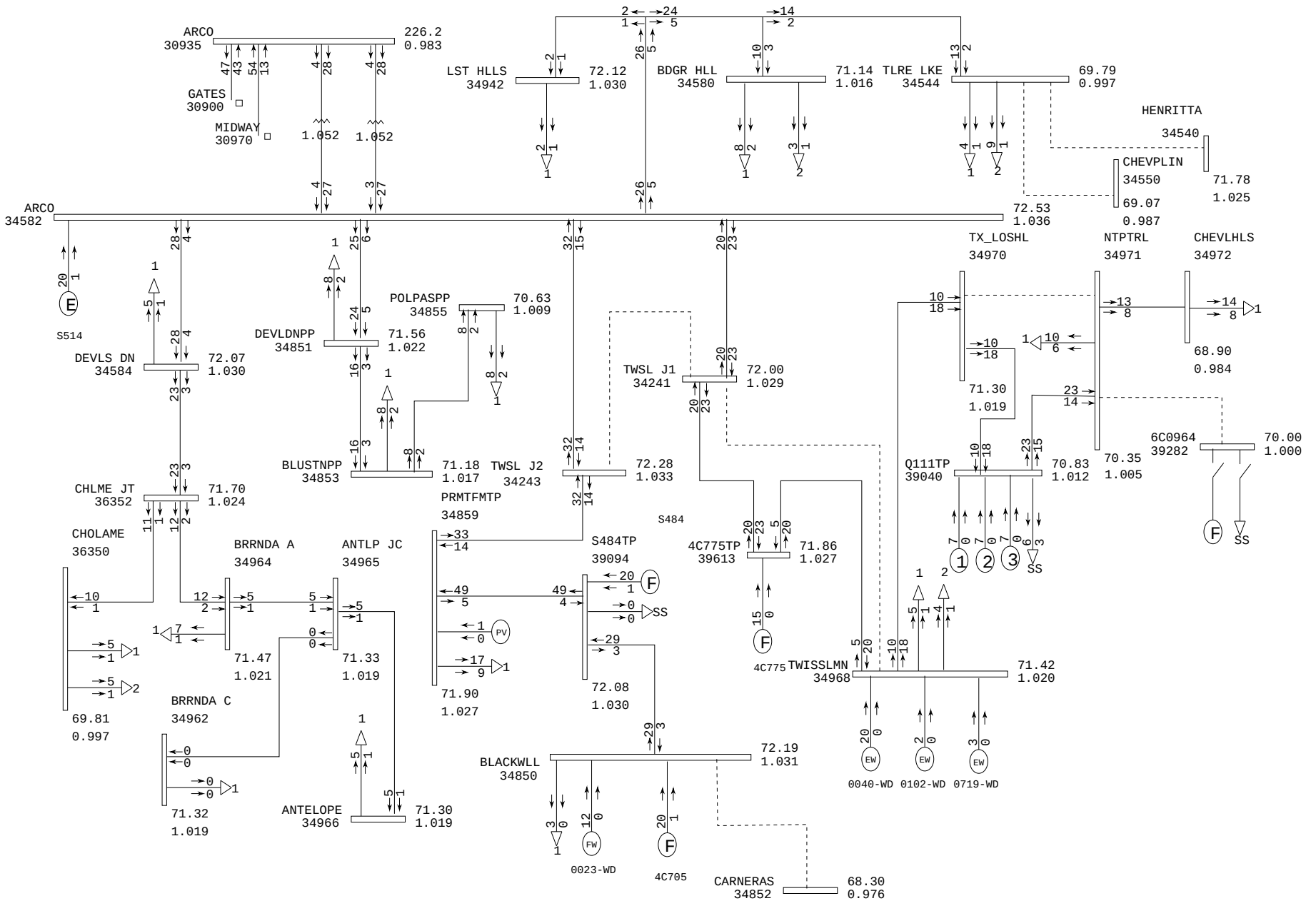
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 101: Base Case Condition - PG&E 500 kV	MW/MVAR qc6p1_500kV.drw Rating = 1



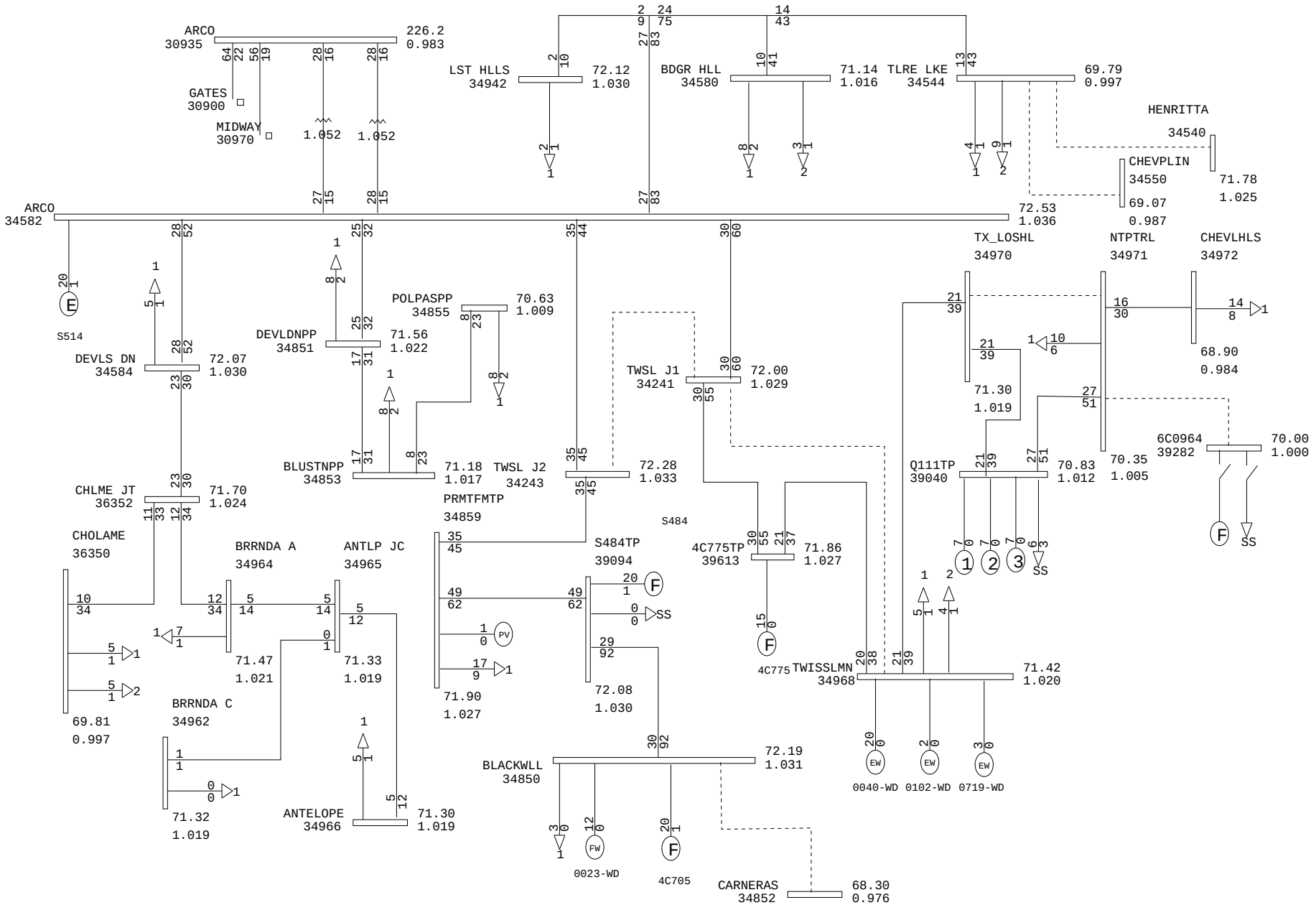
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 102: Base Case Condition - PG&E 500 kV	MVA/%rate qc6p1_500kV.drw Rating = 1



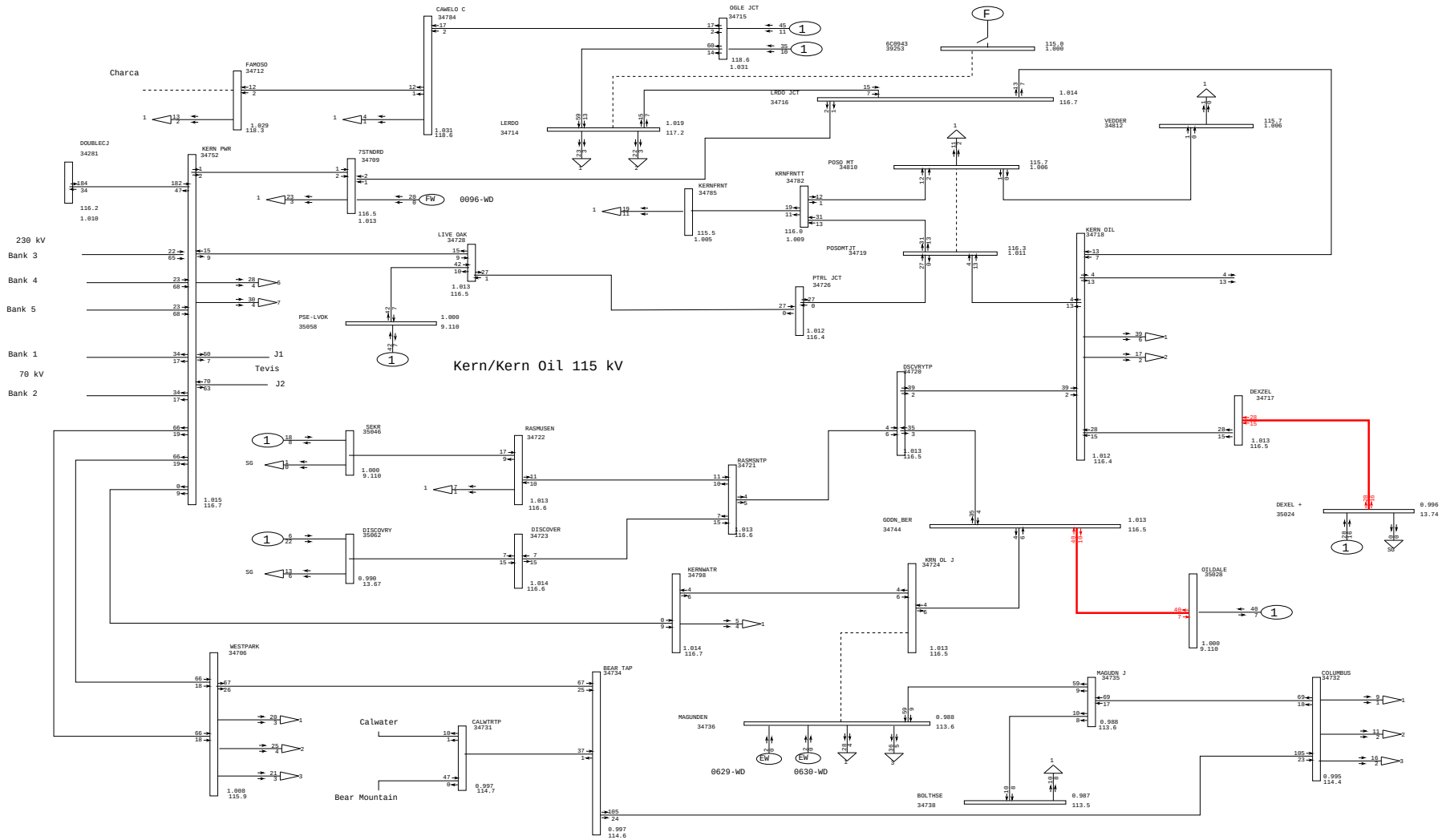
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 103: Base Case Condition - Arco 70 kV	MW/MVAR qc6p1_kern_arco70kV.drw Rating = 1



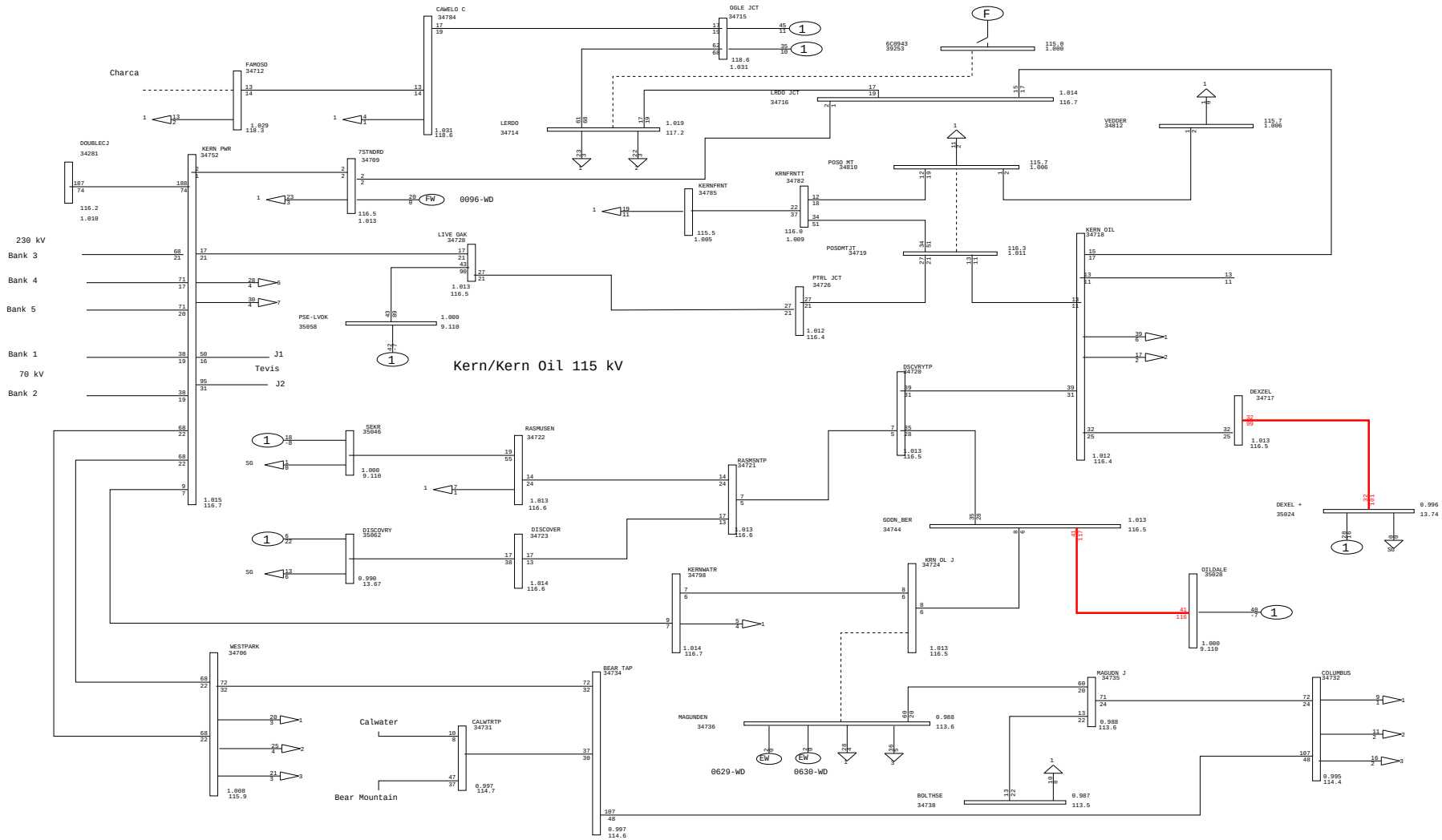
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 104: Base Case Condition - Arco 70 kV	MVA/%rate qc6p1_kern_arco70kV.drw Rating = 1



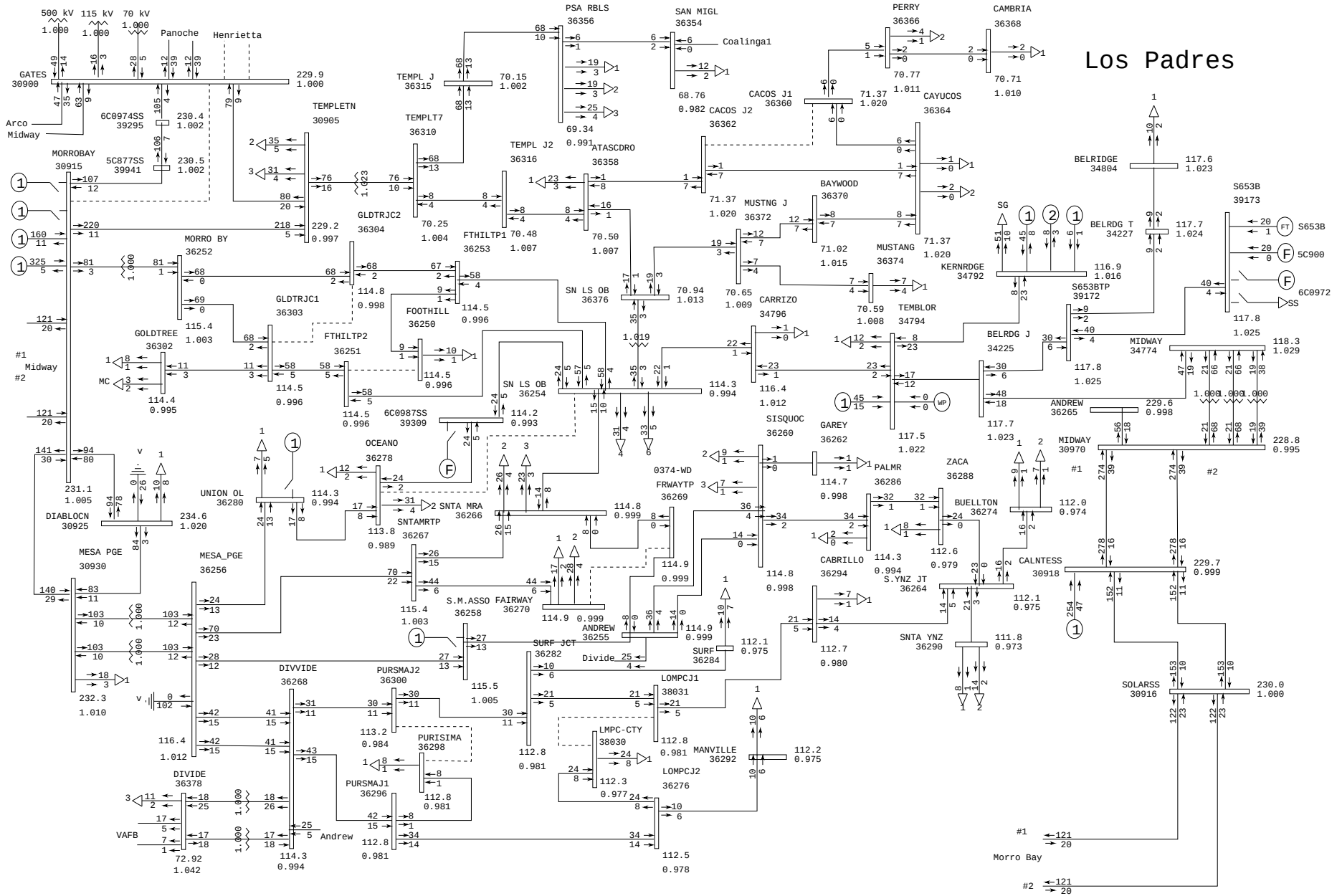
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(S-N) PDCI= 2801 MW(S-N) COI= 4791 MW(S-N) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 105: Base Case Condition - Kern Oil 115 kV	MW/MVAR qc6p1_kern_kernoil115kV. Rating = 1



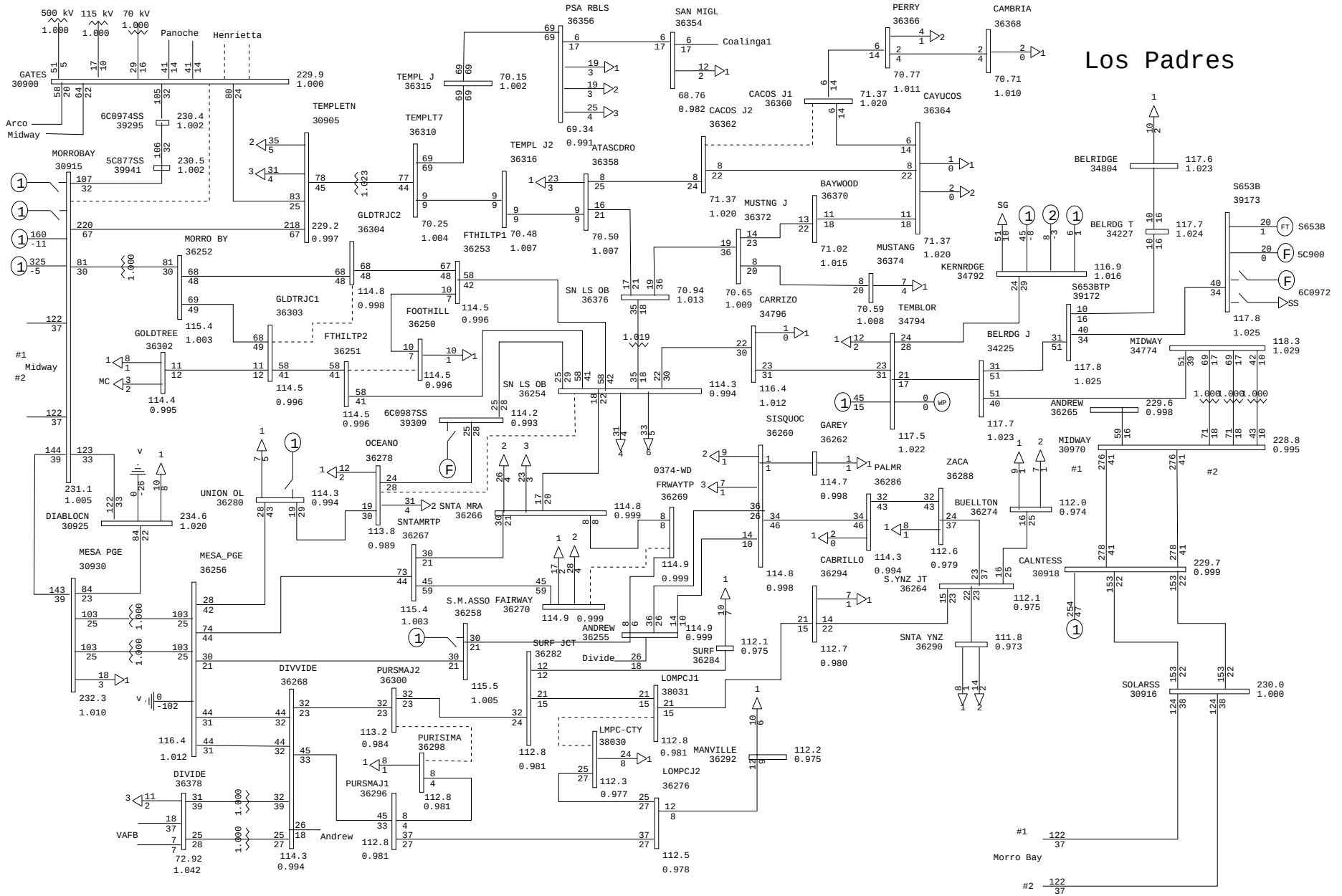
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 106: Base Case Condition - Kern Oil 115 kV	MVA/%rate qc6p1_kern_kernoil115kV. Rating = 1



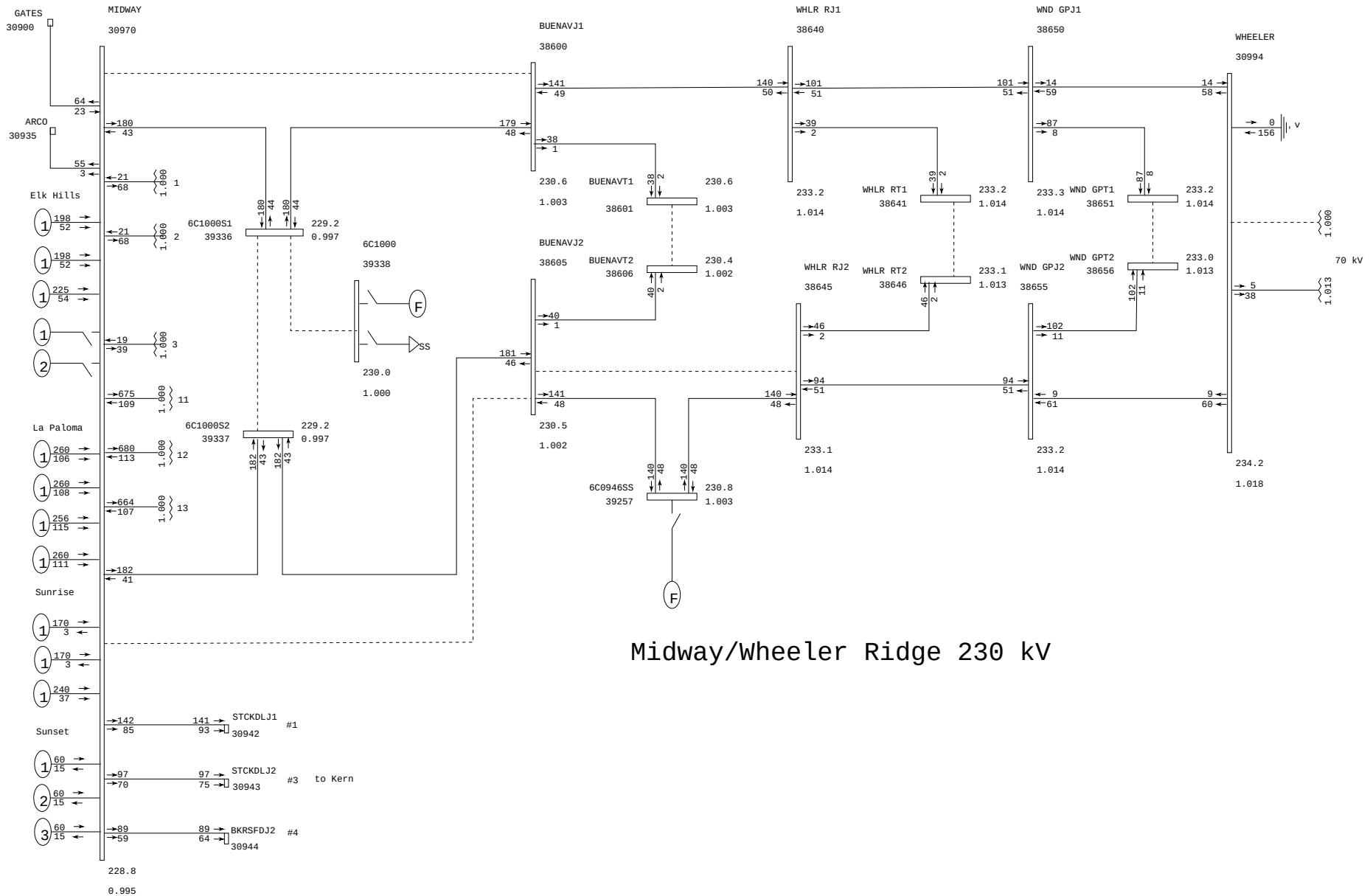
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 107: Base Case Condition - Los Padres Area	MW/MVAR qc6p1_kern_lospadres-and Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:35:57 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 108: Base Case Condition - Los Padres Area
		MVA/%rate qc6p1_kern_lospadres-and Rating = 1



Midway/Wheeler Ridge 230 kV

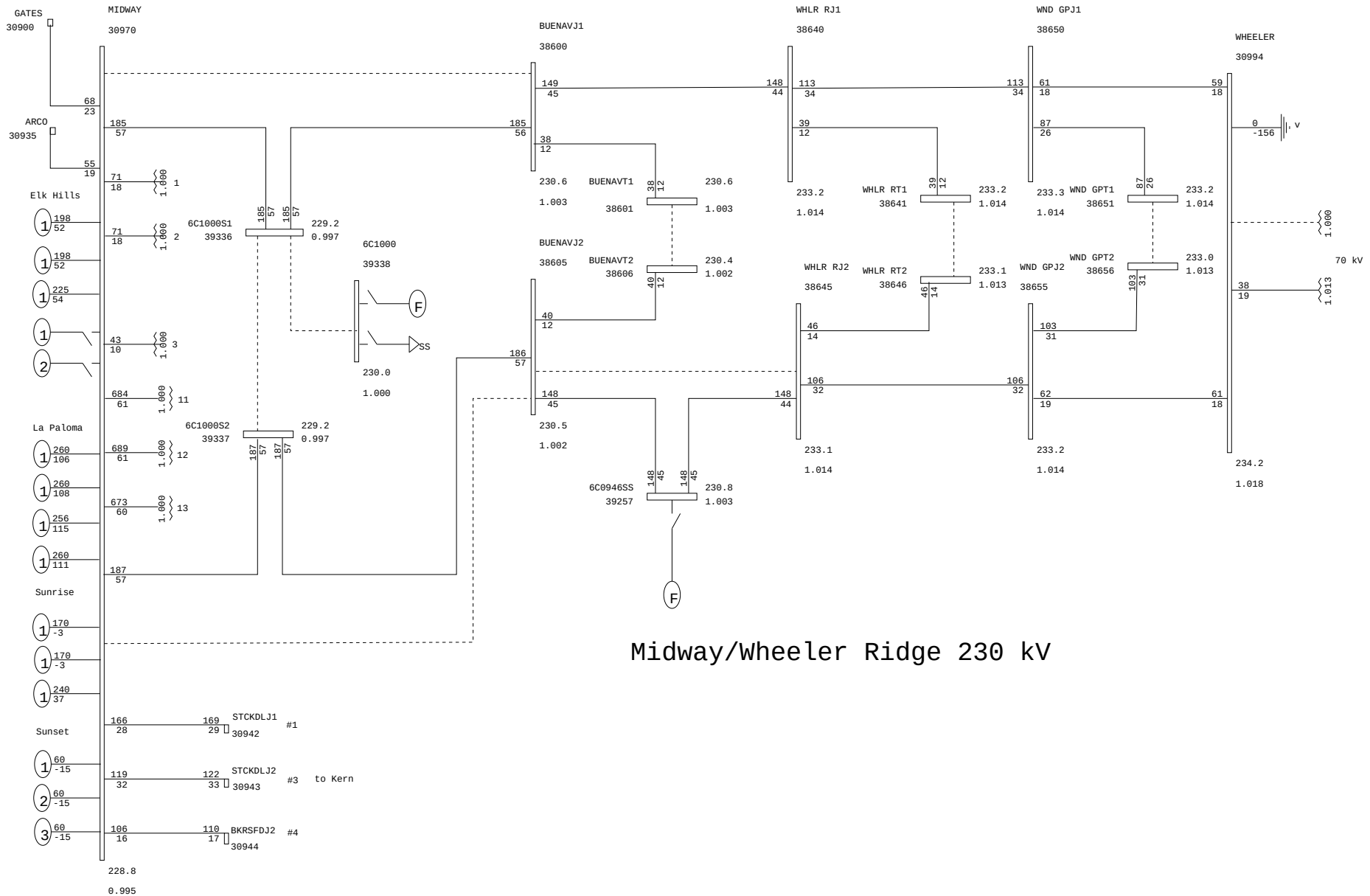
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 109: Base Case Condition - Midway/Wheeler Ridge 230 kV

MW/MVAR

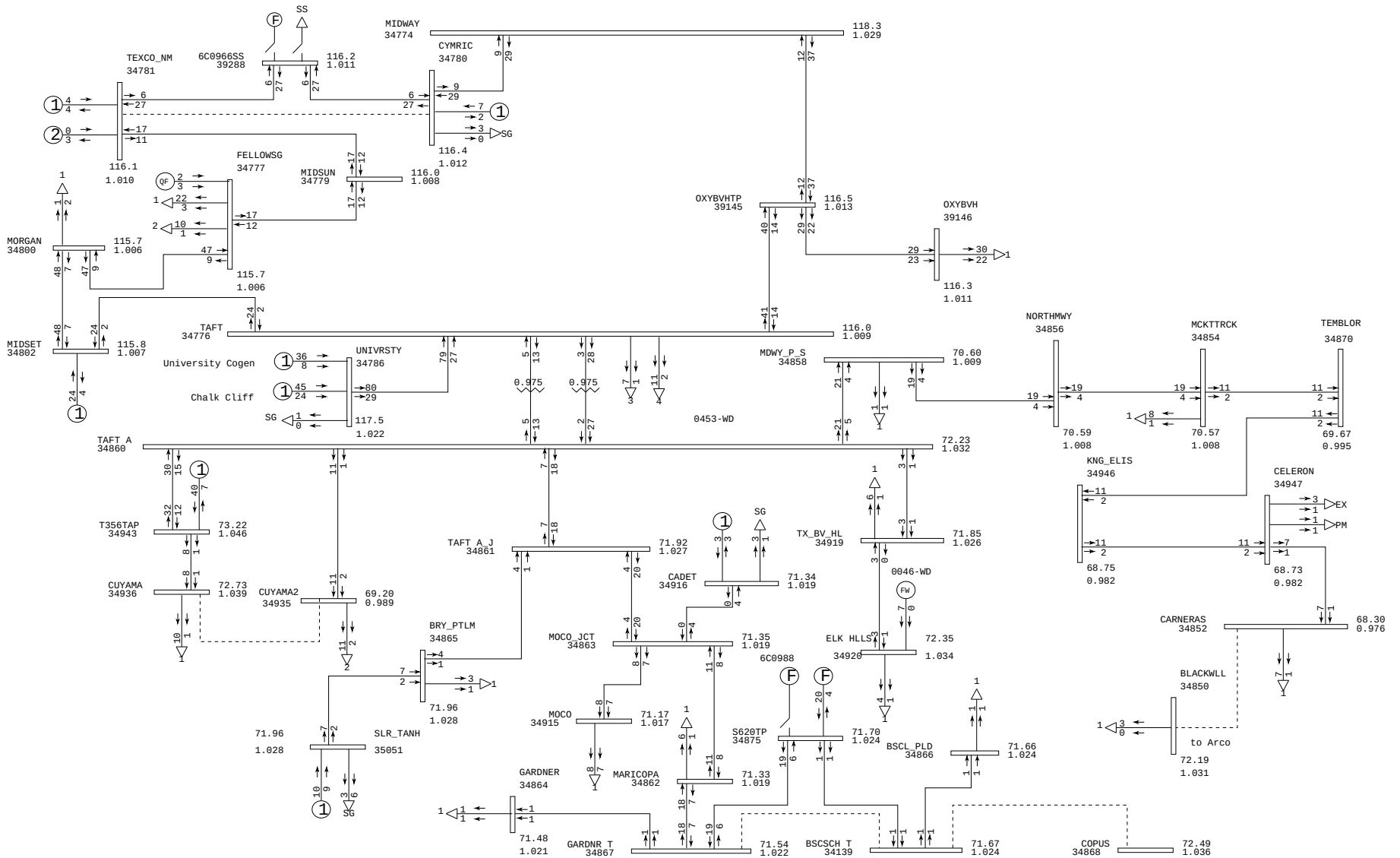
qc6p1_kern_midway-wheele

Rating = 1



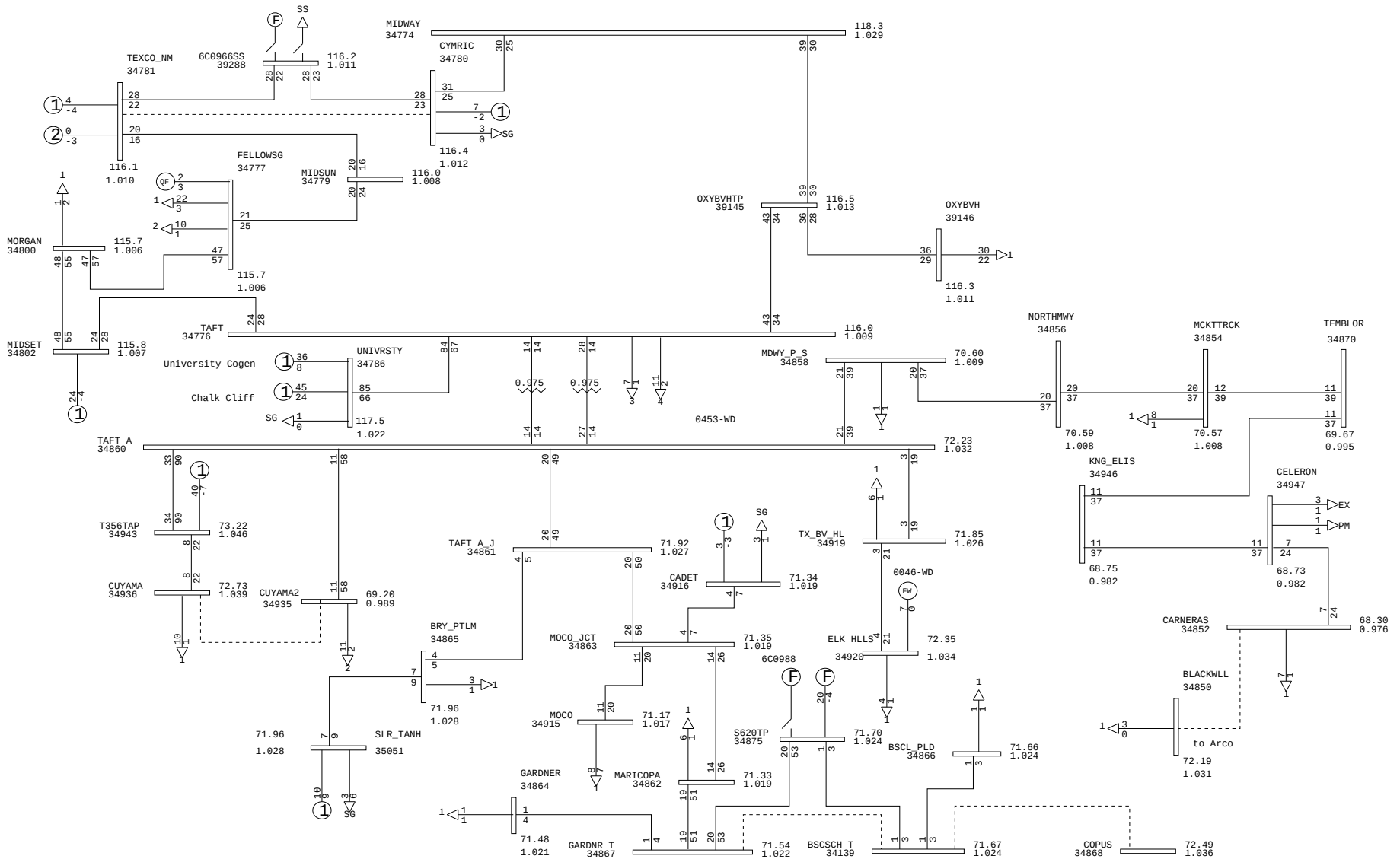
General Electric International, Inc. PSLF Program Tue Jan 14 09:35:58 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 110: Base Case Condition - Midway/Wheeler Ridge 230 kV	MVA/%rate qc6p1_kern_midway-wheele Rating = 1



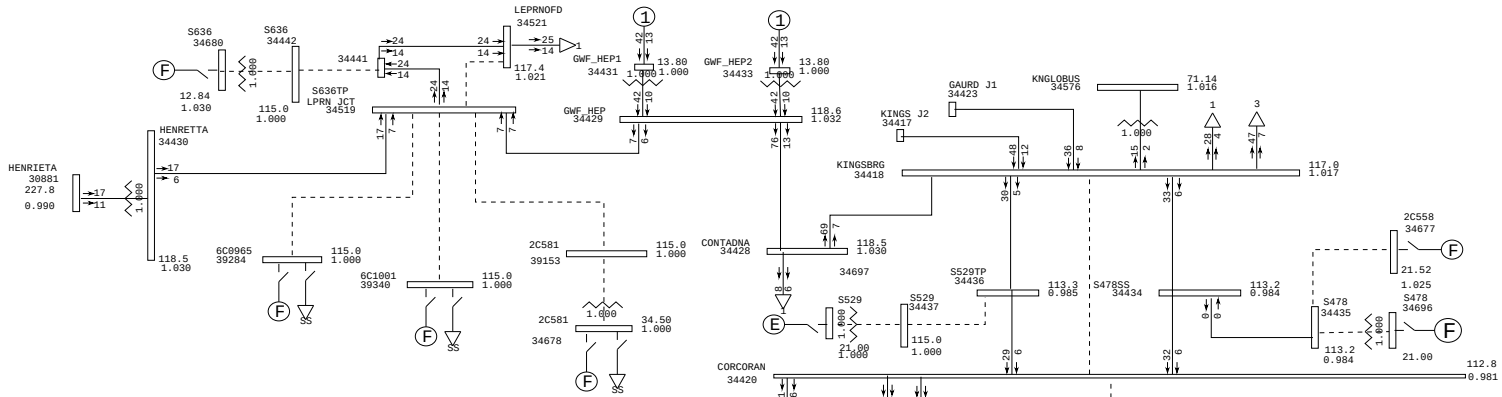
General Electric International, Inc. PSLF Program Tue Jan 14 09:35:58 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 111: Base Case Condition - Taft Area	MW/MVAR qc6p1_kern_taft.drw Rating = 1

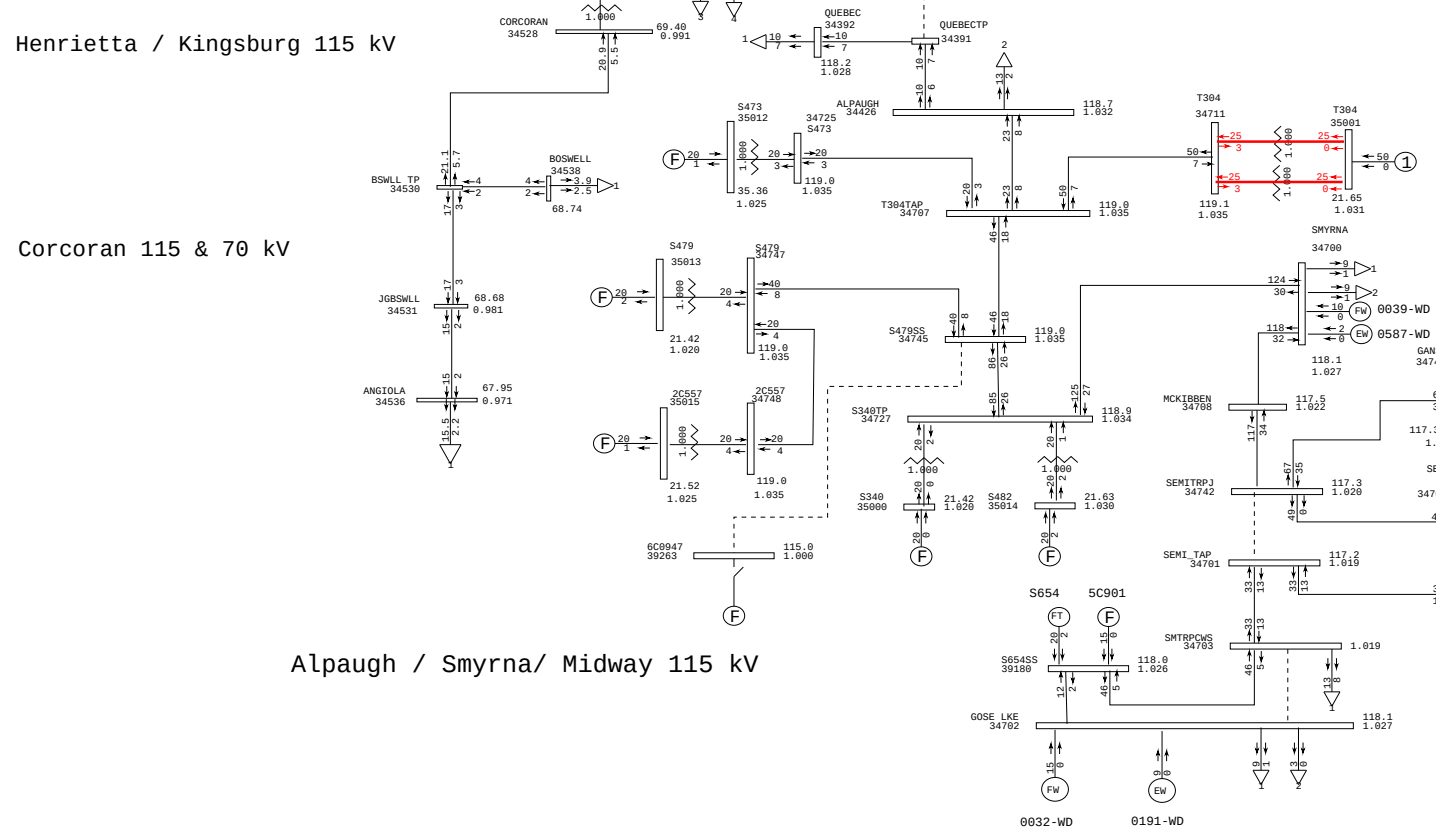


General Electric International, Inc. PSLF Program Tue Jan 14 09:35:58 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 112: Base Case Condition - Taft Area	MVA/%rate qc6p1_kern_taft.drw Rating = 1



Henrietta / Kingsburg 115 kV

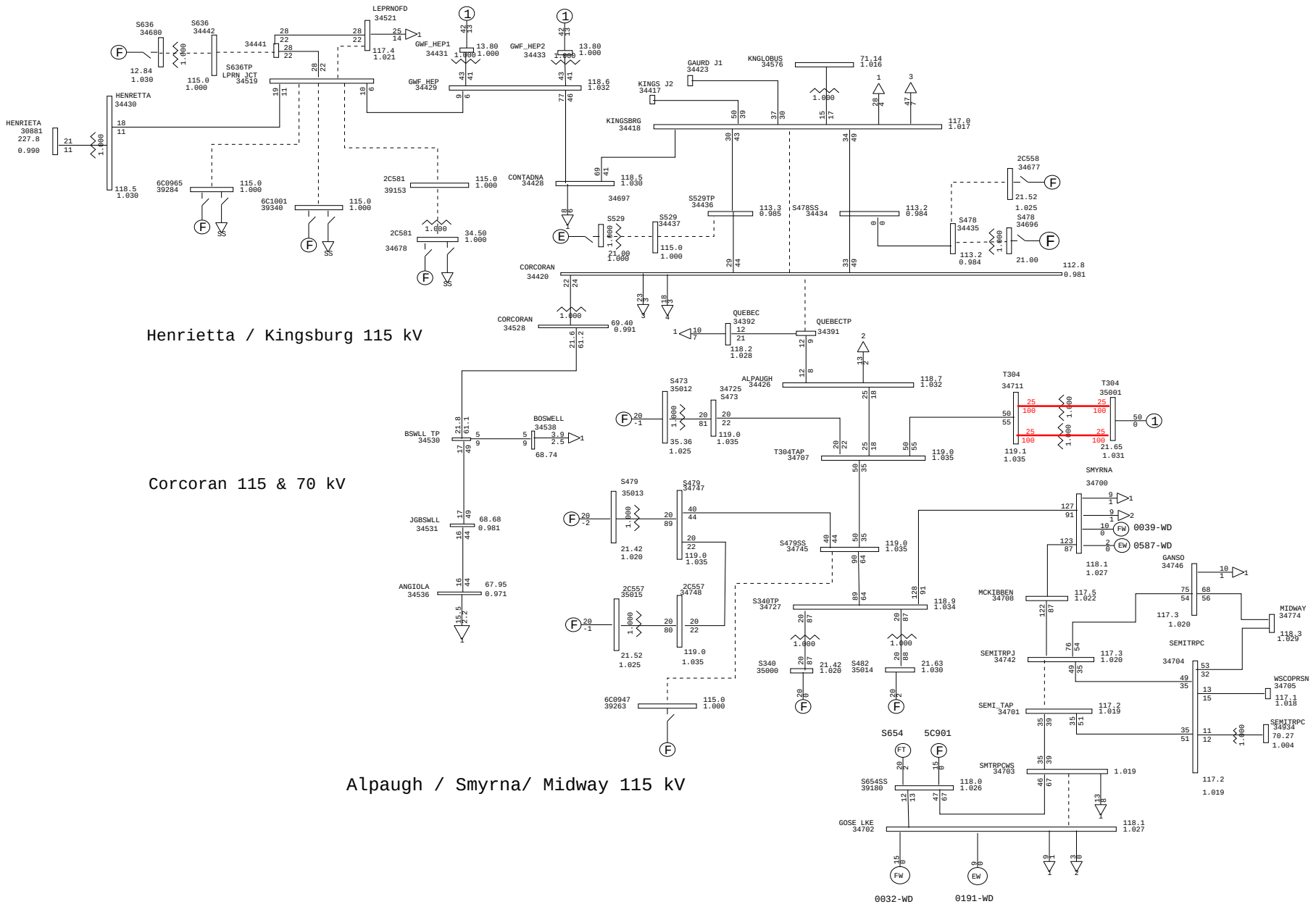


Corcoran 115 & 70 kV

Alpaugh / Smyrna/ Midway 115 kV

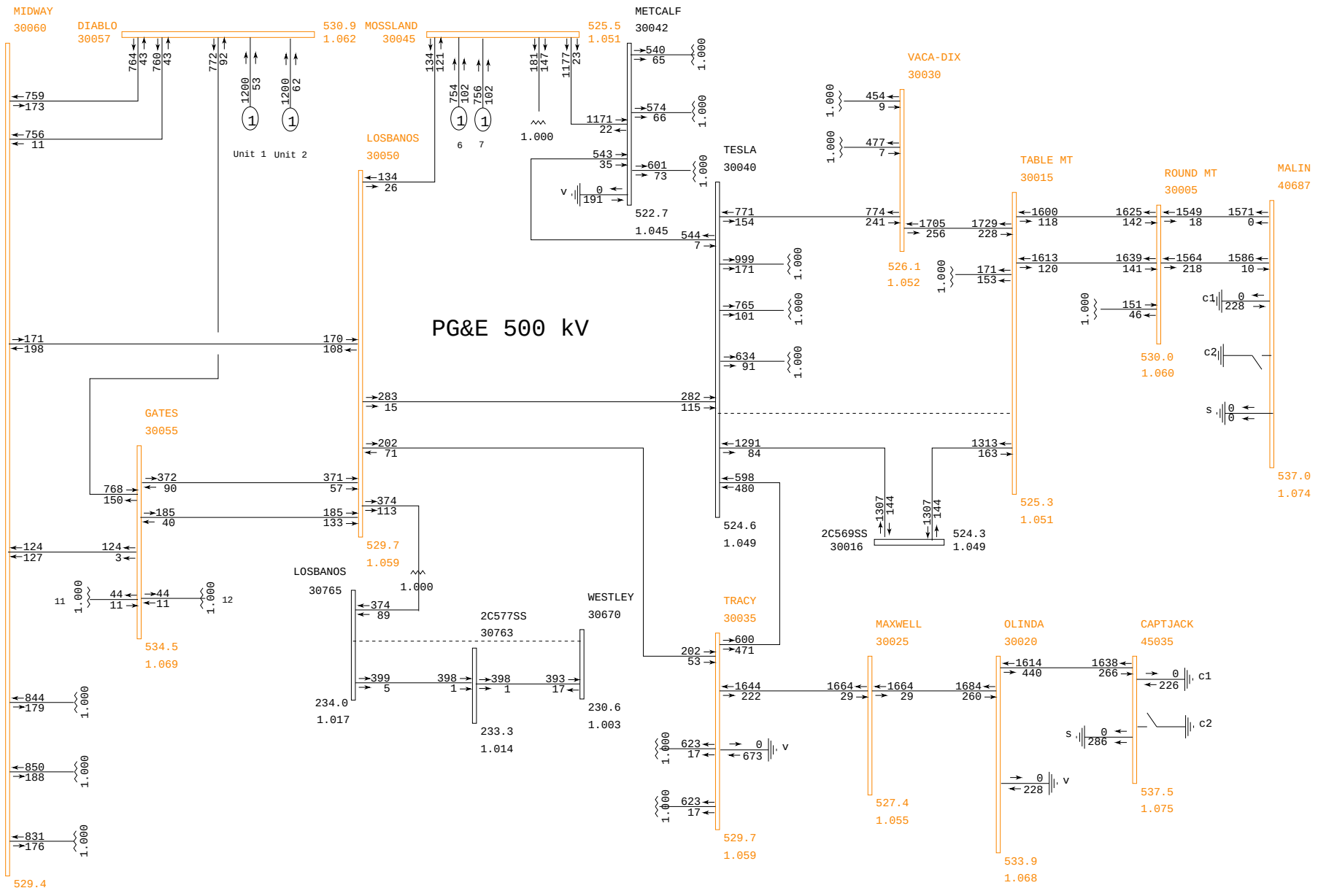
General Electric International, Inc. PSLF Program Tue Jan 14 09:35:59 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 113: Base Case Condition - Kingsburg/Alpaugh 115 kV	MW/MVAR qc6p1_fsno-kern_kings-al Rating = 1



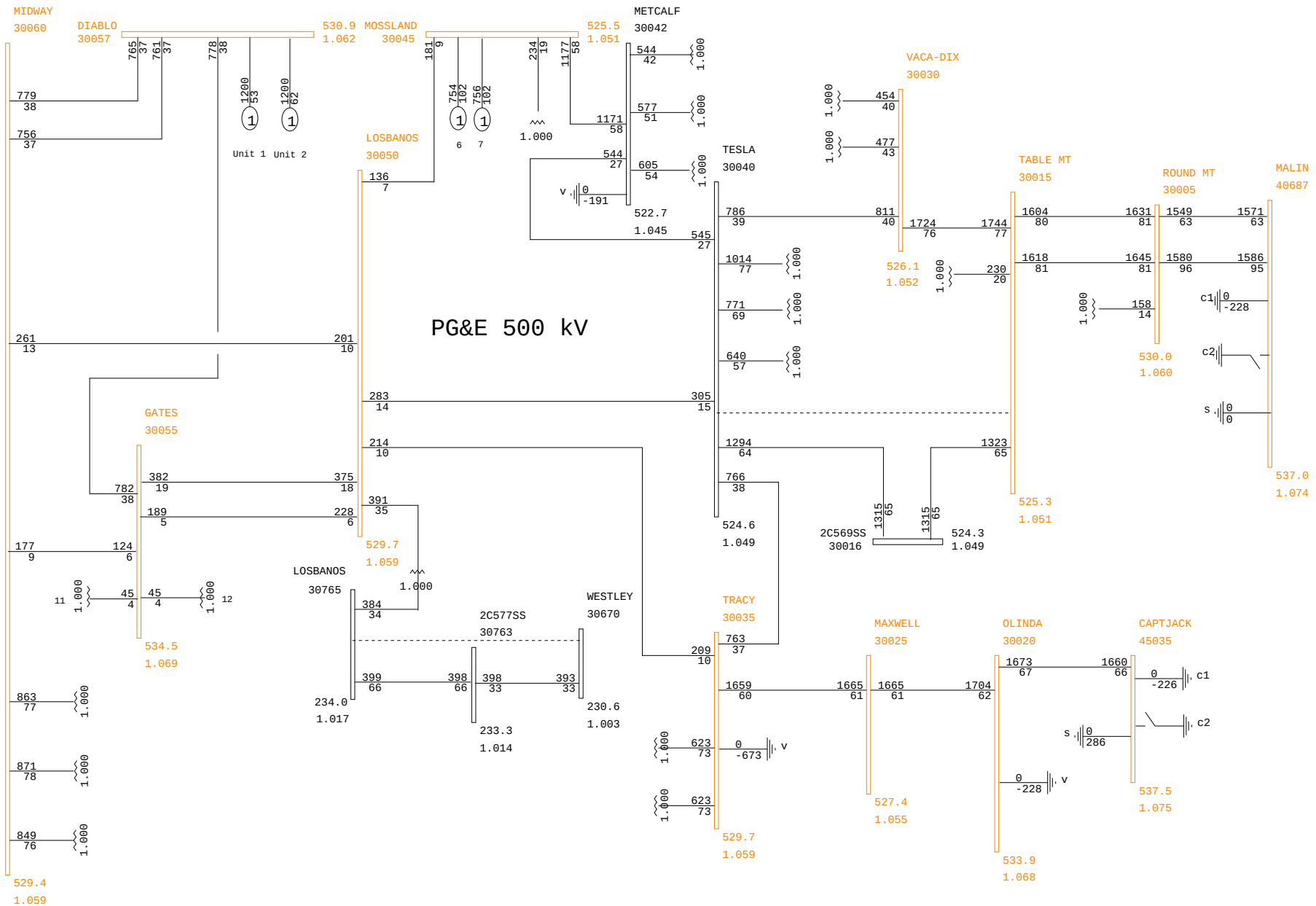
General Electric International, Inc. PSLF Program Tue Jan 14 09:35:59 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 542 MW(S-N) PATH26= 3992 MW(N-S) PDCI= 2801 MW(N-S) COI= 4791 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pre-project case weo r8b3	Plot 114: Base Case Condition - Kingsburg/Alpaugh 115 kV	MVA/%rate qc6p1_fsno-kern_kings-al Rating = 1



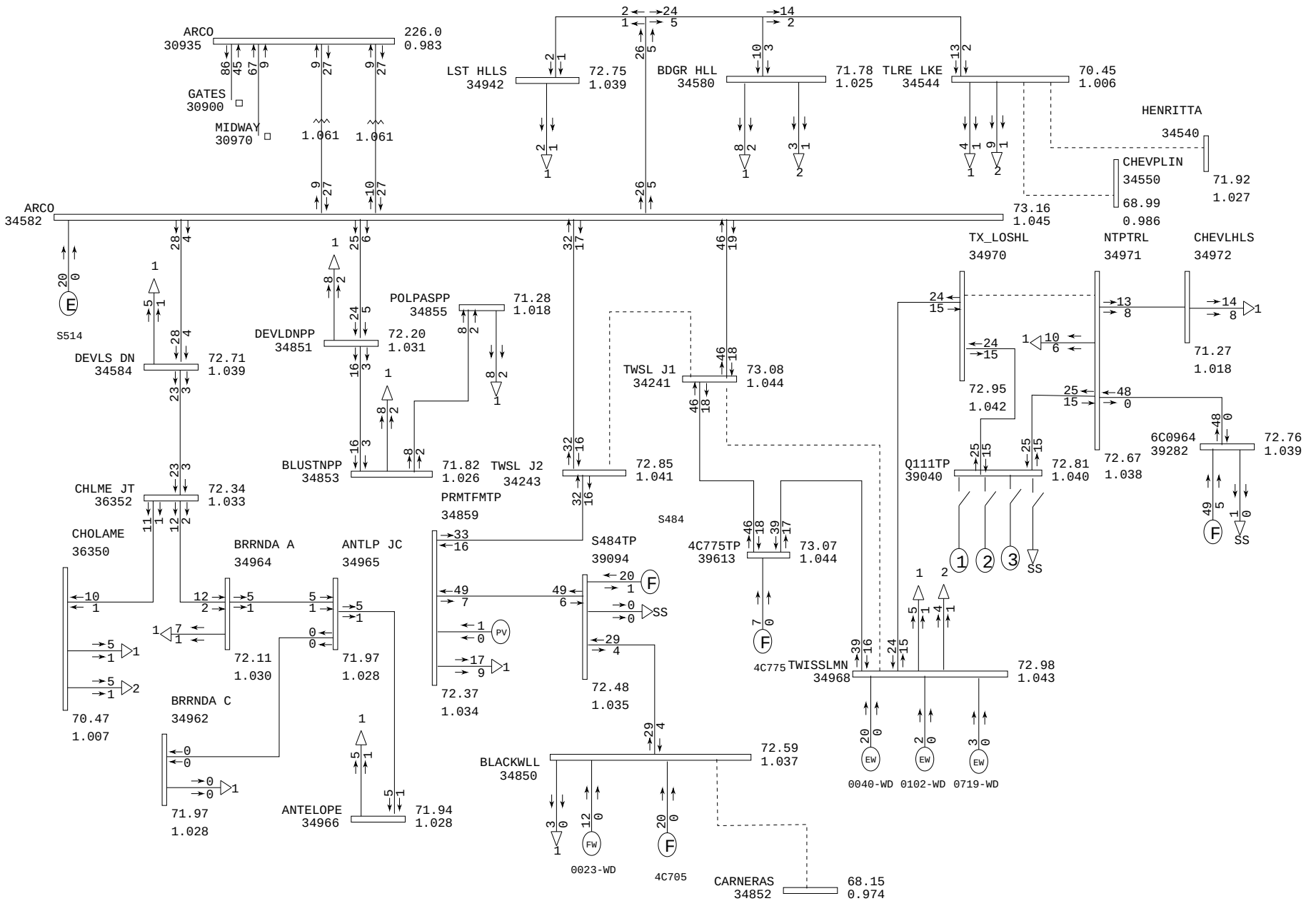
General Electric International, Inc. PSLF Program Tue Jan 14 09:35:59 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 115: Base Case Condition - PG&E 500 kV	MW/MVAR qc6p1_500kV.drw Rating = 1



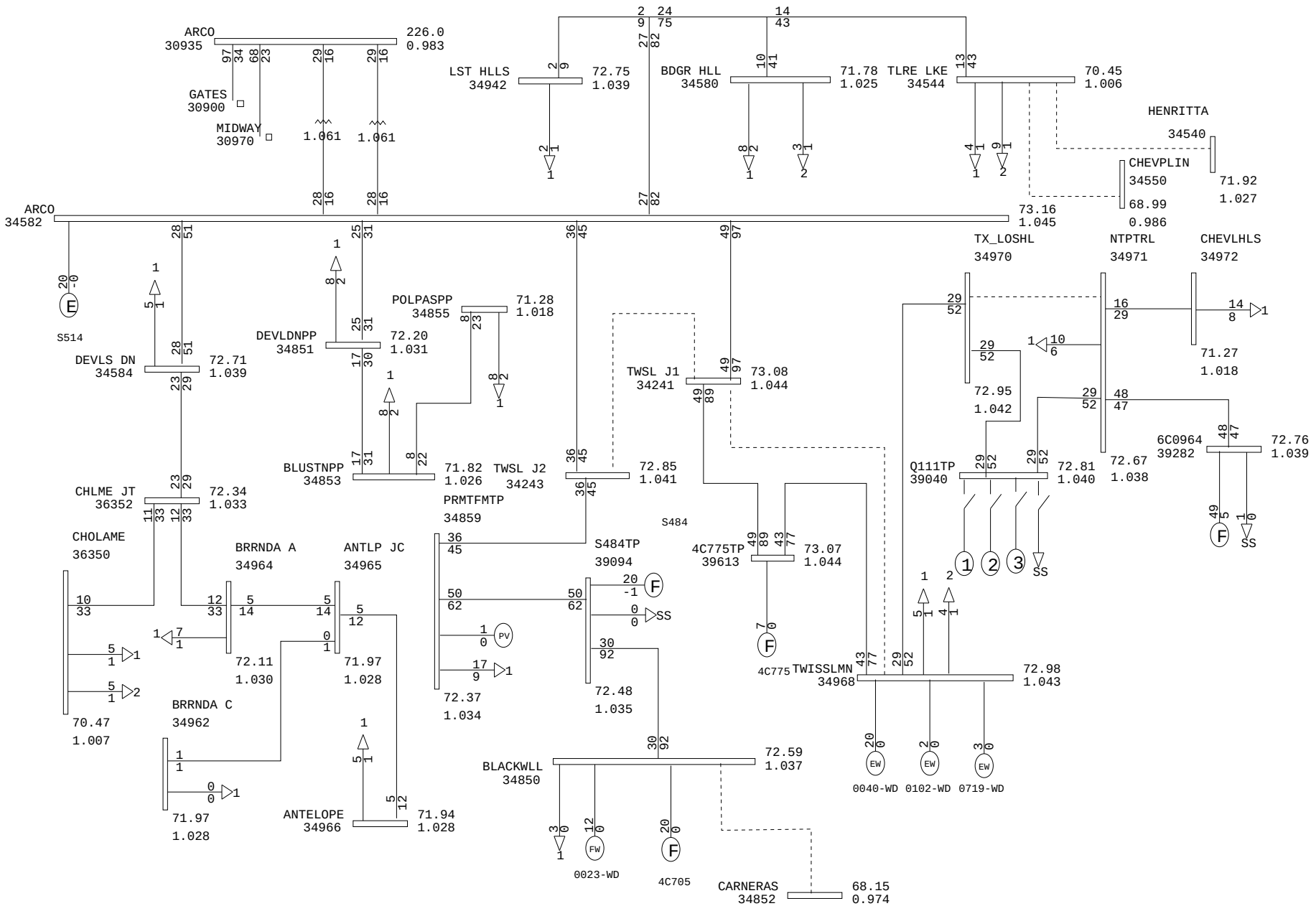
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:00 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 116: Base Case Condition - PG&E 500 kV	MVA/%rate qc6p1_500kV.drw Rating = 1



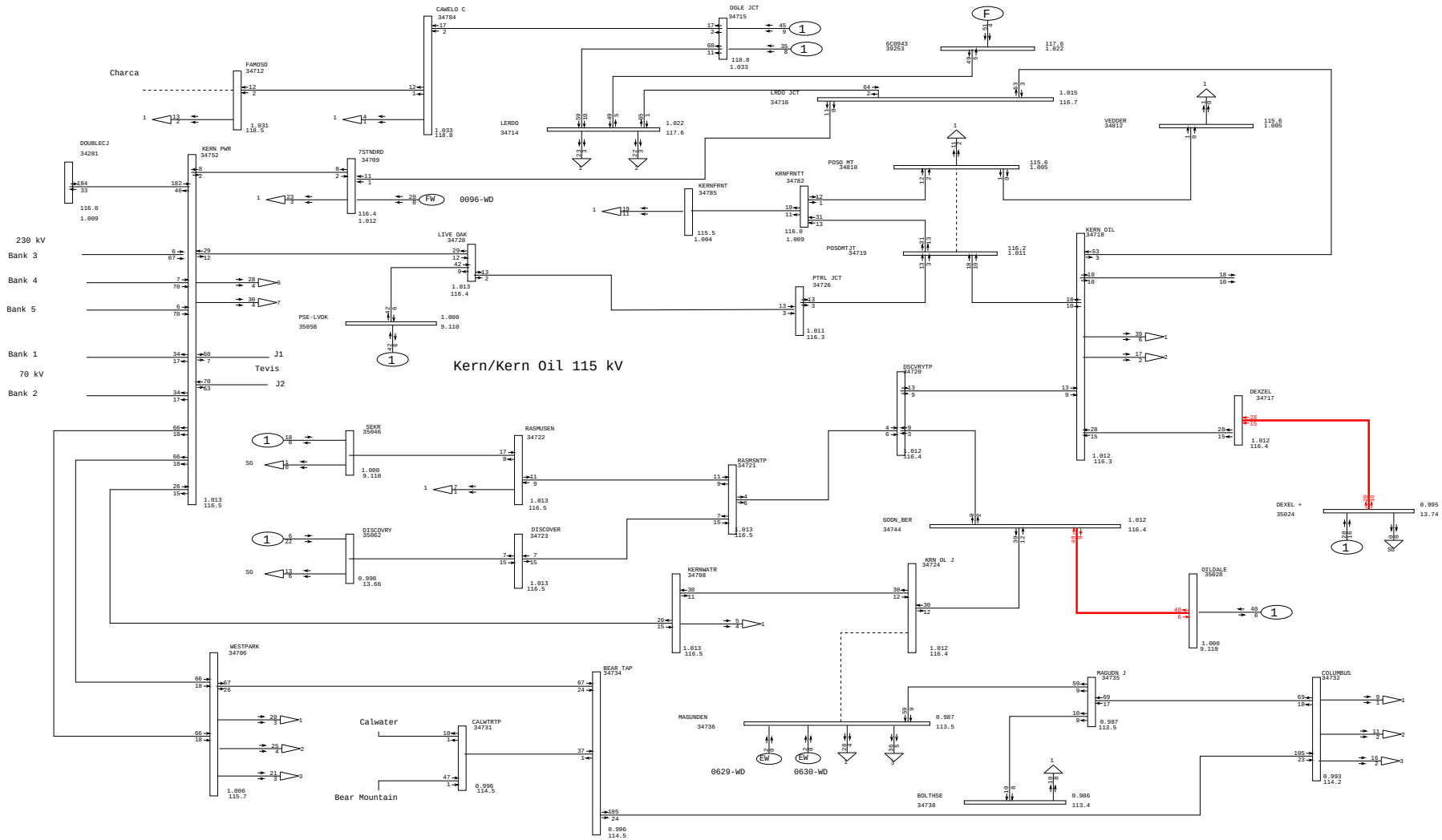
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:00 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 117: Base Case Condition - Arco 70 kV	MW/MVAR qc6p1_kern_arco70kV.drw Rating = 1



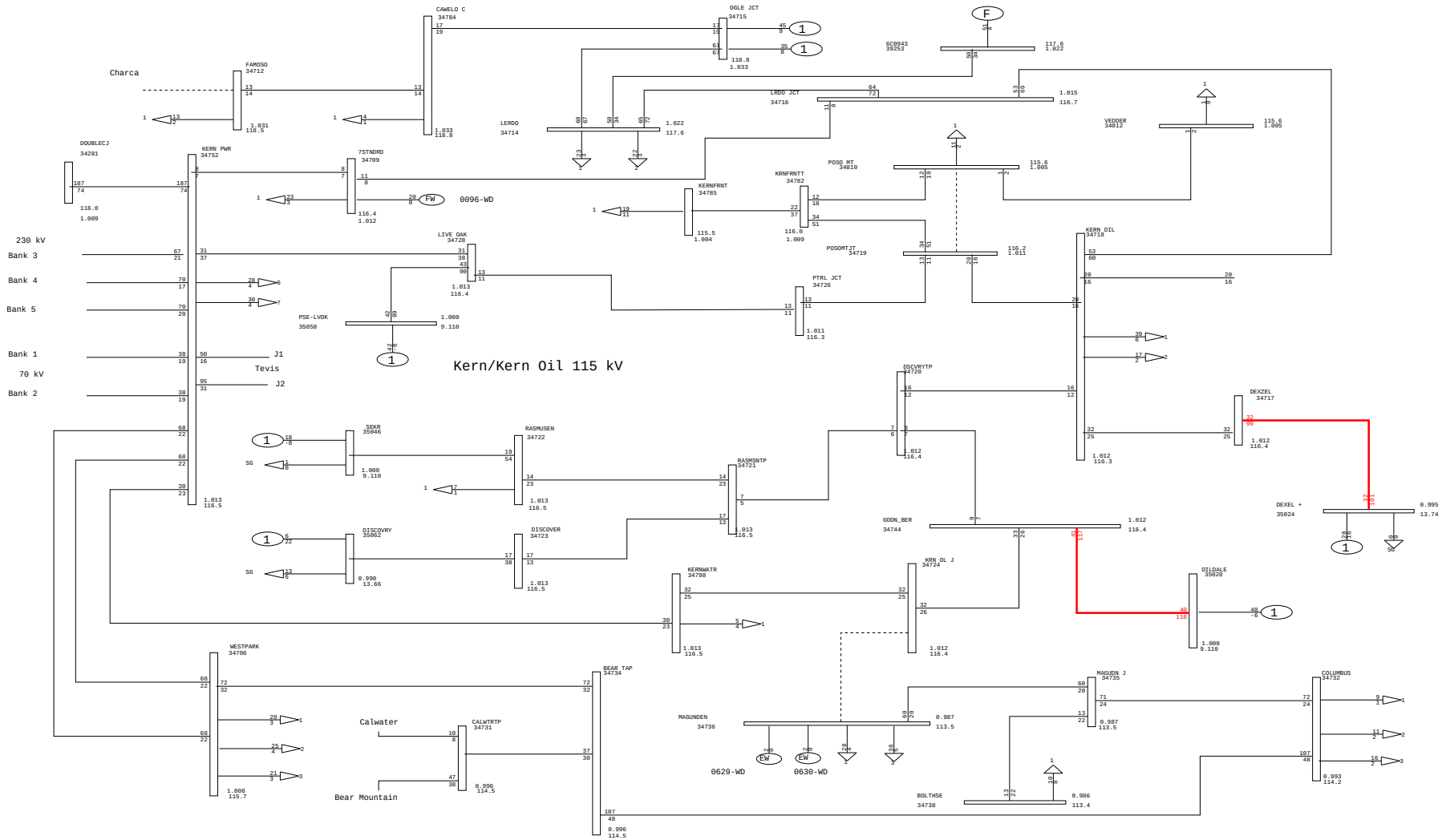
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:00 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 118: Base Case Condition - Arco 70 kV	MVA/%rate qc6p1_kern_arco70kV.drw Rating = 1



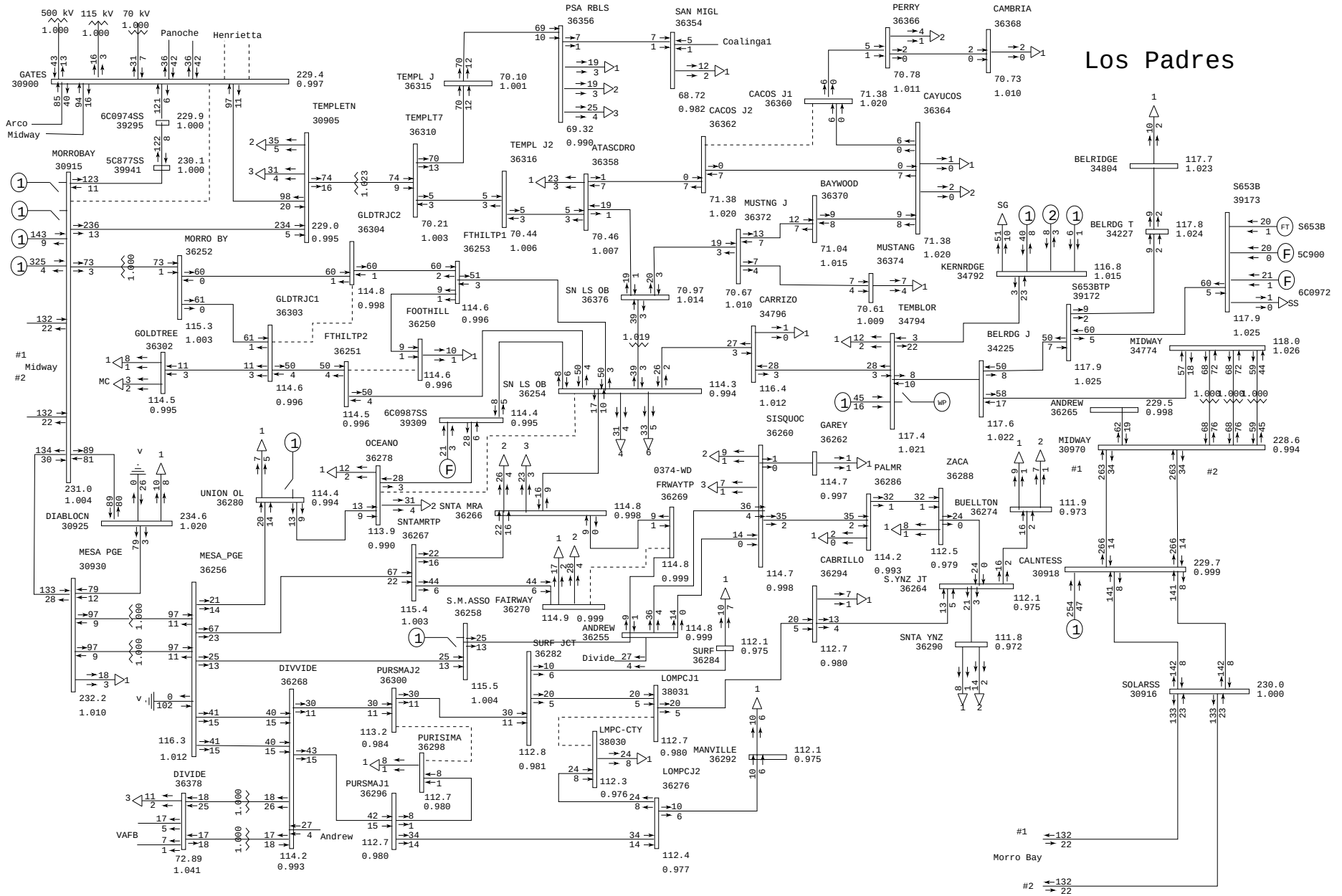
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:00 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 119: Base Case Condition - Kern Oil 115 kV	MW/MVAR qc6p1_kern_kernoil115kV. Rating = 1



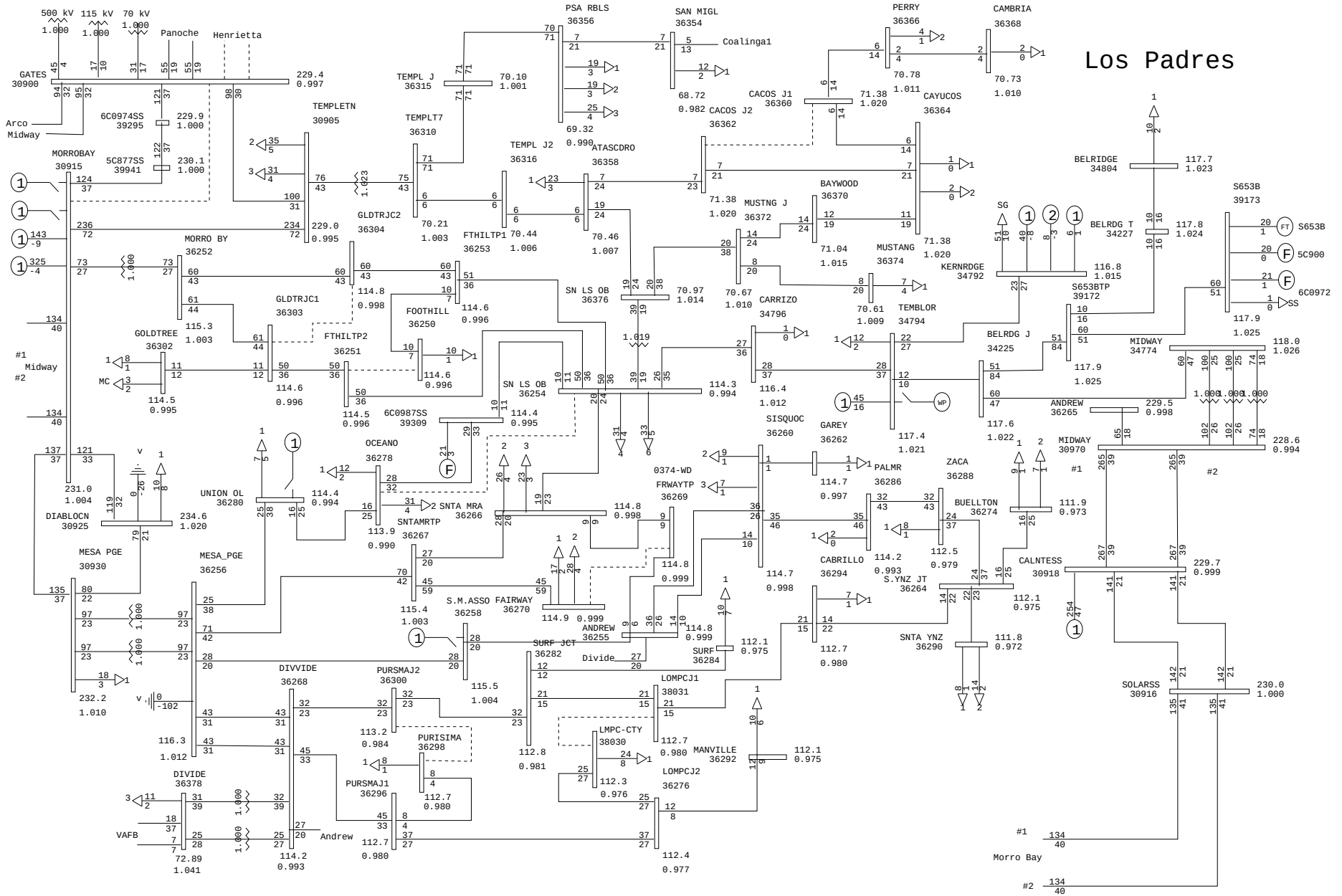
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:01 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 120: Base Case Condition - Kern Oil 115 kV	MVA/%rate qc6p1_kern_kernoil115kV. Rating = 1



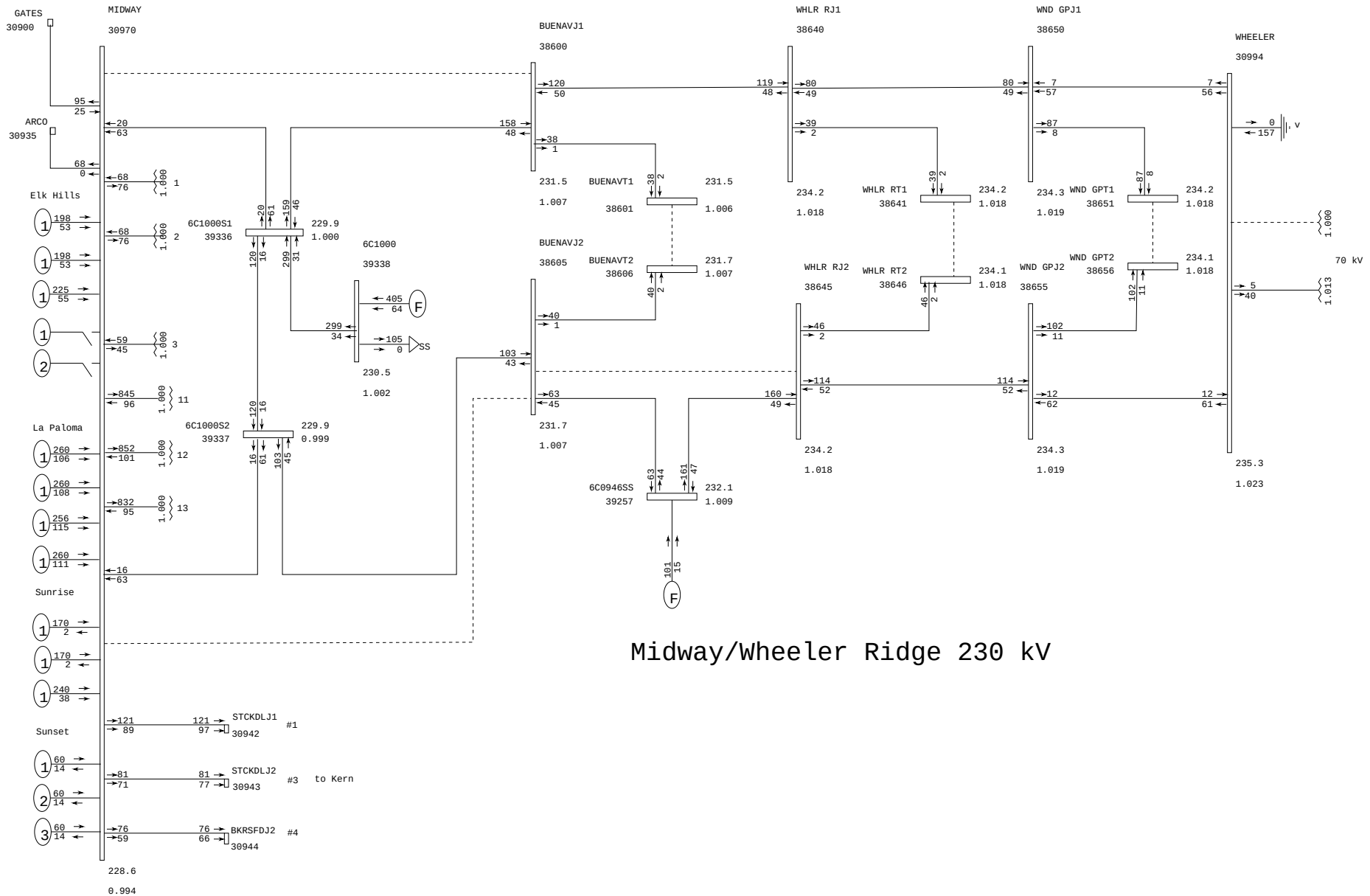
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:01 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 121: Base Case Condition - Los Padres Area	MW/MVAR qc6p1_kern_lospadres-and Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:01 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

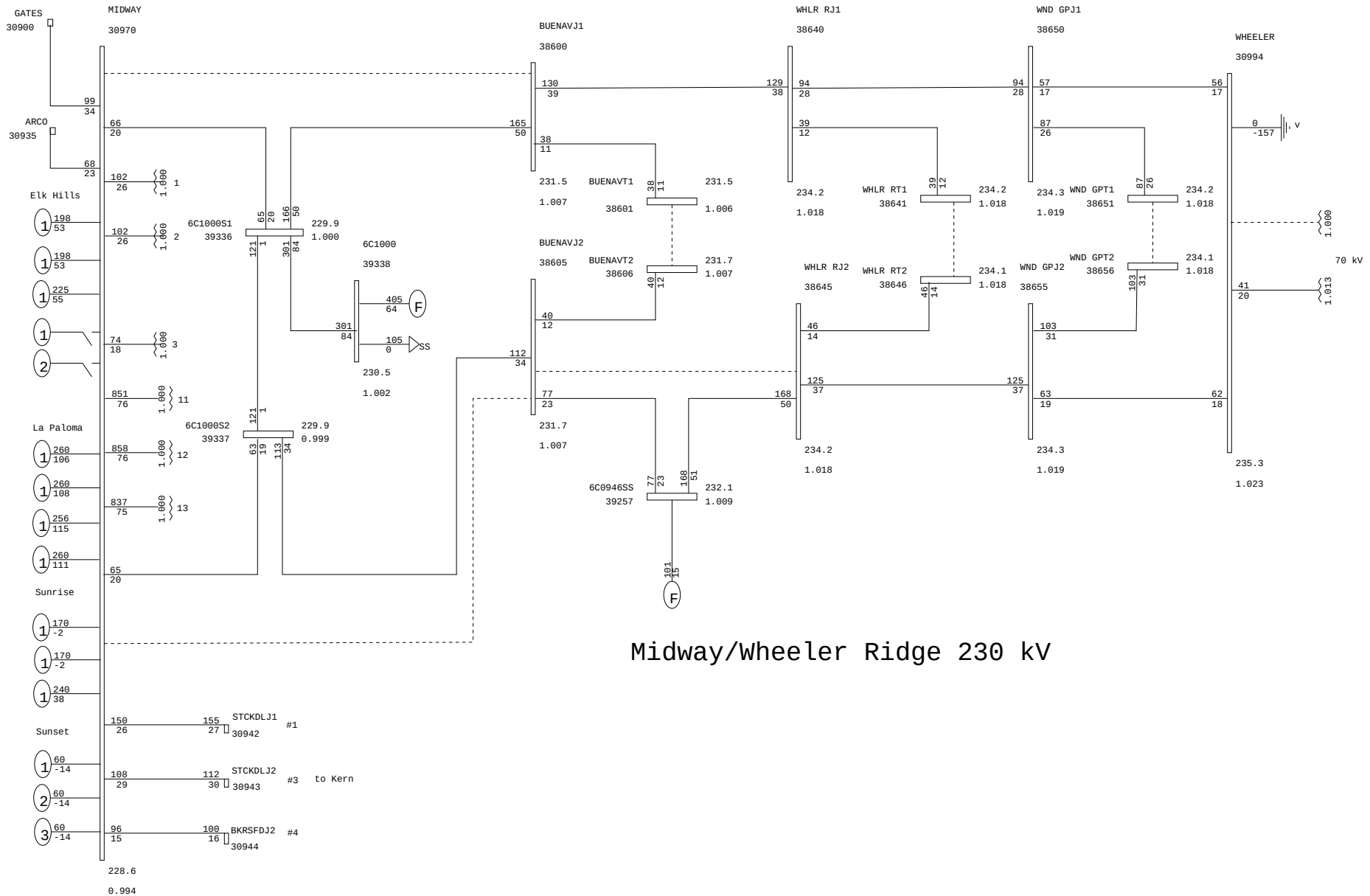
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 122: Base Case Condition - Los Padres Area	MVA/%rate qc6p1_kern_lospadres-and Rating = 1



Midway/Wheeler Ridge 230 kV

General Electric International, Inc. PSLF Program Tue Jan 14 09:36:01 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

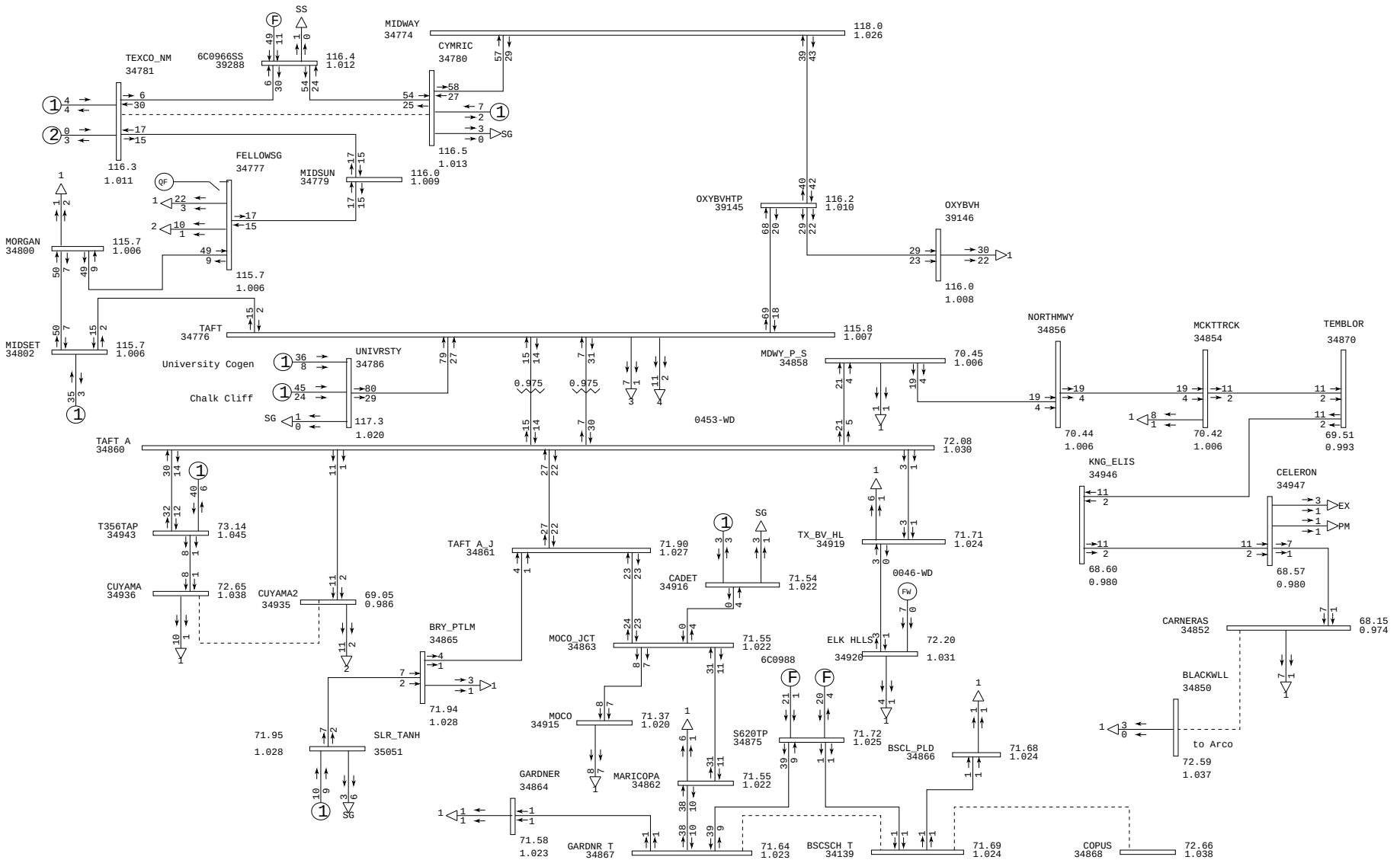
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 123: Base Case Condition - Midway/Wheeler Ridge 230 kV	MW/MVAR qc6p1_kern_midway-wheele Rating = 1



General Electric International, Inc. PSLP Program Tue Jan 14 09:36:02 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

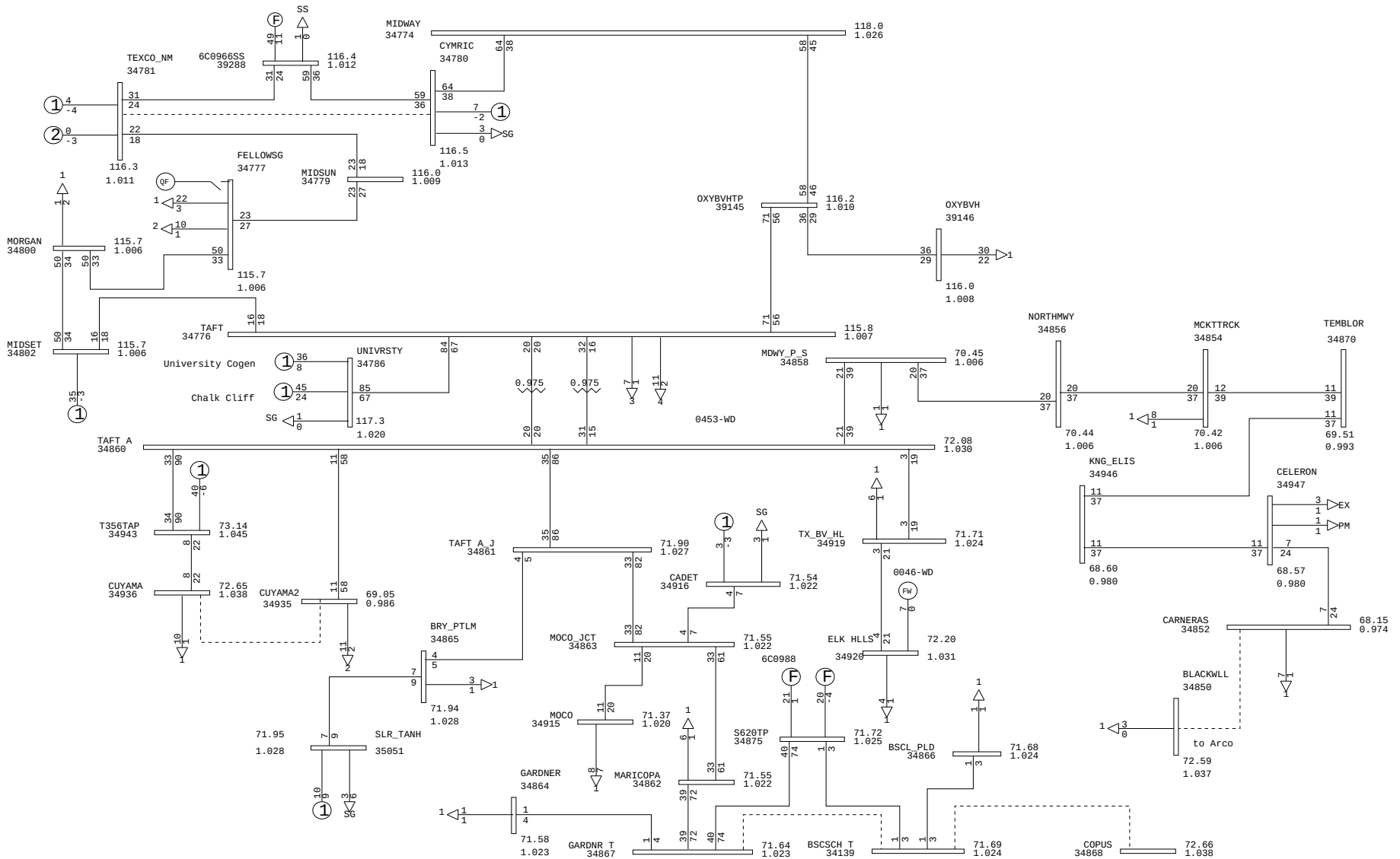
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 124: Base Case Condition - Midway/Wheeler Ridge 230 kV

MVA/%rate
qc6p1_kern_midway-wheele
Rating = 1



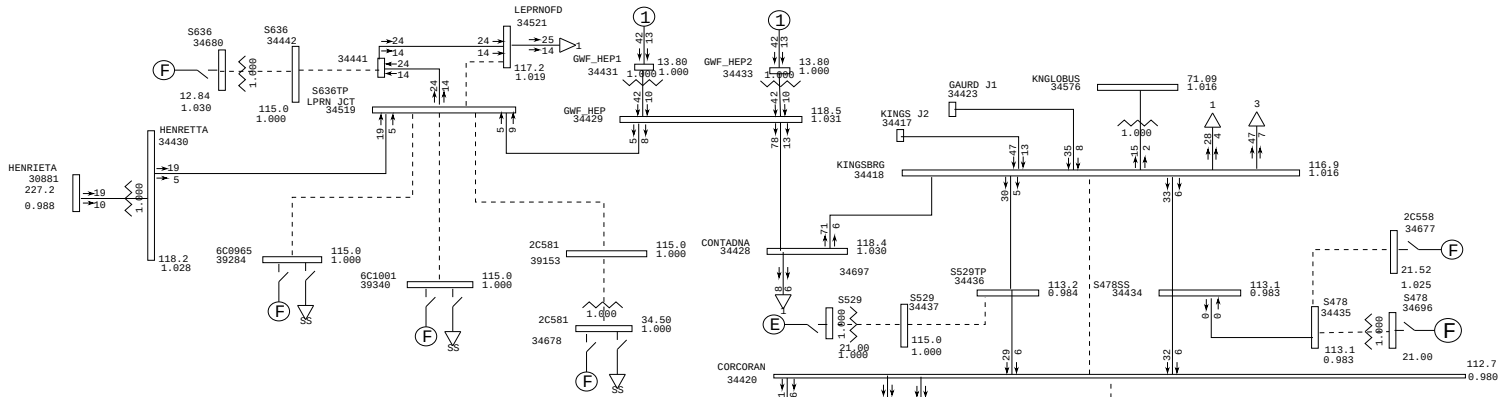
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:02 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 125: Base Case Condition - Taft Area	MW/MVAR qc6p1_kern_taft.drw Rating = 1

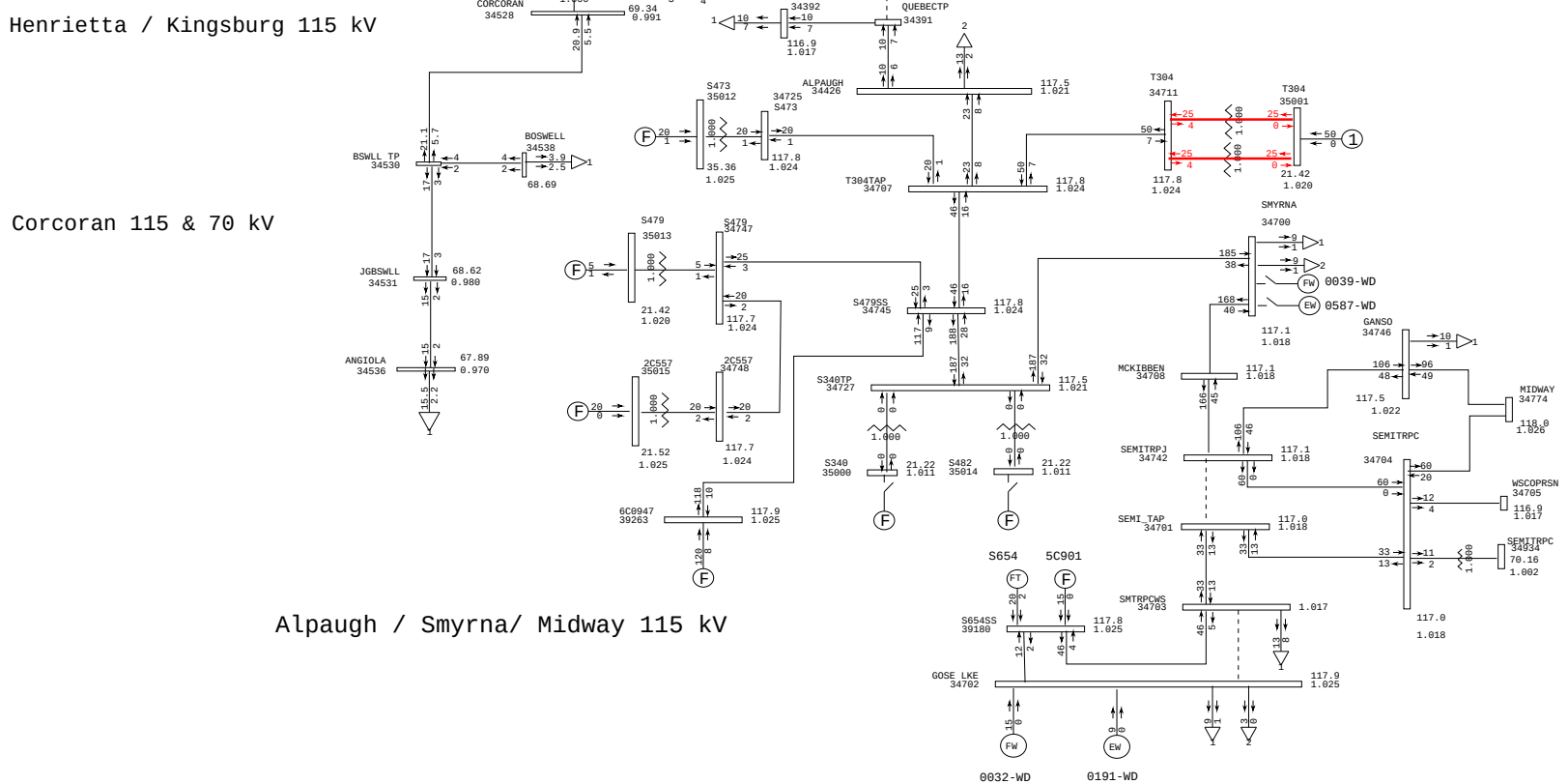


General Electric International, Inc. PSLF Program Tue Jan 14 09:36:02 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 126: Base Case Condition - Taft Area	MVA/%rate qc6p1_kern_taft.drw Rating = 1



Henrietta / Kingsburg 115 kV



Corcoran 115 & 70 kV

Alpaugh / Smyrna/ Midway 115 kV

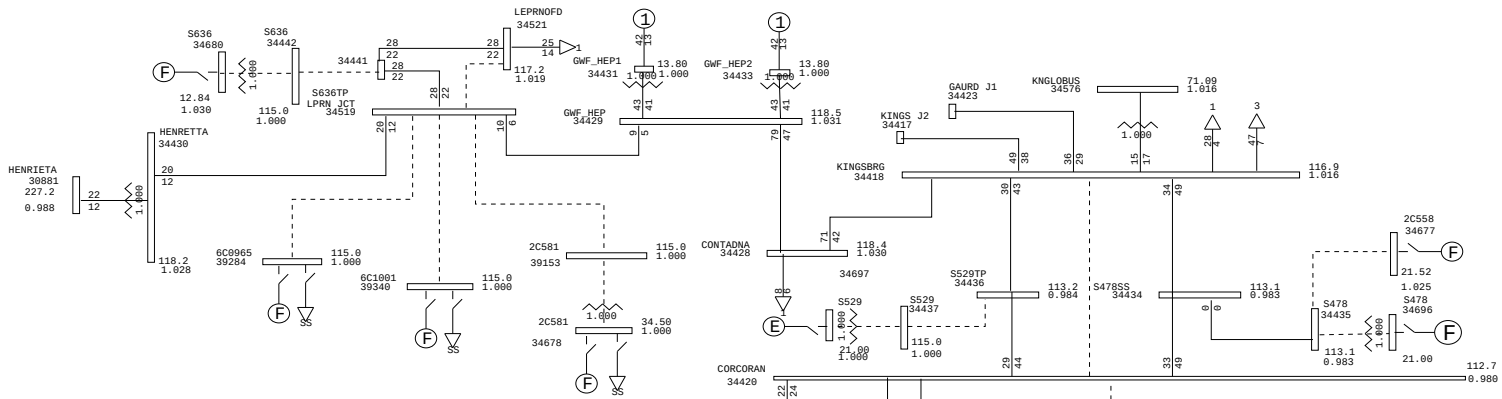
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:02 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 127: Base Case Condition - Kingsburg/Alpaugh 115 kV

MW/MVAR

qc6p1_fsno-kern_kings-al

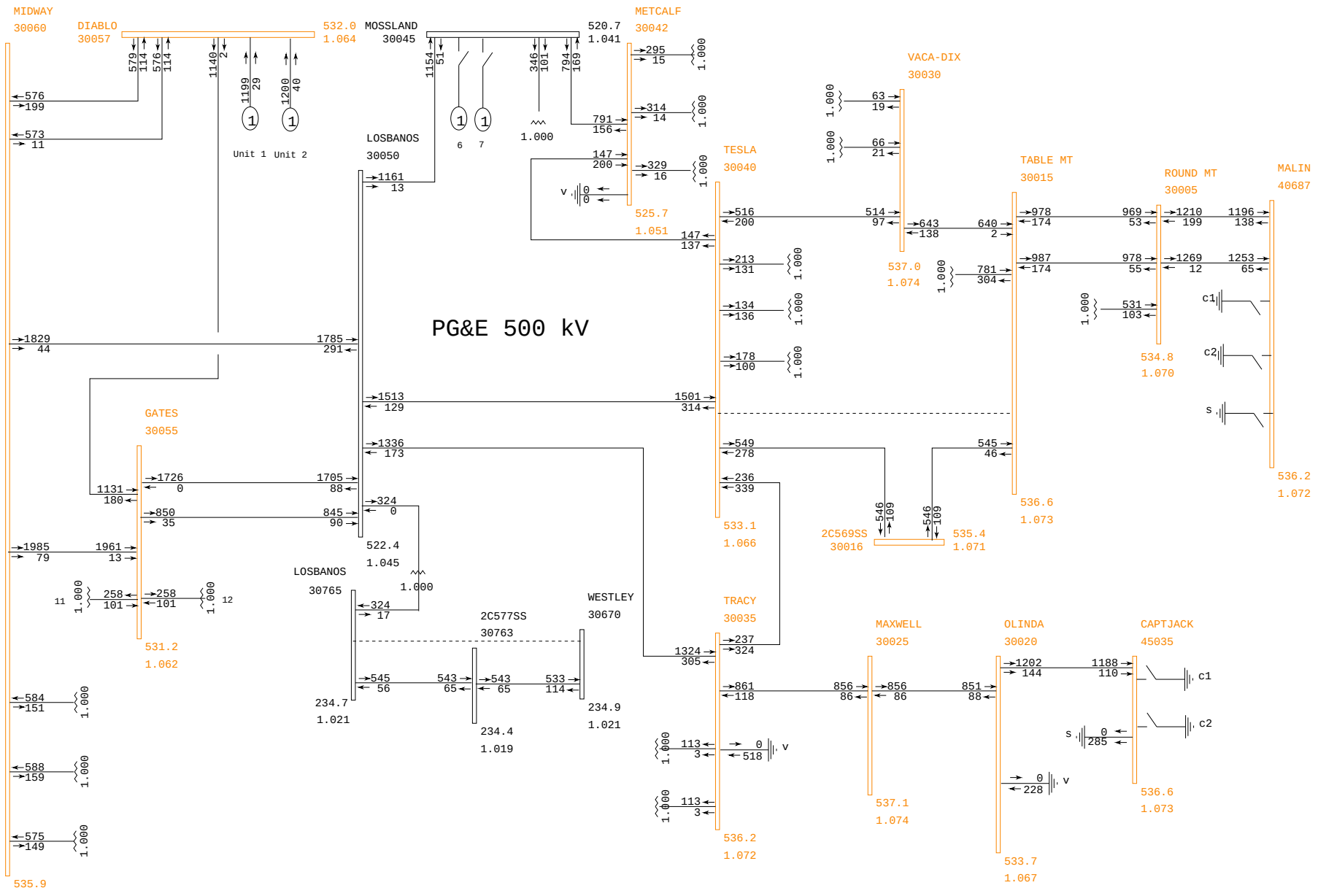
Rating = 1



Alpaugh / Smyrna/ Midway 115 kV

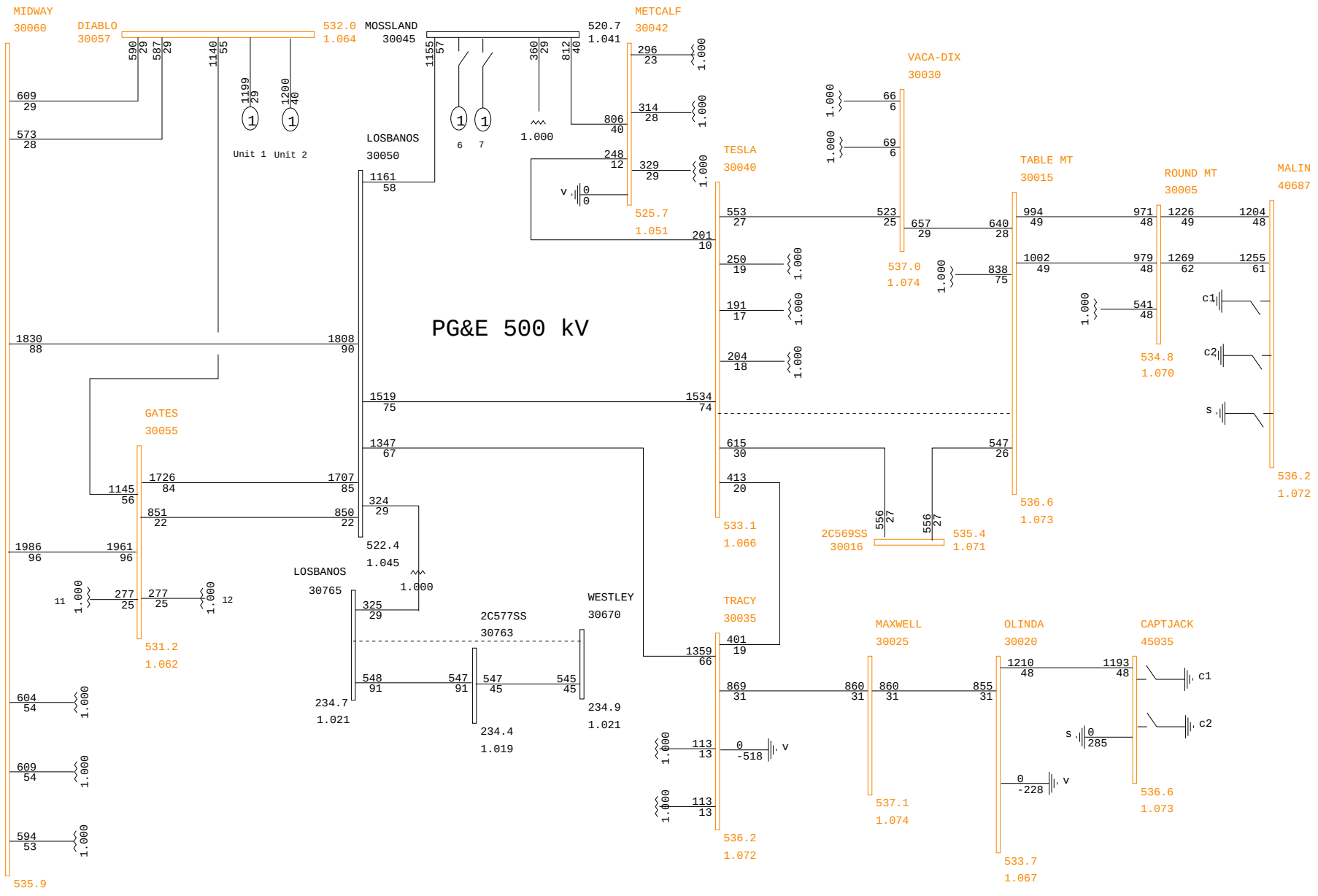
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:03 2014 cases\sumpk\kern\pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 SJVL/Los Padres Summer Peak Main Year (1-in-10 ld) PATH15= 1150 MW(S-N) PATH26= 3993 MW(N-S) PDCI= 2801 MW(N-S) COI= 4796 MW(N-S) PG&E qc6p1 18sumpkmy Fresno Area pst-project case weo r8b3 m1	Plot 128: Base Case Condition - Kingsburg/Alpaugh 115 kV	MVA/%rate qc6p1_fsno-kern_kings-al Rating = 1



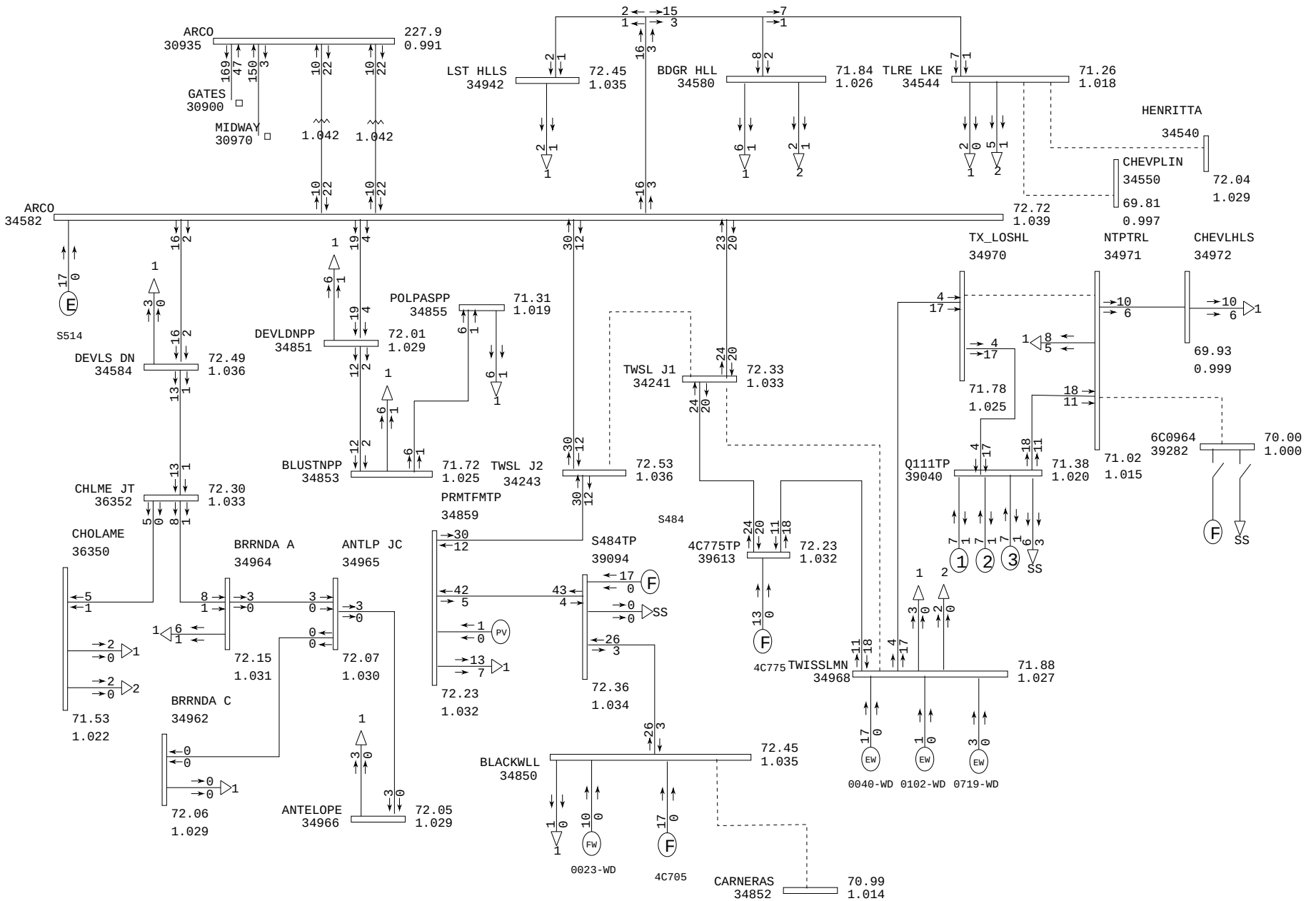
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:03 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 129: Base Case Condition - PG&E 500 kV	MW/MVAR qc6p1_500kV.drw Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:03 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

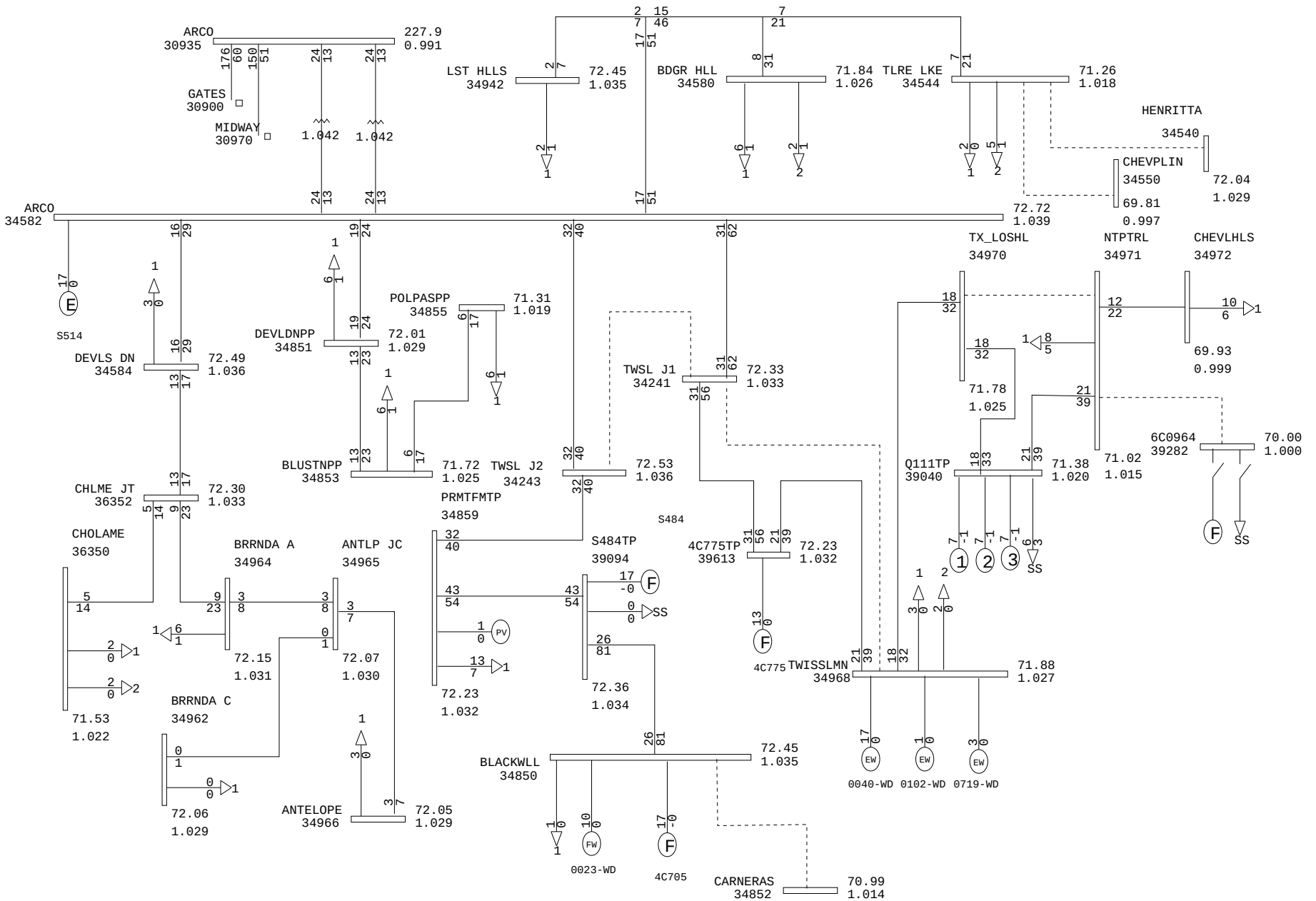
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 130: Base Case Condition - PG&E 500 kV	MVA/%rate qc6p1_500kV.drw Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:04 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

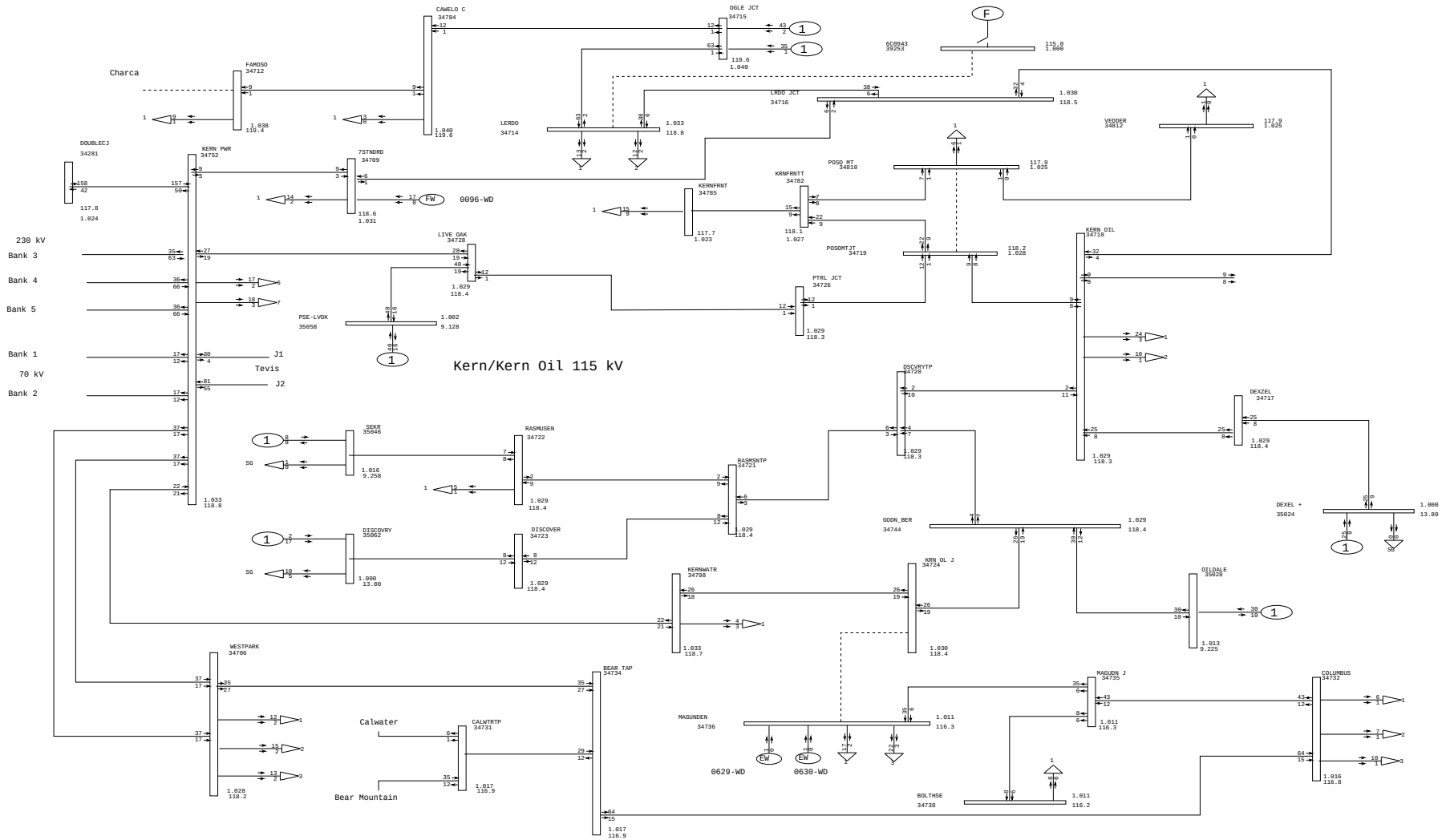
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 131: Base Case Condition - Arco 70 kV

MW/MVAR
qc6p1_kern_arco70kV.drw
Rating = 1



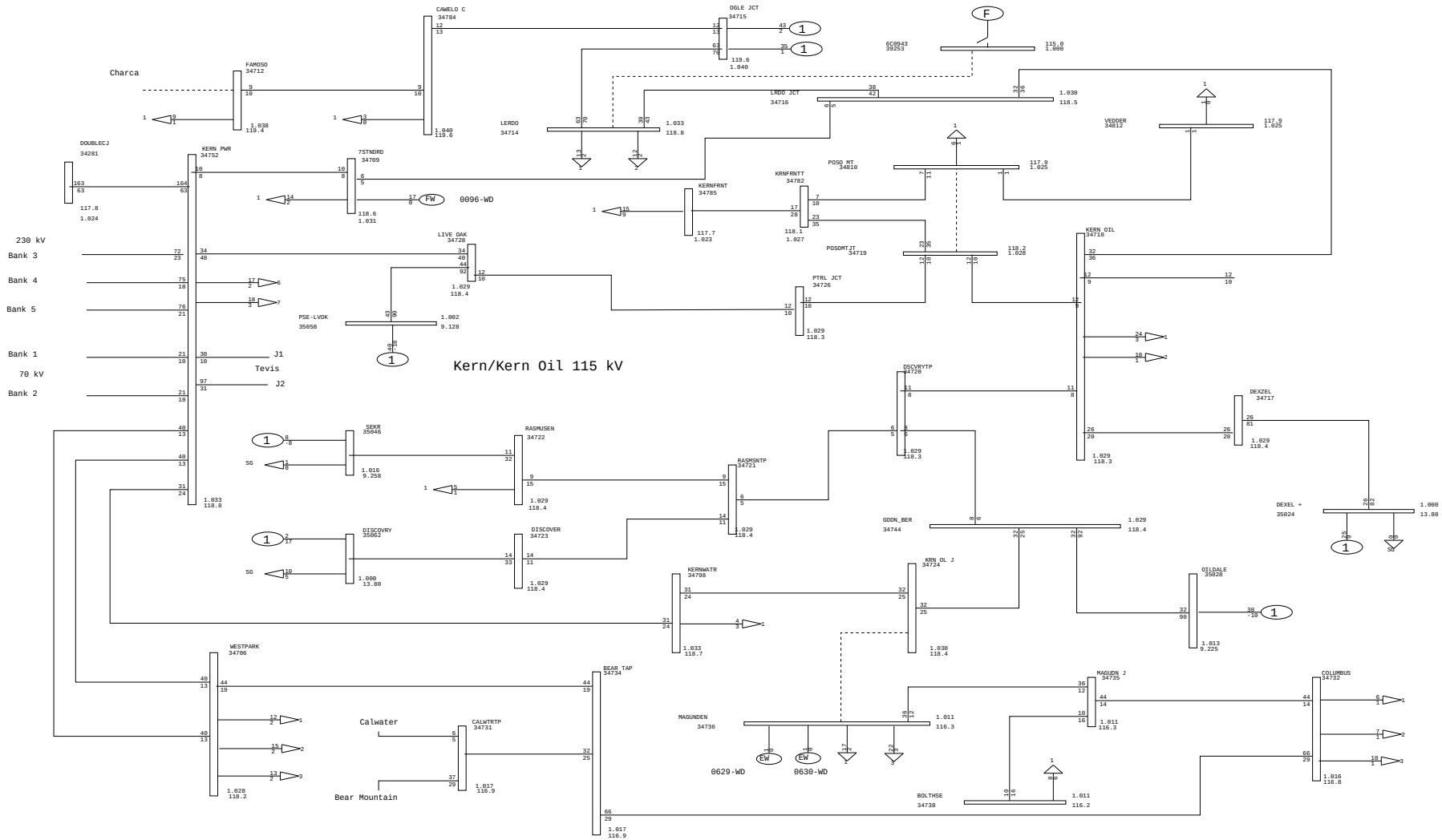
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:04 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 132: Base Case Condition - Arco 70 kV	MVA/%rate qc6p1_kern_arco70kV.drw Rating = 1



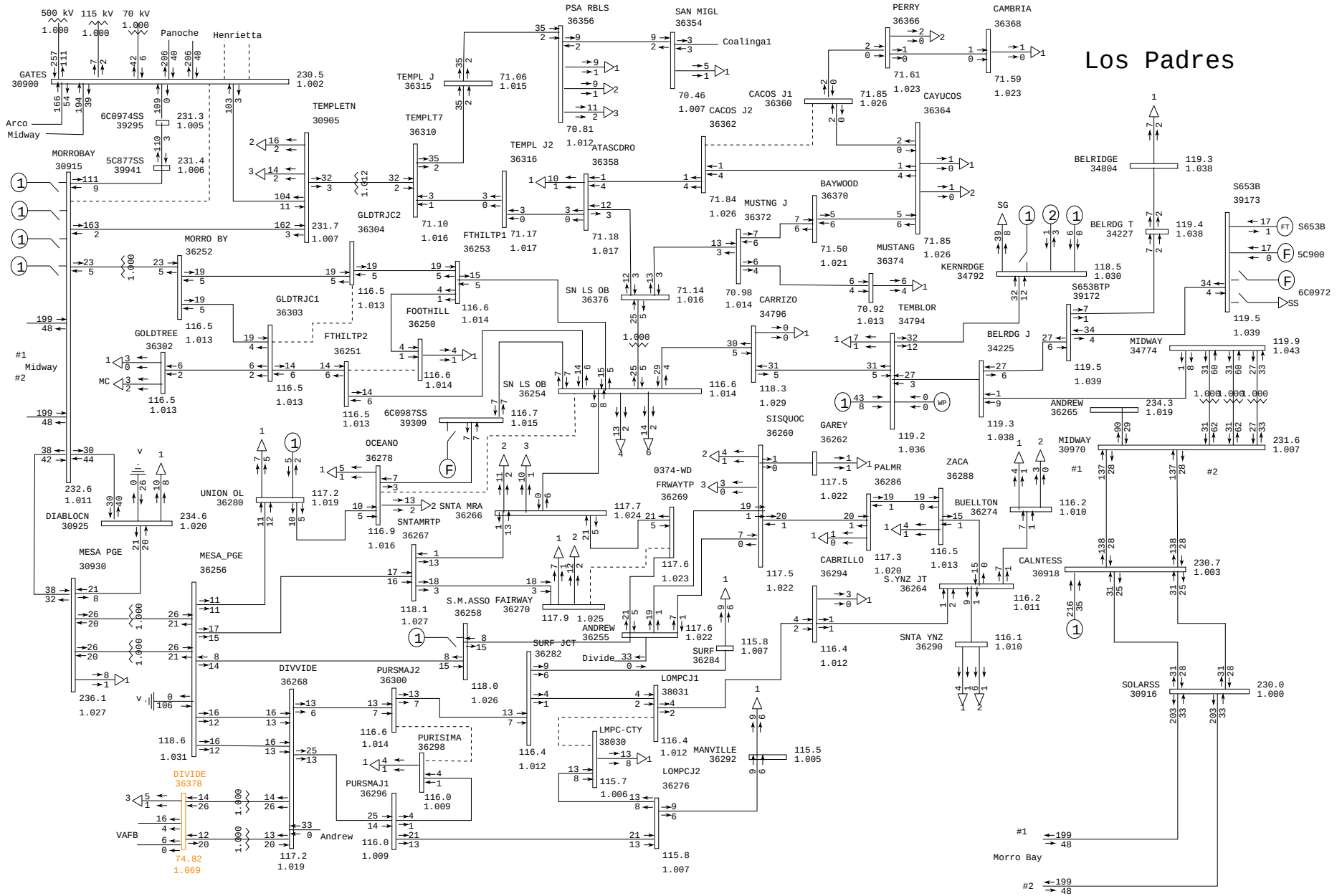
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 133: Base Case Condition - Kern Oil 115 kV	MW/MVAR qc6p1_kern_kernoil115kV. Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:04 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 134: Base Case Condition - Kern Oil 115 kV	MVA/%rate qc6p1_kern_kernoil115kV. Rating = 1



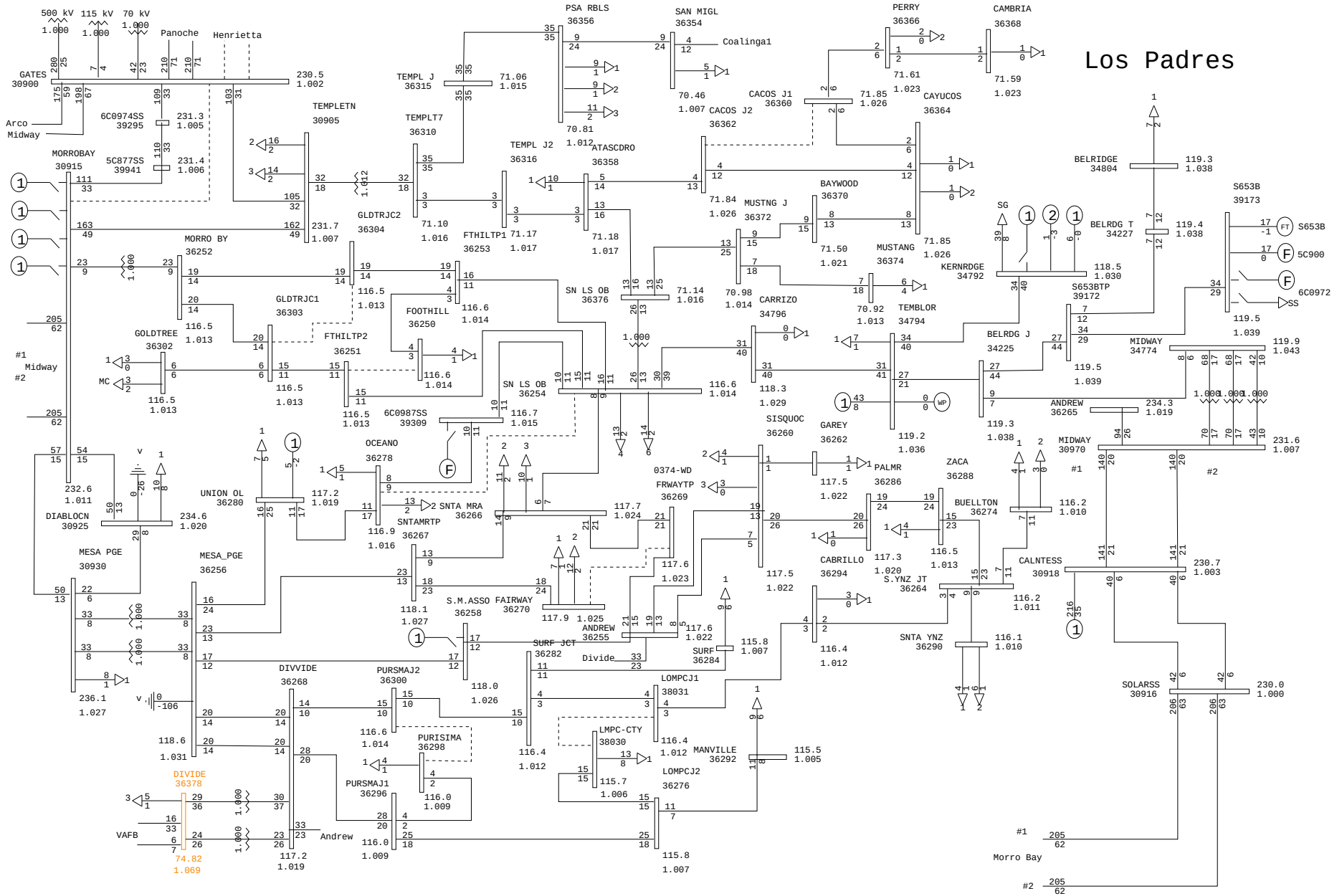
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 135: Base Case Condition - Los Padres Area

MW/MVAR

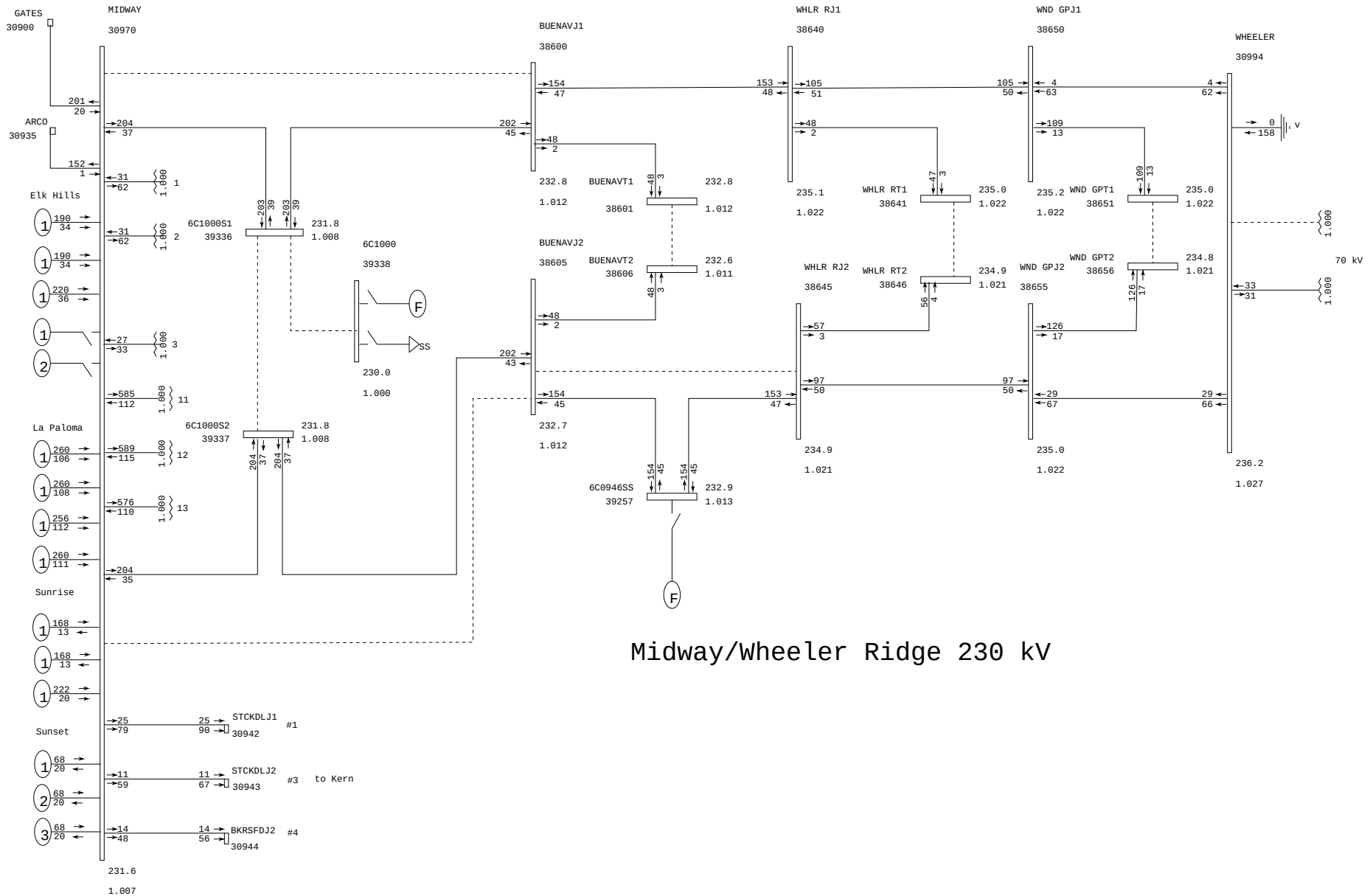
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Rating = 1



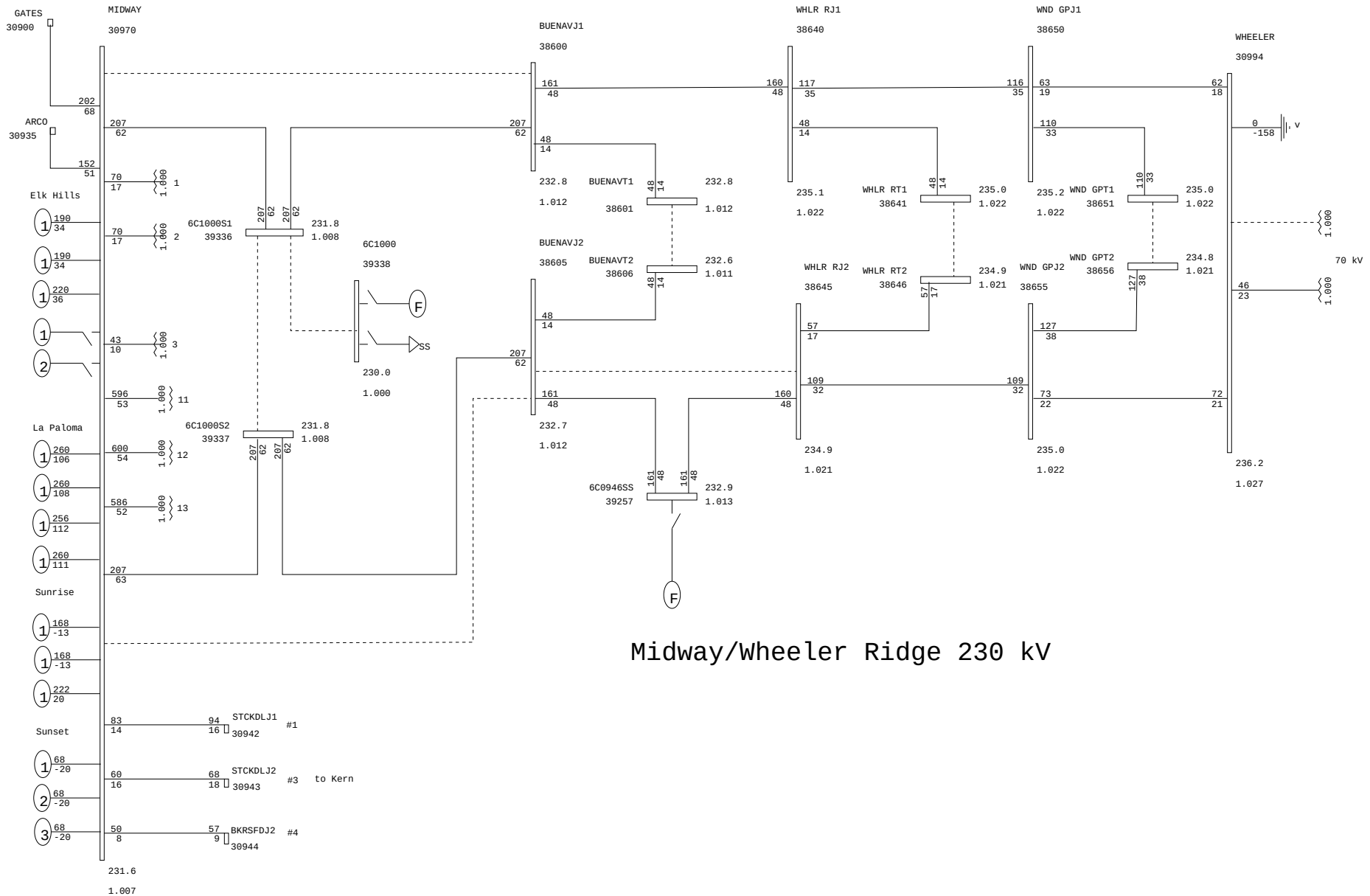
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Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(S-N) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 136: Base Case Condition - Los Padres Area	MVA/%rate qc6p1_kern_lospadres-and Rating = 1



General Electric International, Inc. PSLP Program Tue Jan 14 09:36:05 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

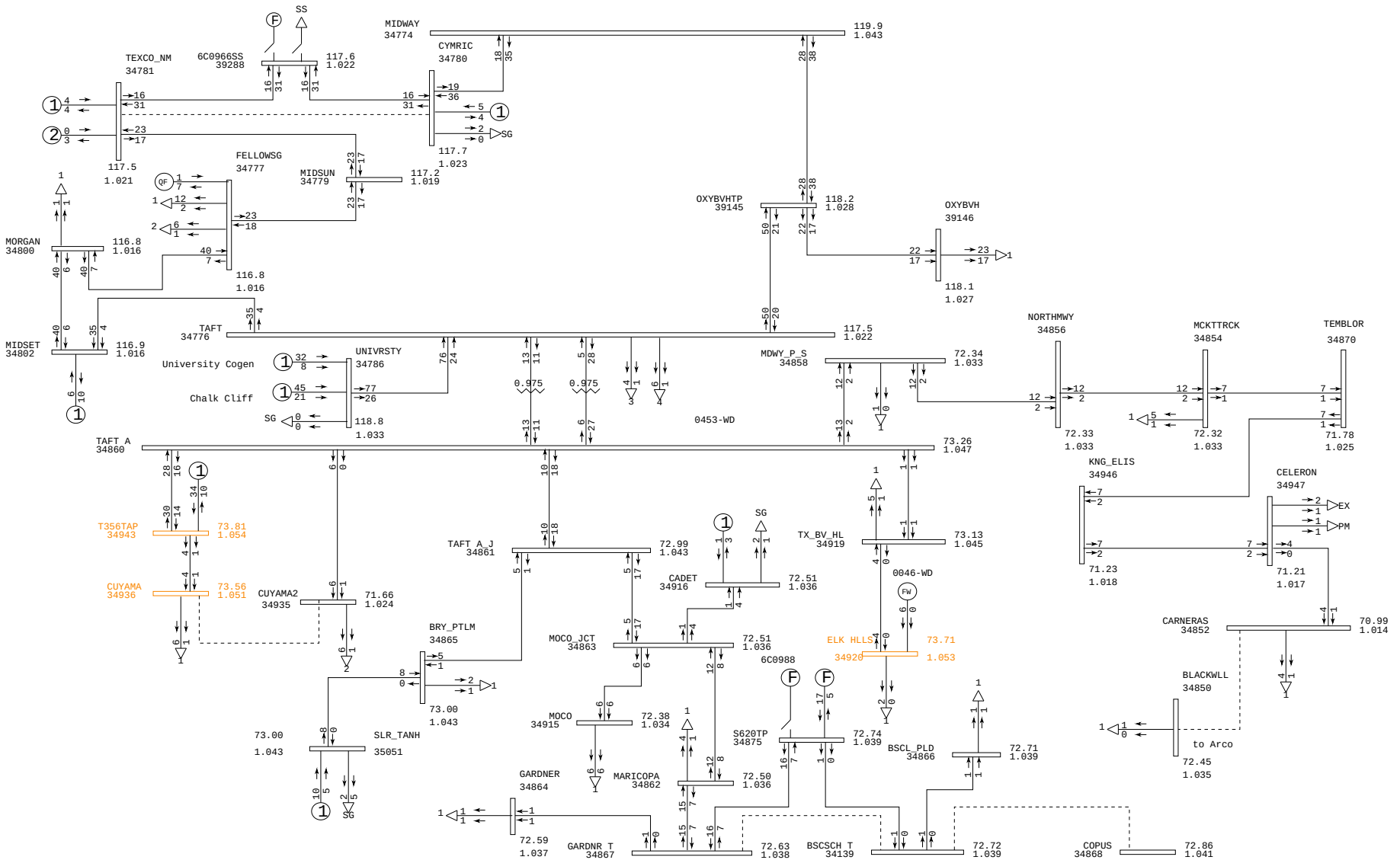
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 137: Base Case Condition - Midway/Wheeler Ridge 230 kV	MW/MVAR qc6p1_kern_midway-wheele Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:05 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

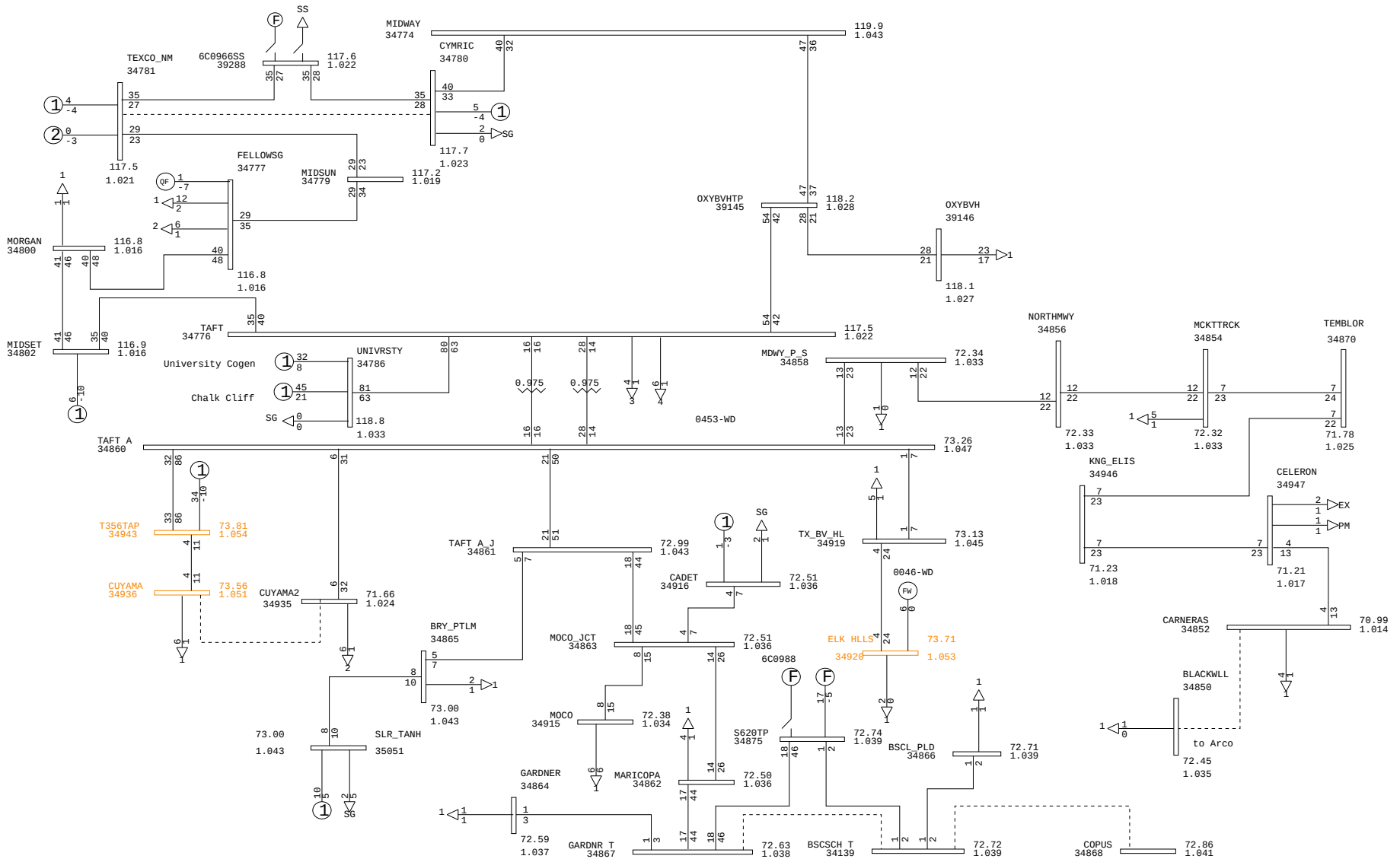
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 138: Base Case Condition - Midway/Wheeler Ridge 230 kV

MVA/%rate
qc6p1_kern_midway-wheele
Rating = 1



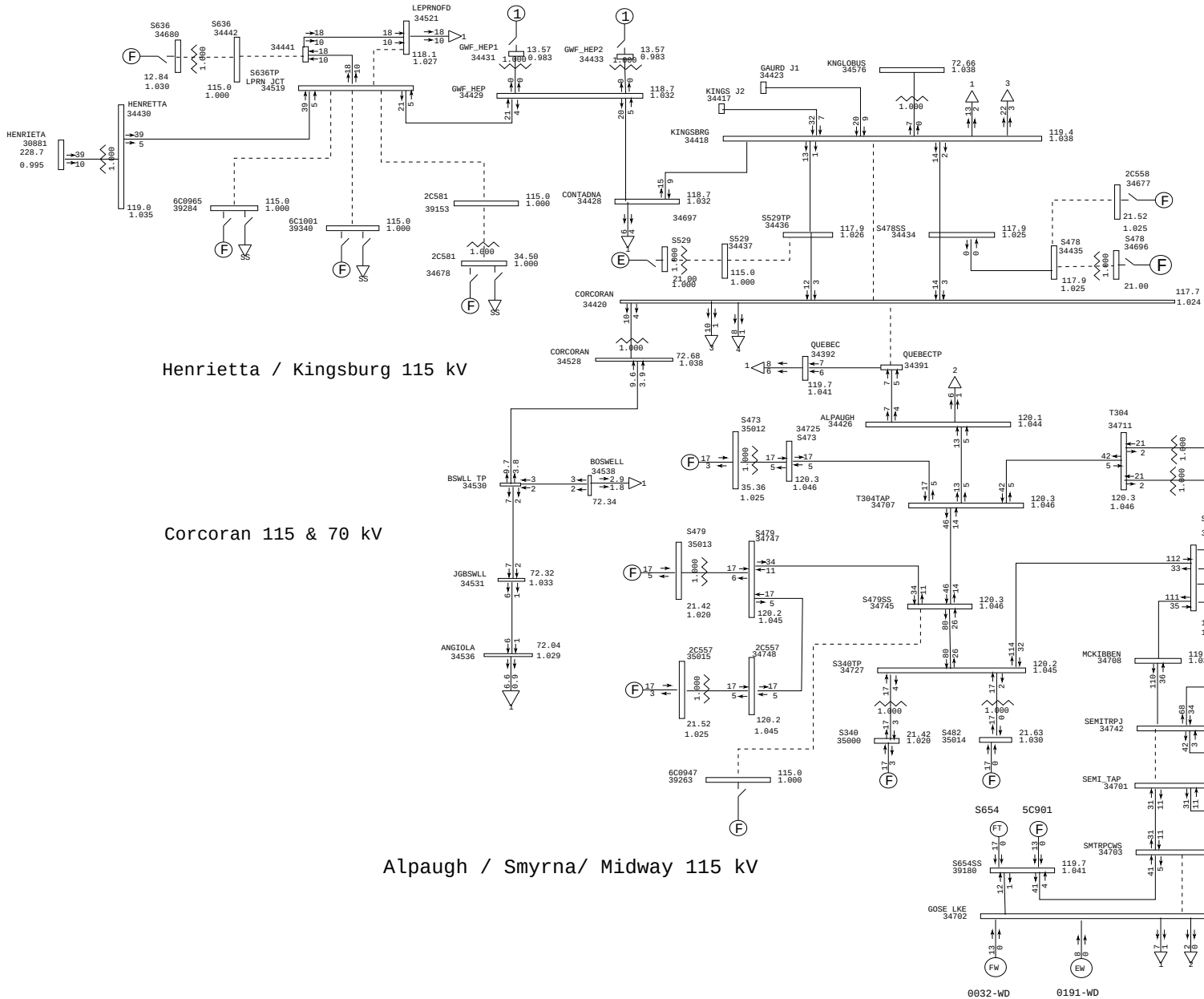
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:06 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 139: Base Case Condition - Taft Area	MW/MVAR qc6p1_kern_taft.drw Rating = 1



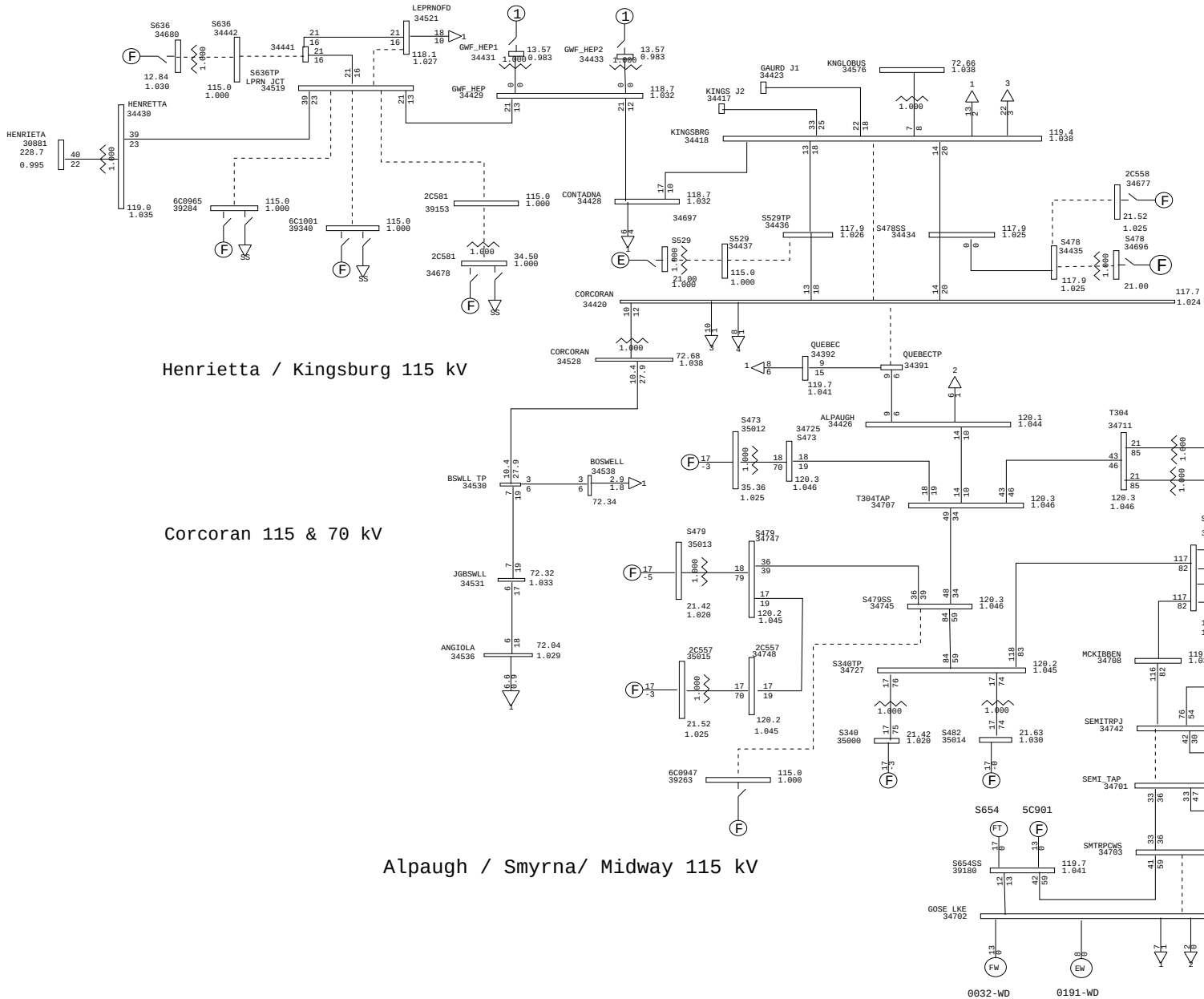
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:06 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 140: Base Case Condition - Taft Area	MVA/%rate qc6p1_kern_taft.drw Rating = 1



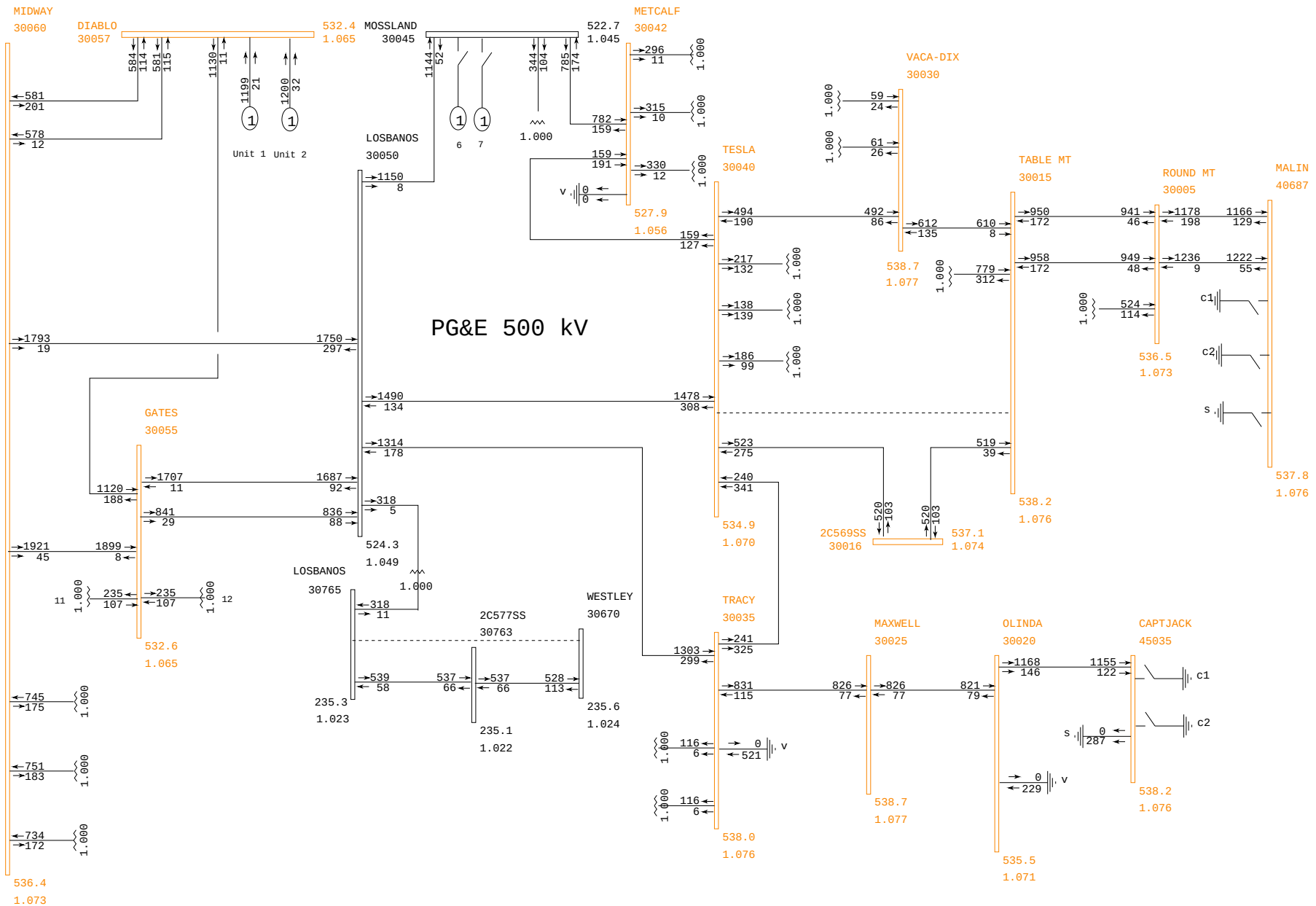
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:06 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 141: Base Case Condition - Kingsburg/Alpaugh 115 kV	MW/MVAR qc6p1_fsno-kern_kings-al Rating = 1



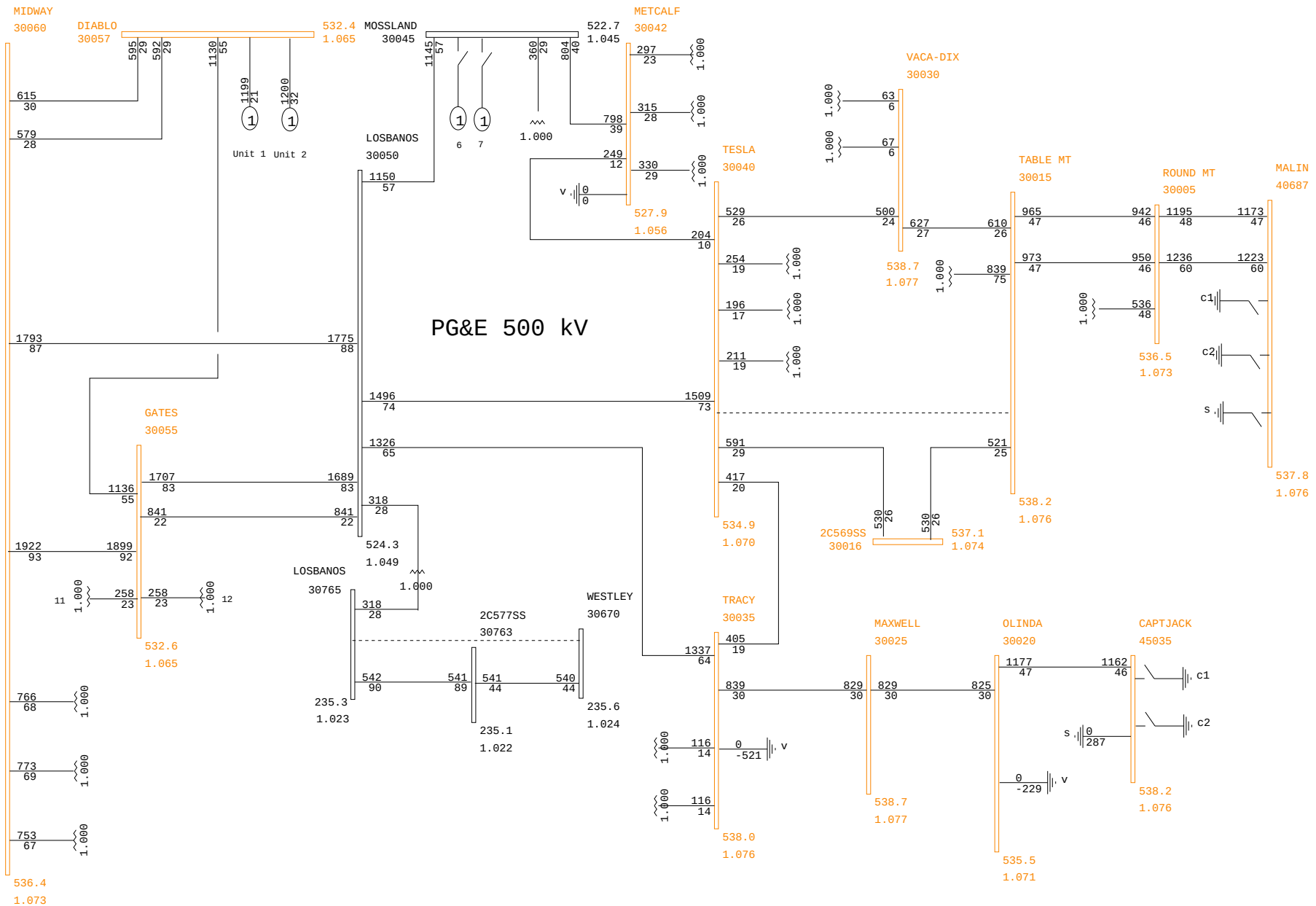
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:06 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pre-r8b3.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5367 MW(S-N) PATH26= -917 MW(N-S) PDCI= -0 MW(N-S) COI=-3637 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pre-project case weo r8b3	Plot 142: Base Case Condition - Kingsburg/Alpaugh 115 kV	MVA/%rate qc6p1_fsno-kern_kings-al Rating = 1



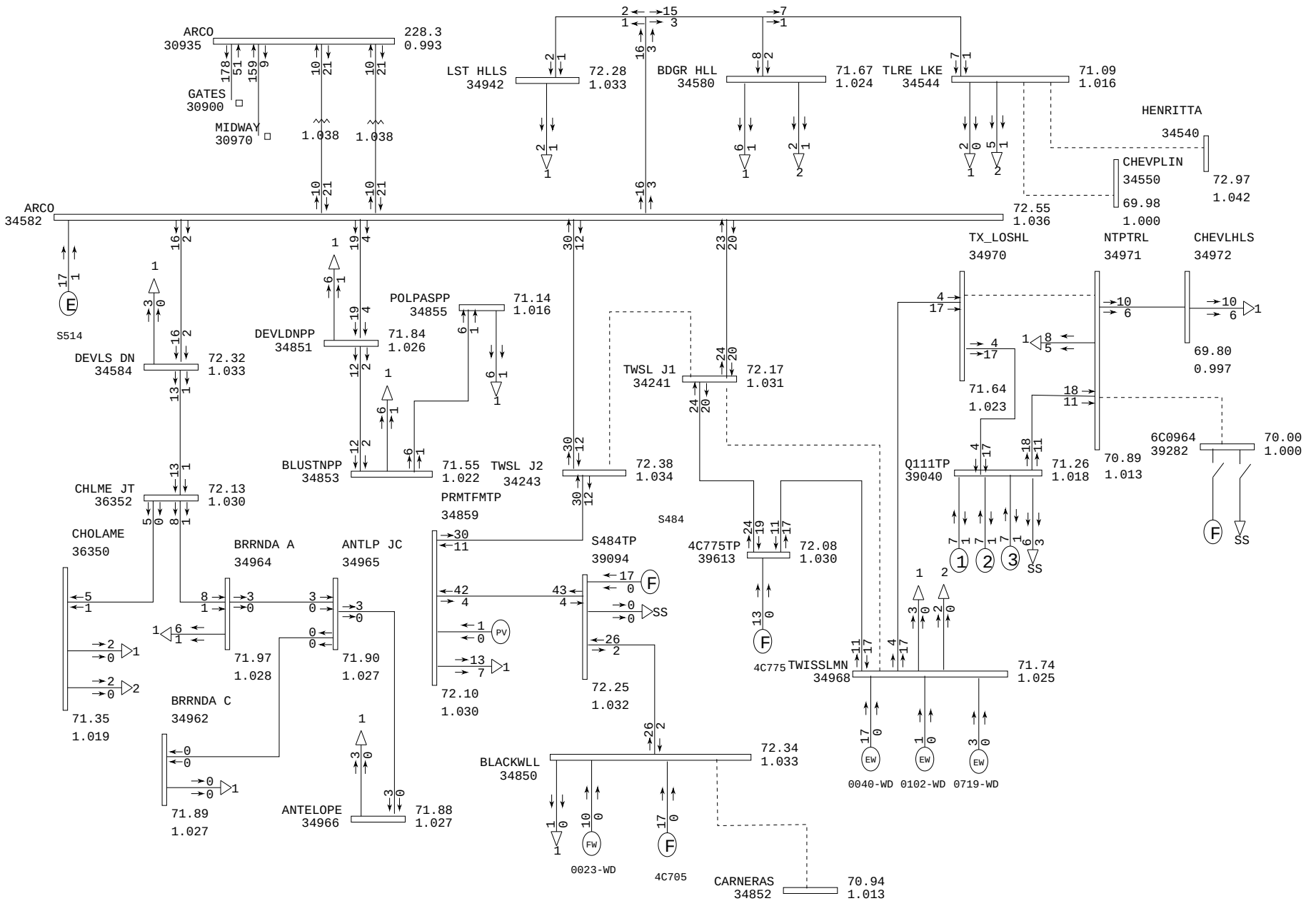
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:07 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 143: Base Case Condition - PG&E 500 kV	MW/MVAR qc6p1_500kV.drw Rating = 1



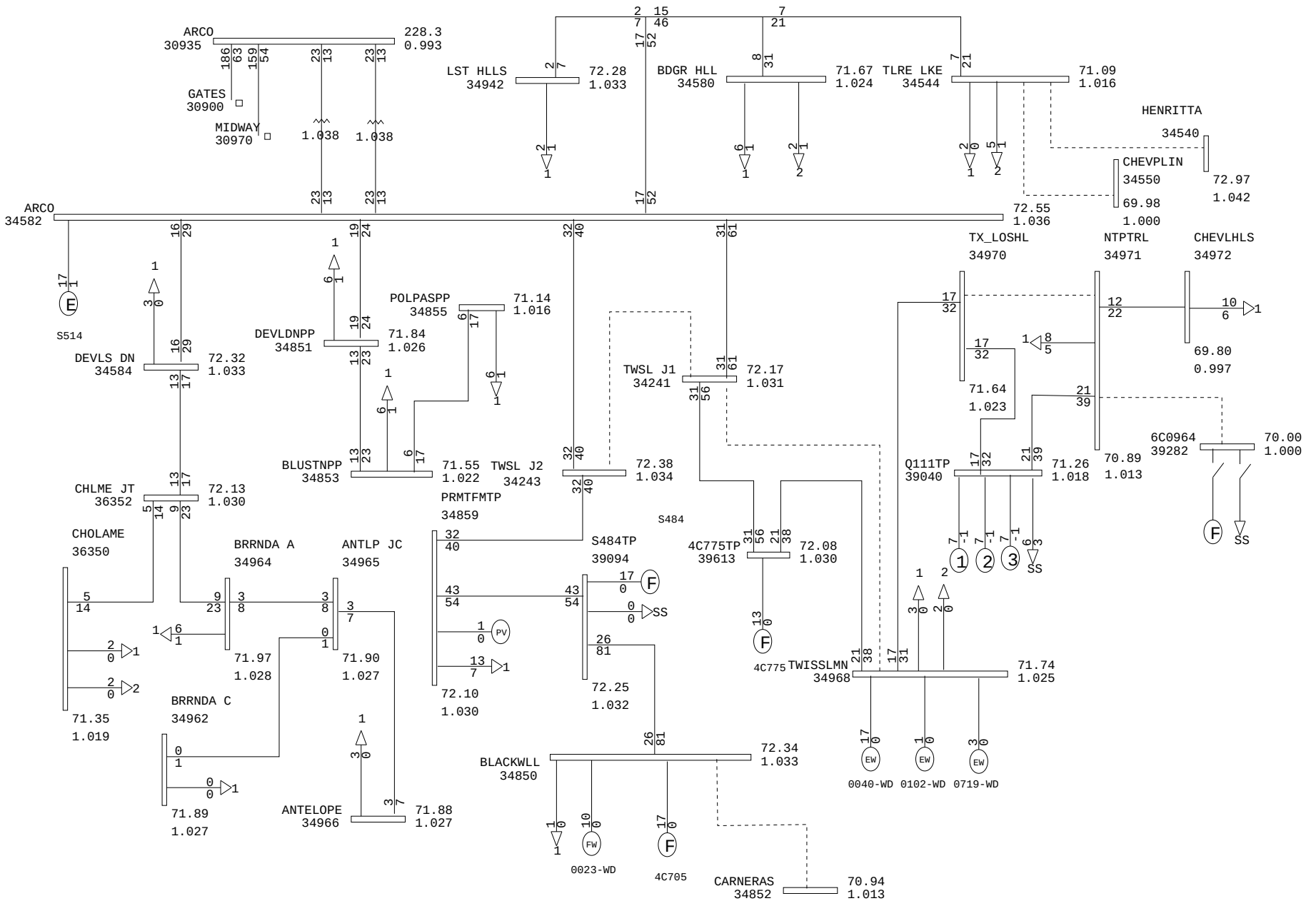
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:07 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 144: Base Case Condition - PG&E 500 kV	MVA/%rate qc6p1_500kV.drw Rating = 1



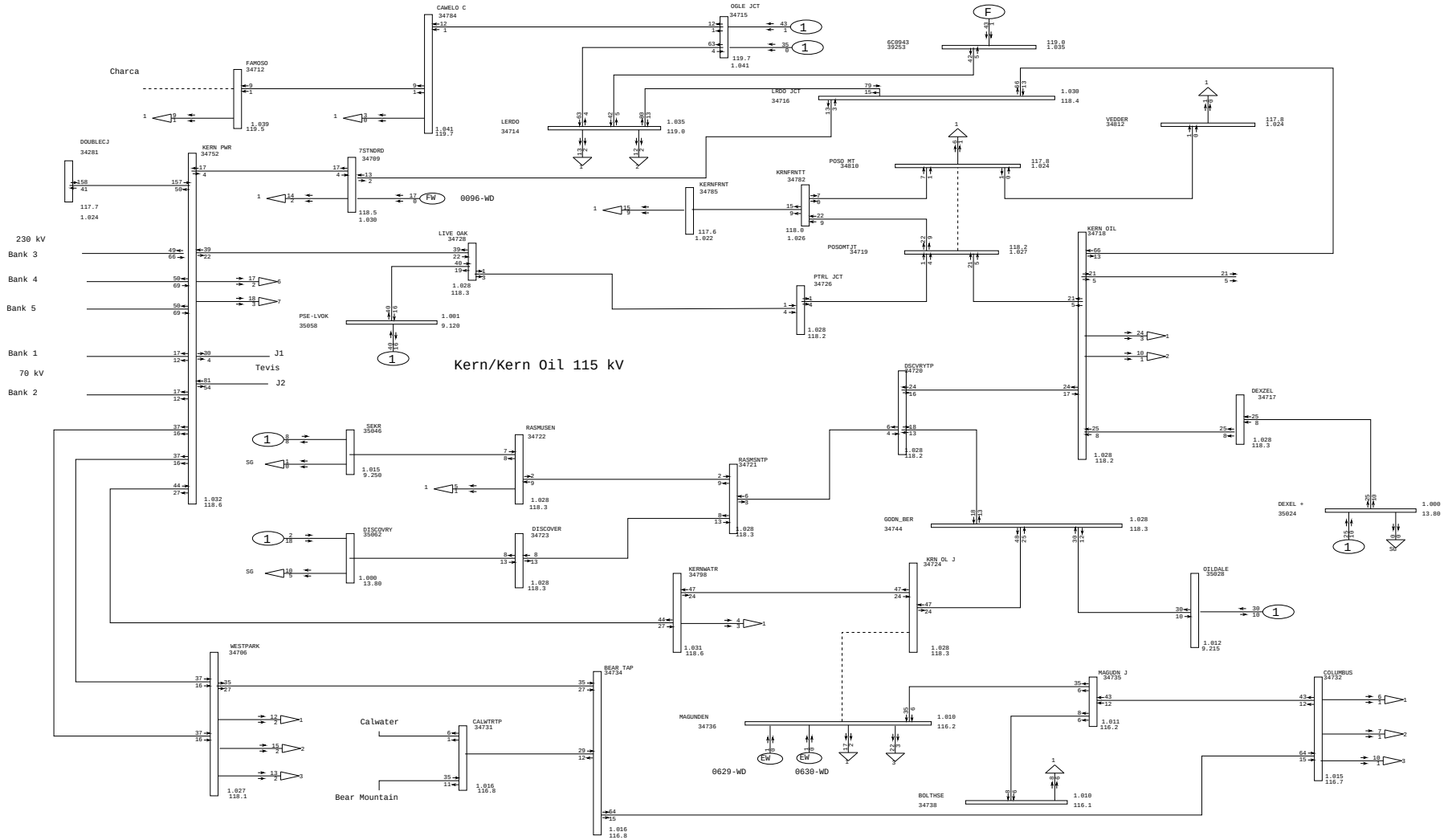
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:07 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 145: Base Case Condition - Arco 70 kV	MW/MVAR qc6p1_kern_arco70kV.drw Rating = 1



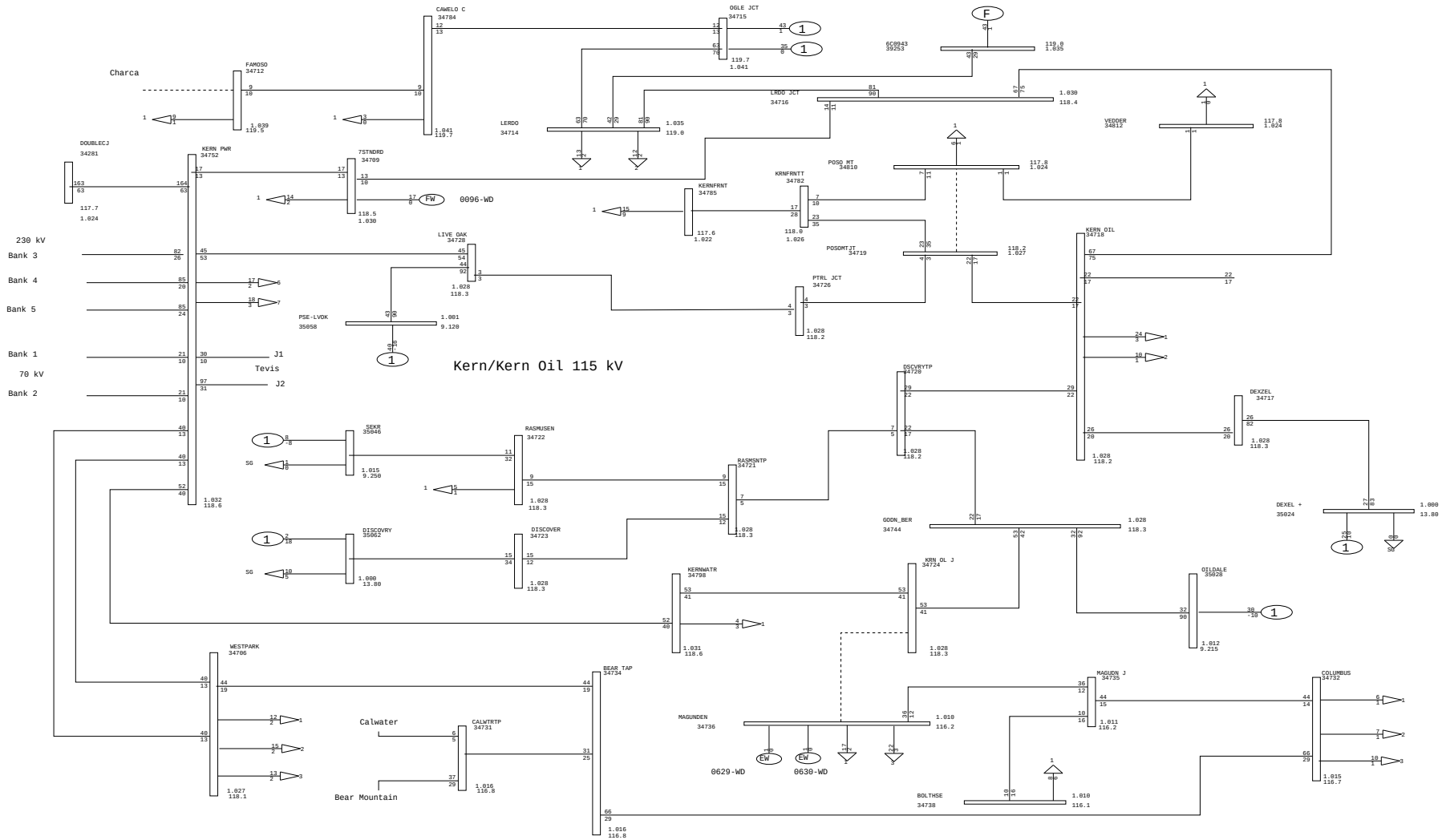
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:08 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 146: Base Case Condition - Arco 70 kV	MVA/%rate qc6p1_kern_arco70kV.drw Rating = 1



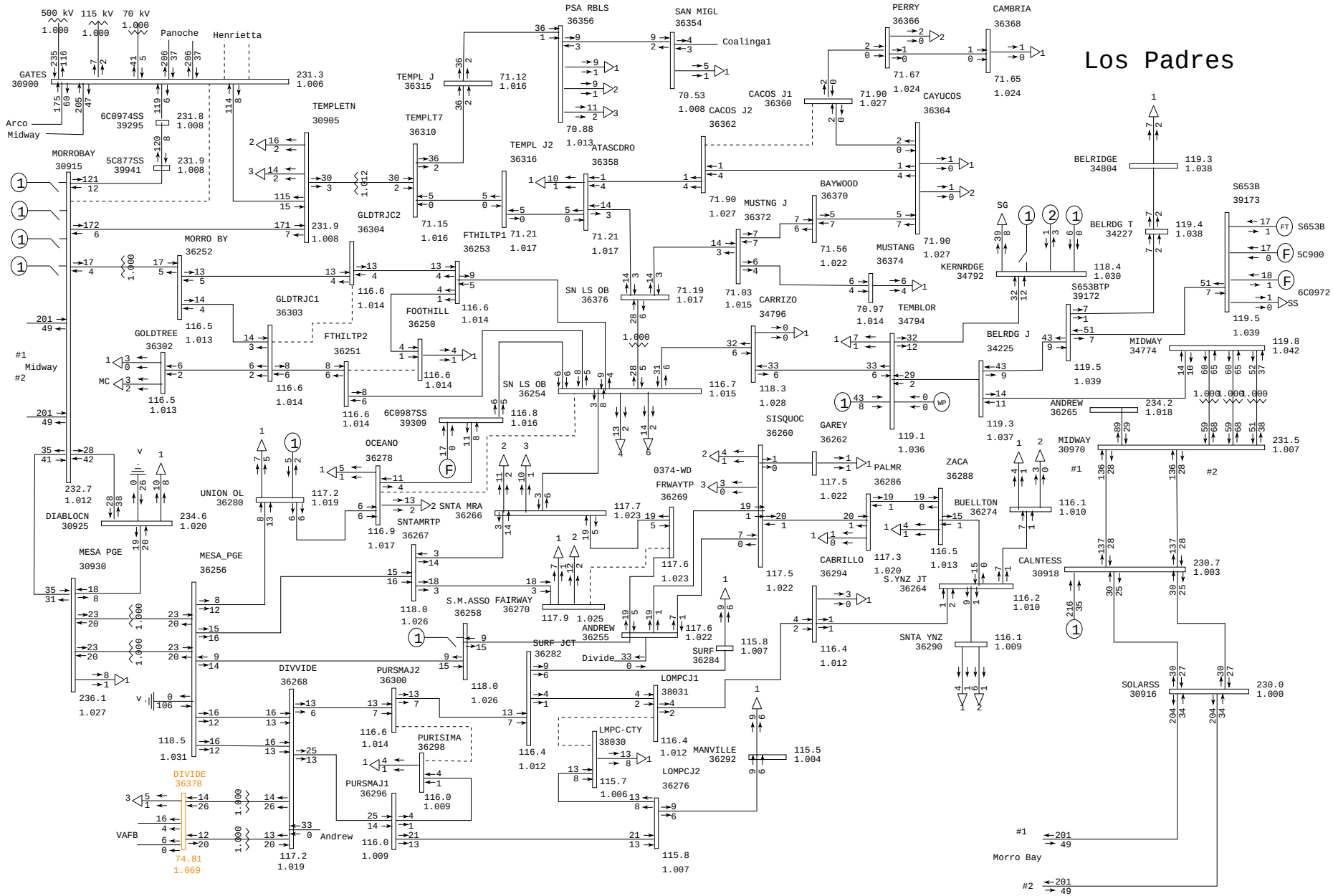
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:08 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 147: Base Case Condition - Kern Oil 115 kV	MW/MVAR qc6p1_kern_kernoil115kV. Rating = 1



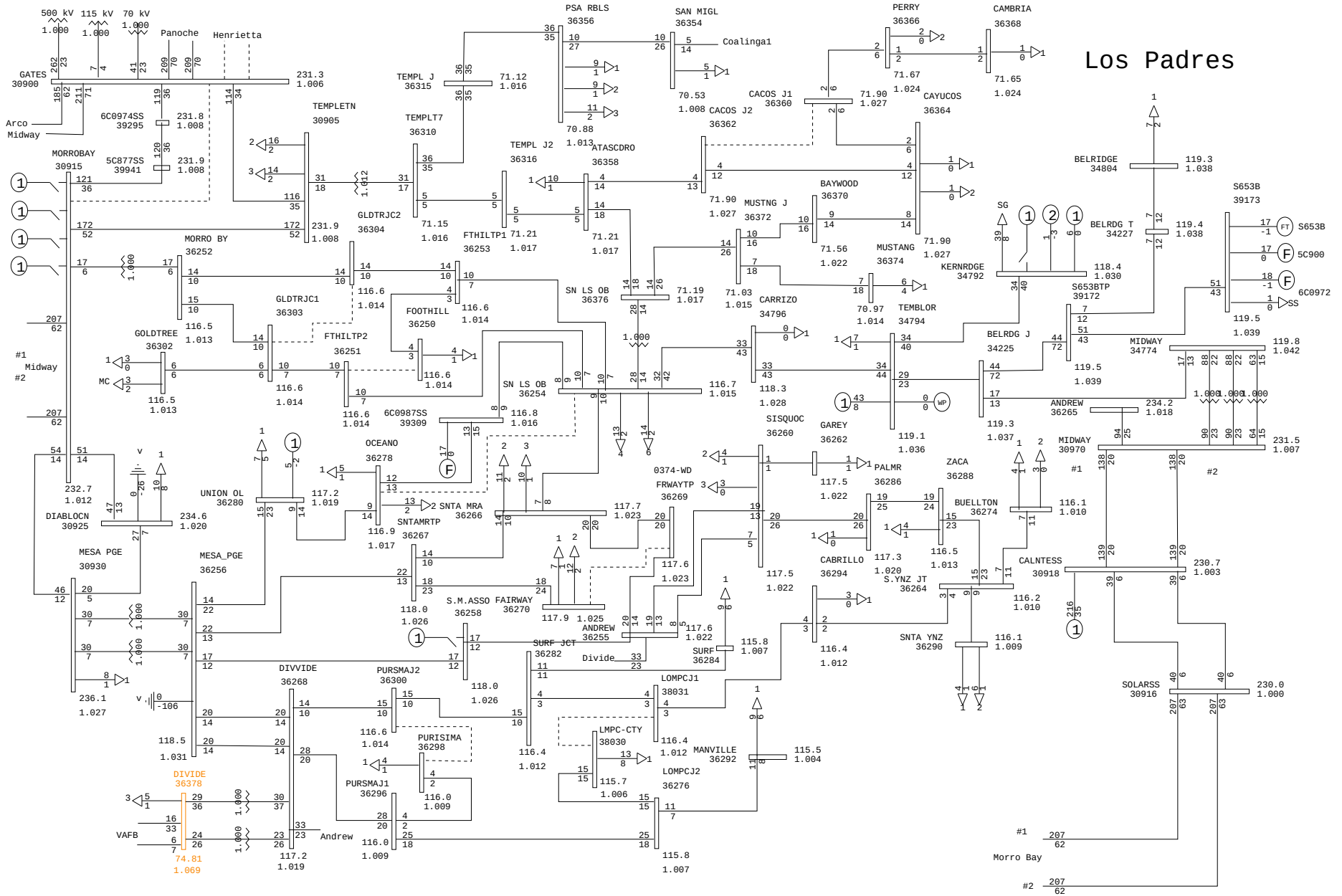
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:08 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 148: Base Case Condition - Kern Oil 115 kV	MVA/%rate qc6p1_kern_kernoil115kV. Rating = 1



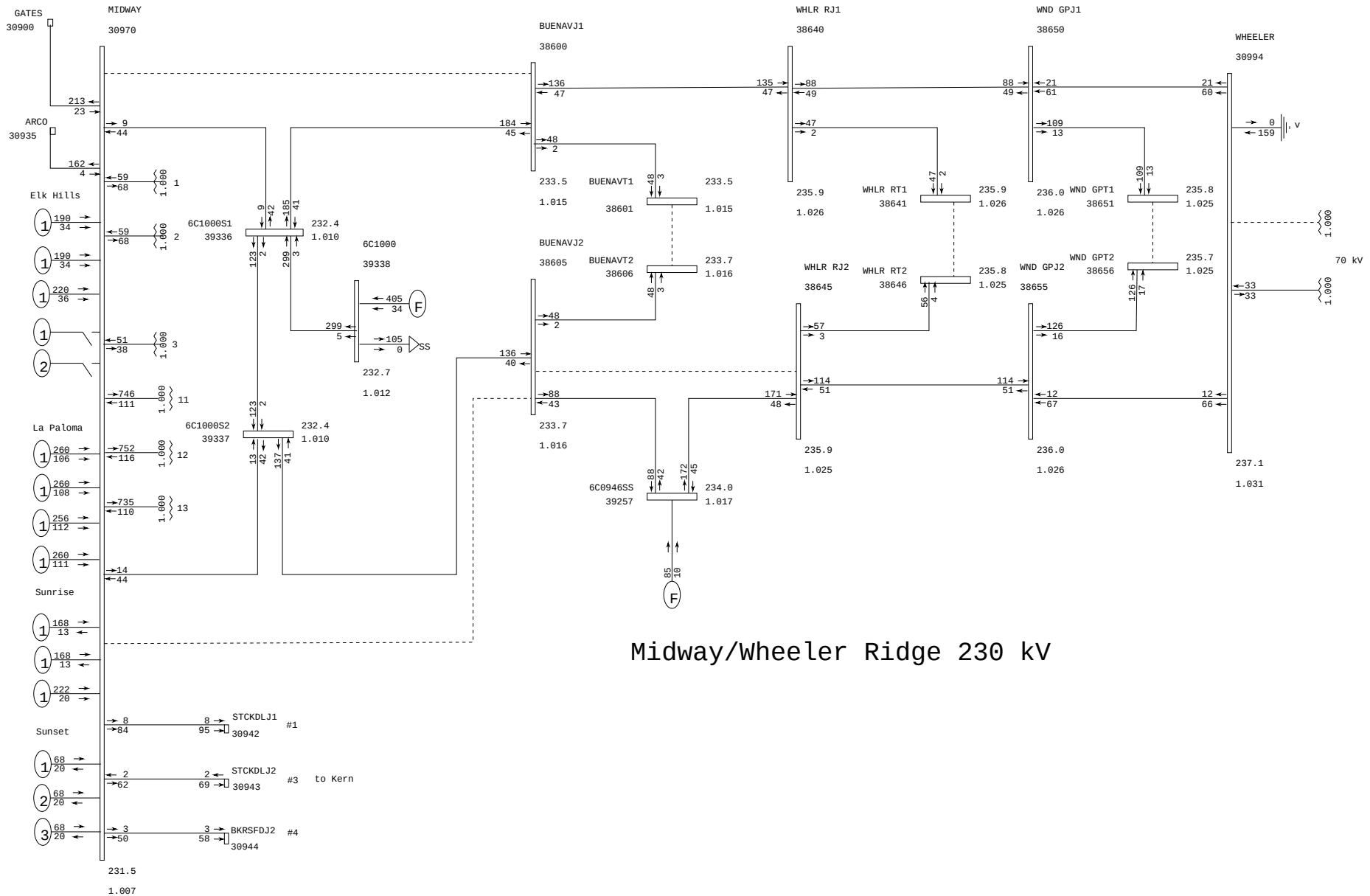
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:08 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 149: Base Case Condition - Los Padres Area	MW/MVAR qc6p1_kern_lospadres-and Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:09 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

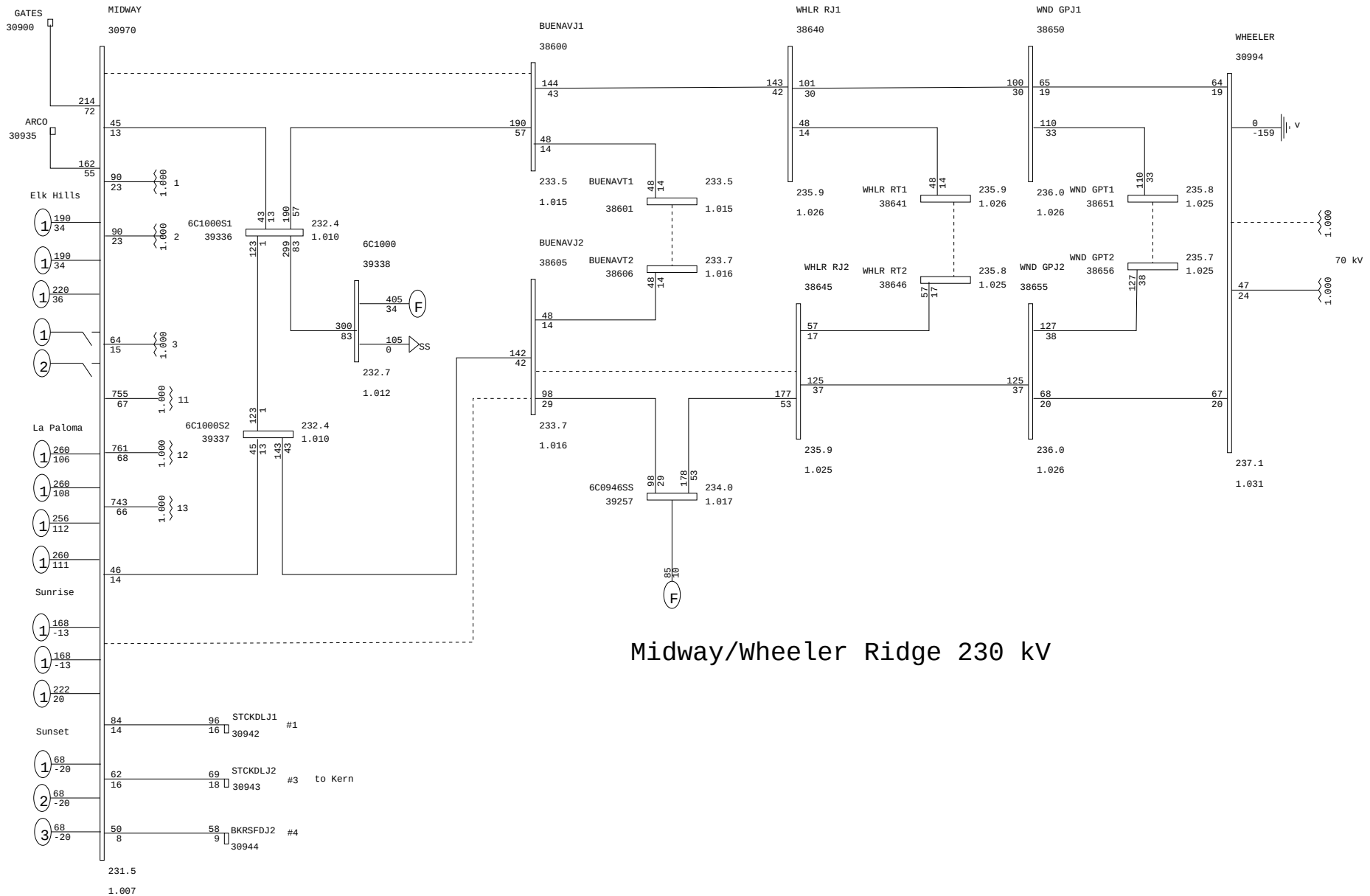
Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 150: Base Case Condition - Los Padres Area	MVA/%rate qc6p1_kern_lospadres-and Rating = 1



Midway/Wheeler Ridge 230 kV

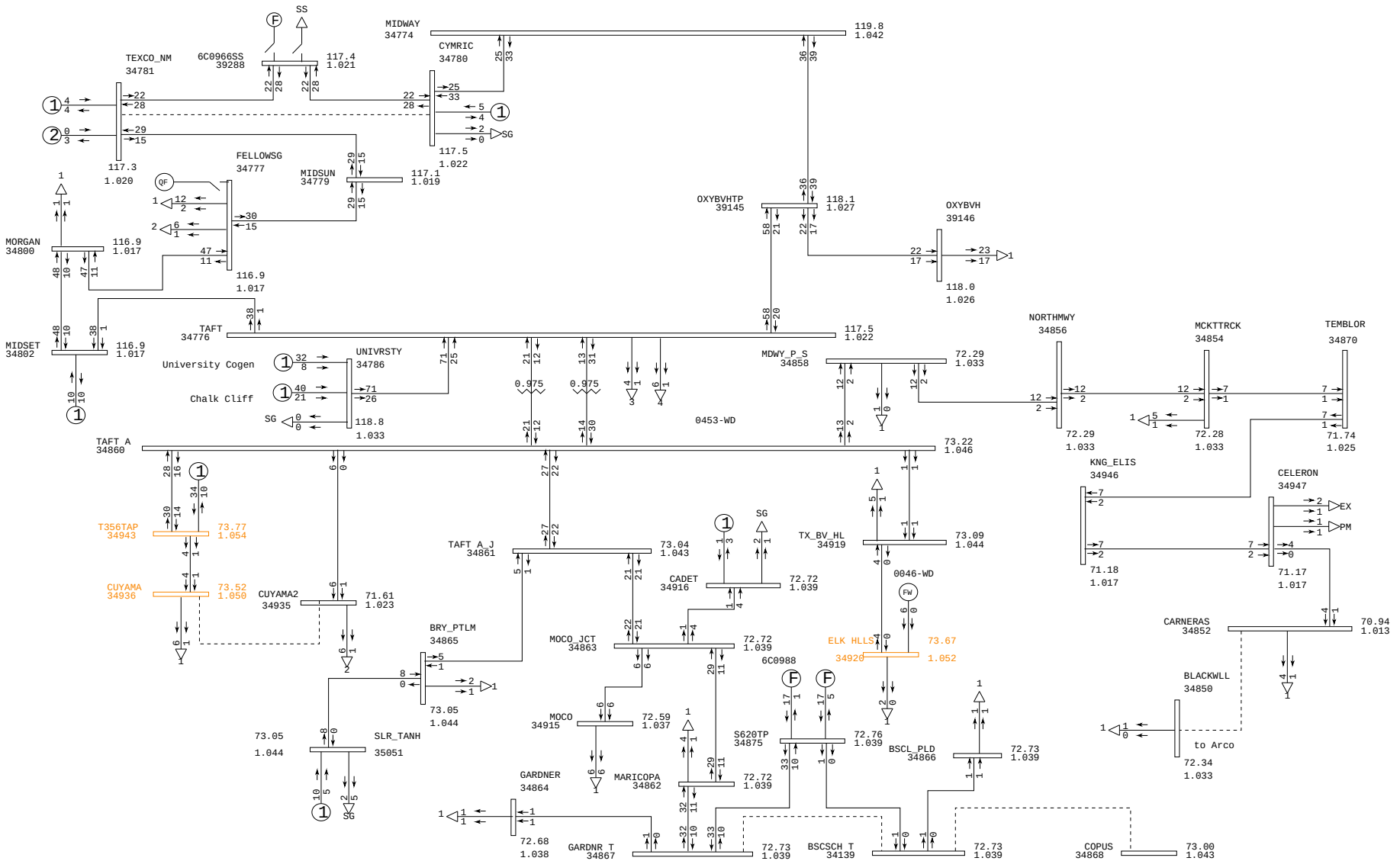
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:09 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 151: Base Case Condition - Midway/Wheeler Ridge 230 kV	MW/MVAR qc6p1_kern_midway-wheele Rating = 1



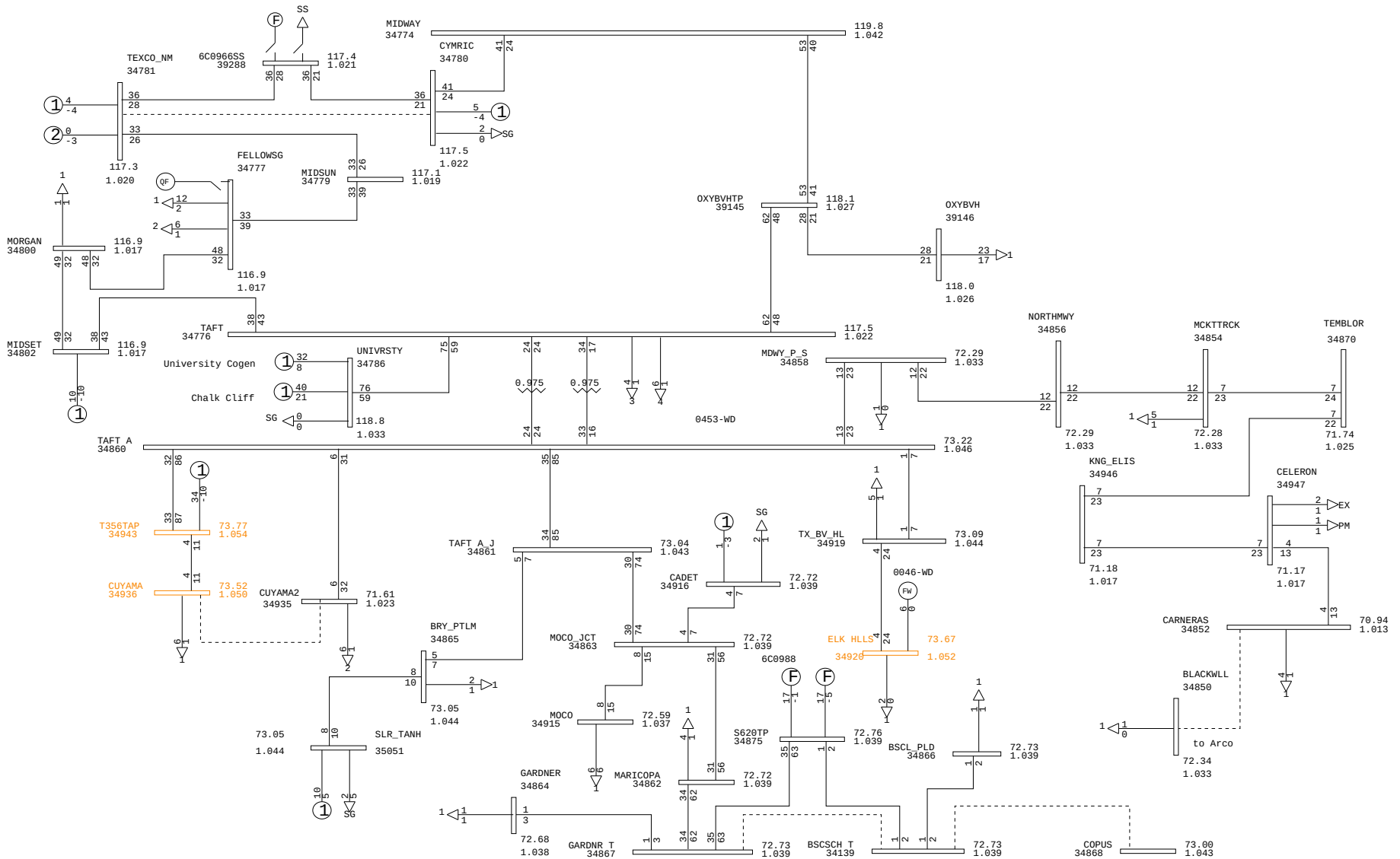
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:09 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 152: Base Case Condition - Midway/Wheeler Ridge 230 kV	MVA/%rate qc6p1_kern_midway-wheele Rating = 1



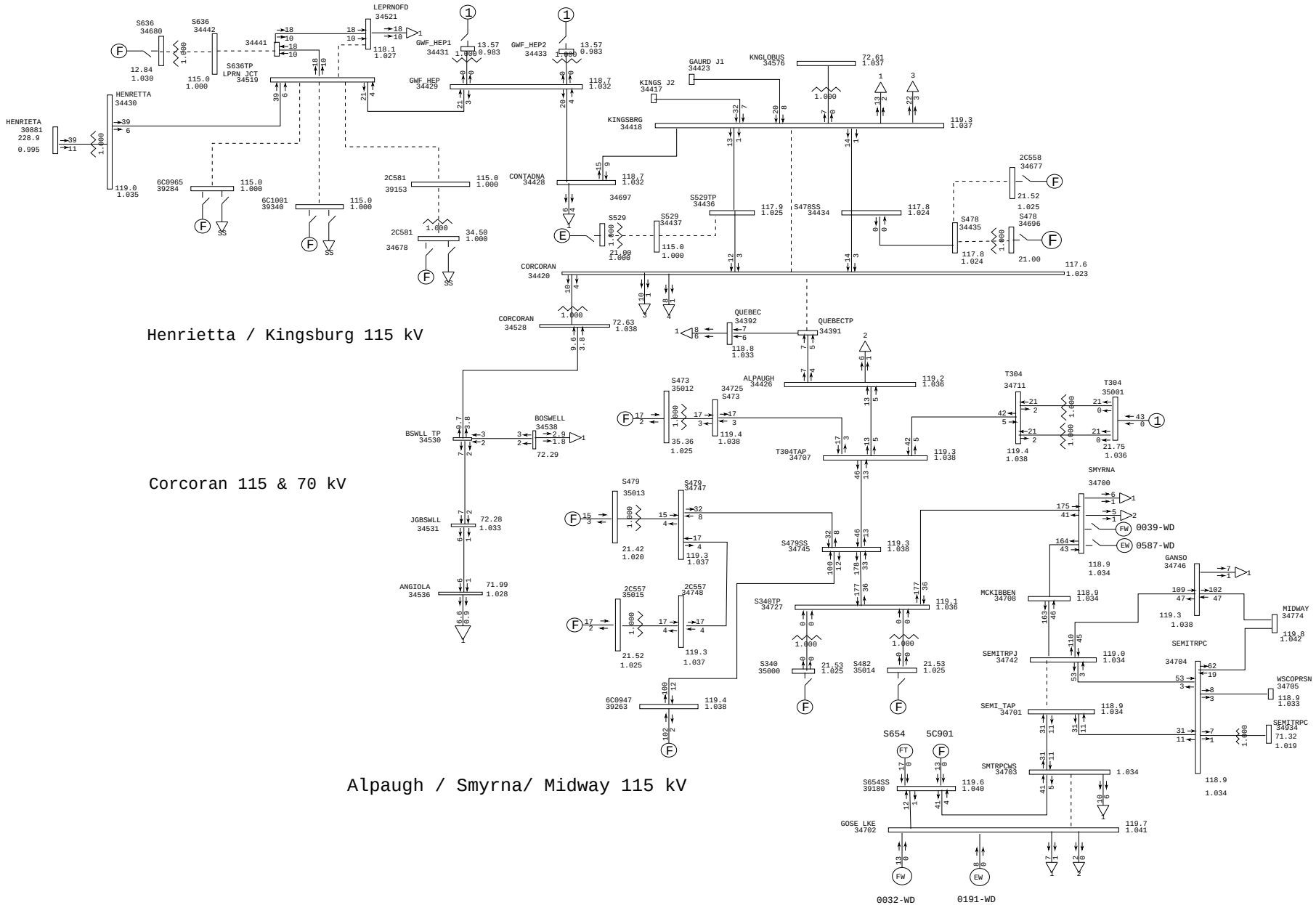
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:09 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 153: Base Case Condition - Taft Area	MW/MVAR qc6p1_kern_taft.drw Rating = 1



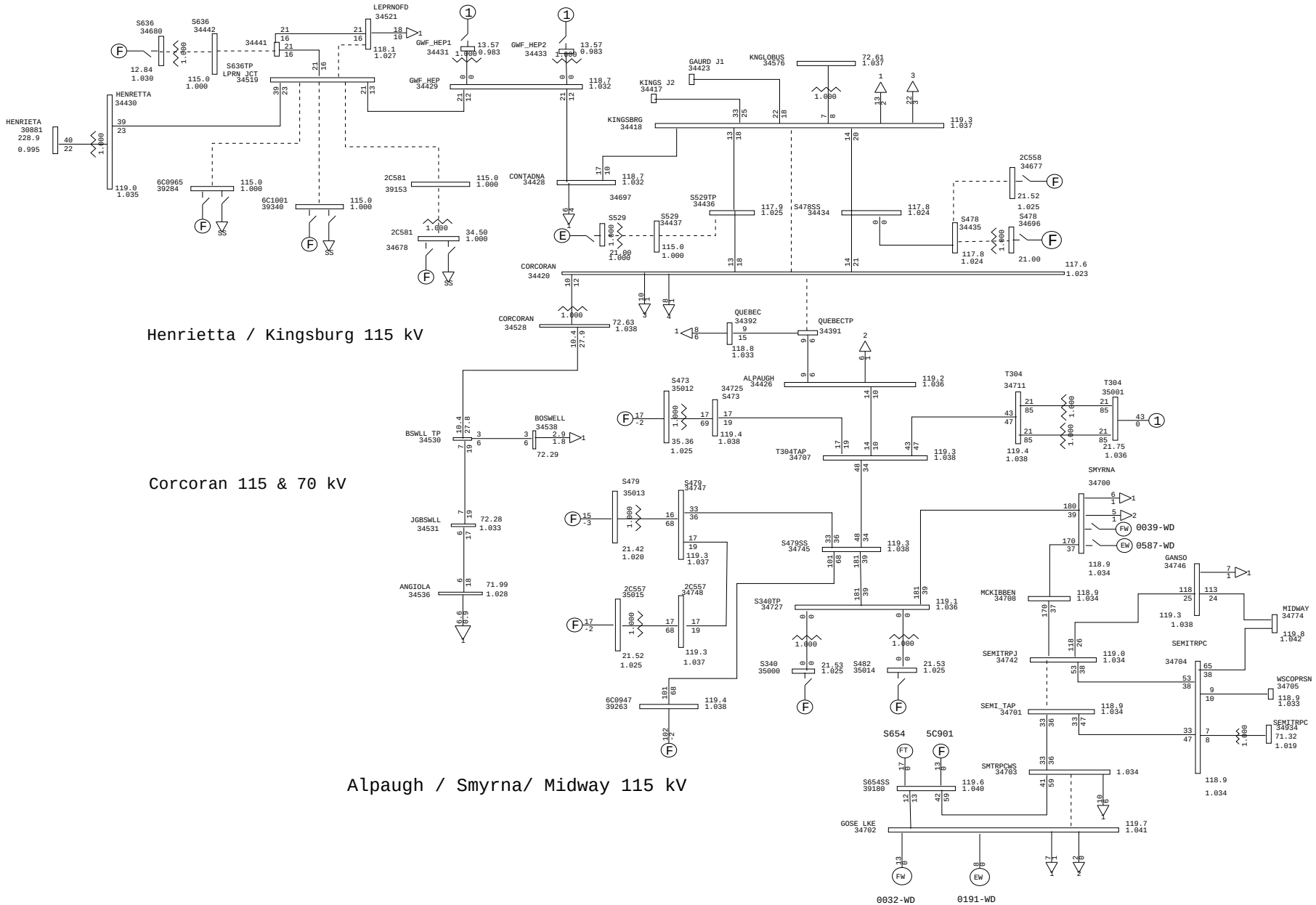
General Electric International, Inc. PSLF Program Tue Jan 14 09:36:10 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 154: Base Case Condition - Taft Area	MVA/%rate qc6p1_kern_taft.drw Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:10 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 155: Base Case Condition - Kingsburg/Alpaugh 115 kV	MW/MVAR qc6p1_fsno-kern_kings-al Rating = 1



General Electric International, Inc. PSLF Program Tue Jan 14 09:36:10 2014 cases\sumop\kern\pge-qc6p1-18sumopmy-kern-weo-pst-r8b3-m1.sav

Pacific Gas and Electric Company	PG&E 2013 CASE SERIES: 2018 System Summer Off Peak Main Year Case PATH15= 5348 MW(S-N) PATH26= -310 MW(N-S) PDCI= 0 MW(N-S) COI=-3529 MW(N-S) PG&E qc6p1 18sumopmy Kern Area pst-project case weo r8b3 m1	Plot 156: Base Case Condition - Kingsburg/Alpaugh 115 kV	MVA/%rate qc6p1_fsno-kern_kings-al Rating = 1

Cluster 6 Phase I

PG&E Kern Interconnection Area

Appendix E

Reliability Power Flow Results

Cluster 6 Phase I PG&E Kern Interconnection Area Power Flow Case Descriptions

Case Name	Description
18my-kern-weo-pre-r8b-xcm	2018 Kern with Energy Only pre-project revision 8b without Congestion Management/Generation Curtailment
18my-kern-weo-pst-r8b-m1-xcm	2018 Kern with Energy Only post-project revision 8b with mitigation 1 without Congestion Management/Generation Curtailment
18my-kern-weo-pre-r8b-wcm	2018 Kern with Energy Only pre-project revision 8b with Congestion Management/Generation Curtailment
18my-kern-weo-pst-r8b-m1-wcm	2018 Kern with Energy Only post-project revision 8b with mitigation 1 with Congestion Management/Generation Curtailment

Facility	Contingency Description	Rating (MVA)	18my-kern-weo-pre-r8b-xcm	18my-kern-weo-pst-r8b-m1-xcm	18my-kern-weo-pre-r8b-wcm	18my-kern-weo-pst-r8b-m1-wcm	Case	Category
2C577-Los Banos 230 kV Line	Tesla-Los Banos and Tracy-Los Banos 500 kV DLO w/o IRAS	678.0	1.86	1.84	1.84	1.81	sumop	C
2C577-Los Banos 230 kV Line	Tesla-Los Banos and Tracy-Los Banos 500 kV DLO w/ IRAS	678.0	1.17	1.15	1.15	1.13	sumop	C
2C577-Los Banos 230 kV Line	Tesla-Tracy and Tracy-Los Banos 500 kV DLO	678.0	1.13	1.12	1.12	1.10	sumop	C
2C577-Los Banos 230 kV Line	Tesla-Los Banos 500 kV Line	678.0	1.09	1.09	1.09	1.07	sumop	B
2C577-Los Banos 230 kV Line	Tracy-Los Banos and Los Banos-Gates 500 kV DLO (LB CB832)	678.0	1.08	1.08	1.08	1.06	sumop	C
2C577-Los Banos 230 kV Line	Tracy-Los Banos 500 kV Line	678.0	1.05	1.05	1.05	1.03	sumop	B
6C1000SS-6C0946SS #2 230 kV Line (6C1000SS-Buena Vista Jct 2)	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	389.0	1.08	Not Rec	1.08	Not Rec	sumop	C
6C1000SS-6C0946SS #2 230 kV Line (6C1000SS-Buena Vista Jct 2)	Midway 230 kV CB632 Failure	389.0	1.07	Not Rec	1.07	Not Rec	sumop	C
6C1000SS-6C0946SS #2 230 kV Line (6C1000SS-Buena Vista Jct 2)	Midway 230 kV Bus Section 1D	389.0	1.07	Not Rec	1.07	Not Rec	sumop	C
6C1000SS-6C0946SS #2 230 kV Line (6C1000SS-Buena Vista Jct 2)	Midway-6C1000SS #1 230 kV Line	389.0	1.07	Not Rec	1.07	Not Rec	sumop	B
6C1000SS-6C0946SS #2 230 kV Line (6C1000SS-Buena Vista Jct 2)	Midway 230 kV CB552 Failure w/ Elk Hills/Sunrise SPS	389.0	1.07	Not Rec	1.06	Not Rec	sumop	C
6C1000SS-Wheeler Ridge #1 230 kV Line (6C1000SS-Buena Vista Jct 1)	Midway 230 kV CB642 Failure	389.0	1.07	Not Rec	1.07	Not Rec	sumop	C
6C1000SS-Wheeler Ridge #1 230 kV Line (6C1000SS-Buena Vista Jct 1)	Midway-6C1000SS #2 230 kV Line	389.0	1.07	Not Rec	1.07	Not Rec	sumop	B
6C1000SS-Wheeler Ridge #1 230 kV Line (6C1000SS-Buena Vista Jct 1)	Midway 230 kV CB562 Failure w/o Elk Hills/Sunrise SPS	389.0	1.07	Not Rec	1.07	Not Rec	sumop	C
6C1000SS-Wheeler Ridge #1 230 kV Line (6C1000SS-Buena Vista Jct 1)	Midway 230 kV Bus Section 2D	389.0	1.06	Not Rec	1.06	Not Rec	sumop	C
6C1000SS-Wheeler Ridge #1 230 kV Line (6C1000SS-Buena Vista Jct 1)	Midway 230 kV CB562 Failure w/ Elk Hills/Sunrise SPS	389.0	1.06	Not Rec	1.06	Not Rec	sumop	C
Arco-Midway 230 kV Line	Los Banos-Midway #2 and Gates-Midway 500 kV DLO w/o IRAS	338.6	1.47	1.48	1.46	1.46	sumop	C
Arco-Twisselman 70 kV Line (4C775 Tap-Twisselman)	Base system (n-0)	53.3	0.37	1.04	0.38	0.77	sumpk	A
Arco-Twisselman 70 kV Line (Arco-Twisselman Jct 1)	Arco-Blackwell 70 kV Line	48.5	0.62	1.45	0.62	Not Rec	sumpk	B
Arco-Twisselman 70 kV Line (Arco-Twisselman Jct 1)	Base system (n-0)	48.5	0.60	1.44	0.60	0.97	sumpk	A
Arco-Twisselman 70 kV Line (Twisselman Jct 1-4C775 Tap)	Arco-Blackwell 70 kV Line	62.3	0.48	1.13	0.48	Not Rec	sumpk	B
Arco-Twisselman 70 kV Line (Twisselman Jct 1-4C775 Tap)	Base system (n-0)	53.3	0.55	1.31	0.55	0.89	sumpk	A
Borden-Gregg #2 230 kV Line	Borden-Gregg #1 230 kV Line and Melones 2	339.0	0.99	1.07	0.97	1.03	sumpk	B
Borden-Gregg #2 230 kV Line	Borden-Gregg #1 230 kV Line and Exchequer	339.0	0.98	1.05	0.95	1.02	sumpk	B
Borden-Madera #1 70 kV Line	Borden-Madera #2 and Glass-Borden 70 kV Lines w/o Madera SPS	90.0	1.15	1.16	1.15	1.15	sumpk	C
California Ave-Sanger 115 kV Line	McCall-West Fresno and McCall-California Ave 115 kV Lines	194.2	1.00	1.00	1.00	1.00	sumpk	C
Chowchilla-Kerckhoff #2 115 kV Line (Certanteed Jct 1-Chowchilla)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.0	1.67	1.67	1.67	1.67	sumpk	C
Chowchilla-Kerckhoff #2 115 kV Line (Certanteed Jct 1-Chowchilla)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.0	1.61	1.61	1.61	1.61	sumop	C
Chowchilla-Kerckhoff #2 115 kV Line (Certanteed Jct 1-Sharon Tap)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.5	1.66	1.66	1.66	1.66	sumpk	C
Chowchilla-Kerckhoff #2 115 kV Line (Certanteed Jct 1-Sharon Tap)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.5	1.60	1.60	1.60	1.60	sumop	C
Chowchilla-Kerckhoff #2 115 kV Line (Kerckhoff Jct 1-Kerckhoff 2)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	147.8	1.21	1.21	1.21	1.21	sumpk	C
Chowchilla-Kerckhoff #2 115 kV Line (Kerckhoff Jct 1-Kerckhoff 2)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	147.8	1.01	1.01	1.01	1.01	sumop	C
Chowchilla-Kerckhoff #2 115 kV Line (Sharon Tap-Oakhurst Jct)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.5	1.72	1.72	1.72	1.72	sumpk	C
Chowchilla-Kerckhoff #2 115 kV Line (Sharon Tap-Oakhurst Jct)	Kerckhoff-E2 #1 and #2 115 kV Lines w/o Kerckhoff SPS	79.5	1.66	1.66	1.66	1.66	sumop	C
Chowchilla-Kerckhoff #2 115 kV Line (Sharon Tap-Oakhurst Jct)	E1-Gregg #1 and #2 230 kV Lines	79.5	1.00	1.03	0.99	1.02	sumpk	C
Coalinga #1-San Miguel 70 kV Line	Templeton 230 kV CB282 Failure w/o Paso Robles UVLS	42.0	1.05	1.05	1.05	1.05	sumop	C
Coalinga #1-San Miguel 70 kV Line	Templeton-Atascadero and Paso Robles-Templeton 70 kV Lines w/o Paso Robles UVLS	42.0	1.05	1.05	1.05	1.04	sumop	C
Coalinga #1-San Miguel 70 kV Line	Templeton 230 kV Bus Section F w/o Paso Roble UVLS	42.0	1.05	1.05	1.05	1.04	sumop	C
Cottonwood-Panorama 115 kV Line (Cottonwood-Wheelabrator)	Base system (n-0)	88.0	1.00	1.00	1.00	1.00	sumpk	A
Exchequer-LeGrand 115 kV Line	Merced Falls 70 kV Bus	79.5	1.04	1.04	0.96	0.95	sumop	C
Exchequer-LeGrand 115 kV Line	Merced-Merced Falls 70 kV Line	79.5	1.04	1.04	0.96	0.95	sumop	B
Exchequer-LeGrand 115 kV Line	Merced 70 kV Bus	79.5	1.04	1.04	0.96	0.95	sumop	C
Exchequer-LeGrand 115 kV Line	Merced 115 kV Bus w/ S550 SPS	79.5	1.04	1.04	0.96	0.95	sumop	C
Exchequer-LeGrand 115 kV Line	Merced 115 kV Bus w/o S550 SPS	79.5	1.04	1.04	0.96	0.95	sumop	C
Exchequer-LeGrand 115 kV Line	Merced 115/70 kV Transformer Bank 2 w/ S550 SPS	79.5	1.04	1.03	0.96	0.95	sumop	B
Exchequer-LeGrand 115 kV Line	Merced 115/70 kV Transformer Bank 2 w/o S550 SPS	79.5	1.04	1.03	0.96	0.95	sumop	B
Fellows-Midsun 115 kV Line	Taft 115 kV CB152 Failure	96.4	0.81	1.00	0.70	1.00	sumpk	C
Fellows-Midsun 115 kV Line	Taft 115 kV CB152 Failure	96.4	1.12	1.28	0.85	0.97	sumop	C
Fellows-Midsun 115 kV Line	Midway-Taft 115 kV Line	96.4	1.08	1.24	0.81	0.94	sumop	B
Fellows-Midsun 115 kV Line	Taft 115 kV CB192 Failure	96.4	1.08	1.24	0.81	0.93	sumop	C
Fellows-Midsun 115 kV Line	Midway 115 kV Bus Section 2D	96.4	0.89	1.04	0.62	0.75	sumop	C
Fellows-Midsun 115 kV Line	Midway 115 kV CB182 Failure	96.4	0.87	1.03	0.60	0.74	sumop	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Taft 115 kV CB152 Failure	169.0	1.10	0.74	0.99	0.74	sumpk	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Midway-Taft 115 kV Line	169.0	1.04	0.71	0.92	0.71	sumpk	B
Fellows-Taft 115 kV Line (Fellows-Morgan)	Taft 115 kV CB192 Failure	169.0	1.03	0.70	0.92	0.70	sumpk	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Taft 115 kV CB152 Failure	169.0	1.26	0.82	0.98	0.65	sumop	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Midway-Taft 115 kV Line	169.0	1.22	0.79	0.94	0.63	sumop	B
Fellows-Taft 115 kV Line (Fellows-Morgan)	Taft 115 kV CB192 Failure	169.0	1.22	0.79	0.94	0.63	sumop	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Midway 115 kV Bus Section 2D	169.0	1.03	0.68	0.76	0.52	sumop	C
Fellows-Taft 115 kV Line (Fellows-Morgan)	Midway 115 kV CB182 Failure	169.0	1.03	0.68	0.75	0.51	sumop	C
Fellows-Taft 115 kV Line (Midset-Taft)	Taft 115 kV CB152 Failure	102.0	0.86	1.03	0.86	0.98	sumop	C
Fellows-Taft 115 kV Line (Morgan-Midset)	Taft 115 kV CB152 Failure	169.0	1.05	0.75	0.94	0.75	sumpk	C
Fellows-Taft 115 kV Line (Morgan-Midset)	Taft 115 kV CB152 Failure	169.0	1.20	0.82	0.93	0.65	sumop	C
Fellows-Taft 115 kV Line (Morgan-Midset)	Midway-Taft 115 kV Line	169.0	1.16	0.80	0.90	0.63	sumop	B
Fellows-Taft 115 kV Line (Morgan-Midset)	Taft 115 kV CB192 Failure	169.0	1.16	0.80	0.89	0.63	sumop	C
Gates-Arco 230 kV Line	Los Banos-Midway #2 and Gates-Midway 500 kV DLO w/o IRAS	338.6	1.54	1.55	1.53	1.52	sumop	C
Gates-Midway 230 kV Line	Los Banos-Midway #2 and Gates-Midway 500 kV DLO w/o IRAS	338.6	1.85	1.86	1.84	1.83	sumop	C
Gates-Midway 230 kV Line	Los Banos-Midway #2 and Gates-Midway 500 kV DLO w/ IRAS	338.6	1.01	1.03	1.00	1.00	sumop	C
Gates-Midway 230 kV Line	Gates-Midway #1 500 kV Line	338.6	0.97	1.01	0.97	0.99	sumop	B

Facility	Contingency Description	Rating (MVA)	18my-kern-weo-pre-r8b-xcm	18my-kern-weo-pst-r8b-m1-xcm	18my-kern-weo-pre-r8b-wcm	18my-kern-weo-pst-r8b-m1-wcm	Case	Category
Herndon-Bullard #2 115 kV Line (Pinedale Jct 1-Bullard)	Herndon 115 kV Bus Section 1	148.0	1.19	1.19	1.19	1.19	sumpk	C
Merced 115/70 kV Transformer Bank 2	LeGrand 115 kV Bus w/o Exchequer SPS	60.0	1.41	1.41	1.29	1.27	sumop	C
Merced Falls-Exchequer 70 kV Line (McSwain Jct-Exchequer)	LeGrand 115 kV Bus w/o Exchequer SPS	34.2	2.15	2.15	1.95	1.92	sumop	C
Merced Falls-Exchequer 70 kV Line (McSwain Jct-Exchequer)	LeGrand 115 kV Bus w/o Exchequer SPS	34.2	1.32	1.32	1.32	1.32	sumpk	C
Merced Falls-Exchequer 70 kV Line (McSwain Jct-Merced Falls)	LeGrand 115 kV Bus w/o Exchequer SPS	45.7	1.81	1.81	1.66	1.64	sumop	C
Merced Falls-Exchequer 70 kV Line (McSwain Jct-Merced Falls)	LeGrand 115 kV Bus w/o Exchequer SPS	45.7	1.14	1.14	1.14	1.14	sumpk	C
Merced-Merced Falls 70 kV Line	LeGrand 115 kV Bus w/o Exchequer SPS	45.7	1.80	1.80	1.65	1.63	sumop	C
Merced-Merced Falls 70 kV Line	LeGrand 115 kV Bus w/o Exchequer SPS	45.7	1.04	1.04	1.04	1.04	sumpk	C
Midway 500/230 kV Transformer Bank 11	Midway 500/230 kV Transformer Bank 12 w/o Elk Hills/Sunrise SPS	1122.0	0.92	1.16	0.88	1.09	sumpk	B
Midway 500/230 kV Transformer Bank 11	Midway 500/230 kV Transformer Bank 12 w/o Elk Hills/Sunrise SPS	1122.0	0.92	1.16	0.88	1.09	sumpk	B
Midway 500/230 kV Transformer Bank 11	Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS	1122.0	0.91	1.15	0.87	1.08	sumpk	B
Midway 500/230 kV Transformer Bank 11	Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS	1122.0	0.91	1.15	0.87	1.08	sumpk	B
Midway 500/230 kV Transformer Bank 11	Midway 230 kV CB692 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.91	1.15	0.87	1.08	sumpk	C
Midway 500/230 kV Transformer Bank 11	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.89	1.14	0.86	1.07	sumpk	C
Midway 500/230 kV Transformer Bank 11	Midway 230 kV CB562 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.83	1.07	0.79	1.01	sumpk	C
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB252 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.97	1.22	0.93	1.15	sumpk	C
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.94	1.20	0.90	1.12	sumpk	C
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS	1122.0	0.94	1.19	0.90	1.12	sumpk	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS	1122.0	0.94	1.19	0.90	1.12	sumpk	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS	1122.0	0.94	1.18	0.89	1.11	sumpk	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS	1122.0	0.94	1.18	0.89	1.11	sumpk	B
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB692 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.93	1.18	0.89	1.11	sumpk	C
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB252 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.85	1.09	0.84	1.06	sumop	C
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.80	1.03	0.79	1.00	sumop	C
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 11	1122.0	0.79	1.02	0.78	0.99	sumop	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS	1122.0	0.79	1.02	0.78	0.99	sumop	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 13	1122.0	0.79	1.01	0.78	0.99	sumop	B
Midway 500/230 kV Transformer Bank 12	Midway 500/230 kV Transformer Bank 13 w/o Elk Hills/Sunrise SPS	1122.0	0.79	1.01	0.78	0.99	sumop	B
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB692 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.79	1.01	0.78	0.99	sumop	C
Midway 500/230 kV Transformer Bank 12	Midway 230 kV CB682 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.76	1.02	0.72	0.95	sumpk	C
Midway 500/230 kV Transformer Bank 13	Midway 230 kV CB252 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.93	1.17	0.89	1.10	sumpk	C
Midway 500/230 kV Transformer Bank 13	Midway 500/230 kV Transformer Bank 12 w/o Elk Hills/Sunrise SPS	1122.0	0.90	1.14	0.86	1.08	sumpk	B
Midway 500/230 kV Transformer Bank 13	Midway 500/230 kV Transformer Bank 12 w/o Elk Hills/Sunrise SPS	1122.0	0.90	1.14	0.86	1.08	sumpk	B
Midway 500/230 kV Transformer Bank 13	Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS	1122.0	0.90	1.14	0.86	1.07	sumpk	B
Midway 500/230 kV Transformer Bank 13	Midway 500/230 kV Transformer Bank 11 w/o Elk Hills/Sunrise SPS	1122.0	0.90	1.14	0.86	1.07	sumpk	B
Midway 500/230 kV Transformer Bank 13	Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.90	1.14	0.86	1.07	sumpk	C
Midway 500/230 kV Transformer Bank 13	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.88	1.12	0.84	1.05	sumpk	C
Midway 500/230 kV Transformer Bank 13	Midway 230 kV CB252 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.82	1.04	0.81	1.01	sumop	C
Midway 500/230 kV Transformer Bank 13	Midway 230 kV CB562 Failure w/o Elk Hills/Sunrise SPS	1122.0	0.82	1.06	0.78	0.99	sumpk	C
Midway-6C1000SS #1 230 kV Line	Midway 230 kV CB642 Failure	389.0	1.07	0.22	1.07	0.21	sumop	C
Midway-6C1000SS #1 230 kV Line	Midway-6C1000SS #2 230 kV Line	389.0	1.07	0.22	1.07	0.21	sumop	B
Midway-6C1000SS #1 230 kV Line	Midway 230 kV CB562 Failure w/o Elk Hills/Sunrise SPS	389.0	1.07	0.22	1.07	0.21	sumop	C
Midway-6C1000SS #1 230 kV Line	Midway 230 kV Bus Section 2D	389.0	1.06	0.19	1.06	0.18	sumop	C
Midway-6C1000SS #1 230 kV Line	Midway 230 kV CB562 Failure w/ Elk Hills/Sunrise SPS	389.0	1.06	0.16	1.06	0.15	sumop	C
Midway-6C1000SS #2 230 kV Line	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	389.0	1.08	0.28	1.08	0.27	sumop	C
Midway-6C1000SS #2 230 kV Line	Midway 230 kV CB632 Failure	389.0	1.07	0.25	1.07	0.24	sumop	C
Midway-6C1000SS #2 230 kV Line	Midway 230 kV Bus Section 1D	389.0	1.07	0.25	1.07	0.24	sumop	C
Midway-6C1000SS #2 230 kV Line	Midway-6C1000SS #1 230 kV Line	389.0	1.07	0.22	1.07	0.21	sumop	B
Midway-6C1000SS #2 230 kV Line	Midway 230 kV CB552 Failure w/ Elk Hills/Sunrise SPS	389.0	1.07	0.21	1.06	0.20	sumop	C
Midway-Elk Hills #1 230 kV Line	Midway-Elk Hills #2 230 kV Line	519.9	1.03	1.03	1.03	1.03	sumpk	B
Midway-Elk Hills #1 230 kV Line	Midway-Elk Hills #2 230 kV Line	519.9	1.01	1.02	1.01	1.01	sumop	B
Midway-Elk Hills #2 230 kV Line	Midway-Elk Hills #1 230 kV Line	519.9	1.03	1.03	1.03	1.03	sumpk	B
Midway-Elk Hills #2 230 kV Line	Midway-Elk Hills #1 230 kV Line	519.9	1.01	1.02	1.01	1.01	sumop	B
Midway-LaPaloma #1 230 kV Line	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	1450.0	1.10	1.10	1.10	1.10	sumpk	C
Midway-LaPaloma #1 230 kV Line	Midway 230 kV Bus Section 1D	1450.0	1.10	1.10	1.10	1.10	sumpk	C
Midway-LaPaloma #1 230 kV Line	Midway 230 kV CB632 Failure	1450.0	1.10	1.10	1.10	1.10	sumpk	C
Midway-LaPaloma #1 230 kV Line	Midway-LaPaloma #2 230 kV Line	1450.0	1.10	1.10	1.10	1.10	sumpk	B
Midway-LaPaloma #1 230 kV Line	Midway 230 kV CB552 Failure w/o Elk Hills/Sunrise SPS	1450.0	1.08	1.08	1.08	1.08	sumop	C
Midway-LaPaloma #1 230 kV Line	Midway 230 kV CB632 Failure	1450.0	1.08	1.07	1.08	1.07	sumop	C
Midway-LaPaloma #1 230 kV Line	Midway-LaPaloma #2 230 kV Line	1450.0	1.07	1.07	1.07	1.07	sumop	B
Midway-LaPaloma #1 230 kV Line	Midway 230 kV Bus Section 1D	1450.0	1.08	1.07	1.08	1.07	sumop	C
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS	1450.0	1.10	1.10	1.10	1.10	sumpk	C
Midway-LaPaloma #2 230 kV Line	Midway-LaPaloma #1 230 kV Line	1450.0	1.10	1.10	1.10	1.10	sumpk	B
Midway-LaPaloma #2 230 kV Line	Midway 230 kV Bus Section 2E	1450.0	1.10	1.10	1.10	1.10	sumpk	C
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB662 Failure	1450.0	1.10	1.10	1.09	1.09	sumpk	C
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB642 Failure	1450.0	1.10	1.10	1.10	1.09	sumpk	C
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB262 Failure w/o Elk Hills/Sunrise SPS	1450.0	1.08	1.08	1.08	1.08	sumop	C
Midway-LaPaloma #2 230 kV Line	Midway-LaPaloma #1 230 kV Line	1450.0	1.07	1.07	1.07	1.07	sumop	B
Midway-LaPaloma #2 230 kV Line	Midway 230 kV Bus Section 2E	1450.0	1.07	1.07	1.07	1.07	sumop	C

Facility	Contingency Description	Rating (MVA)	18my-kern-weo-pre-r8b-xcm	18my-kern-weo-pst-r8b-m1-xcm	18my-kern-weo-pre-r8b-wcm	18my-kern-weo-pst-r8b-m1-wcm	Case	Category
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB662 Failure	1450.0	1.07	1.07	1.07	1.07	sumop	C
Midway-LaPaloma #2 230 kV Line	Midway 230 kV CB642 Failure	1450.0	1.07	1.07	1.07	1.07	sumop	C
Midway-Shafter 115 kV Line	Midway 115 kV CB302 Failure	79.3	1.50	1.51	1.49	1.50	sumpk	C
Midway-Tupman-Renfro-Rio Bravo 115 kV Line (Renfro Jct-Rio Bravo)	Midway 115 kV CB302 Failure	75.1	1.11	1.12	1.11	1.11	sumpk	C
Morro Bay-Solar SS #1 230 kV Line	Caliente SS-Midway #1 and #2 230 kV Lines w/o Topaz & CVSR SPS	389.0	1.03	1.03	1.03	1.03	sumpk	C
Morro Bay-Solar SS #2 230 kV Line	Caliente SS-Midway #1 and #2 230 kV Lines w/o Topaz & CVSR SPS	389.0	1.03	1.03	1.03	1.03	sumpk	C
Morro Bay-Templeton 230 kV Line	Caliente SS-Midway #1 and #2 230 kV Lines w/o Topaz & CVSR SPS	388.4	1.23	1.28	1.06	1.09	sumpk	C
Morro Bay-Templeton 230 kV Line	Los Banos-Midway #2 and Gates-Midway 500 kV DLO w/o IRAS	388.4	1.02	1.03	1.02	1.02	sumop	C
Morro Bay-Templeton 230 kV Line	Solar SS-Caliente SS #1 and #2 230 kV Lines w/o Topaz & CVSR SPS	388.4	1.00	1.05	0.84	0.86	sumpk	C
Panoche-Gates #1 230 kV Line	Los Banos-Gates #1 and Los Banos-Midway #2 500 kV DLO w/o IRAS	338.6	1.35	1.34	1.34	1.32	sumop	C
Panoche-Gates #2 230 kV Line	Los Banos-Gates #1 and Los Banos-Midway #2 500 kV DLO w/o IRAS	338.6	1.35	1.34	1.34	1.32	sumop	C
Panoche-S648SS 115 kV Line (Hammonds-S541 Tap)	Panoche-Mendota 115 kV Line and Exchequer	102.0	1.07	1.10	1.07	1.09	sumpk	B
Panoche-S648SS 115 kV Line (Hammonds-S541 Tap)	Panoche-Mendota 115 kV Line and Kerckhoff 1	102.0	1.03	1.06	1.02	1.05	sumpk	B
Panoche-S648SS 115 kV Line (Hammonds-S541 Tap)	Panoche-Mendota 115 kV Line	102.0	0.99	1.02	0.98	1.01	sumpk	B
Panoche-S648SS 115 kV Line (Hammonds-S541 Tap)	Borden-Gregg #1 and #2 230 kV Lines	102.0	0.97	1.02	0.95	1.00	sumpk	C
Panoche-S648SS 115 kV Line (Hammonds-S541 Tap)	Gregg 230 kV CB412 Failure	102.0	0.97	1.02	0.95	1.00	sumpk	C
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Panoche-Mendota 115 kV Line and Exchequer	102.4	1.18	1.21	1.17	1.20	sumpk	B
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Panoche-Mendota 115 kV Line and Kerckhoff 1	102.4	1.14	1.17	1.13	1.16	sumpk	B
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Panoche-Mendota 115 kV Line	102.4	1.09	1.12	1.09	1.11	sumpk	B
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Borden-Gregg #1 and #2 230 kV Lines	102.4	1.08	1.13	1.06	1.11	sumpk	C
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Gregg 230 kV CB412 Failure	102.4	1.08	1.13	1.06	1.11	sumpk	C
Panoche-S648SS 115 kV Line (Panoche Jct-Hammonds)	Panoche 230 kV CB202 Failure (1E and 2E)	102.4	0.94	1.01	0.91	0.97	sumpk	C
Panoche-S648SS 115 kV Line (S541 Tap-De Francesco Tap)	Panoche-Mendota 115 kV Line and Exchequer	102.0	1.07	1.10	1.07	1.09	sumpk	B
Panoche-S648SS 115 kV Line (S541 Tap-De Francesco Tap)	Panoche-Mendota 115 kV Line and Kerckhoff 1	102.0	1.03	1.06	1.02	1.05	sumpk	B
Panoche-S648SS 115 kV Line (S541 Tap-De Francesco Tap)	Panoche-Mendota 115 kV Line	102.0	0.99	1.02	0.98	1.01	sumpk	B
Panoche-S648SS 115 kV Line (S541 Tap-De Francesco Tap)	Borden-Gregg #1 and #2 230 kV Lines	102.0	0.97	1.02	0.95	1.00	sumpk	C
Panoche-S648SS 115 kV Line (S541 Tap-De Francesco Tap)	Gregg 230 kV CB412 Failure	102.0	0.97	1.02	0.95	1.00	sumpk	C
Panoche-S648SS 115 kV Line (S648SS-De Francesco Tap)	Panoche-Mendota 115 kV Line and Exchequer	102.4	1.04	1.07	1.03	1.06	sumpk	B
Panoche-S648SS 115 kV Line (S648SS-De Francesco Tap)	Panoche-Mendota 115 kV Line and Kerckhoff 1	102.4	1.00	1.03	0.99	1.02	sumpk	B
San Bernard-Tejon 70 kV Line	Wheeler Ridge-Tejon 70 kV Line	34.2	1.03	1.03	1.03	1.03	sumpk	B
San Luis Obispo-Santa Maria 115 kV Line	Mesa 115 kV CB102 Failure	93.6	1.15	1.16	1.05	1.05	sumpk	C
Semitropic-Midway #1 115 kV Line	Midway 115 kV Bus Section 2E	194.2	0.60	1.10	0.60	0.87	sumop	C
Semitropic-Midway #1 115 kV Line	Midway 115 kV CB182 Failure	194.2	0.60	1.10	0.60	0.87	sumop	C
Semitropic-Midway #1 115 kV Line	Midway 115 kV Bus Section 2E	194.2	0.59	1.18	0.59	0.85	sumpk	C
Semitropic-Midway #1 115 kV Line	Midway 115 kV CB182 Failure	194.2	0.59	1.18	0.59	0.85	sumpk	C
Shafter-Rio Bravo 115 kV Line	Midway 115 kV CB302 Failure	75.1	1.40	1.42	1.40	1.41	sumpk	C
Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)	Semitropic-Midway #1 115 kV Line and Mt Poso	448.0	1.00	0.48	1.00	0.38	sumop	B
Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)	Midway 115 kV Bus Section 1E	448.0	1.00	0.48	1.00	0.38	sumop	C
Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)	Semitropic-Midway #1 115 kV Line	448.0	1.00	0.48	1.00	0.38	sumop	B
Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Semitropic)	Midway 115 kV CB182 Failure	159.0	0.69	1.42	0.69	1.01	sumpk	C
Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Semitropic)	Midway 115 kV Bus Section 2E	159.0	0.69	1.42	0.69	1.01	sumpk	C
Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Semitropic)	Midway 115 kV CB182 Failure	159.0	0.66	1.27	0.66	0.99	sumop	C
Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Semitropic)	Midway 115 kV Bus Section 2E	159.0	0.66	1.27	0.66	0.99	sumop	C
Temblor-San Luis Obispo 115 kV Line (Carrizo-San Luis Obispo)	Midway 115 kV CB302 Failure	87.0	0.81	1.03	0.81	0.97	sumpk	C
Temblor-San Luis Obispo 115 kV Line (Carrizo-San Luis Obispo)	Midway 115 kV CB182 Failure	87.0	0.81	1.03	0.81	0.97	sumpk	C
Temblor-San Luis Obispo 115 kV Line (Carrizo-San Luis Obispo)	Midway 115 kV Bus Section 2D	87.0	0.81	1.03	0.81	0.97	sumpk	C
Temblor-San Luis Obispo 115 kV Line (Temblor-Carrizo)	Midway 115 kV CB302 Failure	87.0	0.82	1.04	0.82	0.98	sumpk	C
Temblor-San Luis Obispo 115 kV Line (Temblor-Carrizo)	Midway 115 kV CB182 Failure	87.0	0.82	1.04	0.82	0.98	sumpk	C
Temblor-San Luis Obispo 115 kV Line (Temblor-Carrizo)	Midway 115 kV Bus Section 2D	87.0	0.82	1.04	0.82	0.98	sumpk	C
Westley-2C577SS 230 kV Line	Tesla-Los Banos and Tracy-Los Banos 500 kV DLO w/o IRAS	1195.0	1.05	1.04	1.05	1.03	sumop	C

Isolated - bus was isolated from the system and out of service

Not Rec - facility loading did not meet the 0.01 pu minimum change threshold or bus voltage did not meet the 0.001 pu minimum change threshold

Not Solved - contingency did not converge

Not Run - monitored facility/substation or element of contingency did not exist in power flow case

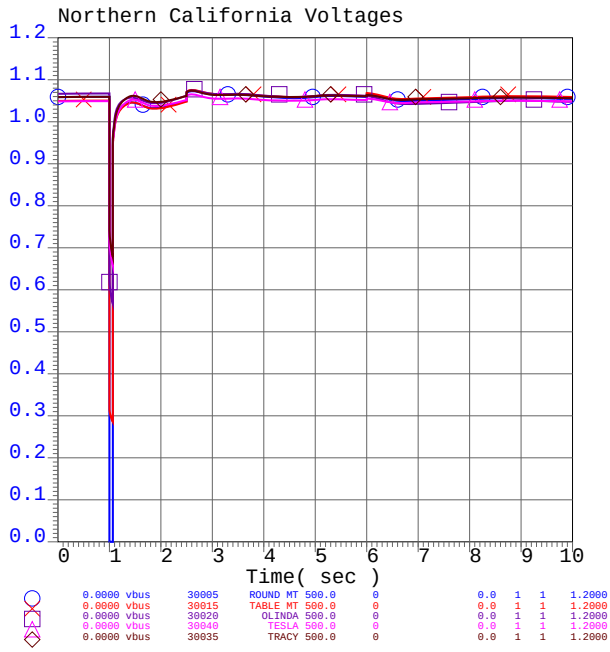
Cluster 6 Phase I

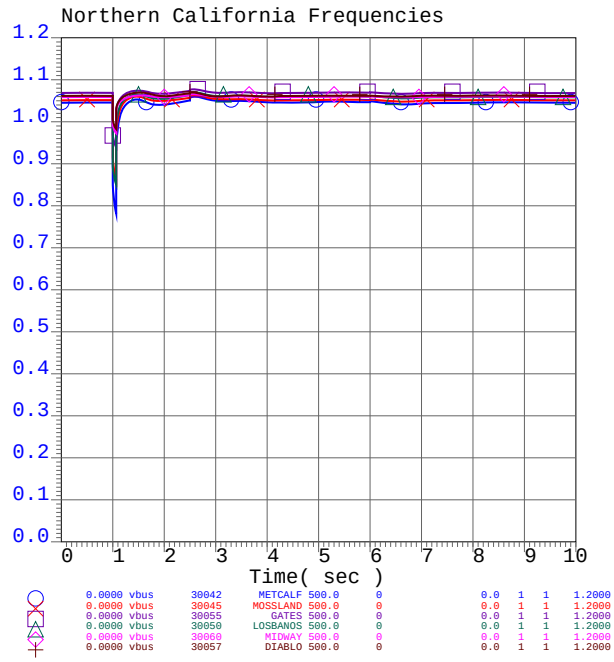
PG&E Kern Interconnection Area

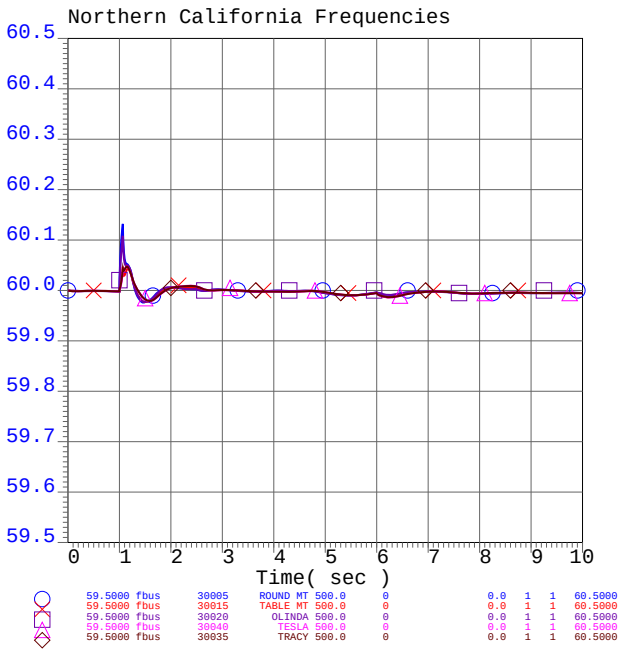
Appendix F

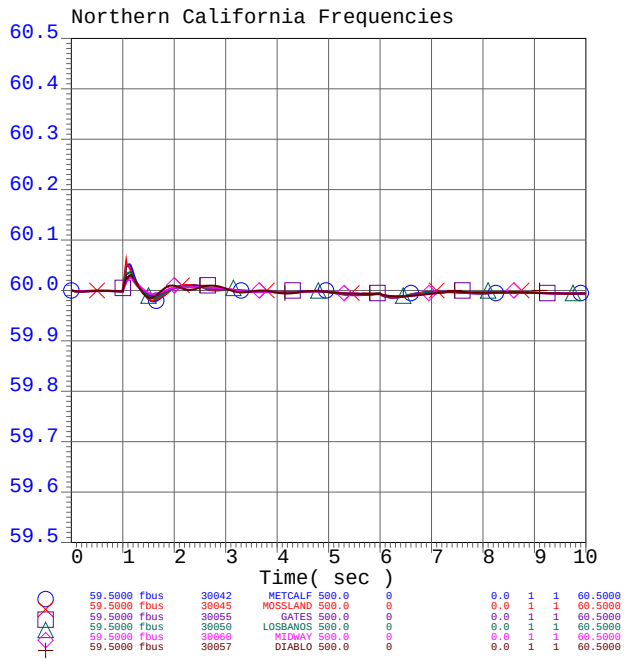
Bulk System Transient Stability Plots

WECC AREA VOLTAGE AND FREQUENCIES



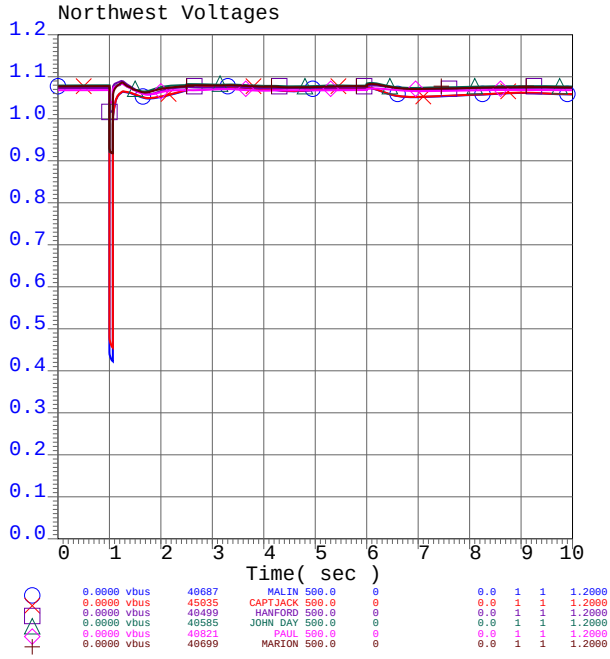


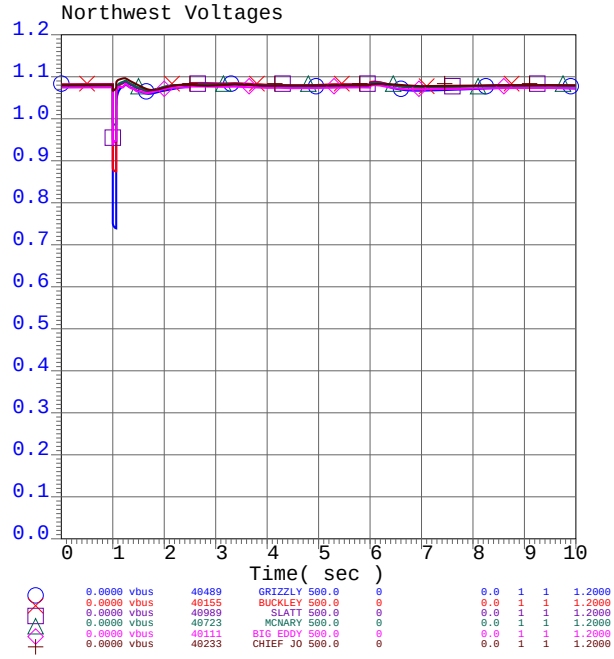


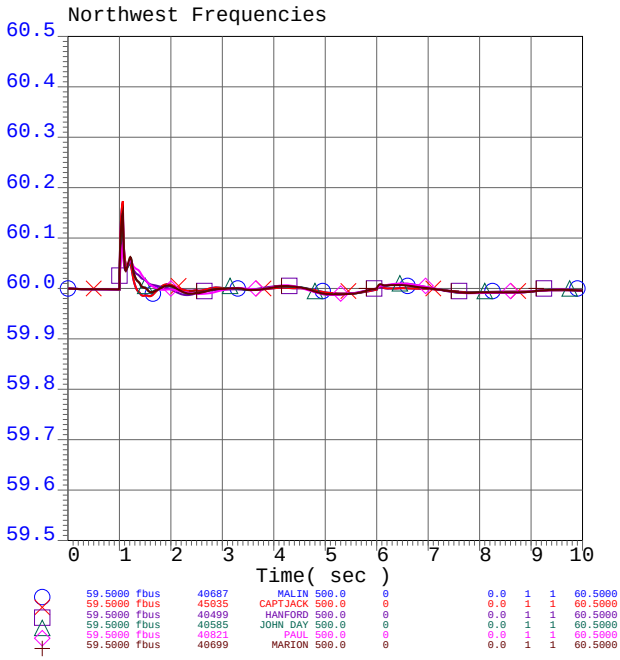


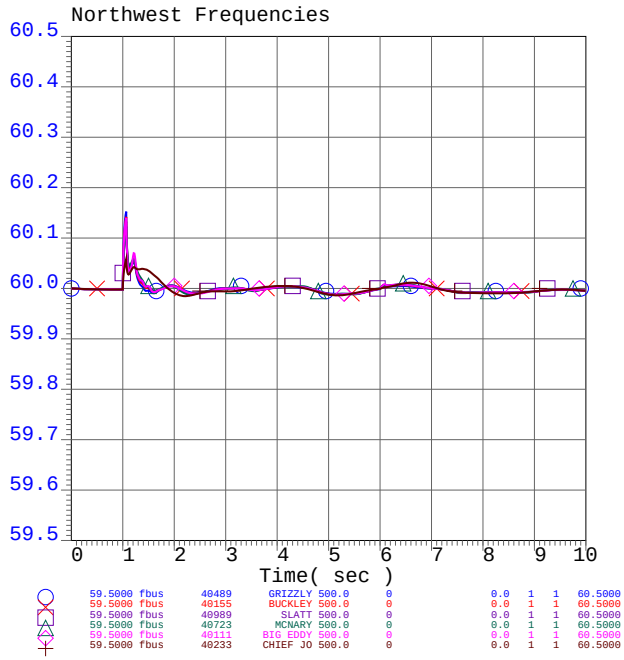
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



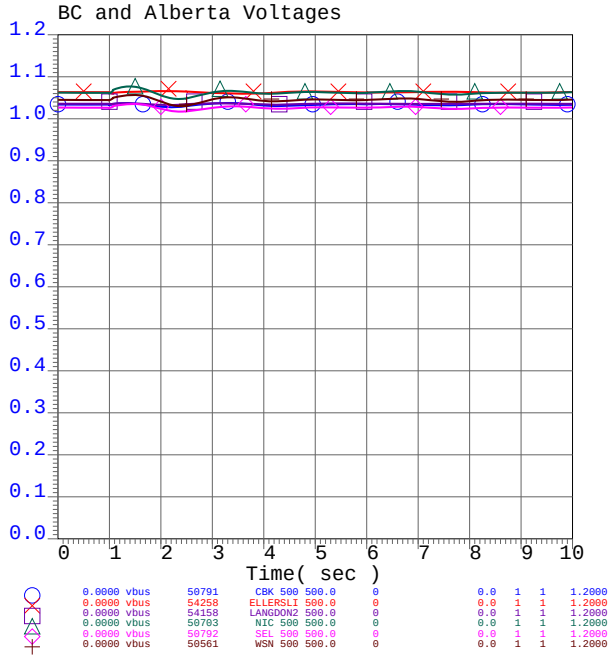


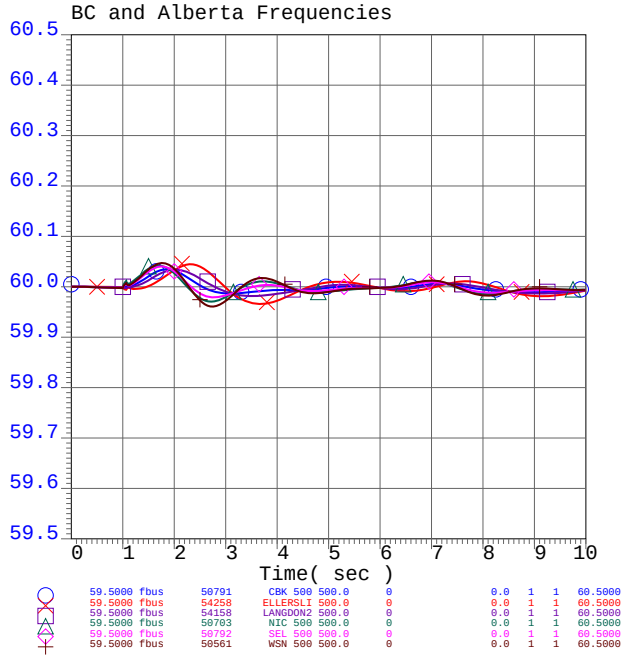


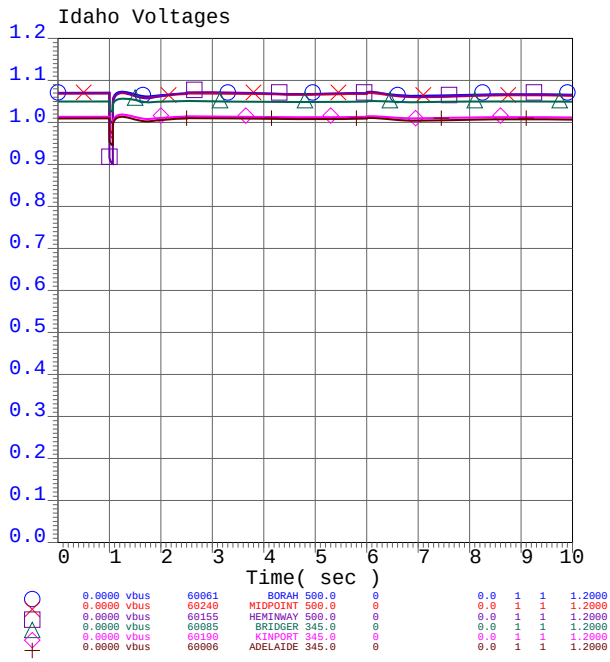


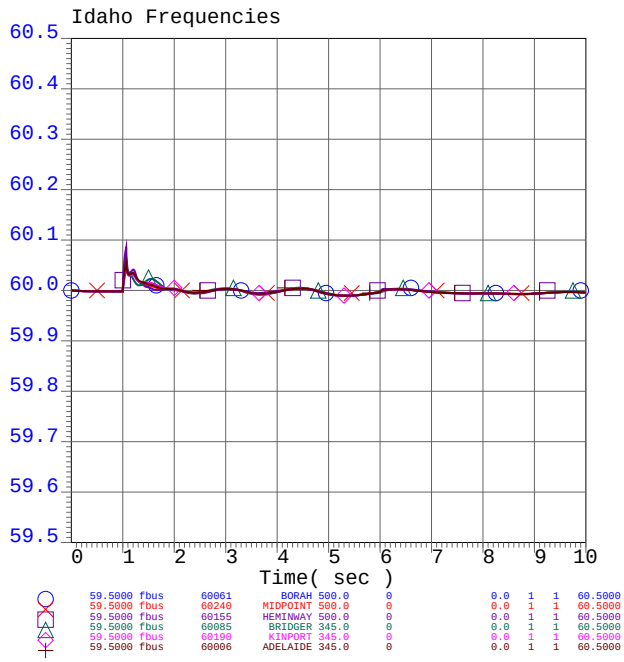
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





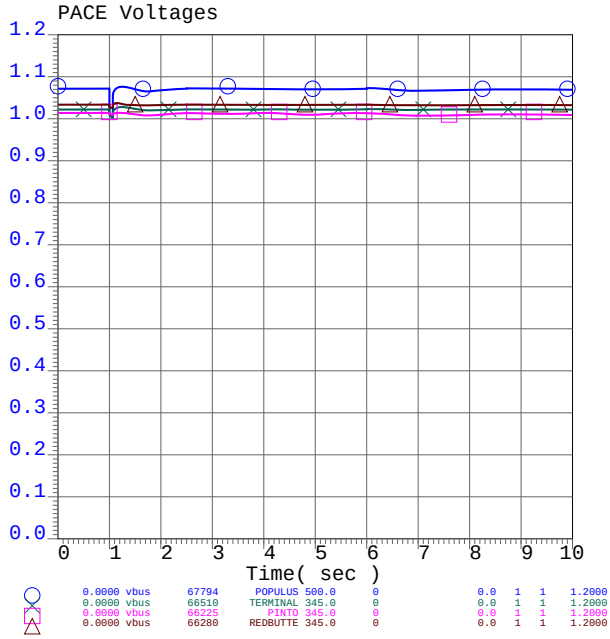




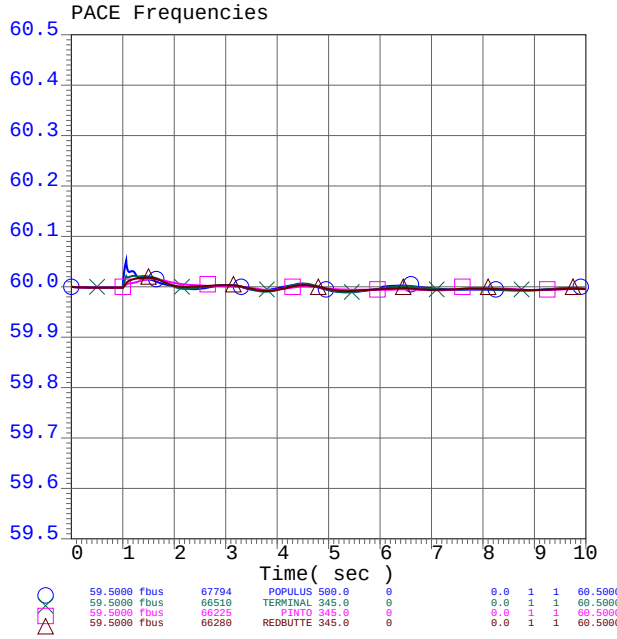
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3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

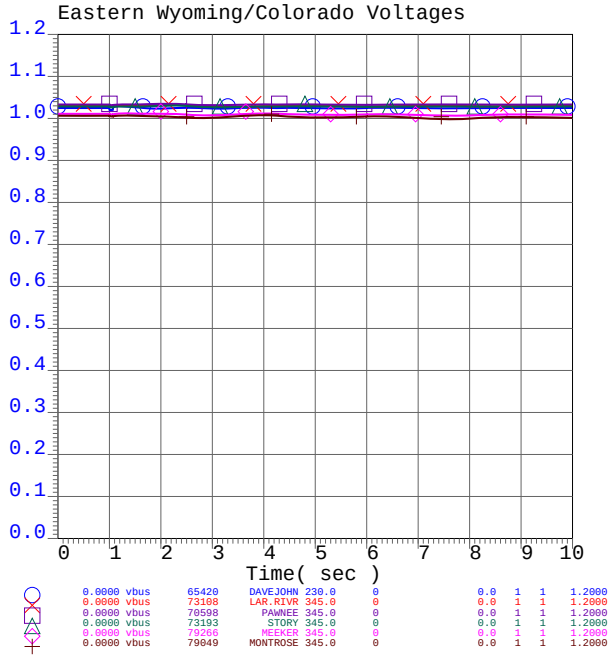
PACE Voltages



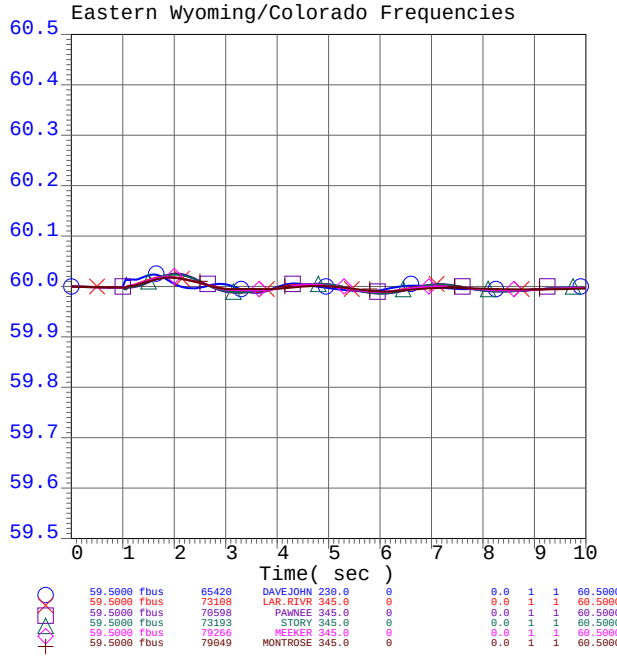
PACE Frequencies



Eastern Wyoming/Colorado Voltages



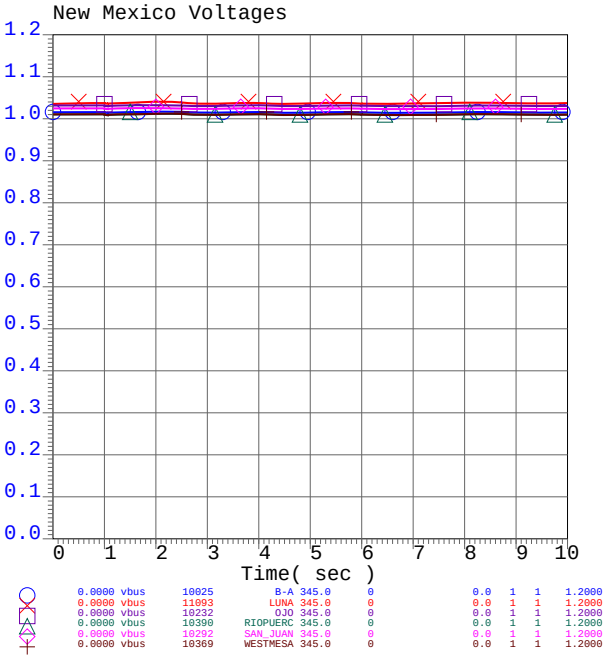
Eastern Wyoming/Colorado Frequencies



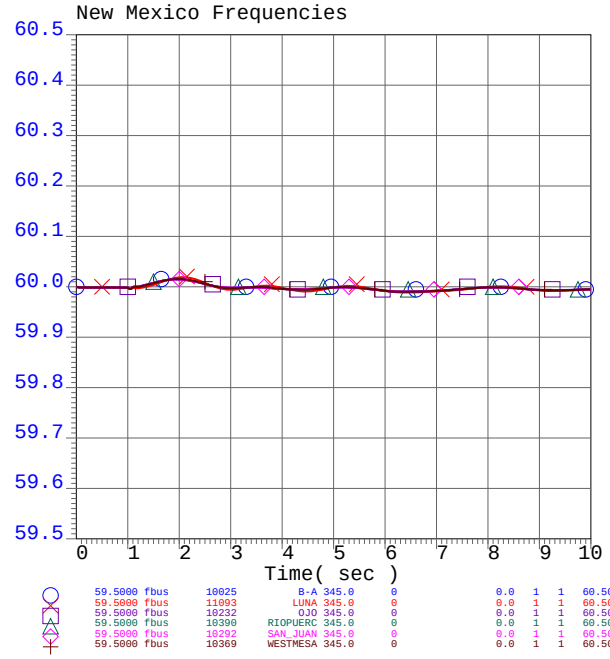
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

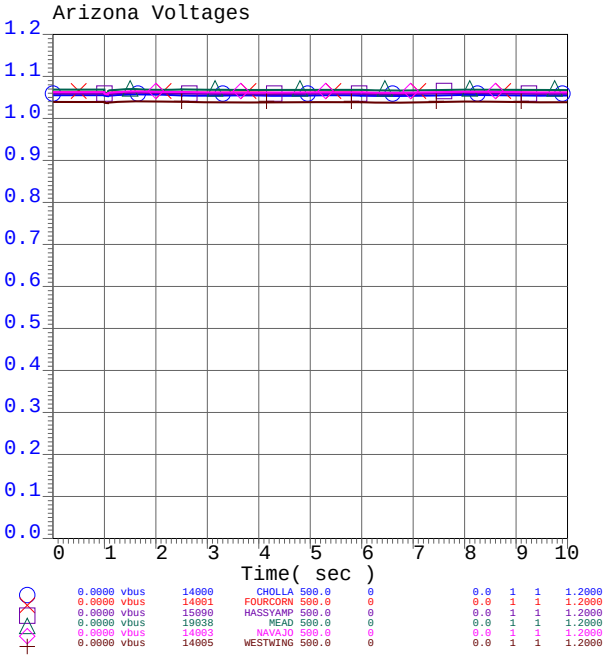
New Mexico Voltages



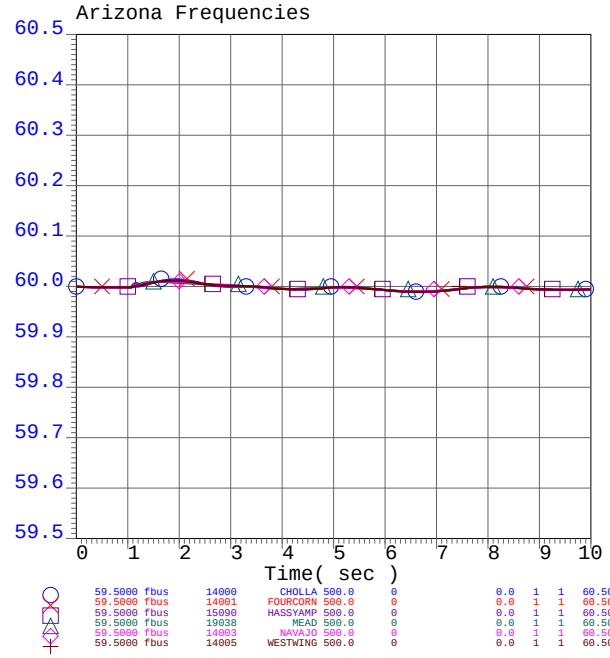
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

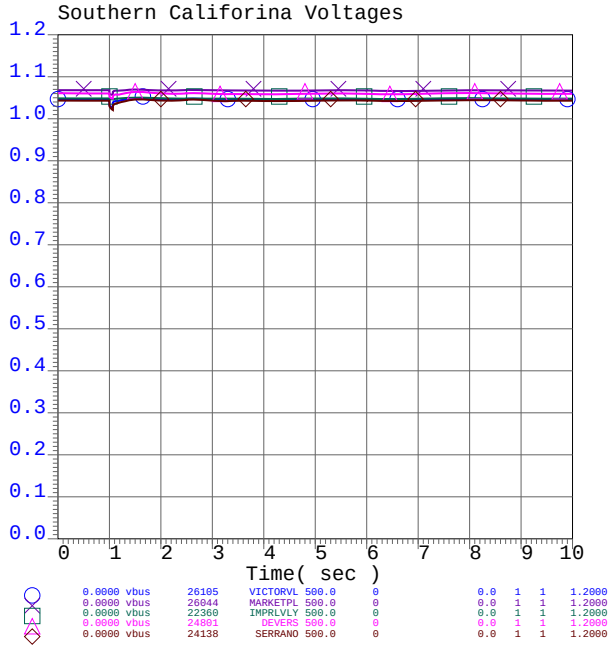


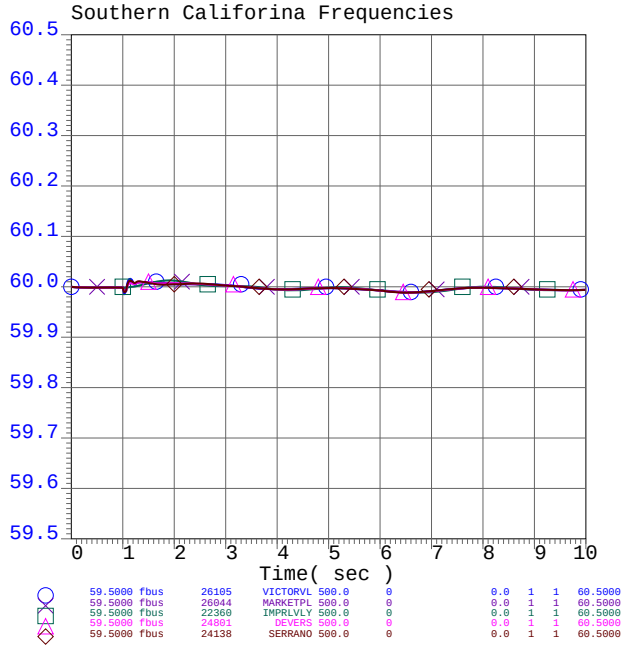
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

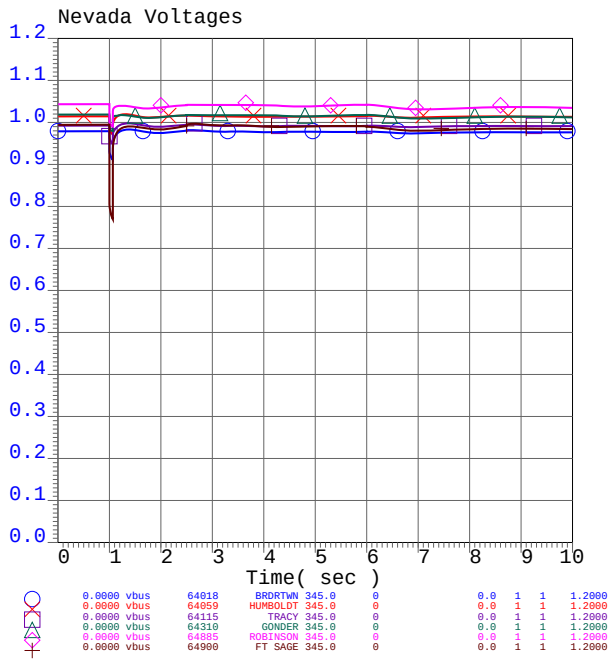
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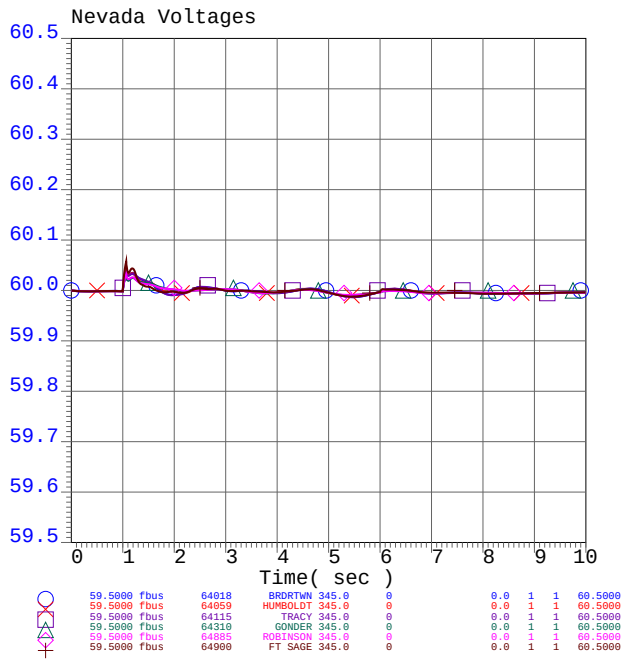
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WECC AREA VOLTAGE AND FREQUENCIES



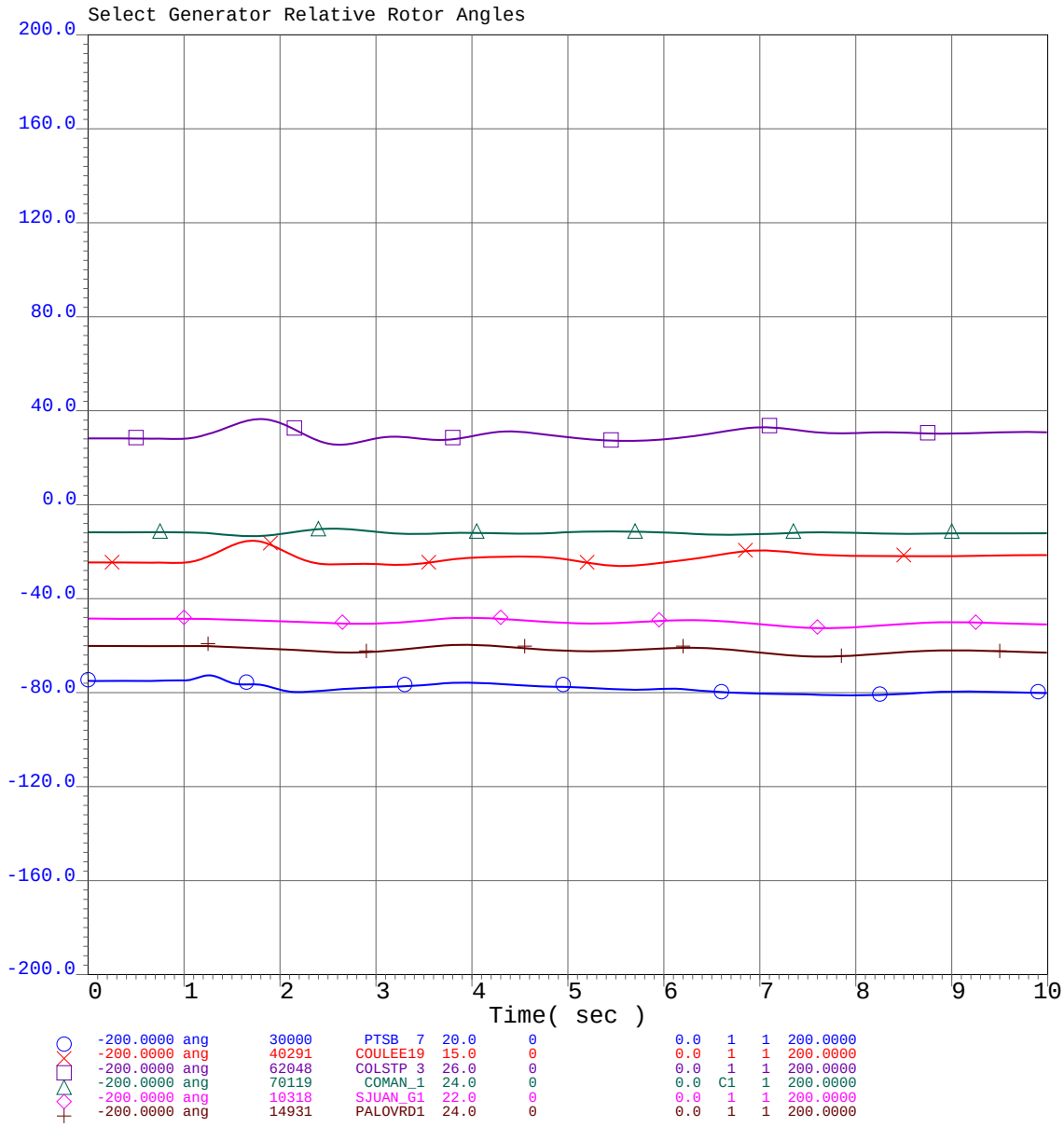






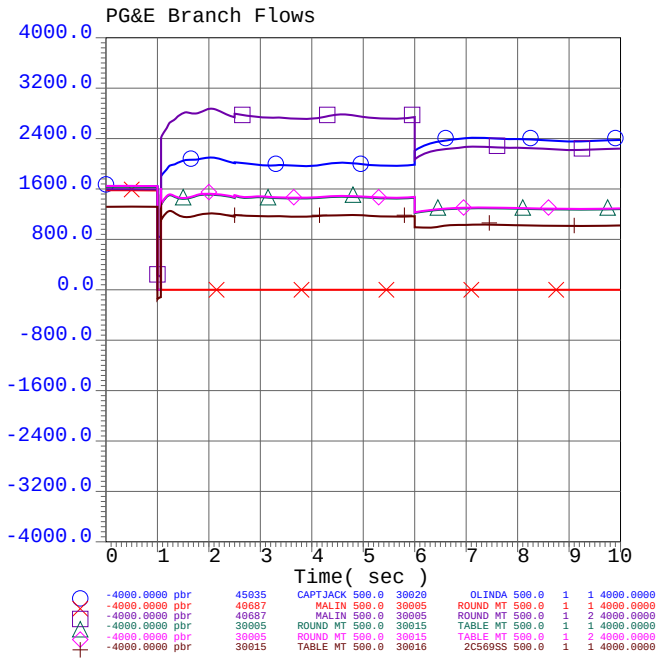
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

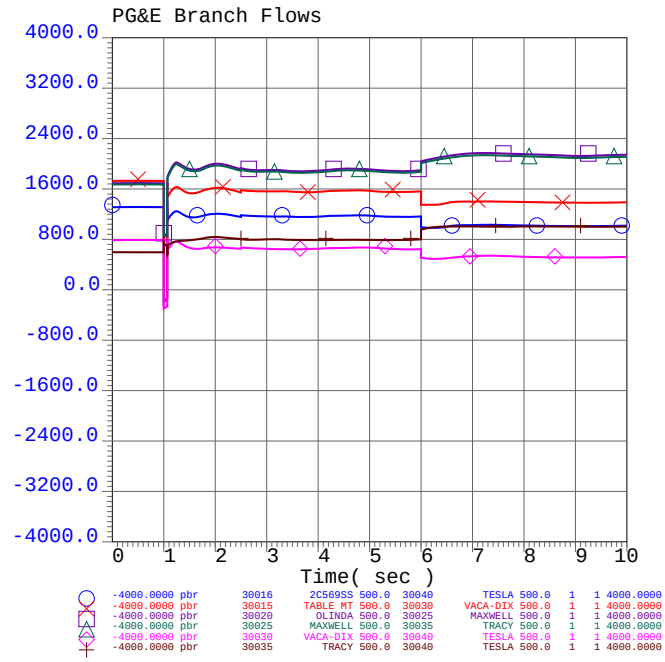
WECC RELATIVE ROTOR ANGLES

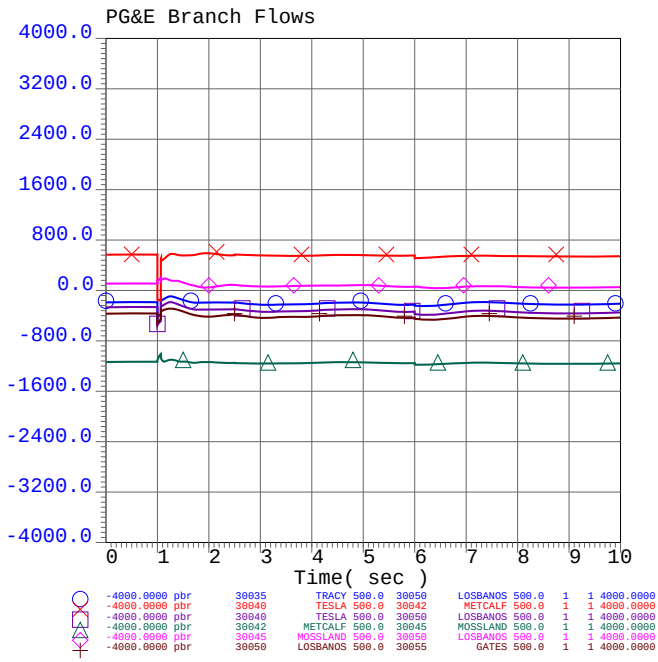


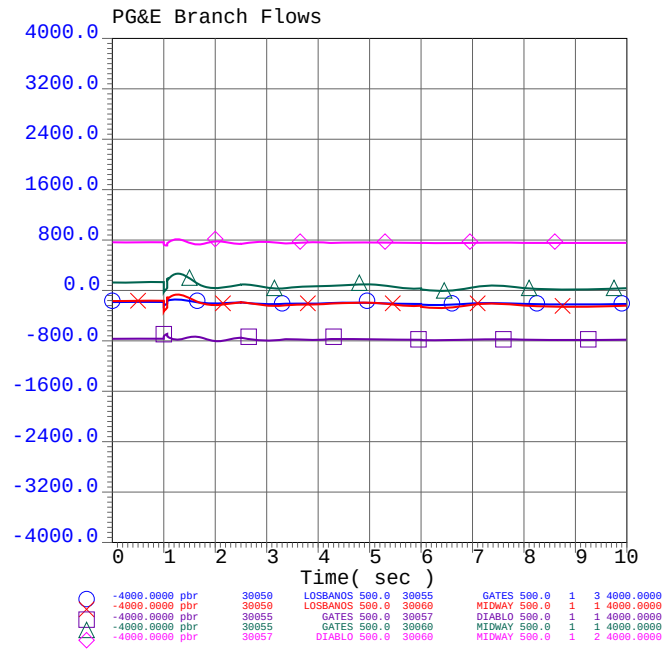
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followed by loss of Malin-Round Mountain #1 500 kV line

SELECT BRANCH FLOWS



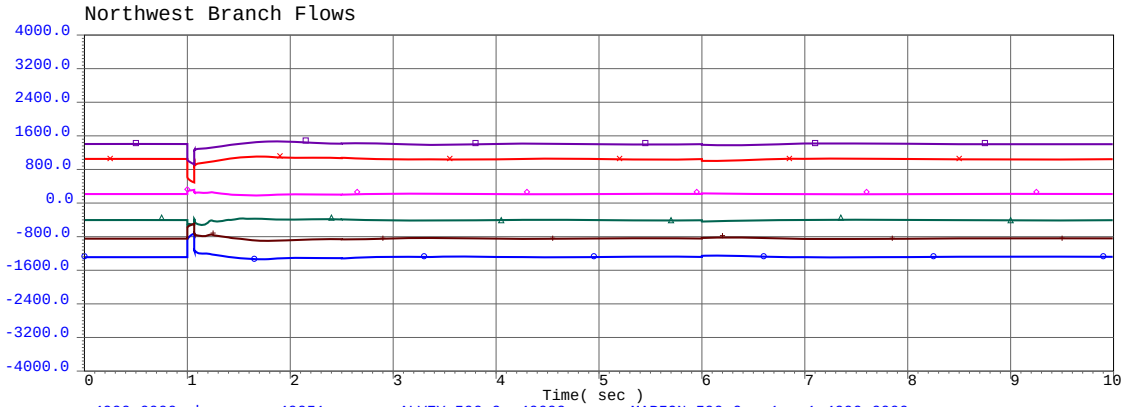




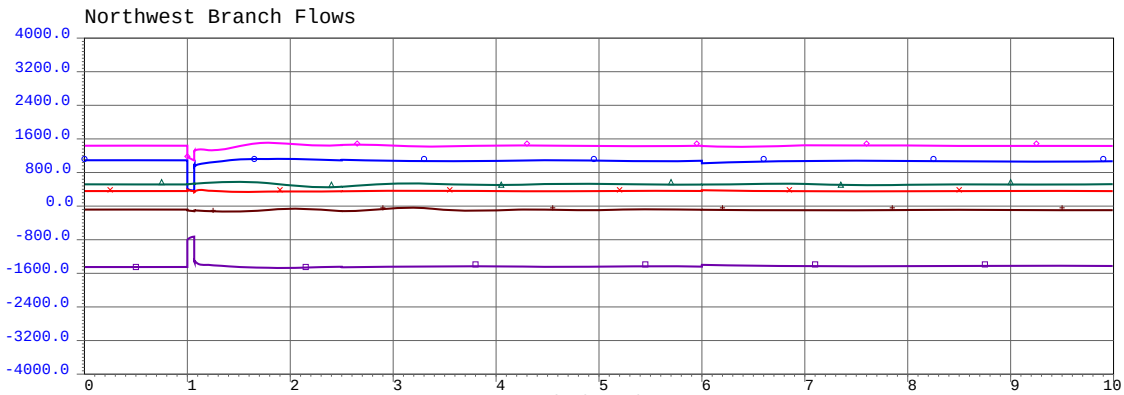


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

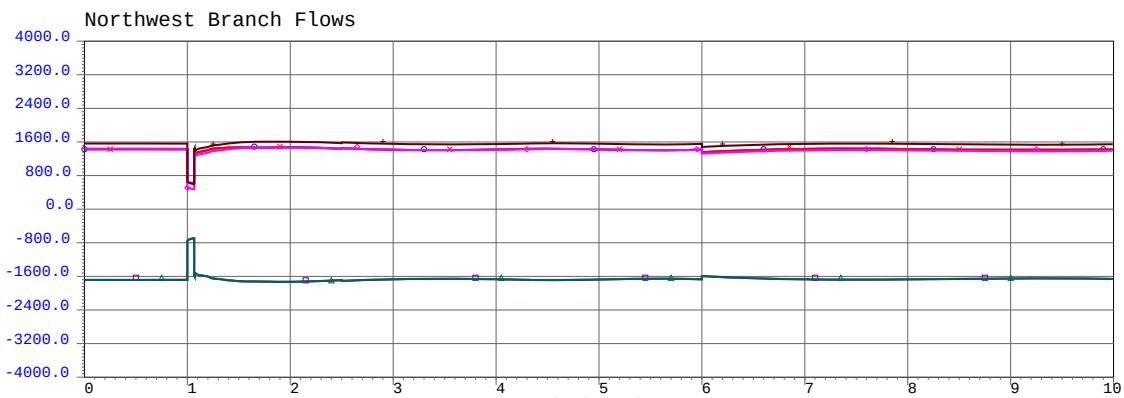
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



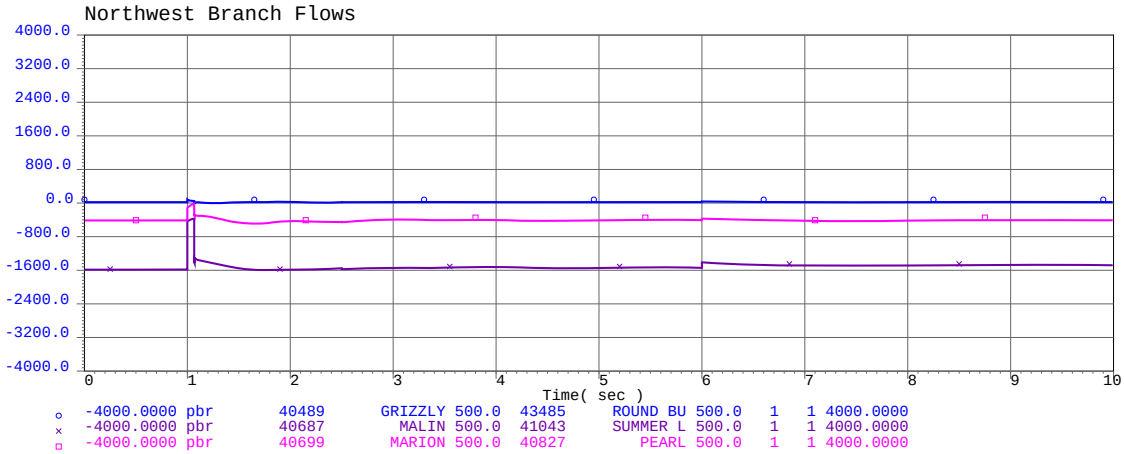
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



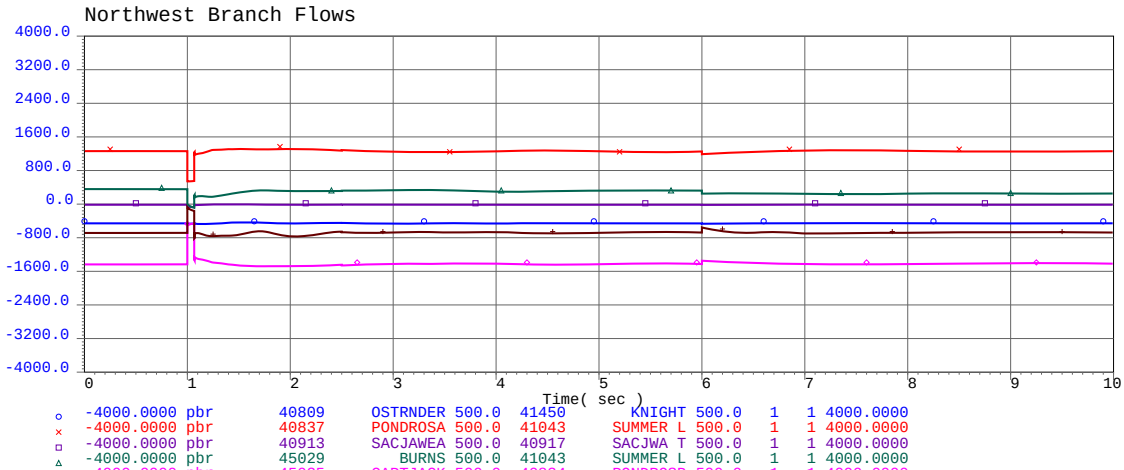
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

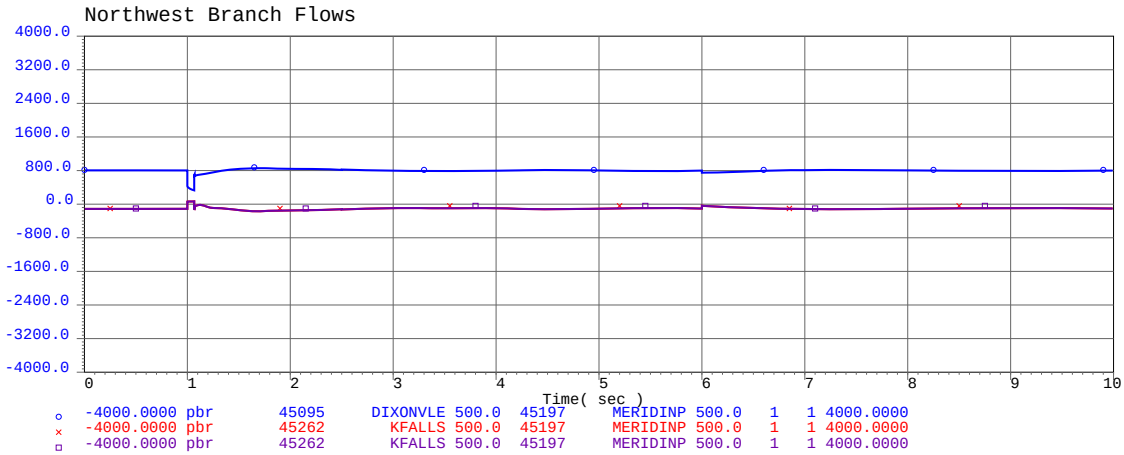
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



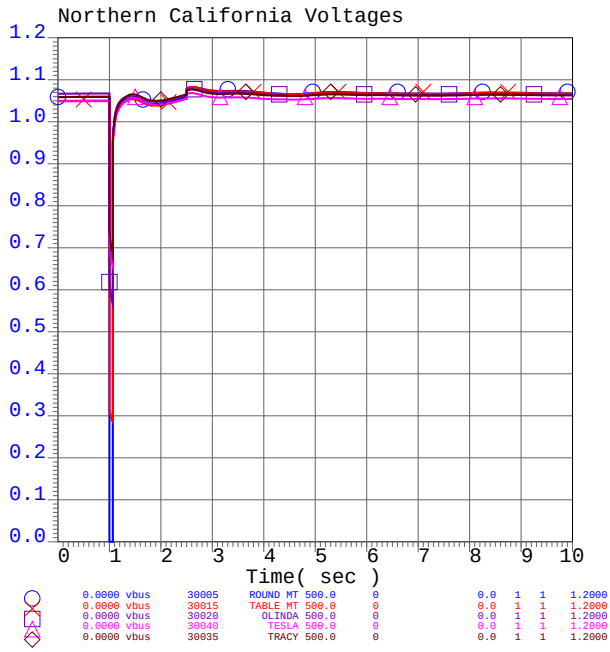
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
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-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

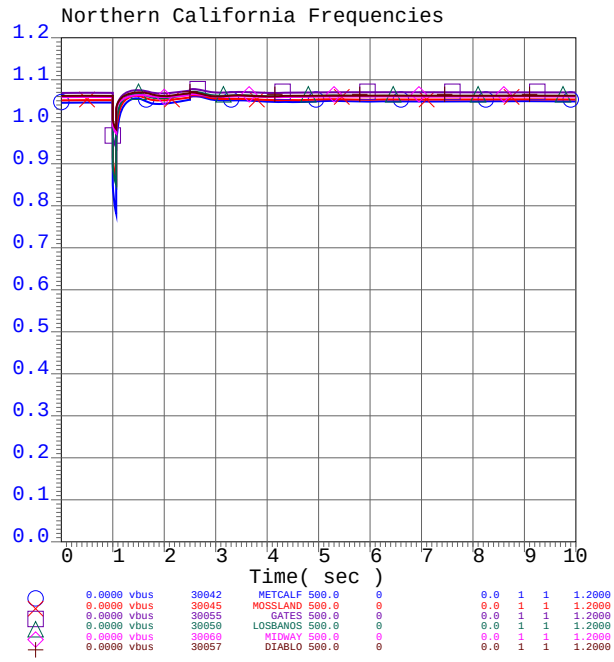


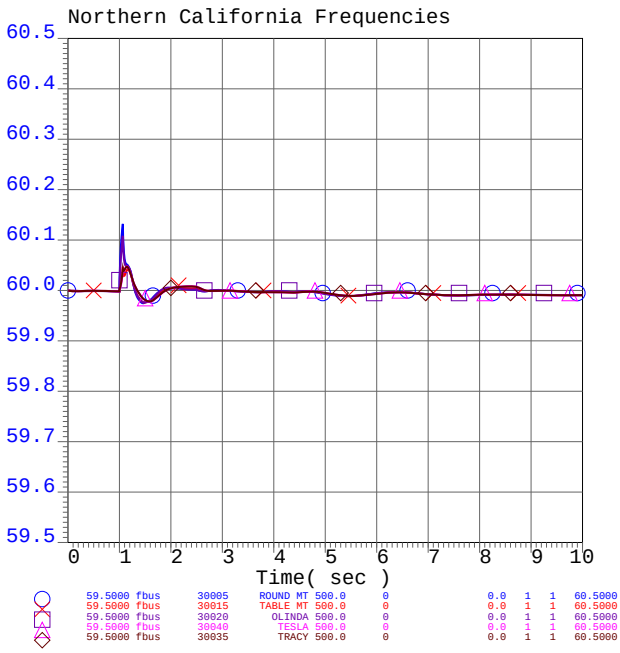
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

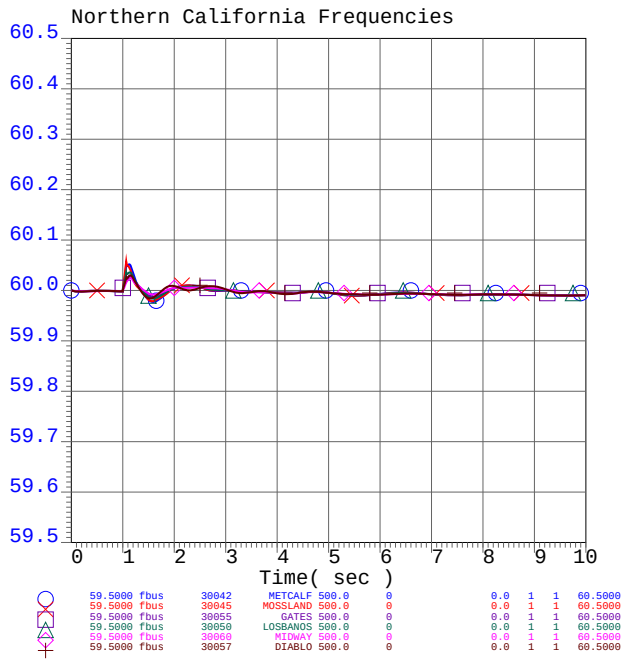
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



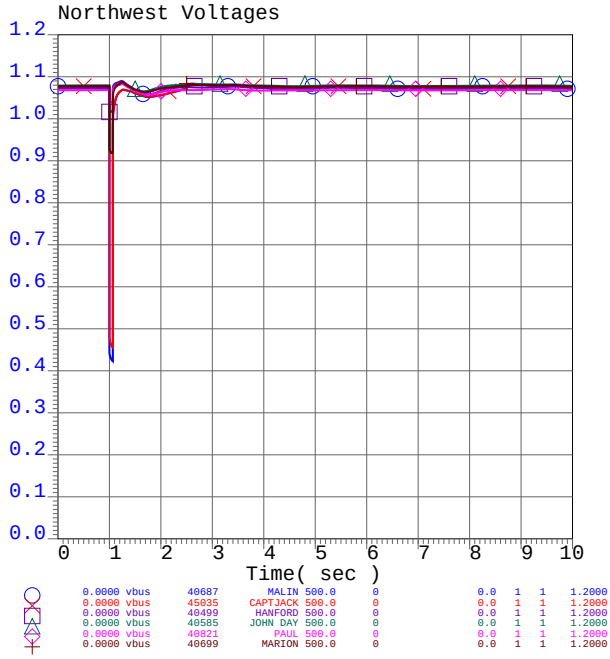


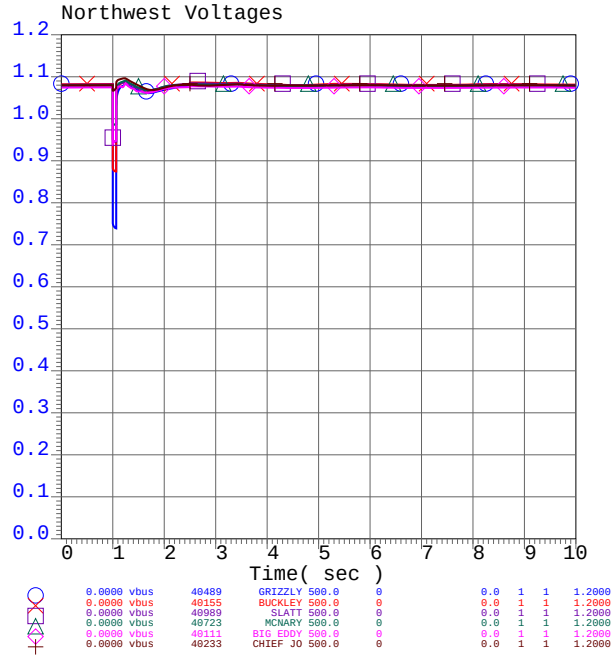


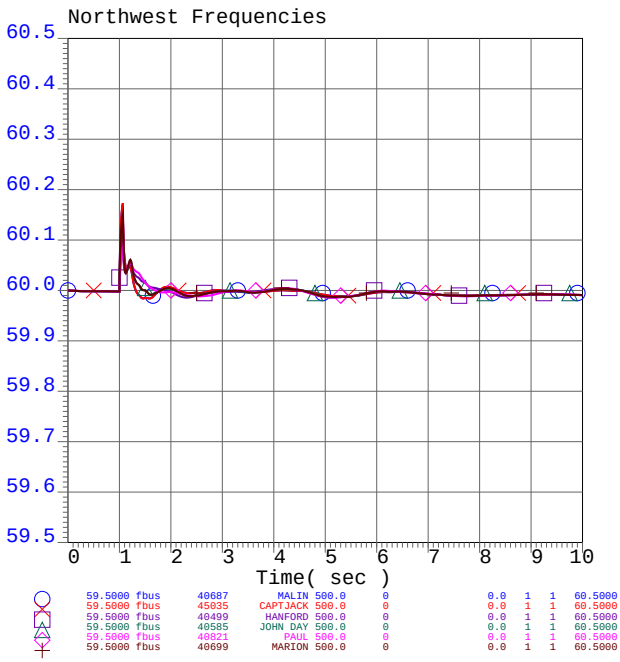


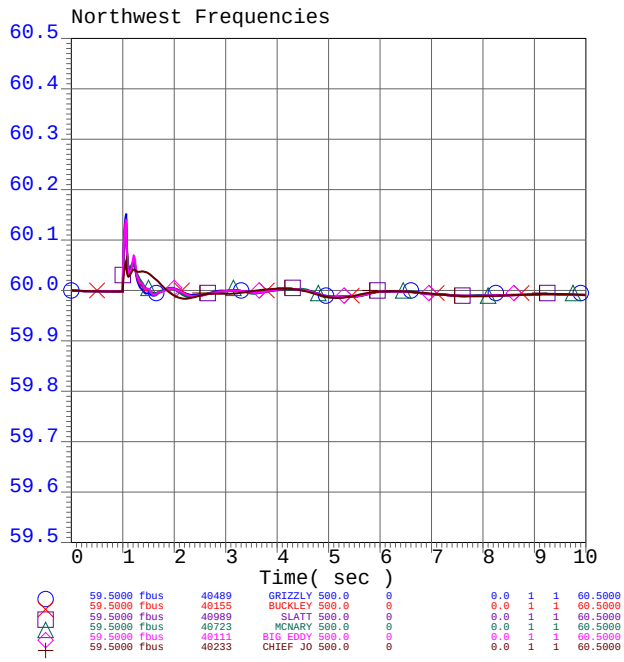
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



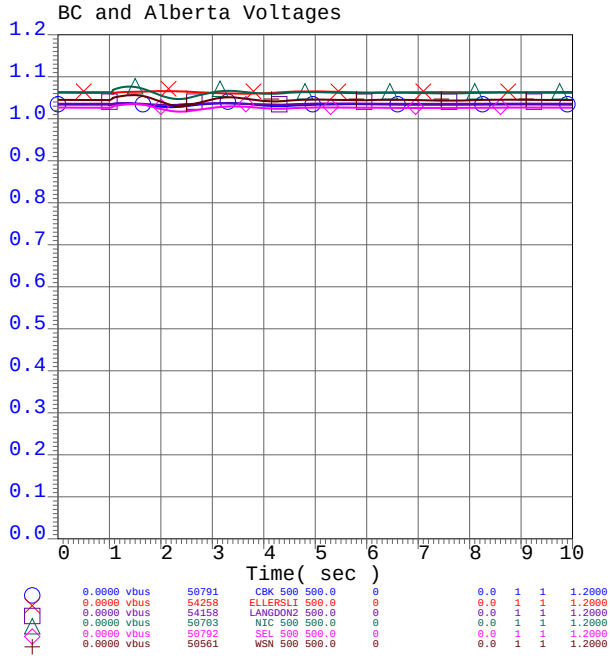


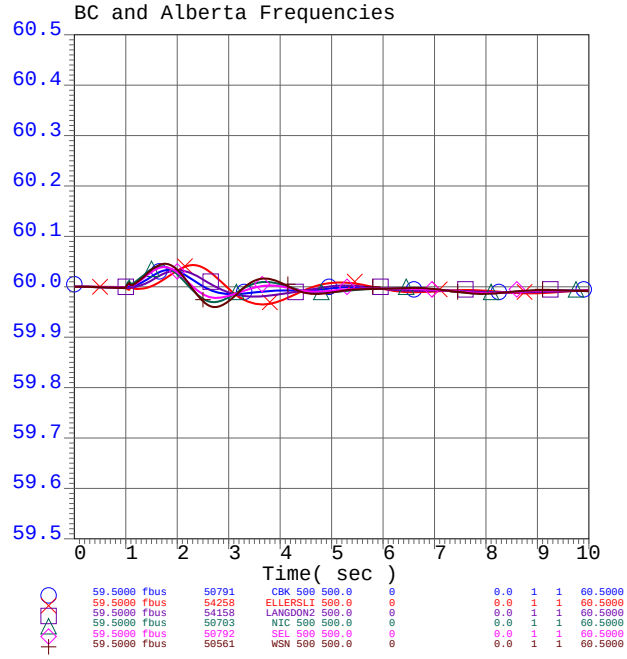


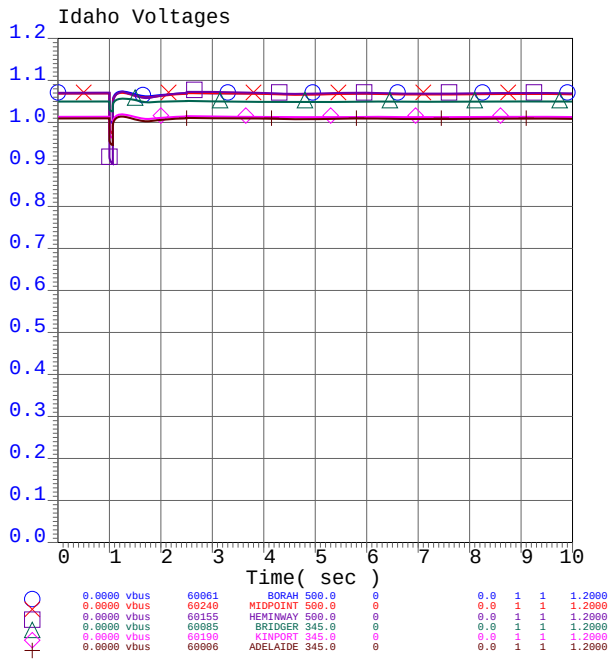


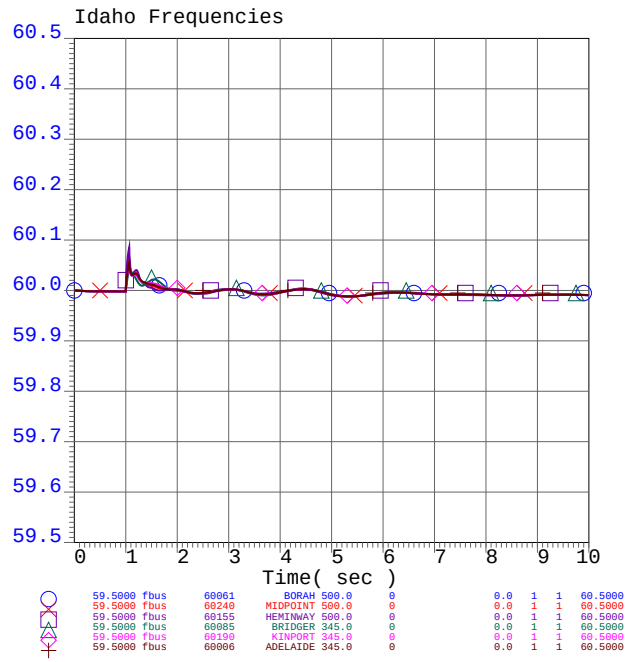
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





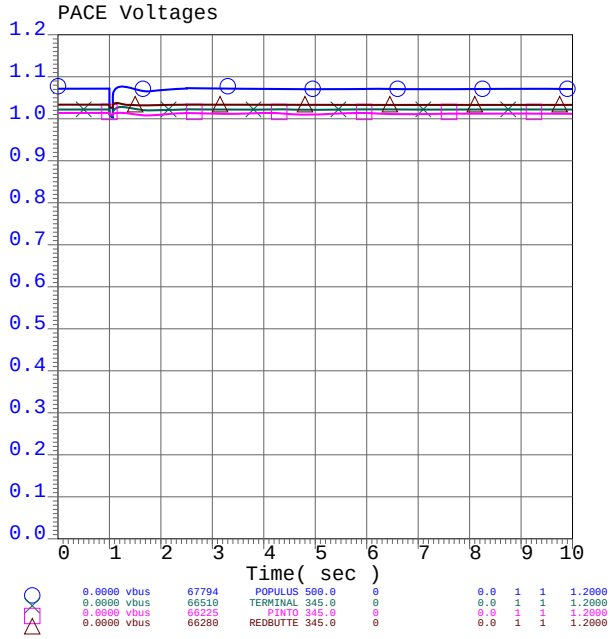




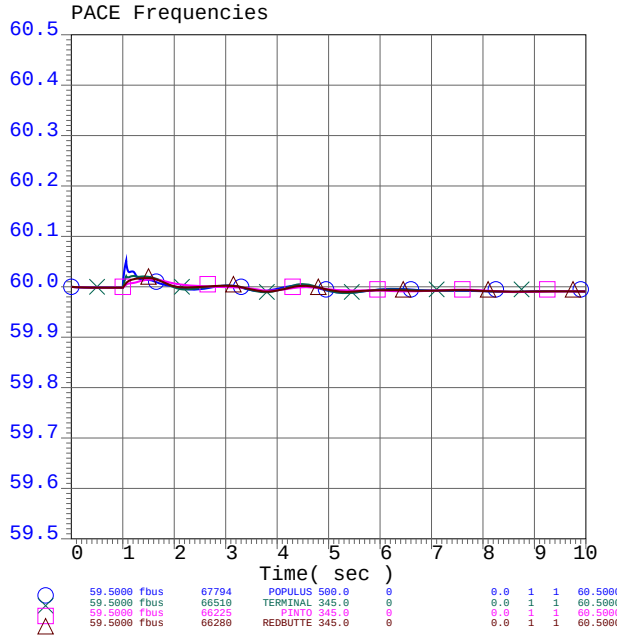
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

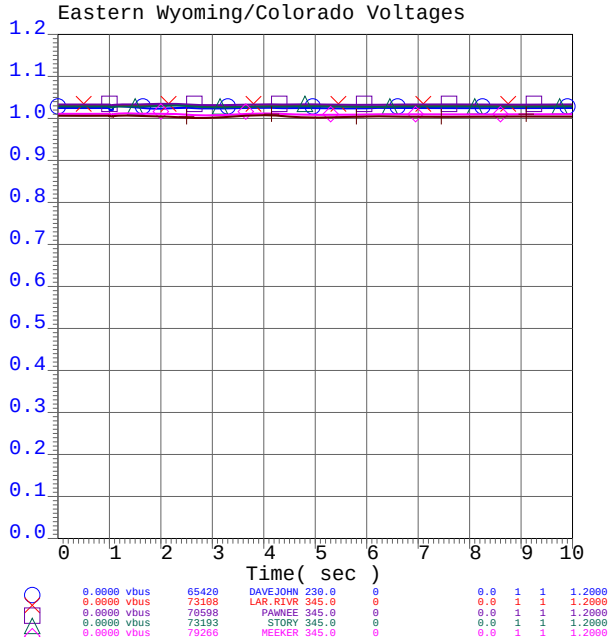
PACE Voltages



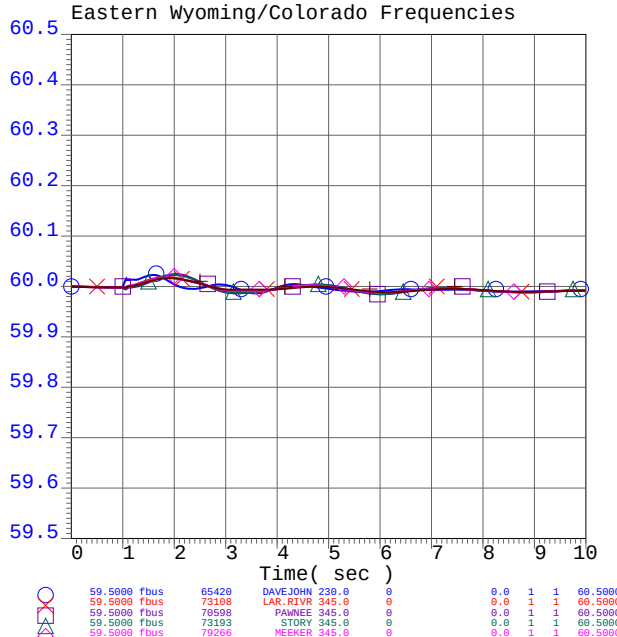
PACE Frequencies



Eastern Wyoming/Colorado Voltages



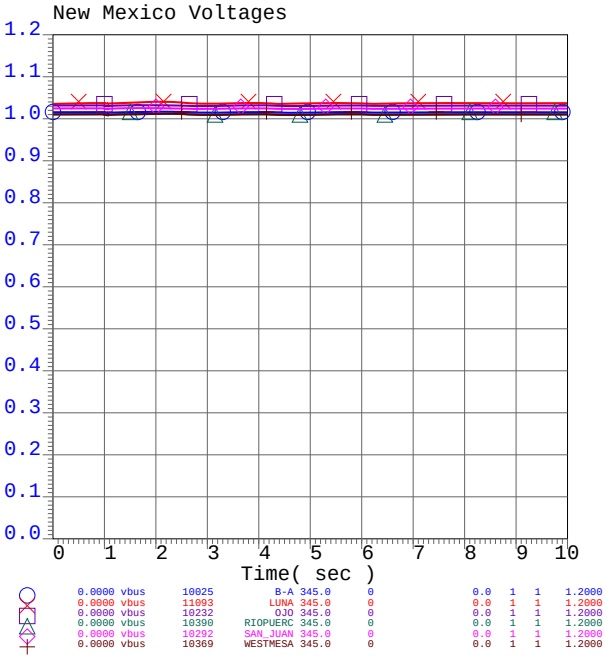
Eastern Wyoming/Colorado Frequencies



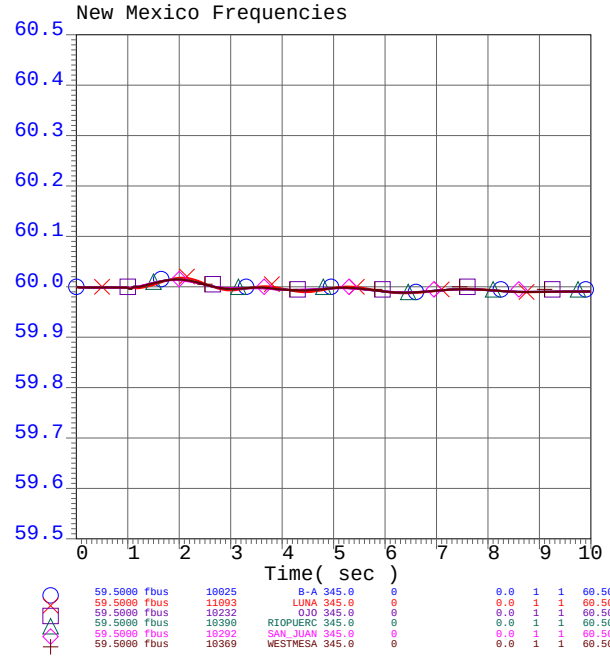
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

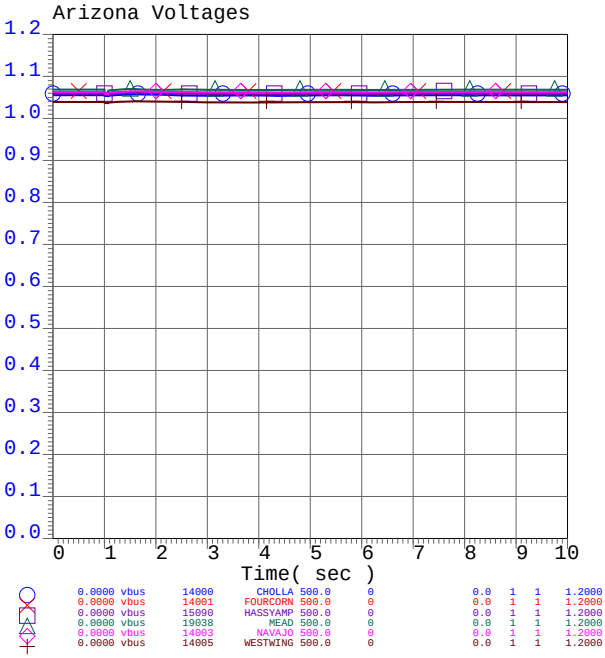
New Mexico Voltages



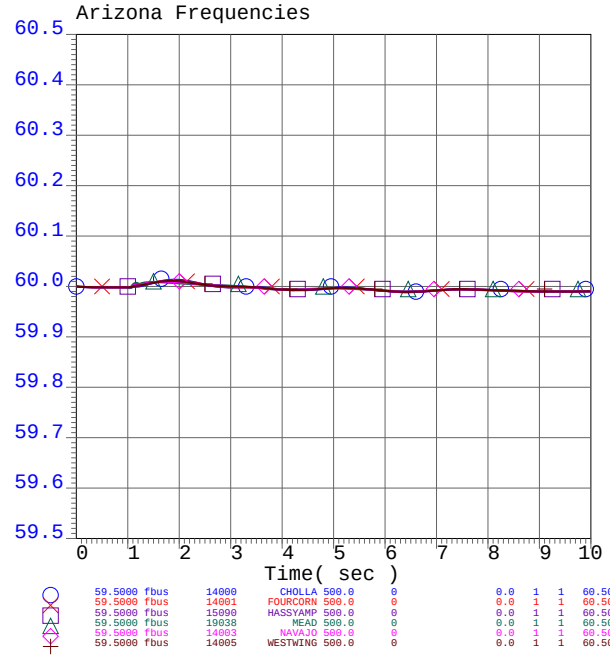
New Mexico Frequencies



Arizona Voltages

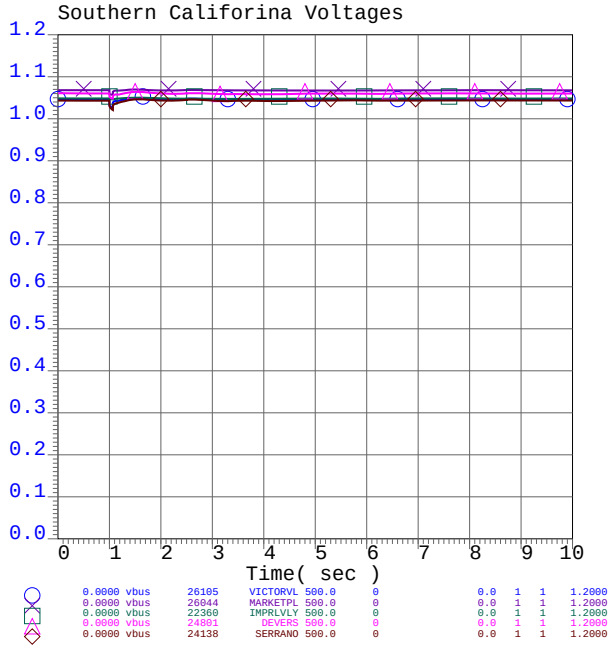


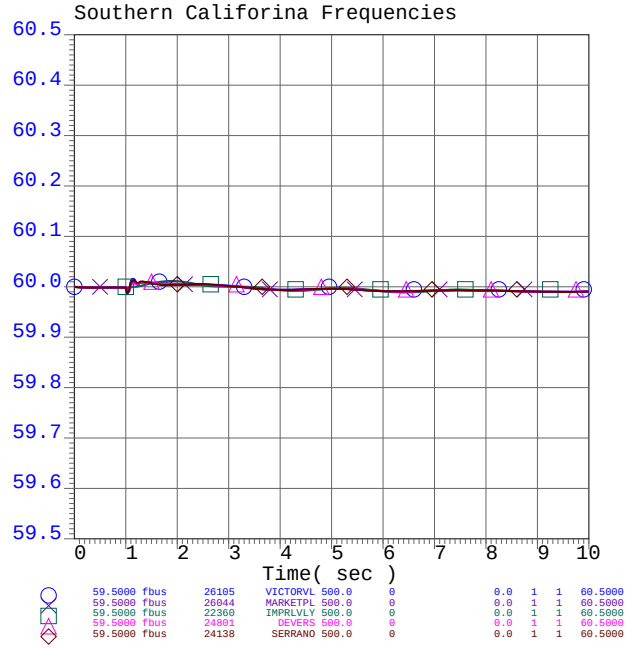
Arizona Frequencies

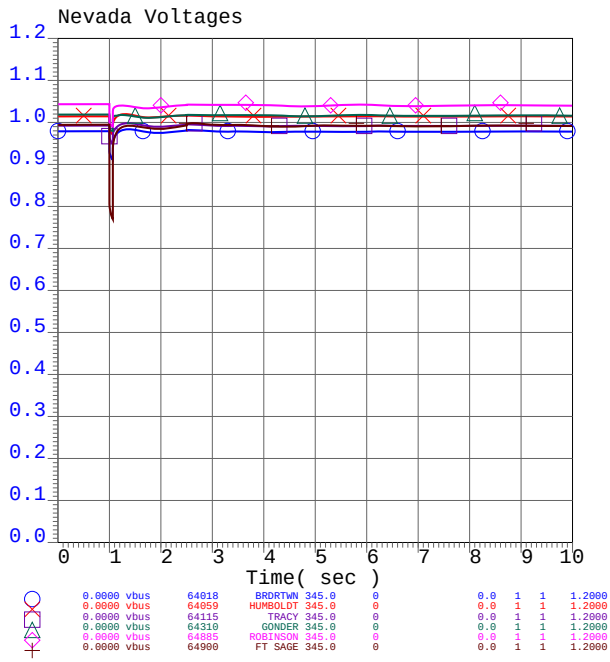


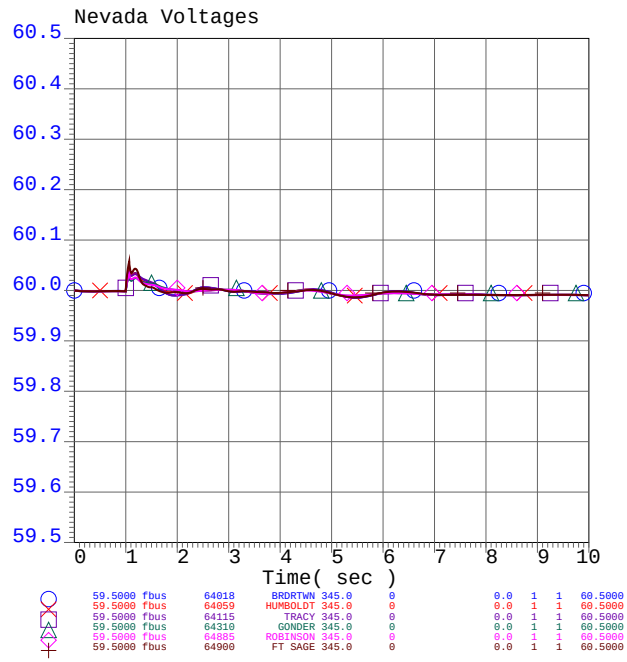
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



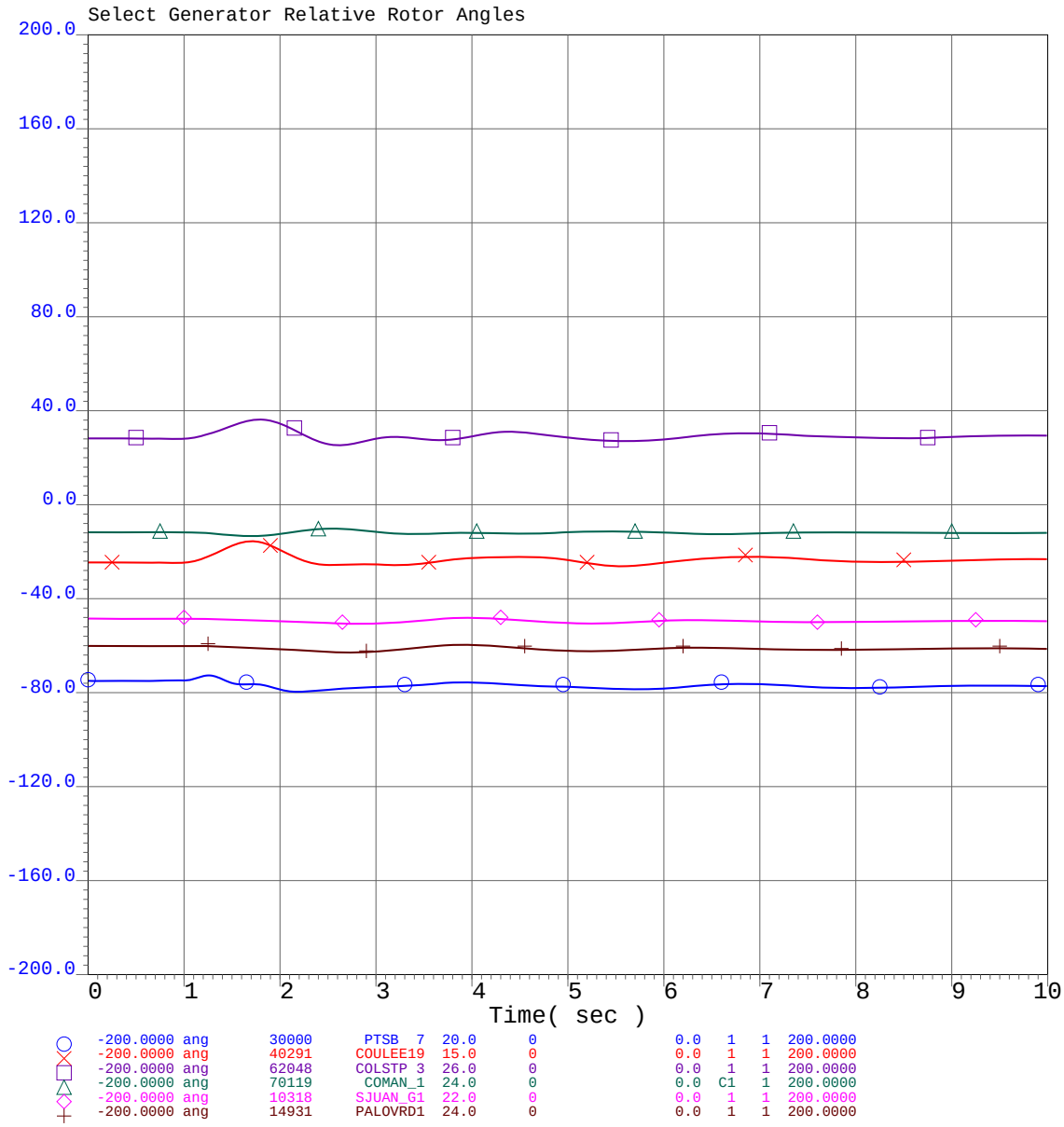






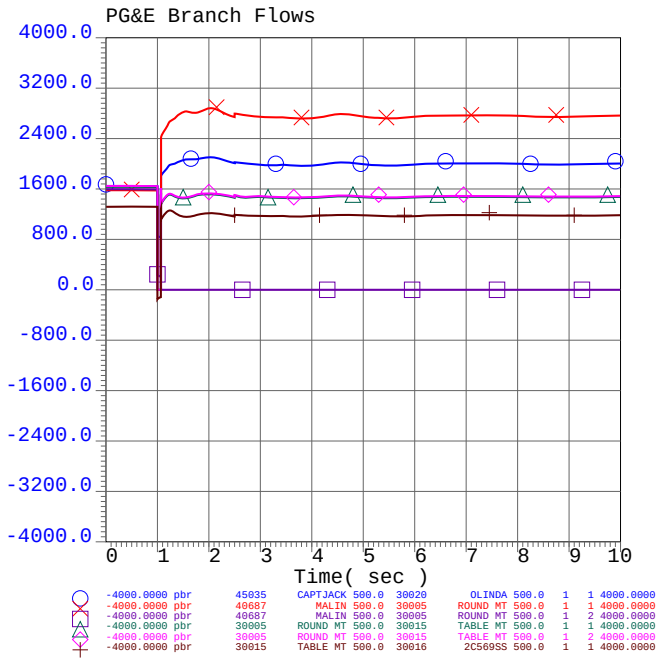
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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followed by loss of Malin-Round Mountain #2 500 kV line

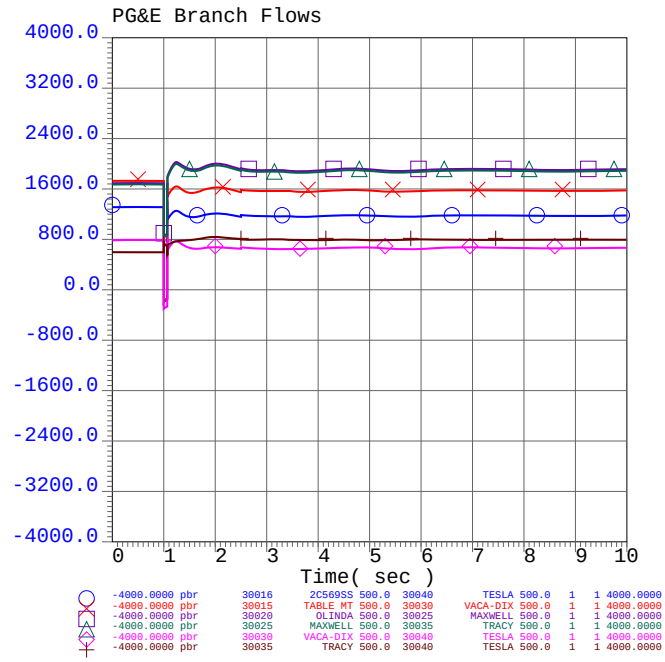
WECC RELATIVE ROTOR ANGLES

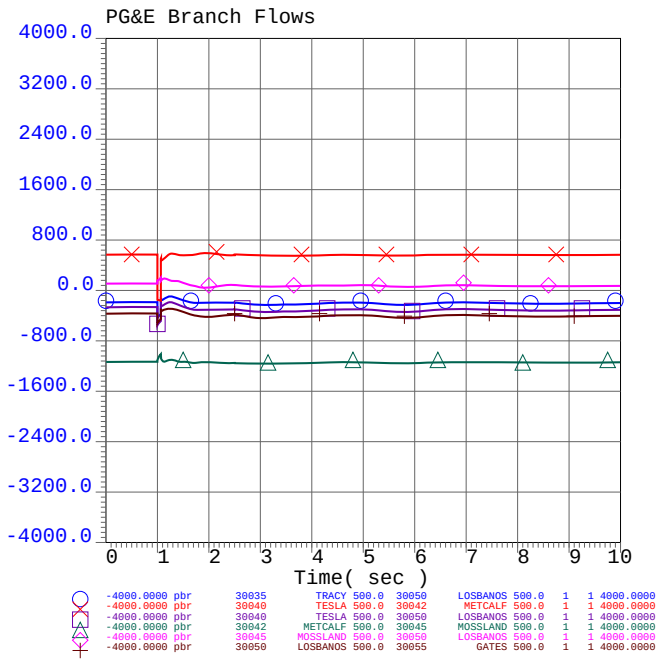


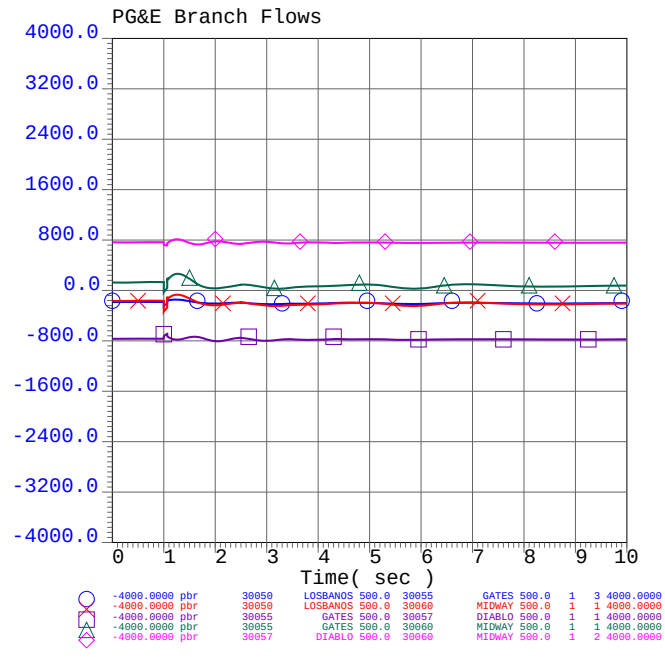
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3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

SELECT BRANCH FLOWS





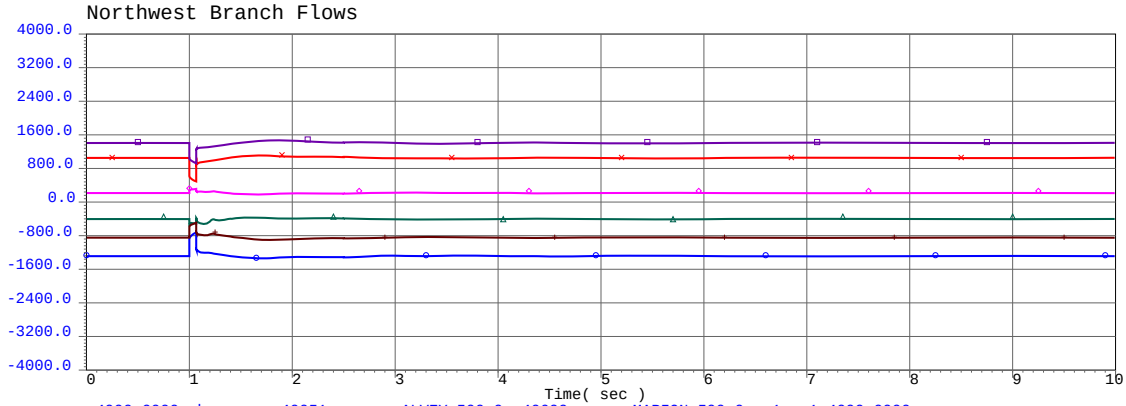




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
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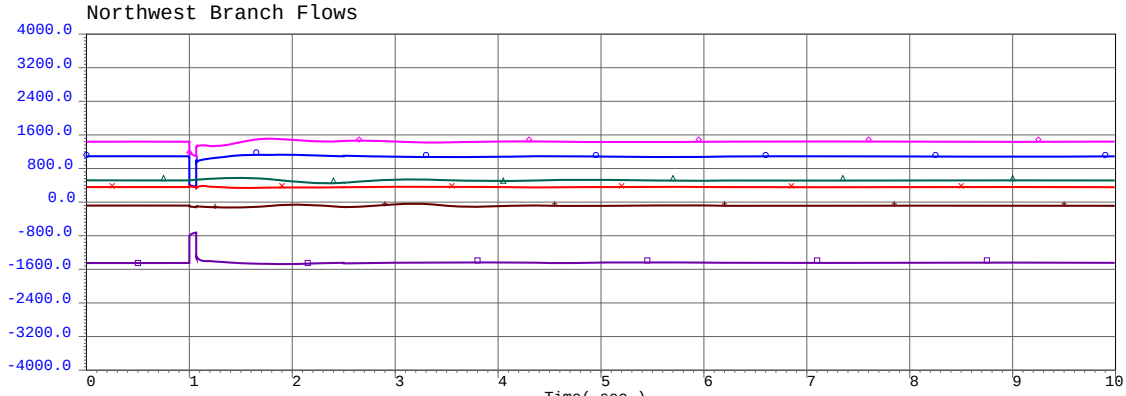
SELECT BRANCH FLOWS

Northwest Branch Flows



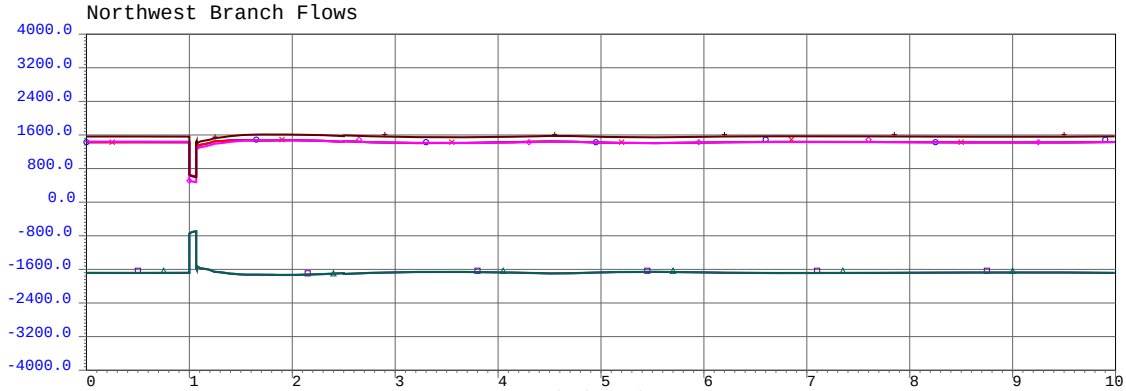
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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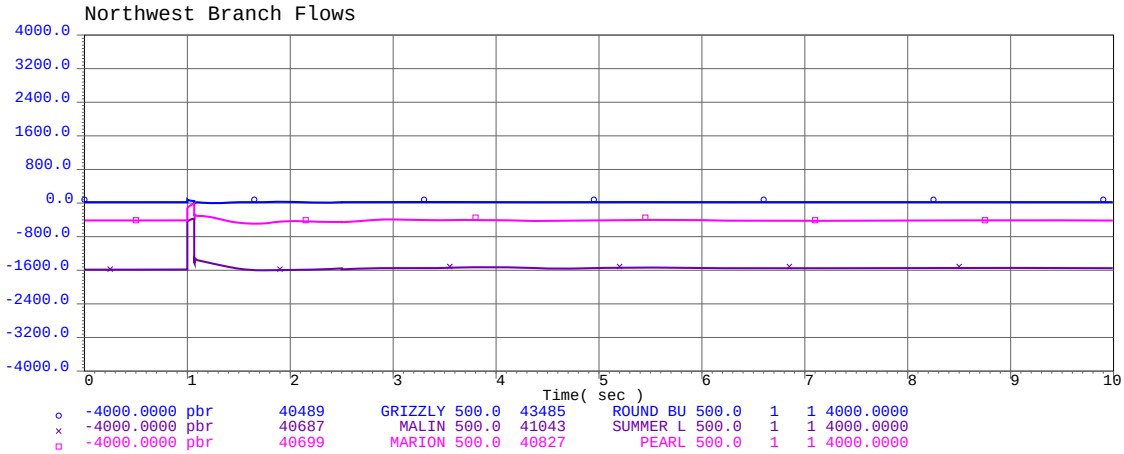
Northwest Branch Flows

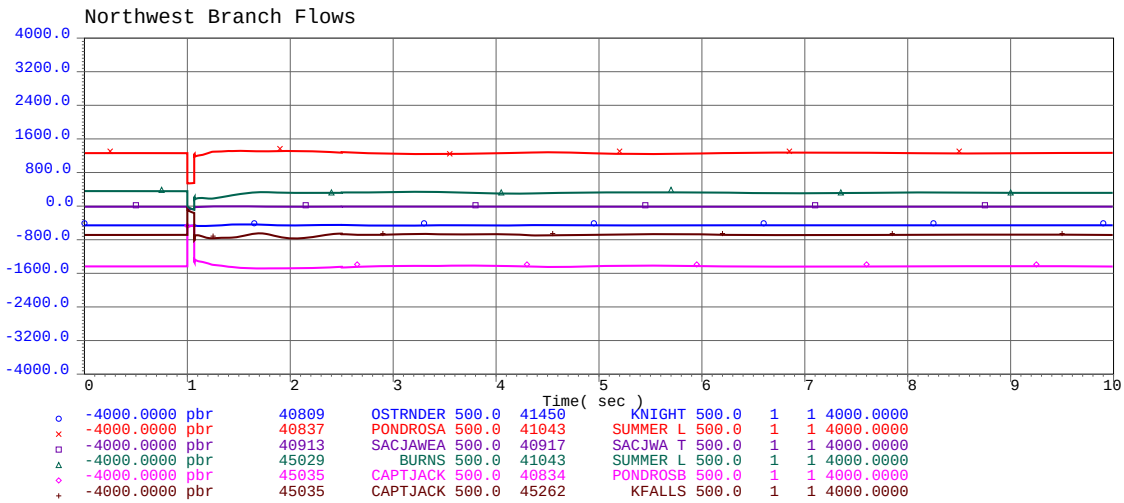


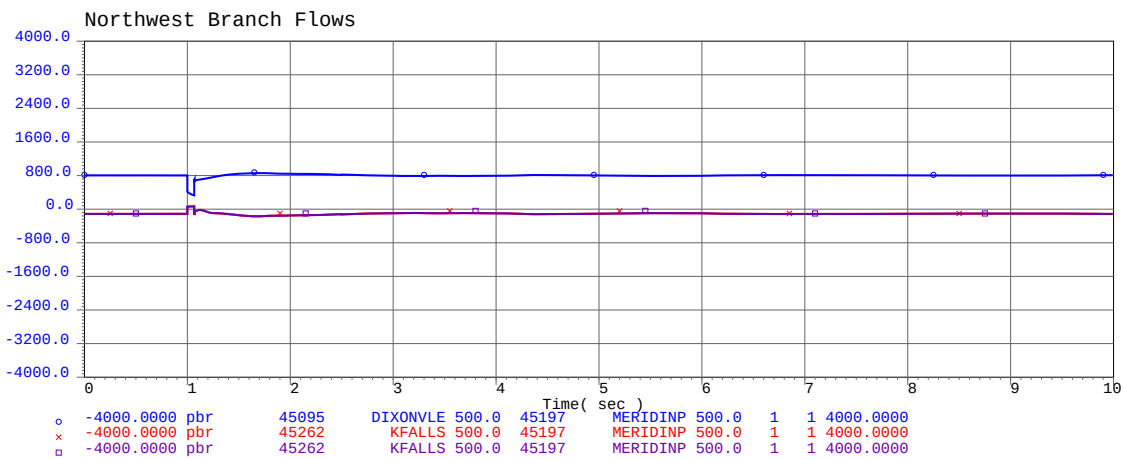
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

SELECT BRANCH FLOWS

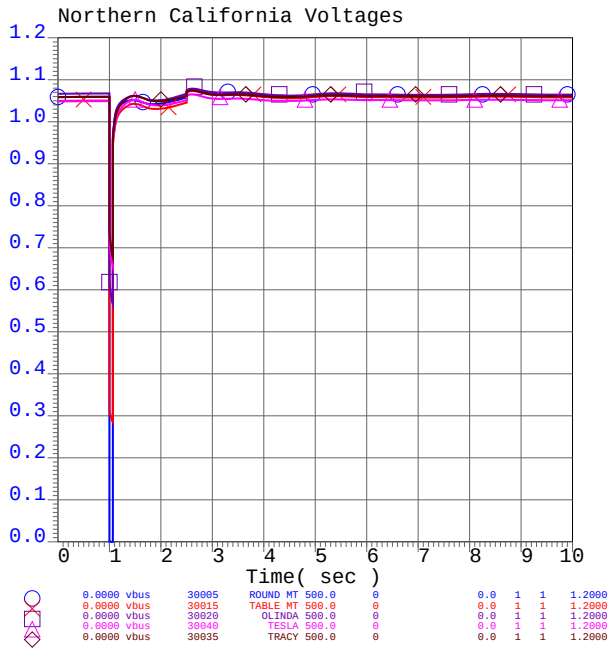


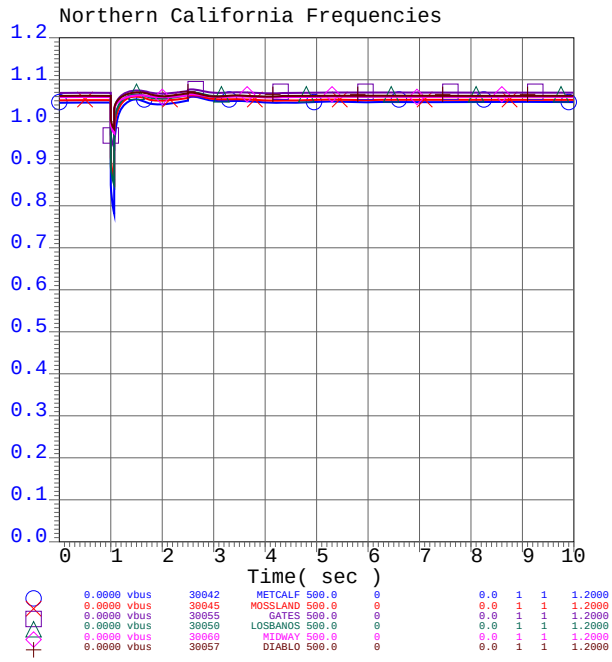


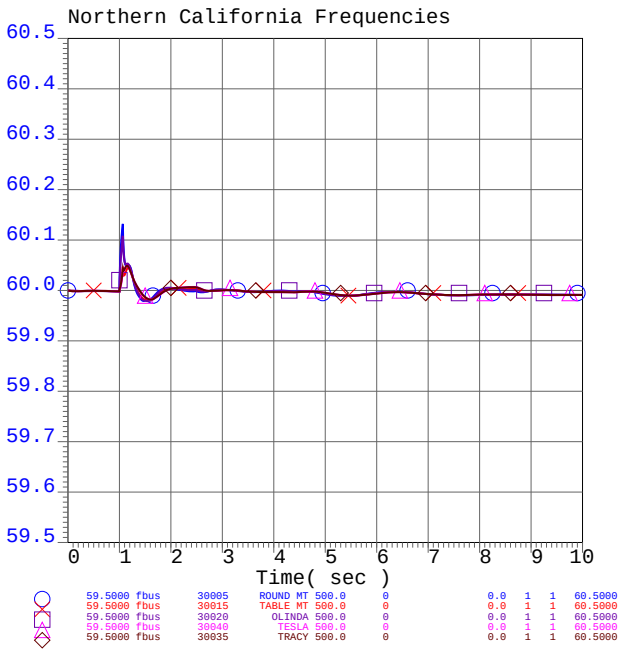


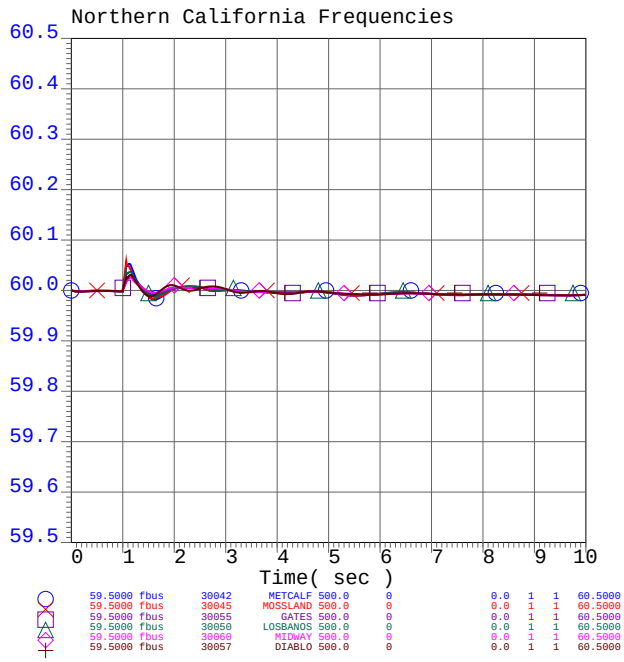
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Malin-Round Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



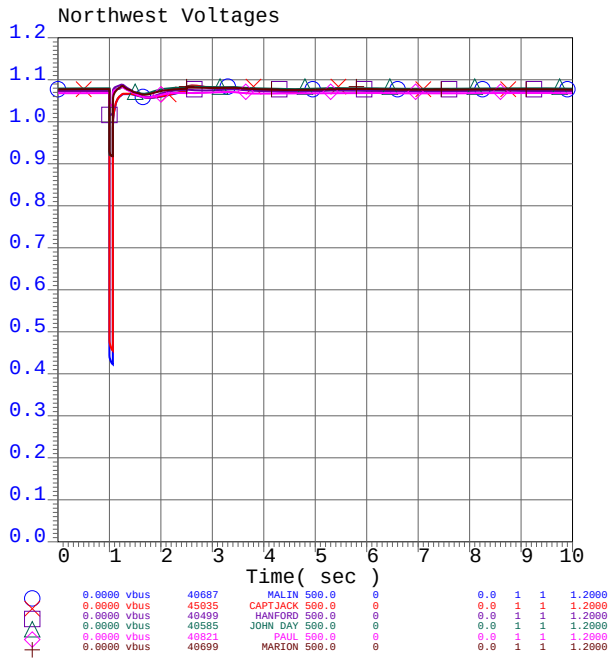


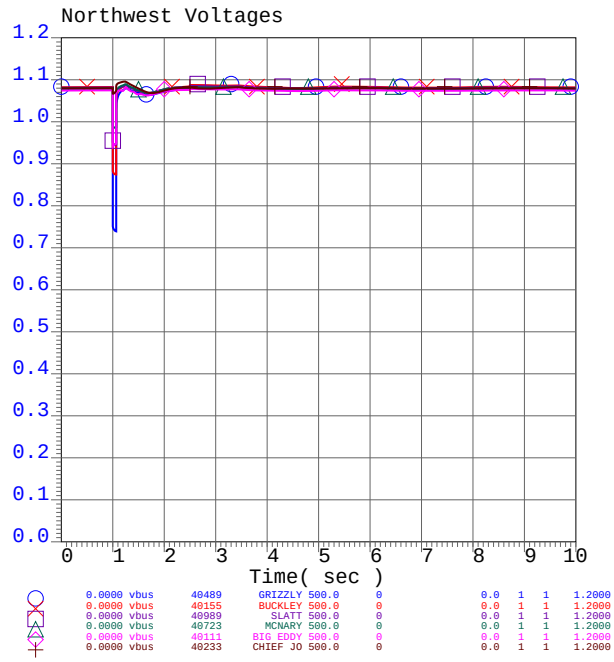


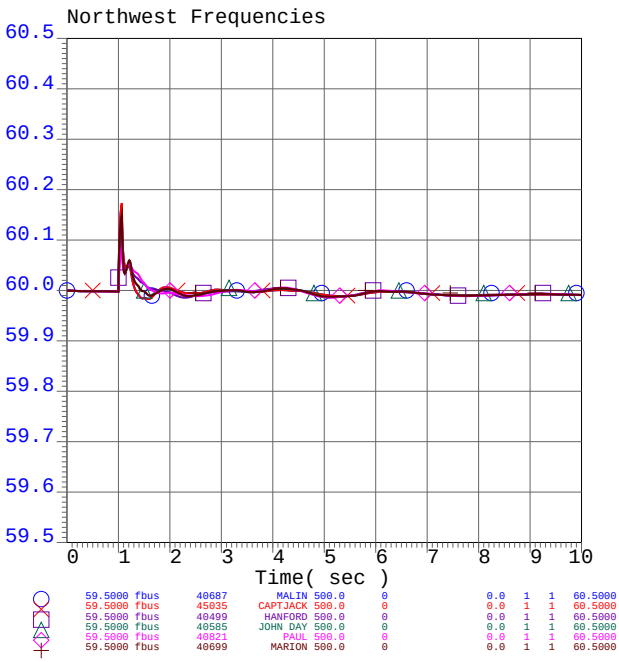


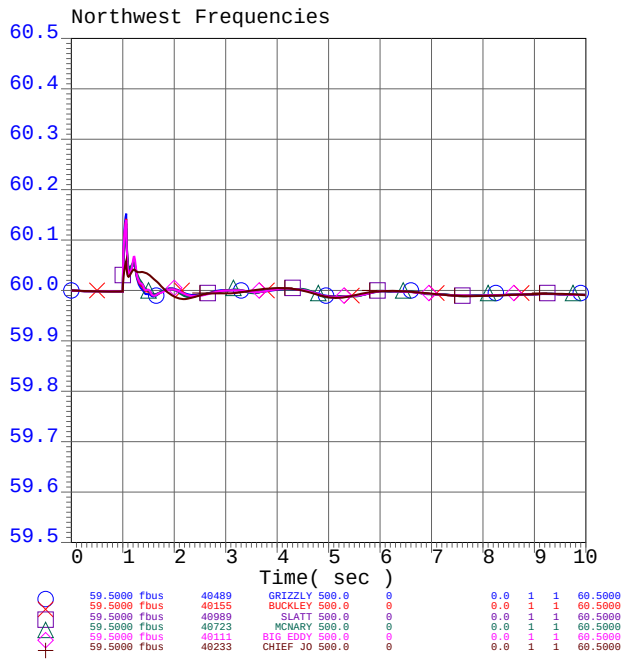
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





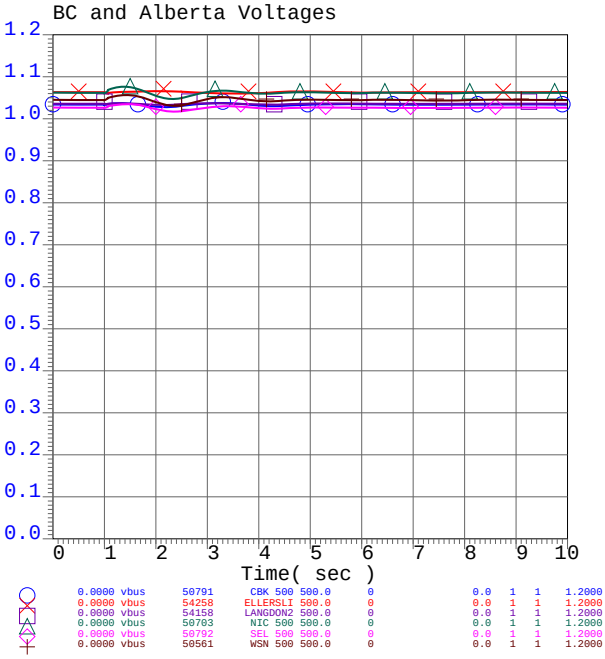




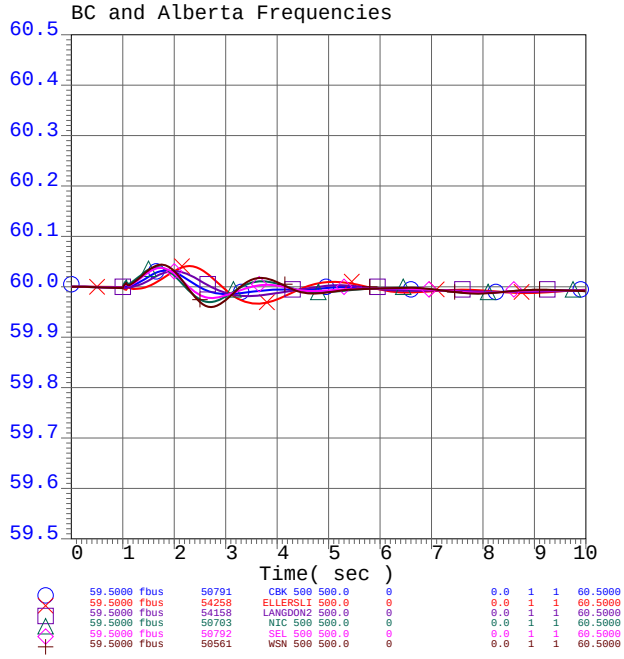
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

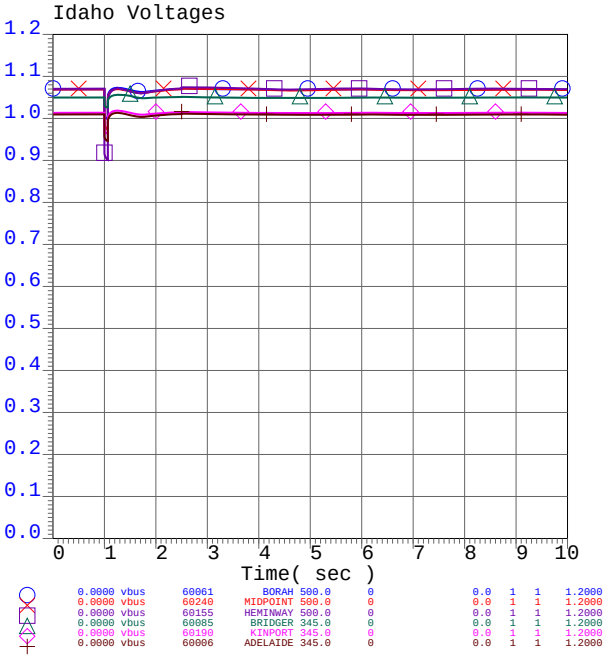
BC and Alberta Voltages



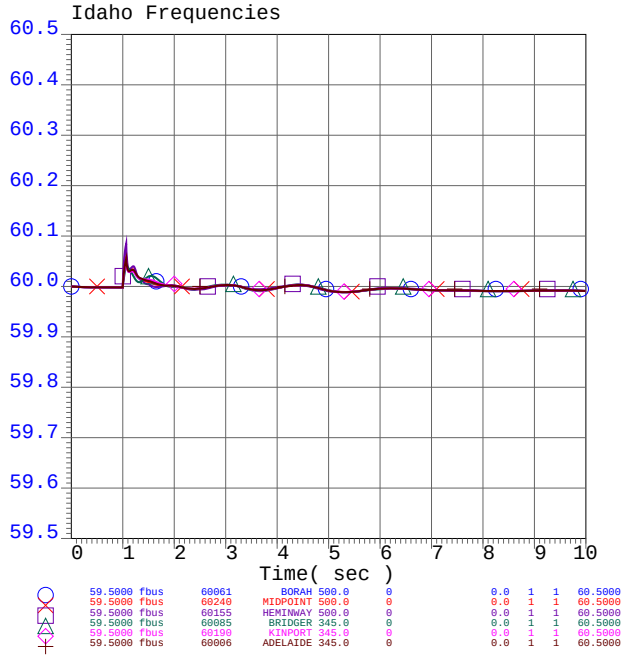
BC and Alberta Frequencies



Idaho Voltages



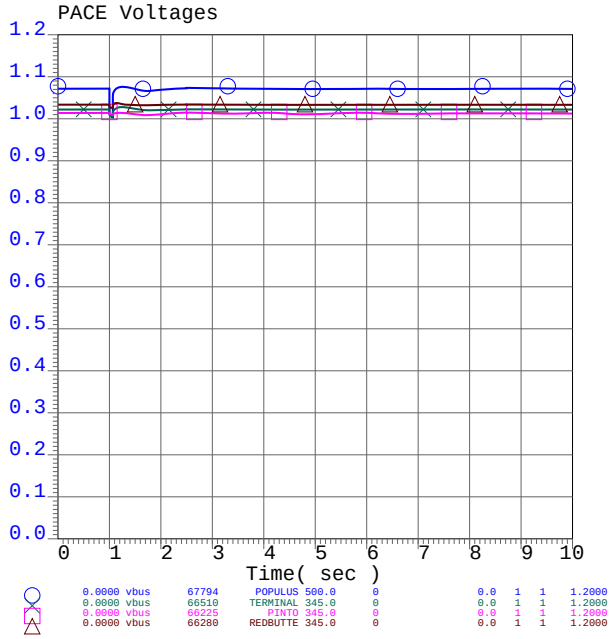
Idaho Frequencies



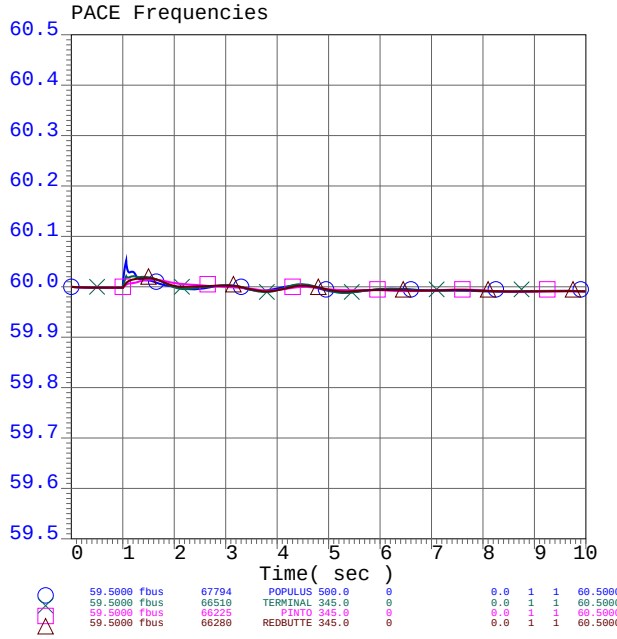
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

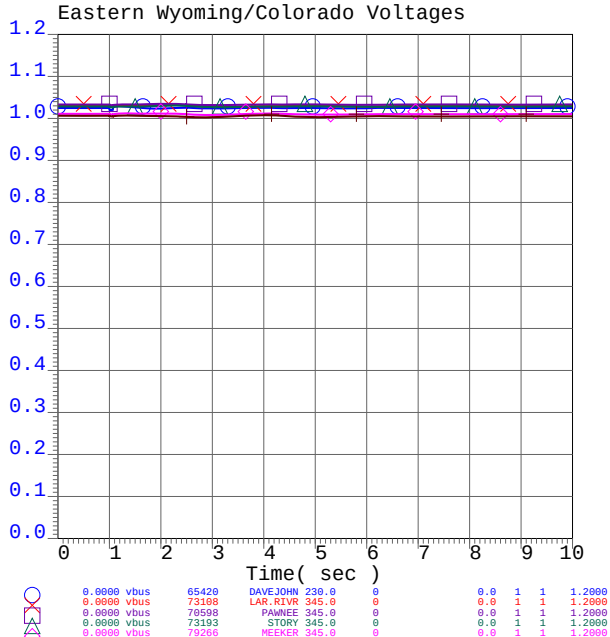
PACE Voltages



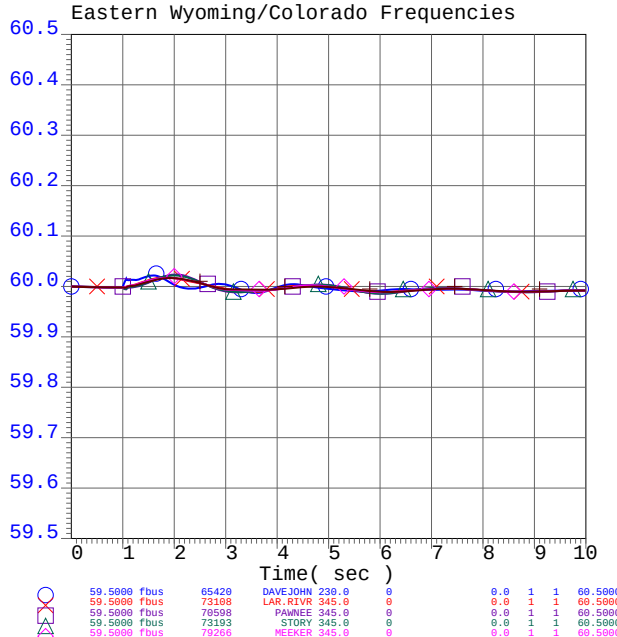
PACE Frequencies



Eastern Wyoming/Colorado Voltages



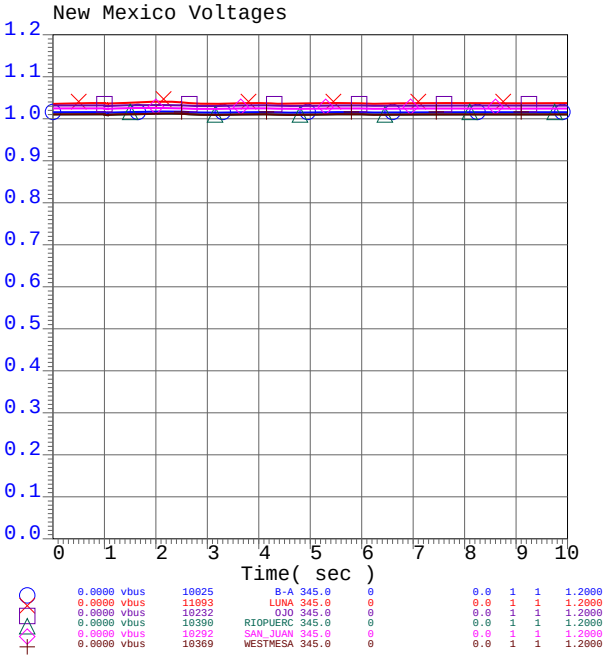
Eastern Wyoming/Colorado Frequencies



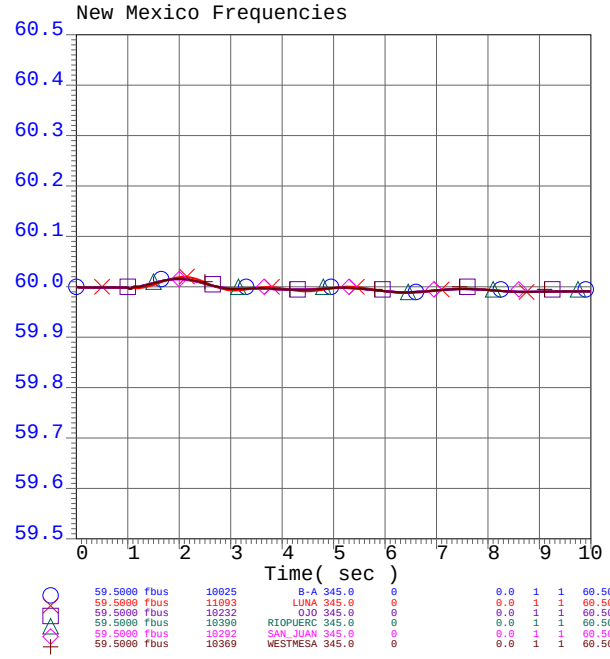
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WECC AREA VOLTAGE AND FREQUENCIES

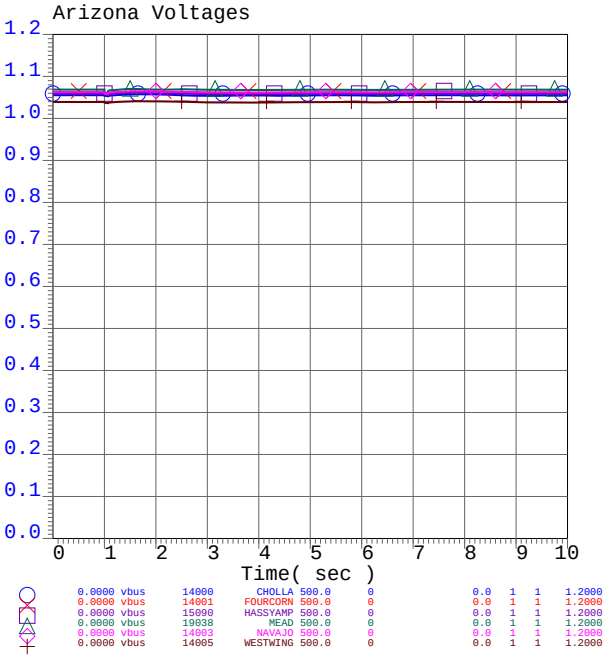
New Mexico Voltages



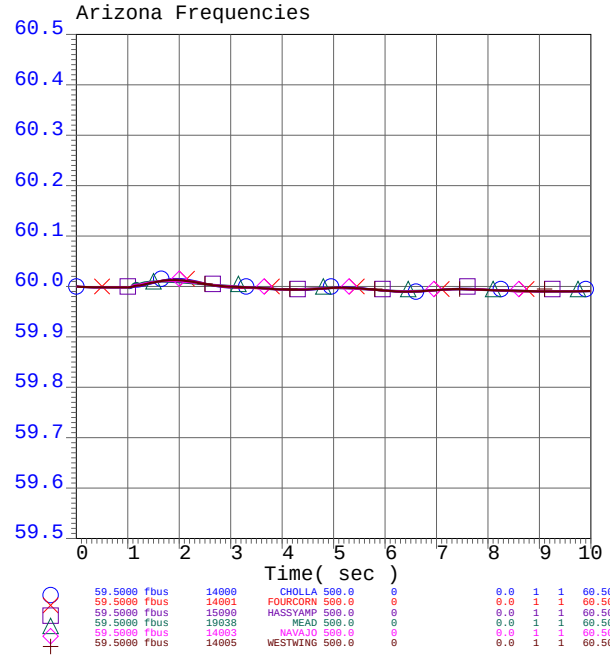
New Mexico Frequencies



Arizona Voltages

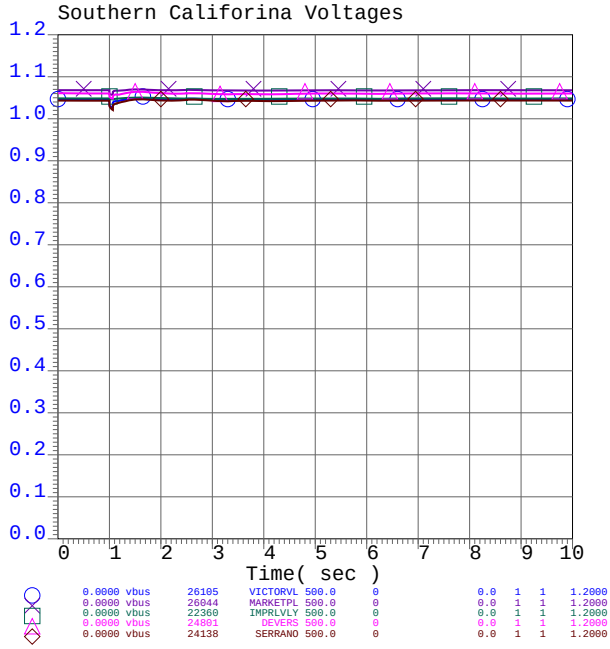


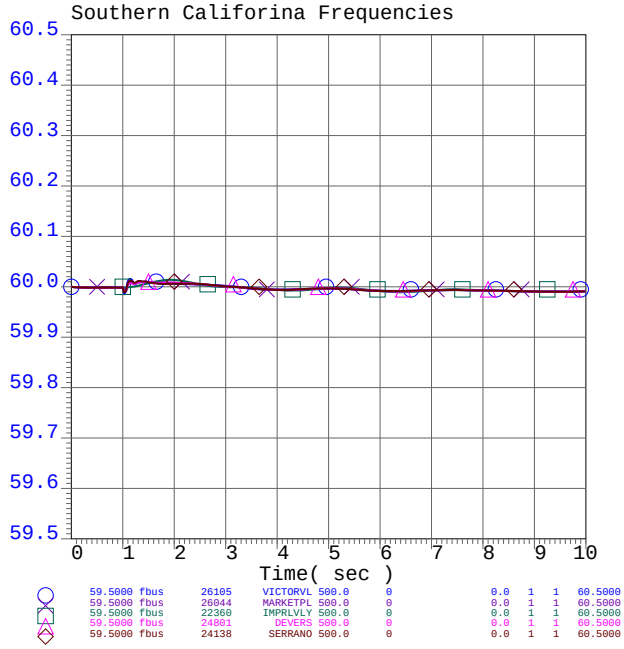
Arizona Frequencies

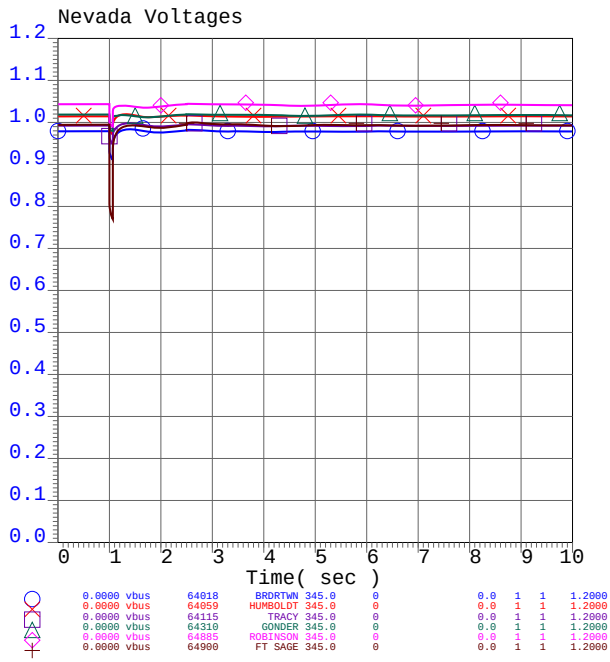


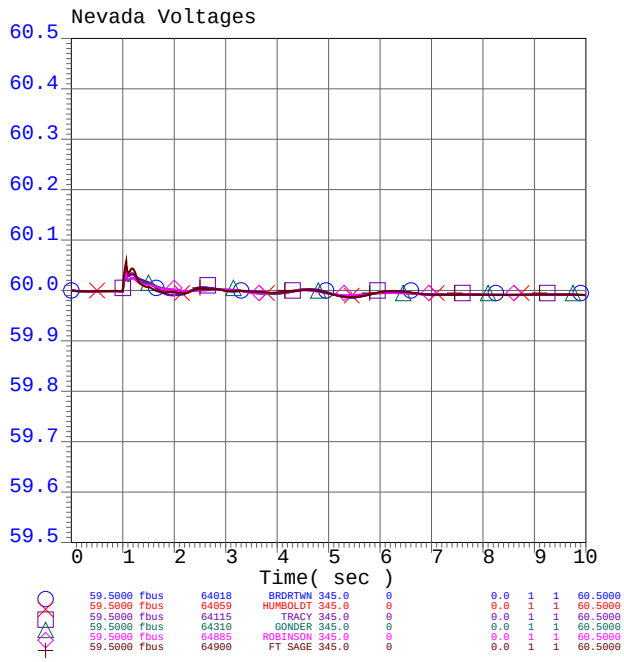
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



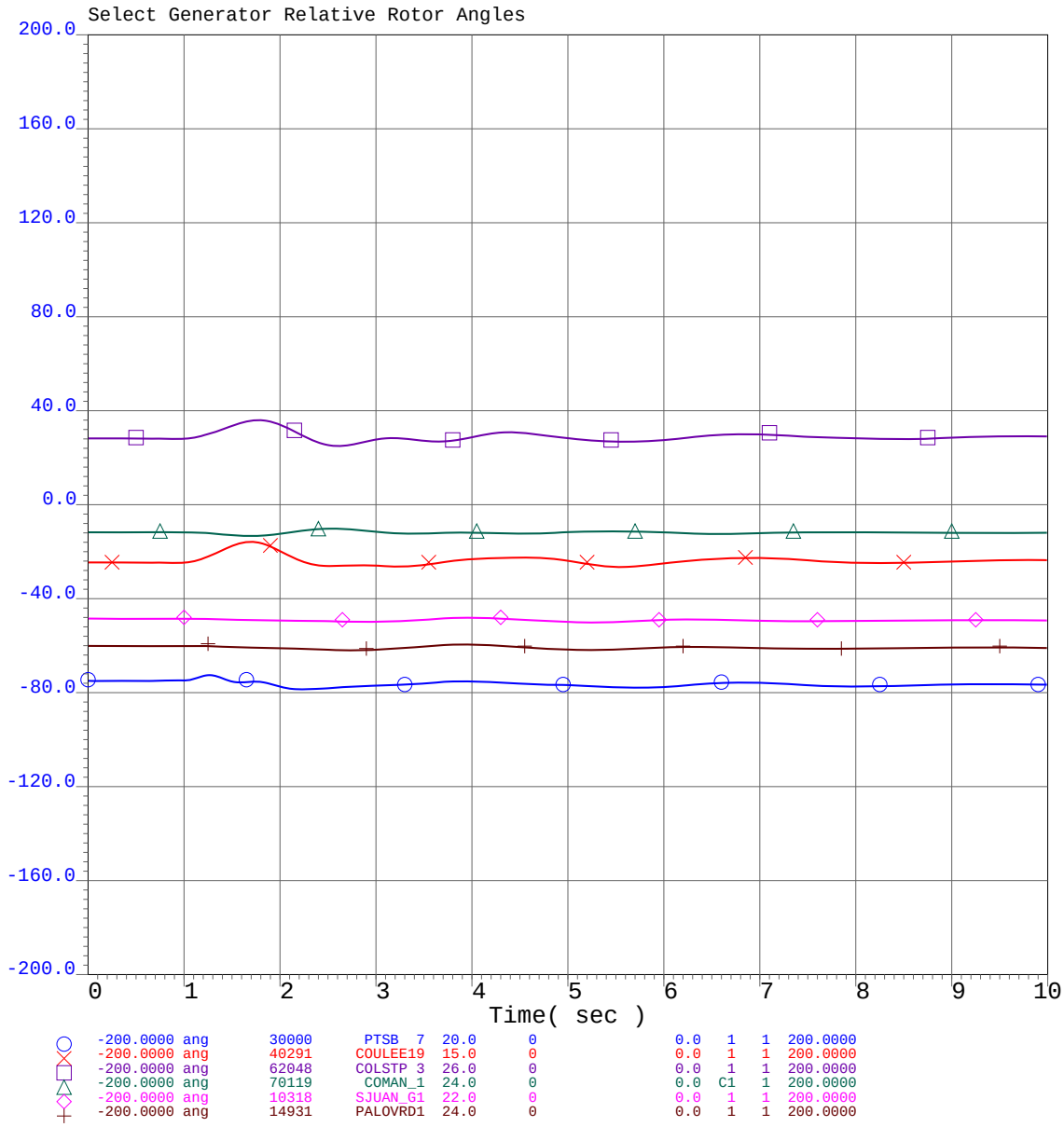






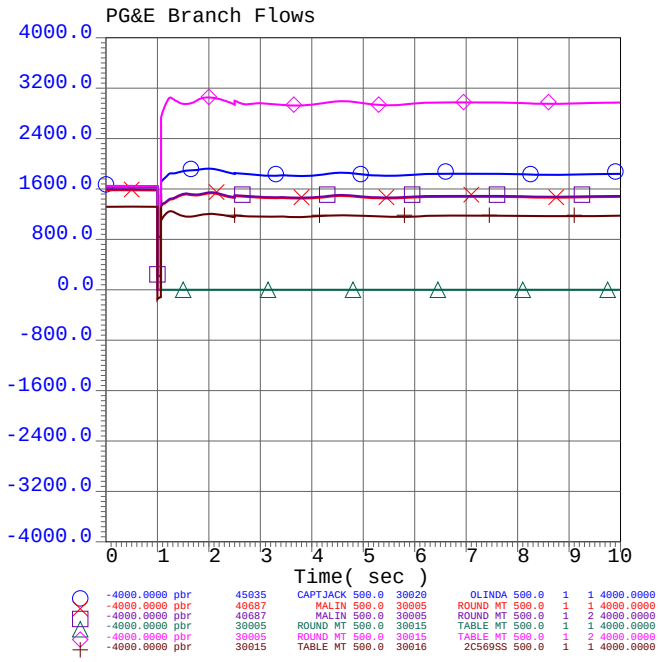
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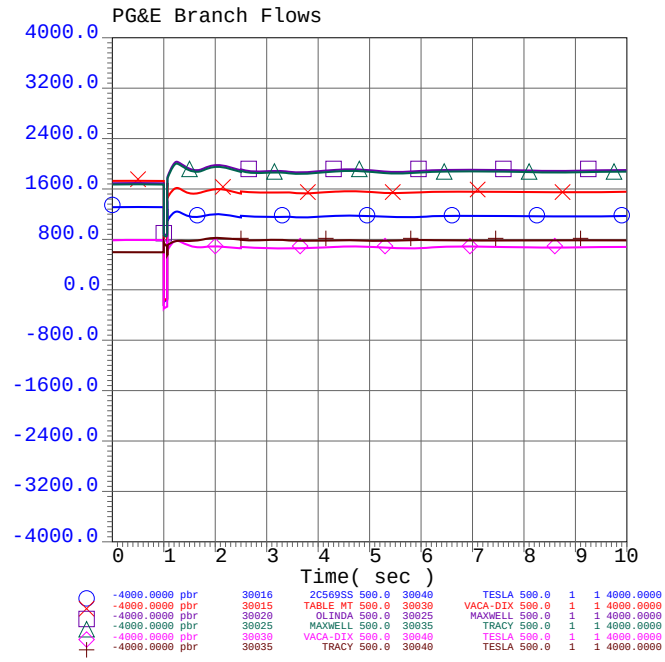
WECC RELATIVE ROTOR ANGLES

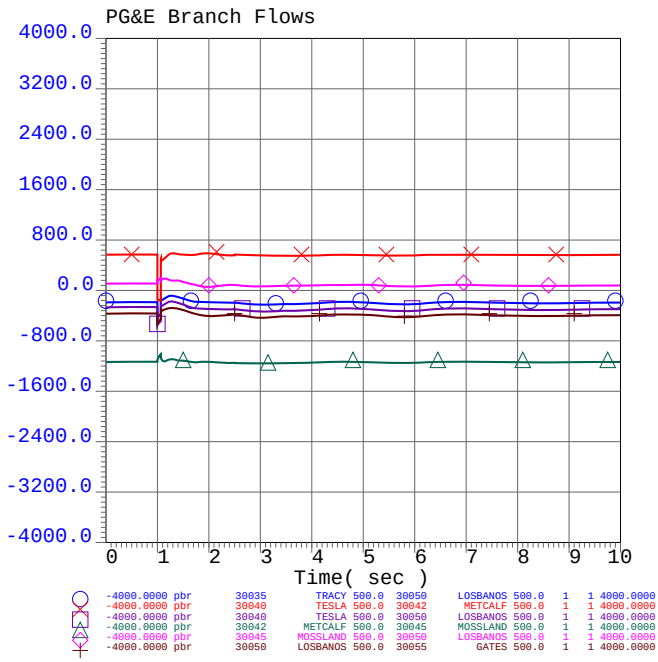


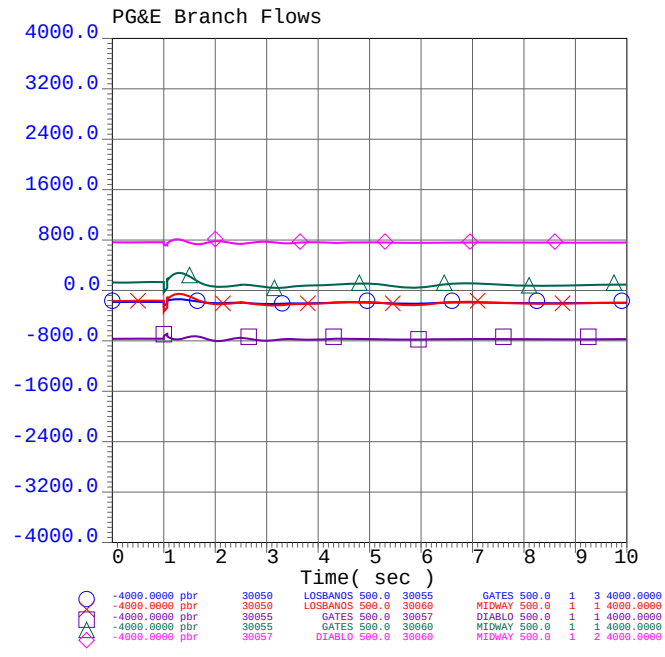
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 500 kV line

SELECT BRANCH FLOWS





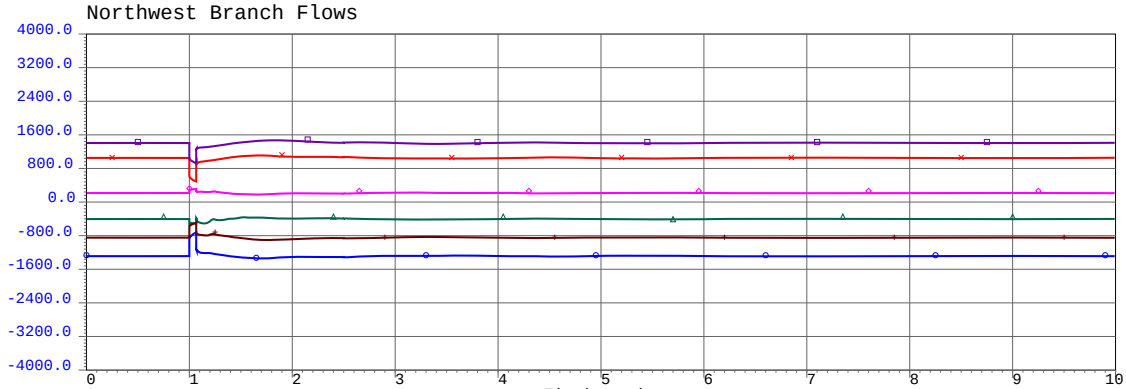




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
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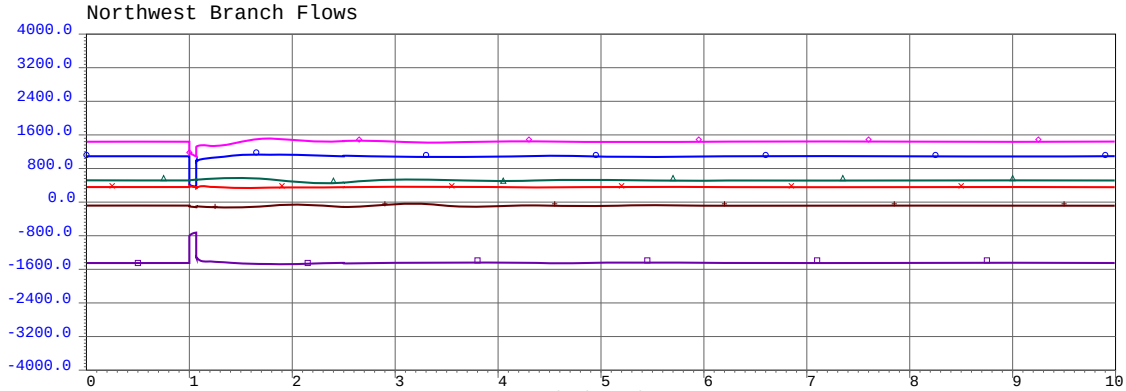
SELECT BRANCH FLOWS

Northwest Branch Flows



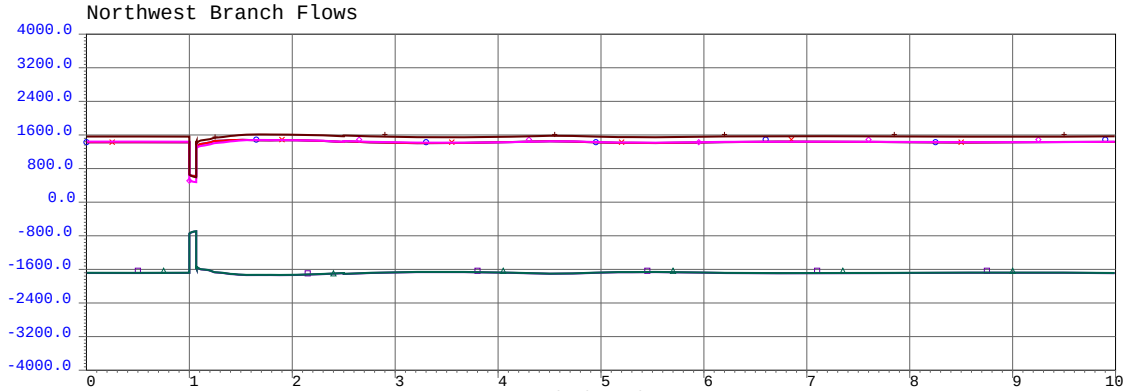
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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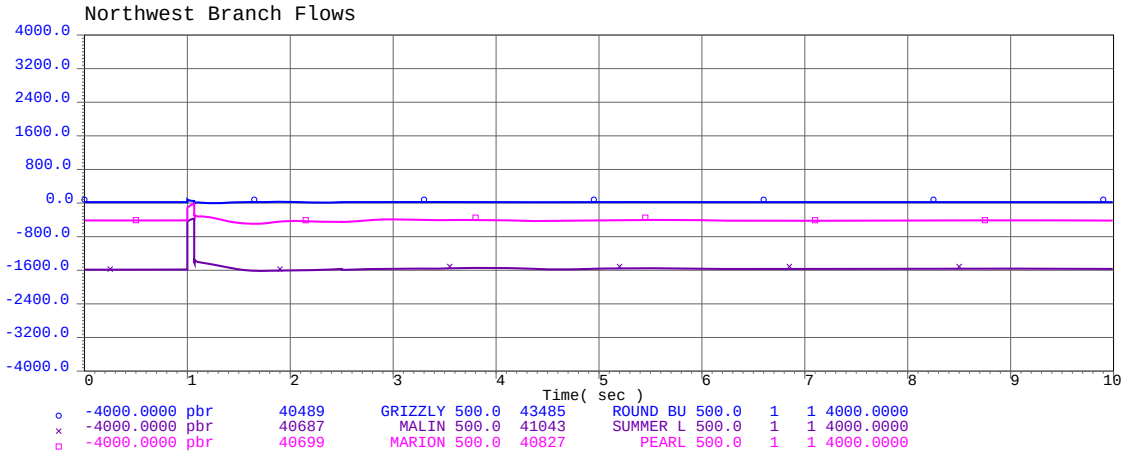
Northwest Branch Flows



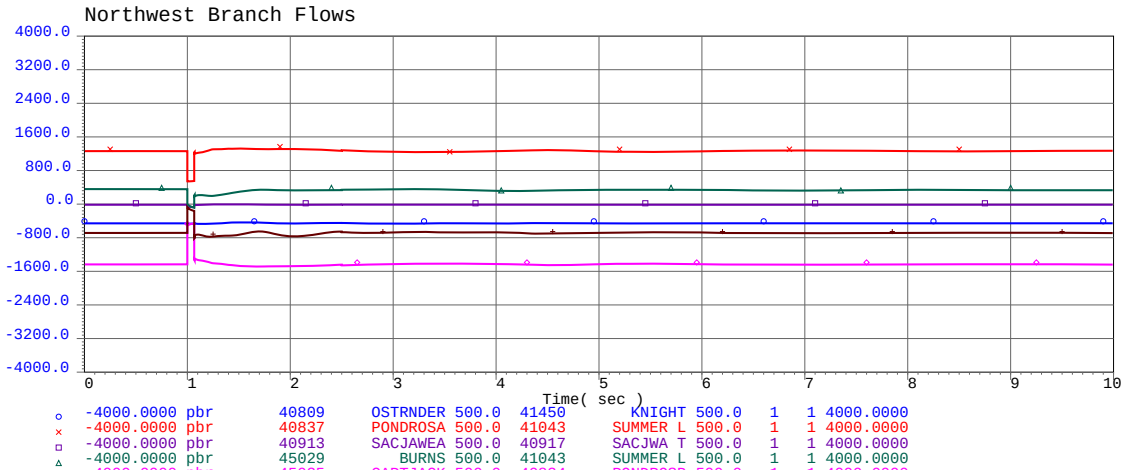
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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3-phase 4 cycle fault at Round Mountain 500 kV
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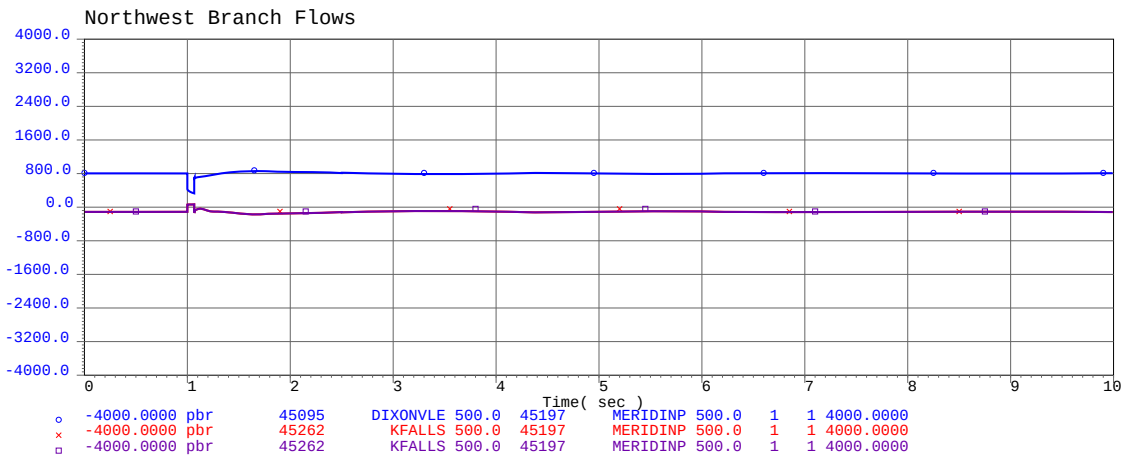
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



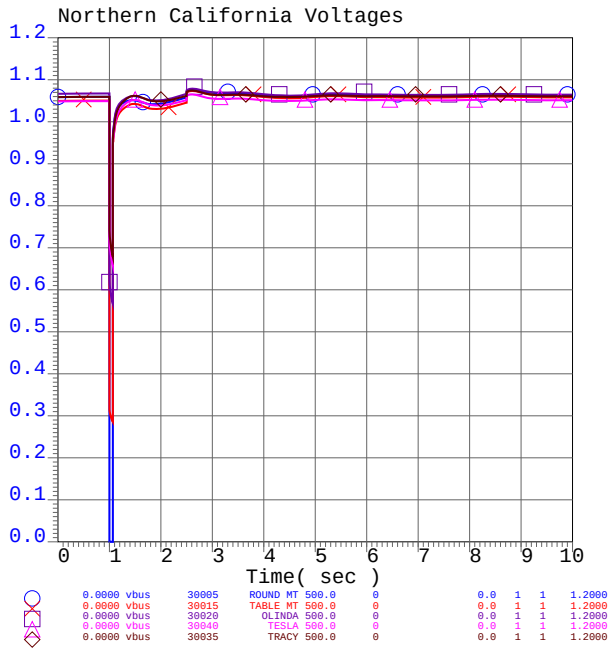
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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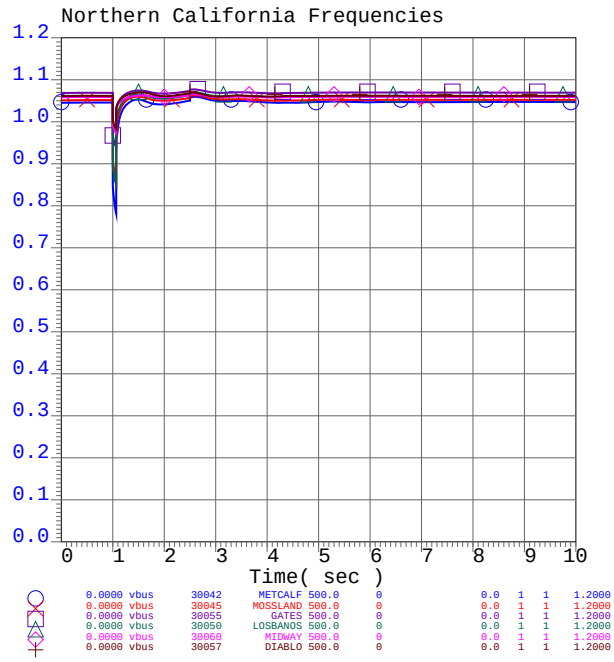


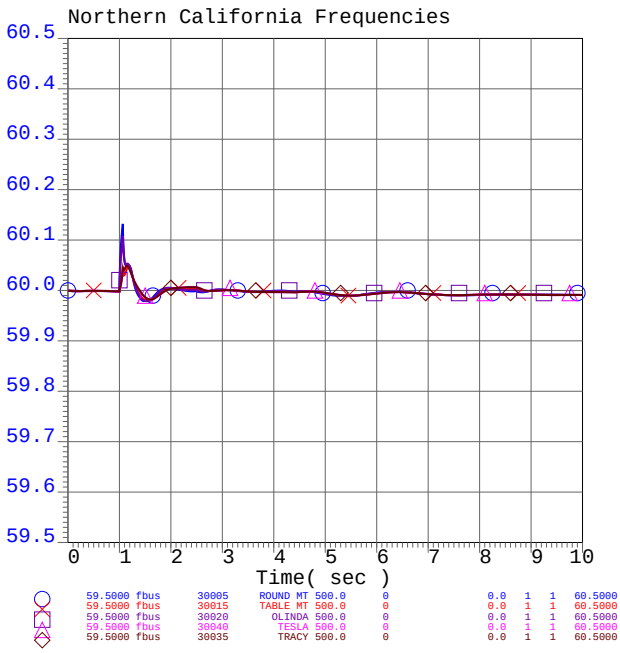
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

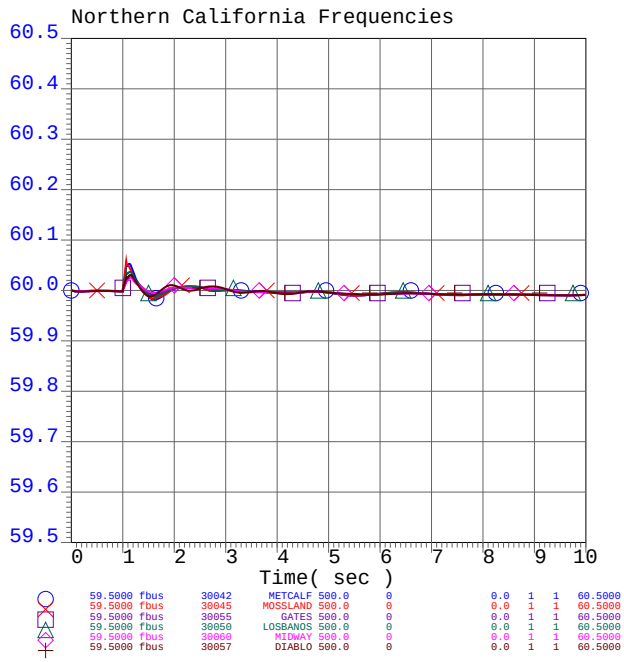
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WECC AREA VOLTAGE AND FREQUENCIES



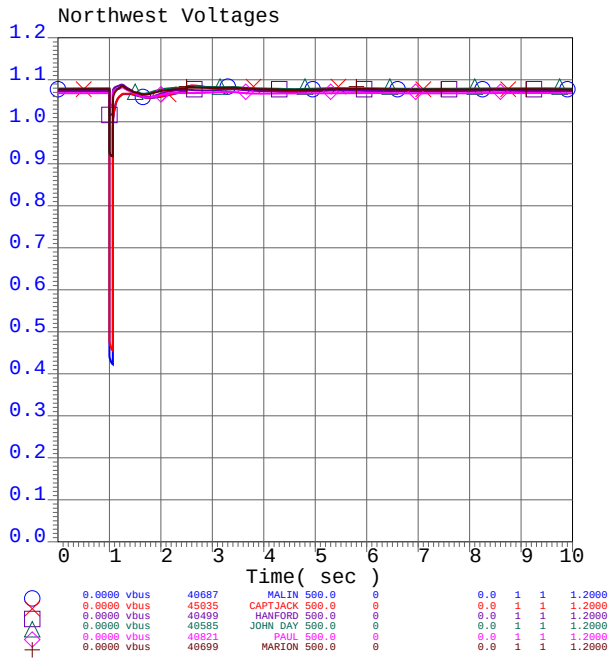


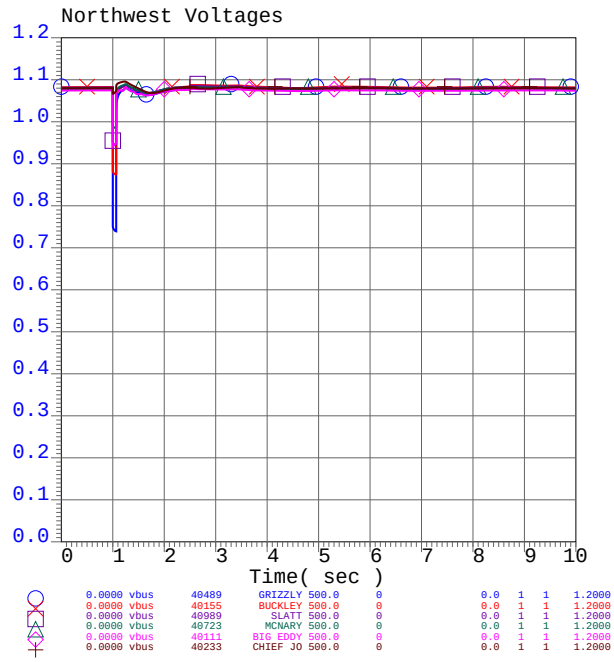


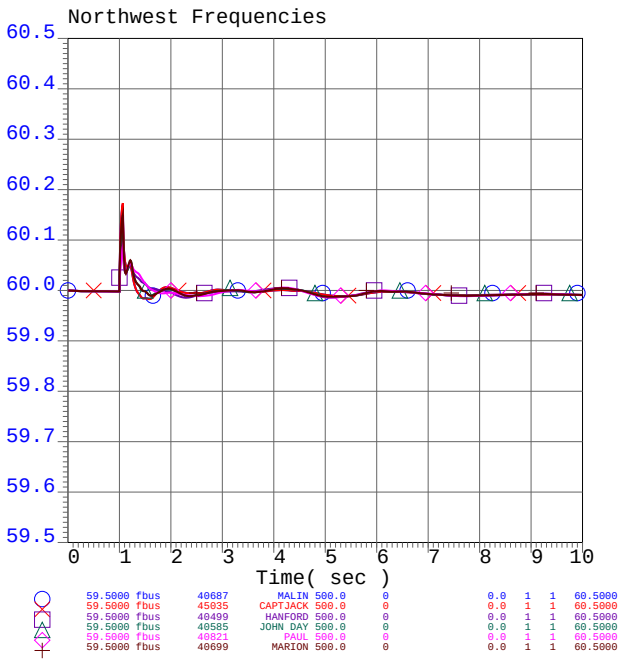


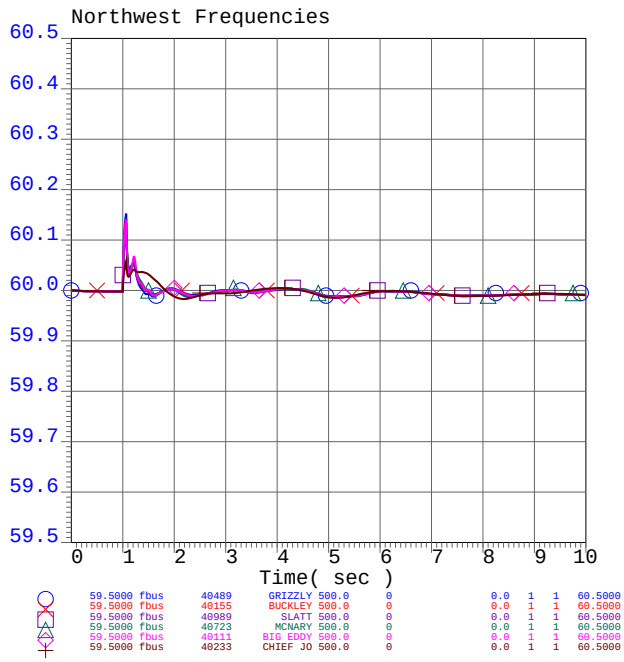
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followed by loss of Round Mountain-Table Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





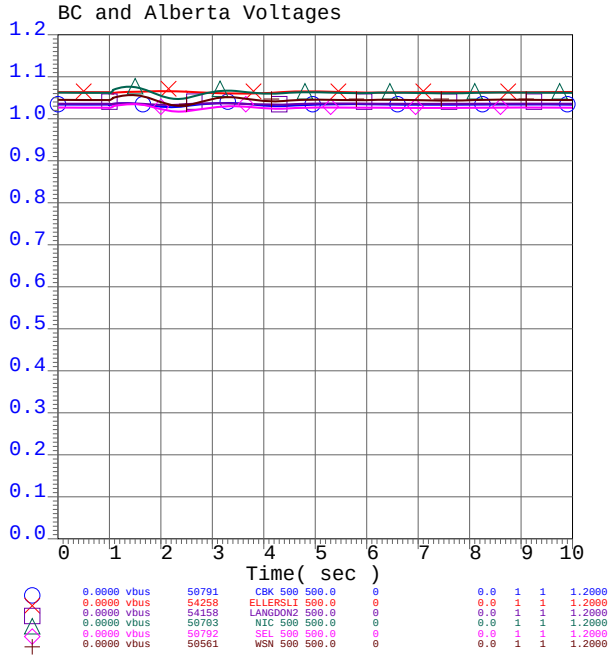




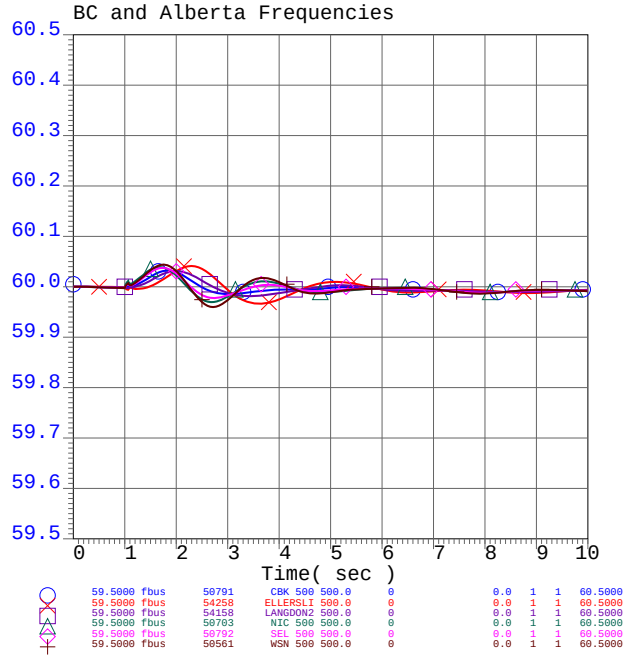
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

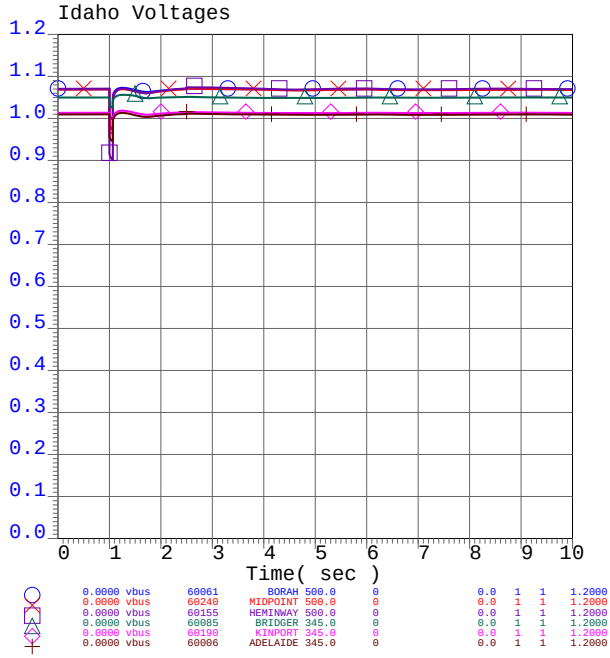
BC and Alberta Voltages



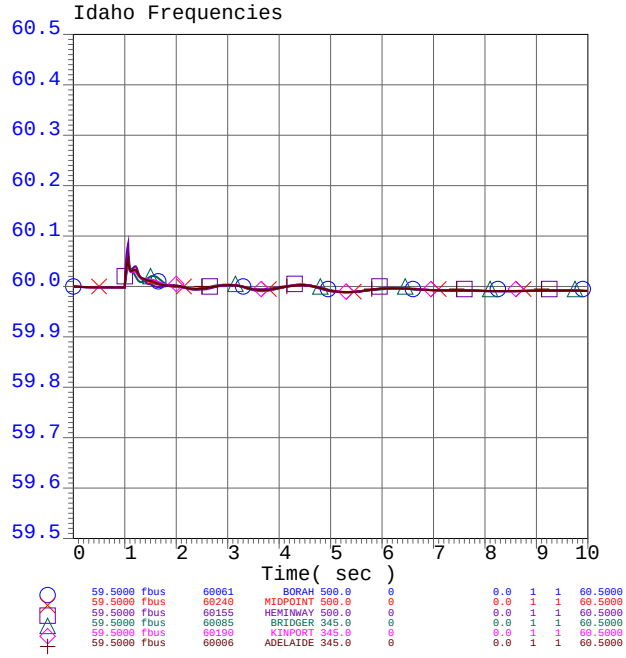
BC and Alberta Frequencies



Idaho Voltages



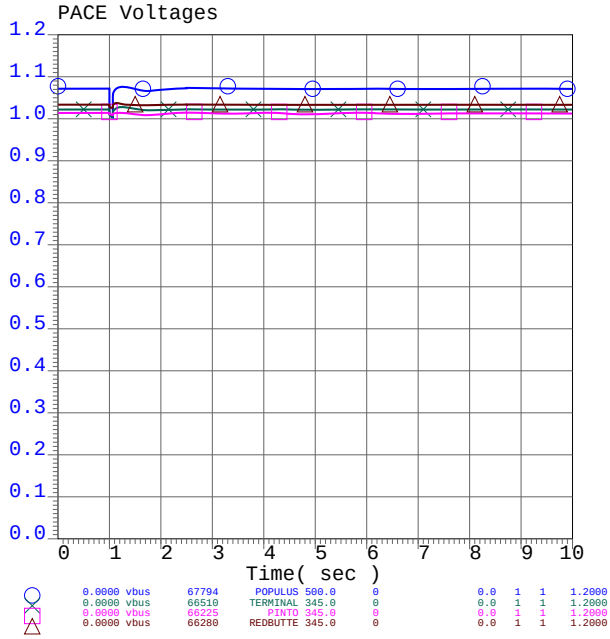
Idaho Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

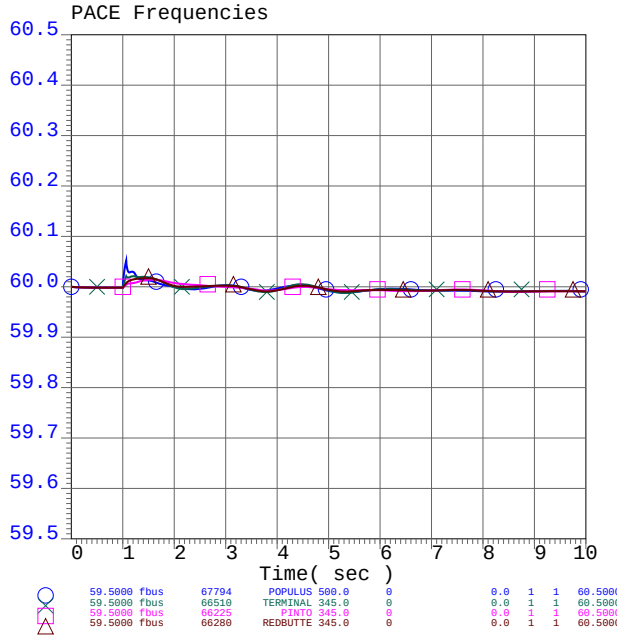
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



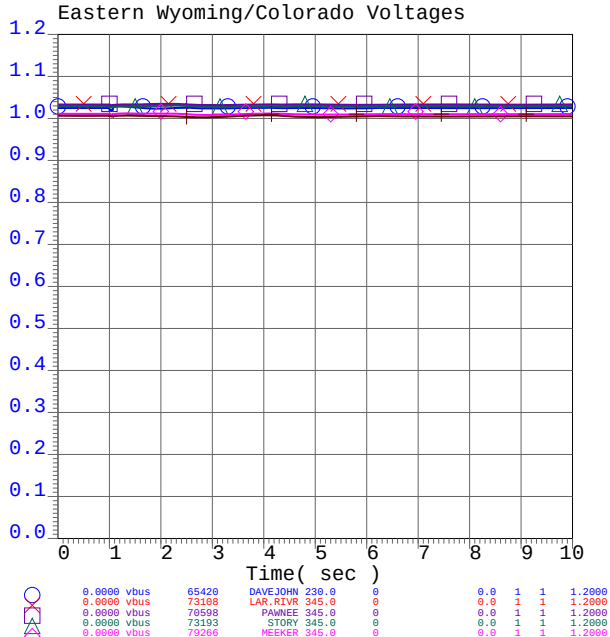
0.0000 vbus 67794 POPULUS 500.0 0 0.0 1 1 1.2000
0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



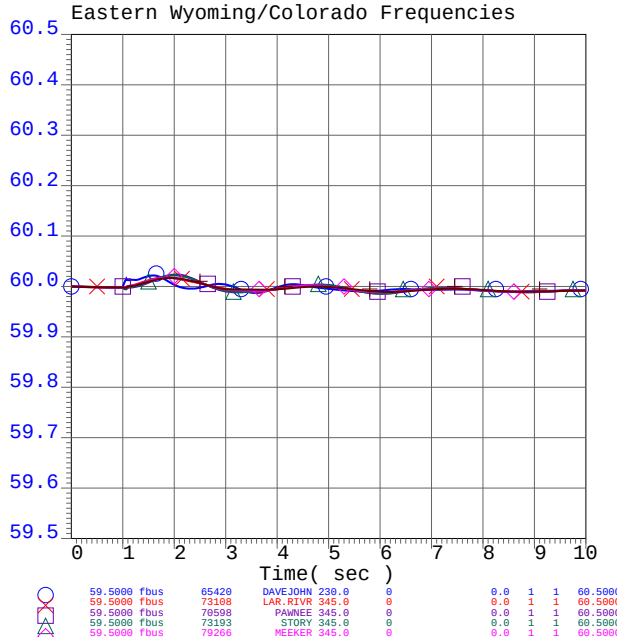
59.5000 fbus 67794 POPULUS 500.0 0 0.0 1 1 60.5000
59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

Eastern Wyoming/Colorado Frequencies

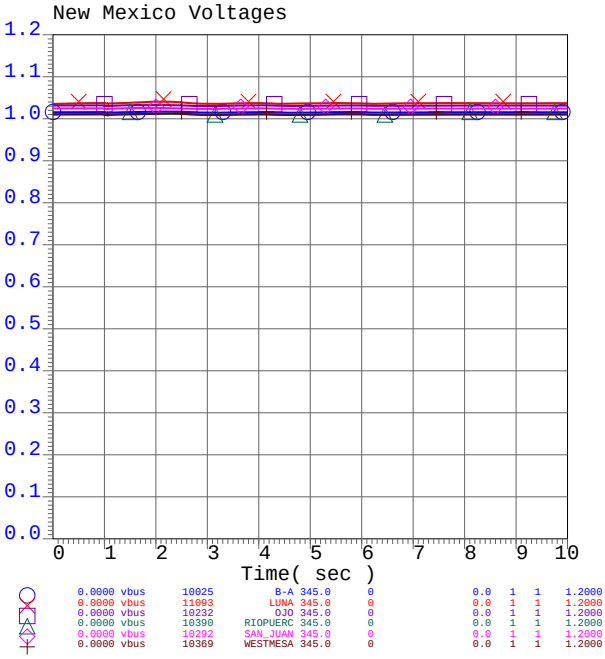


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
59.5000 fbus 70598 PAWNEE 345.0 0 0.0 1 1 60.5000
59.5000 fbus 73193 STORY 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79266 MEEKER 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79049 MONTROSE 345.0 0 0.0 1 1 60.5000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

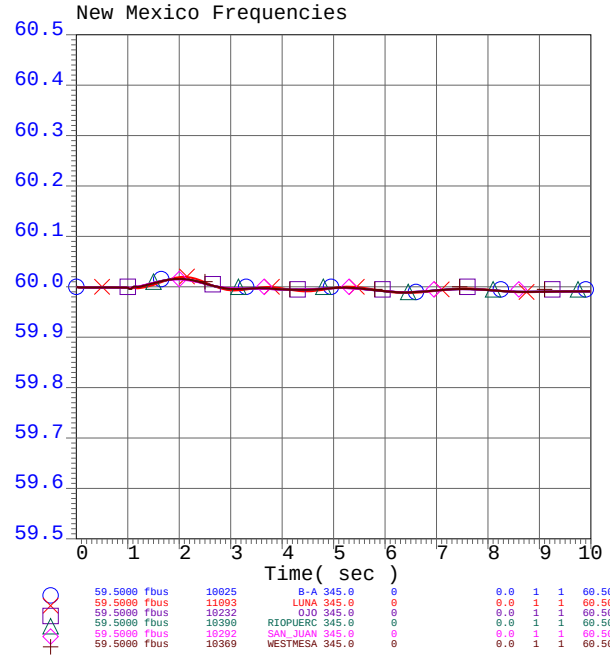
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



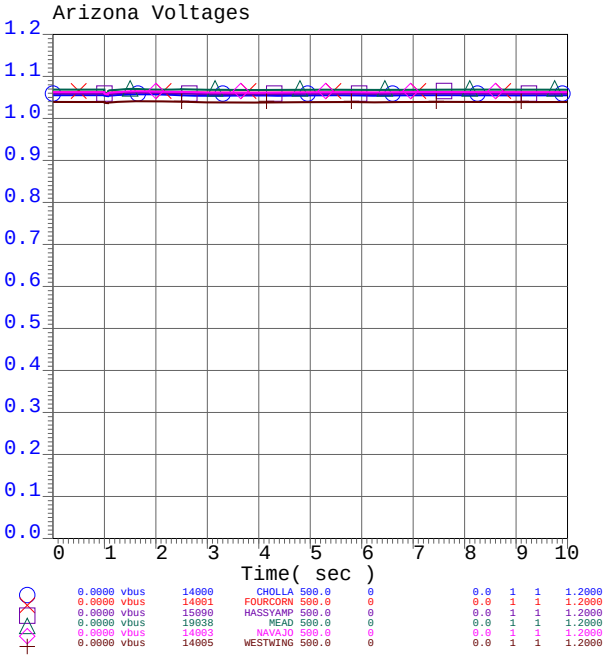
0.0000 vbus	10025	B-A 345.0	0	0.0	1	1	1.2000
0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



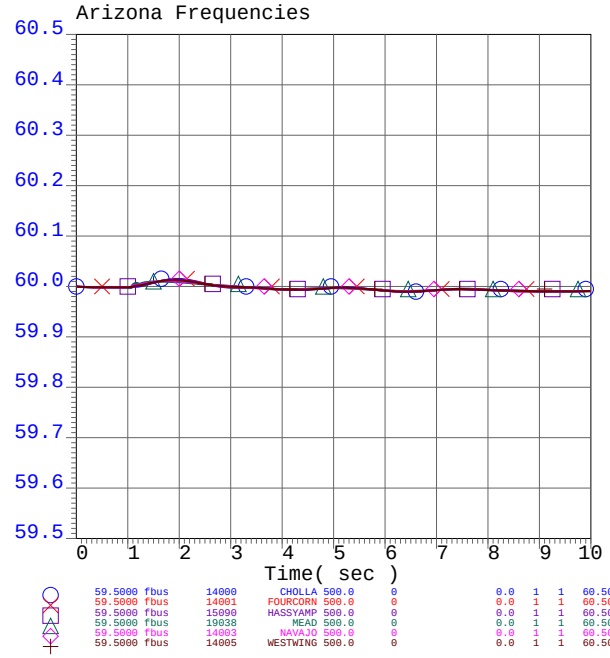
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

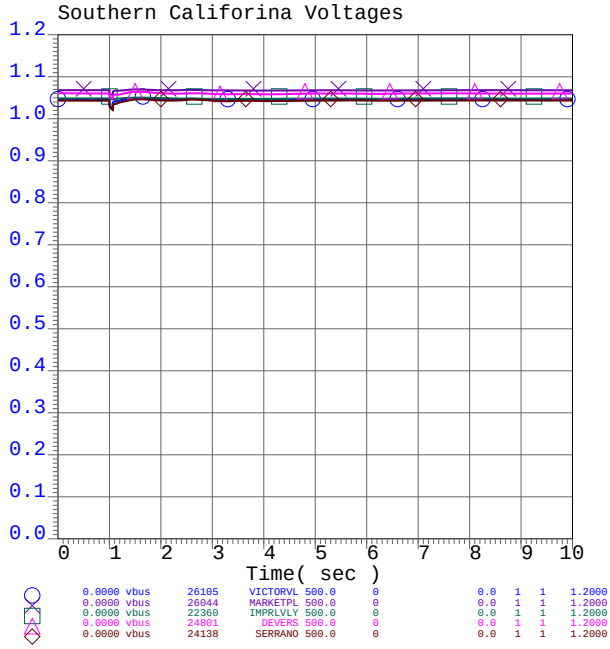
Arizona Frequencies

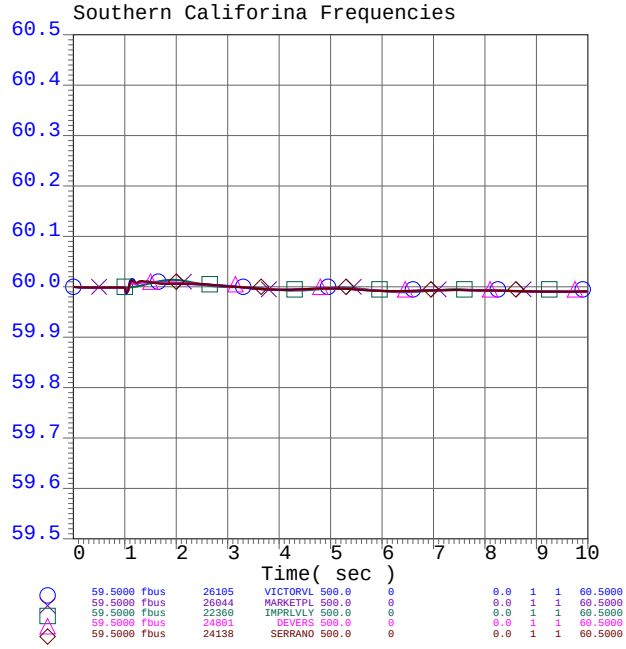


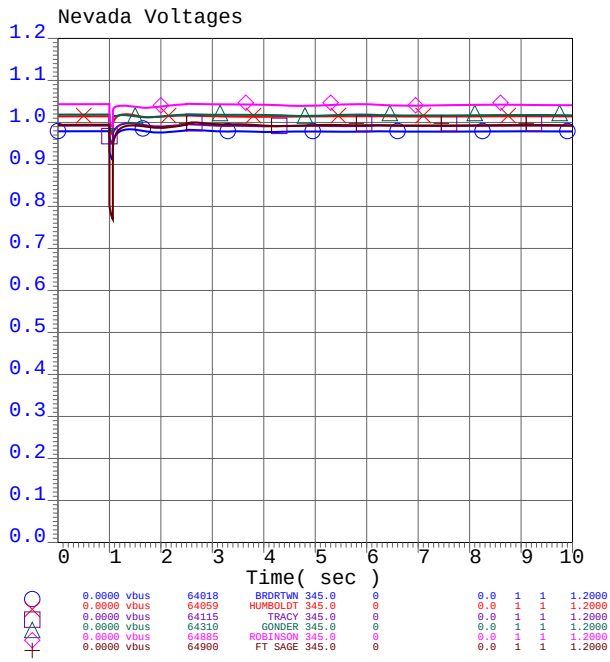
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

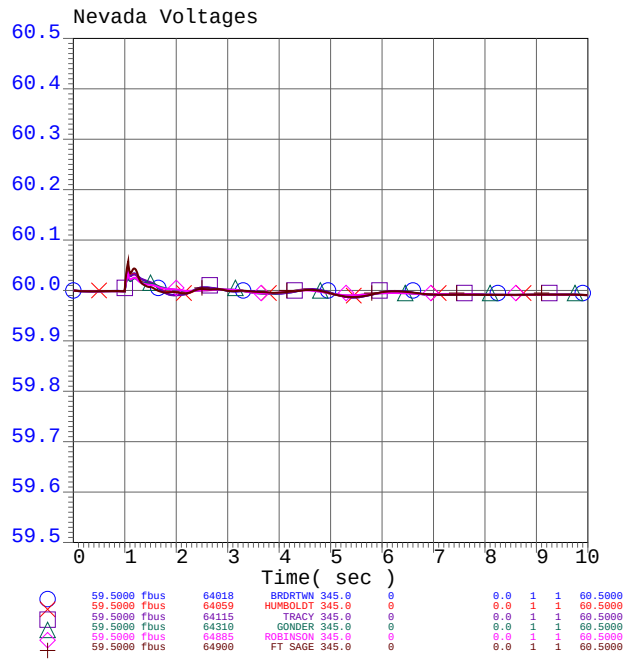
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



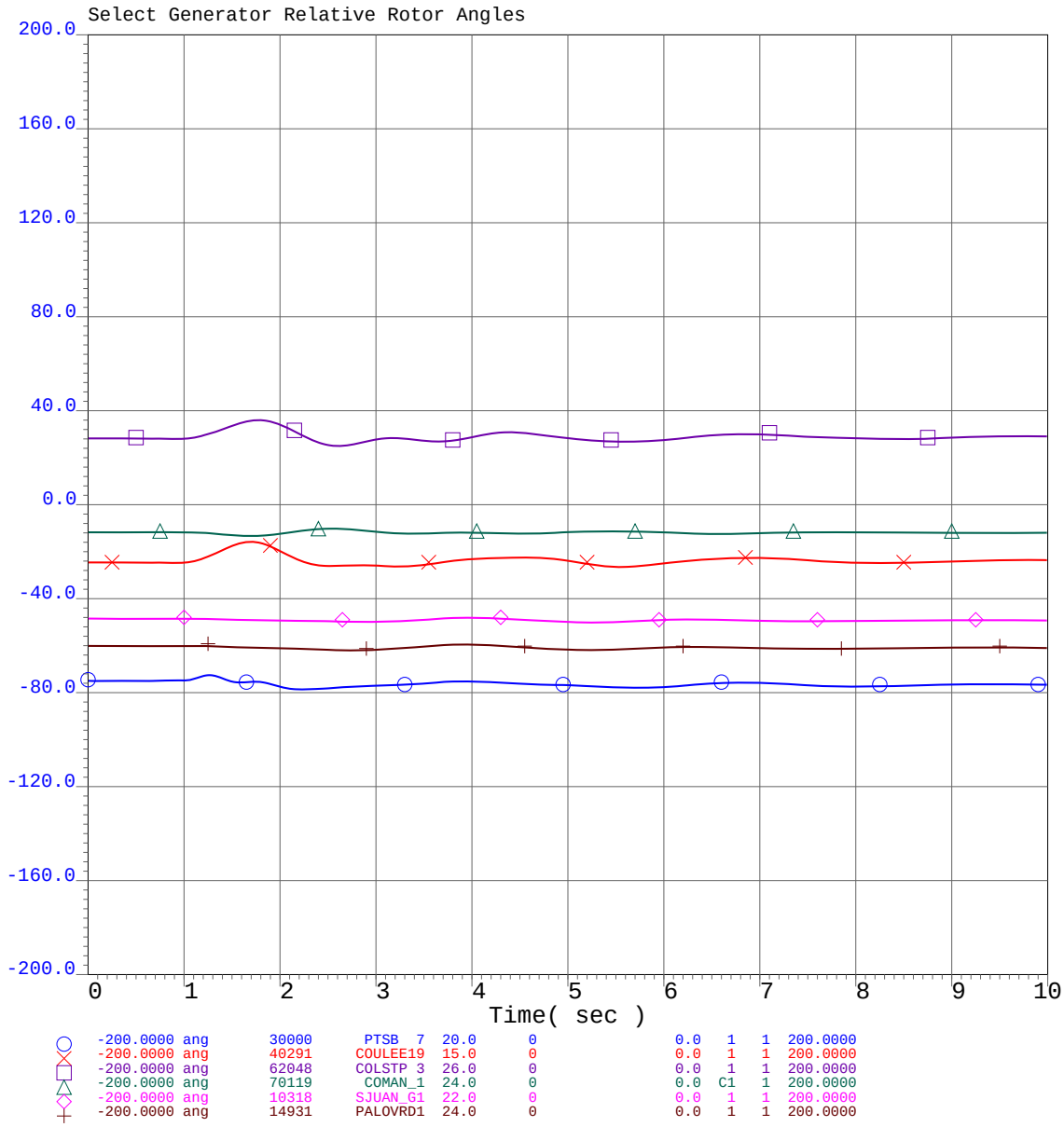






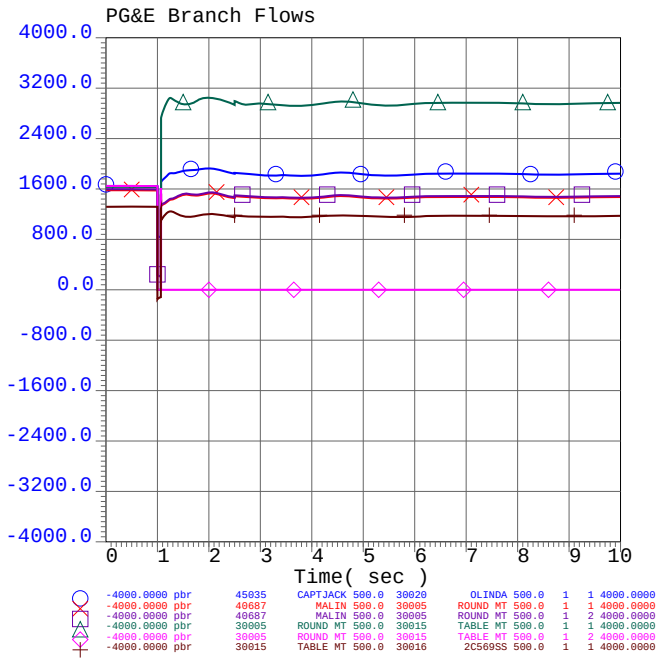
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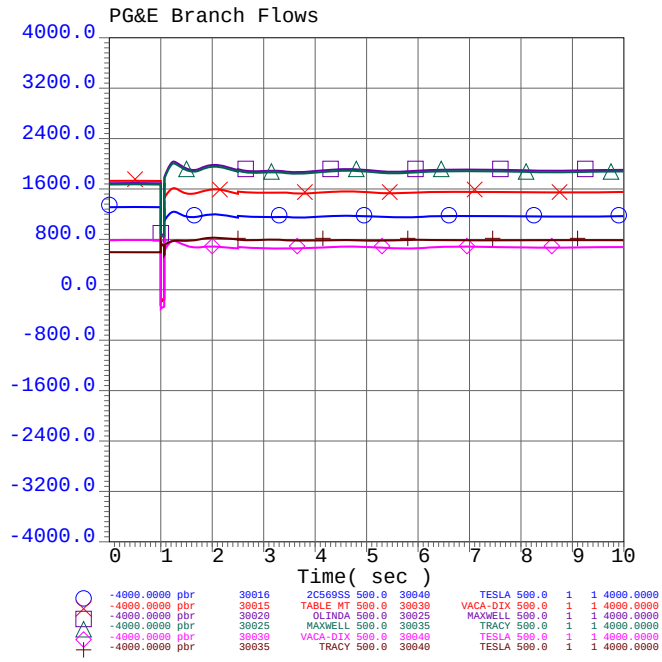
WECC RELATIVE ROTOR ANGLES

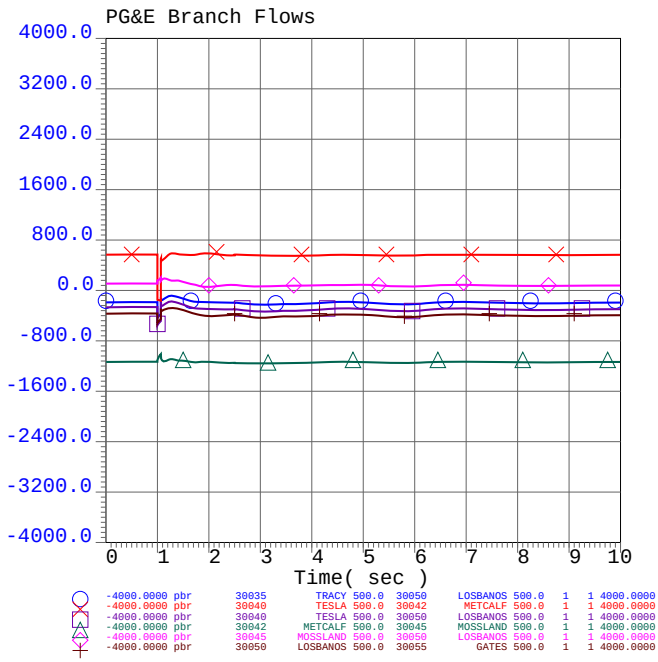


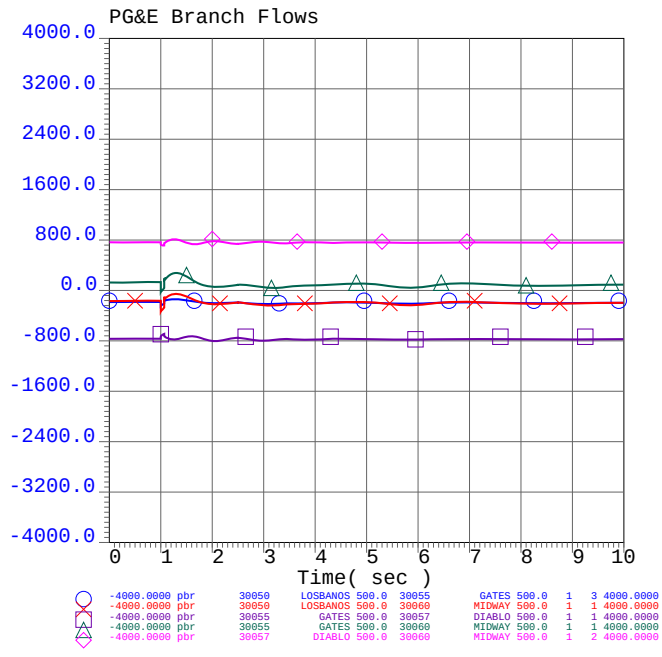
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

SELECT BRANCH FLOWS





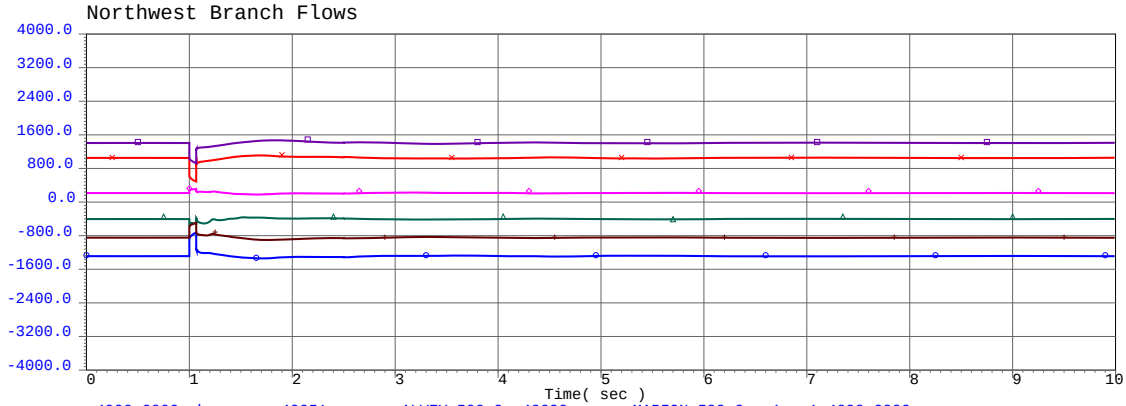




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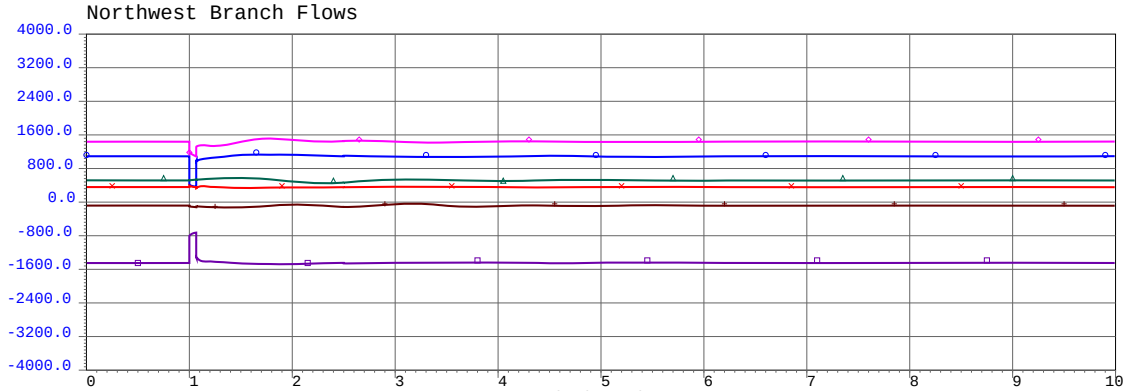
SELECT BRANCH FLOWS

Northwest Branch Flows



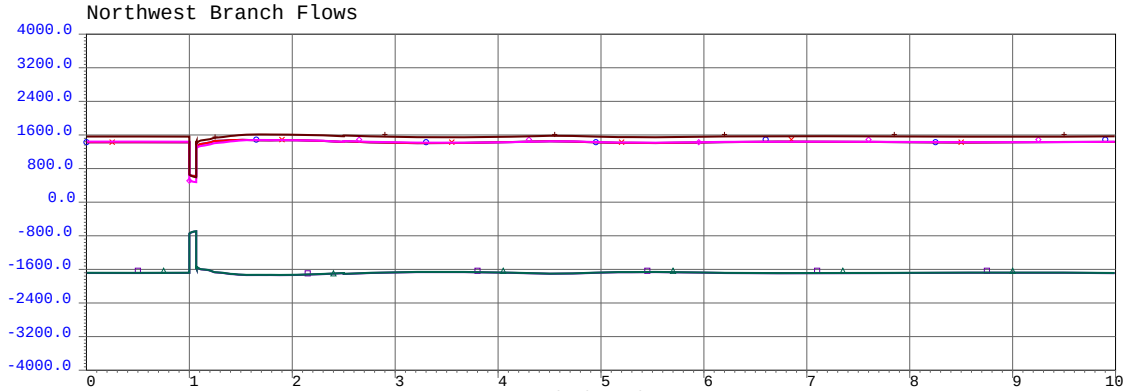
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

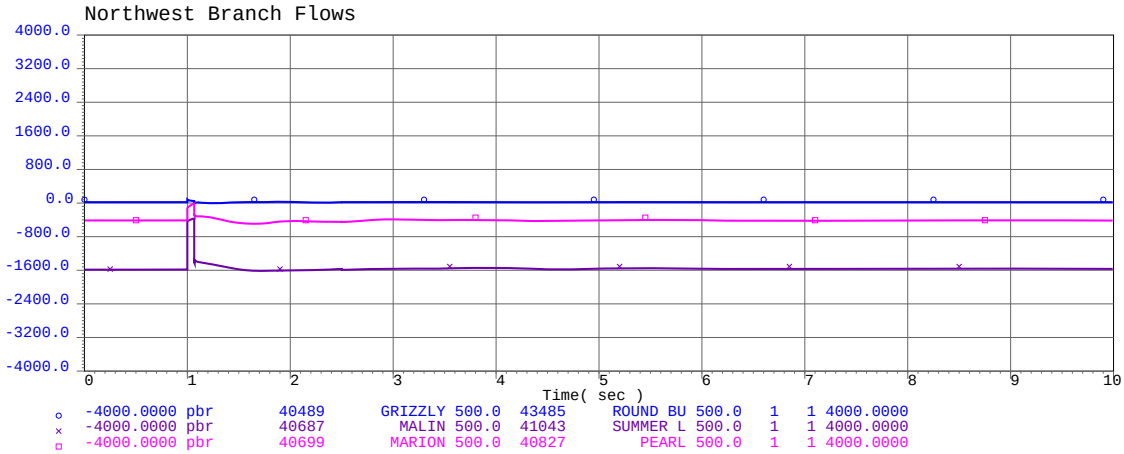
Northwest Branch Flows



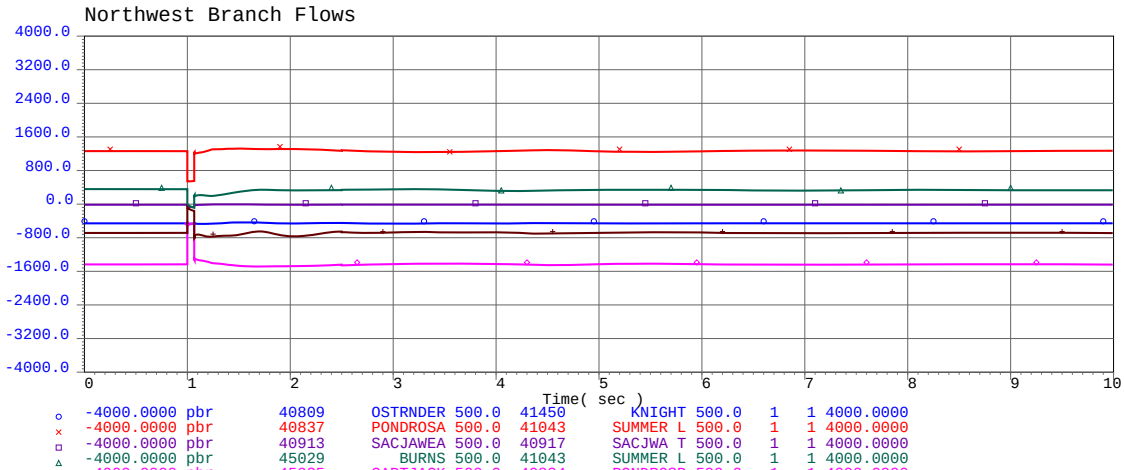
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
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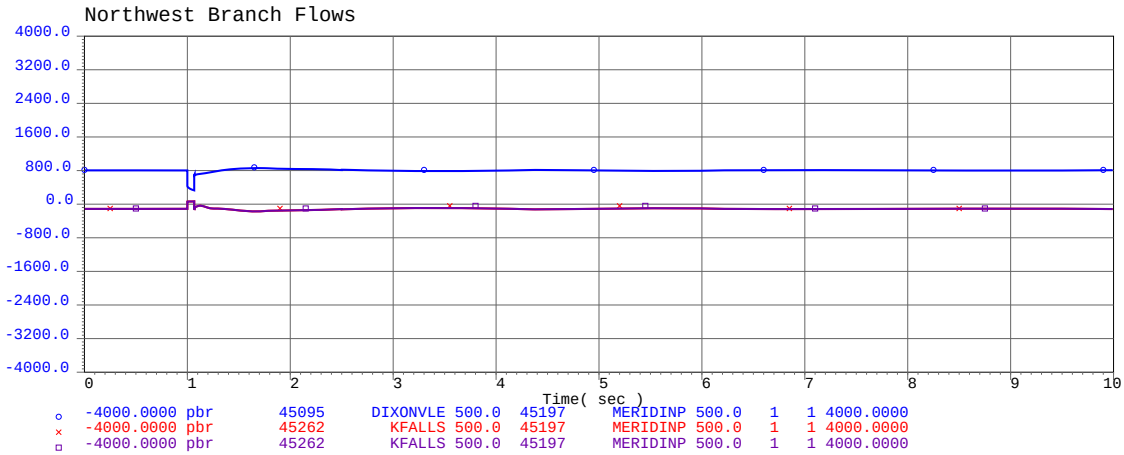
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



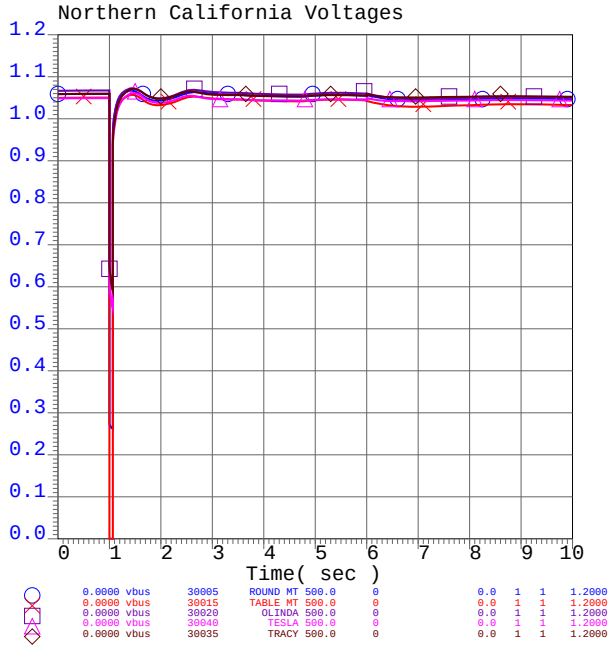
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

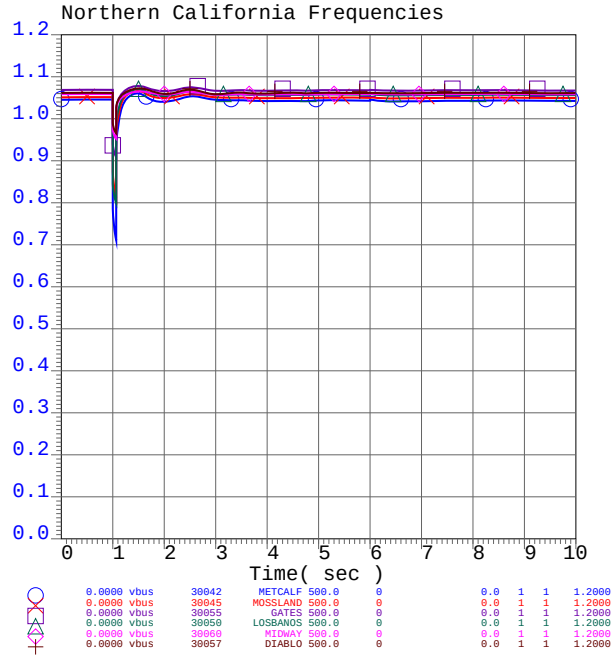


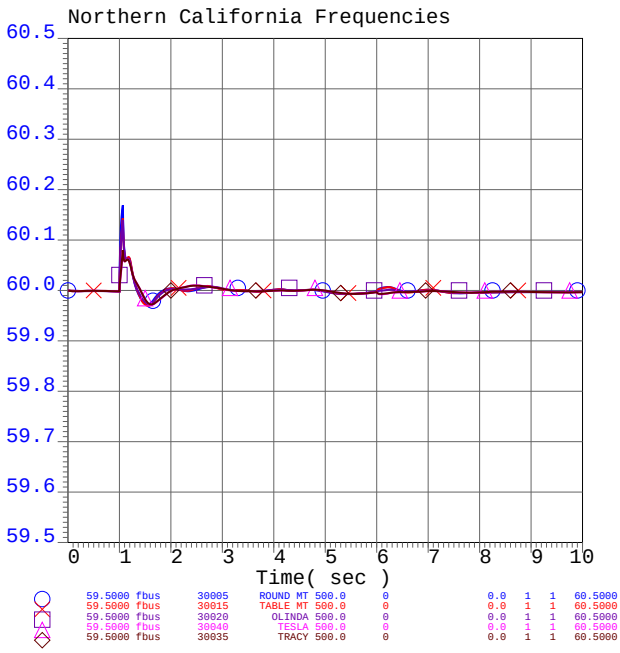
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

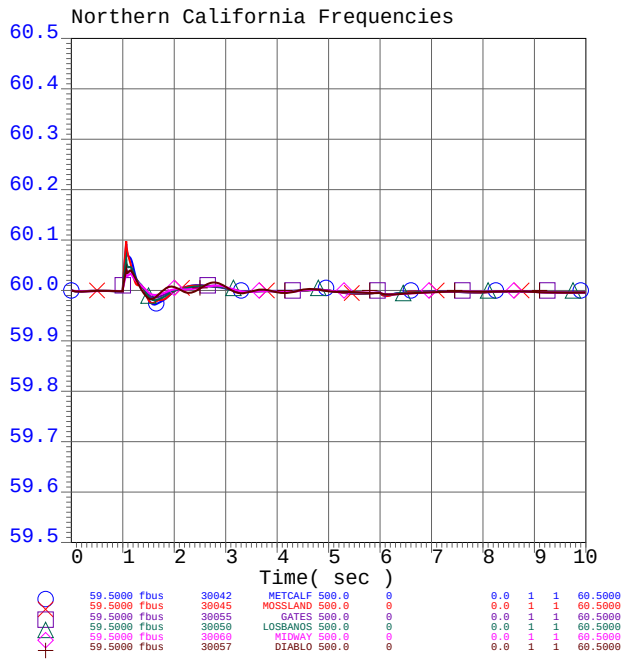
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



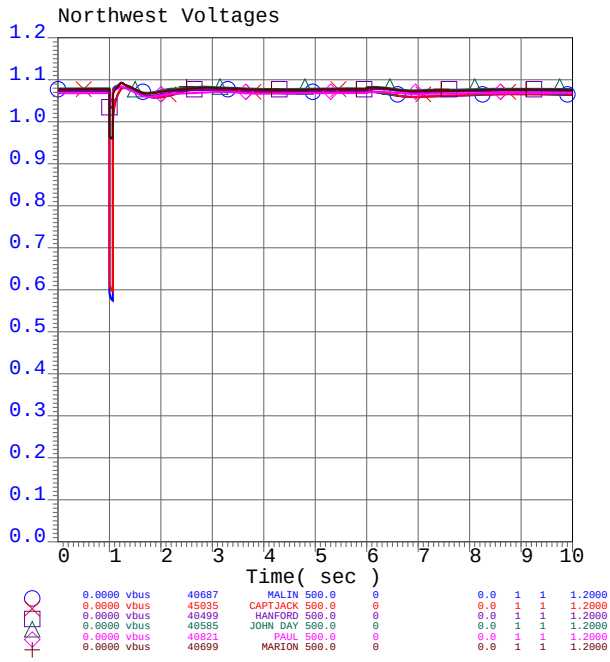


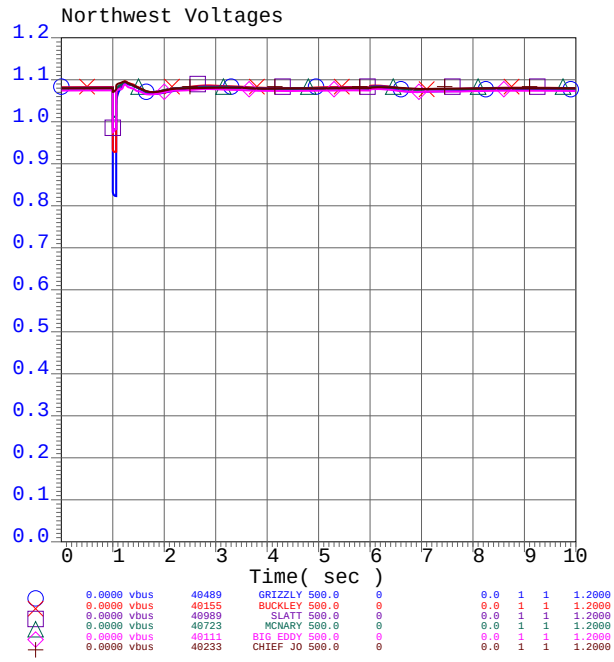


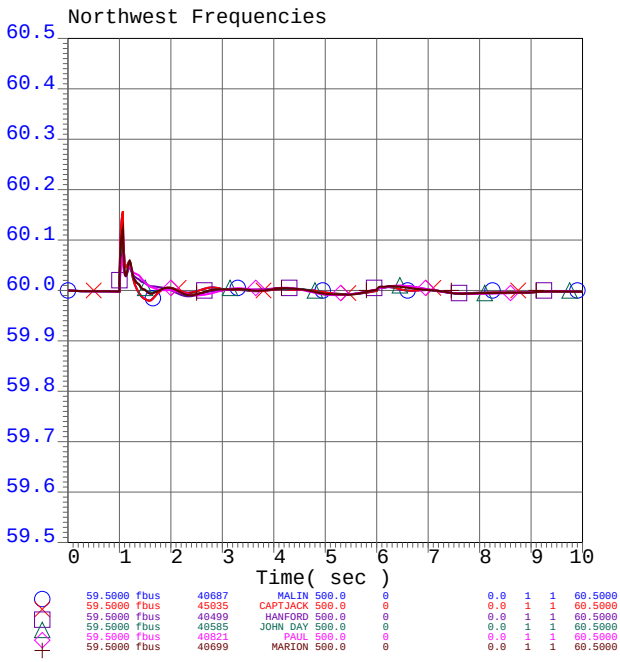


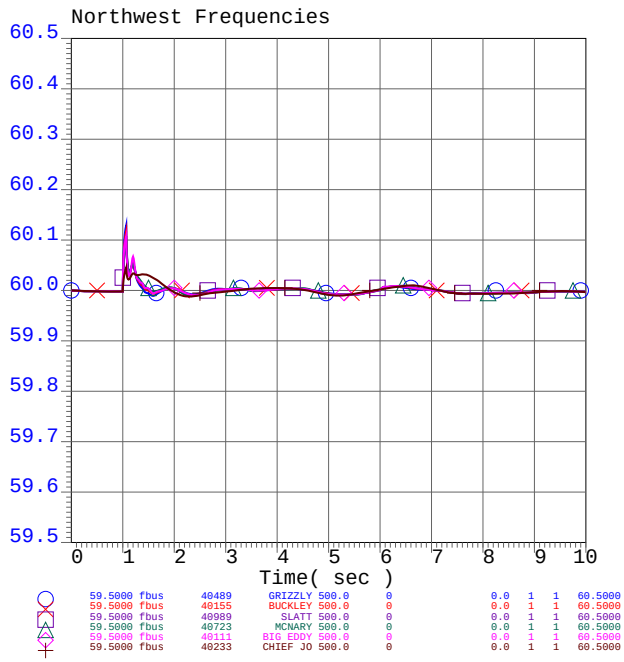
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Table Mountain 500 kV
followed by loss of Table Mountain-C0569SS 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



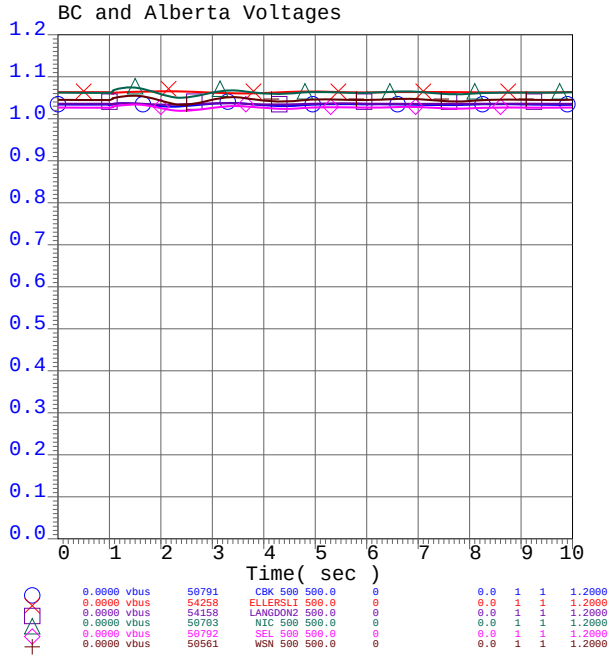


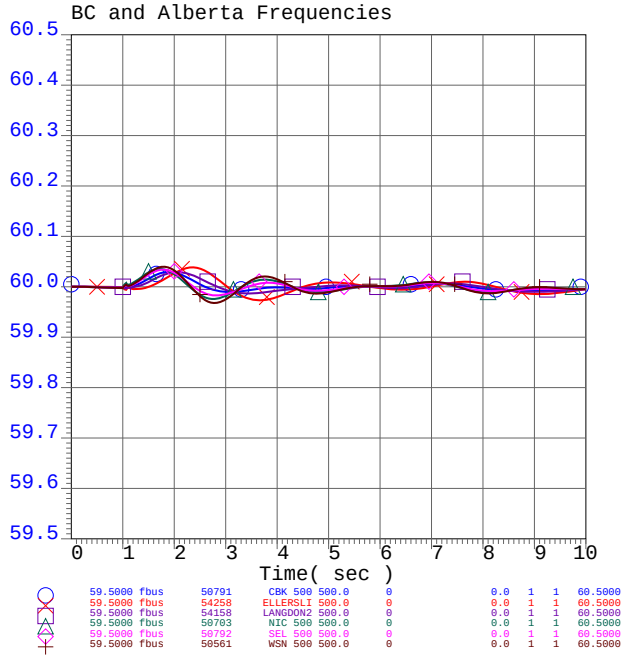


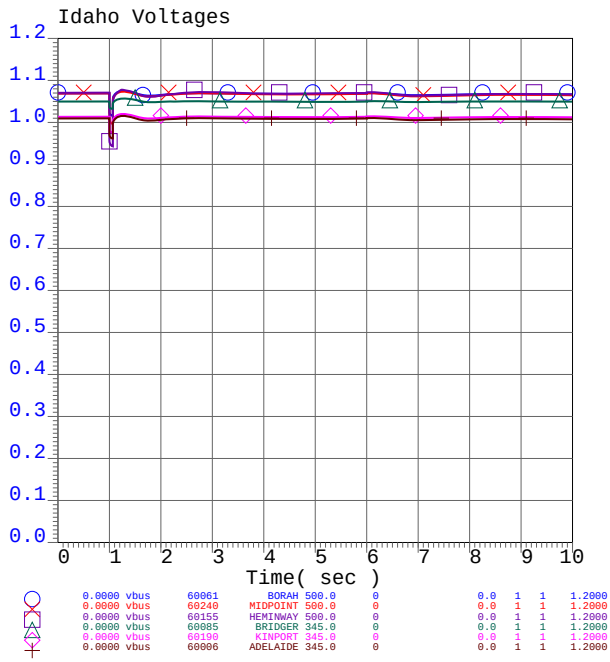


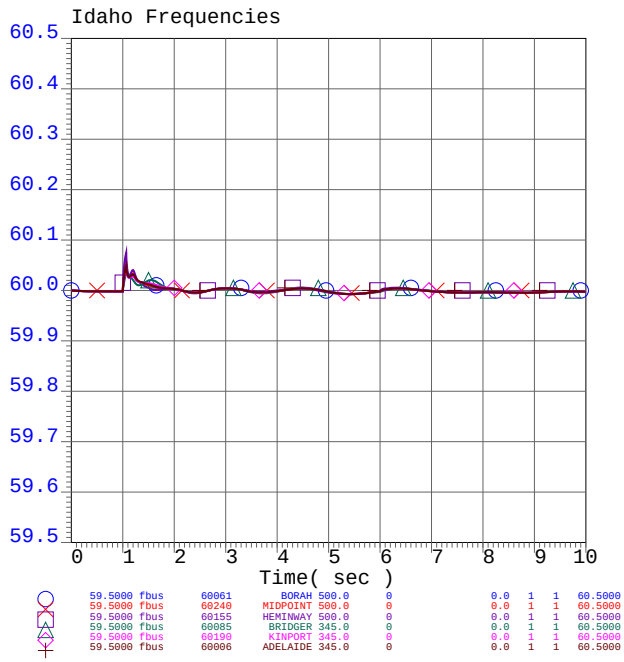
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES



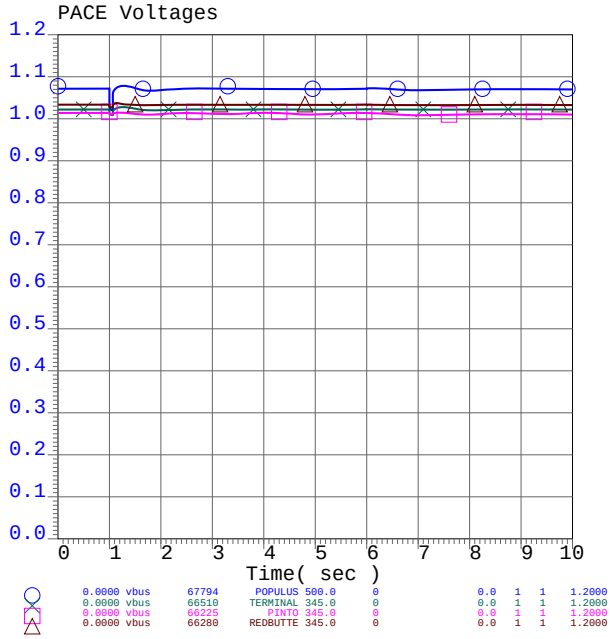


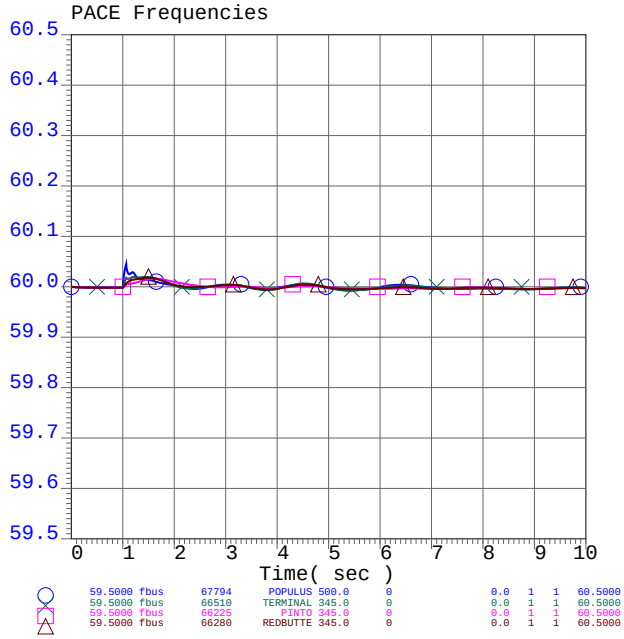


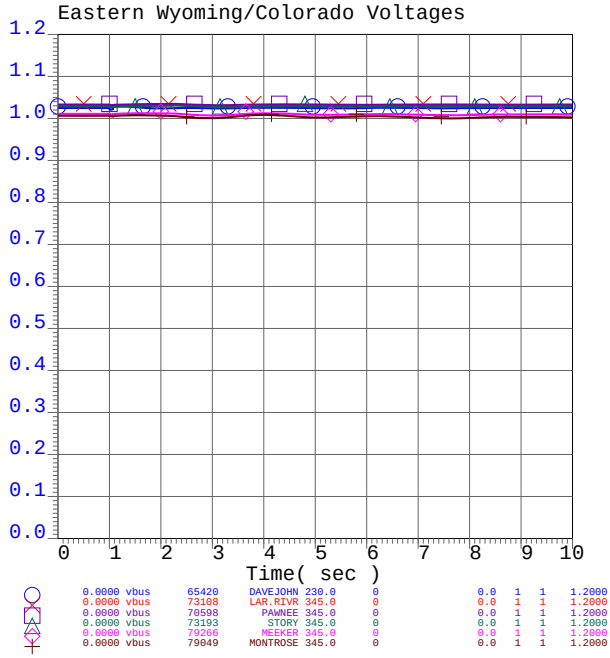


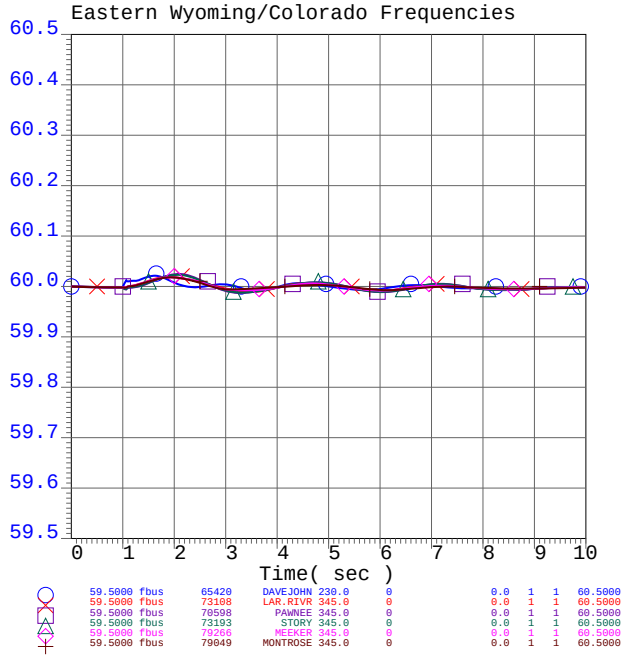
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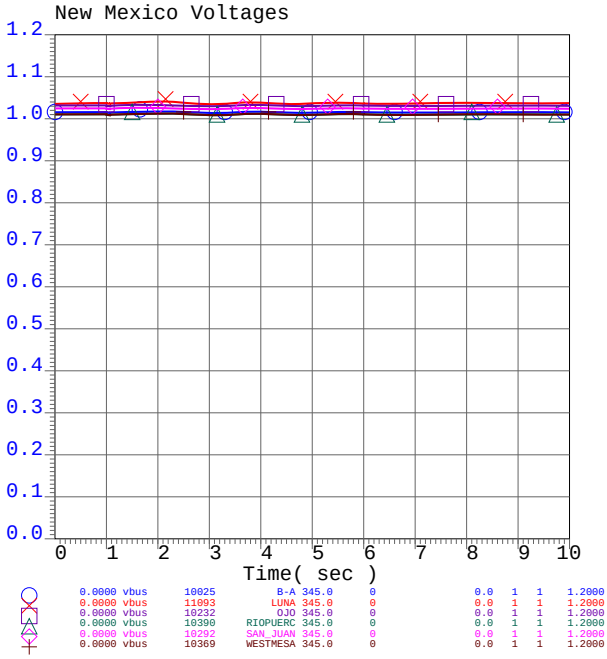




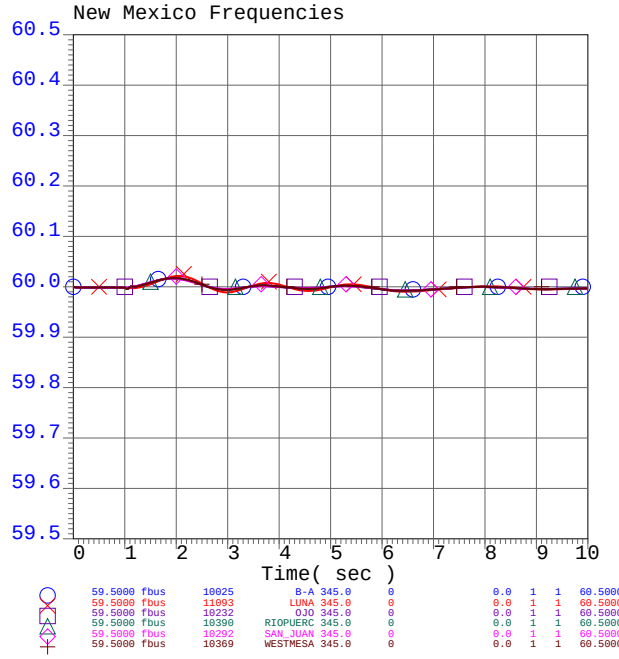
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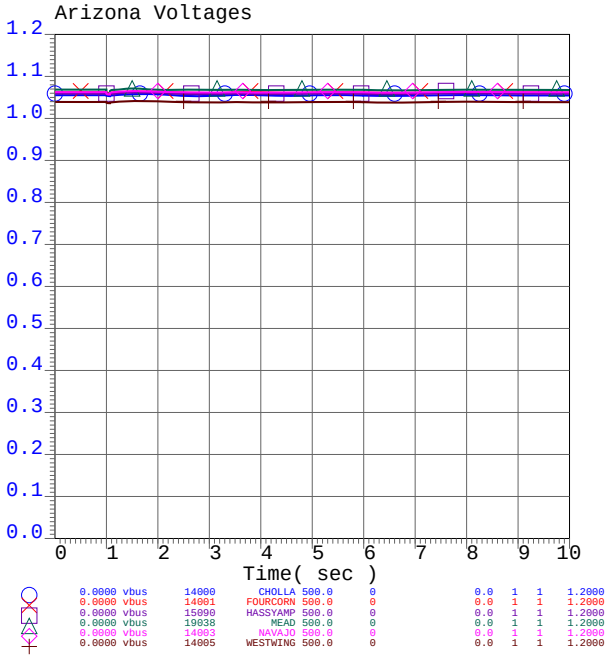
New Mexico Voltages



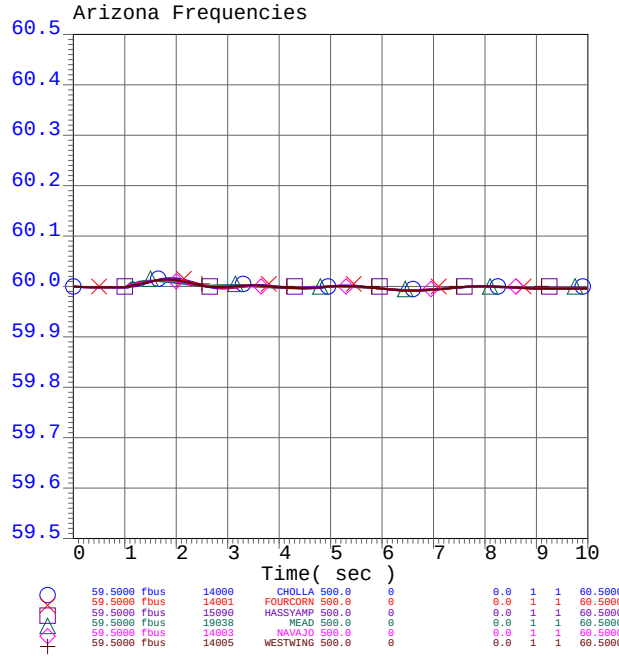
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

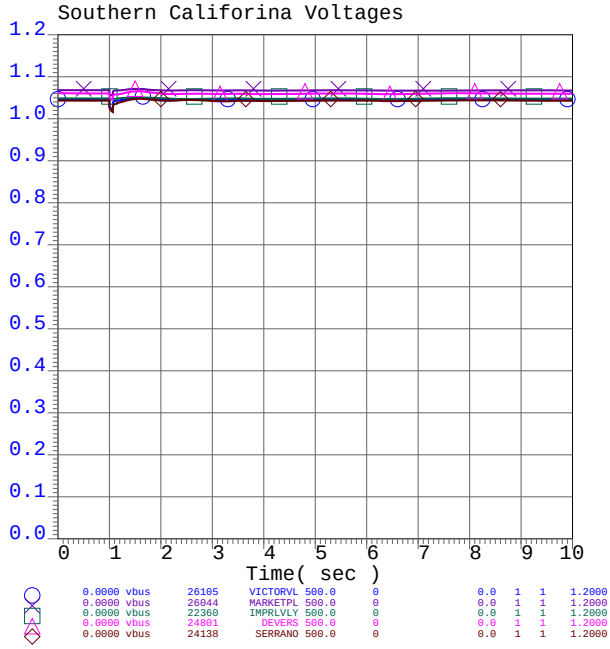


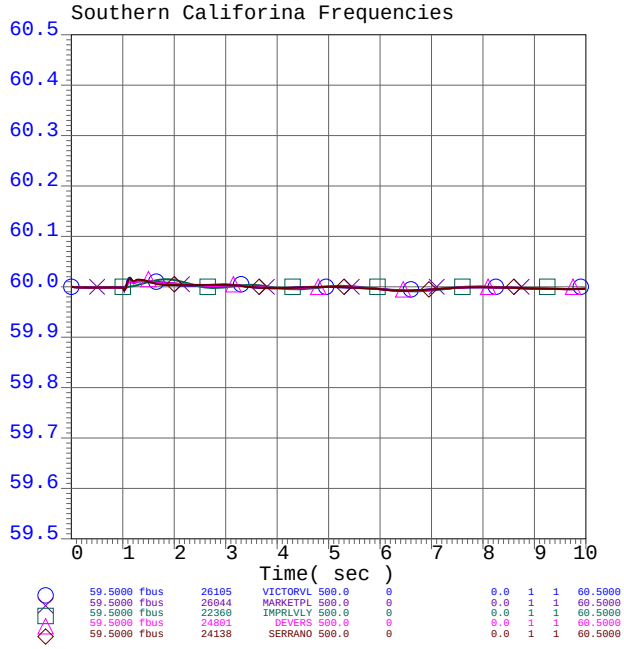
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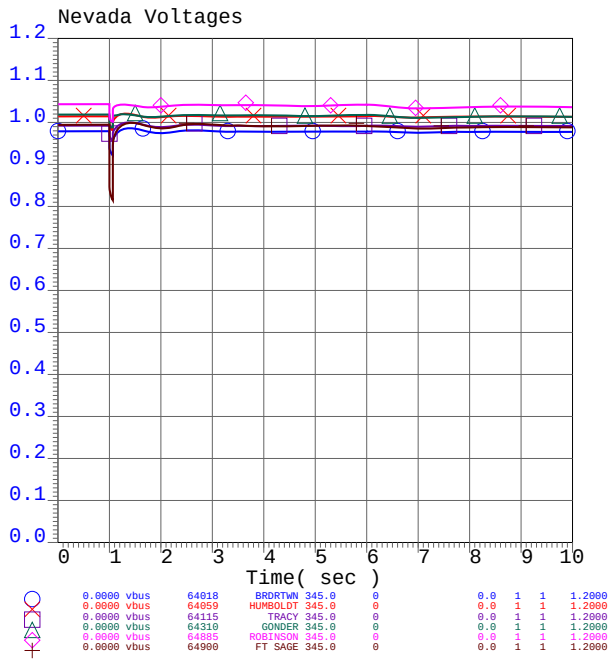
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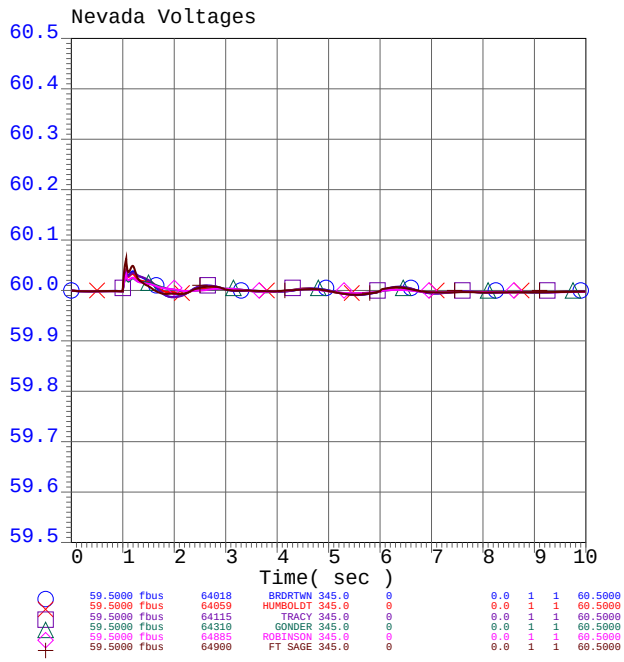
Fri Jan 03 18:04:01 2014

WECC AREA VOLTAGE AND FREQUENCIES



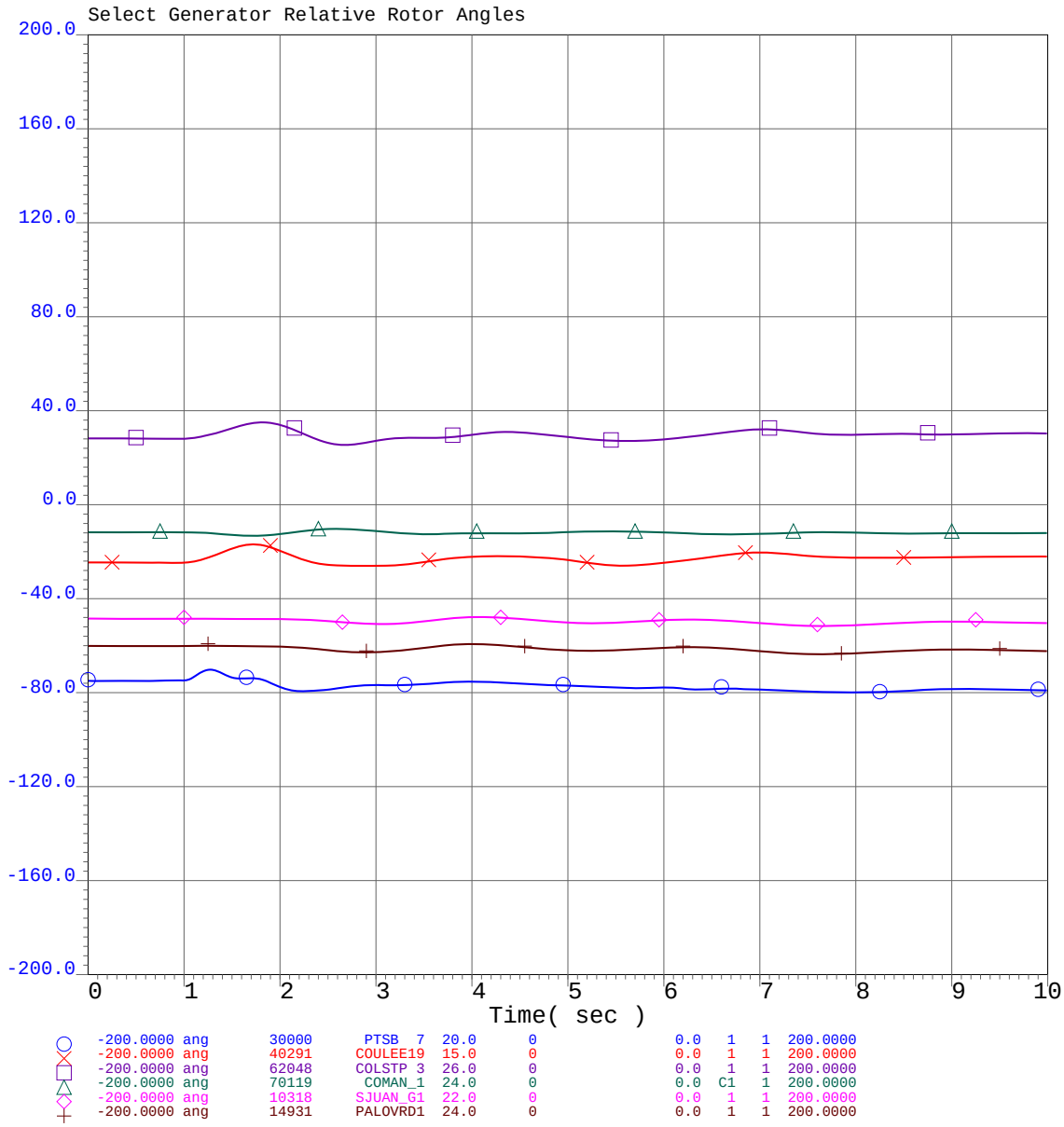






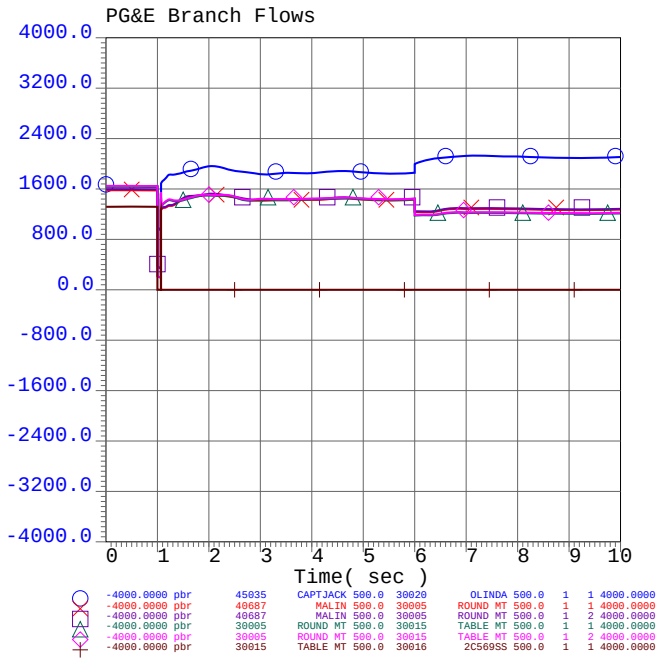
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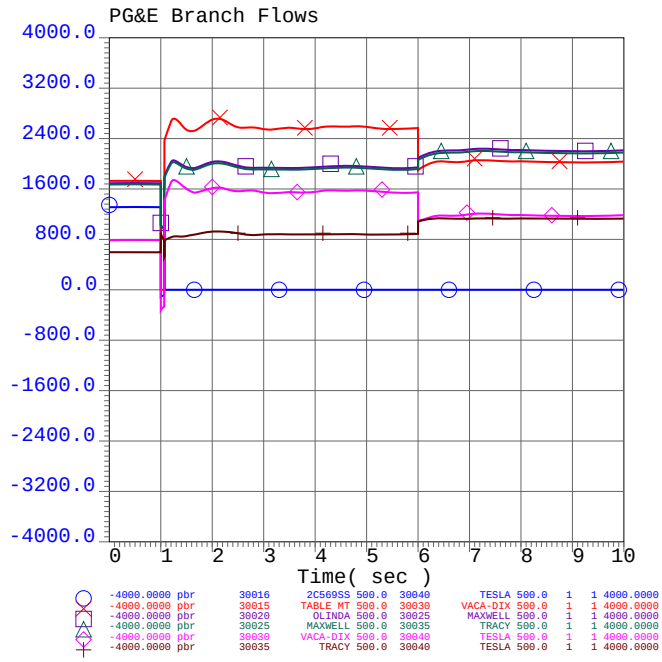
WECC RELATIVE ROTOR ANGLES

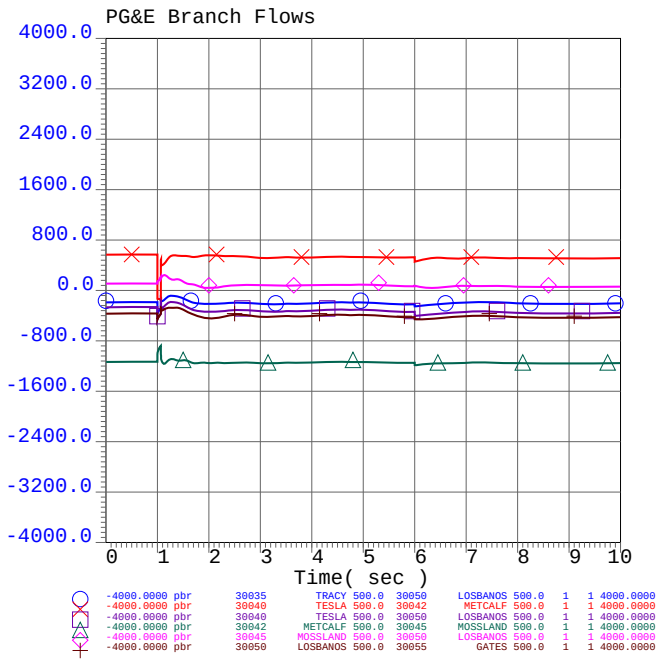


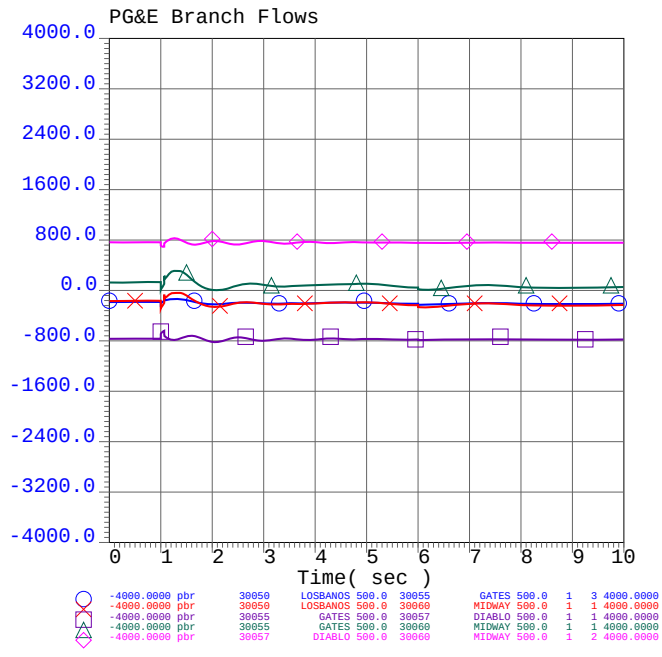
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SELECT BRANCH FLOWS



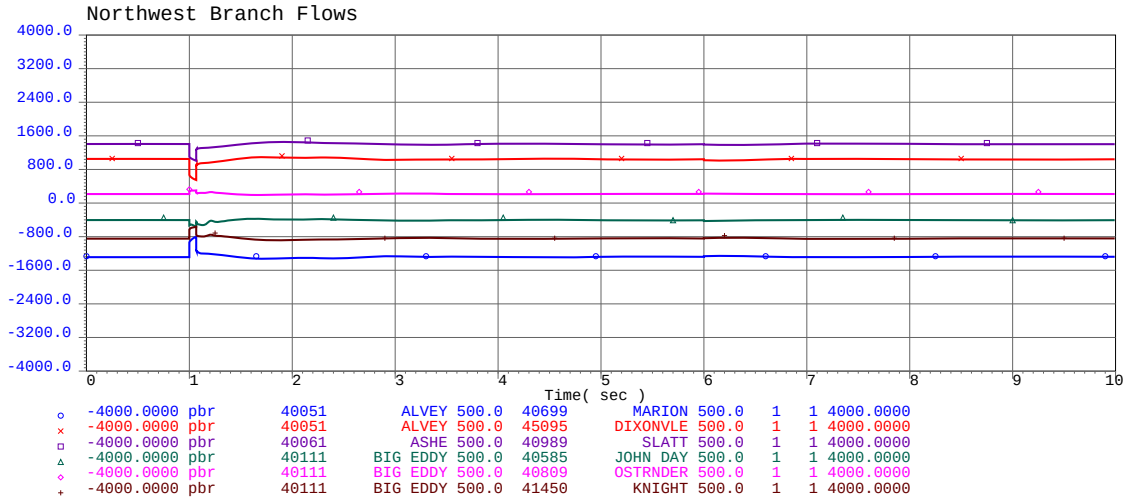




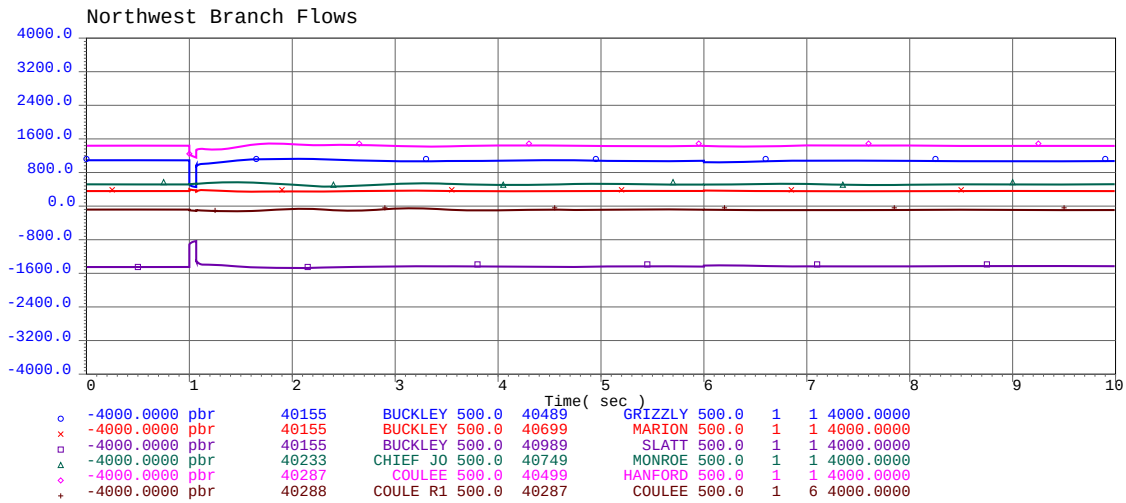


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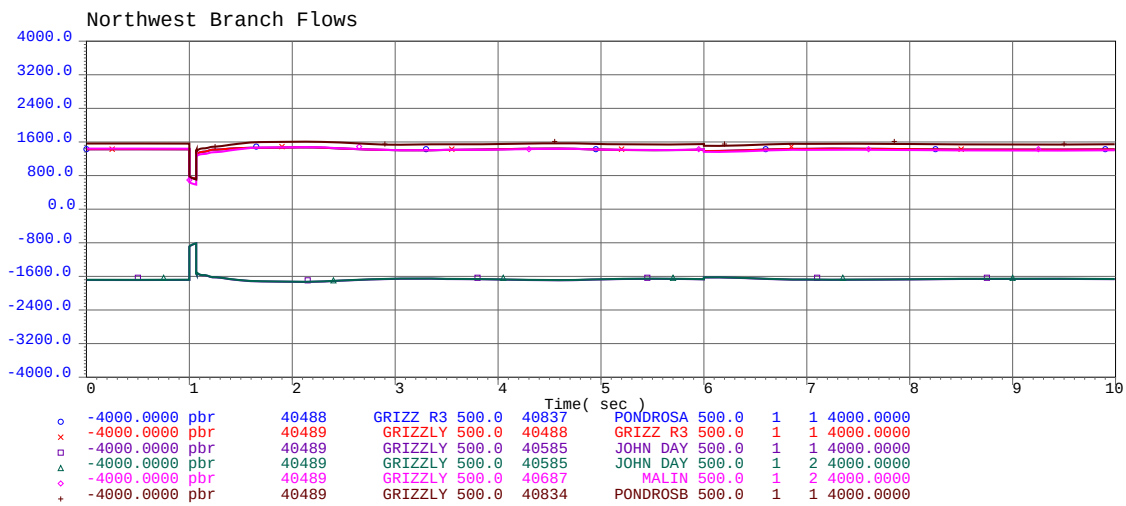
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
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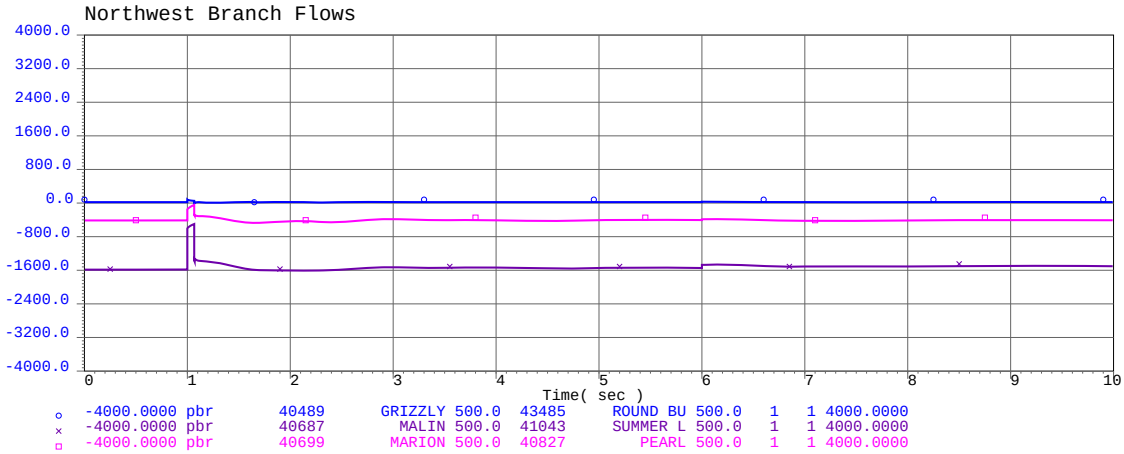
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-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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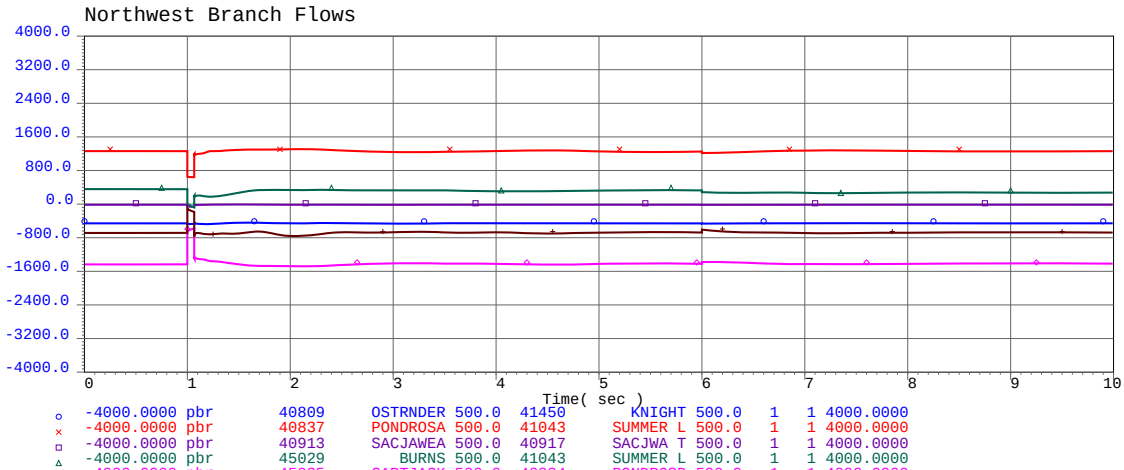
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Table Mountain 500 kV
followed by loss of Table Mountain-C0569SS 500 kV line

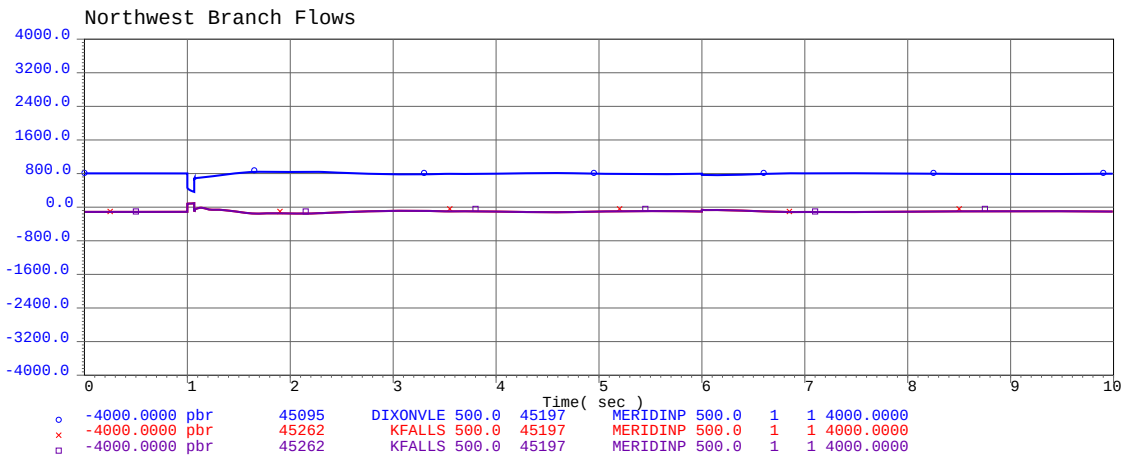
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



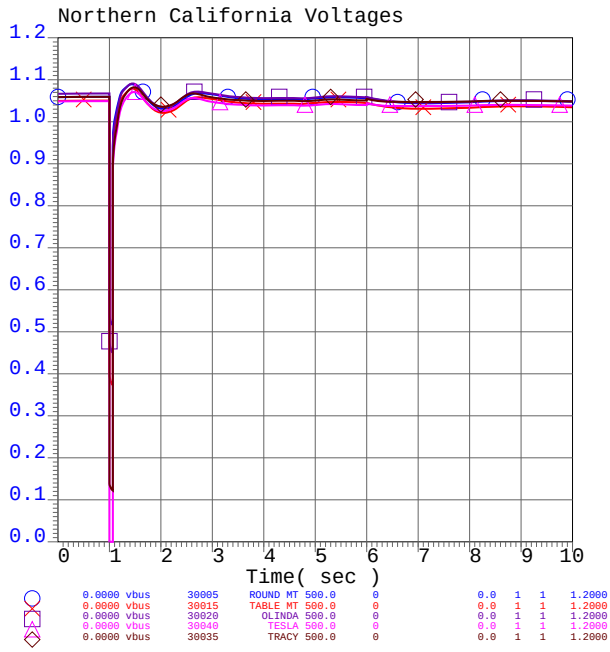
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-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
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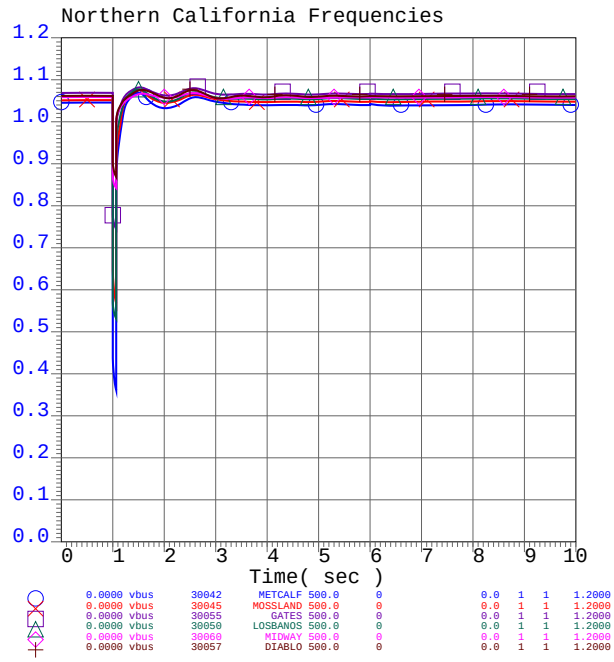


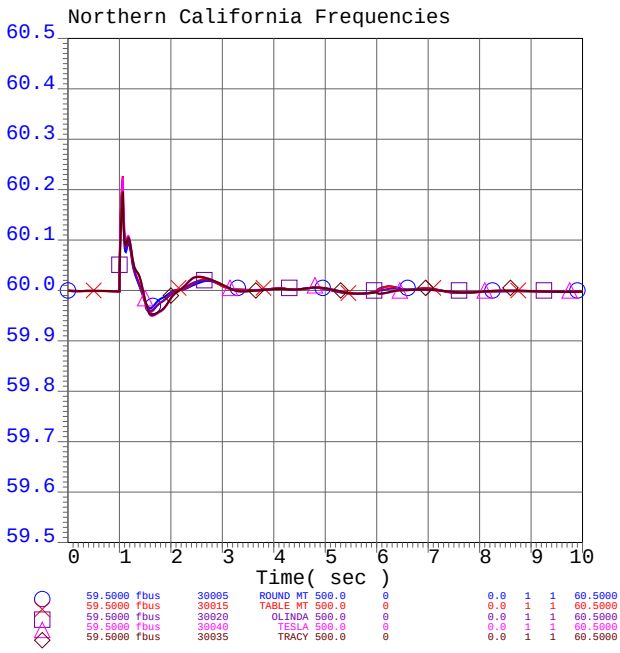
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

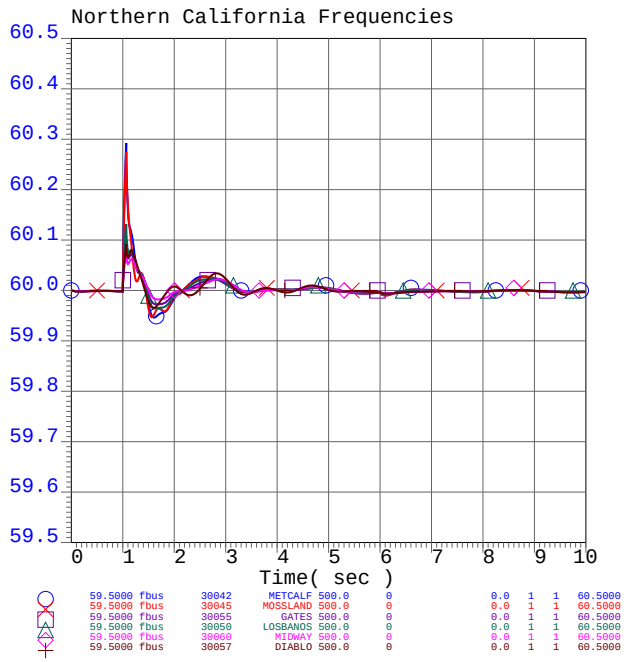
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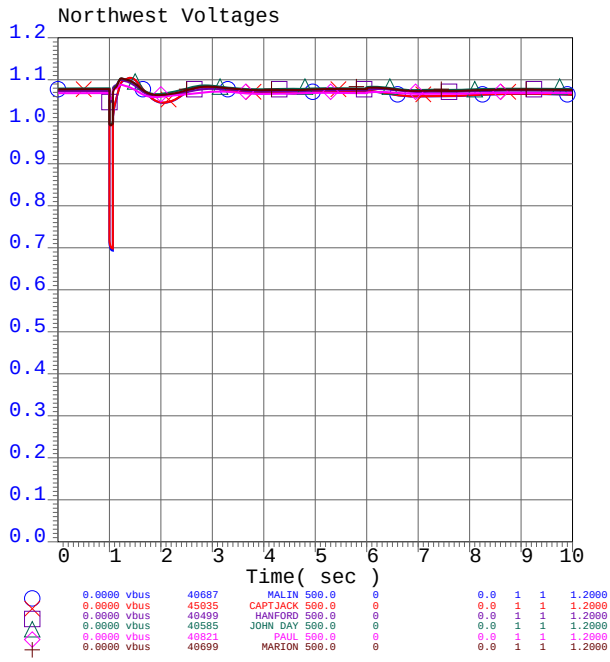


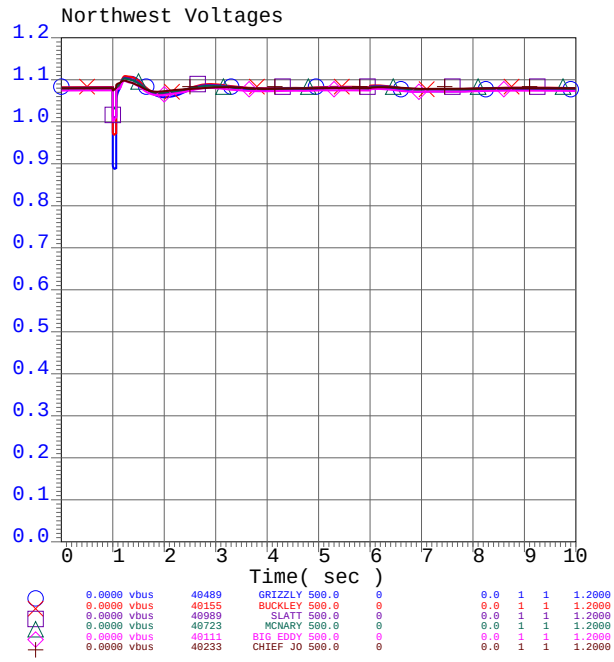


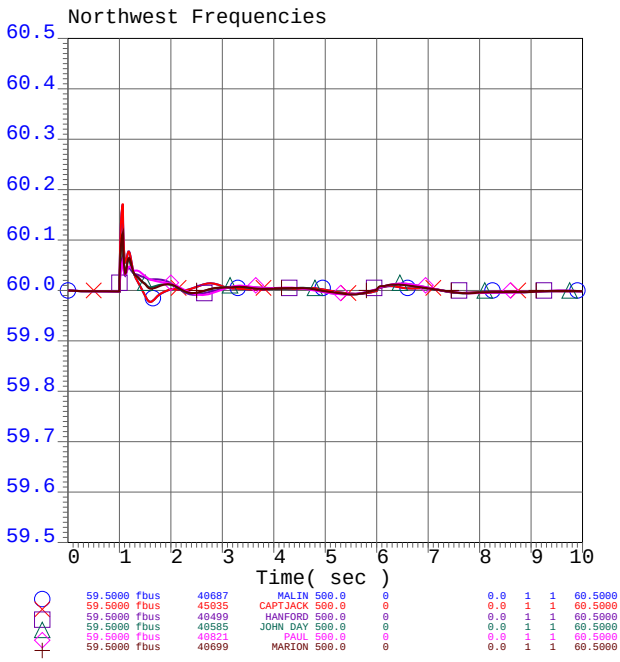


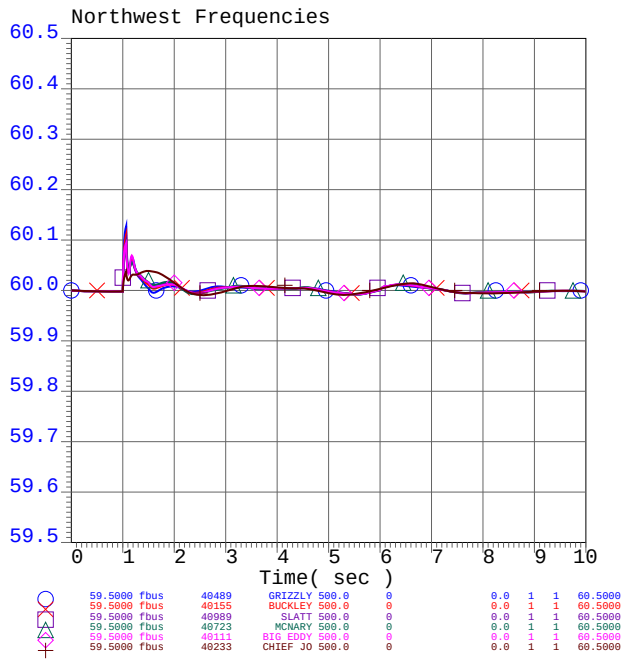
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WECC AREA VOLTAGE AND FREQUENCIES





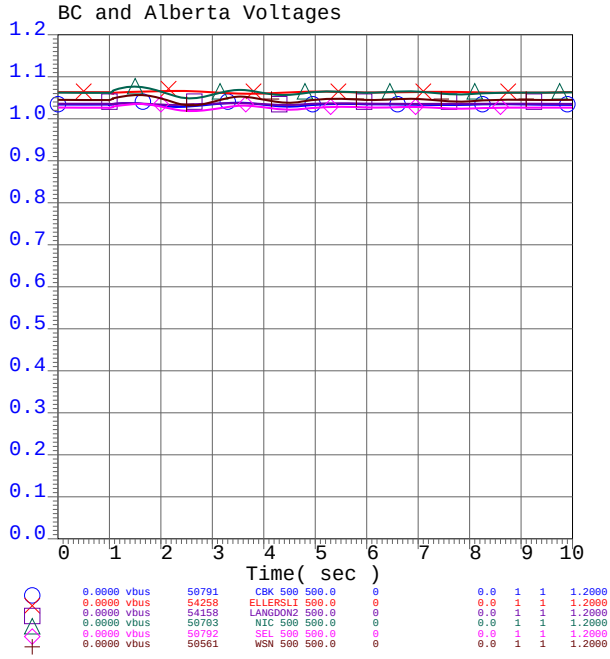




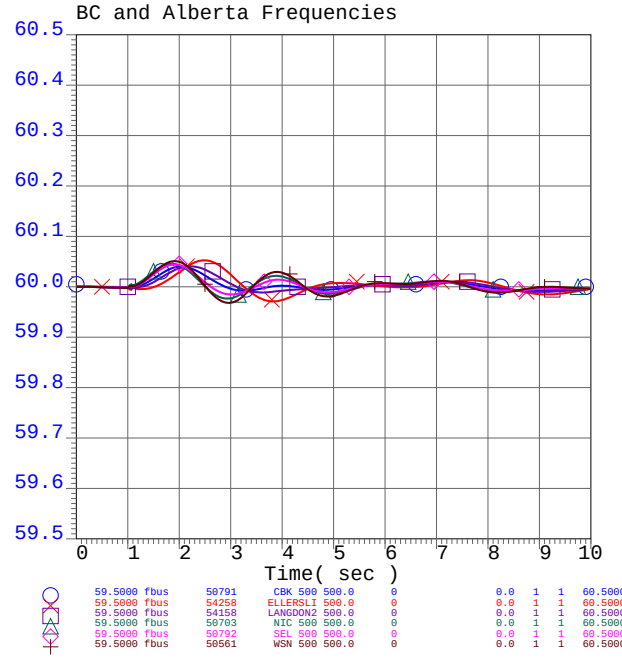
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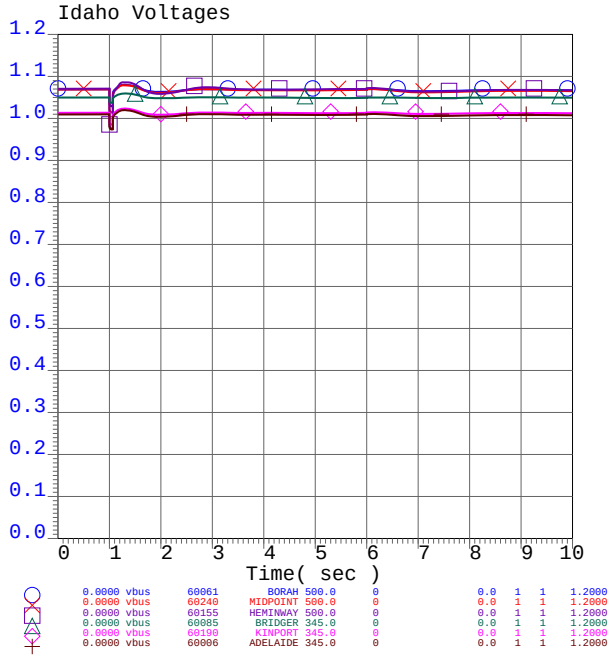
BC and Alberta Voltages



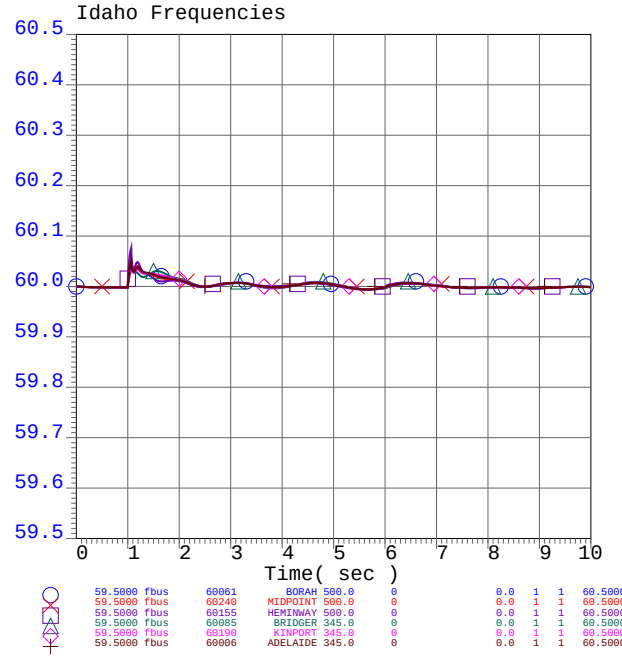
BC and Alberta Frequencies



Idaho Voltages

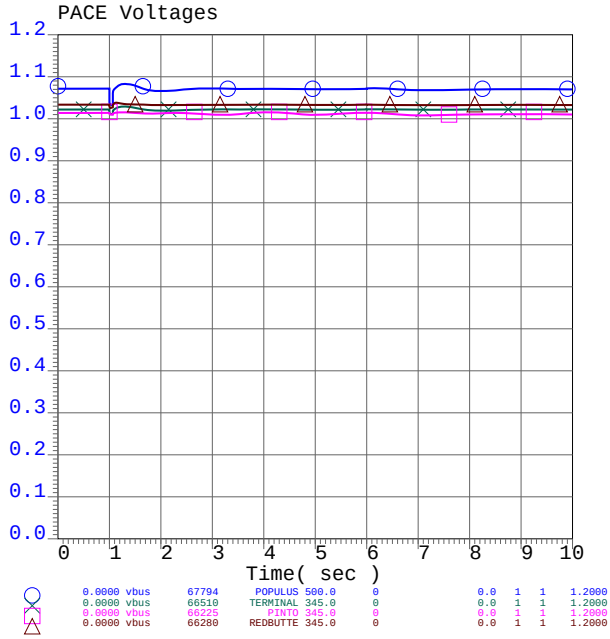


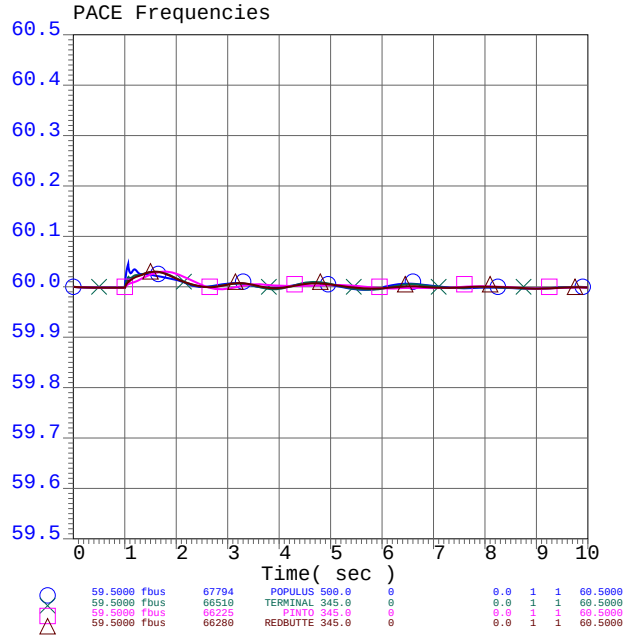
Idaho Frequencies

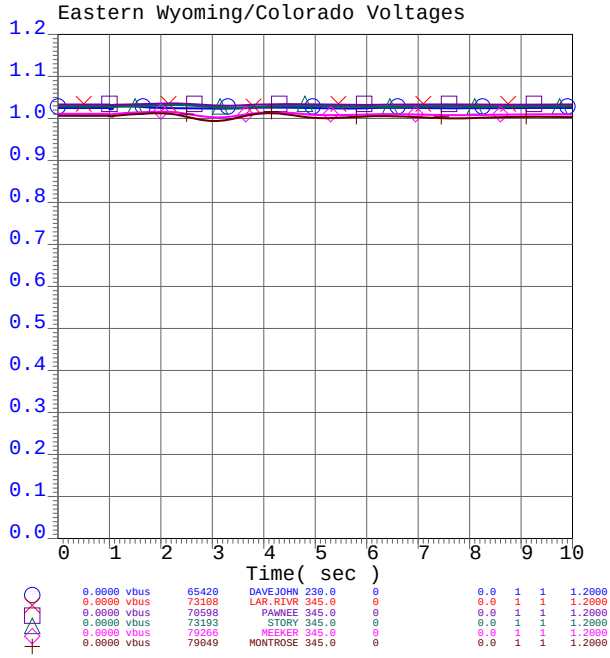


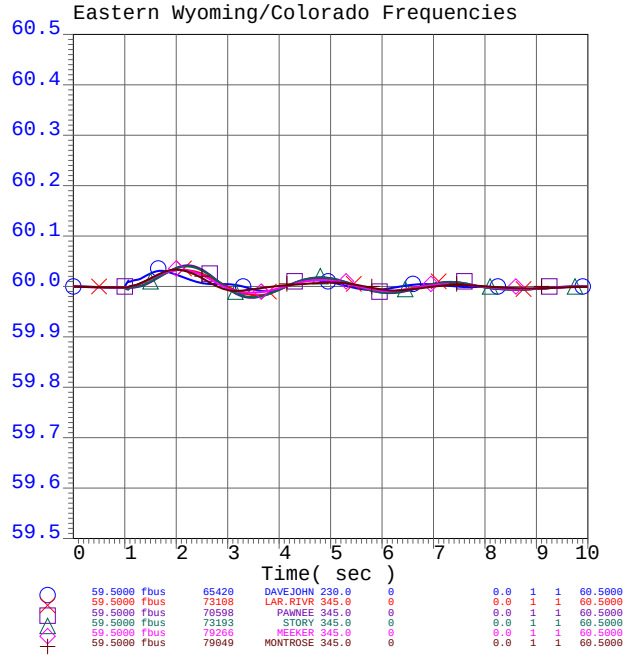
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WECC AREA VOLTAGE AND FREQUENCIES





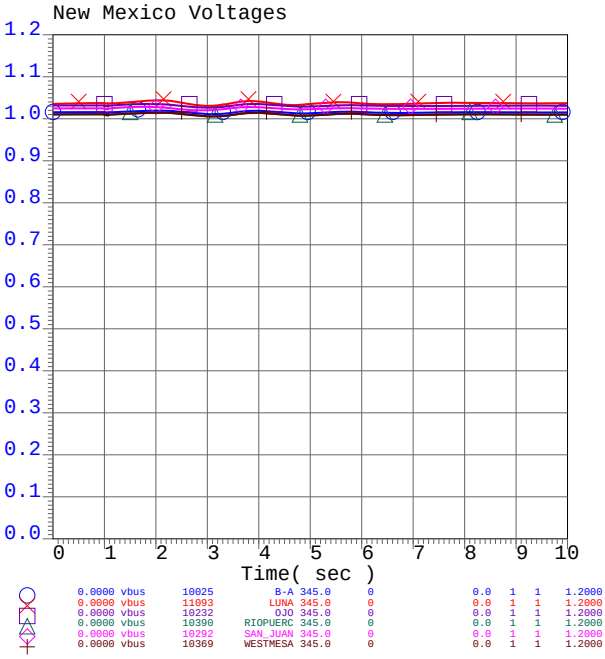




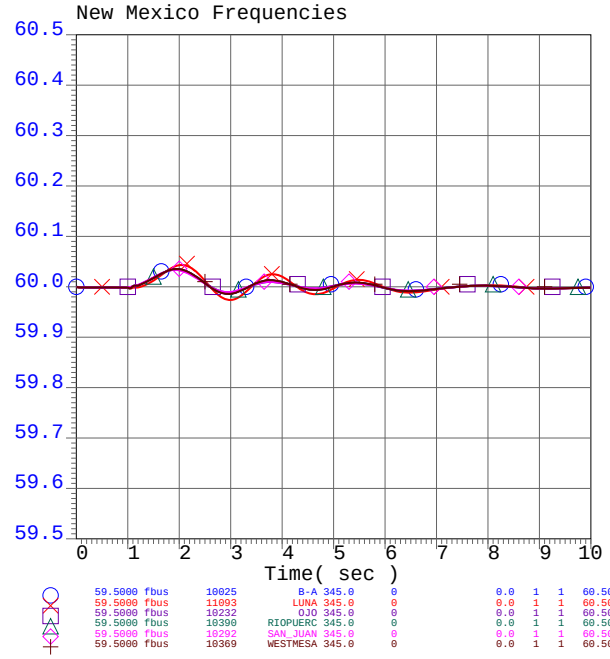
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WECC AREA VOLTAGE AND FREQUENCIES

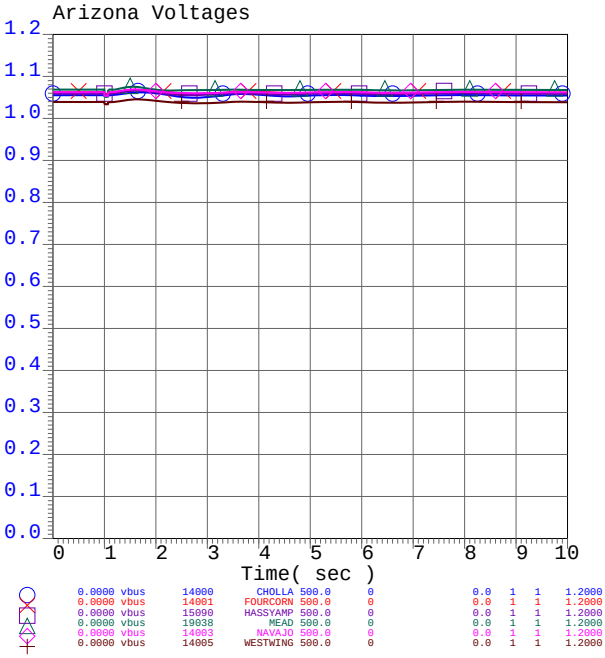
New Mexico Voltages



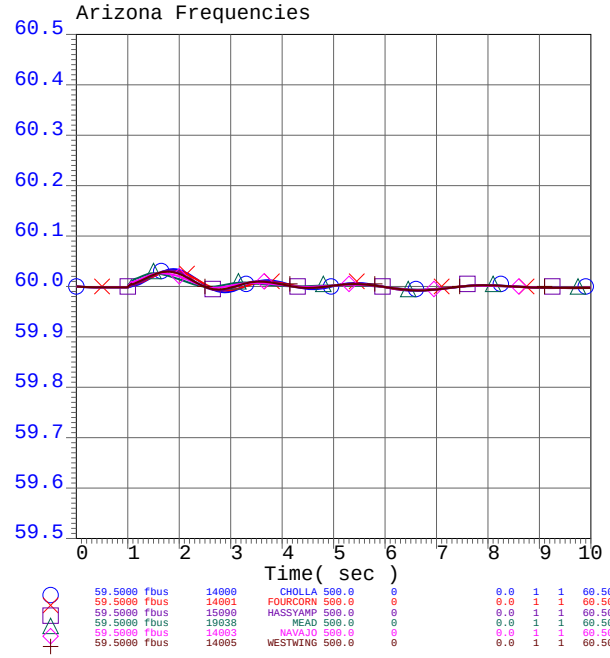
New Mexico Frequencies



Arizona Voltages

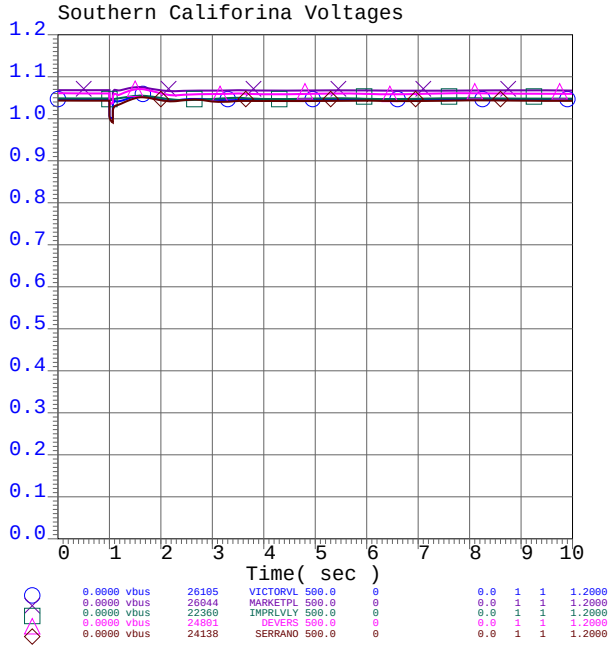


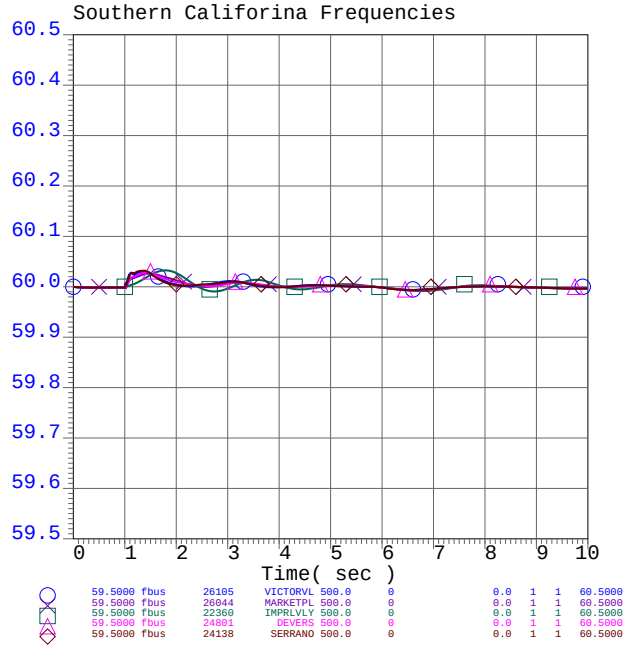
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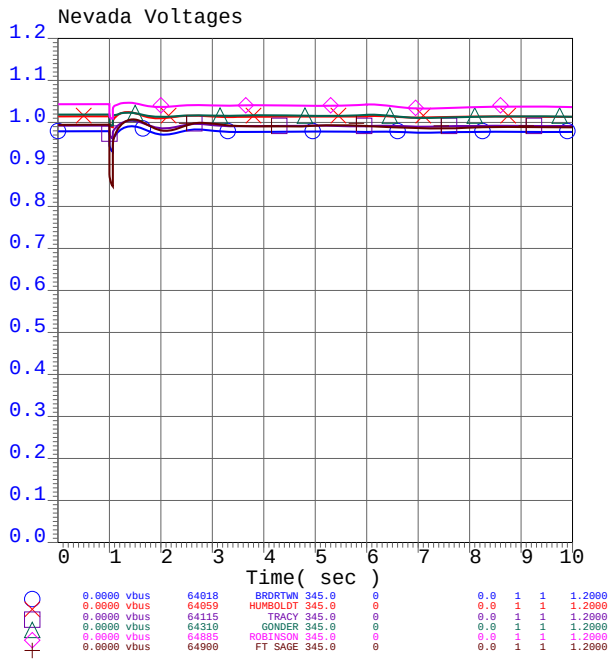


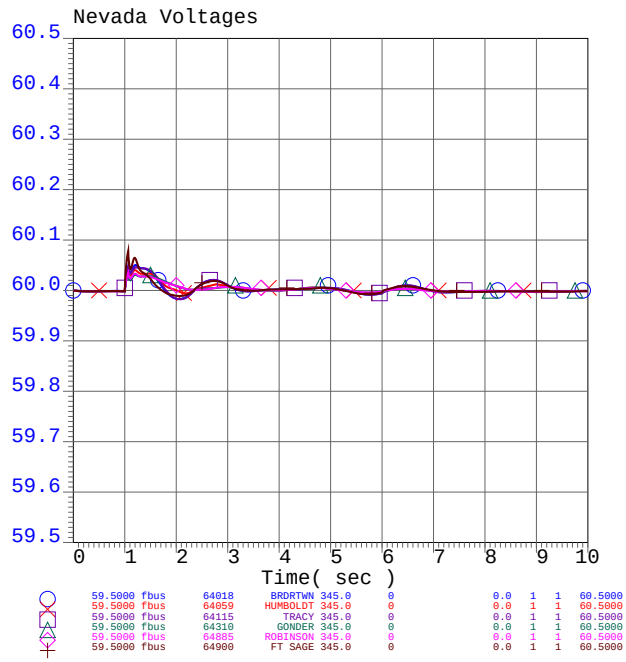
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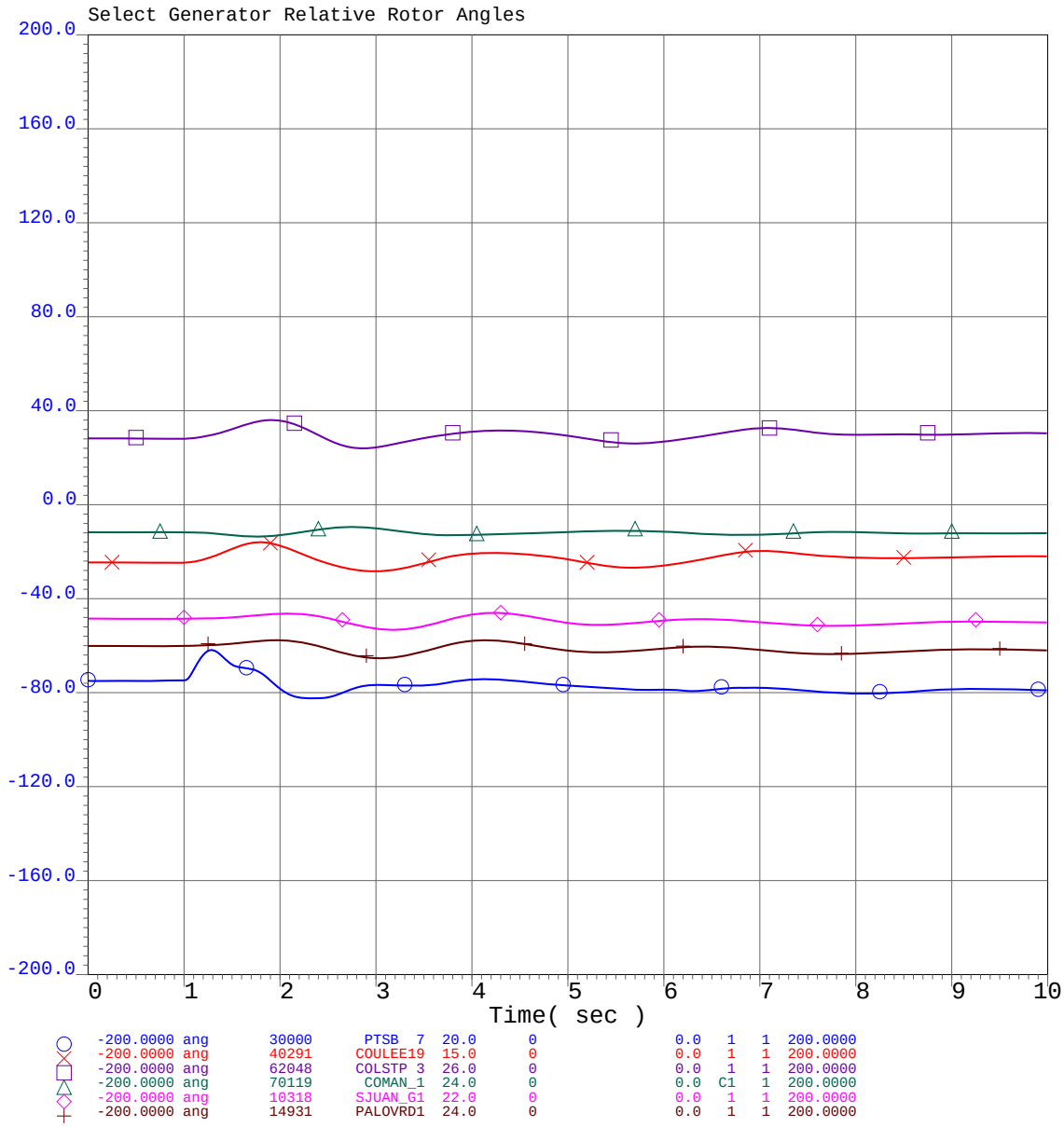






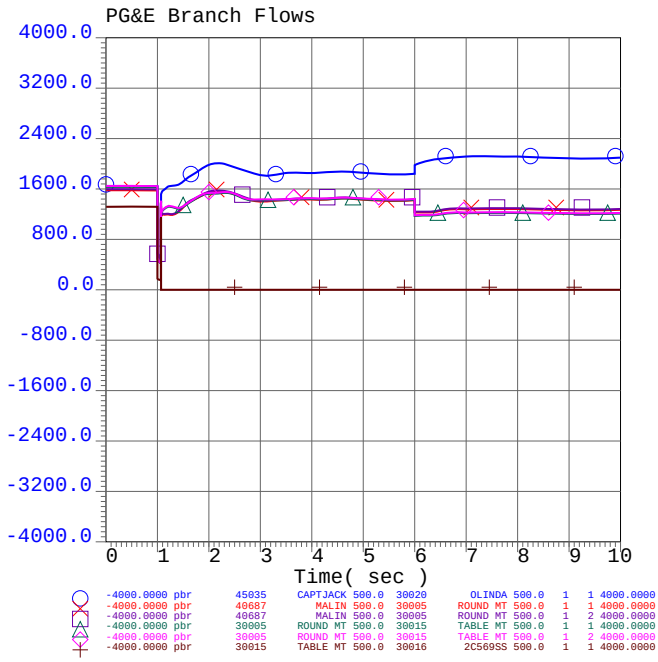
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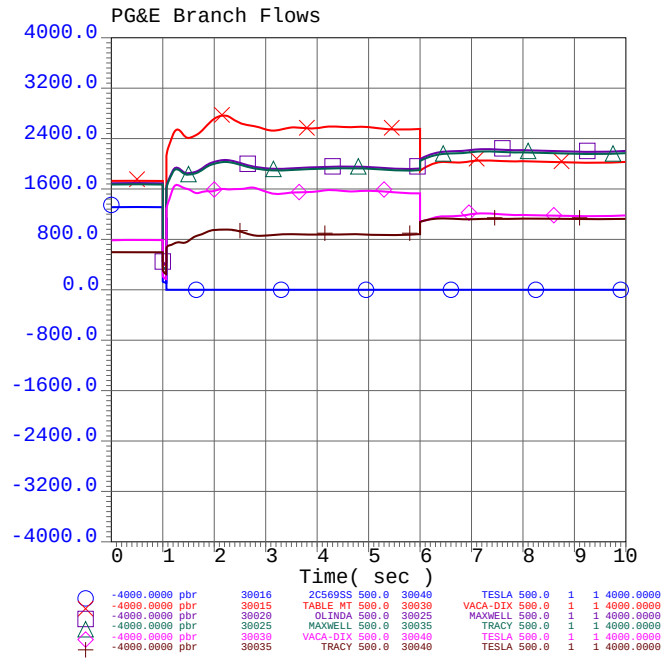
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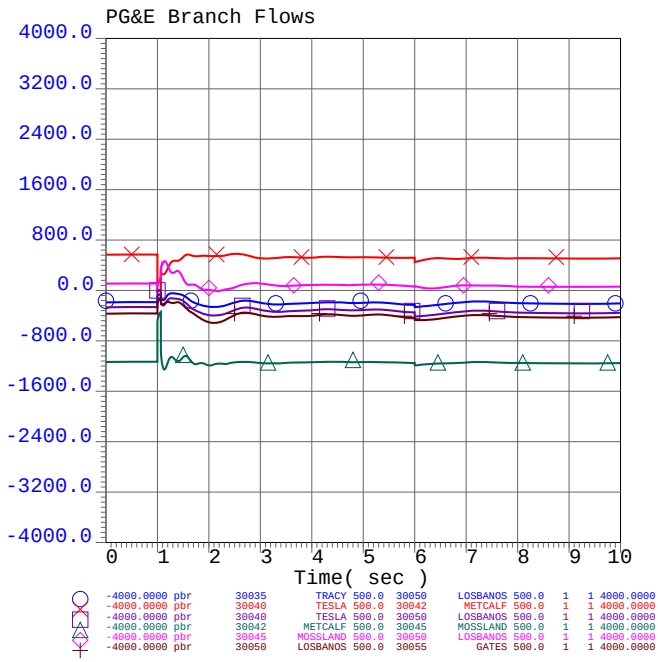


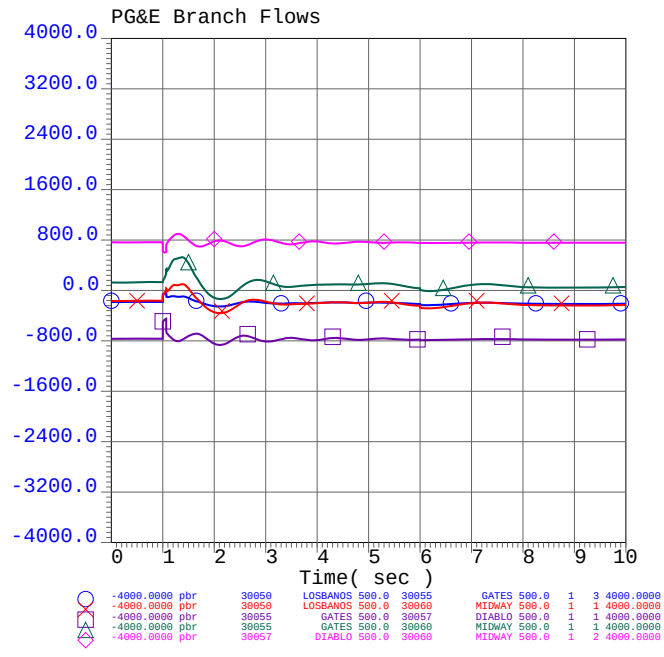
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SELECT BRANCH FLOWS









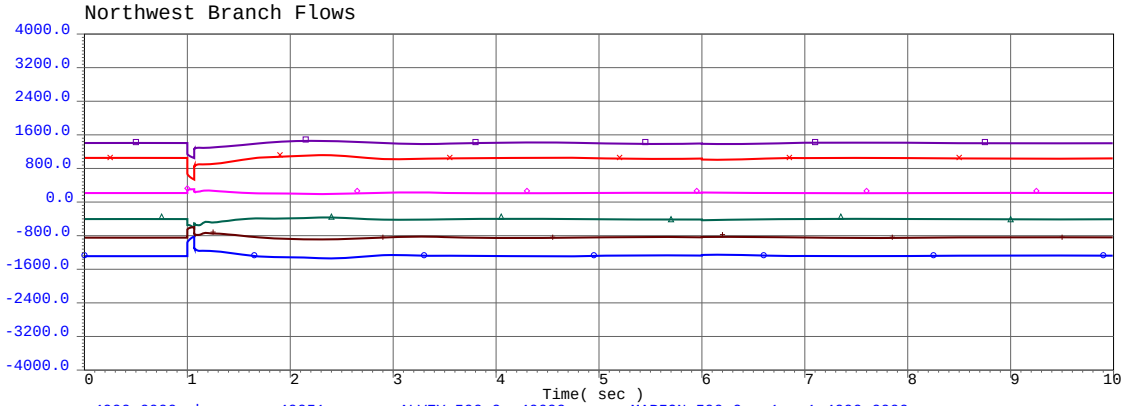
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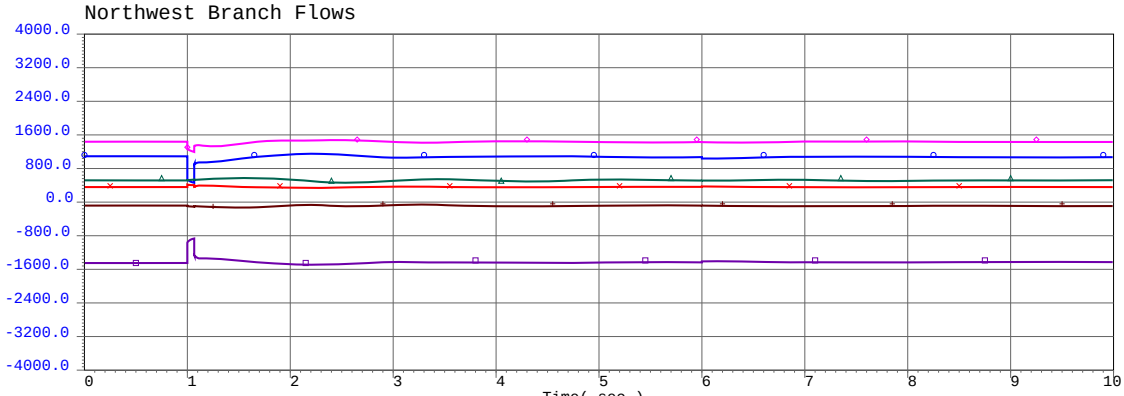
SELECT BRANCH FLOWS

Northwest Branch Flows



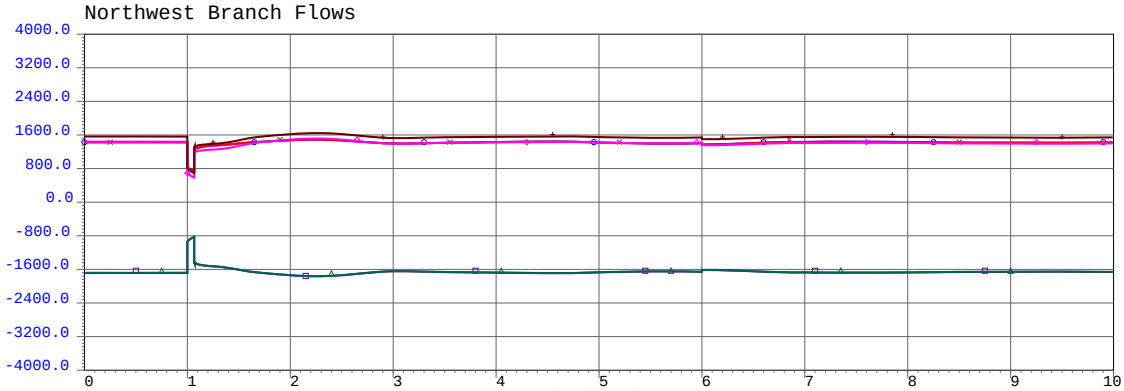
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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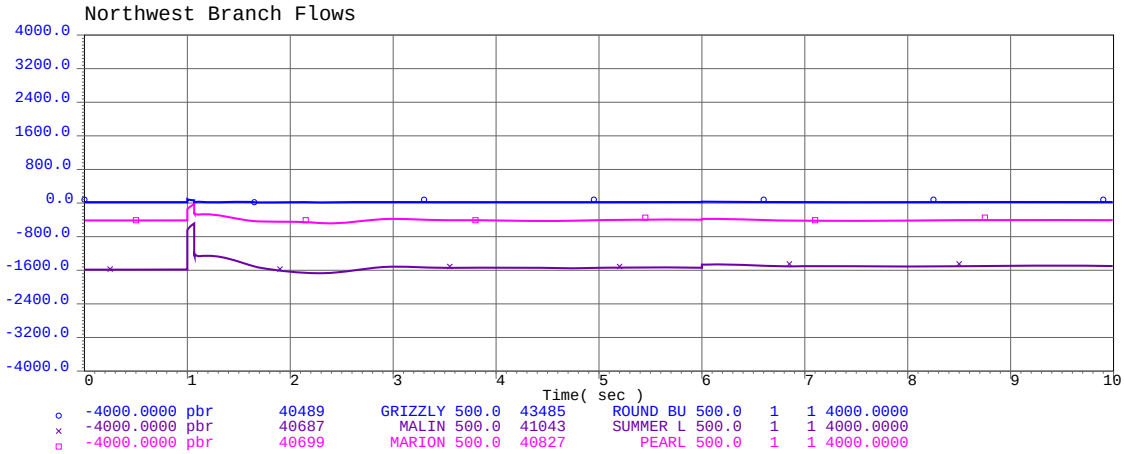
Northwest Branch Flows



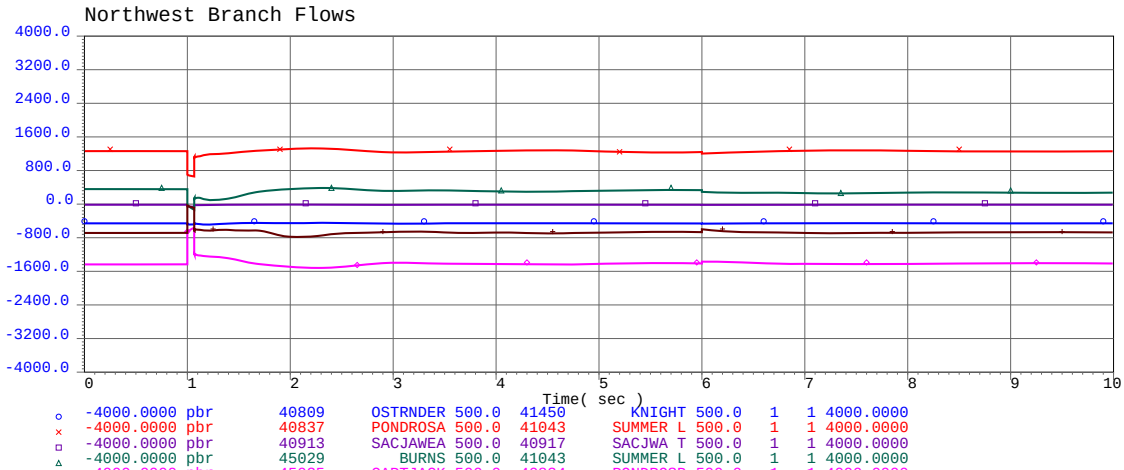
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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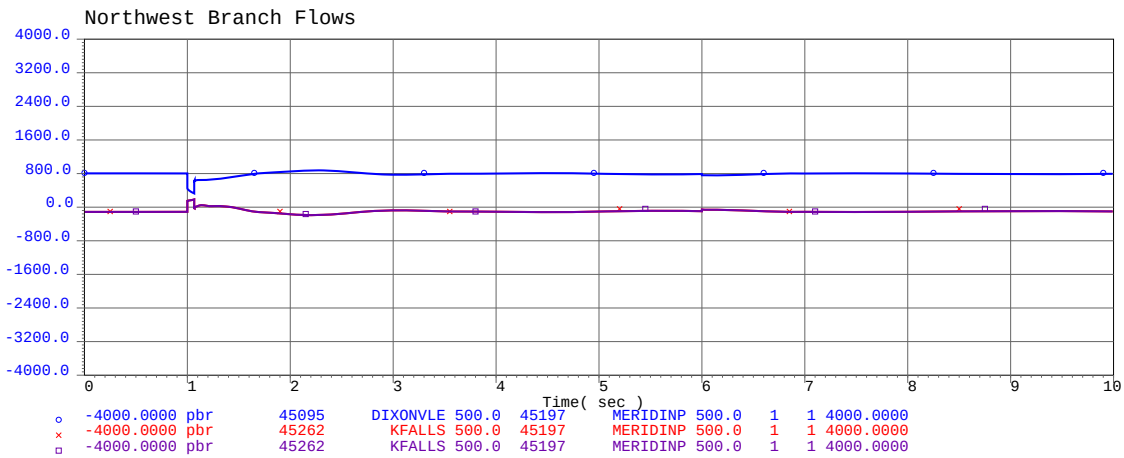
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



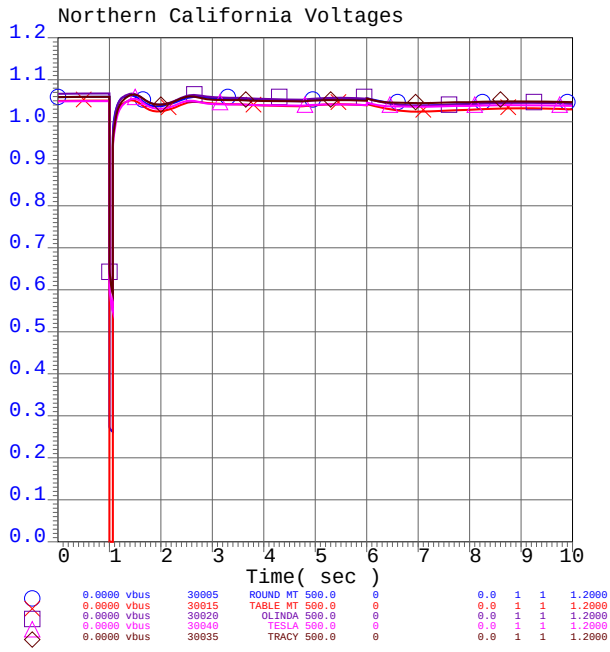
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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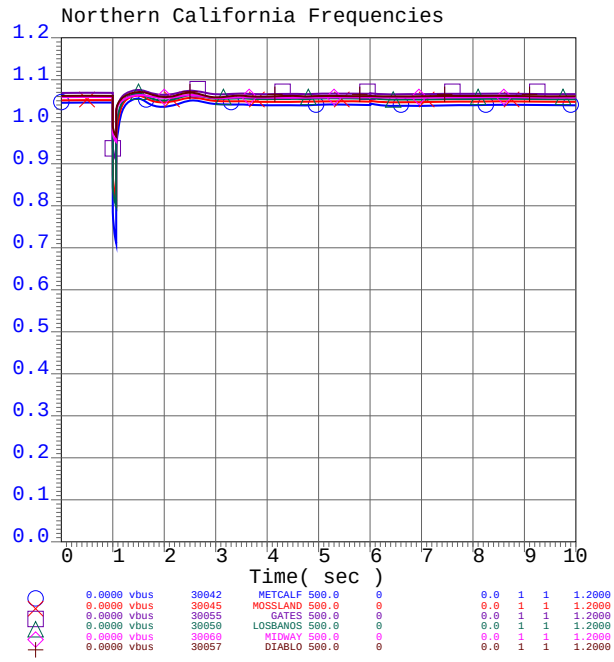


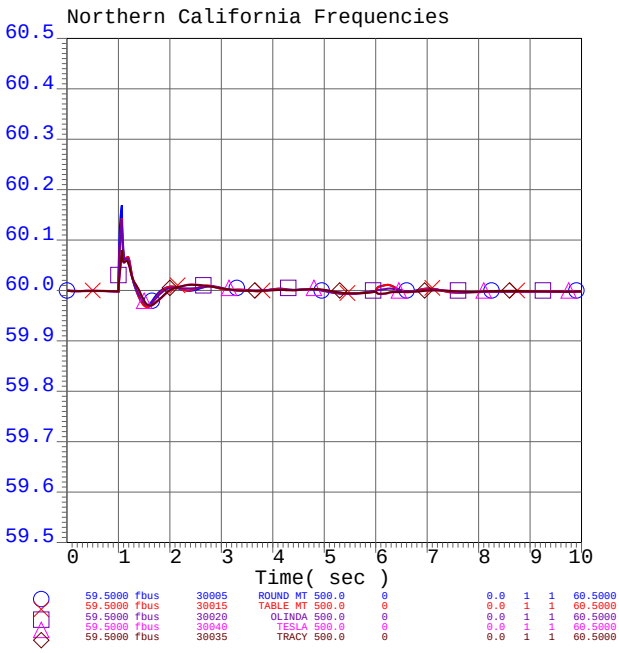
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

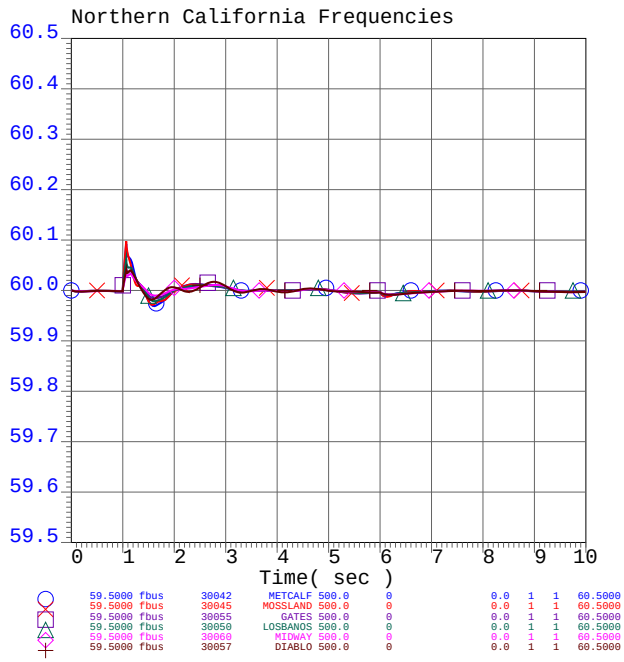
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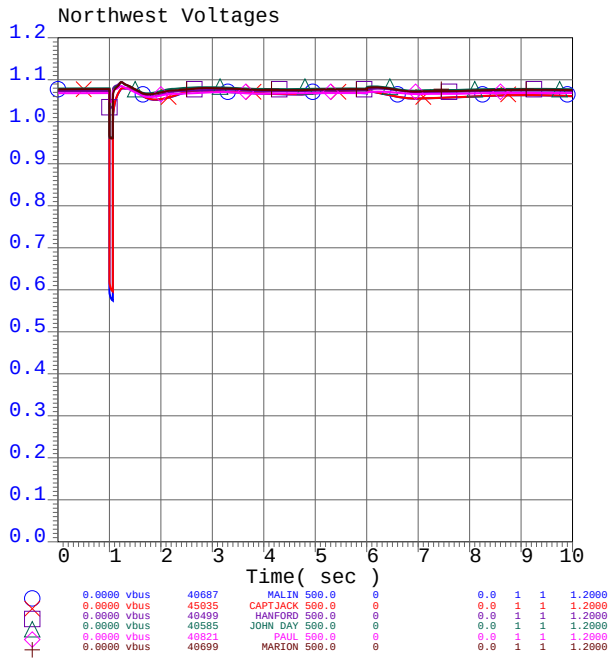


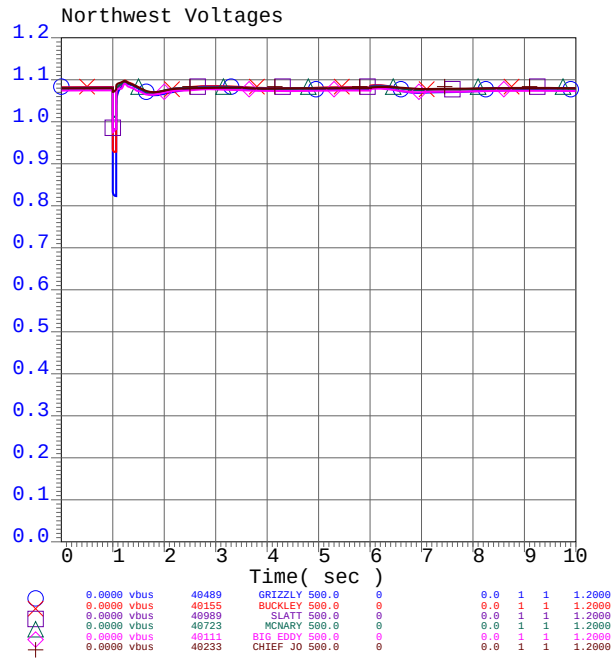


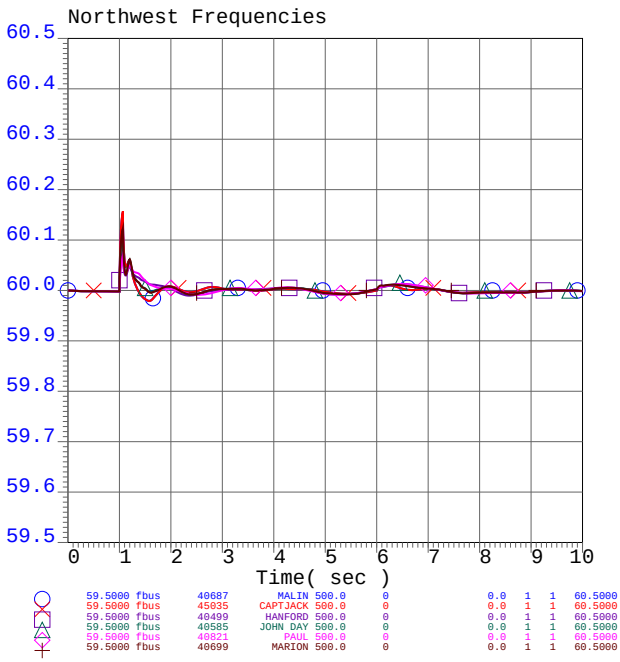


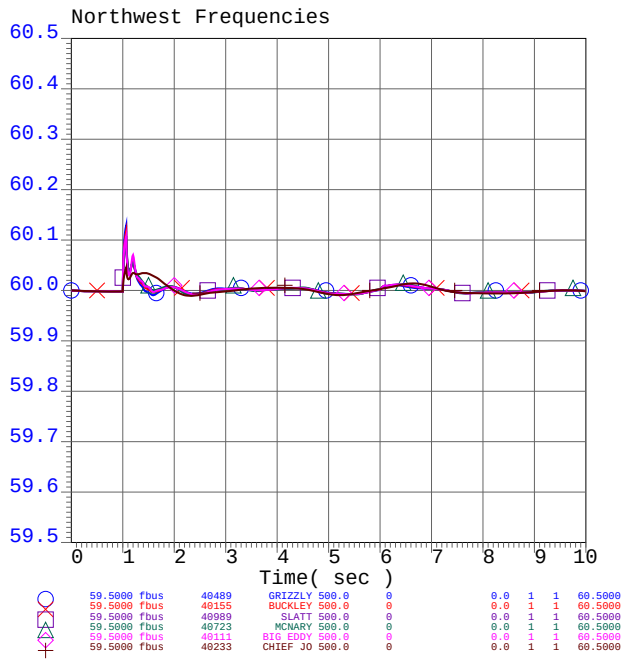
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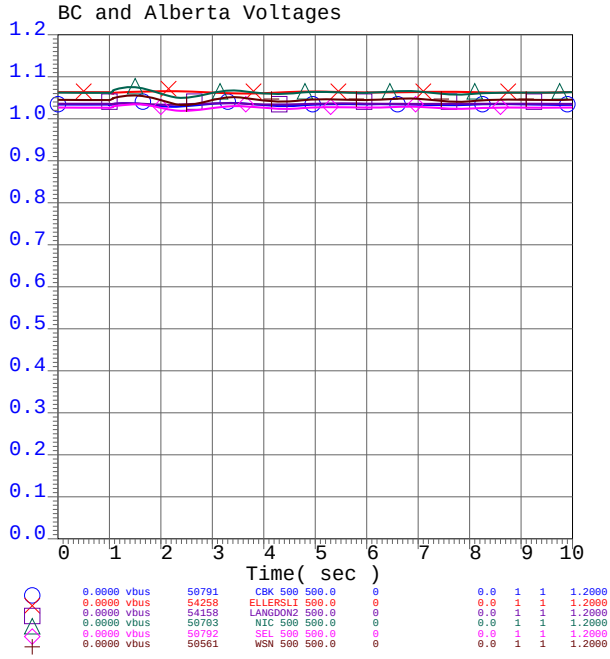


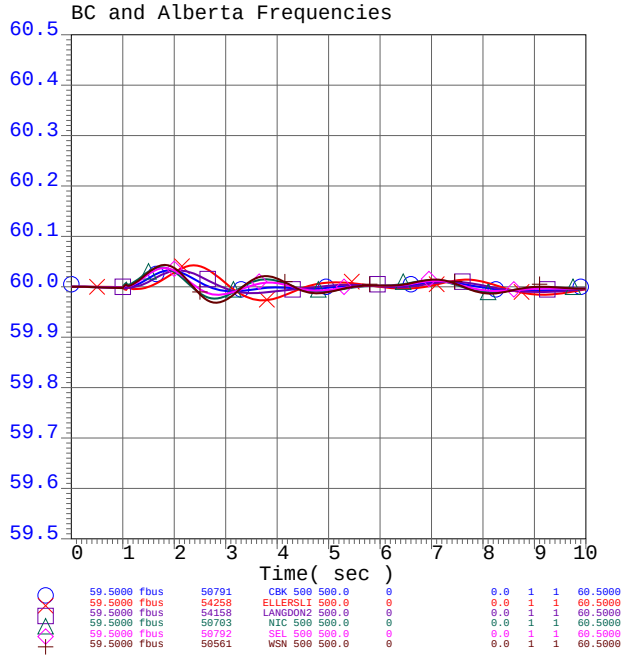


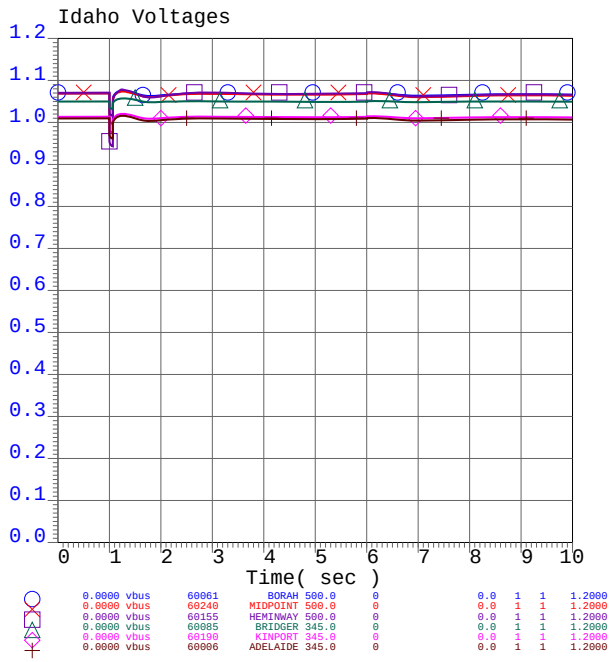


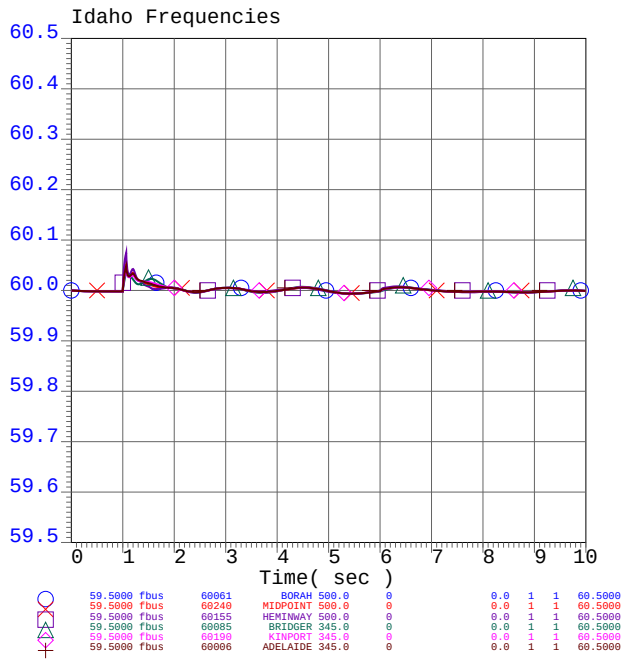
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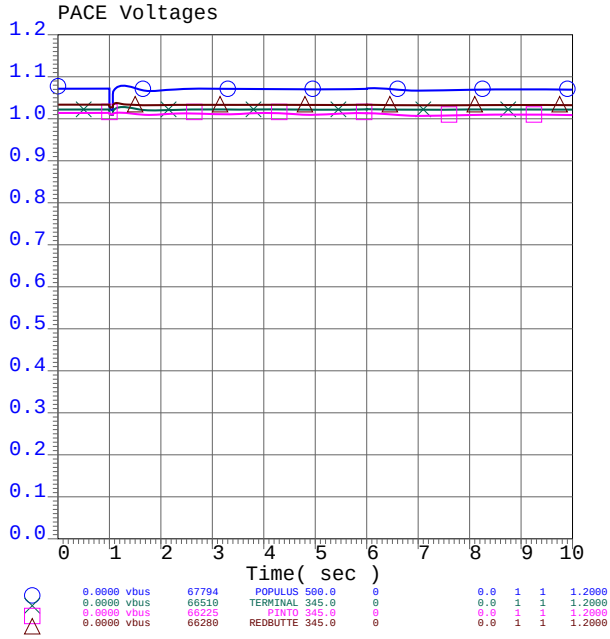


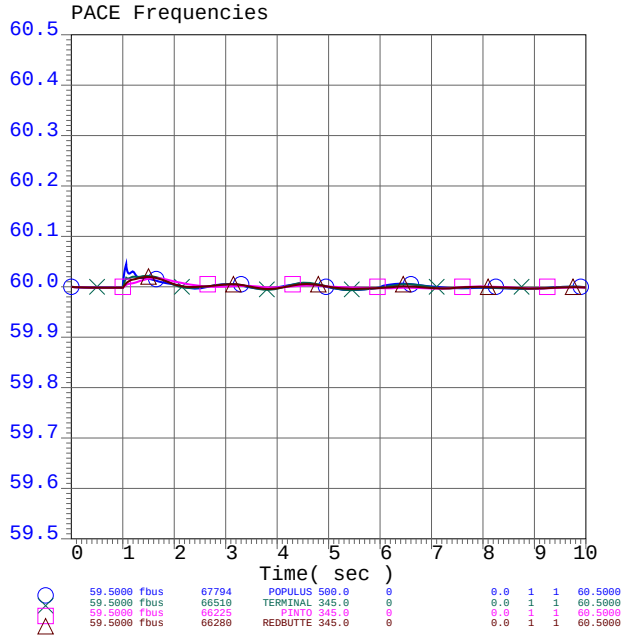


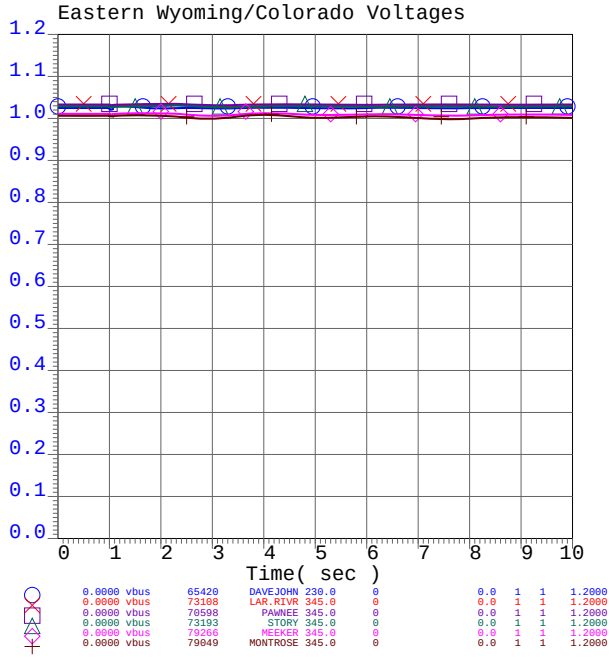


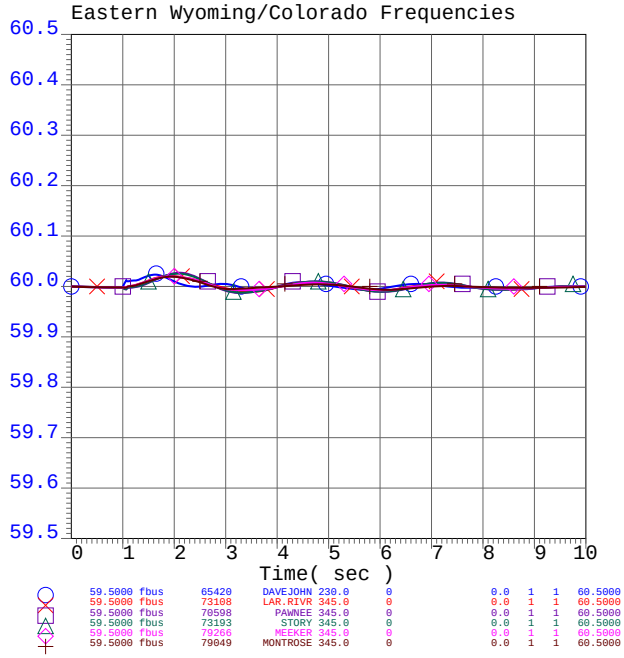
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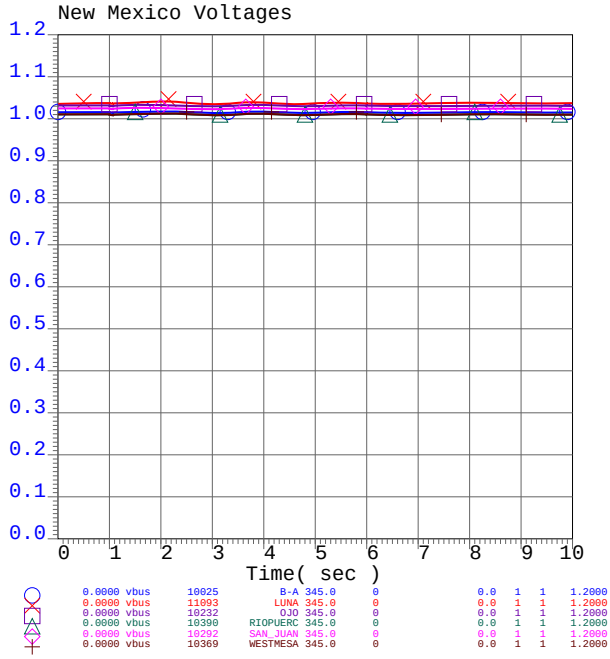




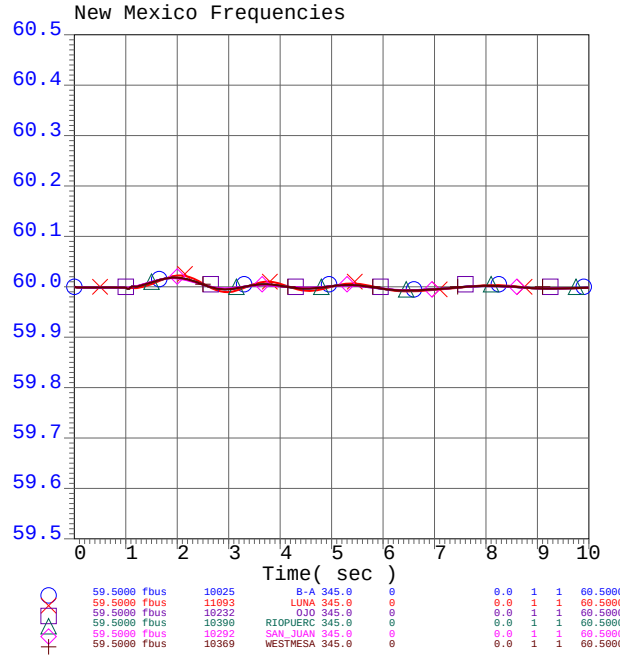
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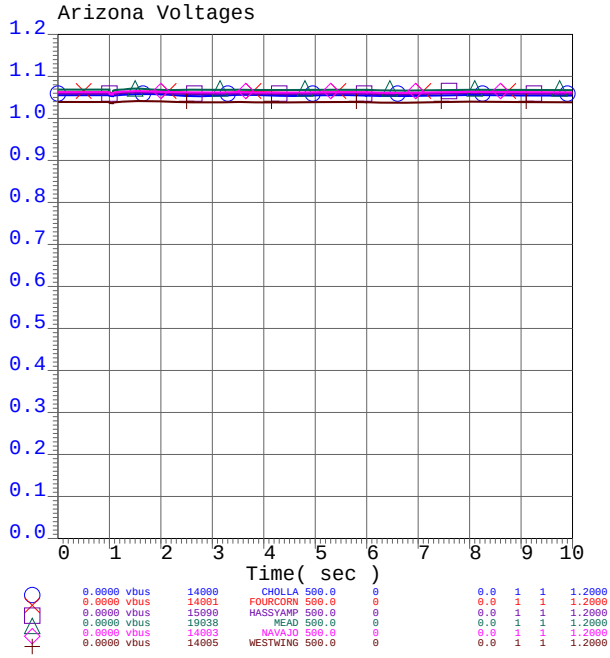
New Mexico Voltages



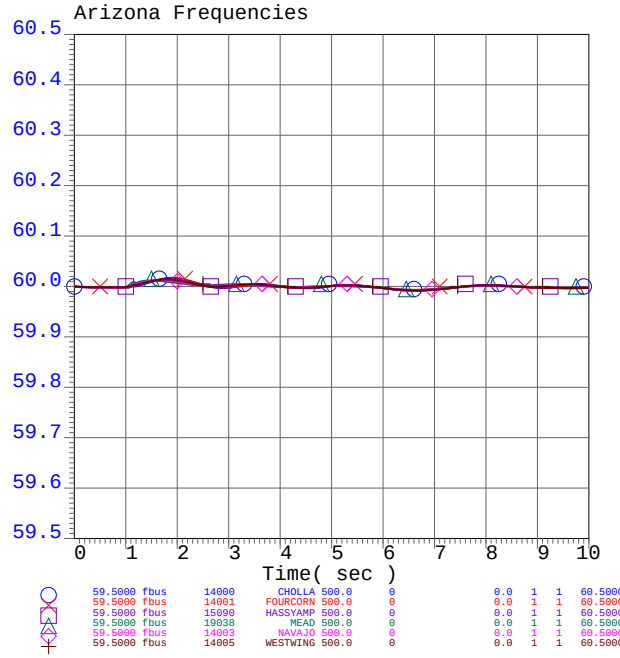
New Mexico Frequencies



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Arizona Frequencies

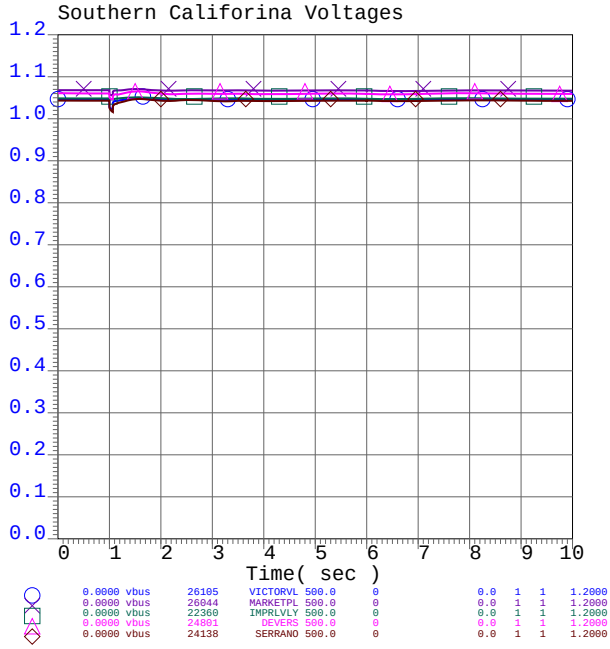


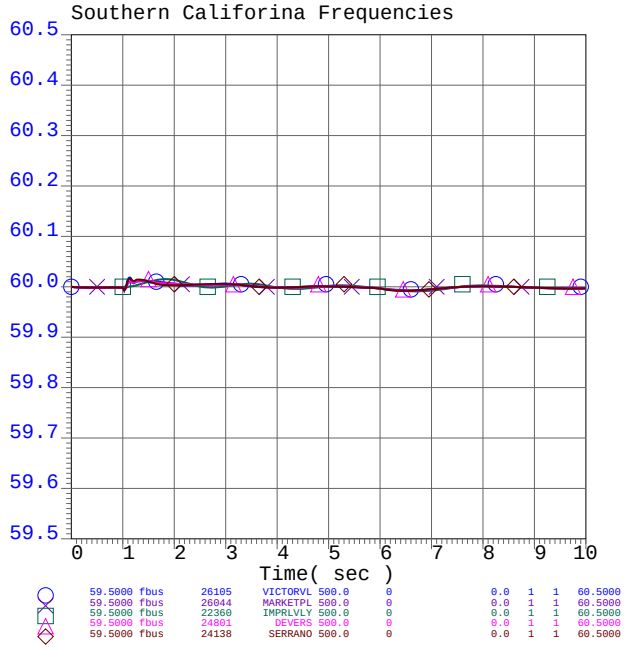
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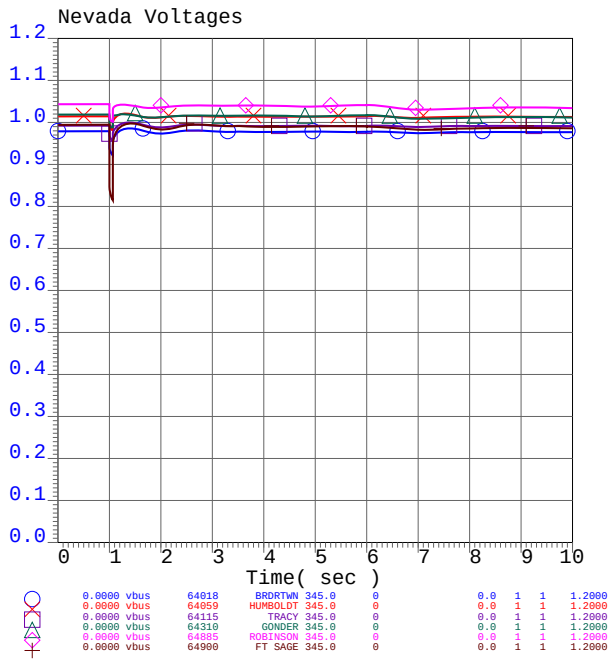
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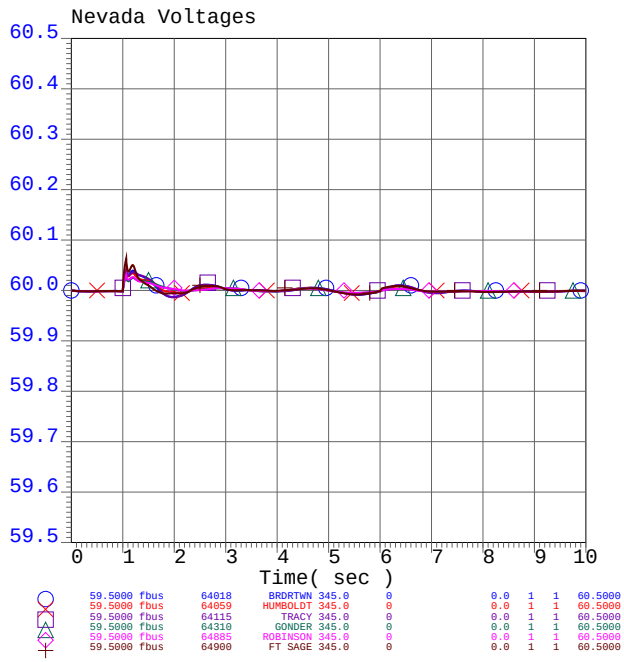
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WECC AREA VOLTAGE AND FREQUENCIES



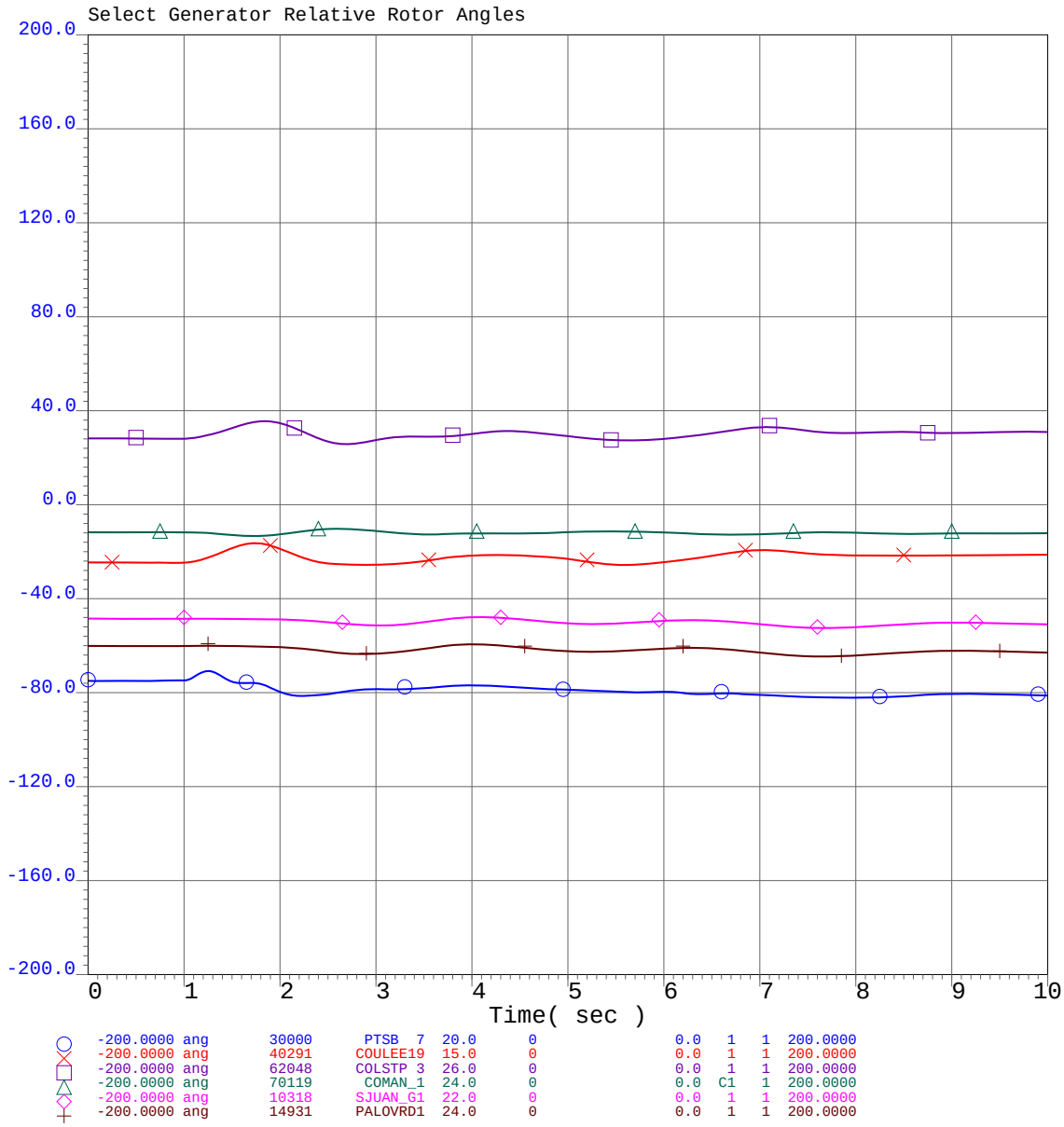






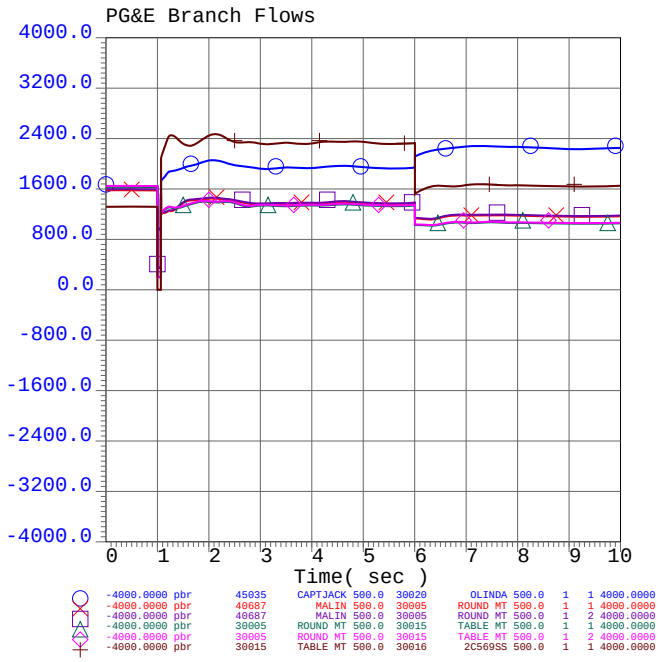
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Table Mountain 500 kV
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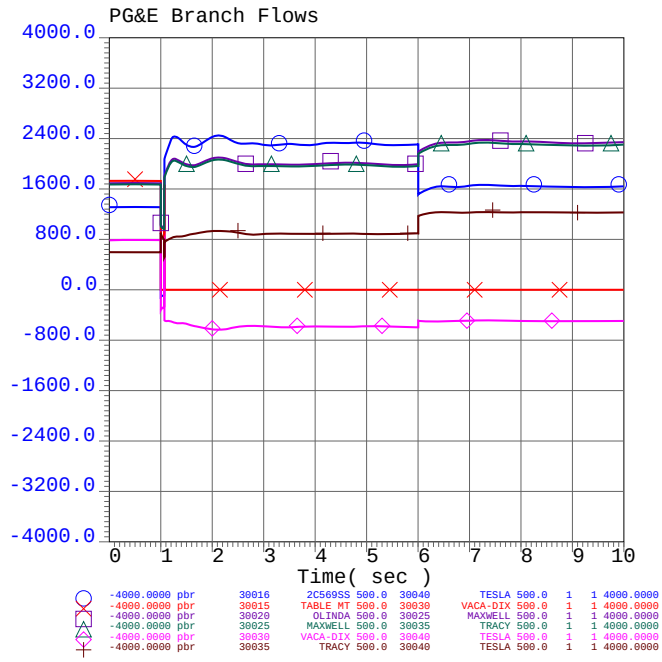
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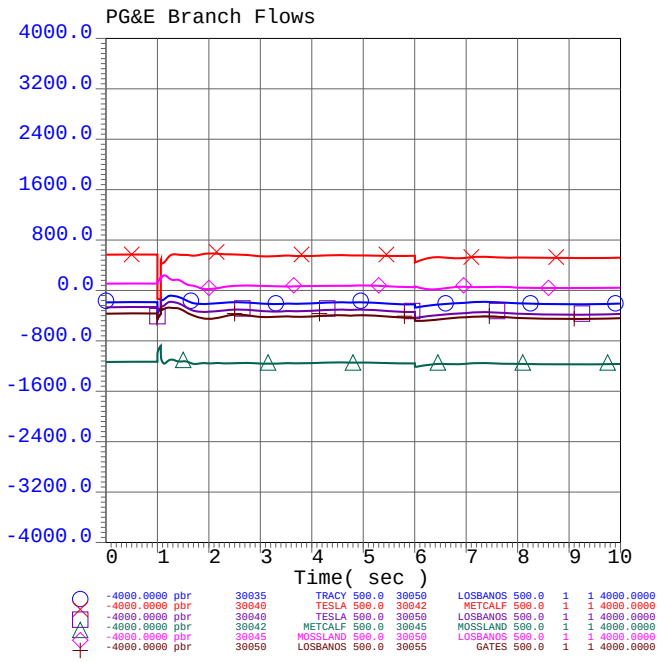


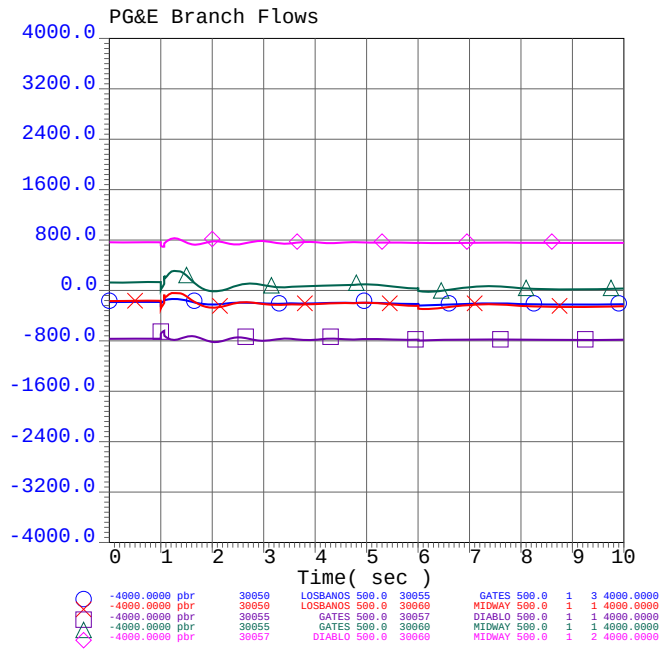
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SELECT BRANCH FLOWS





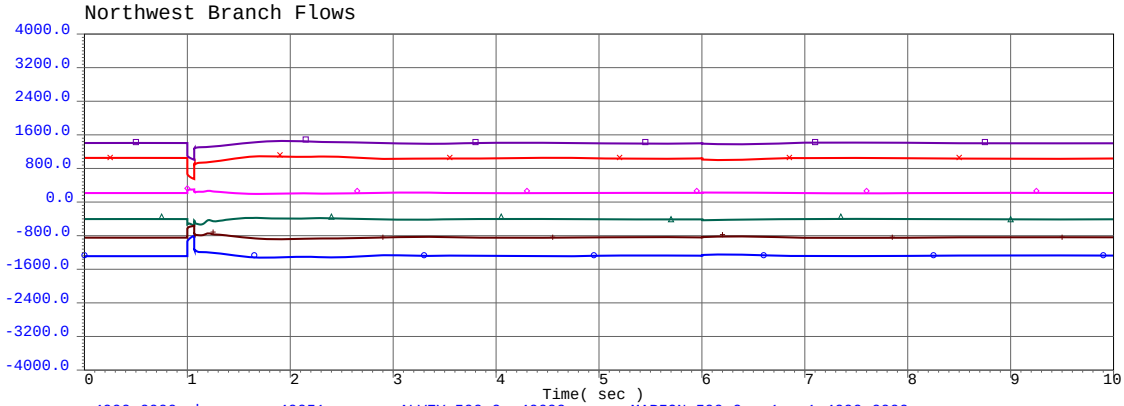




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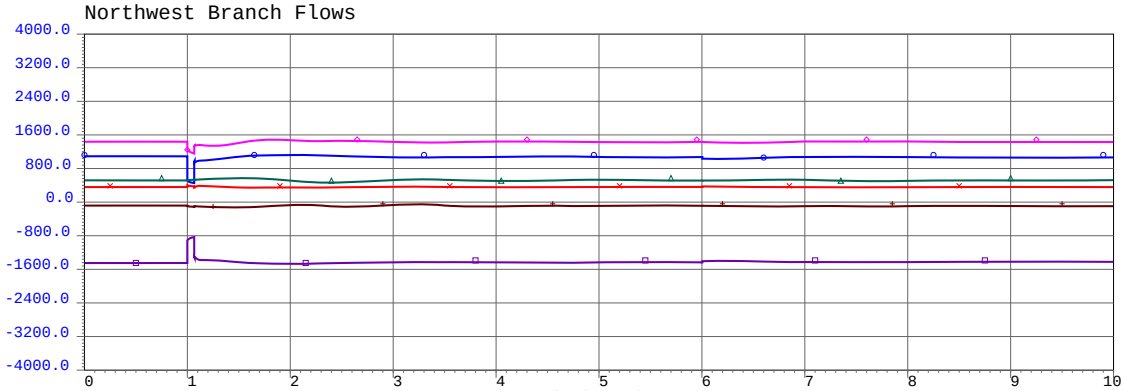
SELECT BRANCH FLOWS

Northwest Branch Flows



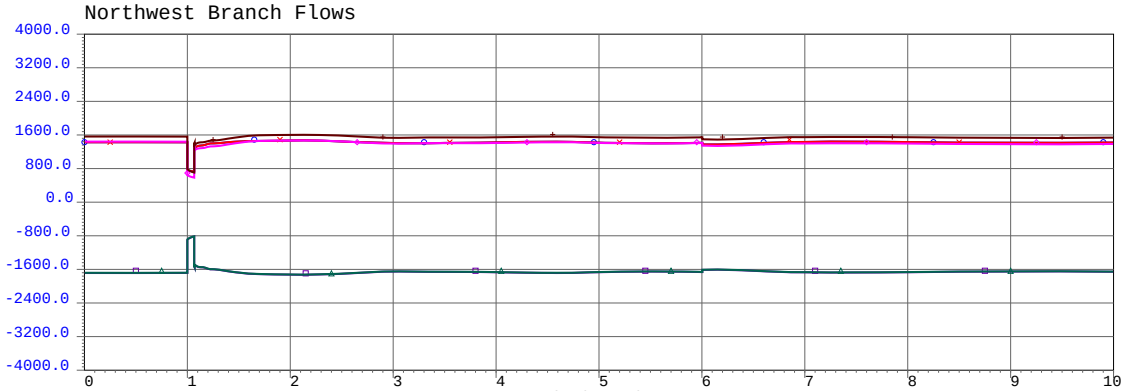
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-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
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-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

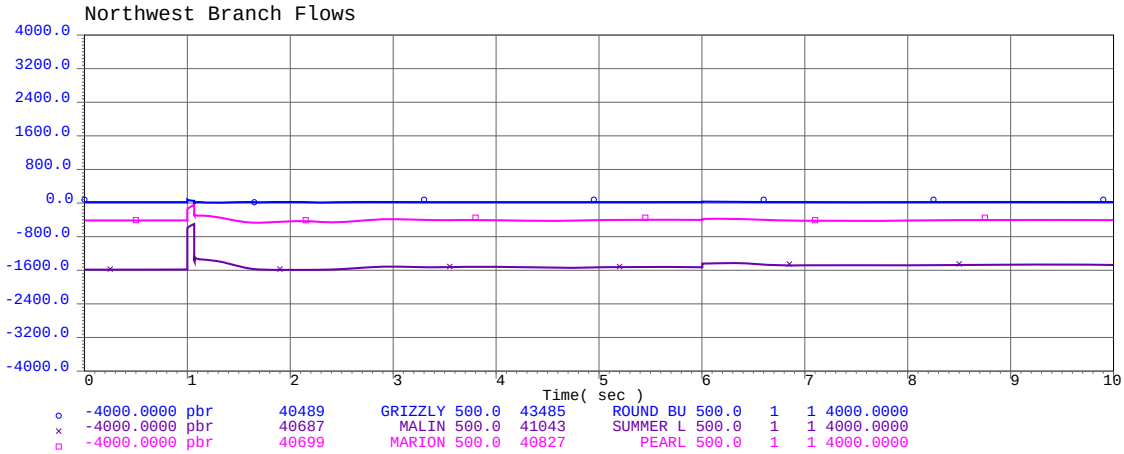
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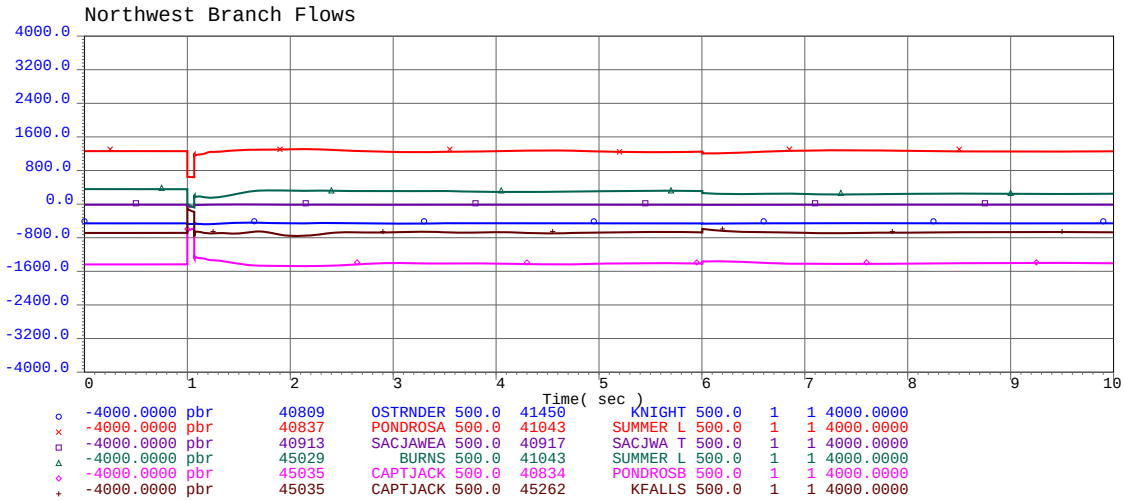


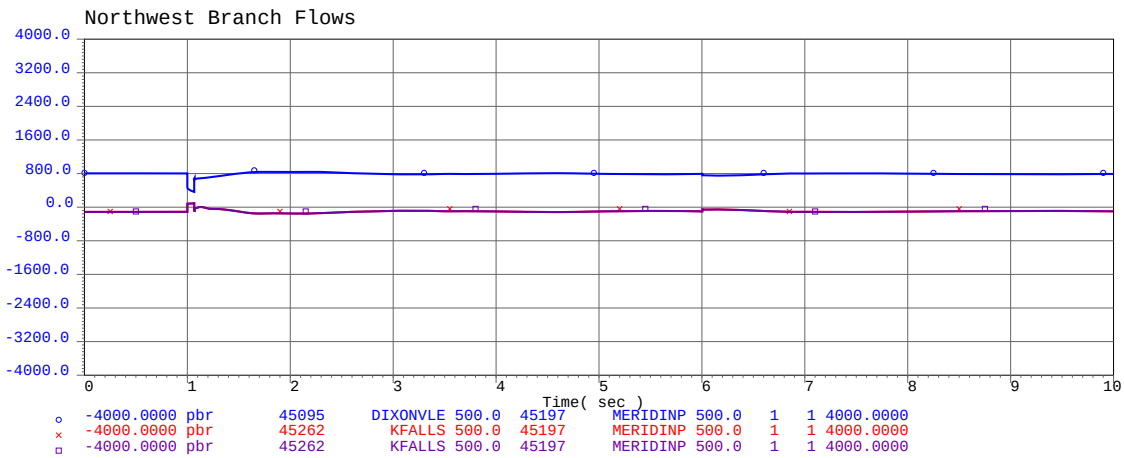
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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SELECT BRANCH FLOWS

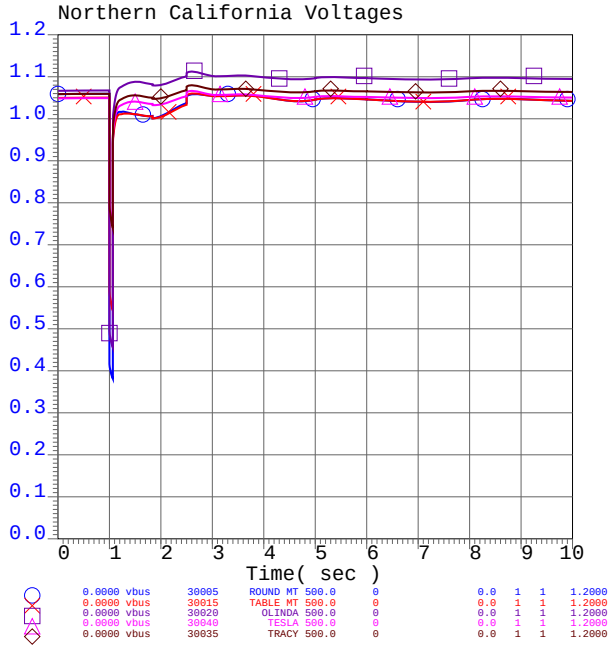


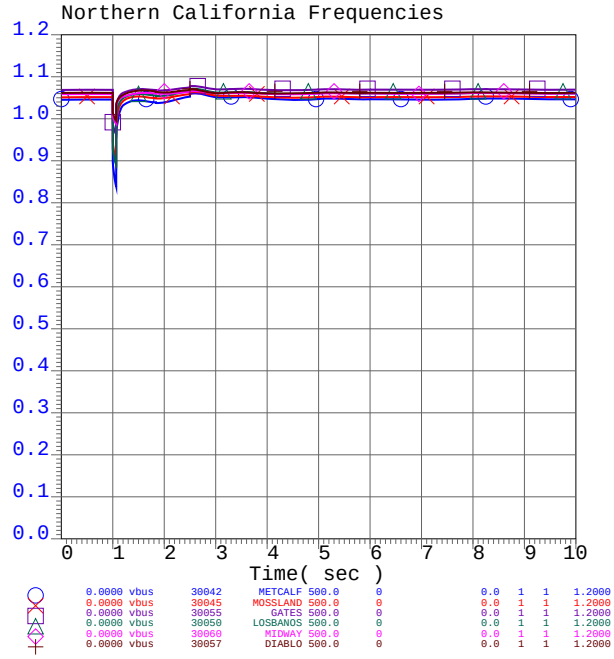


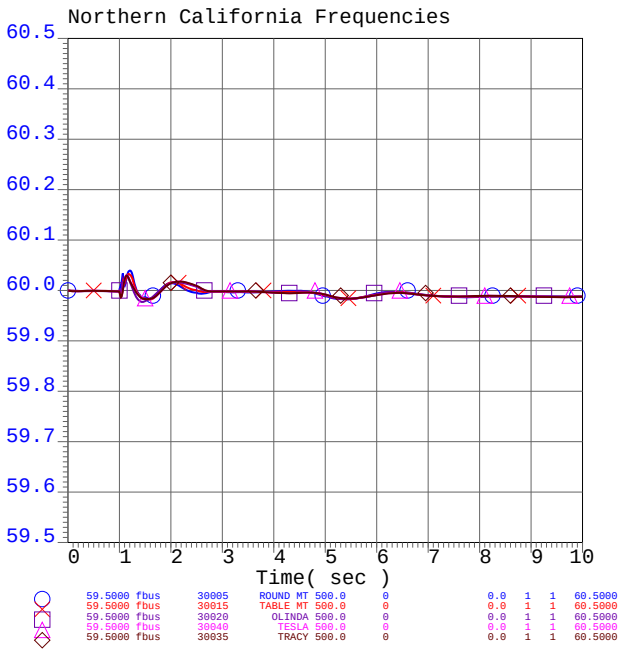


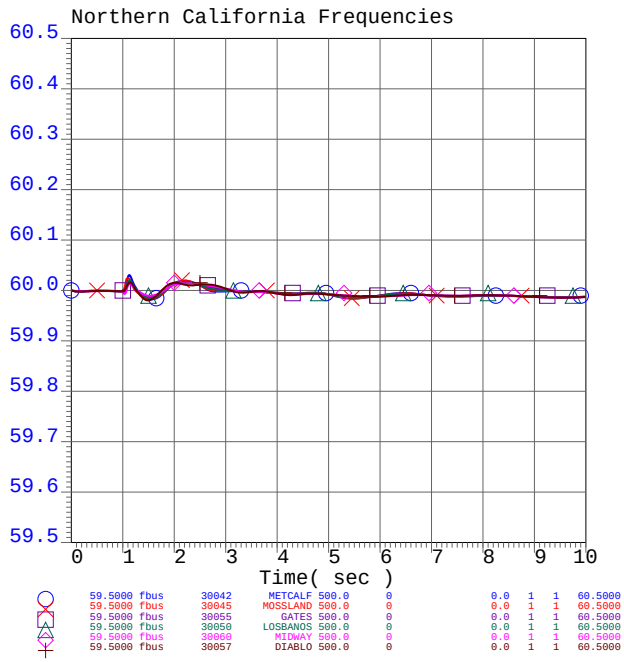
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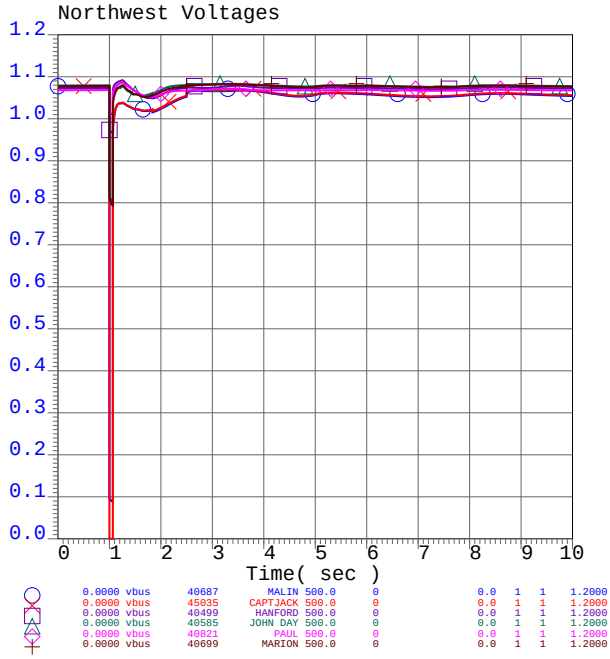


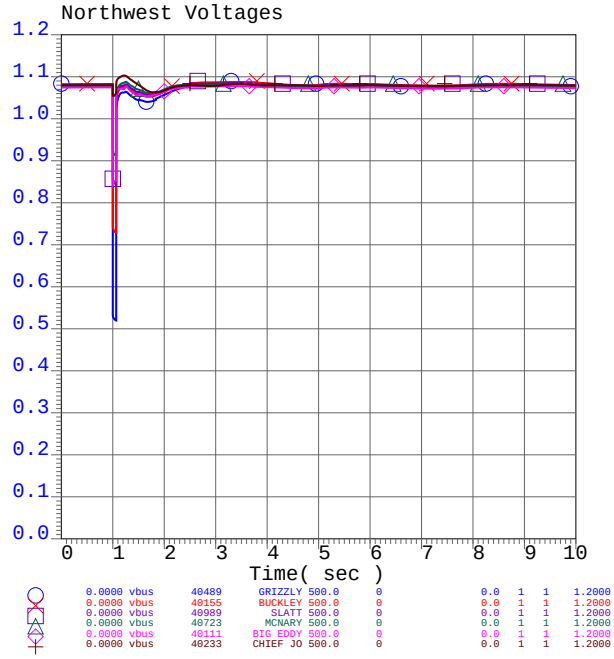


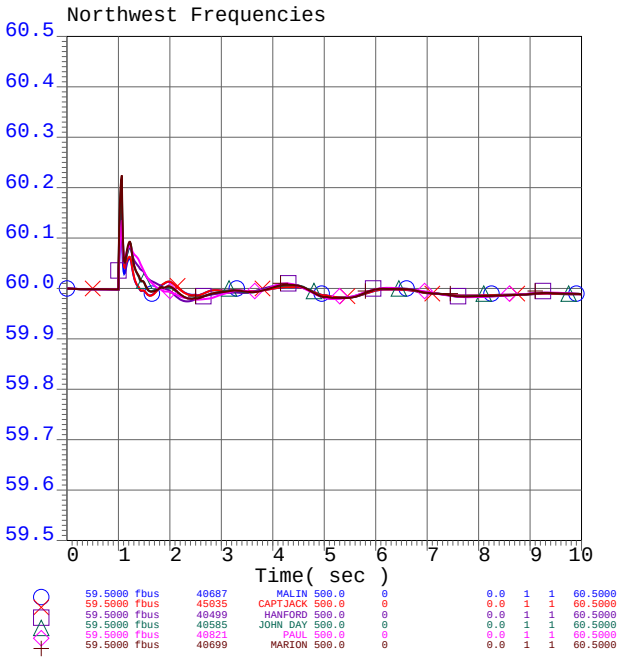


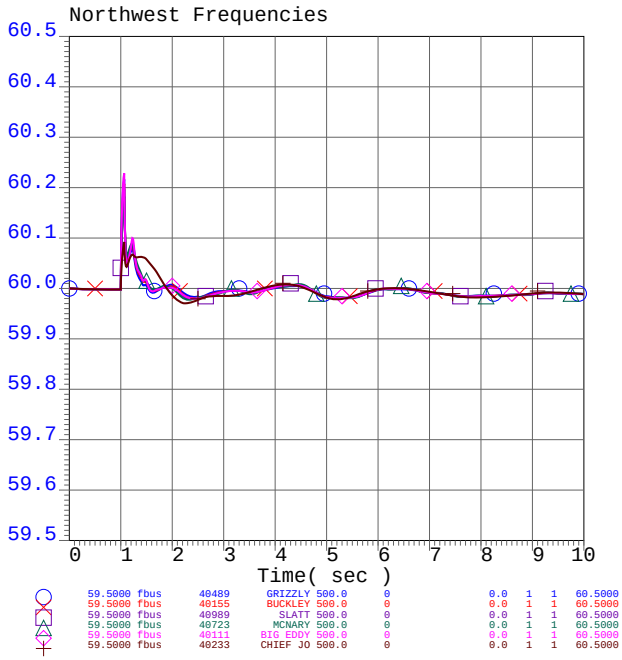
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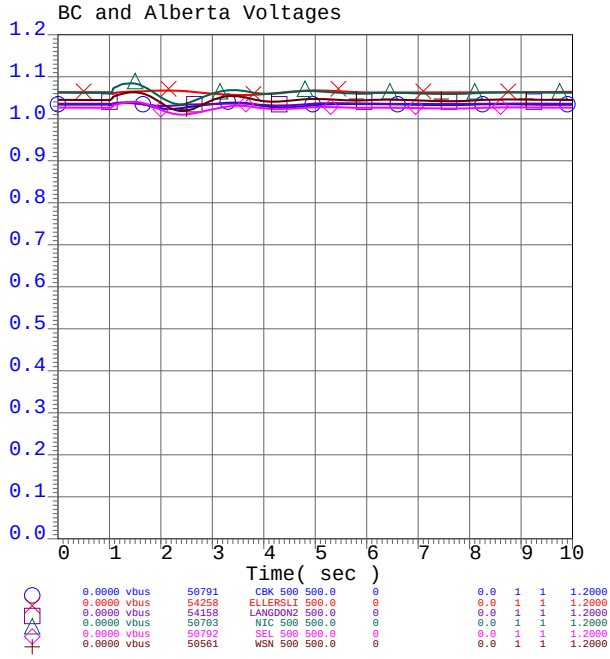


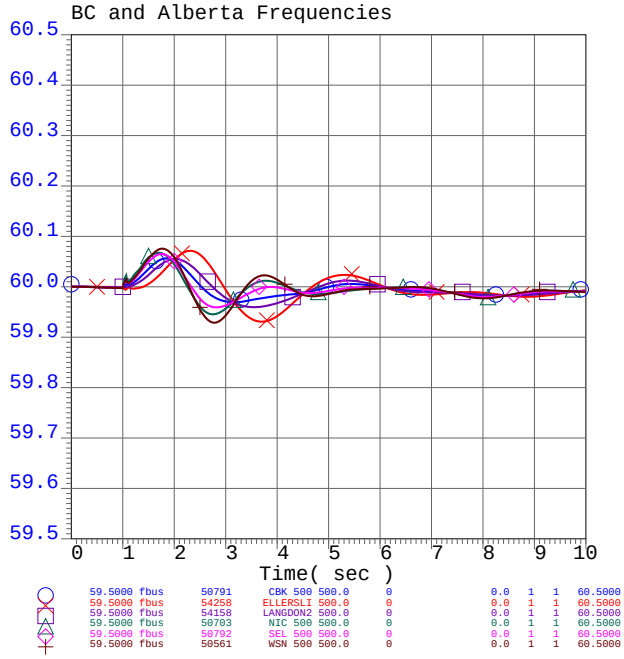


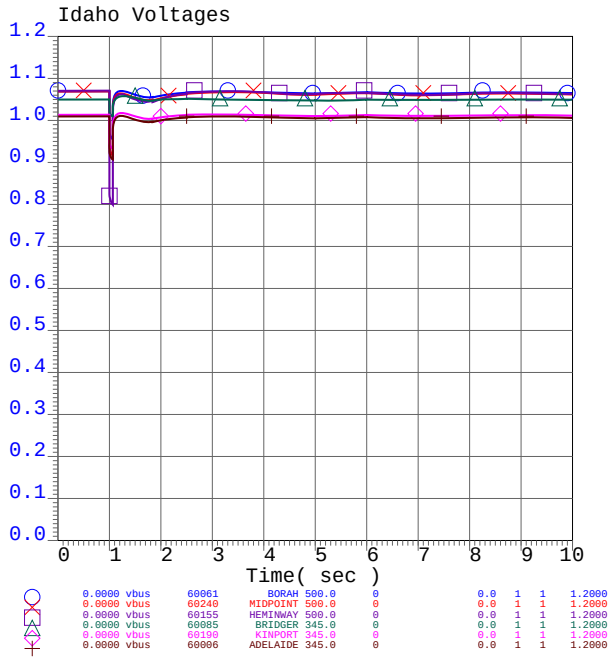


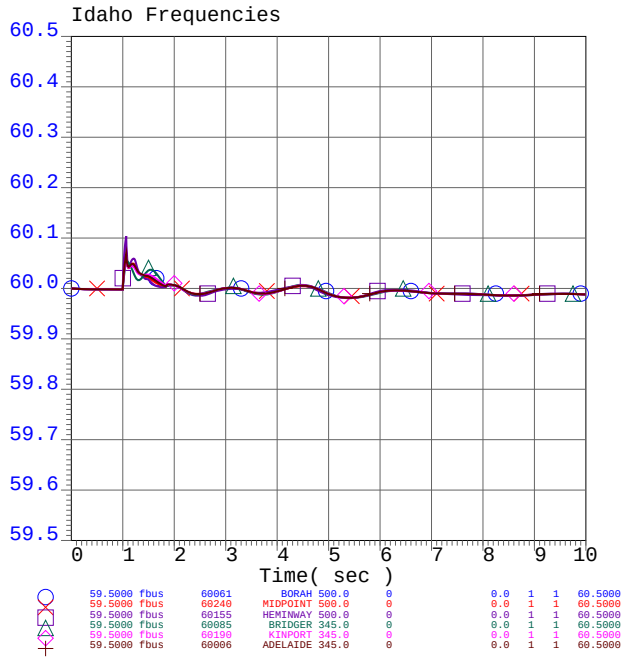
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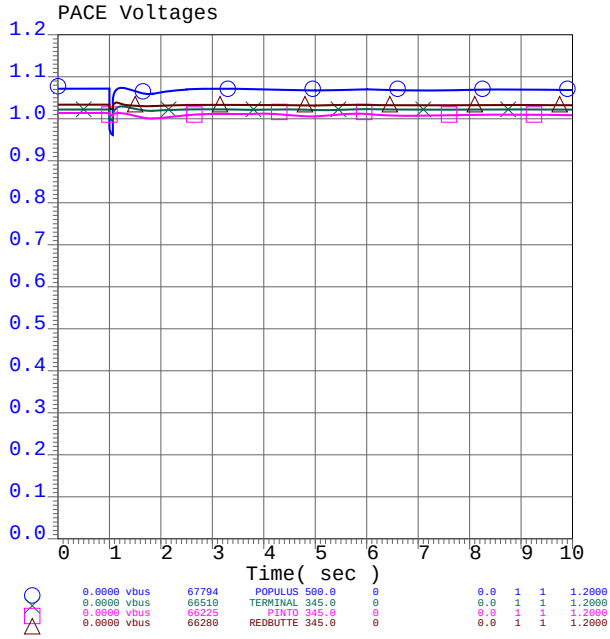


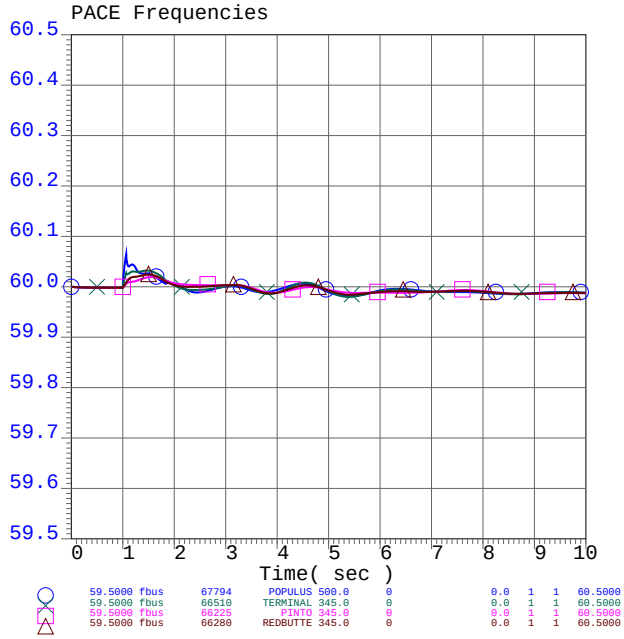


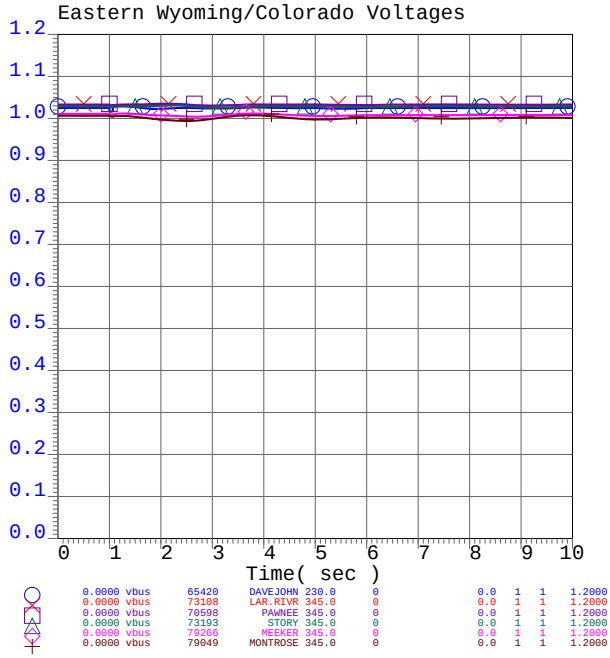


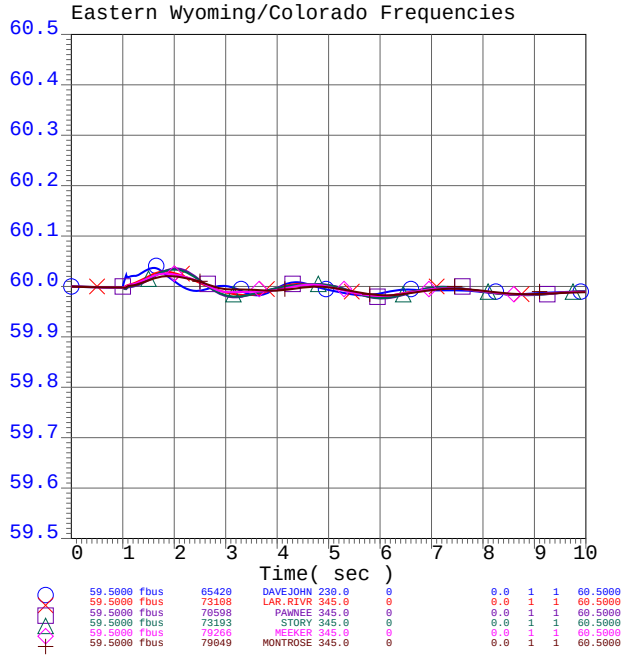
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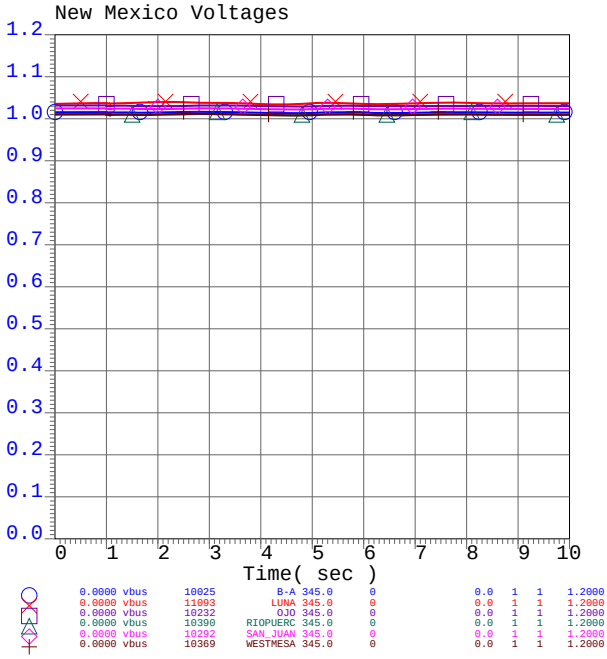




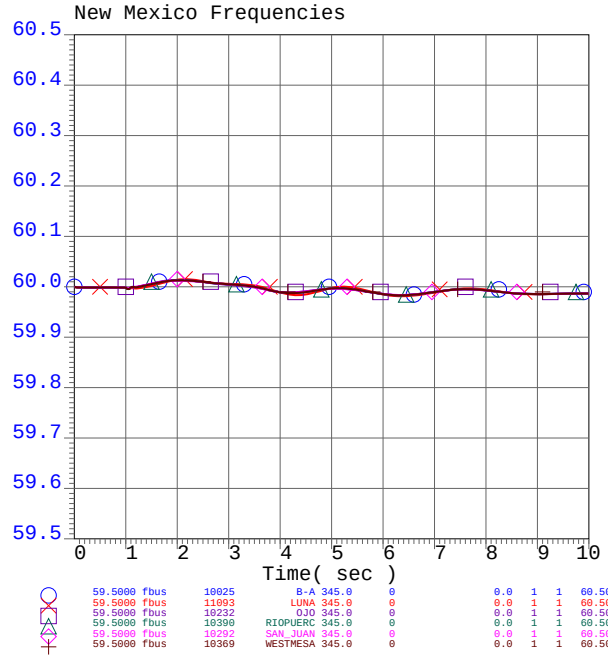
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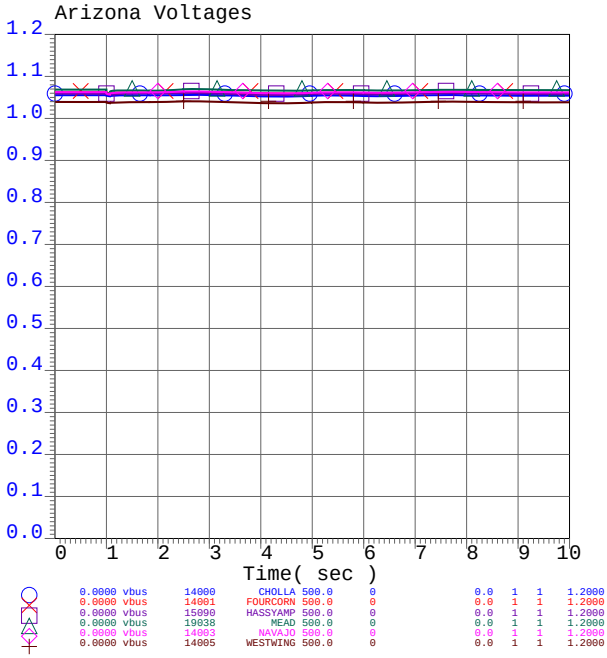
New Mexico Voltages



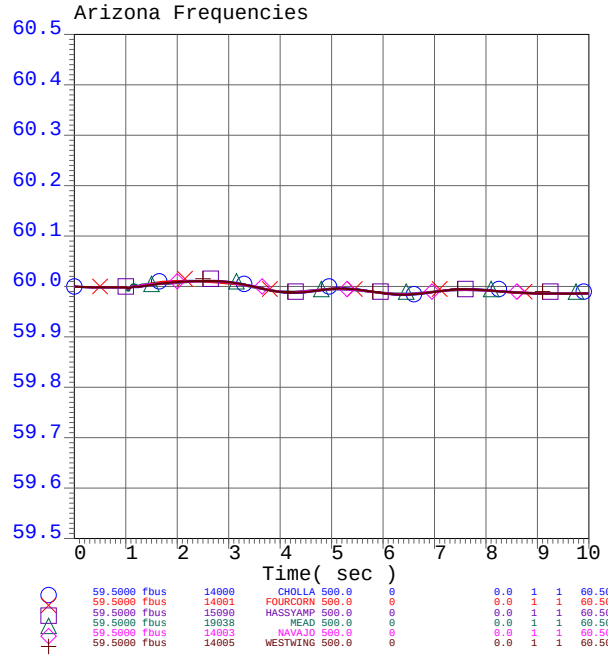
New Mexico Frequencies



Arizona Voltages

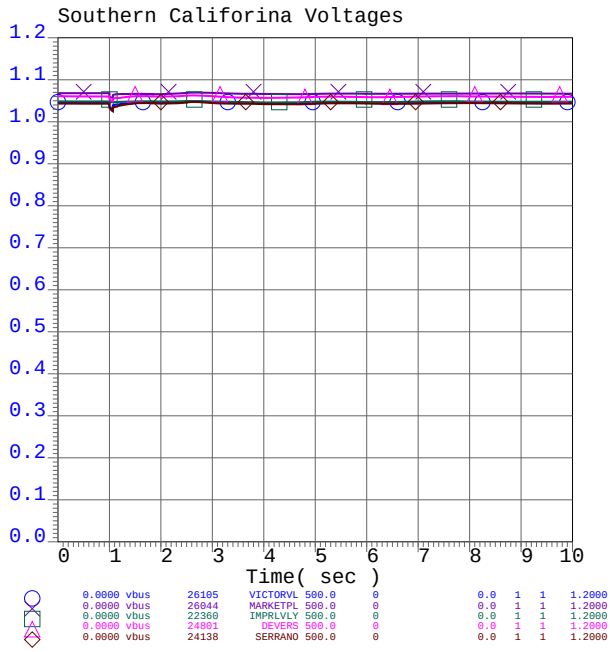


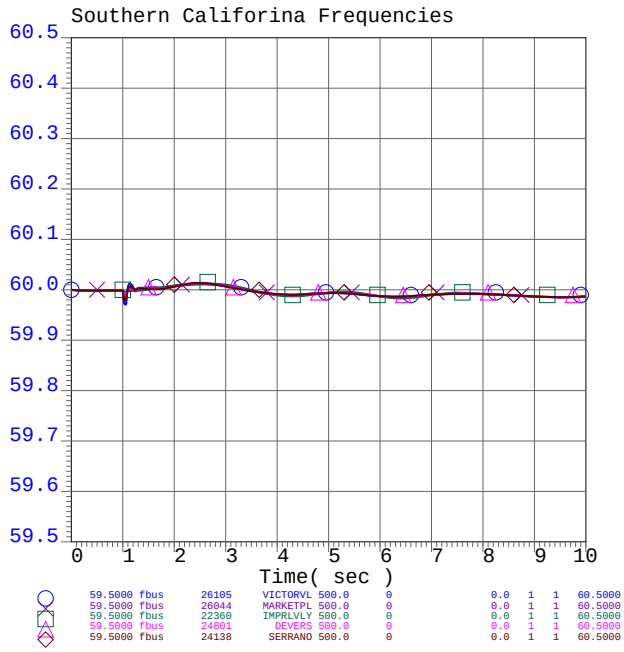
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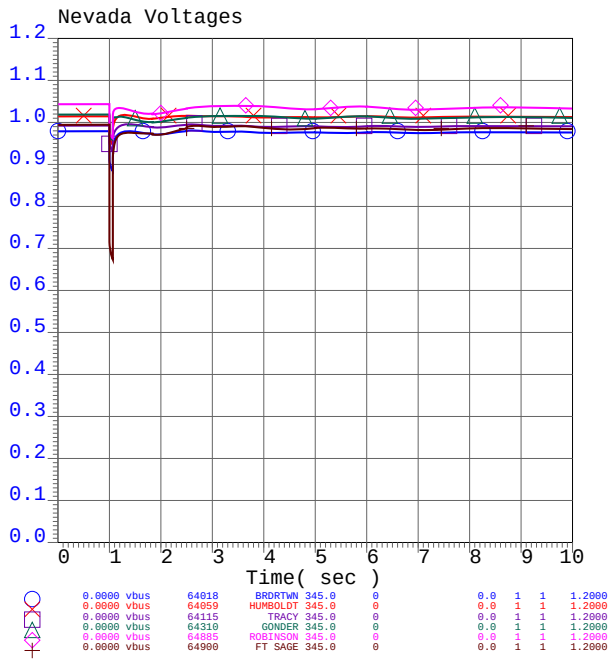


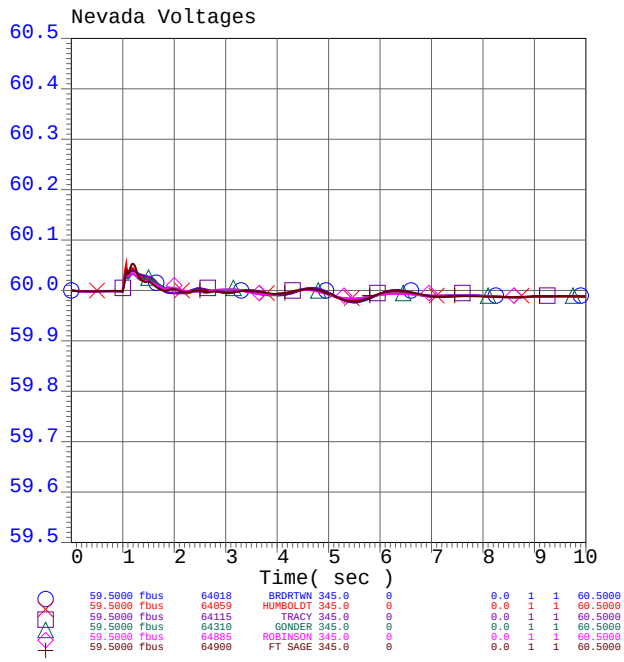
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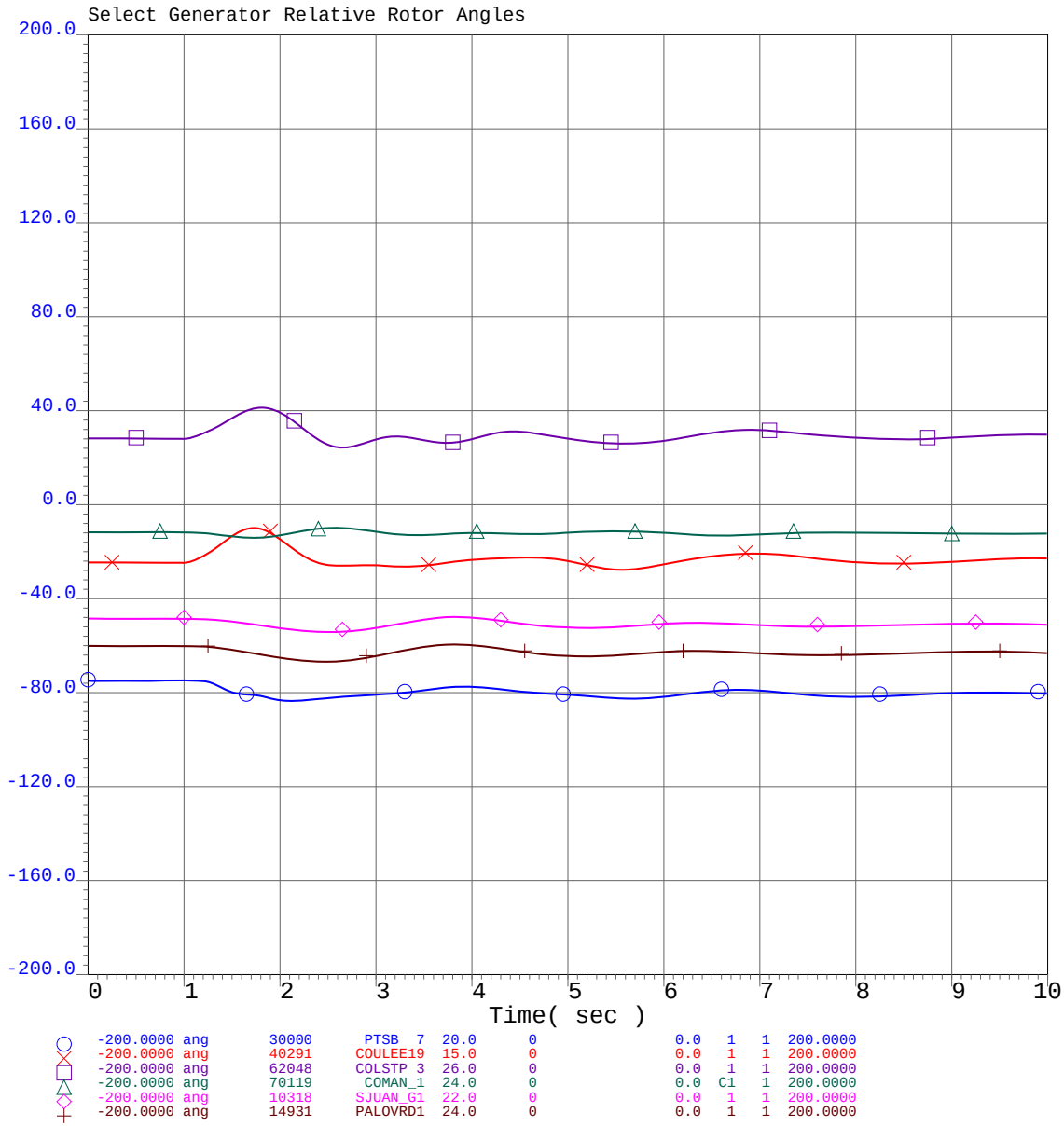






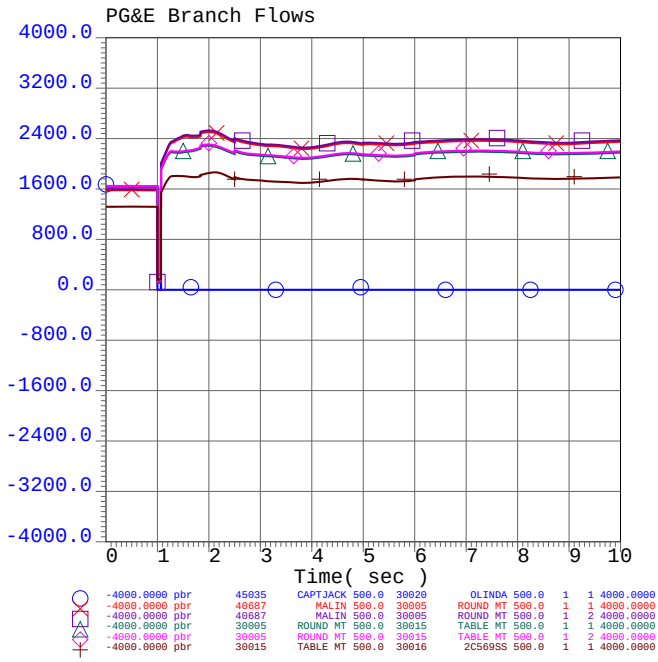
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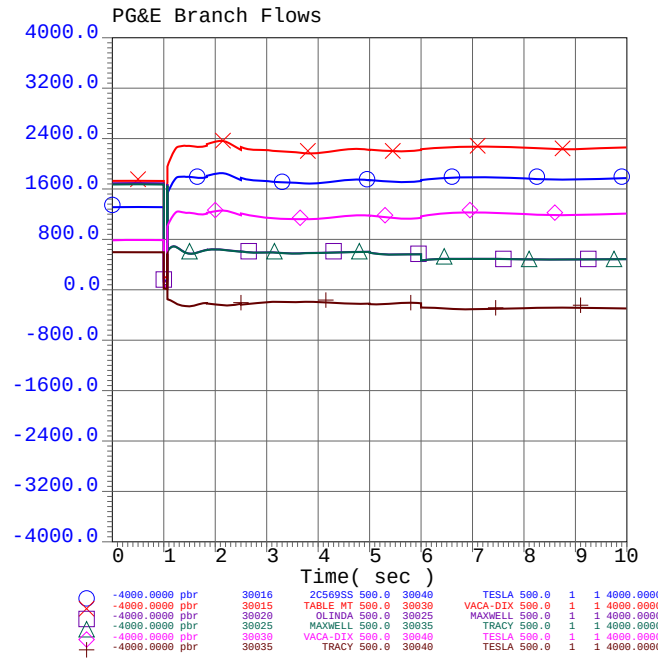
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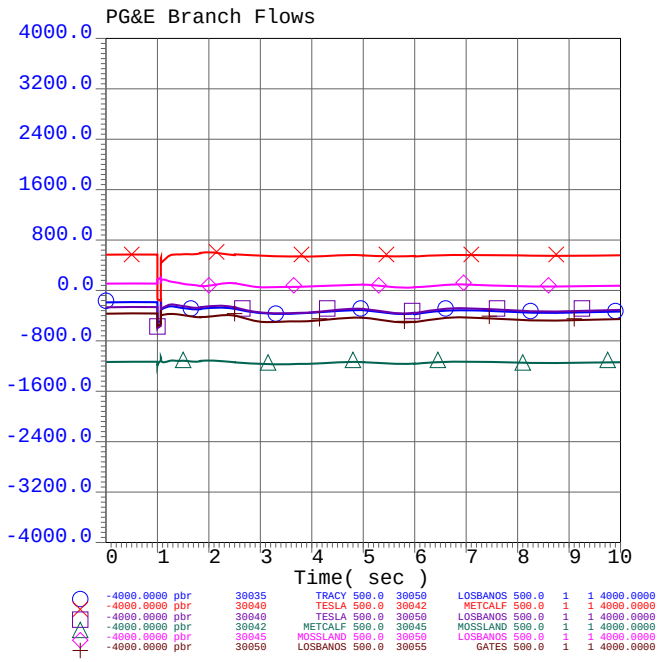


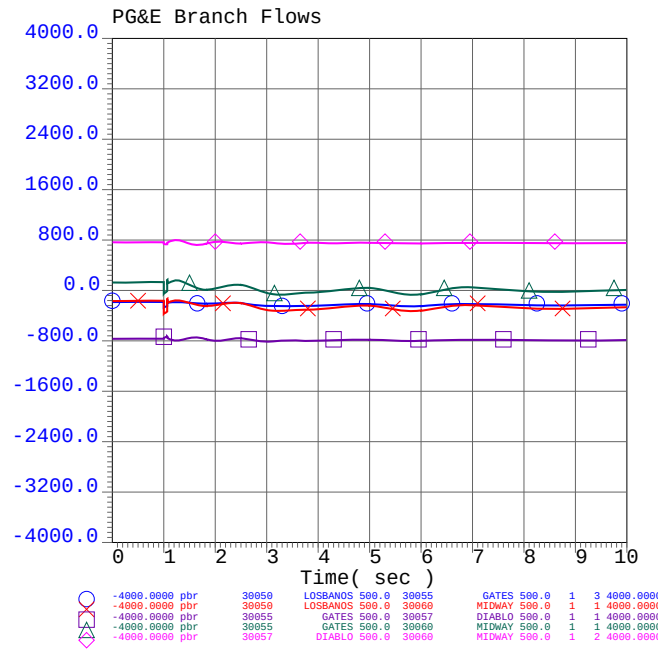
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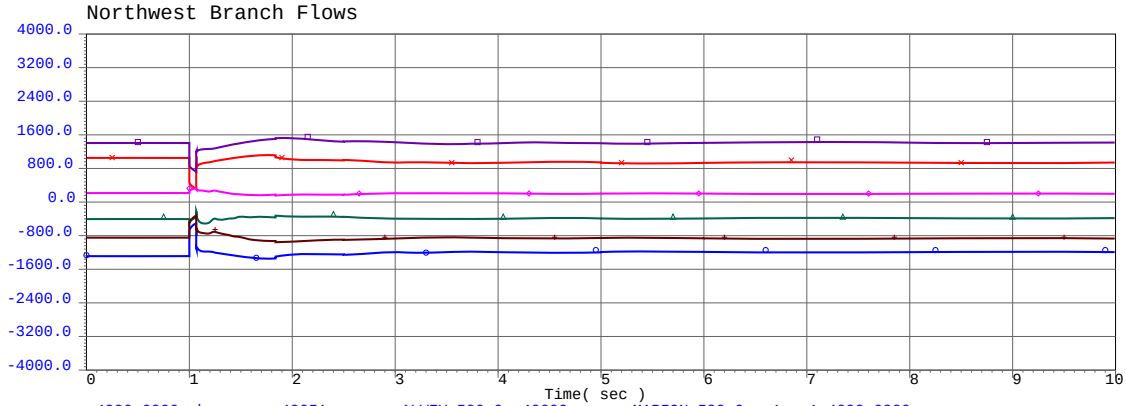




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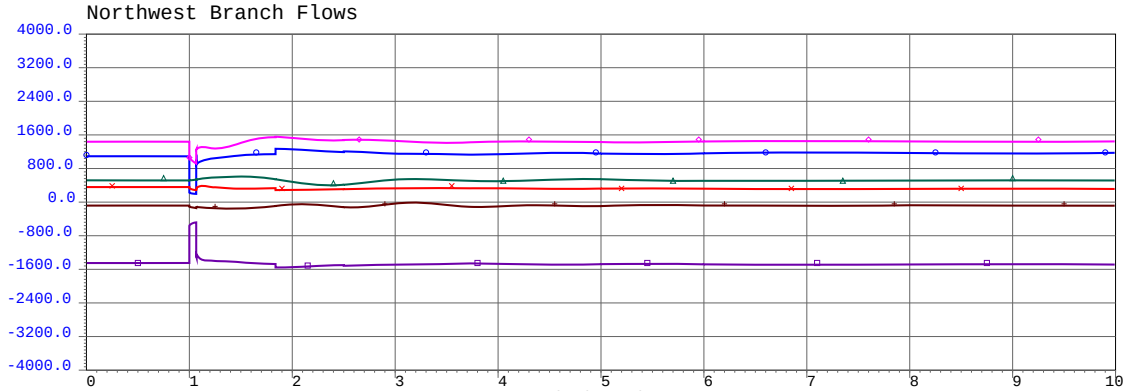
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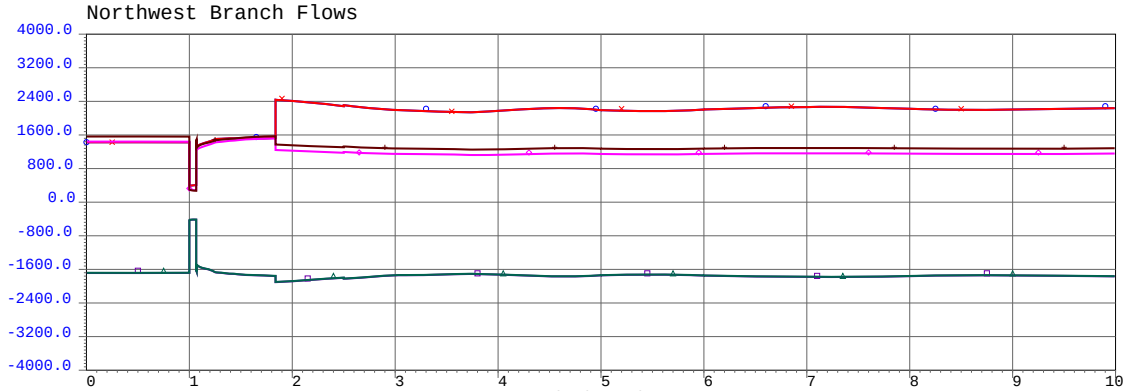
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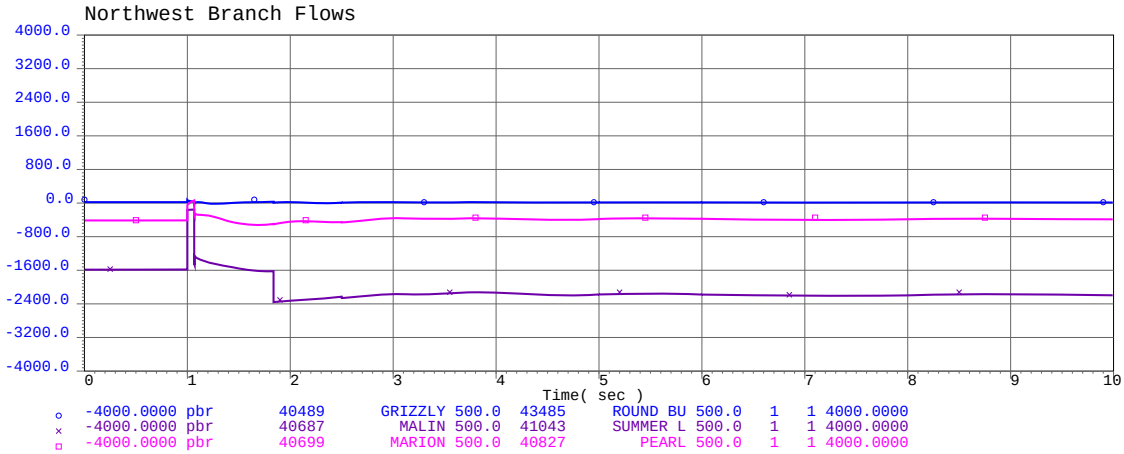
Northwest Branch Flows



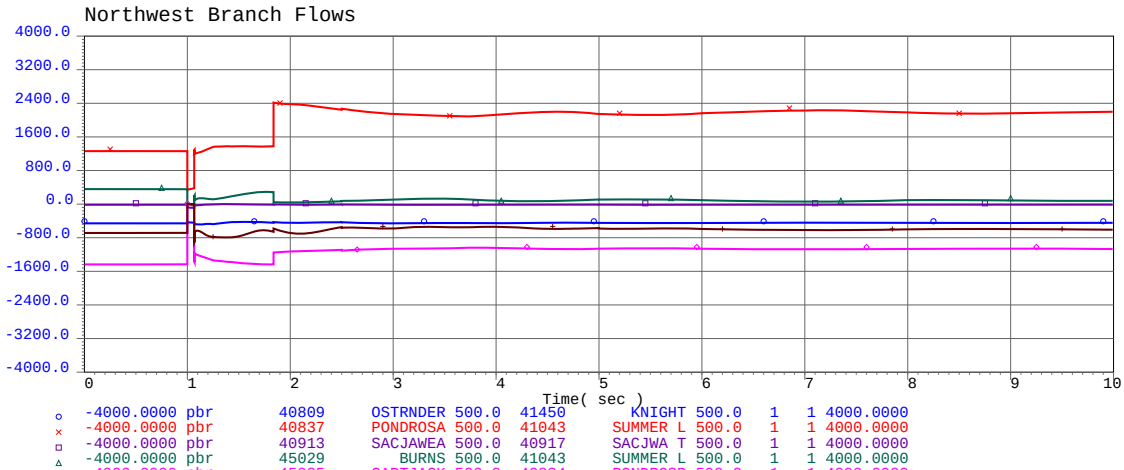
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Captain Jack 500 kV
followed by loss of Captain Jack-Olinda 500 kV line

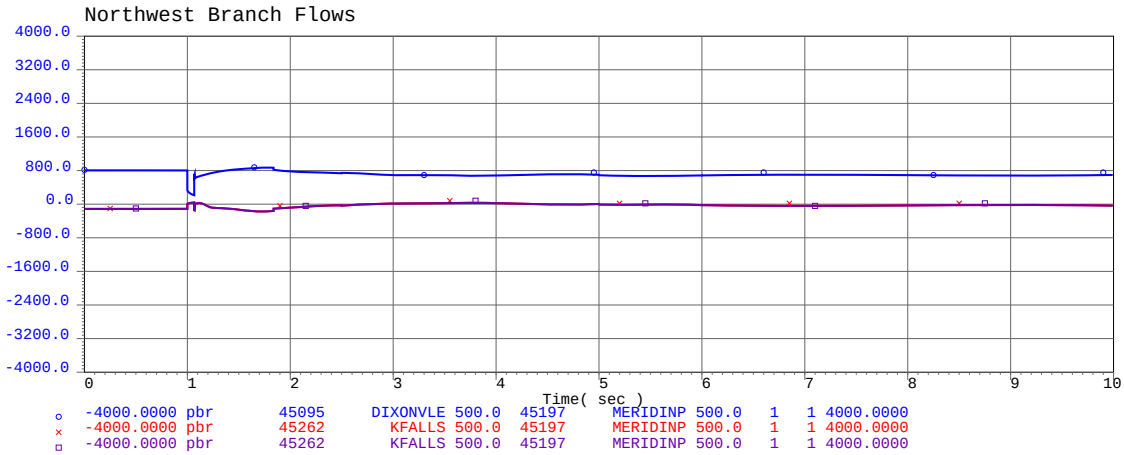
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



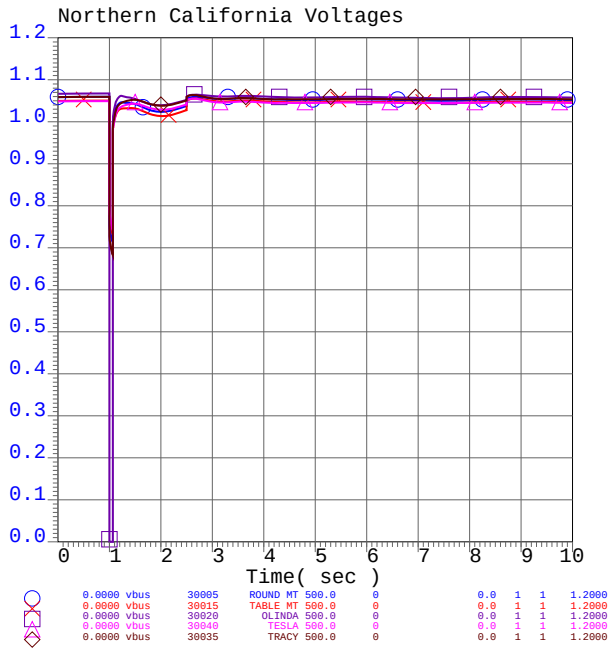
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

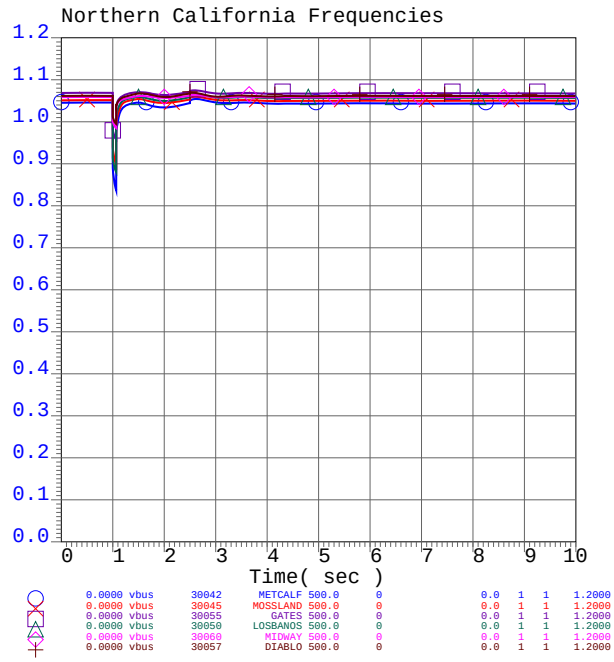


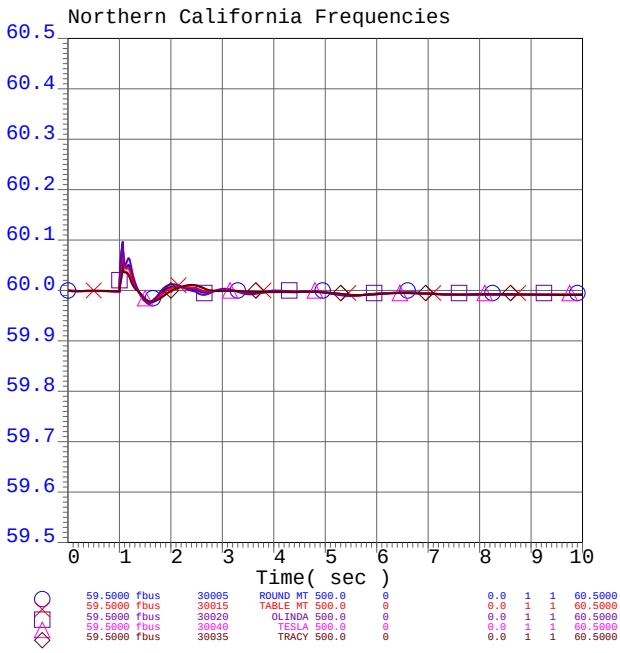
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

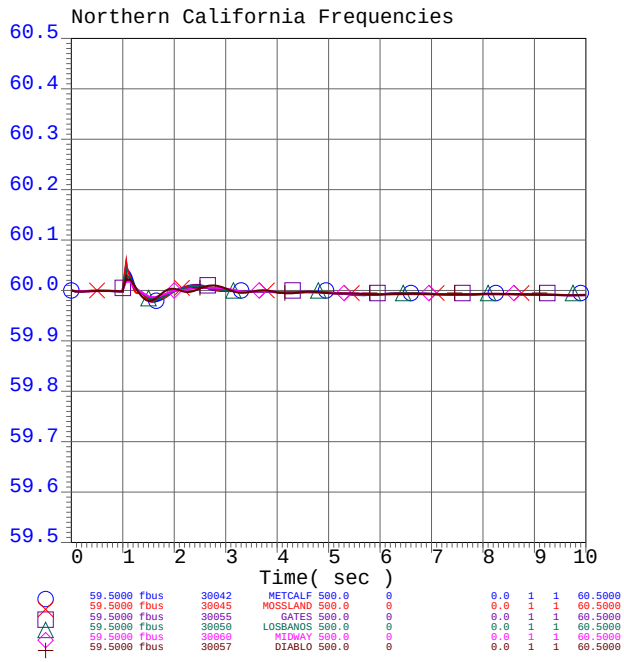
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Captain Jack 500 kV
followed by loss of Captain Jack-Olinda 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



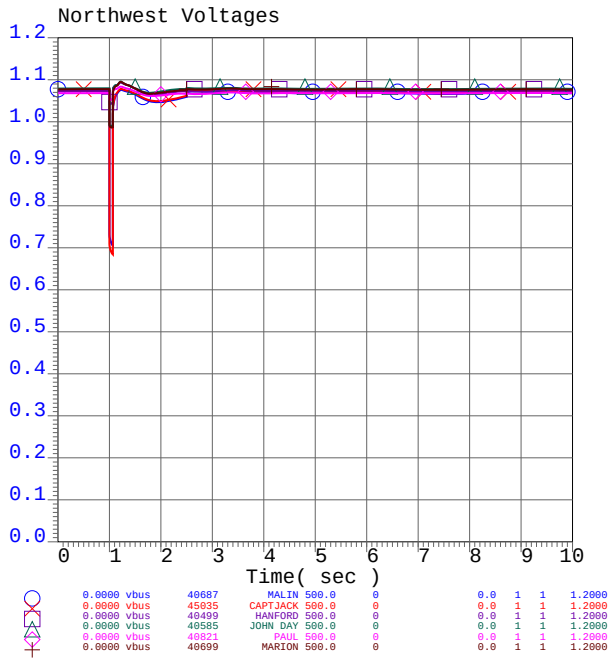


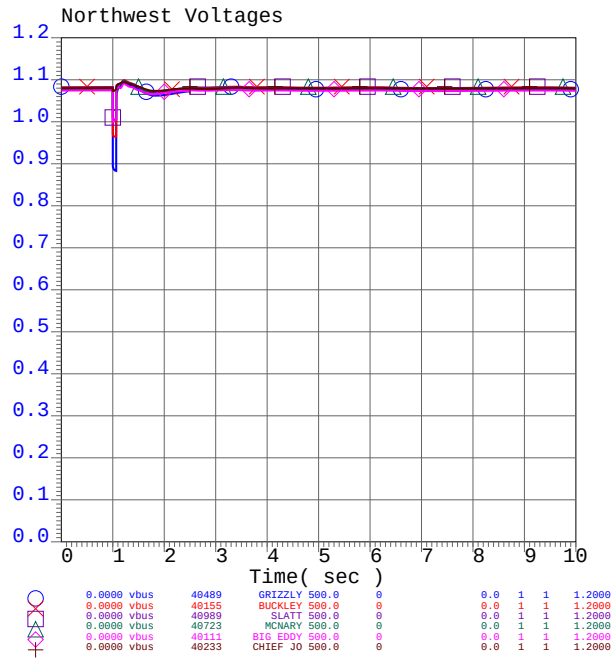


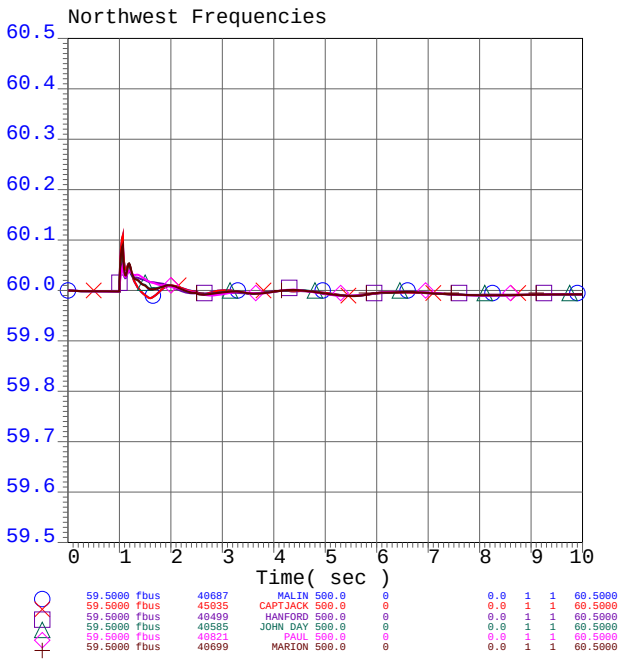


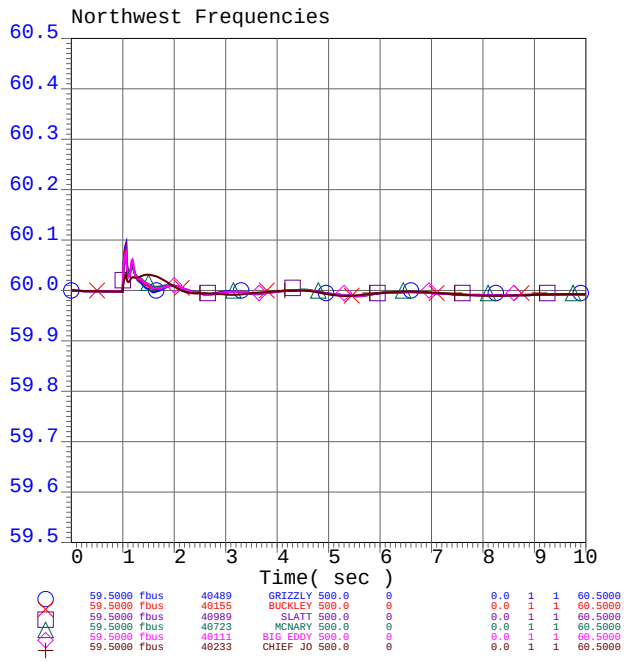
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



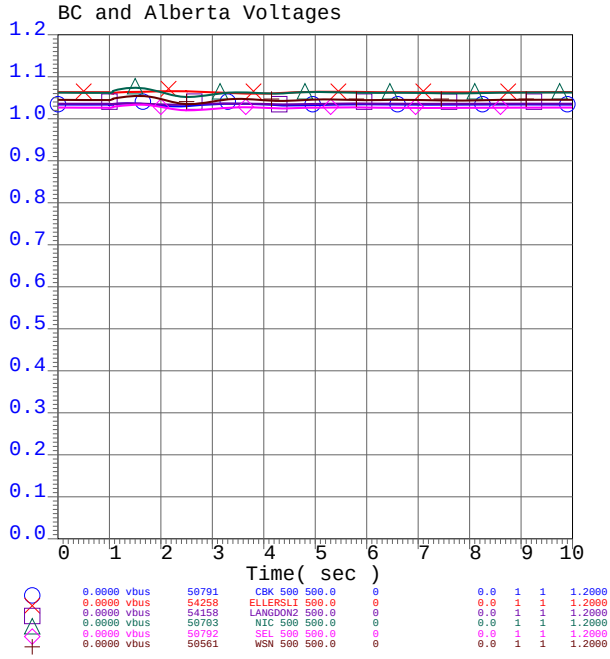


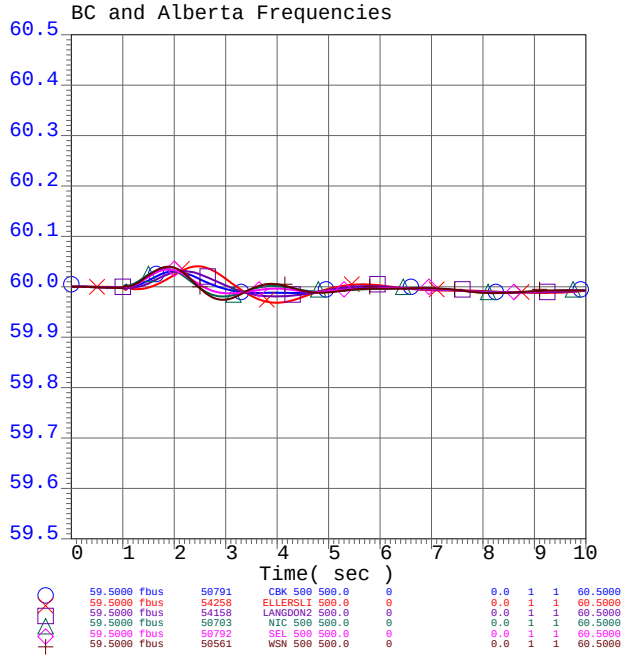


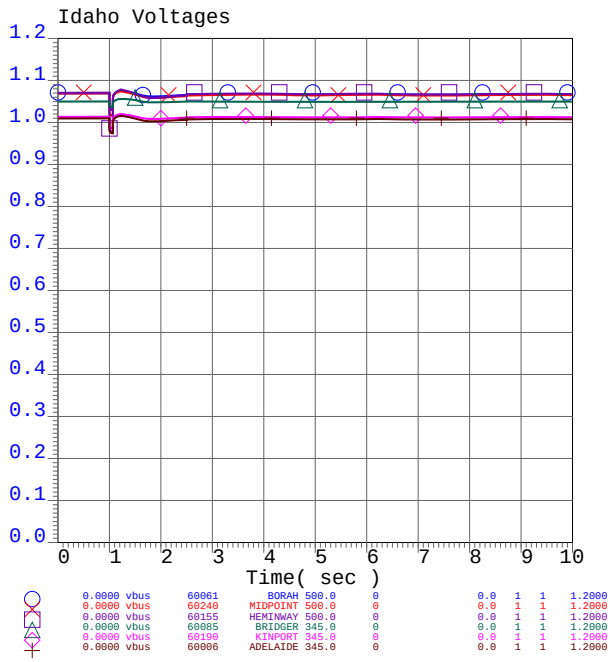


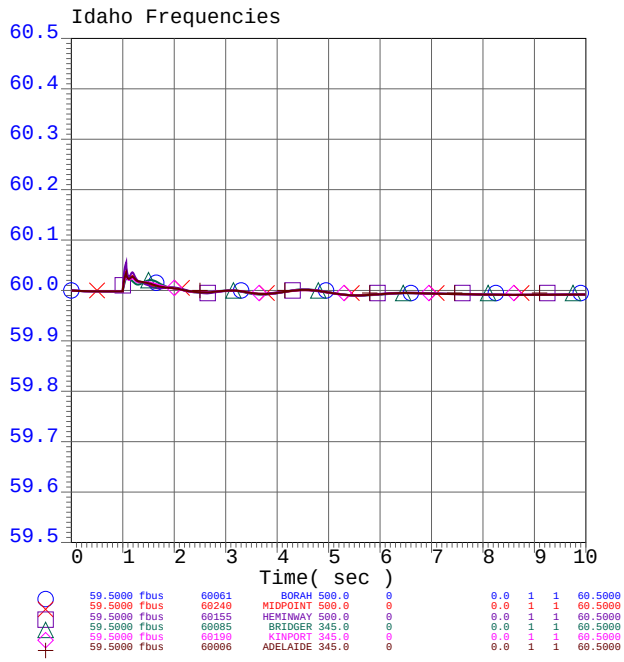
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





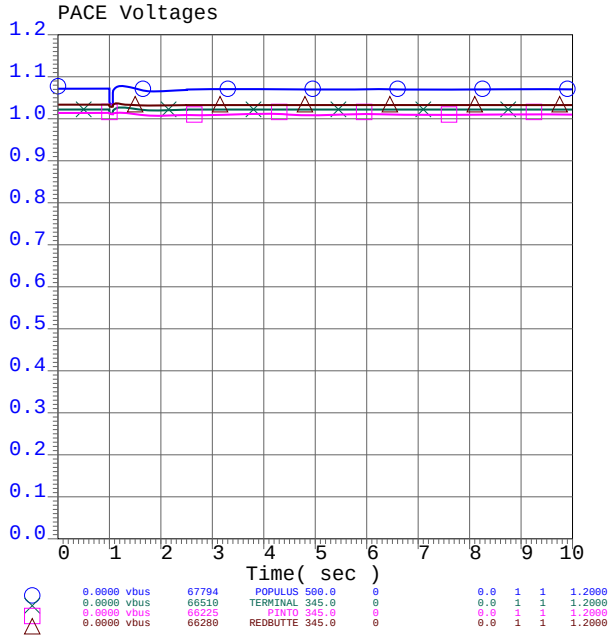




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

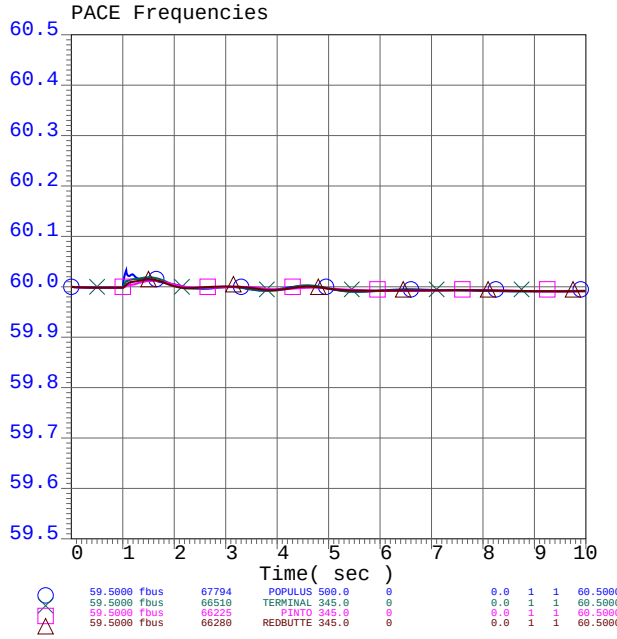
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



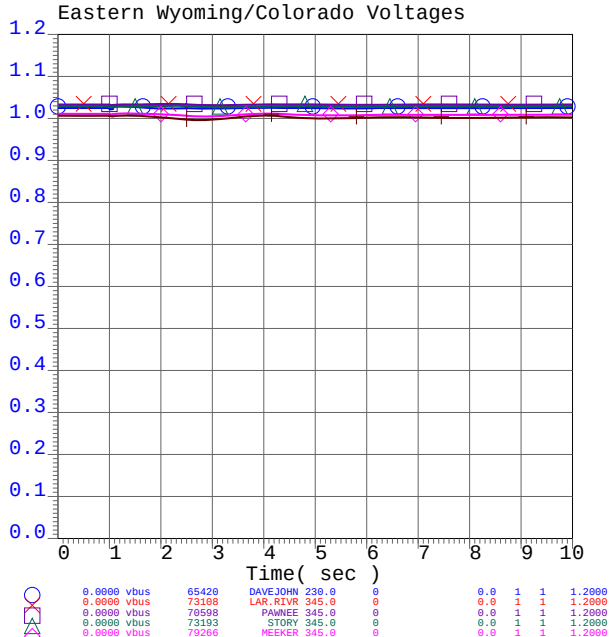
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0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



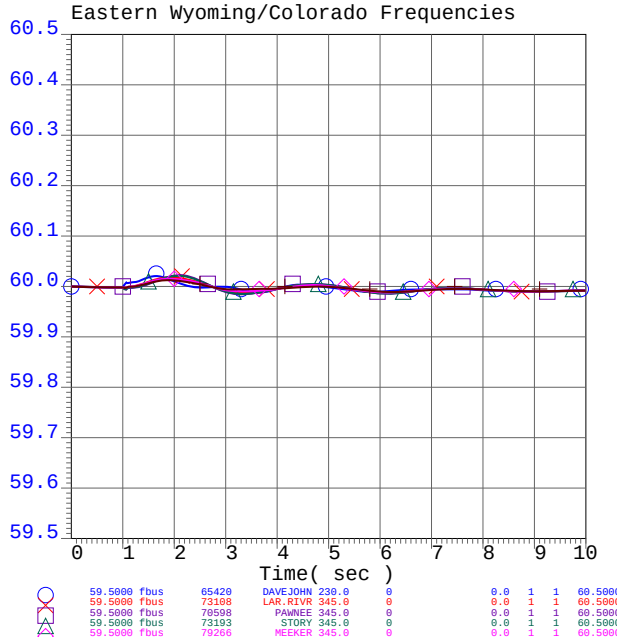
59.5000 fbus 67794 POPULUS 500.0 0 0.0 1 1 60.5000
59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

Eastern Wyoming/Colorado Frequencies

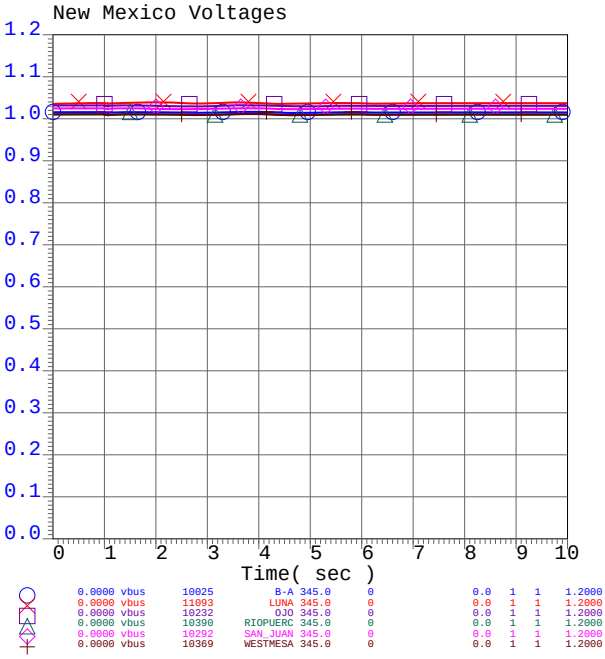


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
59.5000 fbus 70598 PAWNEE 345.0 0 0.0 1 1 60.5000
59.5000 fbus 73193 STORY 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79266 MEEKER 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79049 MONTROSE 345.0 0 0.0 1 1 60.5000

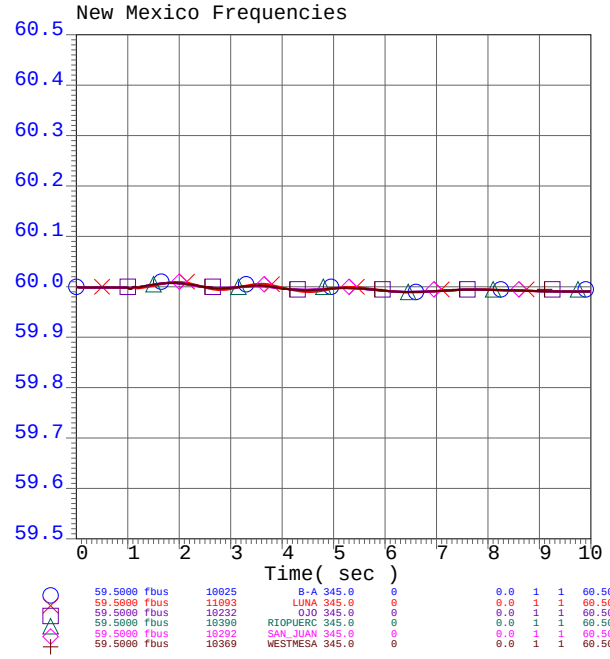
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

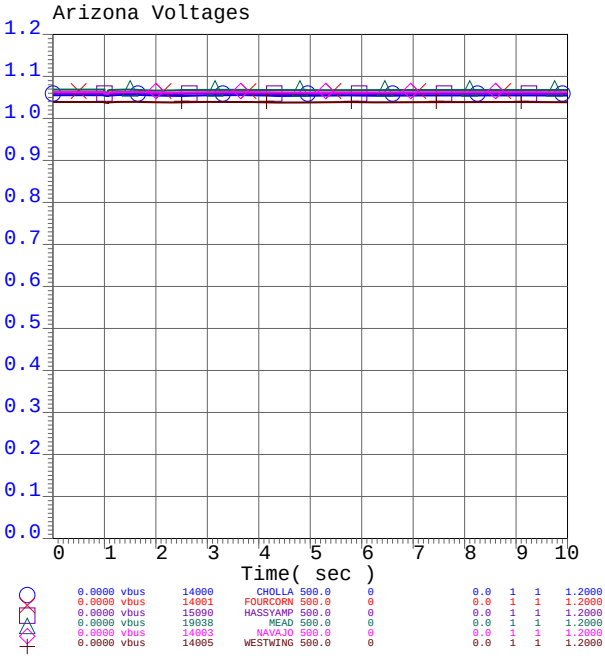
New Mexico Voltages



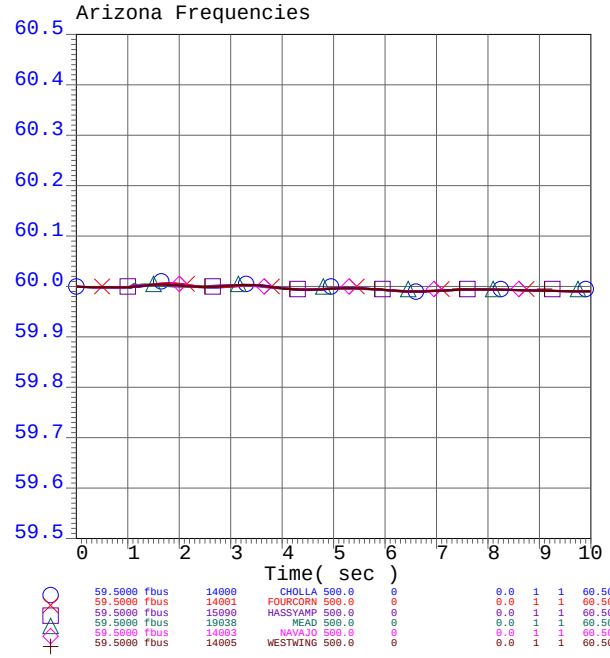
New Mexico Frequencies



Arizona Voltages

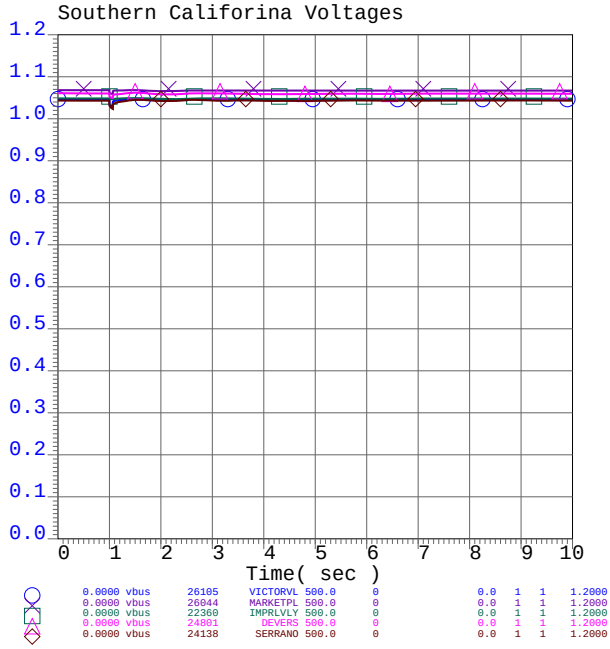


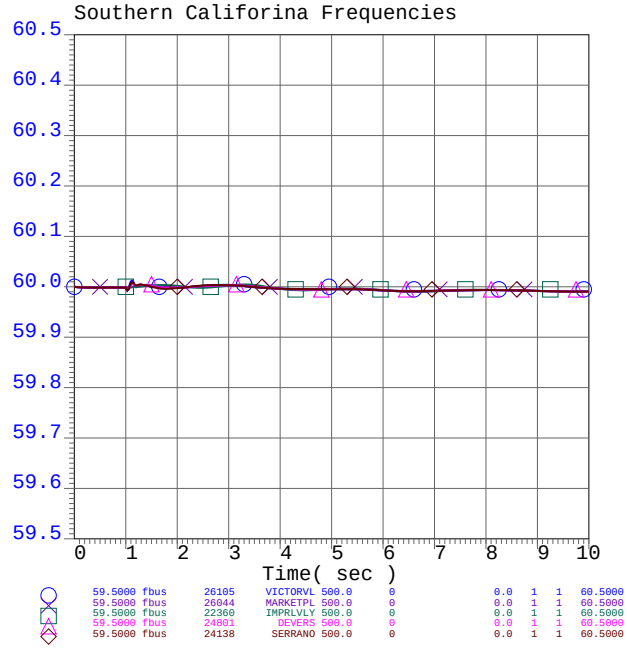
Arizona Frequencies

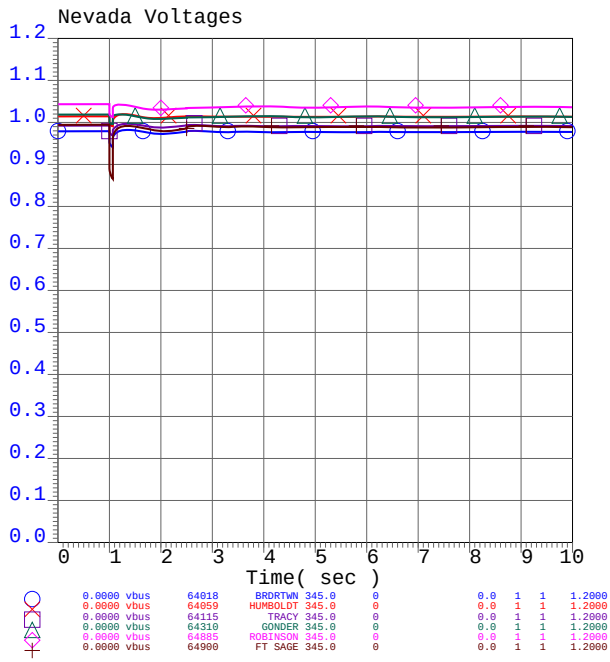


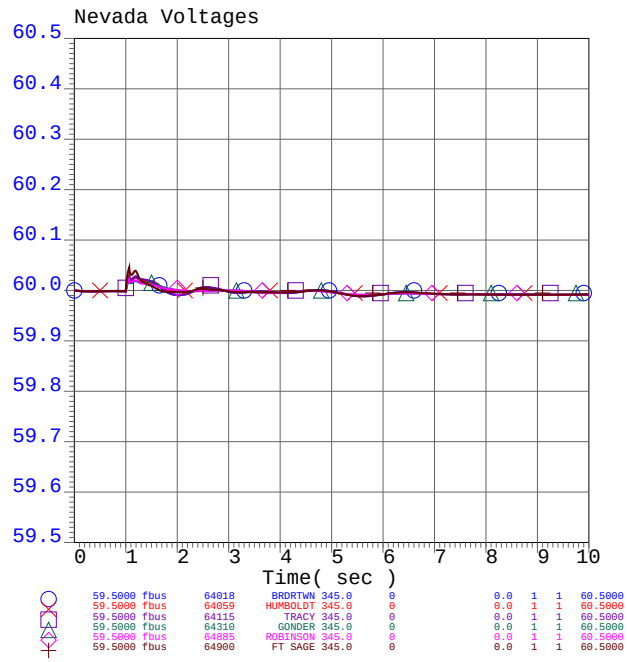
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



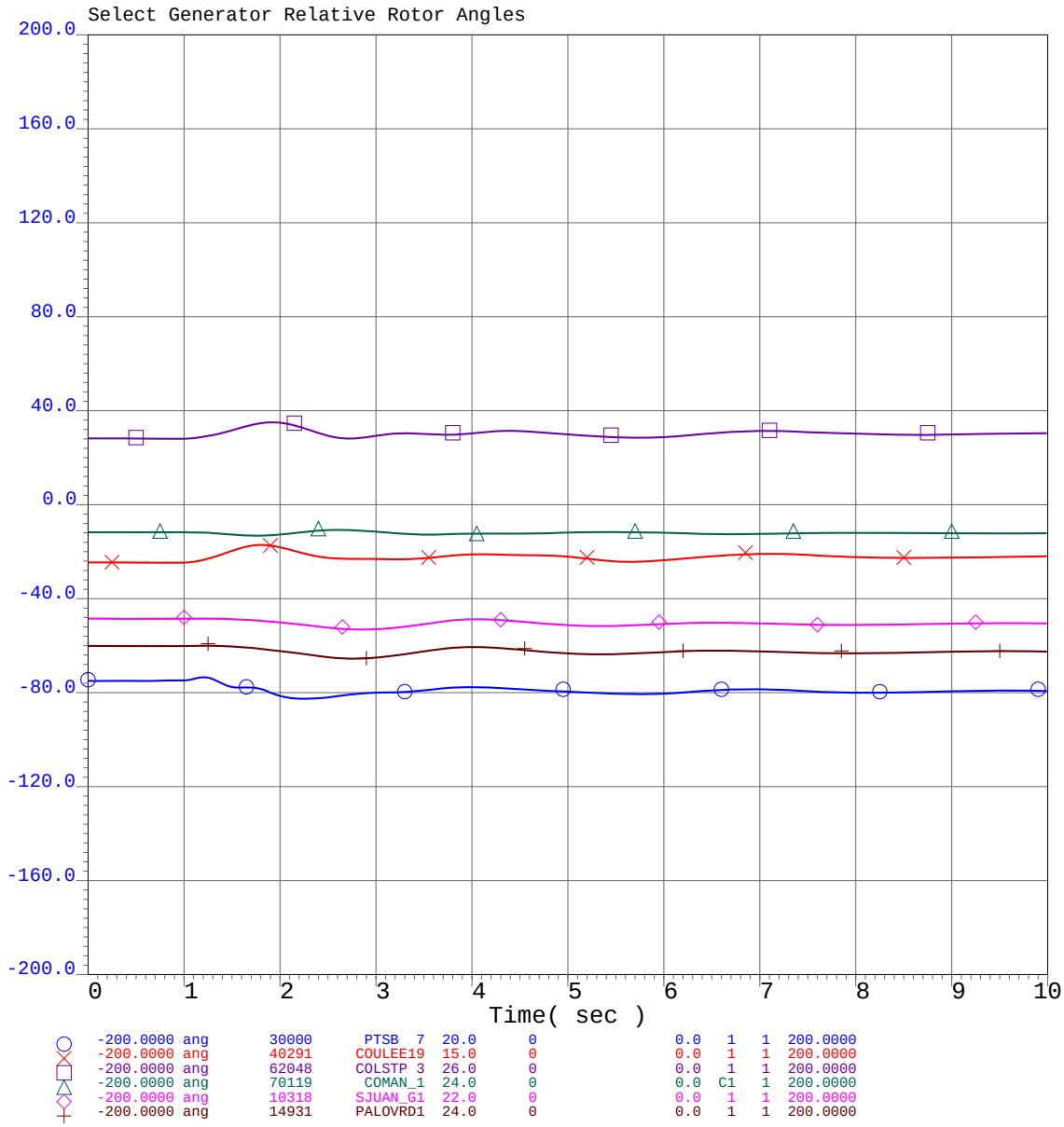






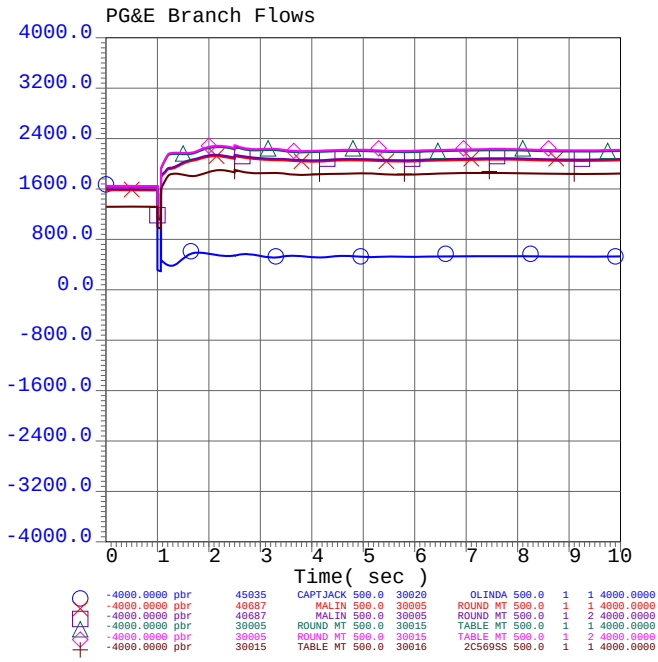
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

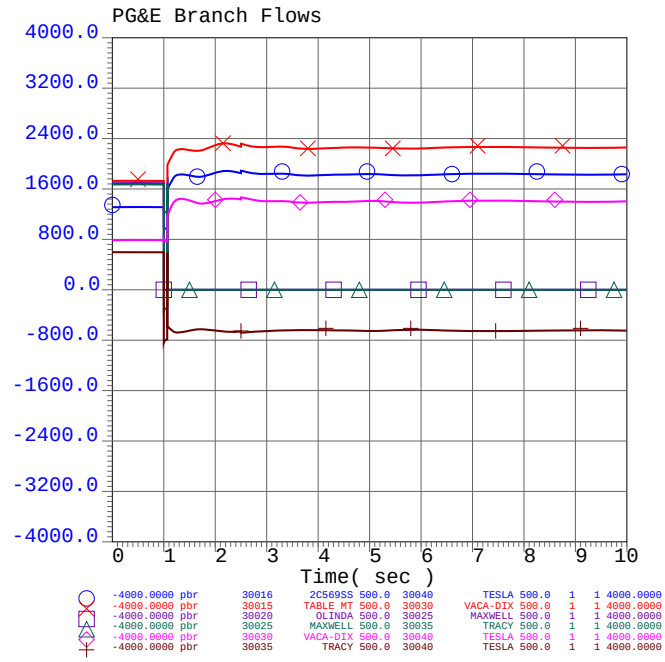
WECC RELATIVE ROTOR ANGLES

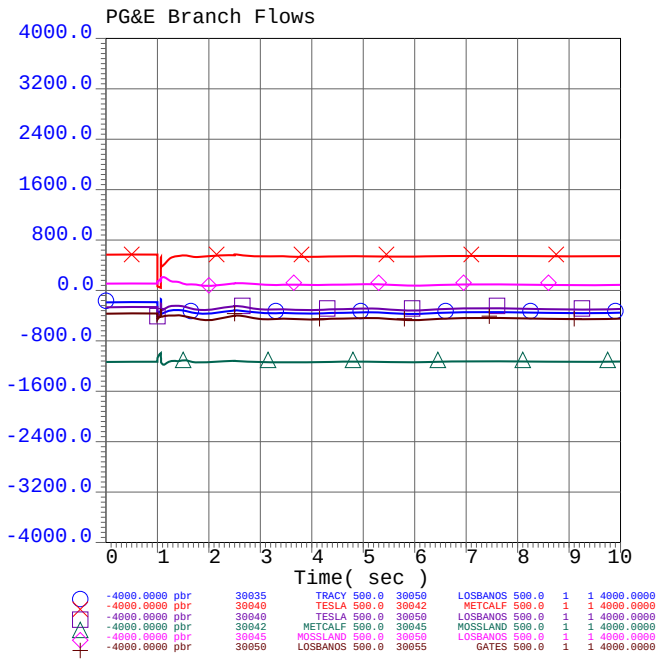


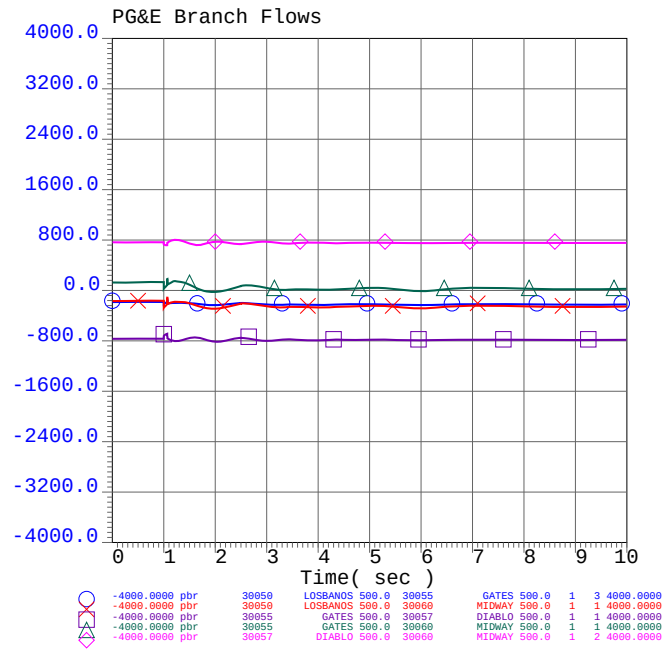
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

SELECT BRANCH FLOWS





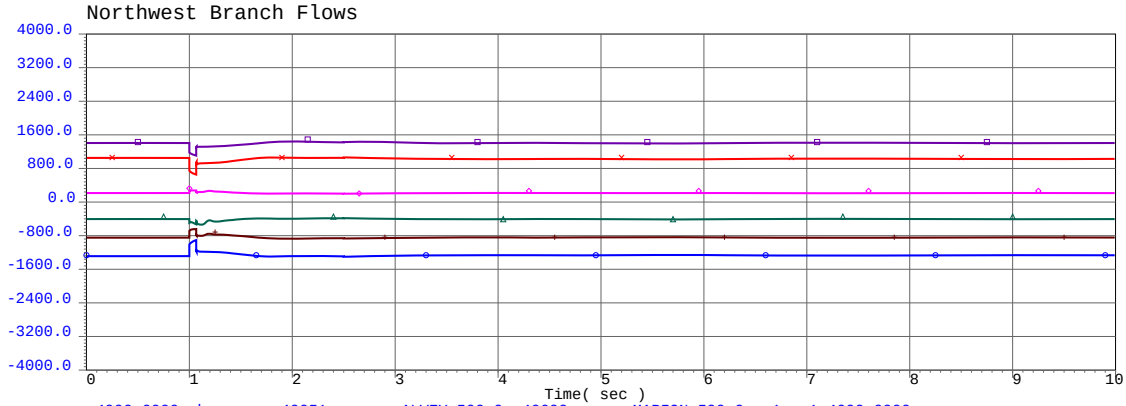




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

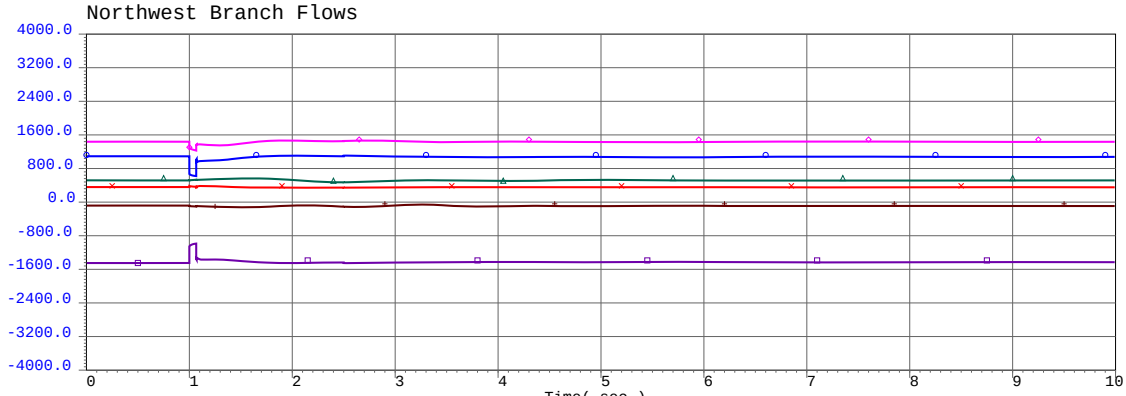
SELECT BRANCH FLOWS

Northwest Branch Flows



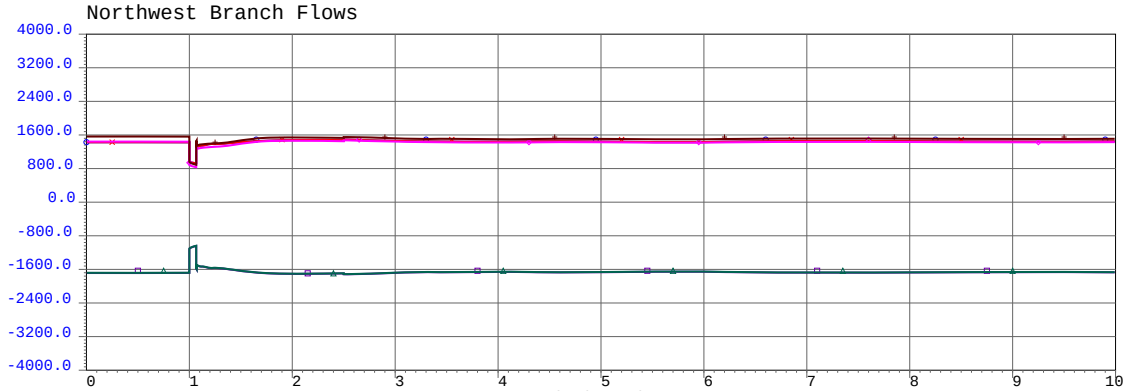
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

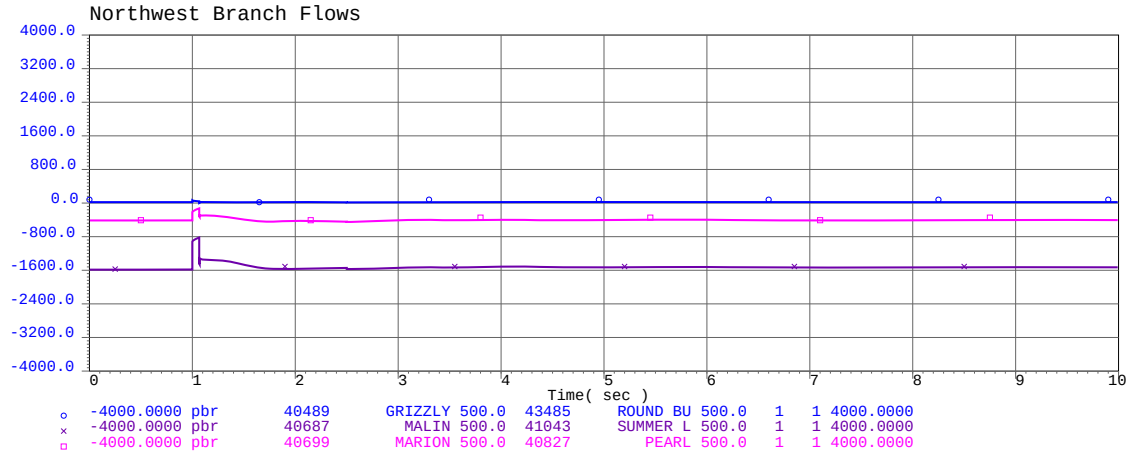
Northwest Branch Flows



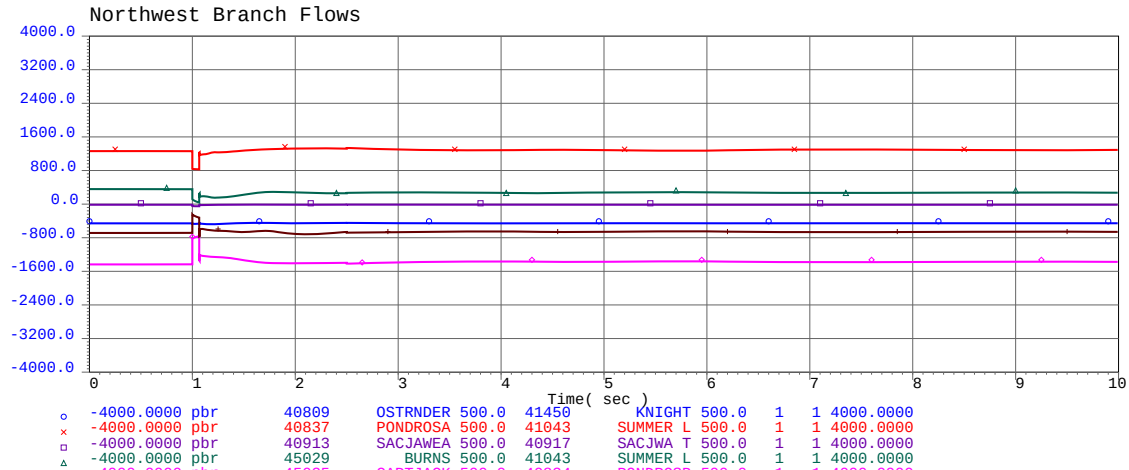
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

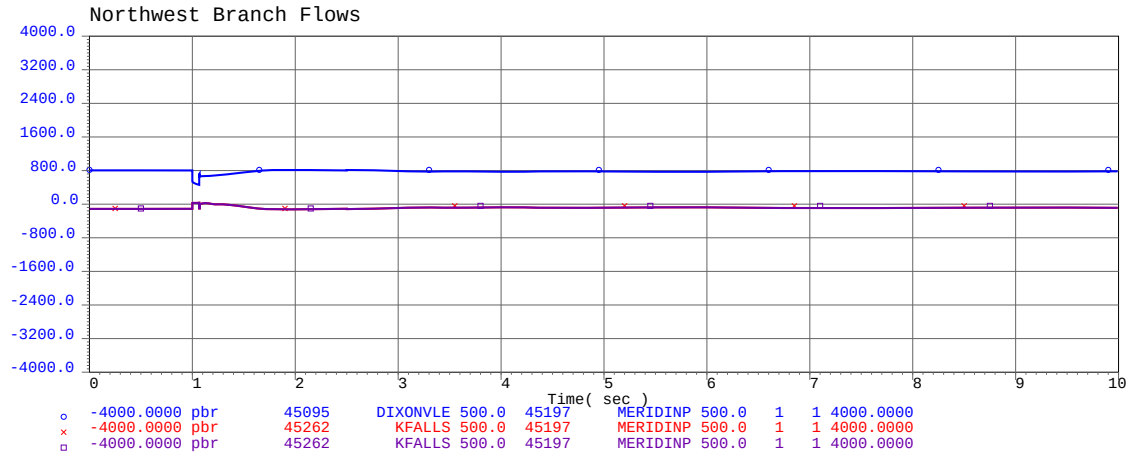
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



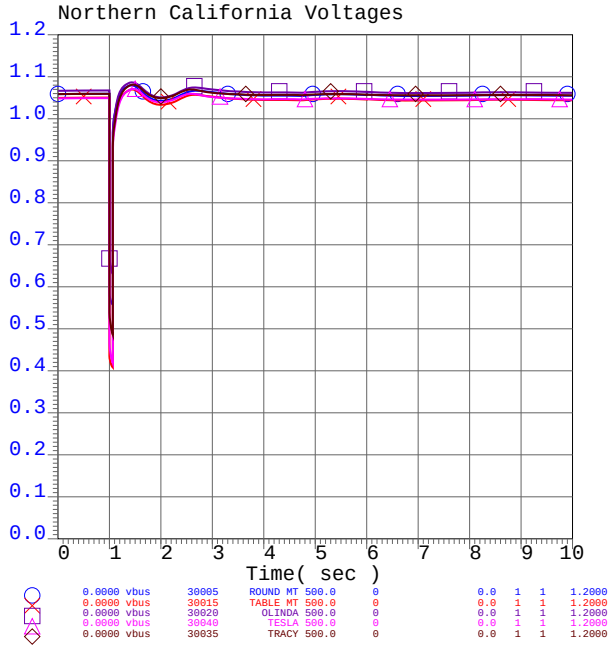
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

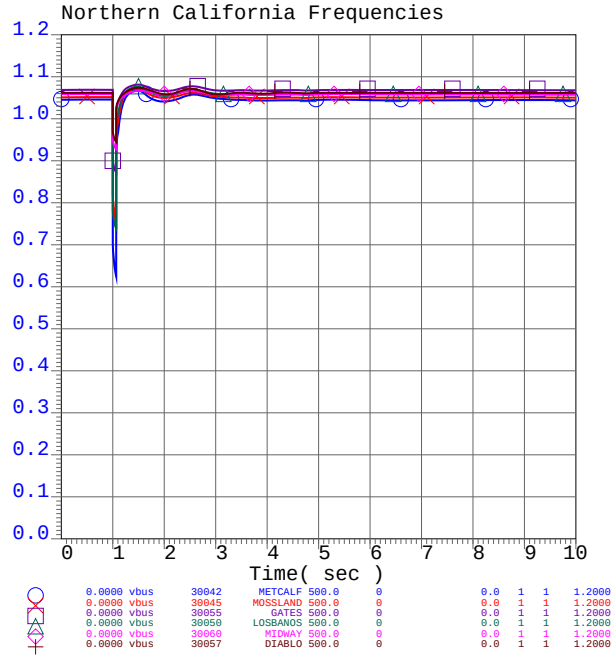


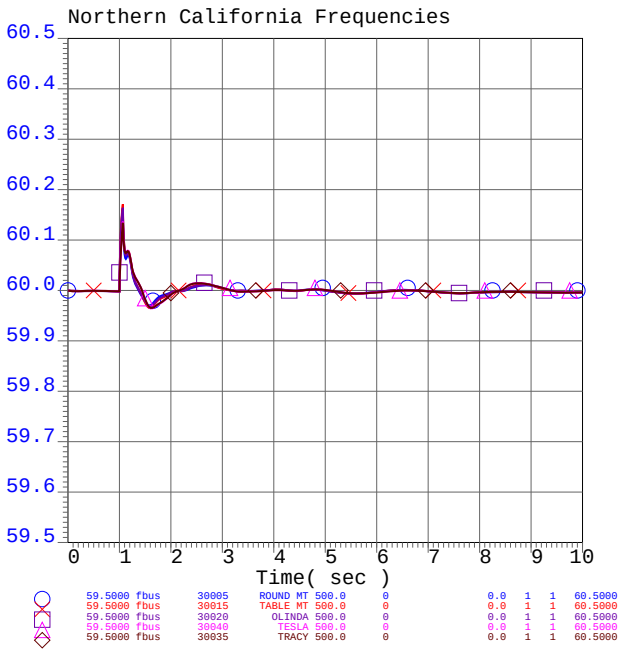
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

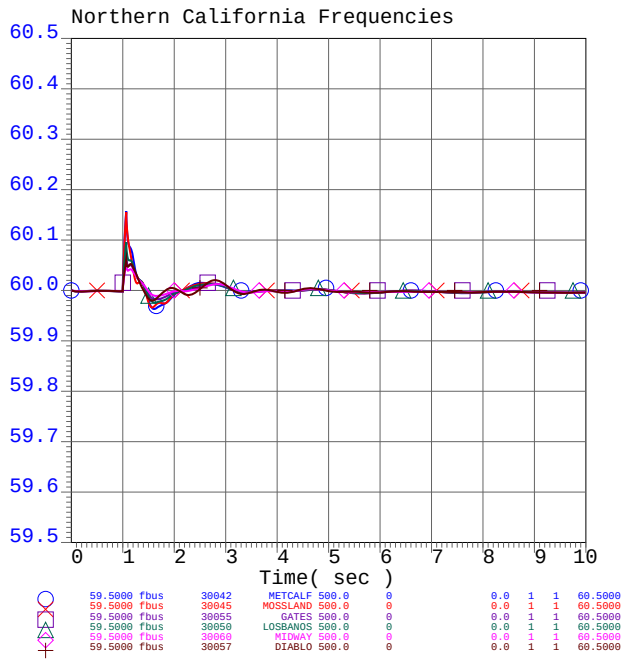
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Olinda 500 kV
followed by loss of Olinda-Tracy 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



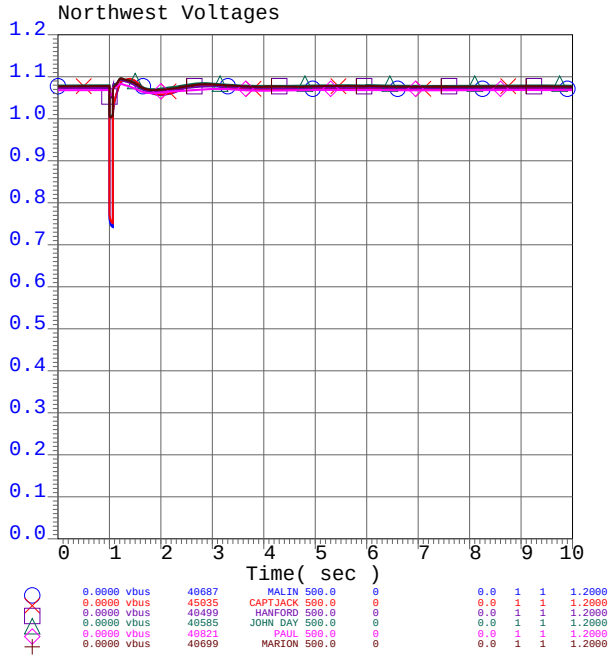


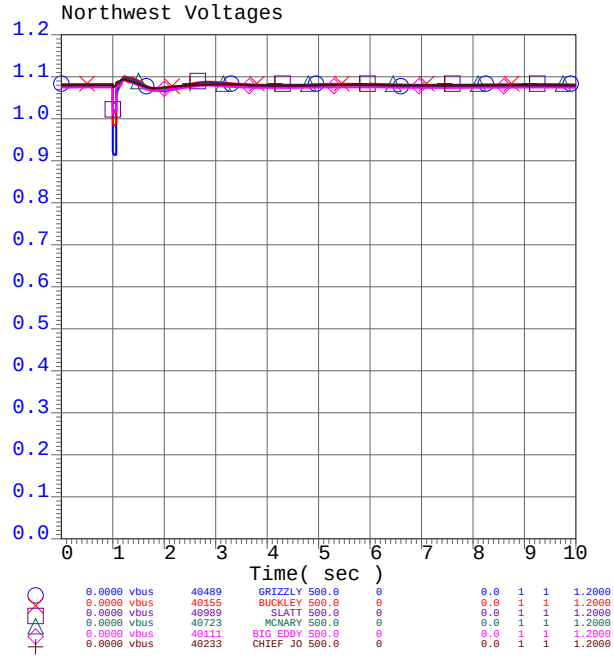


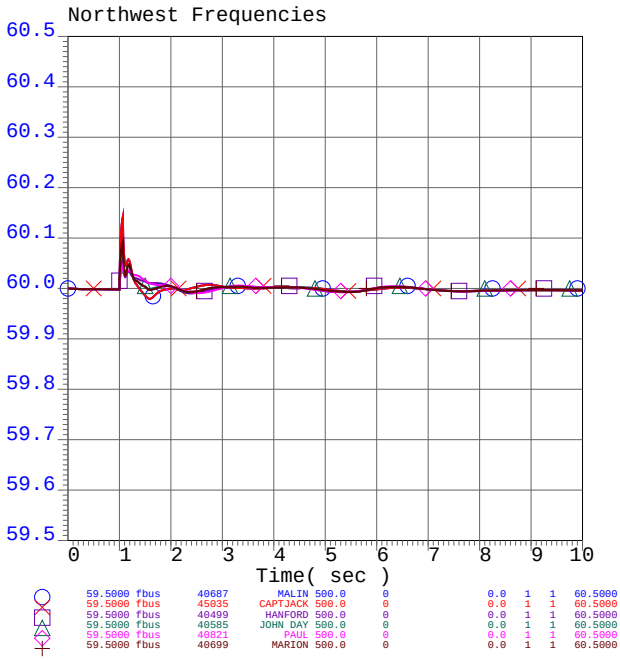


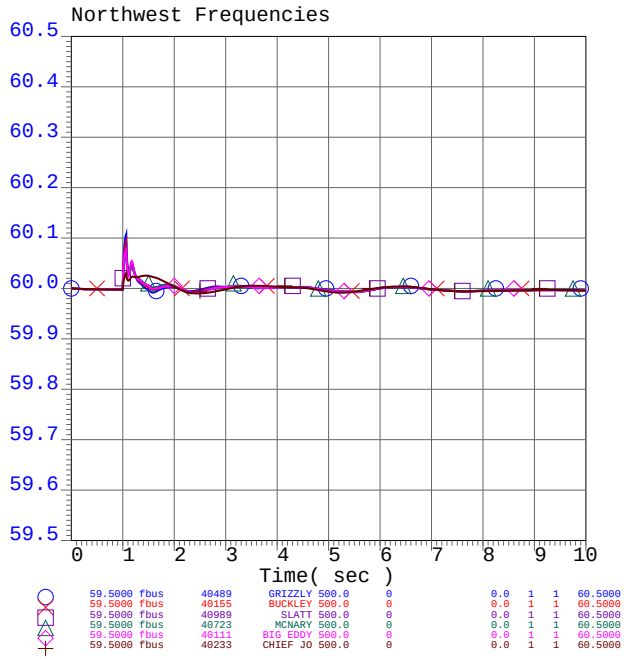
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



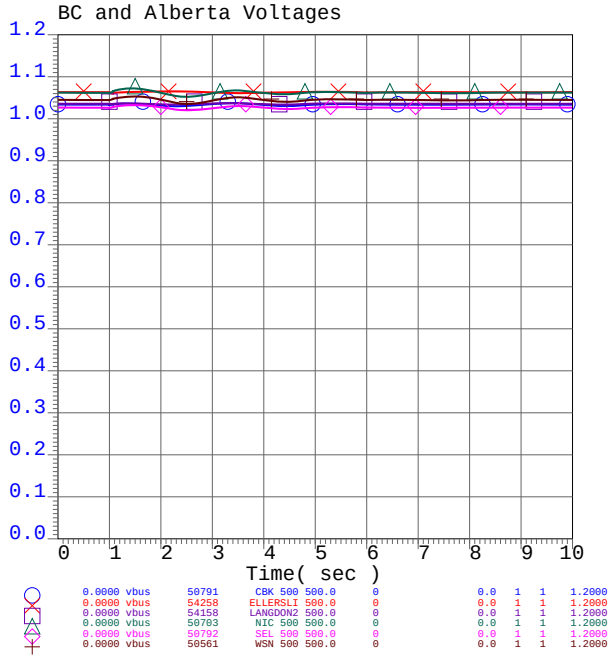


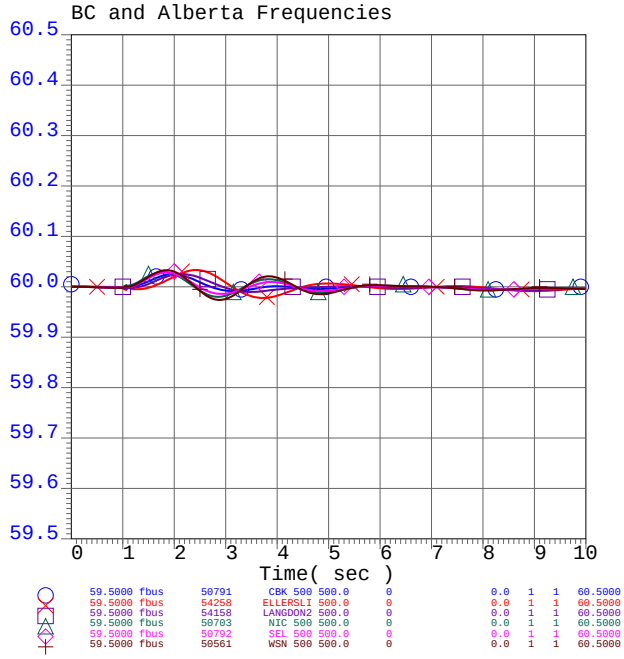


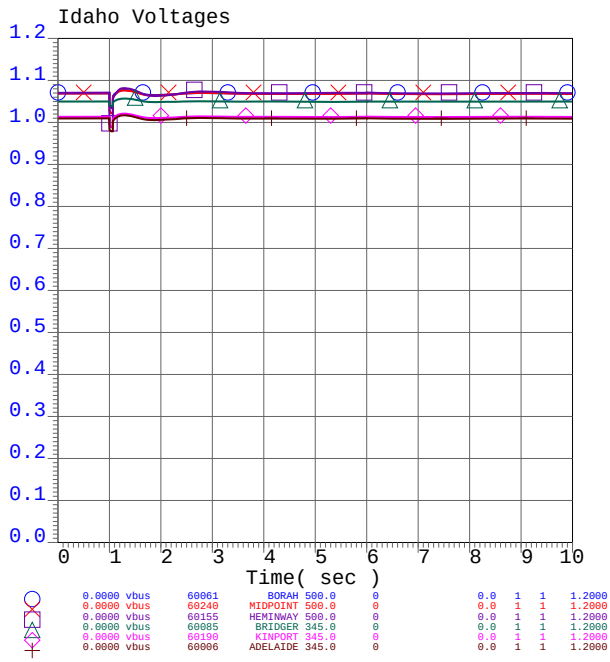


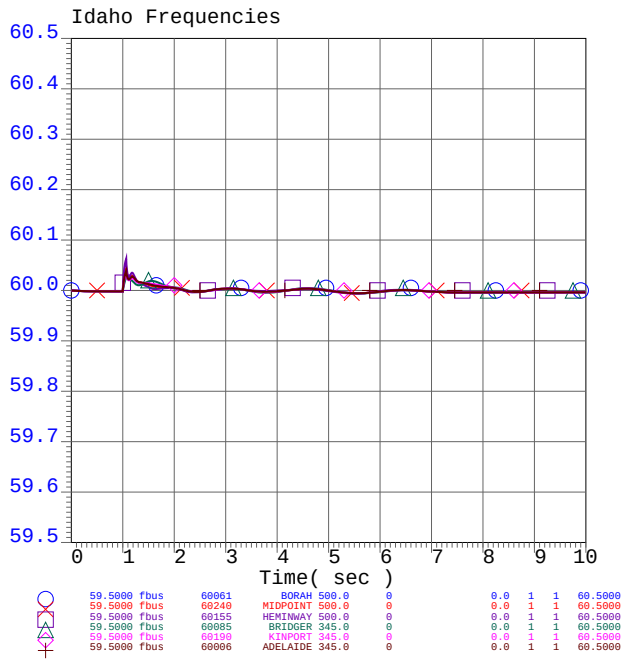
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



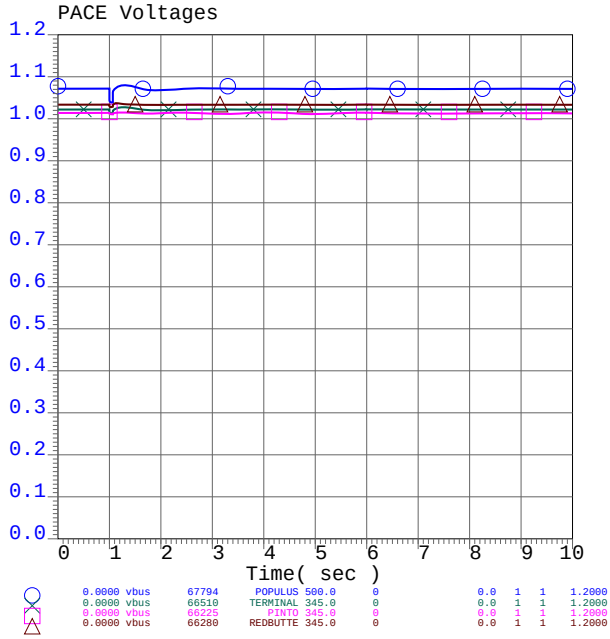


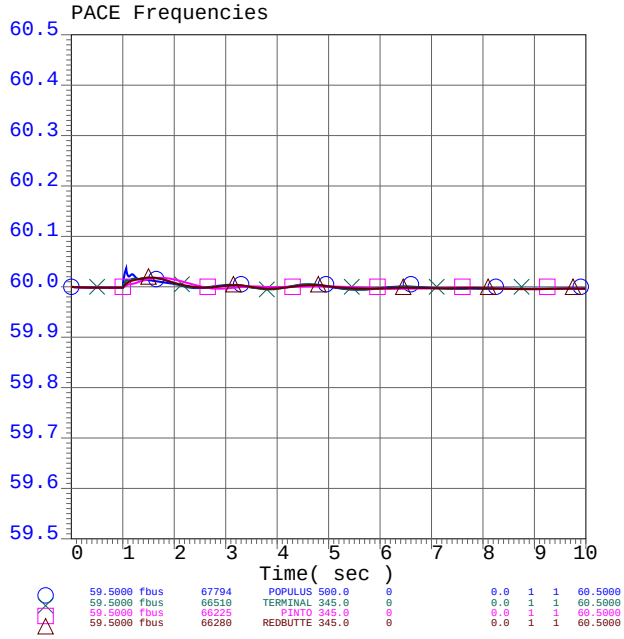


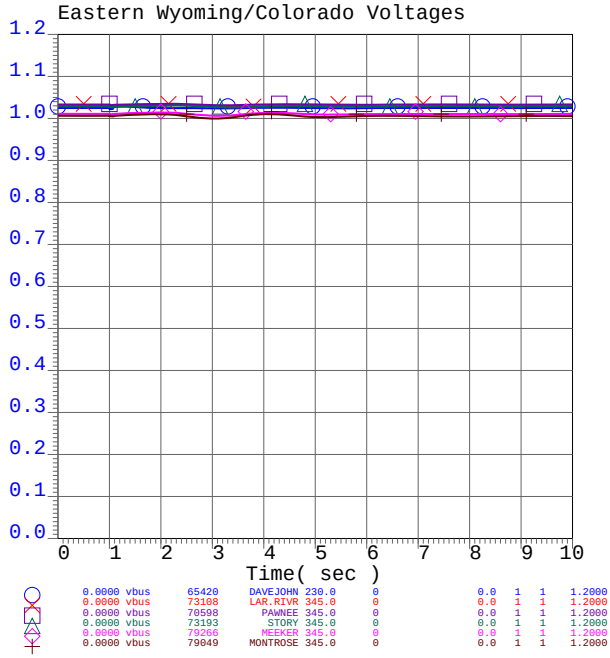


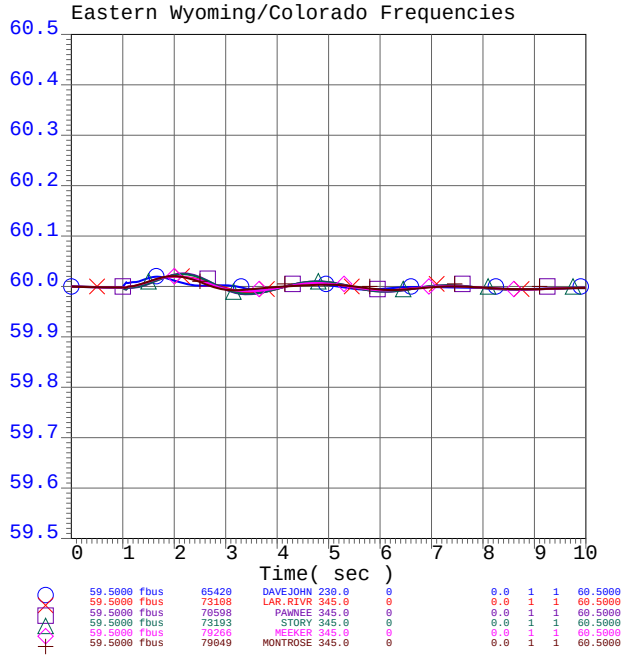
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





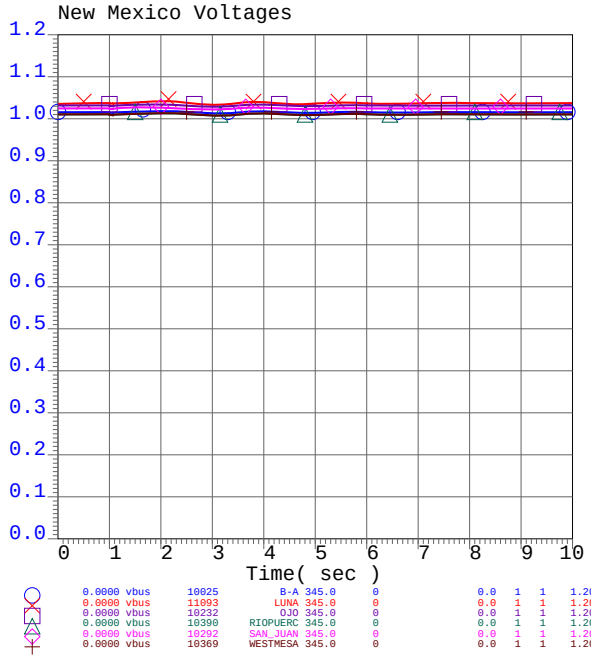




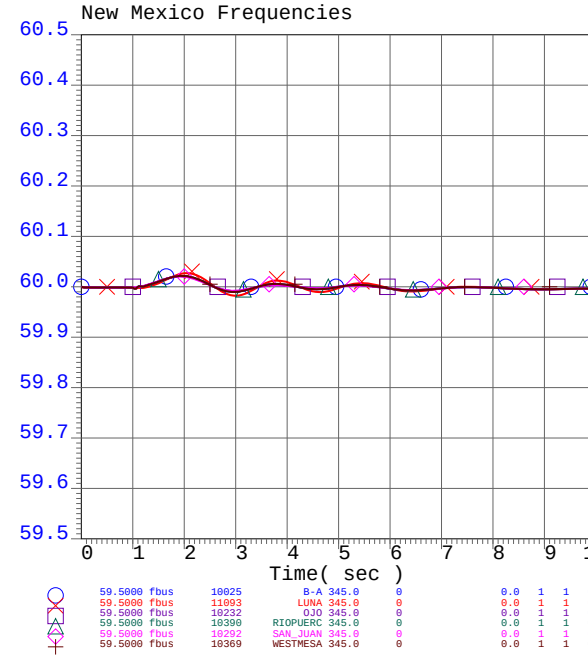
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

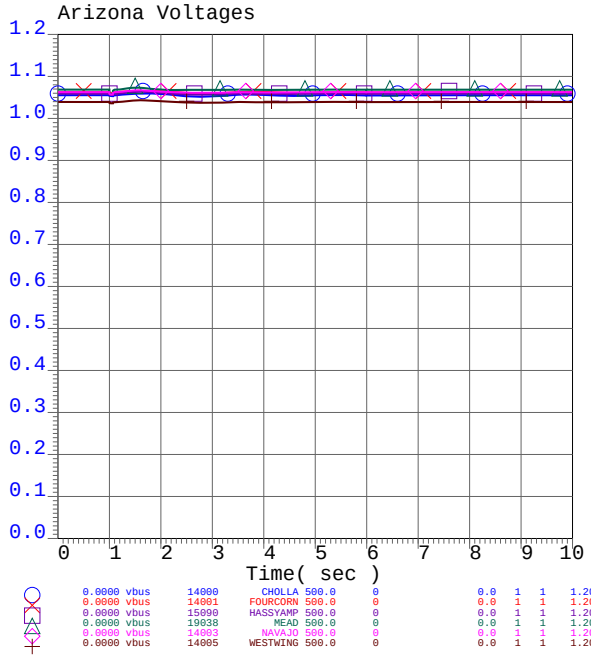
New Mexico Voltages



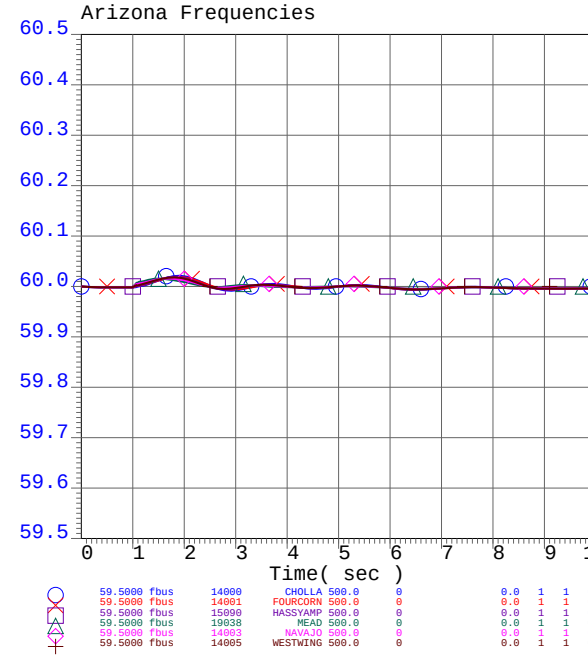
New Mexico Frequencies



Arizona Voltages

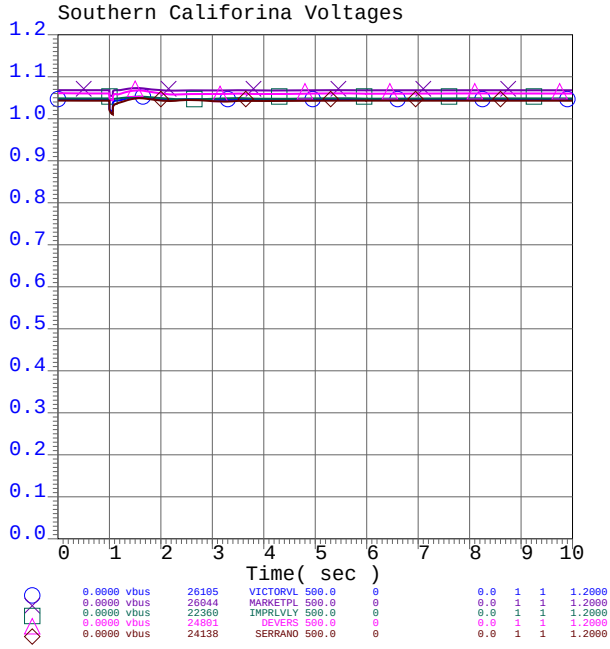


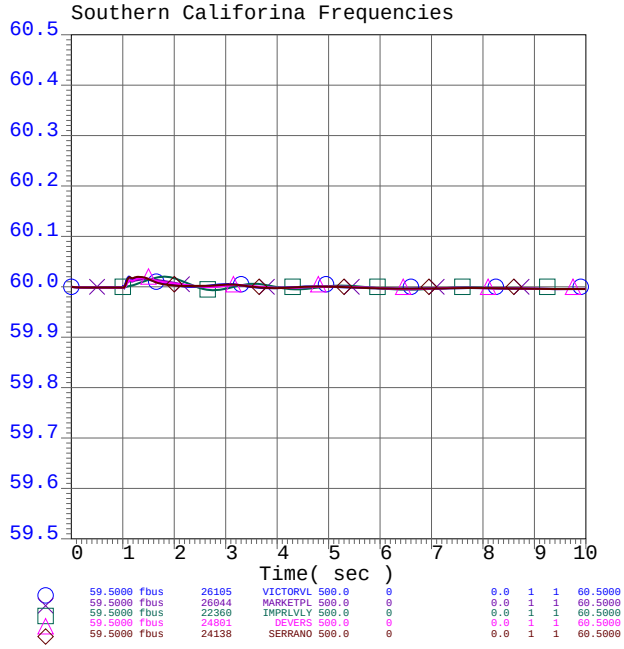
Arizona Frequencies

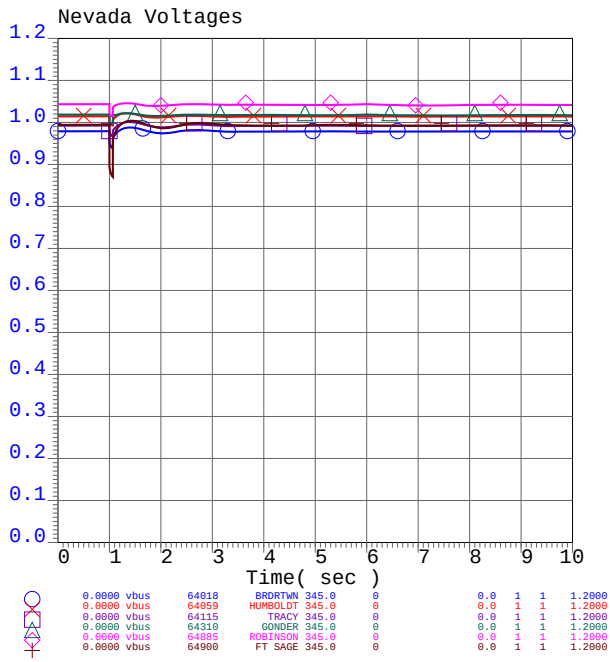


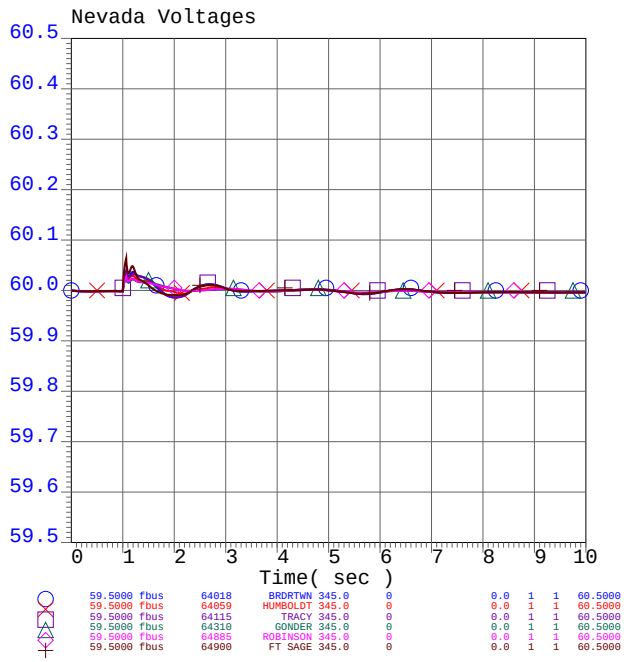
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



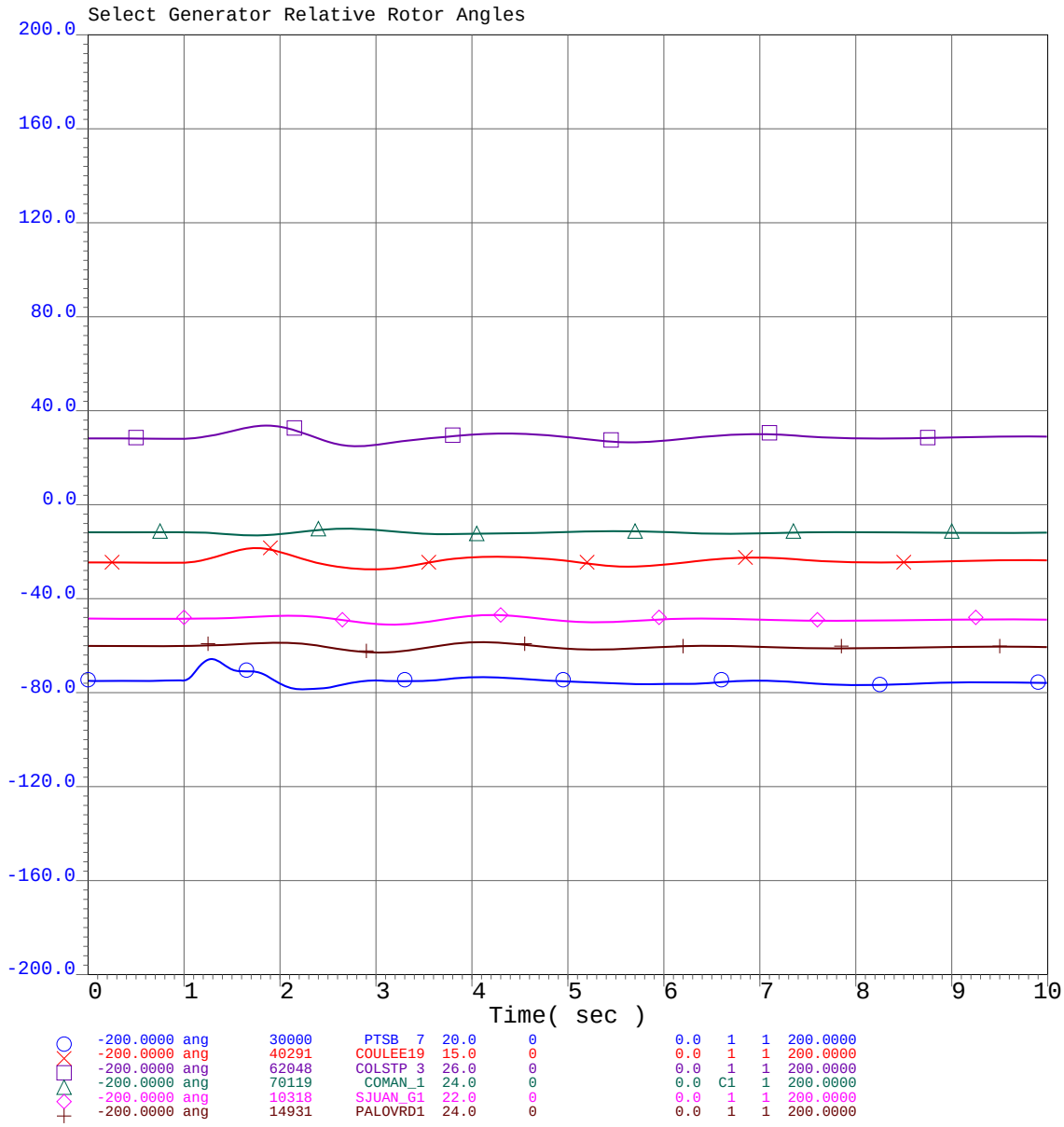






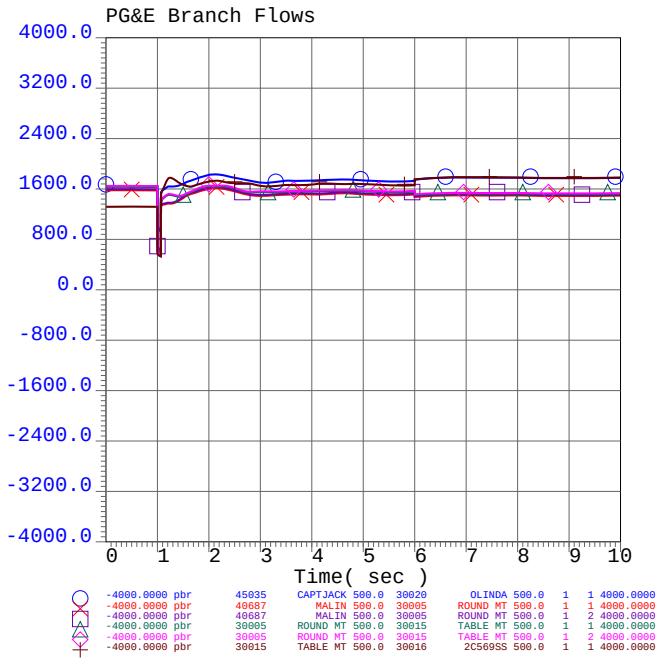
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

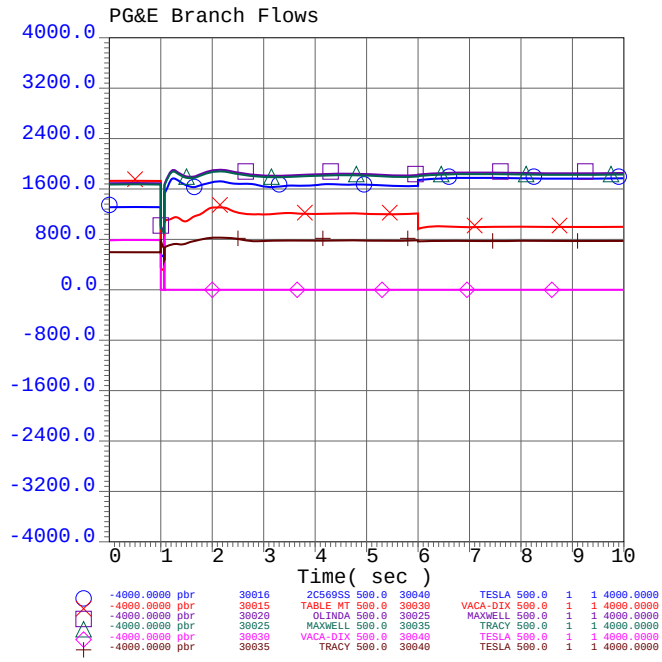
WECC RELATIVE ROTOR ANGLES

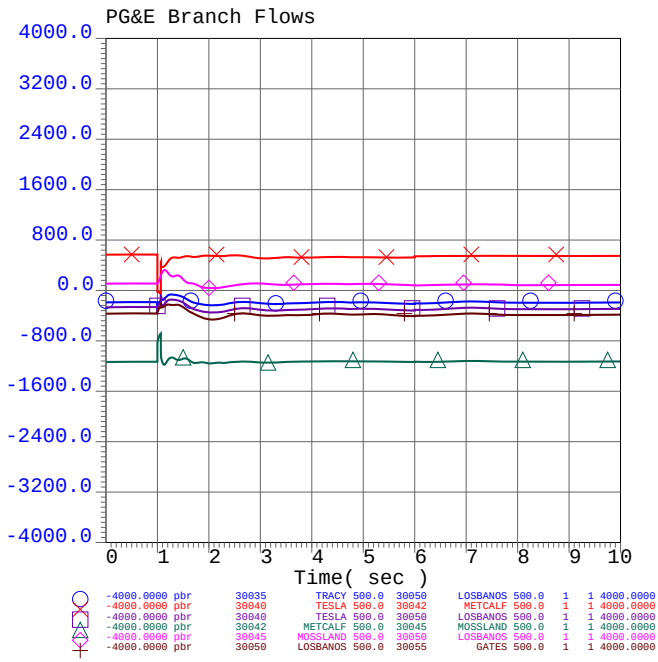


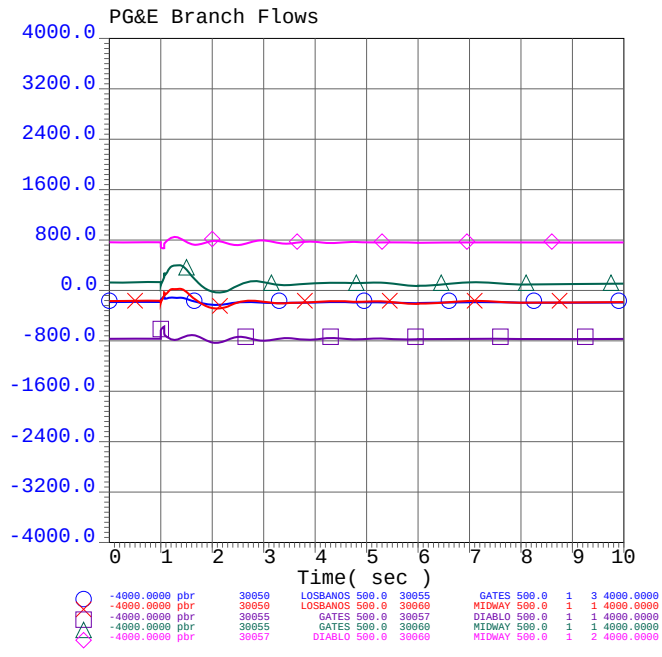
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

SELECT BRANCH FLOWS





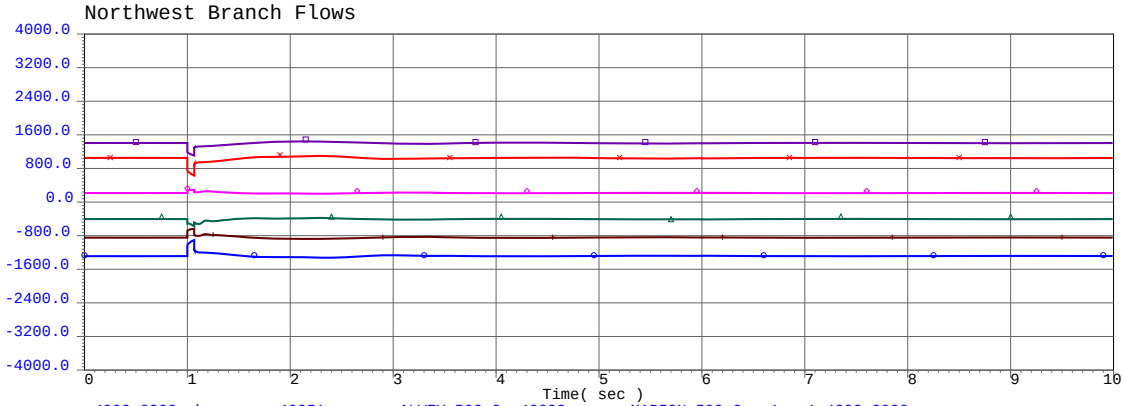




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

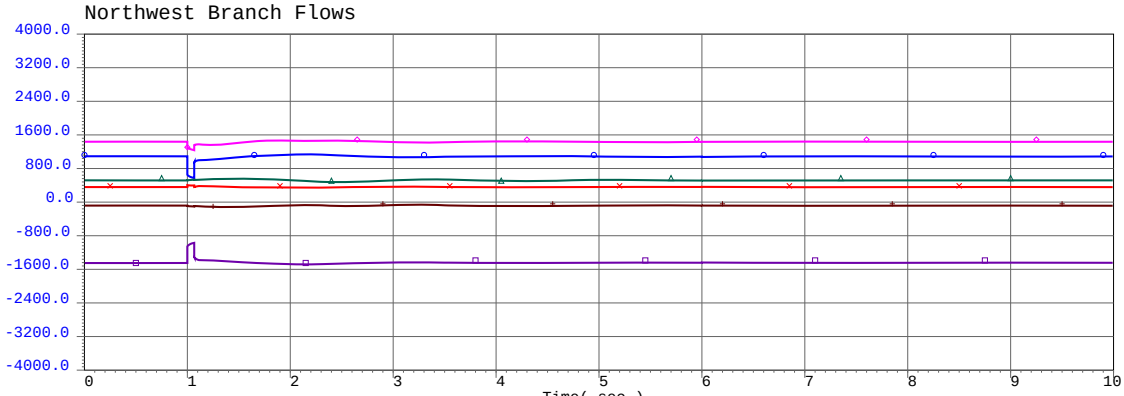
SELECT BRANCH FLOWS

Northwest Branch Flows



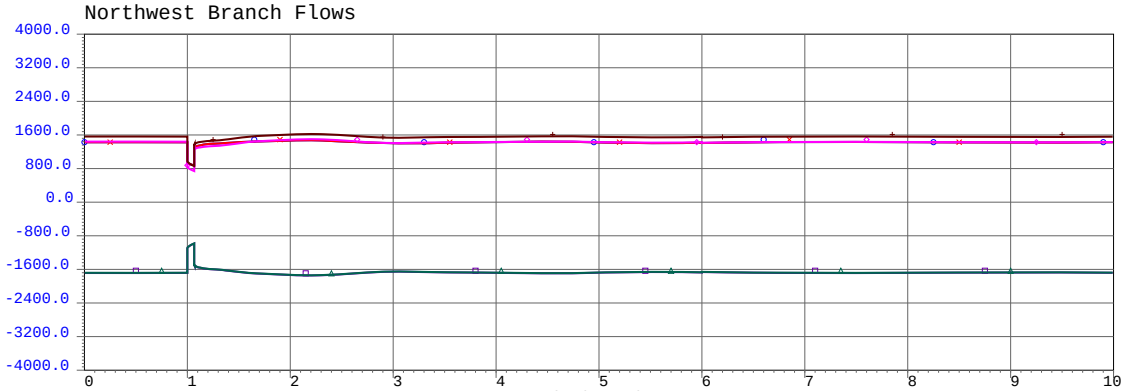
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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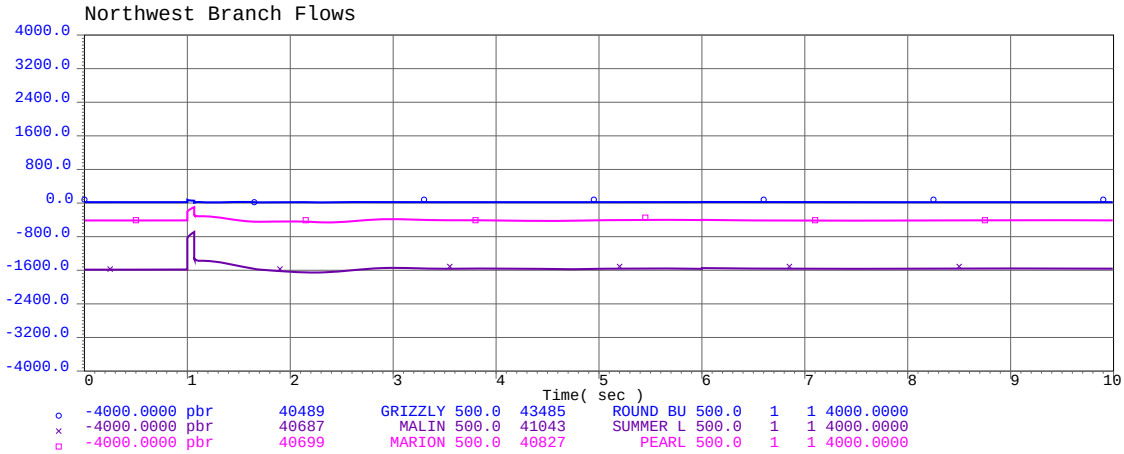
Northwest Branch Flows

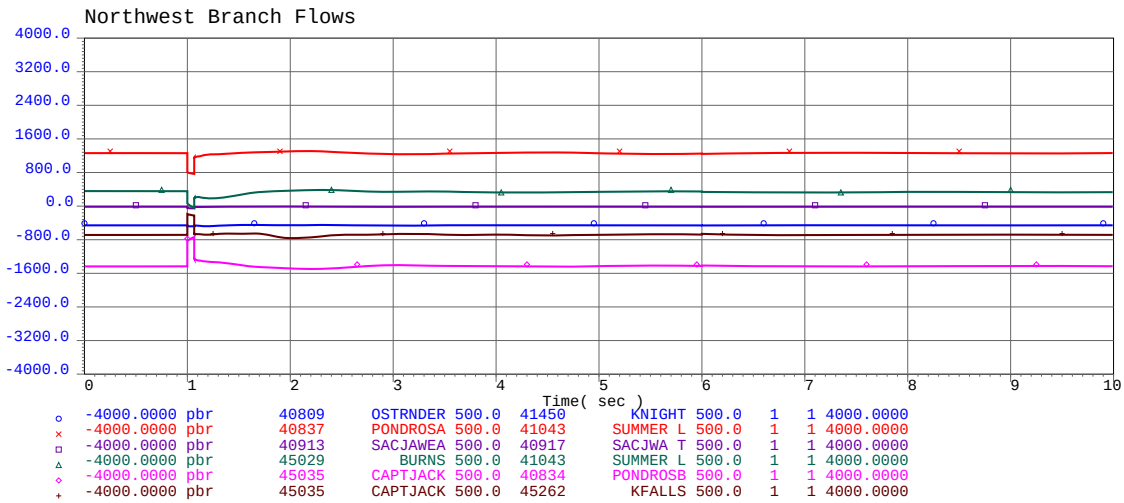


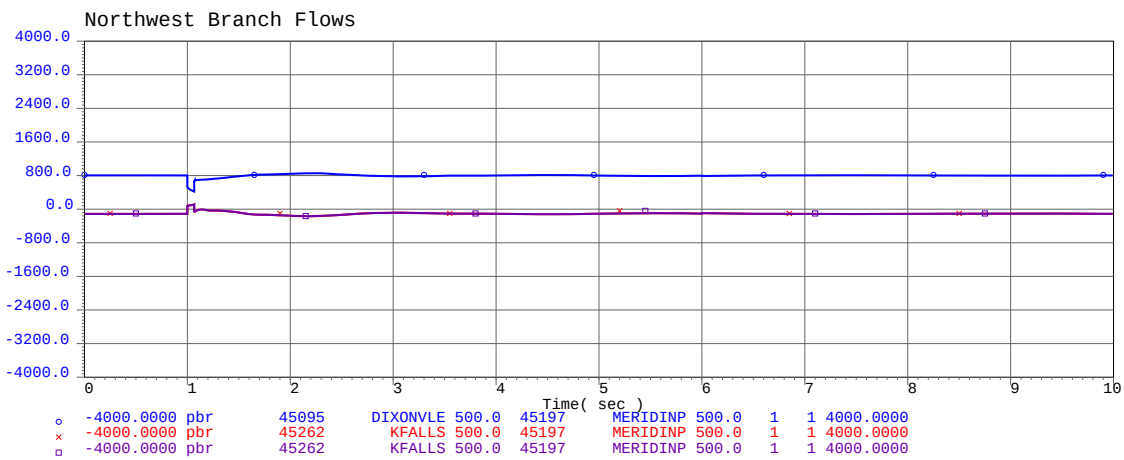
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

SELECT BRANCH FLOWS

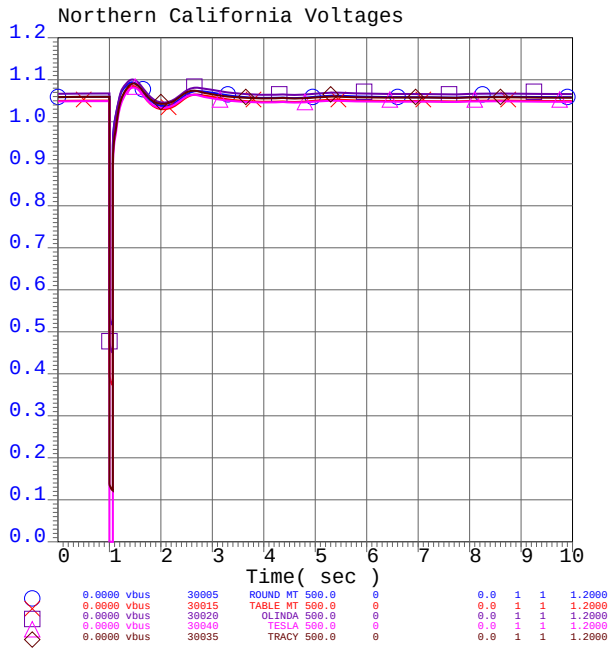


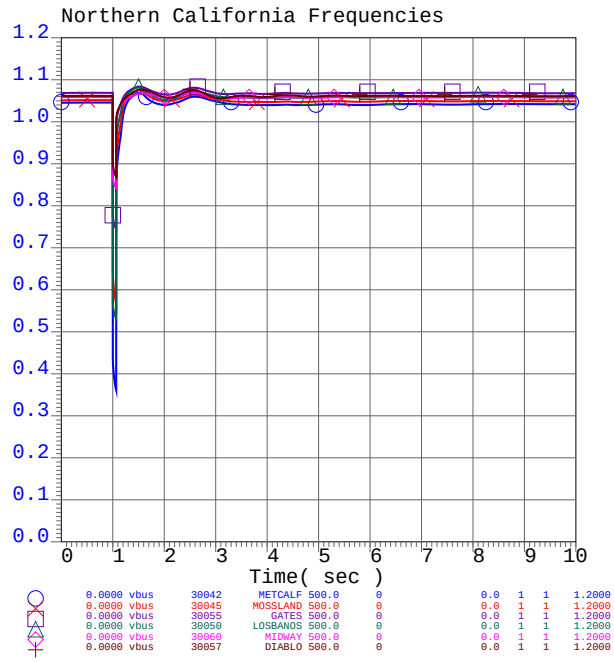


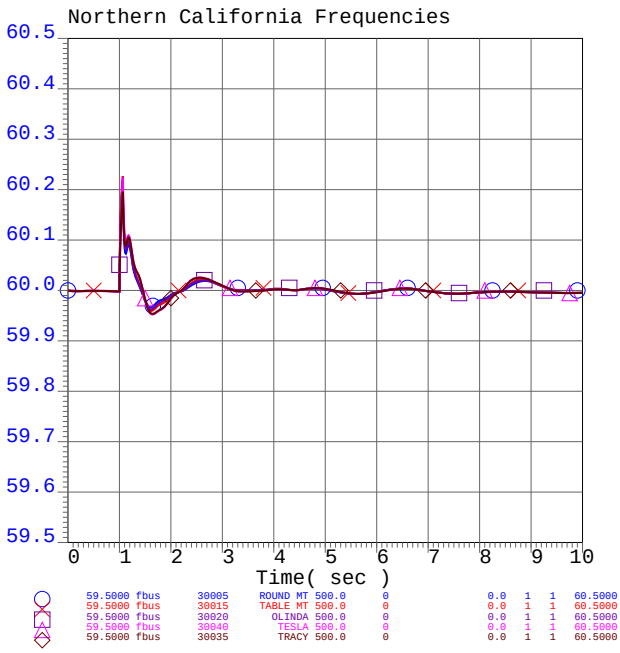


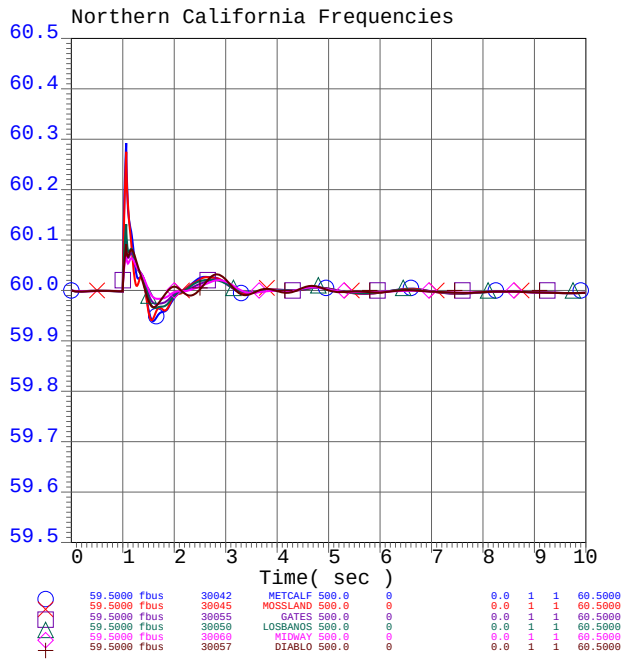
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at VacaDixon 500 kV
followed by loss of VacaDixon-Tesla 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



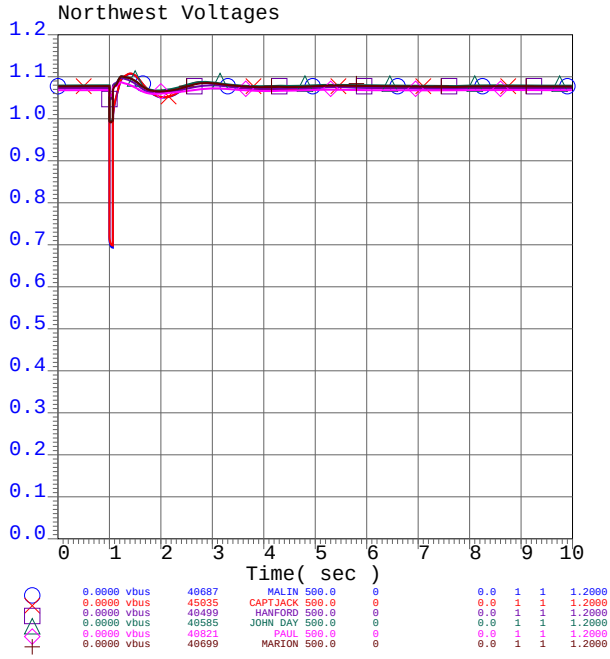


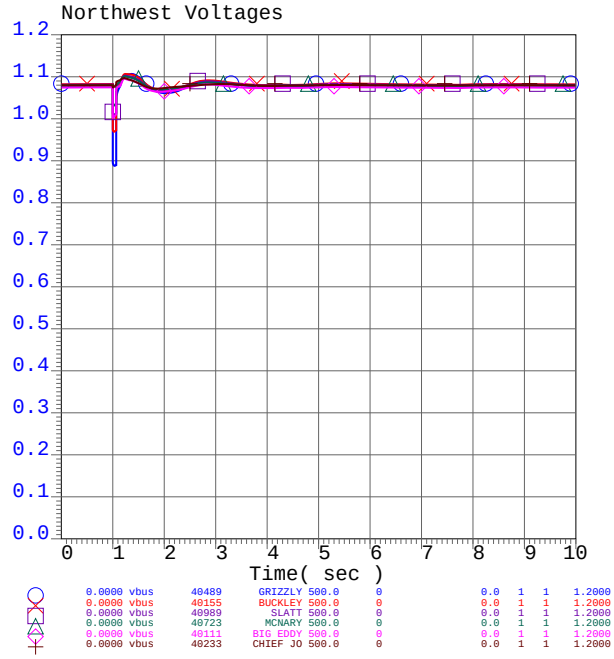


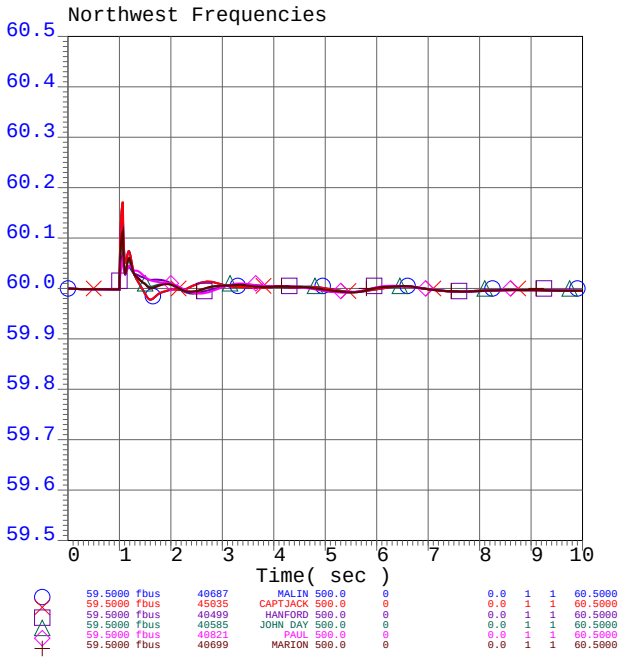


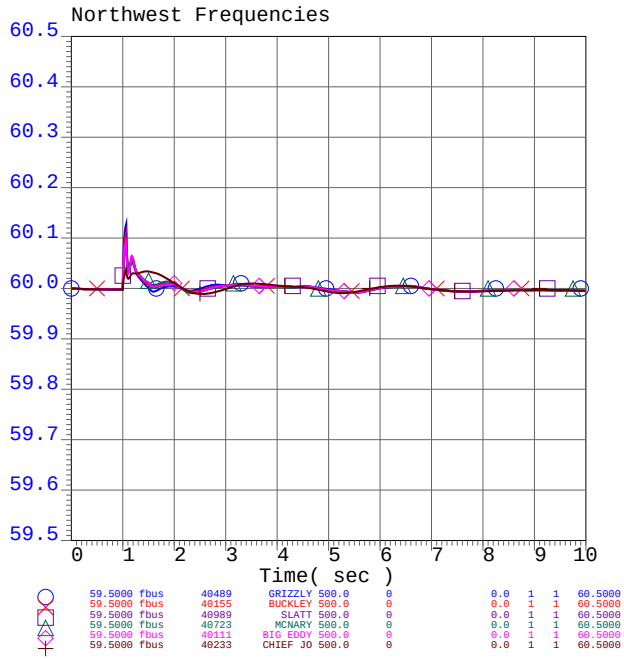
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tesla 500 kV
followed by loss of Tesla-Metcalf 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



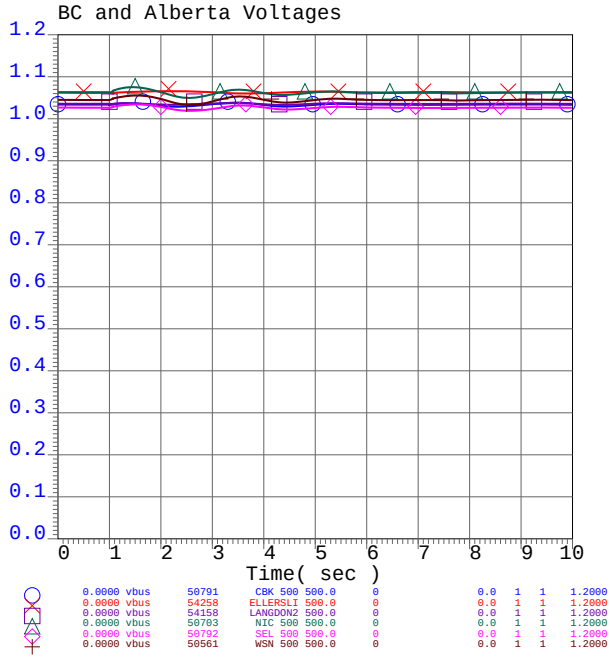


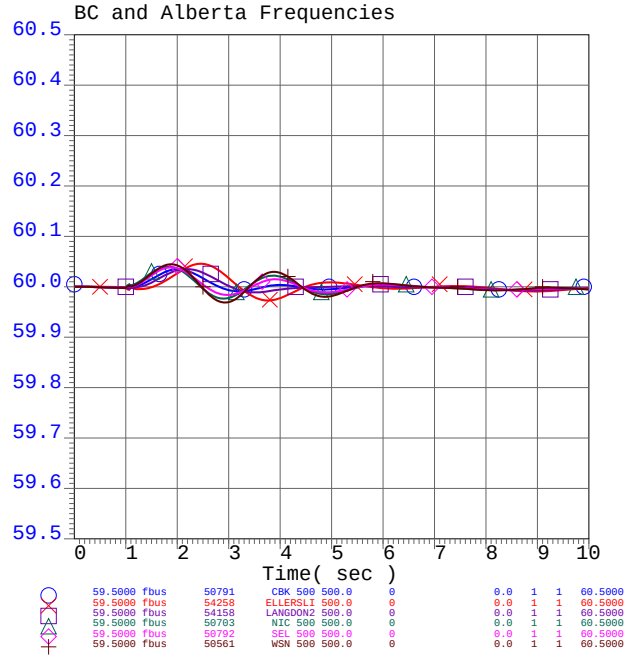


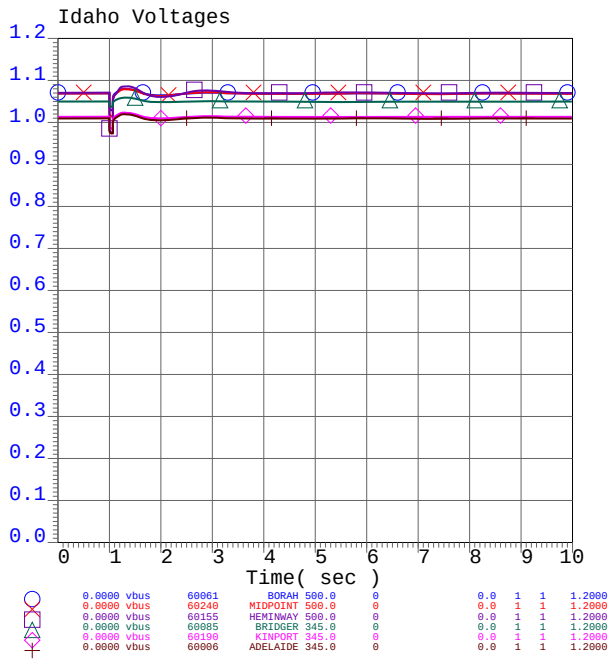


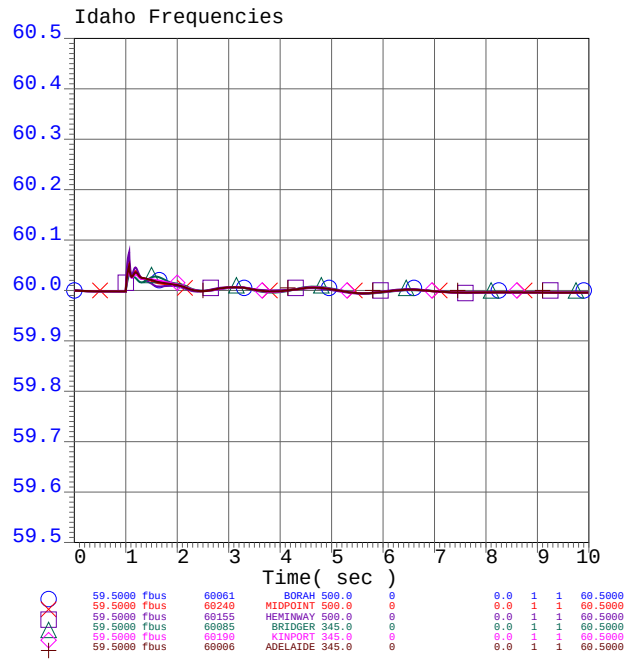
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES



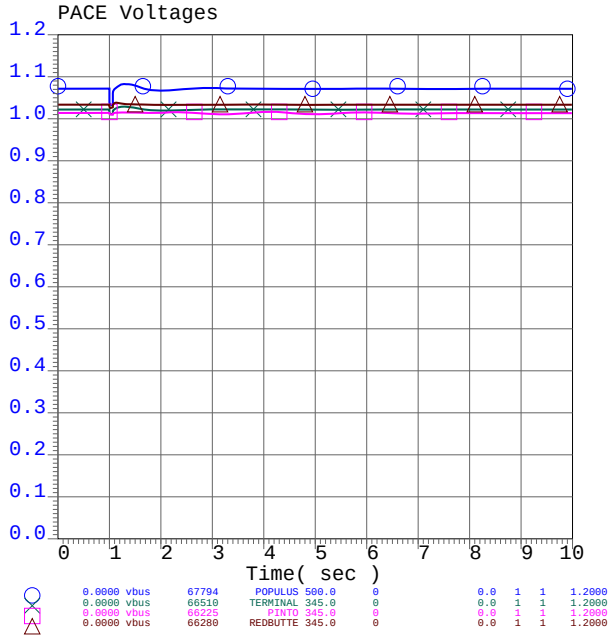


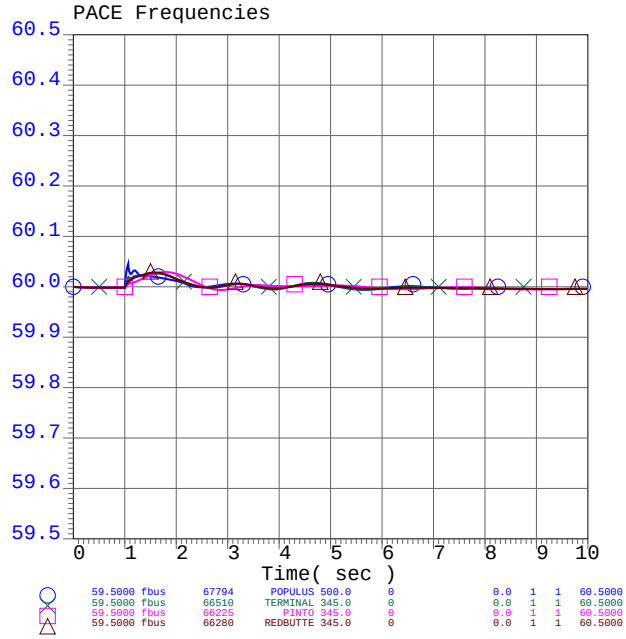


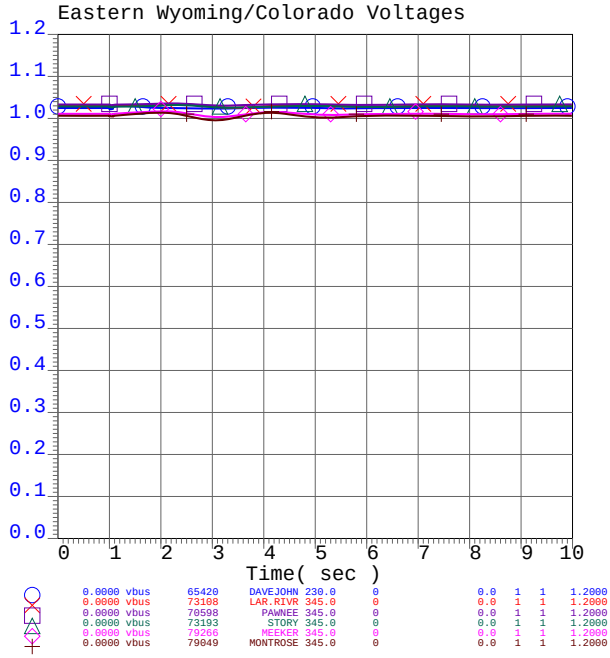


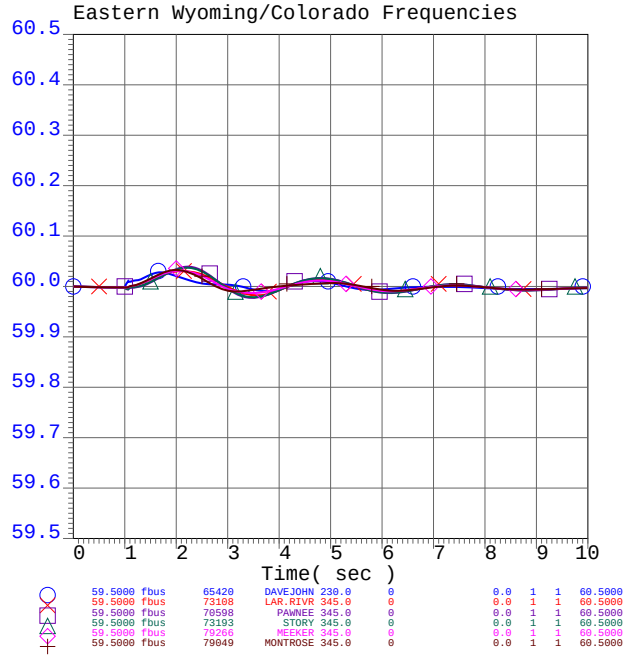
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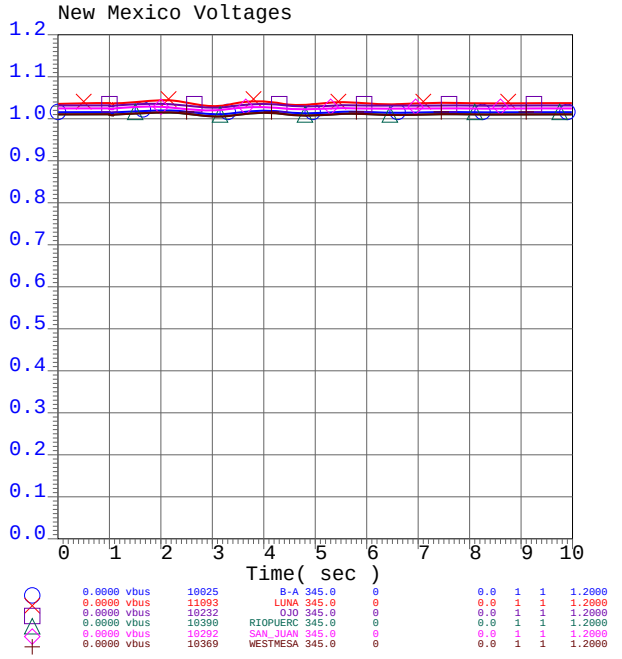




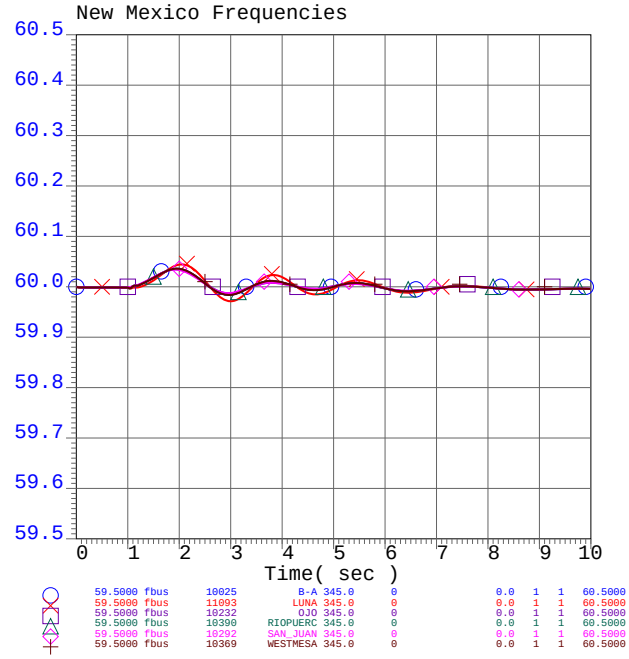
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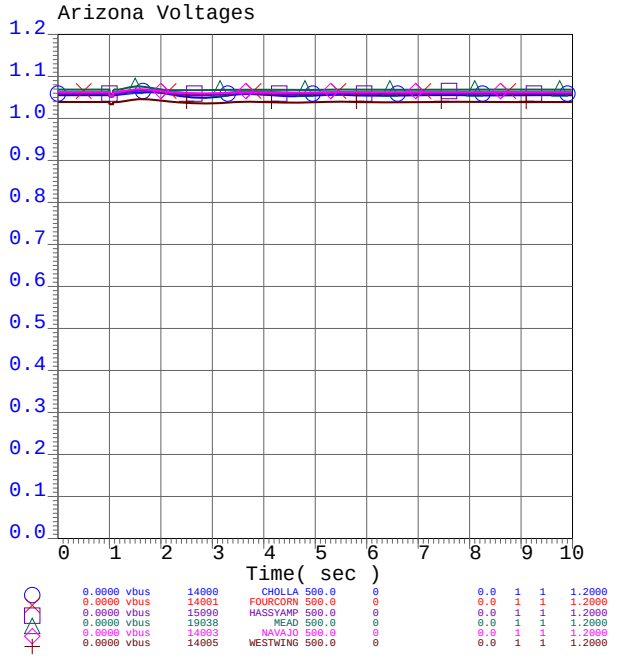
New Mexico Voltages



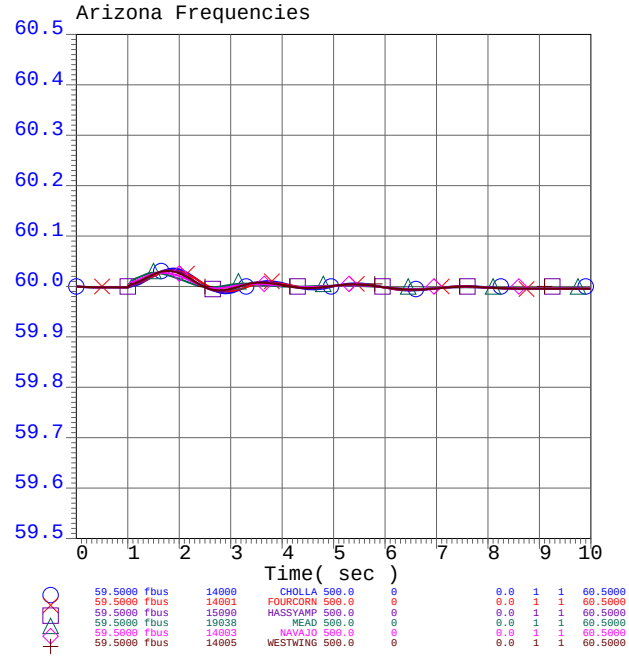
New Mexico Frequencies



Arizona Voltages

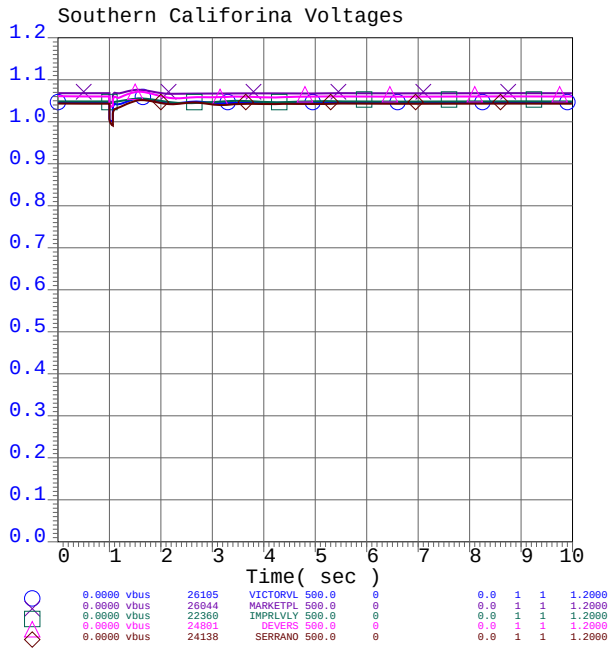


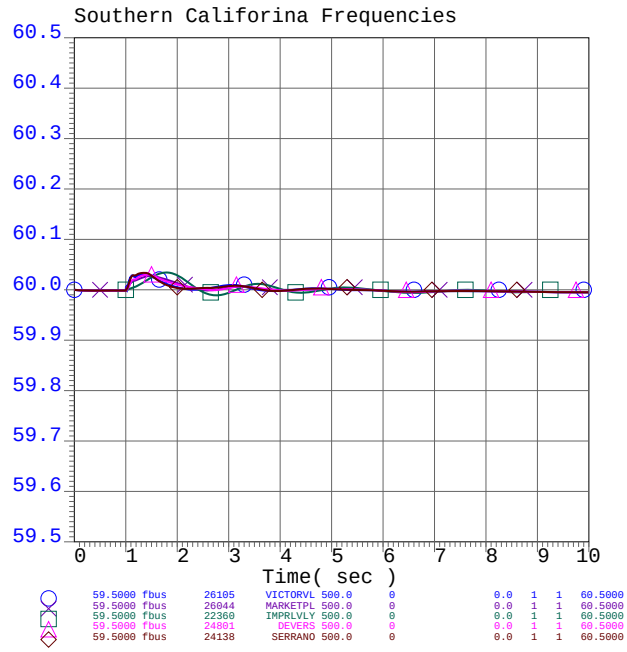
Arizona Frequencies

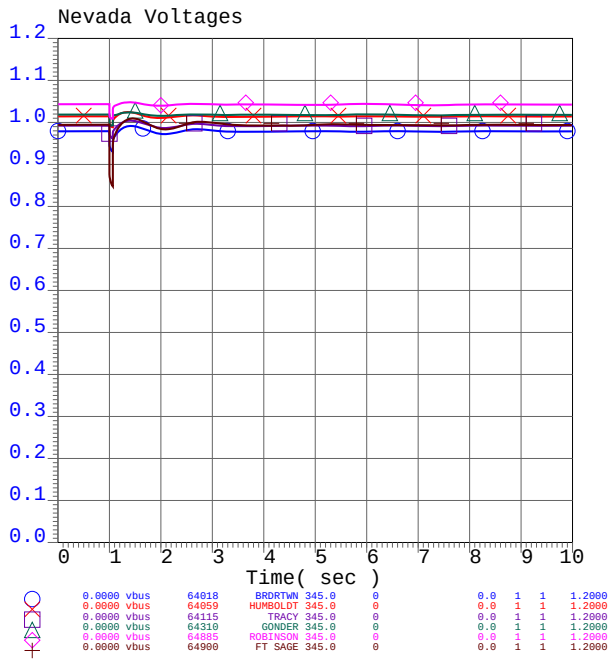


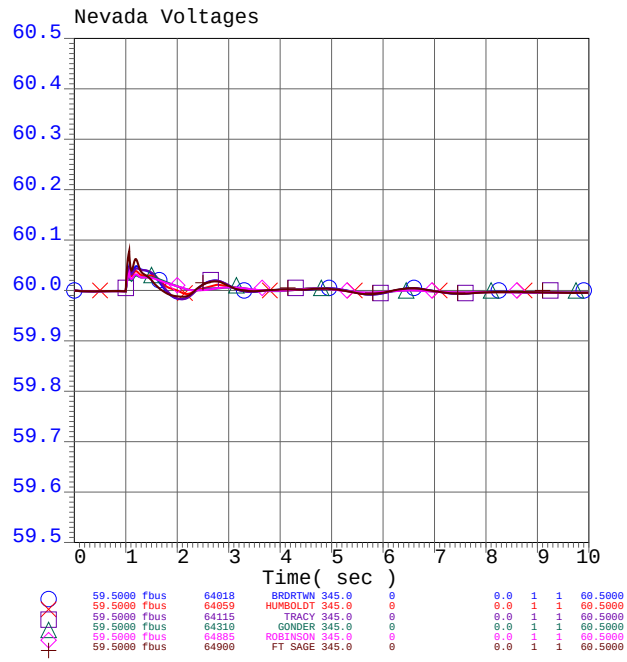
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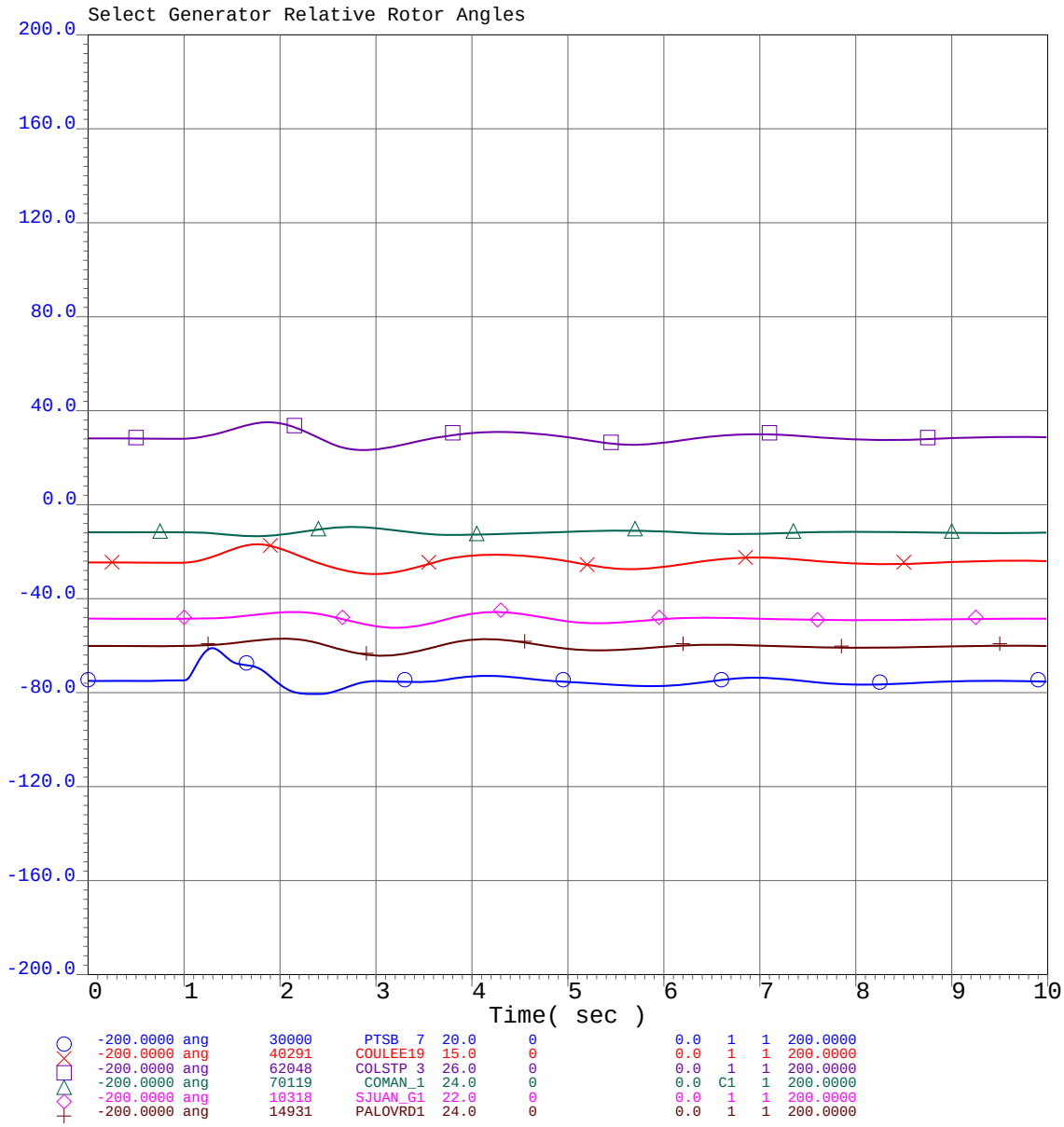






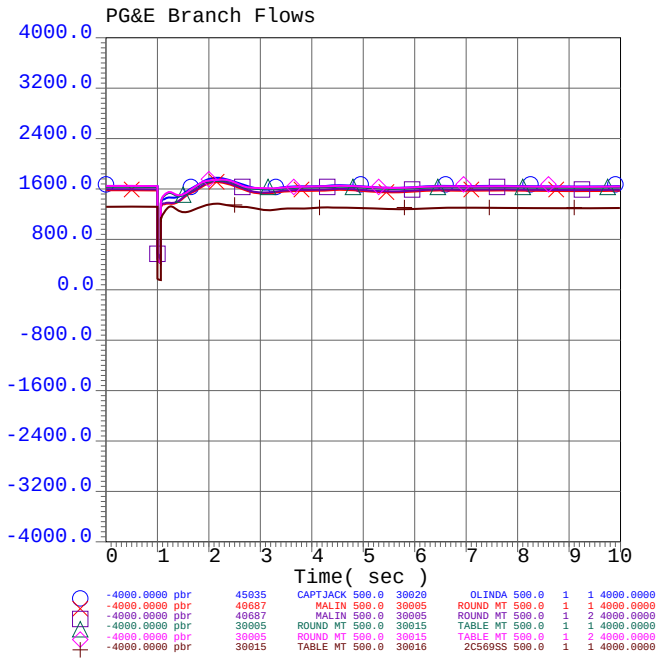
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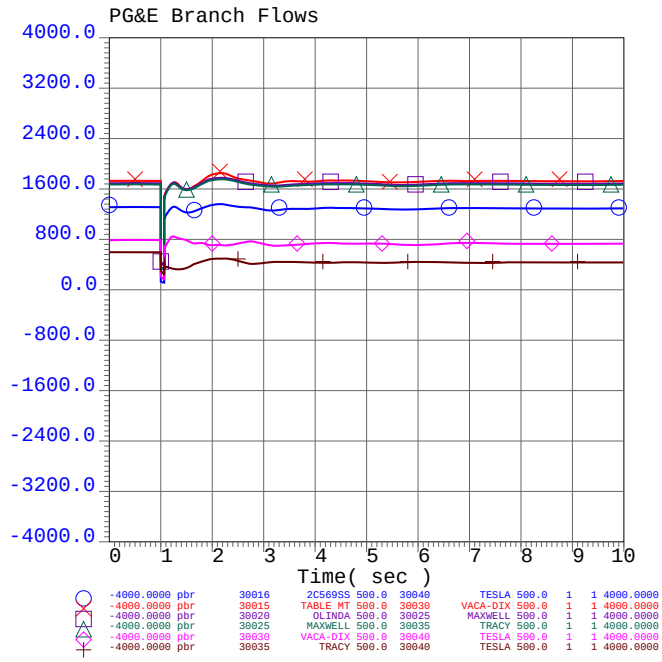
WECC RELATIVE ROTOR ANGLES

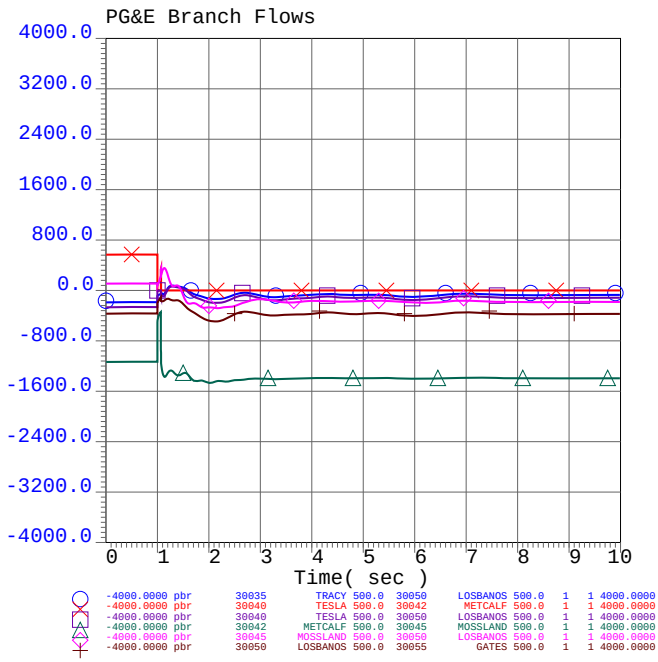


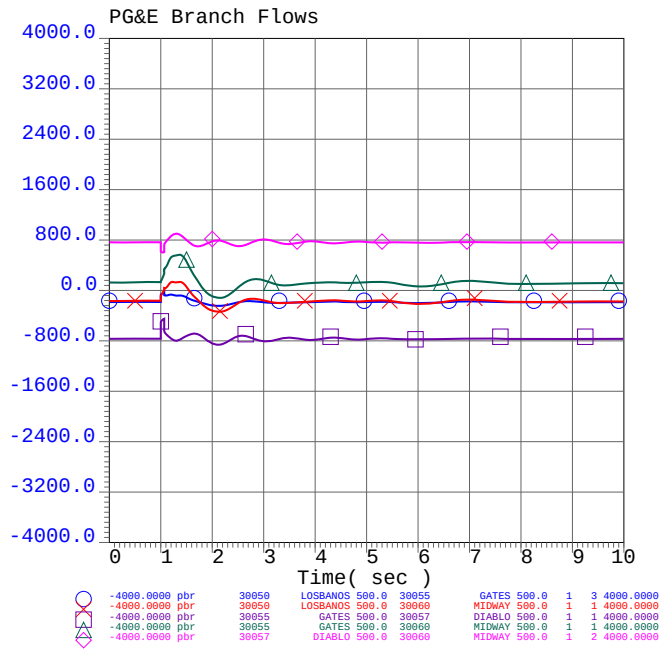
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SELECT BRANCH FLOWS





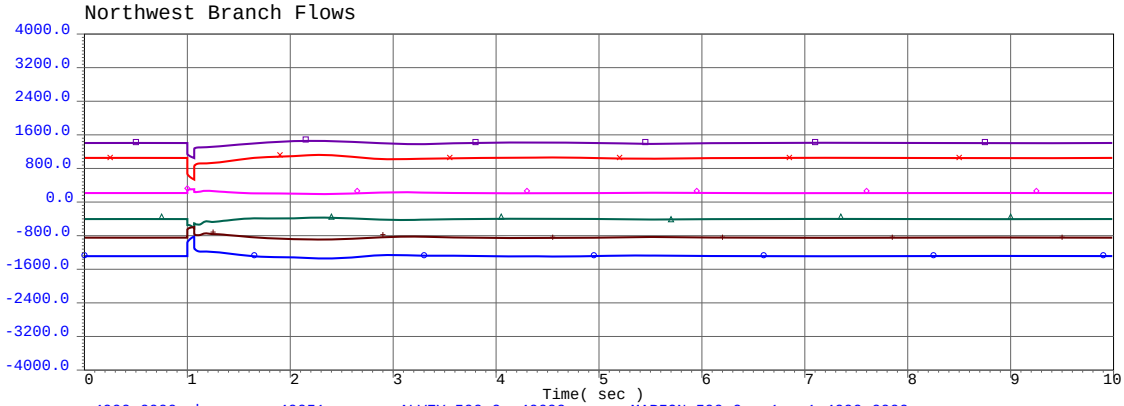




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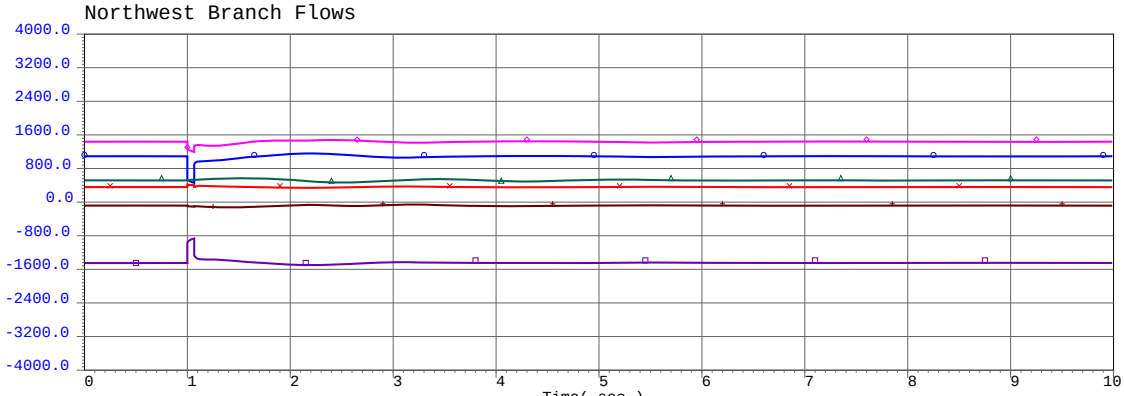
SELECT BRANCH FLOWS

Northwest Branch Flows



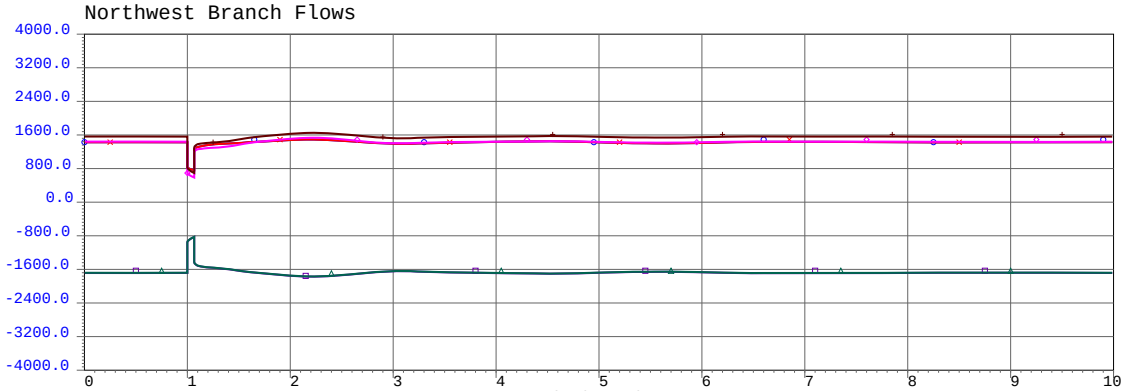
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

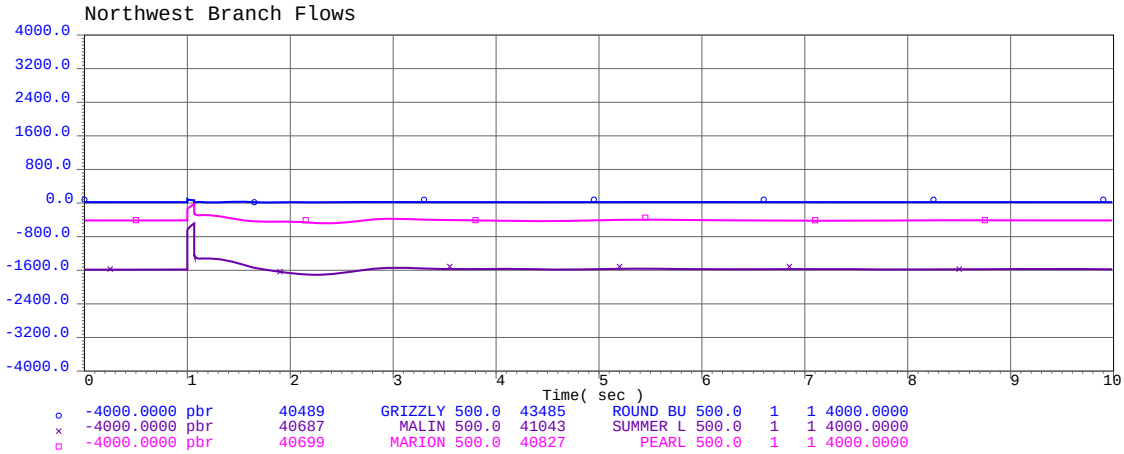
Northwest Branch Flows

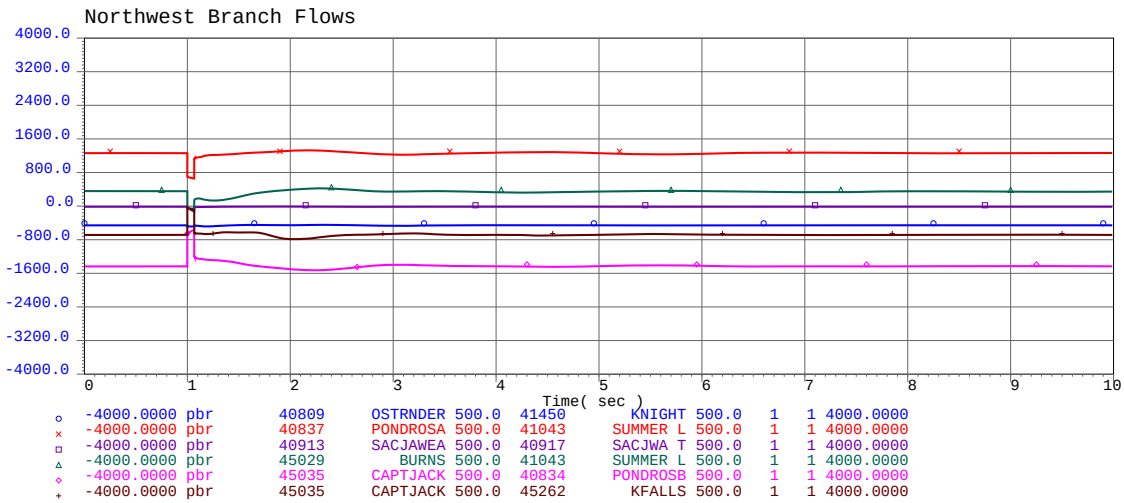


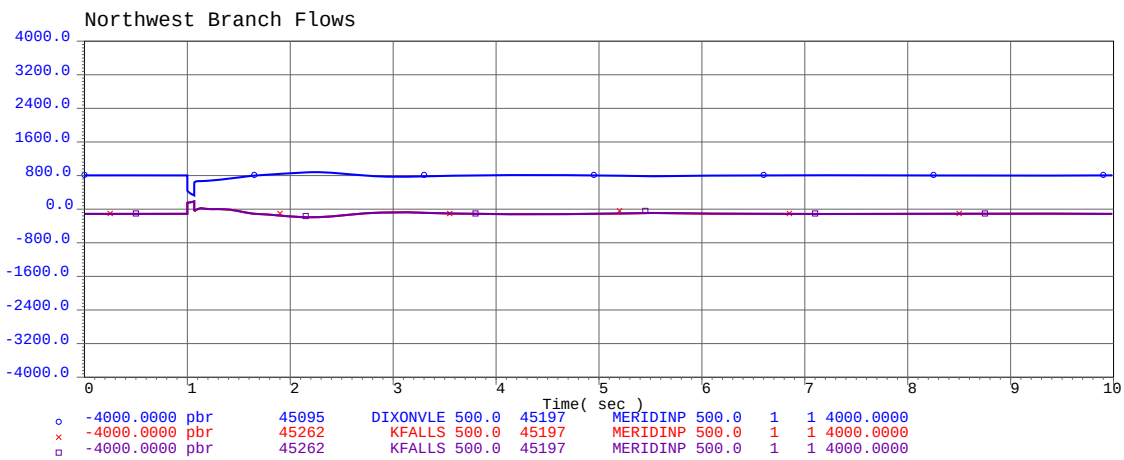
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tesla 500 kV
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SELECT BRANCH FLOWS

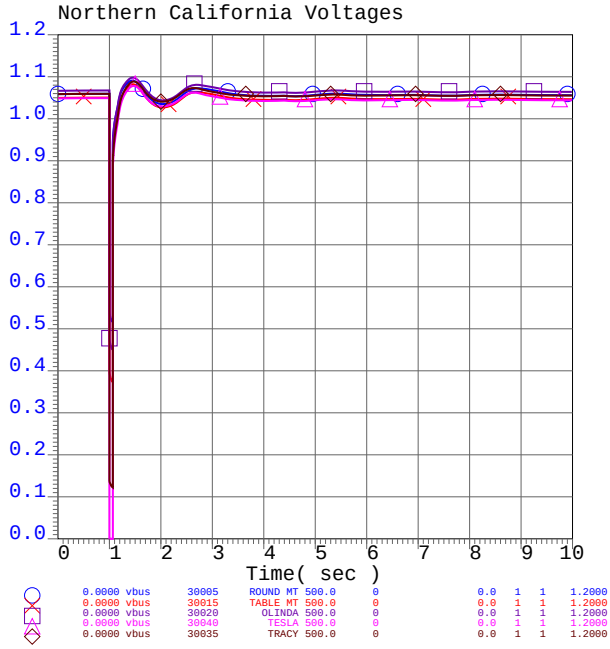


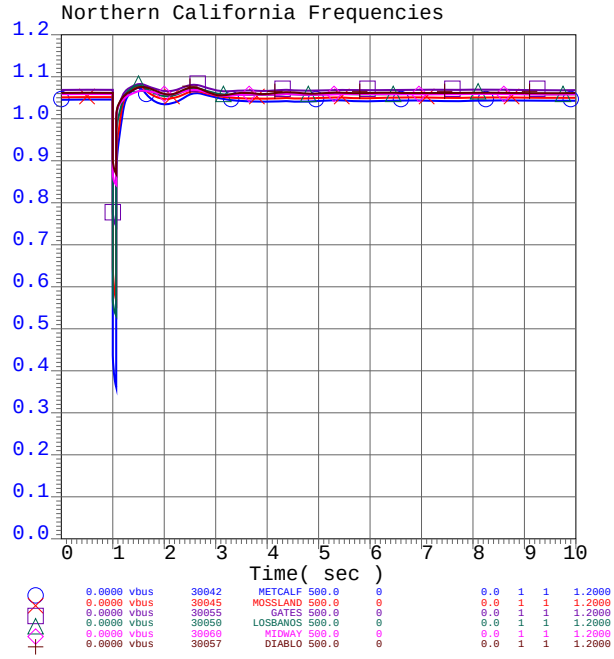


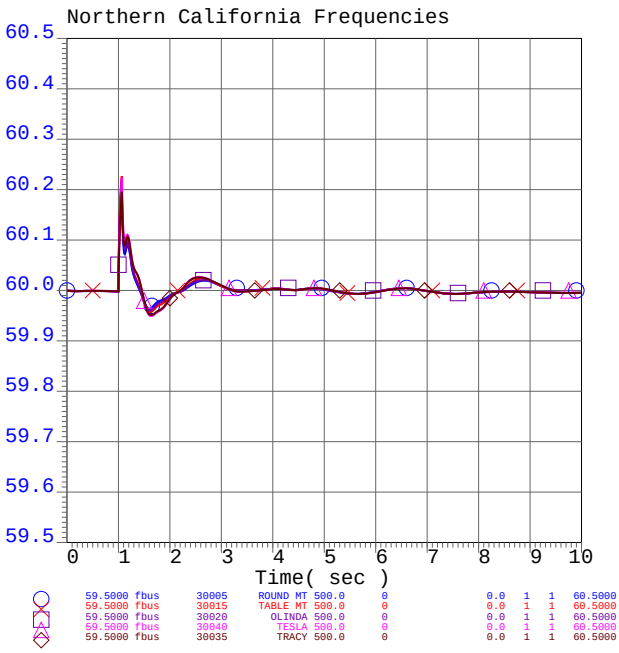


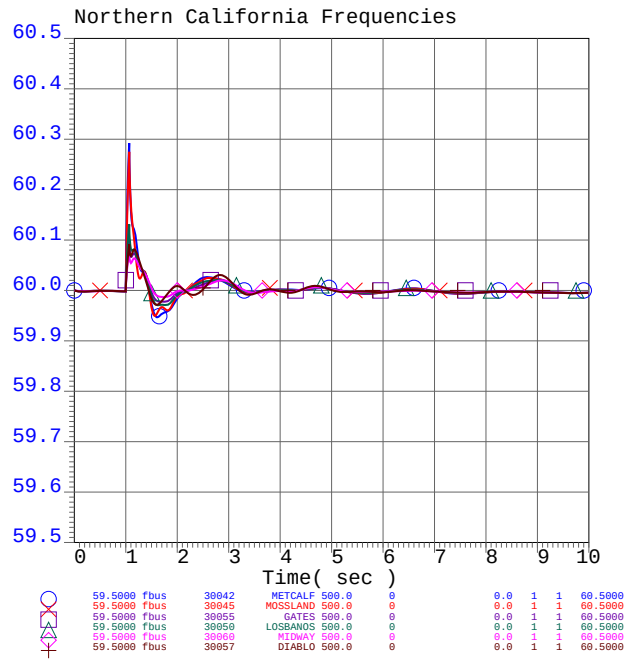
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WECC AREA VOLTAGE AND FREQUENCIES



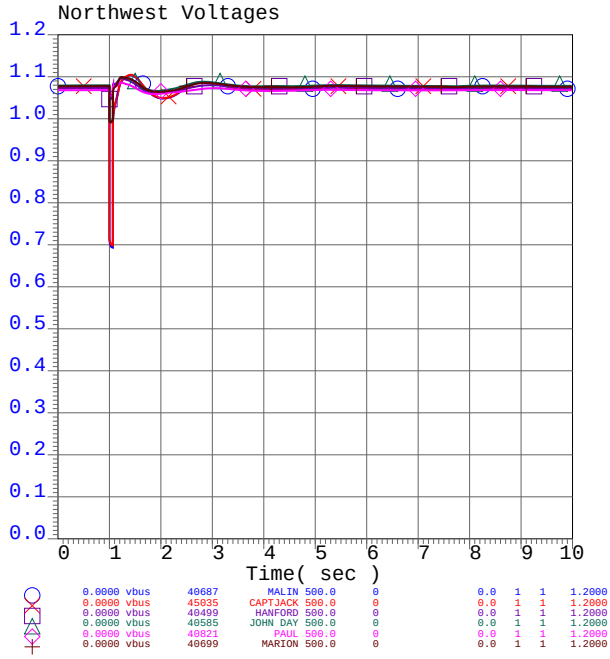


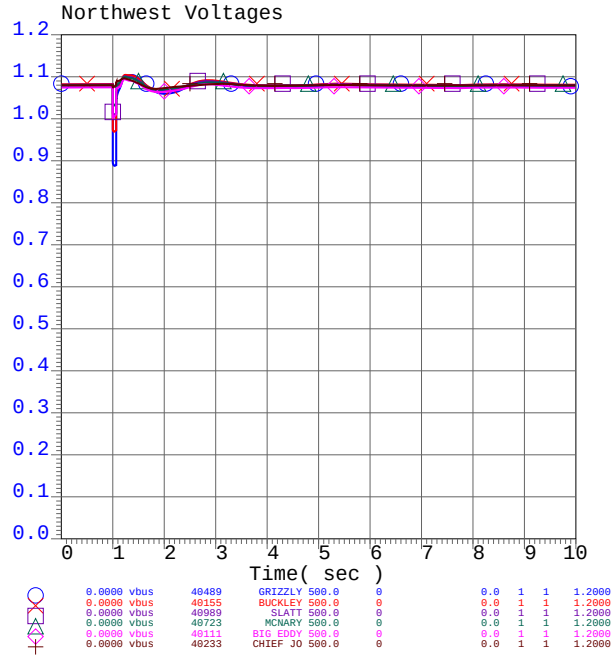


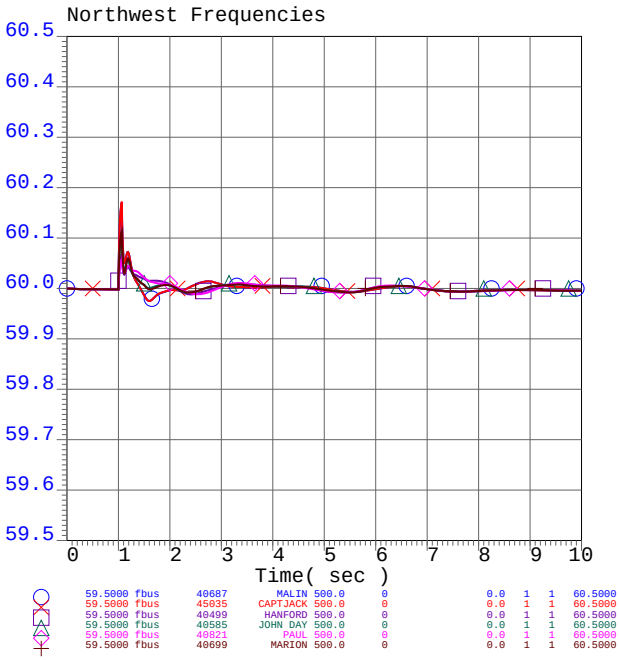


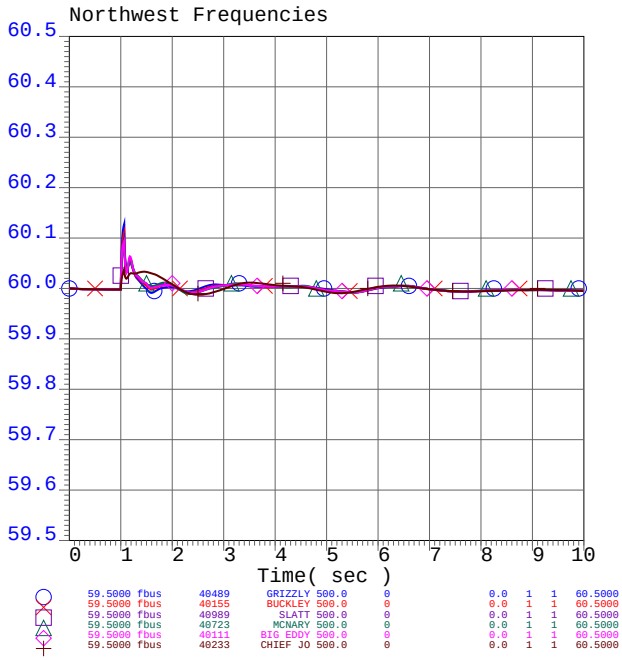
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WECC AREA VOLTAGE AND FREQUENCIES





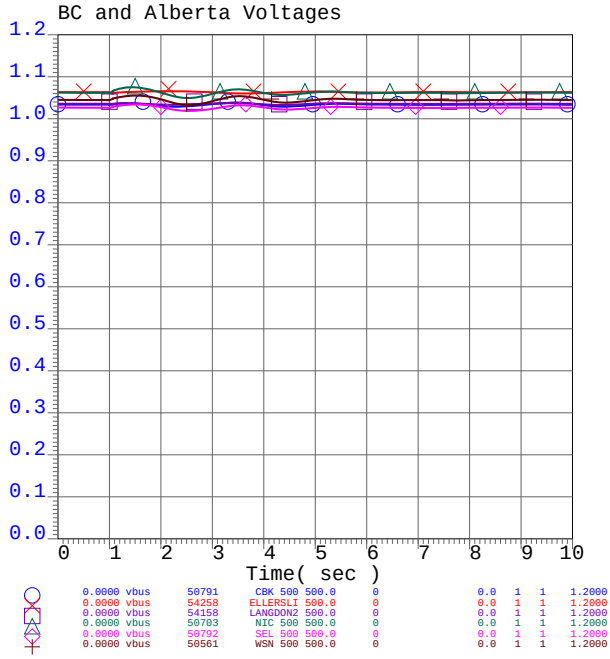




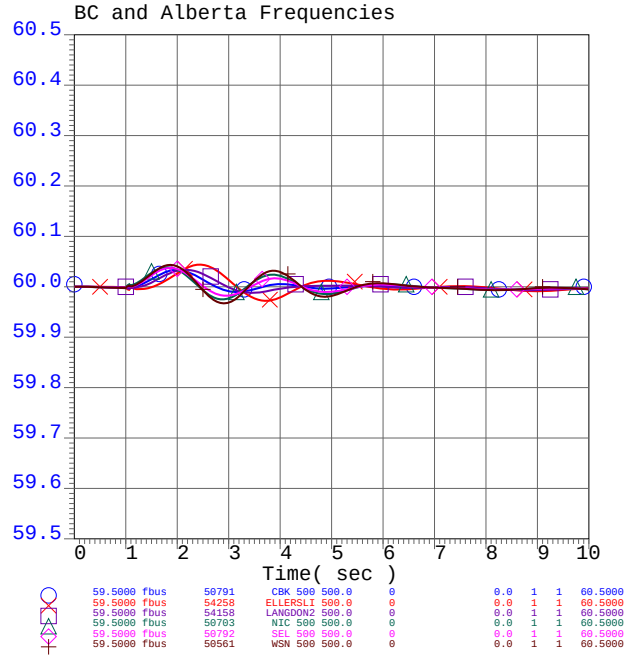
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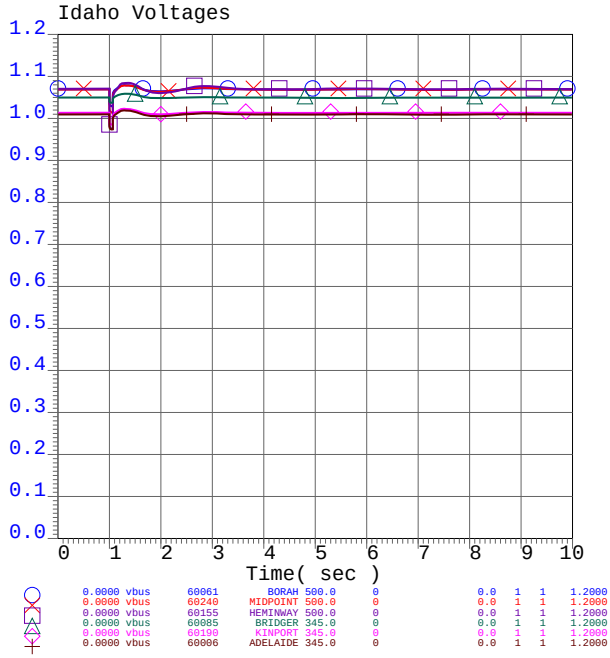
BC and Alberta Voltages



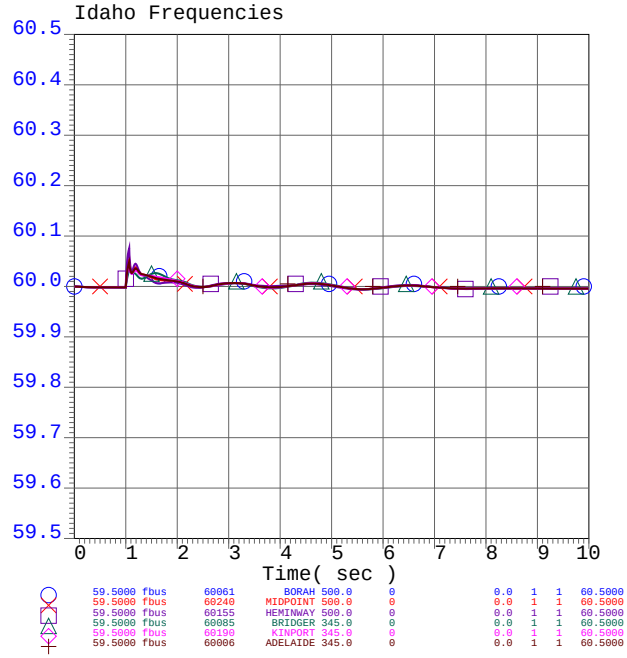
BC and Alberta Frequencies



Idaho Voltages



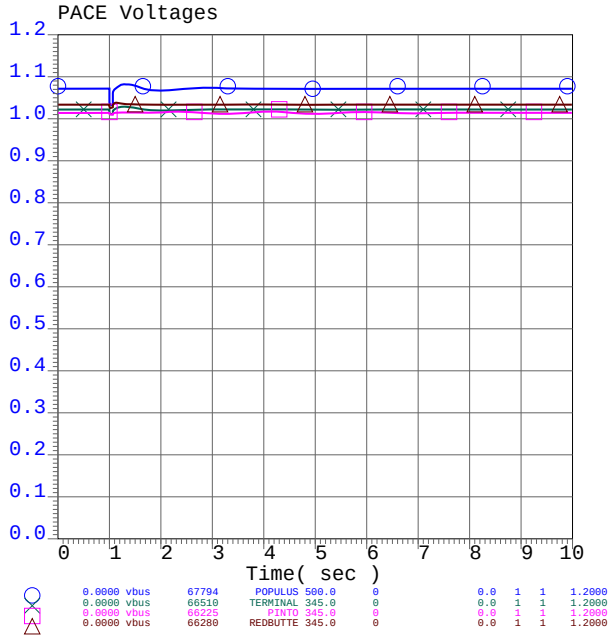
Idaho Frequencies



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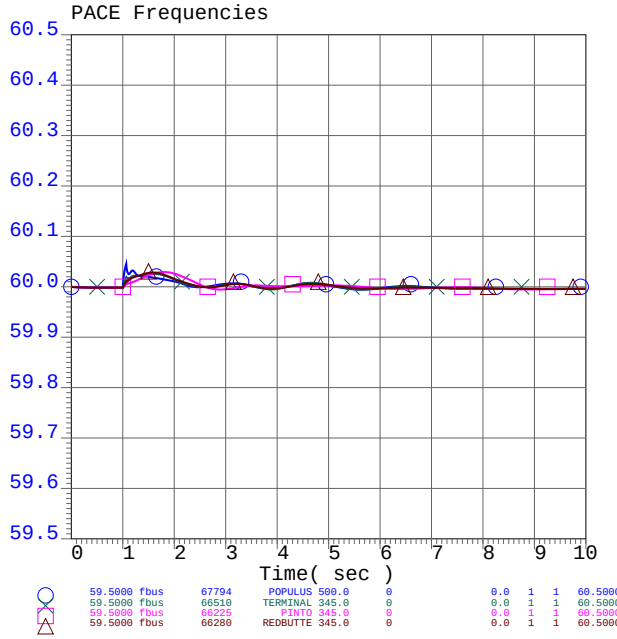
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



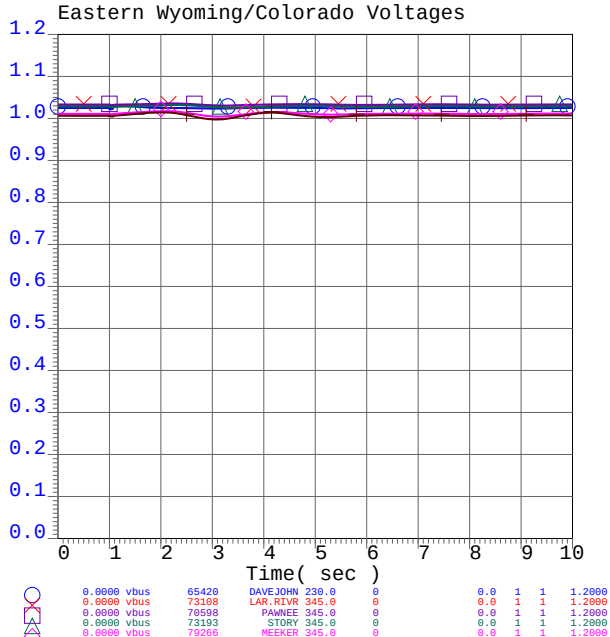
0.0000 vbus	67794	POPULUS 500.0	0	0.0	1	1	1.2000
0.0000 vbus	66510	TERMINAL 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66225	PINTO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66280	REDBUTTE 345.0	0	0.0	1	1	1.2000

PACE Frequencies



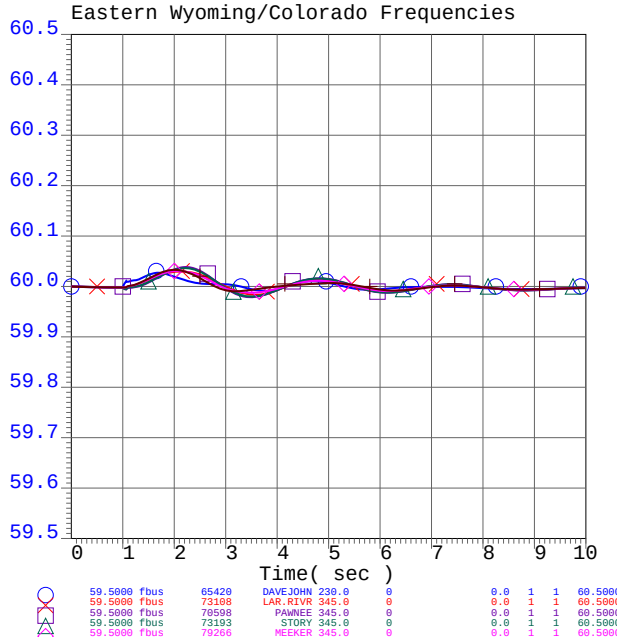
59.5000 fbus	67794	POPULUS 500.0	0	0.0	1	1	60.5000
59.5000 fbus	66510	TERMINAL 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66225	PINTO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66280	REDBUTTE 345.0	0	0.0	1	1	60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus	65420	DAVEJOHN 230.0	0	0.0	1	1	1.2000
0.0000 vbus	73108	LAR.RIVR 345.0	0	0.0	1	1	1.2000
0.0000 vbus	70598	PAWNEE 345.0	0	0.0	1	1	1.2000
0.0000 vbus	73193	STORY 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79266	MEEKER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79049	MONTROSE 345.0	0	0.0	1	1	1.2000

Eastern Wyoming/Colorado Frequencies

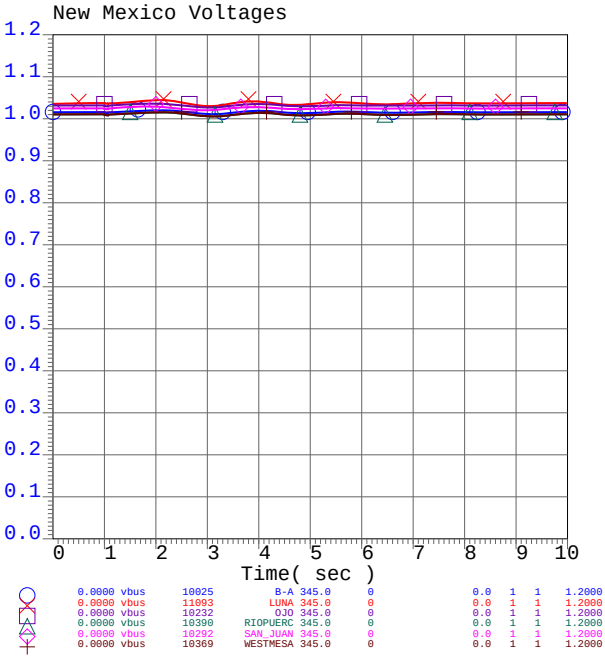


59.5000 fbus	65420	DAVEJOHN 230.0	0	0.0	1	1	60.5000
59.5000 fbus	73108	LAR.RIVR 345.0	0	0.0	1	1	60.5000
59.5000 fbus	70598	PAWNEE 345.0	0	0.0	1	1	60.5000
59.5000 fbus	73193	STORY 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79266	MEEKER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79049	MONTROSE 345.0	0	0.0	1	1	60.5000

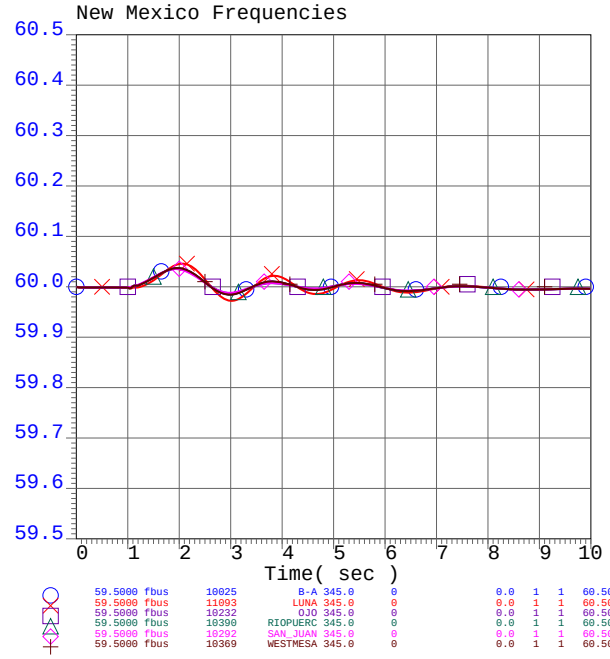
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WECC AREA VOLTAGE AND FREQUENCIES

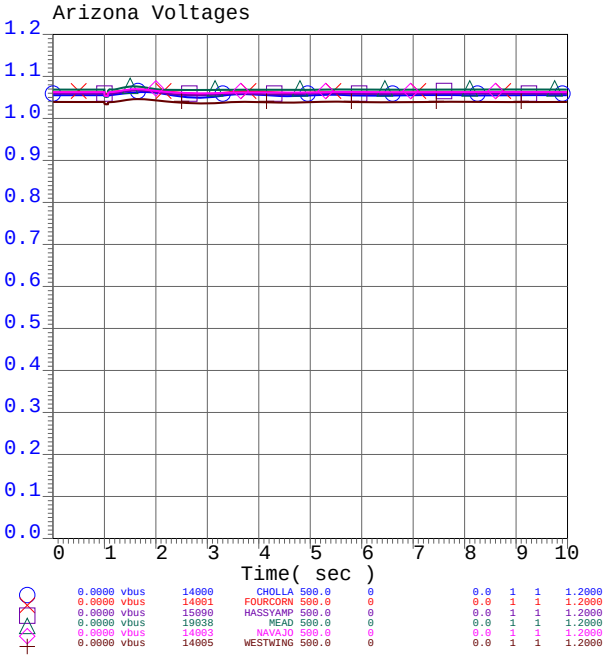
New Mexico Voltages



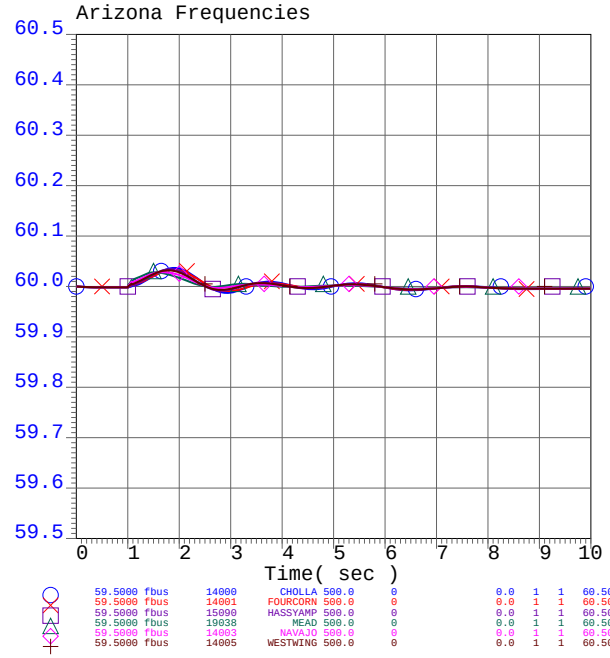
New Mexico Frequencies



Arizona Voltages

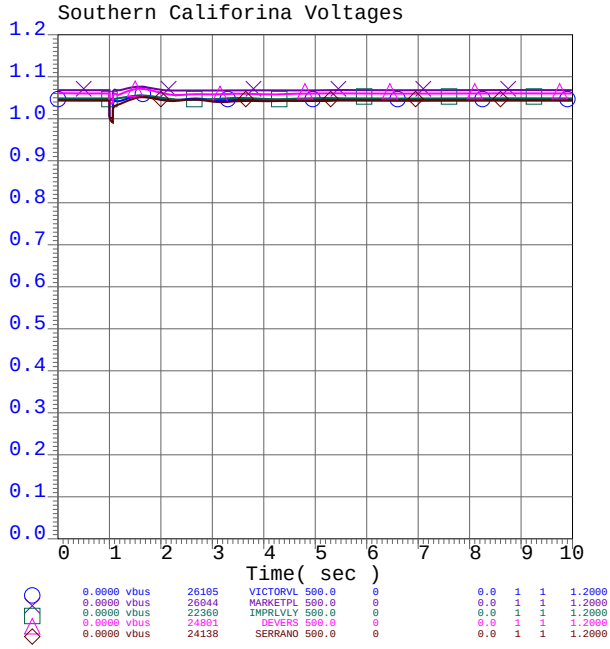


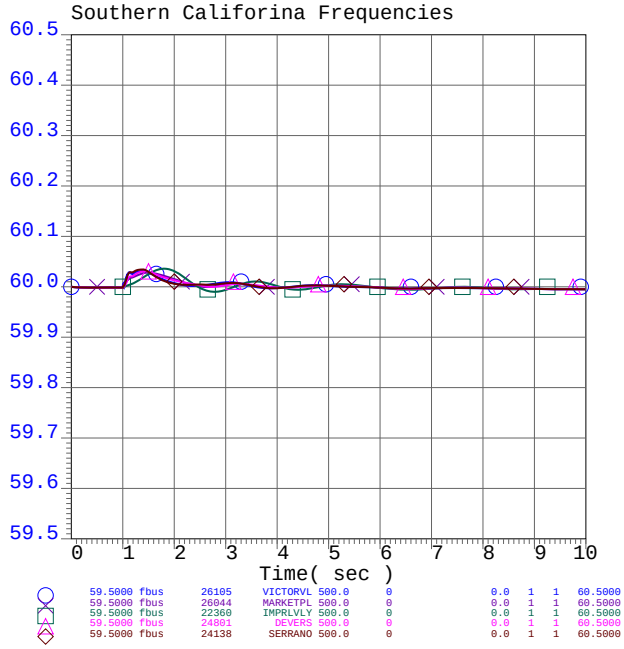
Arizona Frequencies

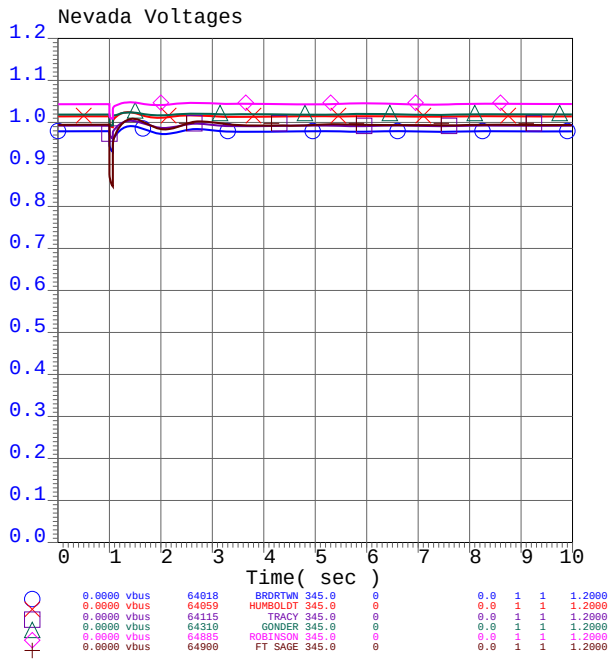


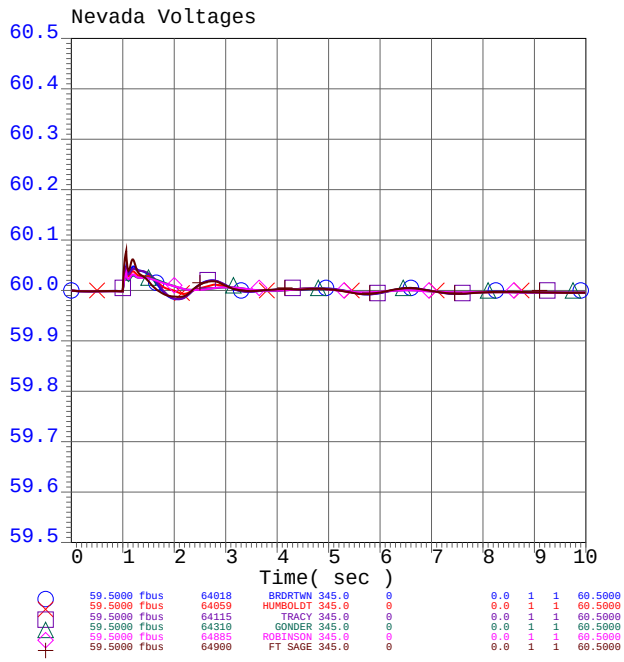
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3-phase 4 cycle fault at Tesla 500 kV
followed by loss of Tesla-Los Banos 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



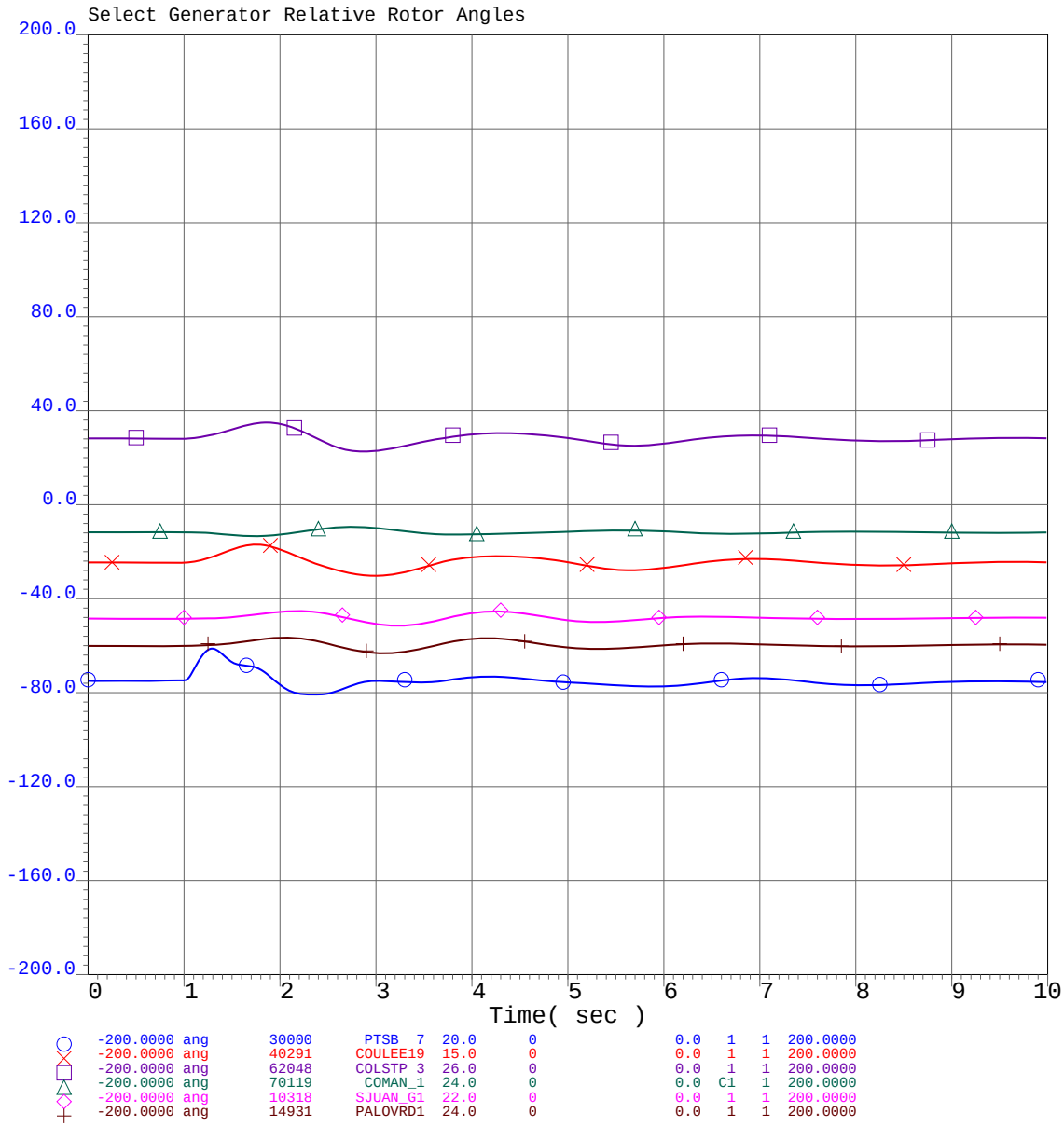






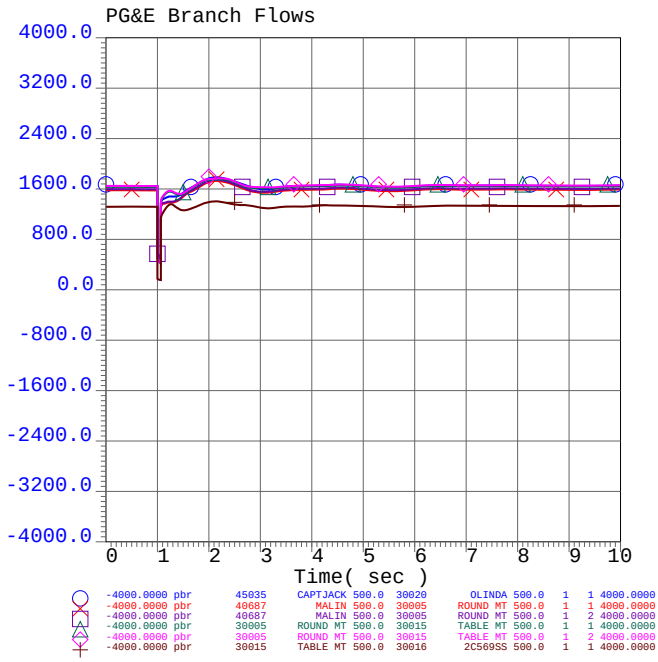
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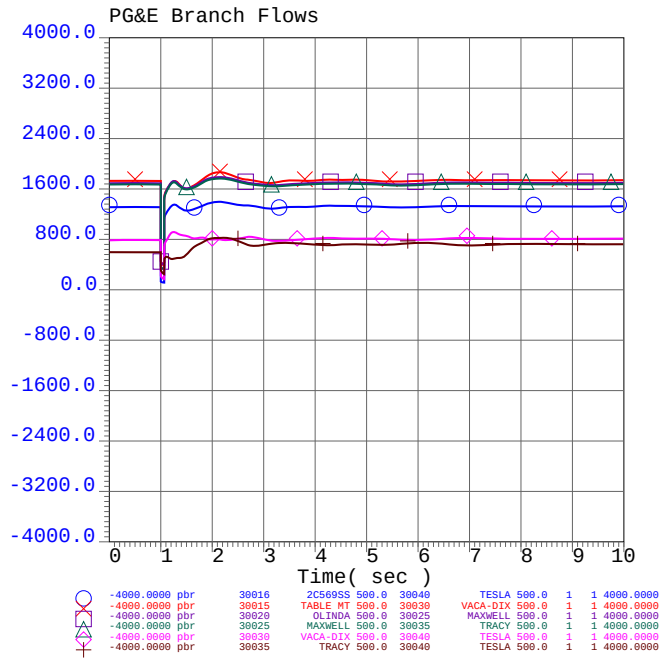
WECC RELATIVE ROTOR ANGLES

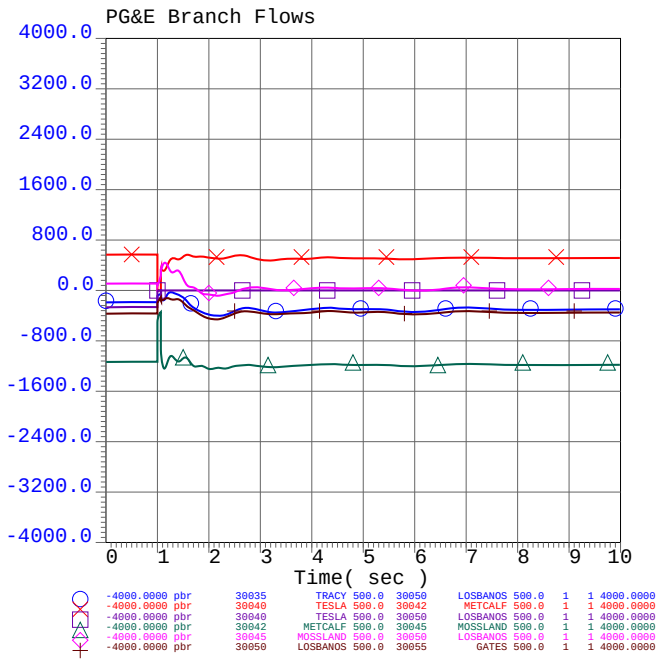


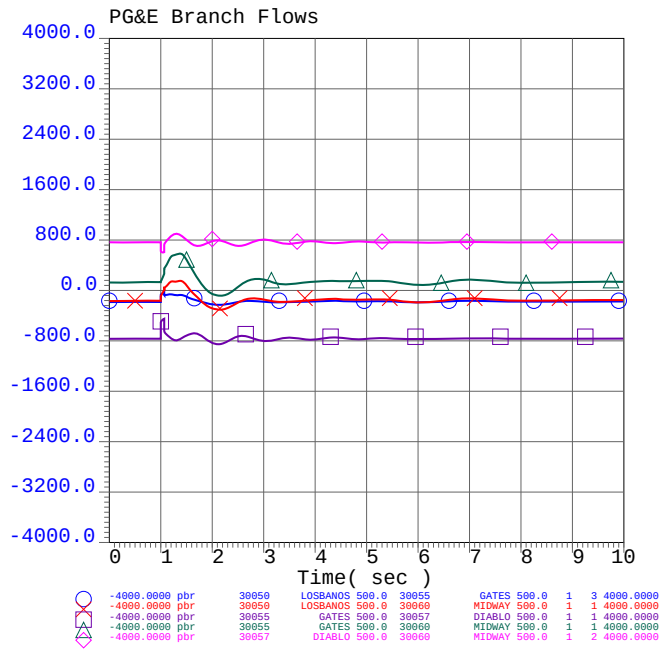
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SELECT BRANCH FLOWS



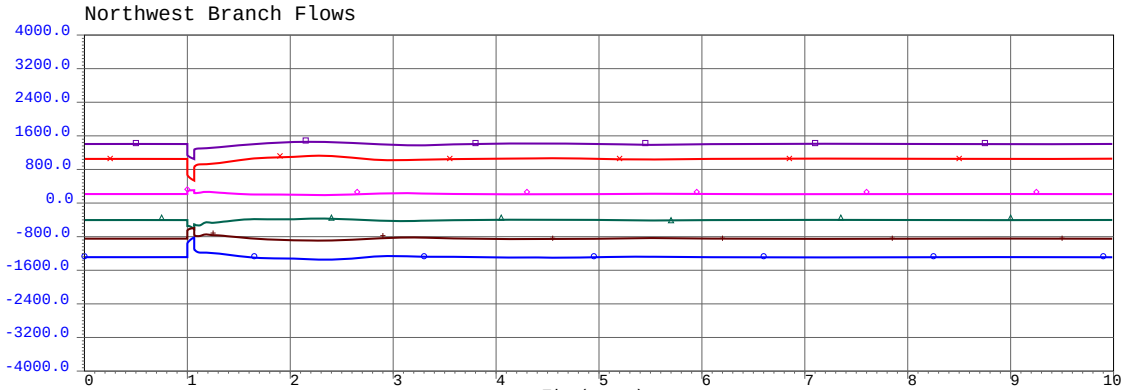




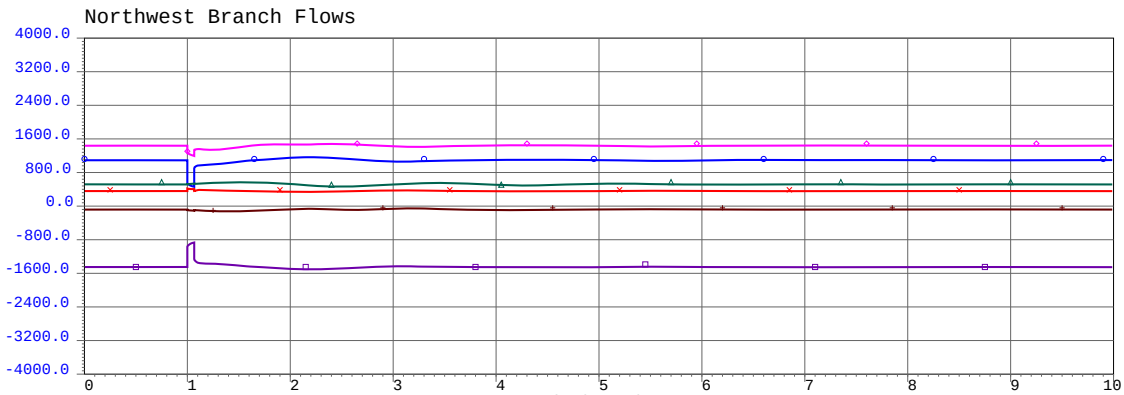


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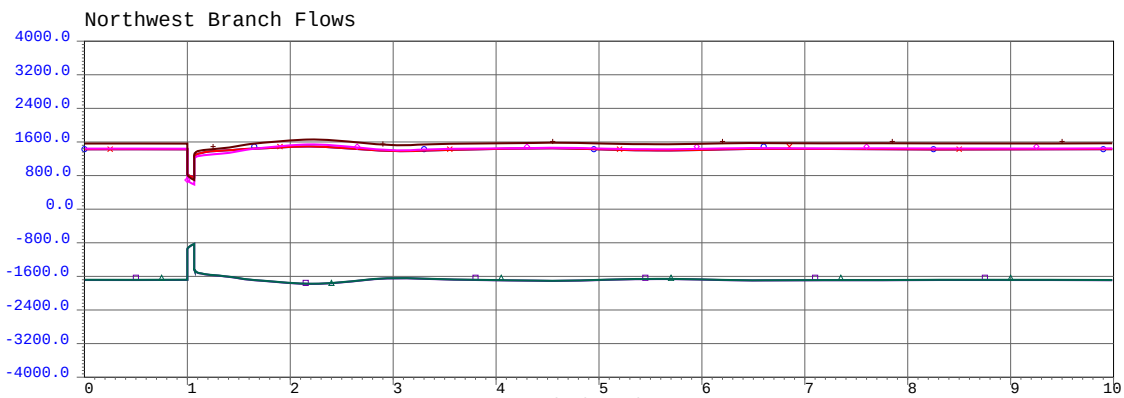
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



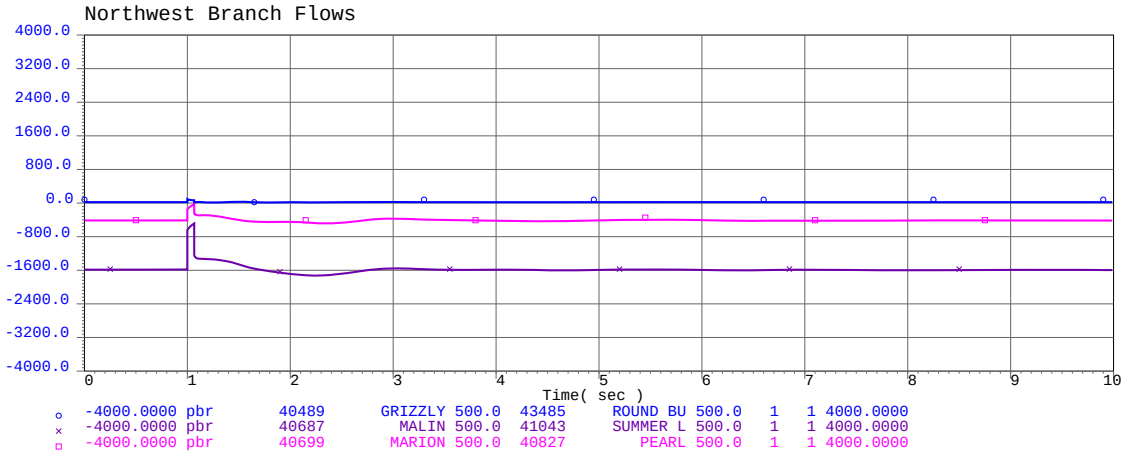
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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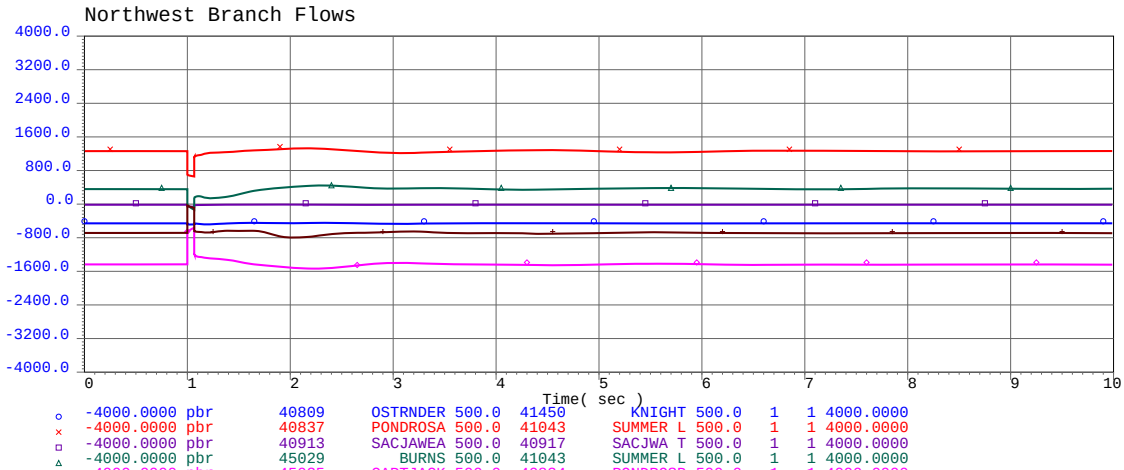
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tesla 500 kV
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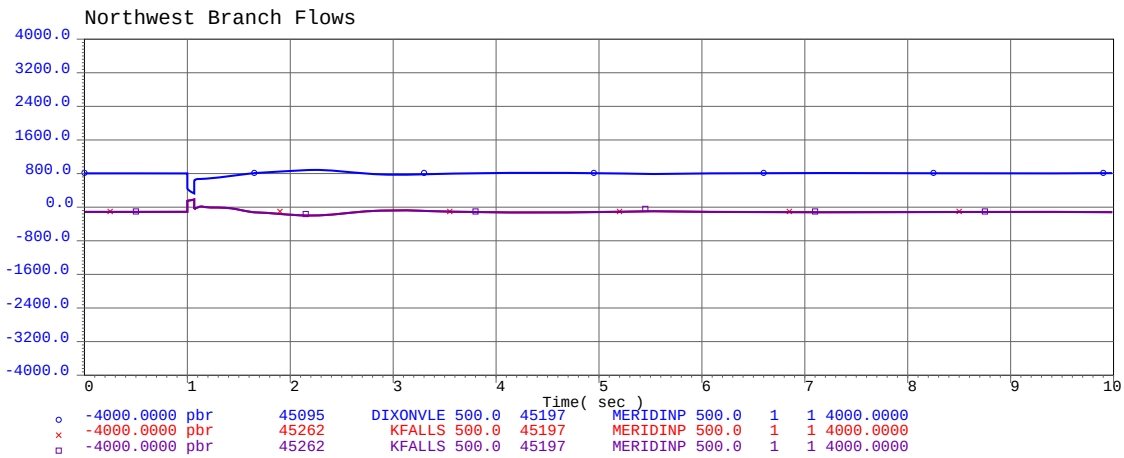
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



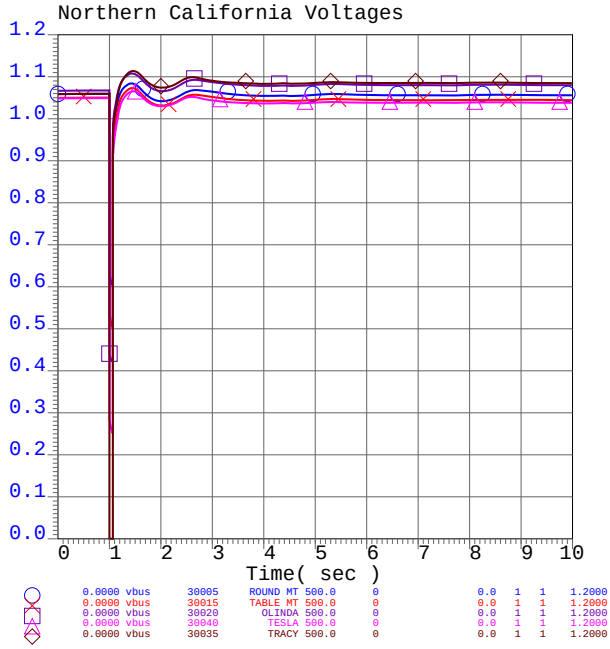
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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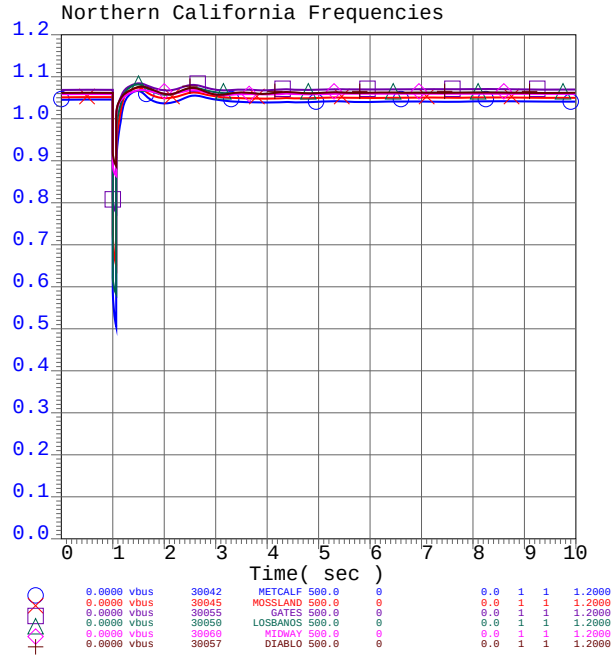


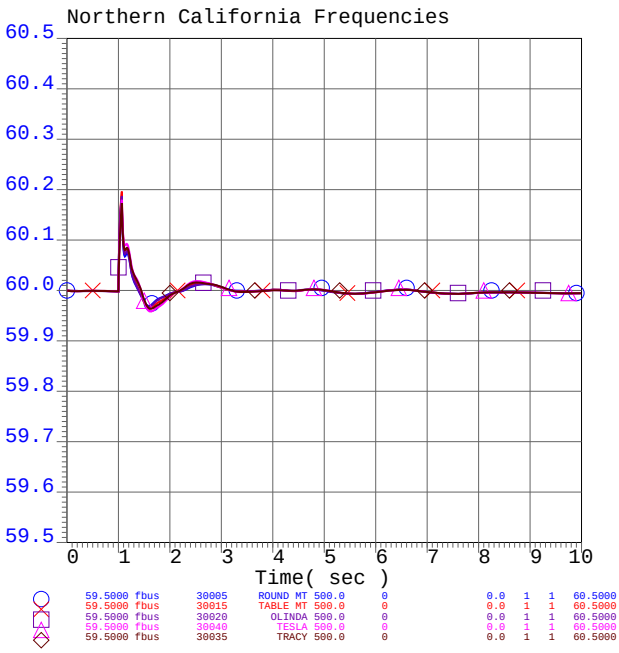
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

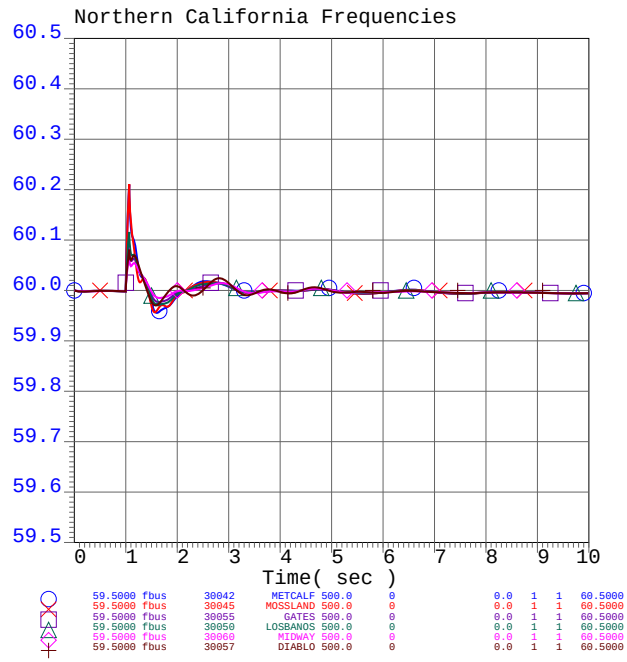
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WECC AREA VOLTAGE AND FREQUENCIES



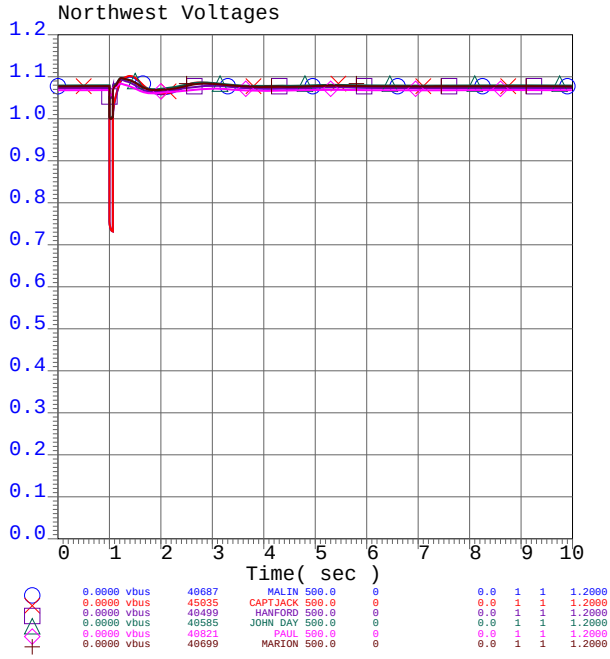


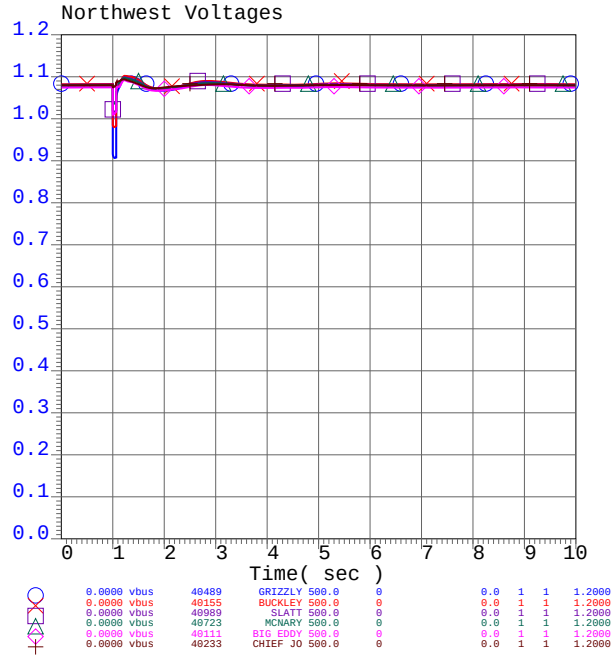


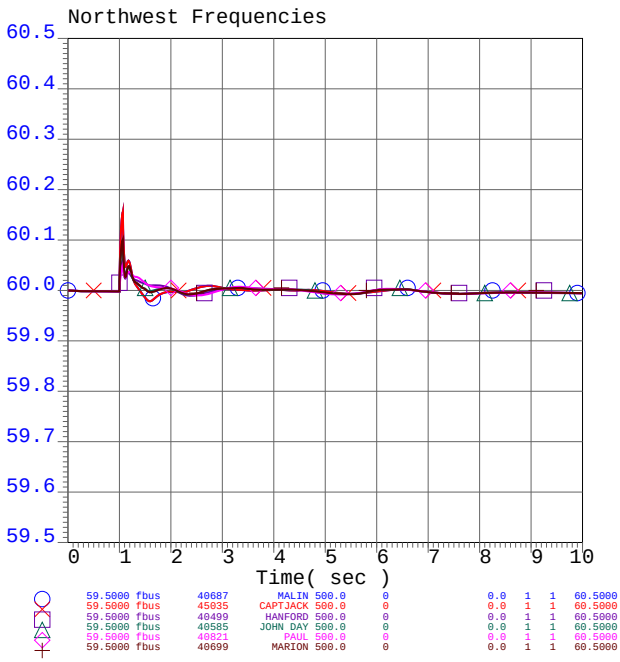


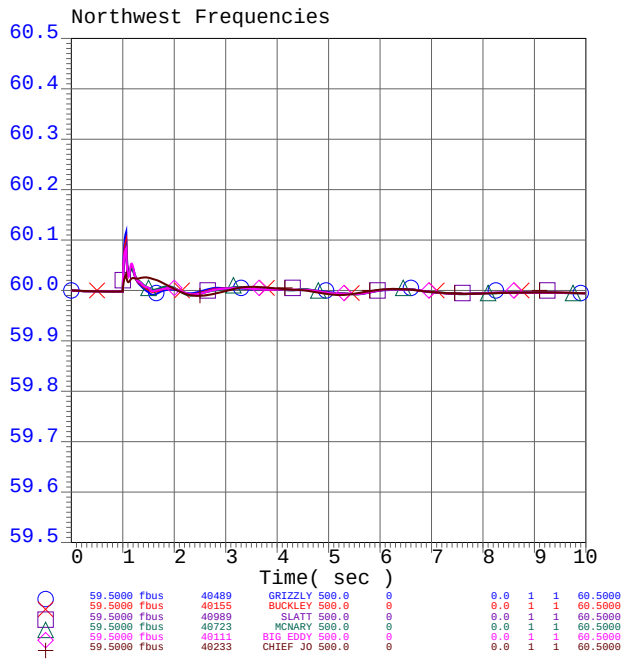
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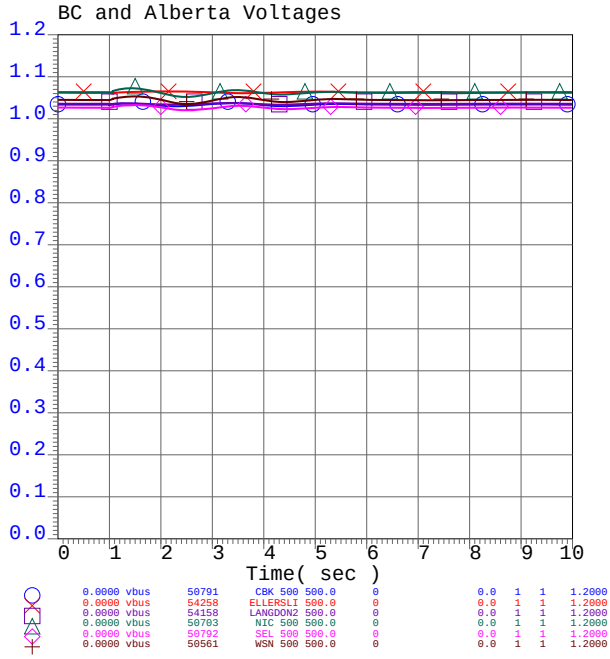


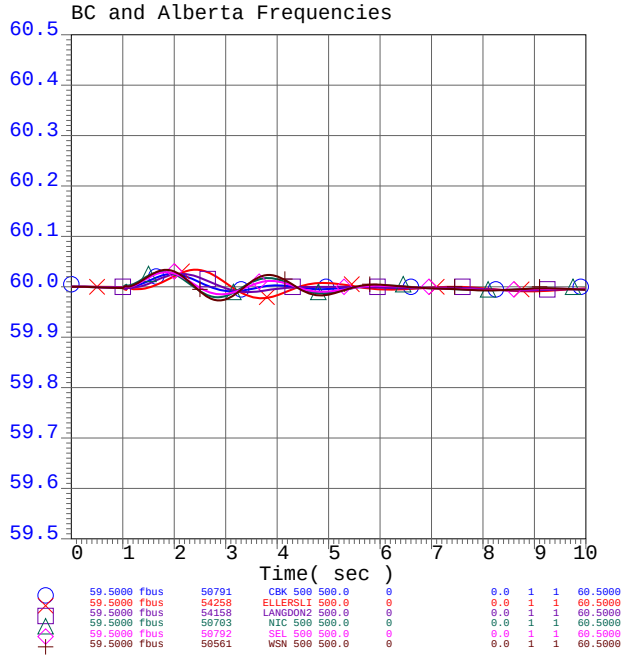


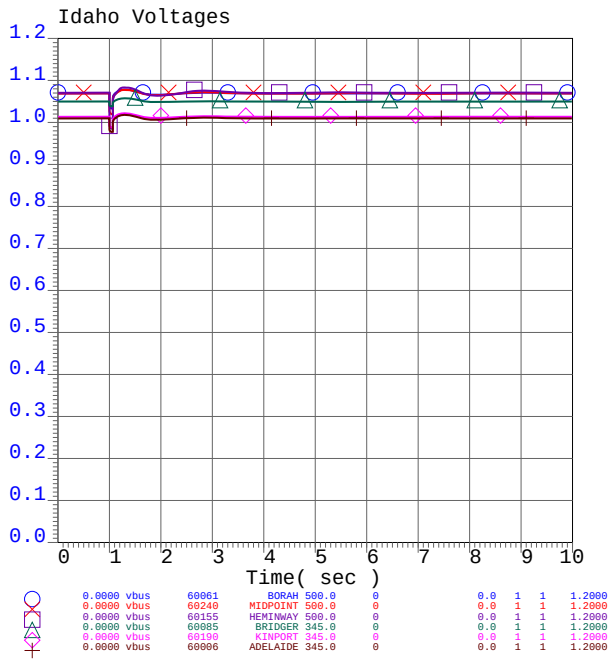


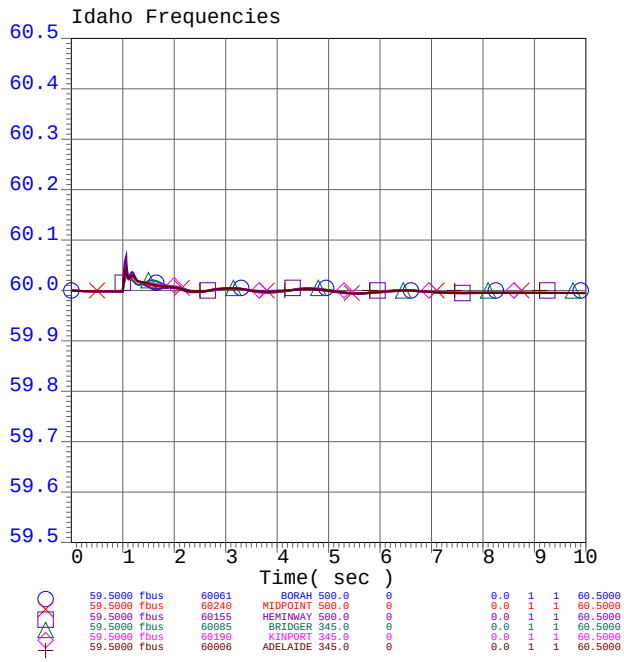
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WECC AREA VOLTAGE AND FREQUENCIES





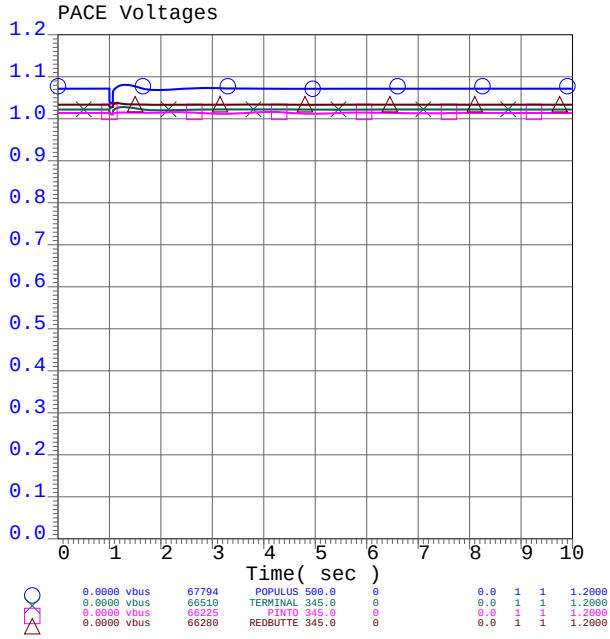




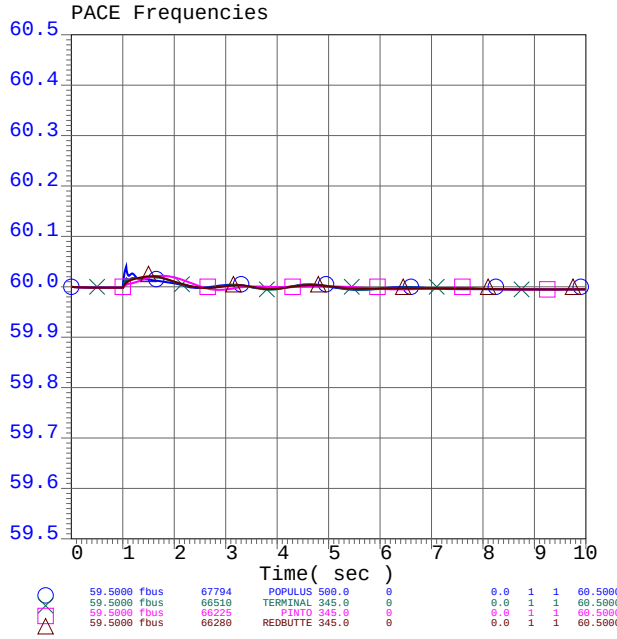
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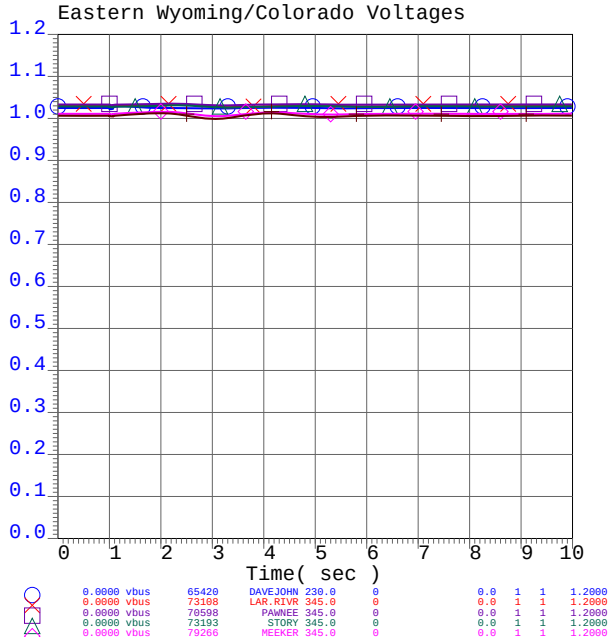
PACE Voltages



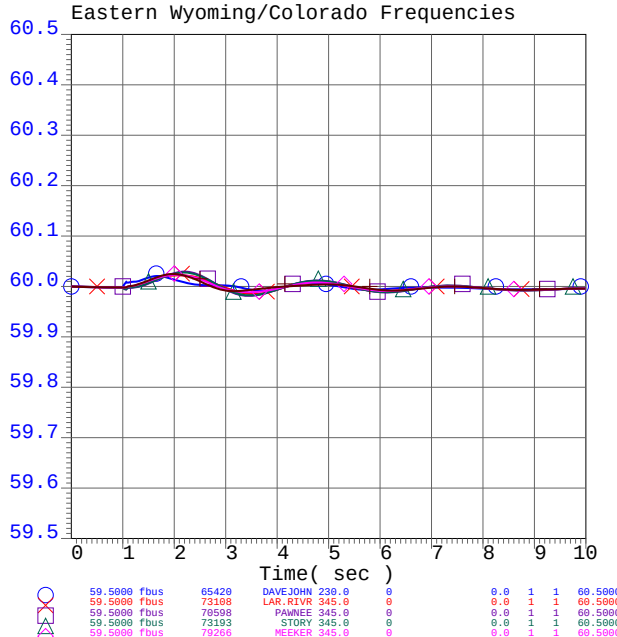
PACE Frequencies



Eastern Wyoming/Colorado Voltages

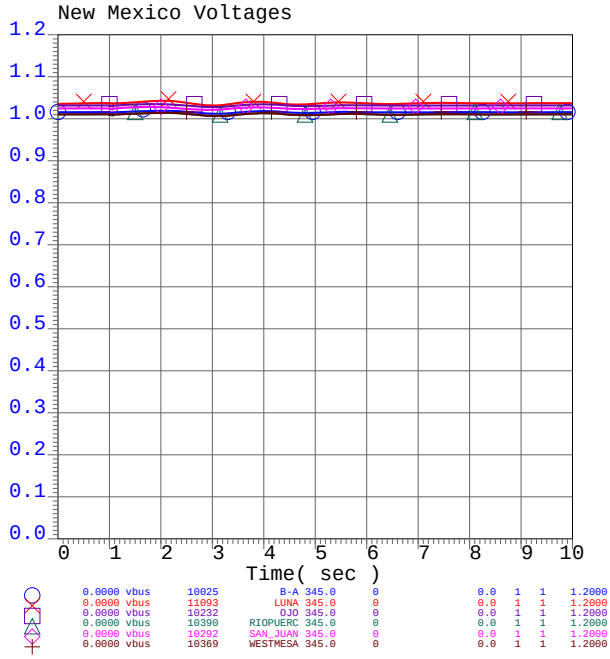


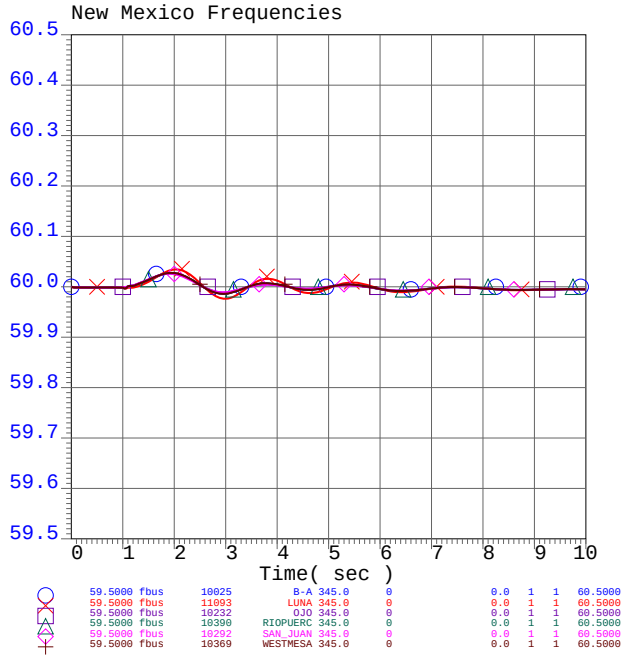
Eastern Wyoming/Colorado Frequencies

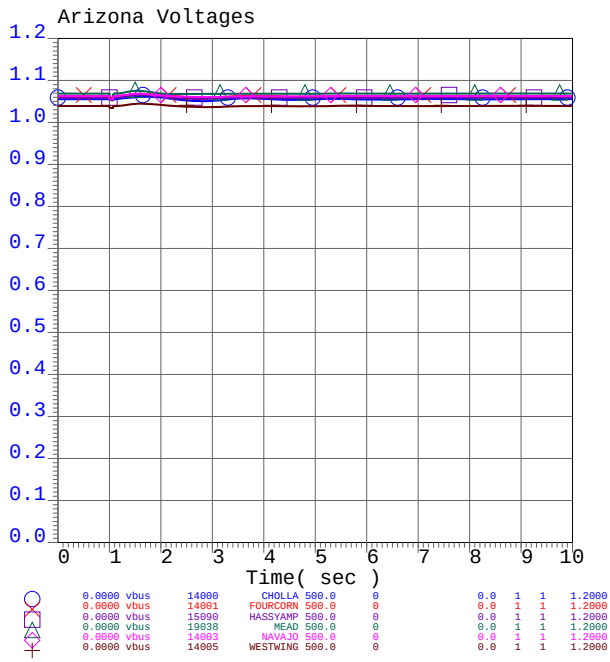


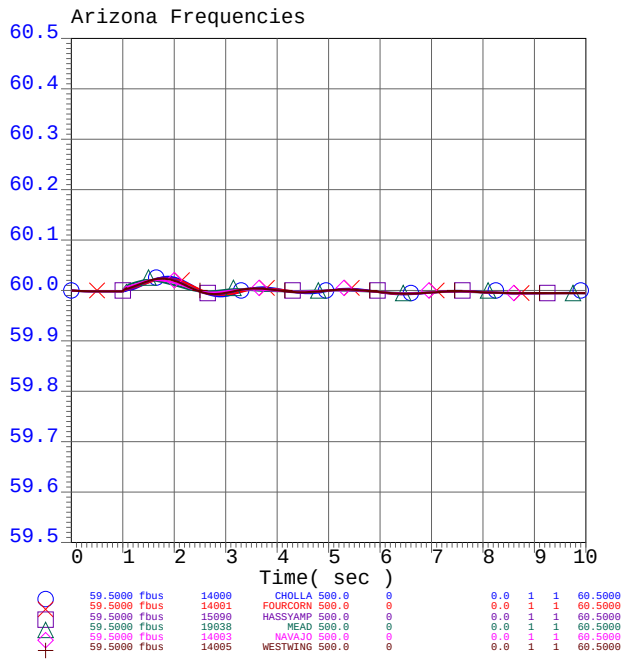
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WECC AREA VOLTAGE AND FREQUENCIES



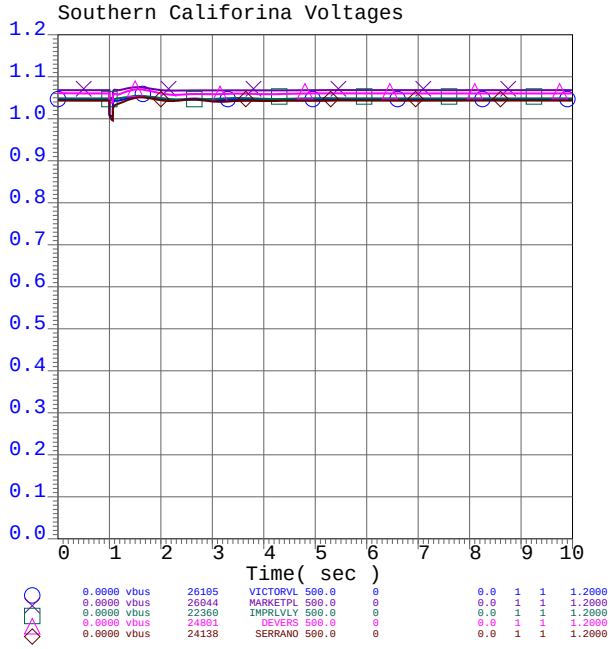


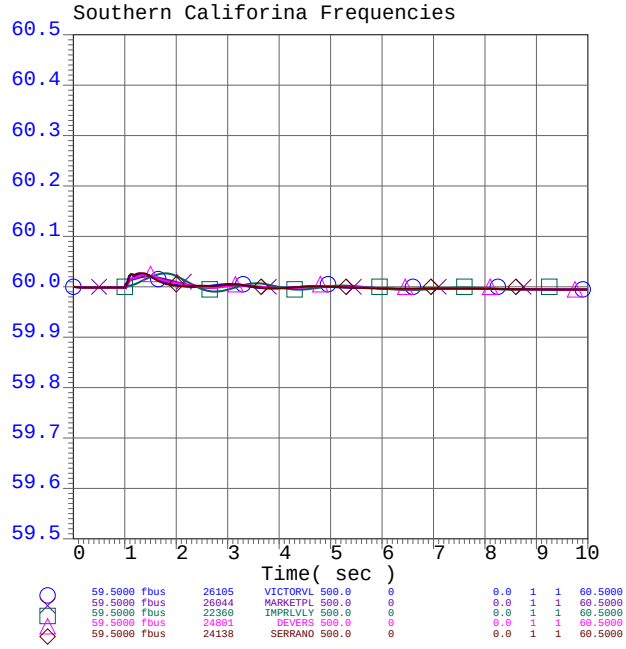


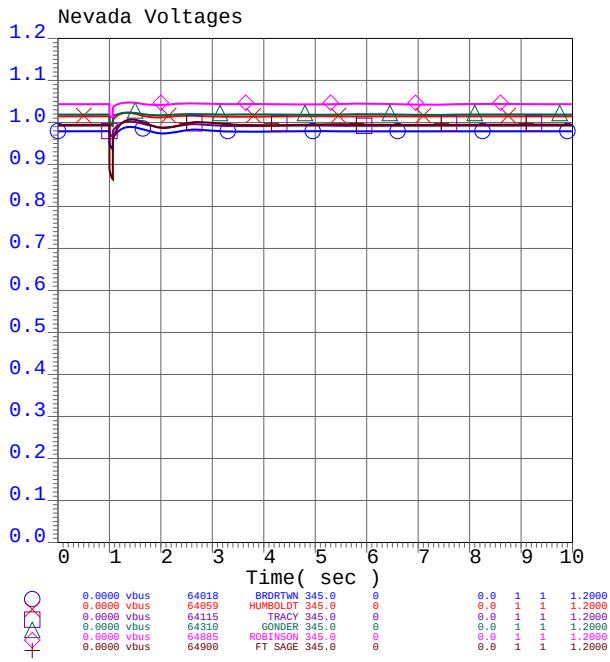


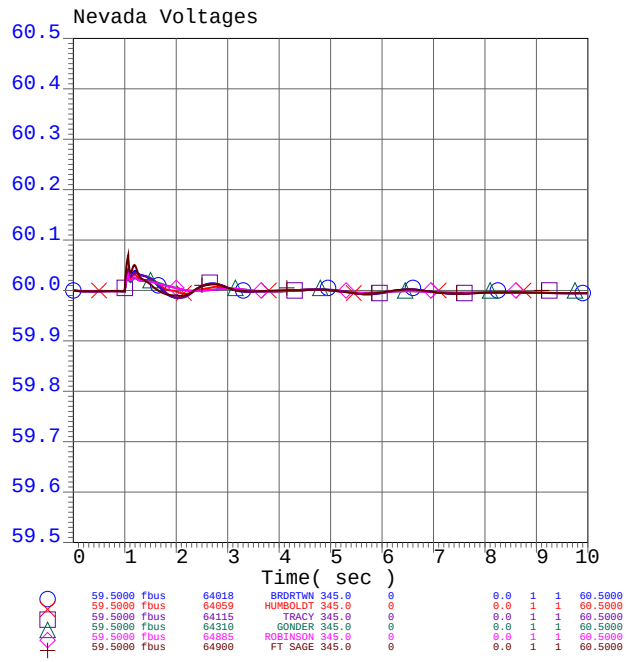
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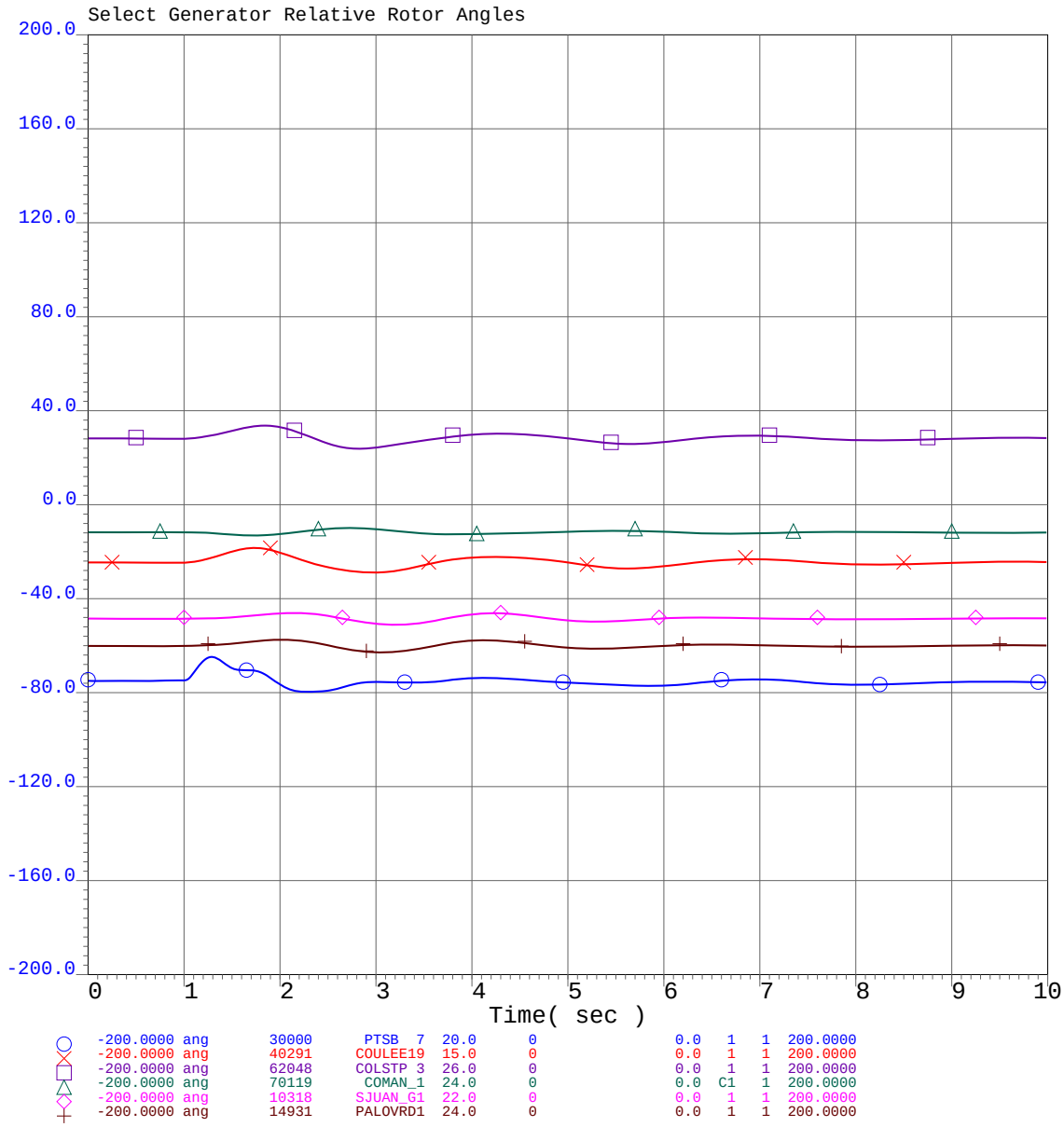






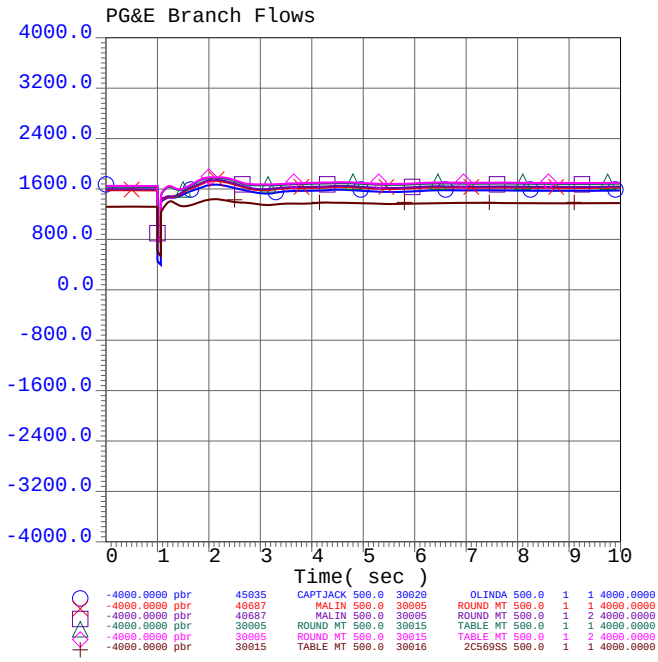
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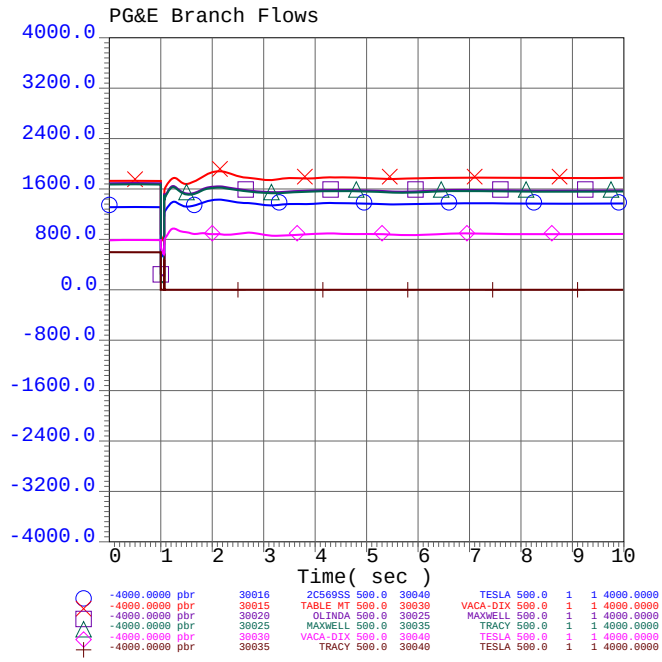
WECC RELATIVE ROTOR ANGLES

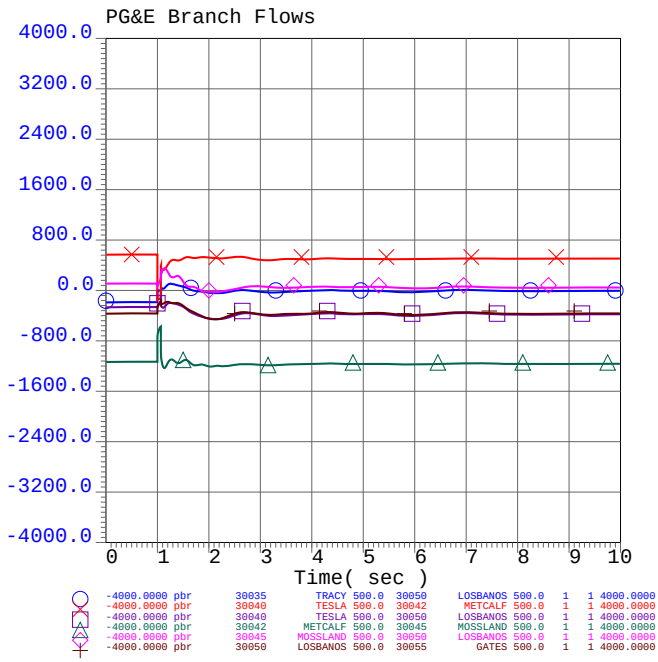


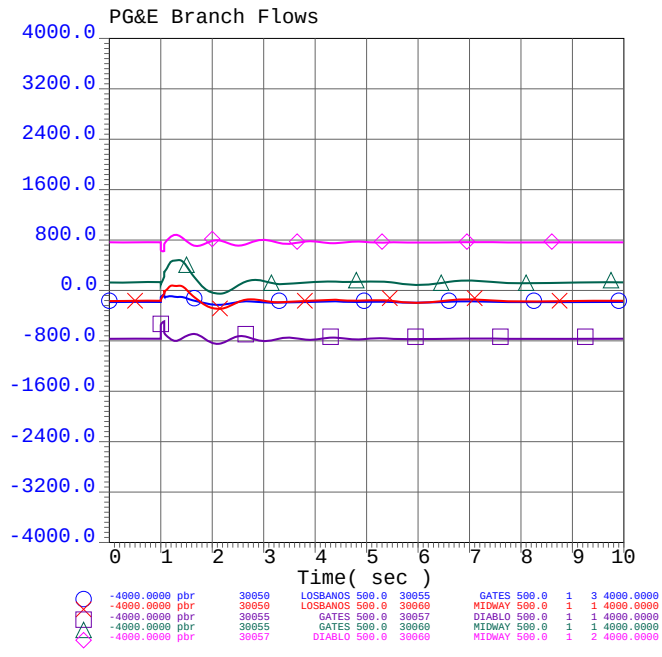
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tracy 500 kV
followed by loss of Tracy-Tesla 500 kV line

SELECT BRANCH FLOWS





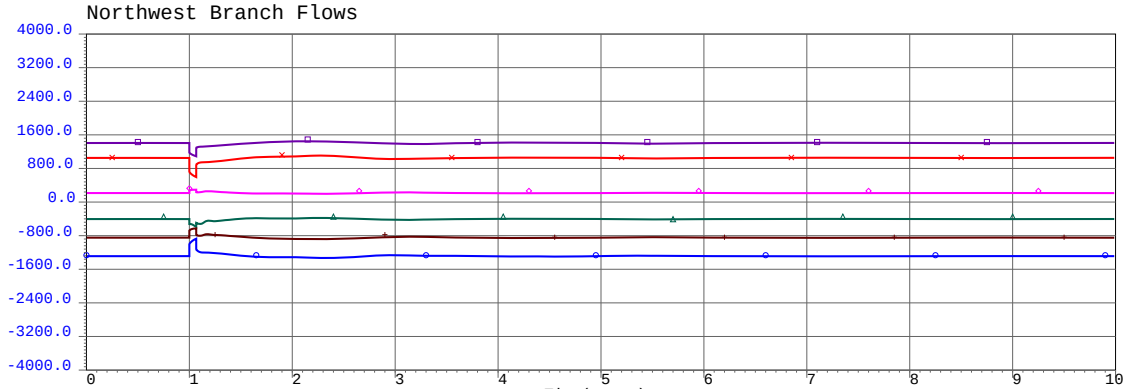




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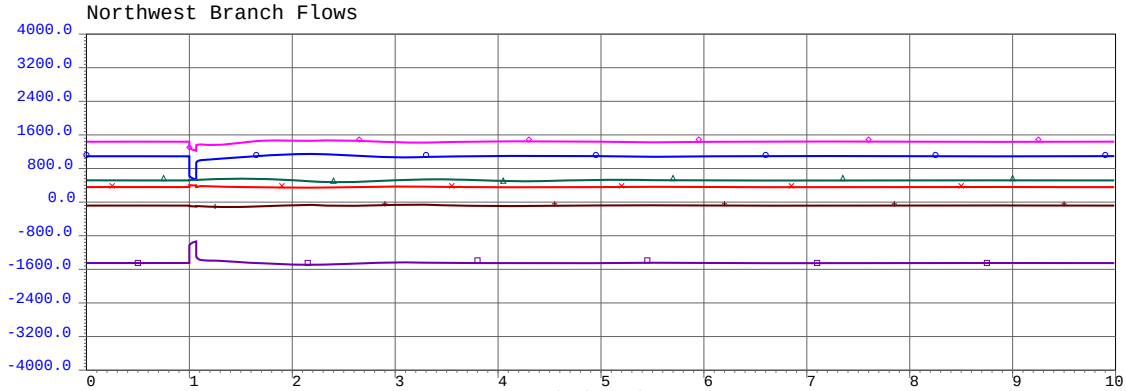
SELECT BRANCH FLOWS

Northwest Branch Flows



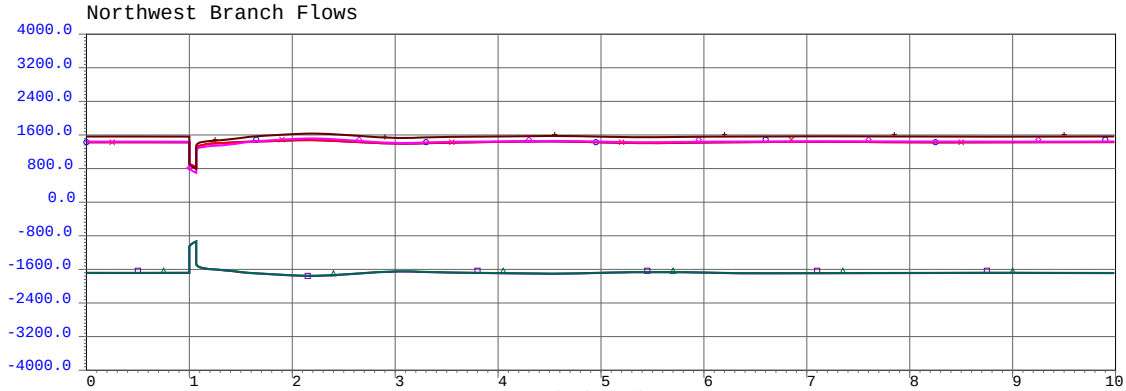
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
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-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

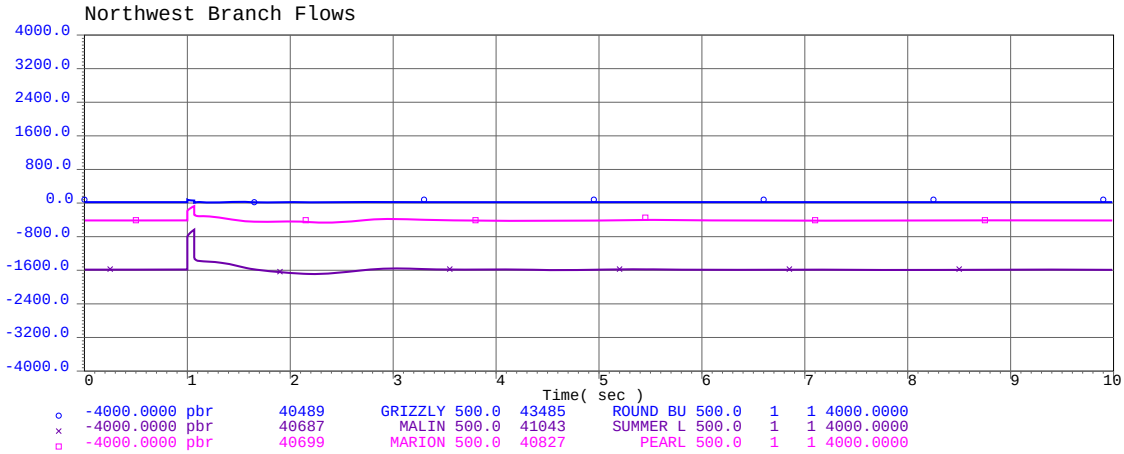
Northwest Branch Flows

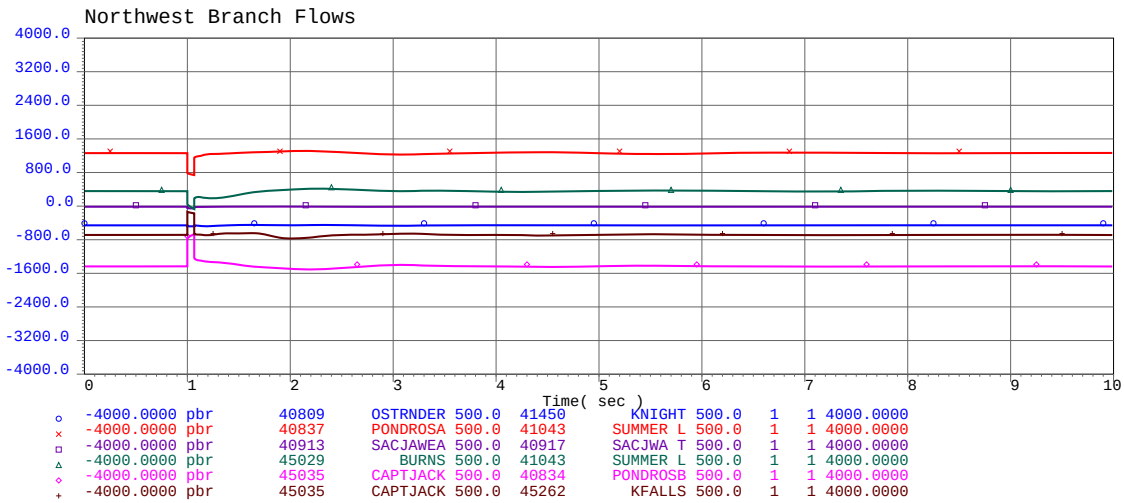


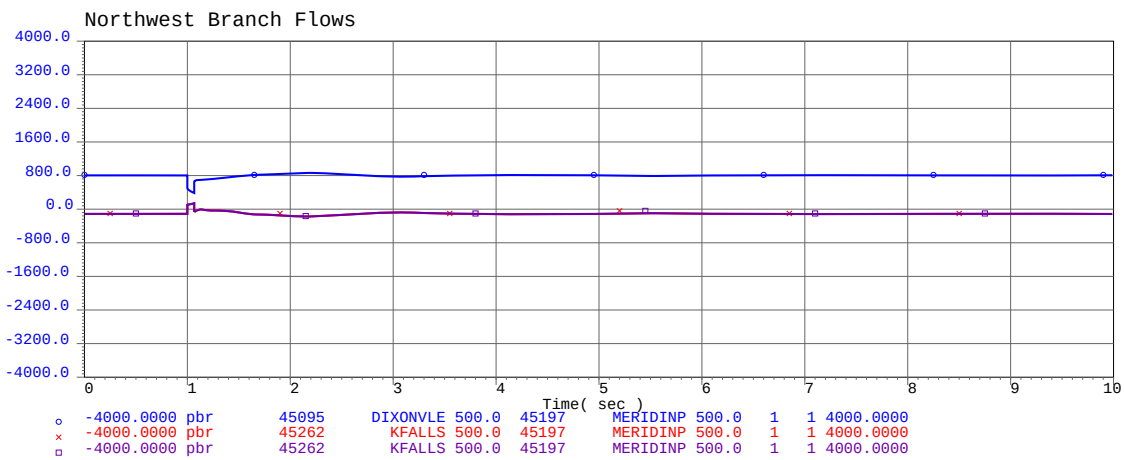
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tracy 500 kV
followed by loss of Tracy-Tesla 500 kV line

SELECT BRANCH FLOWS

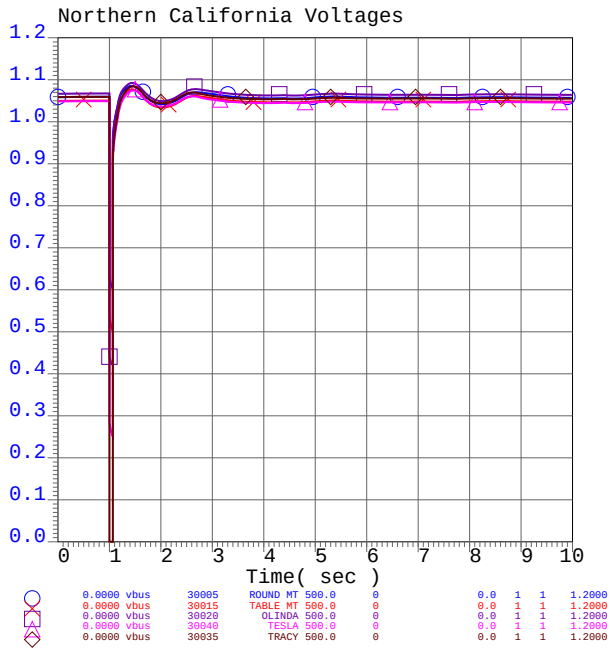


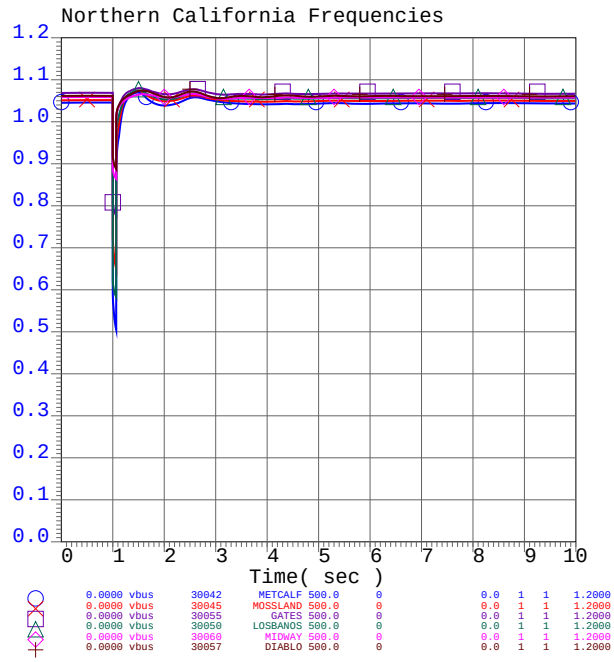


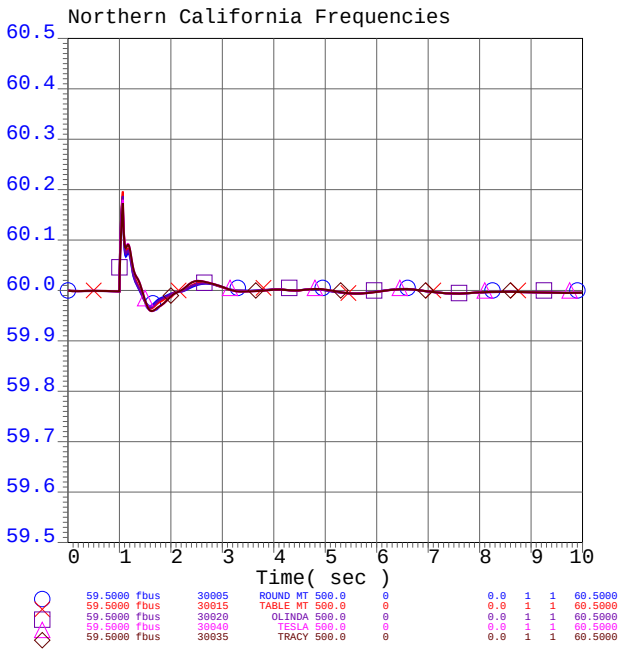


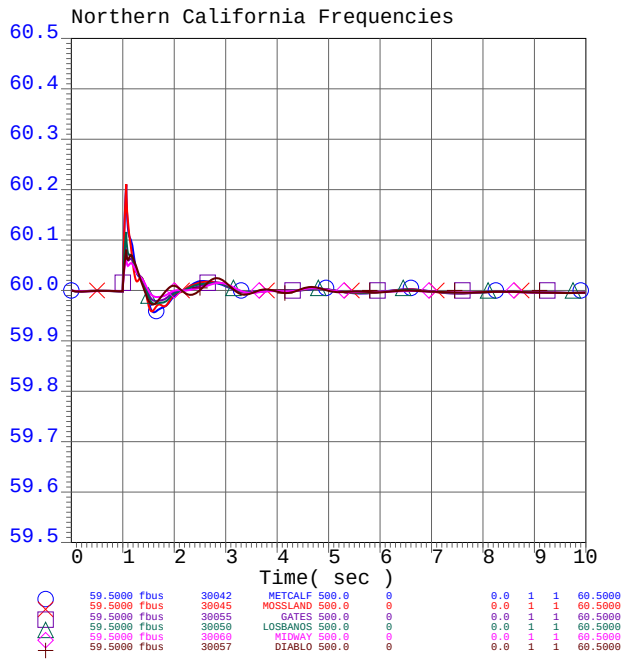
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WECC AREA VOLTAGE AND FREQUENCIES



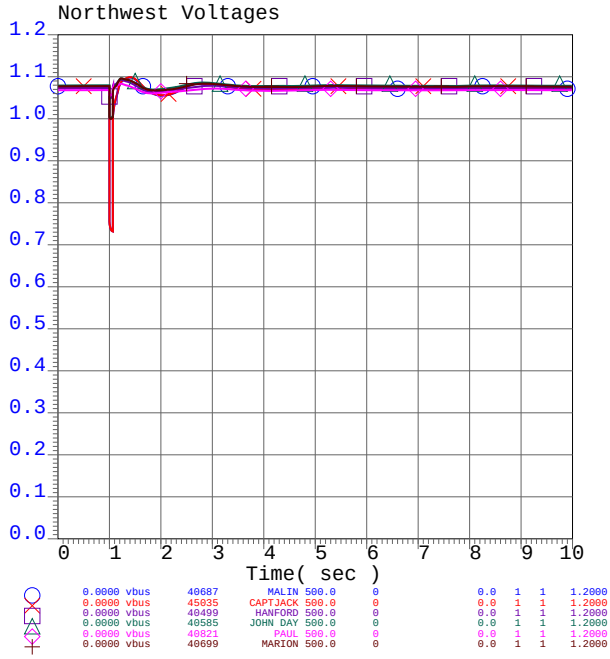


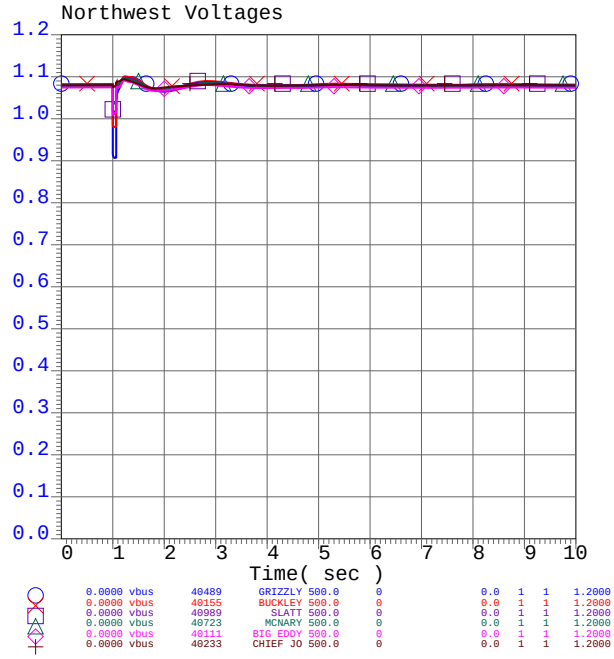


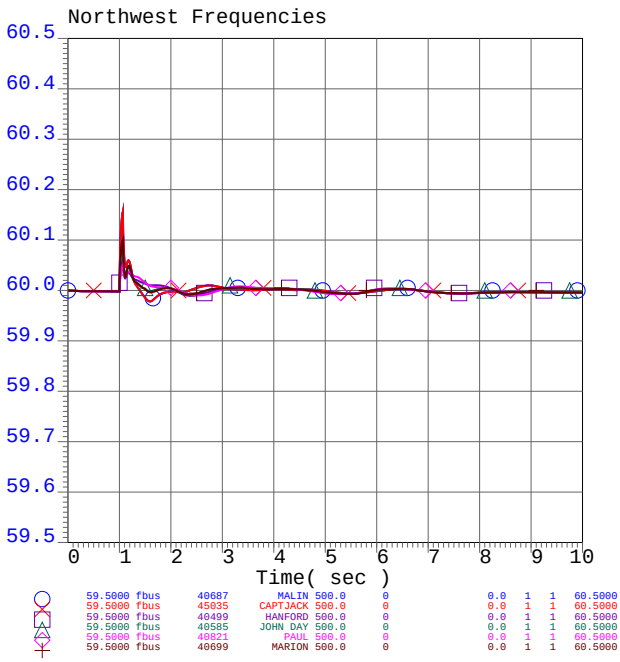


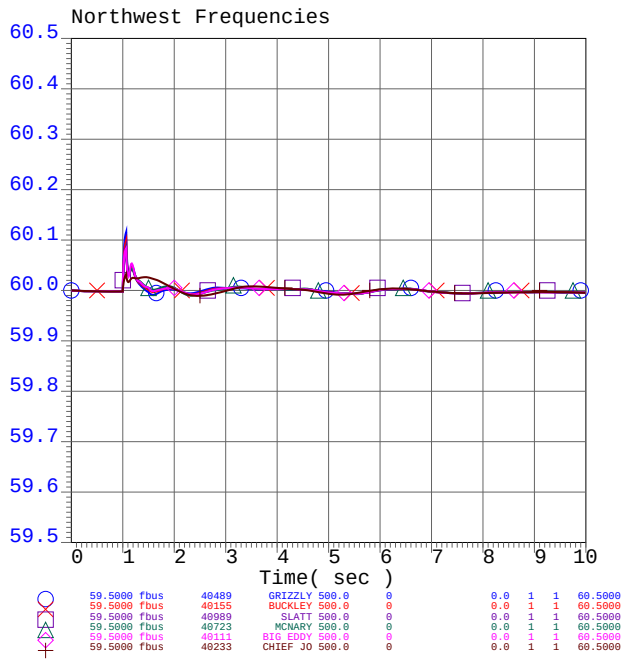
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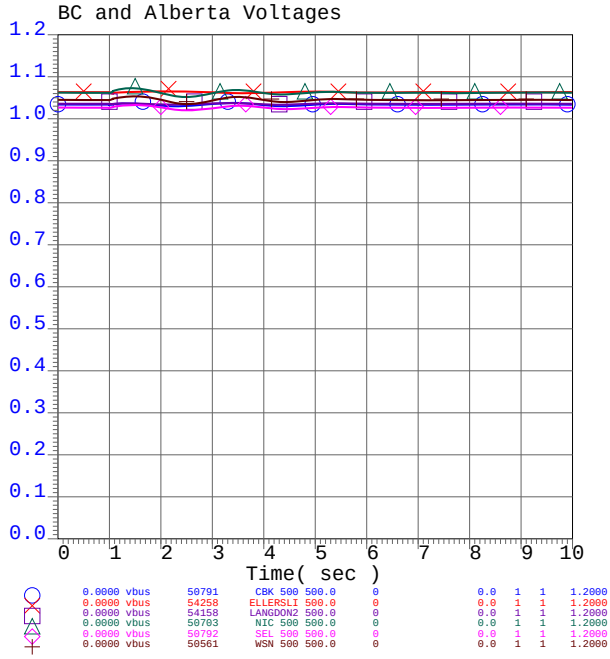


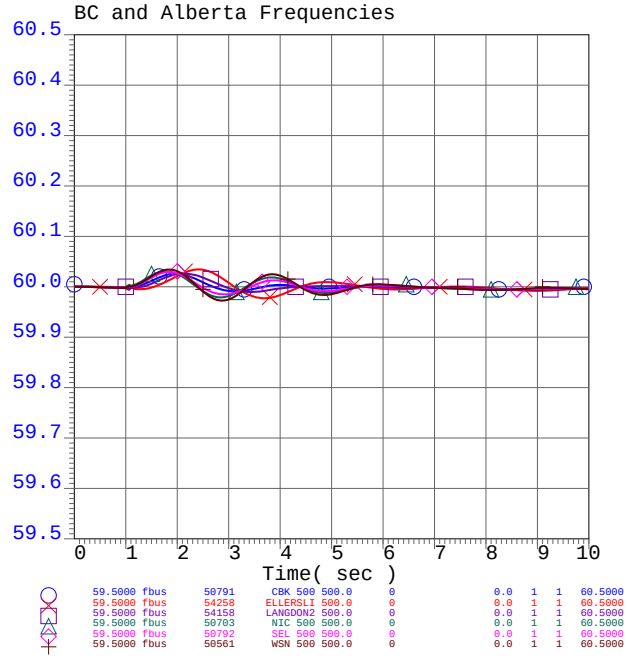


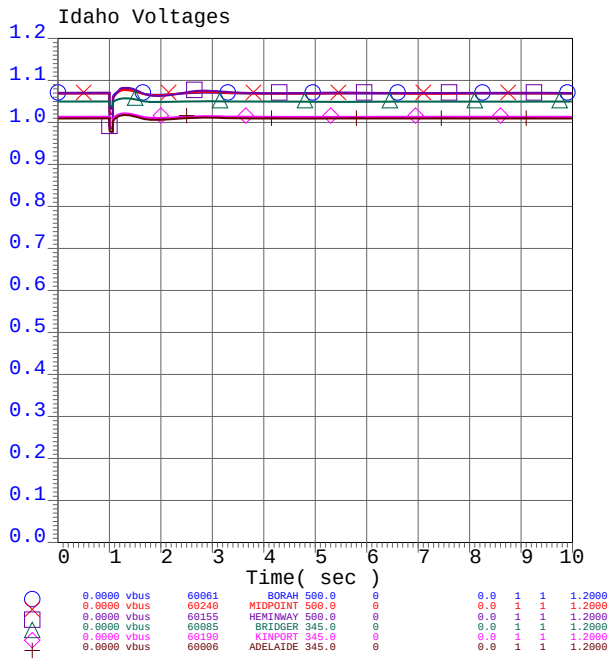


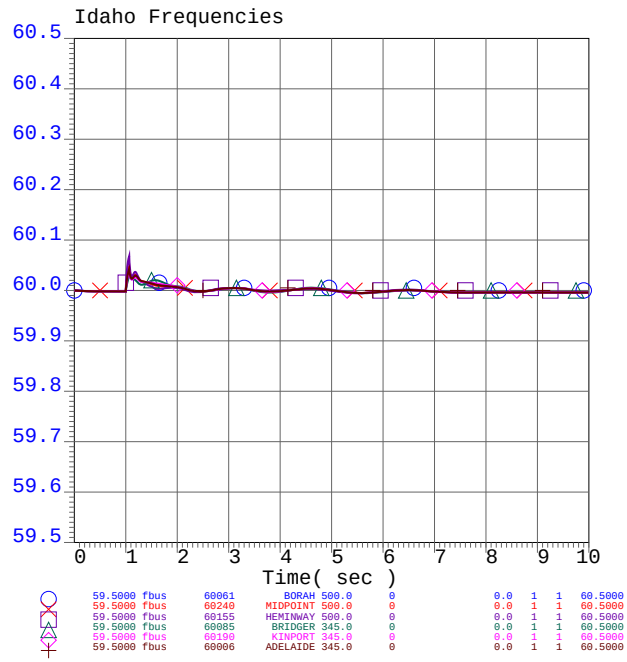
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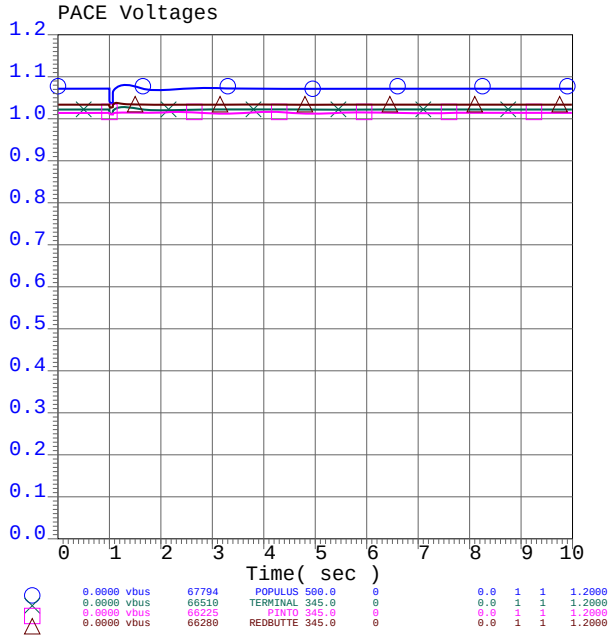


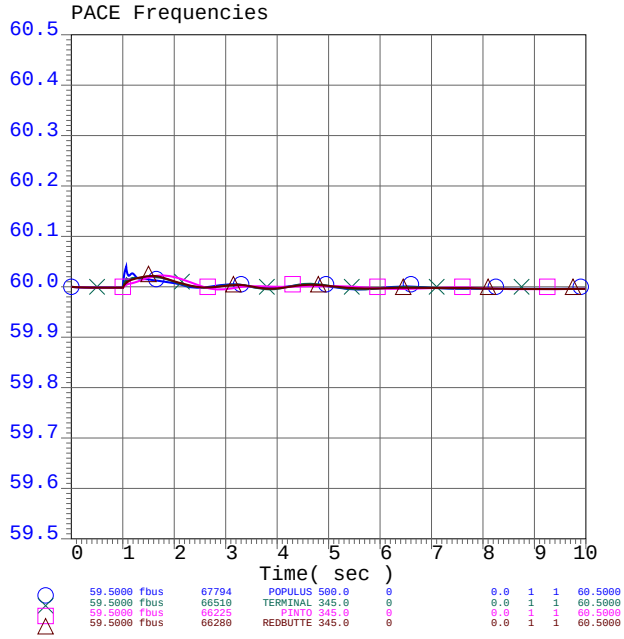


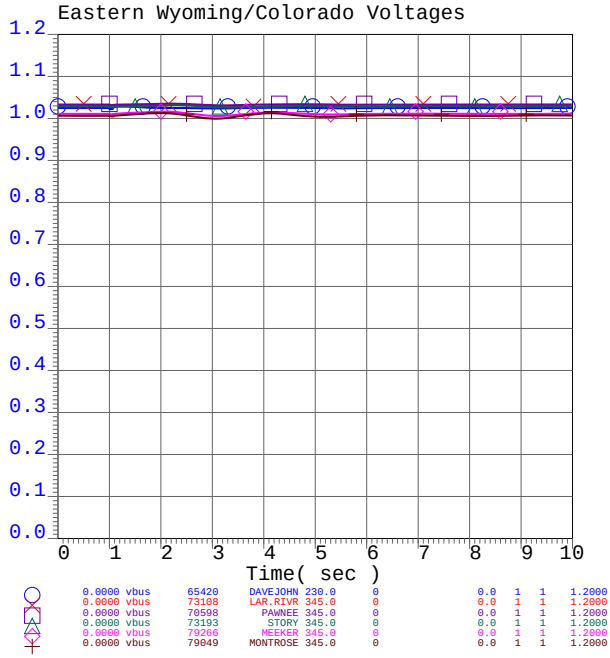


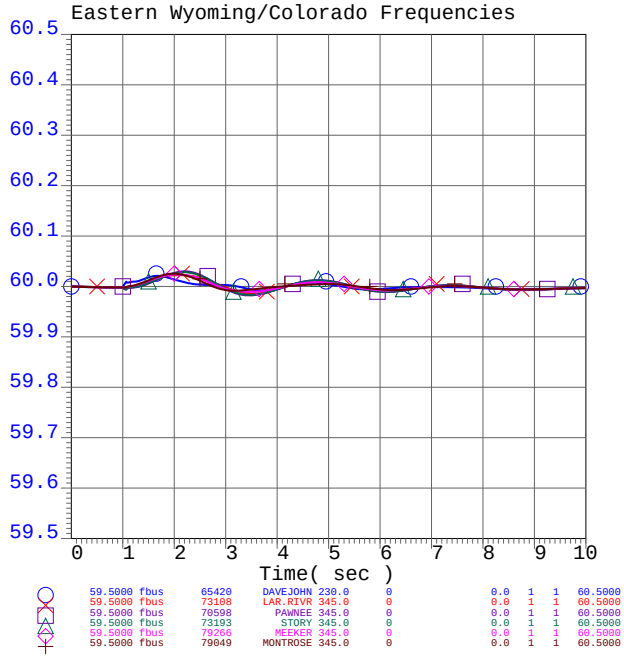
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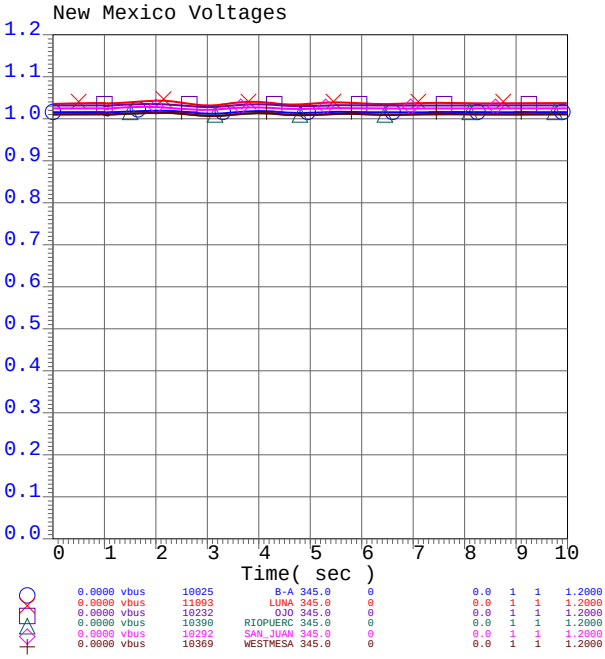




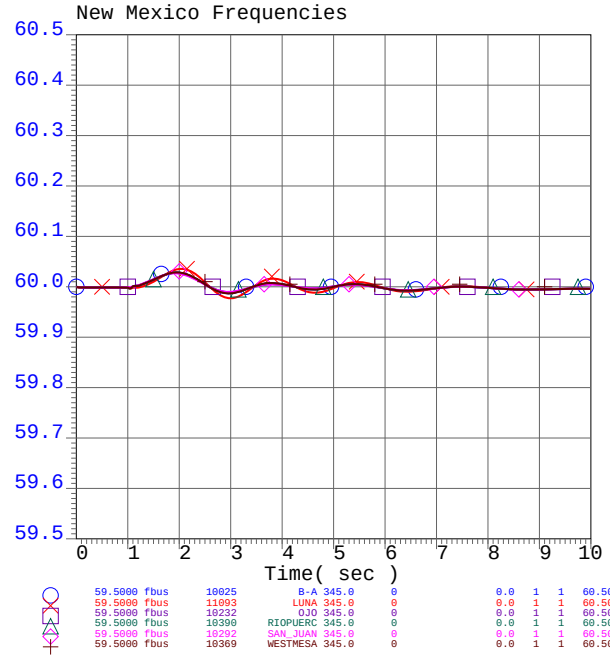
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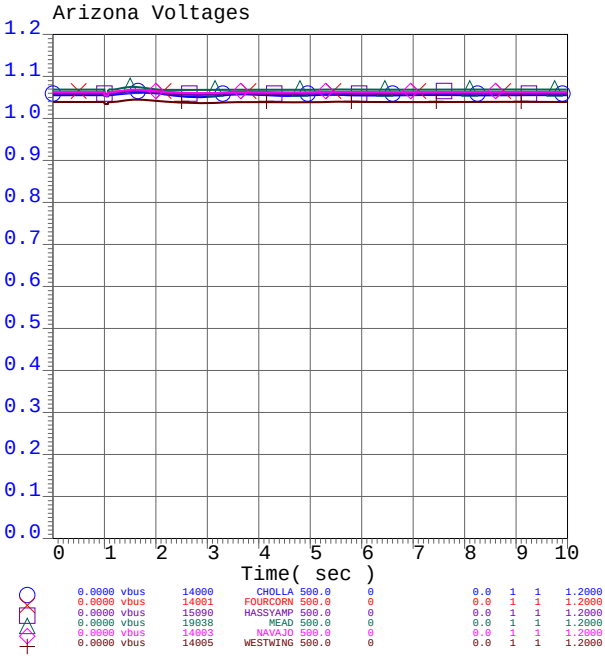
New Mexico Voltages



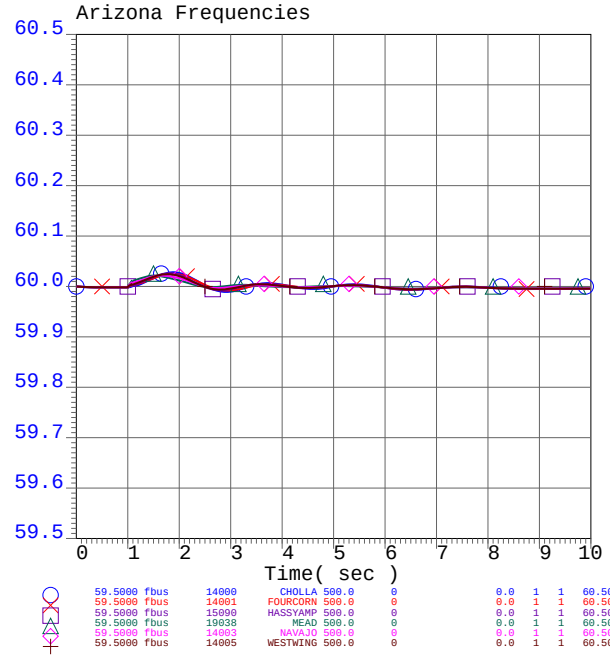
New Mexico Frequencies



Arizona Voltages

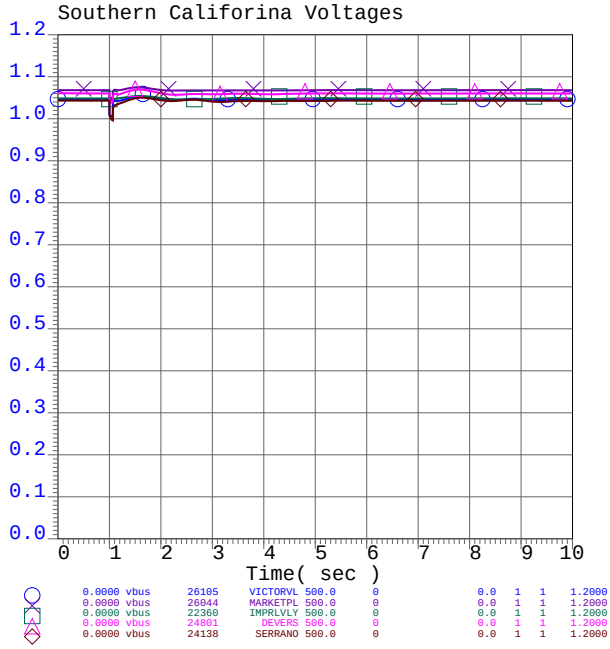


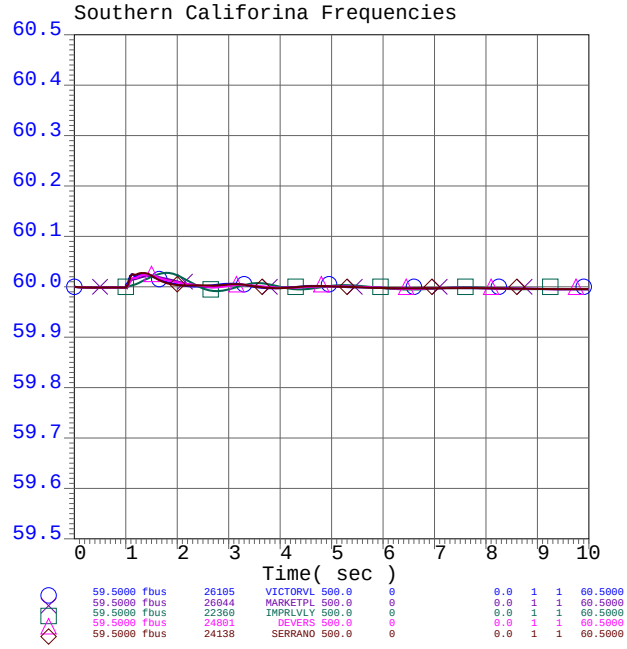
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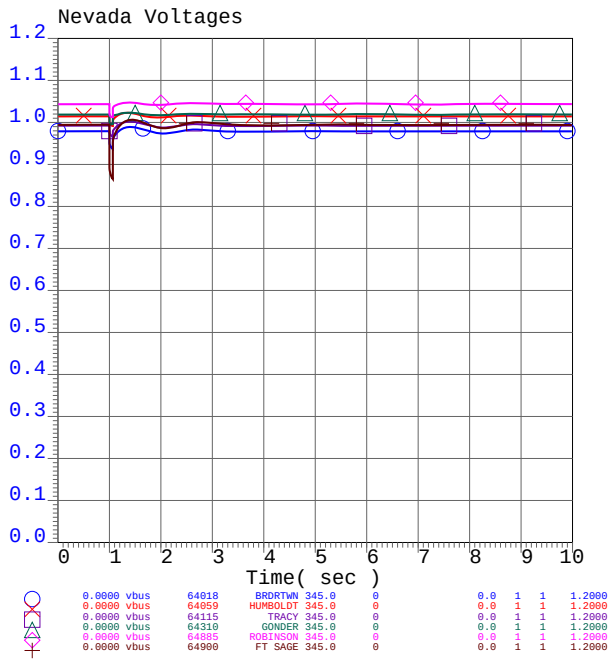


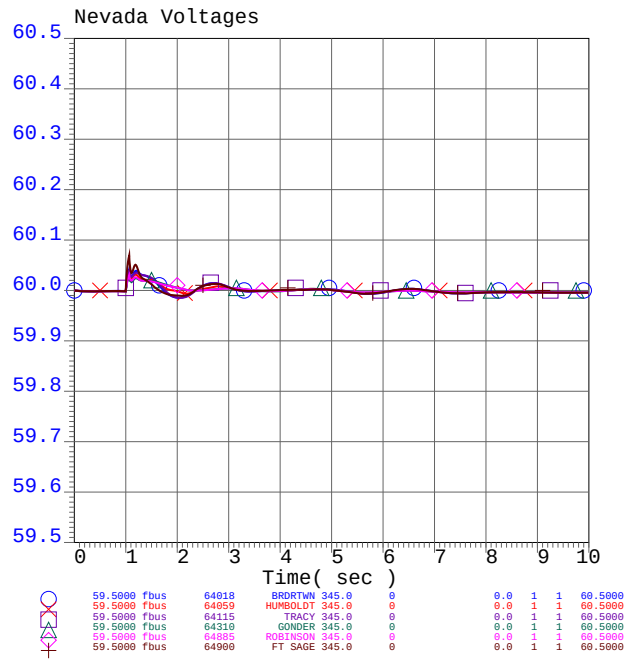
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WECC AREA VOLTAGE AND FREQUENCIES



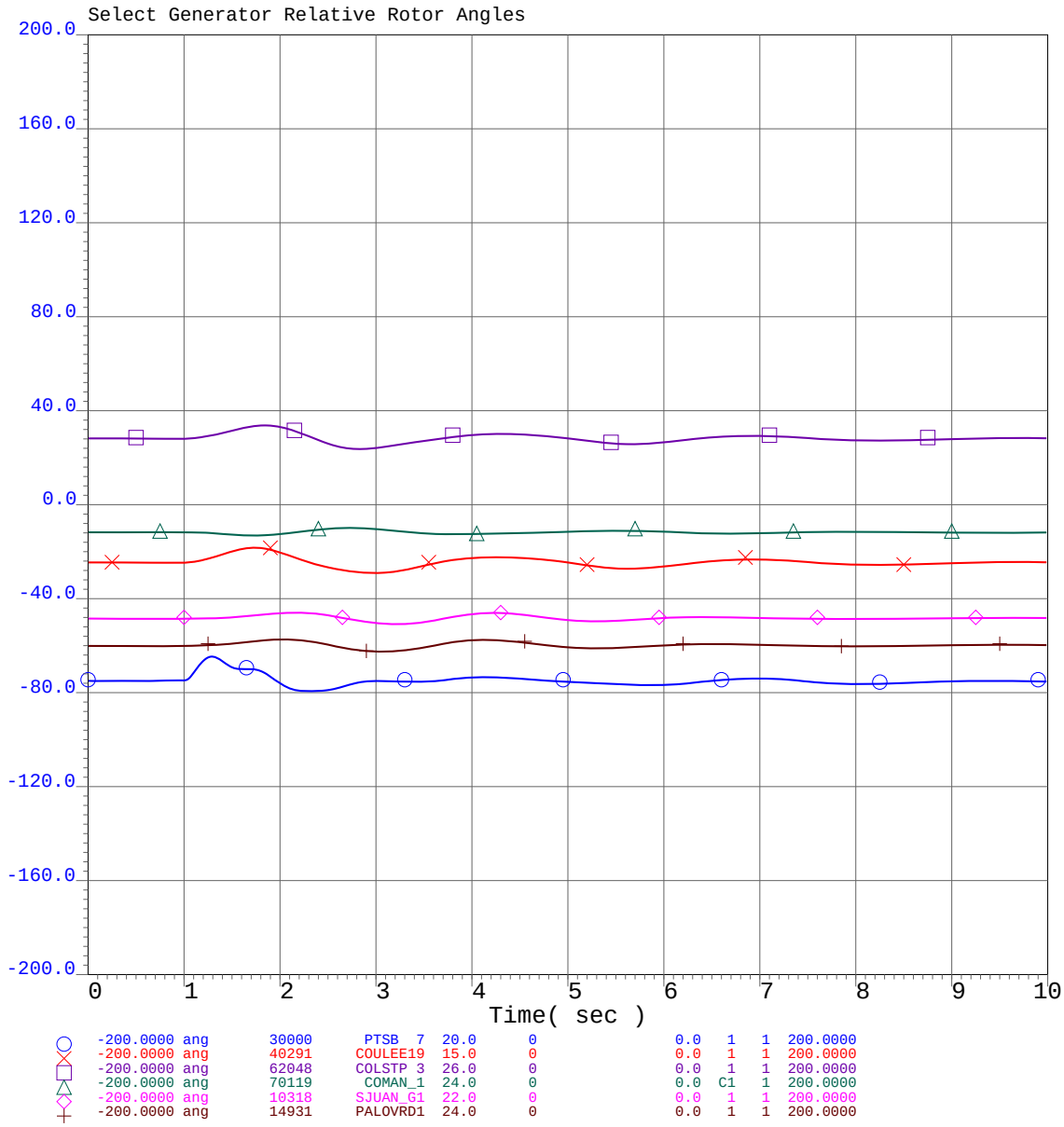






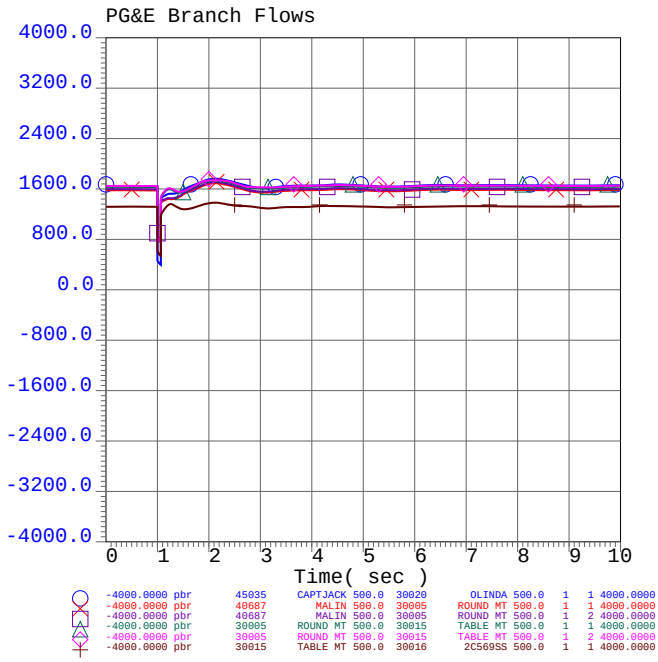
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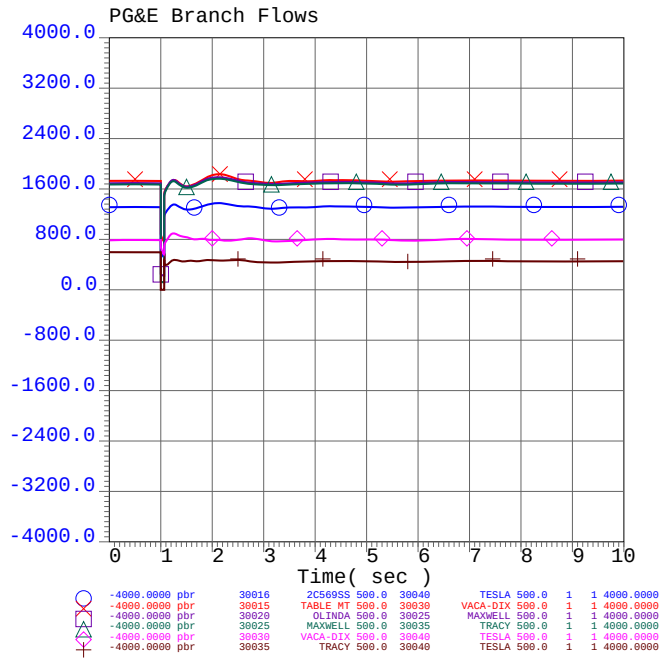
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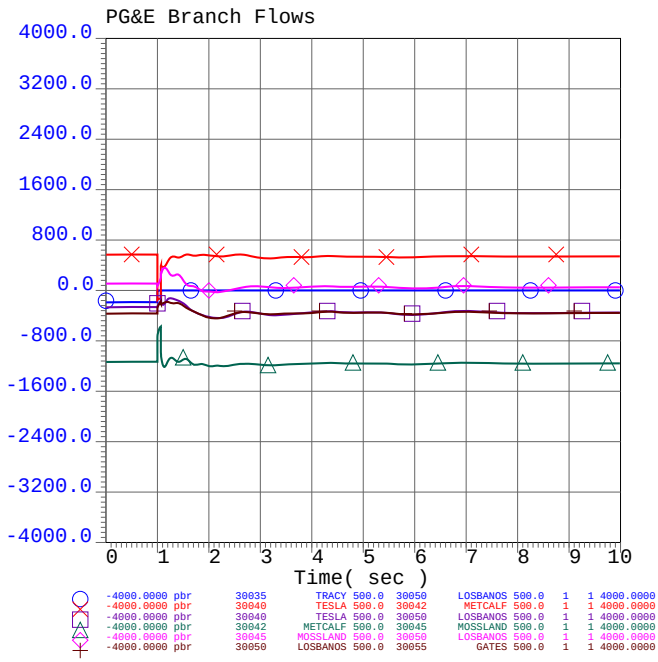


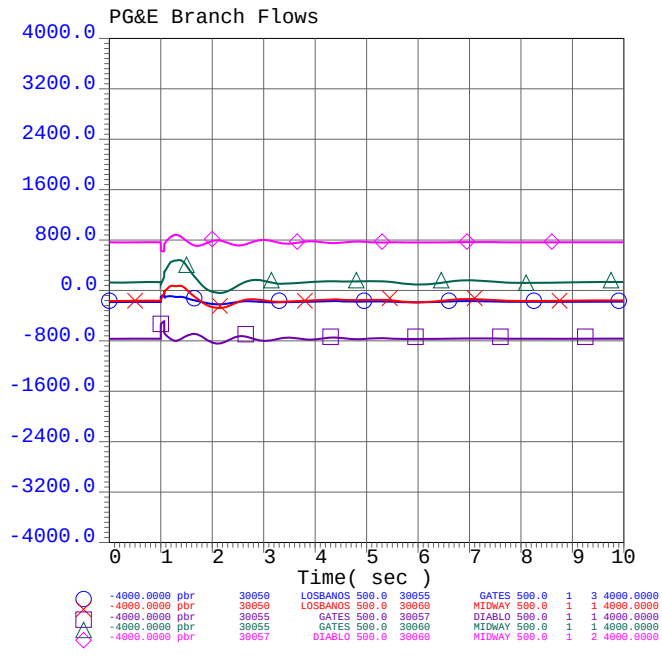
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SELECT BRANCH FLOWS





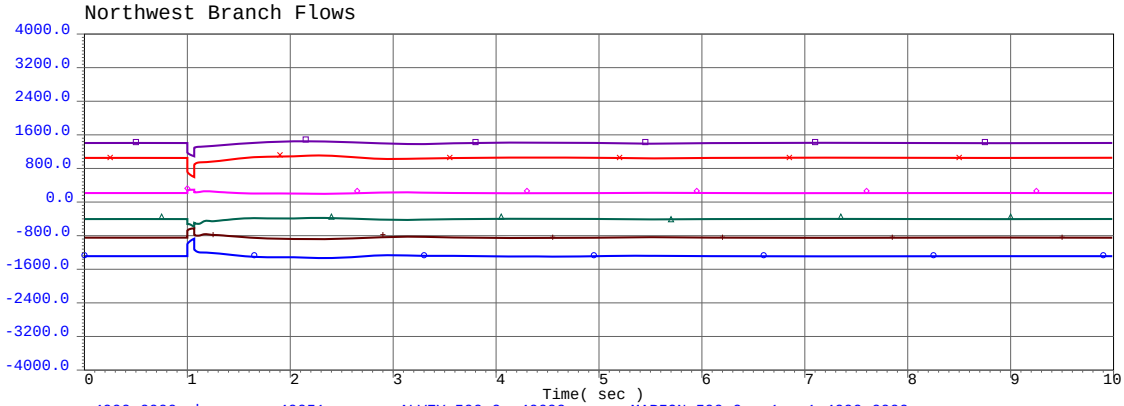




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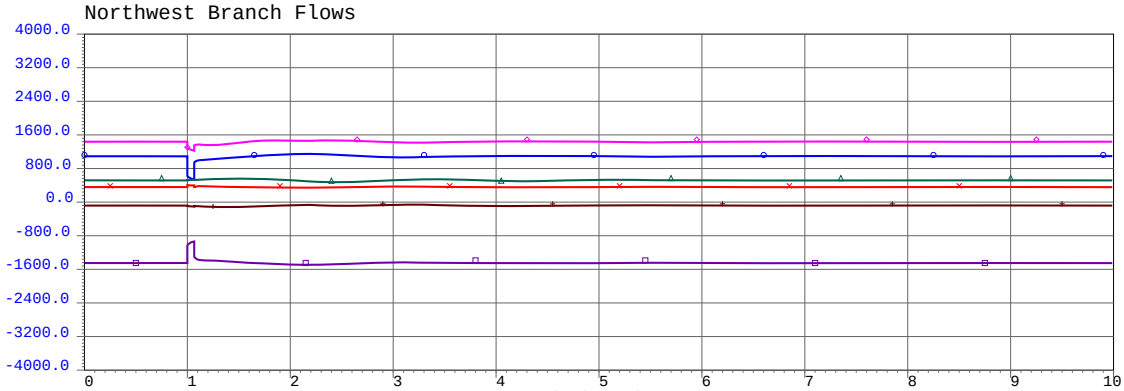
SELECT BRANCH FLOWS

Northwest Branch Flows



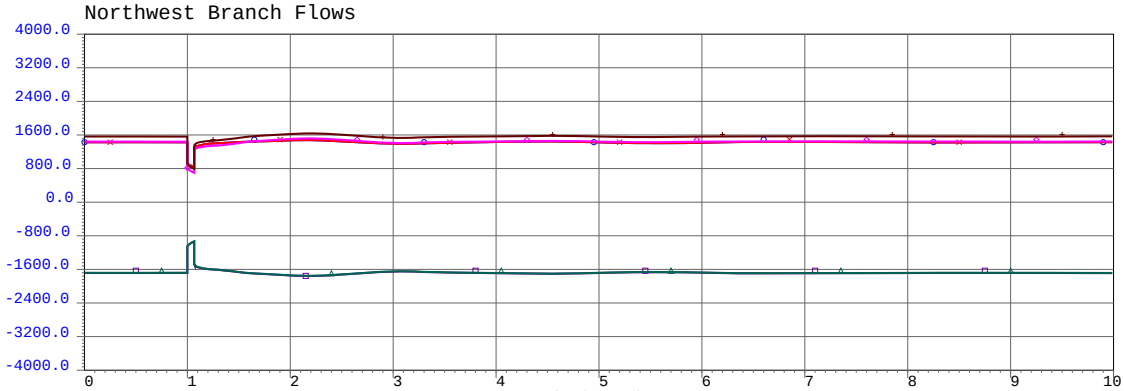
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
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-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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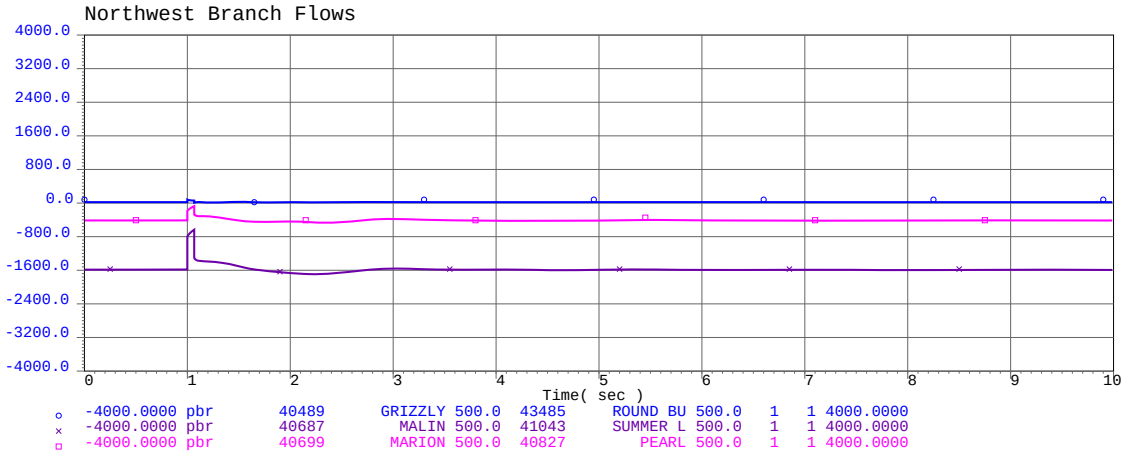
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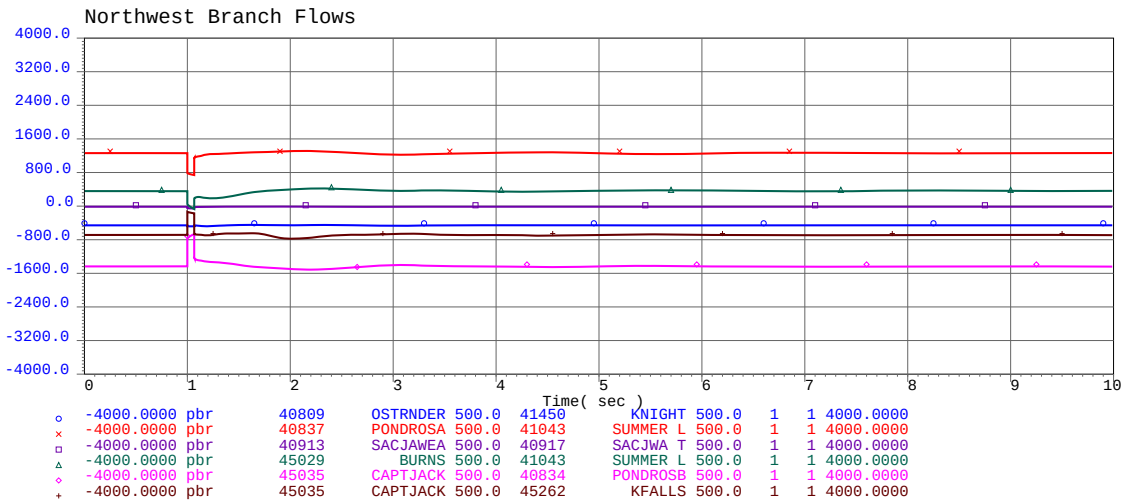


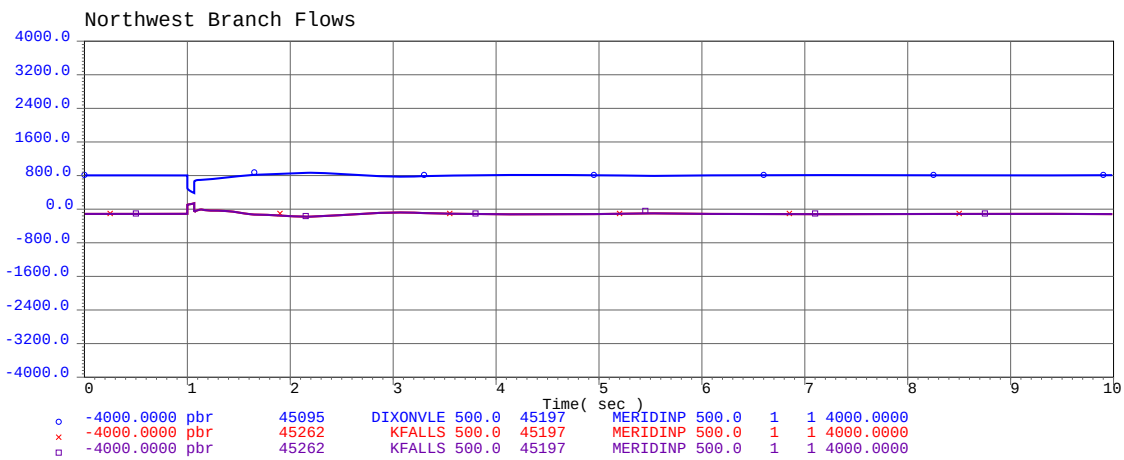
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Tracy 500 kV
followed by loss of Tracy-Los Banos 500 kV line

SELECT BRANCH FLOWS

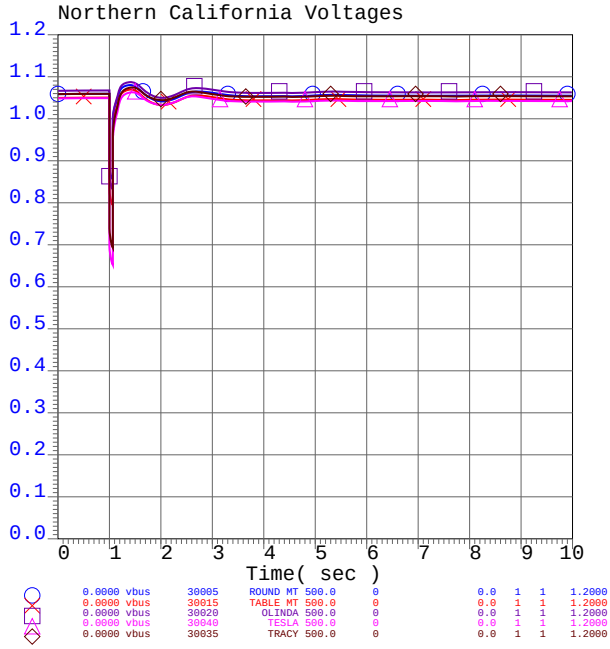


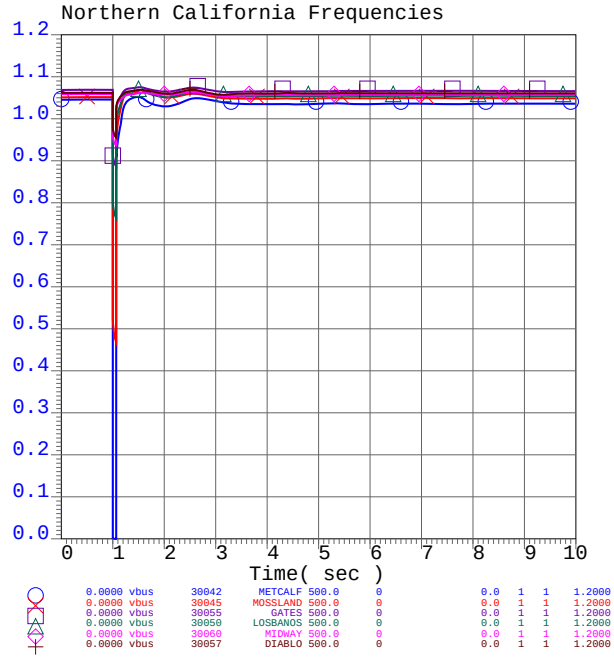


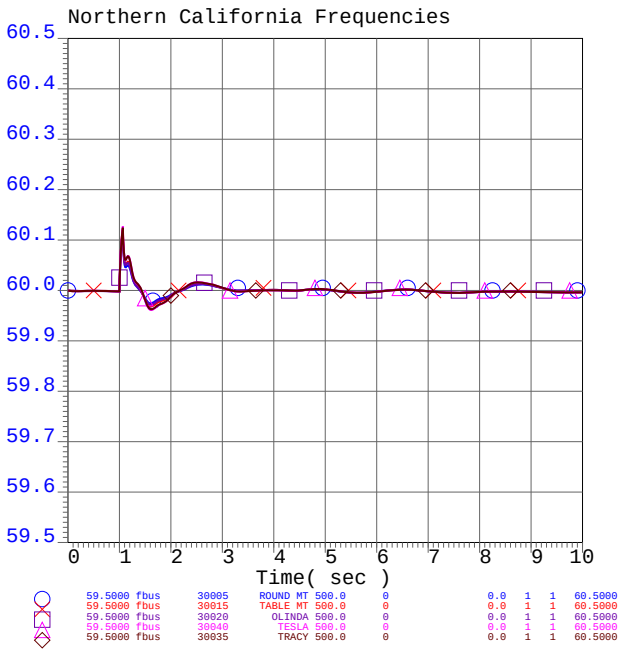


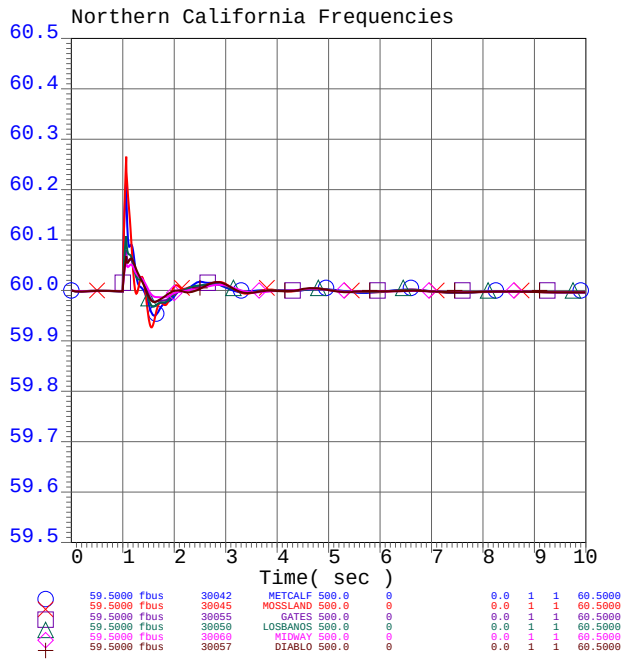
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES



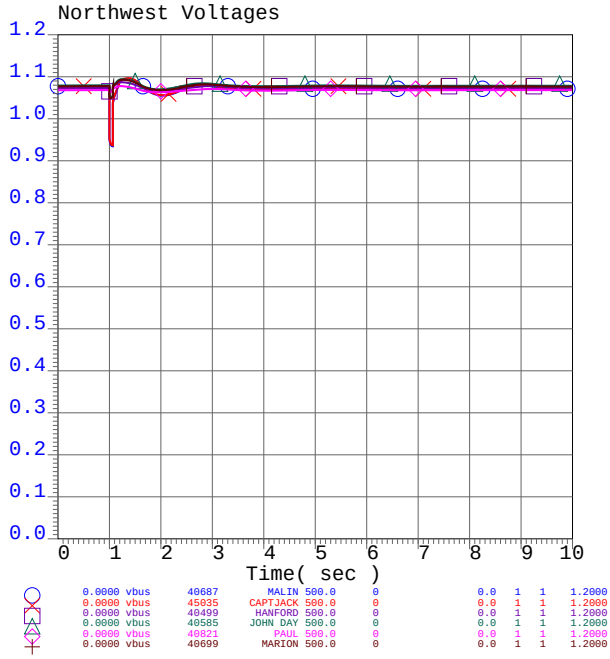


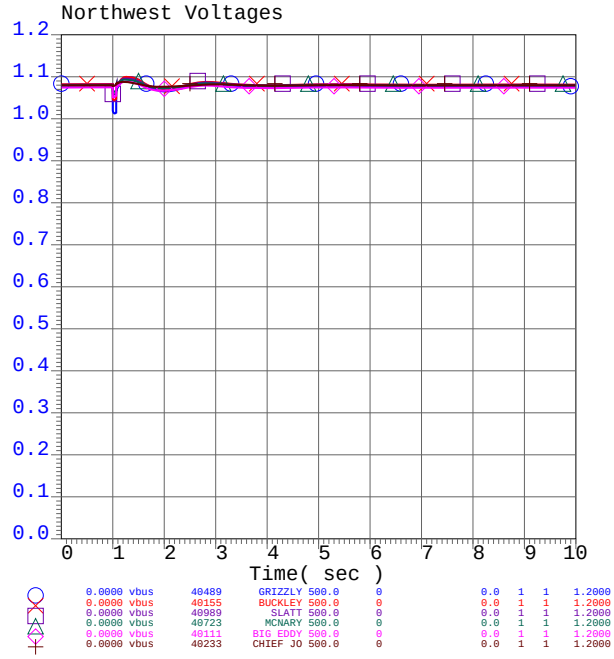


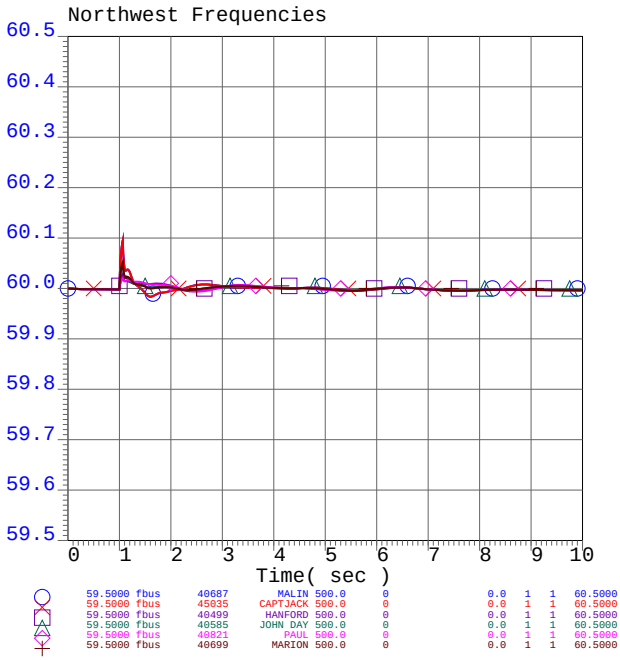


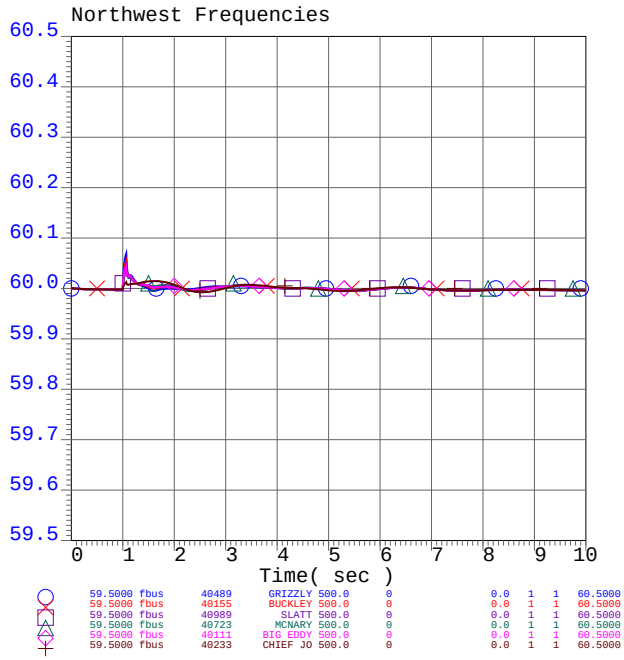
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Metcalf 500 kV
followed by loss of Metcalf-Moss Landing 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





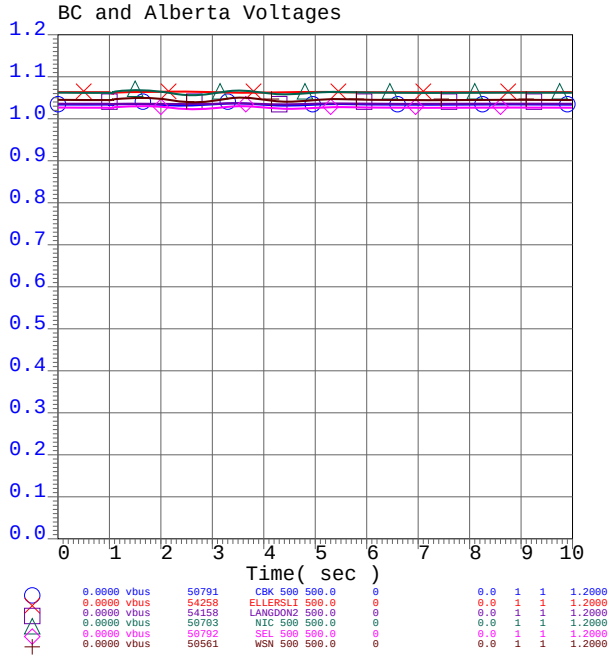




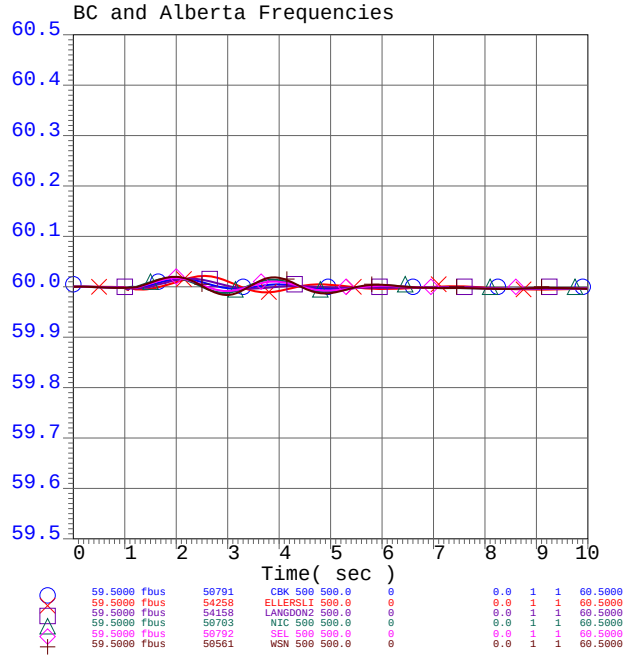
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WECC AREA VOLTAGE AND FREQUENCIES

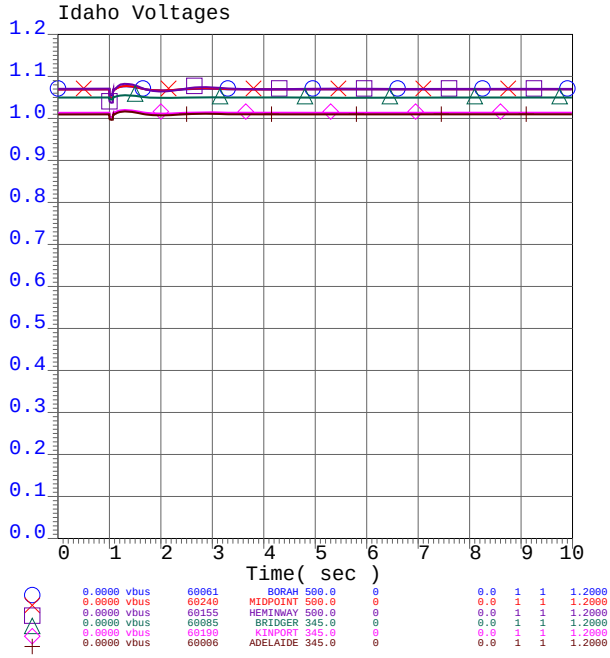
BC and Alberta Voltages



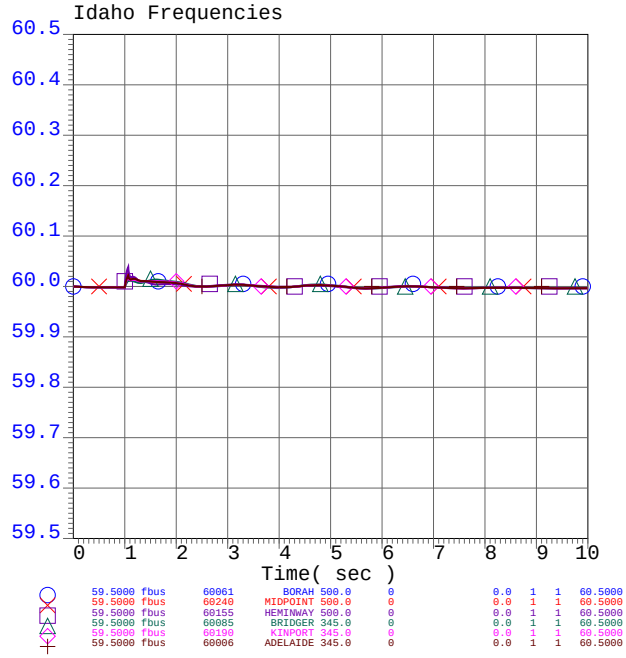
BC and Alberta Frequencies



Idaho Voltages

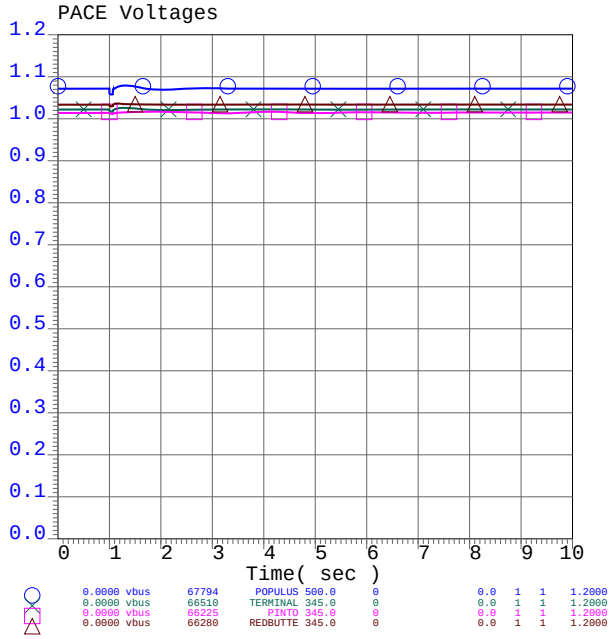


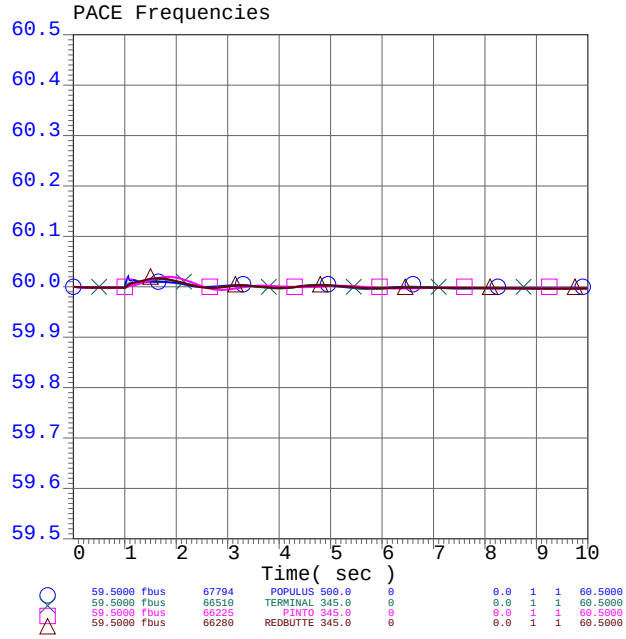
Idaho Frequencies

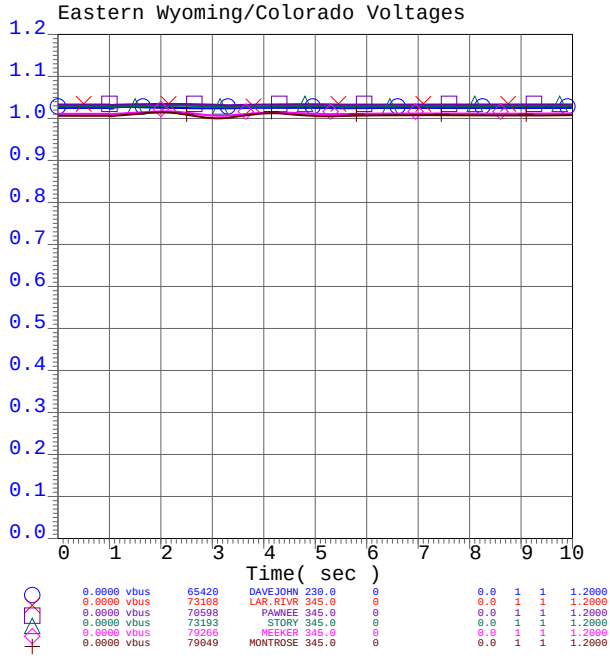


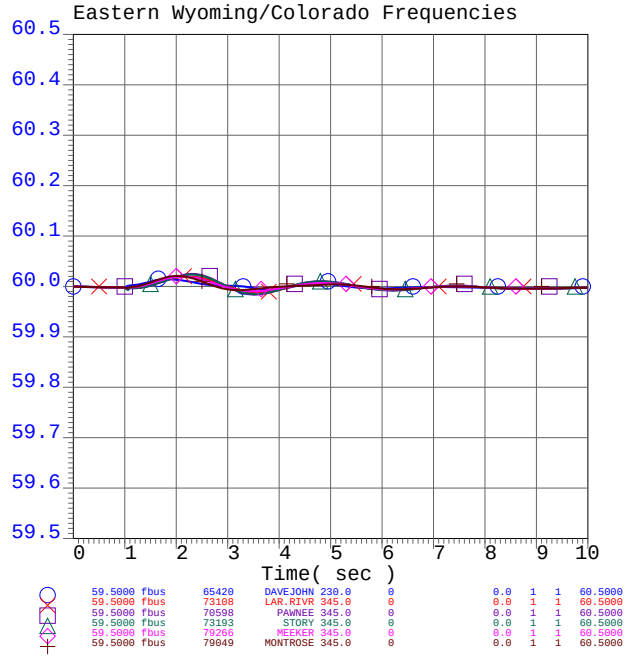
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3-phase 4 cycle fault at Metcalf 500 kV
followed by loss of Metcalf-Moss Landing 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





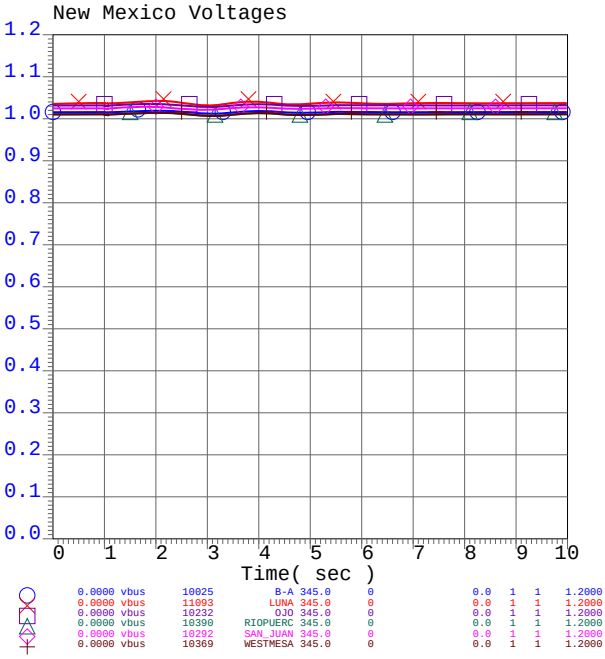




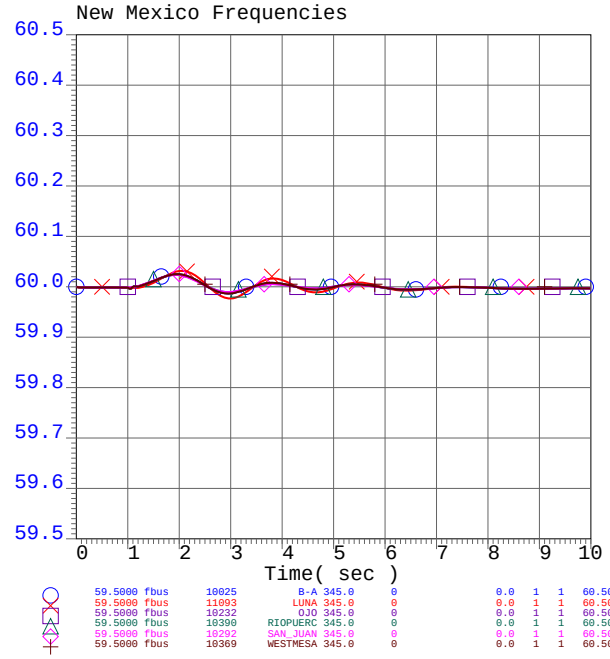
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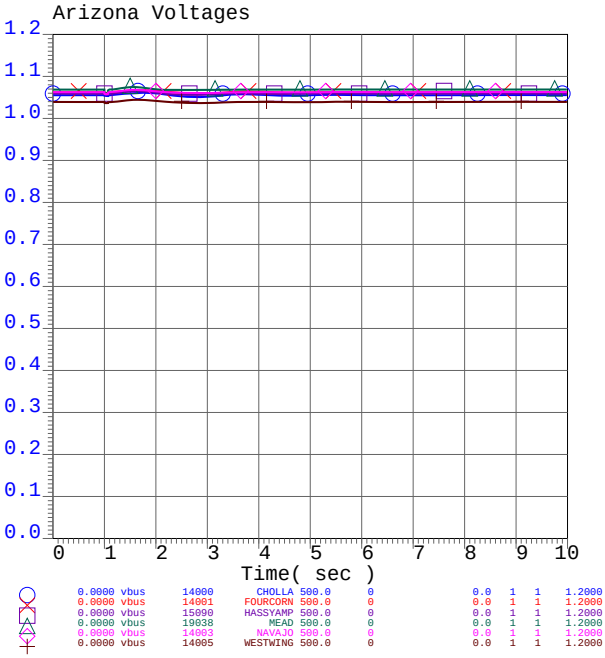
New Mexico Voltages



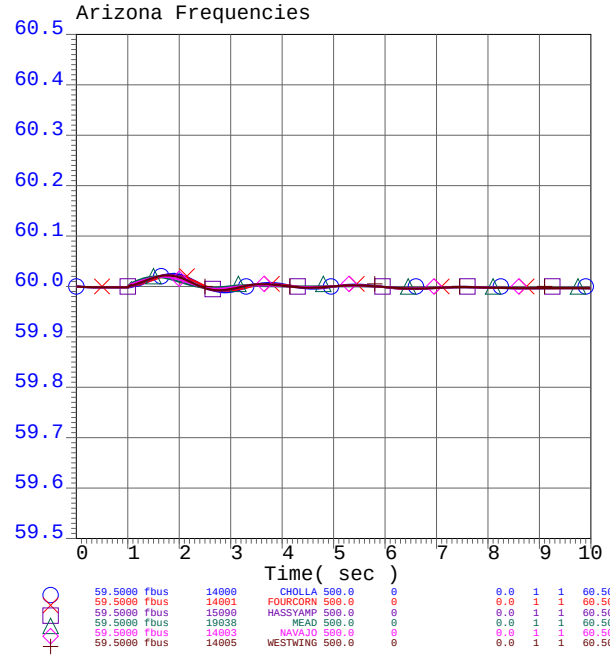
New Mexico Frequencies



Arizona Voltages

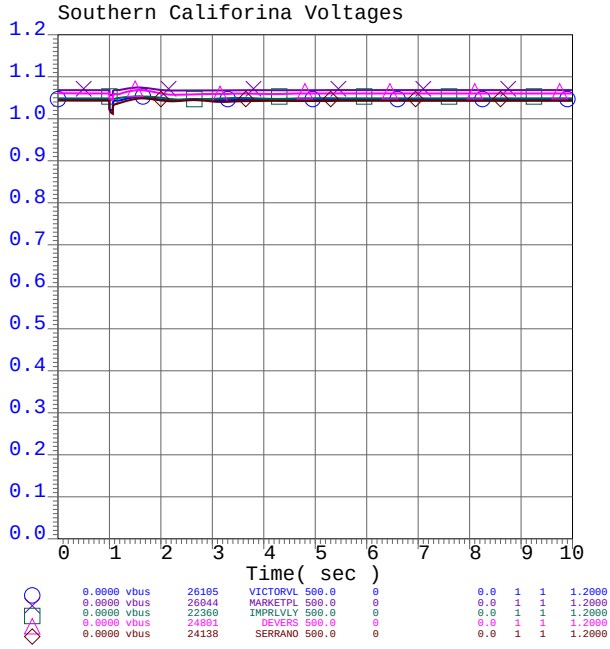


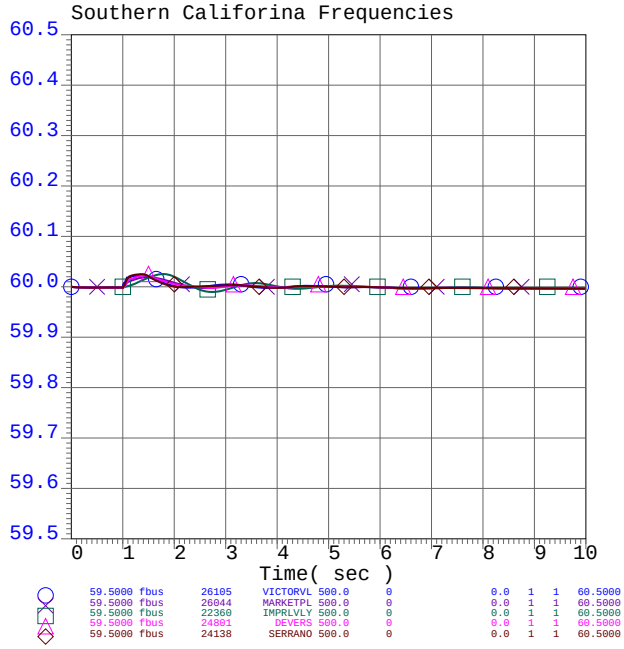
Arizona Frequencies

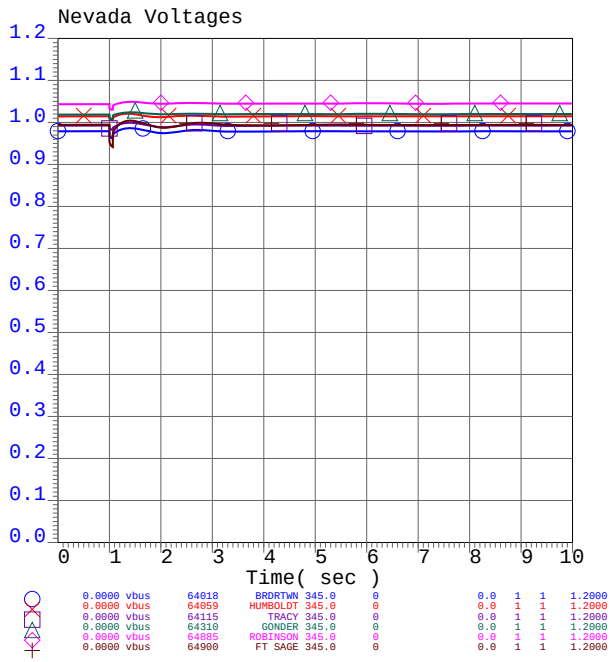


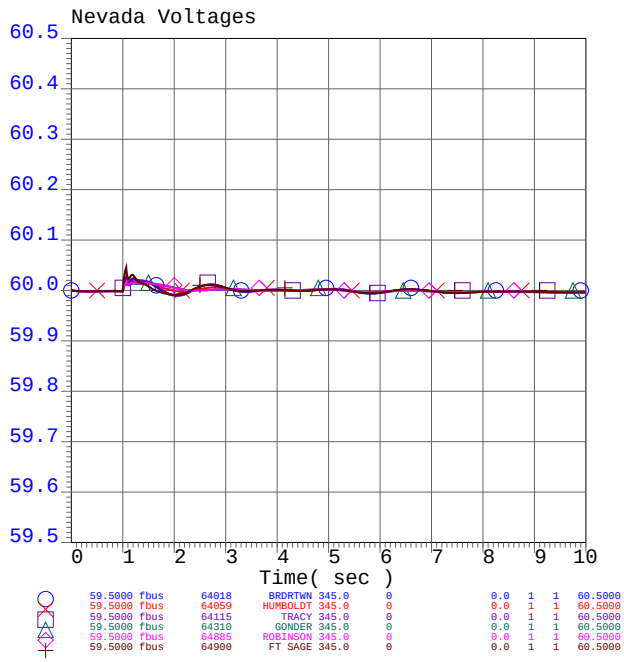
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3-phase 4 cycle fault at Metcalf 500 kV
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WECC AREA VOLTAGE AND FREQUENCIES



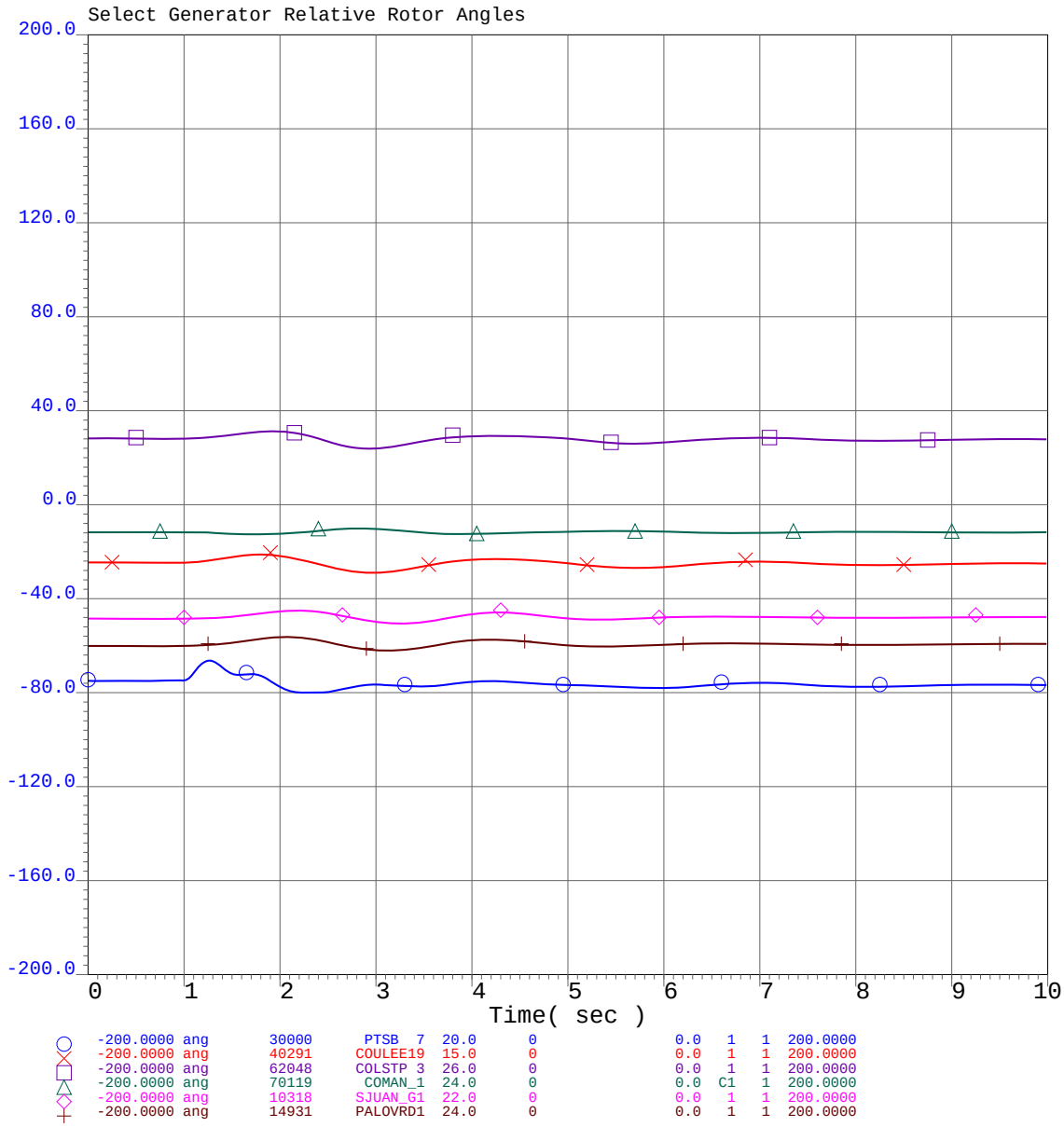






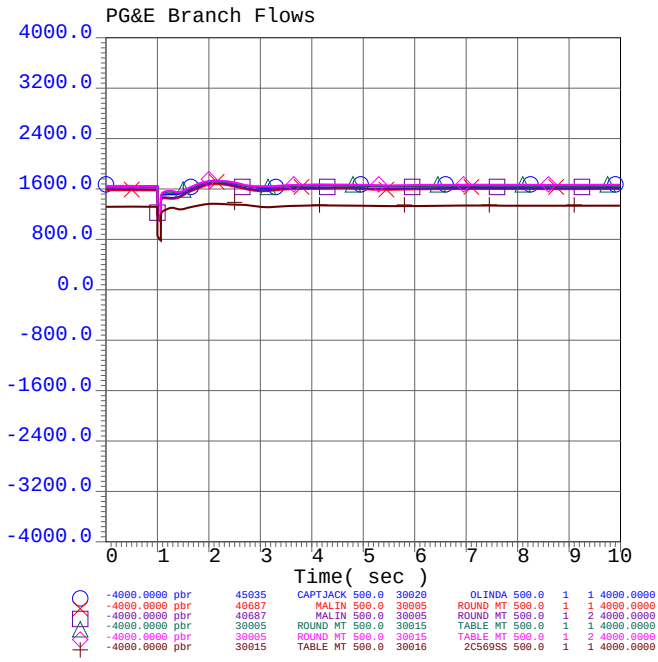
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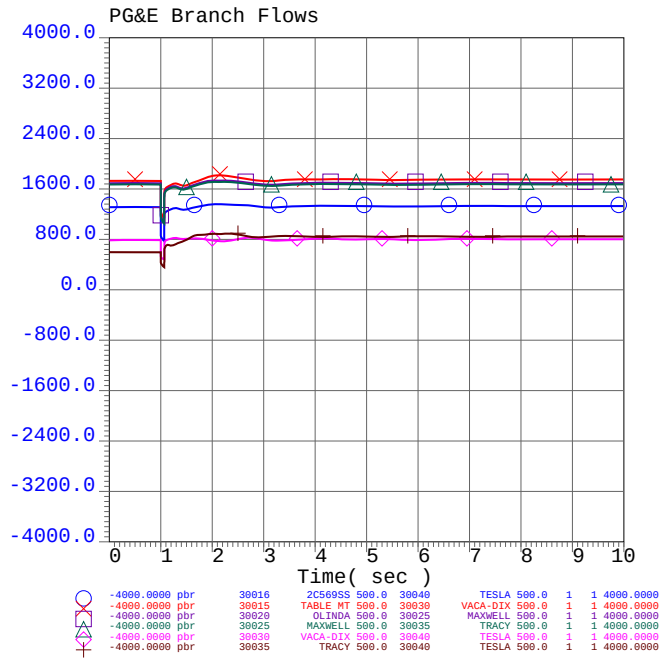
WECC RELATIVE ROTOR ANGLES

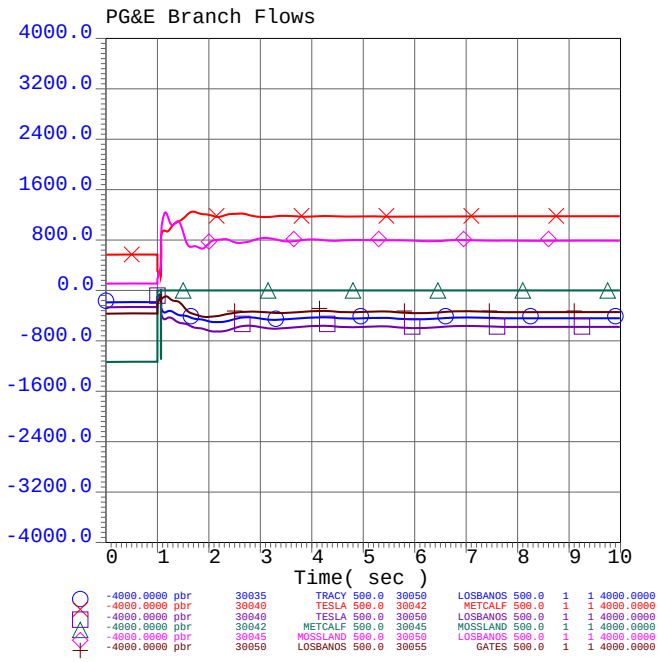


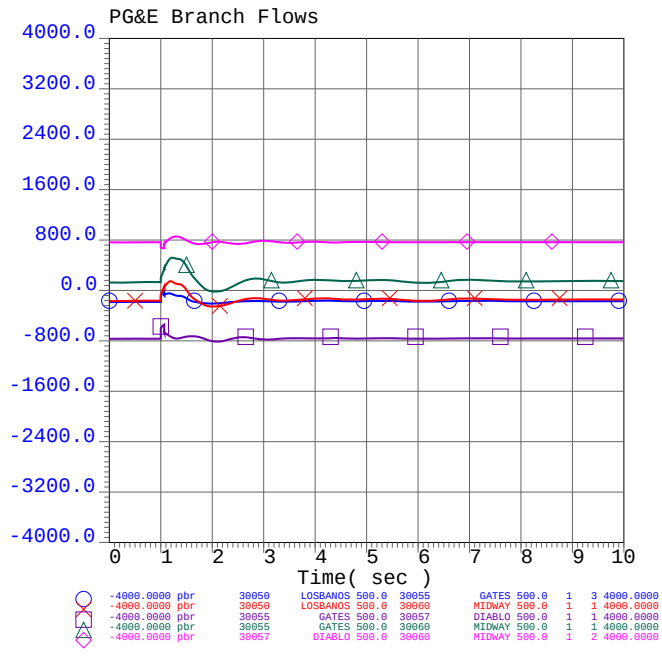
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SELECT BRANCH FLOWS





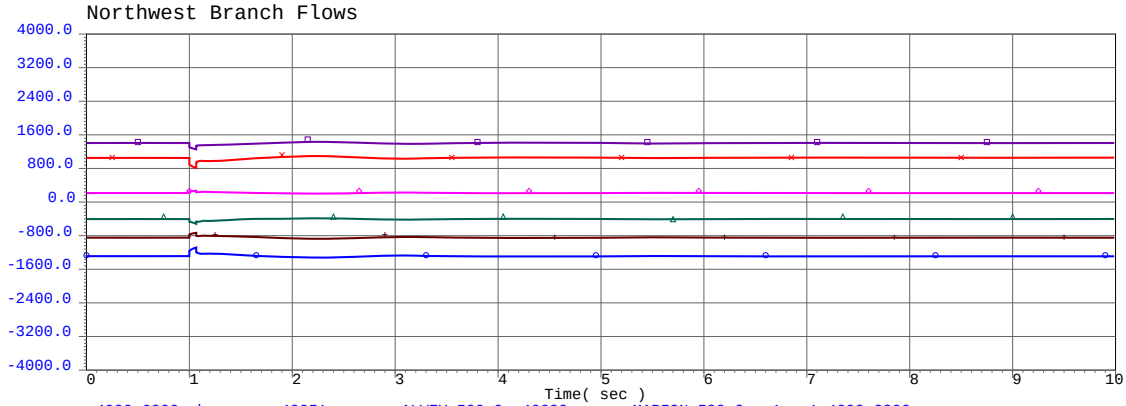




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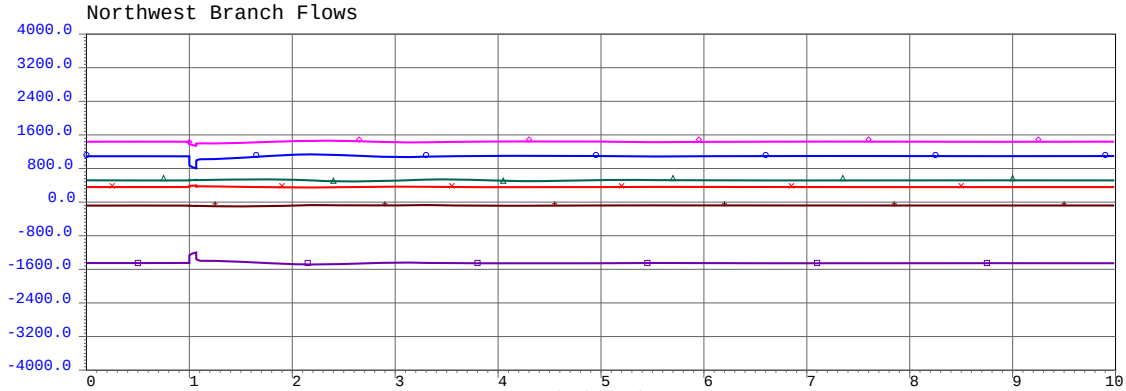
SELECT BRANCH FLOWS

Northwest Branch Flows



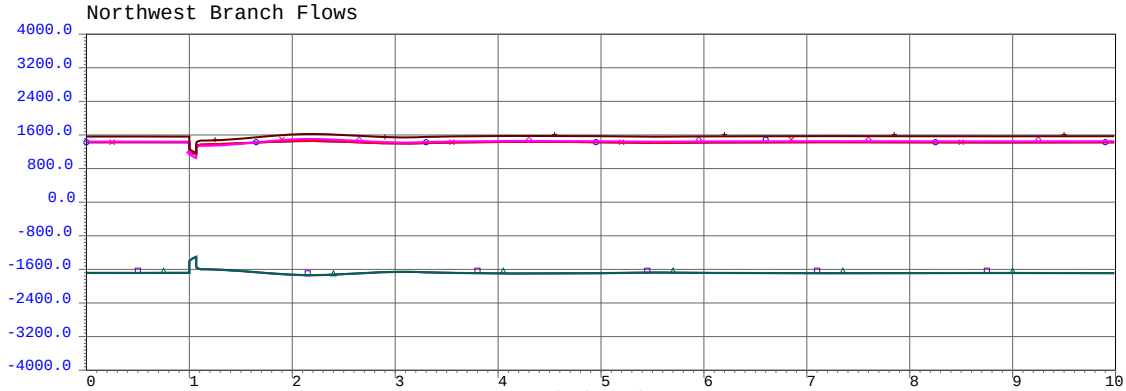
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

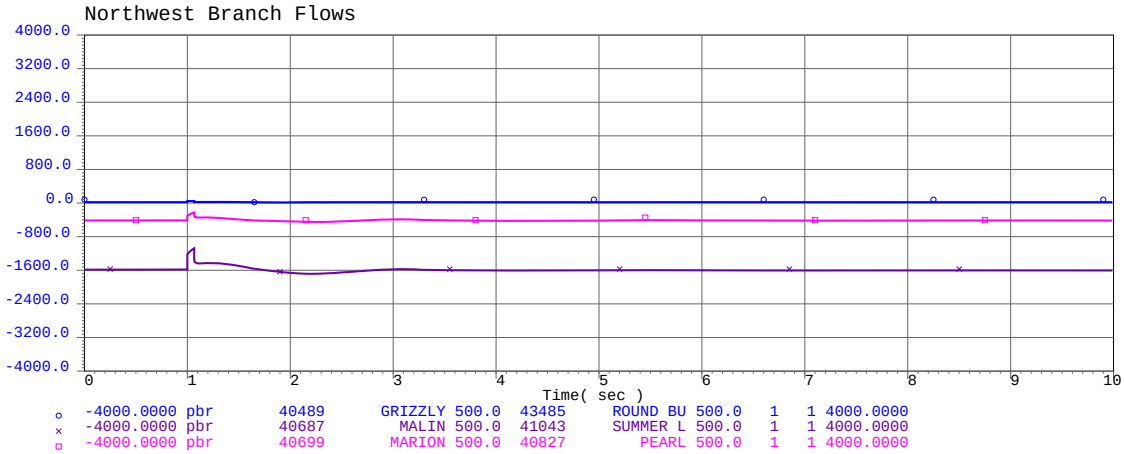
Northwest Branch Flows

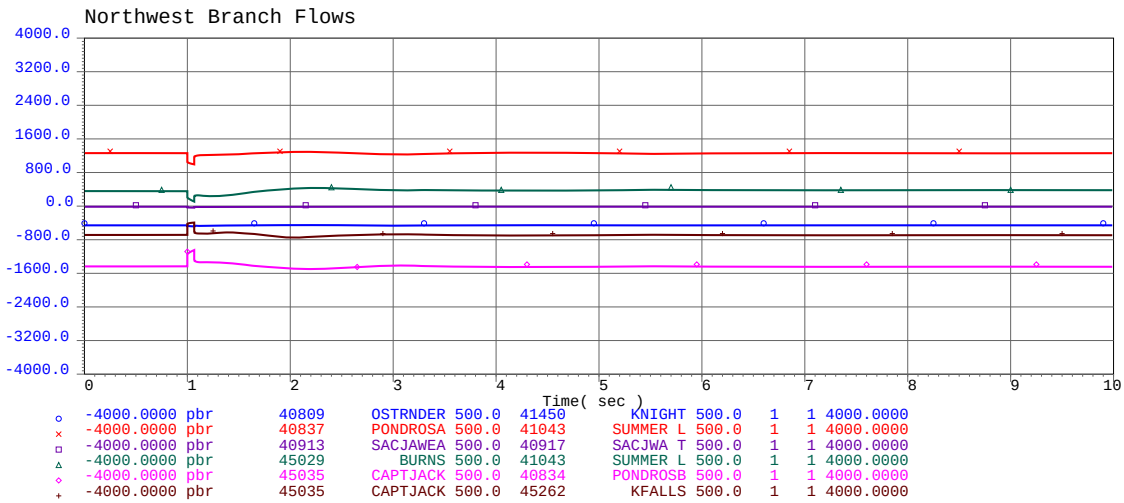


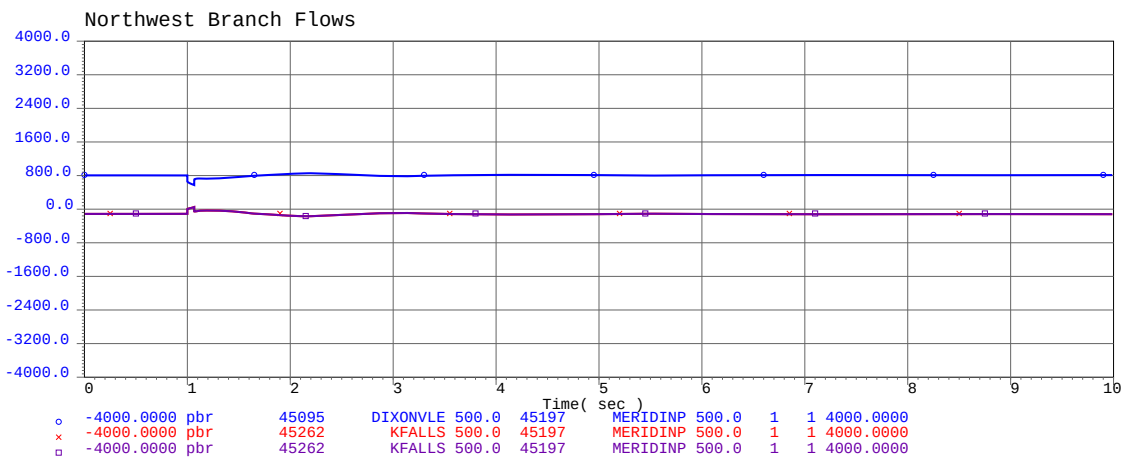
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Metcalf 500 kV
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SELECT BRANCH FLOWS

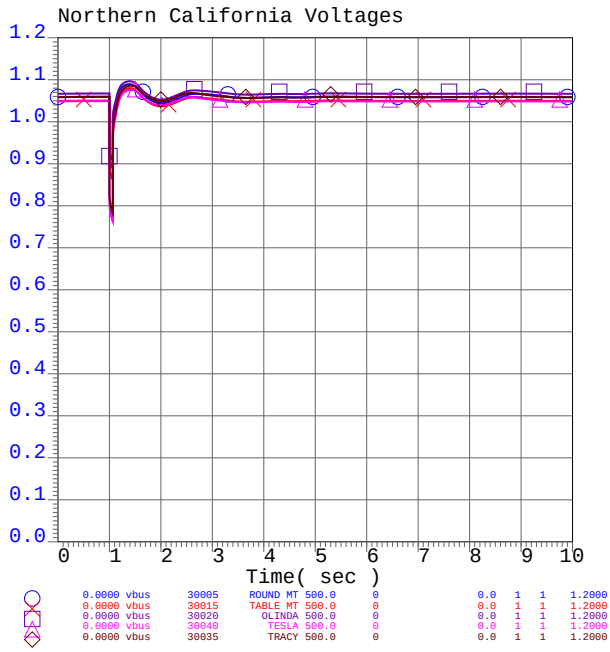


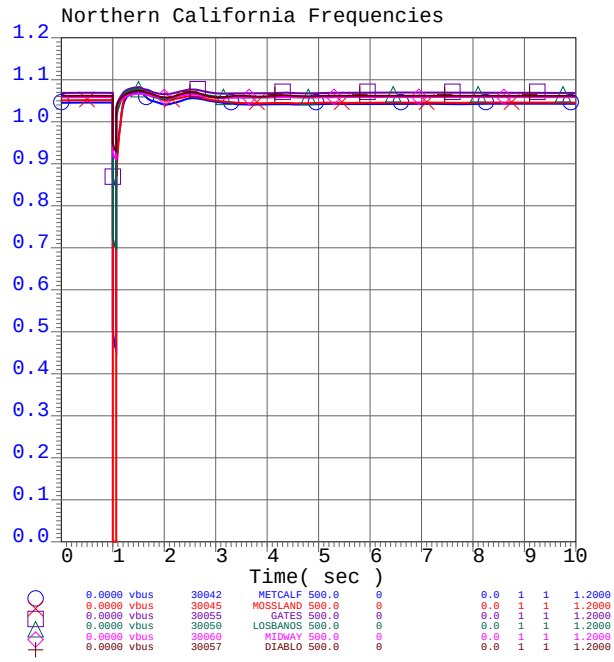


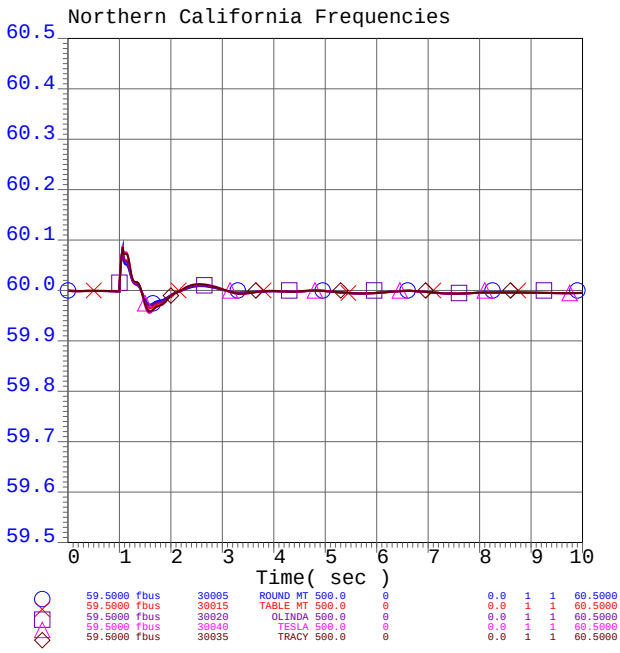


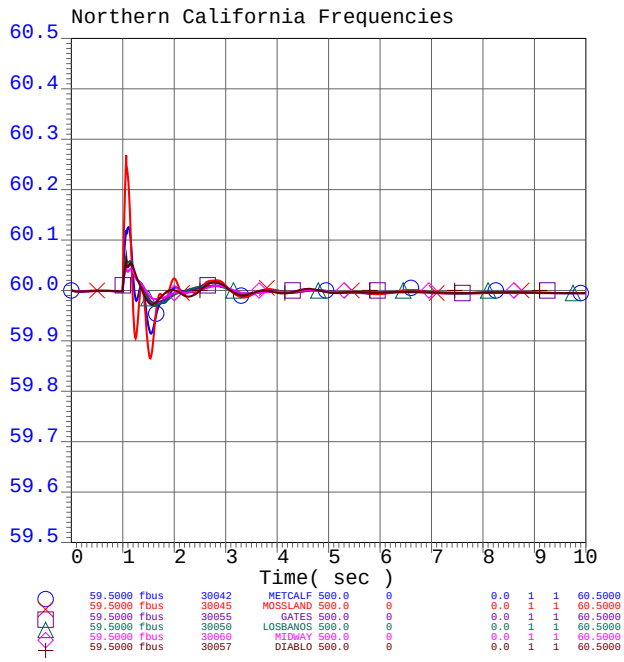
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WECC AREA VOLTAGE AND FREQUENCIES



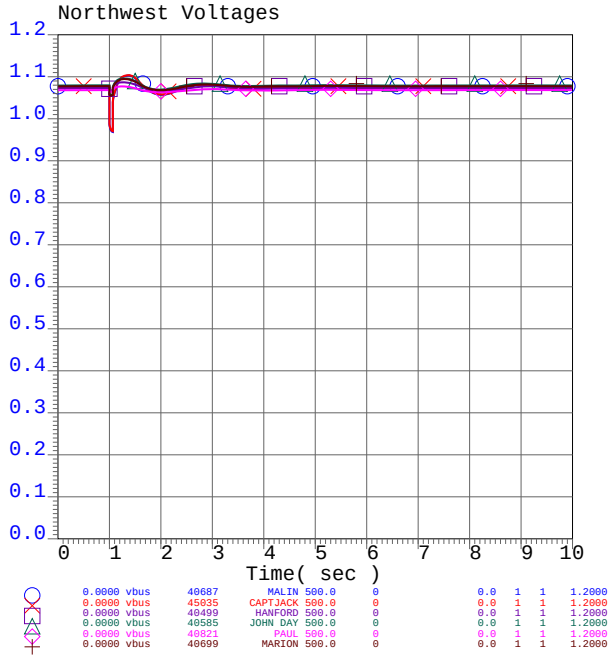


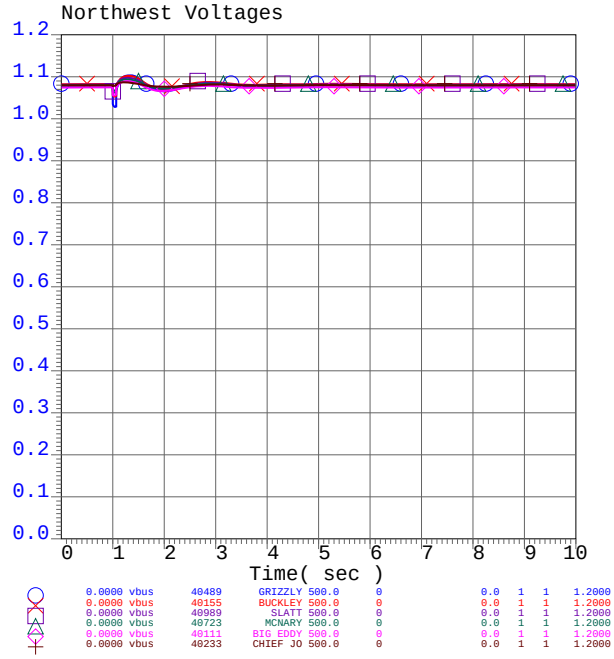


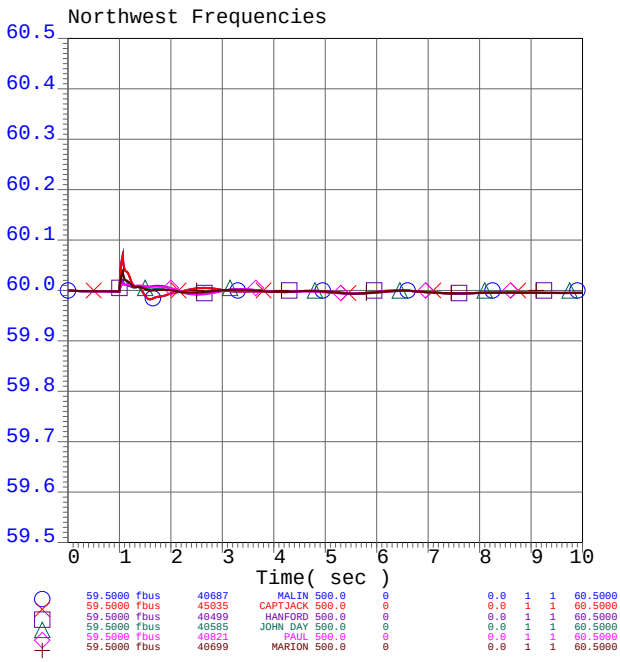


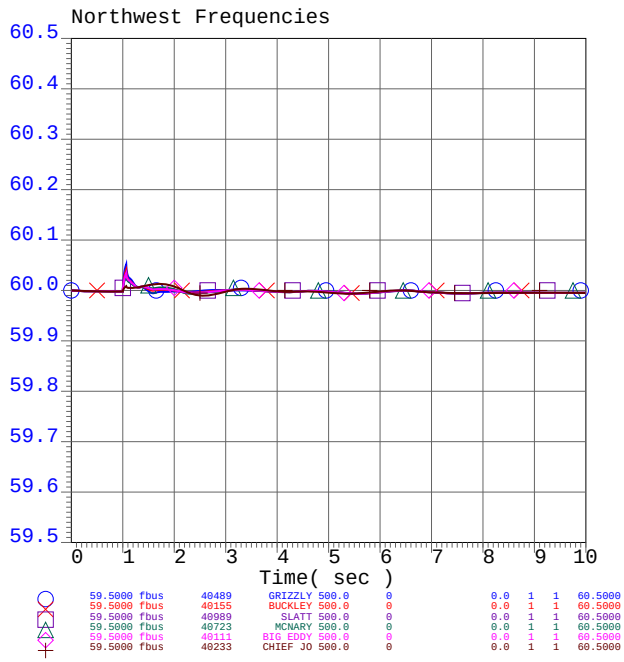
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WECC AREA VOLTAGE AND FREQUENCIES





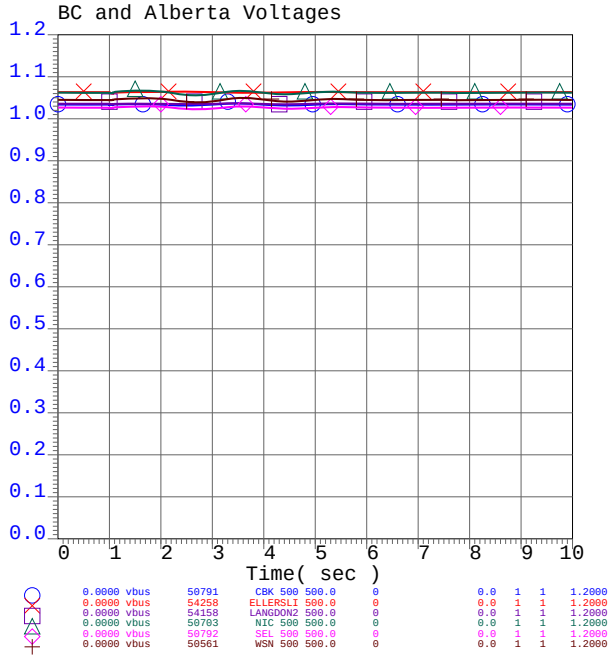




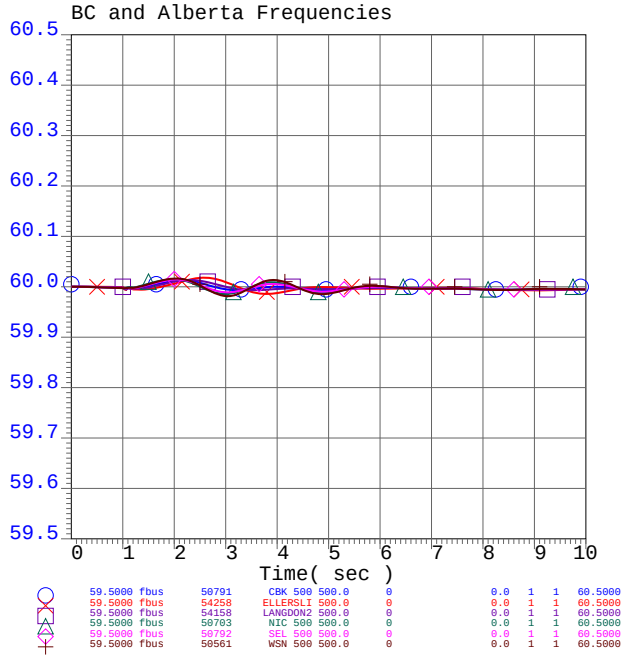
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WECC AREA VOLTAGE AND FREQUENCIES

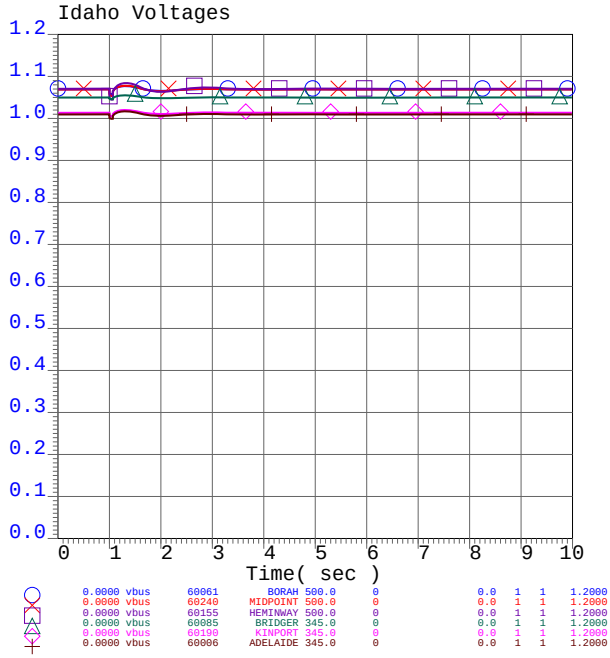
BC and Alberta Voltages



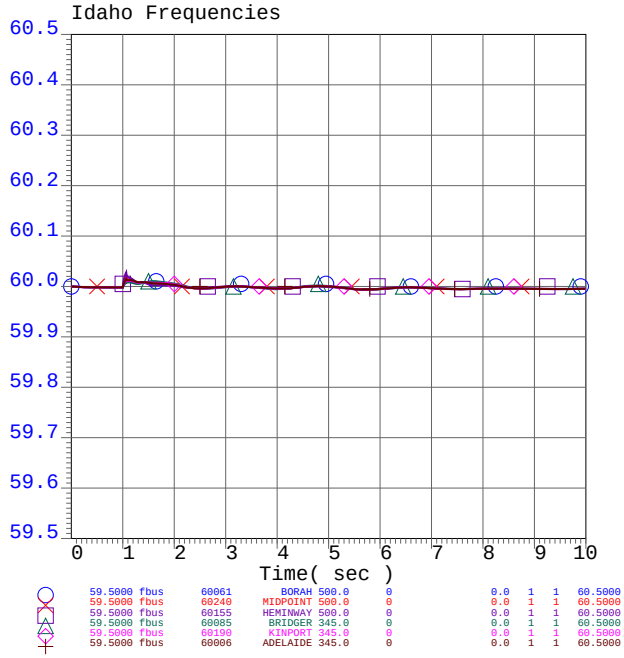
BC and Alberta Frequencies



Idaho Voltages

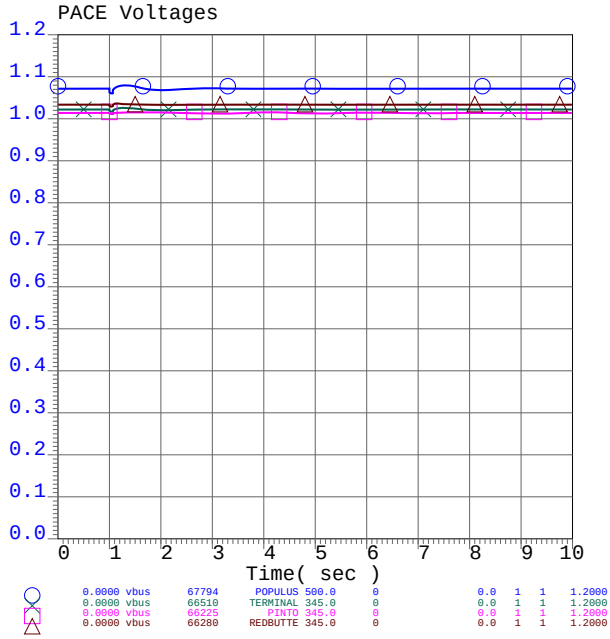


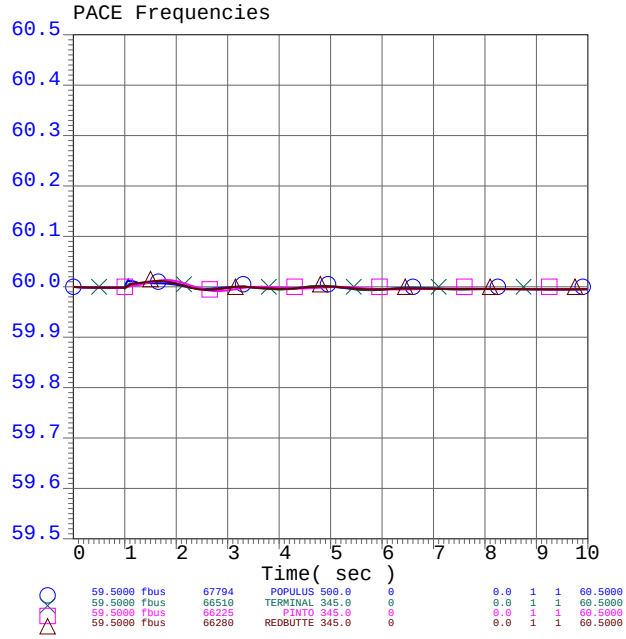
Idaho Frequencies

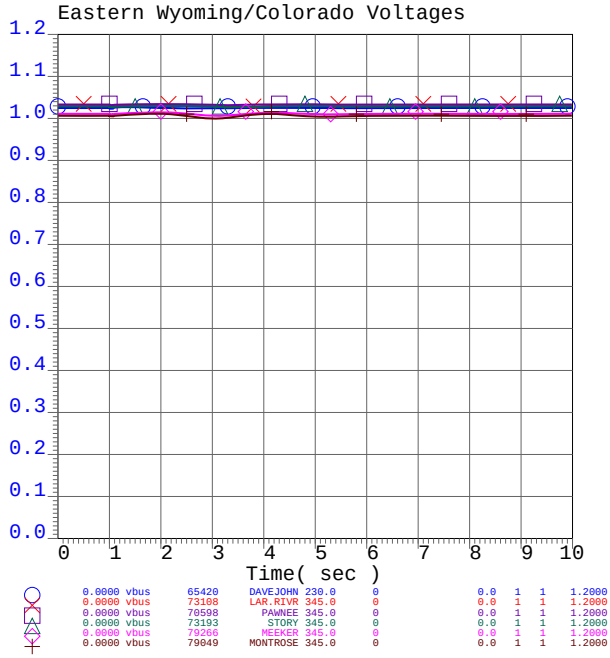


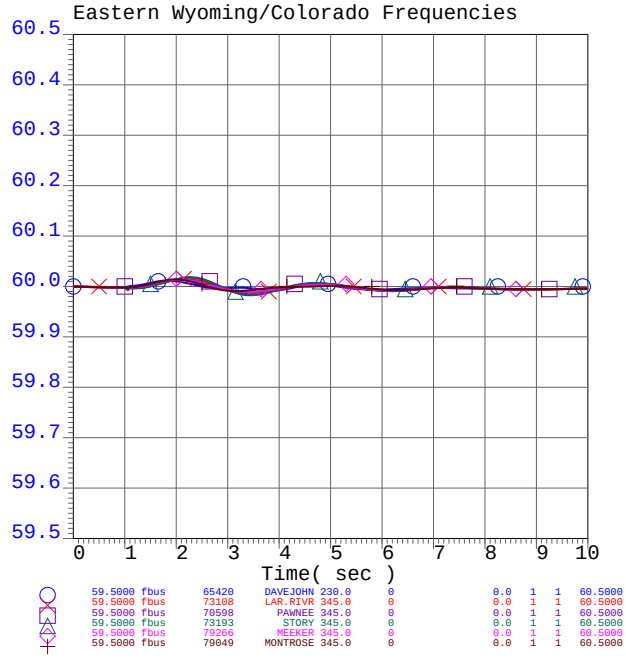
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Moss Landing 500 kV
followed by loss of Moss Landing-Los Banos 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





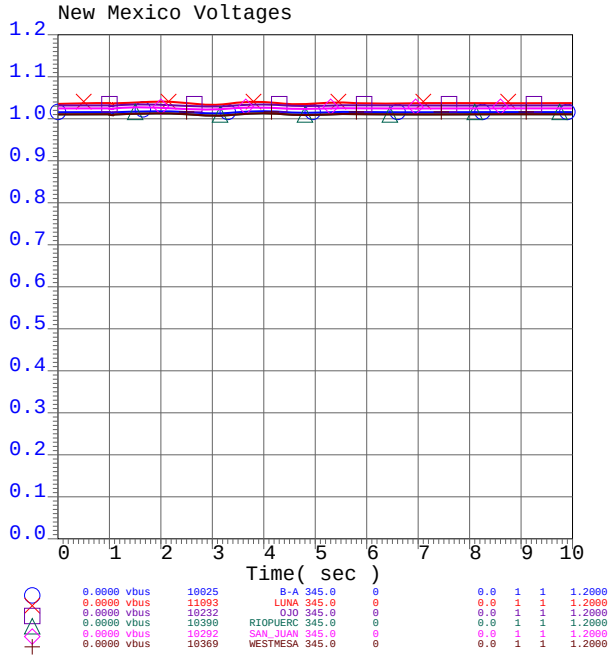




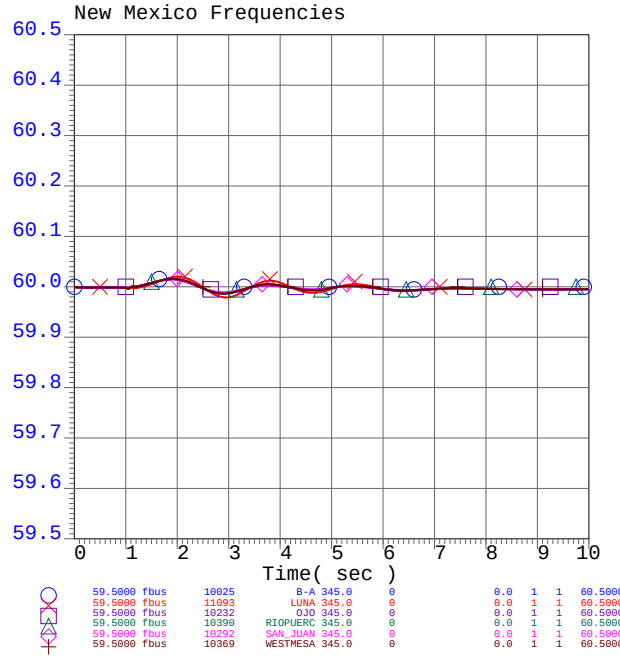
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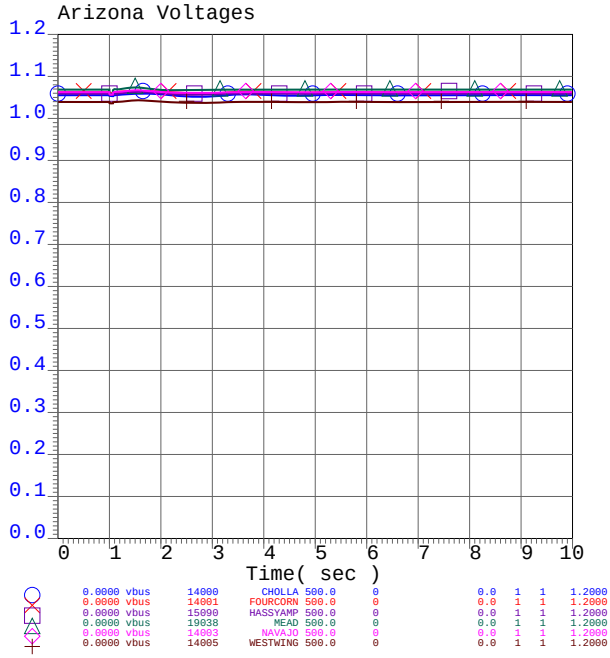
New Mexico Voltages



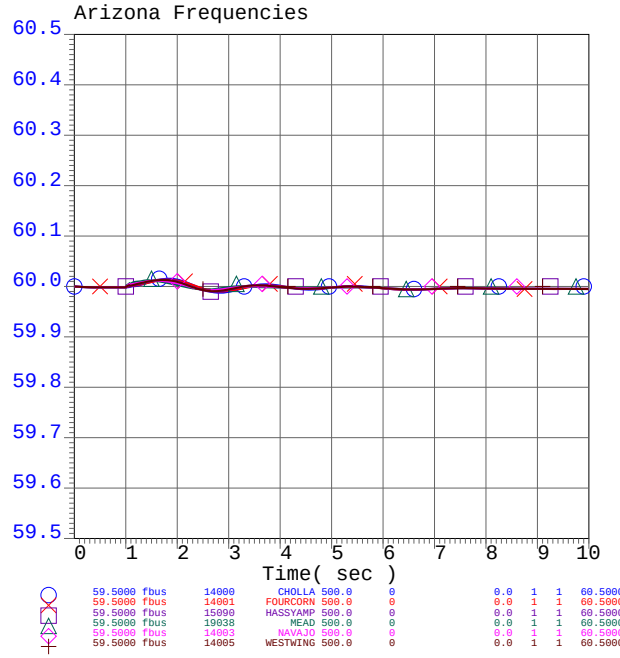
New Mexico Frequencies



Arizona Voltages

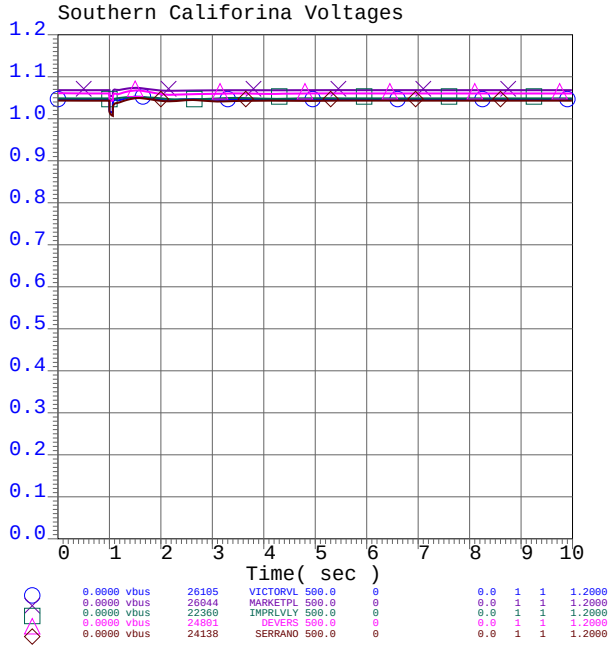


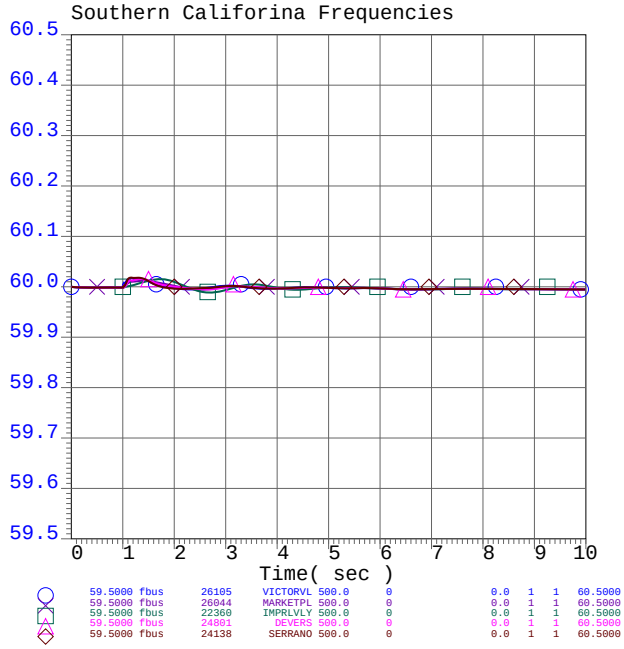
Arizona Frequencies

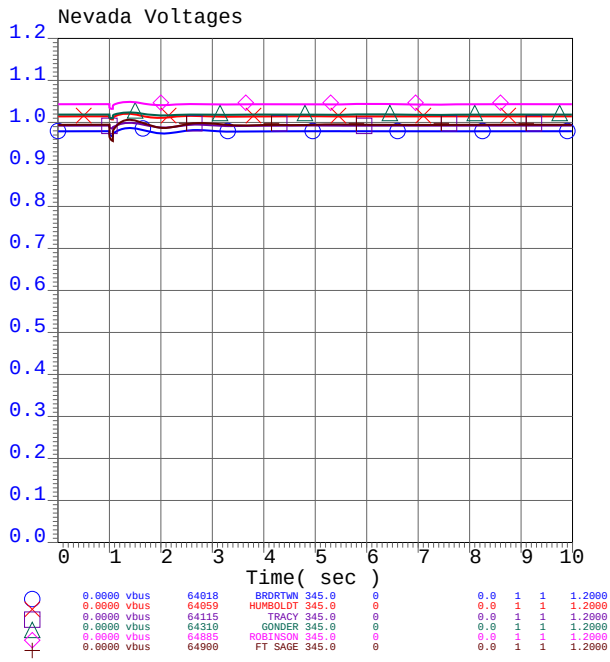


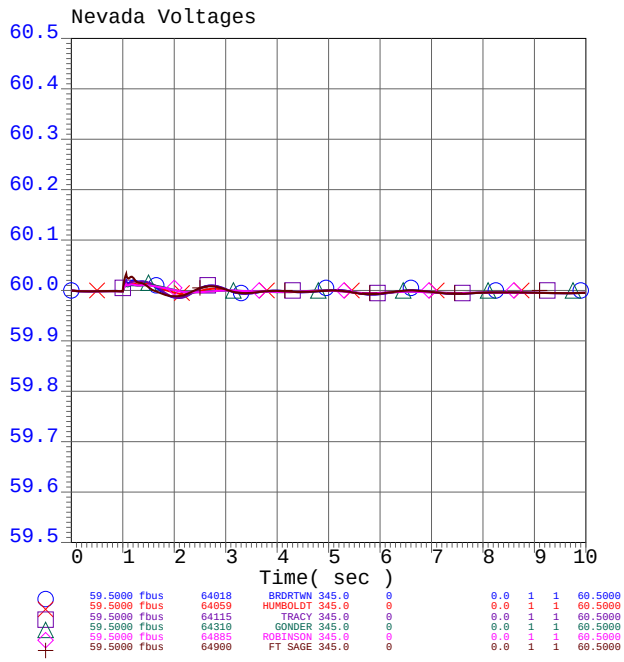
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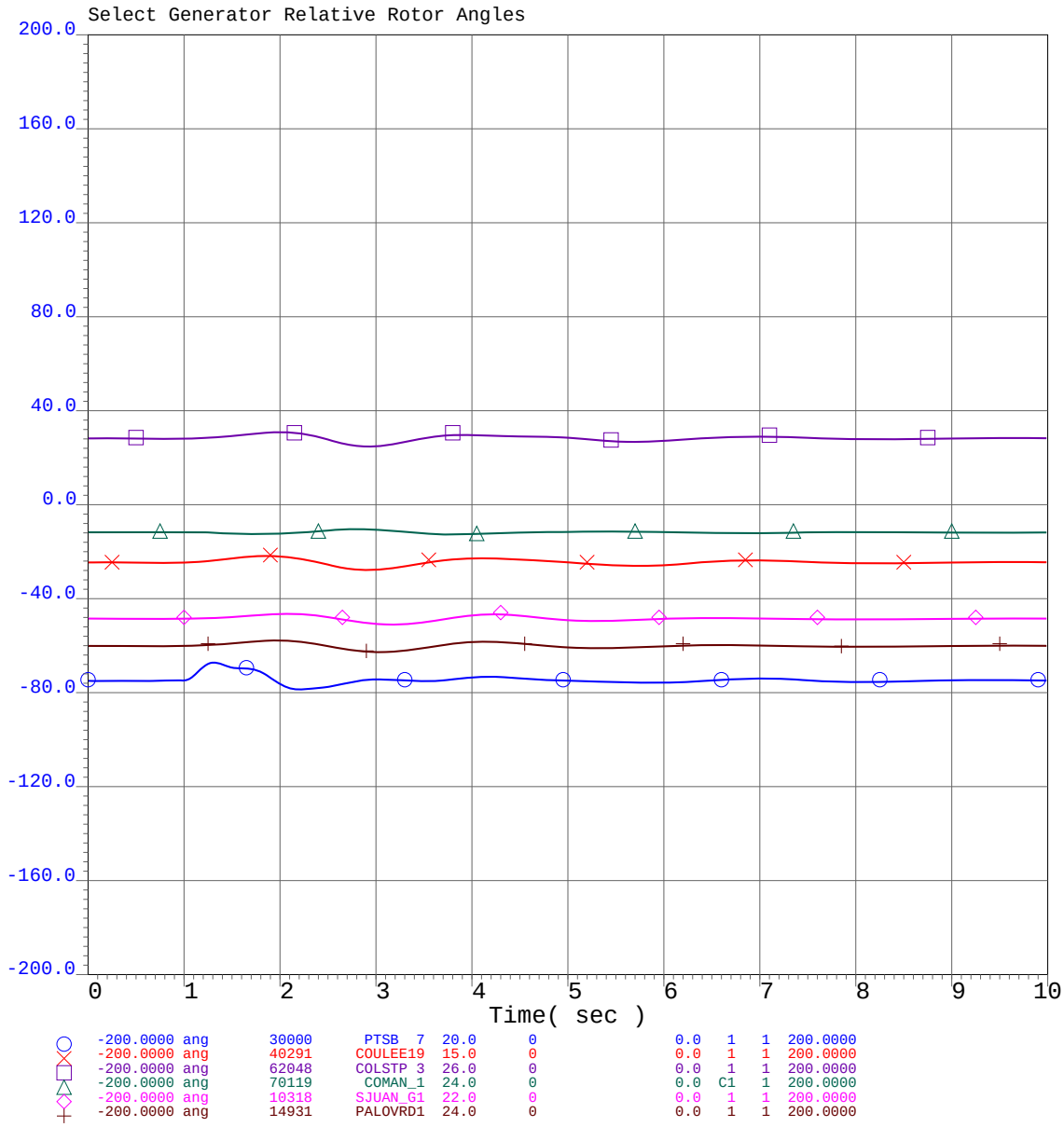






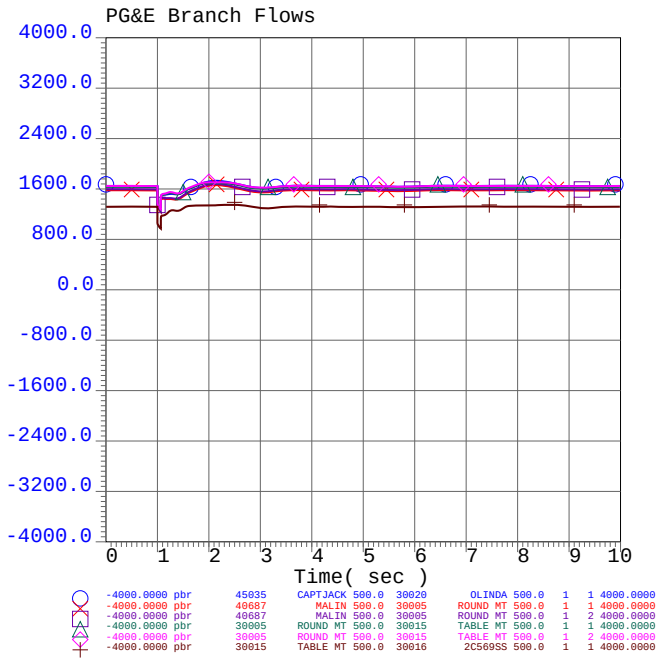
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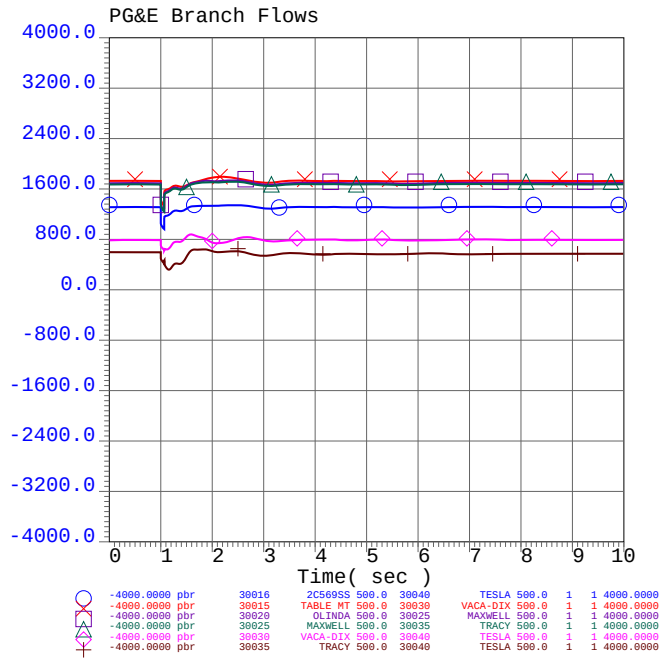
WECC RELATIVE ROTOR ANGLES

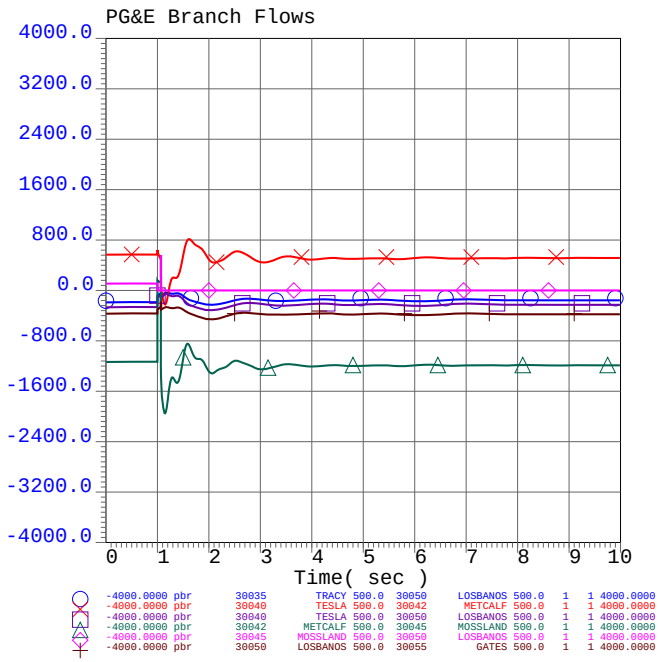


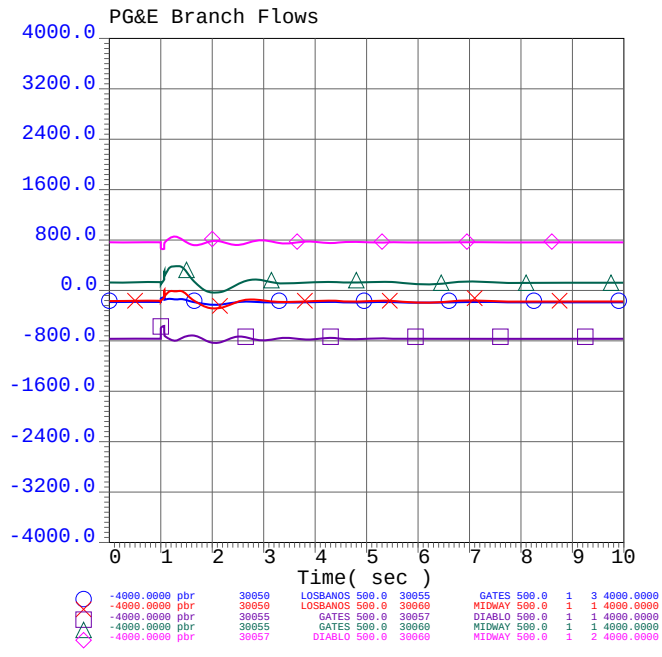
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SELECT BRANCH FLOWS





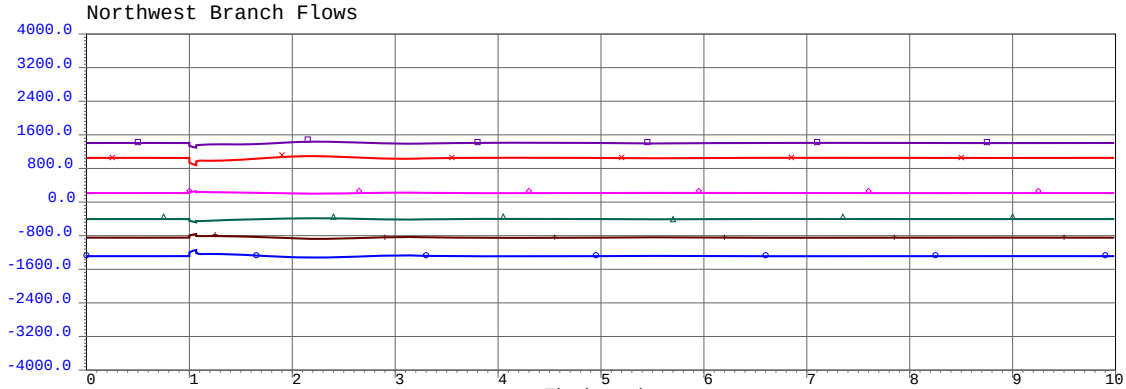




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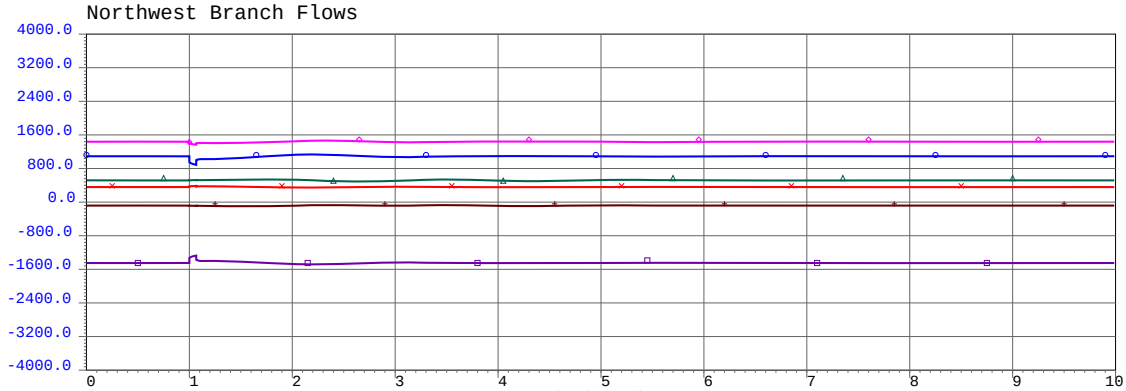
SELECT BRANCH FLOWS

Northwest Branch Flows



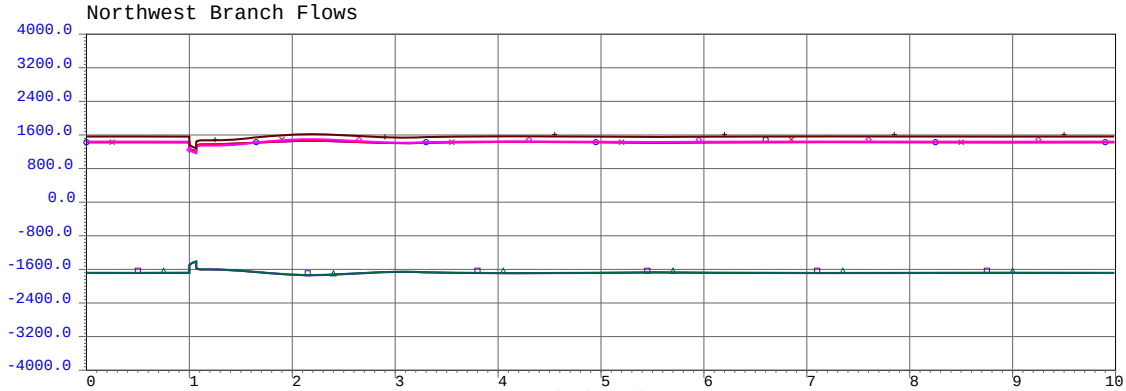
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

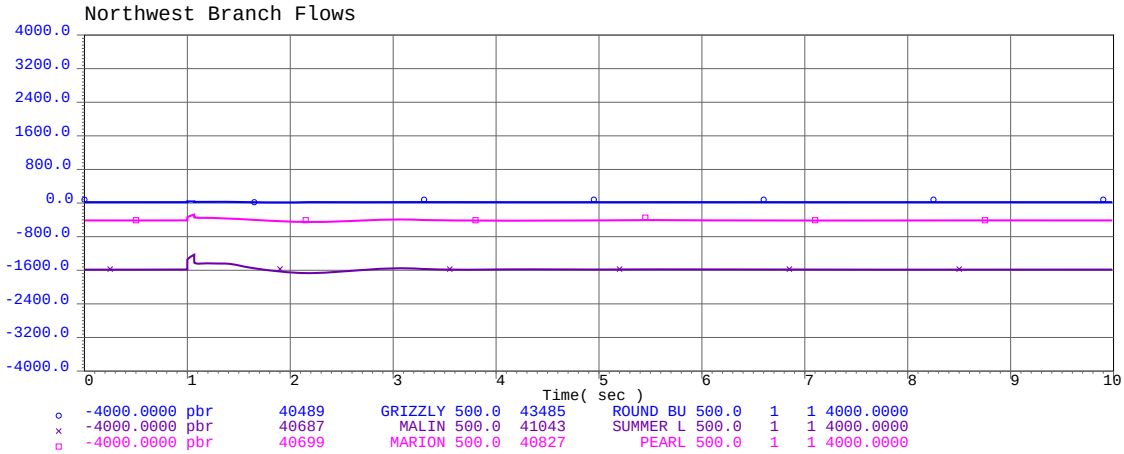
Northwest Branch Flows

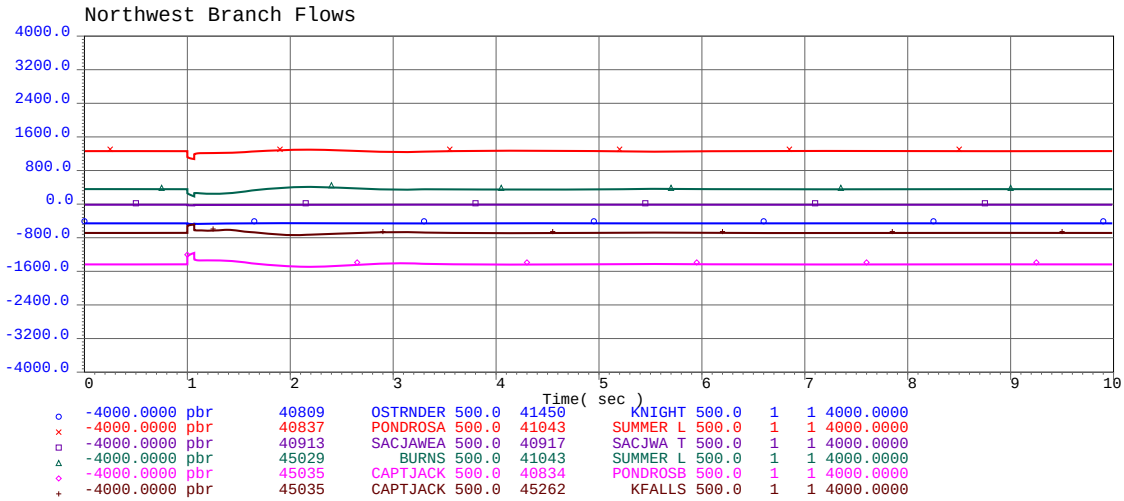


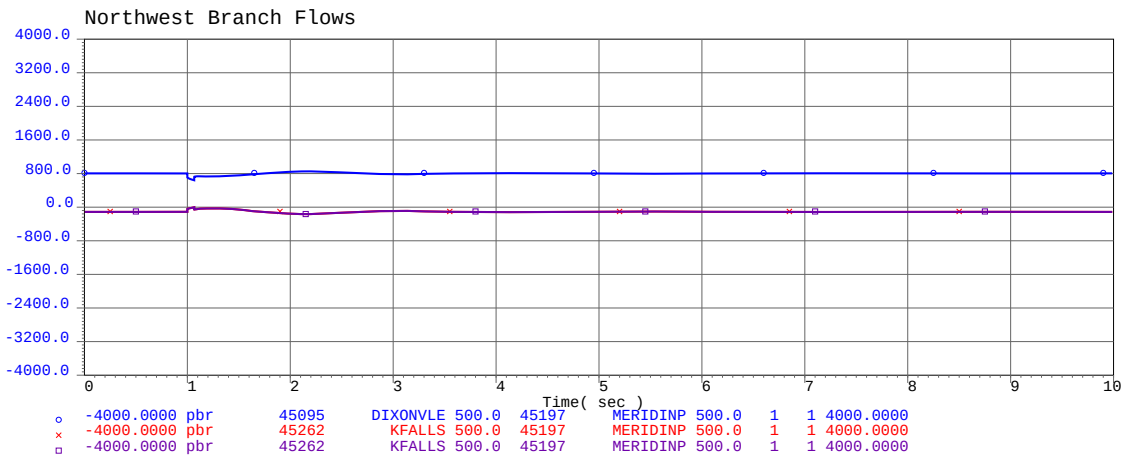
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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SELECT BRANCH FLOWS

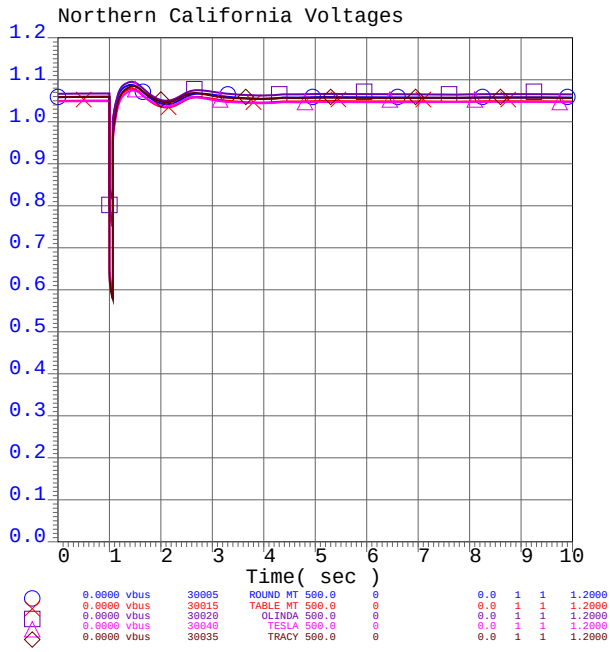


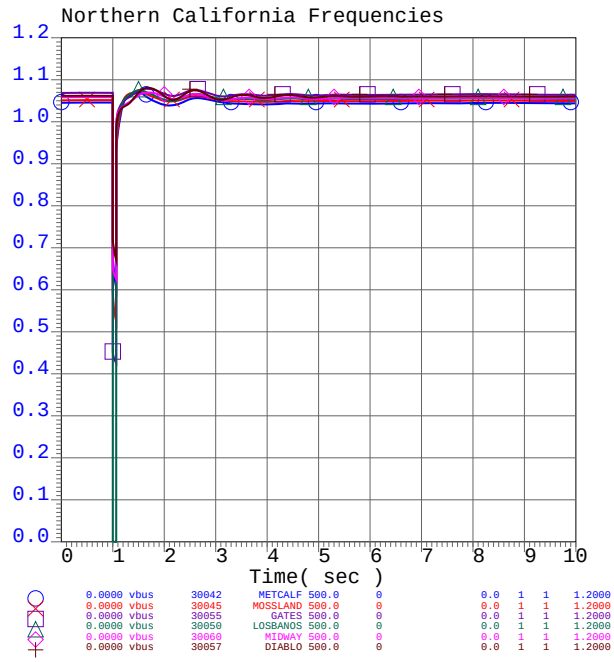


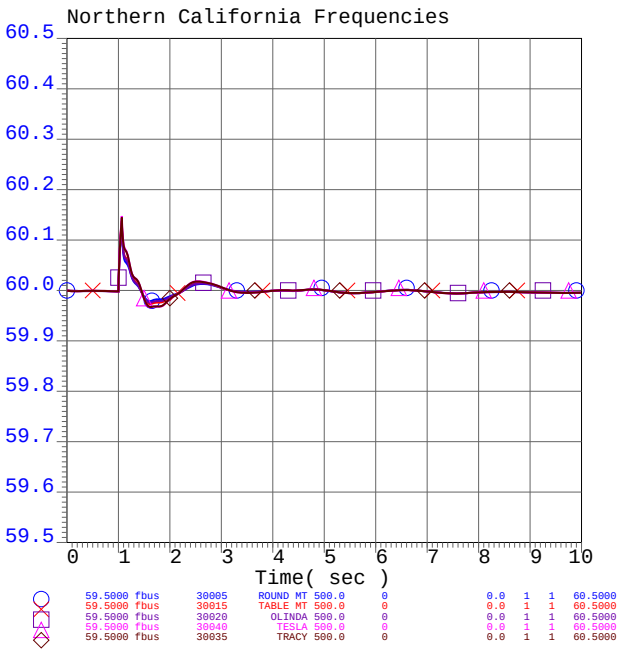


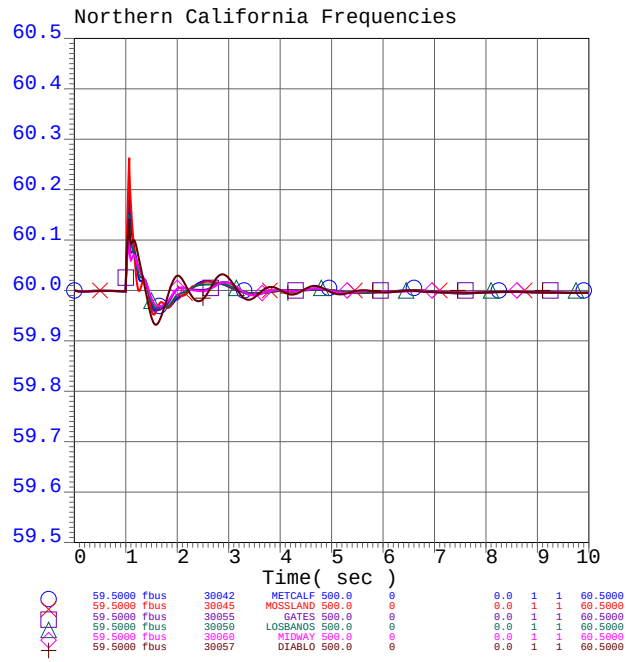
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WECC AREA VOLTAGE AND FREQUENCIES



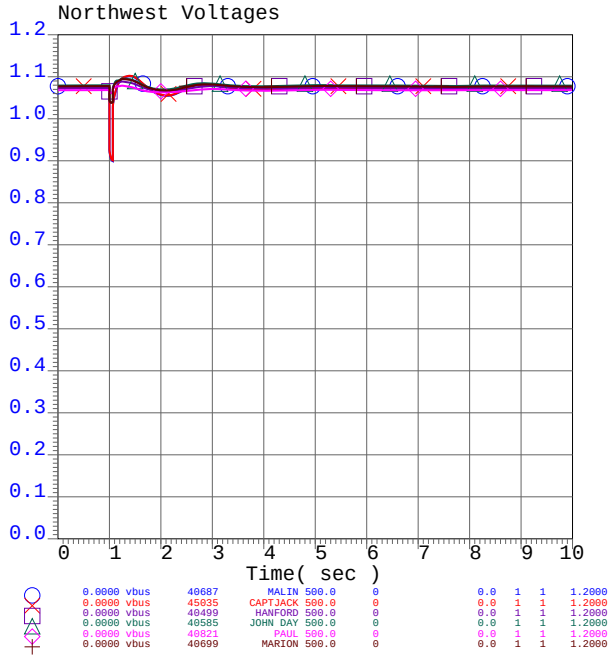


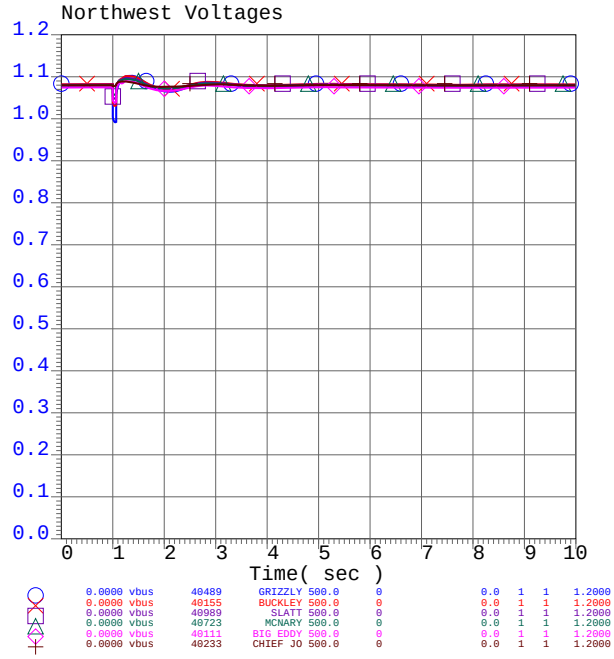


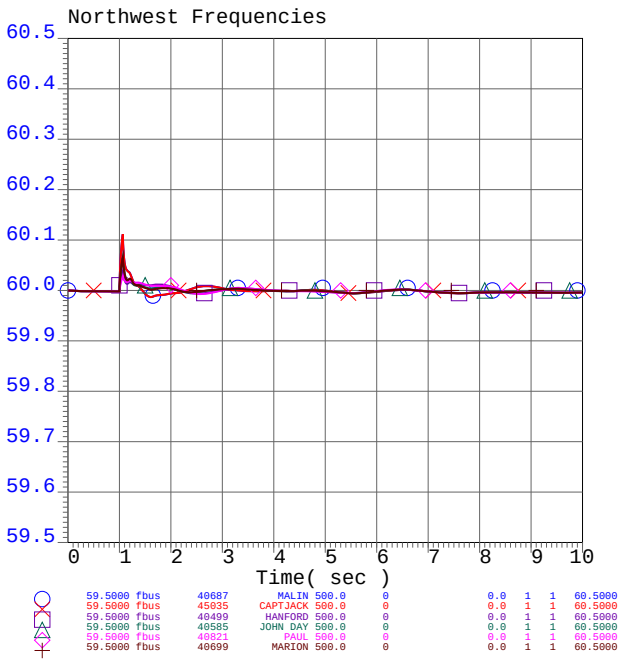


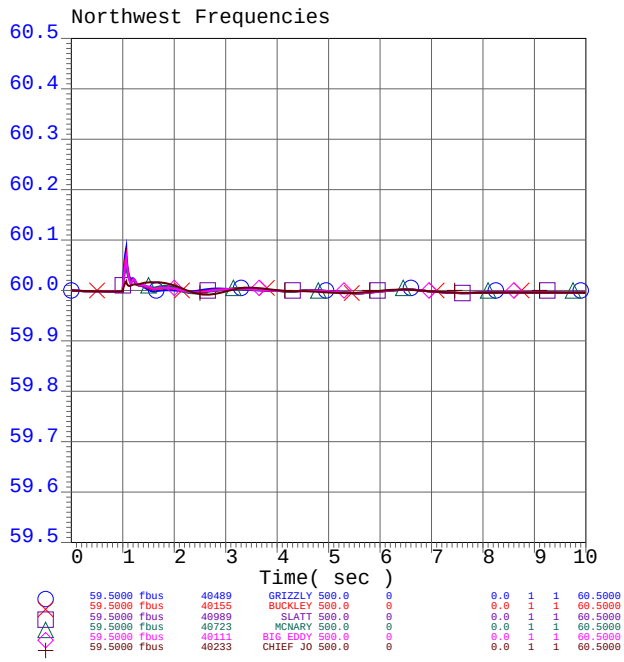
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WECC AREA VOLTAGE AND FREQUENCIES





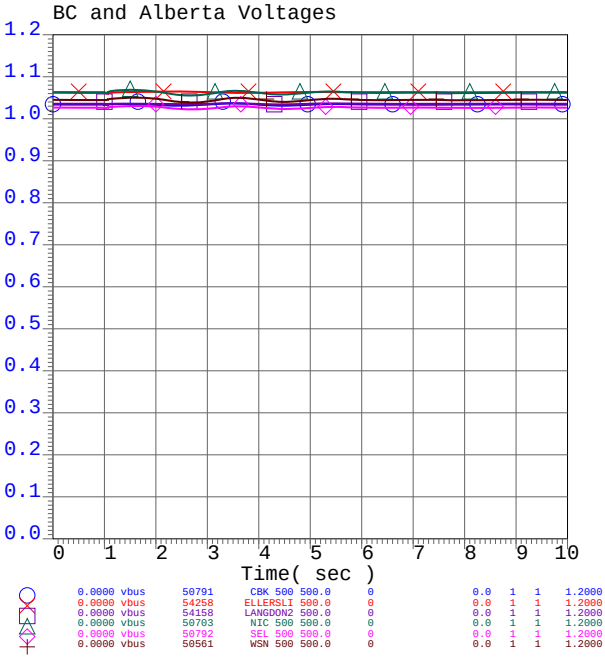




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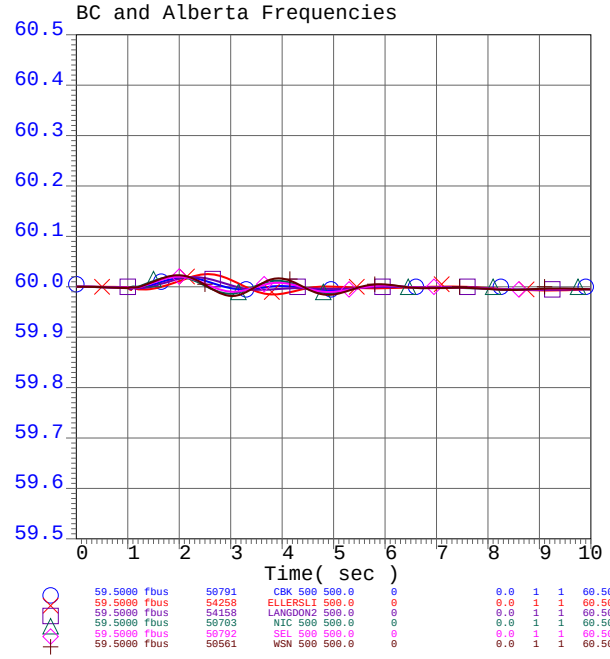
WECC AREA VOLTAGE AND FREQUENCIES

BC and Alberta Voltages



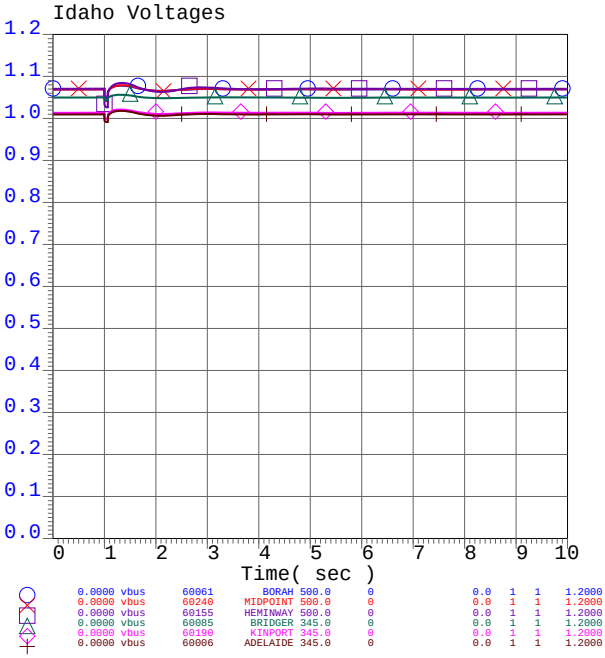
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0.0000 vbus	54258	ELLERSLI	500.0	0	0.0	1	1	1.2000
0.0000 vbus	54158	LANGDON2	500.0	0	0.0	1	1	1.2000
0.0000 vbus	50703	NIC 500	500.0	0	0.0	1	1	1.2000
0.0000 vbus	50792	SEL 500	500.0	0	0.0	1	1	1.2000
0.0000 vbus	50561	WSN 500	500.0	0	0.0	1	1	1.2000

BC and Alberta Frequencies



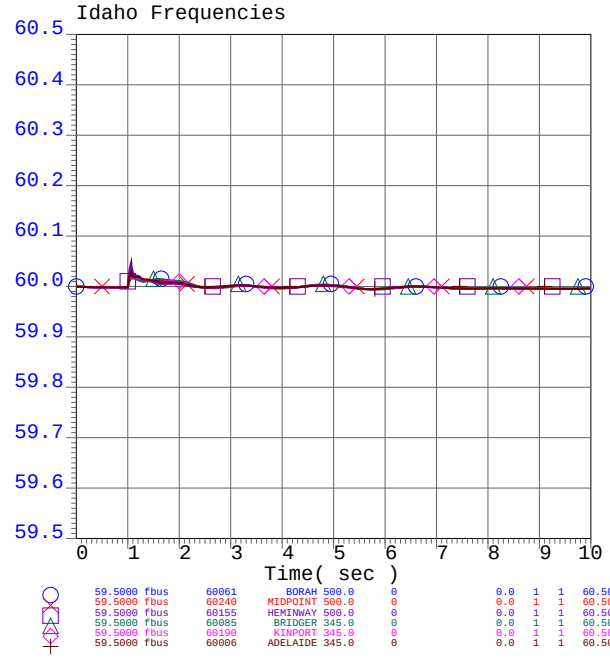
59.5000 fbus	50791	CBK 500	500.0	0	0.0	1	1	60.5000
59.5000 fbus	54258	ELLERSLI	500.0	0	0.0	1	1	60.5000
59.5000 fbus	54158	LANGDON2	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50703	NIC 500	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50792	SEL 500	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50561	WSN 500	500.0	0	0.0	1	1	60.5000

Idaho Voltages



0.0000 vbus	60061	BORAH	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60240	MIDPOINT	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60155	HEMINWAY	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60085	BRIDGER	345.0	0	0.0	1	1	1.2000
0.0000 vbus	60190	KINPORT	345.0	0	0.0	1	1	1.2000
0.0000 vbus	60006	ADELAIDE	345.0	0	0.0	1	1	1.2000

Idaho Frequencies

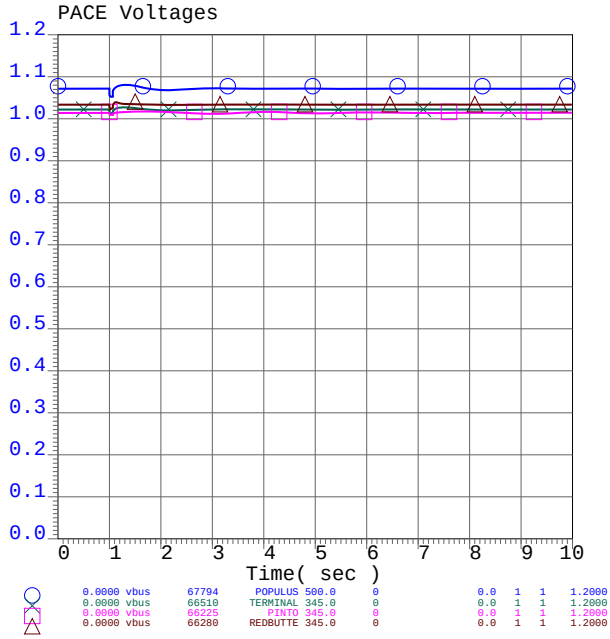


59.5000 fbus	60061	BORAH	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60240	MIDPOINT	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60155	HEMINWAY	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60085	BRIDGER	345.0	0	0.0	1	1	60.5000
59.5000 fbus	60190	KINPORT	345.0	0	0.0	1	1	60.5000
59.5000 fbus	60006	ADELAIDE	345.0	0	0.0	1	1	60.5000

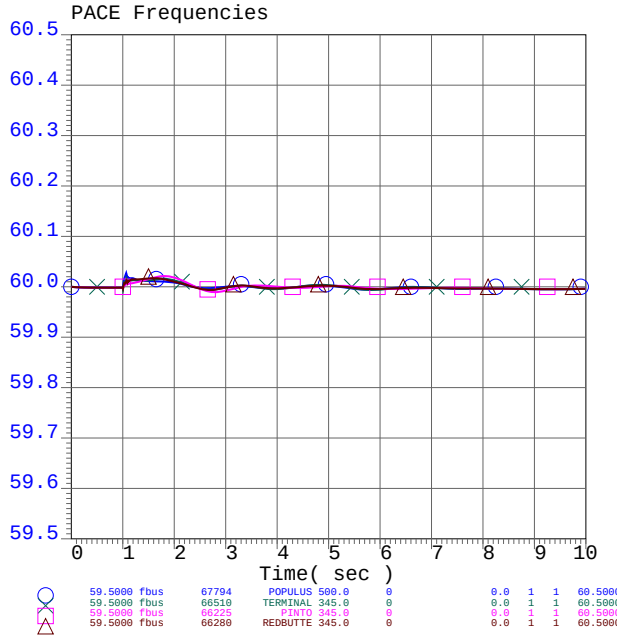
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WECC AREA VOLTAGE AND FREQUENCIES

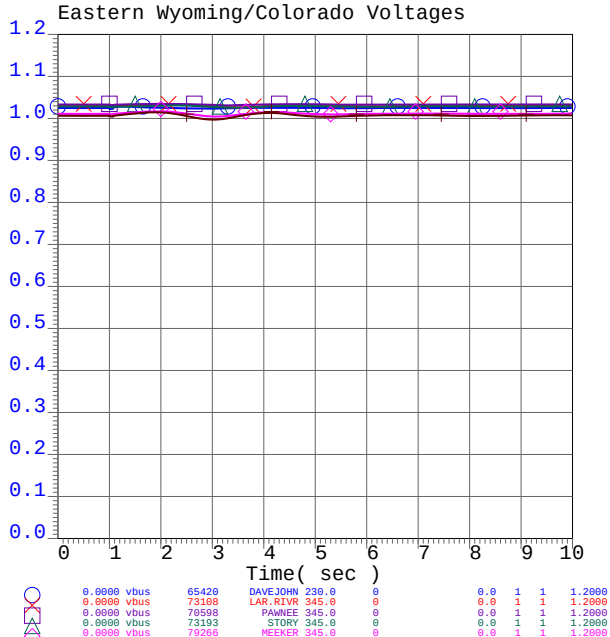
PACE Voltages



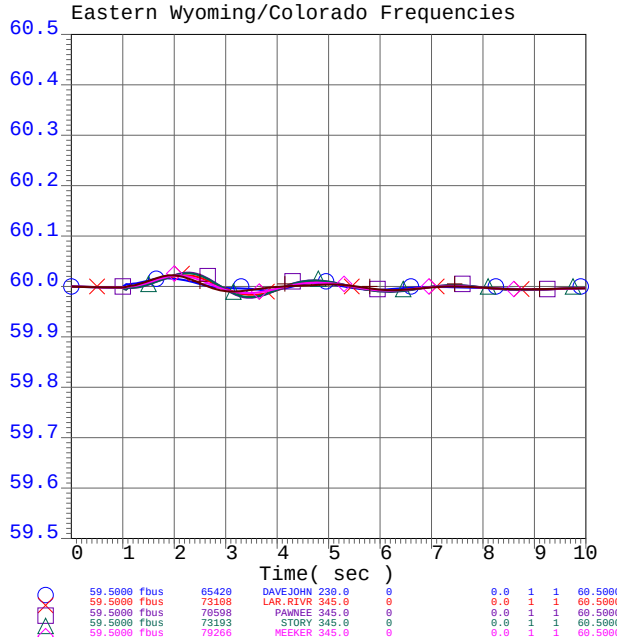
PACE Frequencies



Eastern Wyoming/Colorado Voltages



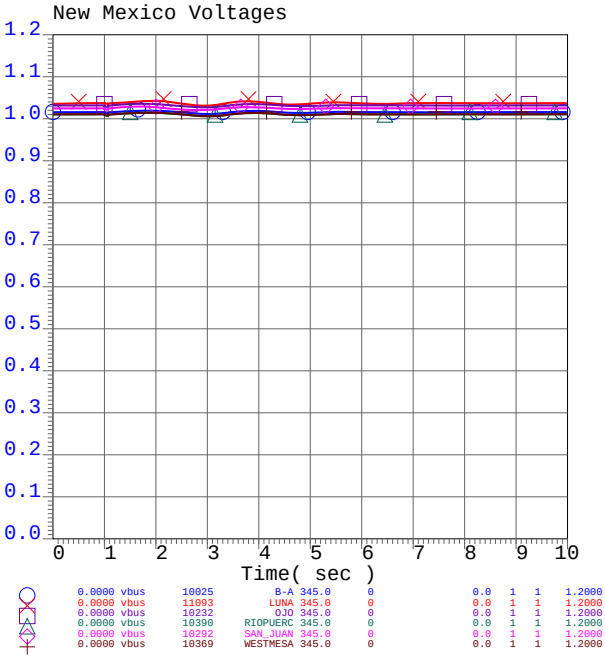
Eastern Wyoming/Colorado Frequencies



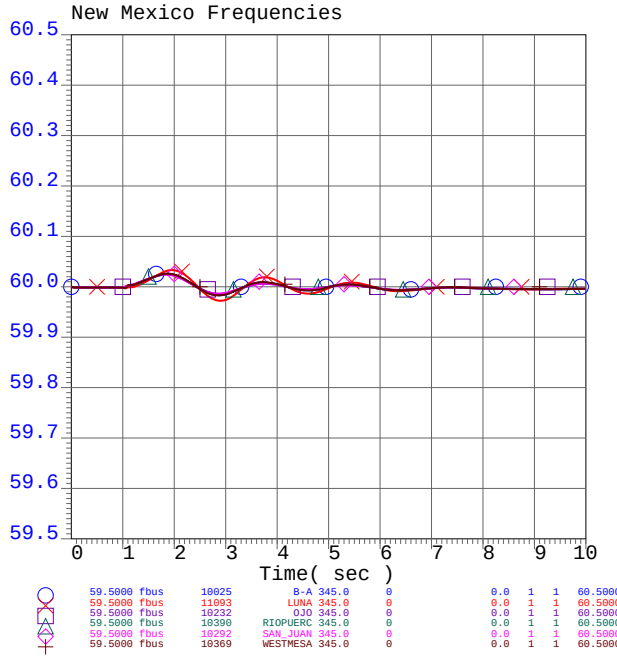
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
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WECC AREA VOLTAGE AND FREQUENCIES

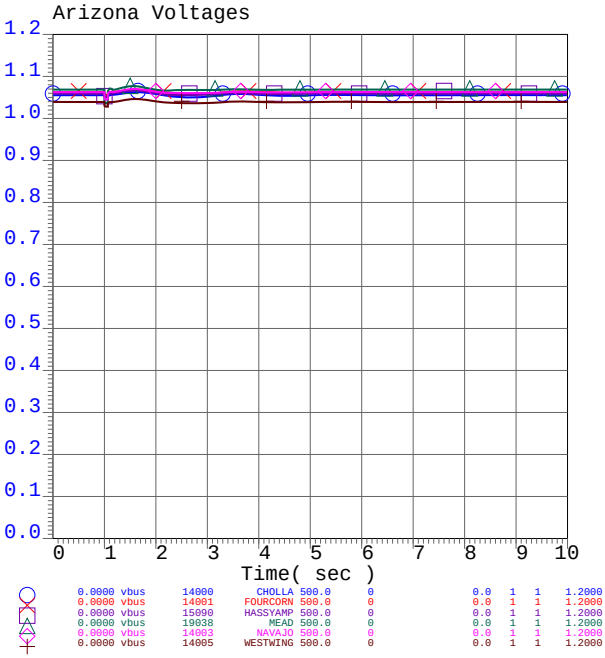
New Mexico Voltages



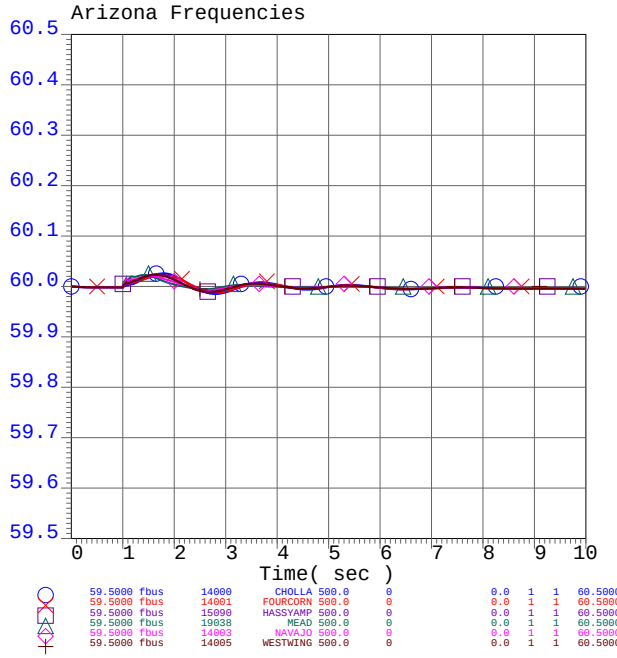
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

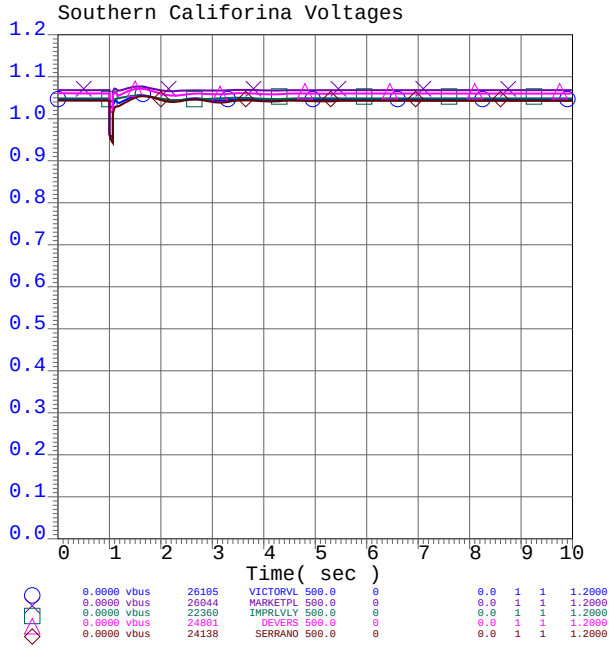


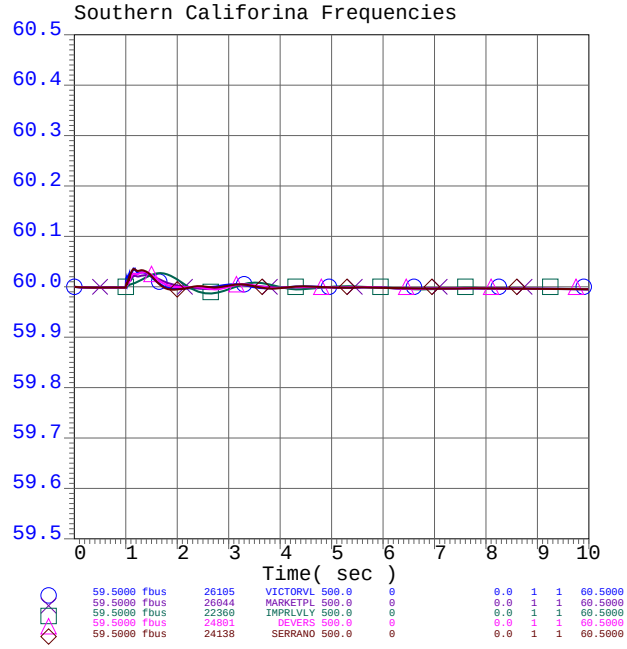
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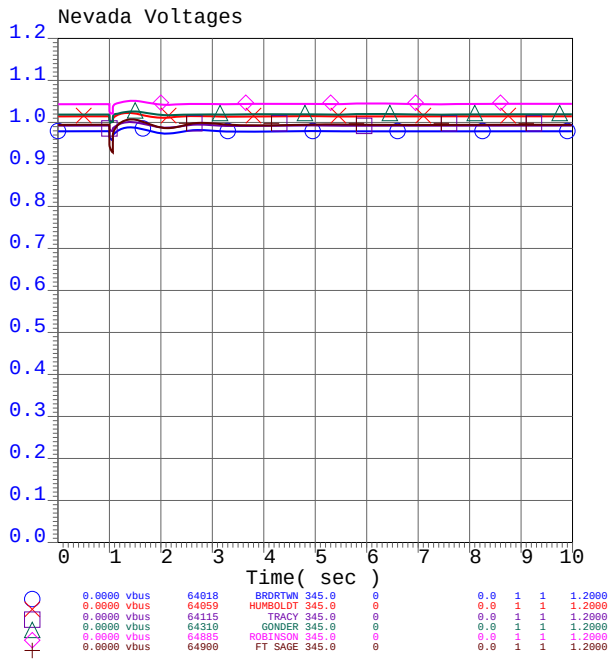
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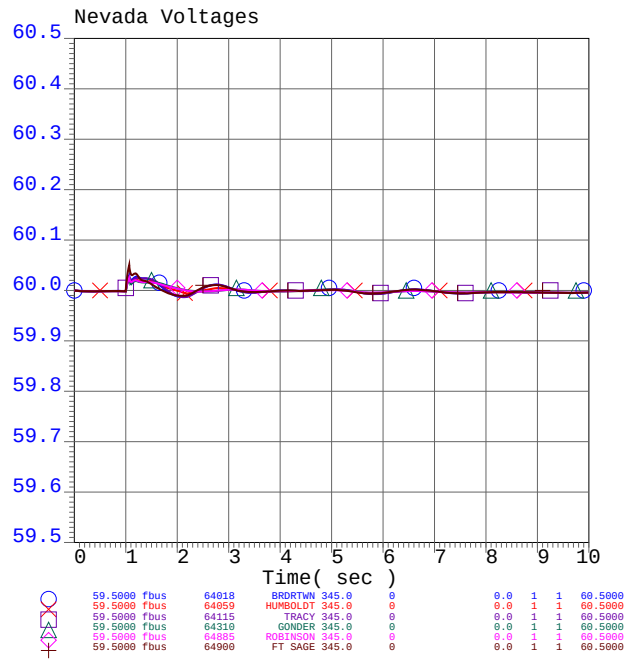
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WECC AREA VOLTAGE AND FREQUENCIES



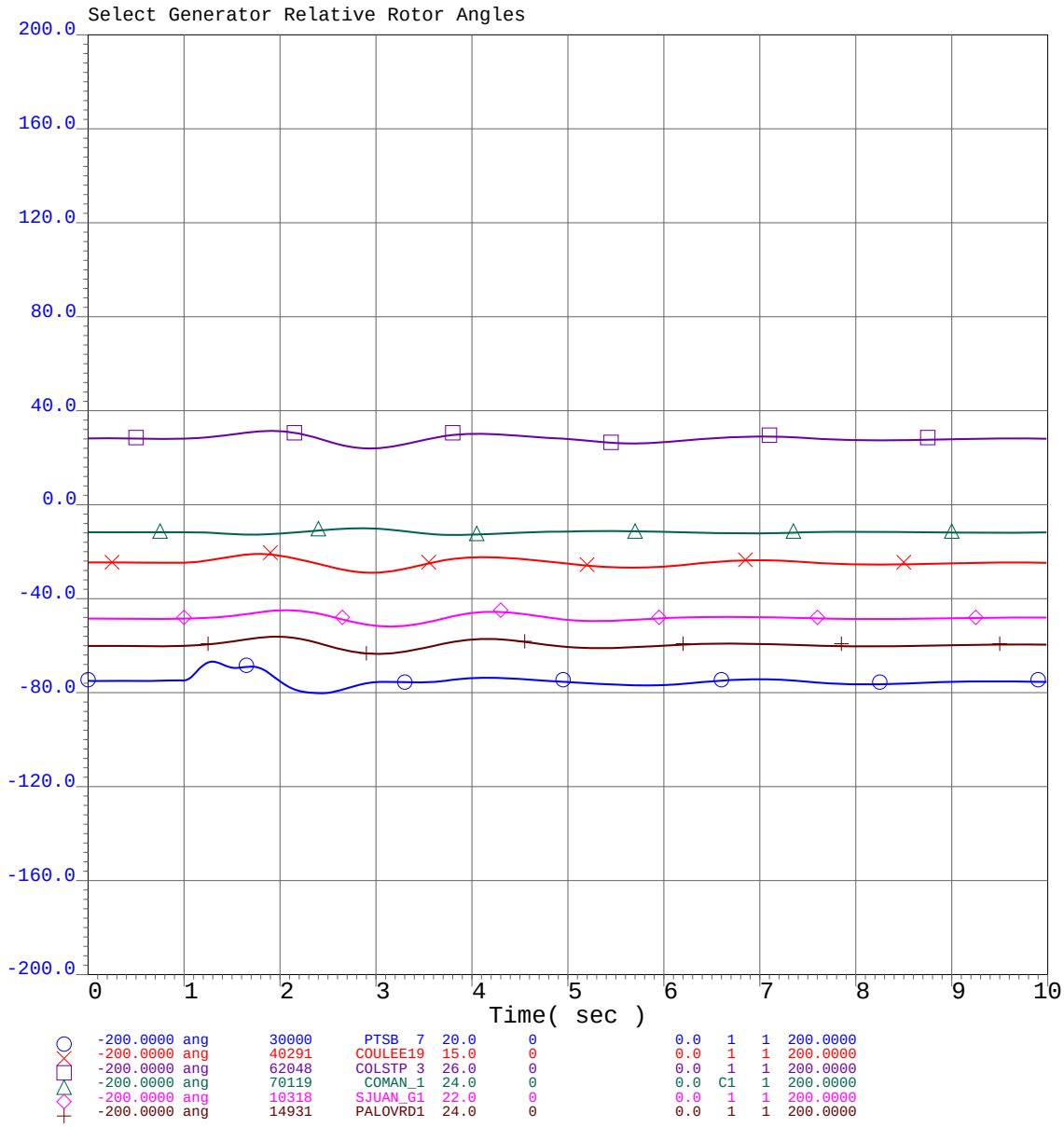






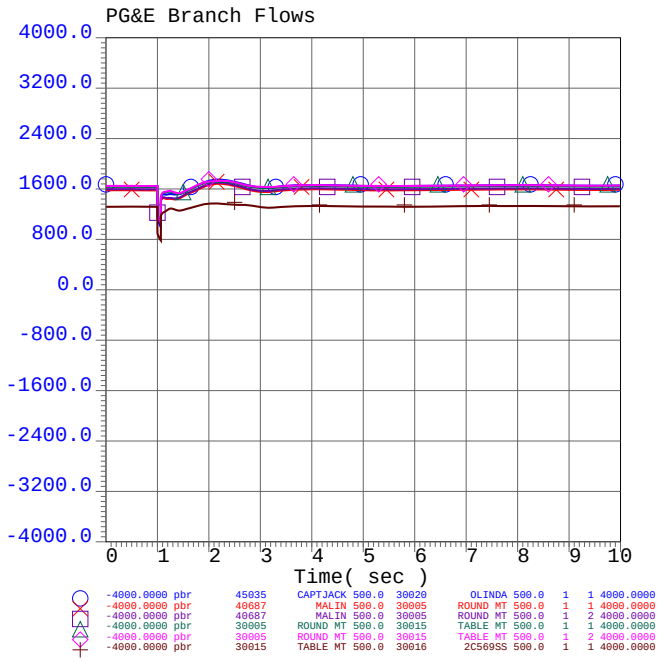
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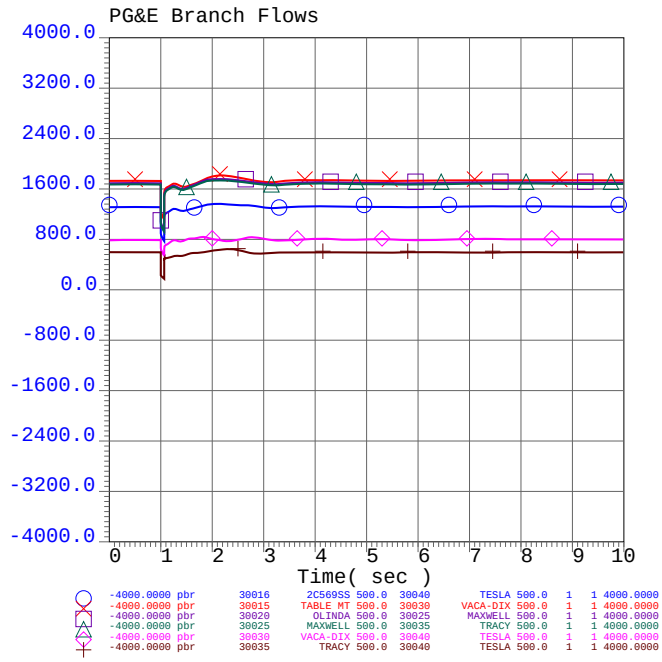
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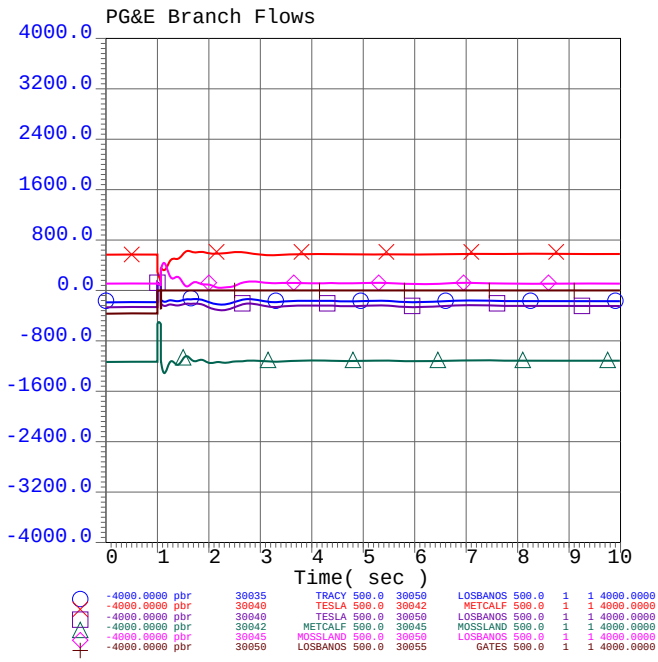


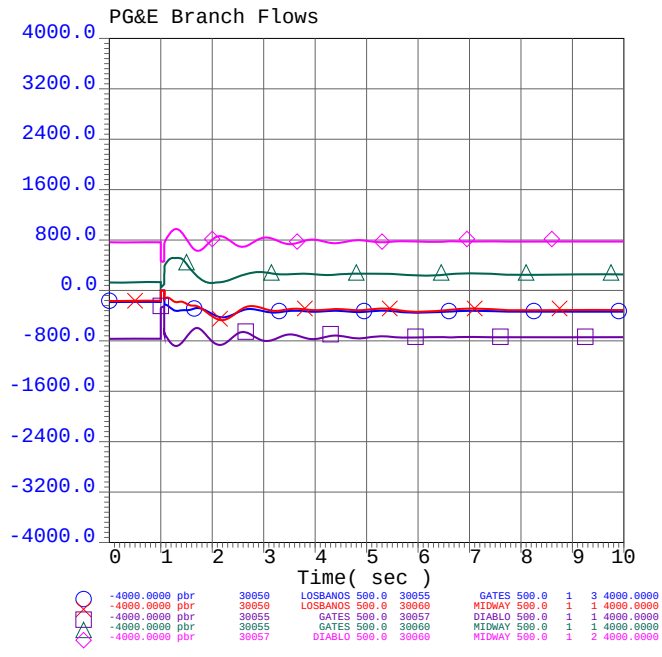
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SELECT BRANCH FLOWS



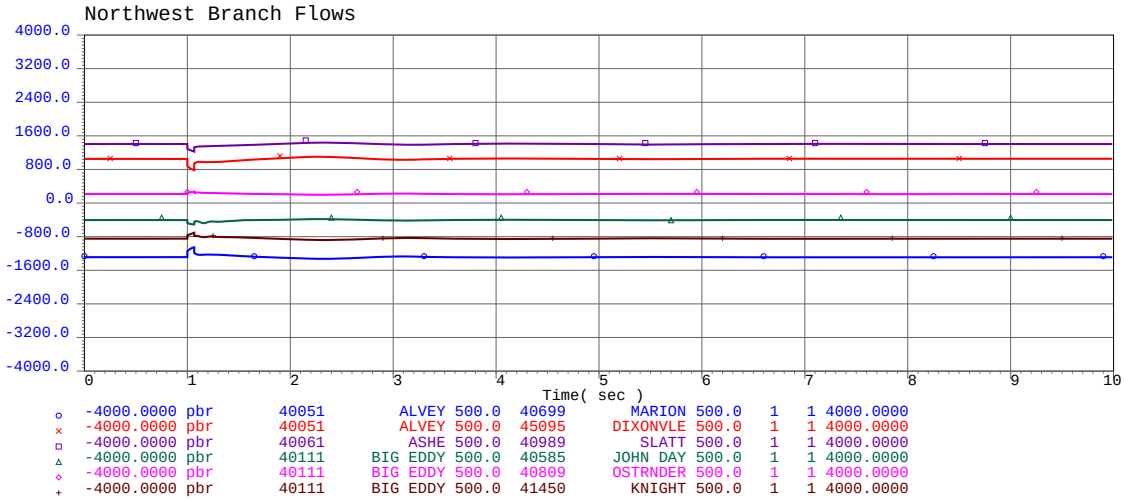




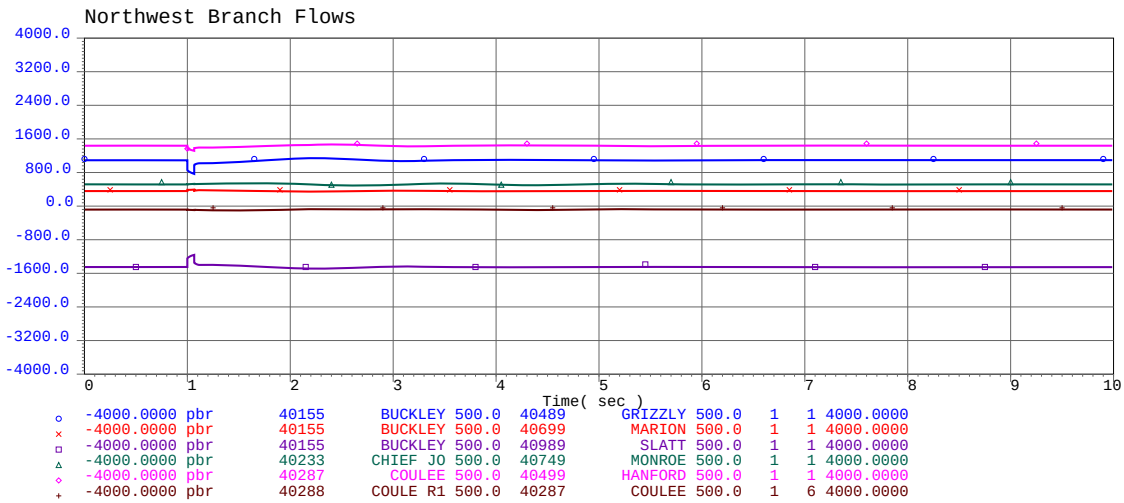


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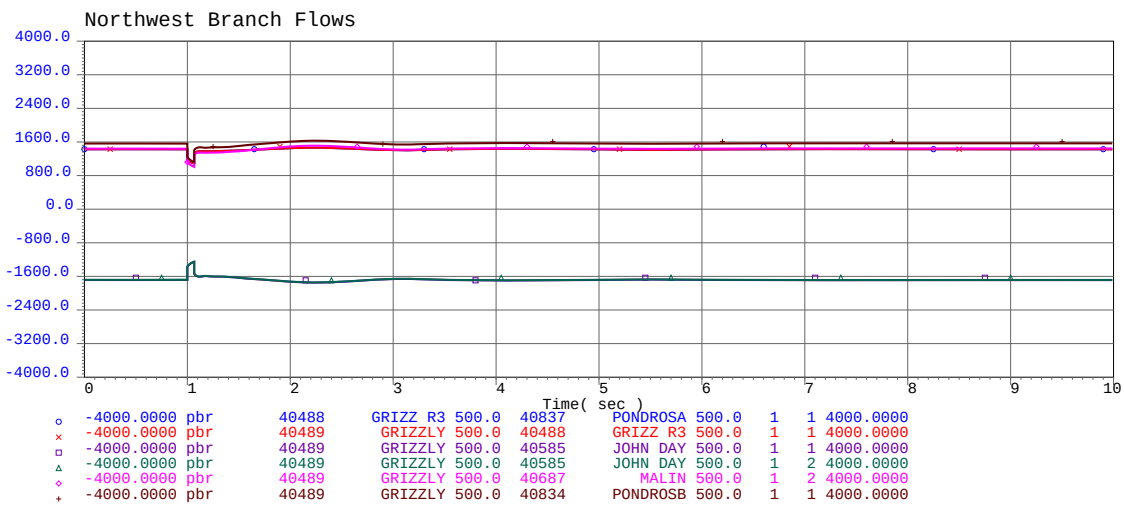
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
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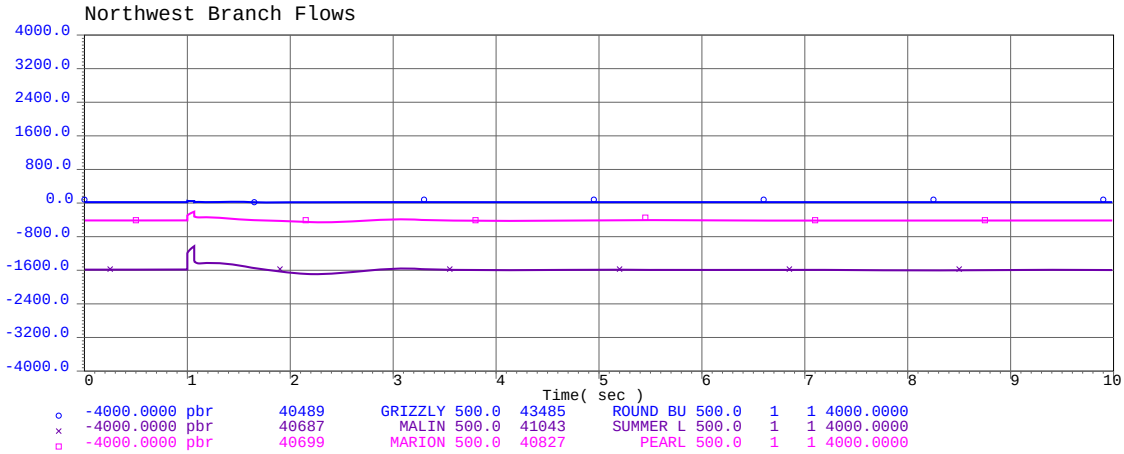
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
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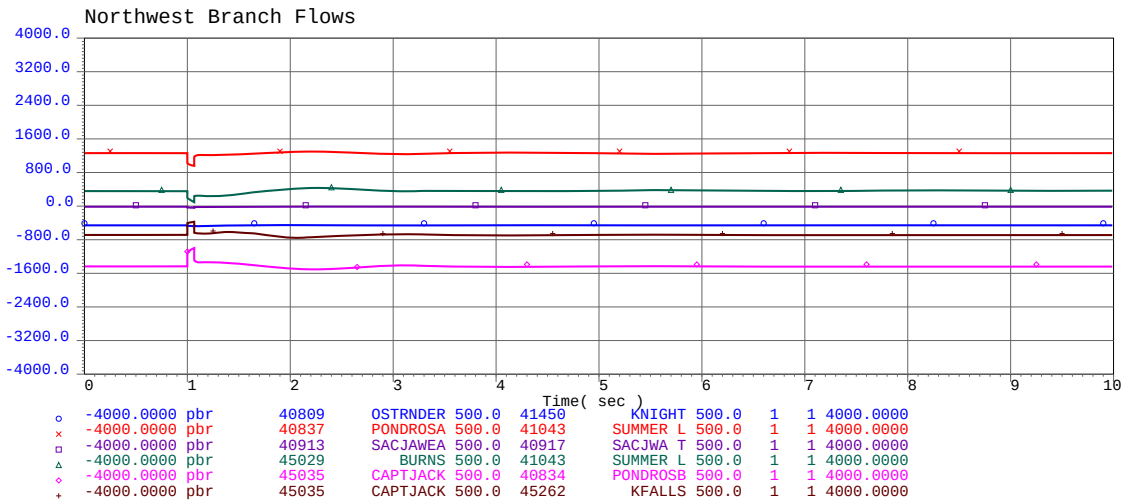
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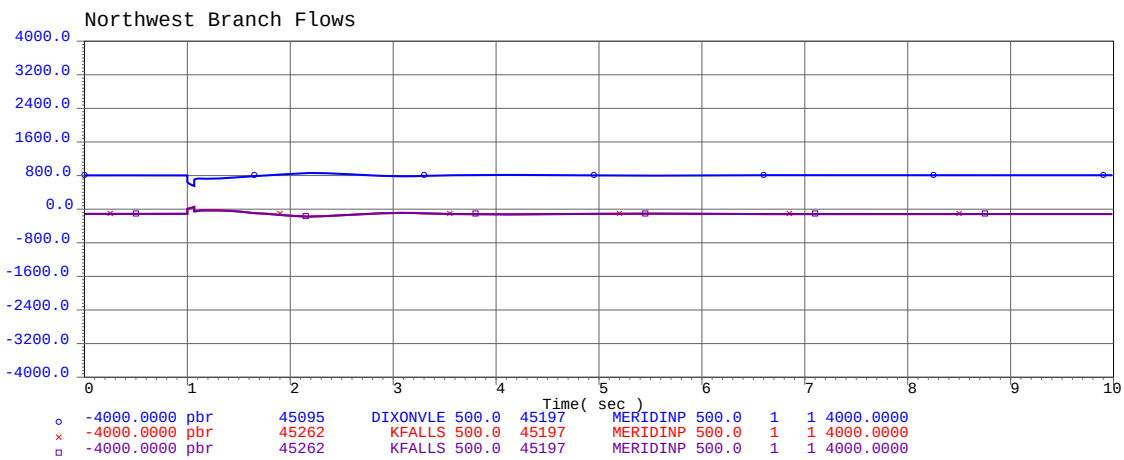
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SELECT BRANCH FLOWS

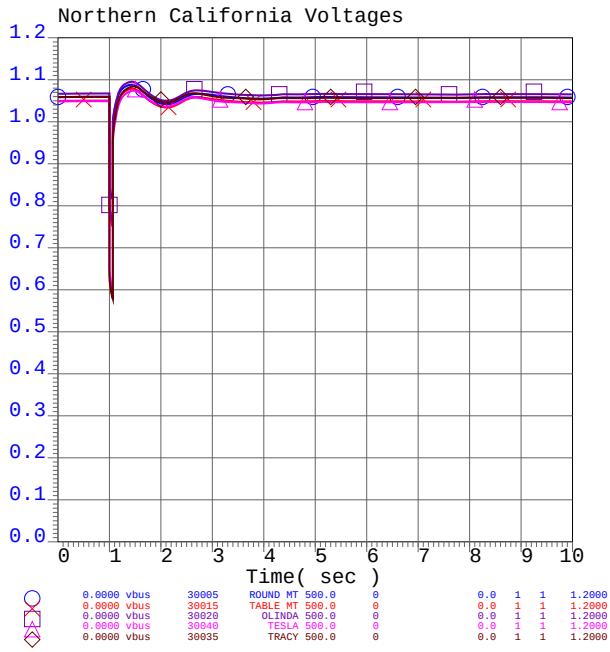


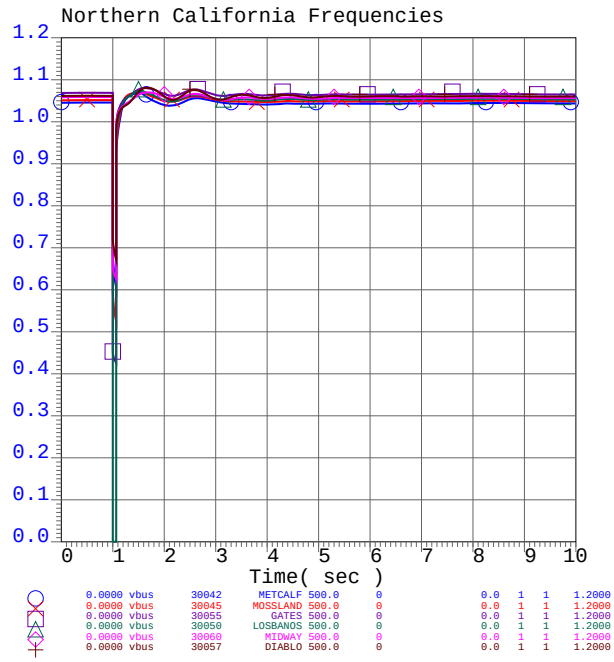


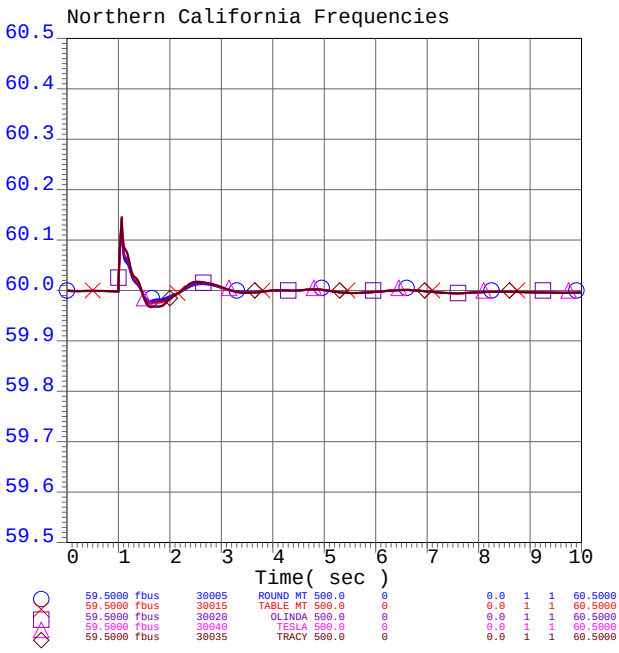


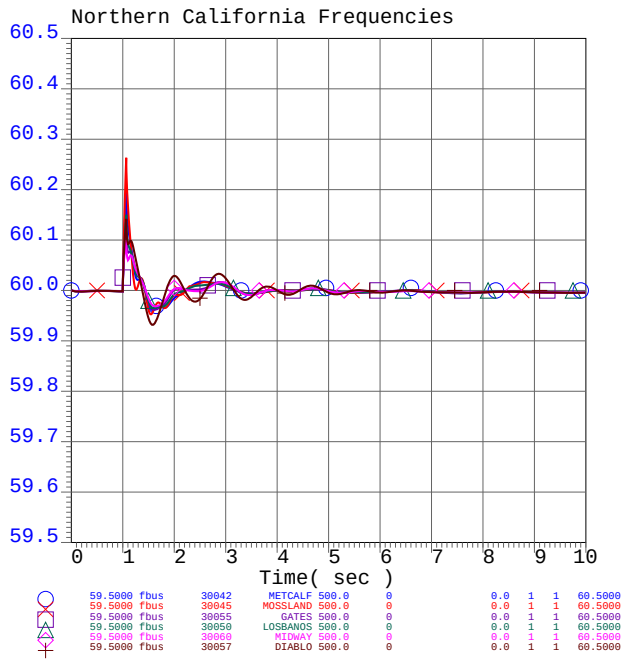
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WECC AREA VOLTAGE AND FREQUENCIES



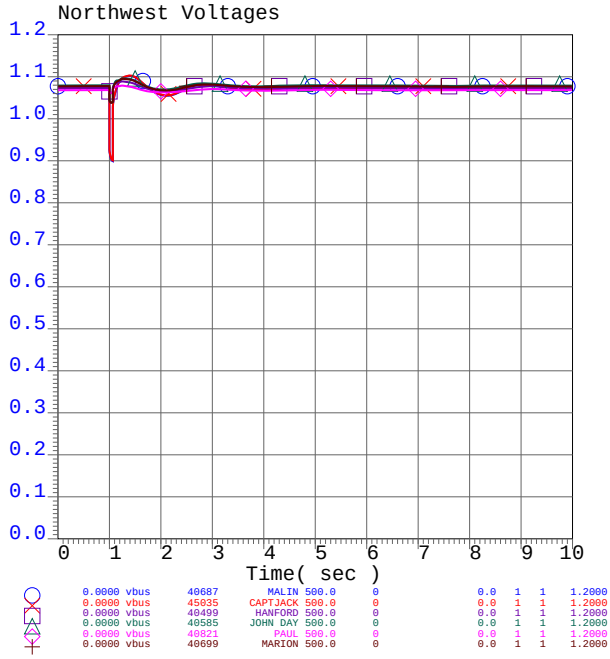


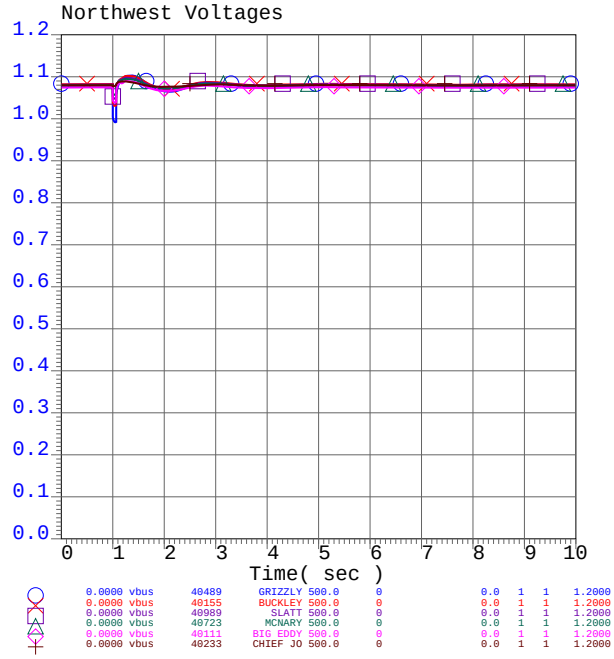


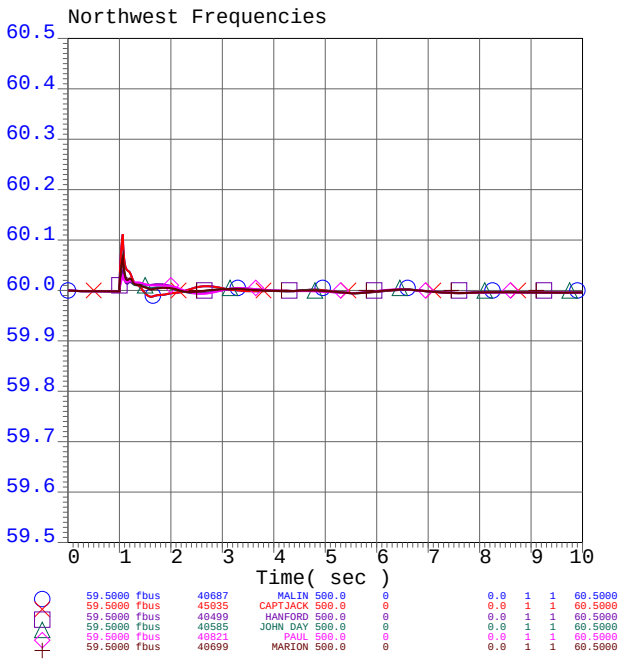


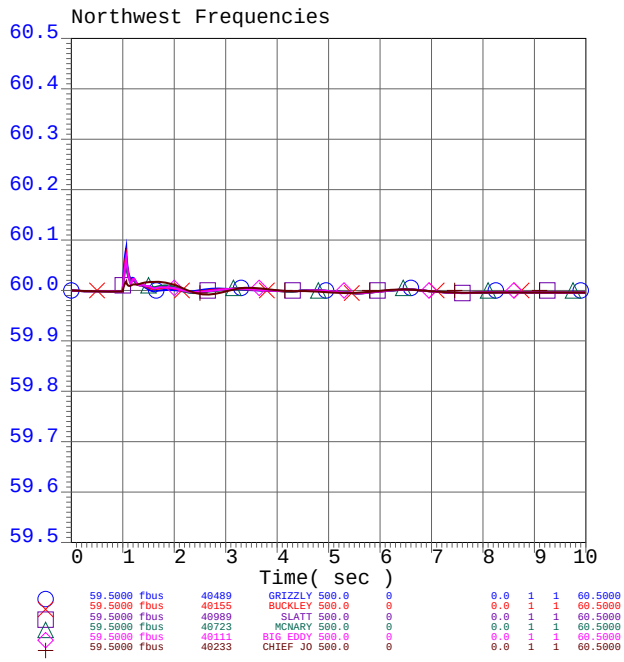
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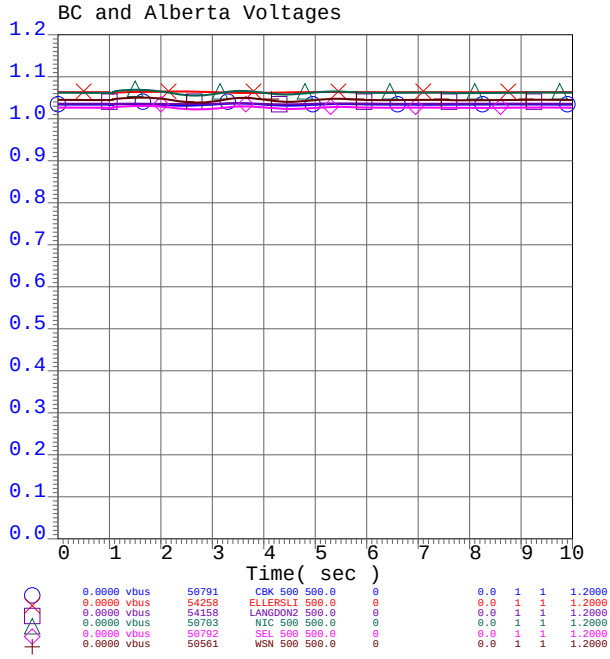




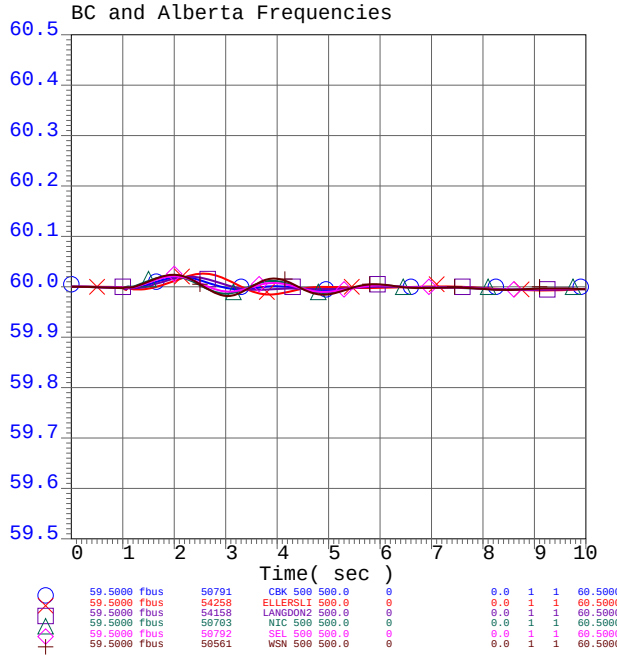
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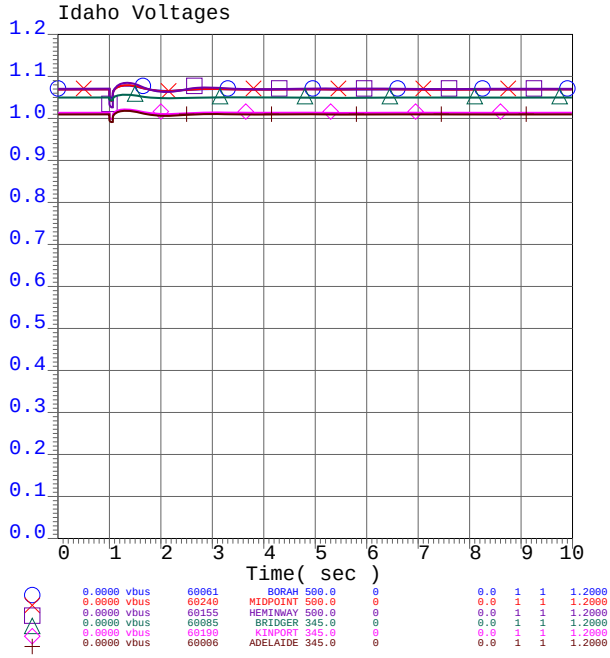
BC and Alberta Voltages



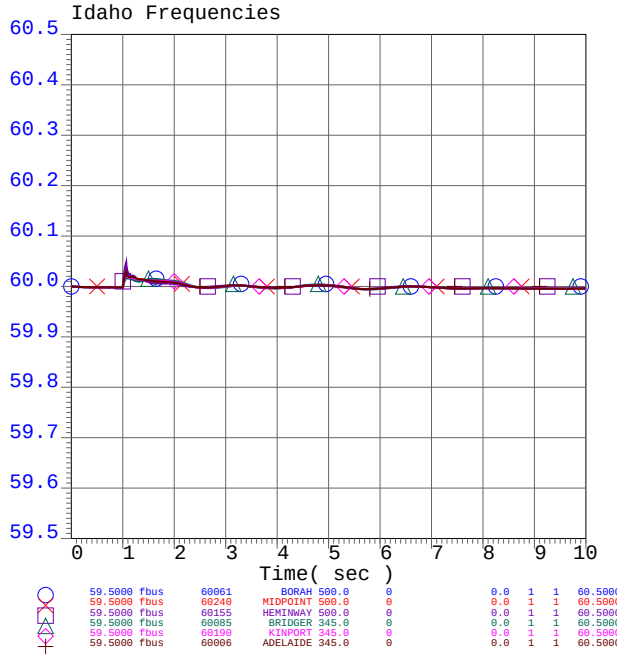
BC and Alberta Frequencies



Idaho Voltages

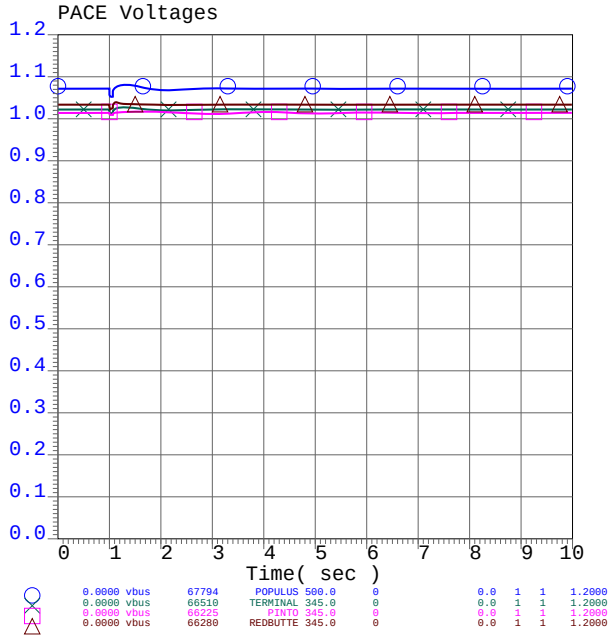


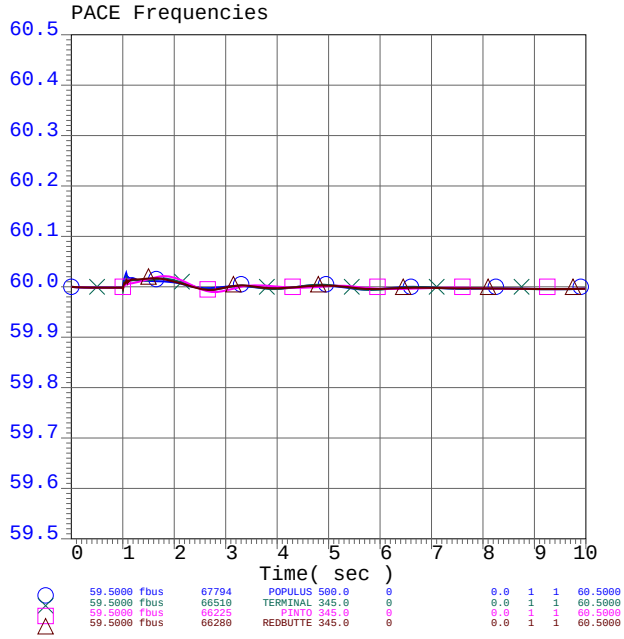
Idaho Frequencies

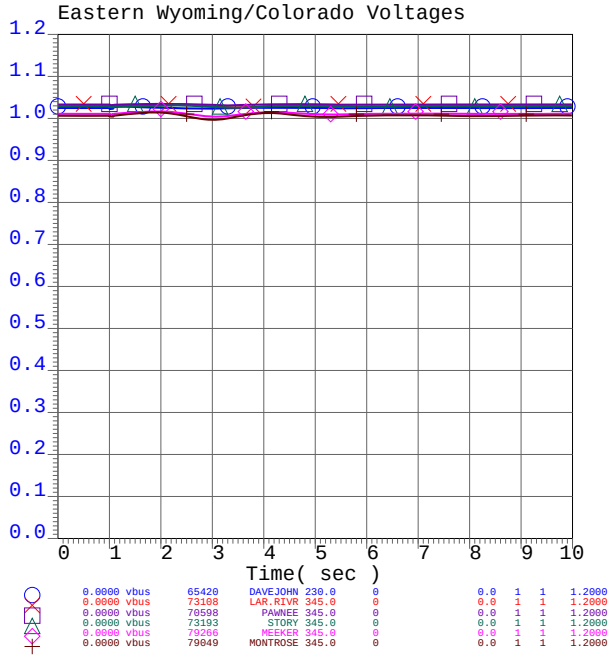


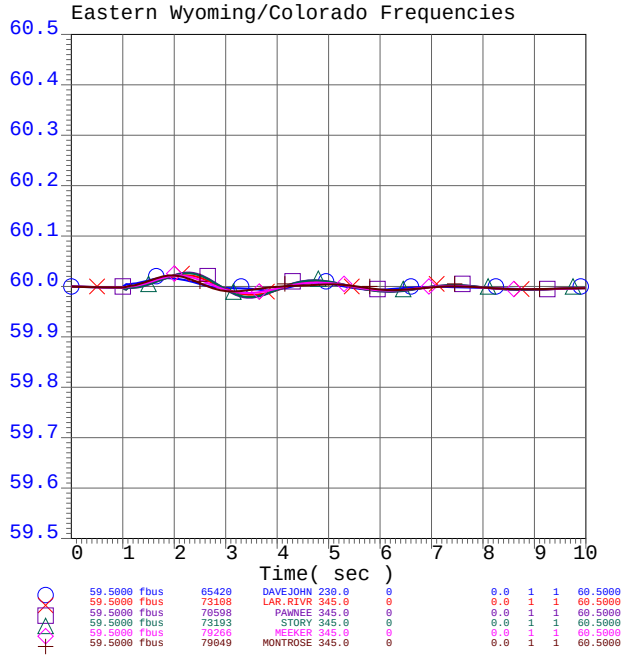
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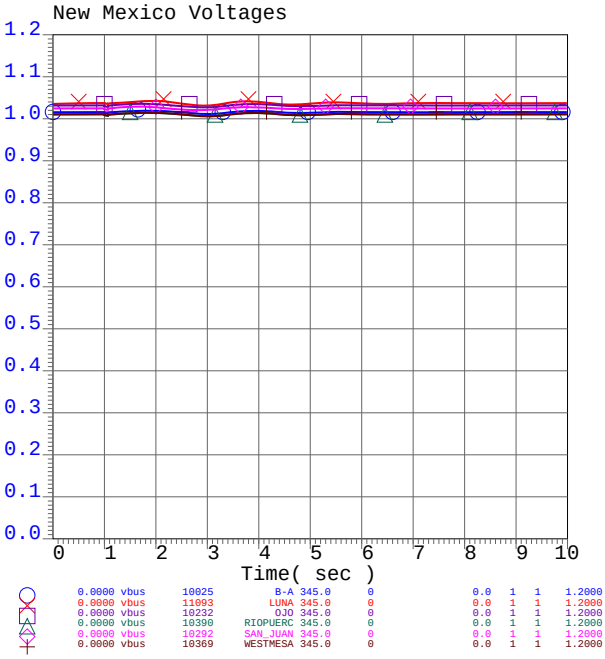




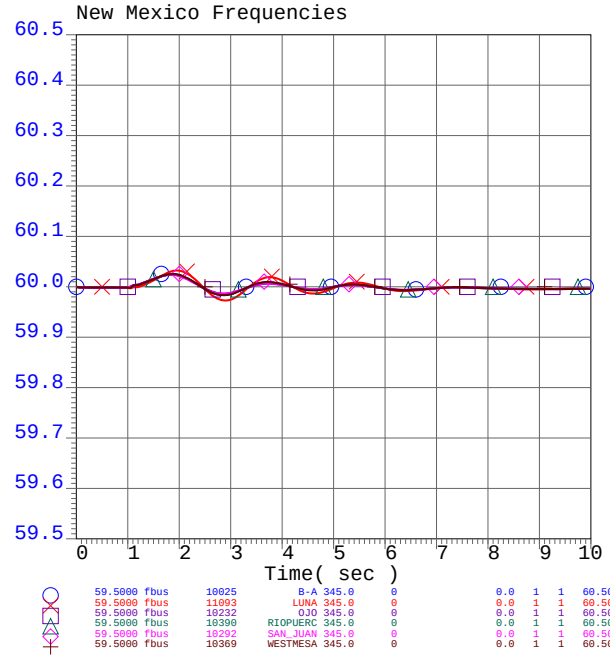
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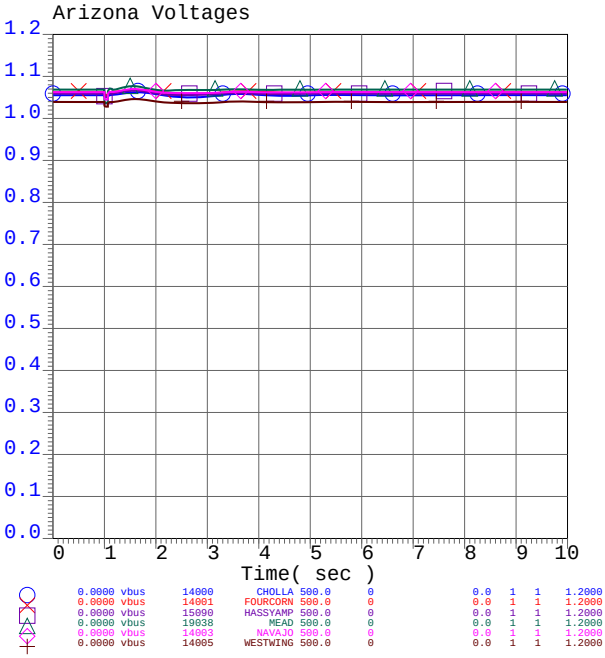
New Mexico Voltages



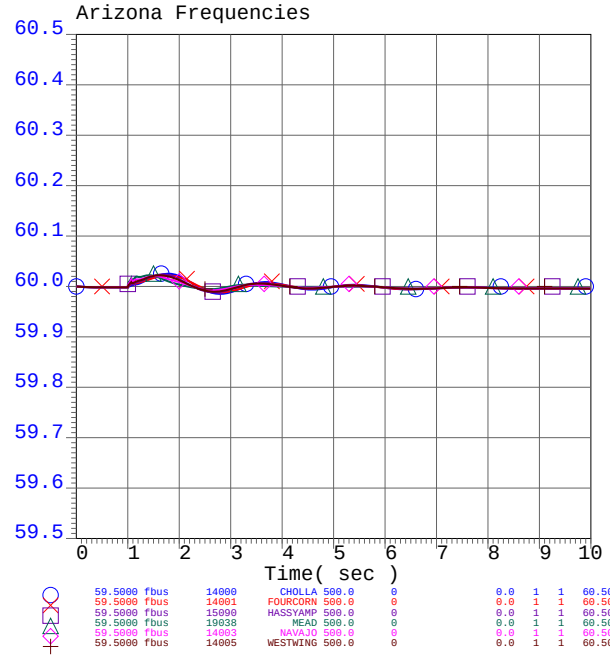
New Mexico Frequencies



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Arizona Frequencies

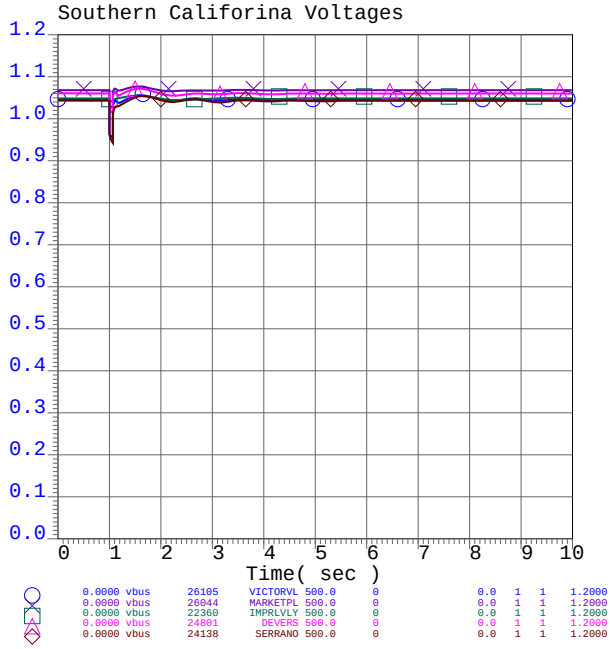


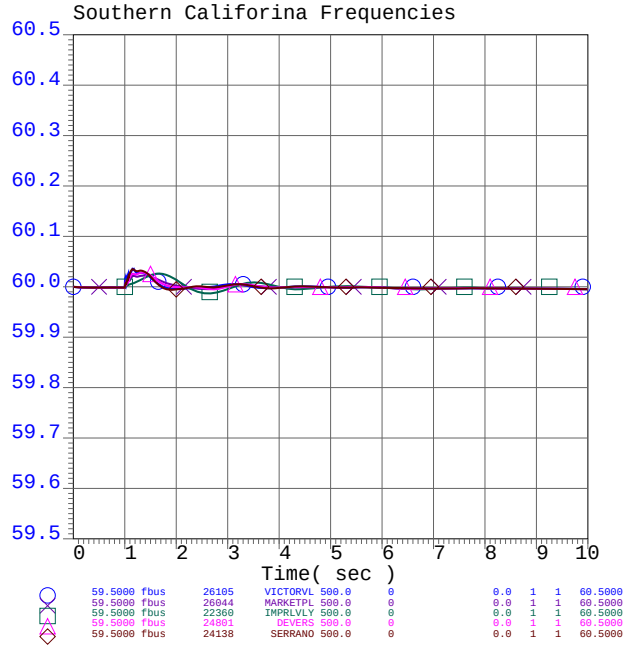
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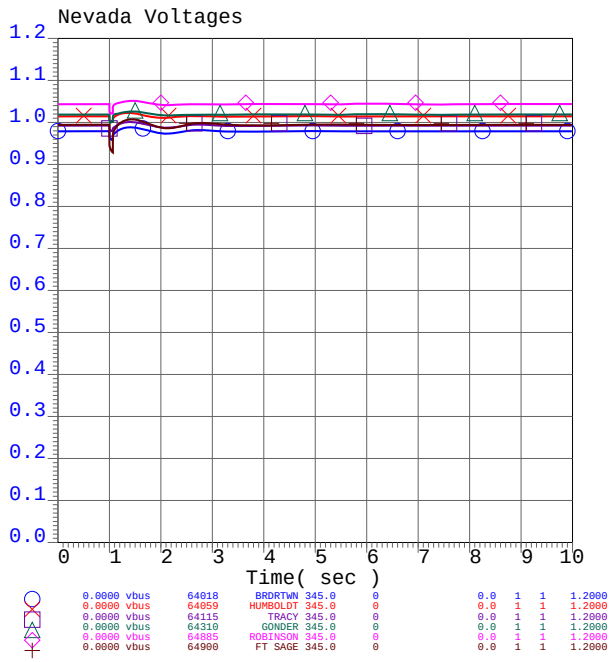
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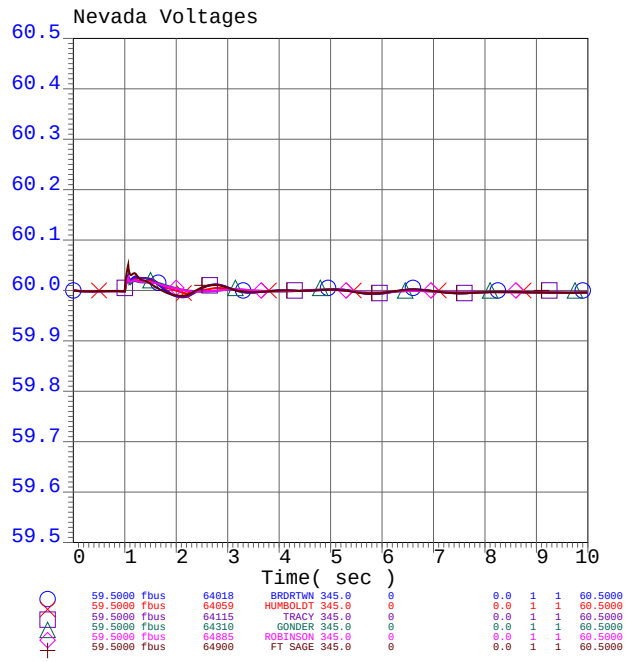
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WECC AREA VOLTAGE AND FREQUENCIES



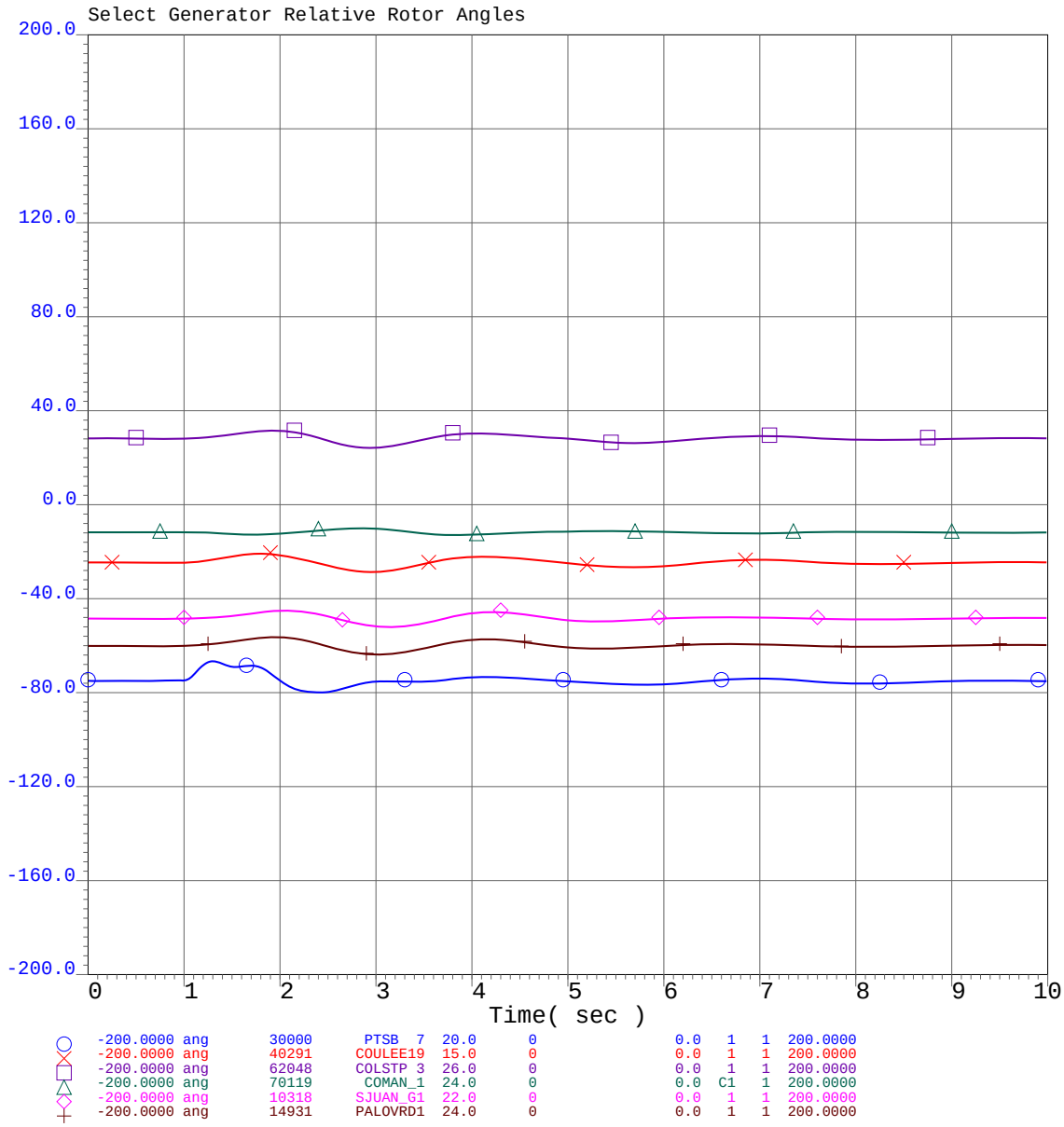






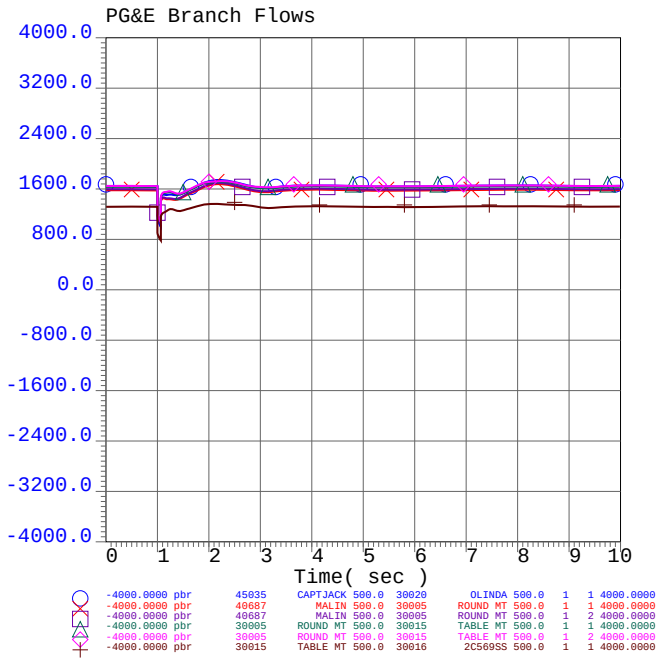
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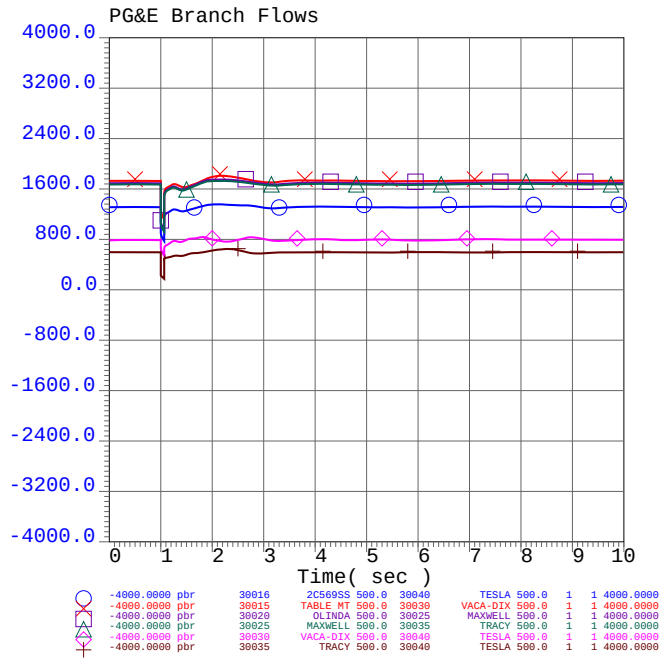
WECC RELATIVE ROTOR ANGLES

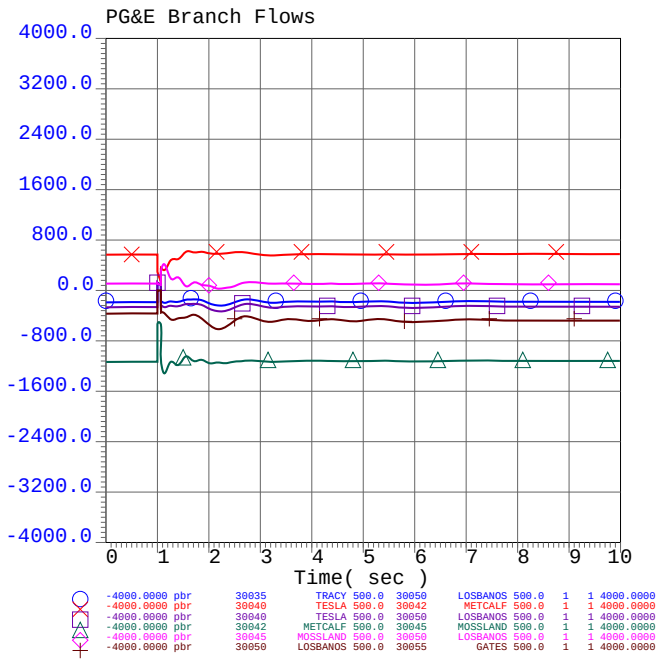


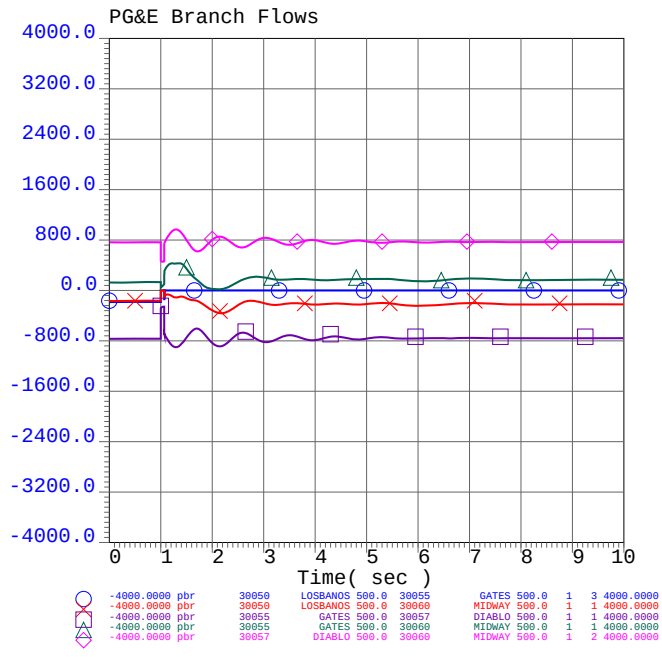
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Gates #1 500 kV line

SELECT BRANCH FLOWS



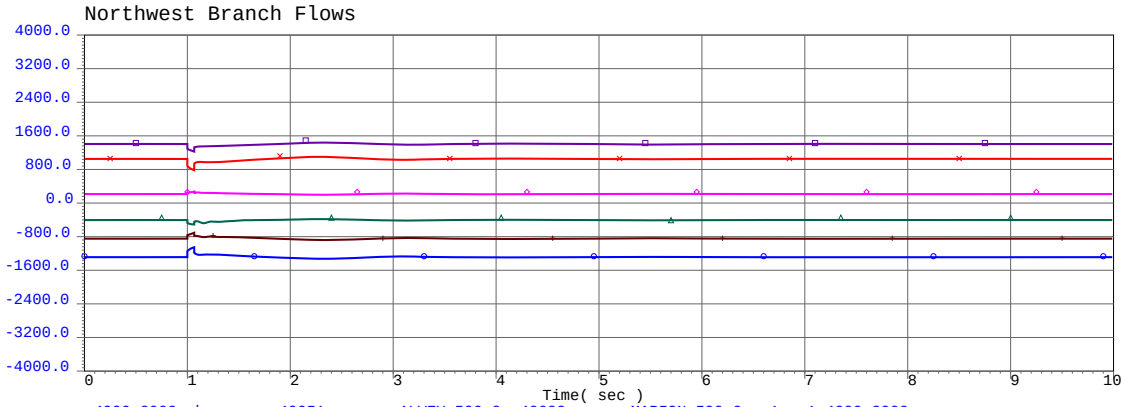




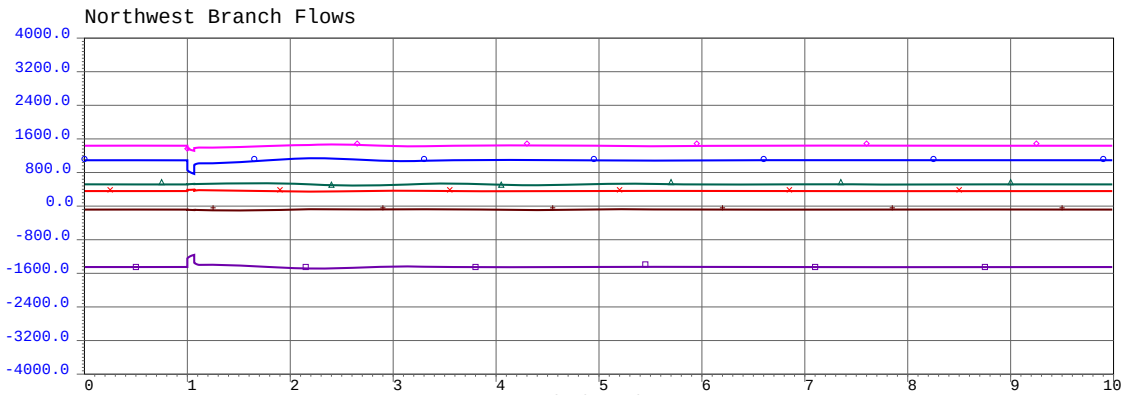


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Gates #1 500 kV line

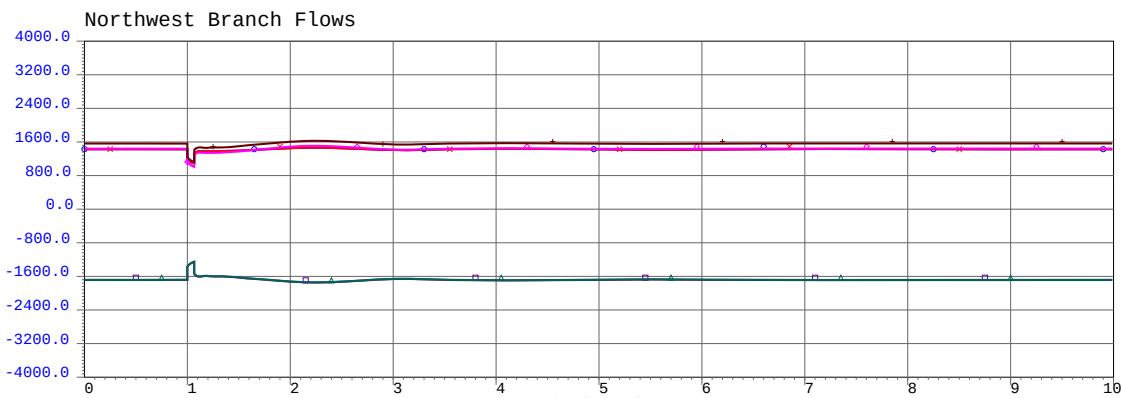
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



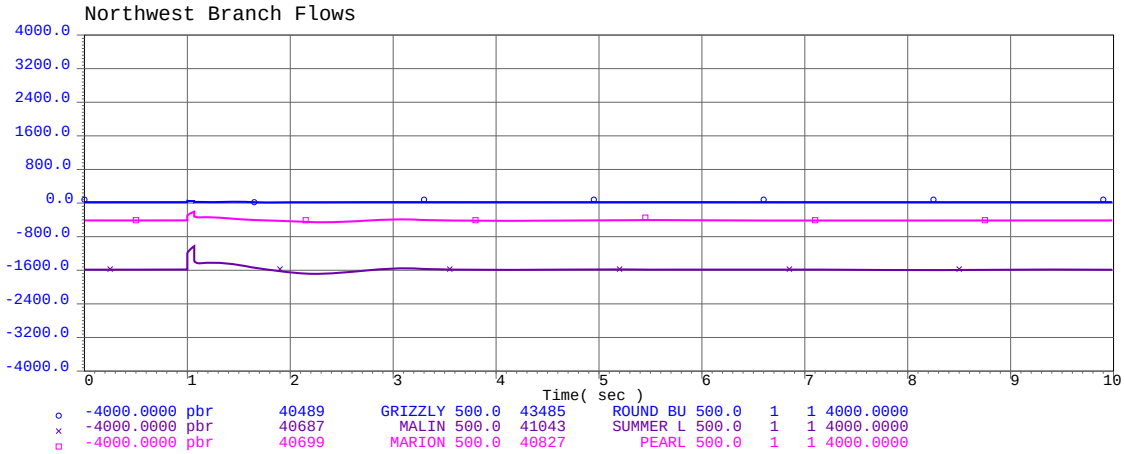
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Gates #1 500 kV line

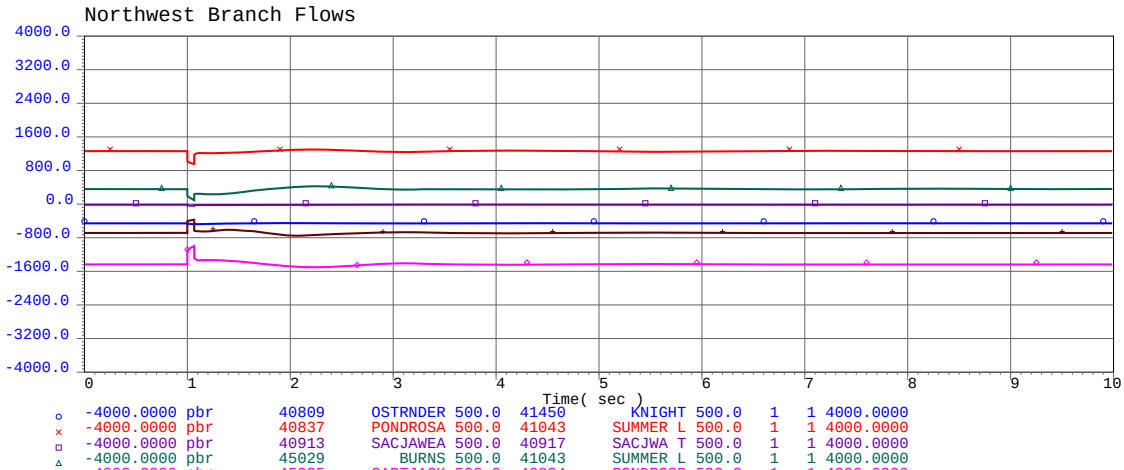
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Fri Jan 03 18:29:14 2014

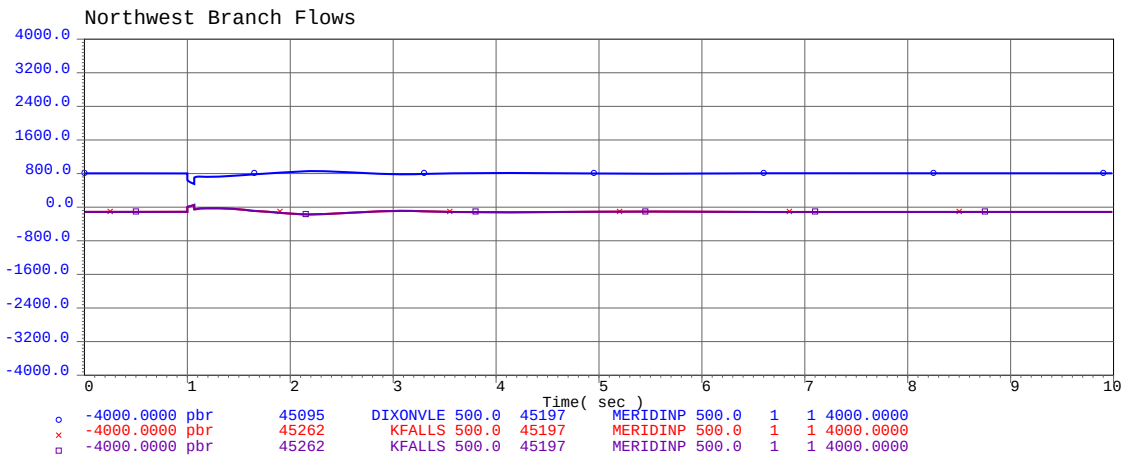
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



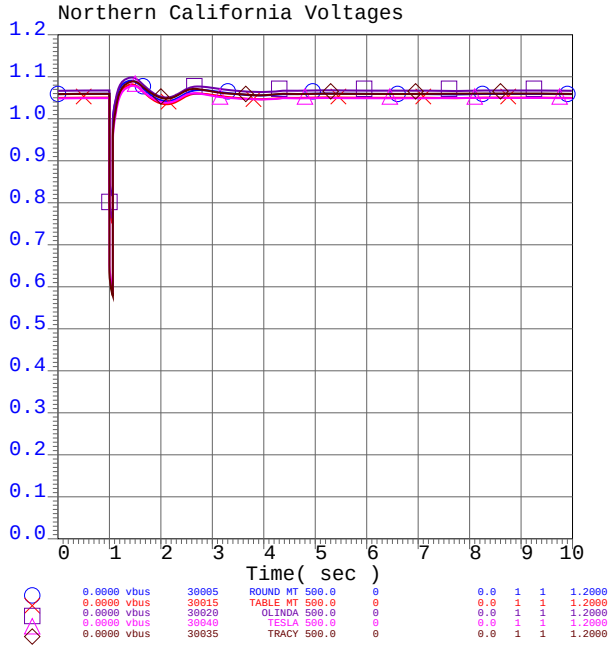
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

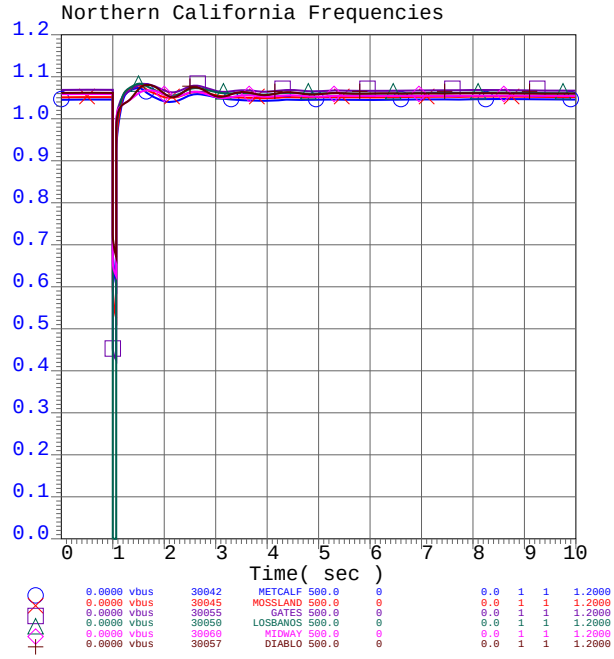


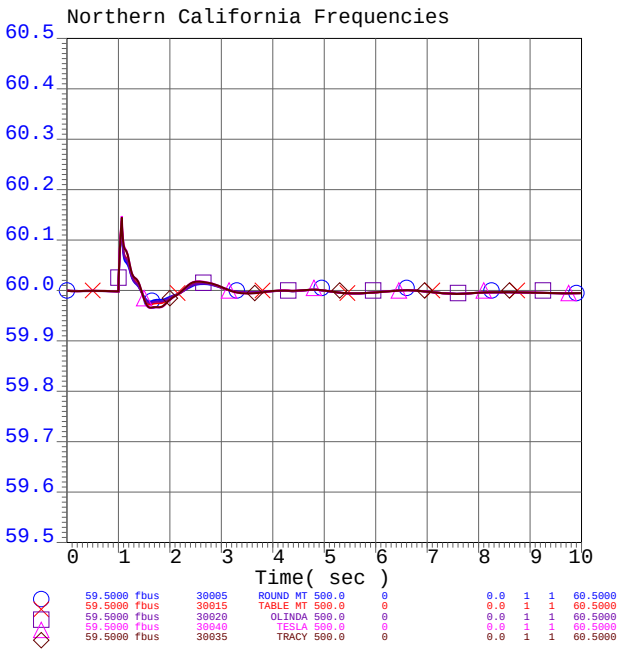
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

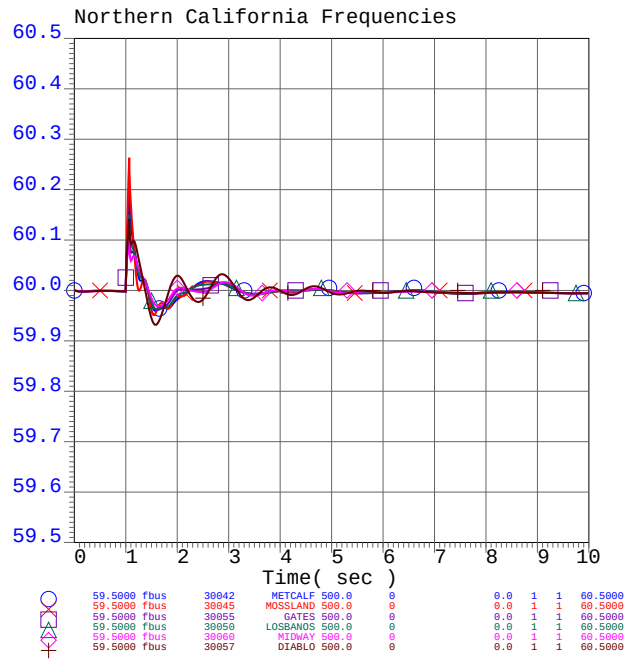
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Gates #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



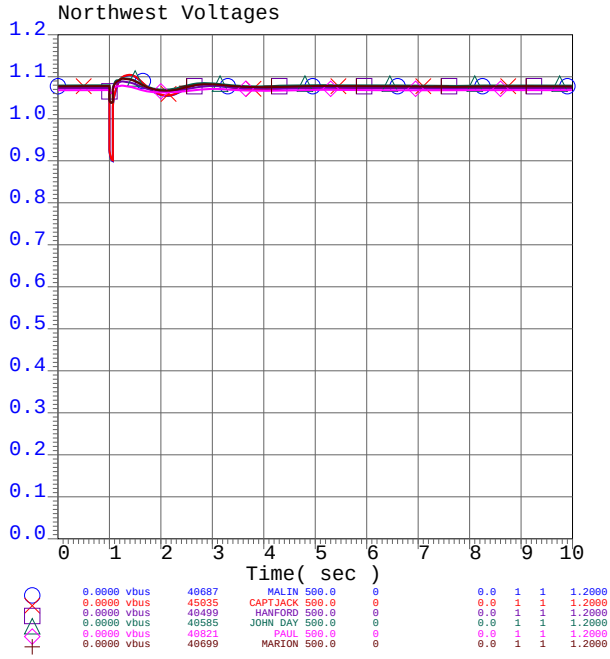


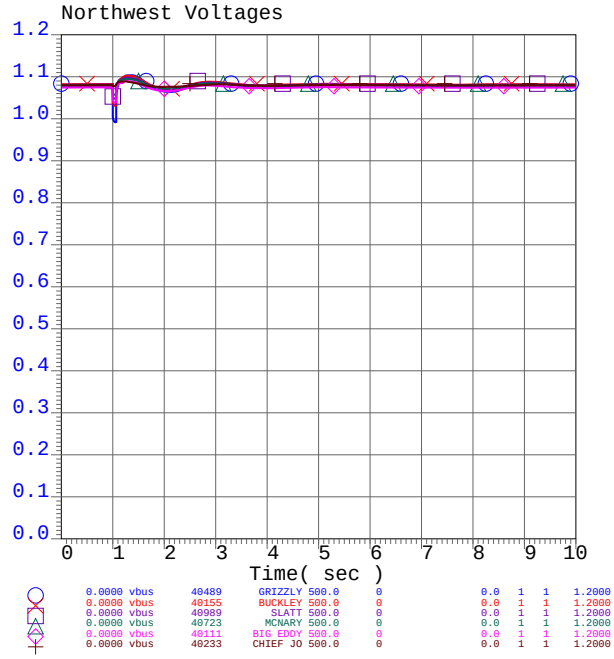


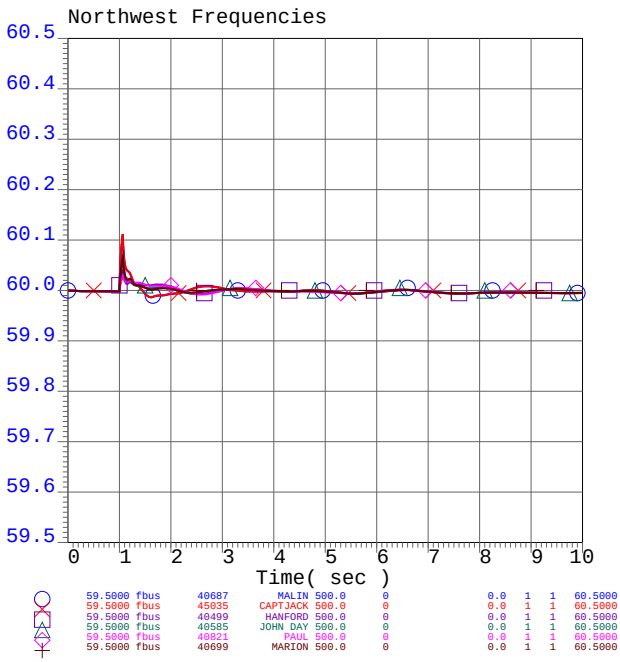


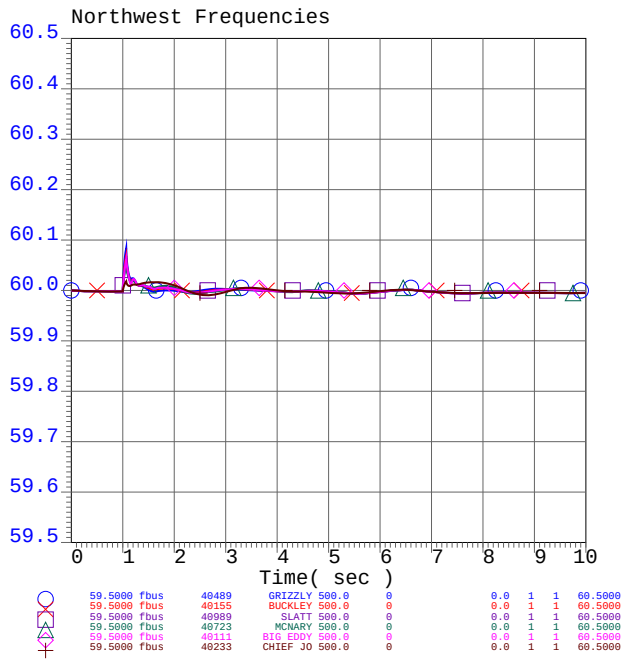
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3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Midway 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





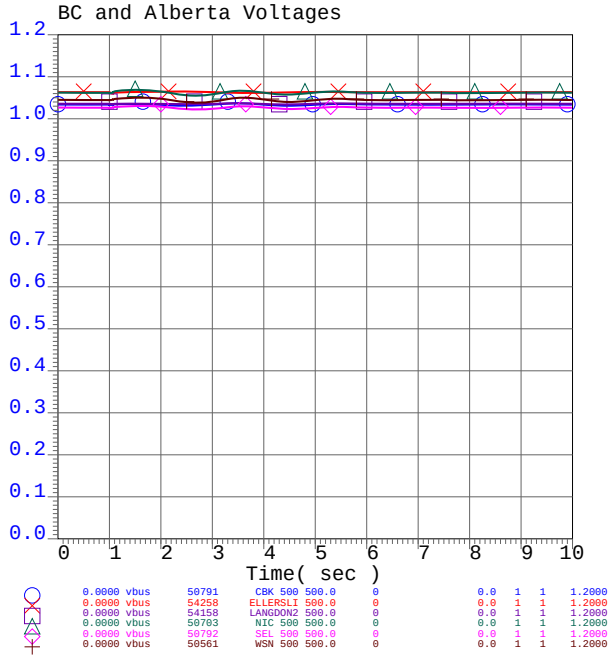




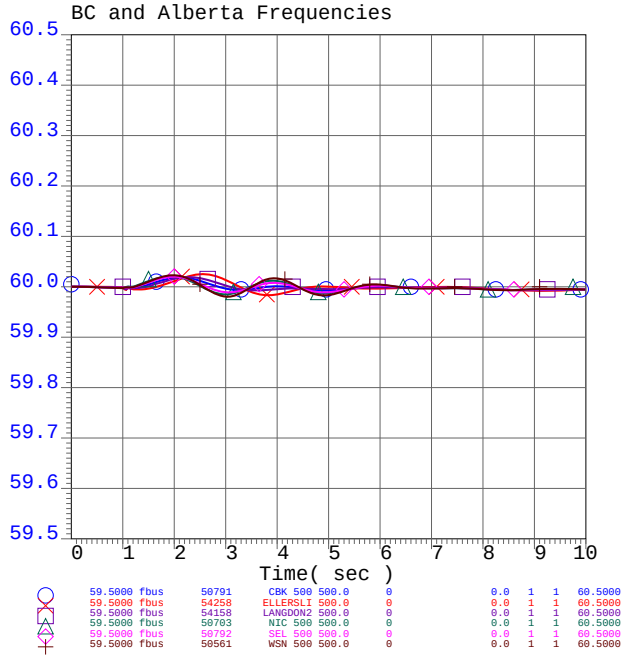
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WECC AREA VOLTAGE AND FREQUENCIES

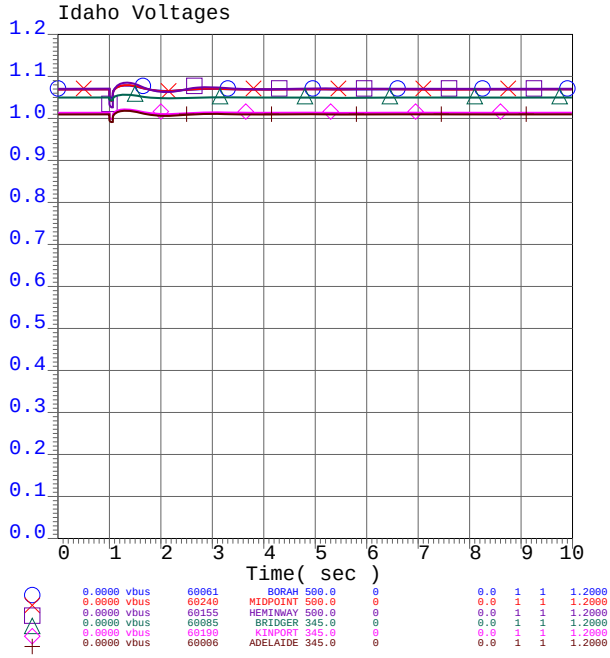
BC and Alberta Voltages



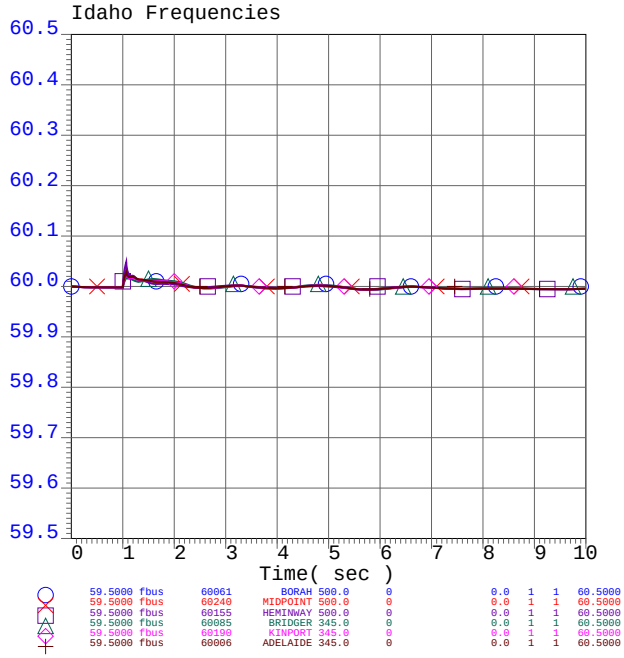
BC and Alberta Frequencies



Idaho Voltages



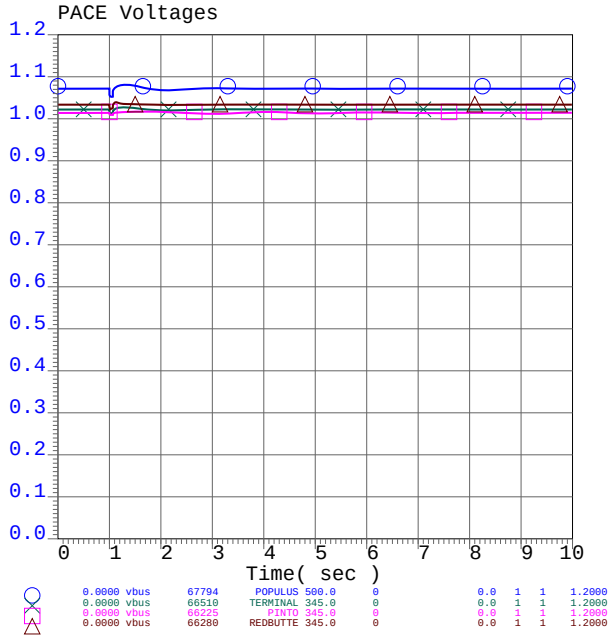
Idaho Frequencies



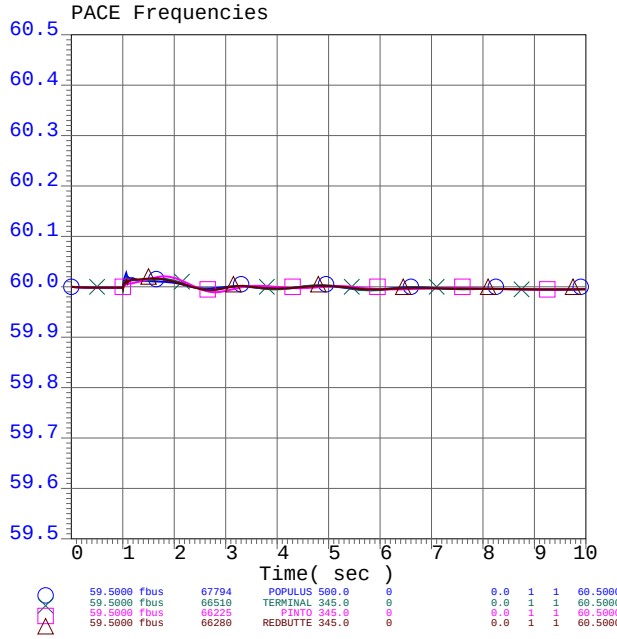
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WECC AREA VOLTAGE AND FREQUENCIES

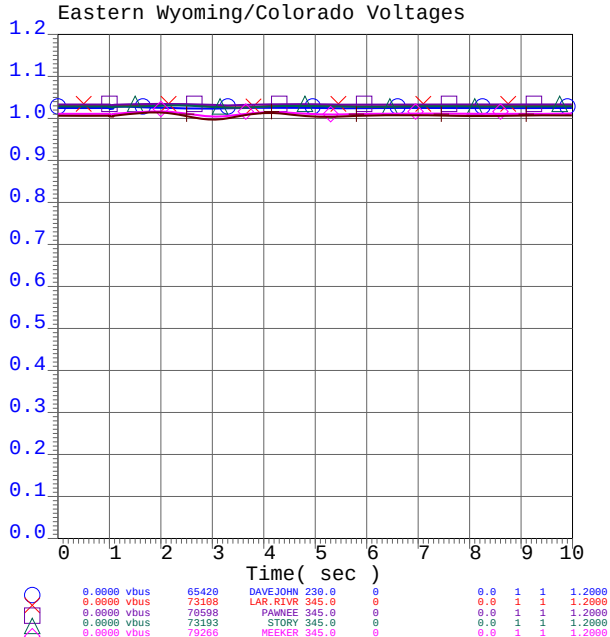
PACE Voltages



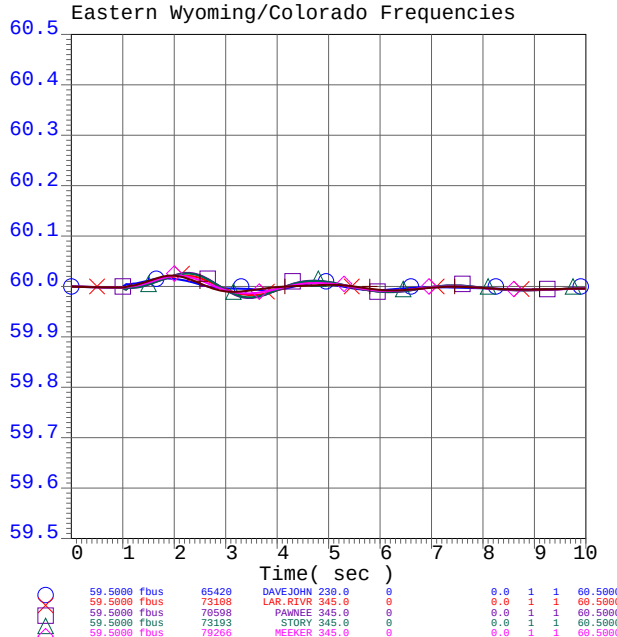
PACE Frequencies



Eastern Wyoming/Colorado Voltages

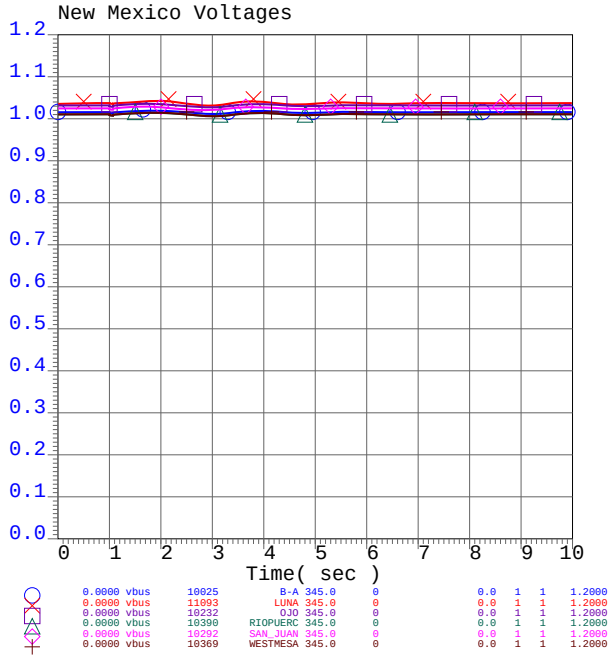


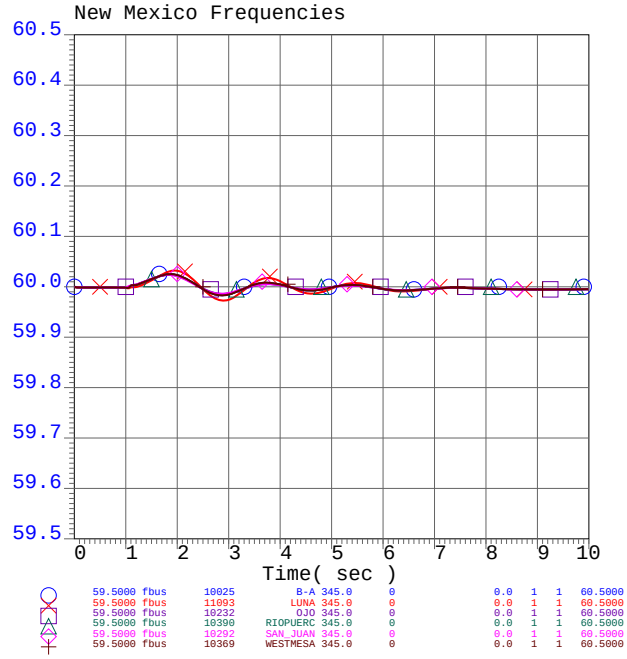
Eastern Wyoming/Colorado Frequencies

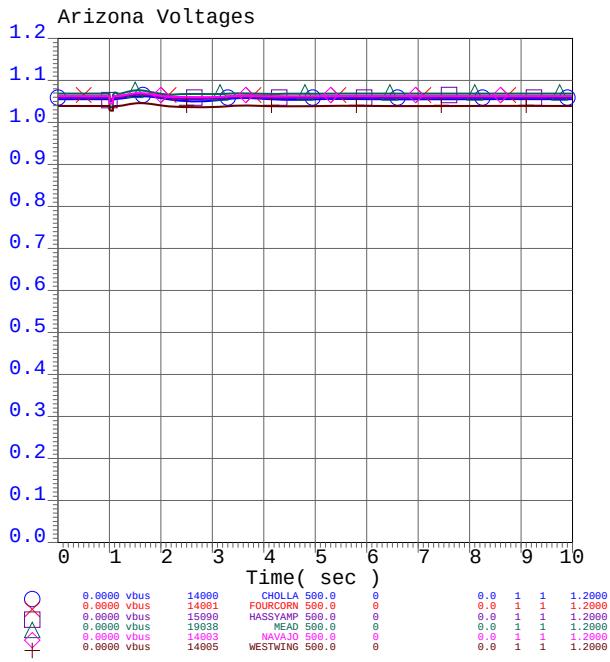


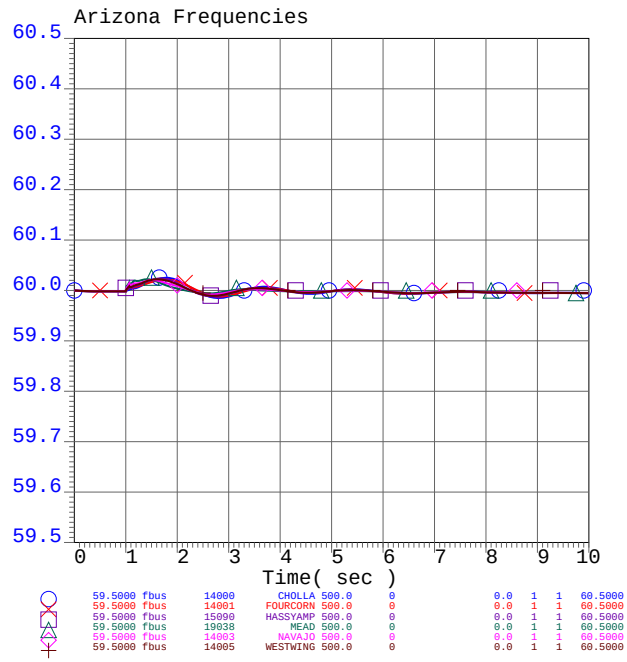
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3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Midway 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



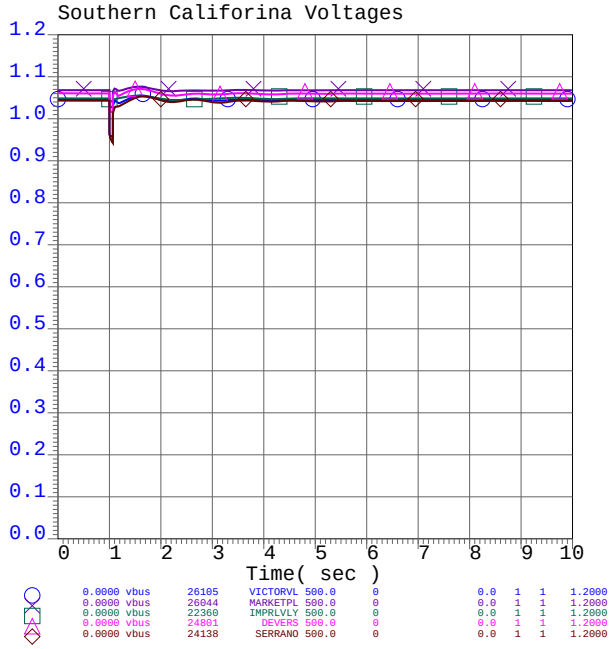


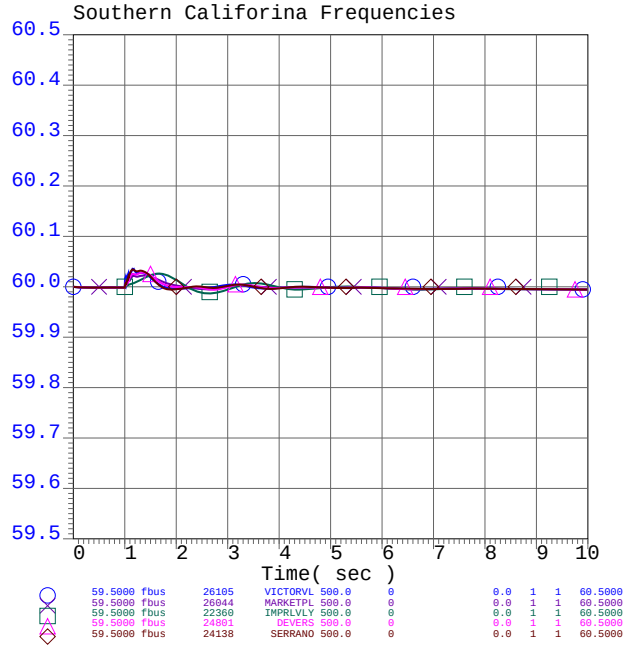


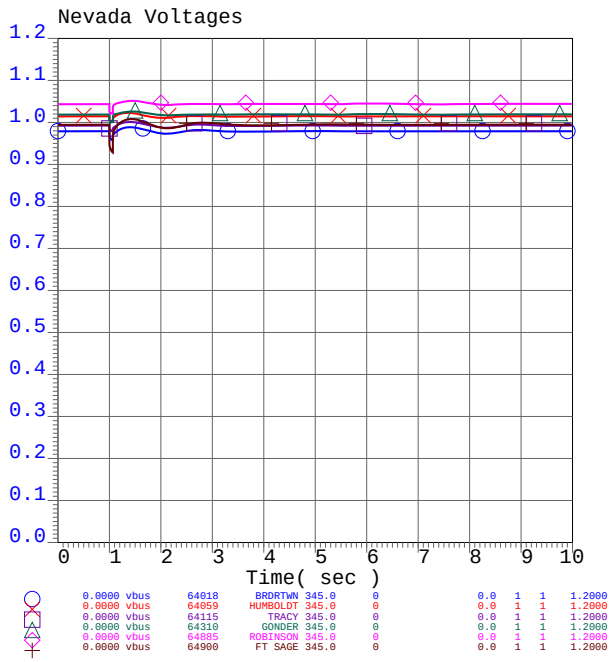


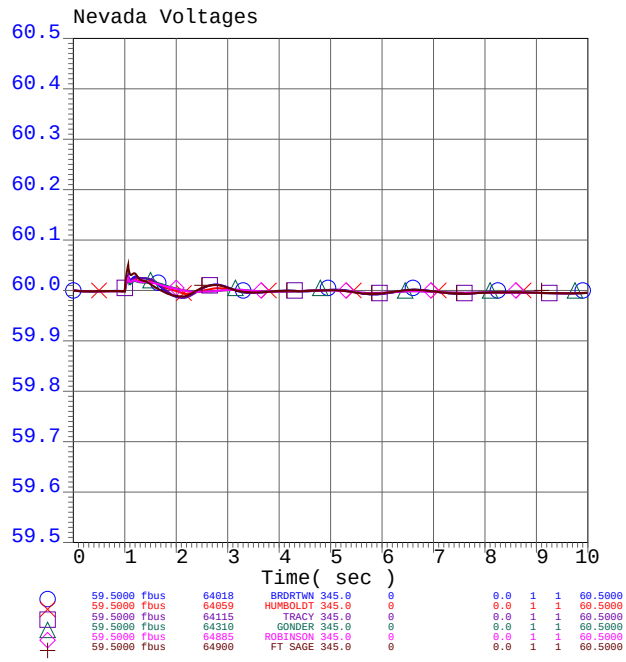
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WECC AREA VOLTAGE AND FREQUENCIES



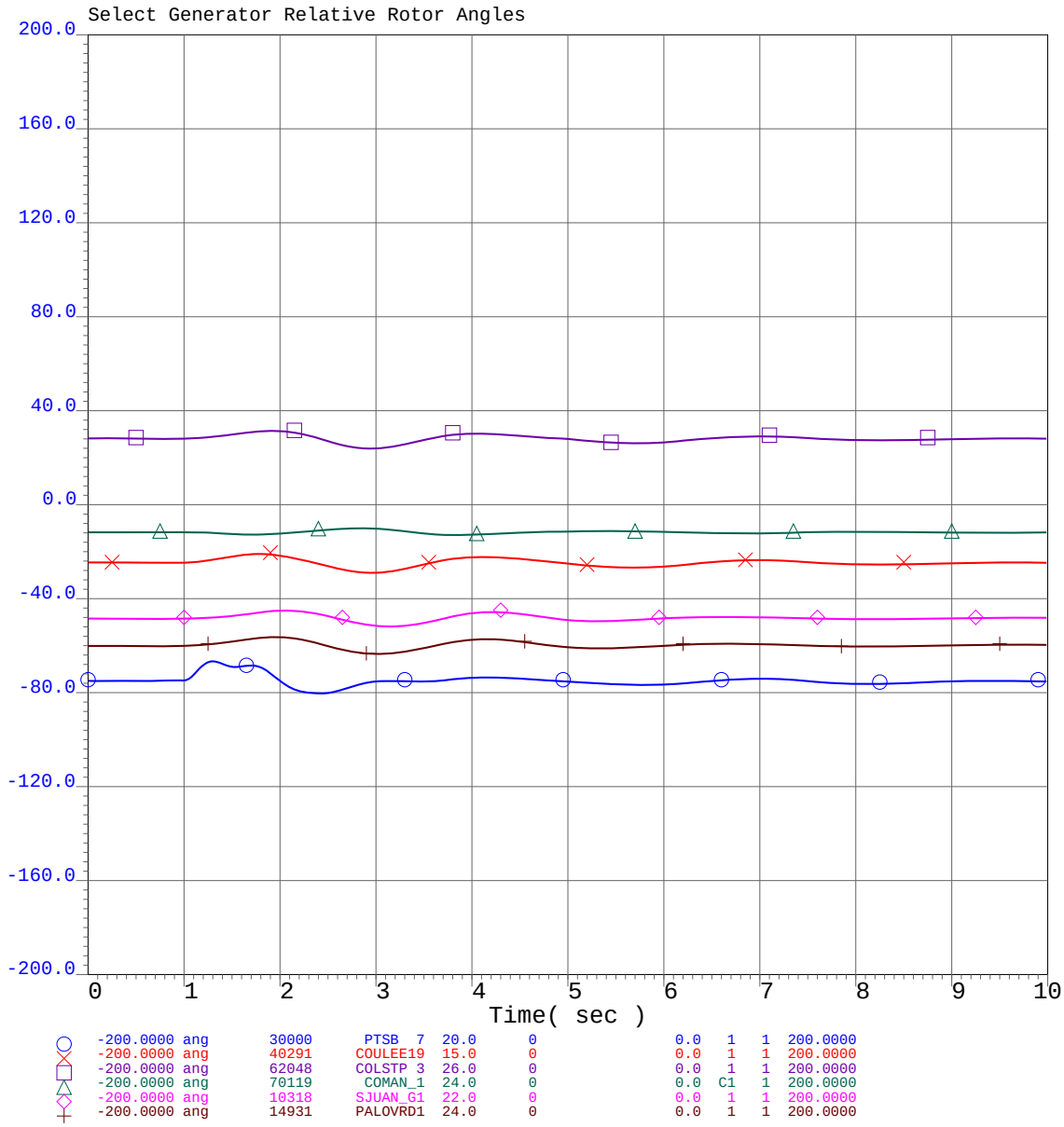






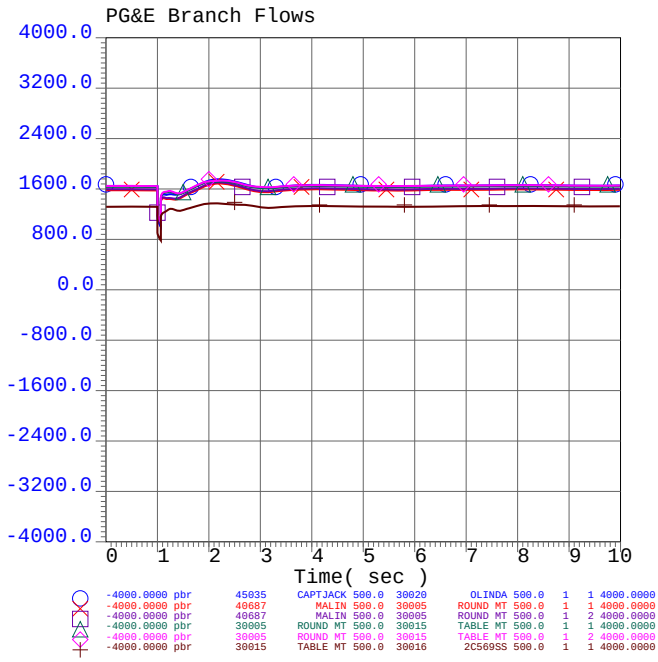
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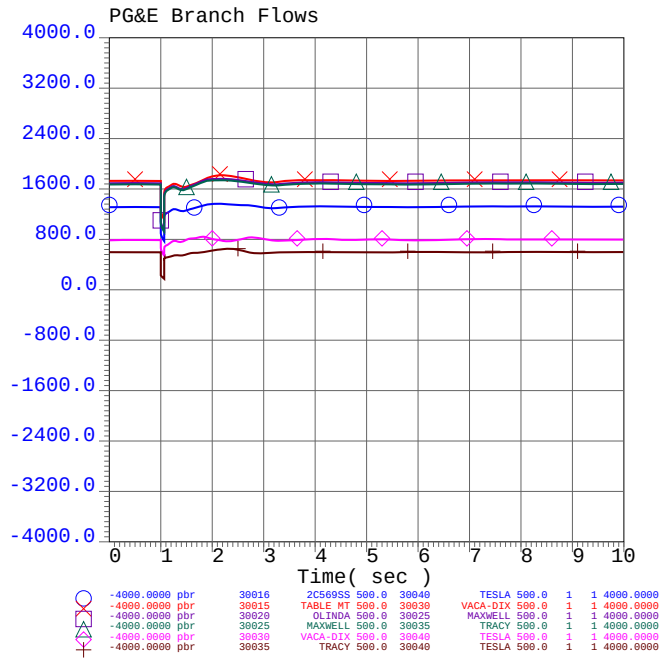
WECC RELATIVE ROTOR ANGLES

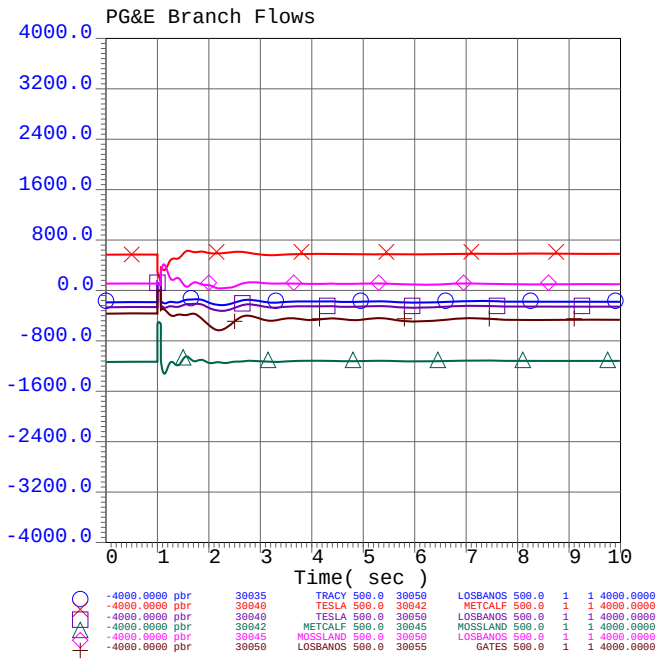


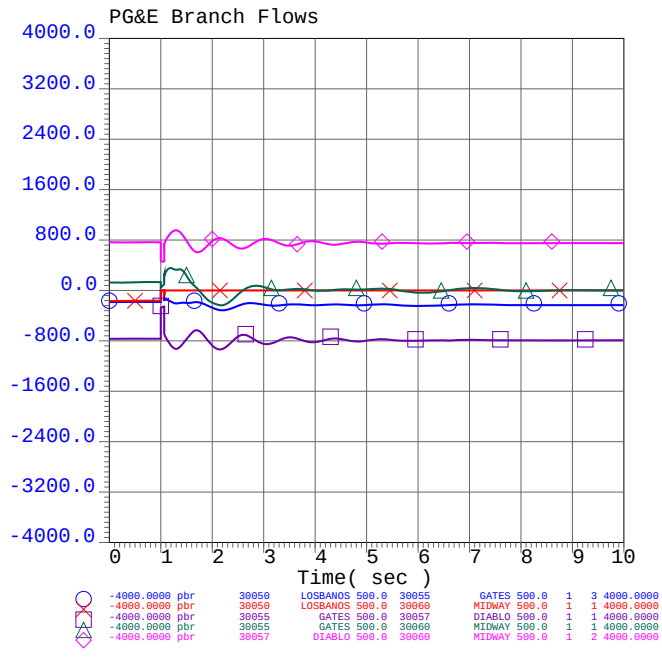
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SELECT BRANCH FLOWS





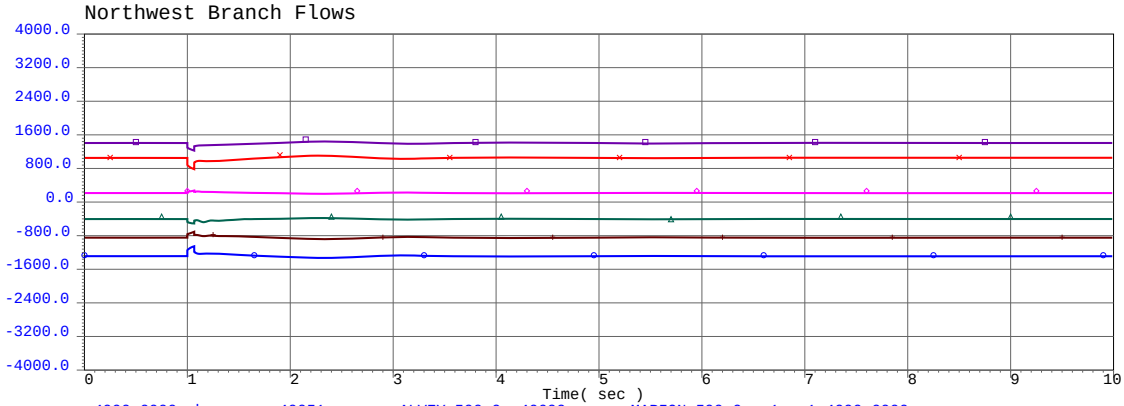




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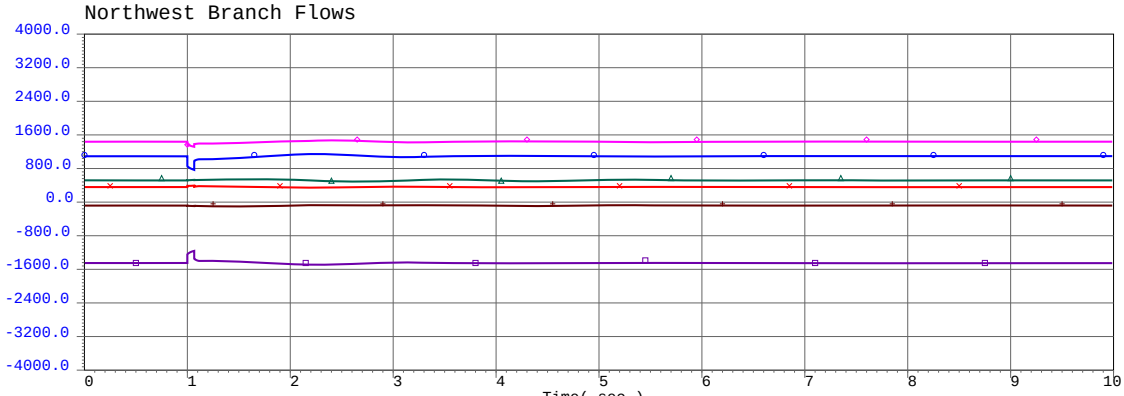
SELECT BRANCH FLOWS

Northwest Branch Flows



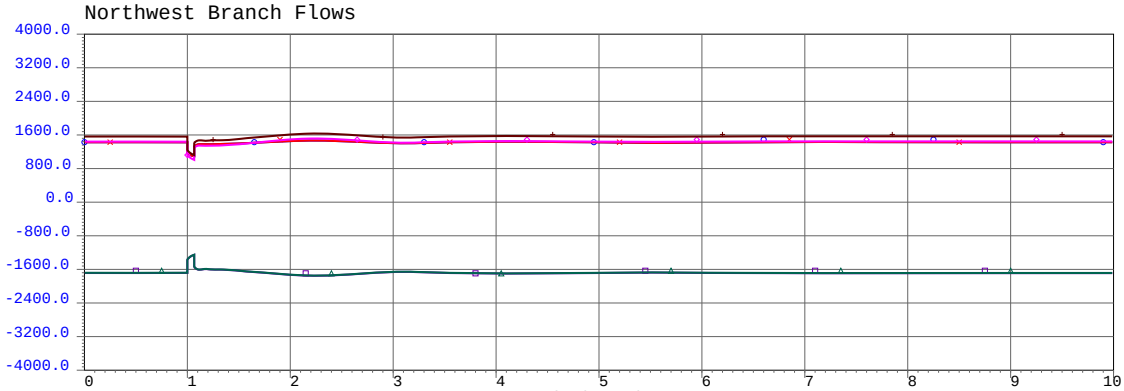
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

Northwest Branch Flows



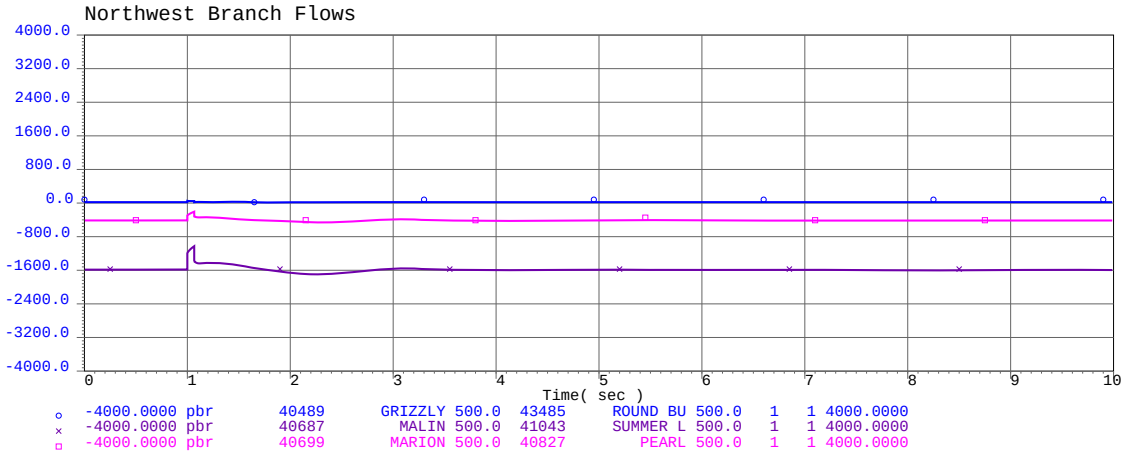
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
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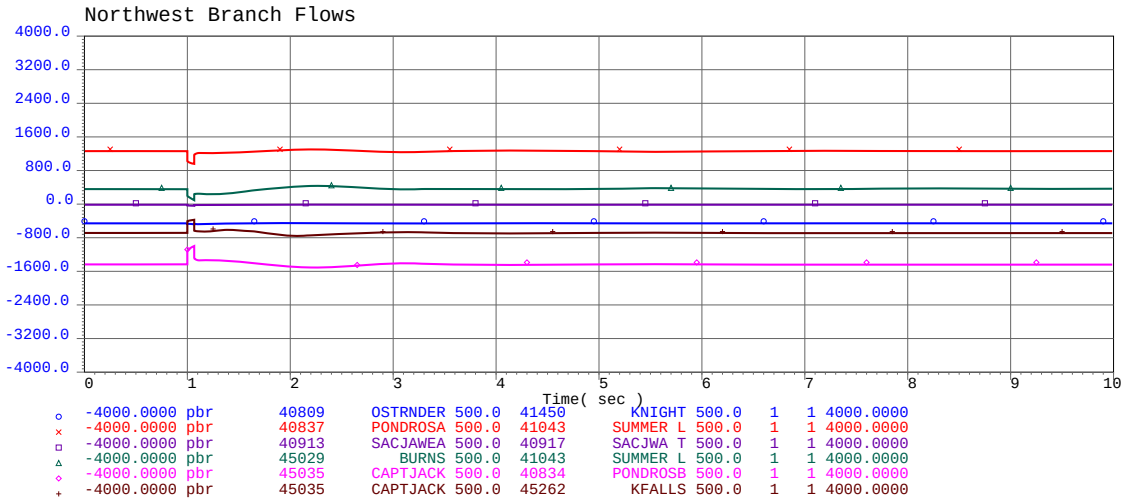
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Midway 500 kV line

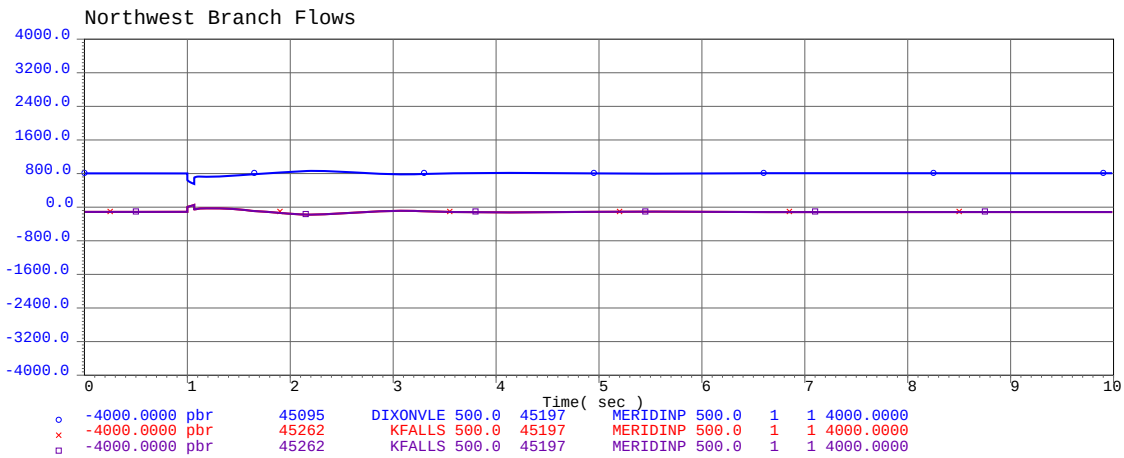
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SELECT BRANCH FLOWS

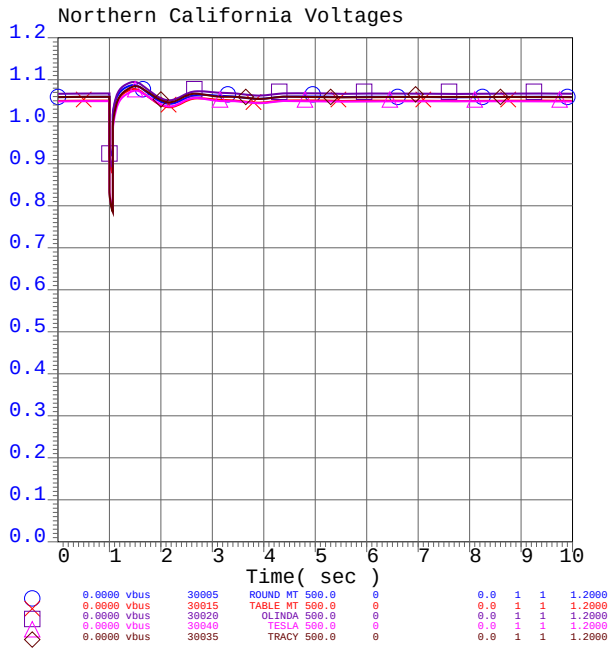


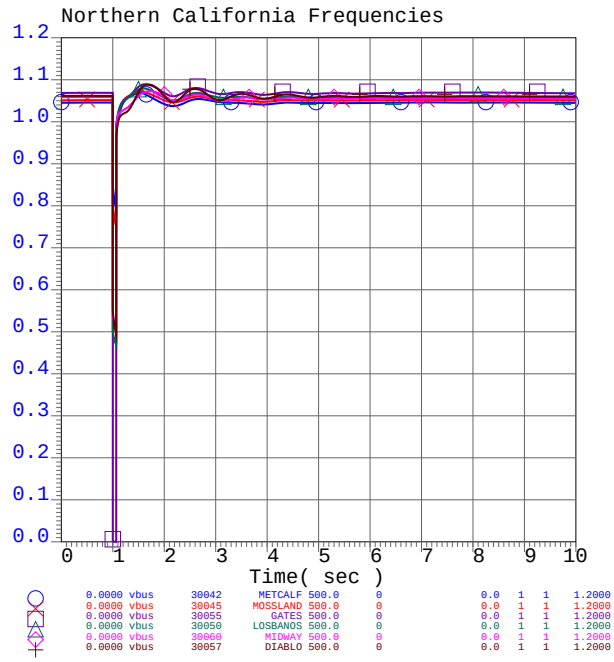


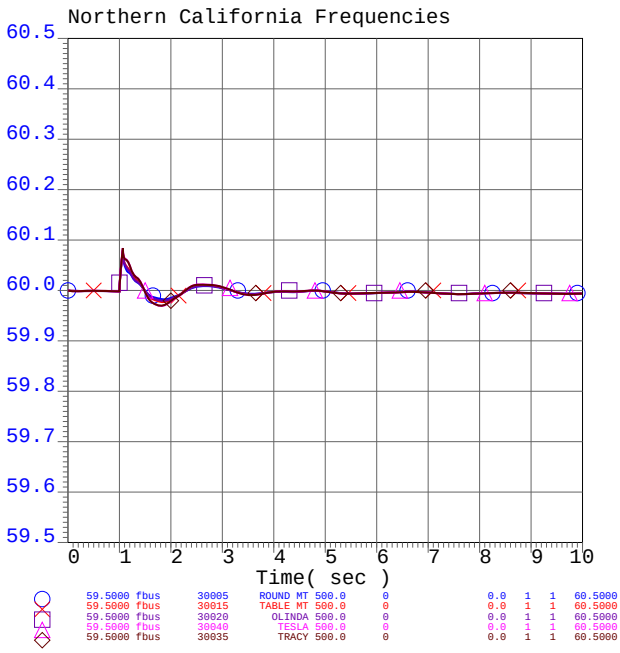


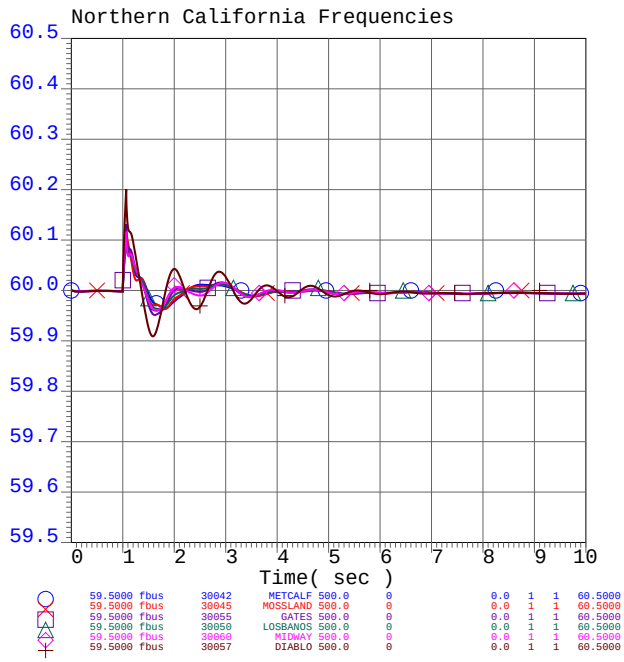
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES



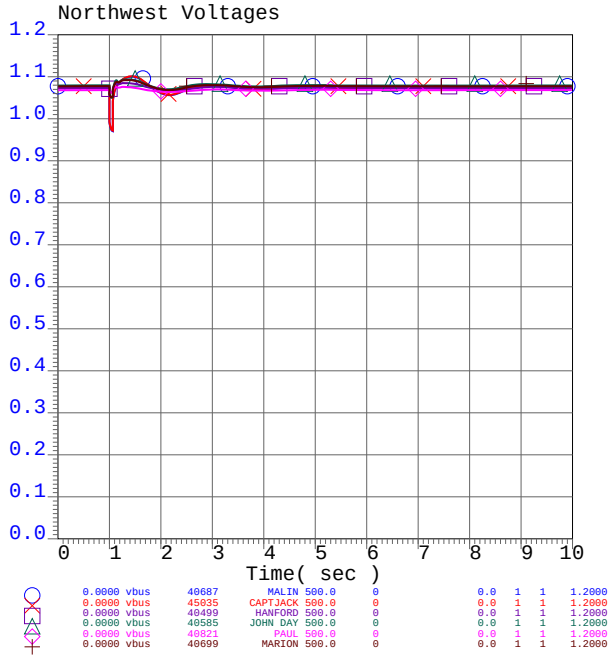


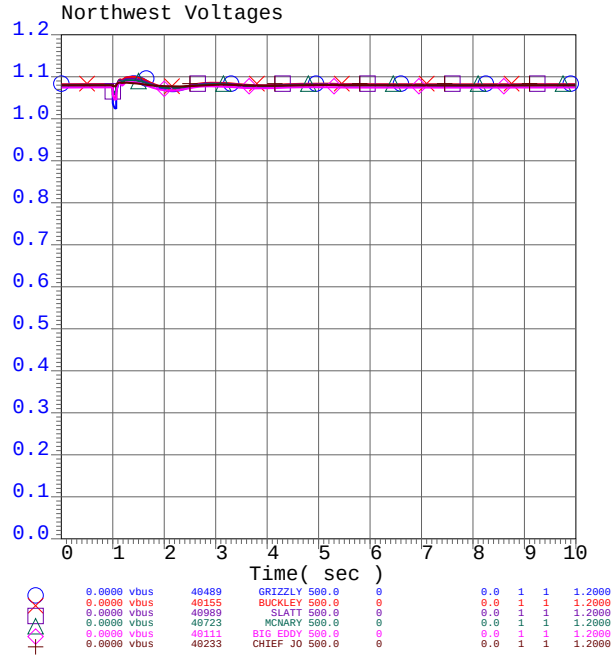


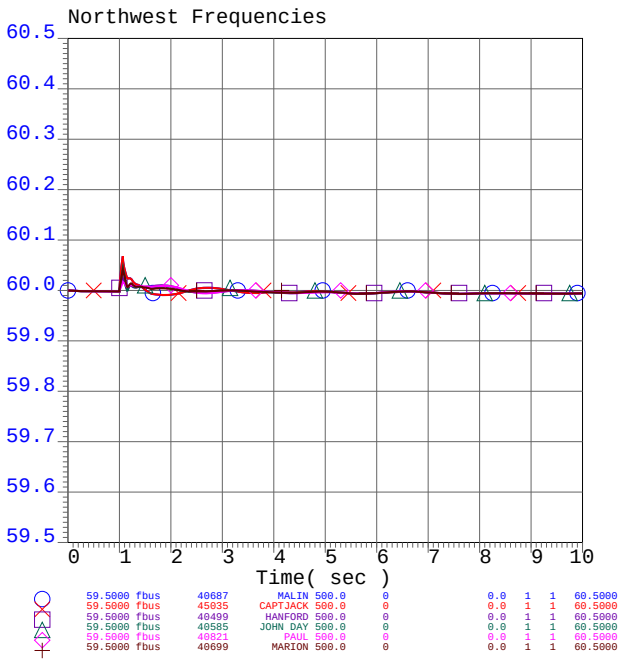


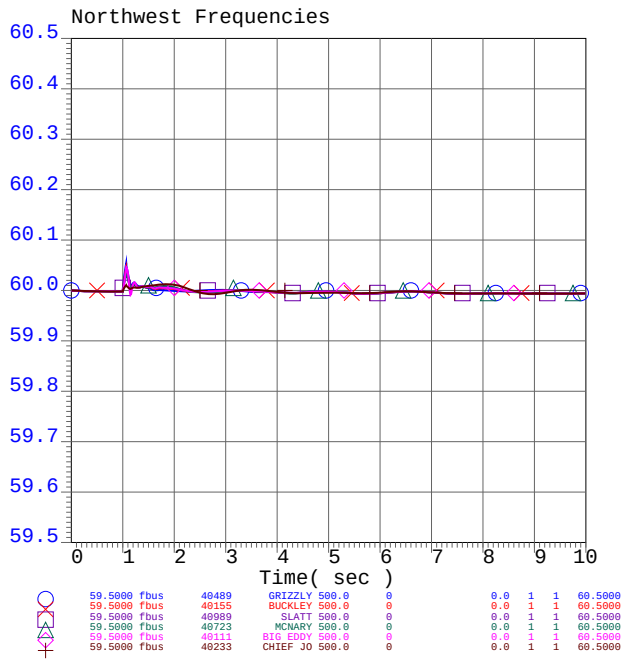
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES





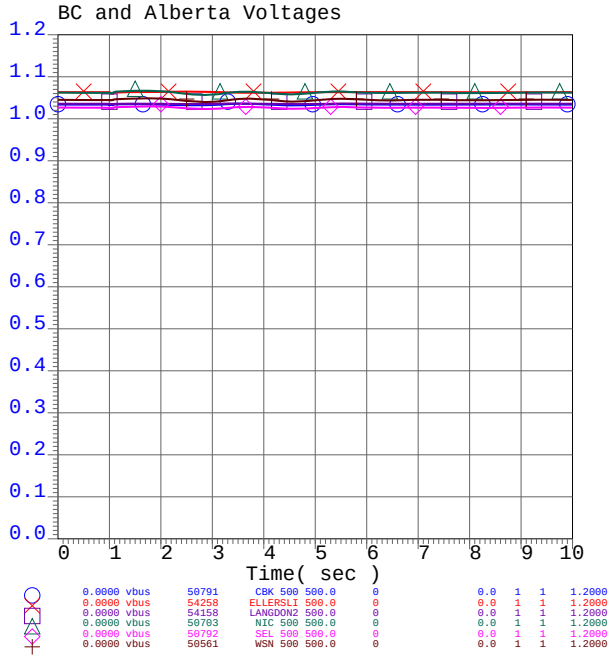




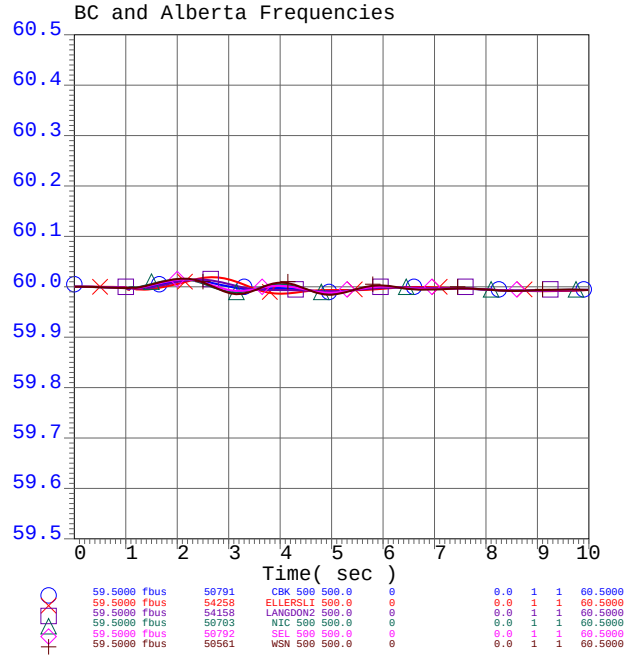
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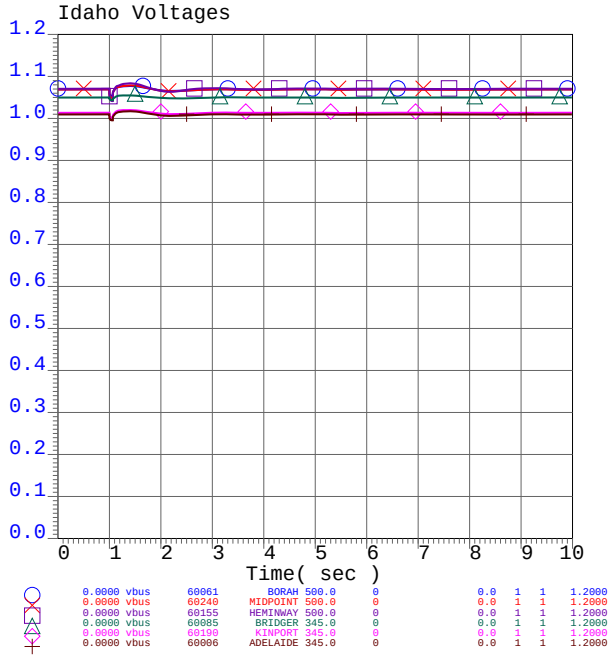
BC and Alberta Voltages



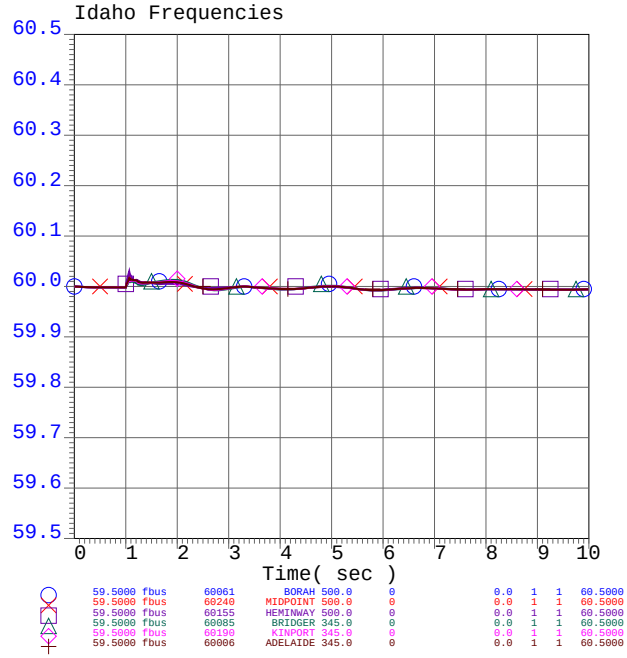
BC and Alberta Frequencies



Idaho Voltages



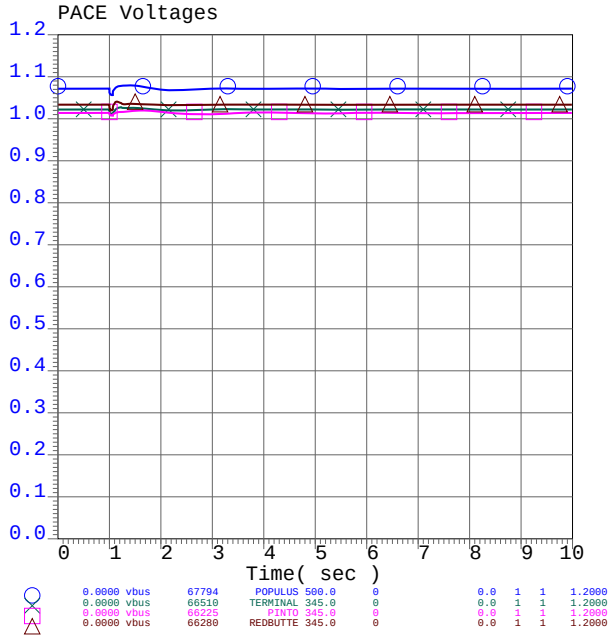
Idaho Frequencies



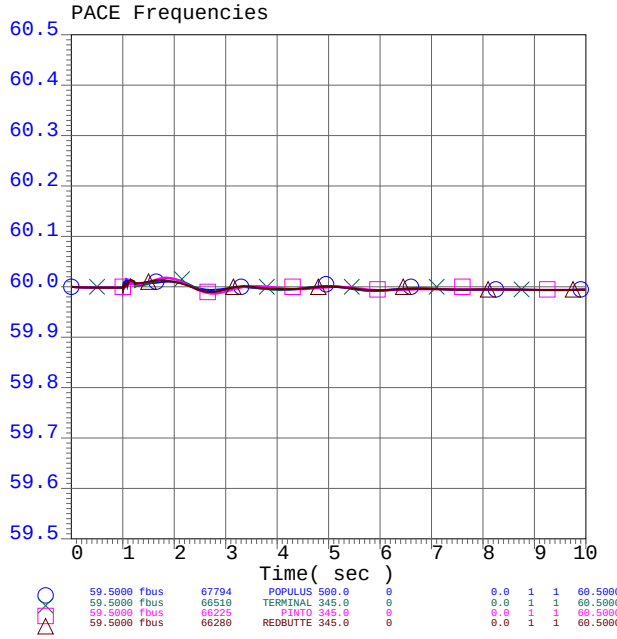
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followed by loss of Gates-Midway 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

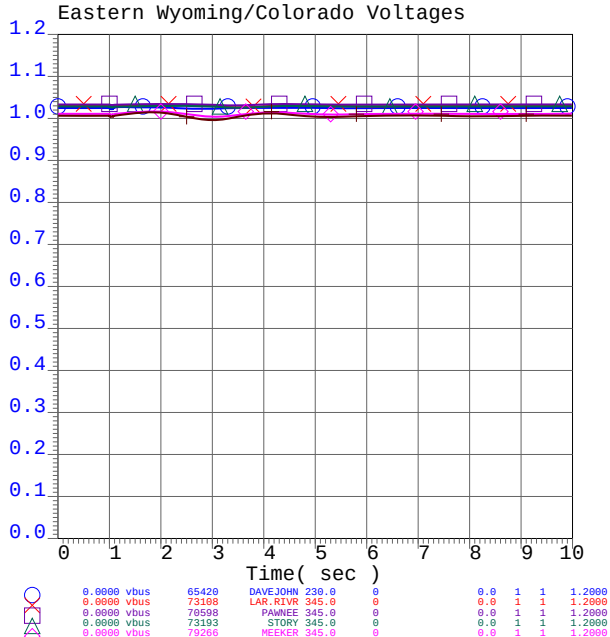
PACE Voltages



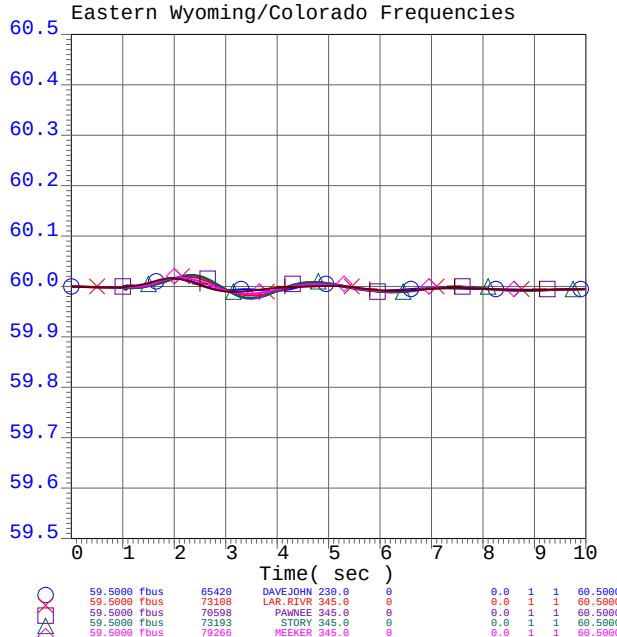
PACE Frequencies



Eastern Wyoming/Colorado Voltages



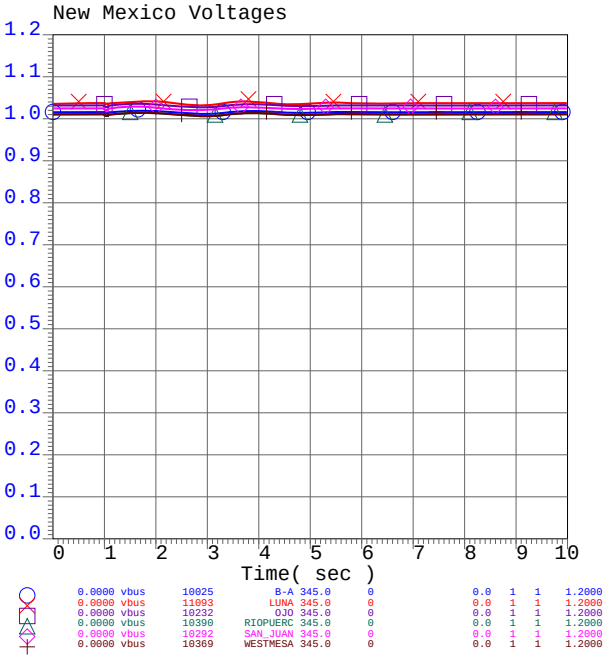
Eastern Wyoming/Colorado Frequencies



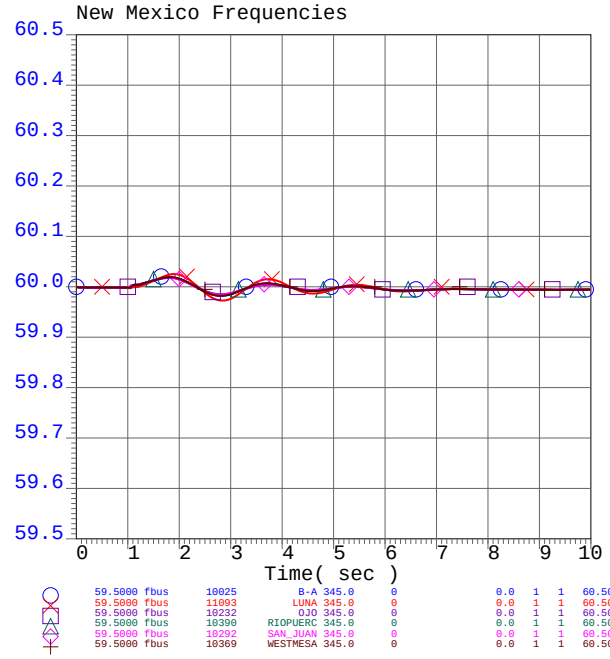
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followed by loss of Gates-Midway 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

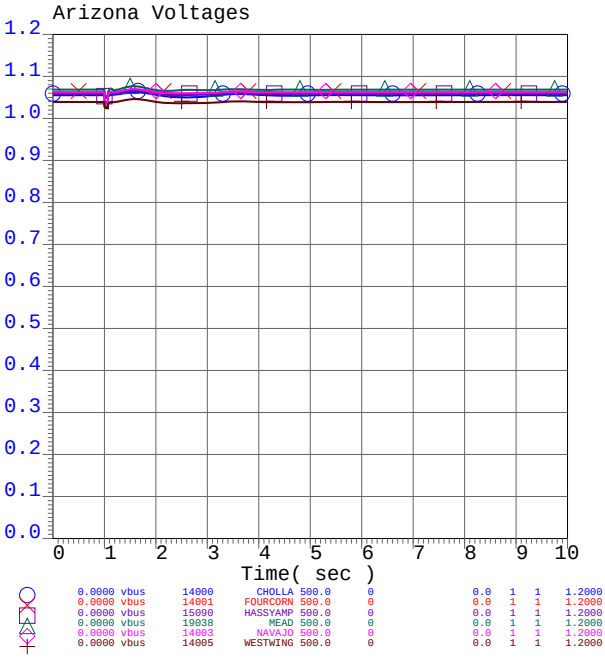
New Mexico Voltages



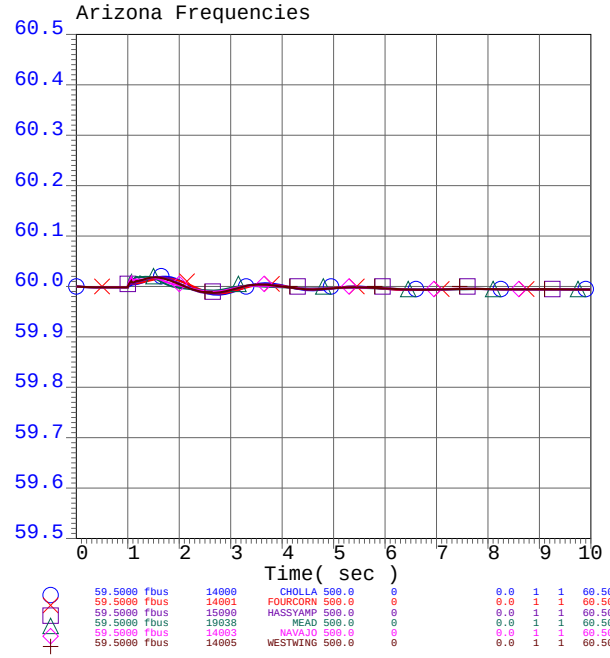
New Mexico Frequencies



Arizona Voltages

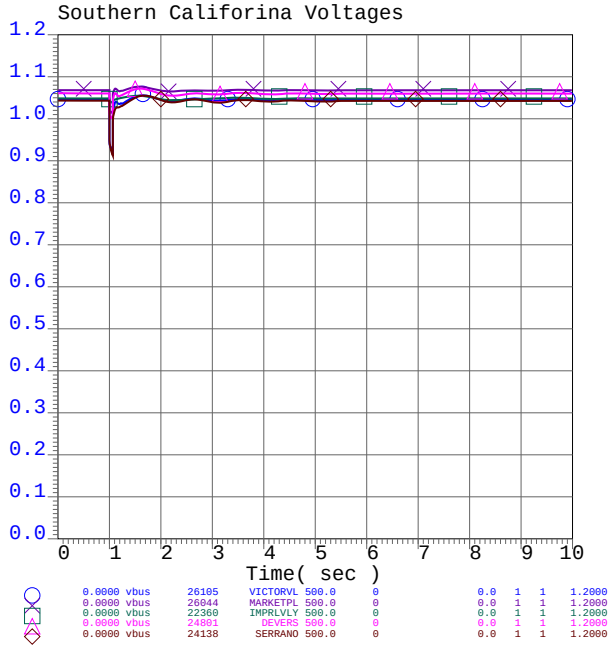


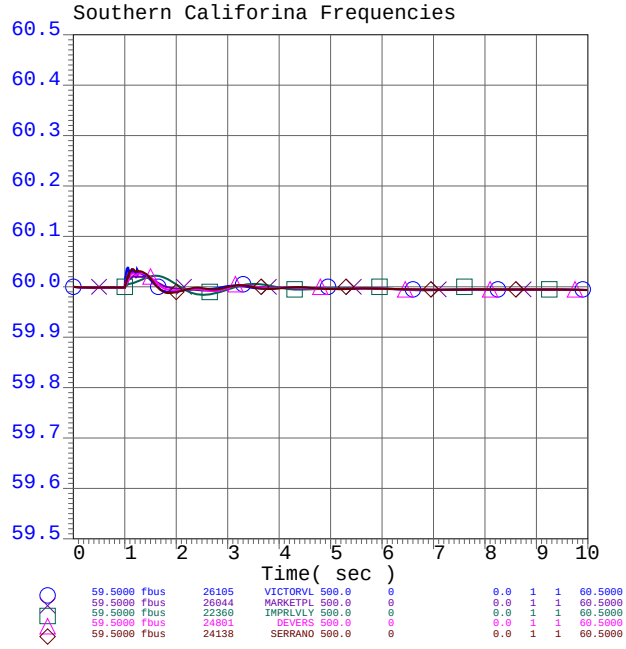
Arizona Frequencies

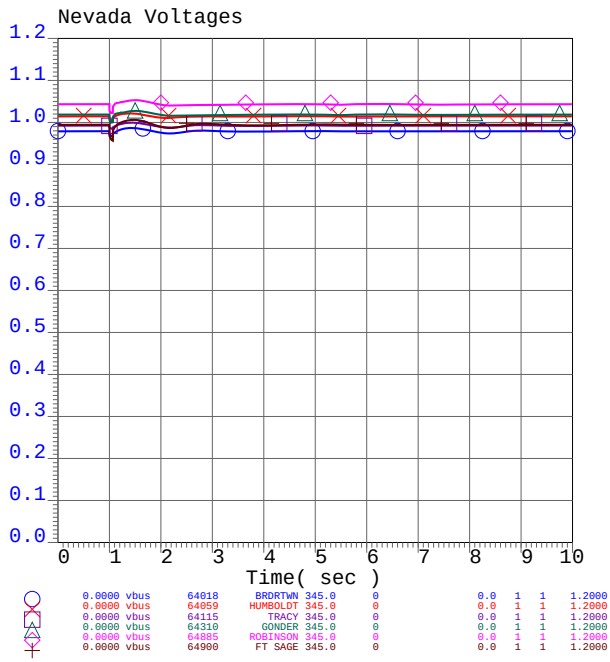


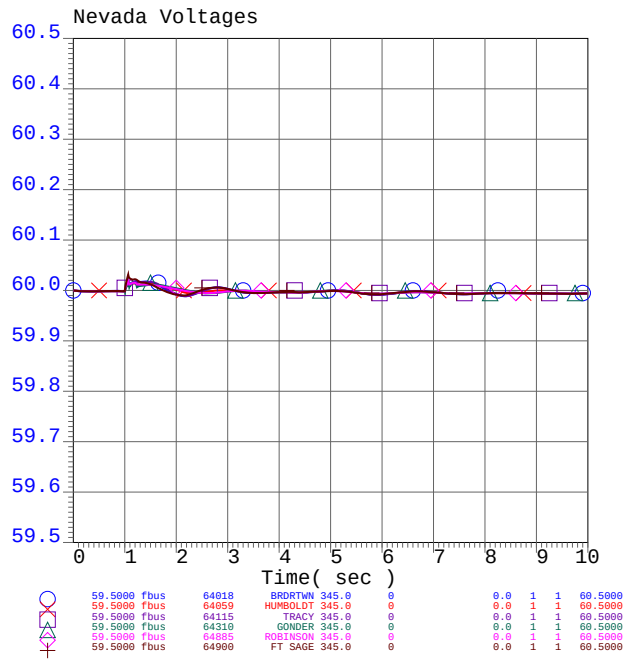
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WECC AREA VOLTAGE AND FREQUENCIES



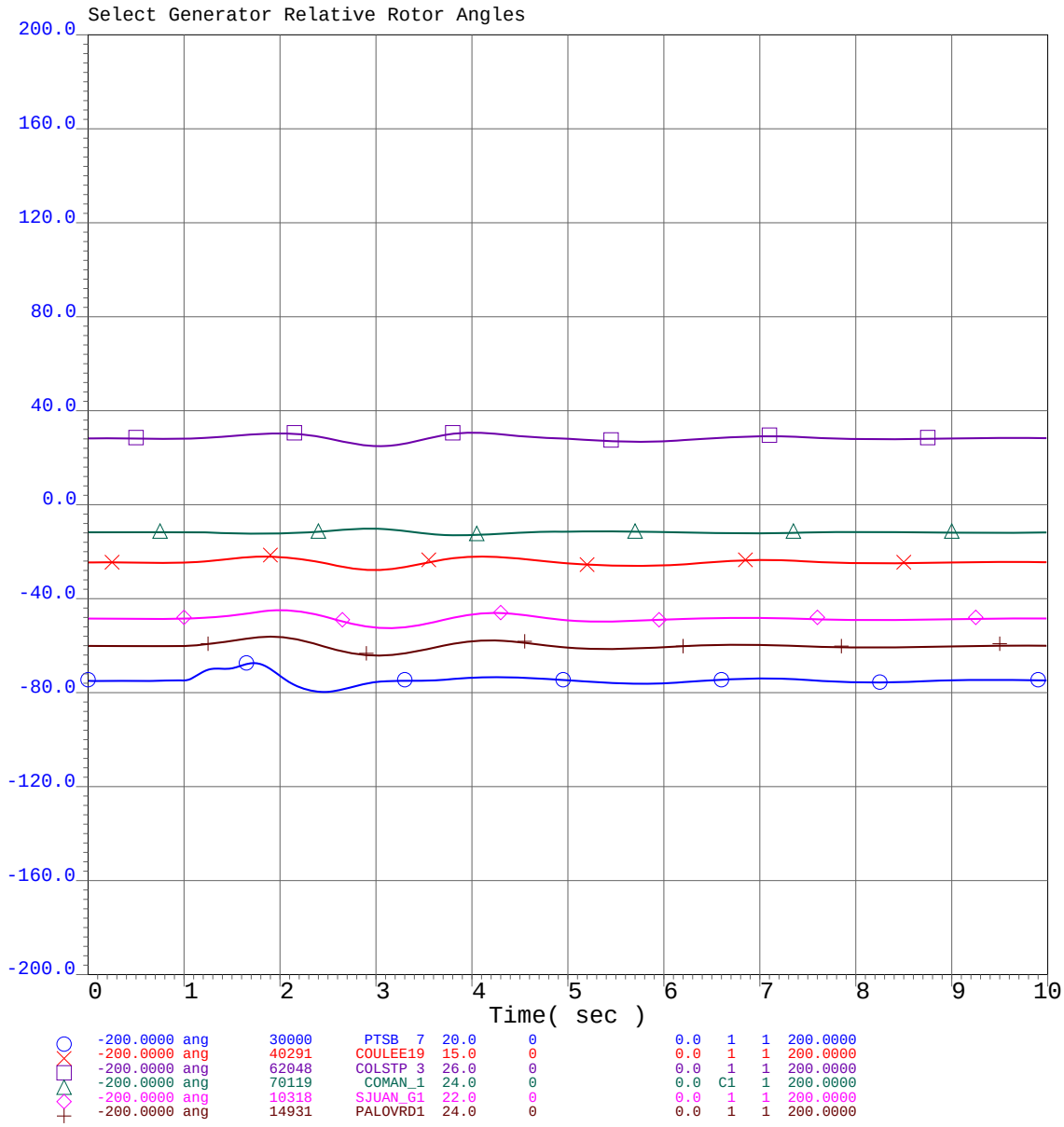






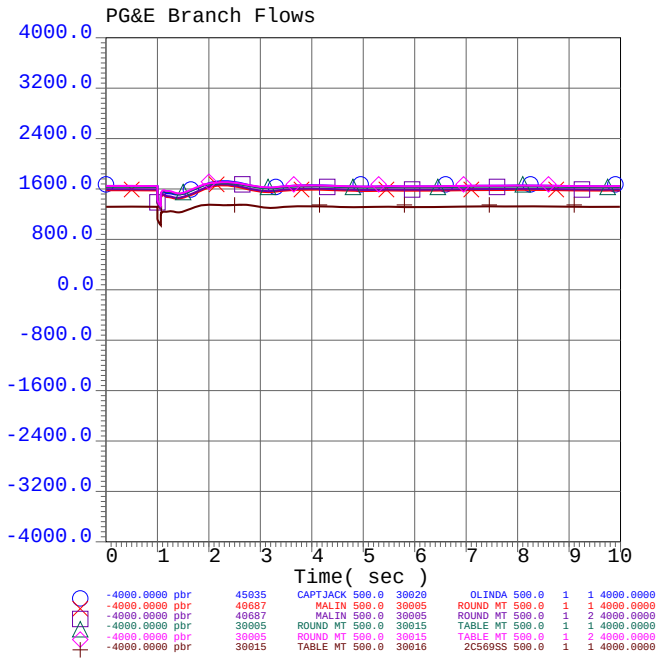
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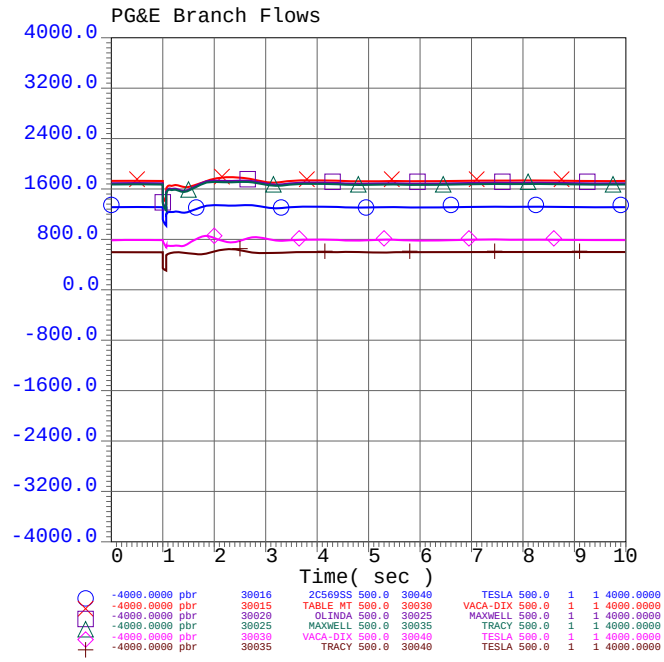
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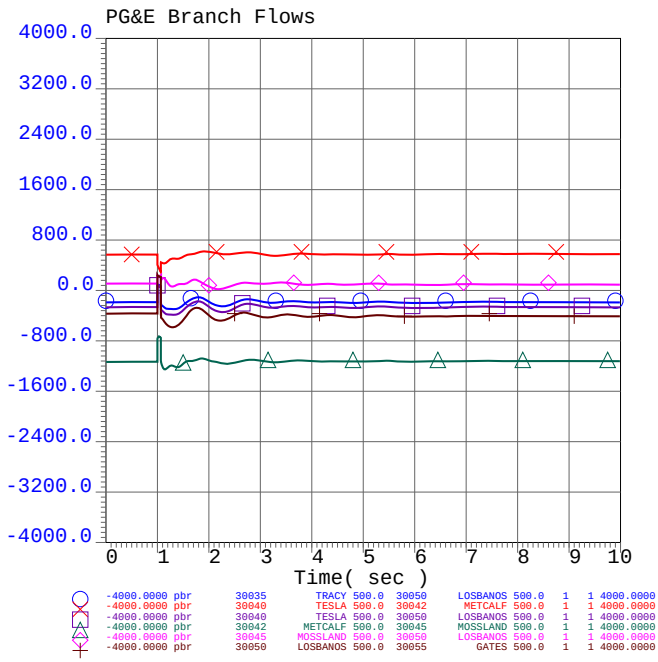


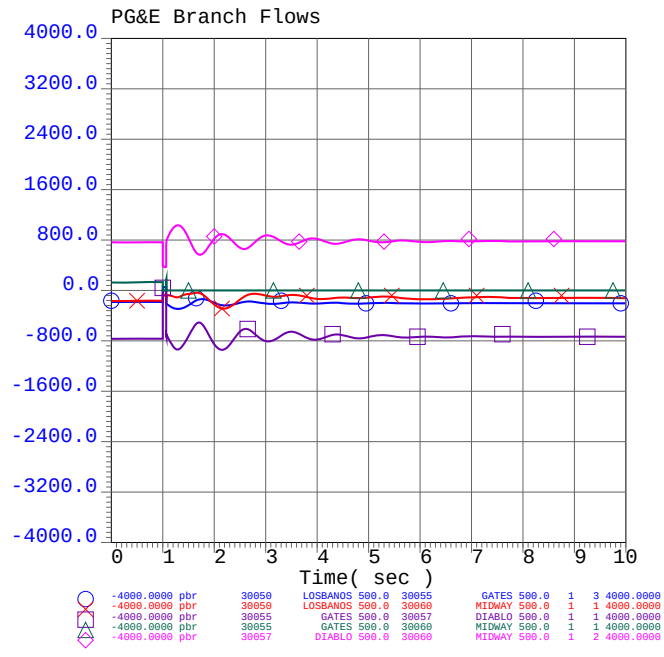
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3-phase 4 cycle fault at Gates 500 kV
followed by loss of Gates-Midway 500 kV line

SELECT BRANCH FLOWS



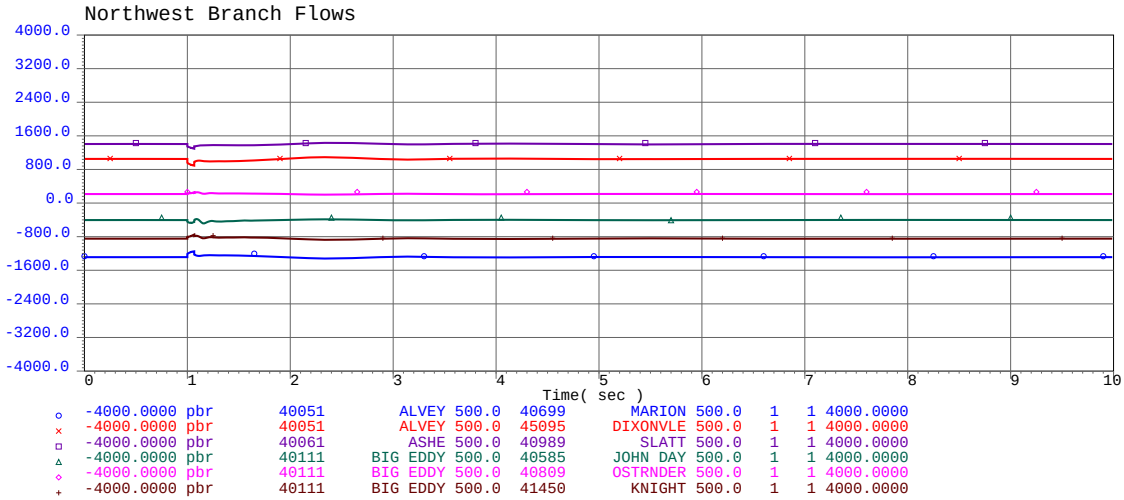




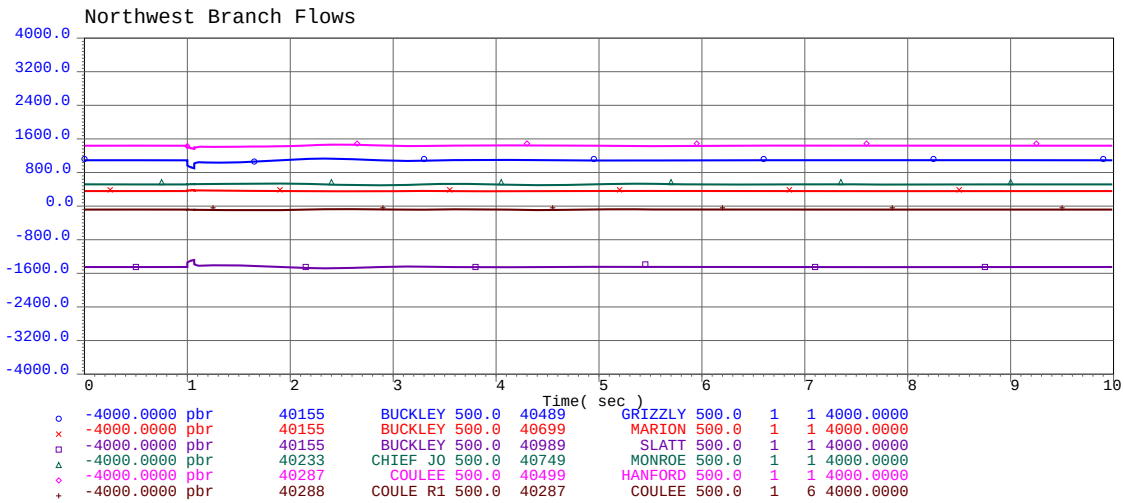


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3-phase 4 cycle fault at Gates 500 kV
followed by loss of Gates-Midway 500 kV line

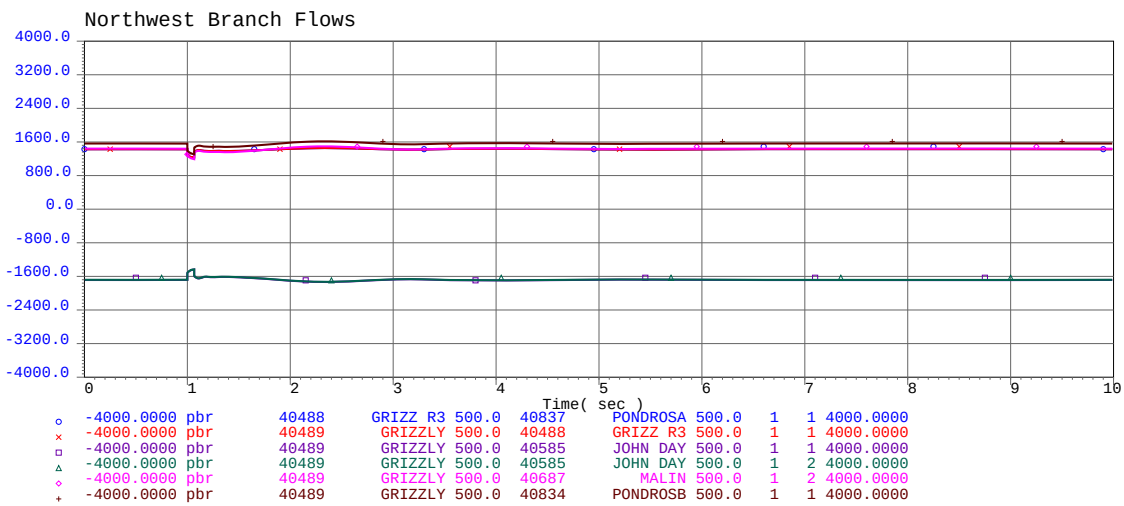
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
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-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
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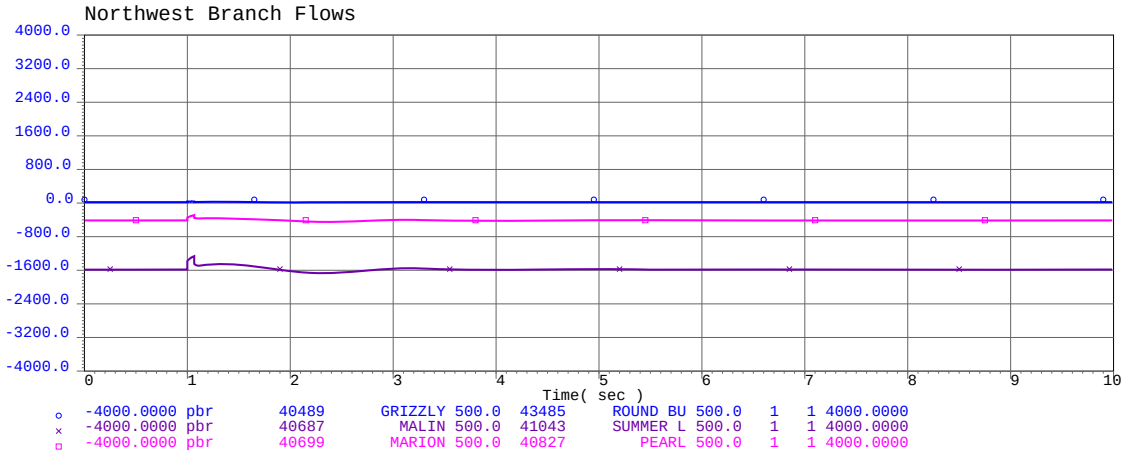
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-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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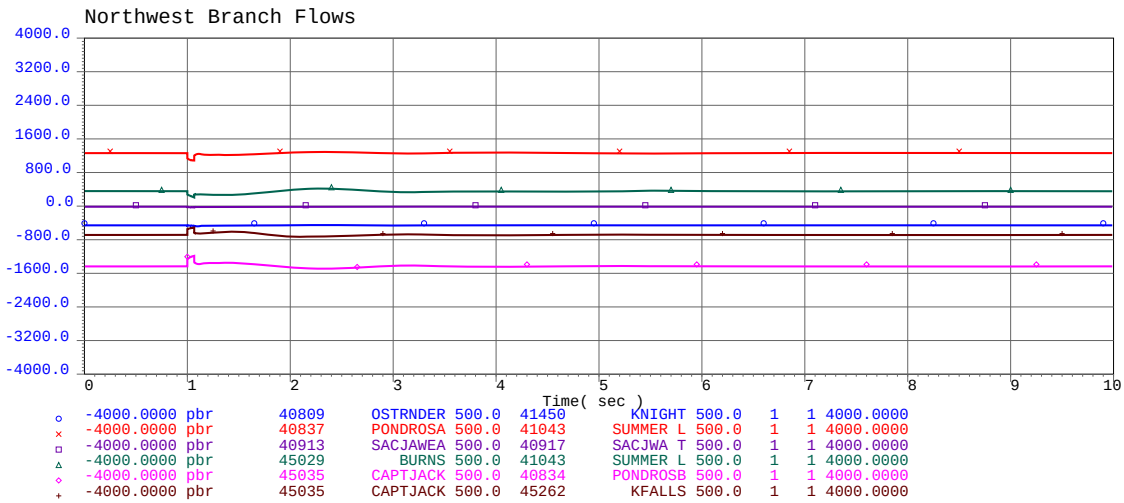


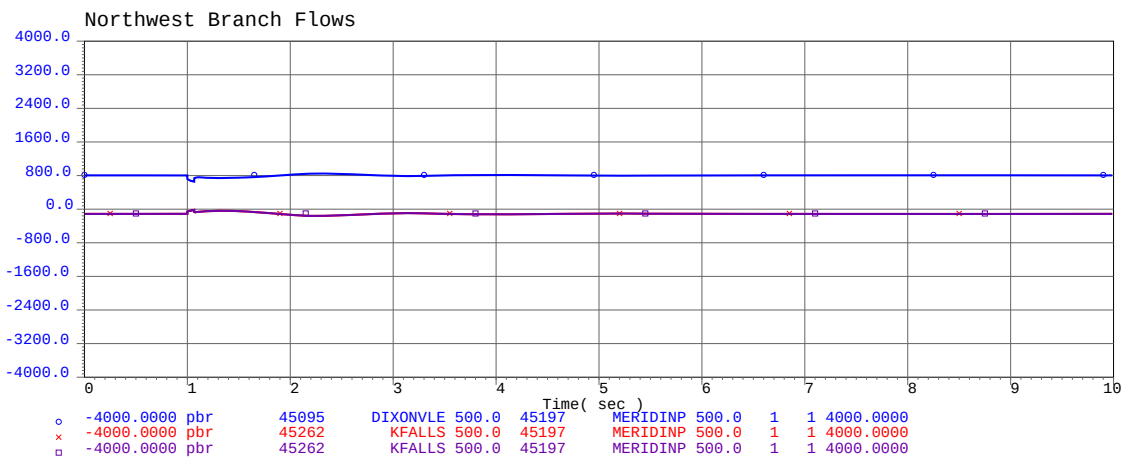
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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3-phase 4 cycle fault at Gates 500 kV
followed by loss of Gates-Midway 500 kV line

SELECT BRANCH FLOWS

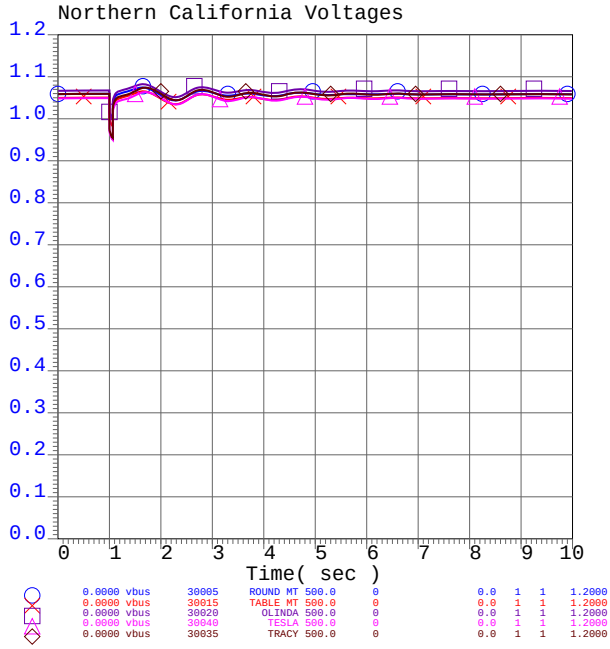


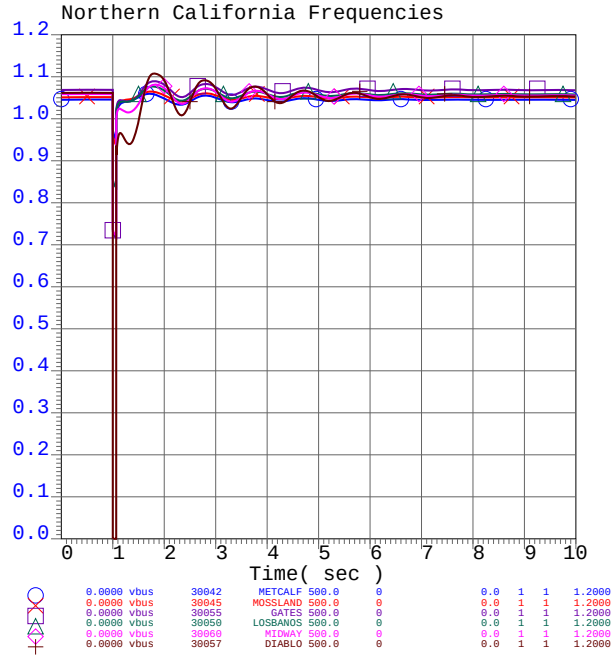


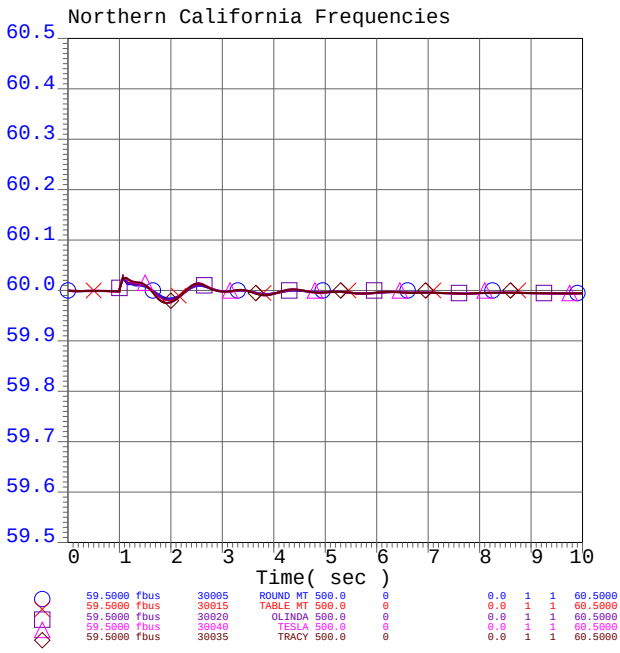


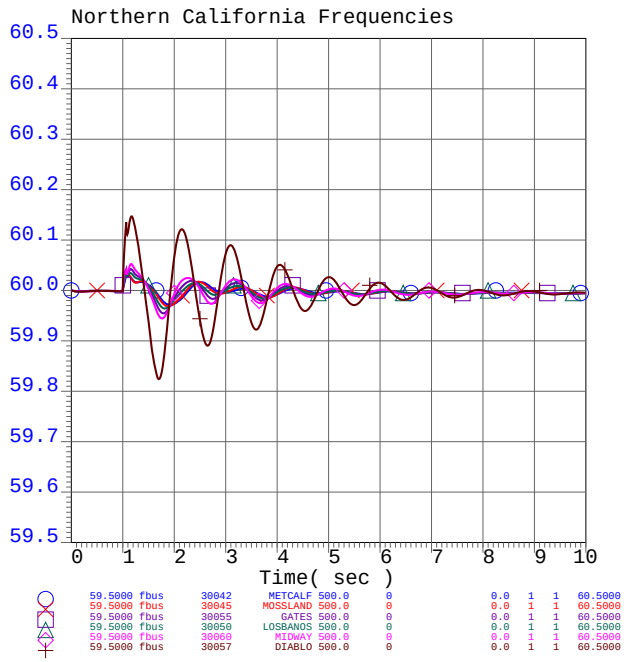
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3-phase 4 cycle fault at Gates 500 kV
followed by loss of Gates-Midway 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES







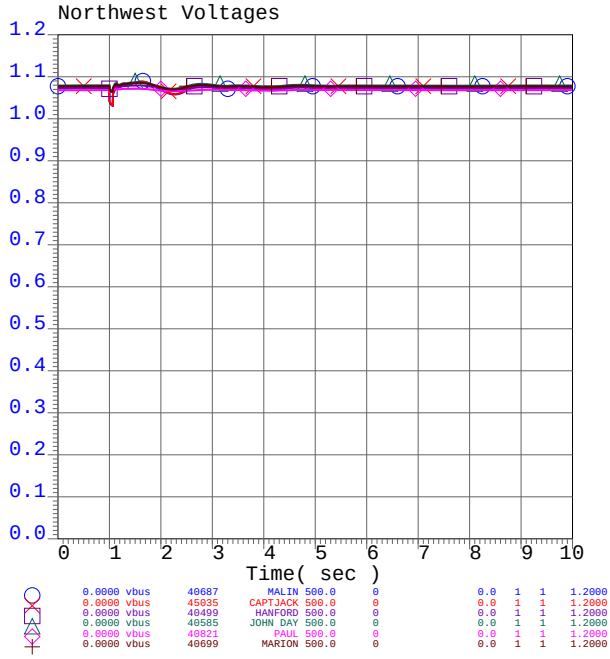


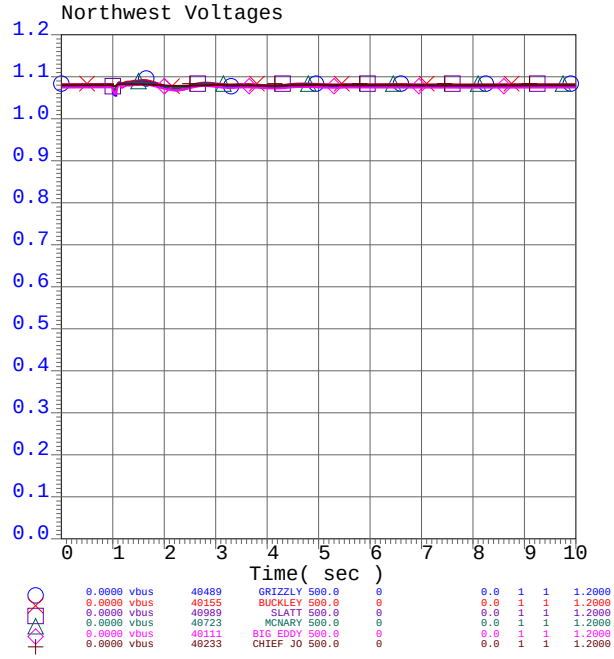
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Gates 500 kV line

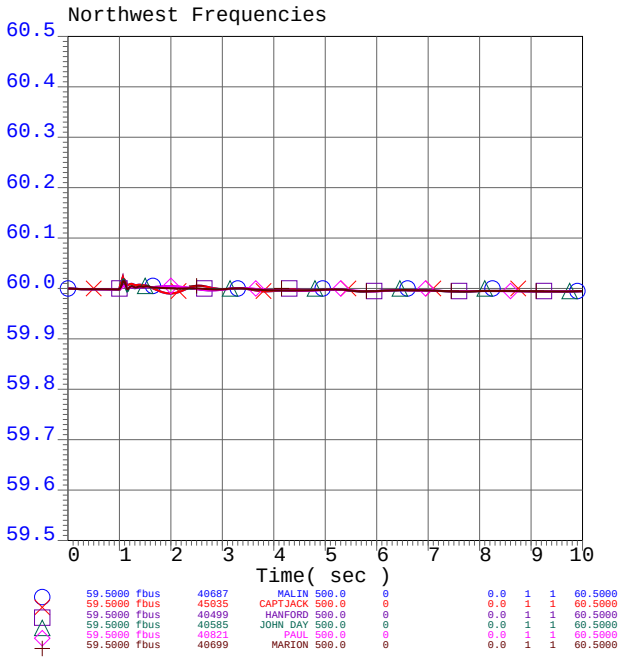
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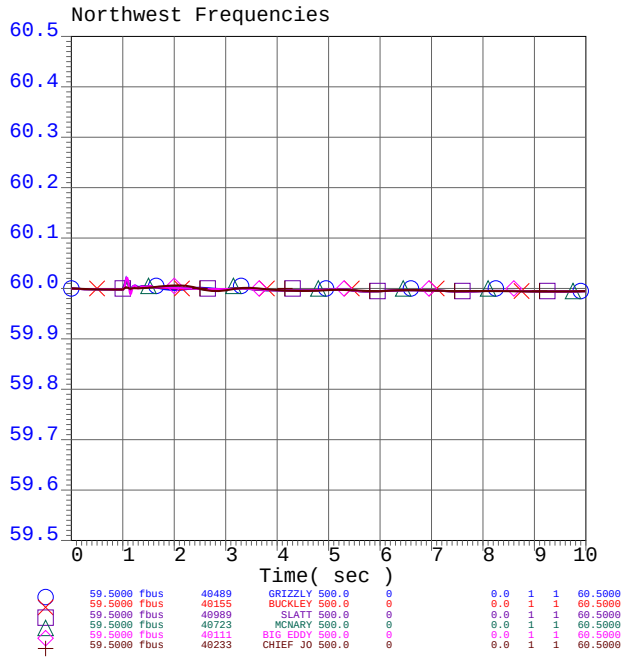
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WECC AREA VOLTAGE AND FREQUENCIES





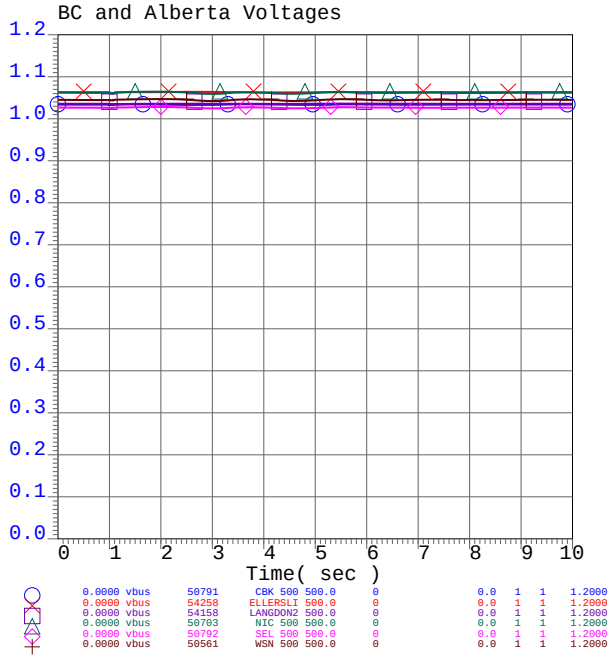




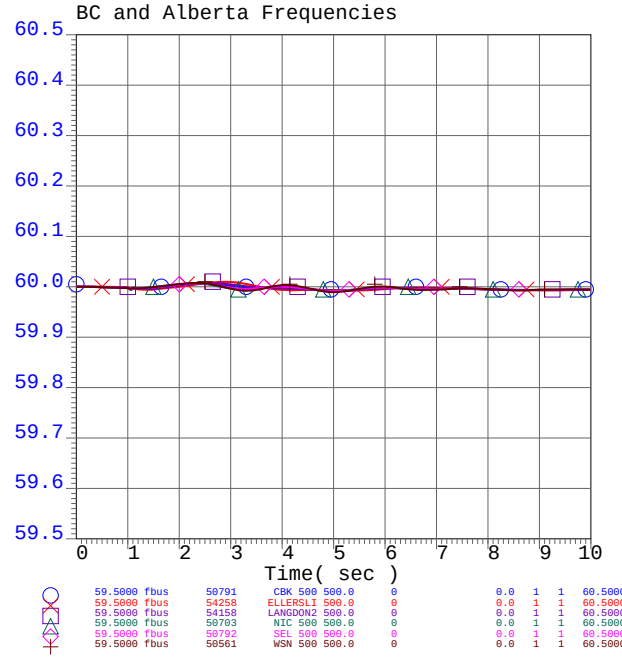
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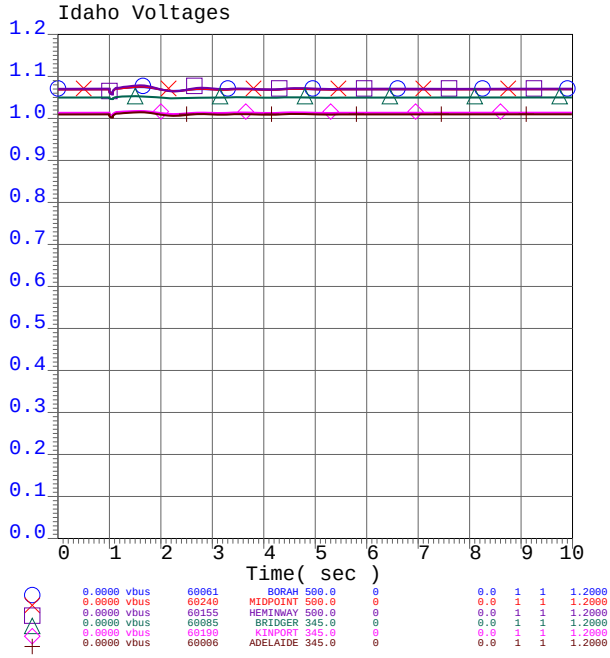
BC and Alberta Voltages



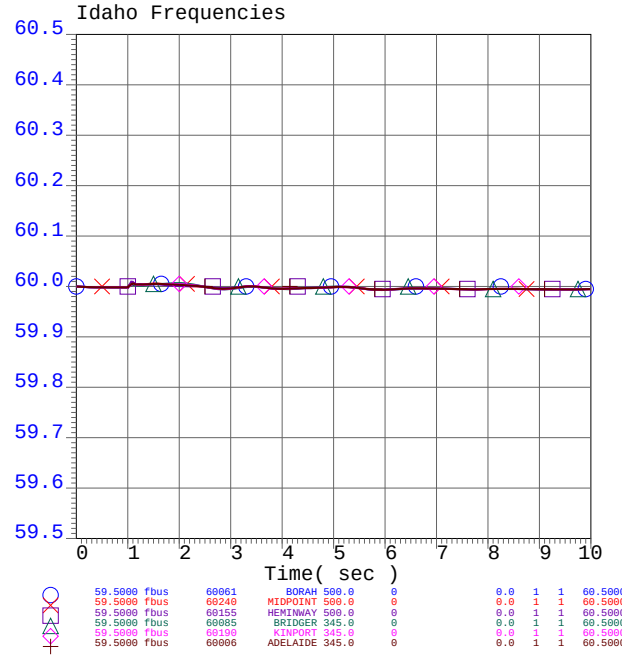
BC and Alberta Frequencies



Idaho Voltages



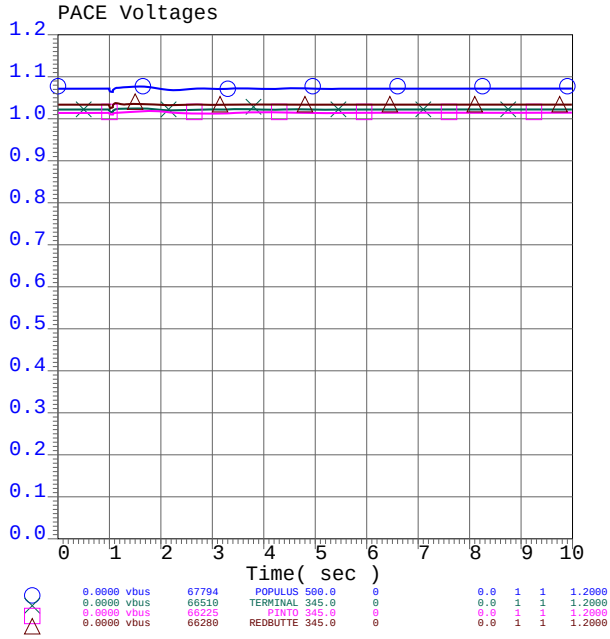
Idaho Frequencies



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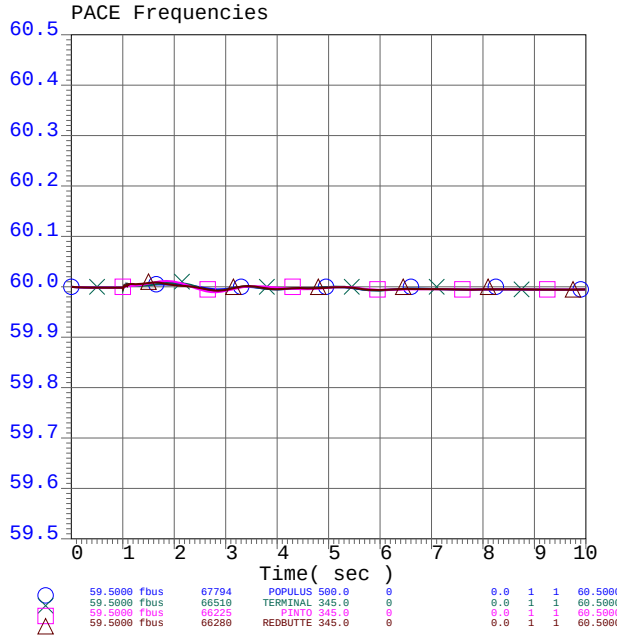
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



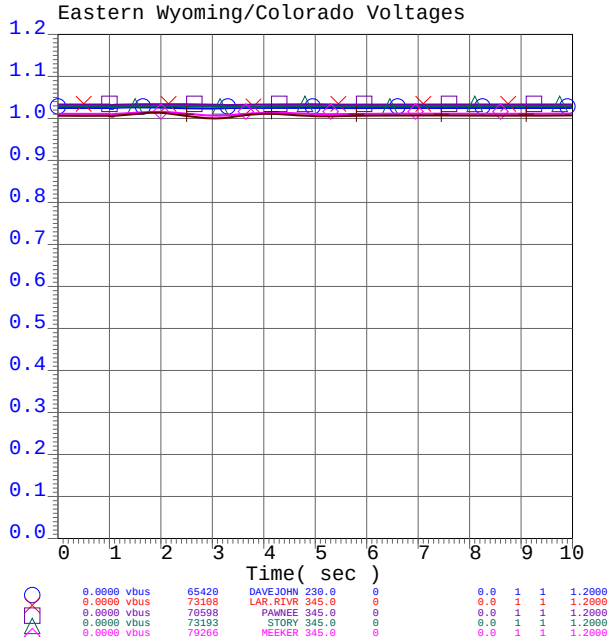
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0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



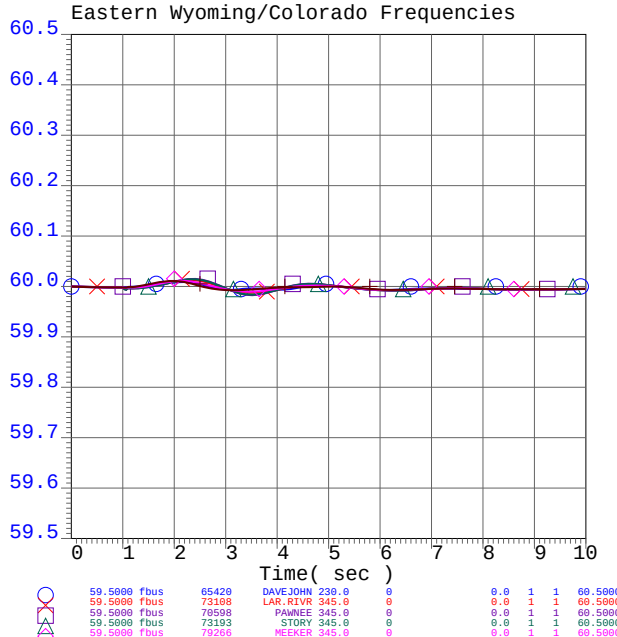
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59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

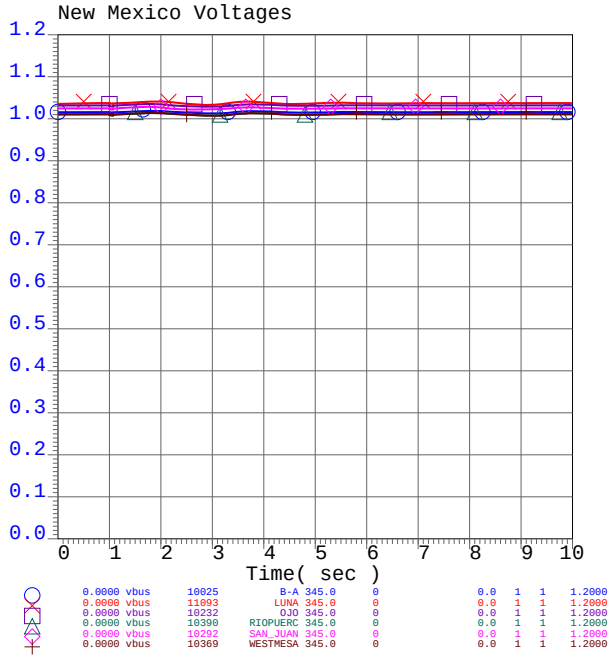
Eastern Wyoming/Colorado Frequencies

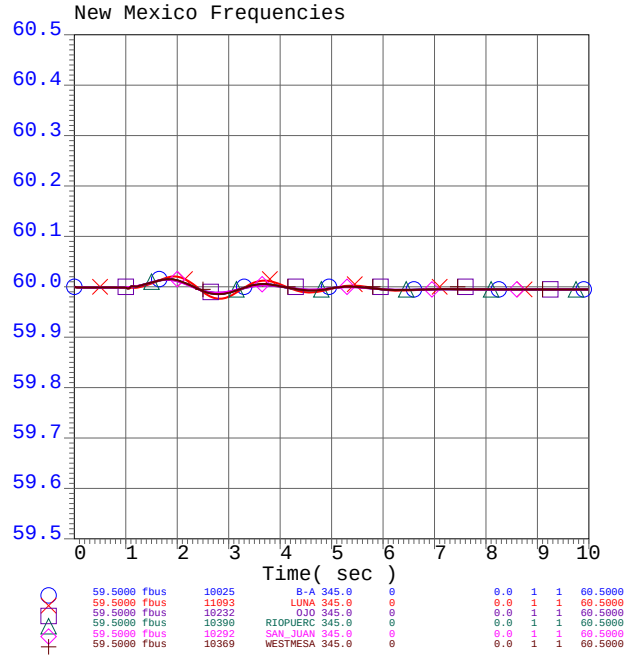


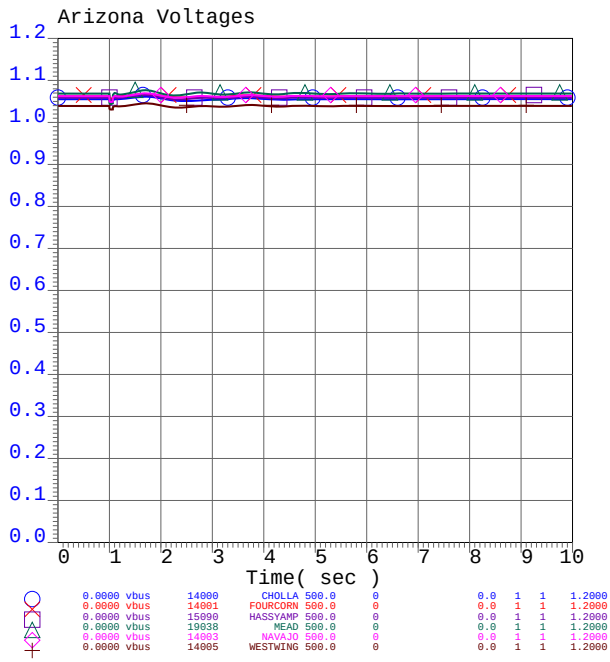
59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
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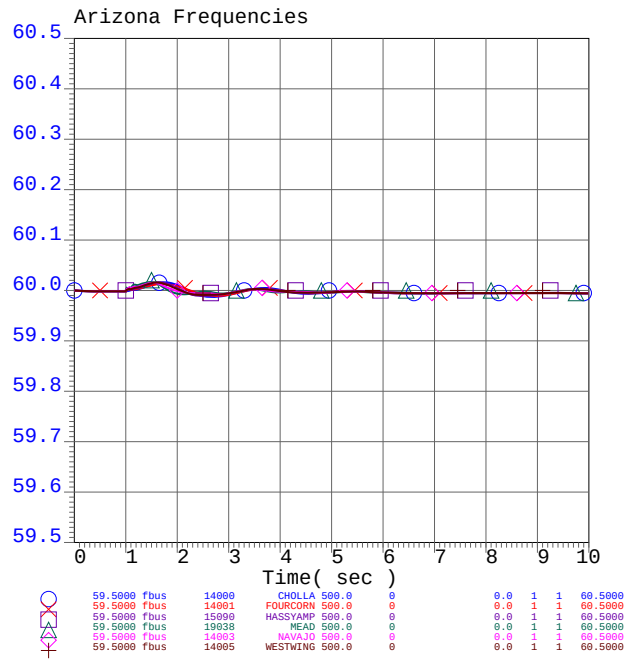
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WECC AREA VOLTAGE AND FREQUENCIES



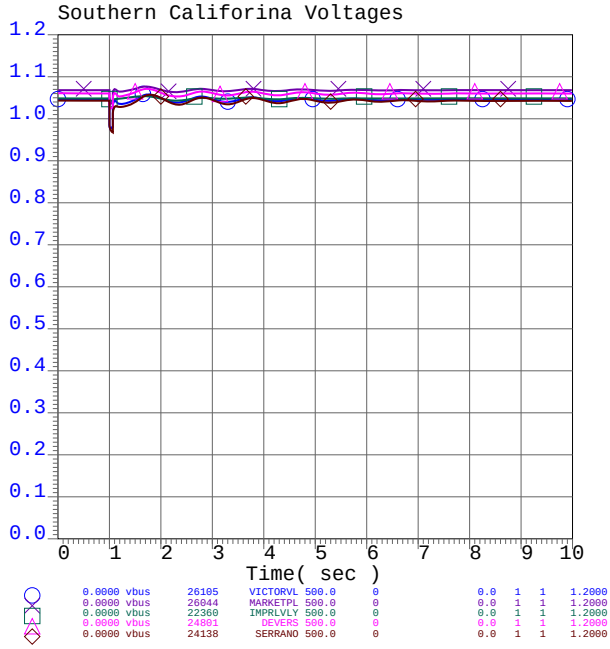


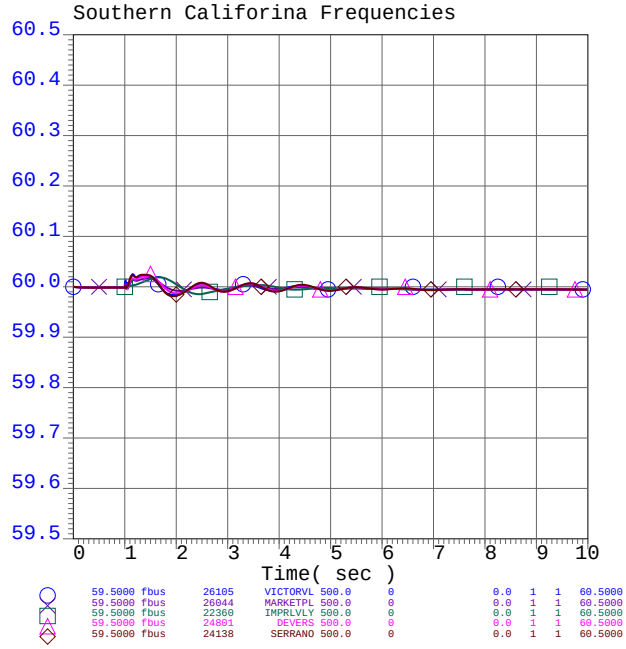


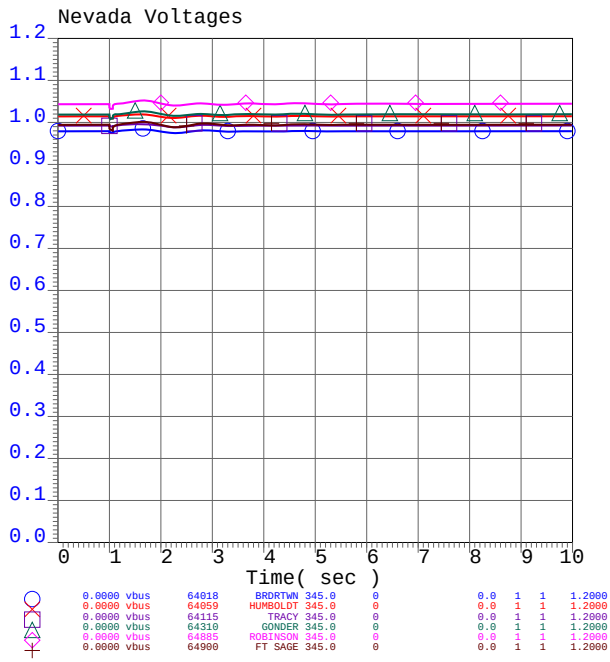


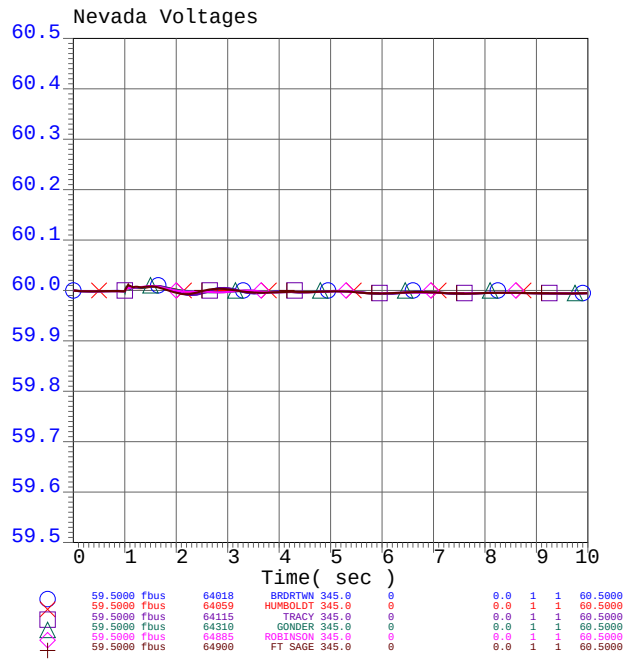
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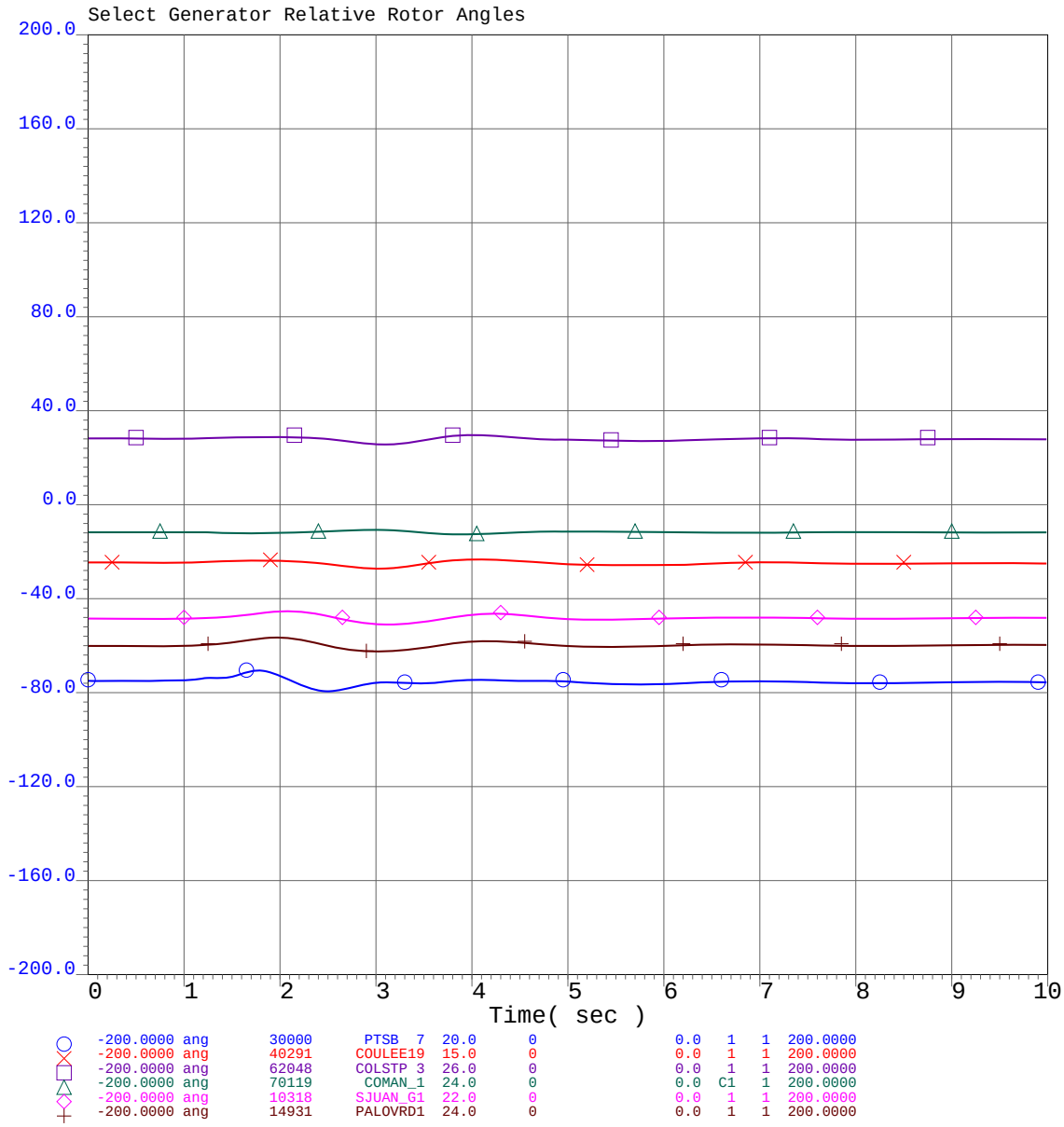






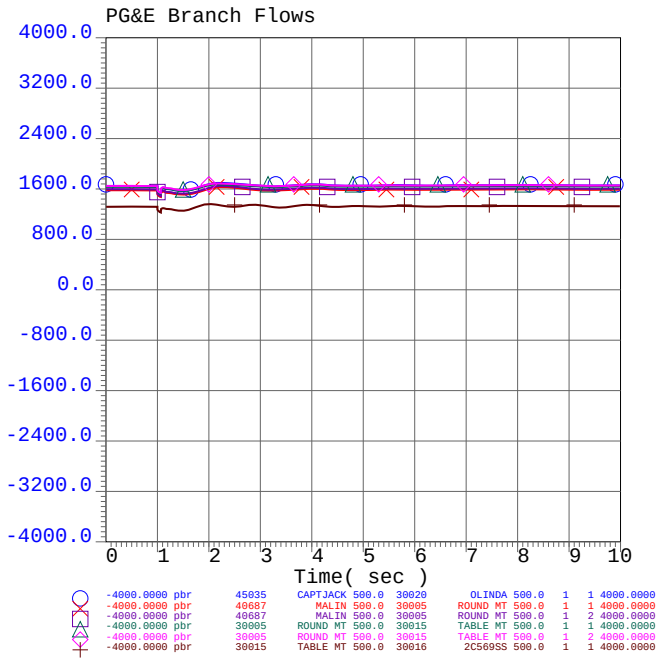
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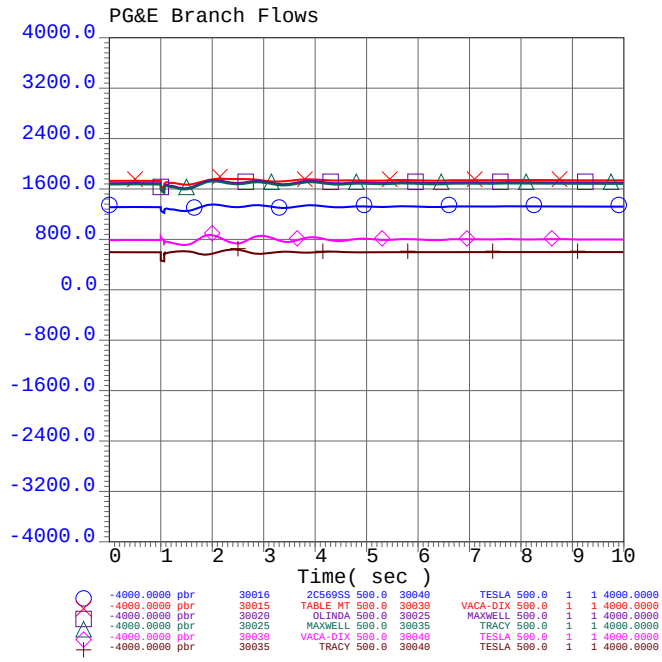
WECC RELATIVE ROTOR ANGLES

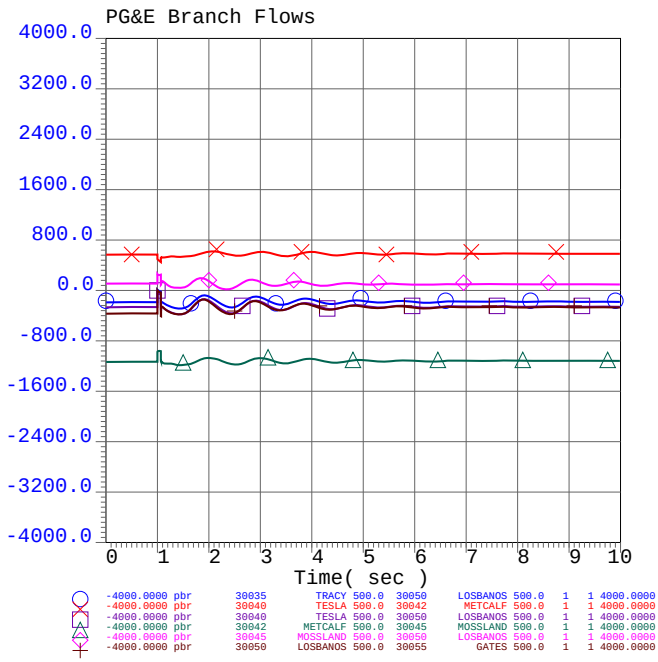


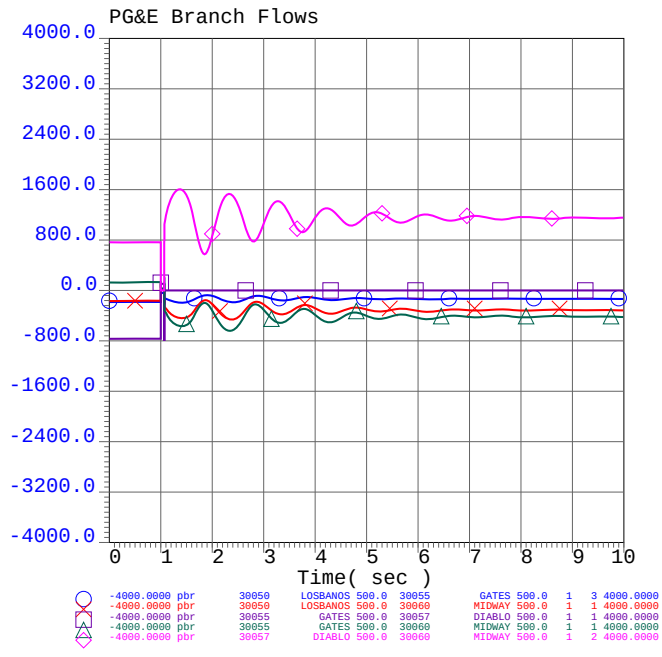
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SELECT BRANCH FLOWS





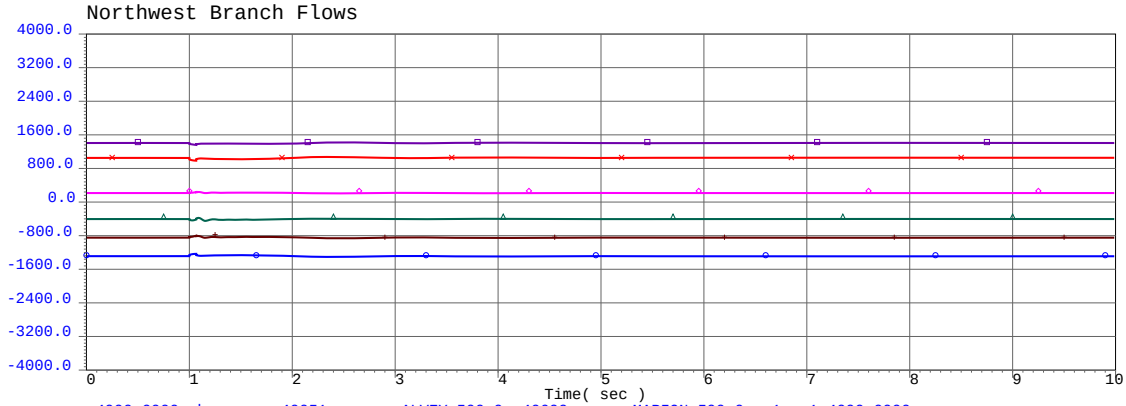




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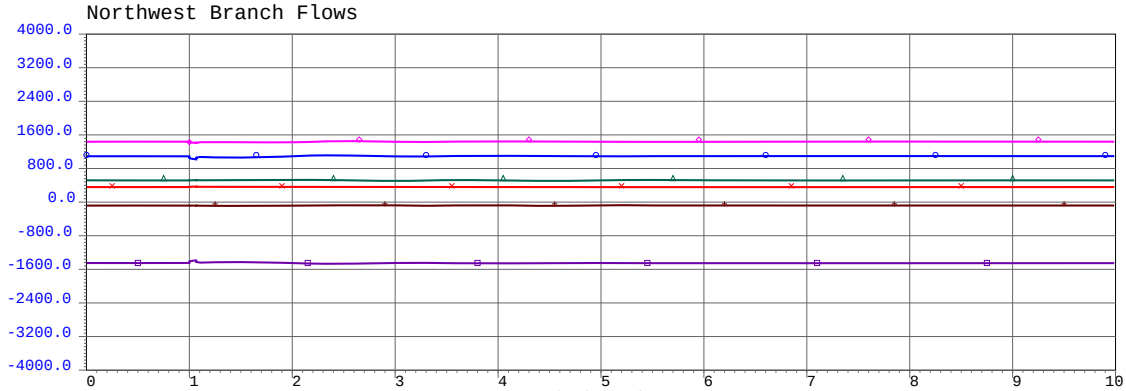
SELECT BRANCH FLOWS

Northwest Branch Flows



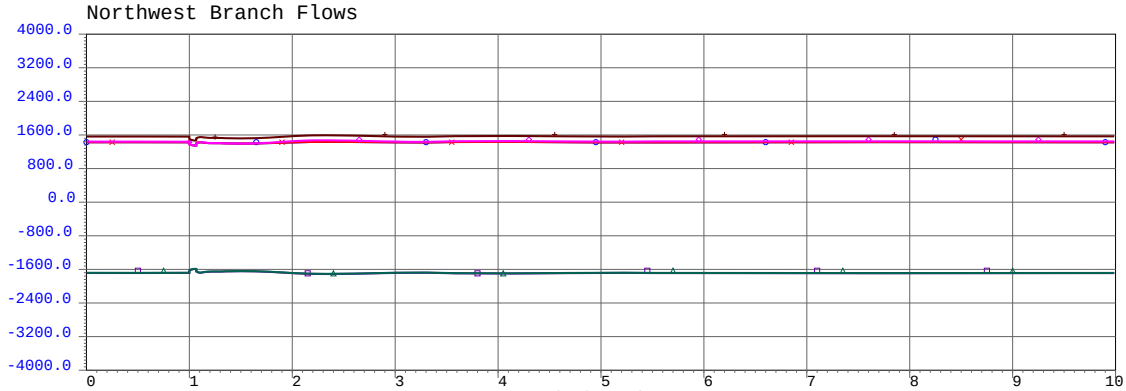
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

Northwest Branch Flows



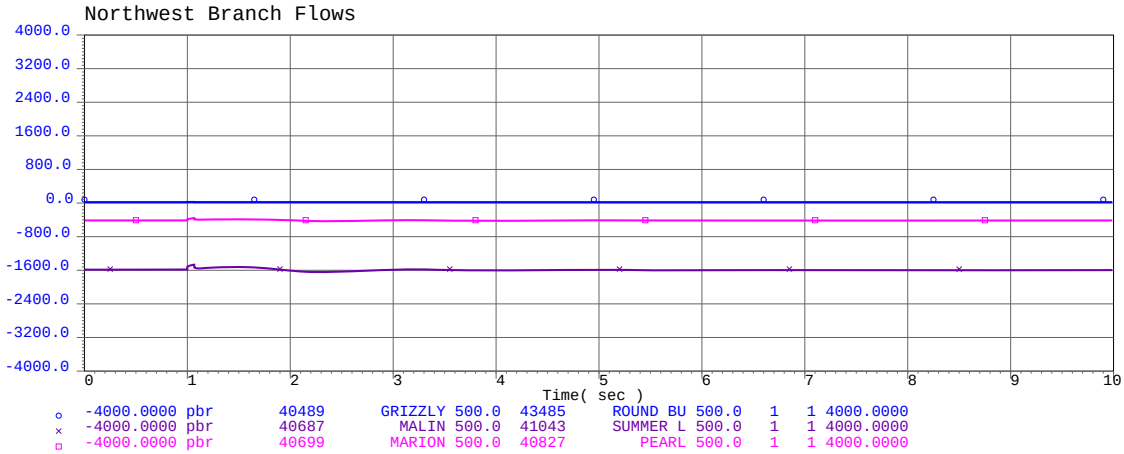
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
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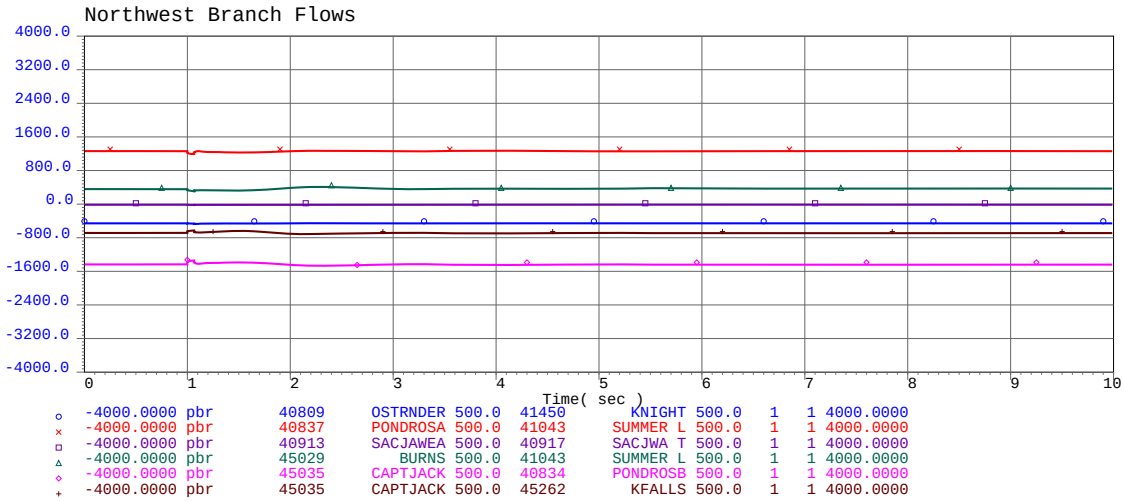
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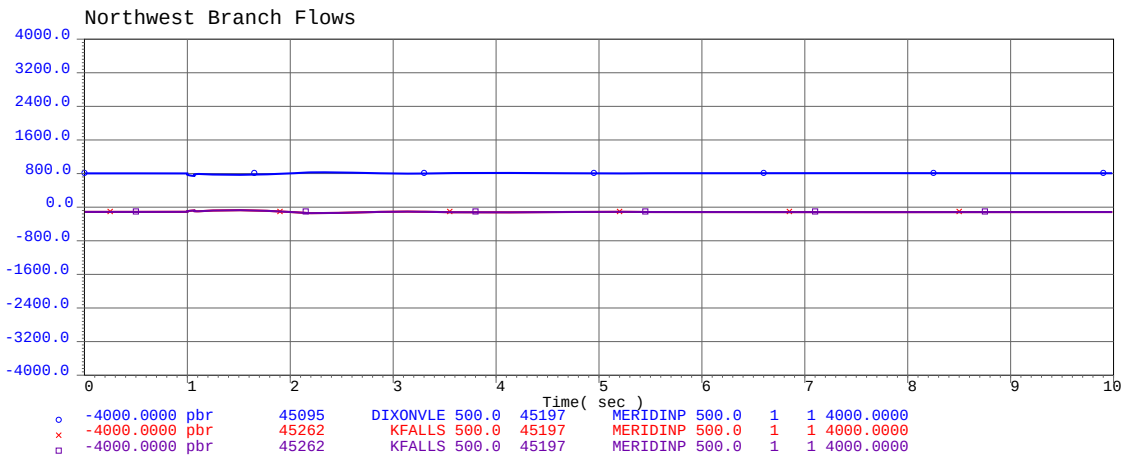
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Fri Jan 03 18:35:57 2014

SELECT BRANCH FLOWS

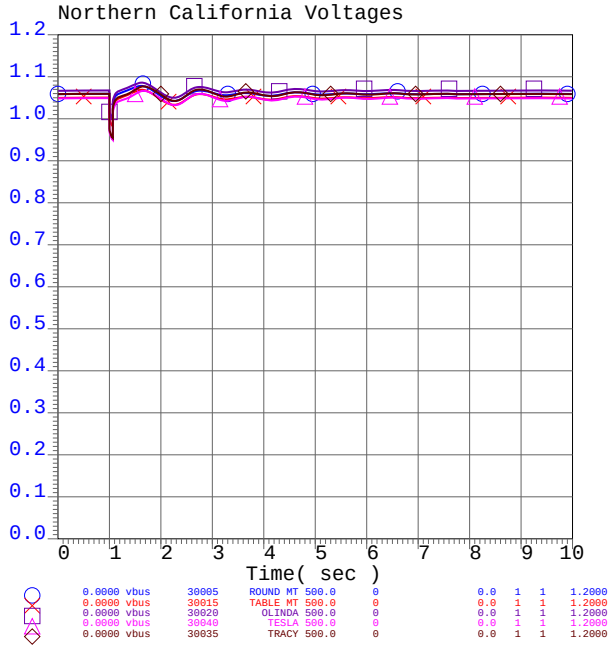


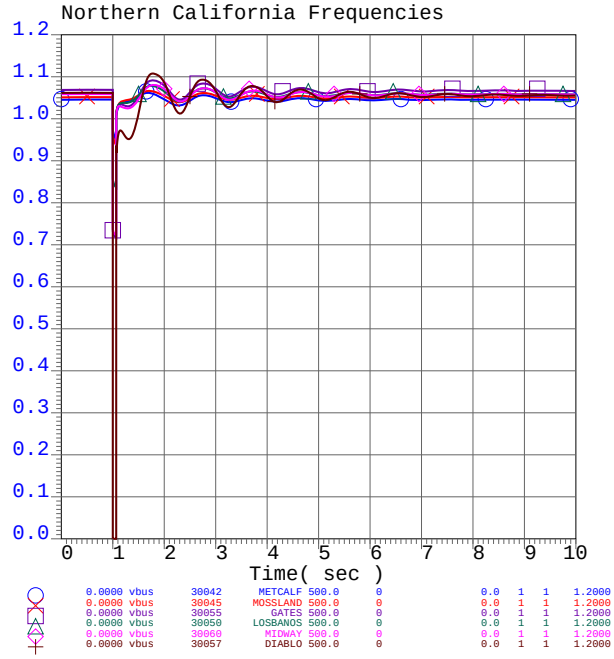


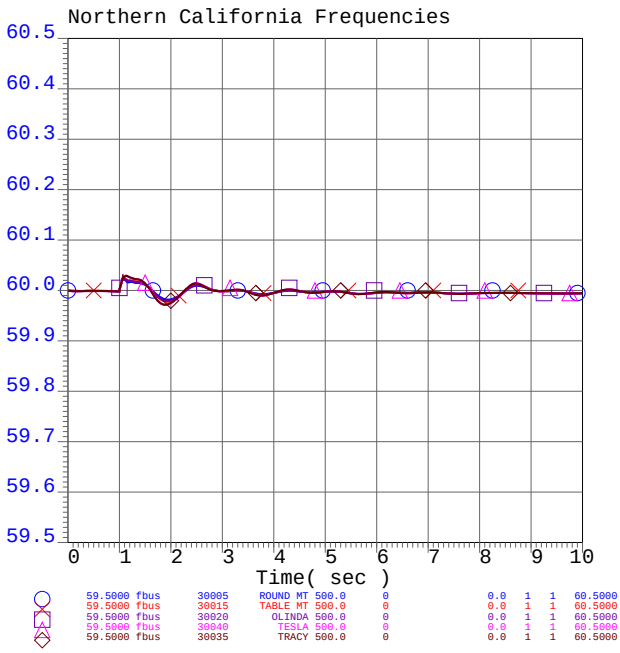


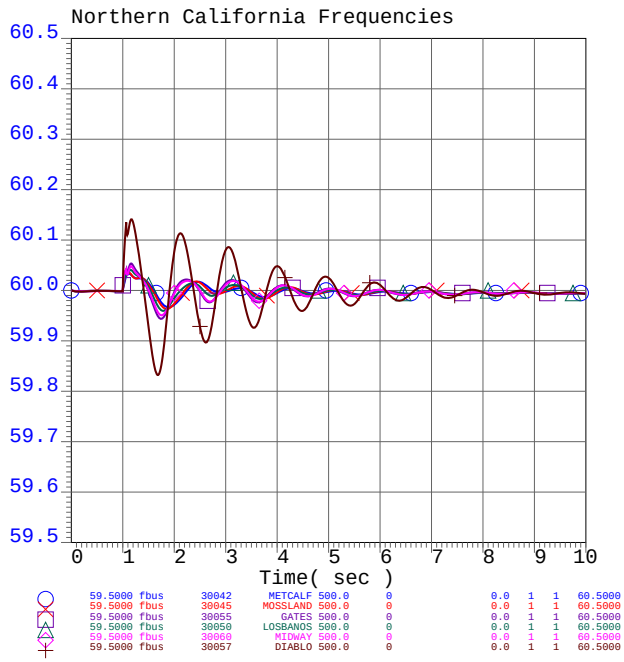
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WECC AREA VOLTAGE AND FREQUENCIES







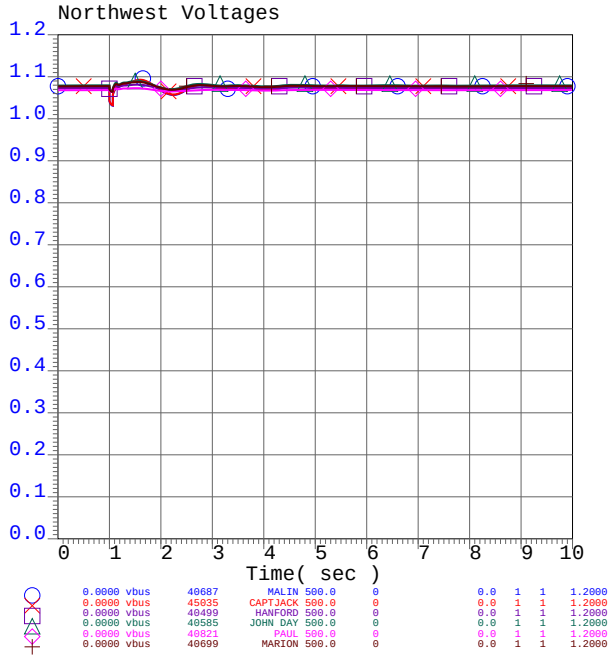


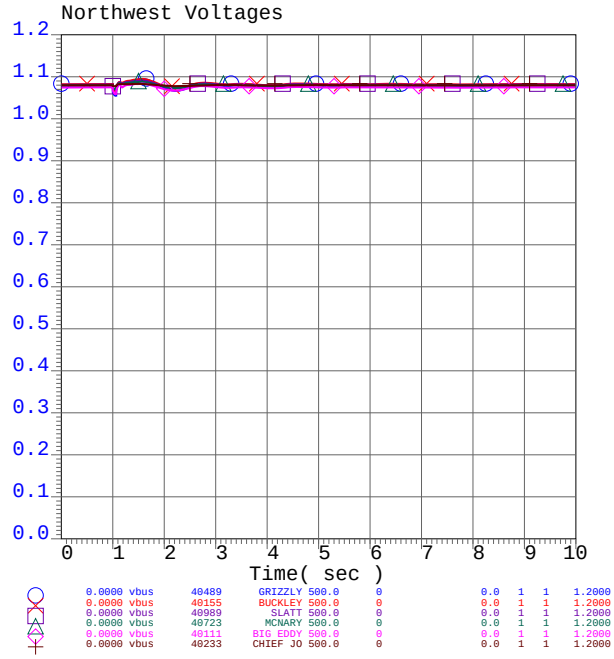
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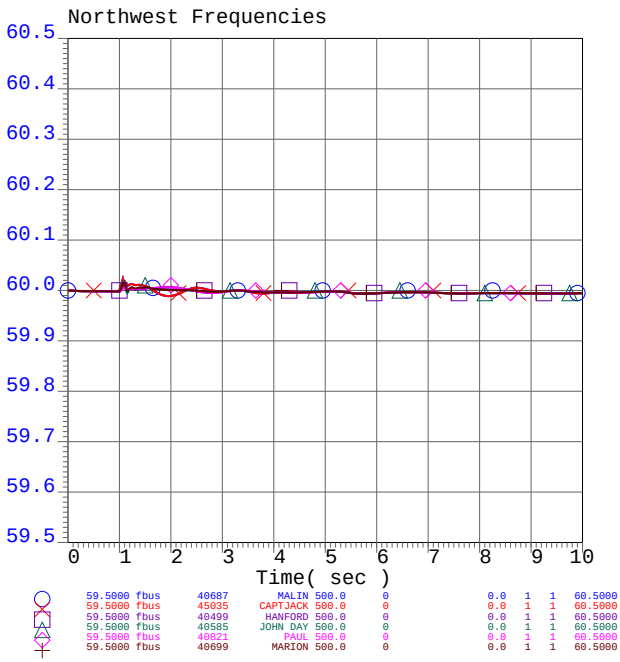
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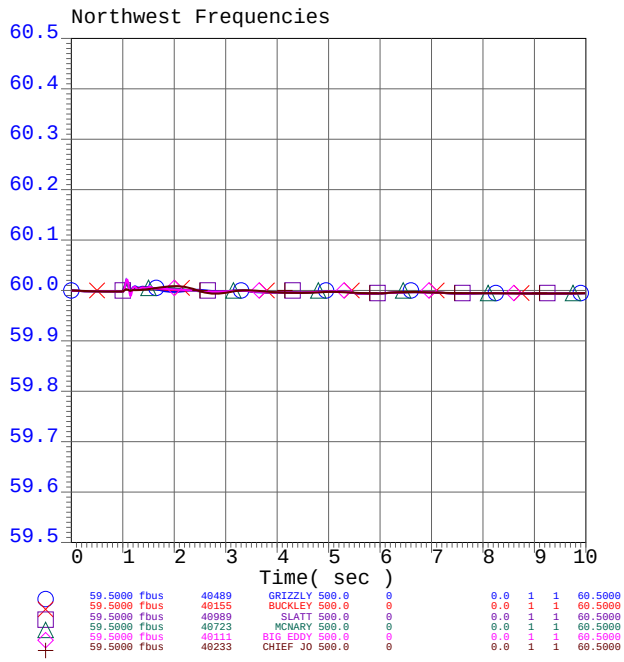
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WECC AREA VOLTAGE AND FREQUENCIES





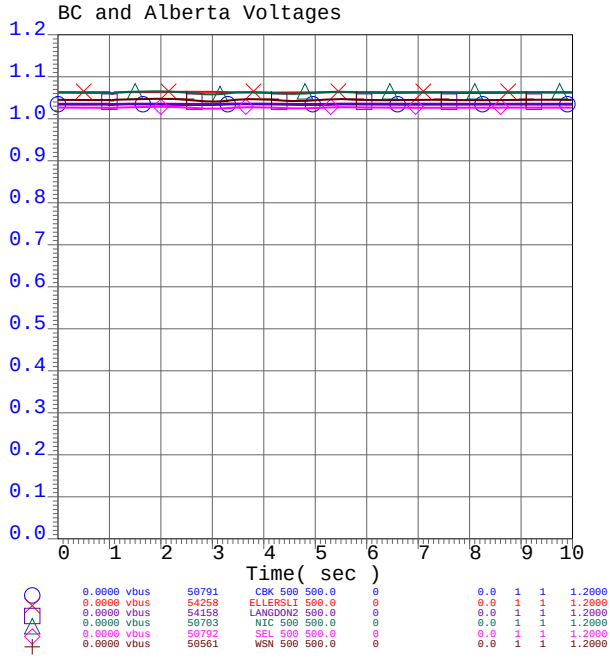




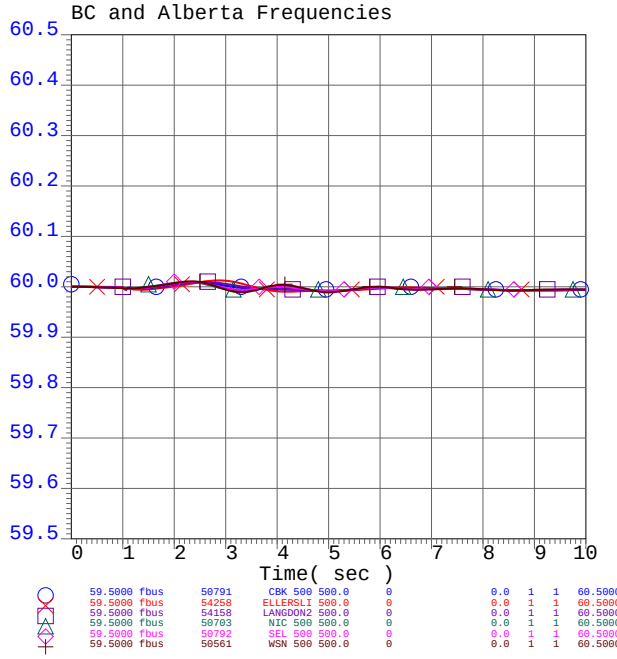
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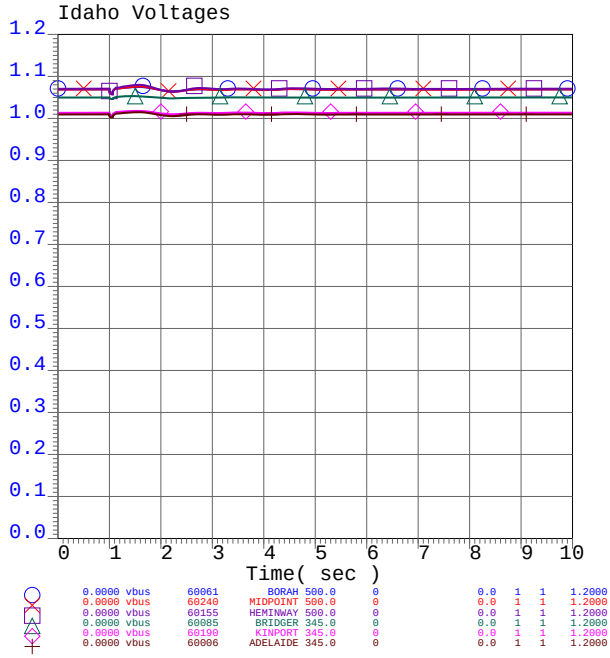
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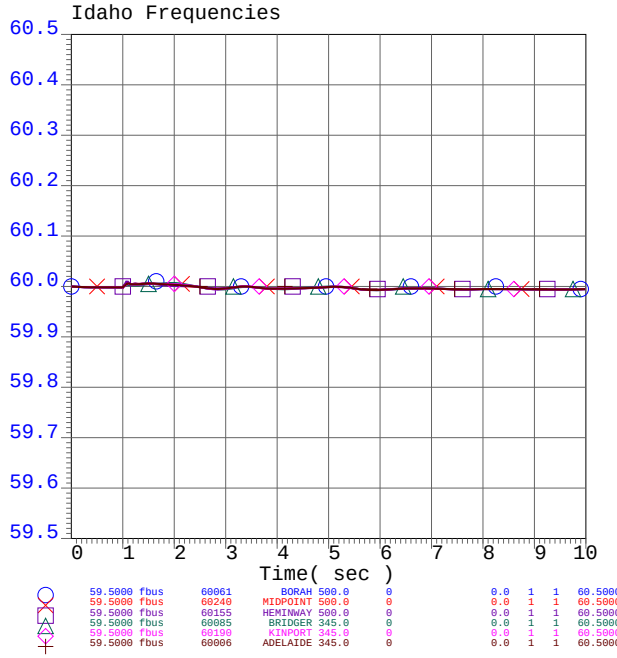
BC and Alberta Frequencies



Idaho Voltages

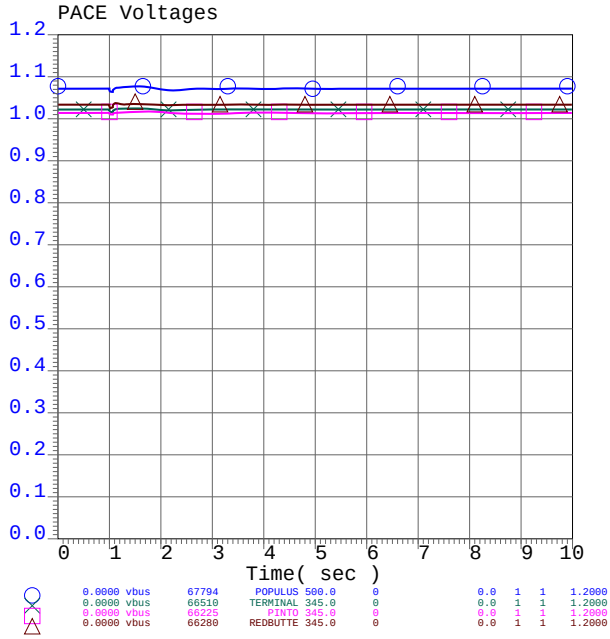


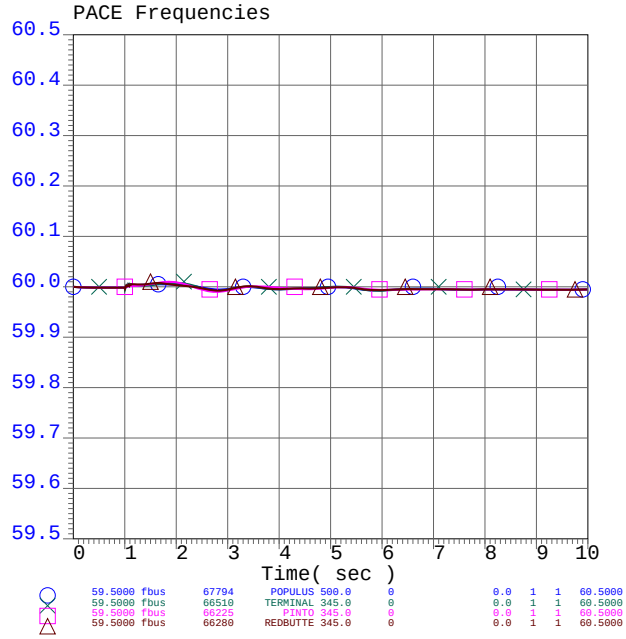
Idaho Frequencies

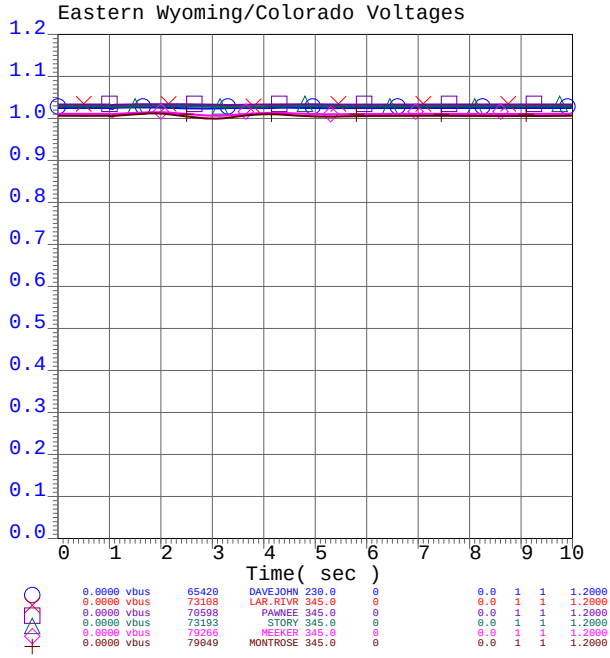


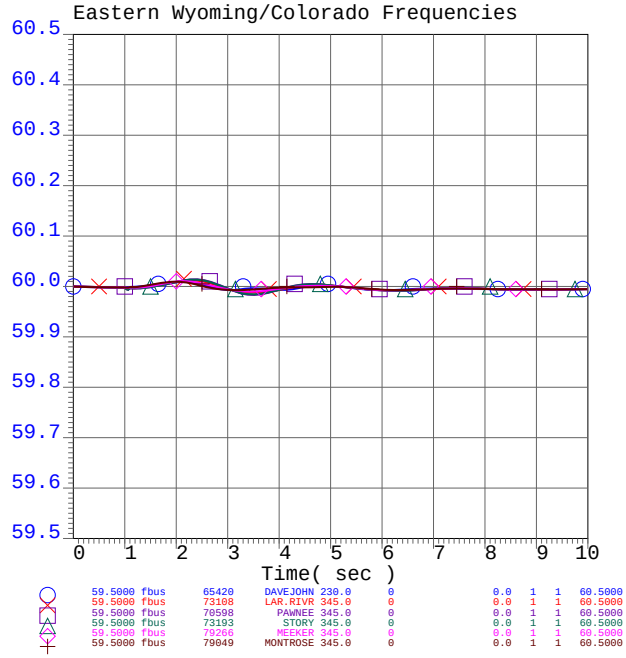
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





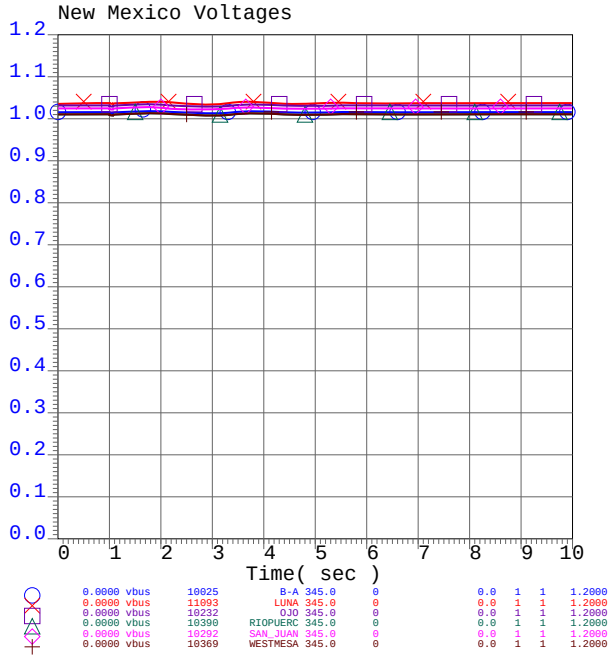




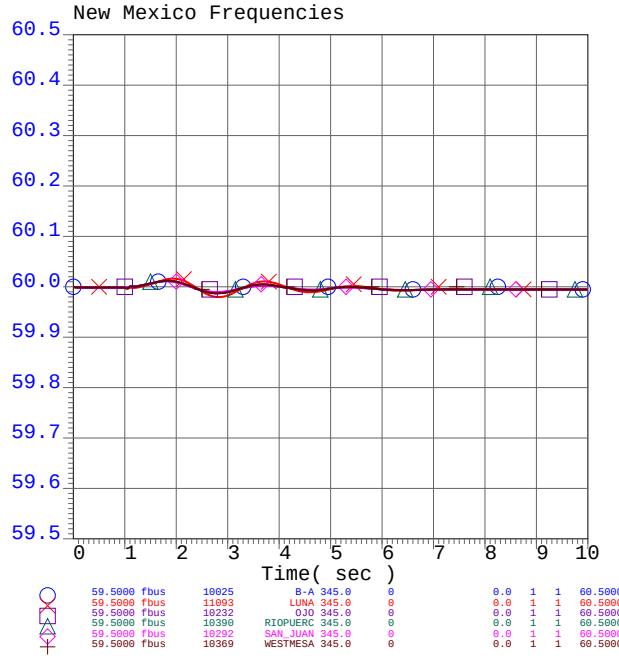
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3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

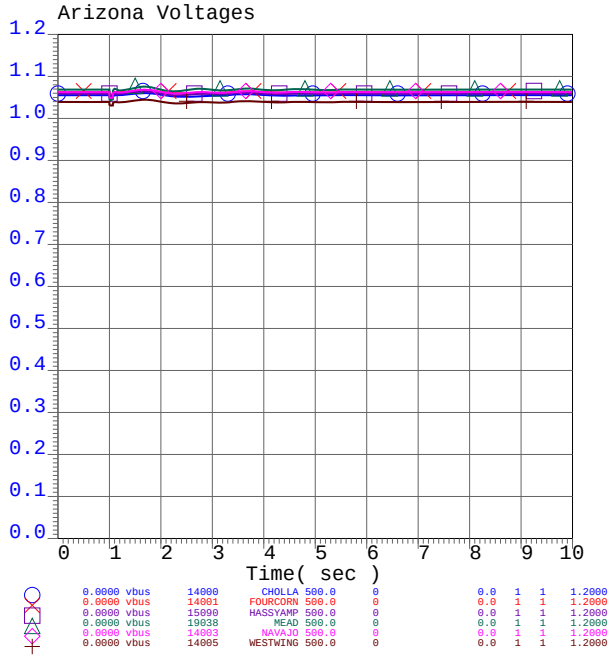
New Mexico Voltages



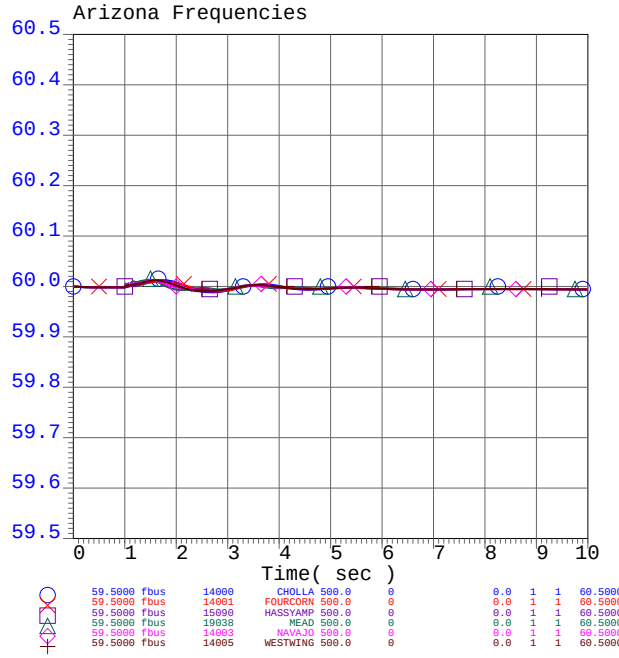
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

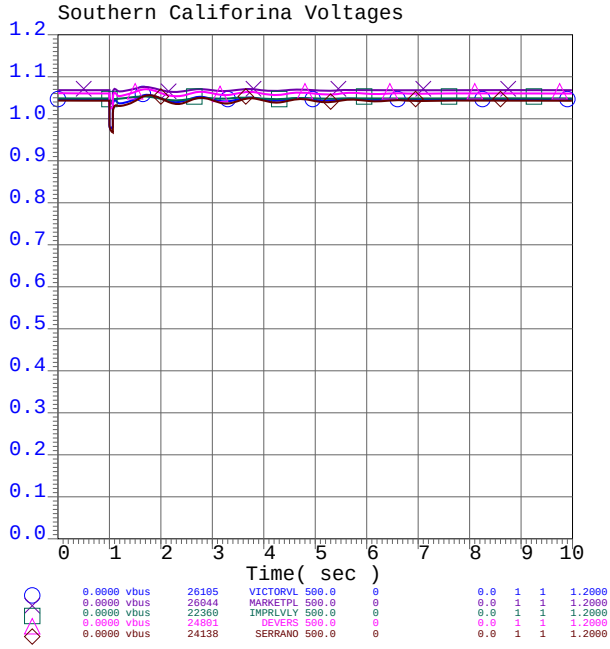


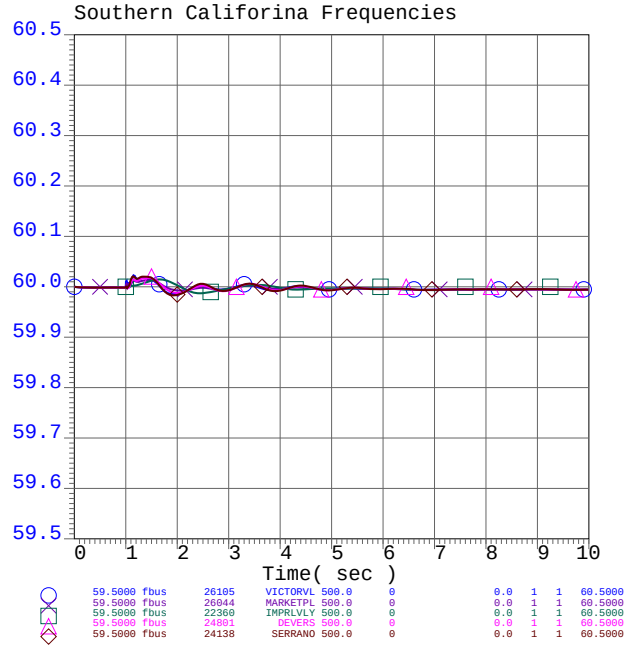
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

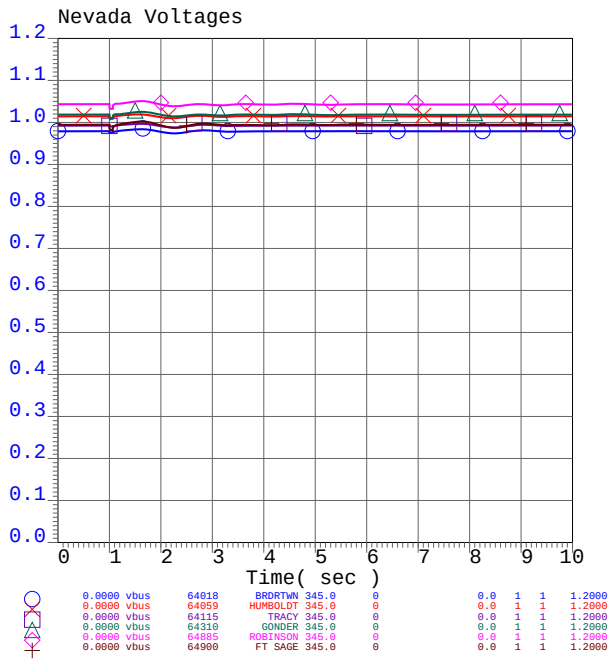
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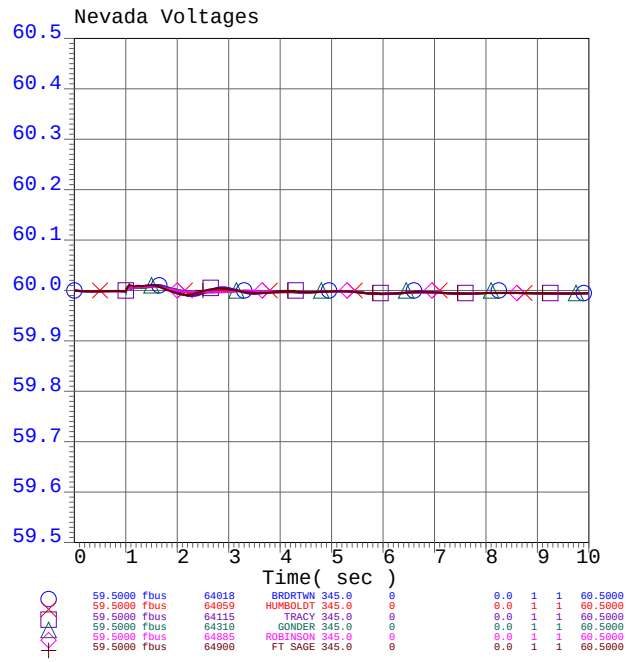
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WECC AREA VOLTAGE AND FREQUENCIES



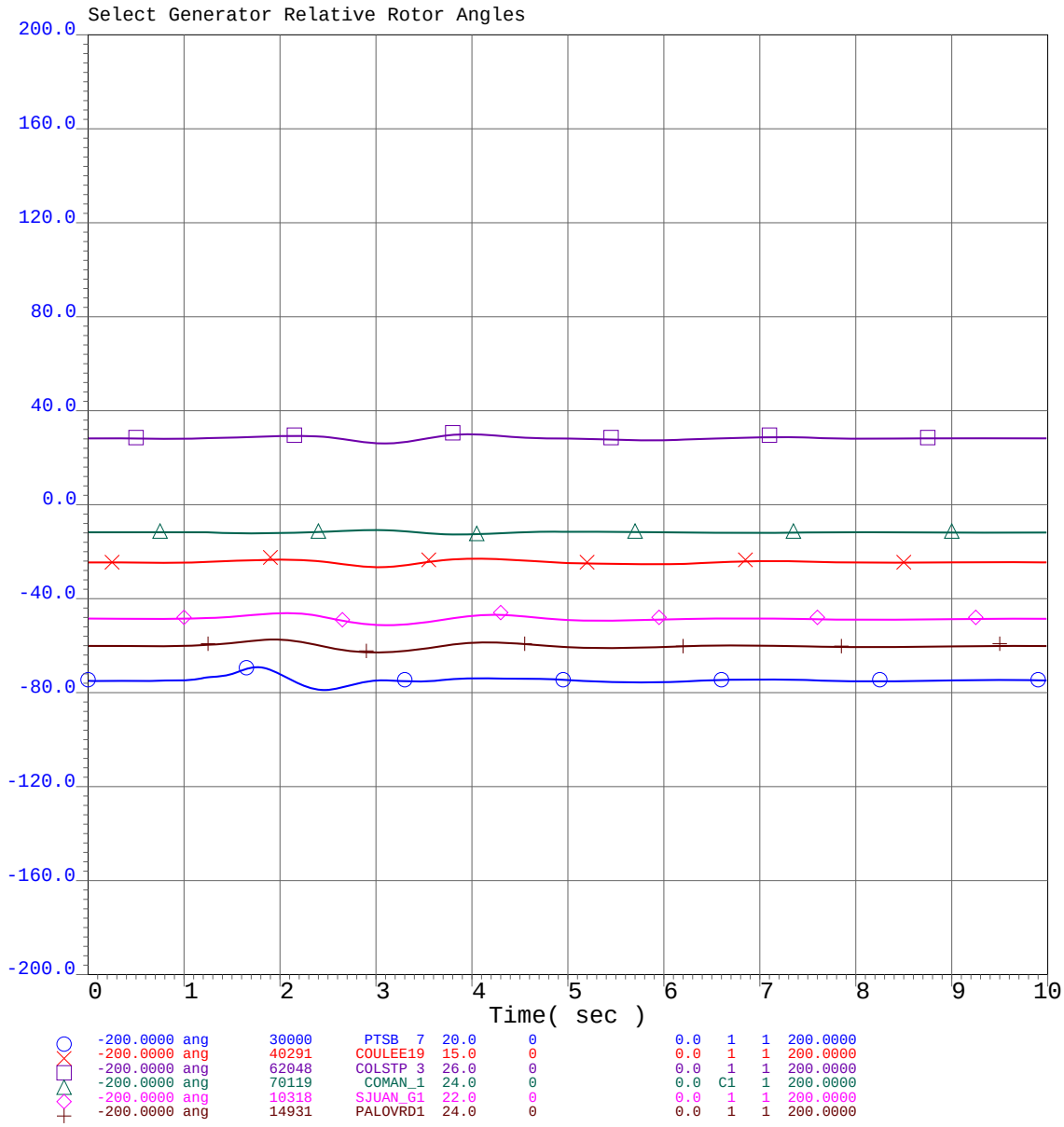






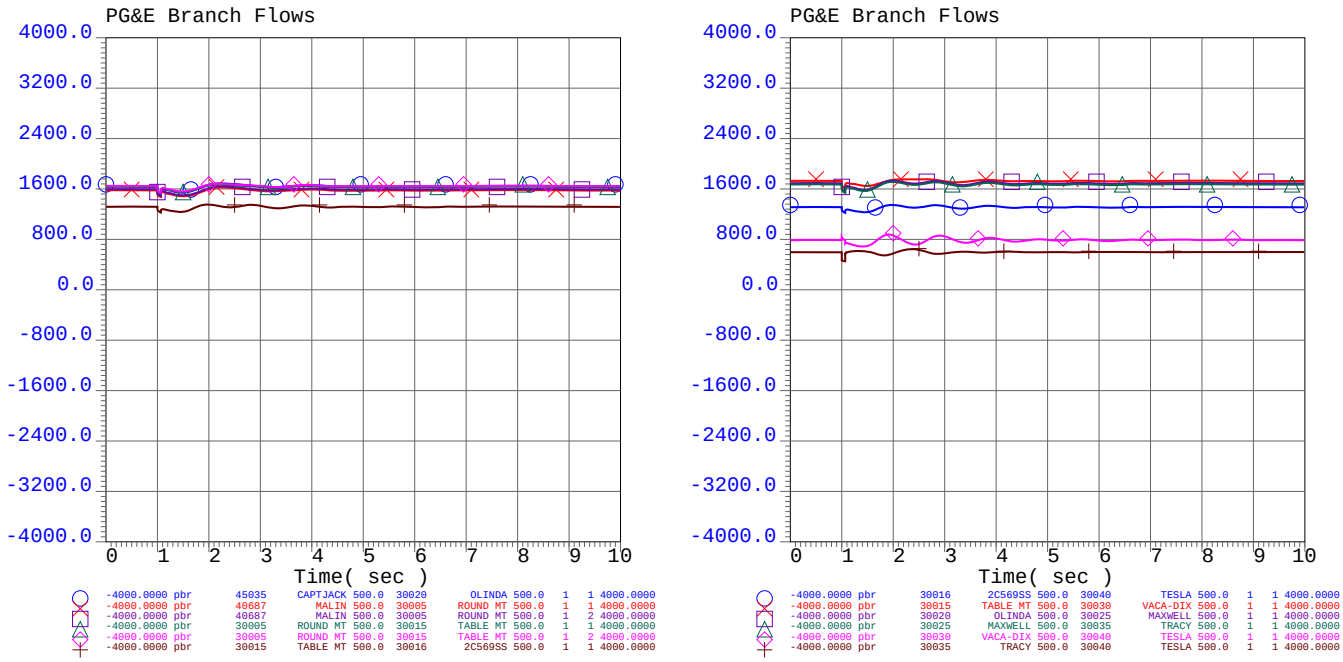
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3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

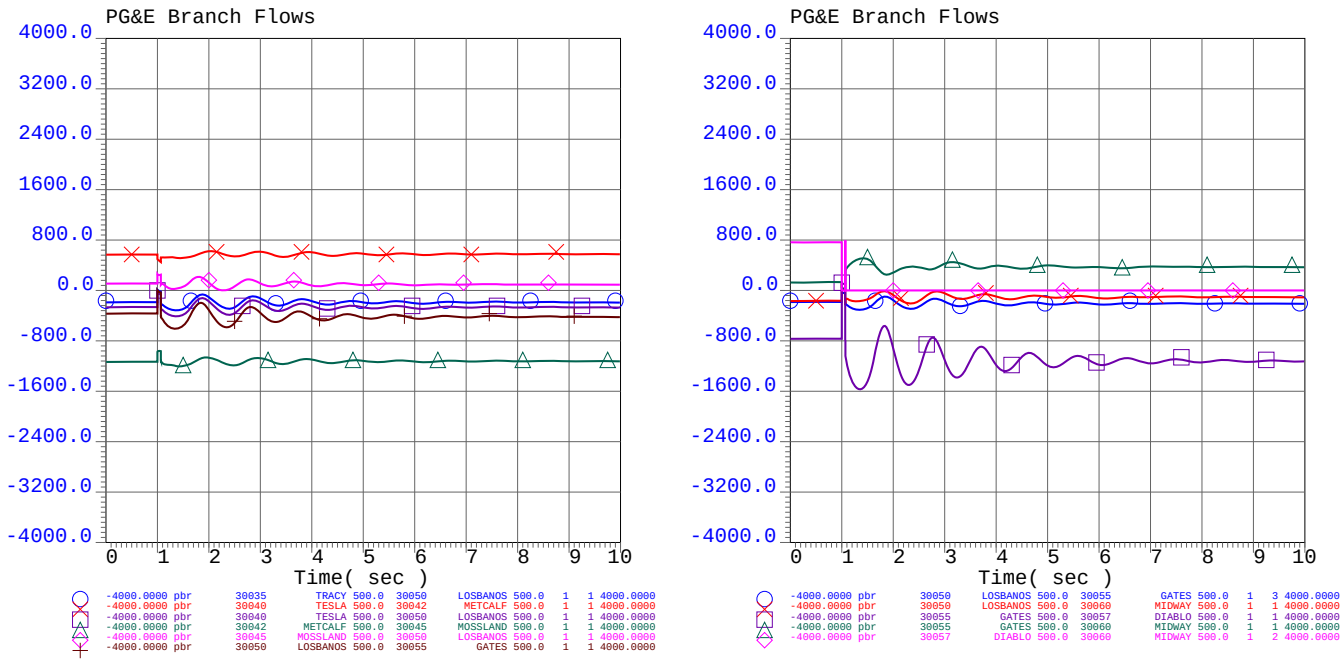
WECC RELATIVE ROTOR ANGLES



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

SELECT BRANCH FLOWS

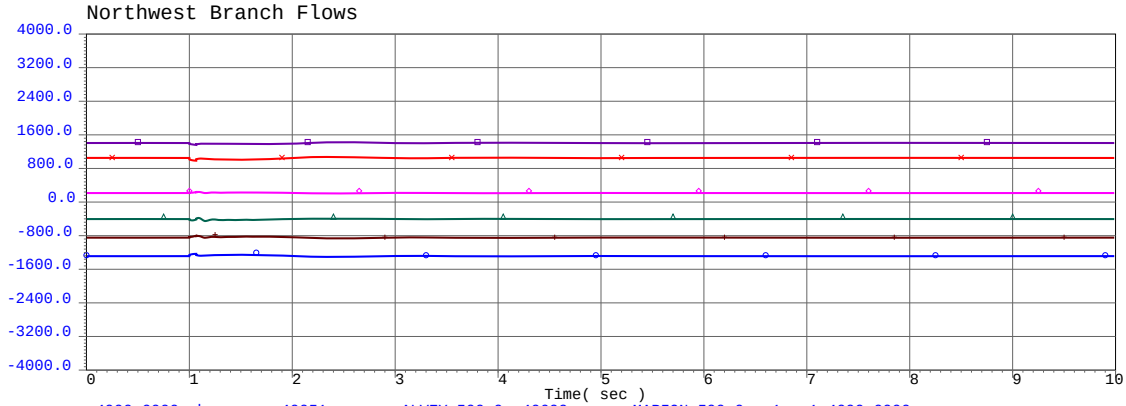




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
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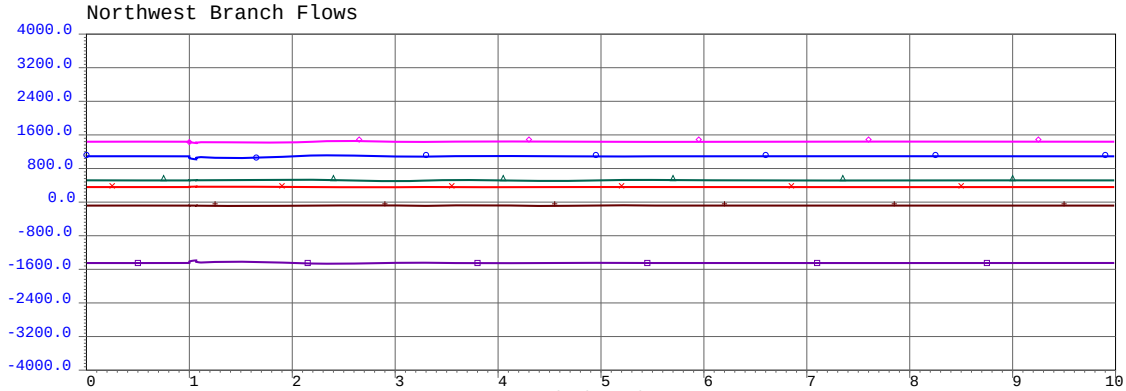
SELECT BRANCH FLOWS

Northwest Branch Flows



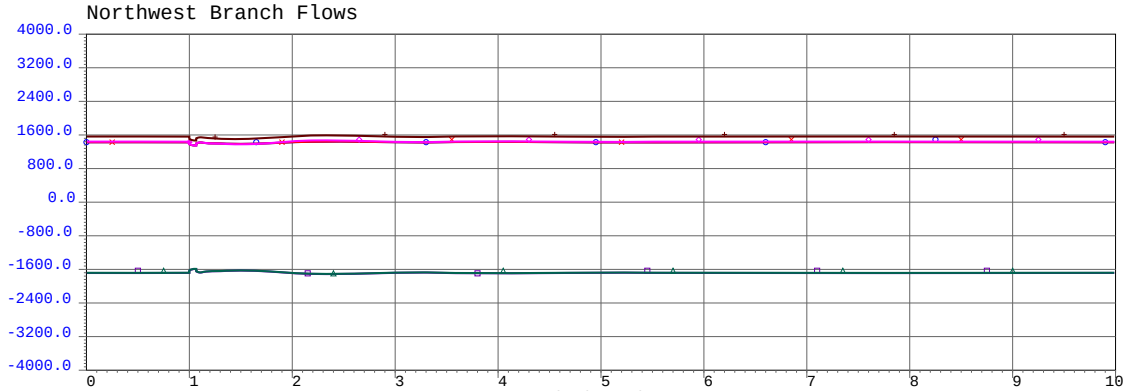
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

Northwest Branch Flows



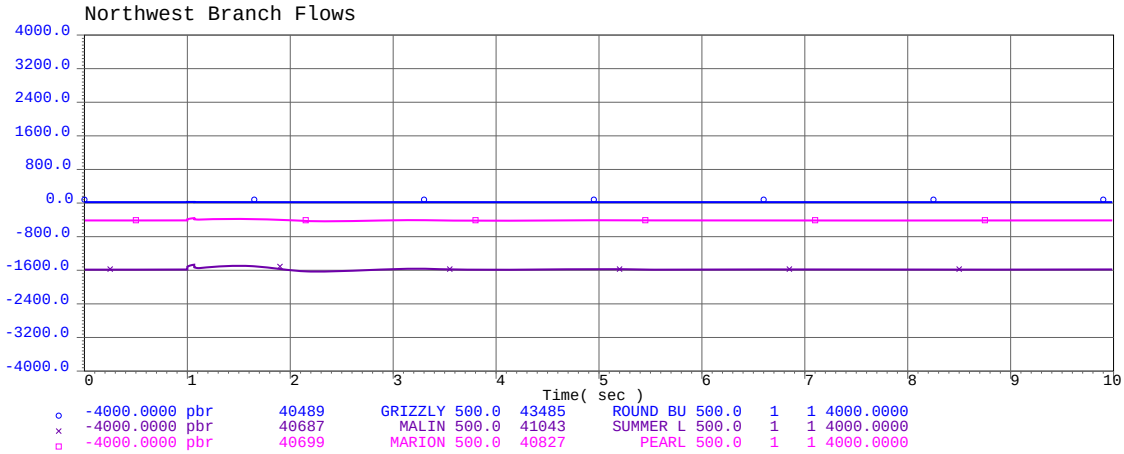
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

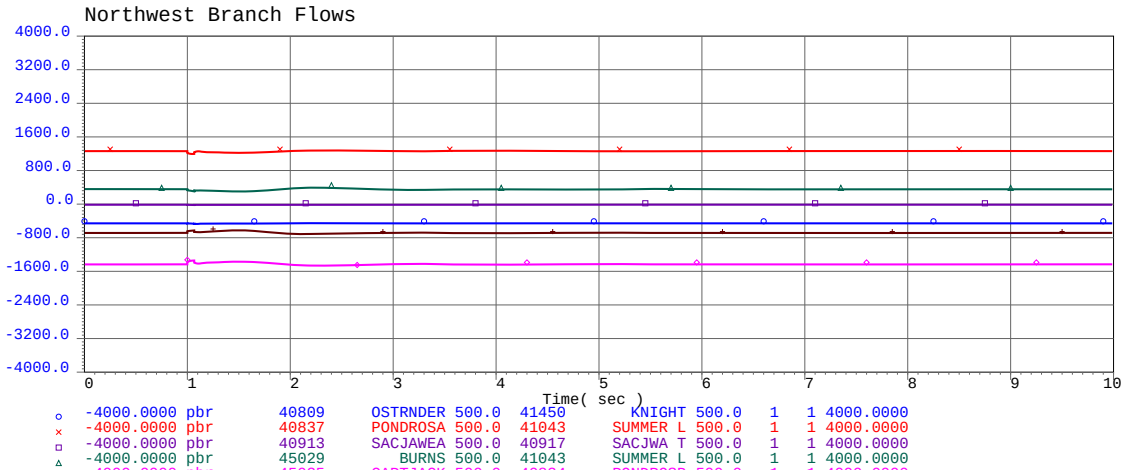
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Fri Jan 03 18:38:08 2014

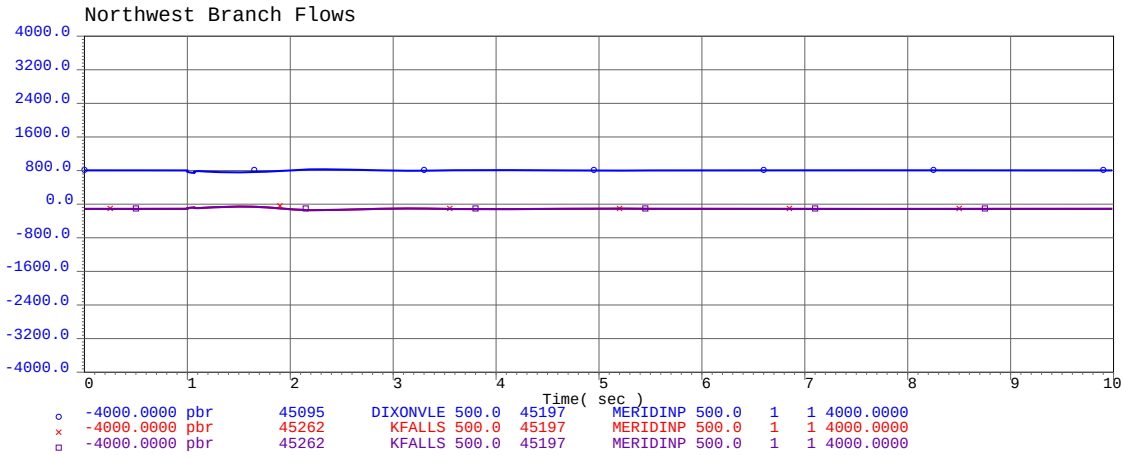
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



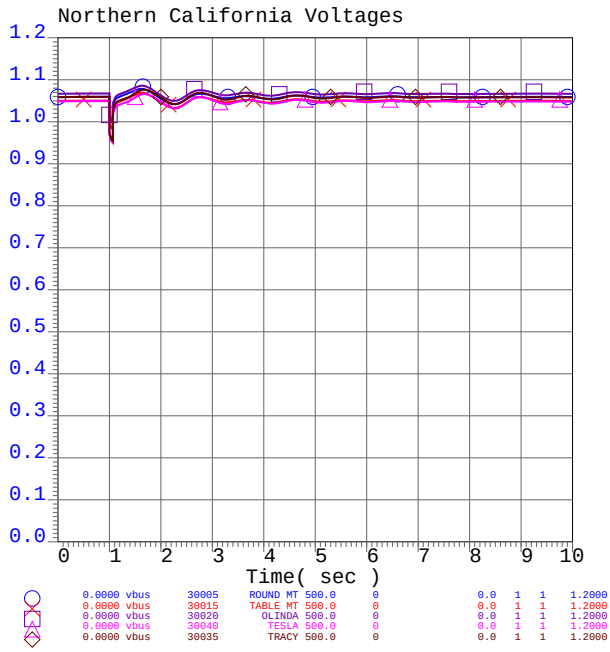
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

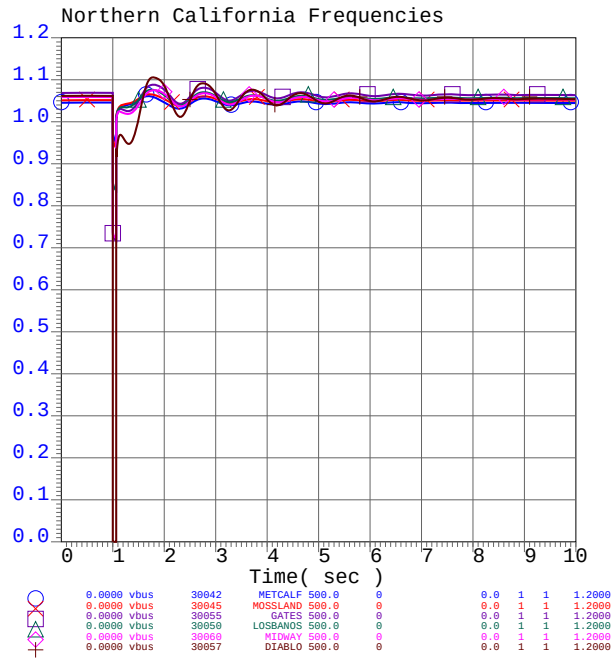


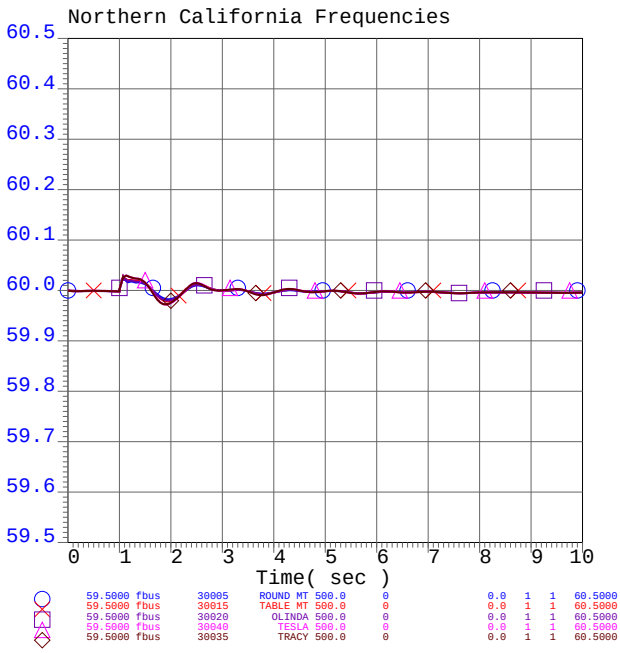
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

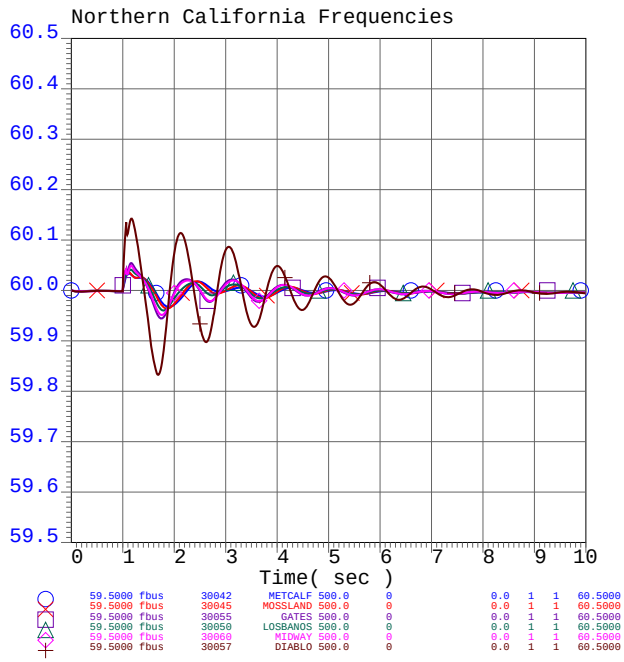
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



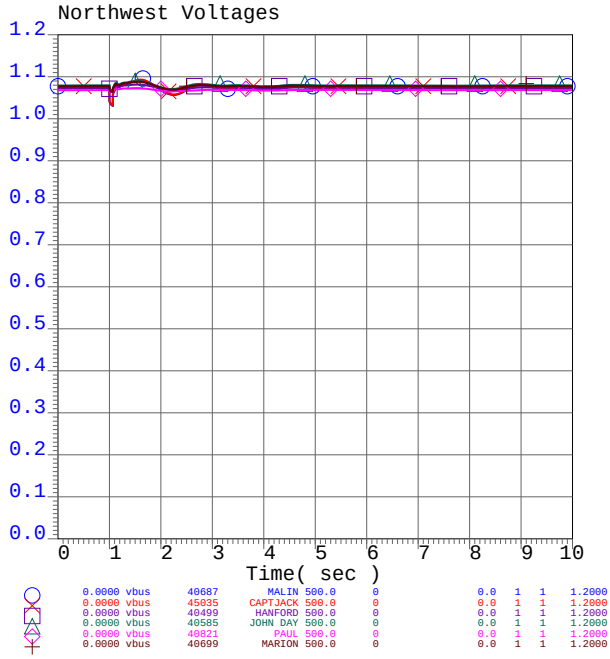


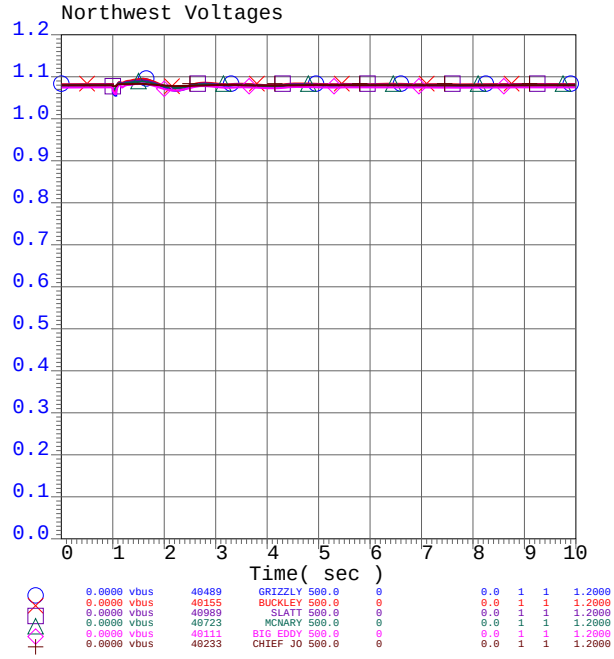


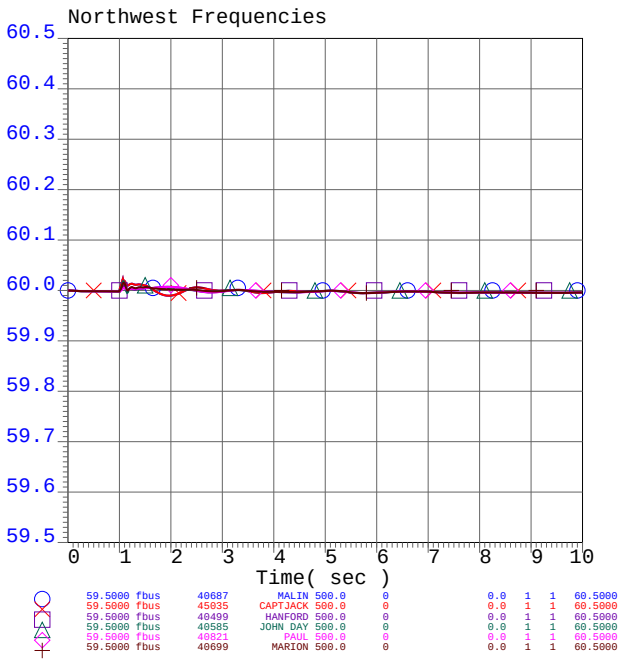


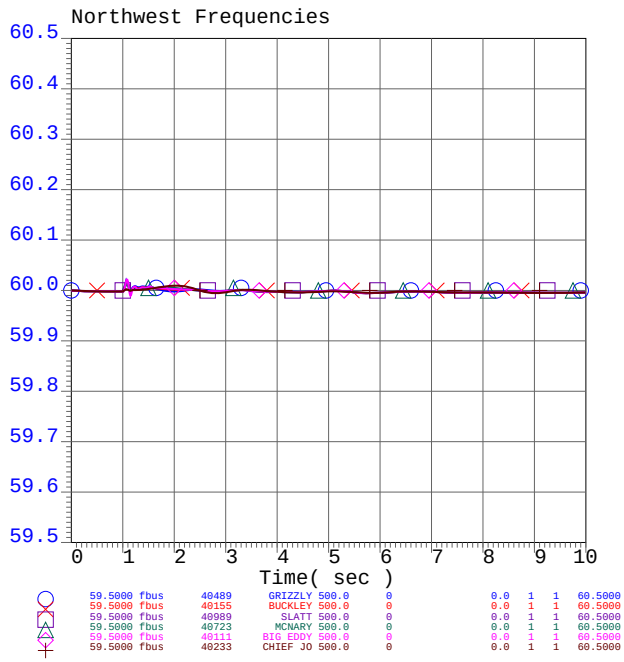
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3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





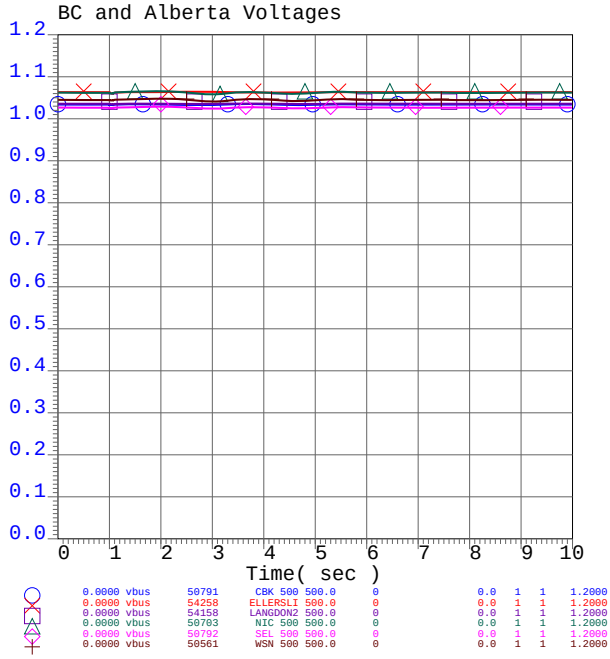




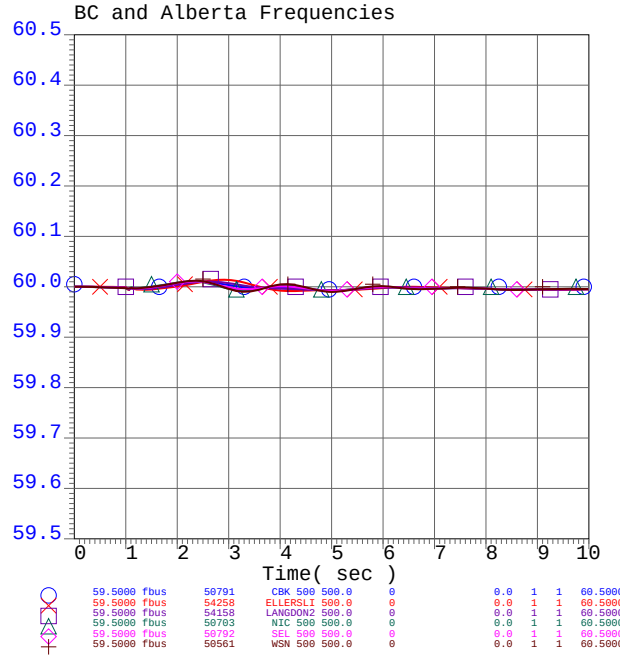
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followed by loss of Diablo-Midway #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

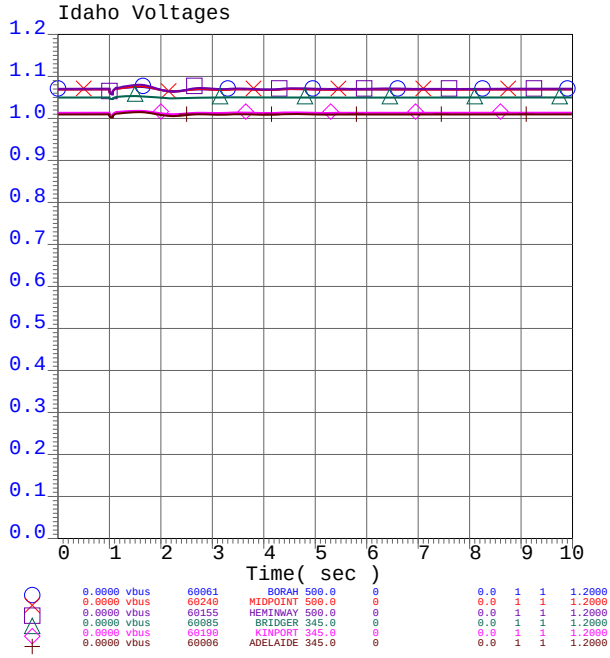
BC and Alberta Voltages



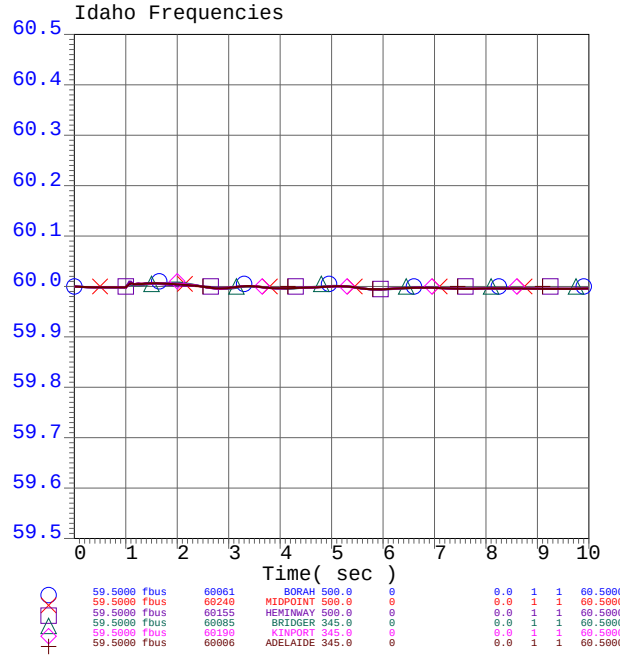
BC and Alberta Frequencies



Idaho Voltages



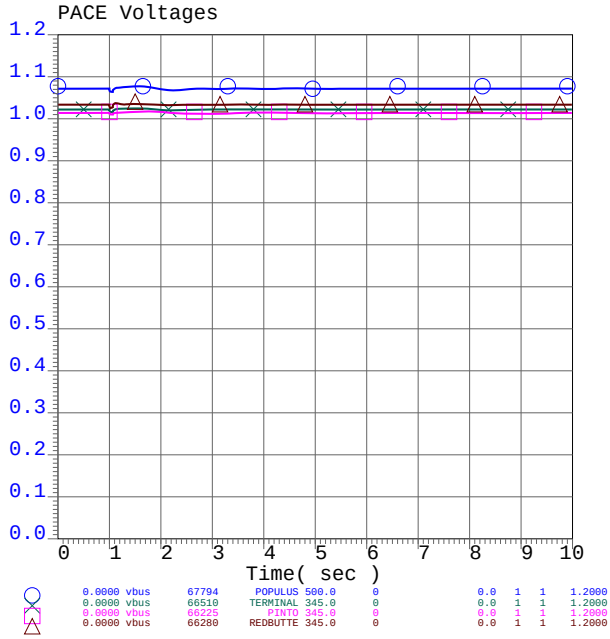
Idaho Frequencies



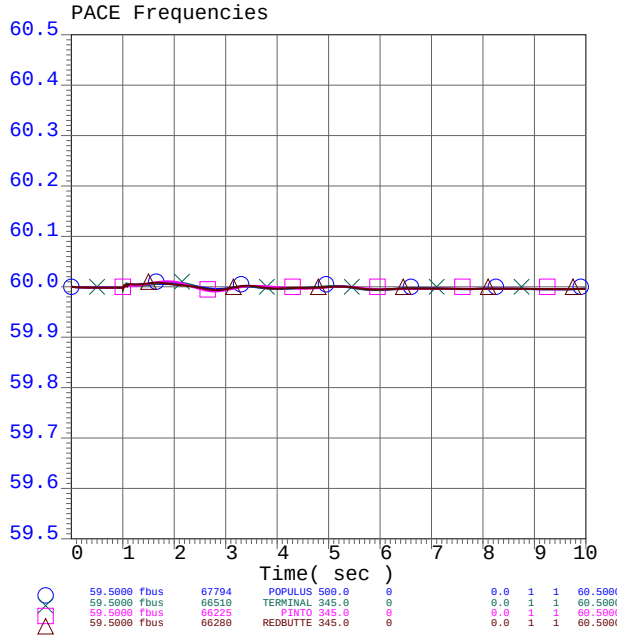
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WECC AREA VOLTAGE AND FREQUENCIES

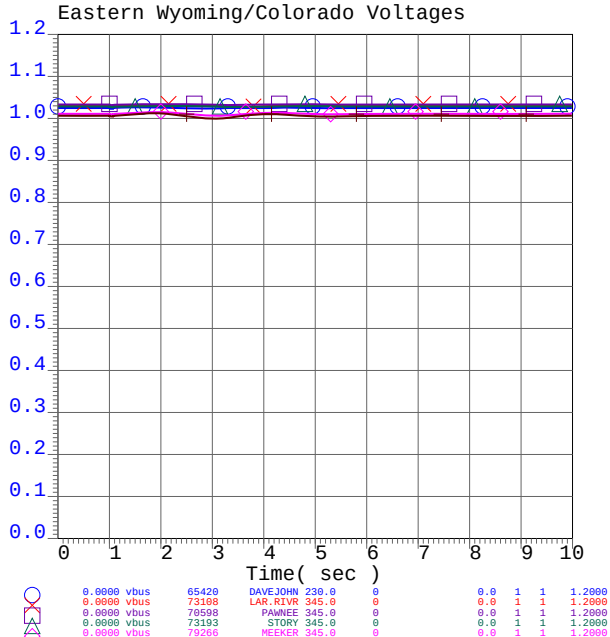
PACE Voltages



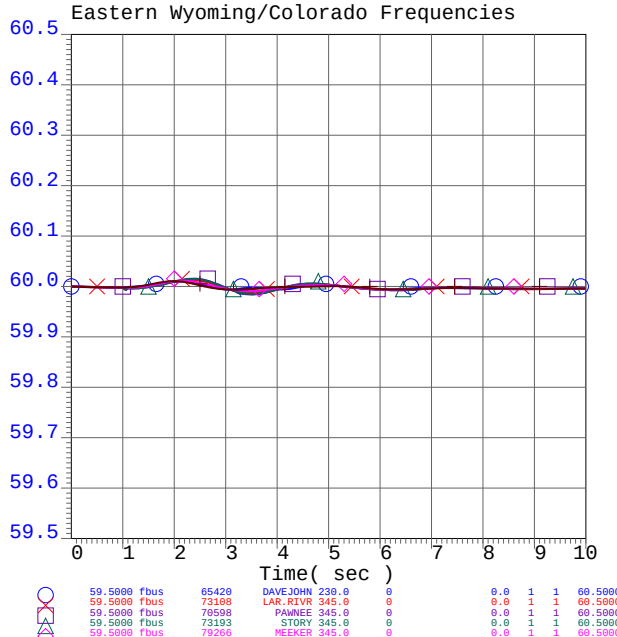
PACE Frequencies



Eastern Wyoming/Colorado Voltages

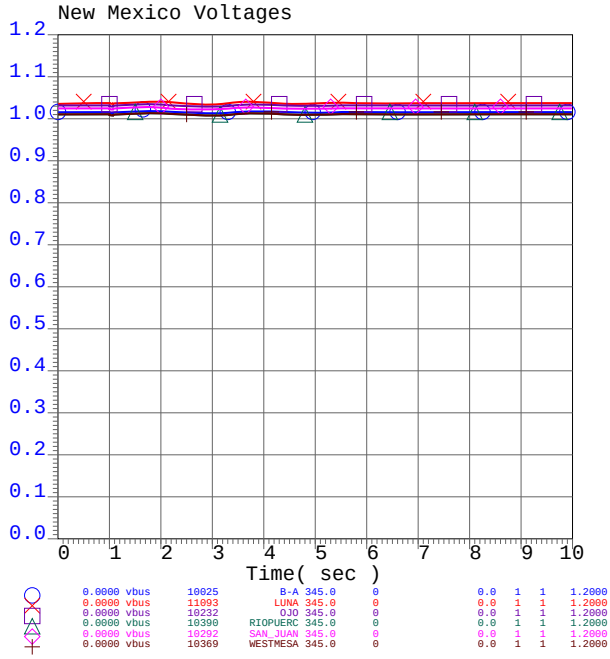


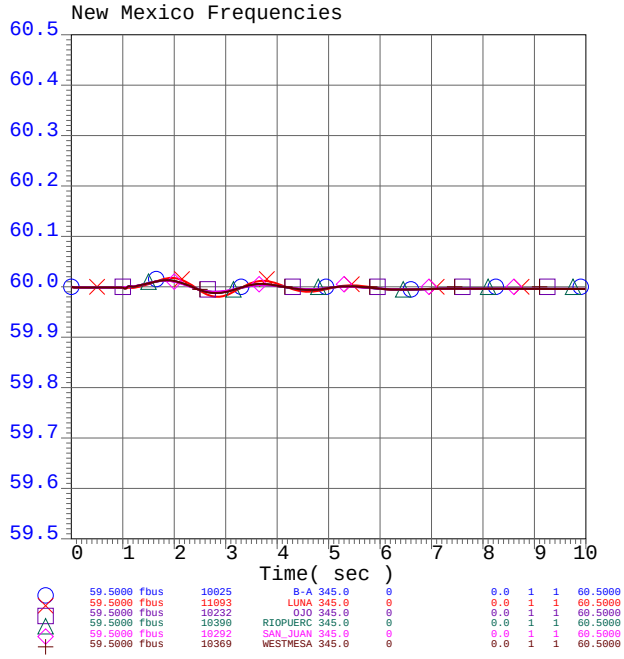
Eastern Wyoming/Colorado Frequencies

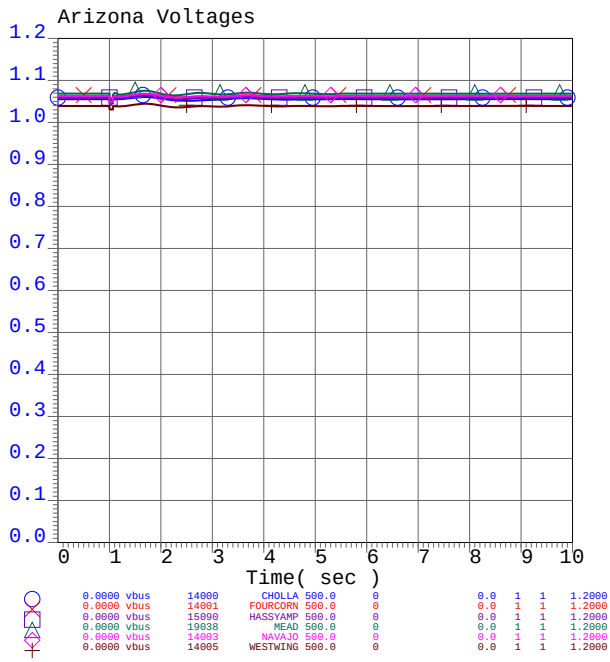


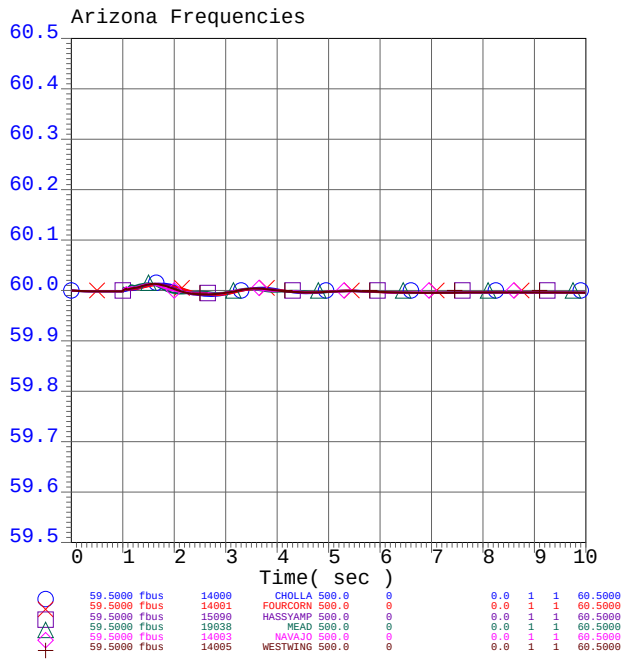
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WECC AREA VOLTAGE AND FREQUENCIES



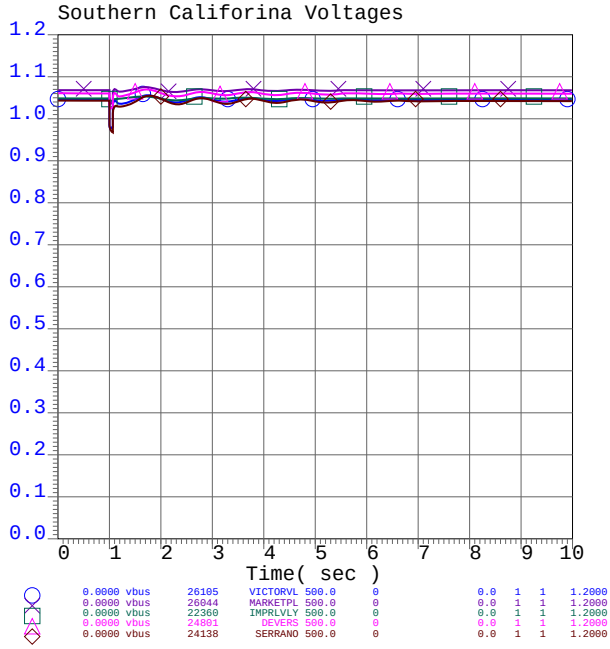


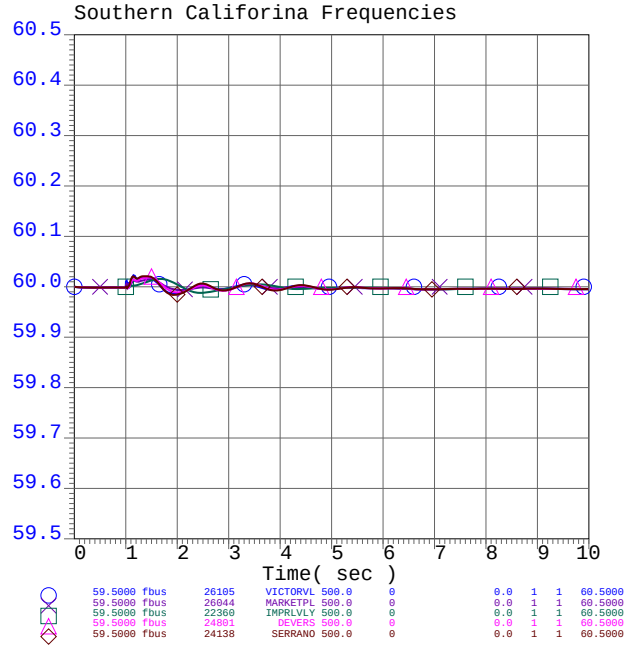


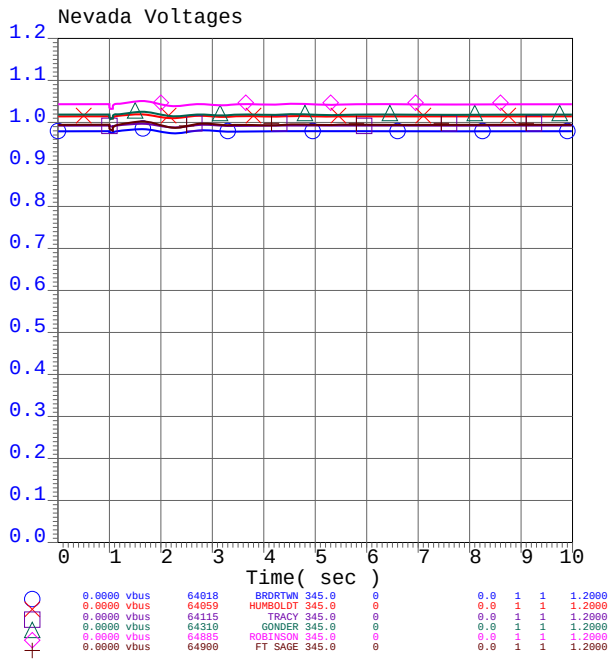


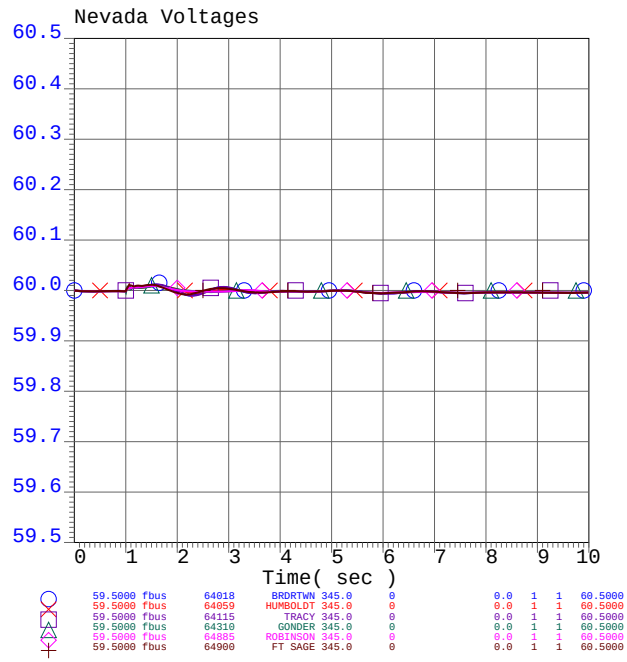
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



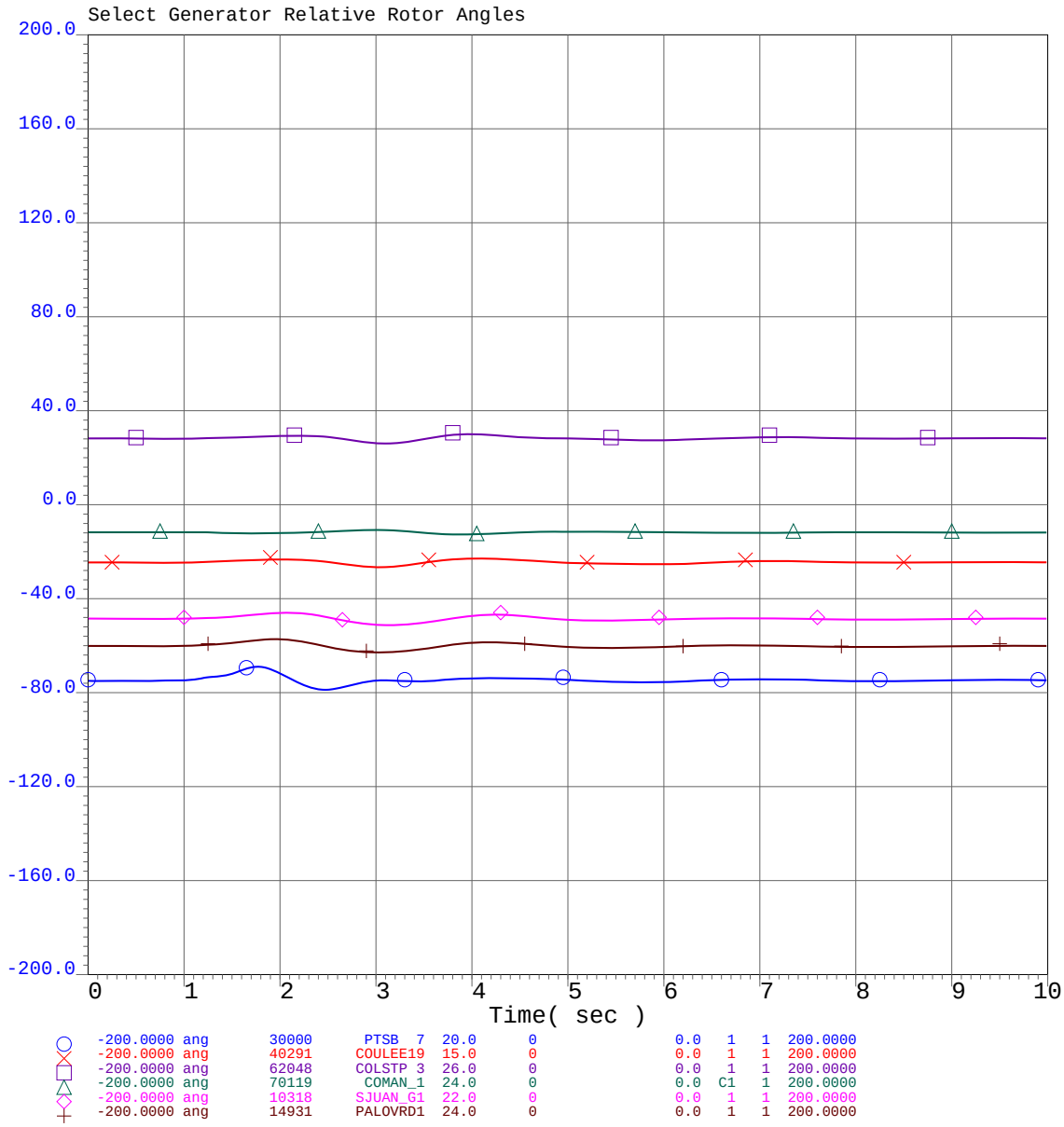






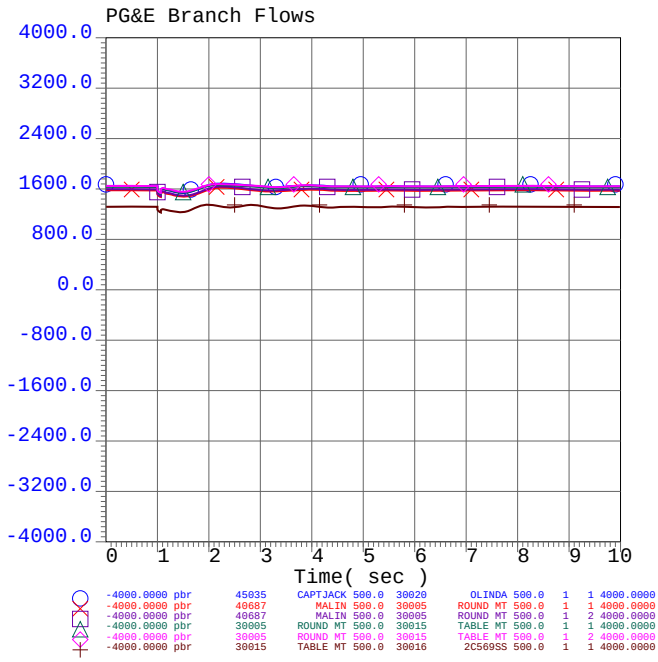
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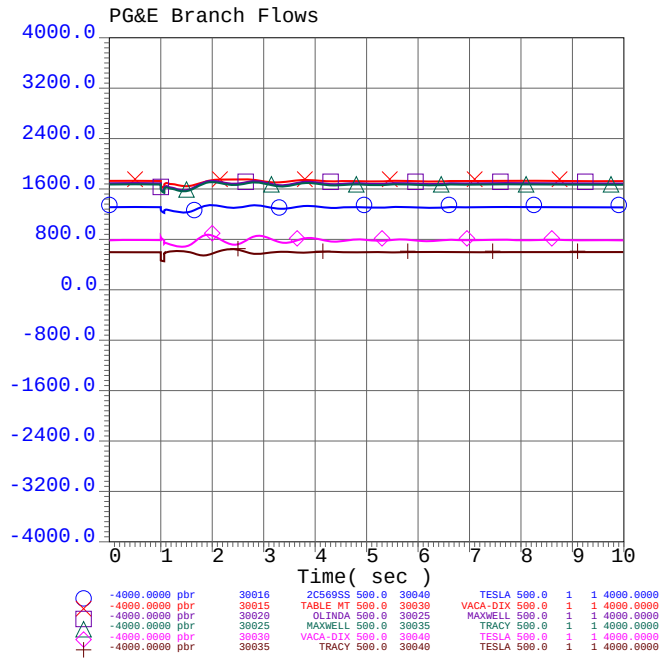
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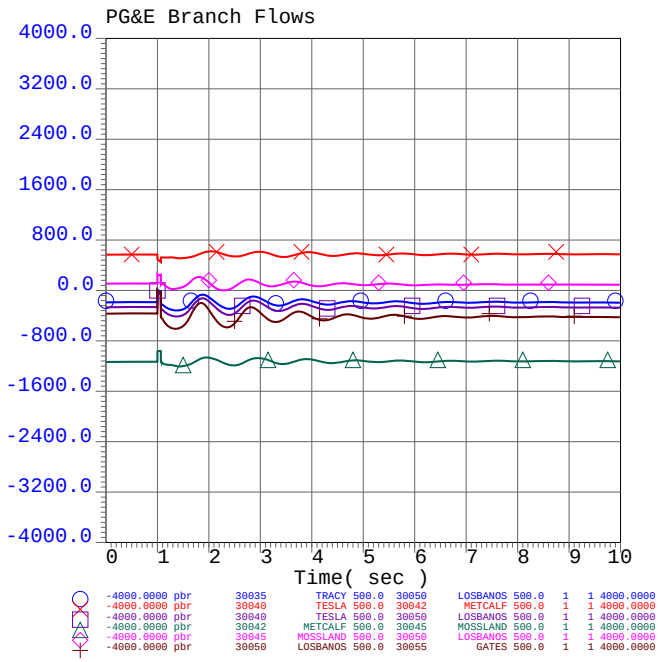


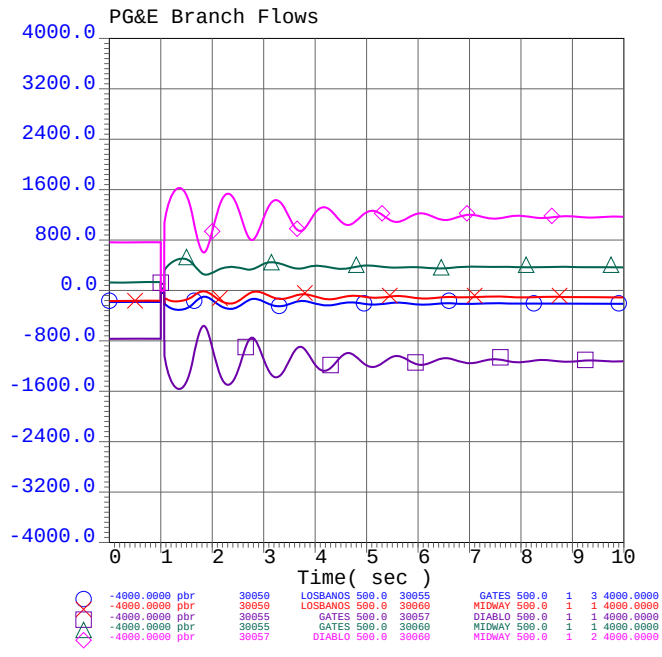
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SELECT BRANCH FLOWS



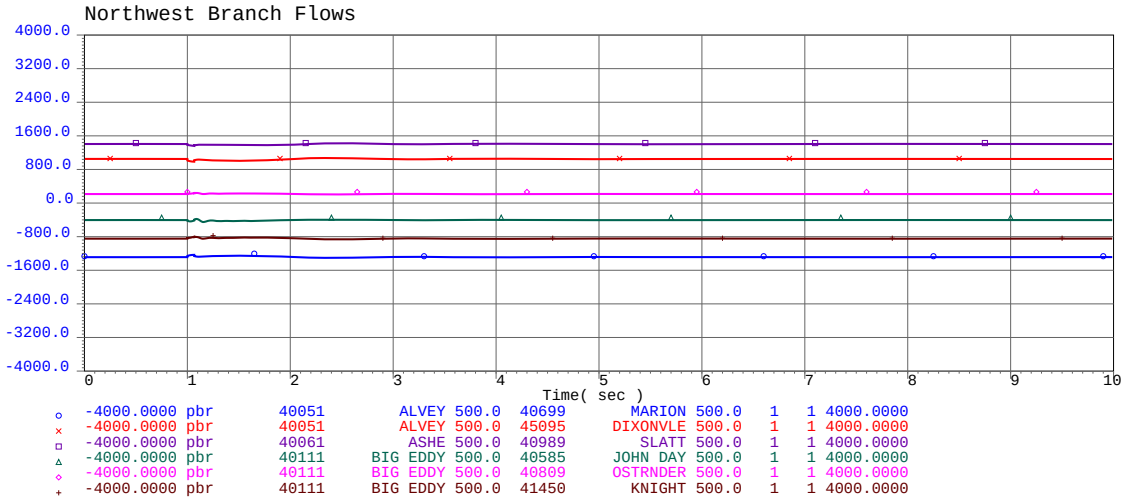




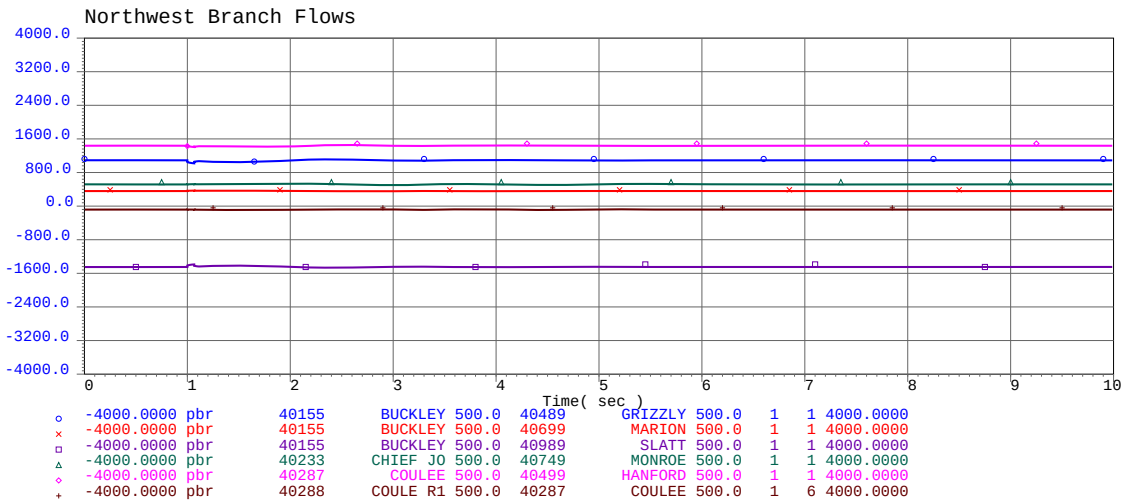


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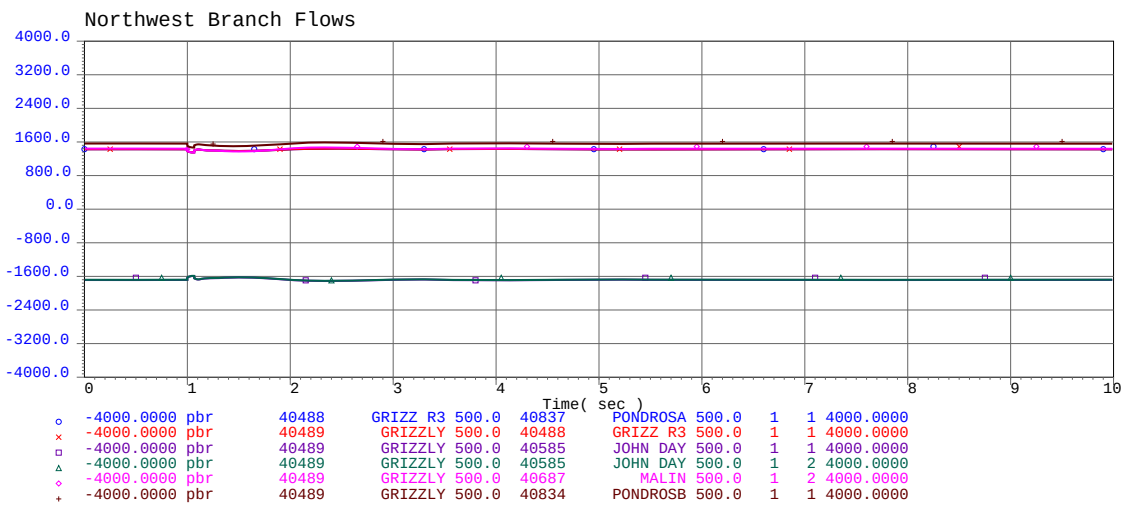
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

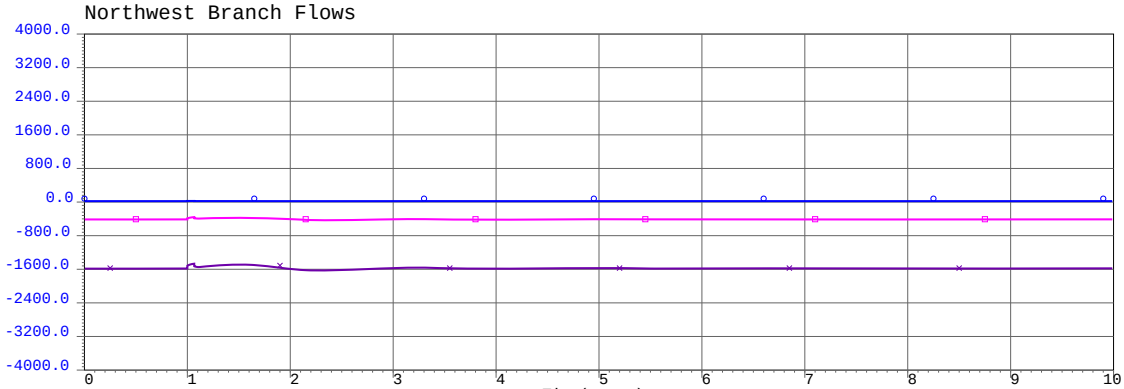
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Fri Jan 03 18:40:19 2014

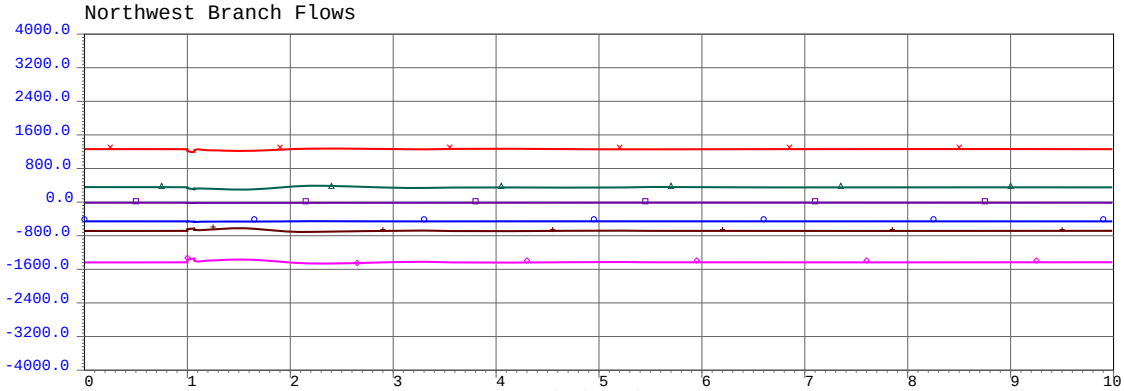
SELECT BRANCH FLOWS

Northwest Branch Flows



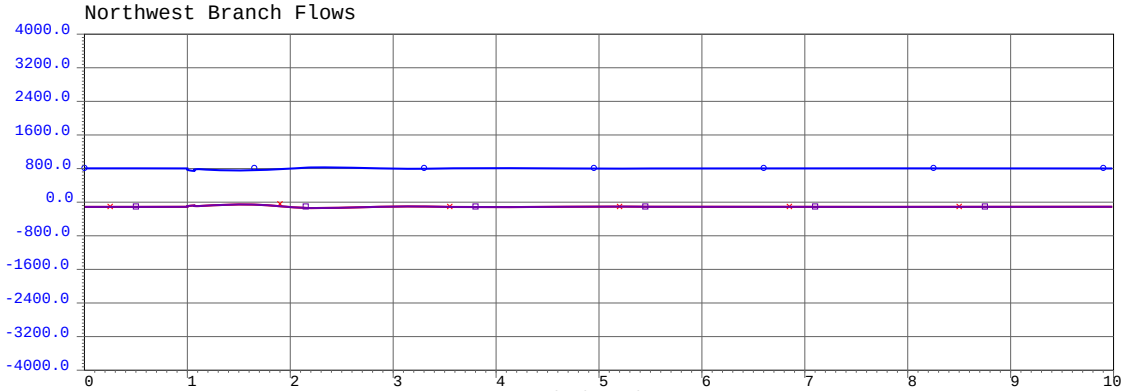
-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

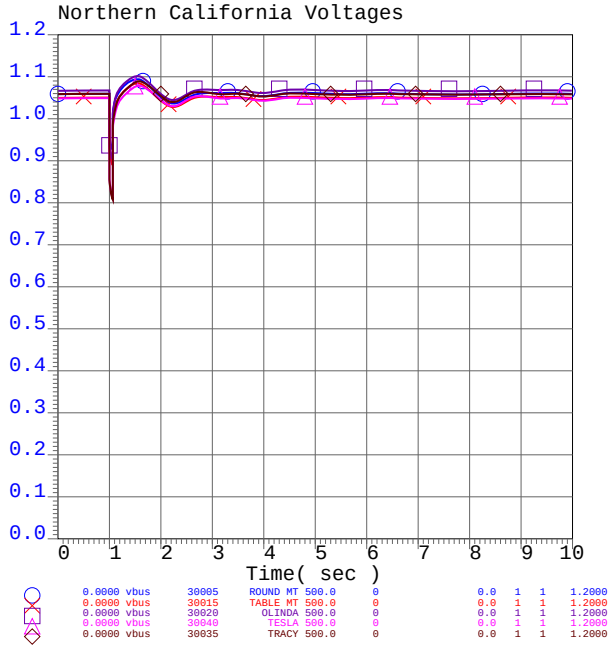
Northwest Branch Flows

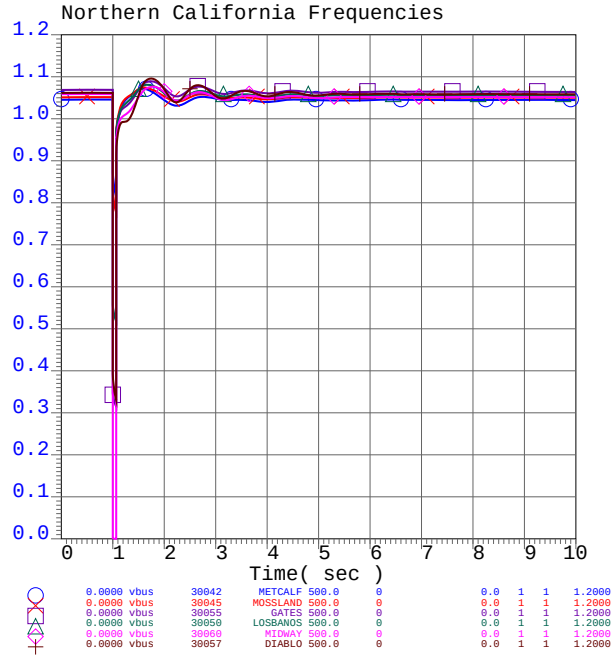


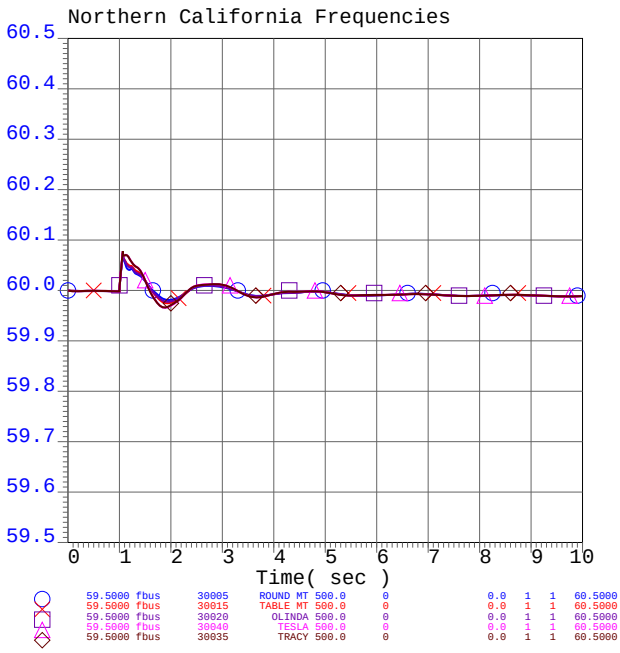
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

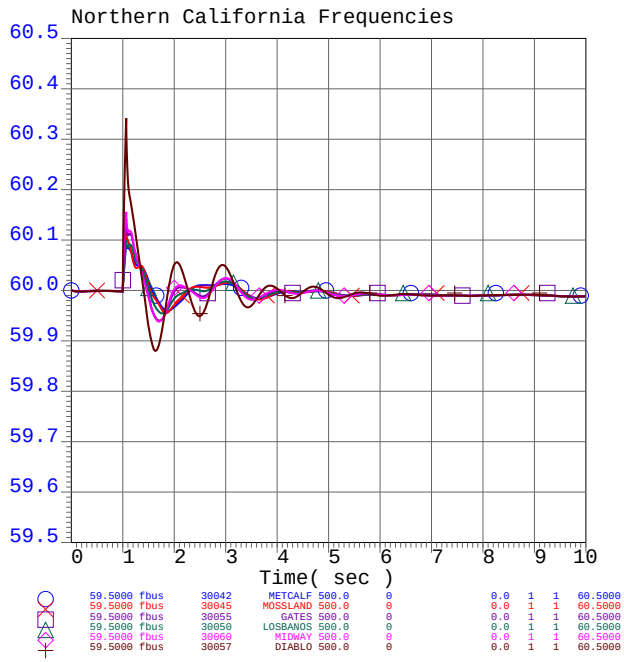
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WECC AREA VOLTAGE AND FREQUENCIES



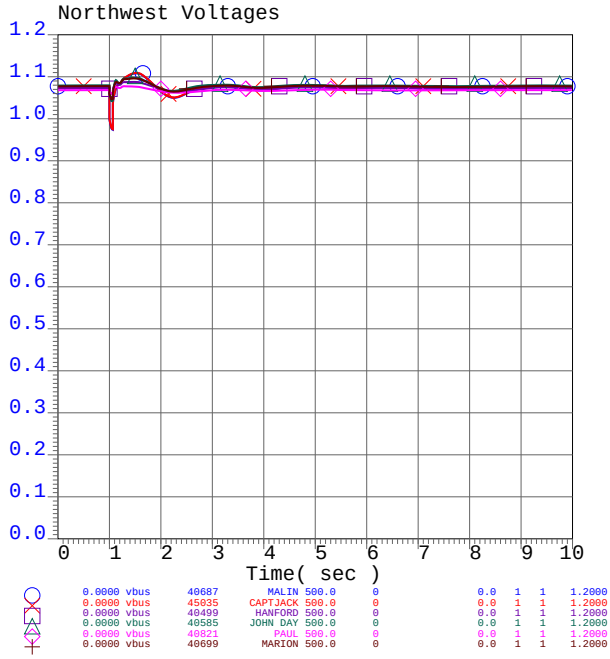


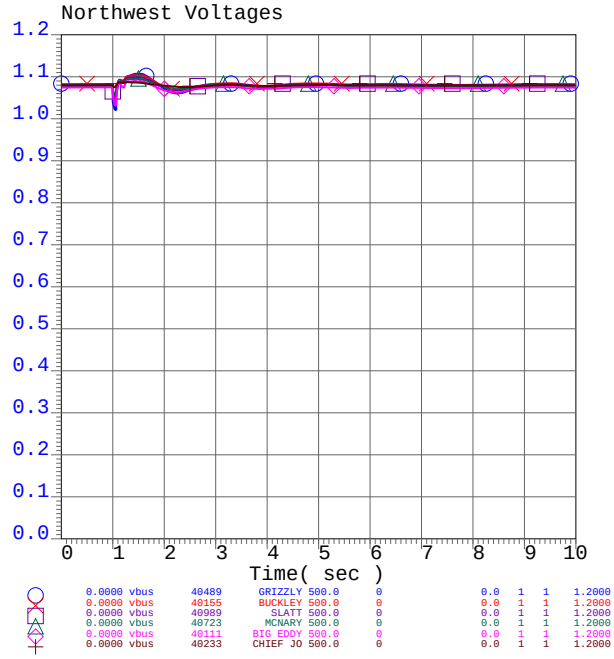


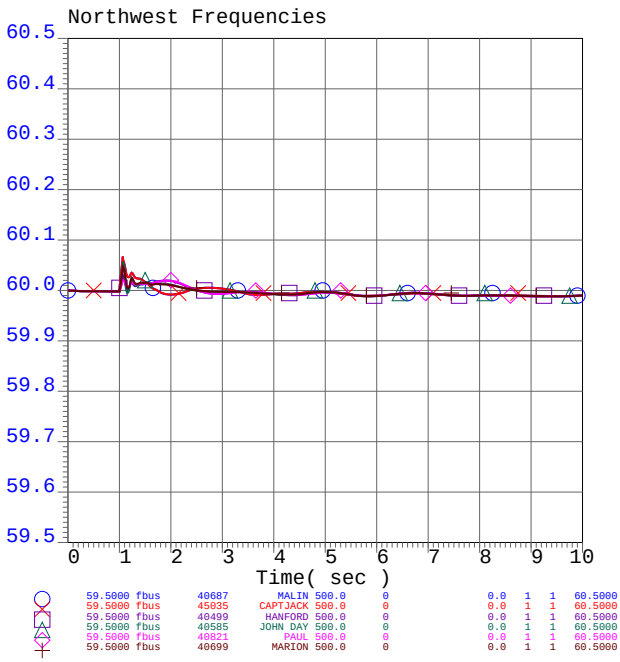


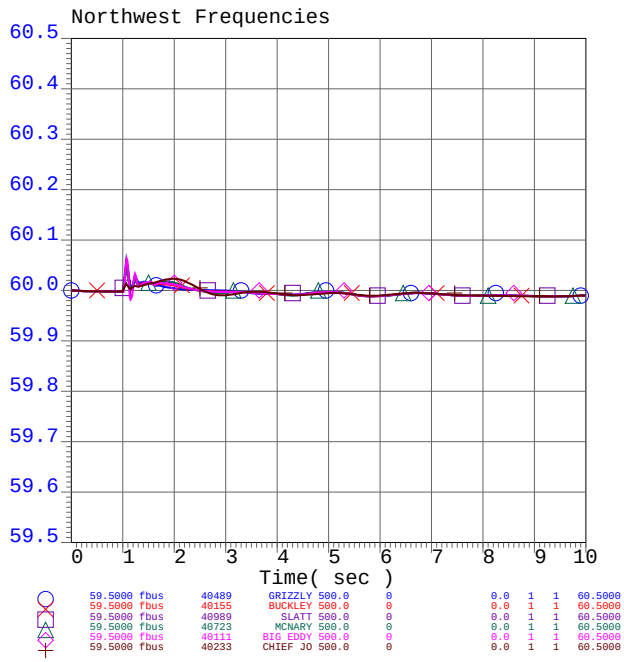
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WECC AREA VOLTAGE AND FREQUENCIES



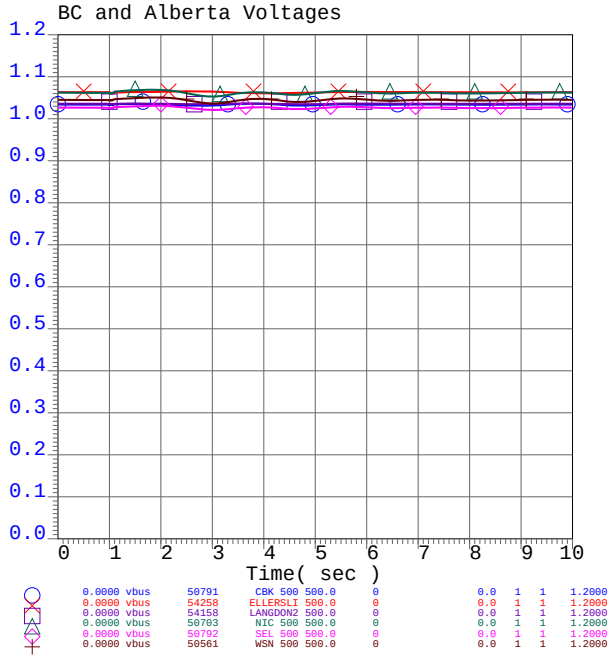


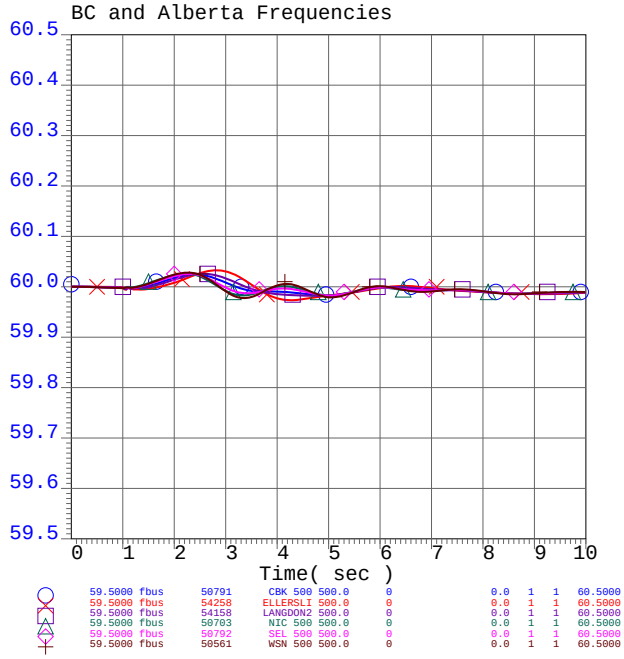


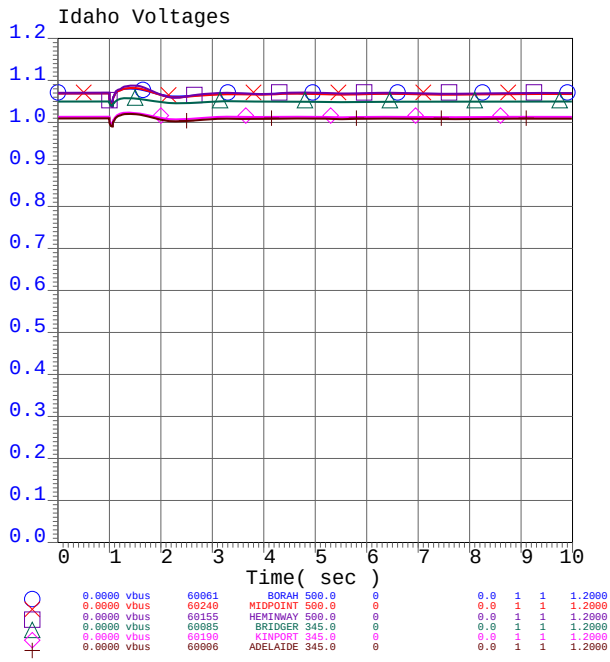


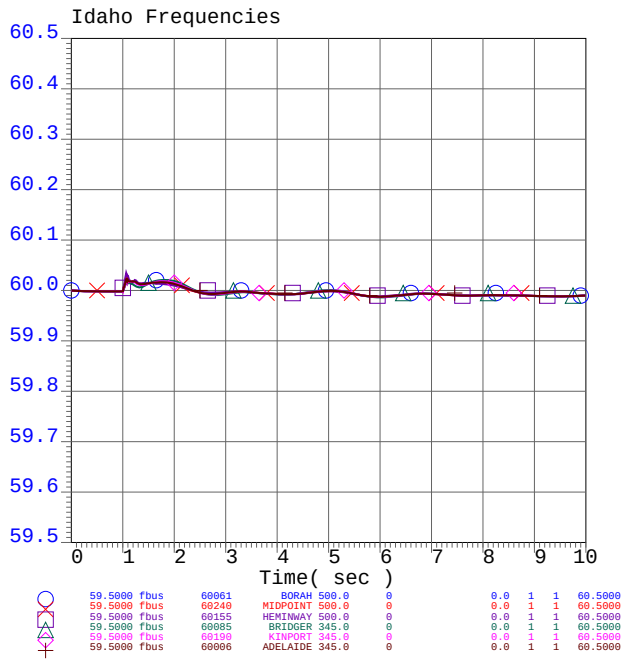
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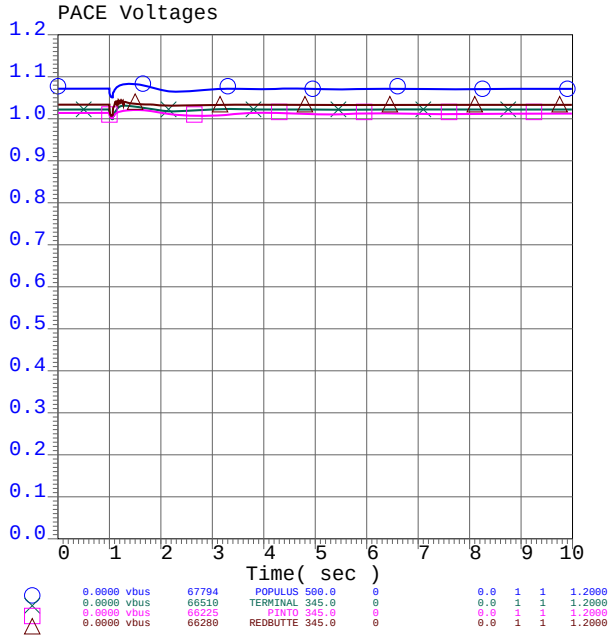


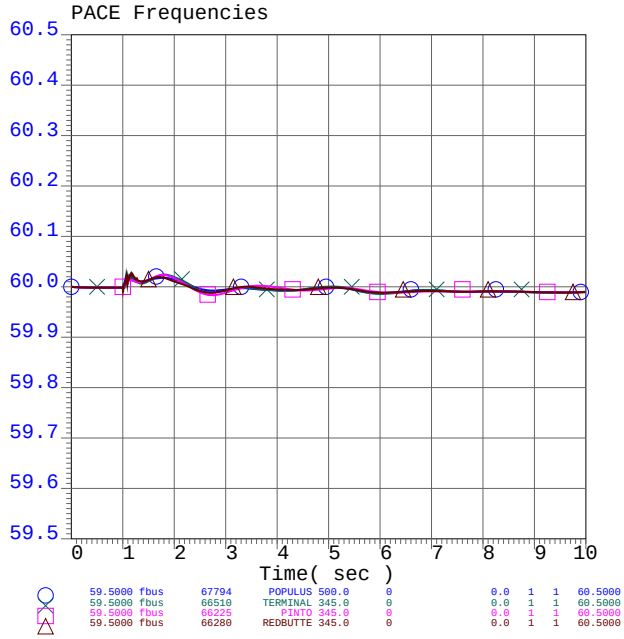


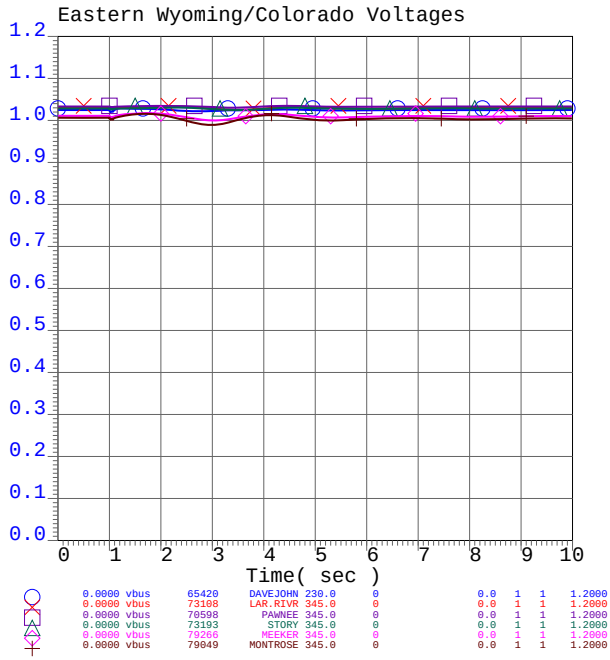


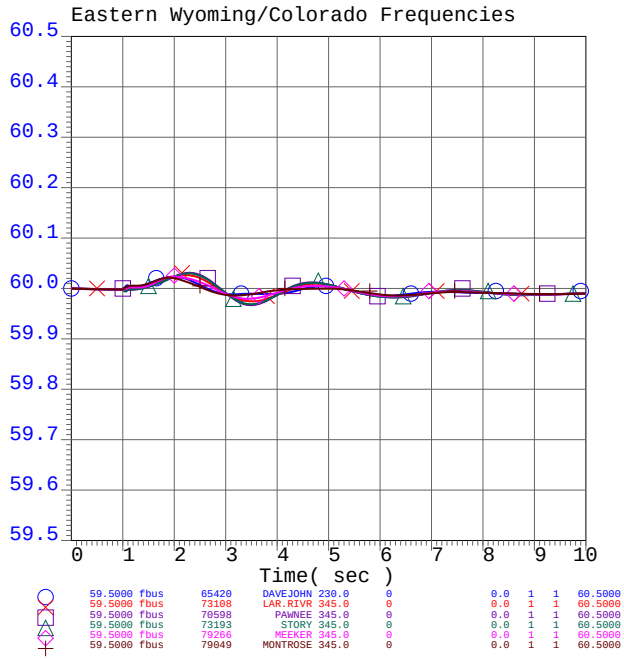
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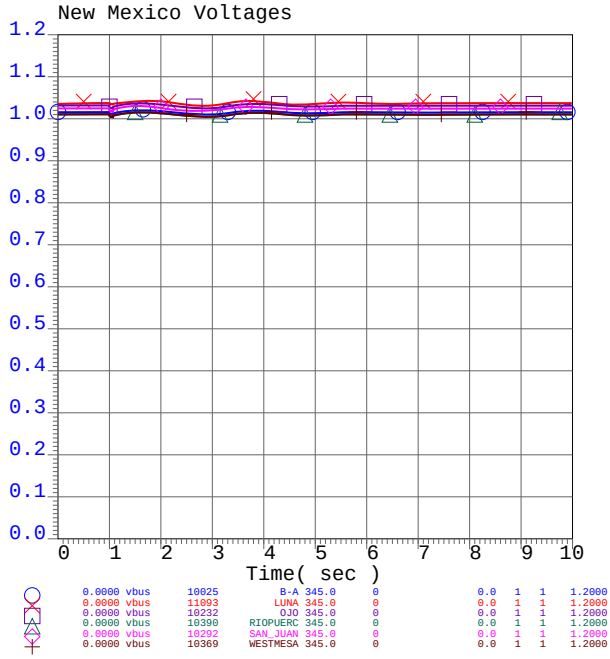


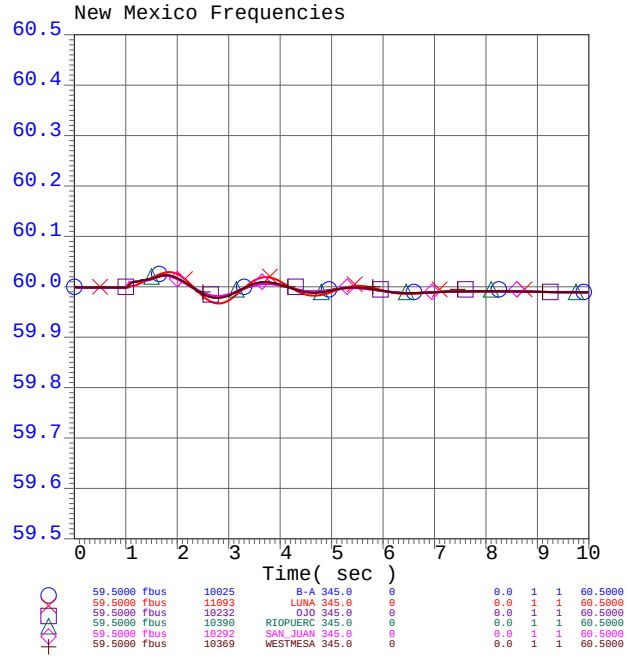


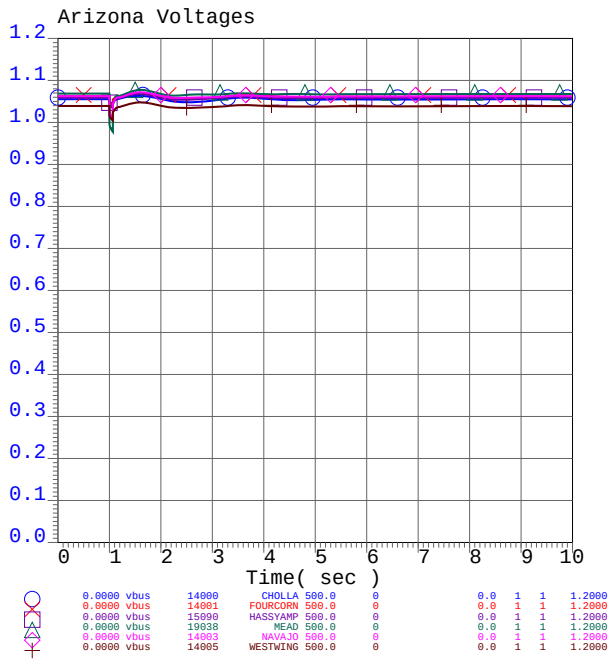


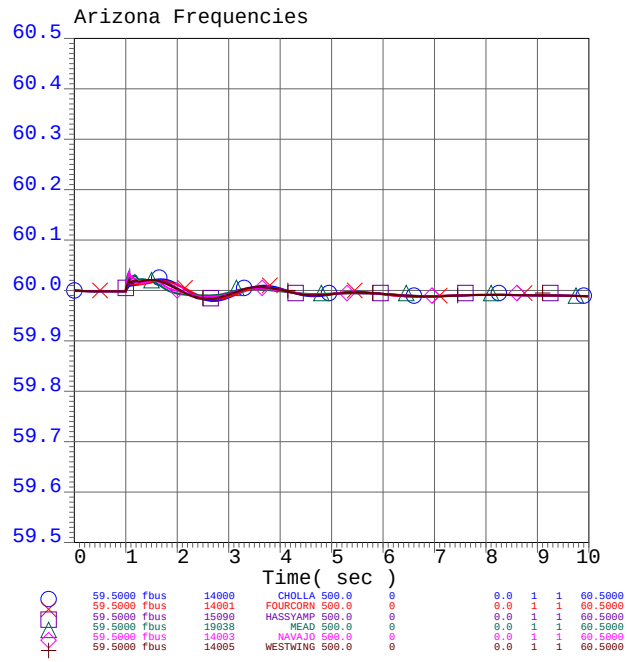
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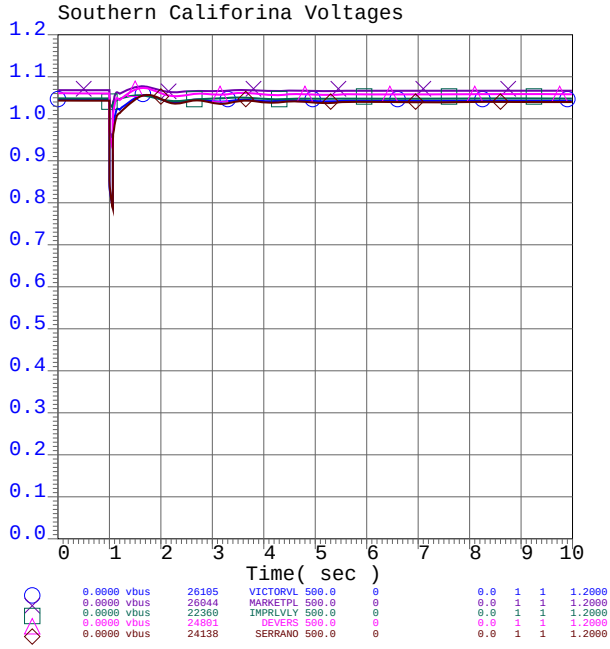


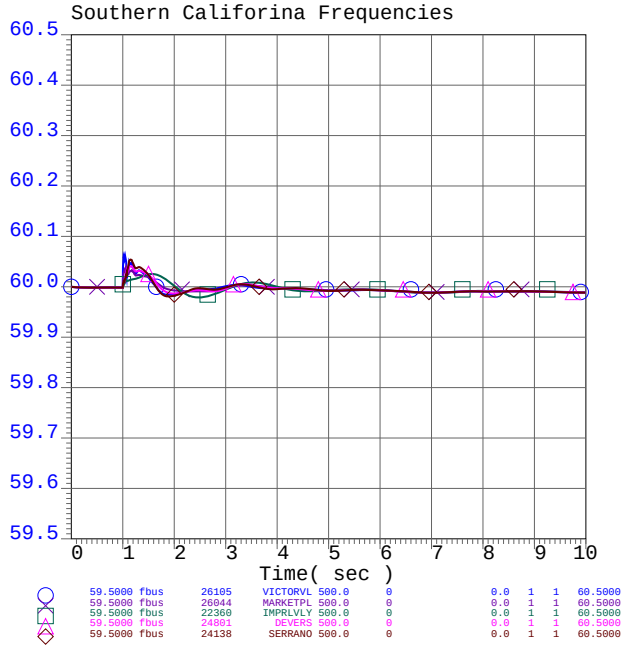


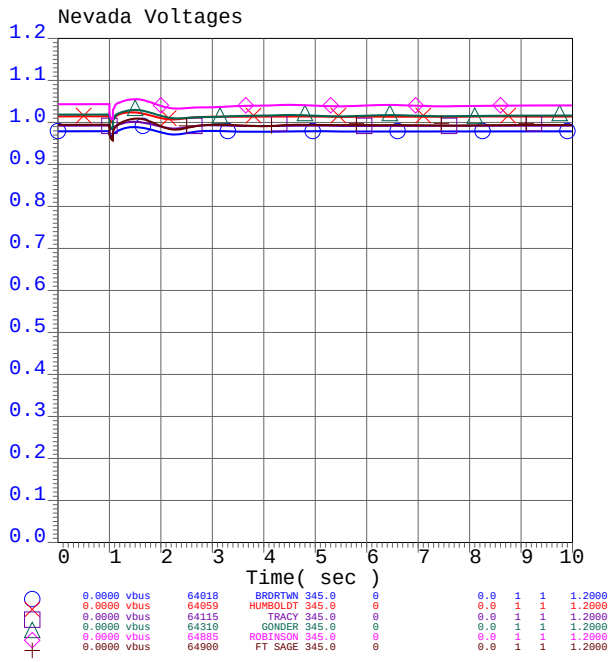


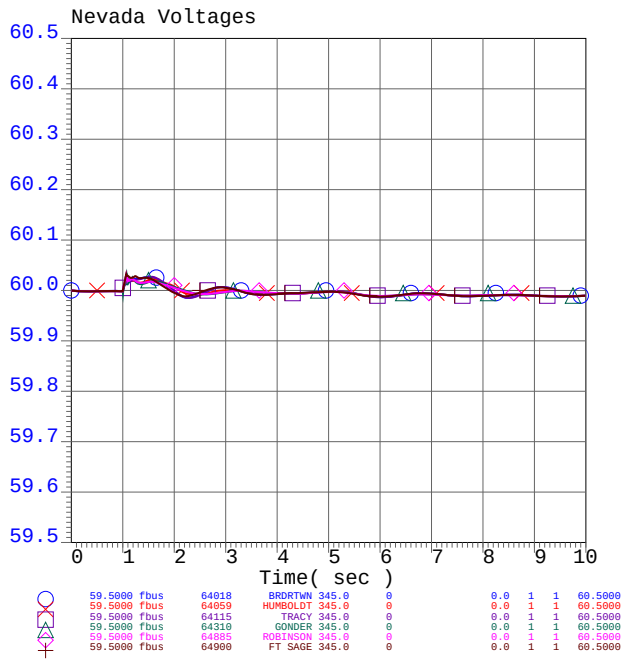
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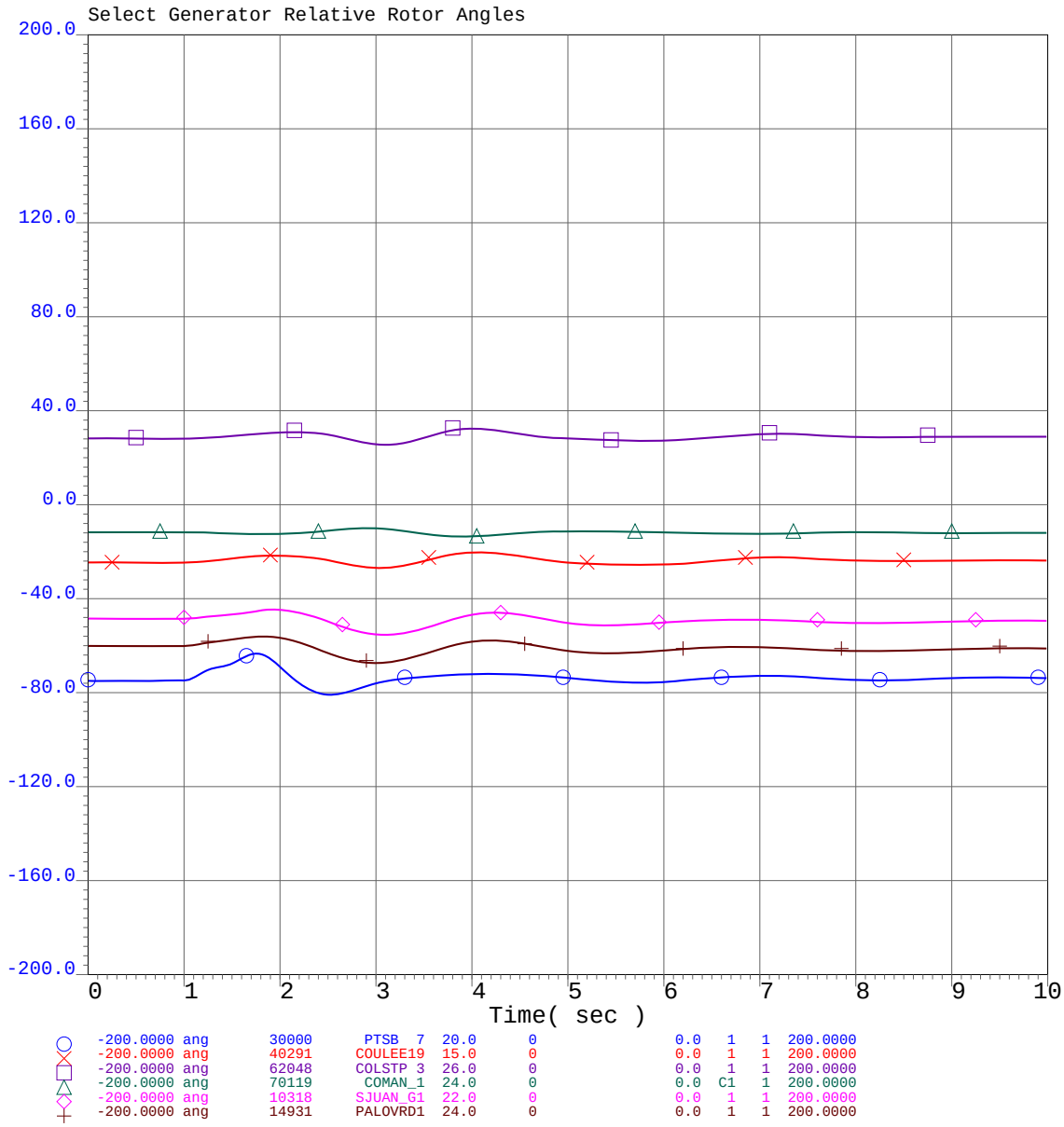






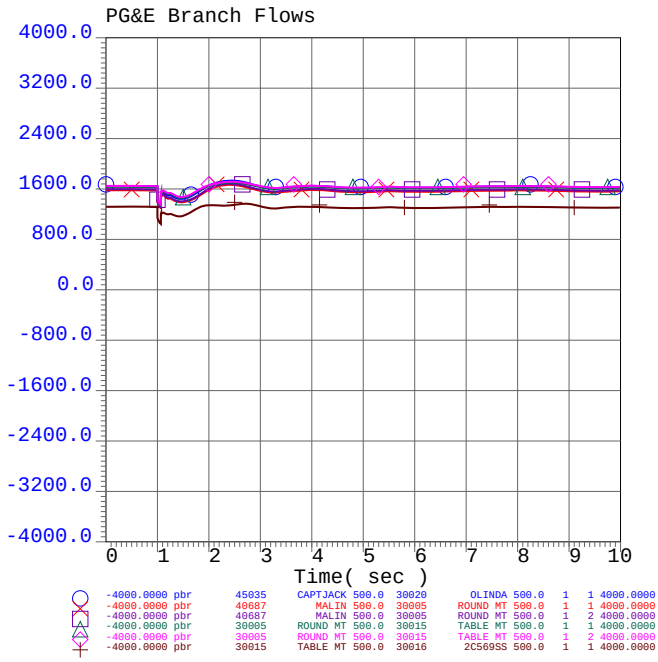
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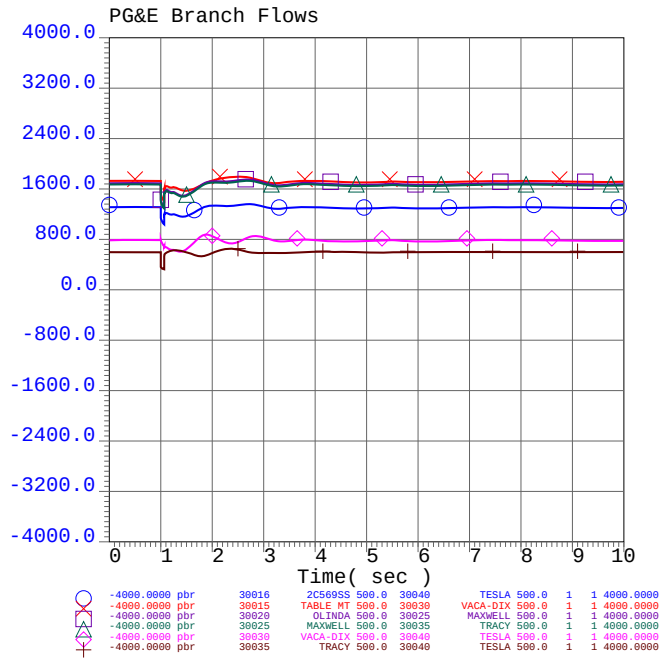
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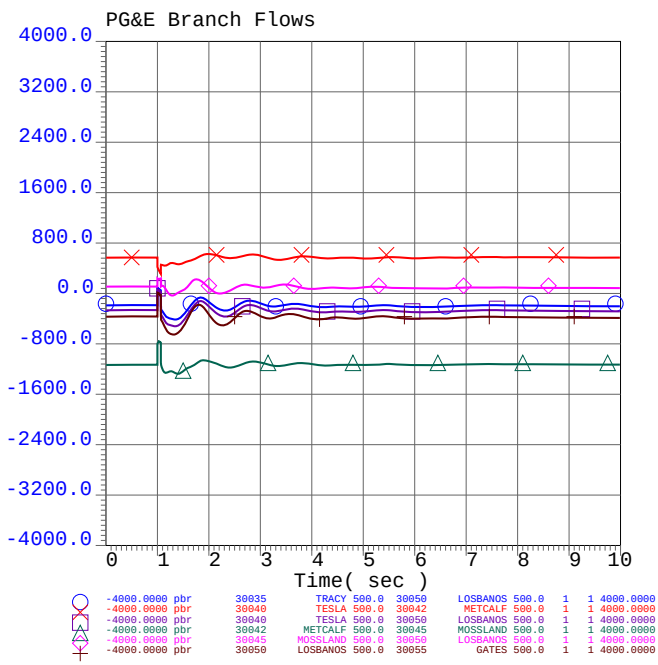


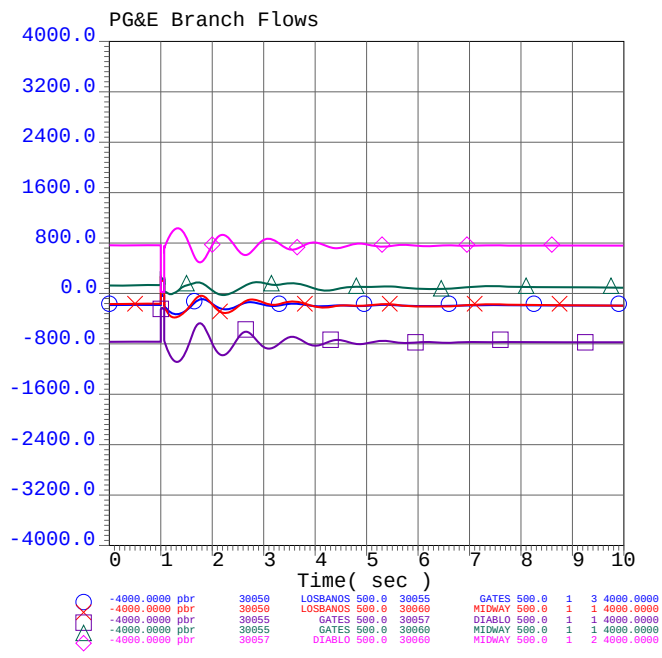
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SELECT BRANCH FLOWS



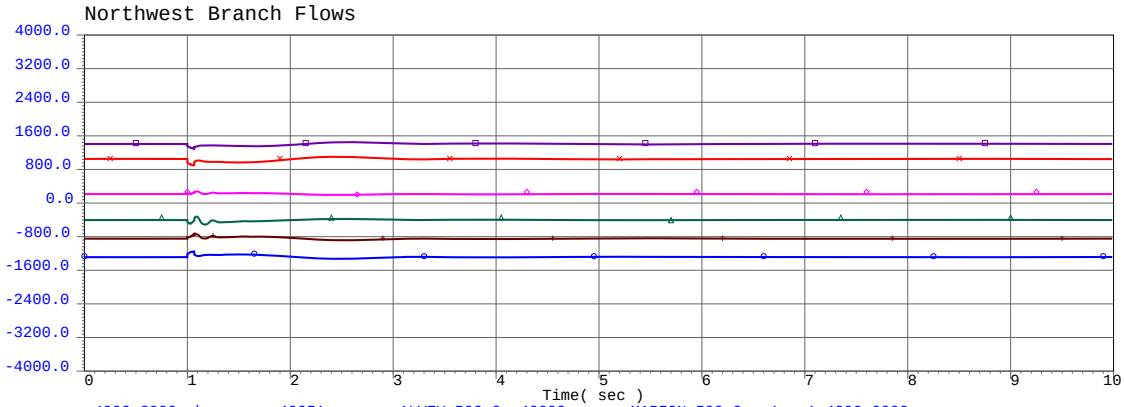




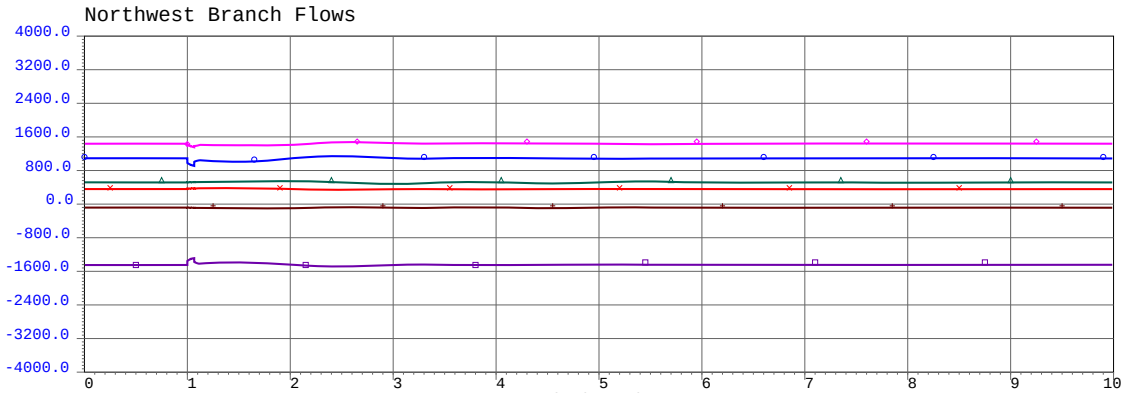


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 500 kV line

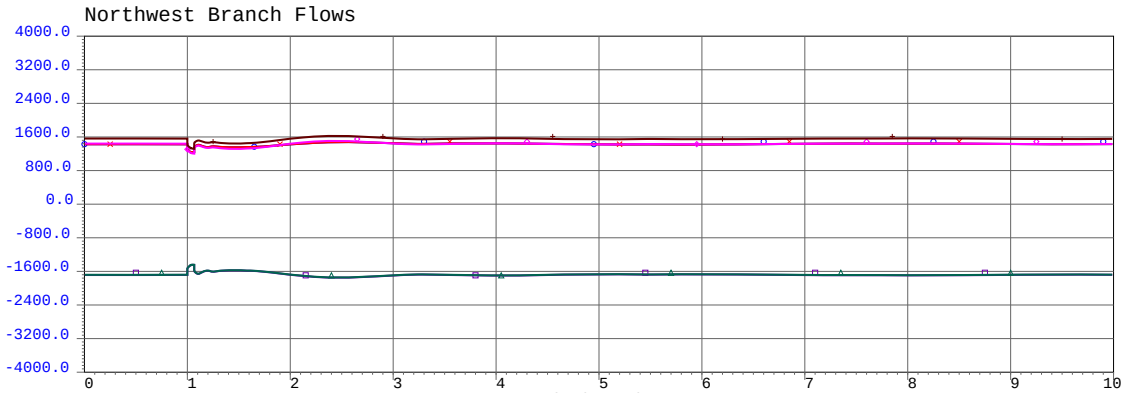
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



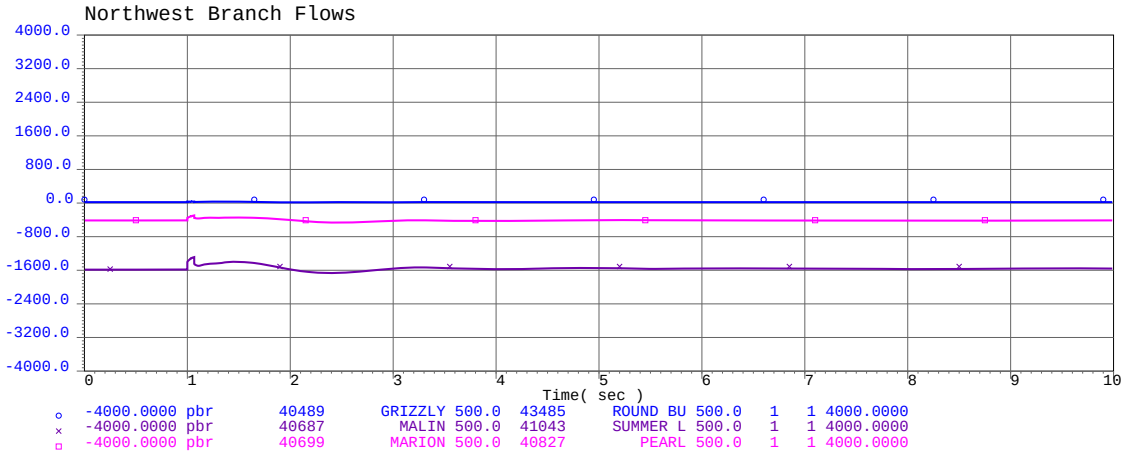
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 500 kV line

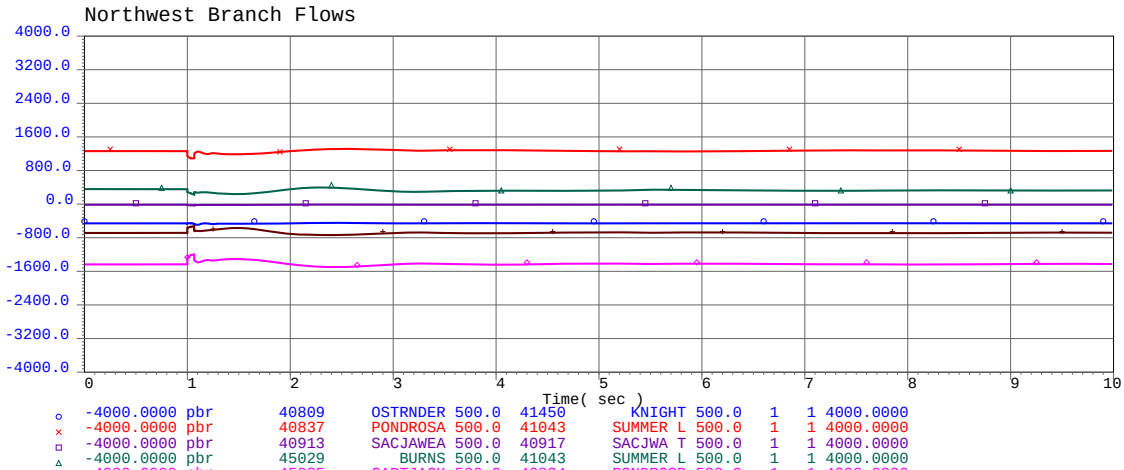
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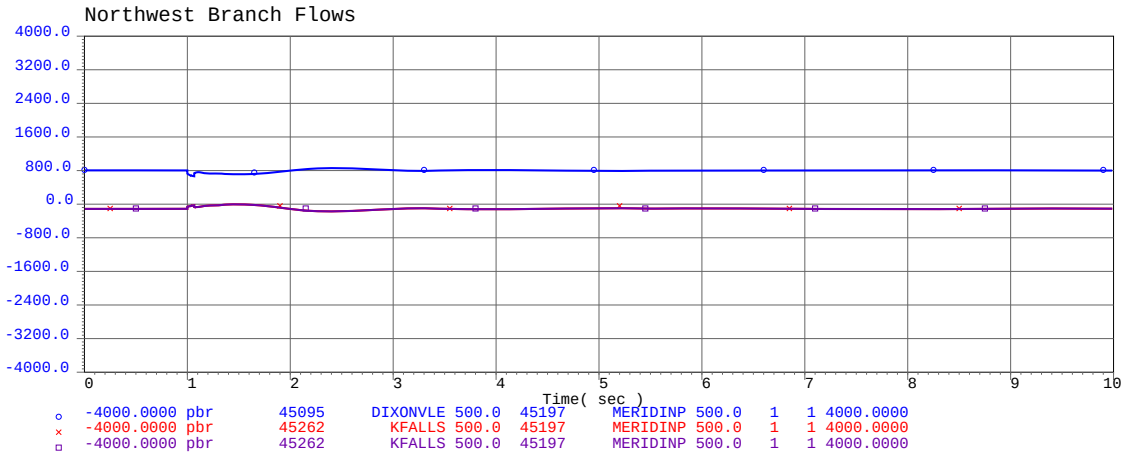
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
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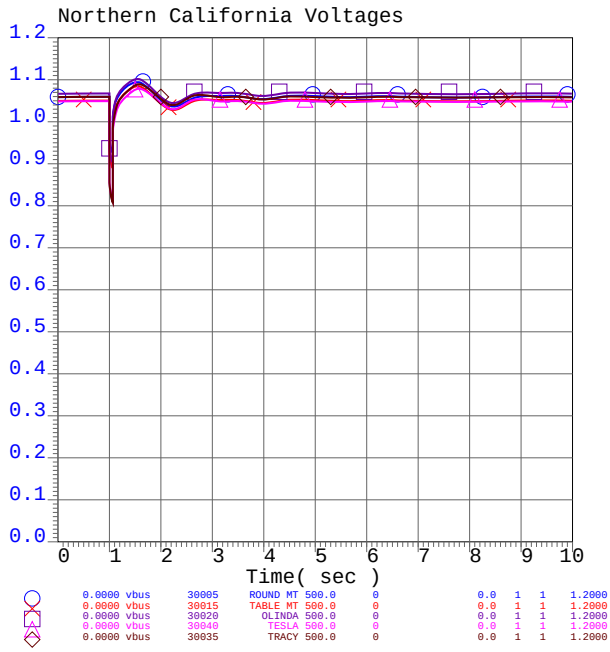
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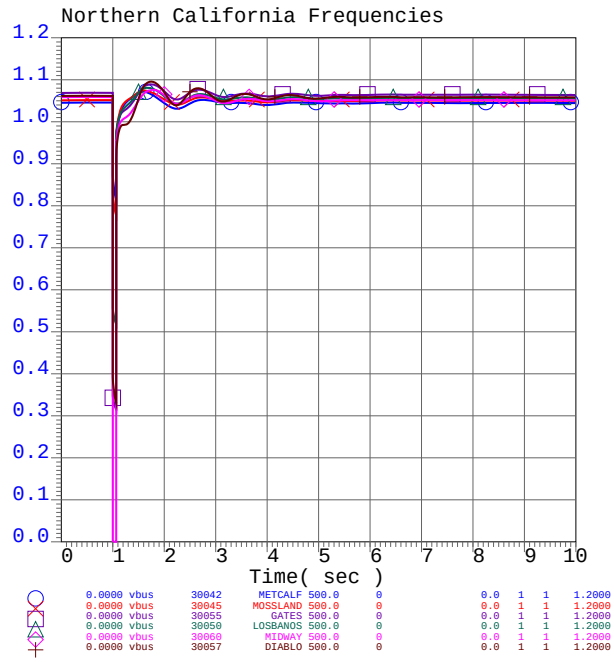


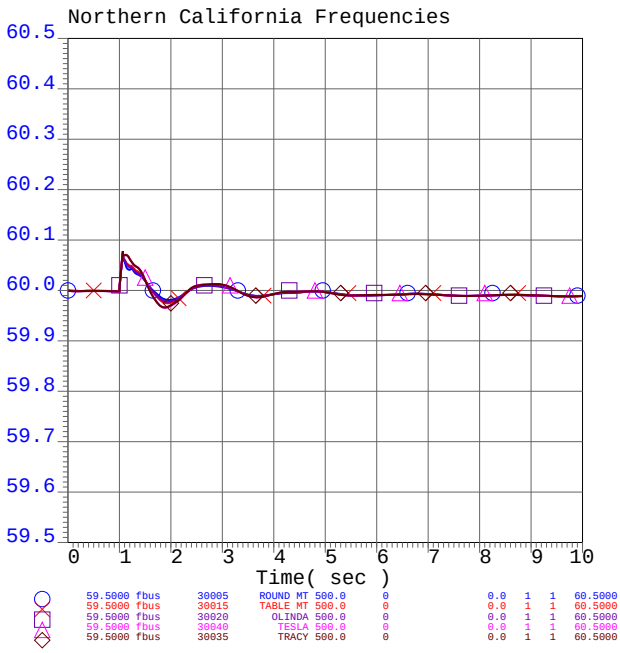
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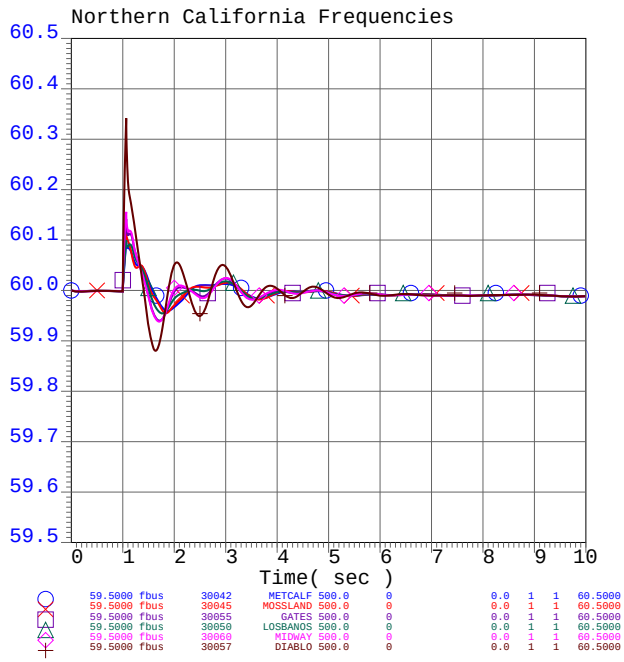
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



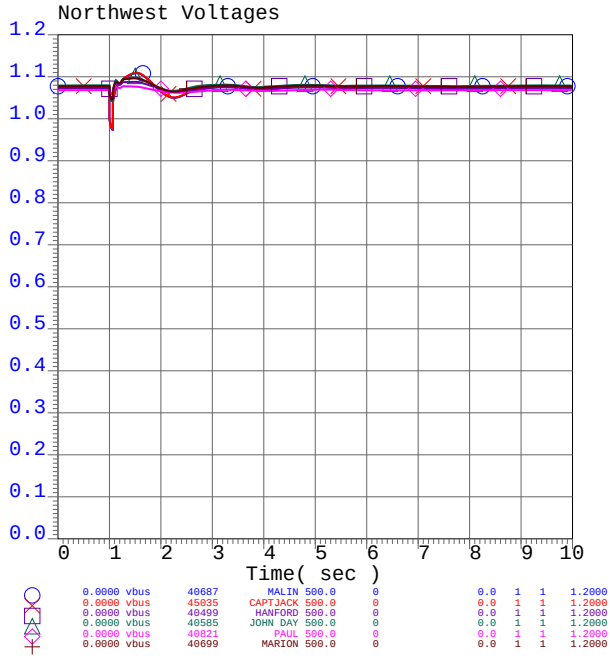


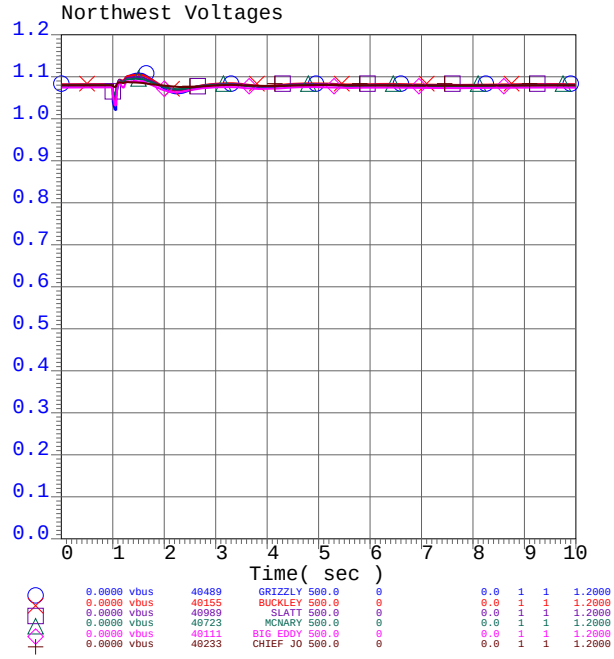


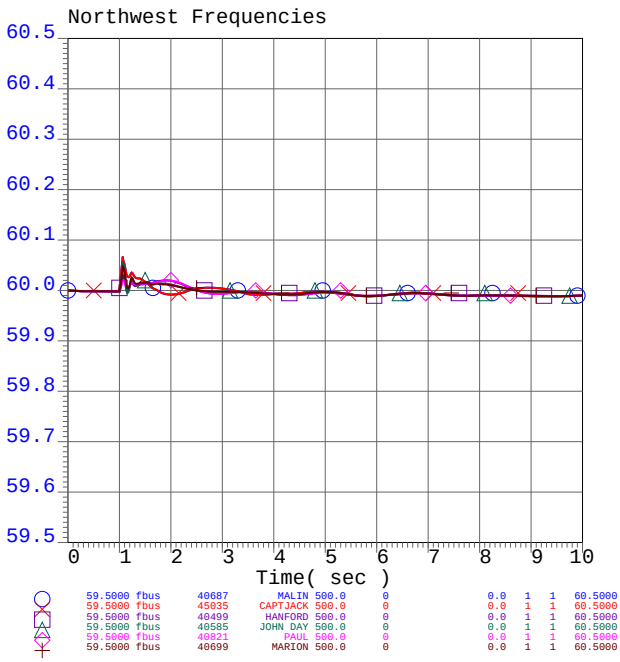


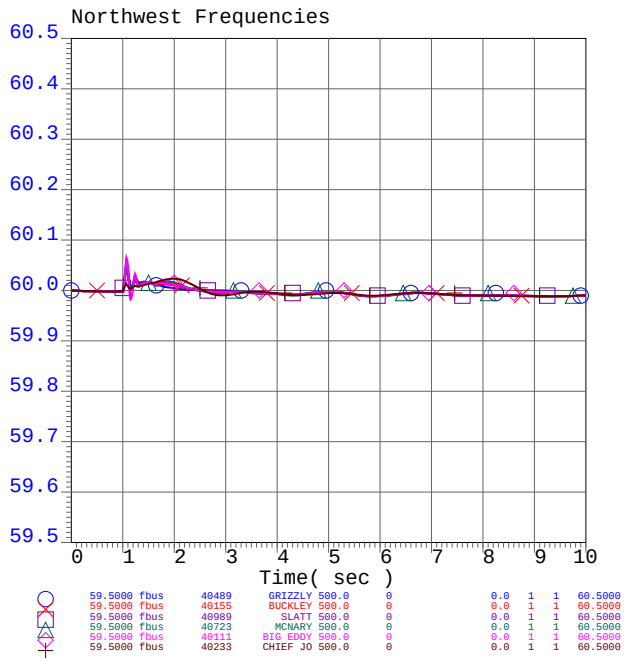
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





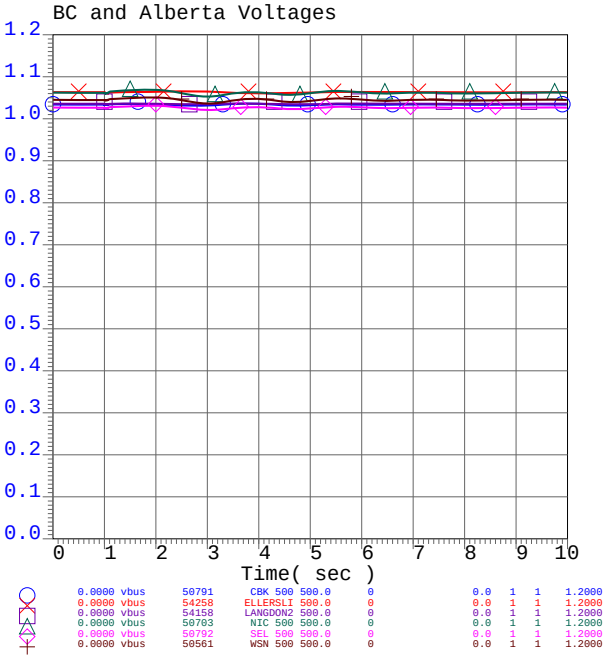




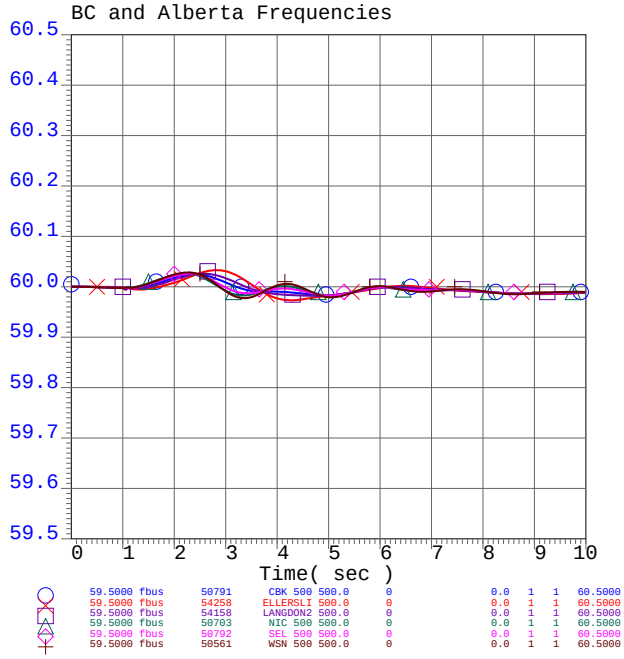
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

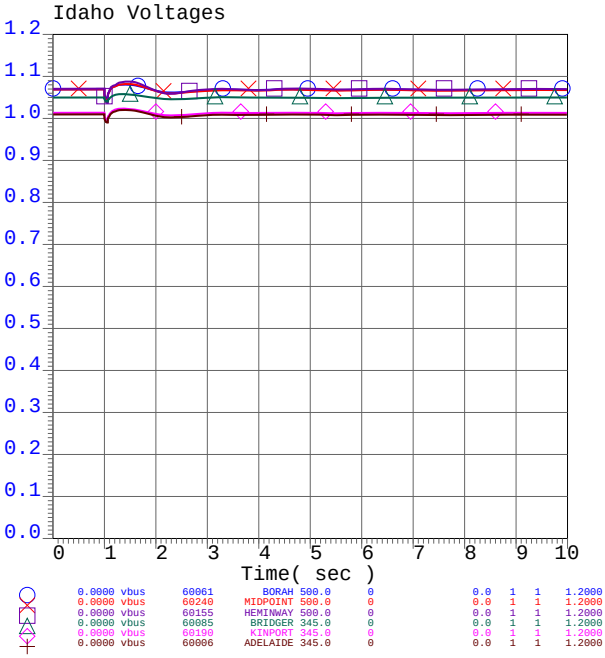
BC and Alberta Voltages



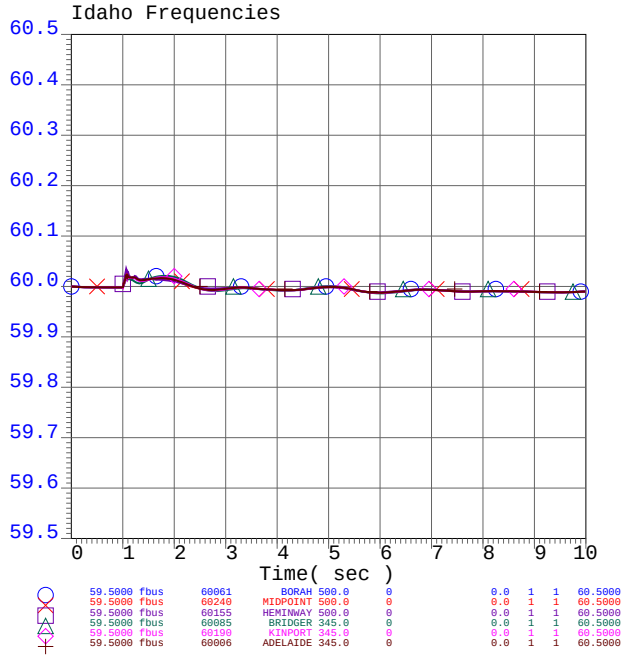
BC and Alberta Frequencies



Idaho Voltages

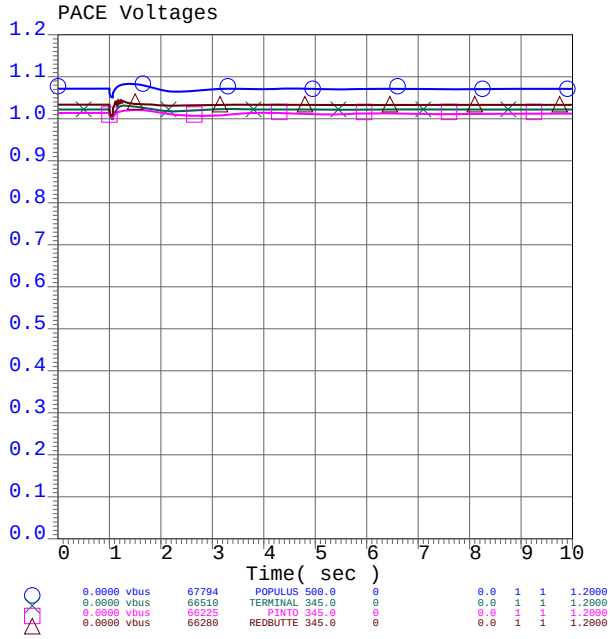


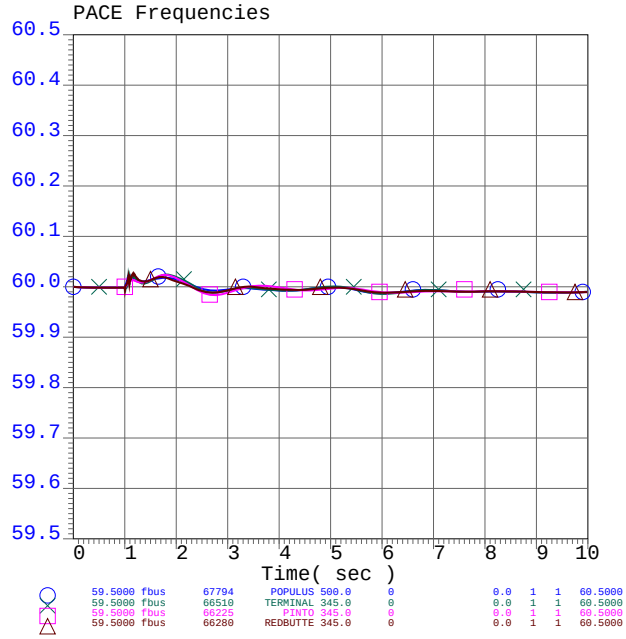
Idaho Frequencies

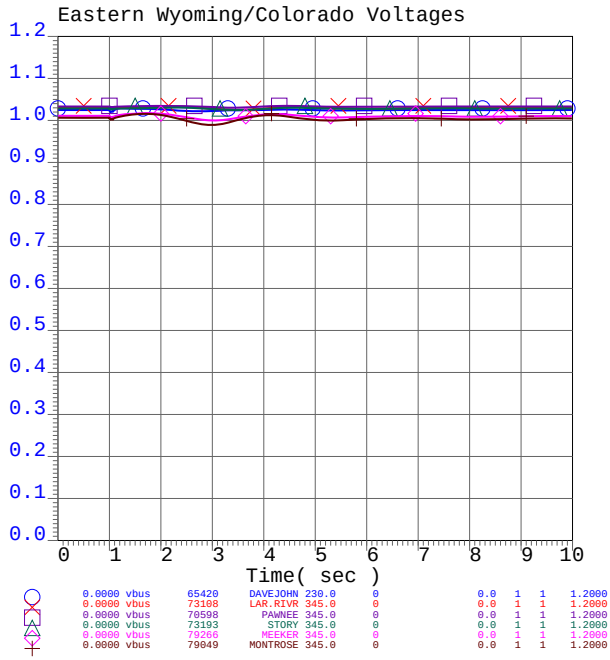


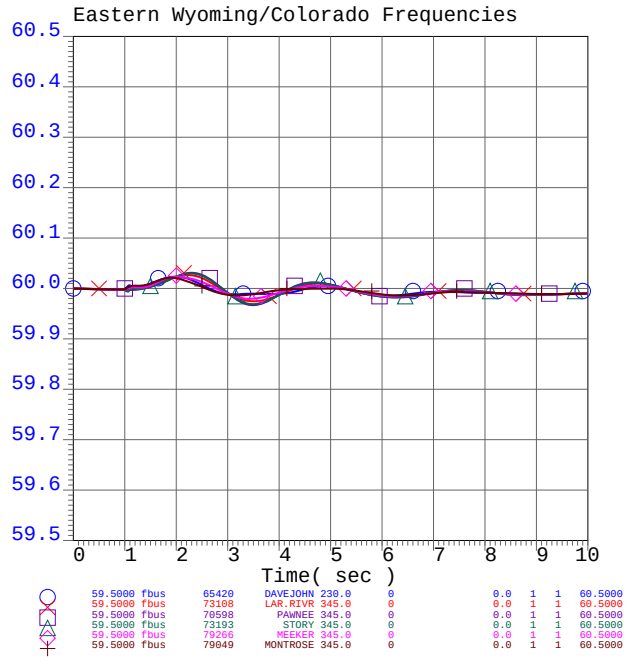
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



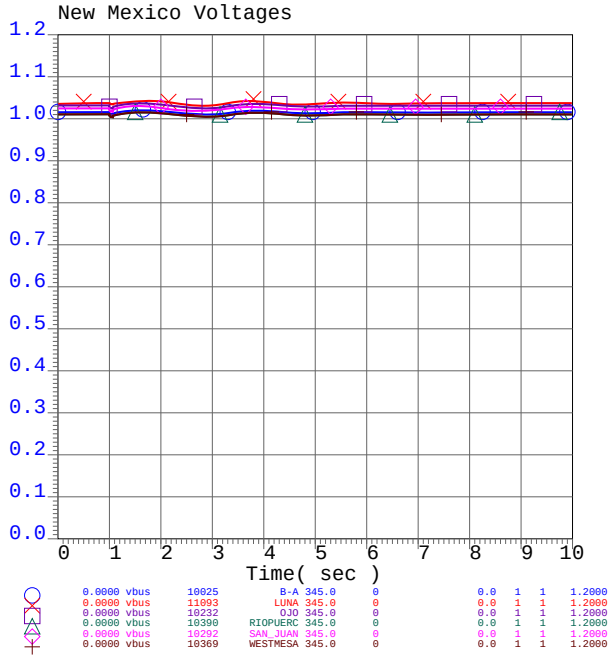


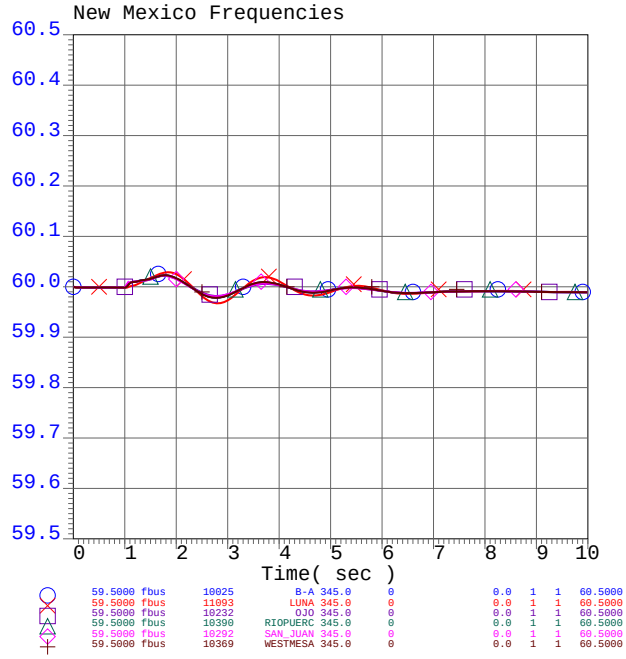


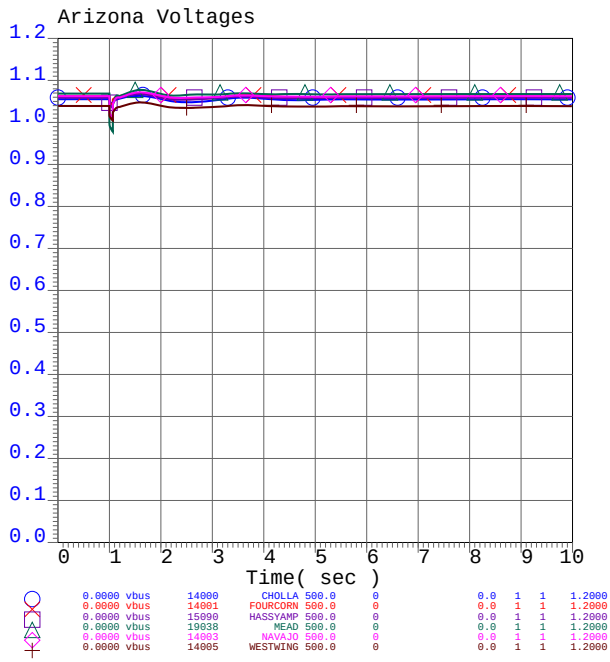


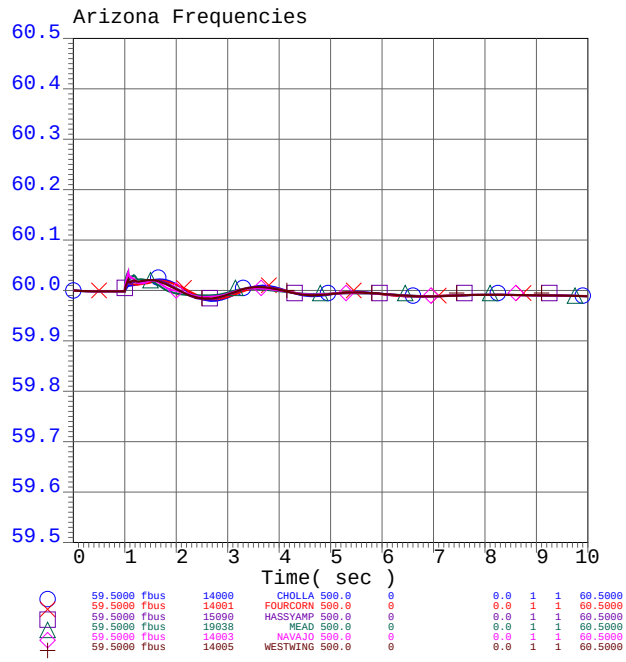
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES







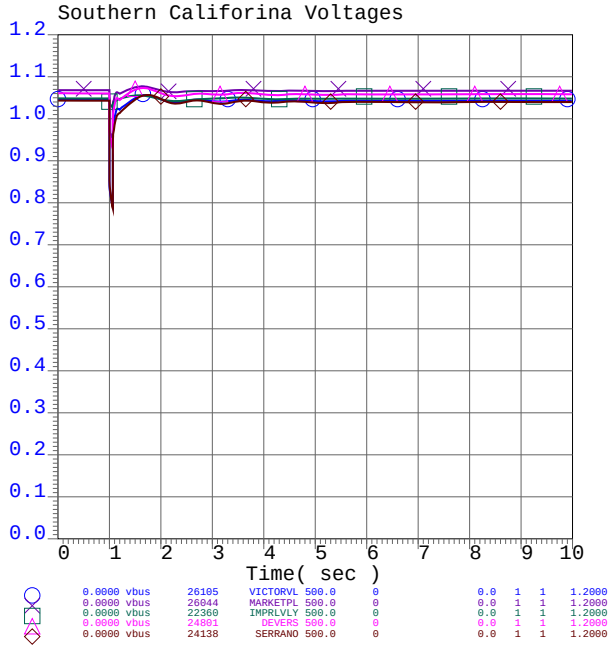


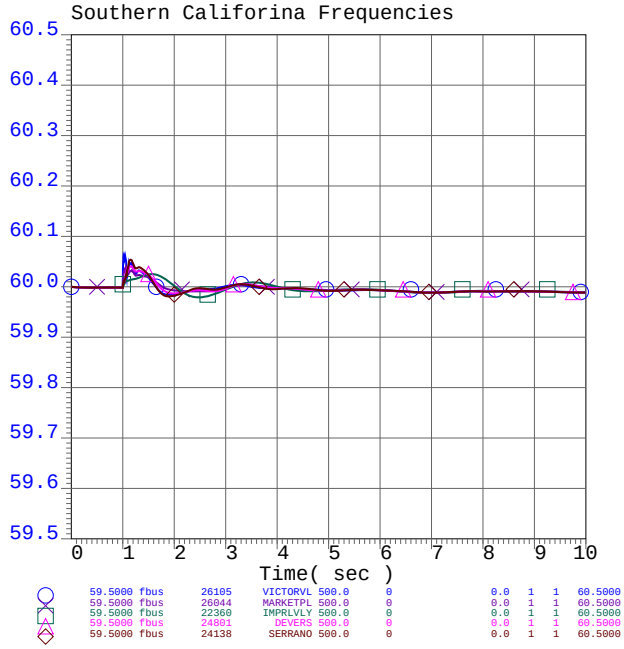
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

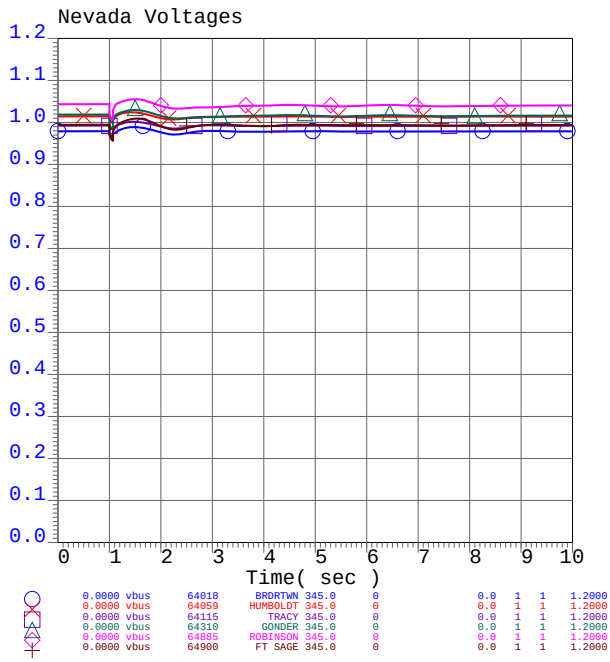
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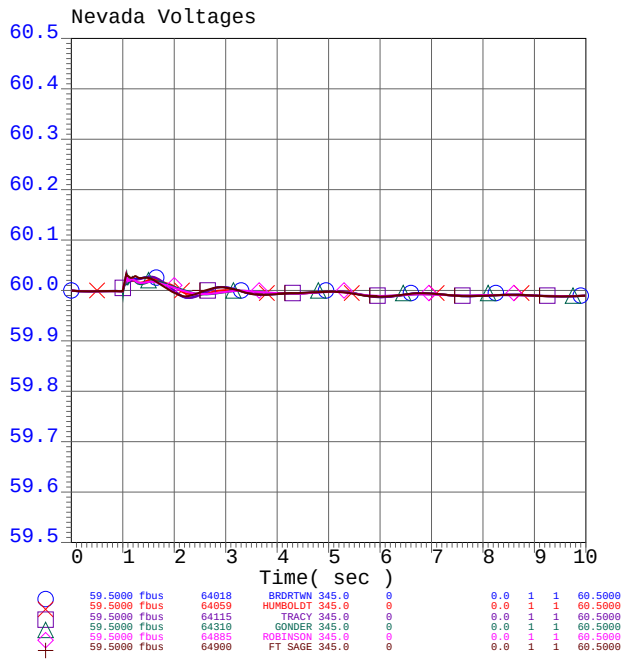
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WECC AREA VOLTAGE AND FREQUENCIES



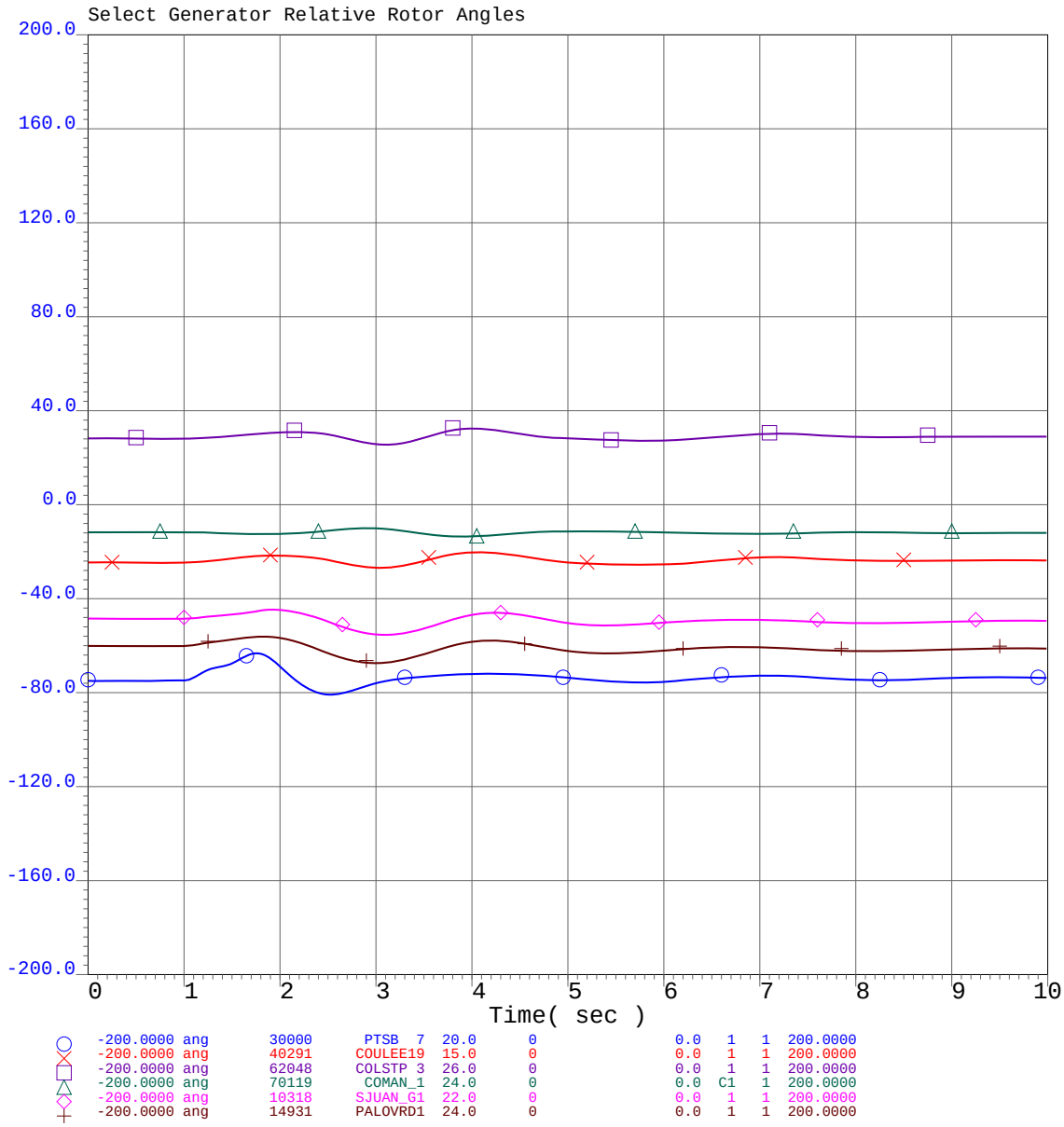






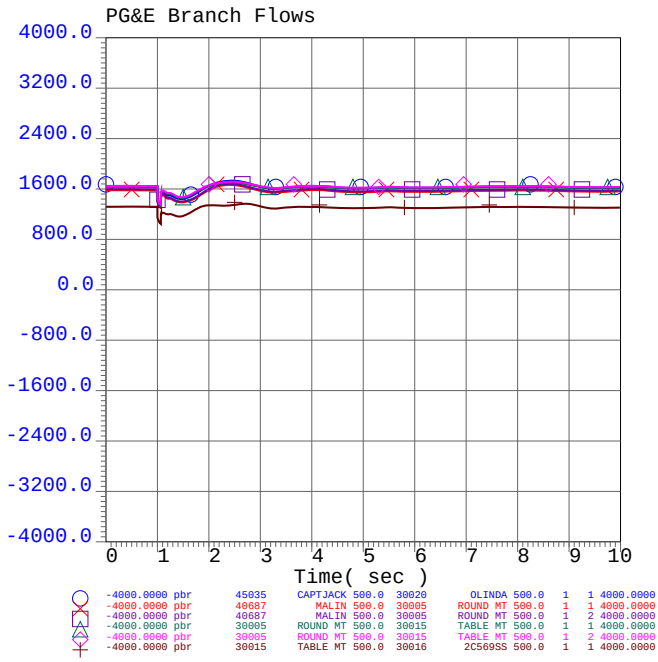
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

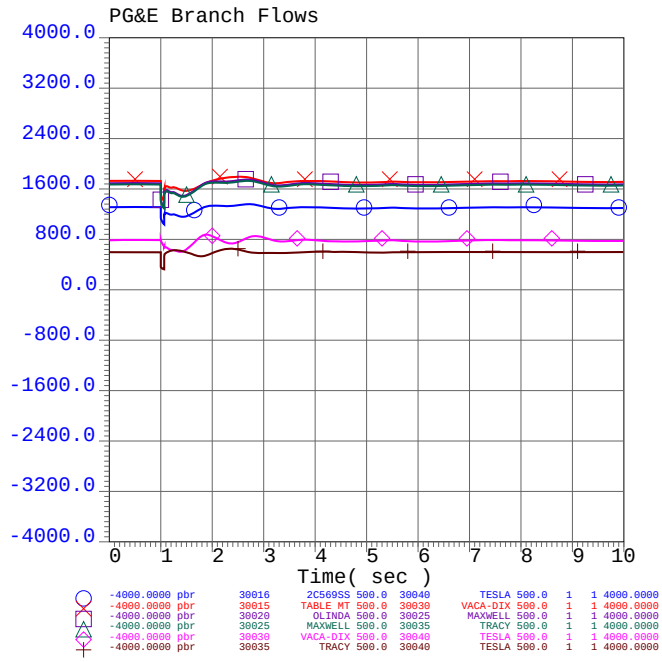
WECC RELATIVE ROTOR ANGLES

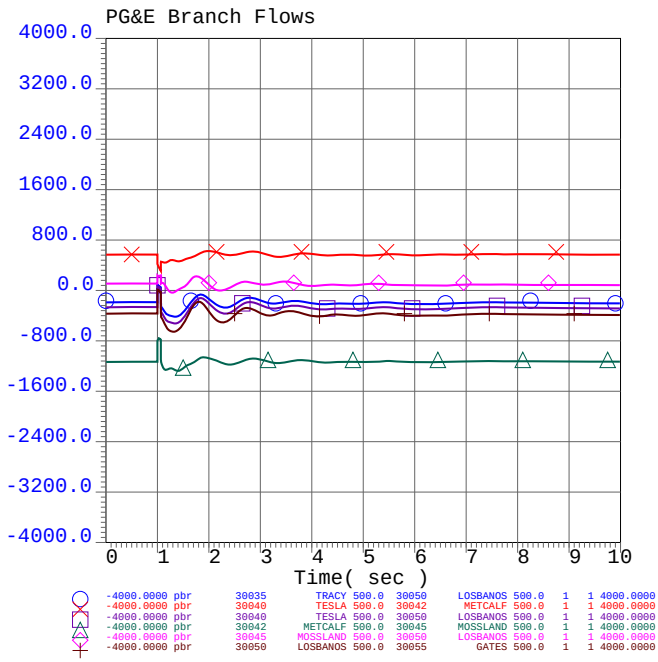


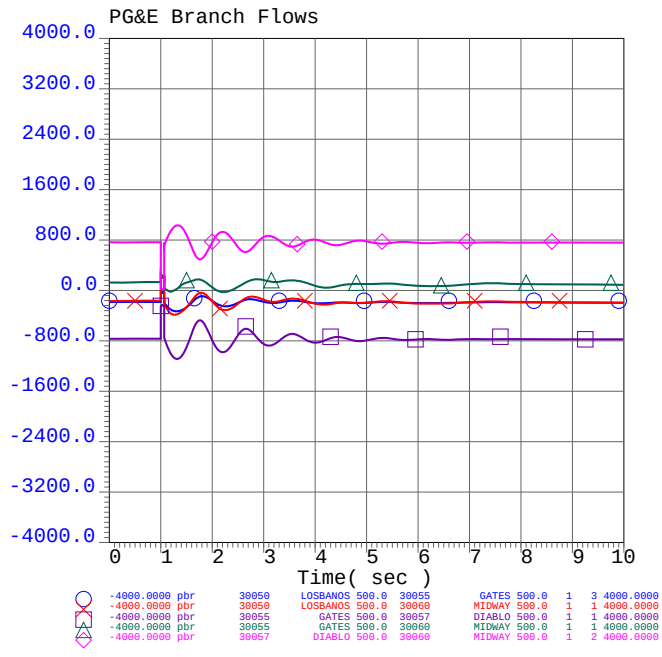
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

SELECT BRANCH FLOWS



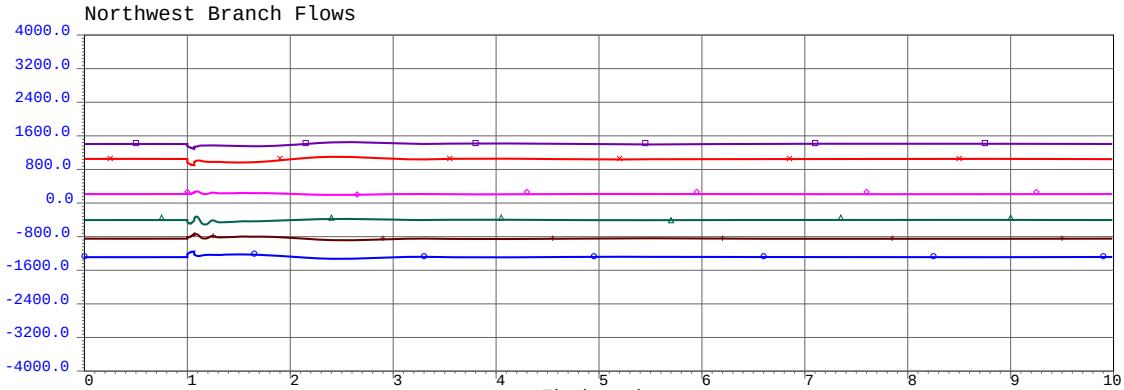




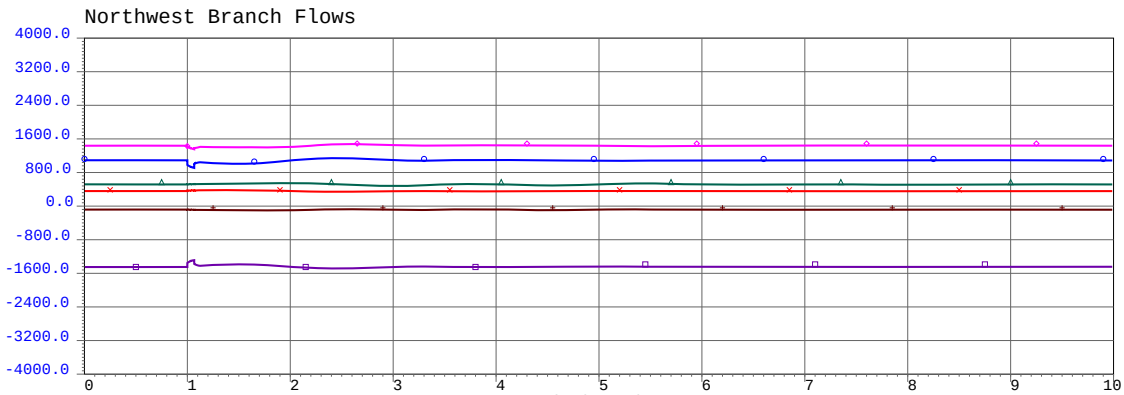


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

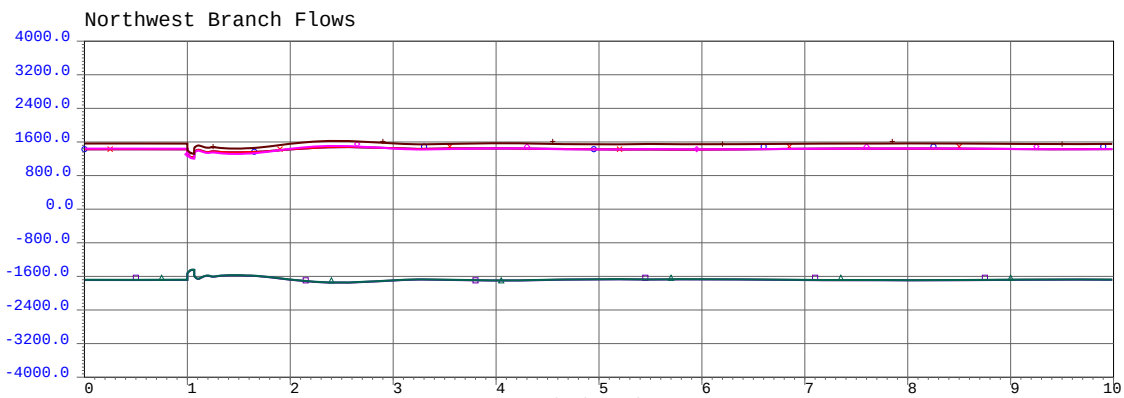
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
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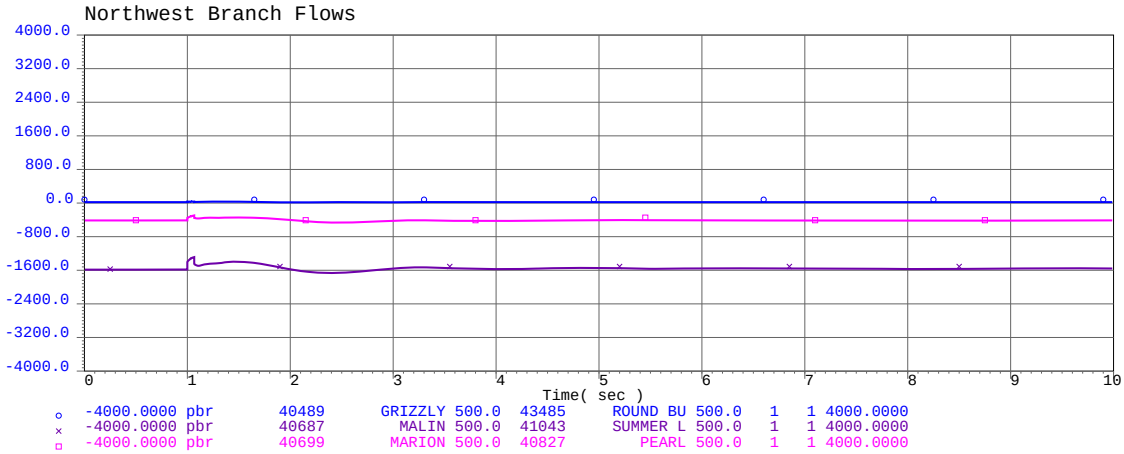
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-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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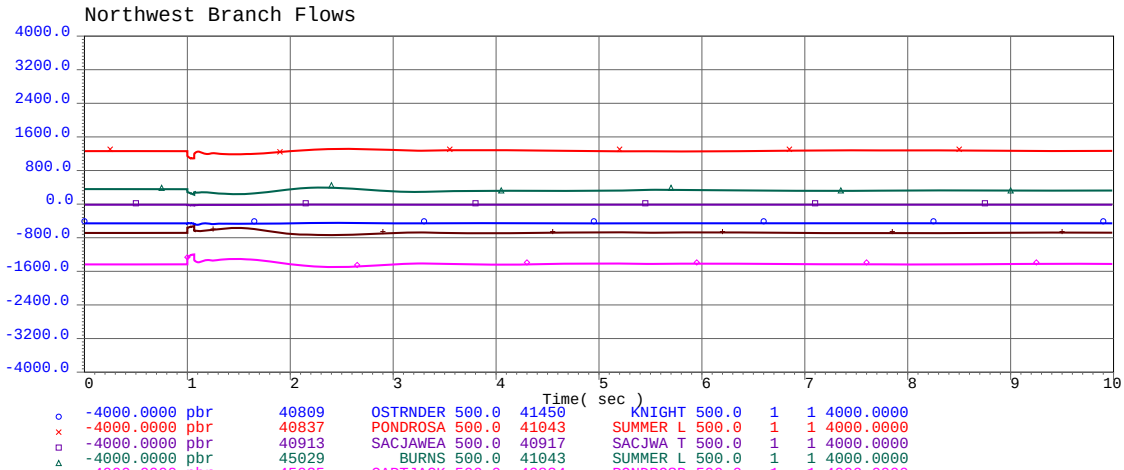
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

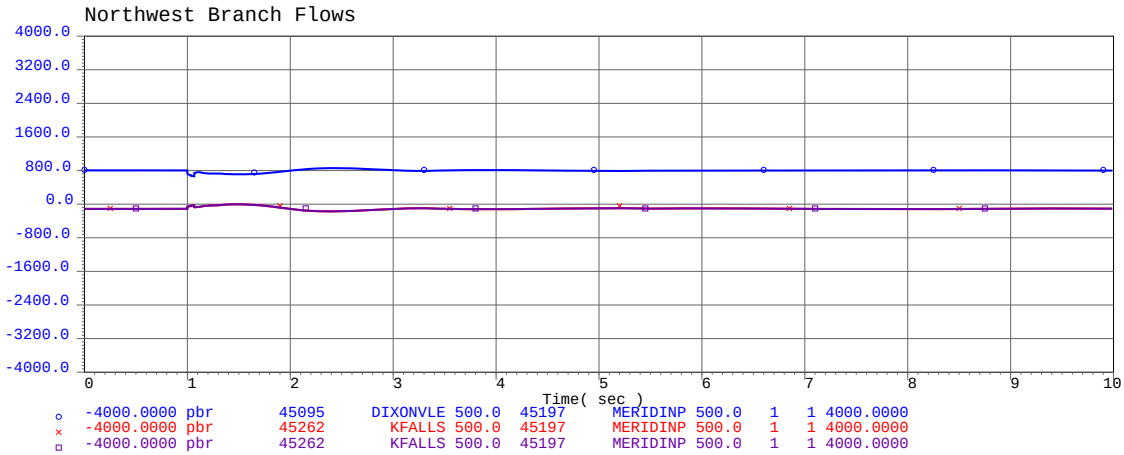
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



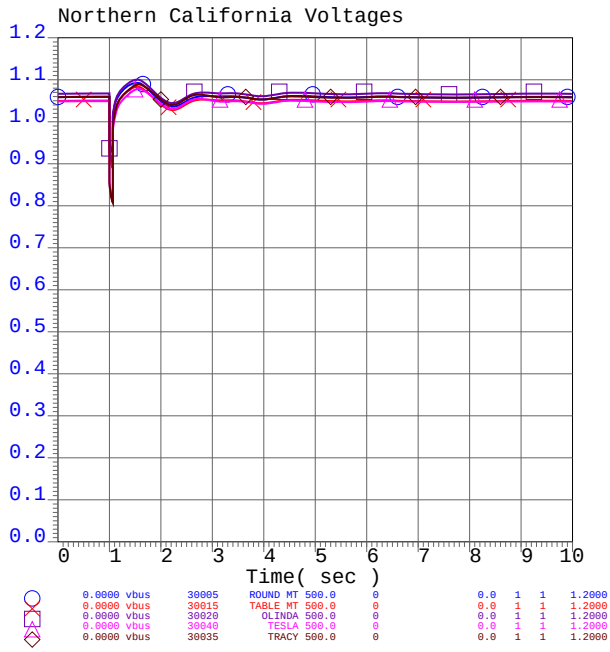
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-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

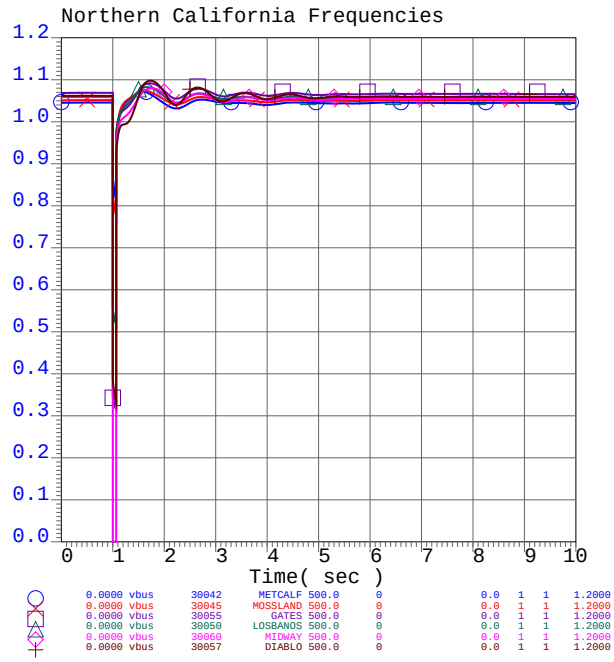


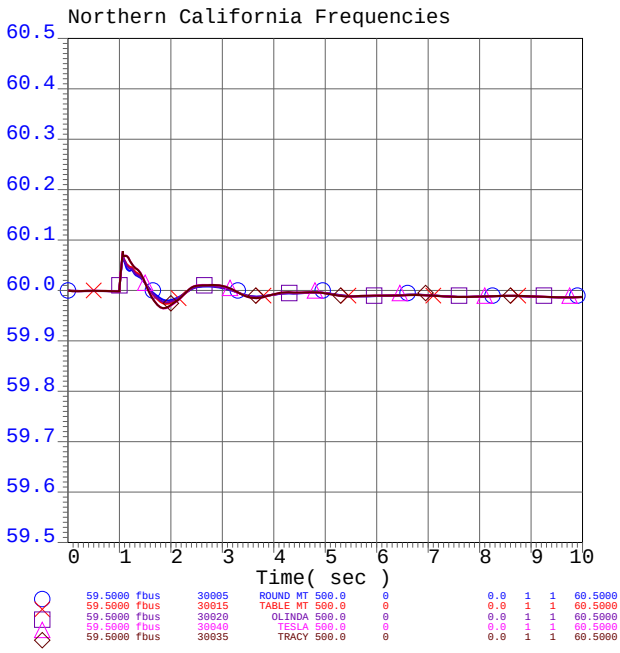
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

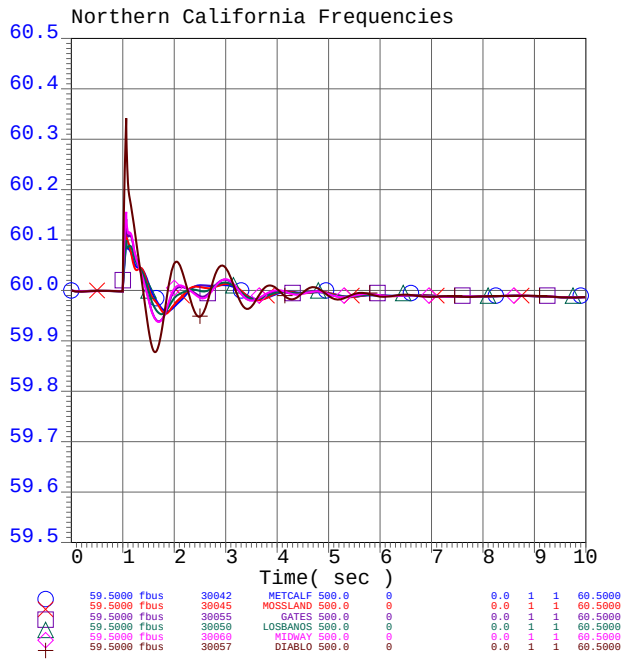
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



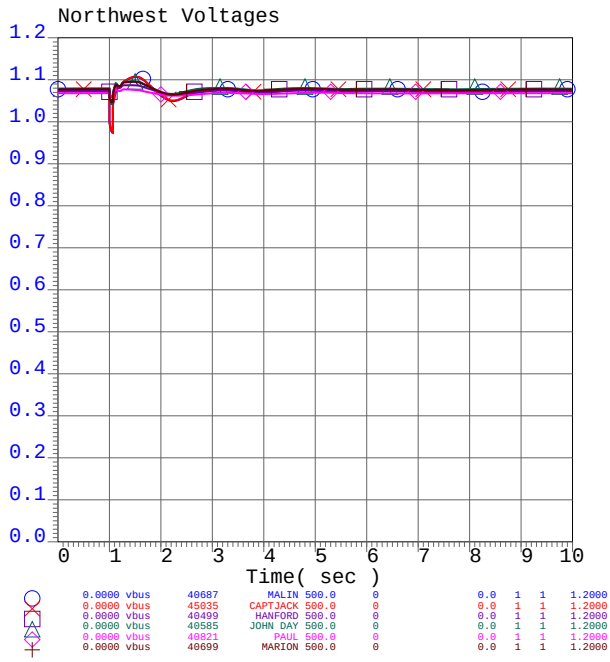


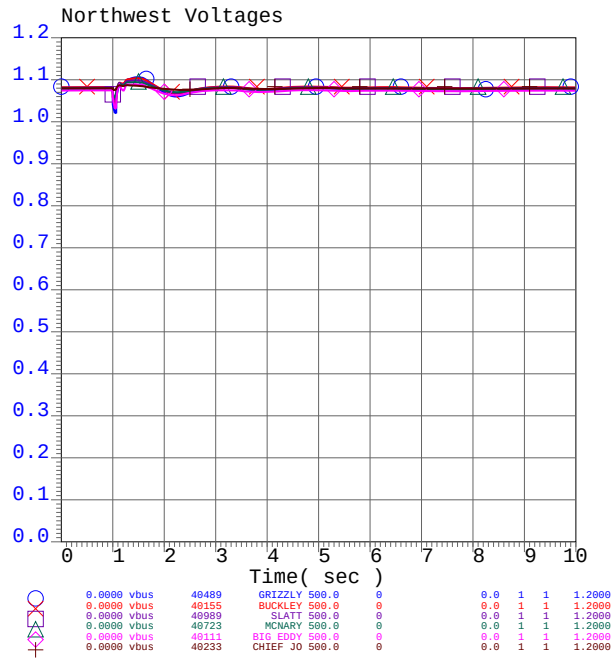


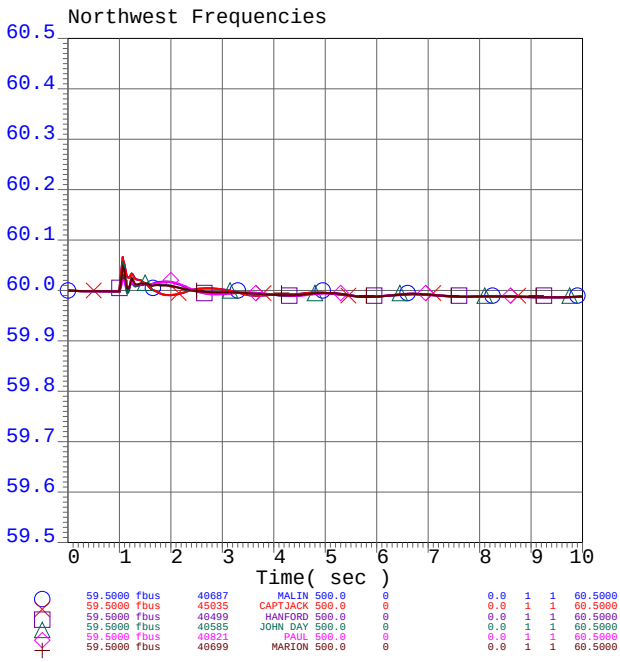


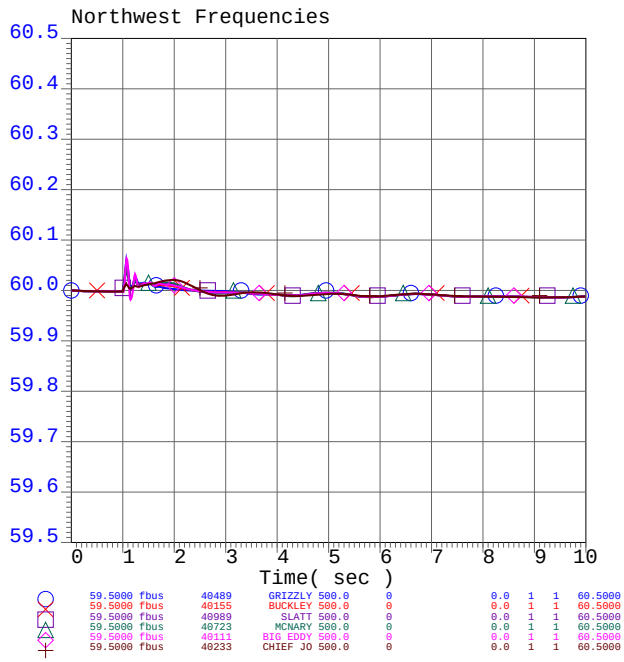
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





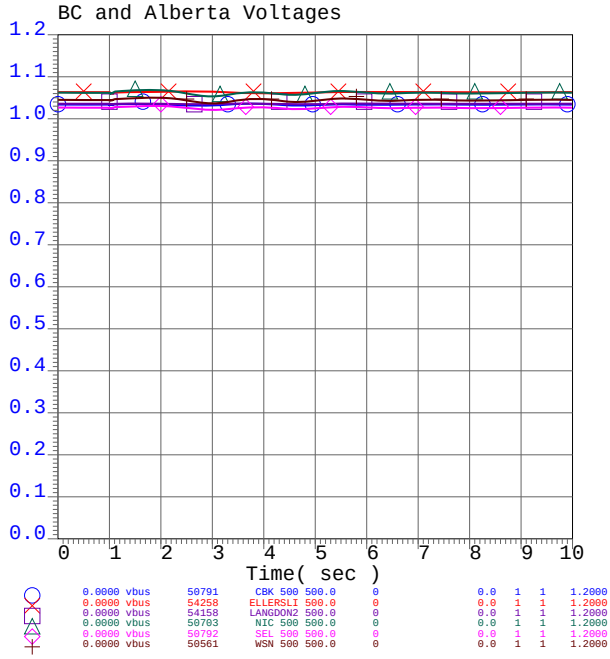




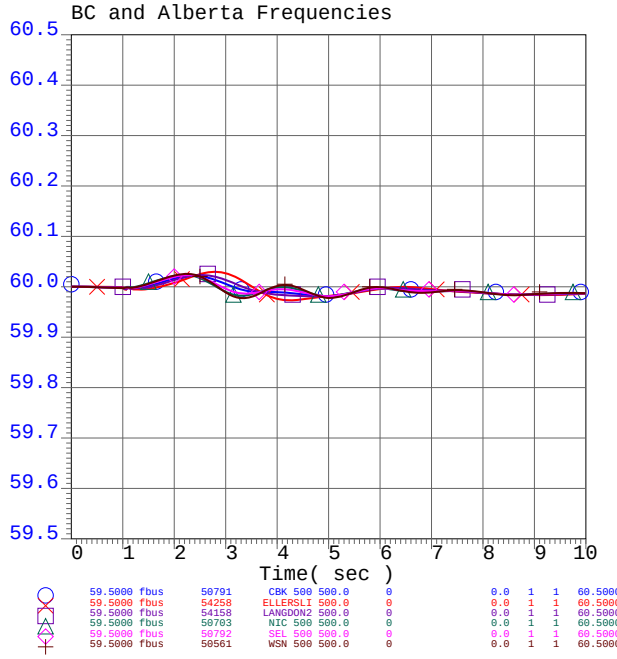
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

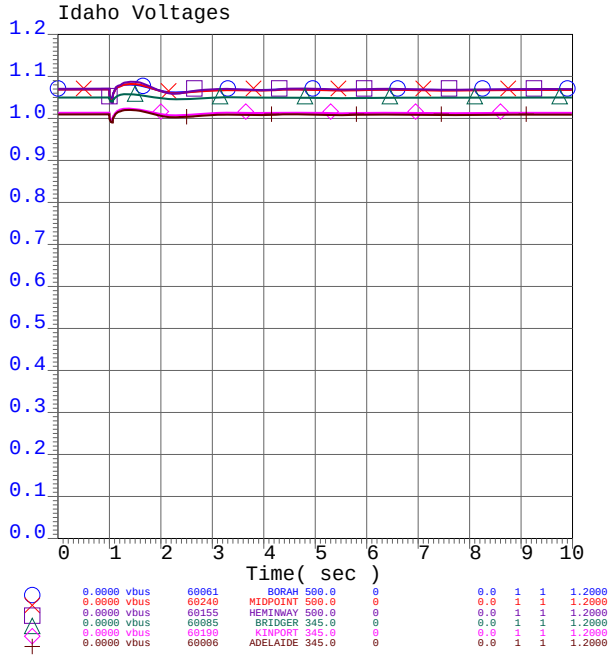
BC and Alberta Voltages



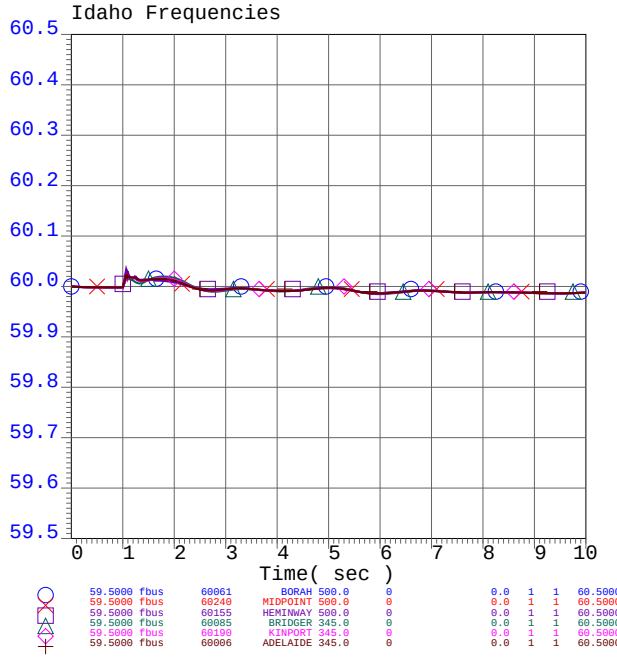
BC and Alberta Frequencies



Idaho Voltages

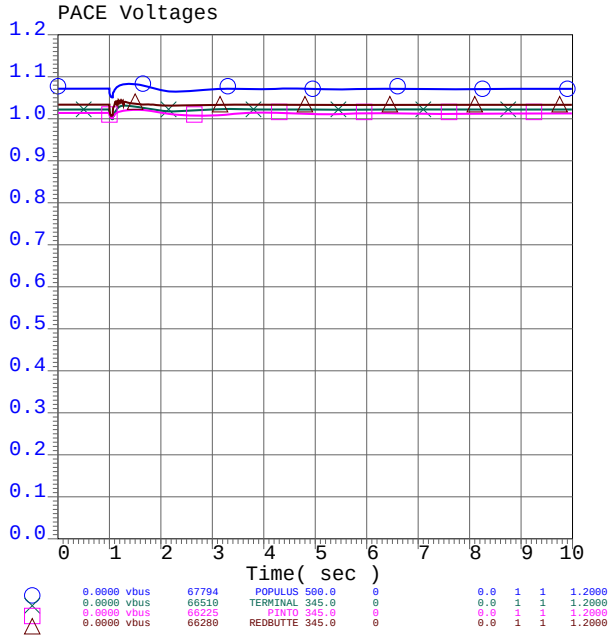


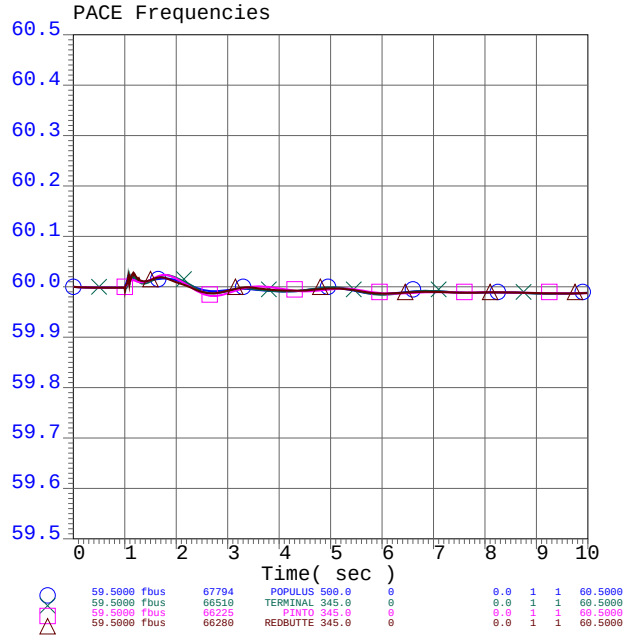
Idaho Frequencies

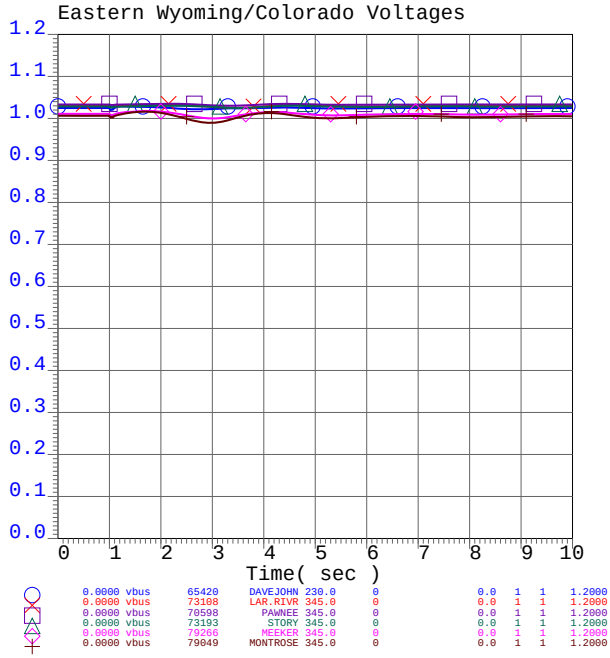


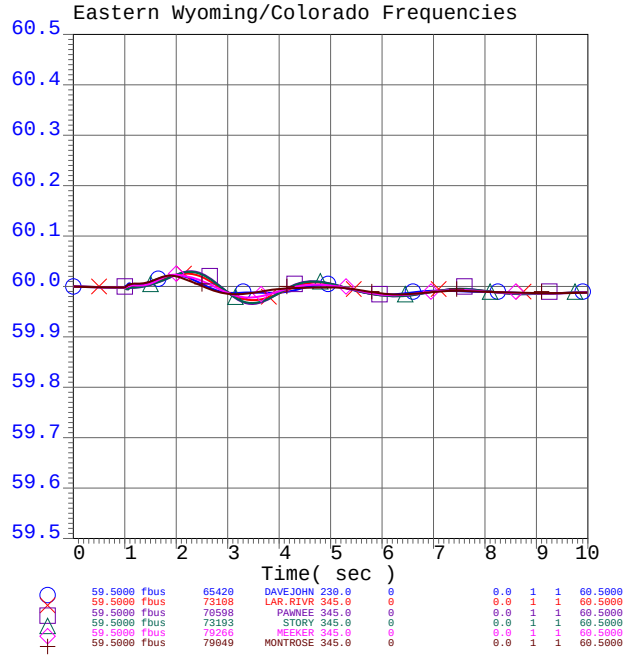
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





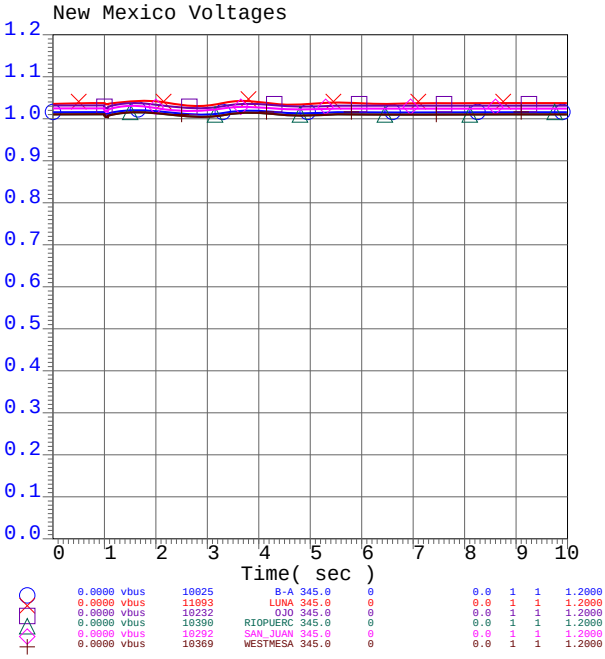




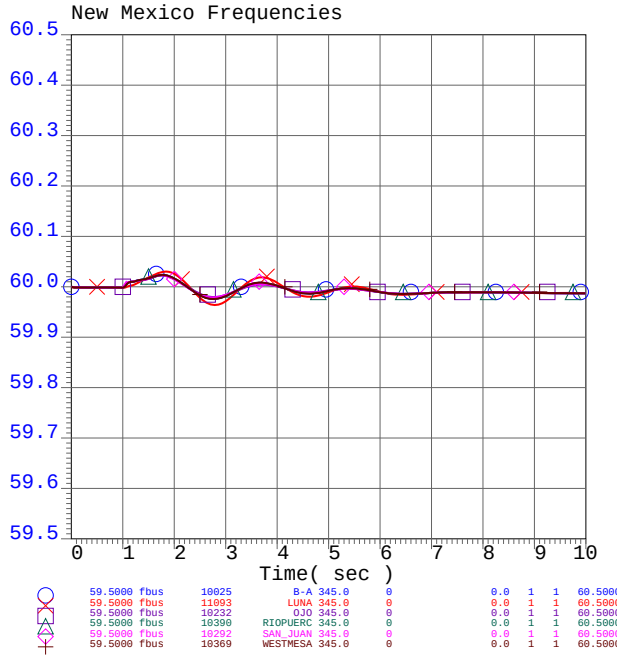
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

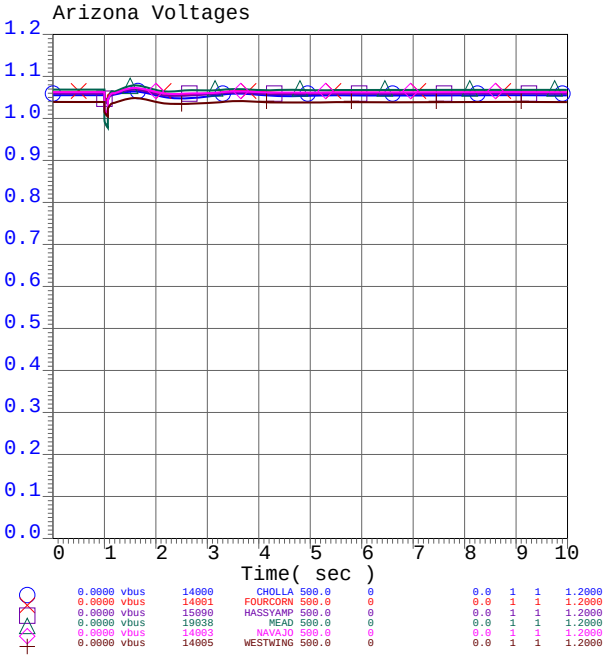
New Mexico Voltages



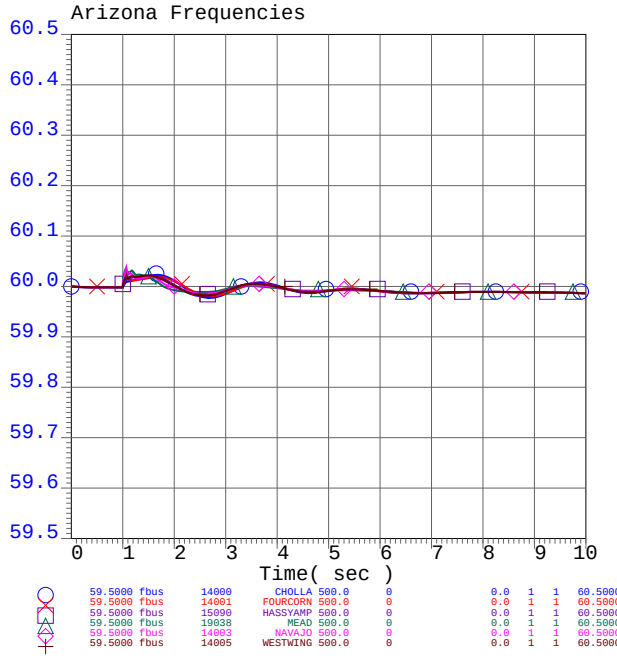
New Mexico Frequencies



Arizona Voltages

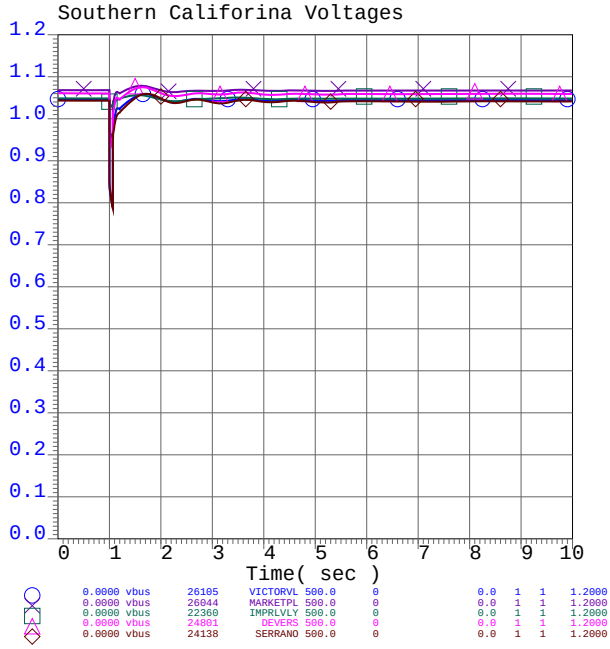


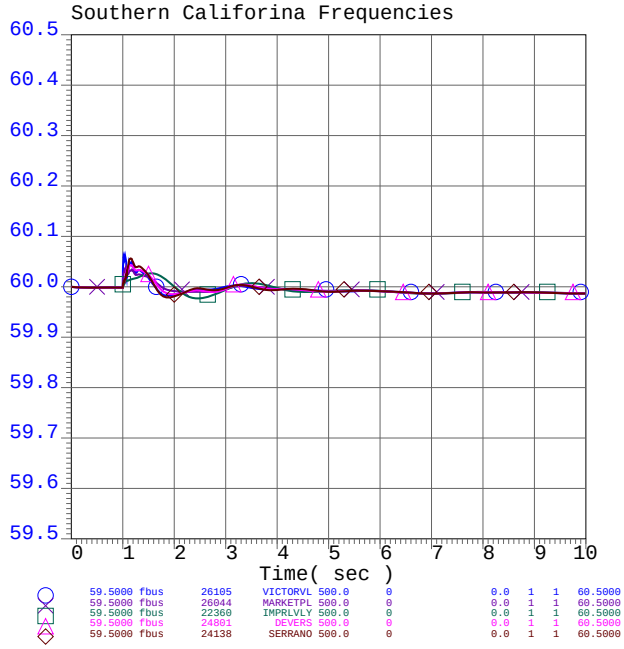
Arizona Frequencies

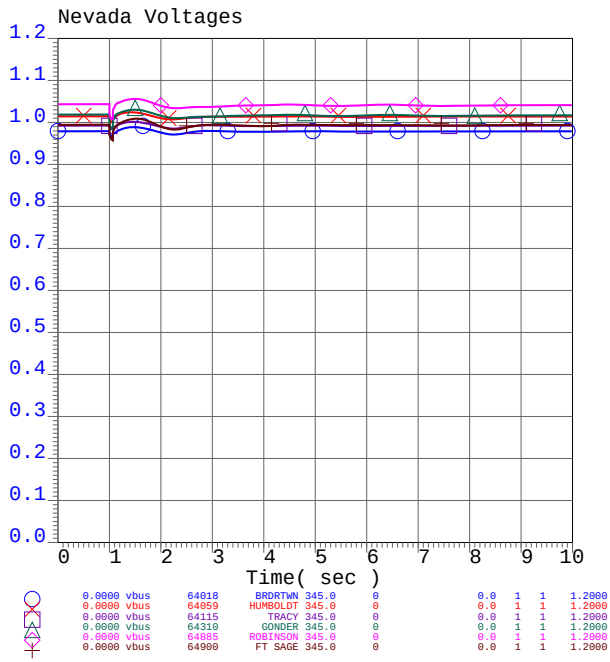


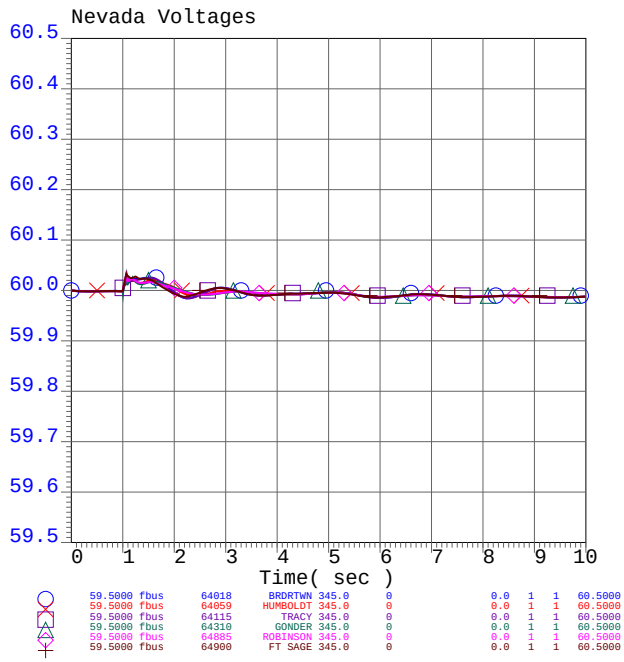
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



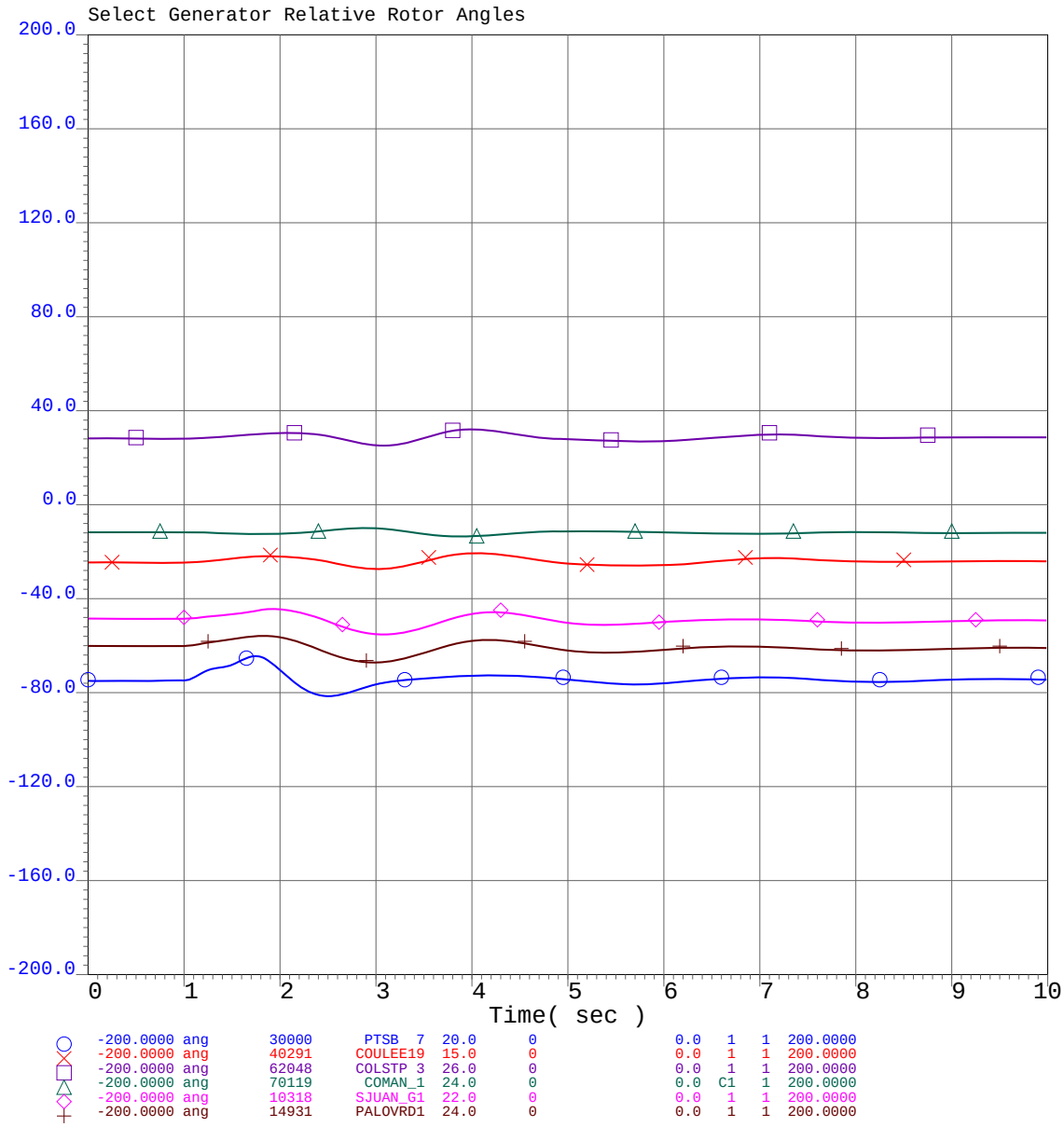






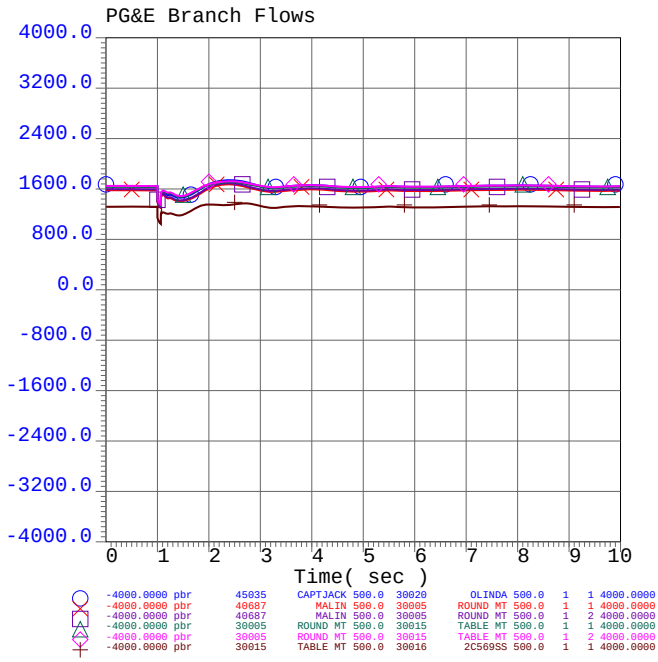
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

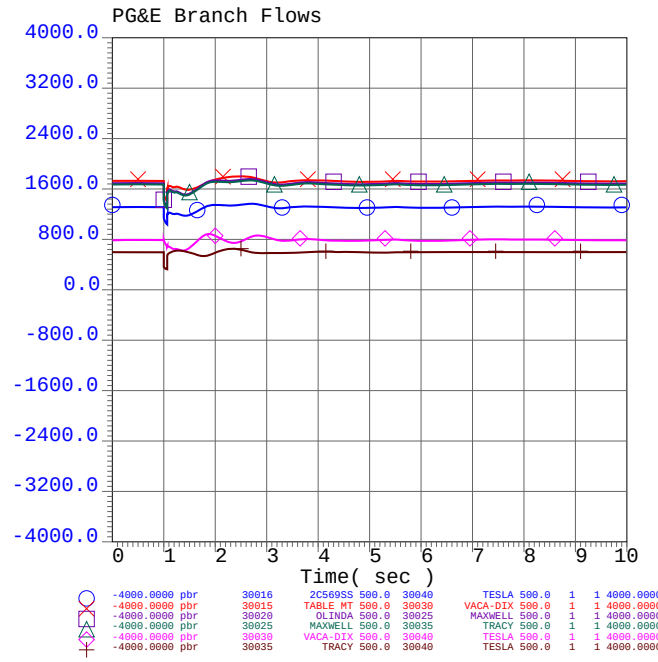
WECC RELATIVE ROTOR ANGLES

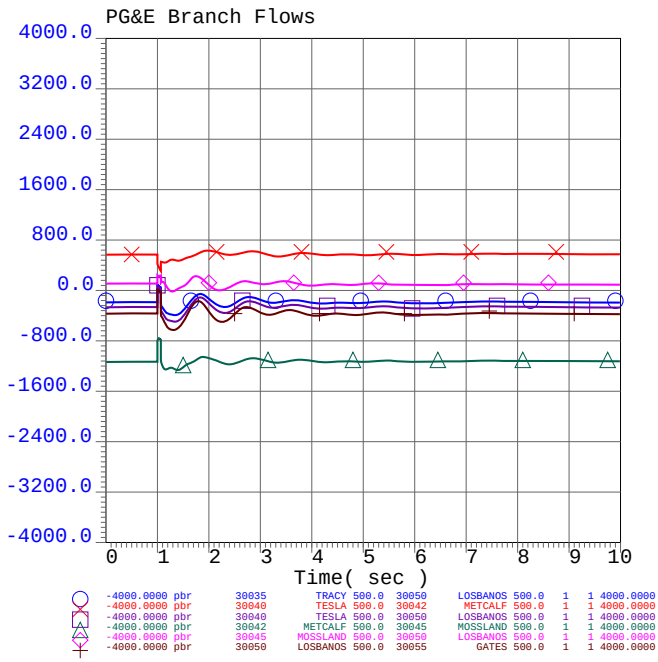


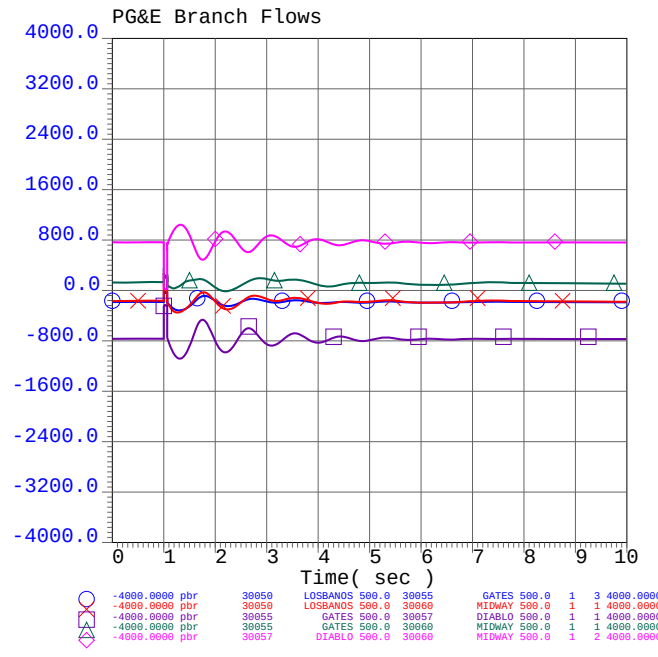
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

SELECT BRANCH FLOWS





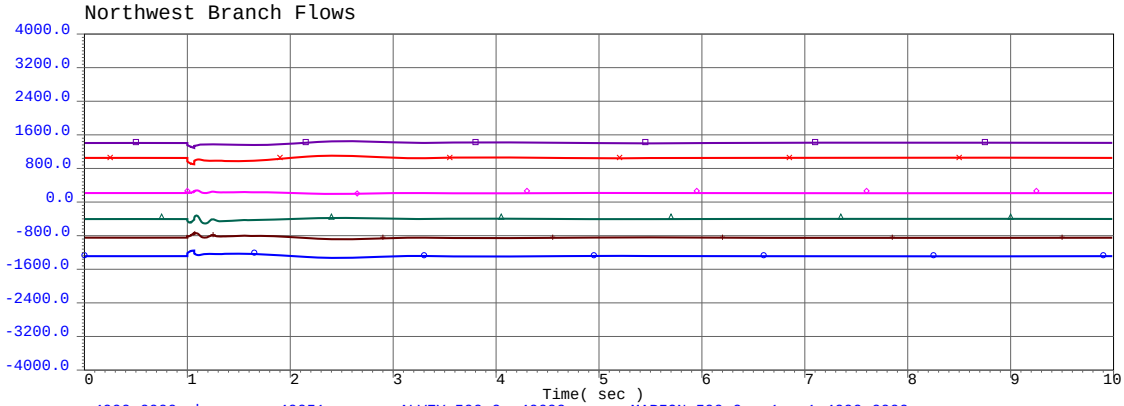




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

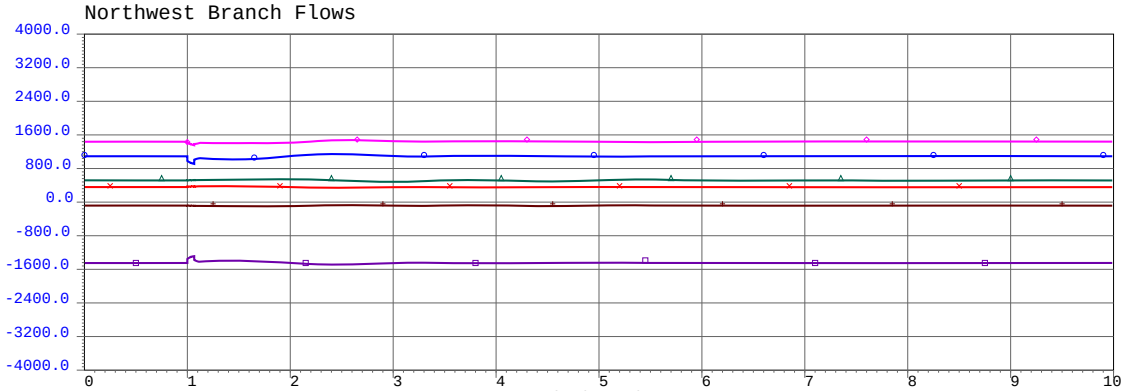
SELECT BRANCH FLOWS

Northwest Branch Flows



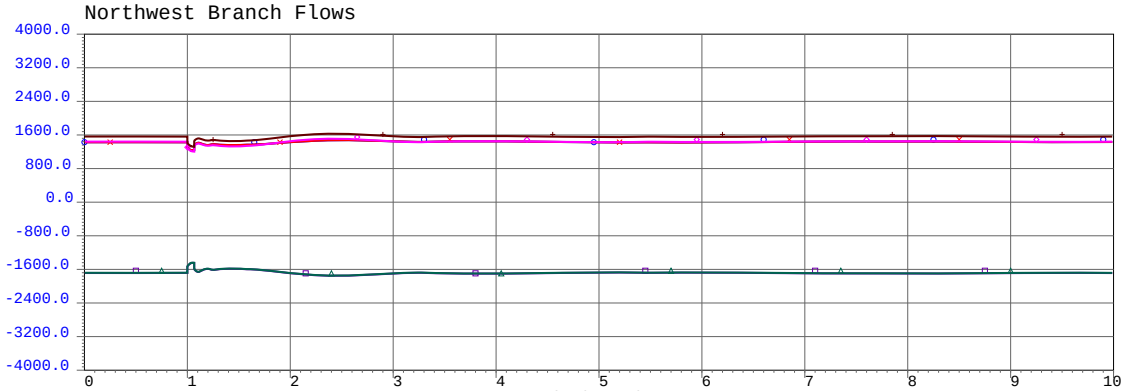
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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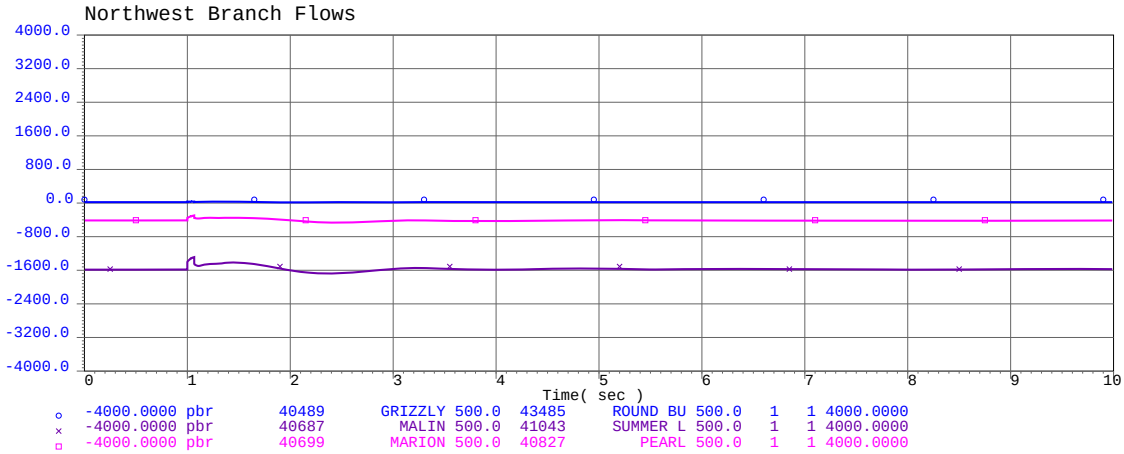
Northwest Branch Flows



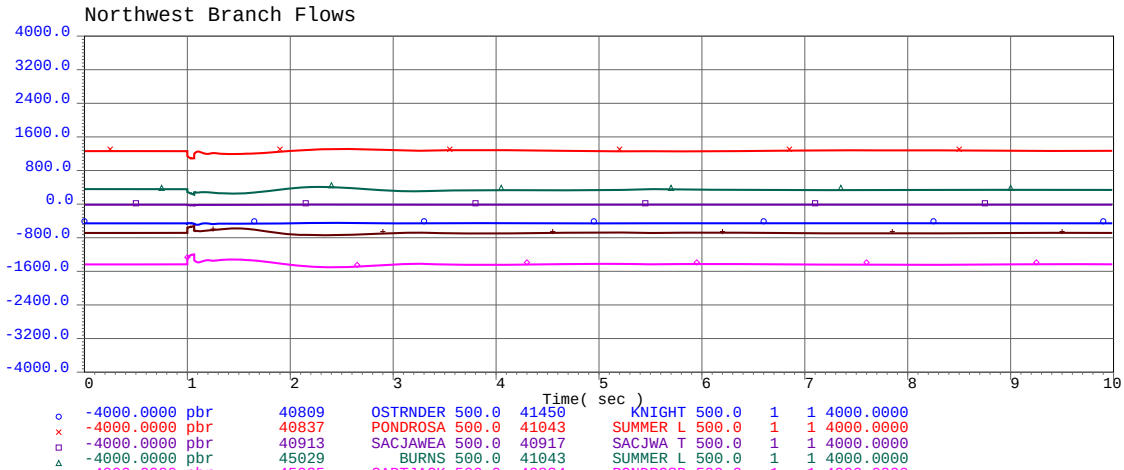
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

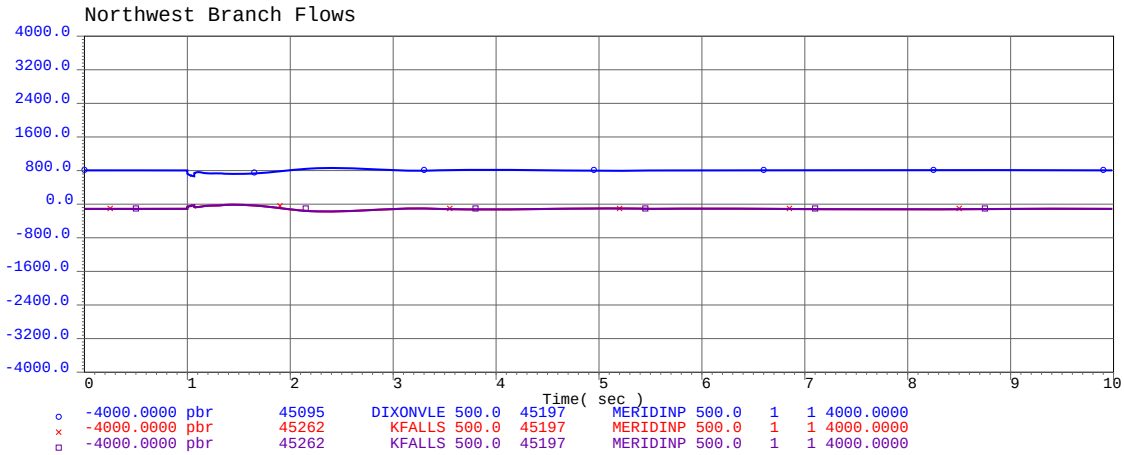
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



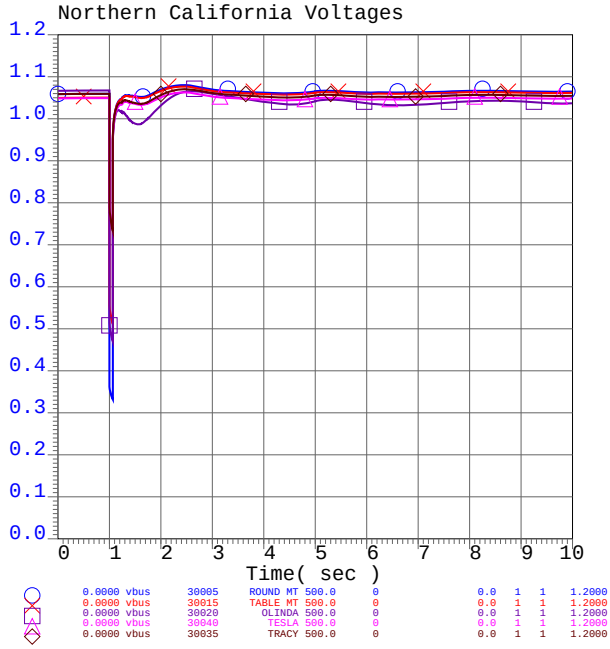
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

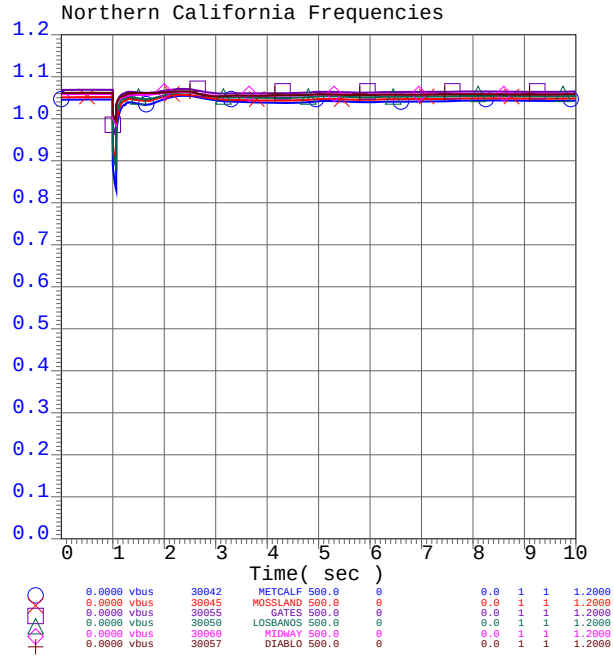


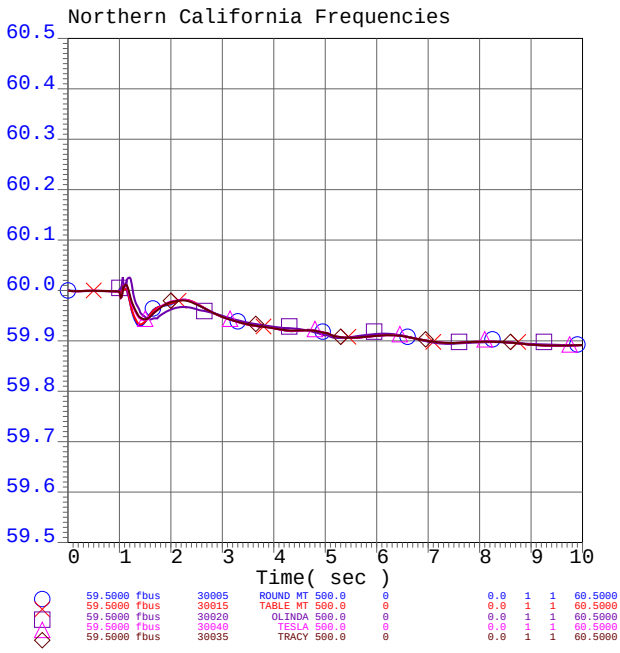
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

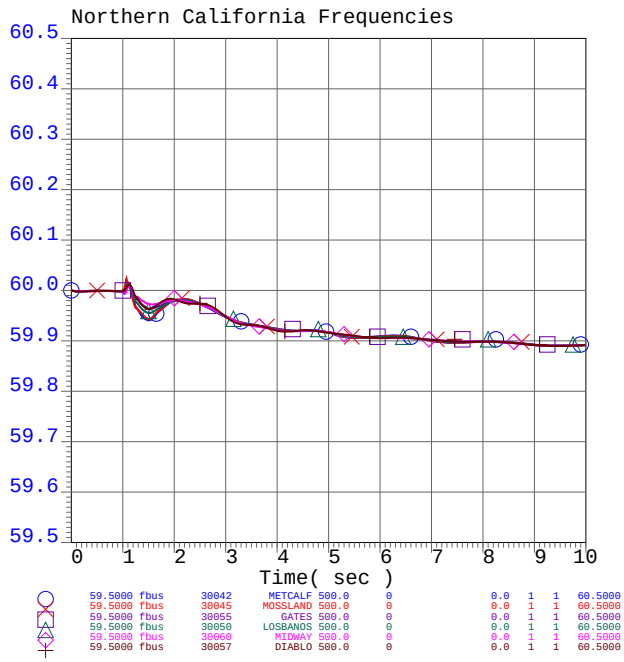
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #3 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES



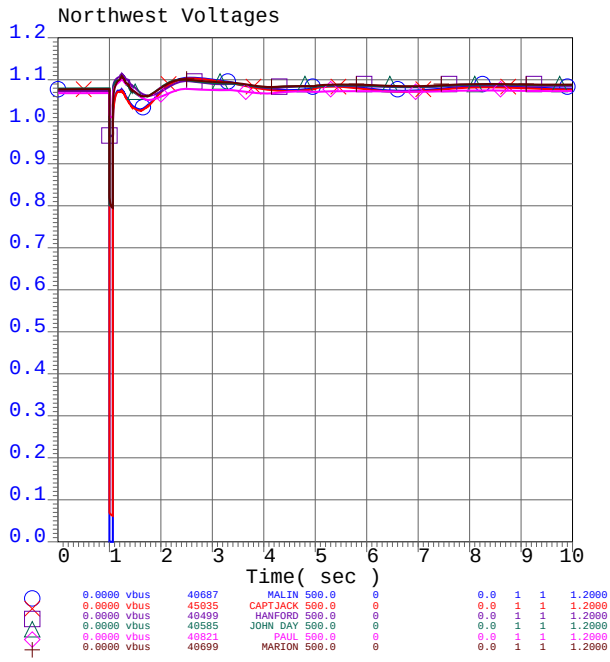


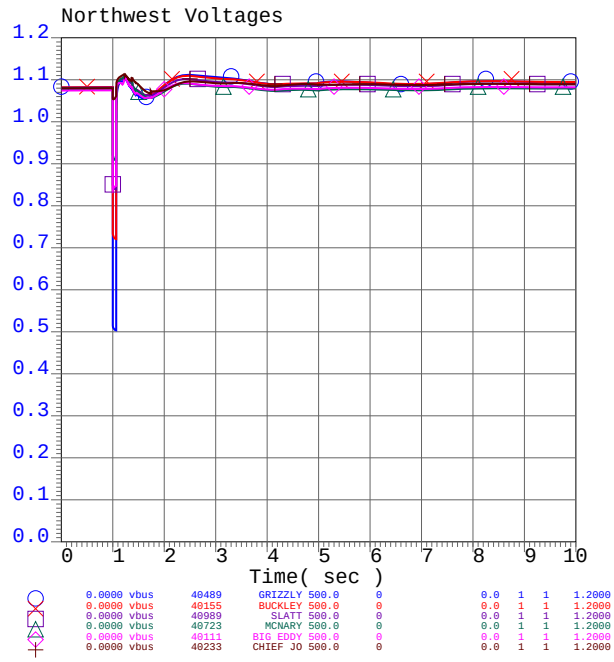


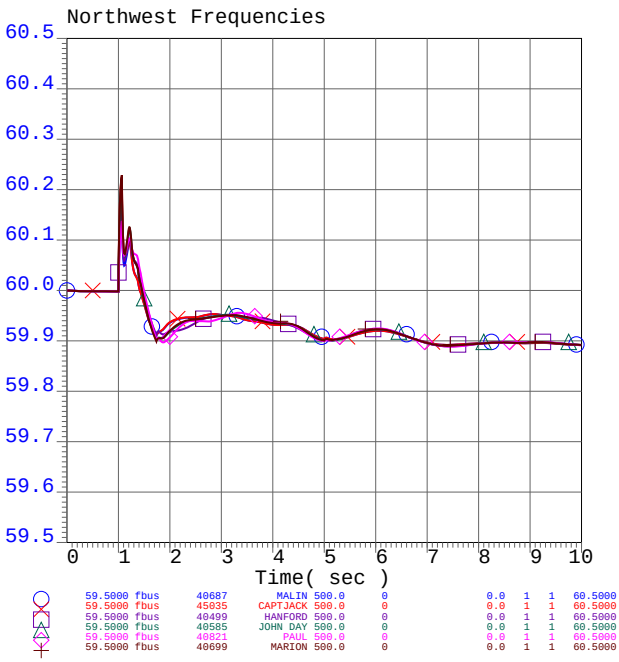


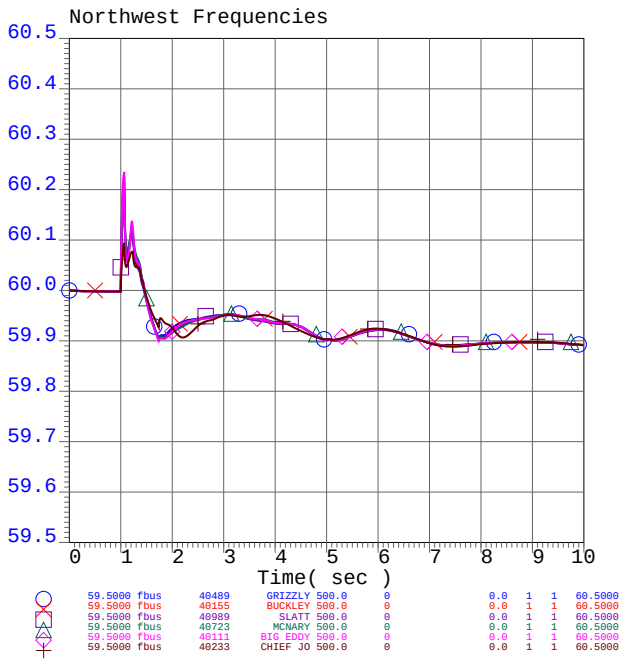
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Malin 500 kV
followed by loss of Malin-Round Mountain #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



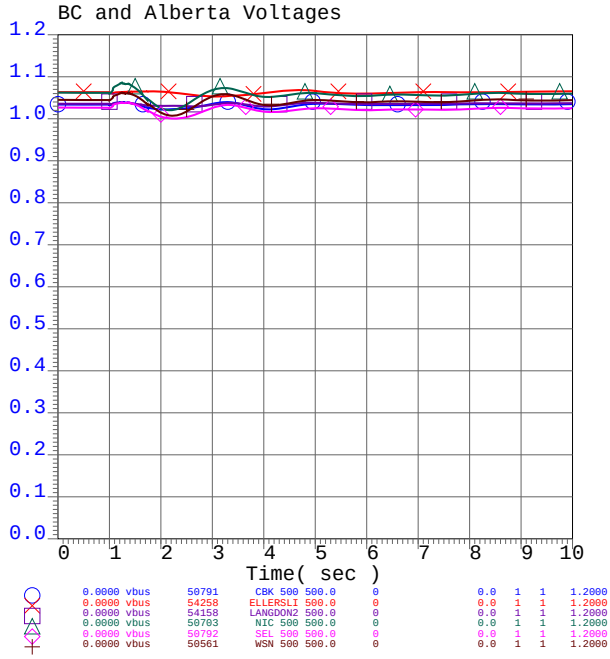


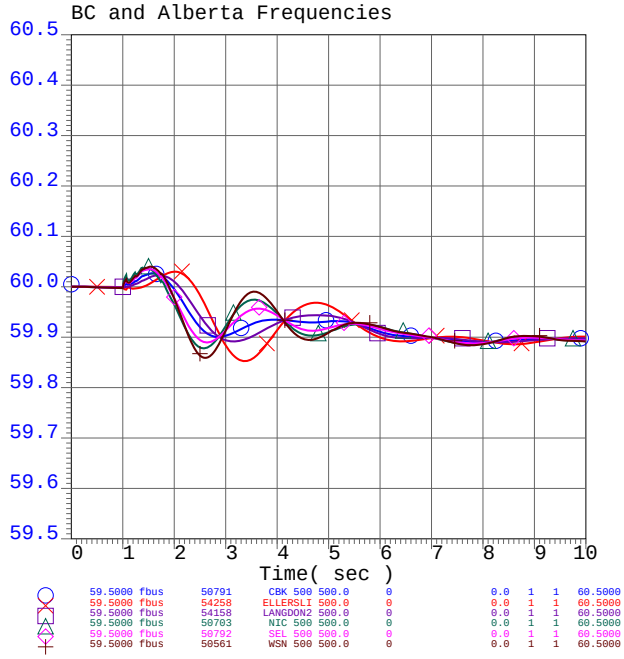


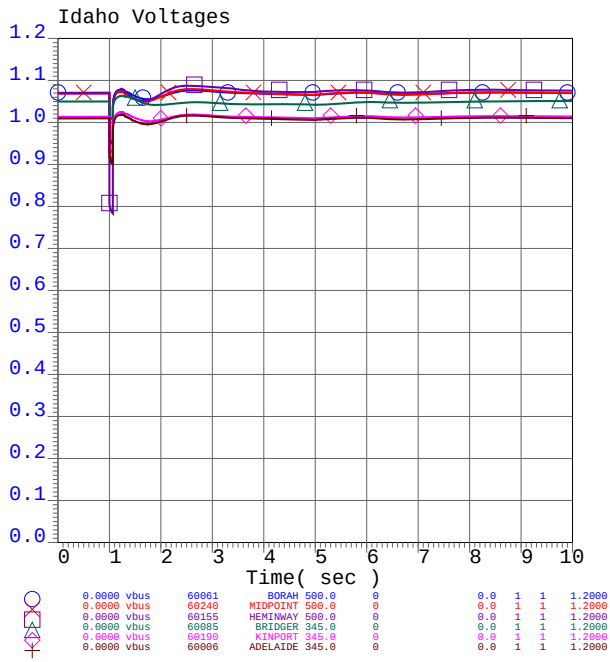


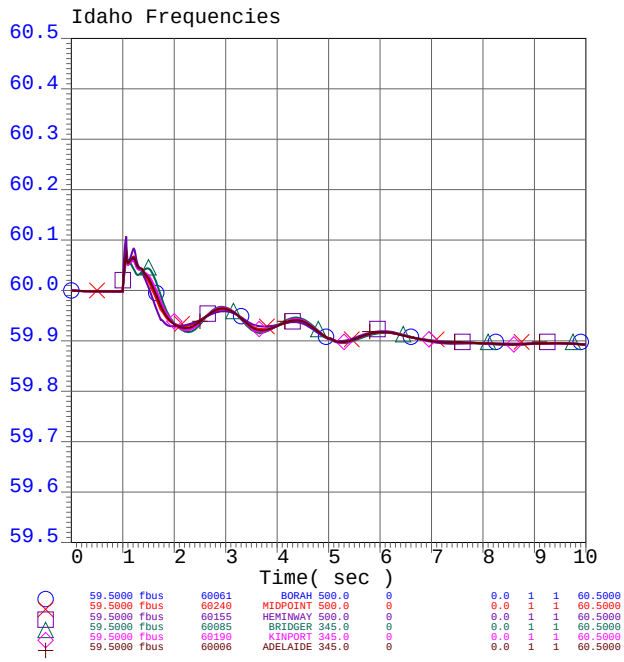
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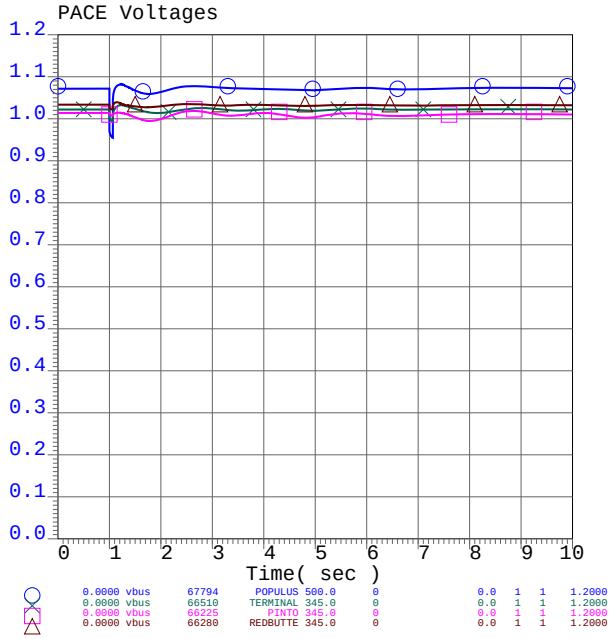


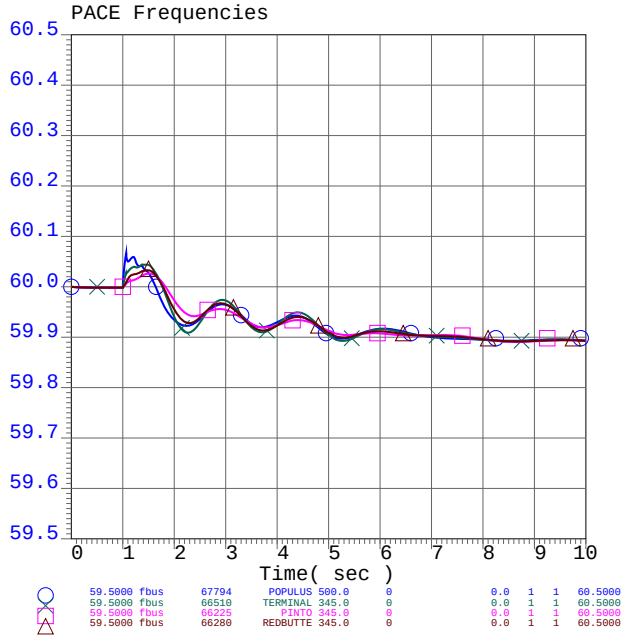


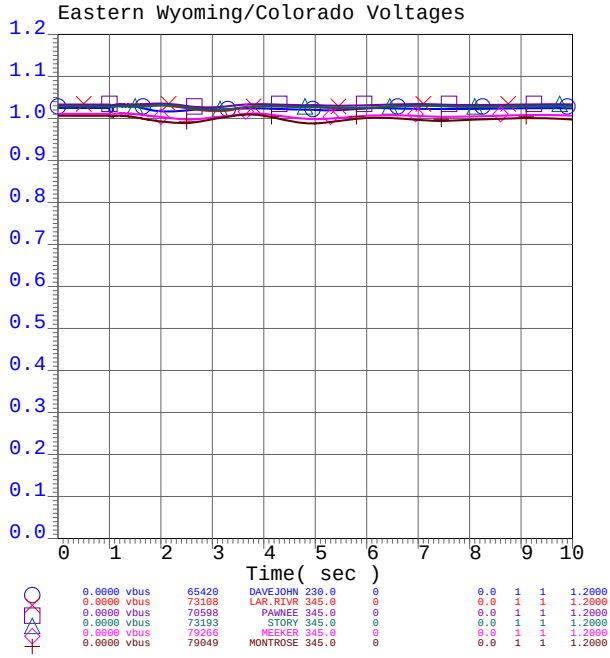


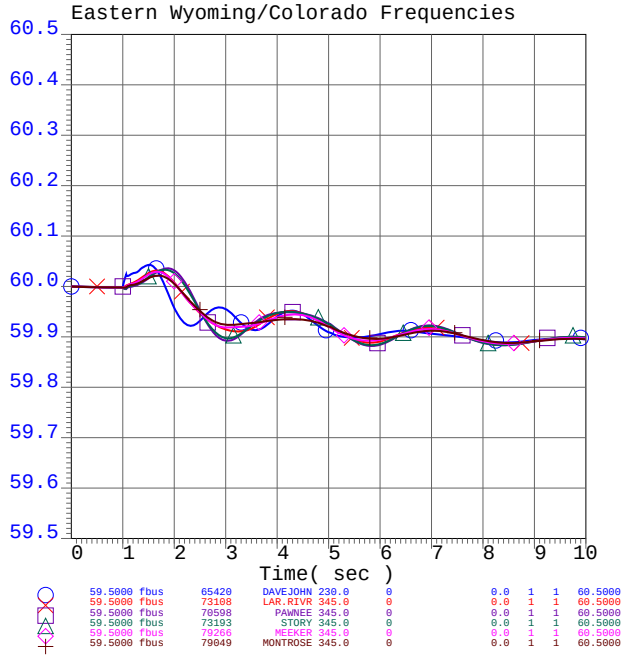
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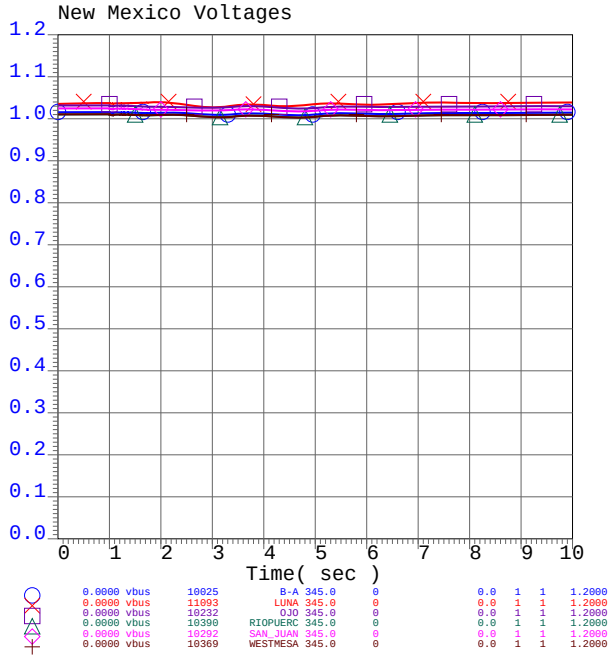


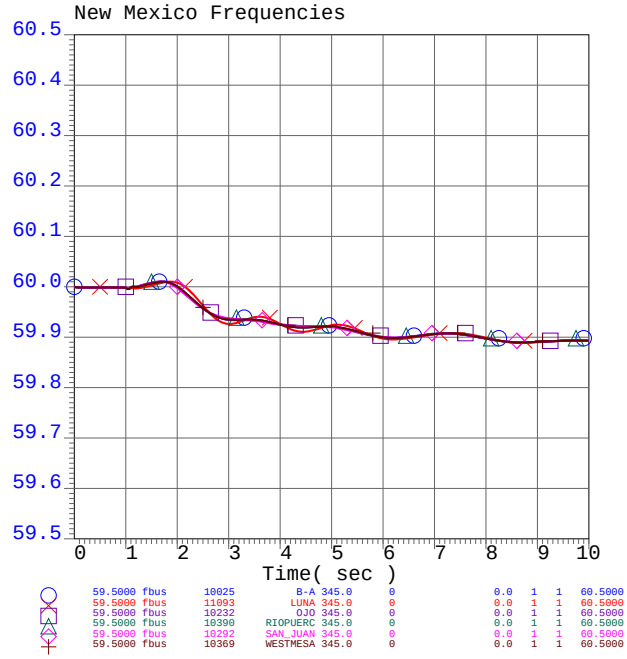


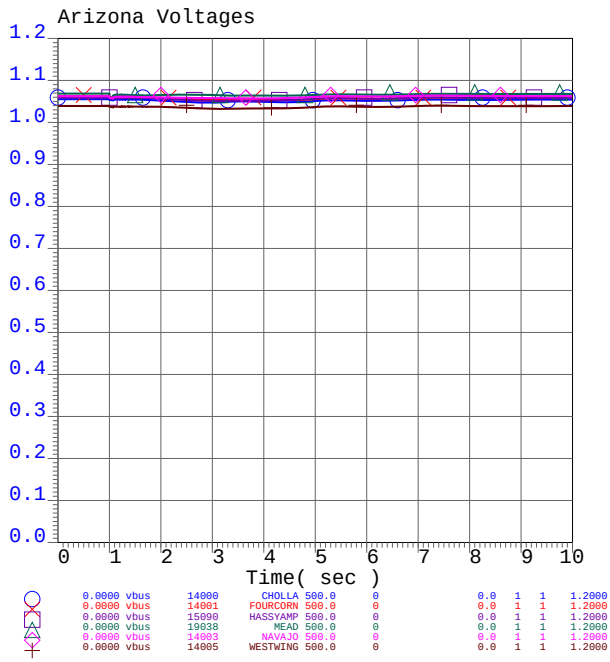


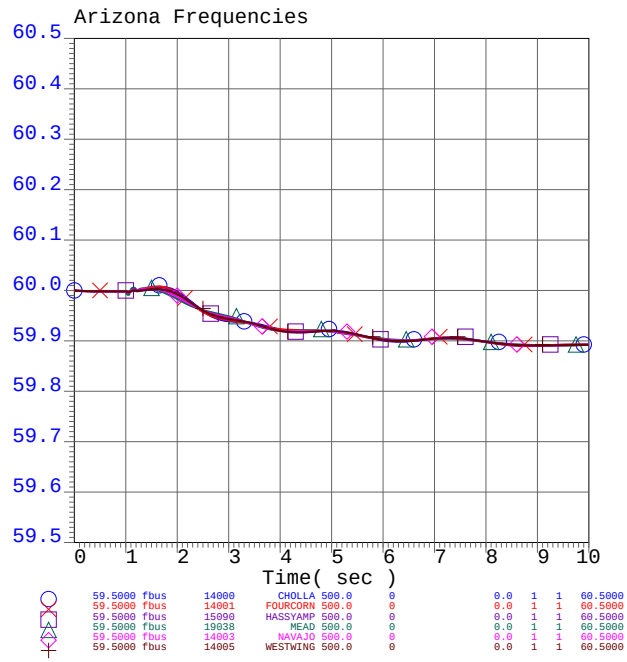
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WECC AREA VOLTAGE AND FREQUENCIES



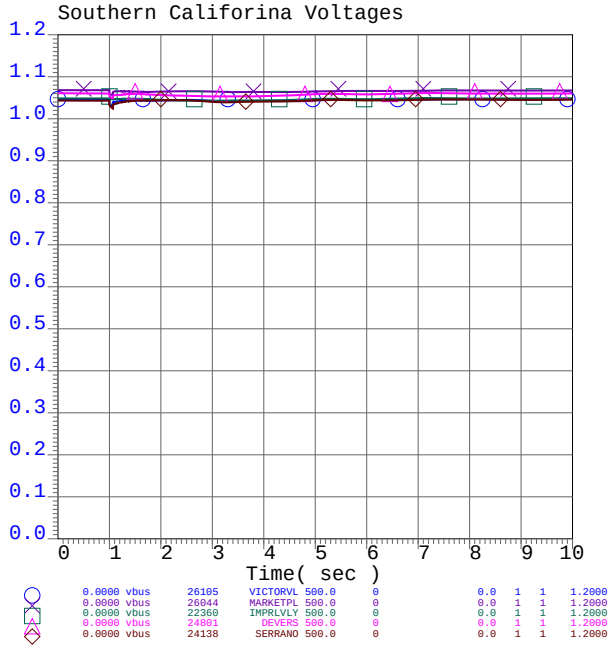


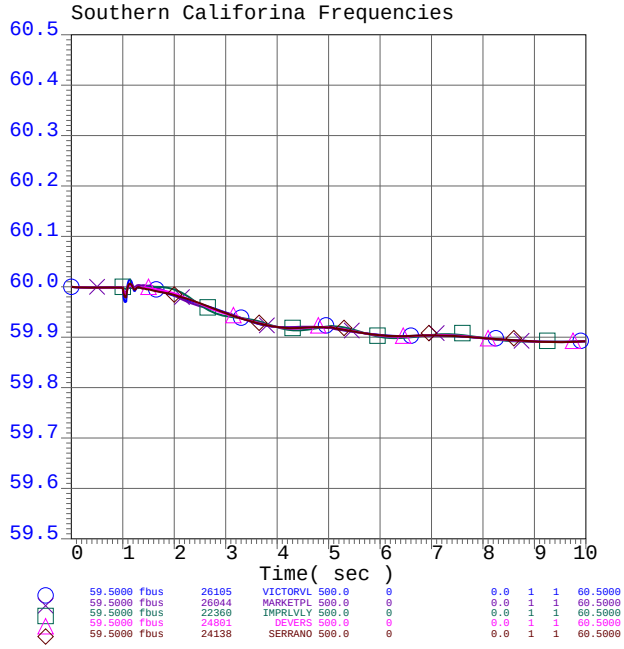


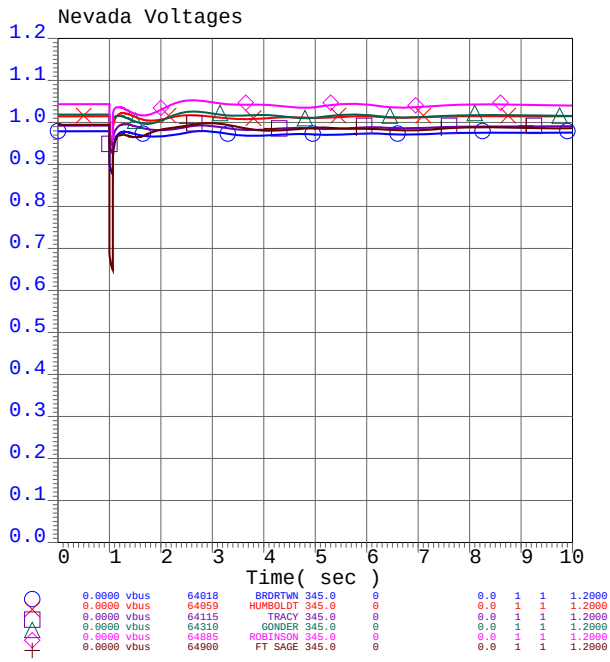


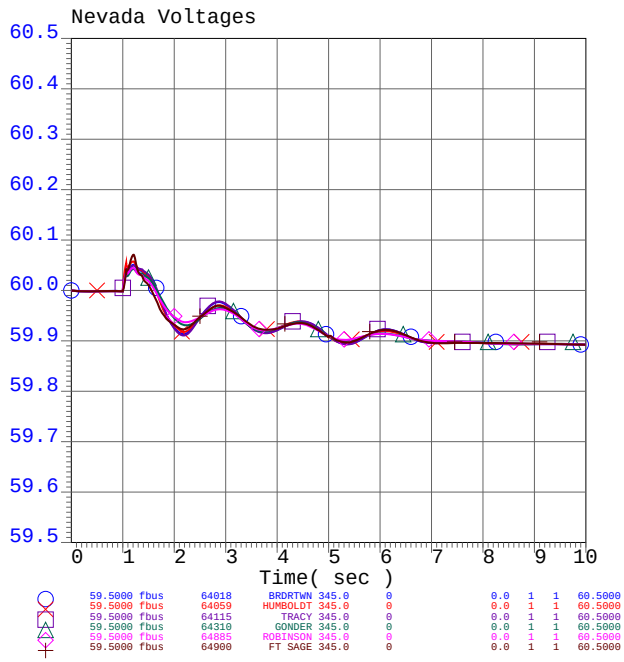
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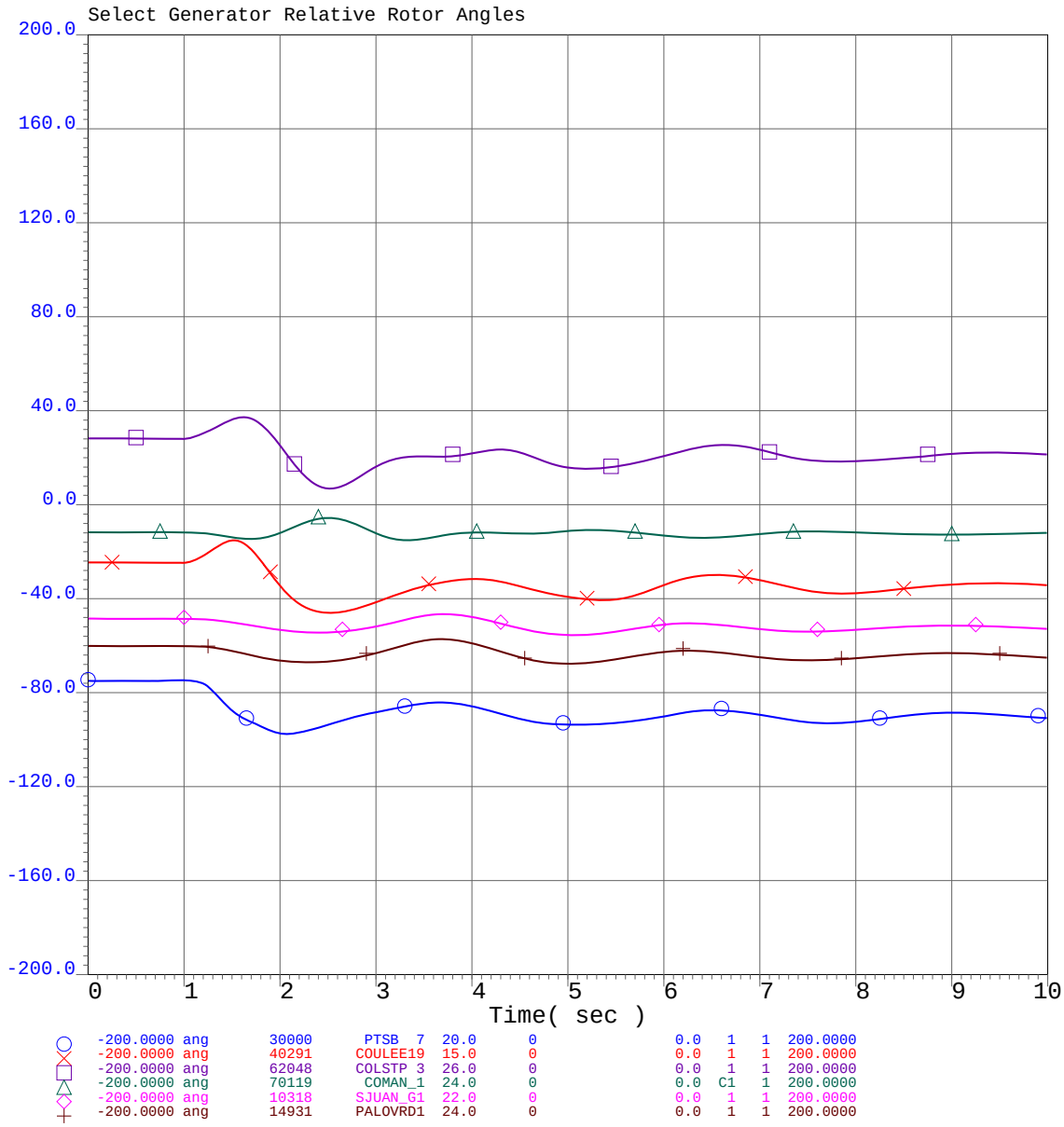






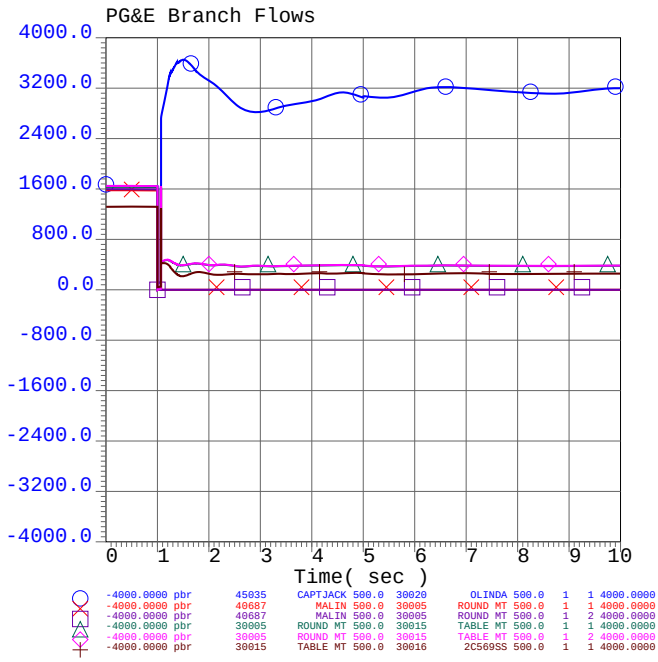
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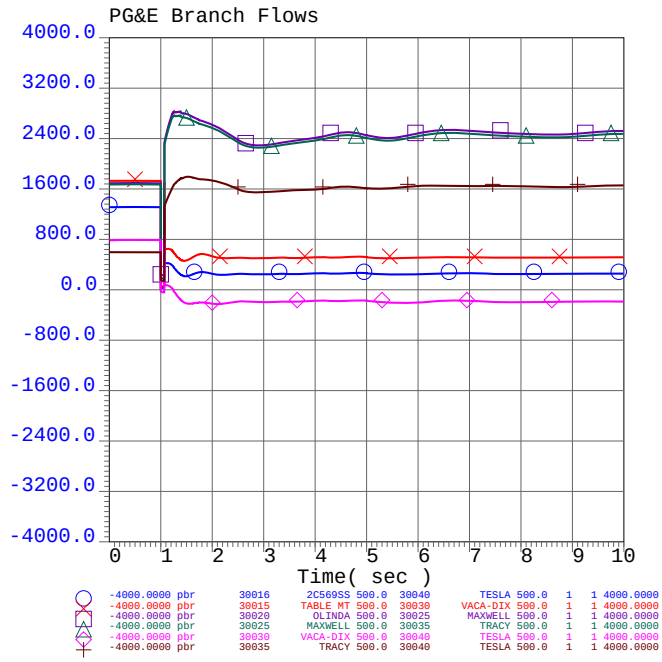
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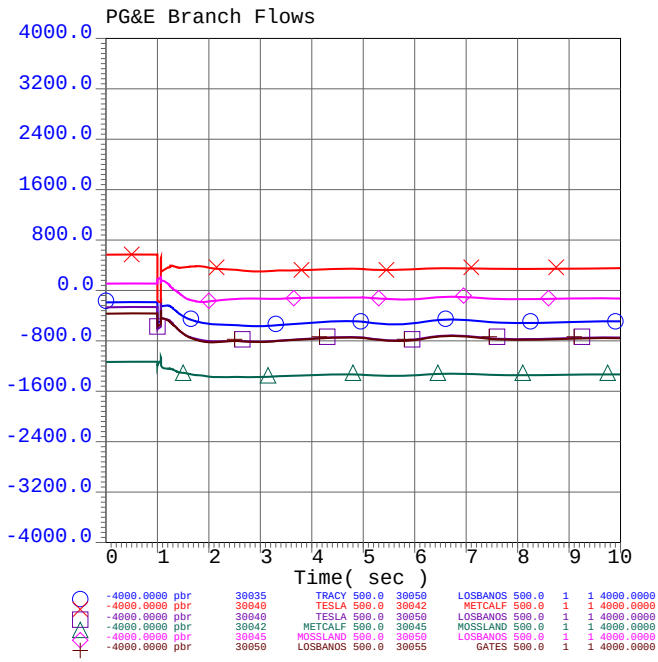


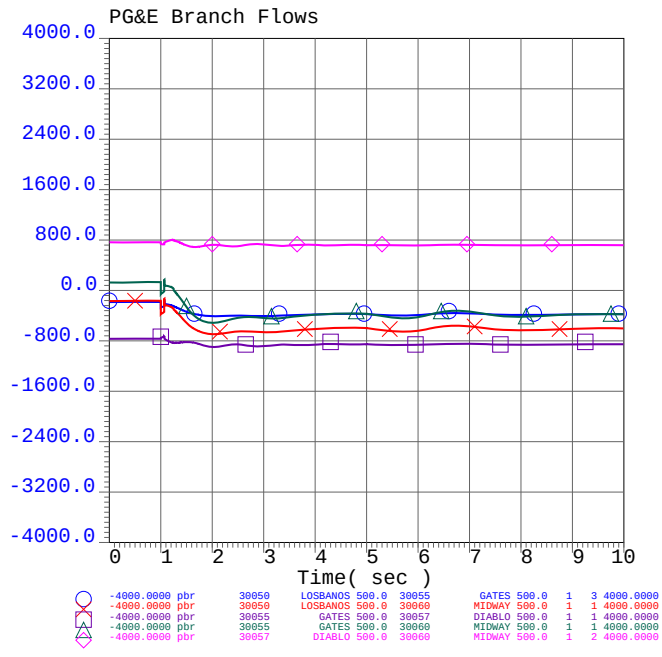
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3-phase 4 cycle fault at Malin 500 kV
followed by loss of Malin-Round Mountain #1 and #2 500 kV lines

SELECT BRANCH FLOWS



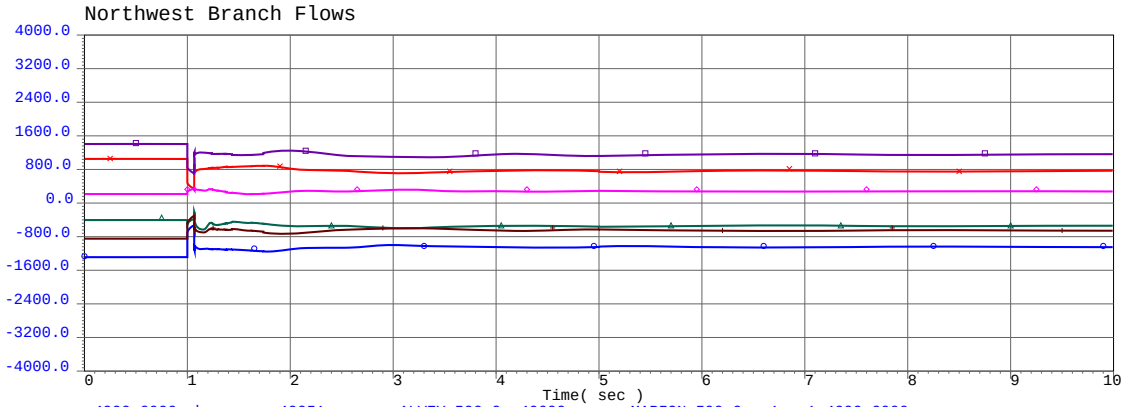




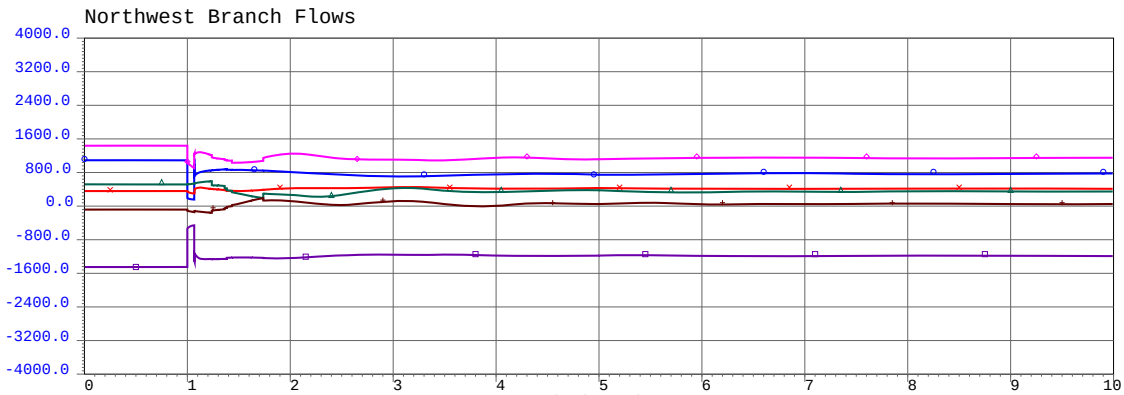


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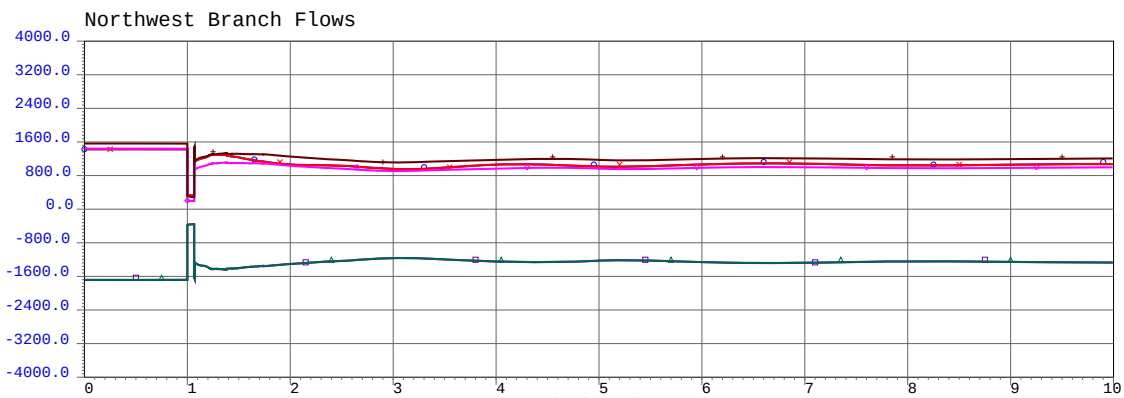
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
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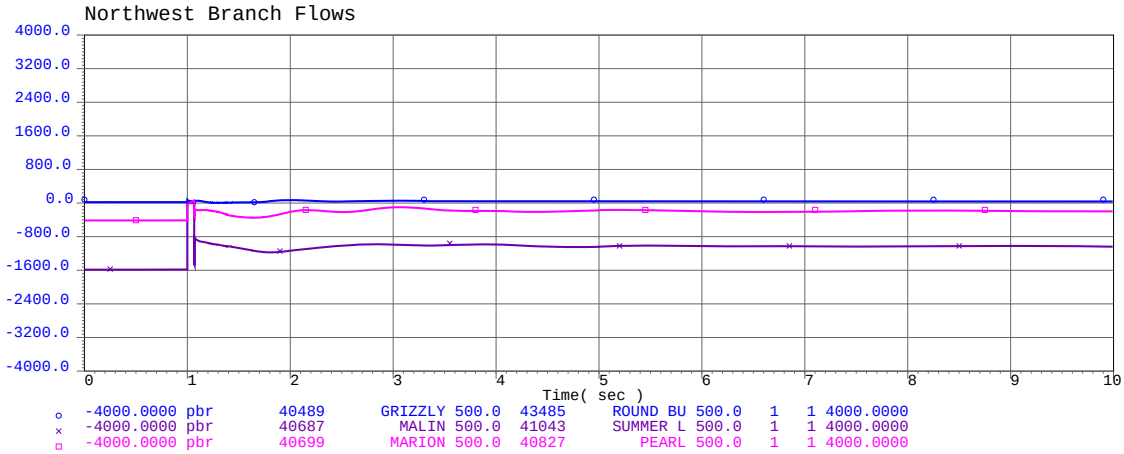
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-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
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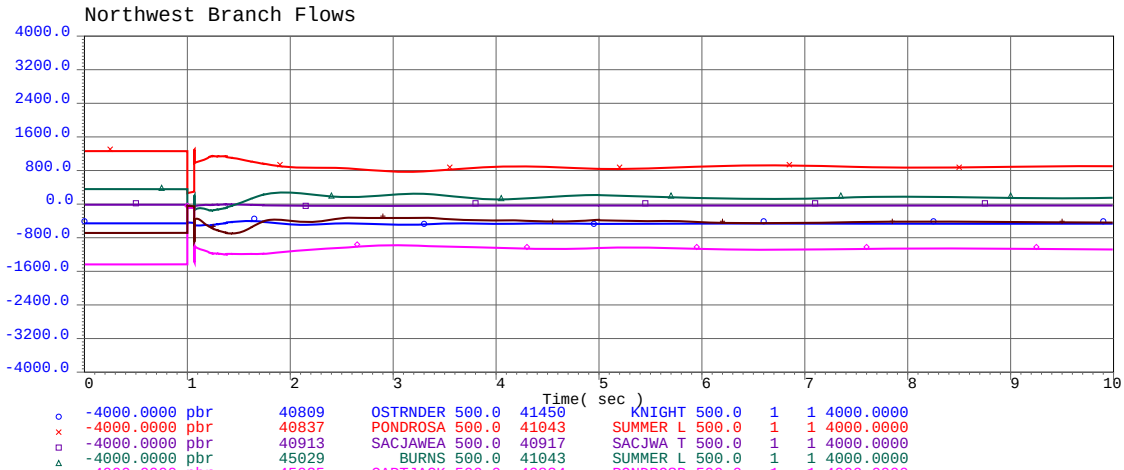
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-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Malin 500 kV
followed by loss of Malin-Round Mountain #1 and #2 500 kV lines

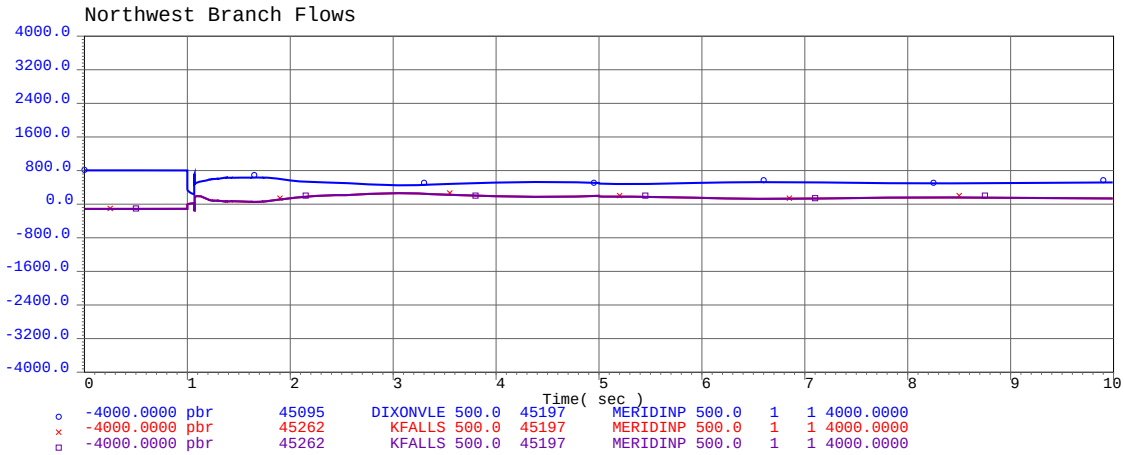
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



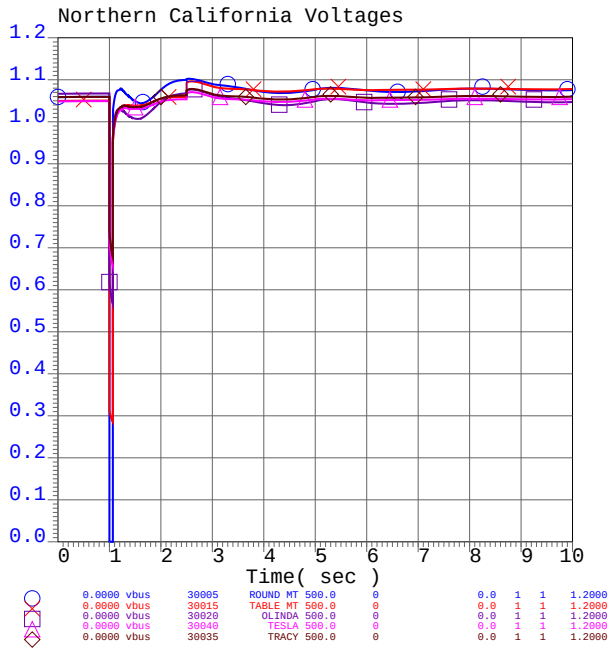
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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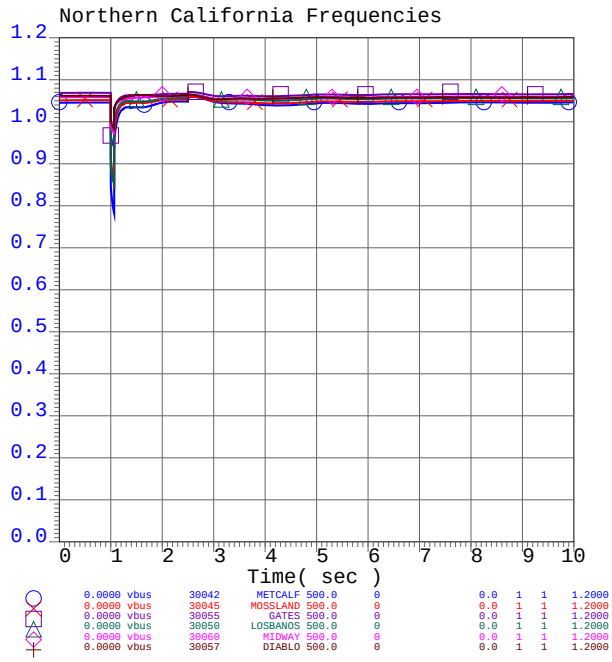


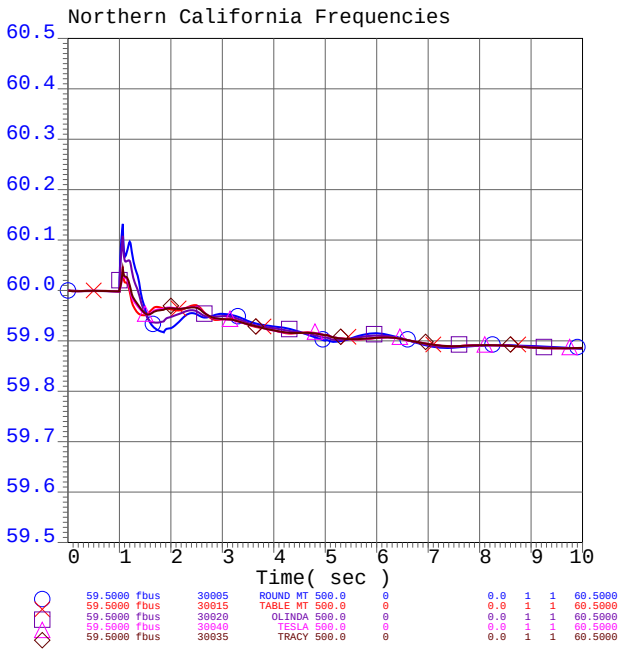
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

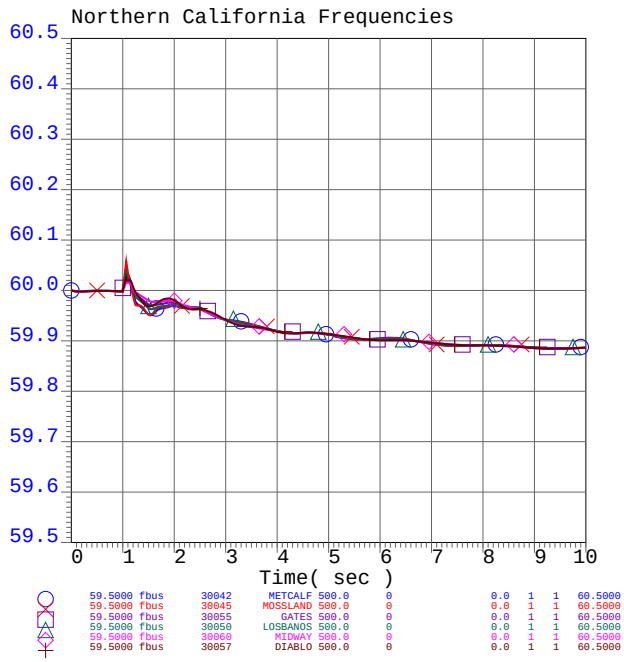
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3-phase 4 cycle fault at Malin 500 kV
followed by loss of Malin-Round Mountain #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES







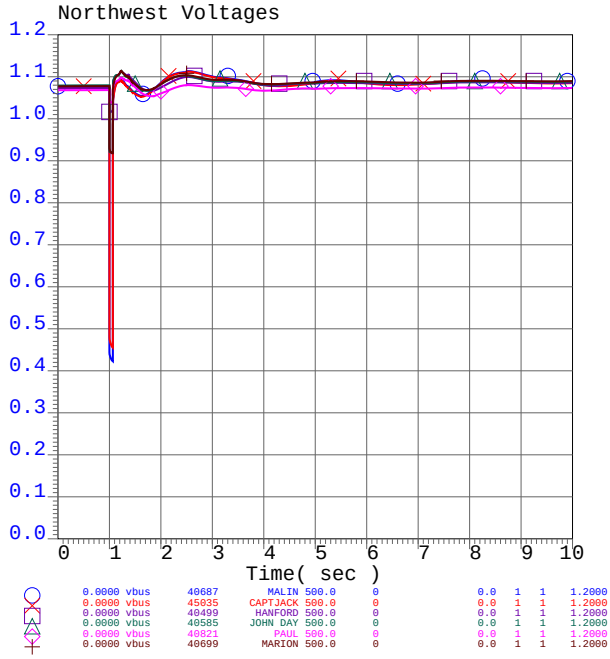


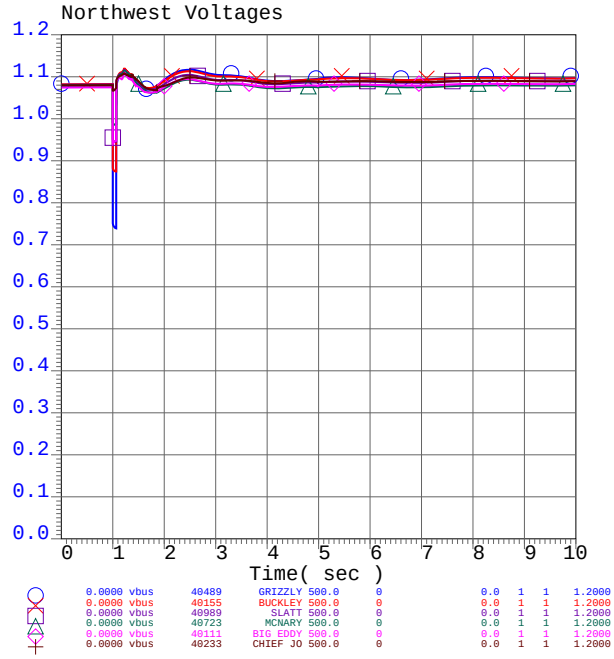
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 and #2 500 kV lines

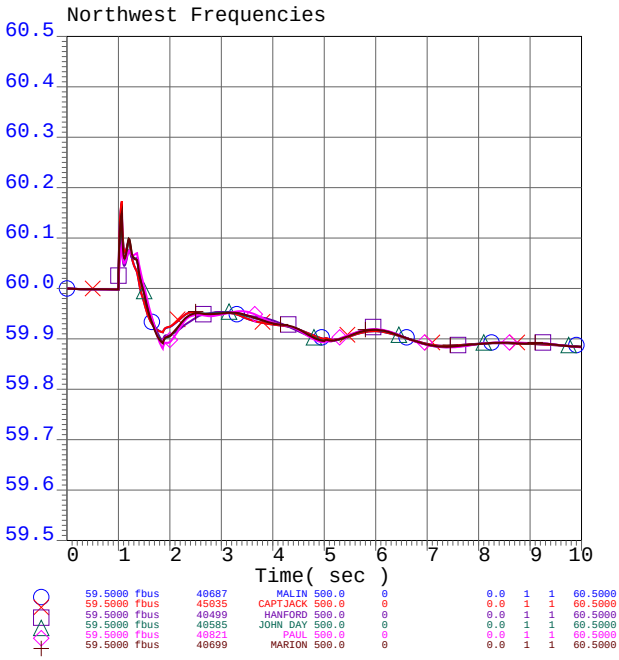
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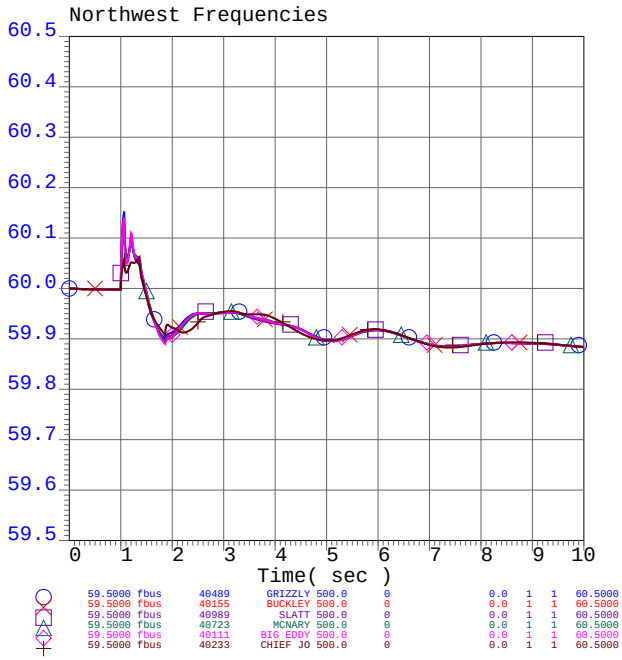
Fri Jan 03 18:52:59 2014

WECC AREA VOLTAGE AND FREQUENCIES



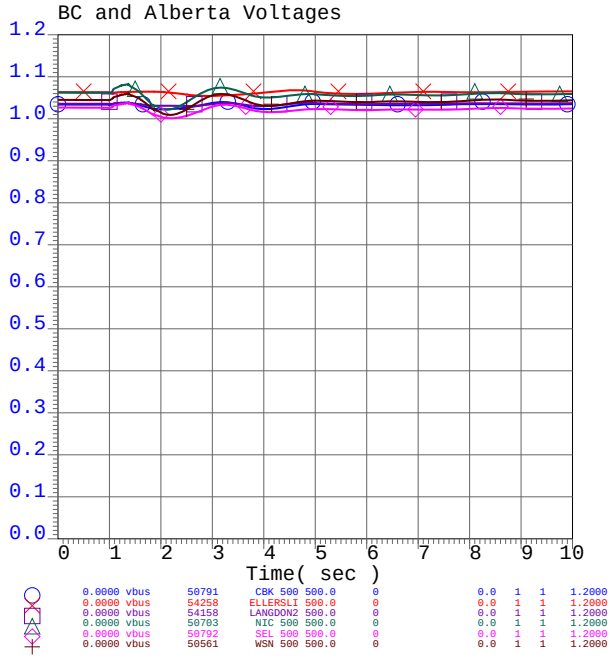


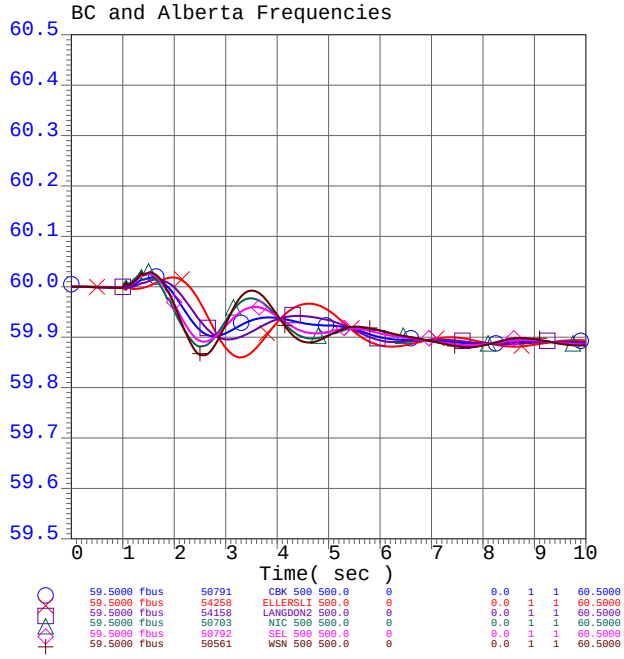


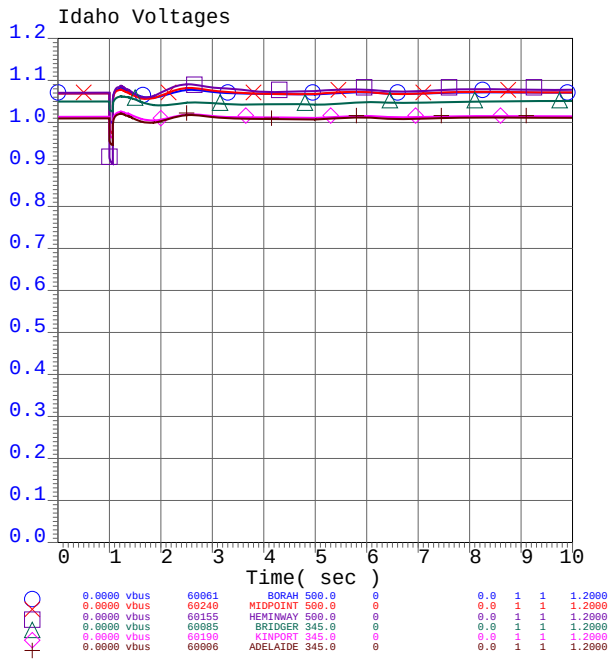


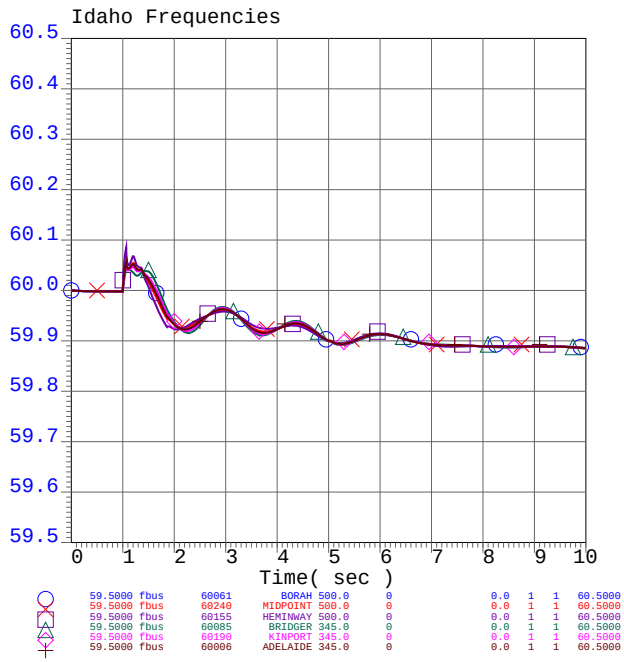
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3-phase 4 cycle fault at Round Mountain 500 kV
followed by loss of Round Mountain-Table Mountain #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



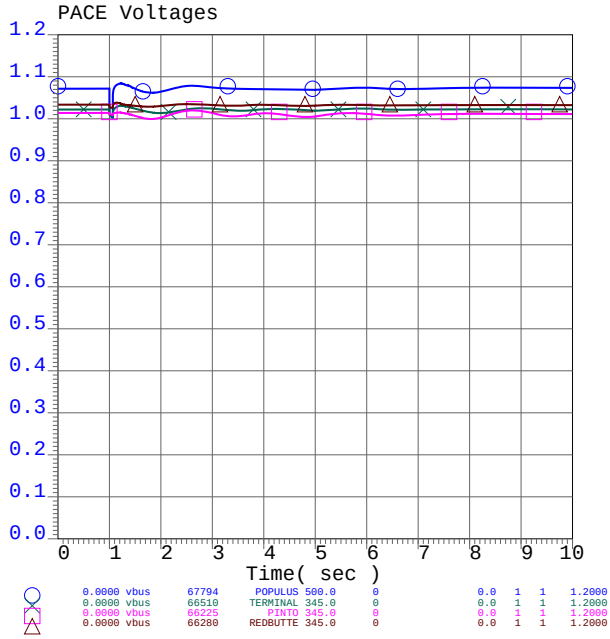


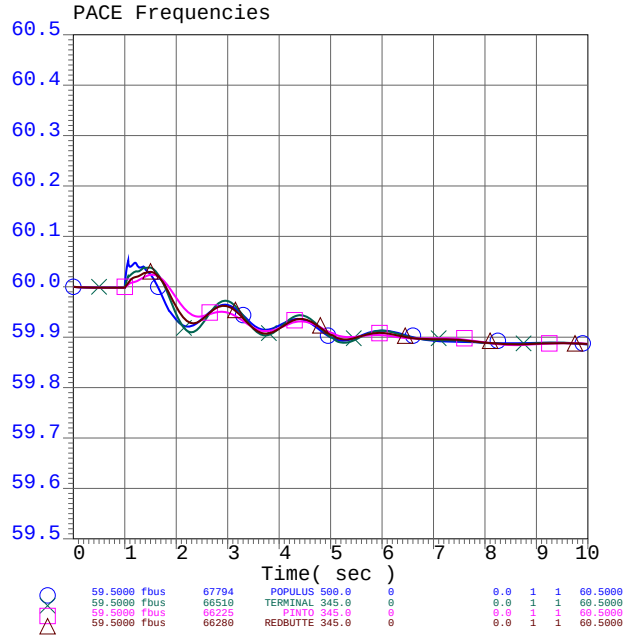


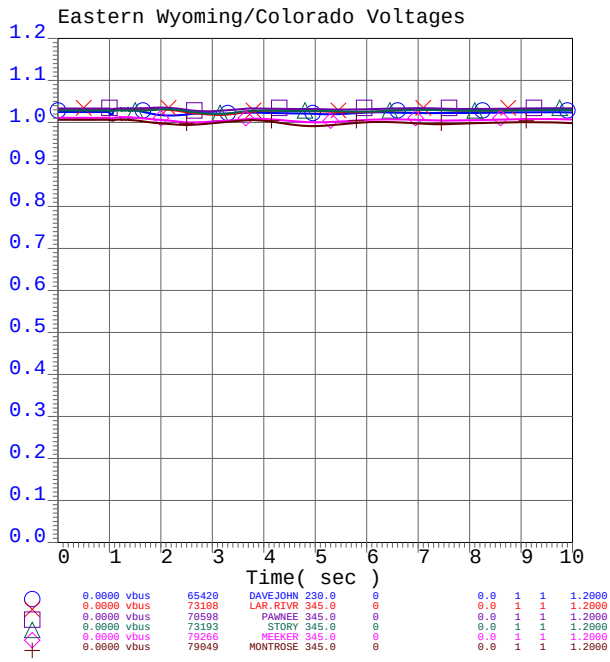


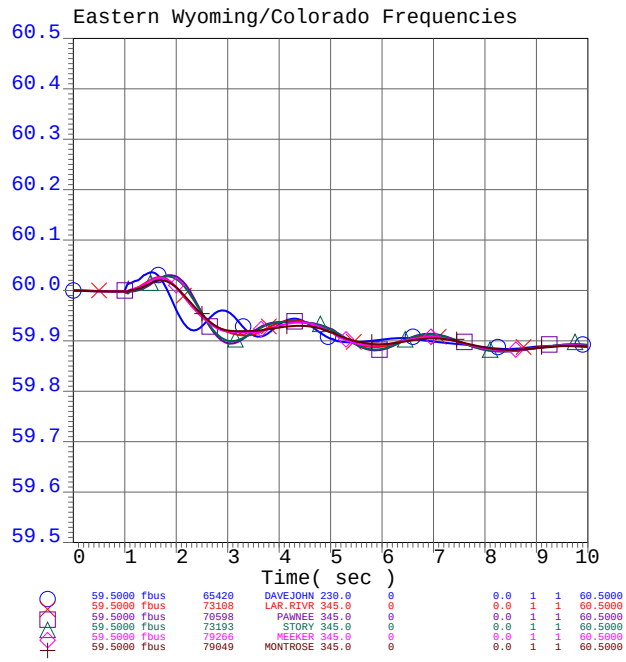
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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followed by loss of Round Mountain-Table Mountain #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES





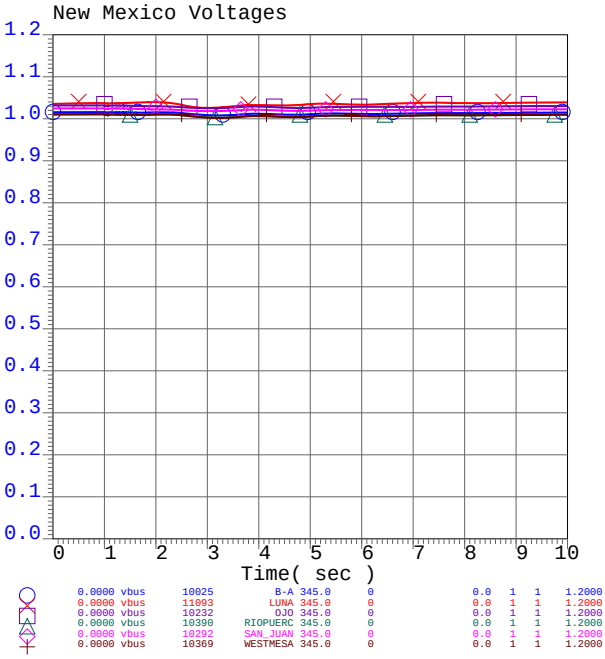




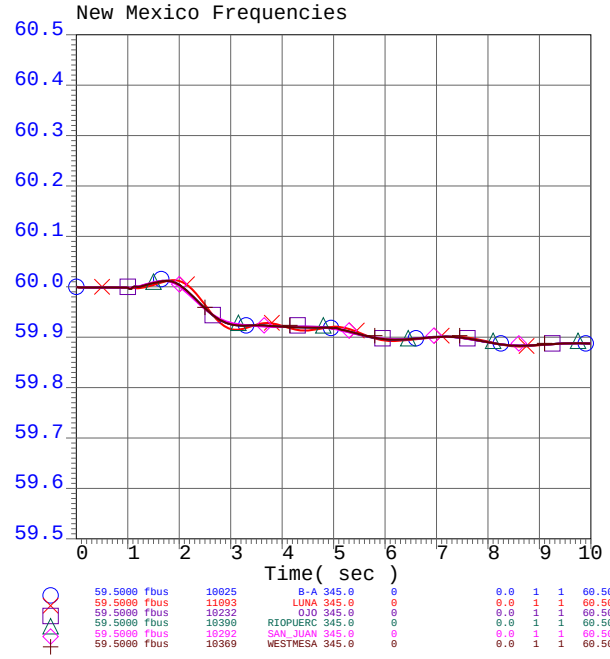
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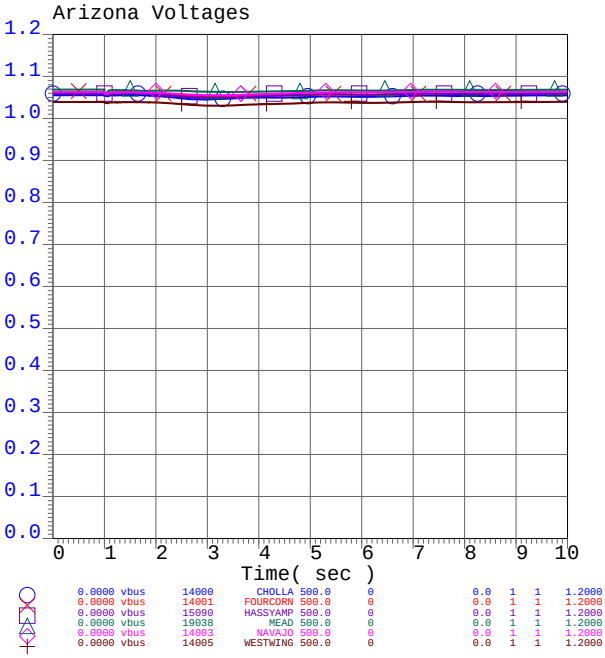
New Mexico Voltages



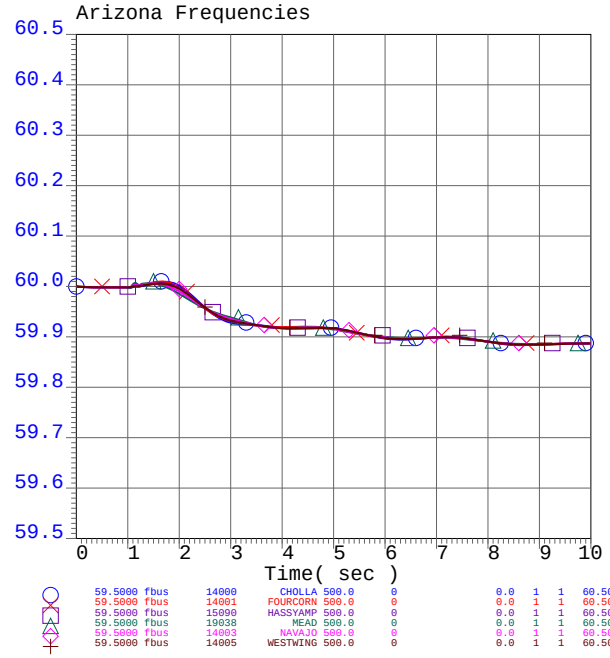
New Mexico Frequencies



Arizona Voltages

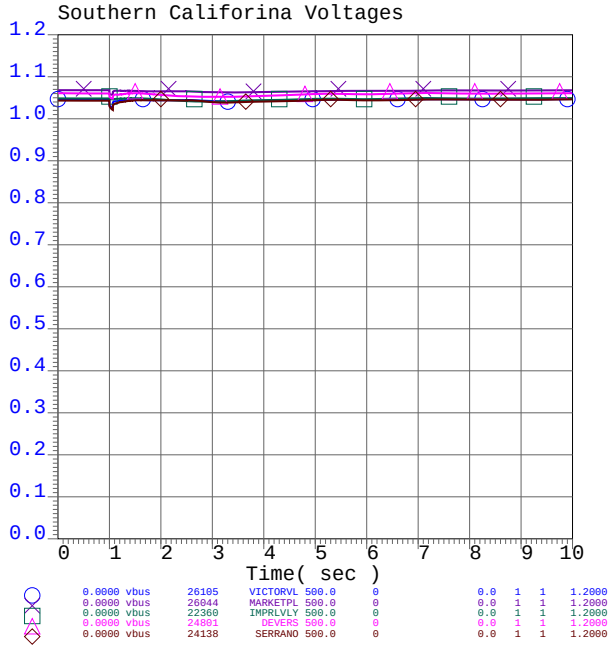


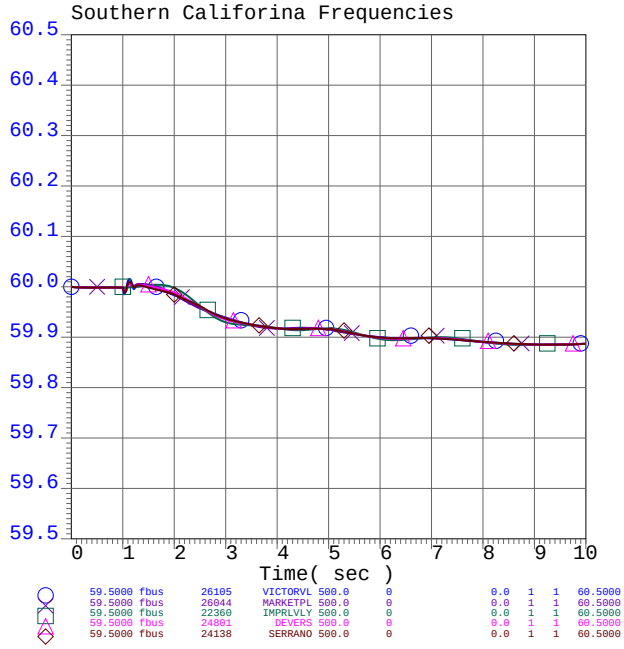
Arizona Frequencies

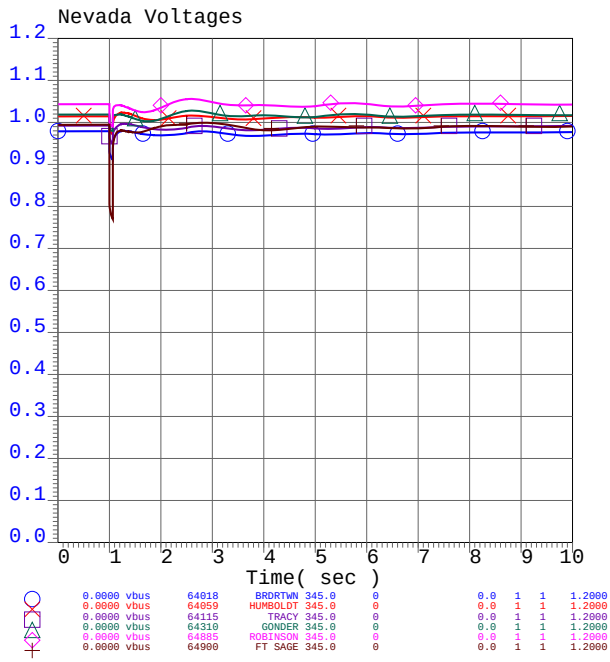


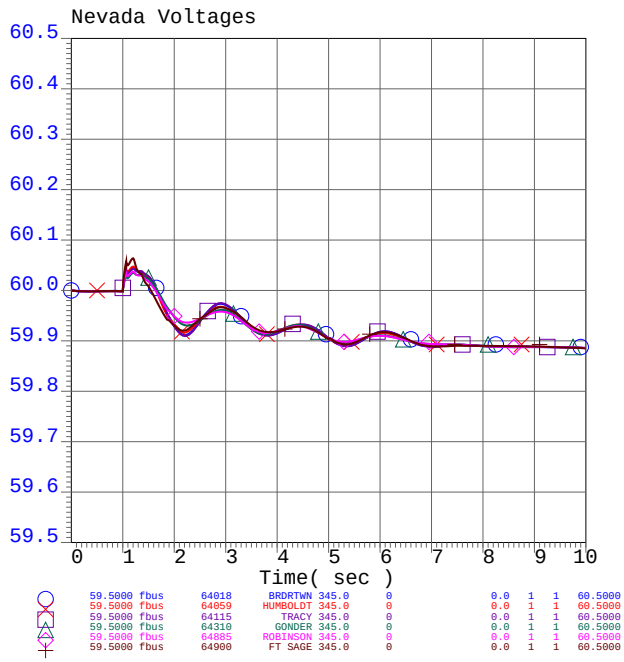
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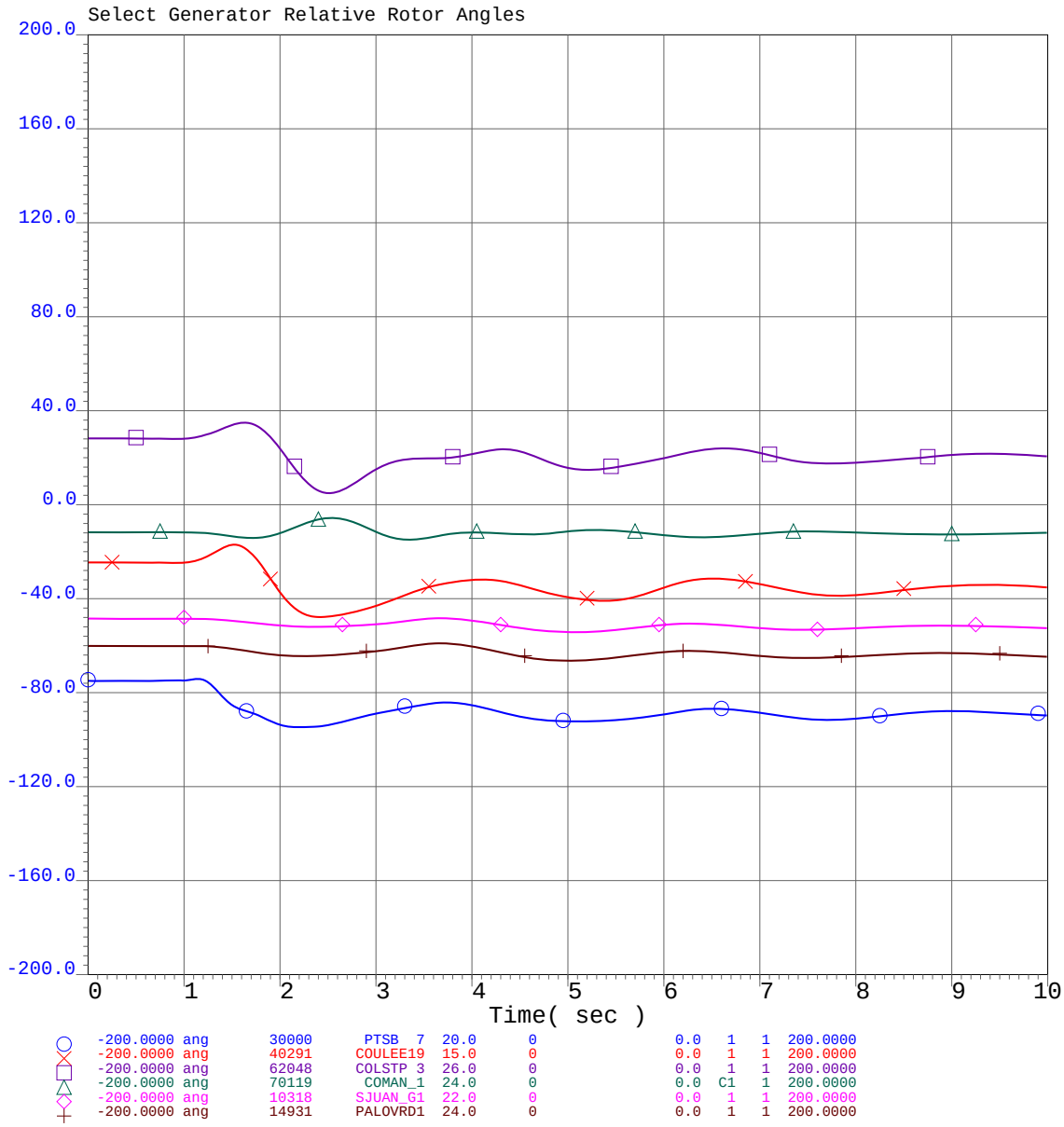






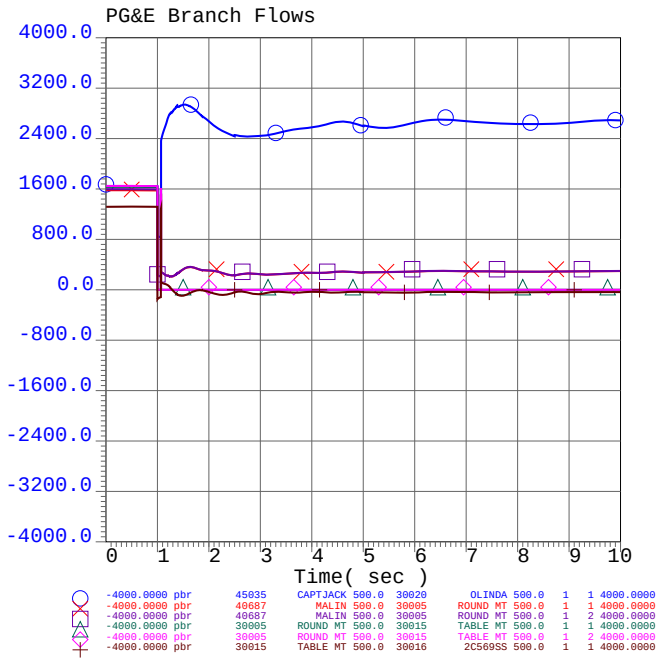
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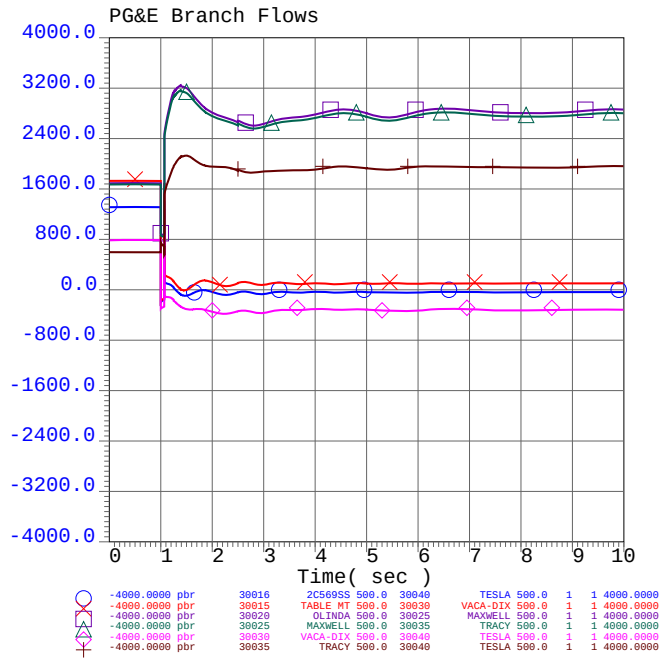
WECC RELATIVE ROTOR ANGLES

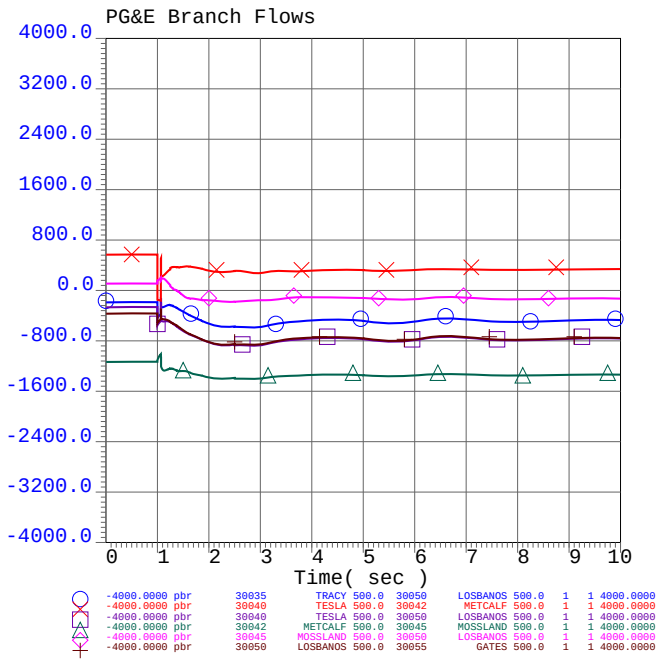


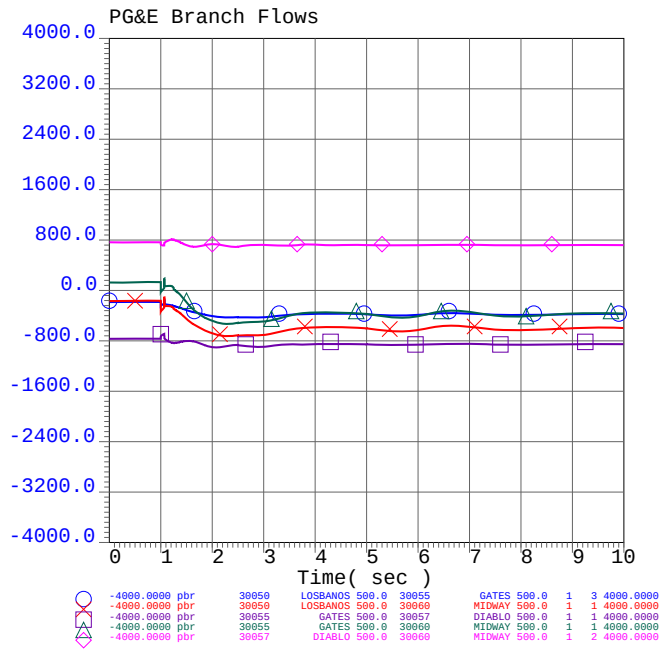
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SELECT BRANCH FLOWS



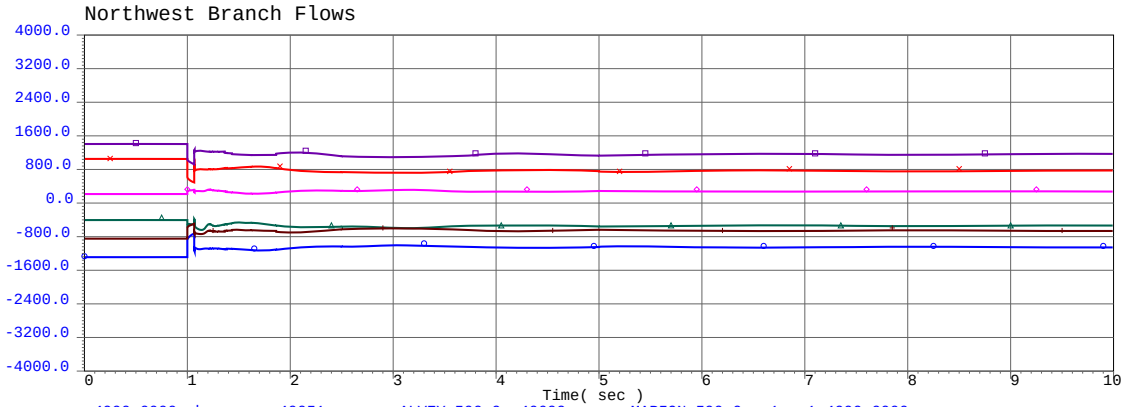




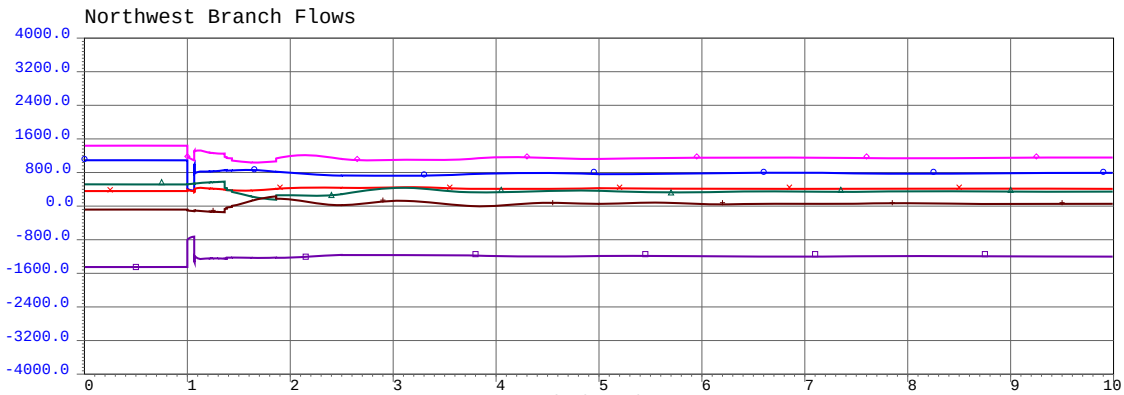


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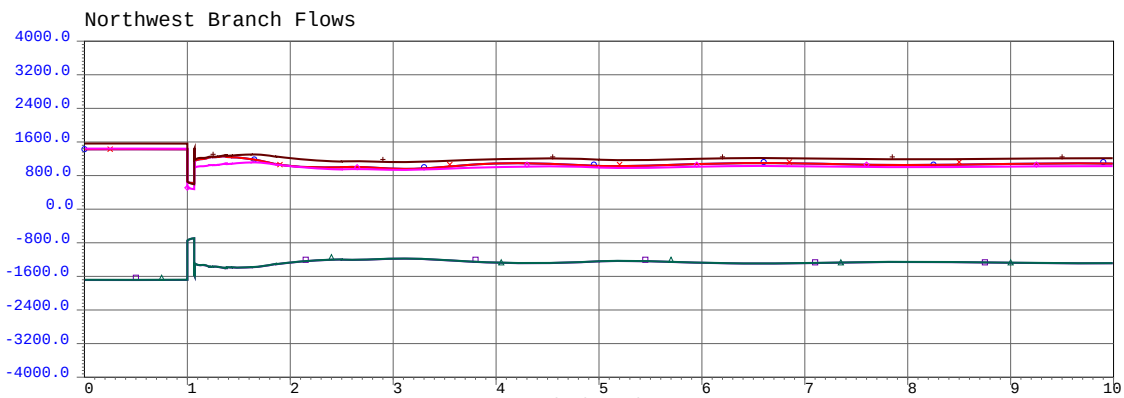
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



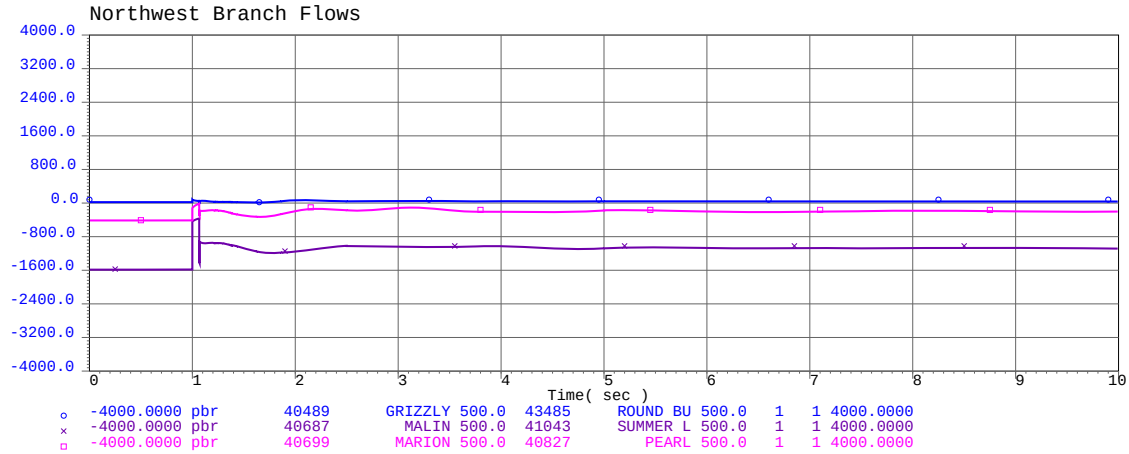
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-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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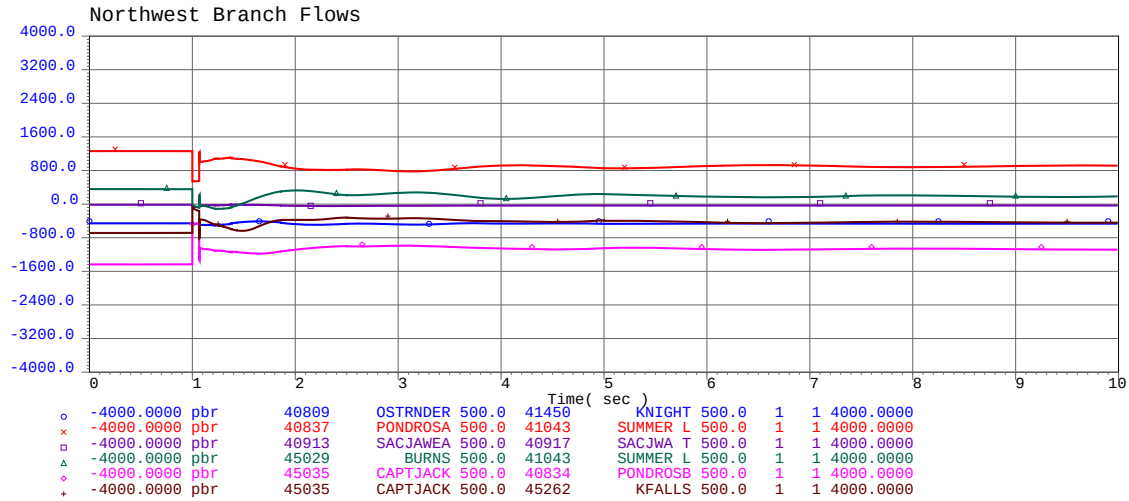
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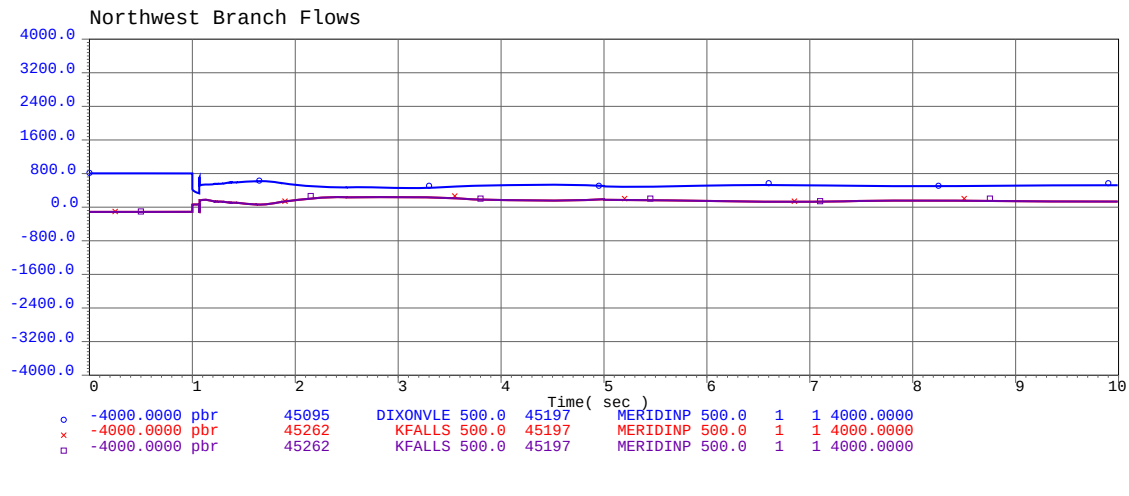
SELECT BRANCH FLOWS



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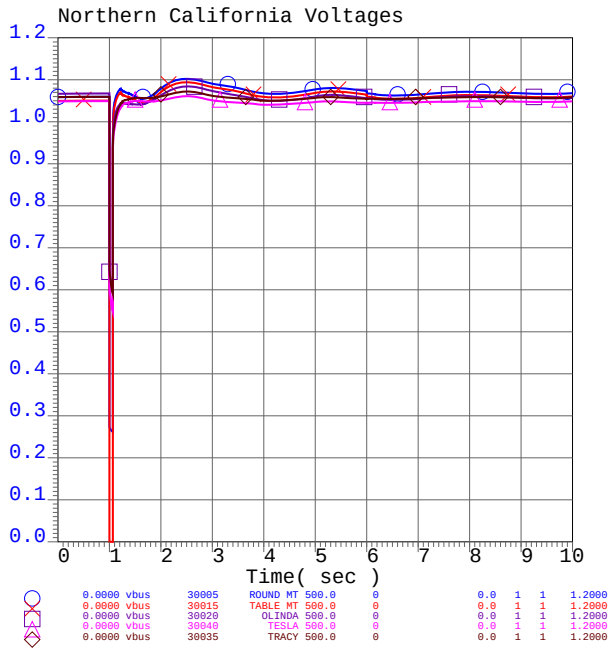
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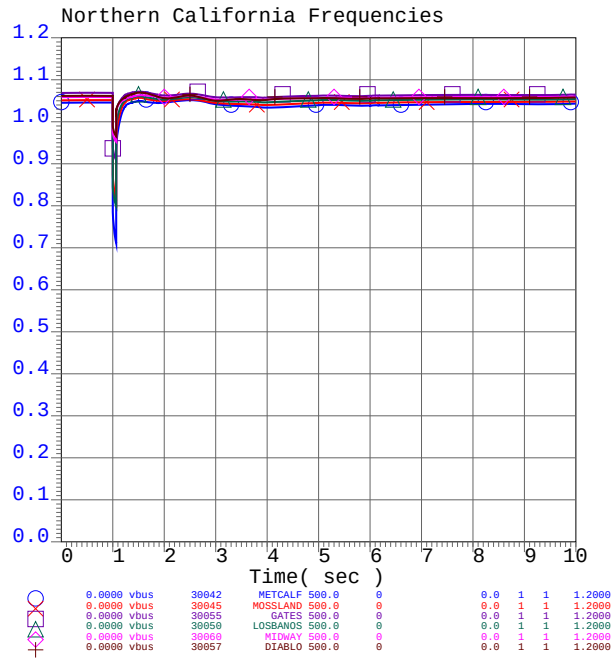


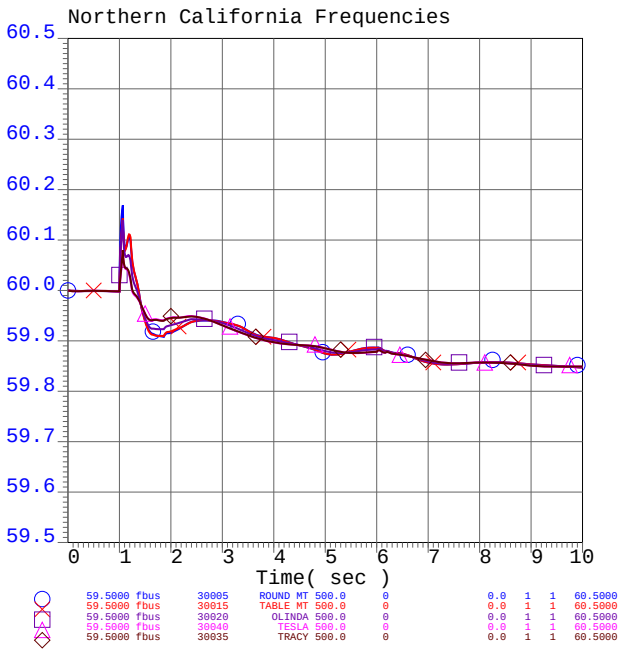
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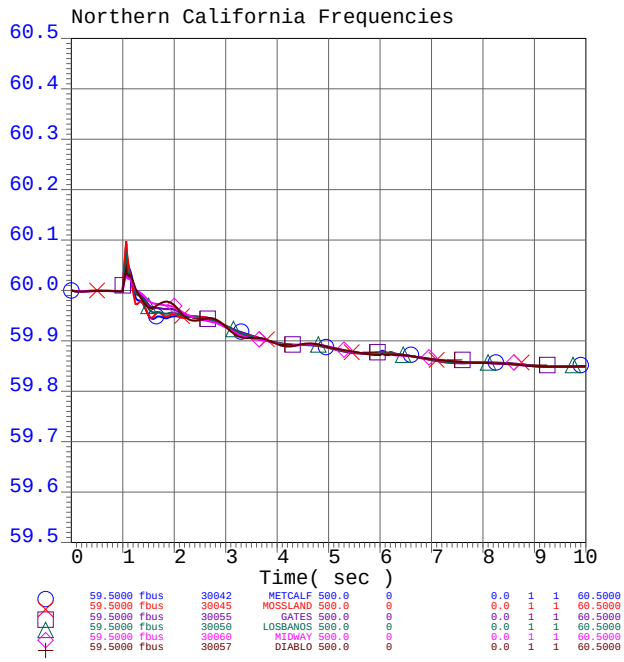
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WECC AREA VOLTAGE AND FREQUENCIES



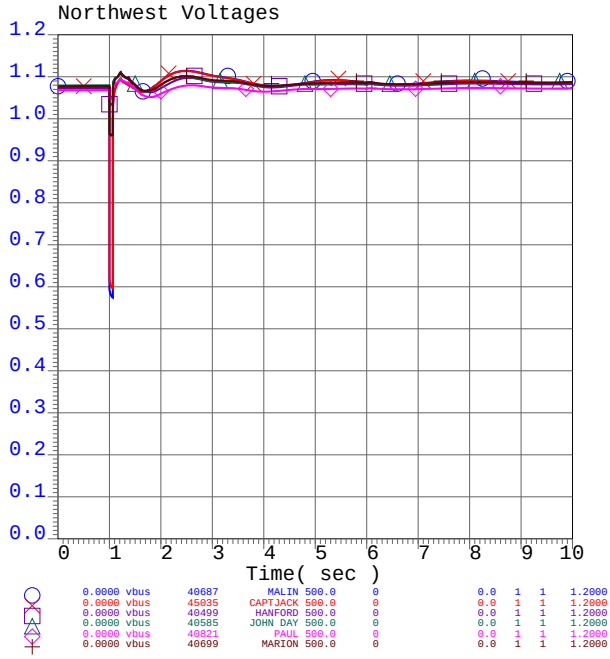


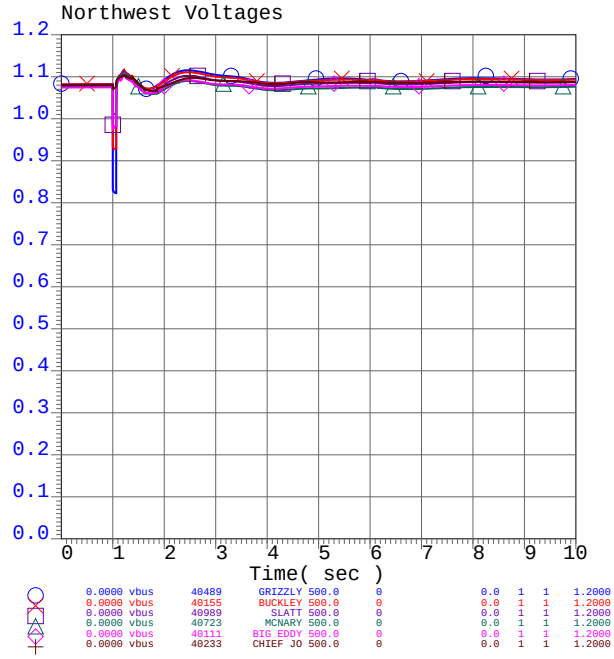


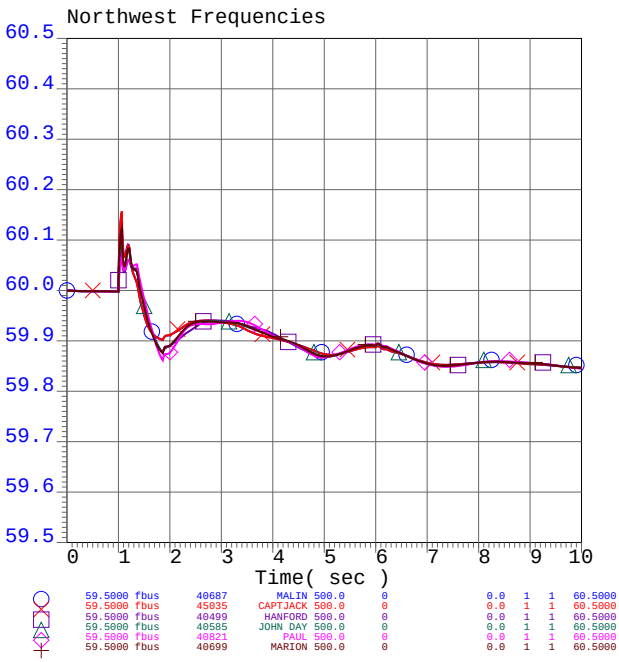


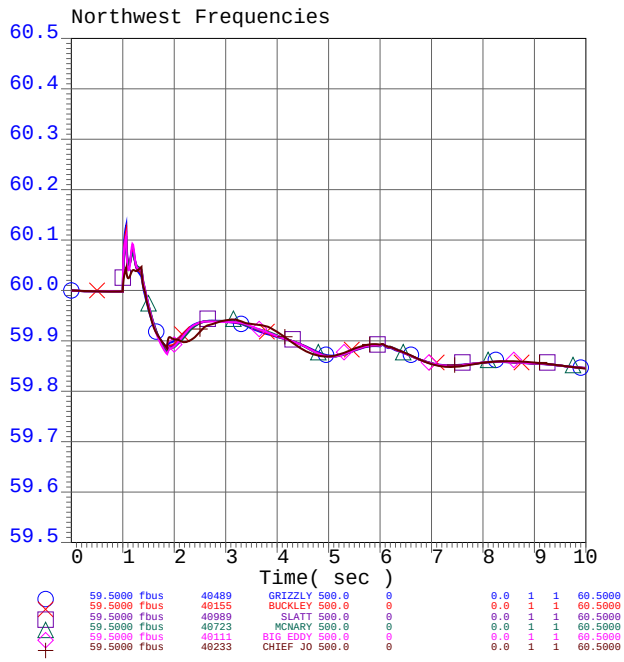
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WECC AREA VOLTAGE AND FREQUENCIES









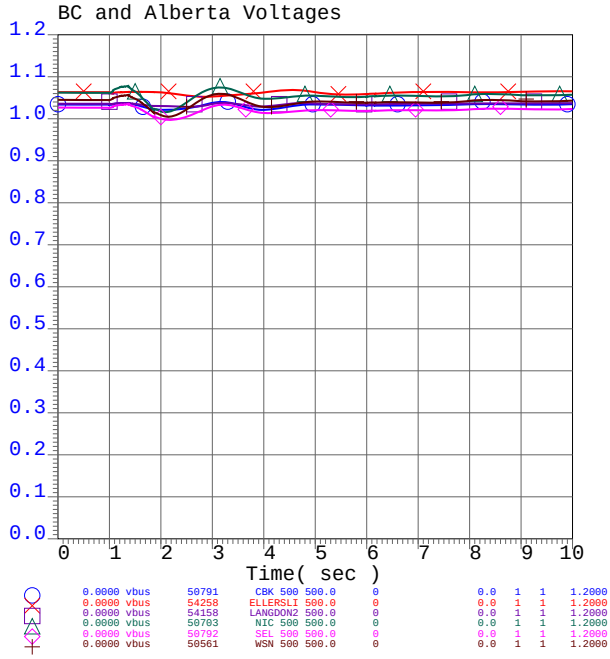
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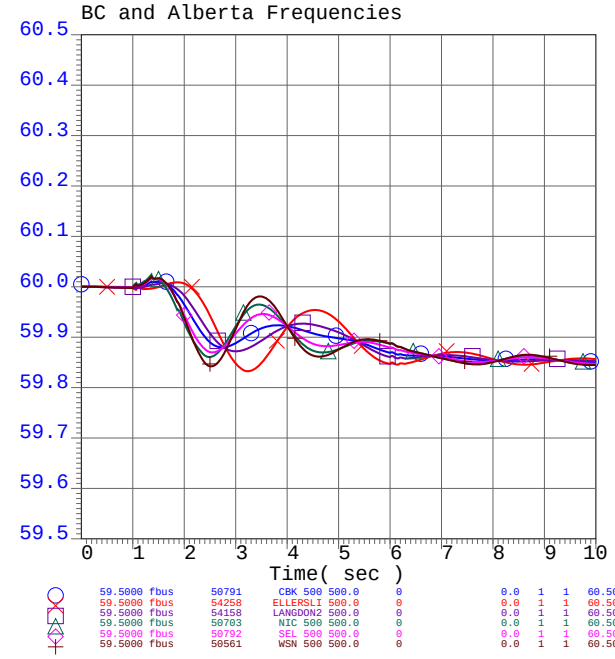
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WECC AREA VOLTAGE AND FREQUENCIES

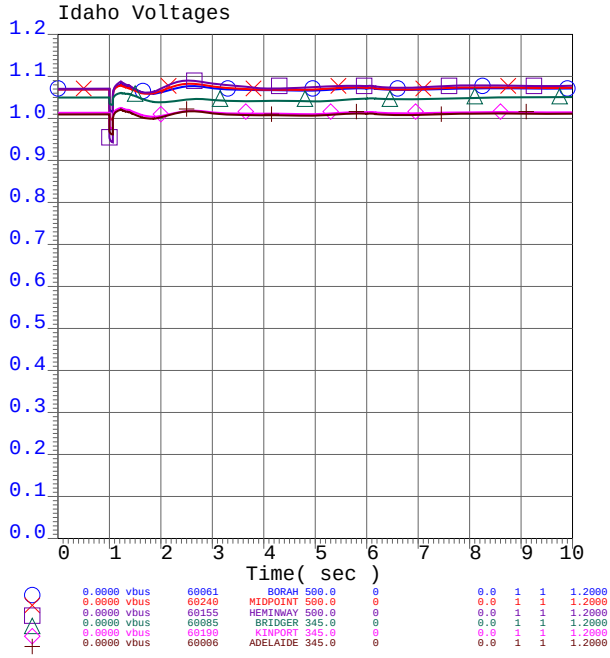
BC and Alberta Voltages



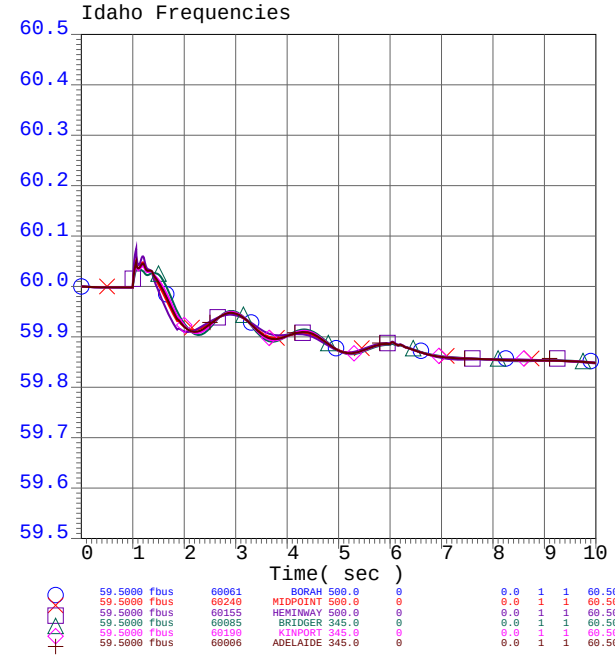
BC and Alberta Frequencies



Idaho Voltages



Idaho Frequencies



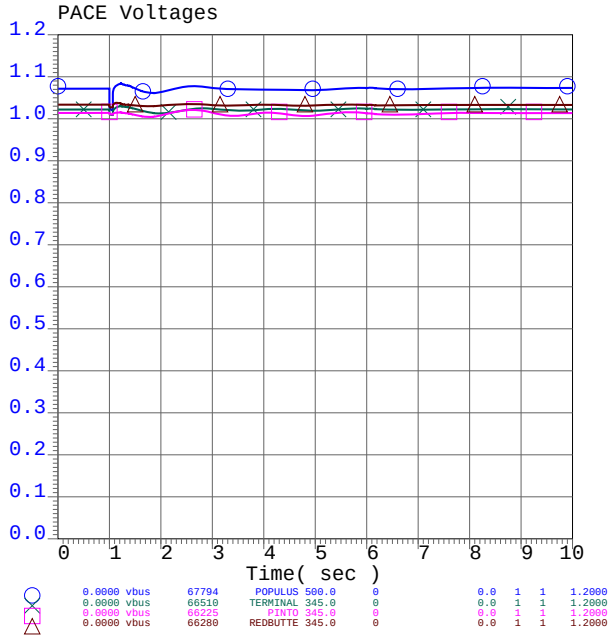
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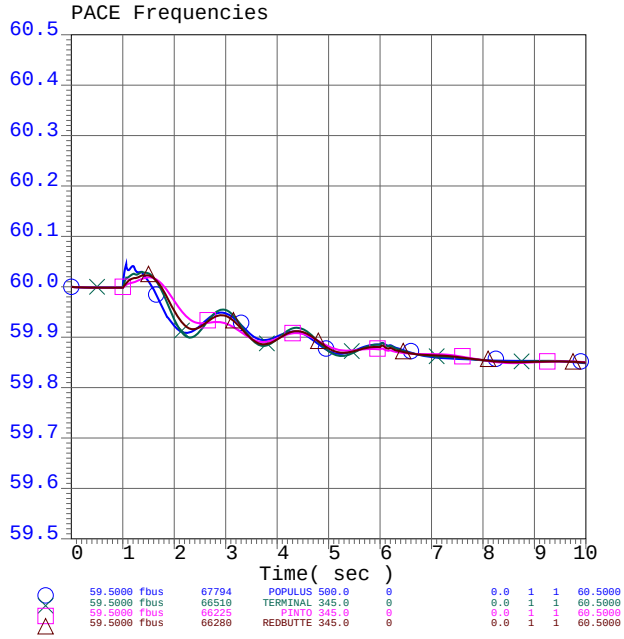
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WECC AREA VOLTAGE AND FREQUENCIES

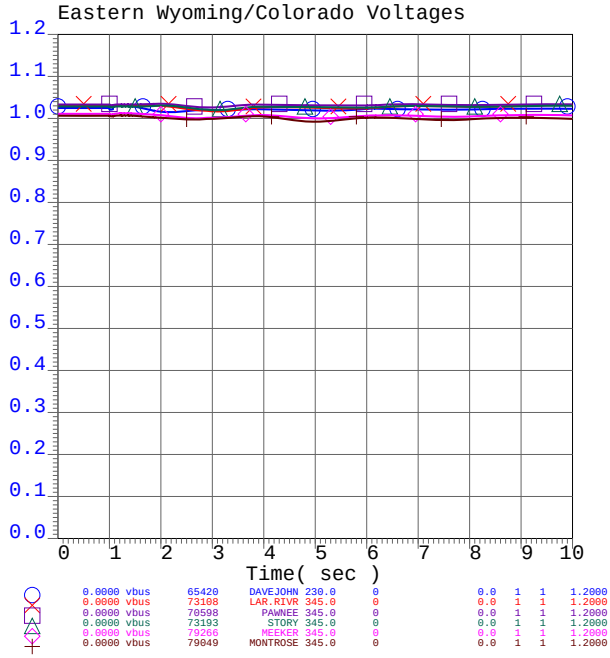
PACE Voltages



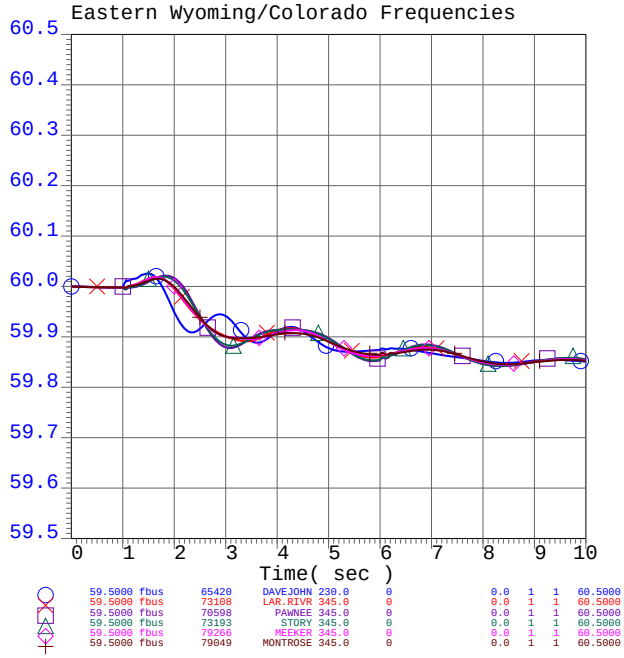
PACE Frequencies



Eastern Wyoming/Colorado Voltages



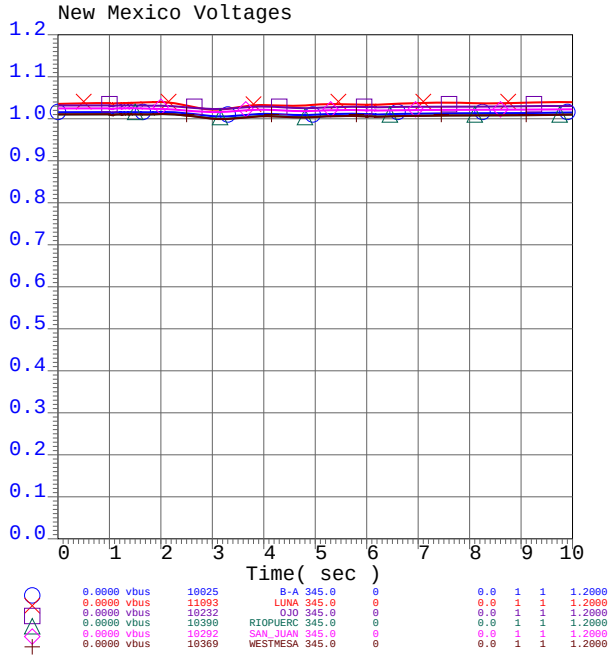
Eastern Wyoming/Colorado Frequencies



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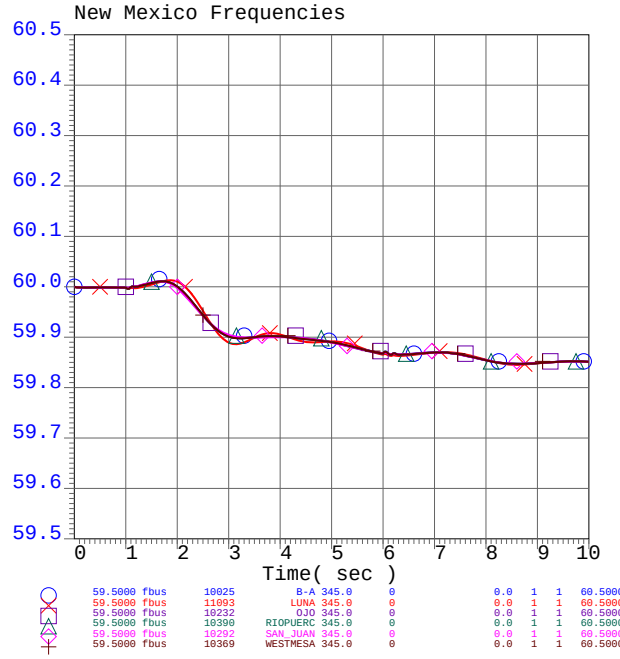
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



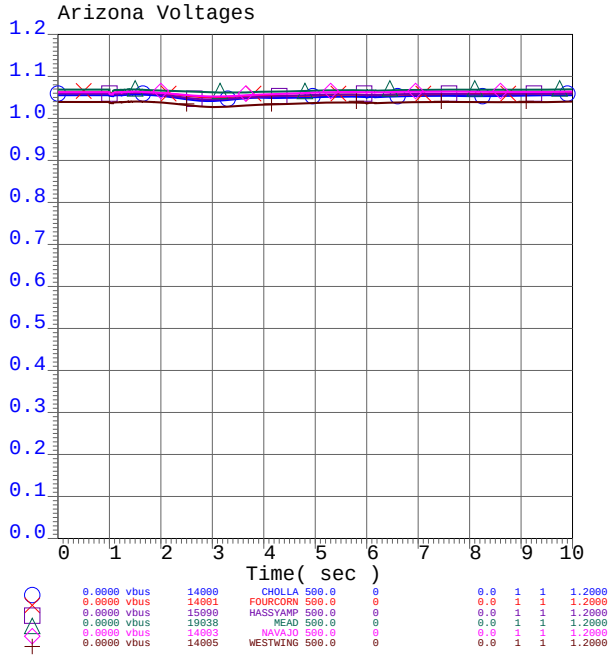
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0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



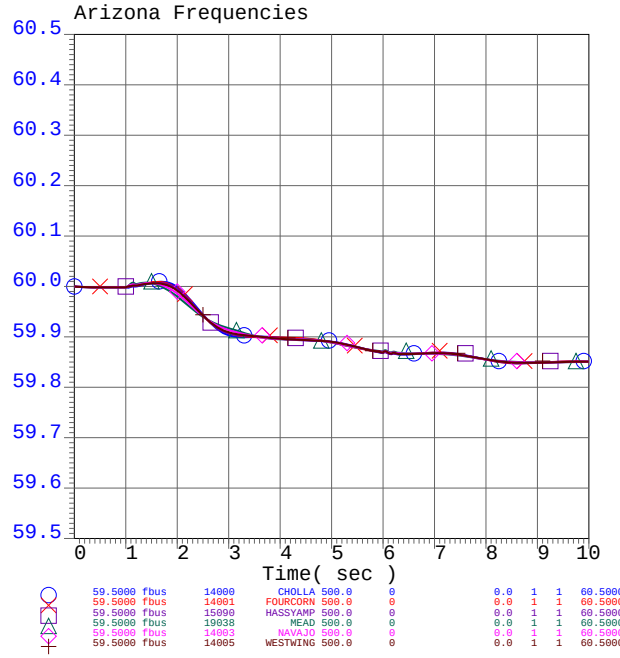
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

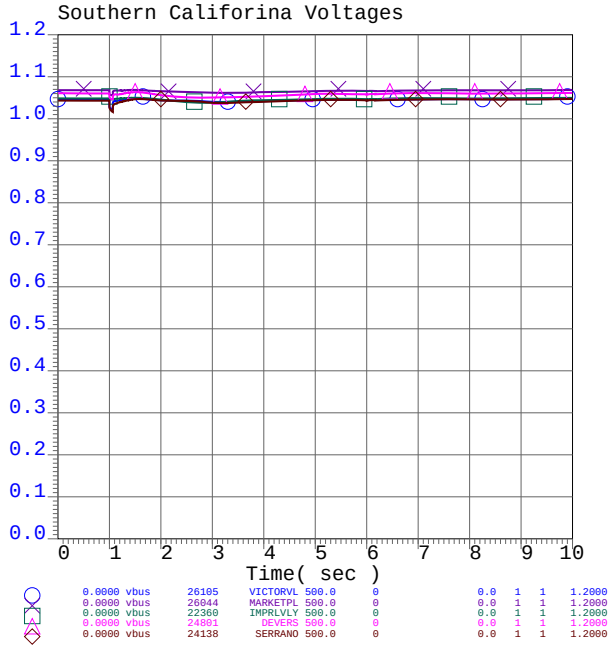
Arizona Frequencies

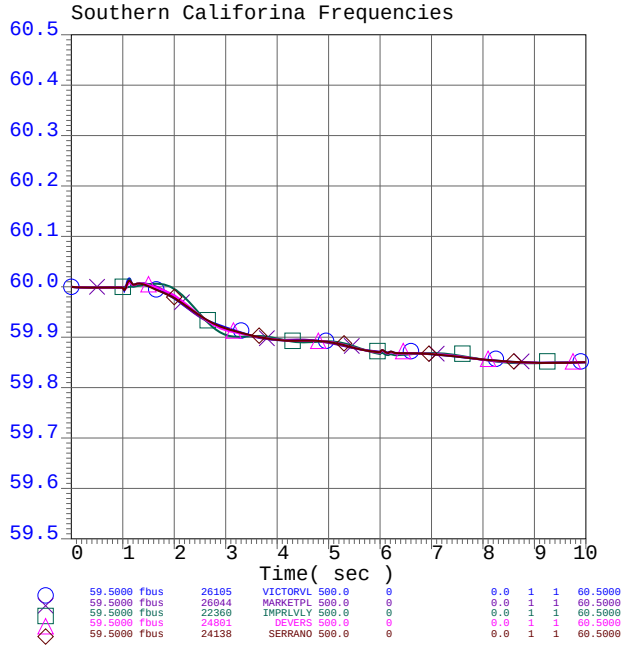


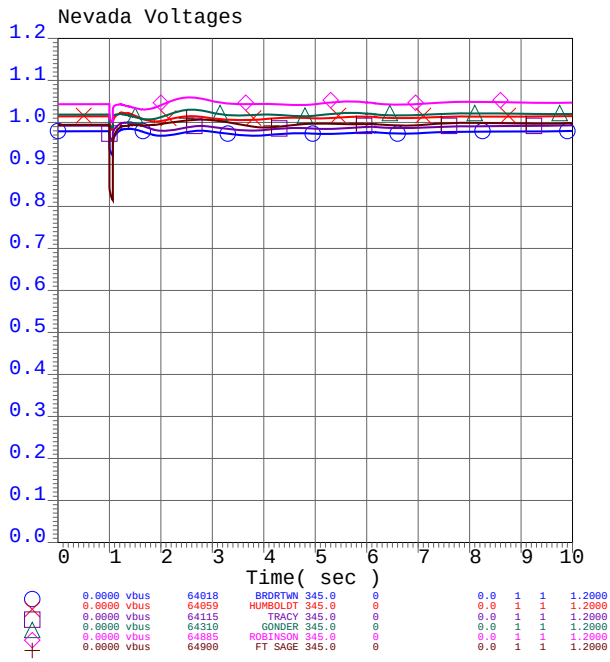
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

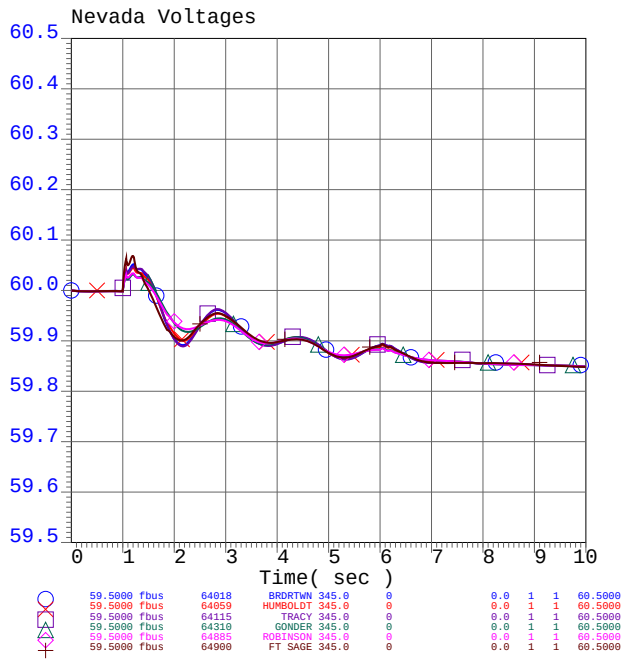
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Table Mountain 500 kV
followed by loss of Table Mountain-2C569SS & Table Mountain-VacaDixon 500

WECC AREA VOLTAGE AND FREQUENCIES



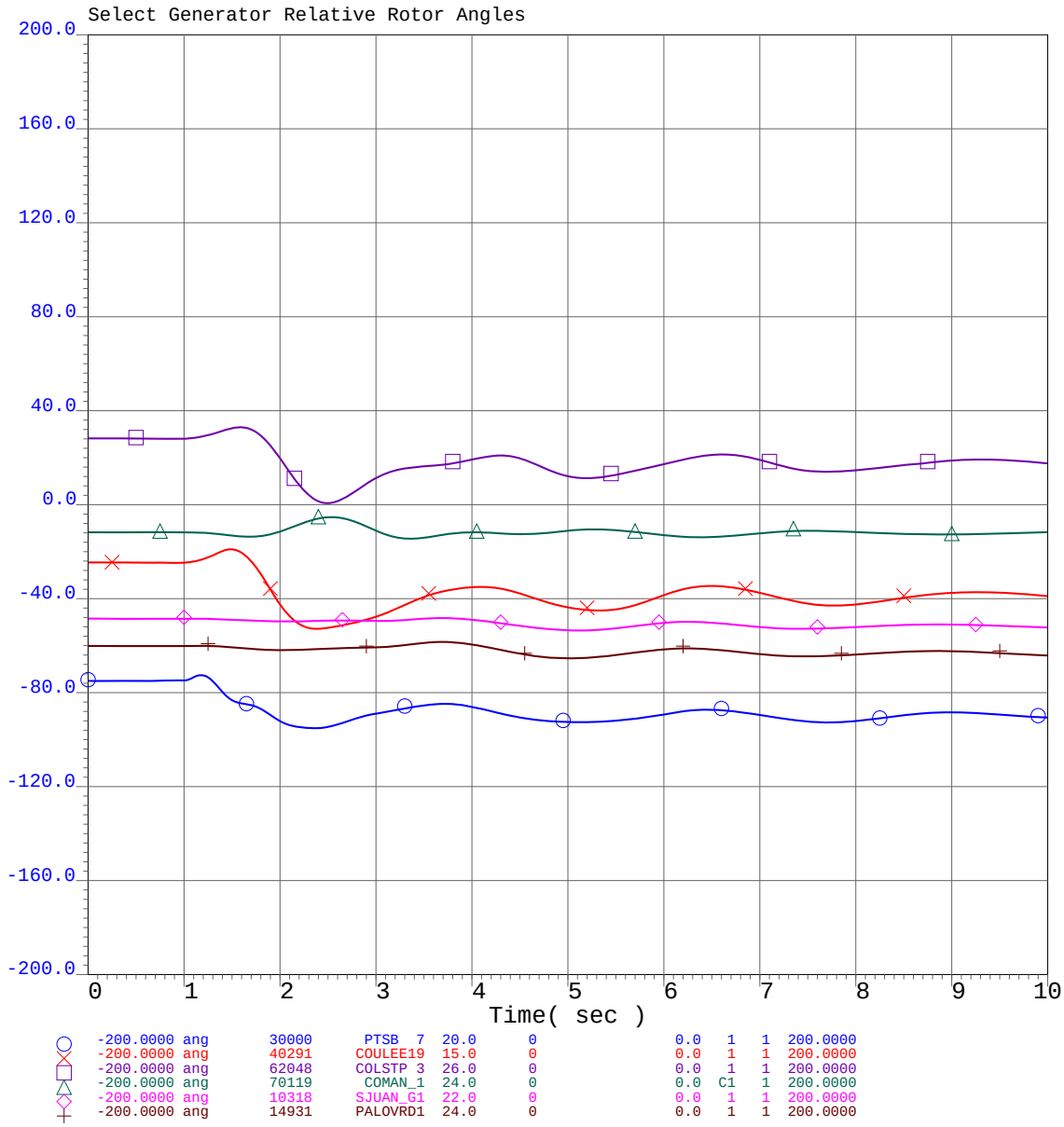






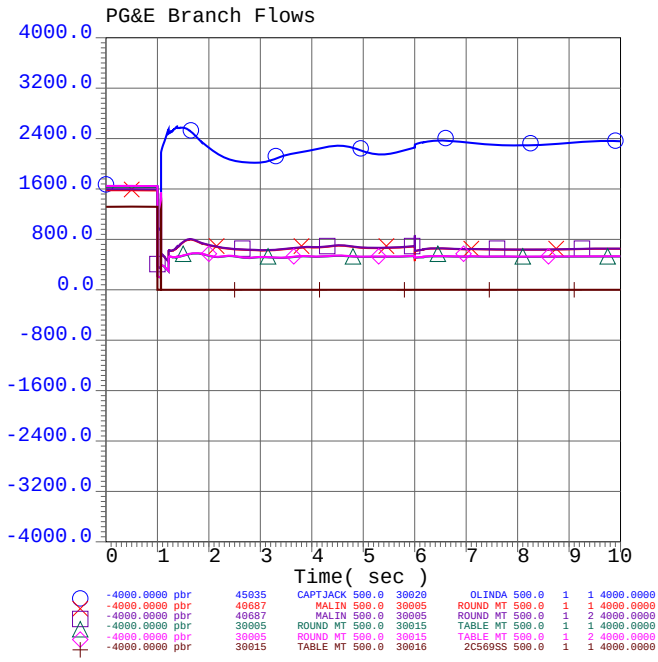
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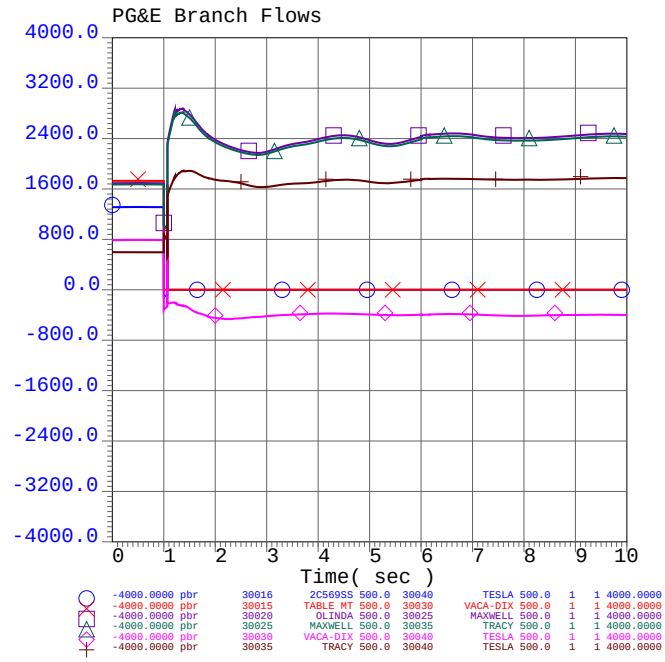
WECC RELATIVE ROTOR ANGLES

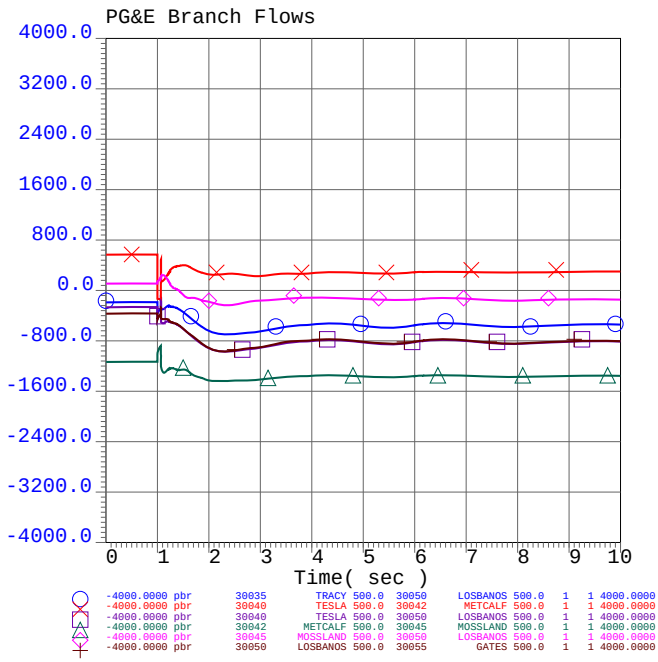


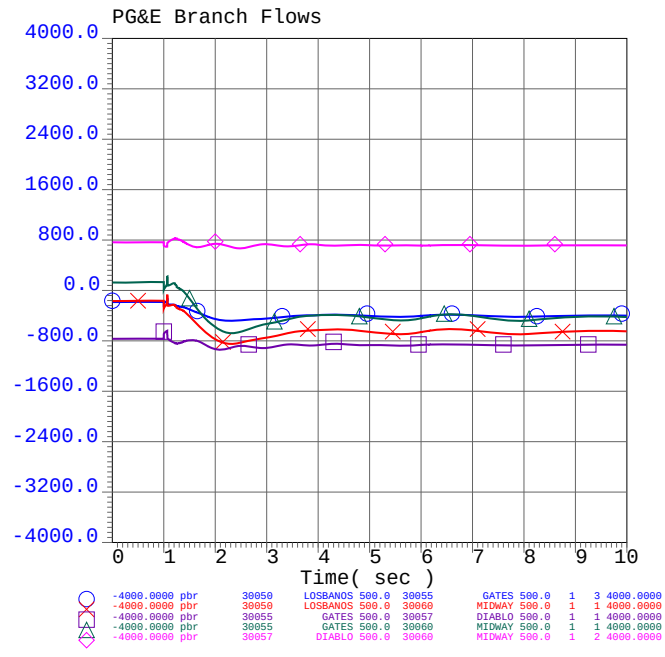
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followed by loss of Table Mountain-2C569SS & Table Mountain-VacaDixon 500

SELECT BRANCH FLOWS







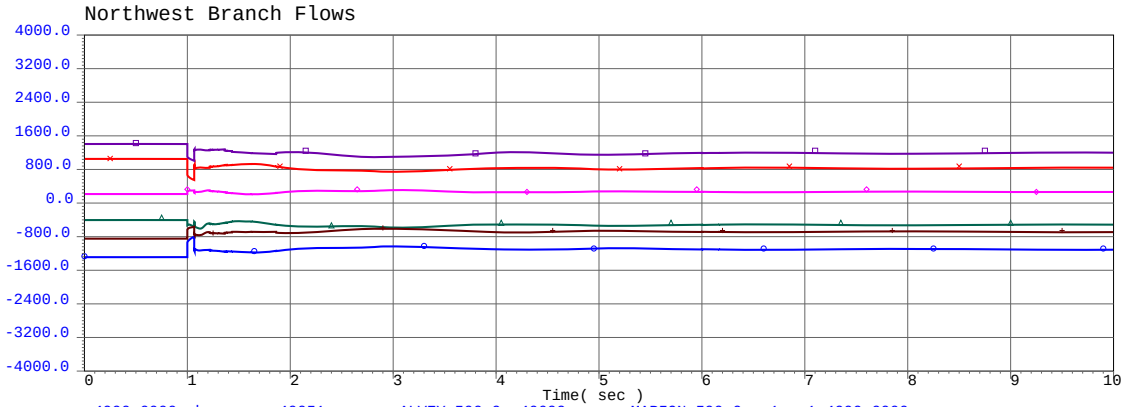


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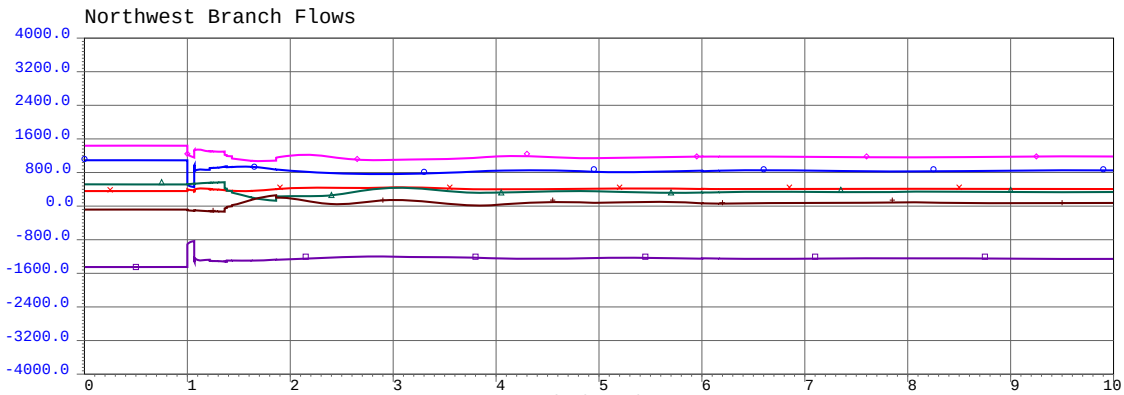
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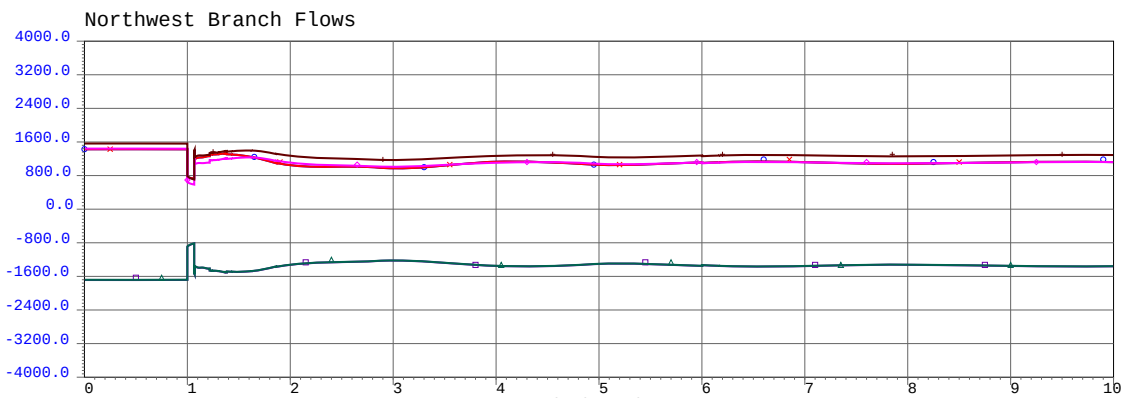
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



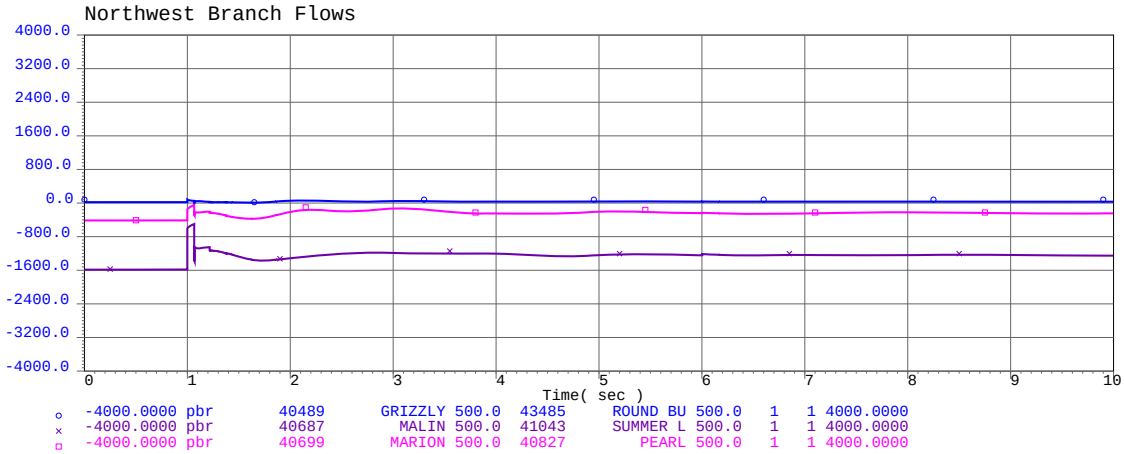
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



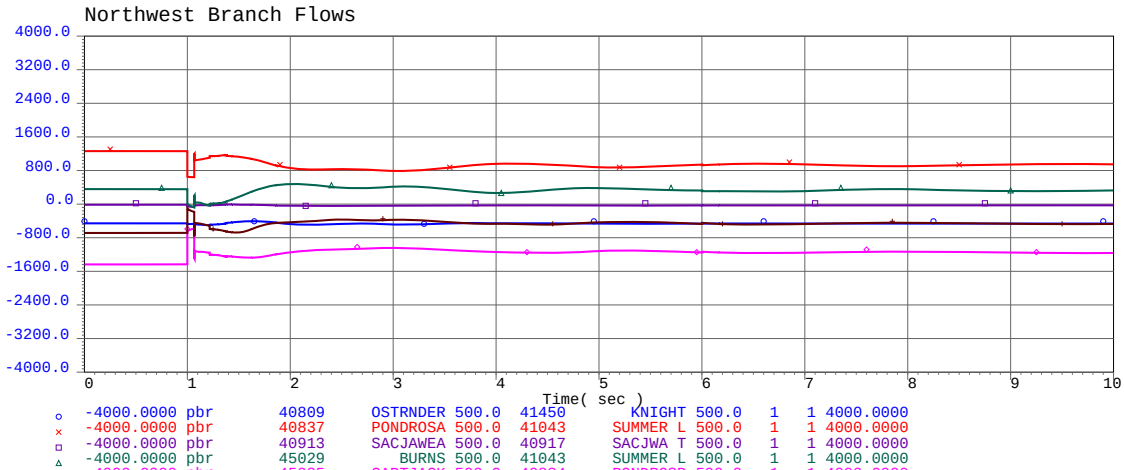
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Table Mountain 500 kV
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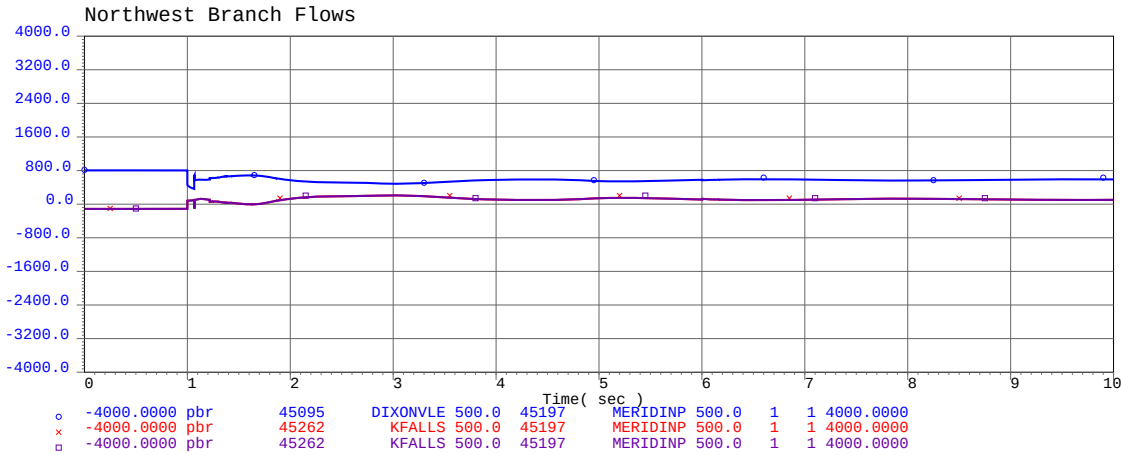
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



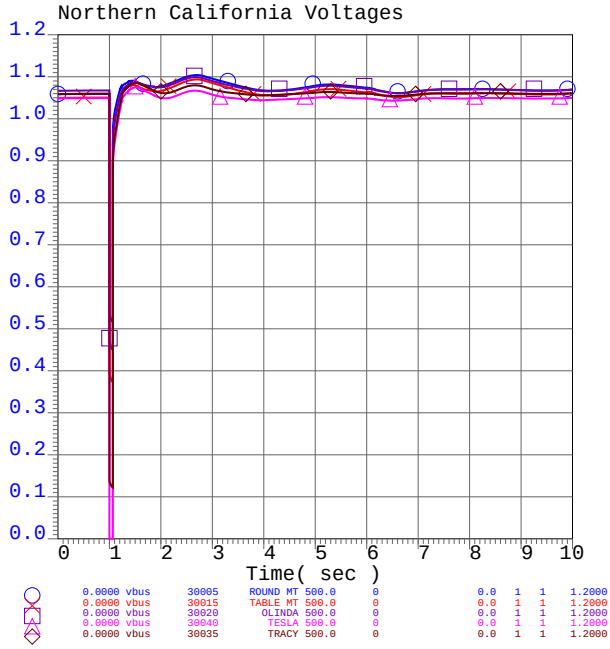
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

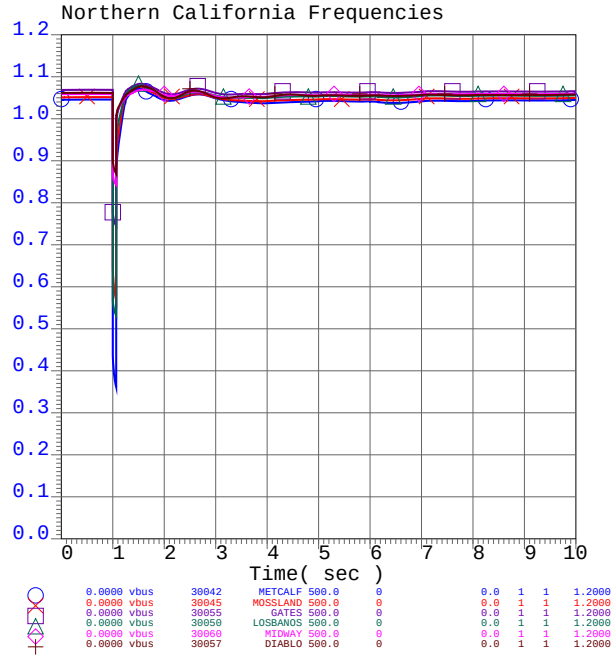


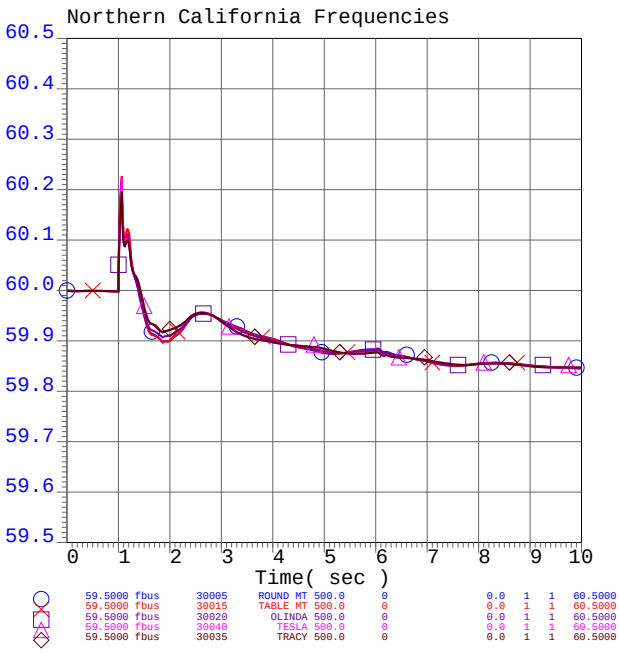
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

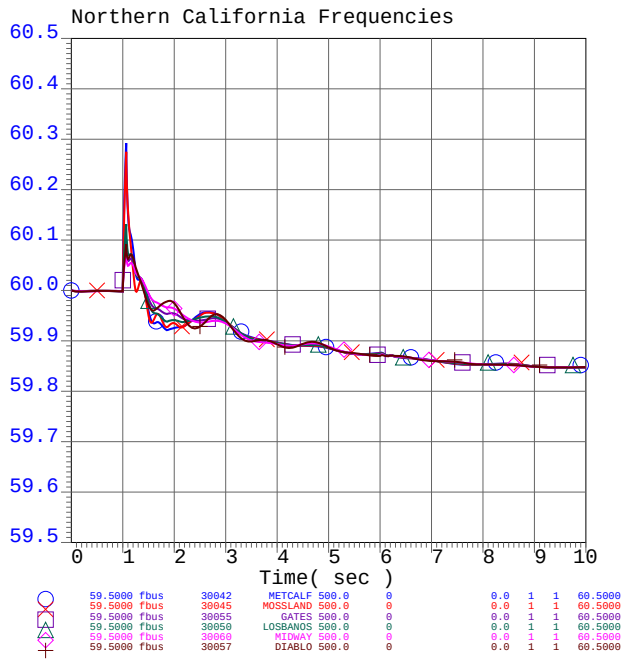
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WECC AREA VOLTAGE AND FREQUENCIES



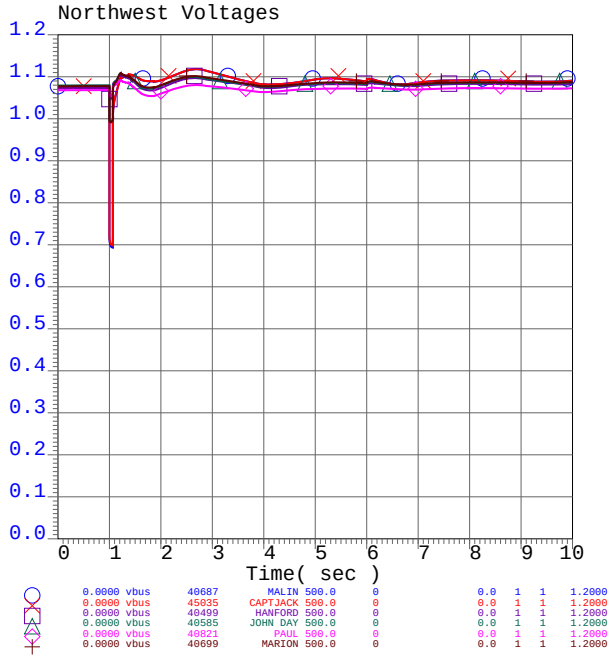


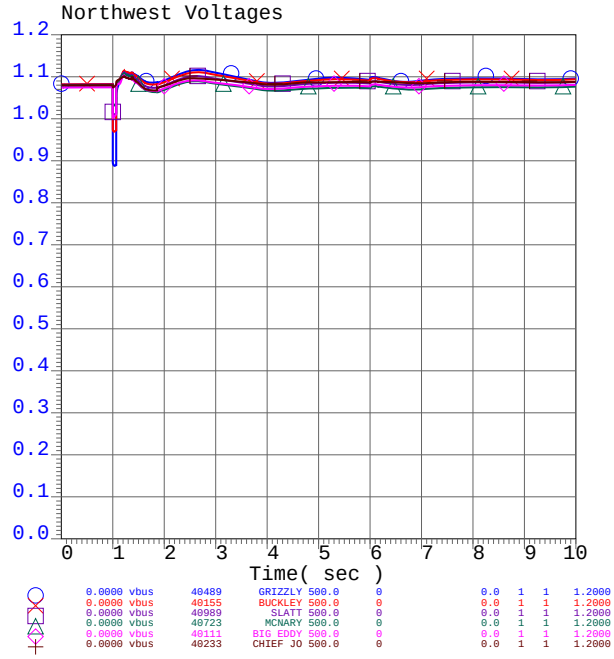


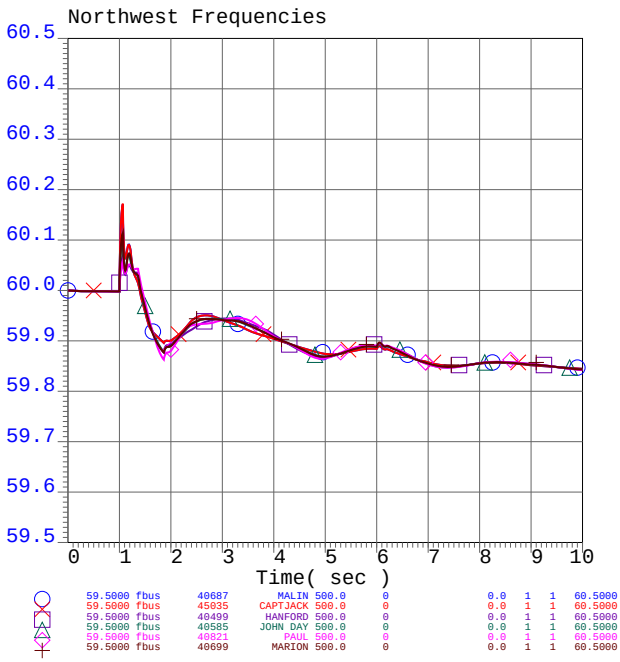


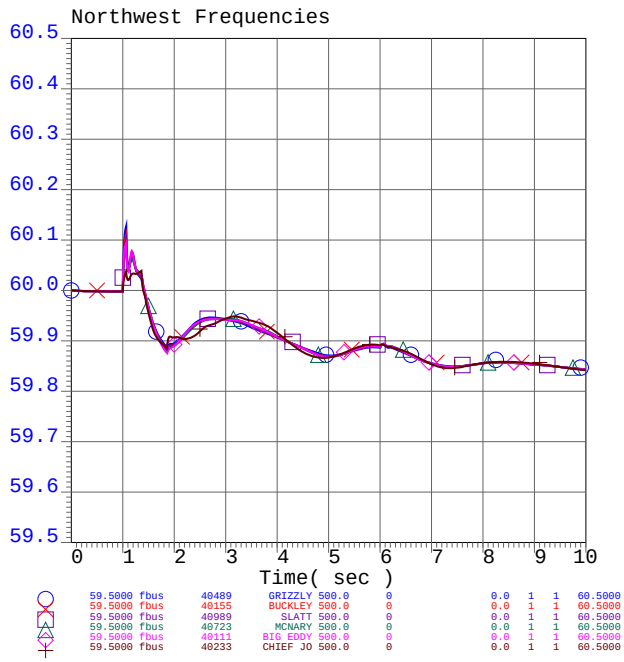
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WECC AREA VOLTAGE AND FREQUENCIES







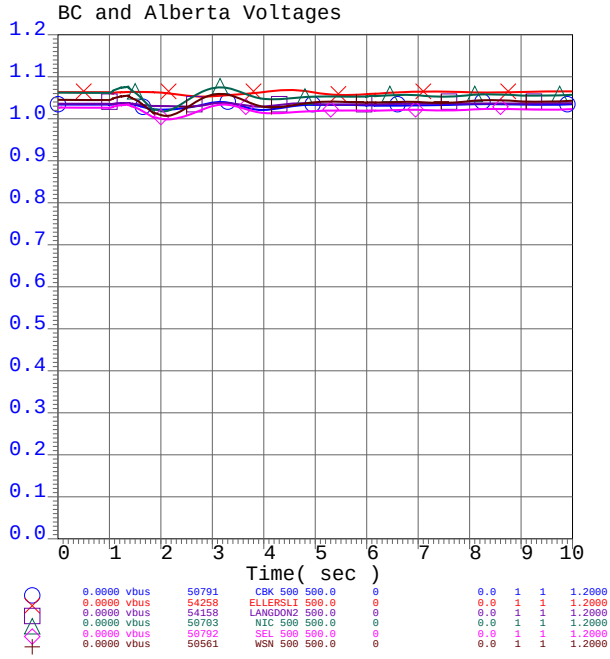


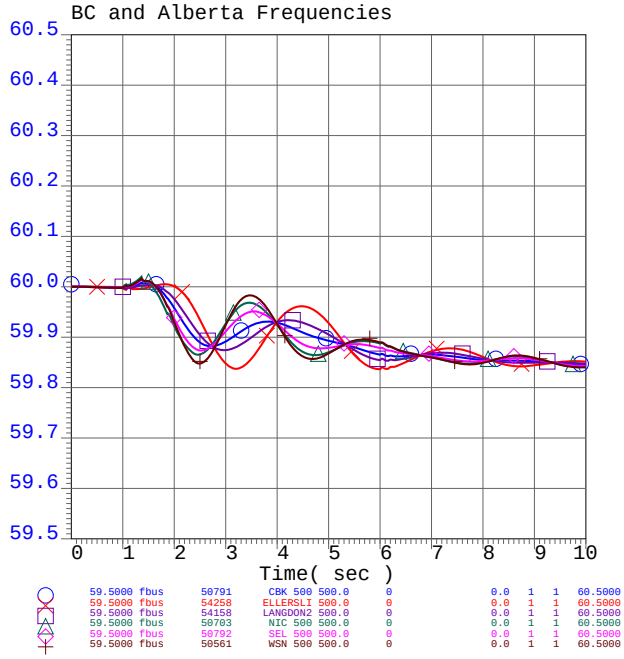
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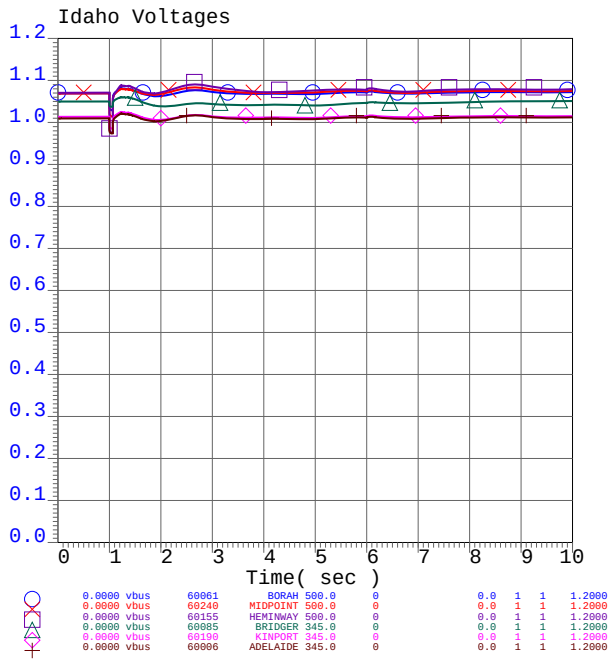
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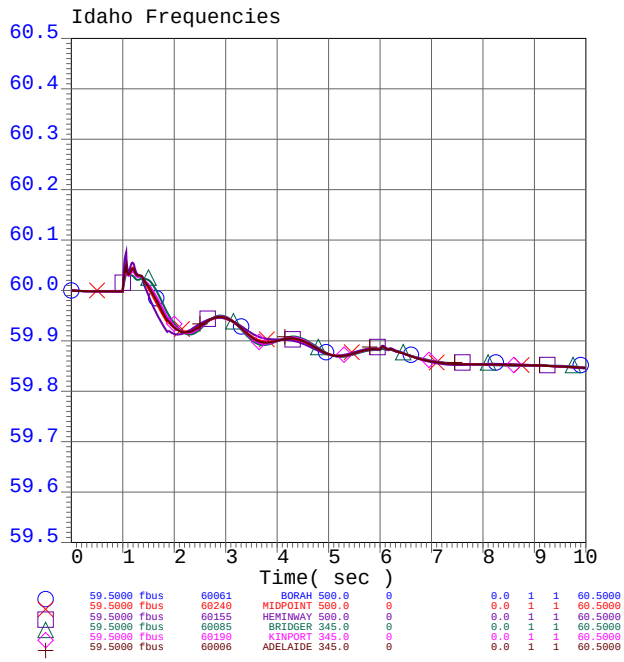
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WECC AREA VOLTAGE AND FREQUENCIES







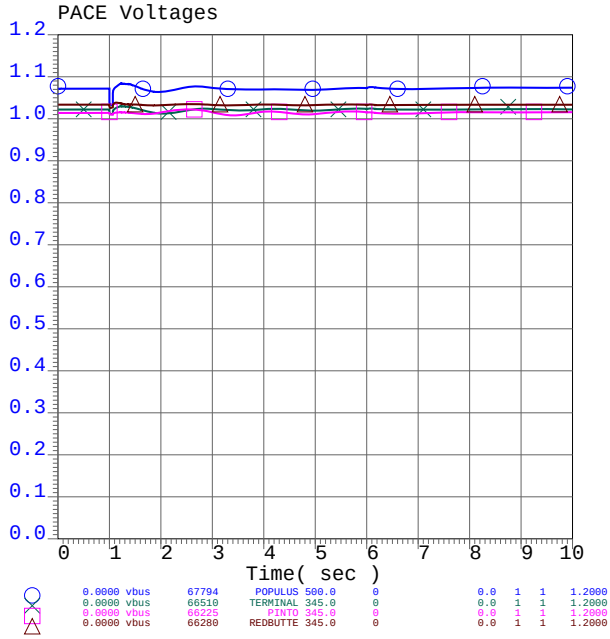


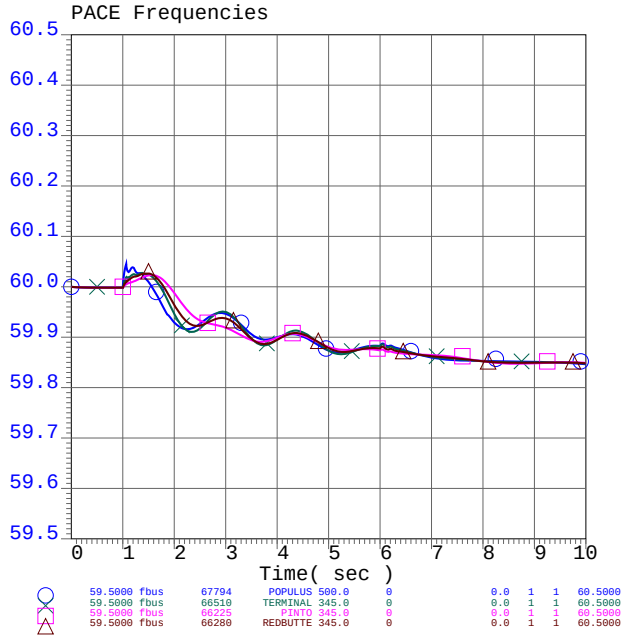
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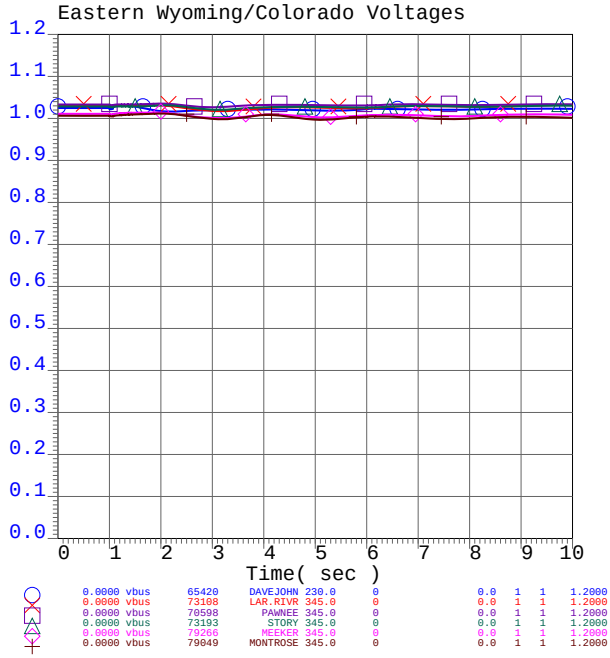
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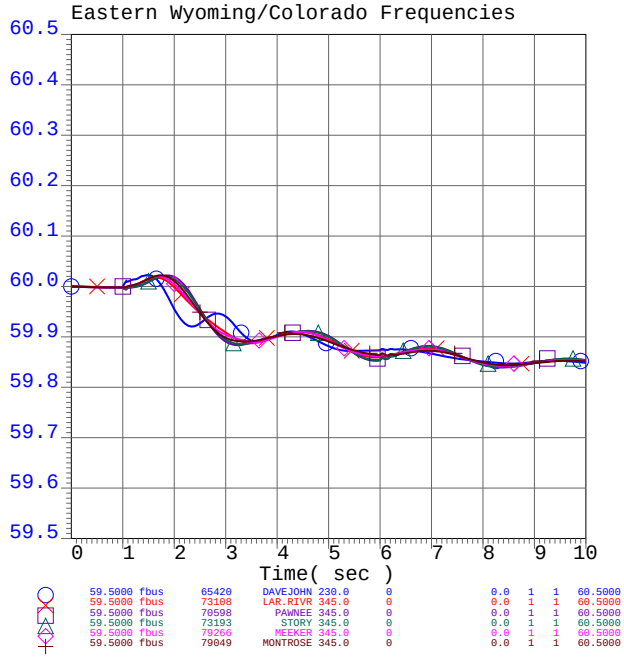
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WECC AREA VOLTAGE AND FREQUENCIES



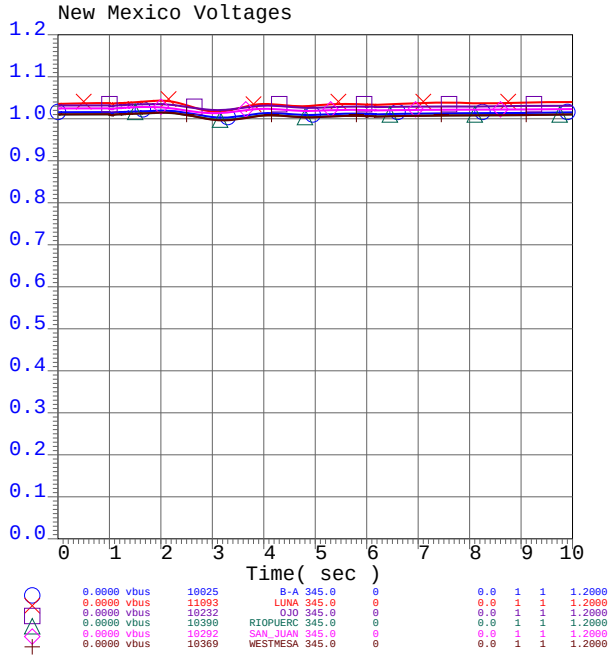


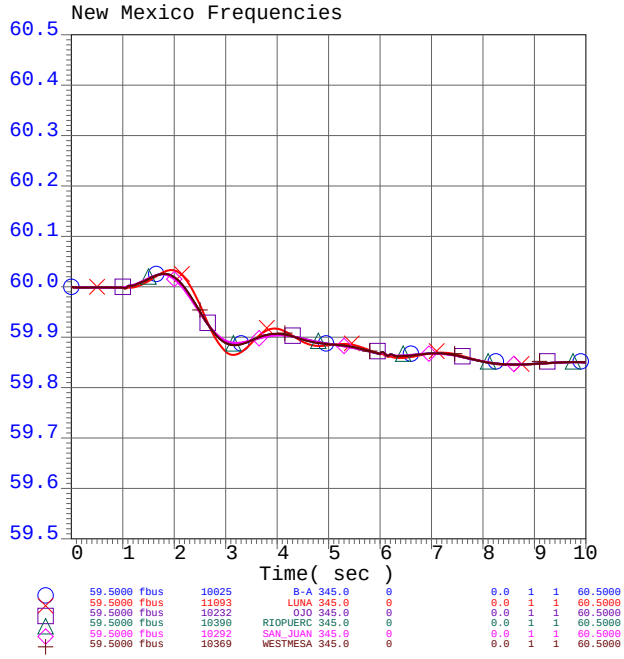


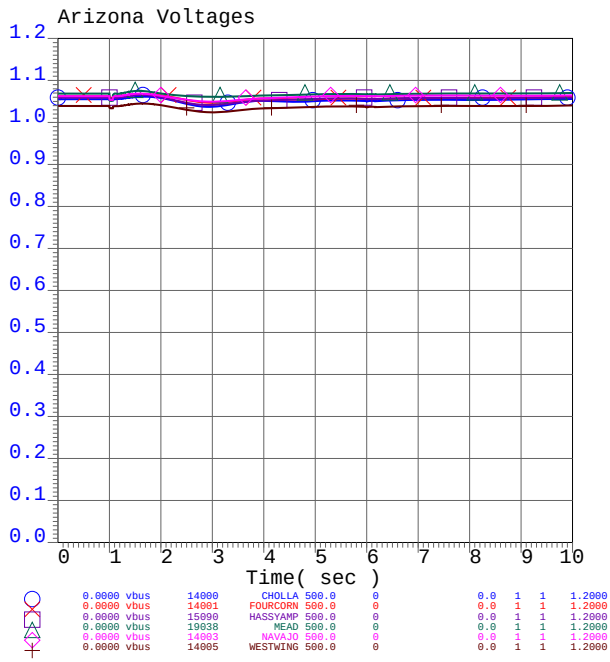


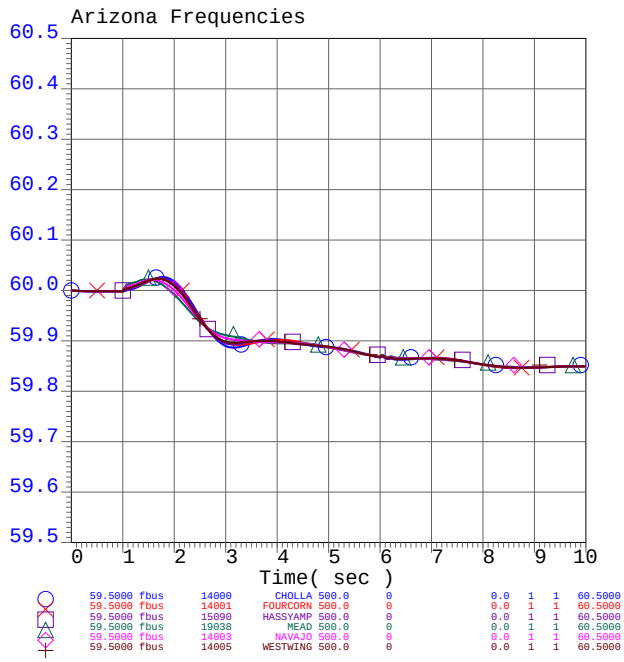
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WECC AREA VOLTAGE AND FREQUENCIES







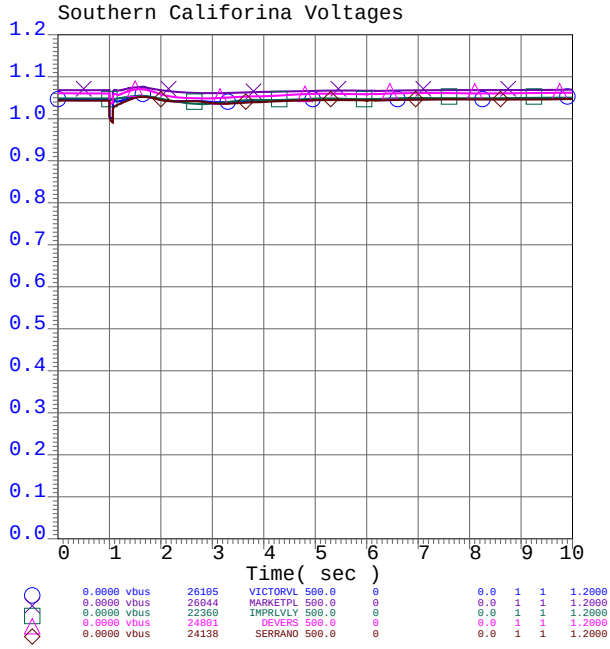


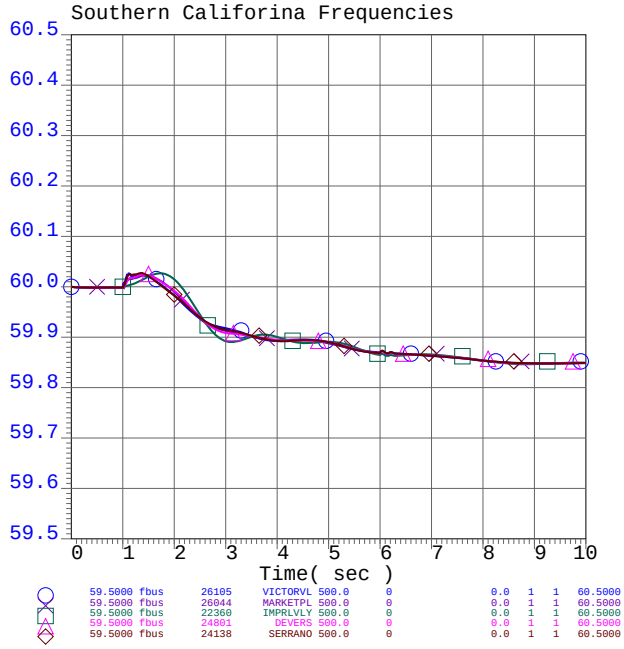
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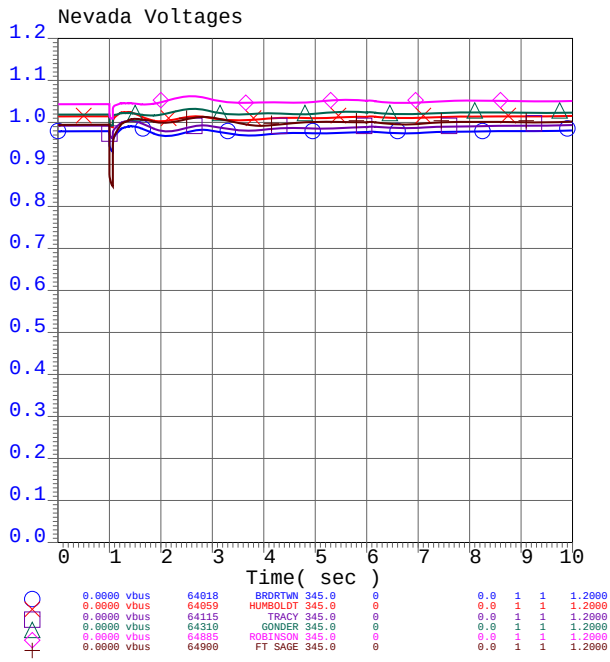
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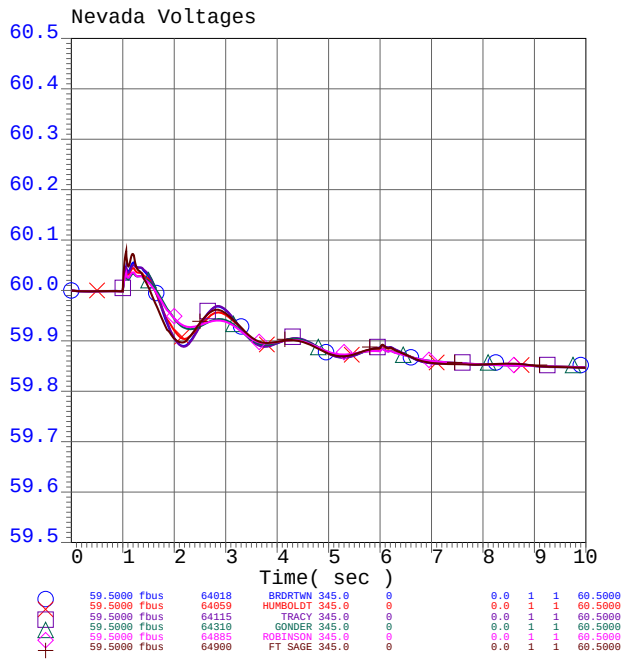
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WECC AREA VOLTAGE AND FREQUENCIES



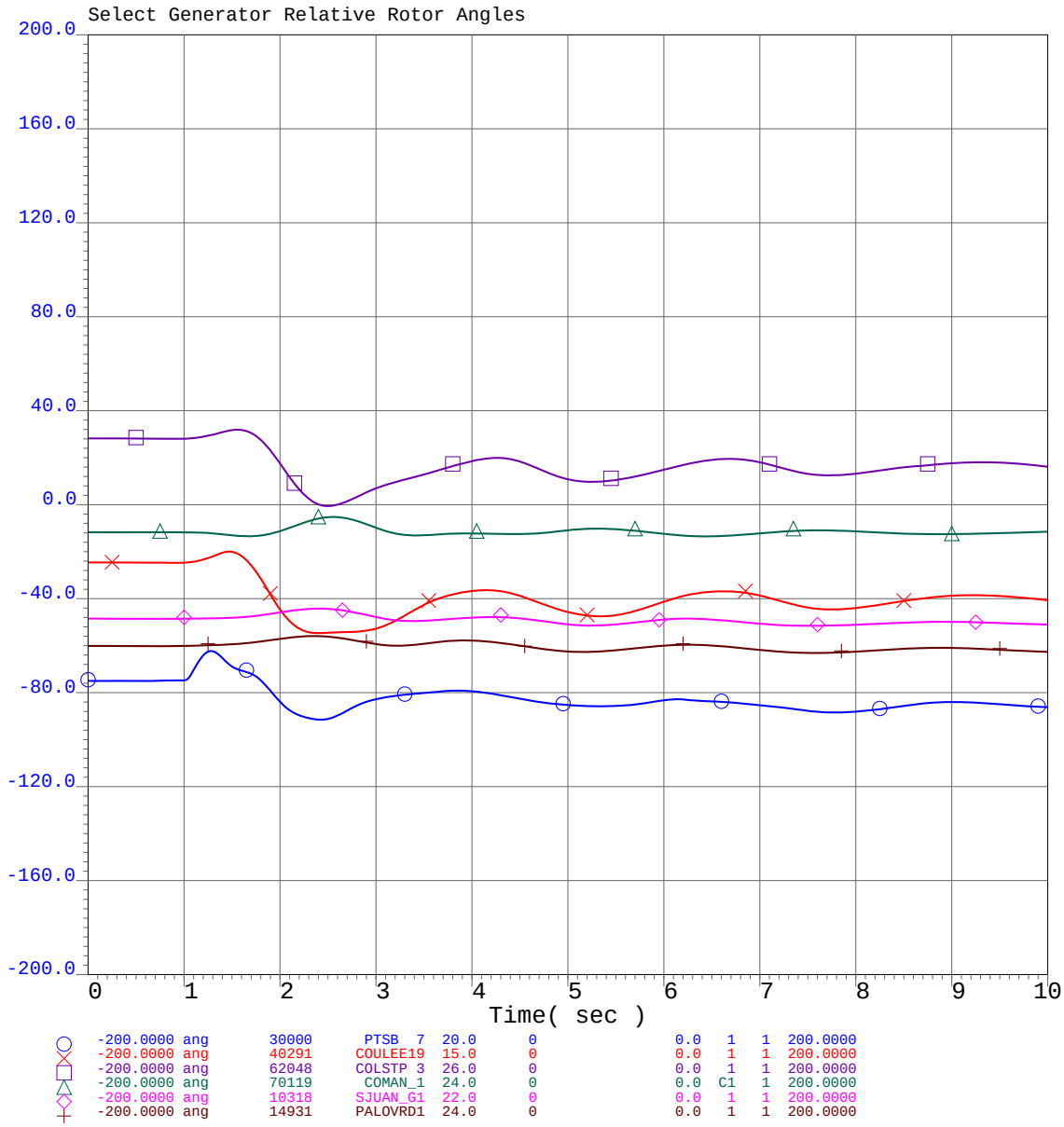






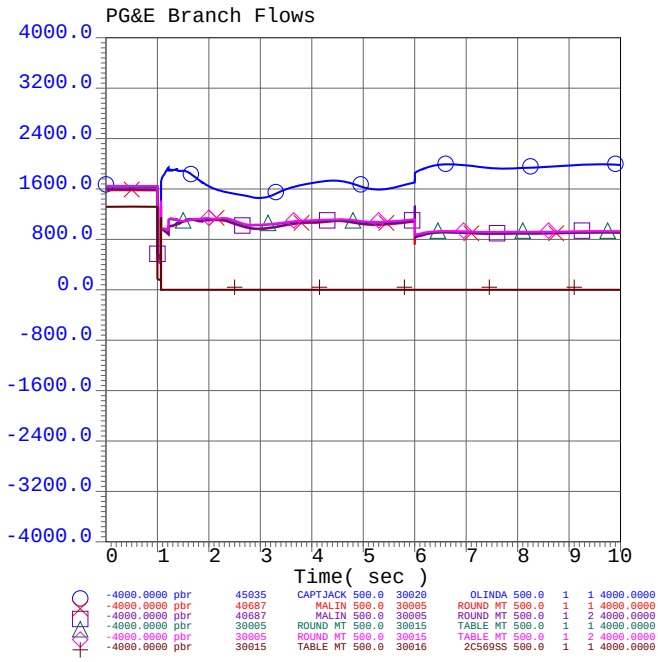
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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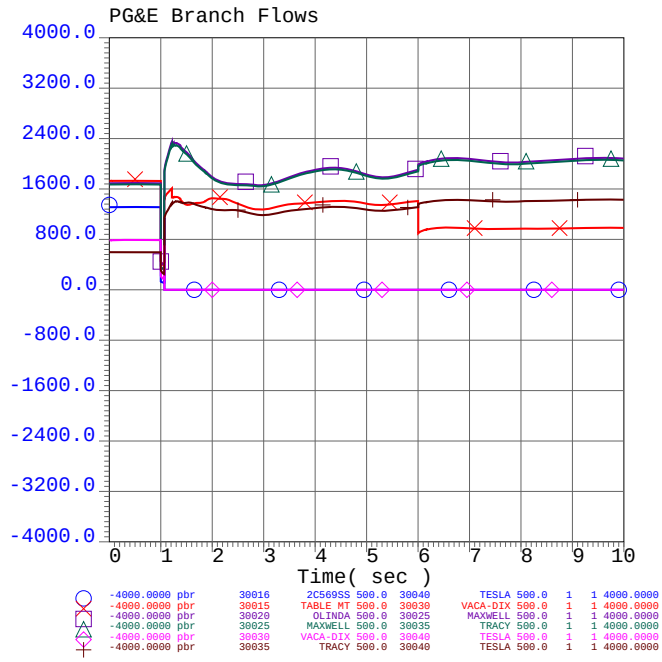
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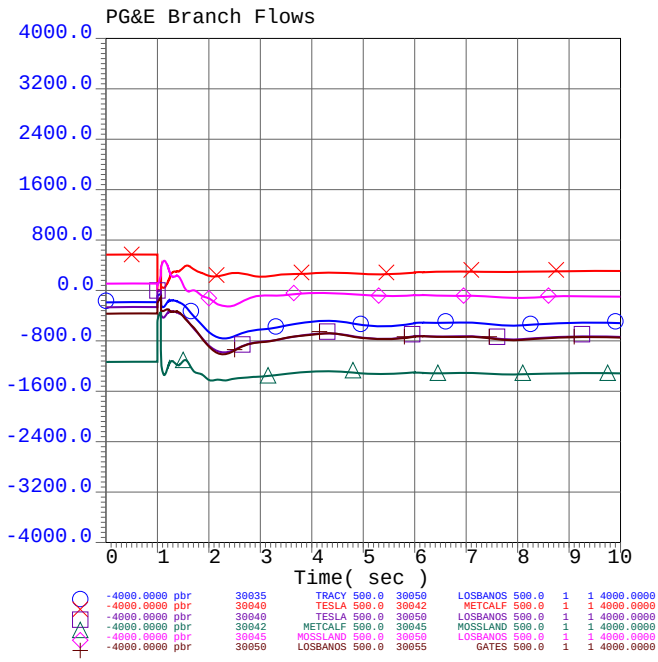


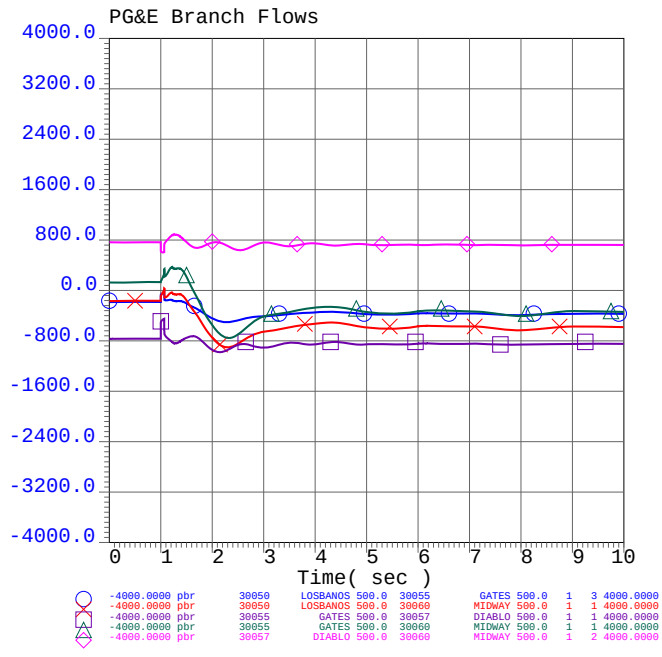
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SELECT BRANCH FLOWS









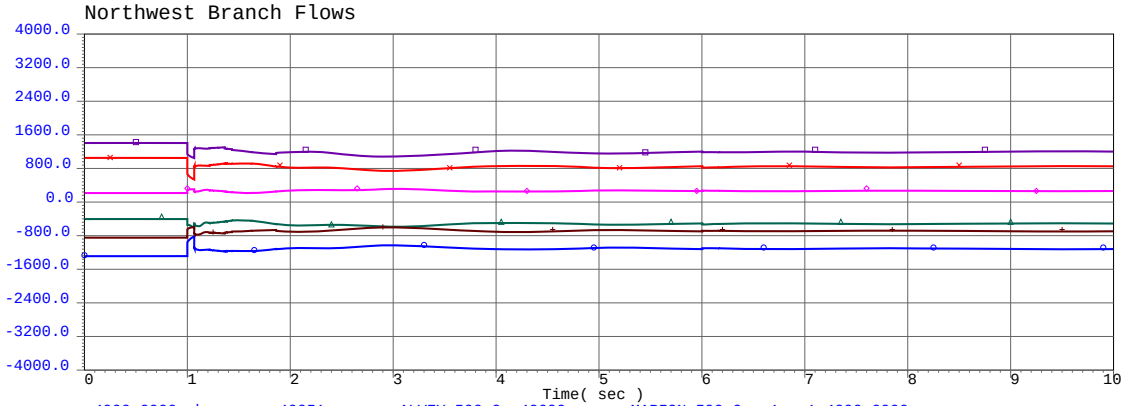
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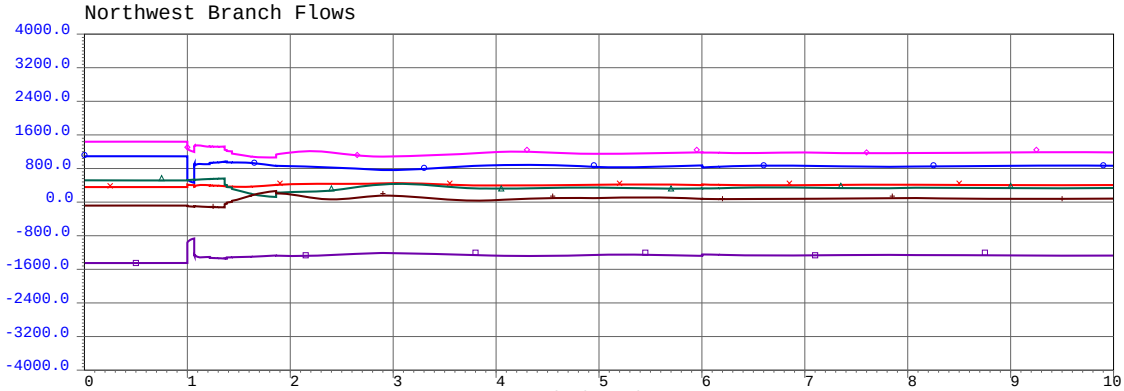
SELECT BRANCH FLOWS

Northwest Branch Flows



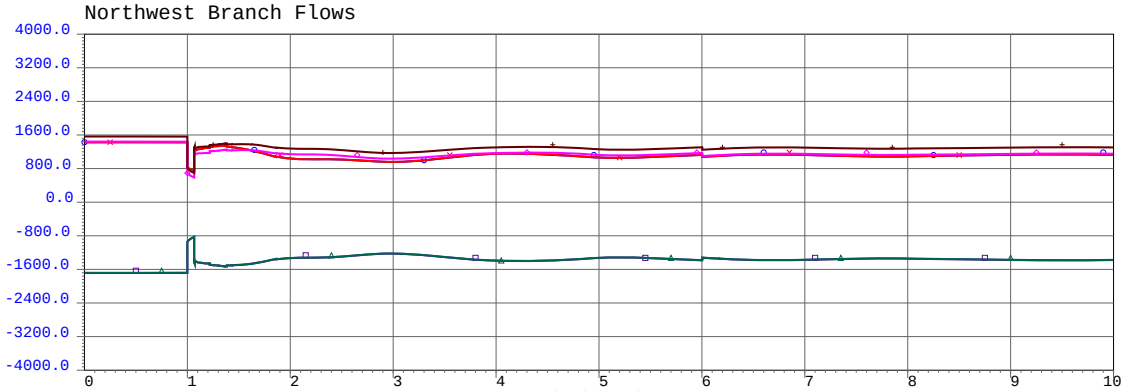
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
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Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
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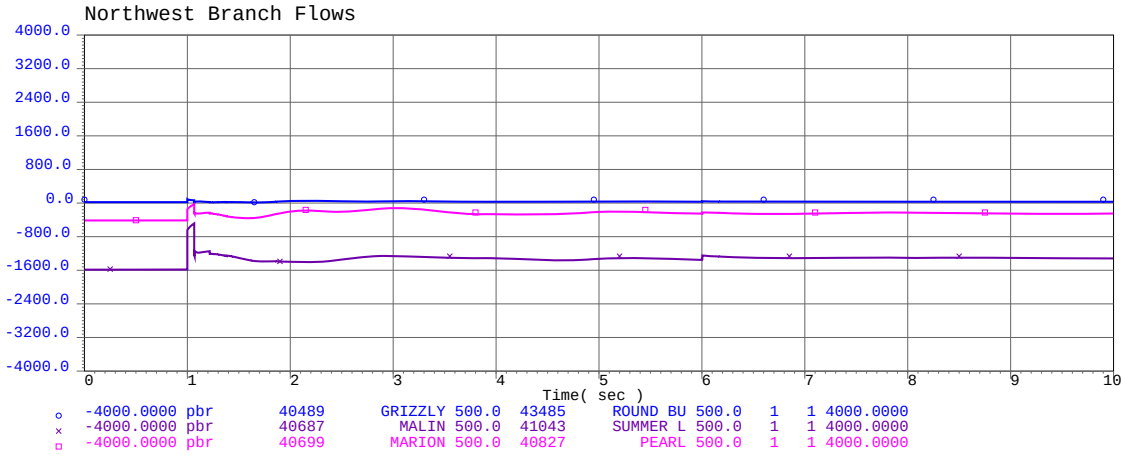
Northwest Branch Flows



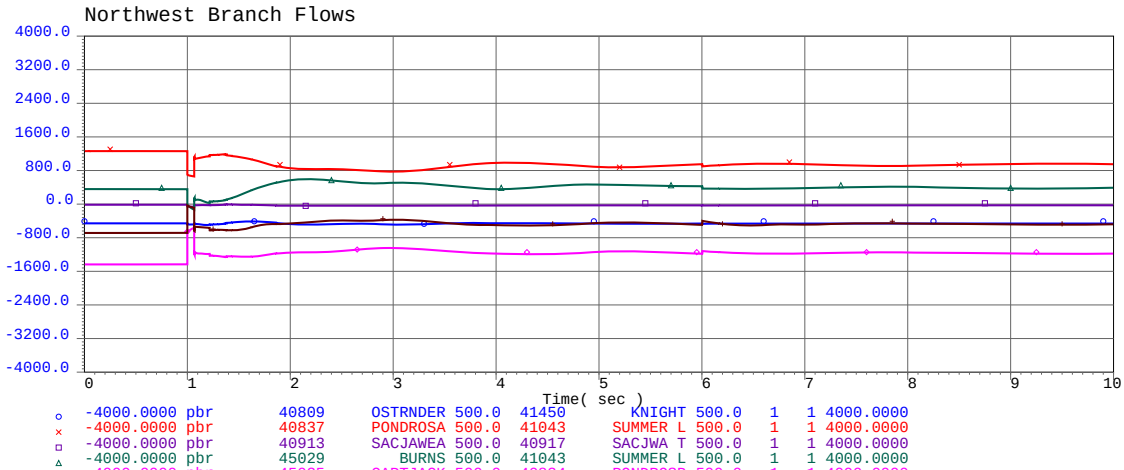
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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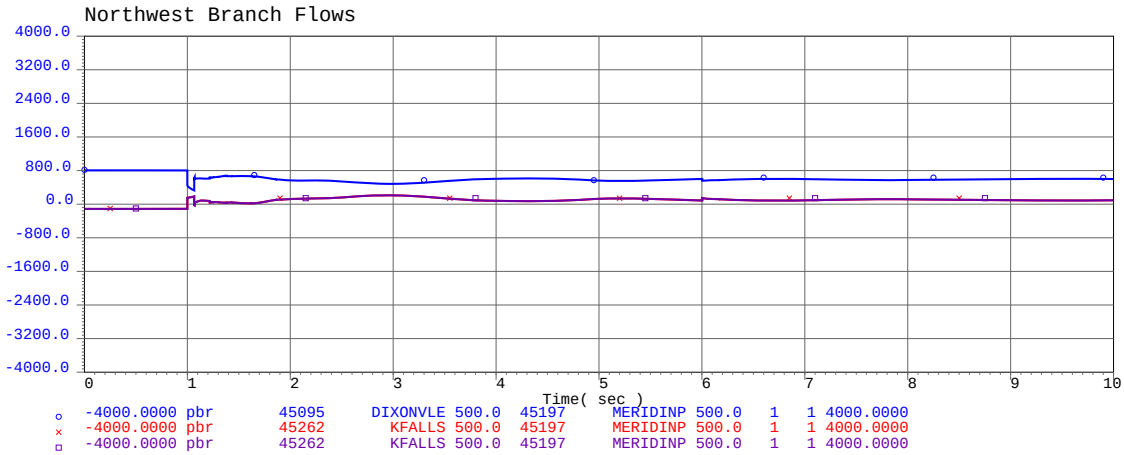
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
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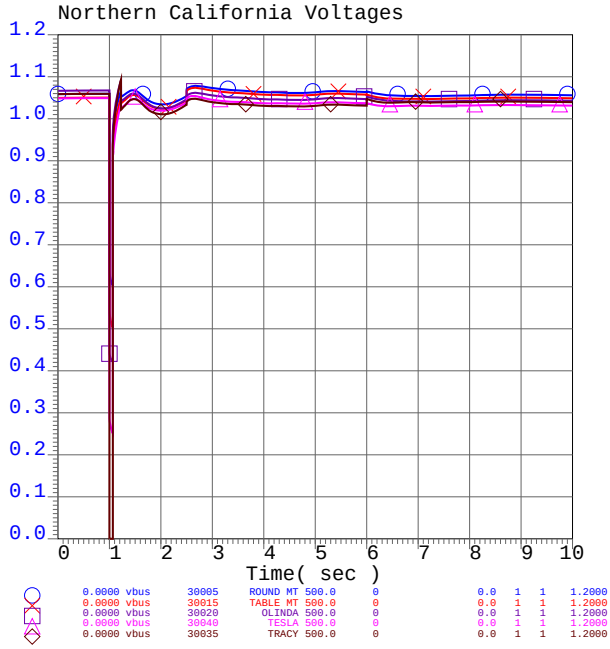
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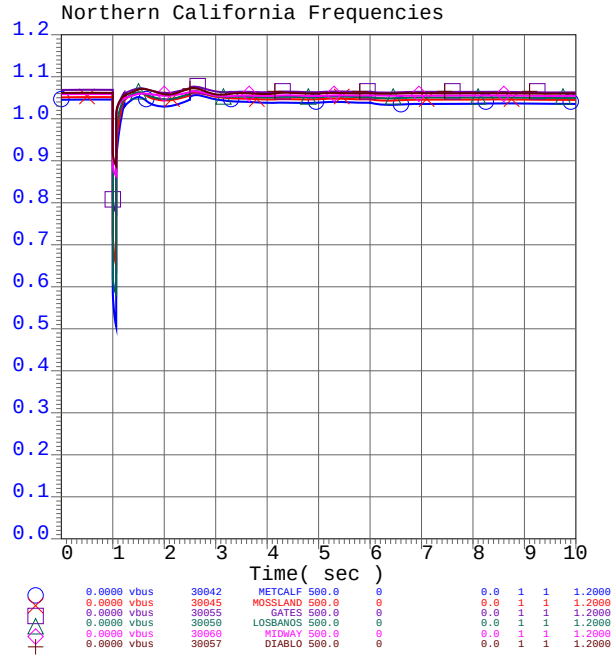


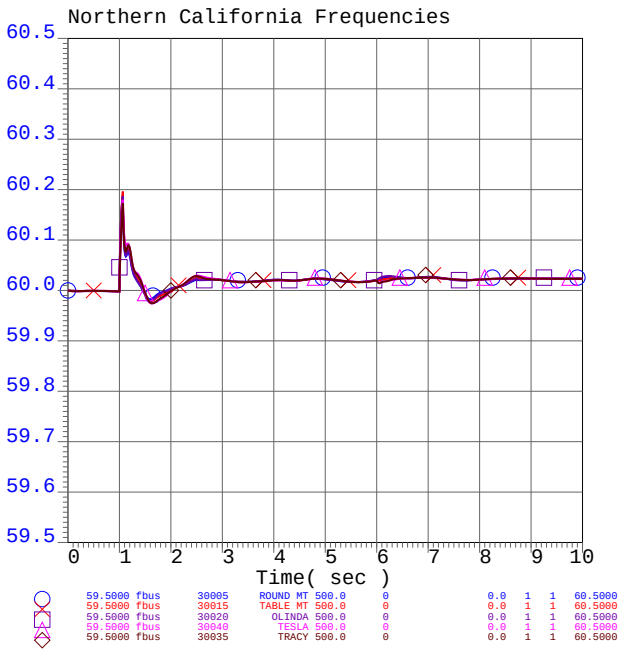
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

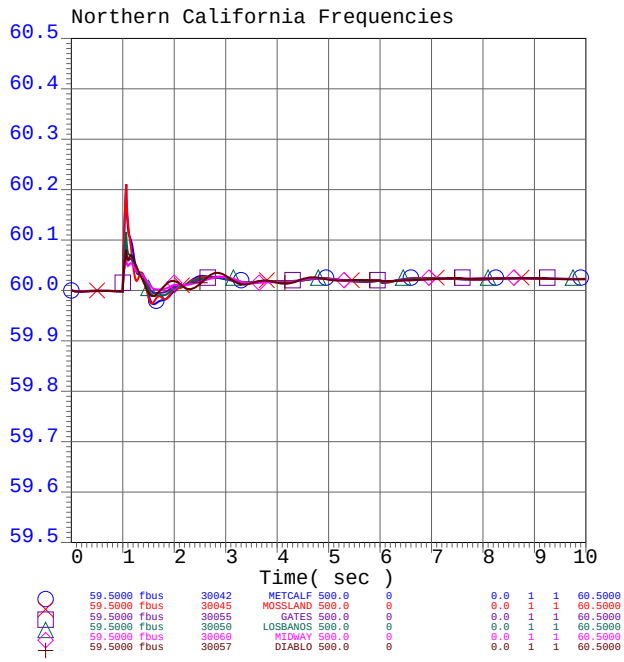
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WECC AREA VOLTAGE AND FREQUENCIES







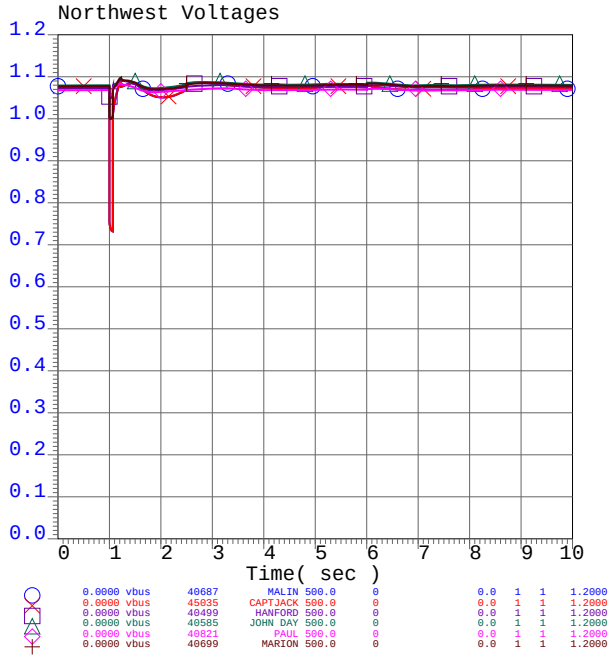


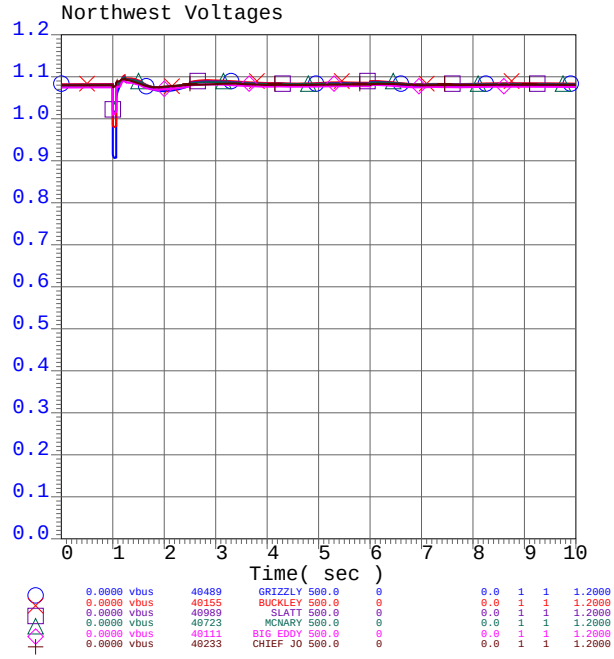
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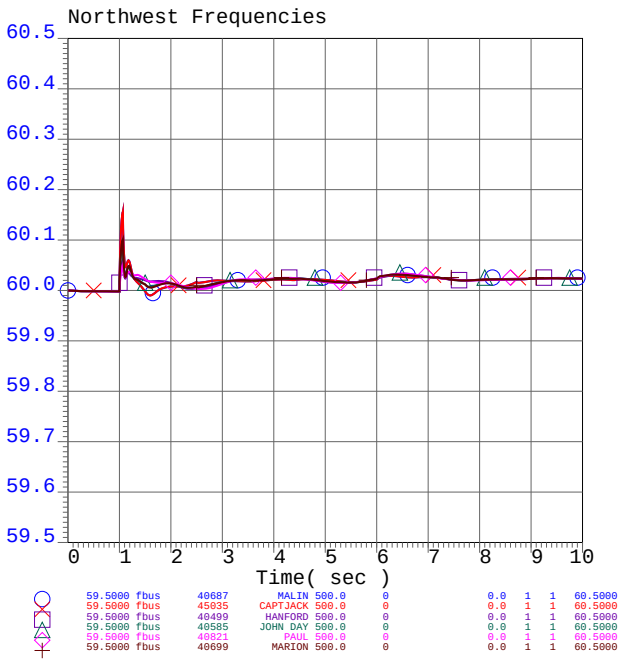
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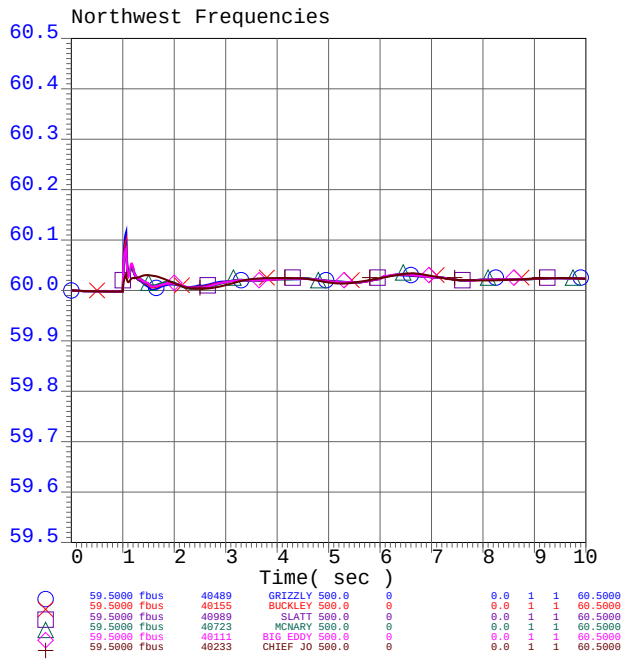
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WECC AREA VOLTAGE AND FREQUENCIES



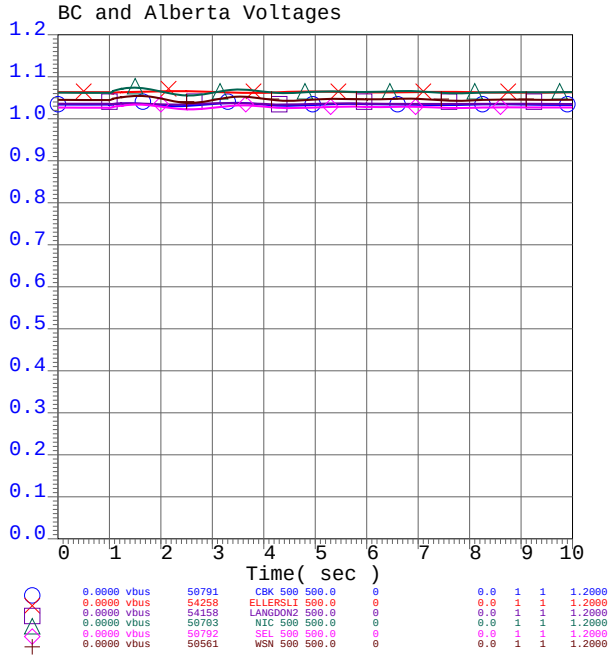


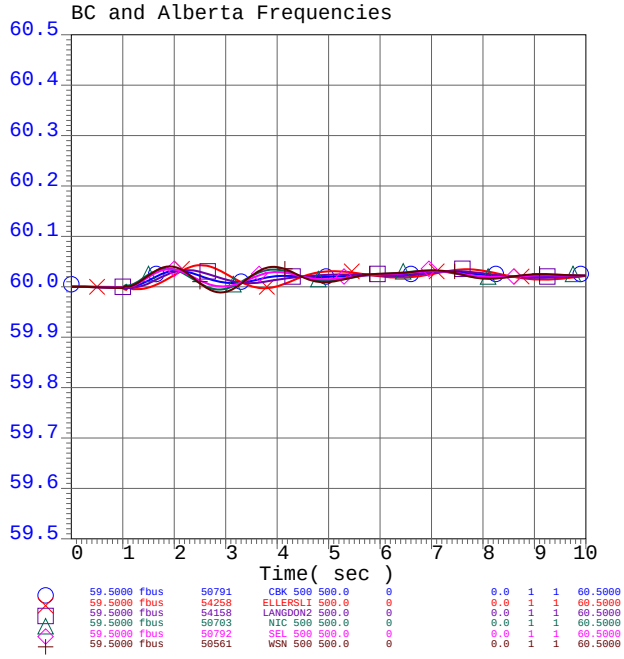


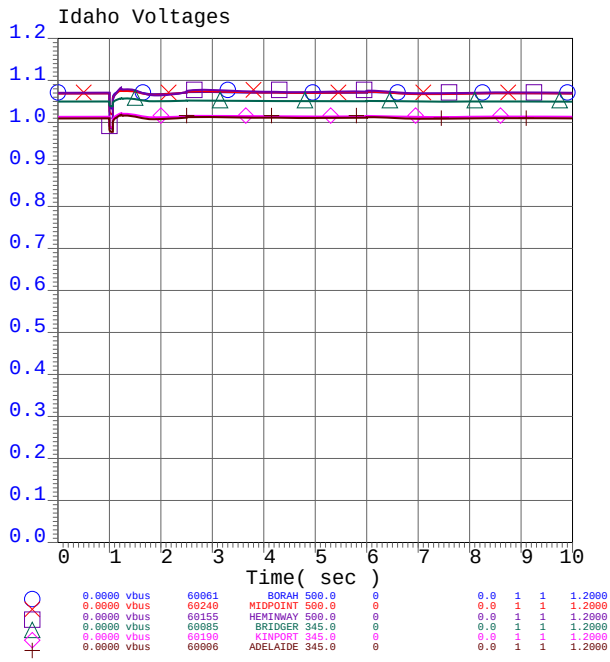


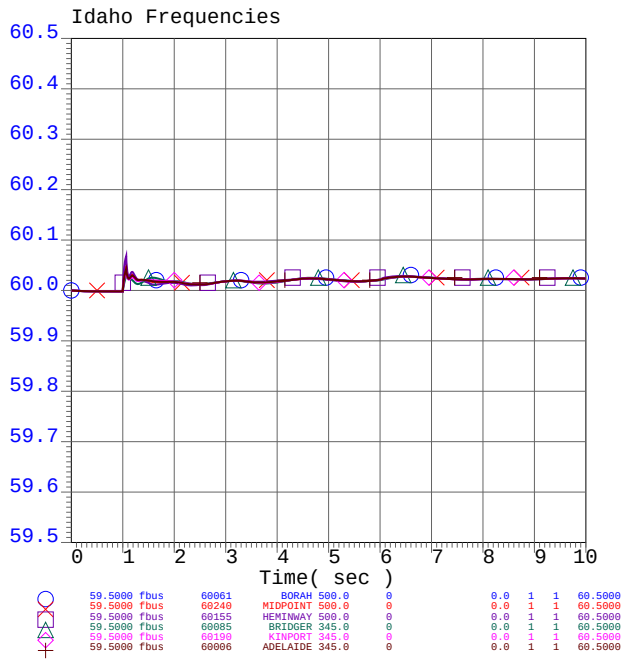
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WECC AREA VOLTAGE AND FREQUENCIES





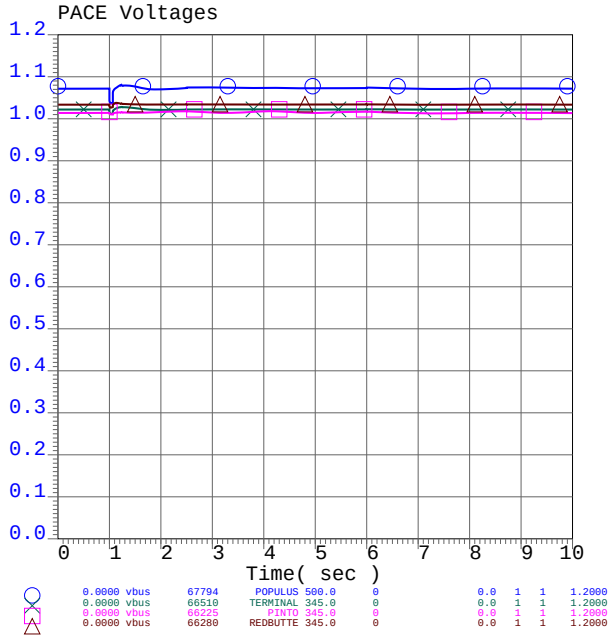




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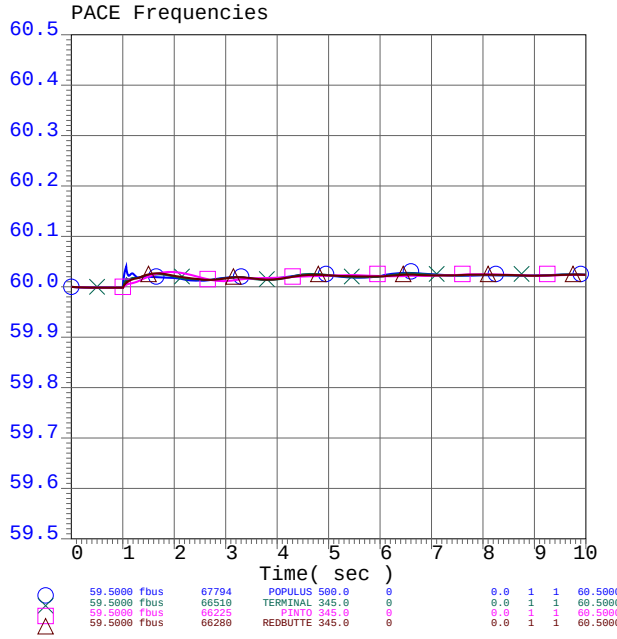
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



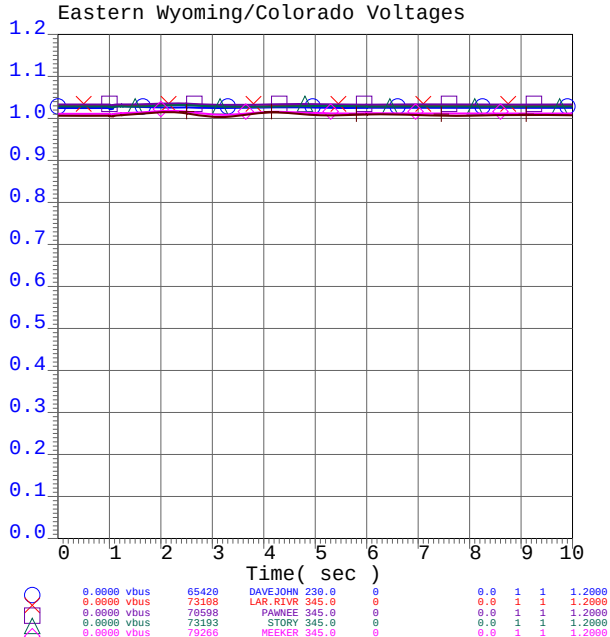
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0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



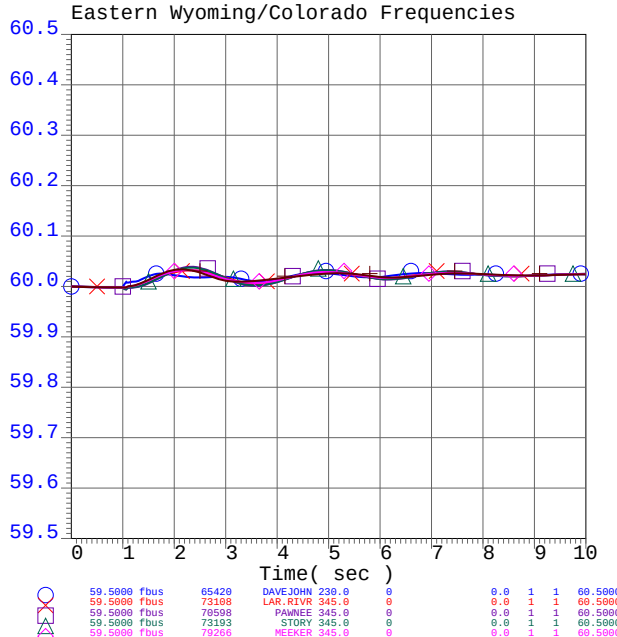
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59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
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Eastern Wyoming/Colorado Frequencies

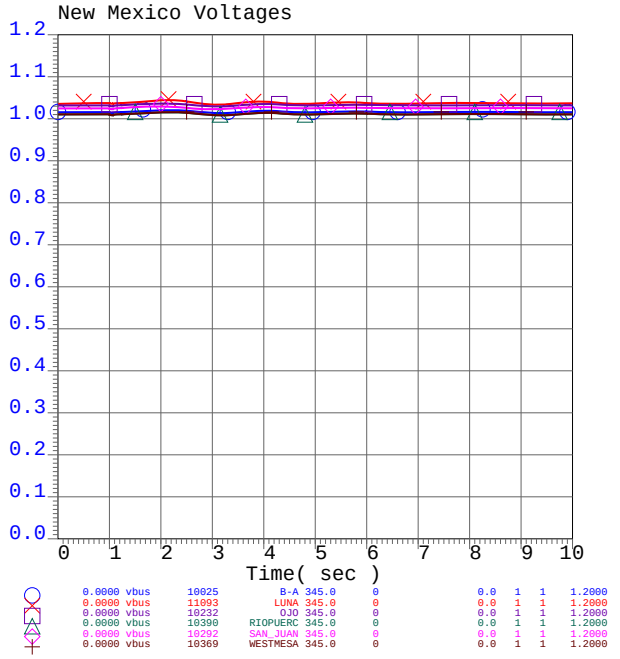


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
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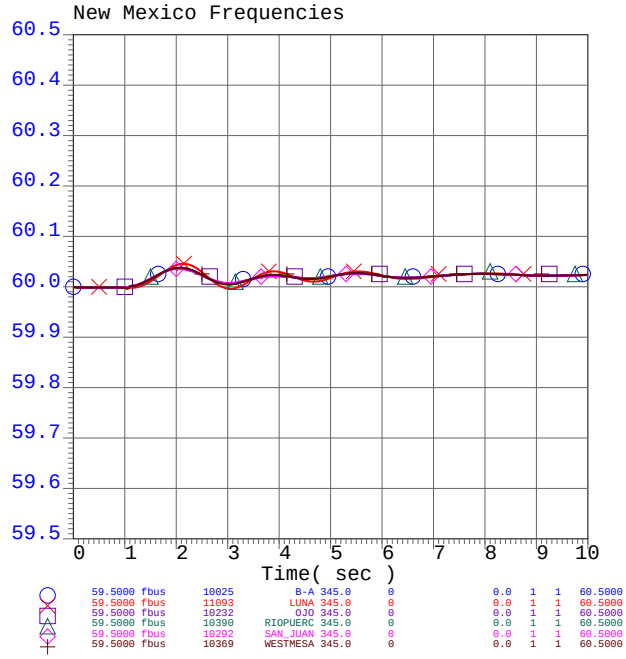
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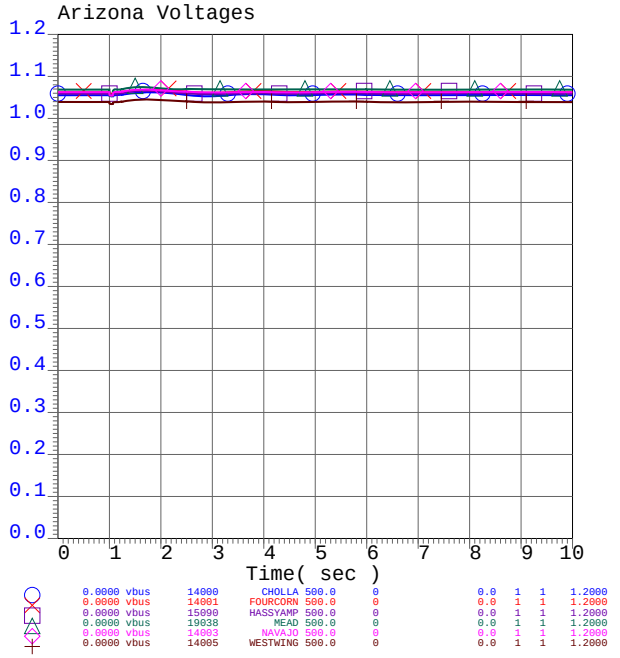
New Mexico Voltages



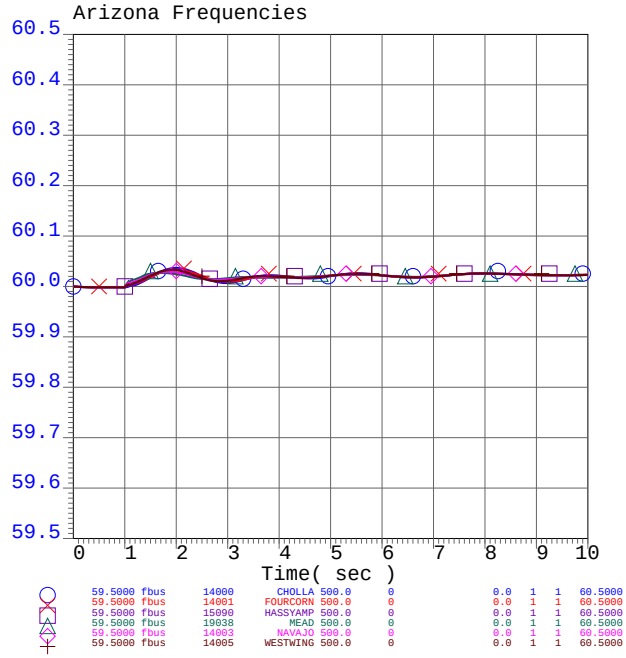
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

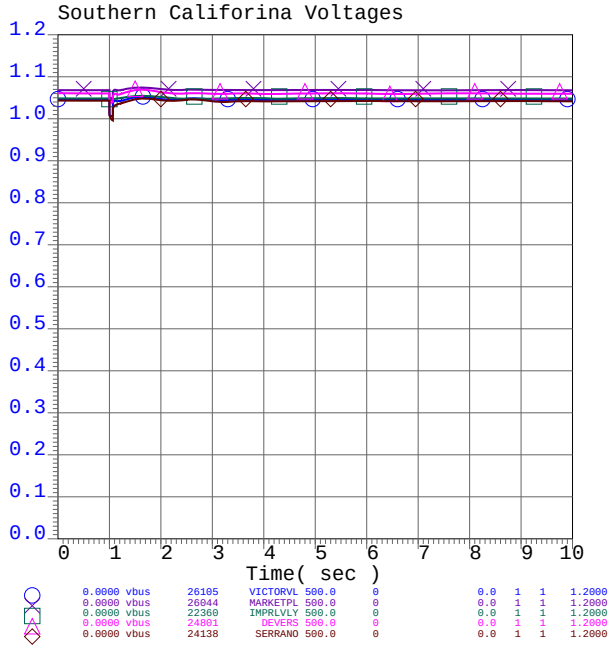


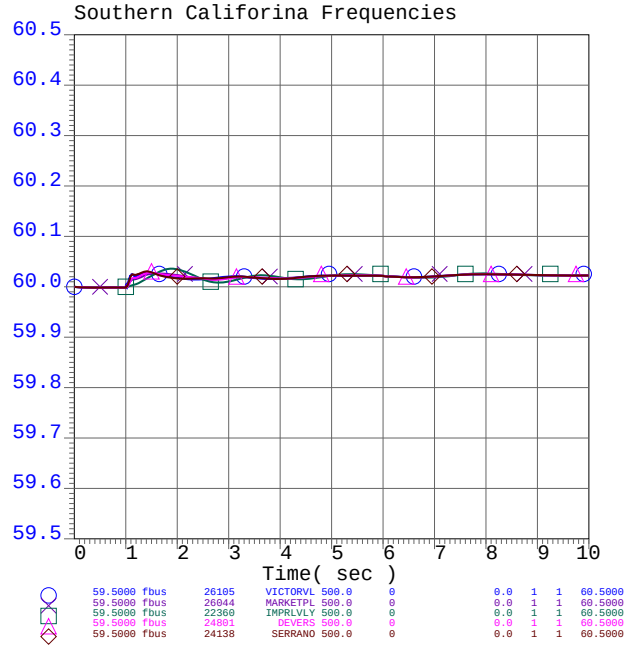
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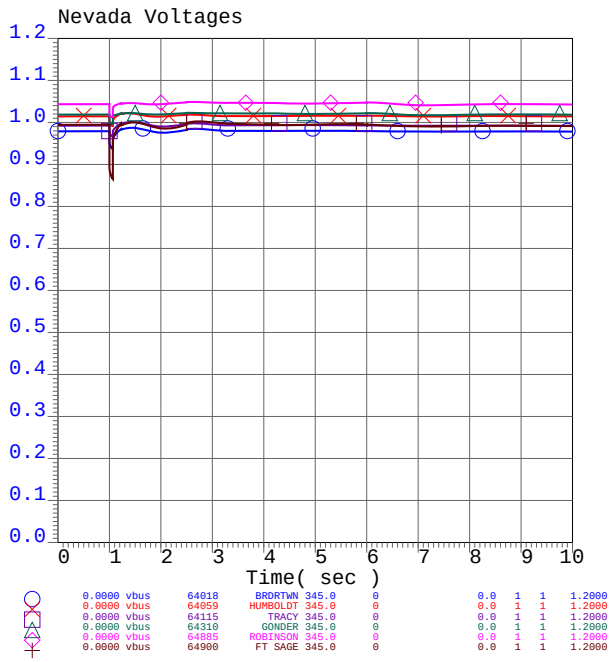
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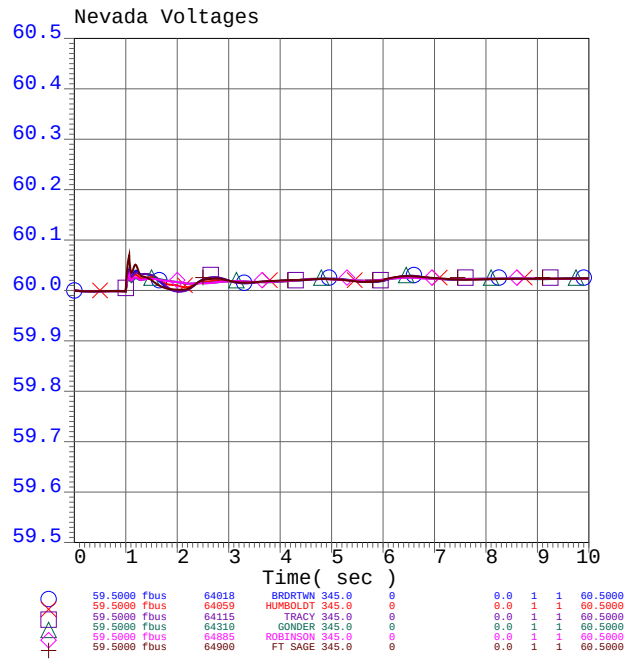
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WECC AREA VOLTAGE AND FREQUENCIES



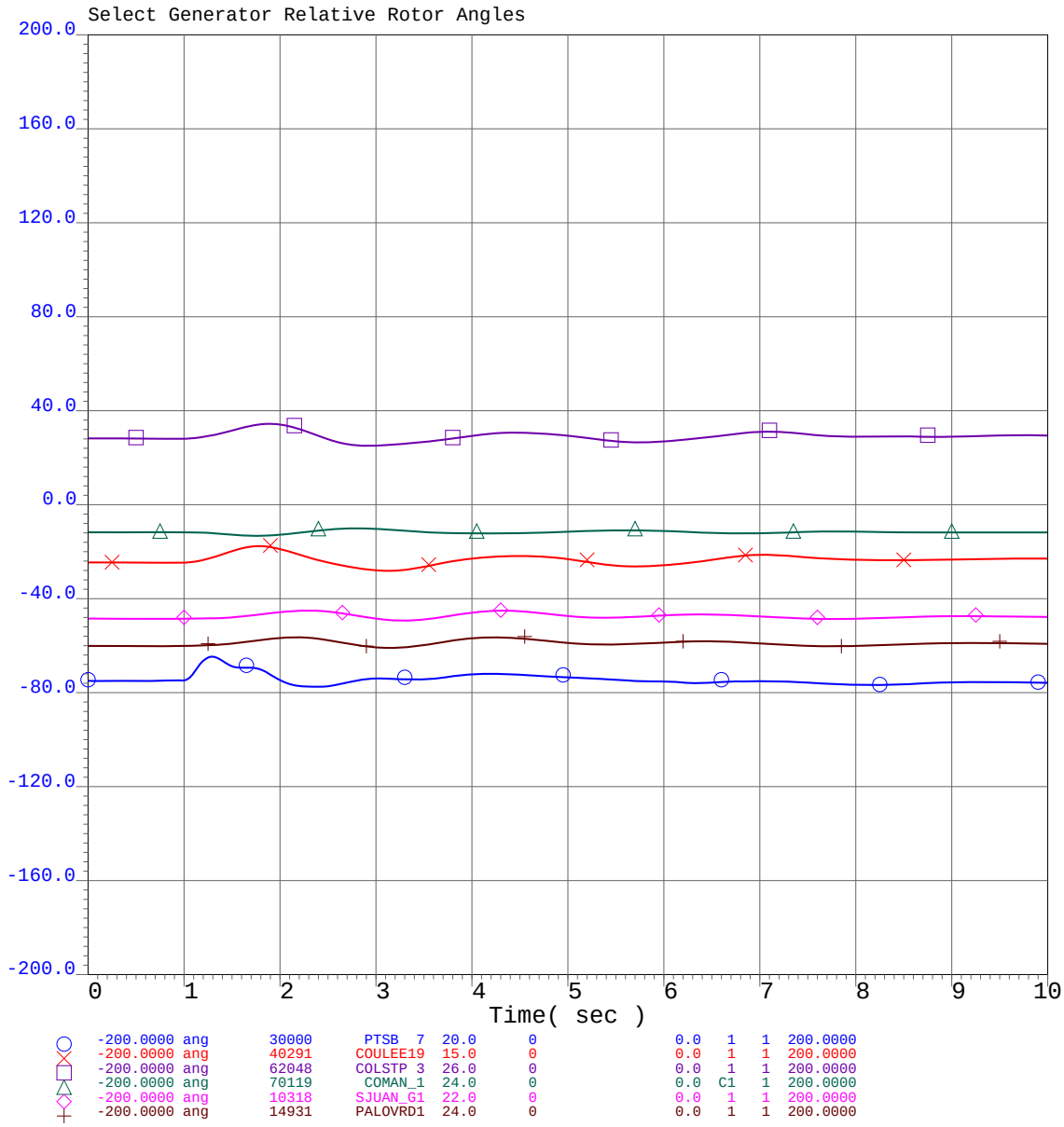






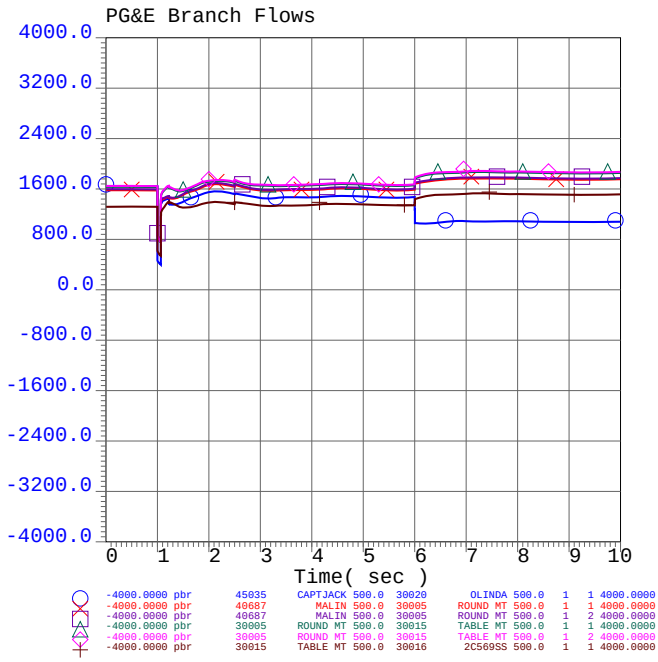
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and Tracy-Los Banos 500 kV lines

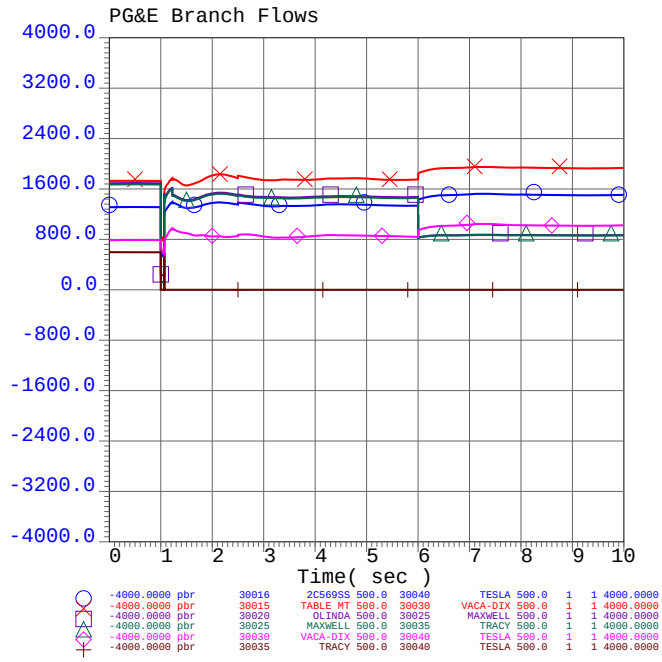
WECC RELATIVE ROTOR ANGLES

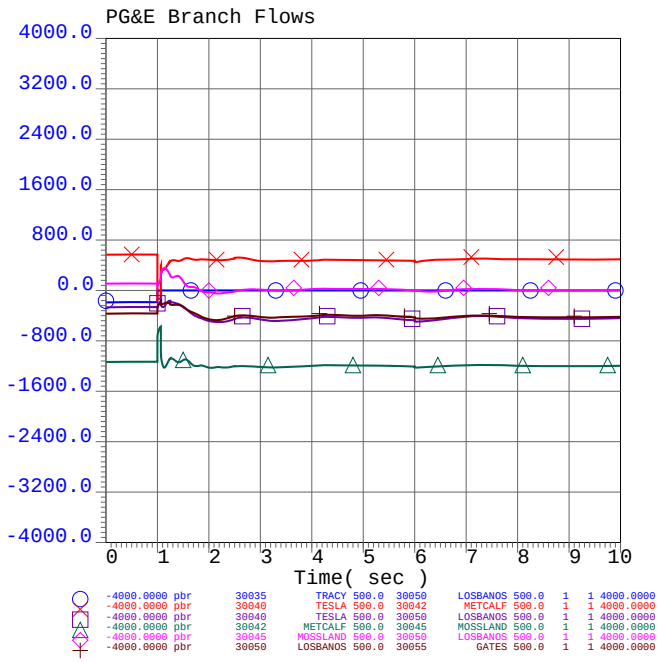


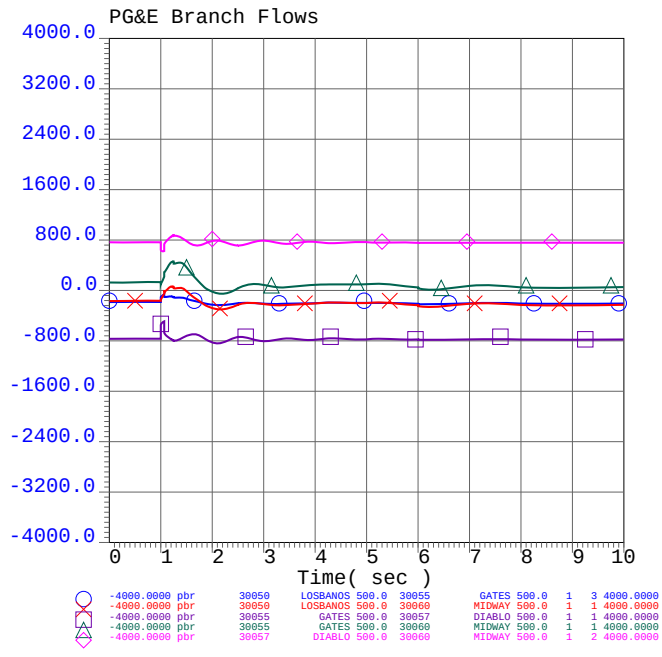
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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SELECT BRANCH FLOWS







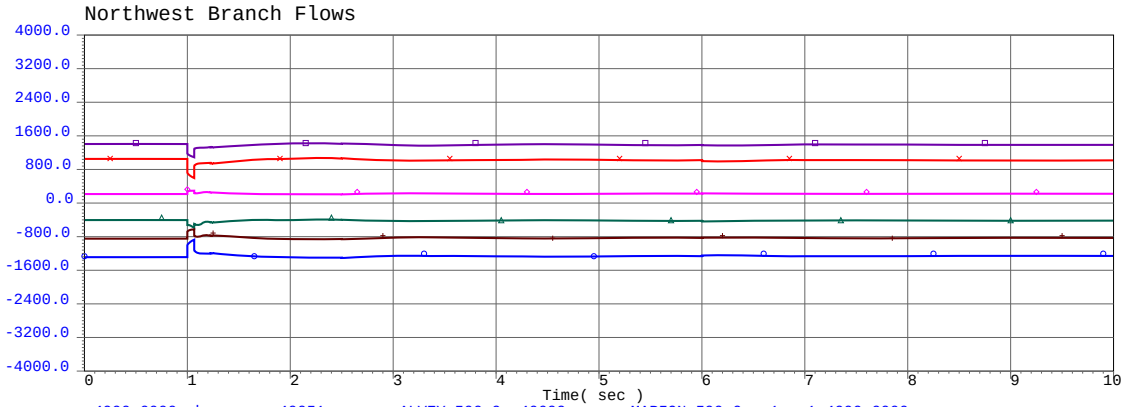


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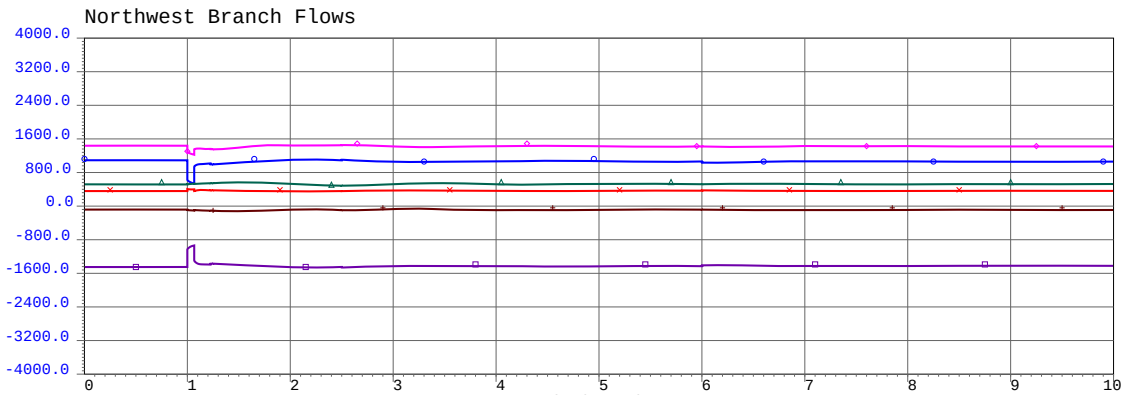
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Fri Jan 03 19:01:37 2014

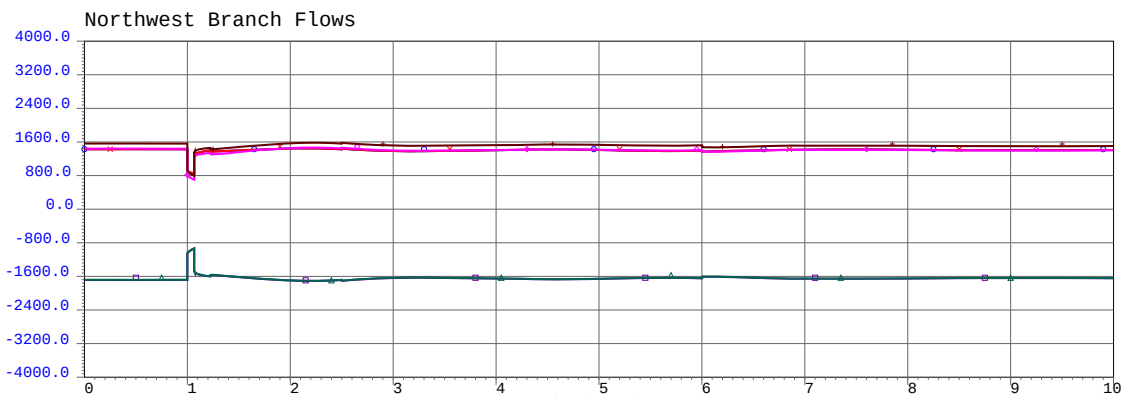
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



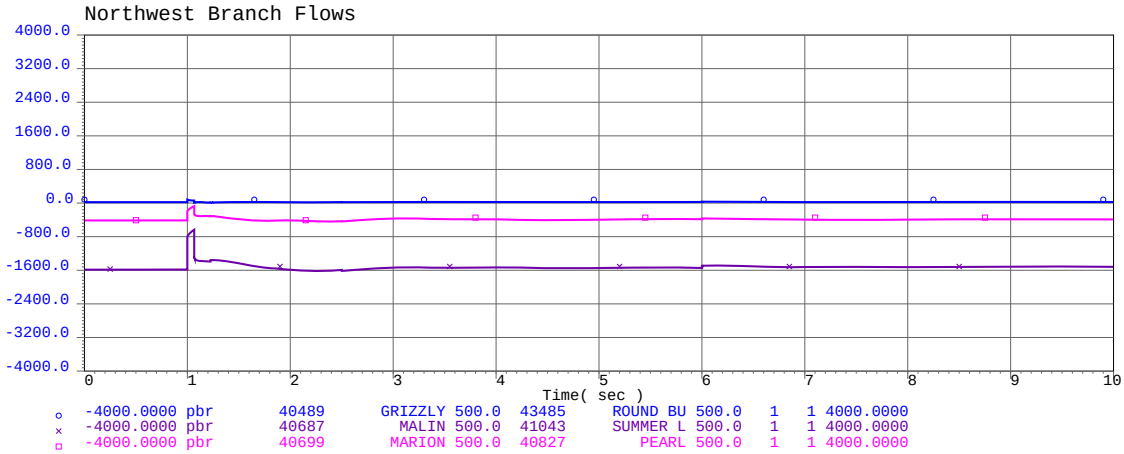
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-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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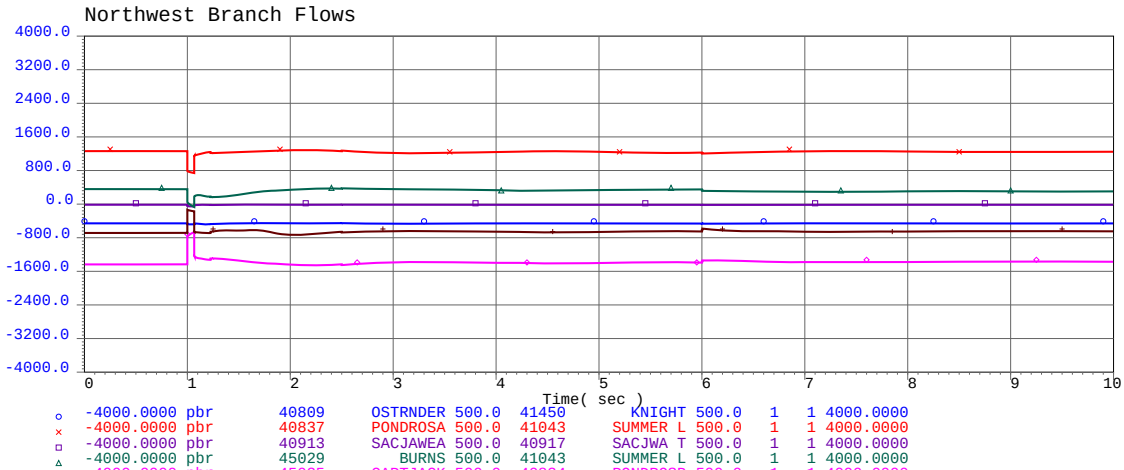
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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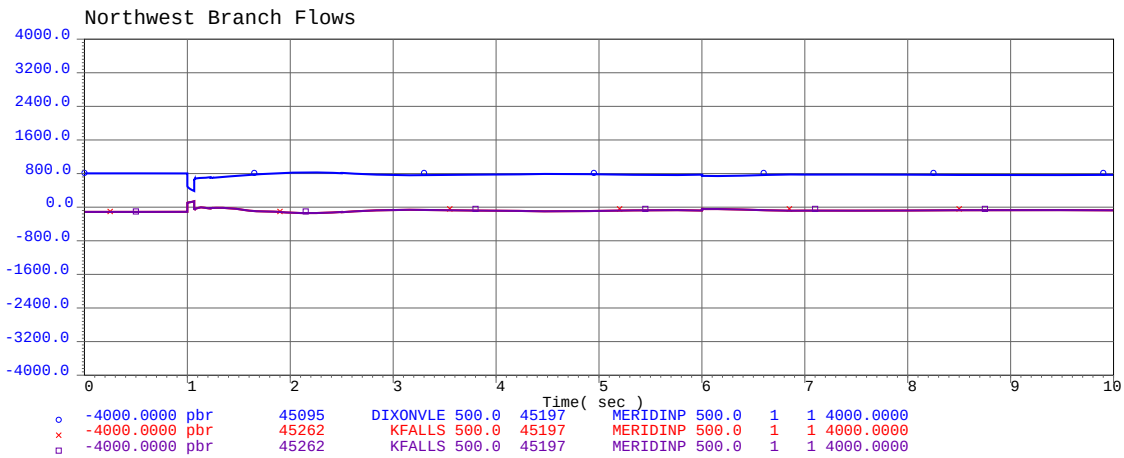
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



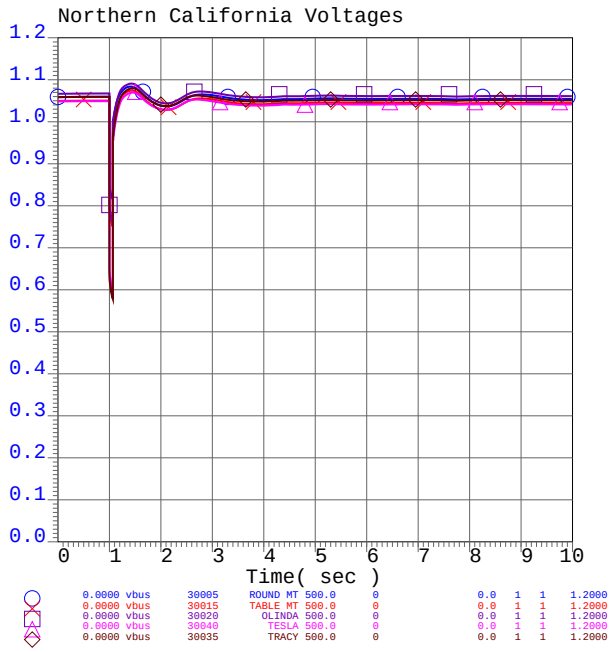
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

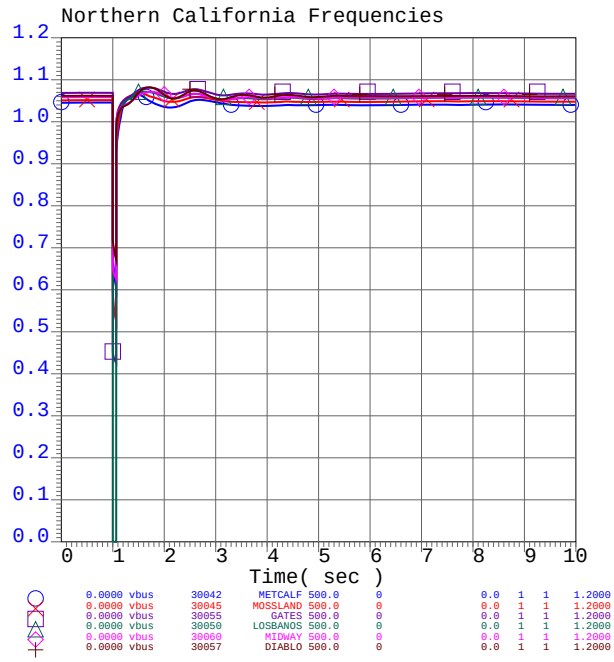


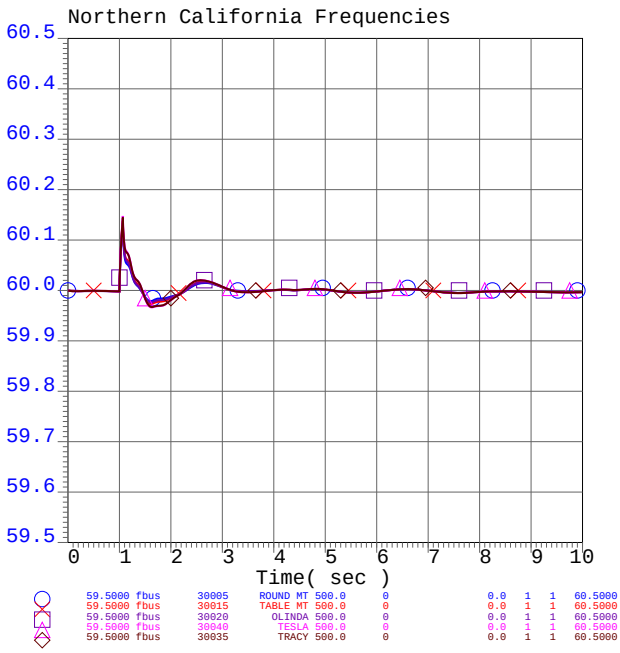
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

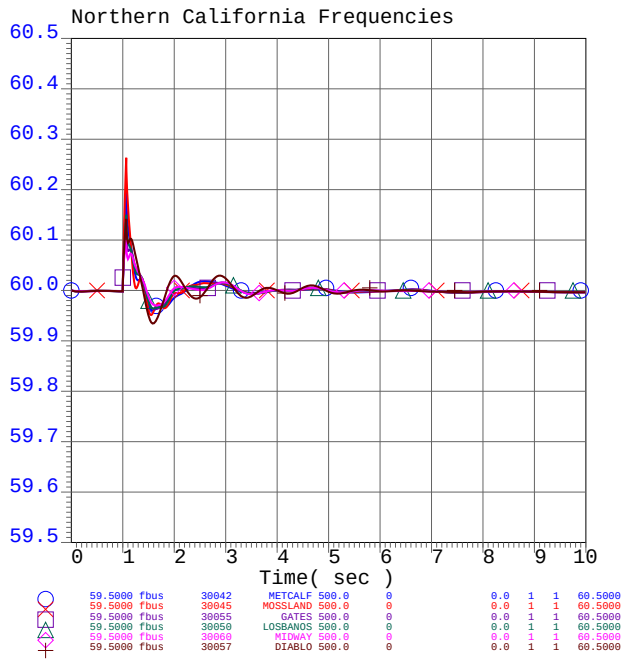
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WECC AREA VOLTAGE AND FREQUENCIES



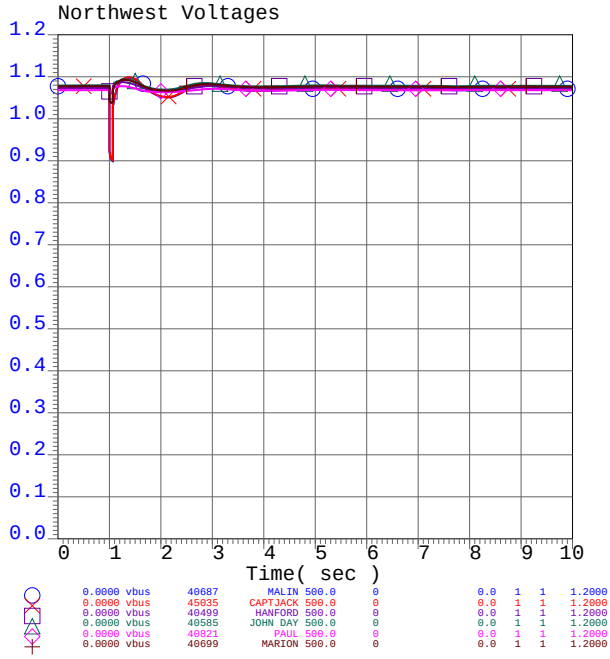


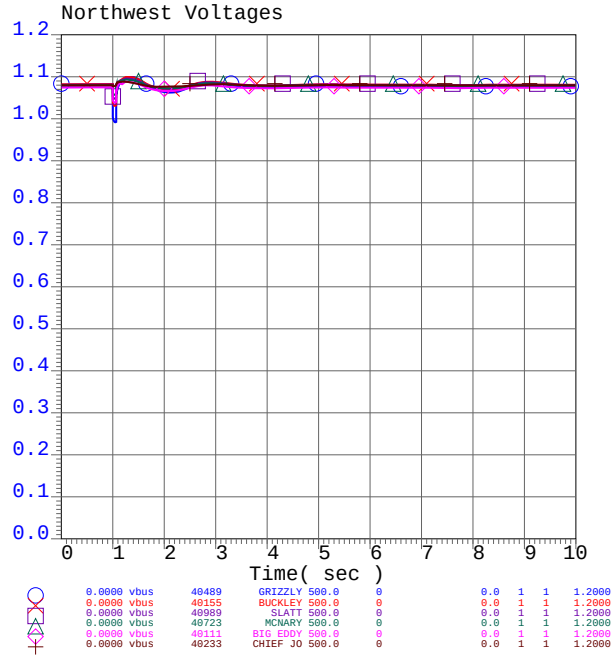


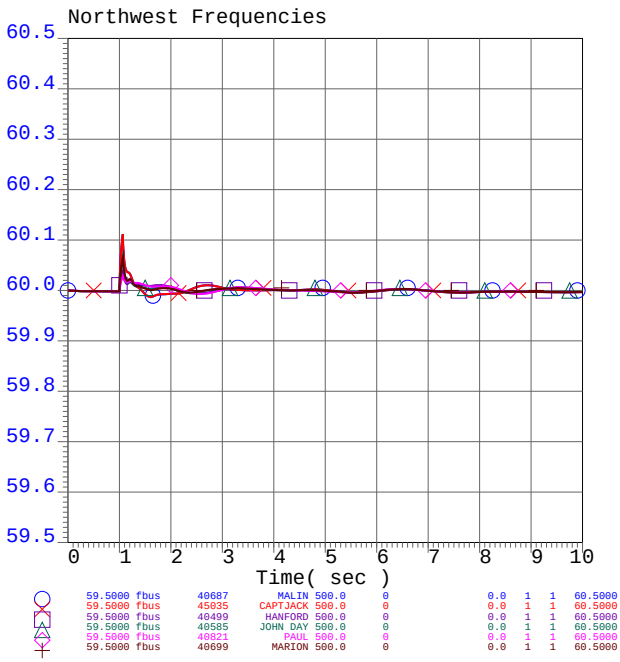


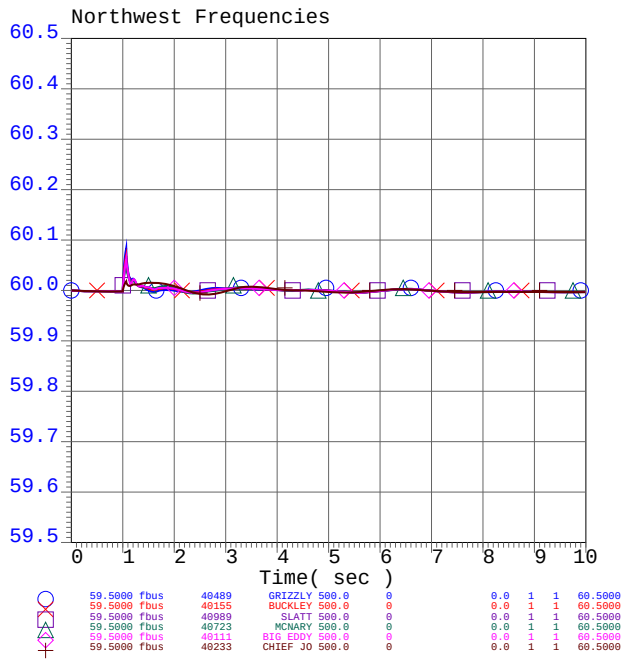
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WECC AREA VOLTAGE AND FREQUENCIES





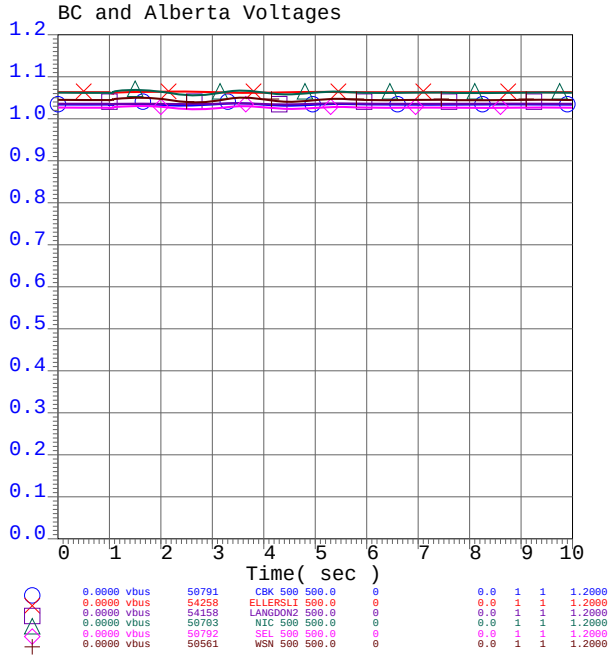




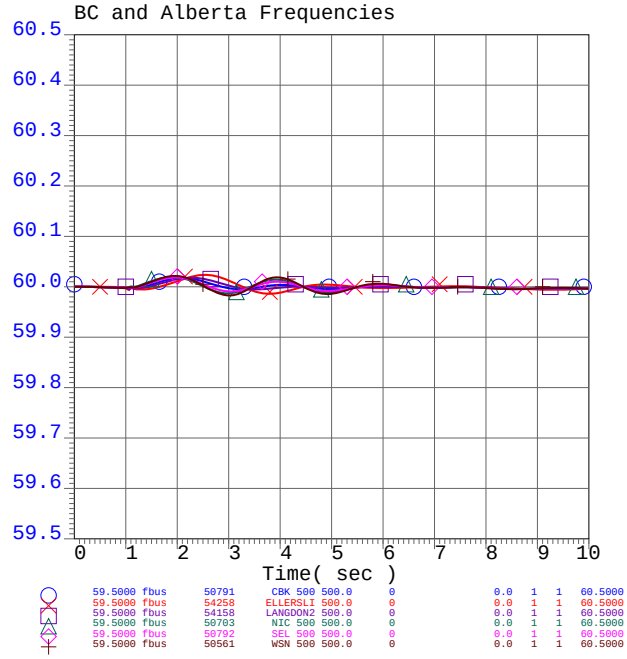
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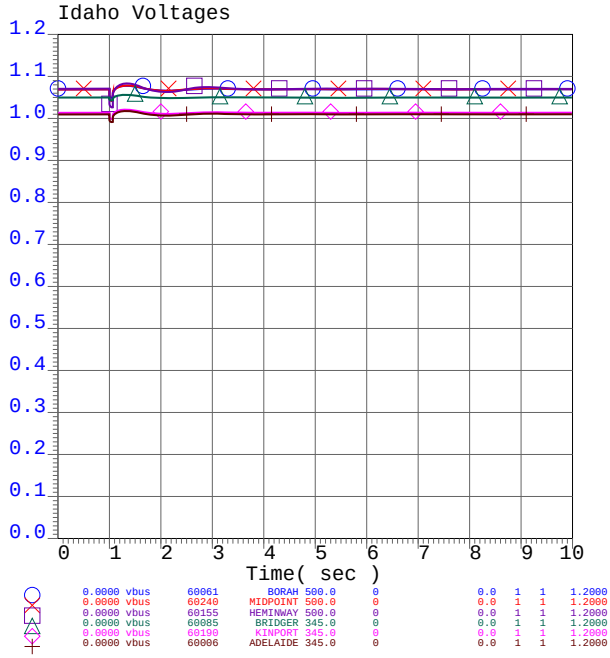
BC and Alberta Voltages



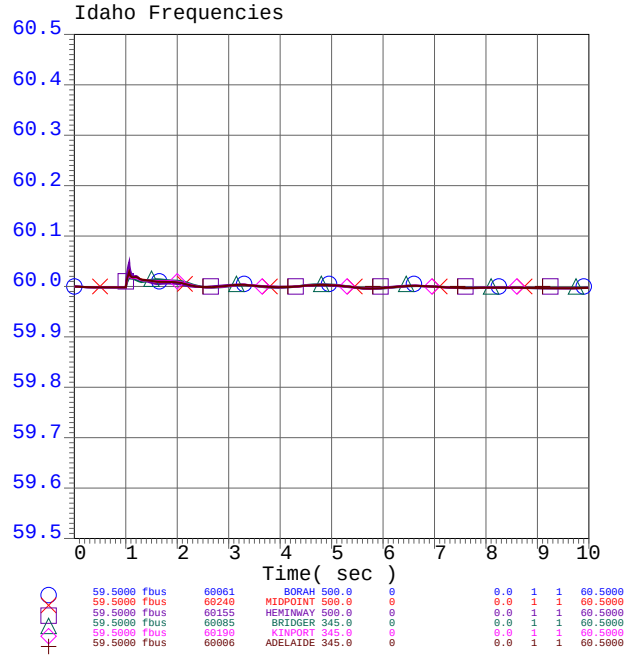
BC and Alberta Frequencies



Idaho Voltages



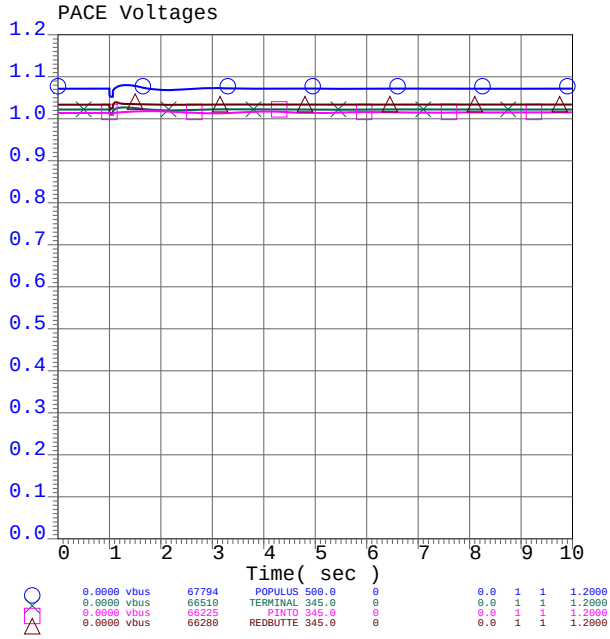
Idaho Frequencies



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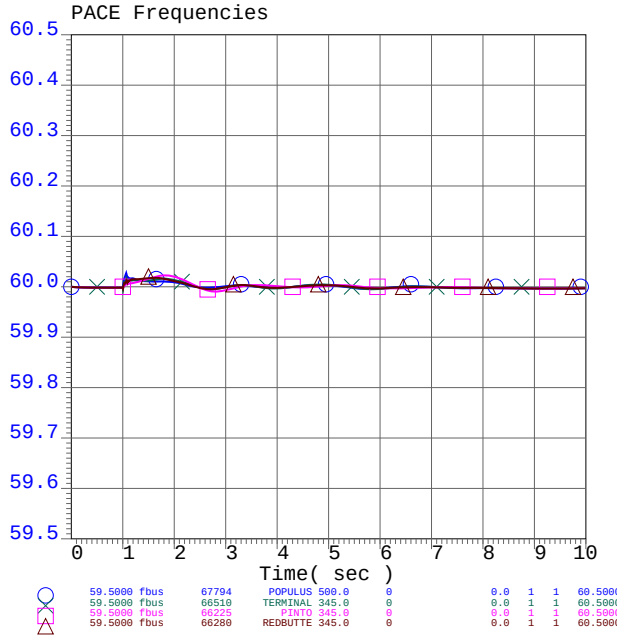
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



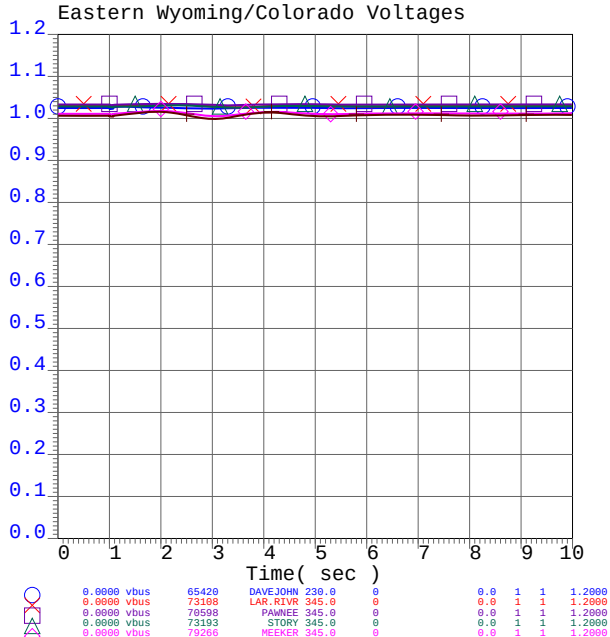
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0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



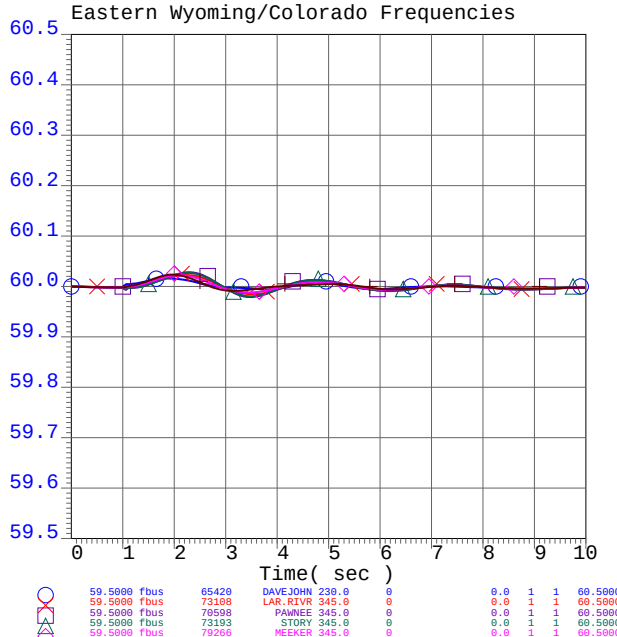
59.5000 fbus 67794 POPULUS 500.0 0 0.0 1 1 60.5000
59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

Eastern Wyoming/Colorado Frequencies

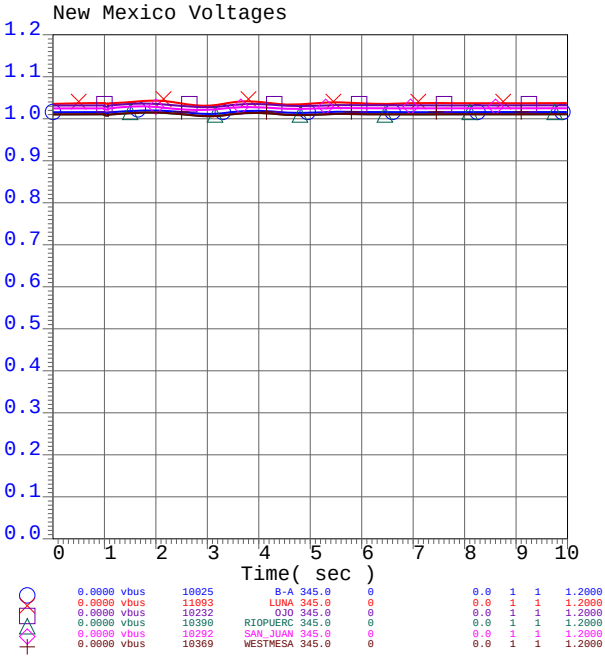


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
59.5000 fbus 70598 PAWNEE 345.0 0 0.0 1 1 60.5000
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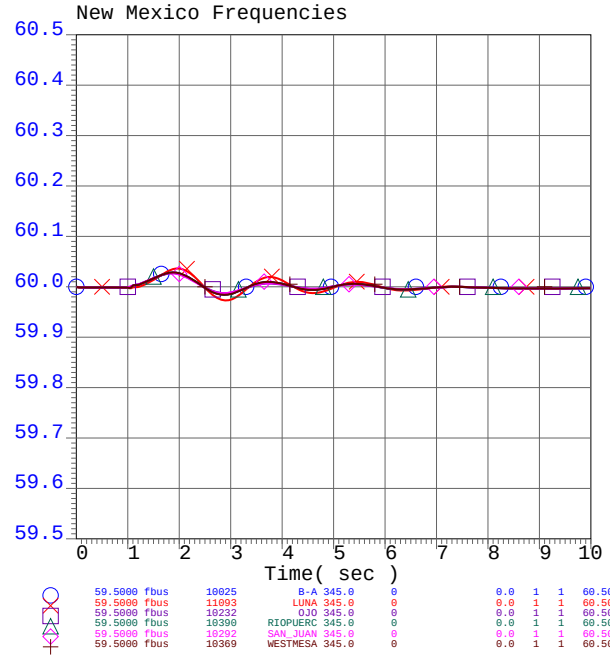
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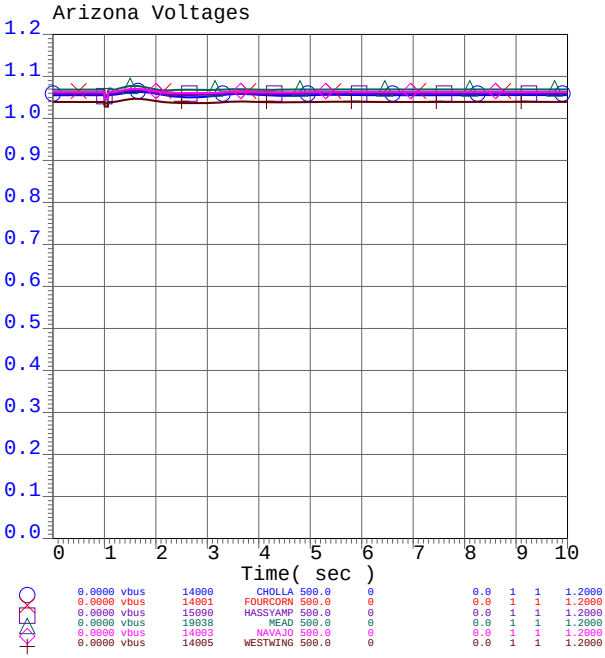
New Mexico Voltages



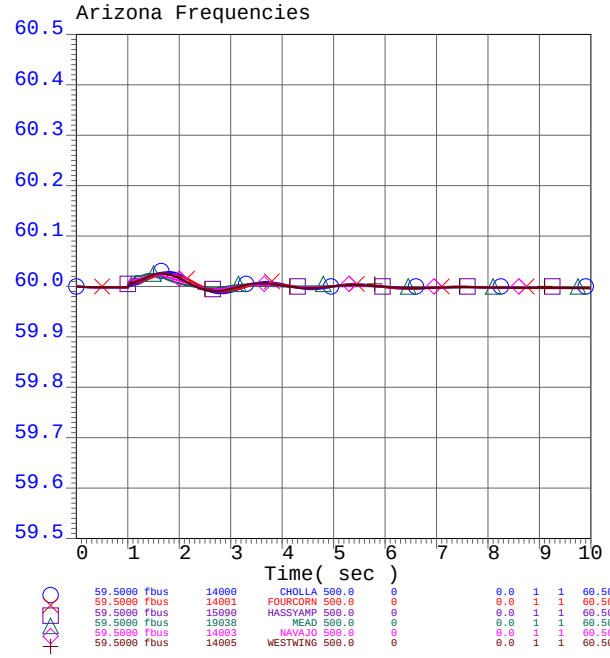
New Mexico Frequencies



Arizona Voltages

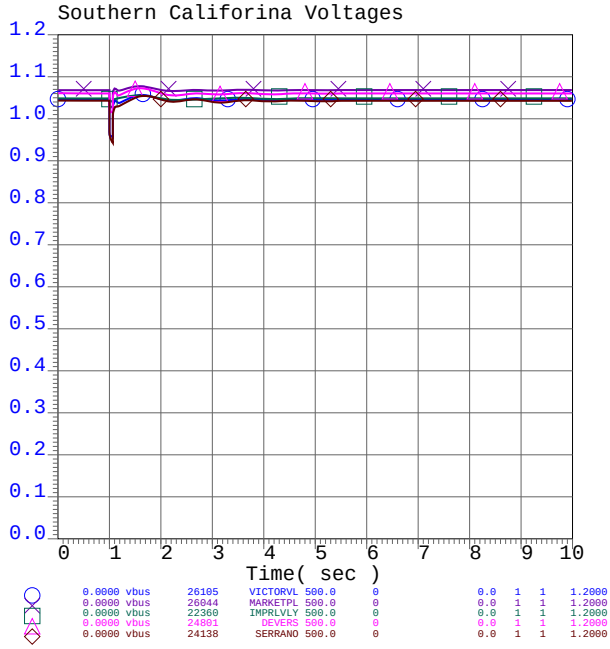


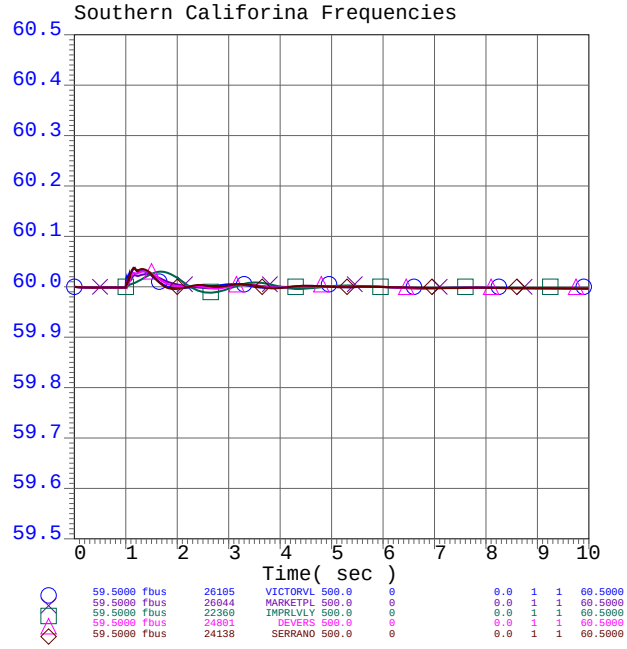
Arizona Frequencies

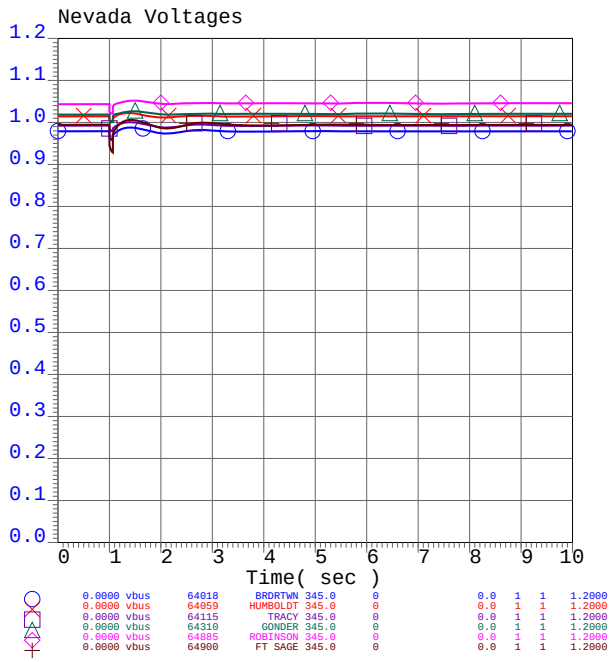


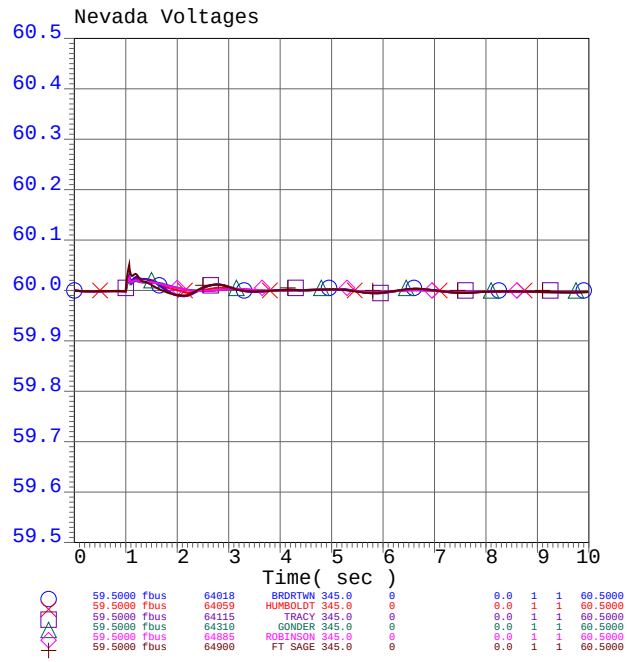
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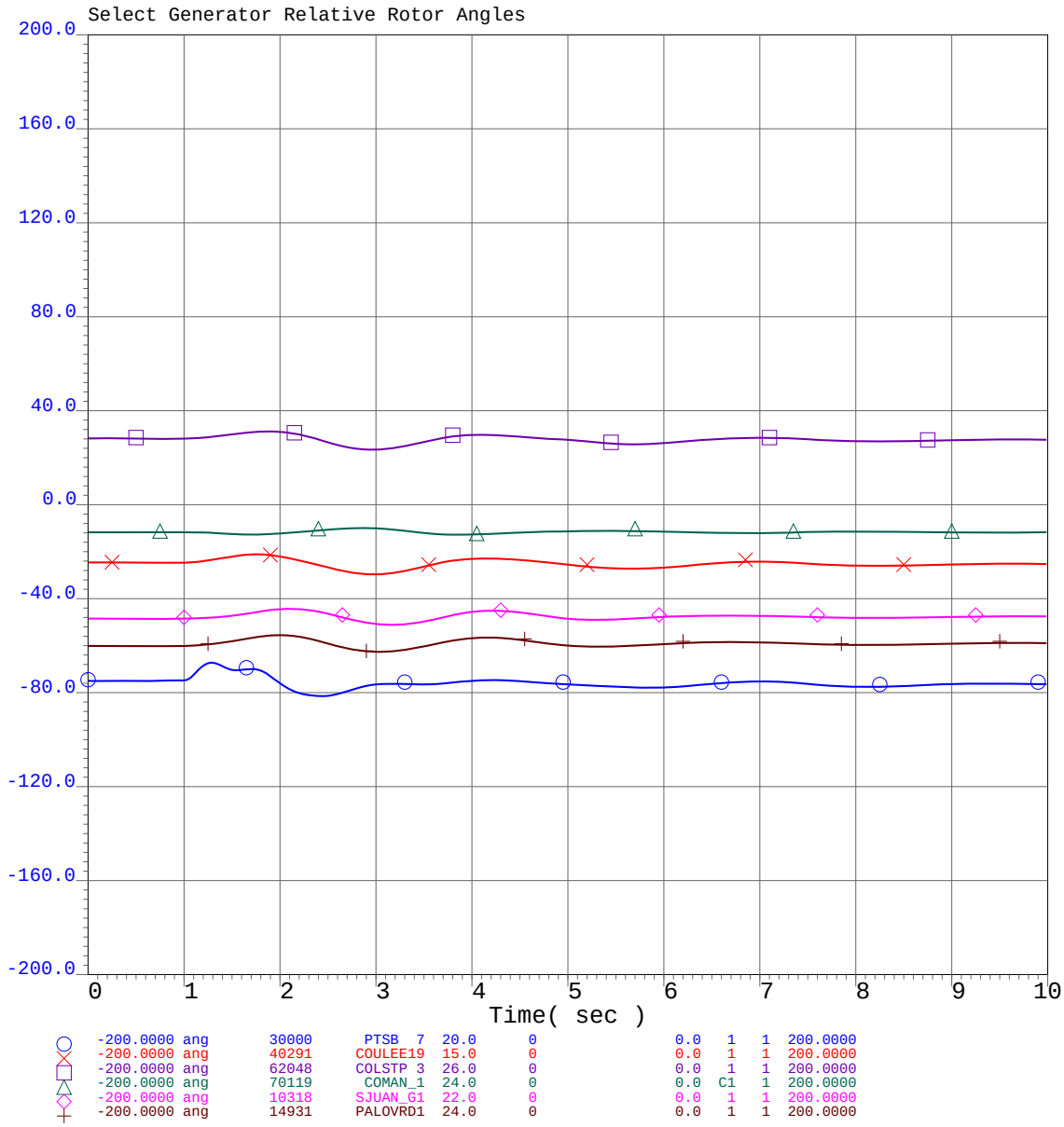






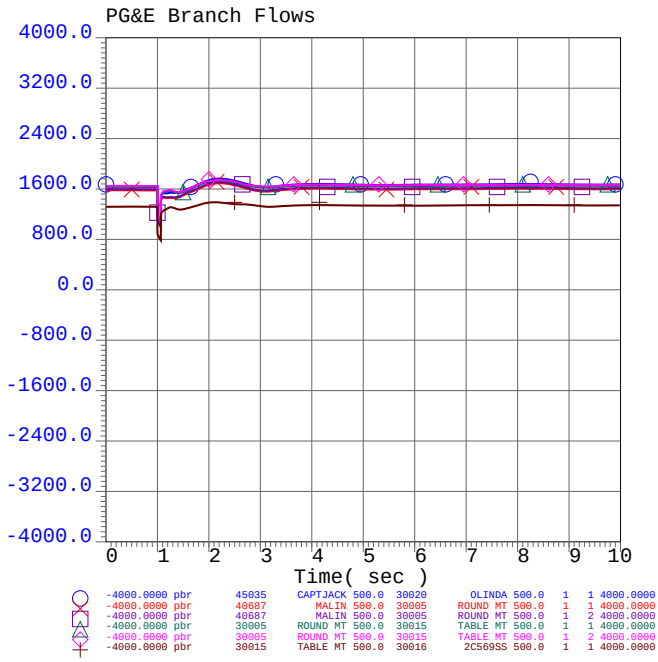
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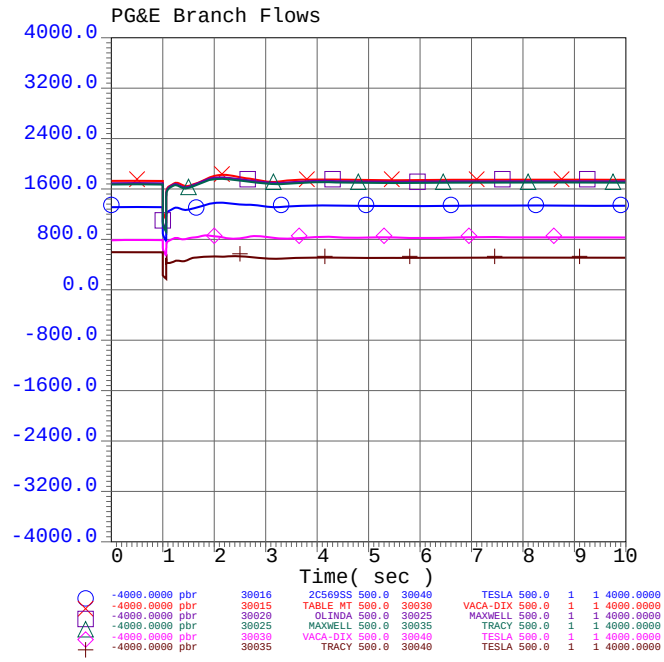
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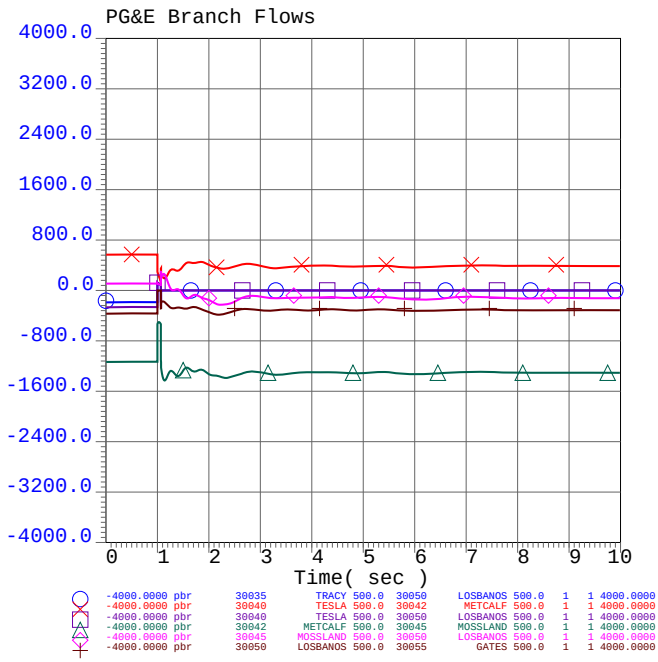


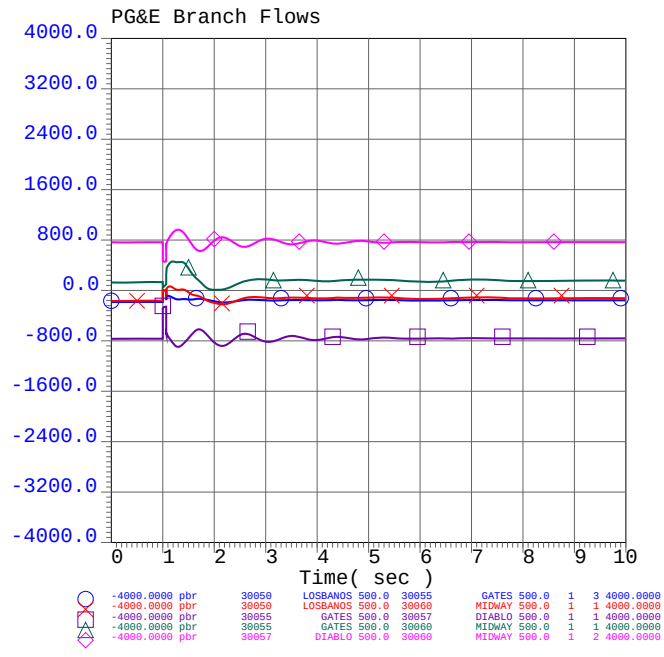
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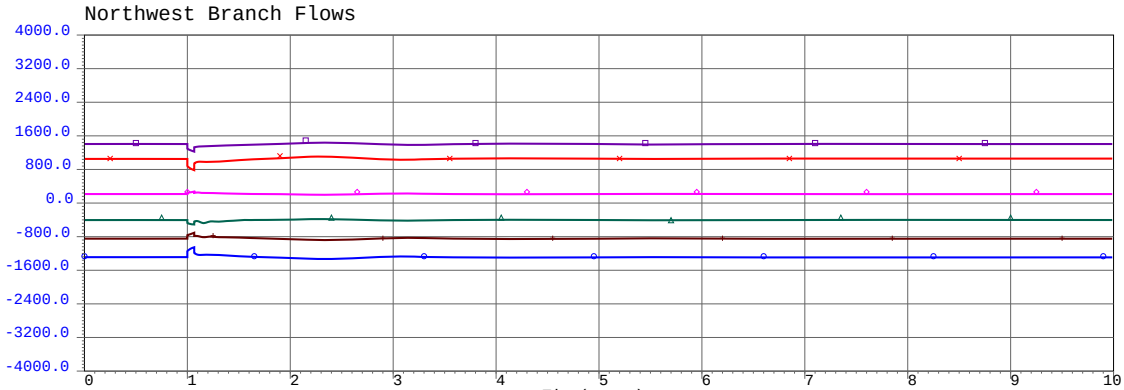




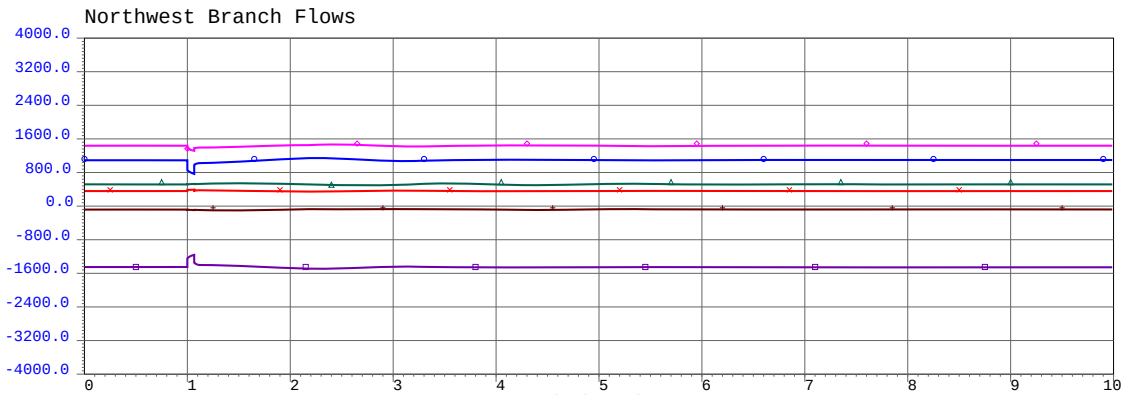


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

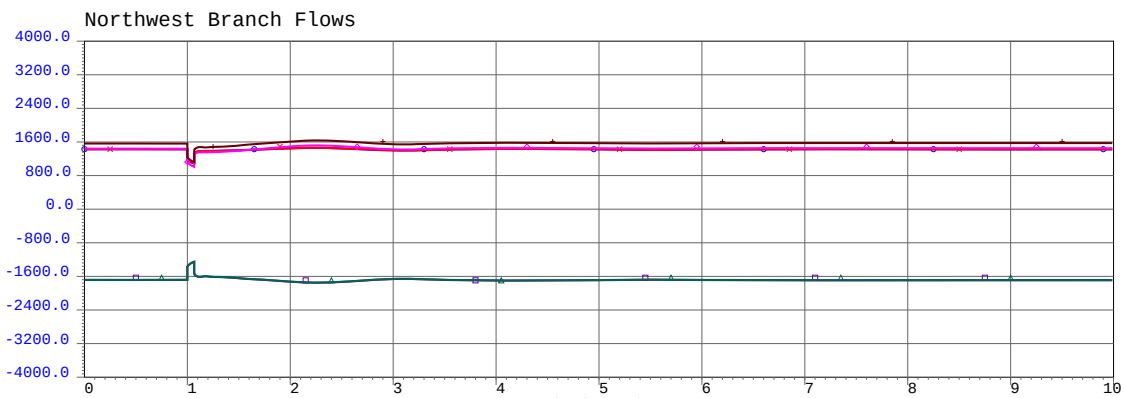
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



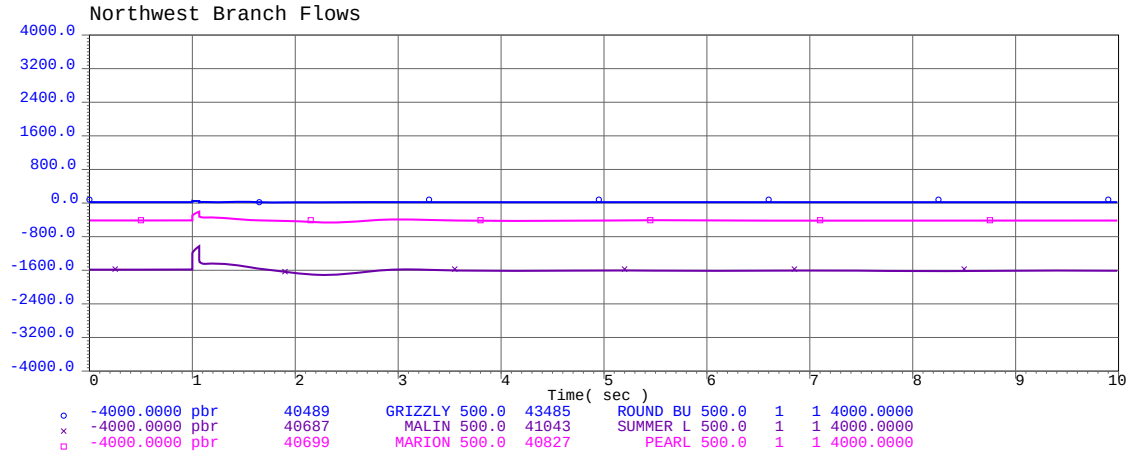
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



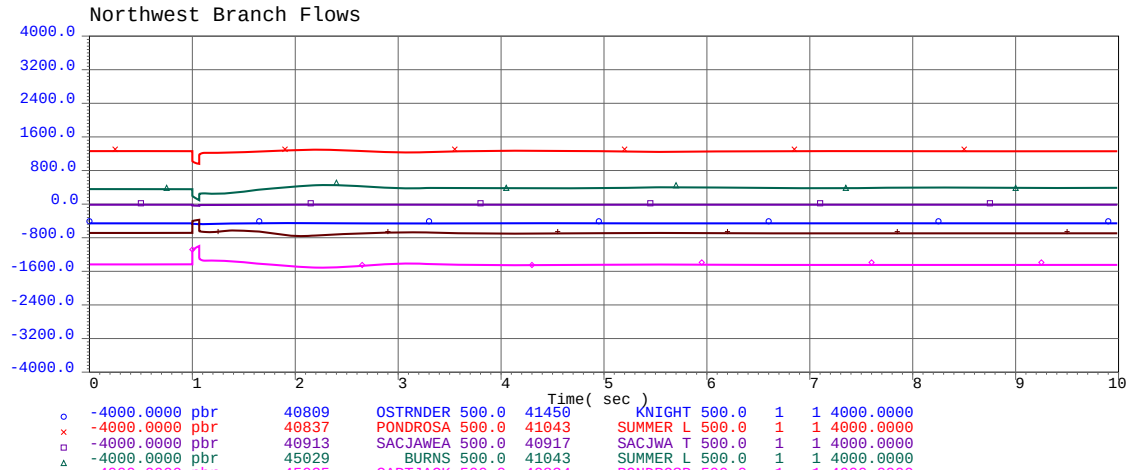
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

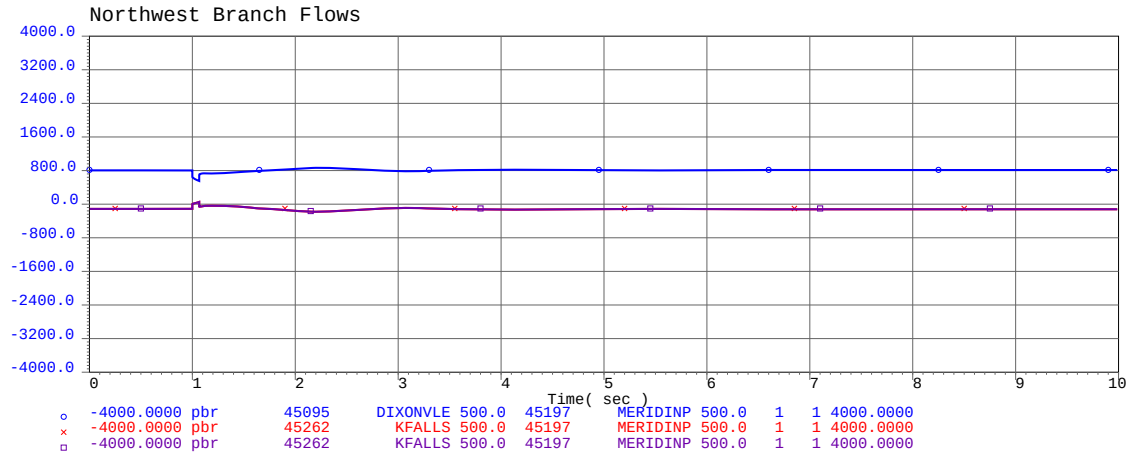
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



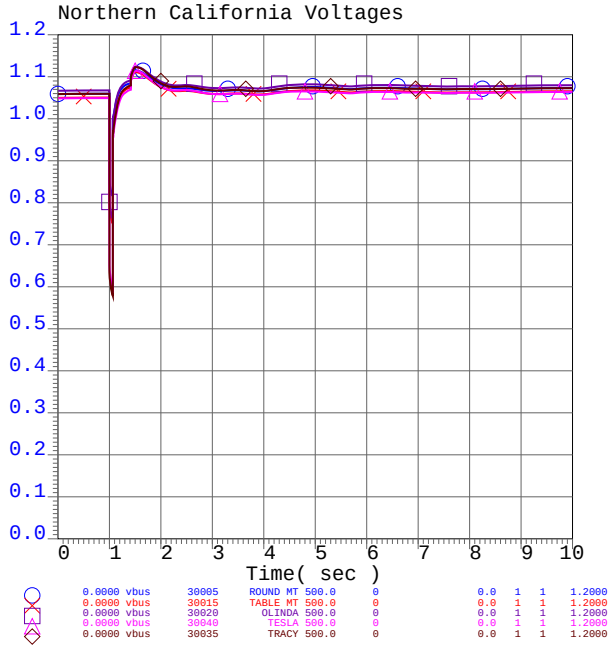
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

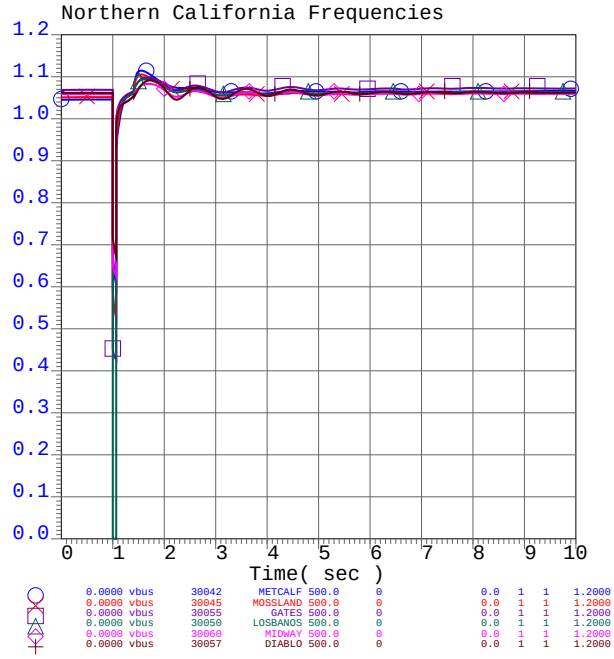


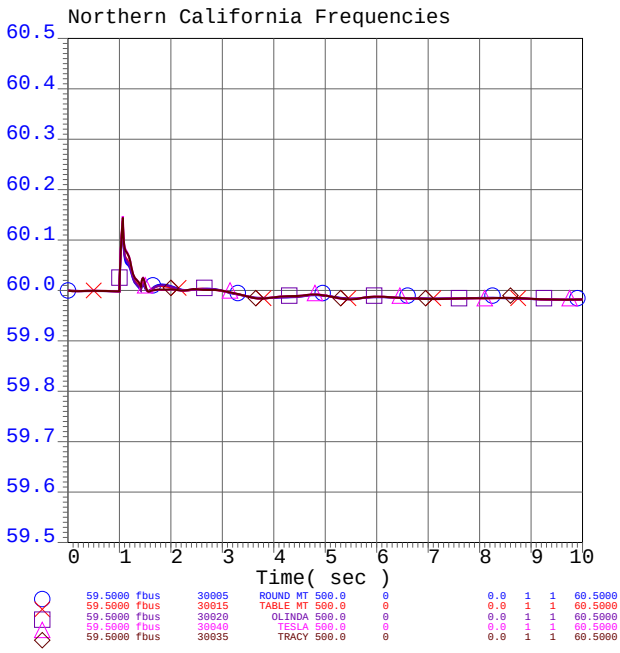
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

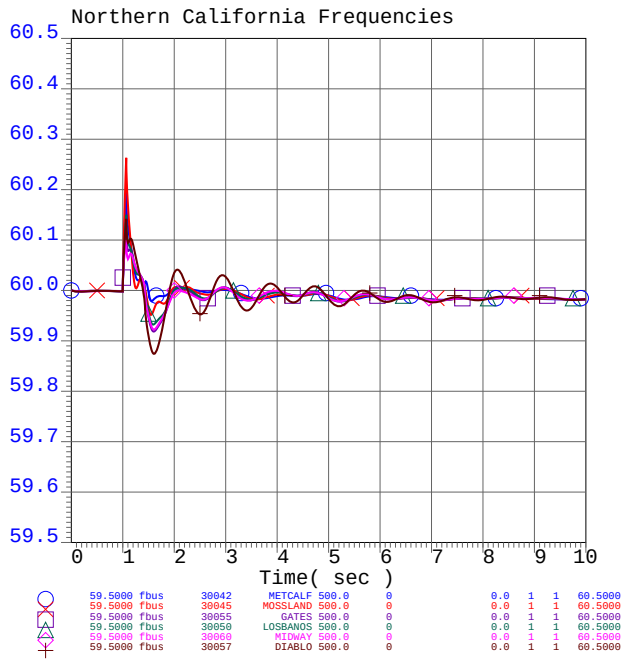
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES







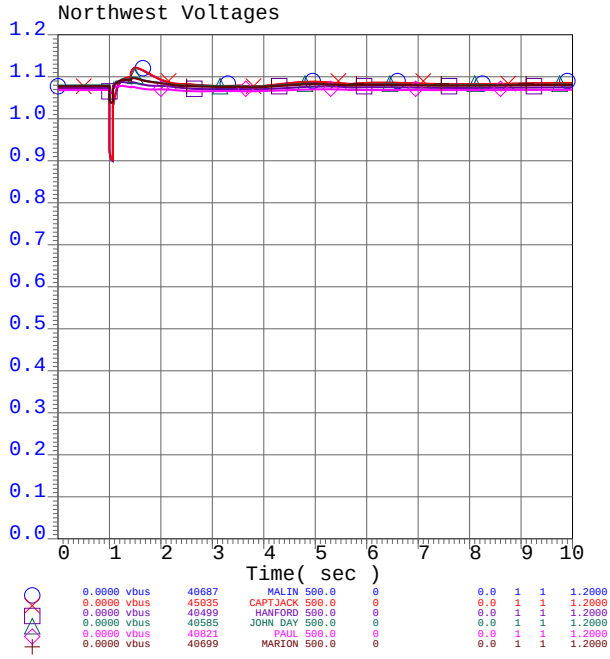


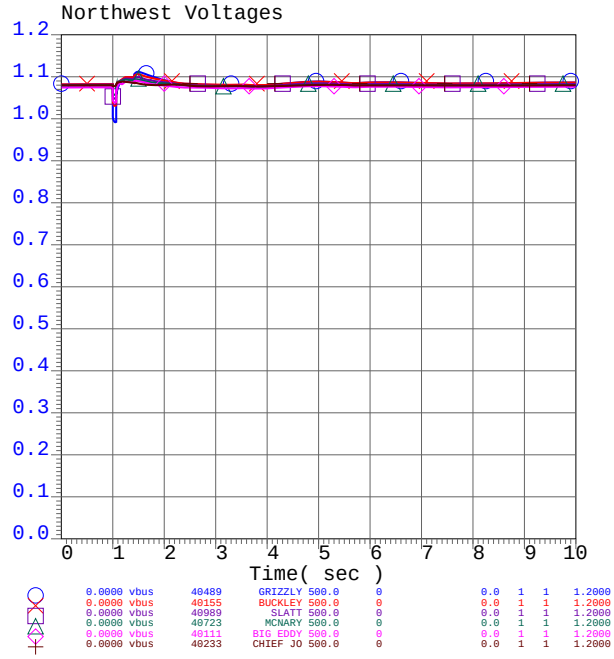
2018 Summer Peak: Cluster 6 Phase 1: Kern Group
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

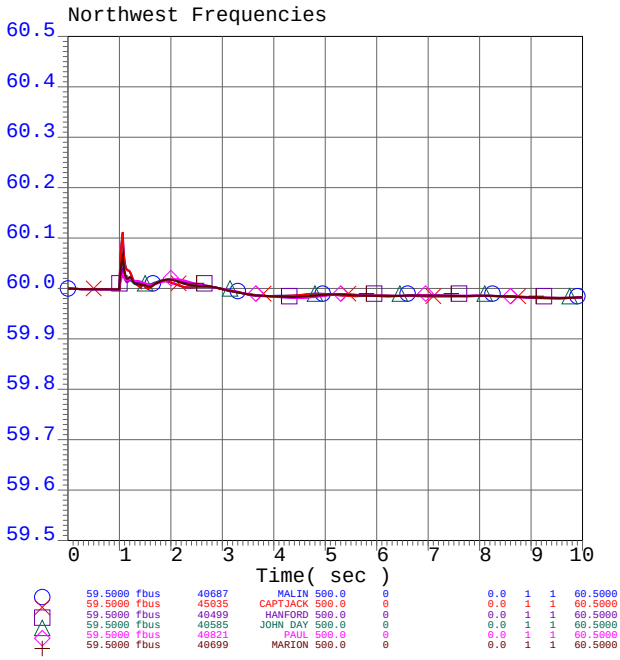
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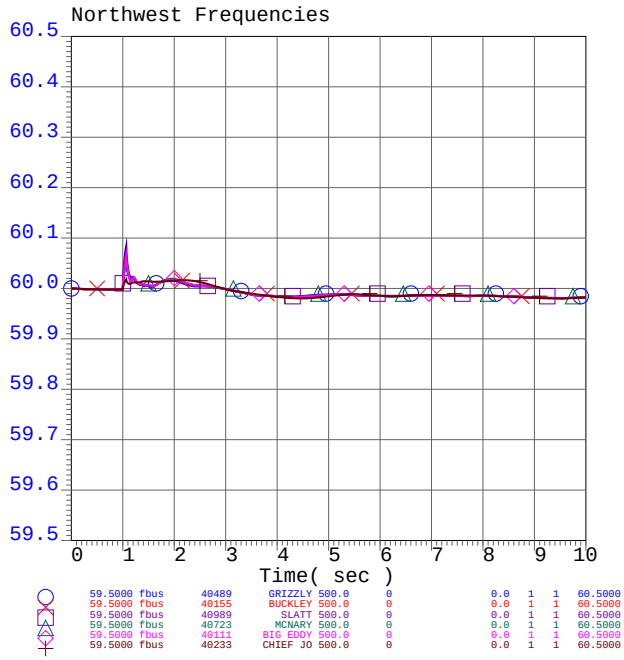
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WECC AREA VOLTAGE AND FREQUENCIES





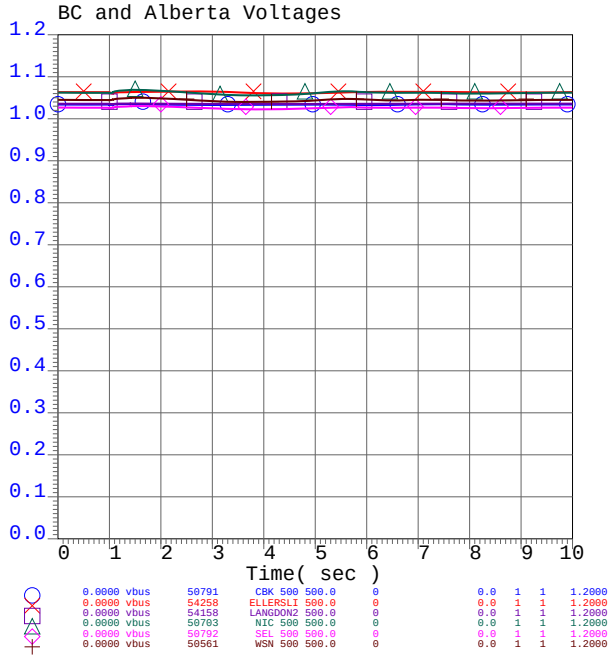




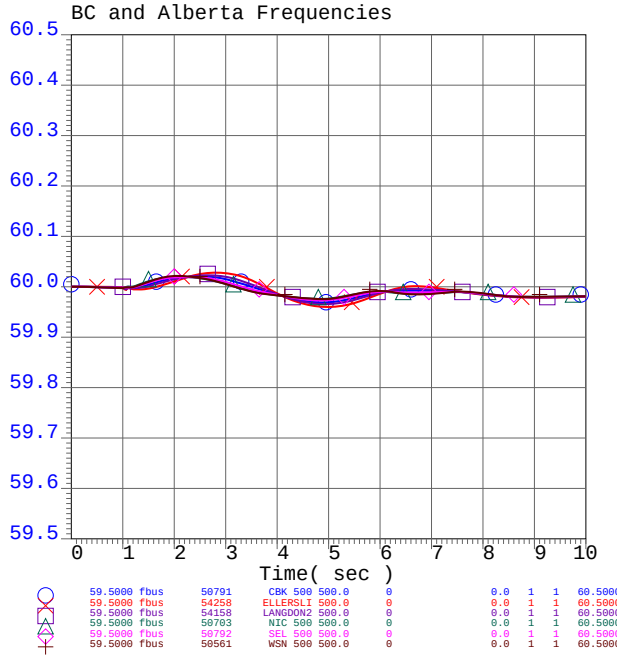
2018 Summer Peak: Cluster 6 Phase 1: Kern Group
3-phase 4 cycle fault at Los Banos 500 kV
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WECC AREA VOLTAGE AND FREQUENCIES

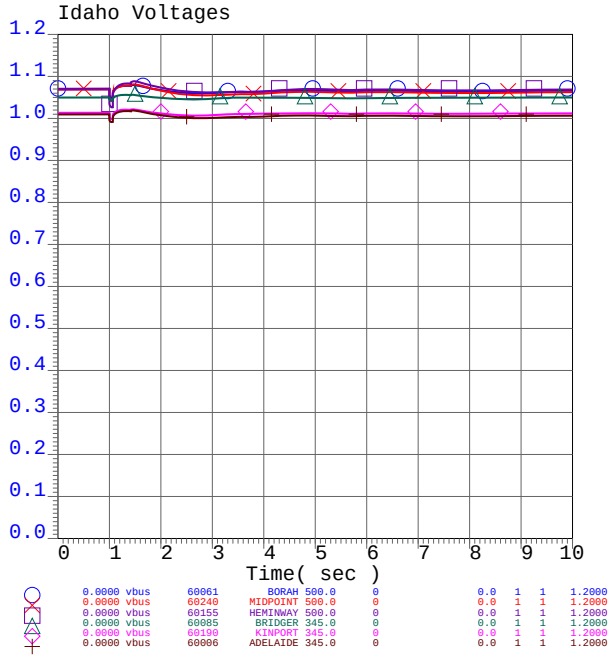
BC and Alberta Voltages



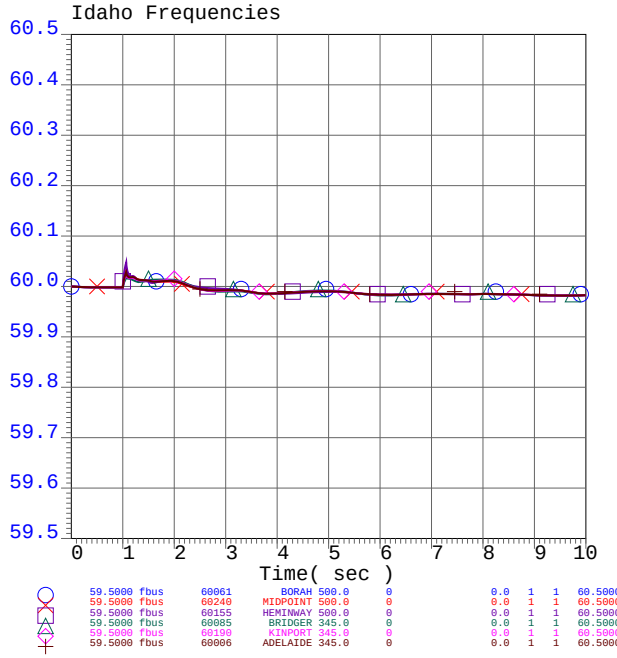
BC and Alberta Frequencies



Idaho Voltages

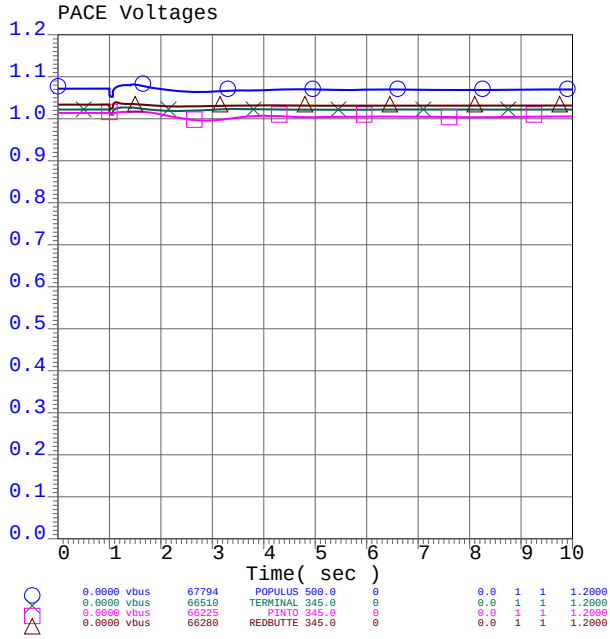


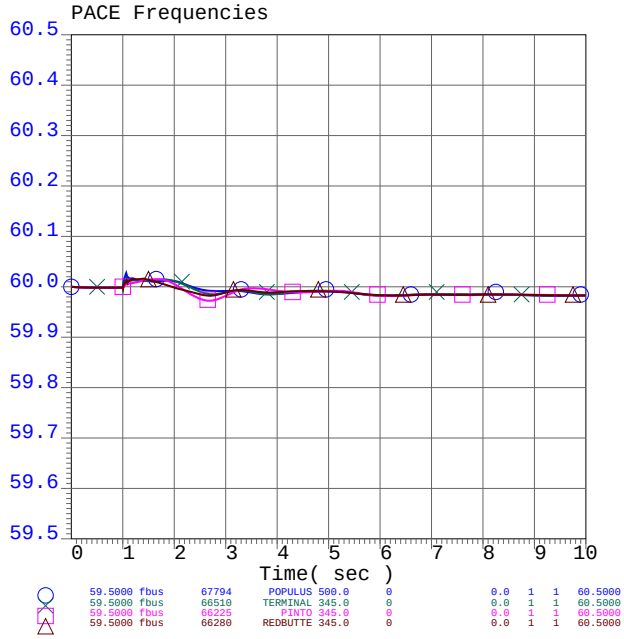
Idaho Frequencies

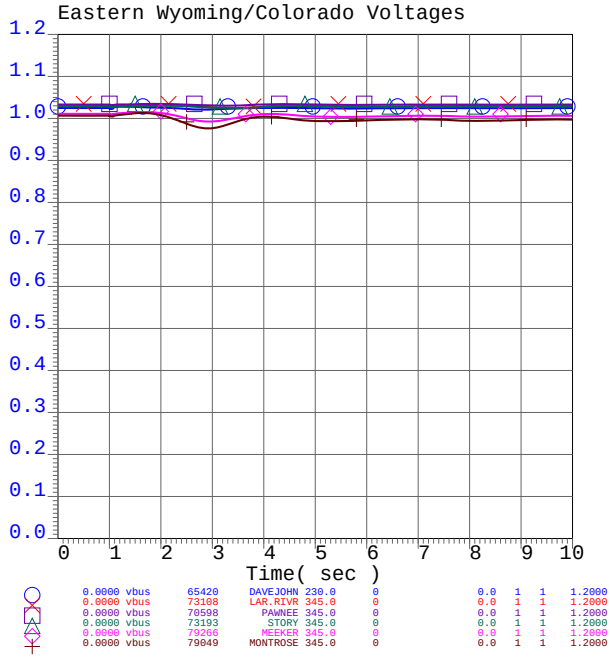


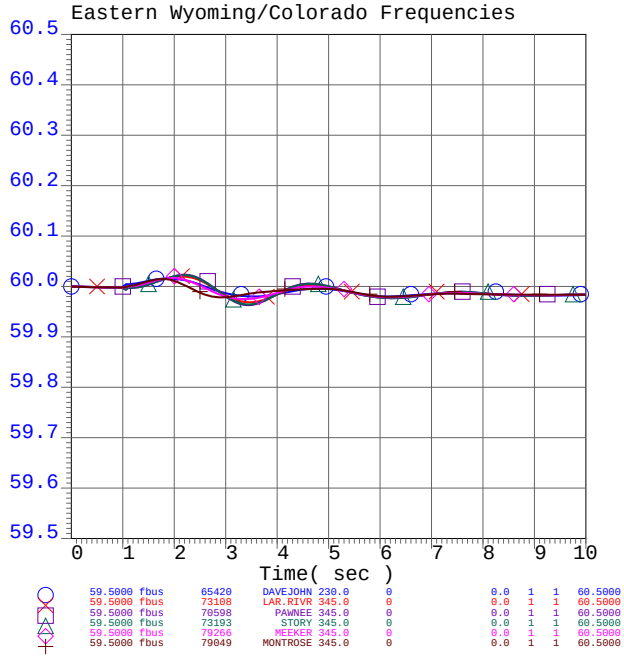
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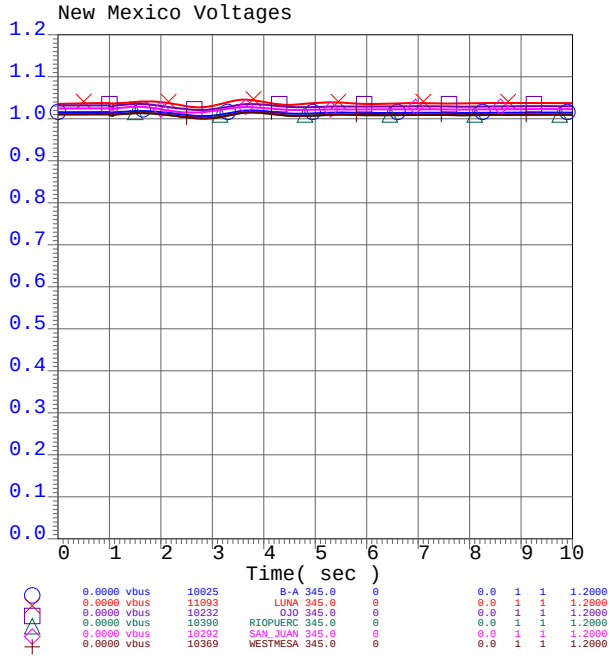


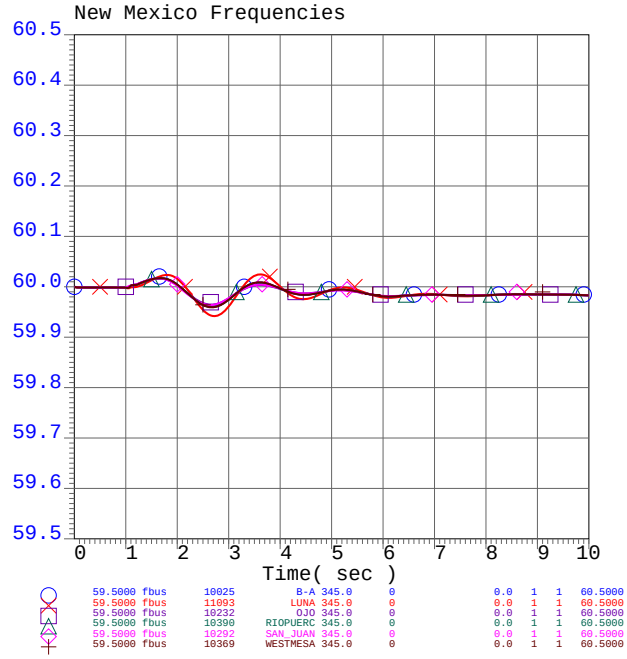


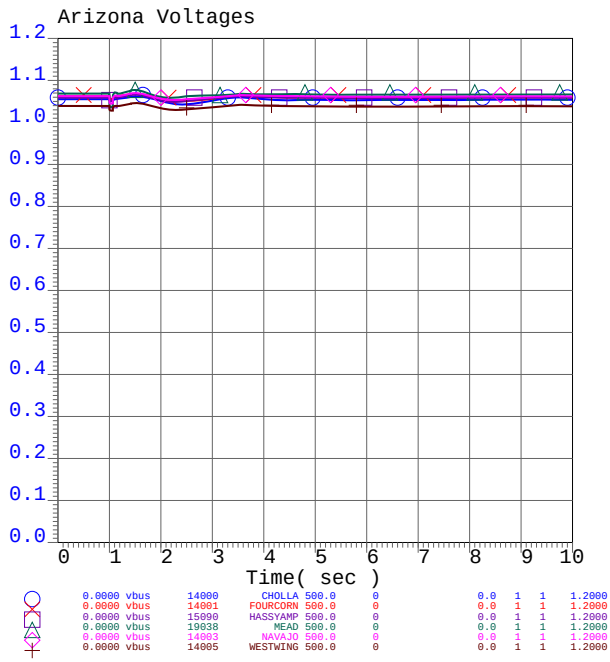


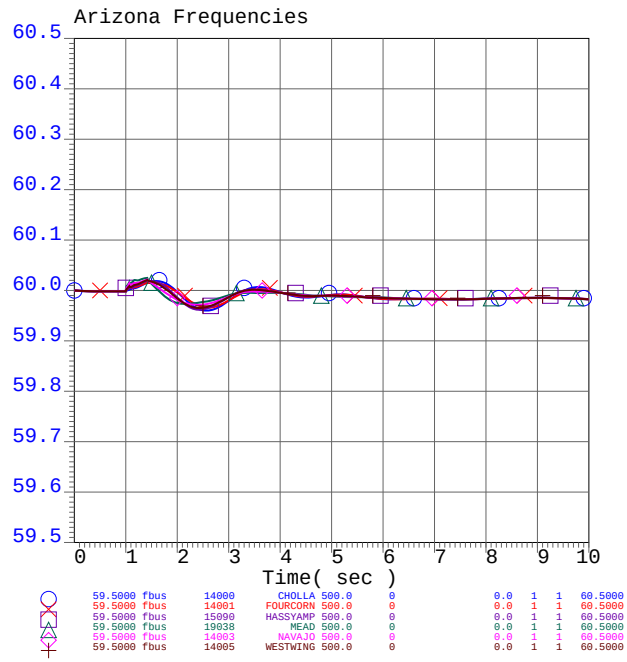
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followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



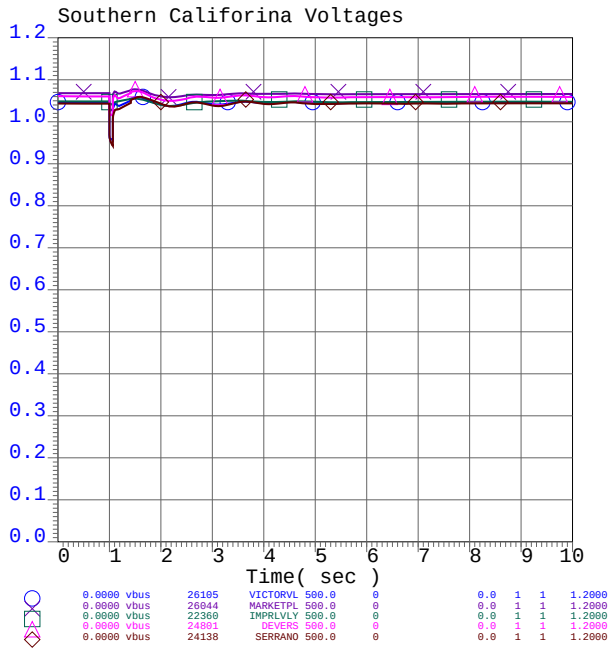


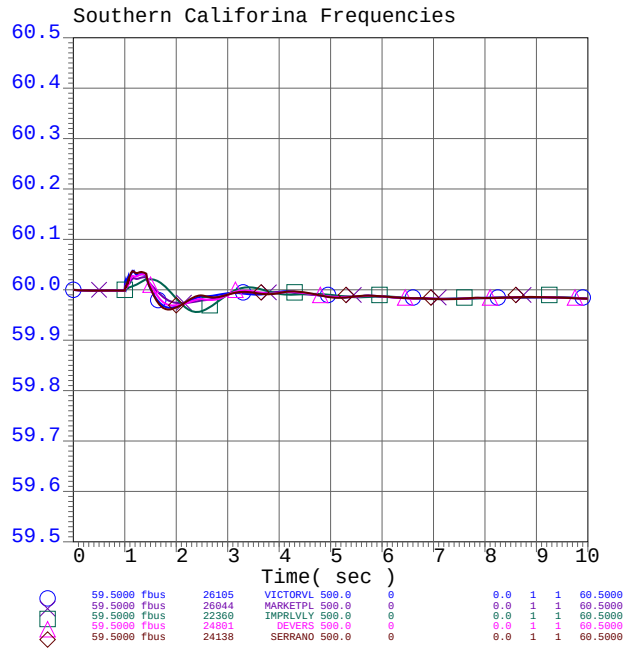


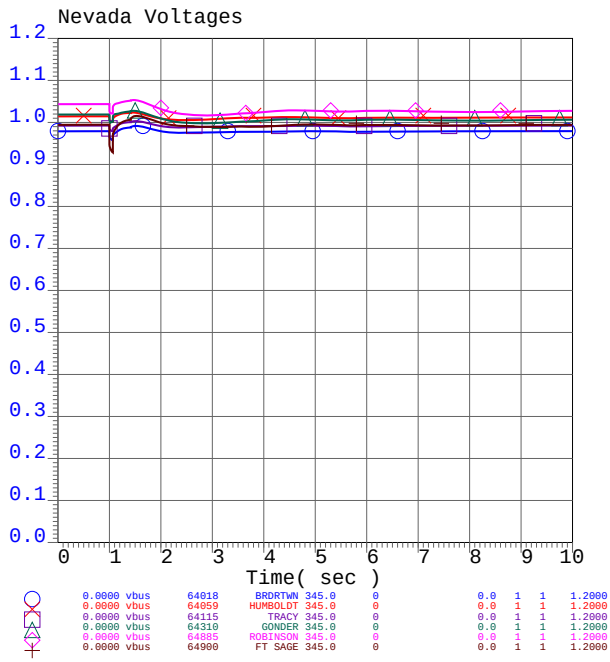


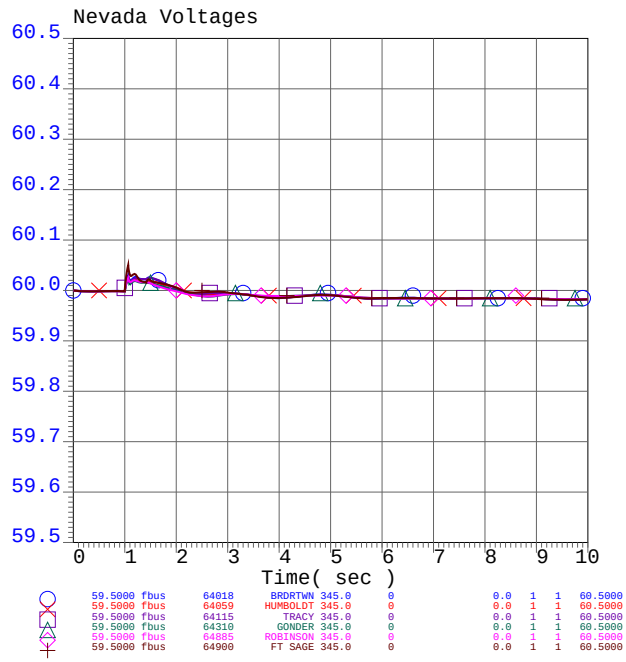
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WECC AREA VOLTAGE AND FREQUENCIES



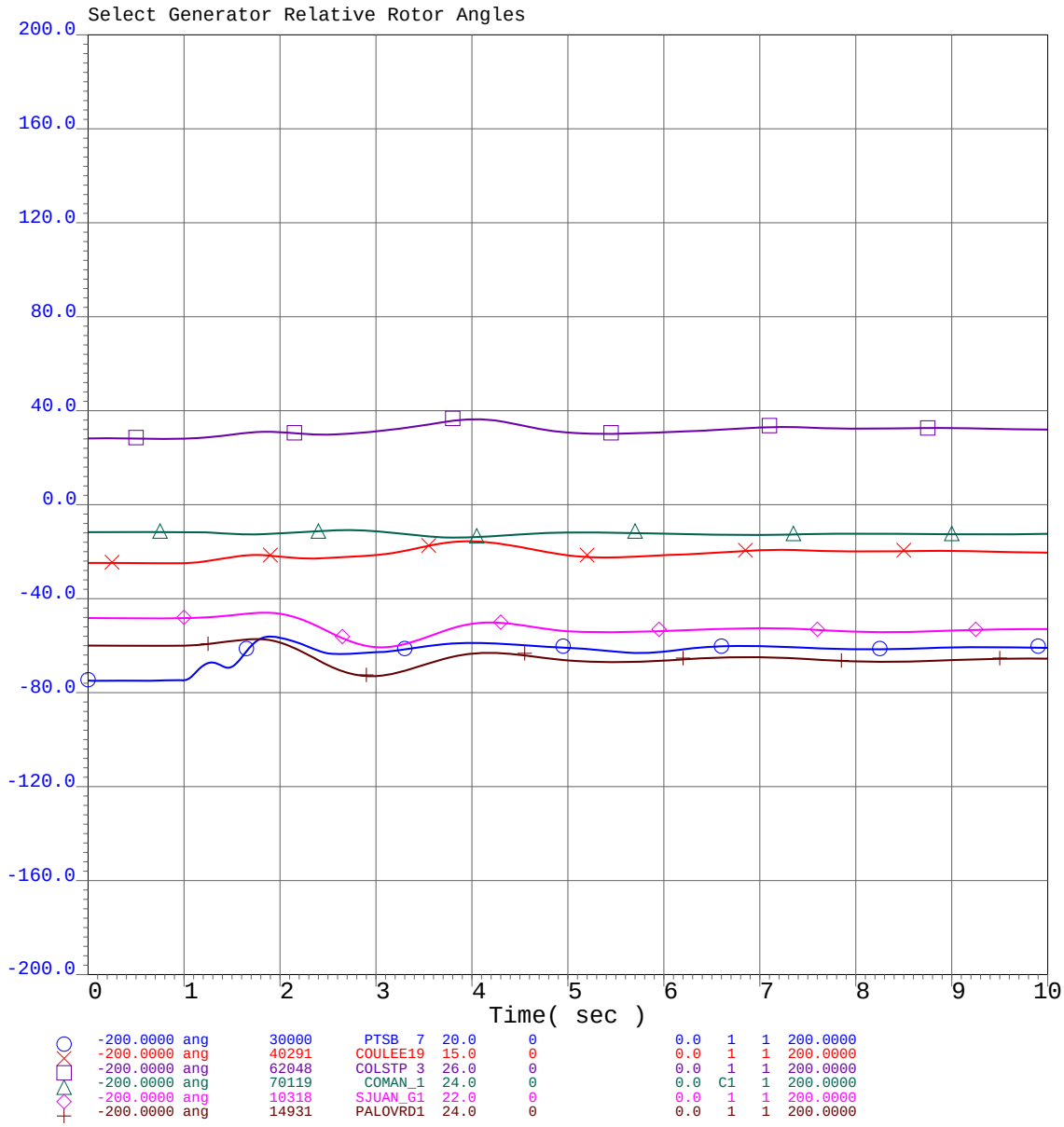






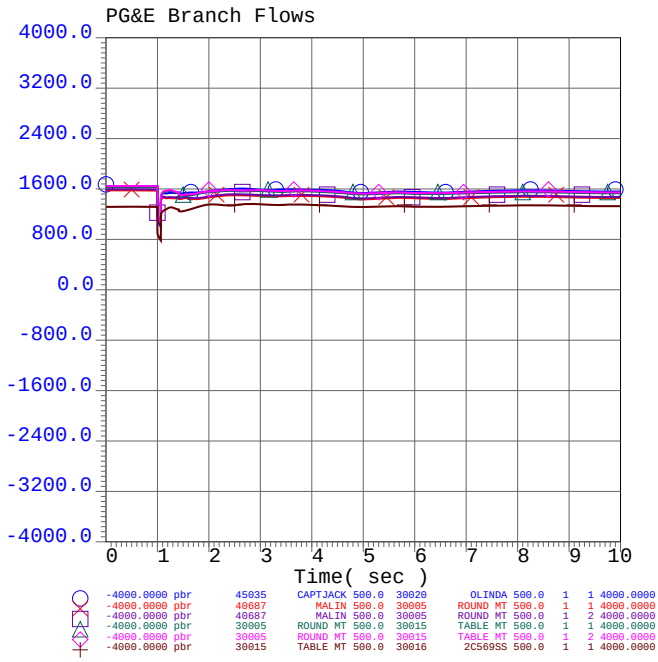
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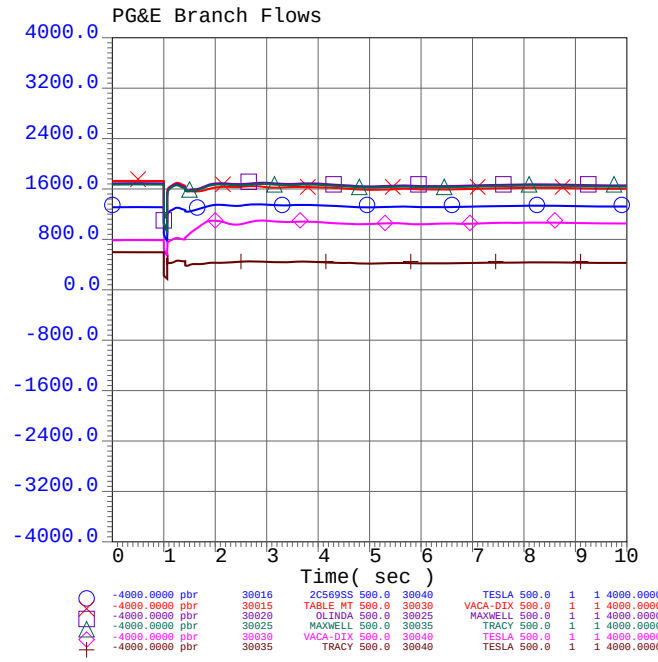
WECC RELATIVE ROTOR ANGLES

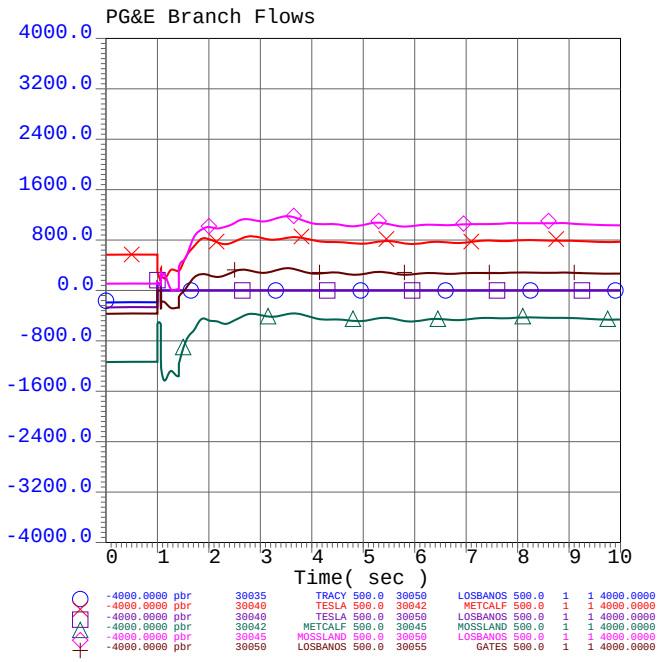


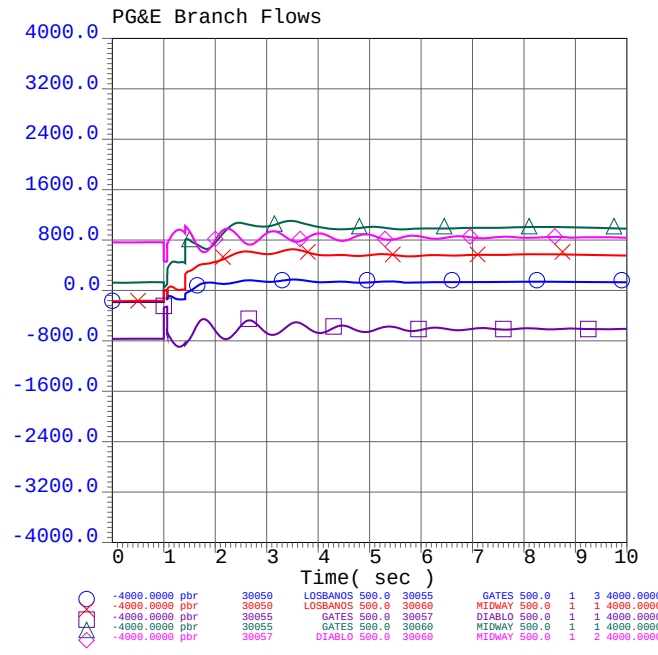
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SELECT BRANCH FLOWS









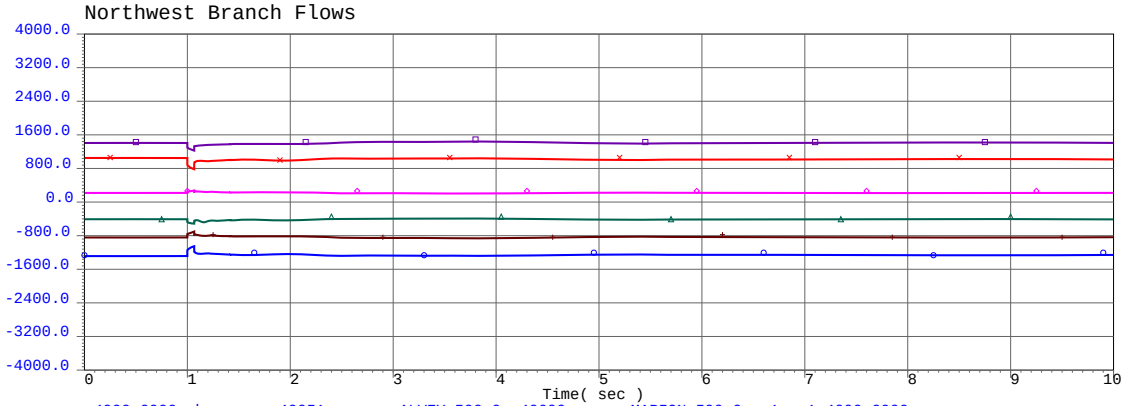
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ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt56_c5_tesla-lsbs_tracy-lsbs-500kVsumpkiras.chf

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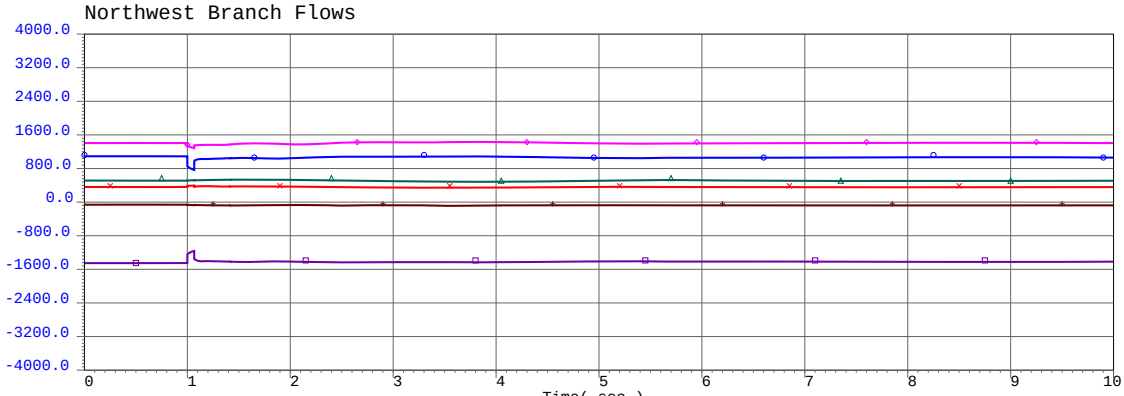
SELECT BRANCH FLOWS

Northwest Branch Flows



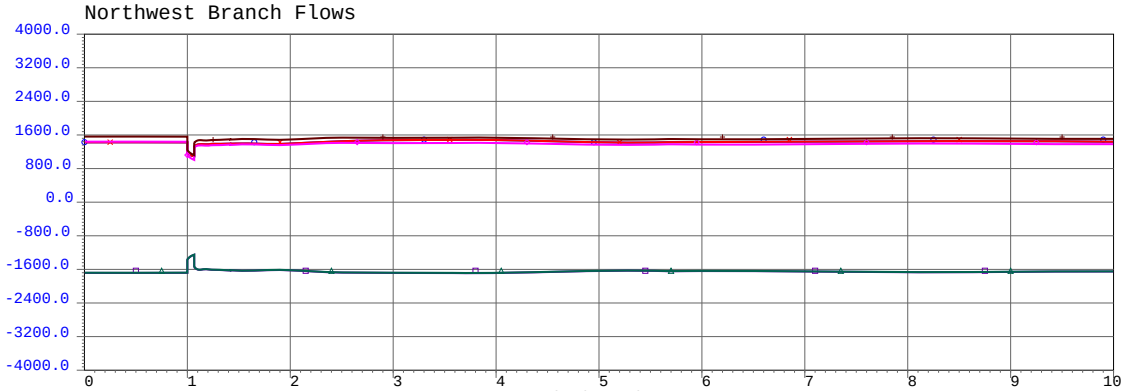
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
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-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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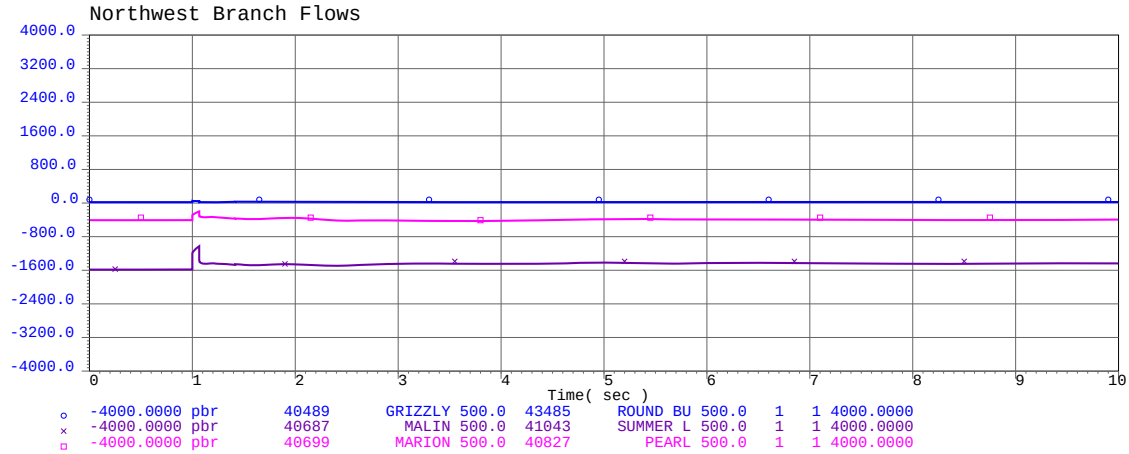
Northwest Branch Flows



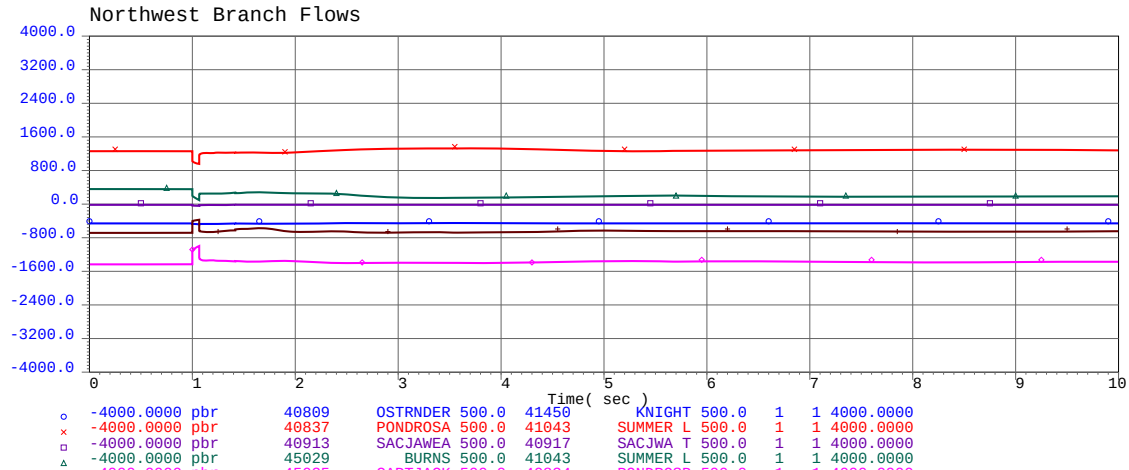
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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followed by loss of Tesla-Los Banos 500 kV & Tracy-Los Banos 500 kV lines

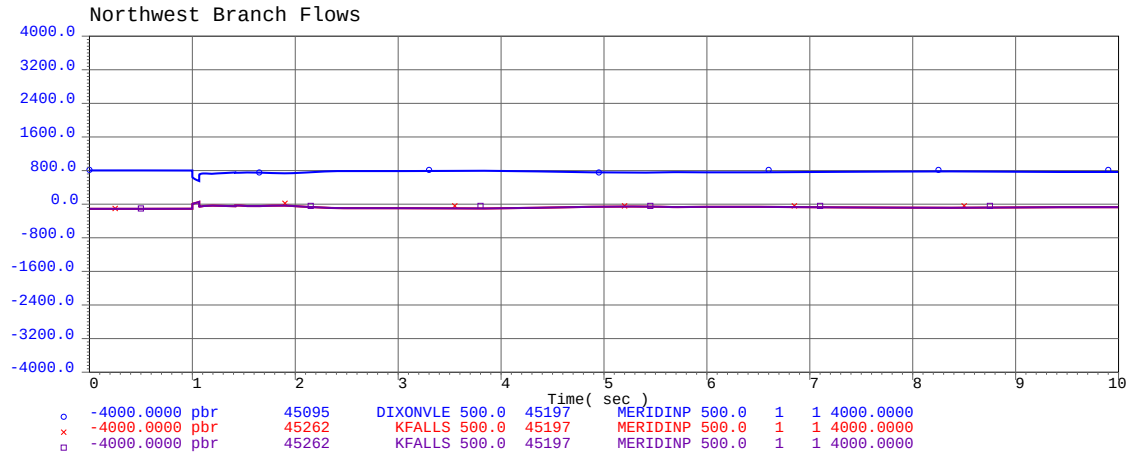
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



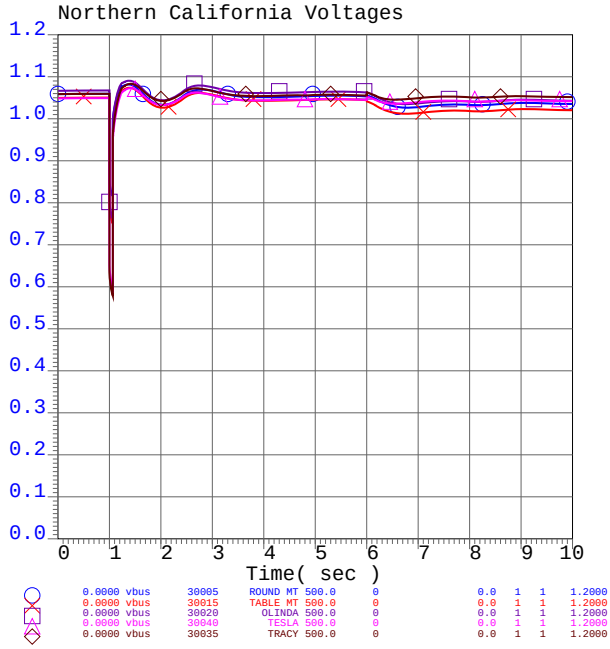
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-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

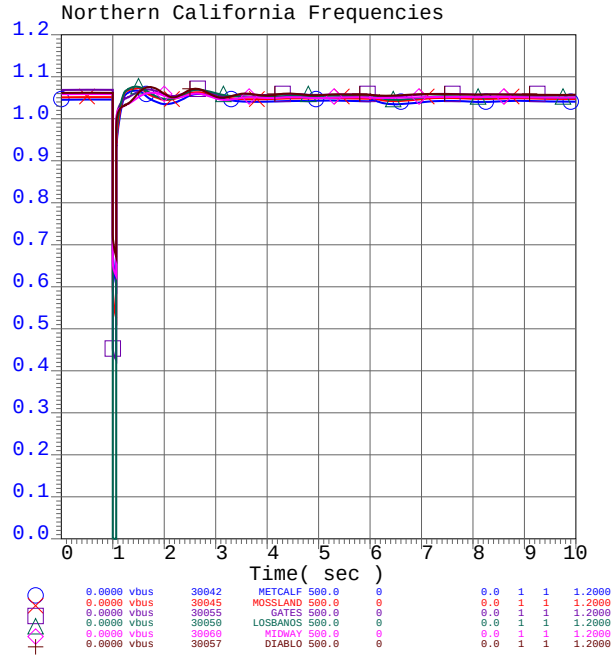


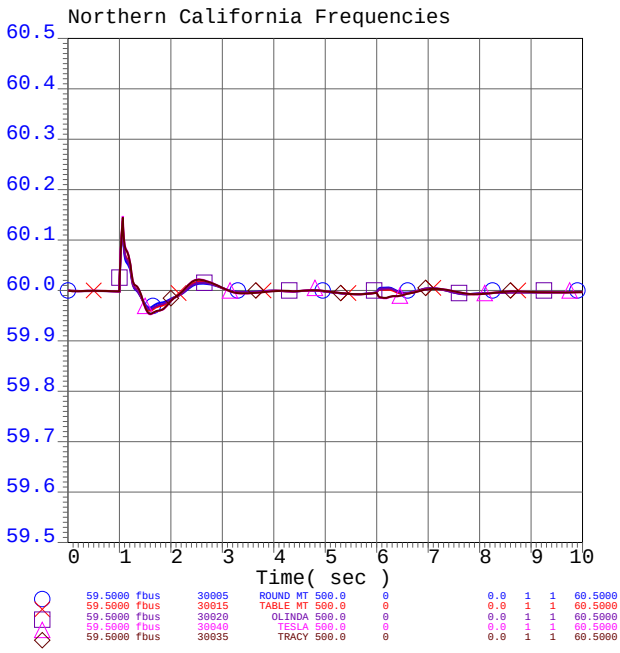
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

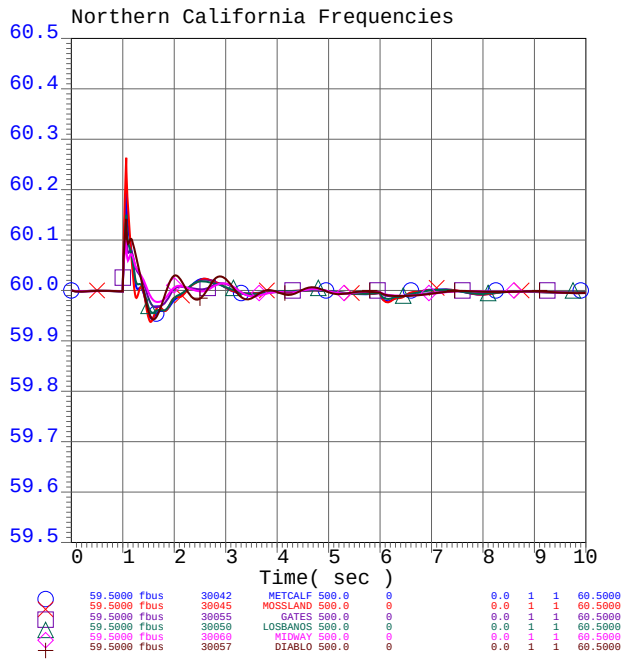
2018 Summer Peak: Cluster 6 Phase 1: Kern Group
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WECC AREA VOLTAGE AND FREQUENCIES



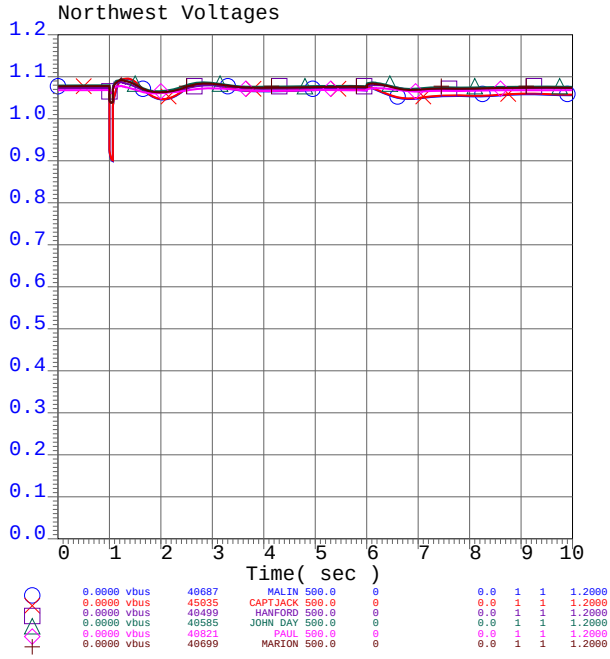


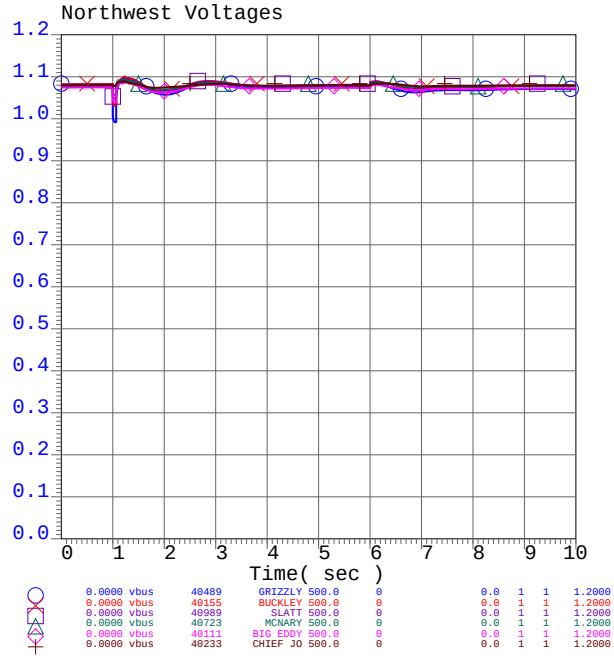


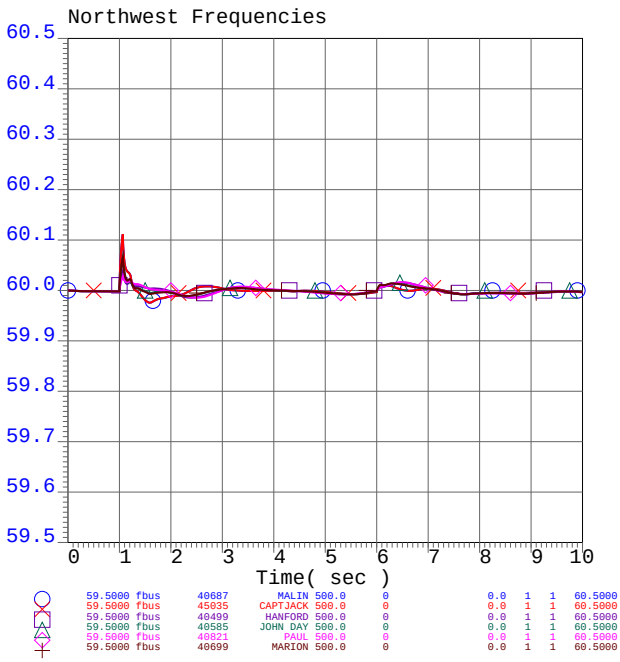


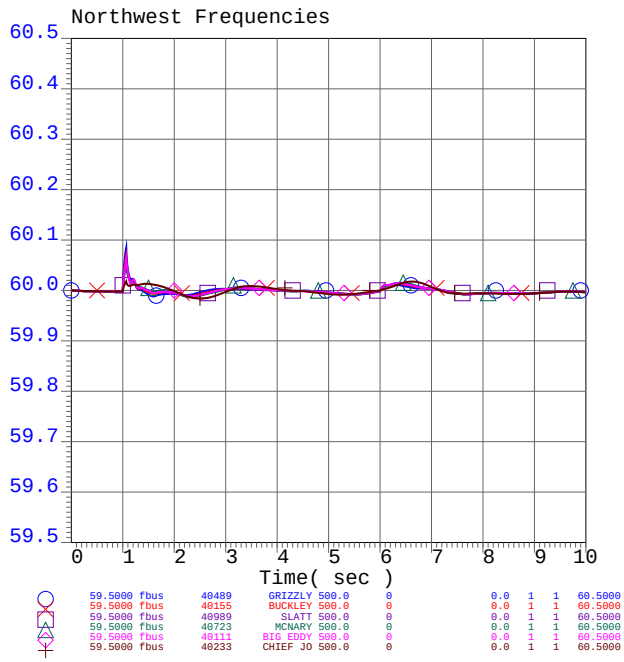
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
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WECC AREA VOLTAGE AND FREQUENCIES







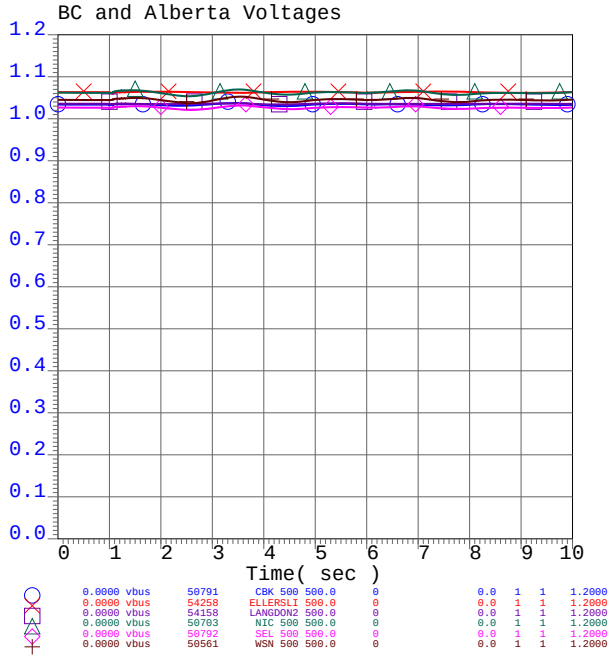


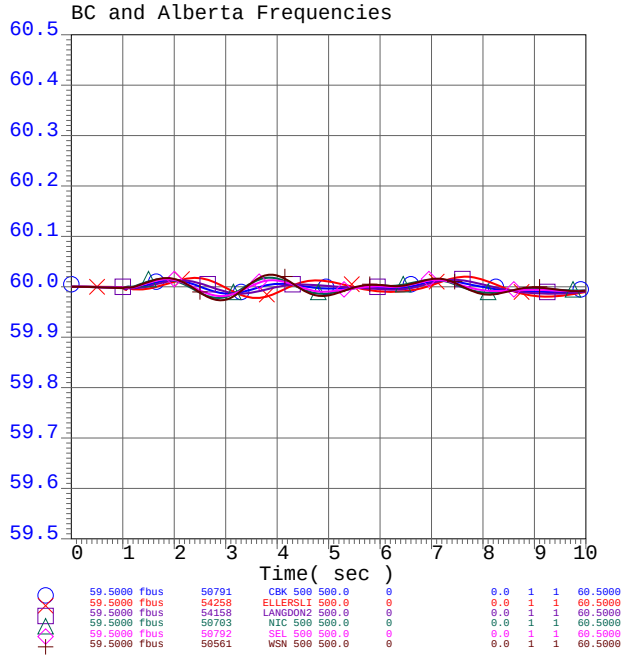
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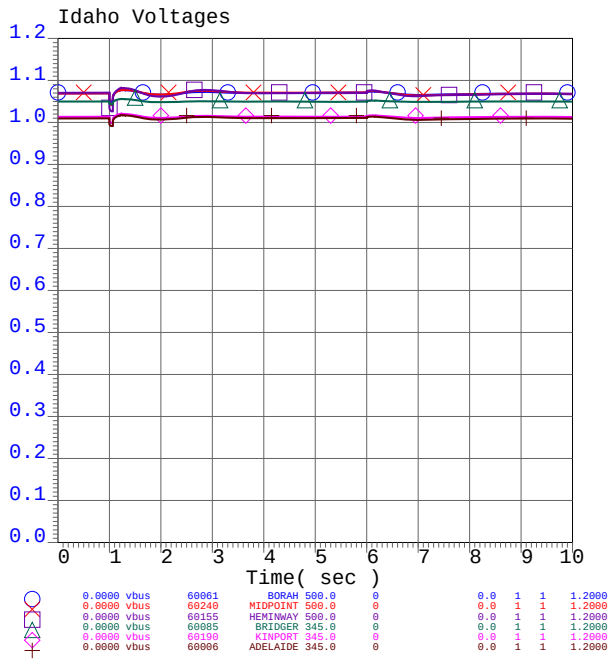
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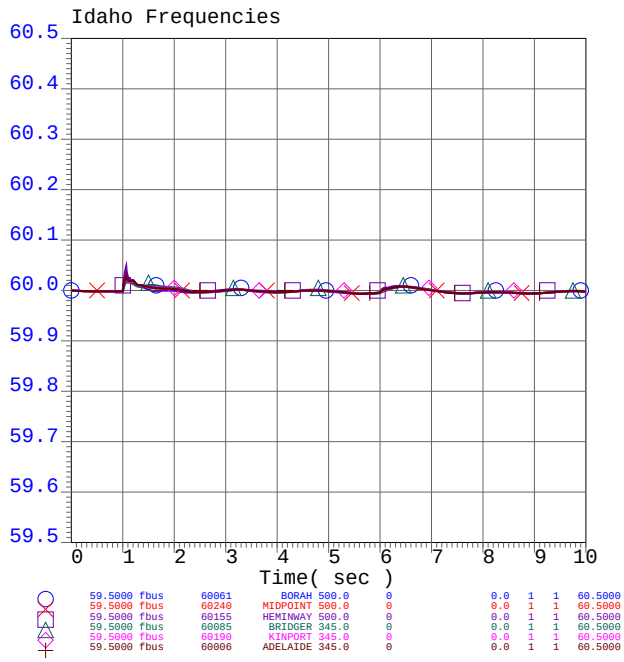
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WECC AREA VOLTAGE AND FREQUENCIES





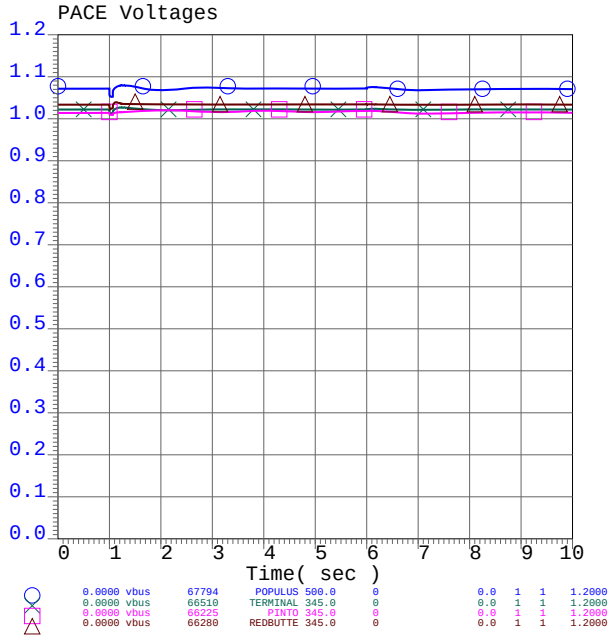




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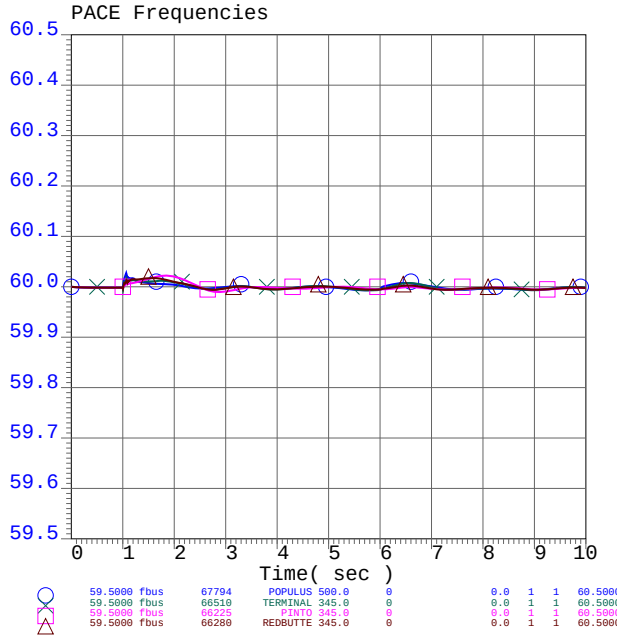
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



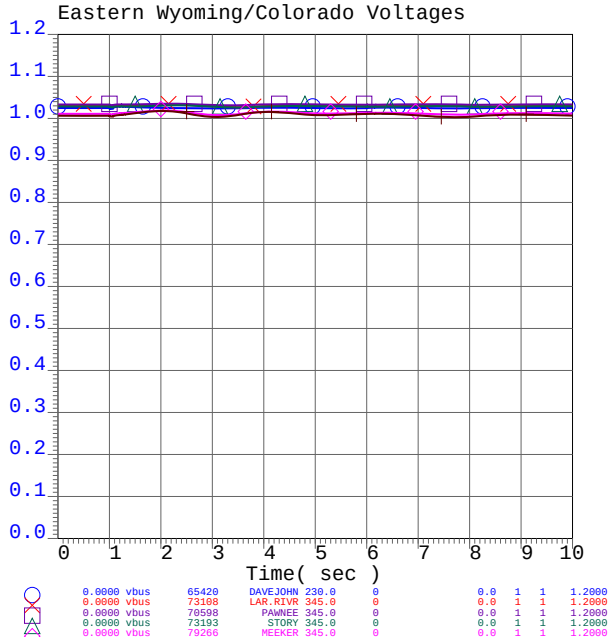
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0.0000 vbus	66510	TERMINAL 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66225	PINTO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66280	REDBUTTE 345.0	0	0.0	1	1	1.2000

PACE Frequencies



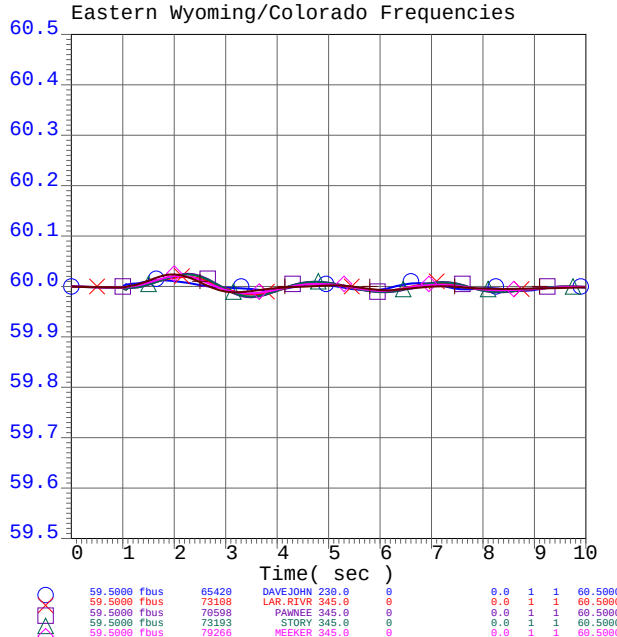
59.5000 fbus	67794	POPULUS 500.0	0	0.0	1	1	60.5000
59.5000 fbus	66510	TERMINAL 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66225	PINTO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66280	REDBUTTE 345.0	0	0.0	1	1	60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus	65420	DAVEJOHN 230.0	0	0.0	1	1	1.2000
0.0000 vbus	73108	LAR.RIVR 345.0	0	0.0	1	1	1.2000
0.0000 vbus	70598	PAWNEE 345.0	0	0.0	1	1	1.2000
0.0000 vbus	73193	STORY 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79266	MEEKER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79049	MONTROSE 345.0	0	0.0	1	1	1.2000

Eastern Wyoming/Colorado Frequencies

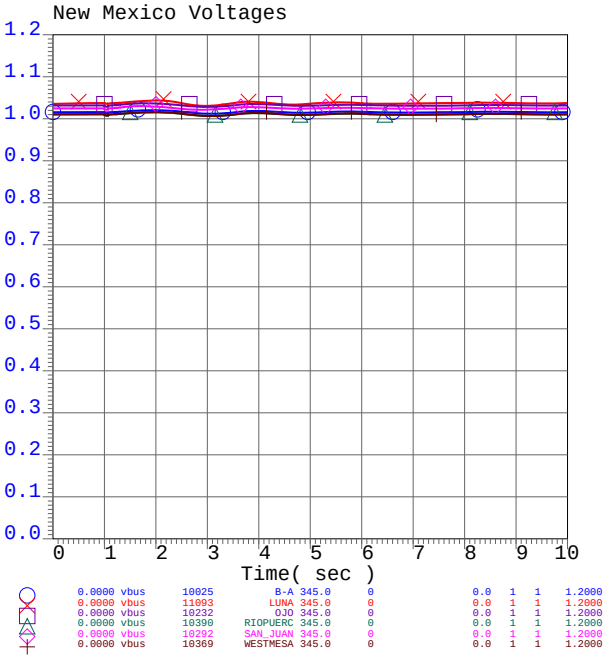


59.5000 fbus	65420	DAVEJOHN 230.0	0	0.0	1	1	60.5000
59.5000 fbus	73108	LAR.RIVR 345.0	0	0.0	1	1	60.5000
59.5000 fbus	70598	PAWNEE 345.0	0	0.0	1	1	60.5000
59.5000 fbus	73193	STORY 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79266	MEEKER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79049	MONTROSE 345.0	0	0.0	1	1	60.5000

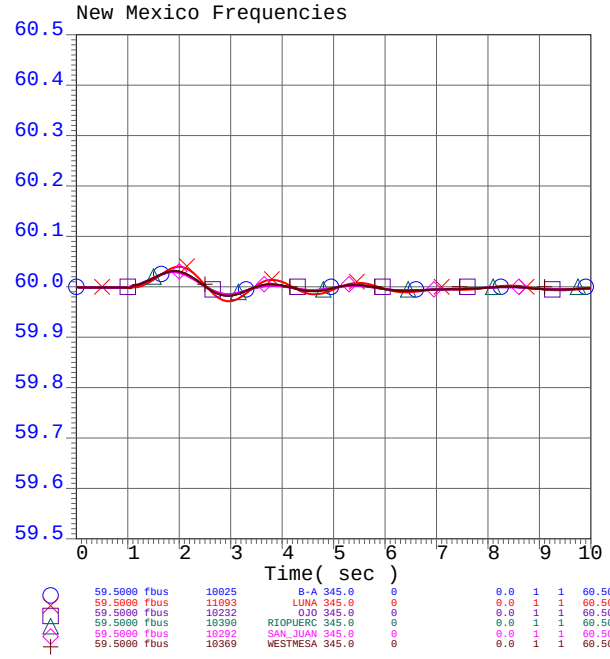
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WECC AREA VOLTAGE AND FREQUENCIES

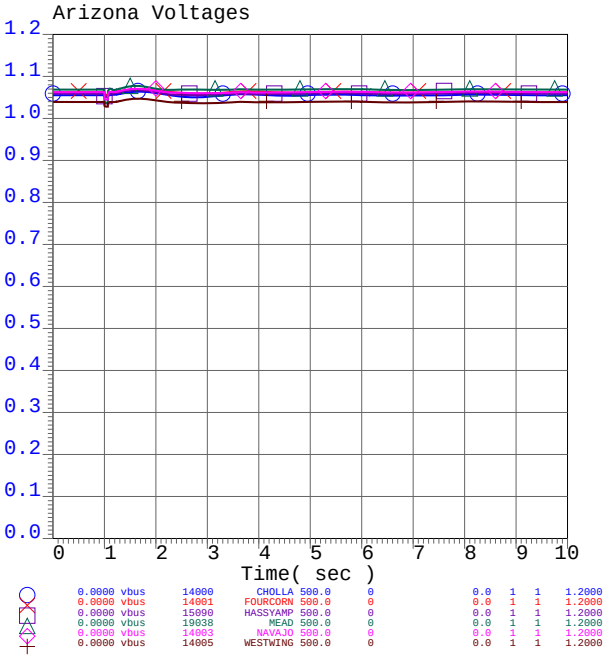
New Mexico Voltages



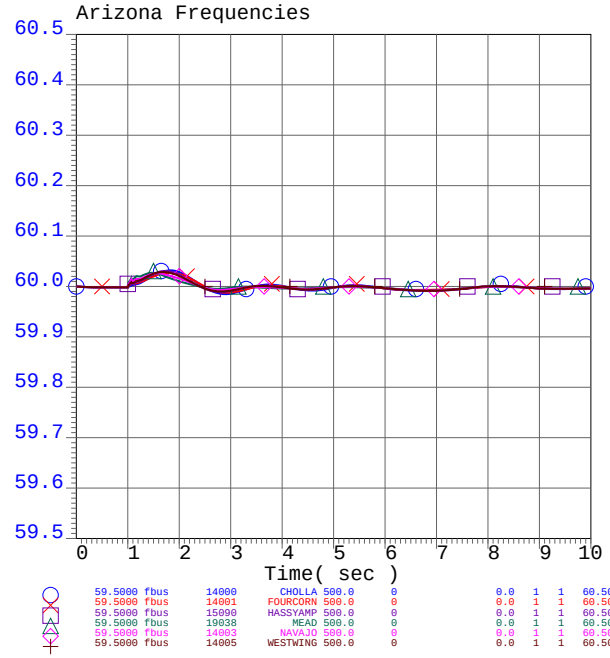
New Mexico Frequencies



Arizona Voltages

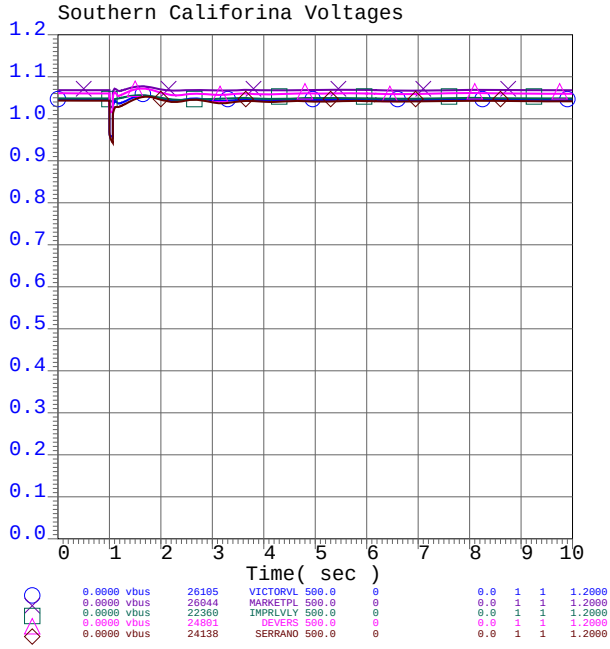


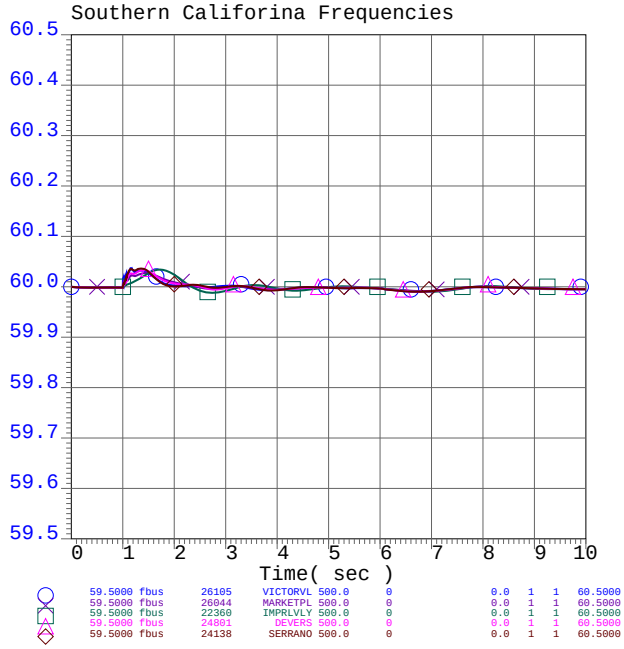
Arizona Frequencies

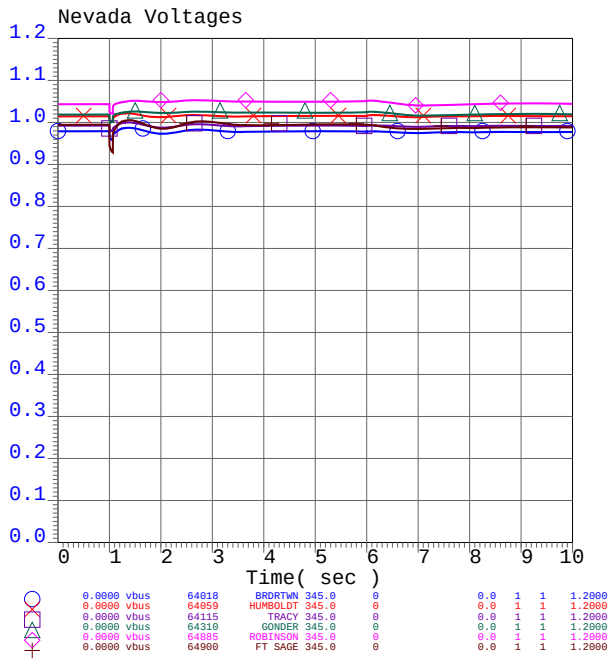


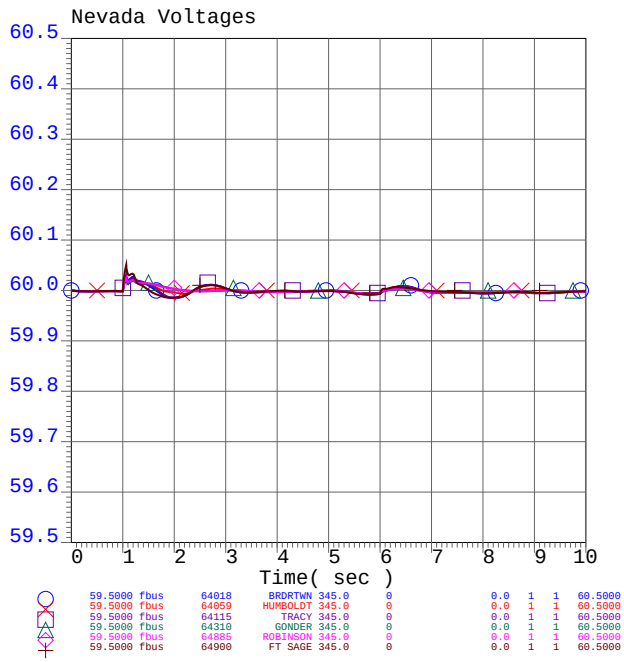
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WECC AREA VOLTAGE AND FREQUENCIES



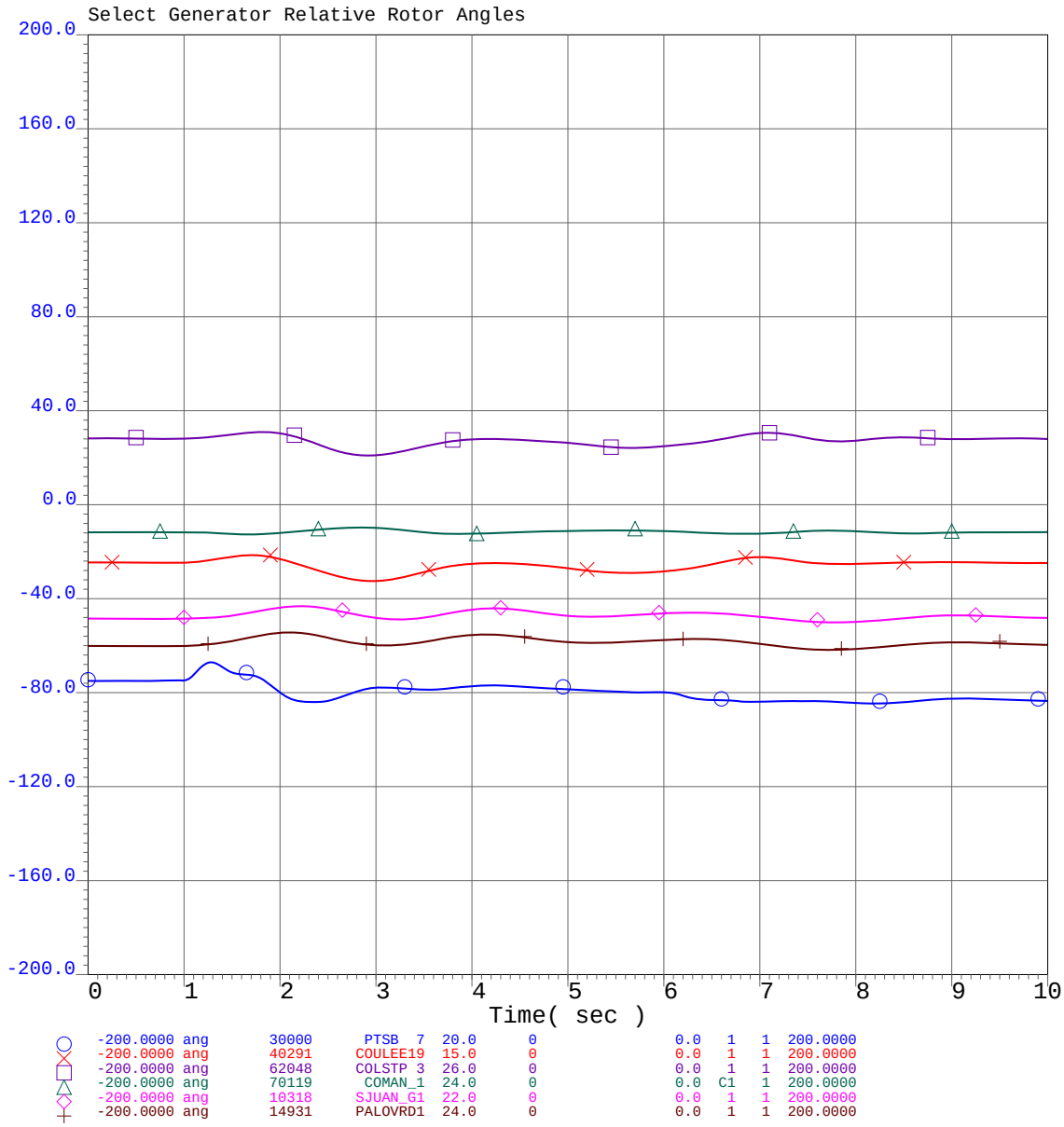






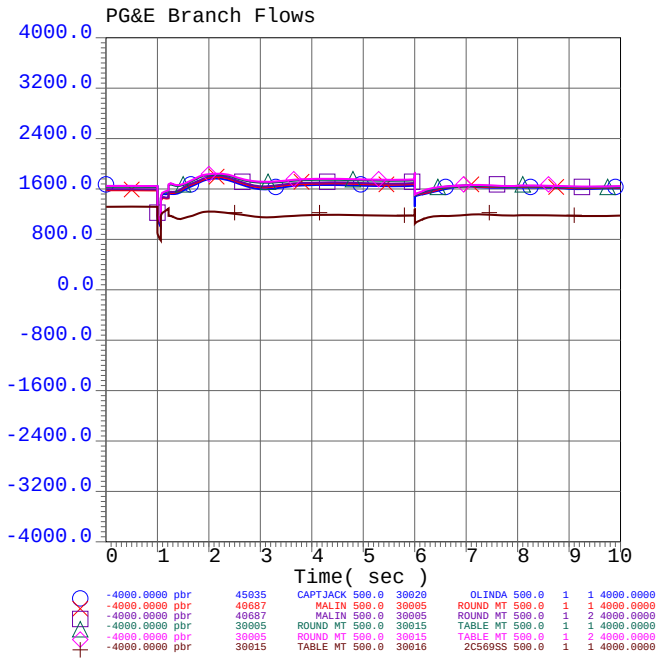
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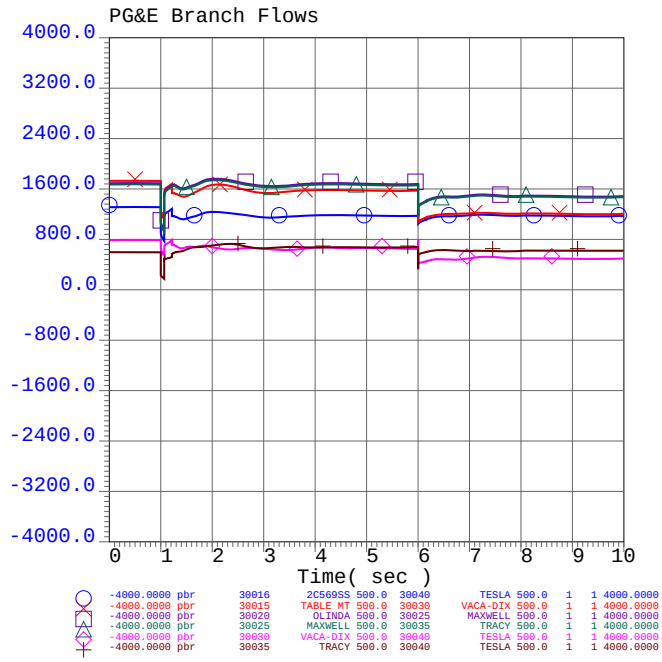
WECC RELATIVE ROTOR ANGLES

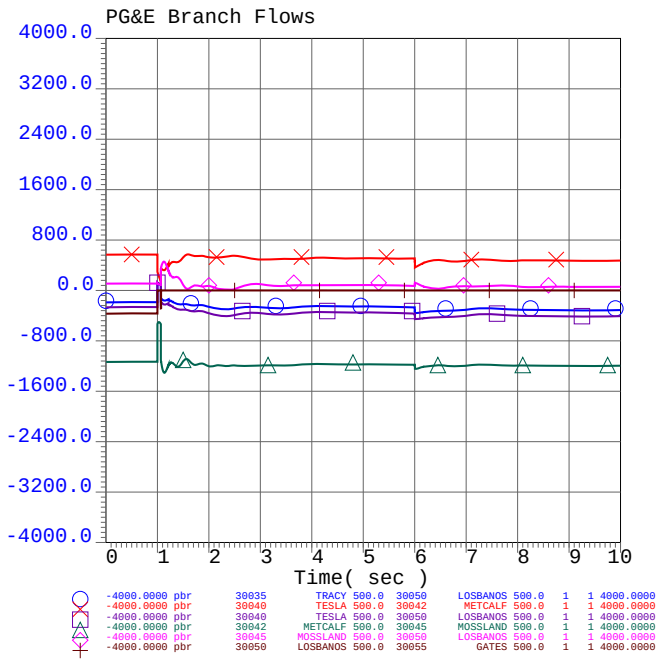


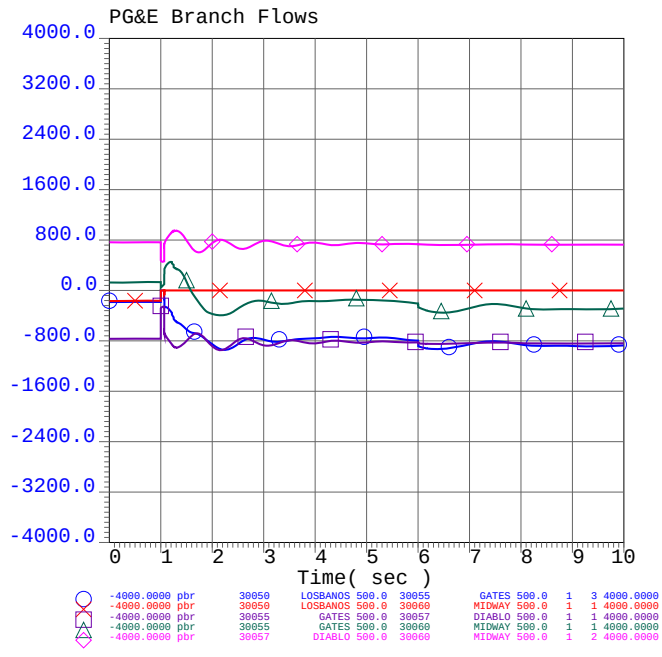
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SELECT BRANCH FLOWS



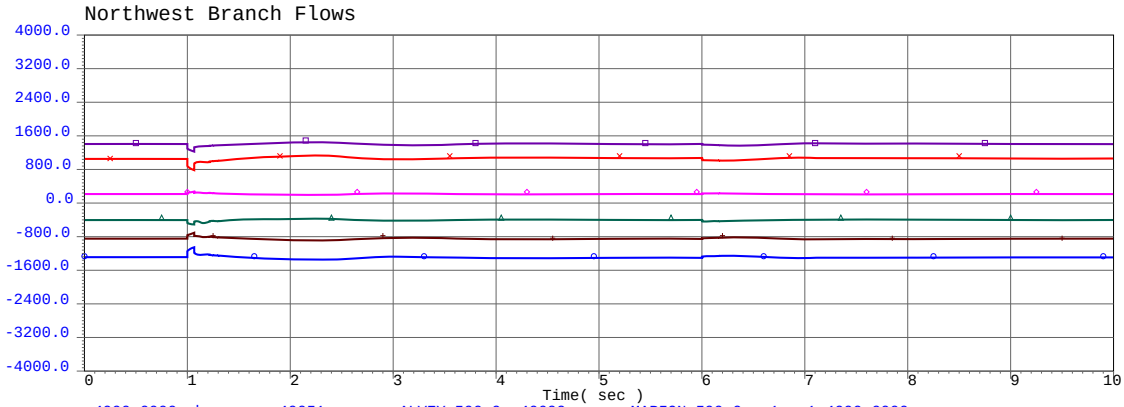




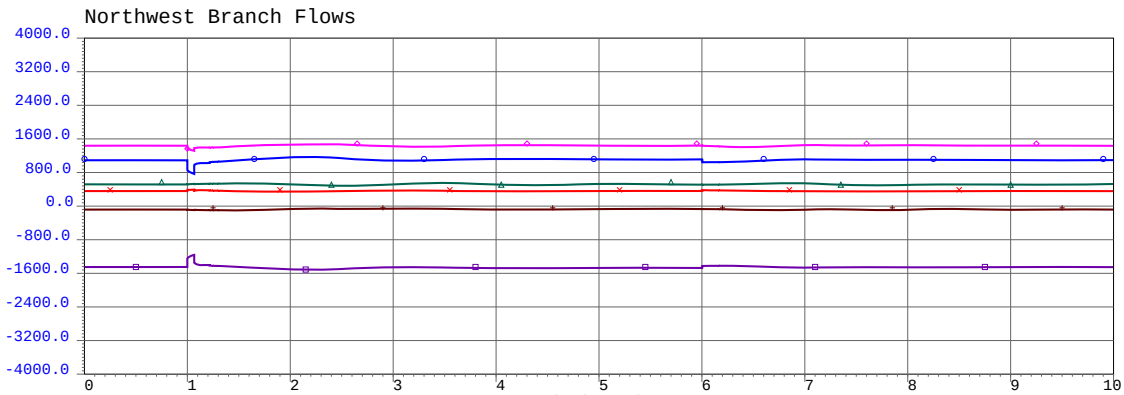


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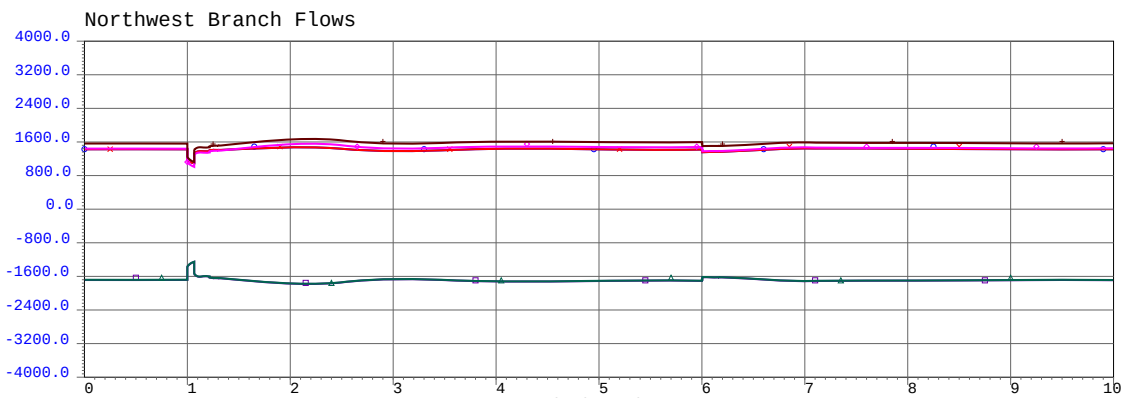
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



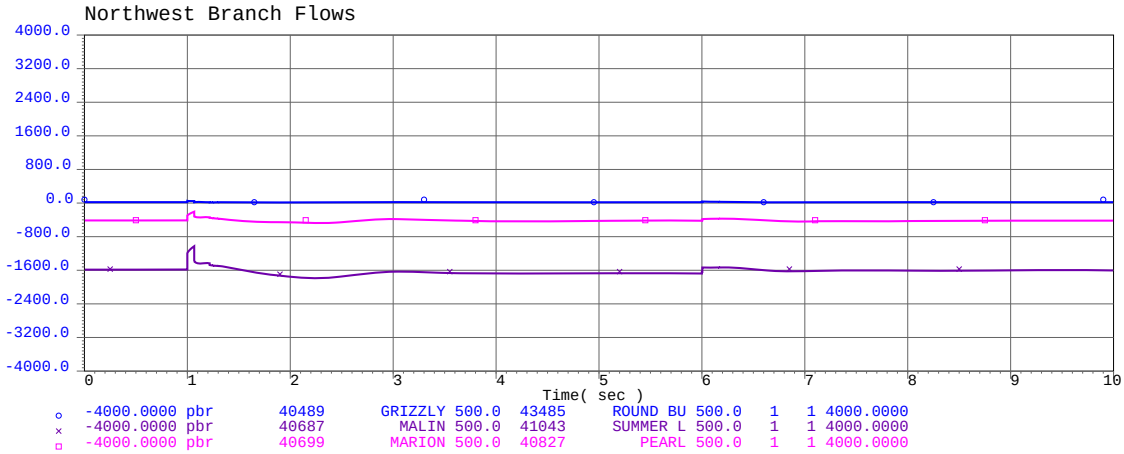
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
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-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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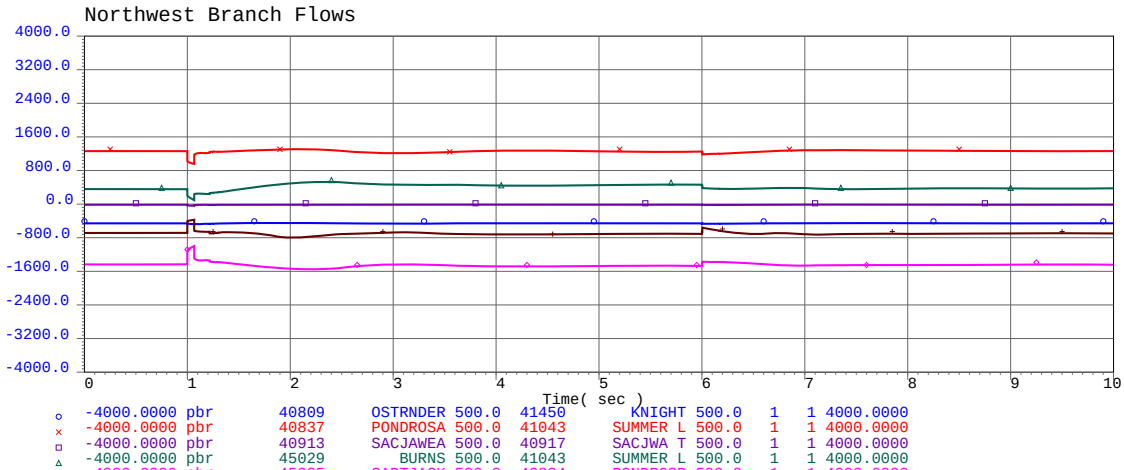
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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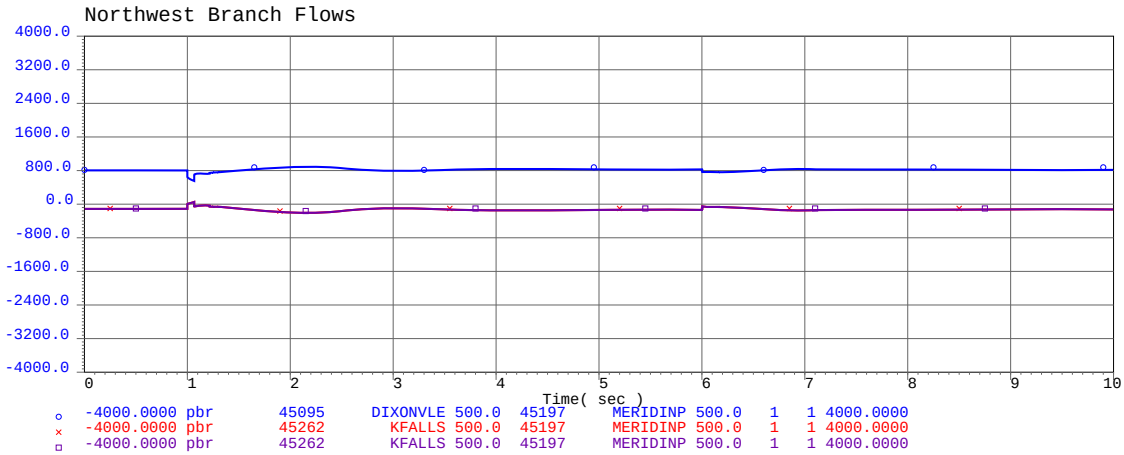
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



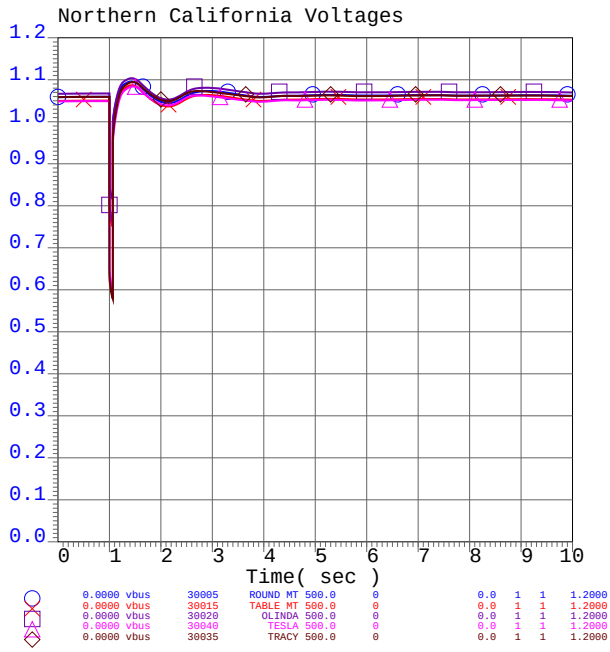
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-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

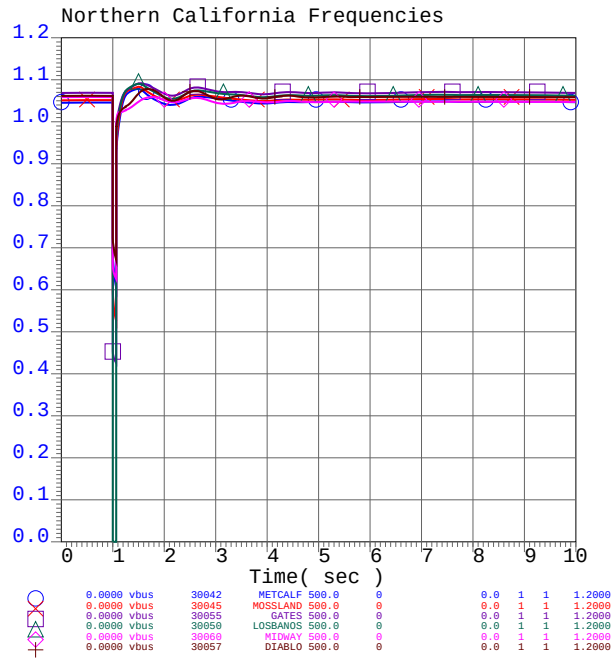


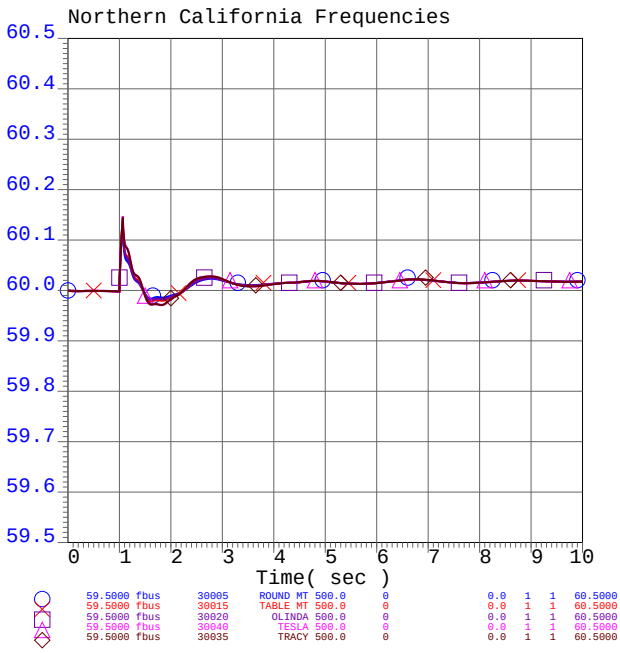
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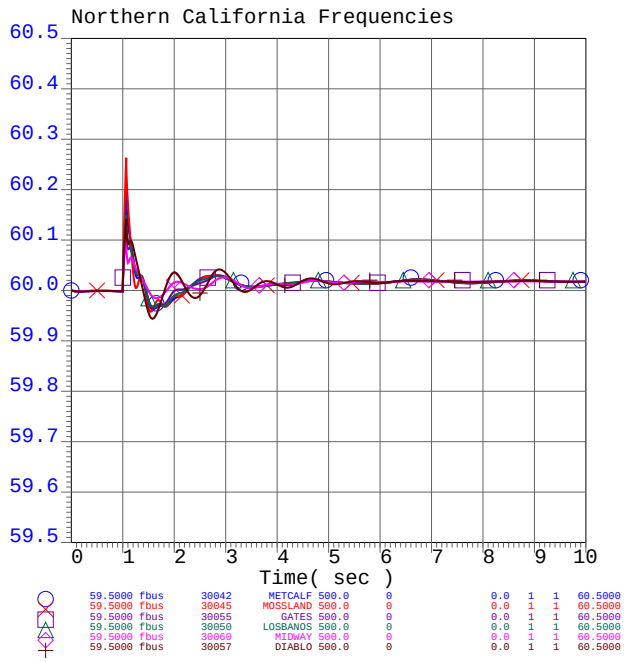
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Los Banos 500 kV
followed by loss of Los Banos-Midway 500 kV & Los Banos-Gates #1 500 kV l

WECC AREA VOLTAGE AND FREQUENCIES







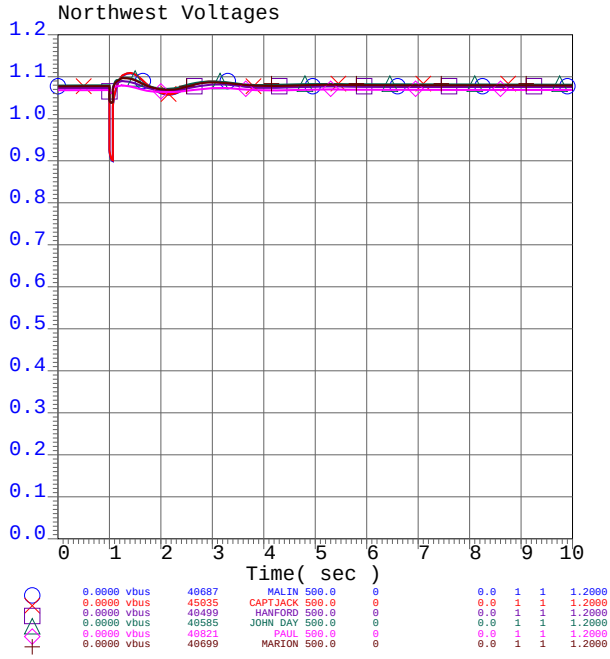


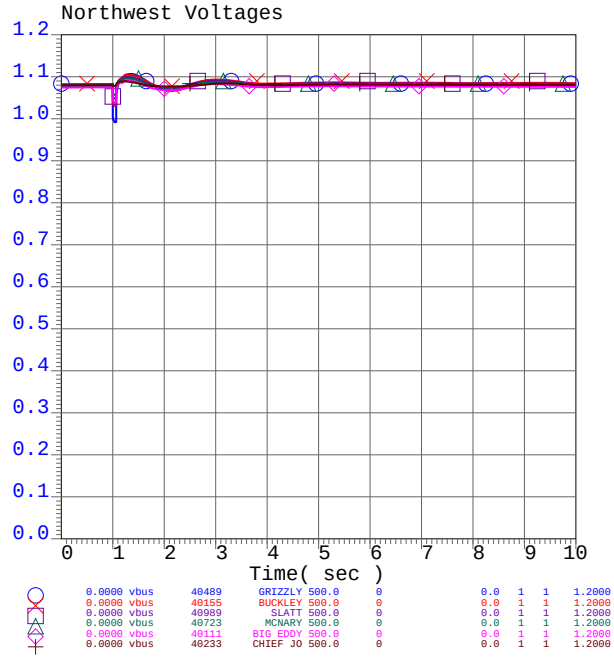
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Los Banos-Midway & Gates-Midway 500 kV lines

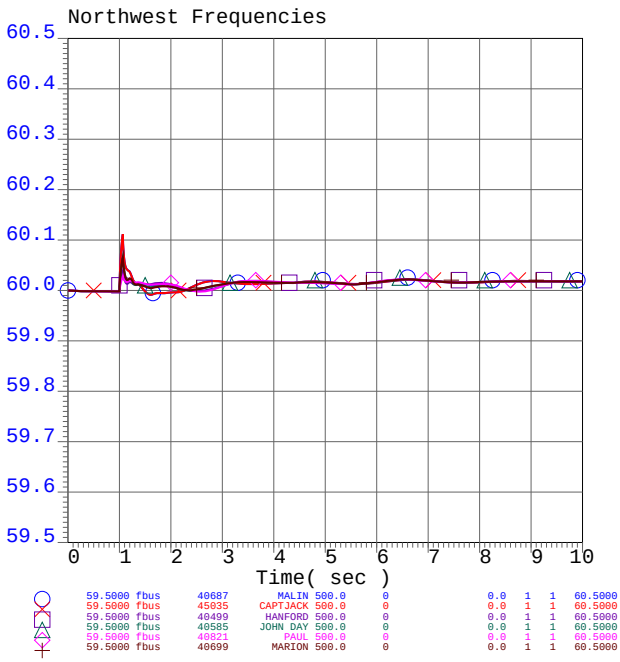
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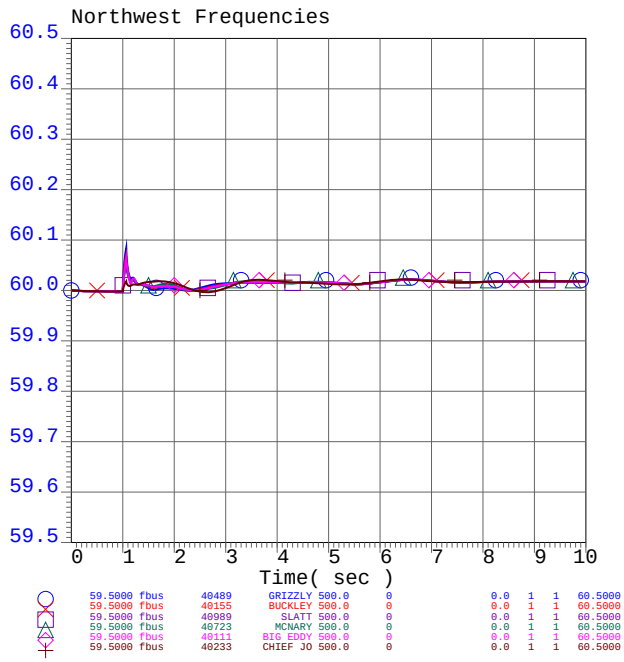
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WECC AREA VOLTAGE AND FREQUENCIES









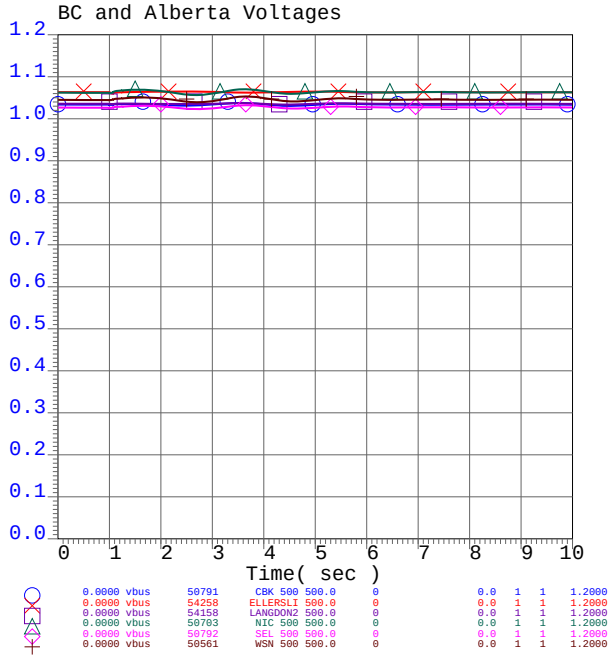
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Los Banos-Midway & Gates-Midway 500 kV lines

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt58_c5_lsbs-mdwy2_gtes-mdwy1-500kVsumpk.chf

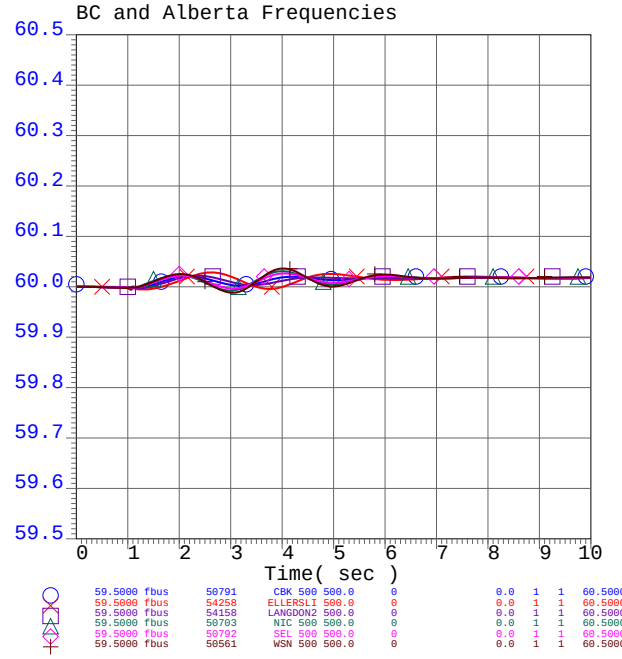
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WECC AREA VOLTAGE AND FREQUENCIES

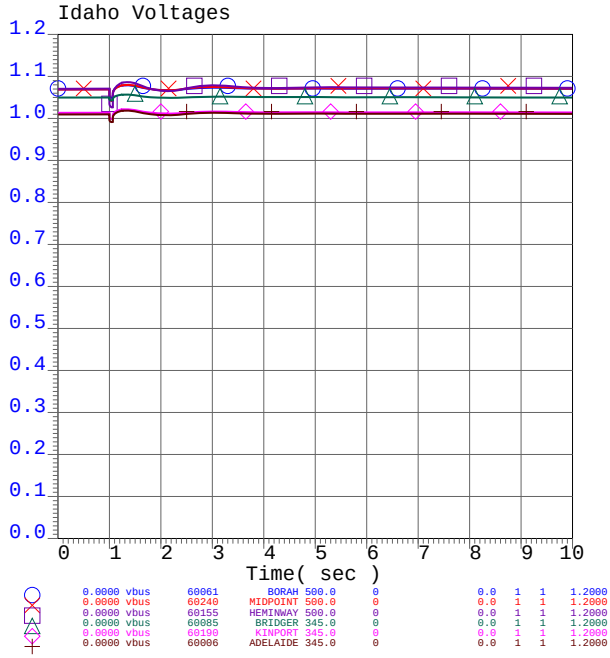
BC and Alberta Voltages



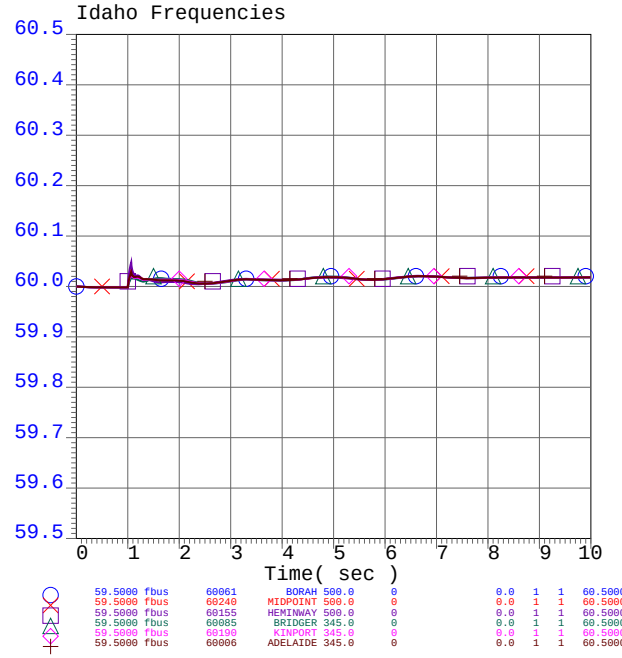
BC and Alberta Frequencies



Idaho Voltages



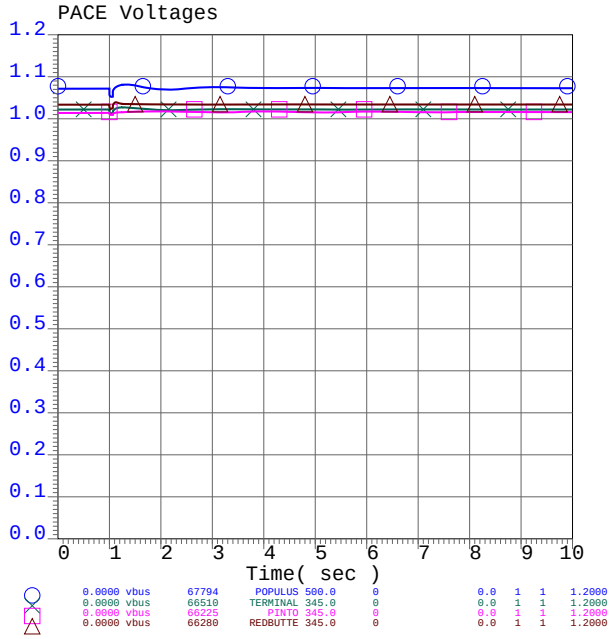
Idaho Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Los Banos-Midway & Gates-Midway 500 kV lines

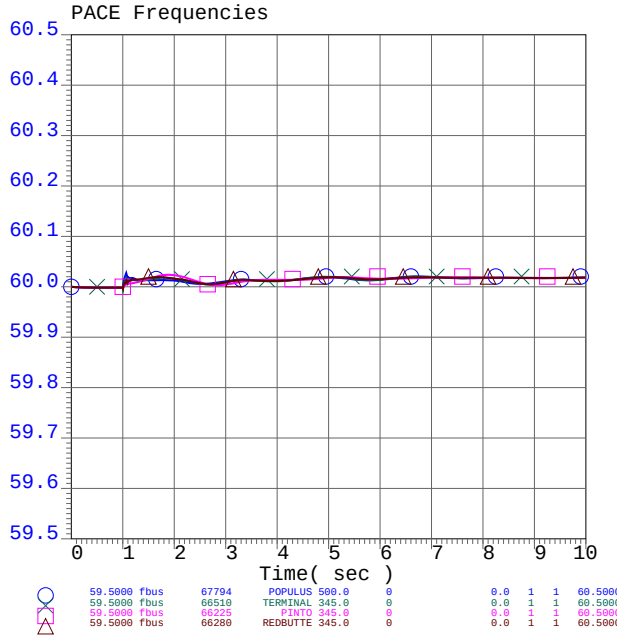
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



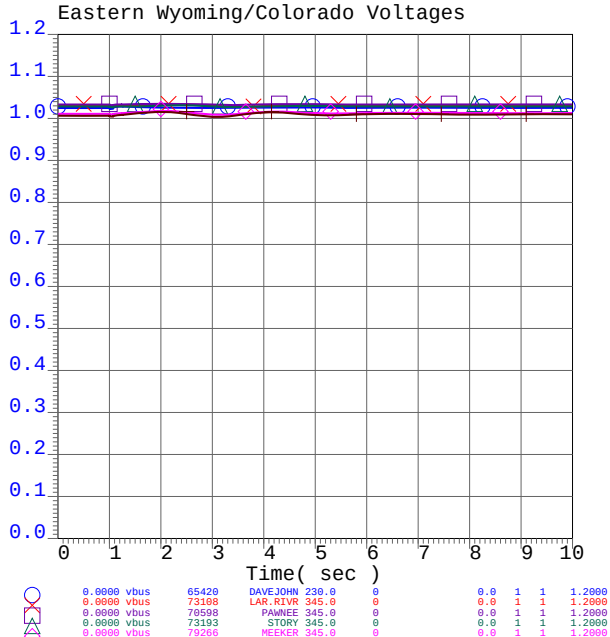
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0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
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PACE Frequencies



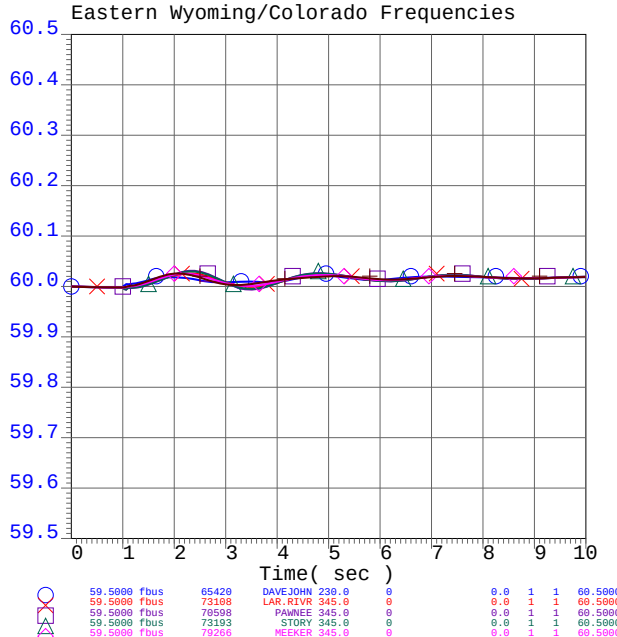
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59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
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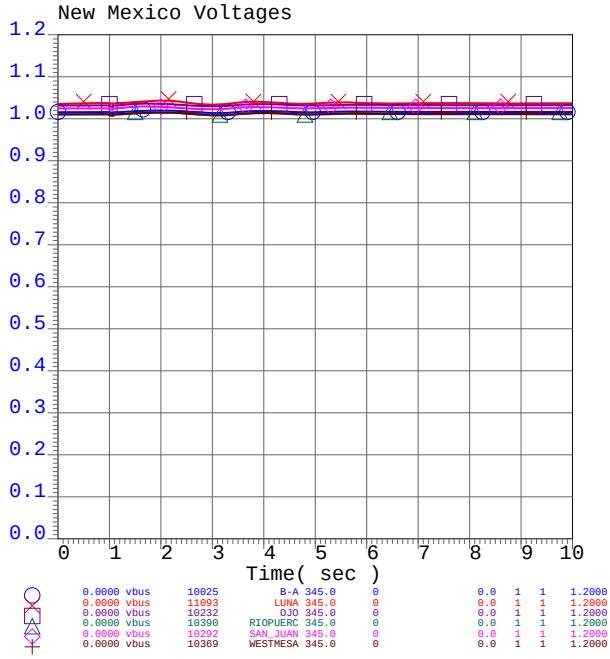
Eastern Wyoming/Colorado Frequencies

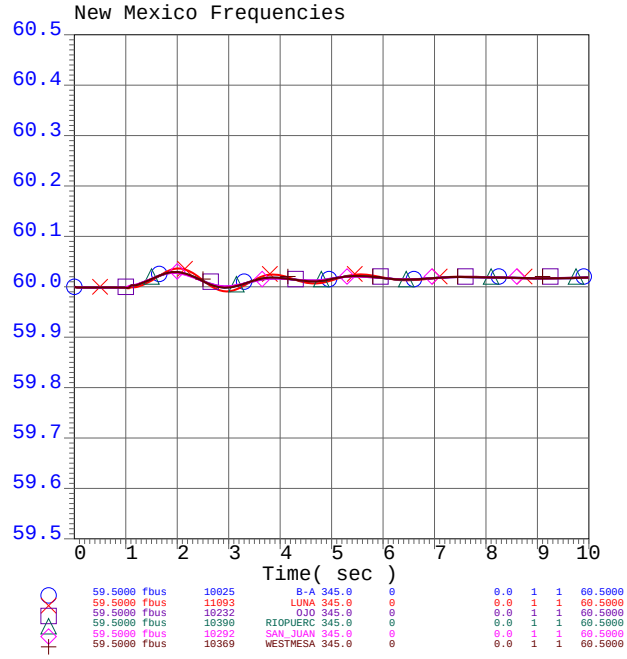


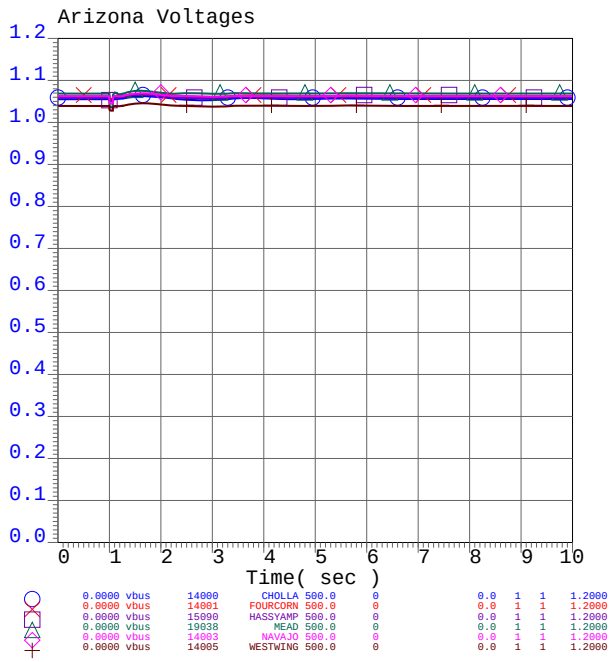
59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
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59.5000 fbus 73193 STORY 345.0 0 0.0 1 1 60.5000
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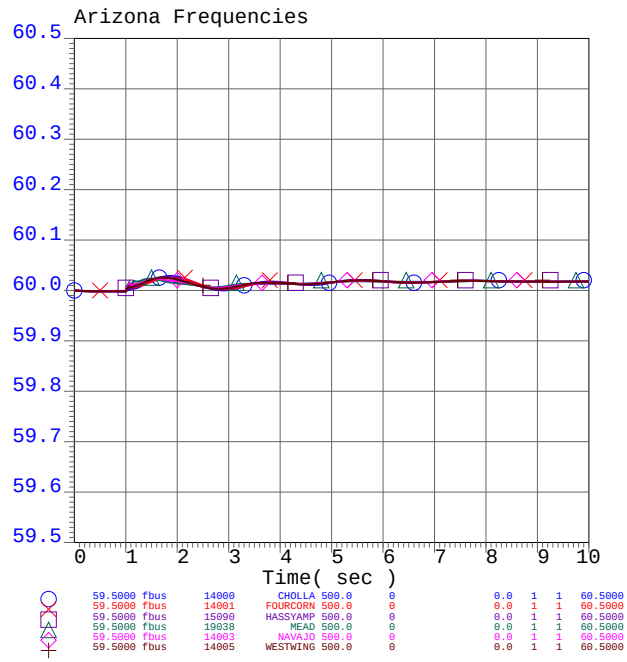
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Los Banos-Midway & Gates-Midway 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES







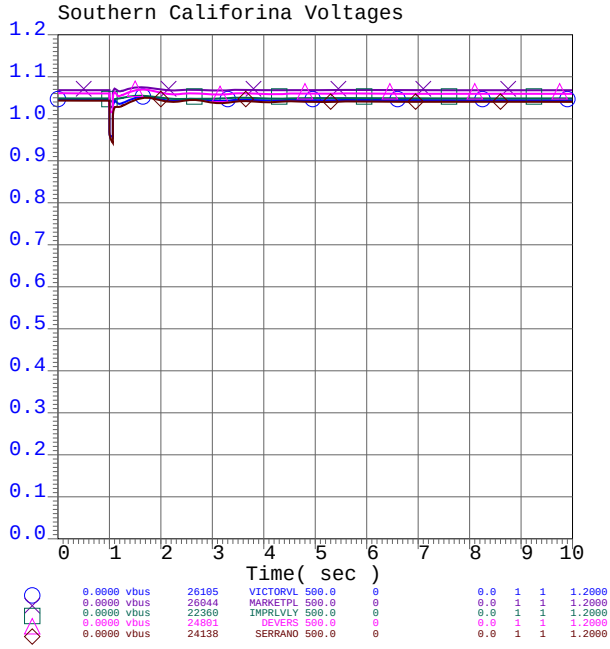


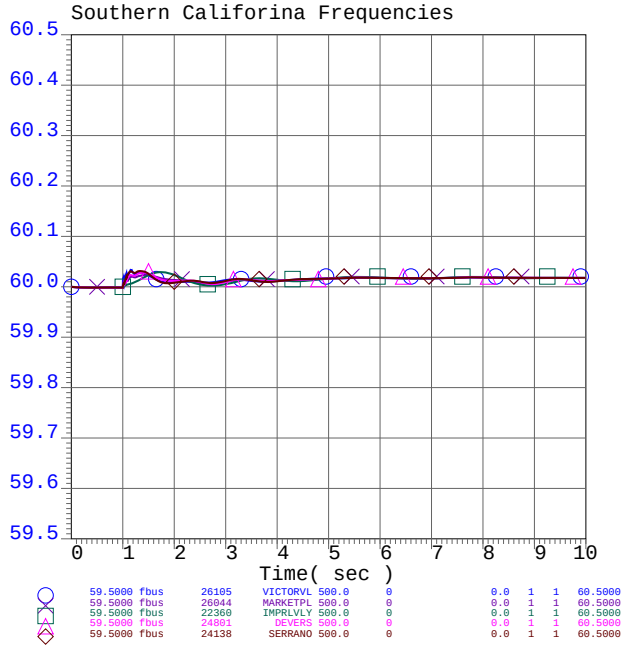
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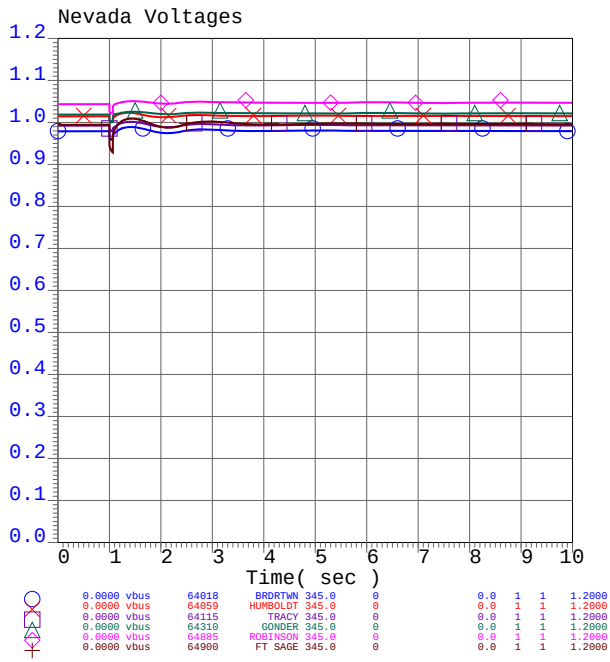
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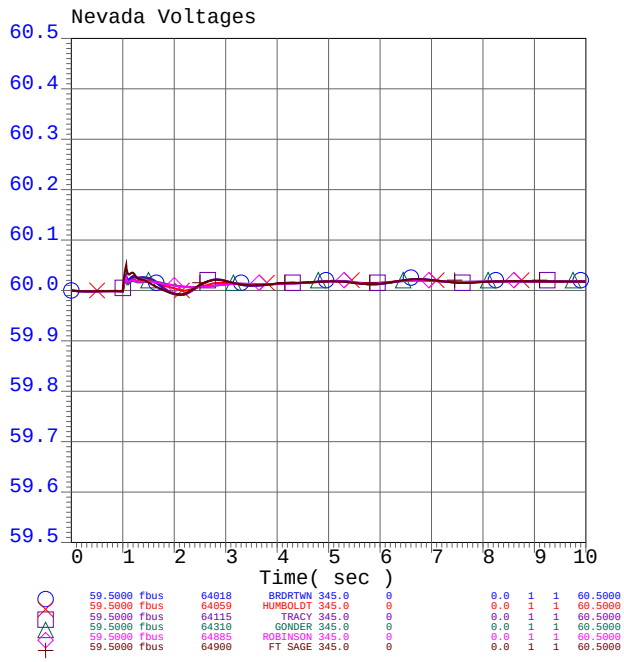
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WECC AREA VOLTAGE AND FREQUENCIES



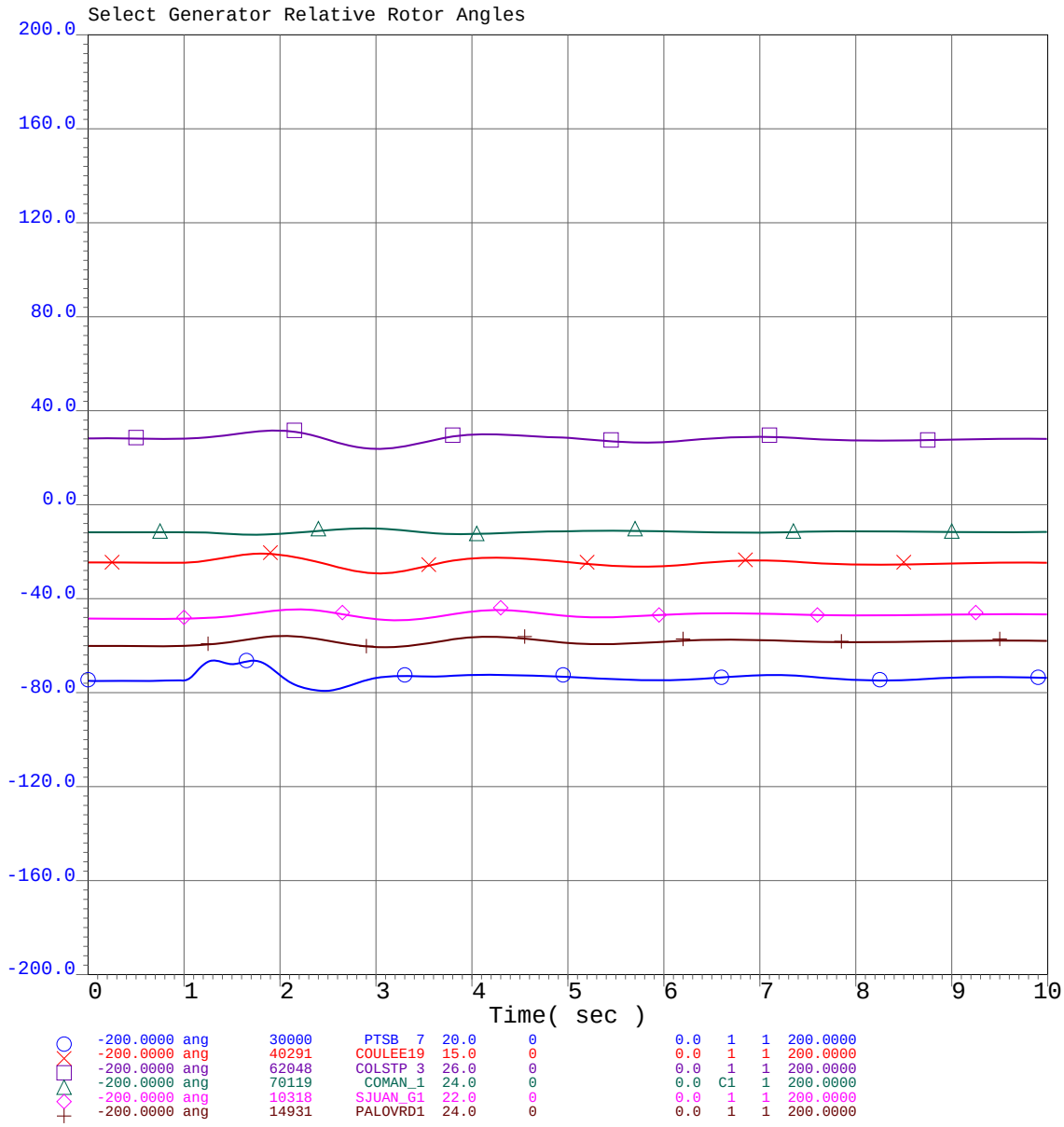






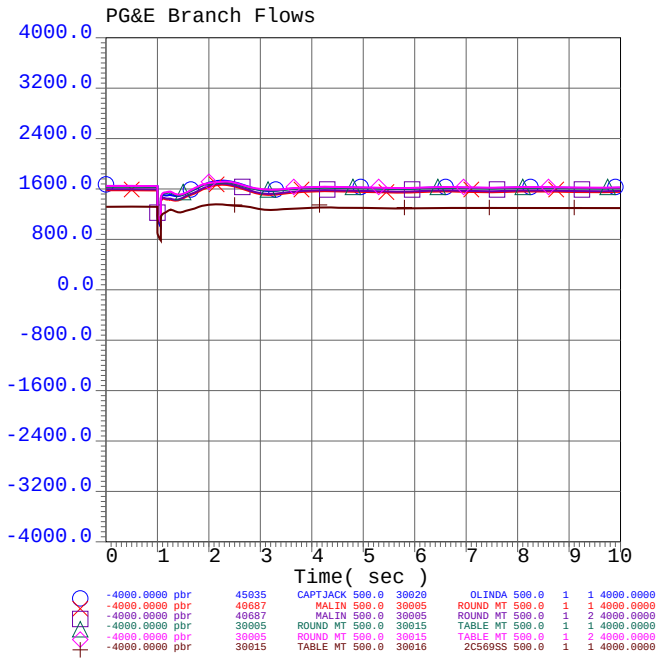
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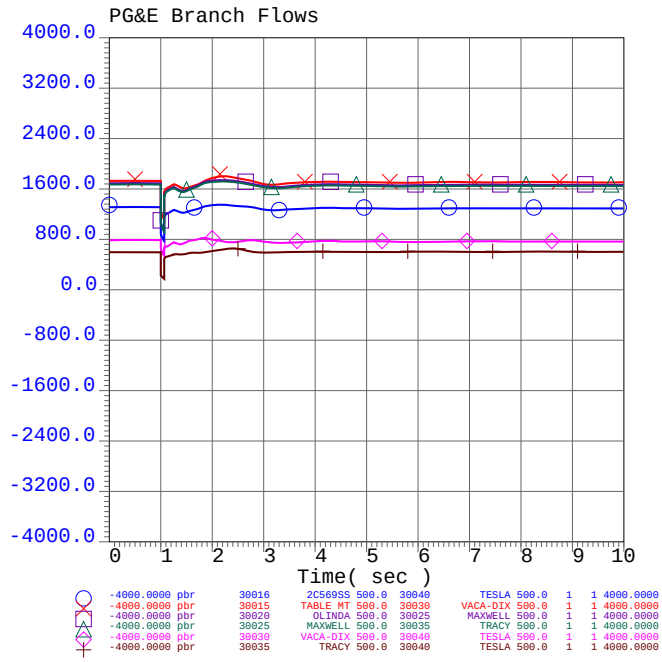
WECC RELATIVE ROTOR ANGLES

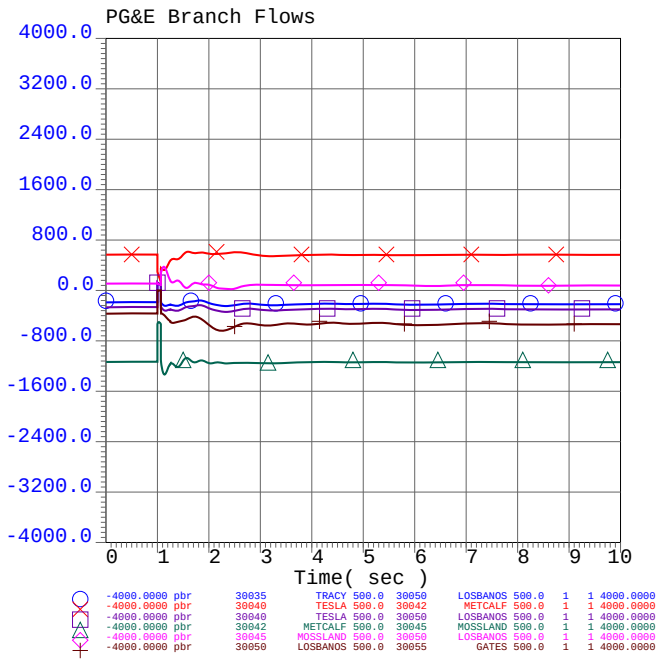


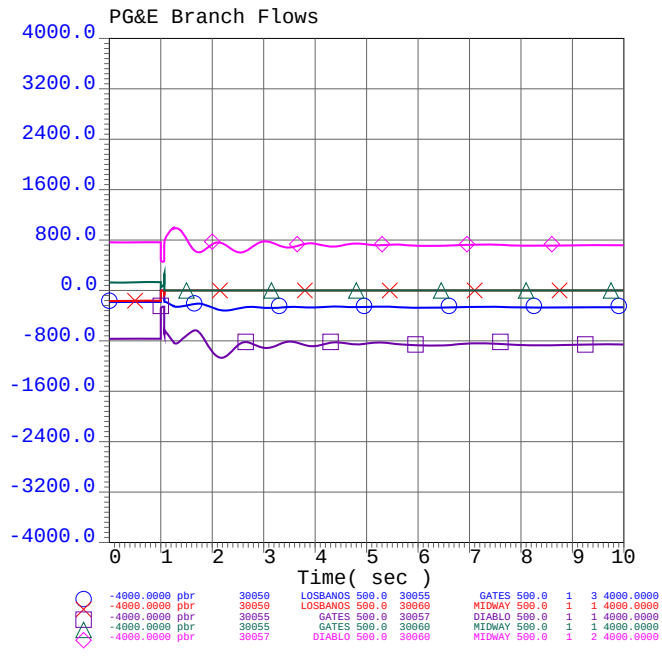
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SELECT BRANCH FLOWS





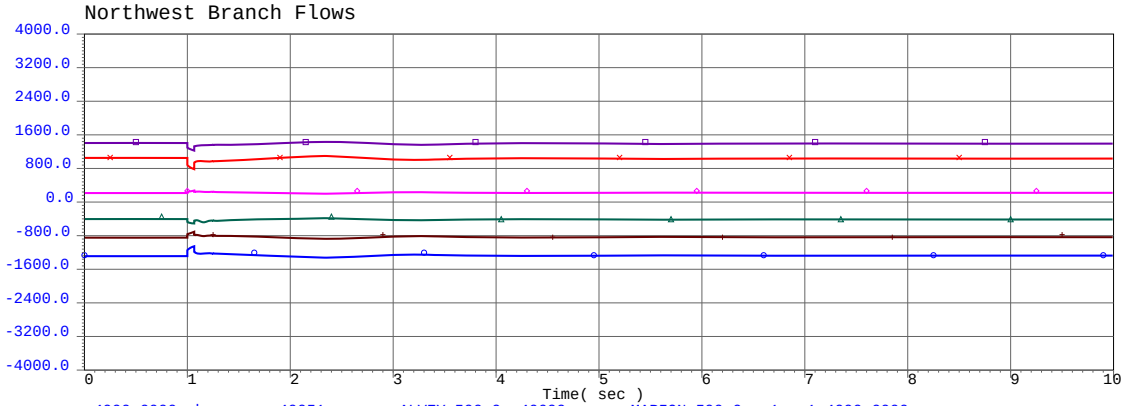




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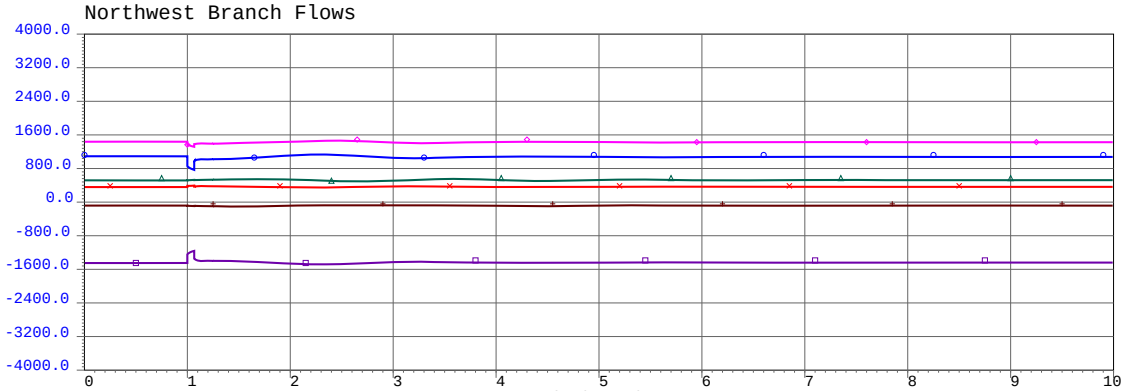
SELECT BRANCH FLOWS

Northwest Branch Flows



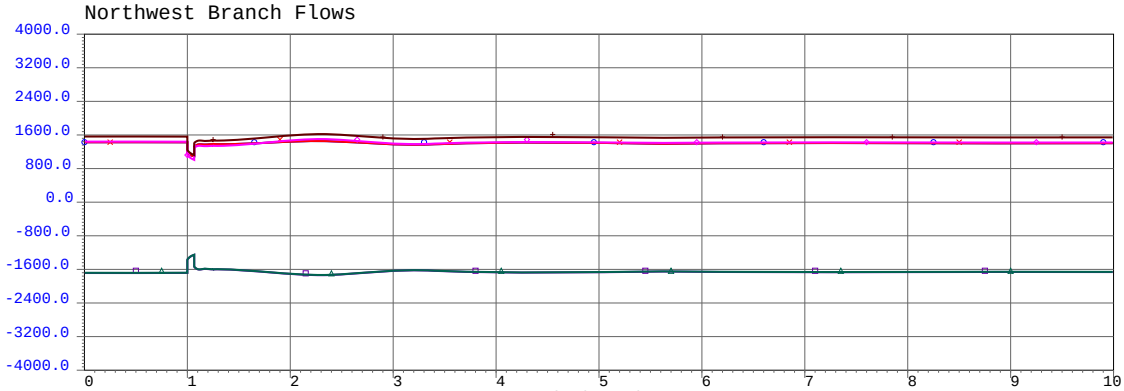
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
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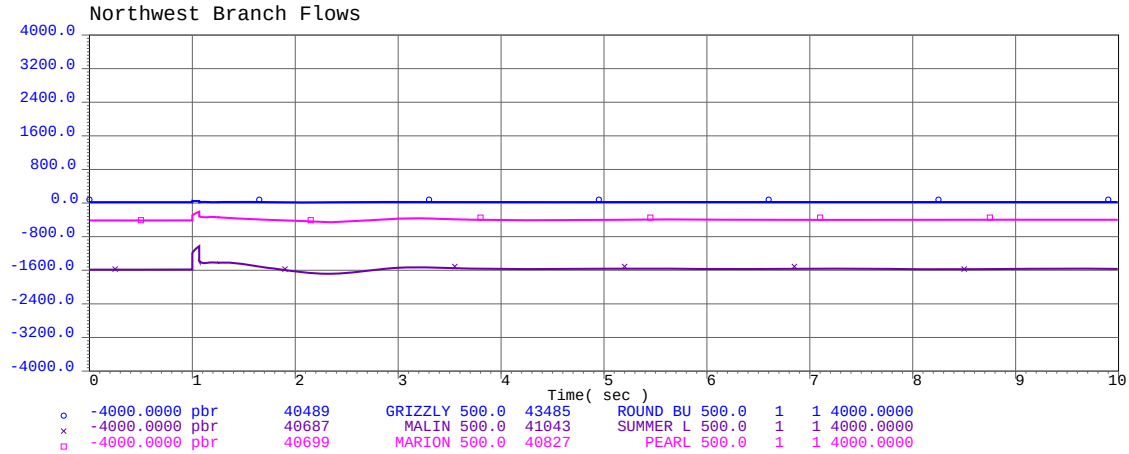
Northwest Branch Flows



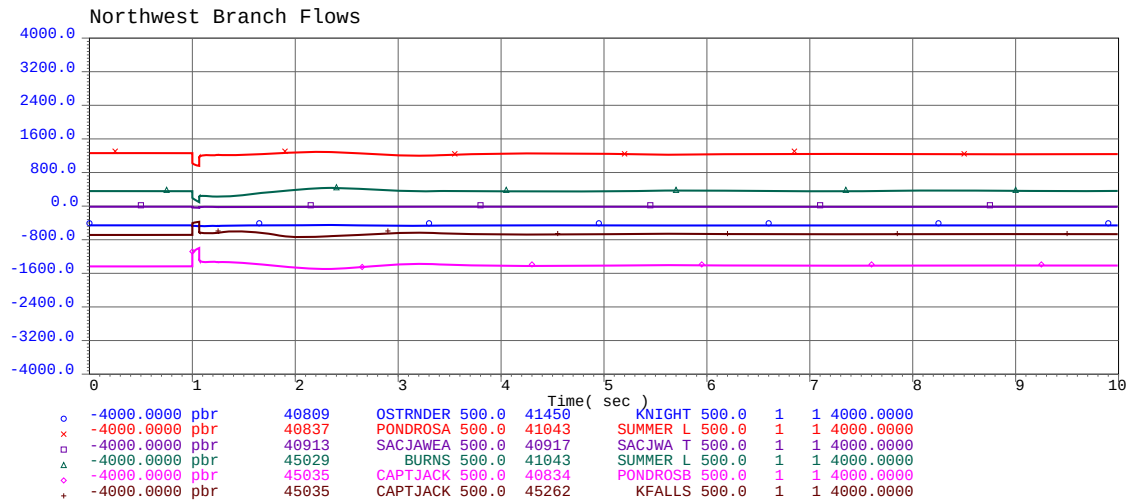
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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3-phase 4 cycle fault at Midway 500 kV
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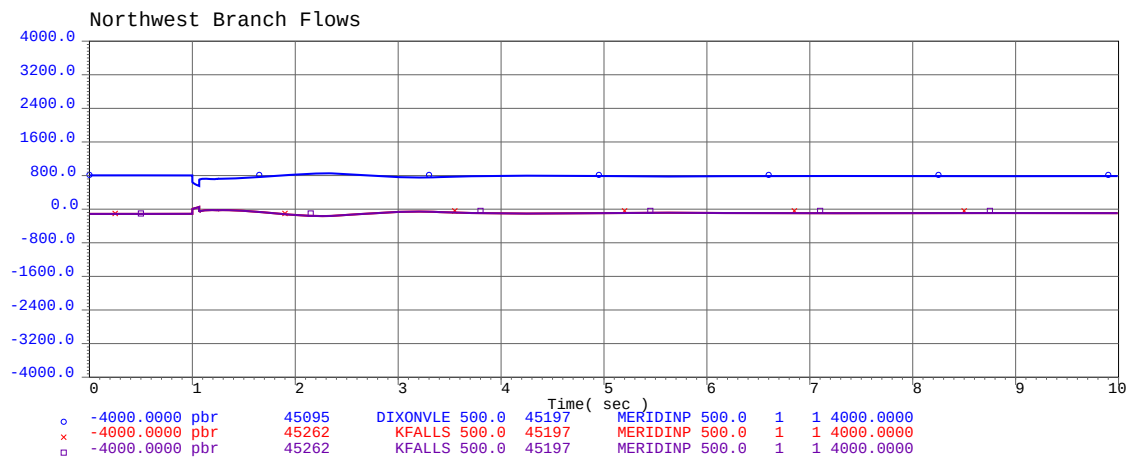
SELECT BRANCH FLOWS



-4000.0000 pbr 40489 GRIZZLY 500.0 43485 ROUND BU 500.0 1 1 4000.0000
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-4000.0000 pbr 40699 MARION 500.0 40827 PEARL 500.0 1 1 4000.0000



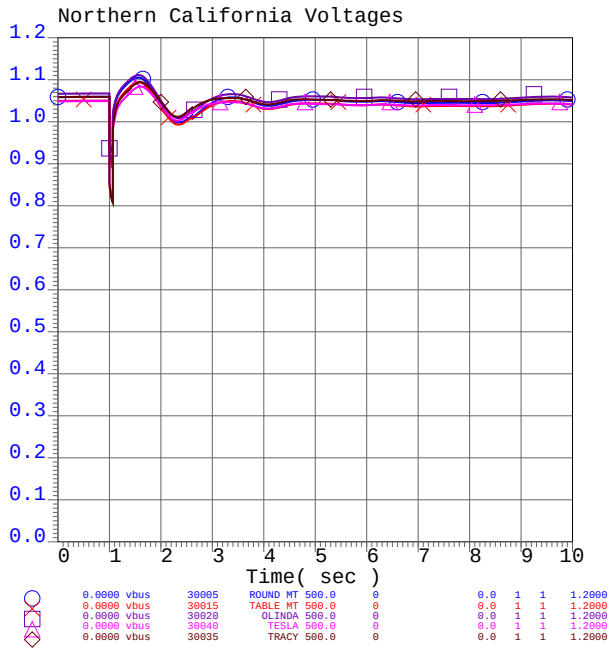
-4000.0000 pbr 40809 OSTRNDER 500.0 41450 KNIGHT 500.0 1 1 4000.0000
-4000.0000 pbr 40837 PONDROSA 500.0 41043 SUMMER L 500.0 1 1 4000.0000
-4000.0000 pbr 40913 SACJAWEA 500.0 40917 SACJWA T 500.0 1 1 4000.0000
-4000.0000 pbr 45029 BURNS 500.0 41043 SUMMER L 500.0 1 1 4000.0000
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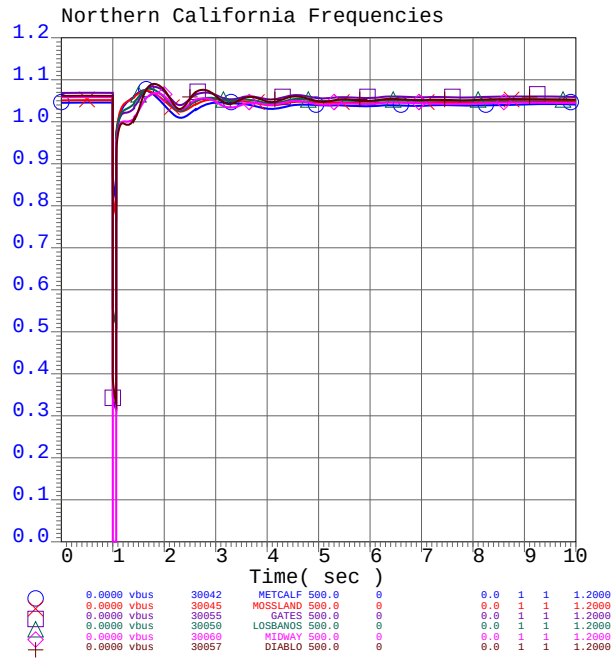


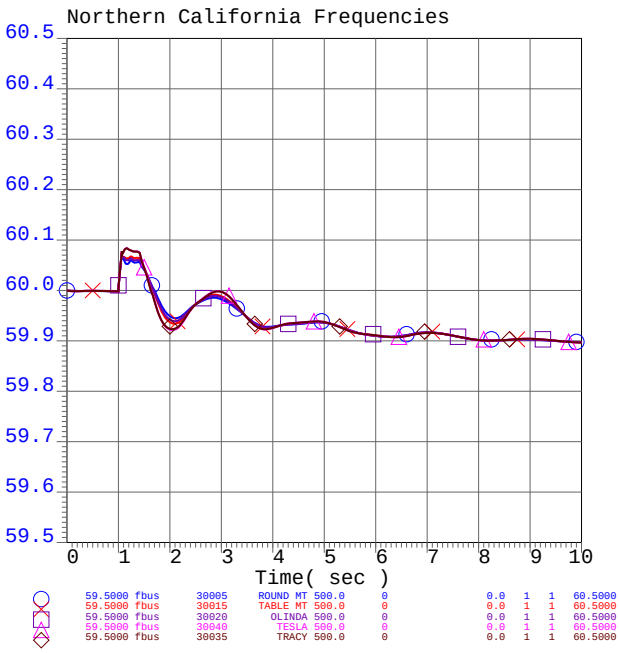
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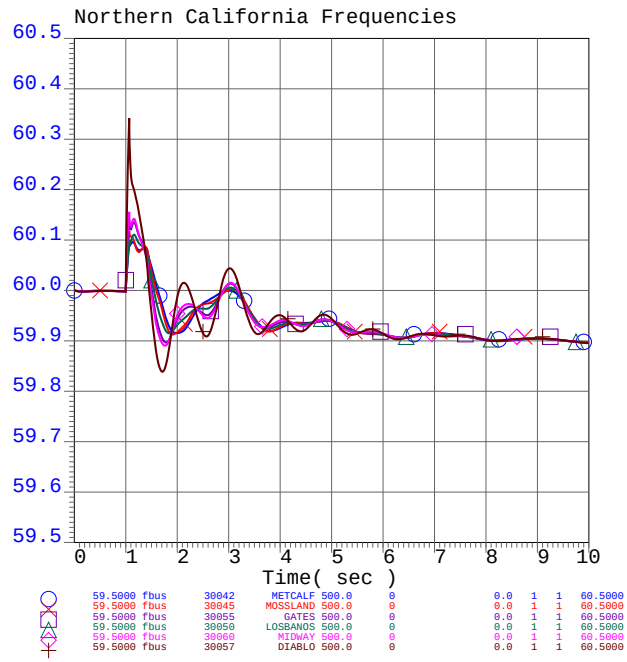
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followed by loss of Los Banos-Midway & Gates-Midway 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



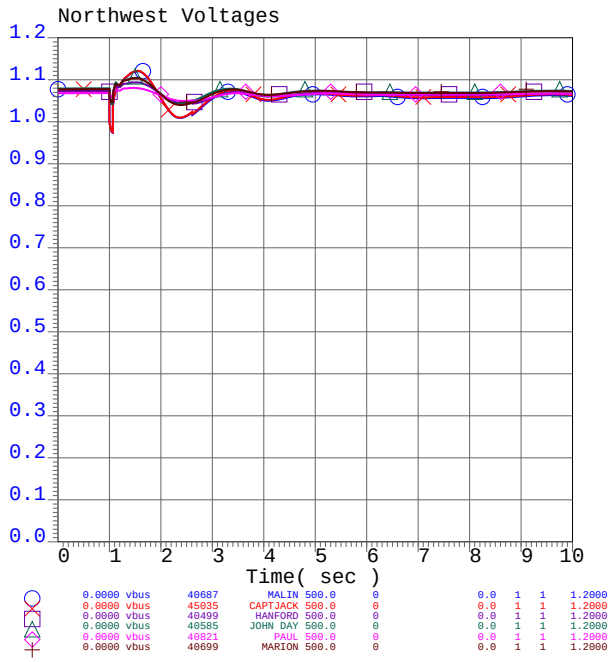


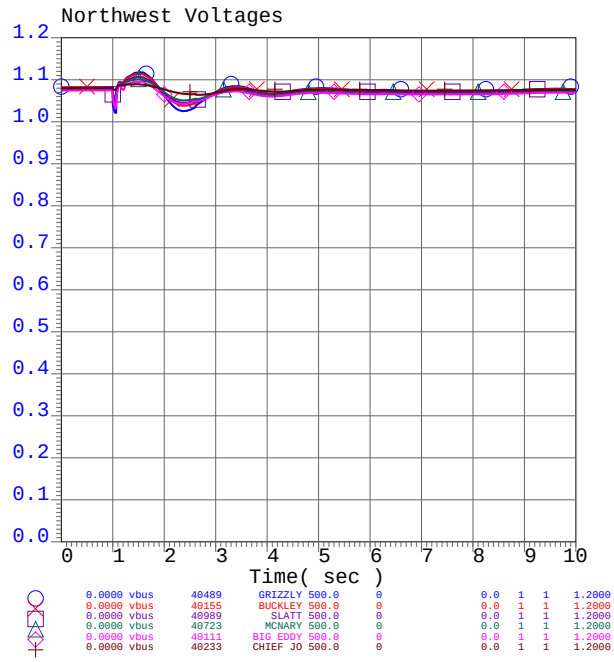


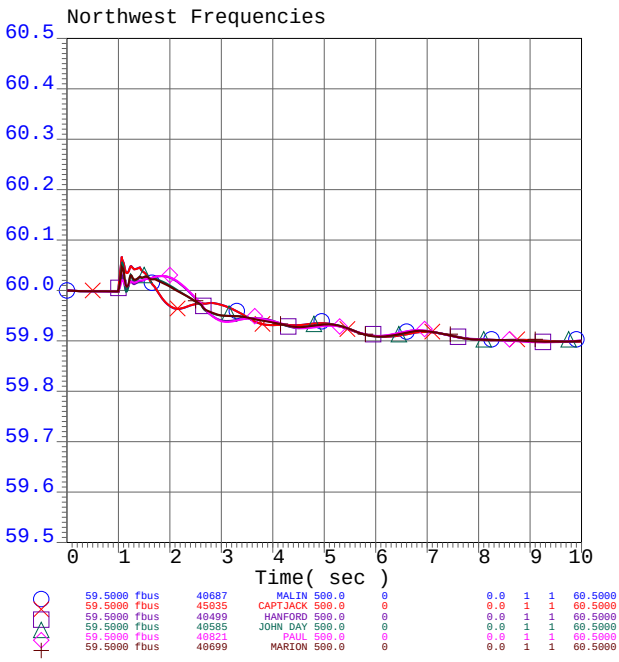


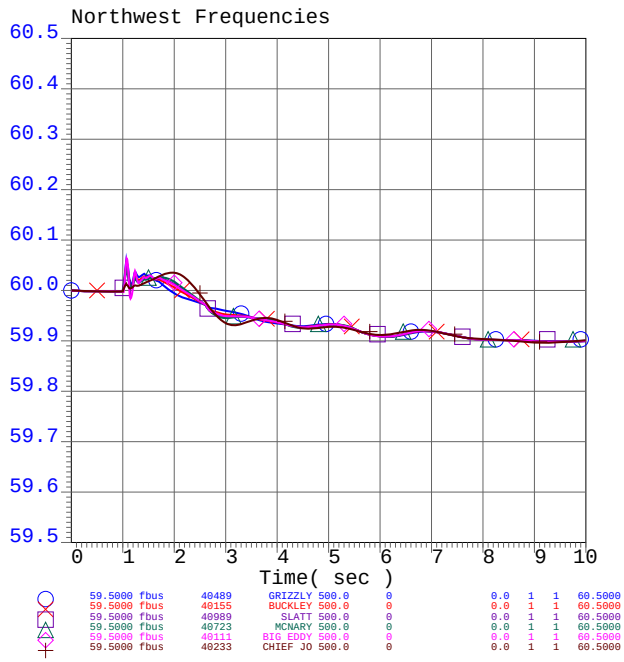
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES





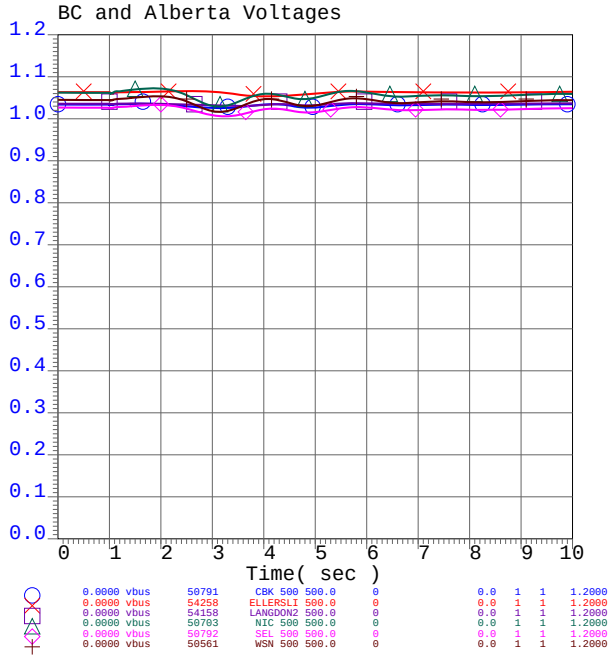




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

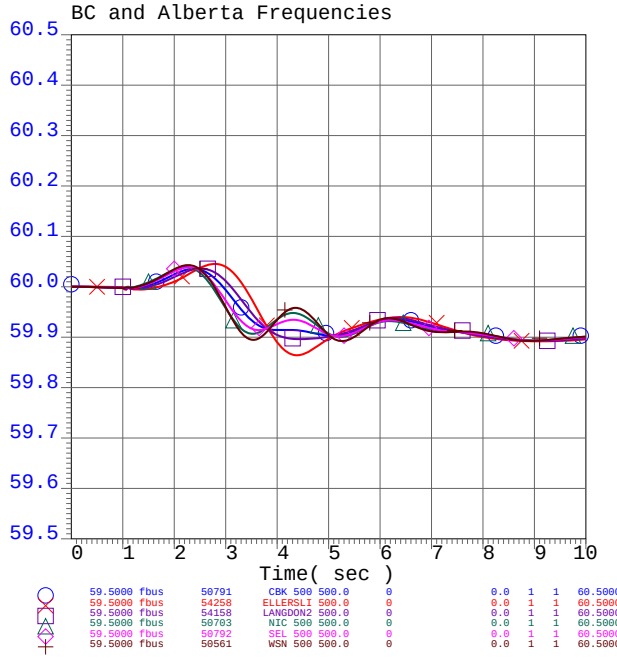
WECC AREA VOLTAGE AND FREQUENCIES

BC and Alberta Voltages



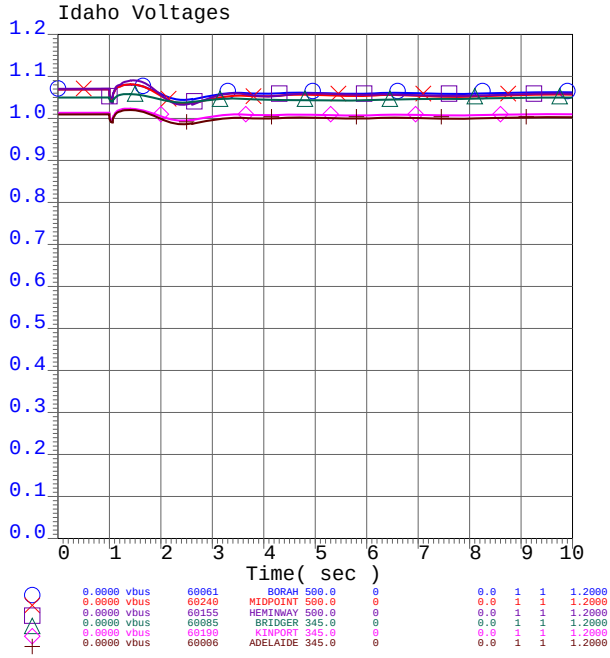
0.0000 vbus	50791	CBK 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	54258	ELLERSLI 500.0	0	0.0	1	1	1.2000
0.0000 vbus	54158	LANGDON2 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50703	NIC 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50792	SEL 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50561	WSN 500 500.0	0	0.0	1	1	1.2000

BC and Alberta Frequencies



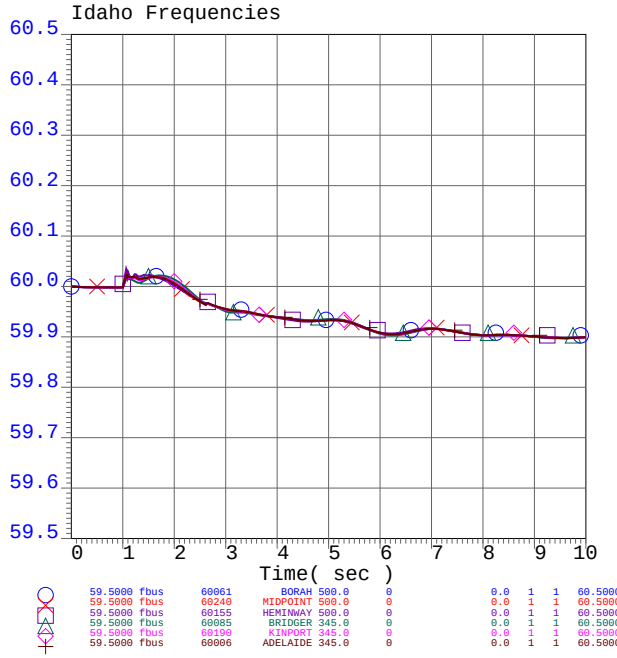
59.5000 fbus	50791	CBK 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54258	ELLERSLI 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54158	LANGDON2 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50703	NIC 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50792	SEL 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50561	WSN 500 500.0	0	0.0	1	1	60.5000

Idaho Voltages



0.0000 vbus	60061	BORAH 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60240	MIDPOINT 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60155	HEMINWAY 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60085	BRIDGER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60190	KINPORT 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60006	ADELAIDE 345.0	0	0.0	1	1	1.2000

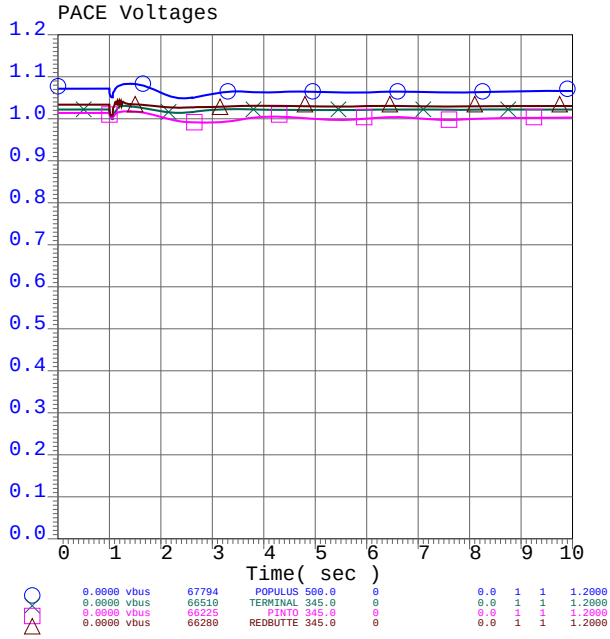
Idaho Frequencies

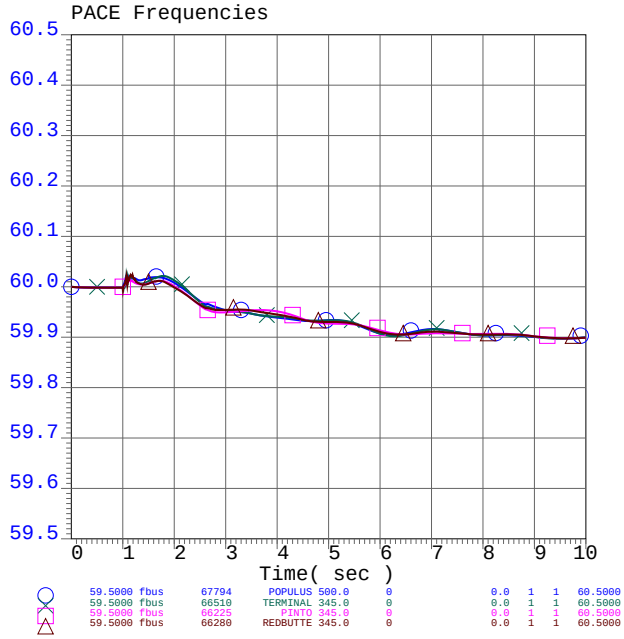


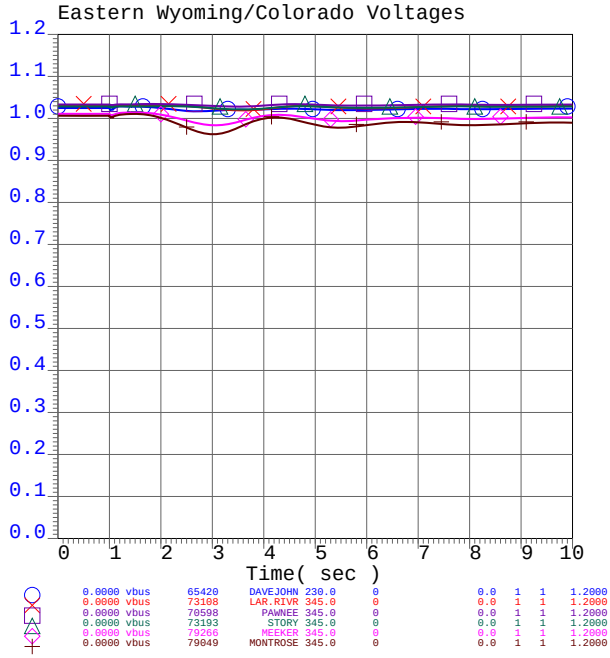
59.5000 fbus	60061	BORAH 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60240	MIDPOINT 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60155	HEMINWAY 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60085	BRIDGER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60190	KINPORT 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60006	ADELAIDE 345.0	0	0.0	1	1	60.5000

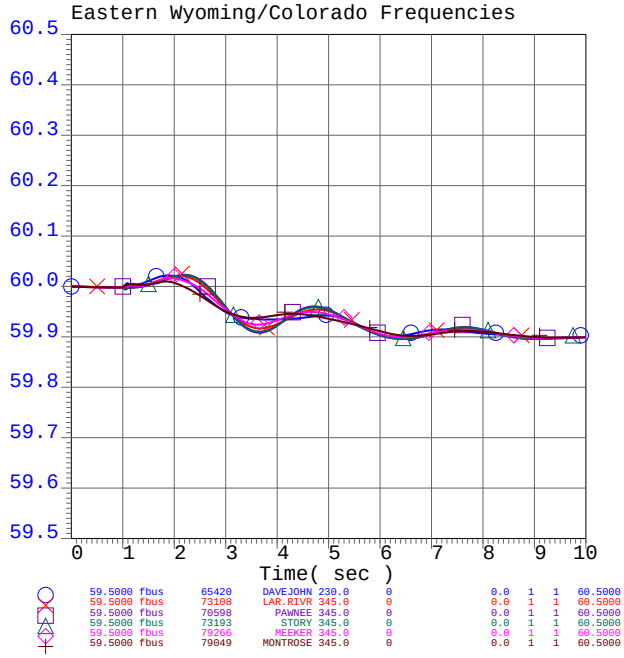
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



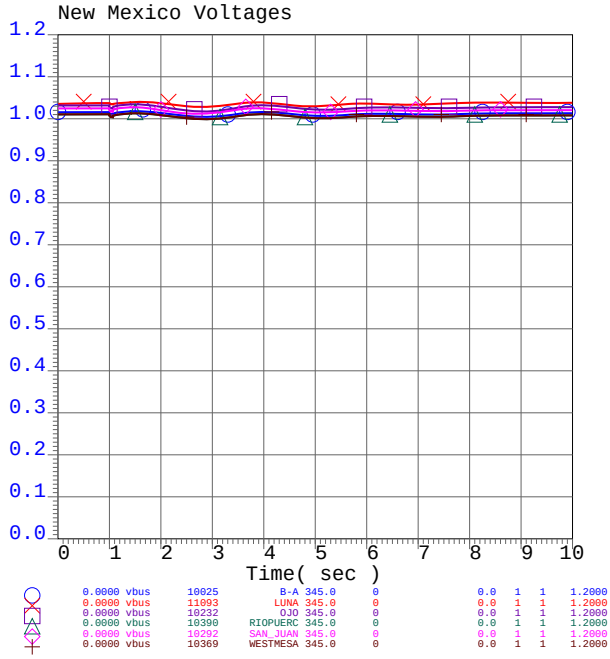


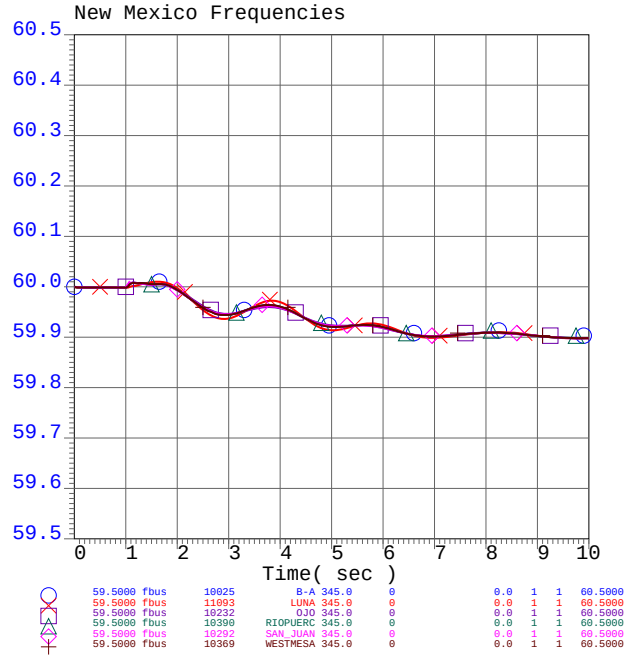


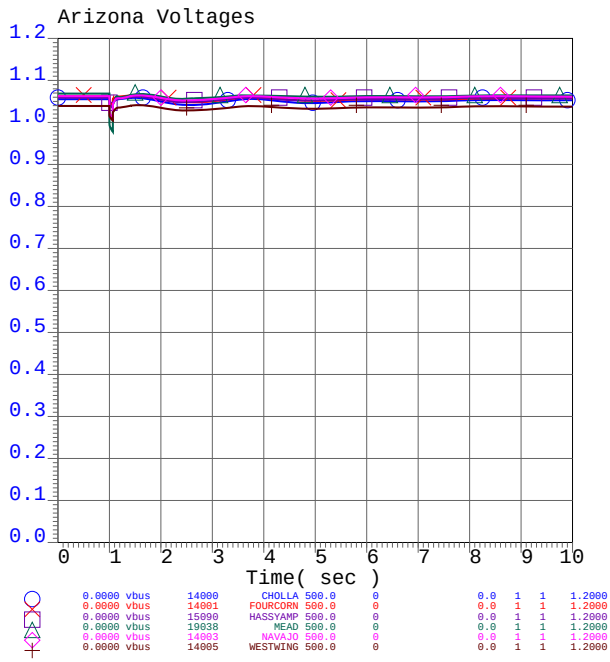


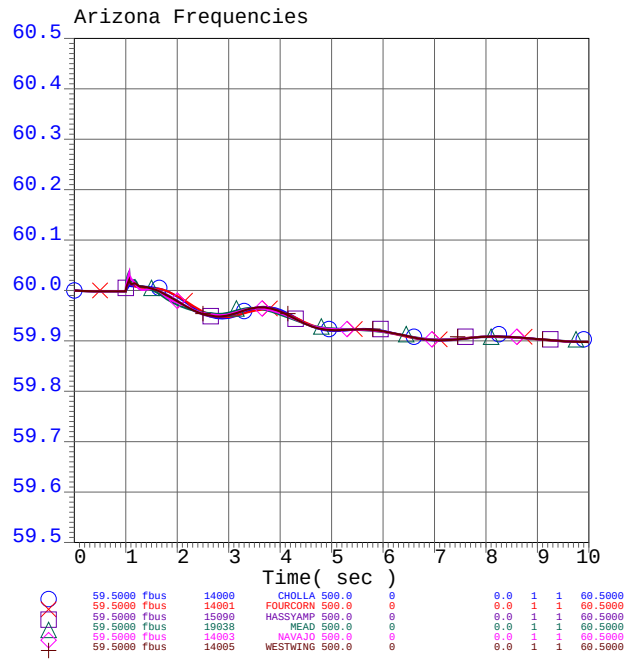
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WECC AREA VOLTAGE AND FREQUENCIES







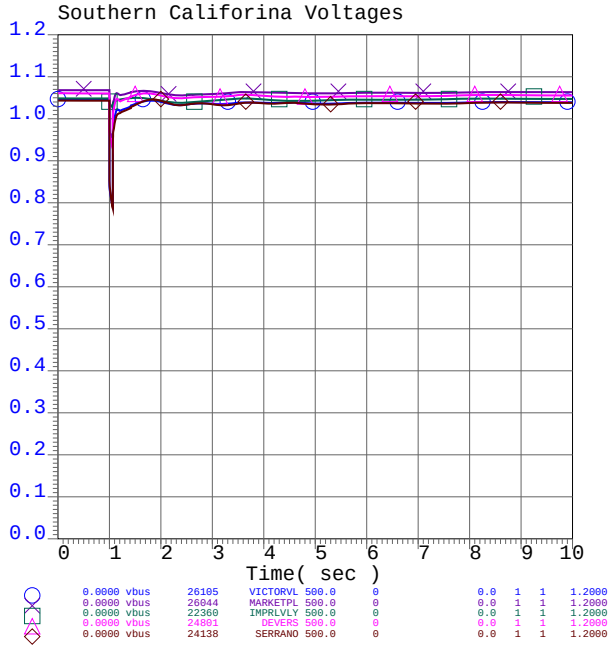


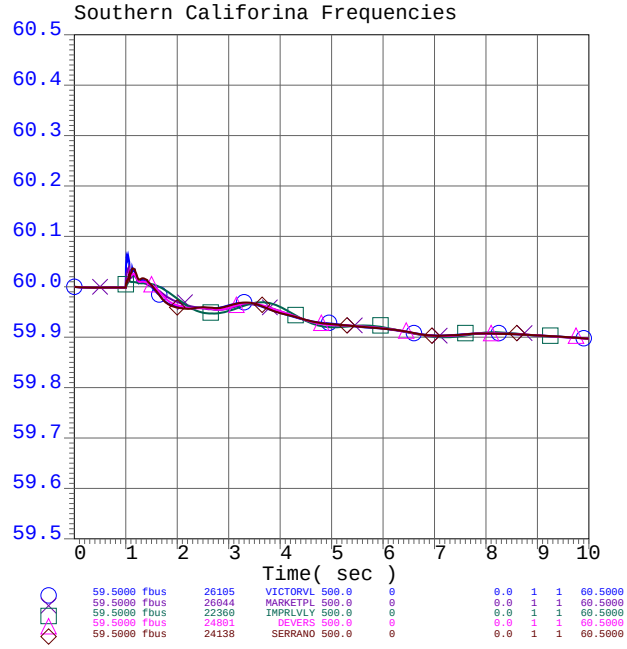
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

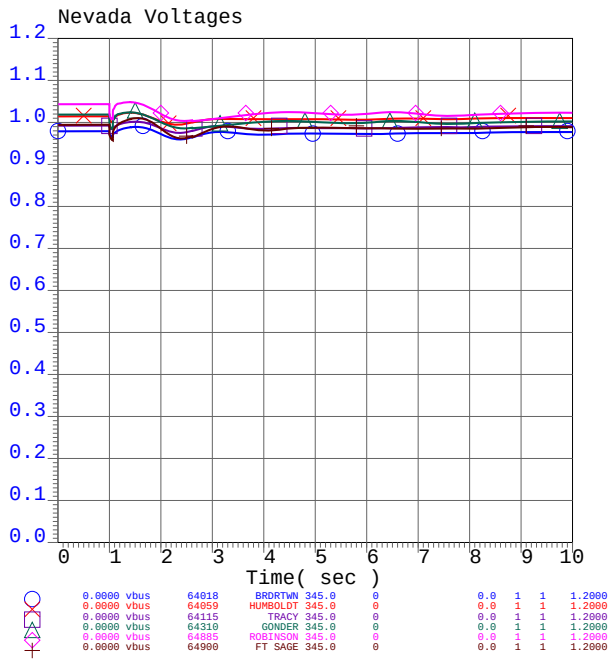
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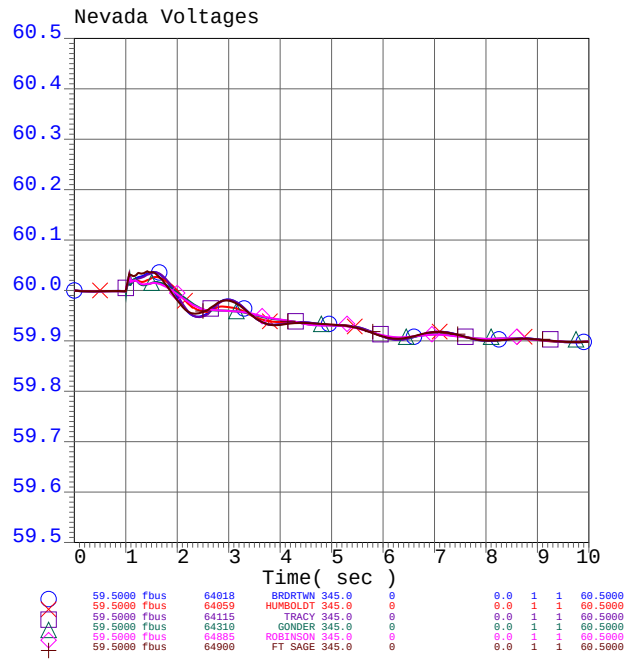
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WECC AREA VOLTAGE AND FREQUENCIES



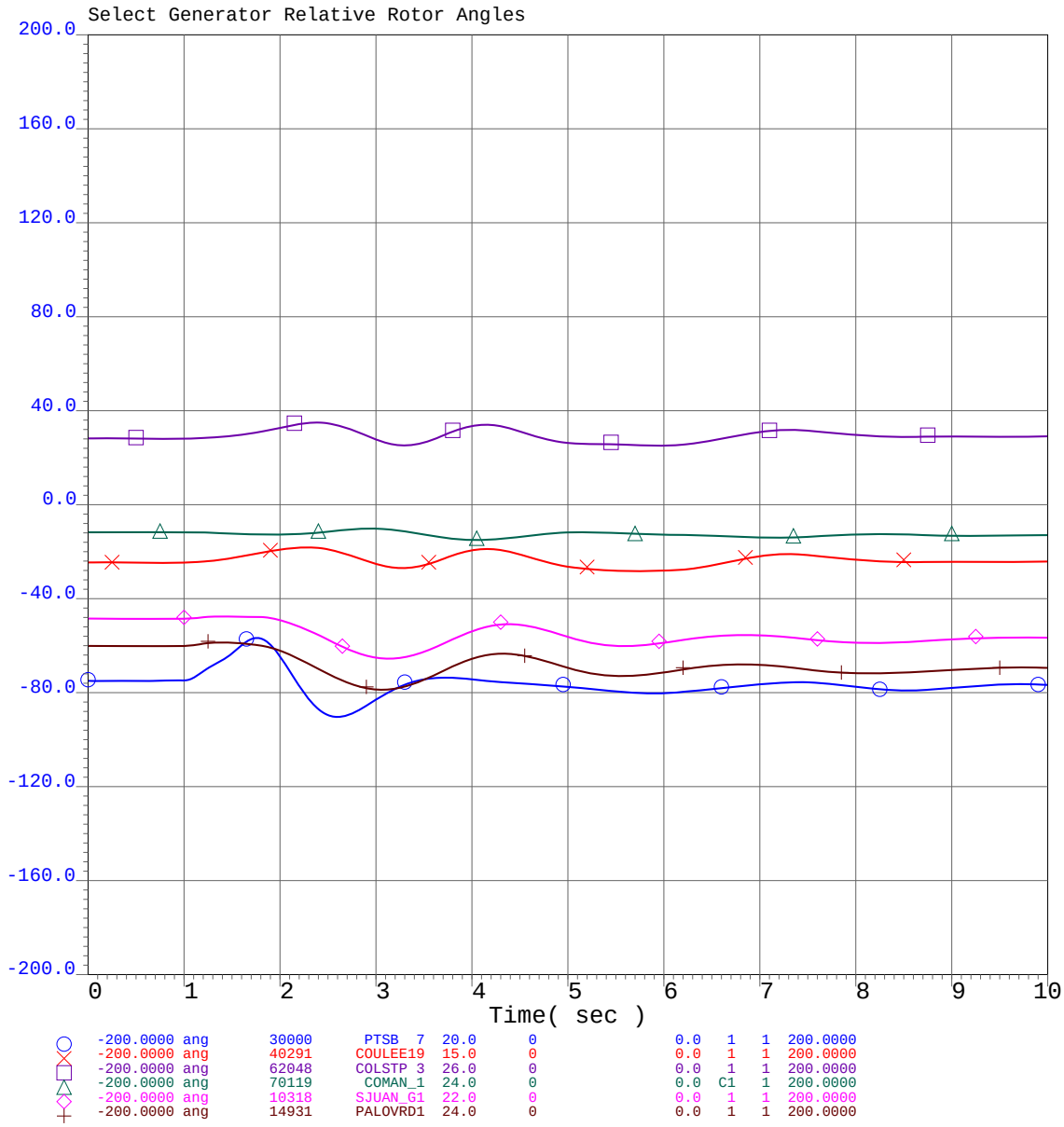






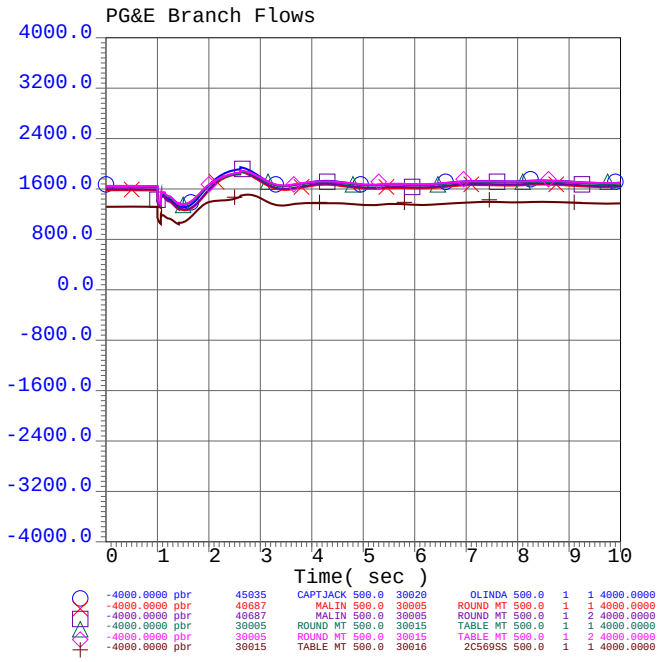
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3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

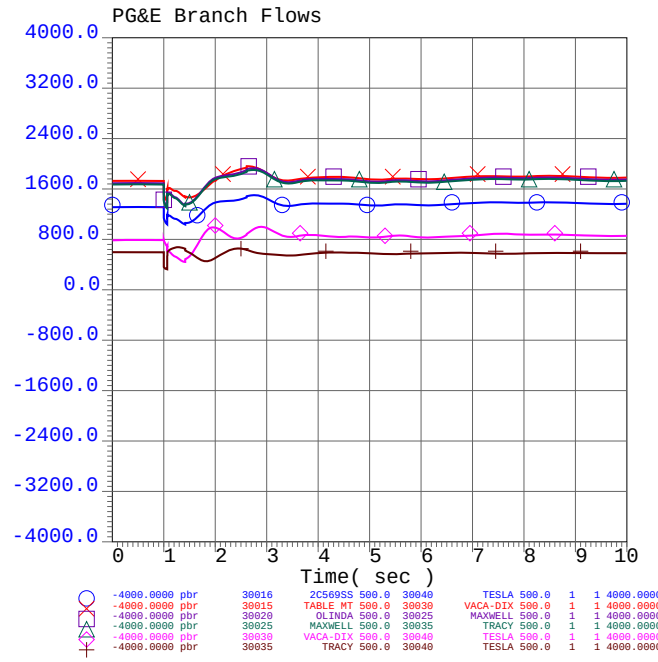
WECC RELATIVE ROTOR ANGLES

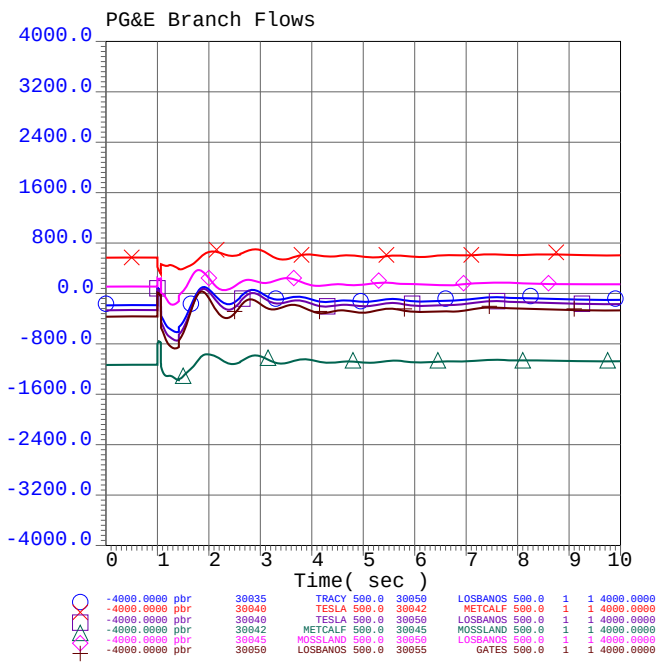


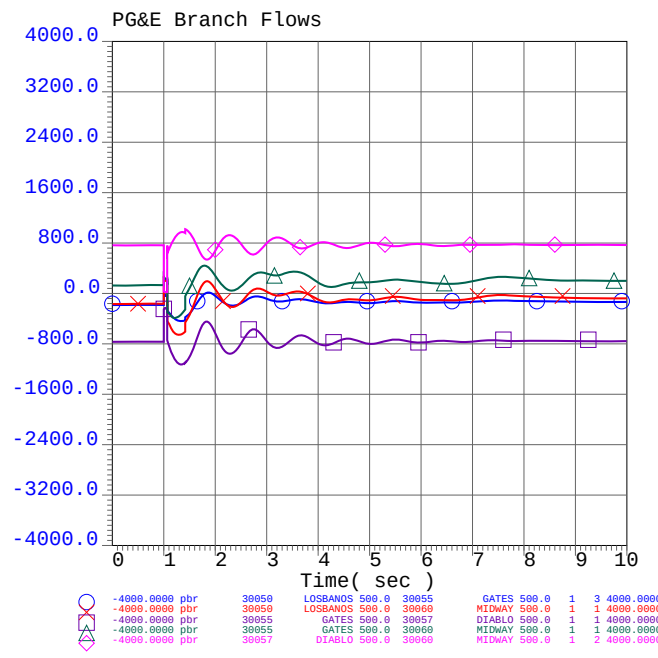
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

SELECT BRANCH FLOWS



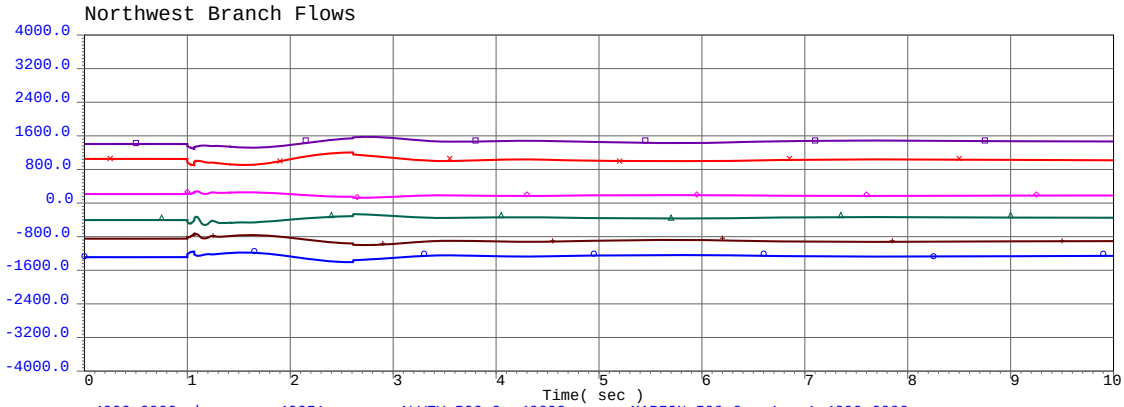




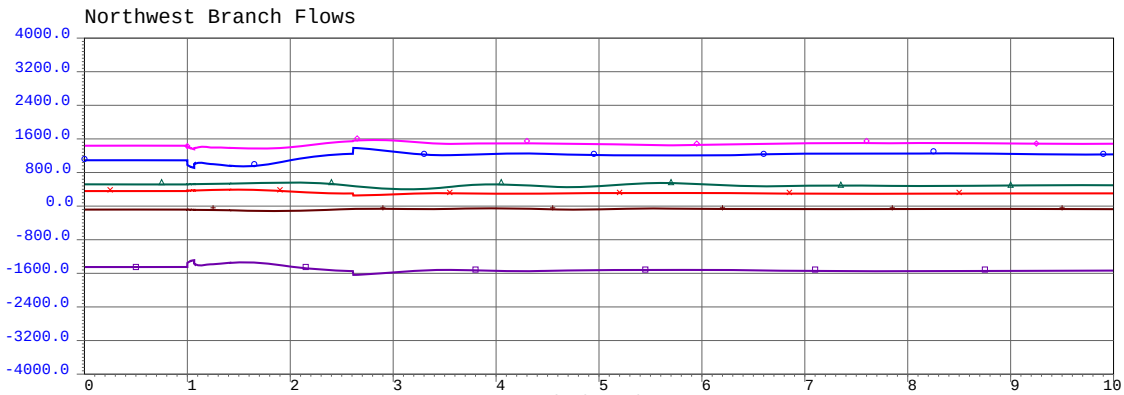


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

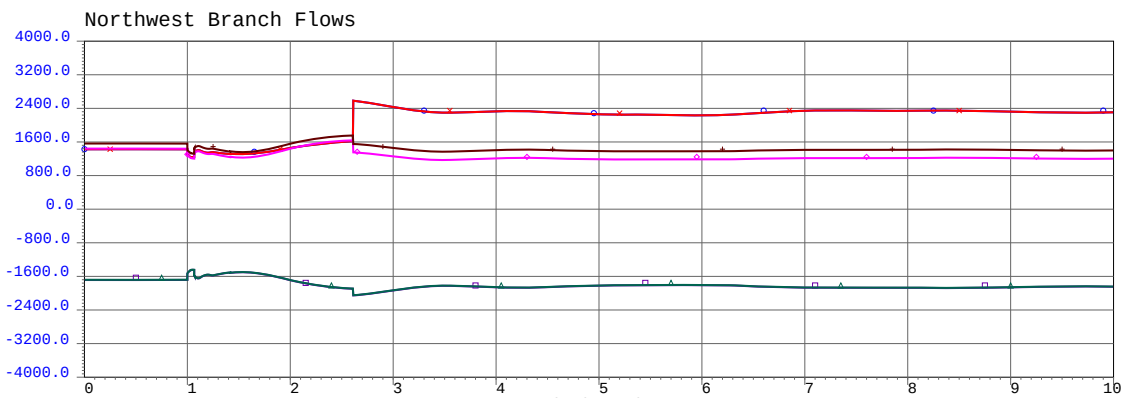
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



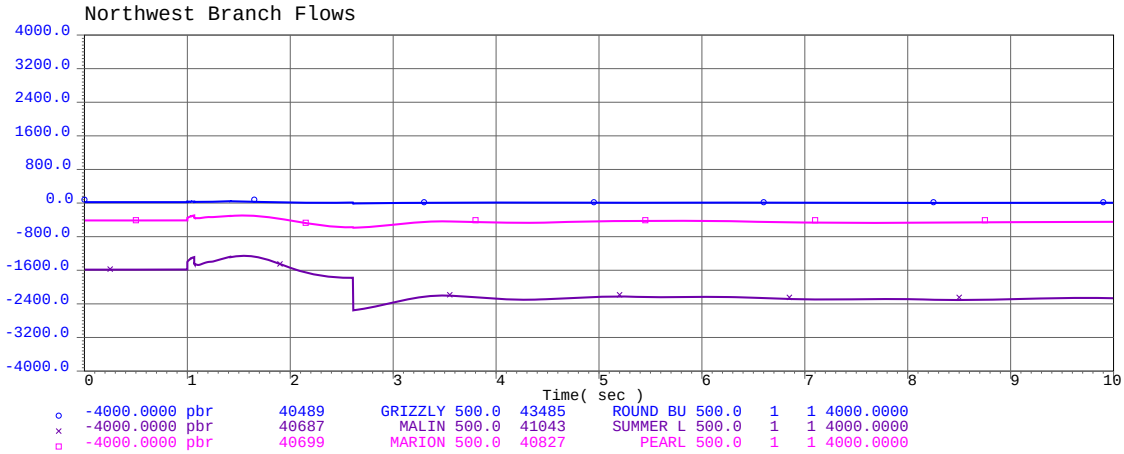
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



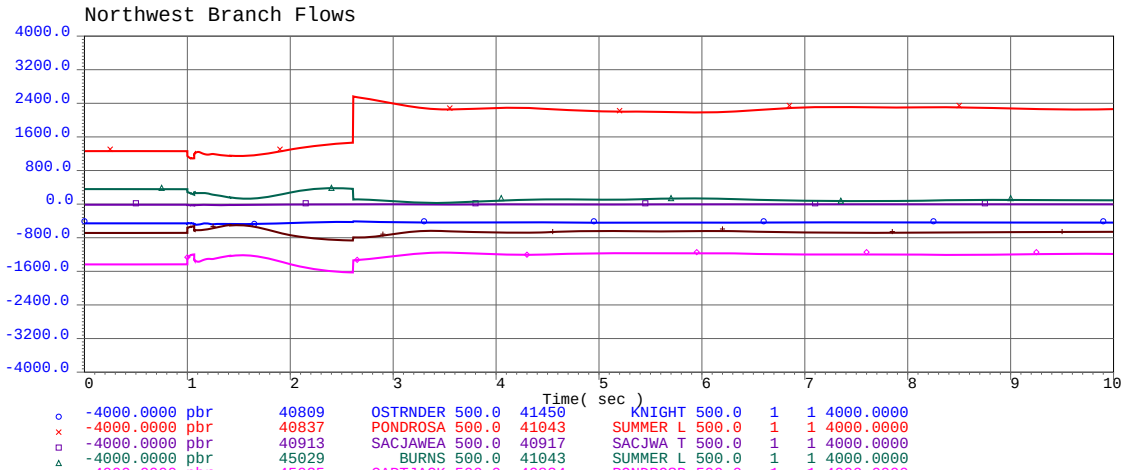
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

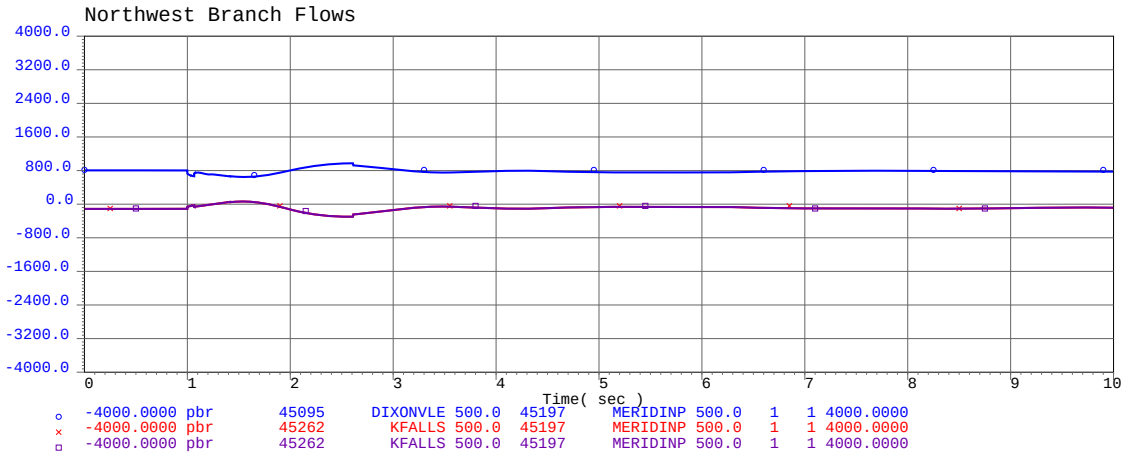
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



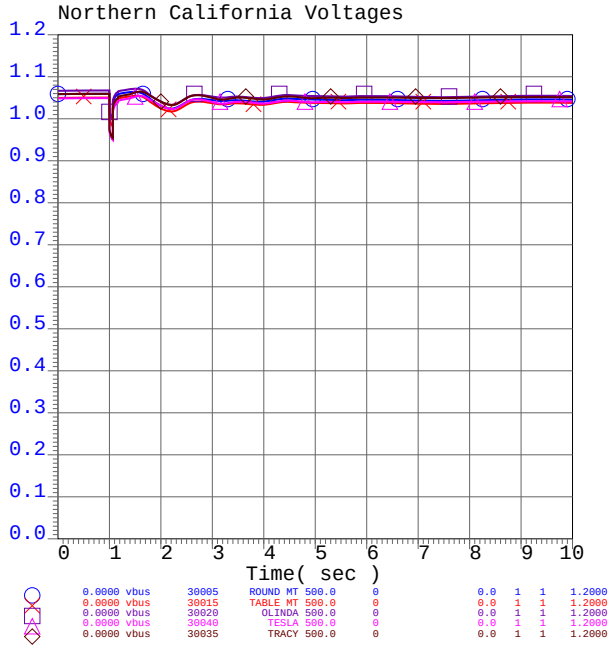
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

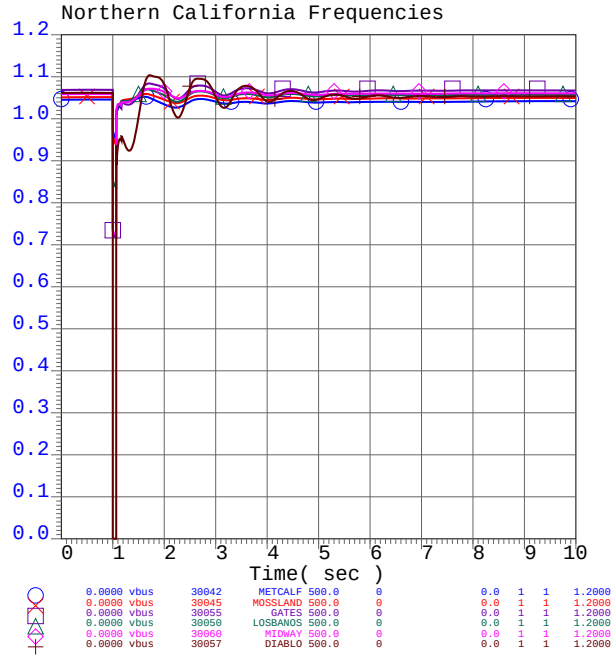


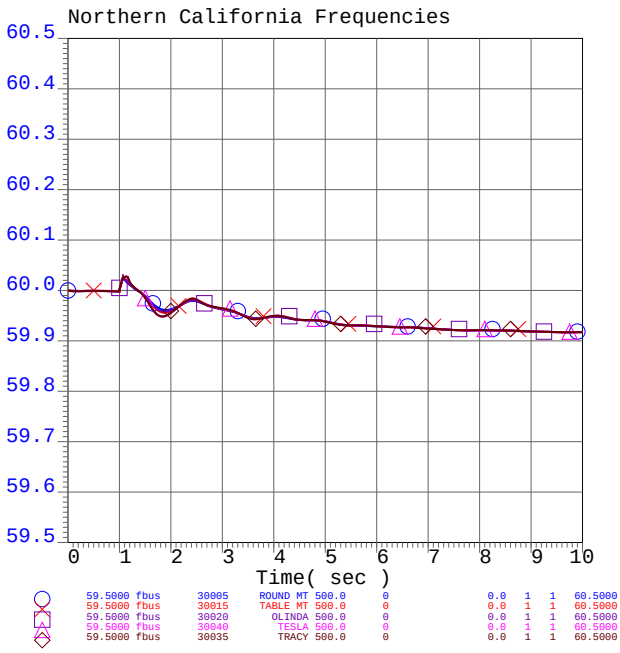
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

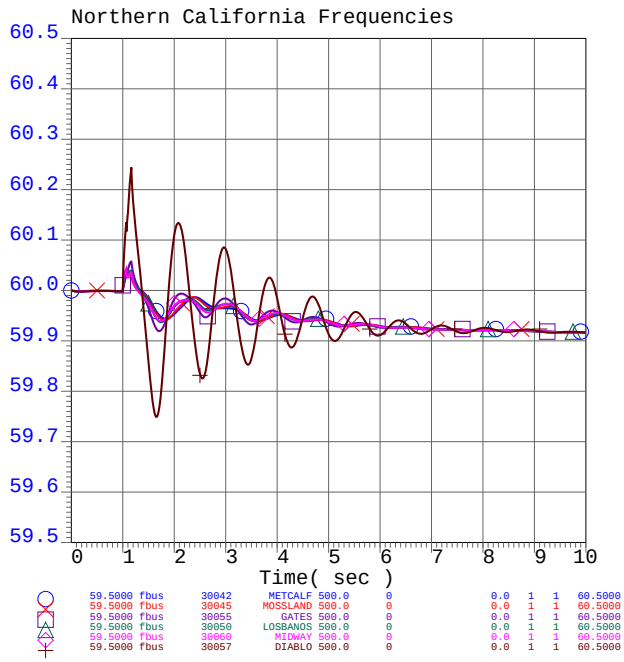
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Midway 500 kV
followed by loss of Midway-Vincent #1 and #2 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



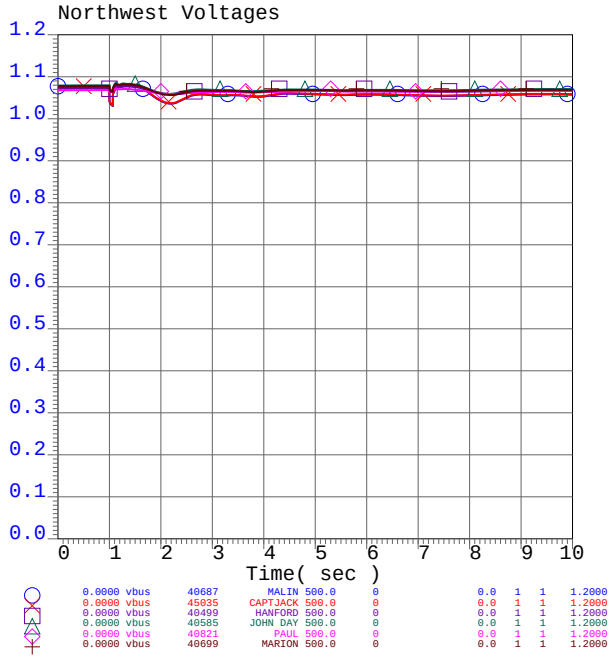


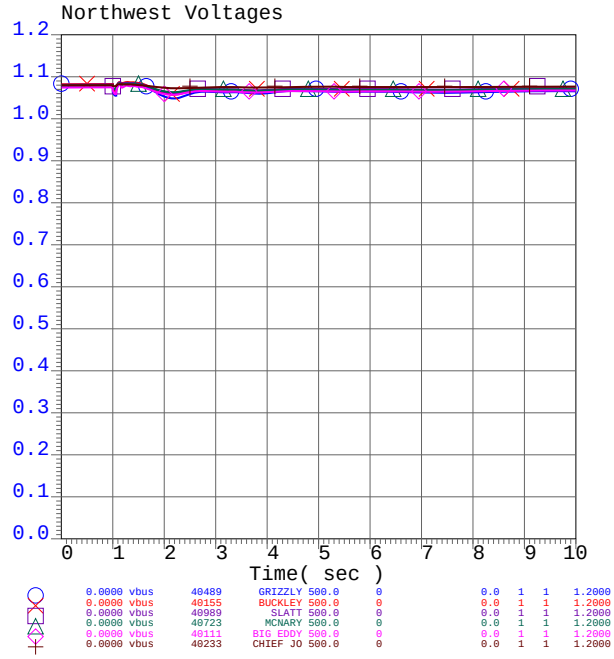


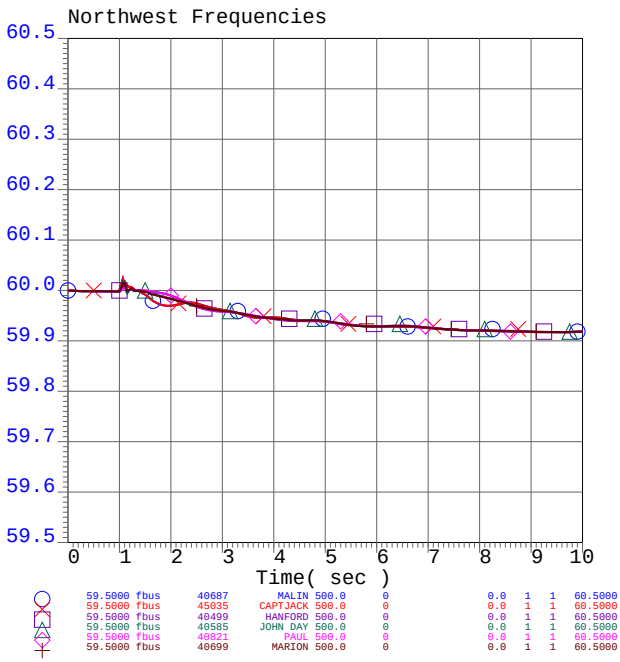


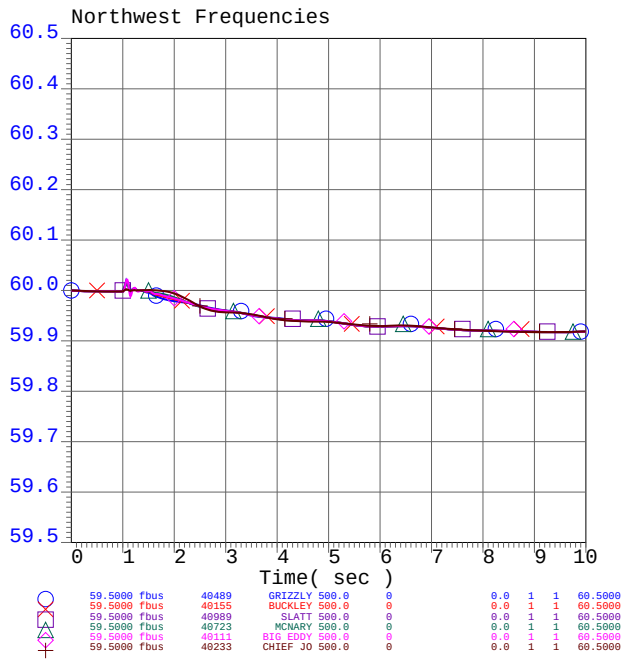
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





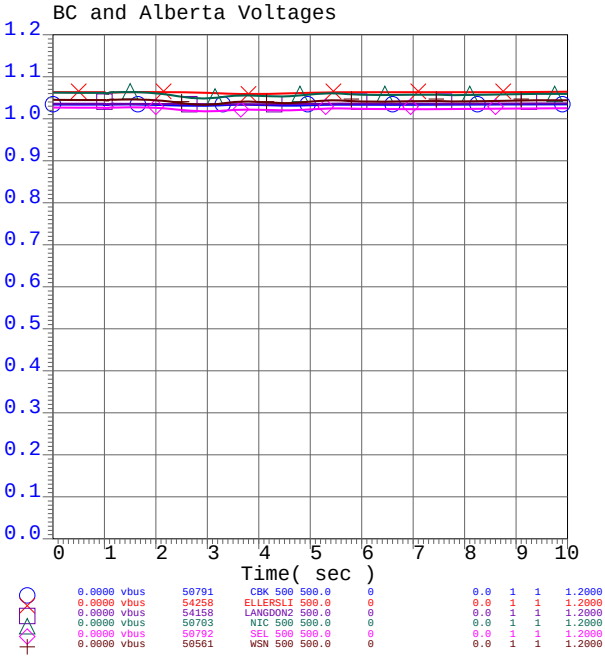




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

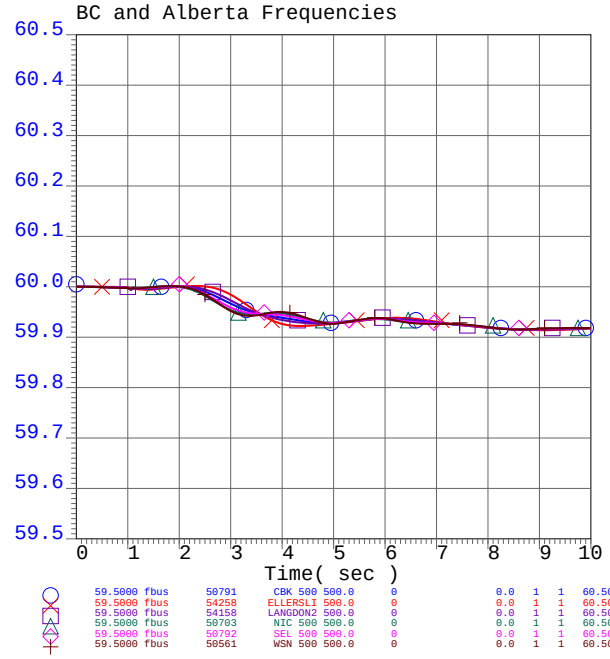
WECC AREA VOLTAGE AND FREQUENCIES

BC and Alberta Voltages



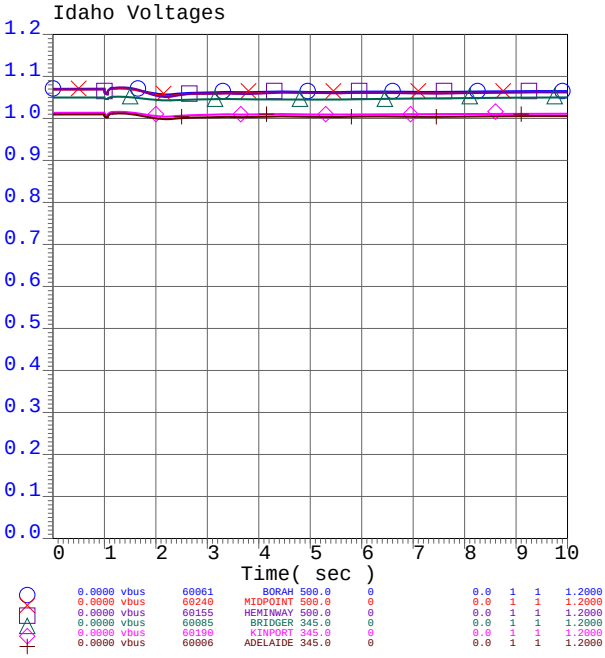
0.0000 vbus	50791	CBK 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	54258	ELLERSLI 500.0	0	0.0	1	1	1.2000
0.0000 vbus	54158	LANGDON2 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50703	NIC 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50792	SEL 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50561	WSN 500 500.0	0	0.0	1	1	1.2000

BC and Alberta Frequencies



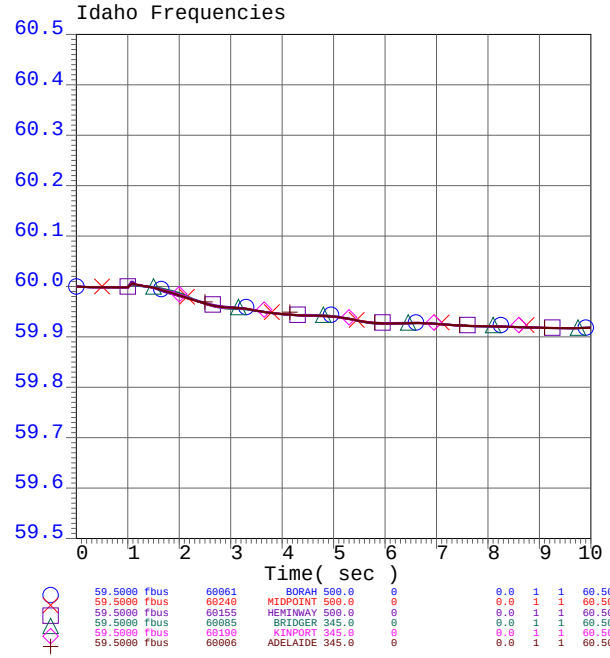
59.5000 fbus	50791	CBK 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54258	ELLERSLI 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54158	LANGDON2 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50703	NIC 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50792	SEL 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50561	WSN 500 500.0	0	0.0	1	1	60.5000

Idaho Voltages



0.0000 vbus	60061	BORAH 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60240	MIDPOINT 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60155	HEMINWAY 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60085	BRIDGER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60190	KINPORT 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60006	ADELAIDE 345.0	0	0.0	1	1	1.2000

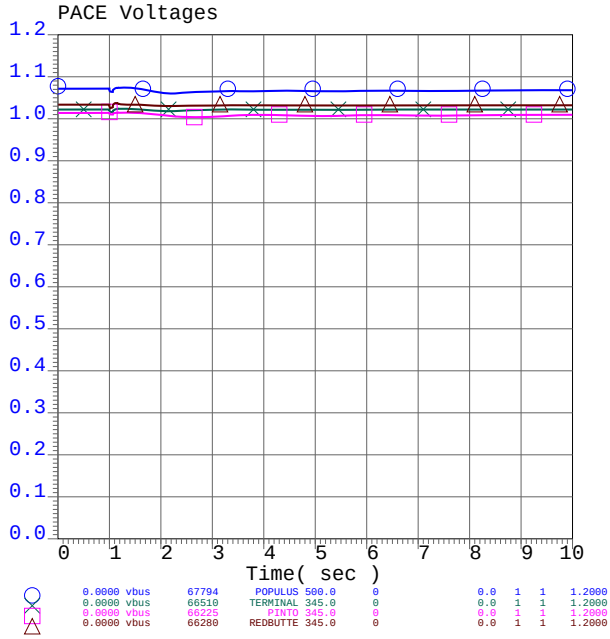
Idaho Frequencies

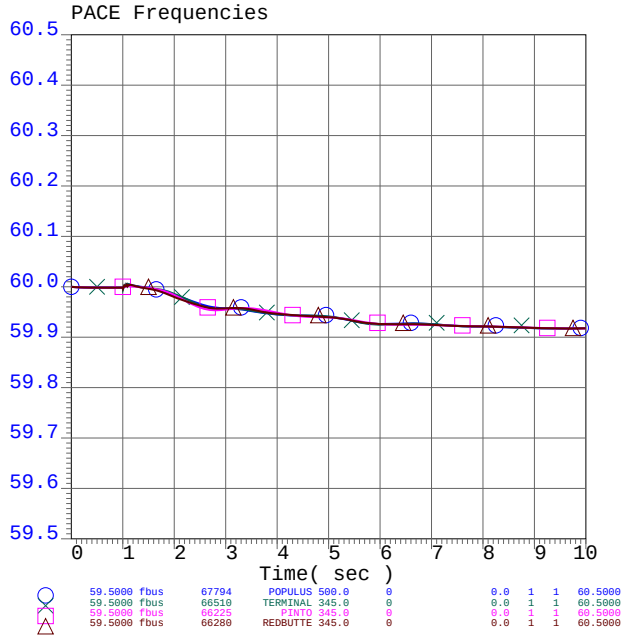


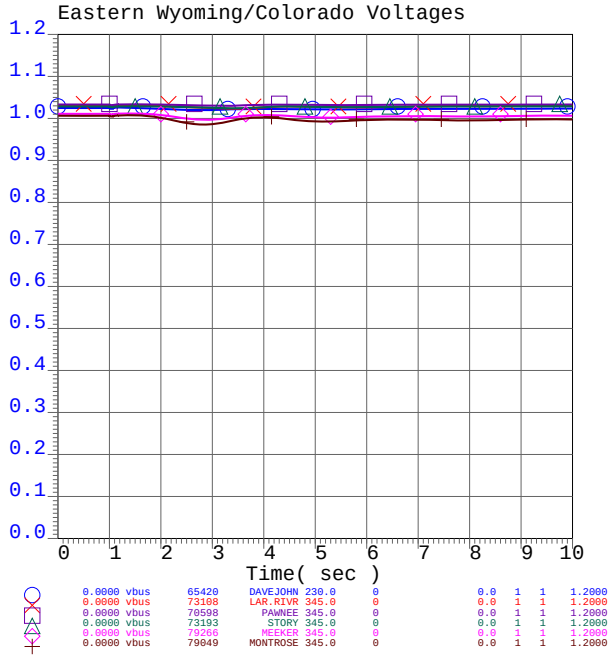
59.5000 fbus	60061	BORAH 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60240	MIDPOINT 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60155	HEMINWAY 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60085	BRIDGER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60190	KINPORT 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60006	ADELAIDE 345.0	0	0.0	1	1	60.5000

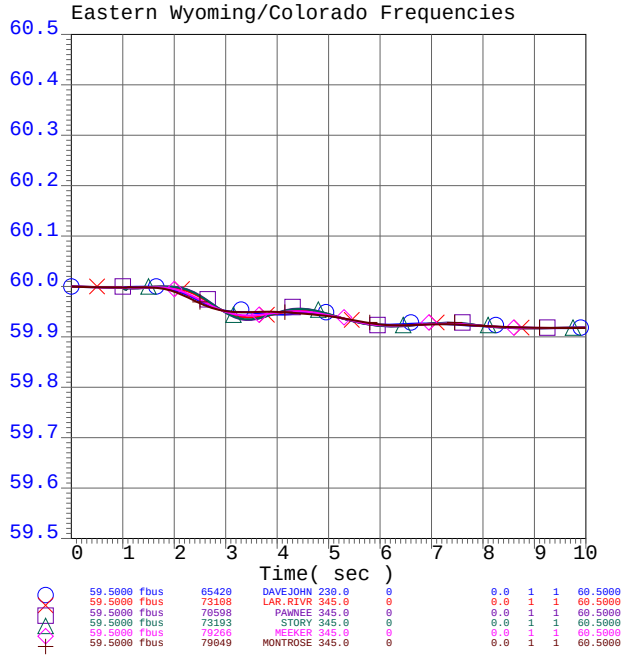
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES





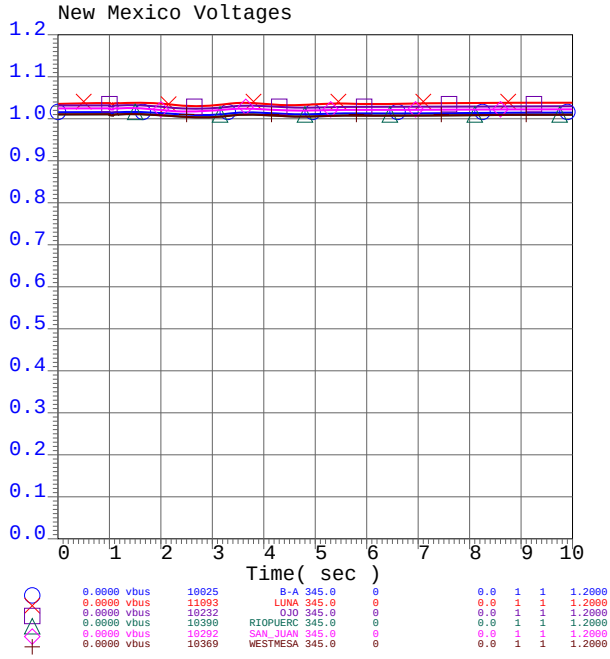




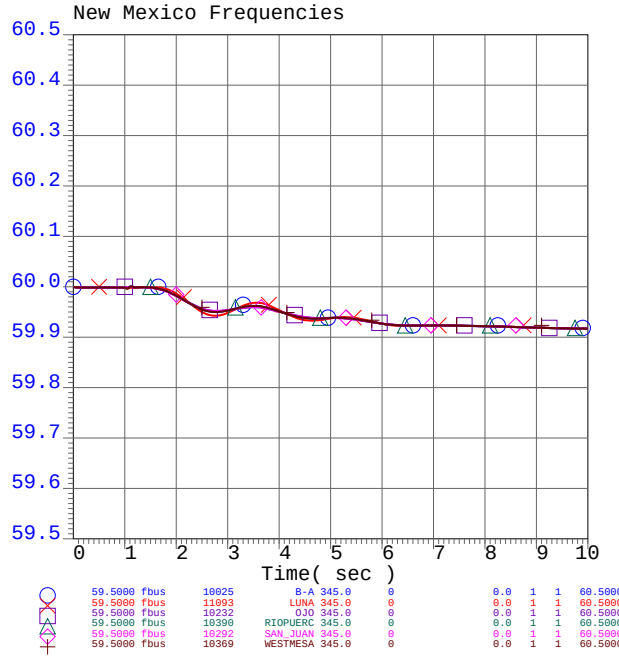
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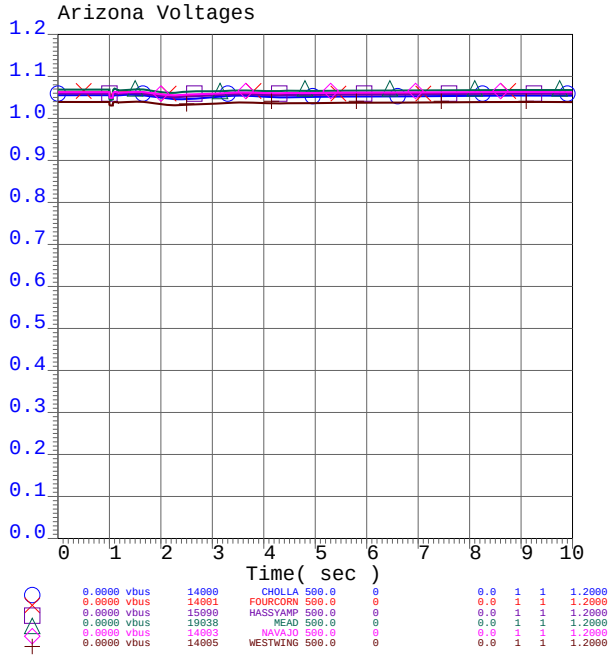
New Mexico Voltages



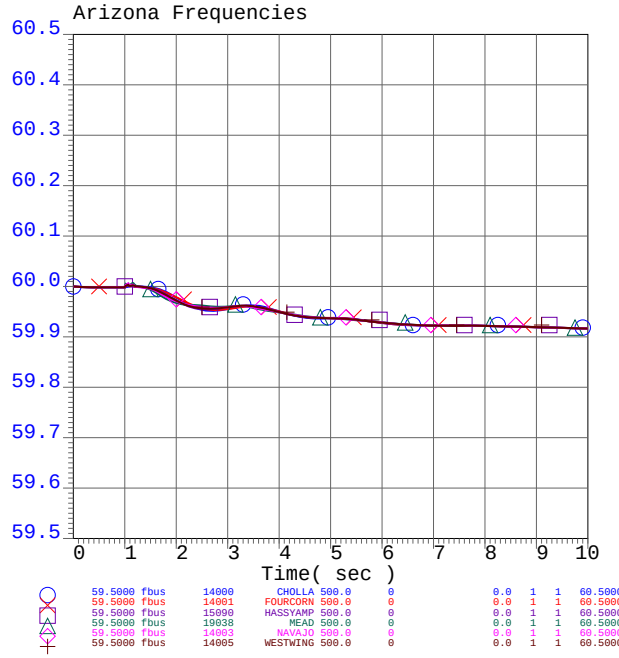
New Mexico Frequencies



Arizona Voltages

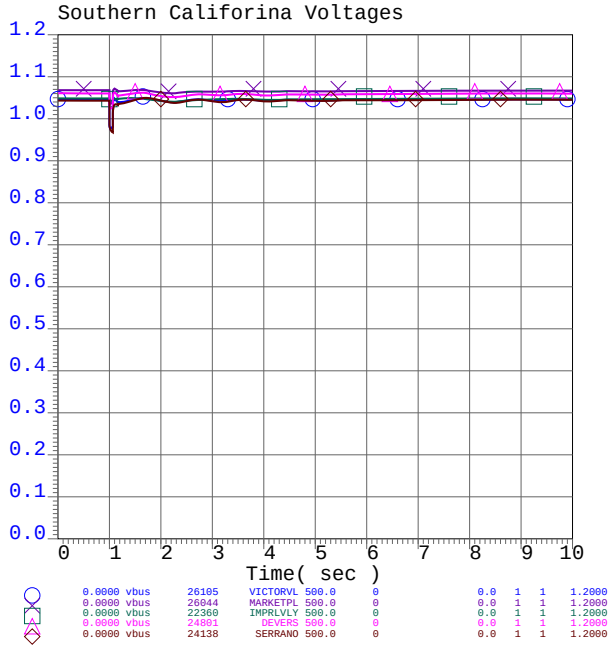


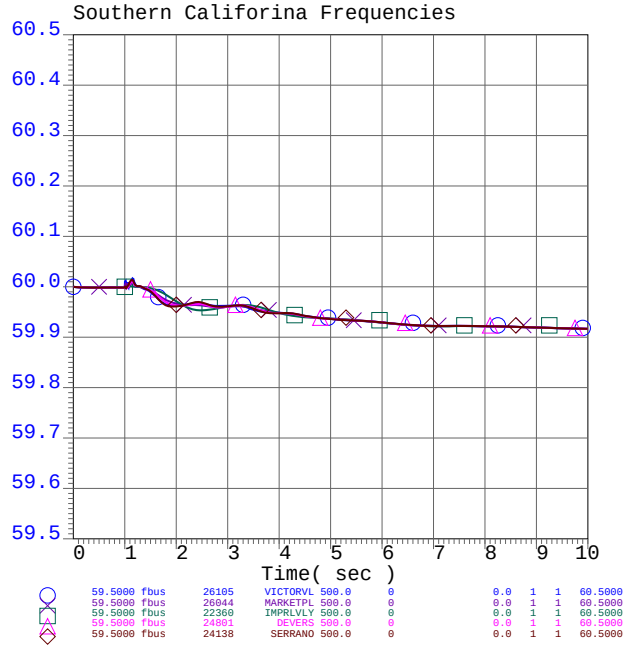
Arizona Frequencies

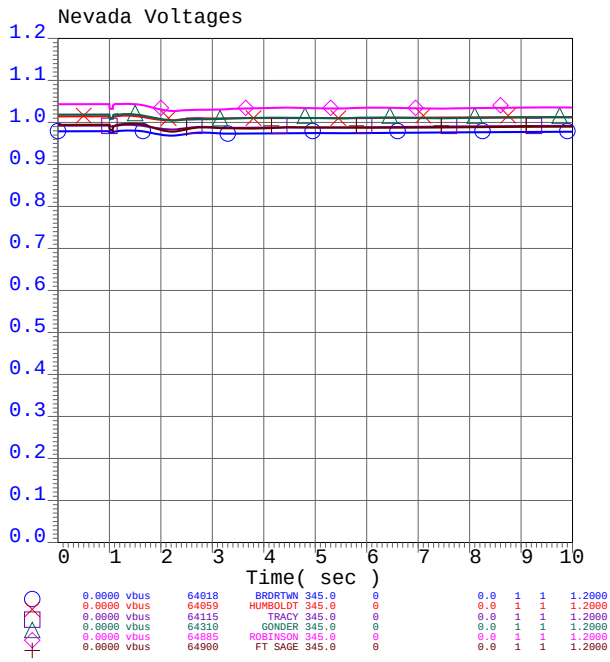


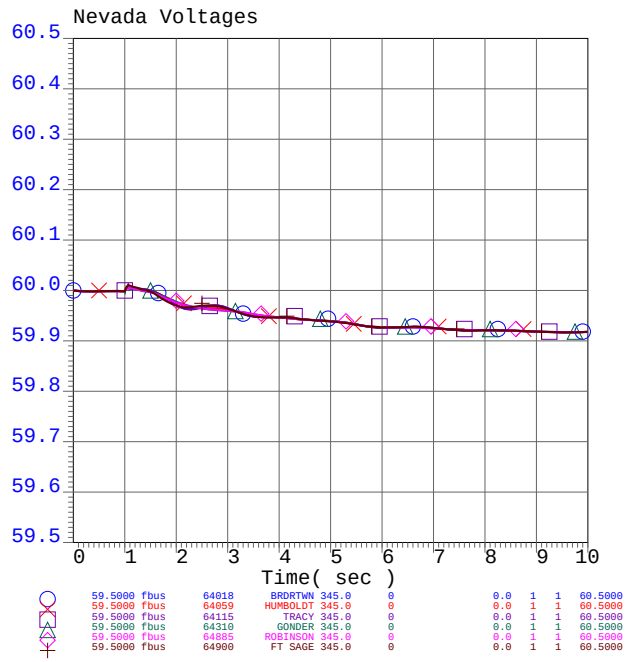
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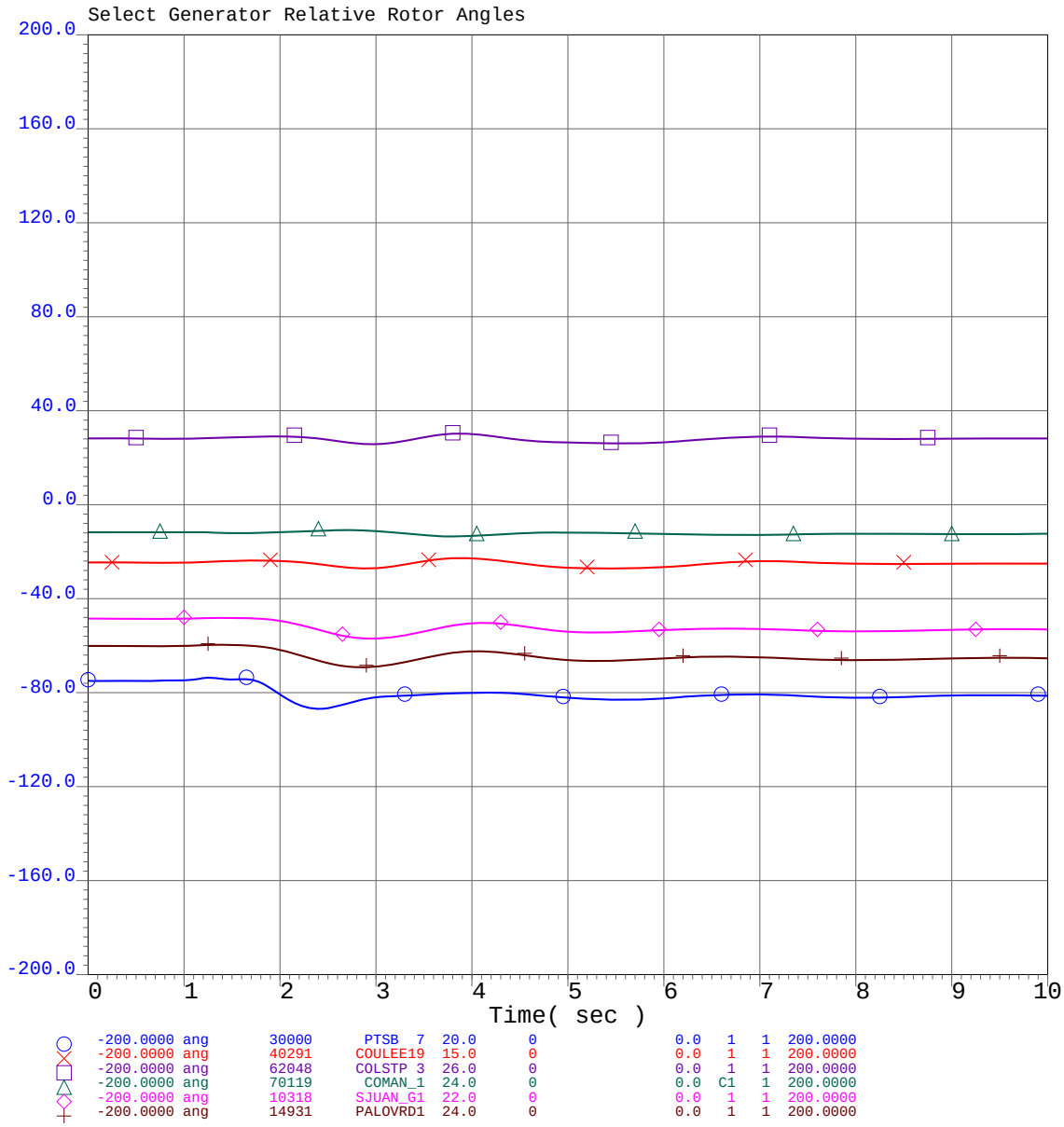






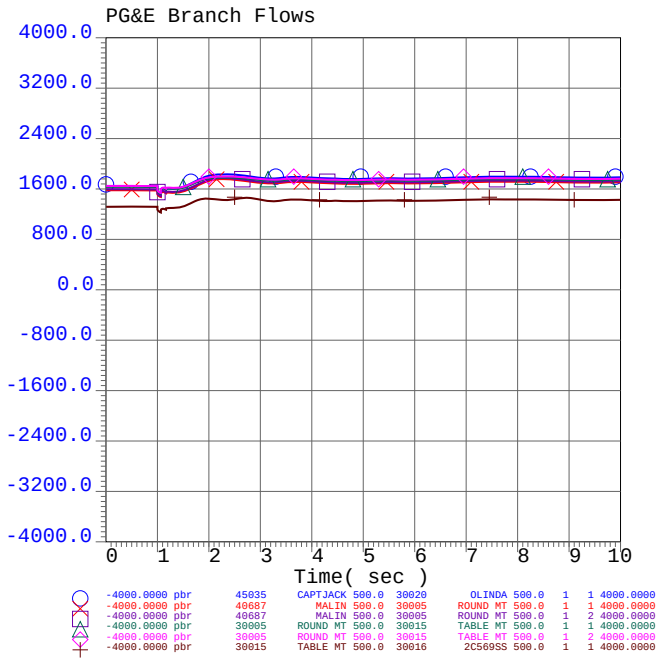
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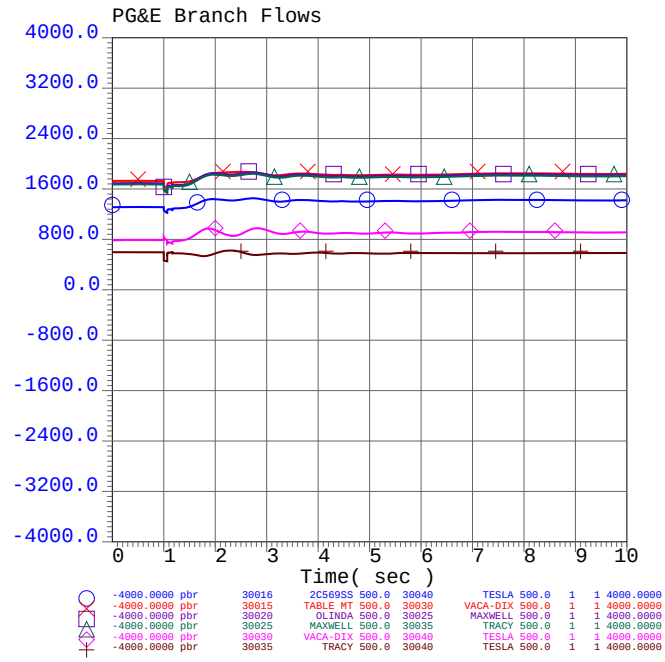
WECC RELATIVE ROTOR ANGLES

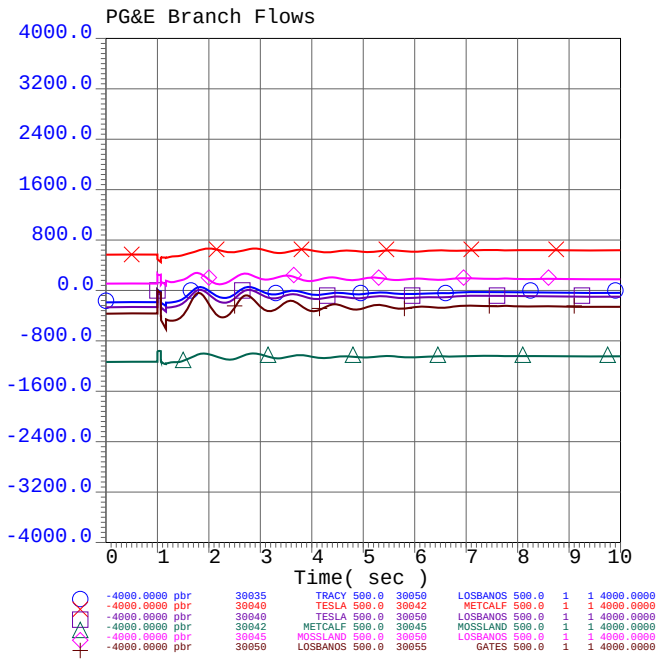


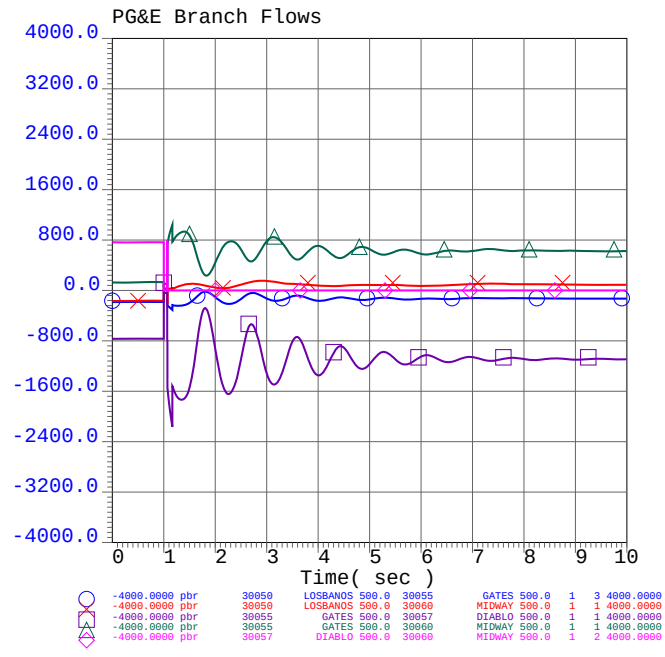
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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SELECT BRANCH FLOWS



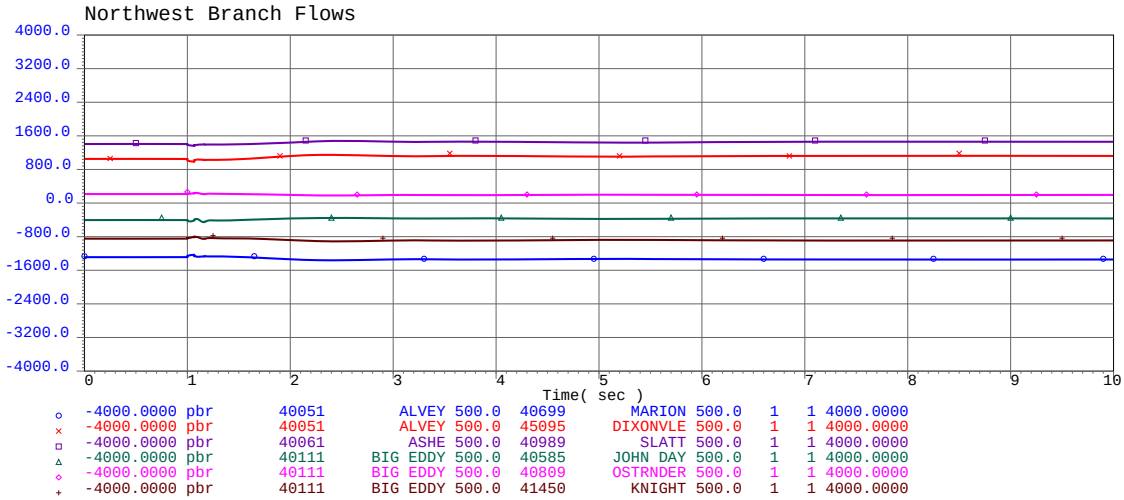




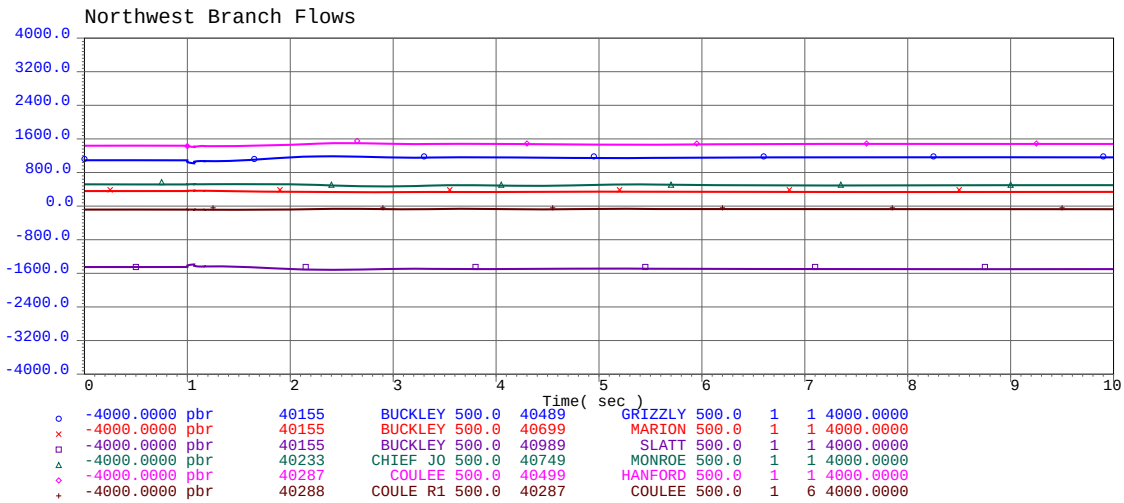


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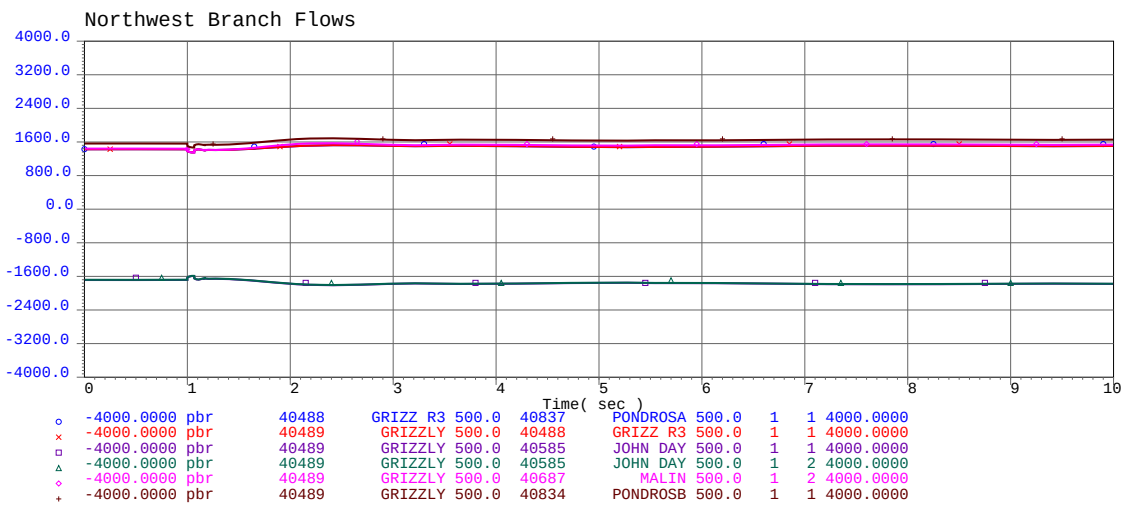
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



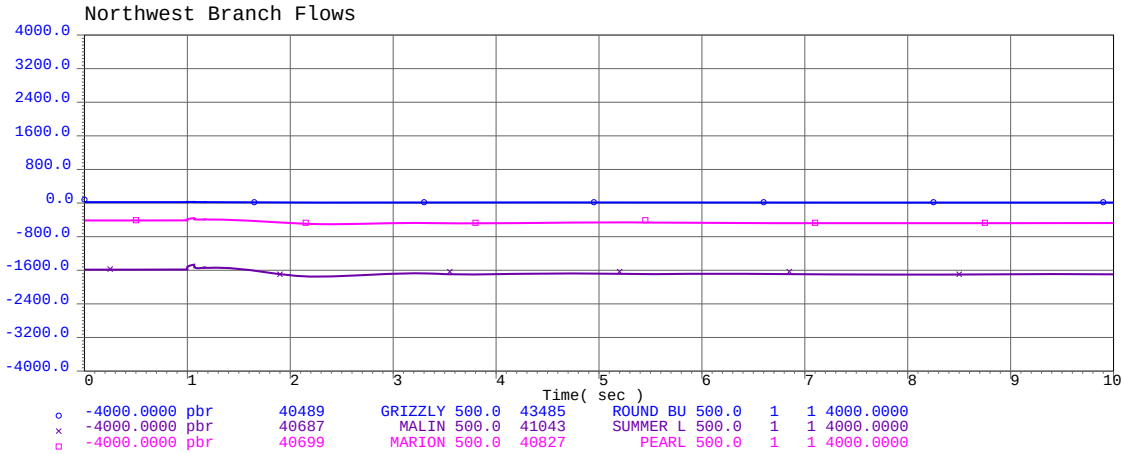
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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3-phase 4 cycle fault at Diablo 500 kV
followed by loss of Diablo-Midway #2 500 kV line

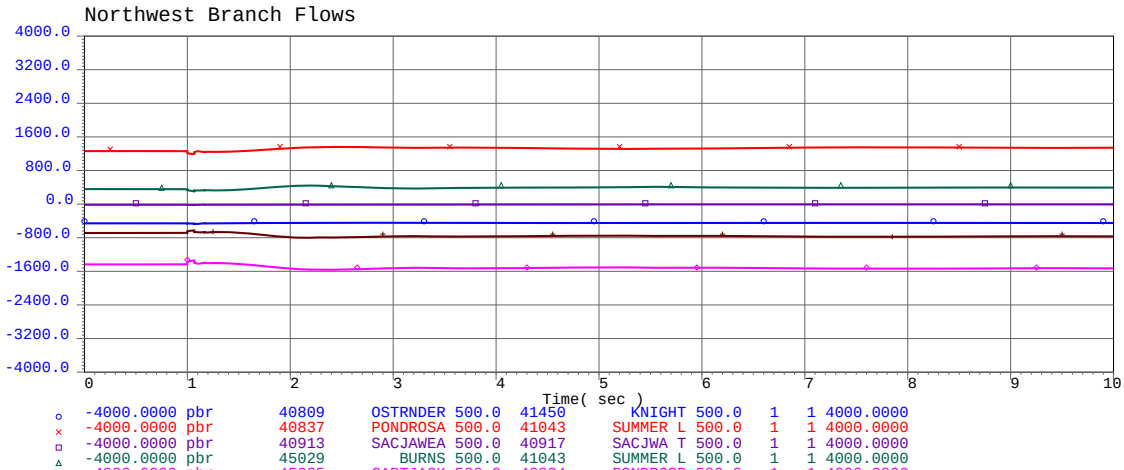
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Fri Jan 03 19:13:37 2014

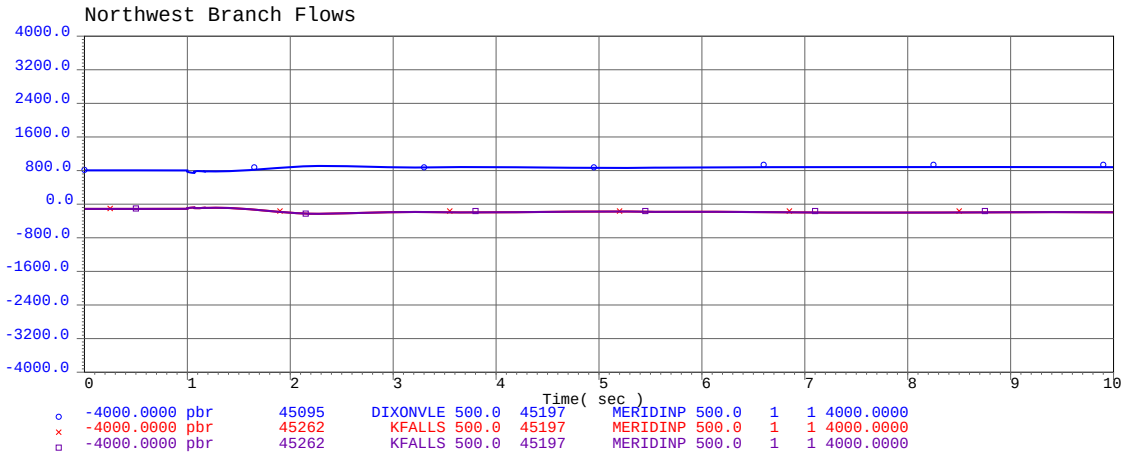
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



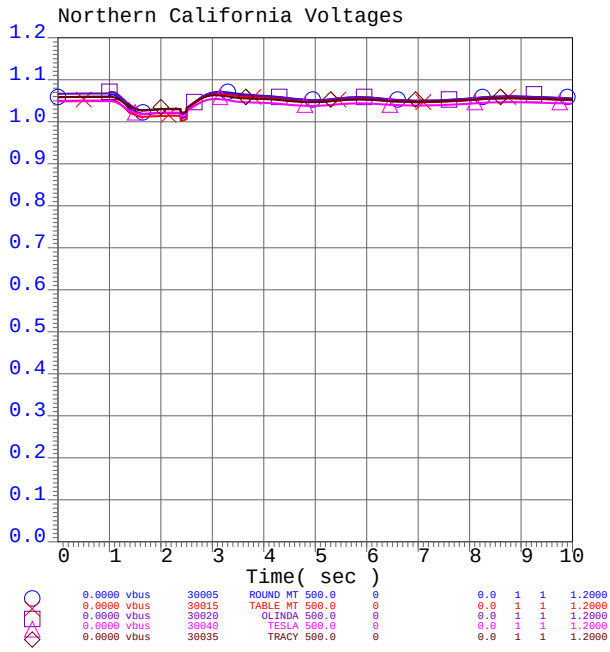
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

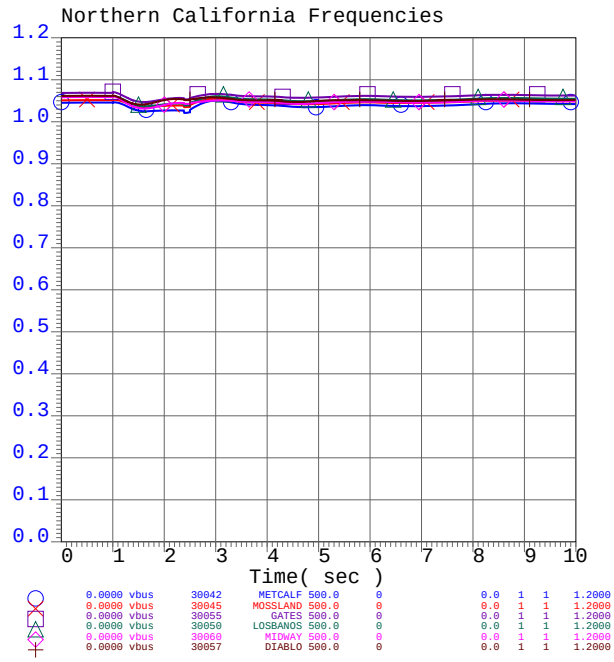


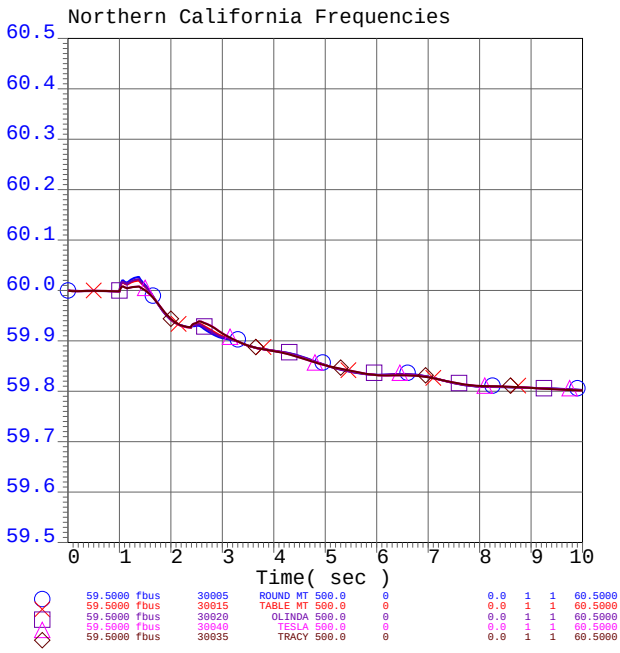
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

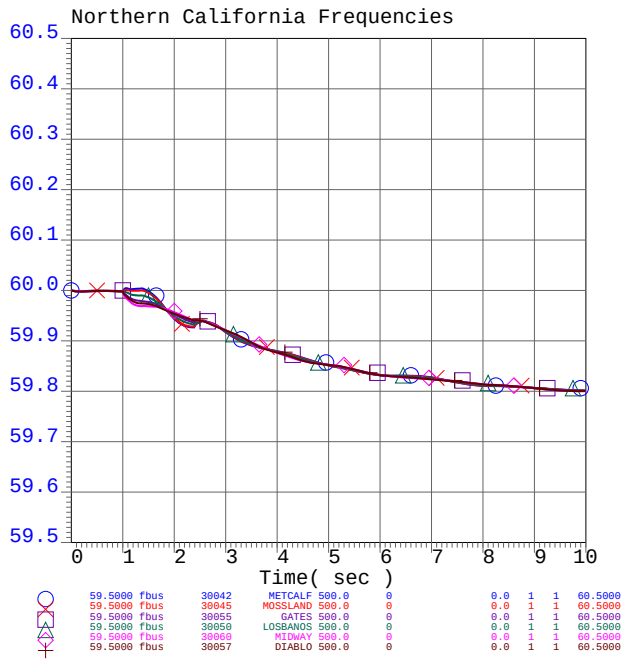
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WECC AREA VOLTAGE AND FREQUENCIES



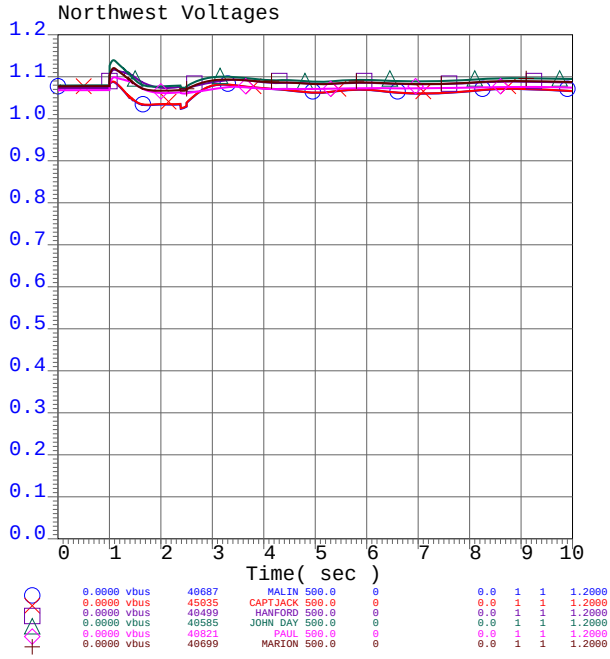


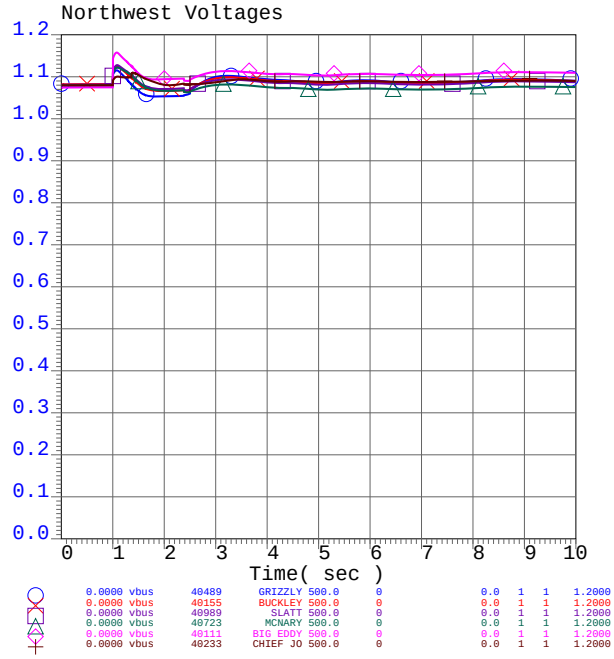


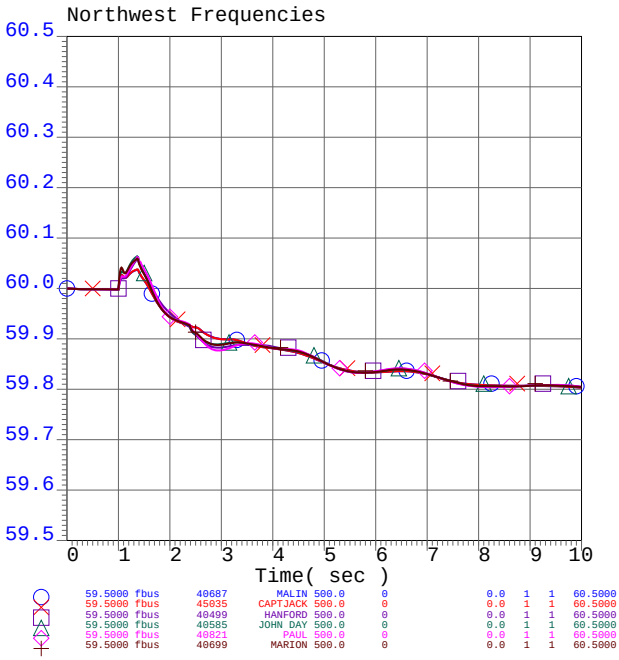


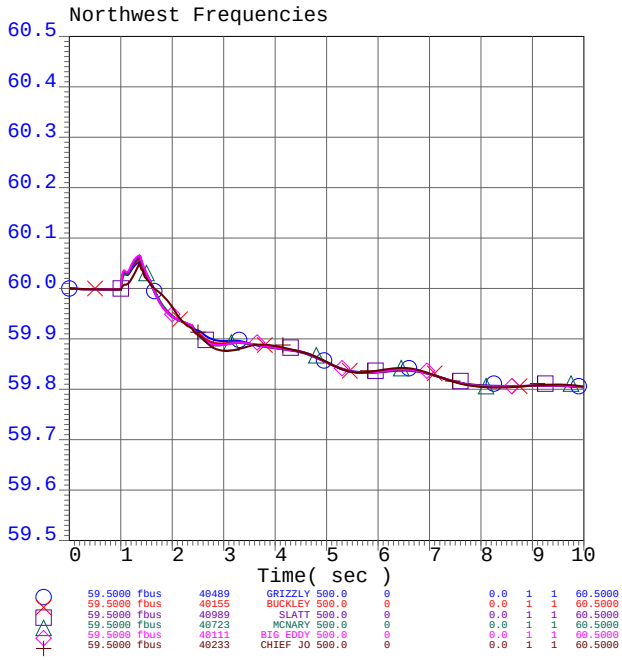
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

WECC AREA VOLTAGE AND FREQUENCIES





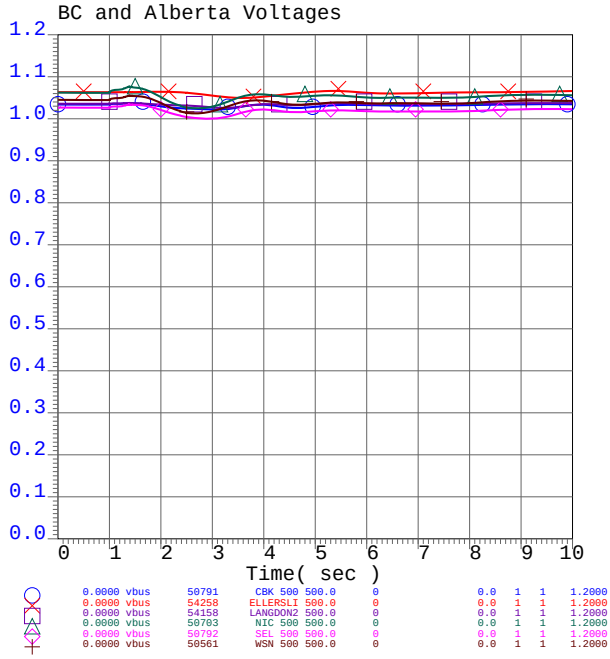




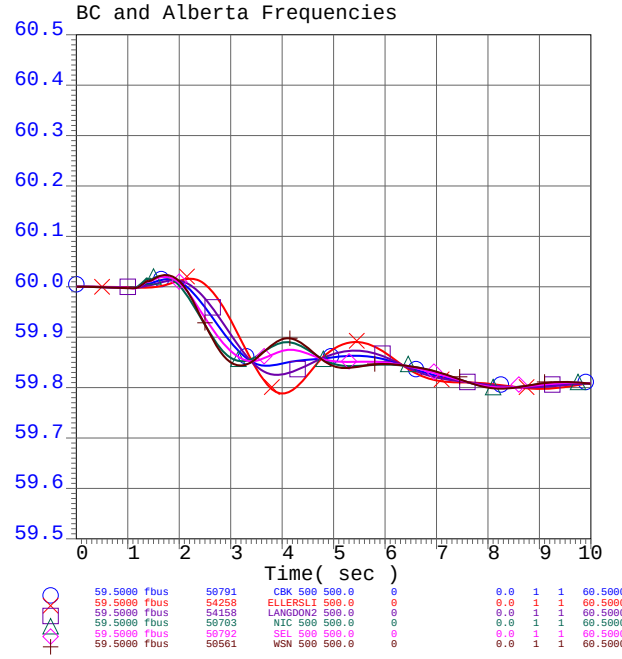
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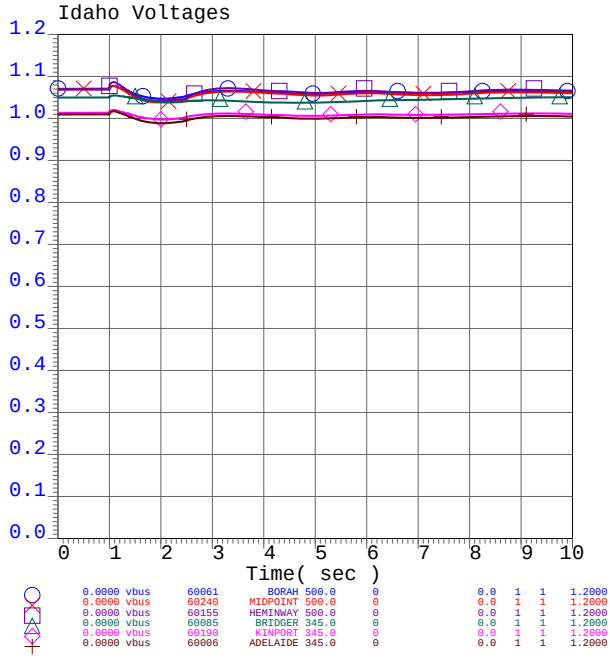
BC and Alberta Voltages



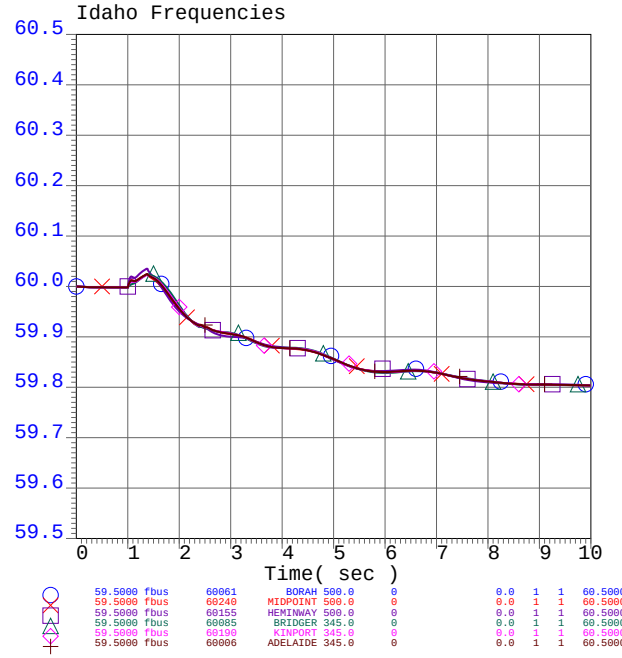
BC and Alberta Frequencies



Idaho Voltages

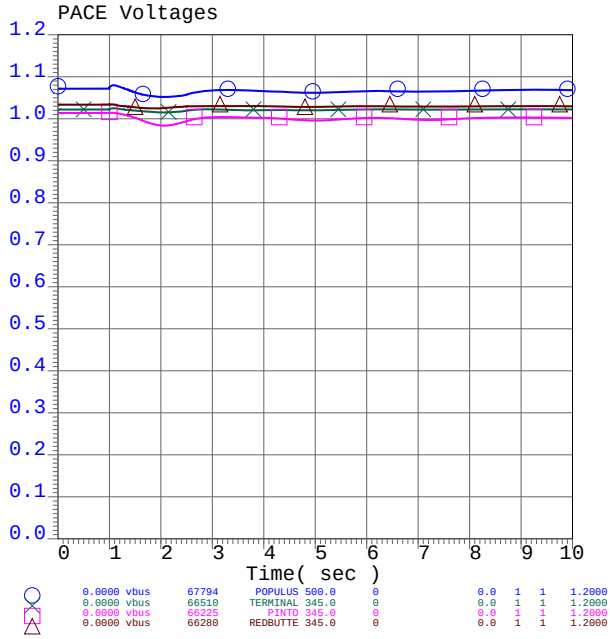


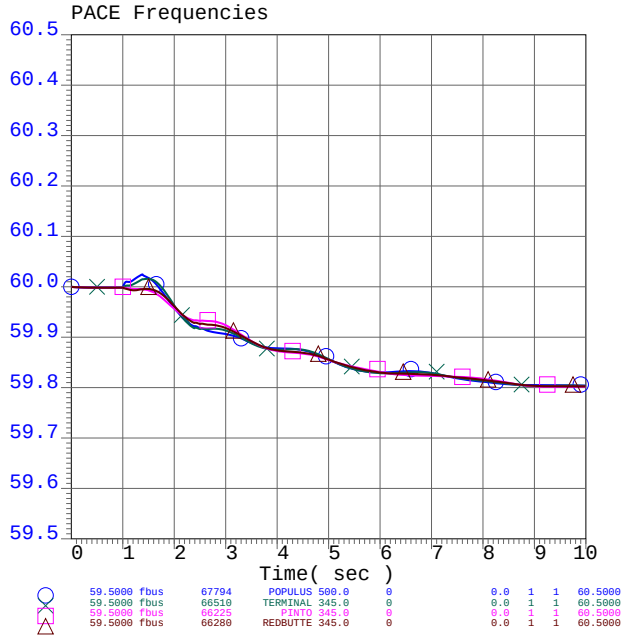
Idaho Frequencies

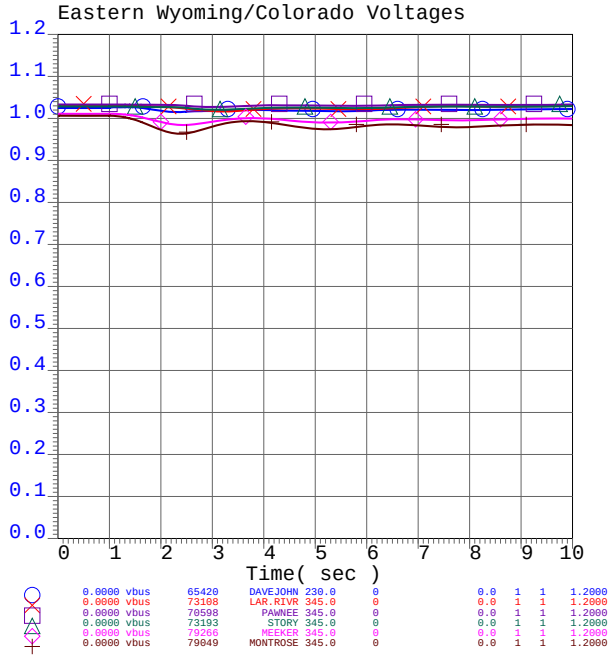


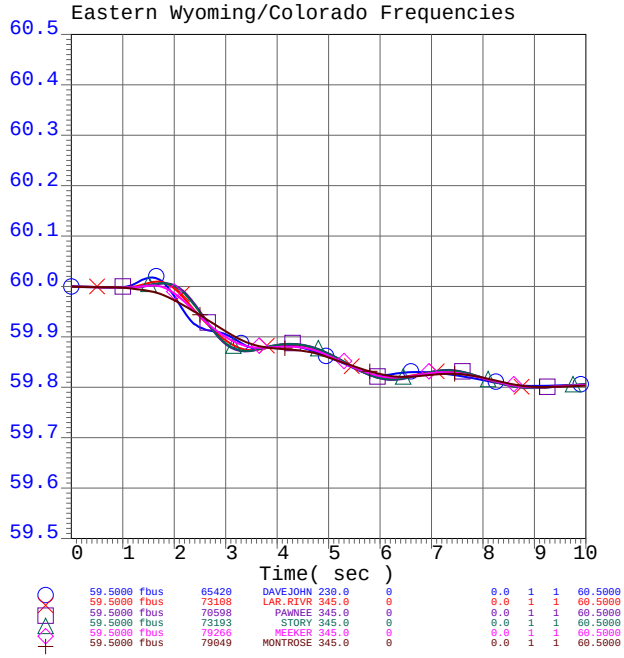
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

WECC AREA VOLTAGE AND FREQUENCIES





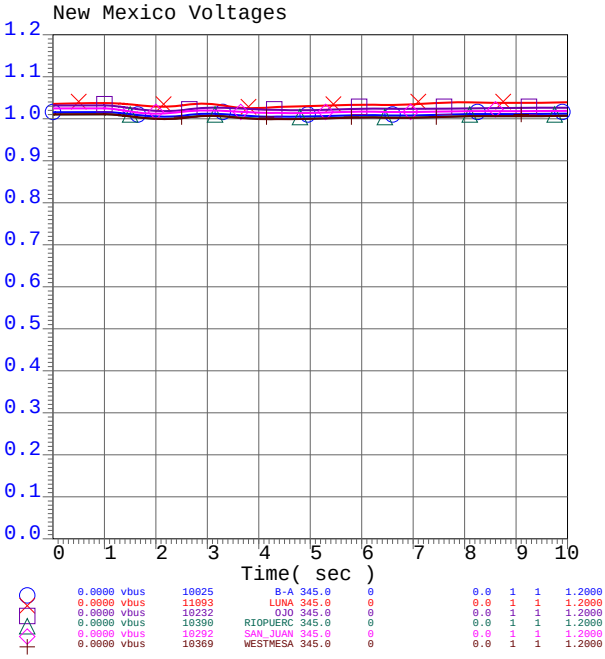




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

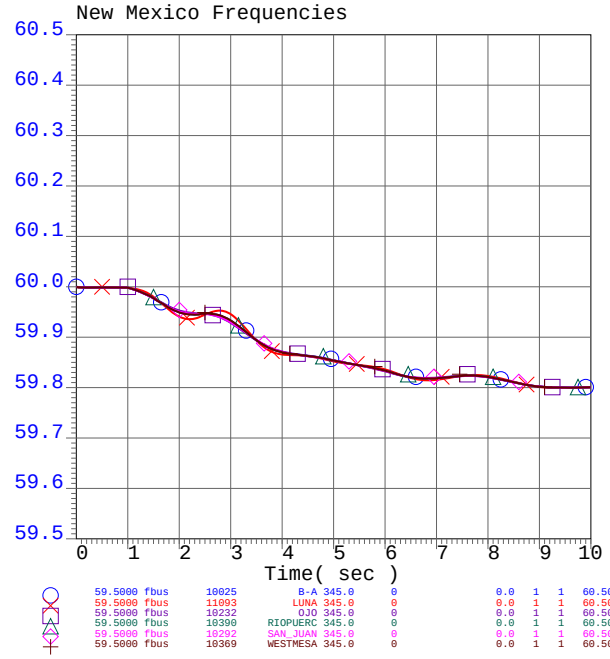
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



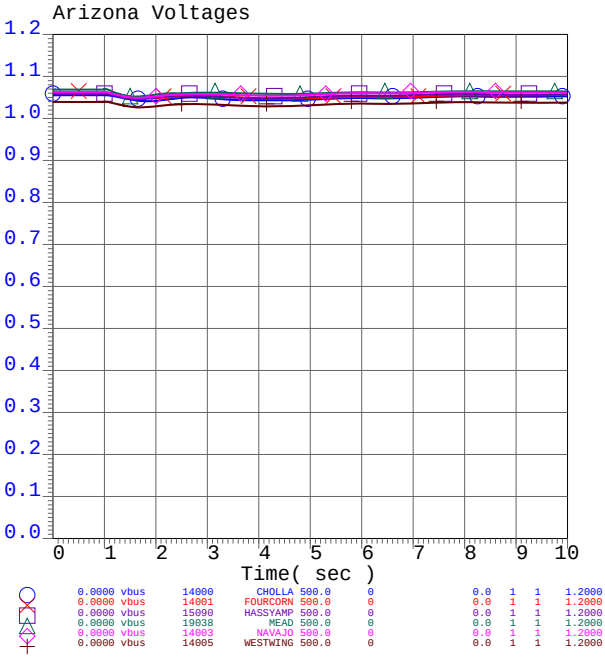
0.0000 vbus	10025	B-A 345.0	0	0.0	1	1	1.2000
0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



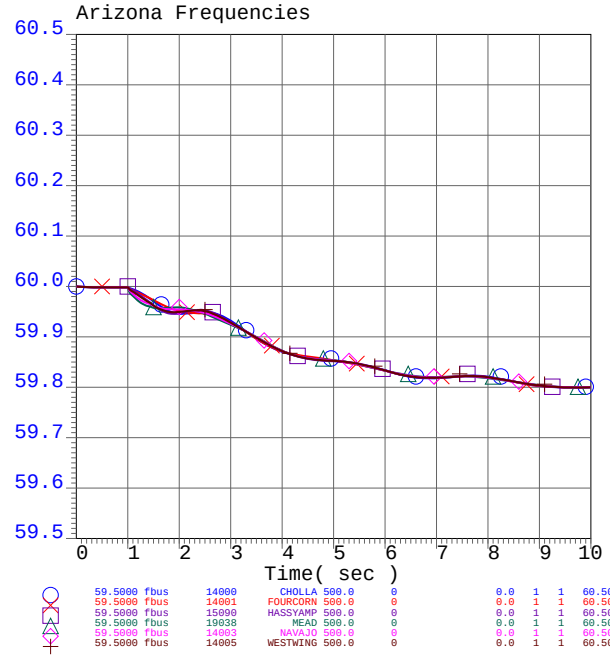
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

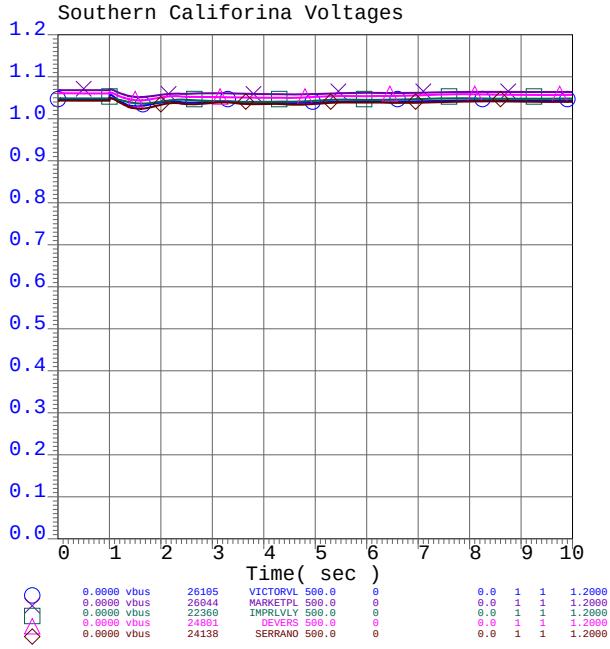
Arizona Frequencies

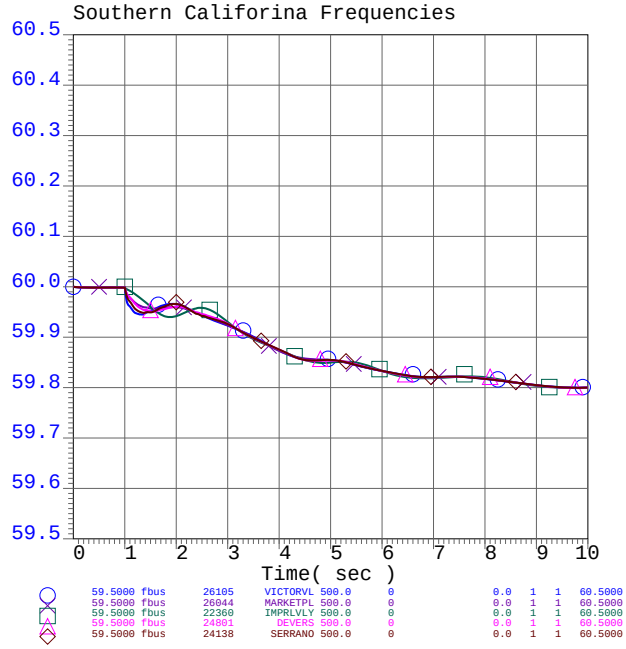


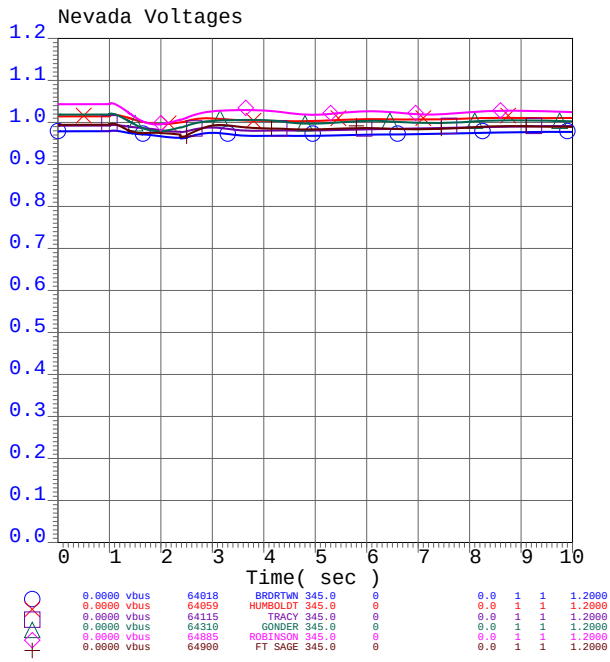
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

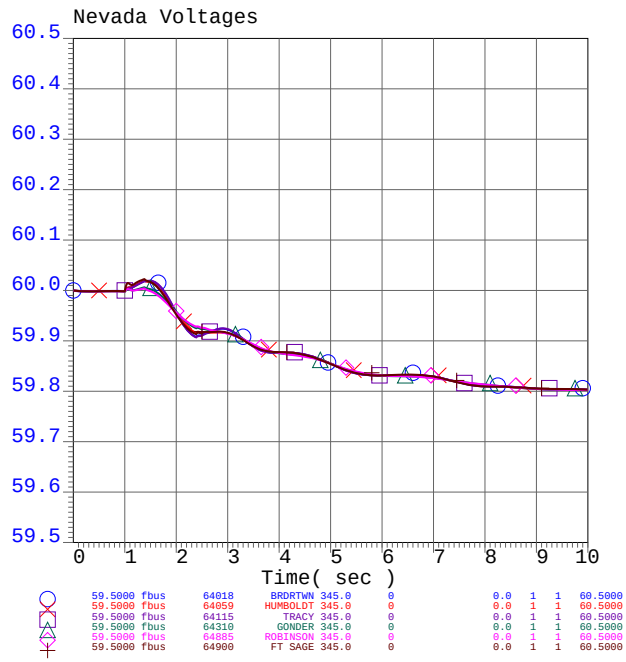
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

WECC AREA VOLTAGE AND FREQUENCIES



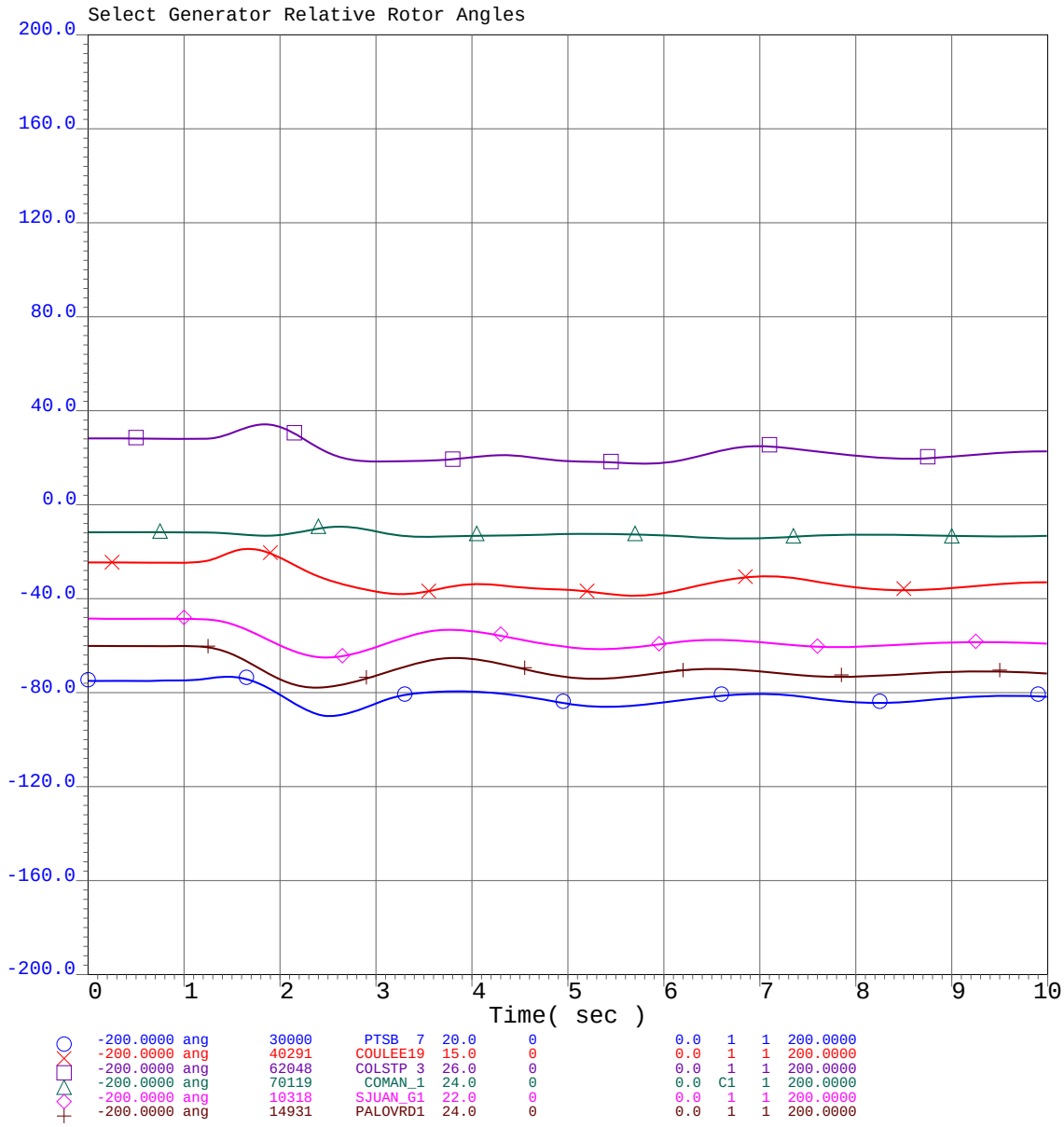






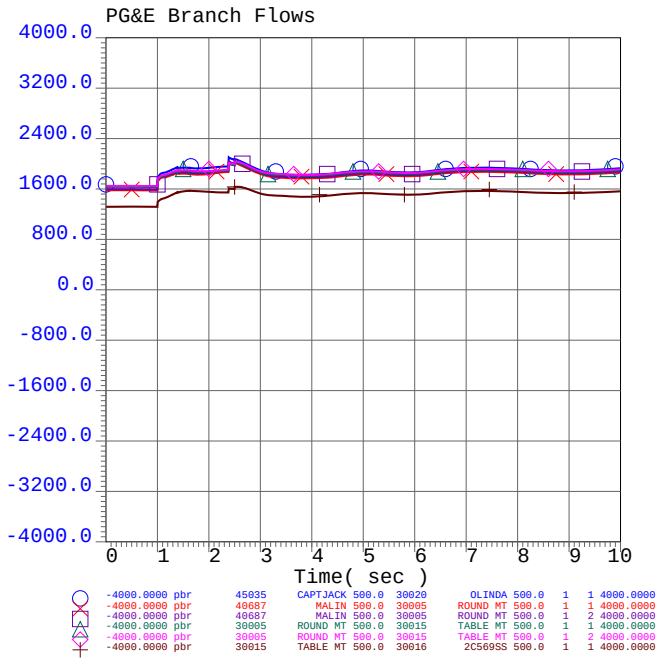
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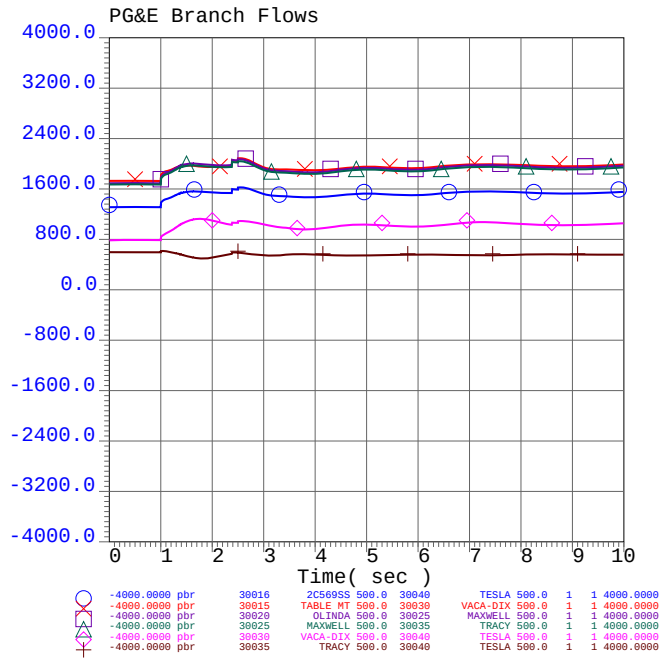
WECC RELATIVE ROTOR ANGLES

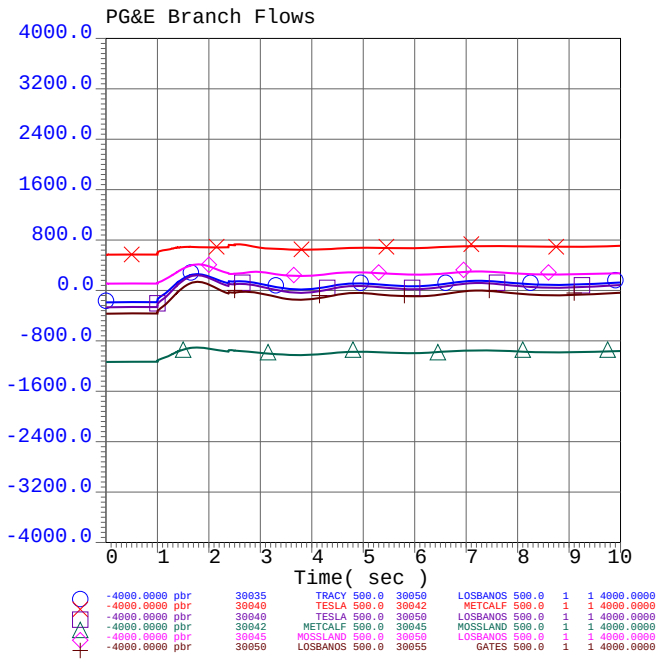


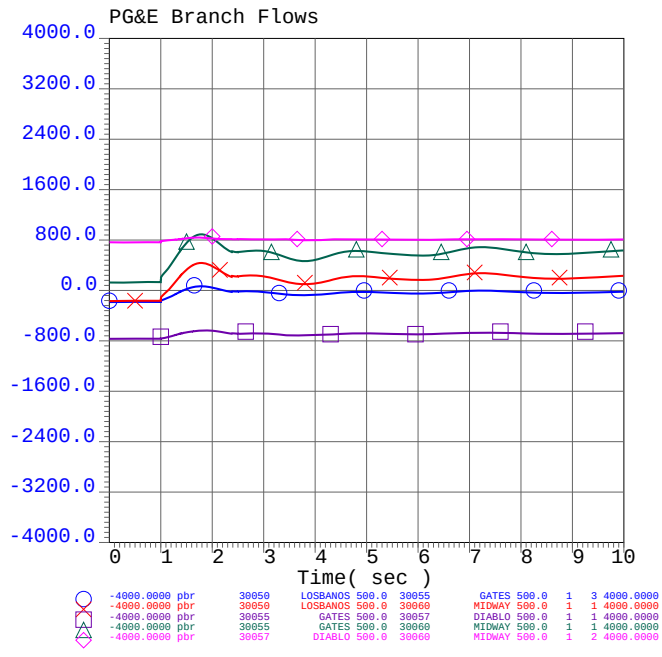
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

SELECT BRANCH FLOWS





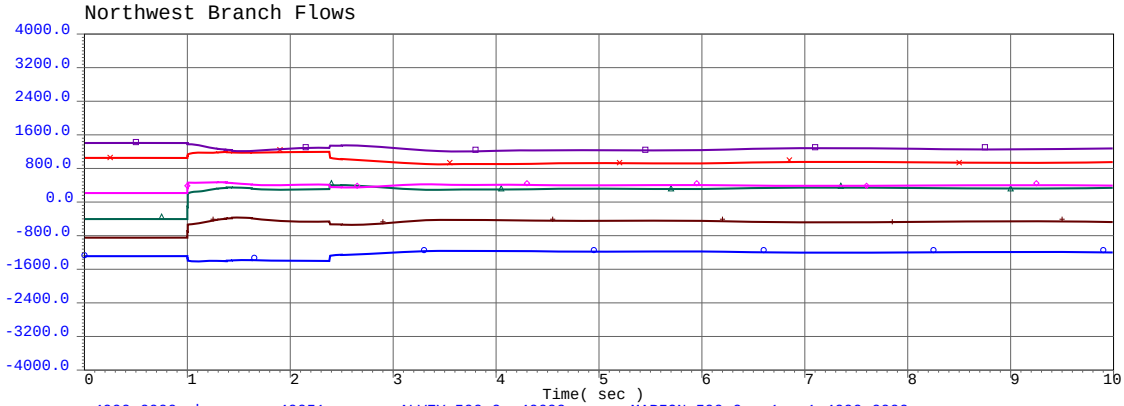




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

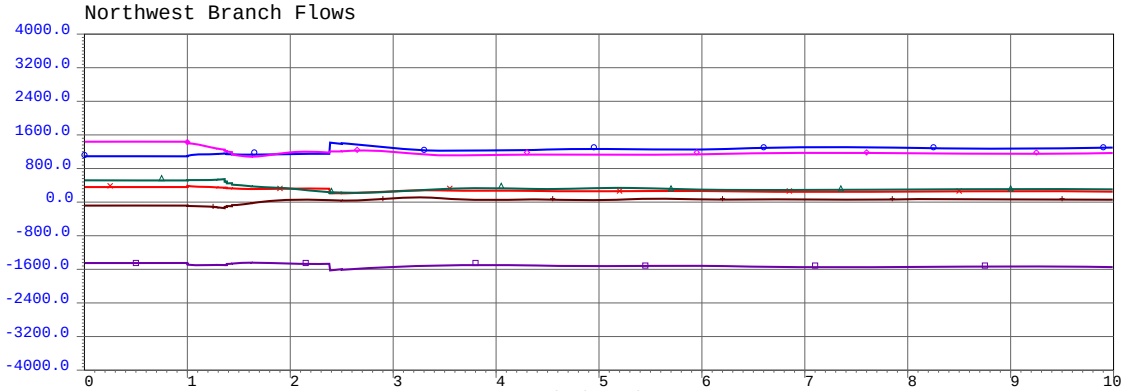
SELECT BRANCH FLOWS

Northwest Branch Flows



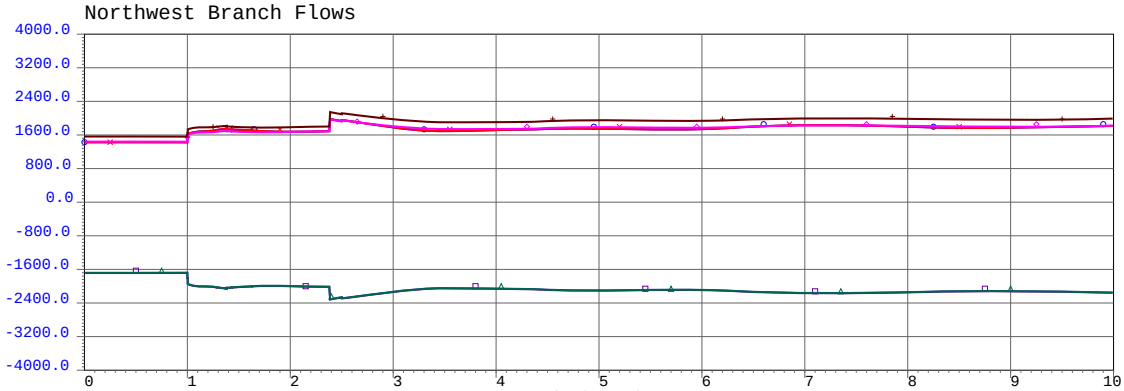
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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Northwest Branch Flows



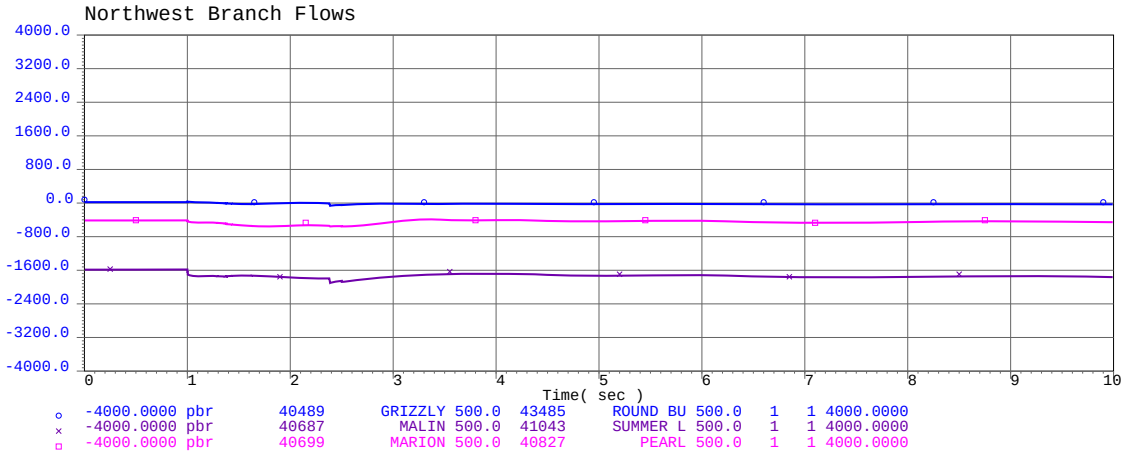
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Loss of PDCI Bipole

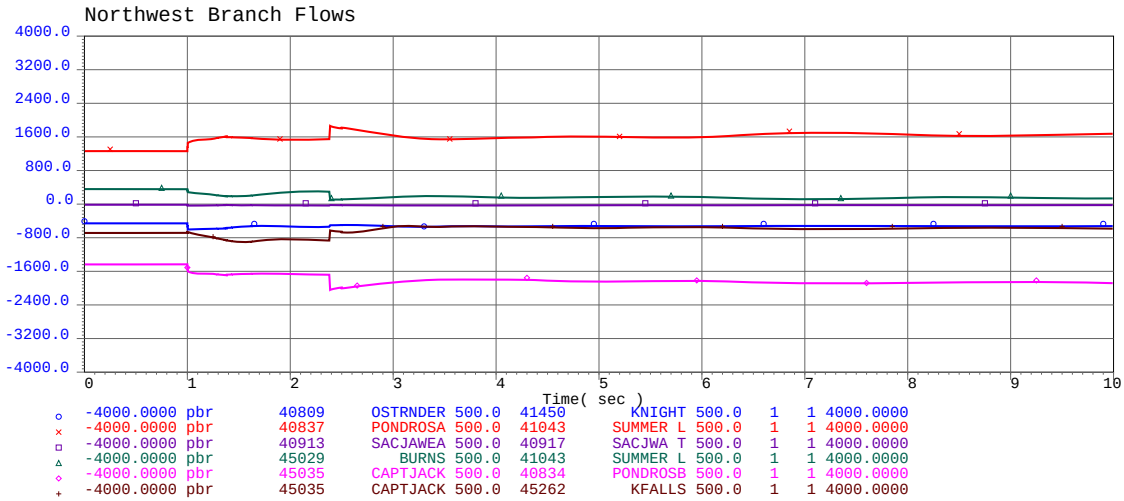
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Sat Jan 04 10:54:06 2014

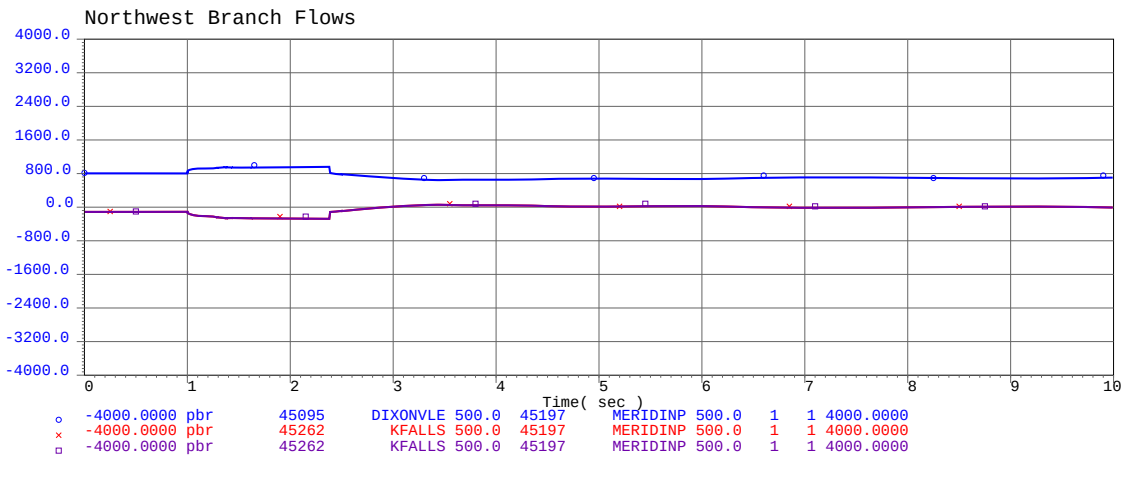
SELECT BRANCH FLOWS



-4000.0000 pbr 40489 GRIZZLY 500.0 43485 ROUND BU 500.0 1 1 4000.0000
-4000.0000 pbr 40687 MALIN 500.0 41043 SUMMER L 500.0 1 1 4000.0000
-4000.0000 pbr 40699 MARION 500.0 40827 PEARL 500.0 1 1 4000.0000



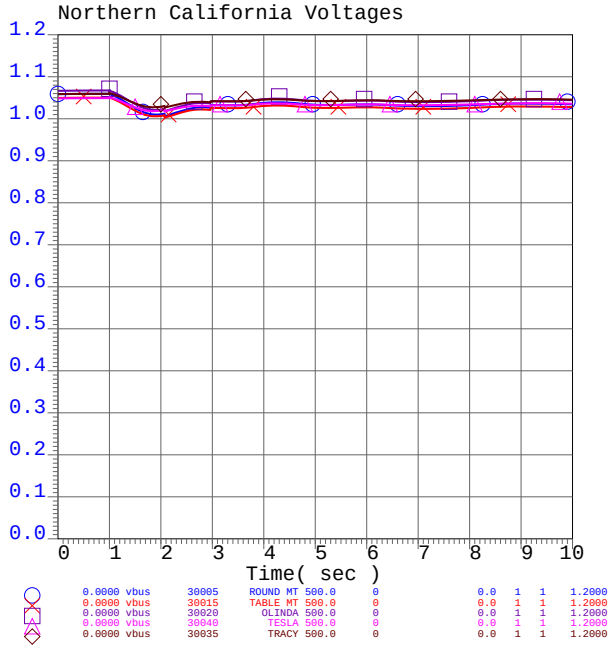
-4000.0000 pbr 40809 OSTRNDER 500.0 41450 KNIGHT 500.0 1 1 4000.0000
-4000.0000 pbr 40837 PONDROSA 500.0 41043 SUMMER L 500.0 1 1 4000.0000
-4000.0000 pbr 40913 SACJAWEA 500.0 40917 SACJWA T 500.0 1 1 4000.0000
-4000.0000 pbr 45029 BURNS 500.0 41043 SUMMER L 500.0 1 1 4000.0000
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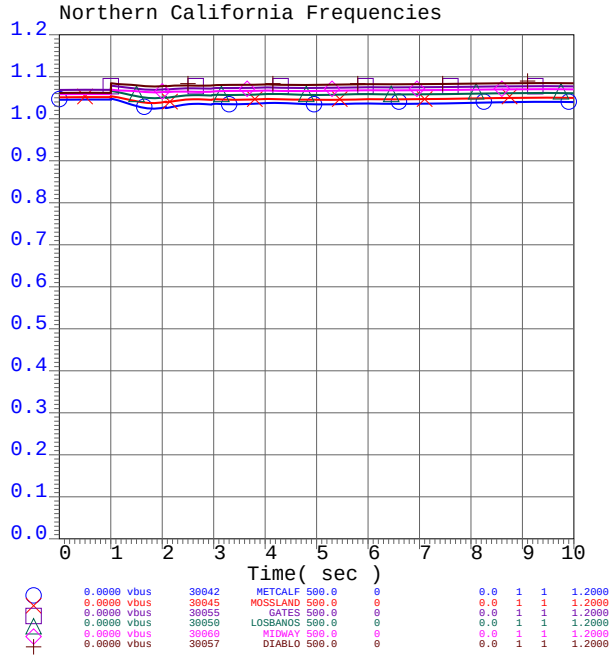


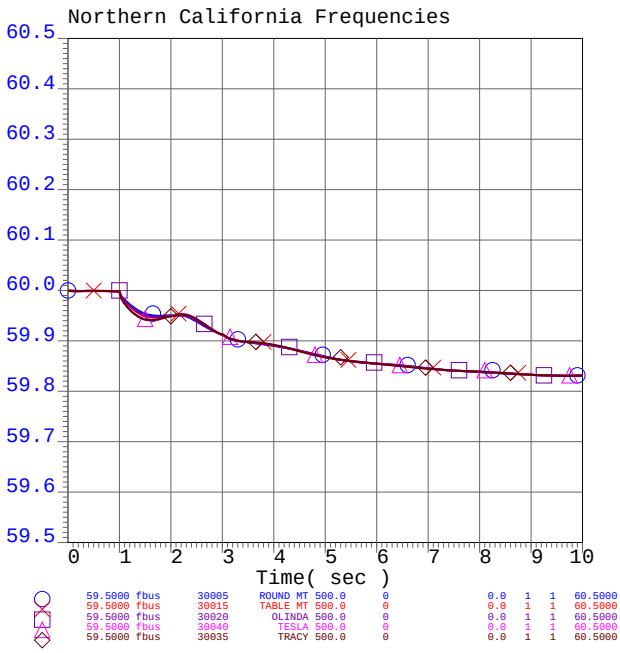
-4000.0000 pbr 45095 DIXONVLE 500.0 45197 MERIDINP 500.0 1 1 4000.0000
-4000.0000 pbr 45262 KFALLS 500.0 45197 MERIDINP 500.0 1 1 4000.0000
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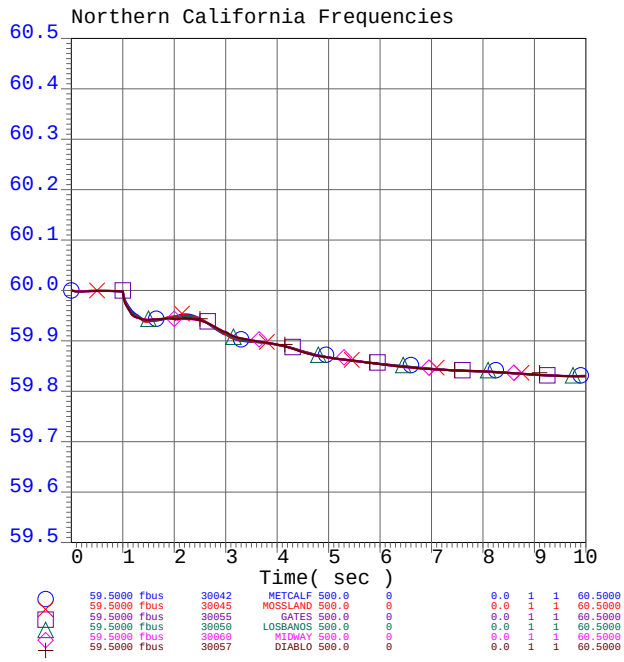
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Loss of PDCI Bipole

WECC AREA VOLTAGE AND FREQUENCIES



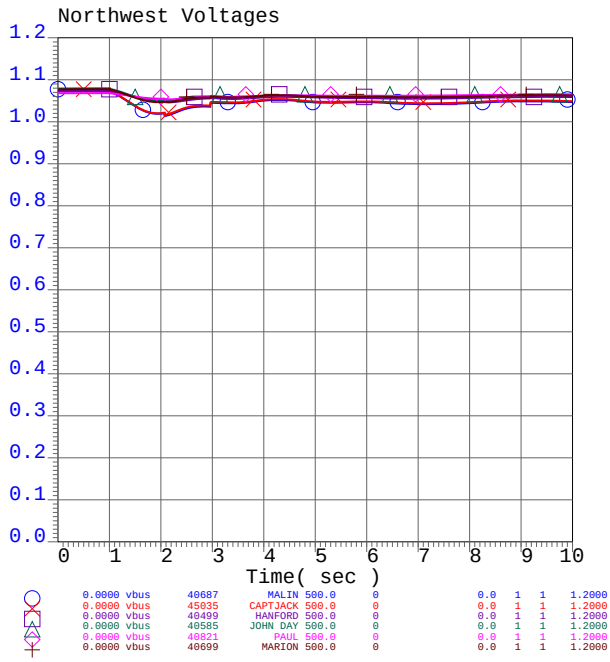


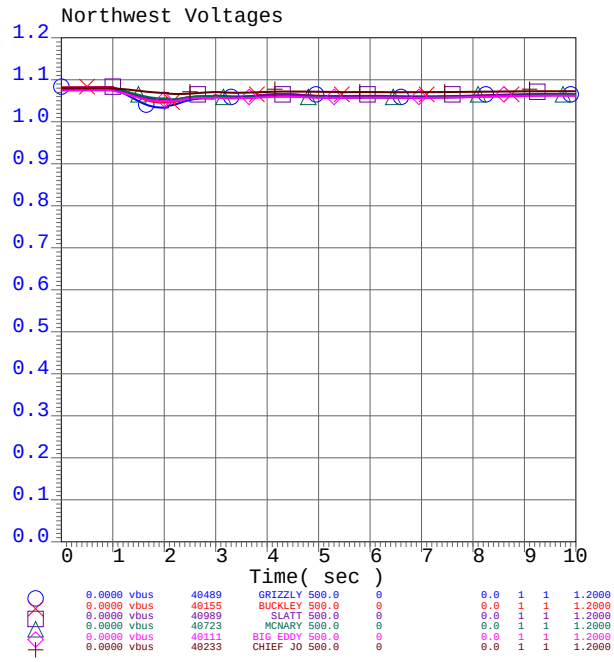


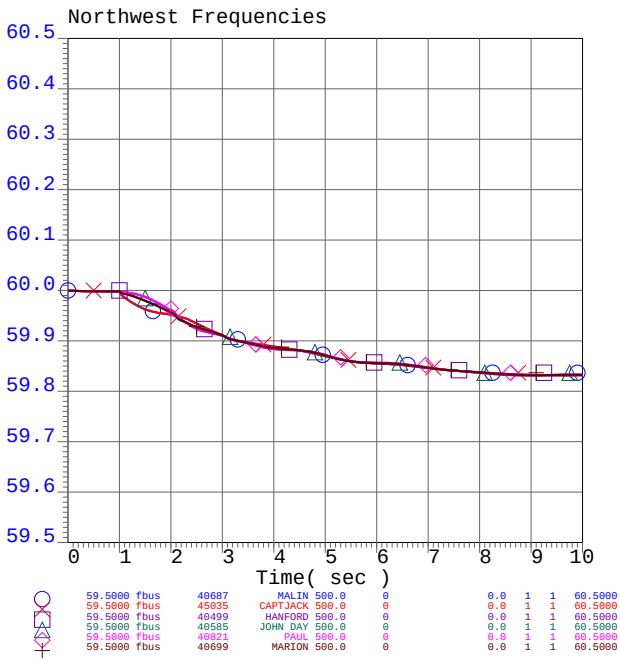


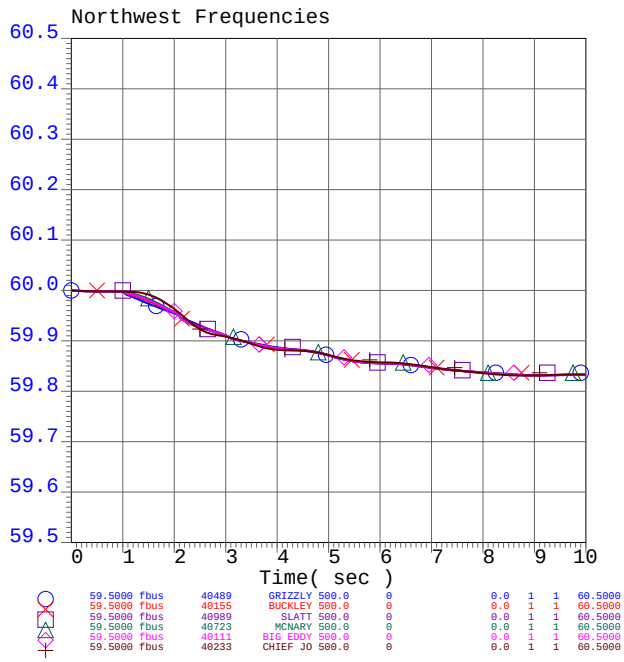
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

WECC AREA VOLTAGE AND FREQUENCIES



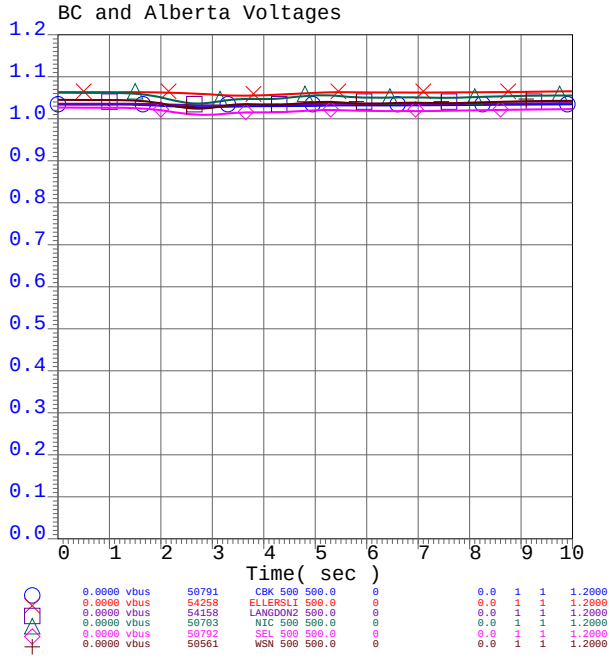


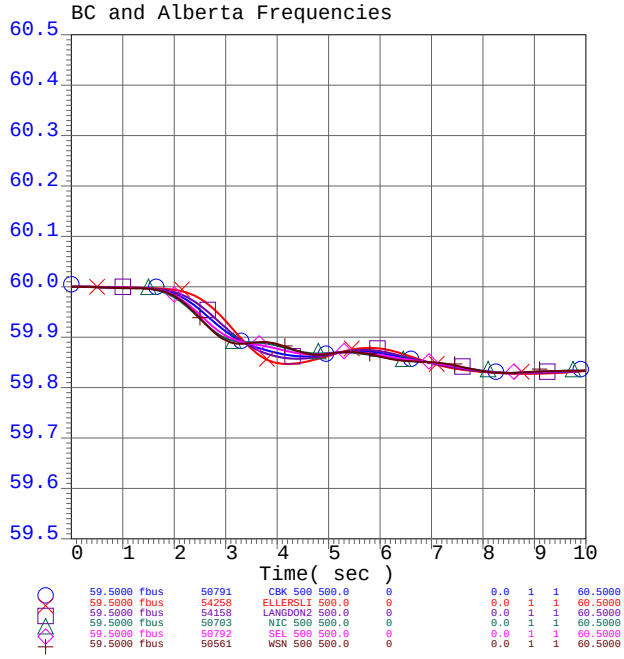


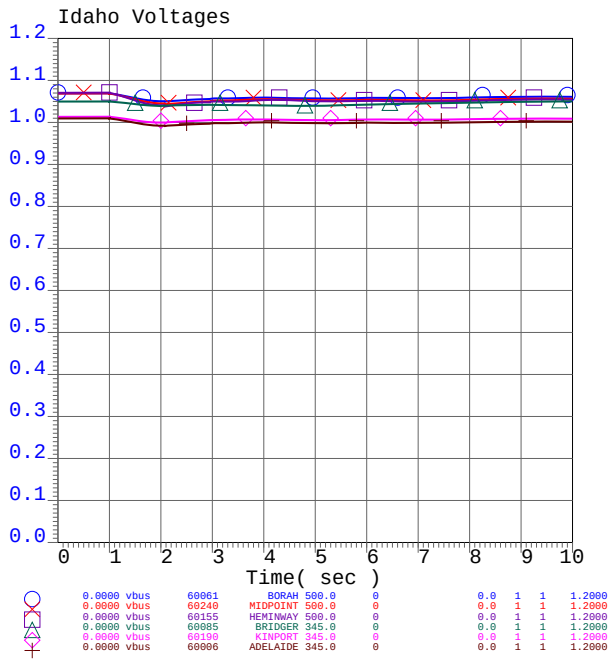


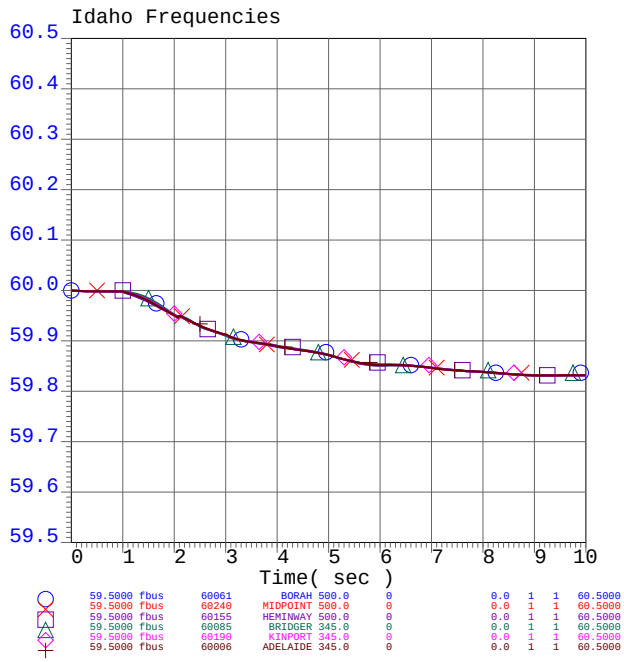
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

WECC AREA VOLTAGE AND FREQUENCIES





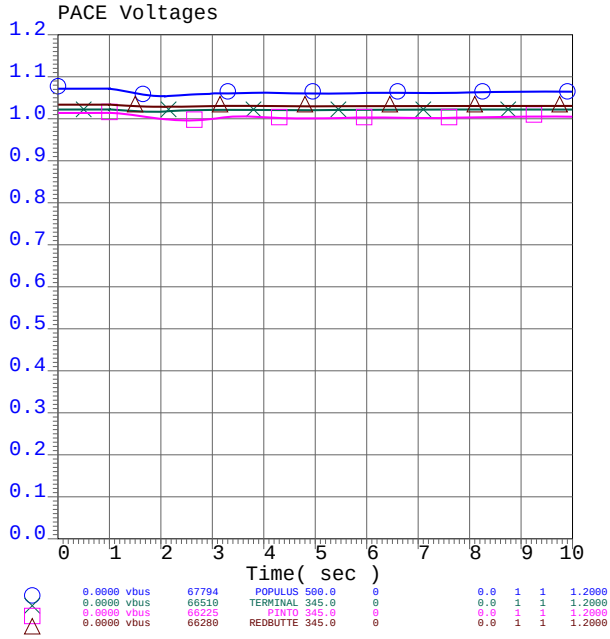




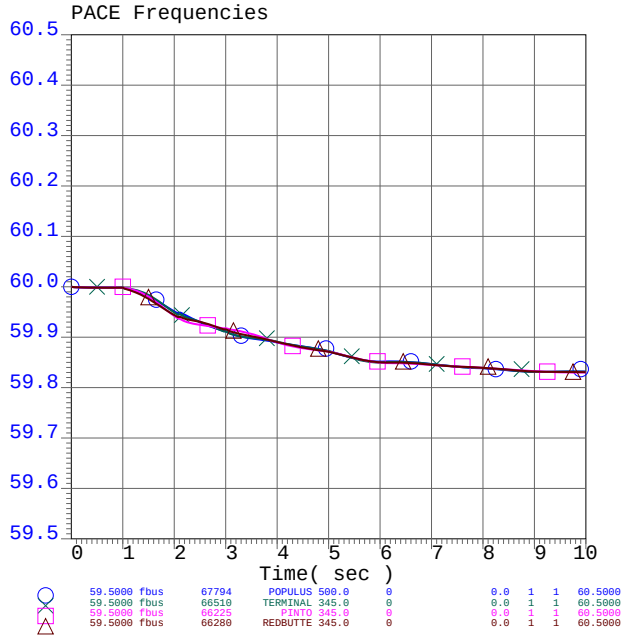
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

WECC AREA VOLTAGE AND FREQUENCIES

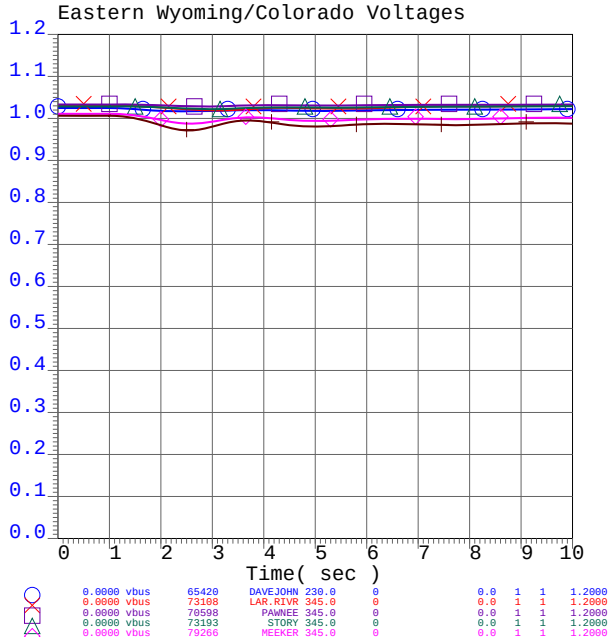
PACE Voltages



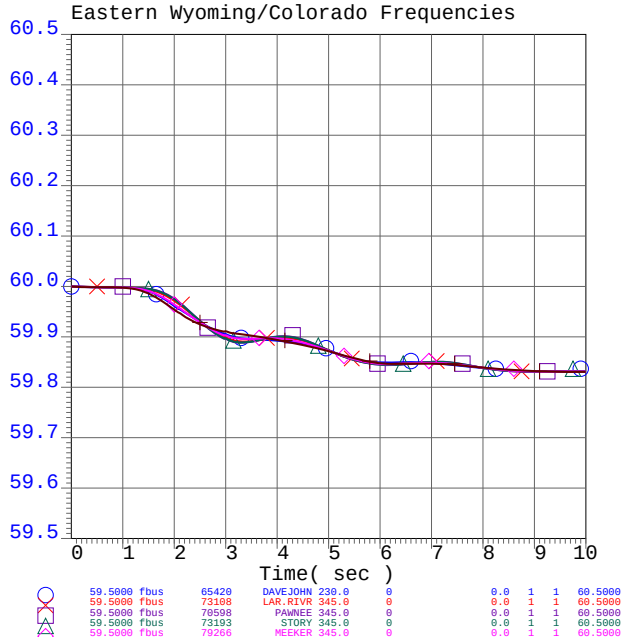
PACE Frequencies



Eastern Wyoming/Colorado Voltages



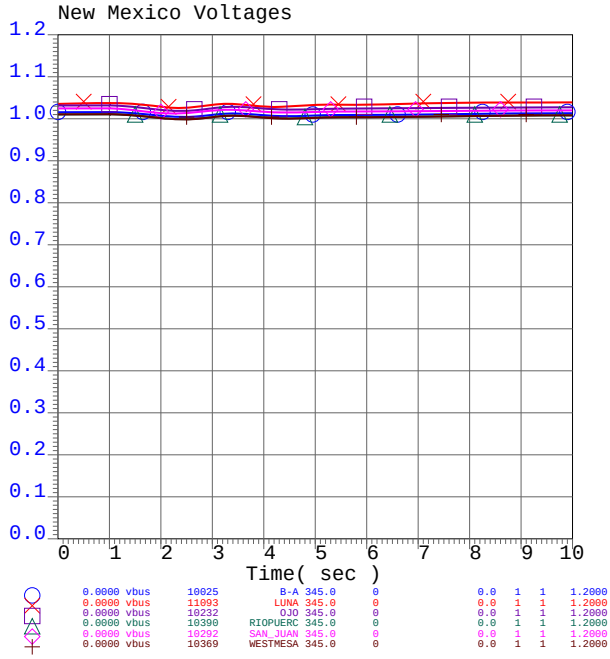
Eastern Wyoming/Colorado Frequencies



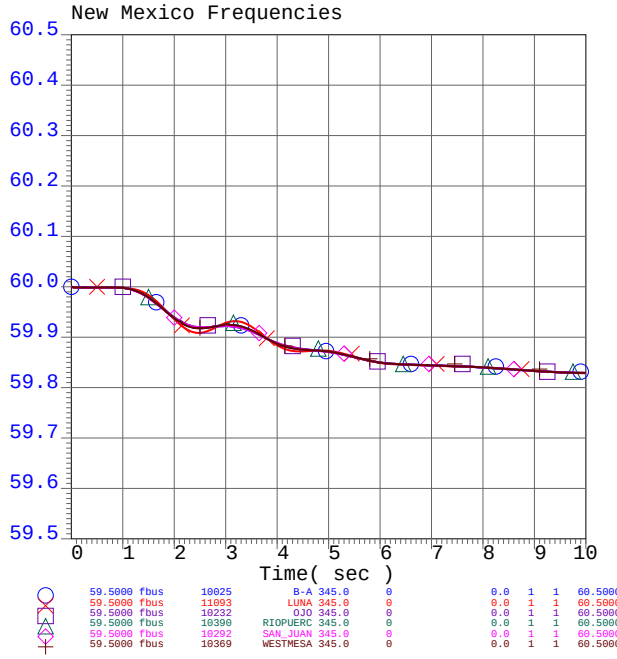
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

WECC AREA VOLTAGE AND FREQUENCIES

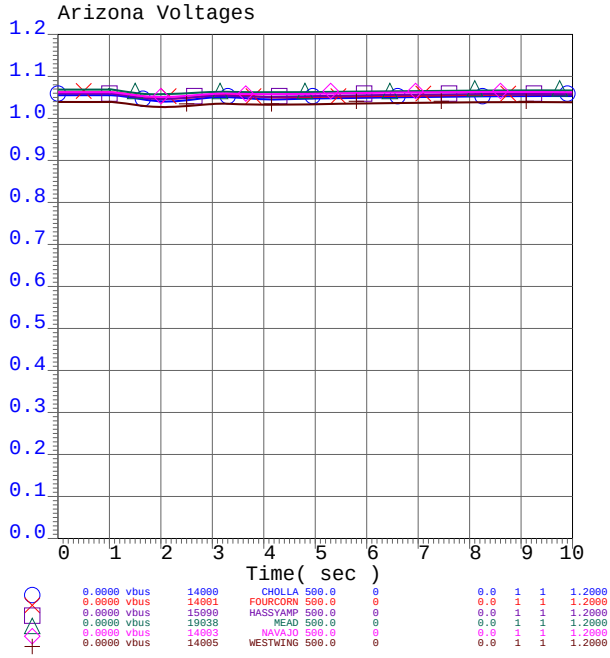
New Mexico Voltages



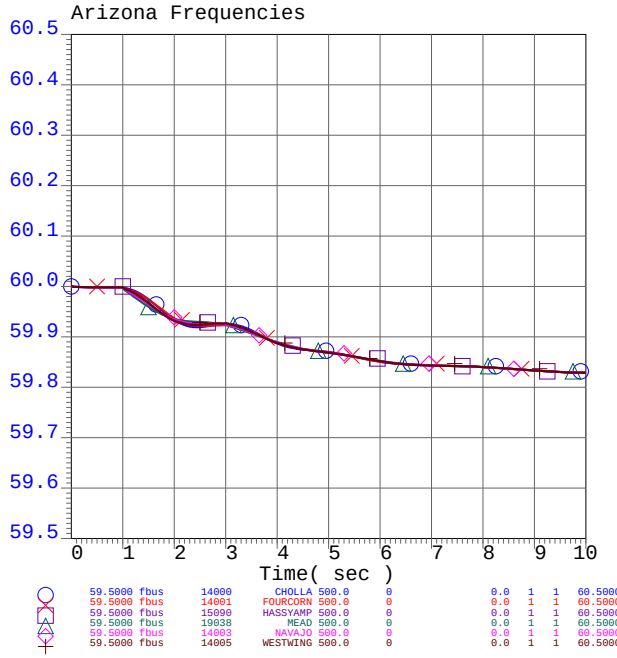
New Mexico Frequencies



Arizona Voltages

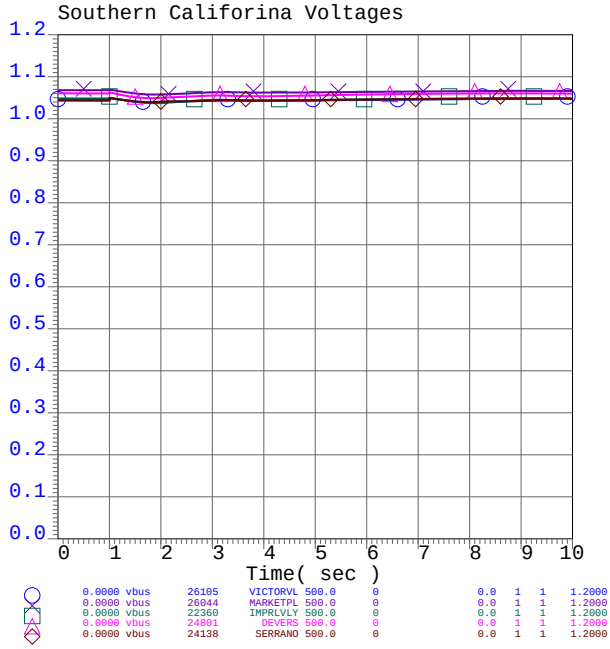


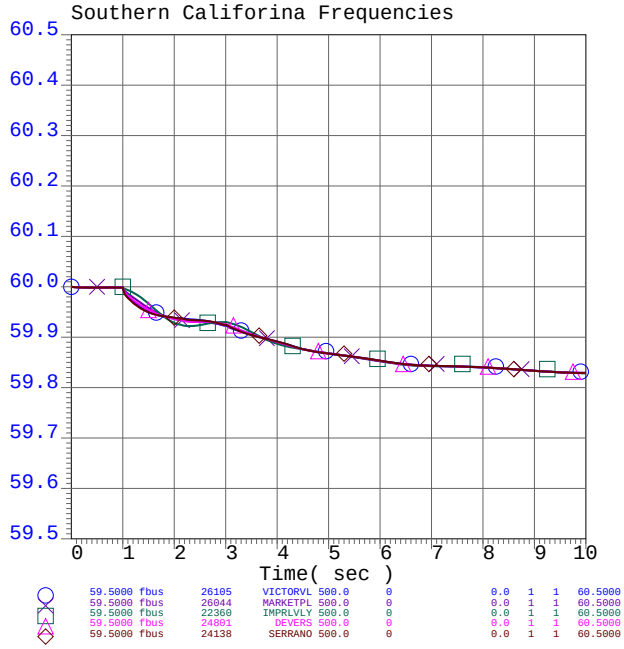
Arizona Frequencies

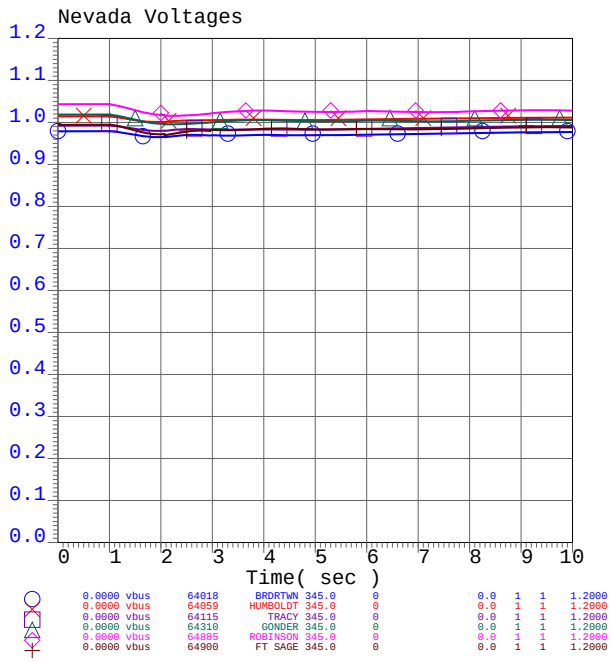


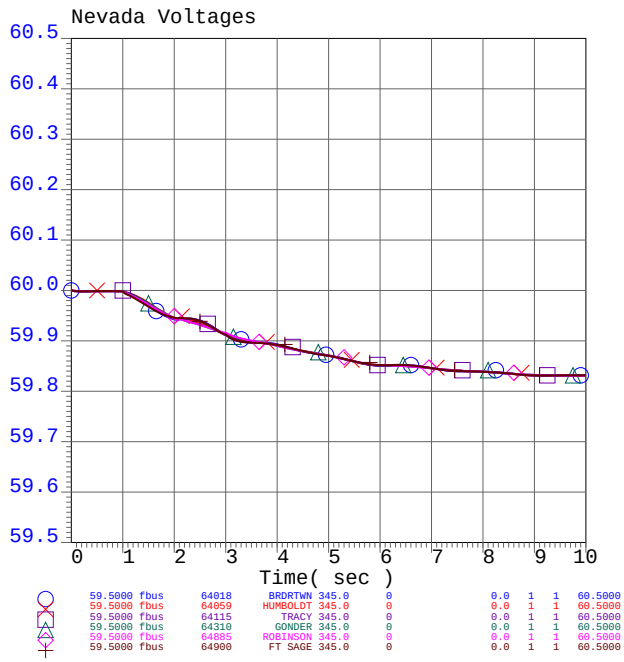
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

WECC AREA VOLTAGE AND FREQUENCIES



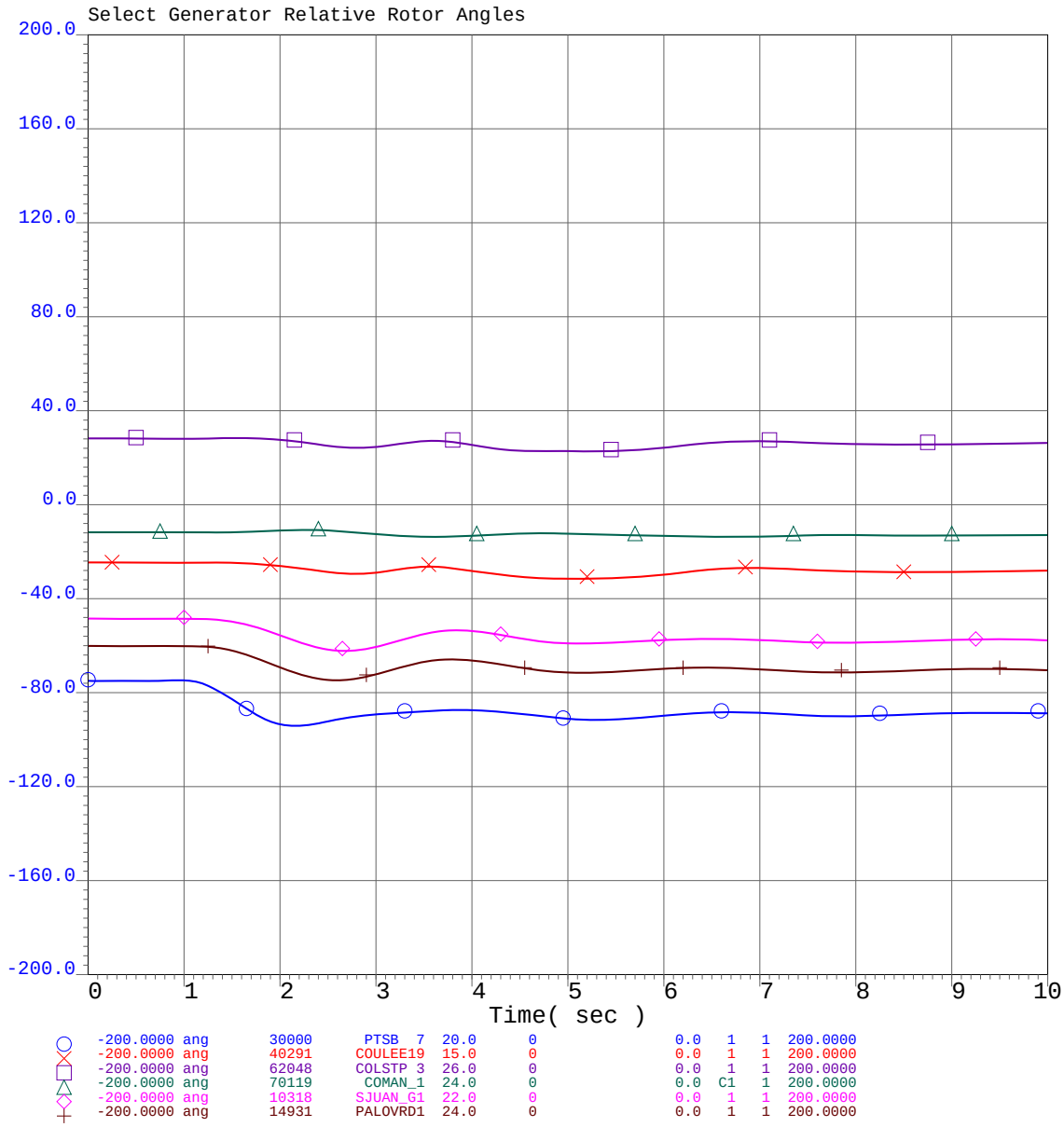






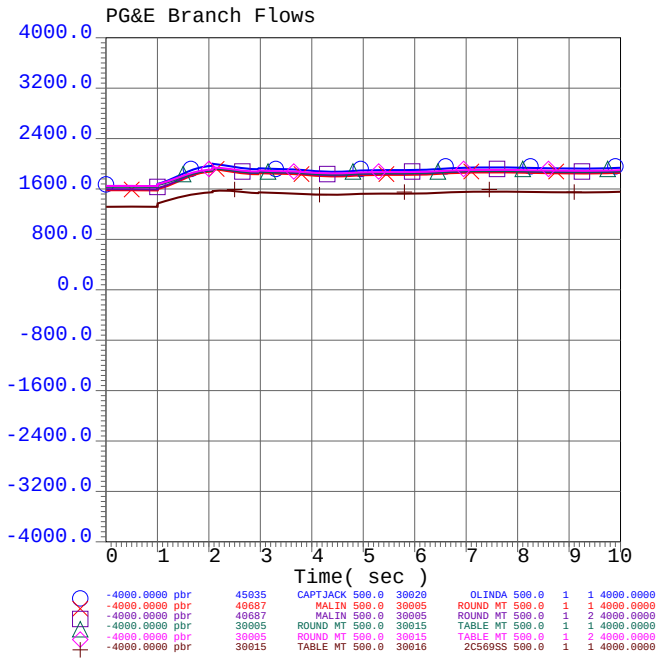
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

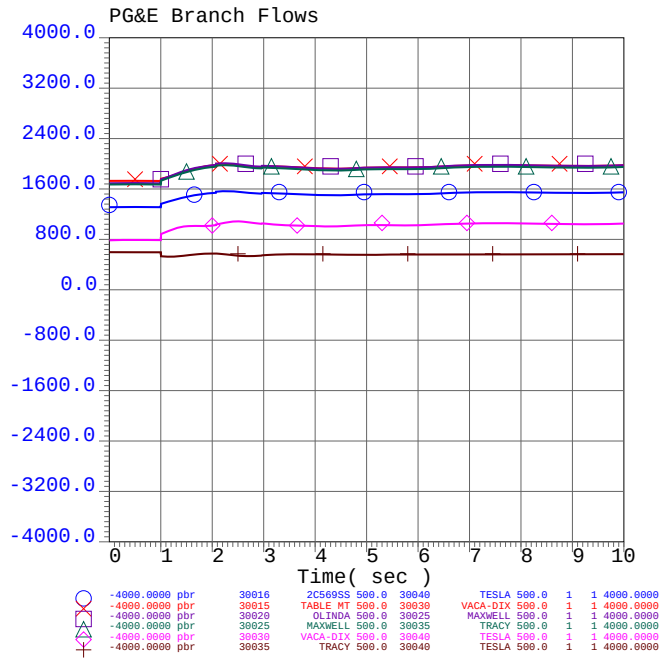
WECC RELATIVE ROTOR ANGLES

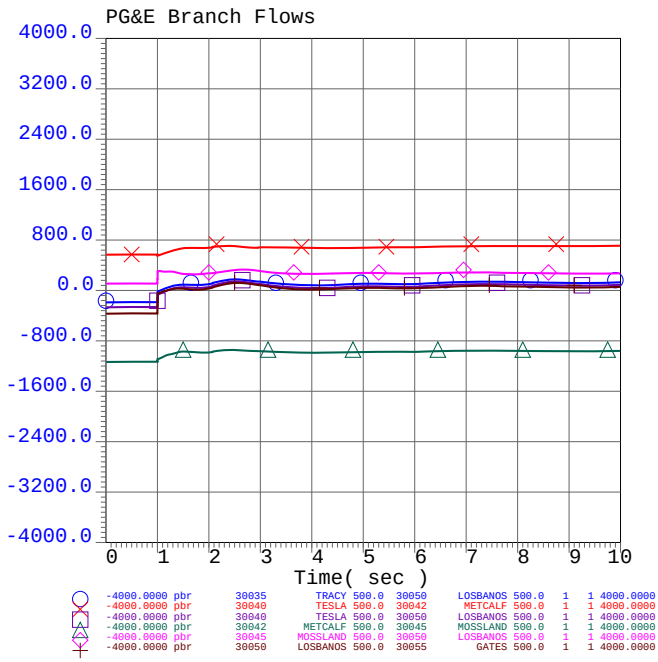


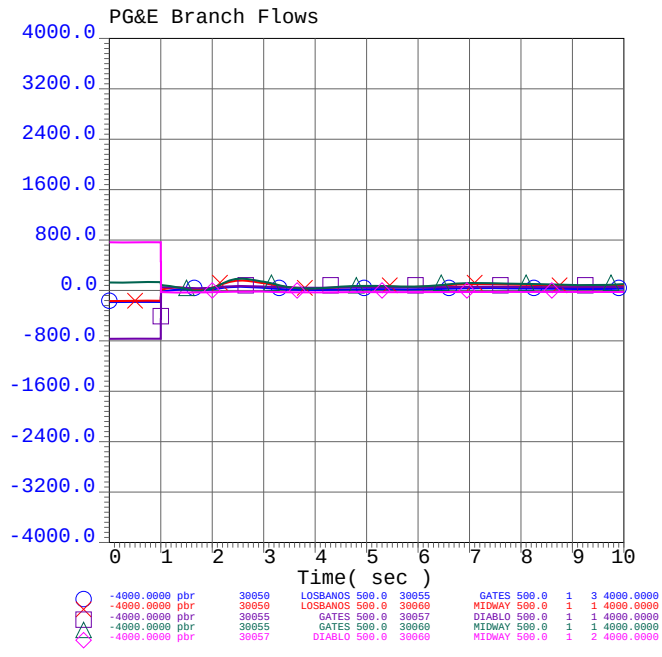
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

SELECT BRANCH FLOWS



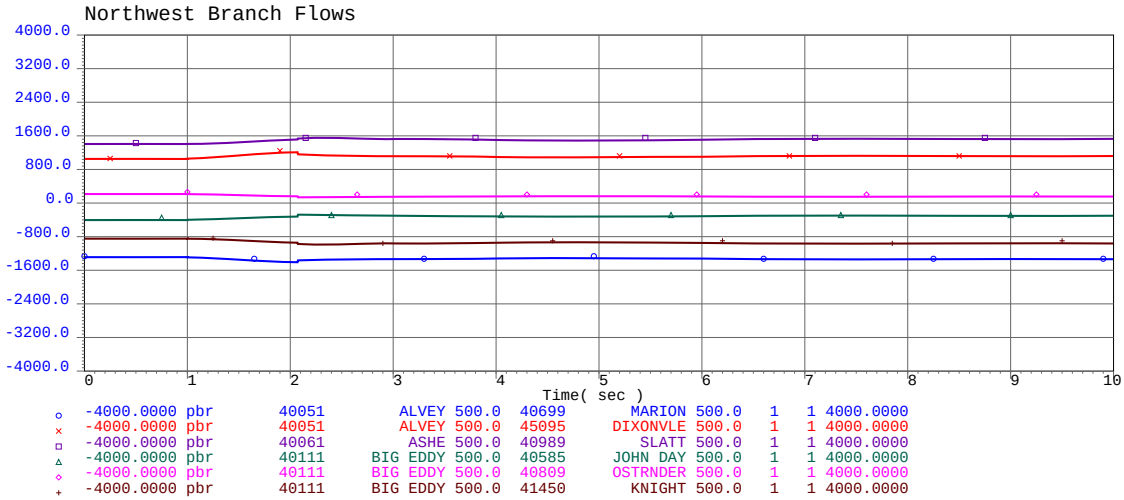




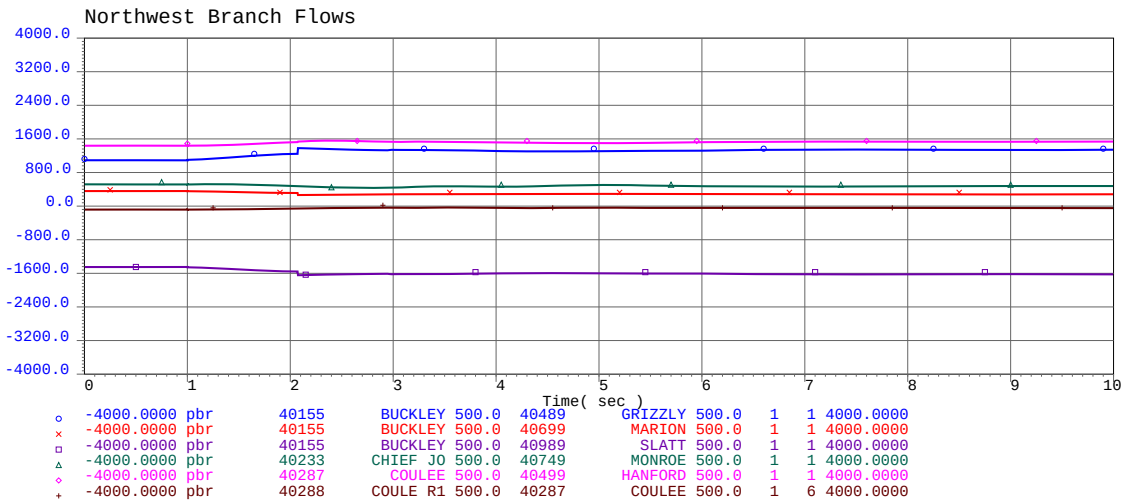


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

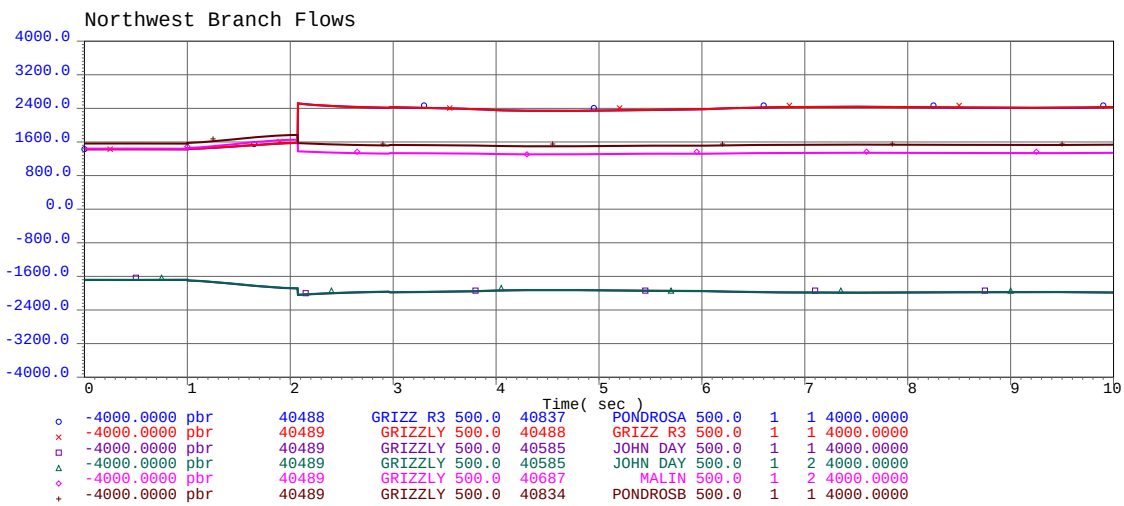
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
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-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
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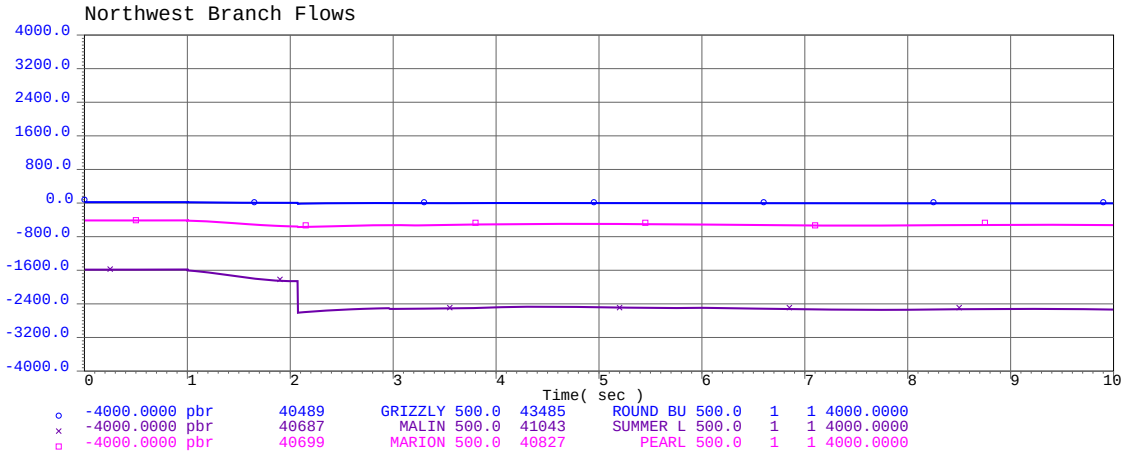
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2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

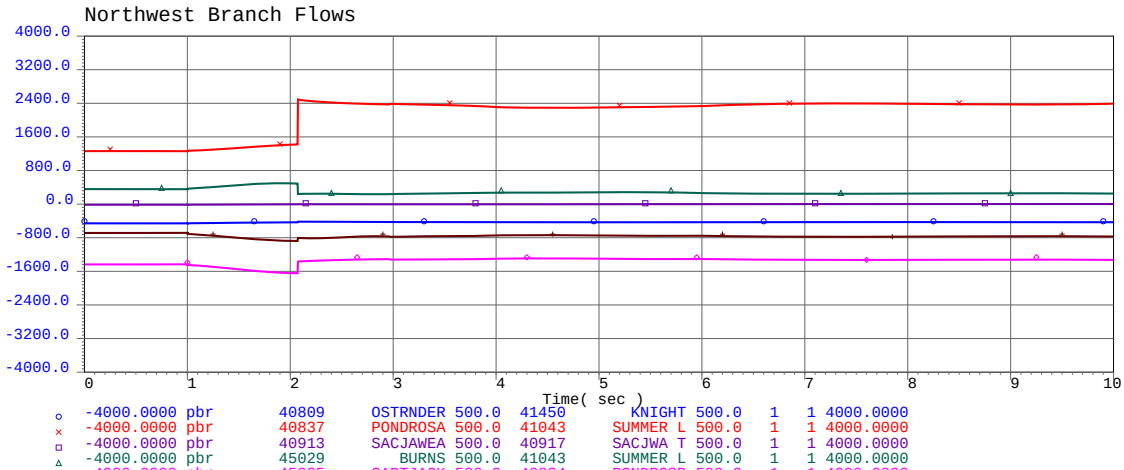
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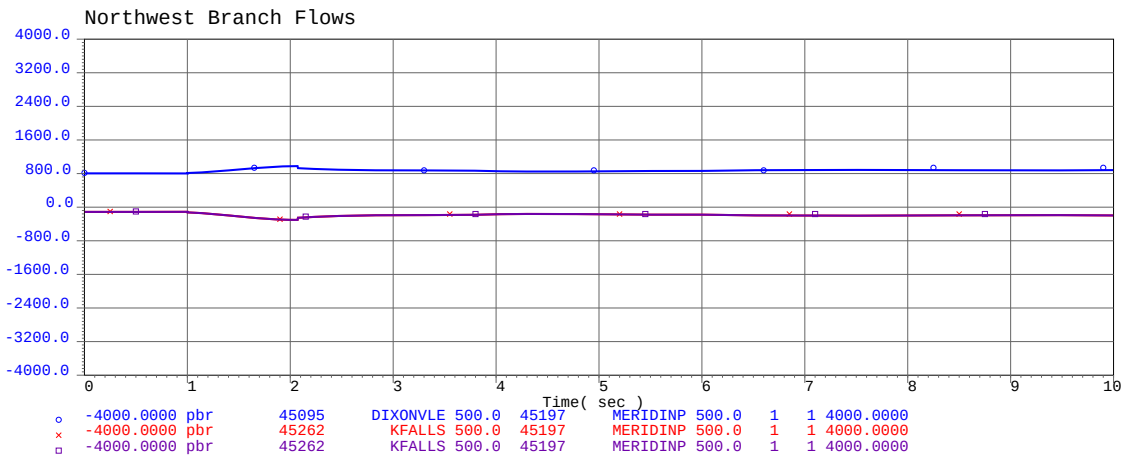
SELECT BRANCH FLOWS



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-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
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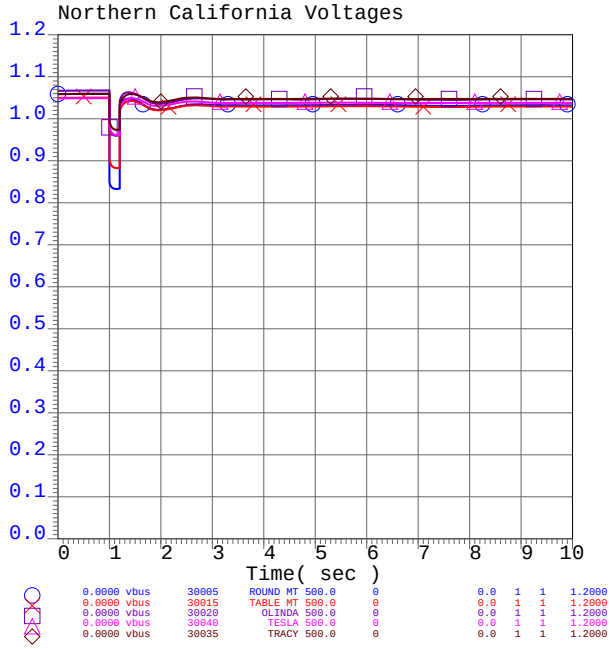
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

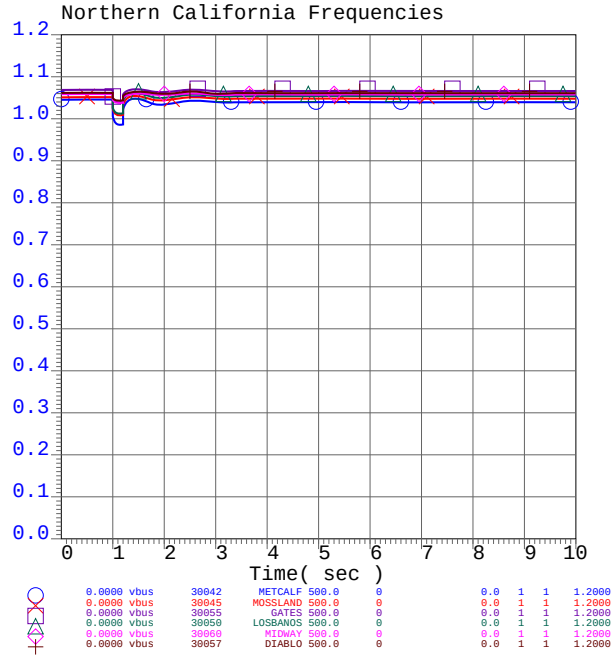
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Diablo Canyon Units

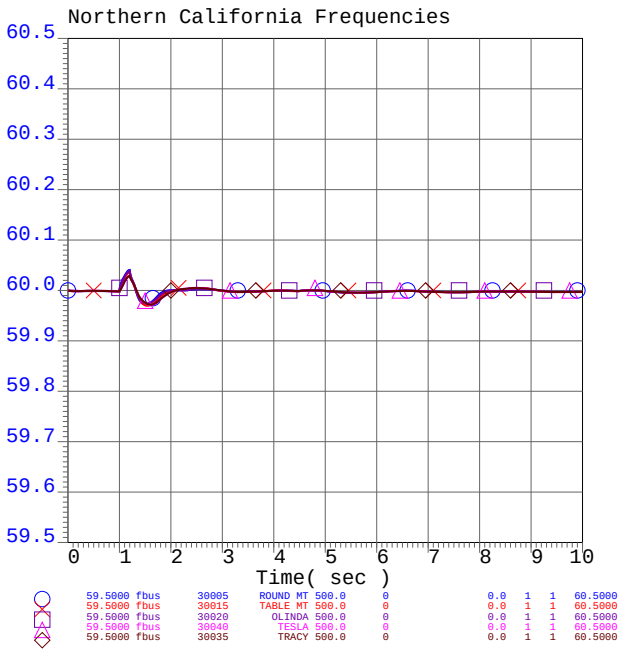
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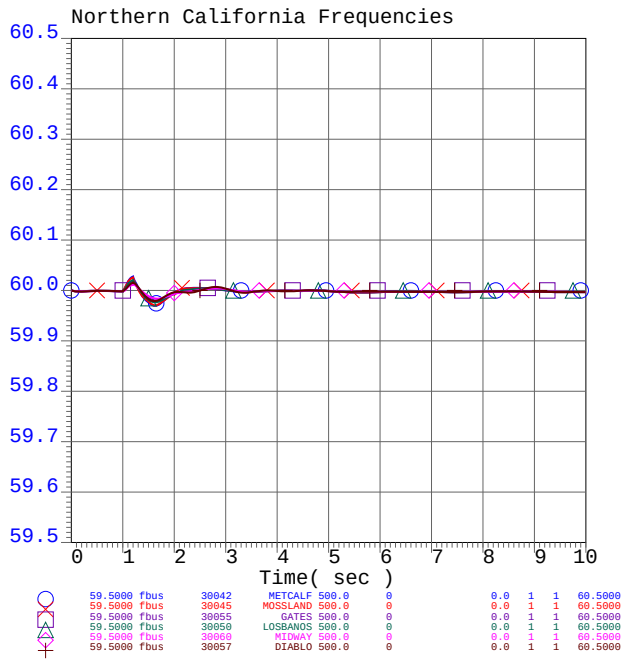
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WECC AREA VOLTAGE AND FREQUENCIES







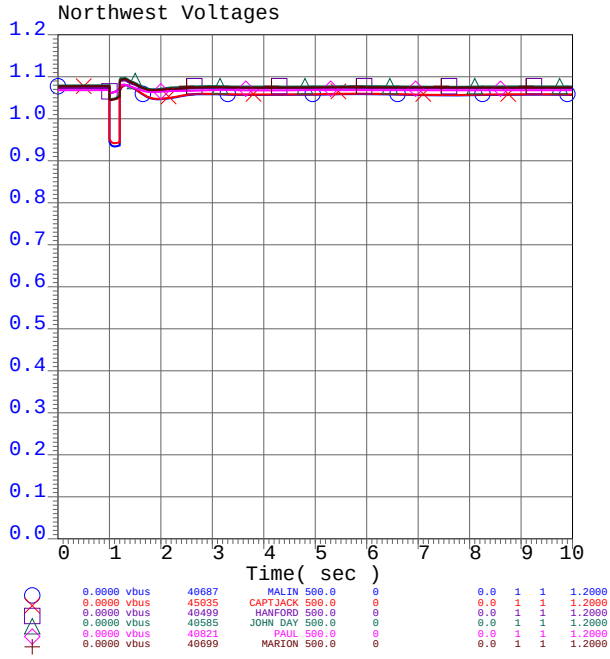


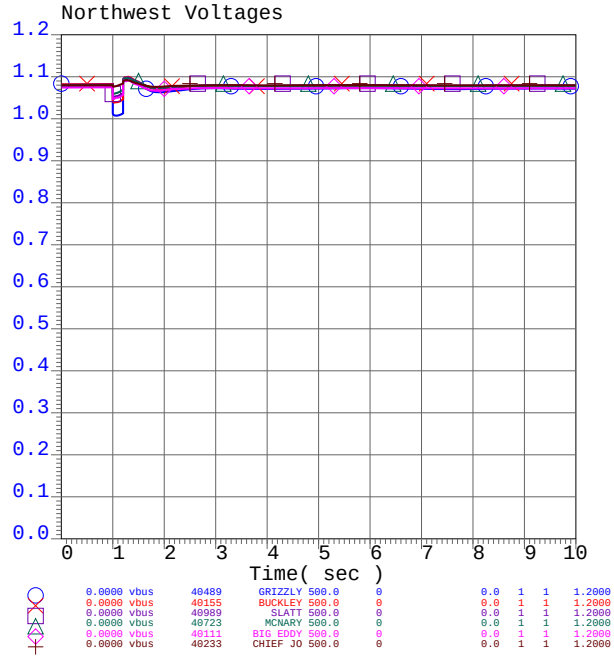
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Round Mountain 500 kV (12 cycle SLG)
followed by loss of Round Mountain-Table Mountain #2 and Malind-Round Mou

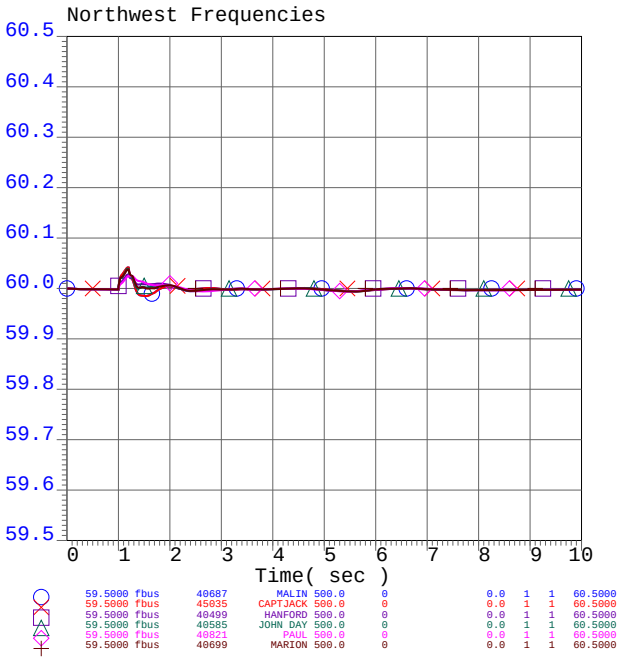
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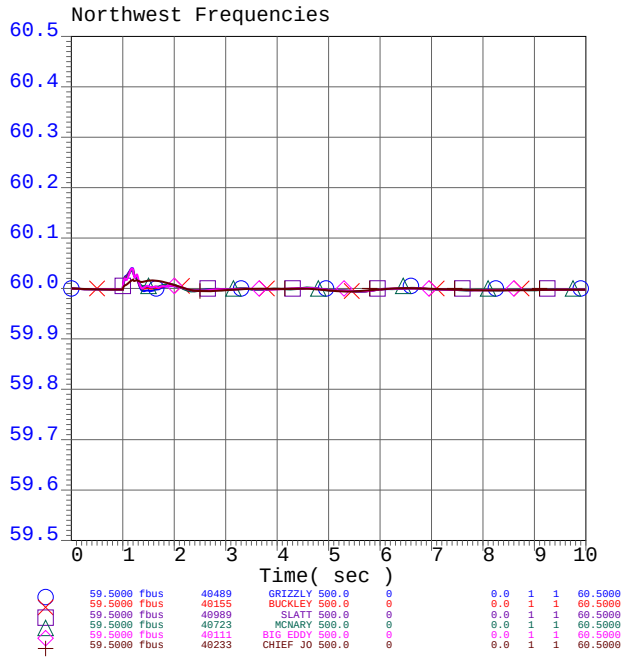
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WECC AREA VOLTAGE AND FREQUENCIES





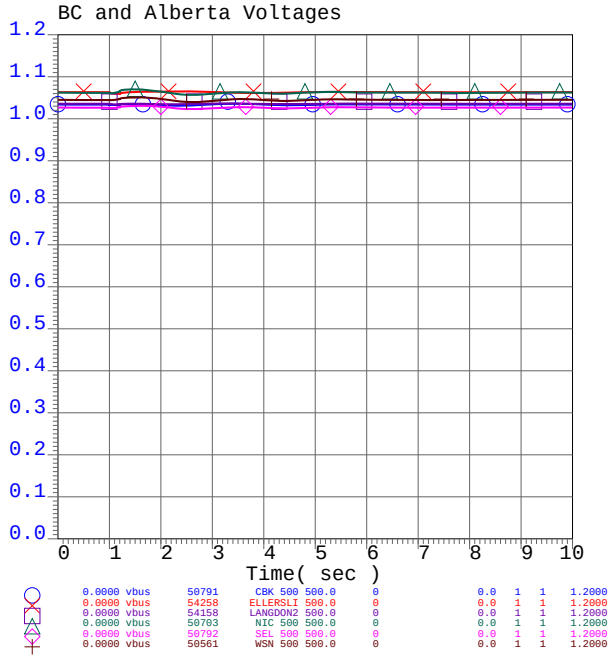




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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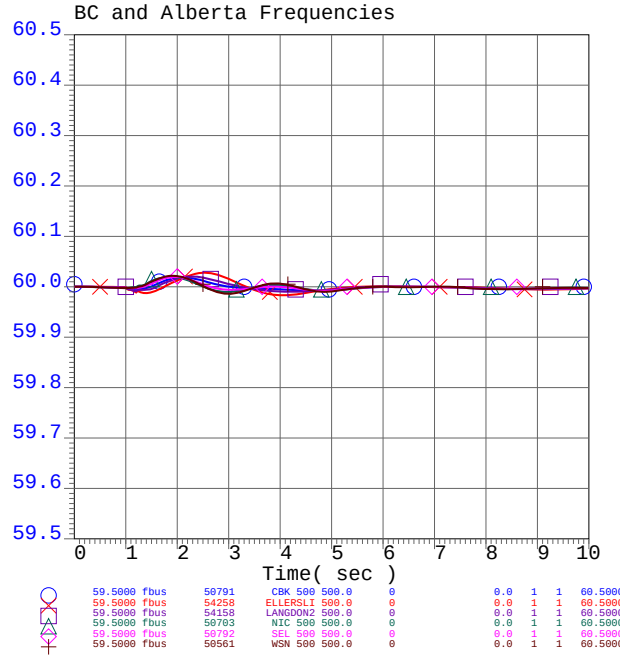
WECC AREA VOLTAGE AND FREQUENCIES

BC and Alberta Voltages



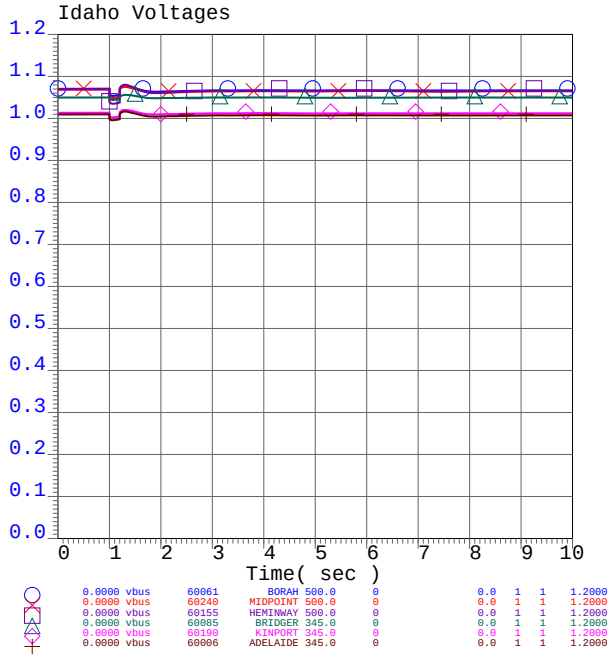
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0.0000 vbus	54258	ELLERSLI	500.0	0	0.0	1	1	1.2000
0.0000 vbus	54158	LANGDON2	500.0	0	0.0	1	1	1.2000
0.0000 vbus	50703	NIC 500	500.0	0	0.0	1	1	1.2000
0.0000 vbus	50792	SEL 500	500.0	0	0.0	1	1	1.2000
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BC and Alberta Frequencies



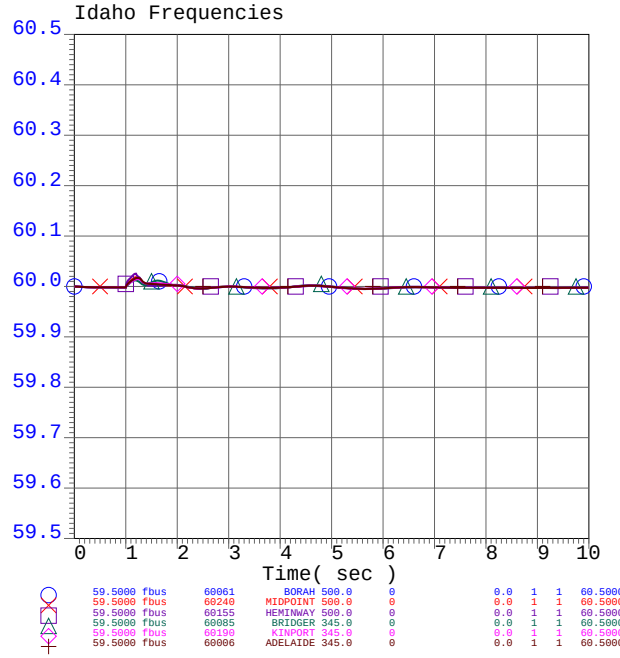
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59.5000 fbus	54258	ELLERSLI	500.0	0	0.0	1	1	60.5000
59.5000 fbus	54158	LANGDON2	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50703	NIC 500	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50792	SEL 500	500.0	0	0.0	1	1	60.5000
59.5000 fbus	50561	WSN 500	500.0	0	0.0	1	1	60.5000

Idaho Voltages



0.0000 vbus	60061	BORAH	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60240	MIDPOINT	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60155	HEMINWAY	500.0	0	0.0	1	1	1.2000
0.0000 vbus	60085	BRIDGER	345.0	0	0.0	1	1	1.2000
0.0000 vbus	60190	KINPORT	345.0	0	0.0	1	1	1.2000
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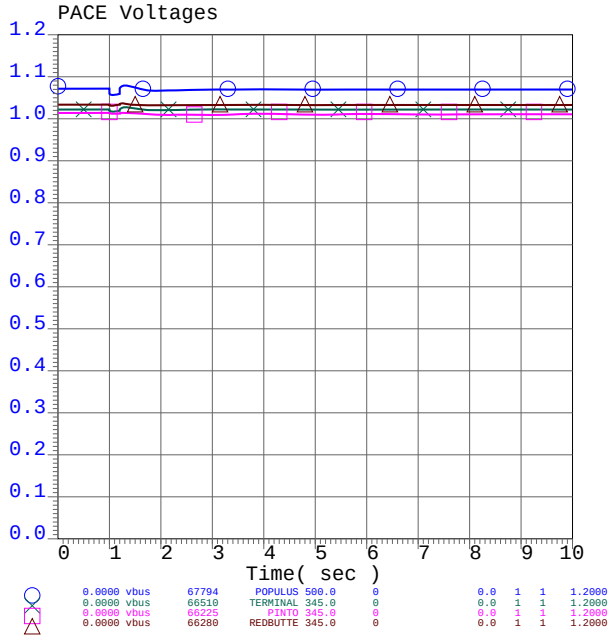
Idaho Frequencies

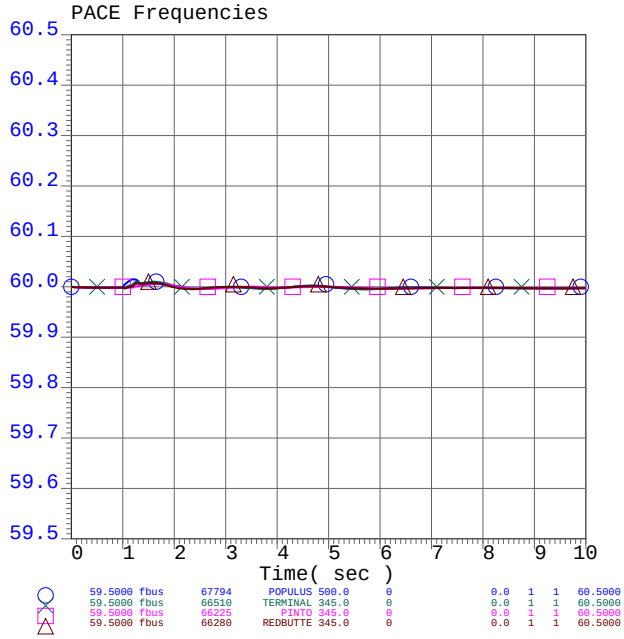


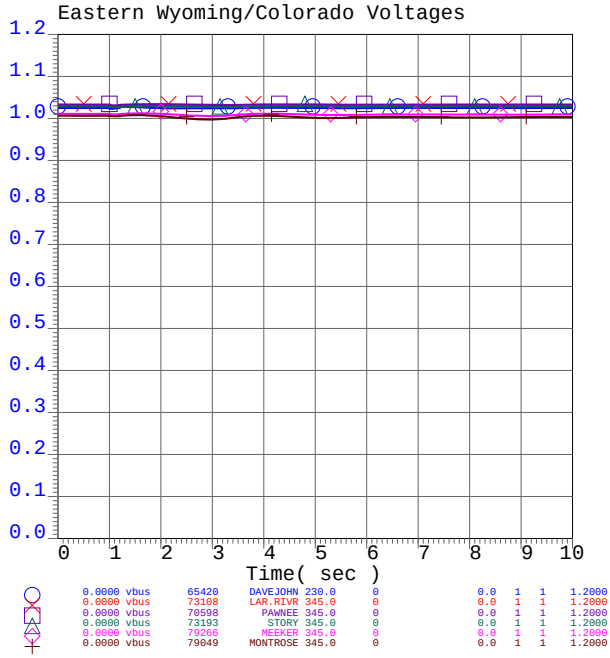
59.5000 fbus	60061	BORAH	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60240	MIDPOINT	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60155	HEMINWAY	500.0	0	0.0	1	1	60.5000
59.5000 fbus	60085	BRIDGER	345.0	0	0.0	1	1	60.5000
59.5000 fbus	60190	KINPORT	345.0	0	0.0	1	1	60.5000
59.5000 fbus	60006	ADELAIDE	345.0	0	0.0	1	1	60.5000

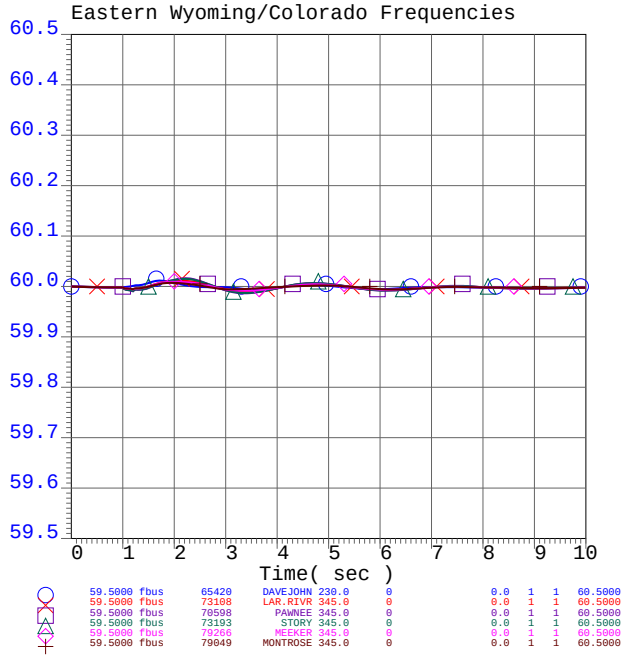
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Round Mountain 500 kV (12 cycle SLG)
followed by loss of Round Mountain-Table Mountain #2 and Malind-Round Mou

WECC AREA VOLTAGE AND FREQUENCIES





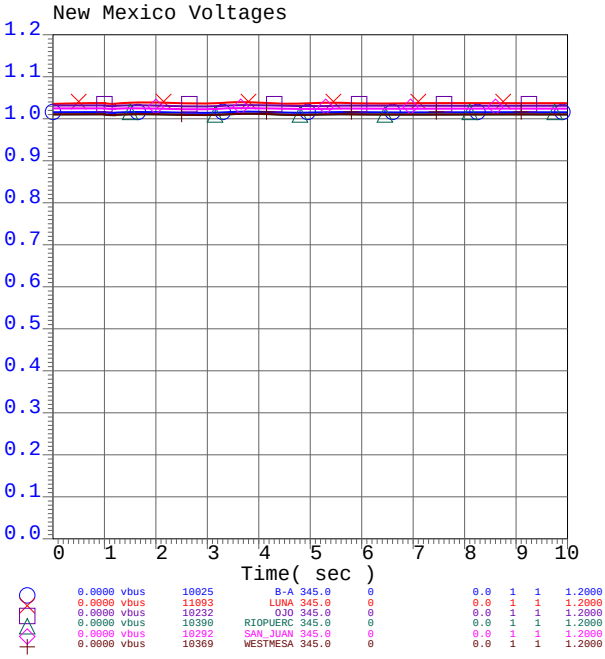




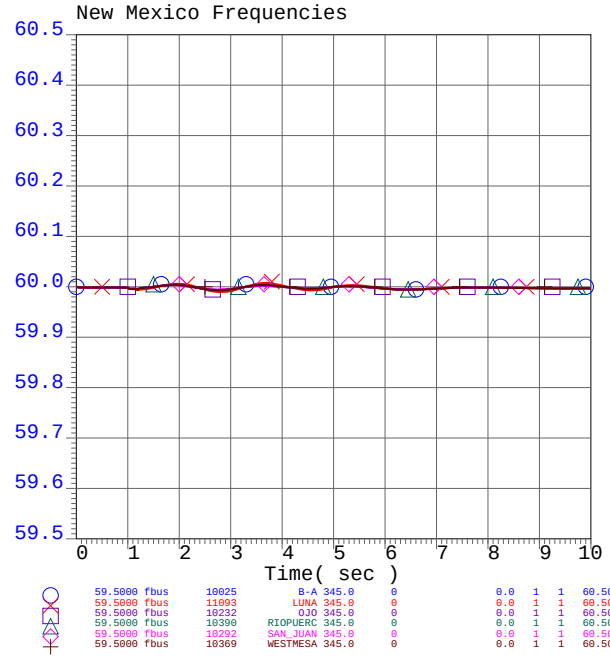
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WECC AREA VOLTAGE AND FREQUENCIES

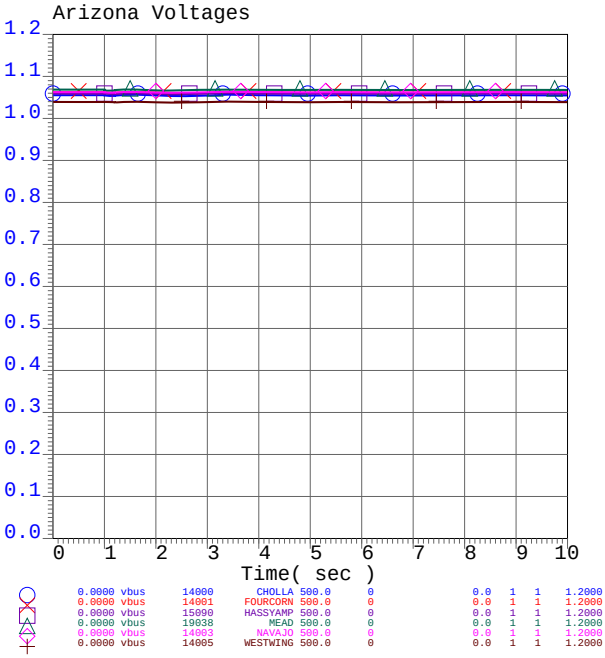
New Mexico Voltages



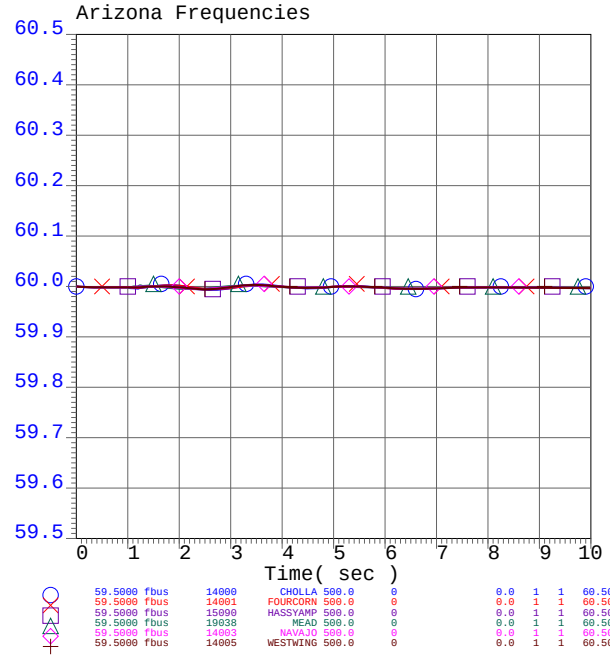
New Mexico Frequencies



Arizona Voltages

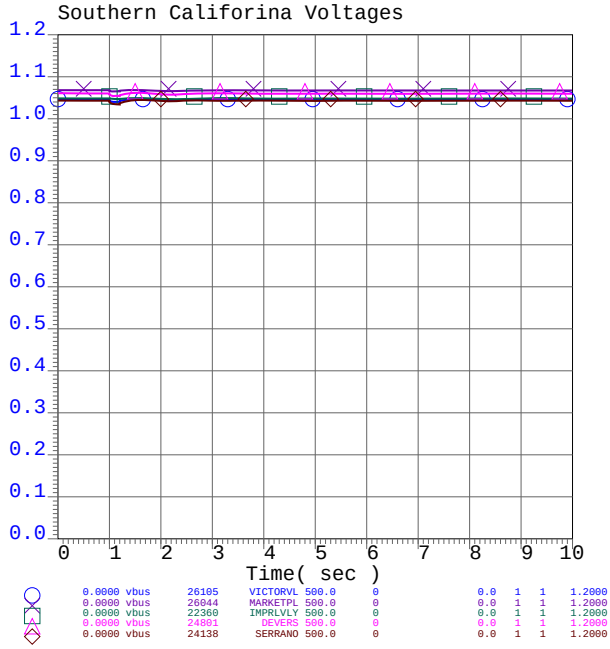


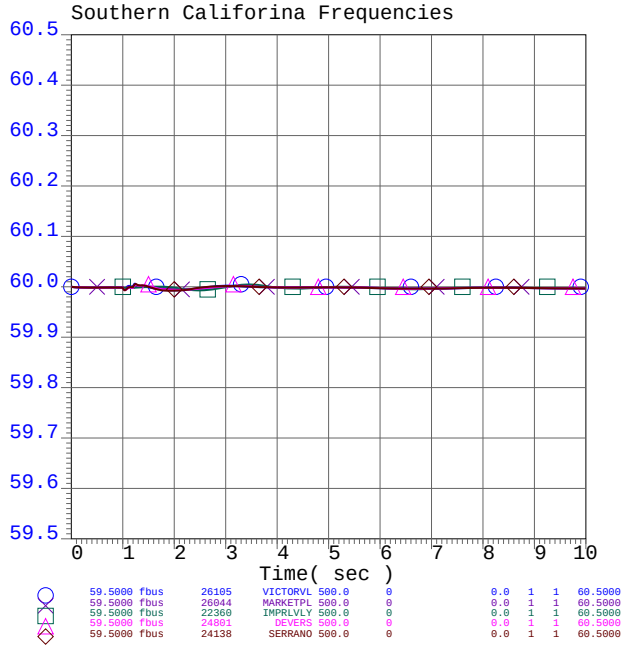
Arizona Frequencies

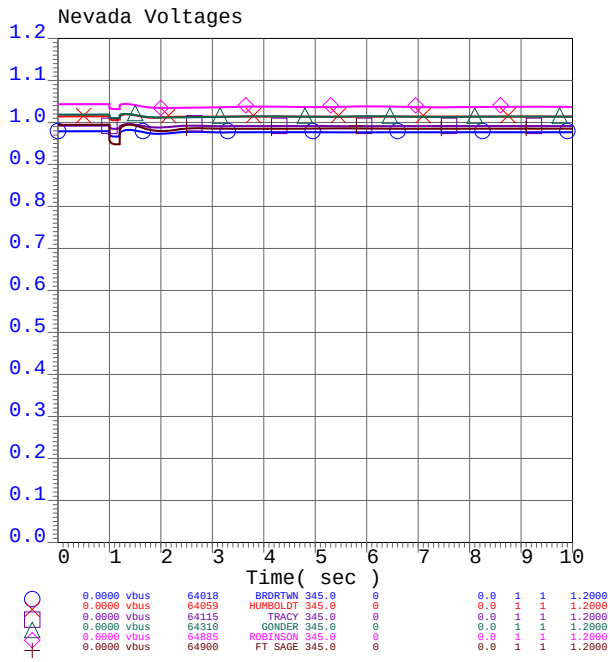


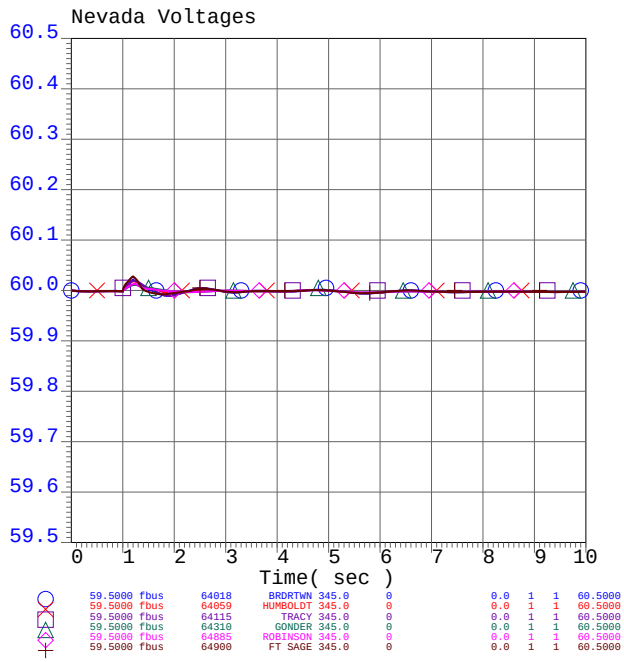
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WECC AREA VOLTAGE AND FREQUENCIES



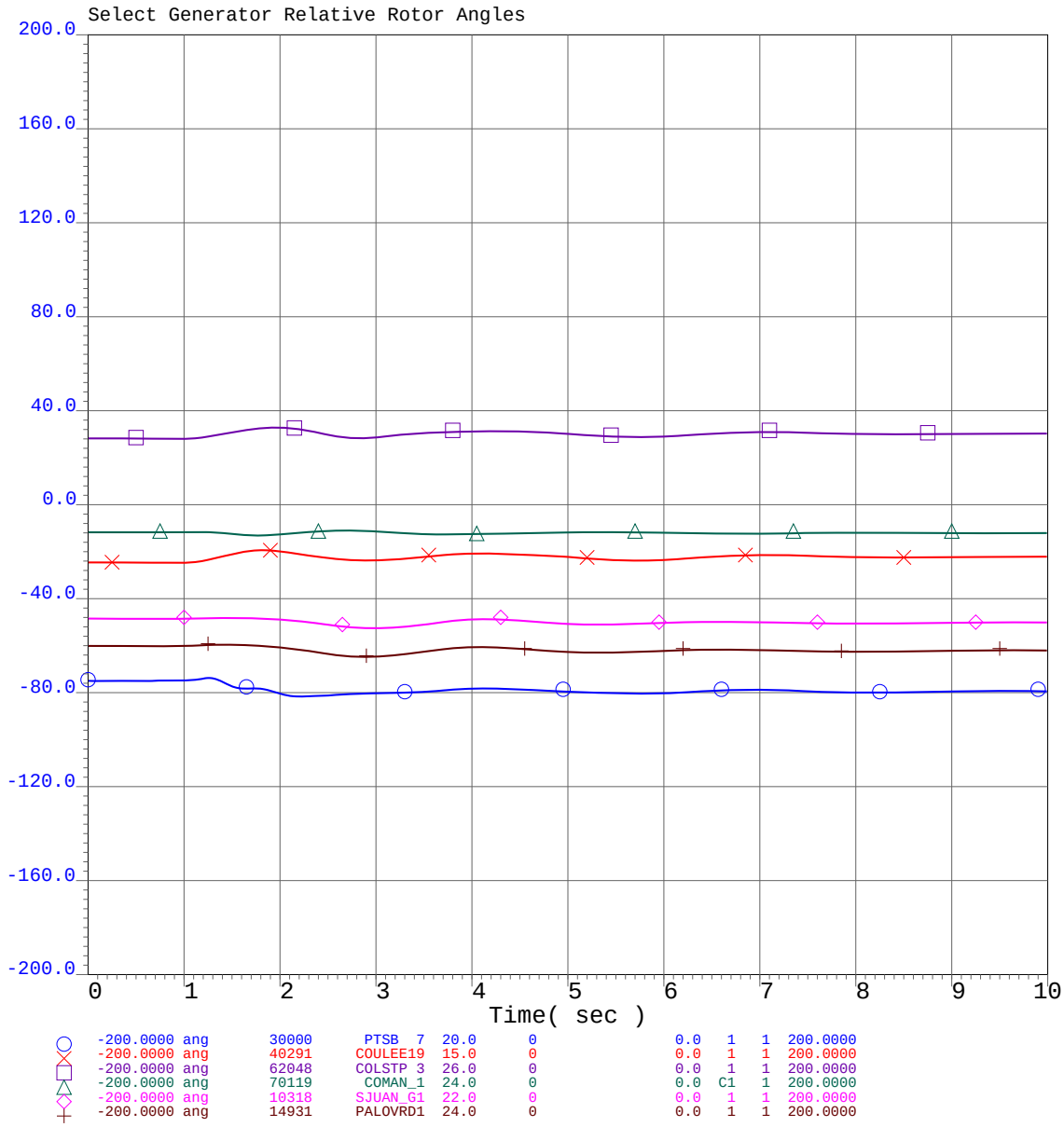






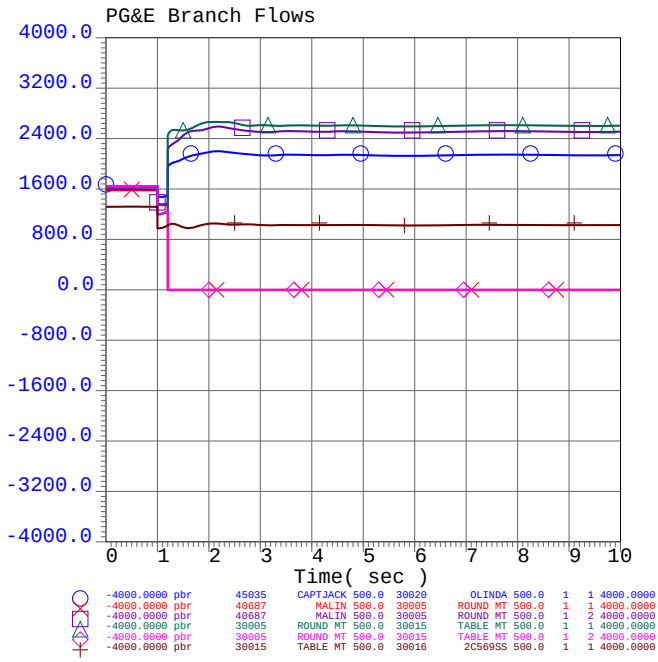
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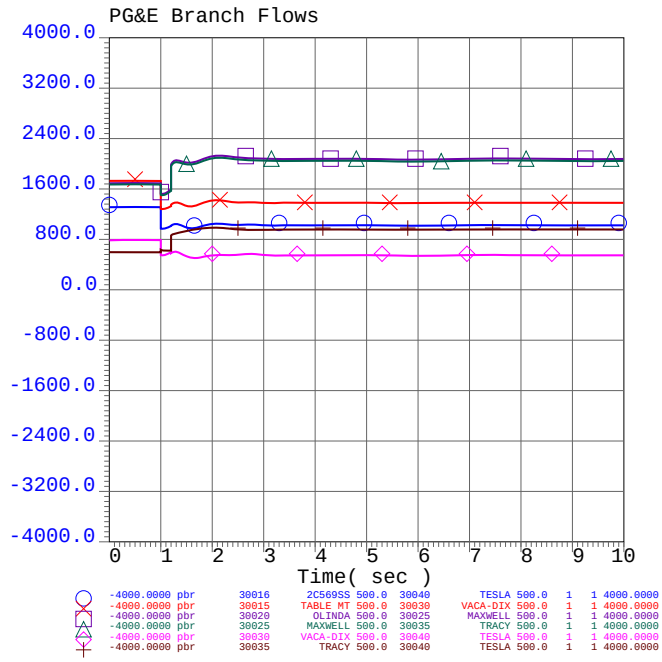
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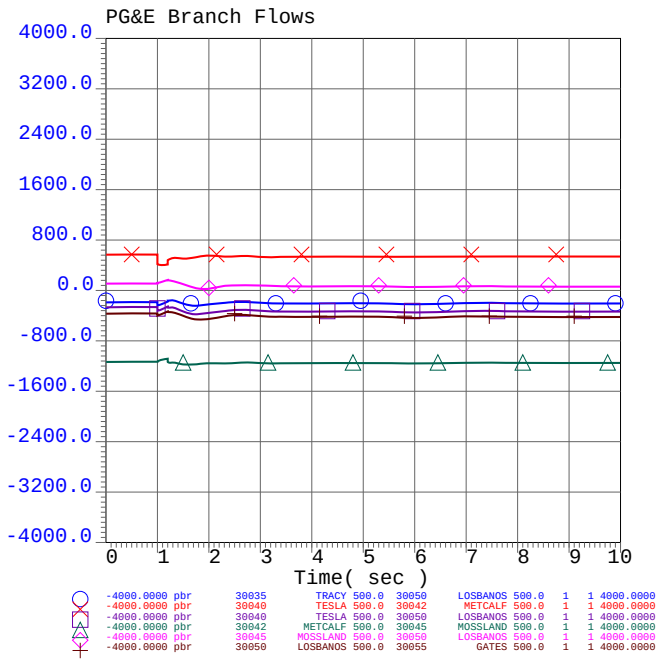


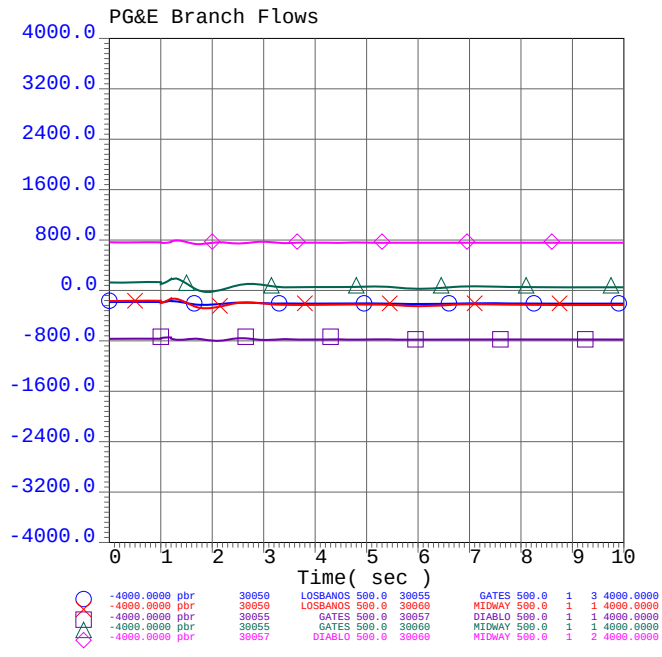
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SELECT BRANCH FLOWS





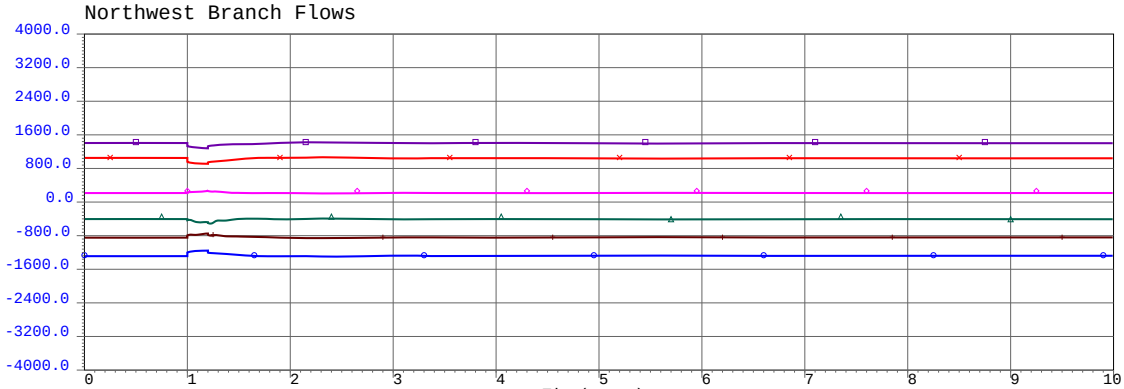




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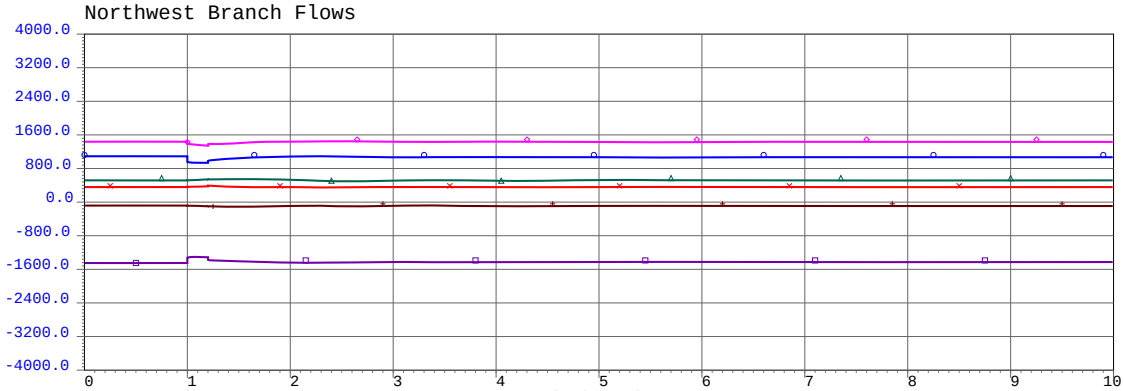
SELECT BRANCH FLOWS

Northwest Branch Flows



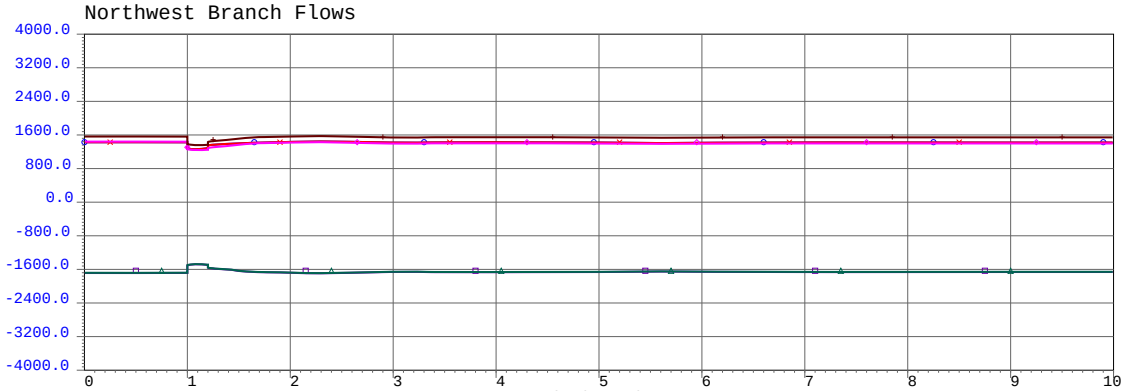
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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

Northwest Branch Flows



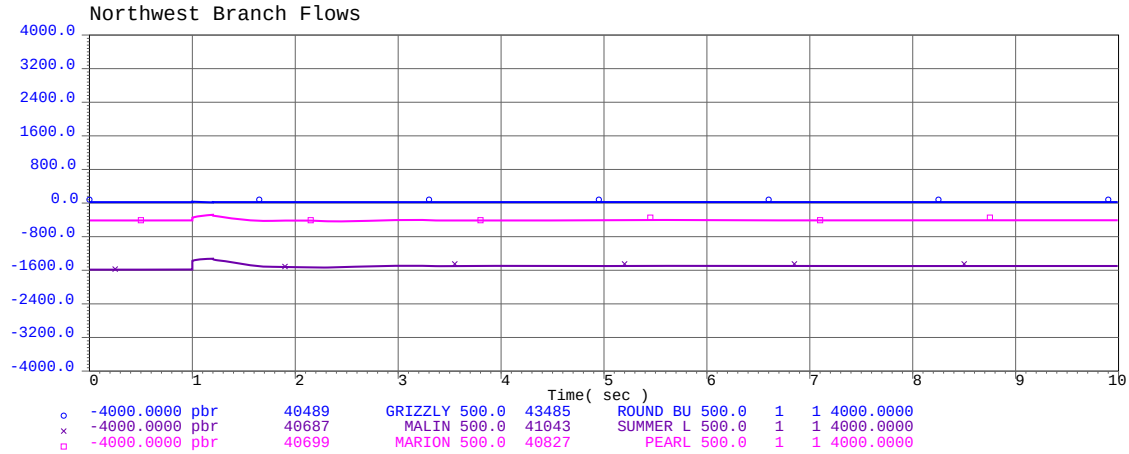
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

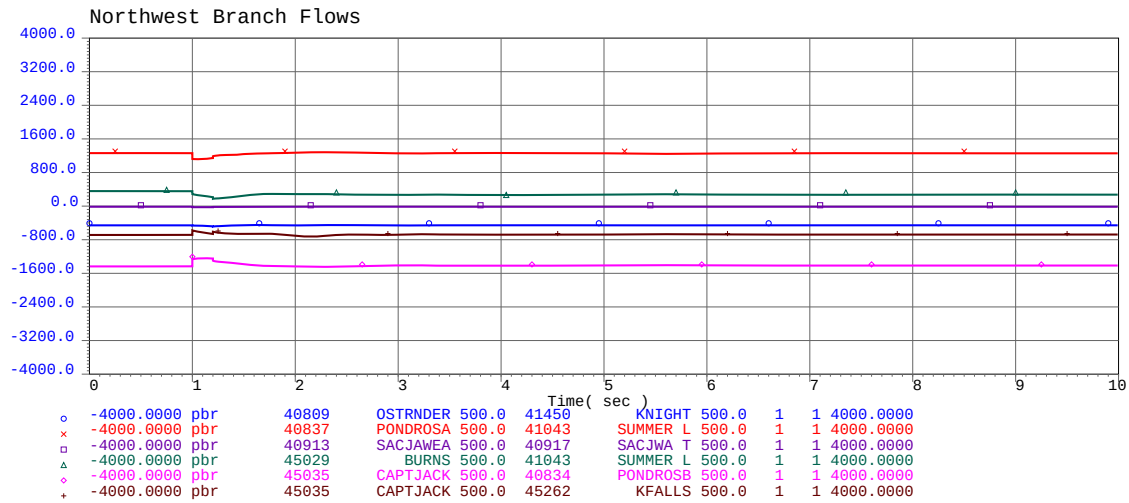
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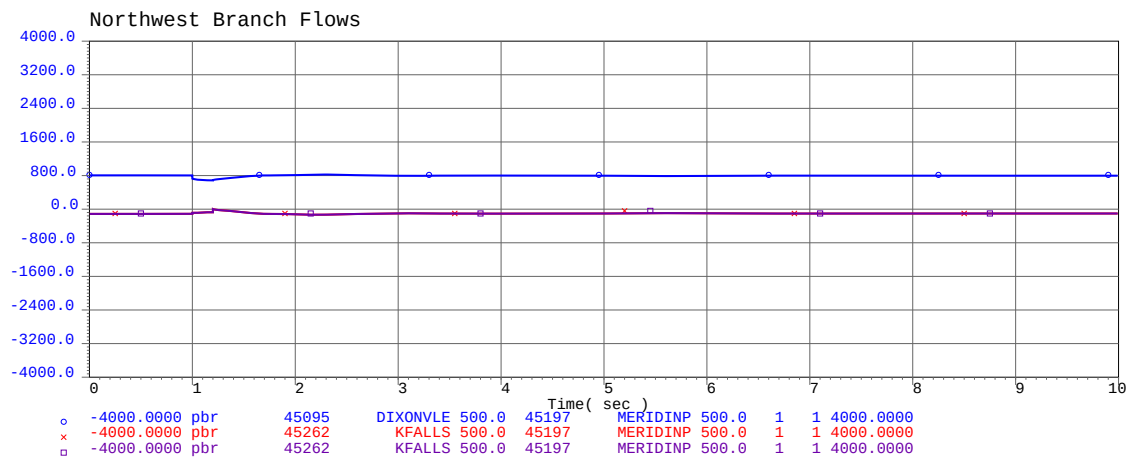
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SELECT BRANCH FLOWS

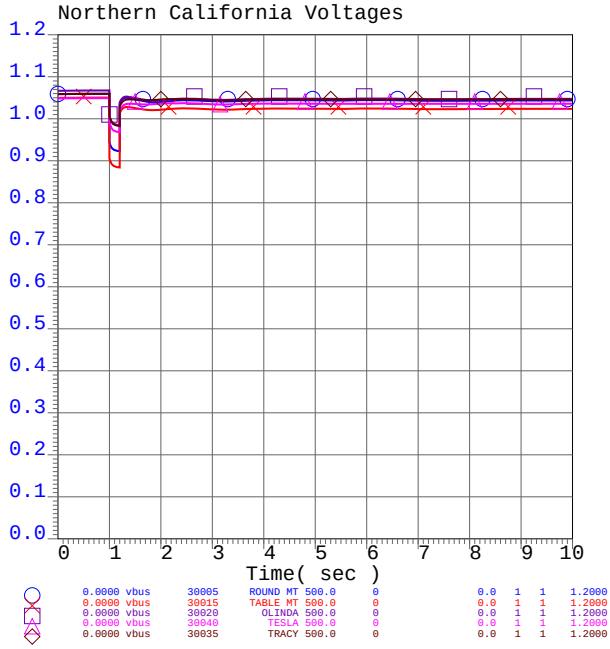


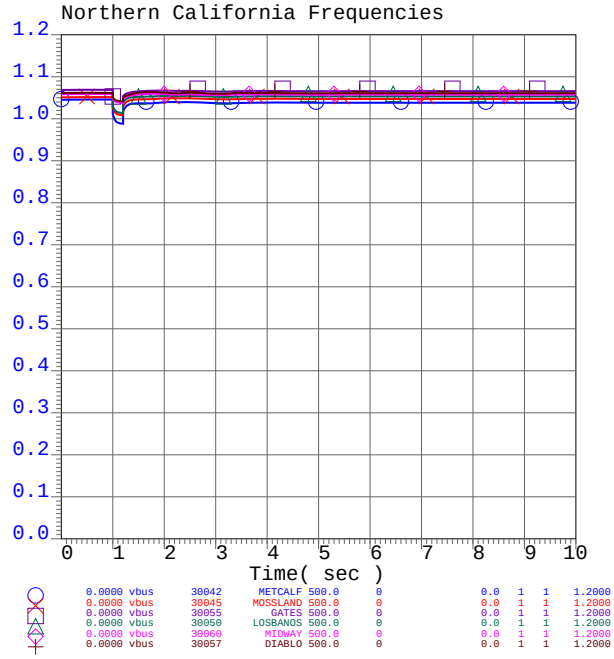


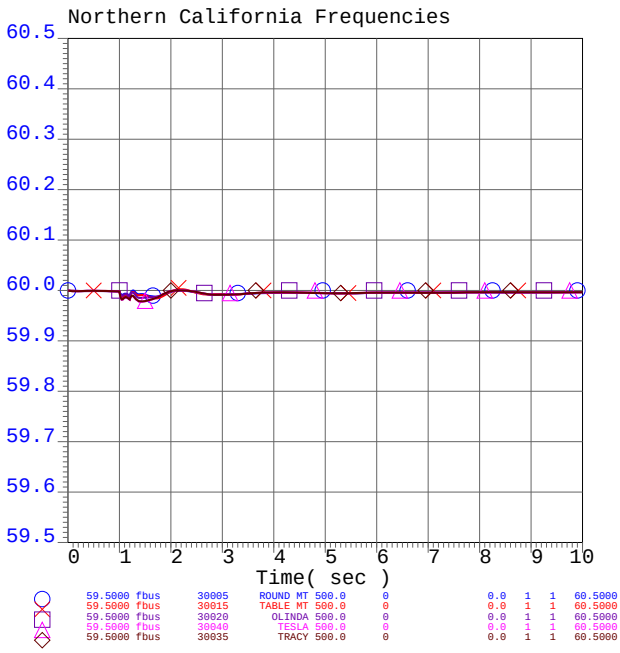


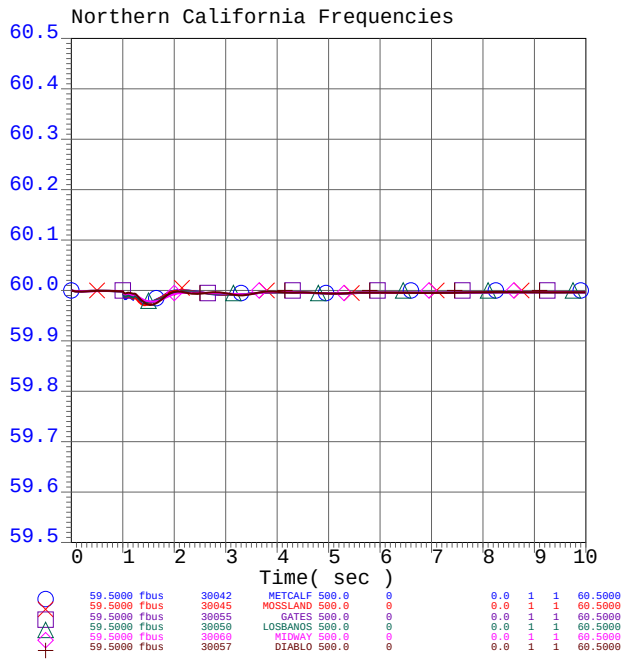
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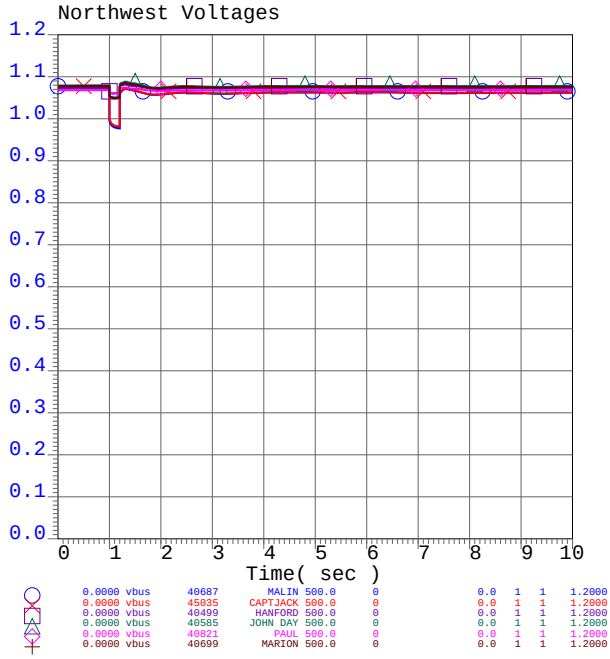


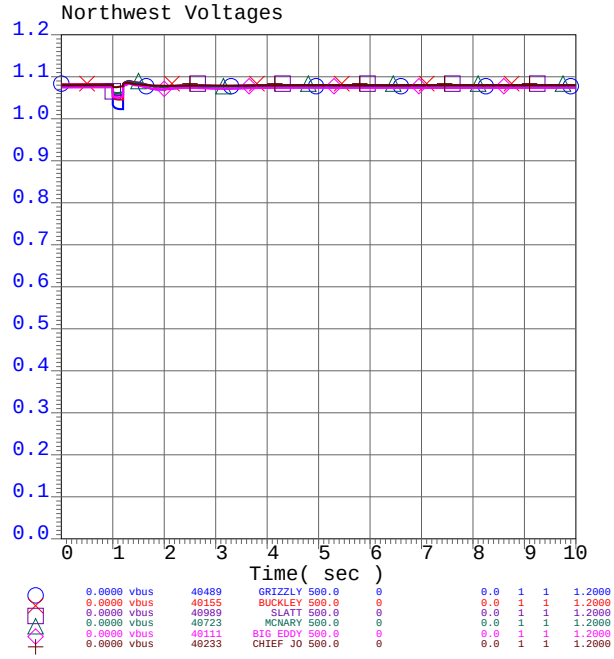


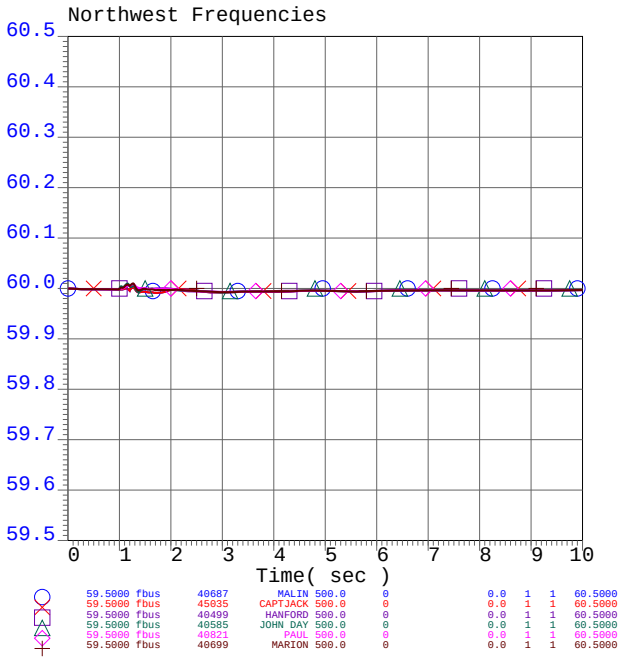


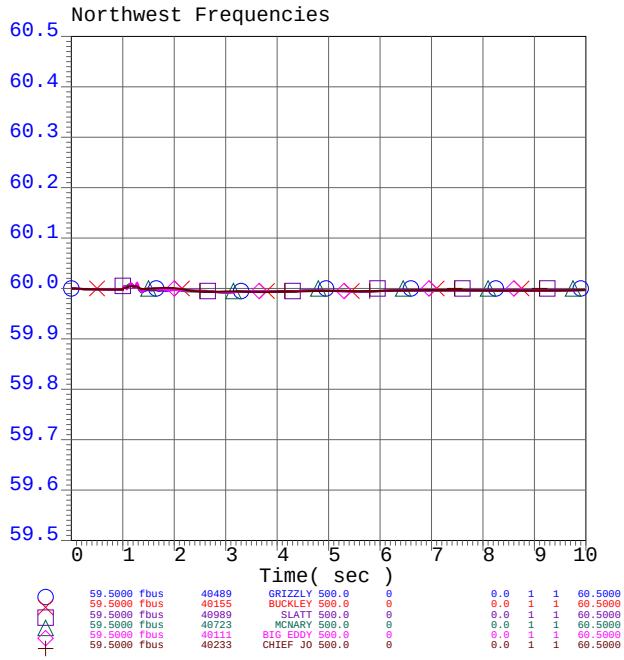
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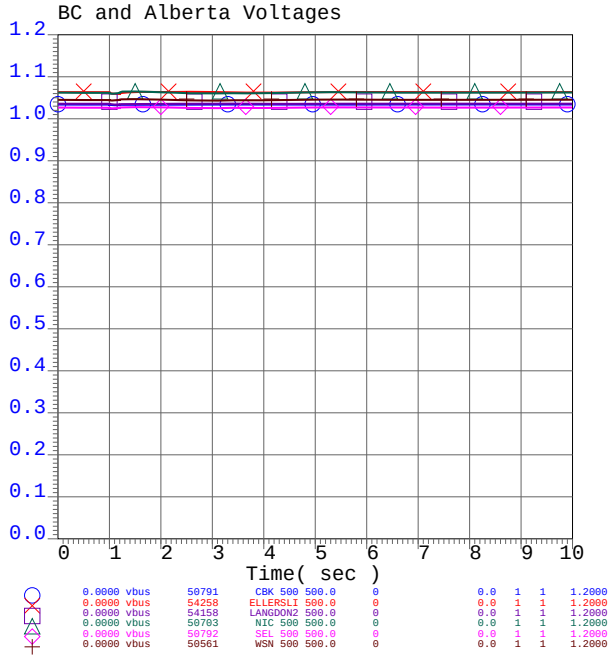


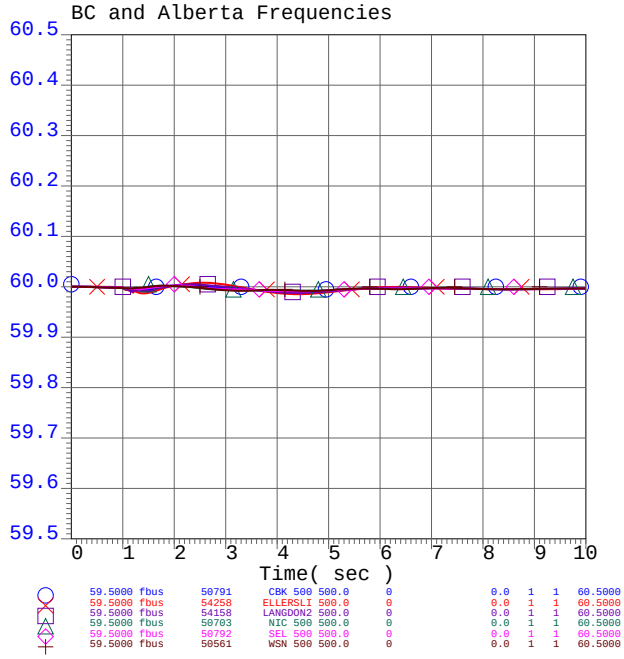


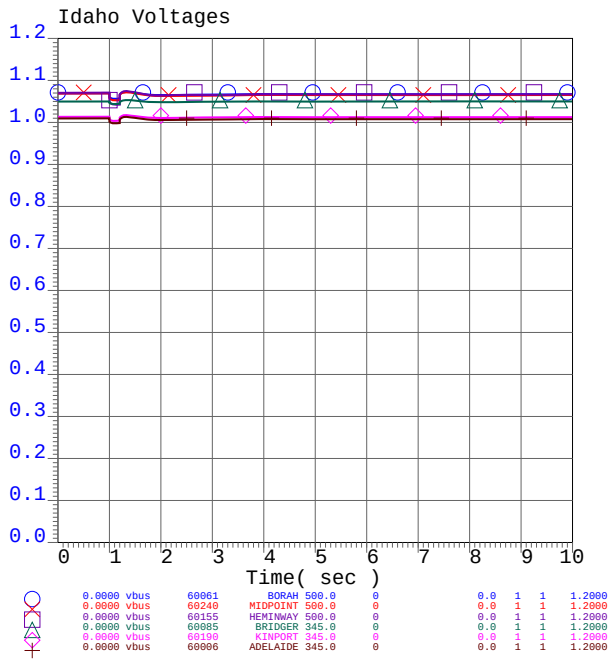


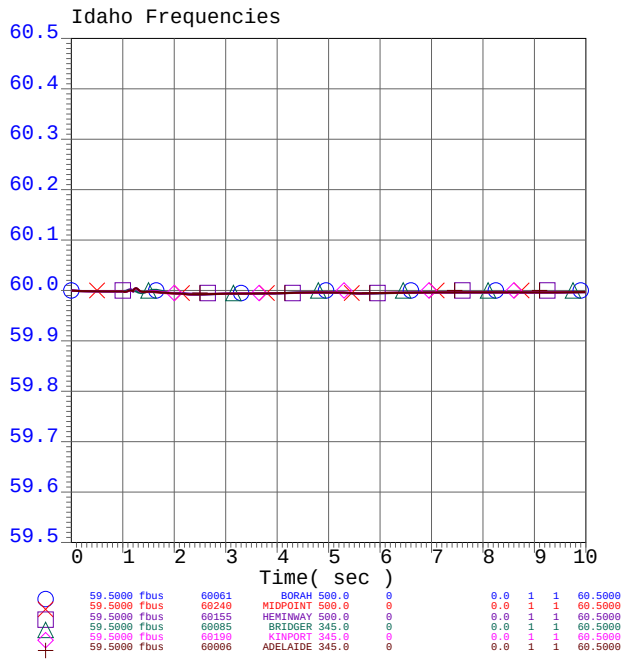
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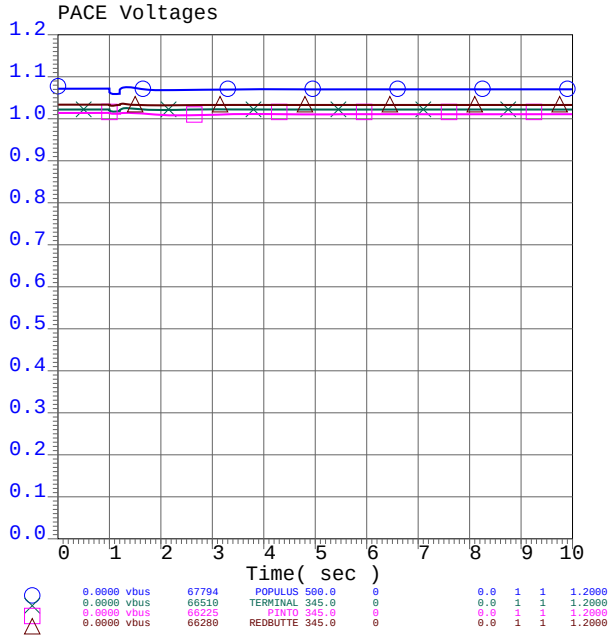




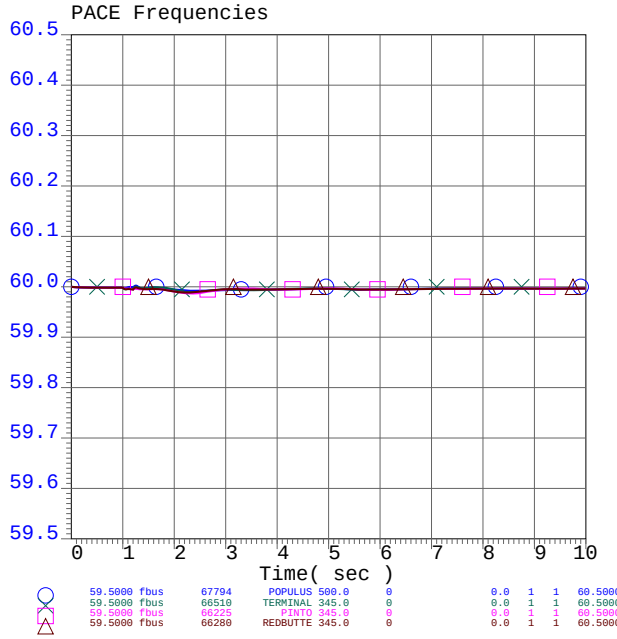
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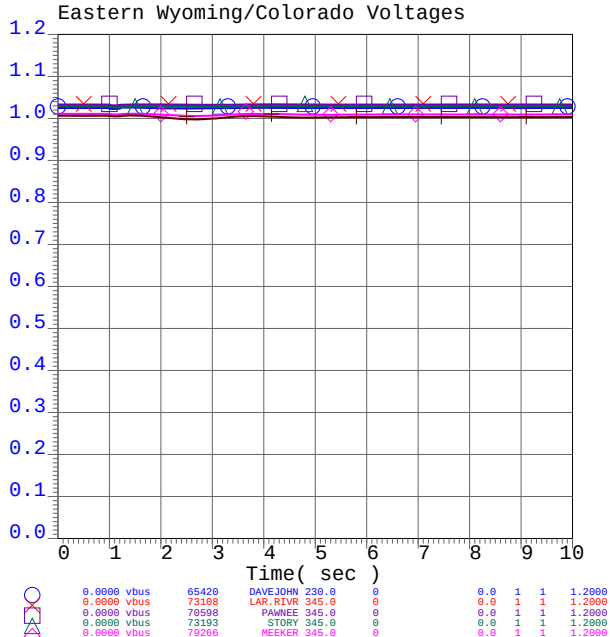
PACE Voltages



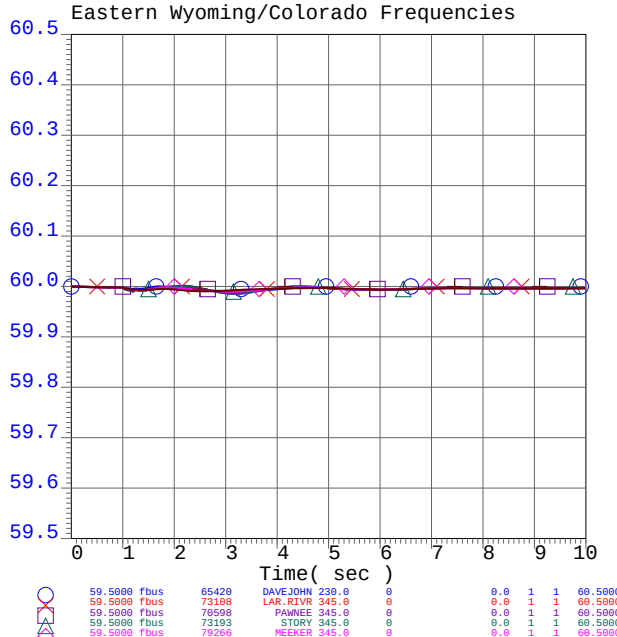
PACE Frequencies



Eastern Wyoming/Colorado Voltages



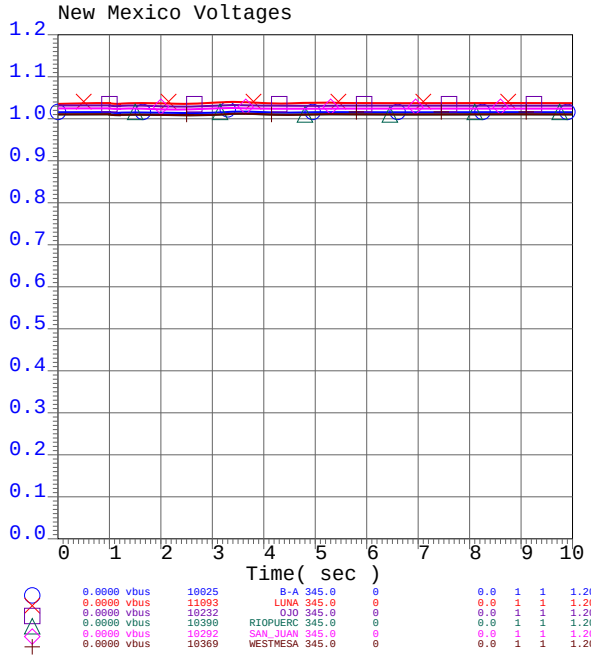
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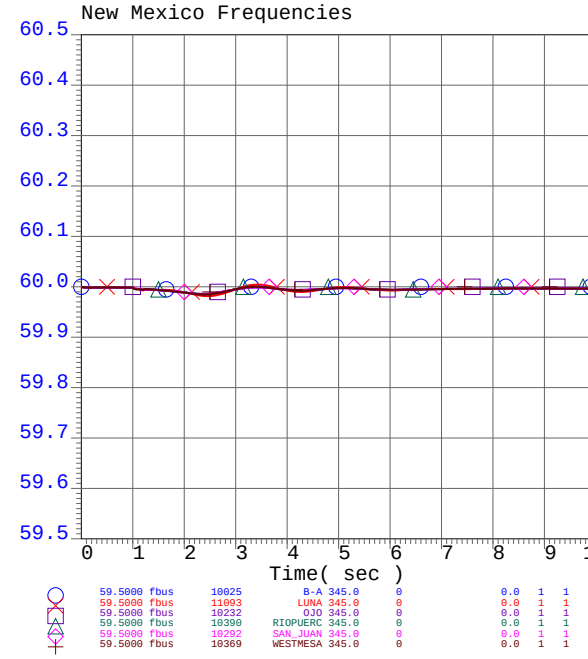
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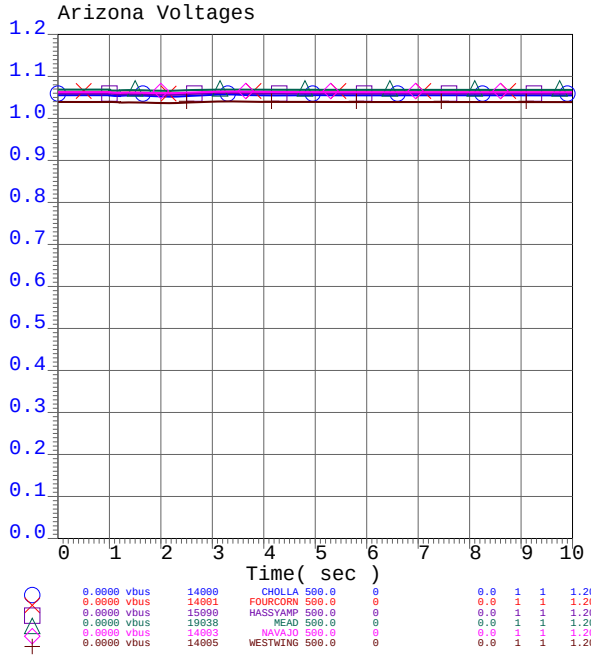
New Mexico Voltages



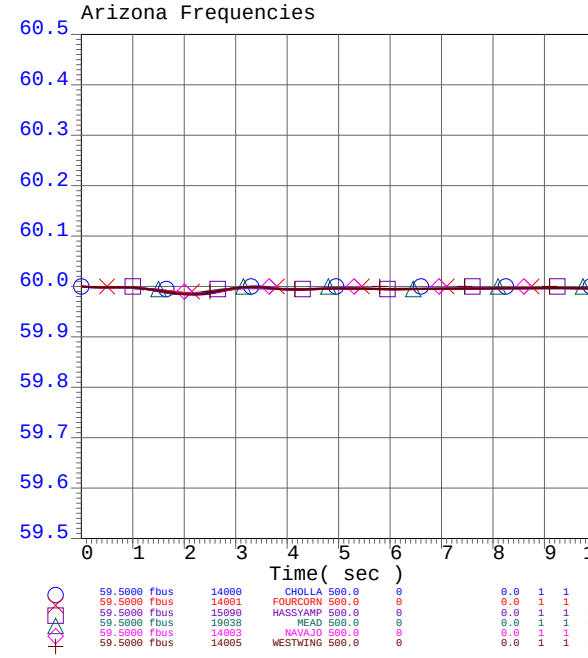
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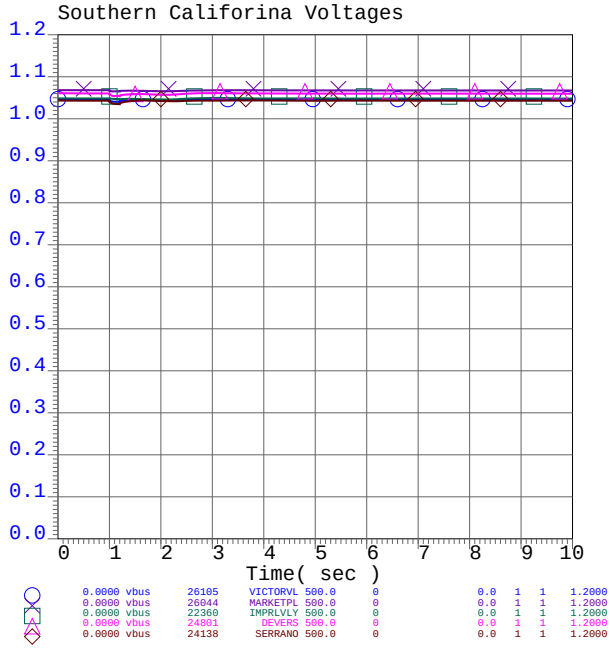


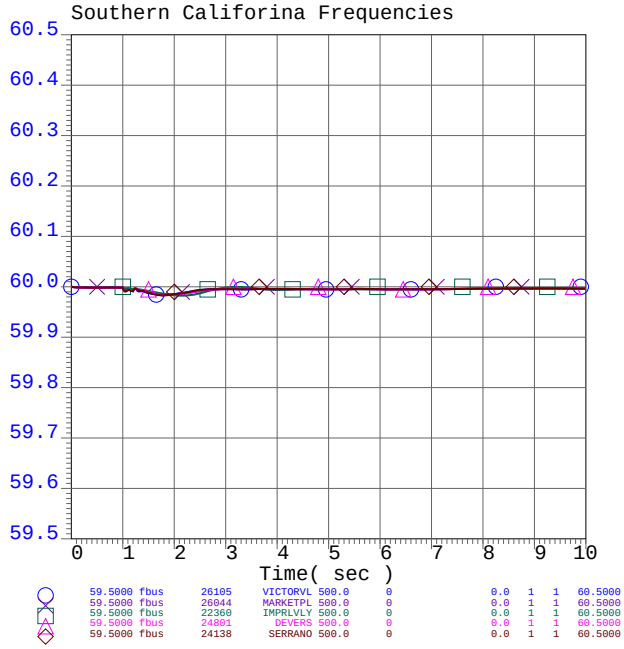
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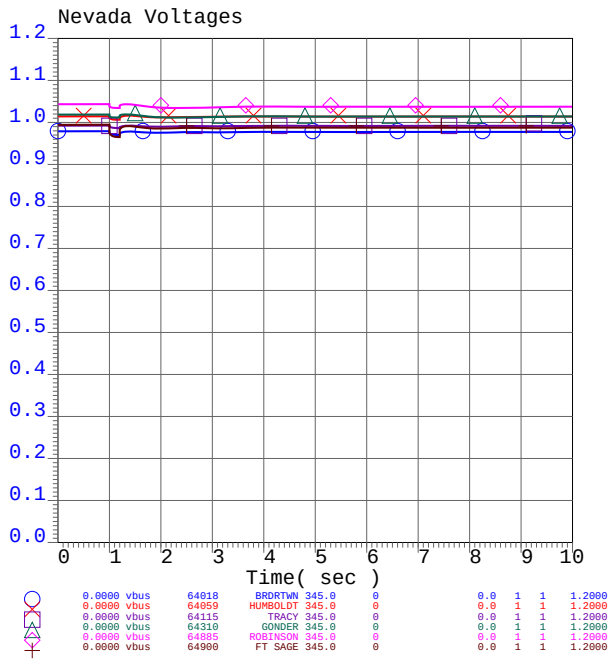


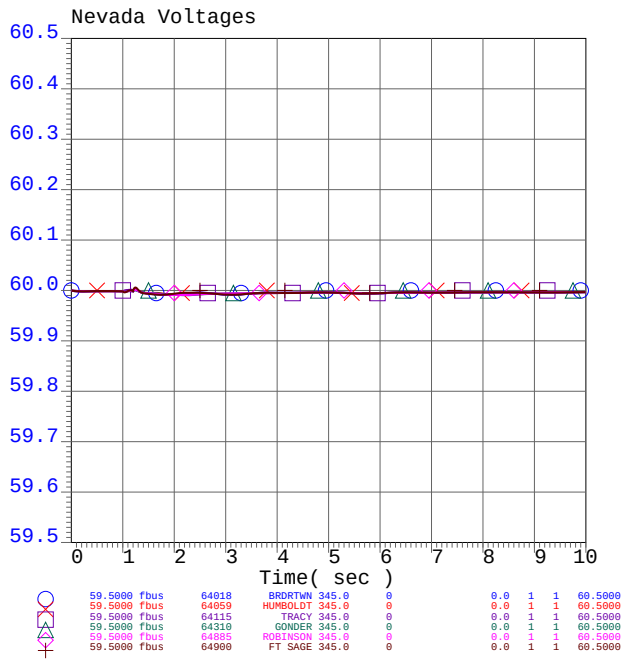
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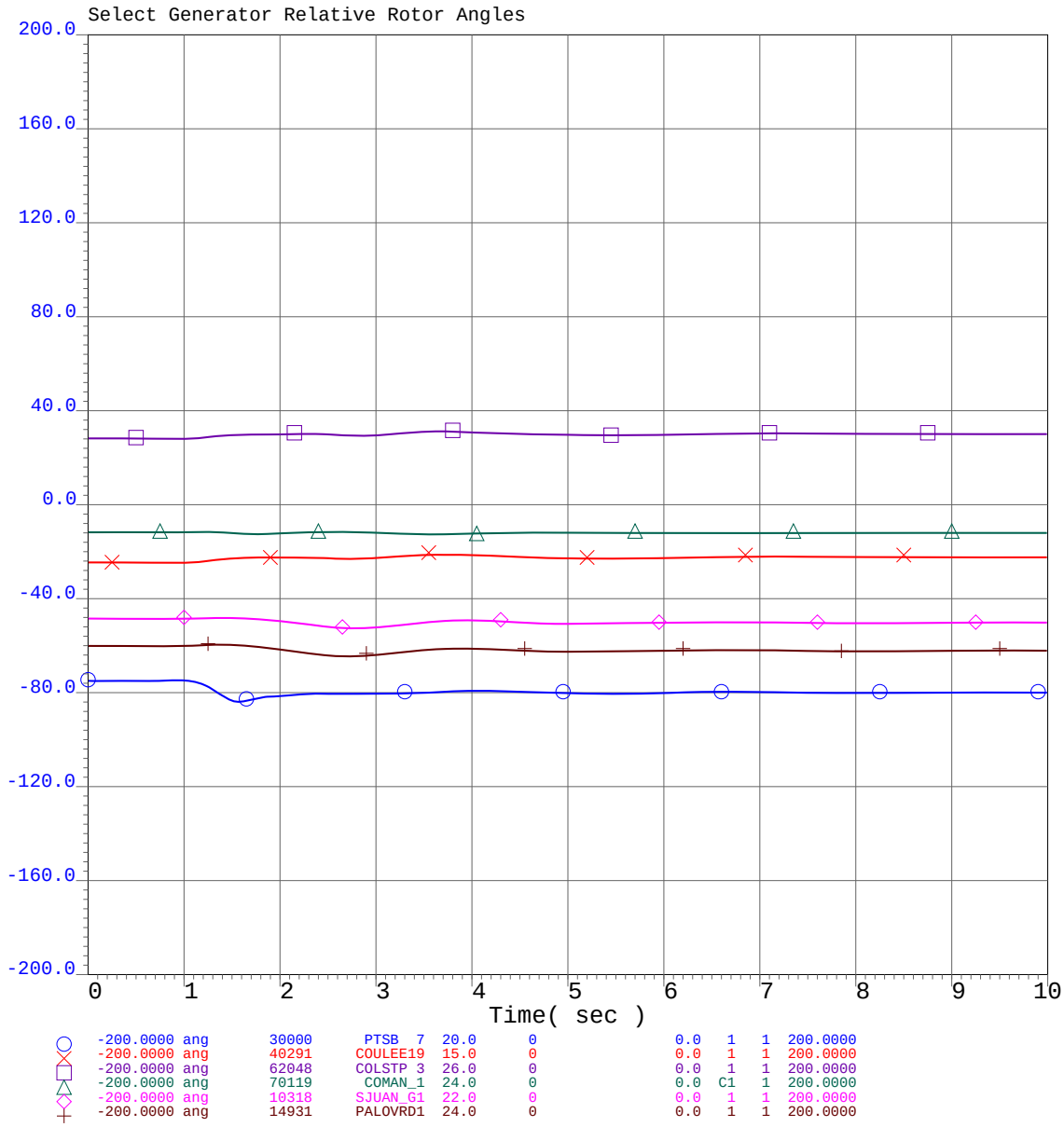






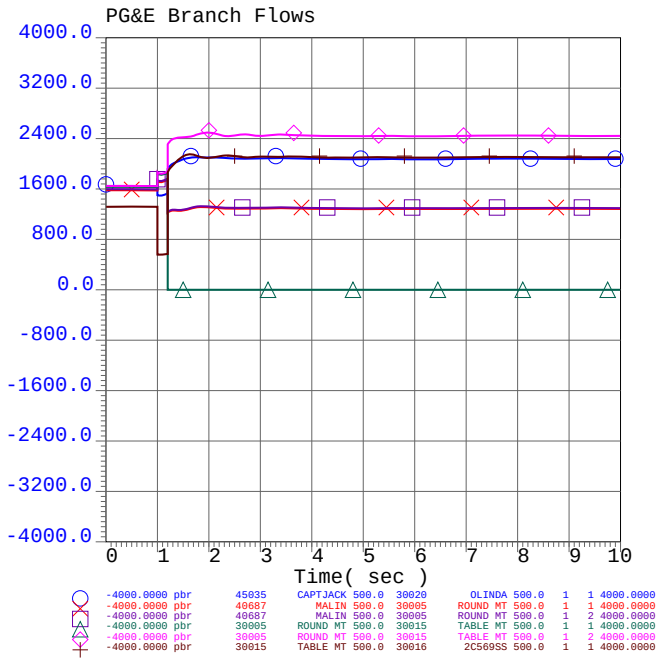
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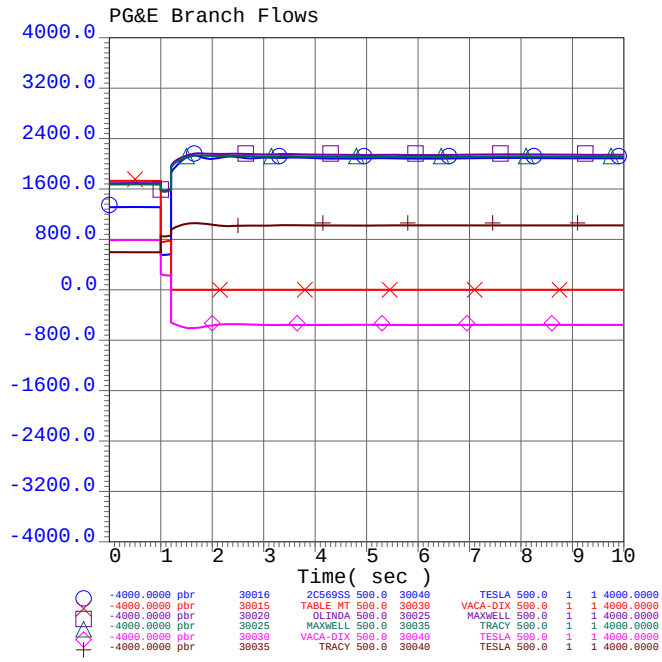
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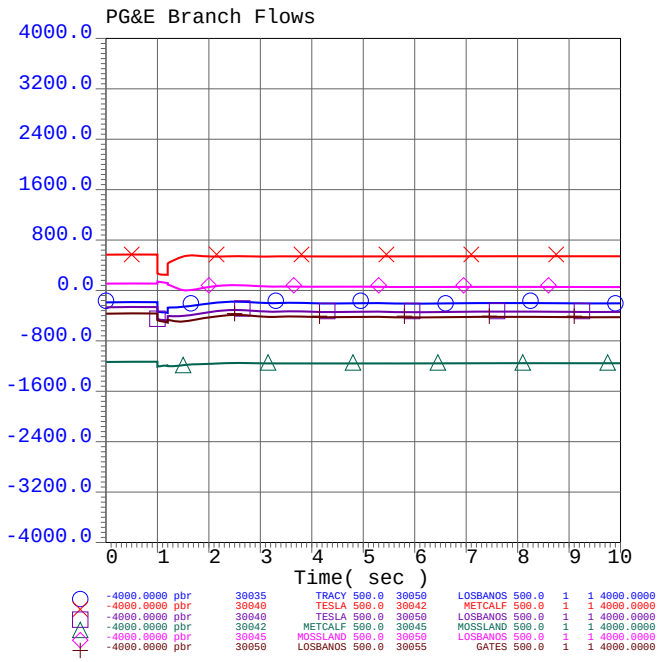


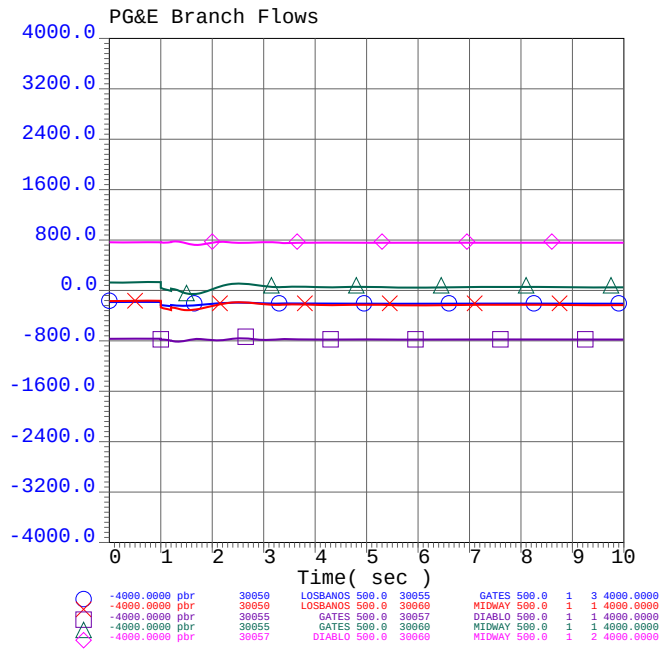
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SELECT BRANCH FLOWS



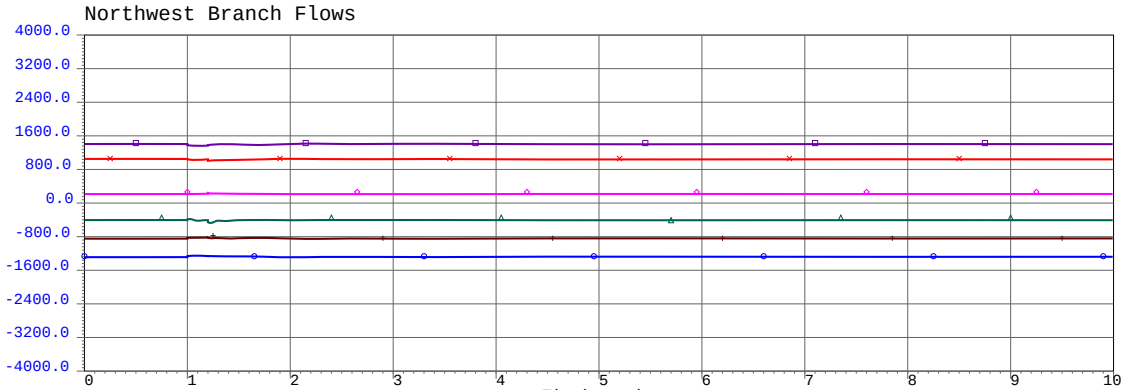




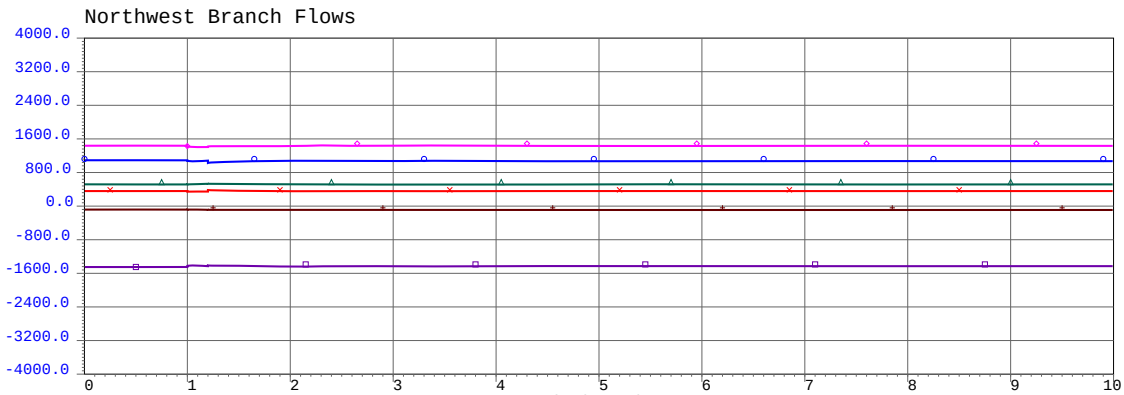


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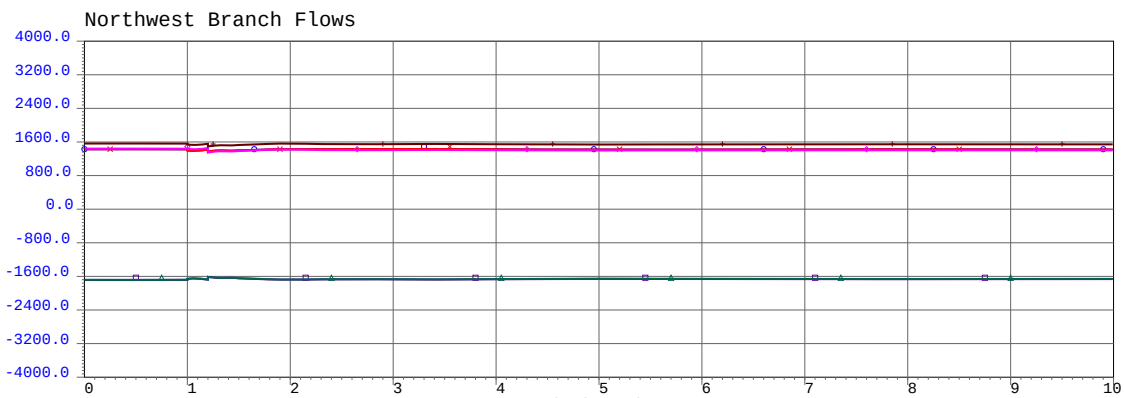
SELECT BRANCH FLOWS



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-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
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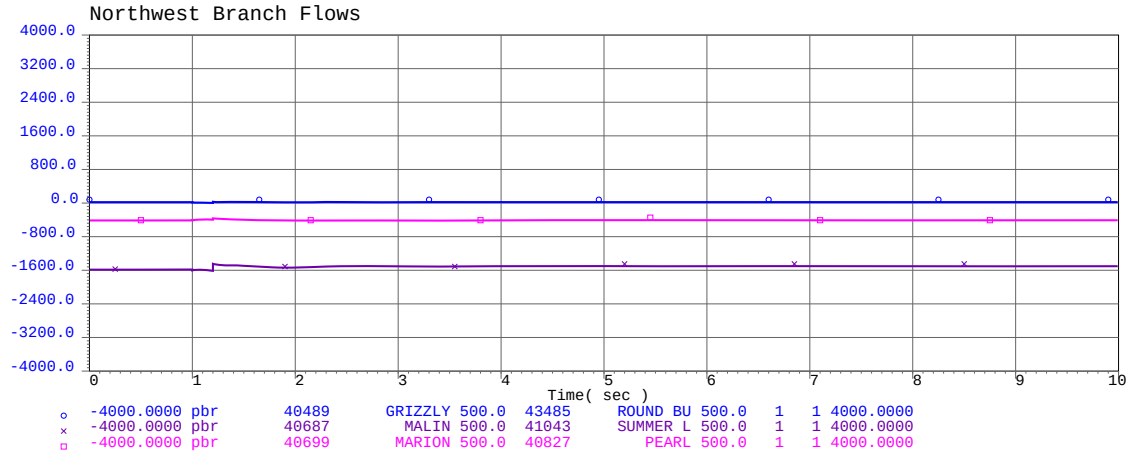
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-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



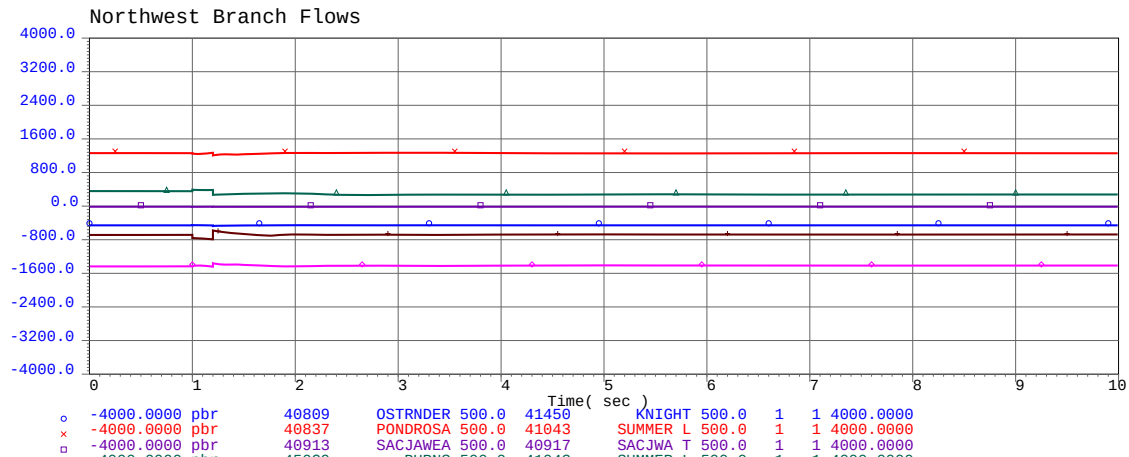
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Table Mountain 500 kV (12 cycle SLG)
followed by loss of Round Mountain-Table Mountain #1 and Table Mountain-V

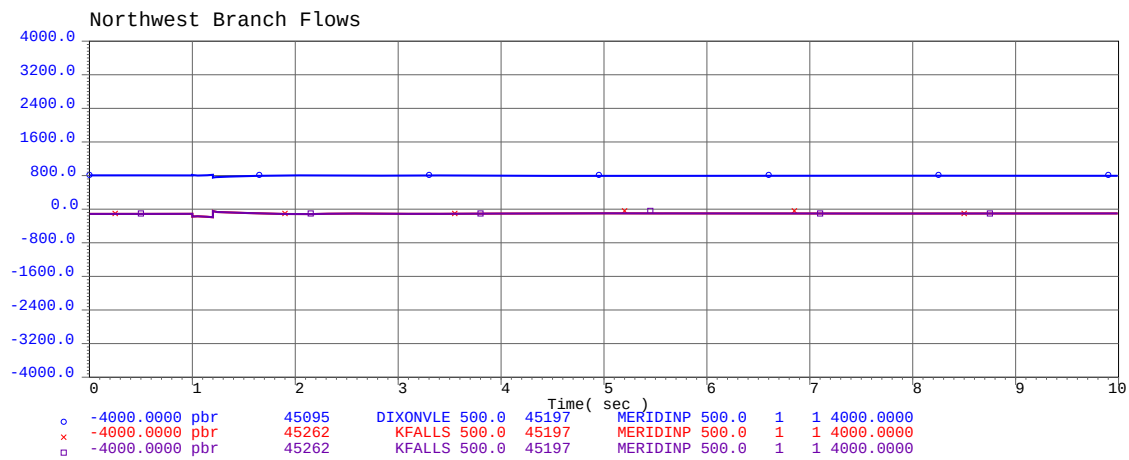
SELECT BRANCH FLOWS



-4000.0000 pbr 40489 GRIZZLY 500.0 43485 ROUND BU 500.0 1 1 4000.0000
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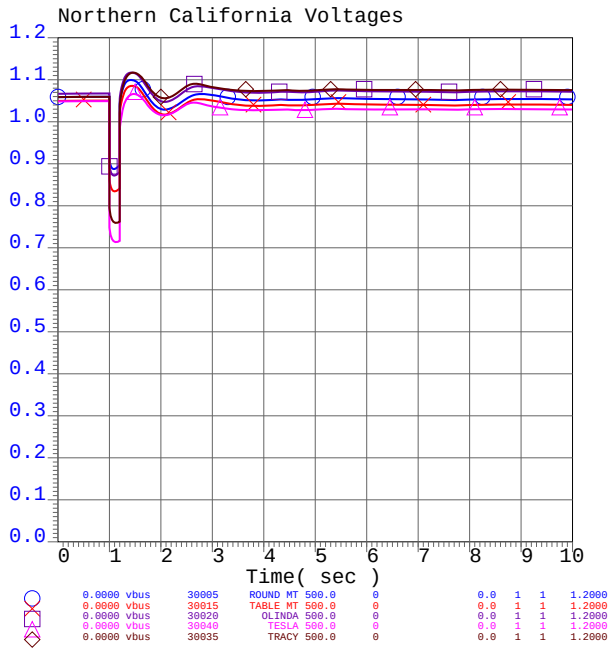
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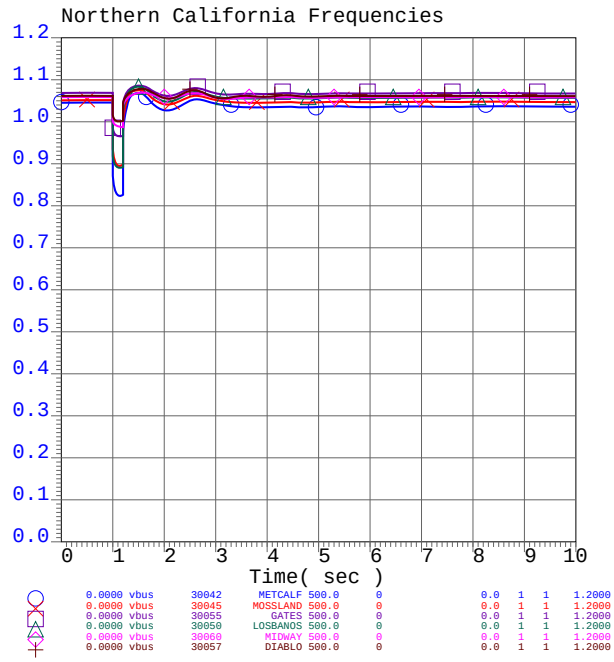


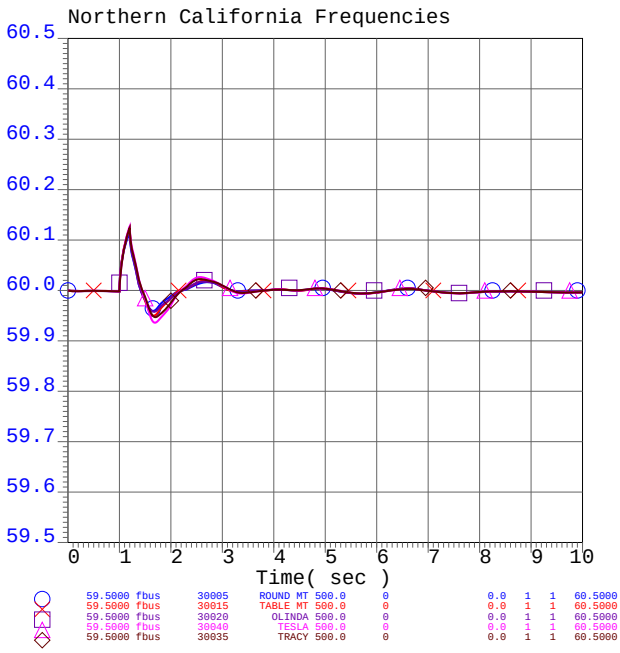
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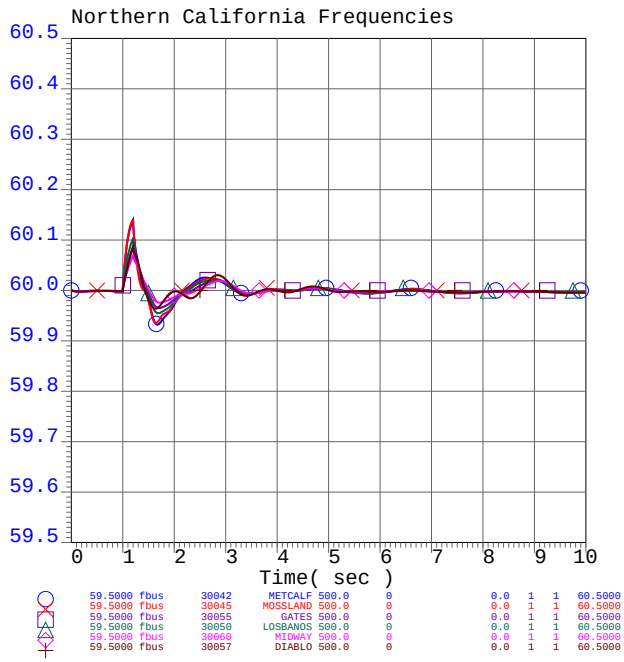
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Table Mountain 500 kV (12 cycle SLG)
followed by loss of Round Mountain-Table Mountain #1 and Table Mountain-V

WECC AREA VOLTAGE AND FREQUENCIES







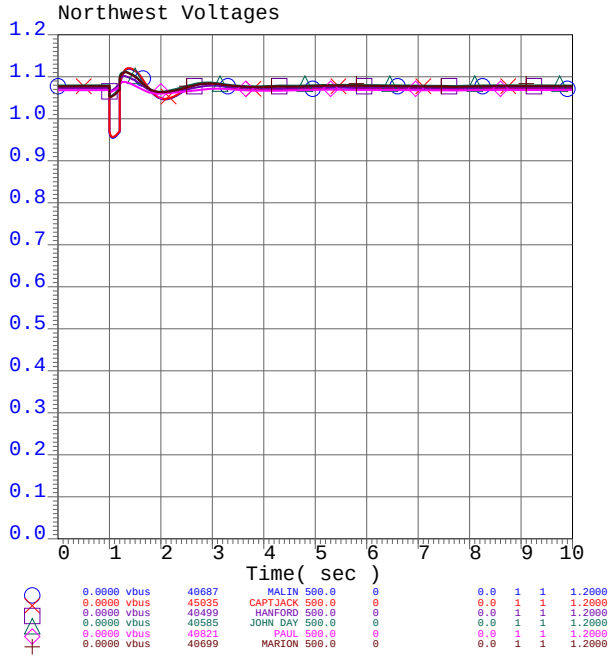


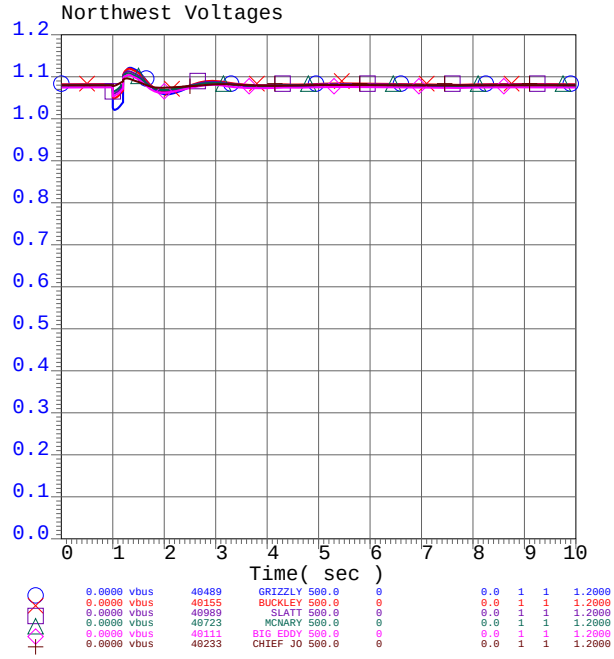
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

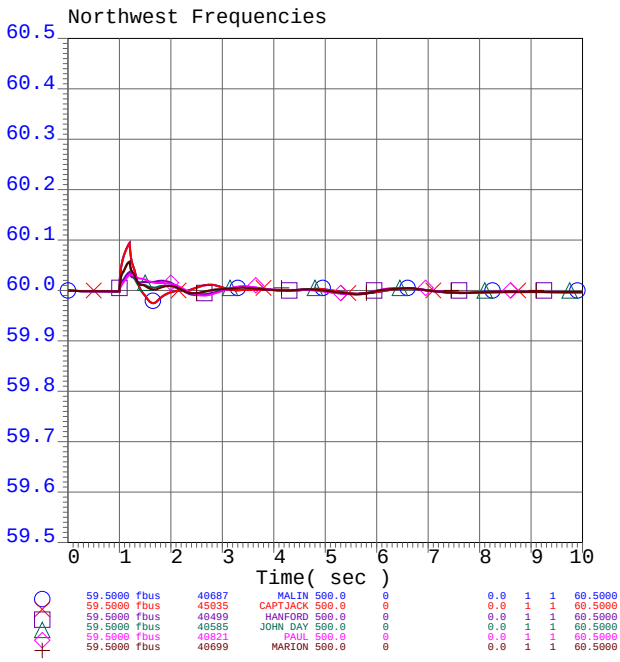
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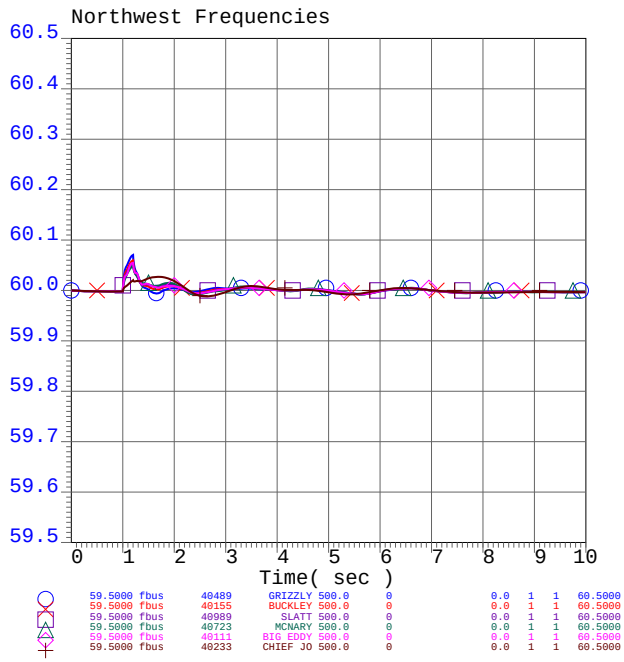
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WECC AREA VOLTAGE AND FREQUENCIES









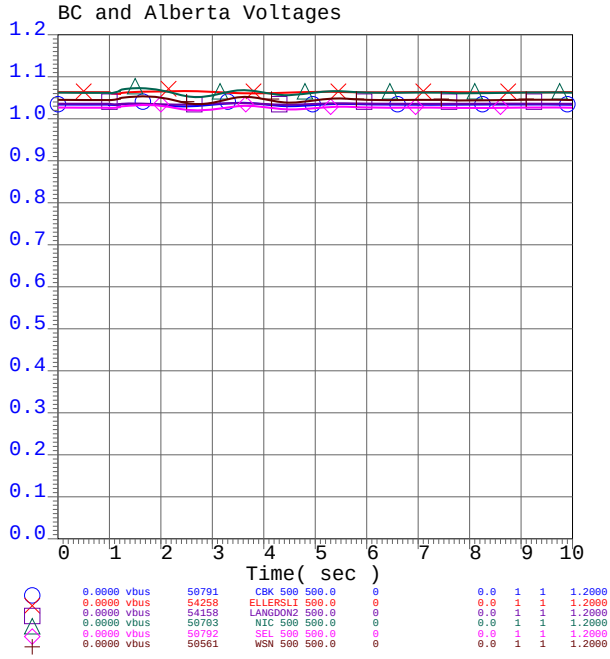
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

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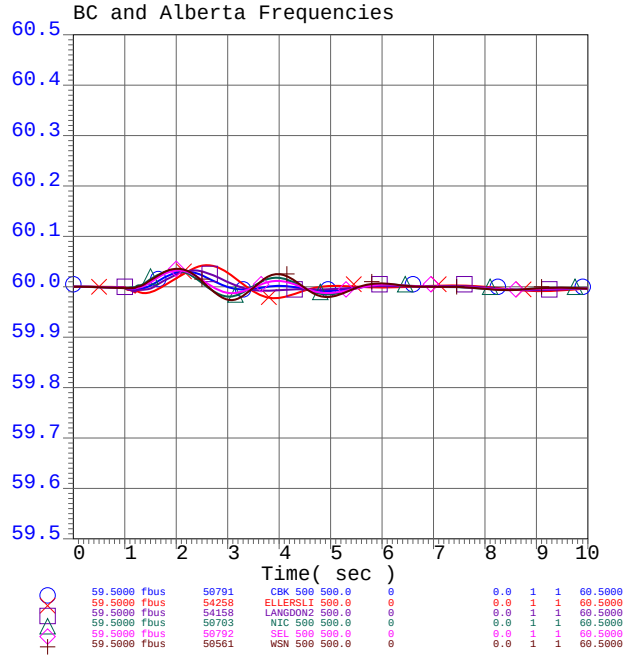
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WECC AREA VOLTAGE AND FREQUENCIES

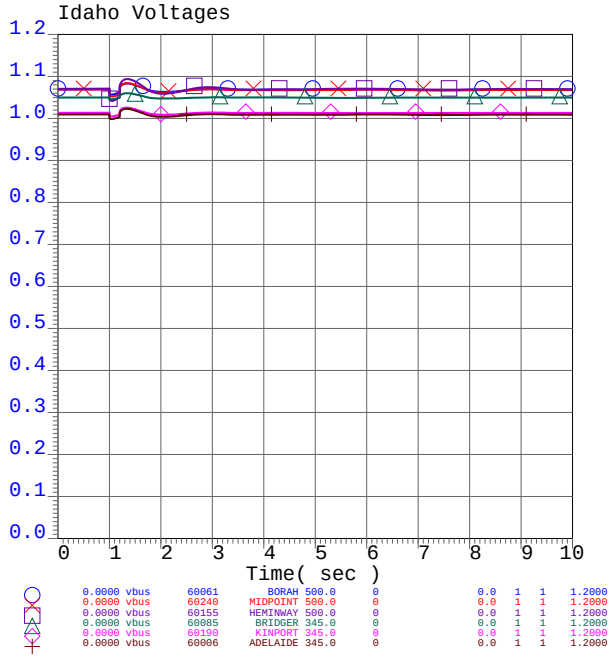
BC and Alberta Voltages



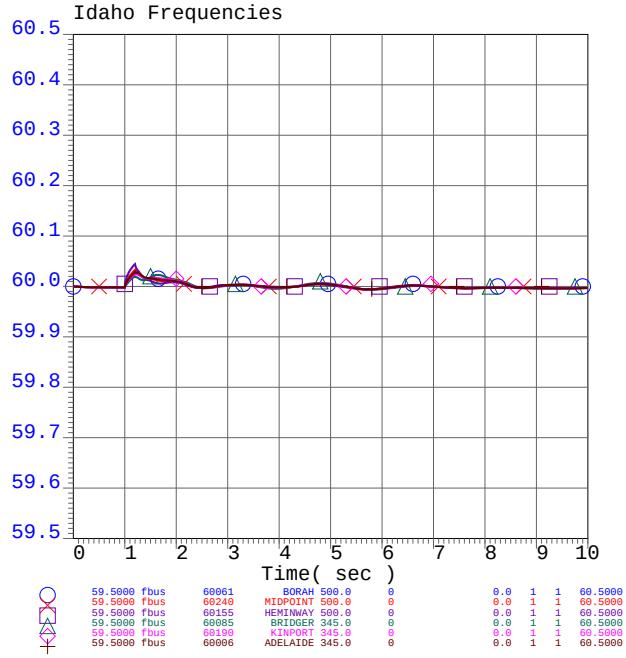
BC and Alberta Frequencies



Idaho Voltages



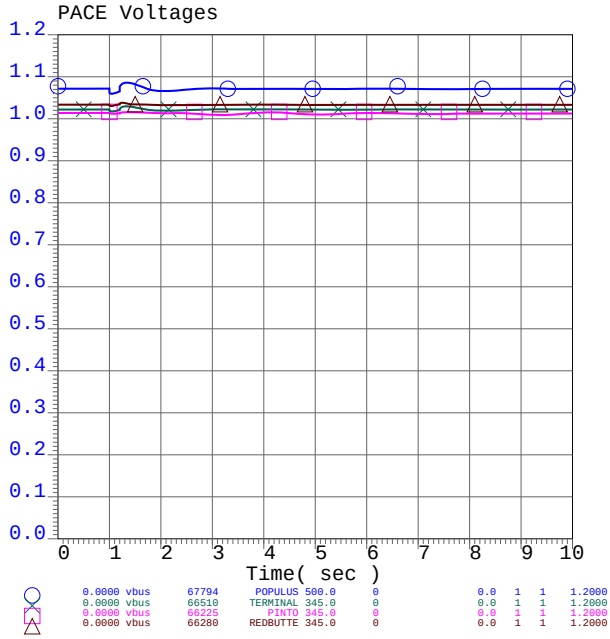
Idaho Frequencies



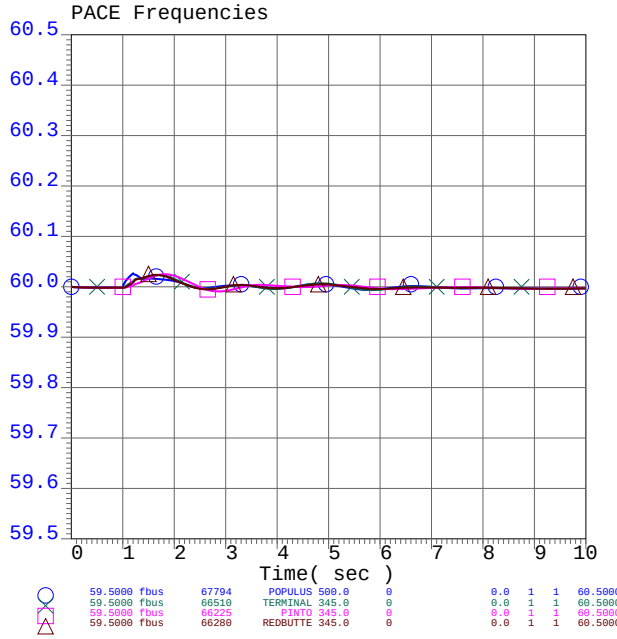
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES

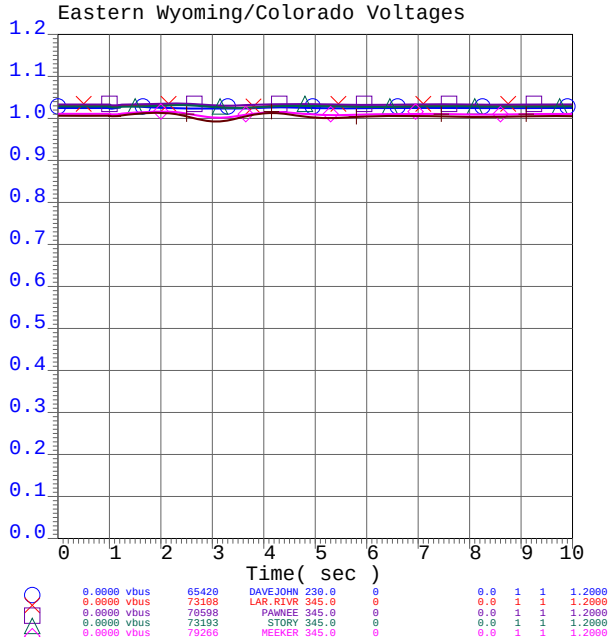
PACE Voltages



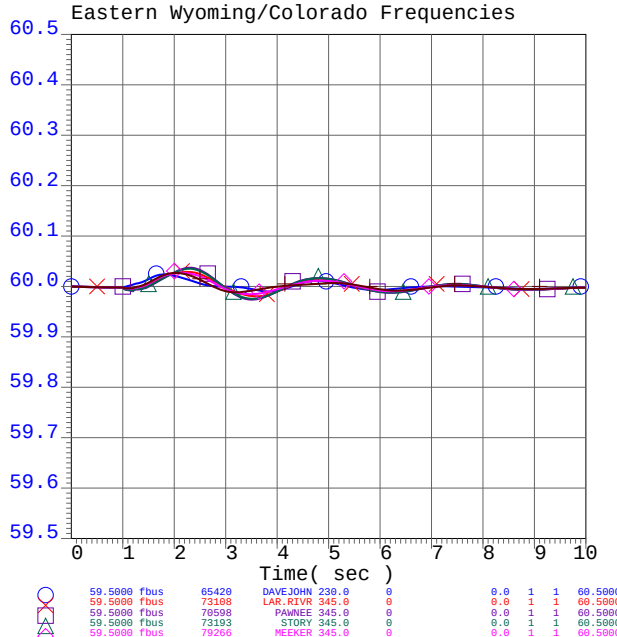
PACE Frequencies



Eastern Wyoming/Colorado Voltages

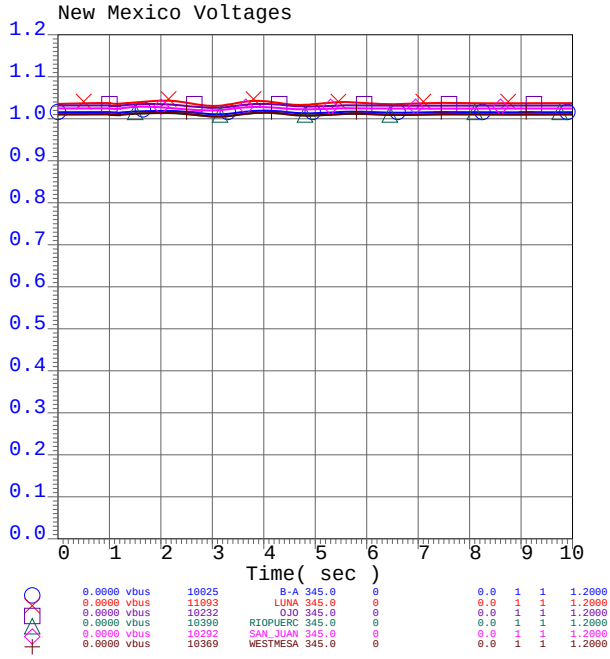


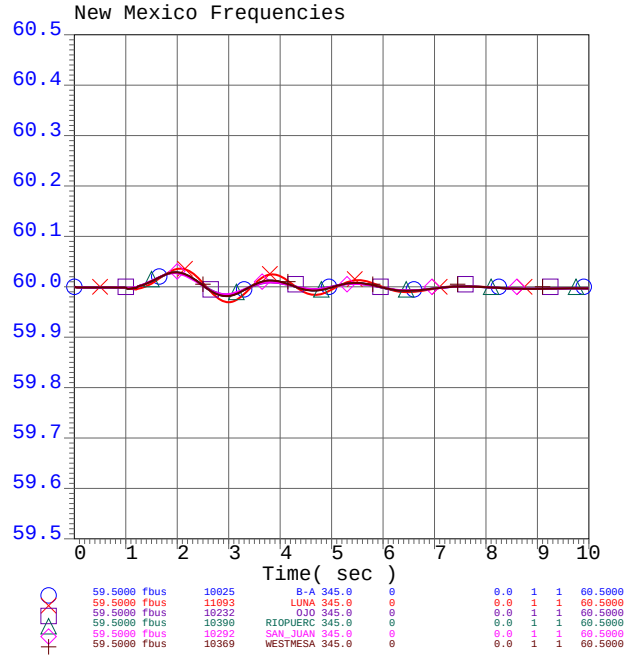
Eastern Wyoming/Colorado Frequencies

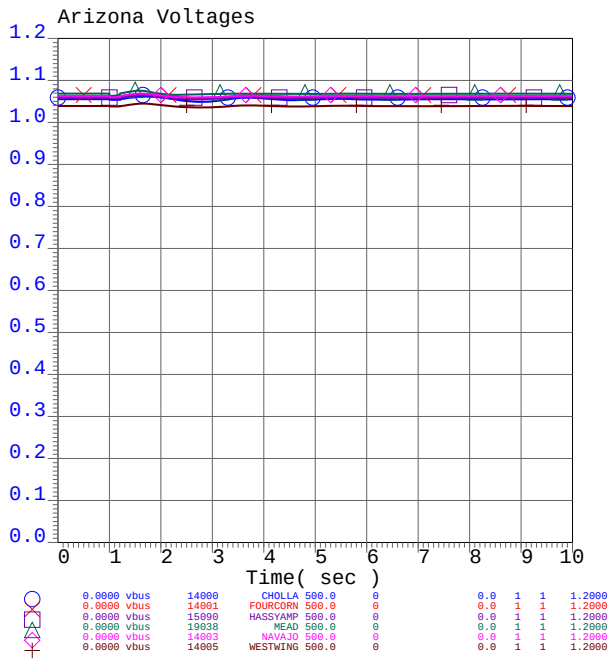


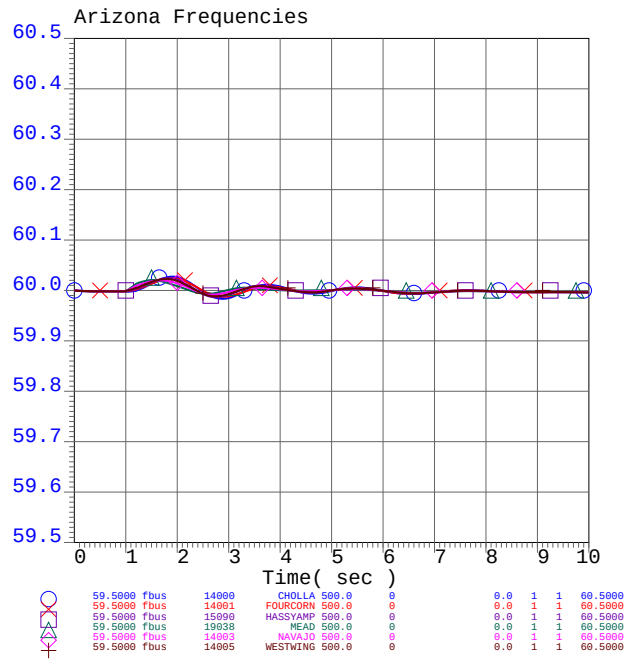
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



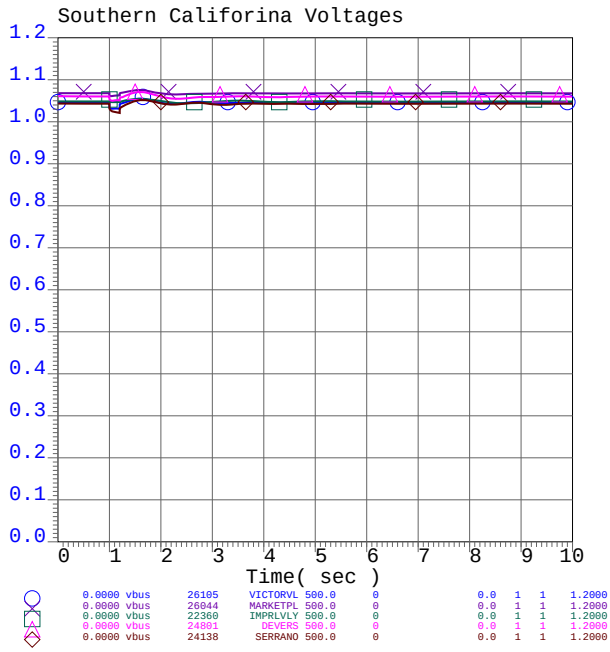


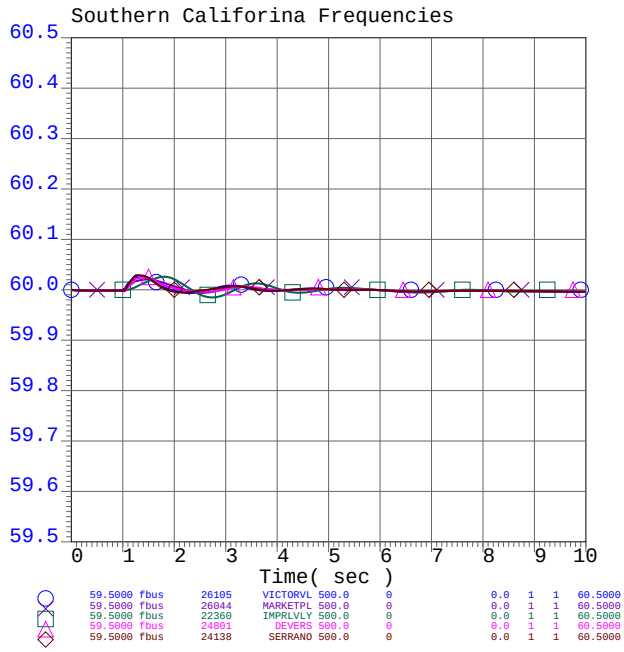


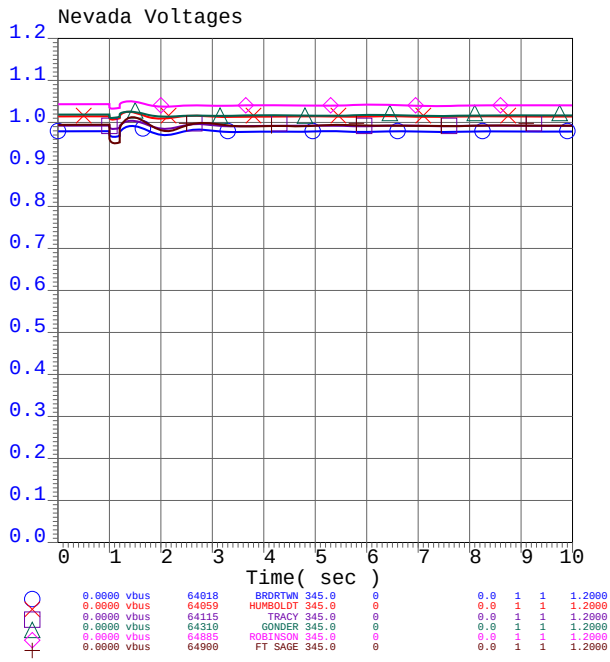


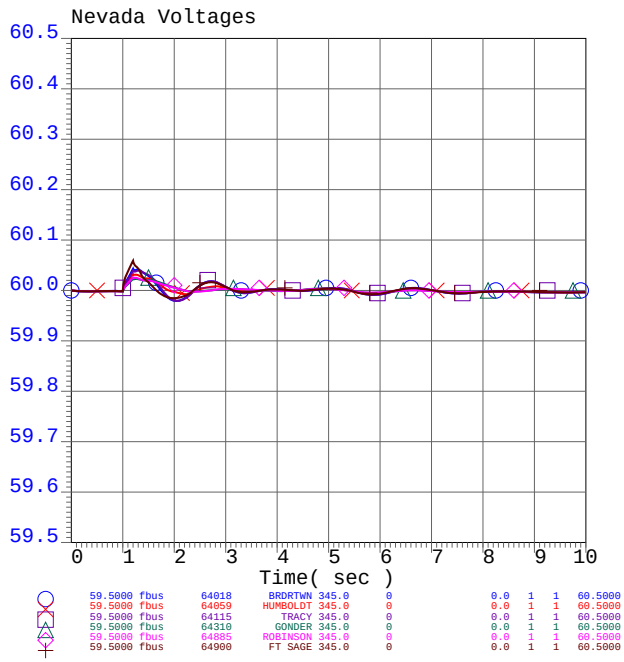
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES



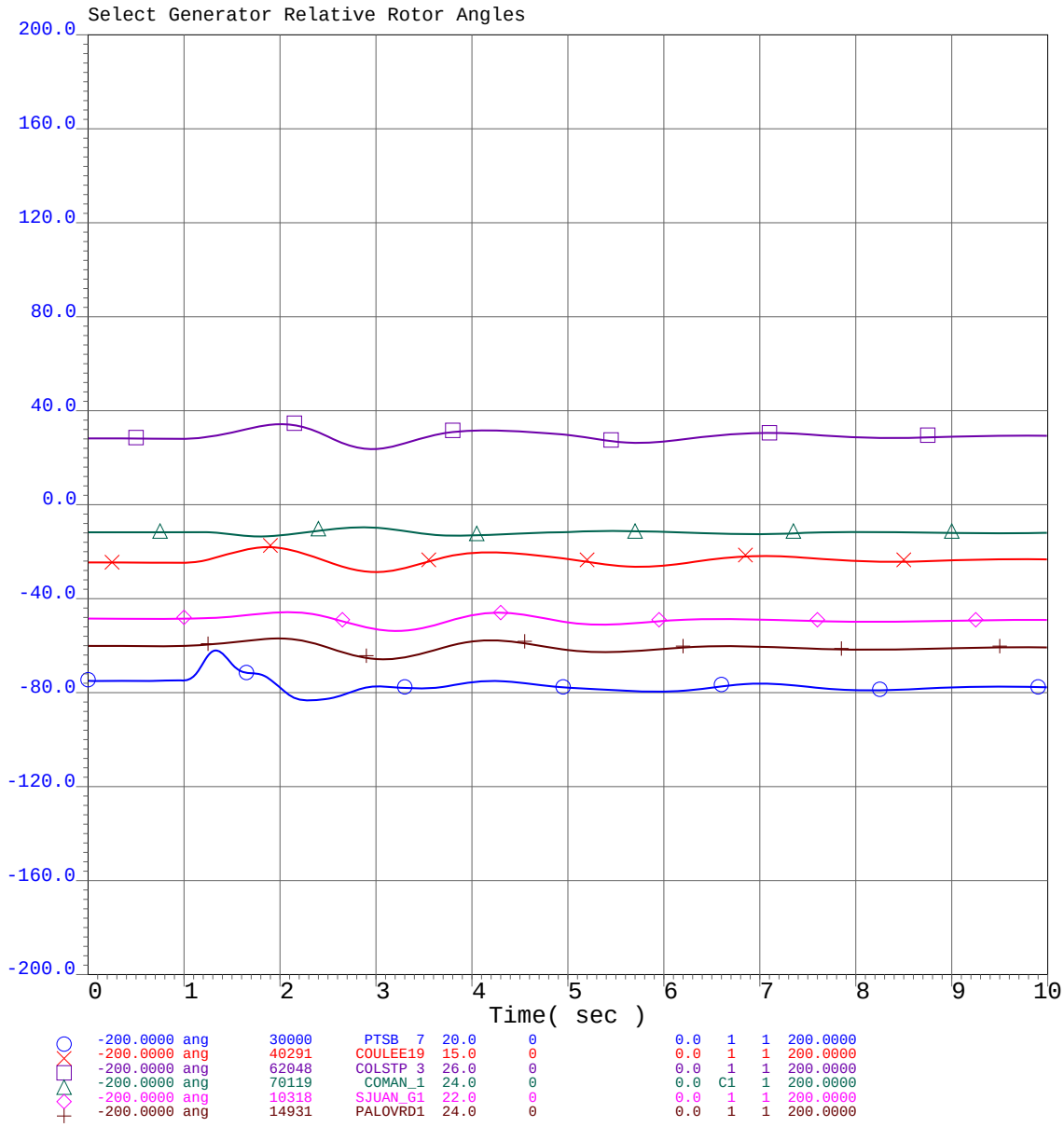






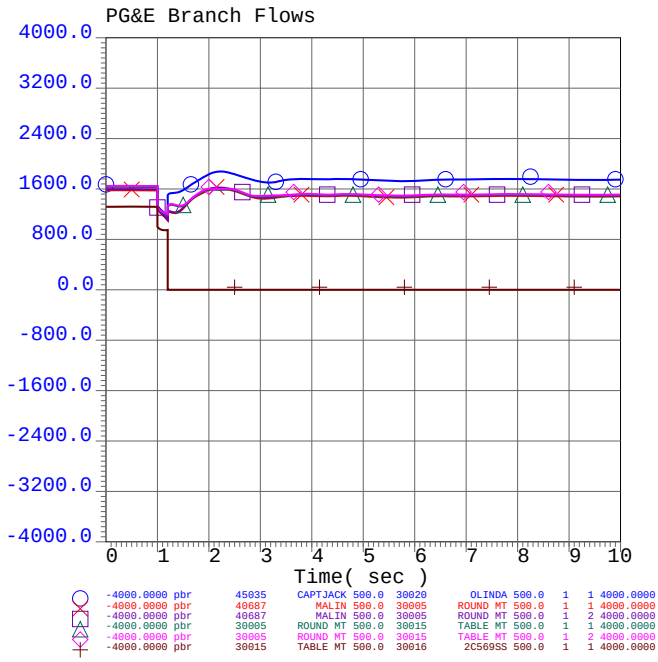
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

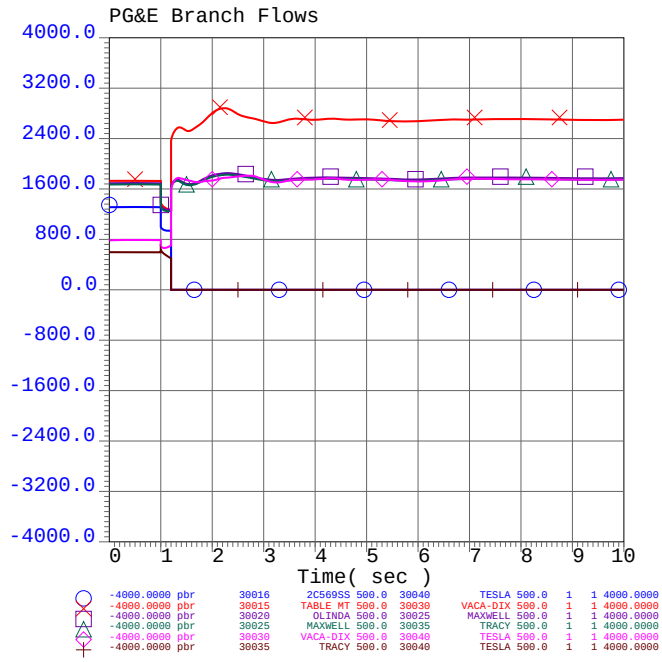
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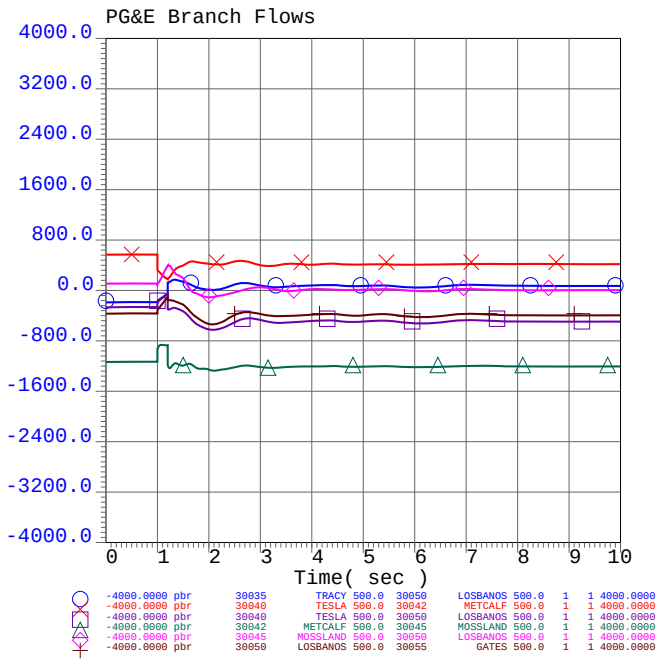


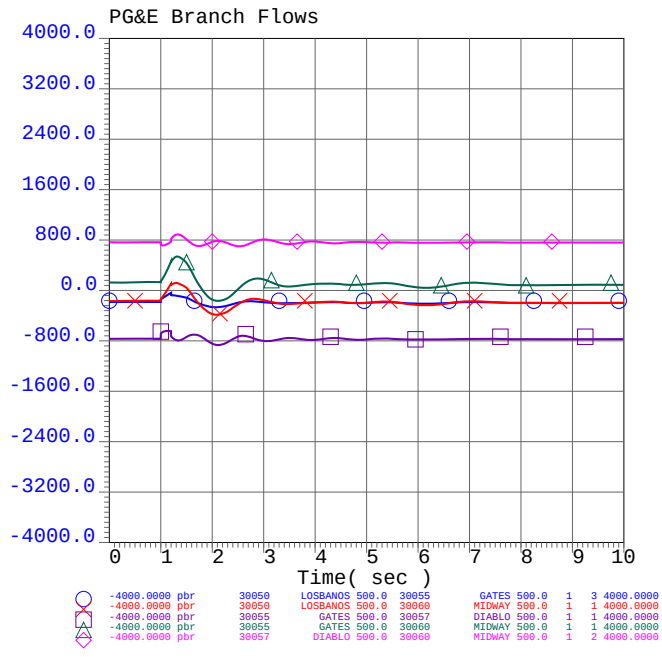
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

SELECT BRANCH FLOWS







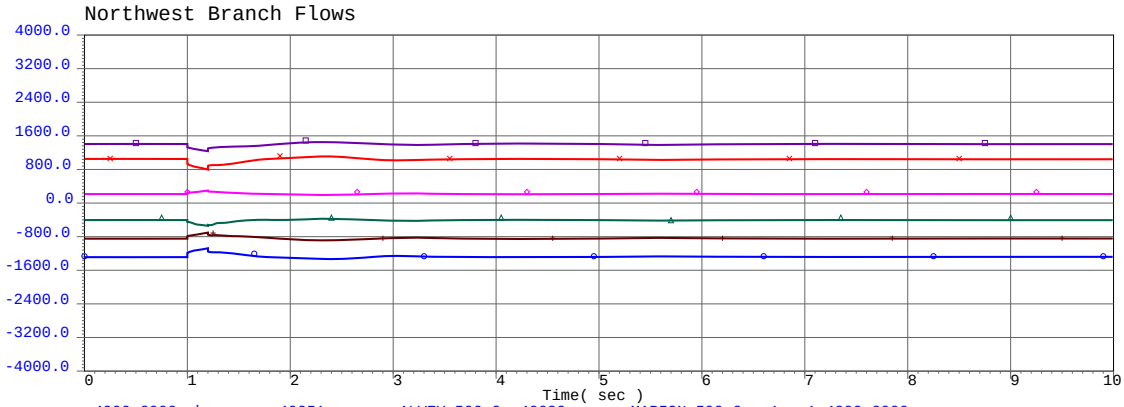


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

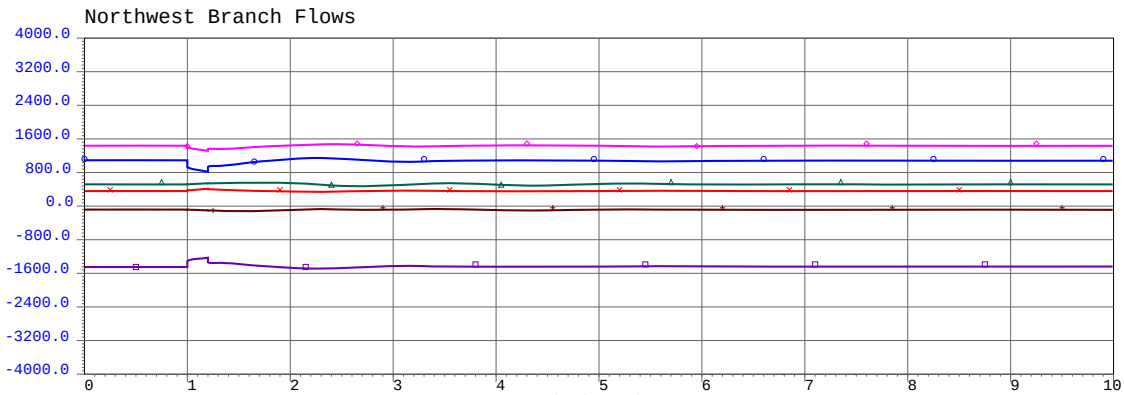
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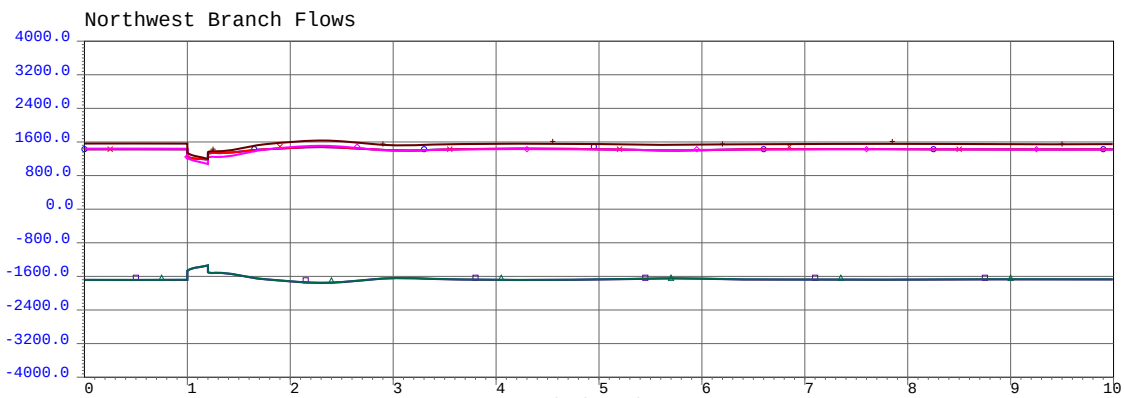
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
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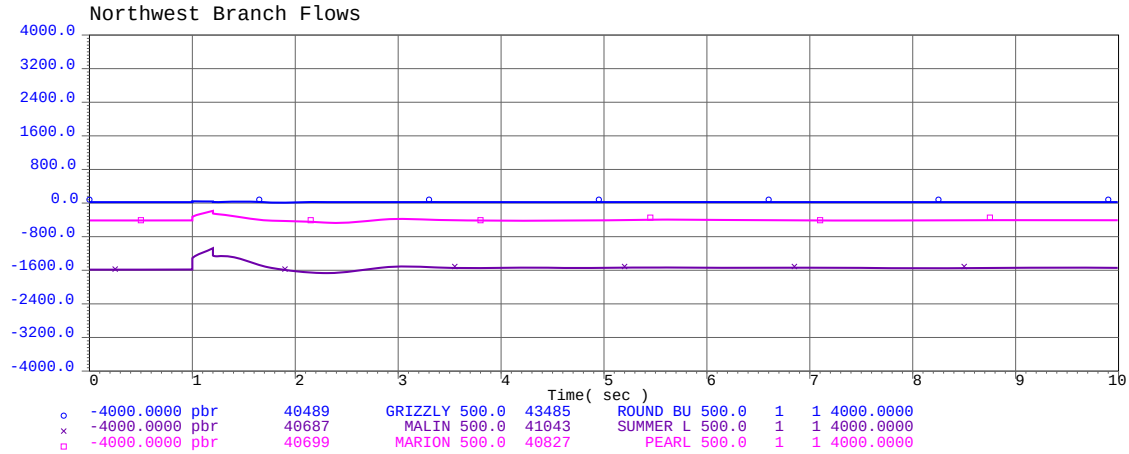
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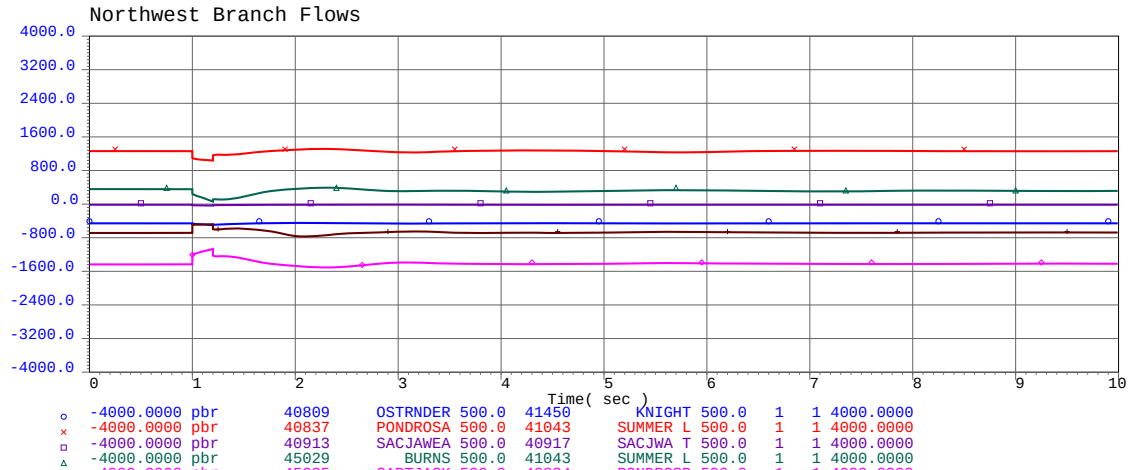
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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Stuck Breaker at Tesla 500 kV (12 cycle SLG)
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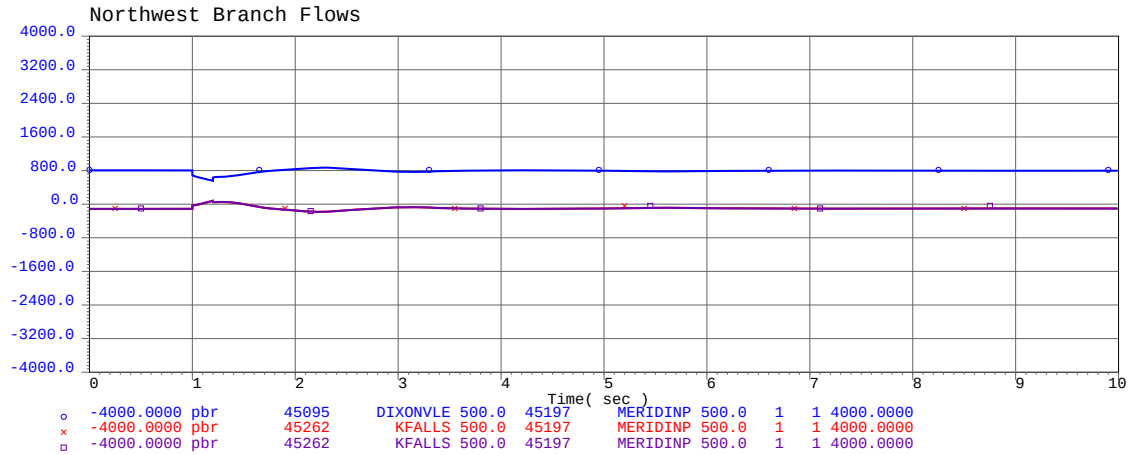
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



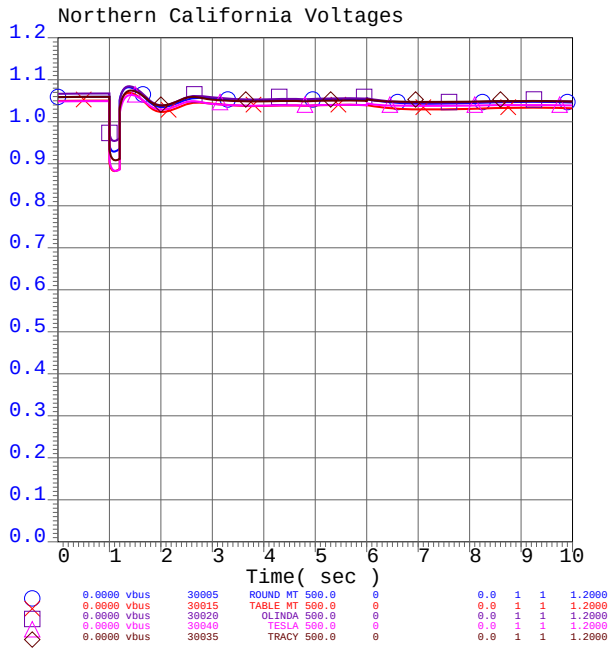
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-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

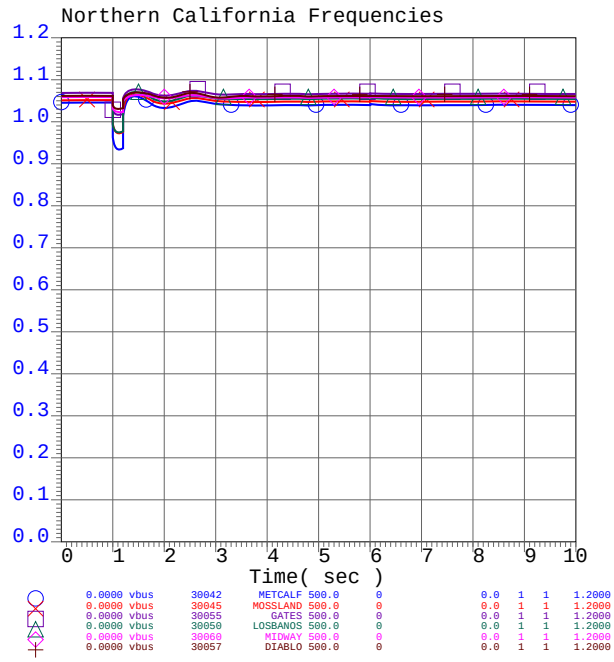


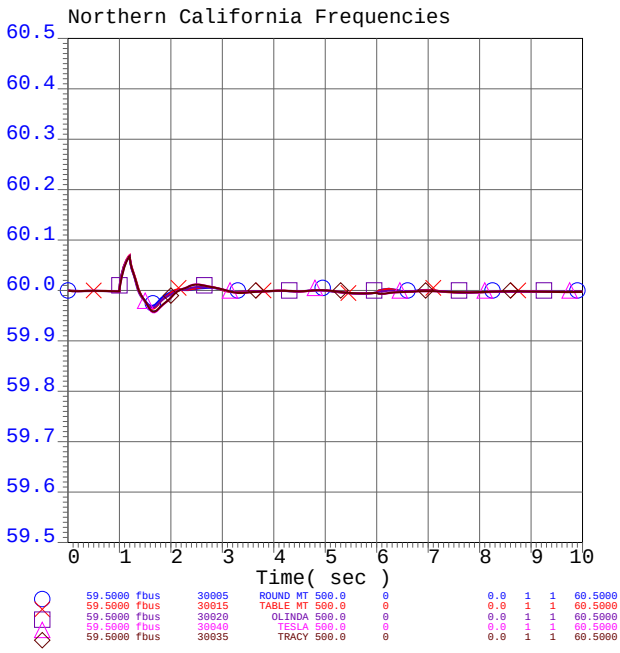
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

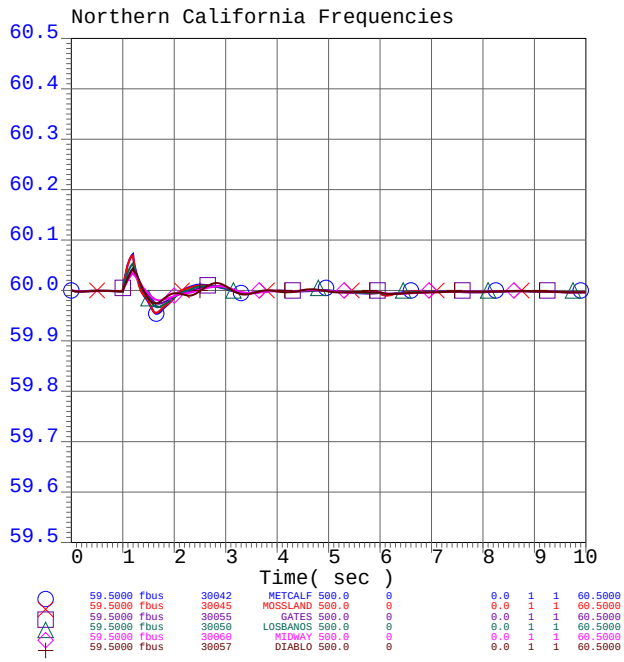
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Tesla 500 kV (12 cycle SLG)
followed by loss of Tesla-C0569SS and Tesla-Tracy 500 kV lines

WECC AREA VOLTAGE AND FREQUENCIES







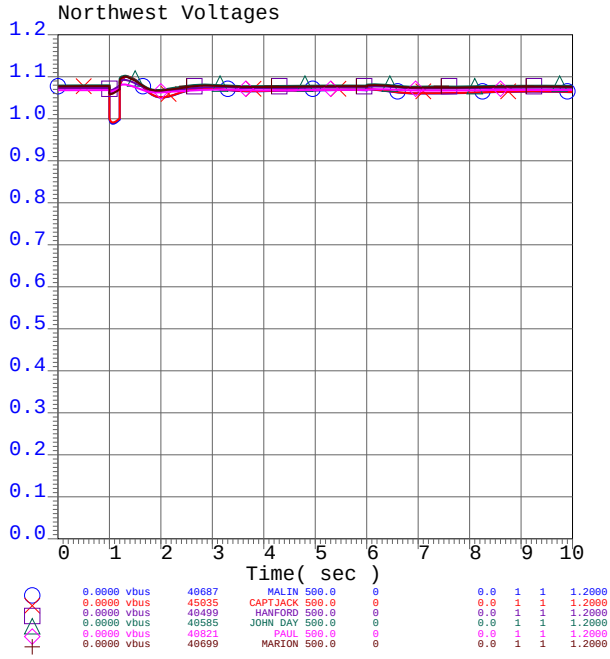


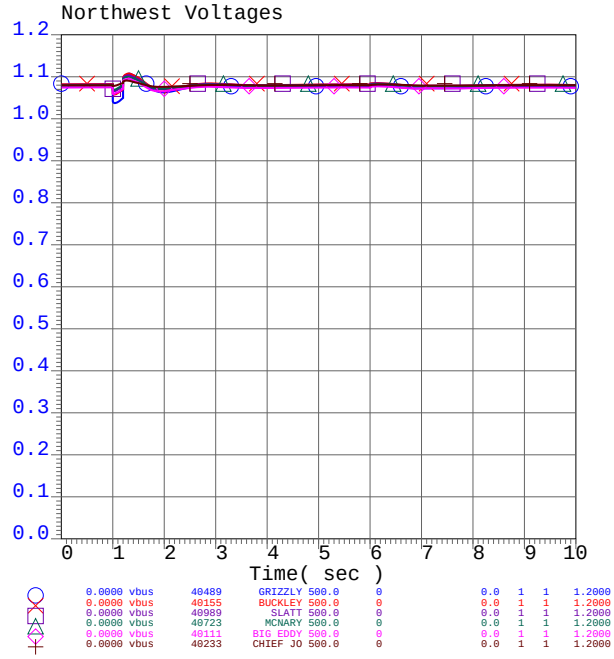
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

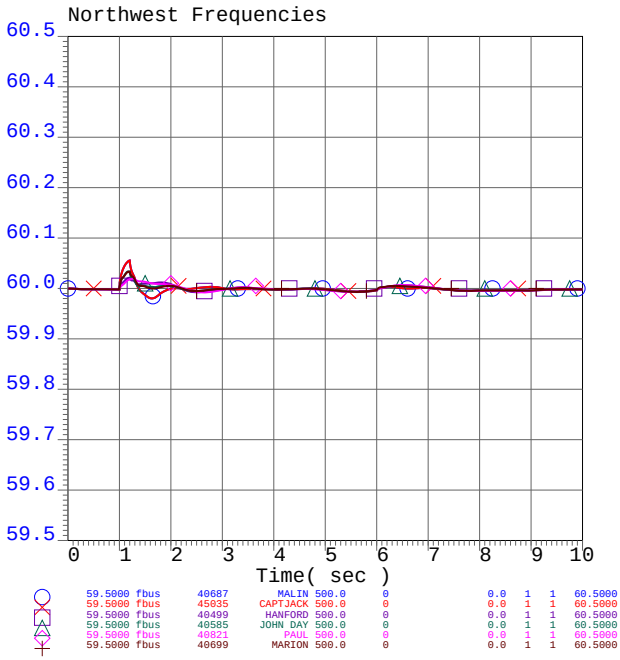
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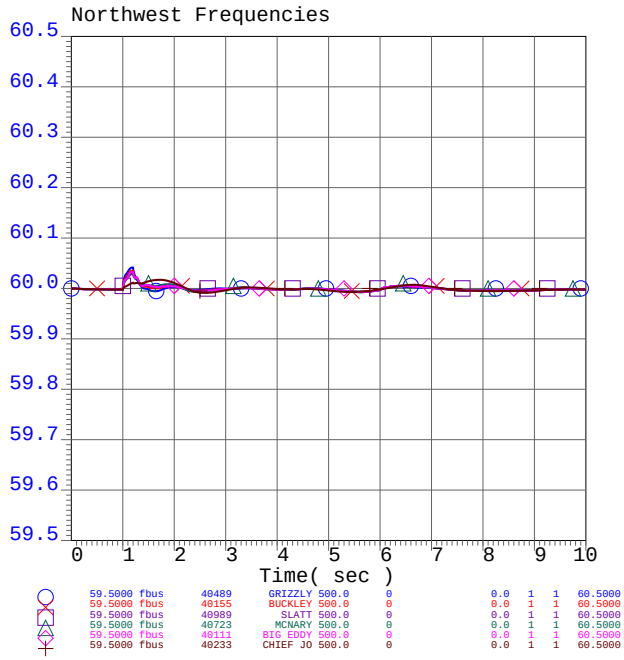
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WECC AREA VOLTAGE AND FREQUENCIES









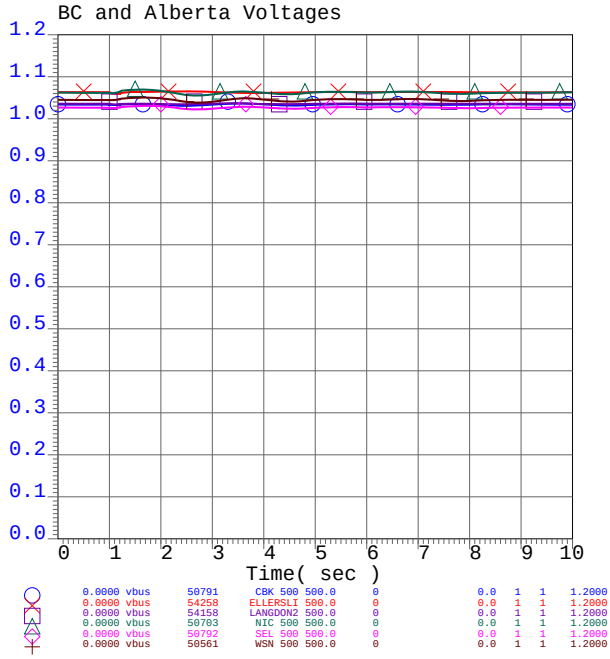
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt73_c8_vaca-tbmt_vacaxfmr-500kVsumpk.chf

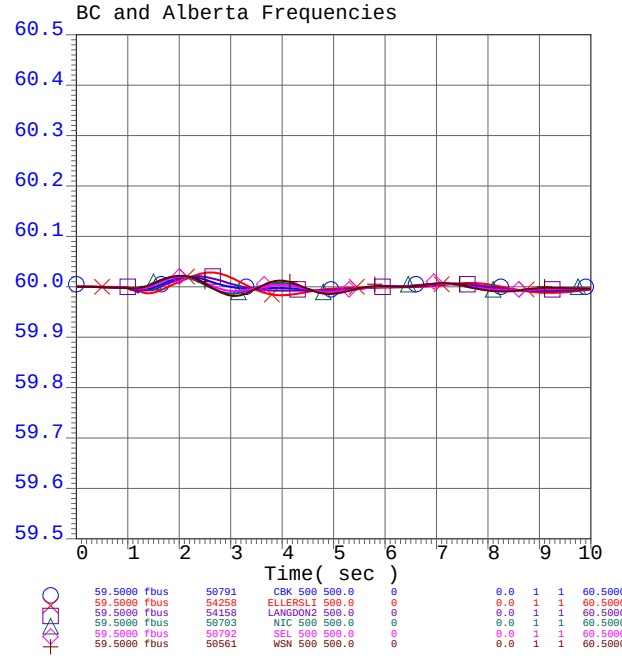
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WECC AREA VOLTAGE AND FREQUENCIES

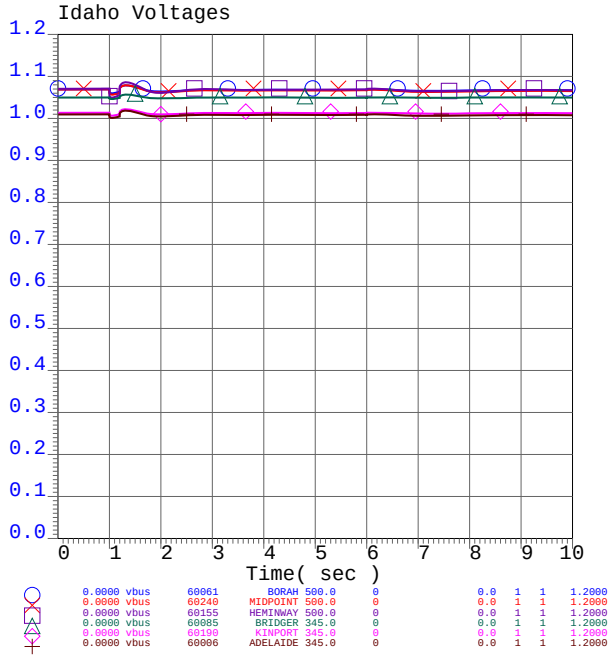
BC and Alberta Voltages



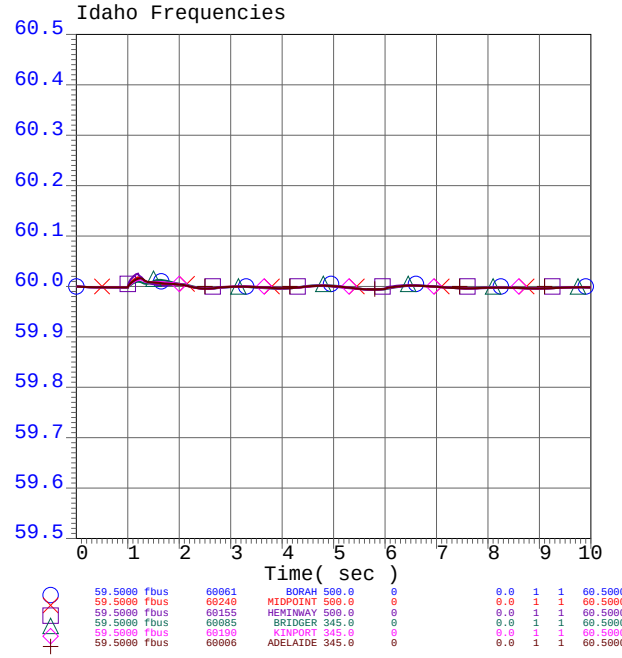
BC and Alberta Frequencies



Idaho Voltages



Idaho Frequencies

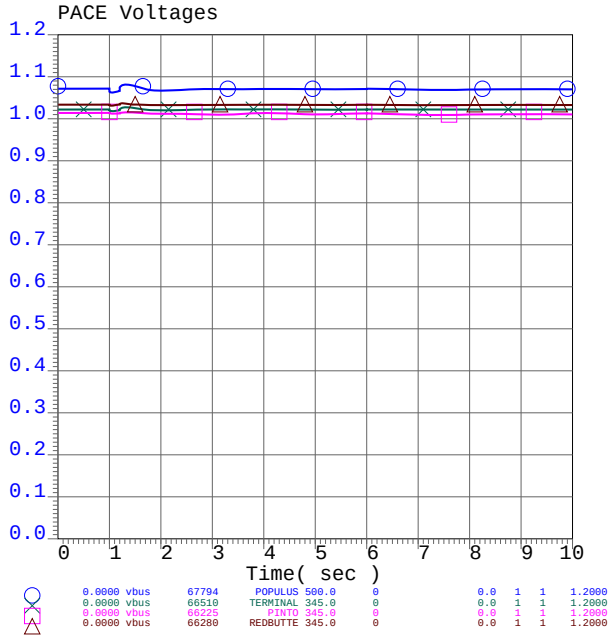


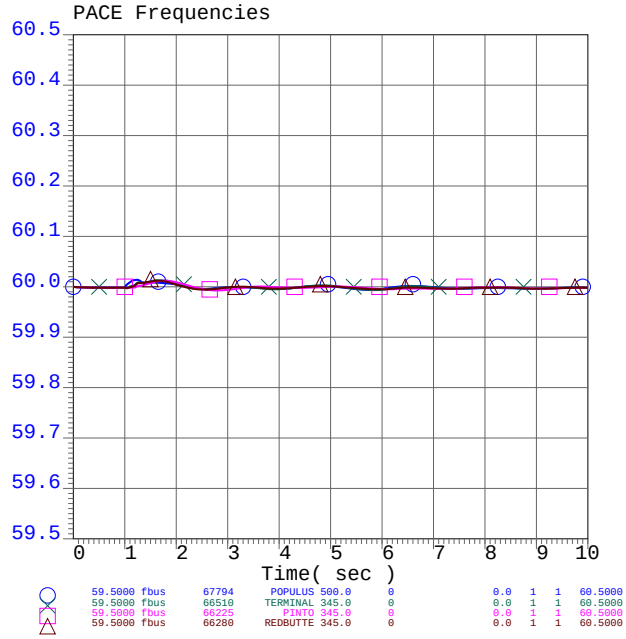
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

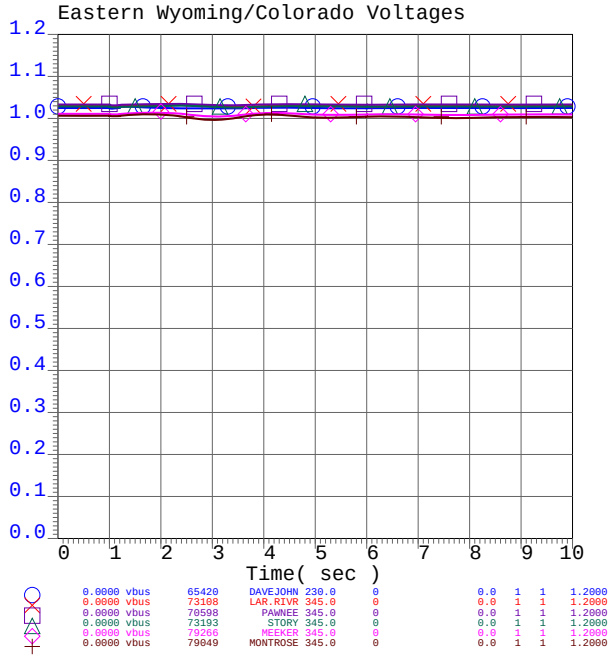
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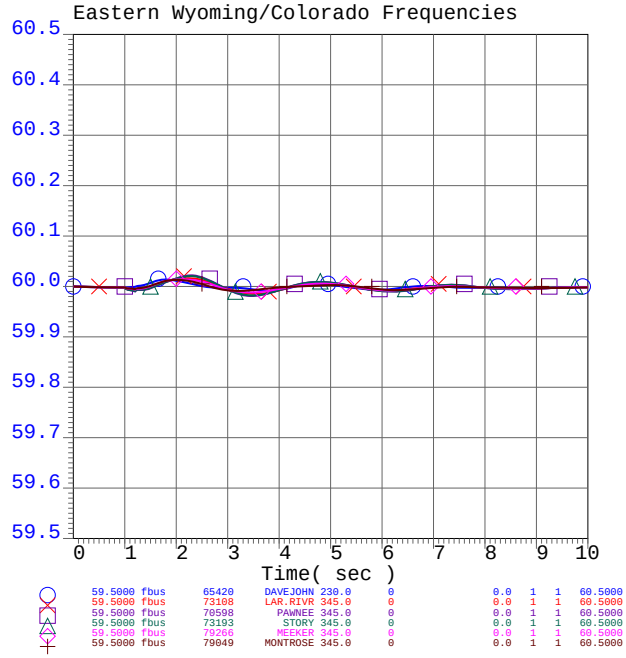
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WECC AREA VOLTAGE AND FREQUENCIES





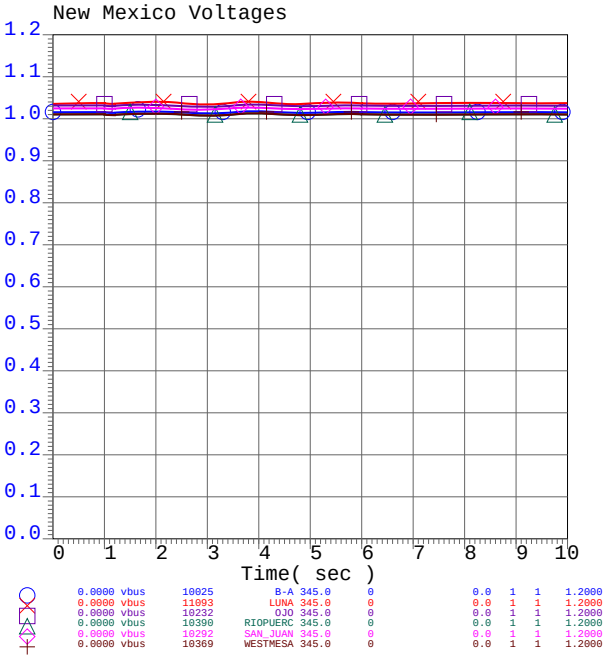




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

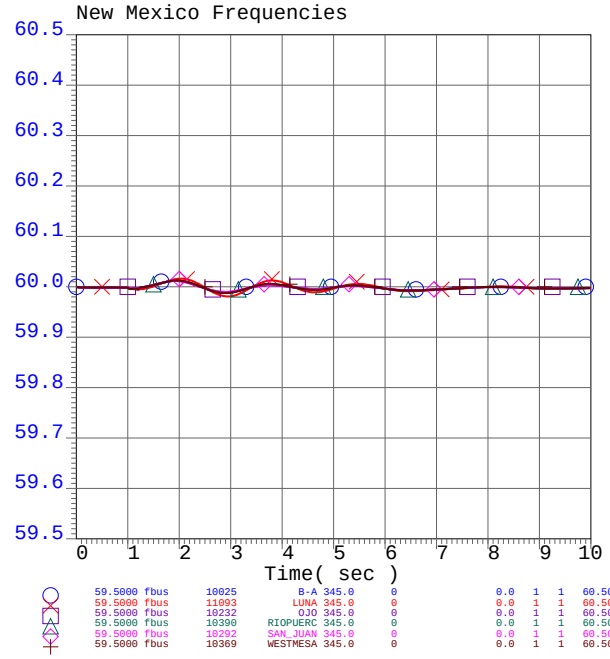
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



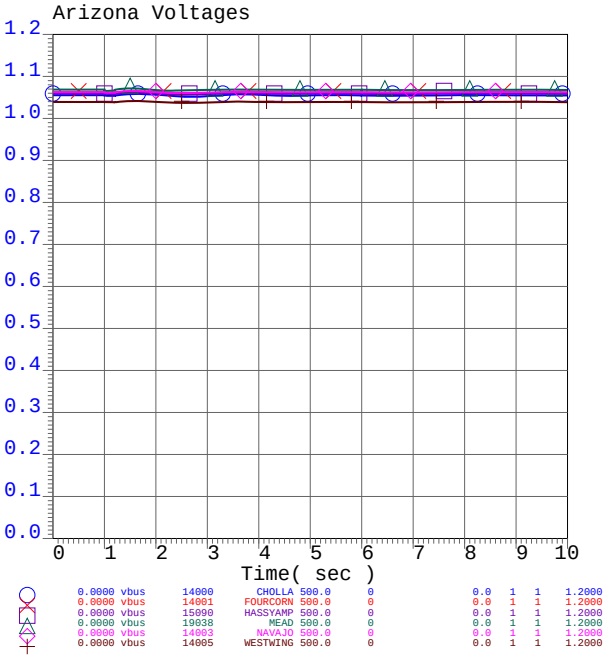
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0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



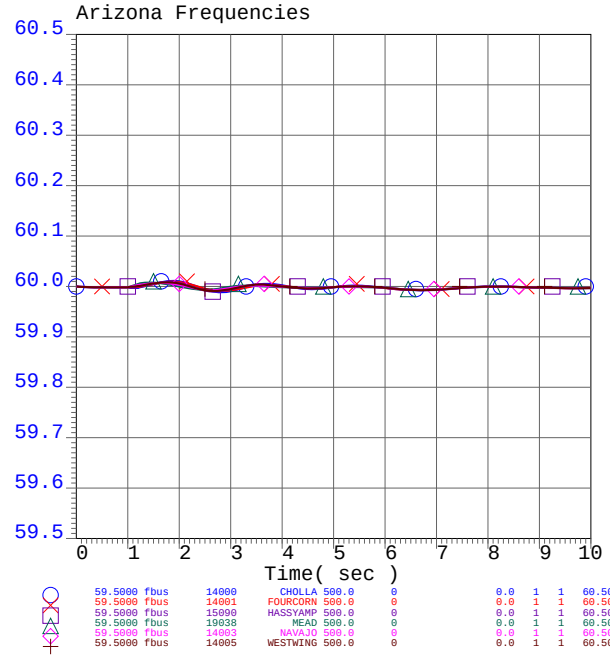
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

Arizona Frequencies



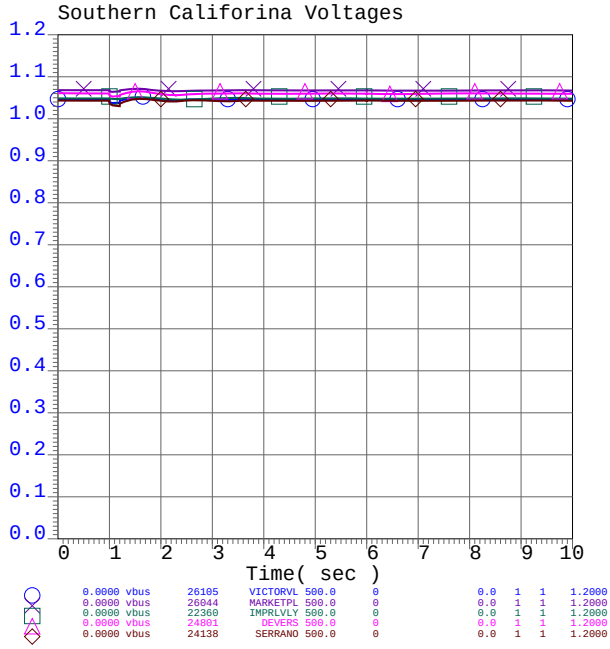
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

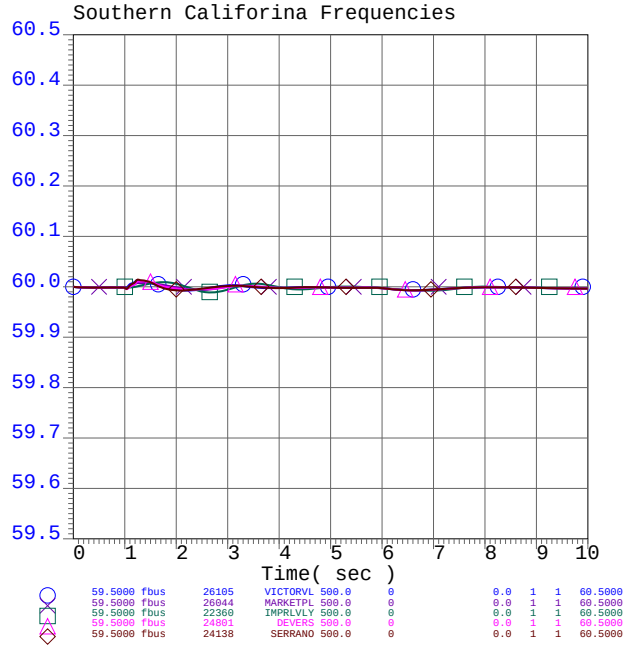
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

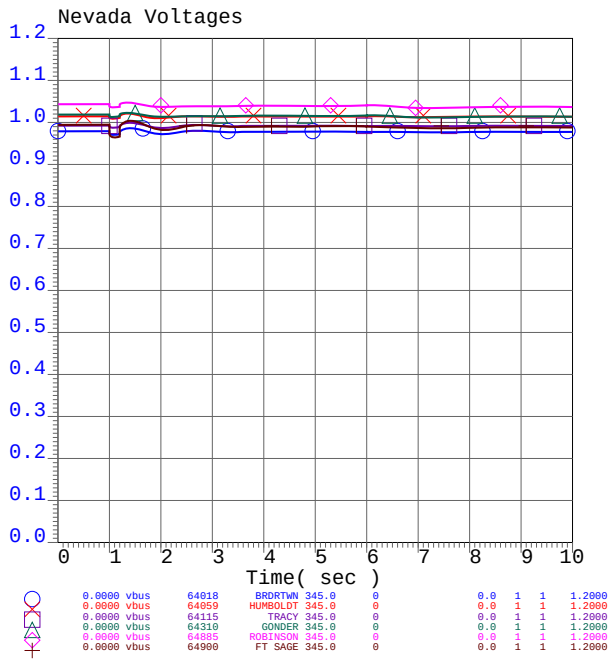
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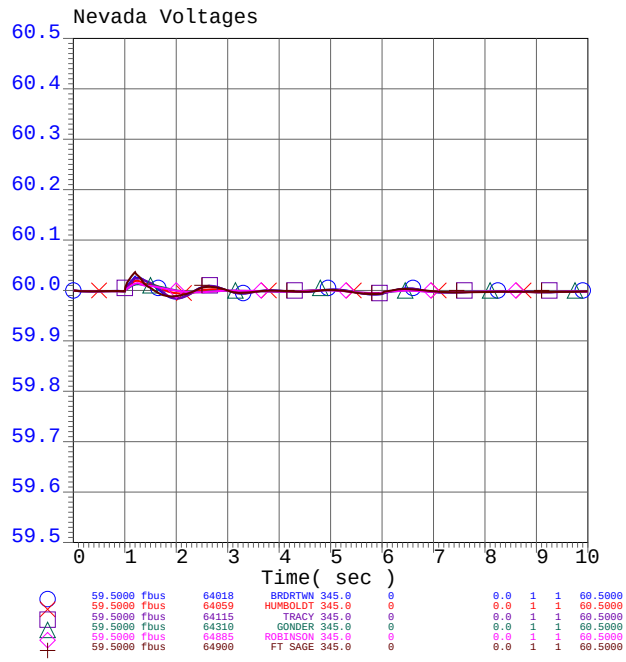
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WECC AREA VOLTAGE AND FREQUENCIES



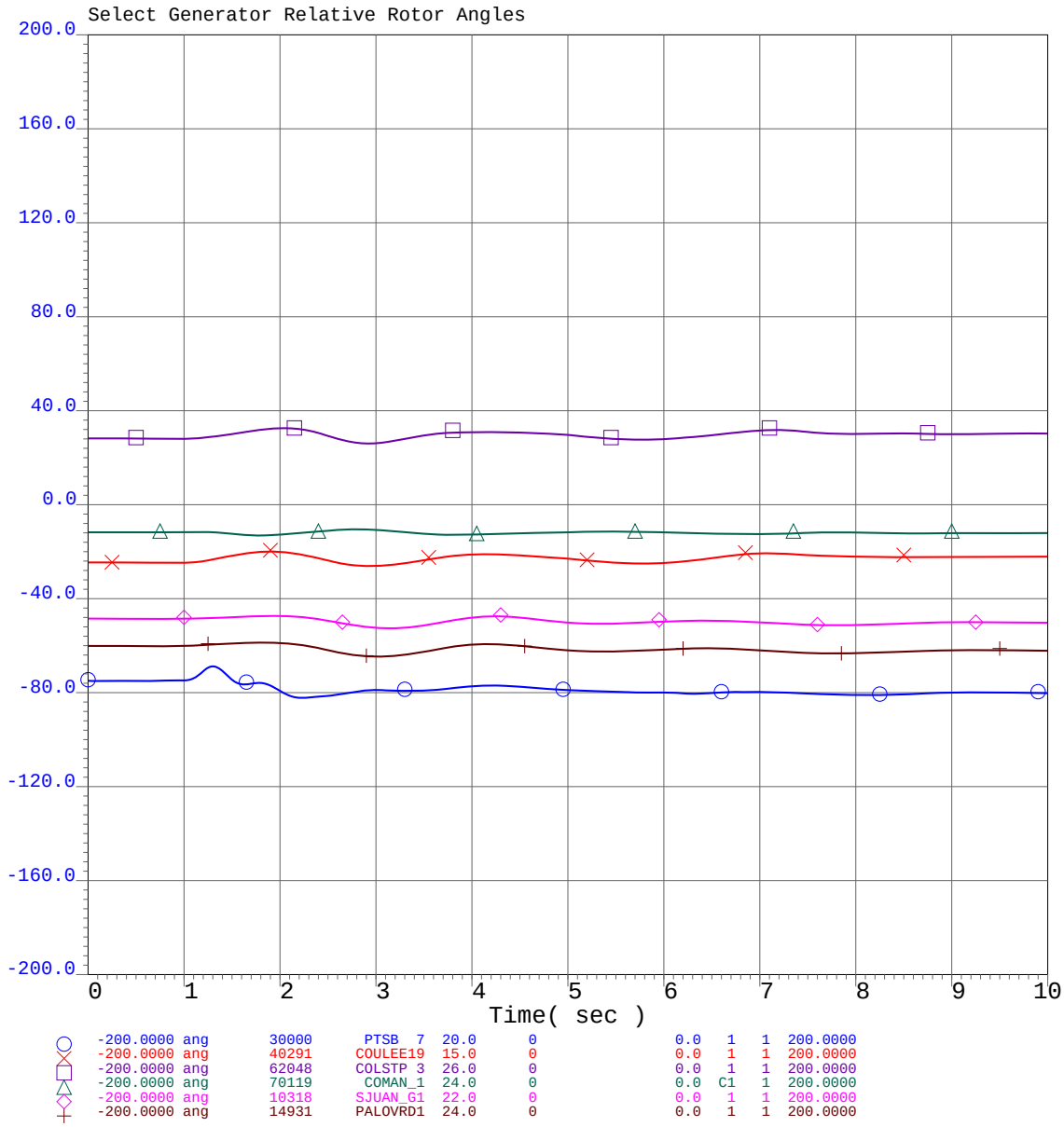






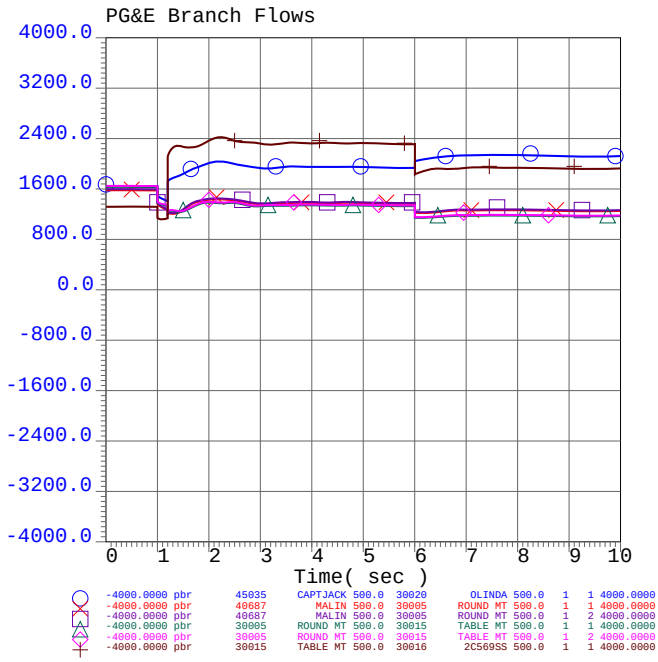
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

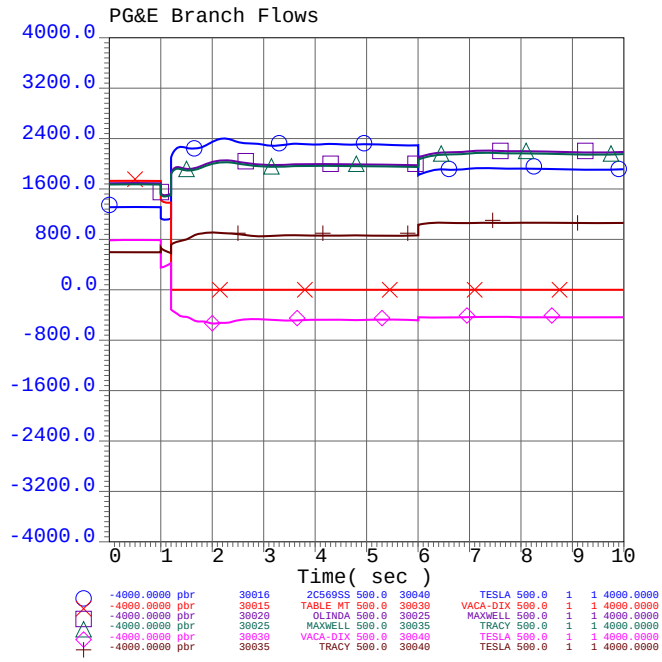
WECC RELATIVE ROTOR ANGLES

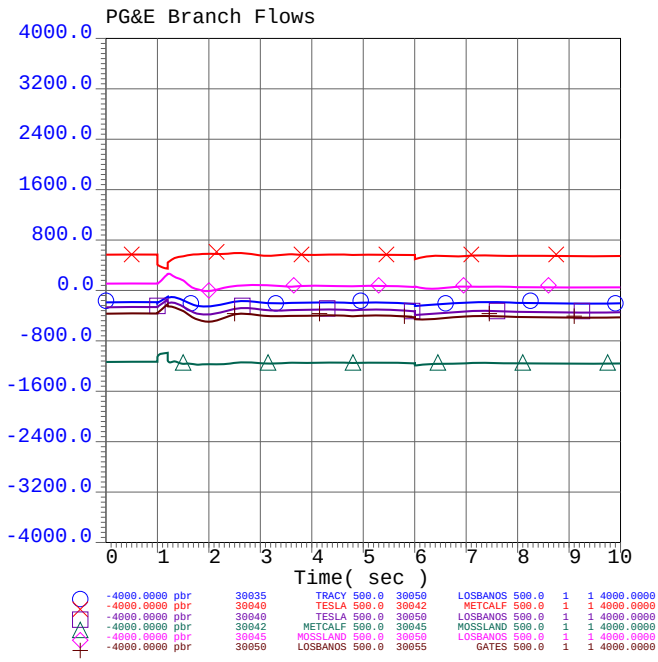


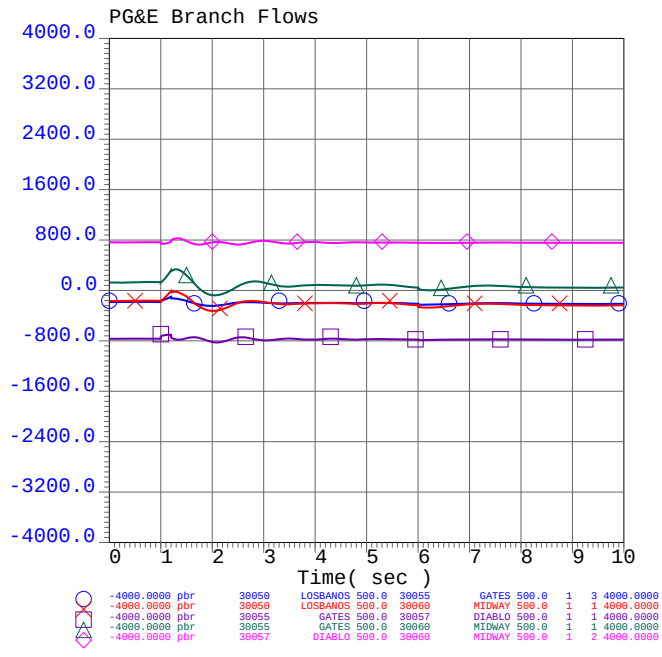
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Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

SELECT BRANCH FLOWS









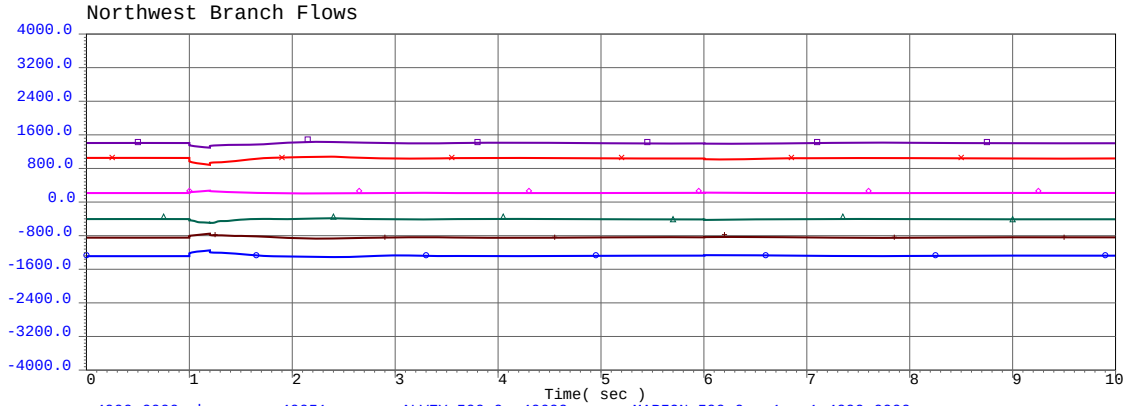
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ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt73_c8_vaca-tbmt_vacaxfmr-500kVsumpk.chf

Fri Jan 03 19:47:08 2014

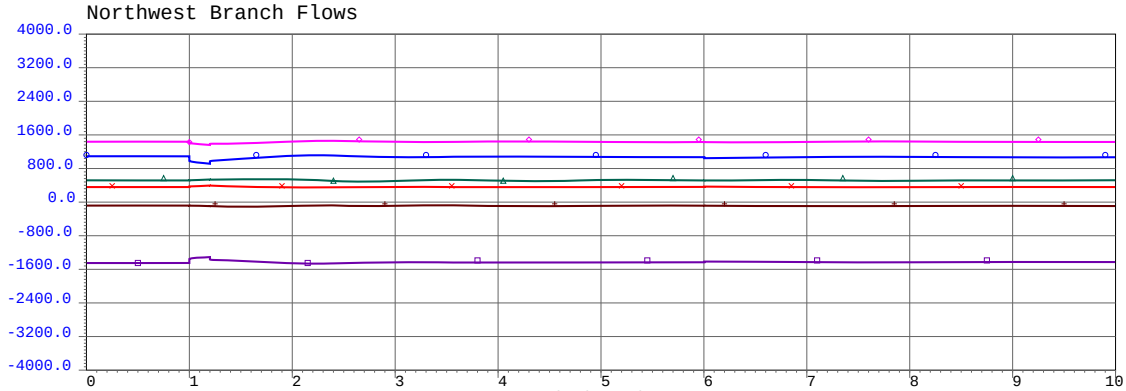
SELECT BRANCH FLOWS

Northwest Branch Flows



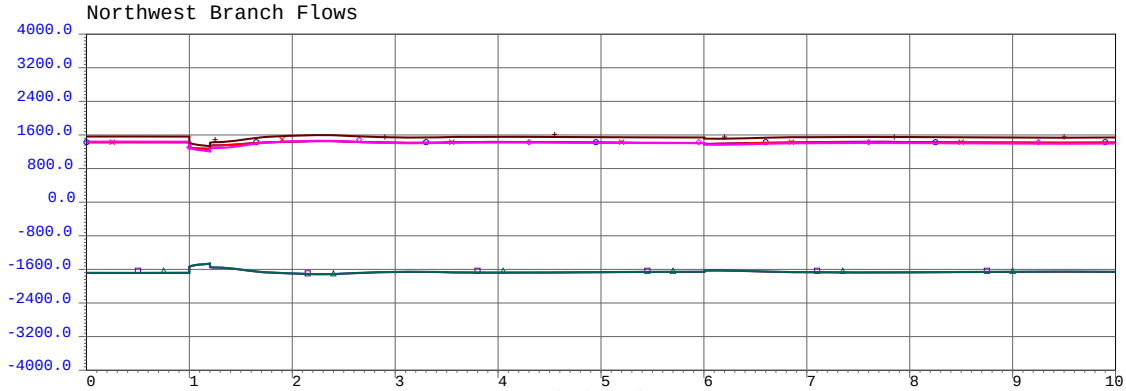
-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000

Northwest Branch Flows



-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

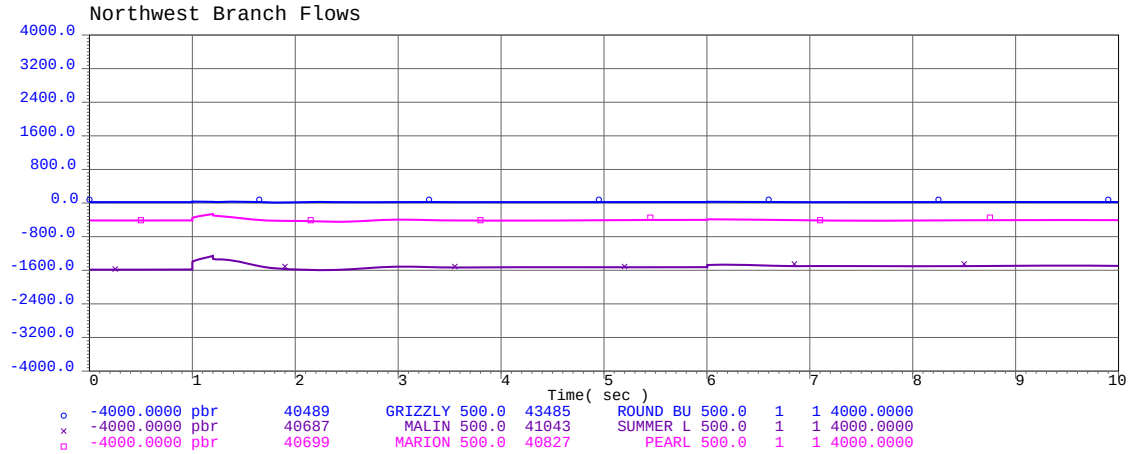
Northwest Branch Flows



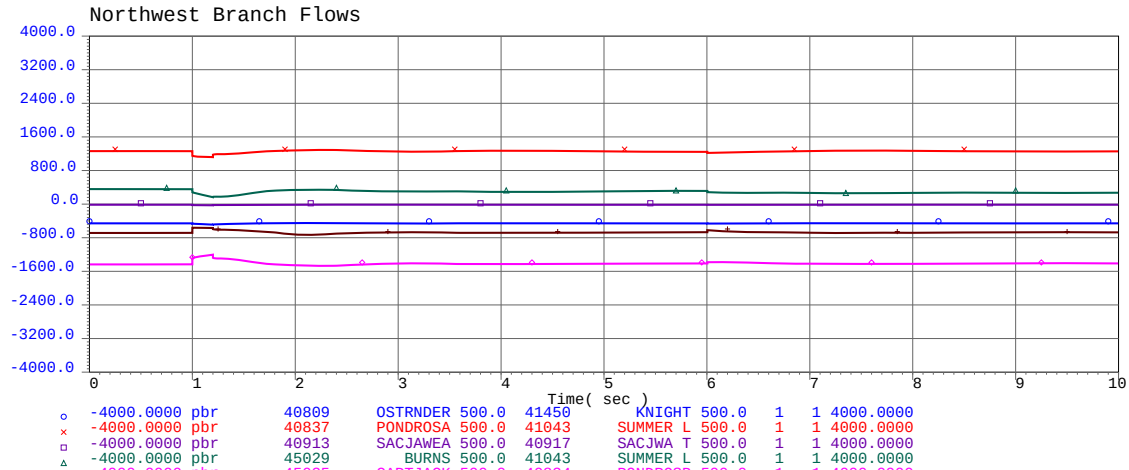
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

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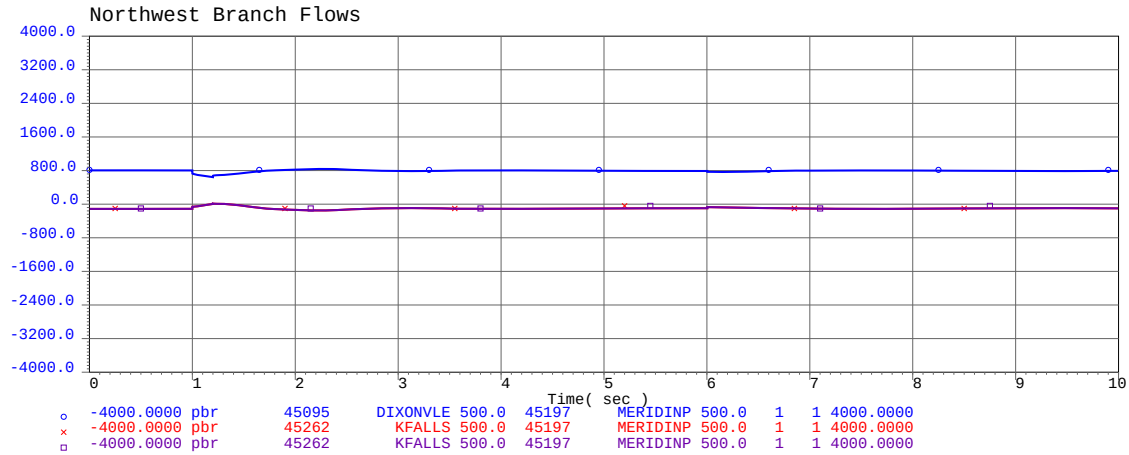
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



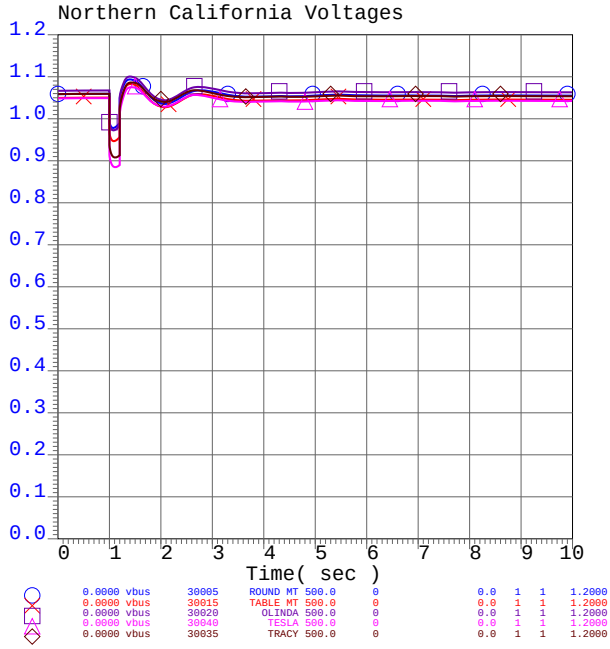
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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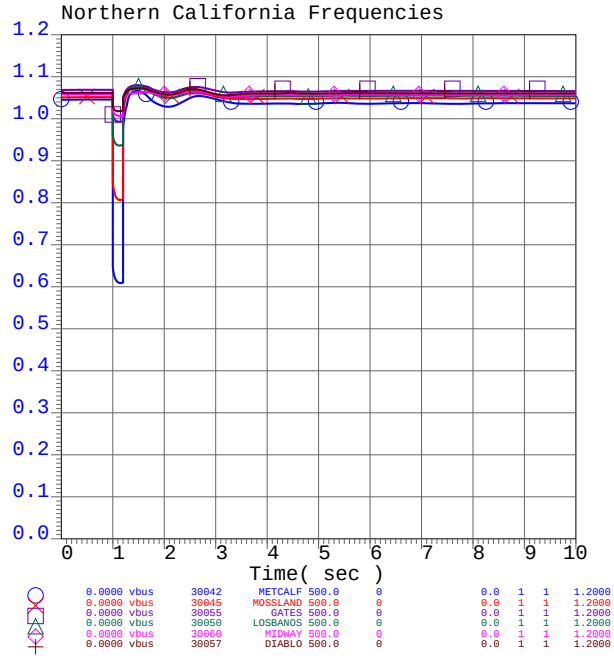


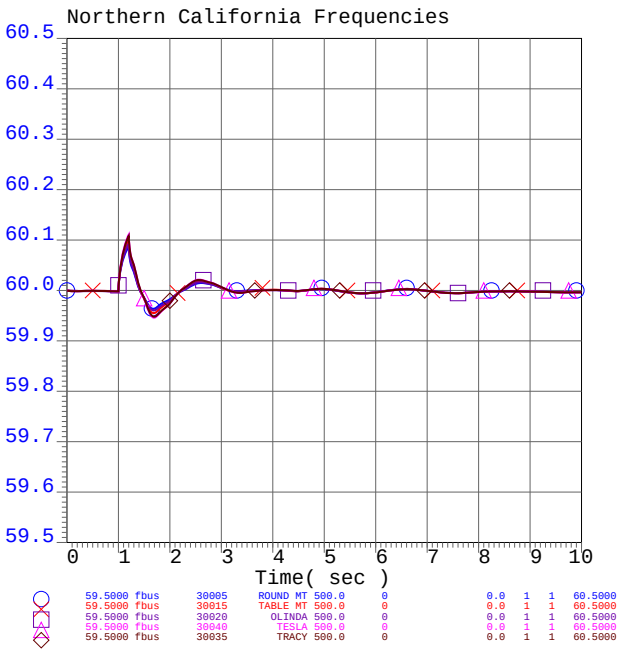
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-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

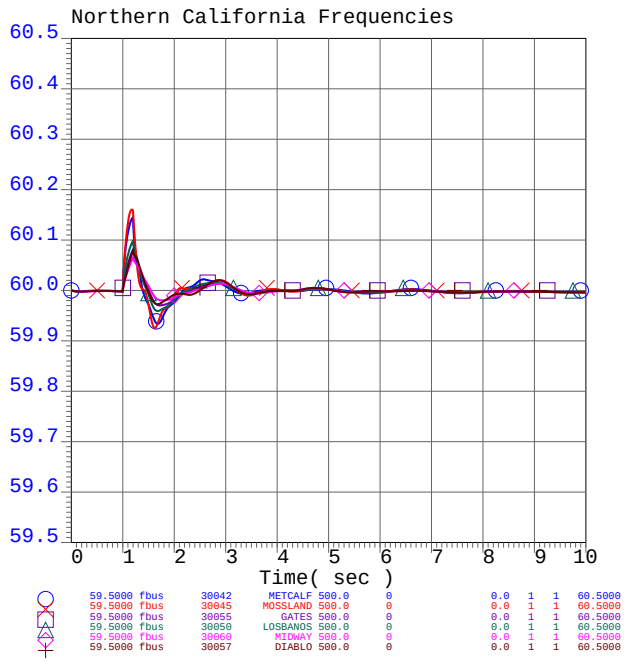
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Vaca Dixon 500 kV (12 cycle SLG)
followed by loss of Table Mountain-VacaDixon 500 kV line & Vaca Dixon 500

WECC AREA VOLTAGE AND FREQUENCIES







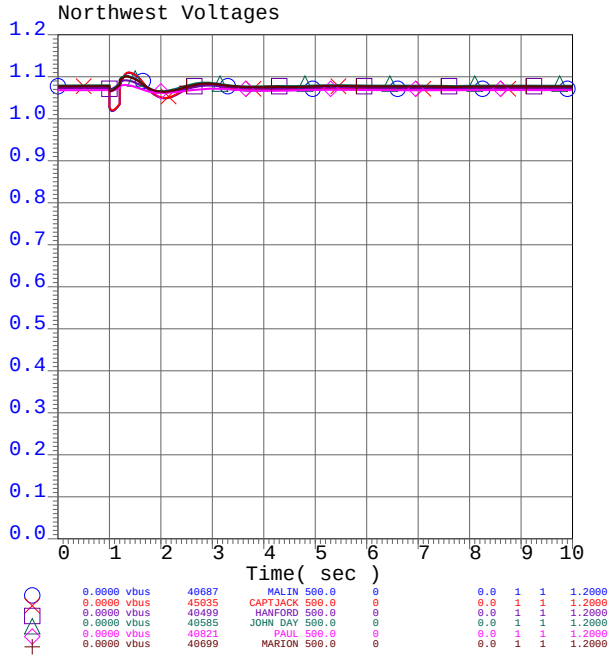


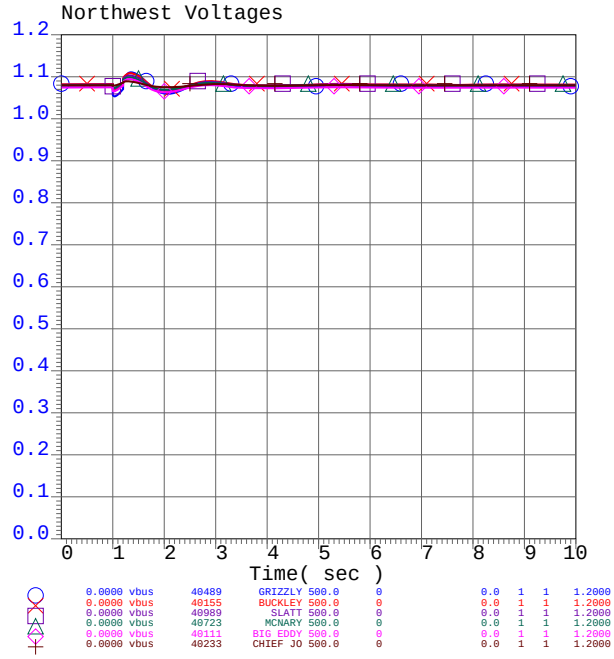
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

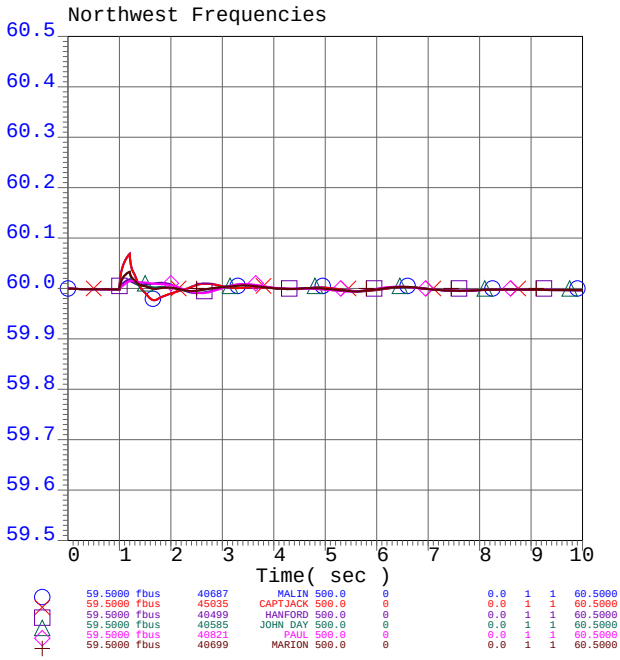
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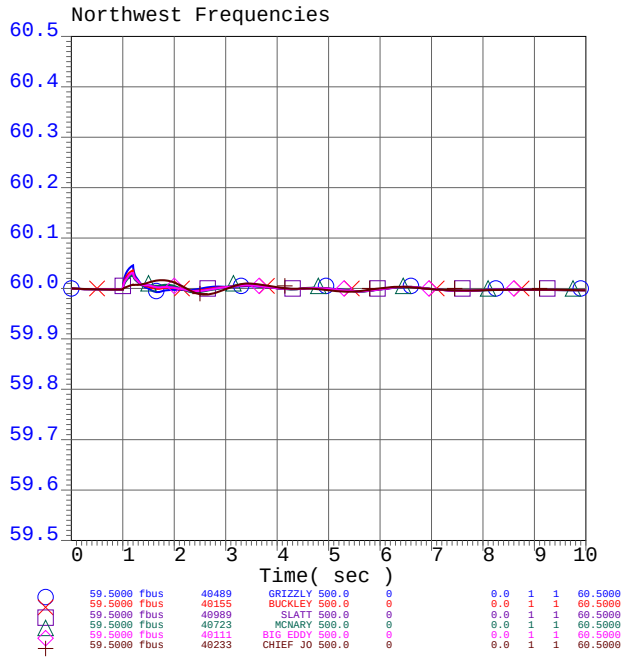
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WECC AREA VOLTAGE AND FREQUENCIES





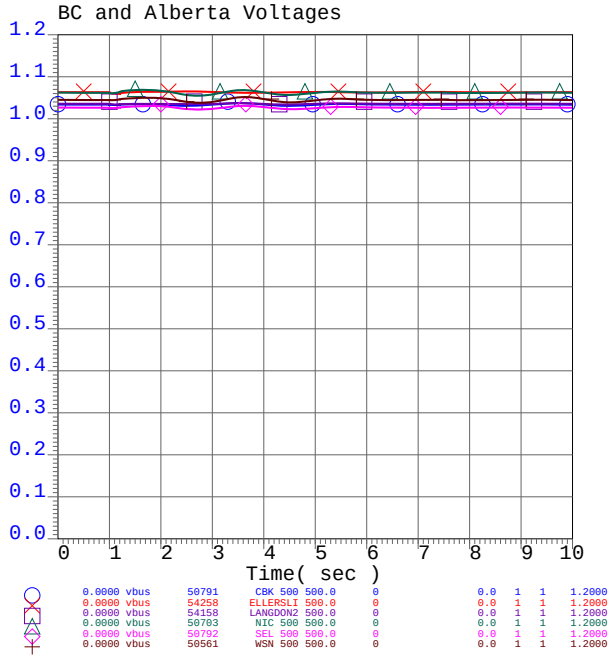




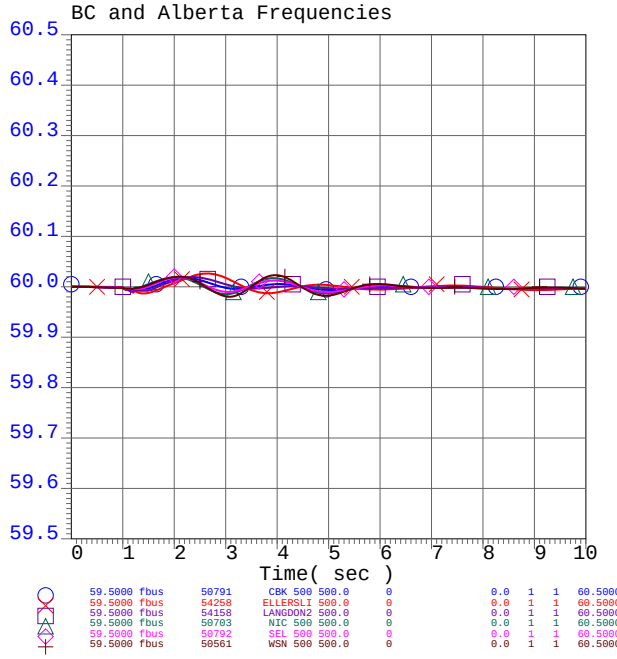
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

WECC AREA VOLTAGE AND FREQUENCIES

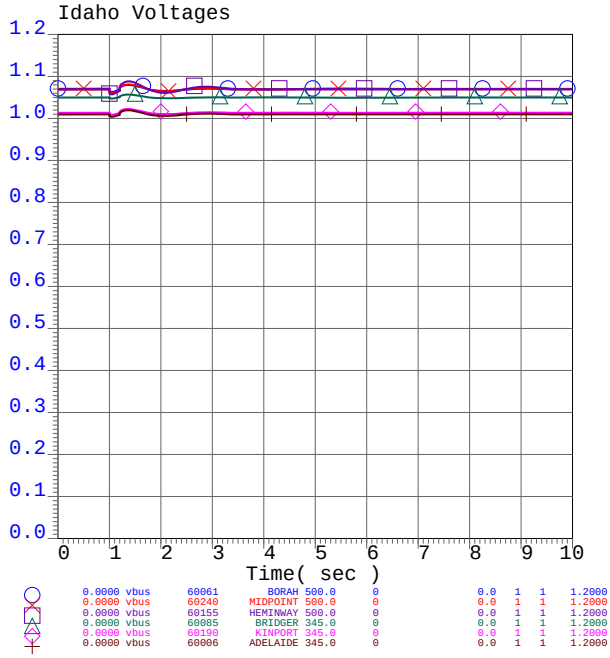
BC and Alberta Voltages



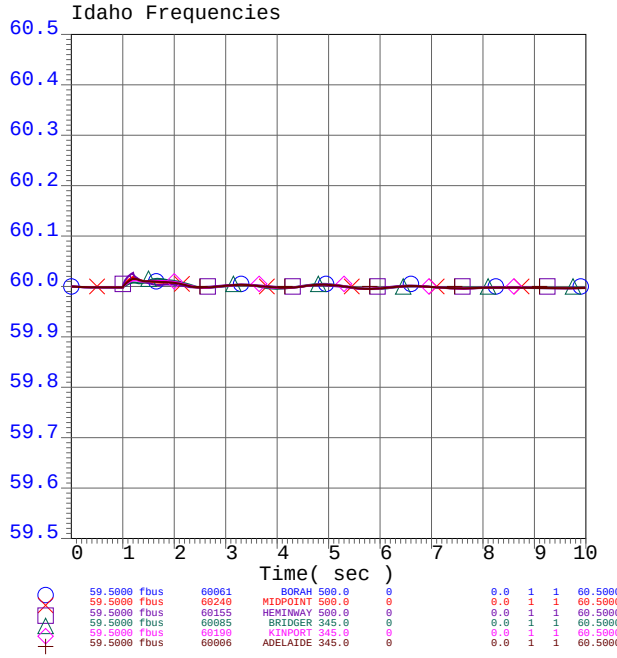
BC and Alberta Frequencies



Idaho Voltages



Idaho Frequencies



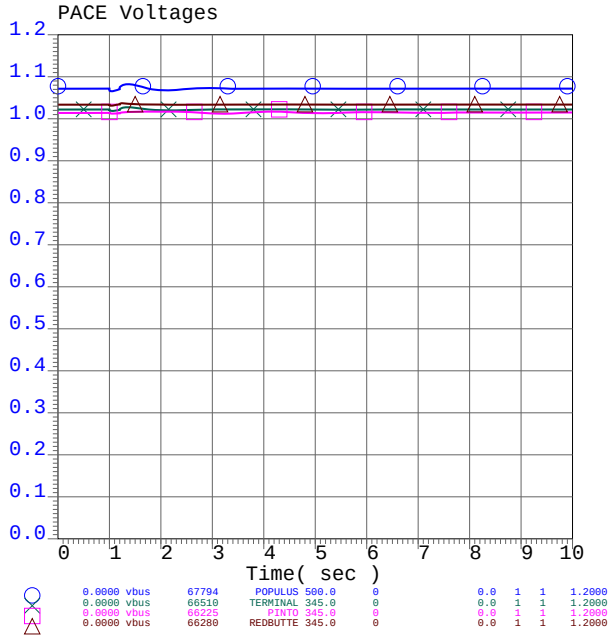
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt74_c8_mtcf-msld_mtcfxfmr-500kVsumpk.chf

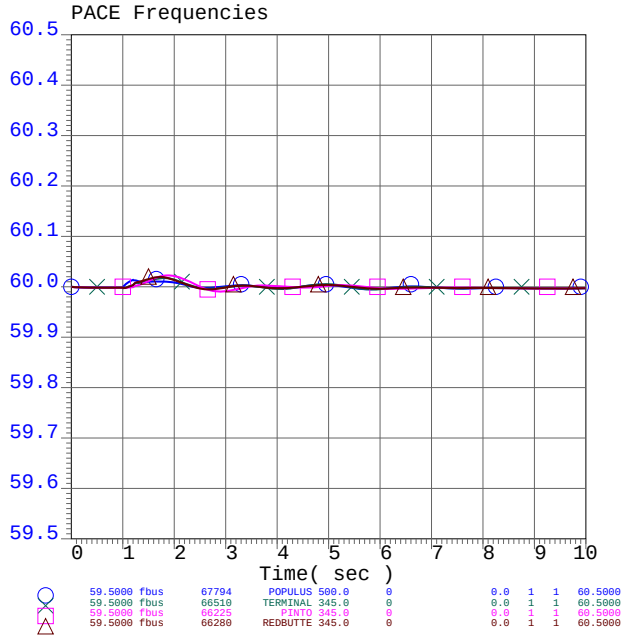
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WECC AREA VOLTAGE AND FREQUENCIES

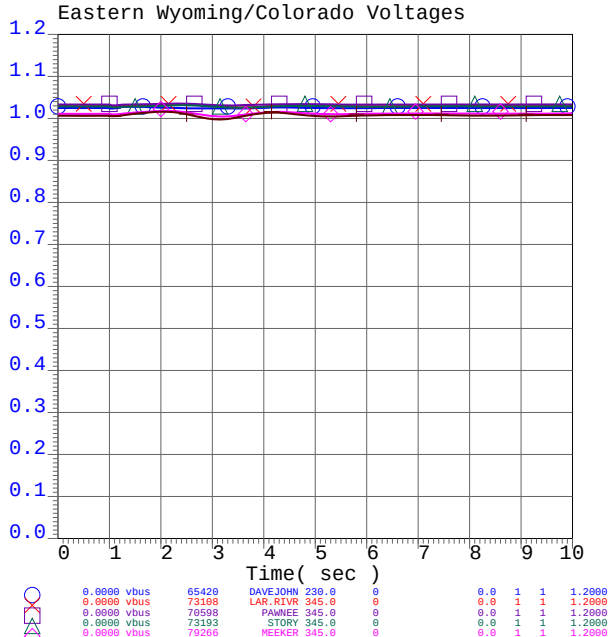
PACE Voltages



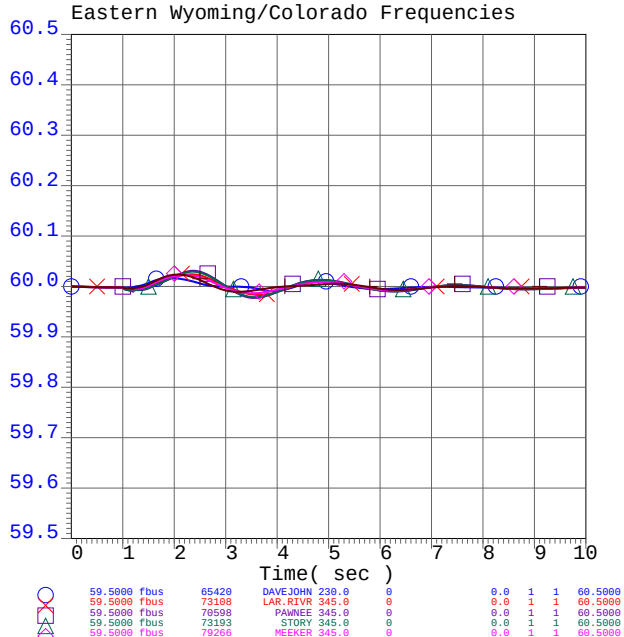
PACE Frequencies



Eastern Wyoming/Colorado Voltages



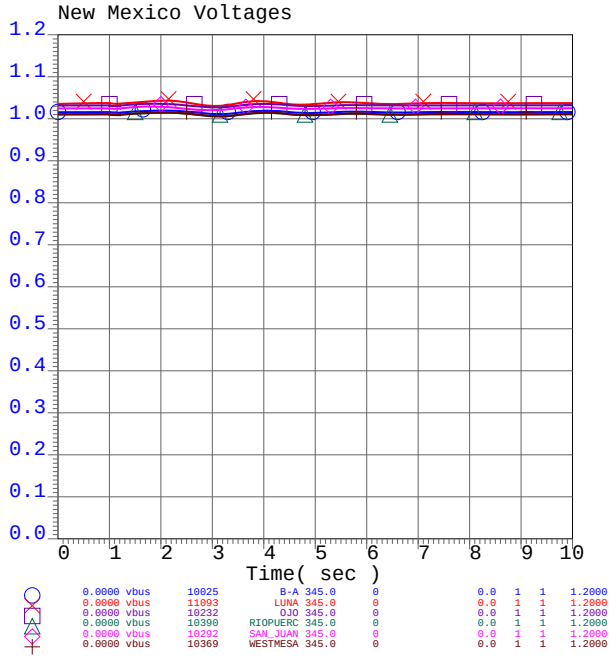
Eastern Wyoming/Colorado Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

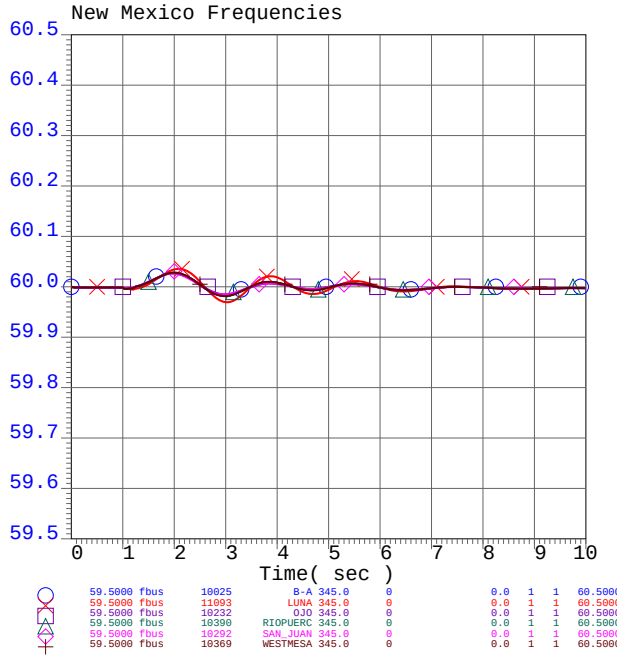
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



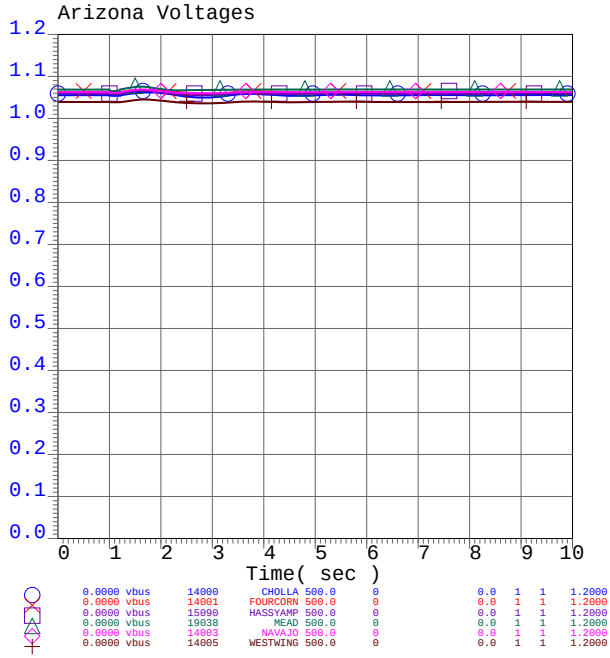
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0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



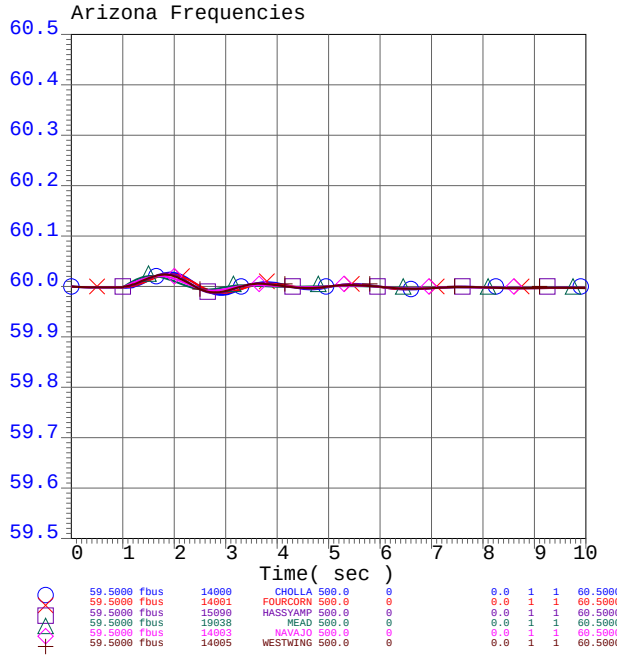
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

Arizona Frequencies



59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

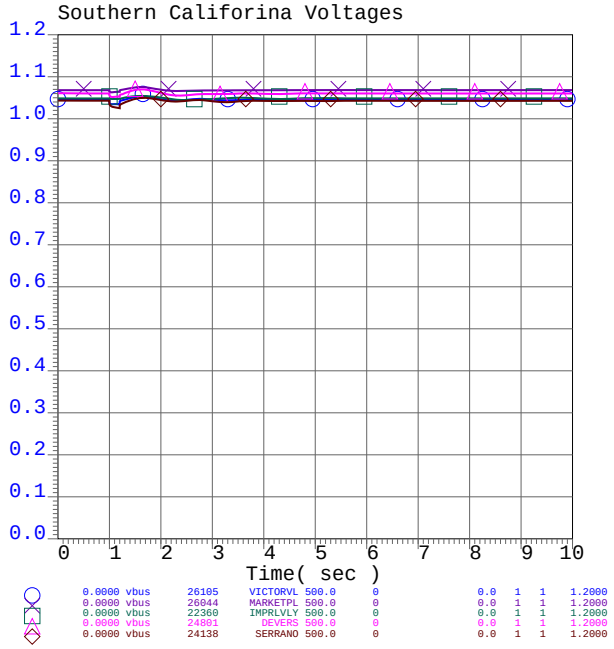
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt74_c8_mtcf-msld_mtcfxfmr-500kVsumpk.chf

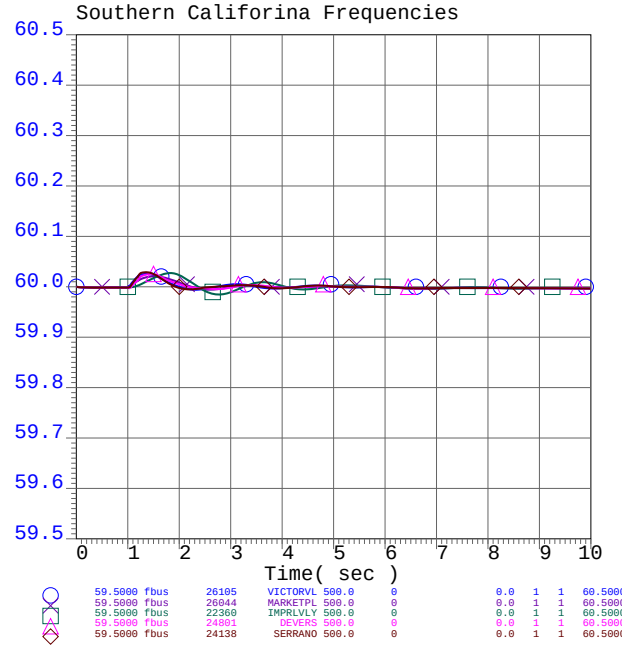
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WECC AREA VOLTAGE AND FREQUENCIES

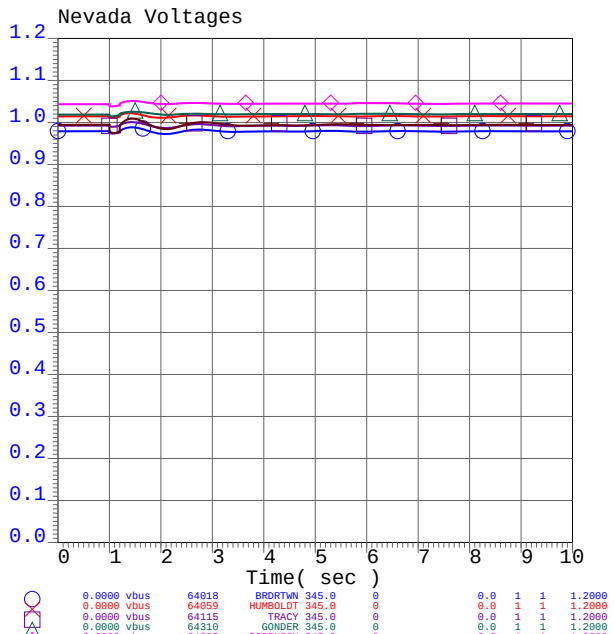
Southern Californa Voltages



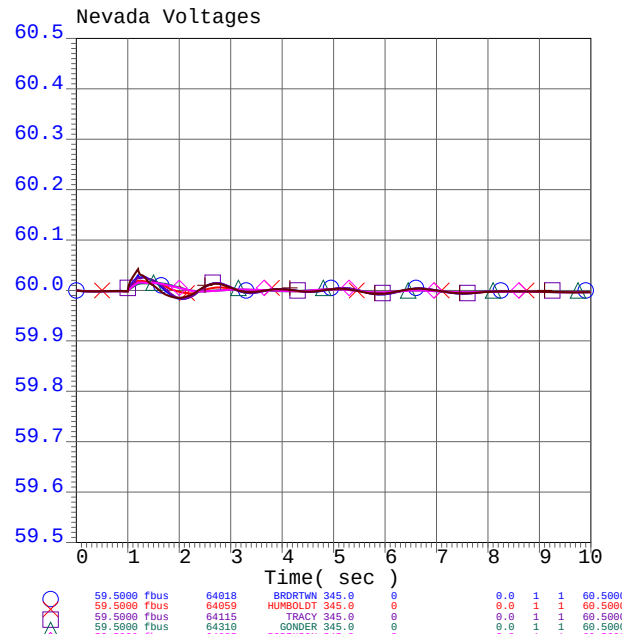
Southern Californa Frequencies



Nevada Voltages

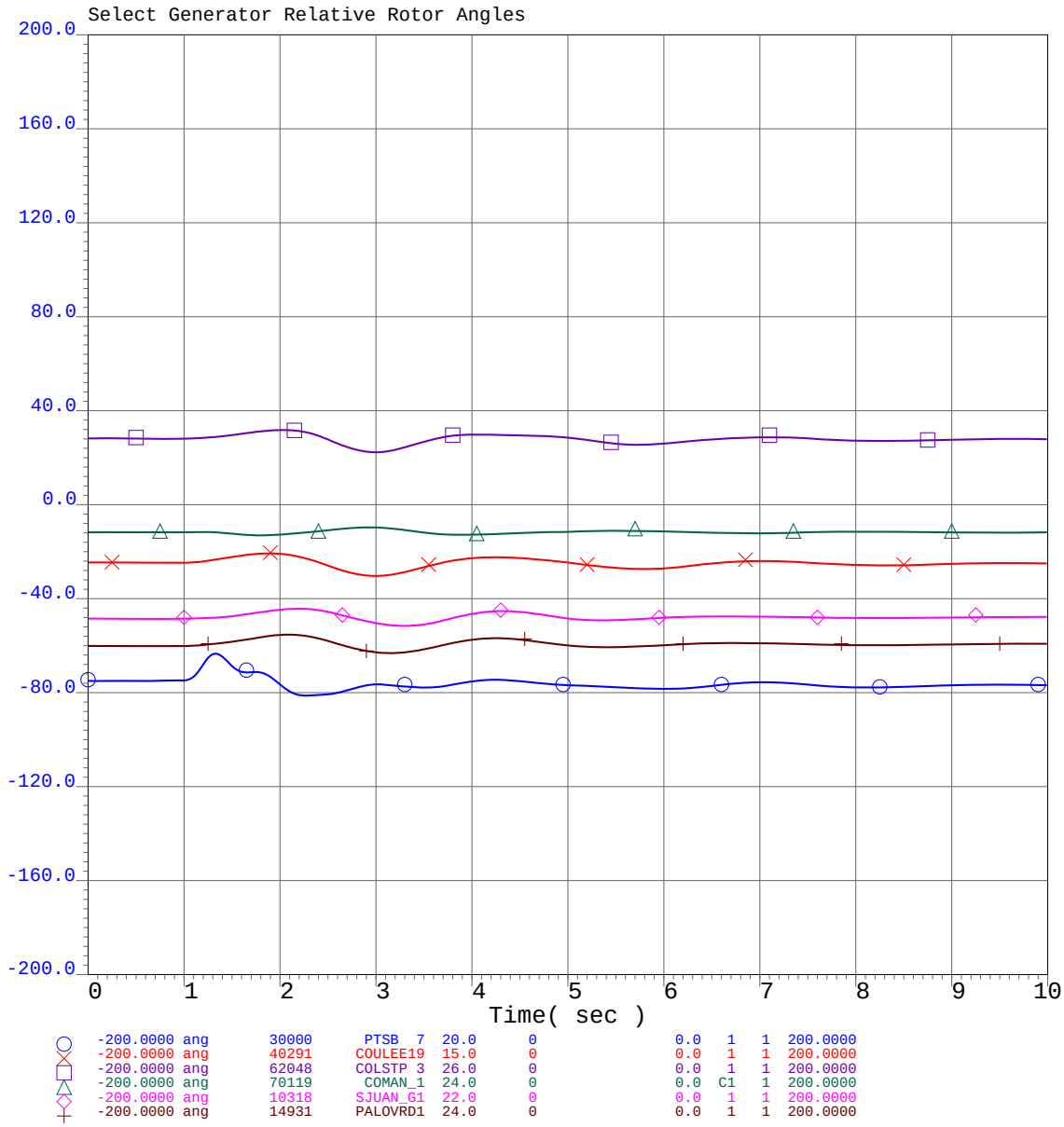


Nevada Voltages



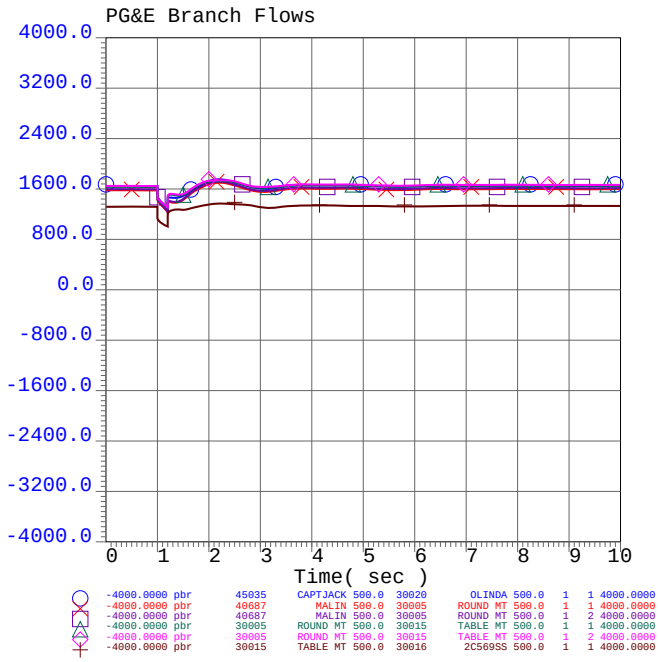
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

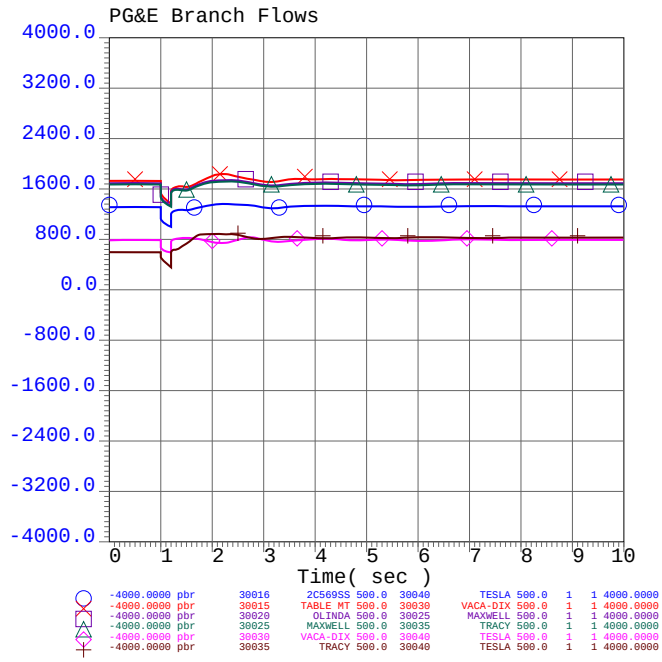
WECC RELATIVE ROTOR ANGLES

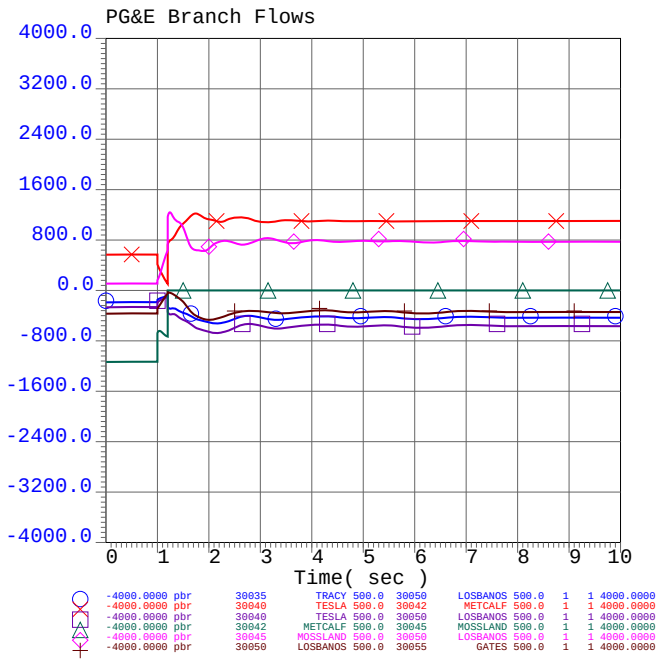


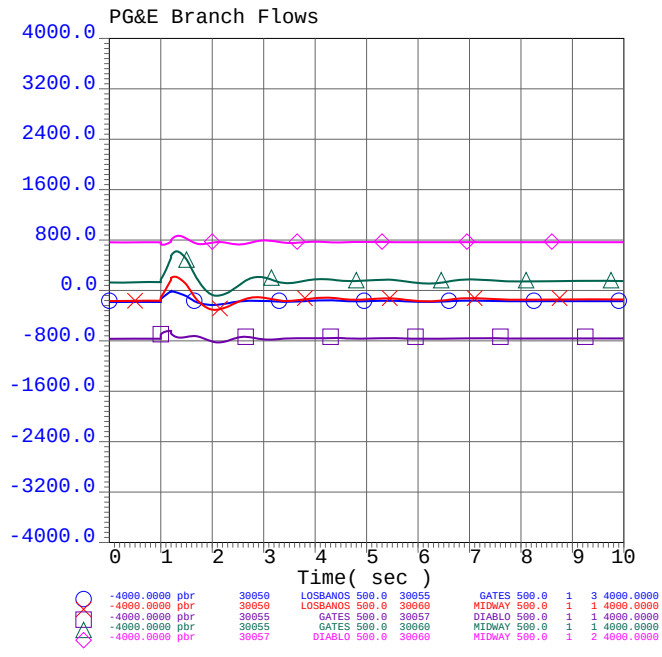
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

SELECT BRANCH FLOWS







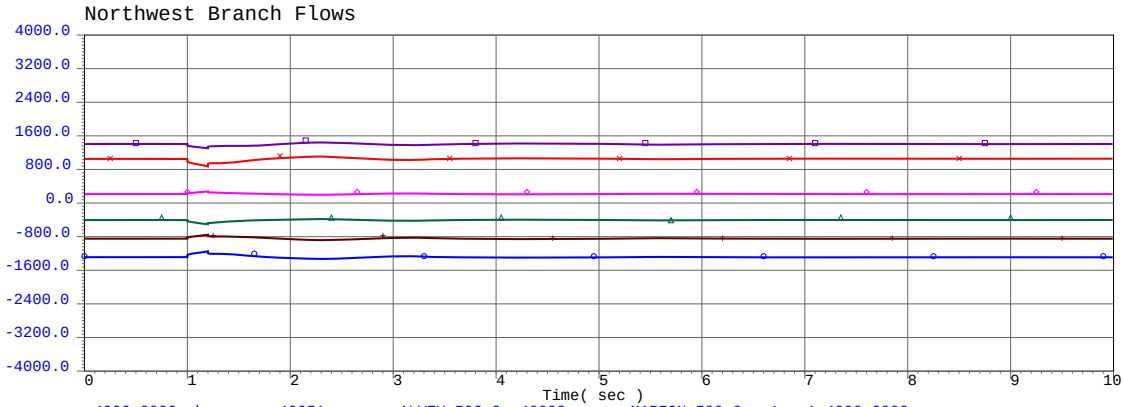


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Stuck Breaker at Metcalf (12 cycle SLG)
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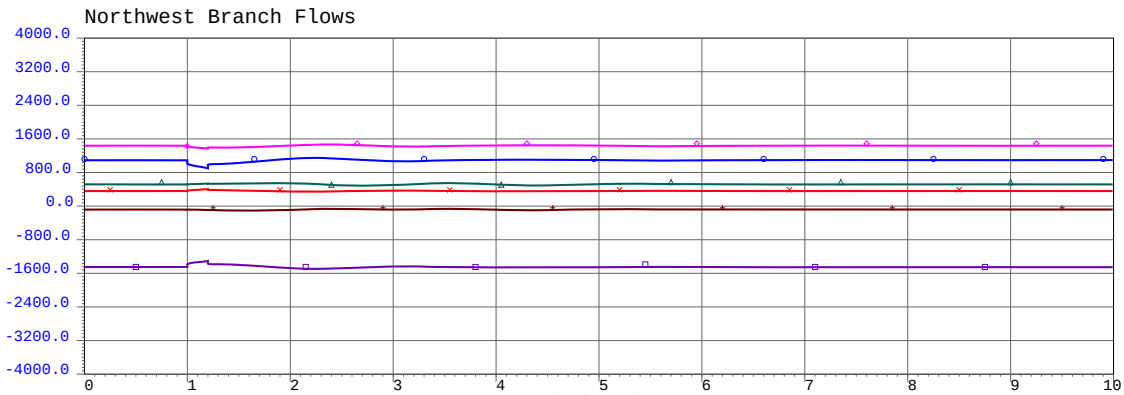
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Fri Jan 03 19:25:12 2014

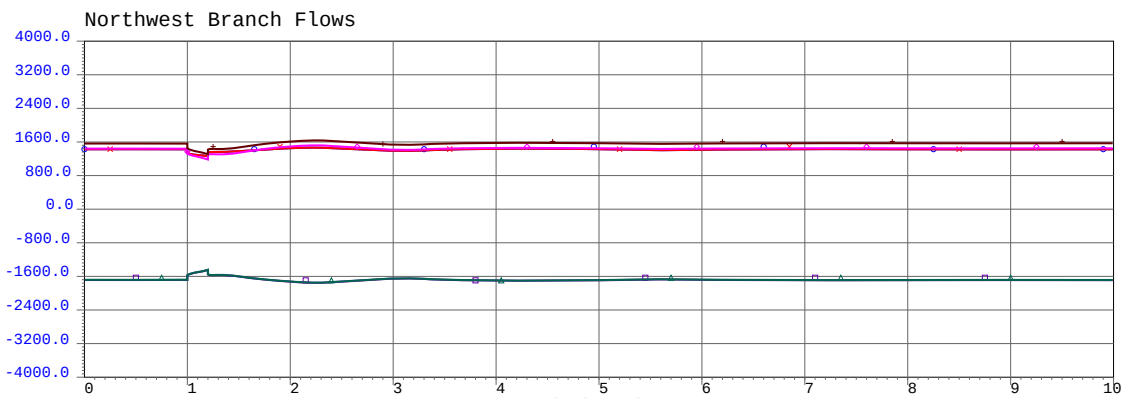
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
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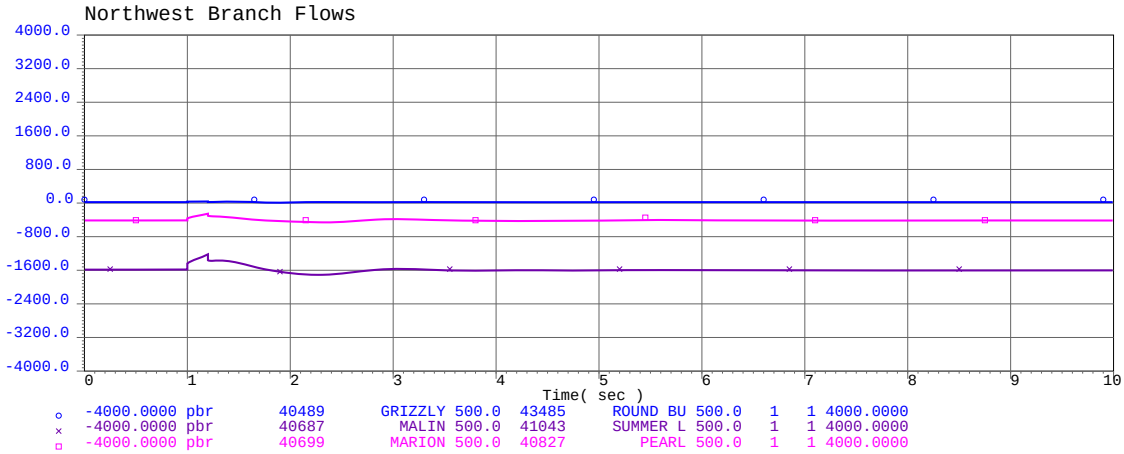
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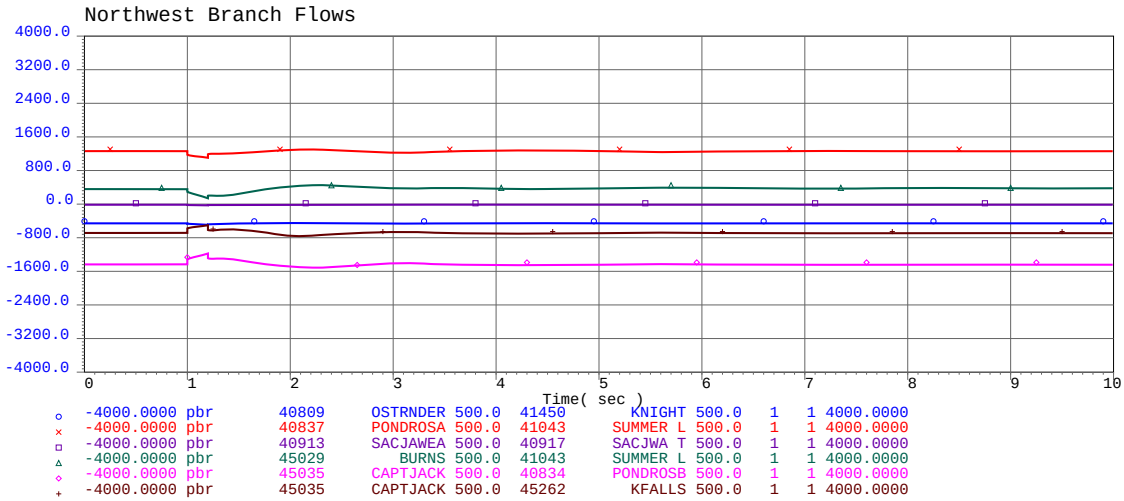


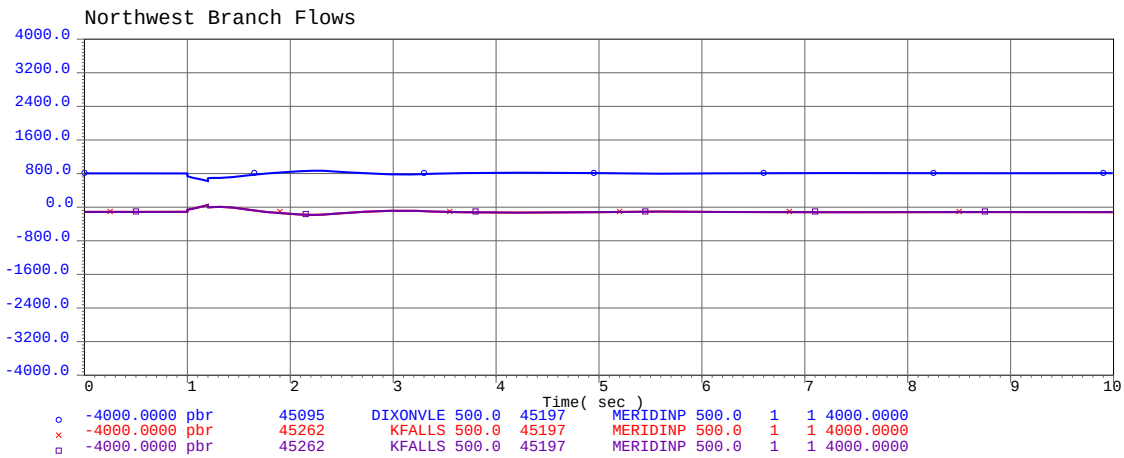
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
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Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

SELECT BRANCH FLOWS

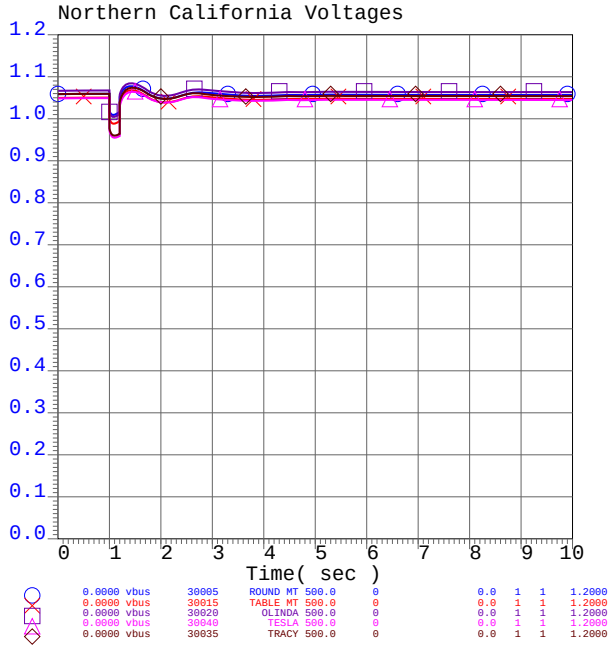


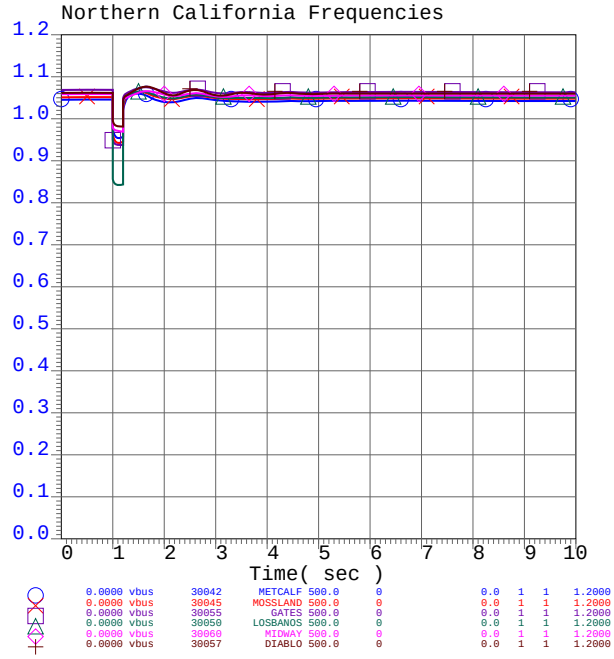


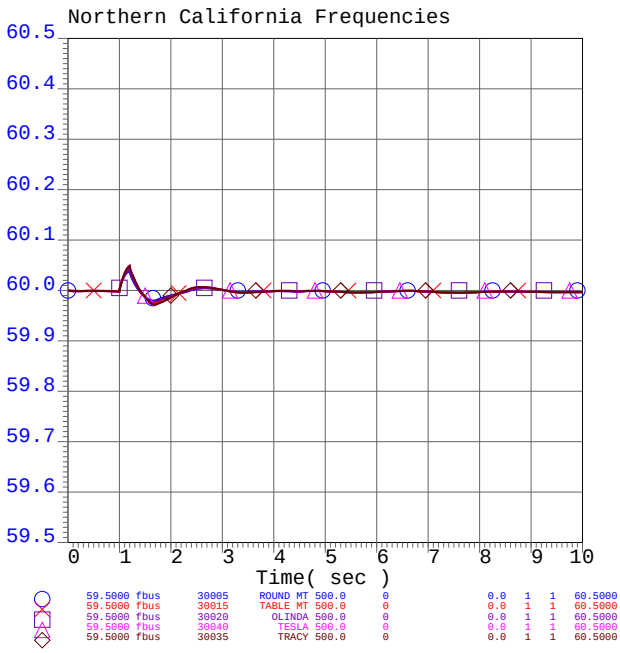


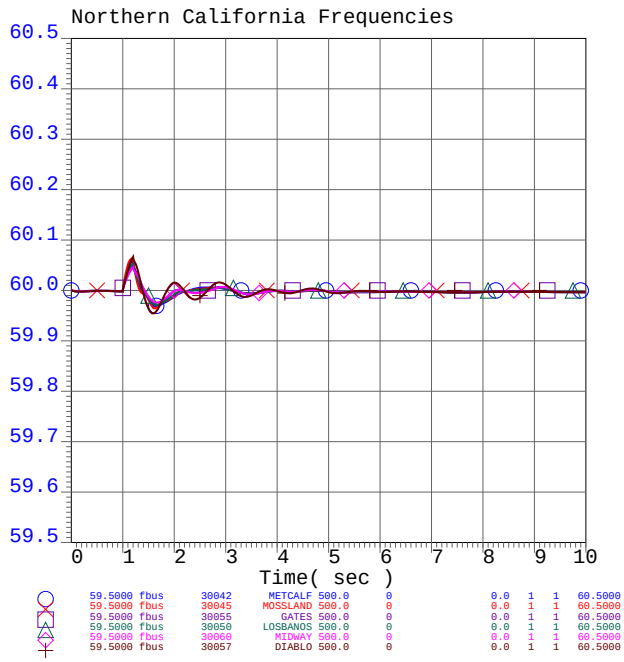
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Metcalf (12 cycle SLG)
followed by loss of Metcalf-Moss Landing 500 kV line & Metcalf 500/230 kV

WECC AREA VOLTAGE AND FREQUENCIES



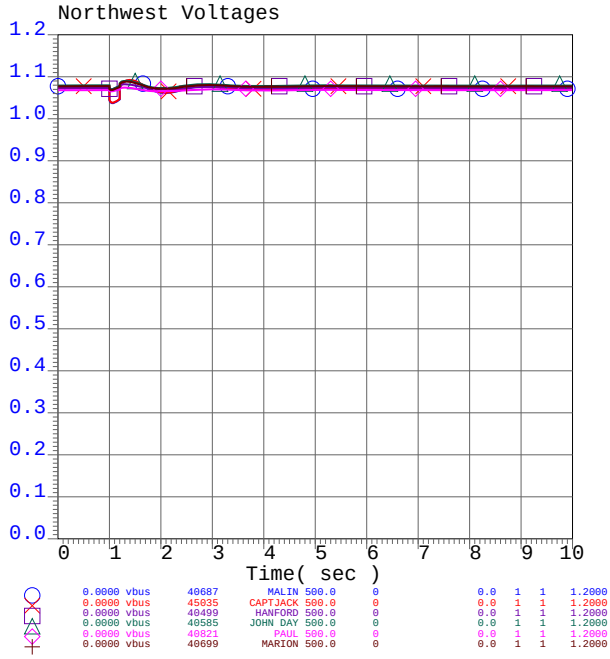


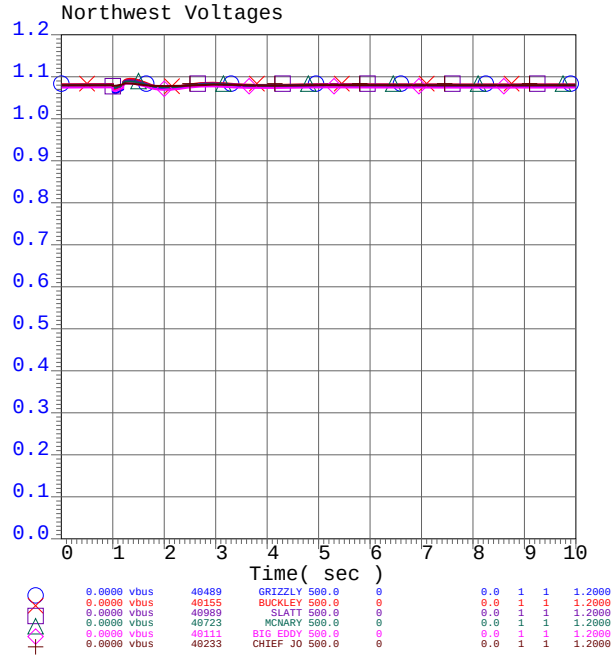


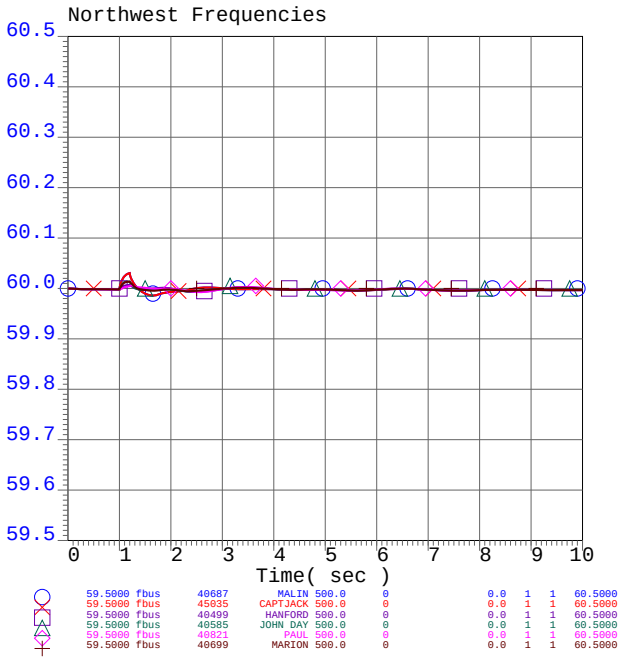


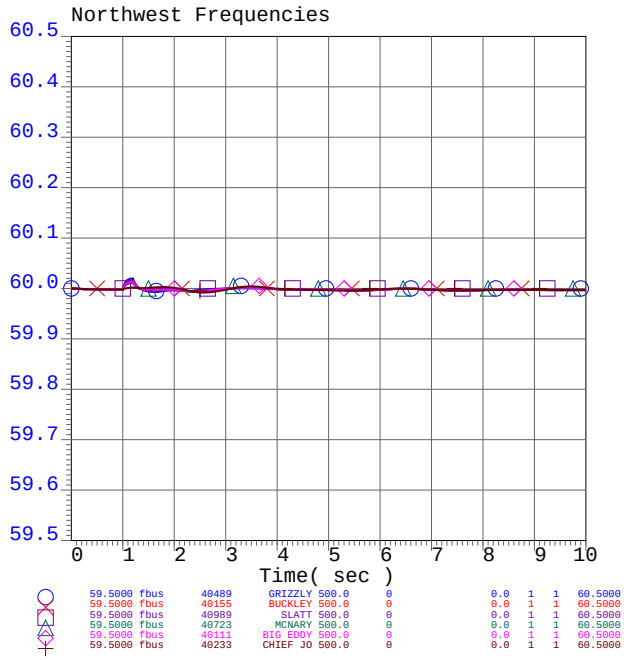
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

WECC AREA VOLTAGE AND FREQUENCIES





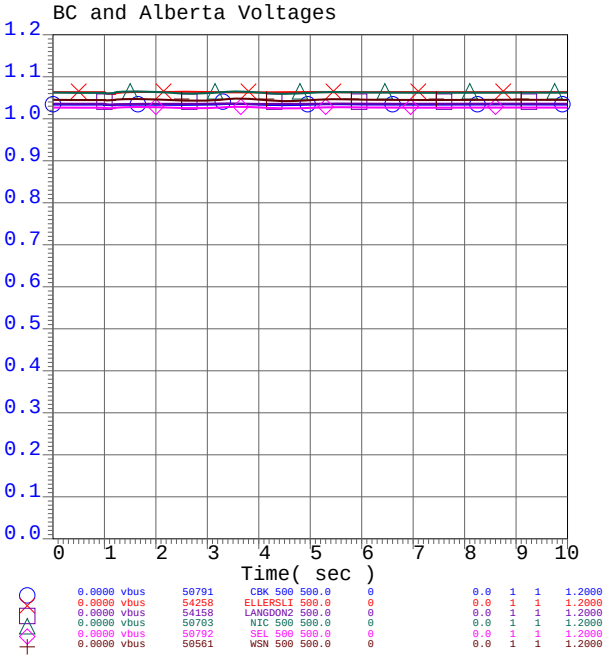




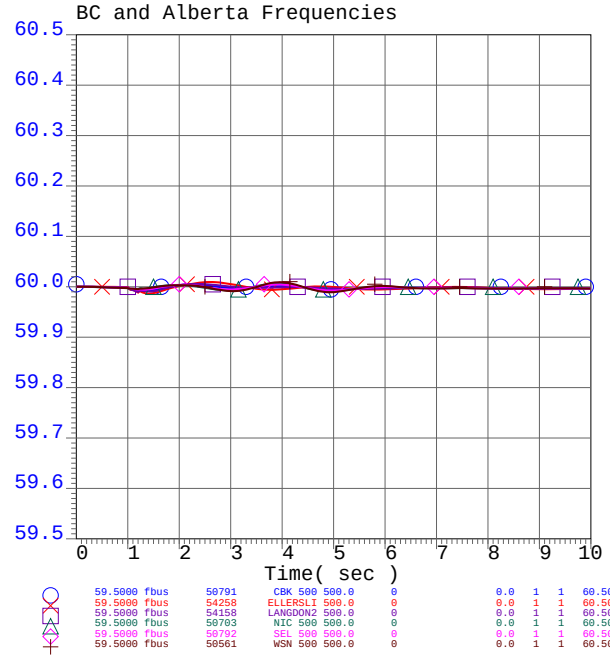
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

WECC AREA VOLTAGE AND FREQUENCIES

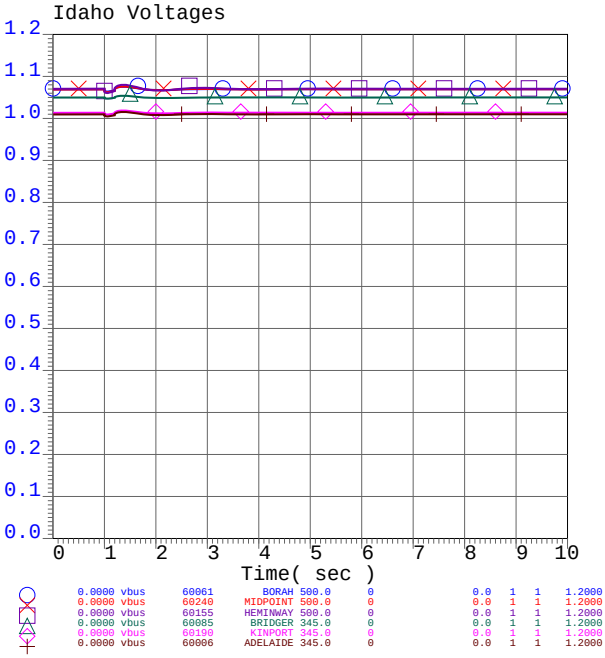
BC and Alberta Voltages



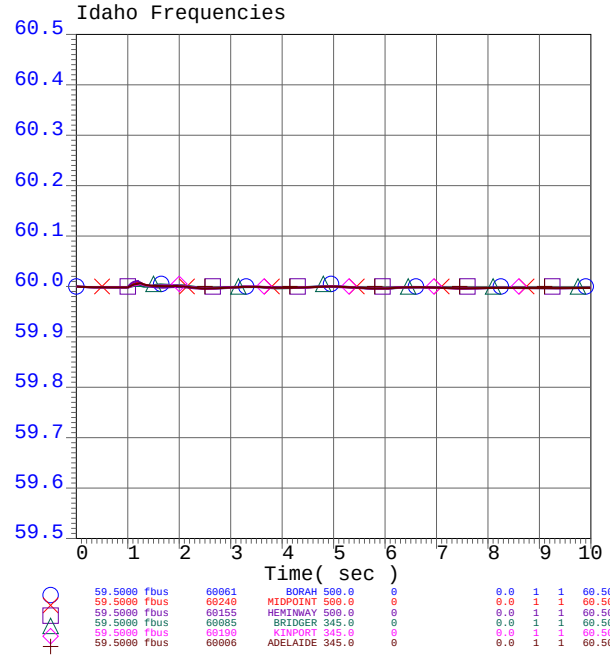
BC and Alberta Frequencies



Idaho Voltages

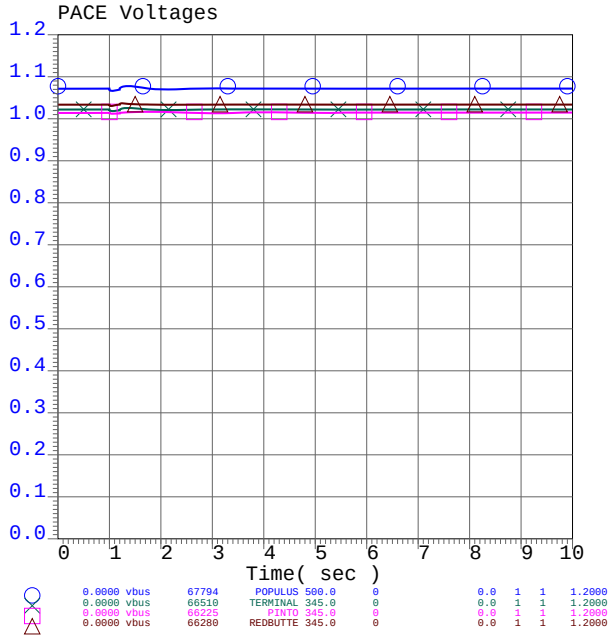


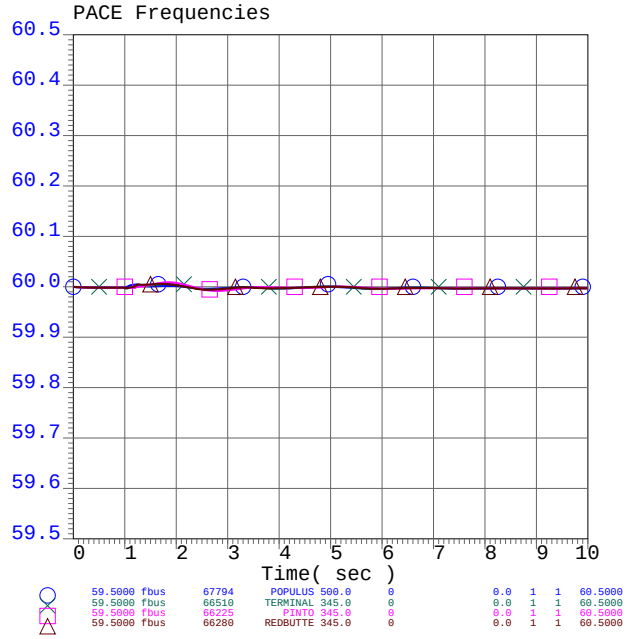
Idaho Frequencies

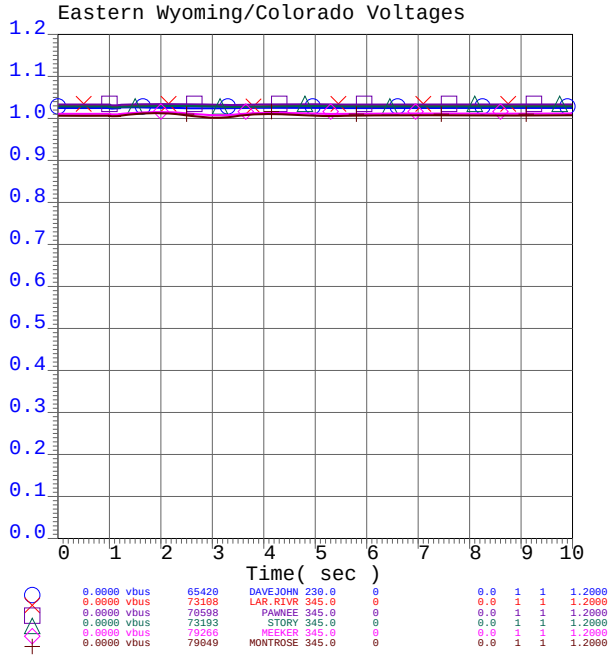


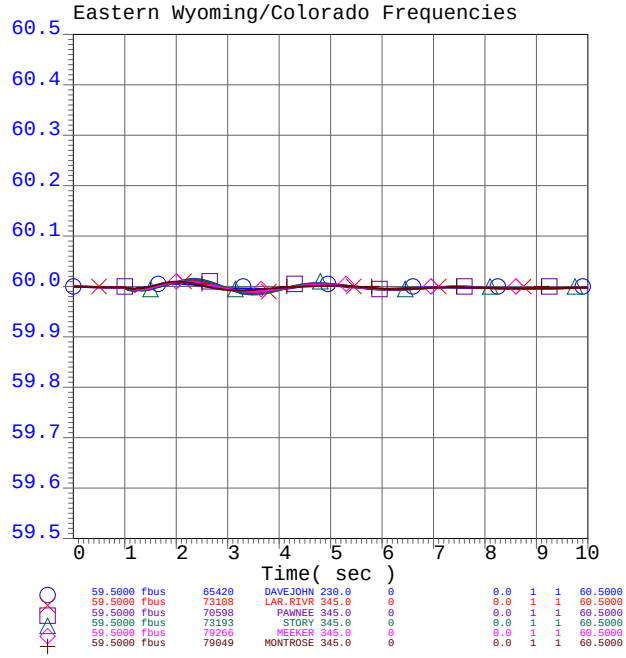
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

WECC AREA VOLTAGE AND FREQUENCIES





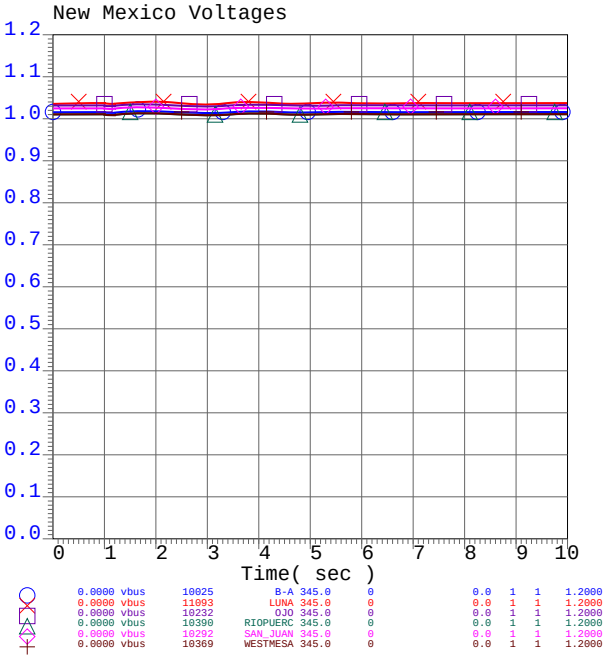




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

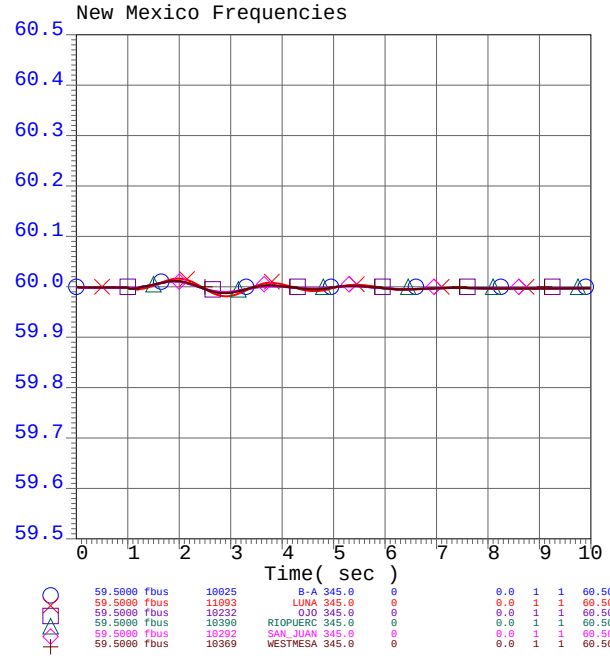
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



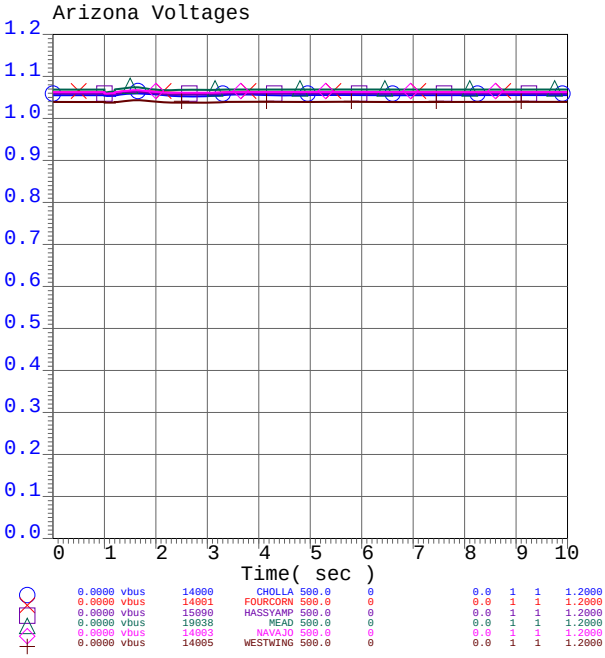
0.0000 vbus	10025	B-A 345.0	0	0.0	1	1	1.2000
0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



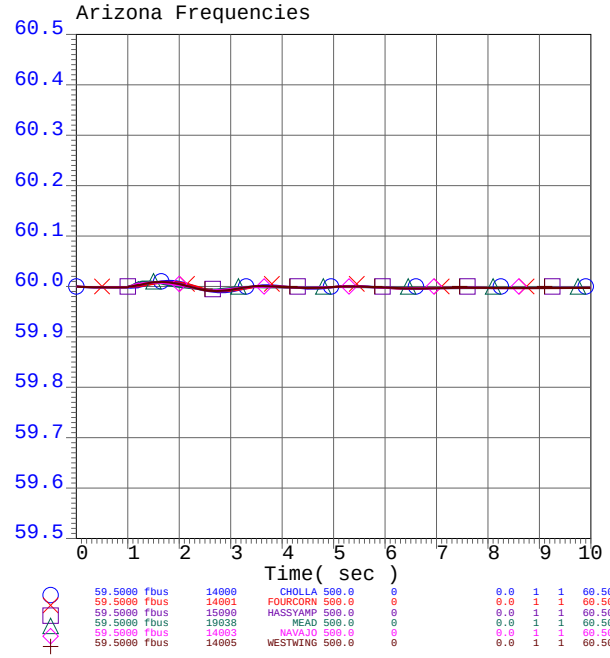
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

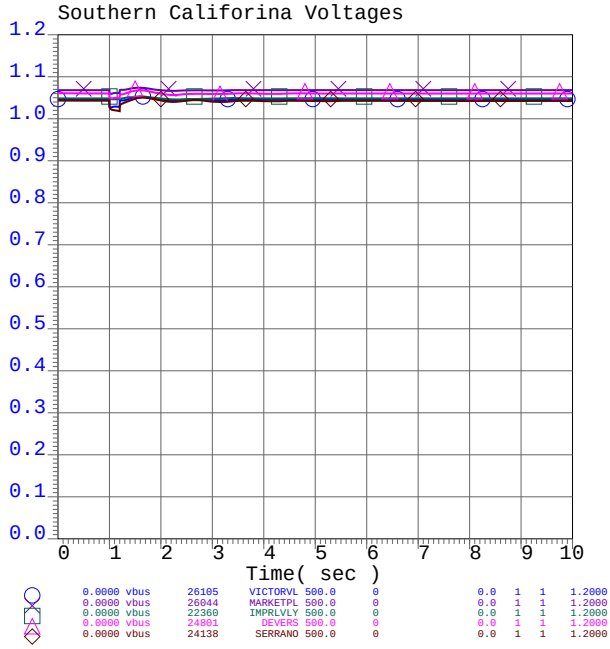
Arizona Frequencies

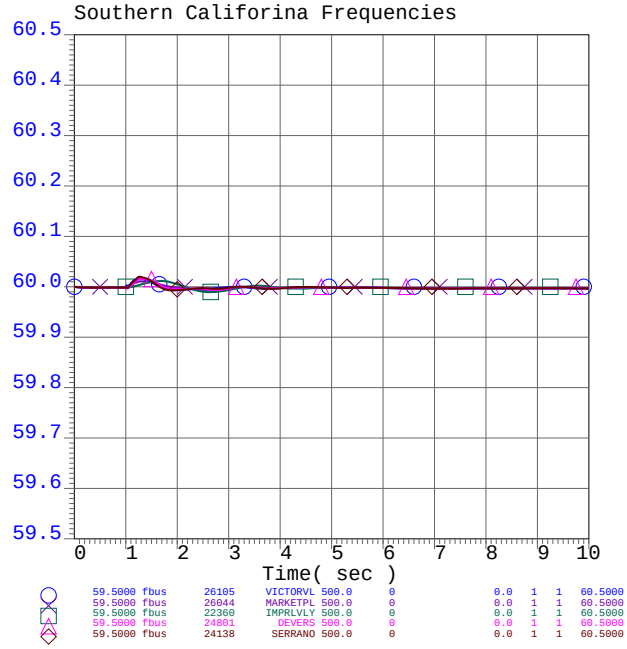


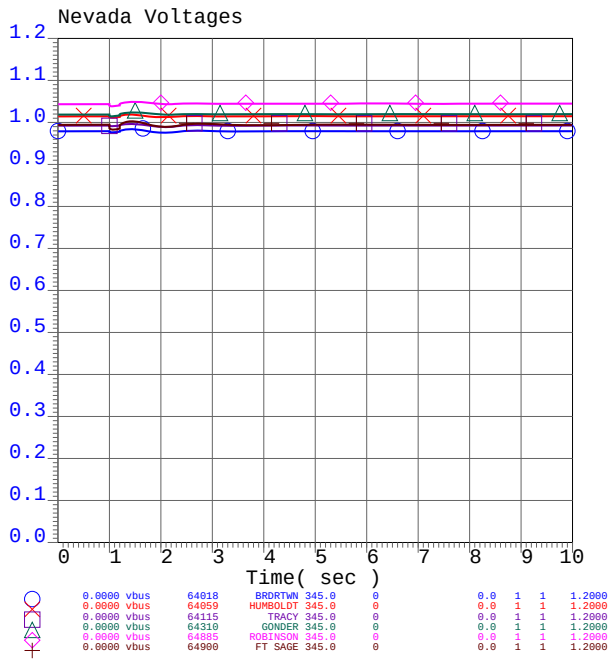
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

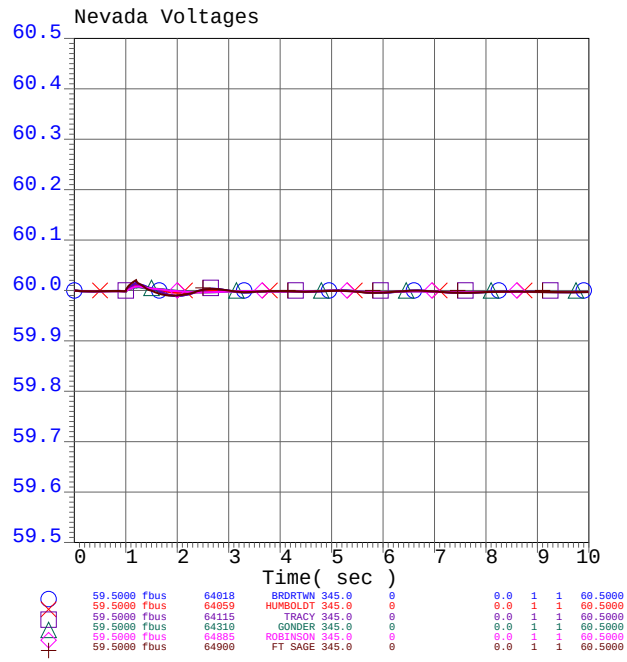
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

WECC AREA VOLTAGE AND FREQUENCIES



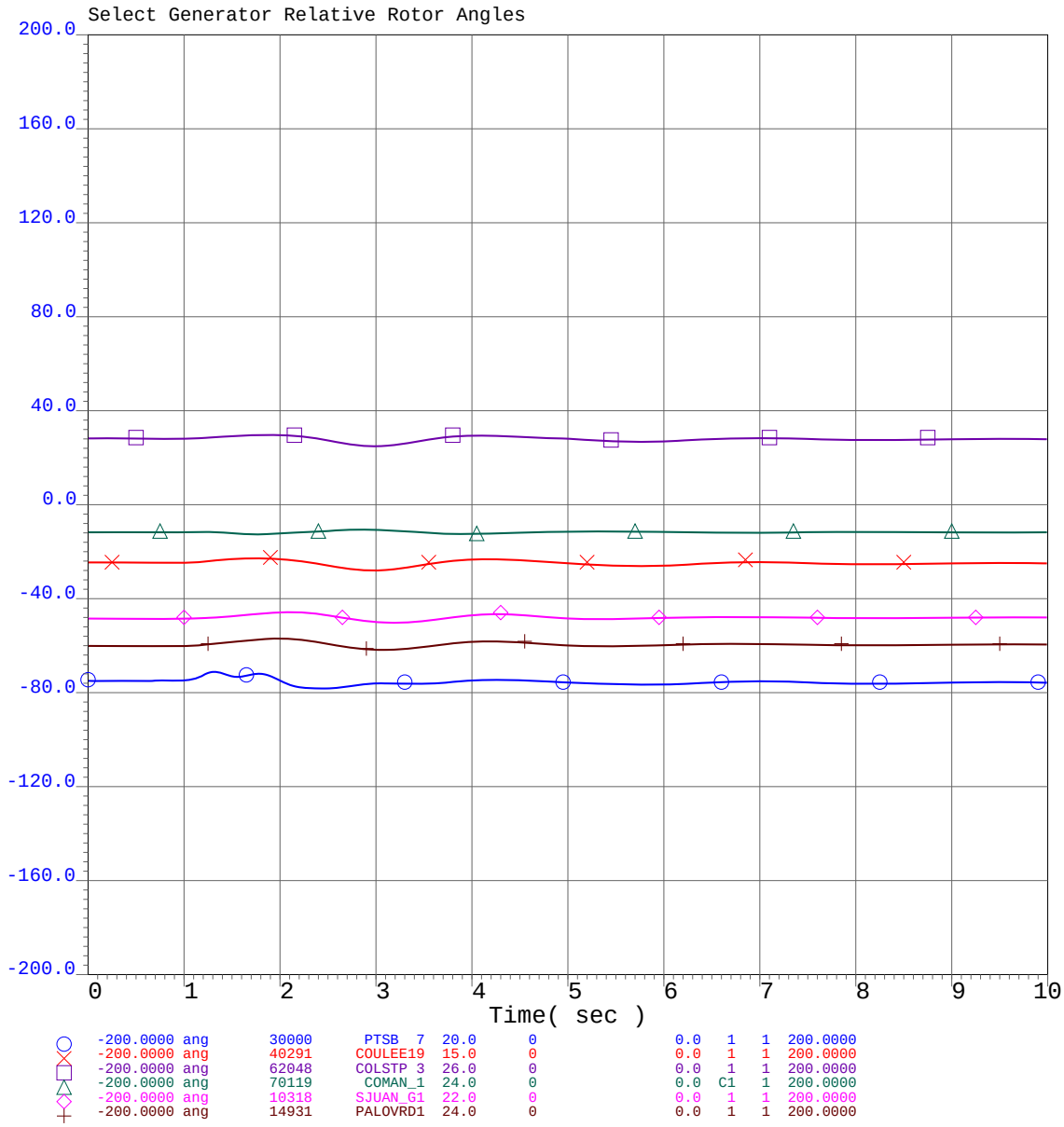






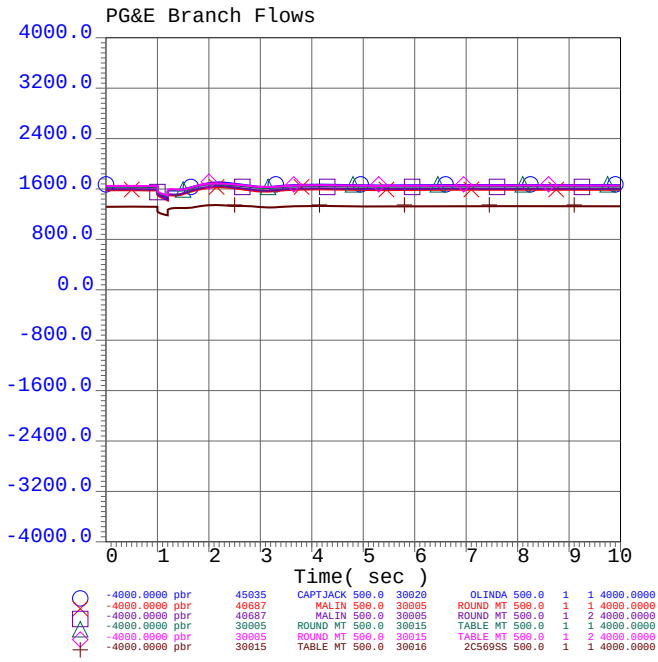
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

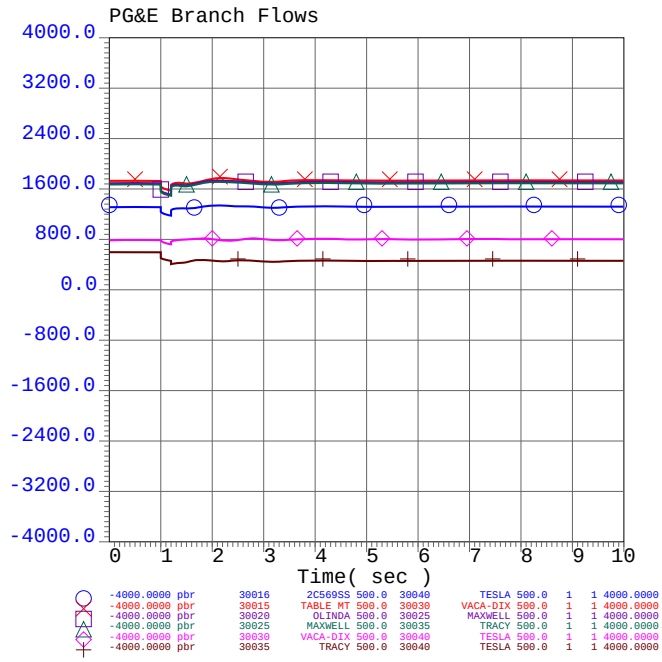
WECC RELATIVE ROTOR ANGLES

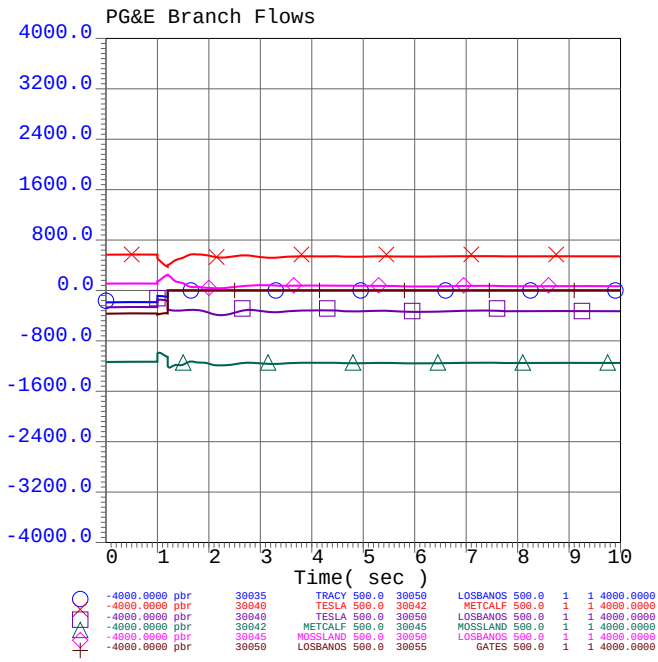


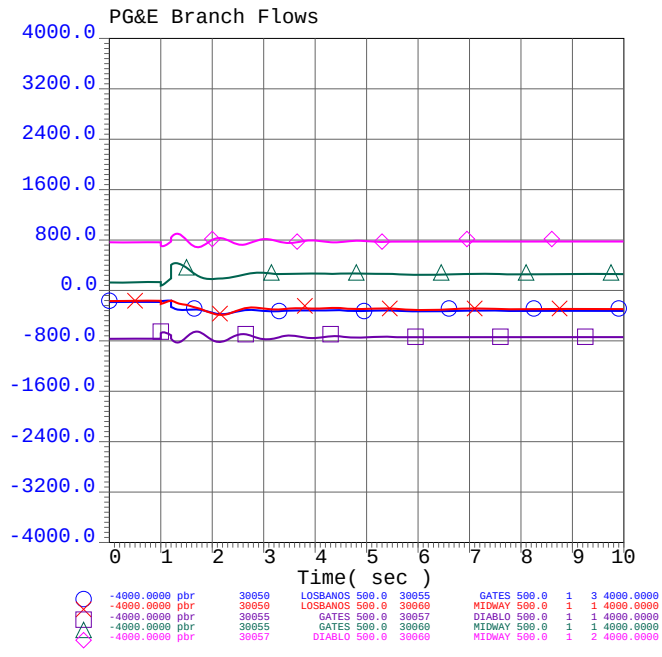
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

SELECT BRANCH FLOWS



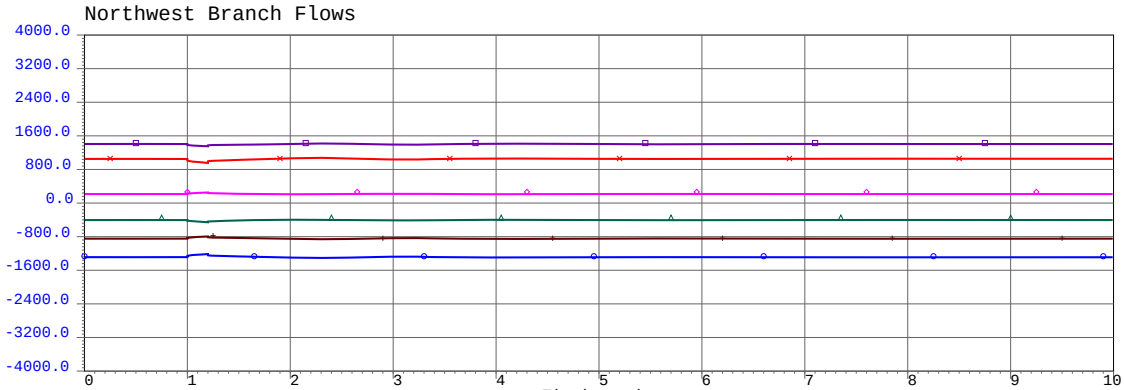




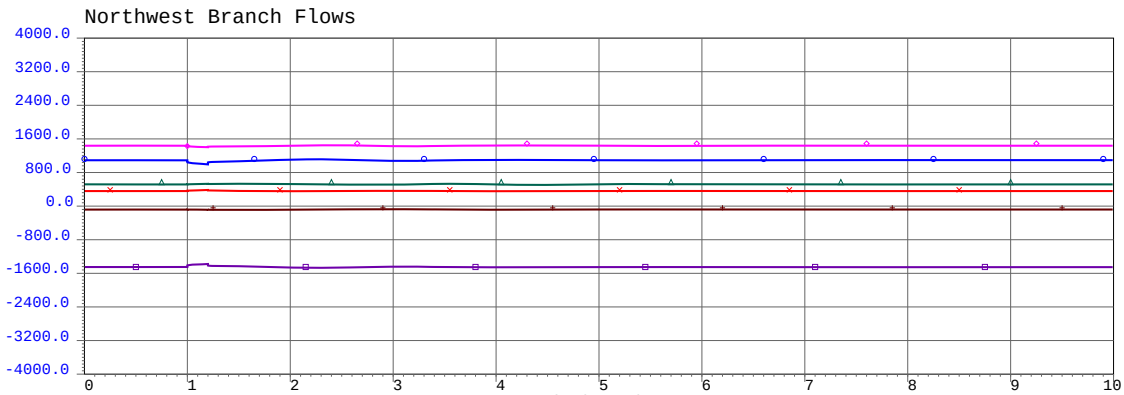


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

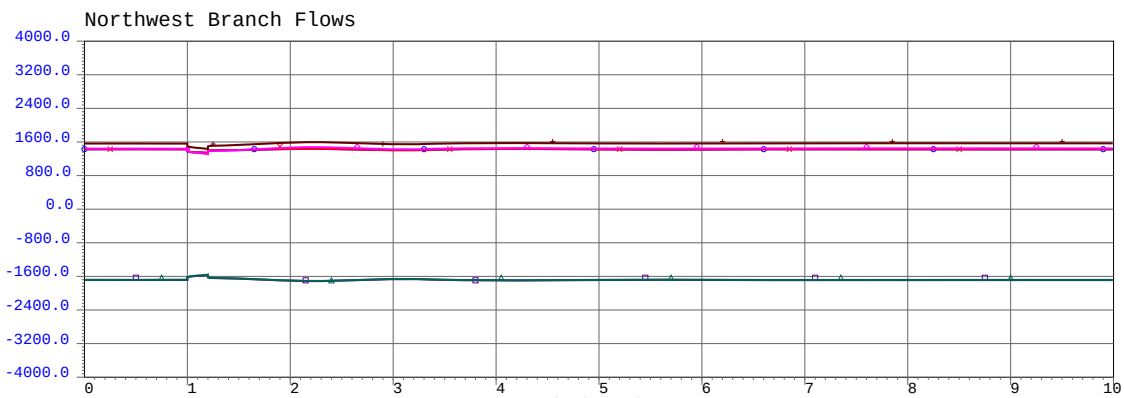
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



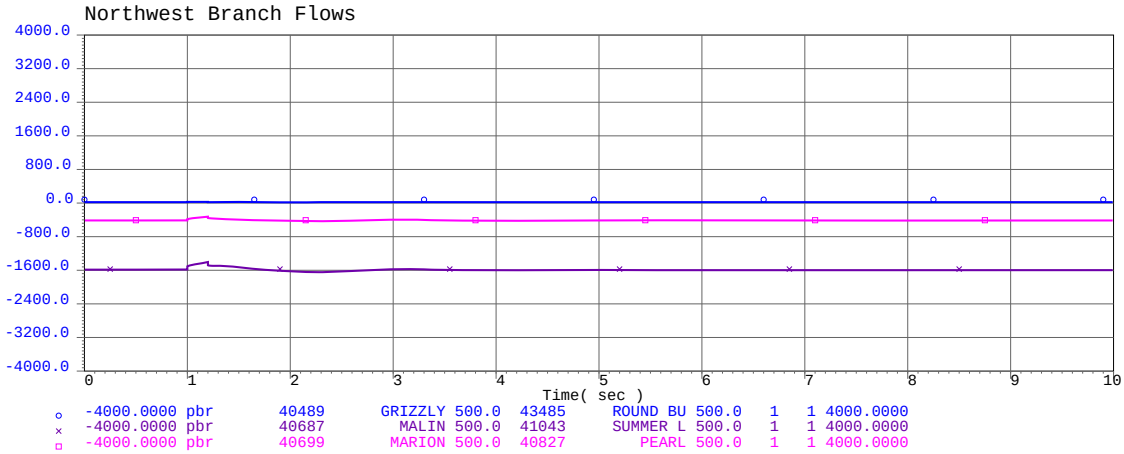
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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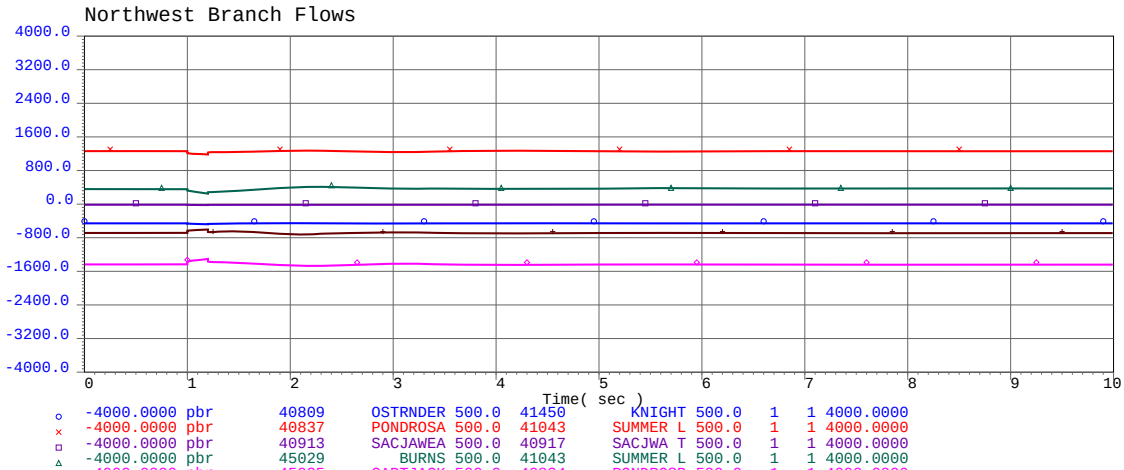
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

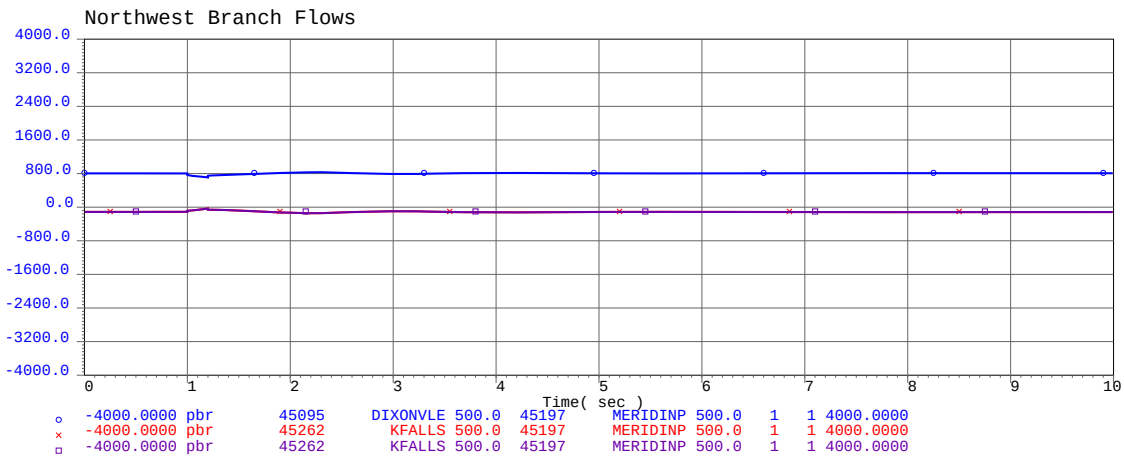
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



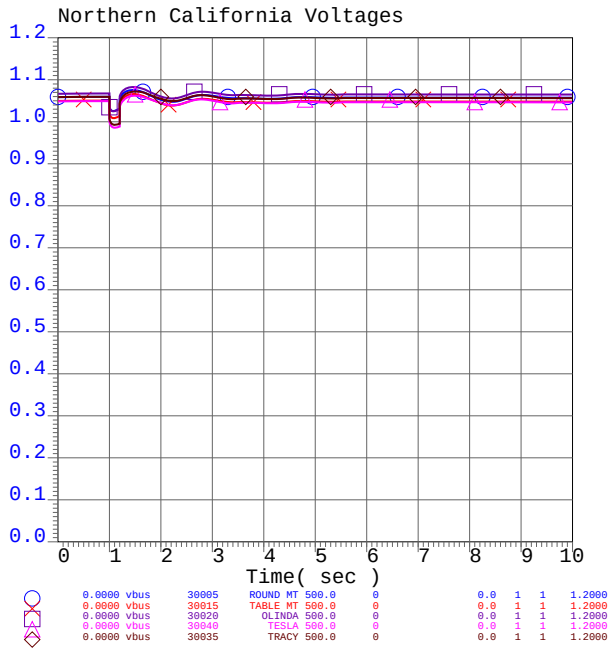
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
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-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
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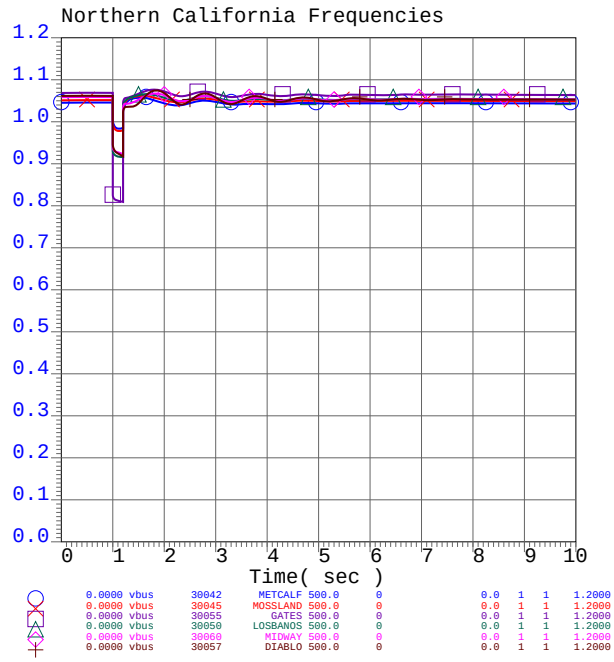


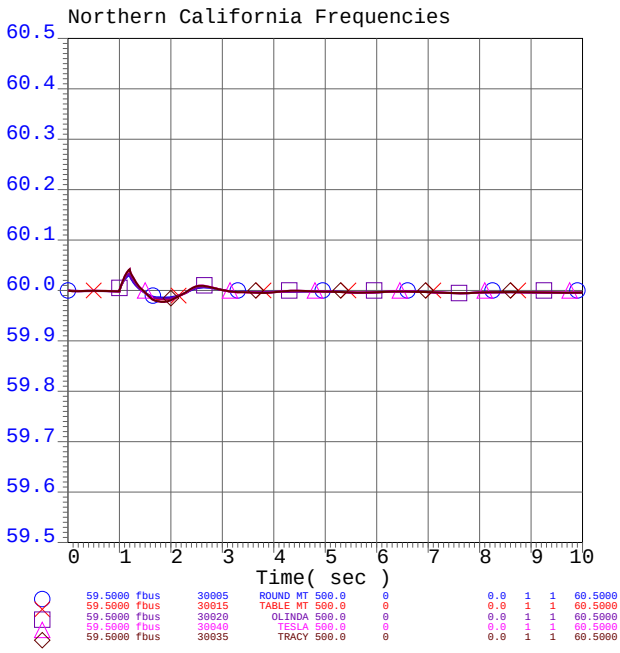
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

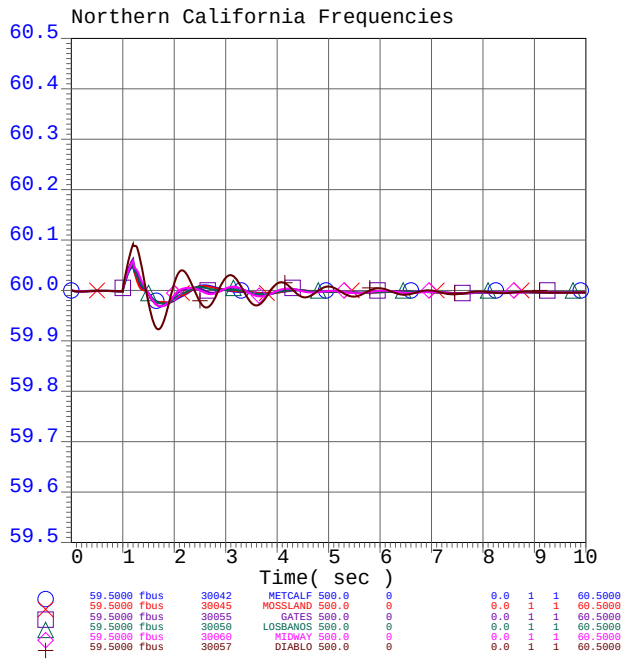
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Los Banos 500 kV (12 cycle SLG)
followed by loss of Los Banos-Tracy 500 kV line & Los Banos-Gates 500 kV

WECC AREA VOLTAGE AND FREQUENCIES



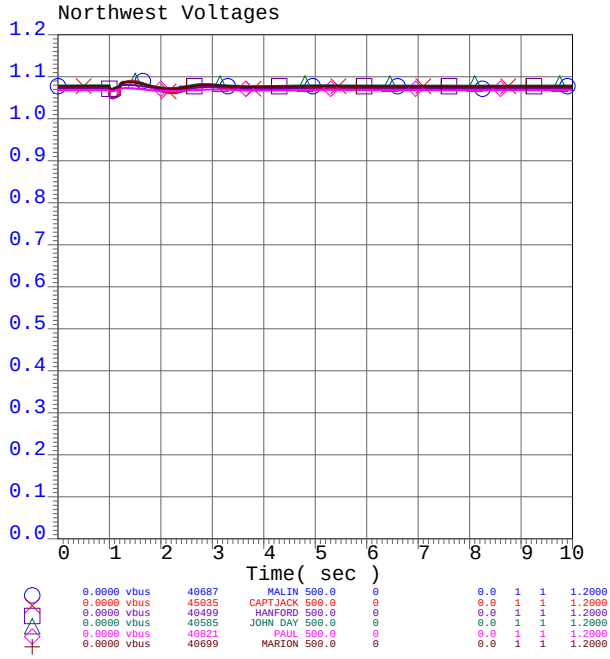


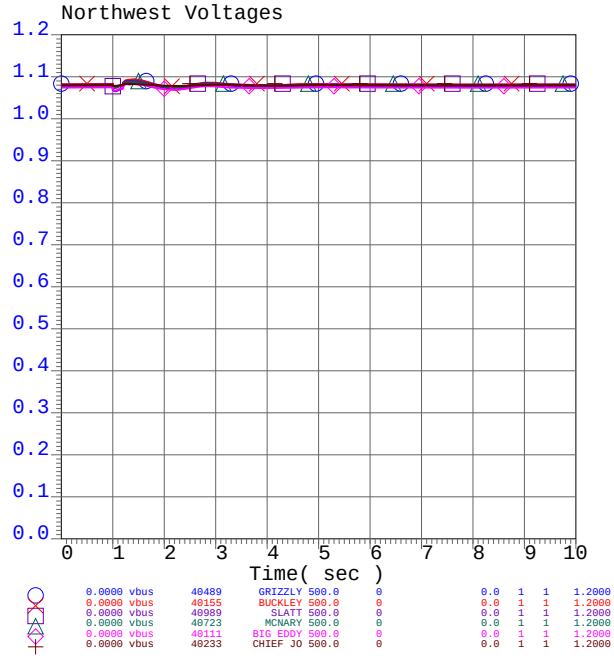


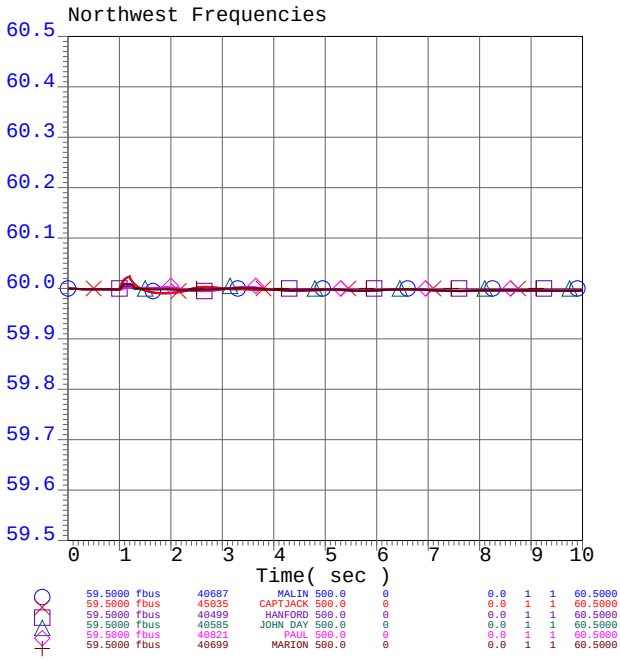


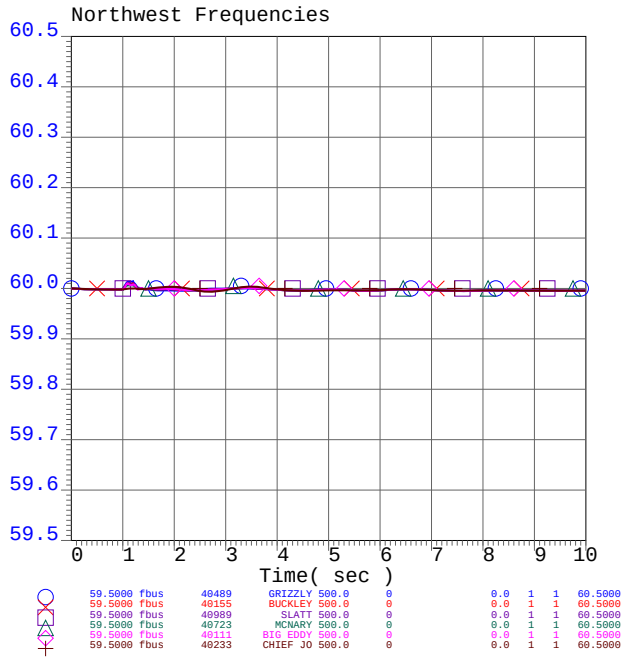
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Gates 500 kV (12 cycle SLG)
followed by loss of Gates-Diablo Canyon 500 and Gates-Los Banos #1 500 kV

WECC AREA VOLTAGE AND FREQUENCIES





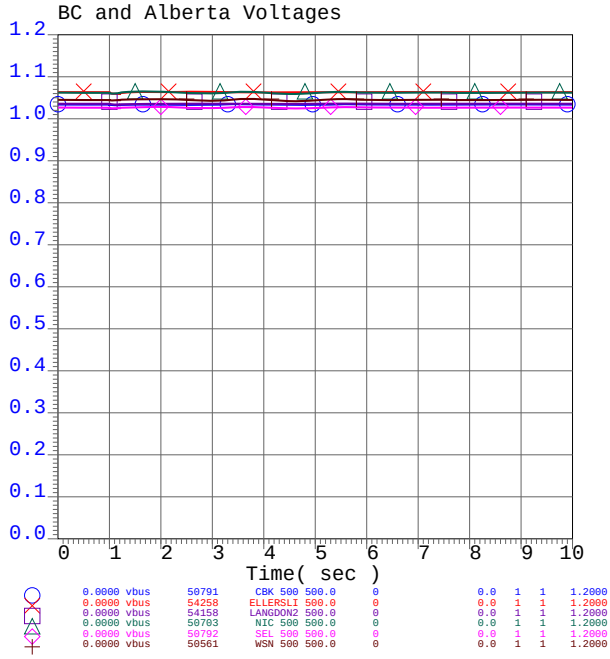




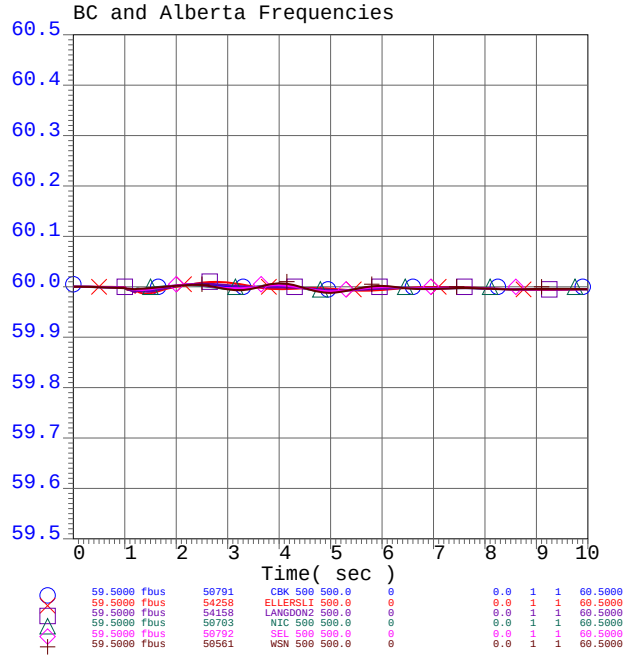
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WECC AREA VOLTAGE AND FREQUENCIES

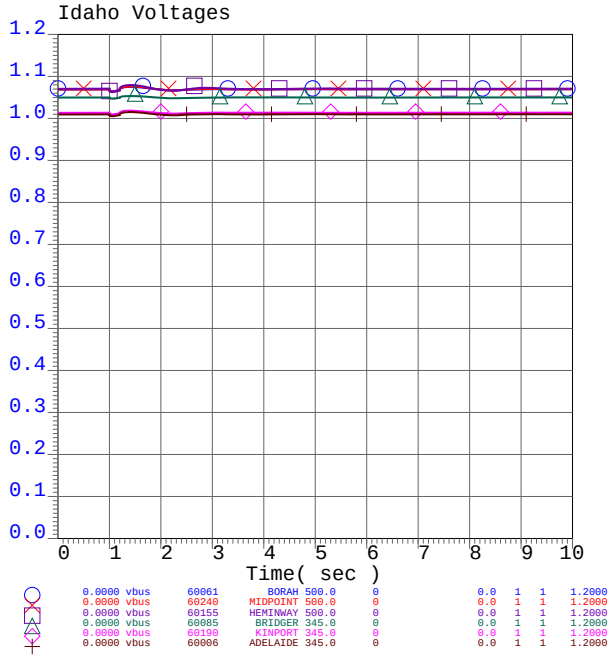
BC and Alberta Voltages



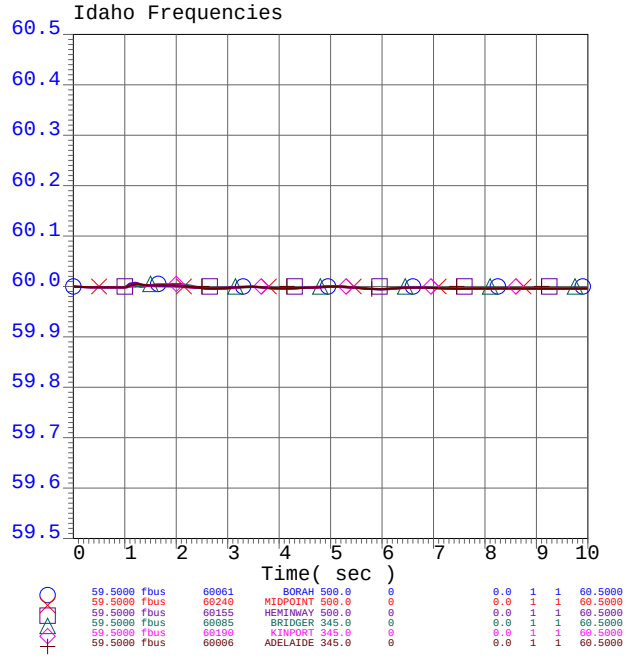
BC and Alberta Frequencies



Idaho Voltages



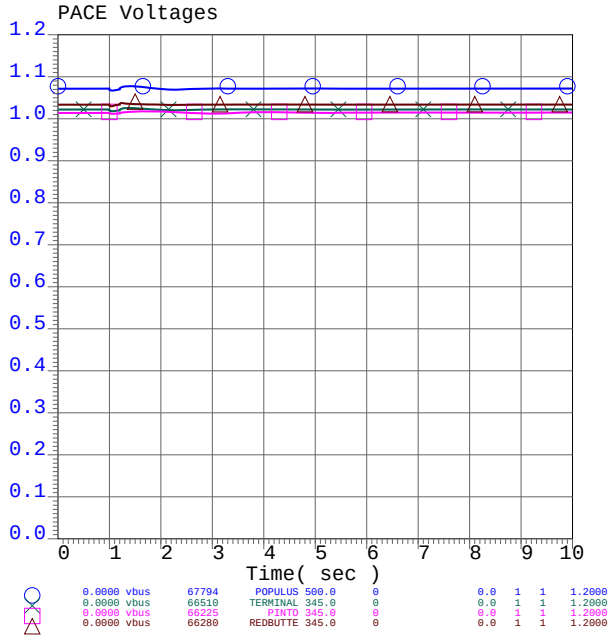
Idaho Frequencies



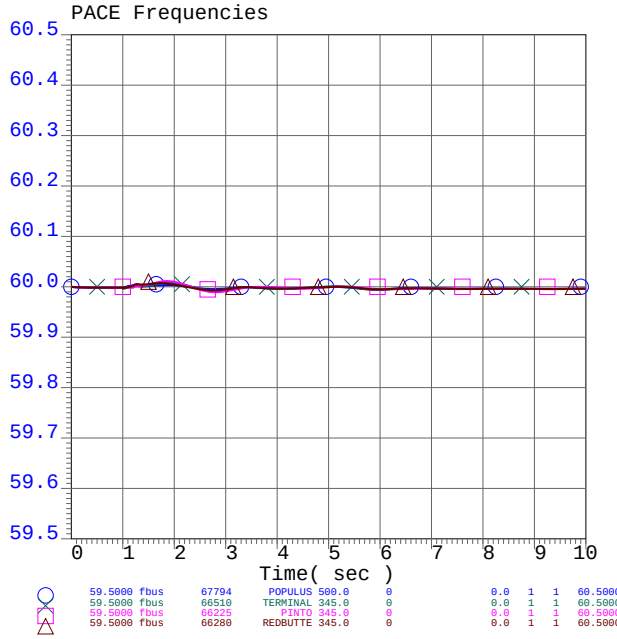
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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WECC AREA VOLTAGE AND FREQUENCIES

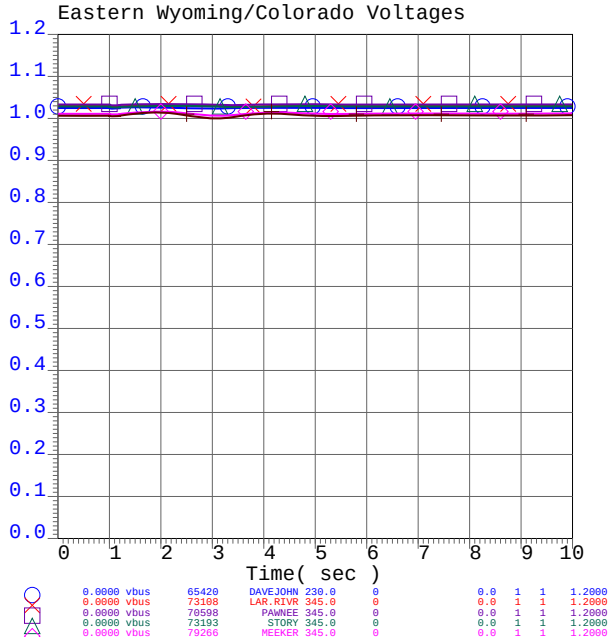
PACE Voltages



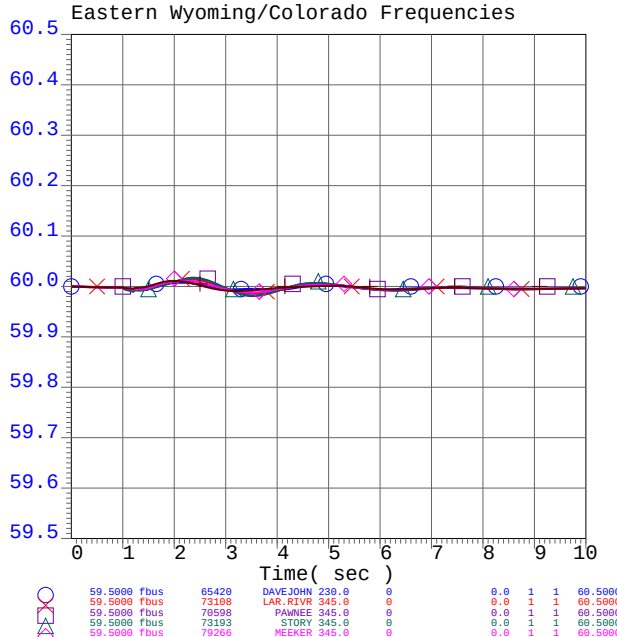
PACE Frequencies



Eastern Wyoming/Colorado Voltages

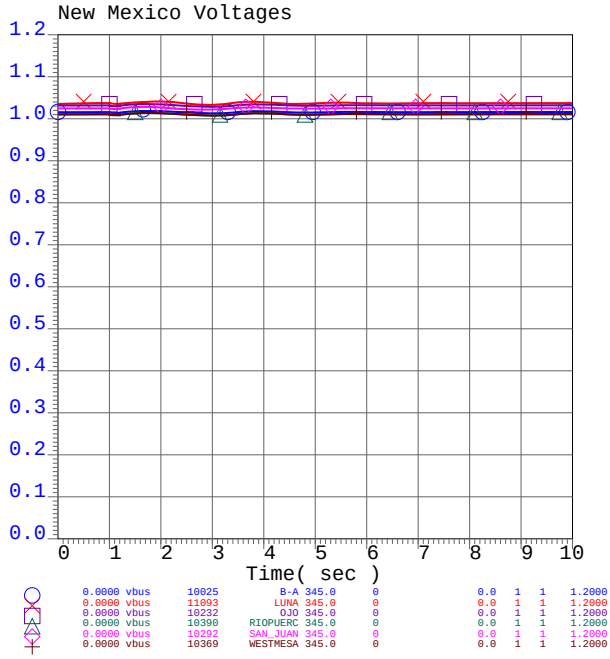


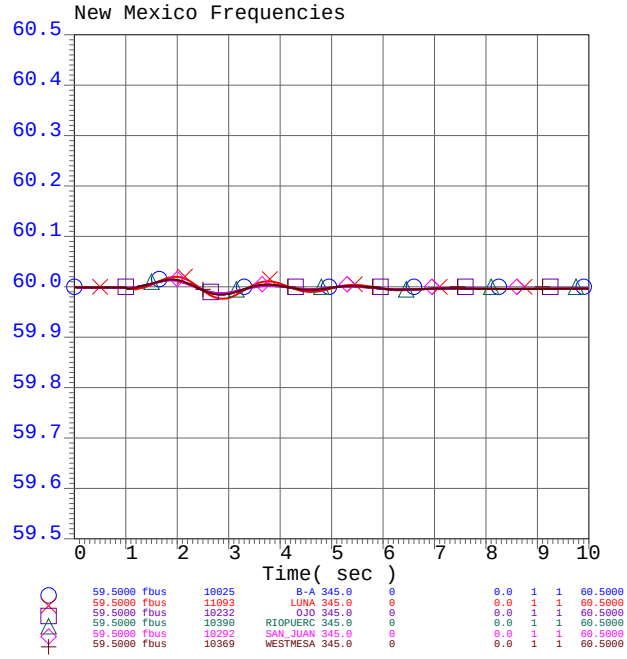
Eastern Wyoming/Colorado Frequencies

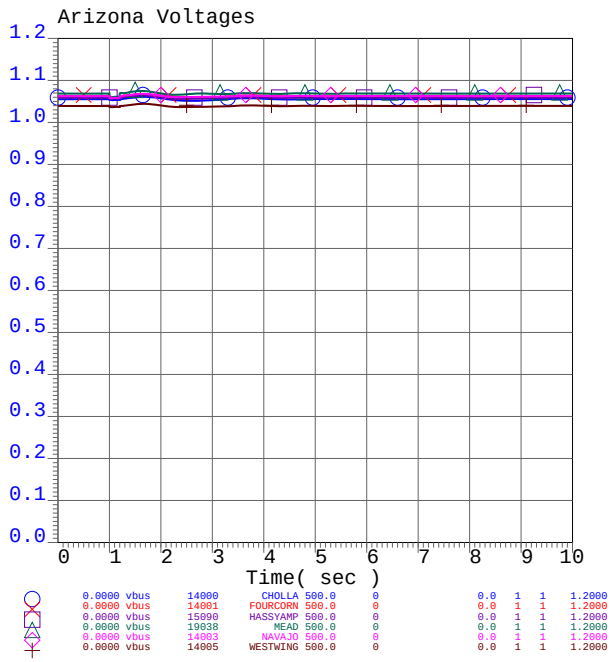


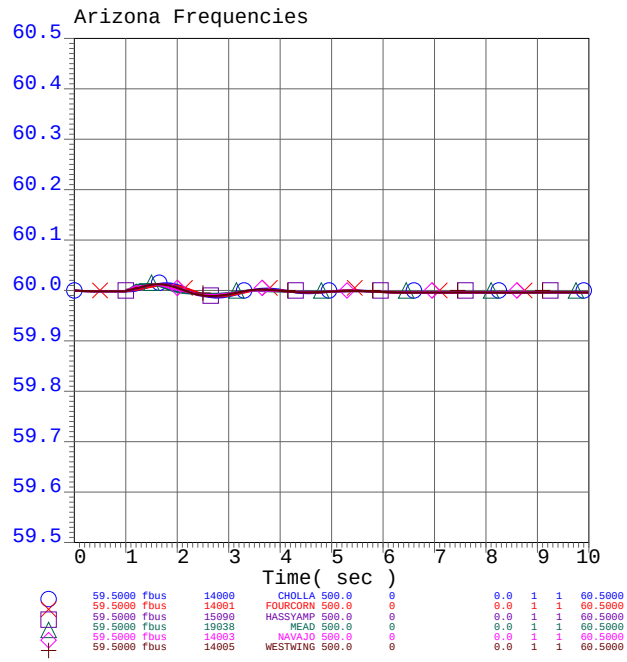
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Stuck Breaker at Gates 500 kV (12 cycle SLG)
followed by loss of Gates-Diablo Canyon 500 and Gates-Los Banos #1 500 kV

WECC AREA VOLTAGE AND FREQUENCIES



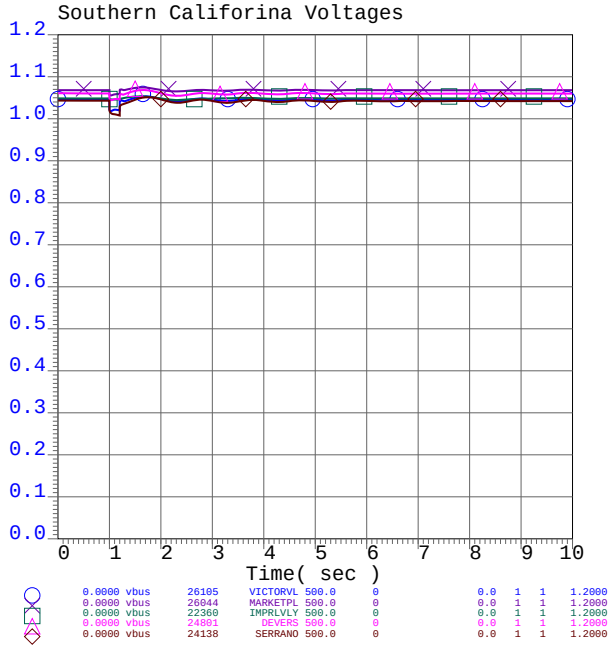


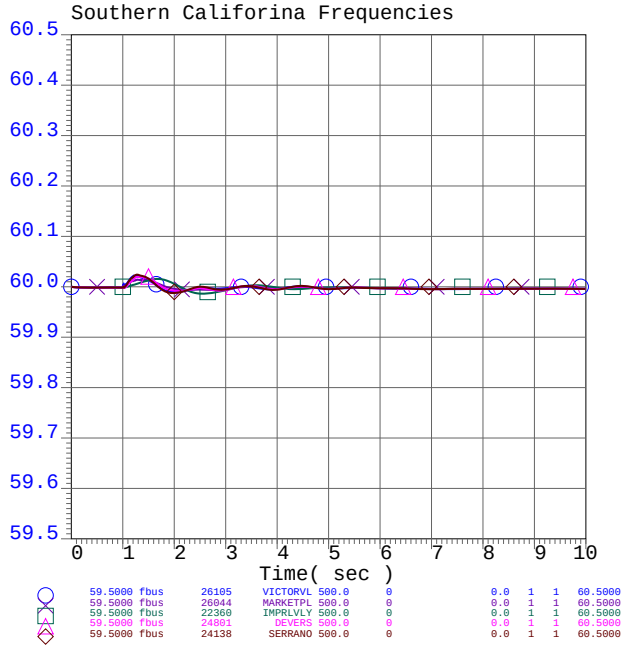


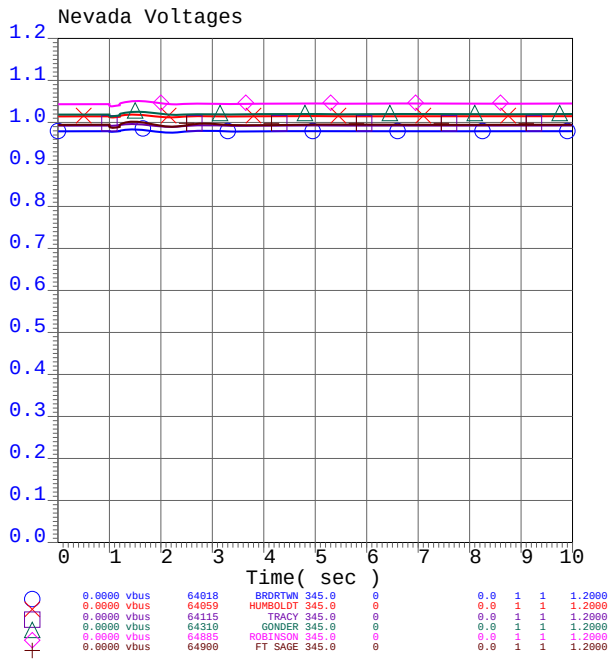


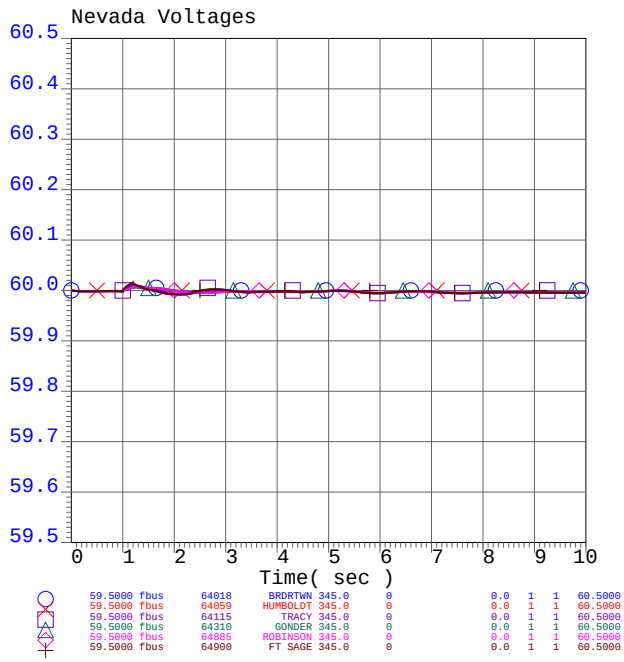
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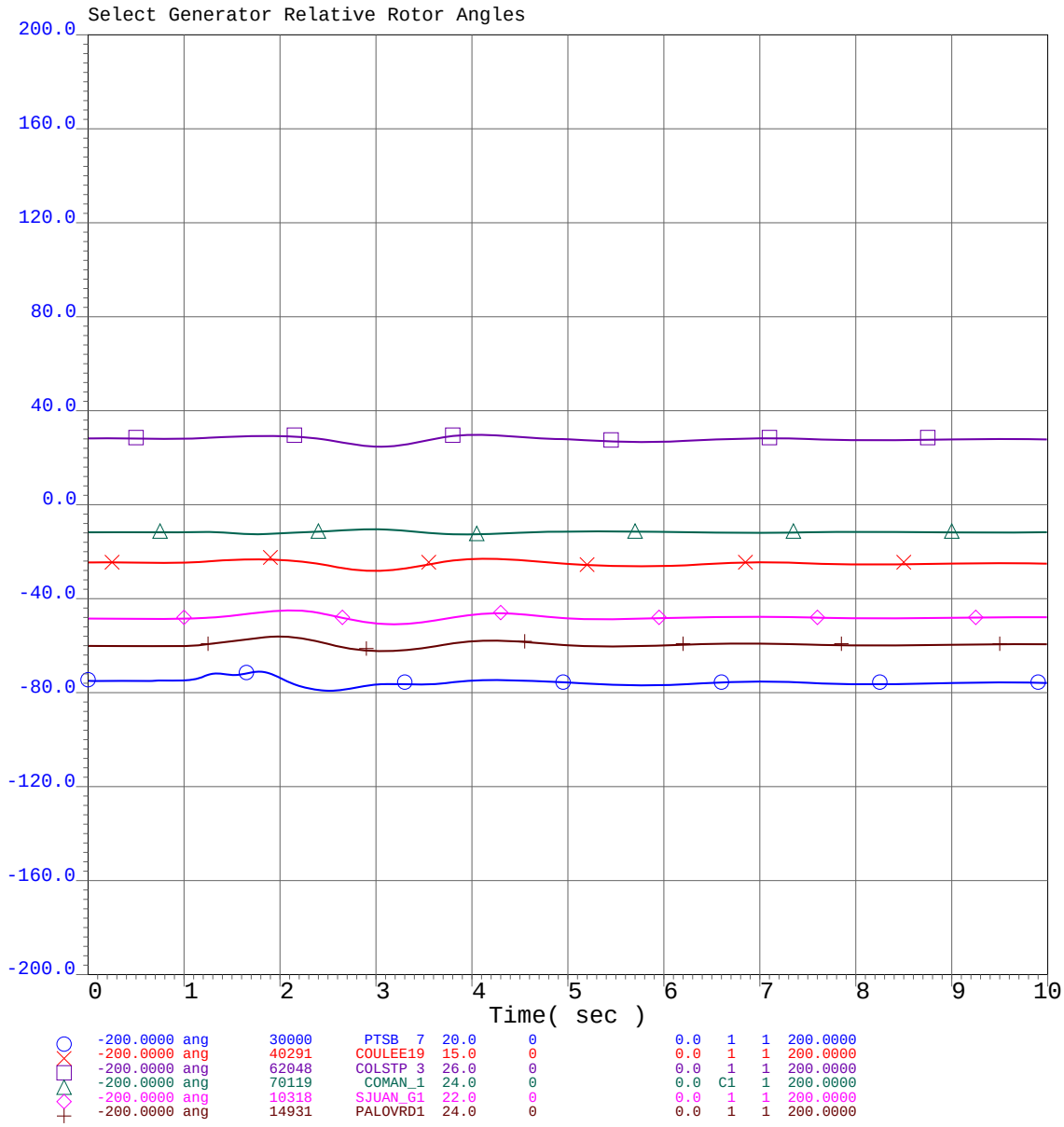






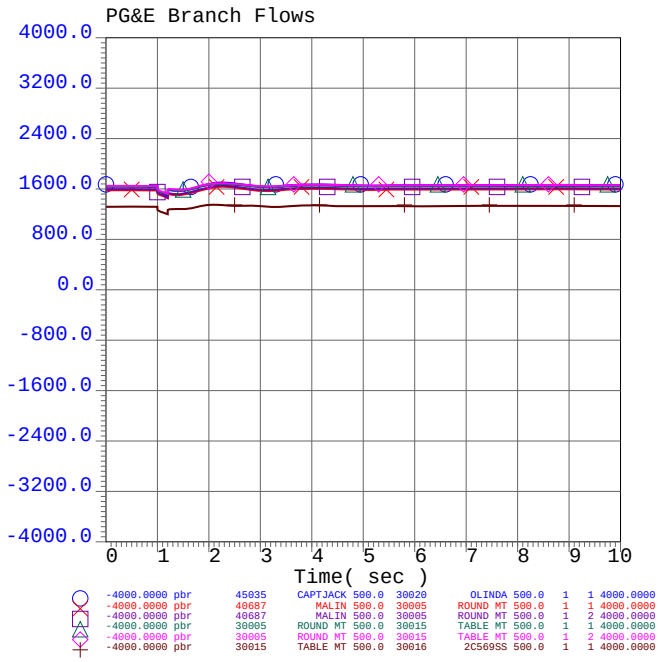
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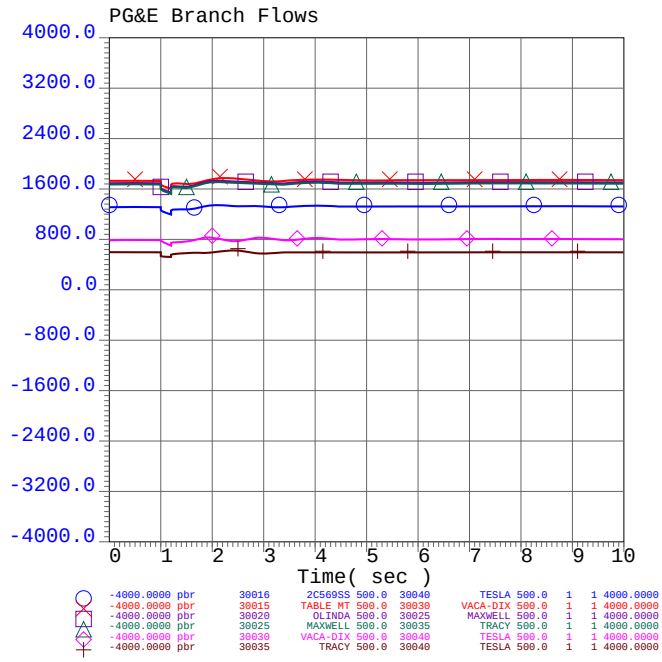
WECC RELATIVE ROTOR ANGLES

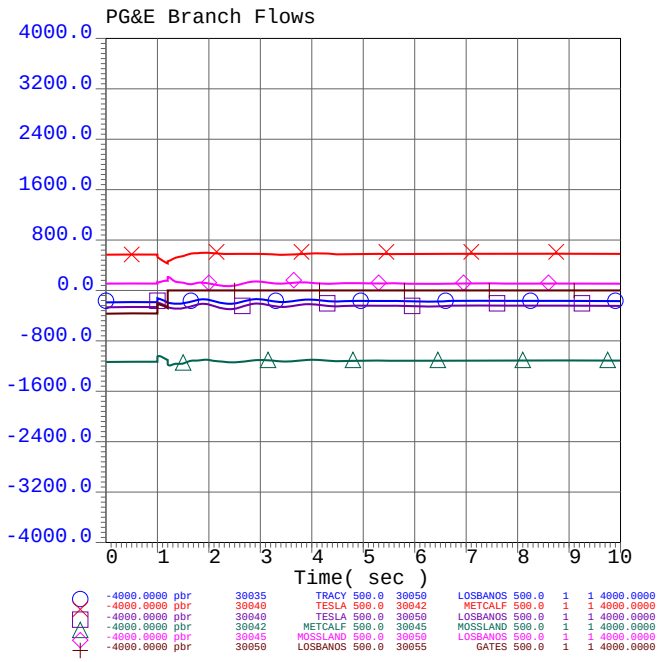


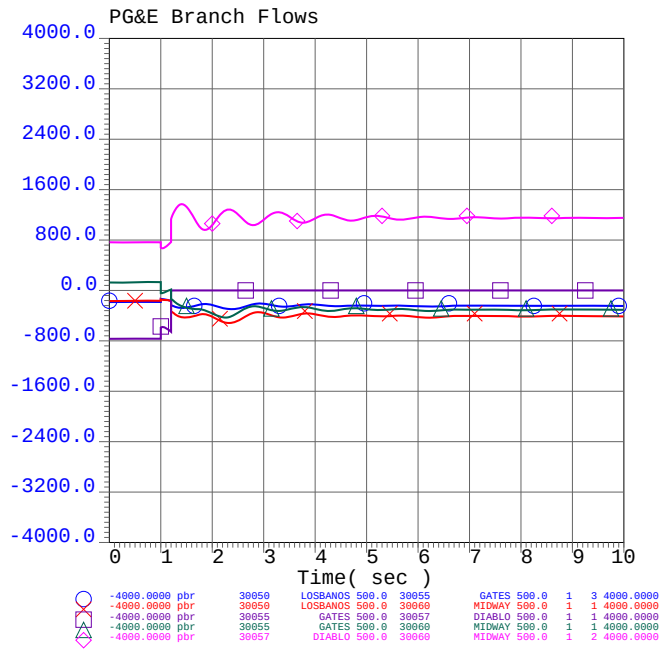
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followed by loss of Gates-Diablo Canyon 500 and Gates-Los Banos #1 500 kV

SELECT BRANCH FLOWS



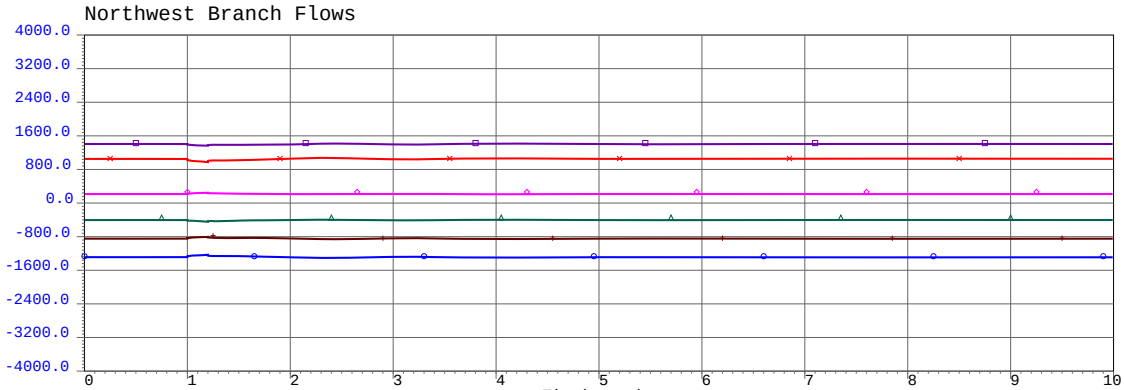




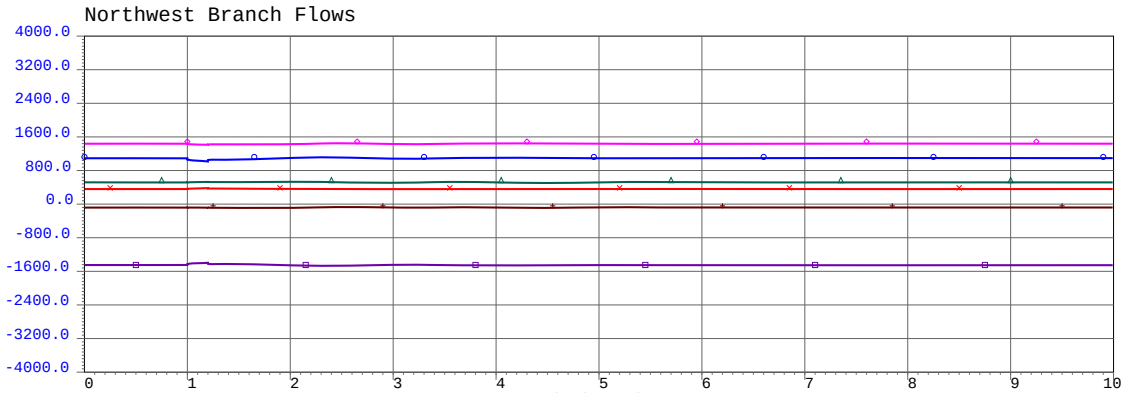


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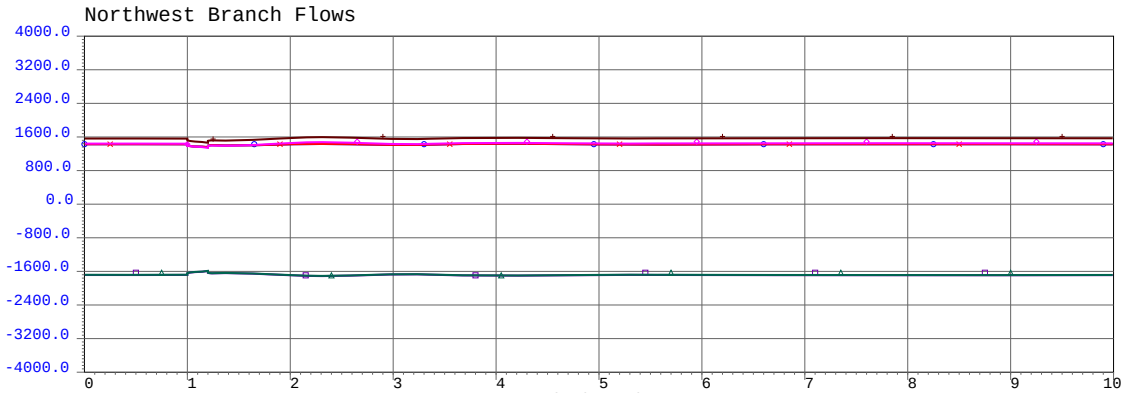
SELECT BRANCH FLOWS



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-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



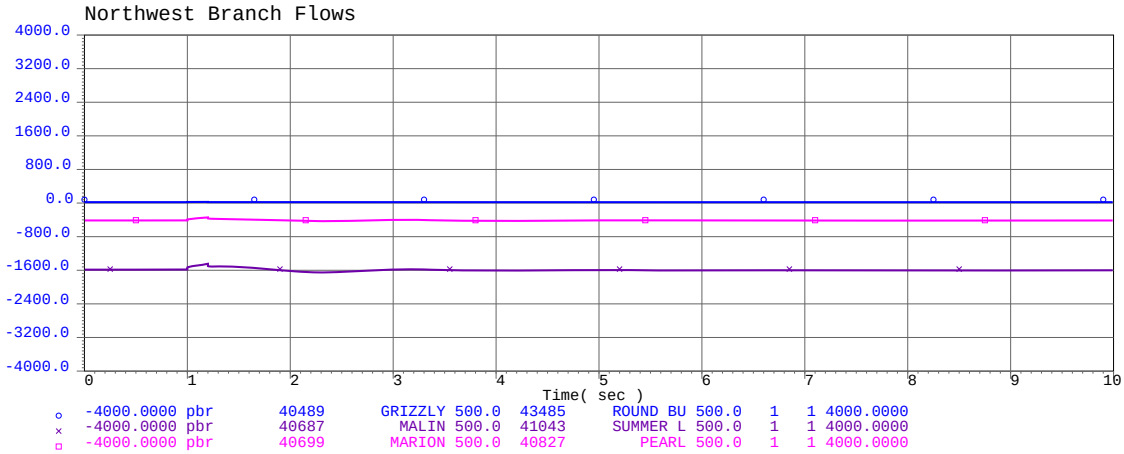
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-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
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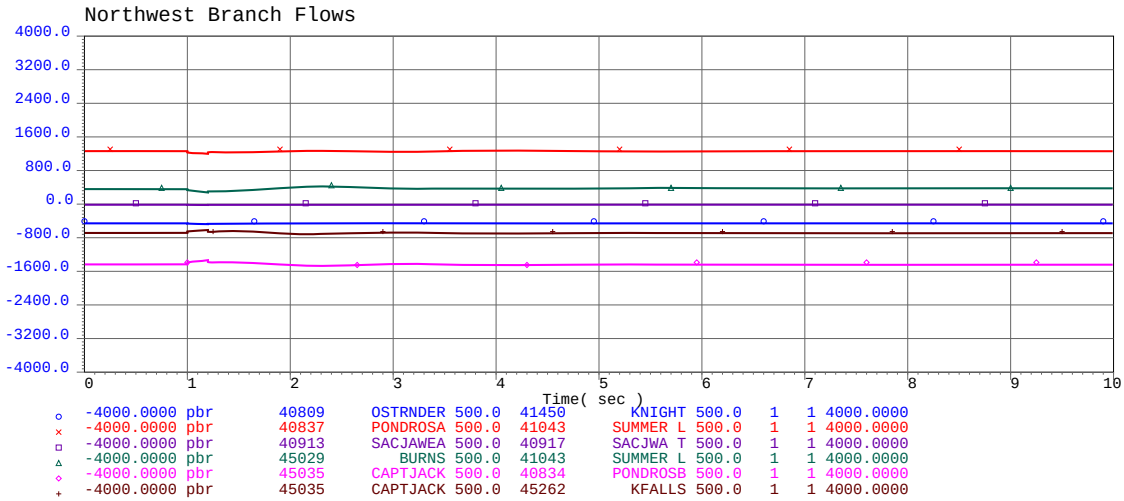


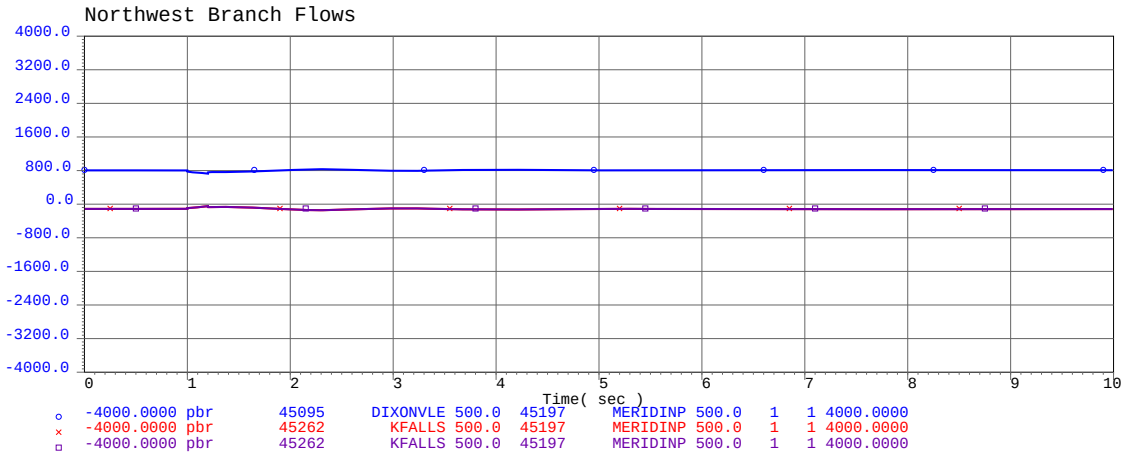
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-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Gates 500 kV (12 cycle SLG)
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SELECT BRANCH FLOWS

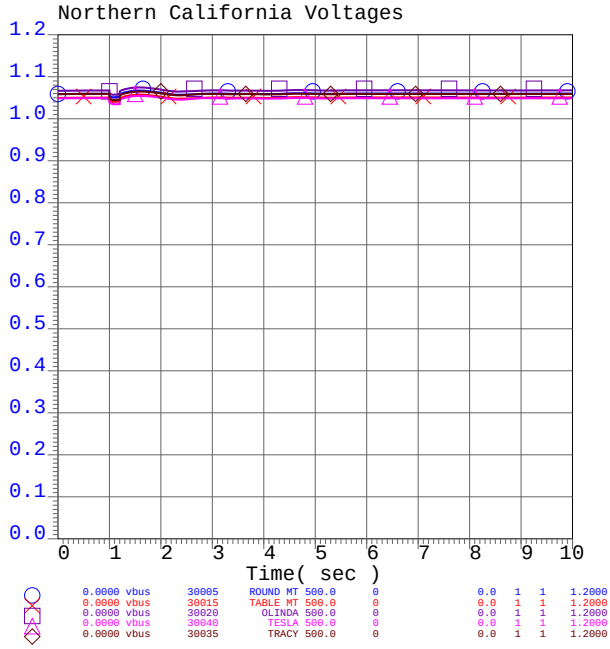


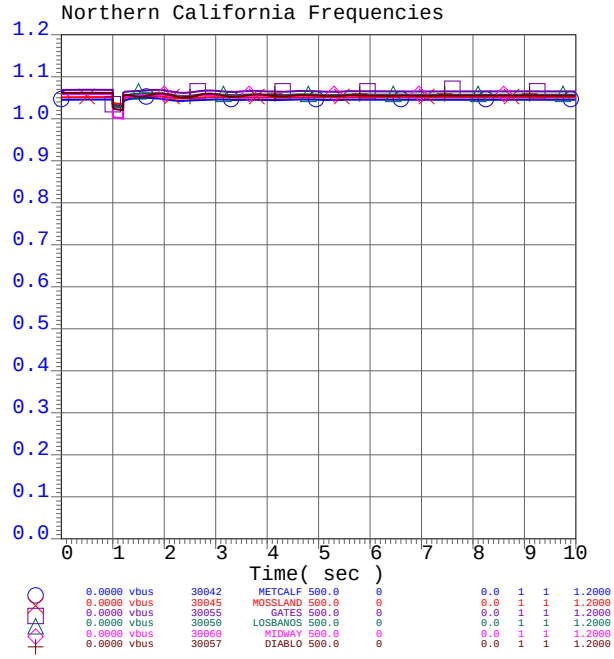


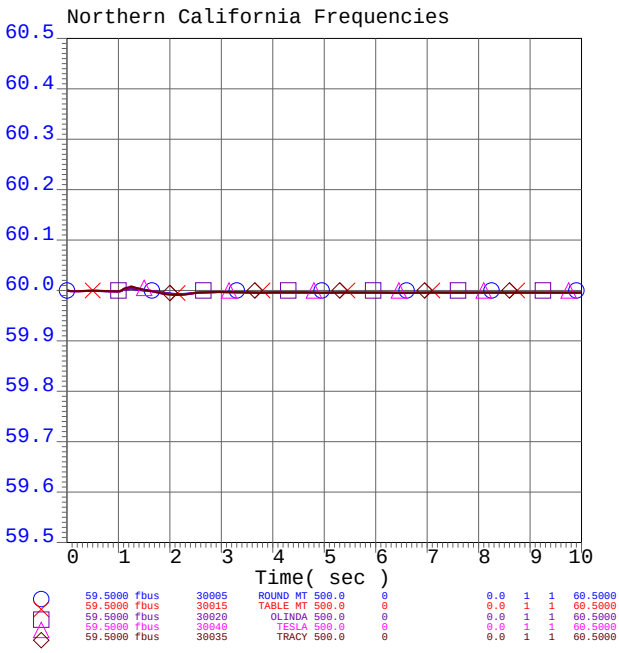


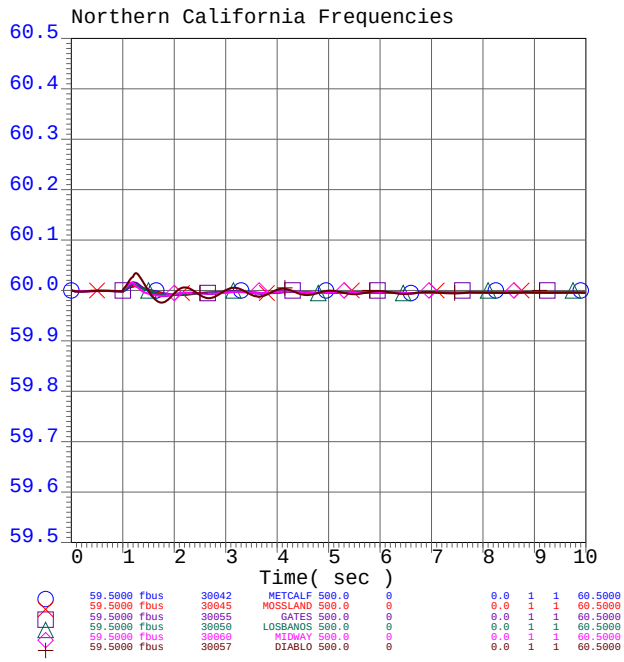
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WECC AREA VOLTAGE AND FREQUENCIES







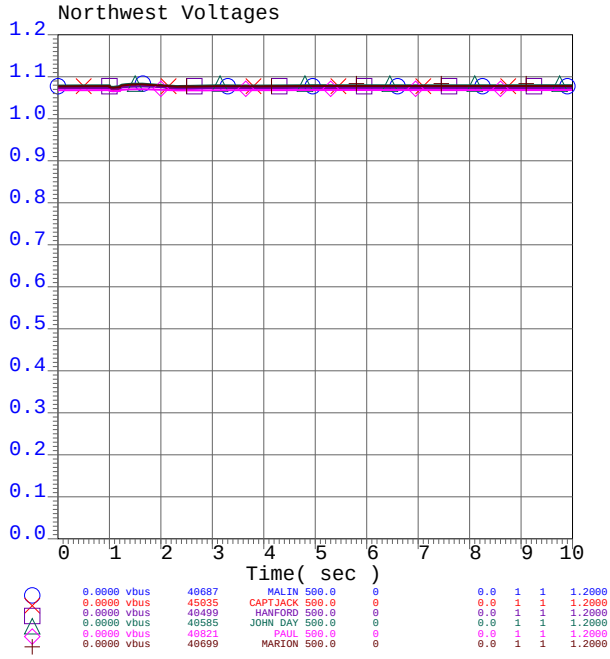


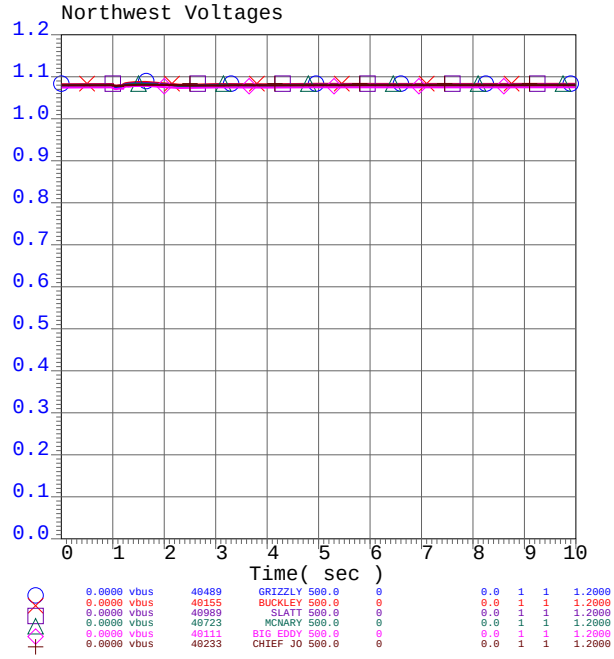
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

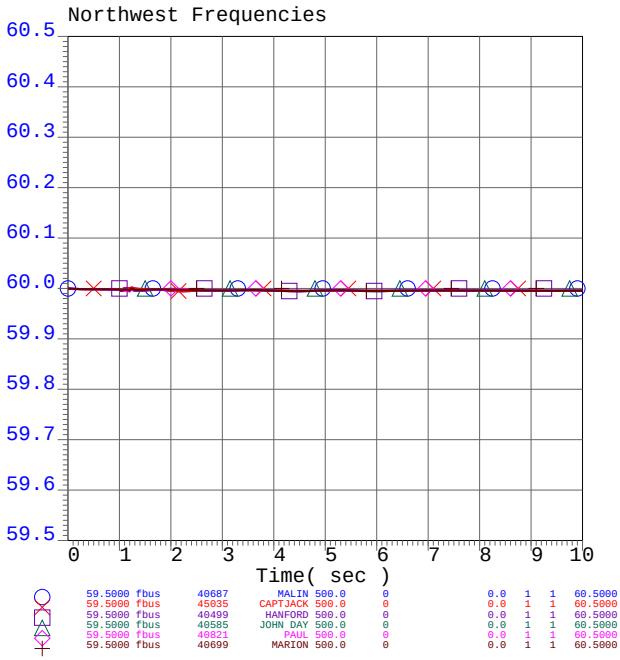
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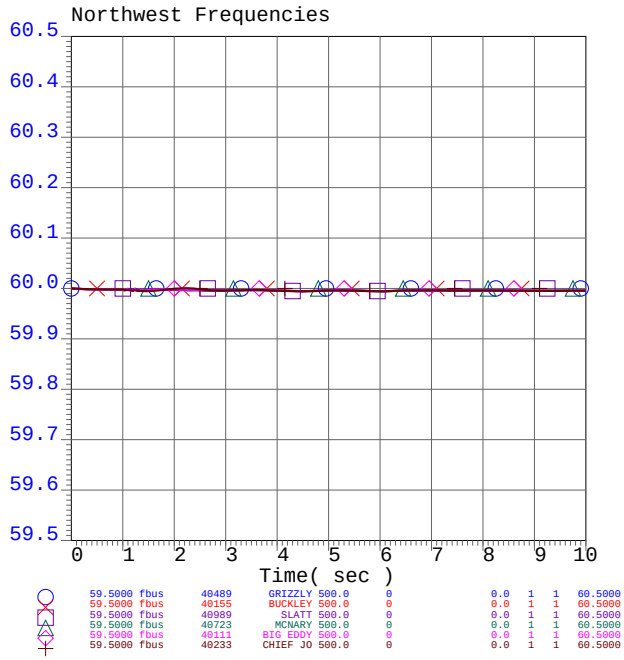
Fri Jan 03 19:29:32 2014

WECC AREA VOLTAGE AND FREQUENCIES









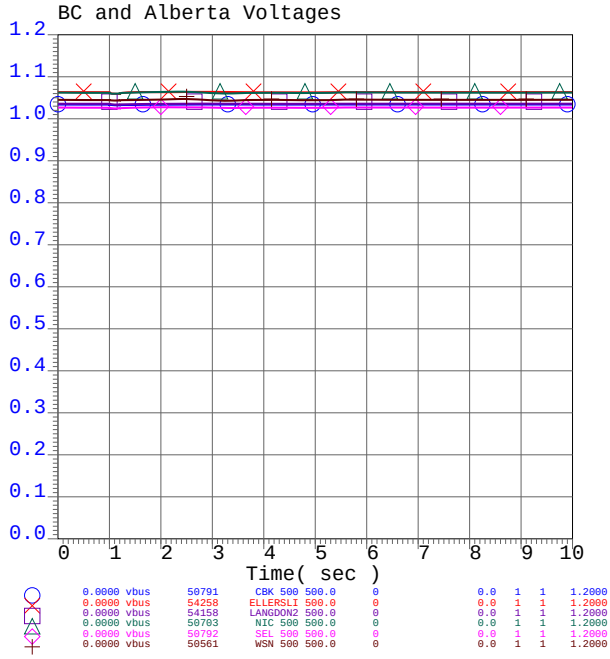
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Stuck Breaker Gates 500 kV (12 cycle SLG)
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ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt77_c8_mdwy-gates_mdwy-dblo-500kVsumpk.chf

Fri Jan 03 19:29:32 2014

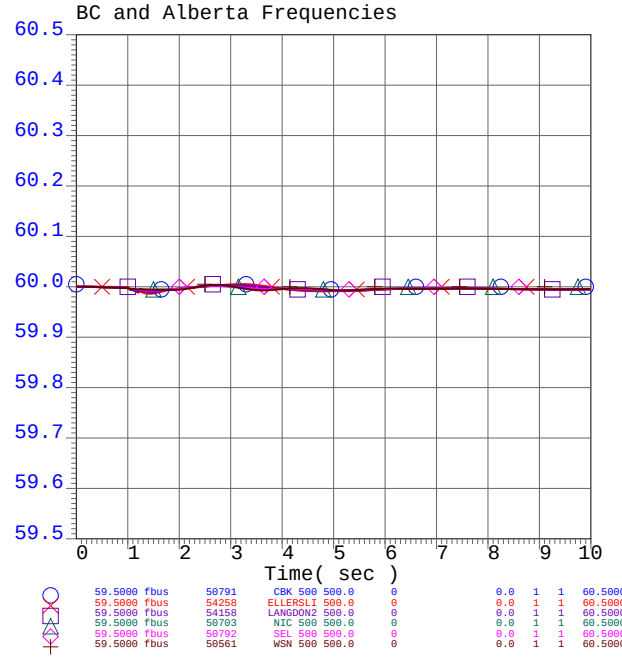
WECC AREA VOLTAGE AND FREQUENCIES

BC and Alberta Voltages



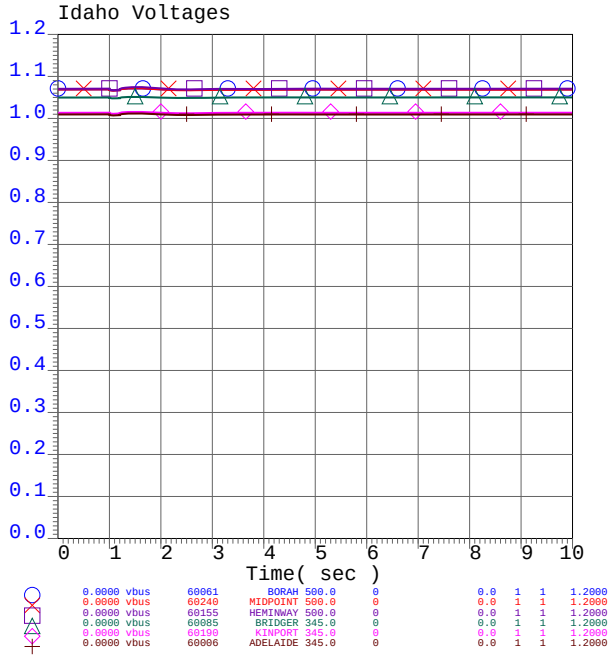
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0.0000 vbus	54258	ELLERSLI 500.0	0	0.0	1	1	1.2000
0.0000 vbus	54158	LANGDON2 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50703	NIC 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50792	SEL 500 500.0	0	0.0	1	1	1.2000
0.0000 vbus	50561	WSN 500 500.0	0	0.0	1	1	1.2000

BC and Alberta Frequencies



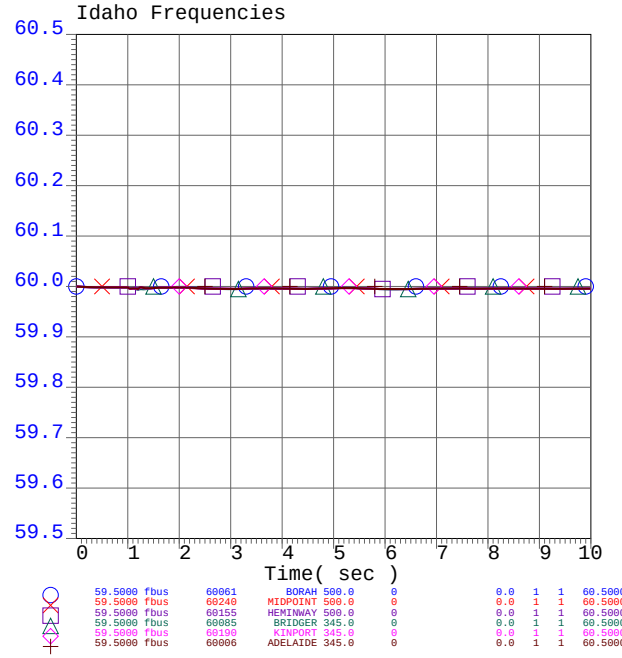
59.5000 fbus	50791	CBK 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54258	ELLERSLI 500.0	0	0.0	1	1	60.5000
59.5000 fbus	54158	LANGDON2 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50703	NIC 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50792	SEL 500 500.0	0	0.0	1	1	60.5000
59.5000 fbus	50561	WSN 500 500.0	0	0.0	1	1	60.5000

Idaho Voltages



0.0000 vbus	60061	BORAH 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60240	MIDPOINT 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60155	HEMINWAY 500.0	0	0.0	1	1	1.2000
0.0000 vbus	60085	BRIDGER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60190	KINPORT 345.0	0	0.0	1	1	1.2000
0.0000 vbus	60006	ADELAIDE 345.0	0	0.0	1	1	1.2000

Idaho Frequencies

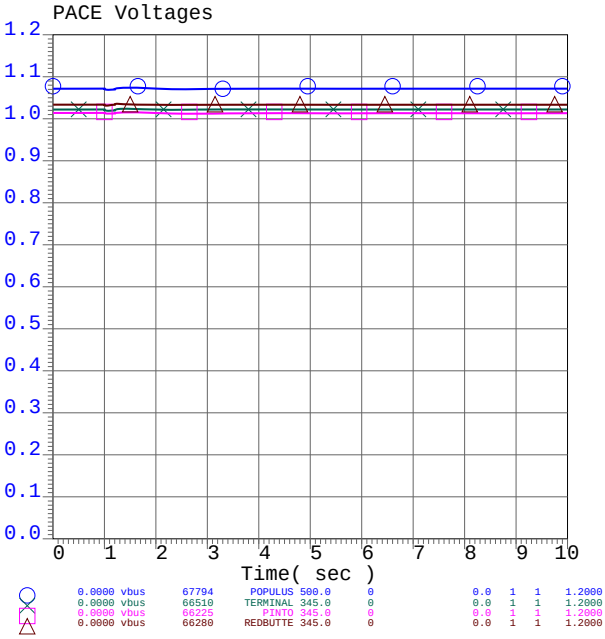


59.5000 fbus	60061	BORAH 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60240	MIDPOINT 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60155	HEMINWAY 500.0	0	0.0	1	1	60.5000
59.5000 fbus	60085	BRIDGER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60190	KINPORT 345.0	0	0.0	1	1	60.5000
59.5000 fbus	60006	ADELAIDE 345.0	0	0.0	1	1	60.5000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

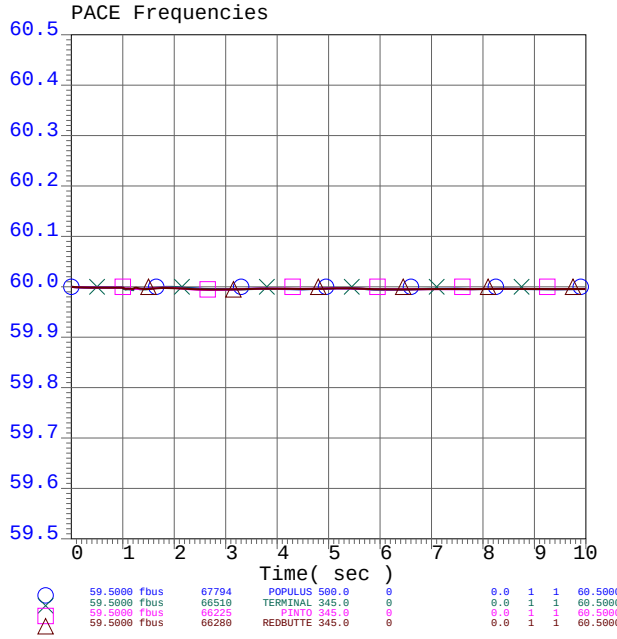
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



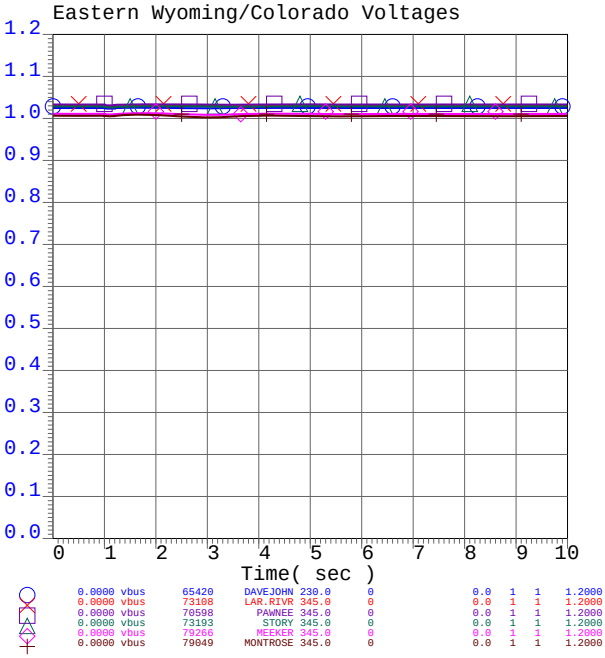
0.0000 vbus 67794 POPULUS 500.0 0 0.0 1 1 1.2000
0.0000 vbus 66510 TERMINAL 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



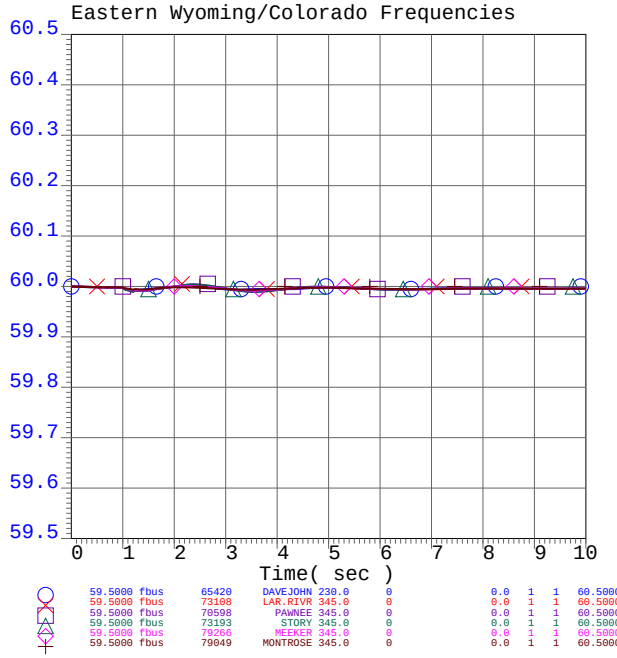
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59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

Eastern Wyoming/Colorado Frequencies

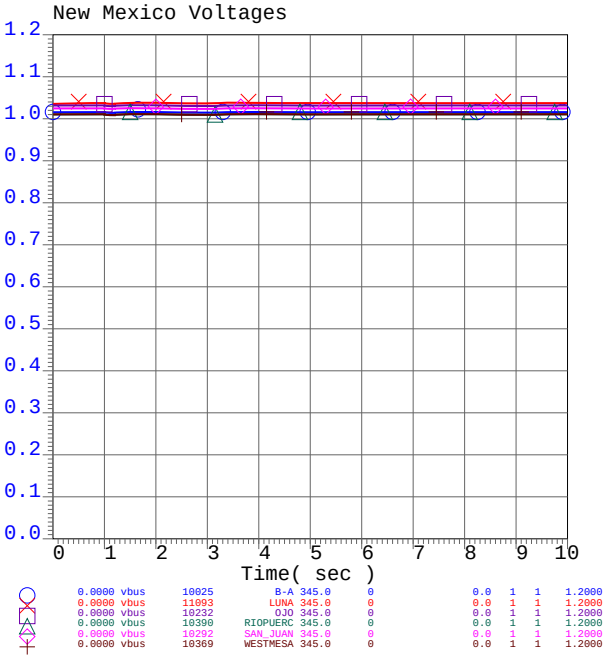


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
59.5000 fbus 70598 PAWNEE 345.0 0 0.0 1 1 60.5000
59.5000 fbus 73193 STORY 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79266 MEEKER 345.0 0 0.0 1 1 60.5000
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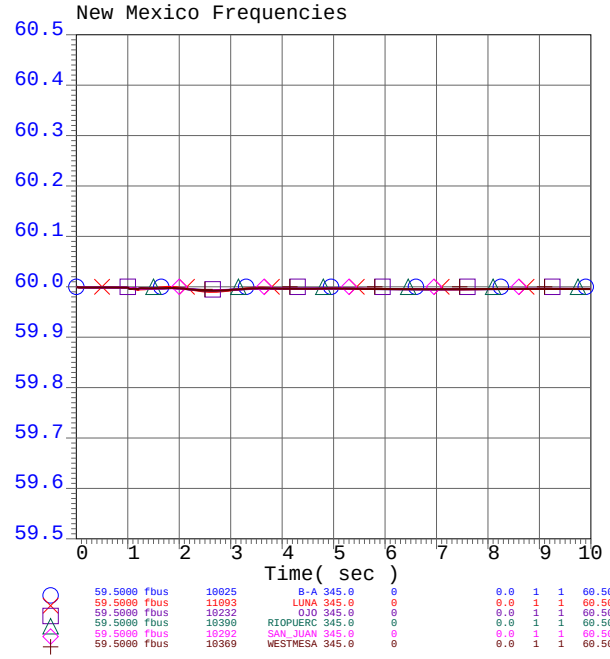
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES

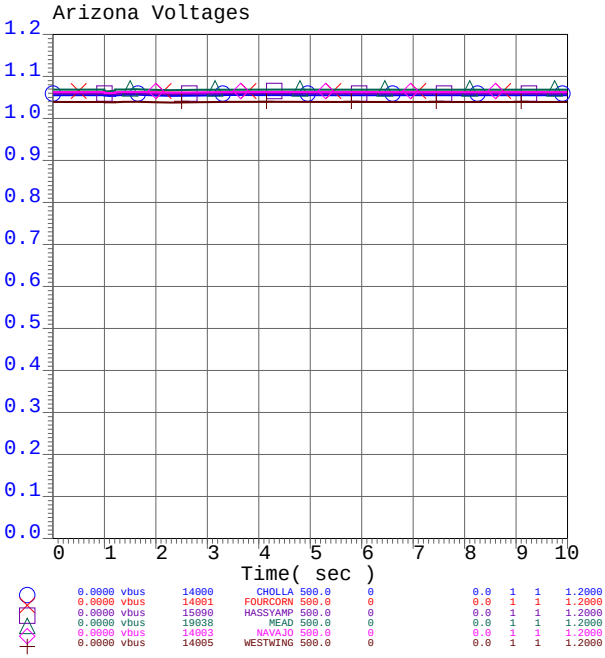
New Mexico Voltages



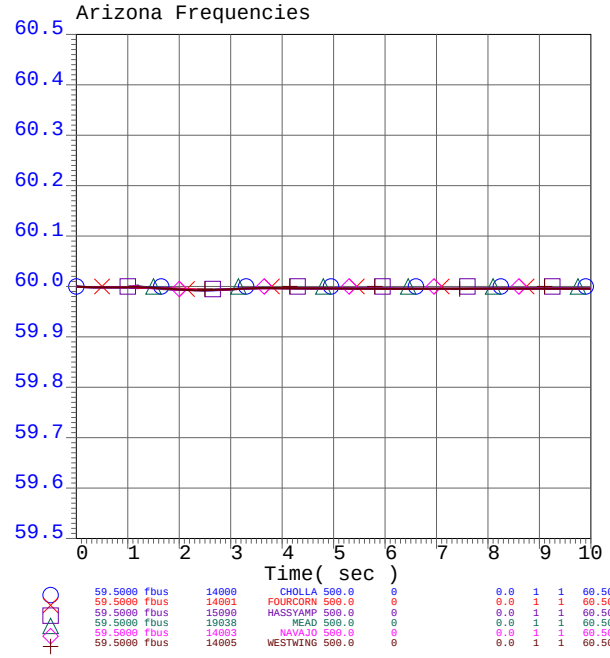
New Mexico Frequencies



Arizona Voltages



Arizona Frequencies

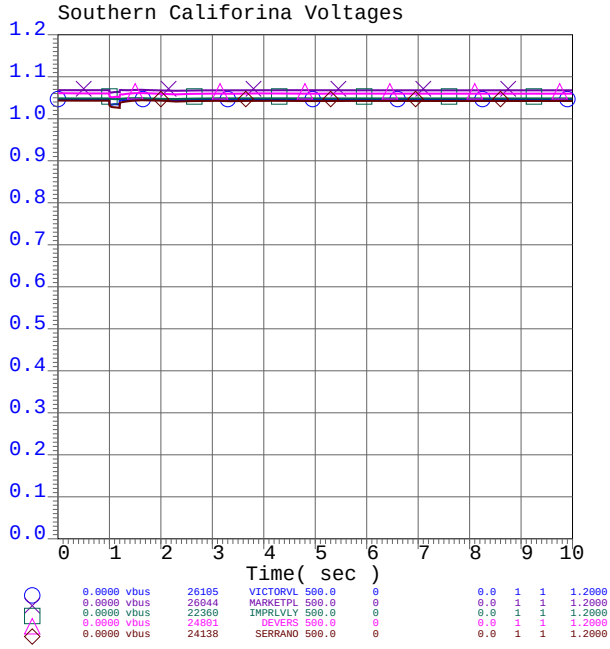


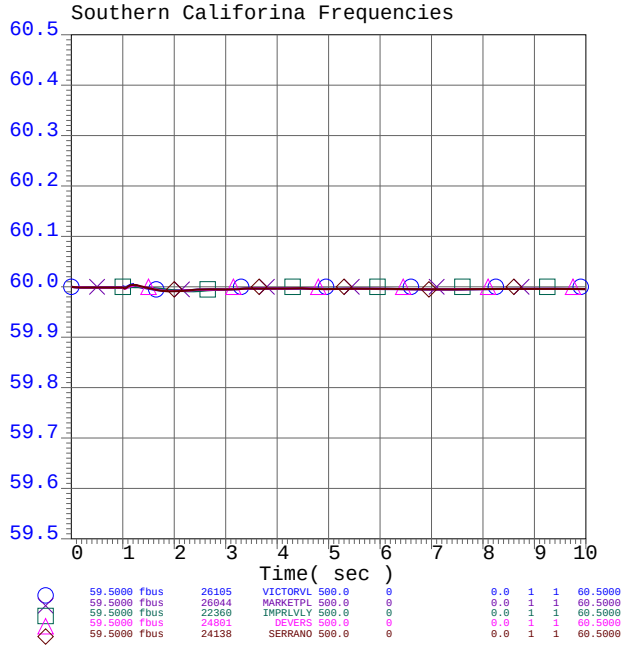
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

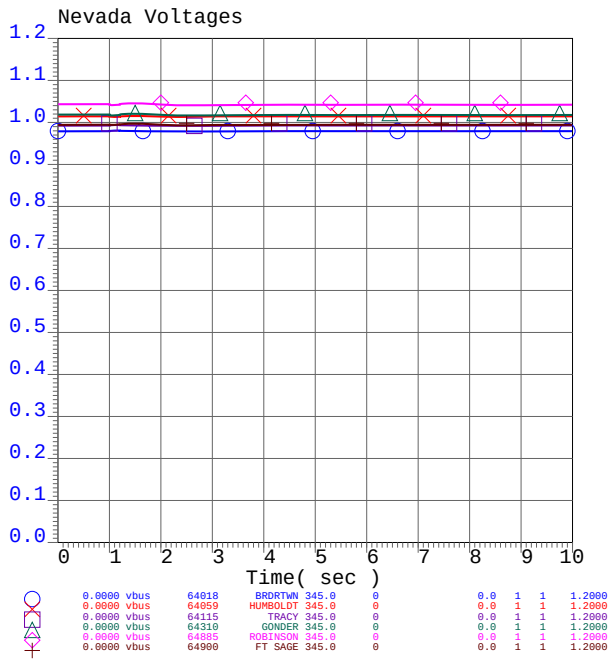
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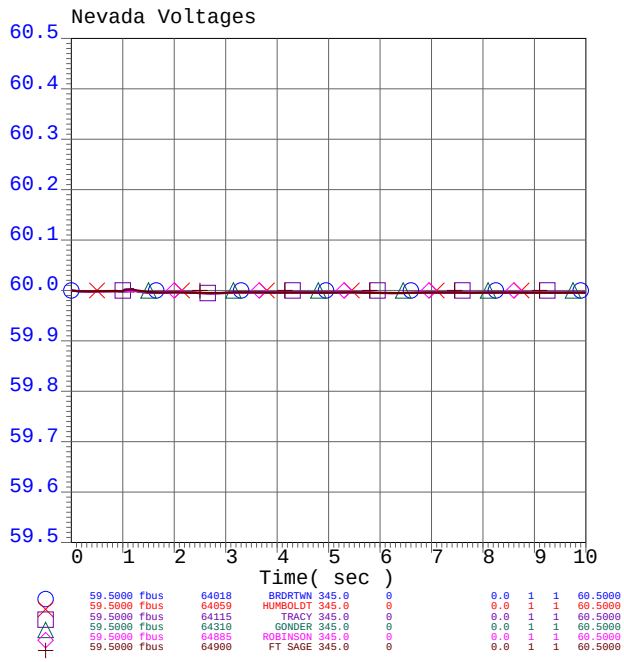
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WECC AREA VOLTAGE AND FREQUENCIES



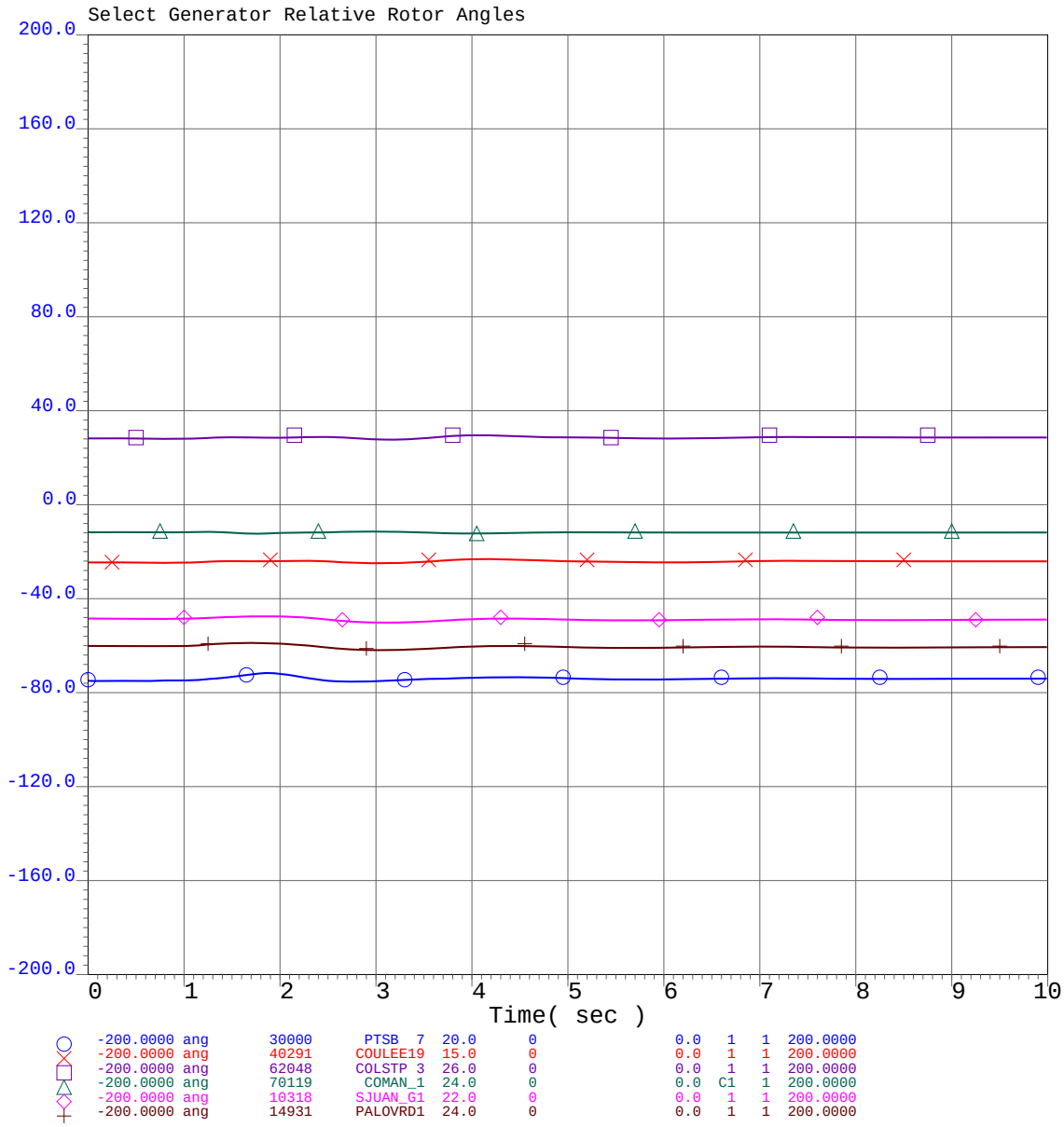






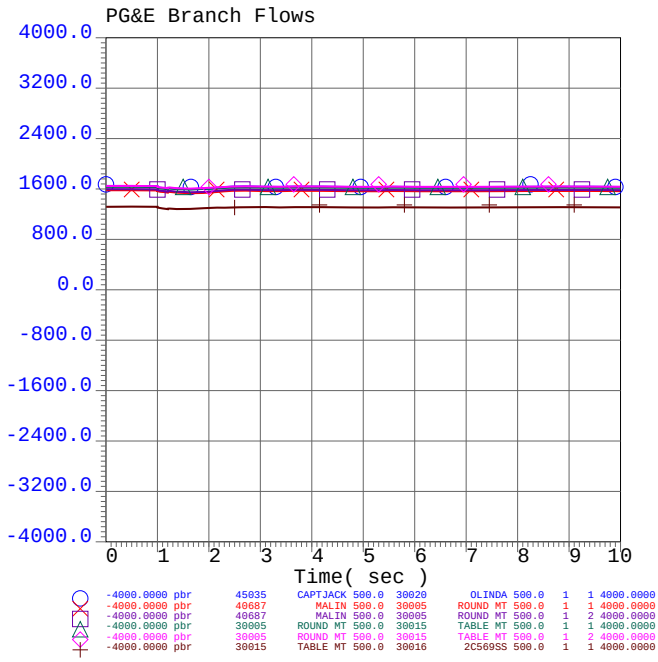
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

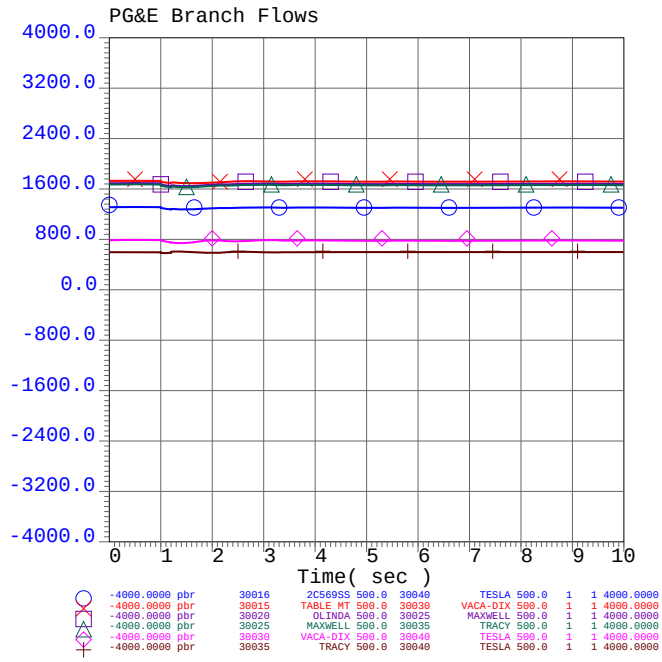
WECC RELATIVE ROTOR ANGLES

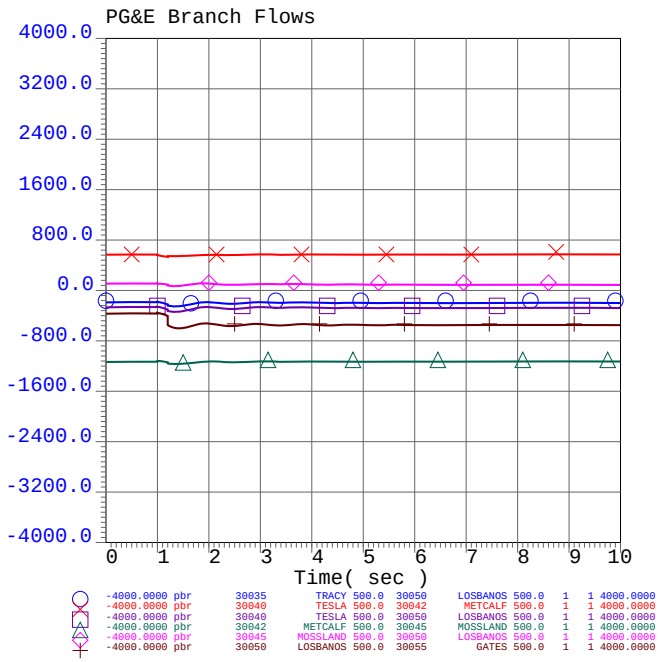


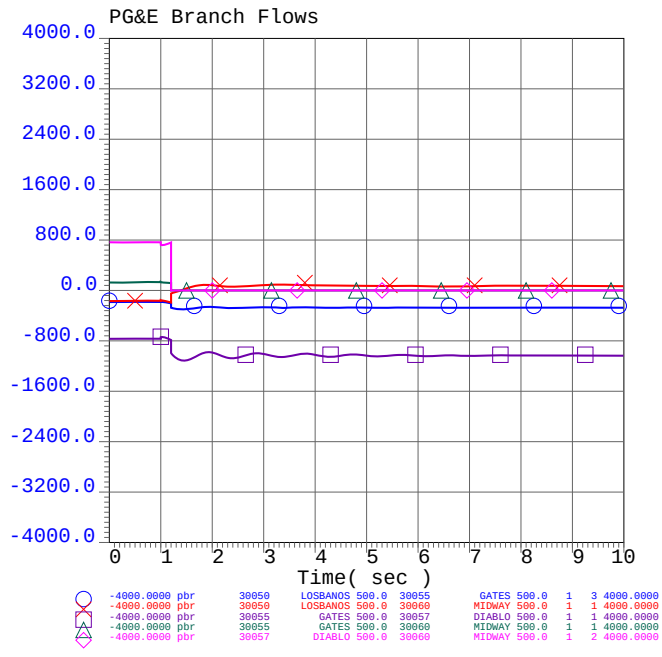
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

SELECT BRANCH FLOWS



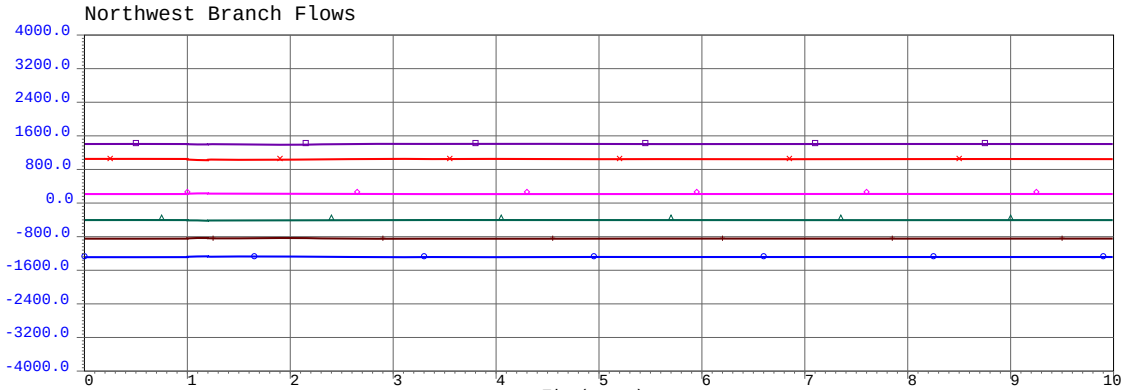




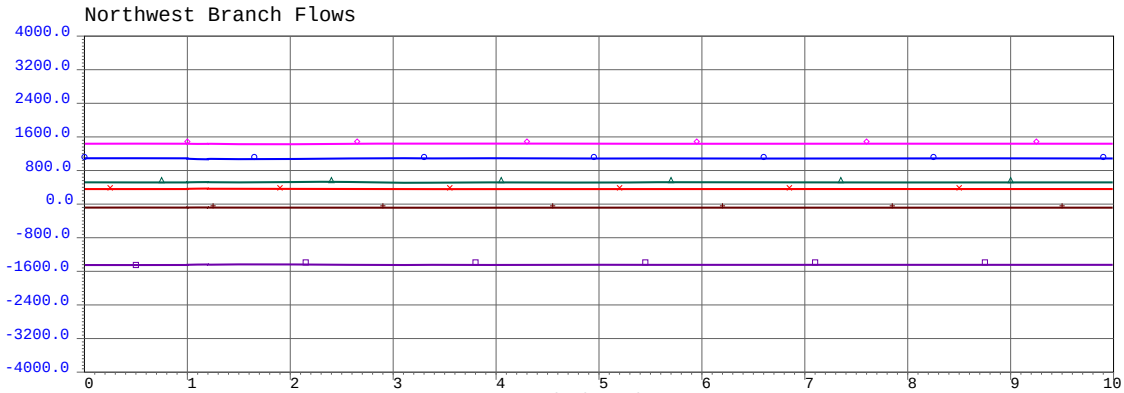


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

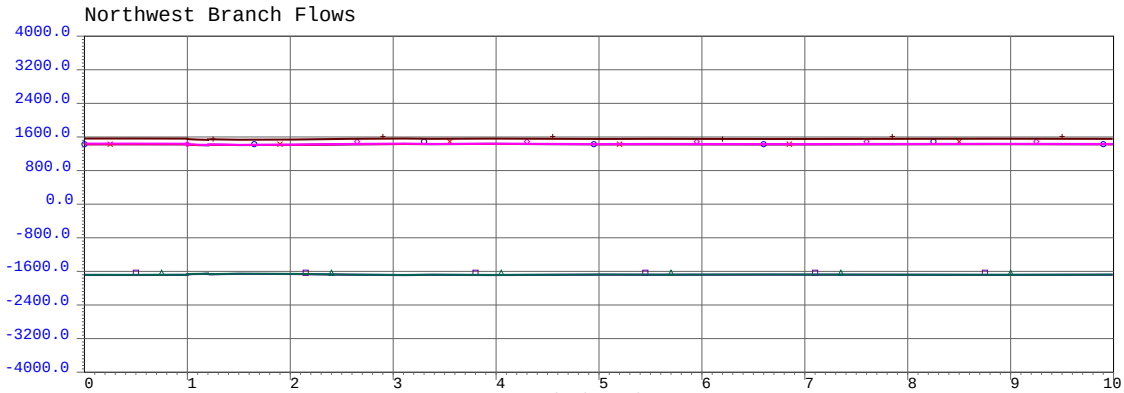
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



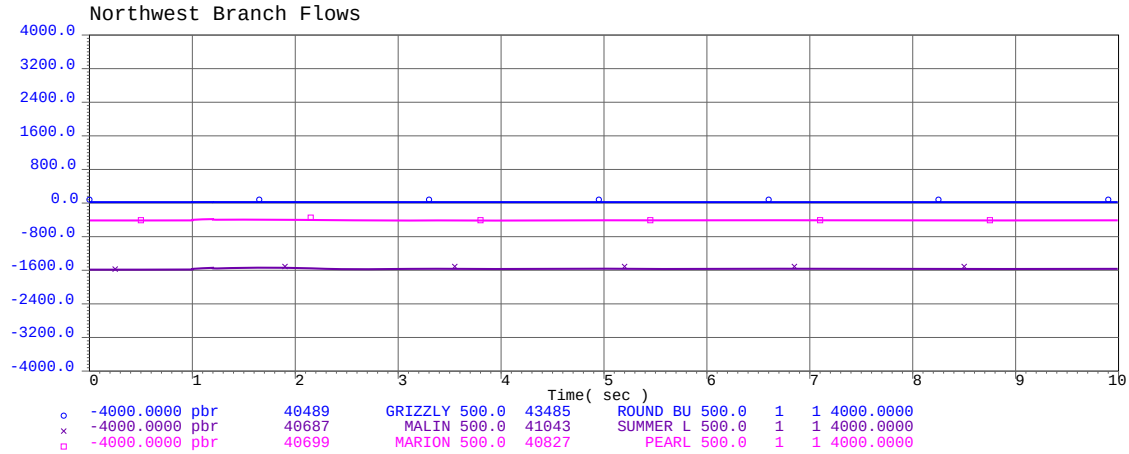
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000

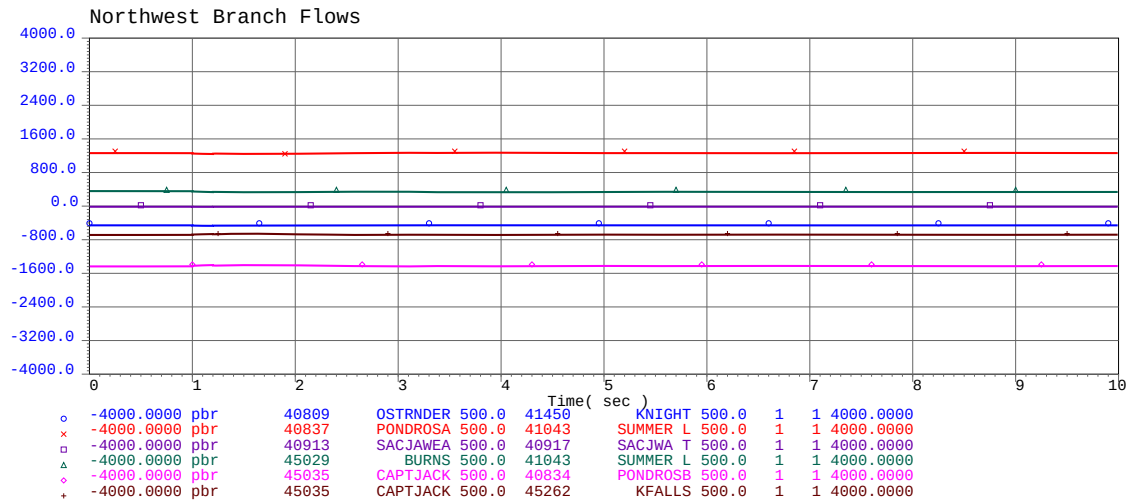


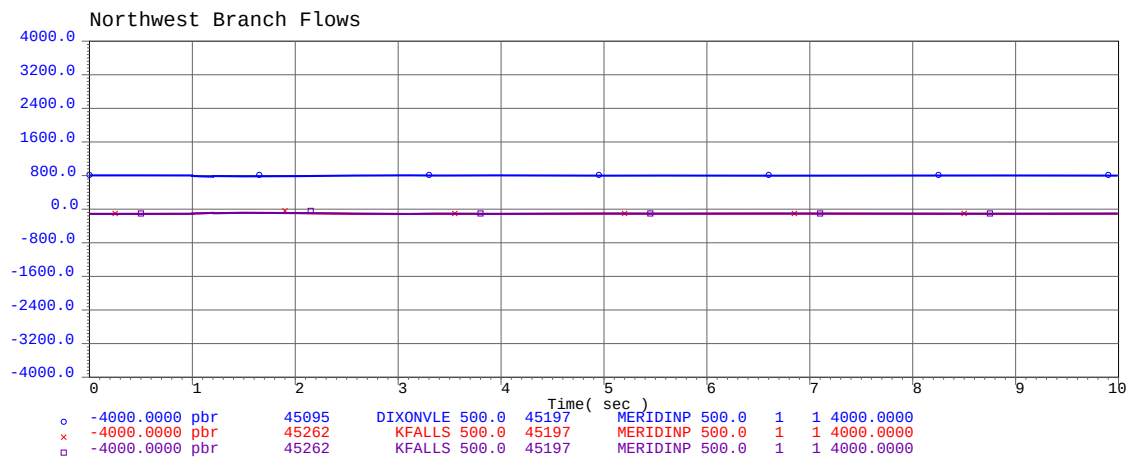
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
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-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
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2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

SELECT BRANCH FLOWS

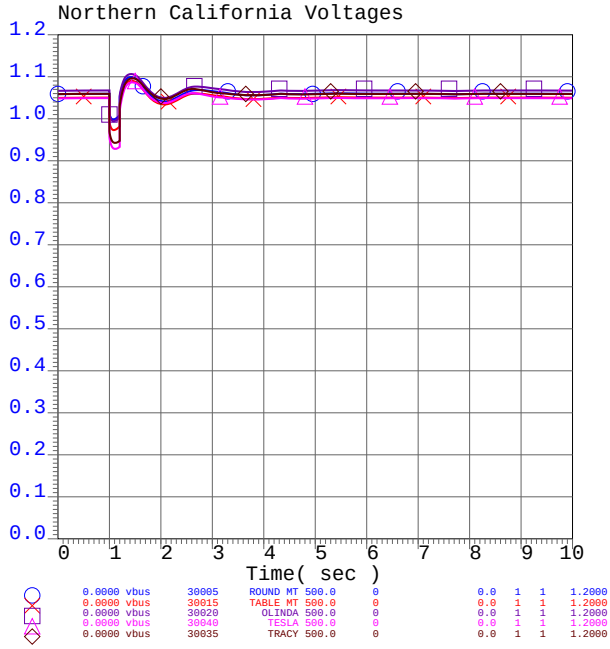


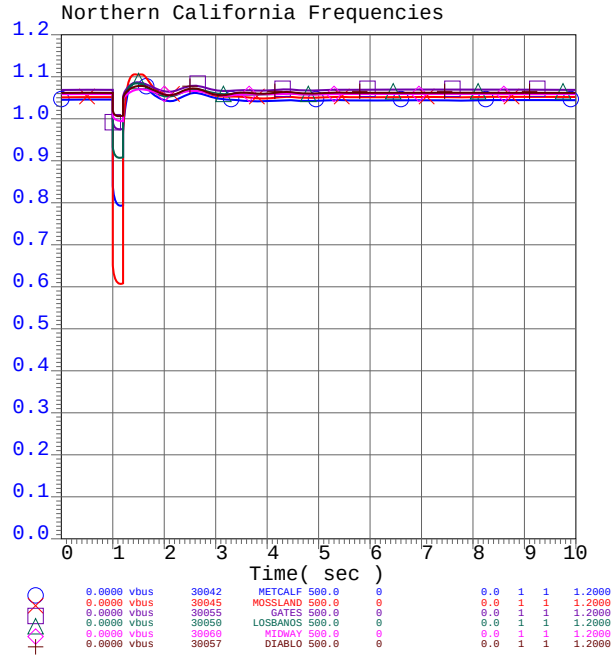


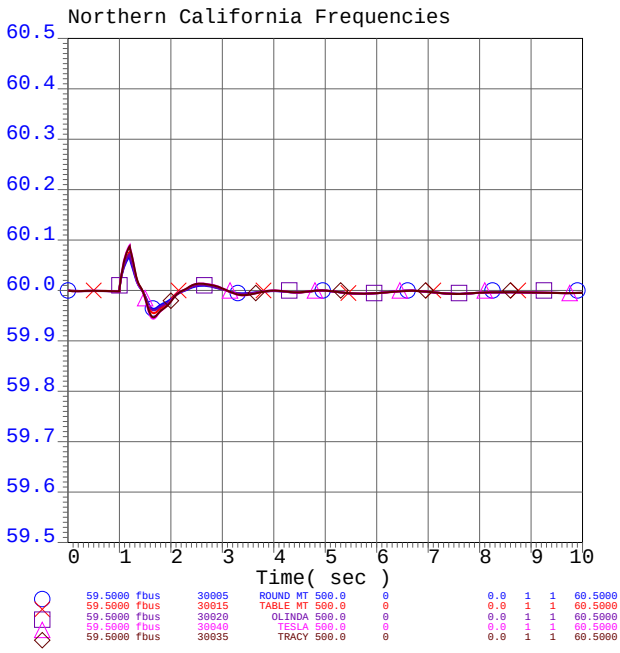


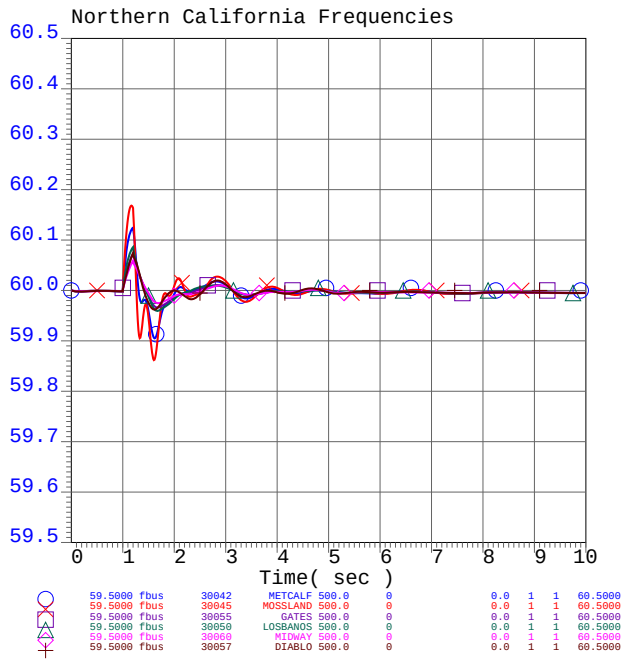
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker Gates 500 kV (12 cycle SLG)
followed by loss of Midway-Diablo Canyon 500 and Midway-Gates 500 kV line

WECC AREA VOLTAGE AND FREQUENCIES







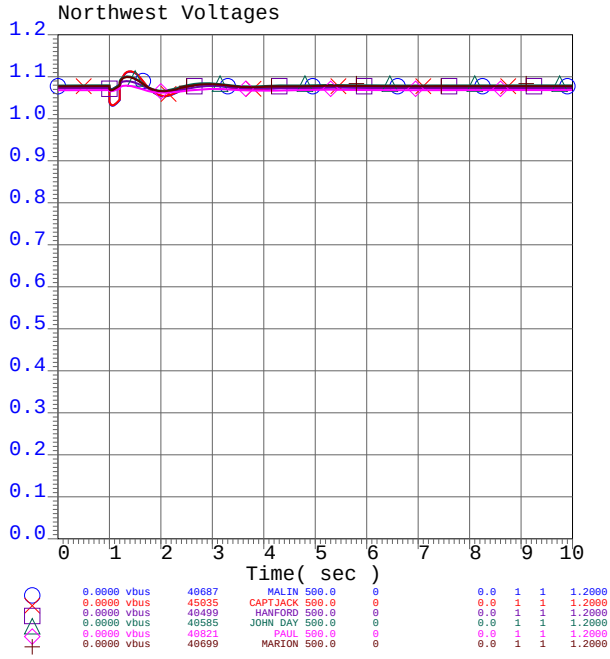


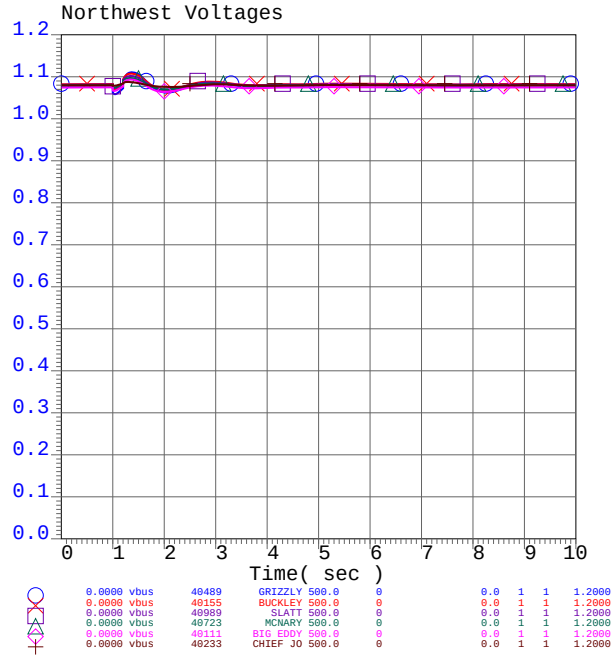
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

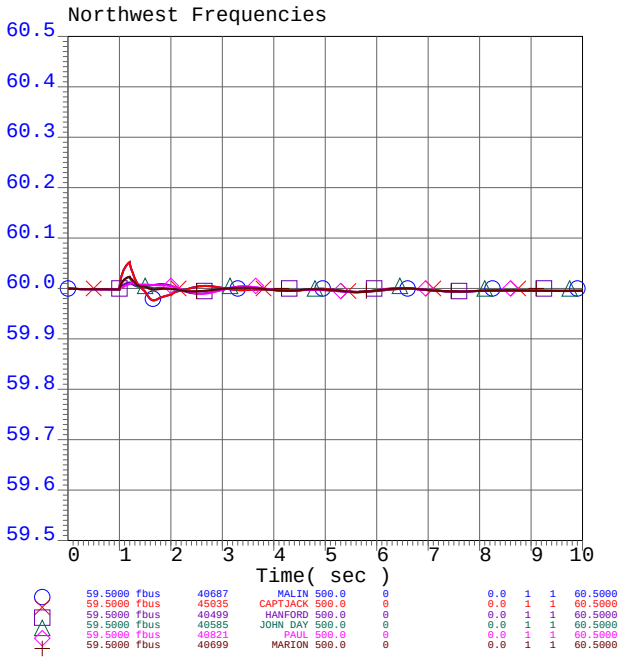
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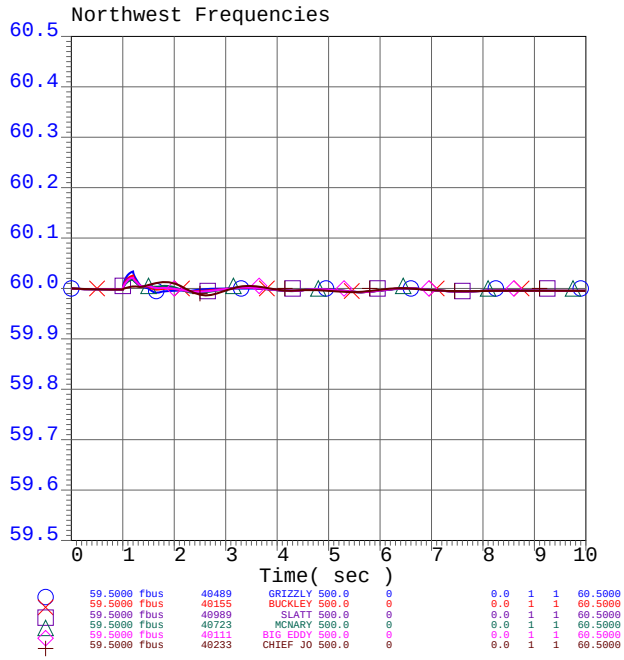
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WECC AREA VOLTAGE AND FREQUENCIES









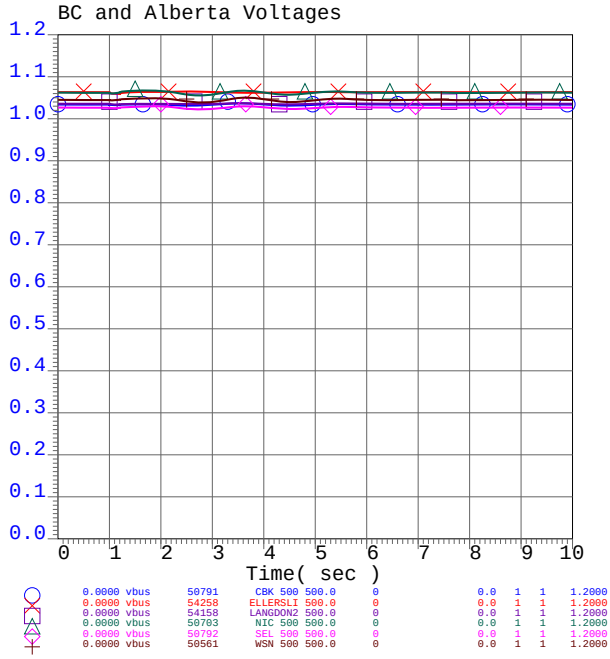
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

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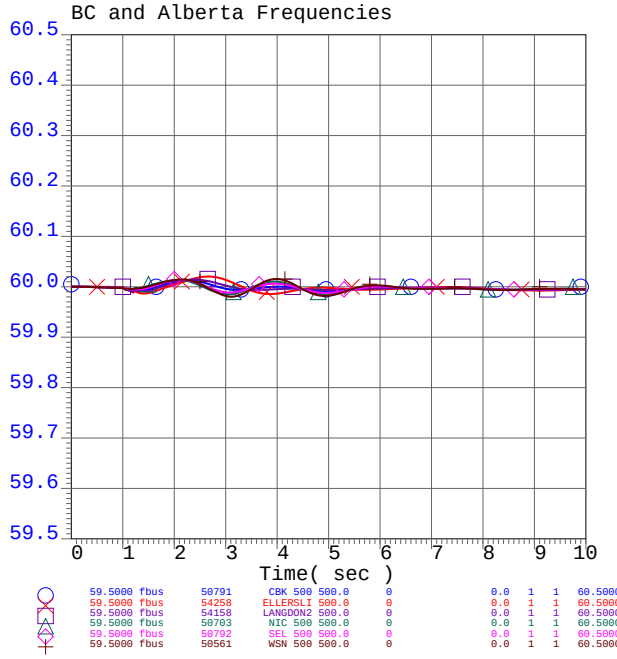
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WECC AREA VOLTAGE AND FREQUENCIES

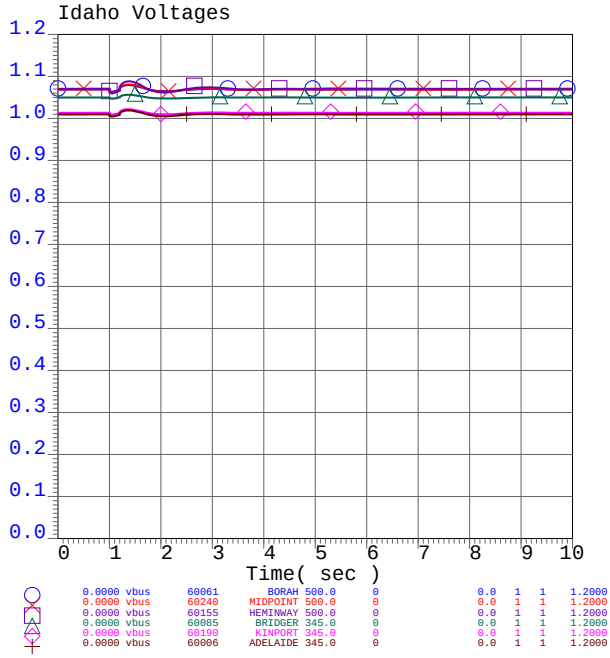
BC and Alberta Voltages



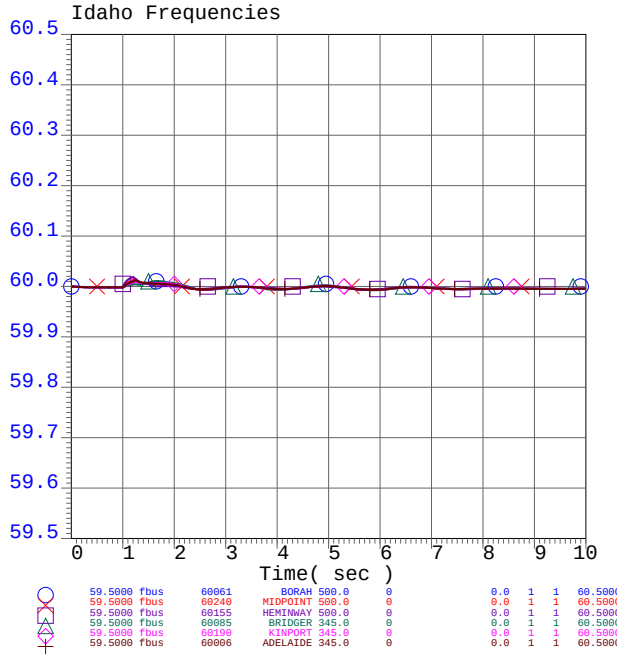
BC and Alberta Frequencies



Idaho Voltages



Idaho Frequencies



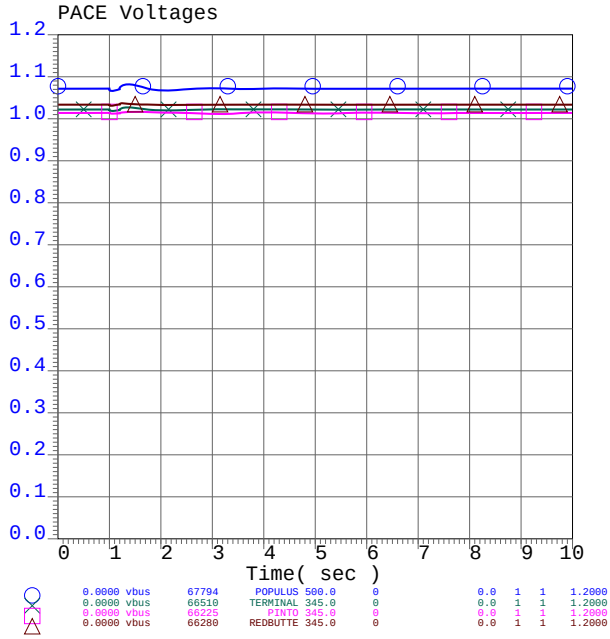
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_swt78_c8_msld-lsds_msldxfmr-500kVsumpk.chf

Fri Jan 03 19:31:46 2014

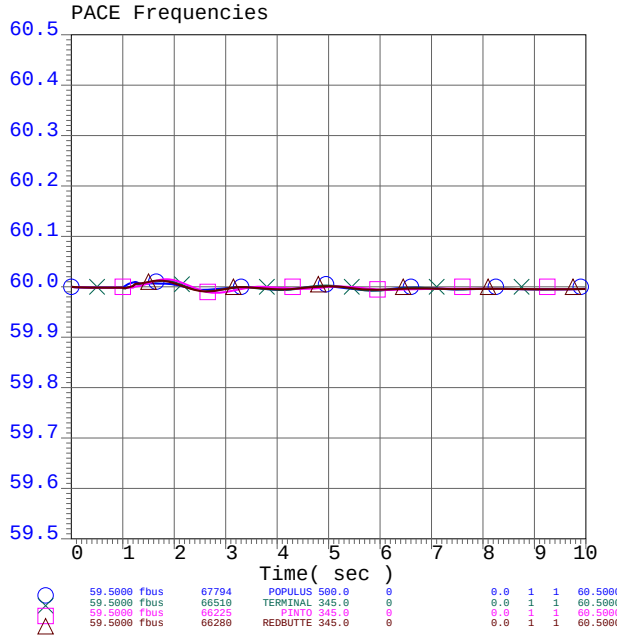
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



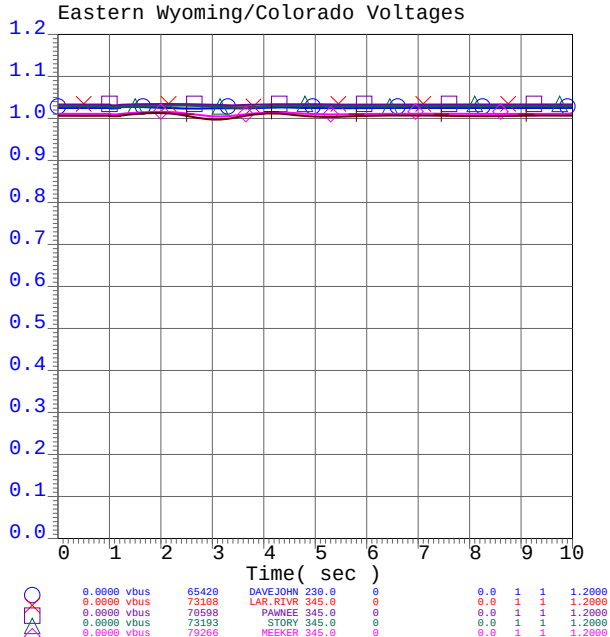
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0.0000 vbus 66225 PINTO 345.0 0 0.0 1 1 1.2000
0.0000 vbus 66280 REDBUTTE 345.0 0 0.0 1 1 1.2000

PACE Frequencies



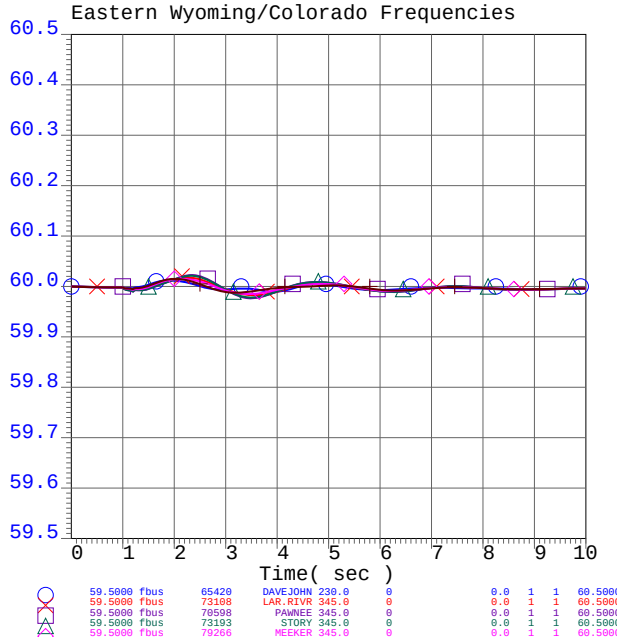
59.5000 fbus 67794 POPULUS 500.0 0 0.0 1 1 60.5000
59.5000 fbus 66510 TERMINAL 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66225 PINTO 345.0 0 0.0 1 1 60.5000
59.5000 fbus 66280 REDBUTTE 345.0 0 0.0 1 1 60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus 65420 DAVEJOHN 230.0 0 0.0 1 1 1.2000
0.0000 vbus 73108 LAR.RIVR 345.0 0 0.0 1 1 1.2000
0.0000 vbus 70598 PAWNEE 345.0 0 0.0 1 1 1.2000
0.0000 vbus 73193 STORY 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79266 MEEKER 345.0 0 0.0 1 1 1.2000
0.0000 vbus 79049 MONTROSE 345.0 0 0.0 1 1 1.2000

Eastern Wyoming/Colorado Frequencies

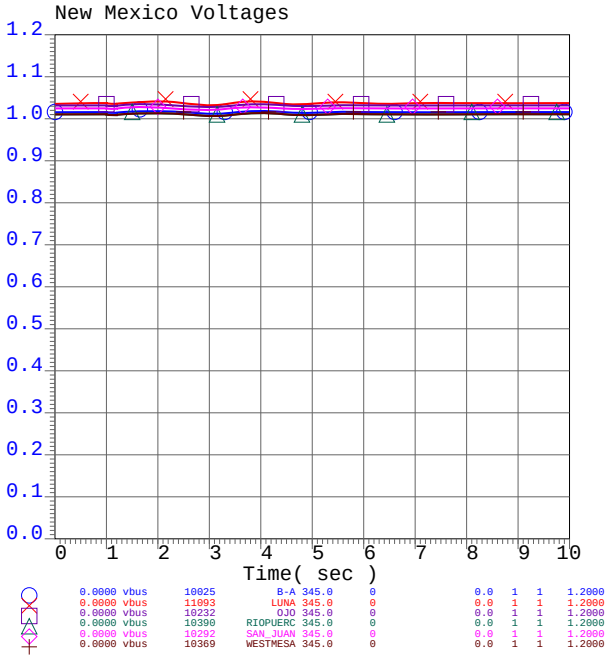


59.5000 fbus 65420 DAVEJOHN 230.0 0 0.0 1 1 60.5000
59.5000 fbus 73108 LAR.RIVR 345.0 0 0.0 1 1 60.5000
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59.5000 fbus 73193 STORY 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79266 MEEKER 345.0 0 0.0 1 1 60.5000
59.5000 fbus 79049 MONTROSE 345.0 0 0.0 1 1 60.5000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
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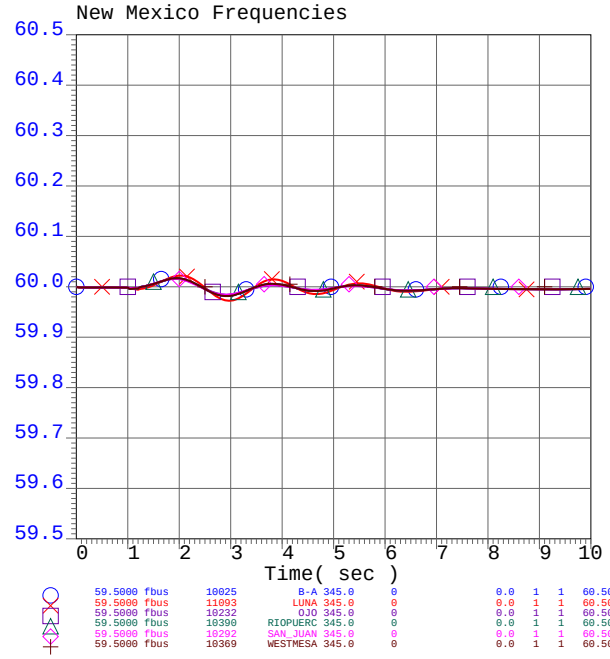
WECC AREA VOLTAGE AND FREQUENCIES

New Mexico Voltages



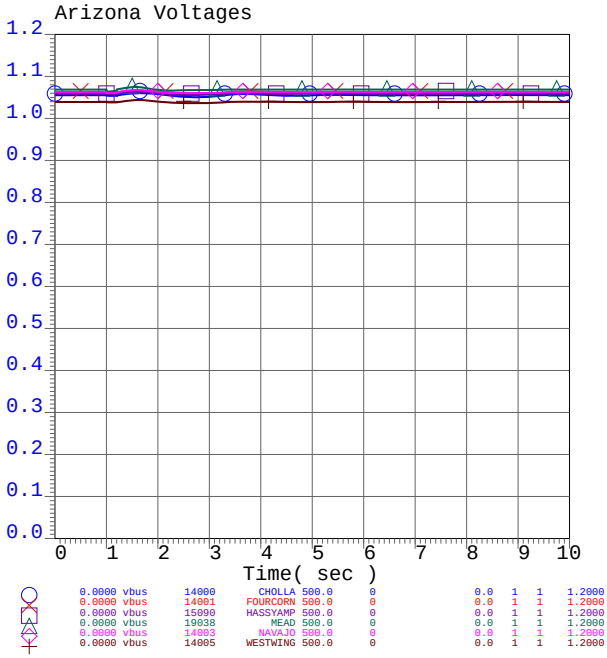
0.0000 vbus	10025	B-A 345.0	0	0.0	1	1	1.2000
0.0000 vbus	11093	LUNA 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10232	OJO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10390	RIOPUERC 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10292	SAN_JUAN 345.0	0	0.0	1	1	1.2000
0.0000 vbus	10369	WESTMESA 345.0	0	0.0	1	1	1.2000

New Mexico Frequencies



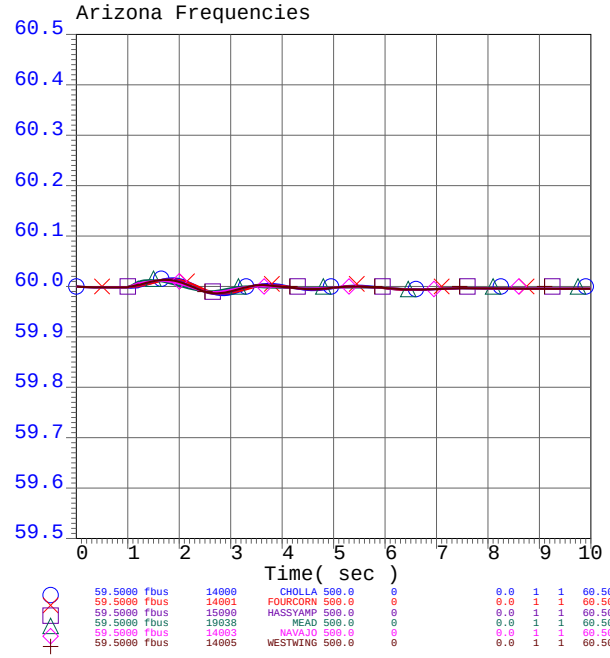
59.5000 fbus	10025	B-A 345.0	0	0.0	1	1	60.5000
59.5000 fbus	11093	LUNA 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10232	OJO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10390	RIOPUERC 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10292	SAN_JUAN 345.0	0	0.0	1	1	60.5000
59.5000 fbus	10369	WESTMESA 345.0	0	0.0	1	1	60.5000

Arizona Voltages



0.0000 vbus	14000	CHOLLA 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14001	FOURCORN 500.0	0	0.0	1	1	1.2000
0.0000 vbus	15090	HASSYAMP 500.0	0	0.0	1	1	1.2000
0.0000 vbus	19038	MEAD 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14003	NAVAJO 500.0	0	0.0	1	1	1.2000
0.0000 vbus	14005	WESTWING 500.0	0	0.0	1	1	1.2000

Arizona Frequencies



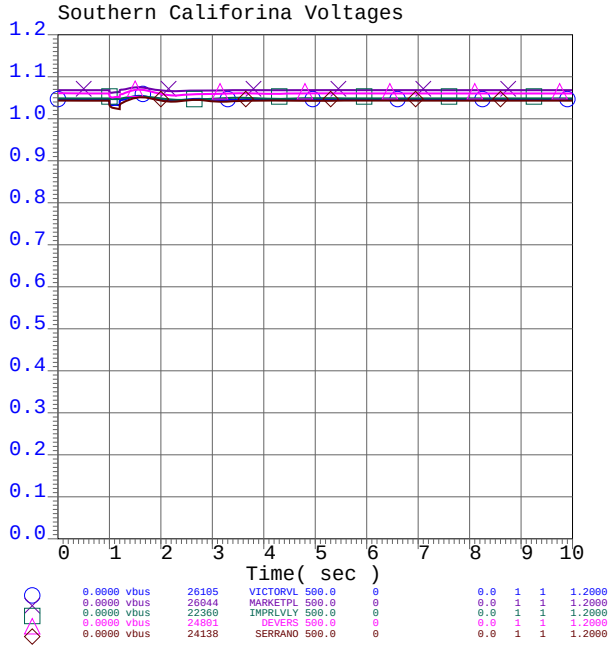
59.5000 fbus	14000	CHOLLA 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14001	FOURCORN 500.0	0	0.0	1	1	60.5000
59.5000 fbus	15090	HASSYAMP 500.0	0	0.0	1	1	60.5000
59.5000 fbus	19038	MEAD 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14003	NAVAJO 500.0	0	0.0	1	1	60.5000
59.5000 fbus	14005	WESTWING 500.0	0	0.0	1	1	60.5000

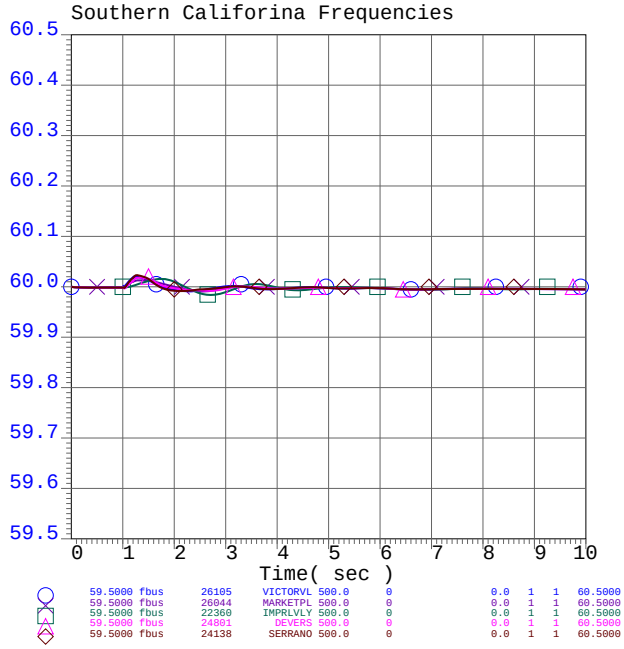
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

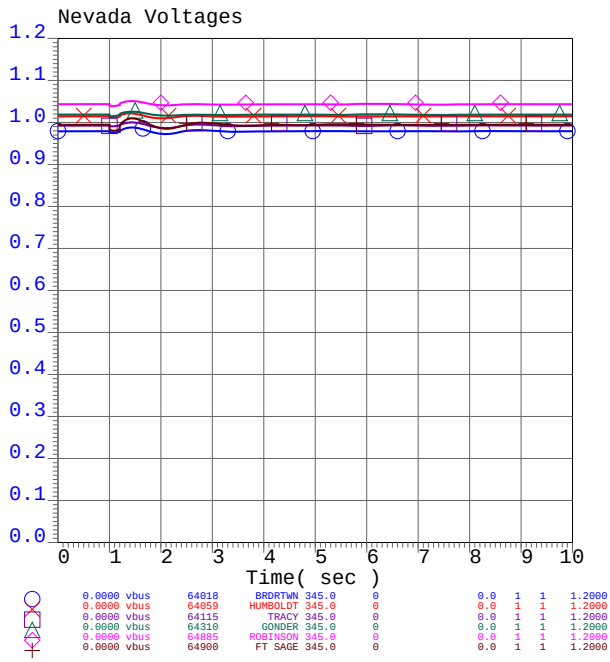
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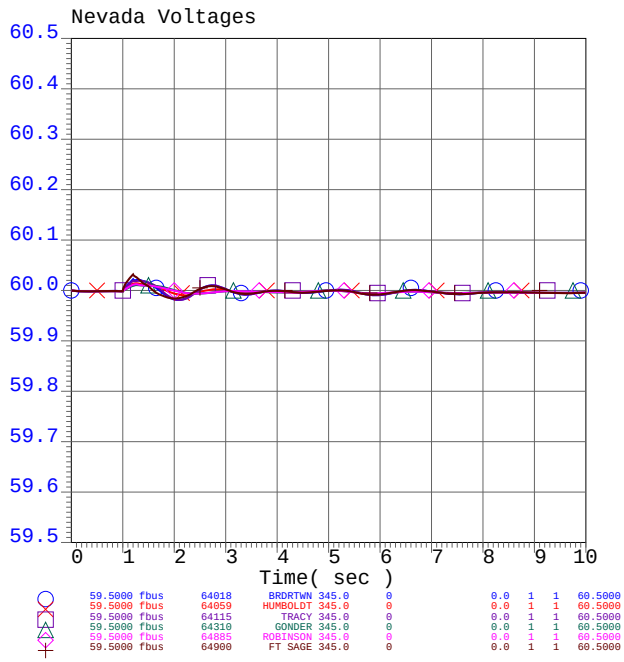
Fri Jan 03 19:31:46 2014

WECC AREA VOLTAGE AND FREQUENCIES



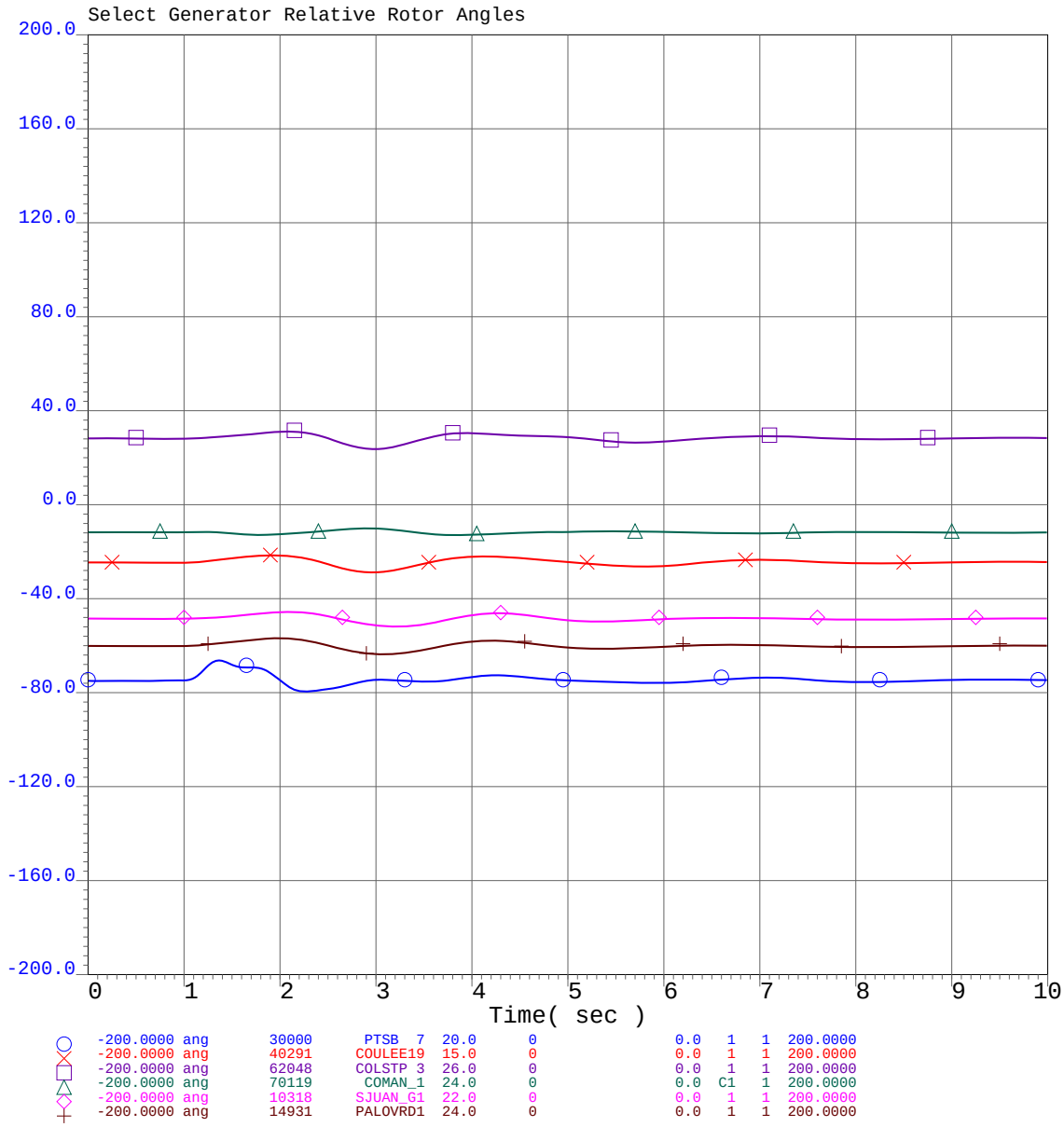






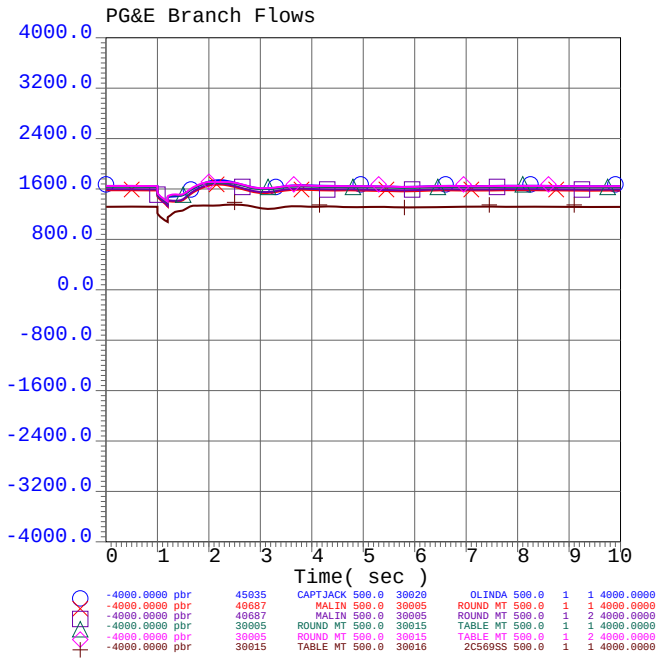
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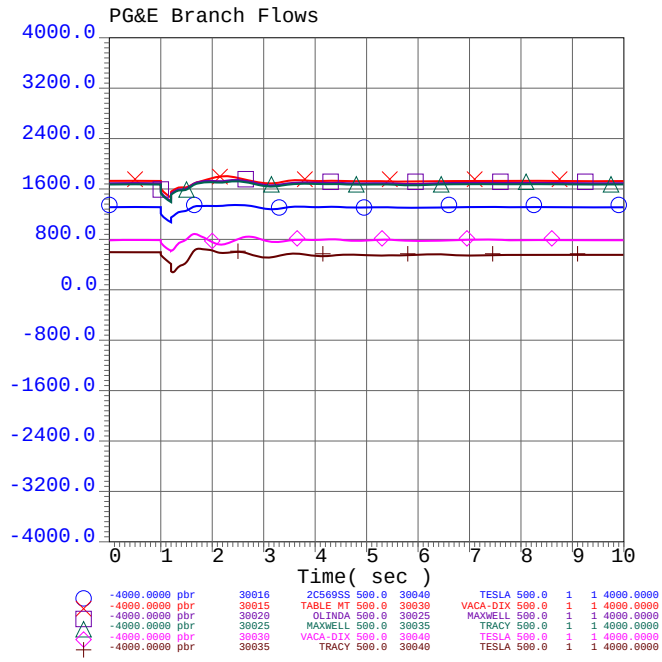
WECC RELATIVE ROTOR ANGLES

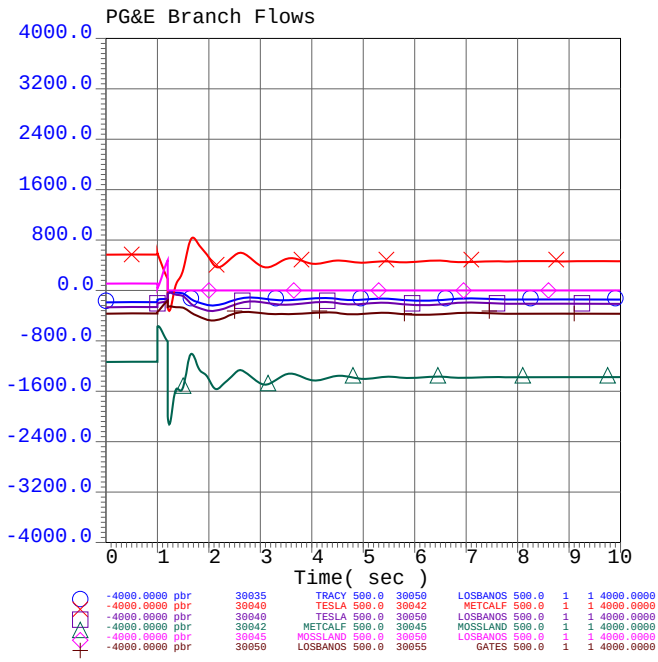


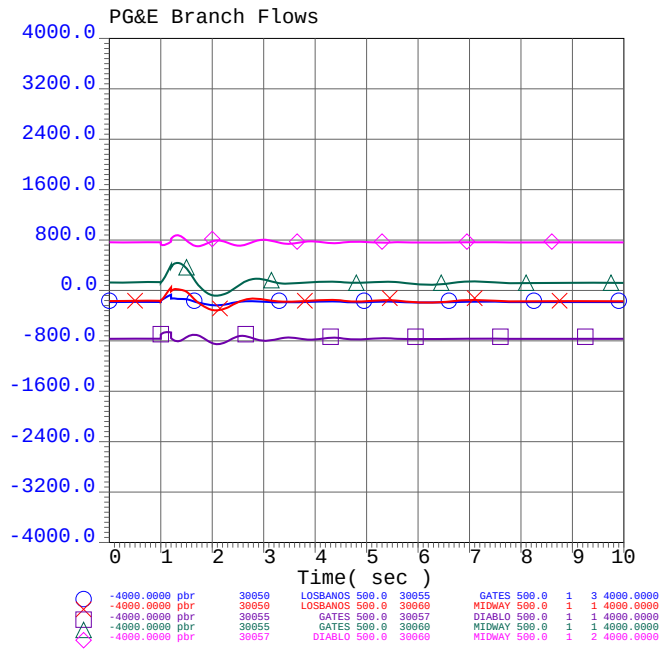
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Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
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Moss Landing 500/230 kV transformer

SELECT BRANCH FLOWS



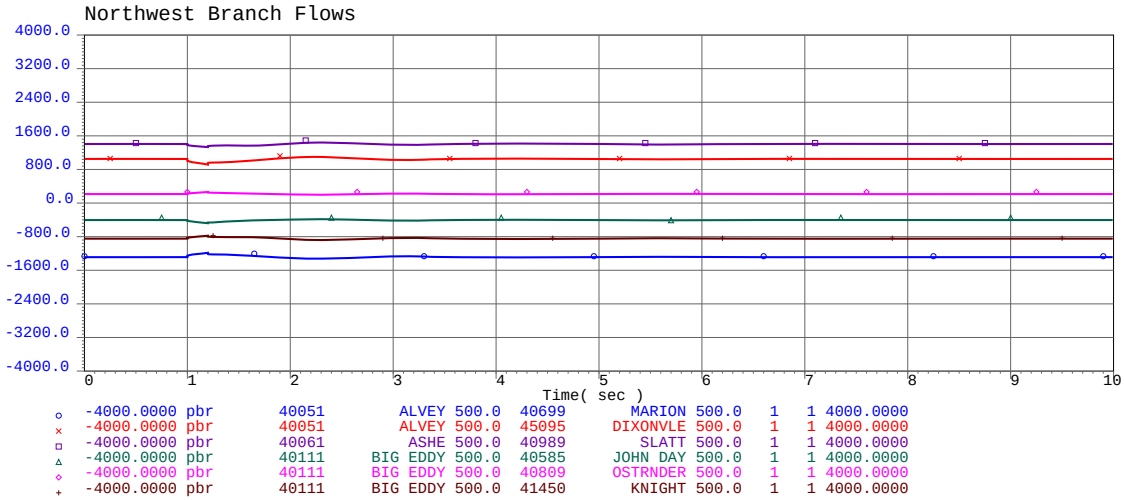




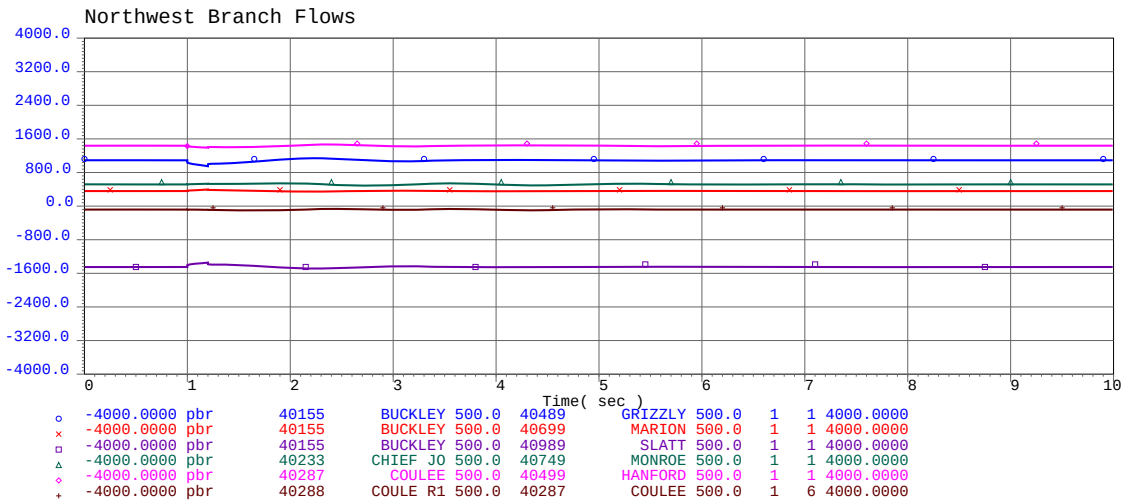


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
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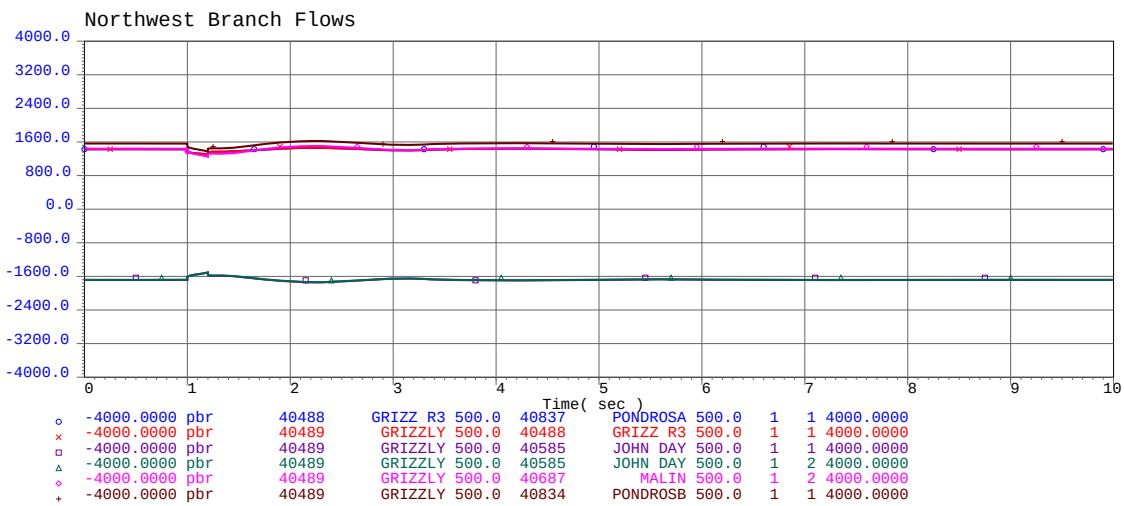
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



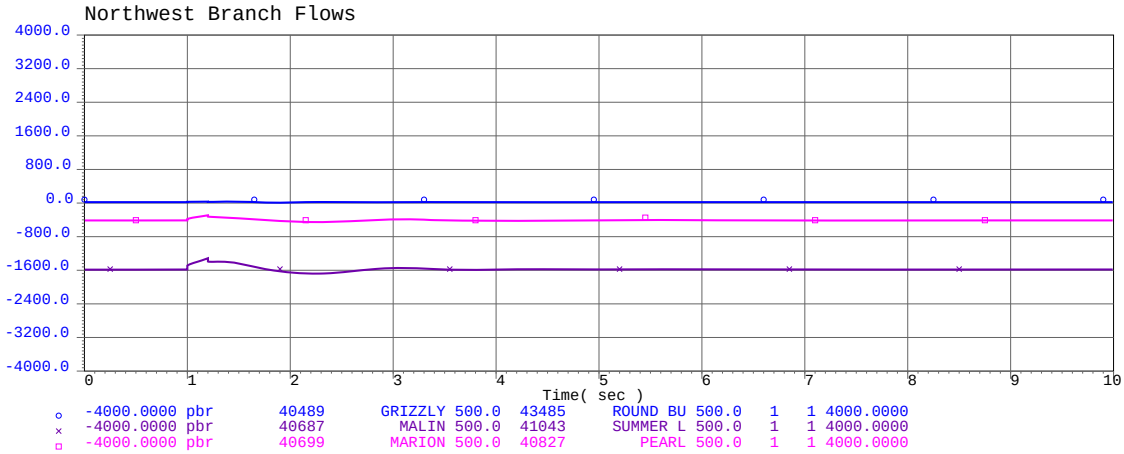
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



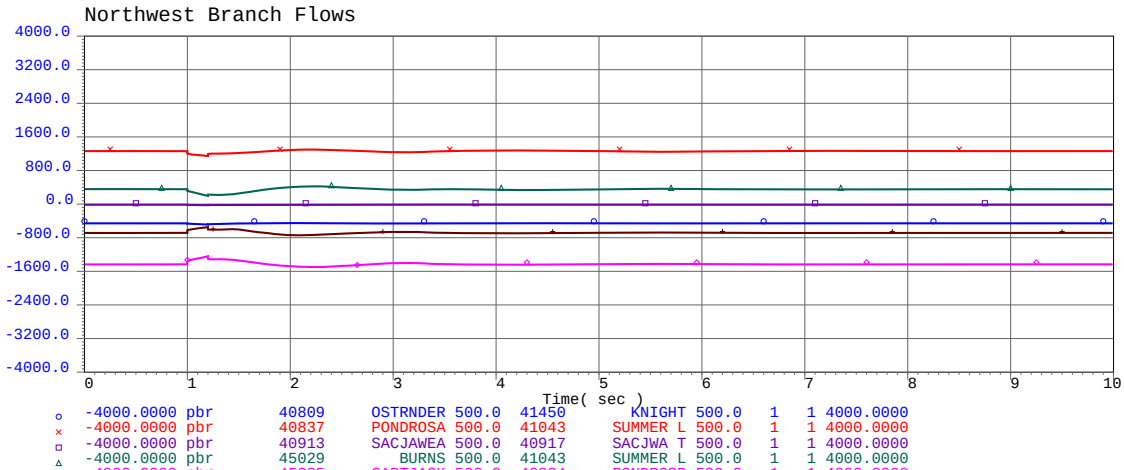
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Stuck Breaker at Moss Landing 500 kV (12 cycle SLG)
followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

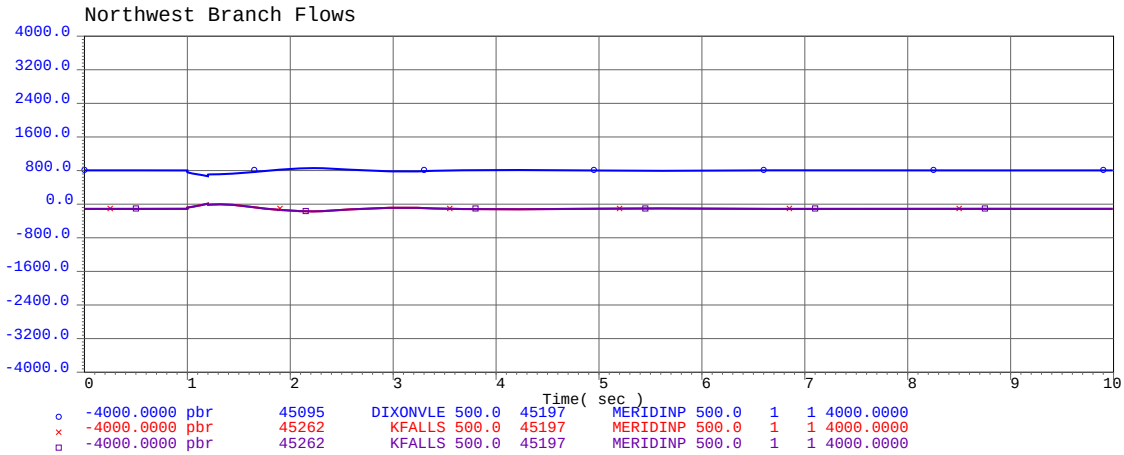
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



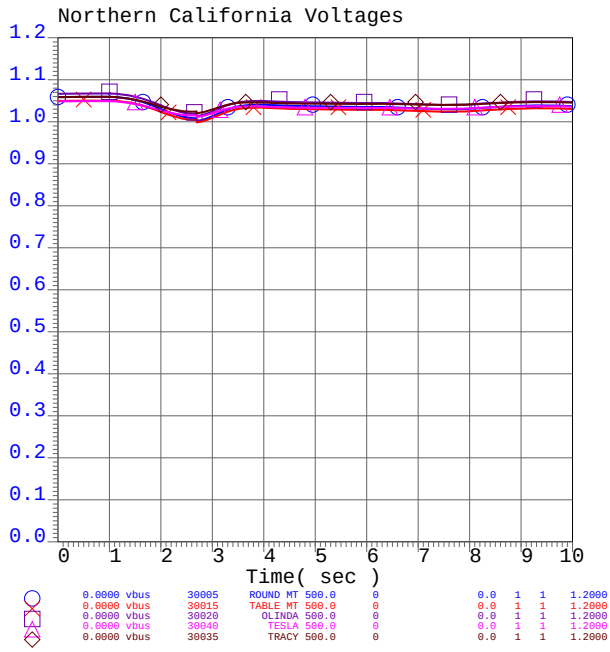
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
-4000.0000 pbr	40837	PONDROSA 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

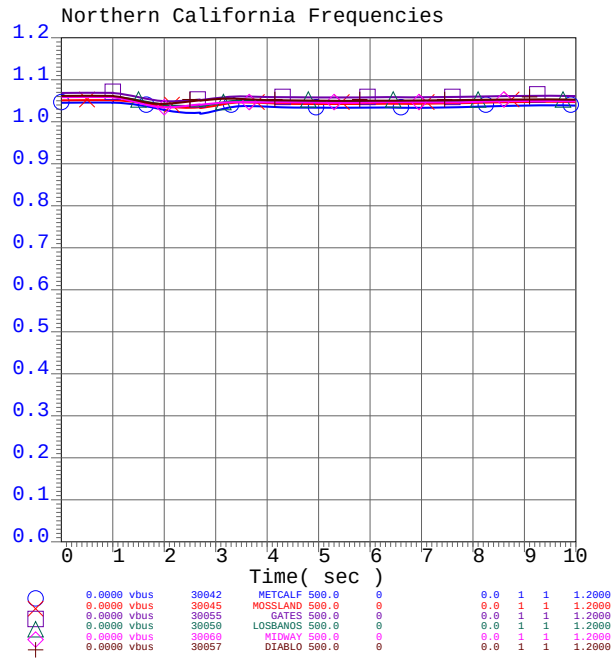


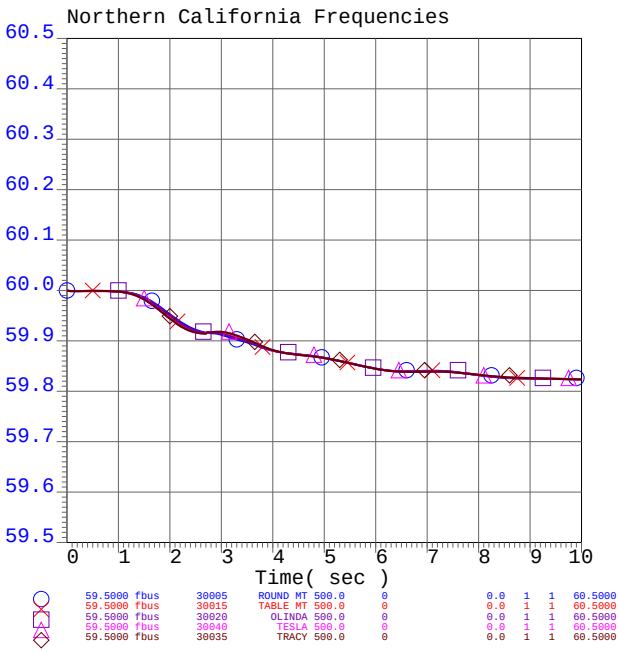
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

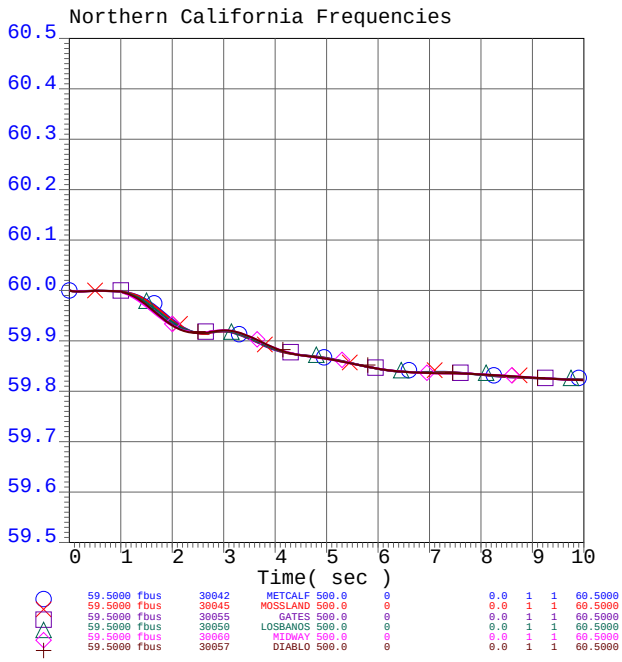
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followed by loss of Moss Landing-Los Banos 500 kV line and
Moss Landing 500/230 kV transformer

WECC AREA VOLTAGE AND FREQUENCIES



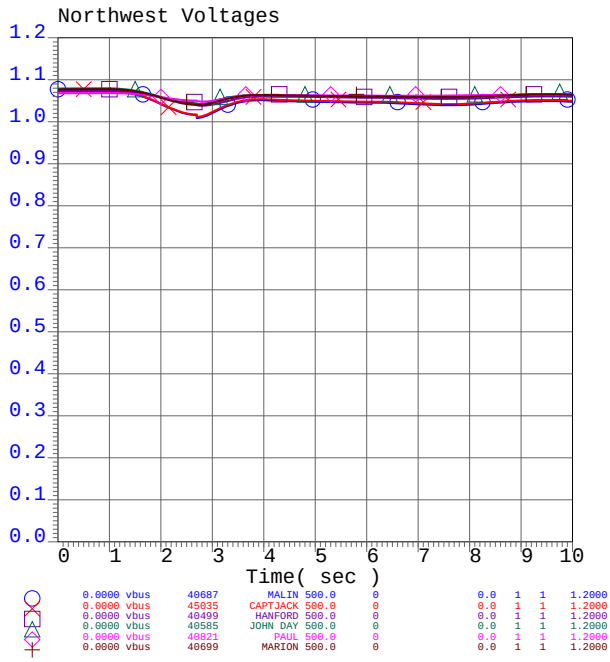


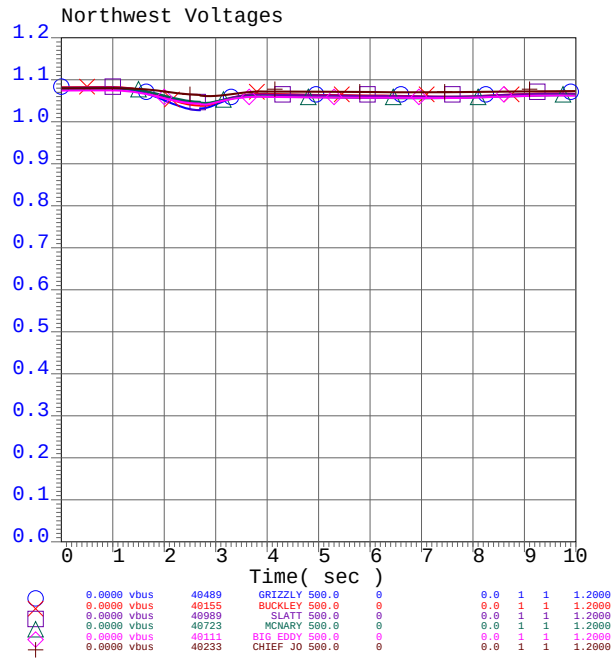


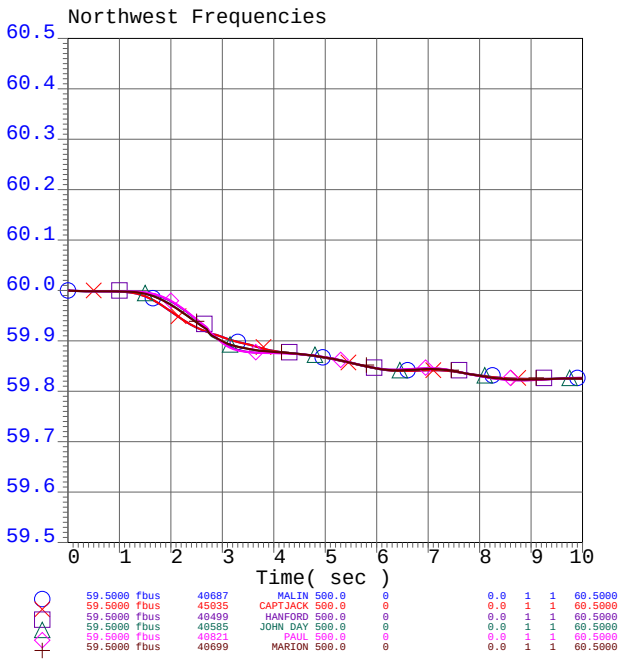


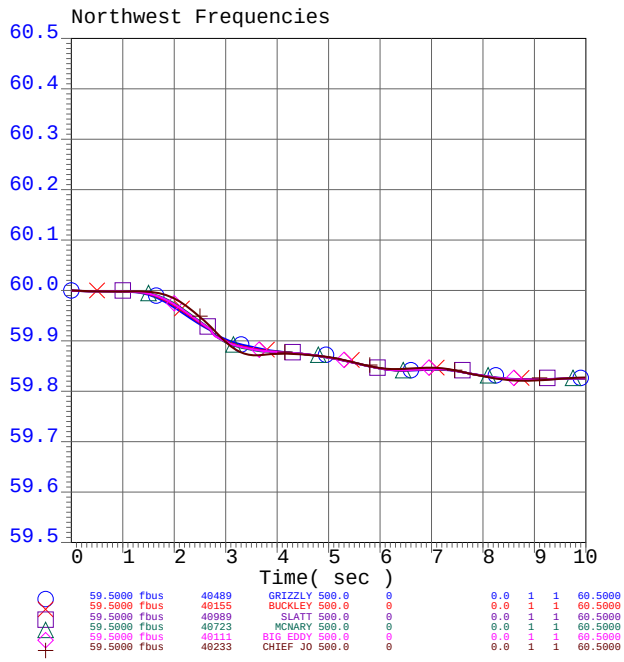
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

WECC AREA VOLTAGE AND FREQUENCIES



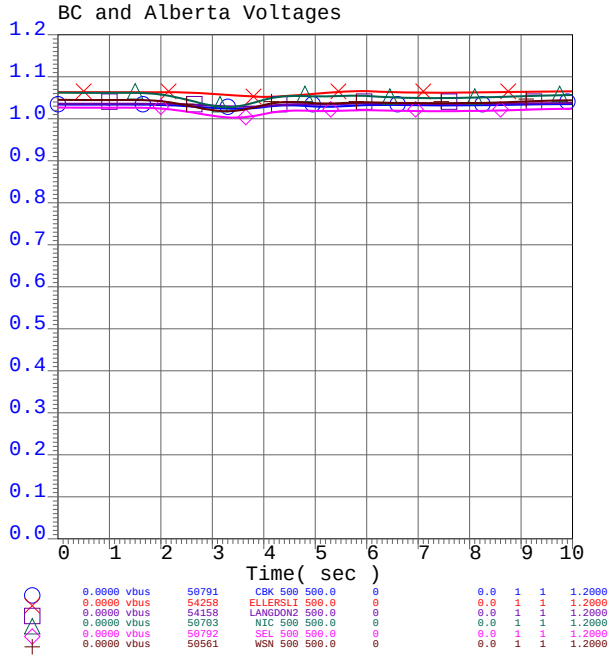


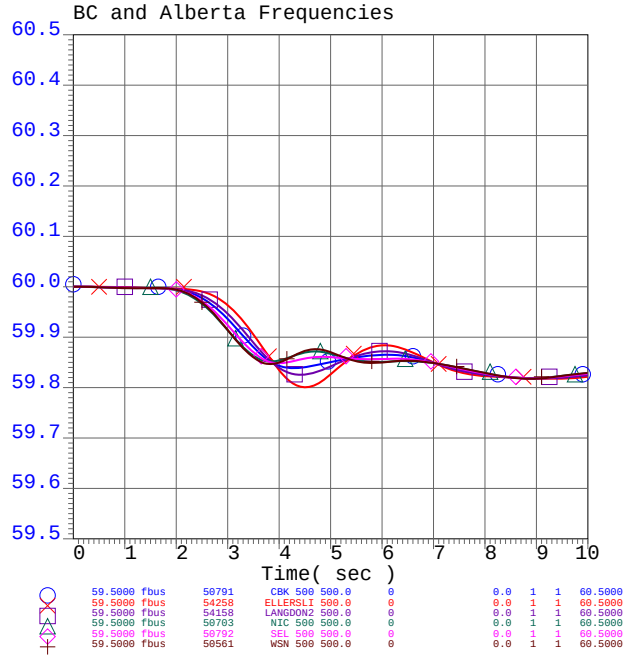


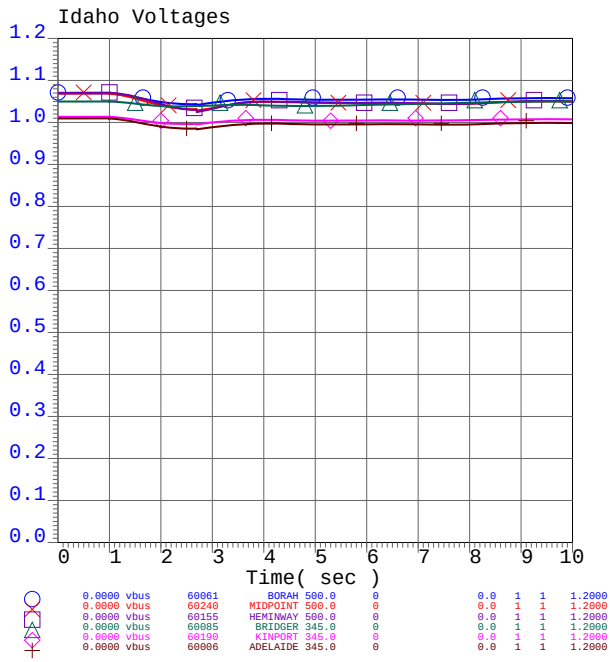


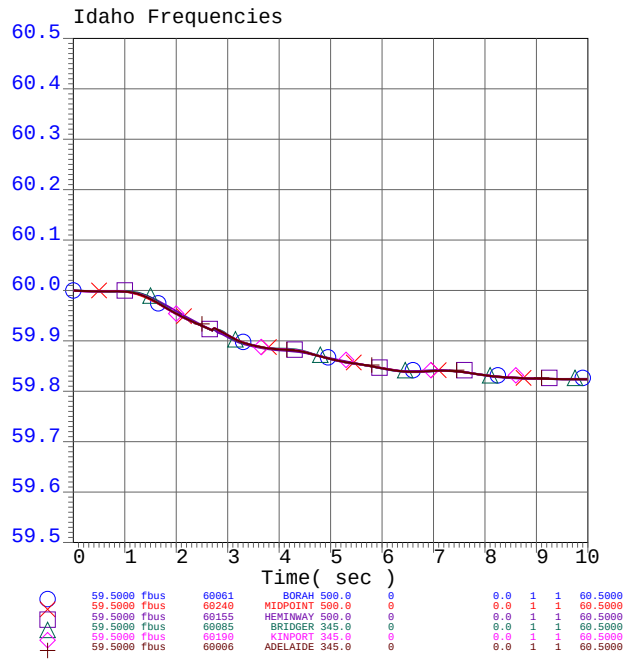
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

WECC AREA VOLTAGE AND FREQUENCIES





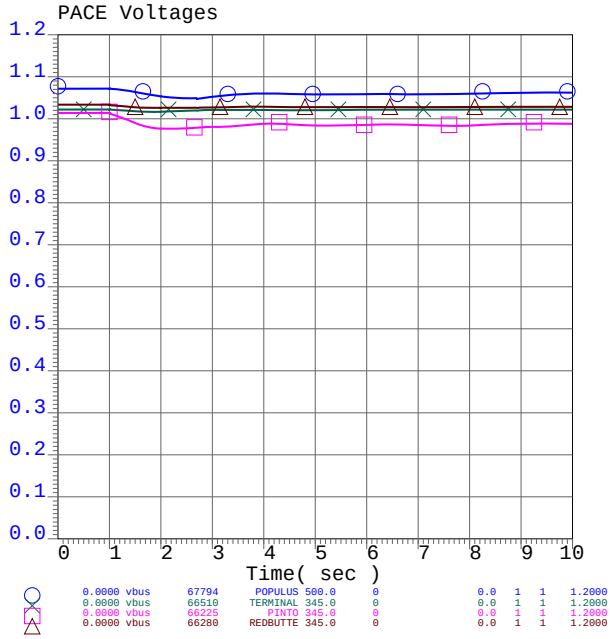




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

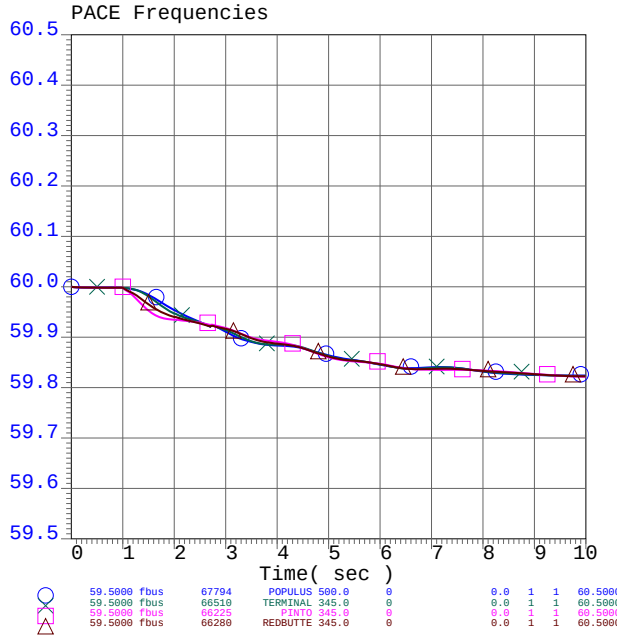
WECC AREA VOLTAGE AND FREQUENCIES

PACE Voltages



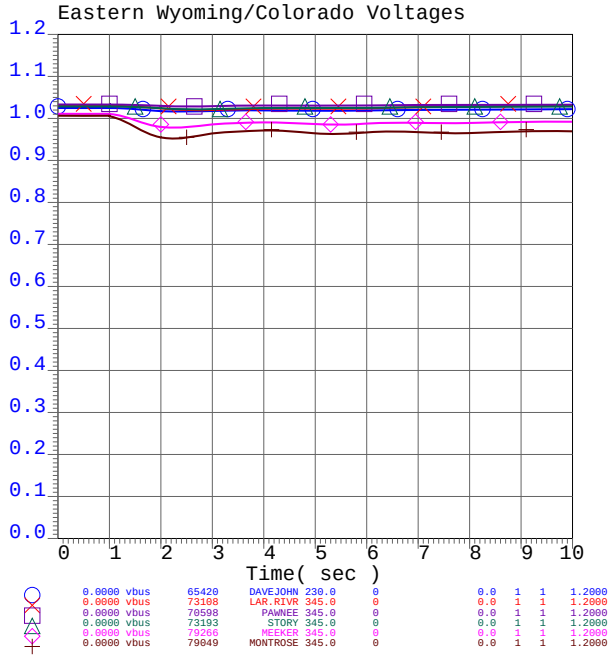
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0.0000 vbus	66510	TERMINAL 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66225	PINTO 345.0	0	0.0	1	1	1.2000
0.0000 vbus	66280	REDBUTTE 345.0	0	0.0	1	1	1.2000

PACE Frequencies



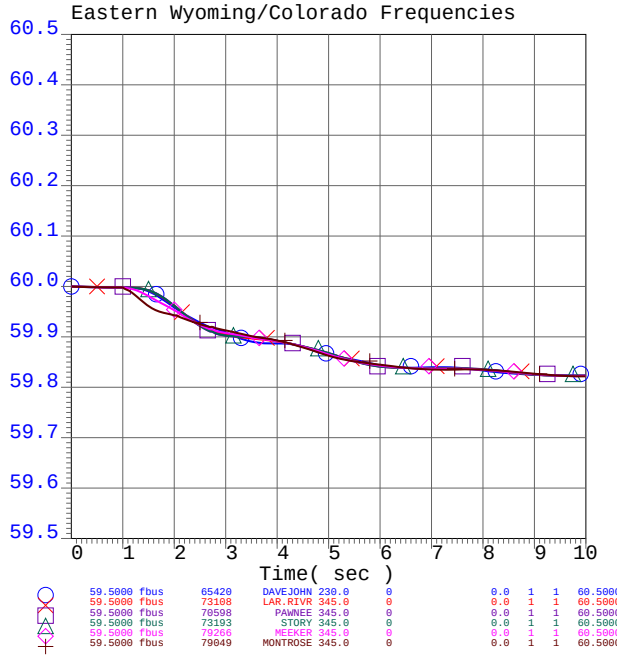
59.5000 fbus	67794	POPULUS 500.0	0	0.0	1	1	60.5000
59.5000 fbus	66510	TERMINAL 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66225	PINTO 345.0	0	0.0	1	1	60.5000
59.5000 fbus	66280	REDBUTTE 345.0	0	0.0	1	1	60.5000

Eastern Wyoming/Colorado Voltages



0.0000 vbus	65420	DAVEJOHN 230.0	0	0.0	1	1	1.2000
0.0000 vbus	73108	LAR.RIVR 345.0	0	0.0	1	1	1.2000
0.0000 vbus	70598	PAWNEE 345.0	0	0.0	1	1	1.2000
0.0000 vbus	73193	STORY 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79266	MEEKER 345.0	0	0.0	1	1	1.2000
0.0000 vbus	79049	MONTROSE 345.0	0	0.0	1	1	1.2000

Eastern Wyoming/Colorado Frequencies

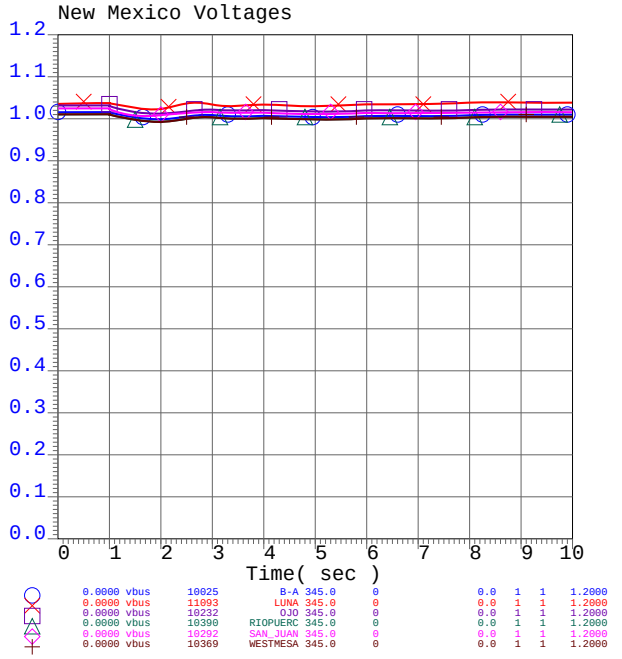


59.5000 fbus	65420	DAVEJOHN 230.0	0	0.0	1	1	60.5000
59.5000 fbus	73108	LAR.RIVR 345.0	0	0.0	1	1	60.5000
59.5000 fbus	70598	PAWNEE 345.0	0	0.0	1	1	60.5000
59.5000 fbus	73193	STORY 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79266	MEEKER 345.0	0	0.0	1	1	60.5000
59.5000 fbus	79049	MONTROSE 345.0	0	0.0	1	1	60.5000

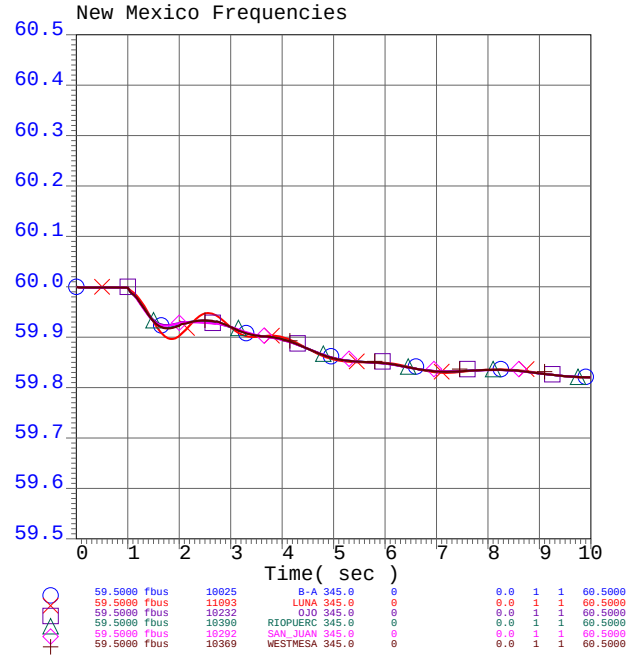
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

WECC AREA VOLTAGE AND FREQUENCIES

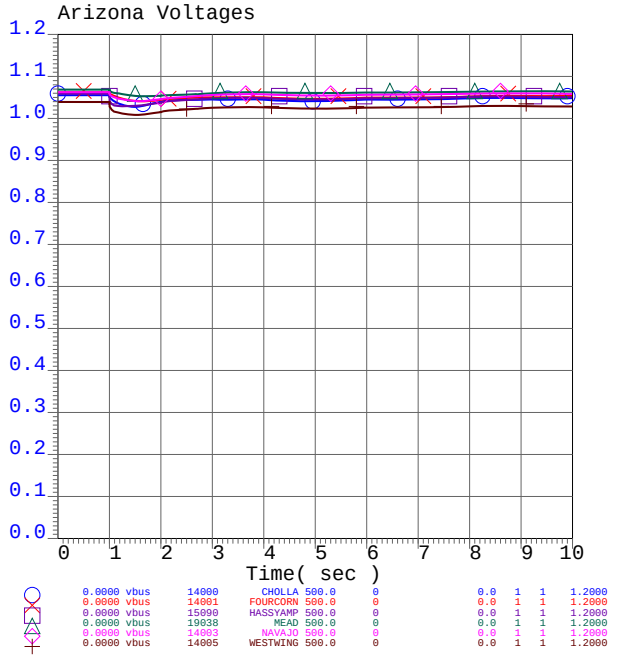
New Mexico Voltages



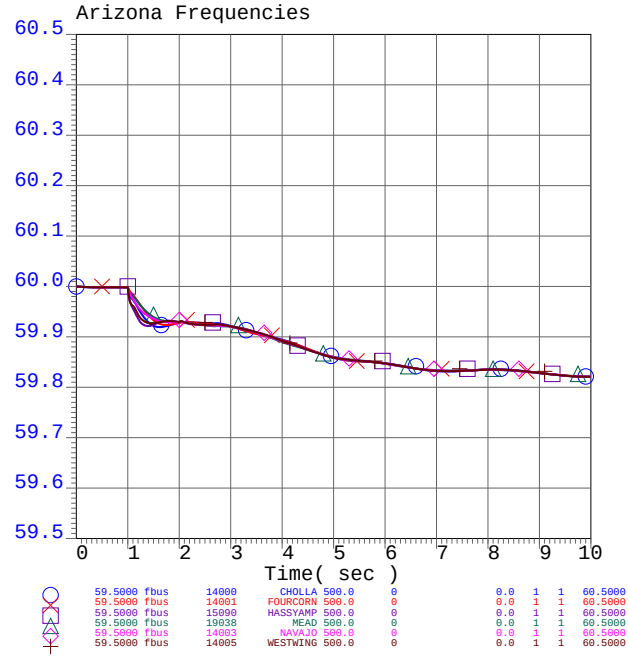
New Mexico Frequencies



Arizona Voltages

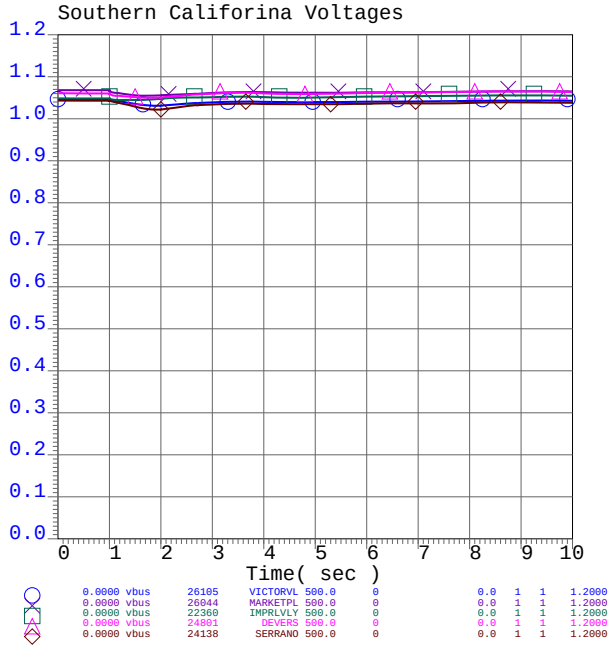


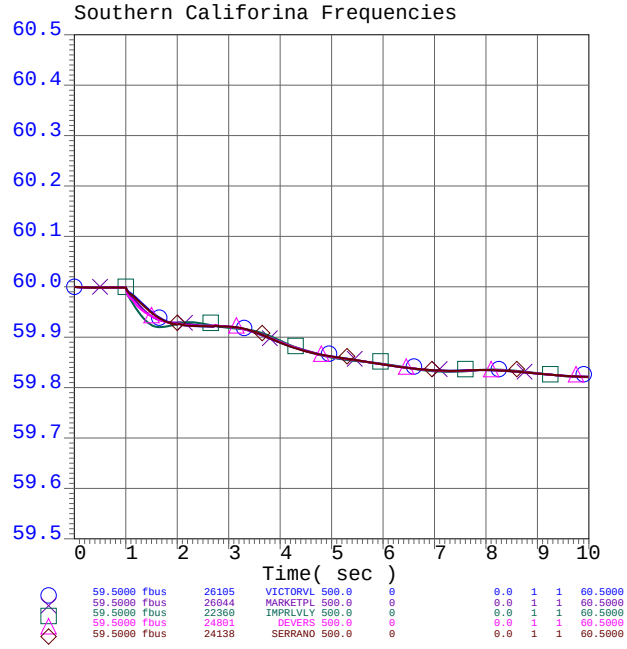
Arizona Frequencies

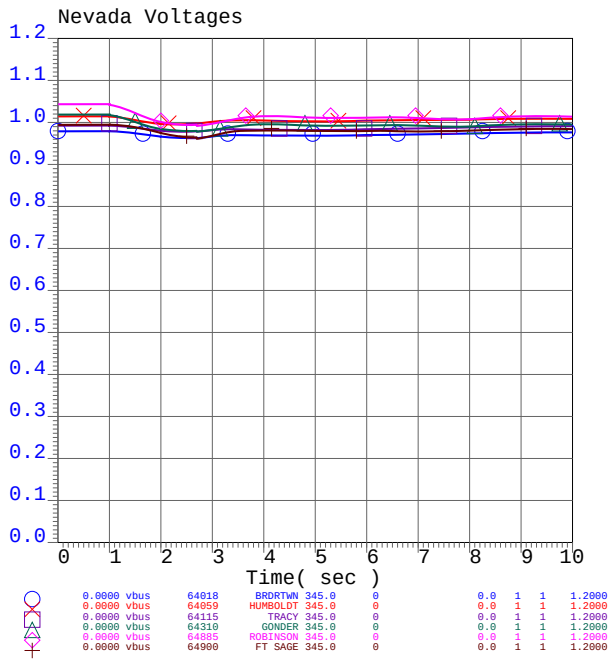


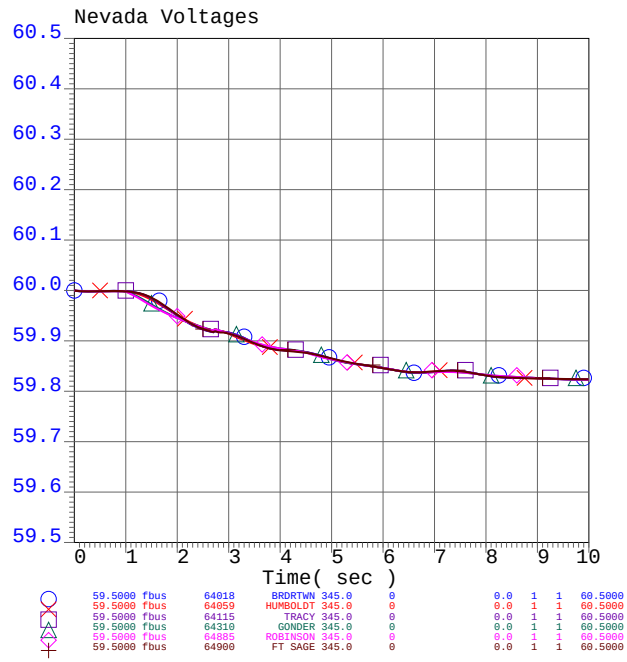
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

WECC AREA VOLTAGE AND FREQUENCIES



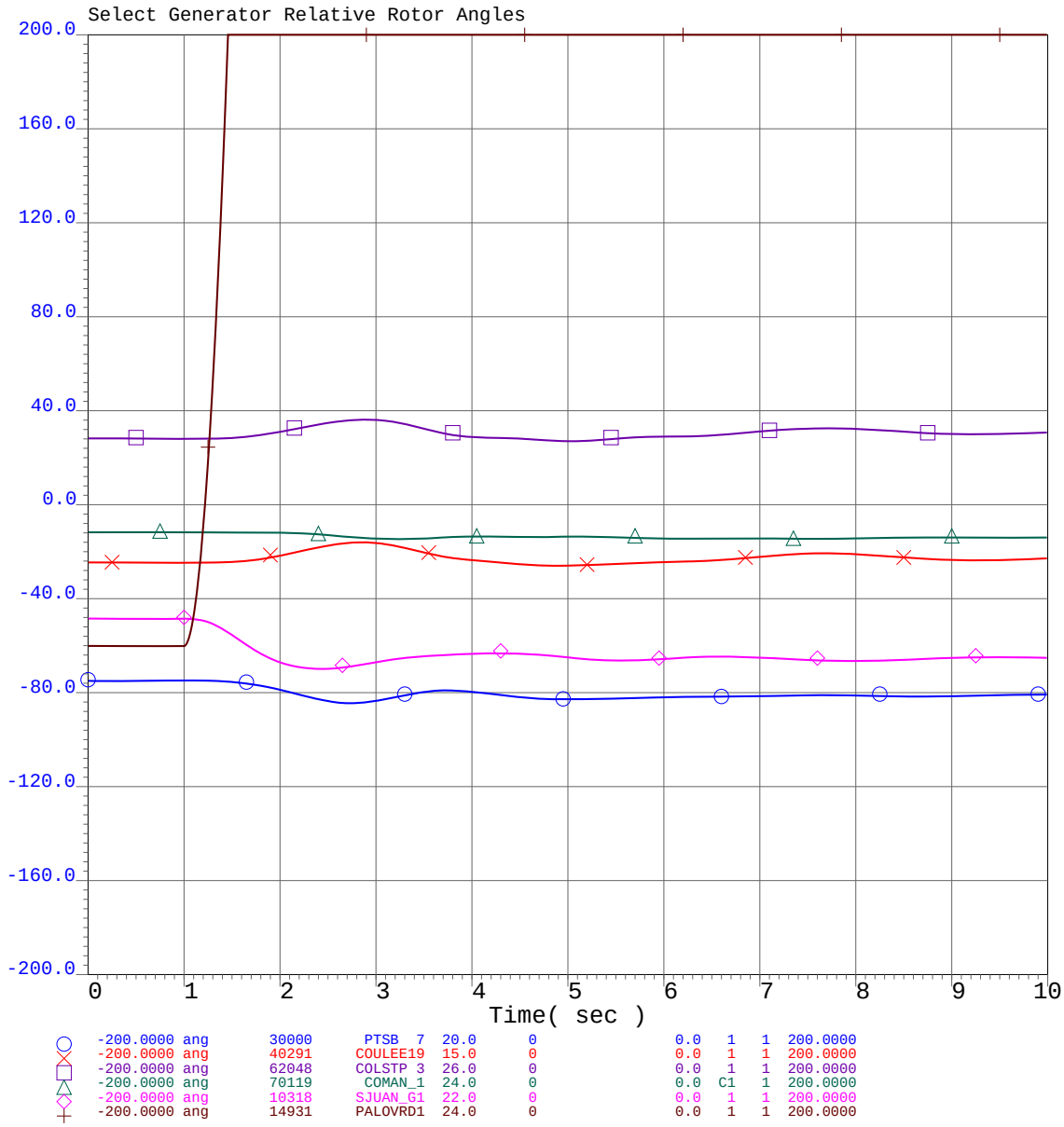






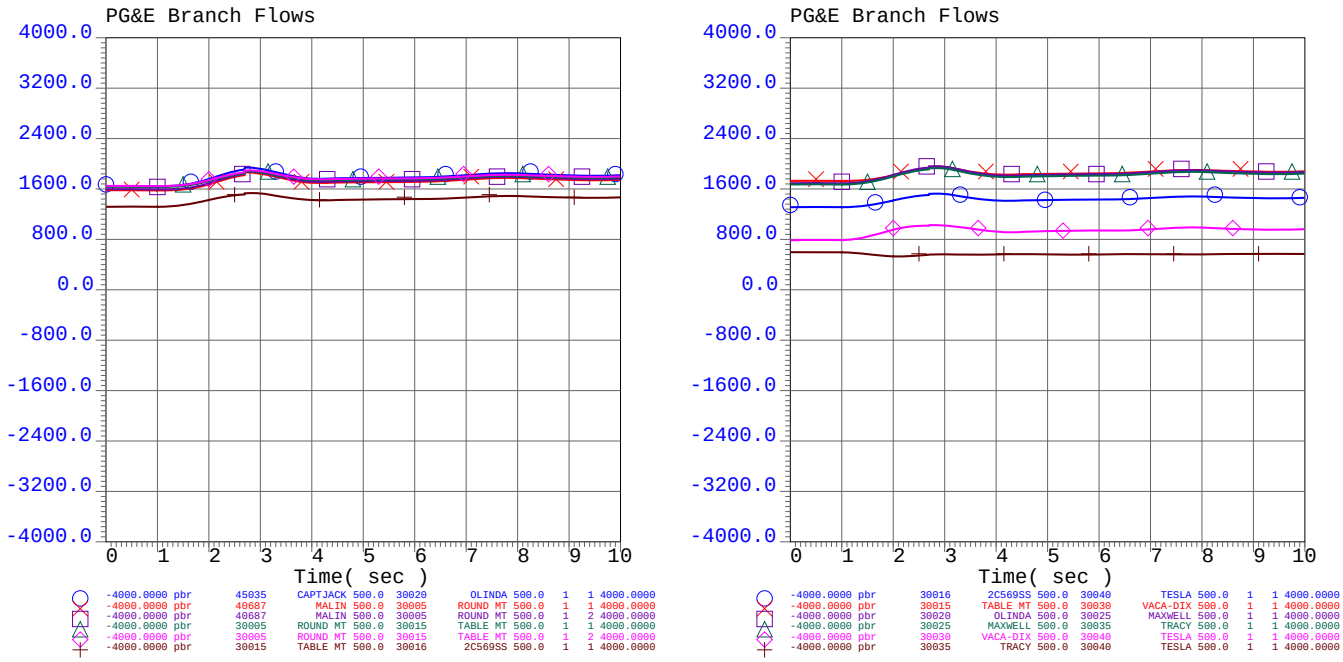
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

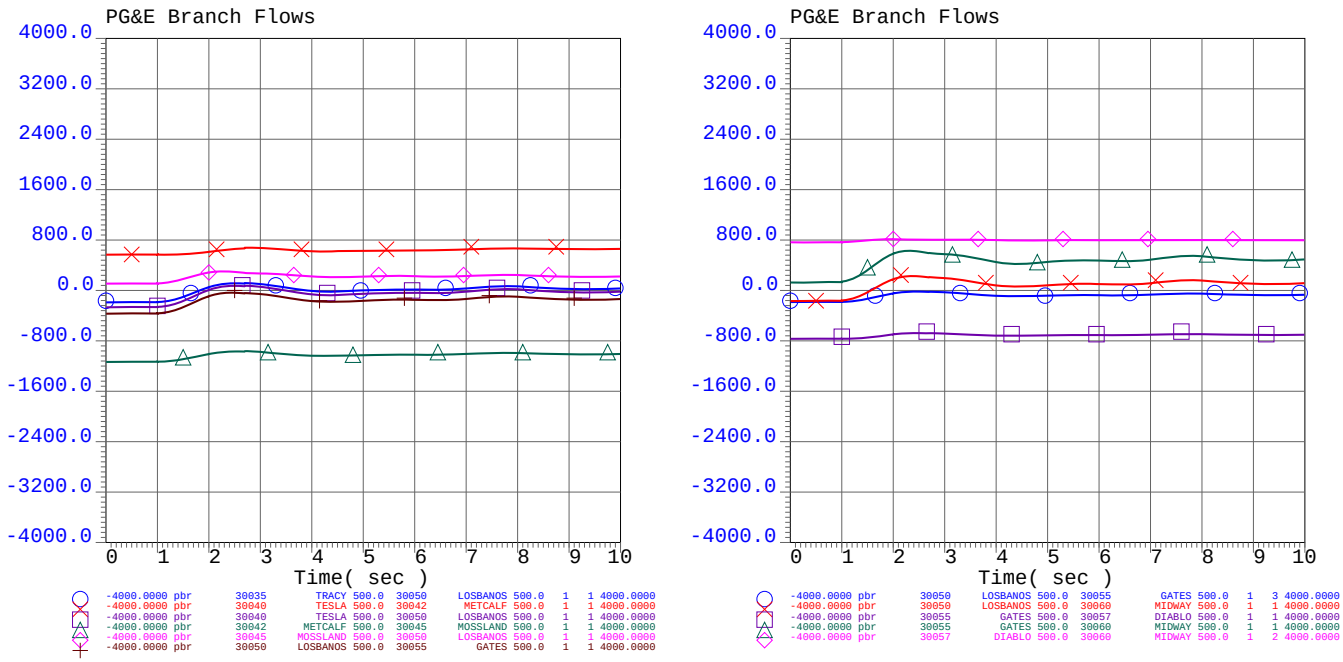
WECC RELATIVE ROTOR ANGLES



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

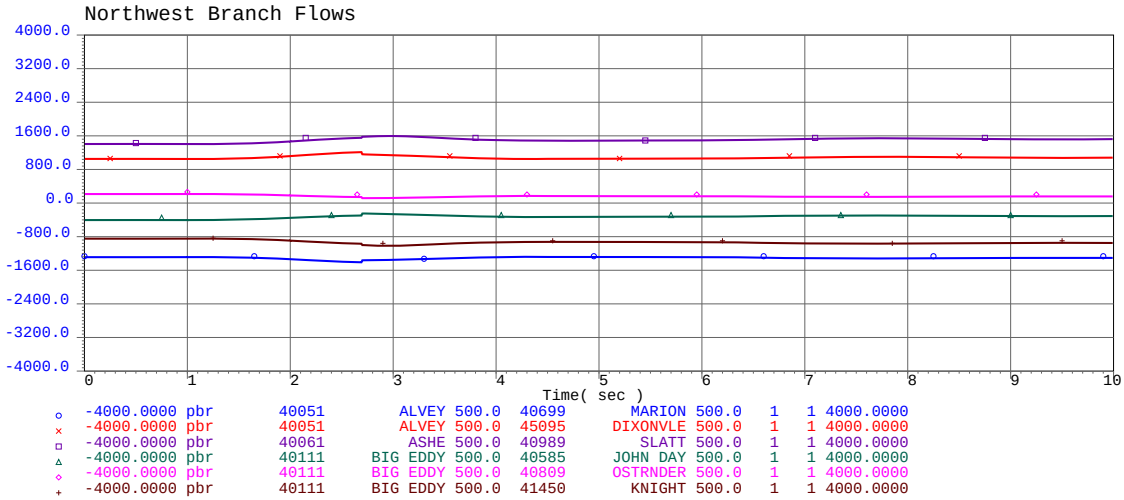
SELECT BRANCH FLOWS



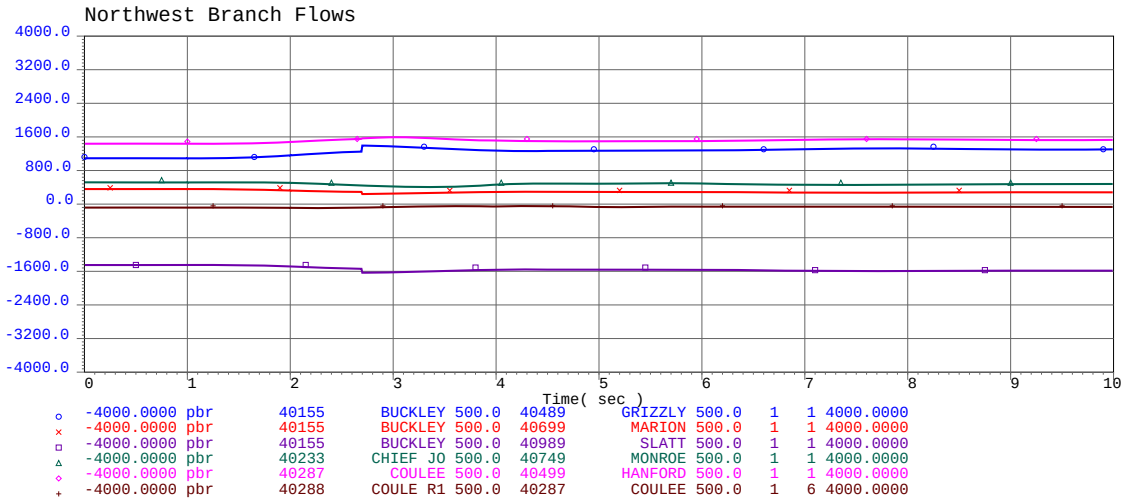


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

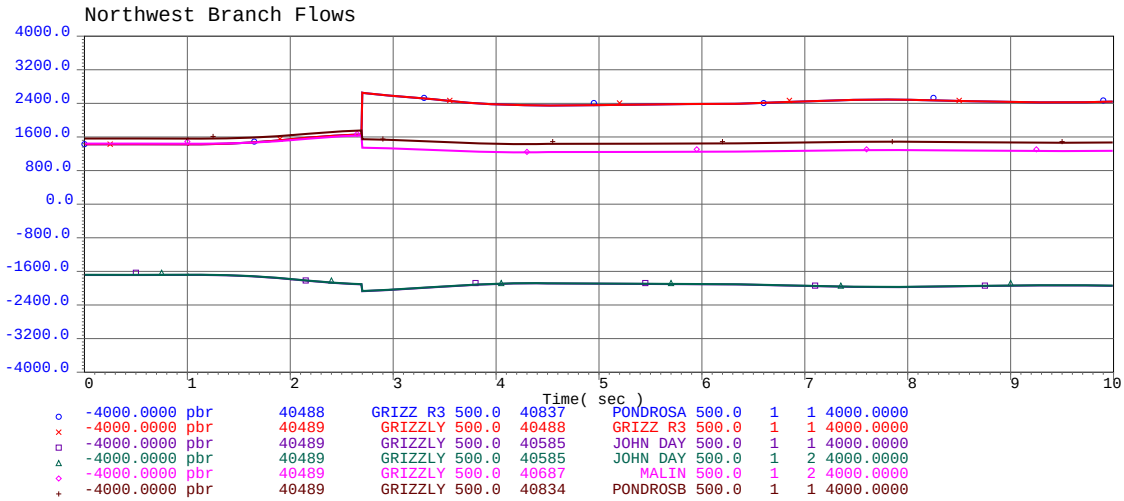
SELECT BRANCH FLOWS



-4000.0000 pbr	40051	ALVEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40051	ALVEY 500.0	45095	DIXONVLE 500.0	1	1	4000.0000
-4000.0000 pbr	40061	ASHE 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	40809	OSTRNDER 500.0	1	1	4000.0000
-4000.0000 pbr	40111	BIG EDDY 500.0	41450	KNIGHT 500.0	1	1	4000.0000



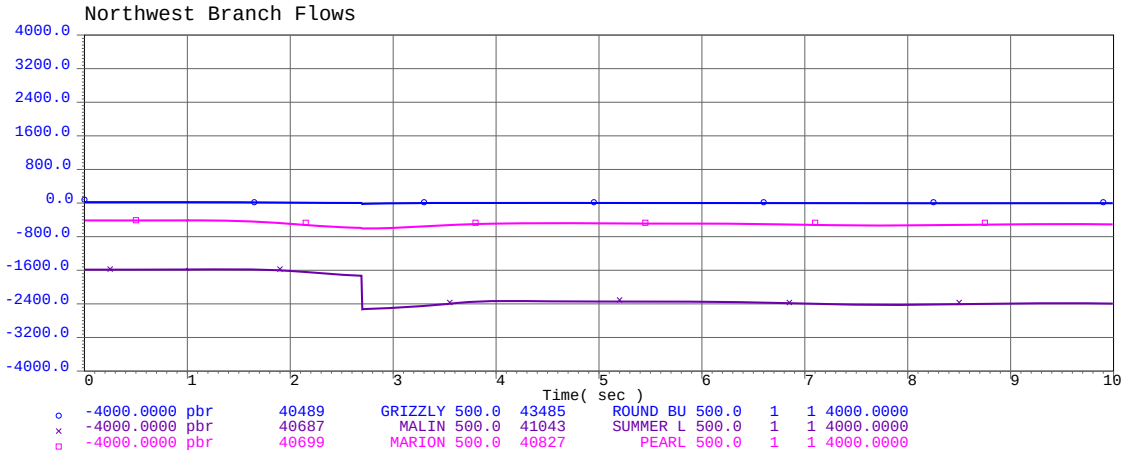
-4000.0000 pbr	40155	BUCKLEY 500.0	40489	GRIZZLY 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40699	MARION 500.0	1	1	4000.0000
-4000.0000 pbr	40155	BUCKLEY 500.0	40989	SLATT 500.0	1	1	4000.0000
-4000.0000 pbr	40233	CHIEF JO 500.0	40749	MONROE 500.0	1	1	4000.0000
-4000.0000 pbr	40287	COULEE 500.0	40499	HANFORD 500.0	1	1	4000.0000
-4000.0000 pbr	40288	COULE R1 500.0	40287	COULEE 500.0	1	6	4000.0000



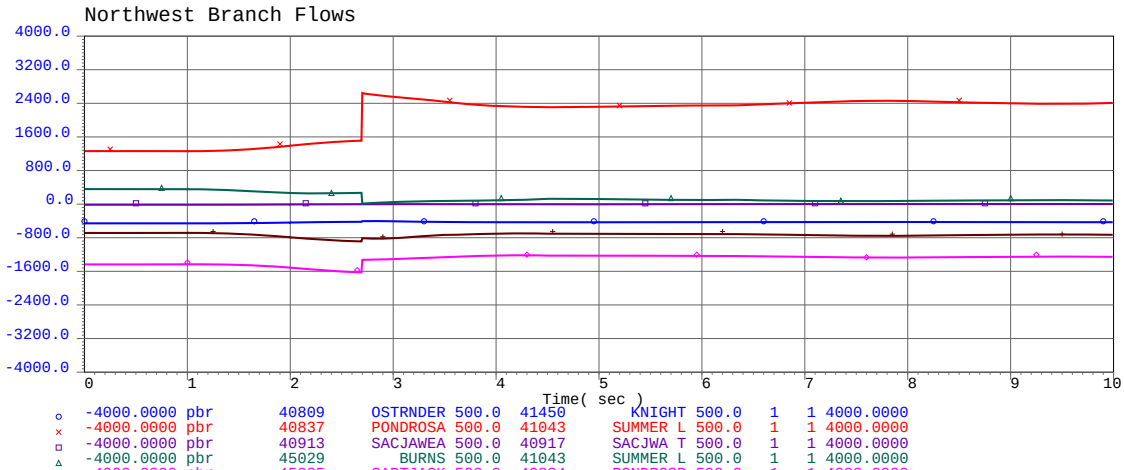
-4000.0000 pbr	40488	GRIZZ R3 500.0	40837	PONDROSA 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40488	GRIZZ R3 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	1	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40585	JOHN DAY 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40687	MALIN 500.0	1	2	4000.0000
-4000.0000 pbr	40489	GRIZZLY 500.0	40834	PONDROSB 500.0	1	1	4000.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

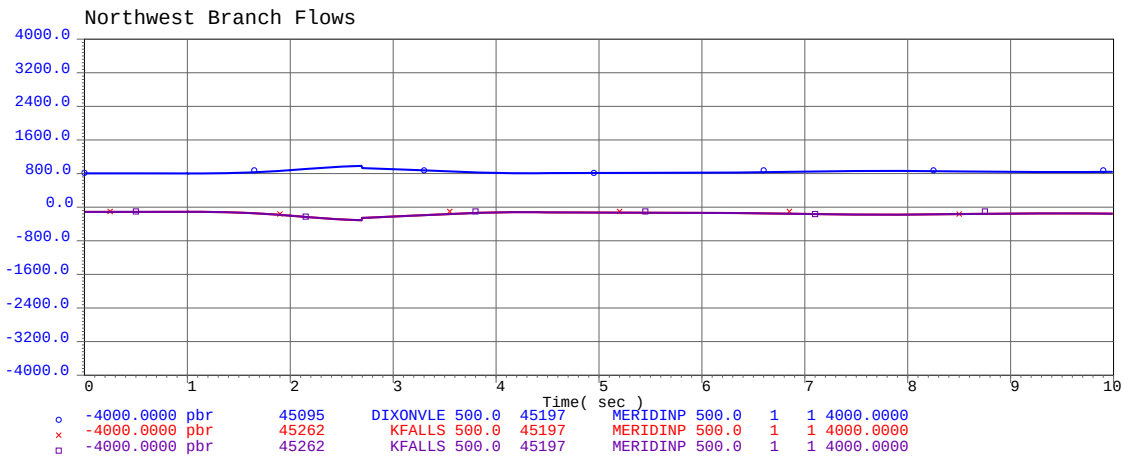
SELECT BRANCH FLOWS



-4000.0000 pbr	40489	GRIZZLY 500.0	43485	ROUND BU 500.0	1	1	4000.0000
-4000.0000 pbr	40687	MALIN 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	40699	MARION 500.0	40827	PEARL 500.0	1	1	4000.0000



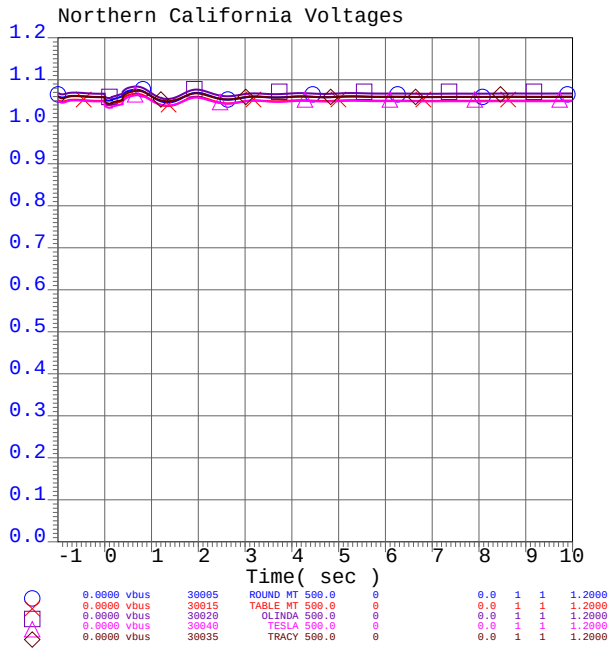
-4000.0000 pbr	40809	OSTRNDER 500.0	41450	KNIGHT 500.0	1	1	4000.0000
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-4000.0000 pbr	40913	SACJAWEA 500.0	40917	SACJWA T 500.0	1	1	4000.0000
-4000.0000 pbr	45029	BURNS 500.0	41043	SUMMER L 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	40834	PONDROSB 500.0	1	1	4000.0000
-4000.0000 pbr	45035	CAPTJACK 500.0	45262	KFALLS 500.0	1	1	4000.0000

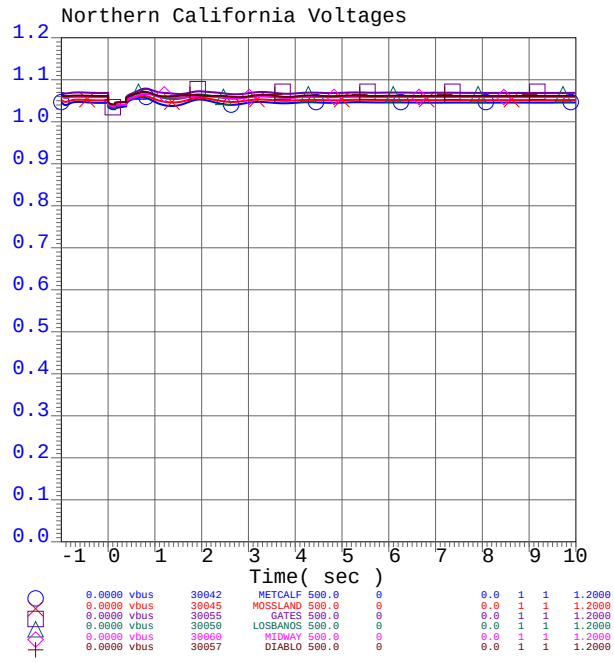


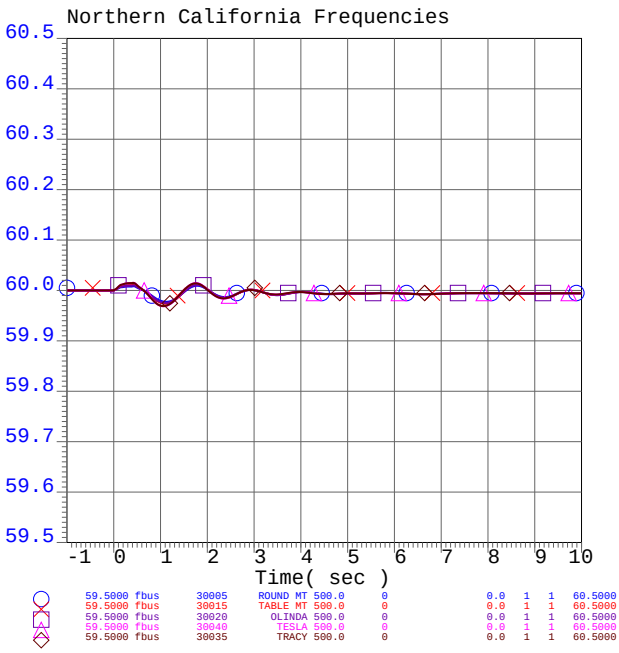
-4000.0000 pbr	45095	DIXONVLE 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000
-4000.0000 pbr	45262	KFALLS 500.0	45197	MERIDINP 500.0	1	1	4000.0000

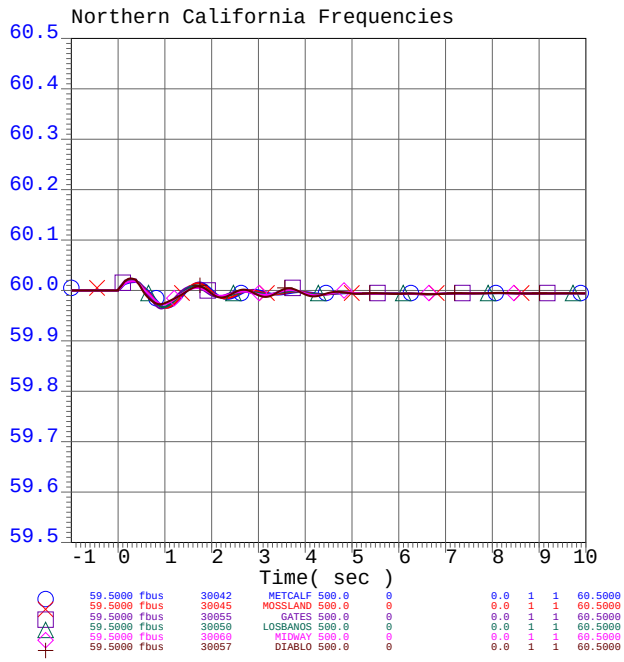
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
Trip two Palo Verde Units

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



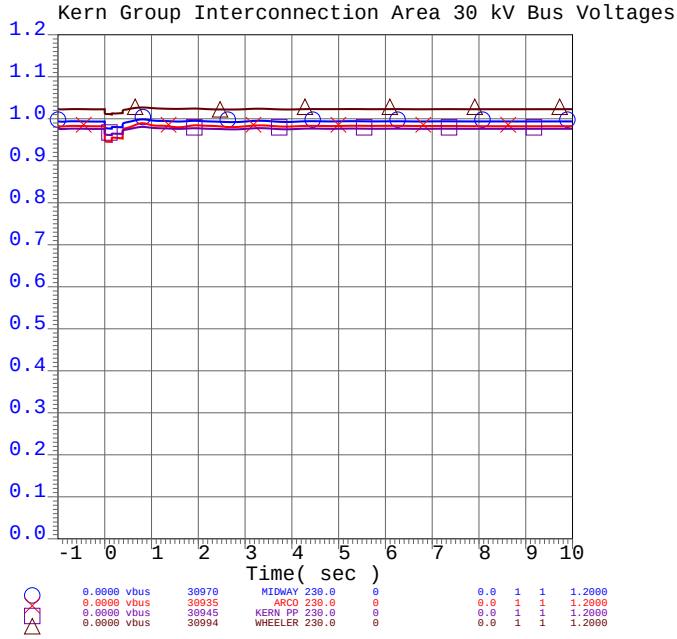


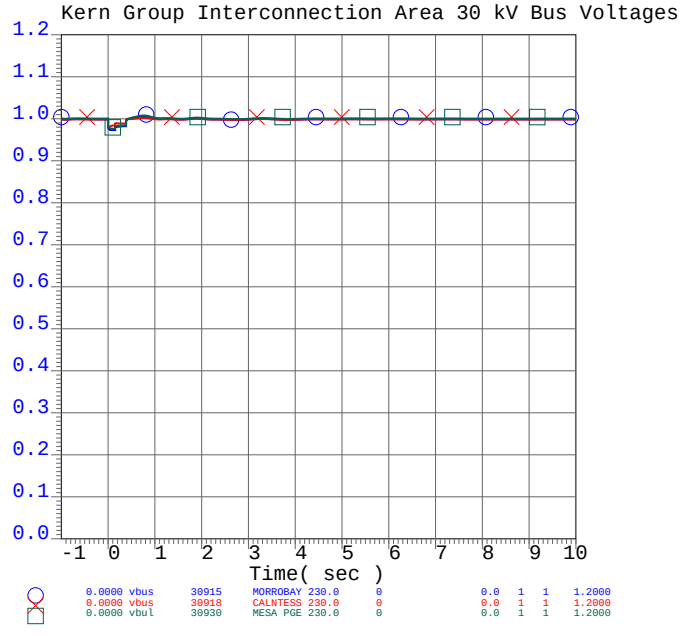


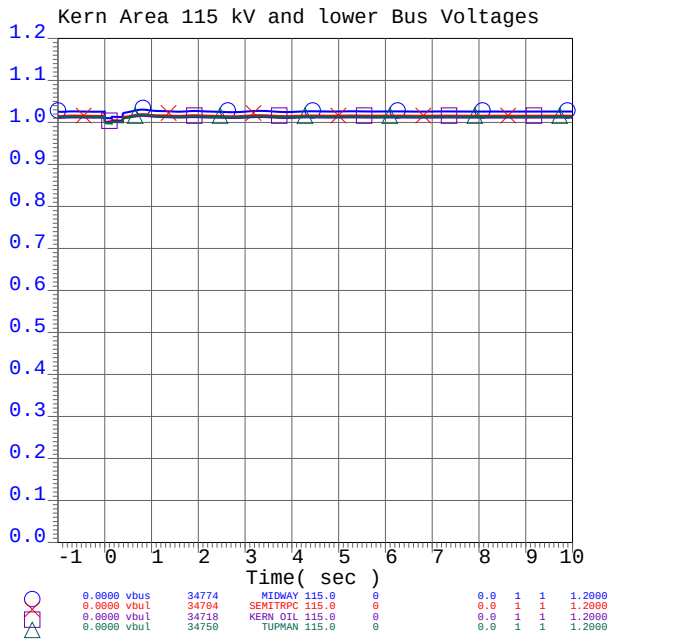


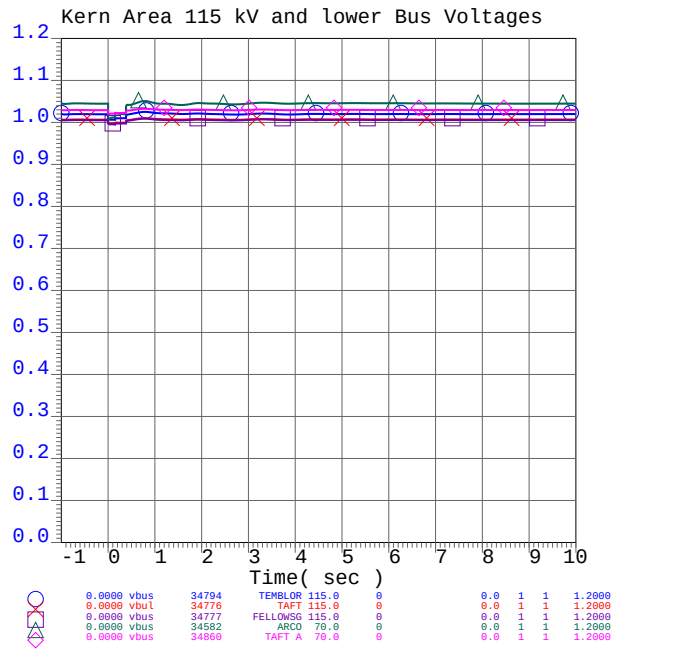
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 512 (Borden-Gregg 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



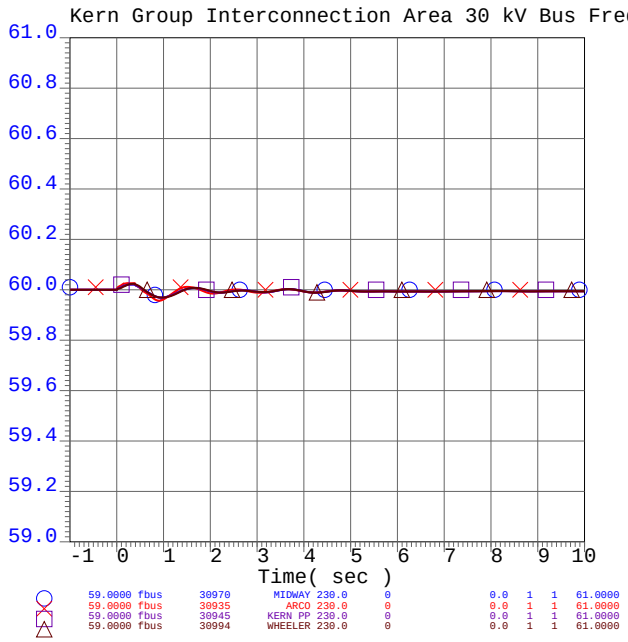


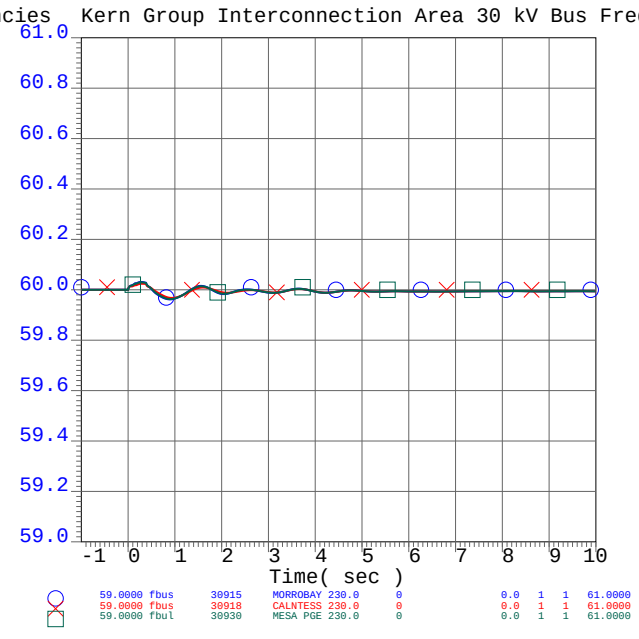


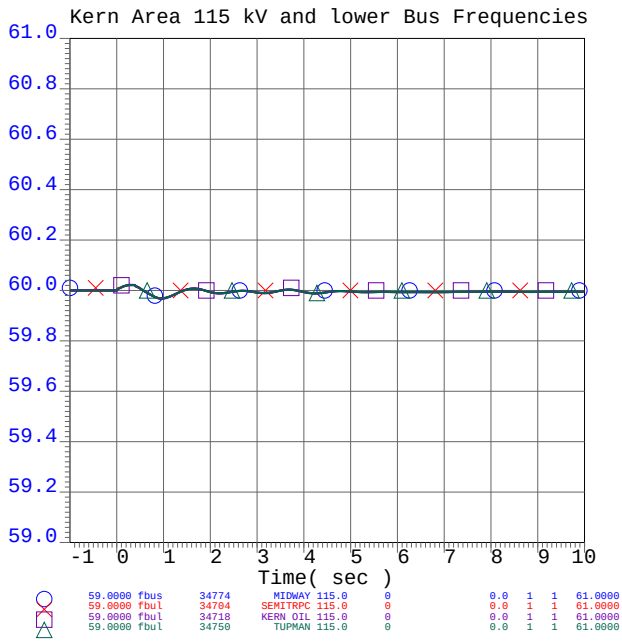


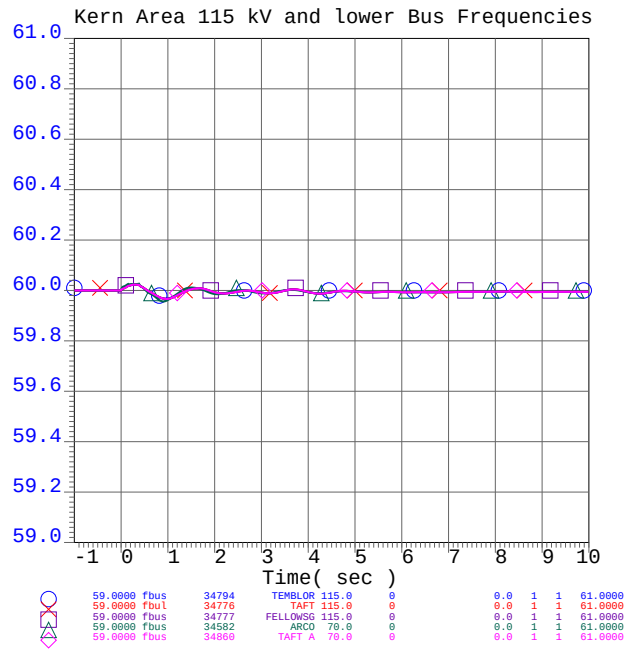
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 512 (Borden-Gregg 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





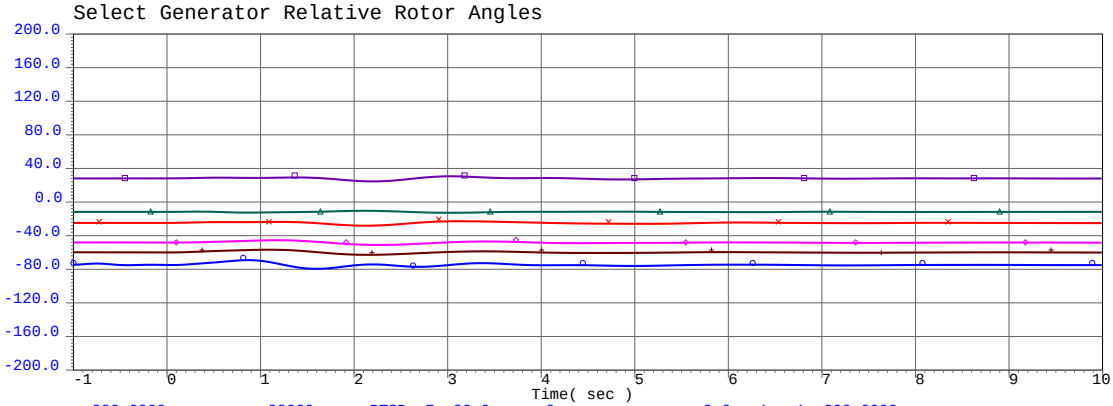




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 512 (Borden-Gregg 230 kV line) Fails to Operate

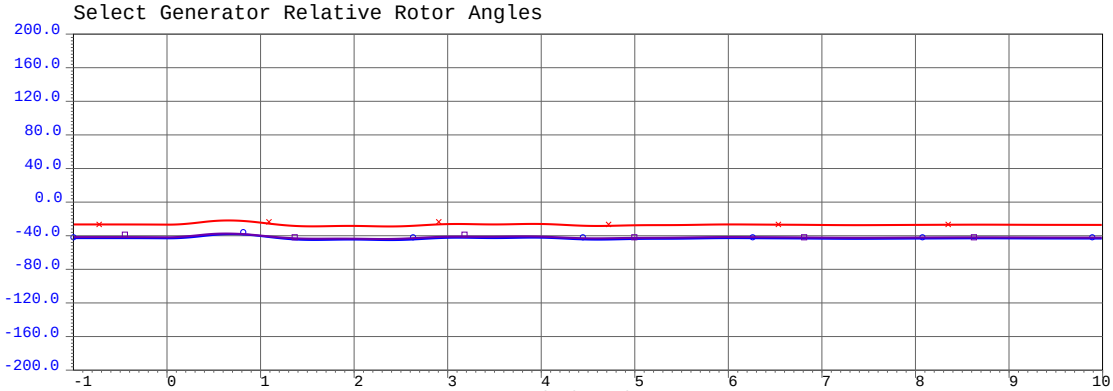
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



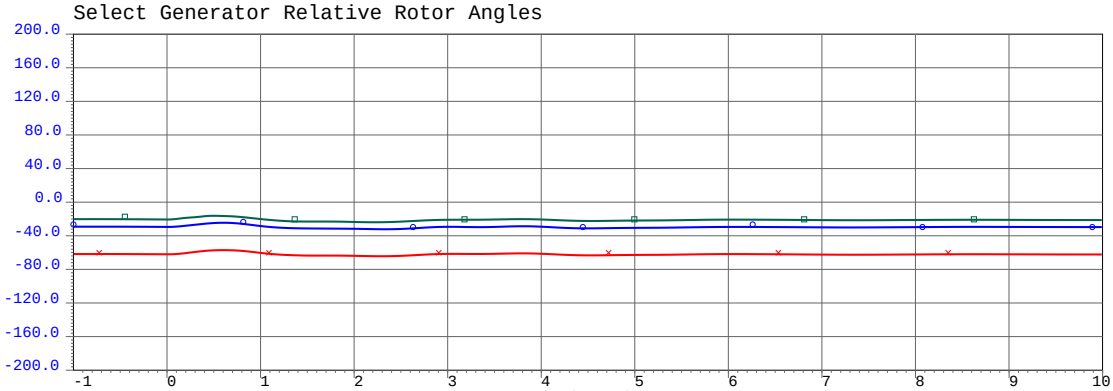
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

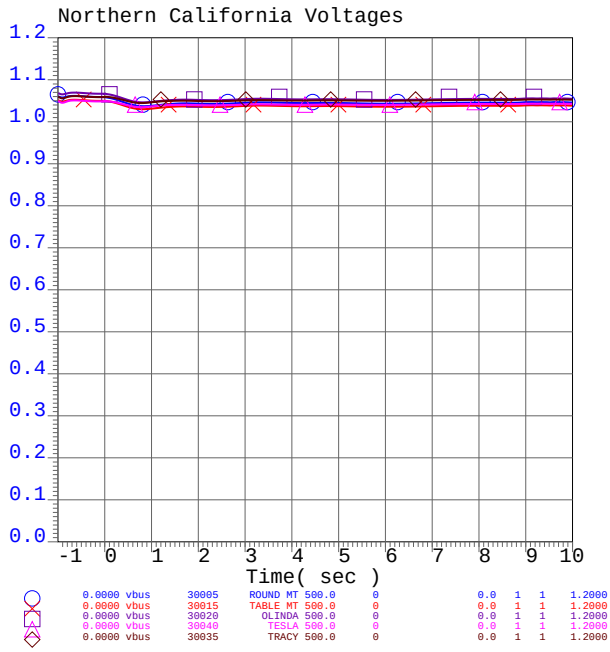
Select Generator Relative Rotor Angles

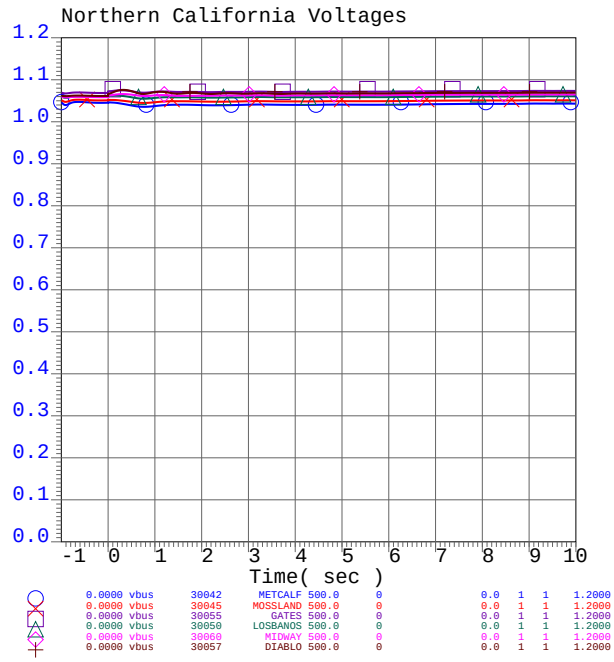


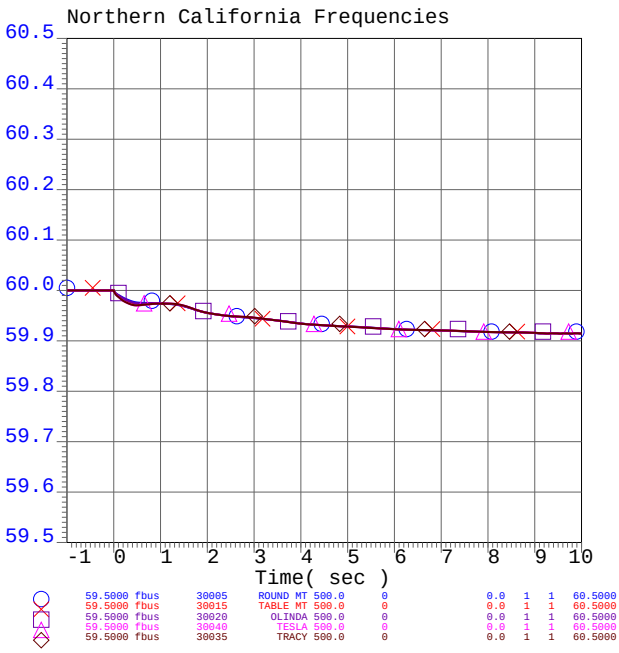
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

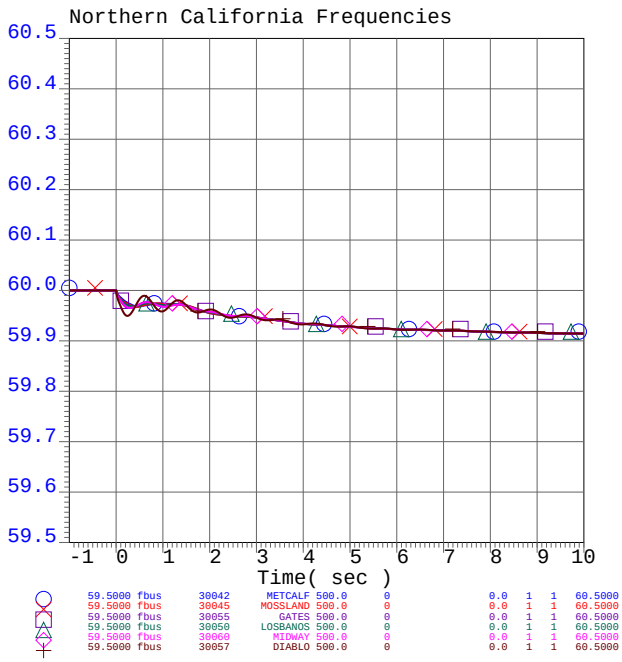
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 512 (Borden-Gregg 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES









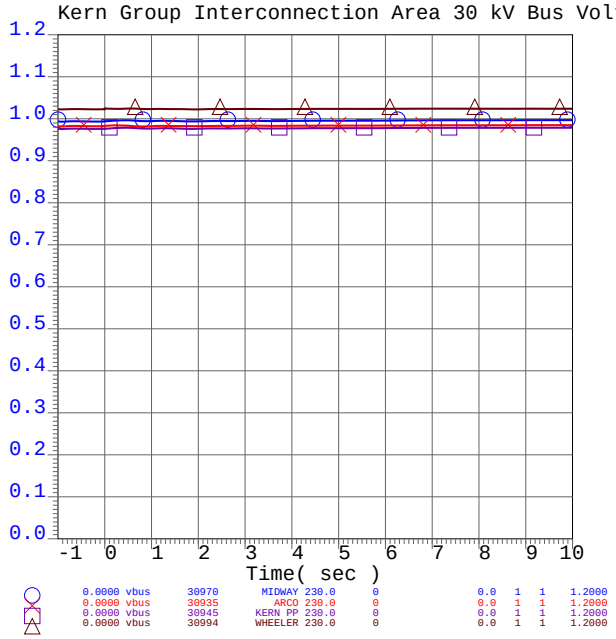
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Diablo Canyon PP Unit 1
Diablo Canyon PP CB632 Fails to Operate

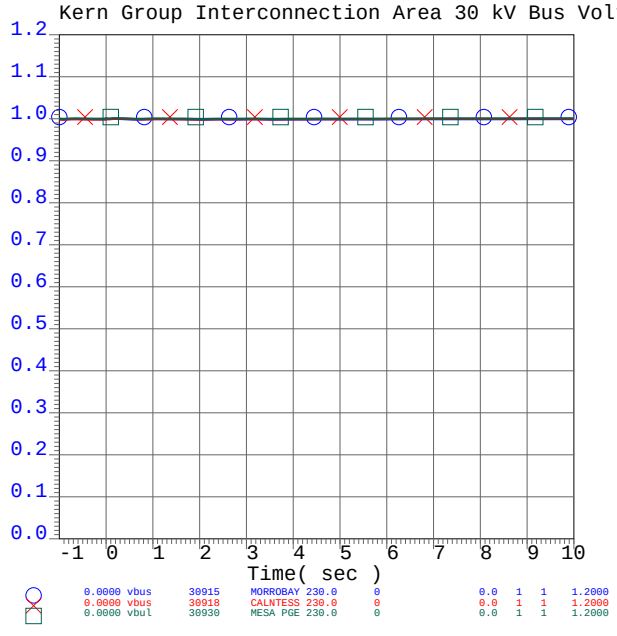
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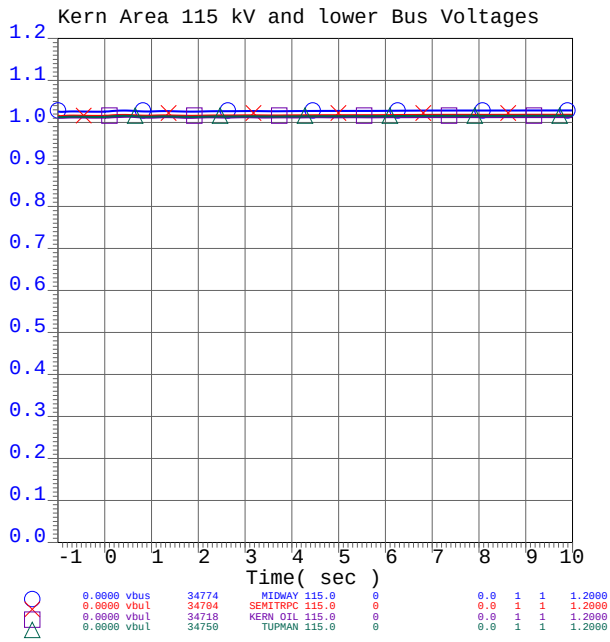
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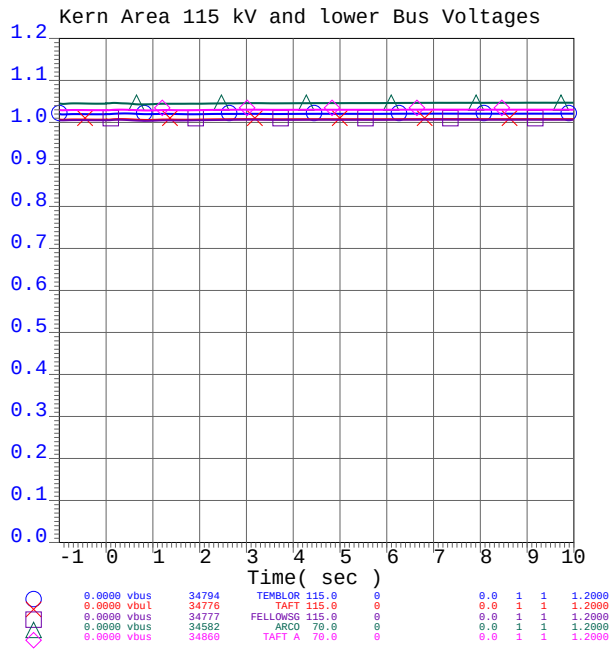
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KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





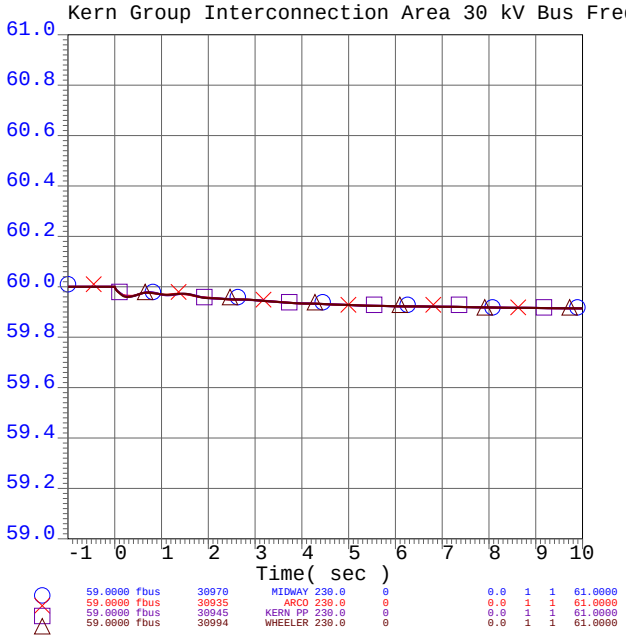




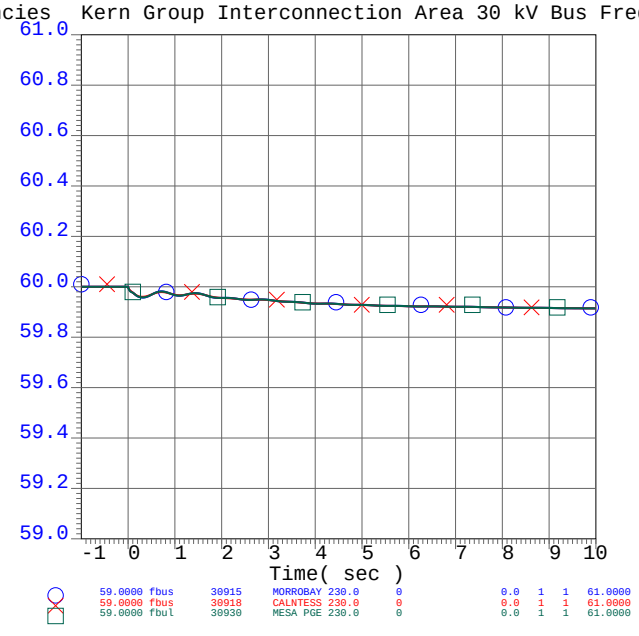
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Diablo Canyon PP Unit 1
Diablo Canyon PP CB632 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

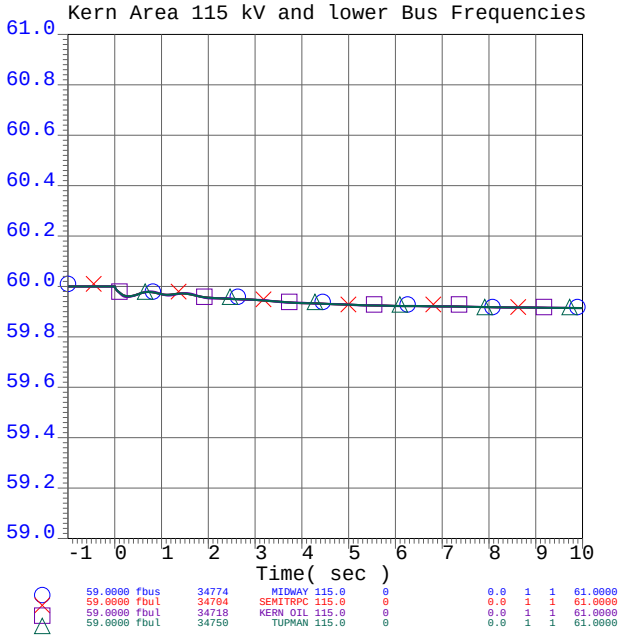
Kern Group Interconnection Area 30 kV Bus Frequencies



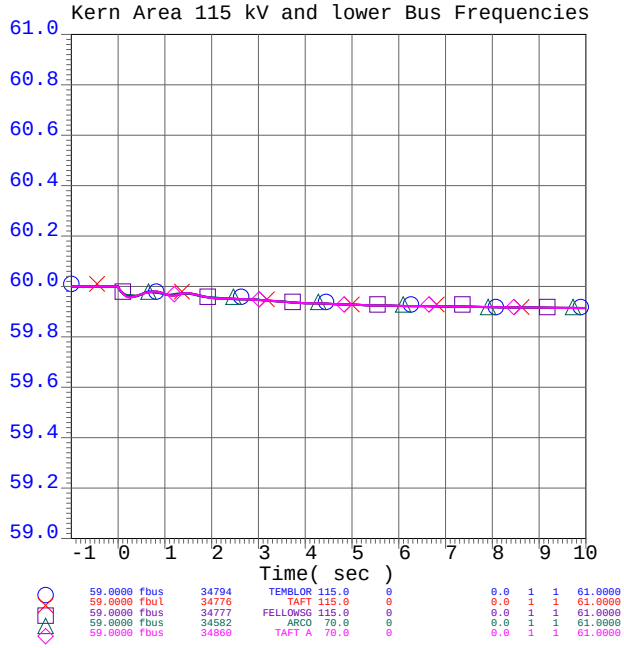
Kern Group Interconnection Area 30 kV Bus Frequencies



Kern Area 115 kV and lower Bus Frequencies

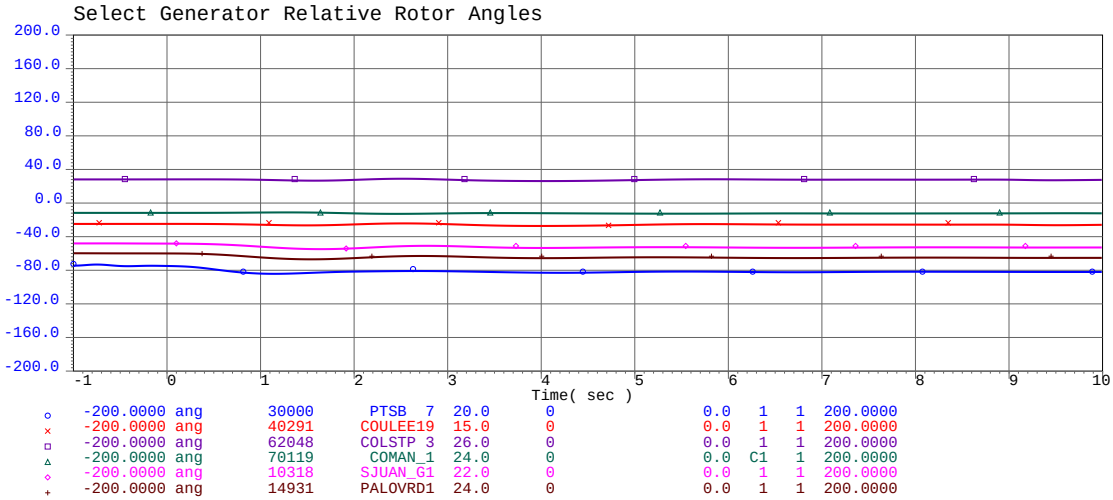


Kern Area 115 kV and lower Bus Frequencies

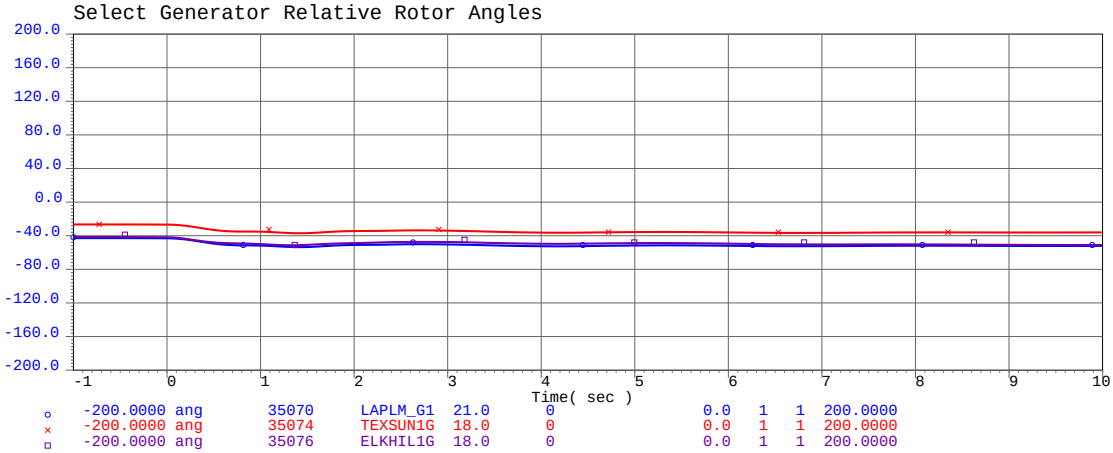


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Diablo Canyon PP Unit 1
Diablo Canyon PP CB632 Fails to Operate

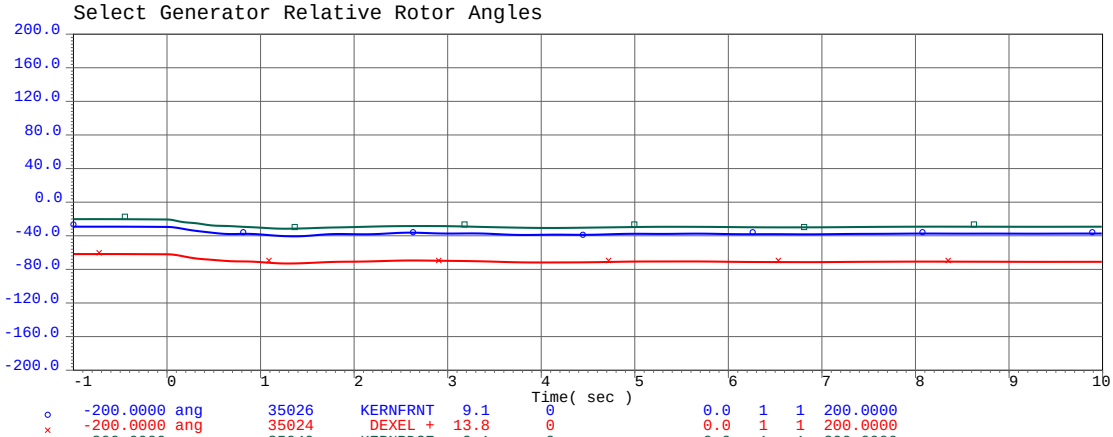
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



○	-200.0000 ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
×	-200.0000 ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
□	-200.0000 ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
△	-200.0000 ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
◇	-200.0000 ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
+	-200.0000 ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000



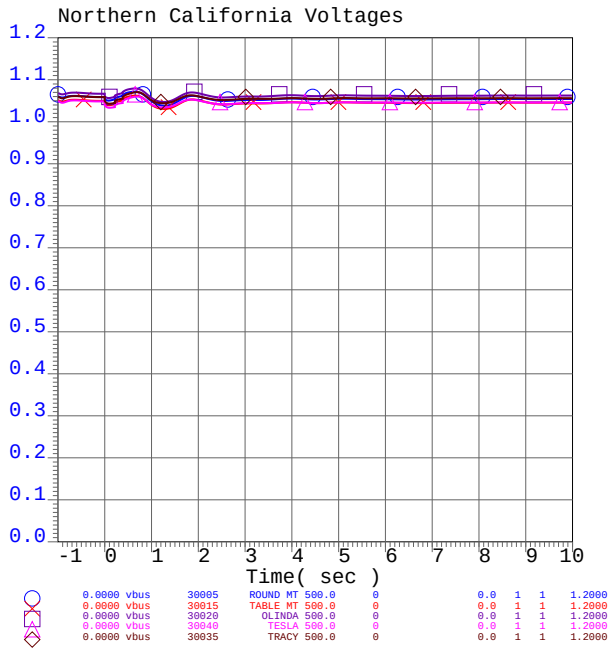
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×	-200.0000 ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
□	-200.0000 ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

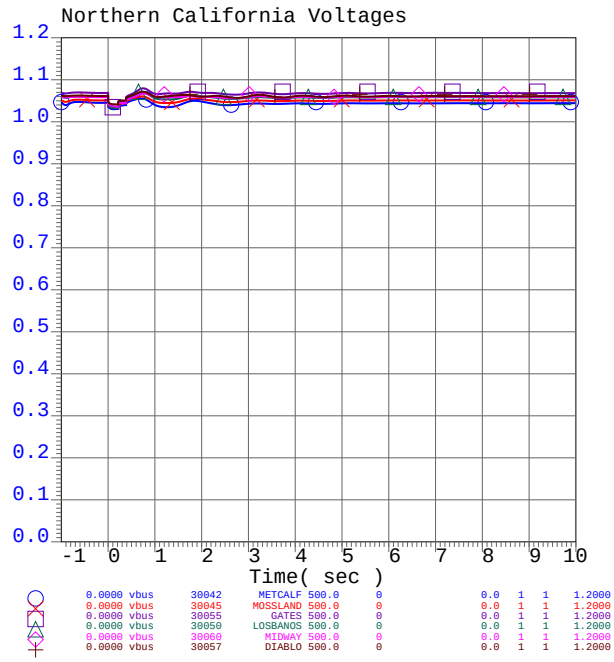


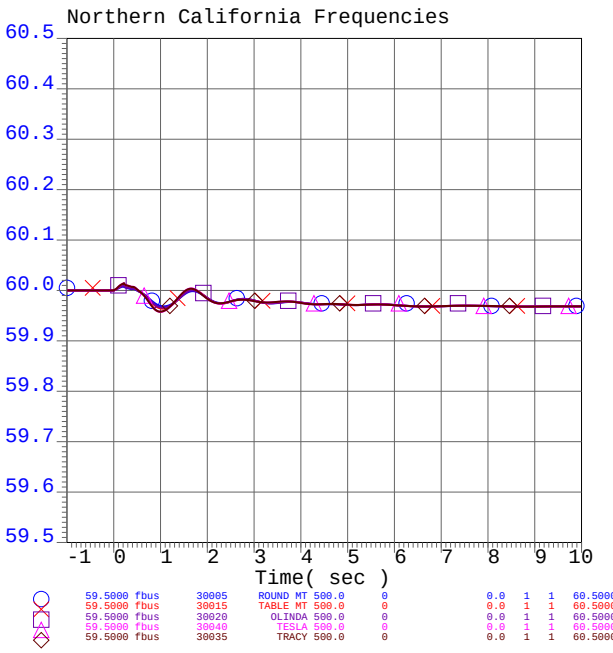
○	-200.0000 ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
×	-200.0000 ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
□	-200.0000 ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

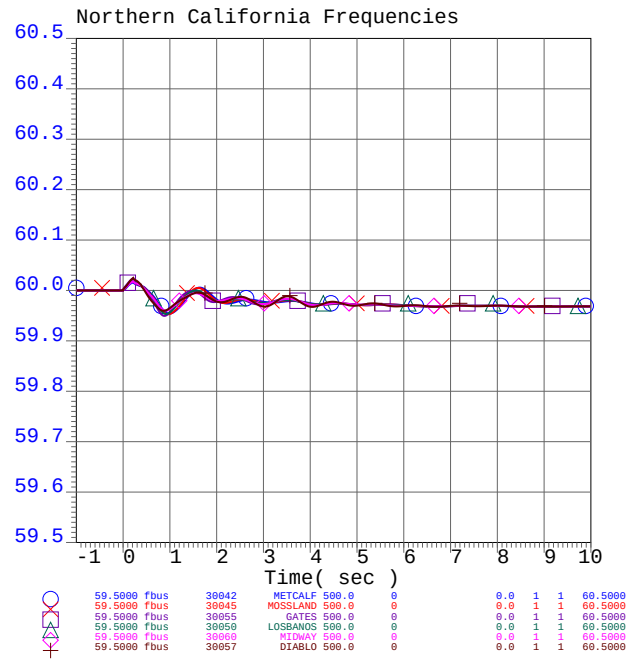
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Diablo Canyon PP Unit 1
Diablo Canyon PP CB632 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



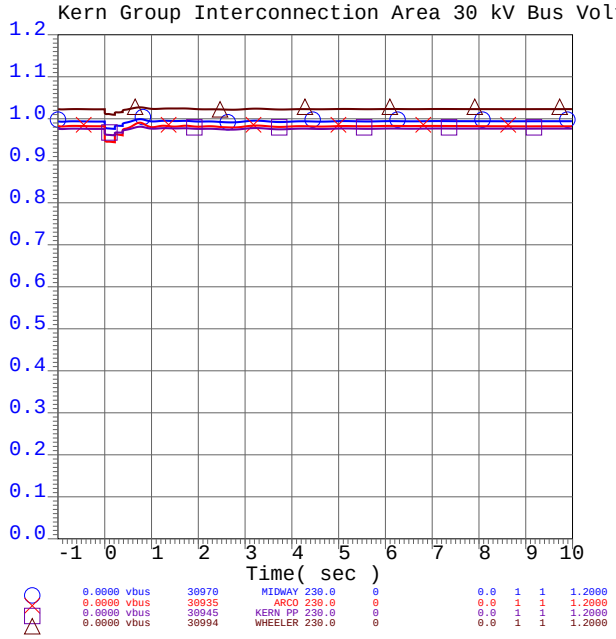


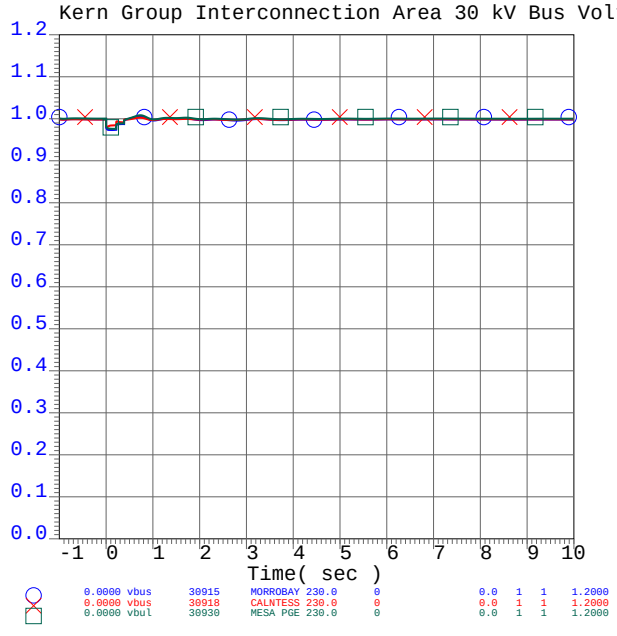


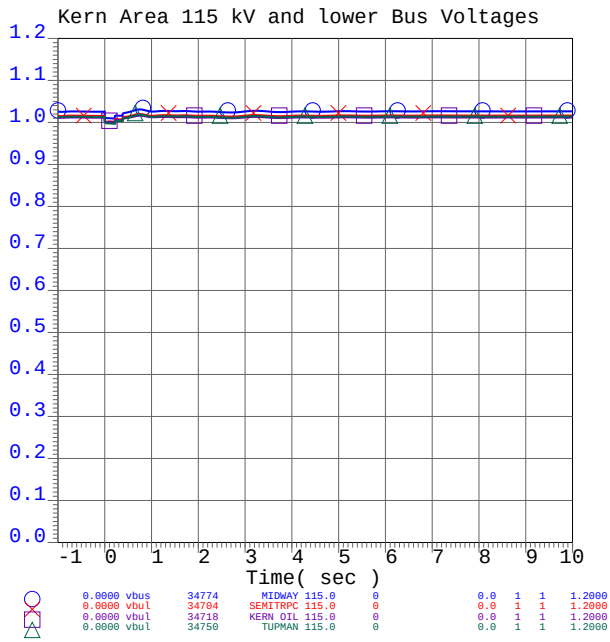


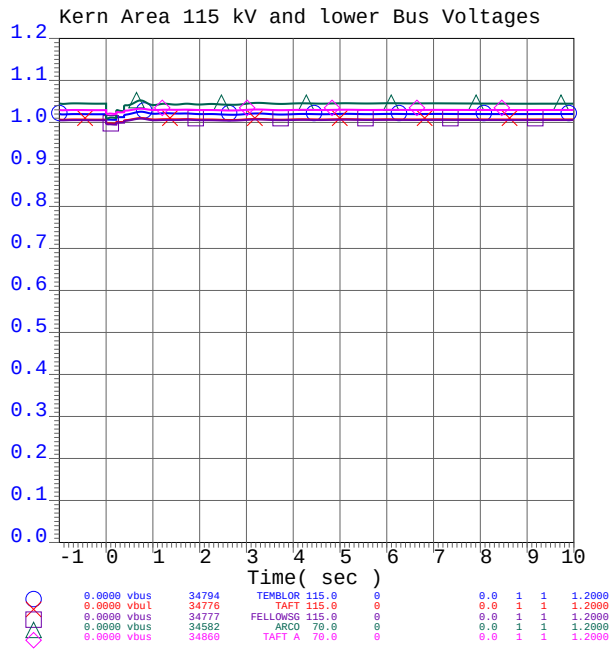
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 332 (Helms (E1)-Gregg #1 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



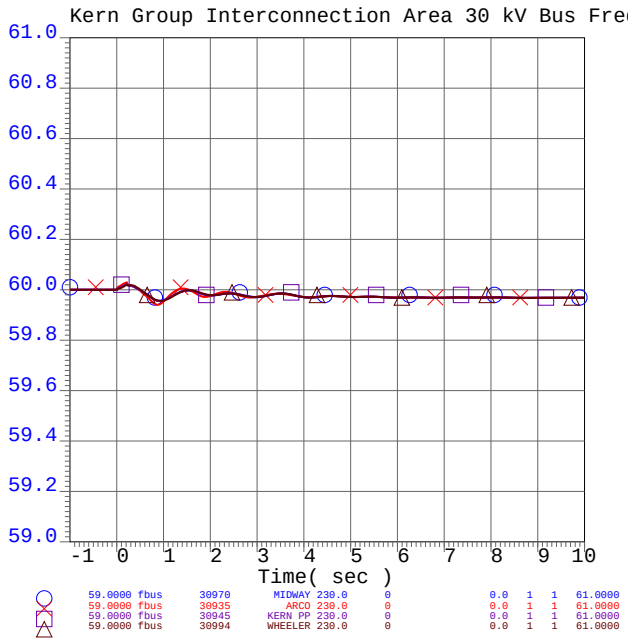


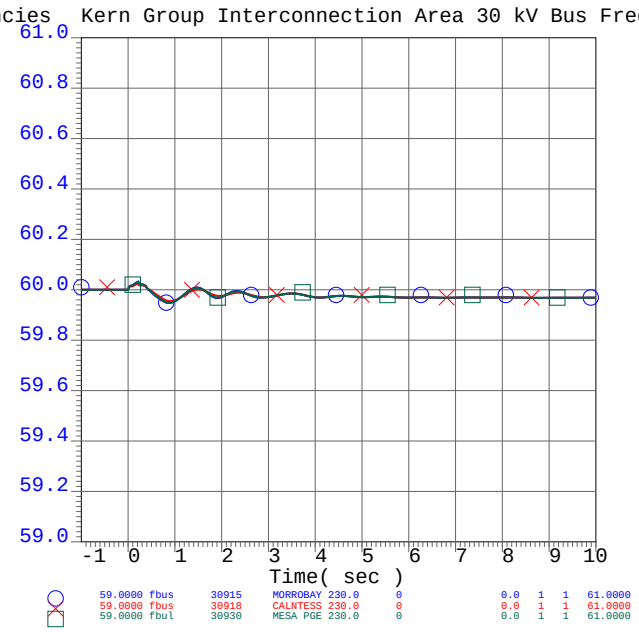


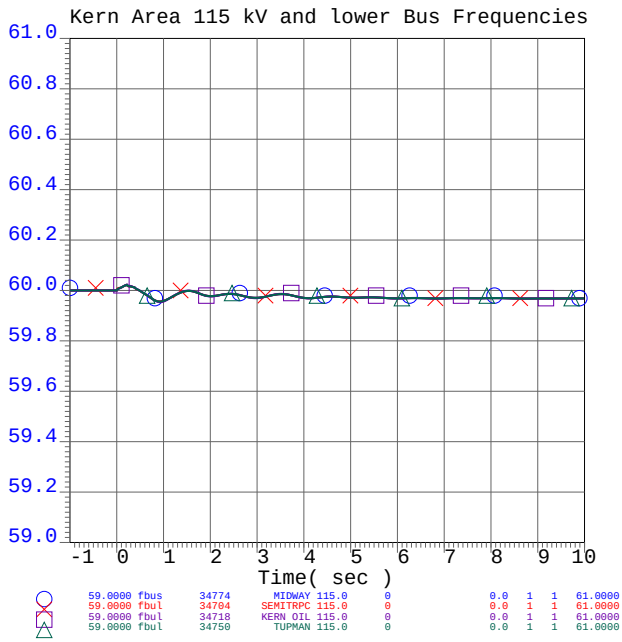


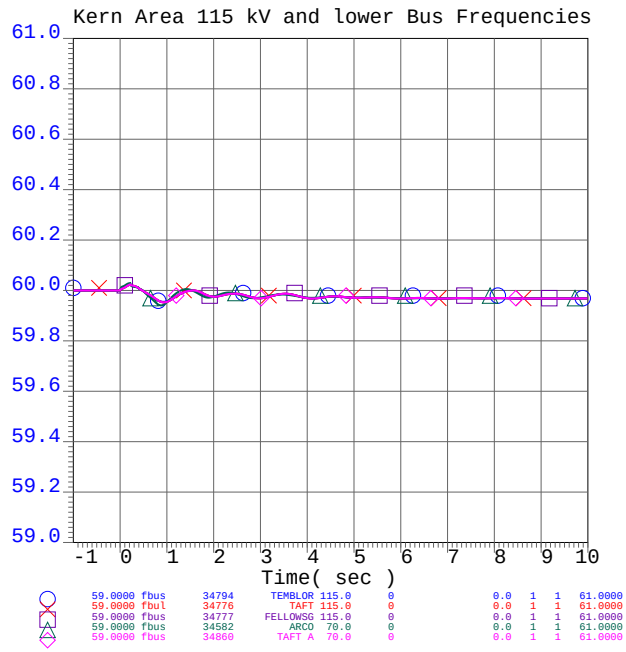
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 332 (Helms (E1)-Gregg #1 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





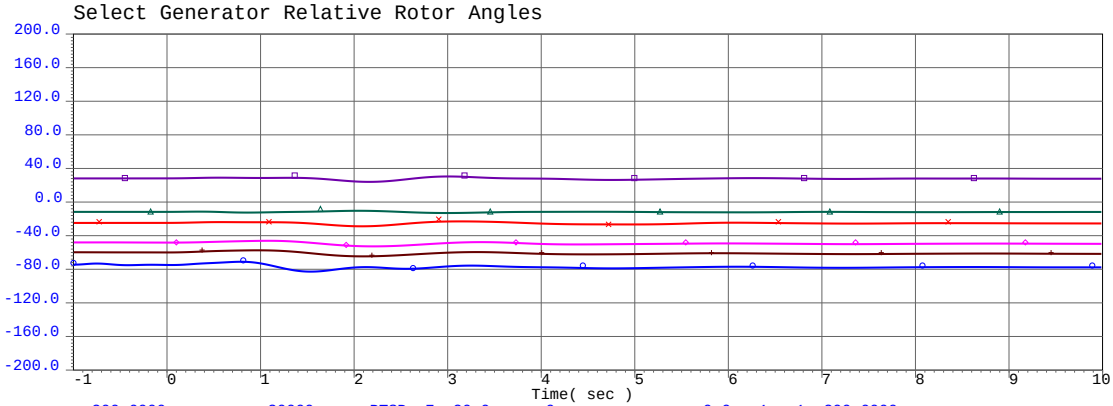




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 332 (Helms (E1)-Gregg #1 230 kV line) Fails to Operate

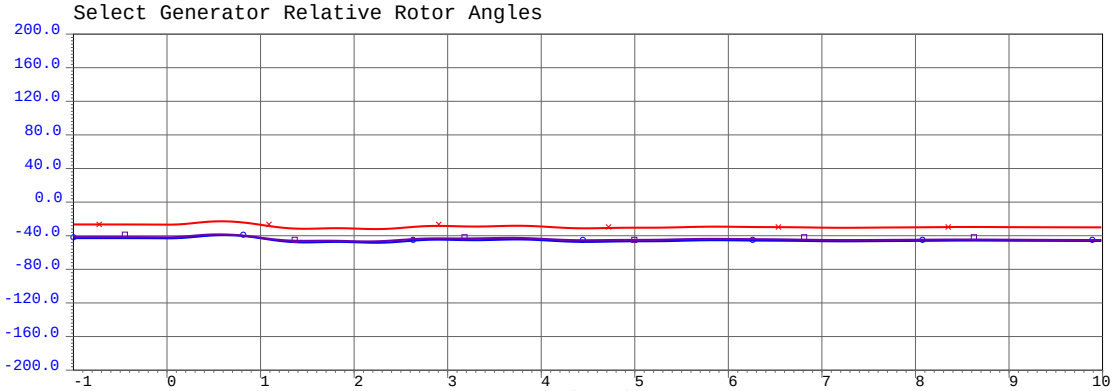
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



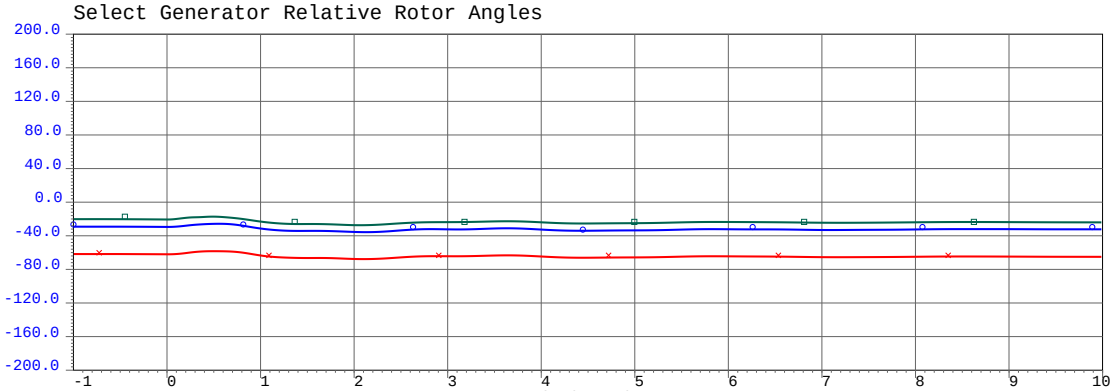
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×	-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
□	-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
△	-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
◇	-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
+	-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



○	-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
×	-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
□	-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

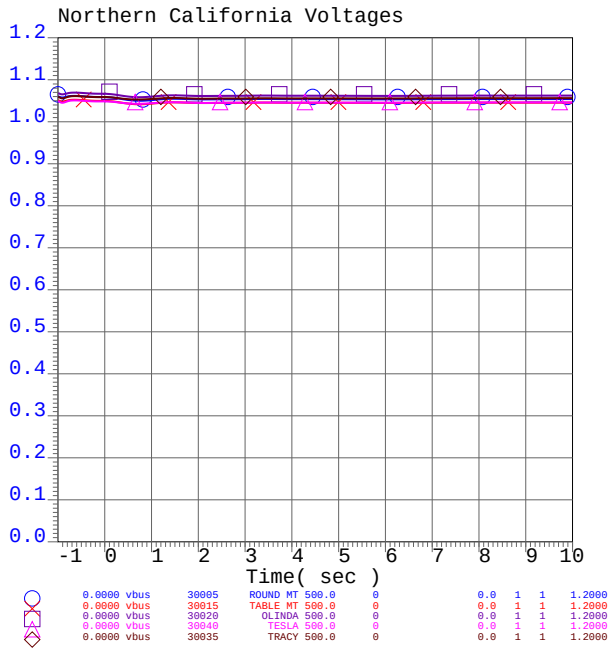
Select Generator Relative Rotor Angles

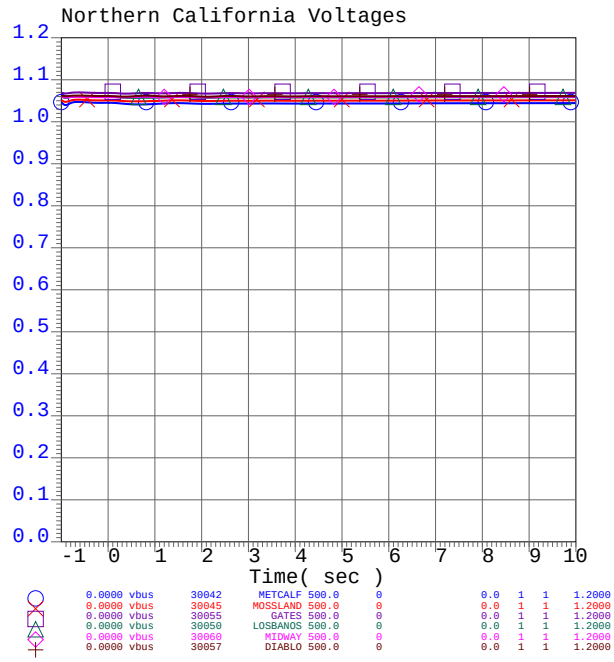


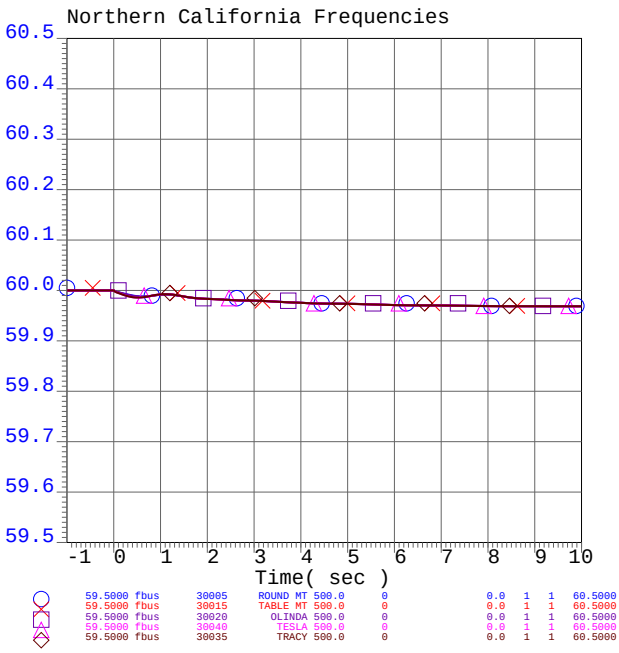
○	-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
×	-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
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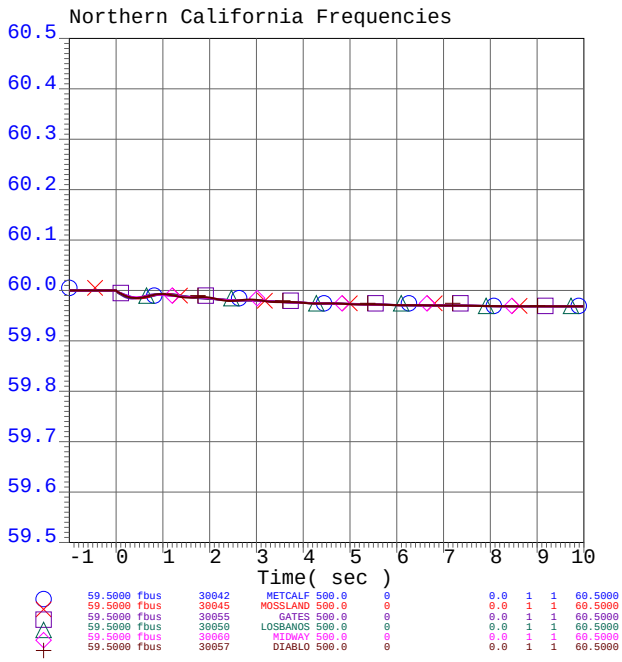
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Gregg 230kV
Gregg CB 332 (Helms (E1)-Gregg #1 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES









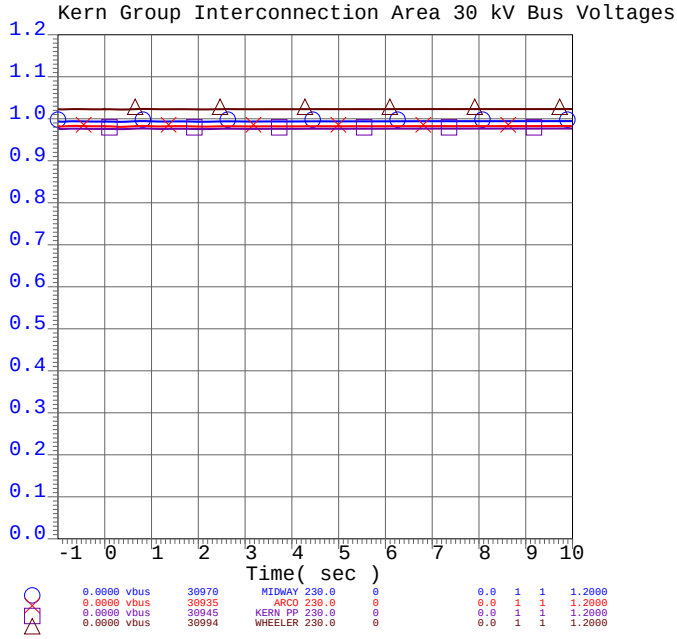
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Helms PGP Unit No.1
Helms CB270 Fails to Operate

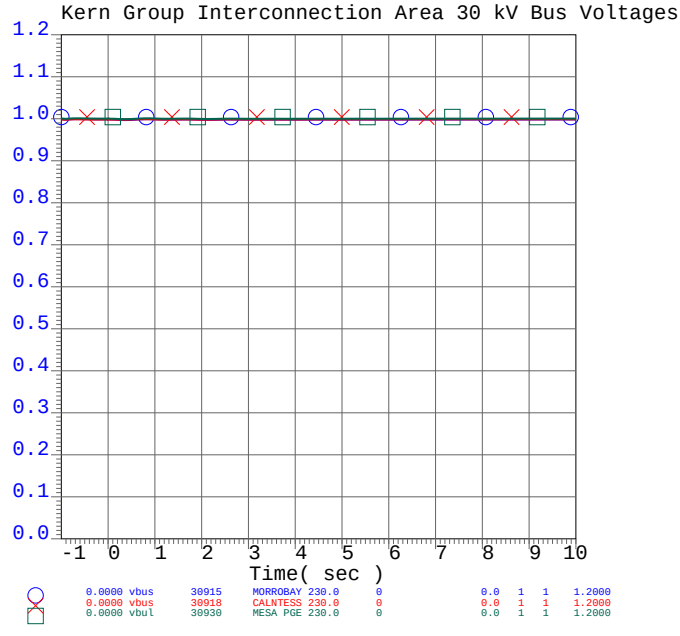
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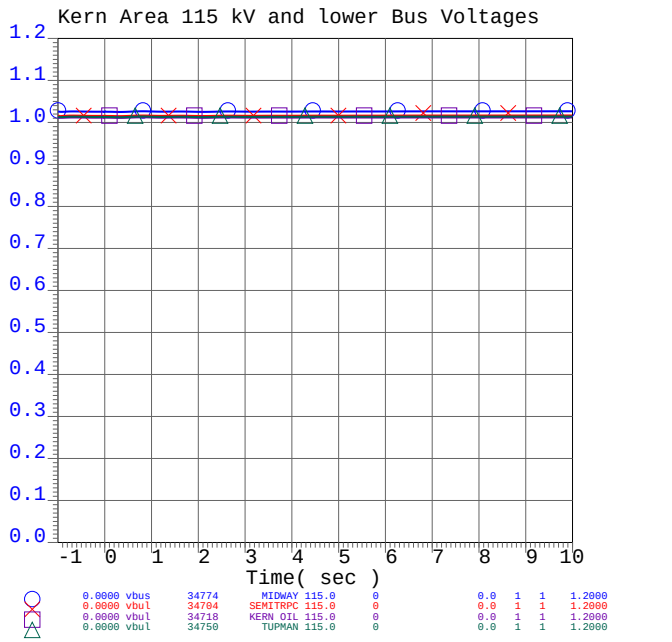
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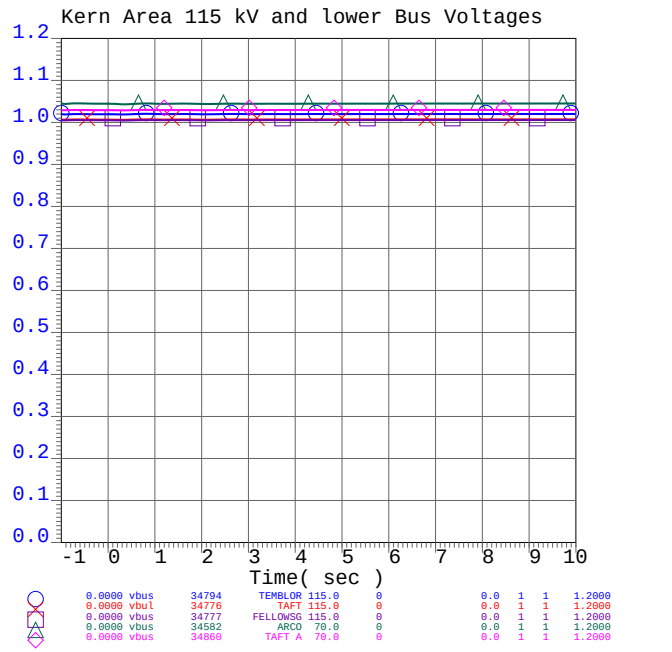
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KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



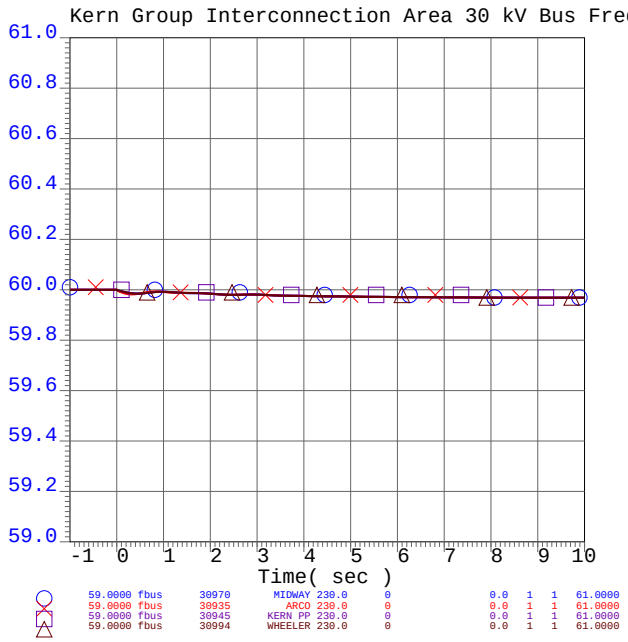


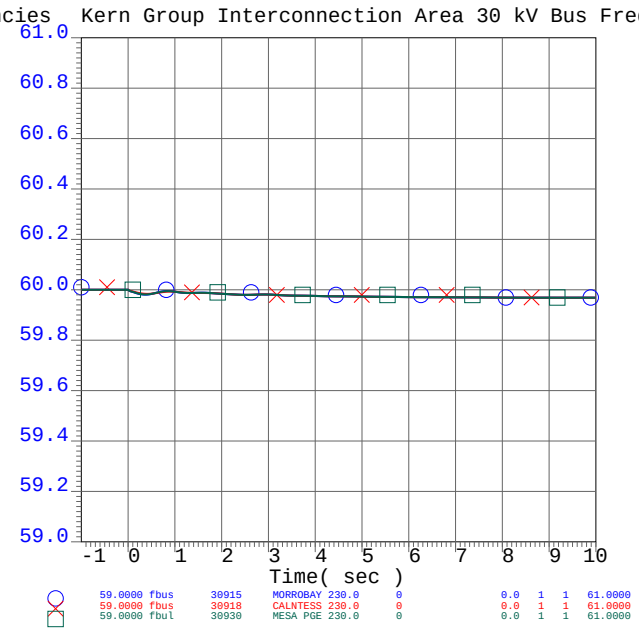


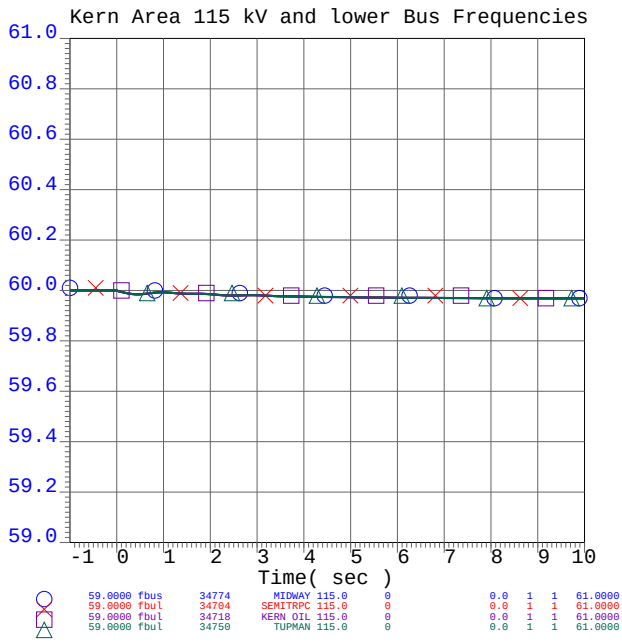


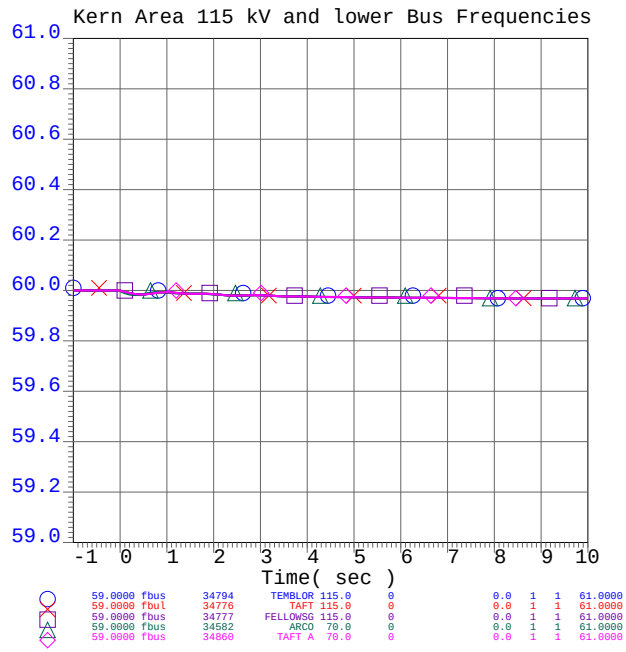
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Helms PGP Unit No.1
Helms CB270 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



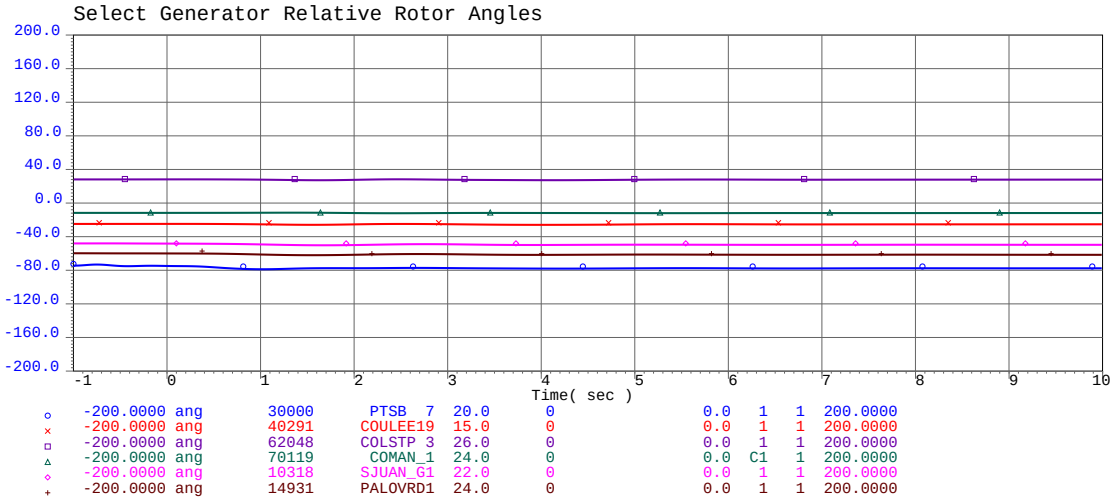




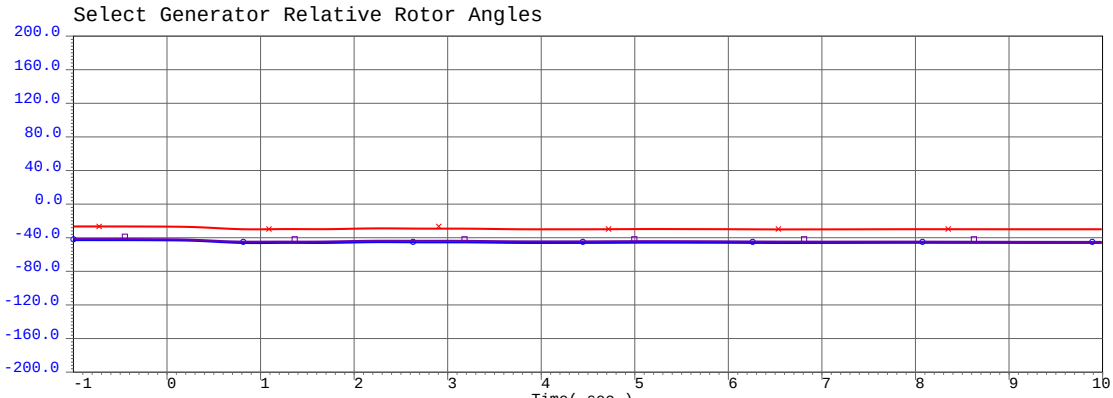


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Helms PGP Unit No.1
Helms CB270 Fails to Operate

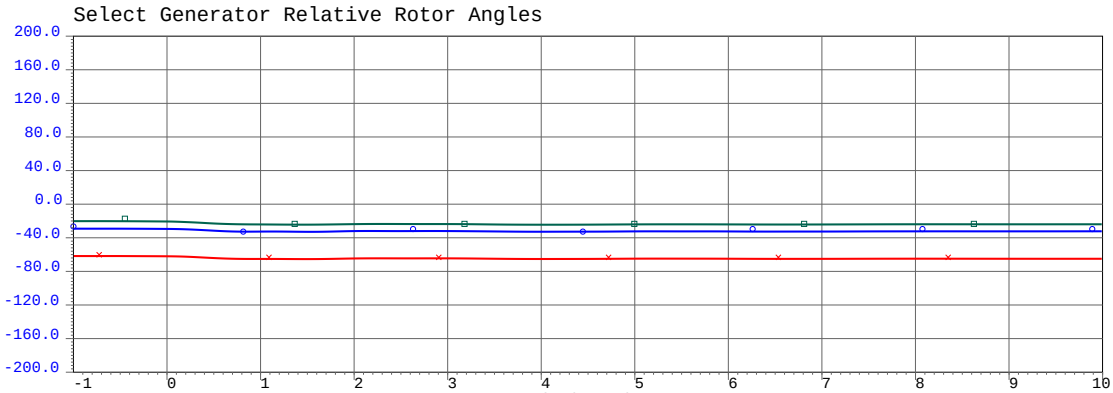
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



-200.0000 ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000 ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
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-200.0000 ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
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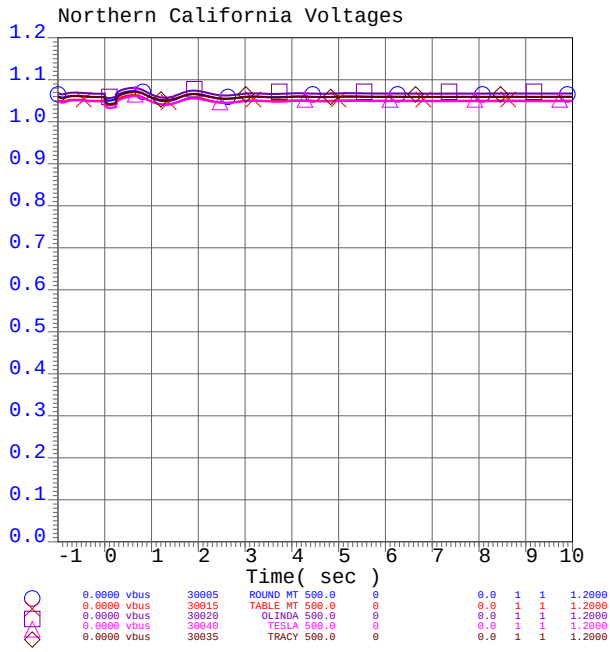
-200.0000 ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000 ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
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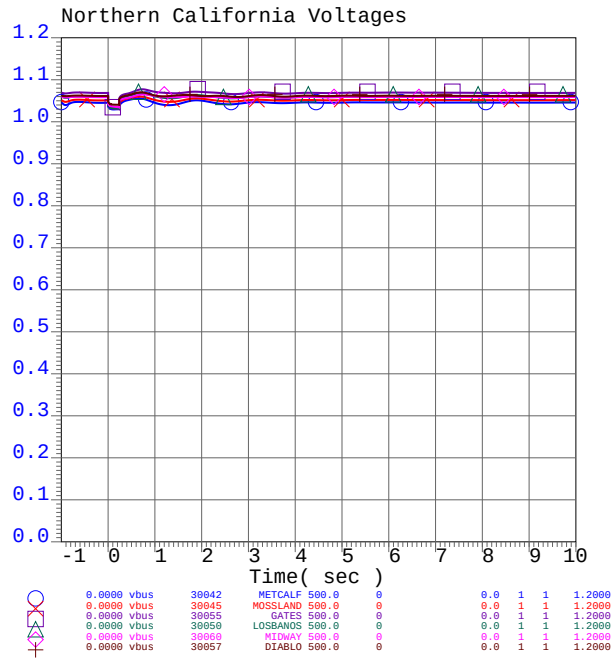


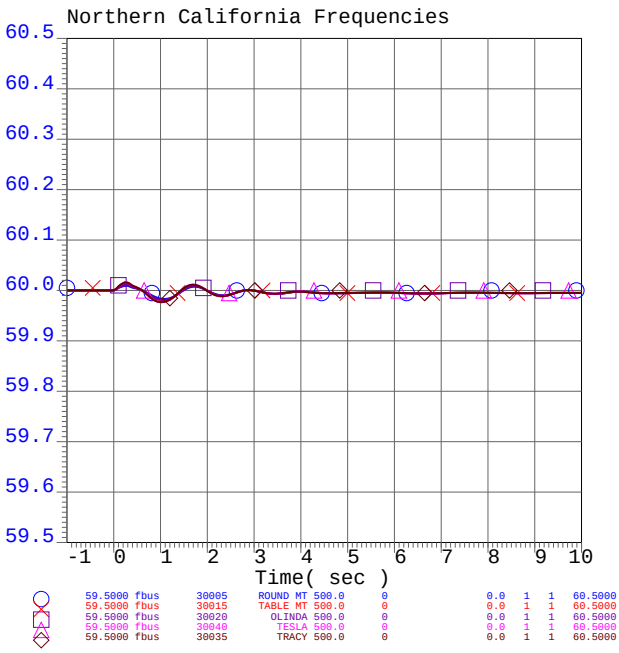
-200.0000 ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000 ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000 ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

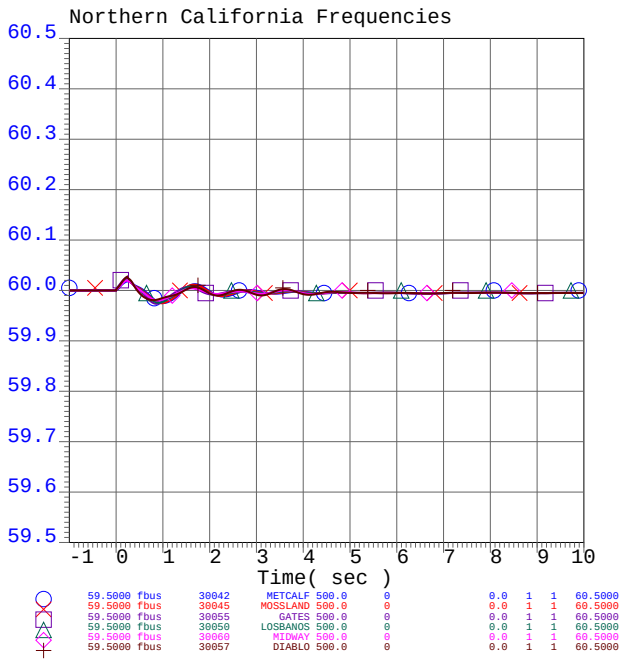
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Helms PGP Unit No.1
Helms CB270 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





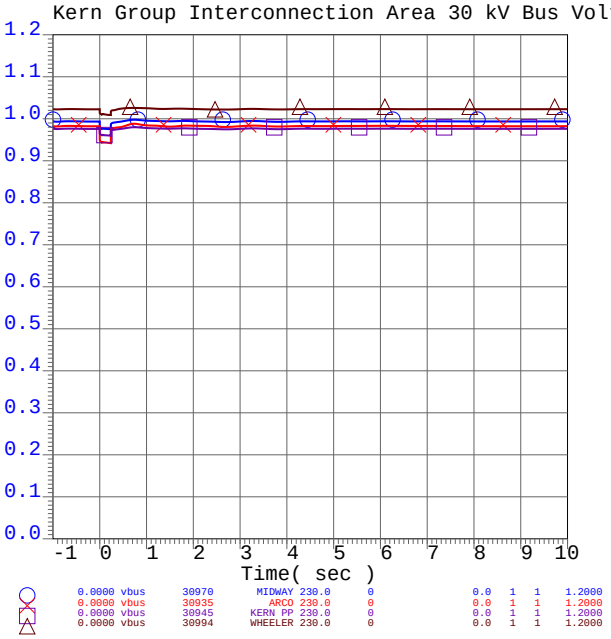




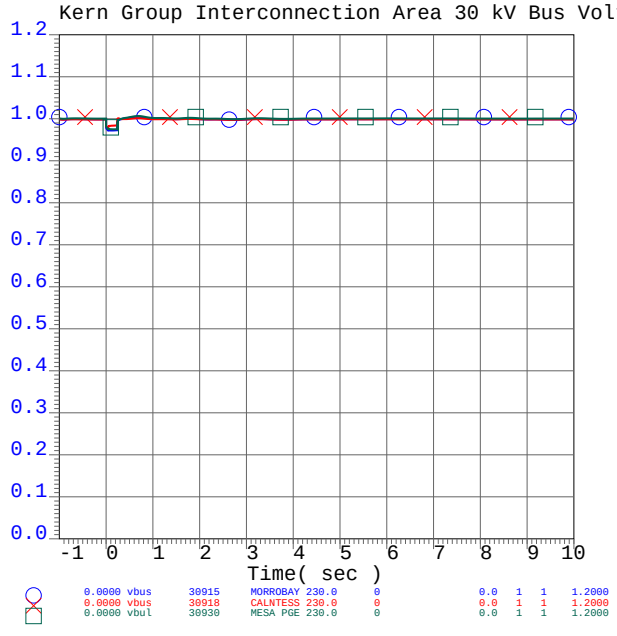
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (14 cyc) @ Herndon 230kV
Herndon CB 272 (Herndon 230/115 kV #1 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

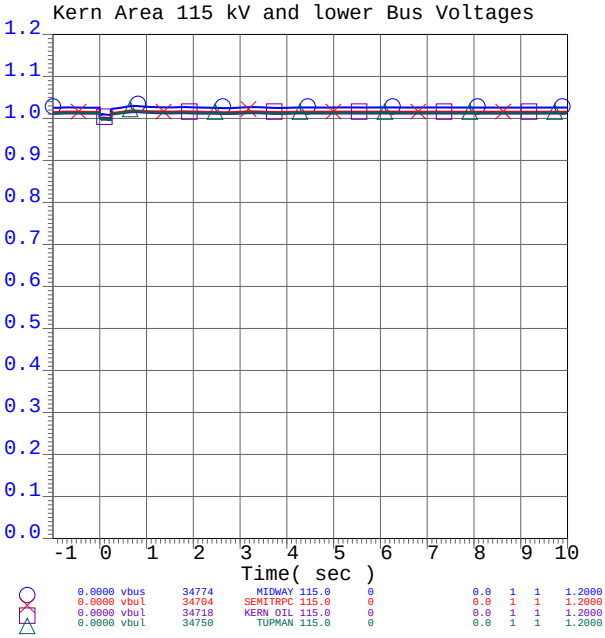
Kern Group Interconnection Area 30 kV Bus Voltages



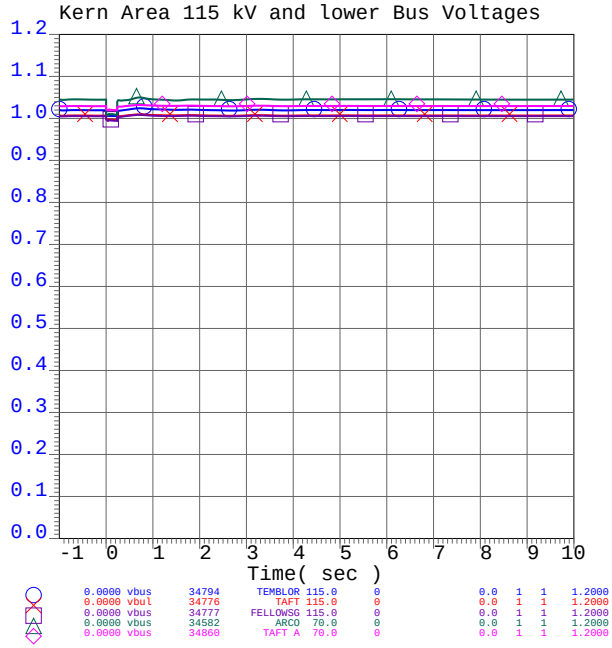
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages



Kern Area 115 kV and lower Bus Voltages

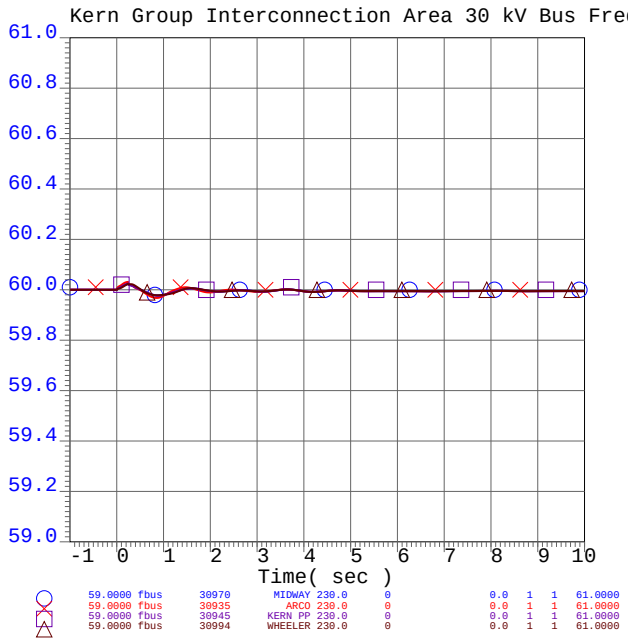


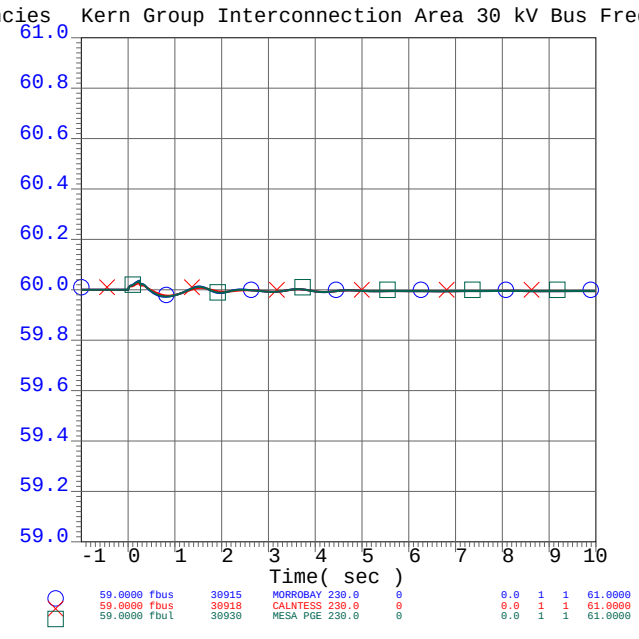
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (14 cyc) @ Herndon 230kV
Herndon CB 272 (Herndon 230/115 kV #1 Transformer) Fails to Operate

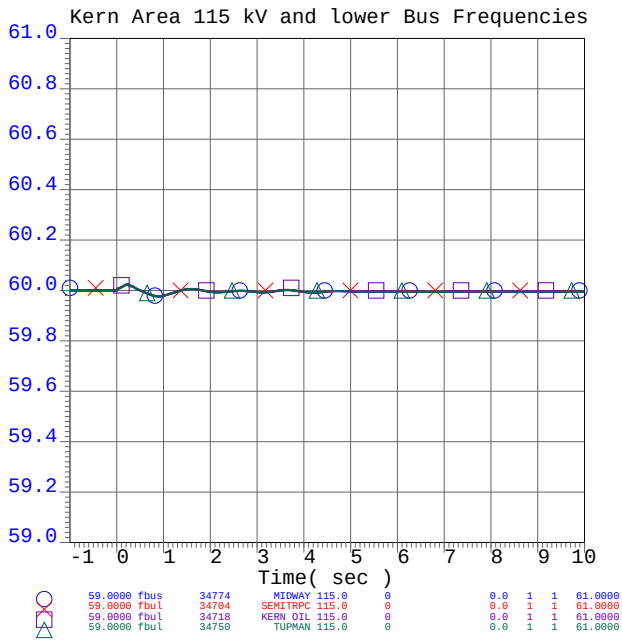
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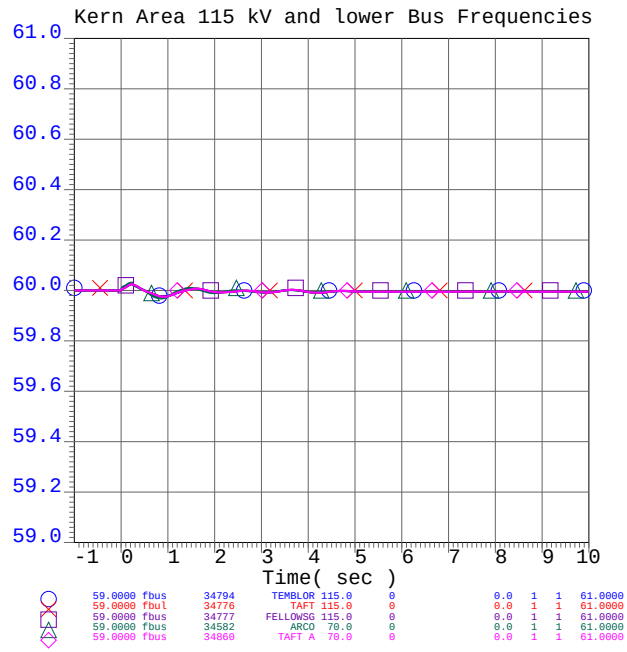
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KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





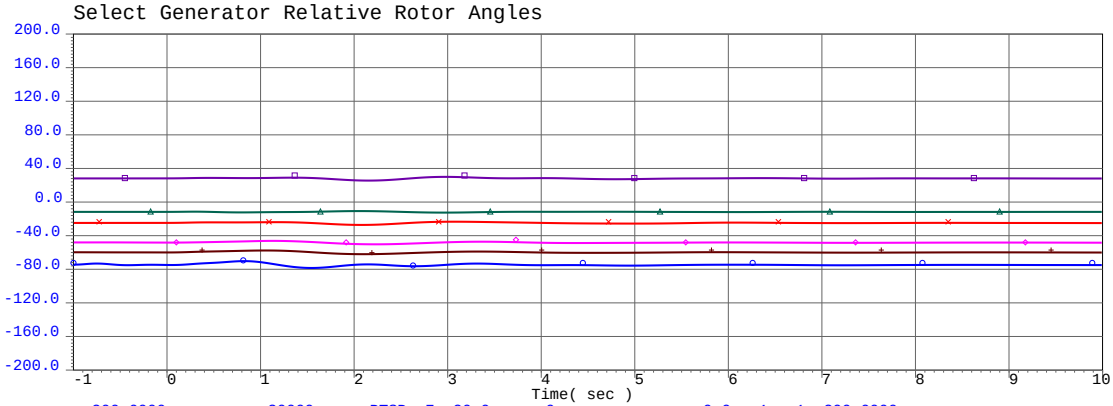




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (14 cyc) @ Herndon 230kV
Herndon CB 272 (Herndon 230/115 kV #1 Transformer) Fails to Operate

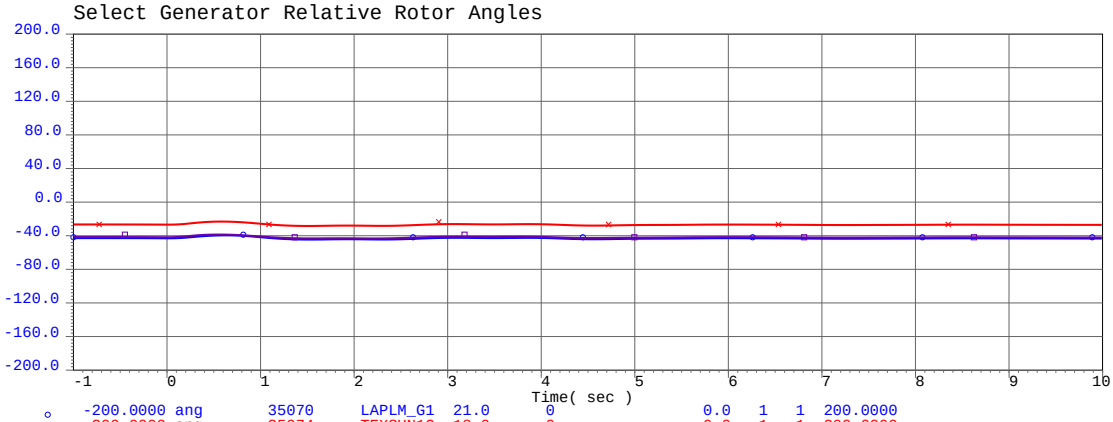
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



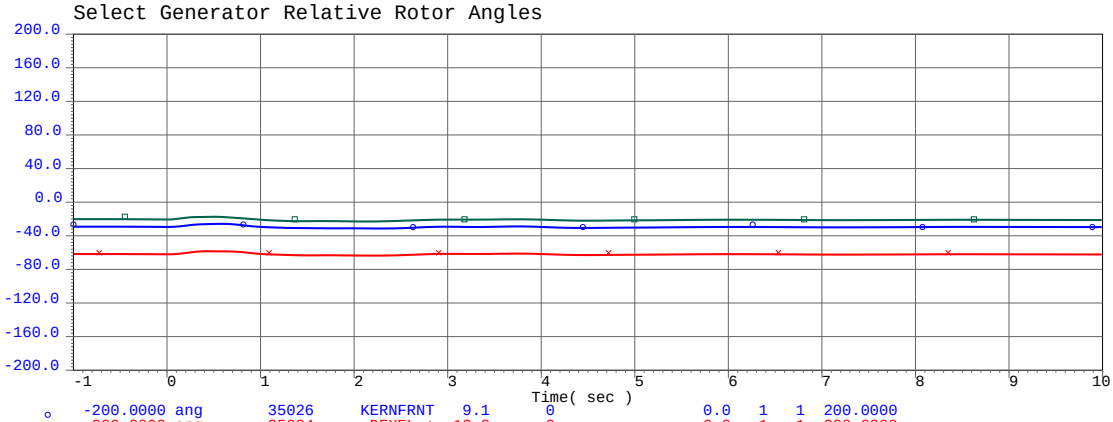
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-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
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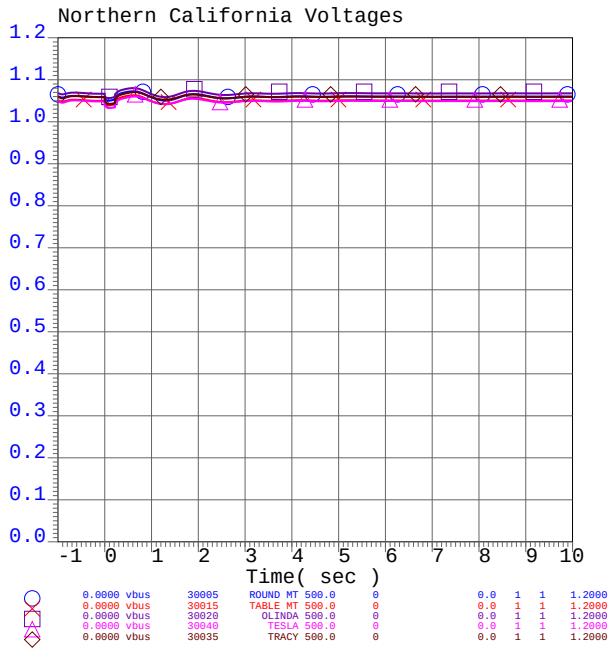
Select Generator Relative Rotor Angles

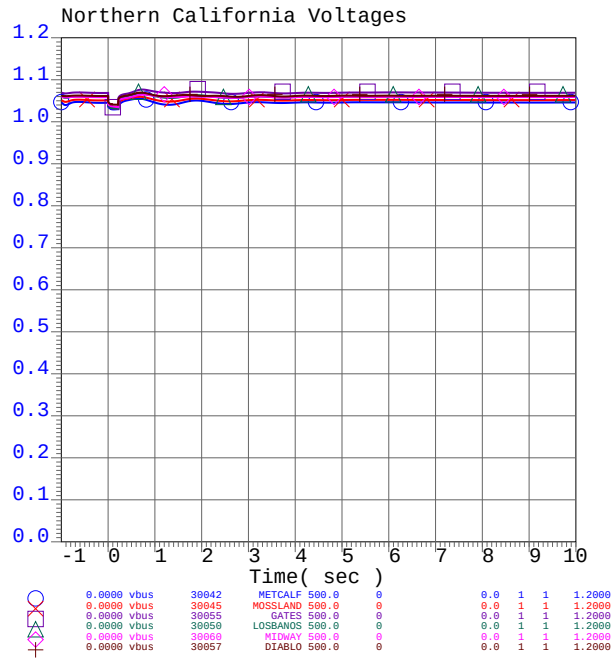


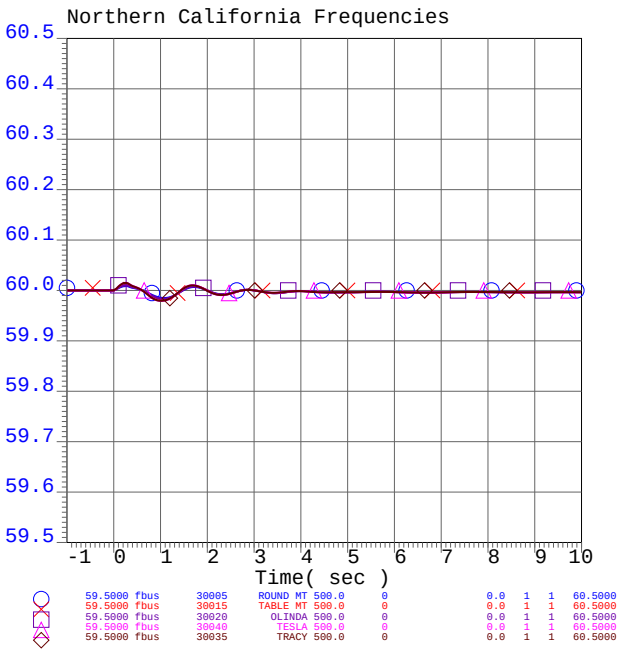
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

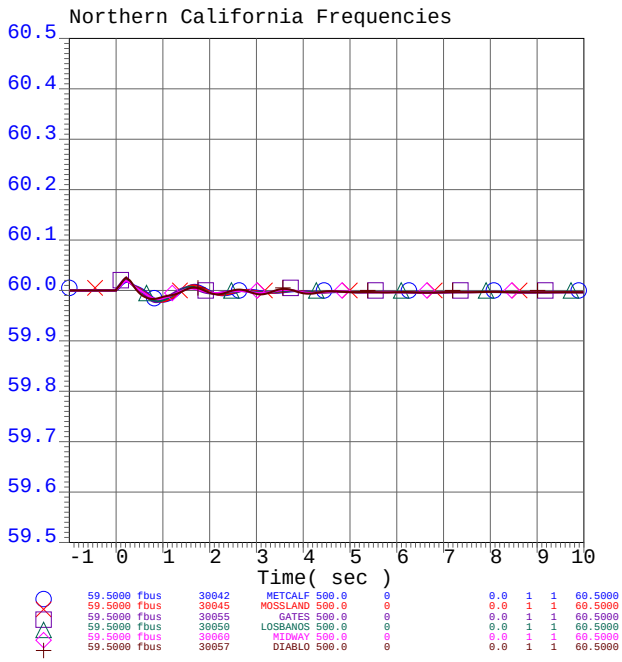
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (14 cyc) @ Herndon 230kV
Herndon CB 272 (Herndon 230/115 kV #1 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





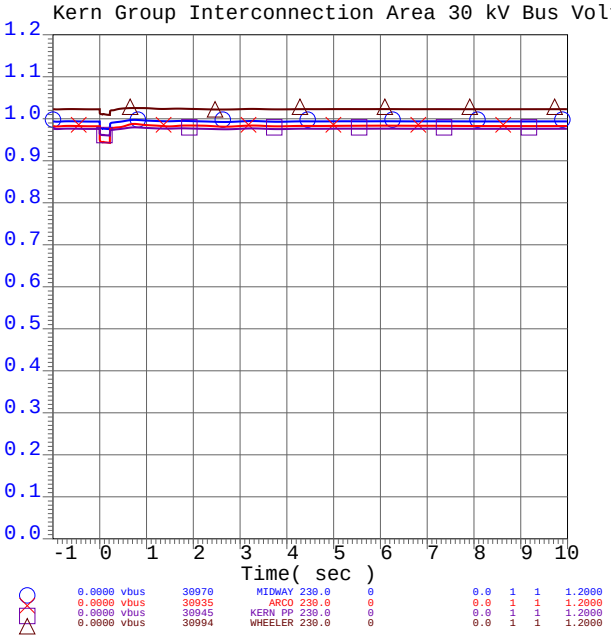




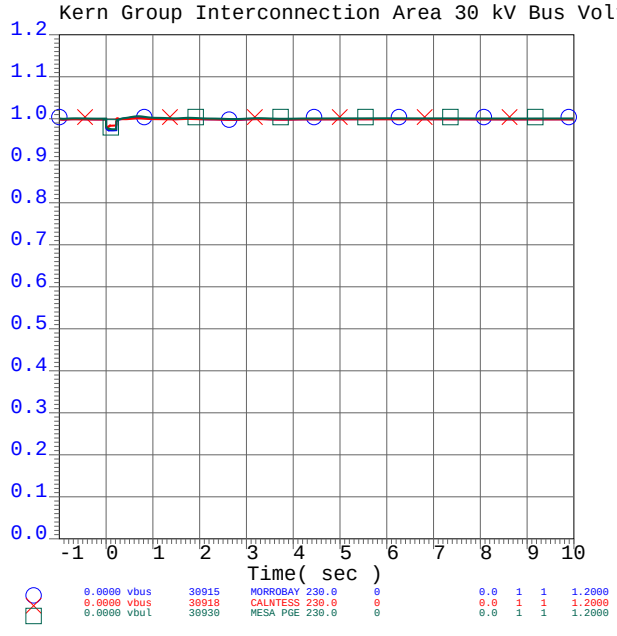
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Herndon 230kV Bus 1
Herndon CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

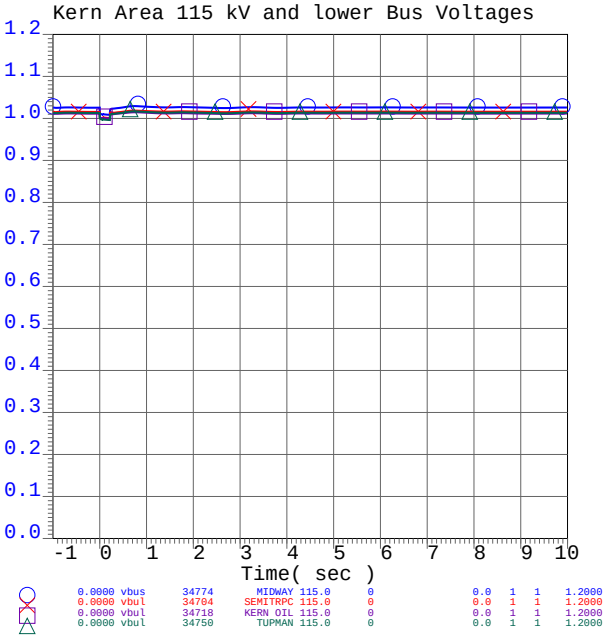
Kern Group Interconnection Area 30 kV Bus Voltages



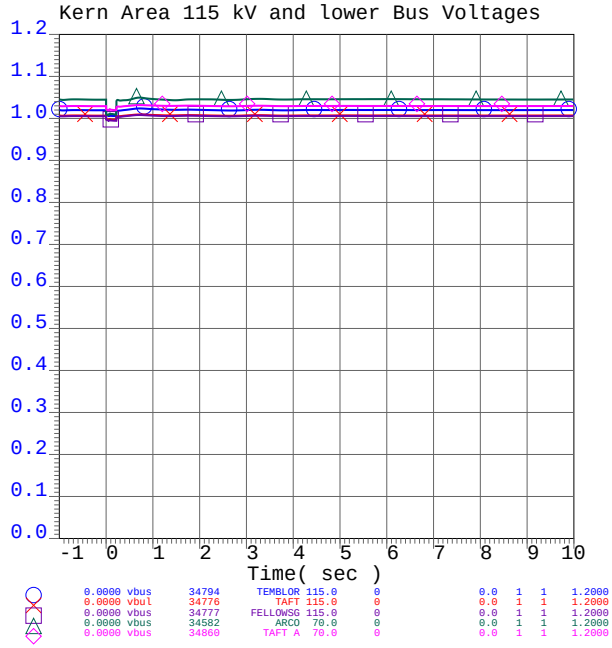
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages



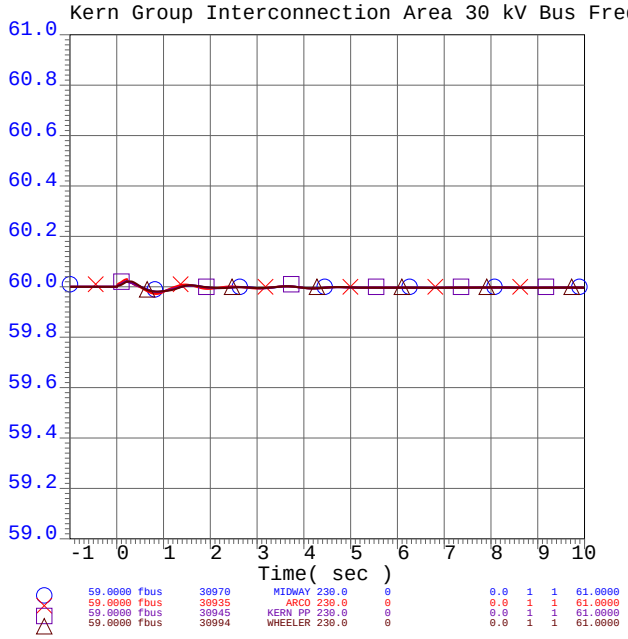
Kern Area 115 kV and lower Bus Voltages



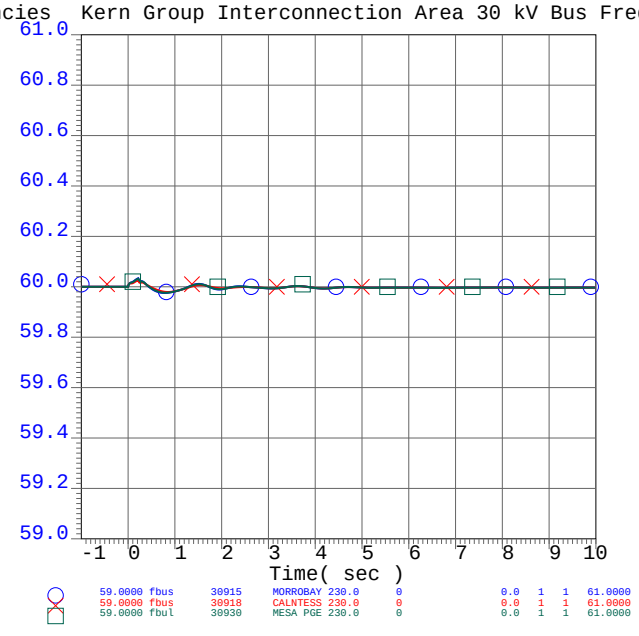
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Herndon 230kV Bus 1
Herndon CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

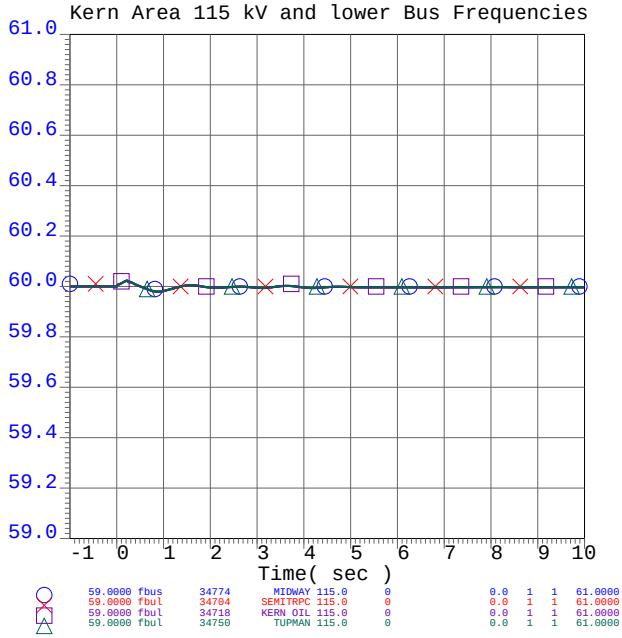
Kern Group Interconnection Area 30 kV Bus Frequencies



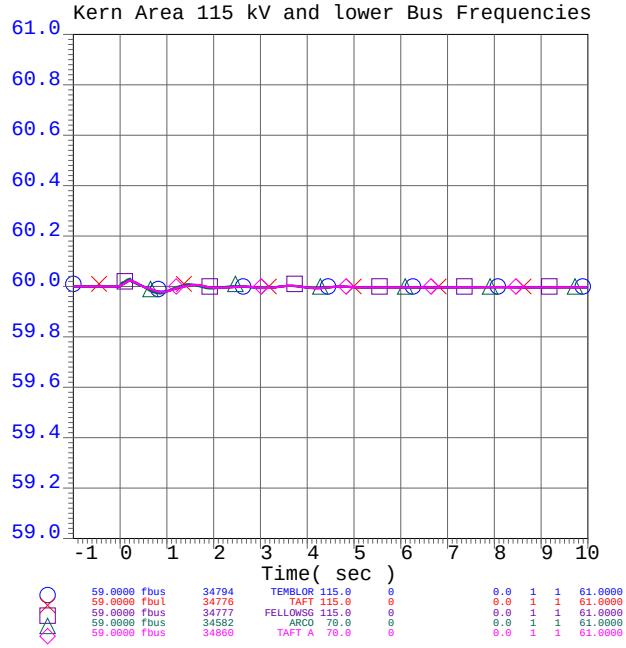
Kern Group Interconnection Area 30 kV Bus Frequencies



Kern Area 115 kV and lower Bus Frequencies



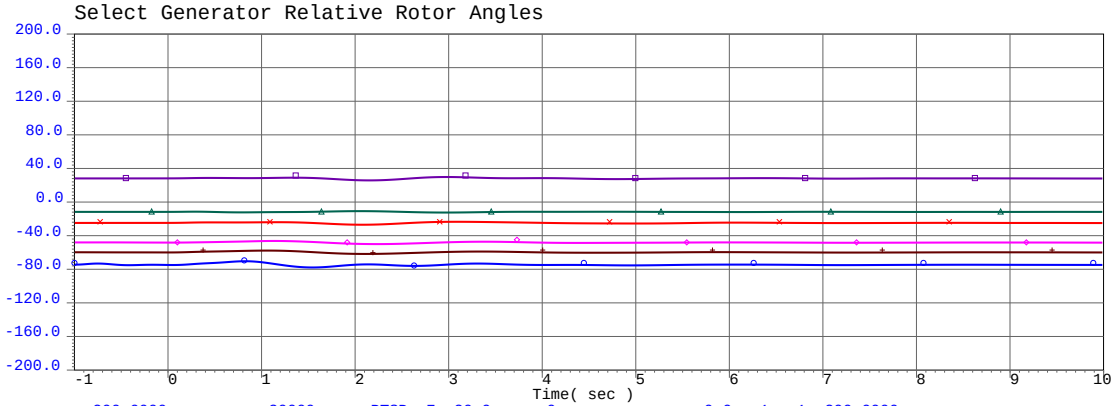
Kern Area 115 kV and lower Bus Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Herndon 230kV Bus 1
Herndon CB 202 Fails to Operate

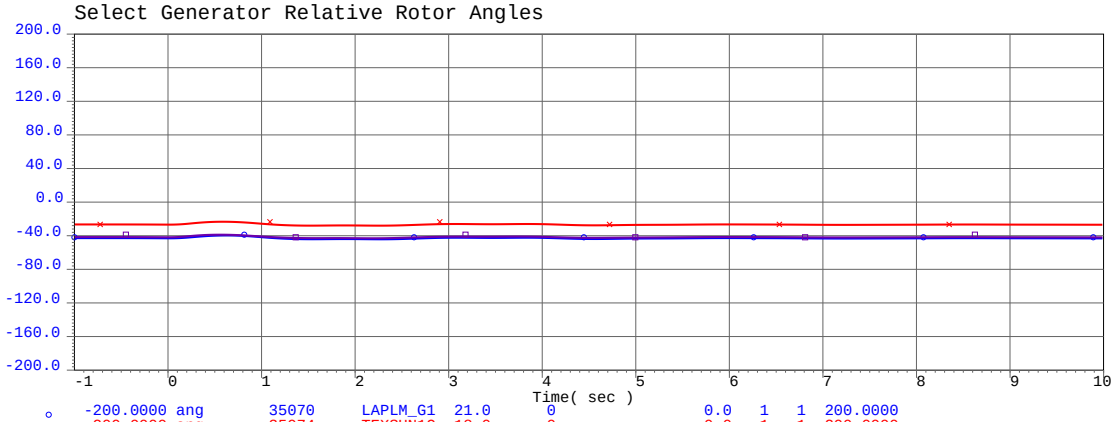
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



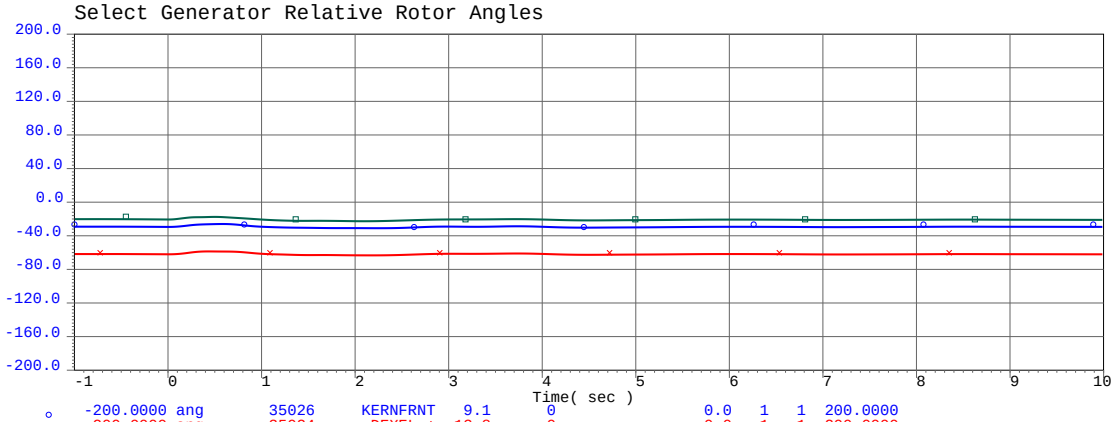
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-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
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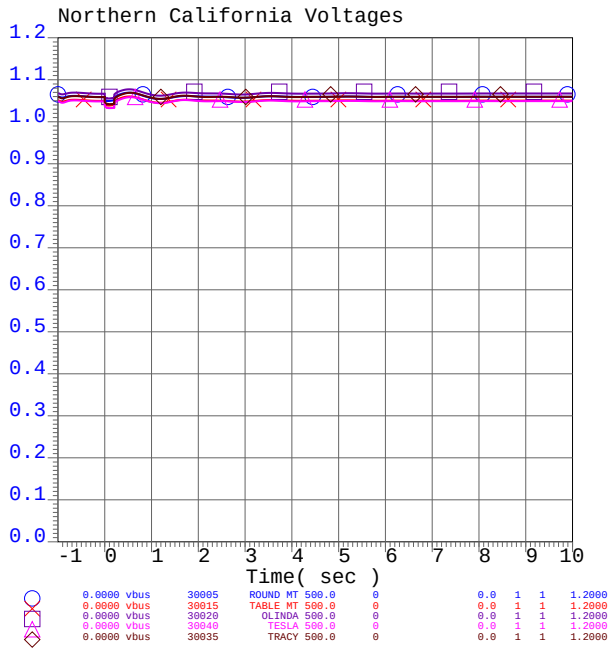
Select Generator Relative Rotor Angles

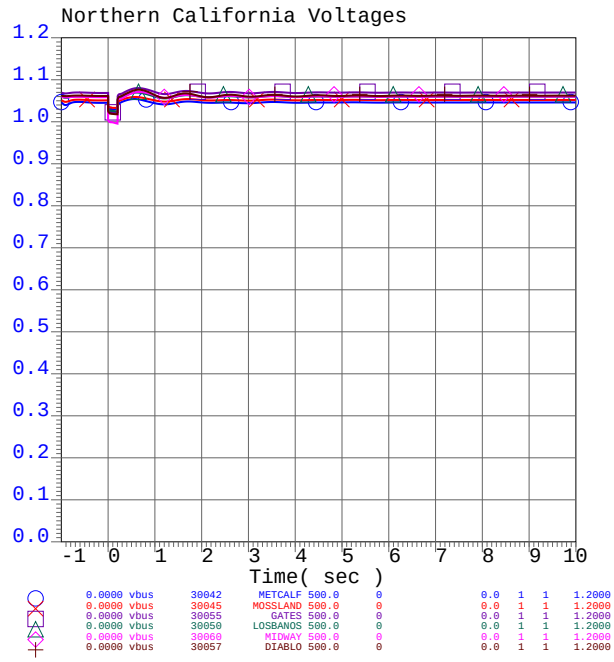


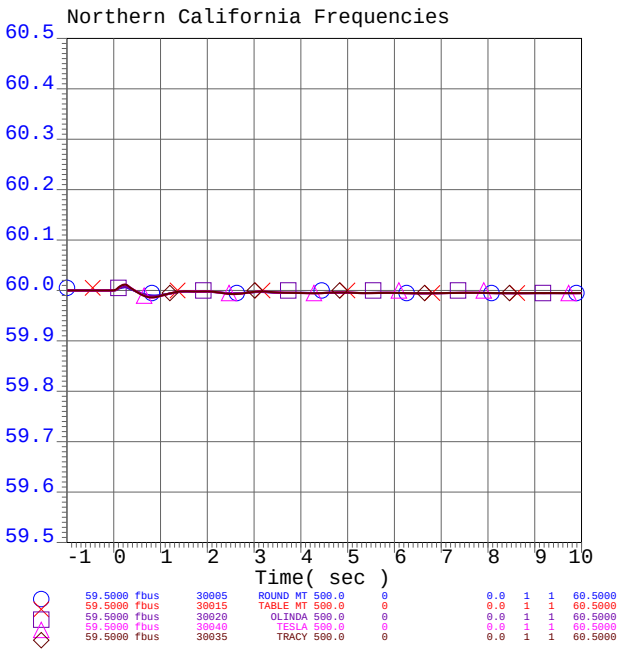
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
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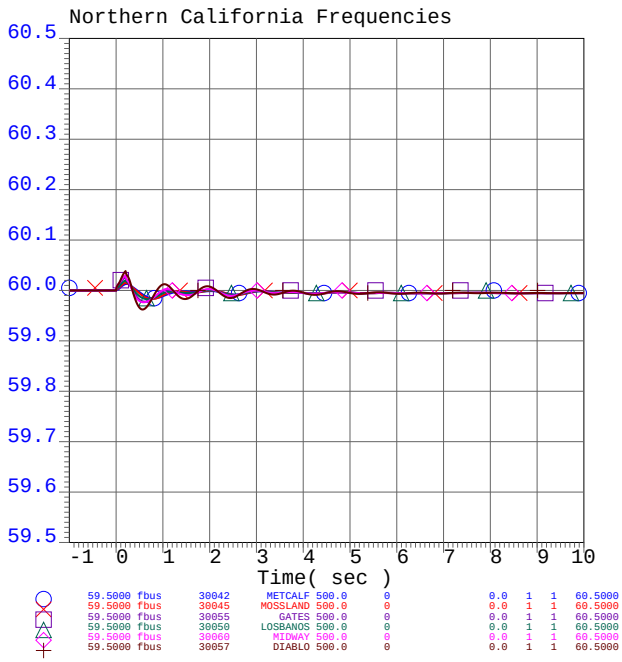
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Herndon 230kV Bus 1
Herndon CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES







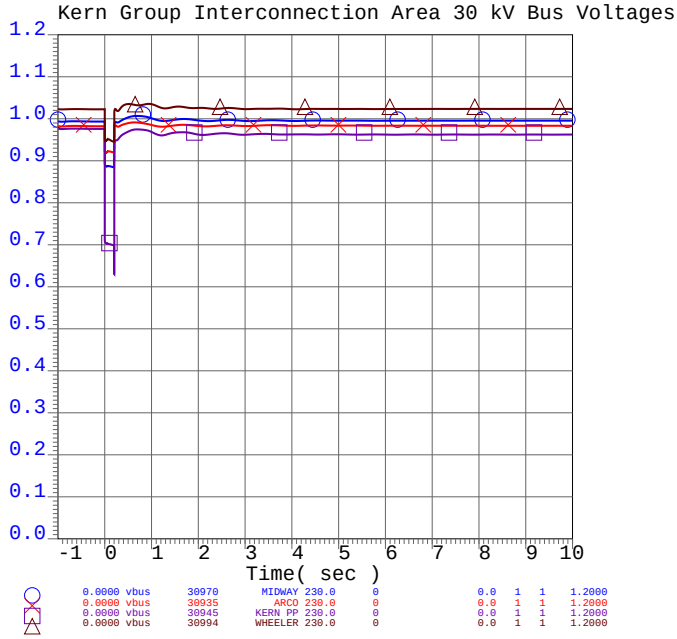


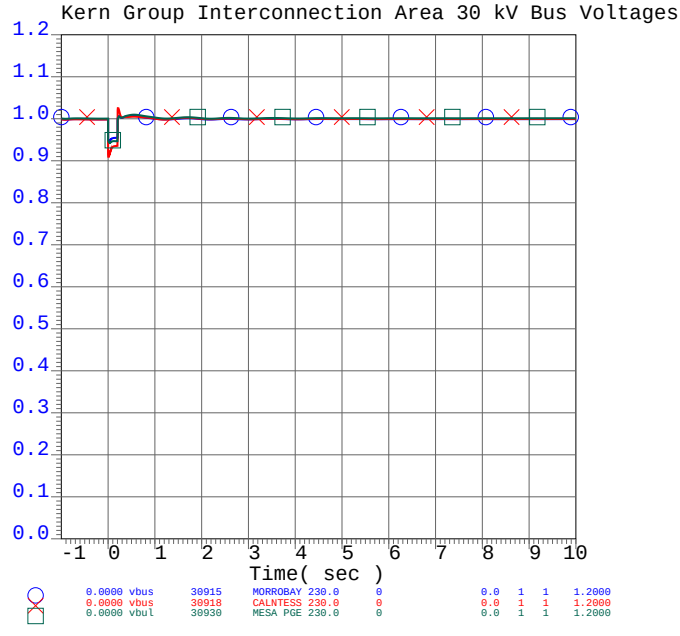
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Kern 230kV
Kern CB 572 (Kern 230/115 kV #5 Transformer) Fails to Operate

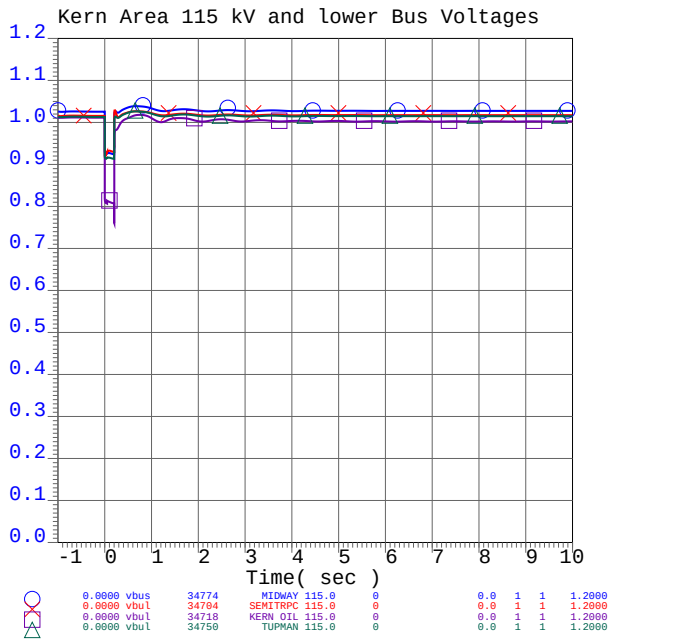
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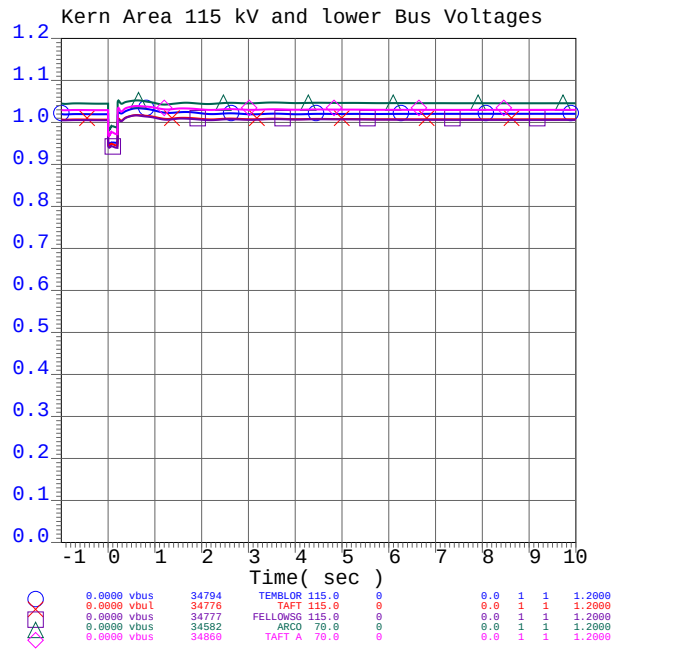
Fri Jan 03 20:10:00 2014

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





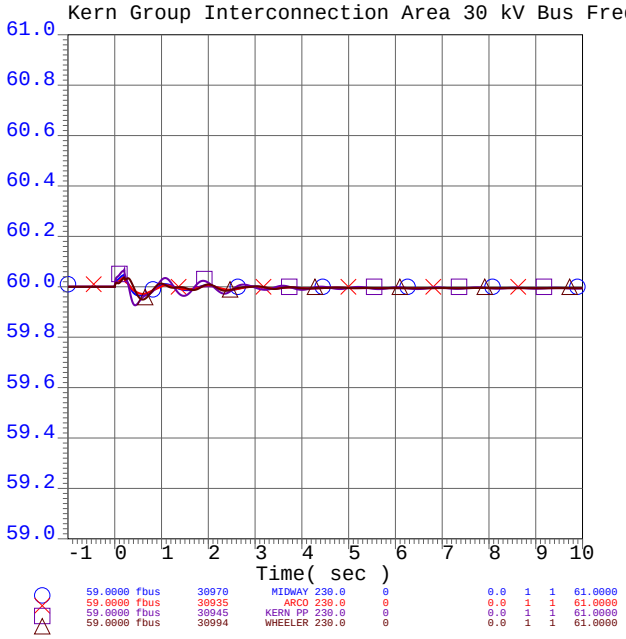




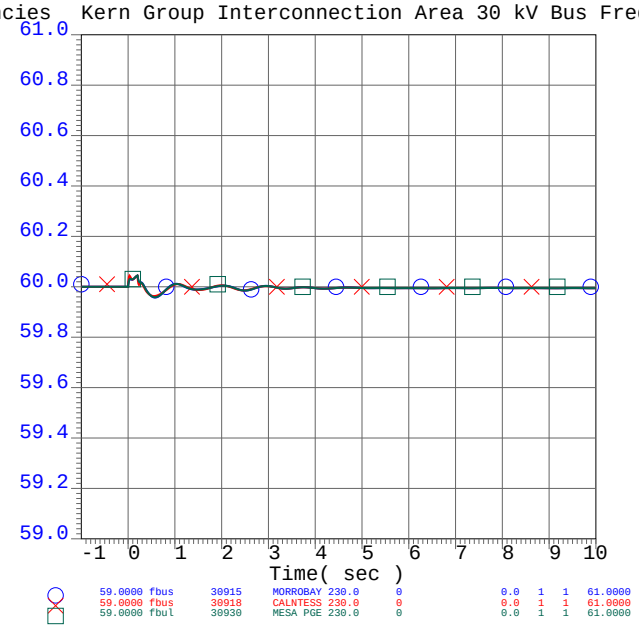
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Kern 230kV
Kern CB 572 (Kern 230/115 kV #5 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

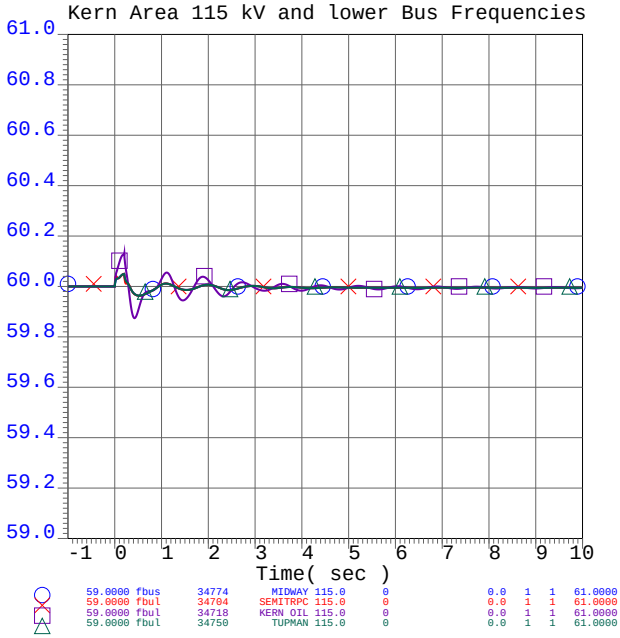
Kern Group Interconnection Area 30 kV Bus Frequencies



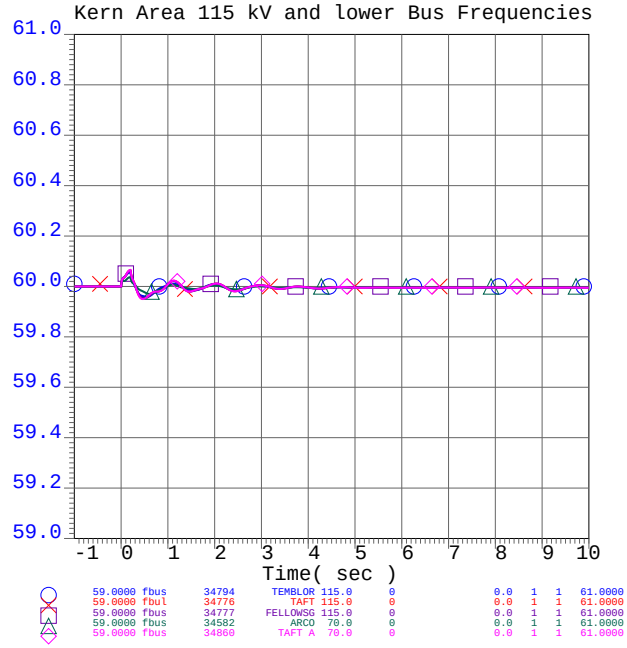
Kern Group Interconnection Area 30 kV Bus Frequencies



Kern Area 115 kV and lower Bus Frequencies



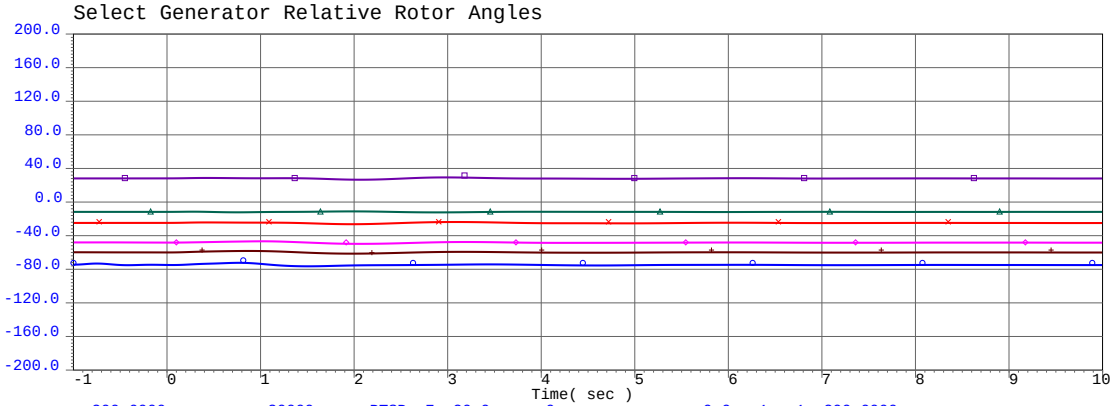
Kern Area 115 kV and lower Bus Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Kern 230kV
Kern CB 572 (Kern 230/115 kV #5 Transformer) Fails to Operate

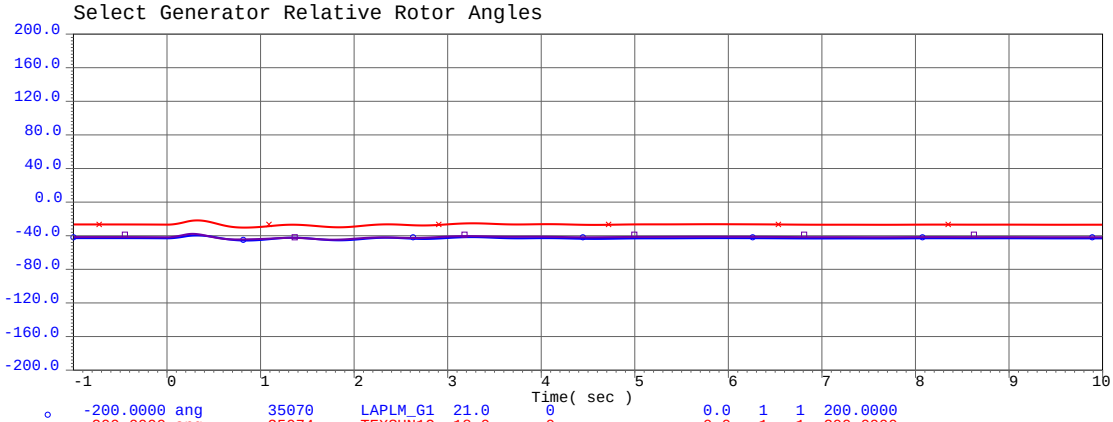
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



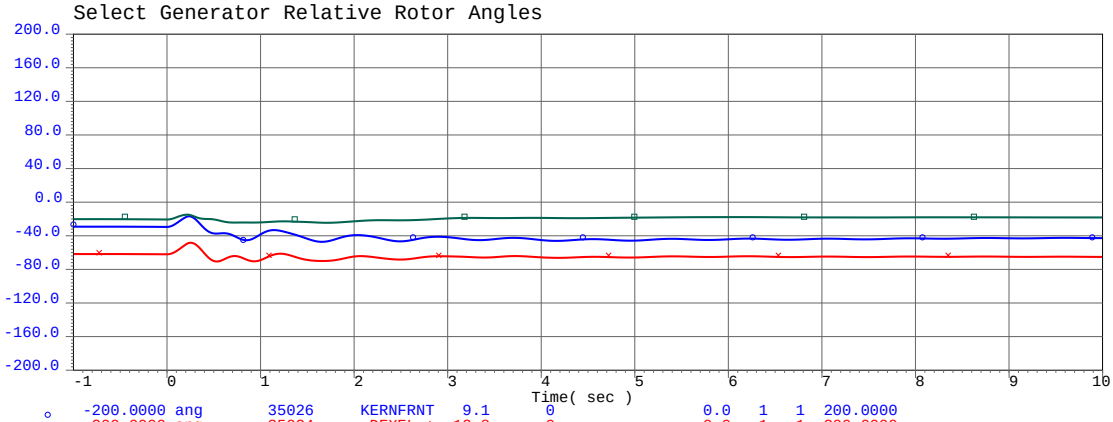
○	-200.0000 ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
×	-200.0000 ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
□	-200.0000 ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
△	-200.0000 ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
◇	-200.0000 ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
+	-200.0000 ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



○	-200.0000 ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
×	-200.0000 ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
□	-200.0000 ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

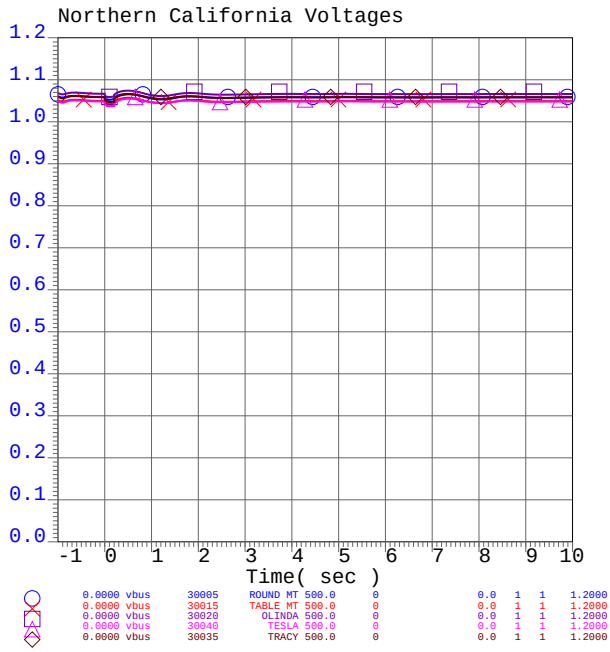
Select Generator Relative Rotor Angles

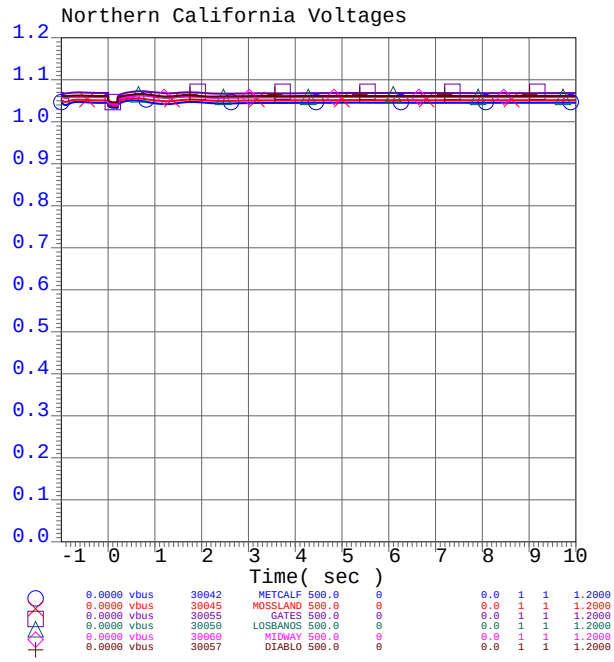


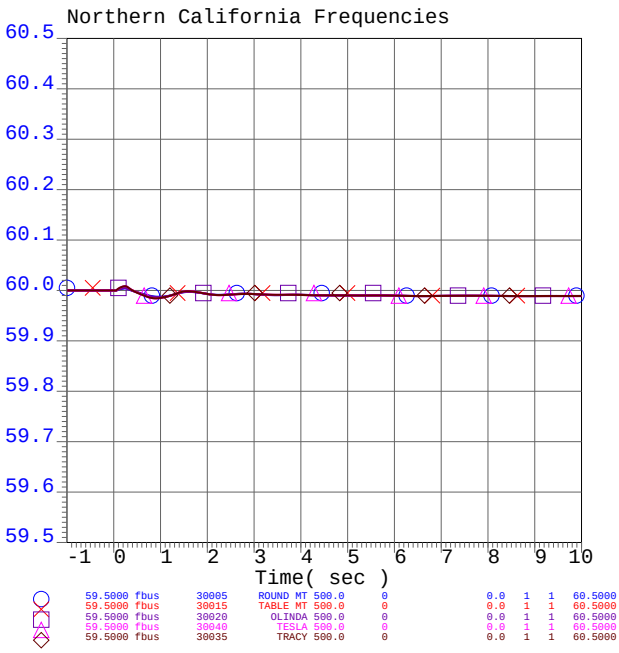
○	-200.0000 ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
×	-200.0000 ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
□	-200.0000 ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

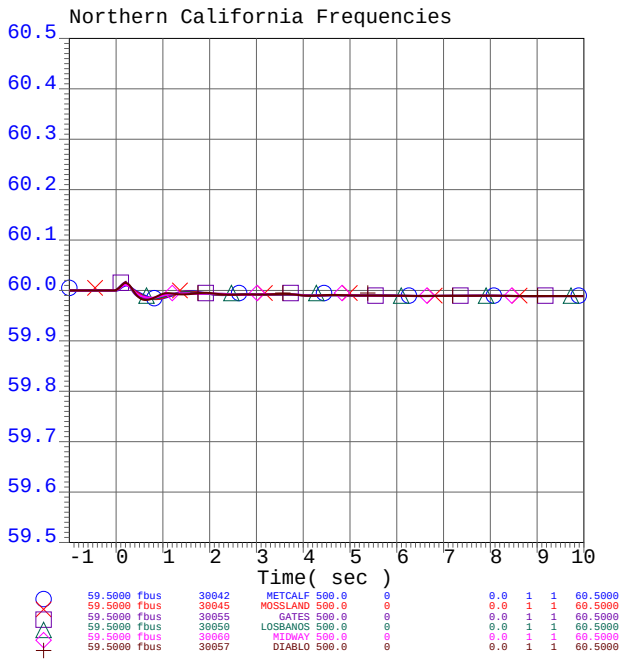
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Kern 230kV
Kern CB 572 (Kern 230/115 kV #5 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



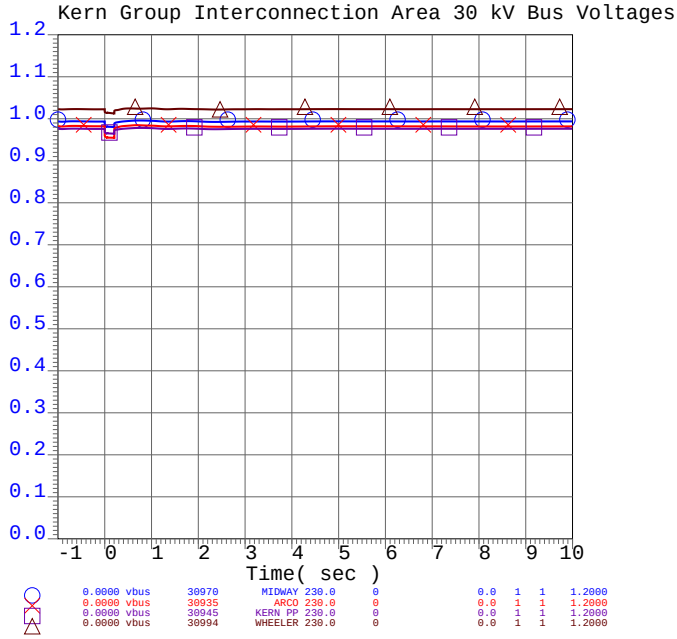


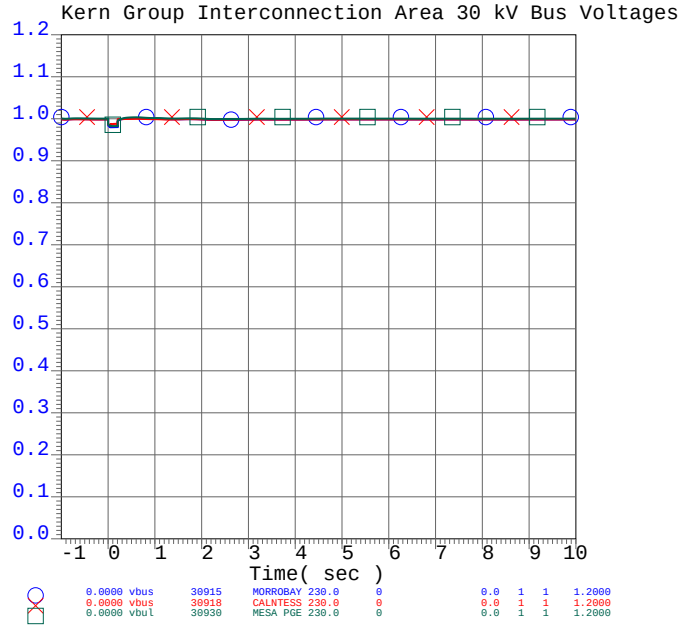


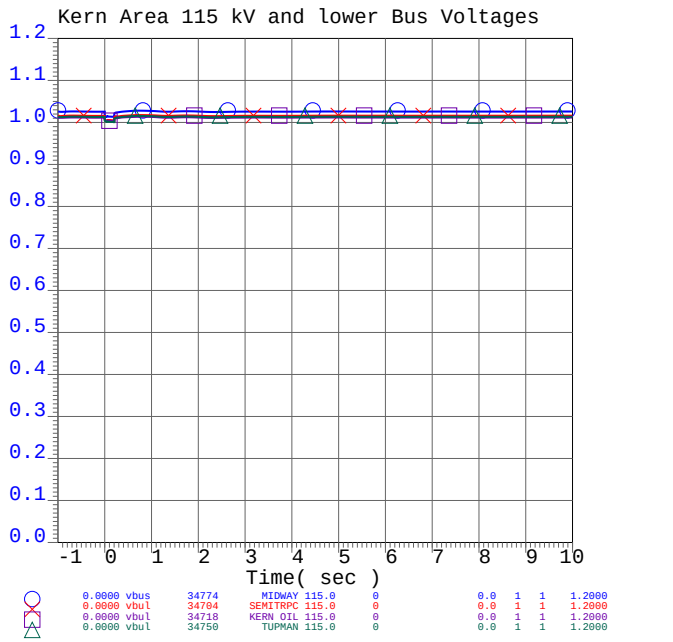


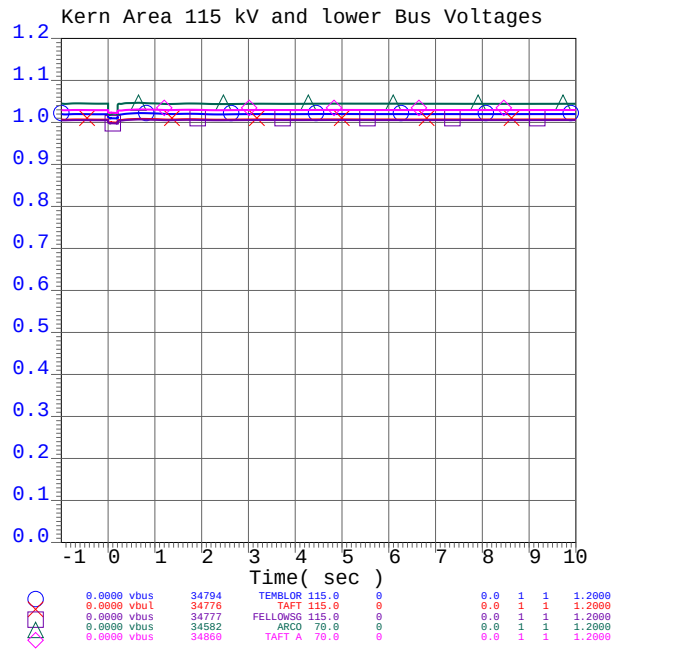
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ McCall 230kV
McCall CB 272 (McCall 230/115 kV #1 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



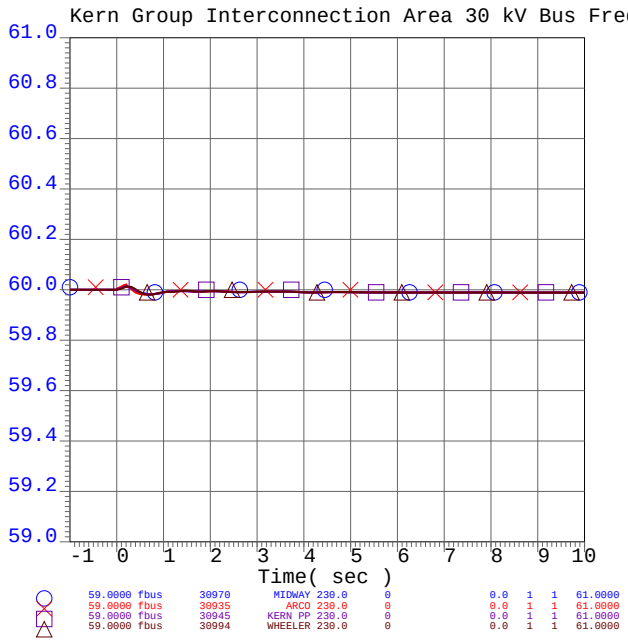


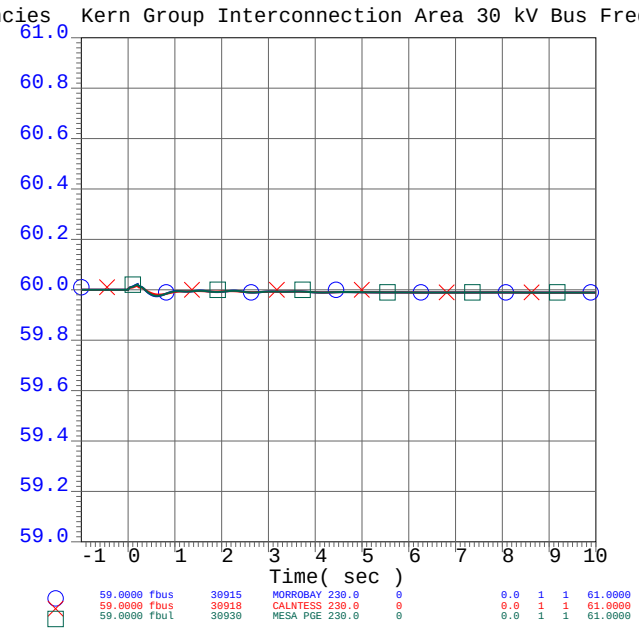


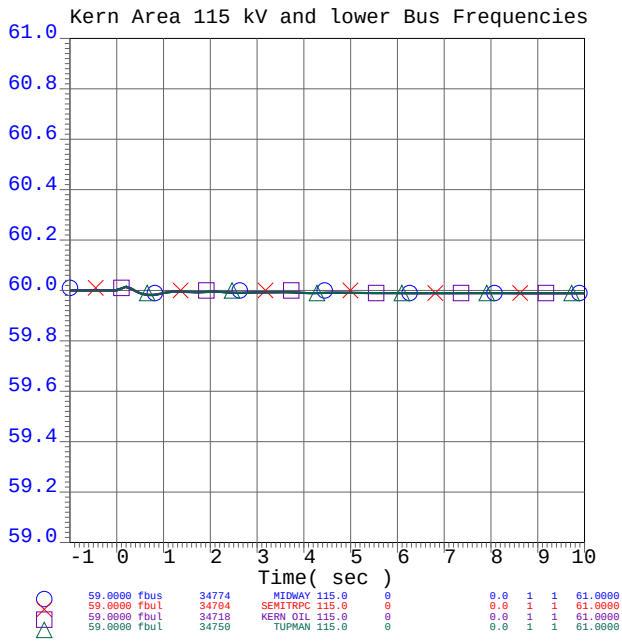


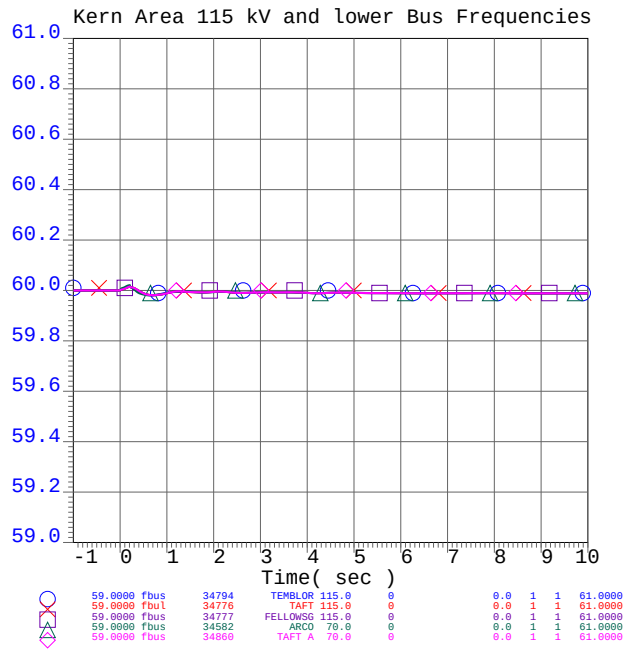
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ McCall 230kV
McCall CB 272 (McCall 230/115 kV #1 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



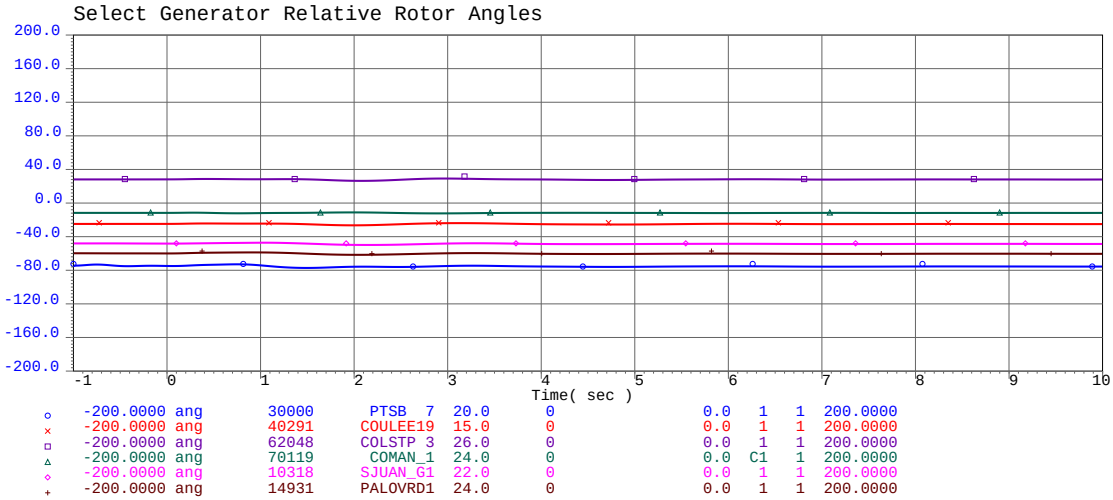




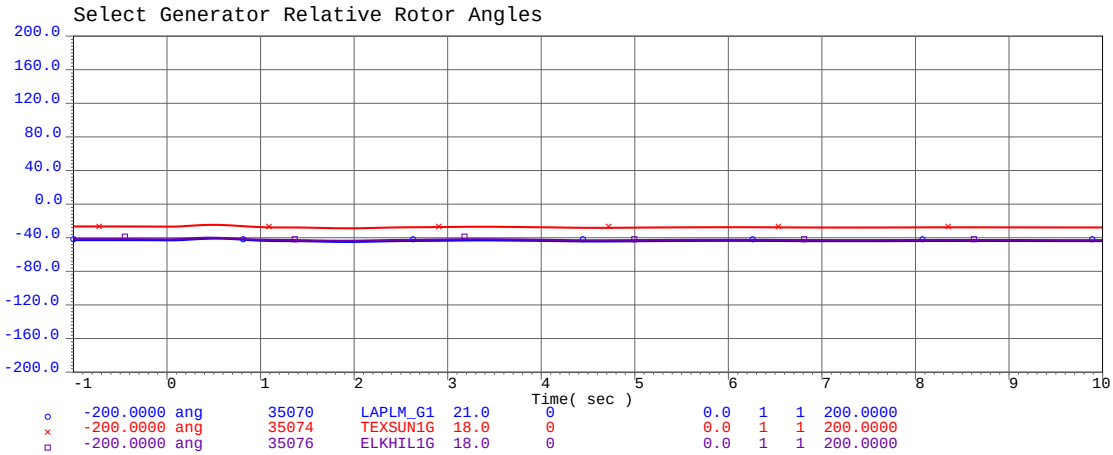


2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ McCall 230kV
McCall CB 272 (McCall 230/115 kV #1 Transformer) Fails to Operate

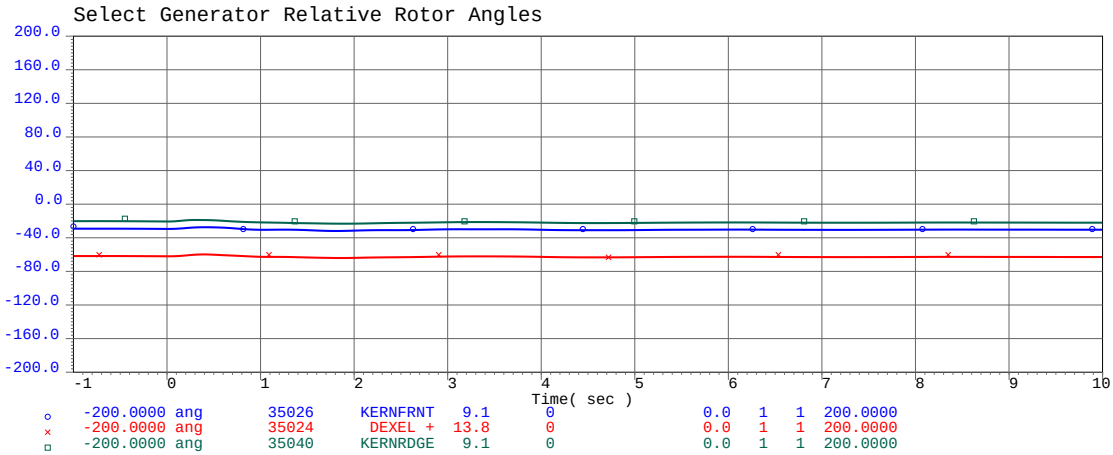
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



-200.0000 ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000 ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000 ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000 ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000 ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000 ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000



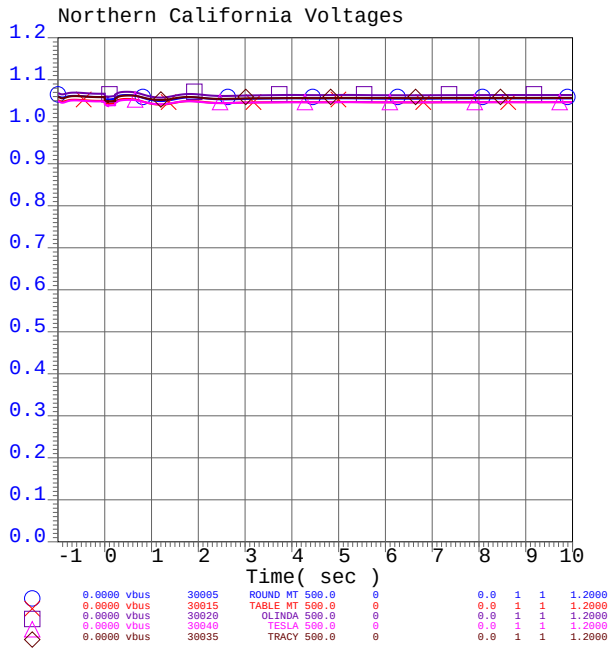
-200.0000 ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000 ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000 ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

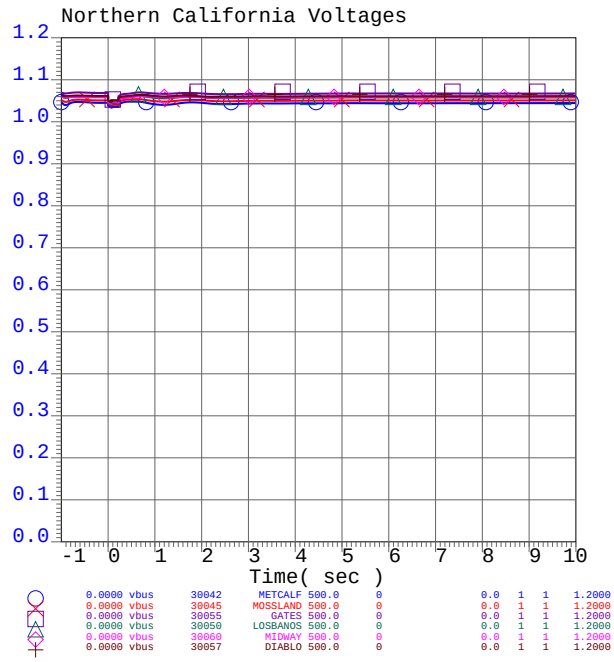


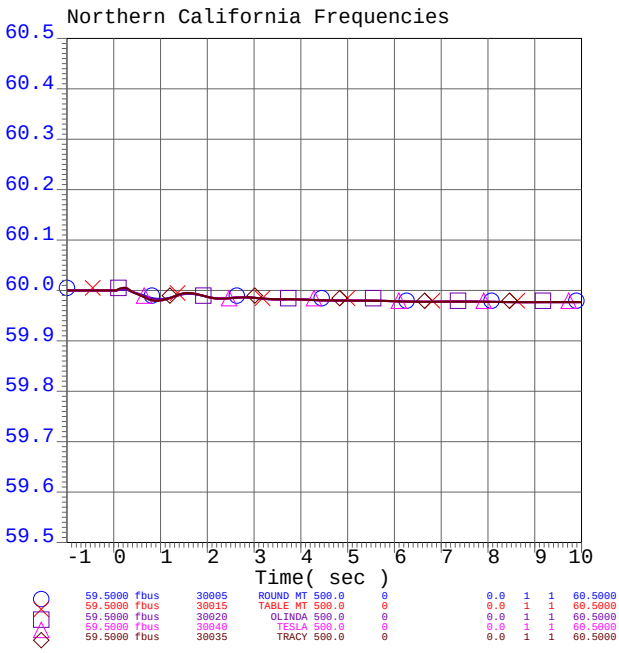
-200.0000 ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000 ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000 ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

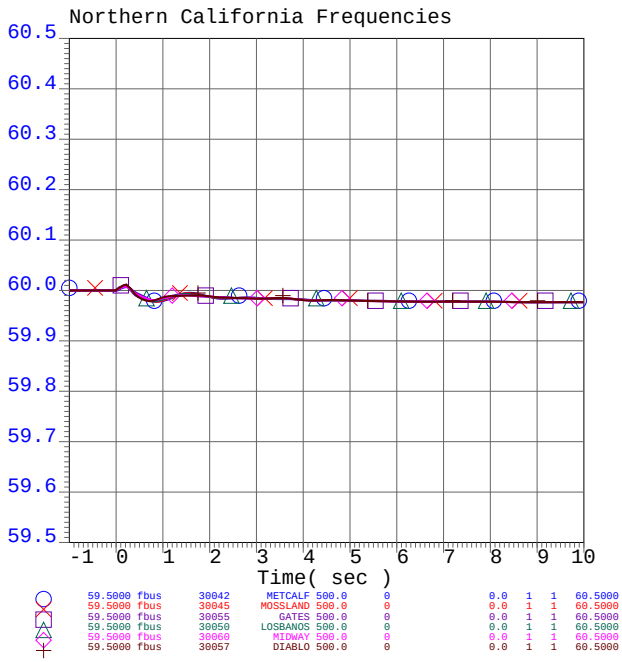
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ McCall 230kV
McCall CB 272 (McCall 230/115 kV #1 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



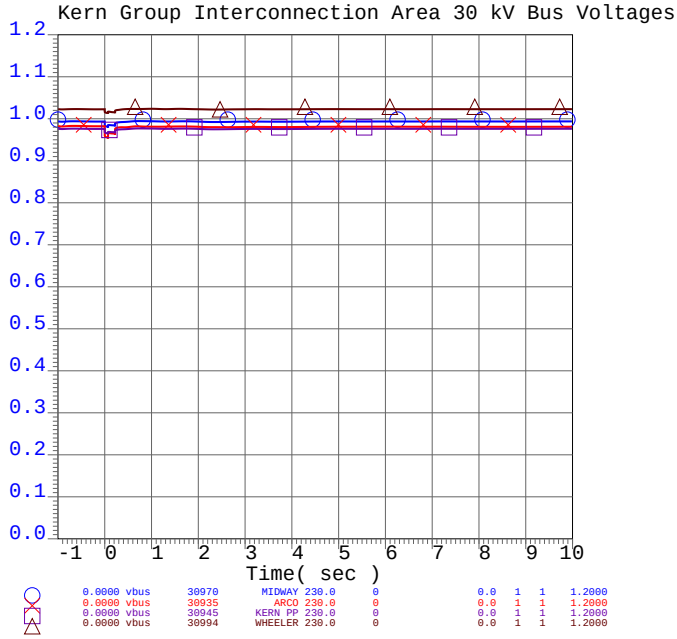


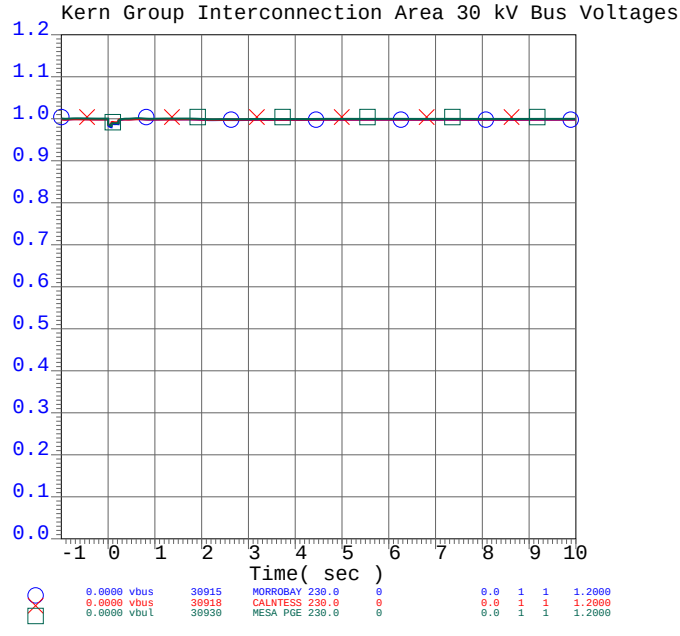


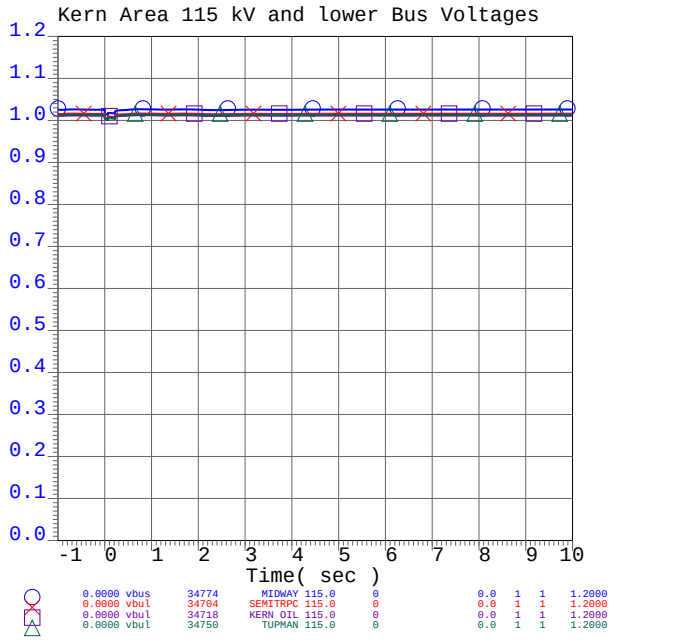


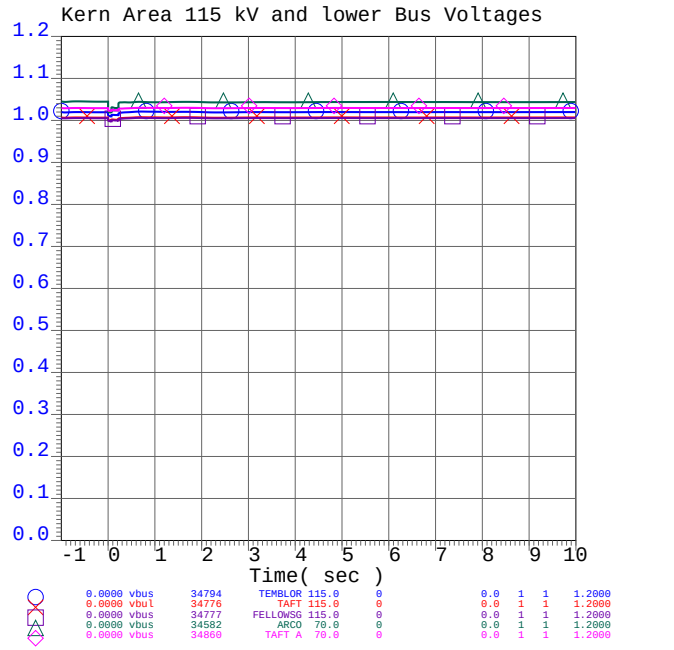
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ McCall 230kV Bus 1
McCall CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



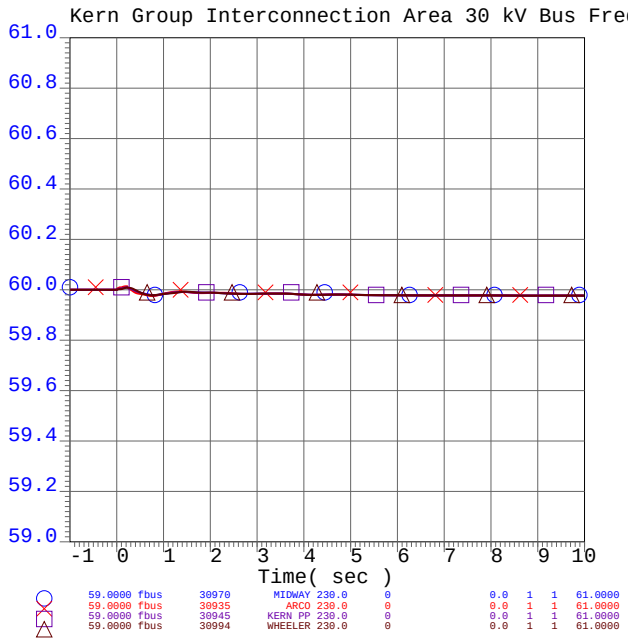


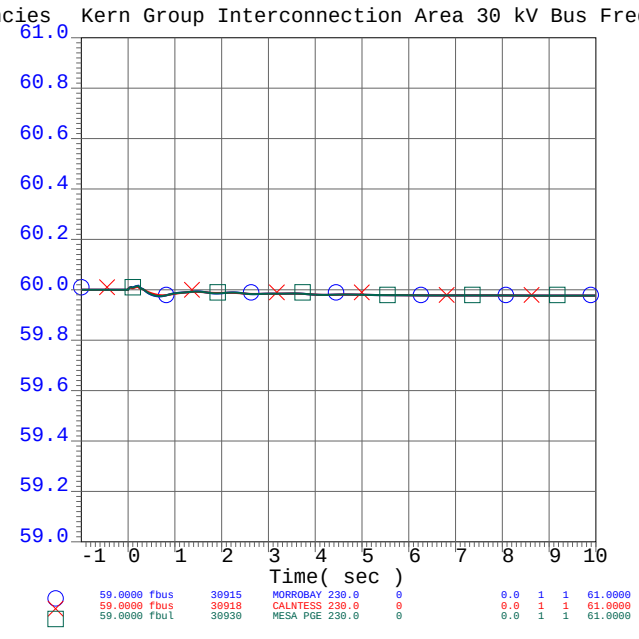


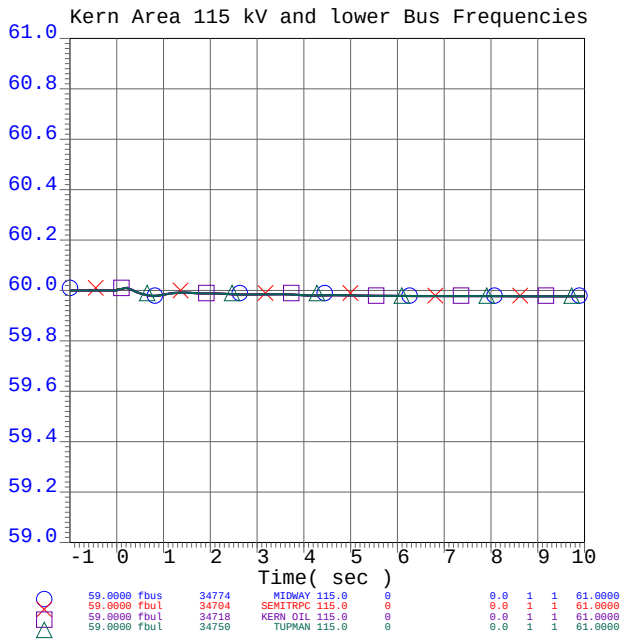


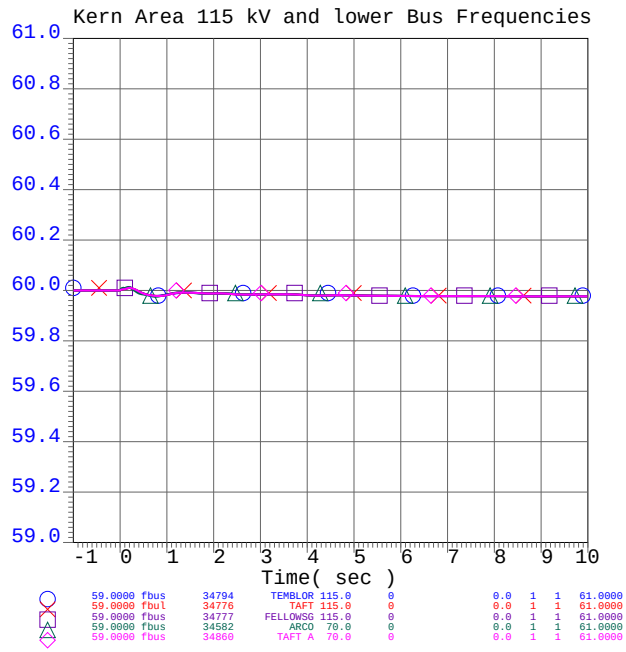
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ McCall 230kV Bus 1
McCall CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





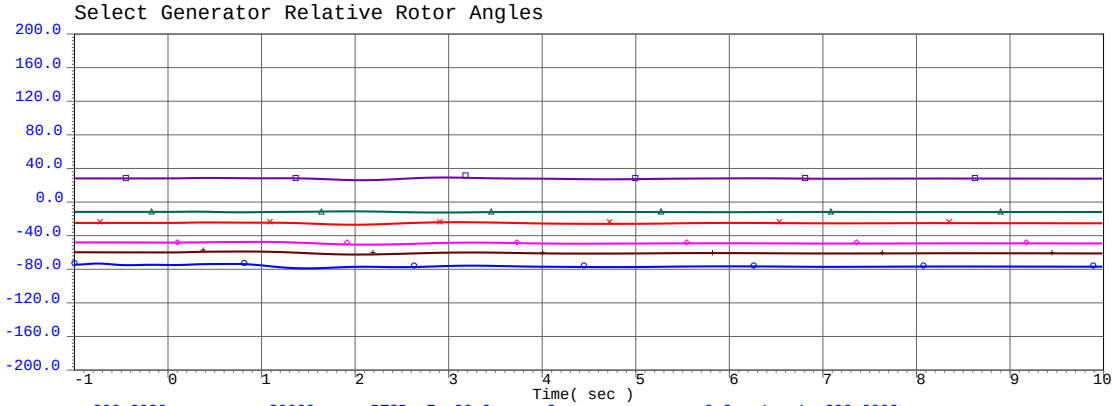




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ McCall 230kV Bus 1
McCall CB 202 Fails to Operate

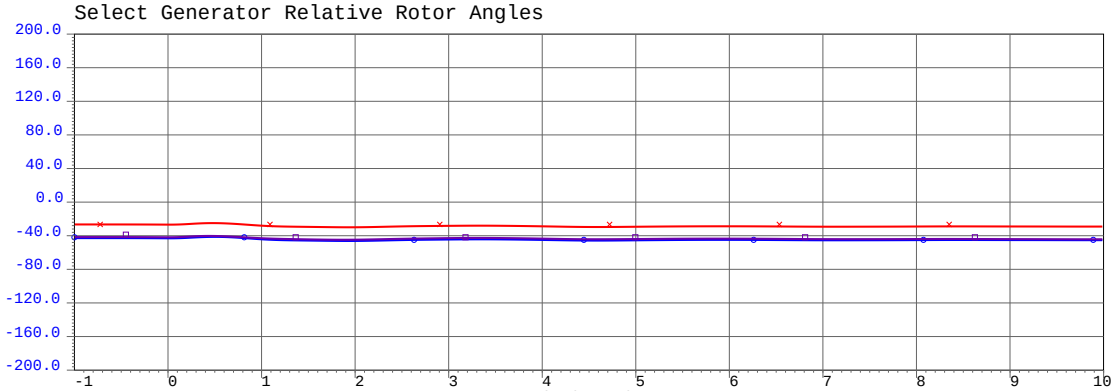
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



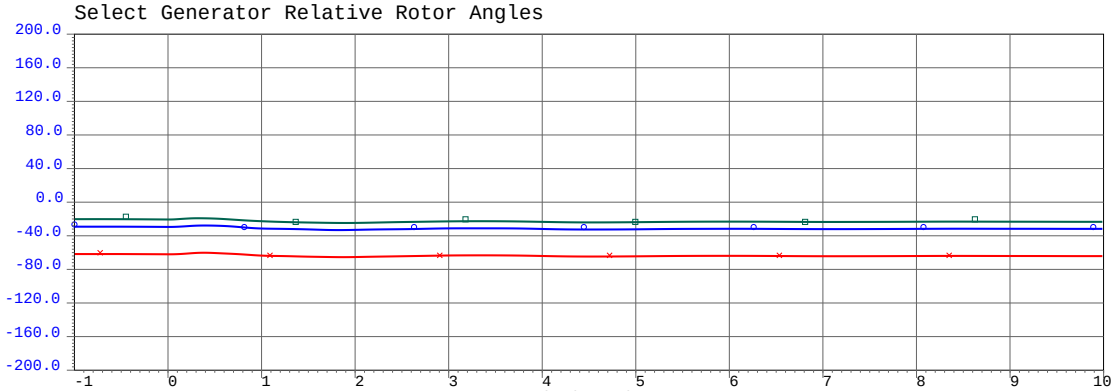
○	-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
×	-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
□	-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
△	-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
◇	-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
+	-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



○	-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
×	-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
□	-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

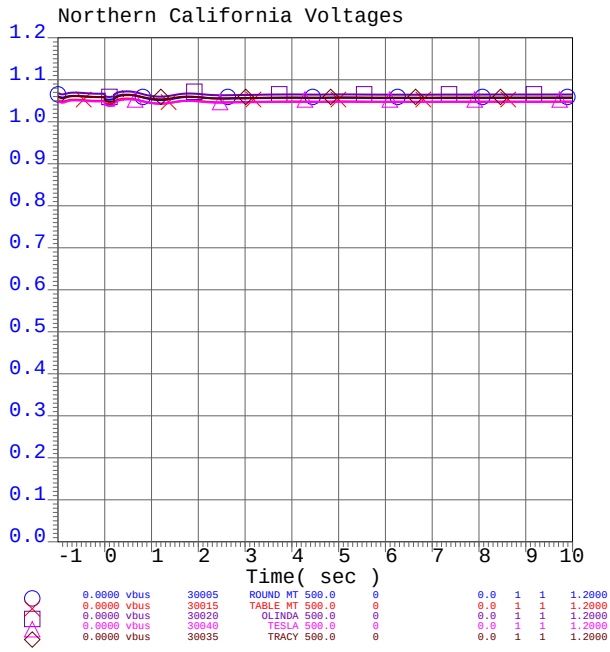
Select Generator Relative Rotor Angles

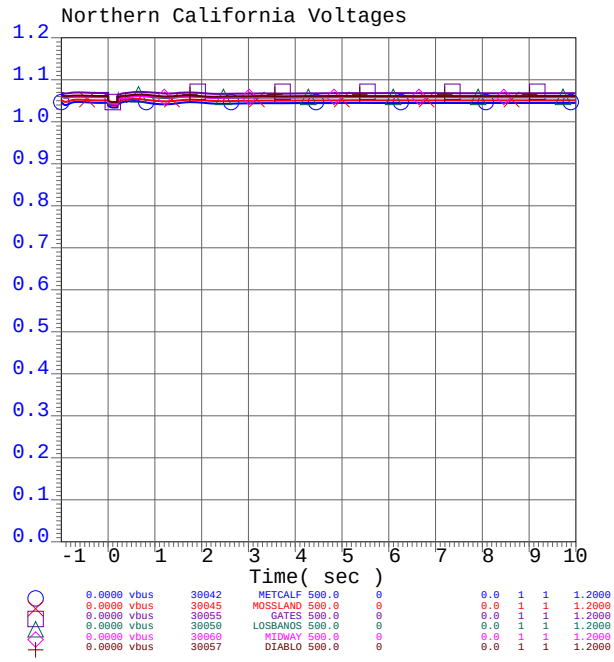


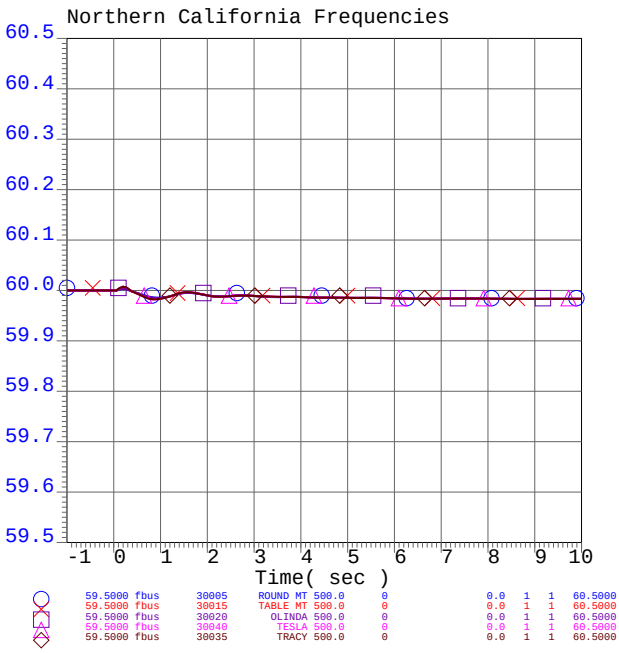
○	-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
×	-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
□	-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

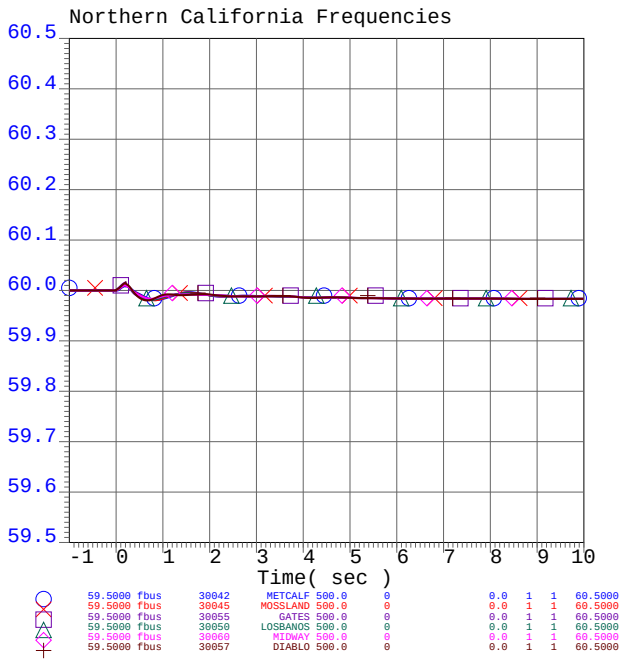
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ McCall 230kV Bus 1
McCall CB 202 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



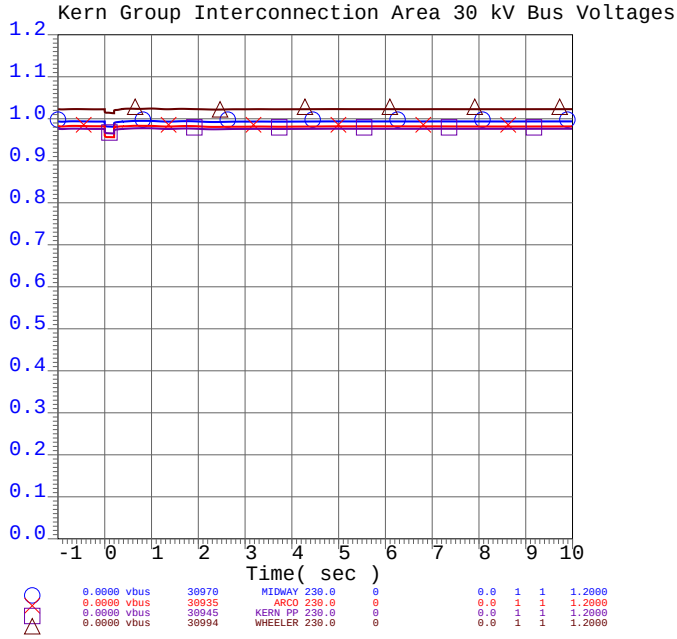


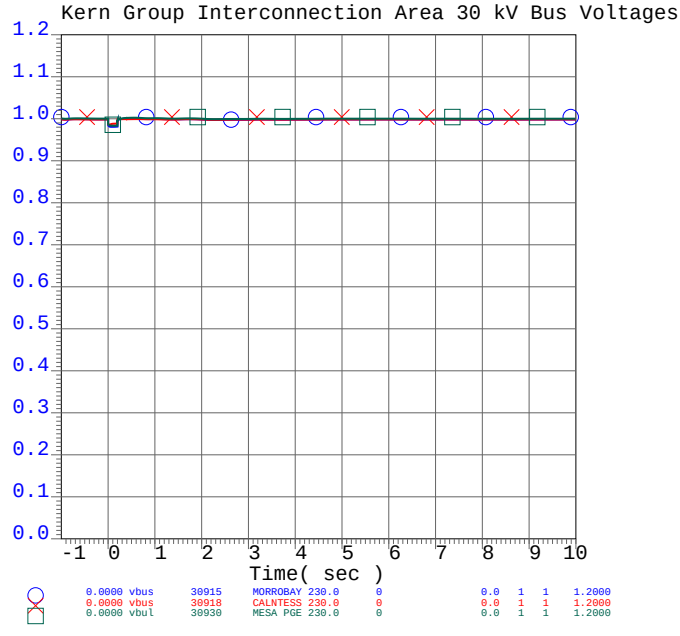


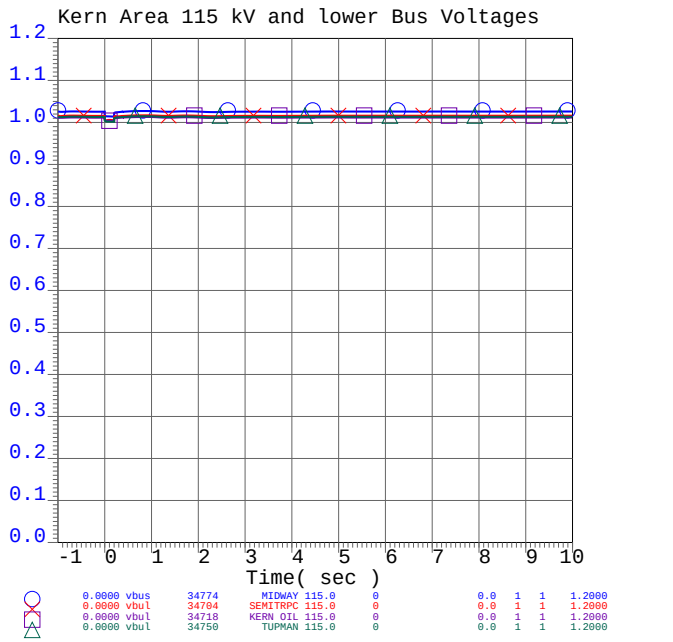


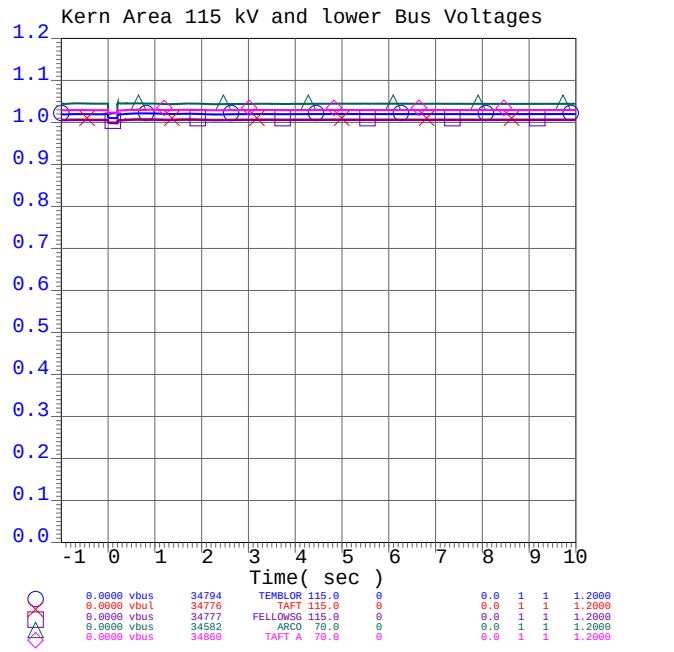
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (12-23 cyc) @ McCall 230kV
McCall CB 262 (Hass-McCall 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





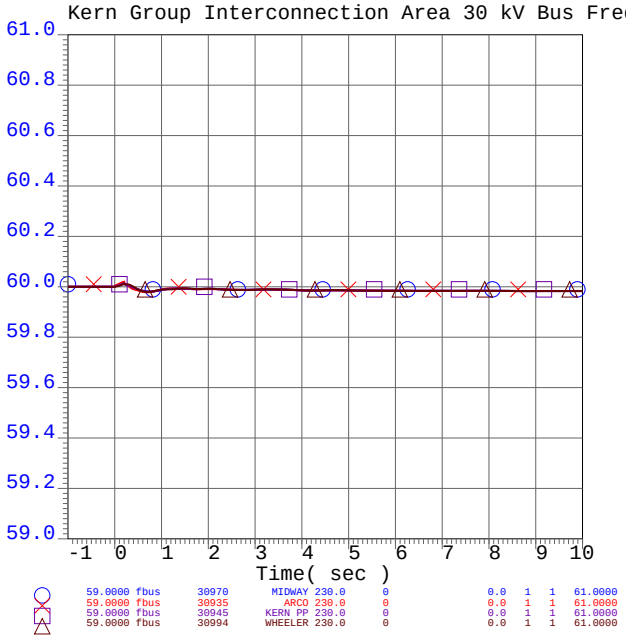




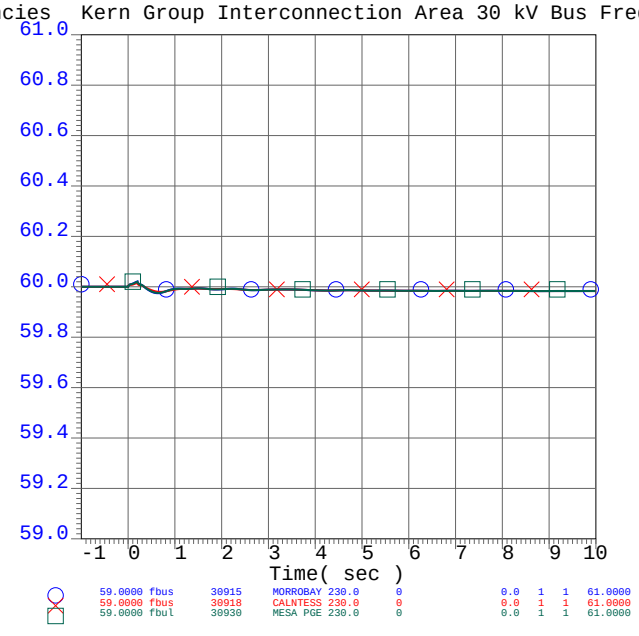
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (12-23 cyc) @ McCall 230kV
McCall CB 262 (Hass-McCall 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

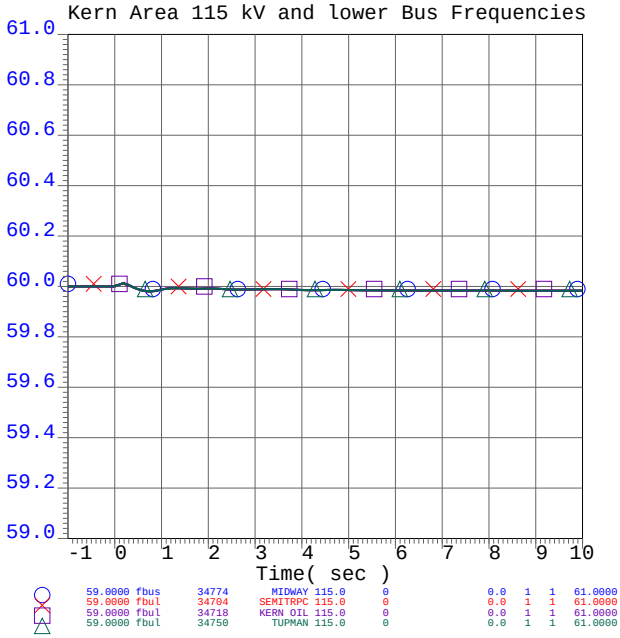
Kern Group Interconnection Area 30 kV Bus Frequencies



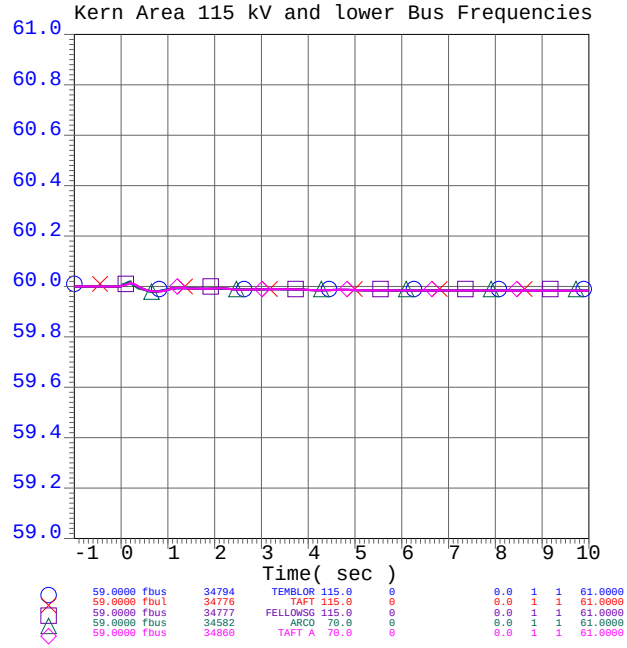
Kern Group Interconnection Area 30 kV Bus Frequencies



Kern Area 115 kV and lower Bus Frequencies



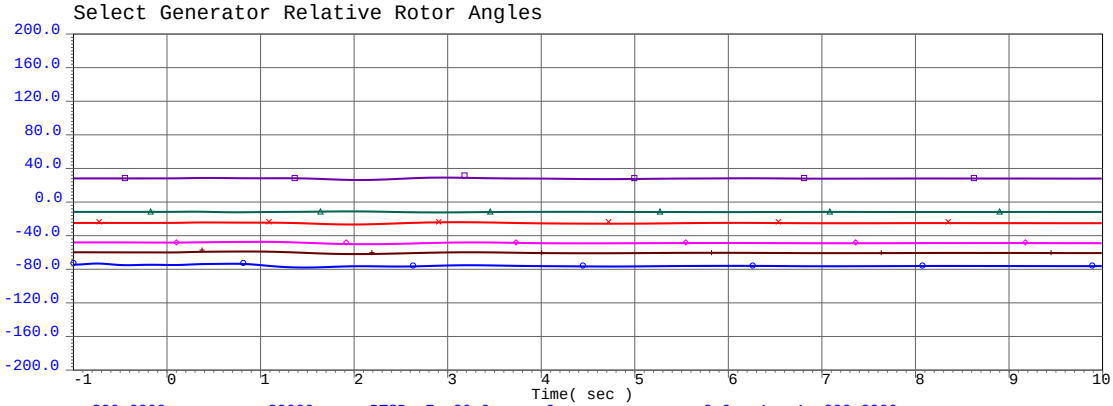
Kern Area 115 kV and lower Bus Frequencies



2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (12-23 cyc) @ McCall 230kV
McCall CB 262 (Hass-McCall 230 kV line) Fails to Operate

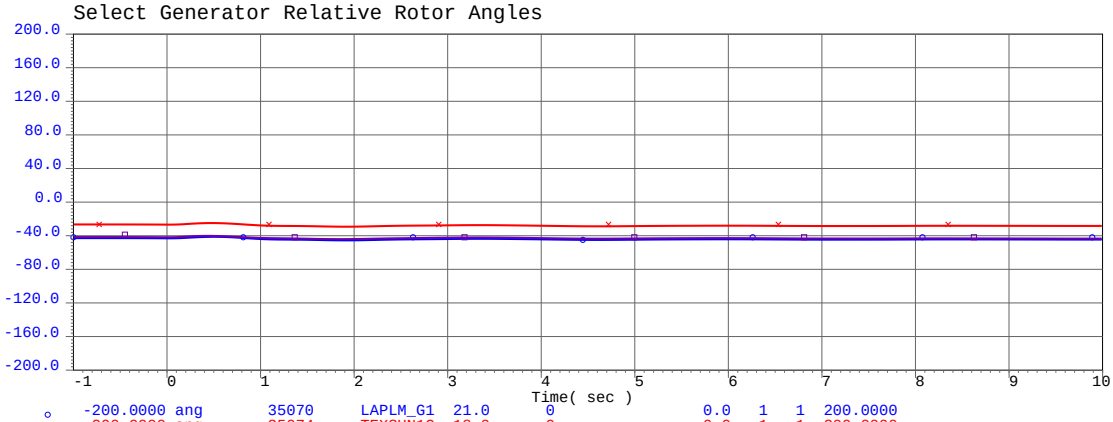
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



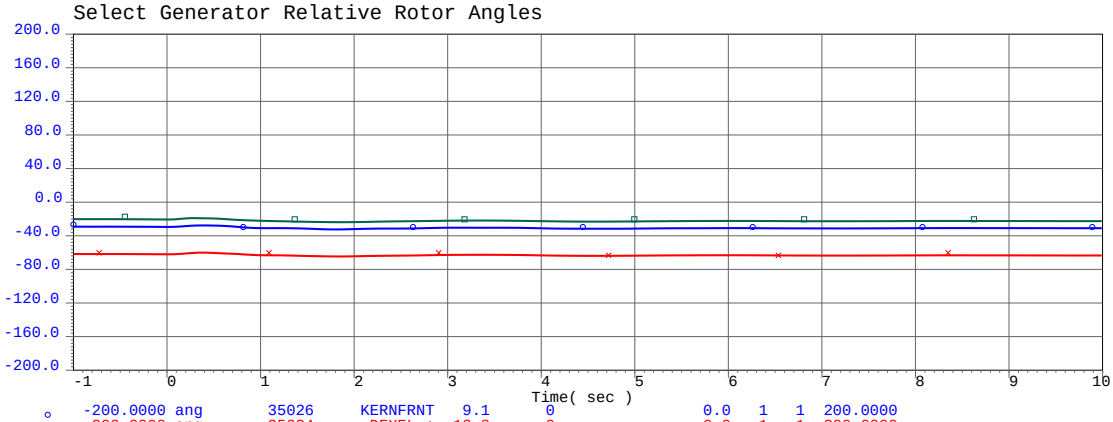
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

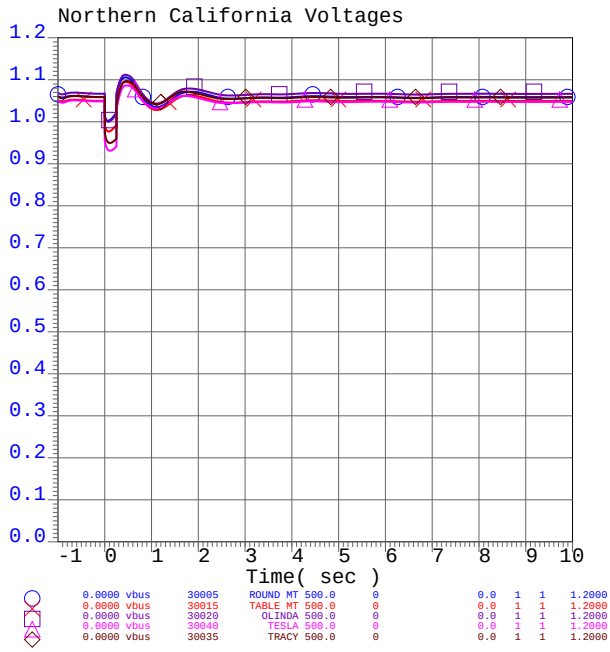
Select Generator Relative Rotor Angles

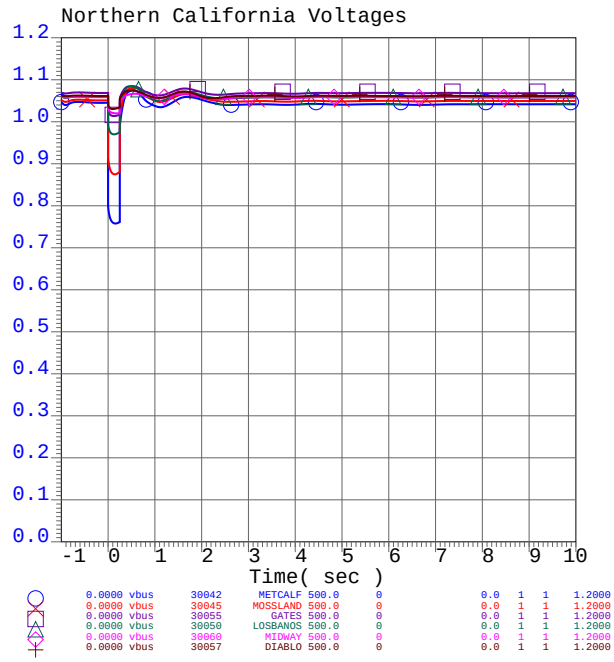


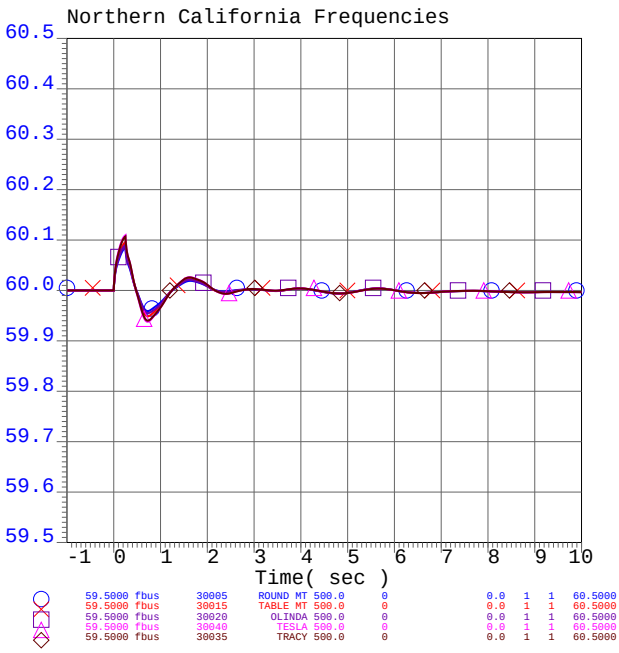
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

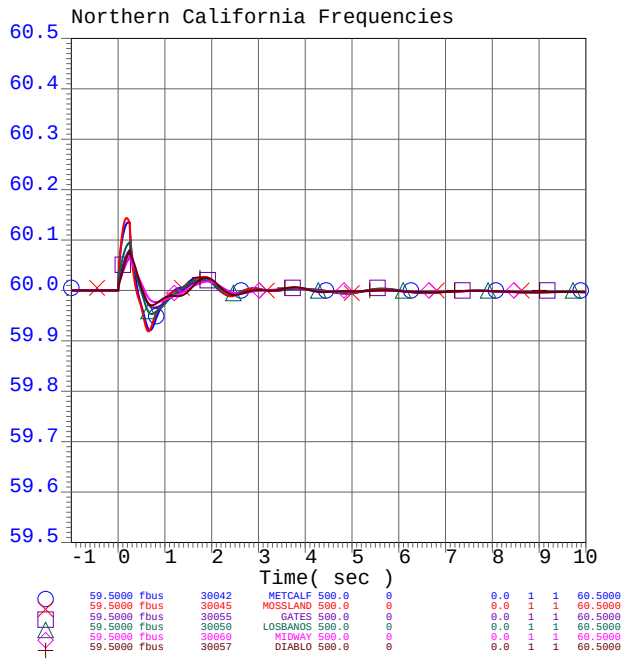
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (12-23 cyc) @ McCall 230kV
McCall CB 262 (Hass-McCall 230 kV line) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





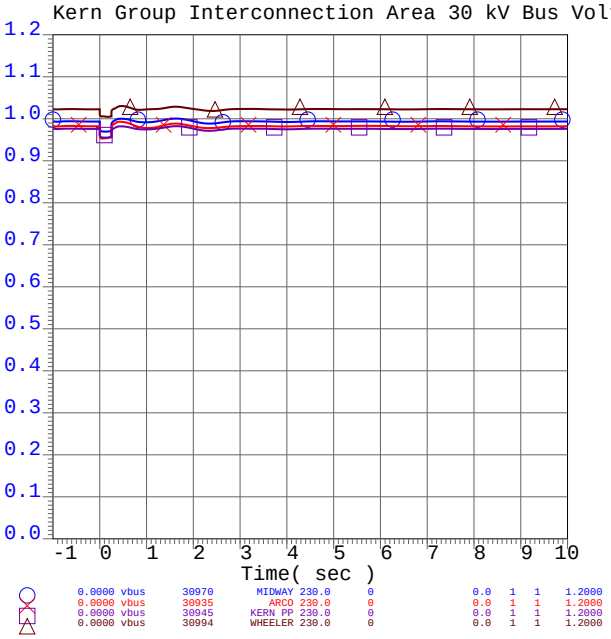




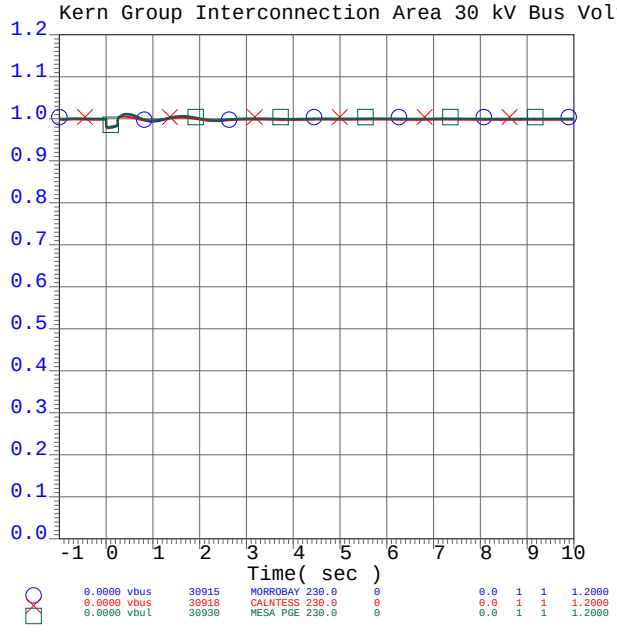
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (15 cyc) @ Metcalf 1D 230 kV
Metcalf CB 582 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

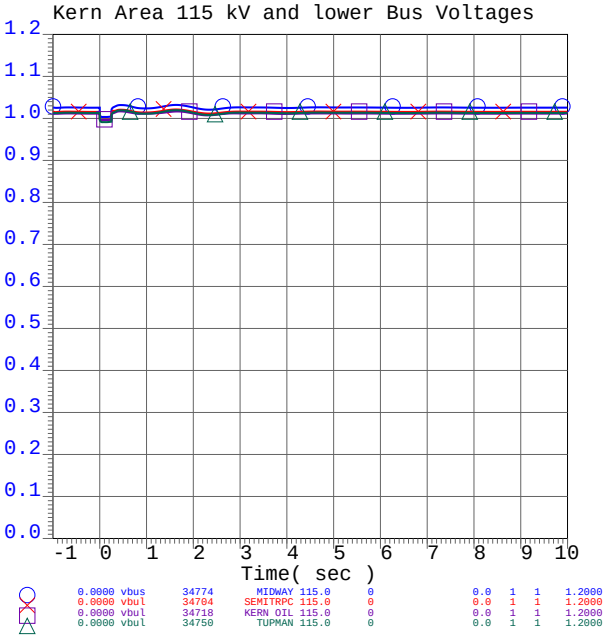
Kern Group Interconnection Area 30 kV Bus Voltages



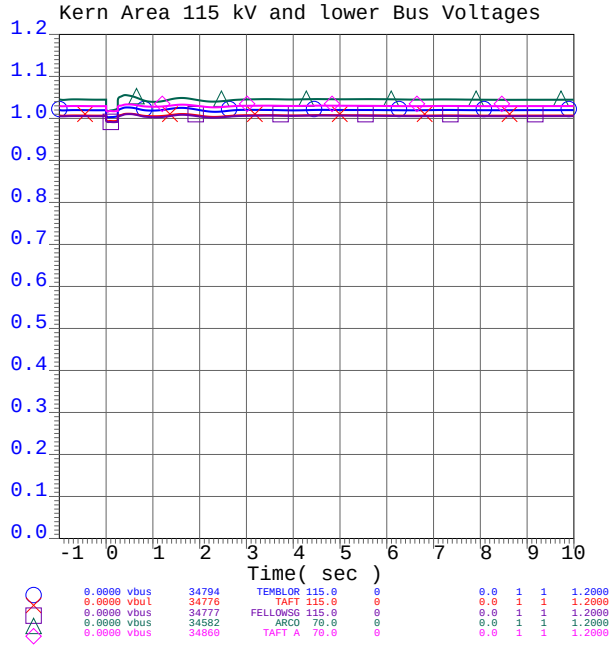
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages

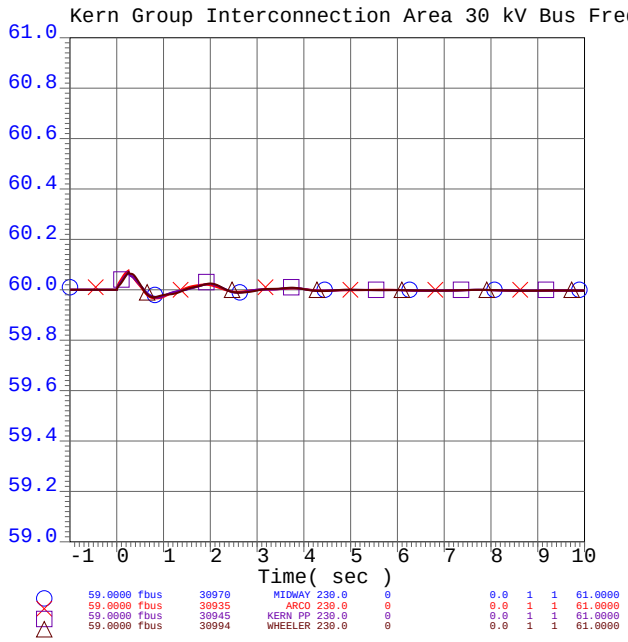


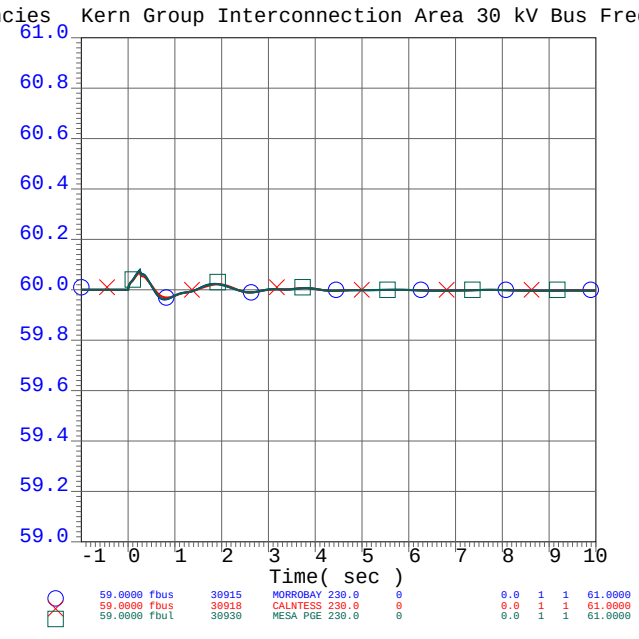
Kern Area 115 kV and lower Bus Voltages

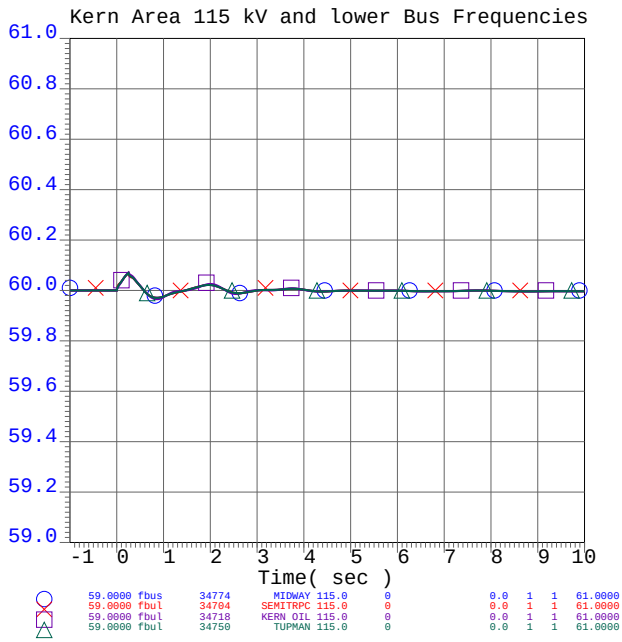


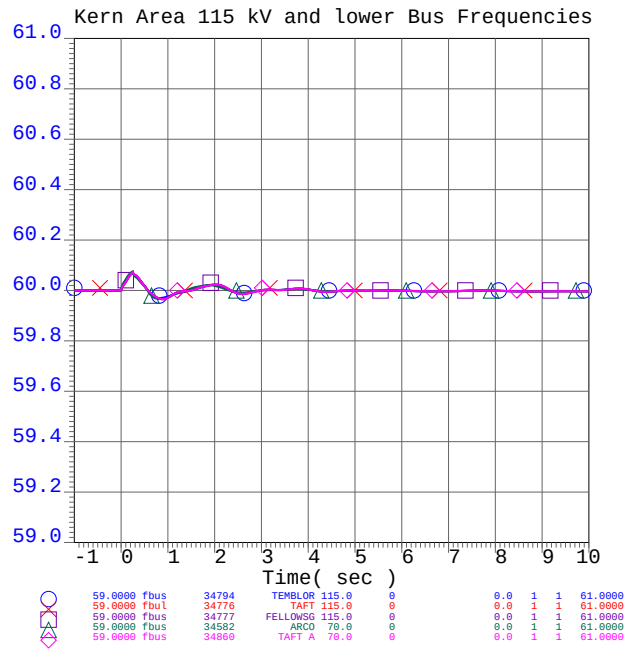
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (15 cyc) @ Metcalf 1D 230 kV
Metcalf CB 582 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





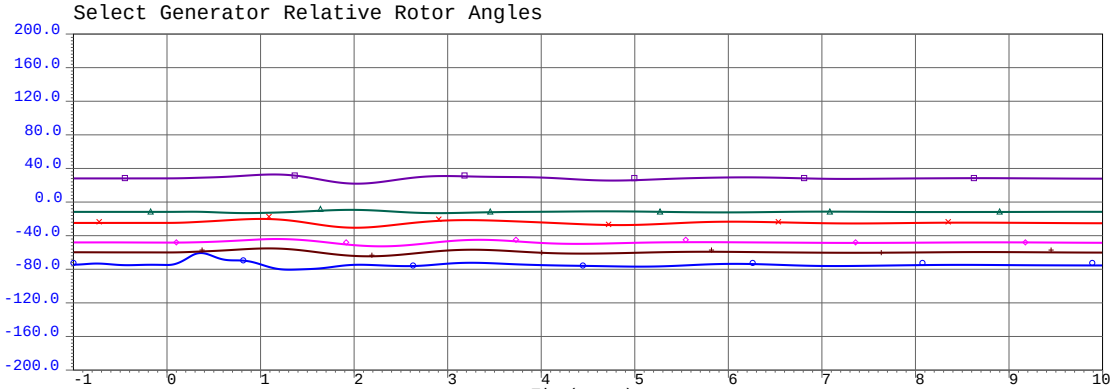




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (15 cyc) @ Metcalf 1D 230 kV
Metcalf CB 582 Fails to Operate

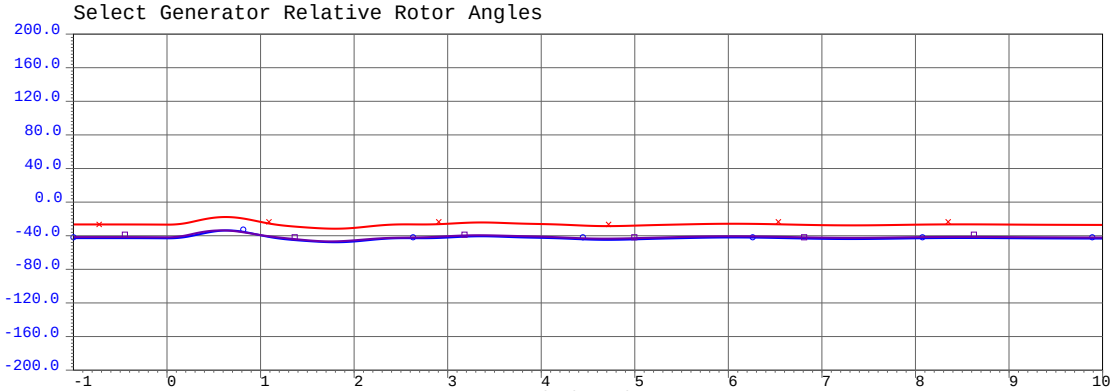
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



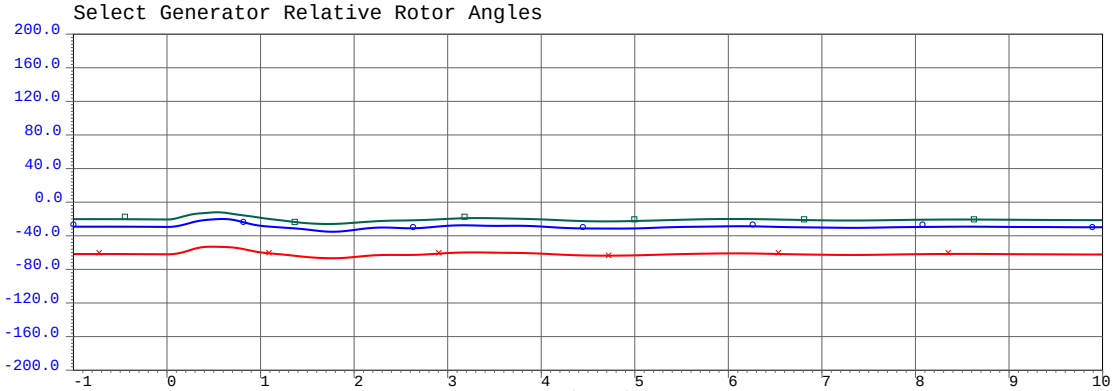
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

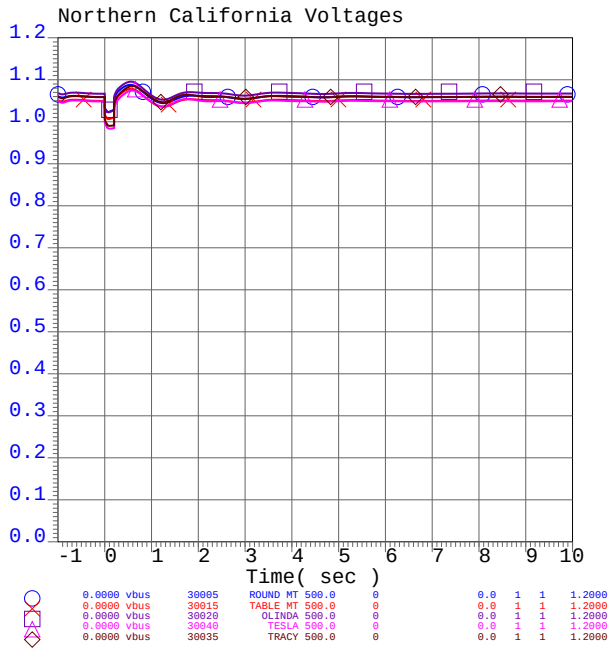
Select Generator Relative Rotor Angles

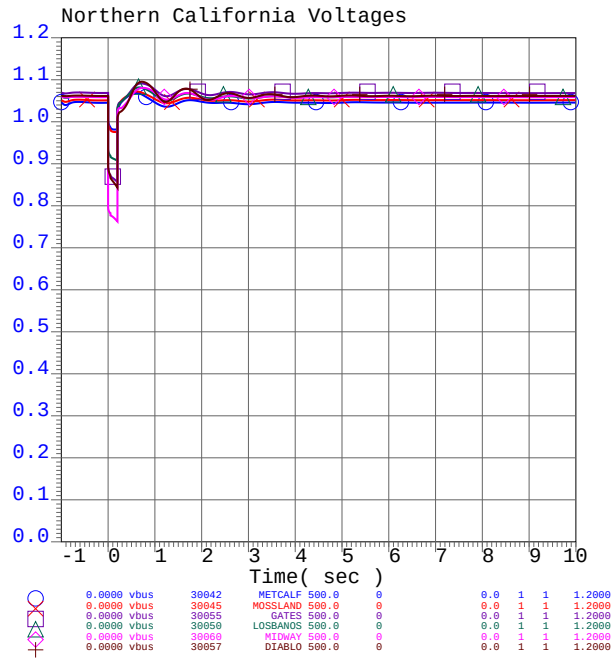


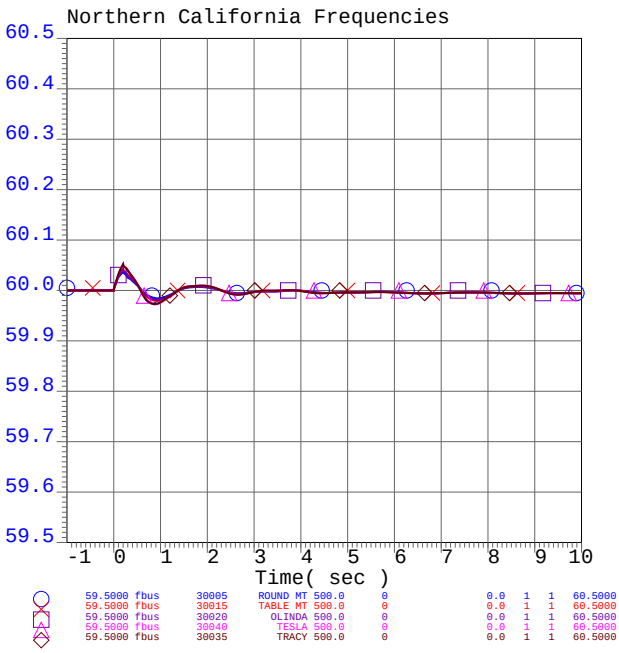
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
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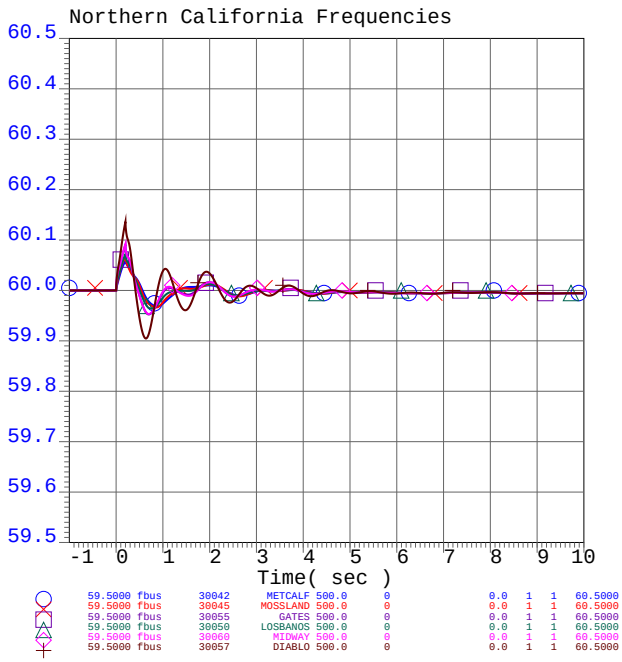
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (15 cyc) @ Metcalf 1D 230 kV
Metcalf CB 582 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





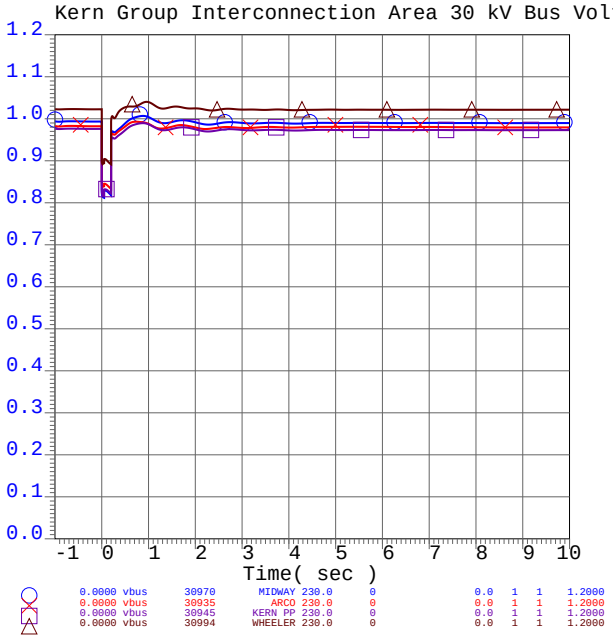




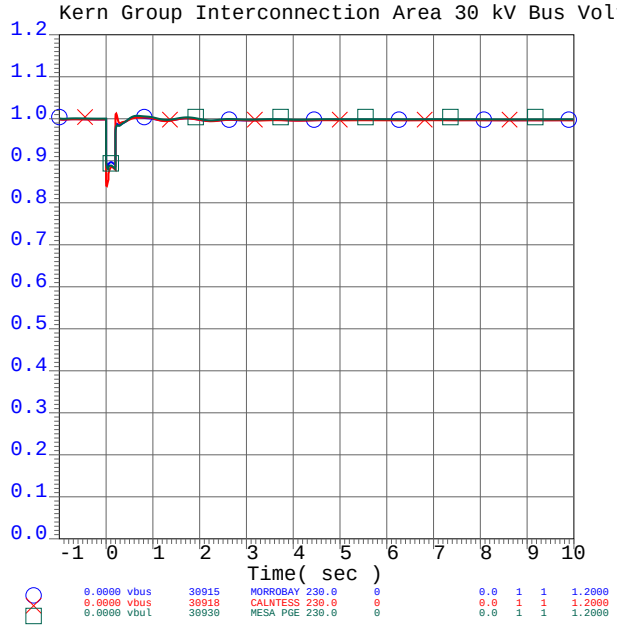
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Midway 500 kV
Midway CB 732 (Midway 500/230 kV #11 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

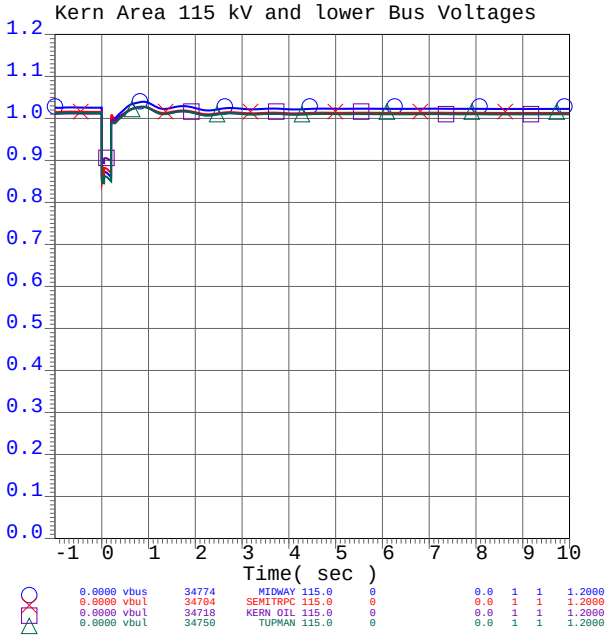
Kern Group Interconnection Area 30 kV Bus Voltages



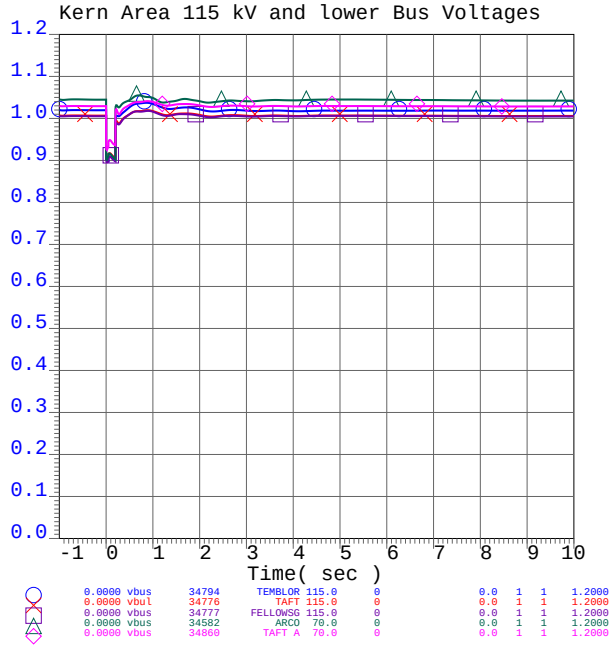
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages

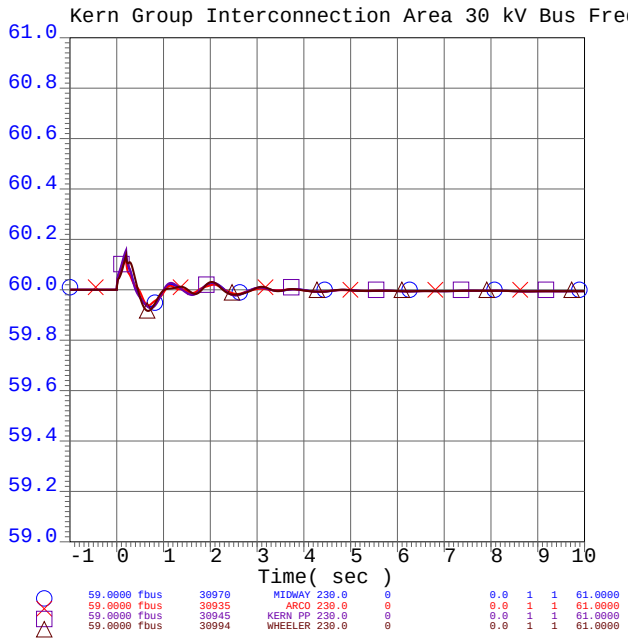


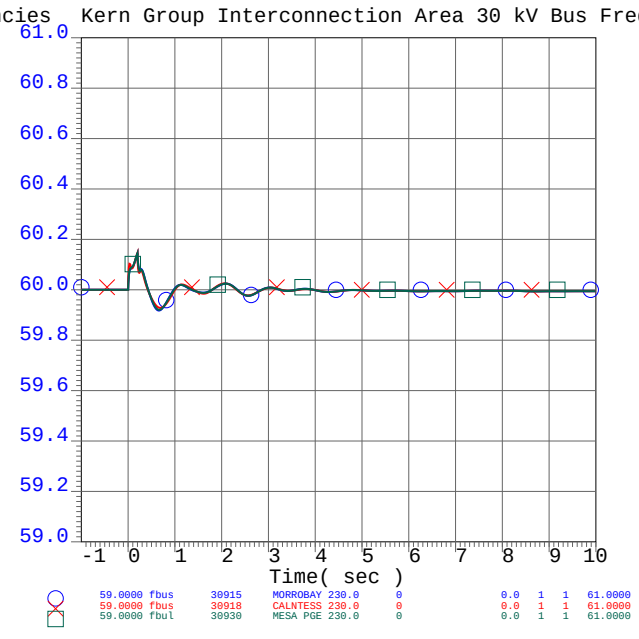
Kern Area 115 kV and lower Bus Voltages

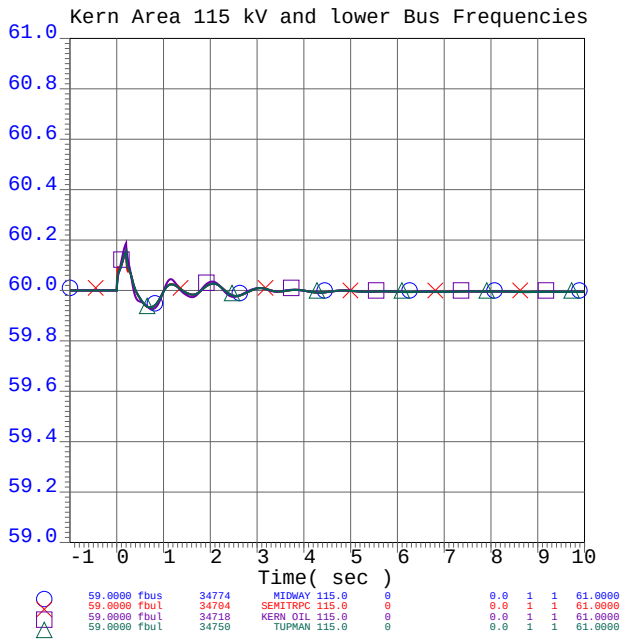


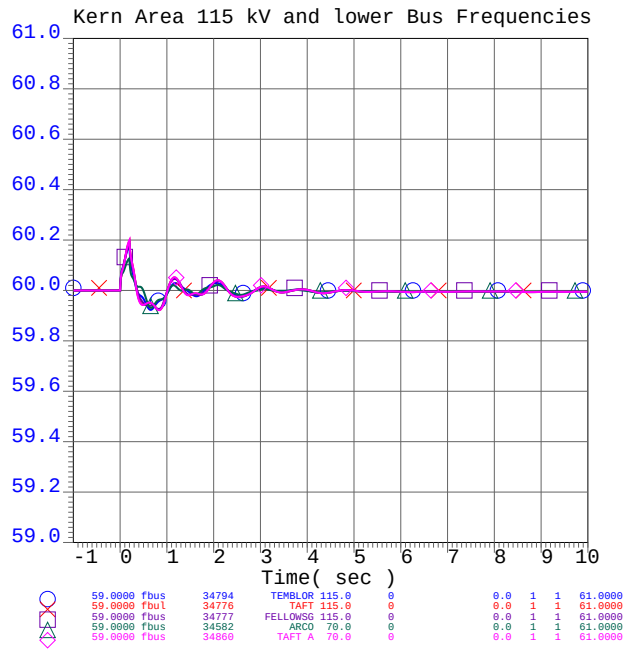
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Midway 500 kV
Midway CB 732 (Midway 500/230 kV #11 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





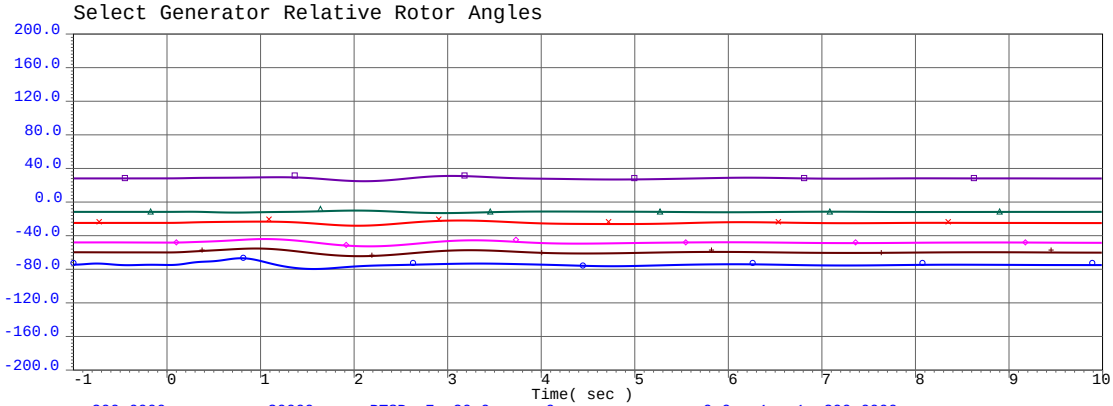




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Midway 500 kV
Midway CB 732 (Midway 500/230 kV #11 Transformer) Fails to Operate

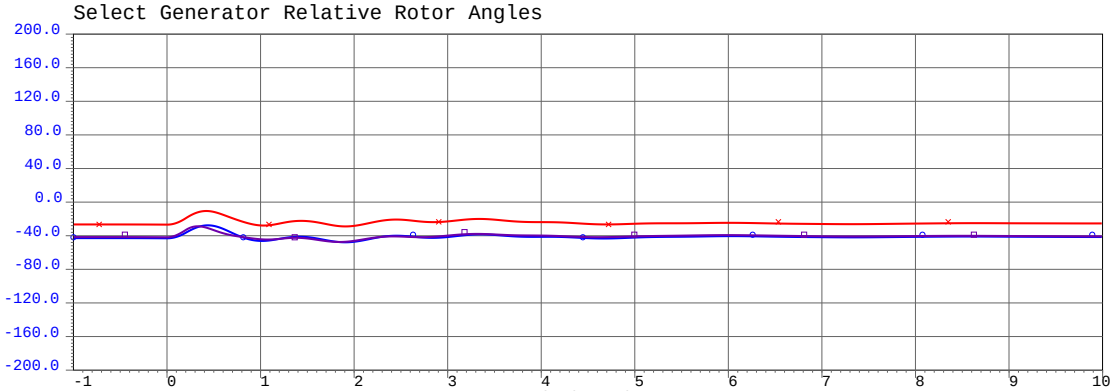
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



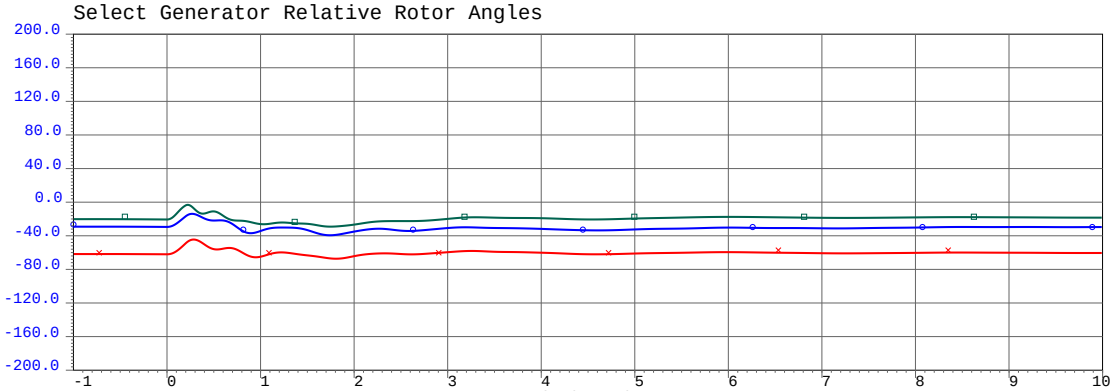
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

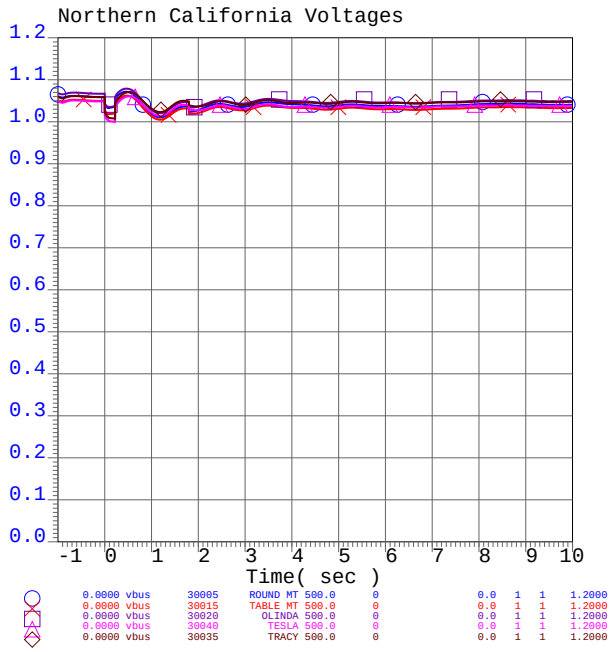
Select Generator Relative Rotor Angles

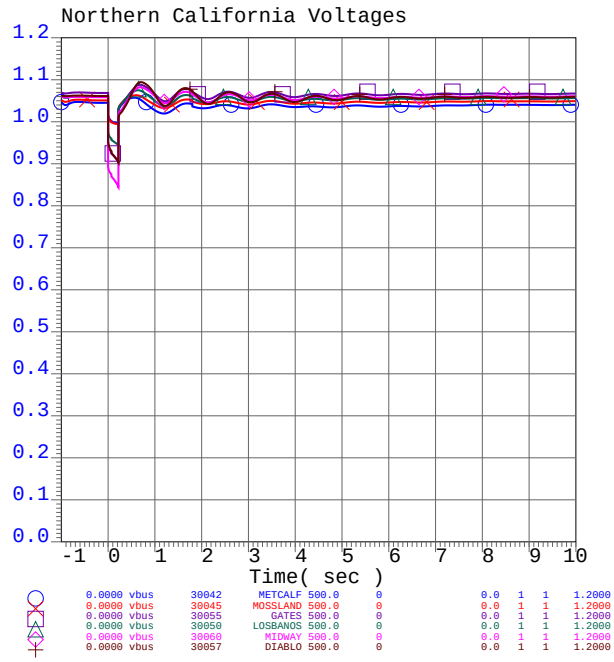


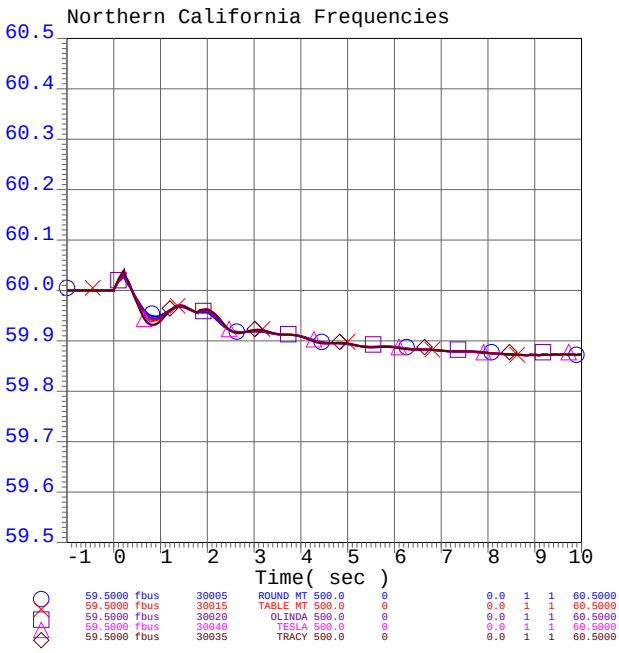
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
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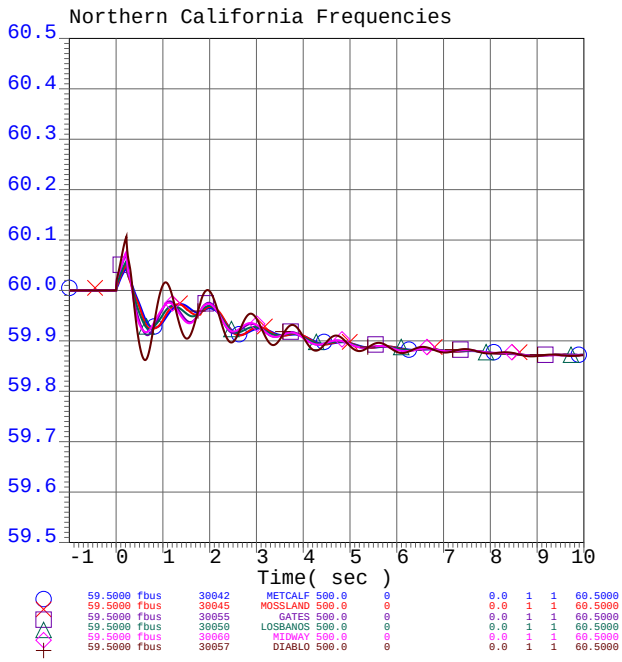
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (23 cyc) @ Midway 500 kV
Midway CB 732 (Midway 500/230 kV #11 Transformer) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



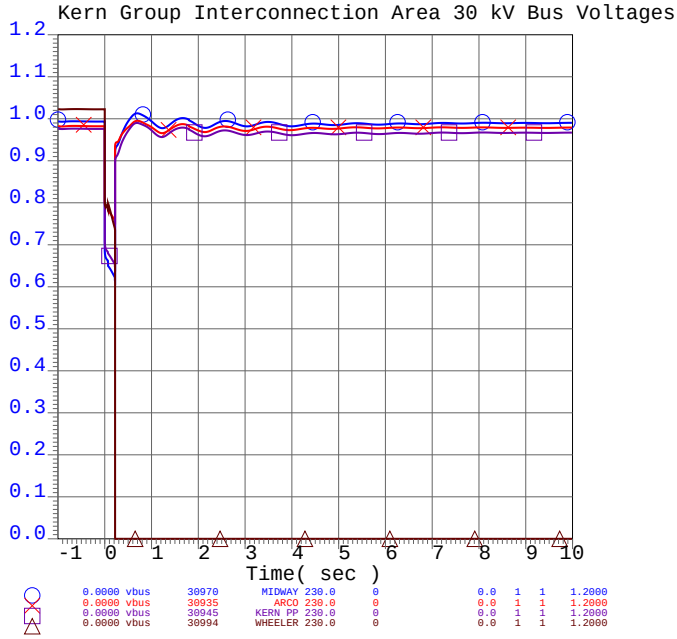


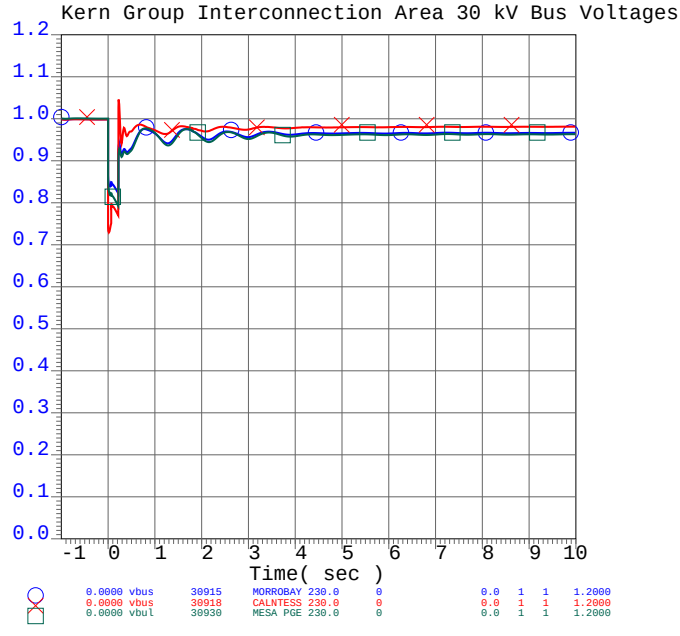


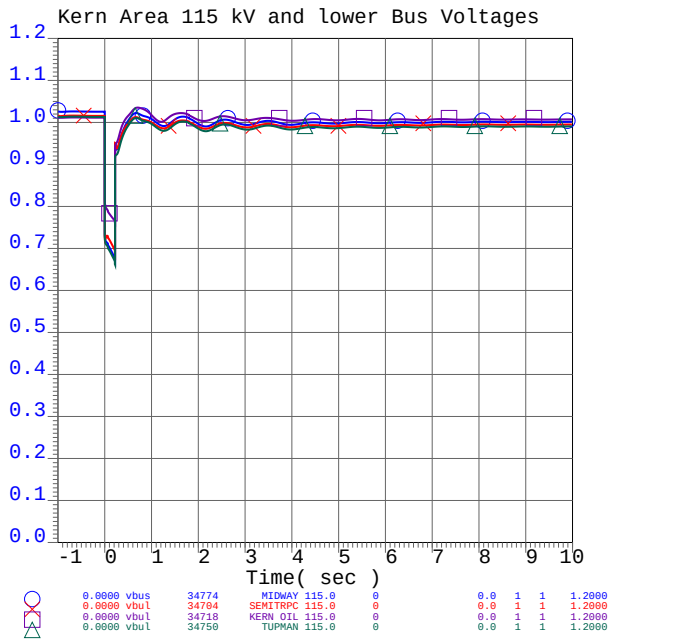


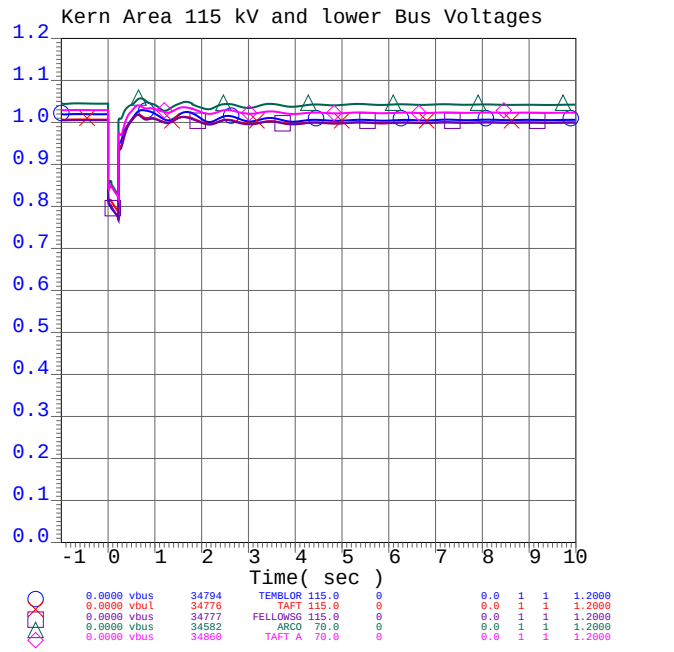
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Midway 230kV Bus 1D
Midway CB 632 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



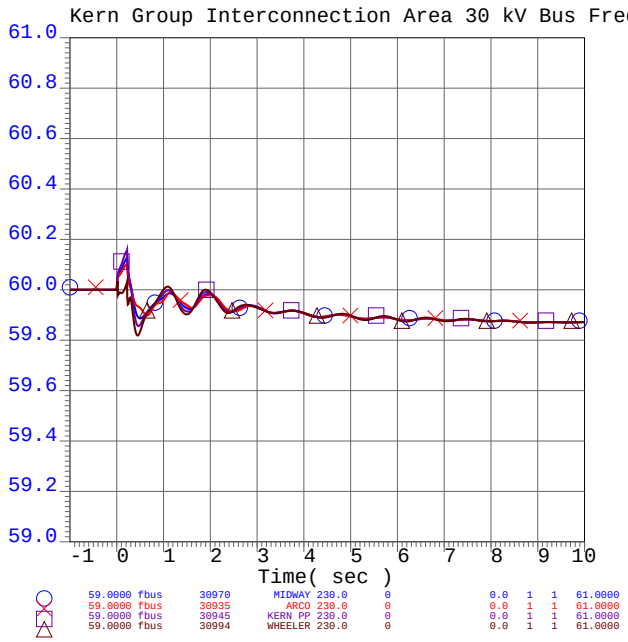


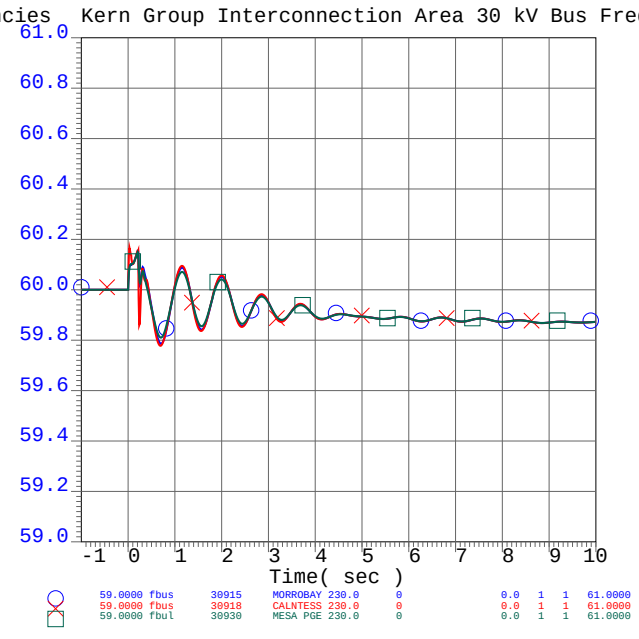


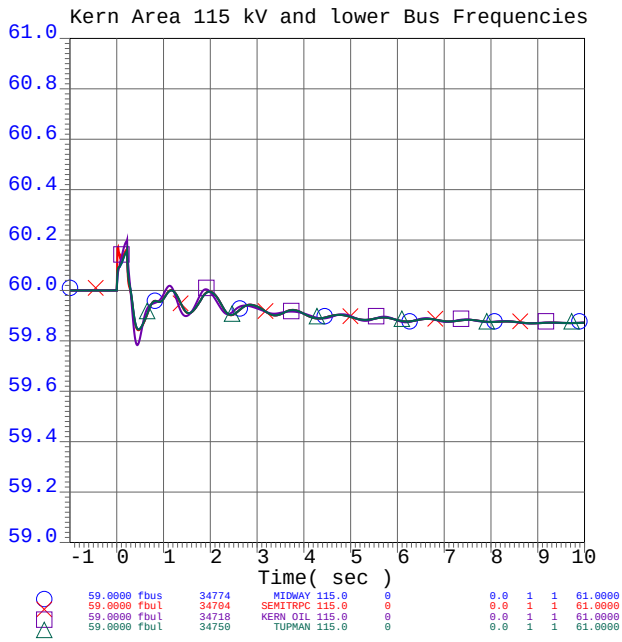


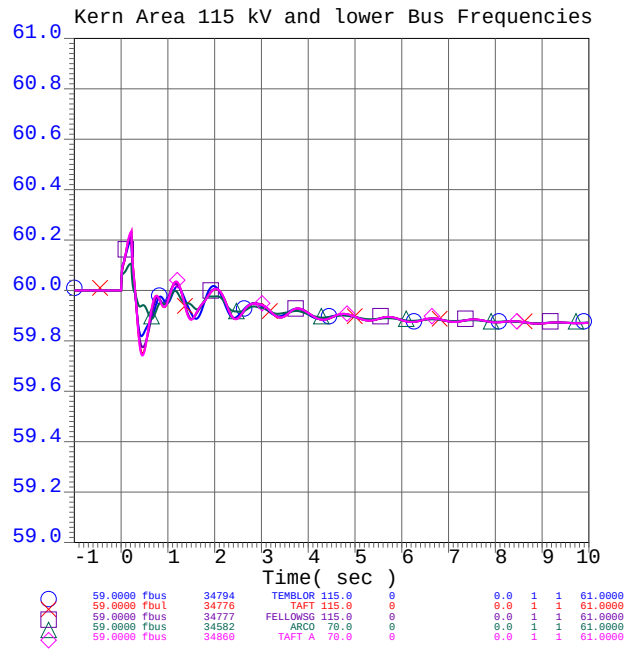
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Midway 230kV Bus 1D
Midway CB 632 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





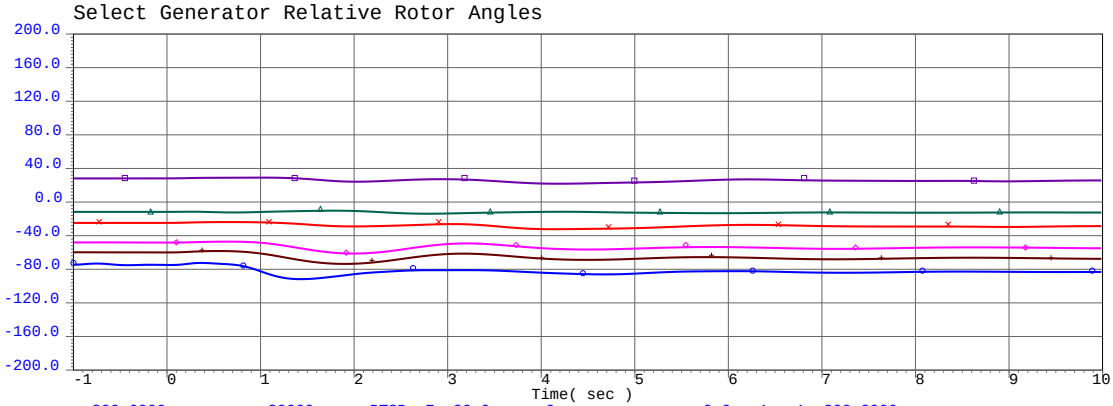




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Midway 230kV Bus 1D
Midway CB 632 Fails to Operate

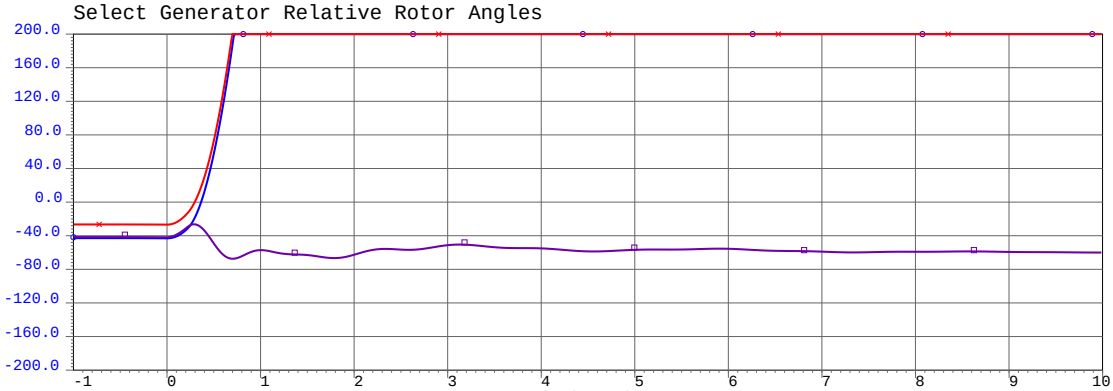
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



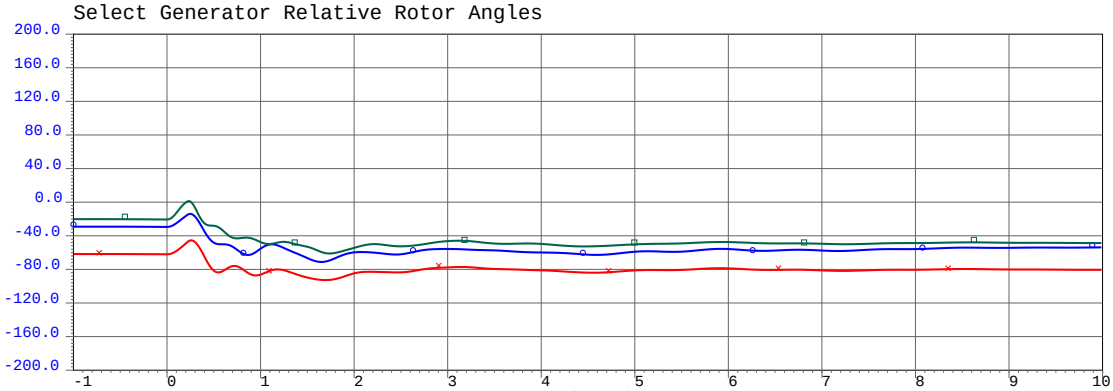
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-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
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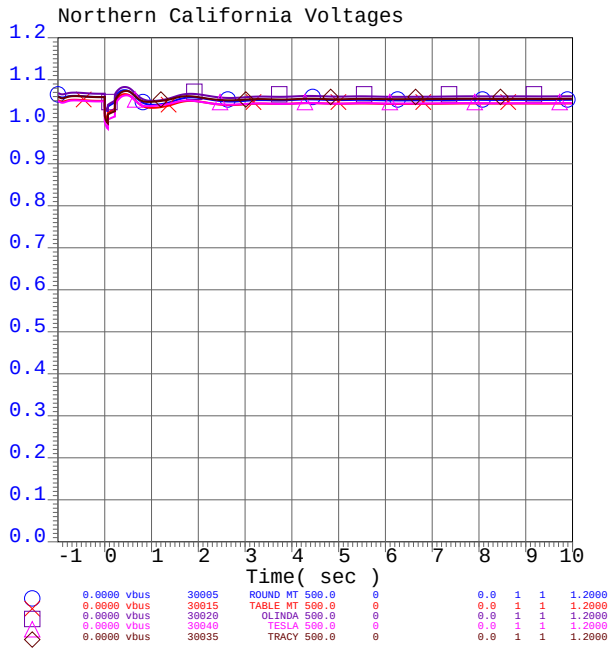
Select Generator Relative Rotor Angles

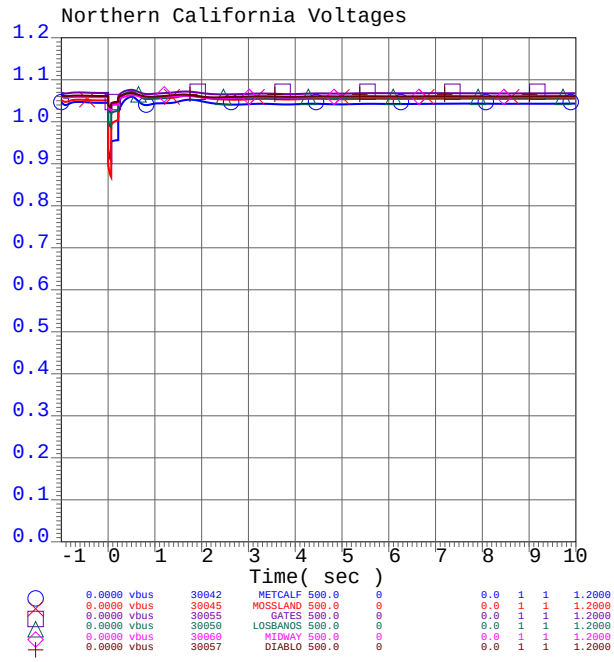


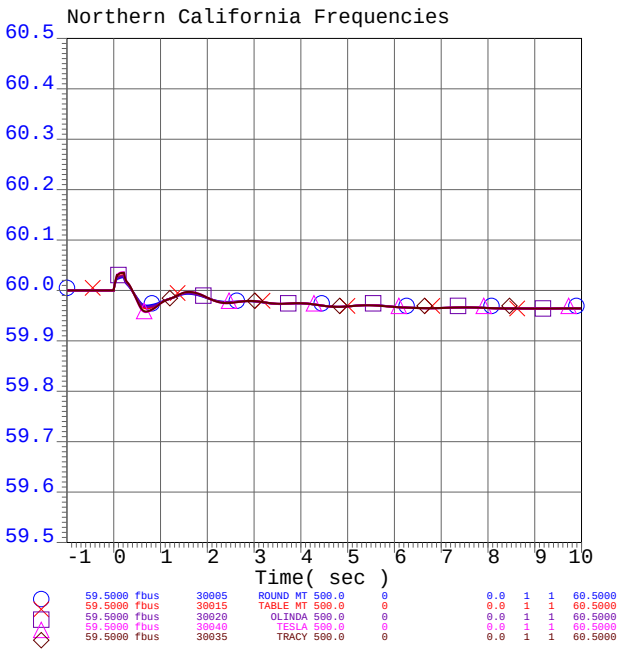
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

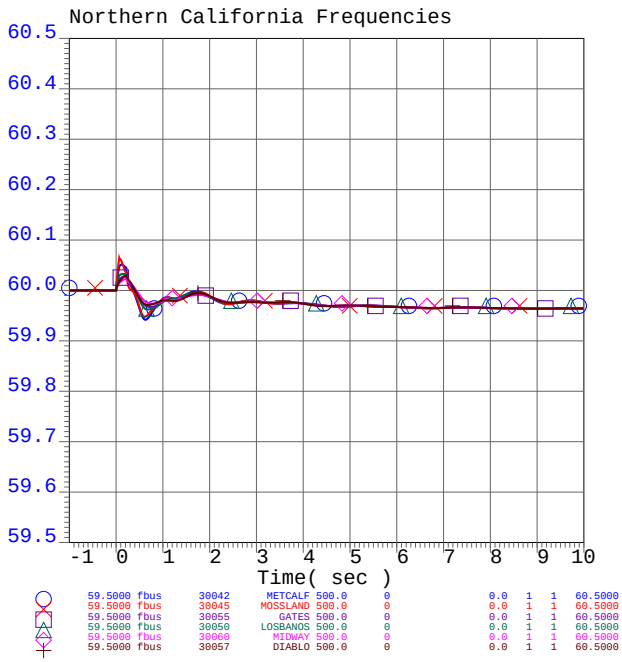
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SLG flt delayed clearing (13 cyc) @ Midway 230kV Bus 1D
Midway CB 632 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





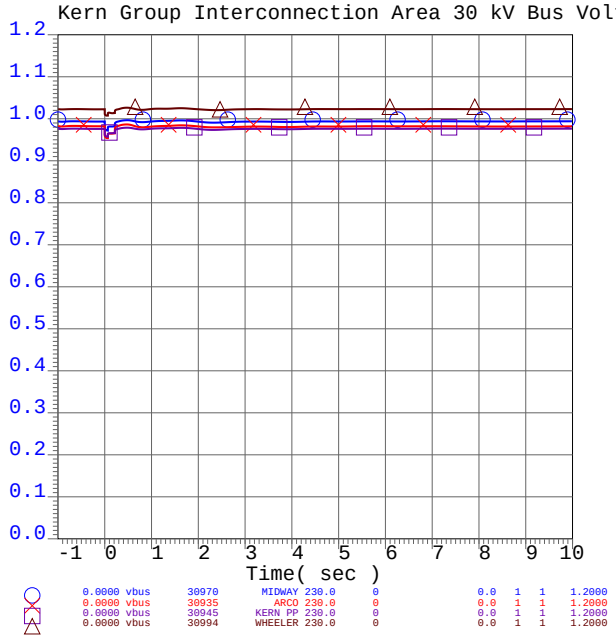




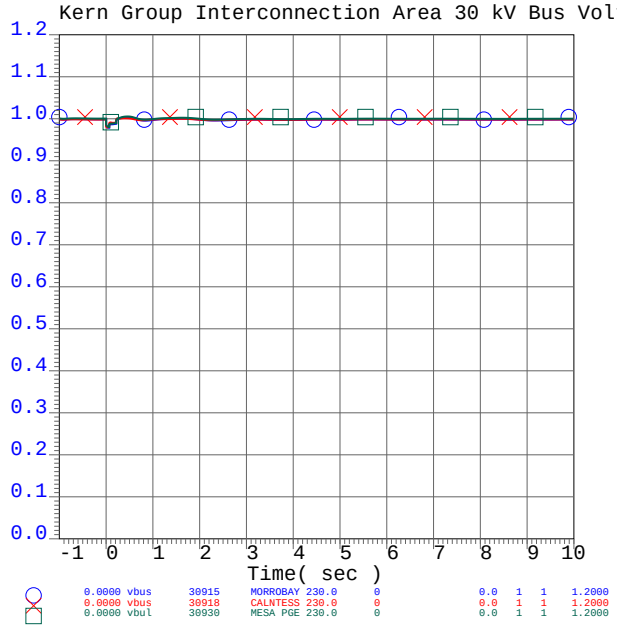
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (13 cyc) @ Moss Landing 1D 230 kV
Moss Landing CB 680 (Moss Landing #9 500/230 kV) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

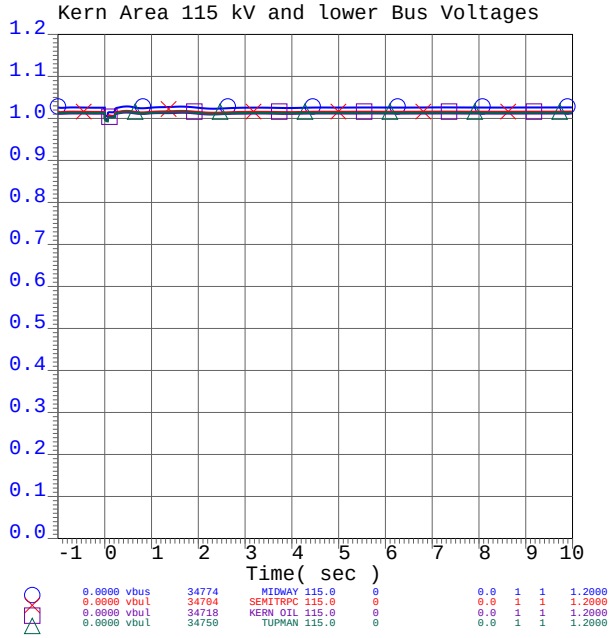
Kern Group Interconnection Area 30 kV Bus Voltages



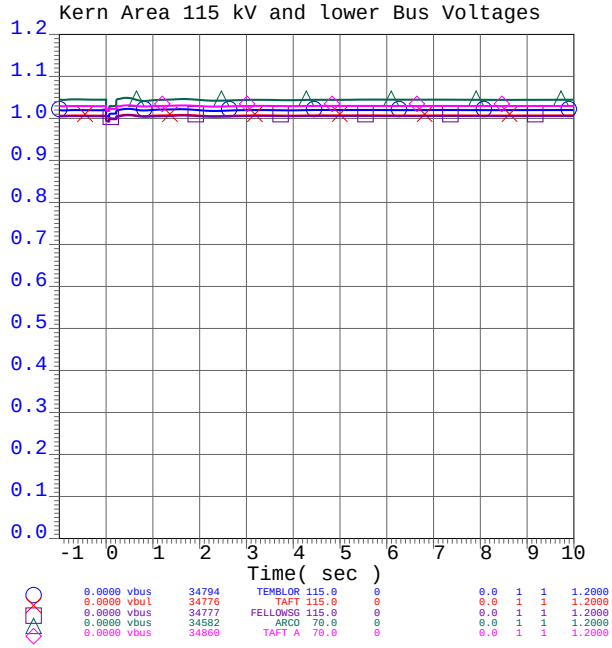
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages

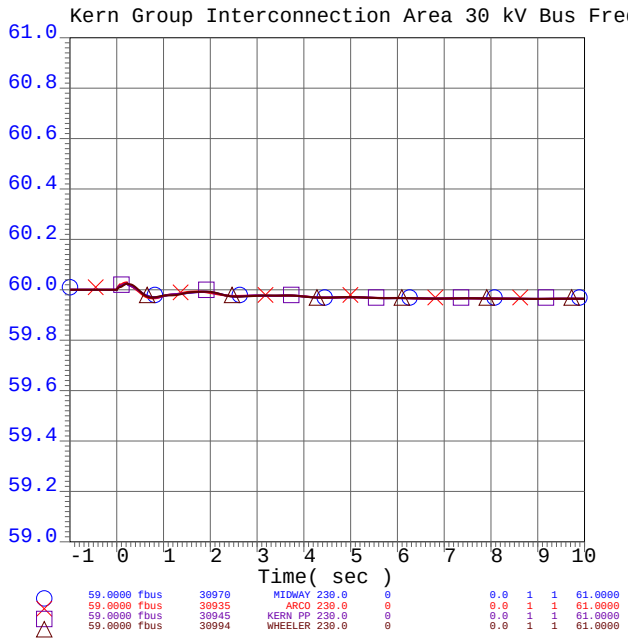


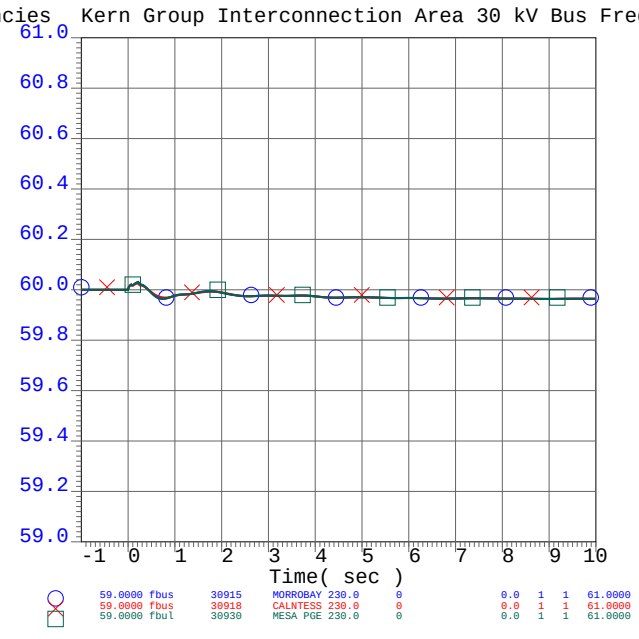
Kern Area 115 kV and lower Bus Voltages

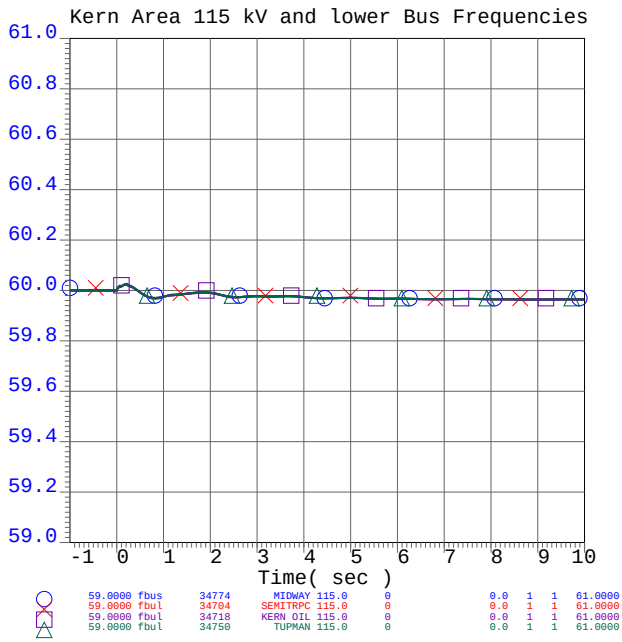


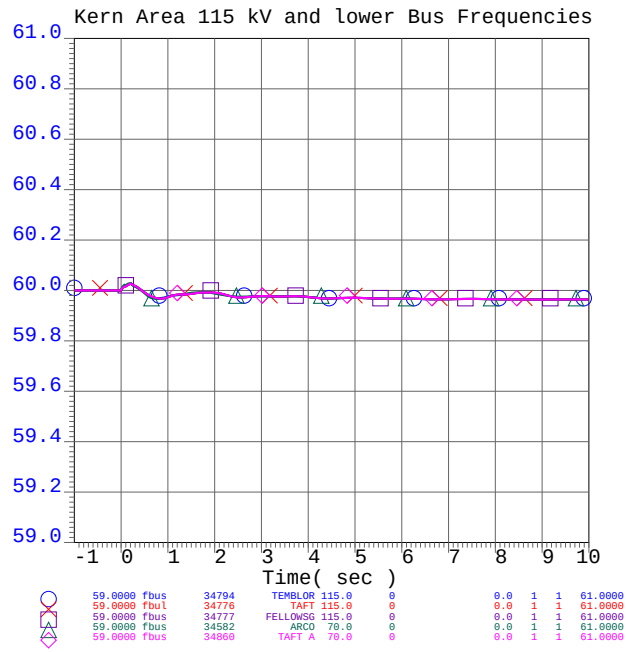
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (13 cyc) @ Moss Landing 1D 230 kV
Moss Landing CB 680 (Moss Landing #9 500/230 kV) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





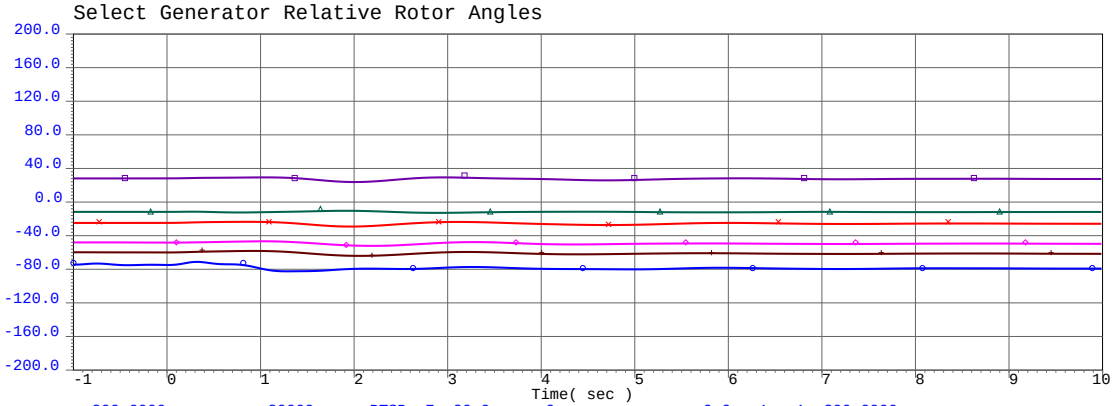




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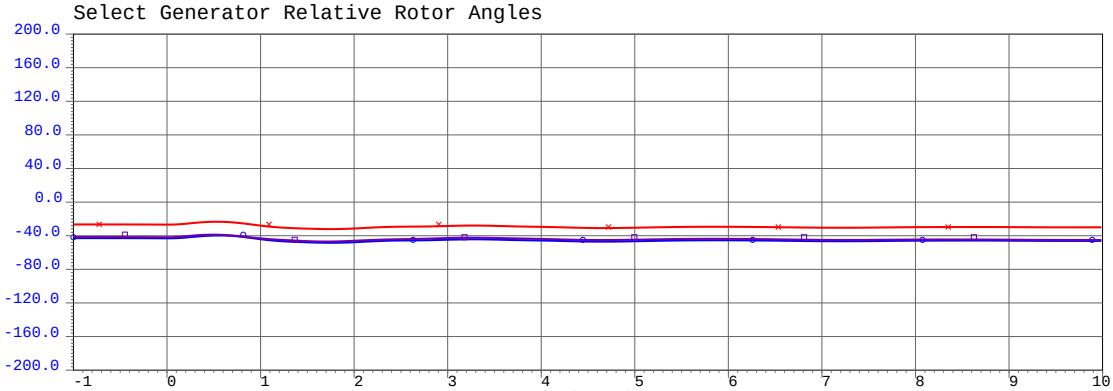
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



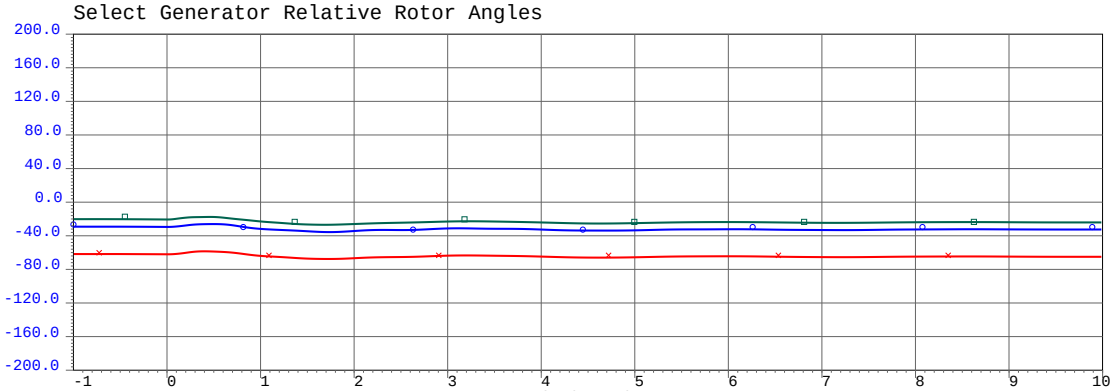
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-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
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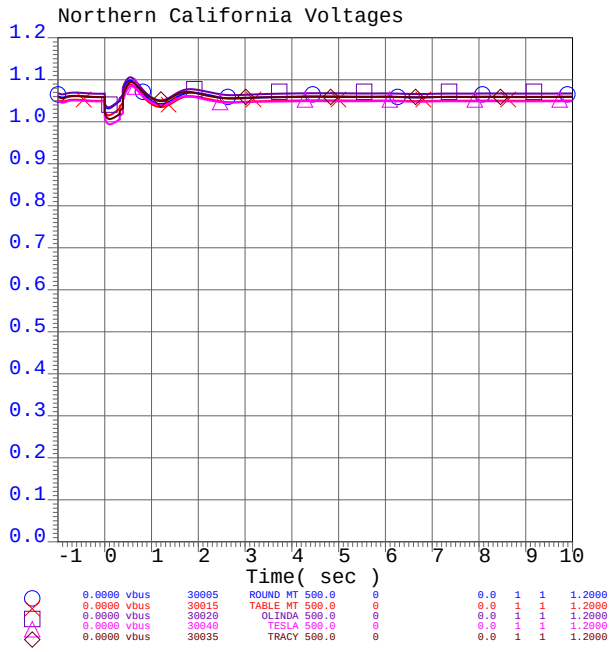
Select Generator Relative Rotor Angles

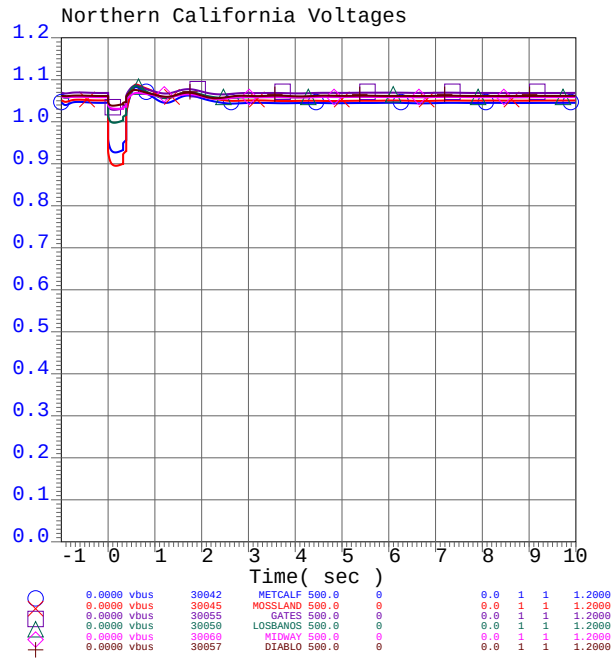


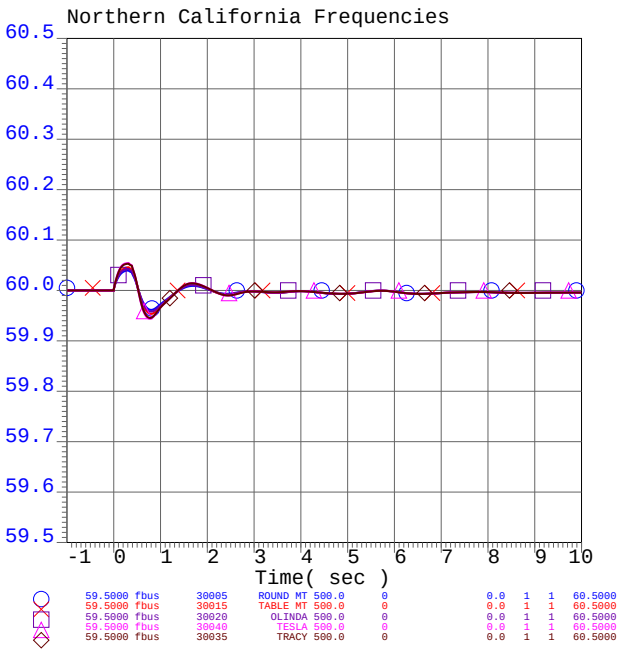
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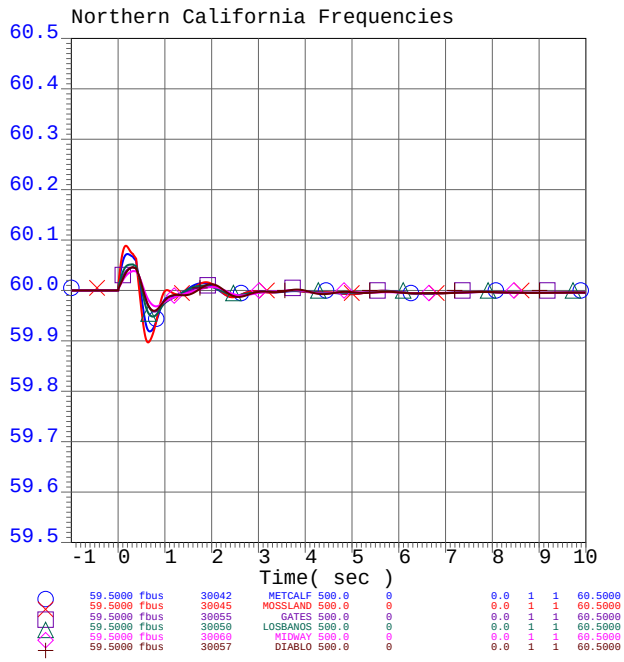
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Moss Landing CB 680 (Moss Landing #9 500/230 kV) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





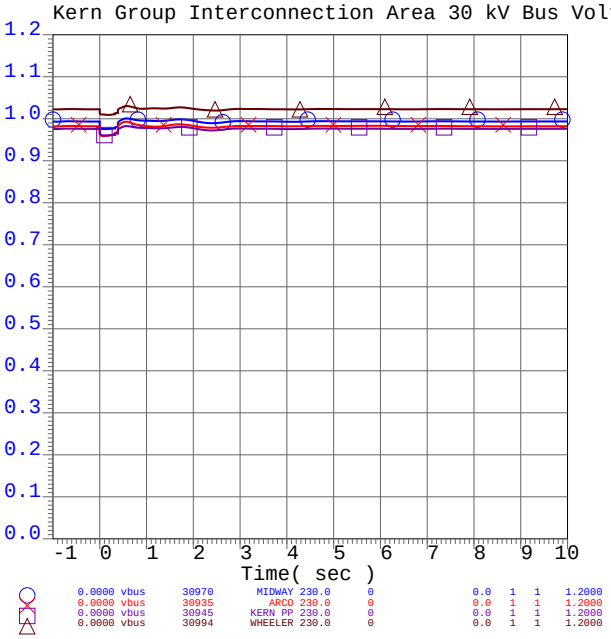




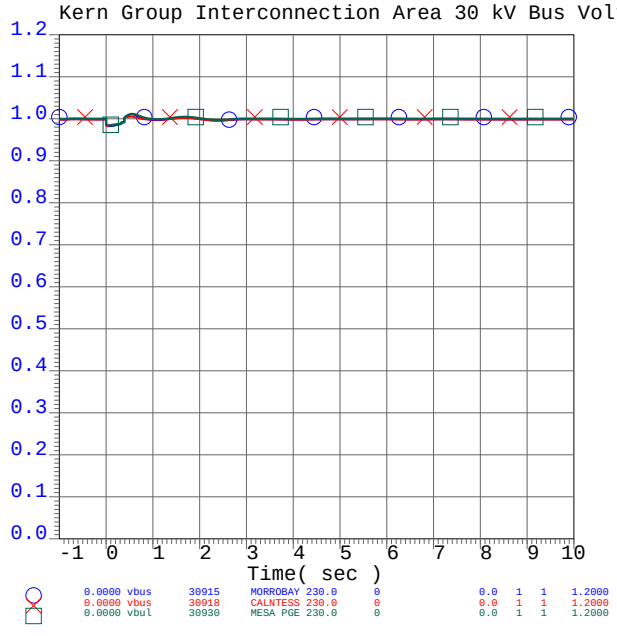
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (19 cyc) @ Moss Landing 115 kV
Moss Landing CB 450 (Moss Landing-Green Valley #1) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

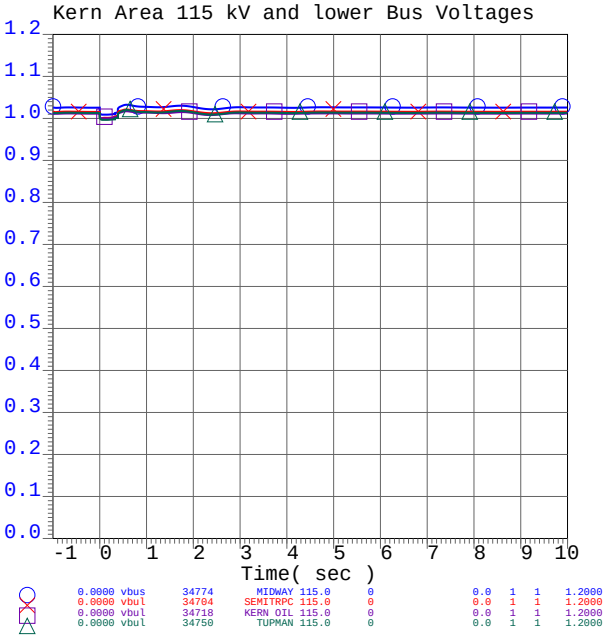
Kern Group Interconnection Area 30 kV Bus Voltages



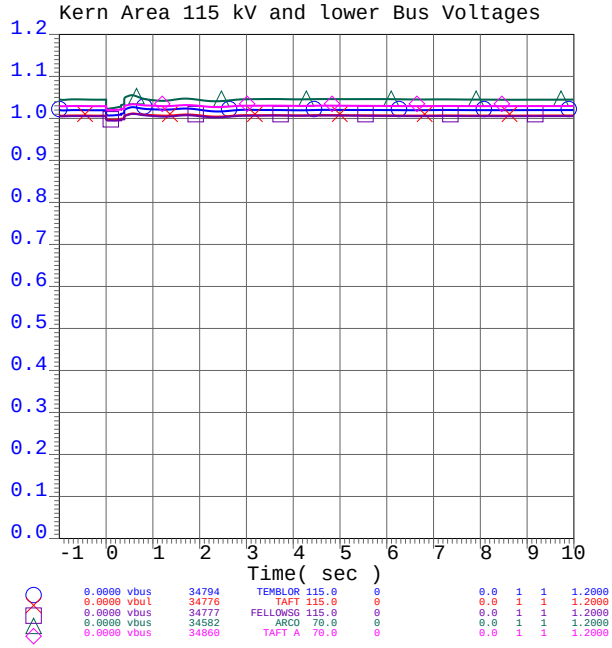
Kern Group Interconnection Area 30 kV Bus Voltages



Kern Area 115 kV and lower Bus Voltages

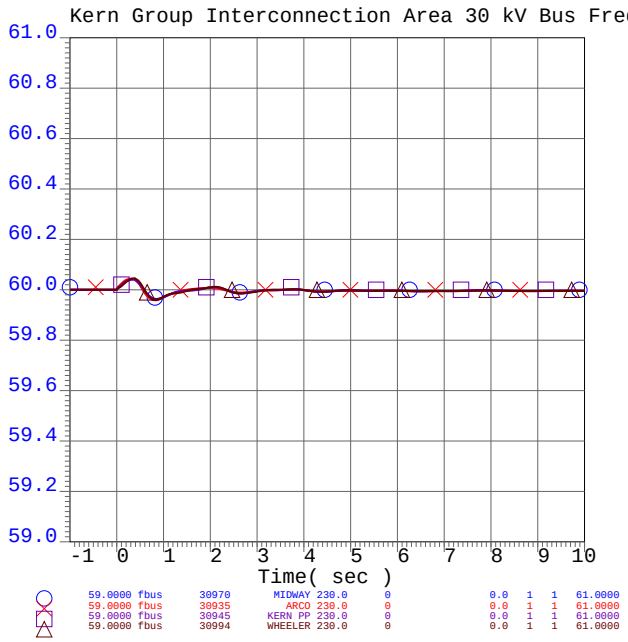


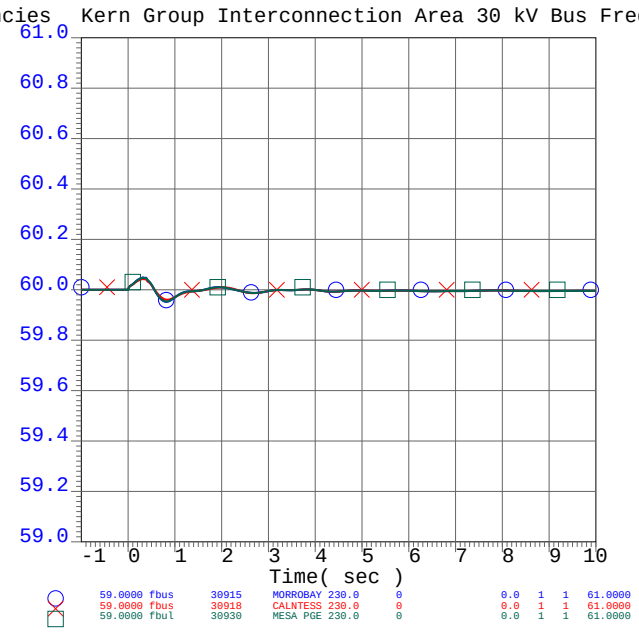
Kern Area 115 kV and lower Bus Voltages

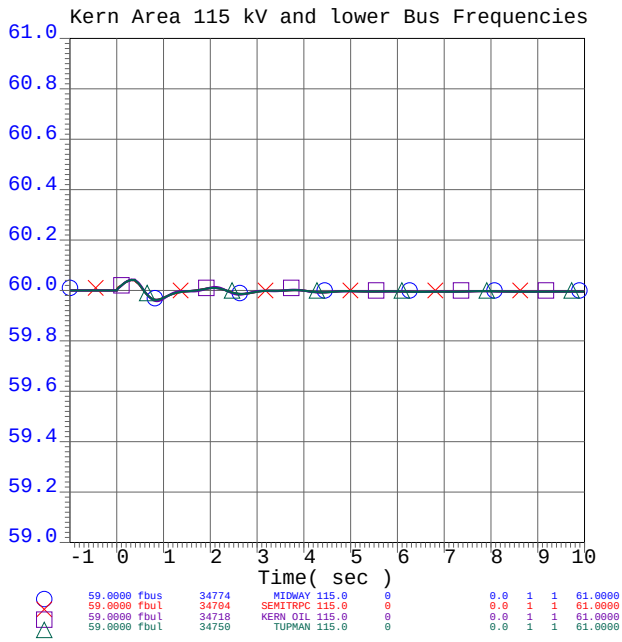


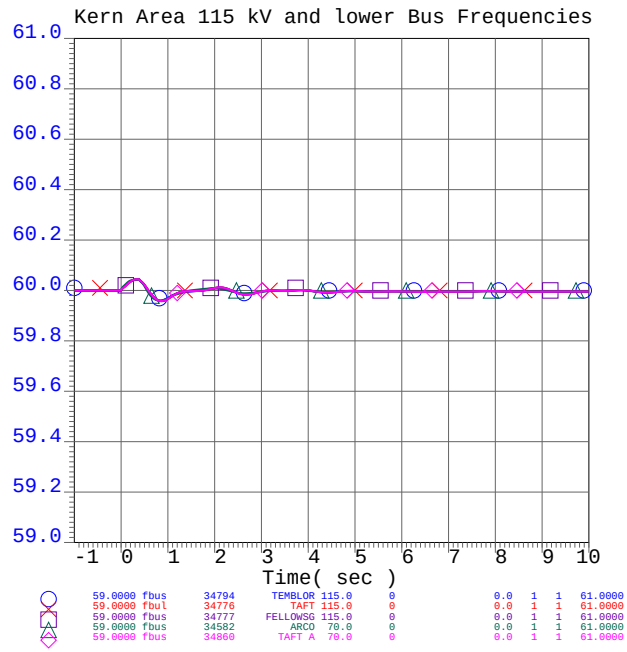
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SLG close-in flt delayed clearing (19 cyc) @ Moss Landing 115 kV
Moss Landing CB 450 (Moss Landing-Green Valley #1) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





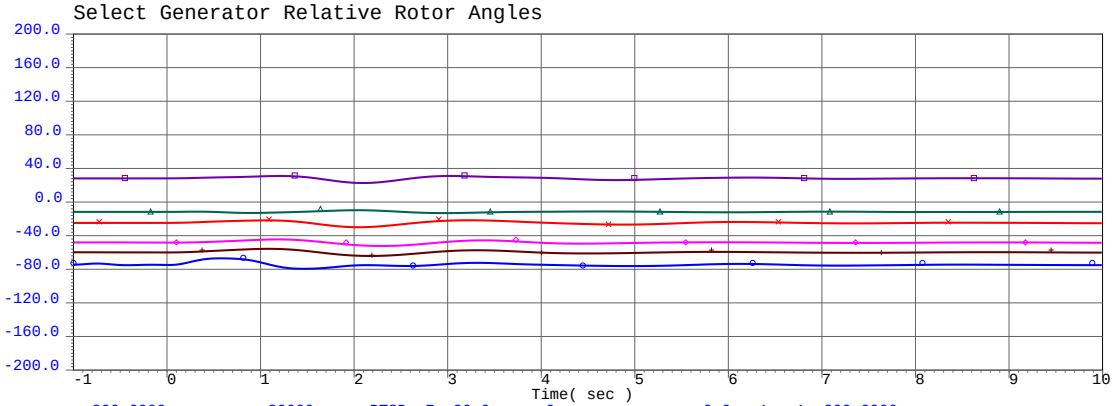




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SLG close-in flt delayed clearing (19 cyc) @ Moss Landing 115 kV
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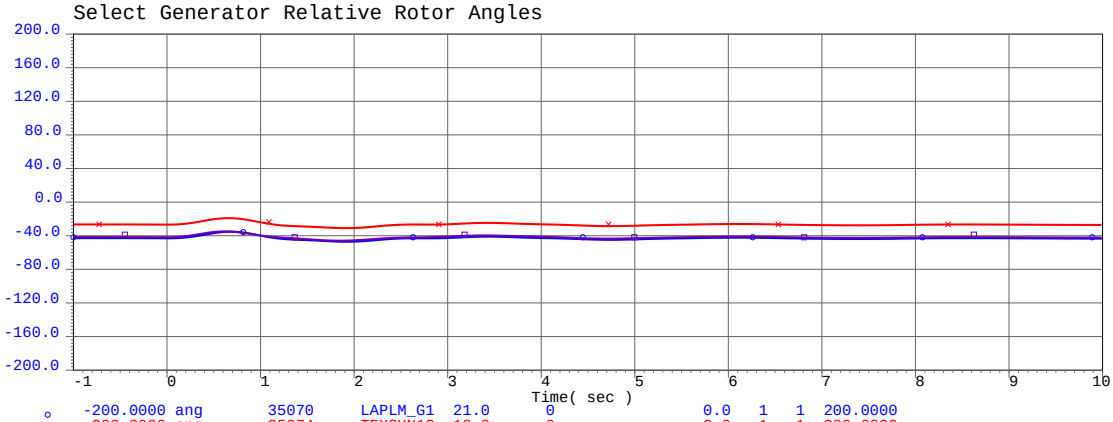
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



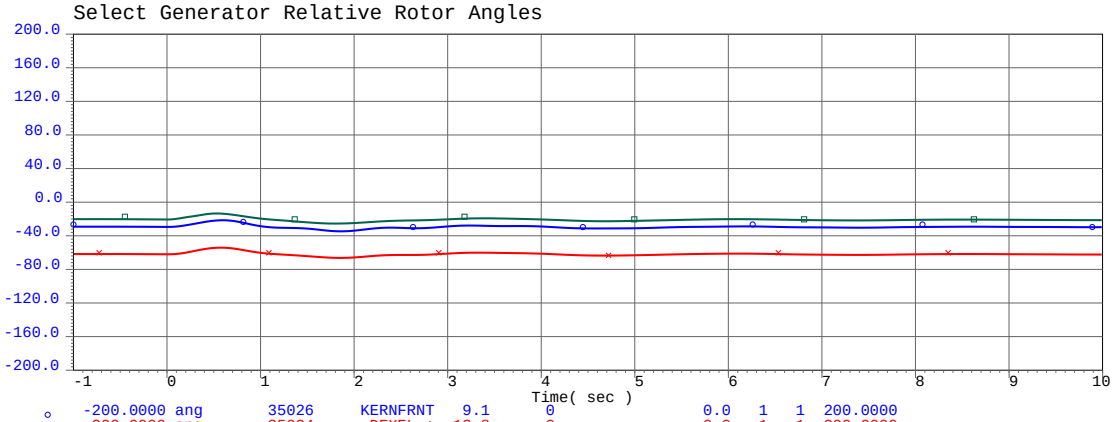
-200.0000 ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000 ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
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-200.0000 ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
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Select Generator Relative Rotor Angles



-200.0000 ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000 ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000 ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

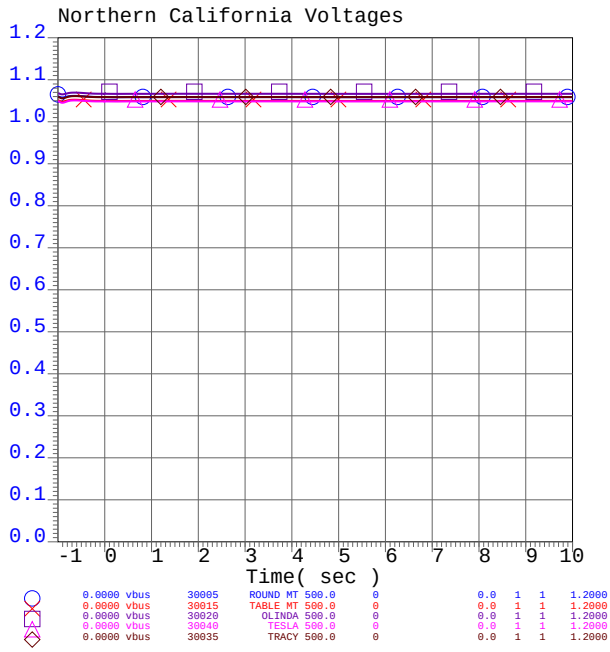
Select Generator Relative Rotor Angles

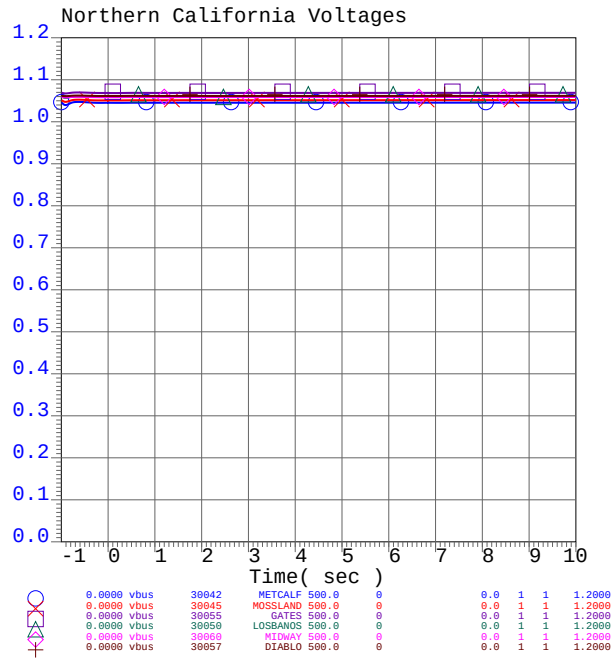


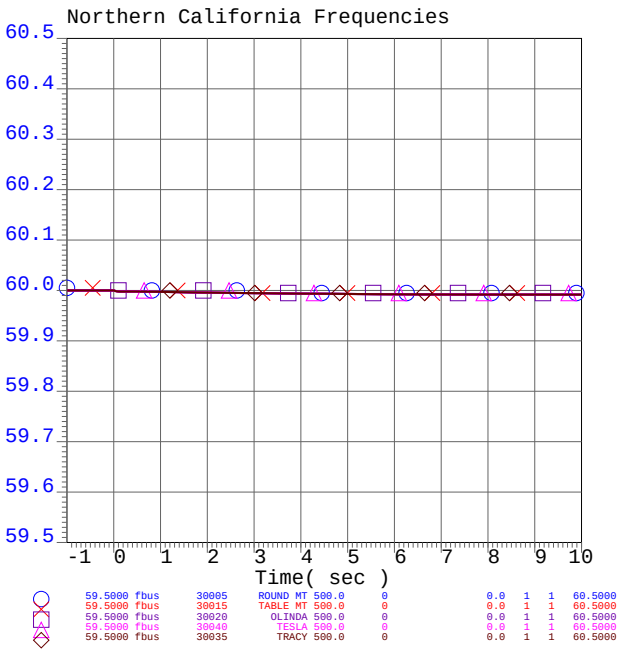
-200.0000 ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000 ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000 ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

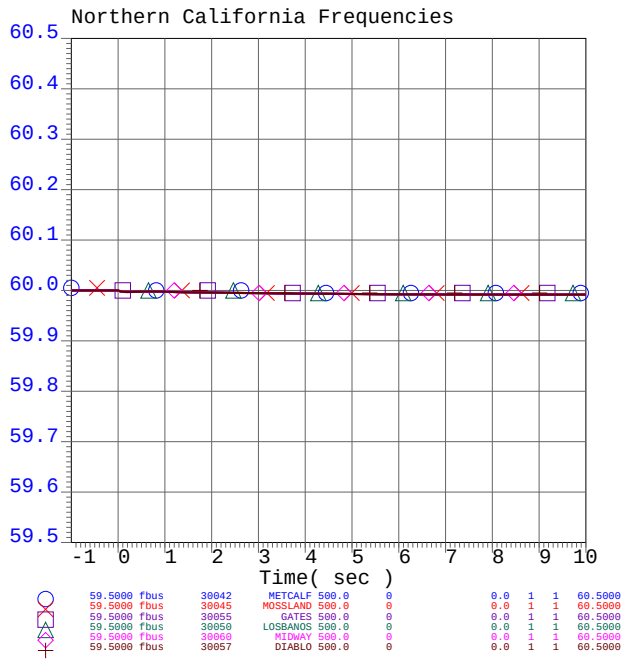
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG close-in flt delayed clearing (19 cyc) @ Moss Landing 115 kV
Moss Landing CB 450 (Moss Landing-Green Valley #1) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



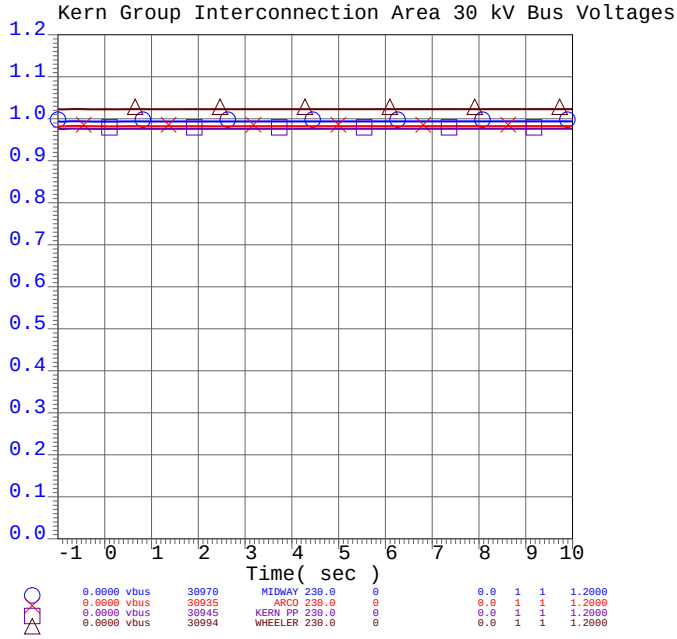


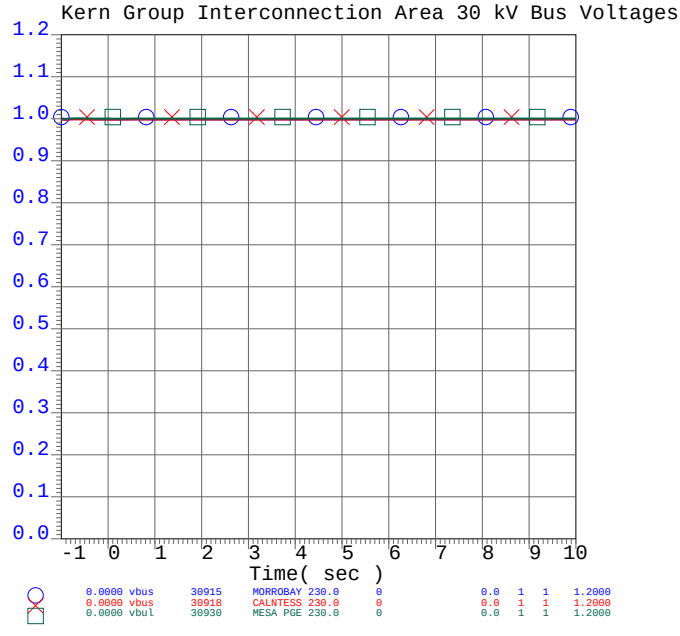


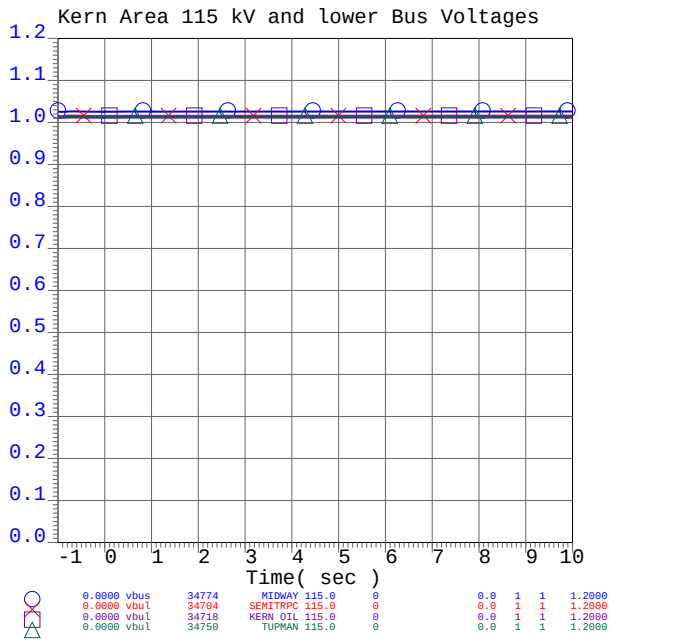


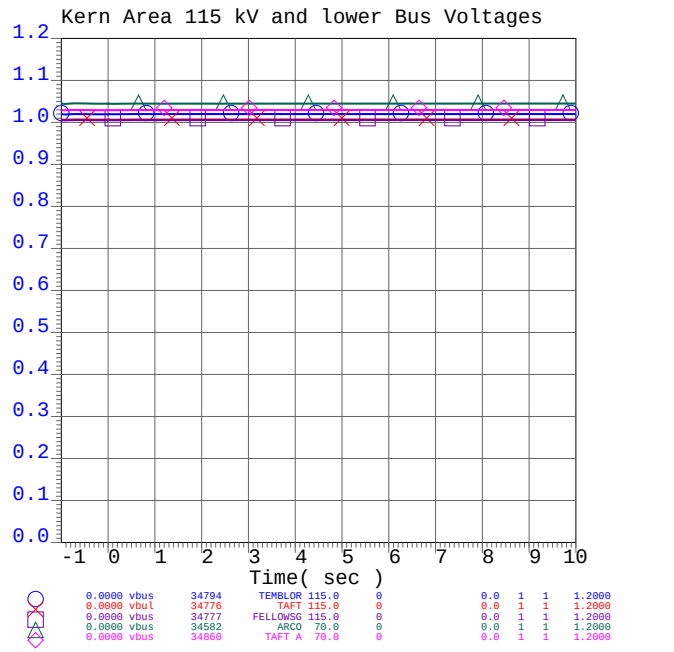
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Pine Flat PH
Pine Flat PH CB760 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



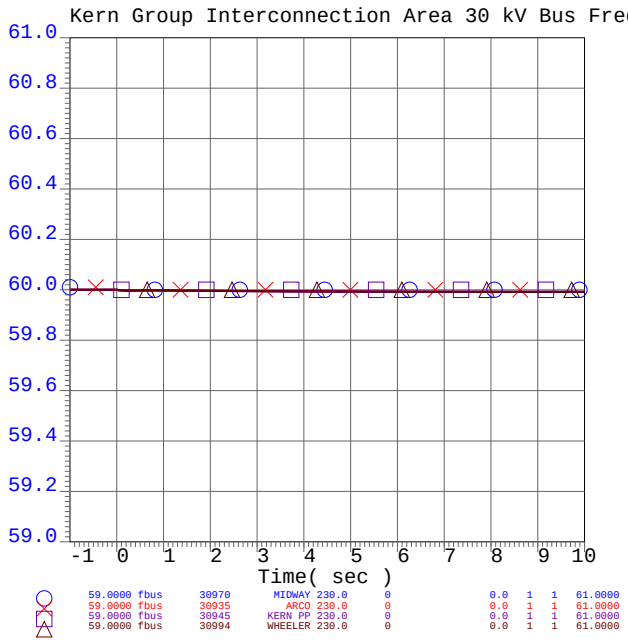


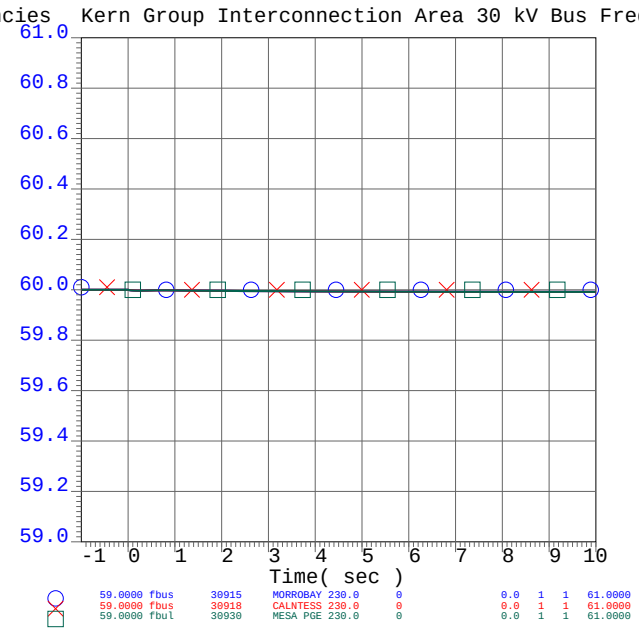


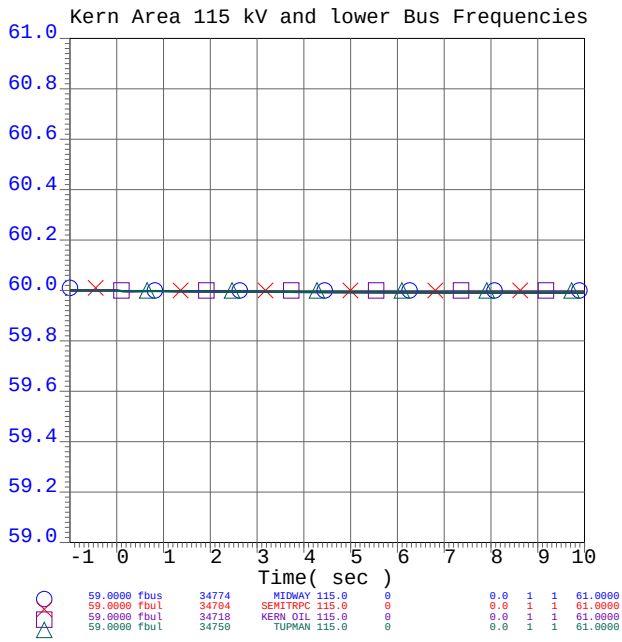


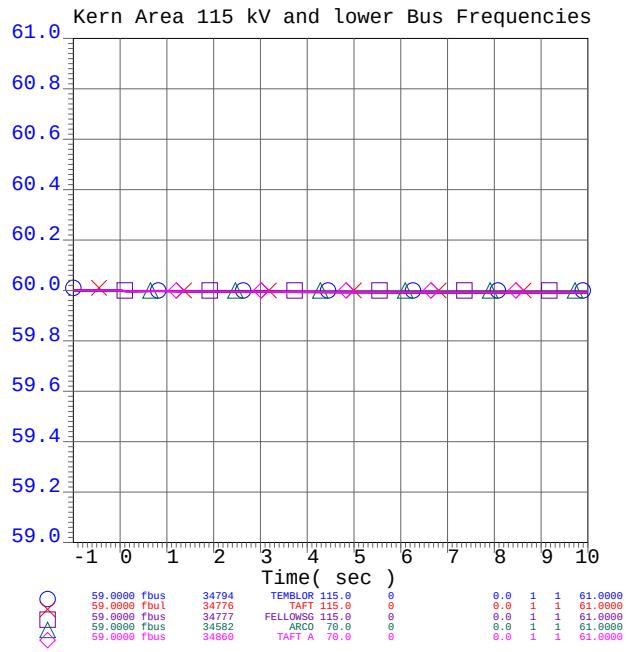
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Pine Flat PH
Pine Flat PH CB760 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





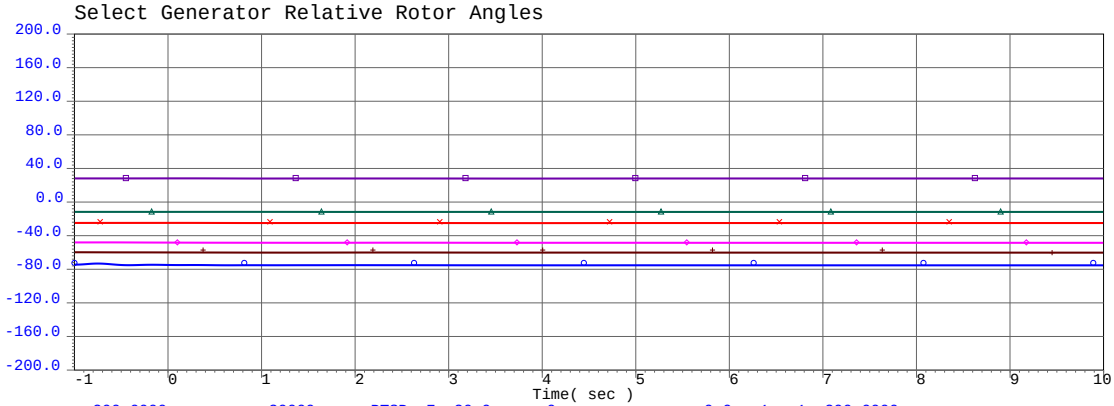




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Pine Flat PH
Pine Flat PH CB760 Fails to Operate

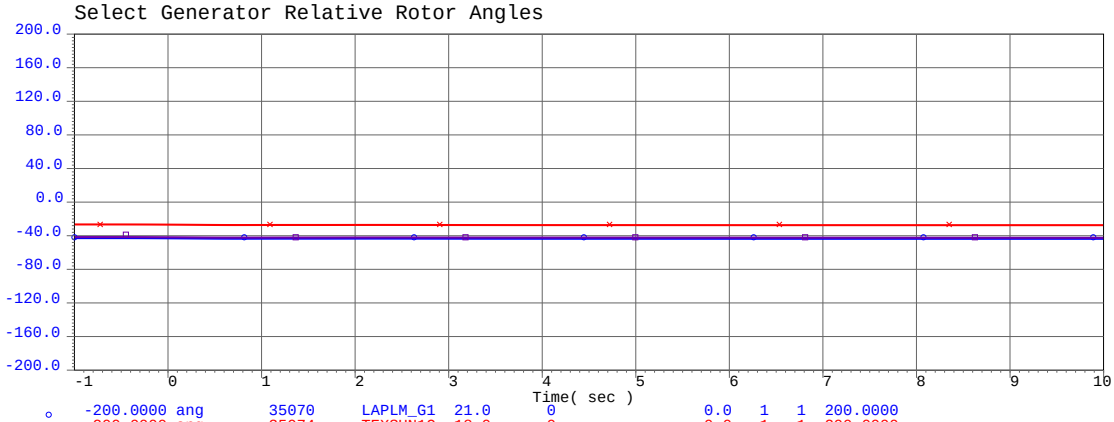
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



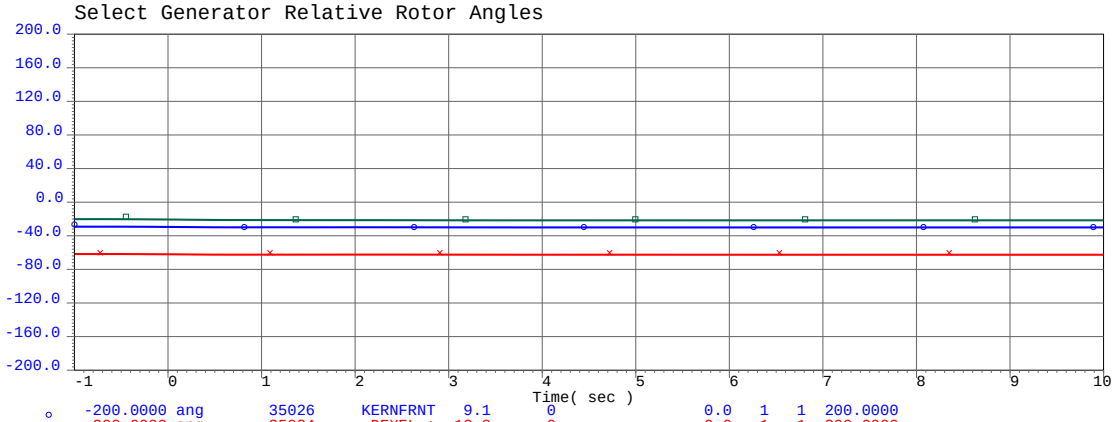
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

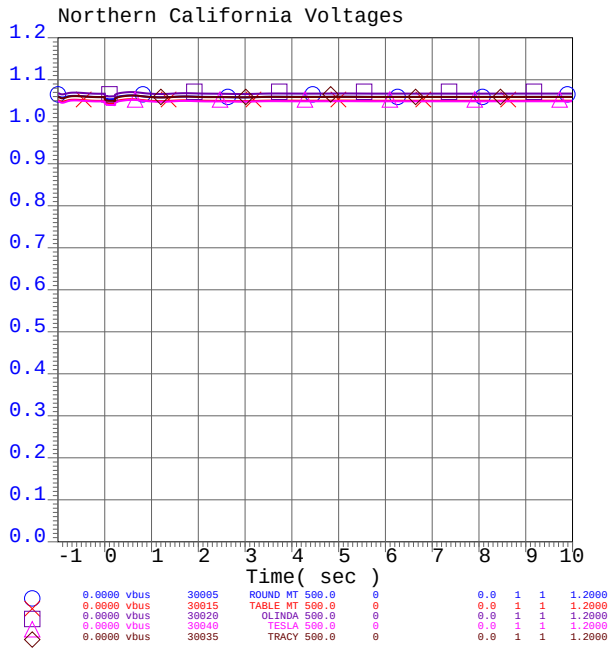
Select Generator Relative Rotor Angles

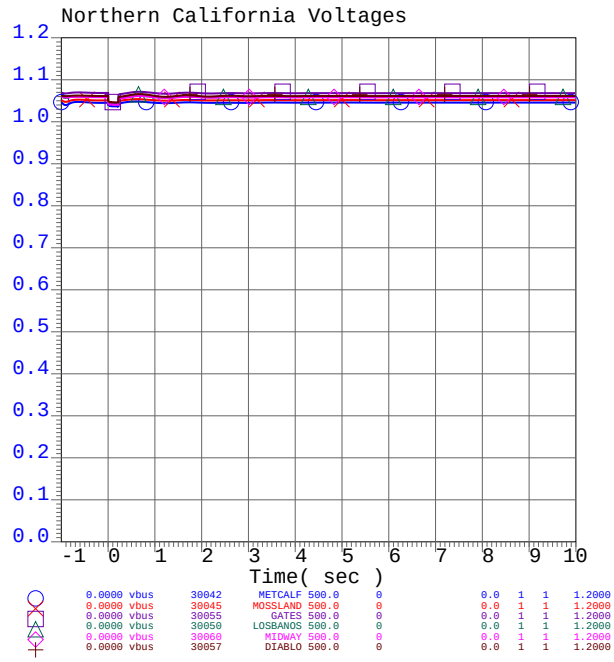


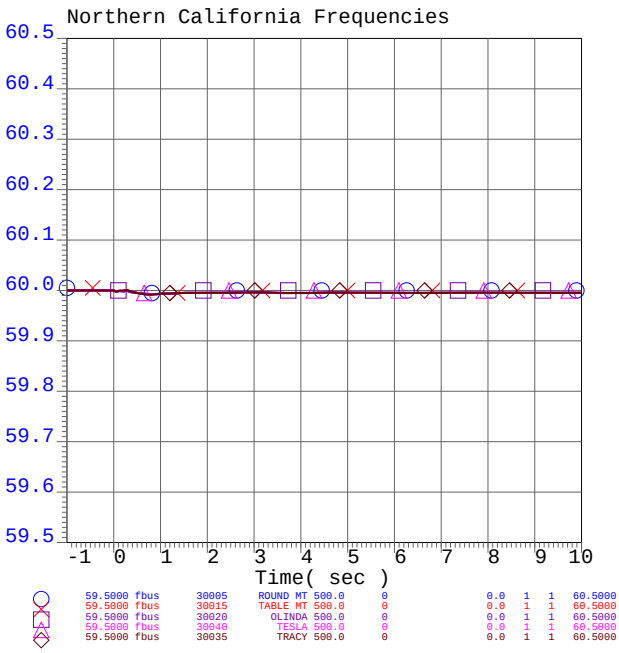
-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

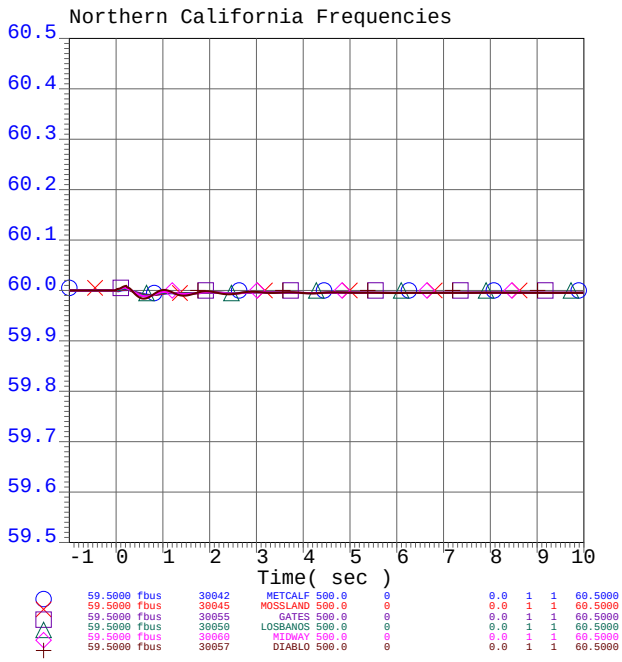
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG High Impedance @ Pine Flat PH
Pine Flat PH CB760 Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



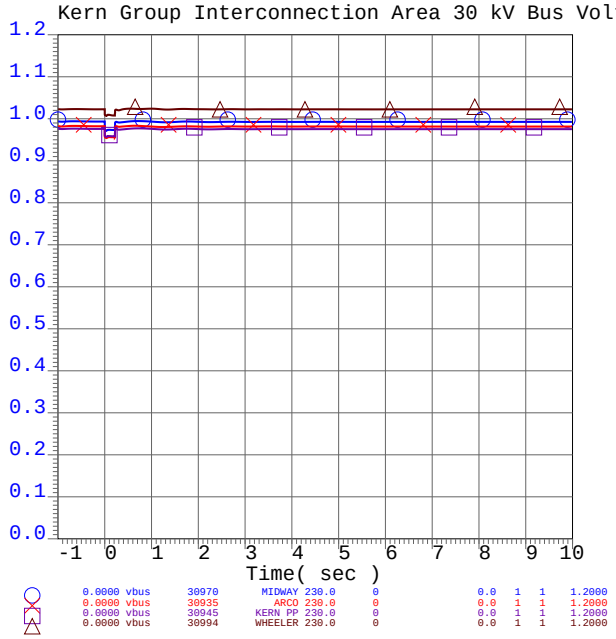


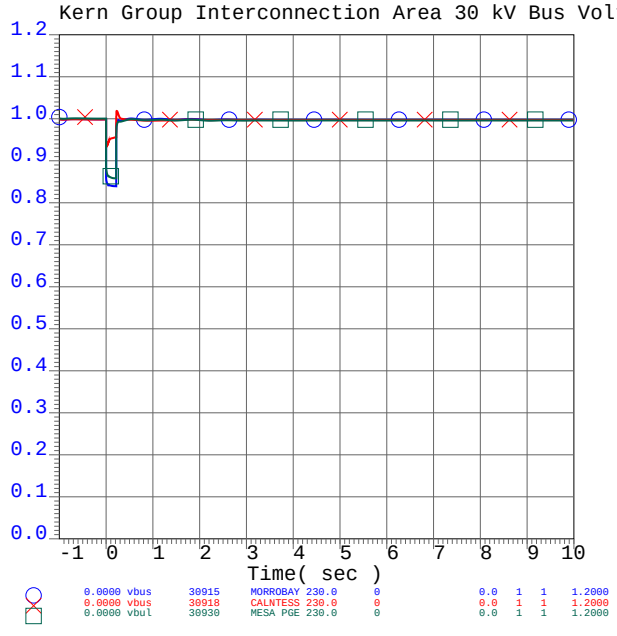


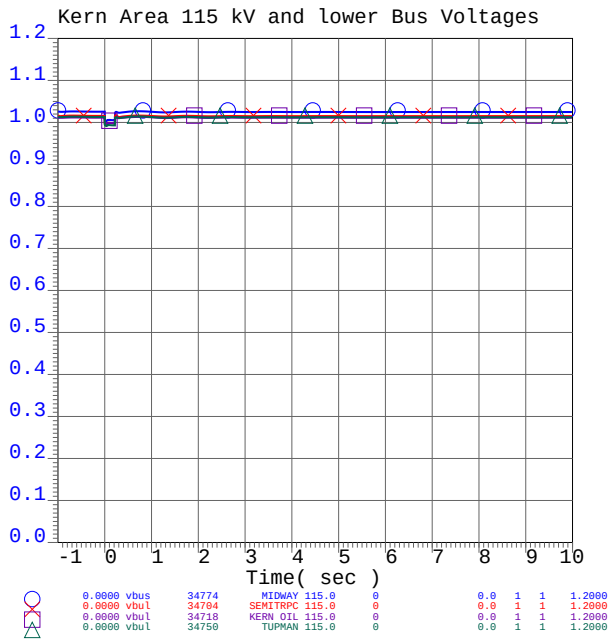


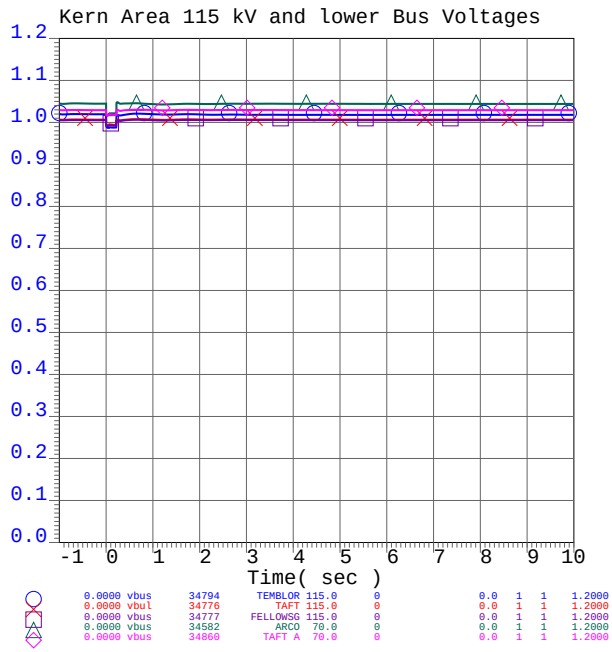
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Templeton 230/70 kV bank
Templeton CB 272 (Templeton-Morro Bay) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES



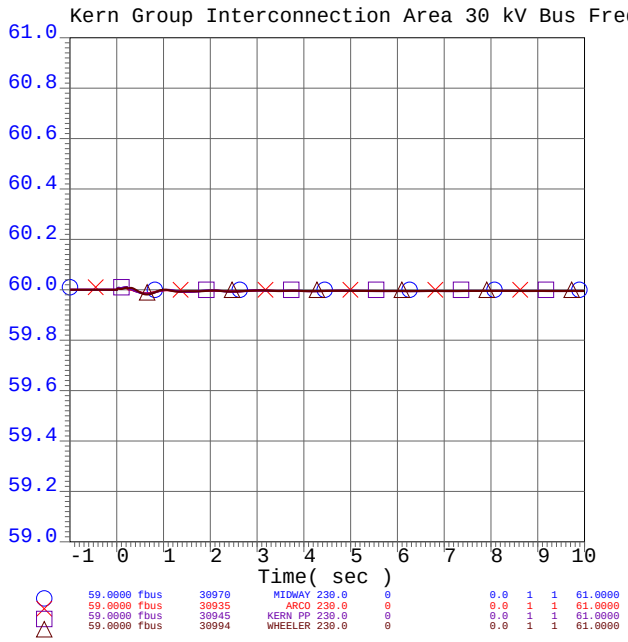


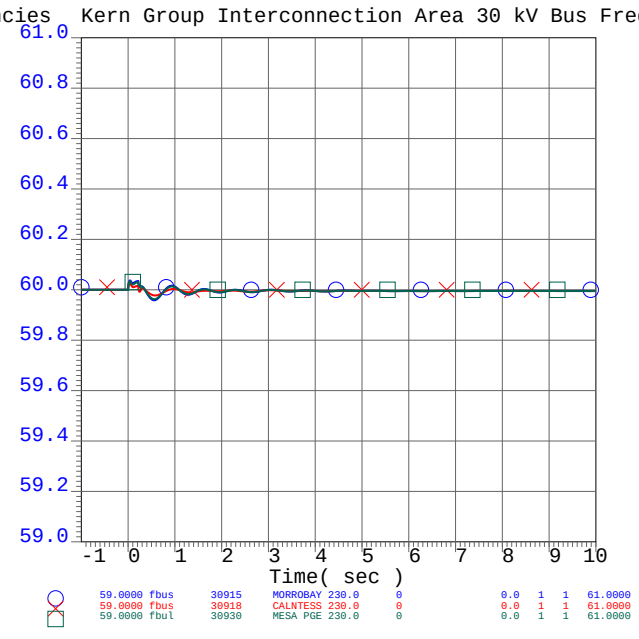


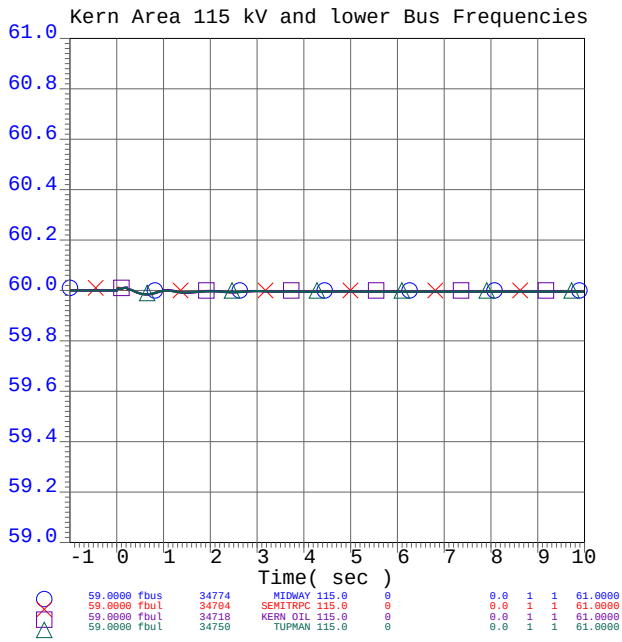


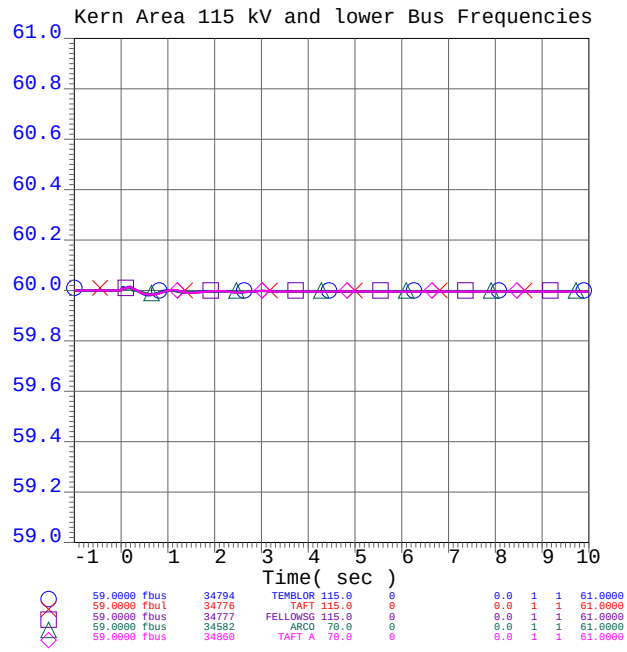
2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Templeton 230/70 kV bank
Templeton CB 272 (Templeton-Morro Bay) Fails to Operate

KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES





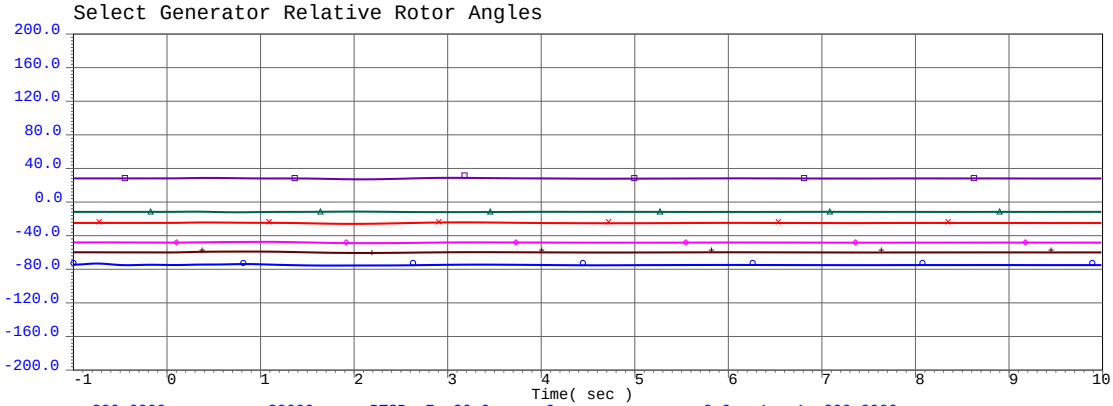




2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Templeton 230/70 kV bank
Templeton CB 272 (Templeton-Morro Bay) Fails to Operate

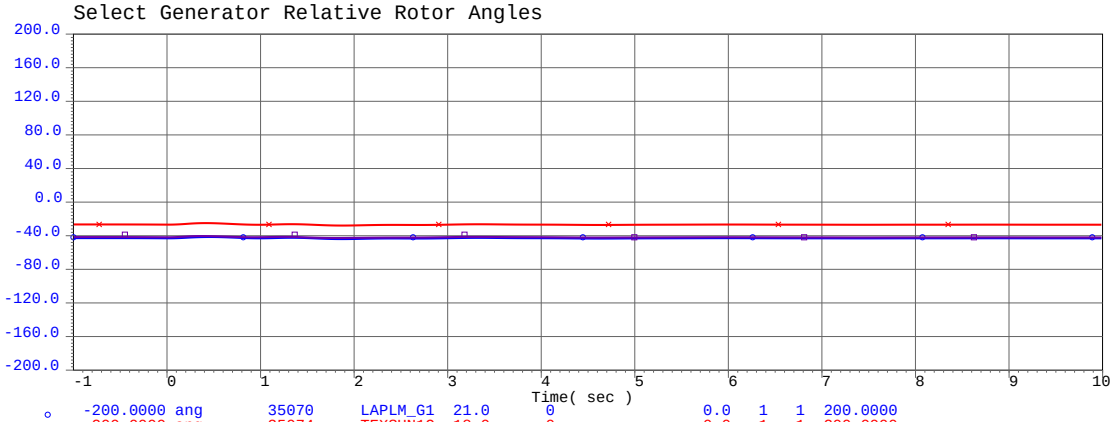
KERN INTERCONNECTION AREA VOLTAGES AND FREQUENCIES

Select Generator Relative Rotor Angles



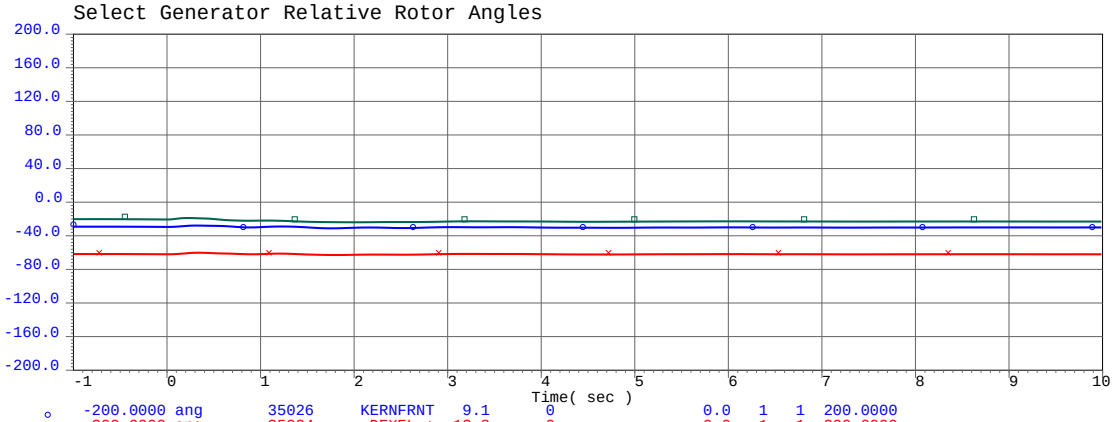
-200.0000	ang	30000	PTSB 7	20.0	0	0.0	1	1	200.0000
-200.0000	ang	40291	COULEE19	15.0	0	0.0	1	1	200.0000
-200.0000	ang	62048	COLSTP 3	26.0	0	0.0	1	1	200.0000
-200.0000	ang	70119	COMAN_1	24.0	0	0.0	C1	1	200.0000
-200.0000	ang	10318	SJUAN_G1	22.0	0	0.0	1	1	200.0000
-200.0000	ang	14931	PALOVRD1	24.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35070	LAPLM_G1	21.0	0	0.0	1	1	200.0000
-200.0000	ang	35074	TEXSUN1G	18.0	0	0.0	1	1	200.0000
-200.0000	ang	35076	ELKHIL1G	18.0	0	0.0	1	1	200.0000

Select Generator Relative Rotor Angles



-200.0000	ang	35026	KERNFRNT	9.1	0	0.0	1	1	200.0000
-200.0000	ang	35024	DEXEL +	13.8	0	0.0	1	1	200.0000
-200.0000	ang	35040	KERNRDGE	9.1	0	0.0	1	1	200.0000

2018 Summer Peak: Cluster 6 Phase 1: Kern Interconnection Area
SLG flt delayed clearing (13 cyc) @ Templeton 230/70 kV bank
Templeton CB 272 (Templeton-Morro Bay) Fails to Operate

Cluster 6 Phase I

Appendix H

Short Circuit Study Results

BUS	ARCO		BELRIDGE		CALLENDER		CHARCA		COPUS		EAST NICHOLAS		EIGHT MILE		FAMOSO		FELLOWS		FULTON		GARDNER		GATES		GOLD HILL		GWF-HNFD STA		HALE BUS 1		HALSEY	
KV	70kV		115kV		115 kV		115kV		70kV		60kV		230kV		115kV		115kV		60kV		70kV		230kV		230kV		115kV		115kV		60kV	
FAULT TYPE	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)
Case 2 : Pre Project On, All C6 On	13816	15934	6152	5611	6283	5404	9588	7460	5316	6045	12488	15298	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51055	51876	17018	15757	8652	8145	4400	4782	7268	6465
Case 1: Pre Project On, ALL C6 OFF	12466	14651	5977	5400	6153	5279	9086	7189	5069	5522	12222	14769	17438	15192	8066	6326	8906	8292	26399	30546	3827	3032	49418	49275	168969	15667	8422	7869	4388	4461	6443	5253
Difference	1350	1283	175	211	130	125	502	271	247	523	266	529	65	46	383	263	465	386	227	325	180	233	1637	2601	-151951	90	230	276	12	321	825	1212
% Increase	9.8%	8.1%	2.8%	3.8%	2.1%	2.3%	5.2%	3.6%	4.6%	8.7%	2.1%	3.5%	0.4%	0.3%	4.5%	4.0%	5.0%	4.4%	0.9%	1.1%	4.5%	7.1%	3.2%	5.0%	-892.9%	0.6%	2.7%	3.4%	0.3%	6.7%	11.4%	18.7%
Case 4: OFF Q943	13,816	15,934	6,153	5,612	6,283	5,405	9,473	7,398	5,317	6,046	12,488	15,298	17,503	15,238	8,298	6,456	9,371	8,679	26,626	30,871	4,008	3,265	51,049	51,874	17,018	15,757	8,652	8,145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	-1	-1	0	-1	115	62	-1	-1	0	0	0	0	151	133	0	-1	0	0	-1	0	6	2	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q945	13816	15934	6152	5611	6283	5404	9588	7460	5316	6045	12488	15298	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51055	51876	17018	15757	8652	8145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q946	13814	15933	6,152	5,611	6283	5404	9586	7460	5,316	6,045	12488	15298	17503	15238	8447	6589	9369	8677	26626	30871	4007	3265	51,034	51,862	17018	15757	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	2	1	0	0	0	0	2	0	0	0	0	0	0	0	2	0	2	1	0	0	0	0	21	14	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q947	13,817	15,937	6151	5613	6,284	5,405	9,397	7,395	5,318	6,048	12,488	15,298	17,503	15,239	8,371	6,567	9,362	8,676	26,626	30,871	4,009	3,266	51040	51869	17,018	15,757	8,652	8,145	4400	4782	7268	6465
Difference: Case 2 - Case 4	-1	-3	1	-2	-1	-1	191	65	-2	-3	0	0	0	-1	78	22	9	2	0	0	-2	-1	15	7	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q951	13816	15934	6,152	5,611	6283	5404	9588	7460	5,316	6,045	12488	15301	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51,055	51,876	17018	15757	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q954	13,809	15,930	6153	5612	6,284	5,405	9,589	7,461	5,317	6,046	12,488	15,298	17,503	15,329	8,449	6,590	9,371	8,679	26,626	30,872	4,008	3,265	50567	50522	17,018	15,757	8,652	8,145	4401	4782	7268	6465
Difference: Case 2 - Case 4	7	4	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	-91	0	-1	0	-1	0	-1	-1	0	488	1354	0	0	0	0	-1	0	0	0
% Increase	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q955	13,816	15,934	6,152	5,611	6,283	5,404	9,588	7,461	5,316	6,045	12,488	15,298	17,503	15,239	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51,055	51,876	17,018	15,757	8,652	8,145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	-1	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q956	13816	15934	6152	5611	6283	5404	9588	7460	5316	6045	12488	15298	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51055	51876	17018	15757	8652	8145	4400	4473	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	309	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	0.0%
Case 4: OFF Q962	13816	15934	6,152	5,611	6283	5404	9588	7460	5,316	6,045	12485	15296	17490	15234	8449	6589	9371	8678	26626	30871	4007	3265	51,055	51,876	16922	15716	8652	8145	4,400	4,782	6,415	5,259
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	3	2	13	4	0	0	0	0	0	0	0	0	0	0	96	41	0	0	0	0	853	1206
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	11.7%	18.7%
Case 4: OFF Q963	13,816	15,934	6152	5611	6,283	5,404	9,588	7,460	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51055	51876	17,018	15,757	8,652	8,145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q964	12723	14946	6,153	5,612	6283	5405	9588	7460	5,317	6,046	12488	15298	17503	15239	8449	6590	9371	8678	26626	30871	4008	3265	50,945	51,814	17018	15757	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	1093	988	-1	-1	0	-1	0	0	-1	-1	0	0	0	-1	0	-1	0	0	0	0	-1	0	110	62	0	0	0	0	0	0	0	0
% Increase	7.9%	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q965	13,816	15,934	6152	5611	6,283	5,404	9,588	7,461	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51014	51828	17,018	15,757	8,566	8,035	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	48	0	0	86	110	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q966	13,816	15,934	6,151	5,611	6,283	5,404	9,584	7,460	5,314	6,044	12,488	15,298	17,503	15,238	8,447	6,590	9,113	8,450	26,626	30,871	4,006	3,265	51,050	51,874	17,018	15,757	8,652	8,145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	1	0	0	0	4	0	2	1	0	0	0	0	2	-1	258	228	0	0	1	0	5	2	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q972	13816	15934	6083	5489	6283	5404	9586	7460	5317	6046	12488	15298	17503	15238	8448	6590	9369	8677	26626	30871	4008	3265	51051	51874	17018	15757	8652	8145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	69	122	0	0	2	0	-1	-1	0	0	0	0	1	-1	2	1	0	0	-1	0	4	2	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	1.1%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q974	13816	15934	6,152	5,611	6283	5404	9588	7460	5,316	6,045	12488	15298	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51,055	51,703	17018	15757	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	173	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q975	13,816	15,934	6152	5611	6,283	5,404	9,588	7,460	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51055	51876	17,018	15,757	8,652	8,145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q976	13816	15934	6,152	5,611	6283	5404	9588	7460	5,316	6,045	12488	15298	17503	15238	8449	6589	9371	8678	26626	30871	4007	3265	51,055	51,876	17018	15753	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q987	13,816	15,934	6150	5610	6,229	5,342	9,588	7,461	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,008	3,265	51036	51862	17,018	15,757	8,652	8,145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	2	1	54	62	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	19	14	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q988	13,816	15,934	6,152	5,612	6,283	5,404	9,588	7,461	5,129	5,584	12,488	15,298	17,503	15,238	8,449	6,589	9,324	8,656	26,626	30,871	4,873	3,065	51,055	51,876	17,018	15,757	8,652	8,145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	-1	0	0	0	-1	187	461	0	0	0	0	0	0	47	22	0	0	-866	200	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	7.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.3%	0.0%	0.0%	-21.6%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q989	13816	15934	6152	5611	6283	5404	9588	7460	5316	6045	12488	15298	17502	15238	8449	6589	9371	8678	26626	30871	4007	3265	51055	51876	17018	15757	8652	8145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q992	13816	15934	6,152	5,611	6283	5404	9588	7460	5,316	6,045	12243	14792	17498	15237	8449	6589	9371	8678	26626	30871	4007	3265	51,055	51,876	16994	15738	8652	8145	4,401	4,782	7,268	6,466
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	245	506	5	1	0	0	0	0	0	0	0	0	0	0	24	19	0	0	-1	0	0	-1
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q997	13,816	15,934	6152	5611	6,283	5,404	9,588	7,460	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,426	30,577	4,007	3,265	51055	51876	17,018	15,757	8,652	8,145	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	294	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1000	13811	15930	6,151	5,611	6283	5404	9582	7458	5,314	6,044	12488	15298	17503	15238	8447	6590	9367	8676	26626	30871	4006	3265	50,989	51,829	17018	15757	8652	8145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	5	4	1	0	0	0	6	2	2	1	0	0	0	0	2	-1	4	2	0	0	1	0	66	47	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1001	13,816	15,934	6152	5611	6,283	5,404	9,588	7,461	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51014	51828	17,018	15,757	8,566	8,035	4400	4782	7268	6465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	48	0	0	86	110	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1002	13,816	15,934	6,152	5,611	6,283	5,404	9,588	7,460	5,316	6,045	12,488	15,298	17,503	15,238	8,449	6,589	9,371	8,678	26,626	30,871	4,007	3,265	51,055	51,876	17,018	15,757	8,652	8,145	4,400	4,782	7,268	6,465
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

BUS	HENRIETTA		HERDLYN		JAMESON		KASSON		KERN OIL		KINGSBURG B D		LAS POSITAS		LERDO		LODI STIG		LOUISE		MANTECA		MARICOPA		MIDSUN		MIDWAY		MIDWAY D		MIDWAY E	
KV	115kV		60kV		115kV		60kV		115kV		115kV		60kV		115kV		230kV		60kV		60kV		70kV		115.kV		115kV		230.kV		230.kV	
FAULT TYPE	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)
Case 2 : Pre Project On, All C6 On	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6012	6039	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Case 1: Pre Project On, ALL C6 OFF	9895	13400	15759	12742	3587	3781	9606	10137	18764	18121	13847	11467	11703	13338	10011	7287	16335	14941	6553	5554	5867	3635	7161	6642	8947	7646	49320	53073	68845	68852	68881	66885
Difference	341	519	61	49	10	247	271	487	594	612	162	101	261	468	523	1546	59	45	222	458	172	200	273	335	605	596	3212	2422	5039	3420	5036	5415
% Increase	3.3%	3.7%	0.4%	0.4%	0.3%	6.1%	2.7%	4.6%	3.1%	3.3%	1.2%	0.9%	2.2%	3.4%	5.0%	17.5%	0.4%	0.3%	3.3%	7.6%	2.8%	5.2%	3.7%	4.8%	6.3%	7.2%	6.1%	4.4%	6.8%	4.7%	6.8%	7.5%
Case 4: OFF Q943	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,157	18,462	14,009	11,568	11,964	13,806	10,217	7,415	16,394	14,986	6,775	6,013	6,040	3,835	7,435	6,978	9,552	8,243	52,415	55,395	73,727	72,143	73,804	72,173
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	201	271	0	0	0	0	317	1418	0	0	0	-1	-1	0	-1	-1	0	-1	117	100	157	129	113	127
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%	3.0%	16.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Case 4: OFF Q945	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6012	6039	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q946	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,349	18,727	14,009	11,568	11,964	13,806	10,532	8,832	16,394	14,986	6,775	6,013	6,039	3,835	7,434	6,977	9,550	8,242	52,400	55,393	73,605	71,918	73,637	71,946
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	9	6	0	0	0	0	2	1	0	0	0	-1	0	0	0	0	2	0	132	102	279	354	280	354
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	0.4%	0.5%	0.4%	0.5%
Case 4: OFF Q947	10236	13919	15820	12792	3597	4028	9877	10624	19336	18723	14009	11568	11964	13806	10507	8826	16394	14986	6775	6013	6040	3835	7436	6980	9516	8211	51882	54706	73564	71910	73596	71938
Difference: Case 2 - Case 4	0	0	0	-1	0	0	0	0	22	10	0	0	0	0	27	7	0	0	0	-1	-1	0	-2	-3	36	31	650	789	320	362	321	362
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	1.2%	1.4%	0.4%	0.5%	0.4%	0.5%
Case 4: OFF Q951	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,725	13,363	10,534	8,833	16,394	14,986	6,775	6,013	6,040	3,835	7,434	6,977	9,526	8,213	52,532	55,495	73,884	72,272	73,917	72,300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	239	443	0	0	0	0	0	-1	-1	0	0	0	26	29	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q954	10227	13909	15821	12792	3598	4028	9877	10624	19358	18734	14006	11568	11965	13806	10534	8834	16395	14986	6775	6013	6040	3836	7435	6978	9526	8214	52514	55483	73689	72119	73794	72220
Difference: Case 2 - Case 4	9	10	-1	-1	-1	0	0	0	0	-1	3	0	-1	0	0	-1	-1	0	0	-1	-1	-1	-1	-1	26	28	18	12	195	153	123	80
% Increase	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.3%	0.2%	0.2%	0.1%
Case 4: OFF Q955	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,013	6,039	3,835	7,434	6,978	9,552	8,242	52,533	55,496	73,884	72,272	73,917	72,300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	-1	-1	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q956	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6012	6039	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q962	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,382	14,981	6,775	6,013	6,040	3,835	7,434	6,977	9,552	8,242	52,532	55,495	73,884	72,272	73,917	72,300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	5	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q963	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6012	6039	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q964	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,013	6,039	3,835	7,435	6,978	9,552	8,243	52,522	55,489	73,794	72,224	73,827	72,252
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	-1	0	-1	10	6	90	48	90	48
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%
Case 4: OFF Q965	10119	13733	15820	12791	3597	4028	9877	10624	19358	18733	13973	11548	11964	13806	10534	8833	16394	14986	6775	6013	6039	3835	7434	6977	9552	8242	52532	55495	73881	72270	73914	72298
Difference: Case 2 - Case 4	117	186	0	0	0	0	0	0	0	0	36	20	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	3	2	3	2
% Increase	1.1%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q966	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,356	18,732	14,009	11,568	11,964	13,806	10,533	8,833	16,394	14,986	6,775	6,013	6,040	3,835	7,416	6,969	9,149	7,785	51,992	55,054	73,658	72,111	73,690	72,139
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	-1	-1	0	18	8	403	457	540	441	226	161	227	161
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	4.2%	5.5%	1.0%	0.8%	0.3%	0.2%	0.3%	0.2%
Case 4: OFF Q972	10236	13919	15820	12791	3597	4028	9877	10624	19357	18732	14009	11568	11964	13806	10533	8833	16394	14986	6775	6013	6039	3835	7434	6978	9550	8242	52443	55371	73842	72216	73874	72244
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	-1	0	0	0	-1	2	0	89	124	42	56	43	56
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
Case 4: OFF Q974	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,012	6,039	3,835	7,434	6,977	9,552	8,242	52,532	55,495	73,884	72,270	73,917	72,298
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q975	10236	13919	15820	12791	3597	4028	9862	10613	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6769	6010	6034	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	15	11	0	0	0	0	0	0	0	0	0	0	6	2	5	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q976	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,012	6,039	3,835	7,434	6,977	9,552	8,242	52,532	55,495	73,884	72,272	73,917	72,300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q987	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6013	6039	3835	7434	6978	9552	8242	52514	55483	73859	72244	73892	72272
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	-1	0	0	18	12	25	28	25	28
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q988	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,357	18,732	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,012	6,039	3,835	7,272	6,734	9,520	8,234	52,484	55,455	73,849	72,239	73,882	72,267
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	162	243	32	8	48	40	35	33	35	33
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	3.5%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q989	10236	13919	15820	12791	3597	4028	9846	10174	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6576	5571	5887	3645	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	31	450	0	0	0	0	0	0	0	0	0	0	199	441	152	190	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	7.3%	2.5%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q992	10,236	13,919	15,821	12,792	3,598	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,390	14,984	6,775	6,013	6,040	3,835	7,434	6,977	9,552	8,242	52,533	55,496	73,884	72,272	73,918	72,300
Difference: Case 2 - Case 4	0	0	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	4	2	0	-1	-1	0	0	0	0	0	-1	-1	0	0	-1	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q997	10236	13919	15820	12791	3597	4028	9877	10624	19358	18733	14009	11568	11964	13806	10534	8833	16394	14986	6775	6013	6040	3835	7434	6977	9552	8242	52532	55495	73884	72272	73917	72300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1000	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,331	18,717	14,009	11,568	11,964	13,806	10,527	8,831	16,394	14,986	6,775	6,013	6,040	3,835	7,434	6,977	9,547	8,240	52,127	54,972	71,804	69,871	71,841	69,905
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	27	16	0	0	0	0	7	2	0	0	0	-1	-1	0	0	0	5	2	405	523	2080	2401	2076	2395
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.8%	0.9%	2.8%	3.3%	2.8%	3.3%
Case 4: OFF Q1001	10119	13733	15820	12791	3597	4028	9877	10624	19358	18733	13973	11548	11964	13806	10534	8833	16394	14986	6775	6013	6039	3835	7434	6977	9552	8242	52532	55495	73881	72270	73914	72298
Difference: Case 2 - Case 4	117	186	0	0	0	0	0	0	0	0	36	20	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	3	2	3	2
% Increase	1.1%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1002	10,236	13,919	15,820	12,791	3,597	4,028	9,877	10,624	19,358	18,733	14,009	11,568	11,964	13,806	10,534	8,833	16,394	14,986	6,775	6,012	6,039	3,835	7,434	6,977	9,552	8,242	52,532	55,495	73,884	72,272	73,917	72,300
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

BUS	MIDWAY F		MORRO BAY #2		MONTE RIO		NATIONS PETROLEUM		NEWMAN		OCEANO		OLIVE		PITTSBURG D		PLACER		Q877 SW Station		REEDLEY		RIO OSO		SALADO		SAN LUIS OBISPO		SANGER N		SEMITROPIC E	
KV	230kV		230kV		60kV		70kV		60kV		115kV		115kV		115kV		60kV		230.kV		115kV		230kV		60kV		115kV		115kV		115kV	
FAULT TYPE	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)
Case 2 : Pre Project On, All C6 On	73811	72198	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8489	10835	9685	8890	26940	24392	14136	12842
Case 1: Pre Project On, ALL C6 OFF	68789	66799	17297	20921	2287	2450	3973	3110	3109	3204	5758	5310	5320	4892	56640	65985	11460	13604	10439	10303	10413	11256	21635	18661	8185	10358	9443	8342	26742	24243	13275	12135
Difference	5022	5399	271	308	53	65	1556	2328	226	276	128	141	860	2187	80	89	773	635	184	917	904	-791	150	323	304	477	242	548	198	149	861	707
% Increase	6.8%	7.5%	1.5%	1.5%	2.3%	2.6%	28.1%	42.8%	6.8%	7.9%	2.2%	2.6%	13.9%	30.9%	0.1%	0.1%	6.3%	4.5%	1.7%	8.2%	8.0%	-7.6%	0.7%	1.7%	3.6%	4.4%	2.5%	6.2%	0.7%	0.6%	6.1%	5.5%
Case 4: OFF Q943	73,698	72,070	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,887	5,452	6,177	7,078	56,720	66,075	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,836	9,685	8,891	26,940	24,392	14,035	12,787
Difference: Case 2 - Case 4	113	128	0	0	0	0	0	0	0	0	-1	-1	3	1	0	-1	0	0	0	0	0	0	0	0	0	-1	0	-1	0	0	101	55
% Increase	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.4%
Case 4: OFF Q945	73811	72198	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8489	10835	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q946	73,847	71,717	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,179	7,078	56,720	66,074	12,233	14,239	10,624	11,219	11,317	10,465	21,785	18,984	8,489	10,836	9,684	8,890	26,940	24,392	14,129	12,839
Difference: Case 2 - Case 4	-36	481	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	-1	1	0	0	0	0	0	-1	1	0	0	0	7	3
% Increase	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q947	73490	71838	17568	21229	2340	2515	5529	5438	3335	3480	5887	5452	5436	4992	56720	66075	12233	14239	10624	11221	11317	10465	21785	18984	8489	10836	9686	8892	26940	24392	13716	12474
Difference: Case 2 - Case 4	321	360	0	0	0	0	0	0	0	0	-1	-1	744	2087	0	-1	0	0	-1	-1	0	0	0	0	0	-1	-1	-2	0	0	420	368
% Increase	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%	29.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	2.9%
Case 4: OFF Q951	73,811	72,198	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,714	66,070	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,836	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	4	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q954	73762	72193	17542	21209	2340	2515	5529	5438	3336	3480	5887	5452	6180	7079	56721	66075	12234	14239	10584	11194	11317	10465	21785	18985	8490	10836	9685	8891	26925	24386	14136	12843
Difference: Case 2 - Case 4	49	5	26	20	0	0	0	0	-1	0	-1	-1	0	0	-1	-1	-1	0	39	26	0	0	0	-1	-1	-1	0	-1	15	6	0	-1
% Increase	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Case 4: OFF Q955	73,810	72,199	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,075	12,233	14,239	10,426	10,292	11,317	10,465	21,785	18,984	8,489	10,836	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	197	928	0	0	0	0	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q956	73811	72198	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8489	10835	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q962	73,811	72,198	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,074	11,478	13,624	10,623	11,220	11,317	10,465	21,714	18,958	8,489	10,836	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	755	615	0	0	0	0	71	26	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.2%	4.3%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q963	73811	72198	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8489	10835	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q964	73,720	72,151	17,568	21,229	2,340	2,515	4,043	3,163	3,335	3,480	5,887	5,452	6,180	7,079	56,720	66,075	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,836	9,685	8,891	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	91	47	0	0	0	0	1486	2275	0	0	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	-1	0	-1	0	0	0	0
% Increase	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	26.9%	41.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q965	73808	72197	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10622	11219	11314	10464	21785	18984	8489	10836	9685	8890	26920	24382	14136	12842
Difference: Case 2 - Case 4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	-1	0	0	20	10	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Case 4: OFF Q966	73,585	72,037	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,452	6,178	7,078	56,720	66,075	12,234	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,835	9,685	8,891	26,940	24,392	14,118	12,834
Difference: Case 2 - Case 4	226	161	0	0	0	0	0	0	0	0	0	-1	2	1	0	-1	-1	0	0	0	0	0	0	0	0	0	0	-1	0	0	18	8
% Increase	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Case 4: OFF Q972	73768	72143	17556	21219	2340	2515	5529	5438	3335	3480	5886	5451	6179	7078	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8489	10836	9679	8888	26940	24392	14127	12838
Difference: Case 2 - Case 4	43	55	12	10	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	-1	6	2	0	0	9	4
% Increase	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%
Case 4: OFF Q974	73,811	72,197	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,074	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,835	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q975	73811	72198	17568	21229	2340	2515	5529	5438	3116	3211	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8224	10404	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	219	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265	431	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q976	73,811	72,198	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,074	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,763	8,489	10,835	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	221	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q987	73785	72170	17508	21150	2340	2515	5529	5438	3335	3480	5828	5373	6180	7079	56720	66074	12233	14239	10614	11214	11317	10465	21785	18984	8489	10836	9560	8440	26940	24392	14135	12842
Difference: Case 2 - Case 4	26	28	60	79	0	0	0	0	0	0	58	78	0	0	0	0	0	0	9	6	0	0	0	0	0	-1	125	450	0	0	1	0
% Increase	0.0%	0.0%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	5.1%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q988	73,775	72,166	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,074	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,836	9,685	8,890	26,940	24,392	14,135	12,842
Difference: Case 2 - Case 4	36	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	1	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q989	73811	72198	17568	21229	2340	2515	5529	5438	3335	3482	5886	5451	6180	7079	56720	66074	12233	14239	10623	11220	11317	10465	21785	18984	8471	10815	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	20	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q992	73,811	72,198	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,075	12,231	14,238	10,623	11,220	11,317	10,465	21,740	18,937	8,489	10,836	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	2	1	0	0	0	0	45	47	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q997	73811	72198	17568	21229	2289	2453	5529	5438	3335	3480	5886	5451	6180	7079	56716	66071	12233	14239	10623	11220	11317	10465	21785	18984	8489	10836	9685	8890	26940	24392	14136	12842
Difference: Case 2 - Case 4	0	0	0	0	51	62	0	0	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	2.2%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1000	71,743	69,813	17,559	21,221	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,178	7,077	56,720	66,074	12,233	14,239	10,621	11,218	11,317	10,465	21,785	18,984	8,489	10,836	9,683	8,890	26,940	24,392	14,116	12,832
Difference: Case 2 - Case 4	2068	2385	9	8	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2	0	0	0	0	0	-1	2	0	0	0	20	10
% Increase	2.8%	3.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Case 4: OFF Q1001	73808	72197	17568	21229	2340	2515	5529	5438	3335	3480	5886	5451	6180	7079	56720	66074	12233	14239	10622	11219	11314	10464	21785	18984	8489	10836	9685	8890	26920	24382	14136	12842
Difference: Case 2 - Case 4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	-1	0	0	20	10	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Case 4: OFF Q1002	73,811	72,198	17,568	21,229	2,340	2,515	5,529	5,438	3,335	3,480	5,886	5,451	6,180	7,079	56,720	66,074	12,233	14,239	10,623	11,220	11,317	10,465	21,785	18,984	8,489	10,835	9,685	8,890	26,940	24,392	14,136	12,842
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

BUS	SMYRNA		SOUTH PH		Switching Station built by Q639		Switching Station built by Q581		TABLE MOUNTAIN D		TAFT		TEMBLOR		TWISSELMAN		VACA DIXON		VACAVILLE B1		VASCO		VOLTA		WHEELER RIDGE	
KV	115kV		60kV		60kV		115kV		230kV		115 kV		115kV		70kV		115 kV		115 kV		60kV		60kV		230 kV	
FAULT TYPE	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)	3LG (A)	1LG (A)
Case 2 : Pre Project On, All C6 On	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Case 1: Pre Project On, ALL C6 OFF	8133	6461	4123	3715	3977	4650	8604	8469	29137	30863	10285	11606	10532	10169	5502	5196	50162	51198	12707	9206	9771	9069	3773	3443	7481	6491
Difference	951	1162	5	5	341	749	352	1045	94	98	399	414	305	475	1414	1460	171	173	37	45	265	789	5	4	395	336
% Increase	10.5%	15.2%	0.1%	0.1%	7.9%	13.9%	3.9%	11.0%	0.3%	0.3%	3.7%	3.4%	2.8%	4.5%	20.4%	21.9%	0.3%	0.3%	0.3%	0.5%	2.6%	8.0%	0.1%	0.1%	5.0%	4.9%
Case 4: OFF Q943	9,073	7,621	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,683	12,020	10,837	10,645	6,917	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,875	6,827
Difference: Case 2 - Case 4	11	2	0	0	0	0	0	0	0	0	1	0	0	-1	-1	0	0	0	0	0	0	0	0	0	1	0
% Increase	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q945	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q946	9,082	7,622	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,682	12,018	10,835	10,643	6,916	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,715	6,673
Difference: Case 2 - Case 4	2	1	0	0	0	0	0	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0	0	0	161	154
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.3%
Case 4: OFF Q947	8336	6602	4128	3720	4318	5399	8956	9514	29231	30961	10671	12021	10824	10641	6917	6657	50334	51371	12744	9251	10036	9858	3778	3447	7875	6828
Difference: Case 2 - Case 4	748	1021	0	0	0	0	0	0	0	0	13	-1	13	3	-1	-1	-1	0	0	0	0	0	0	0	1	-1
% Increase	8.2%	13.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q951	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,684	12,020	10,837	10,644	6,916	6,656	50,330	51,369	12,744	9,251	9,789	9,085	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	247	773	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	7.8%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q954	9084	7624	4128	3720	4318	5399	8952	9513	29231	30961	10684	12021	10837	10645	6917	6658	50333	51371	12744	9252	10037	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	-1	0	0	0	0	4	1	0	0	0	-1	0	-1	-1	-2	0	0	0	-1	-1	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q955	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,684	12,020	10,837	10,645	6,917	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q956	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50333	51362	12744	9232	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	19	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q962	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,225	30,958	10,684	12,020	10,837	10,644	6,916	6,656	50,331	51,370	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q963	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q964	9,084	7,624	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,684	12,020	10,837	10,645	5,604	5,287	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	-1	0	0	0	0	0	0	0	0	0	0	0	-1	1312	1369	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.0%	20.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q965	9084	7623	4128	3720	4318	5399	8819	9047	29231	30961	10684	12020	10837	10645	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	137	467	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q966	9,078	7,622	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,544	11,900	10,831	10,642	6,917	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,875	6,827
Difference: Case 2 - Case 4	6	1	0	0	0	0	0	0	0	0	140	120	6	2	-1	0	0	0	0	0	0	0	0	0	1	0
% Increase	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q972	9081	7623	4128	3720	4318	5399	8956	9514	29231	30961	10681	12018	10726	10345	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7875	6827
Difference: Case 2 - Case 4	3	0	0	0	0	0	0	0	0	0	3	2	111	299	0	0	0	0	0	0	0	0	0	0	1	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q974	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,684	12,020	10,837	10,644	6,916	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q975	9084	7623	4128	3720	3984	4659	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50332	51370	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	334	740	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	7.7%	13.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q976	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,956	10,684	12,020	10,837	10,644	6,916	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q987	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10824	10637	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	13	7	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q988	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,609	11,923	10,837	10,645	6,916	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,875	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	75	97	0	-1	0	0	0	0	0	0	0	0	0	0	1	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q989	9084	7623	4128	3720	4319	5398	8956	9514	29230	30961	10684	12020	10837	10645	6916	6656	50331	51370	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	-1	1	0	0	1	0	0	0	0	-1	0	0	2	1	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q992	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,210	30,941	10,684	12,020	10,837	10,645	6,916	6,656	50,327	51,367	12,744	9,252	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	21	20	0	0	0	-1	0	0	6	4	0	-1	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q997	9084	7623	4128	3720	4318	5399	8956	9514	29231	30961	10684	12020	10837	10644	6916	6656	50323	51364	12743	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	1	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1000	9,077	7,621	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,678	12,015	10,831	10,641	6,916	6,656	50,333	51,370	12,744	9,251	10,036	9,858	3,778	3,447	7,805	6,788
Difference: Case 2 - Case 4	7	2	0	0	0	0	0	0	0	0	6	5	6	3	0	0	0	1	0	0	0	0	0	0	71	39
% Increase	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.6%
Case 4: OFF Q1001	9084	7623	4128	3720	4318	5399	8819	9047	29231	30961	10684	12020	10837	10645	6916	6656	50333	51371	12744	9251	10036	9858	3778	3447	7876	6827
Difference: Case 2 - Case 4	0	0	0	0	0	0	137	467	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Case 4: OFF Q1002	9,084	7,623	4,128	3,720	4,318	5,399	8,956	9,514	29,231	30,961	10,684	12,020	10,837	10,644	6,916	6,656	50,333	51,371	12,744	9,251	10,036	9,858	3,778	3,447	7,876	6,827
Difference: Case 2 - Case 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Cluster 6 Phase I PG&E Kern Area Interconnection

Appendix I

Deliverability Assessment Results

Cluster 6 Phase I Appendix I - Deliverability Assessment Results - PG&E Kern Area Interconnection Study

Summer Peak

S. No.	Overloaded Facility	Upgrades	Worst Contingency	Contingency Category	Rating (MVA)	Overload	Generation Responsible	Mitigation
1	Maricopa-Copus 70kV Line (Maricopa-Gardner Tap)	Re-conductor 2.99 mi 3/0 AAC with 397.5 AAC conductor and upgrade any associated equipment.	Normal Overload	A	37	102.27	6C0988	Reconductor
2	Maricopa-Copus 70kV Line (Gardner Tap-S620 Tap)	Re-conductor 1.75 mi 3/0 AAC with 397.5 AAC conductor and upgrade any associated equipment.	Normal Overload	A	37	104.94	6C0988	Reconductor
3	Fellows-Taft 115kV Line (Fellows-Morgan)	Re-conductor 0.36 mi 397.5 AAC and 0.14 715 AAC with 975 ACSR conductor, total 0.5 mi, and upgrade any associated equipment.	Loss of Midway-Taft 115kV Line	B	96.4	121.23	6C0988	Reconductor
4	Fellows-Taft 115kV Line (Morgan-Midset)	Re-conductor 0.14 mi 715 AAC and 0.8 mi 397.5 ACSR with 975 ACSR conductor, total 0.94 mi, and upgrade any associated equipment.	Loss of Midway-Taft 115kV Line	B	102	115.18	6C0988	Reconductor
5	Midway-6C0966SS 115kV Line (Midway-Cymric)	Re-conductor 13 mi 715 AAC with 1113 AAC conductor and upgrade any associated equipment.	Normal Overload	A	120	128.03	6C0966 6C0988	Reconductor
6	Midway-6C0966SS 115kV Line (Cymric-6C0966SS)	Re-conductor 0.79 mi 715 AAC with 1113 AAC conductor and upgrade any associated equipment.	Normal Overload	A	120	122.06	6C0966 6C0988	Reconductor
7	S479-Smyrna 115 kV Line (Q340 Tap-S479SS)	Re-conductor 4.5 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.	Normal Overload	A	136	145.1	6C0947	Reconductor
8	S479-Smyrna 115 kV Line (Q340 Tap-Smyrna)	Re-conductor 7.0 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.	Normal Overload	A	136.6	172.09	6C0947	Reconductor
9	Smyrna-Semitropic-Midway 115 kV Line (Smyrna-McKibben Jct)	Re-conductor 6.06 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.	Normal Overload	A	136.6	166.91	6C0947	Reconductor
10	Smyrna-Semitropic-Midway 115 kV Line (McKibben Jct-Semitropic Jct)	Re-conductor 2.11 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.	Normal Overload	A	136.6	166.67	6C0947	Reconductor
11	Smyrna-Semitropic-Midway 115 kV Line (Semitropic Jct-Ganso)	Re-conductor 6.89 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment.	Loss of Semitropic-Midway #1 115kV Line and Mt. Poso	B	159	136.63	6C0947	Reconductor
12	Smyrna-Semitropic-Midway 115 kV Line (Ganso-Midway)	Re-conductor 6.86 mi super bundled 266.8 AAC with super bundled 477 ACSS conductor and upgrade any associated equipment	Loss of Semitropic-Midway #1 115kV Line and Mt. Poso	B	119.5	174.77	6C0947	Reconductor
13	Gates-6C0974SS 230 kV Line	Reconductor 18.5 mi 1113 AAC with 795 ACC conductor and upgrade any associated equipment	Normal Overload	A	329	108.12	6C0987 6C0974	Reconductor

Cluster 6 Phase 1 – Attachment 6

Generator Dynamic Data

Q1000 Dynamic Data

model: genrou

Variable	Description	Value
MVA	Base	452
Tpdo	D-axis transient rotor time constant	8.23
Tppdo	D-axis sub-transient rotor time constant	0.046
Tpqo	Q-axis transient rotor time constant	0.910
Tppqo	Q-axis sub-transient rotor time constant	0.070
H	Inertia constant, sec	19.018
D	Damping factor, pu	0
Ld	D-axis synchronous reactance	1.9
Lq	Q-axis synchronous reactance	1.86
Lpd	D-axis transient reactance	0.294
Lpq	Q-axis transient reactance	0.379
Lppd	D-axis sub-transient reactance	0.223
L1	Stator leakage reactance, pu	0.159
S1	Saturation factor at 1 pu flux	0.12
S12	Saturation factor at 1.2 pu flux	0.63
Ra	Stator resistance, pu	0
Rcomp	Compounding resistance for voltage control, pu	0
Xcomp	Compounding reactance for voltage control, pu	0

model: esac7b

Variable	Description	Value
Tr	Filter time constant, sec	0.0
Kpr	Regulator proportional gain, pu	3.89
Kir	Regulator integral gain, pu	3.89
Kdr	Regulator derivative gain, pu	0.0
Tdr	Derivative gain washout time constant, sec	0.0
Vrmax	Maximum regulator output, pu	6.74
Vrmin	Minimum regulator output, pu	-6.74
Kpa	Amplifier proportional gain	117.7
Kia	Amplifier integral gain, pu	26.80
Vamax	Maximum amplifier output, pu	1.0
Vamin	Minimum amplifier output, pu	-0.94
Kp	Exciter field voltage source gain, pu	12.08/
Kl	Exciter field voltage lower limit parameter, pu	10.00
Te	Exciter time constant, sec	3.0
Vfemax	Exciter field current limit parameter, pu efd	15.2
Vemin	Minimum exciter output voltage, pu efd	0.000
Ke	Exciter field resistance constant, pu	1.00
Kc	Rectifier regulation factor, pu	0.13
Kd	Exciter internal reactance, pu	1.14
Kf1	Field voltage feedback gain, pu	0.194
Kf2	Exciter field current feedback gain, pu	0.0
Kf3	Rate feedback gain, pu	0.0
Tf	Rate feedback time constant, sec	1.0
E1	Field voltage value 1, pu	6.67
S(E1)	Saturation factor at E1	1.951
E2	Field voltage value 2, pu	5.0
S(E2)	Saturation factor at E2	0.156
spdmlt	If not 0, multiply output (Efd) by generator speed	0.000

model: exst1

Variable	Description	Value
Tr	Filter time constant, sec.	0.008
Vimax	Maximum error, p.u.	999
Vimin	Minimum error, p.u.	-999
Tc	Lead time constant, sec.	0.480
Tb	Lag time constant, sec.	1.64
Ka	Gain, p.u. (> 0.)	162.2
Ta	Time constant, sec.	0.029
Vrmax	Maximum controller output, p.u.	5.58
Vrmin	Minimum controller output, p.u.	-2.28
Kc	Excitation system regulation factor, p.u.	0.13
Kf	Rate feedback gain	0.0
Tf	Rate feedback time constant, sec.	1.0
Tc1	Lead time constant, sec.	0
Tb1	Lag time constant, sec.	0
Vamax	Maximum control element output, p.u.	0
Vamin	Minimum control element output, p.u	0
Xe	Excitation xfmr effective reactance, p.u.	0
Ilr	Maximum field current, p.u.	0
Klr	Gain on field current limit	0

model: ggov1

Variable	Description	Value
Mwcap	MWCap	405
R	Permanent droop, pu	0.05
Rselect	Feedback signal for droop (1 = electrical power)	1.00
Tpelec	Electrical power transducer time constant, sec	1.00
Maxerr	Maximum value for speed error signal	0.05
Minerr	Minimum value for speed error signal	-0.05
Kpgov	Governor proportional gain	10.0
Kigov	Governor integral gain	2.0
Kdgov	Governor derivative gain	0.0
Tdgov	Governor derivative controller time constant, sec	1.0
Vmax	Maximum valve position limit	1.0
Vmin	Minimum valve position limit	0.10
Tact	Actuator time constant	0.50
Kturb	Turbine gain (>0)	1.50
Wfnl	No Load fuel flow, pu	0.15
Tb	Turbine lag time constant, sec	300
Tc	Turbine lead time constant, sec	195
Flag	Switch for fuel source characteristic (0 = fuel flow independent of speed)	0.0
Teng	Transport lag time constant for diesel engine	0.0
Tfload	Load limiter time constant, sec	3.0
Kpload	Load limiter proportional gain for PI controller	1.0
Kiload	Load limiter integral gain for PI controller	0.20
Ldref	Load limiter reference value, pu	1.00
Dm	Speed sensitivity coefficient, pu	0.00
Ropen	Maximum valve opening rate, pu/sec	0.10
Rclose	Minimum valve opening rate, pu/sec	-0.10
Kimw	Power controller (reset) gain	0
Pmwset	Power controller setpoint	0
Aset	Acceleration limiter setpoint, pu/sec	0
Ka	Acceleration limiter gain	0
ta	Acceleration limiter time constant, sec	0
Db	Speed governor dead band	0
Tsa	Temperature detection lead time constant, sec	0
Tsb	Temperature detection lag time constant, sec	0
Rup	Maximum rate of load limit increase	0
Rdown	Maximum rate of load limit decrease	0

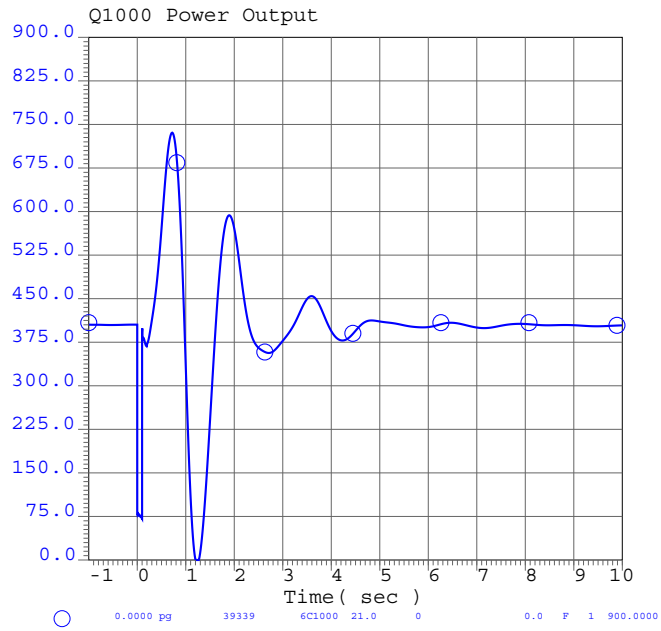
model: pss2b

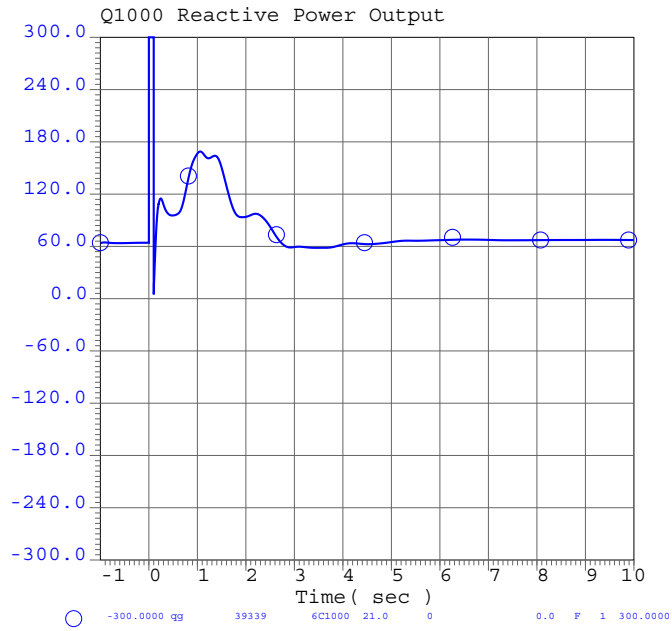
Variable	Description	Value
J1	Input signal #1 code	1.0
K1	Input signal #1 remote bus number	0.0
J2	Input signal #2 code	3.0
K2	Input signal #2 remote bus number	0.0
Vsi1max	Stabilizer output max limit, p.u.	999
Vsi2min	Stabilizer output min limit, p.u.	-999
Tw1	First washout on signal #1, sec.	2.0
Tw2	Second washout on signal #1, sec.	2.0
Vsi2max	Stabilizer output max limit, p.u.	999
Vsi2min	Stabilizer output min limit, p.u.	-999
Tw3	First washout on signal #2, sec.	2.0
Tw4	Second washout on signal #2, sec.	3000.0
T6	Time constant on signal #1, sec.	0.0
T7	Time constant on signal #2, sec.	2.0
Ks2	Gain on signal #2	0.210
Ks3	Gain on signal #2 input before ramp-tracking filter	1.00
T8	Lead of ramp tracking filter	0.400
T9	Lag of ramp tracking filter	0.100
n	Order of ramp tracking filter	1.0
m	Denominator order of ramp tracking filter	0.0
Ks1	Stabilizer gain	2.0
T1	Lead/lag time constant, sec.	0.30
T2	Lead/lag time constant, sec.	0.04
T3	Lead/lag time constant, sec.	0.30
T4	Lead/lag time constant, sec.	0.04
T10	Lead/lag time constant, sec.	0.10
T11	Lead/lag time constant, sec.	0.10
Vstmax	Stabilizer output max limit, p.u.	0.10
Vstmin	Stabilizer output min limit, p.u.	-0.10
a	Lead/lag num. gain. (not in IEEE model)	0
Ta	Lead/lag time constant, sec. (not in IEEE model)	0
Tb	Lead/lag time constant, sec. (not in IEEE model)	0
Ks4	Gain on signal #2 input after ramp-tracking filter (not in IEEE model)	0

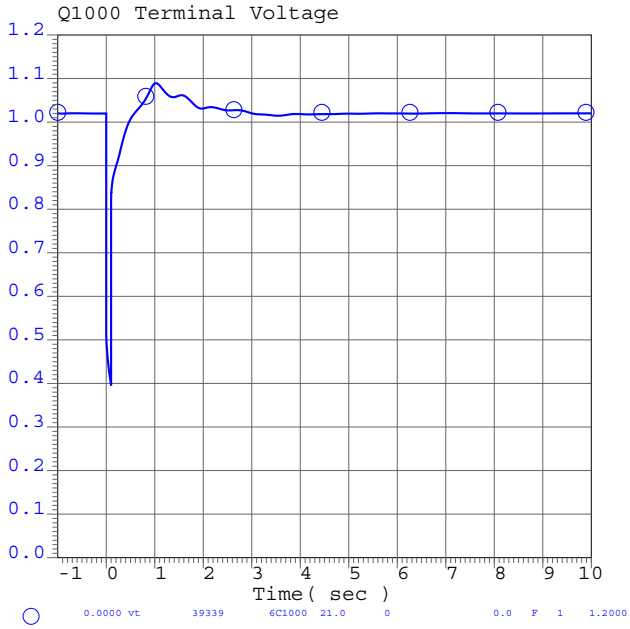
Cluster 6 Phase 1 – Attachment 7

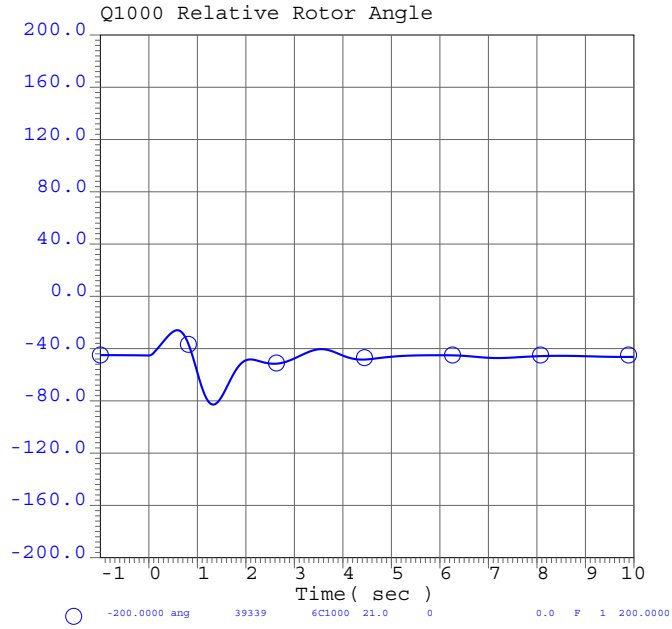
Transient Stability Plots

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







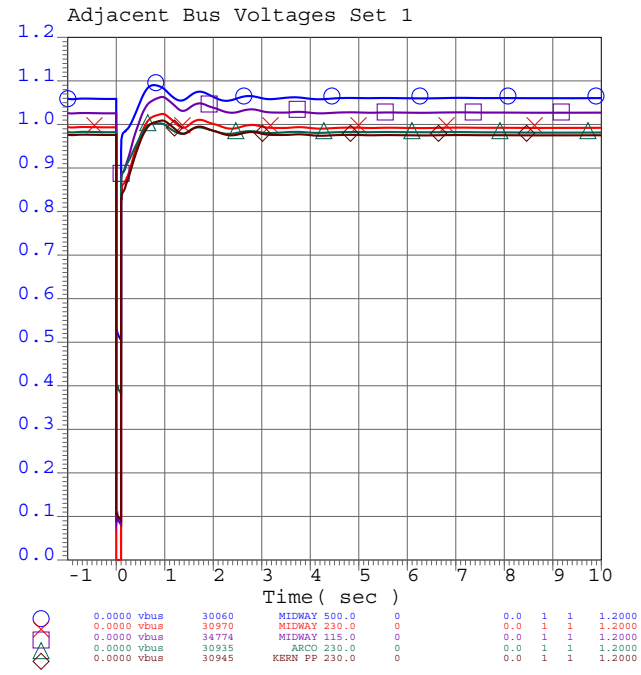


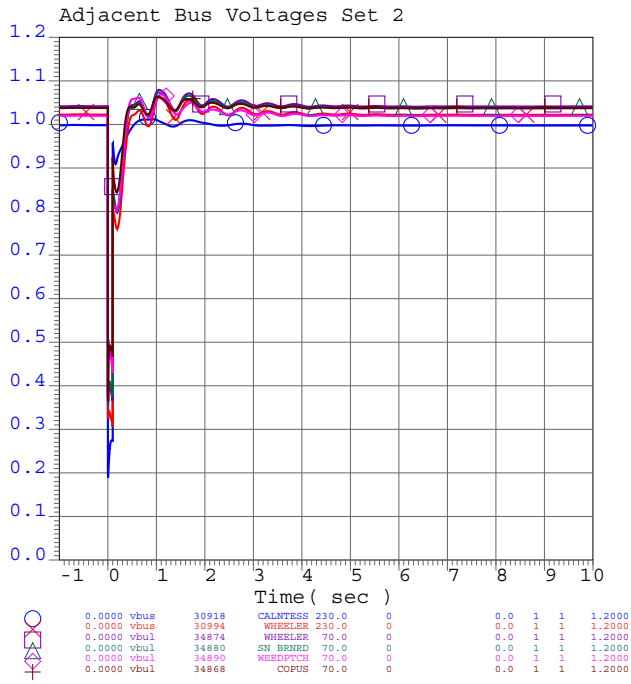
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

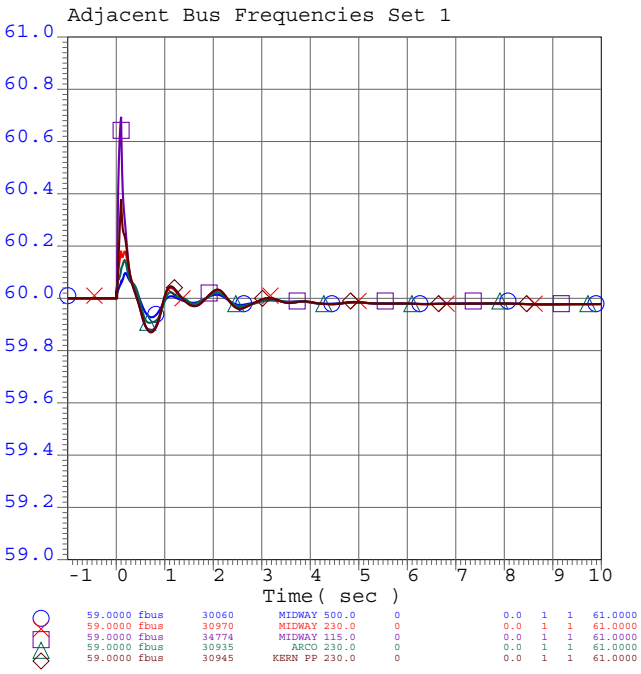
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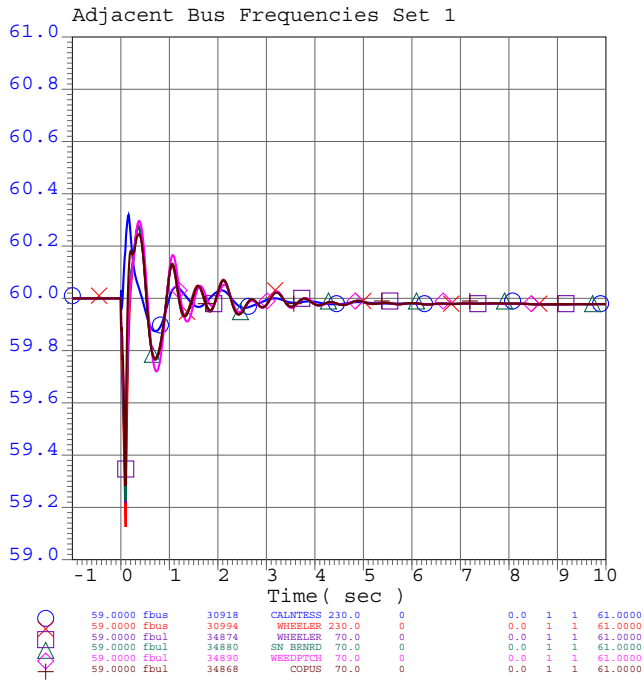
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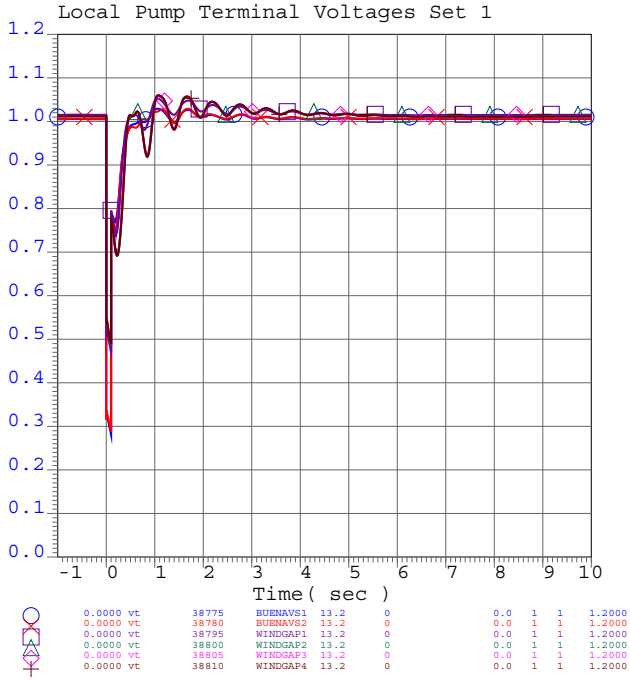




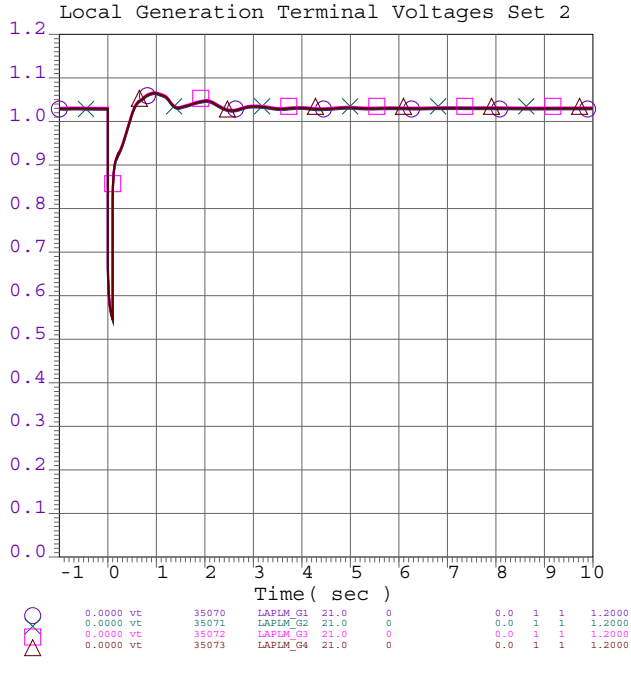


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

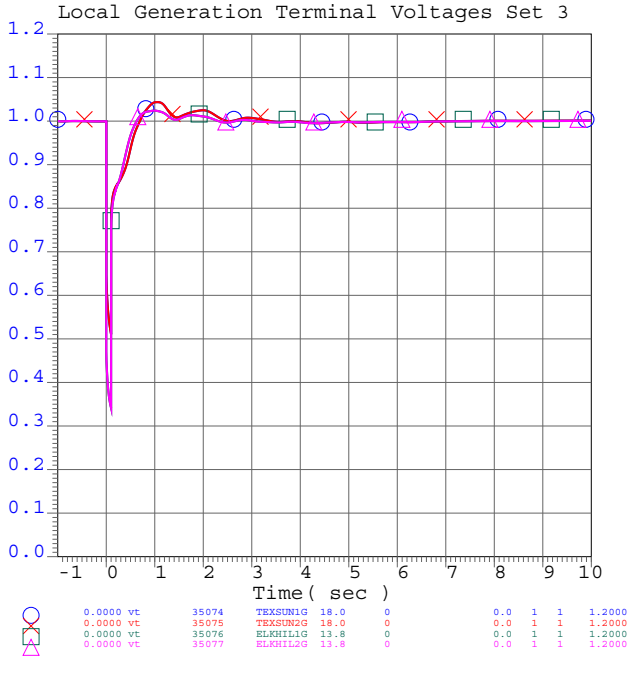
Local Pump Terminal Voltages Set 1



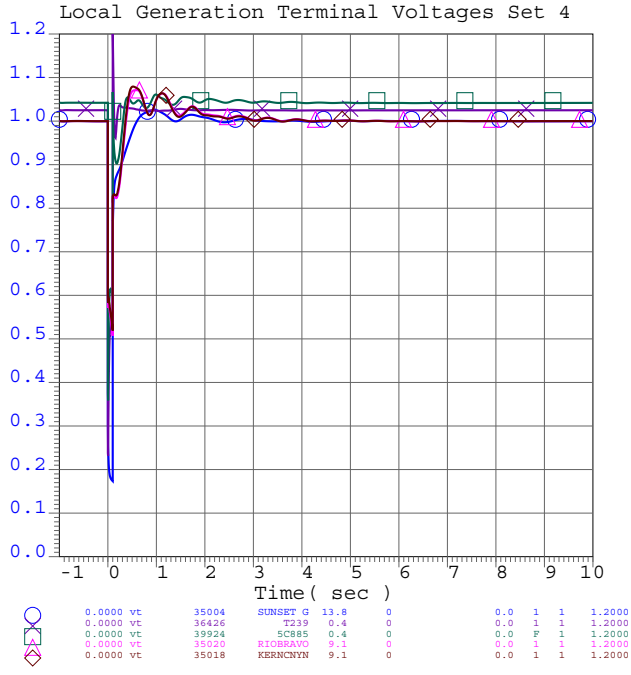
Local Generation Terminal Voltages Set 2



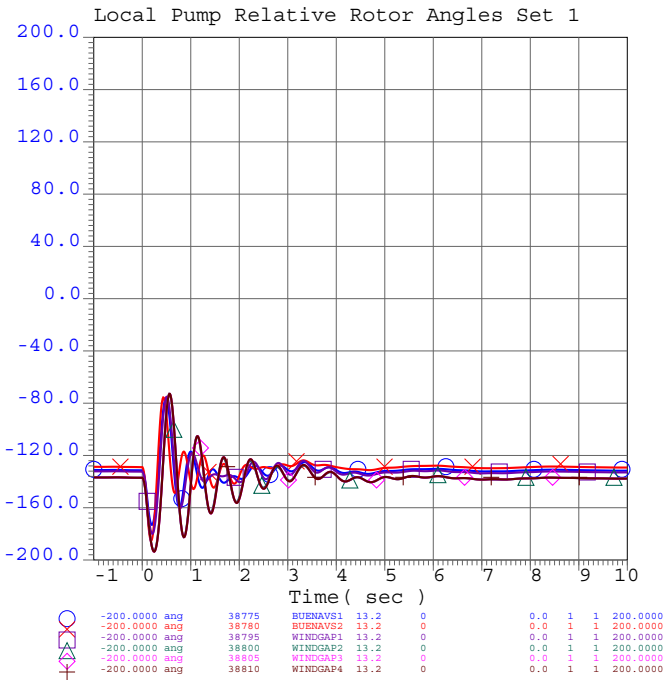
Local Generation Terminal Voltages Set 3

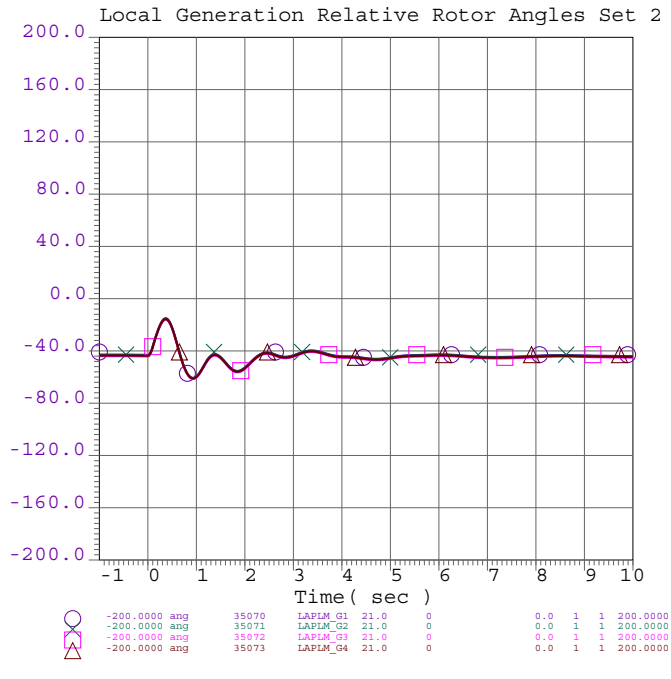


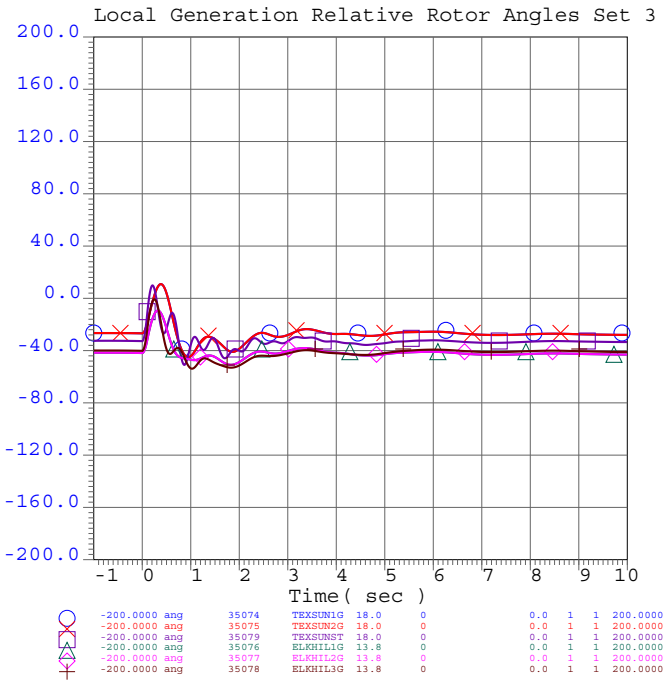
Local Generation Terminal Voltages Set 4

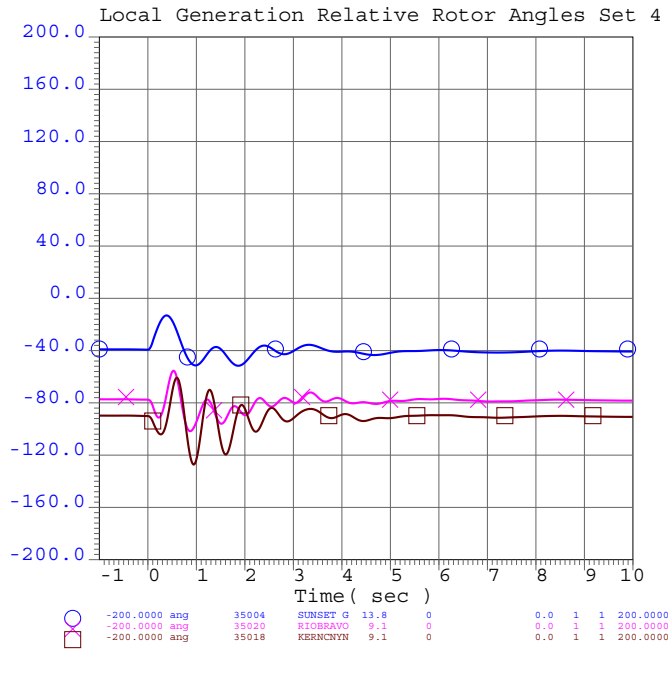


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

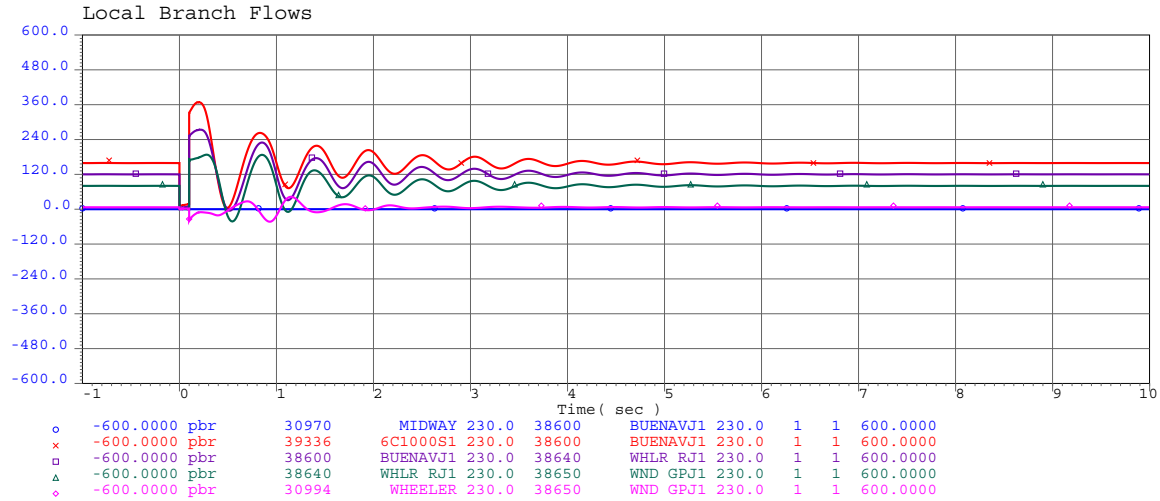


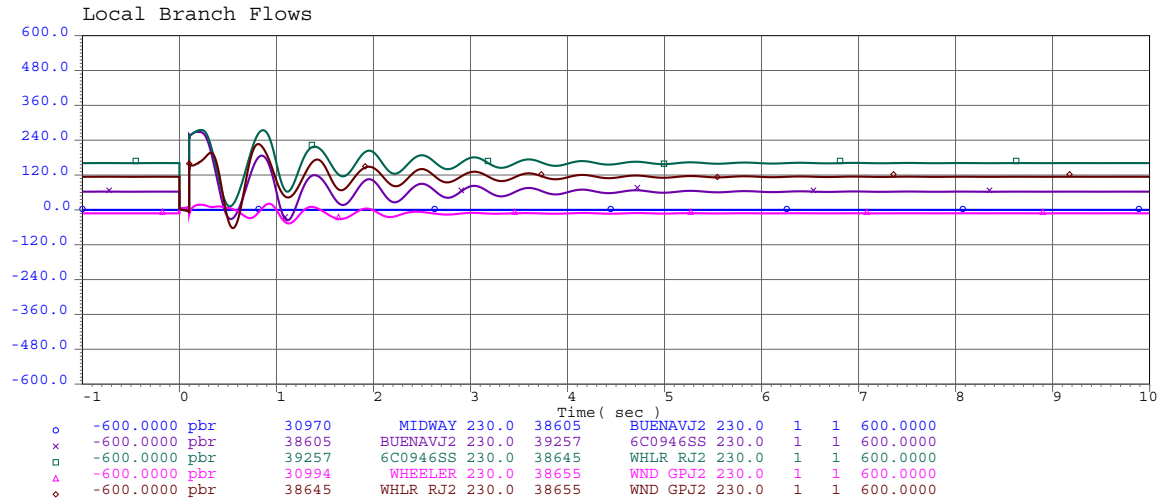


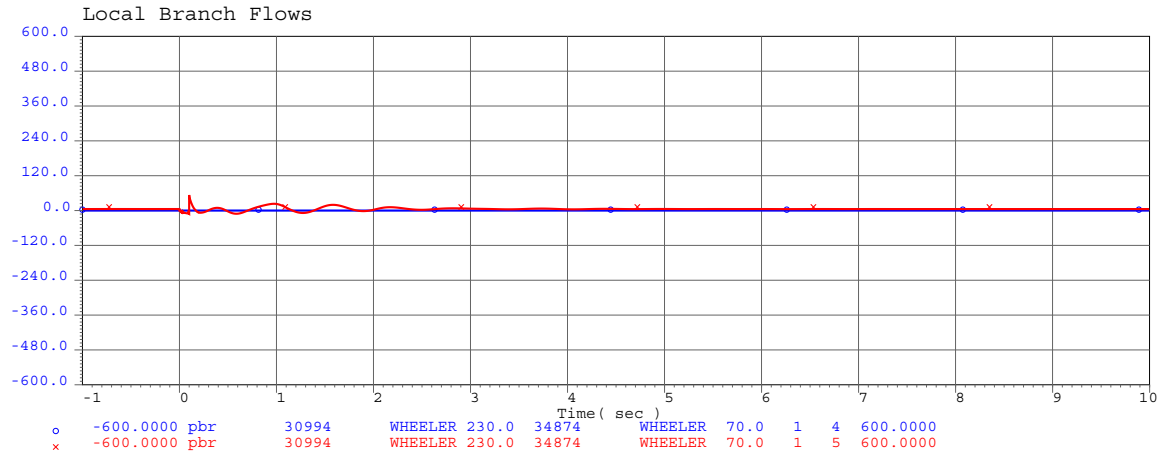




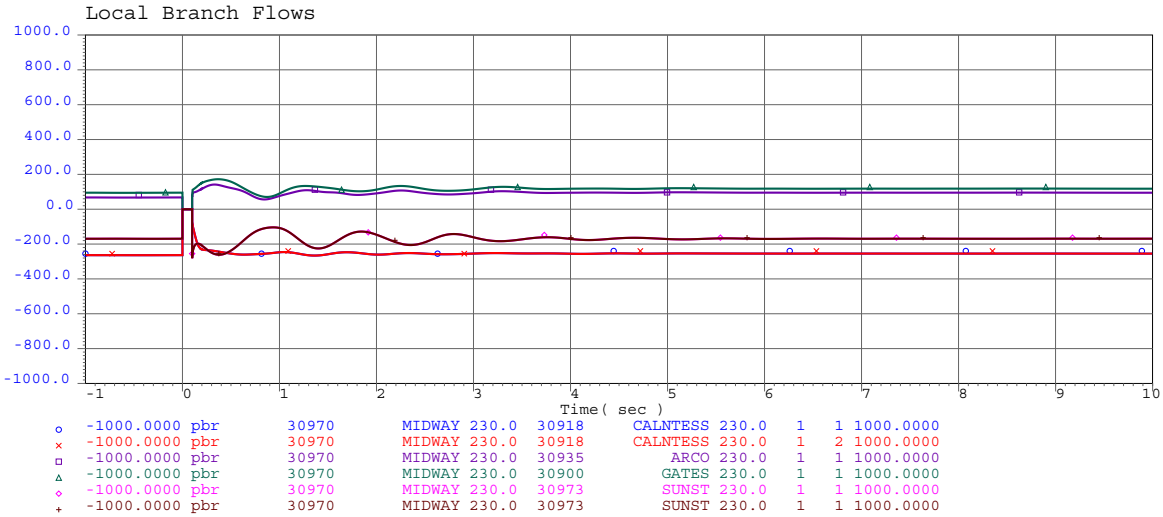
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11



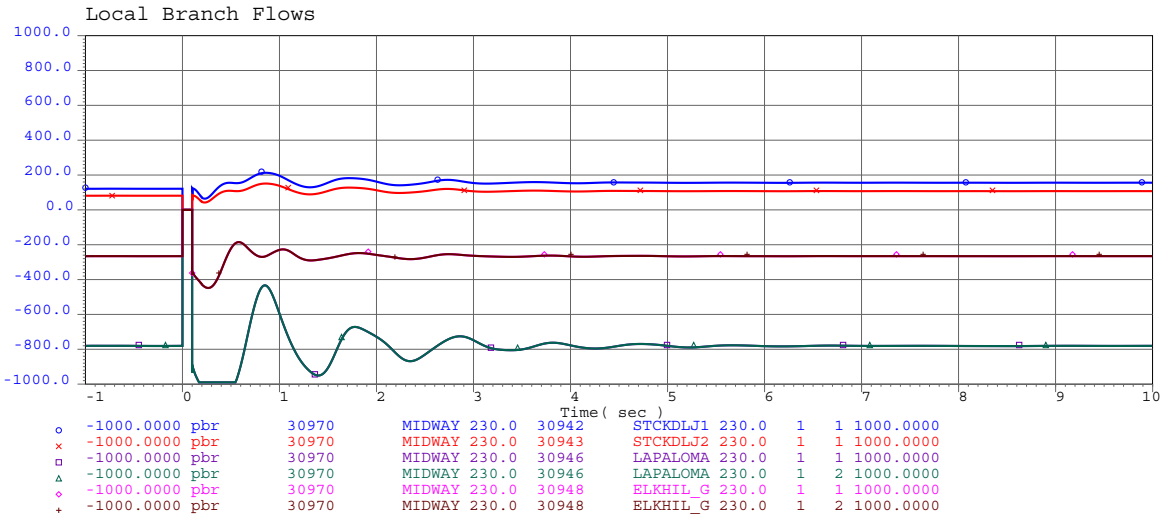




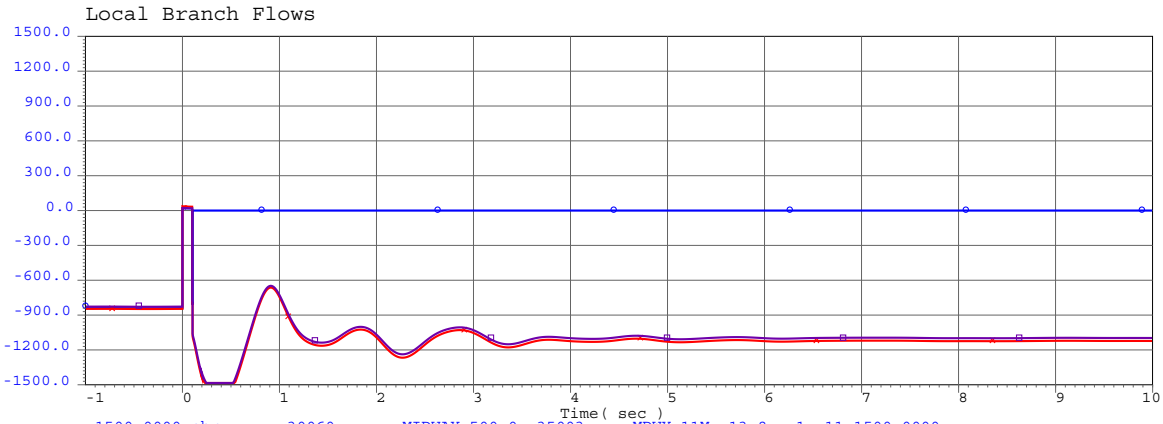
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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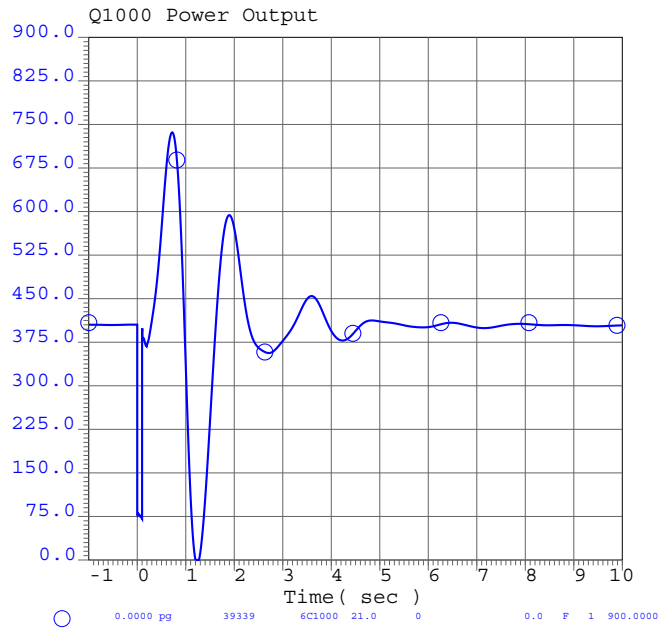
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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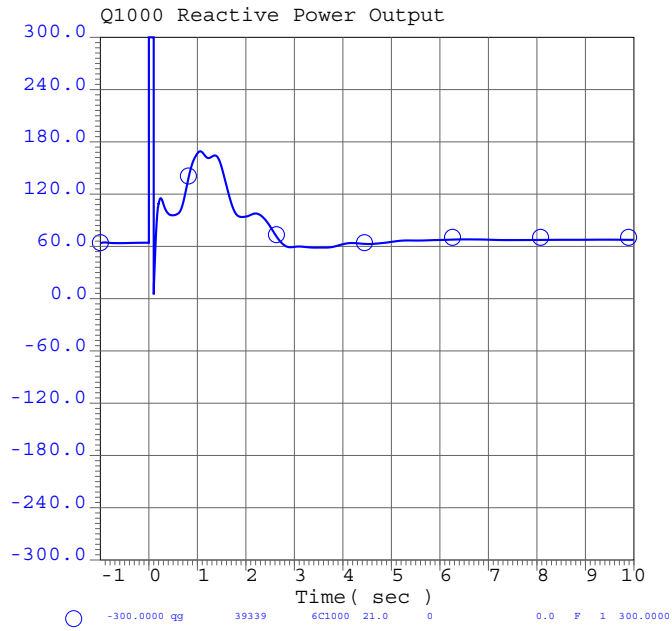


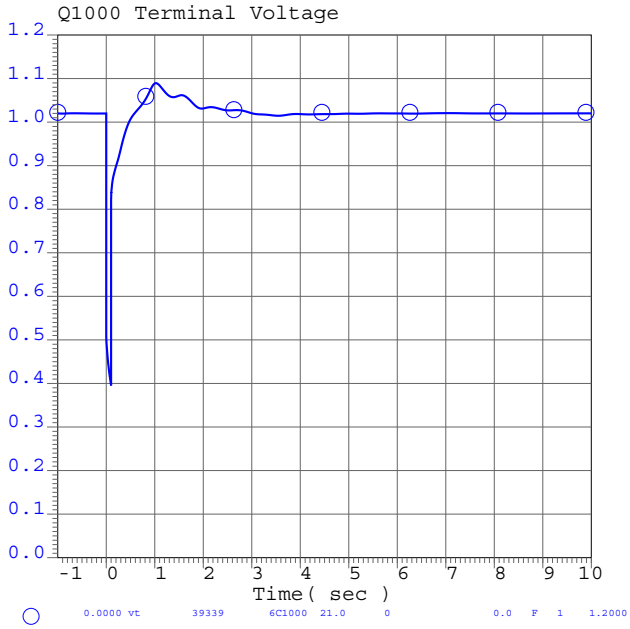
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

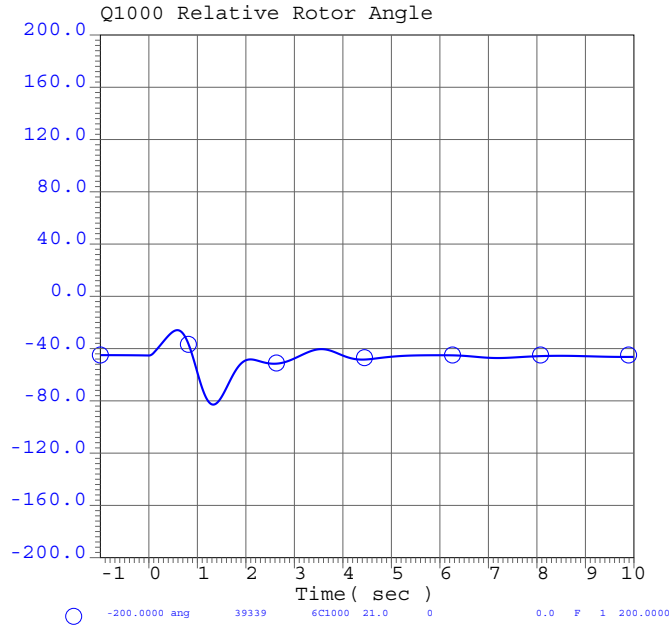
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







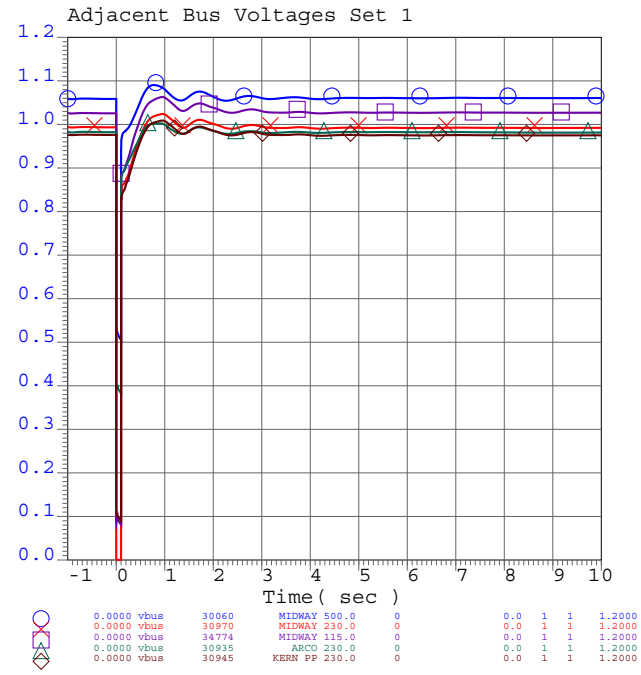


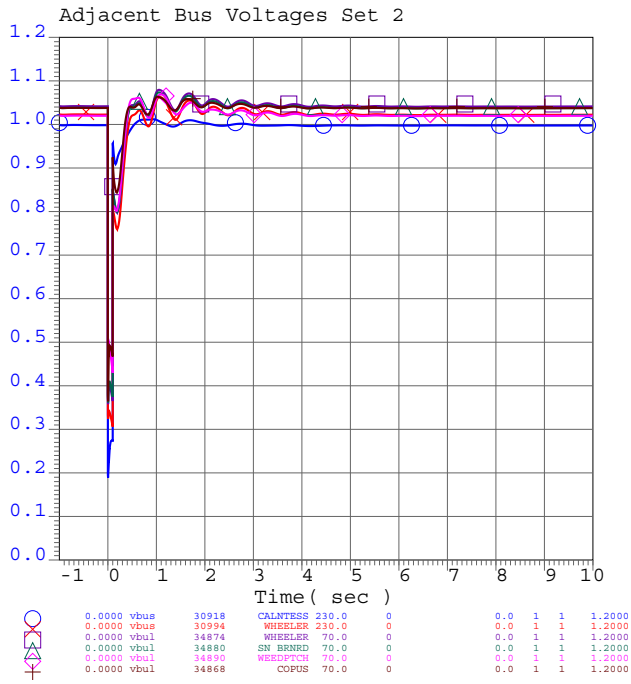
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

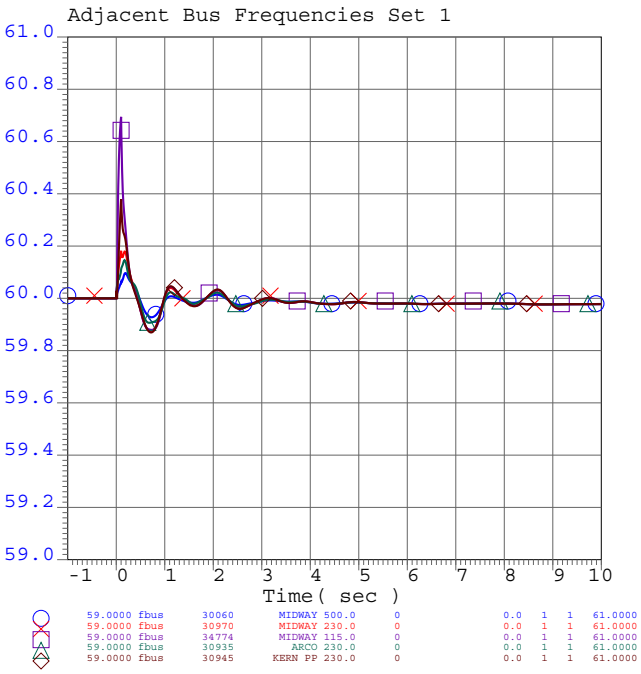
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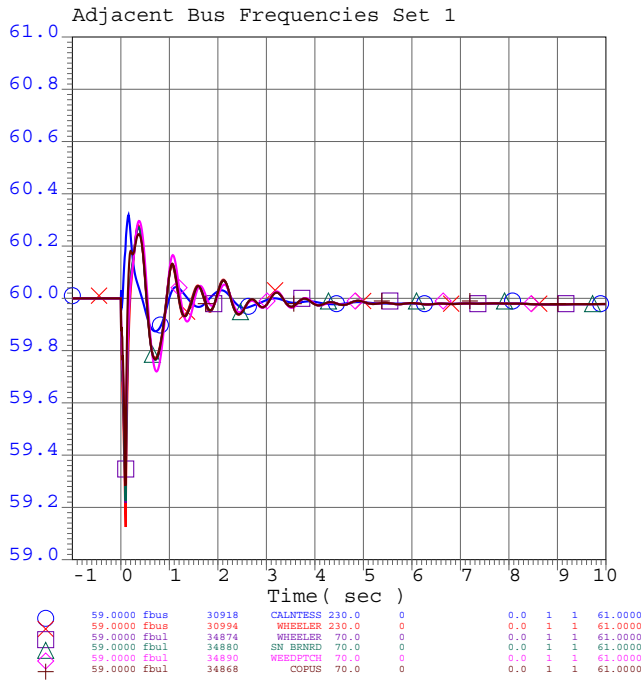
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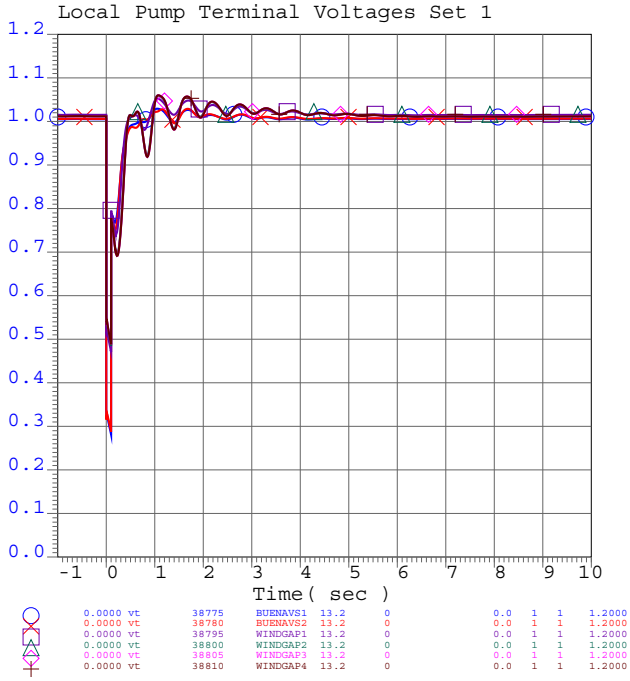






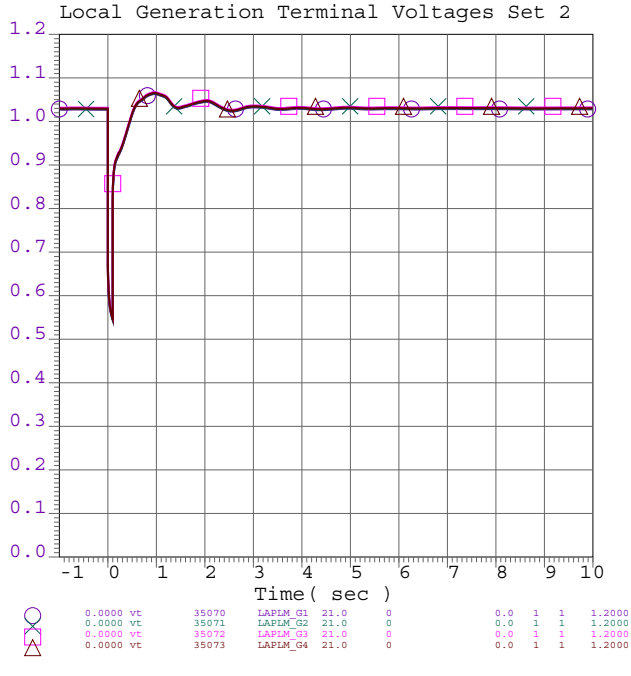
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

Local Pump Terminal Voltages Set 1



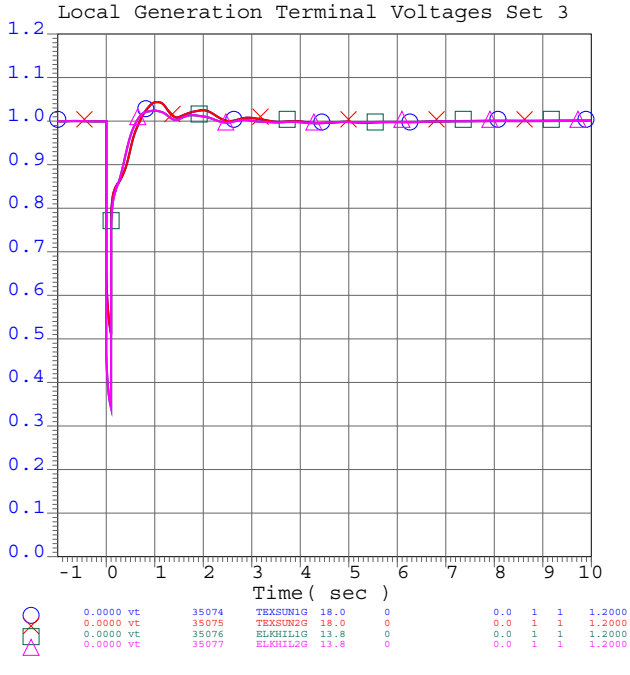
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



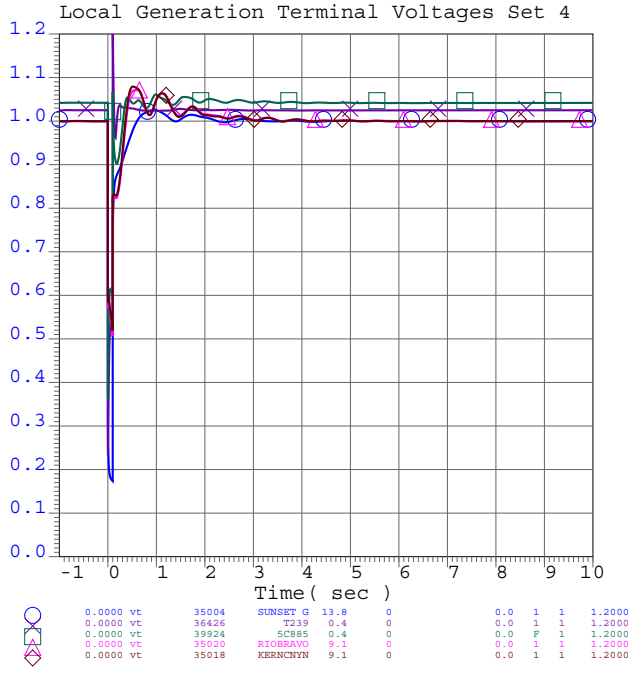
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 4



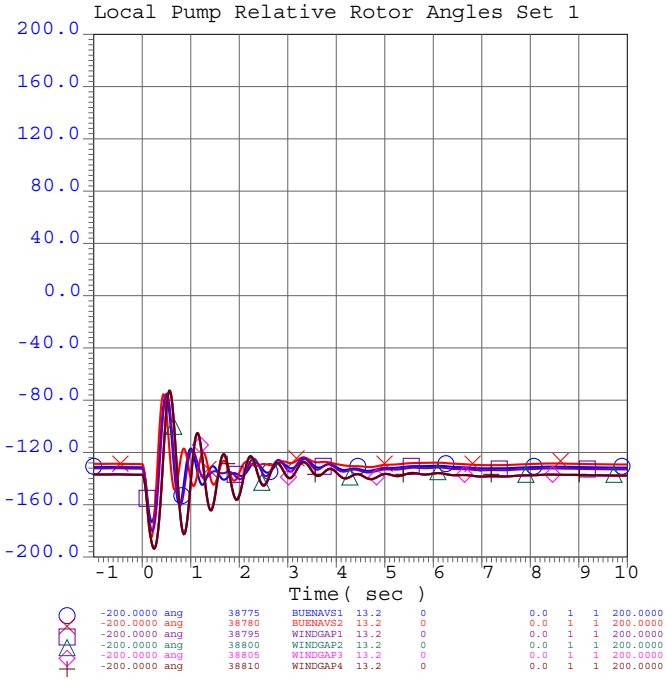
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

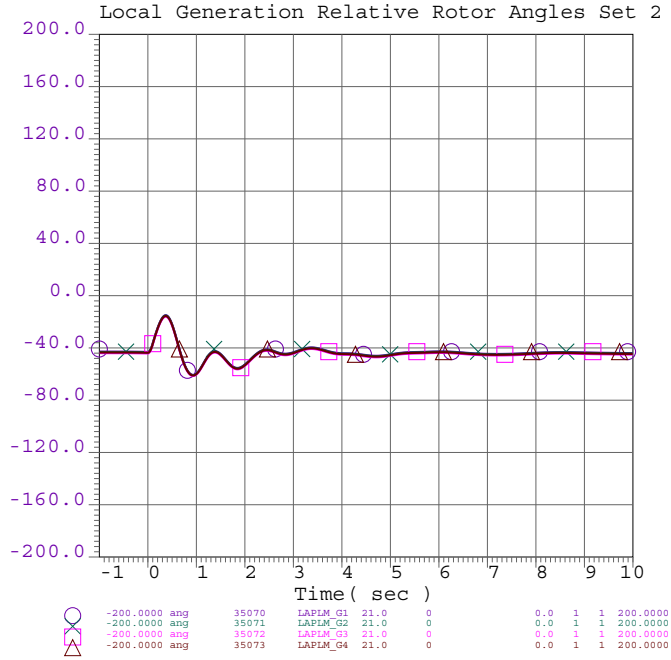
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Tue Dec 24 11:41:07 2013

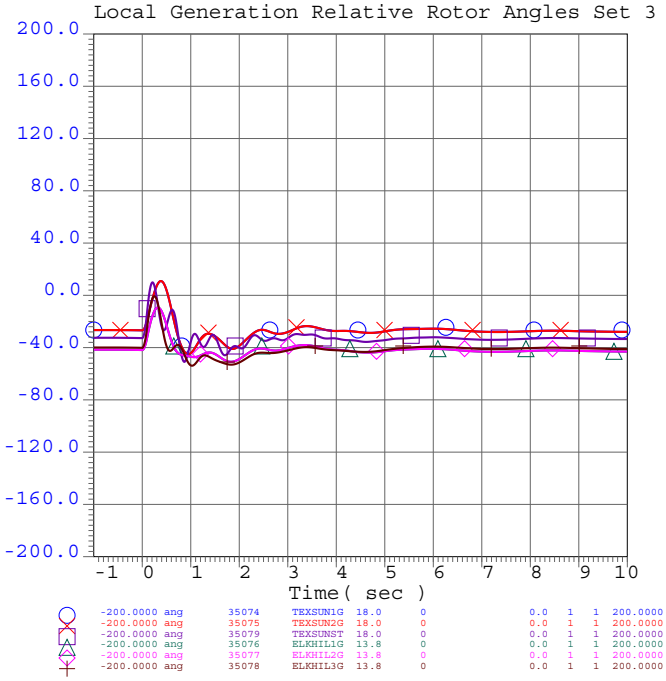
Local Pump Relative Rotor Angles Set 1



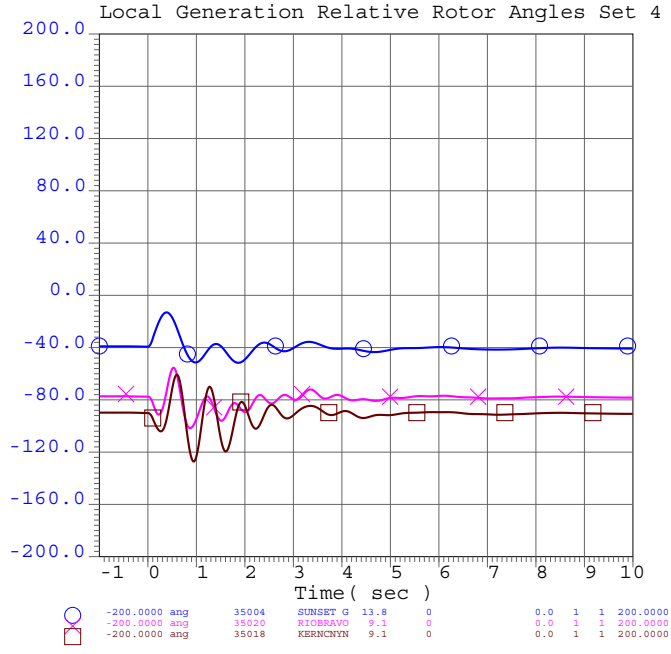
Local Generation Relative Rotor Angles Set 2



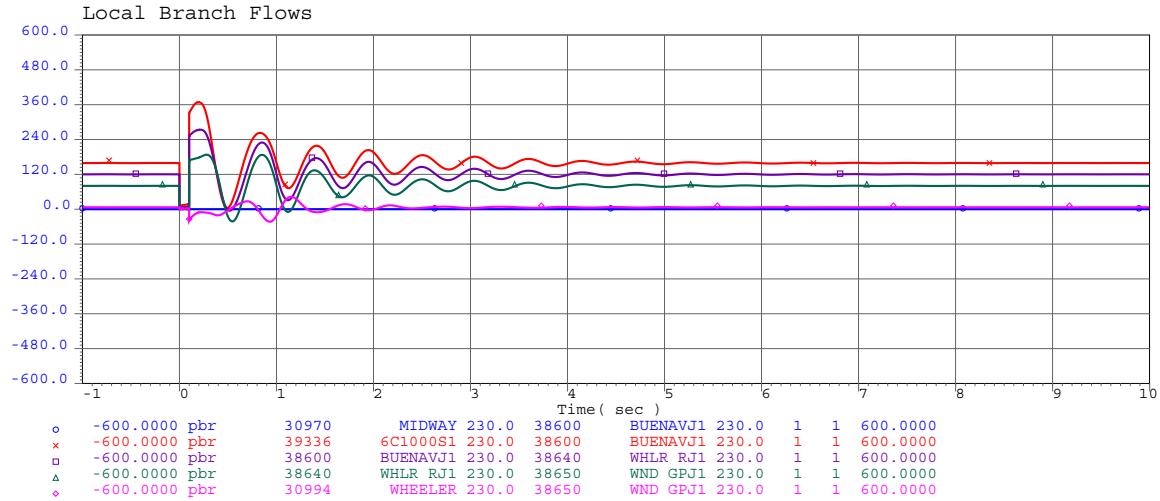
Local Generation Relative Rotor Angles Set 3



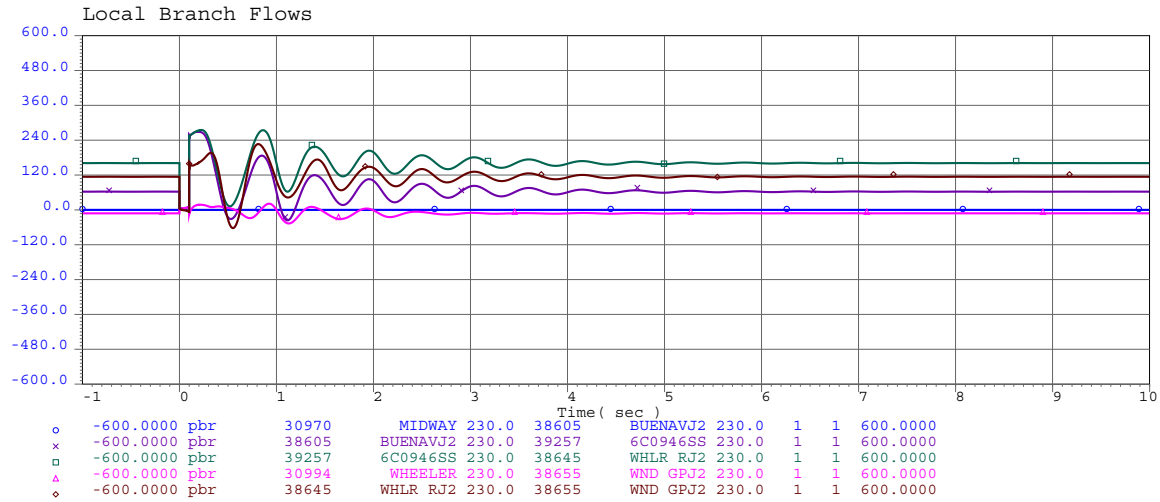
Local Generation Relative Rotor Angles Set 4



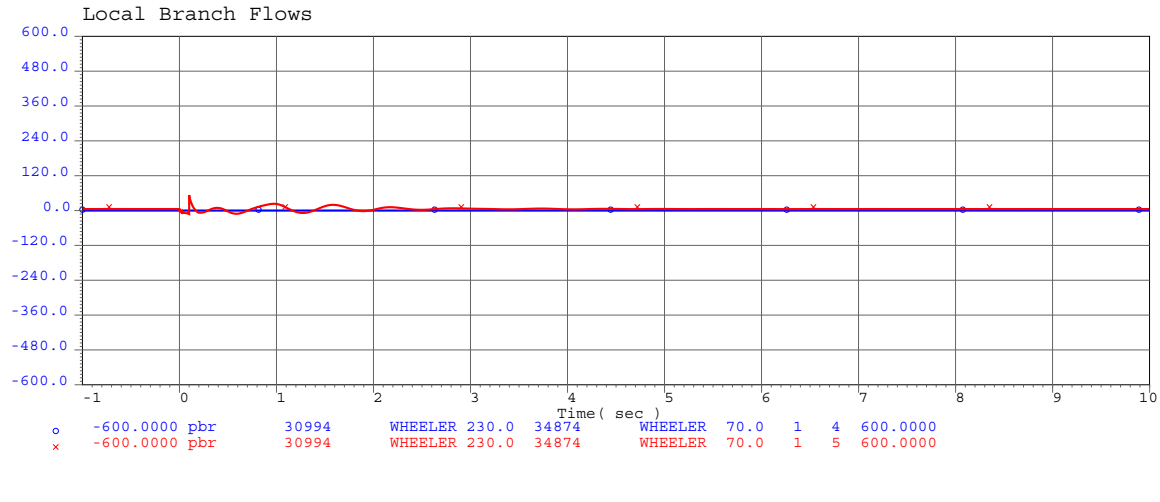
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

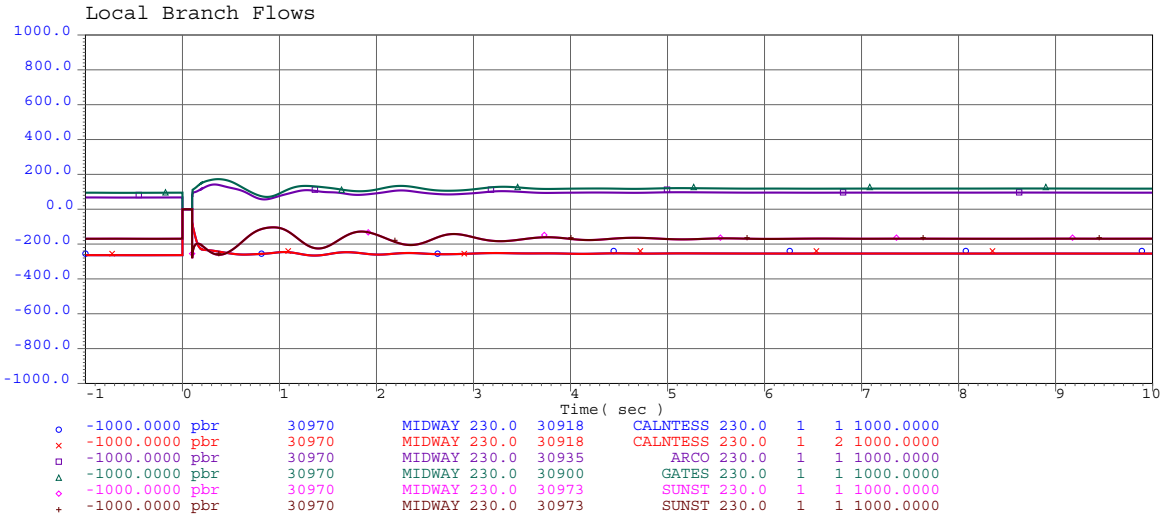


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

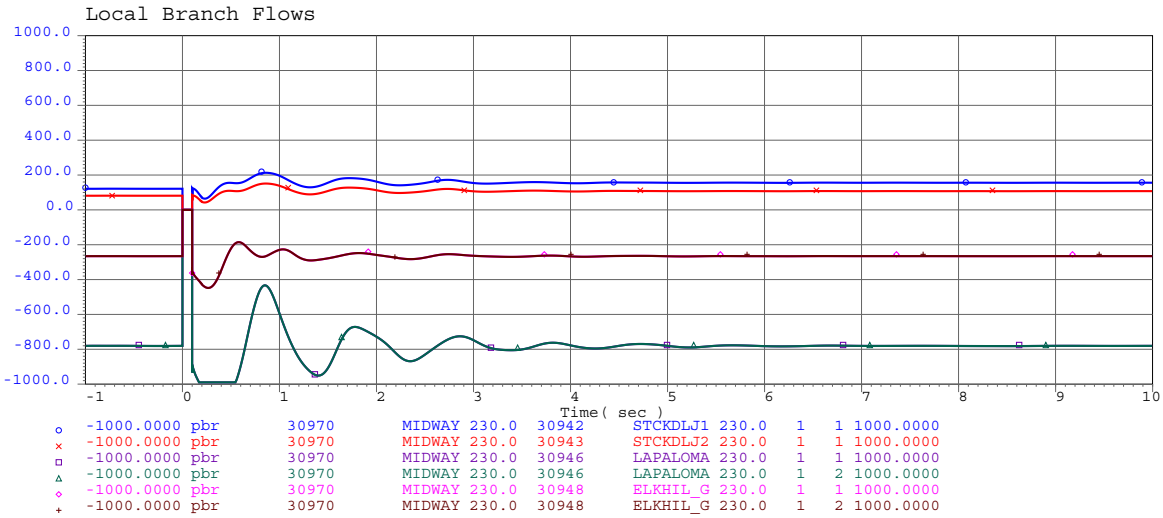


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

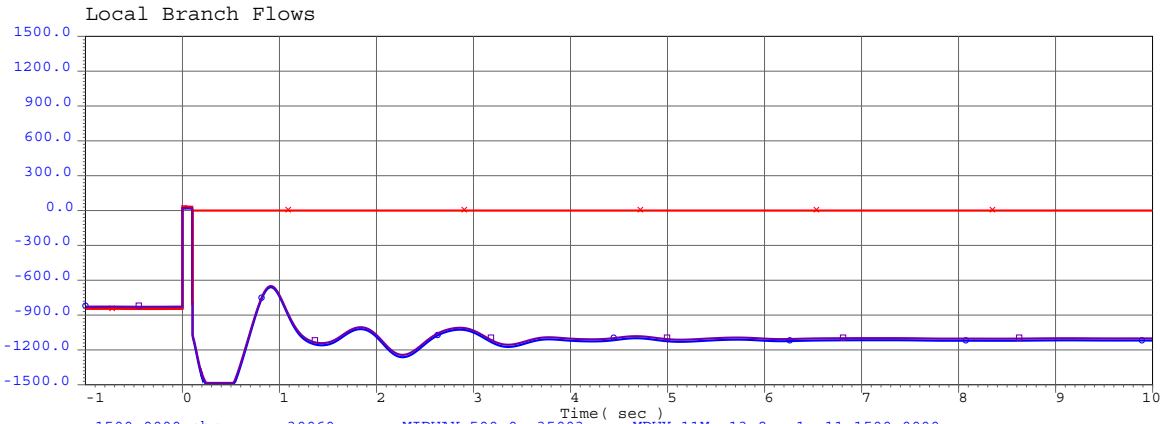
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



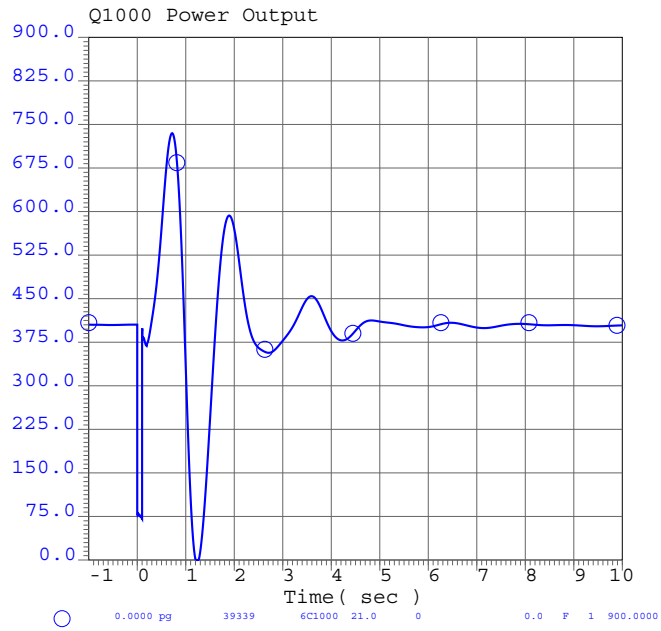
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

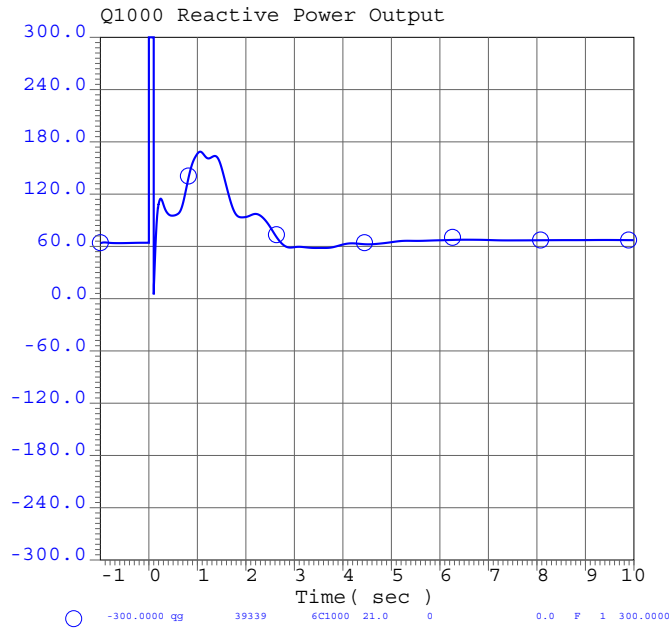


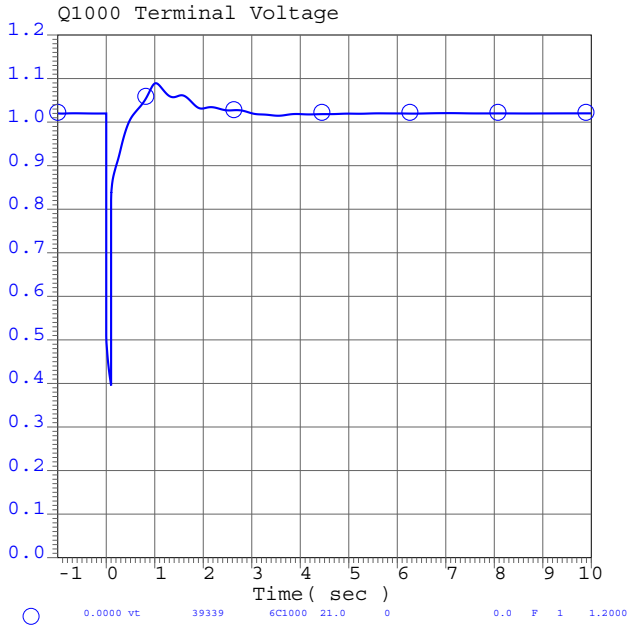
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

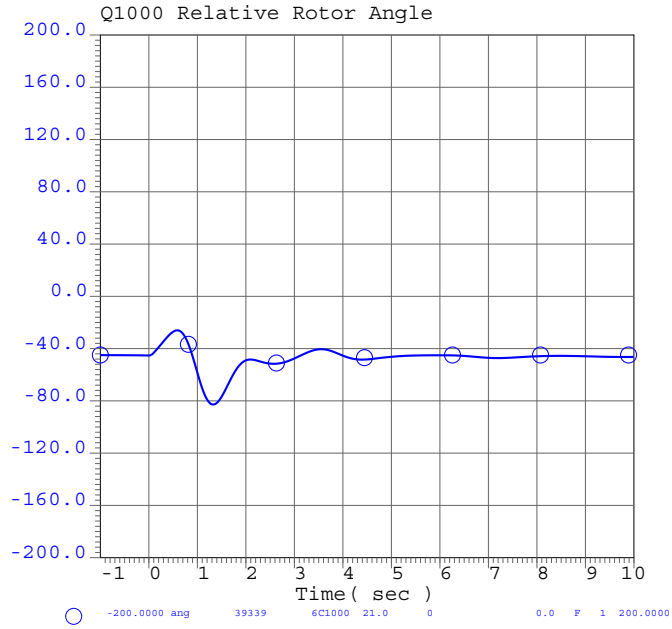
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







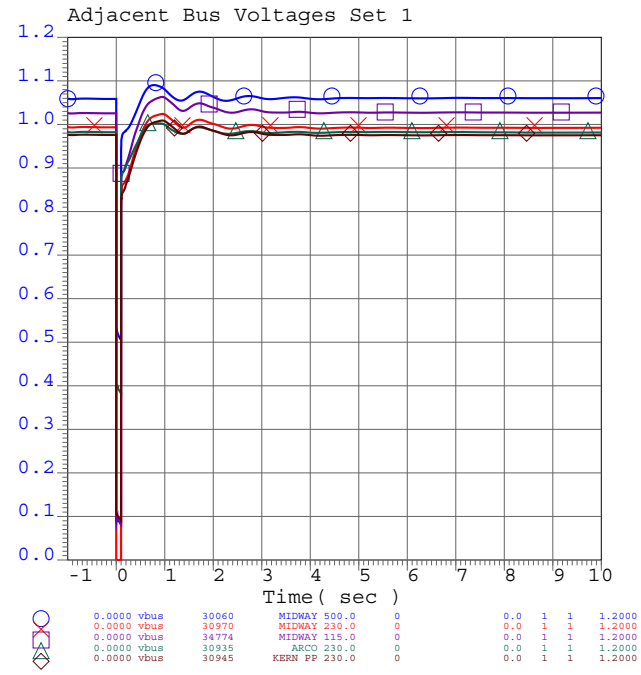


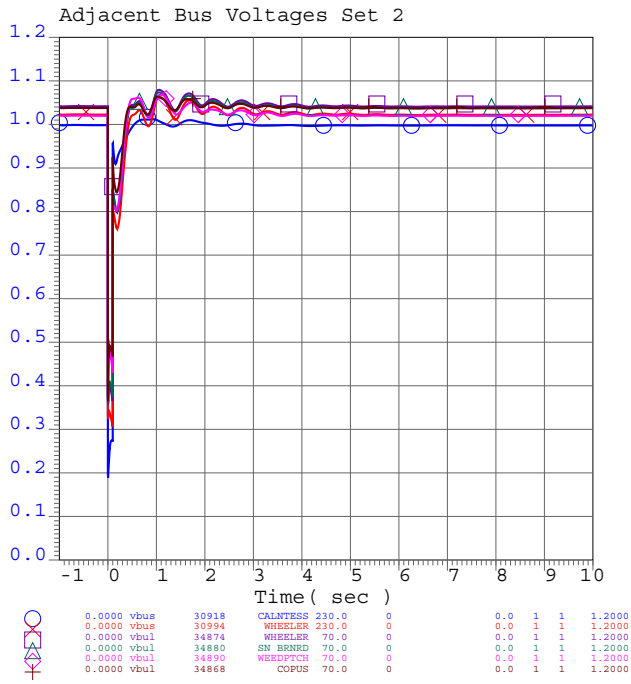
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

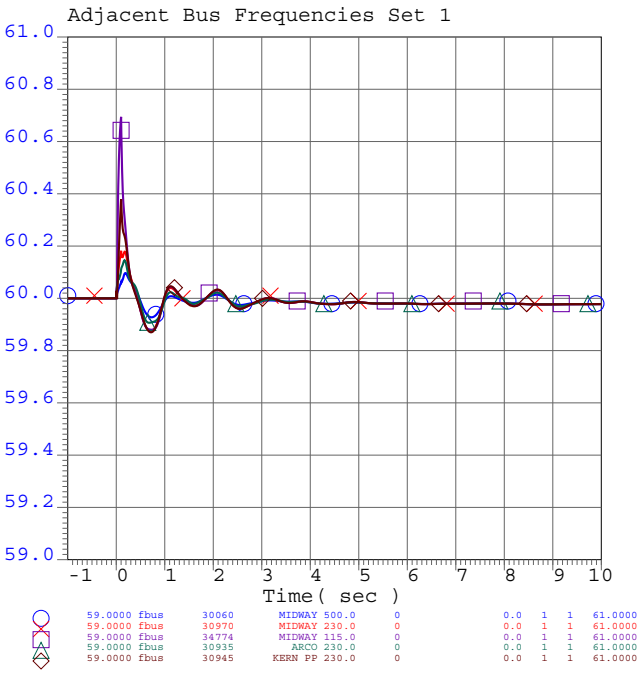
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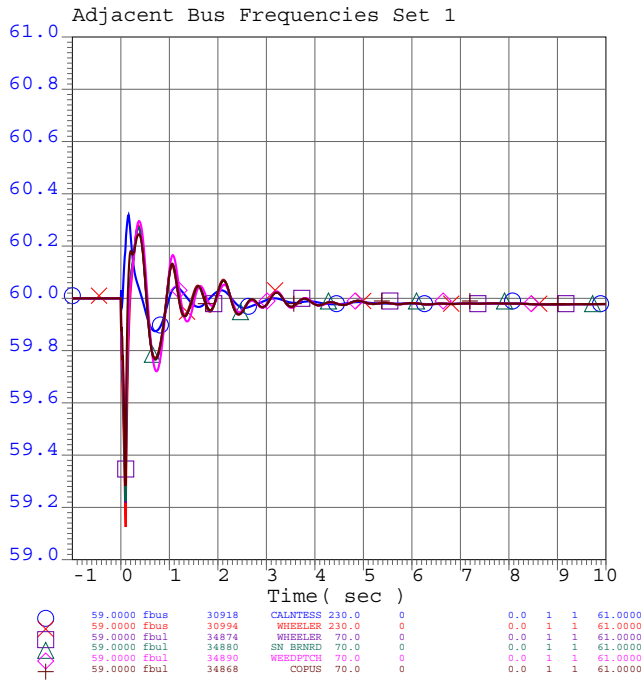
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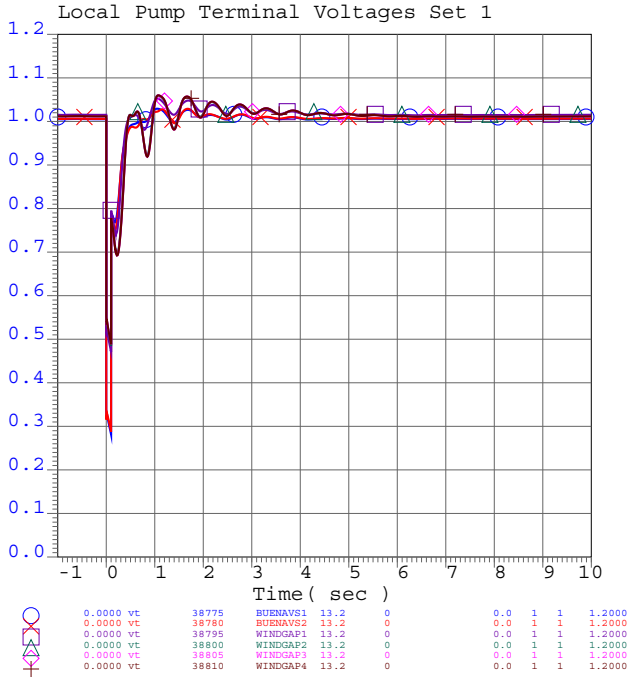




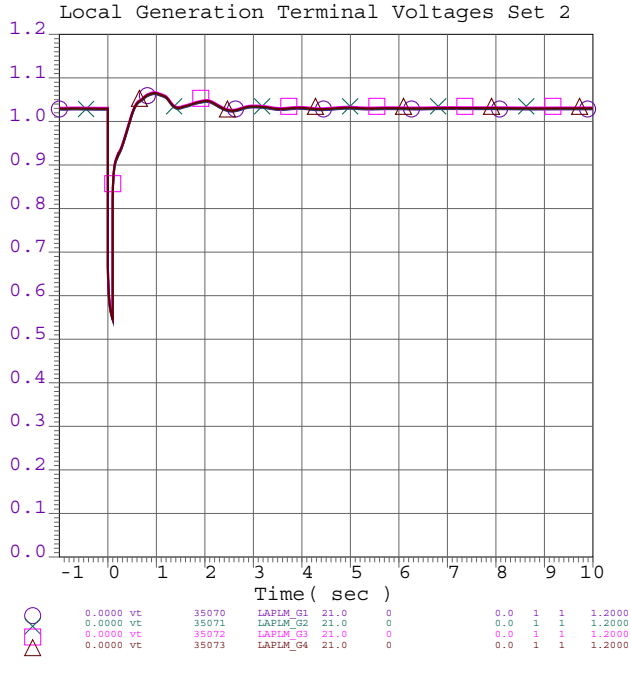


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

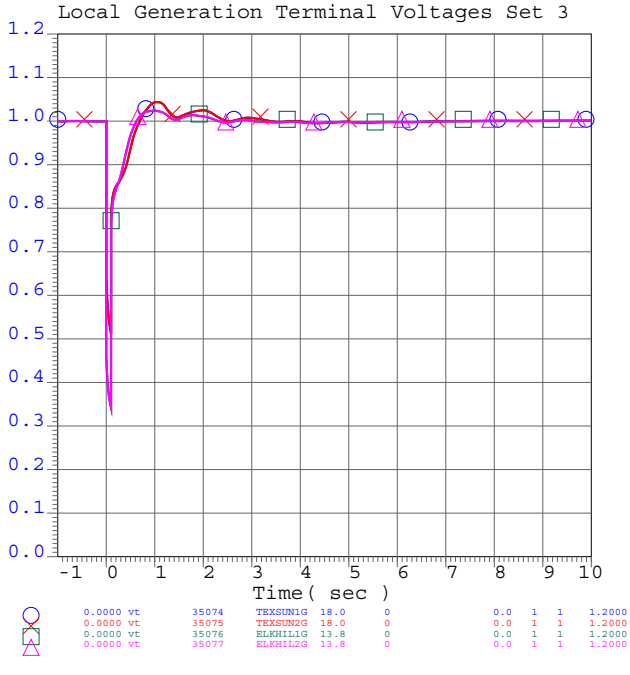
Local Pump Terminal Voltages Set 1



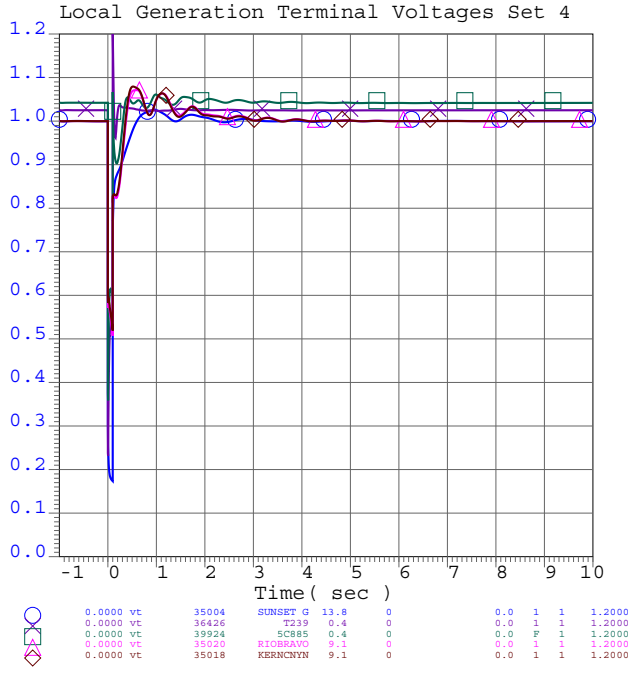
Local Generation Terminal Voltages Set 2



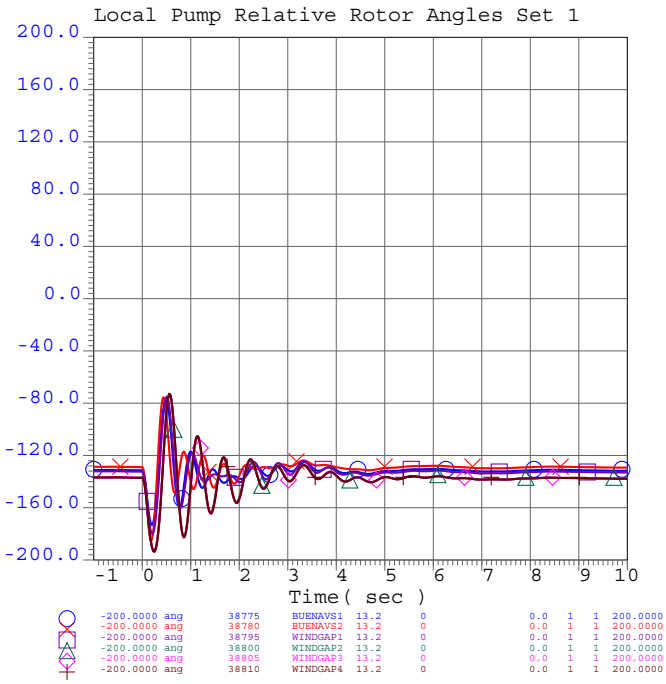
Local Generation Terminal Voltages Set 3

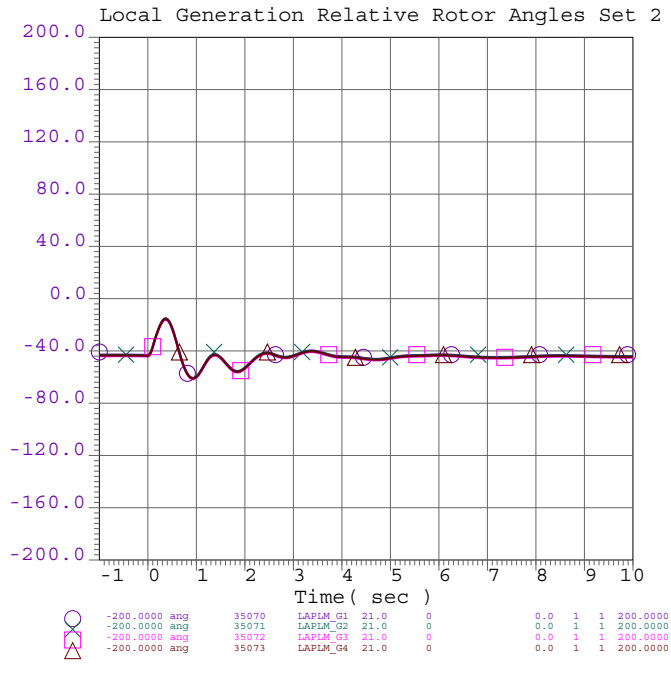


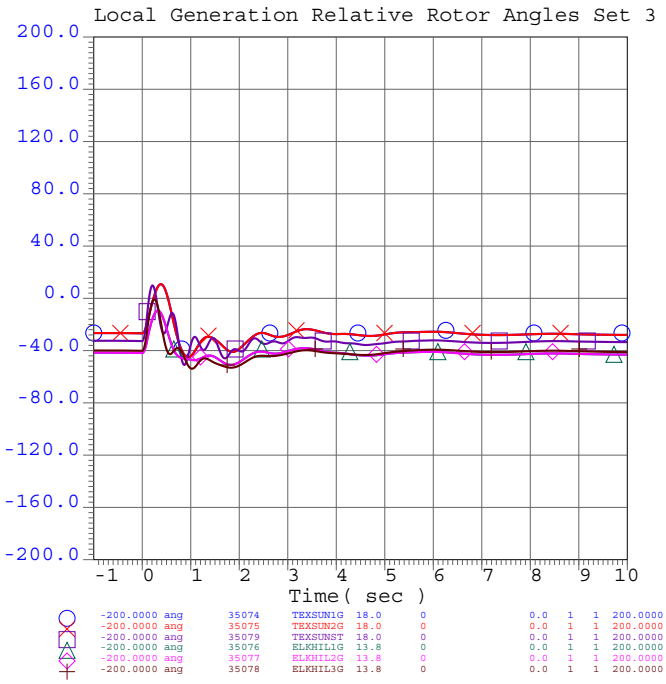
Local Generation Terminal Voltages Set 4

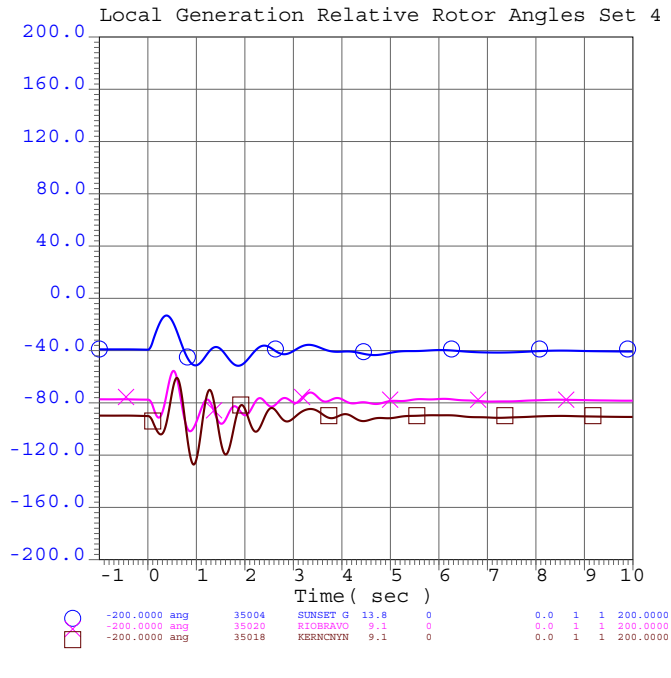


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

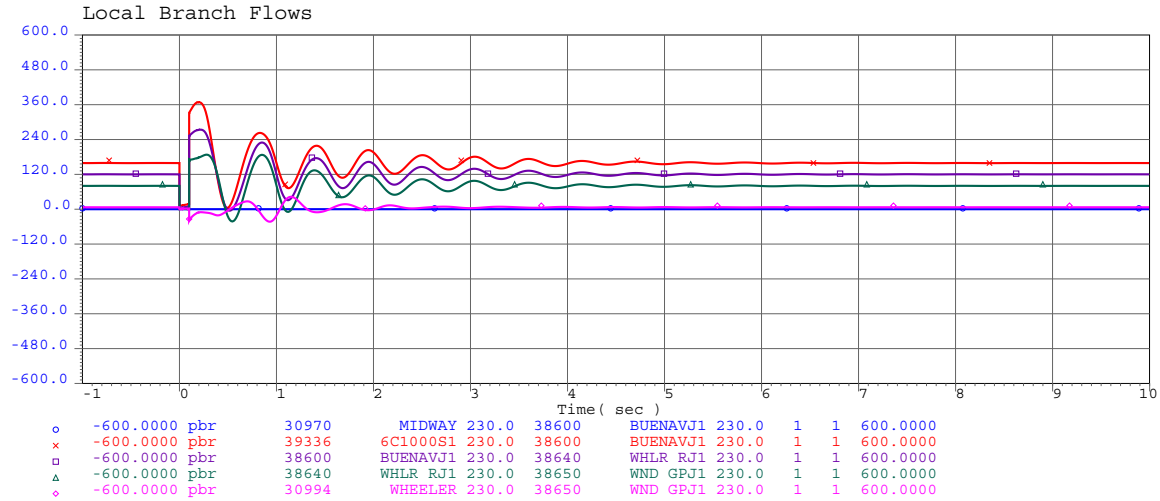




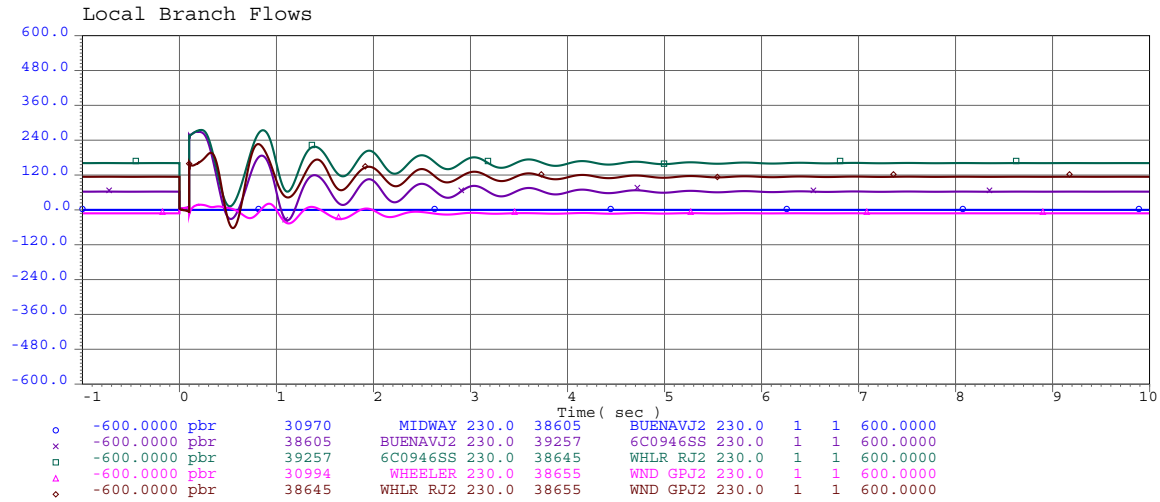




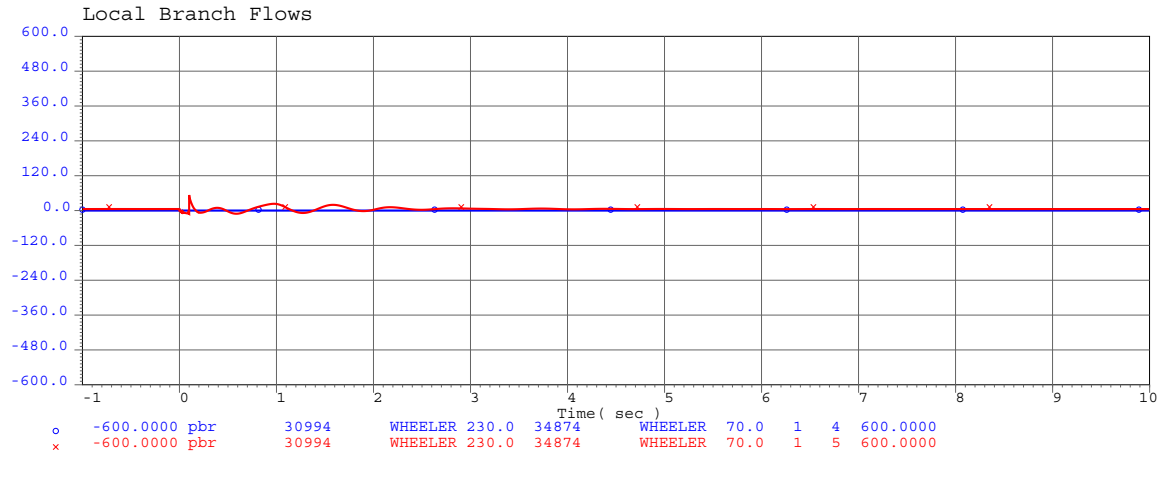
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

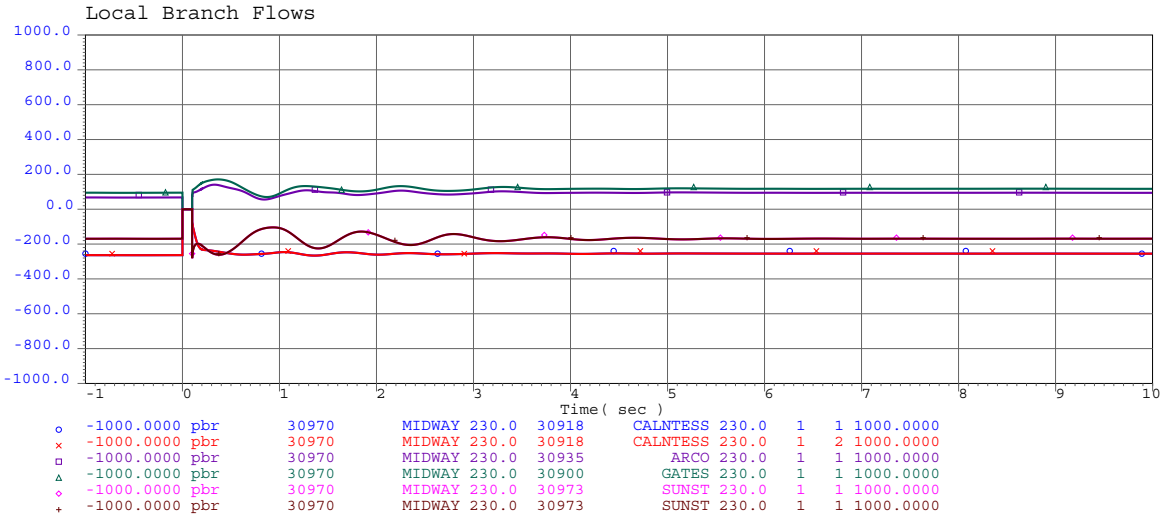


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

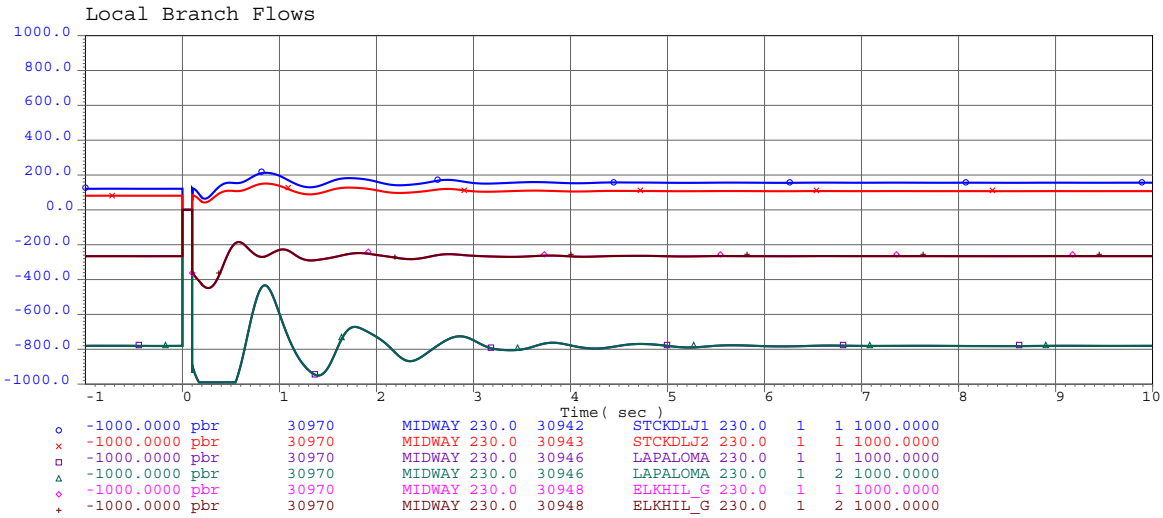


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

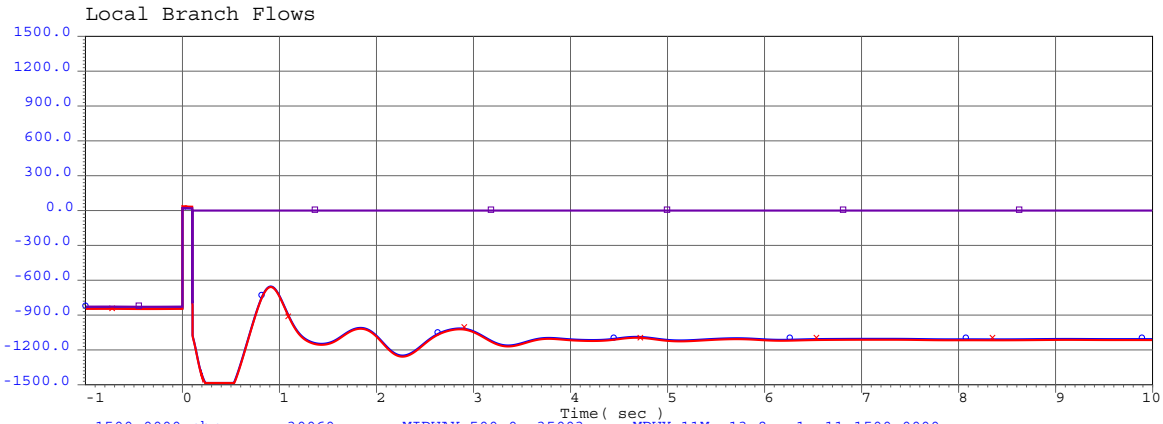
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



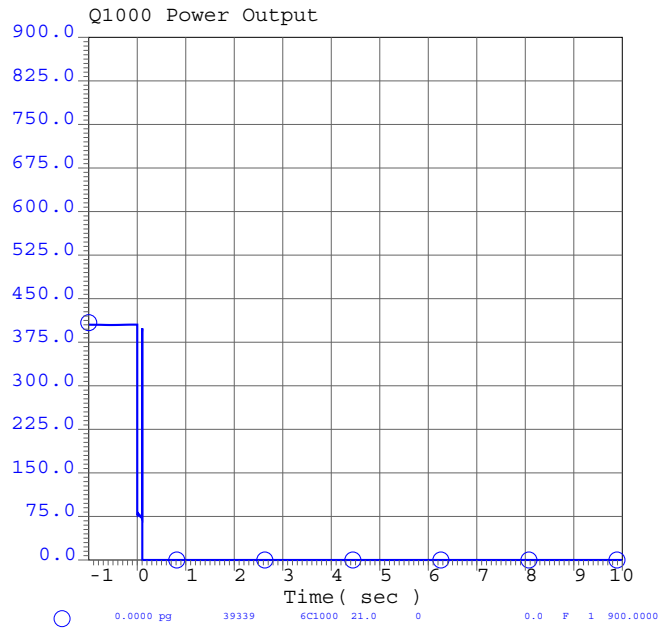
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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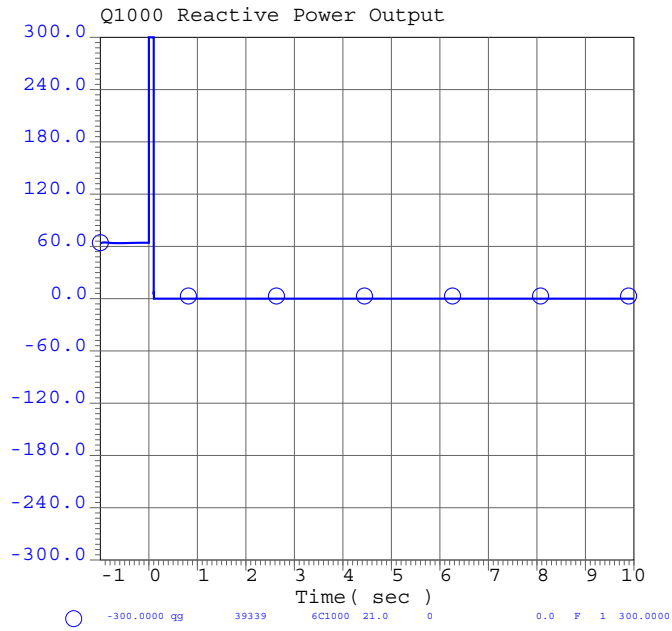


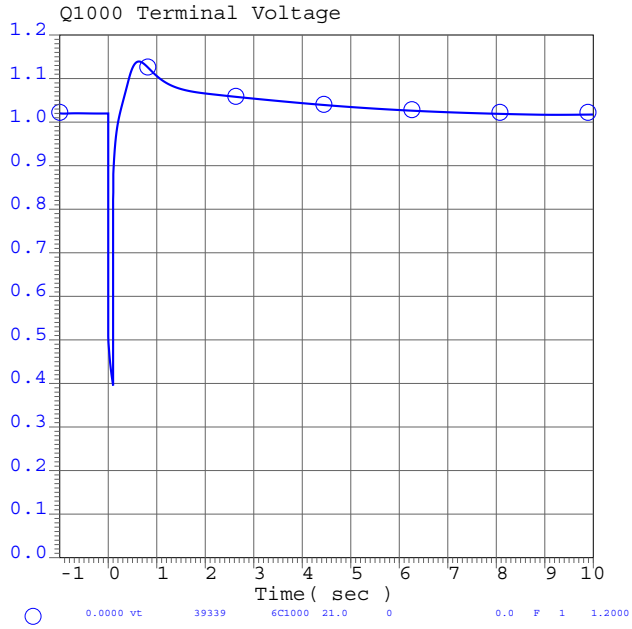
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

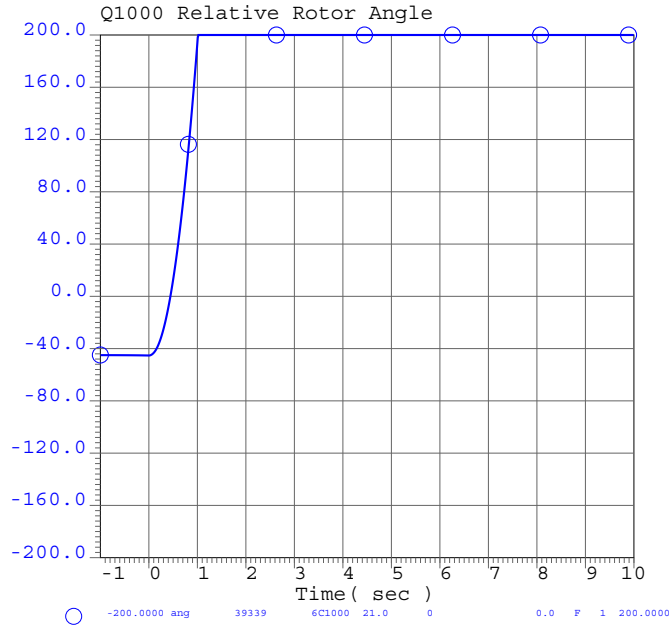
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







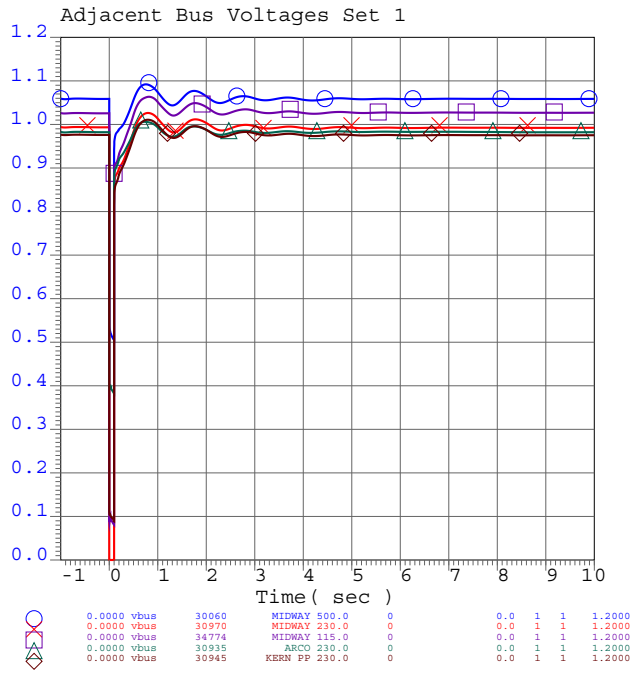


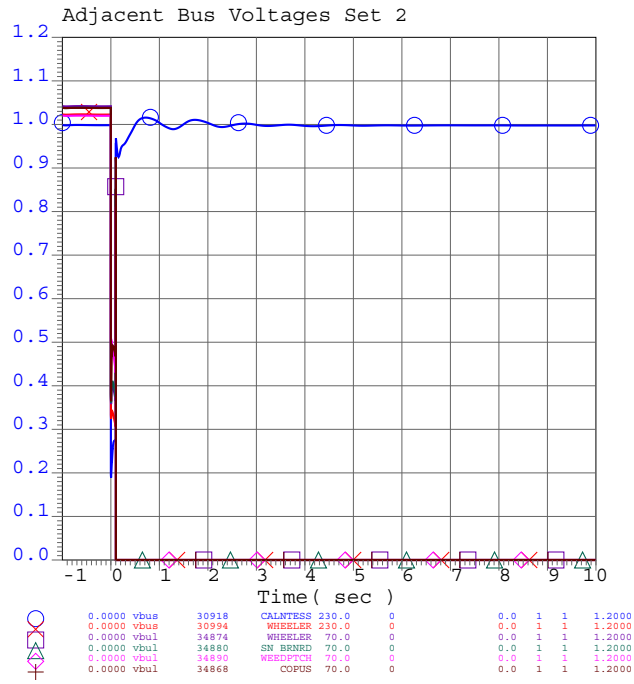
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

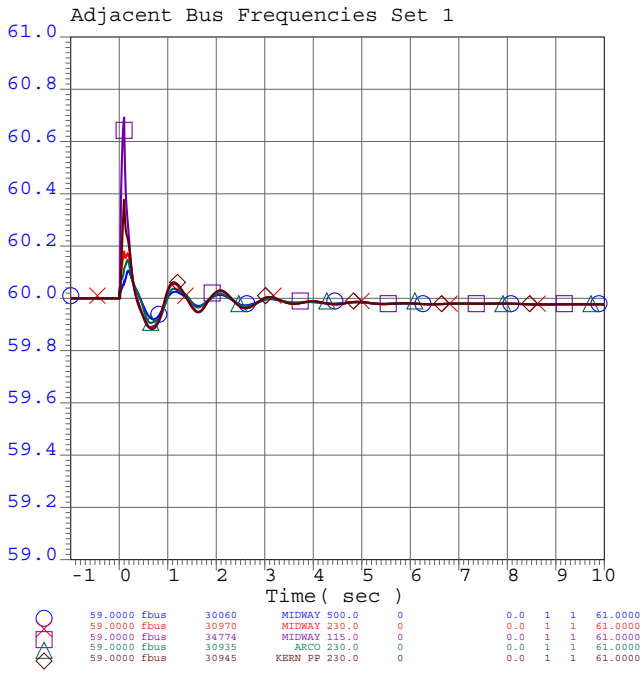
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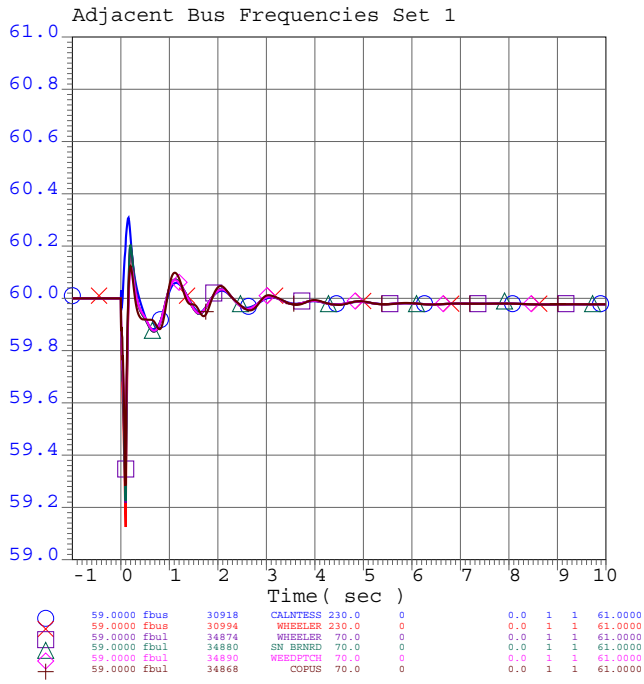
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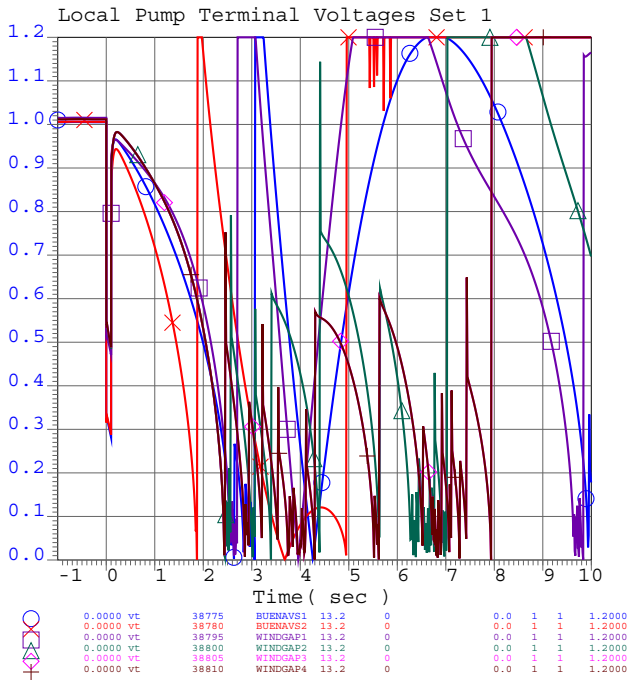


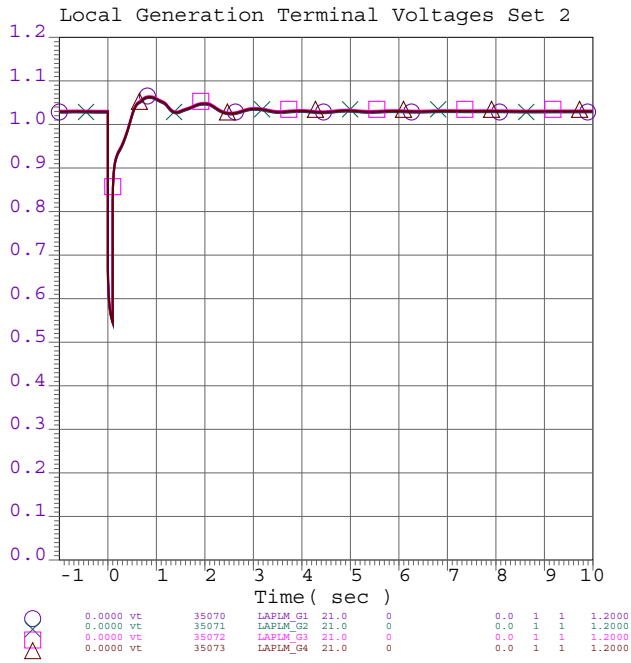


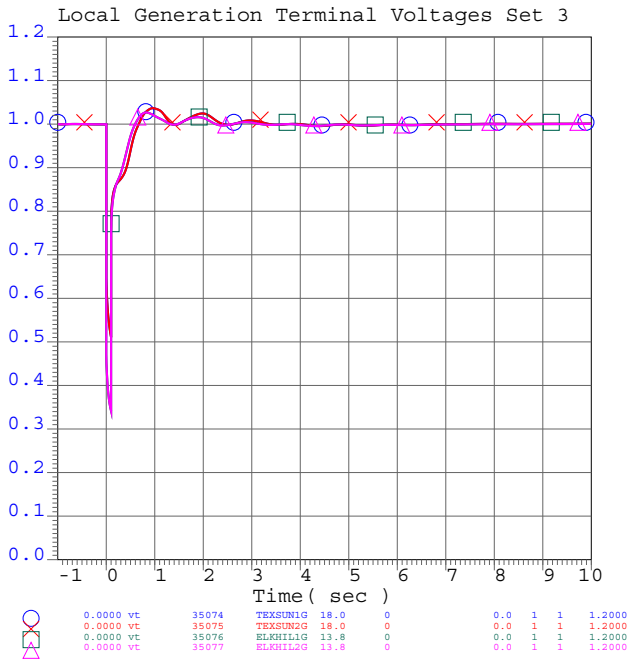


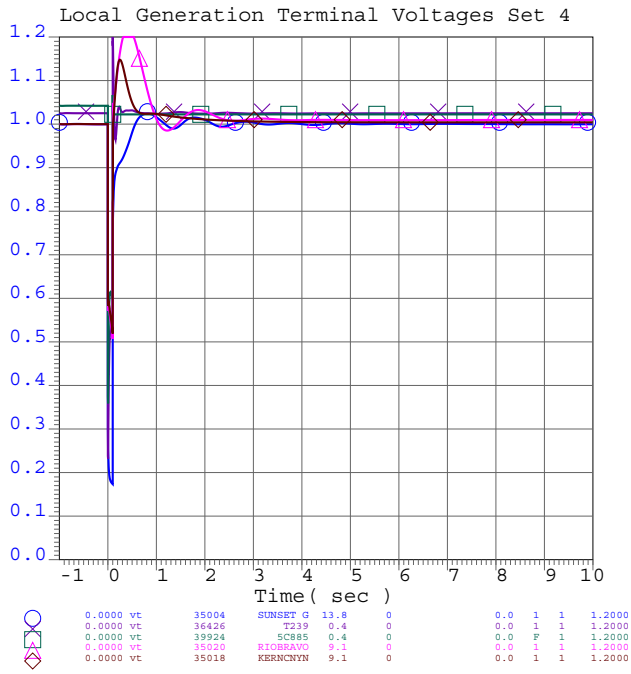


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

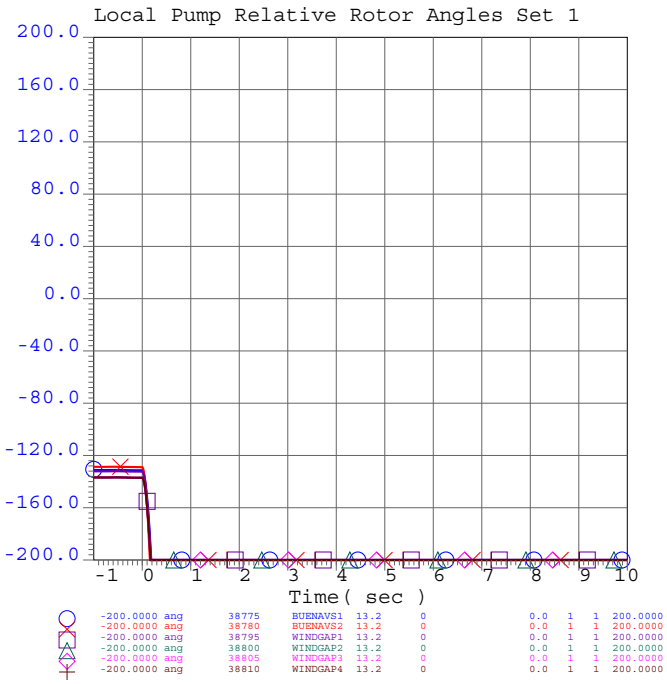


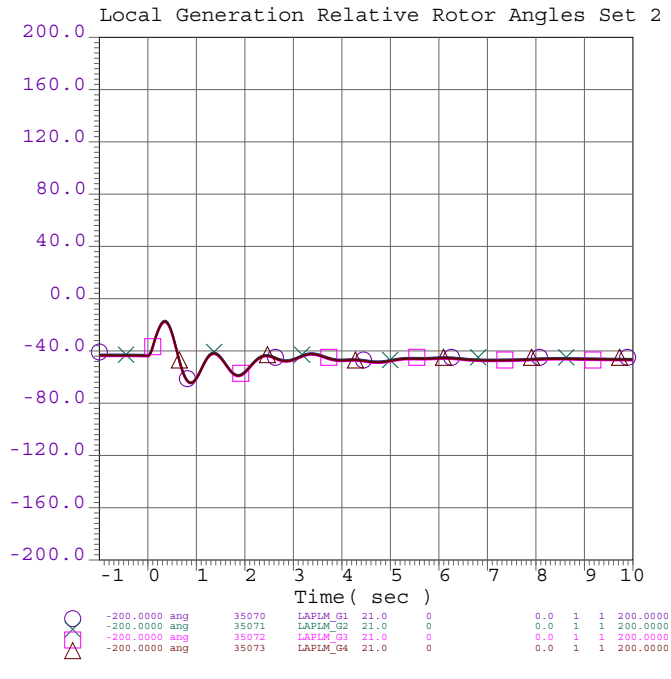


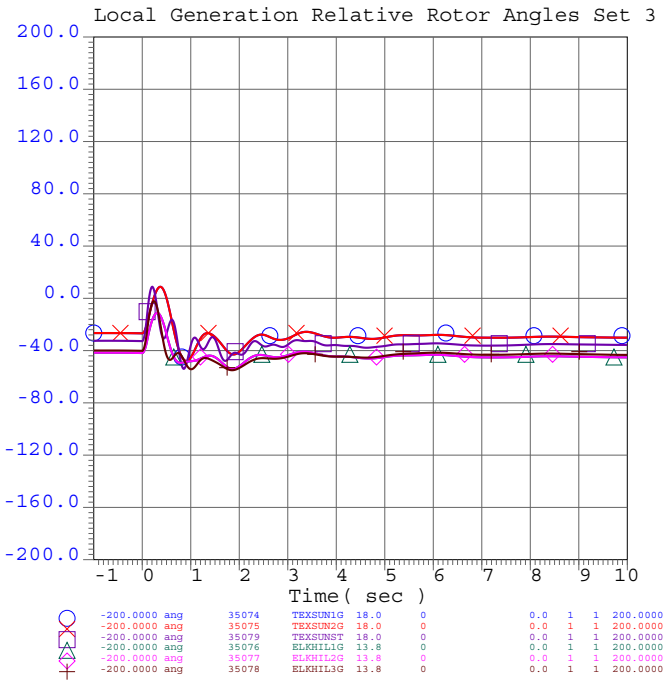


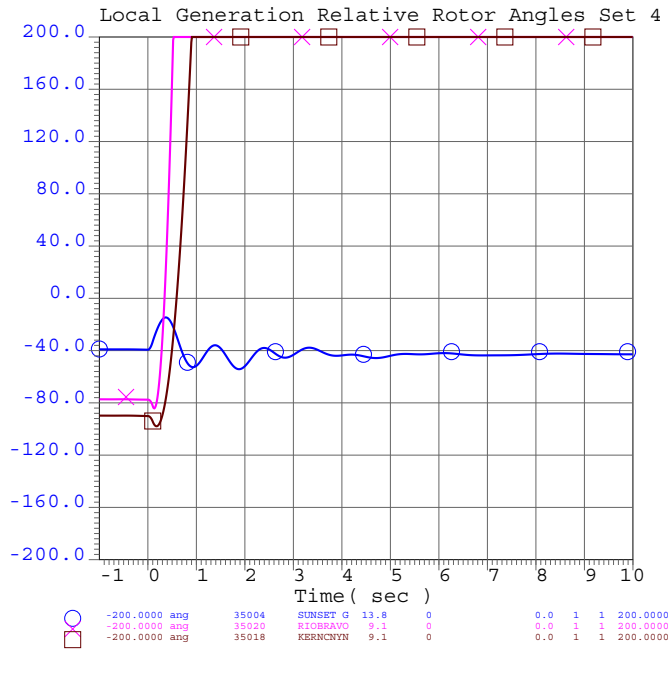


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

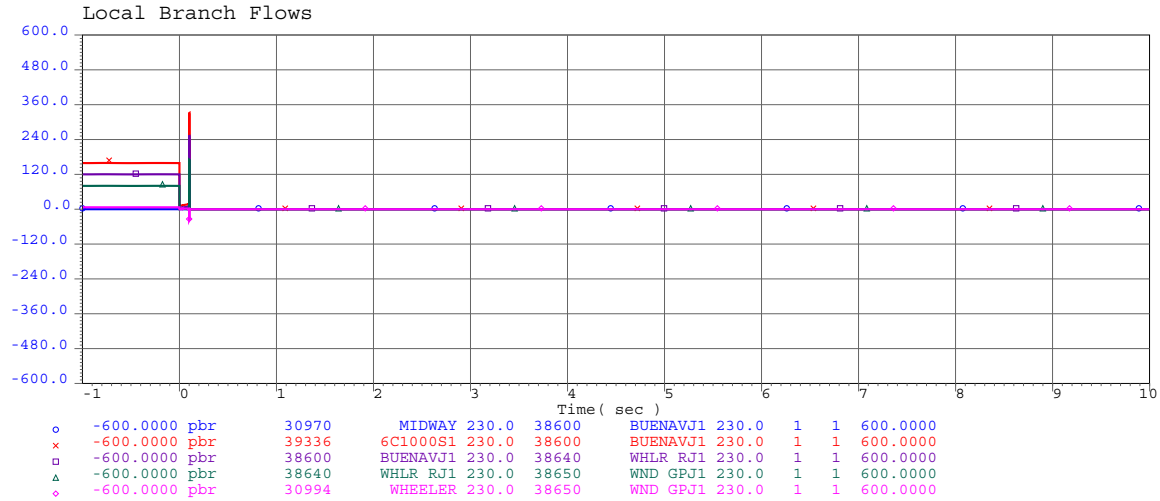


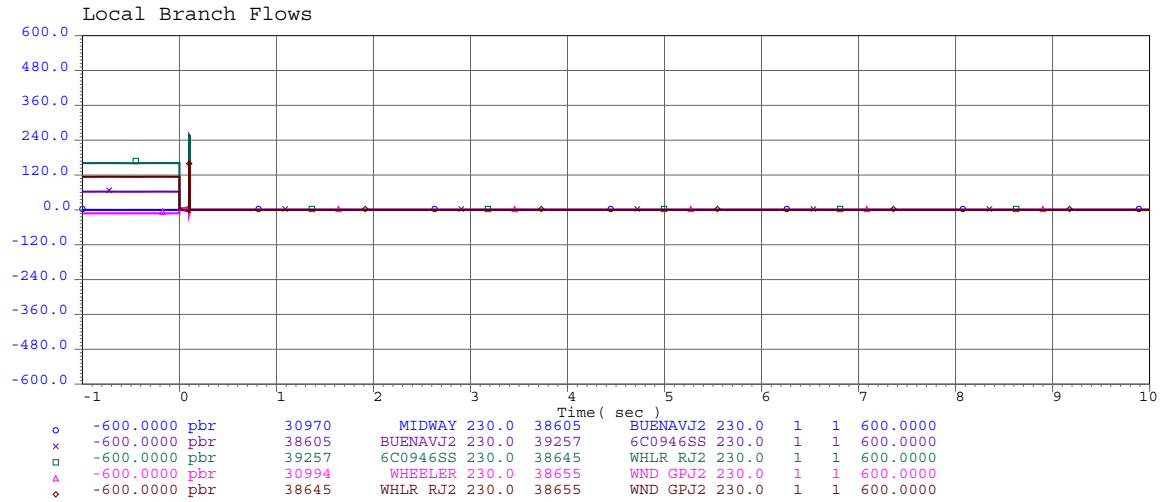


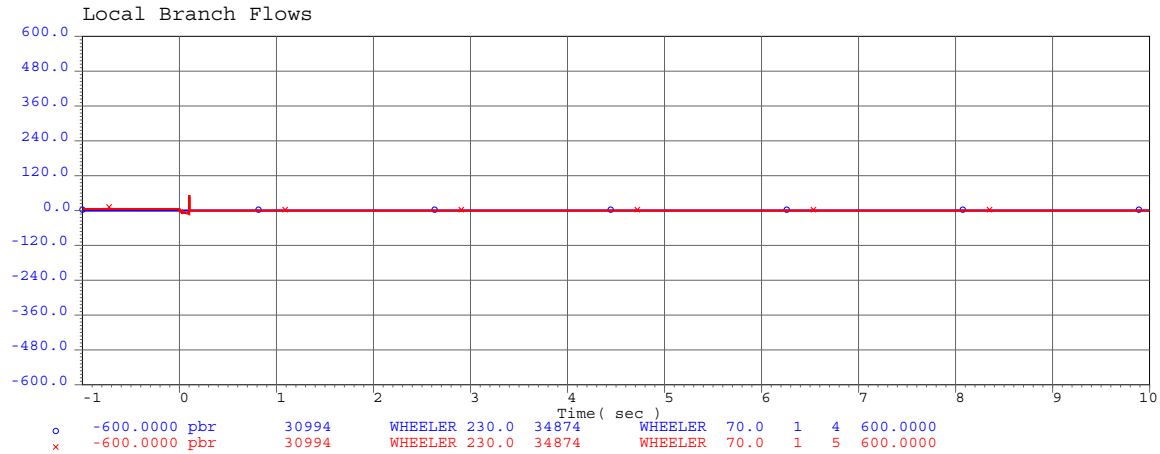




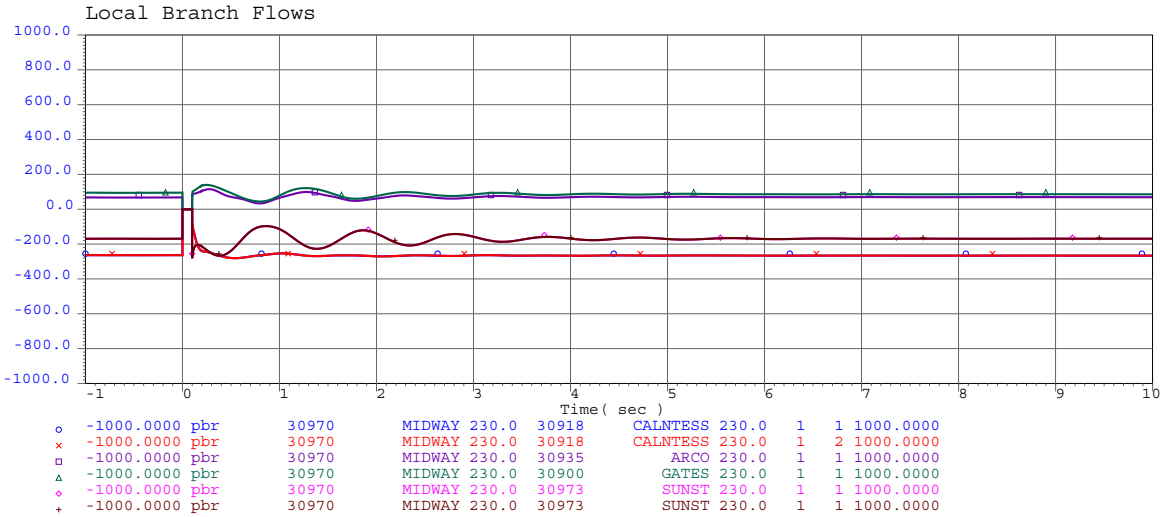
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines



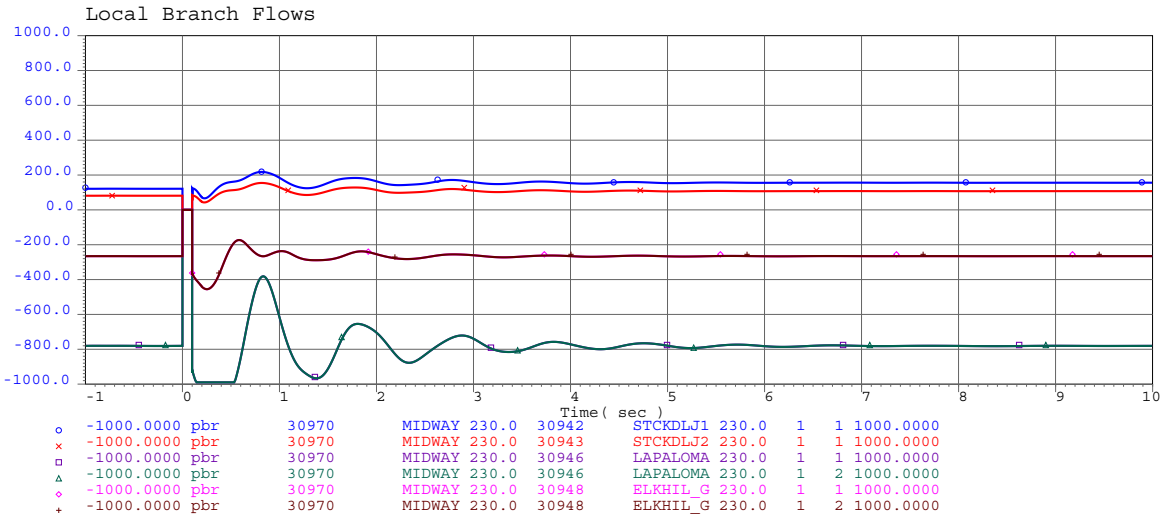




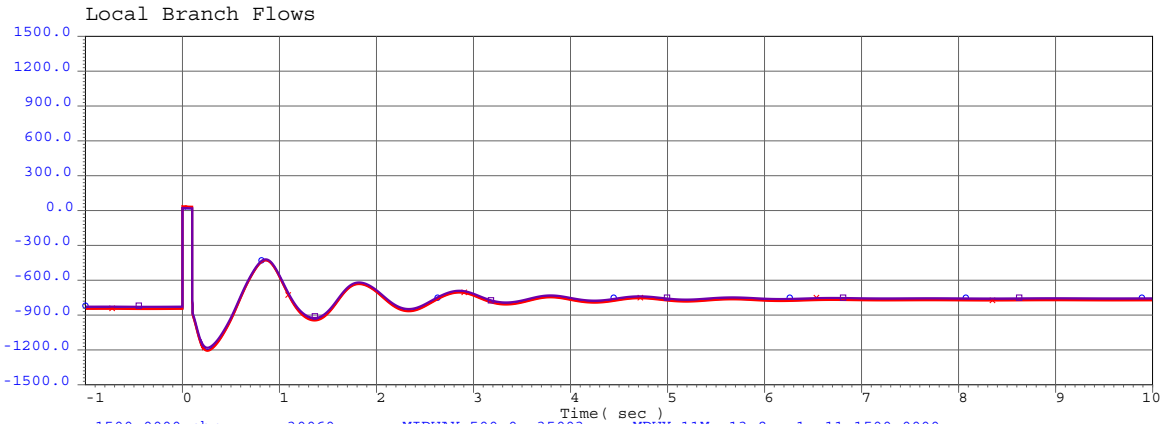
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



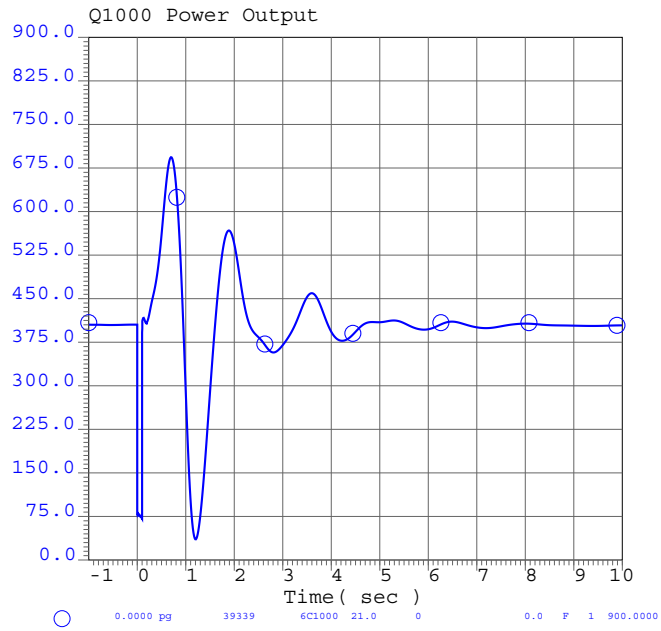
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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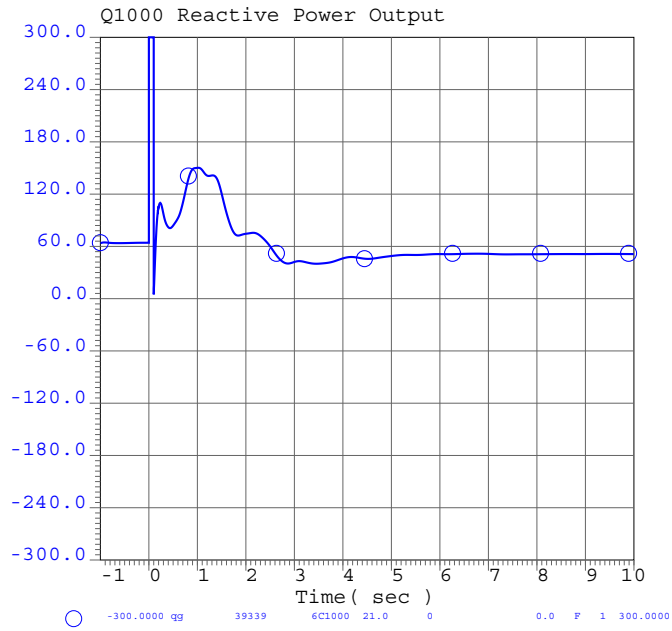


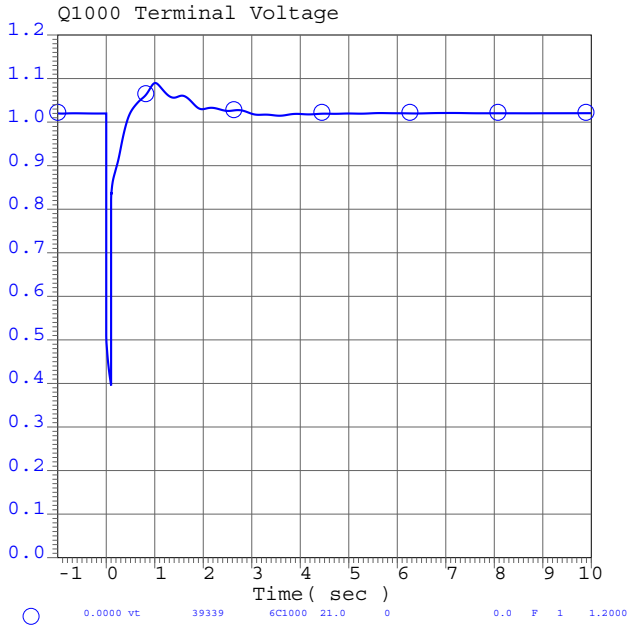
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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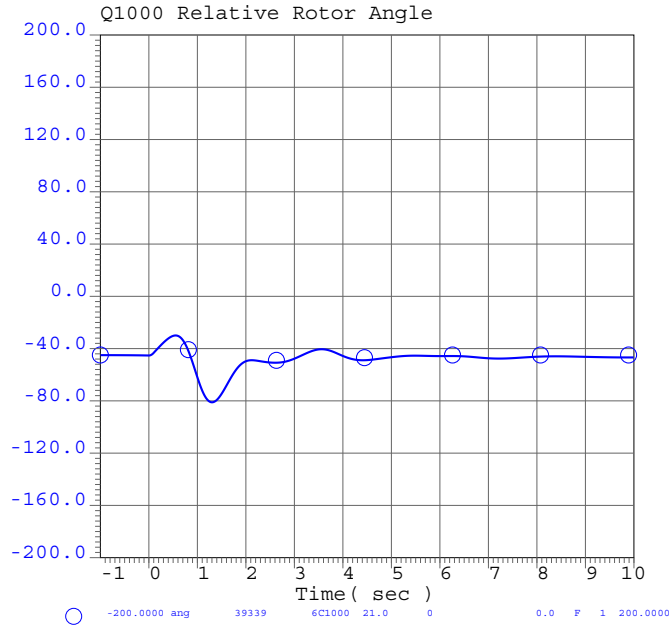
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







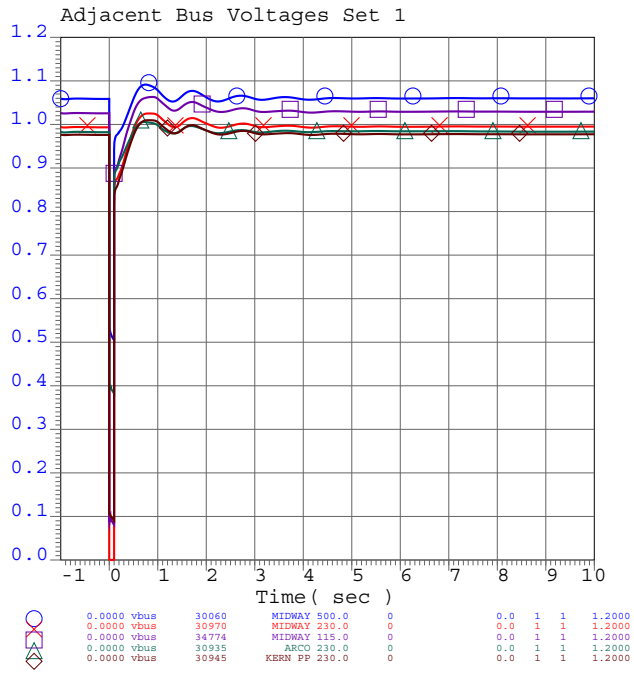


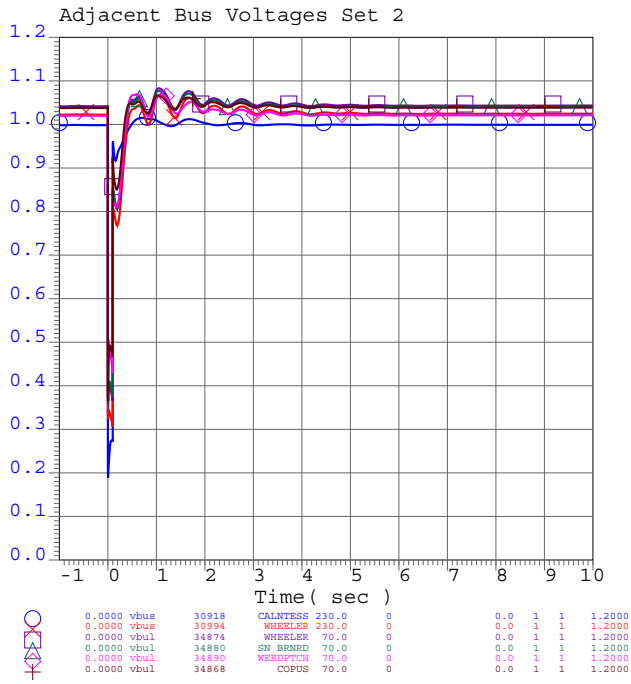
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

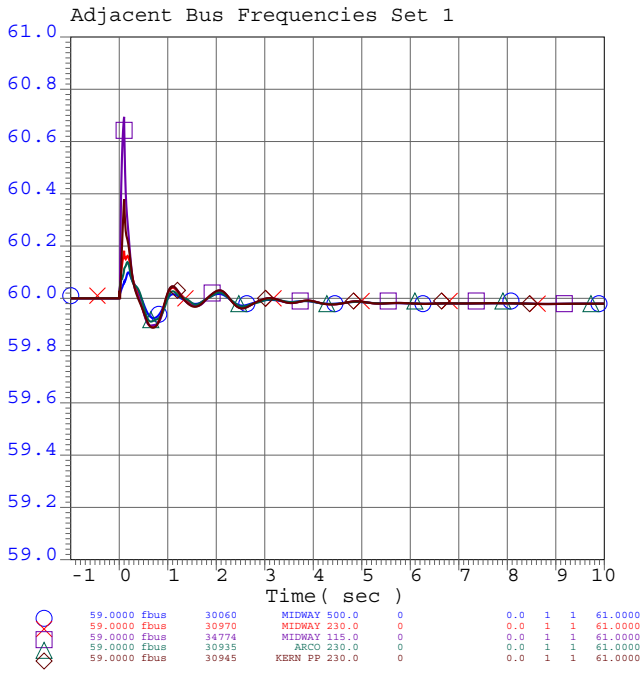
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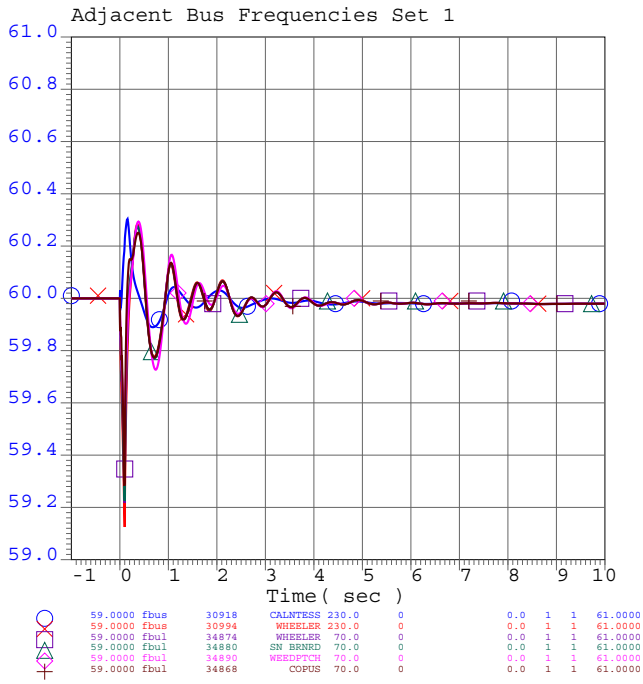
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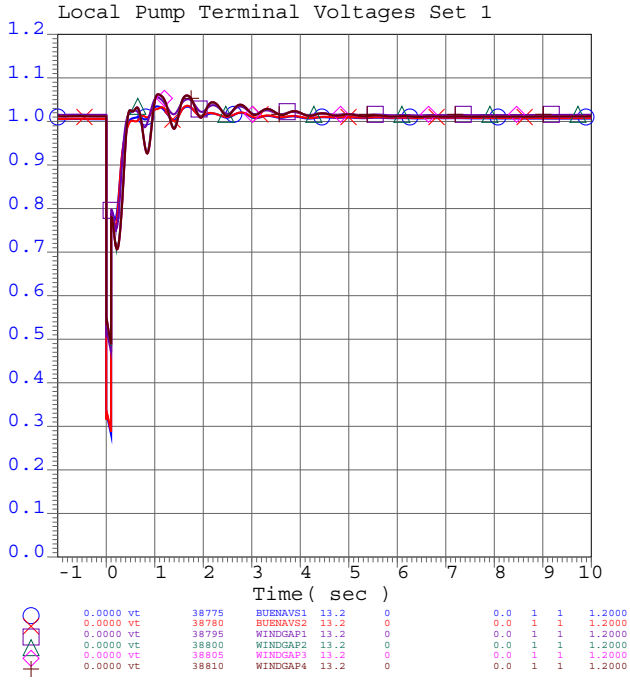




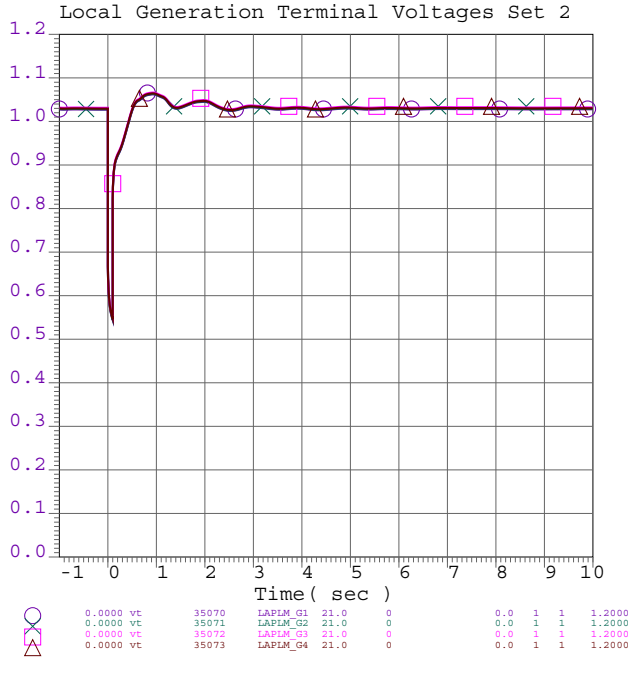


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

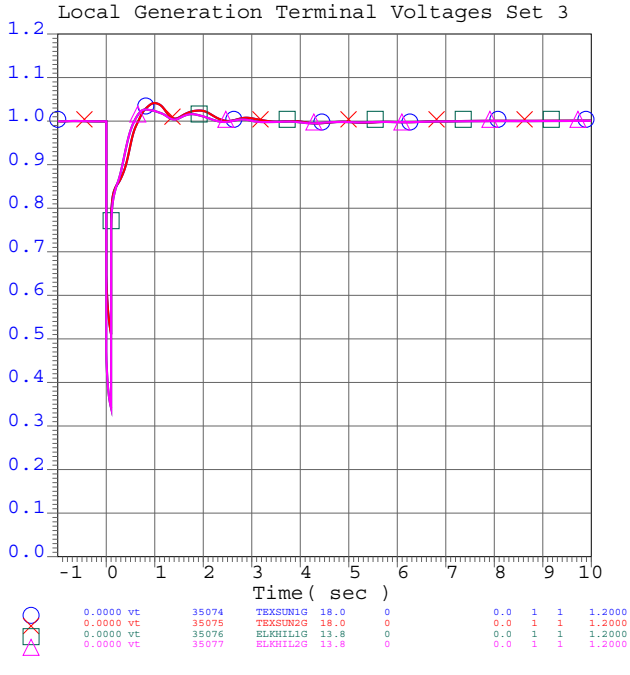
Local Pump Terminal Voltages Set 1



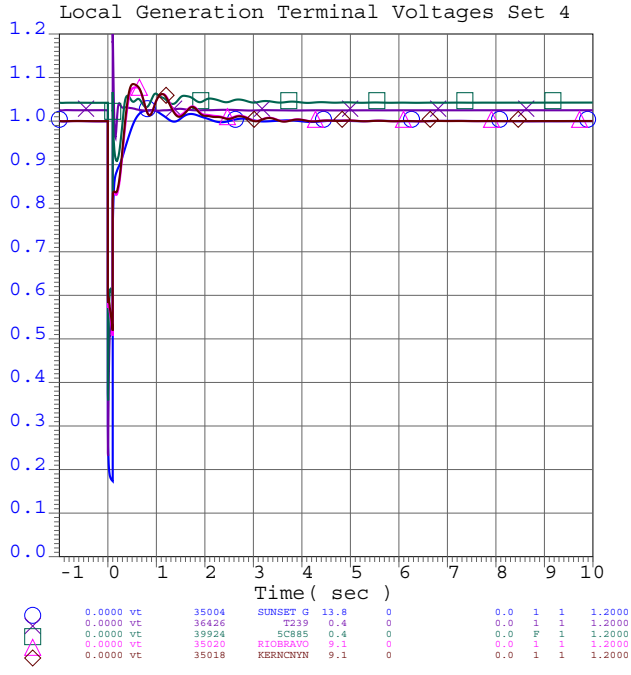
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

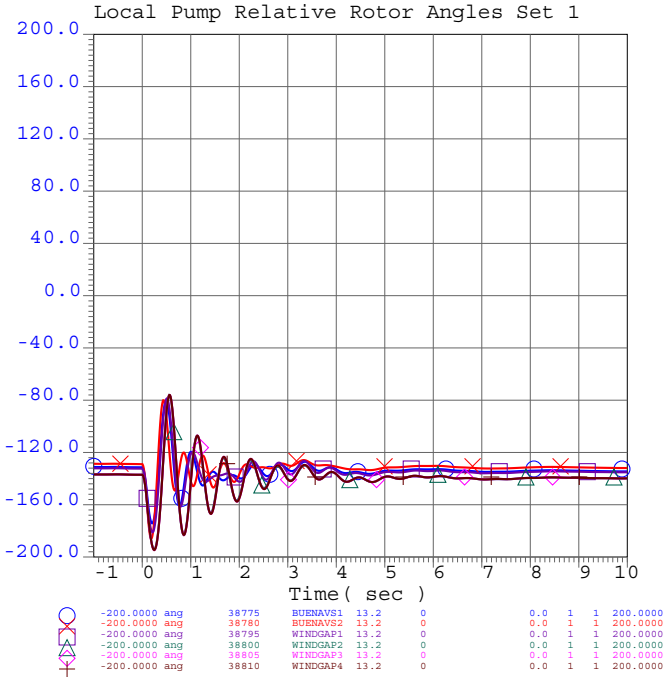


Local Generation Terminal Voltages Set 4

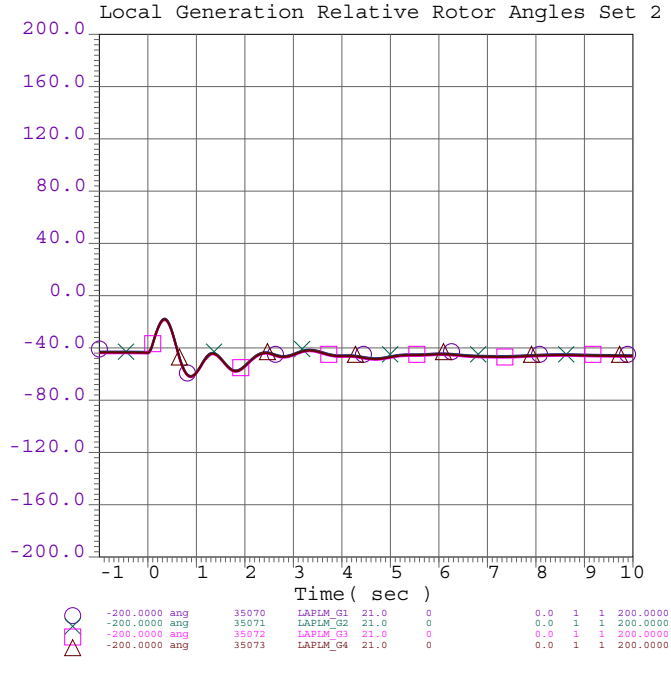


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

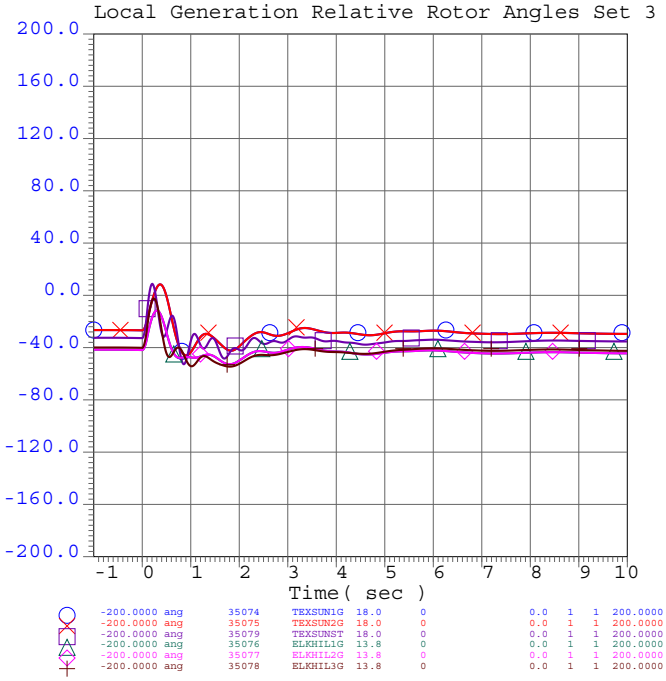
Local Pump Relative Rotor Angles Set 1



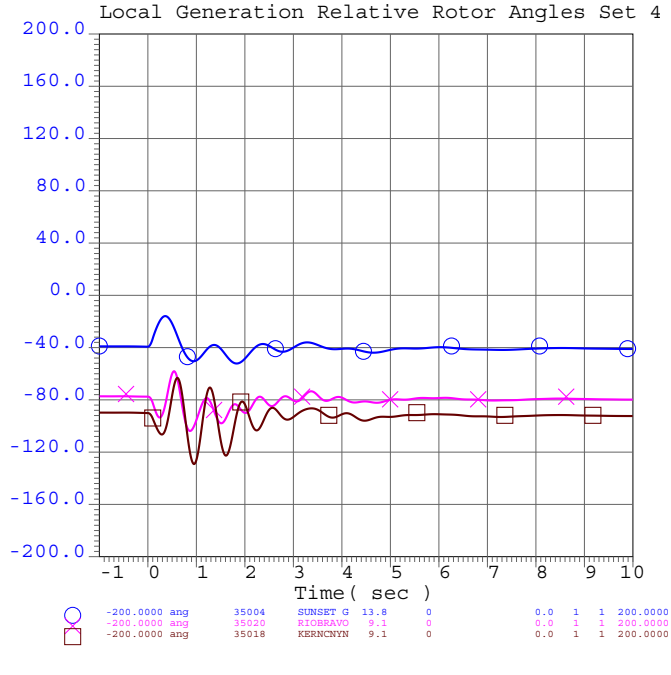
Local Generation Relative Rotor Angles Set 2



Local Generation Relative Rotor Angles Set 3

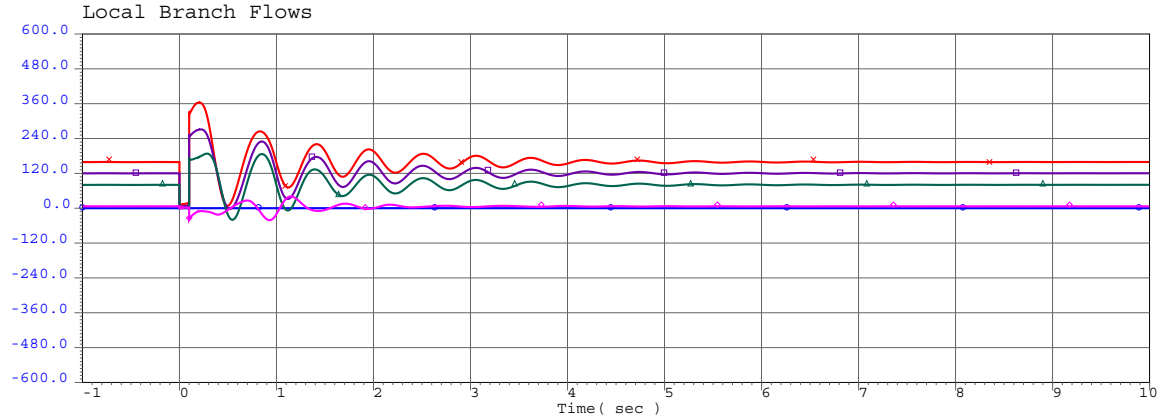


Local Generation Relative Rotor Angles Set 4



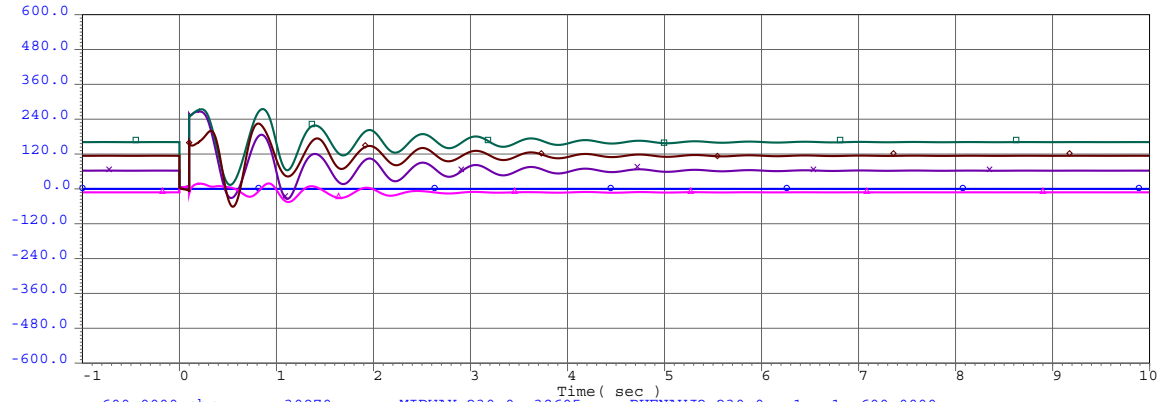
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

Local Branch Flows



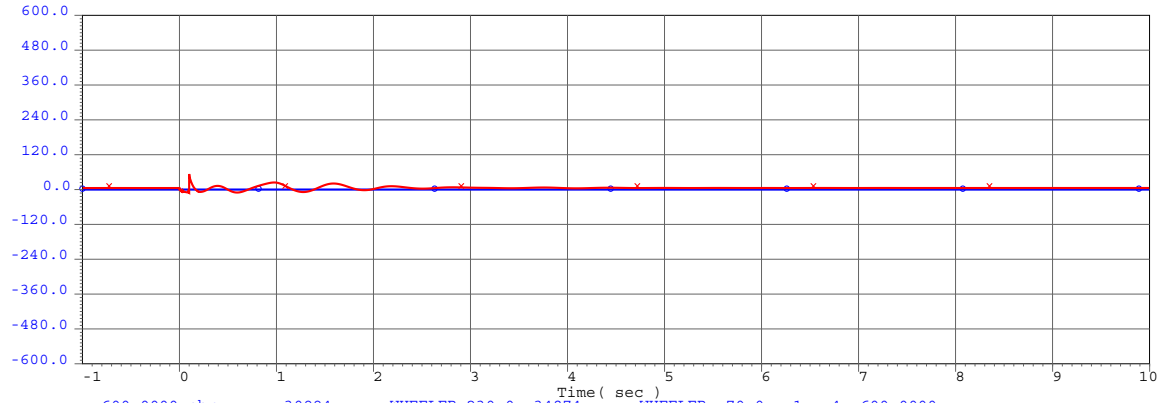
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x	-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
□	-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
△	-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
◇	-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

Local Branch Flows



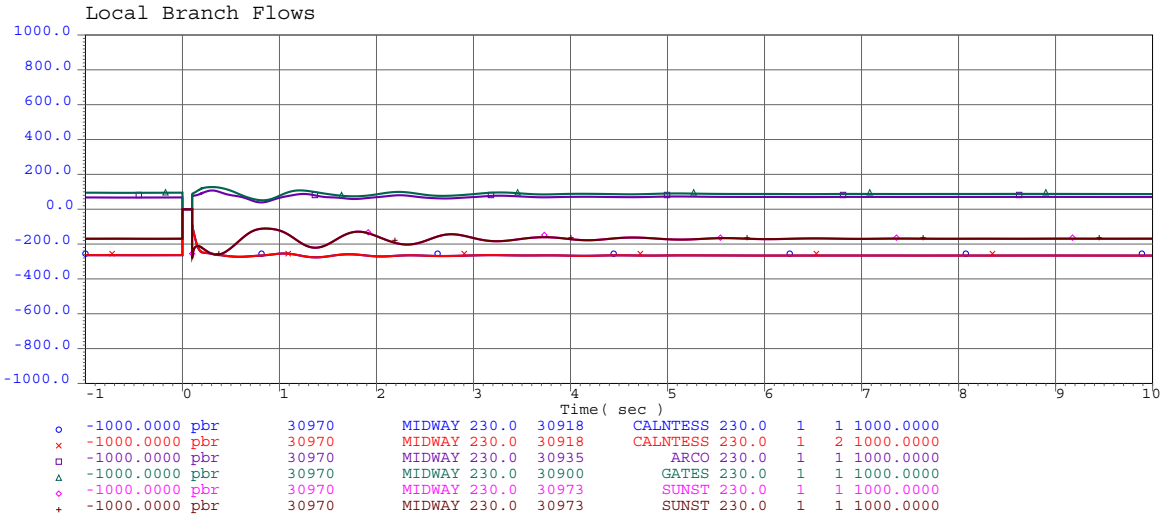
o	-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
x	-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
□	-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
△	-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
◇	-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

Local Branch Flows

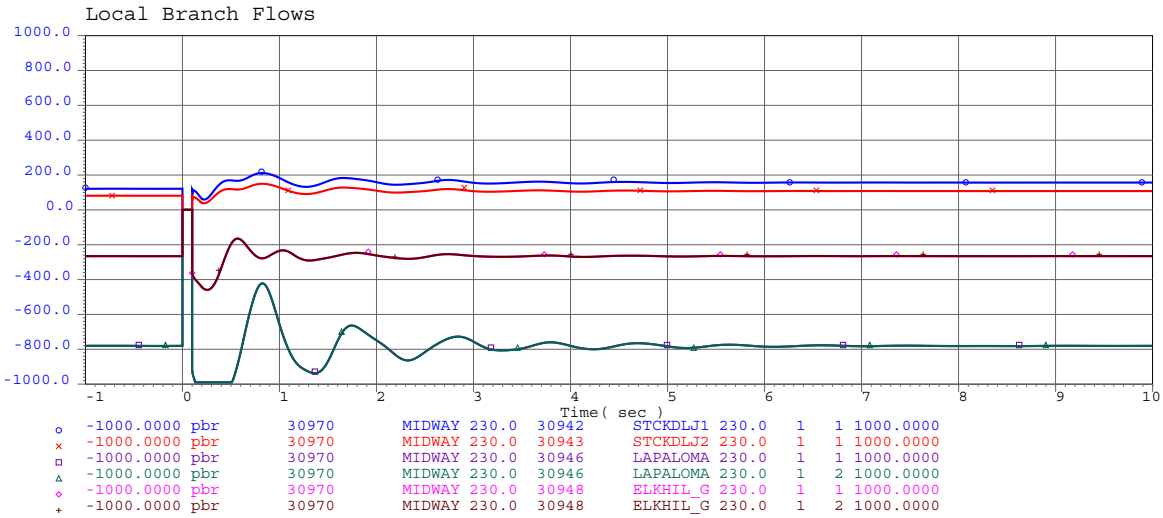


o	-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
x	-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

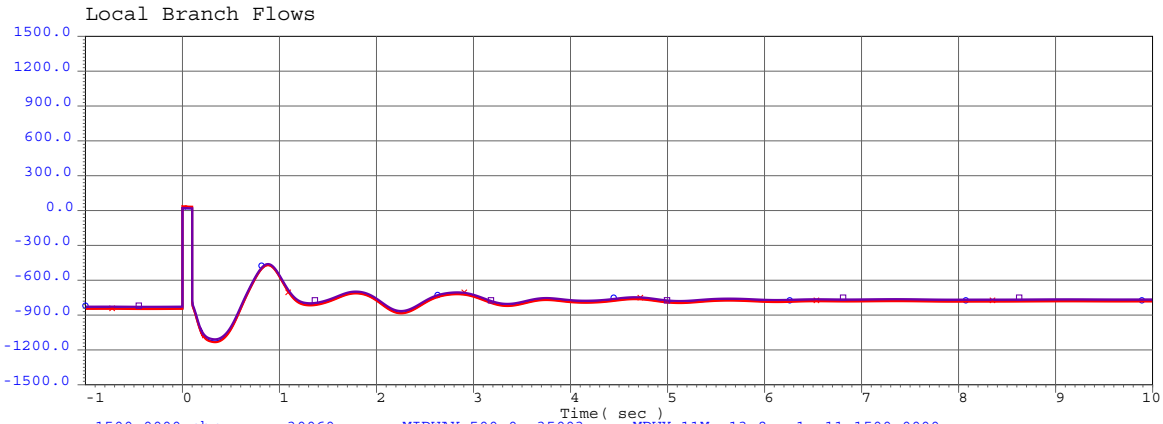
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



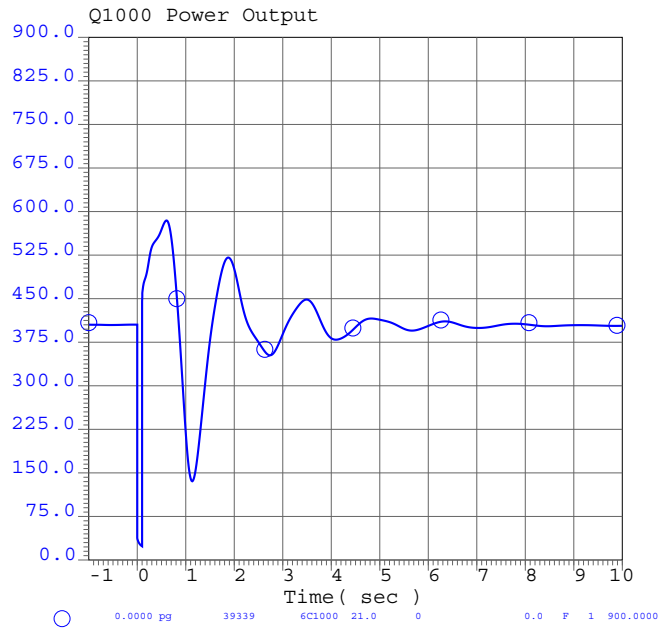
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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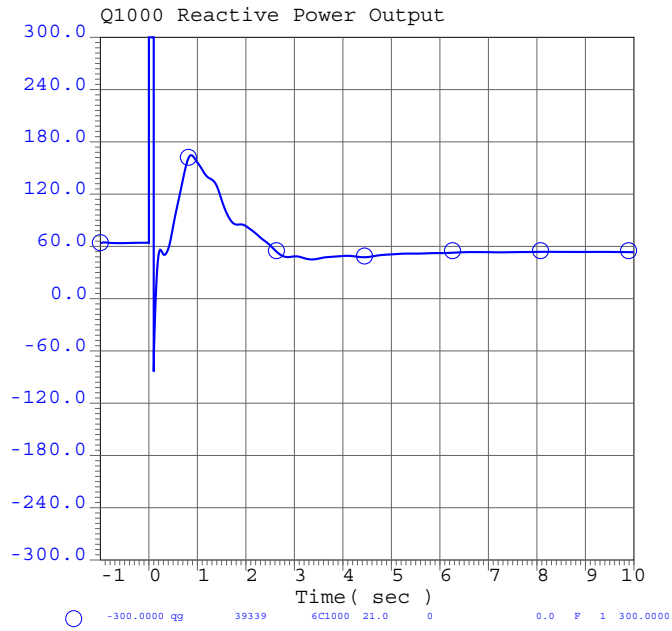


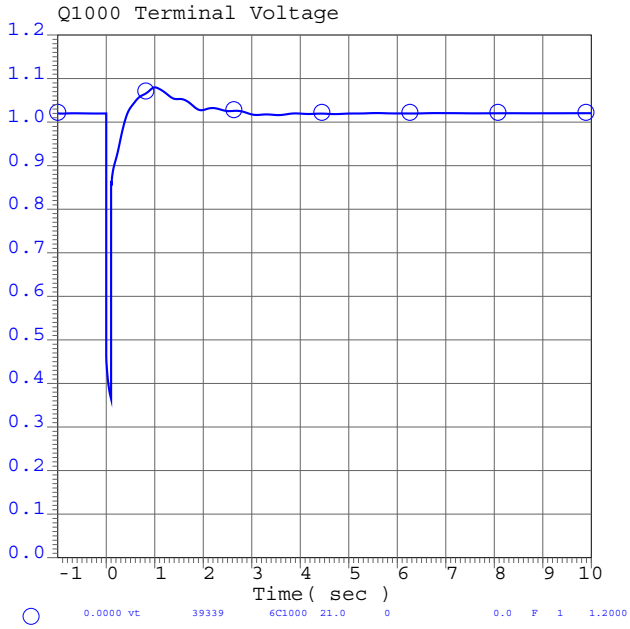
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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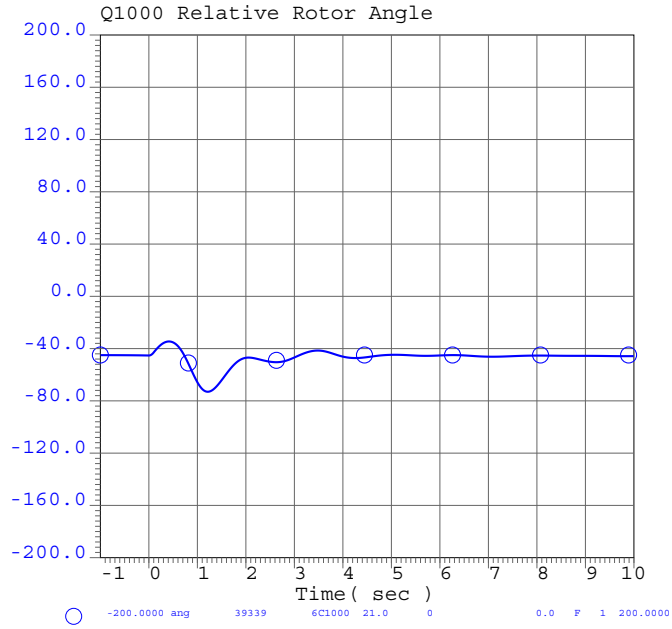
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







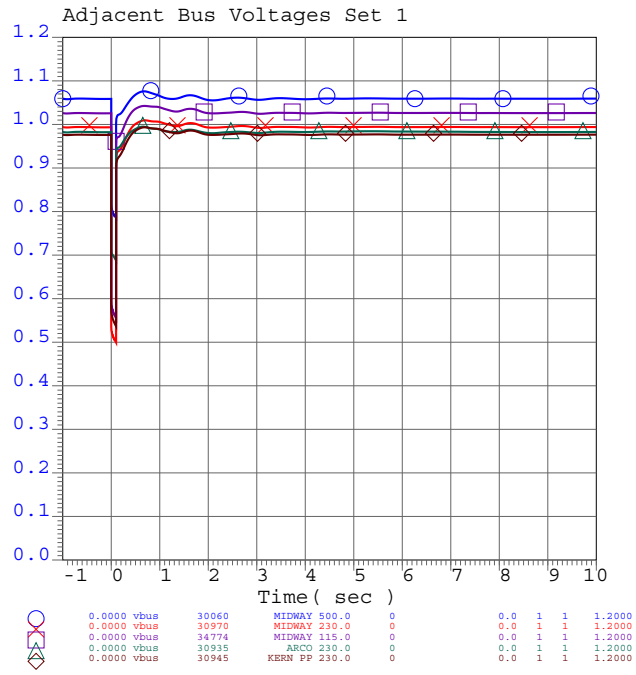


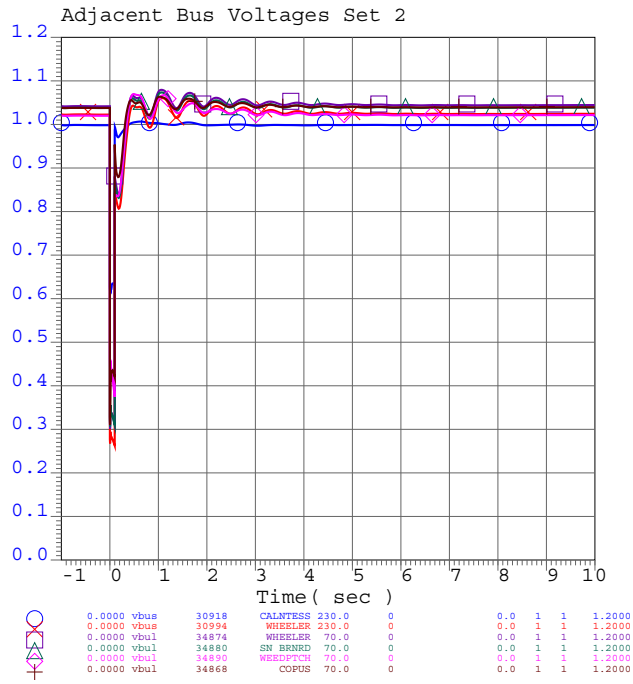
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

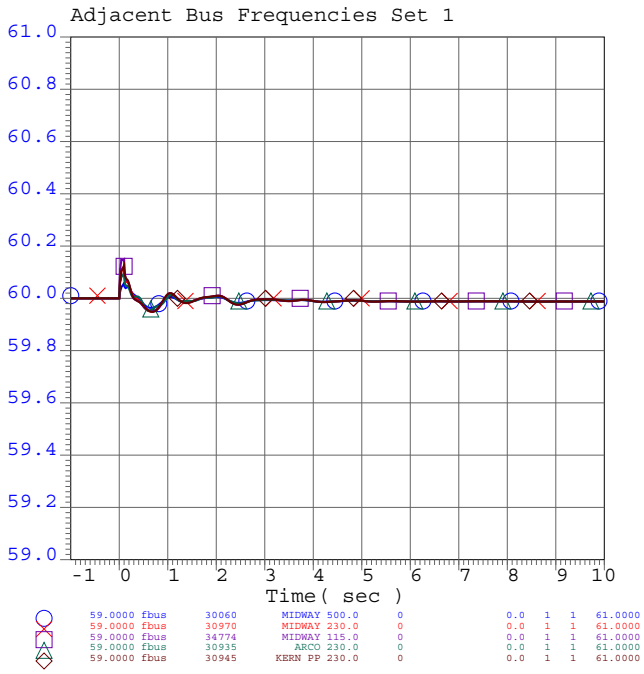
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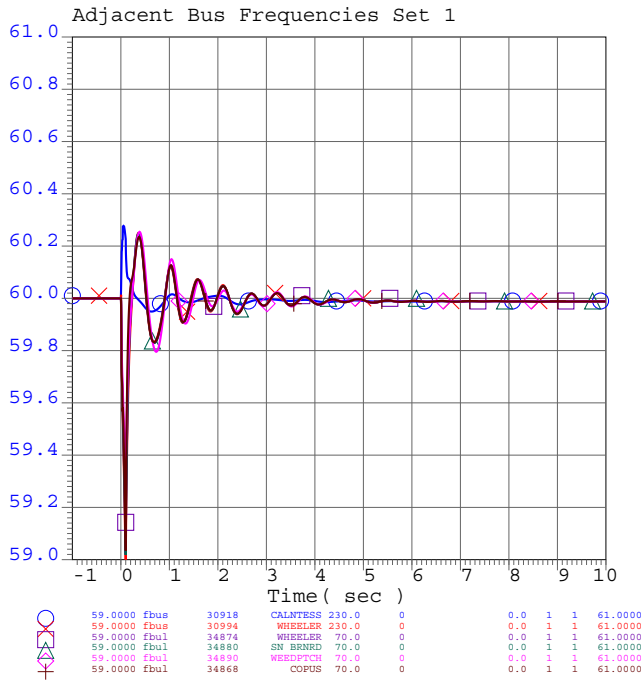
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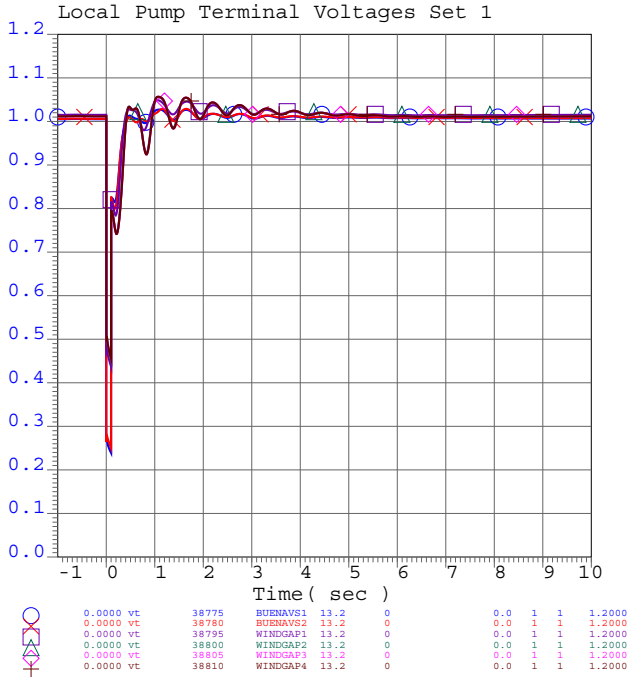




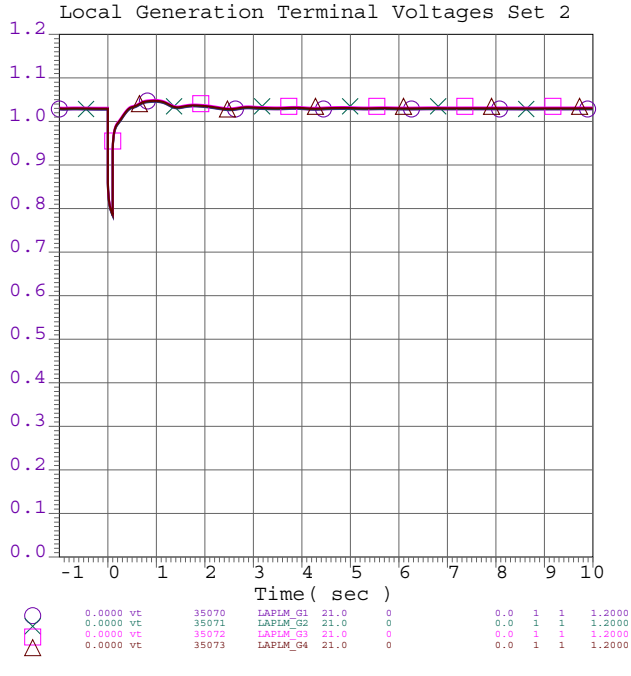


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

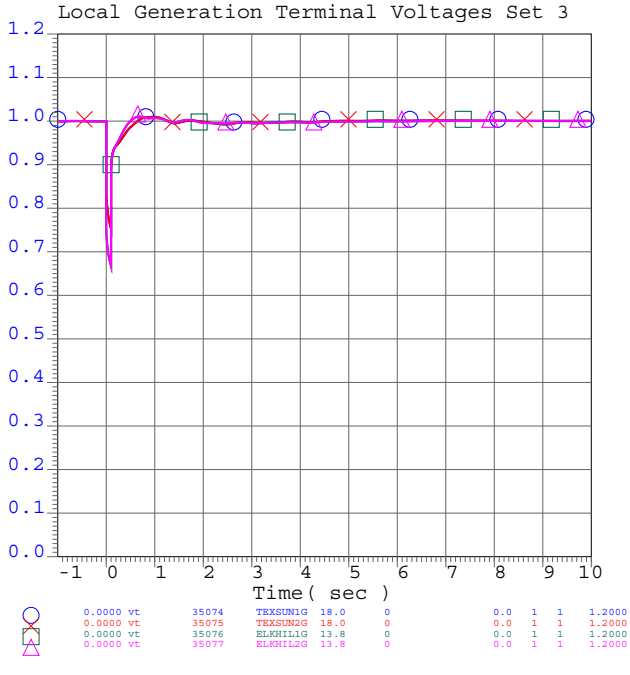
Local Pump Terminal Voltages Set 1



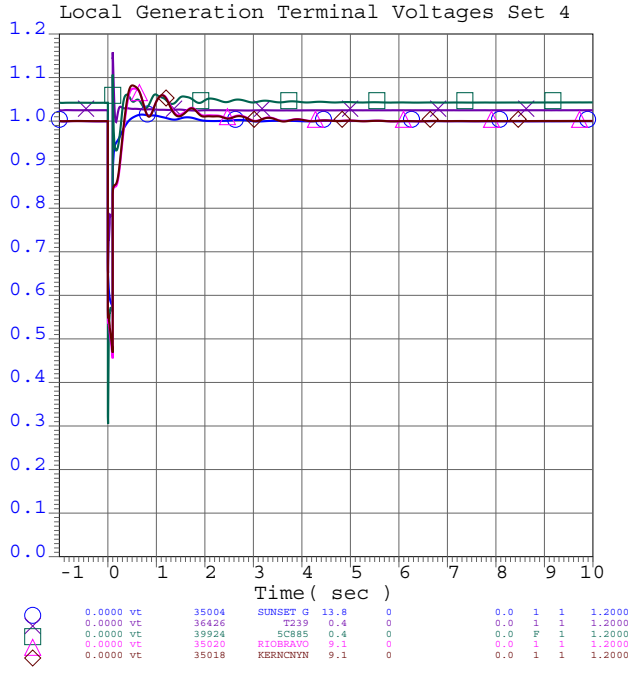
Local Generation Terminal Voltages Set 2



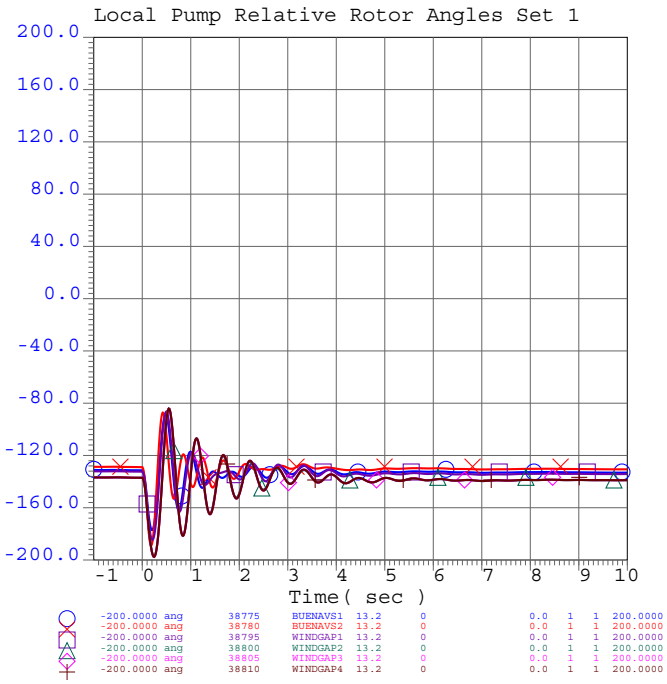
Local Generation Terminal Voltages Set 3

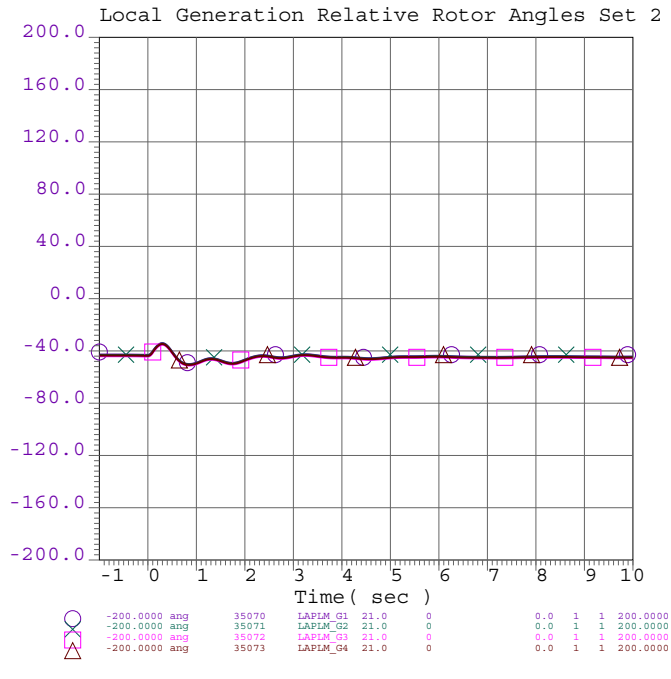


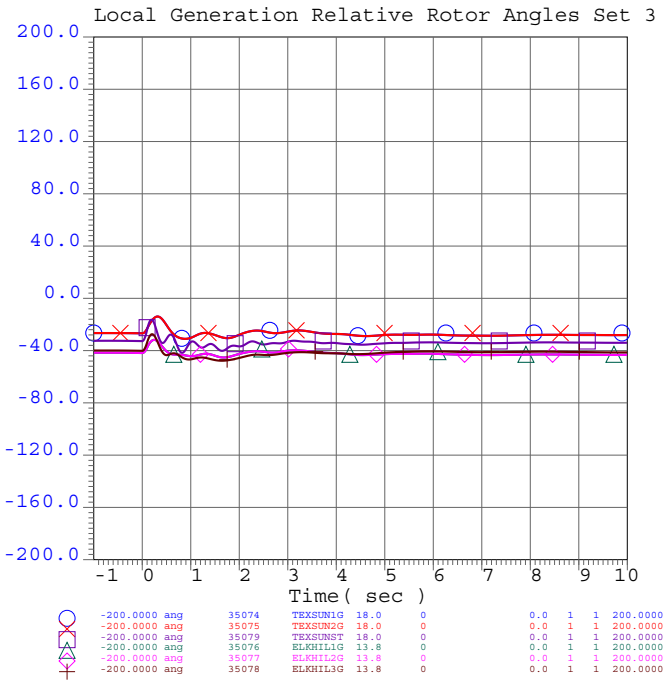
Local Generation Terminal Voltages Set 4

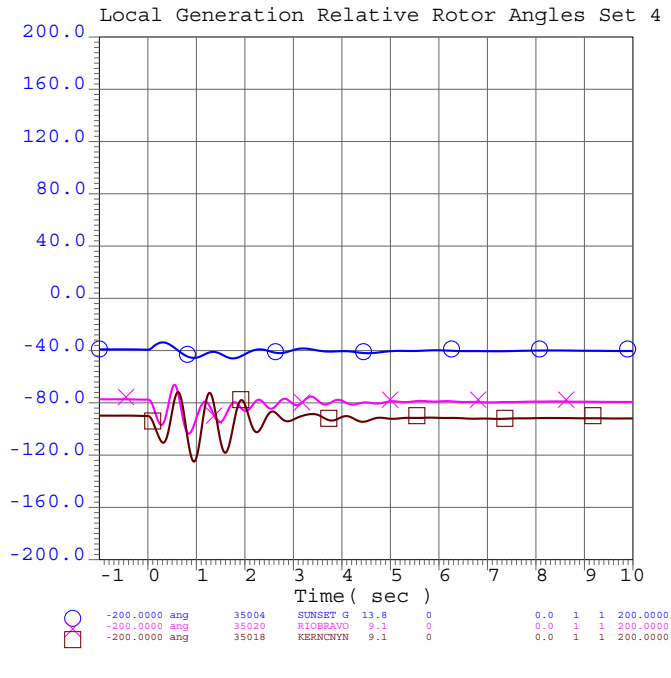


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

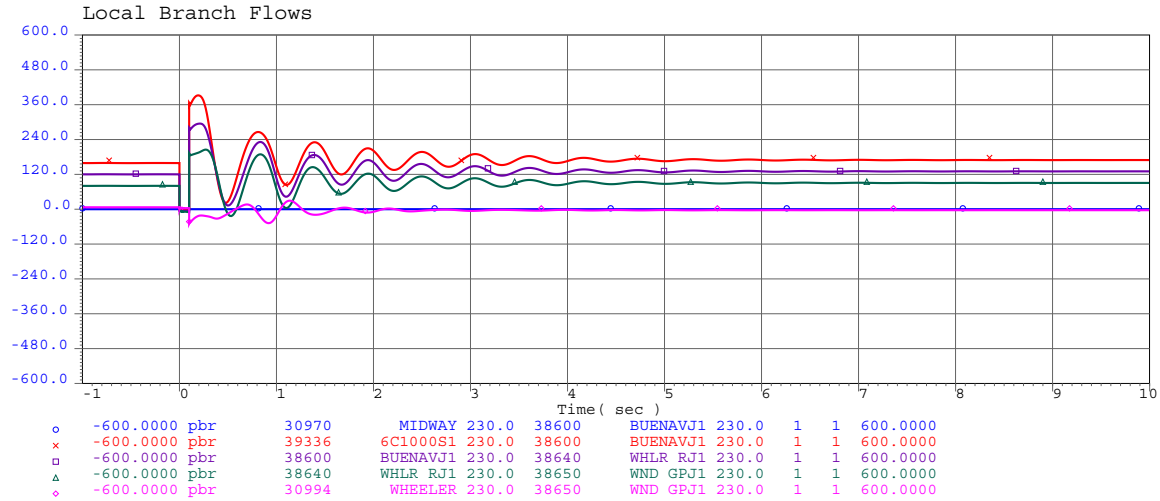




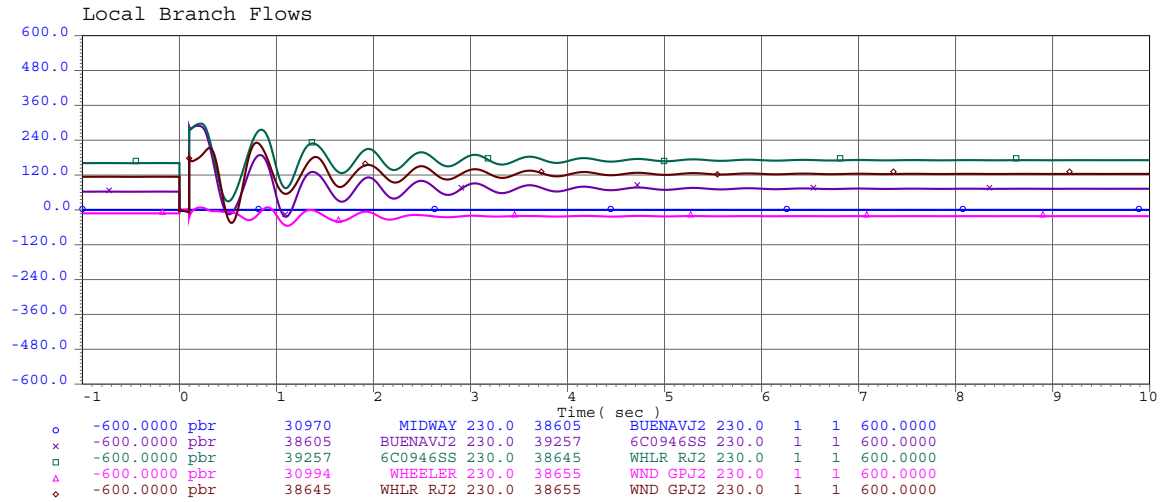




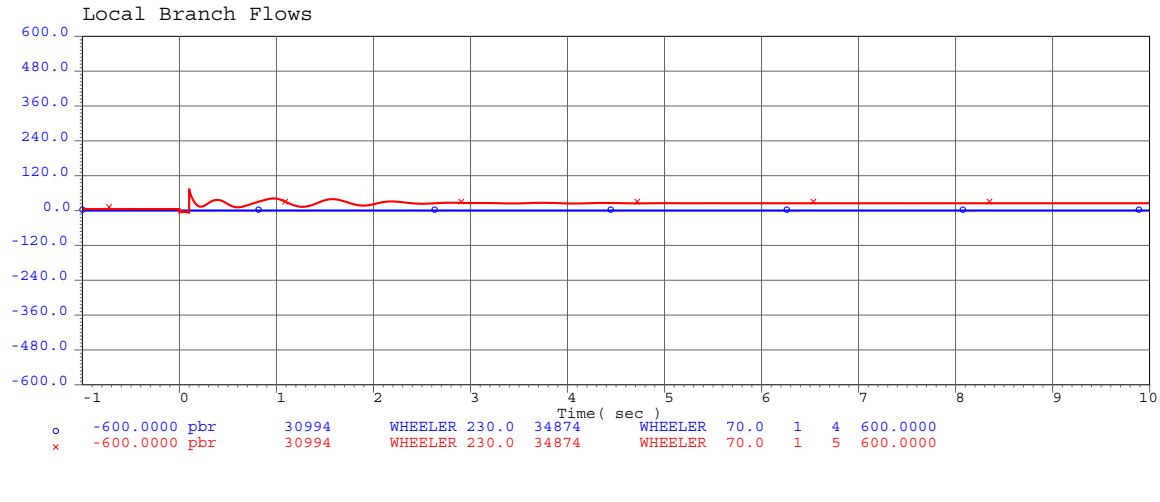
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

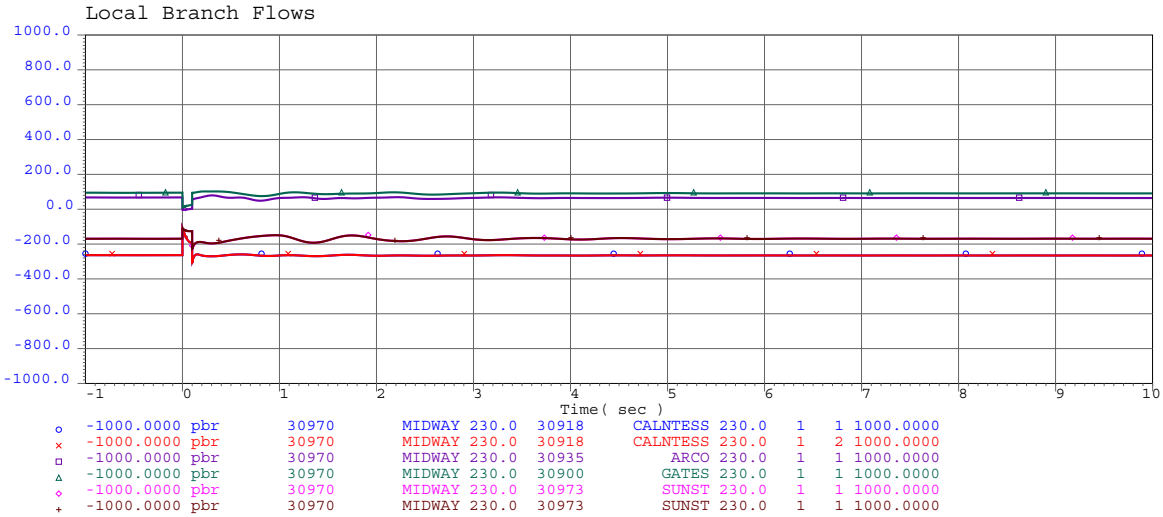


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

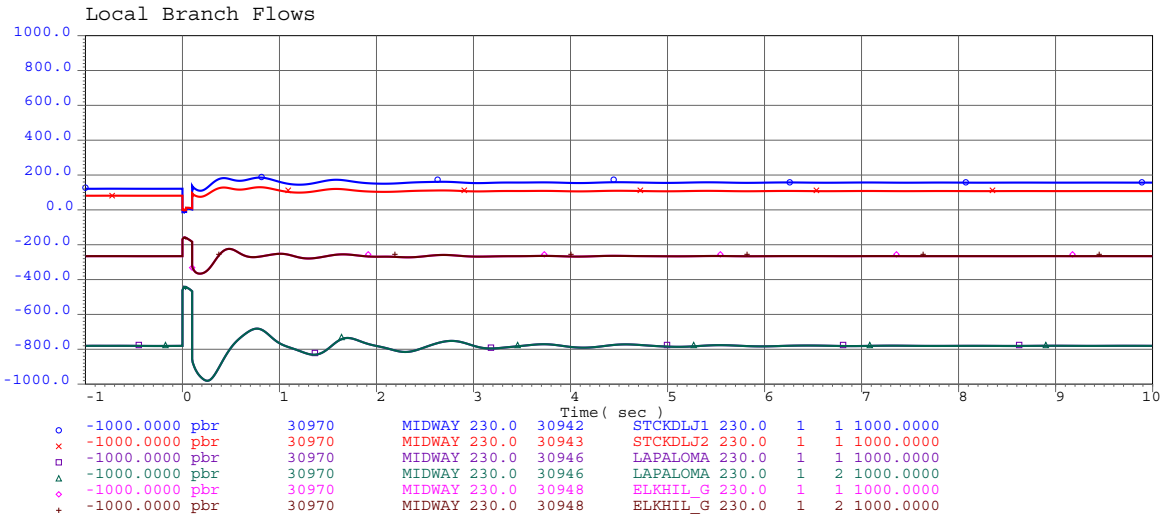


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



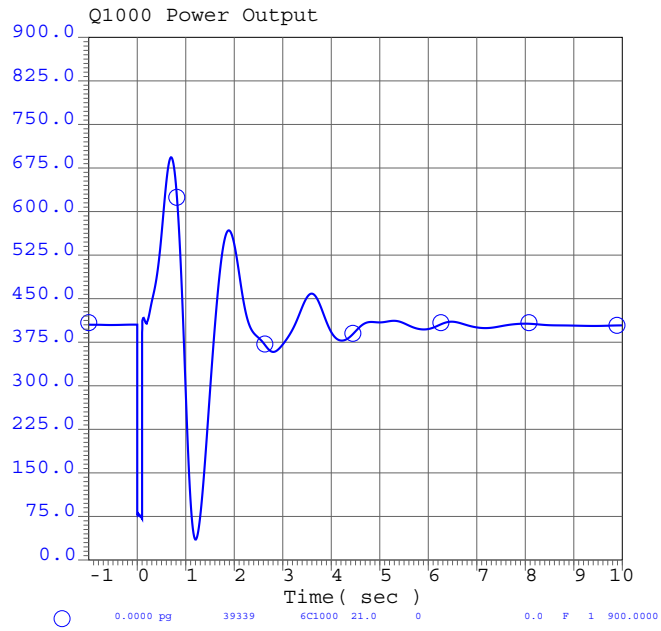
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

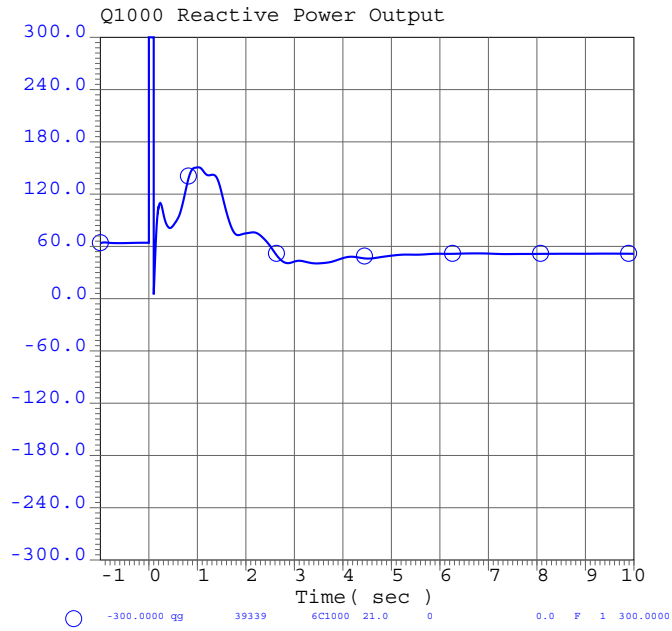


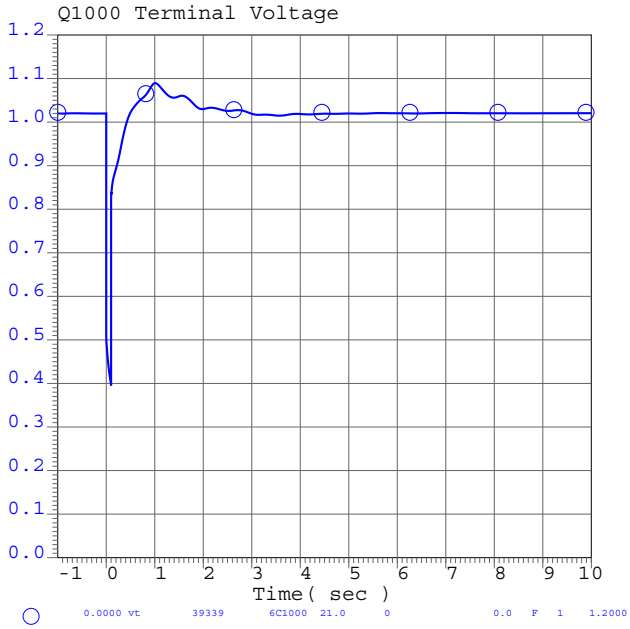
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

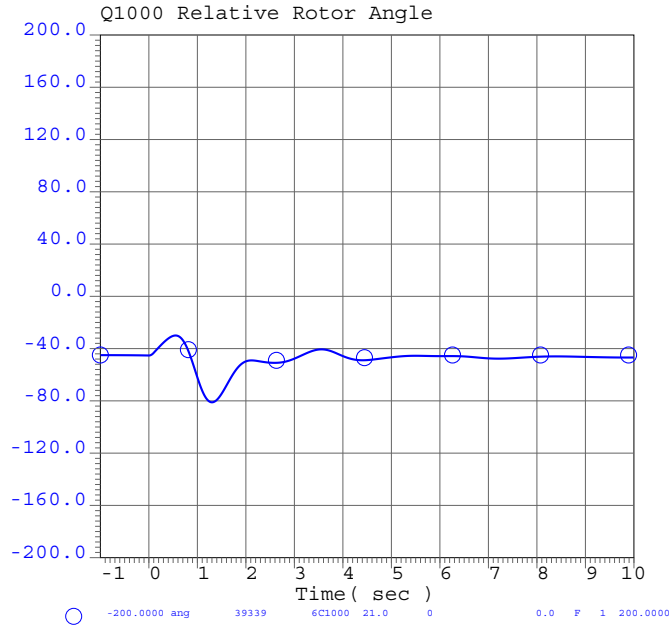
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







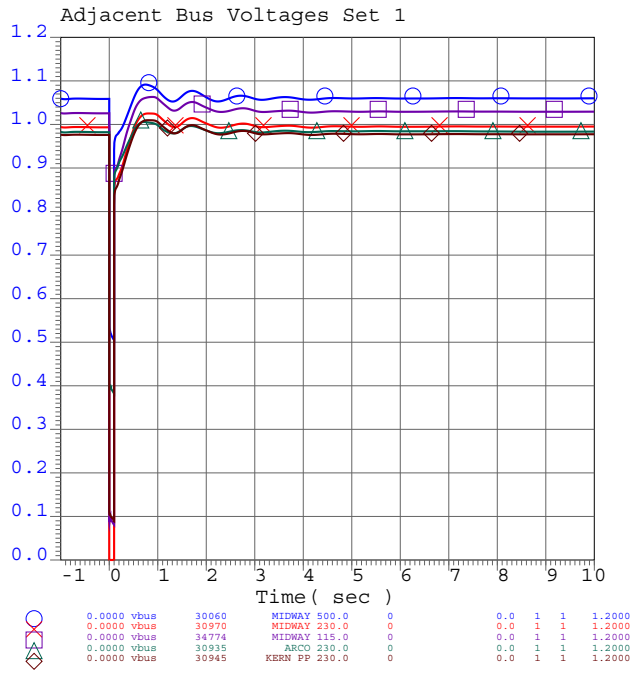


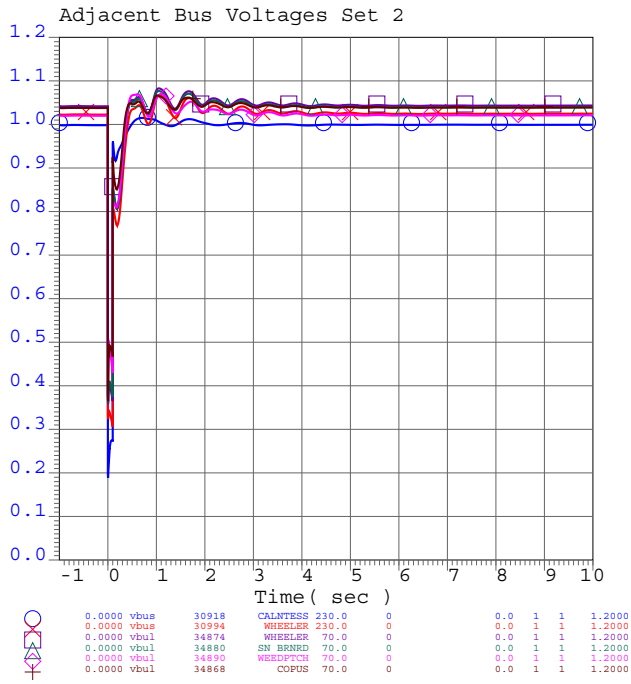
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

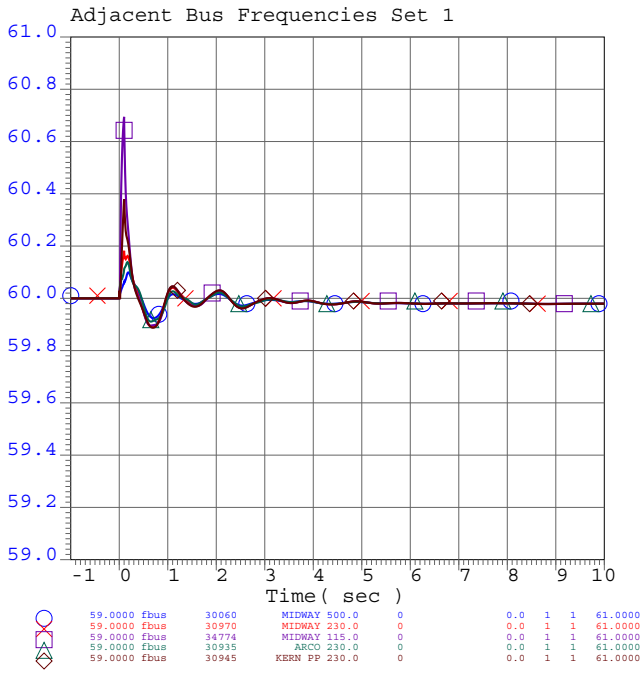
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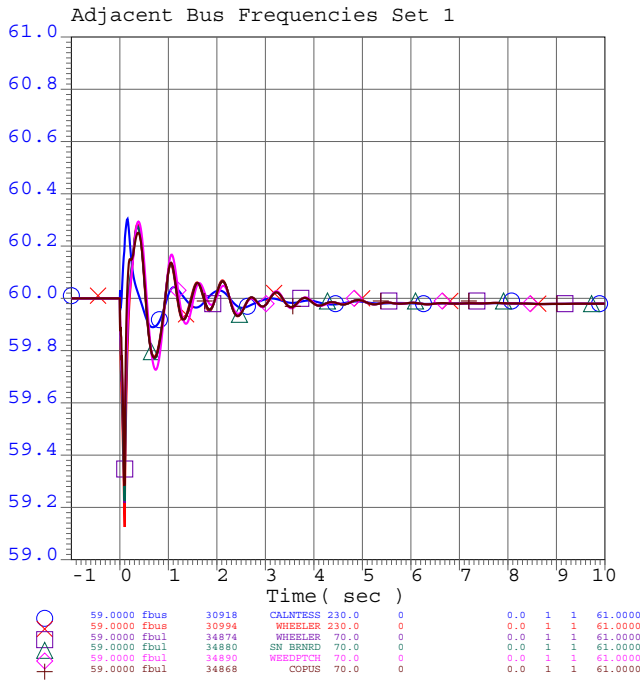
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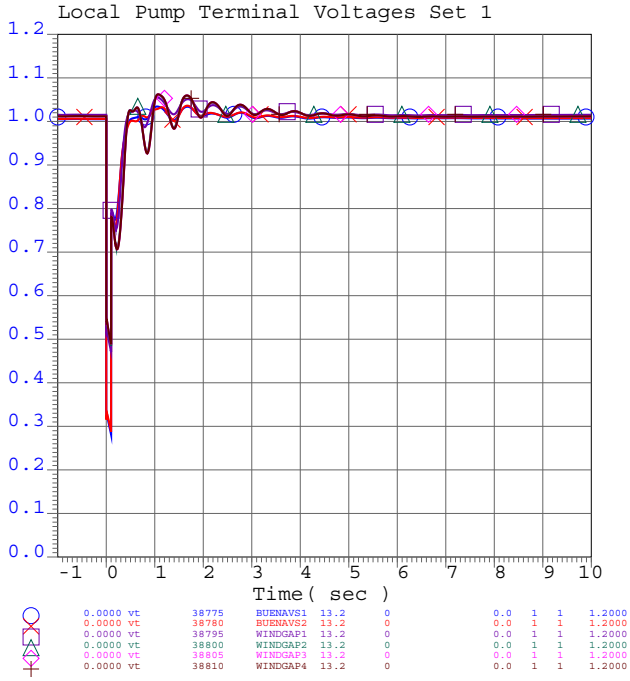




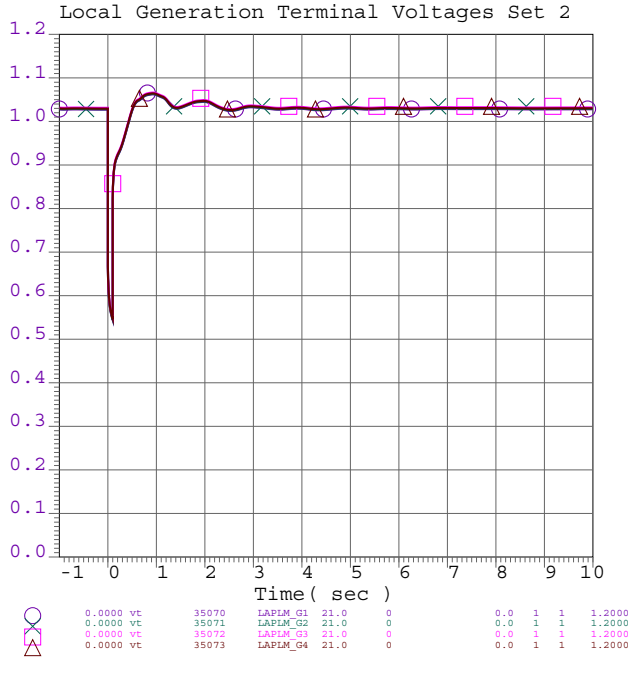


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

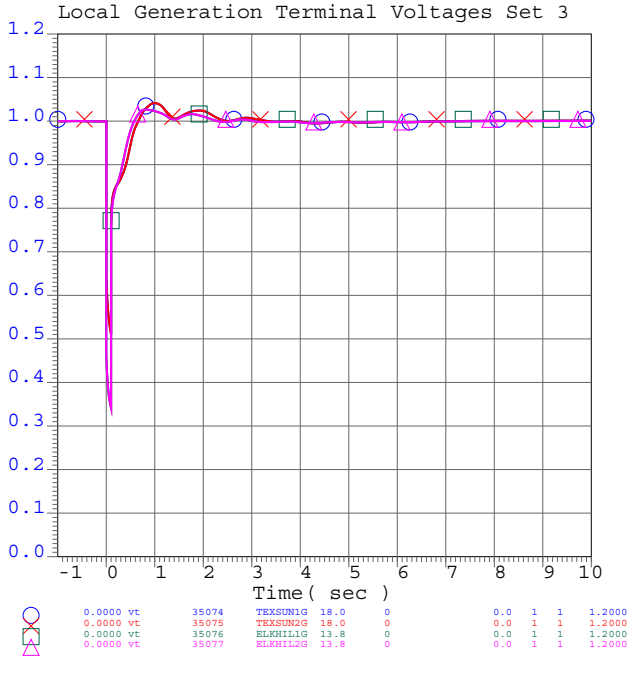
Local Pump Terminal Voltages Set 1



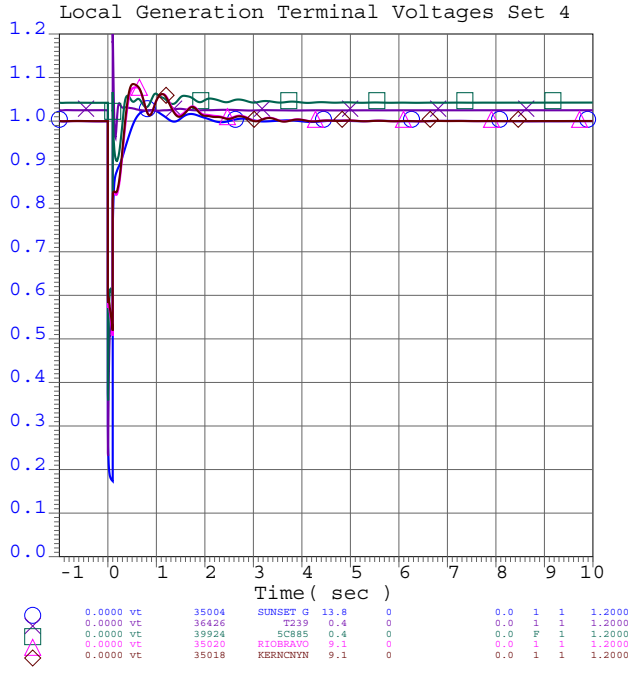
Local Generation Terminal Voltages Set 2



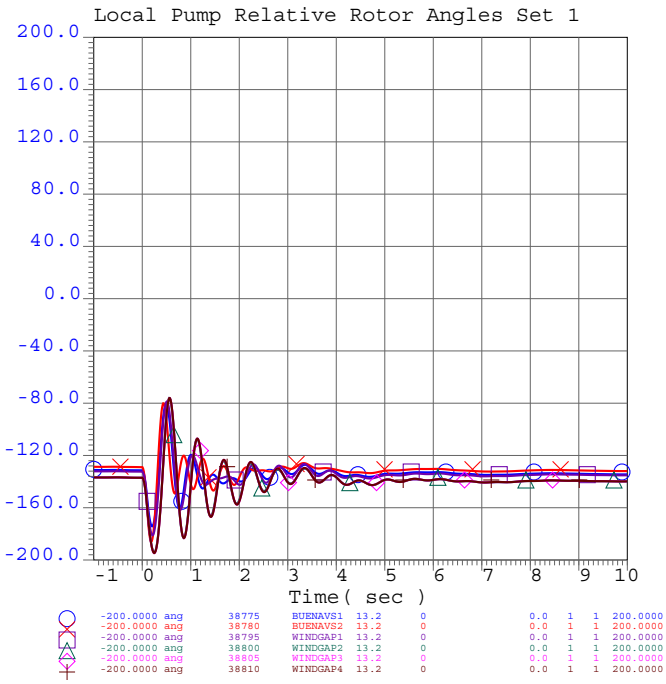
Local Generation Terminal Voltages Set 3

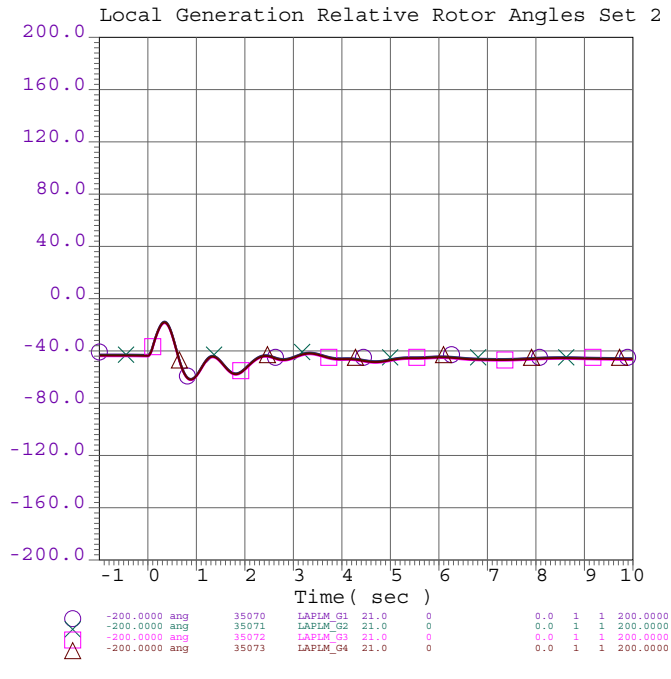


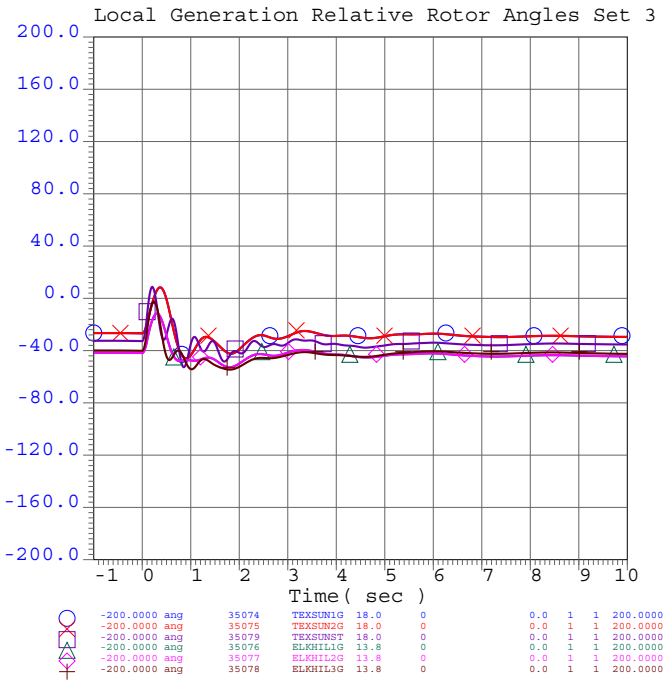
Local Generation Terminal Voltages Set 4

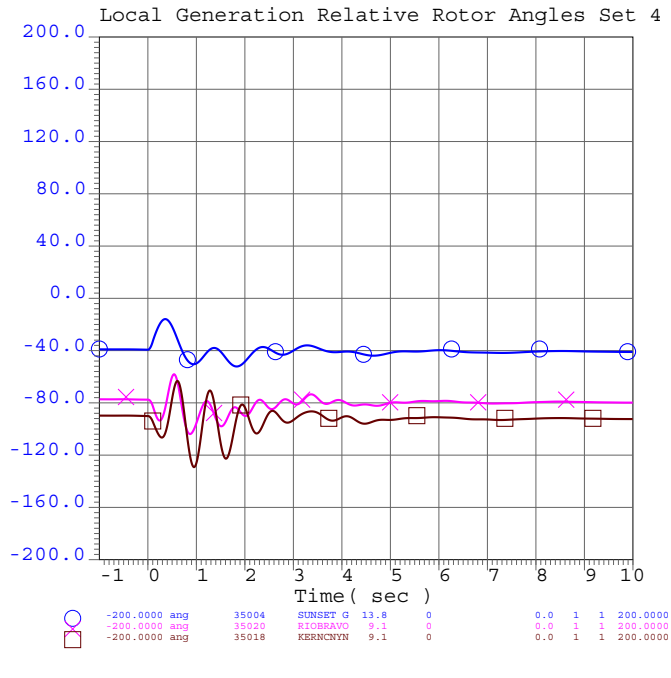


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

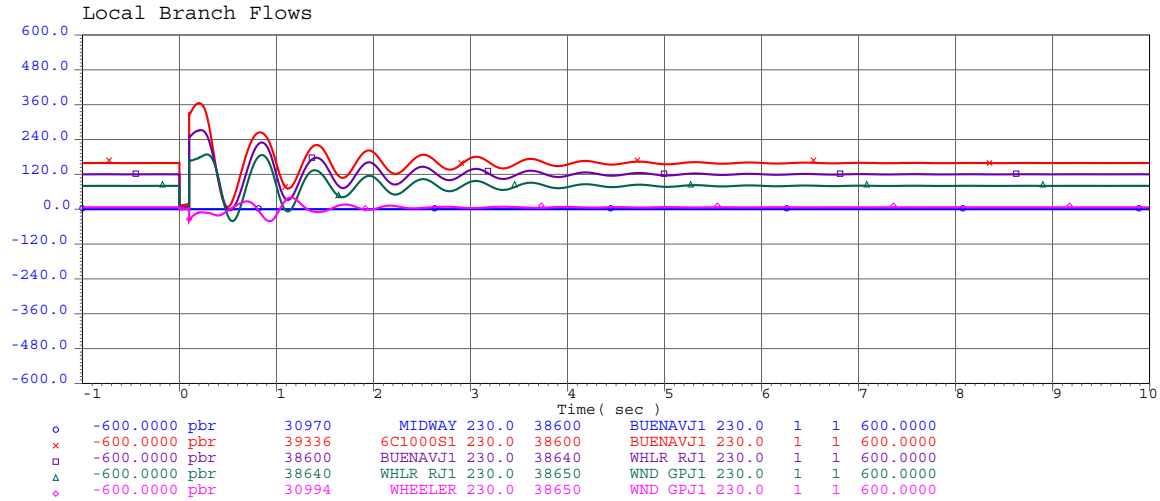




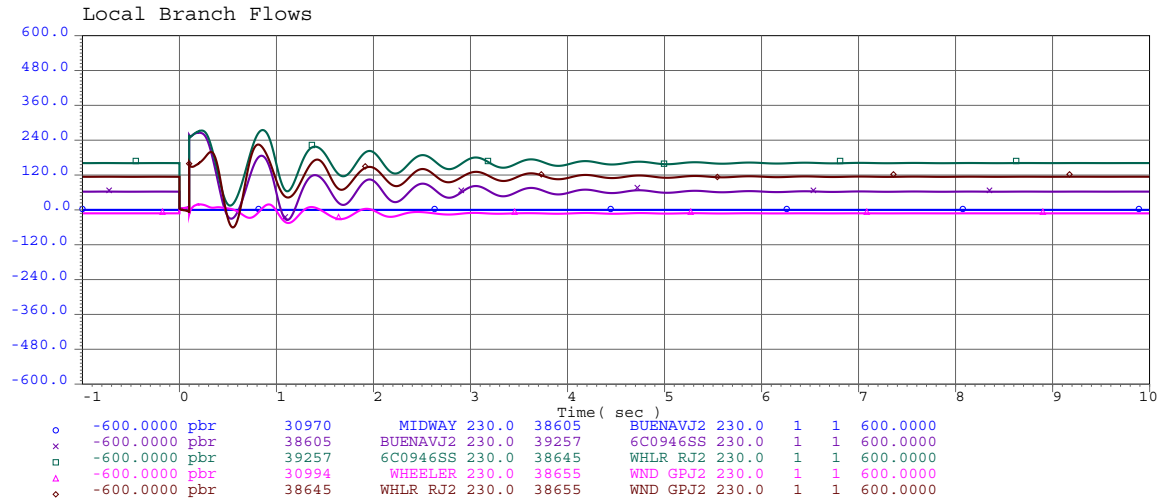




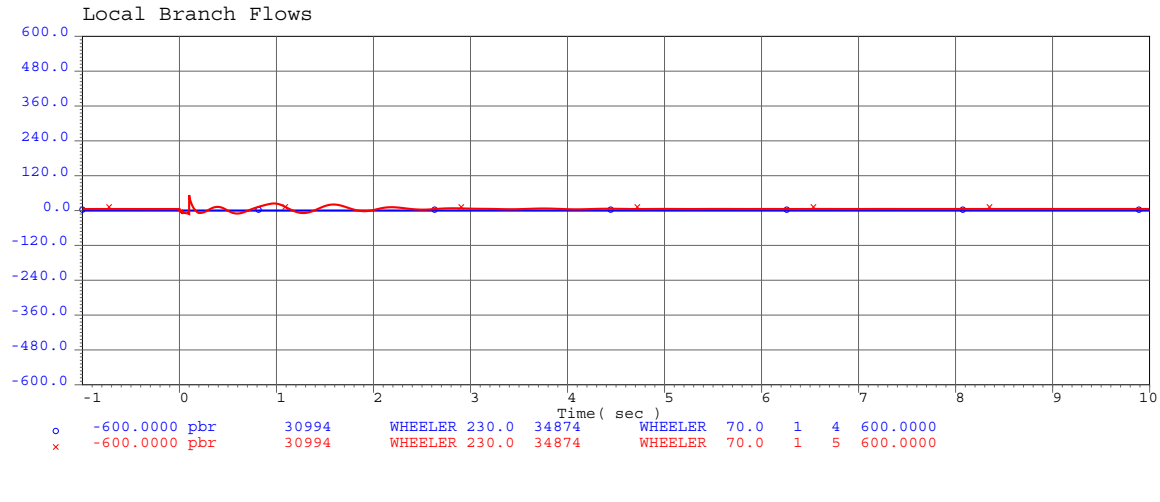
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

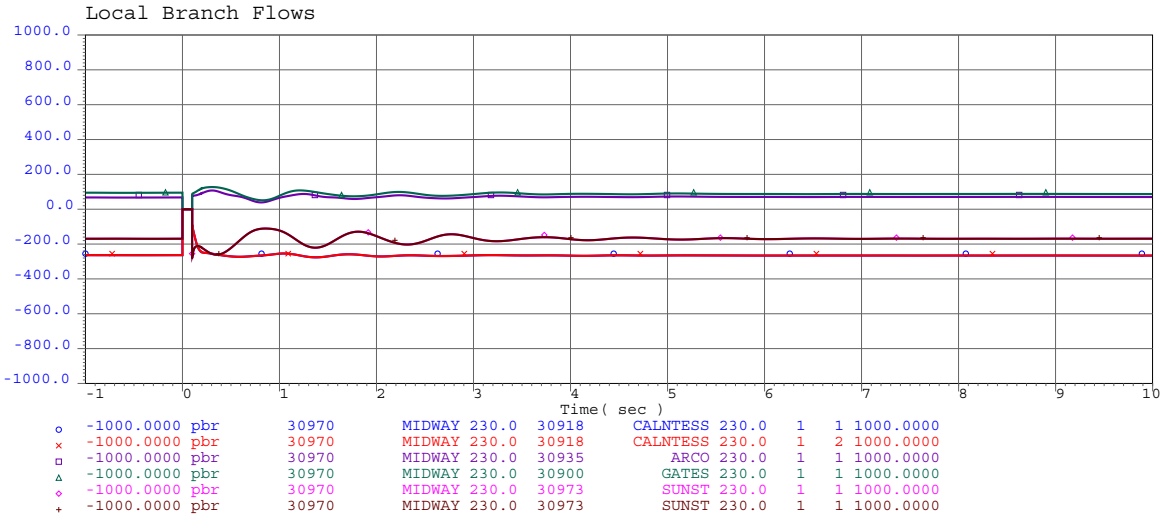


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

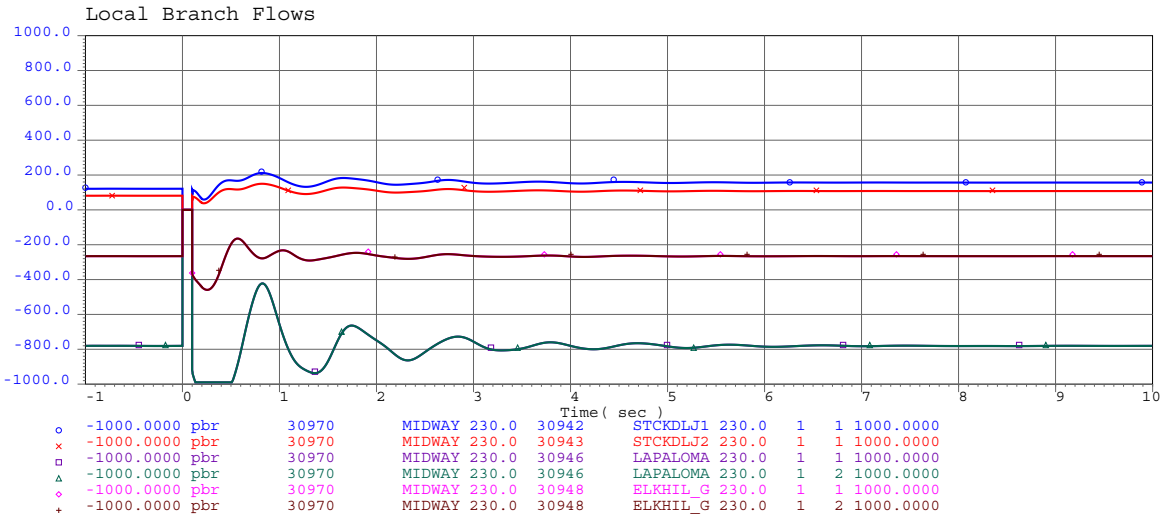


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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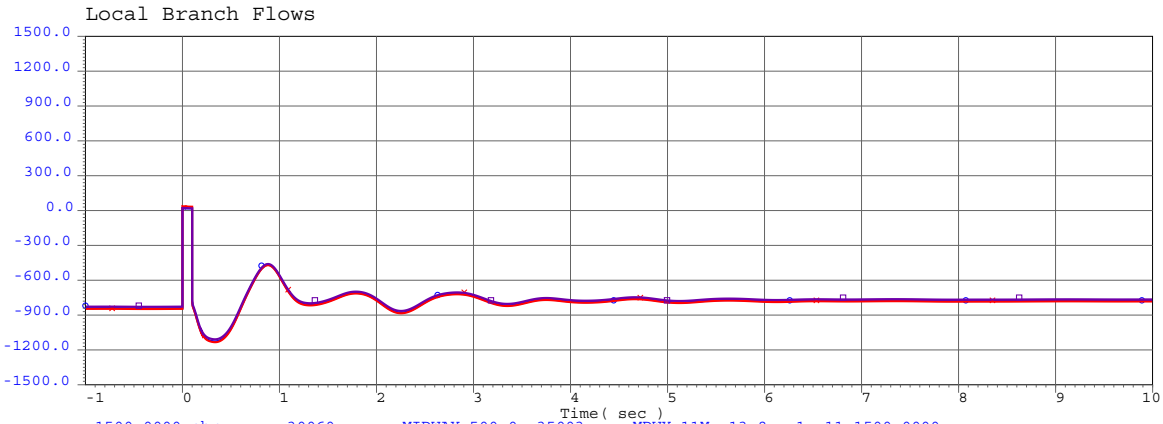
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



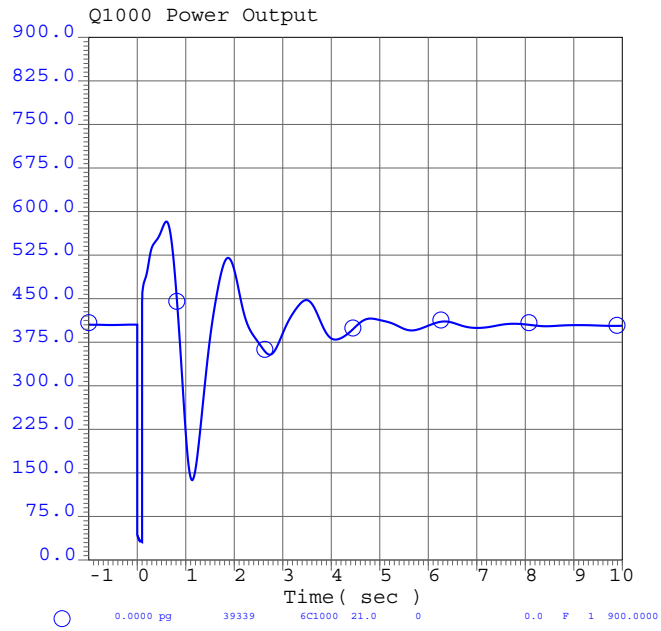
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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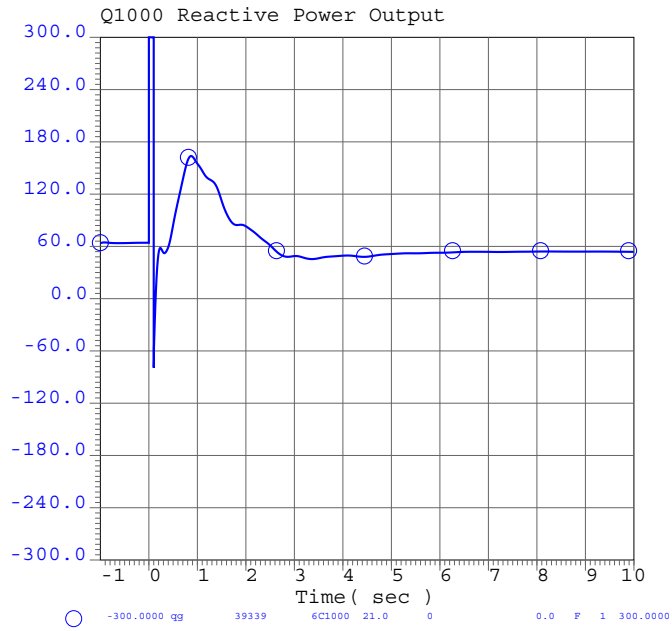


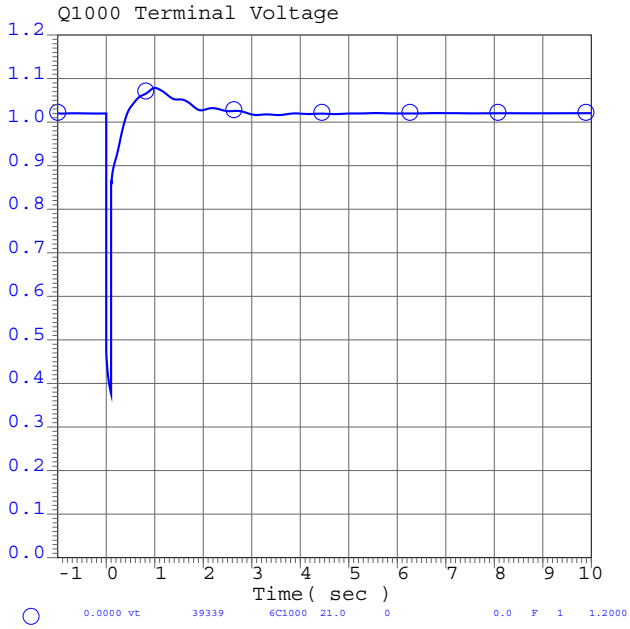
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
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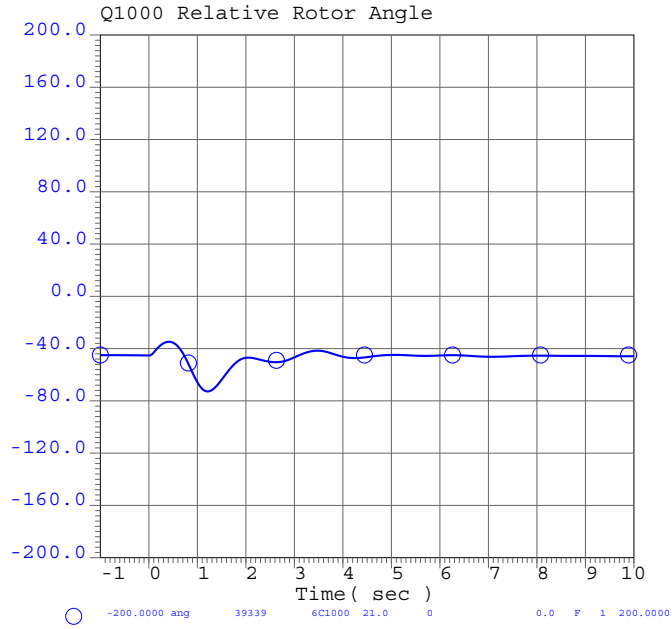
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







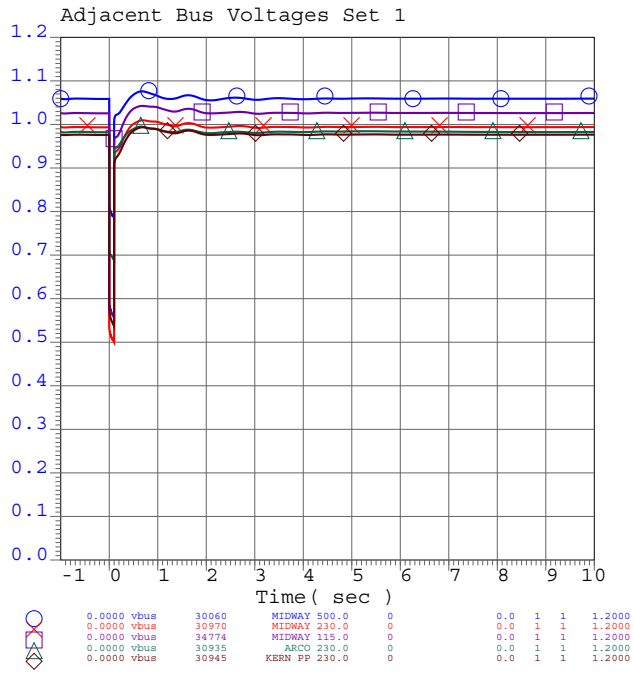


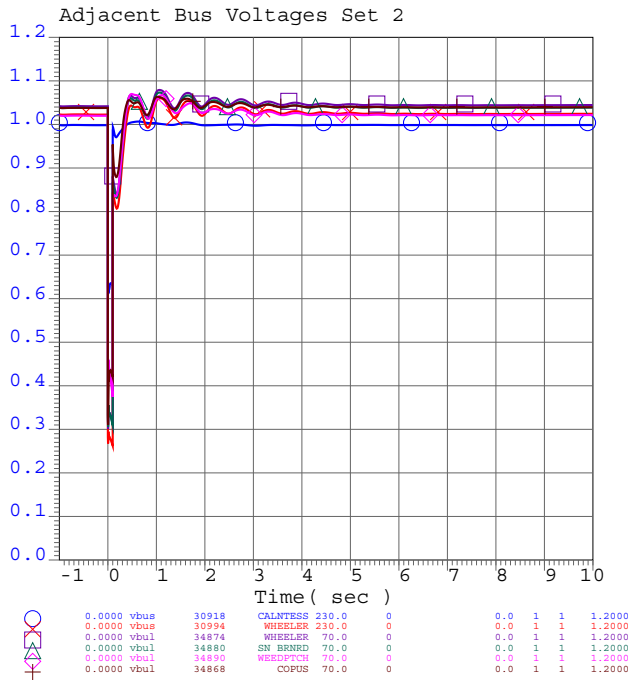
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

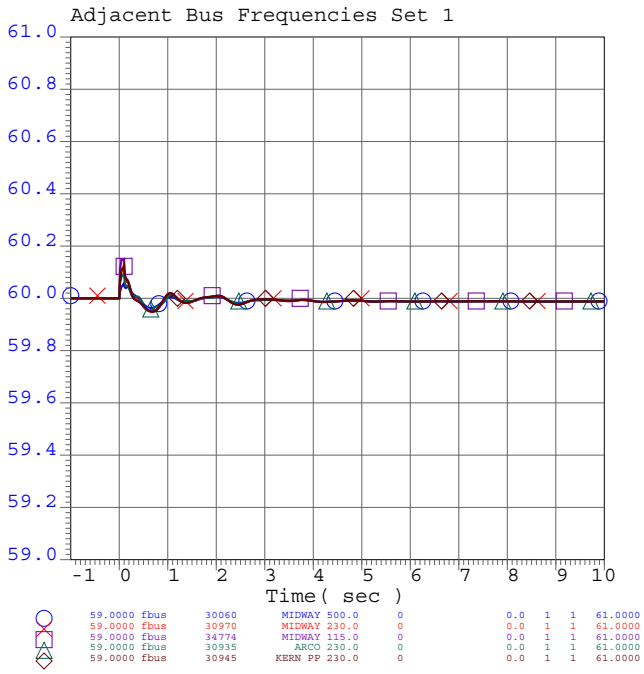
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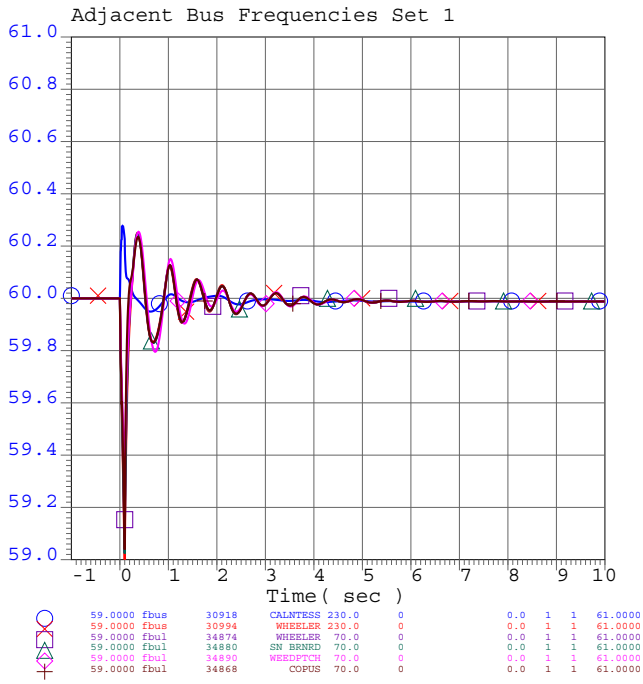
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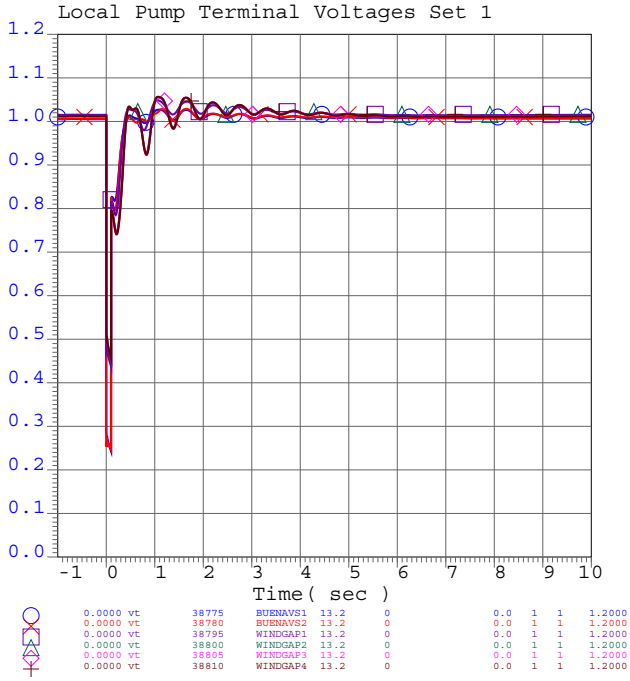






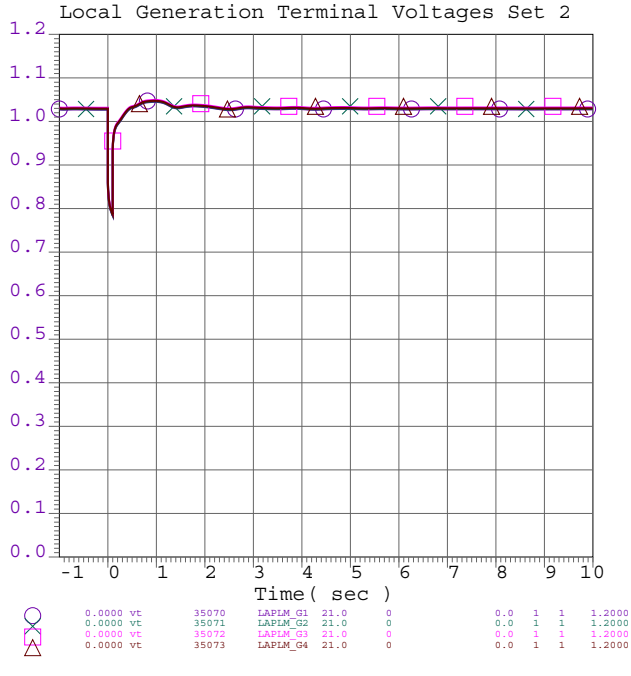
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

Local Pump Terminal Voltages Set 1



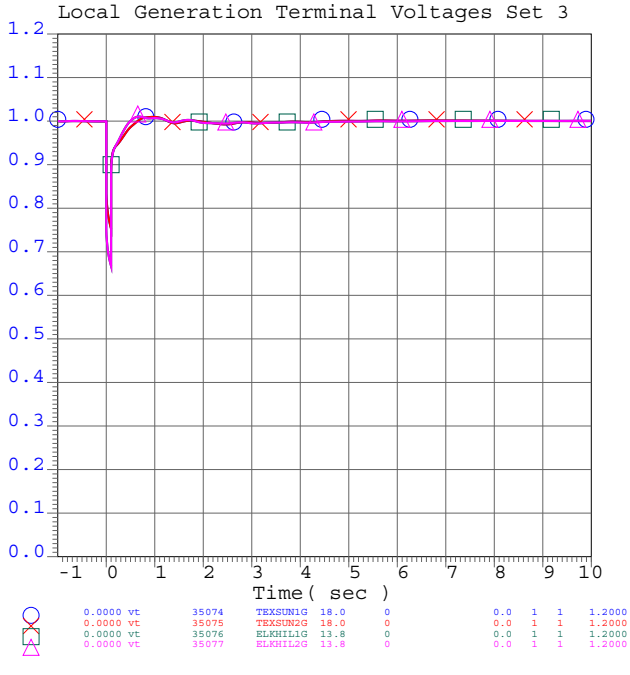
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



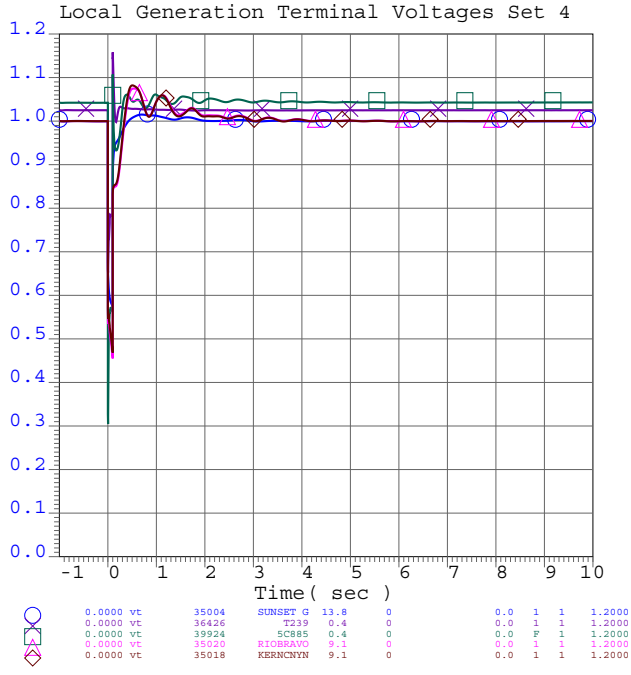
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

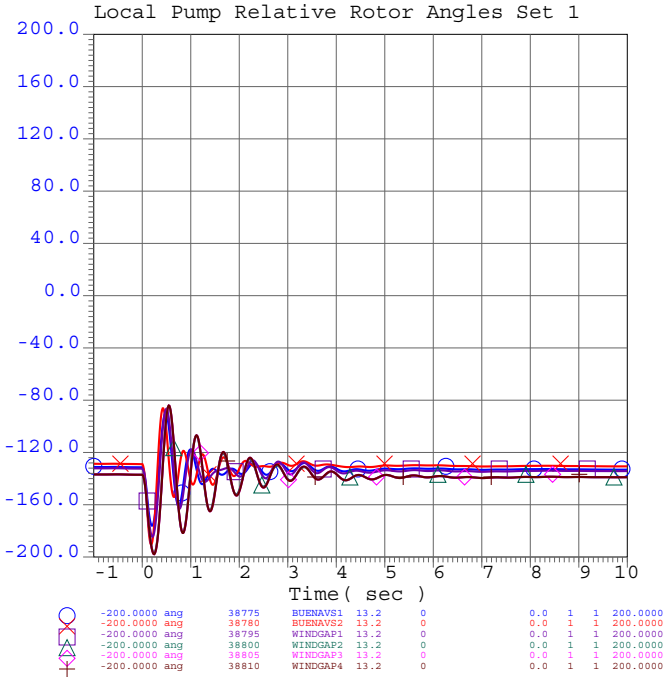
Local Generation Terminal Voltages Set 4



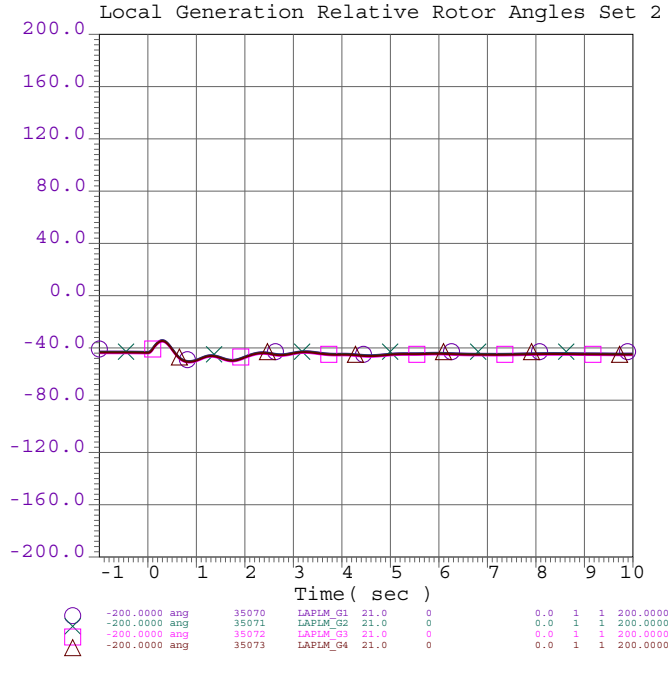
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

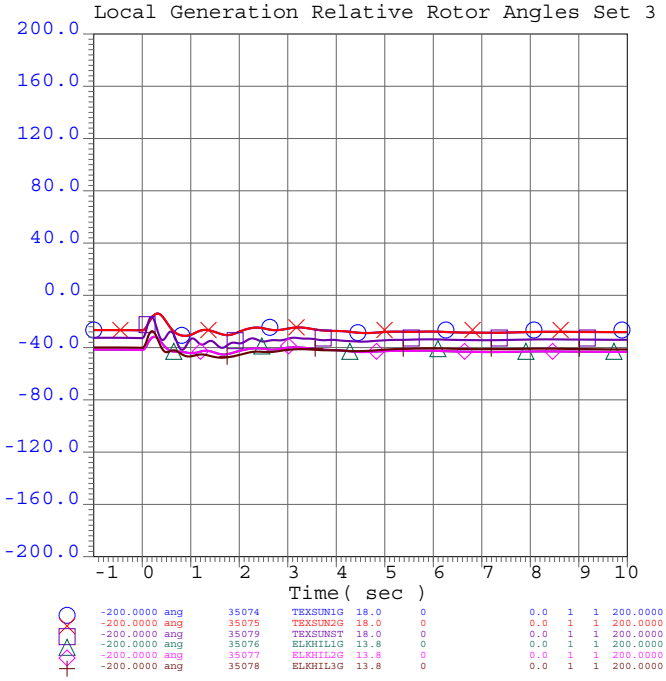
Local Pump Relative Rotor Angles Set 1



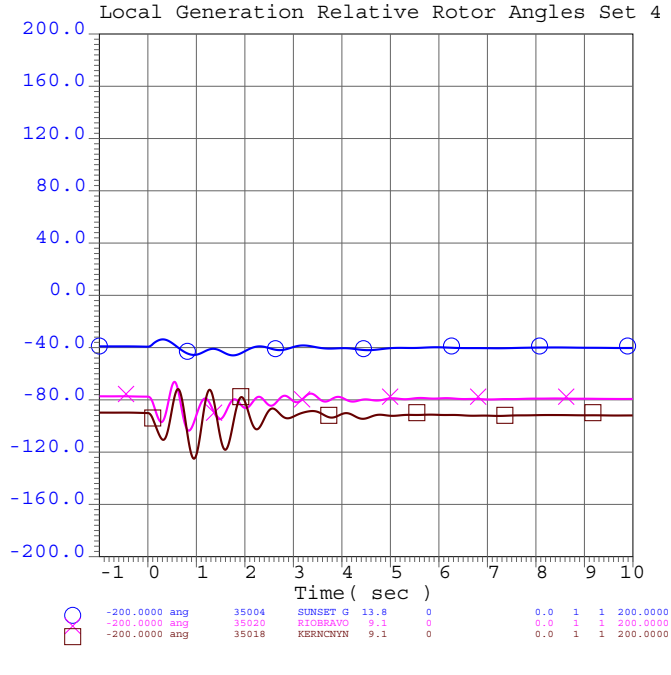
Local Generation Relative Rotor Angles Set 2



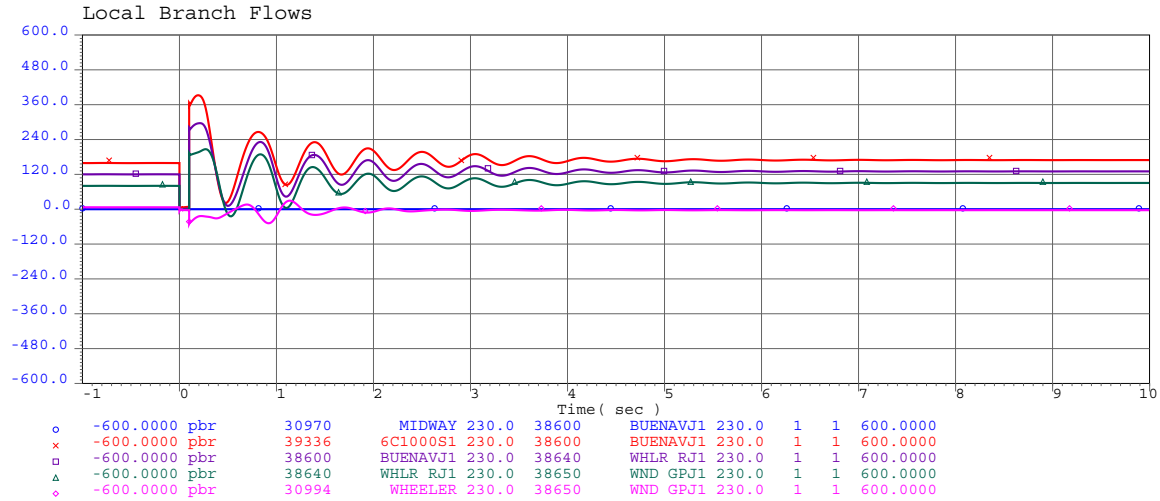
Local Generation Relative Rotor Angles Set 3

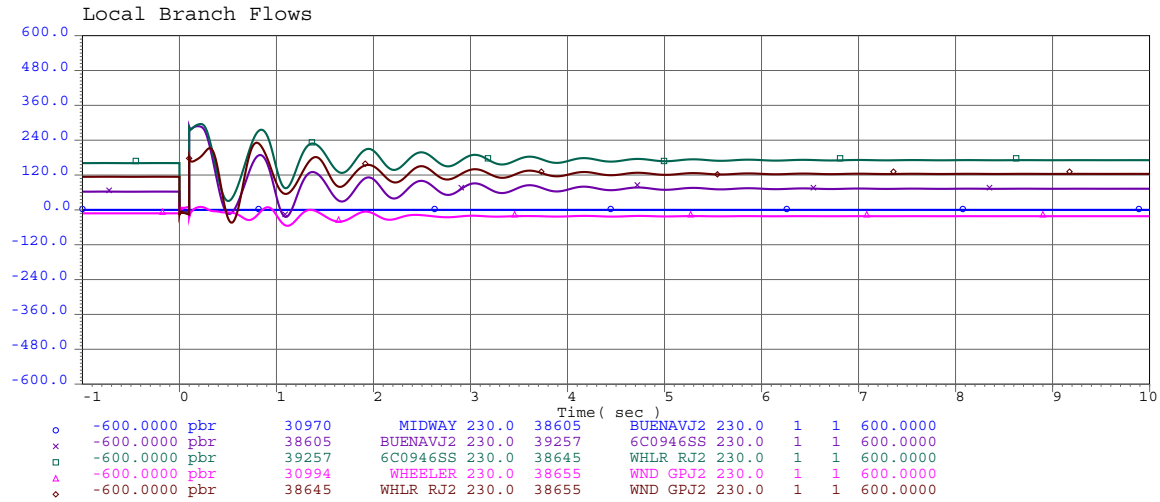


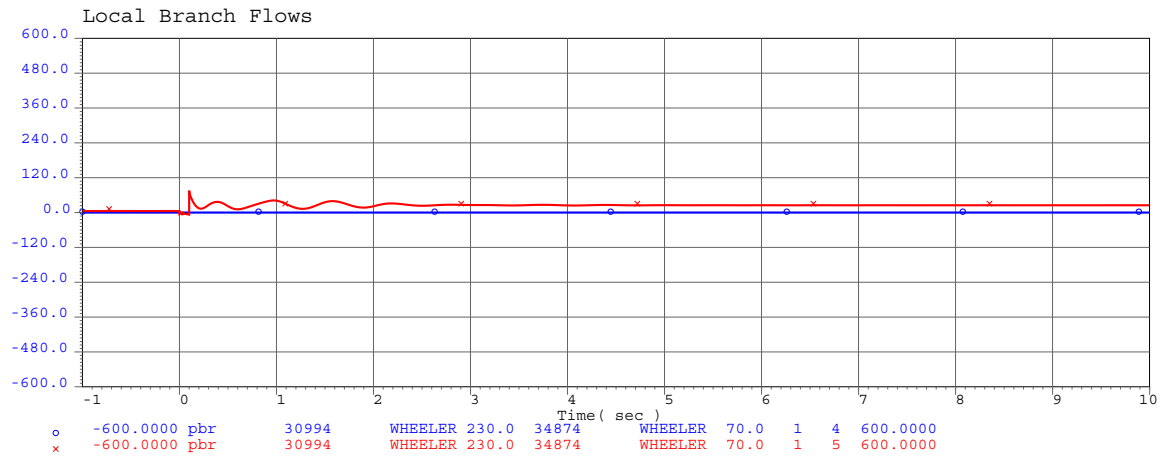
Local Generation Relative Rotor Angles Set 4



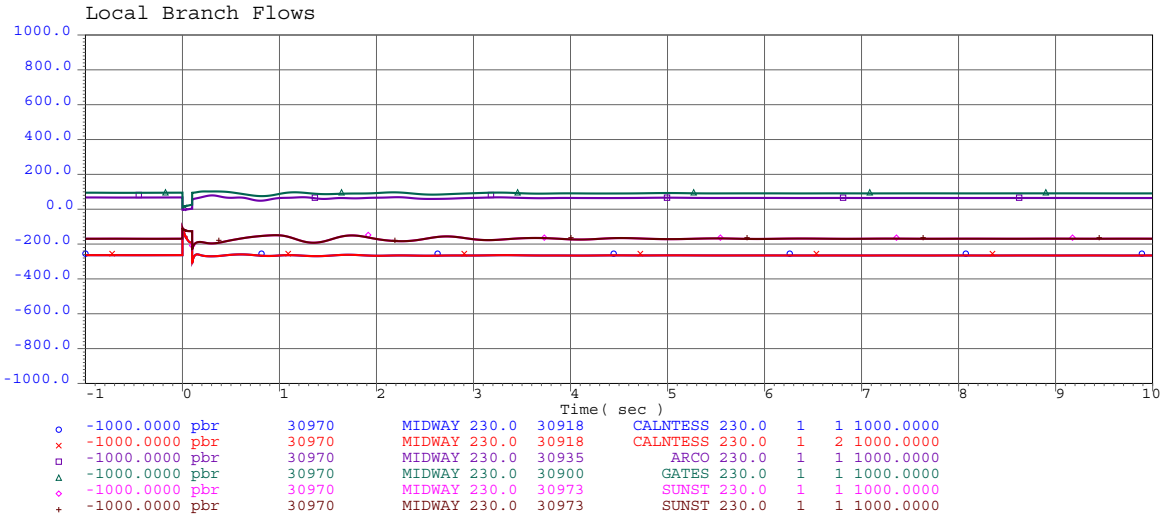
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line



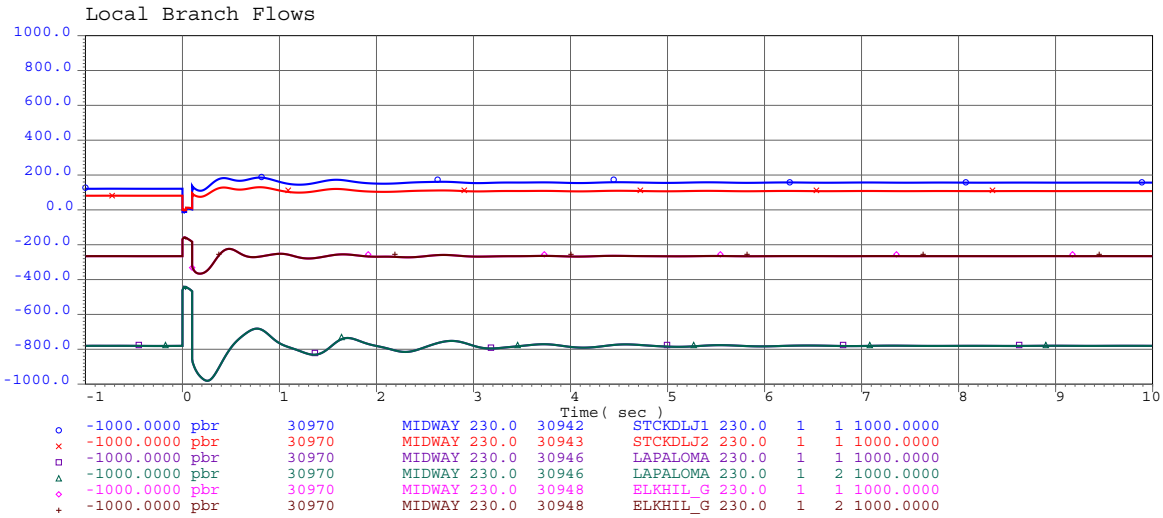




Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



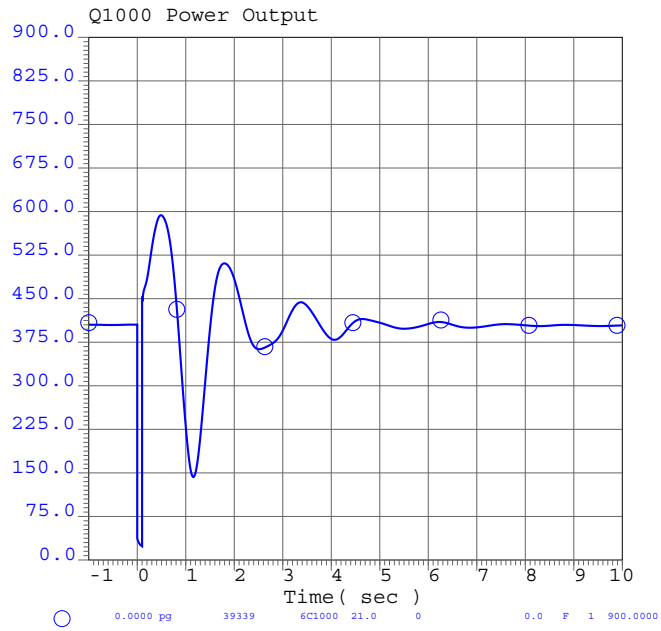
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

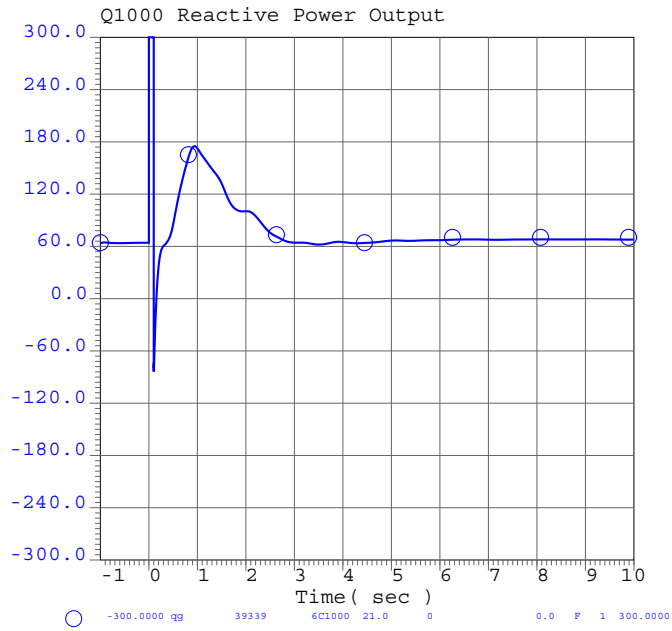


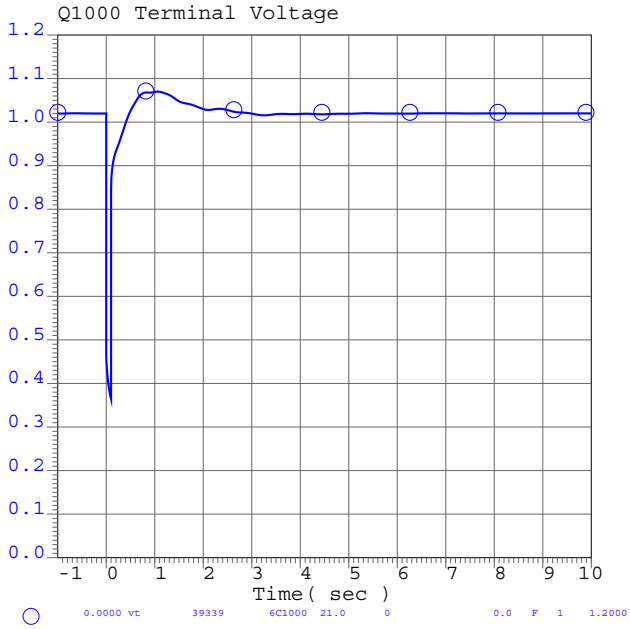
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

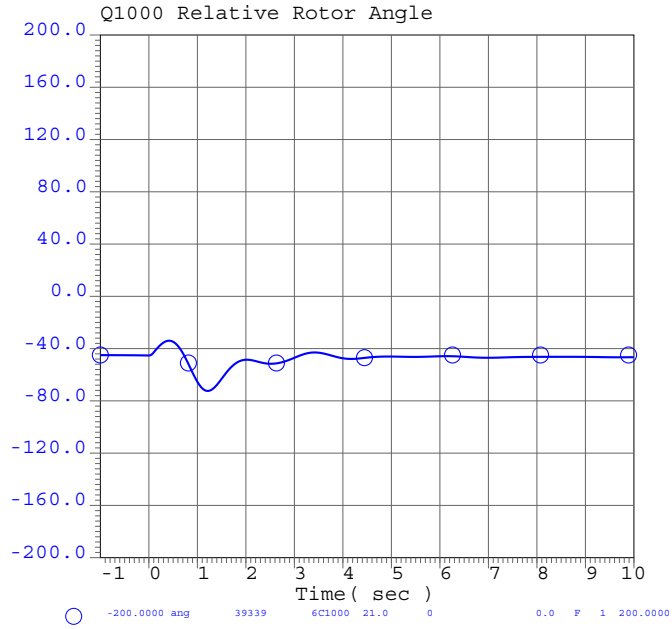
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





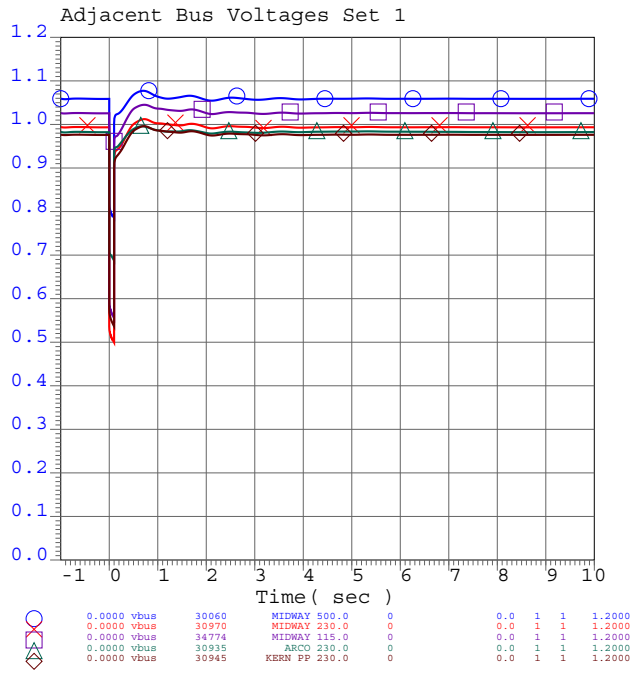


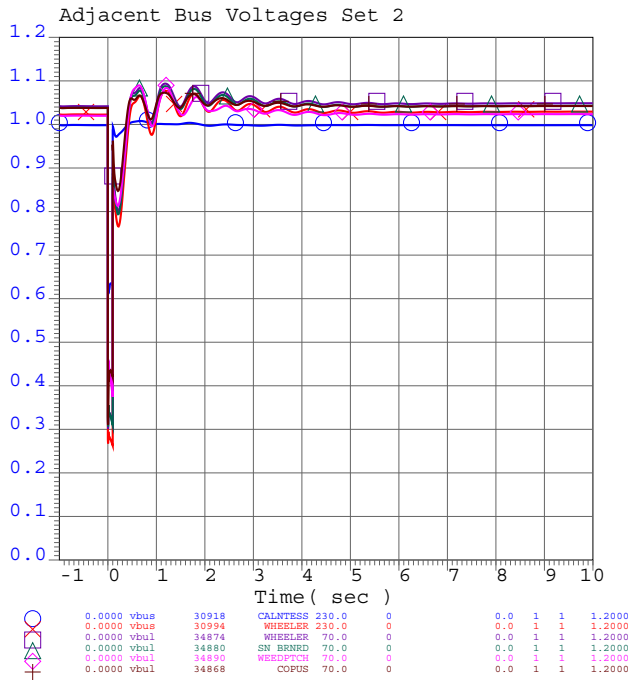


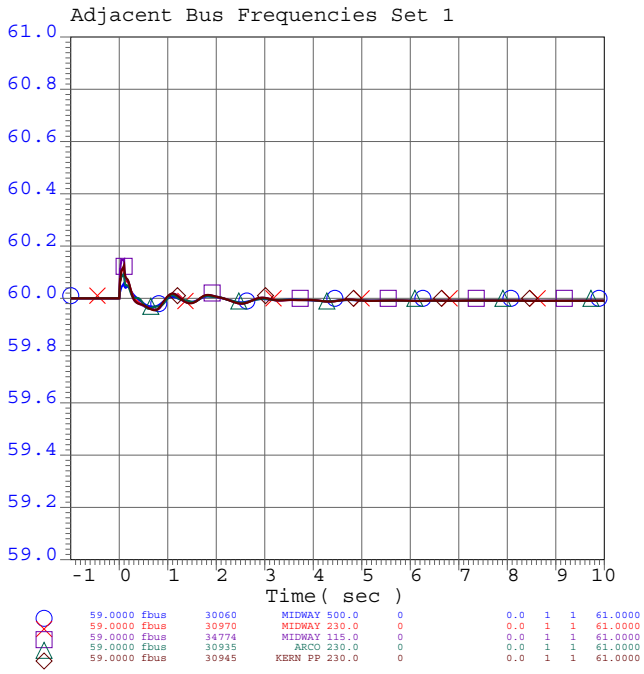
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line

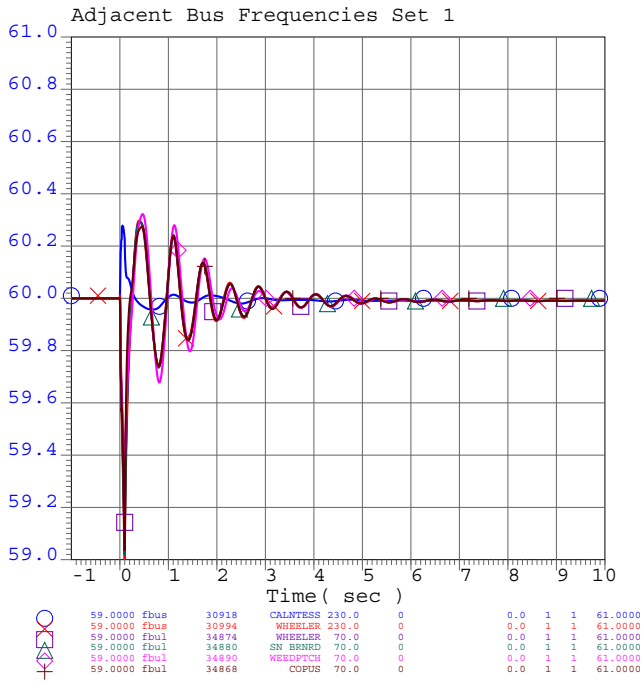
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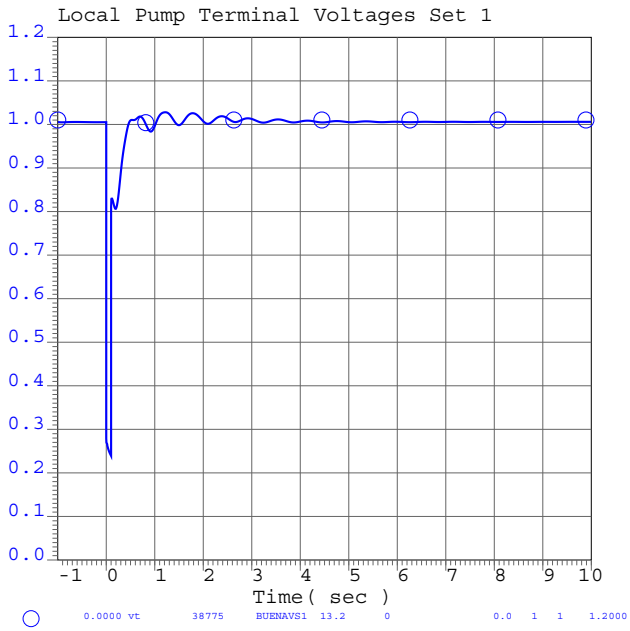


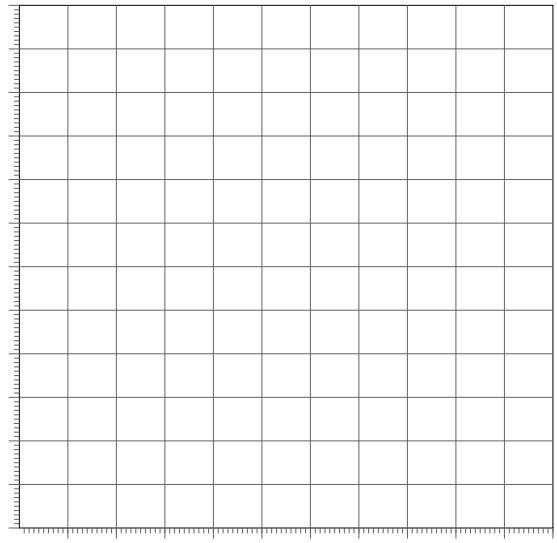


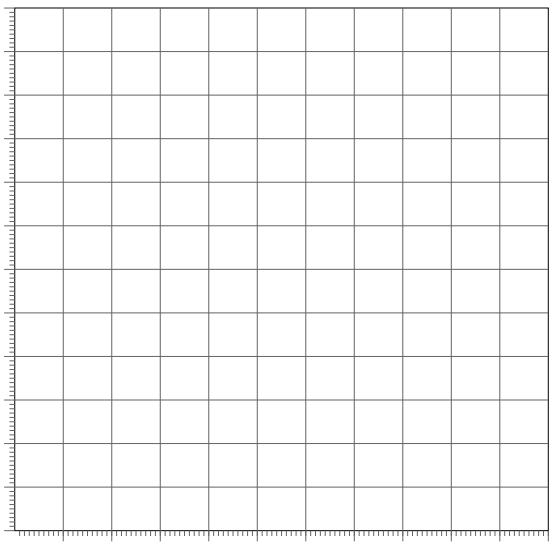


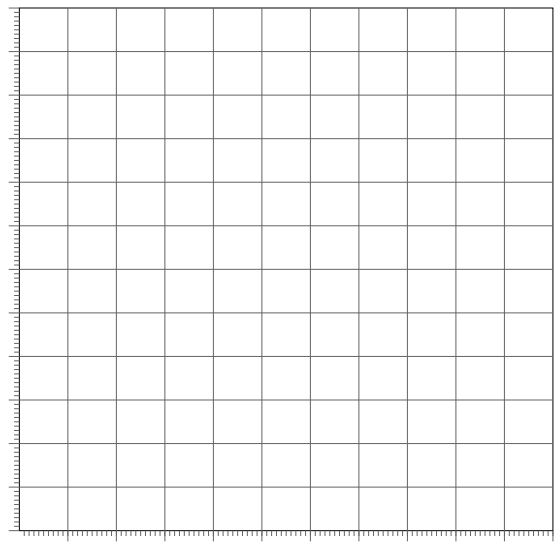


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line



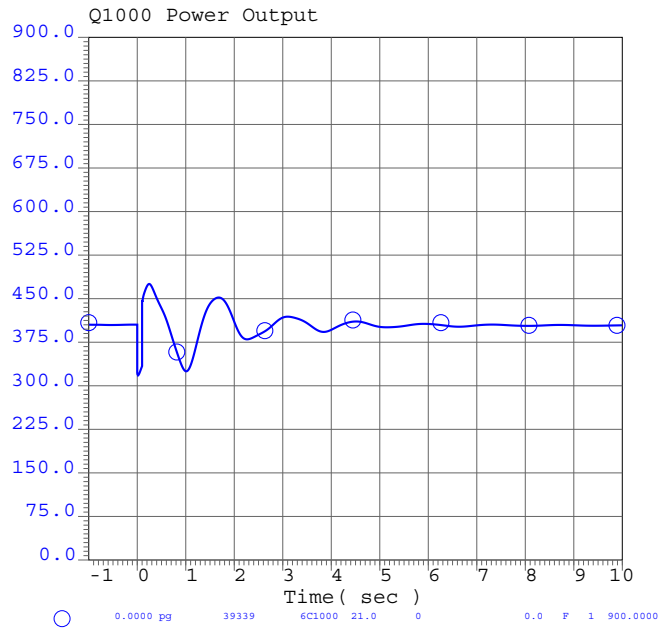


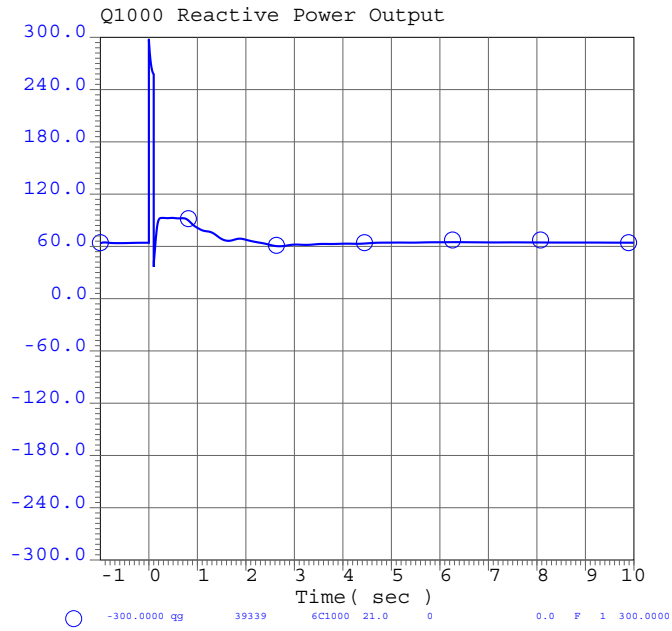


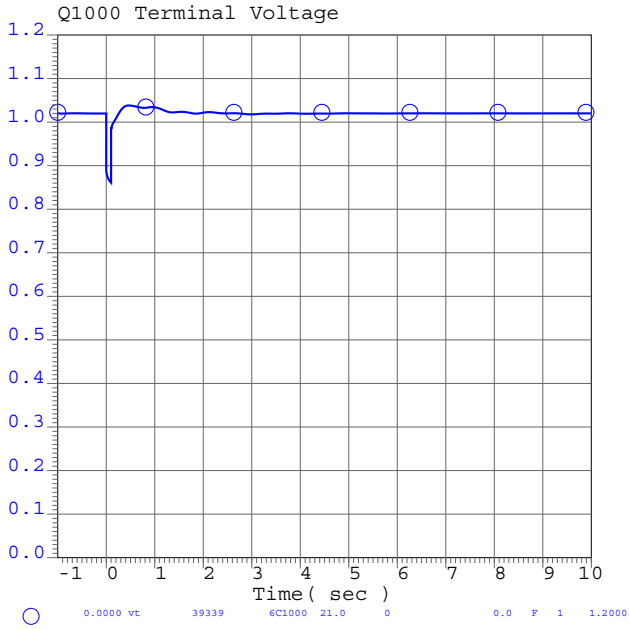


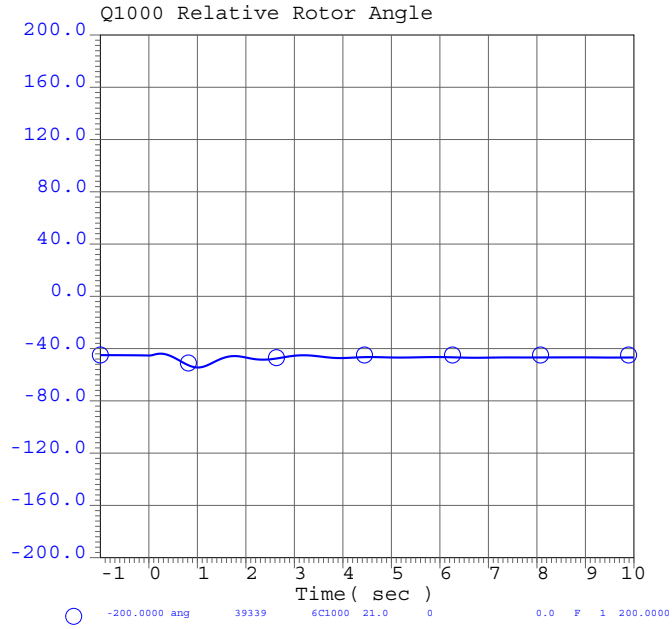
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







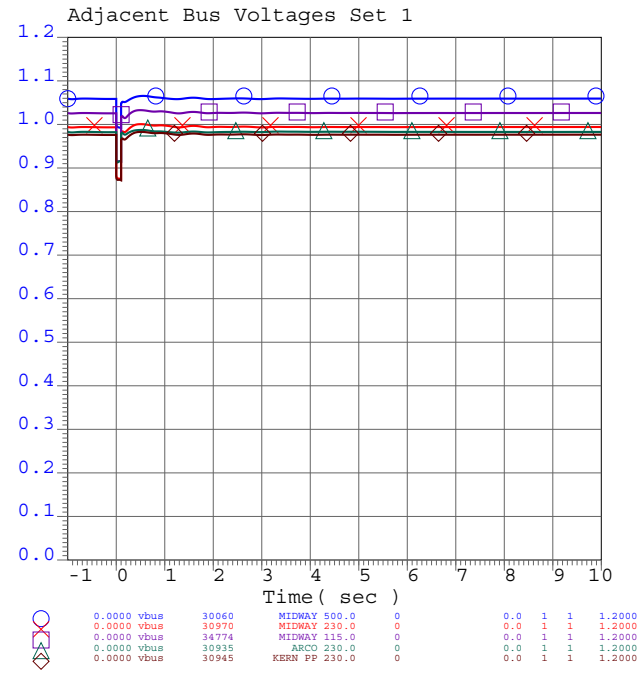


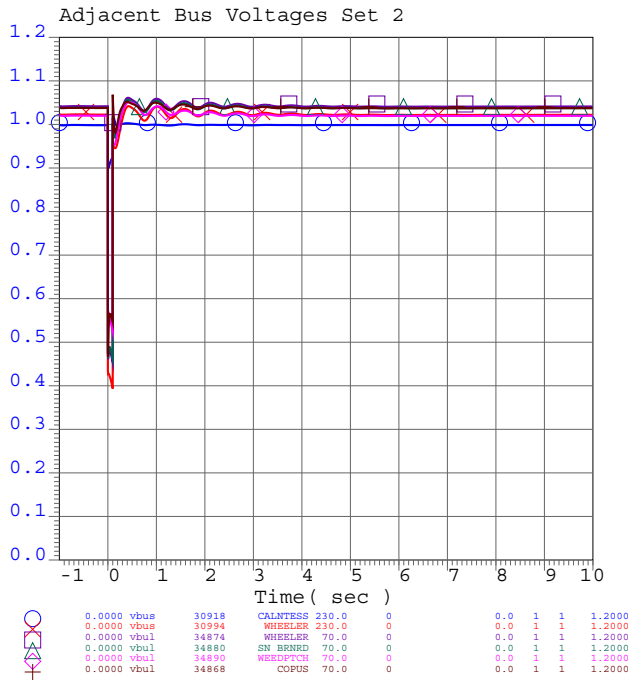
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

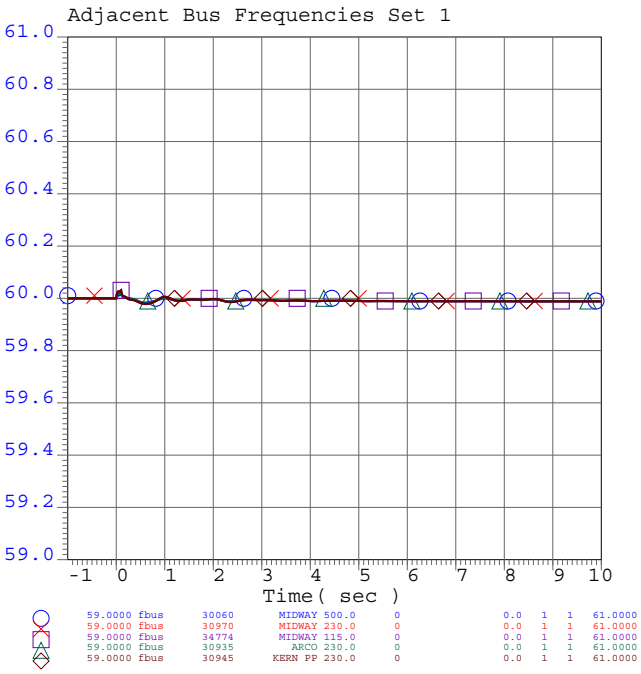
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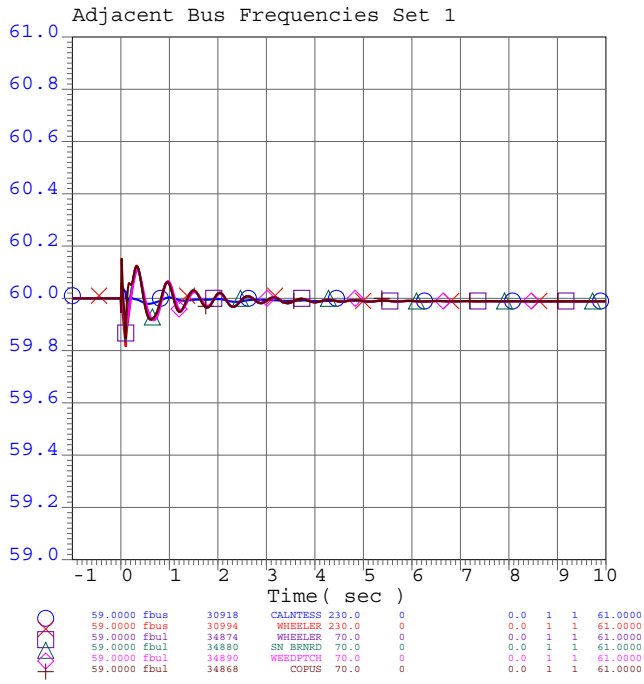
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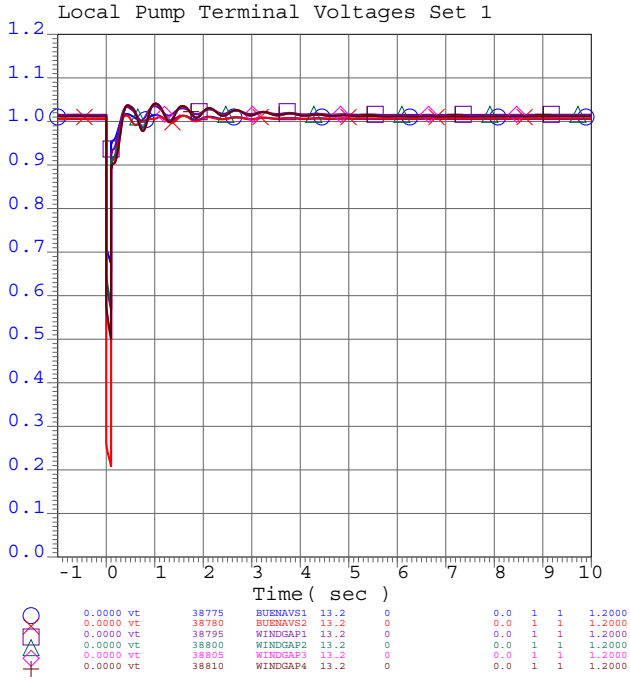




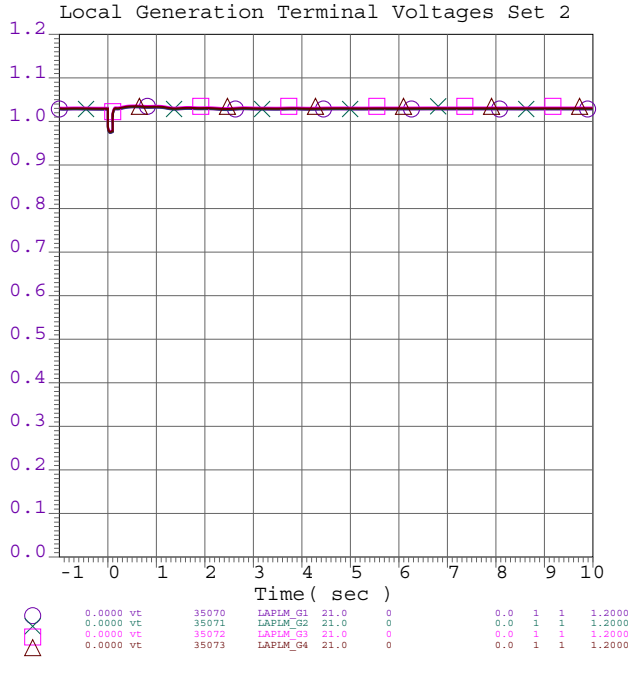


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

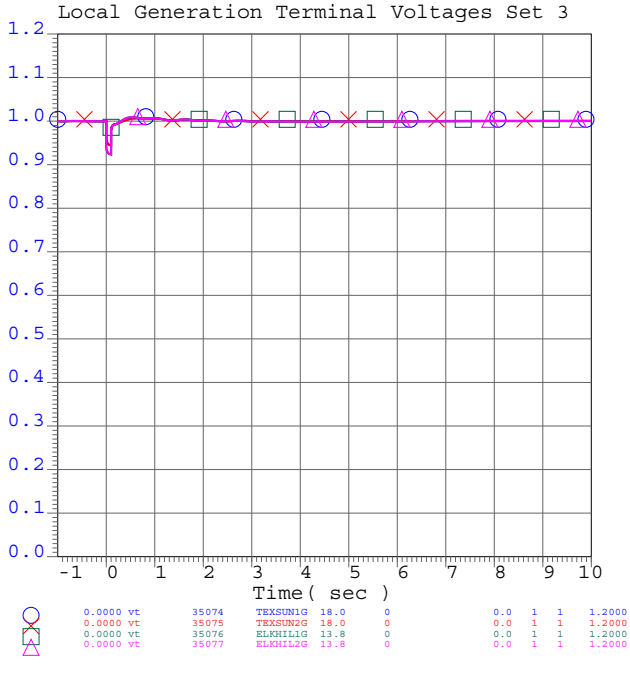
Local Pump Terminal Voltages Set 1



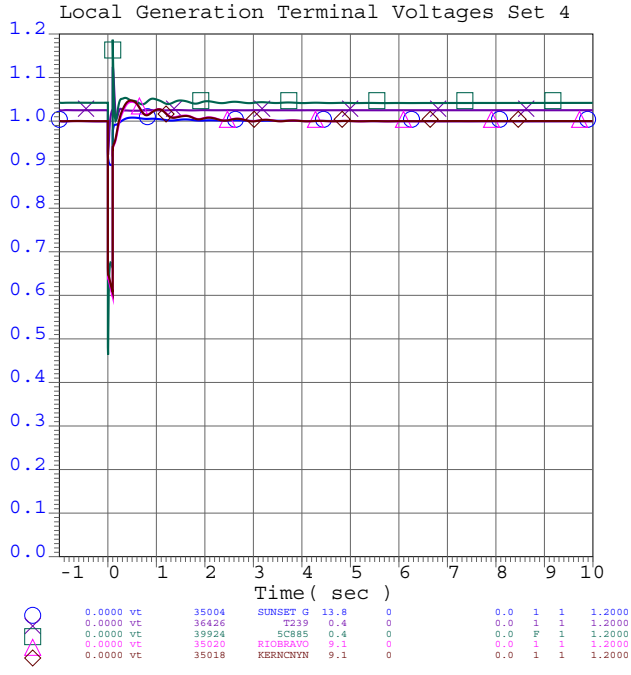
Local Generation Terminal Voltages Set 2



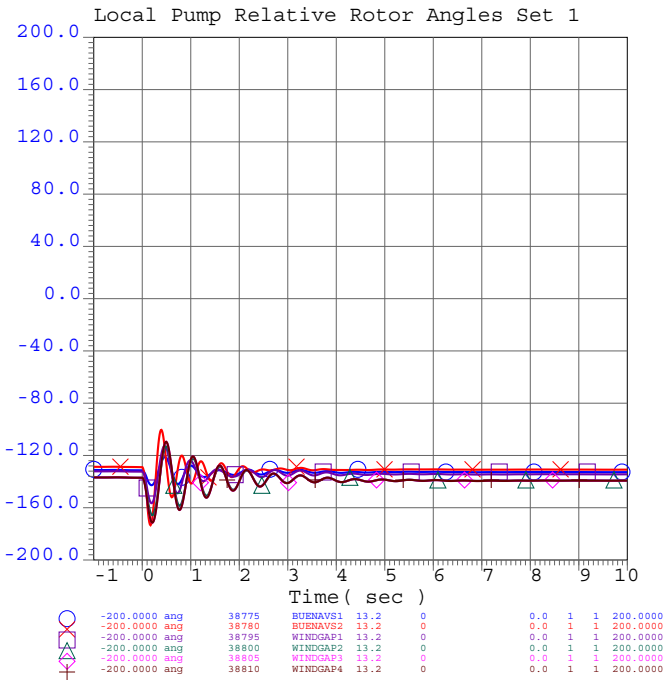
Local Generation Terminal Voltages Set 3

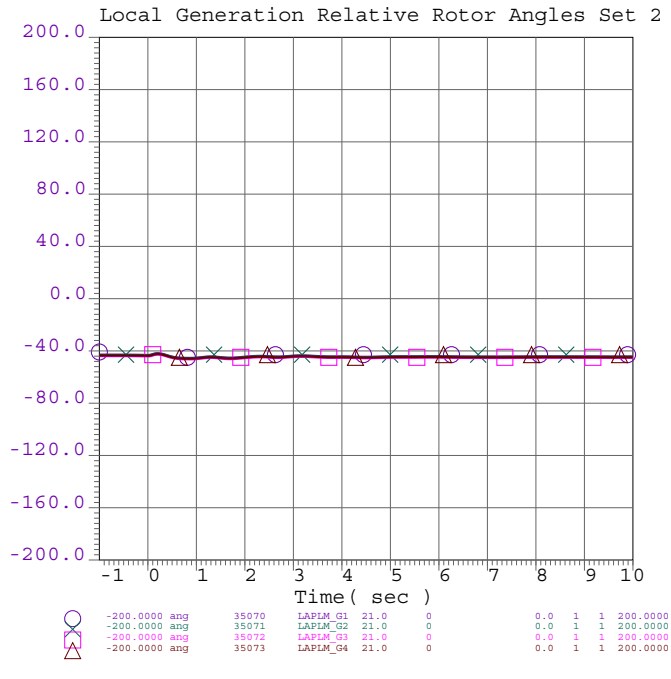


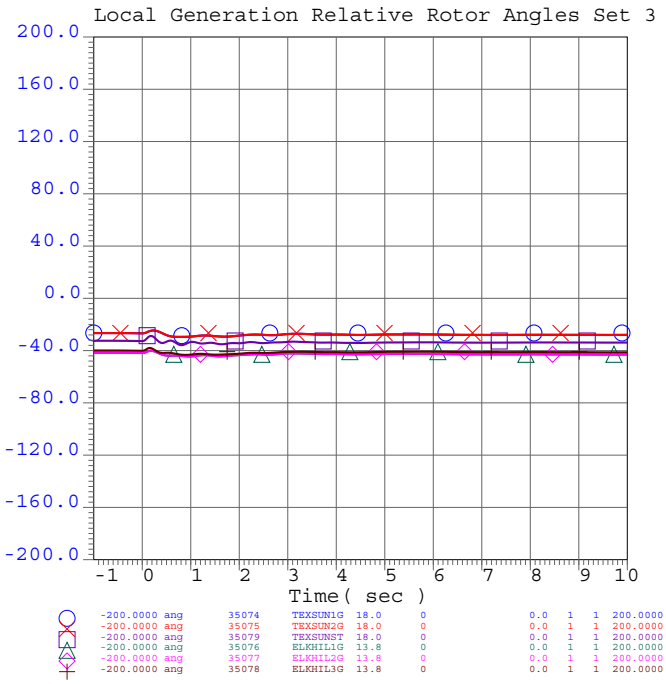
Local Generation Terminal Voltages Set 4

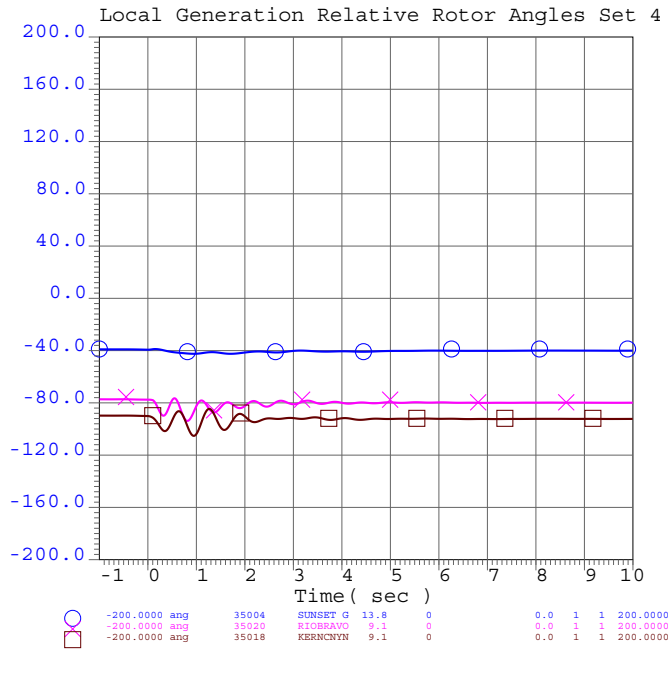


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

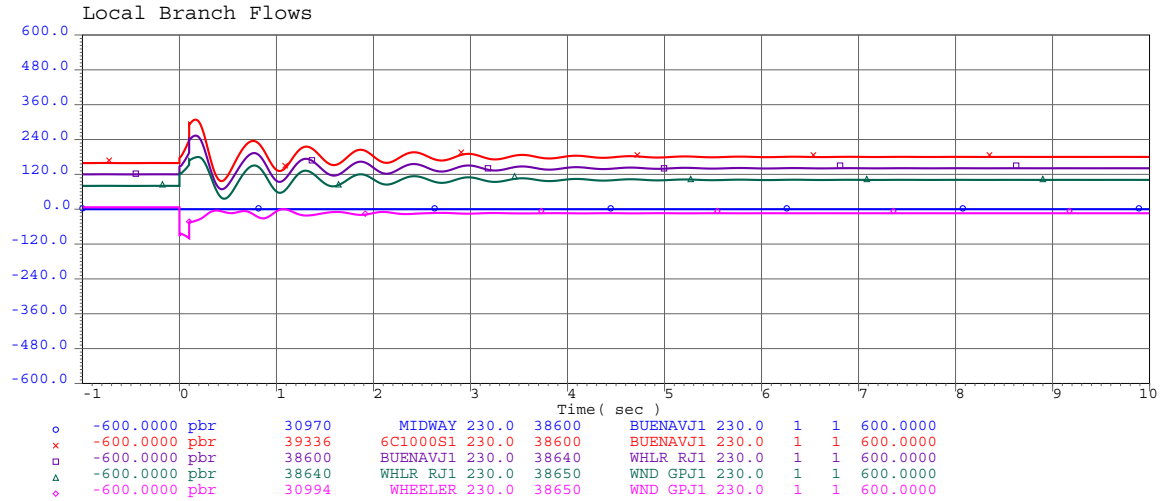




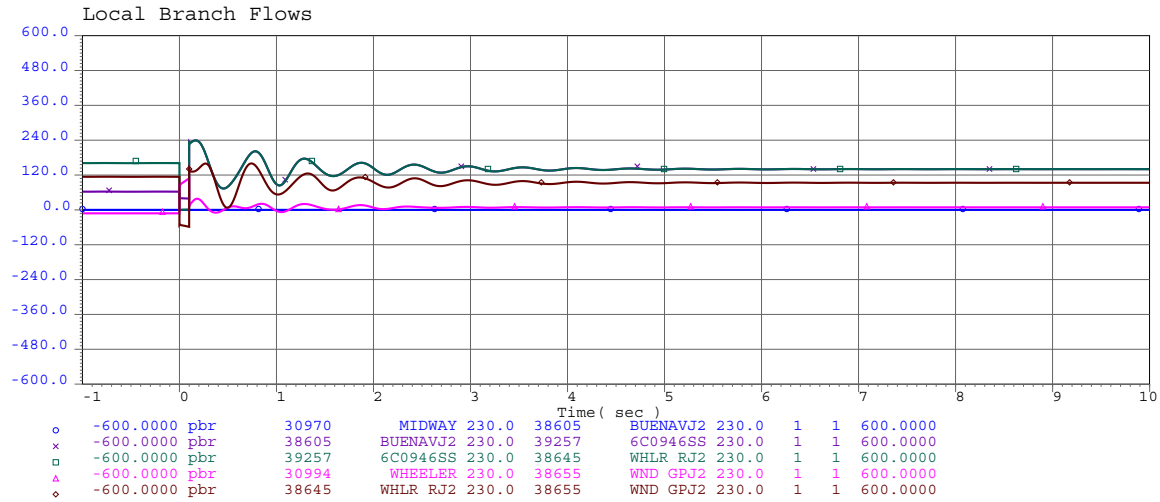




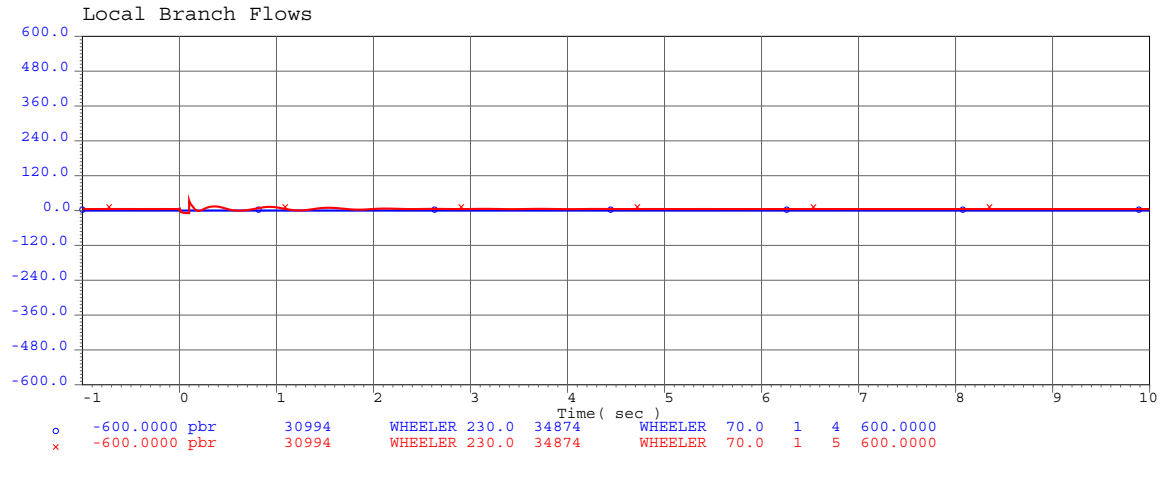
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000



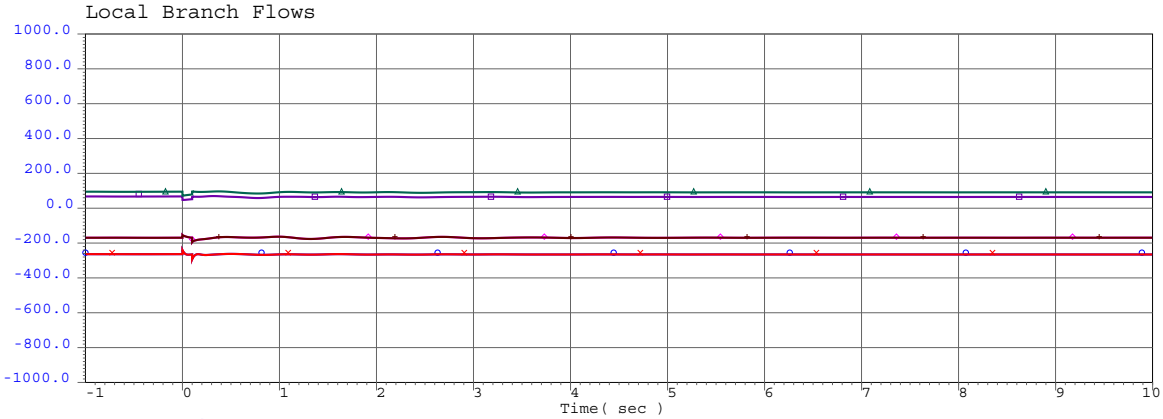
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-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000



-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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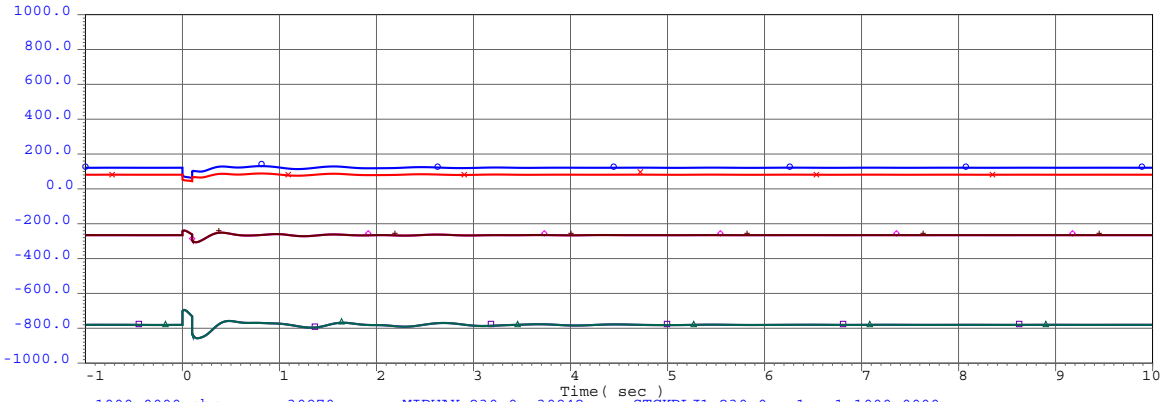
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

Local Branch Flows



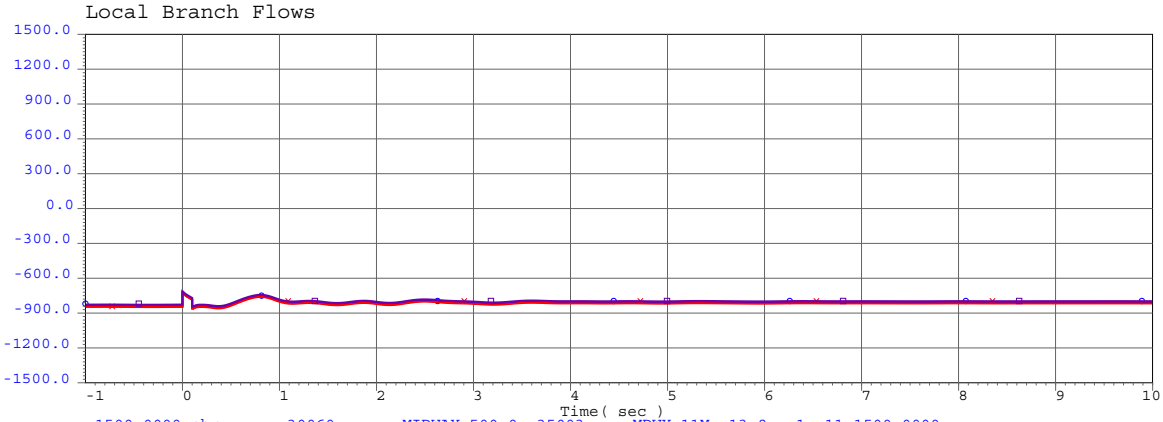
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000

Local Branch Flows



-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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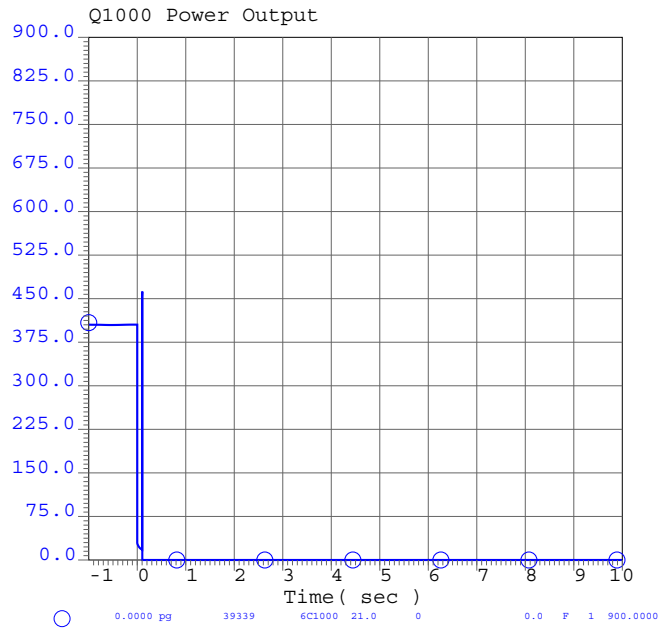
Local Branch Flows

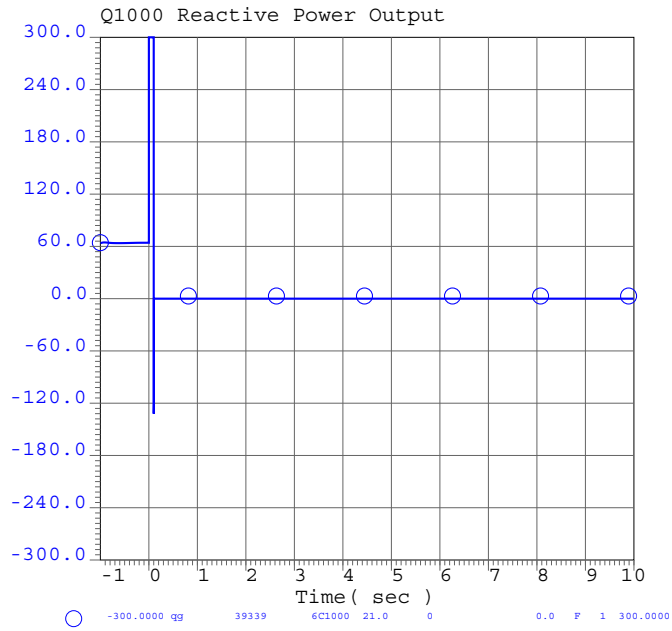


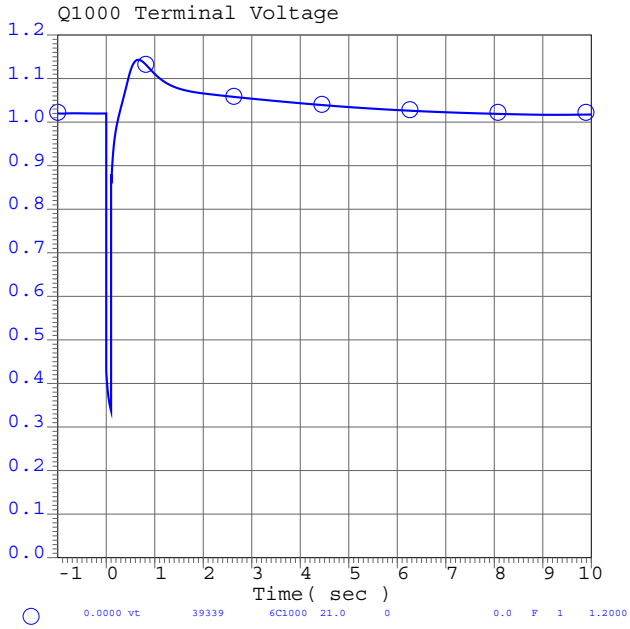
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

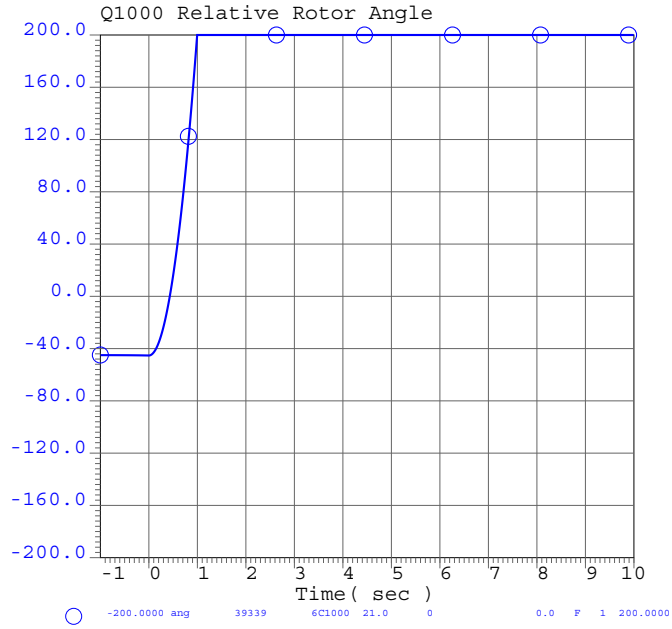
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







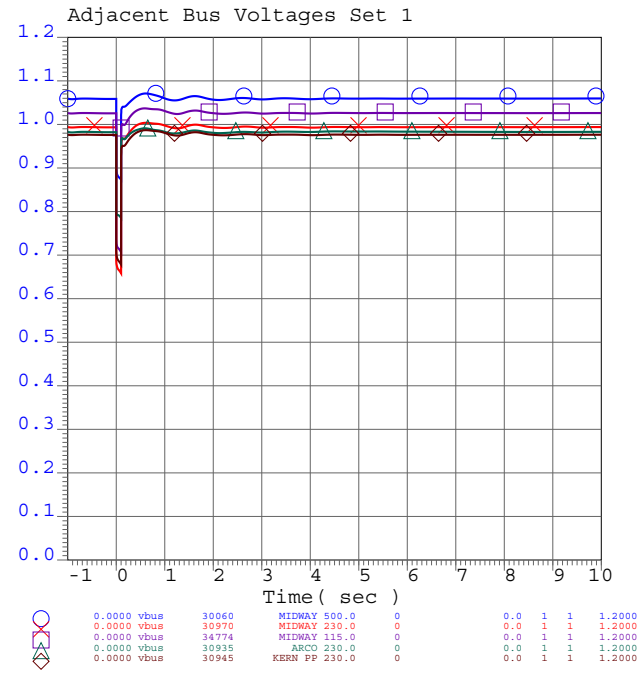


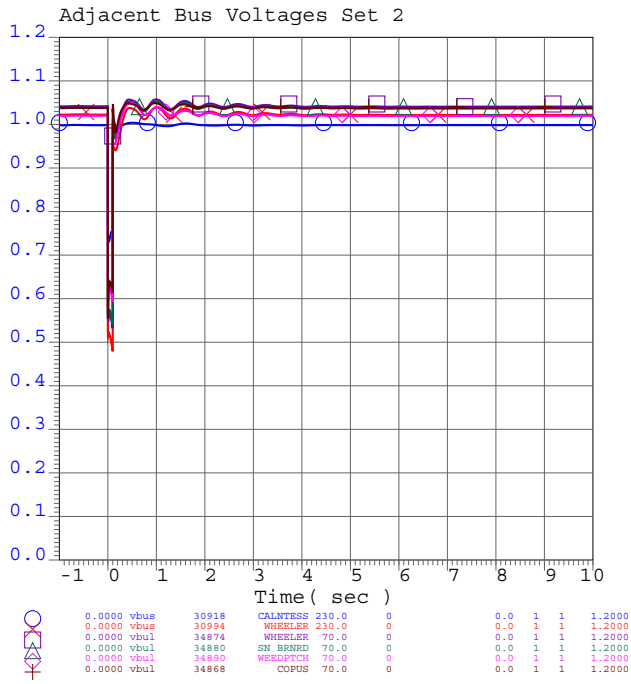
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

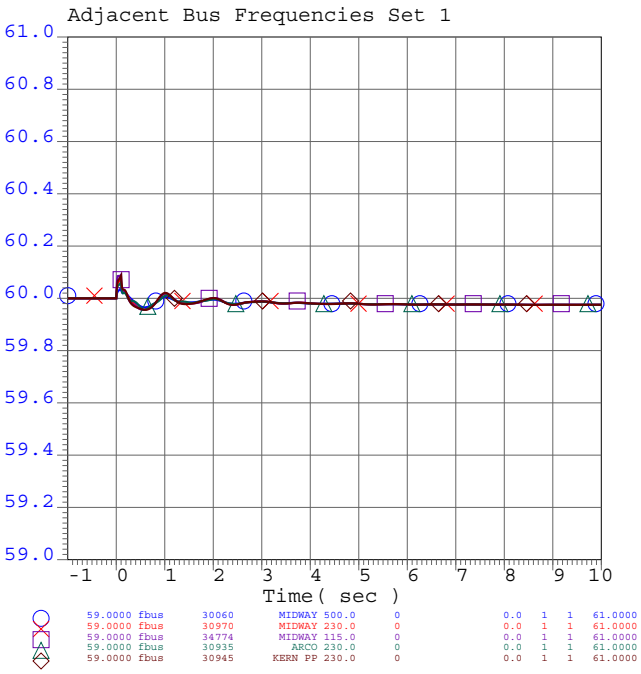
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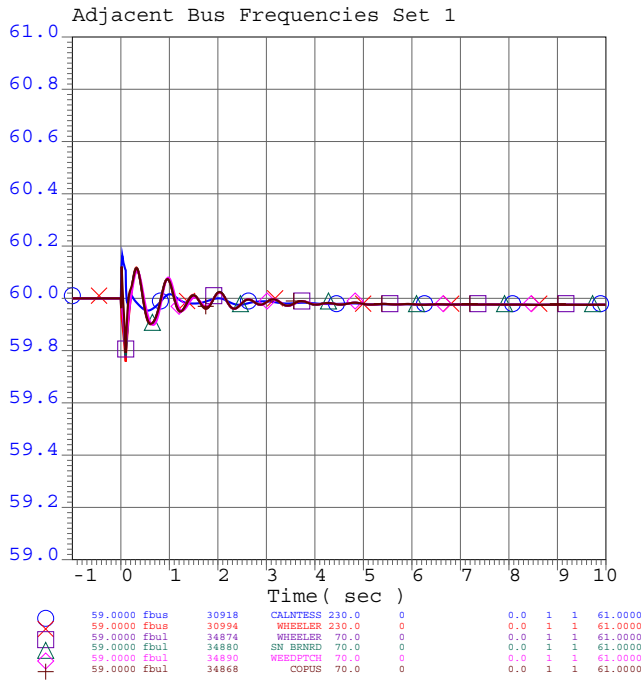
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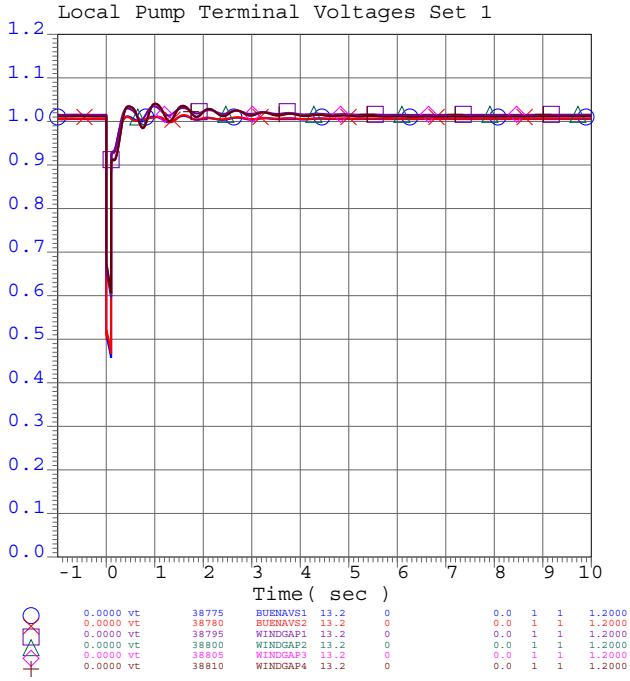




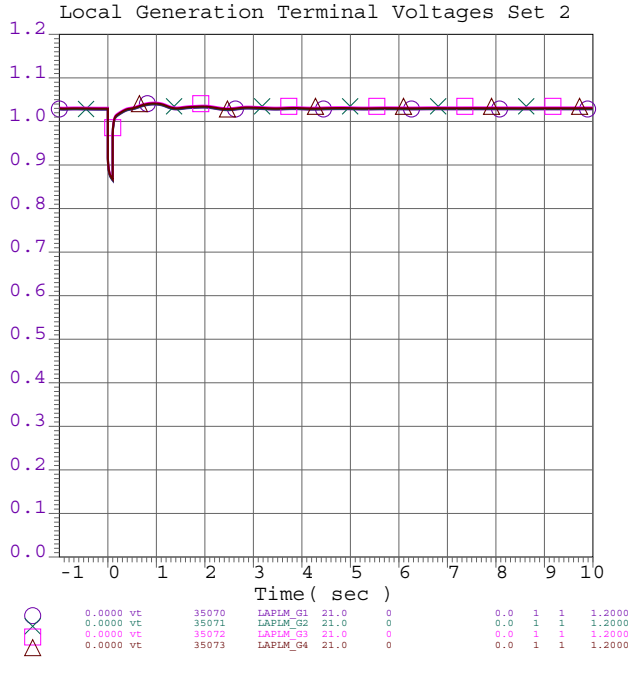


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

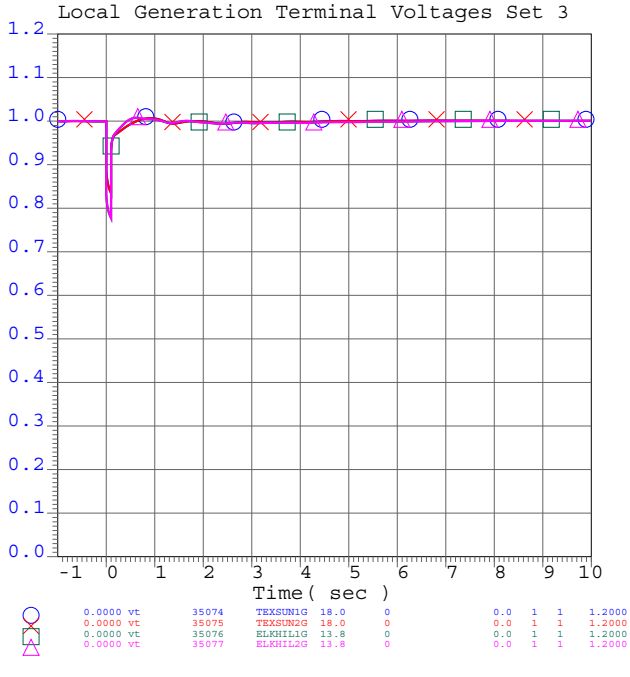
Local Pump Terminal Voltages Set 1



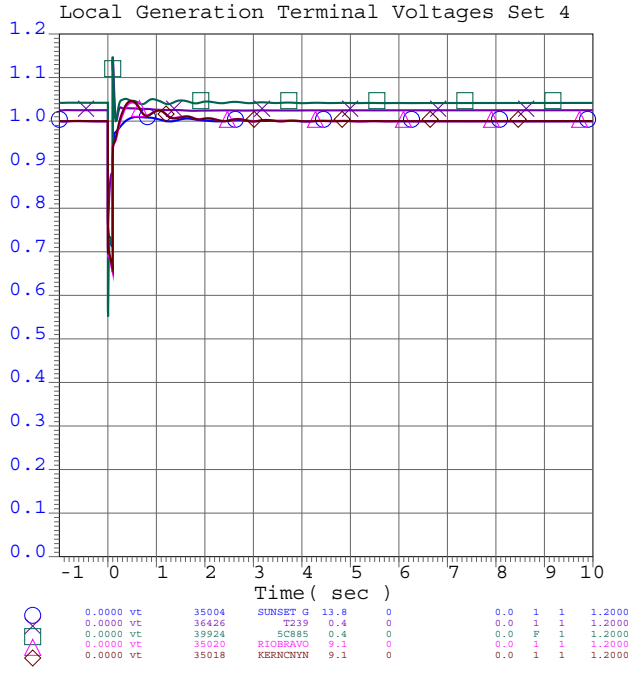
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

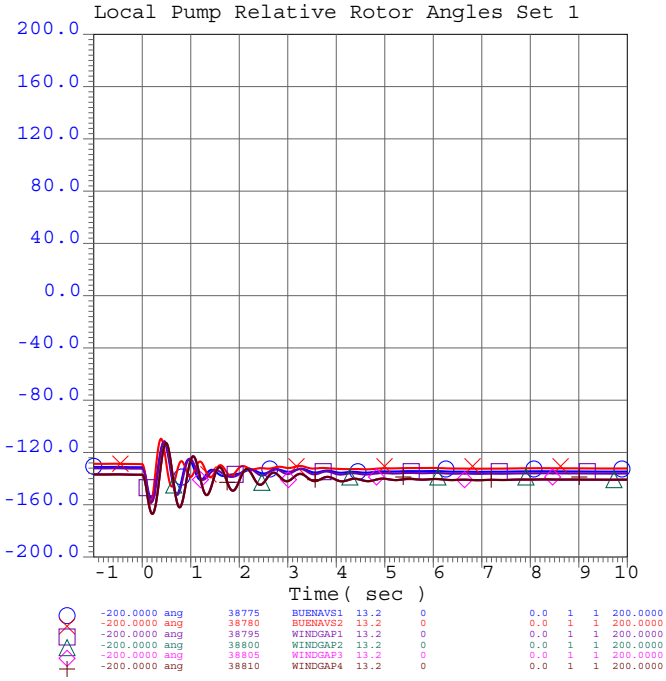


Local Generation Terminal Voltages Set 4

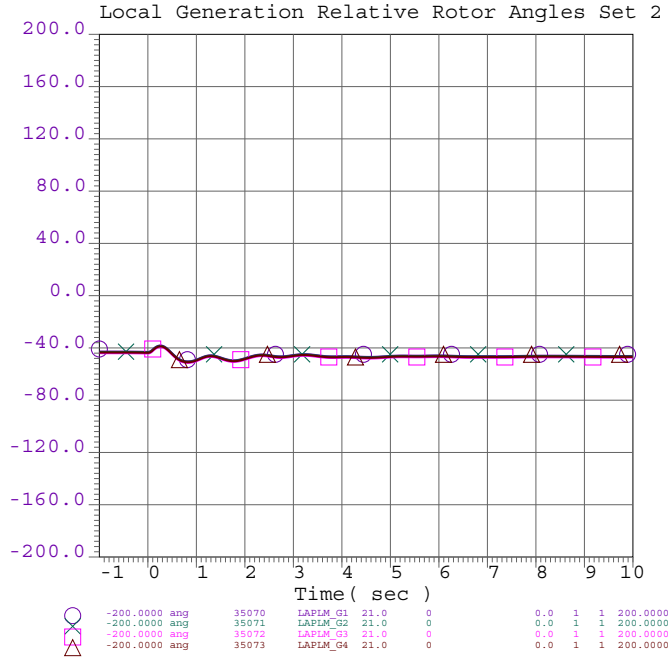


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

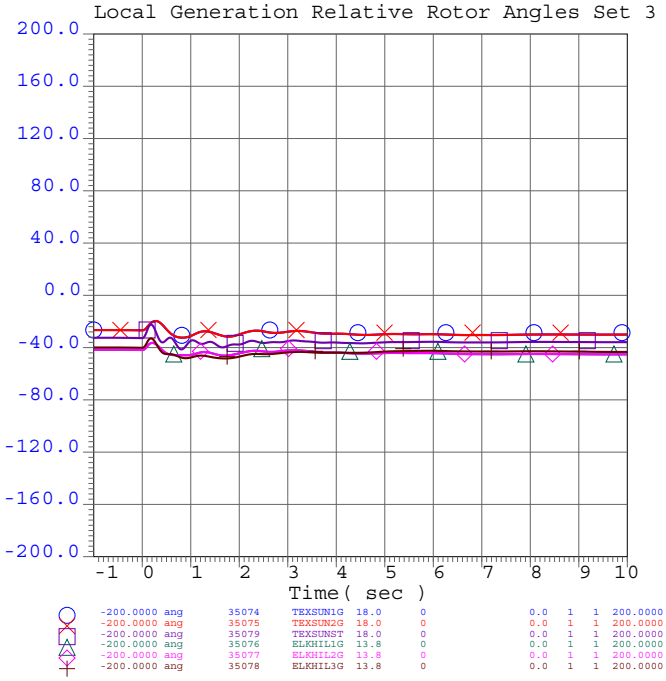
Local Pump Relative Rotor Angles Set 1



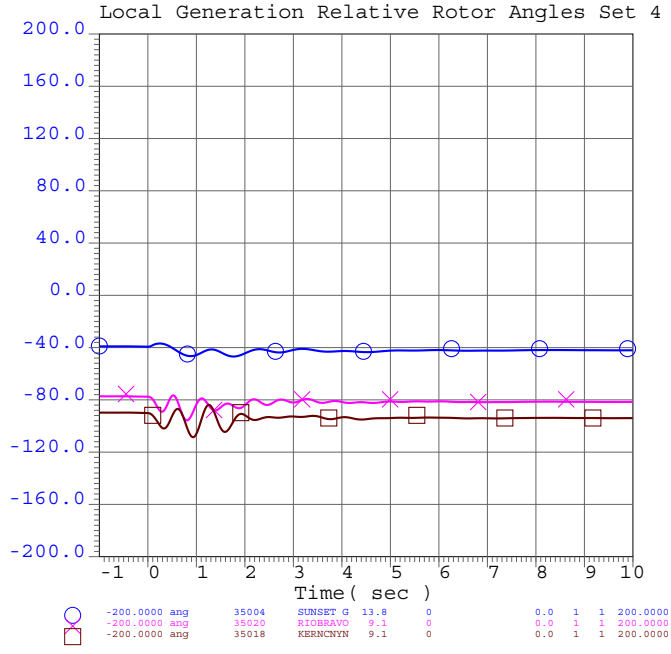
Local Generation Relative Rotor Angles Set 2



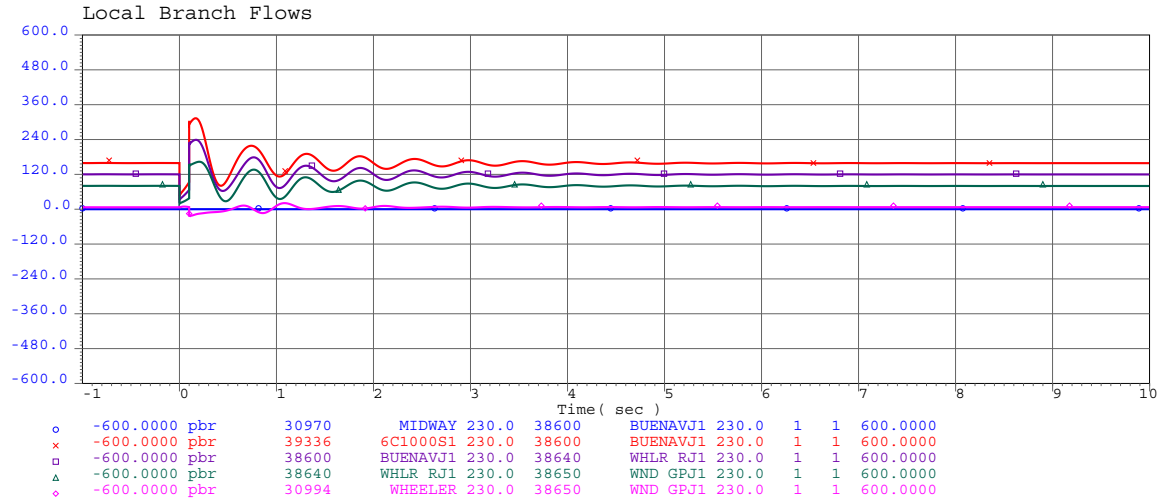
Local Generation Relative Rotor Angles Set 3

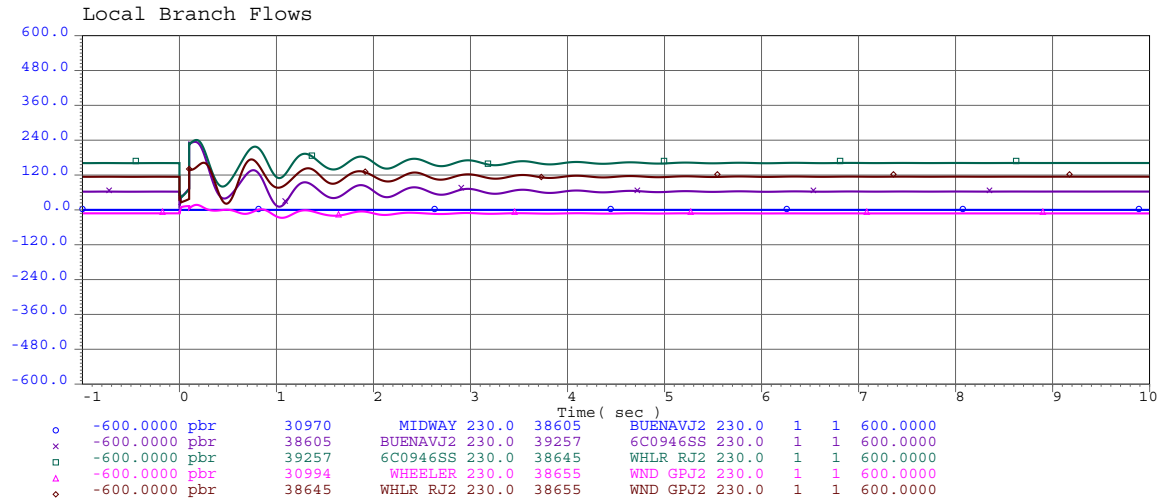


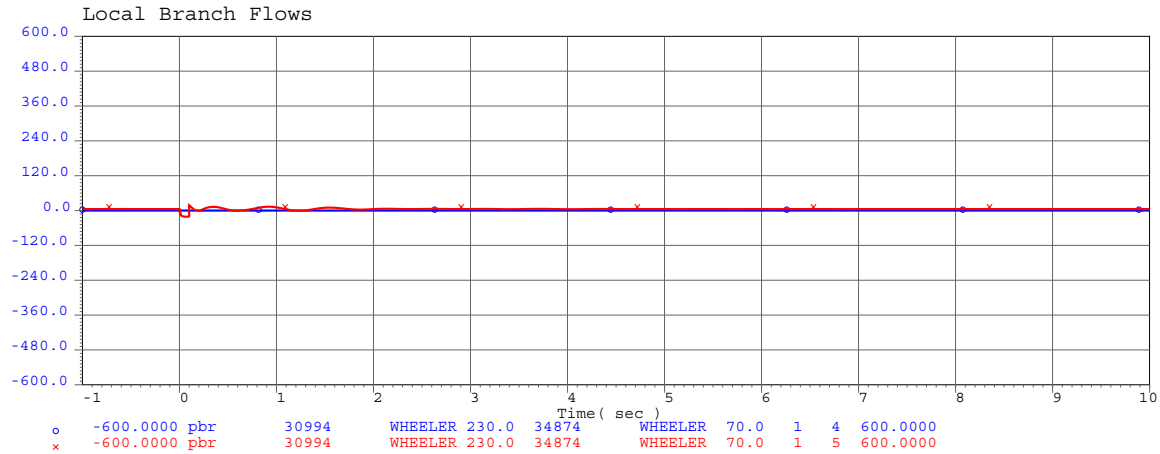
Local Generation Relative Rotor Angles Set 4



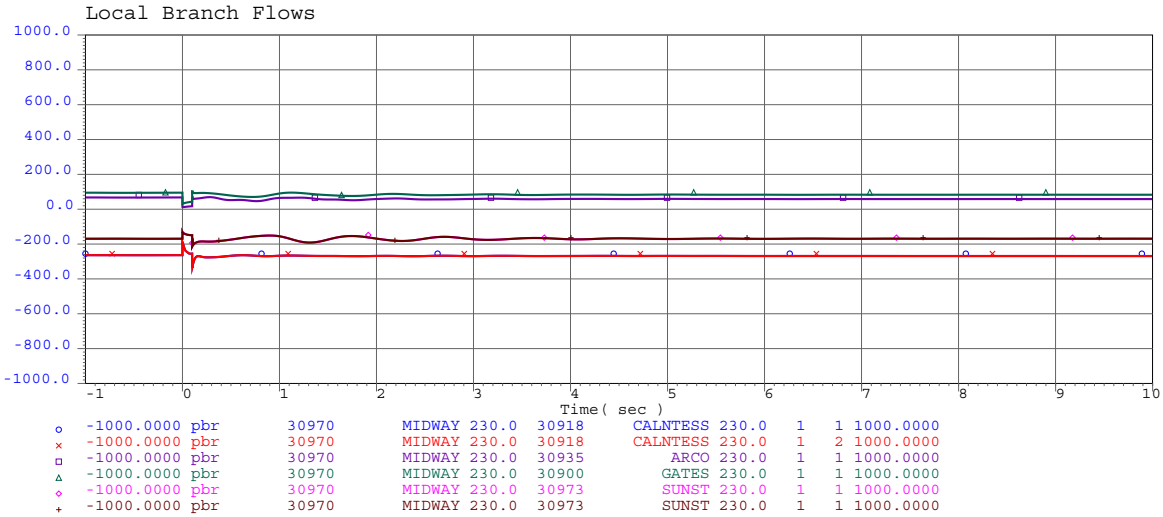
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie



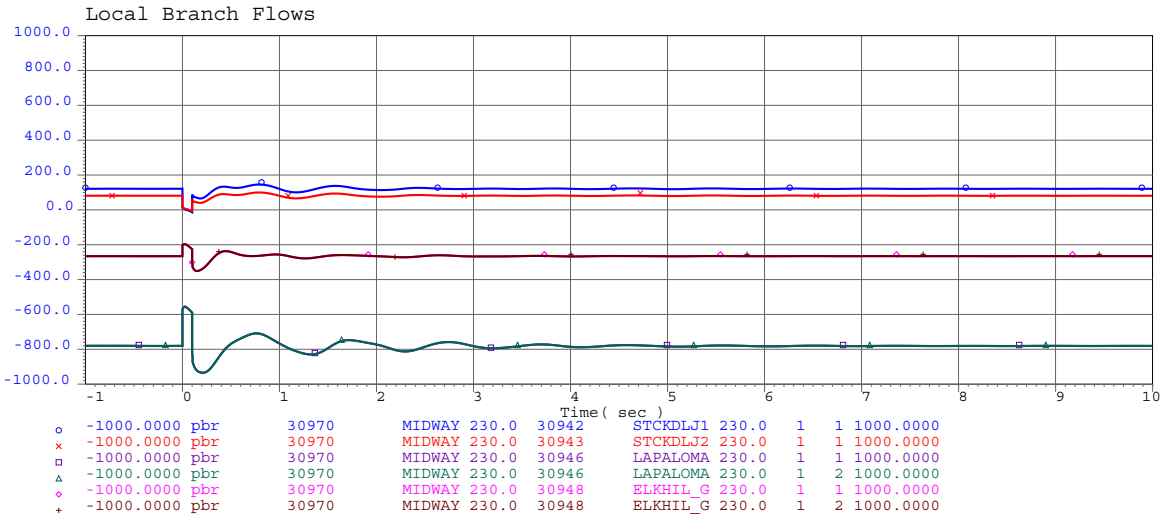




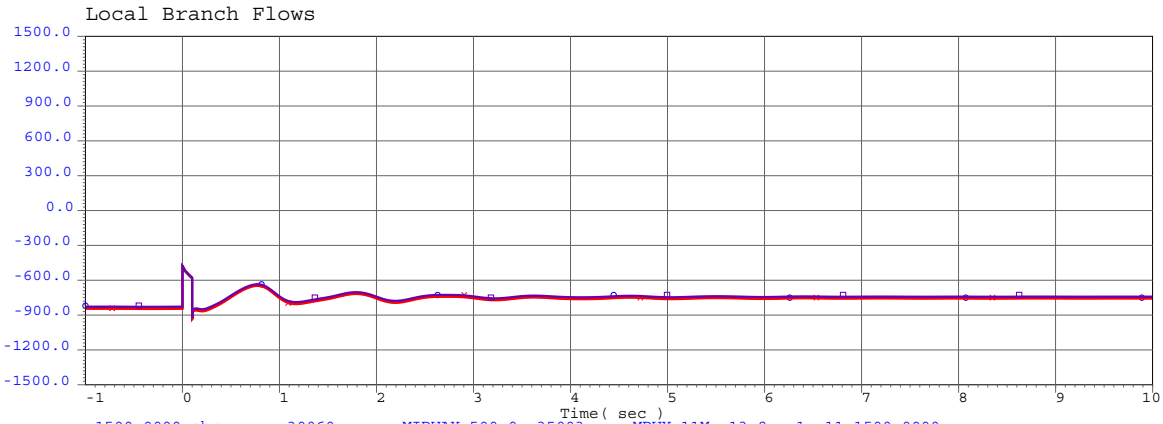
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



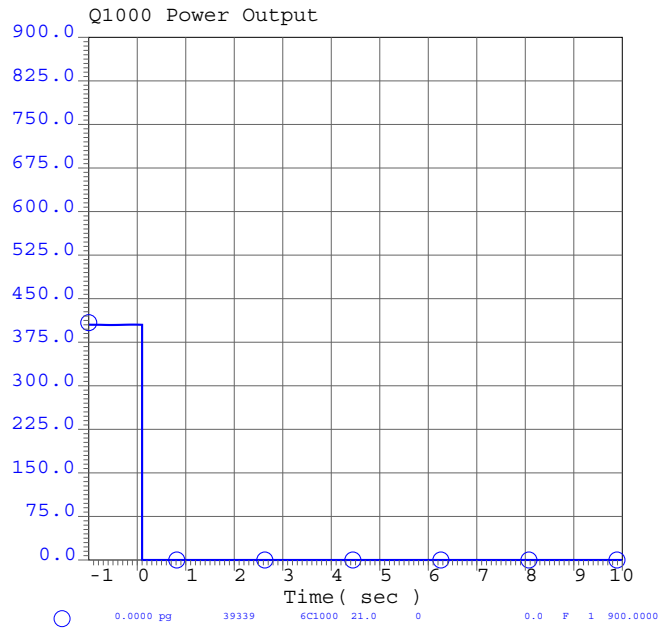
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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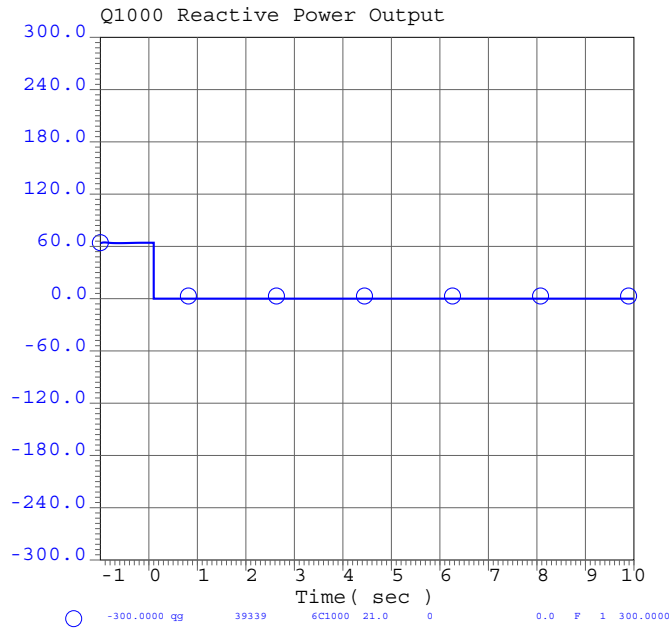


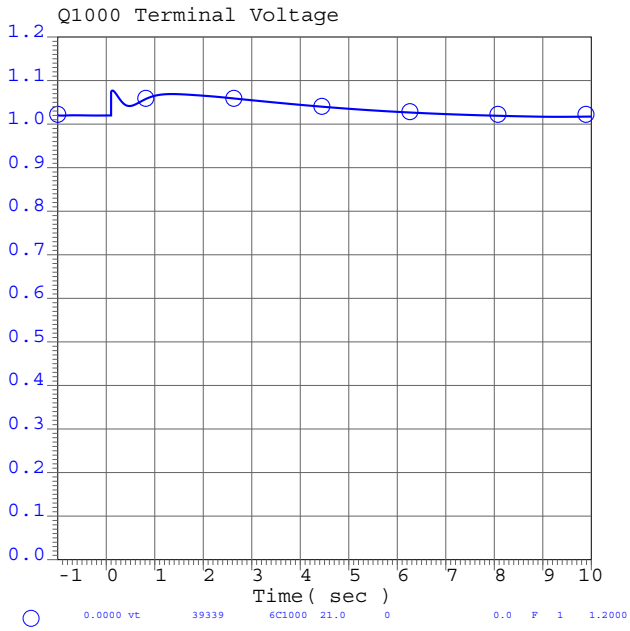
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

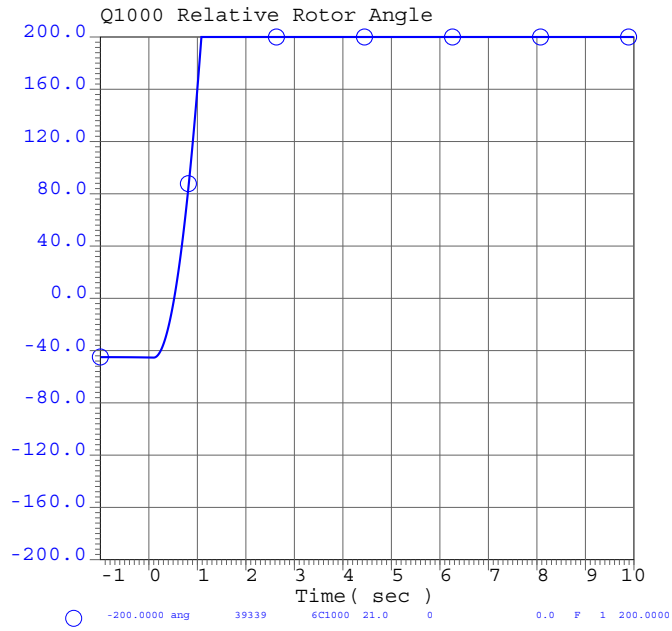
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

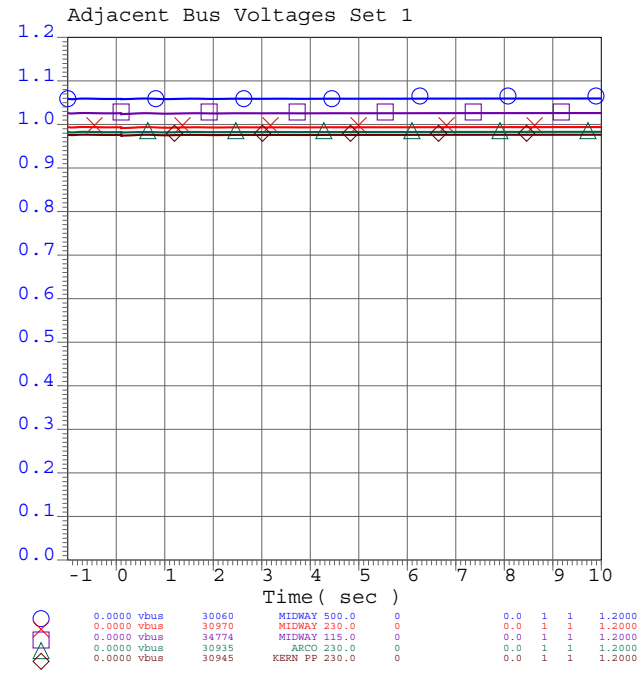


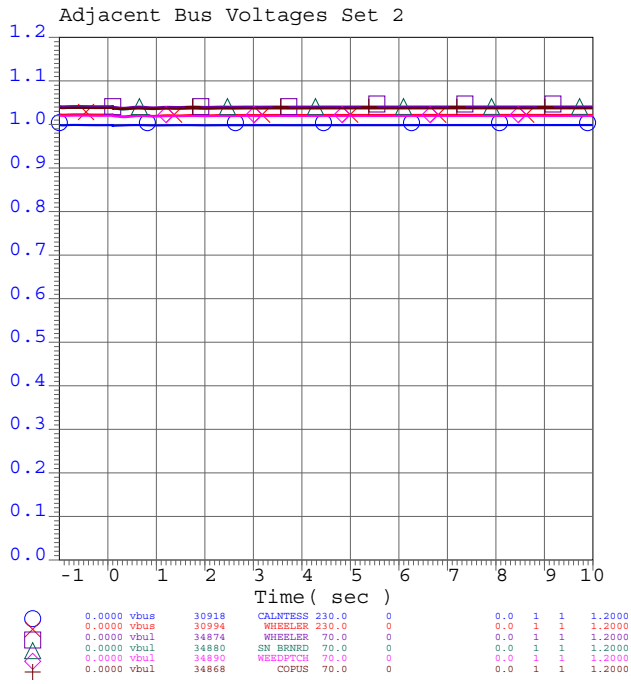


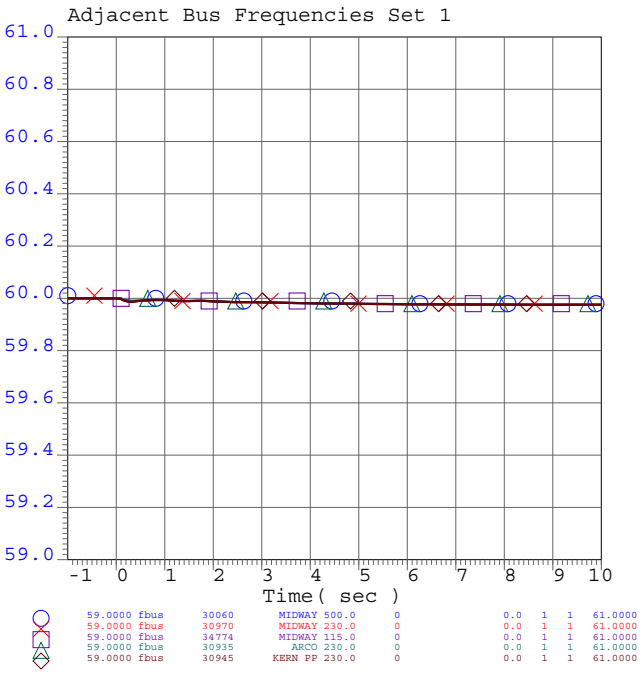


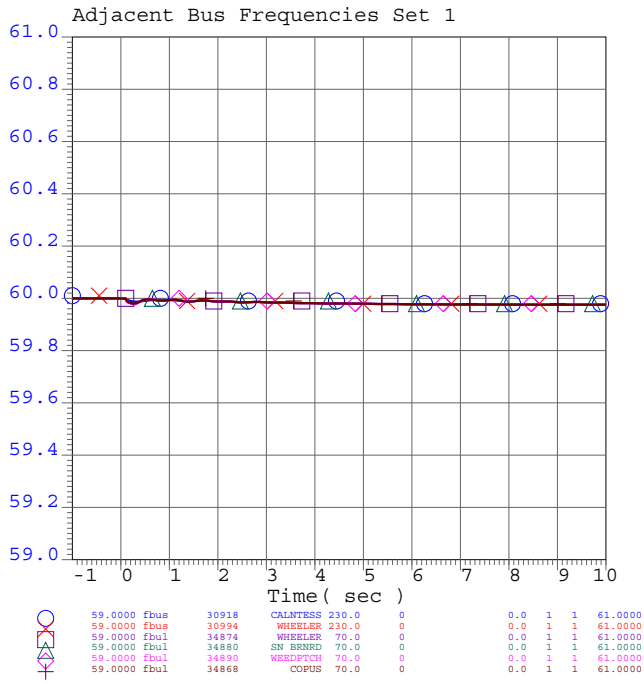


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



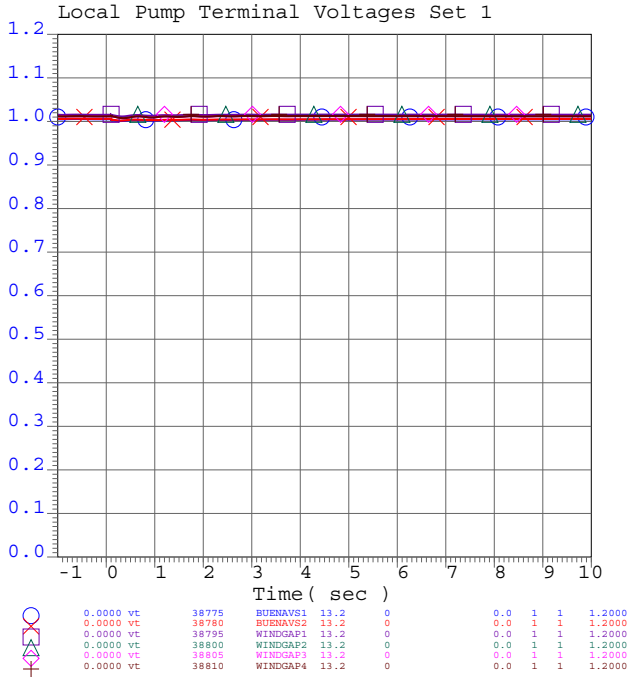






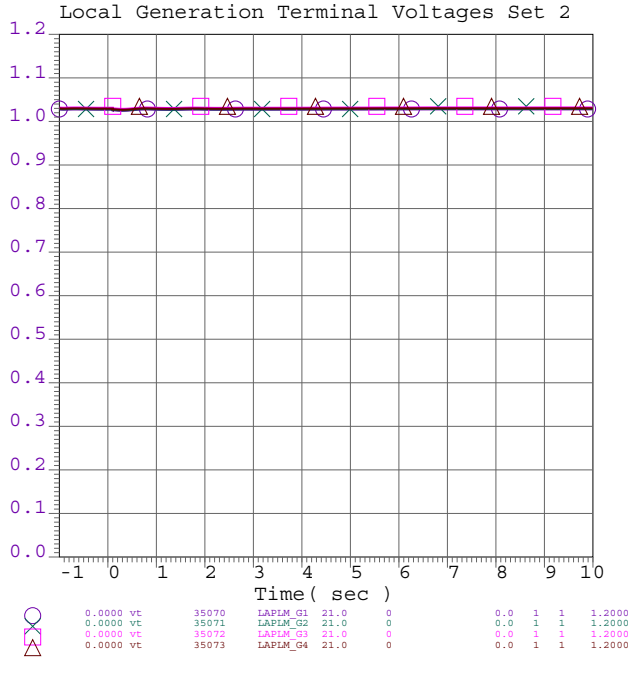
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Local Pump Terminal Voltages Set 1



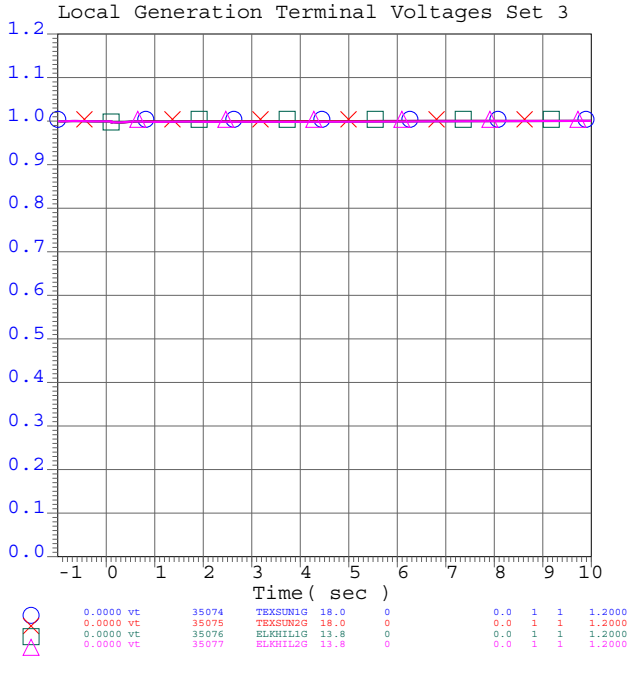
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



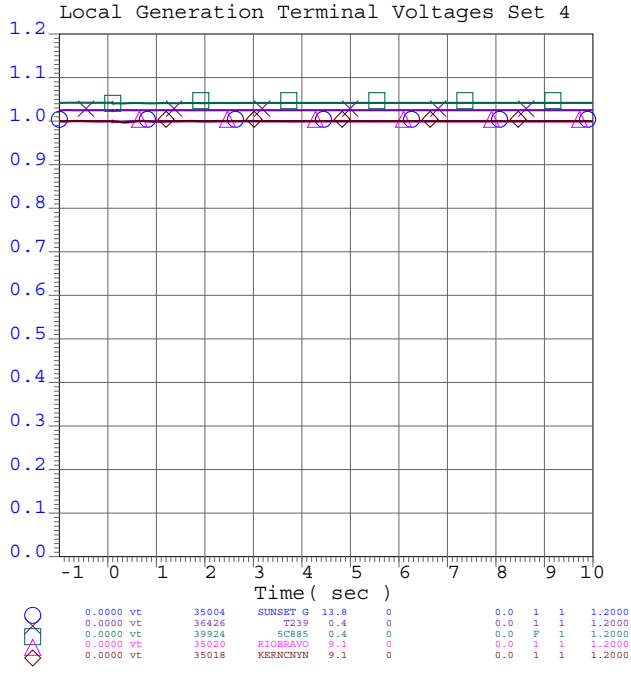
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



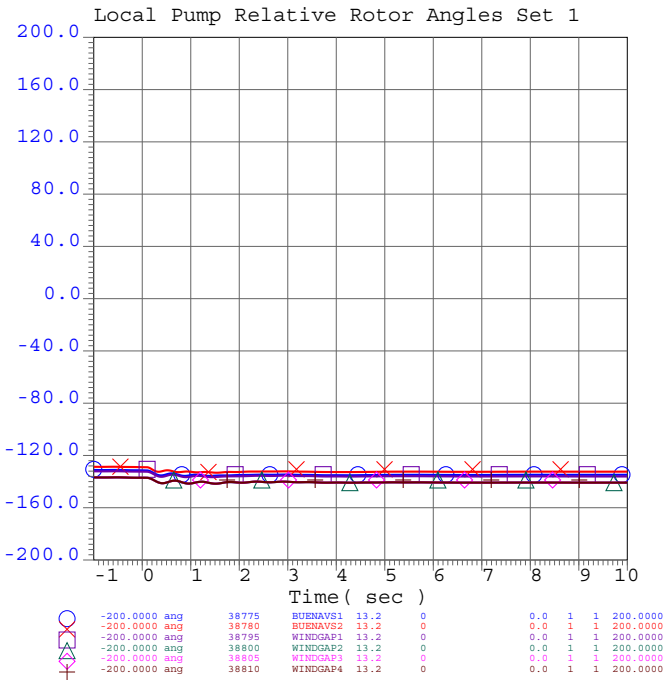
0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

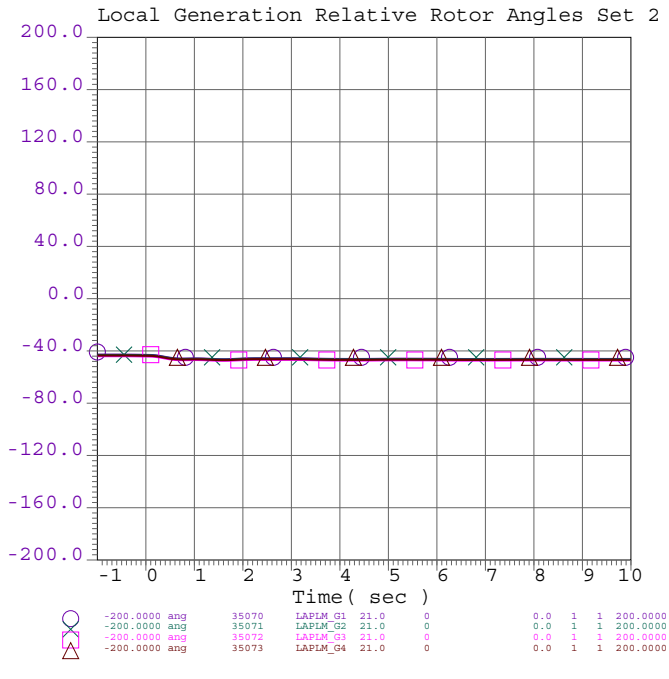
Local Generation Terminal Voltages Set 4

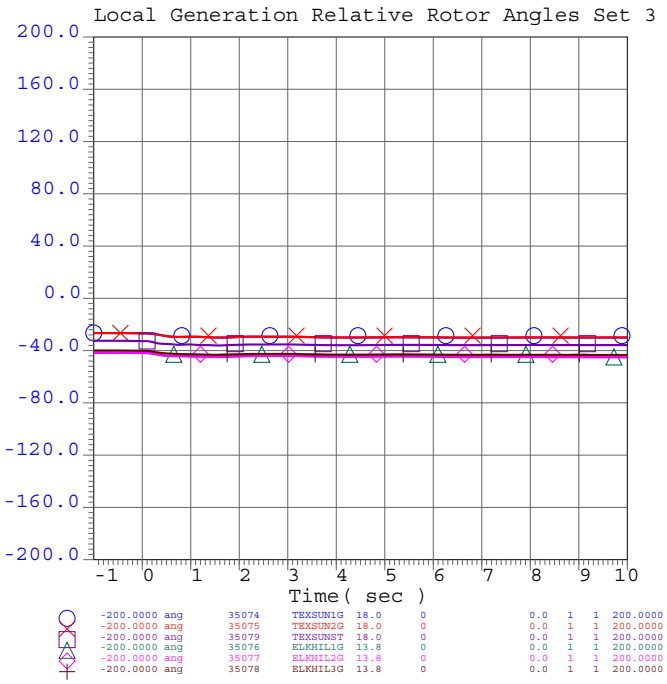


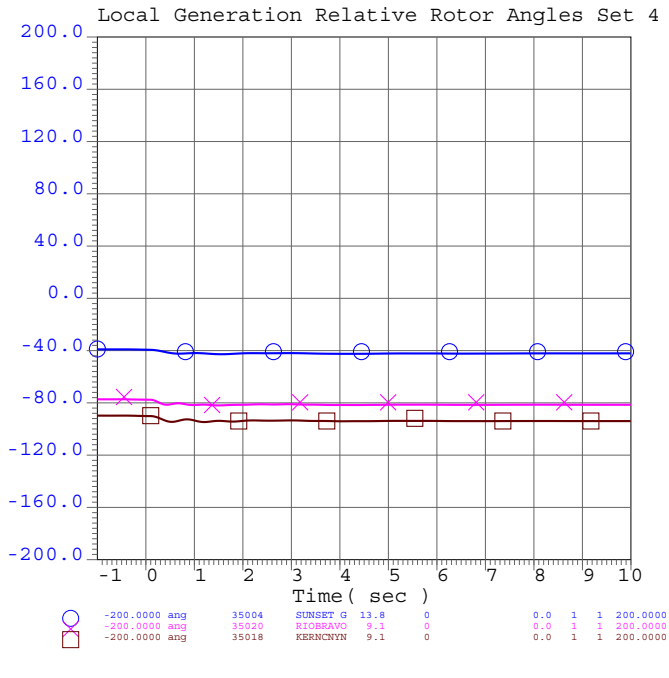
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



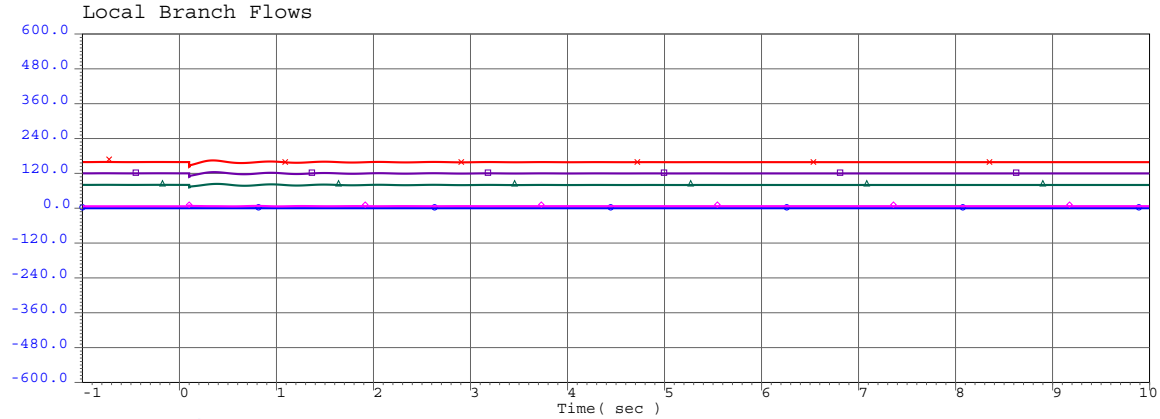






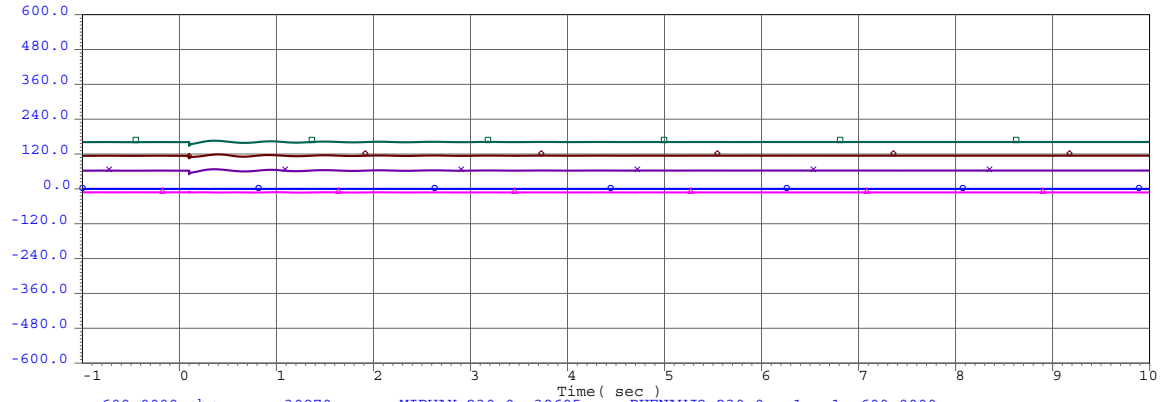
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Local Branch Flows



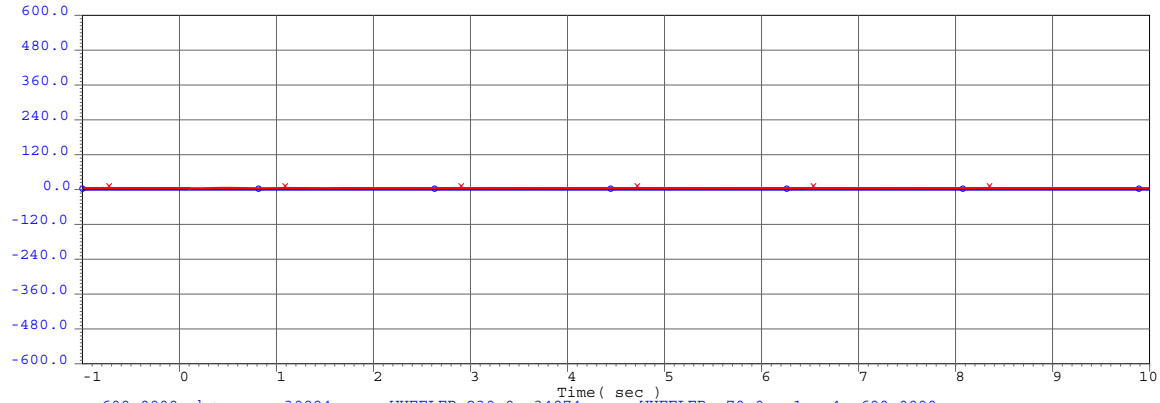
-600.0000	pbr	30970	MIDWAY 230.0	38600	BUENAVJ1 230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1 230.0	38600	BUENAVJ1 230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1 230.0	38640	WHLR RJ1 230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1 230.0	38650	WND GPJ1 230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER 230.0	38650	WND GPJ1 230.0	1	1	600.0000

Local Branch Flows



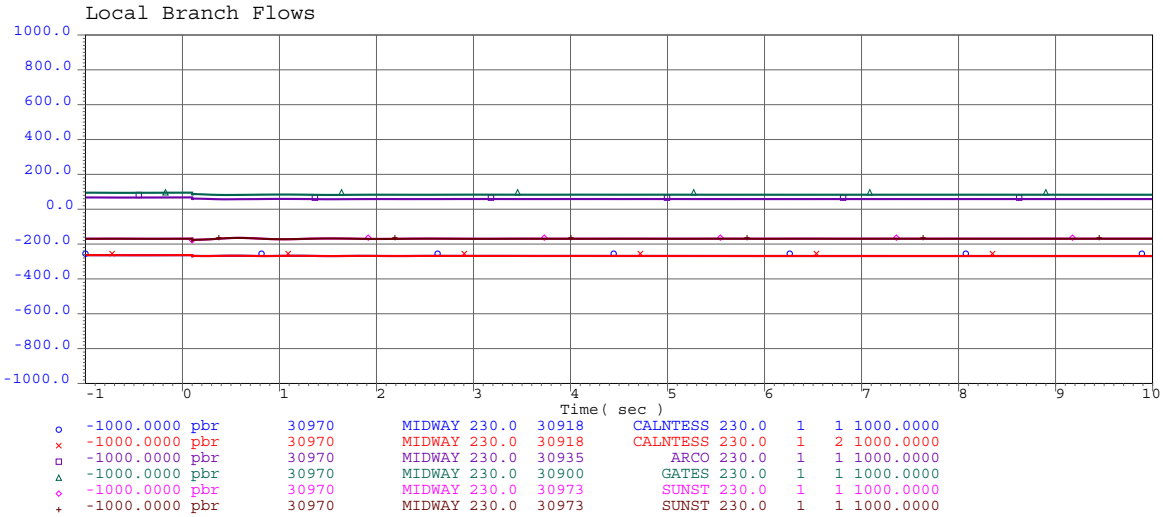
-600.0000	pbr	30970	MIDWAY 230.0	38605	BUENAVJ2 230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2 230.0	39257	6C0946SS 230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS 230.0	38645	WHLR RJ2 230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER 230.0	38655	WND GPJ2 230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2 230.0	38655	WND GPJ2 230.0	1	1	600.0000

Local Branch Flows

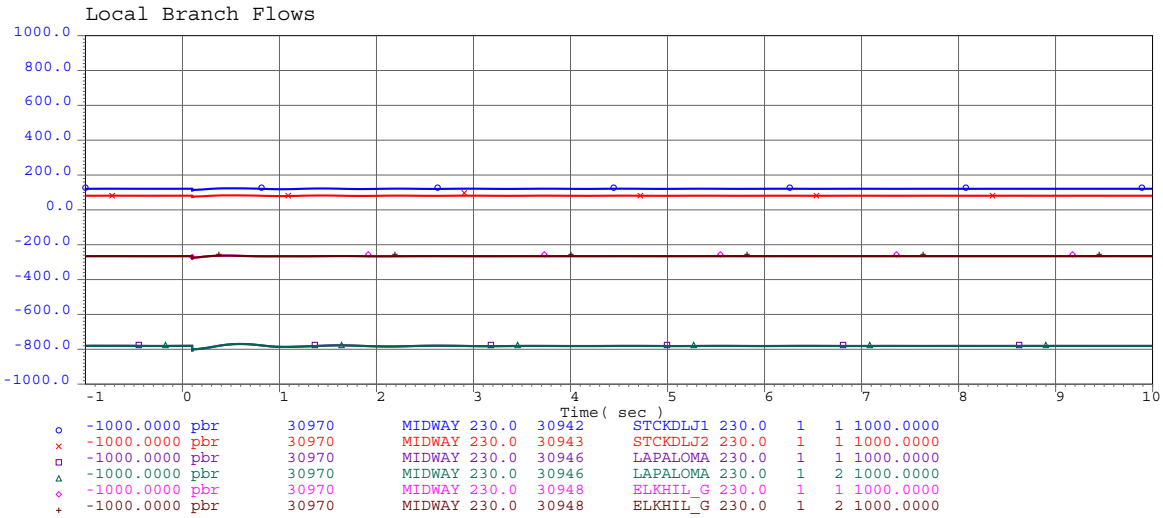


-600.0000	pbr	30994	WHEELER 230.0	34874	WHEELER 70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER 230.0	34874	WHEELER 70.0	1	5	600.0000

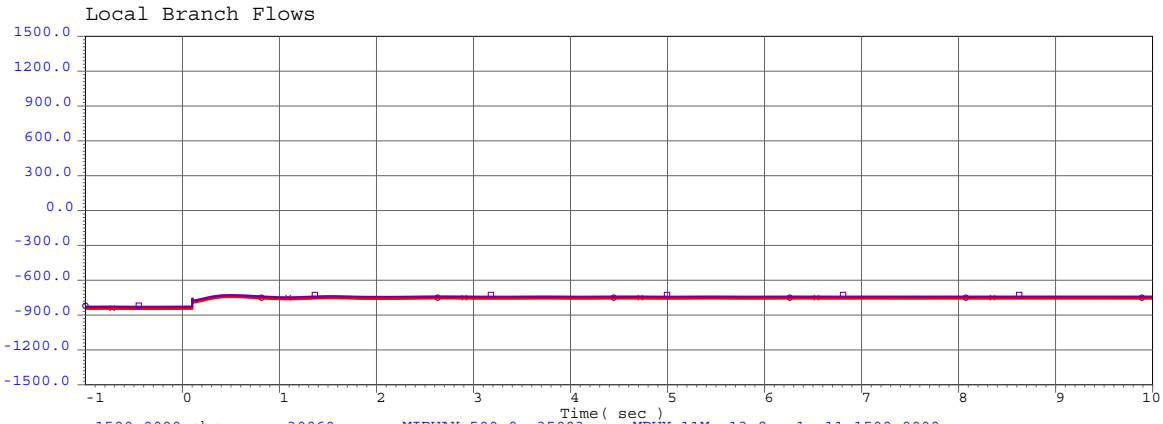
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



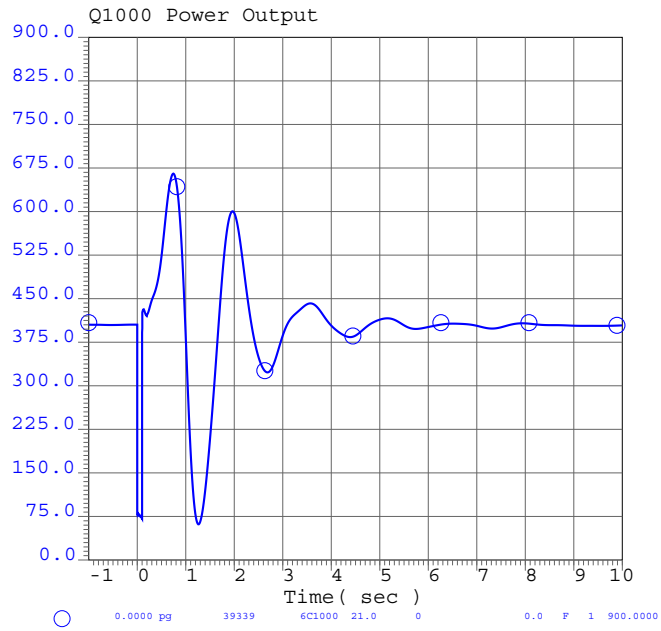
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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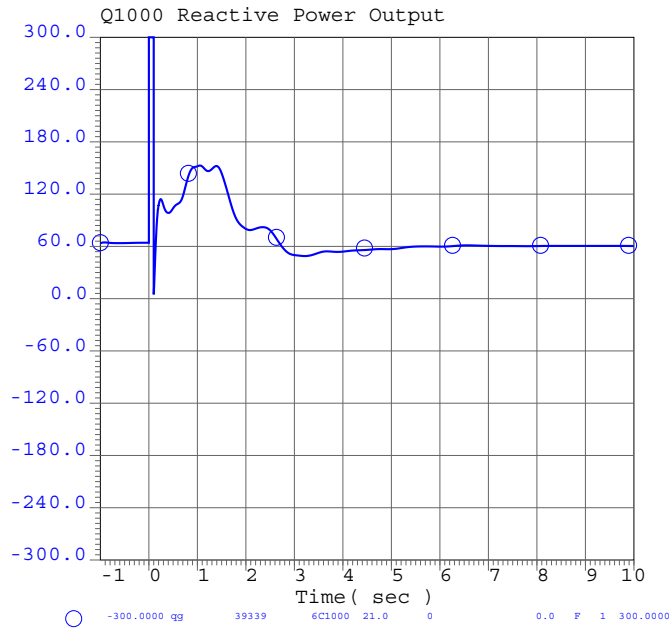


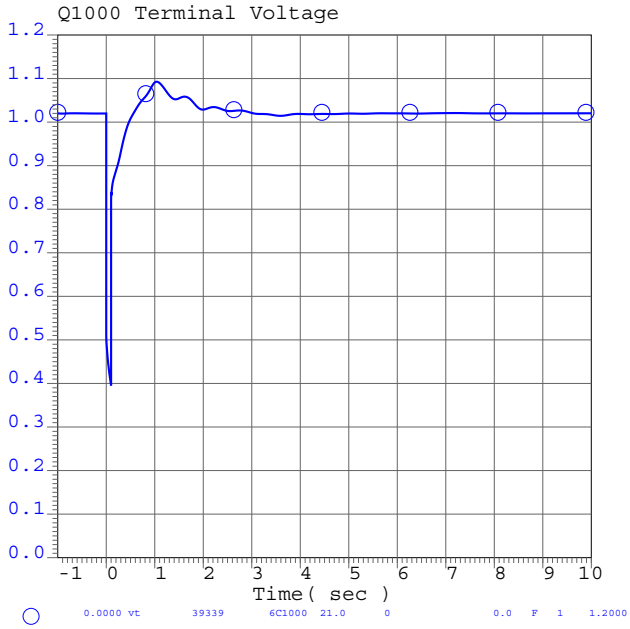
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

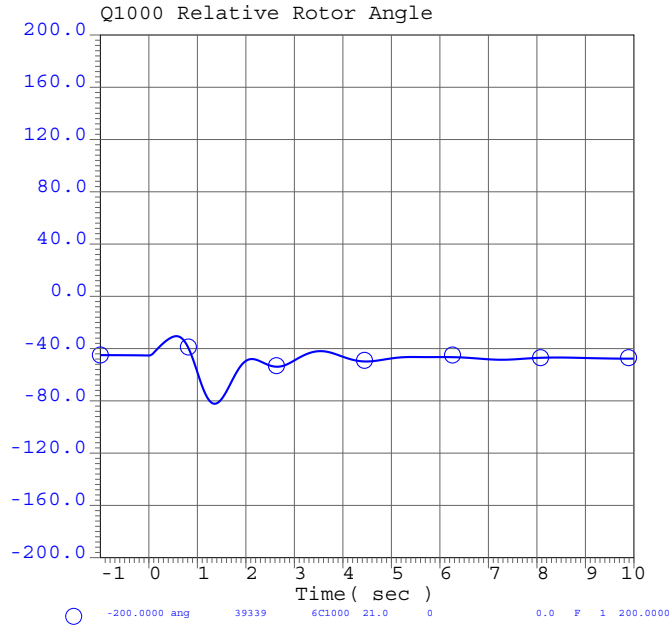
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







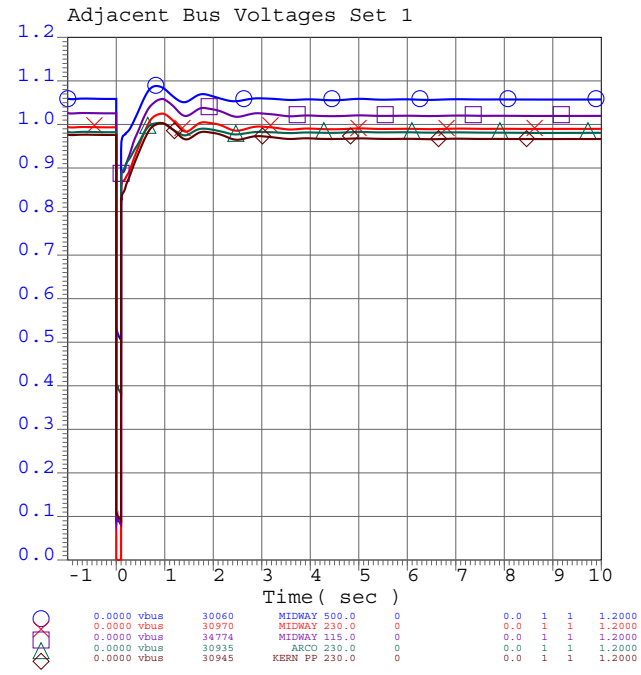


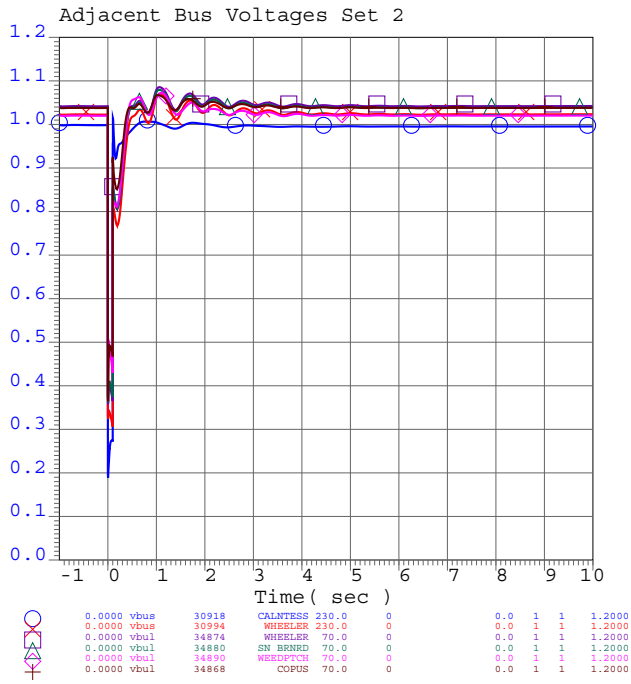
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

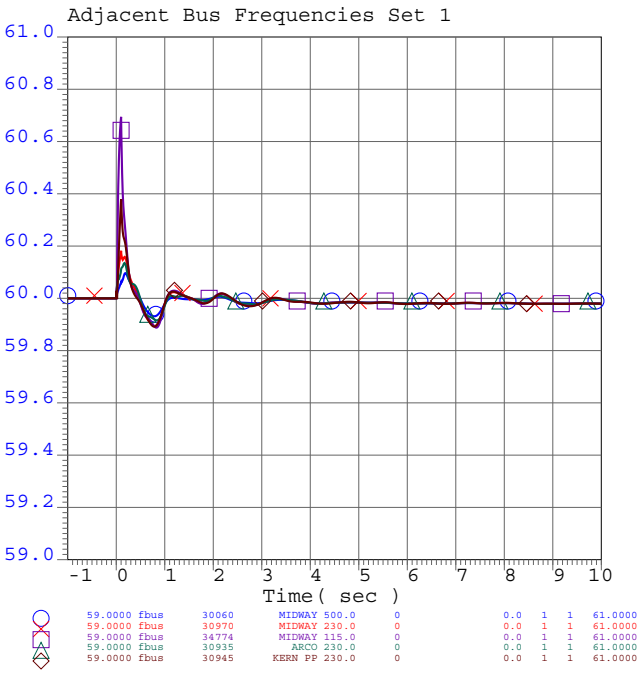
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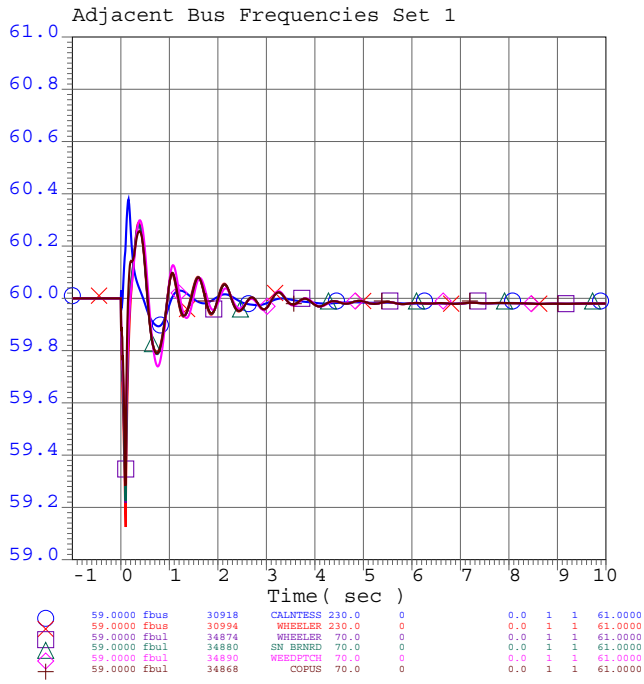
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Tue Dec 24 11:39:18 2013



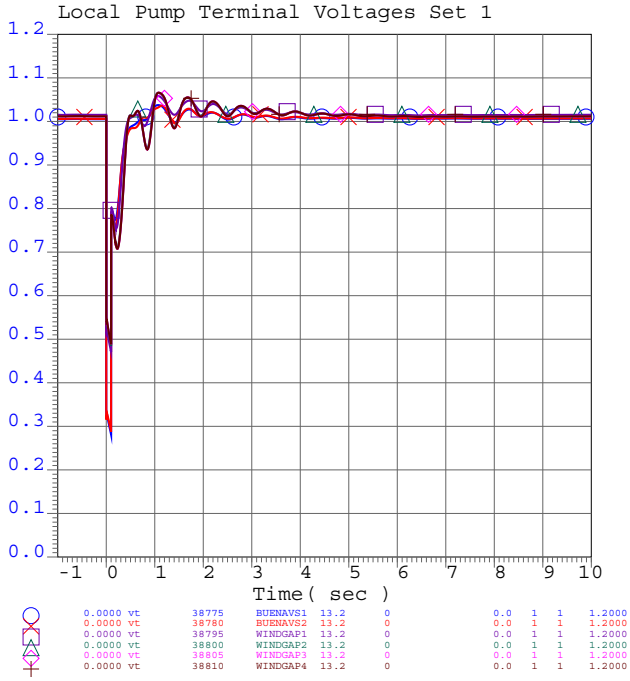




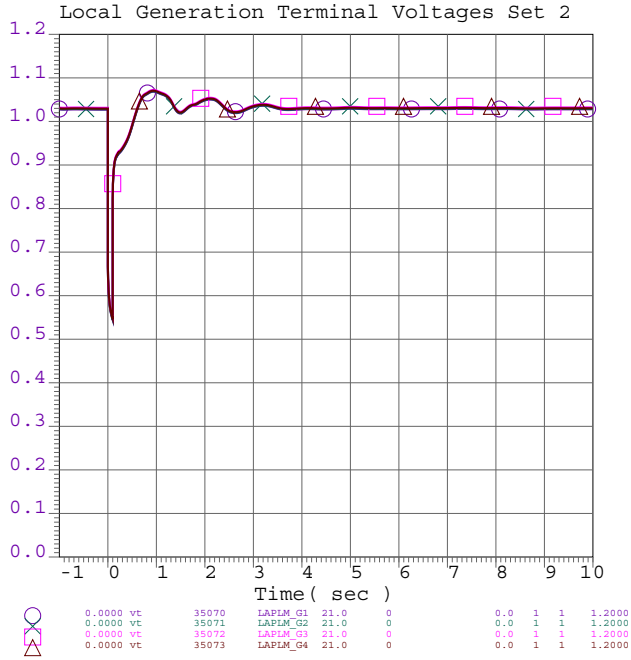


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

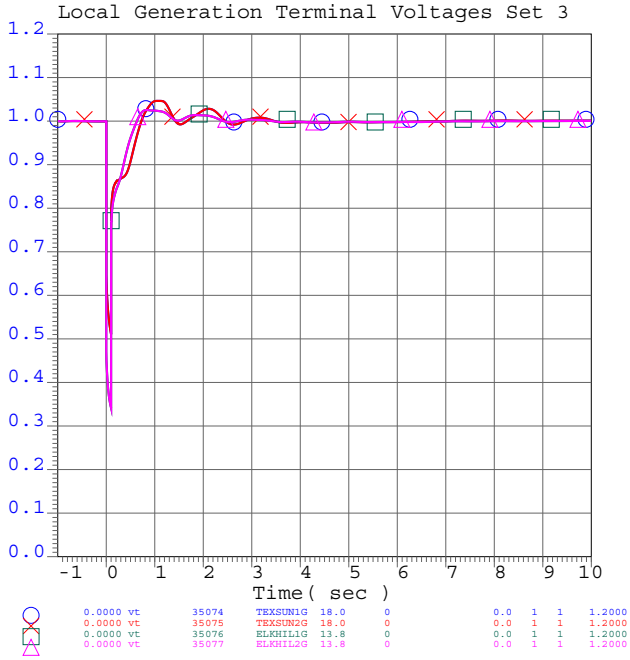
Local Pump Terminal Voltages Set 1



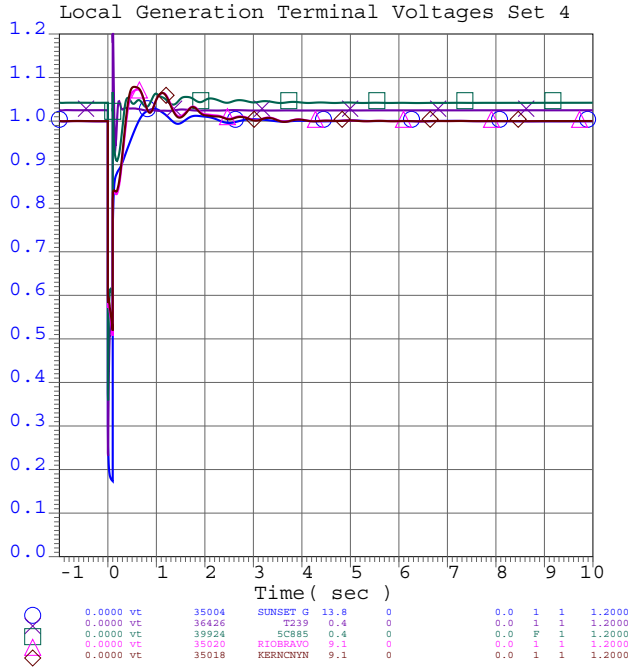
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4

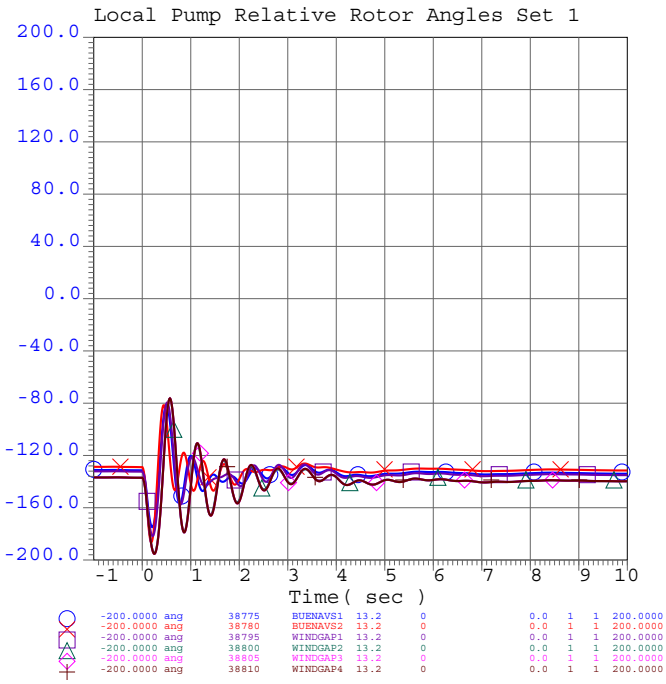


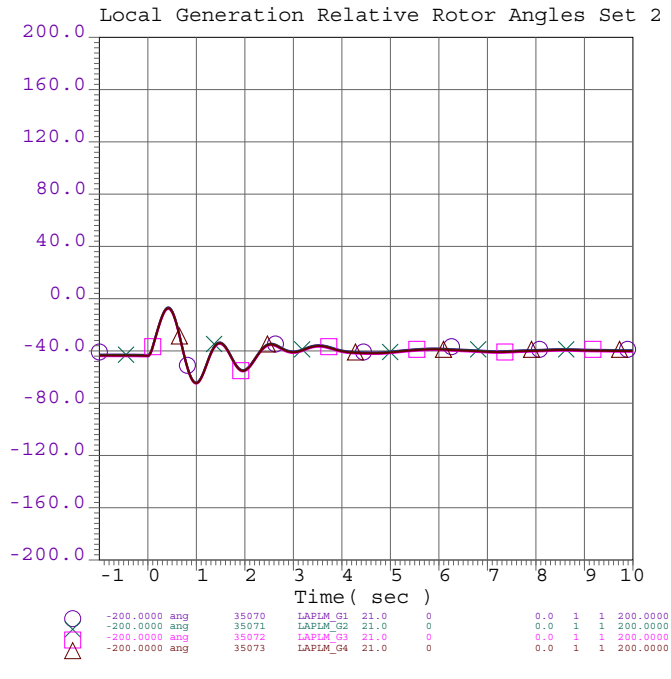
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

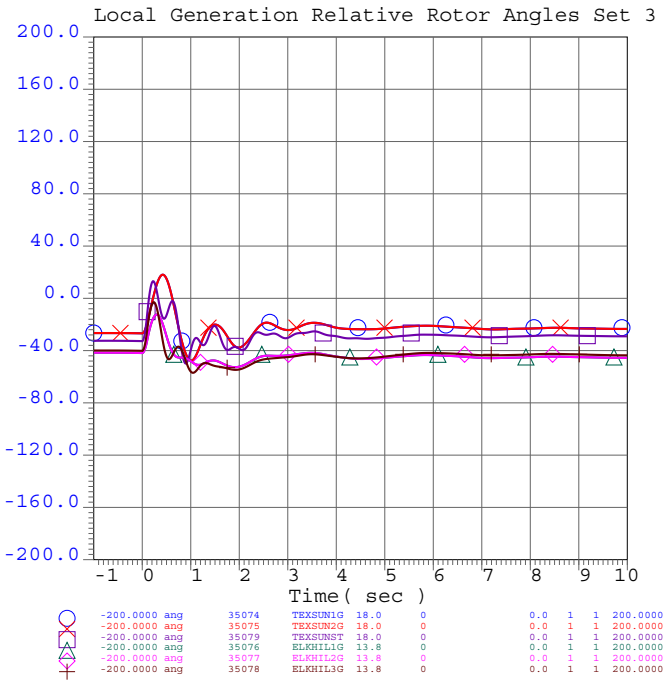
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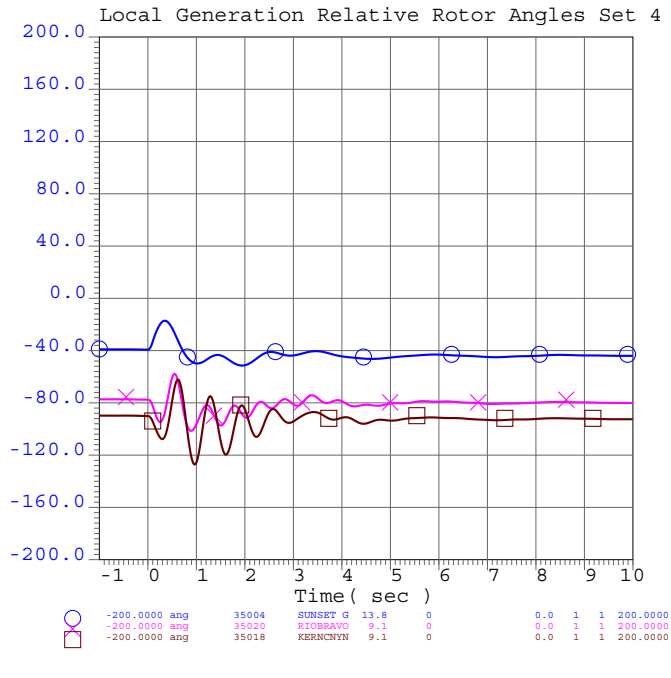
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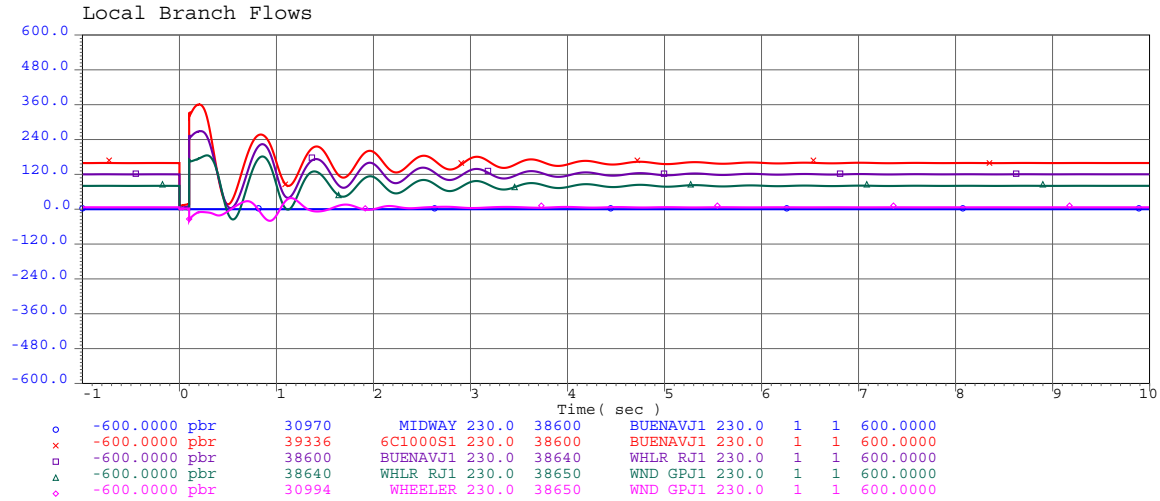


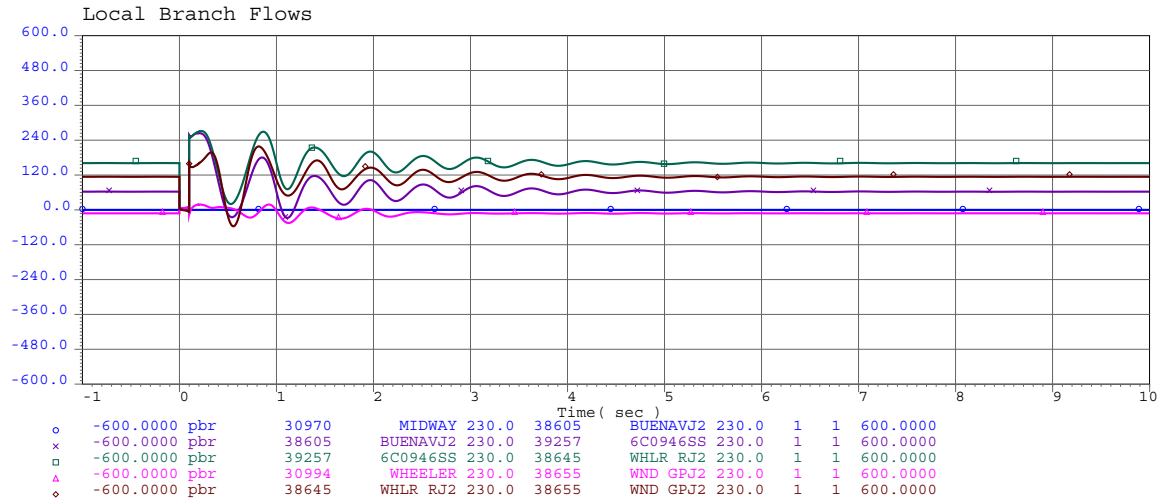


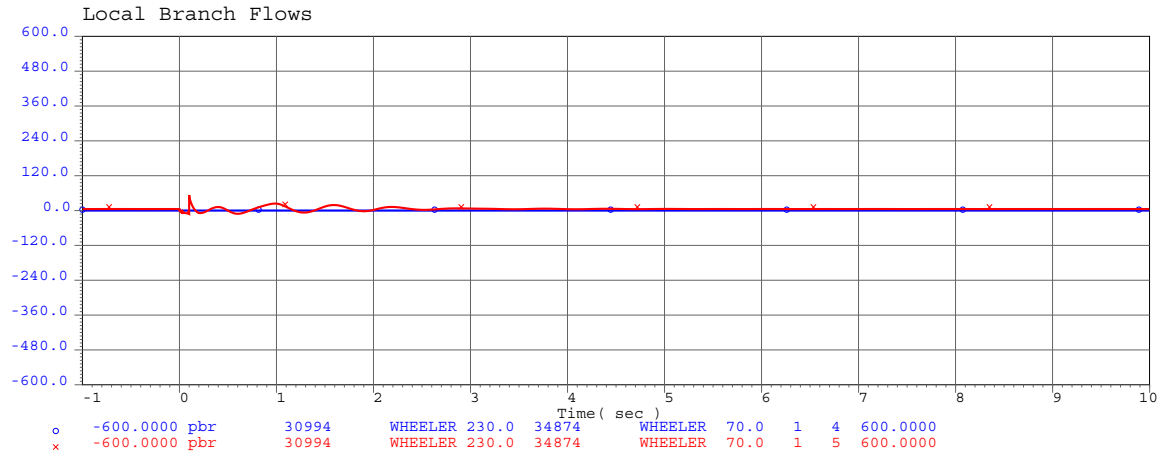




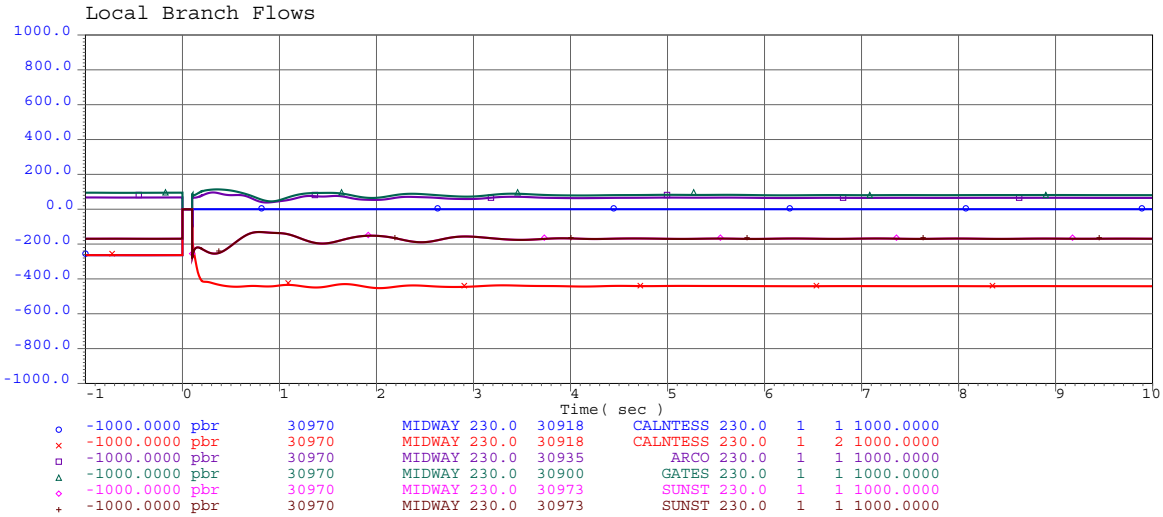
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D



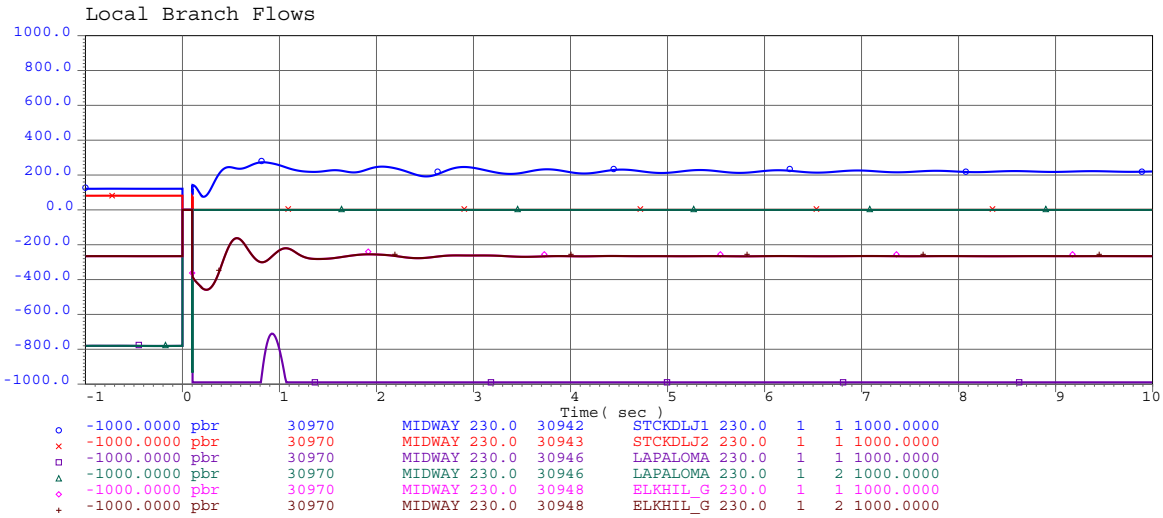




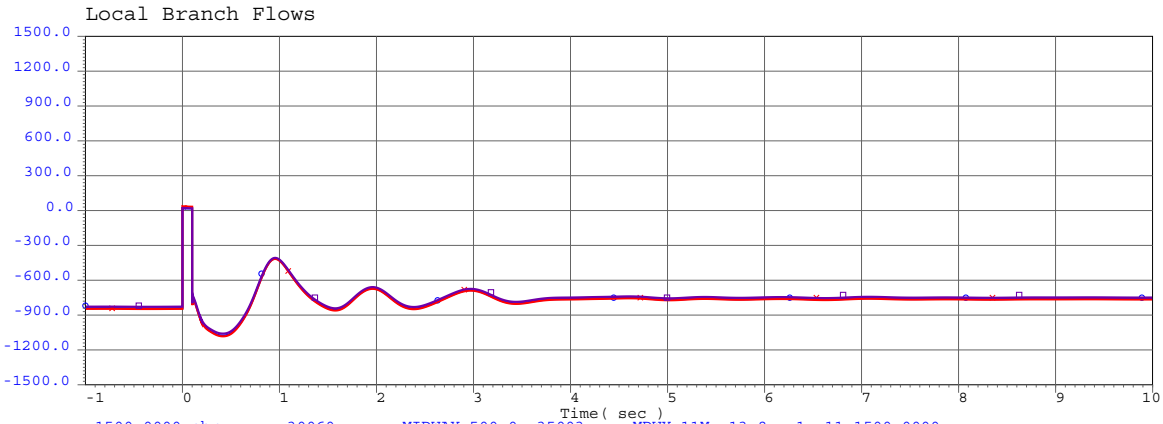
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



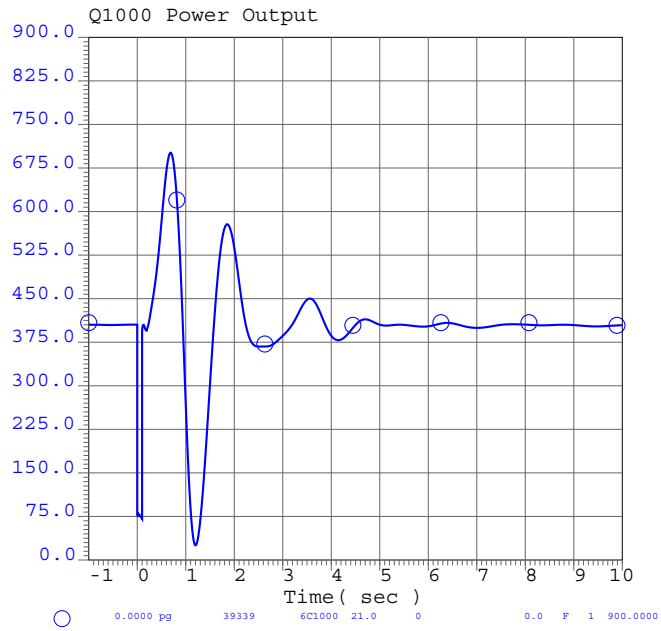
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

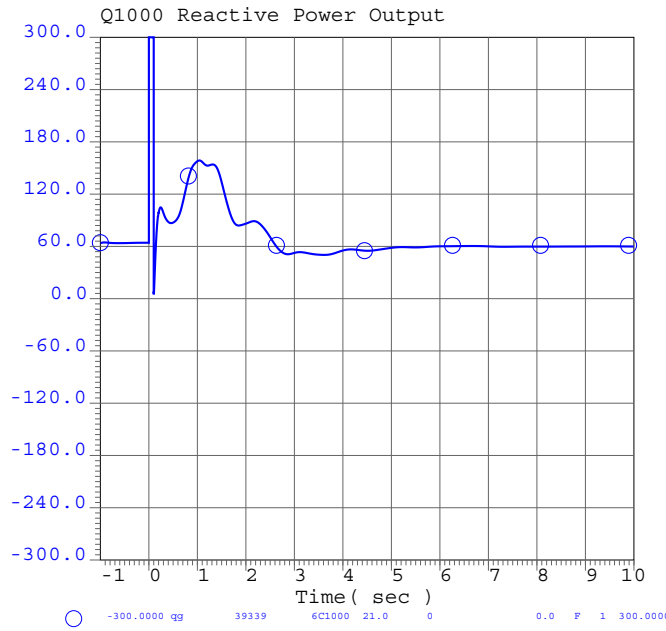


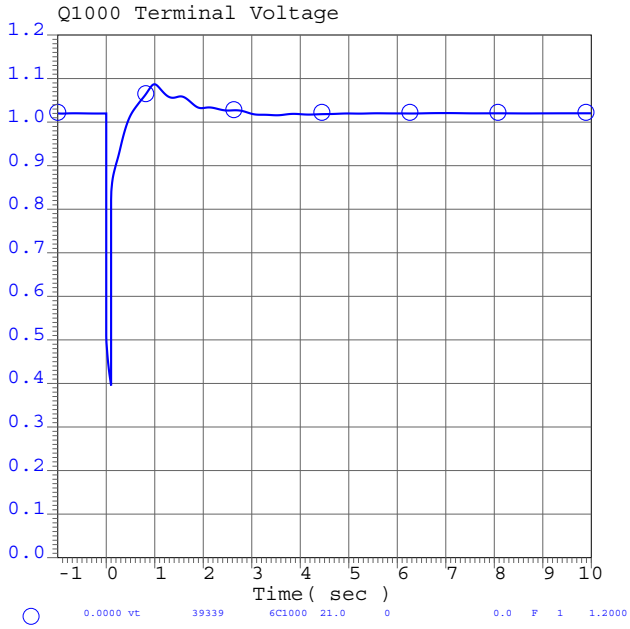
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

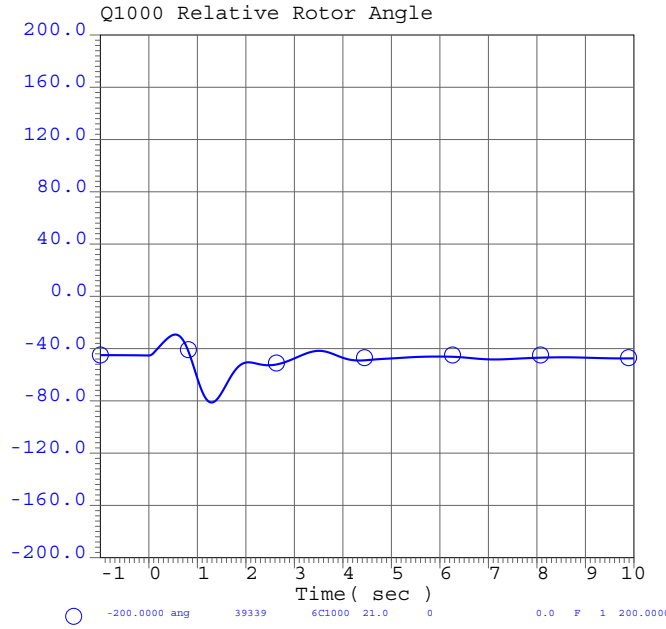
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







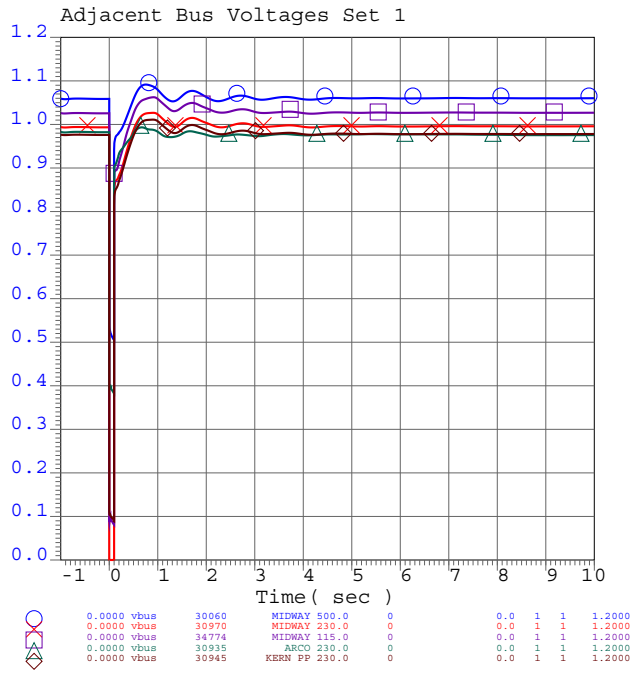


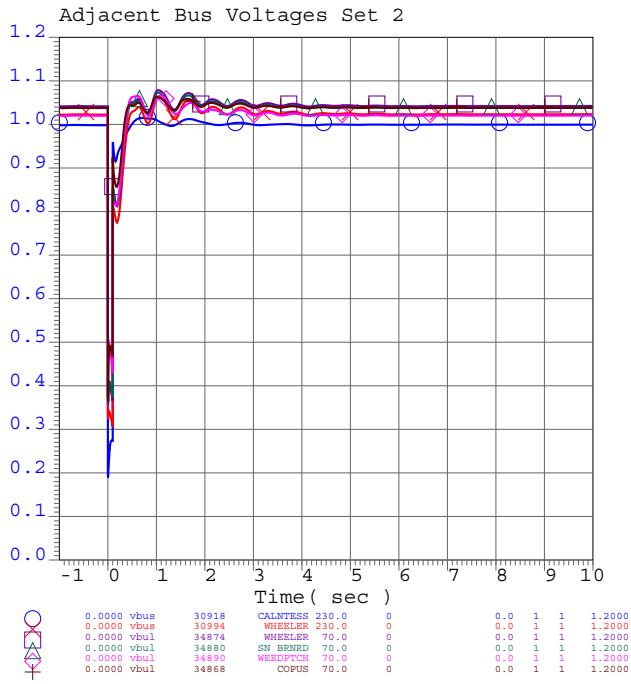
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

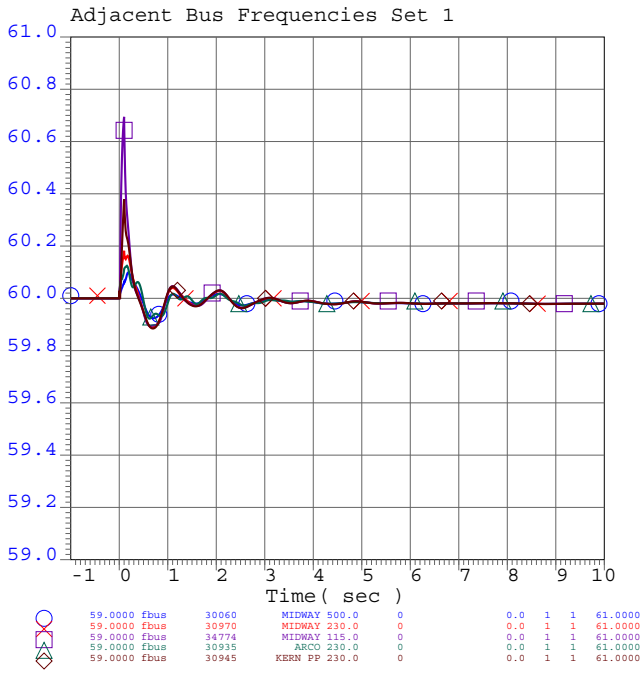
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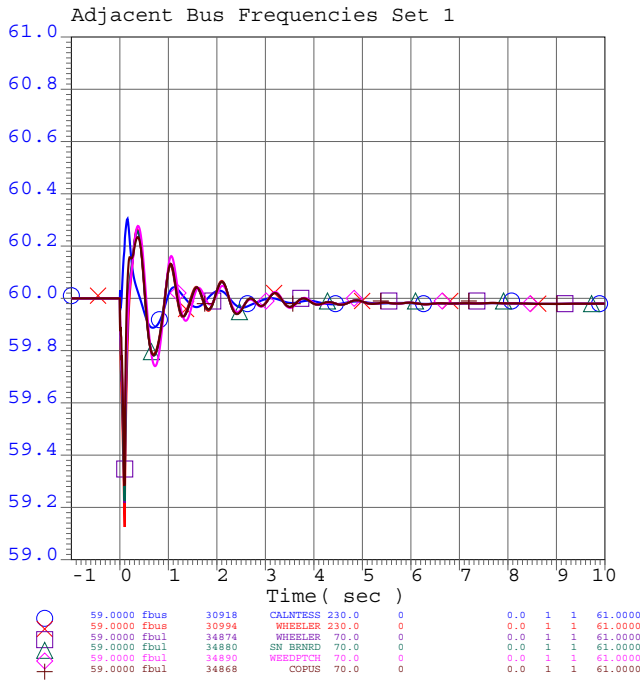
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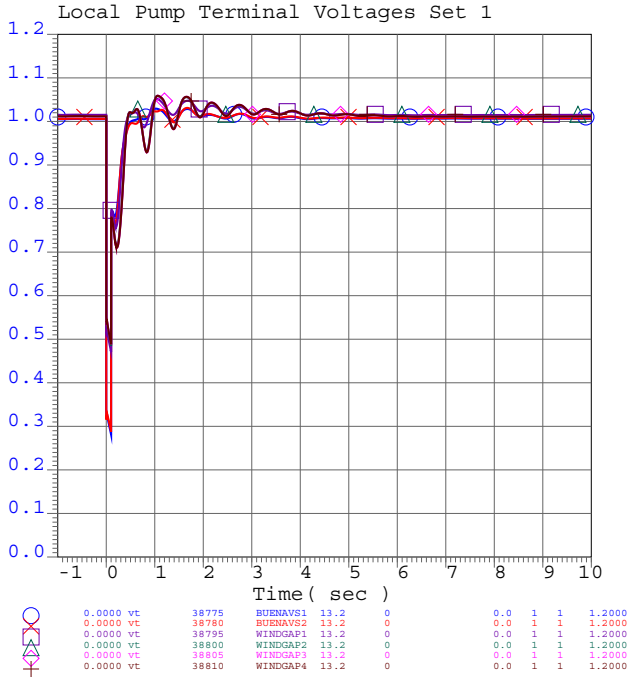




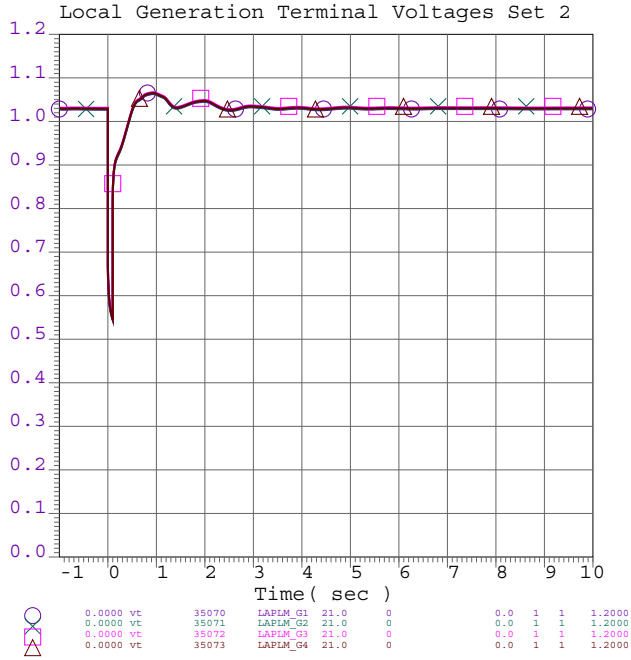


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

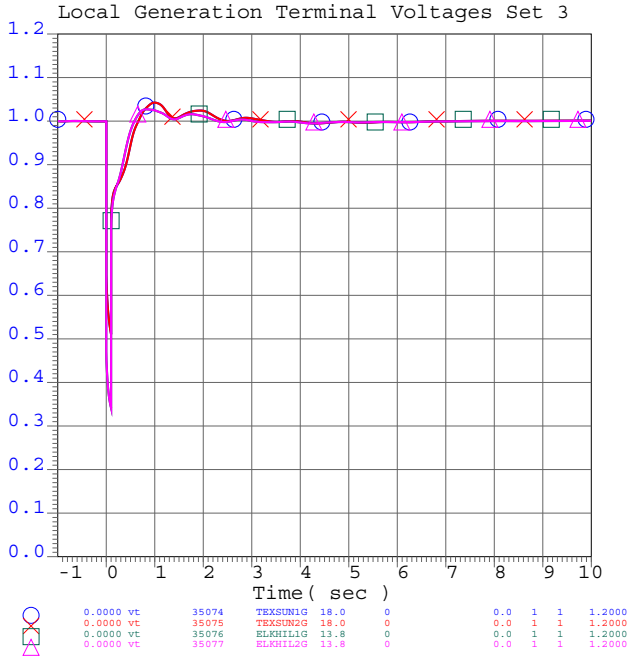
Local Pump Terminal Voltages Set 1



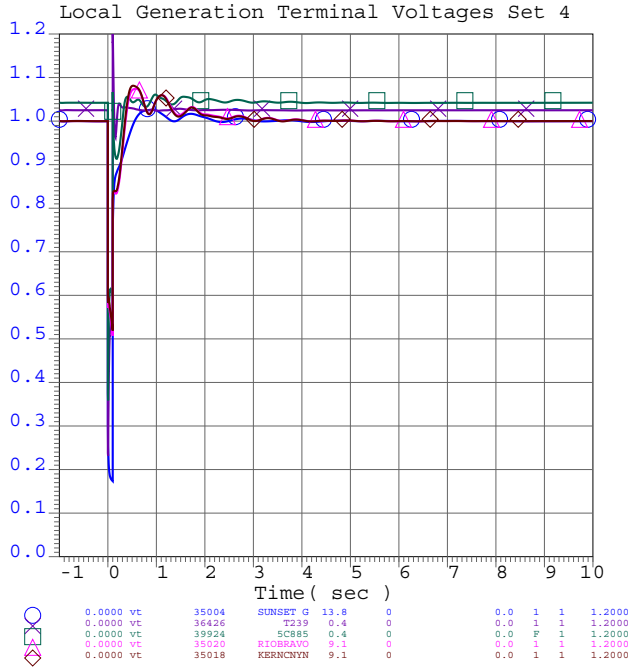
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4

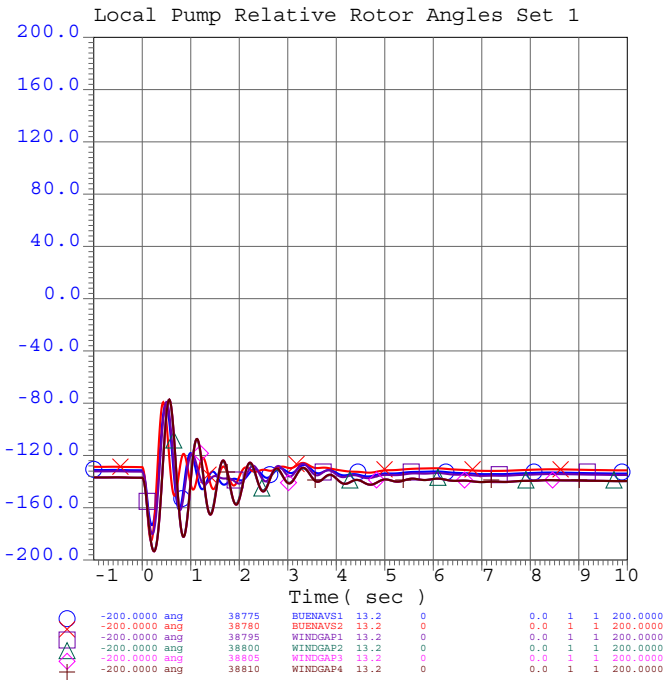


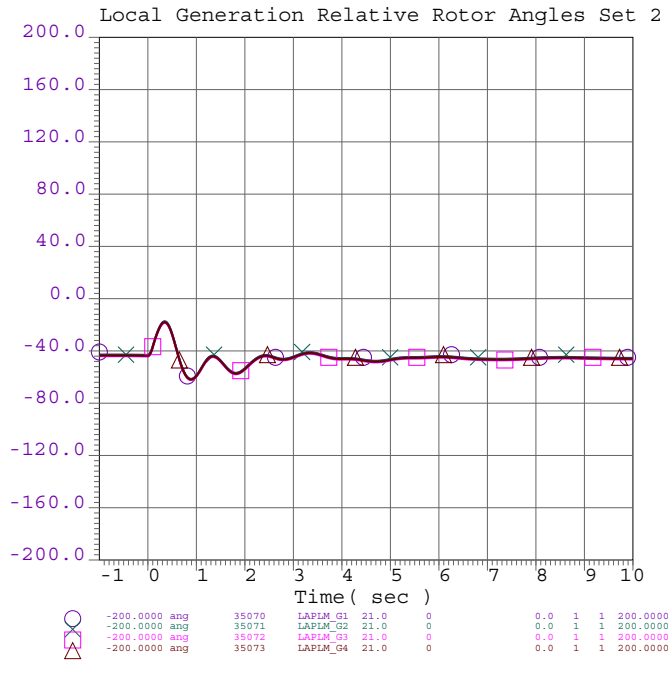
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

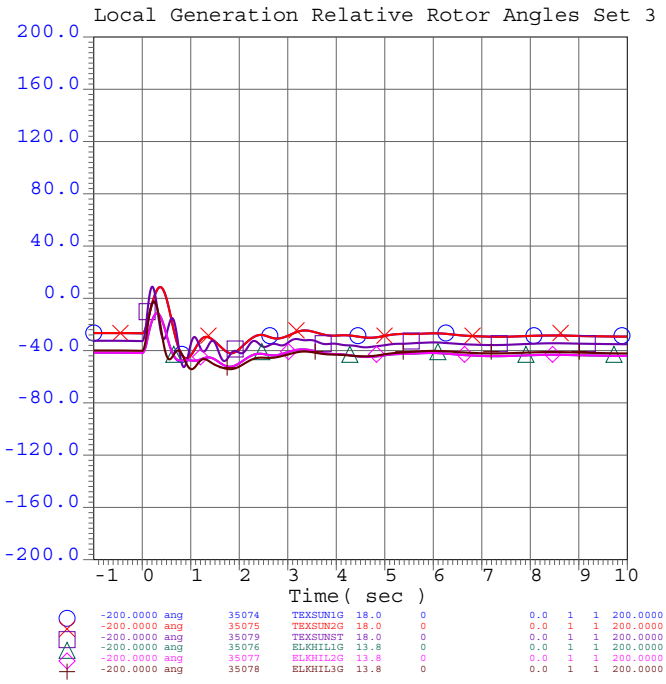
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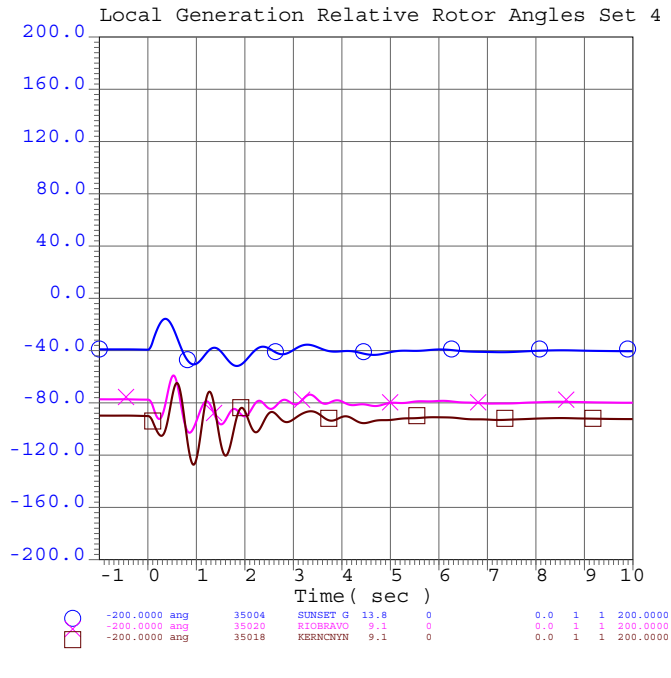
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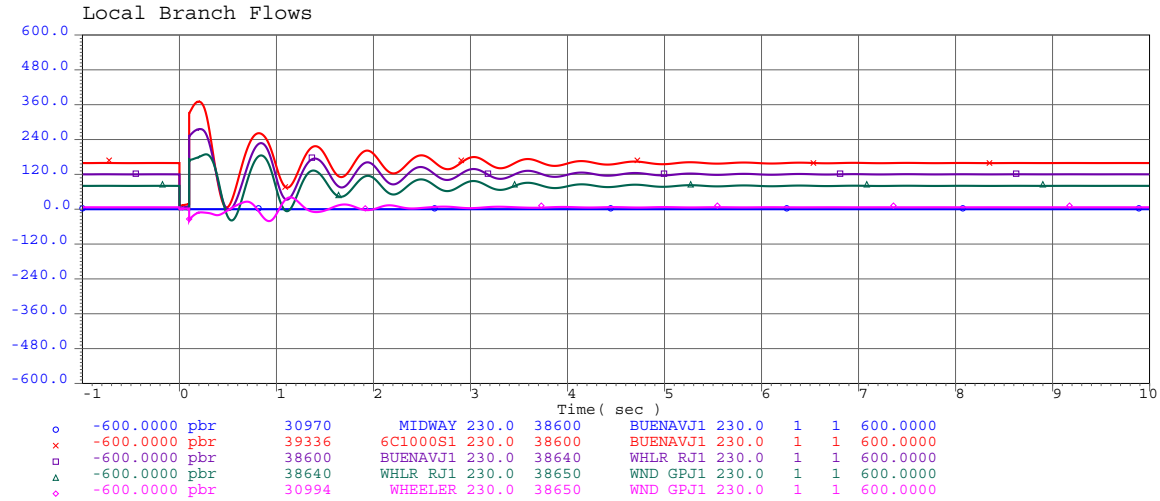


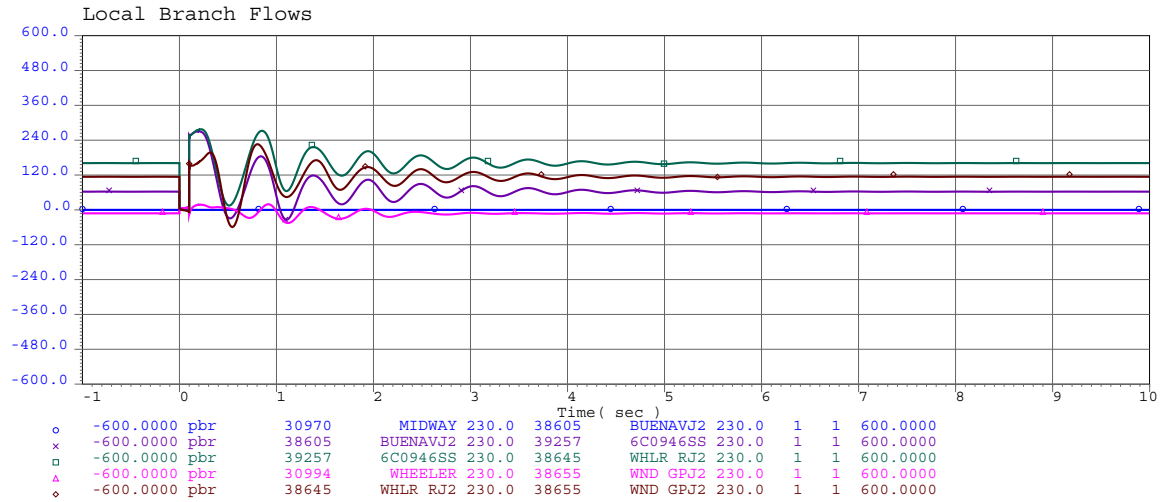


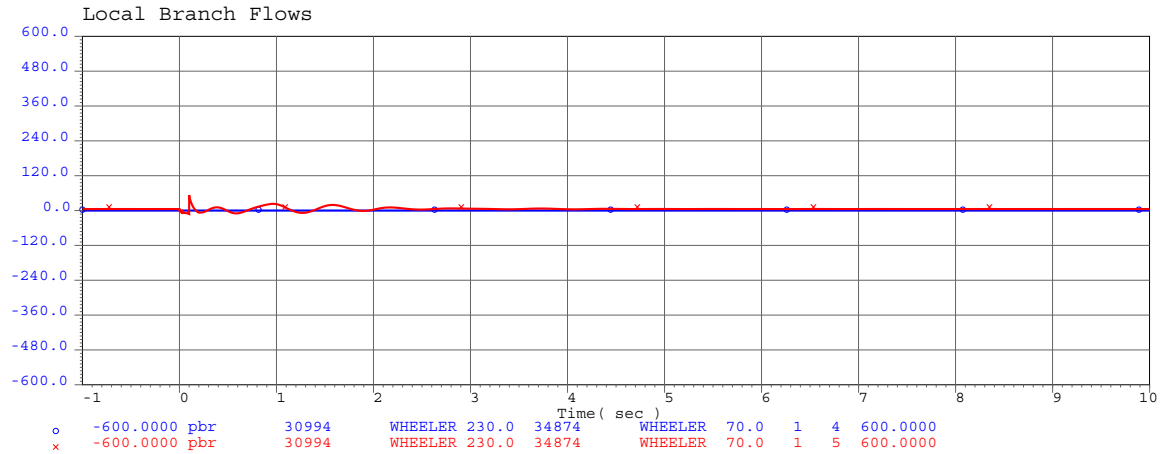




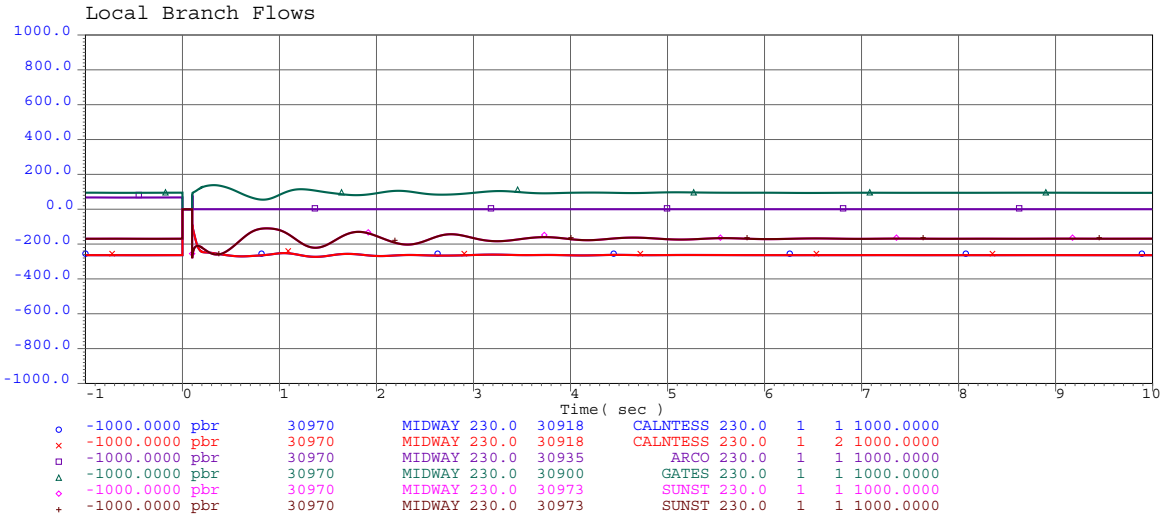
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus



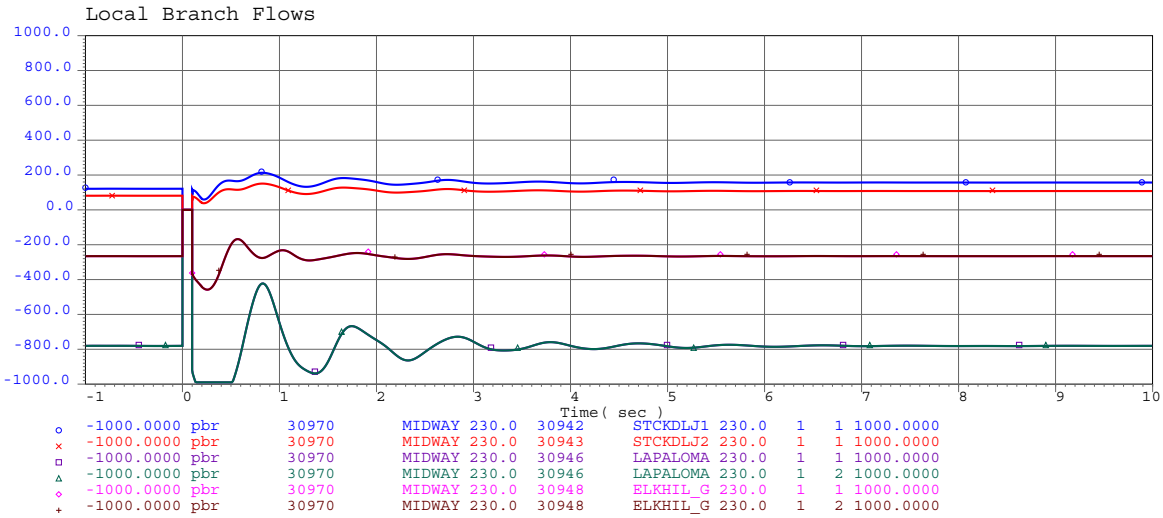




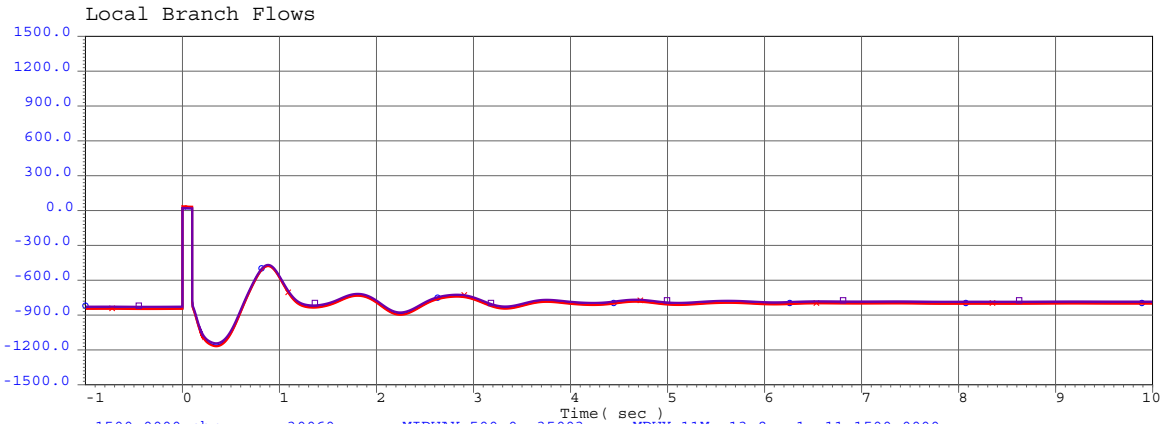
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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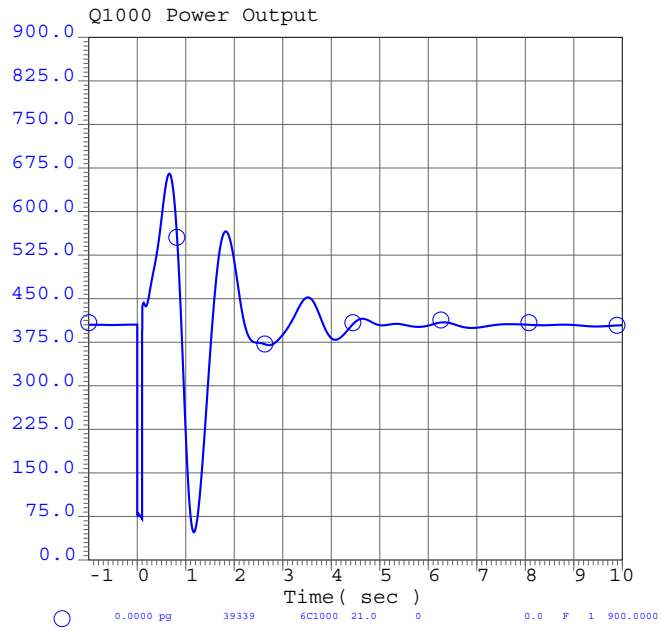
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

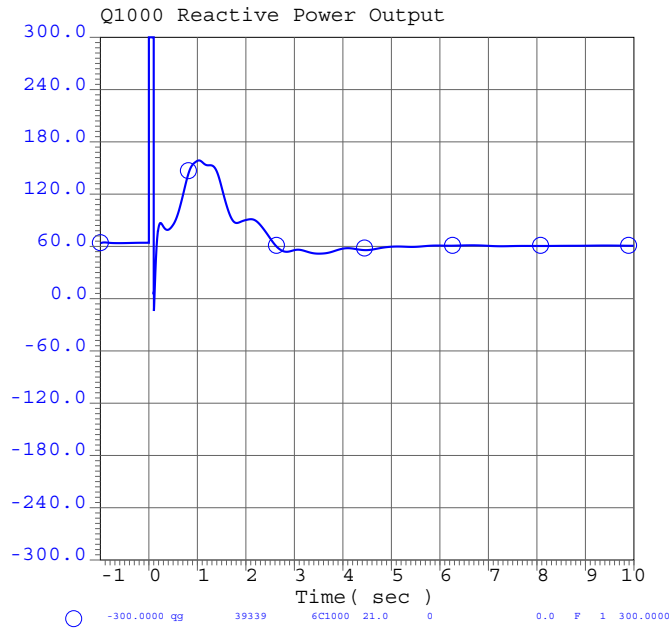


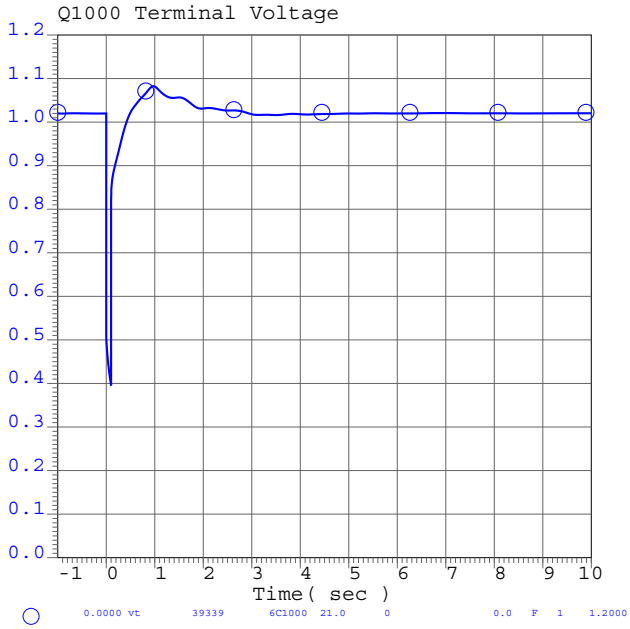
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

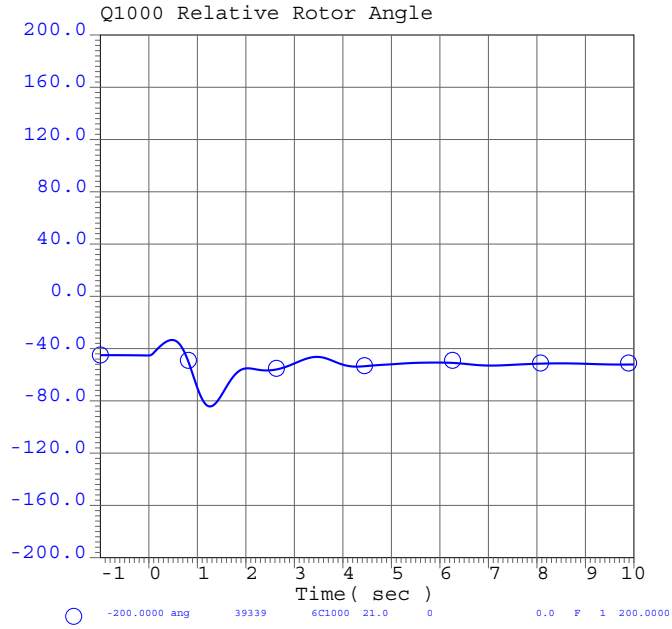
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







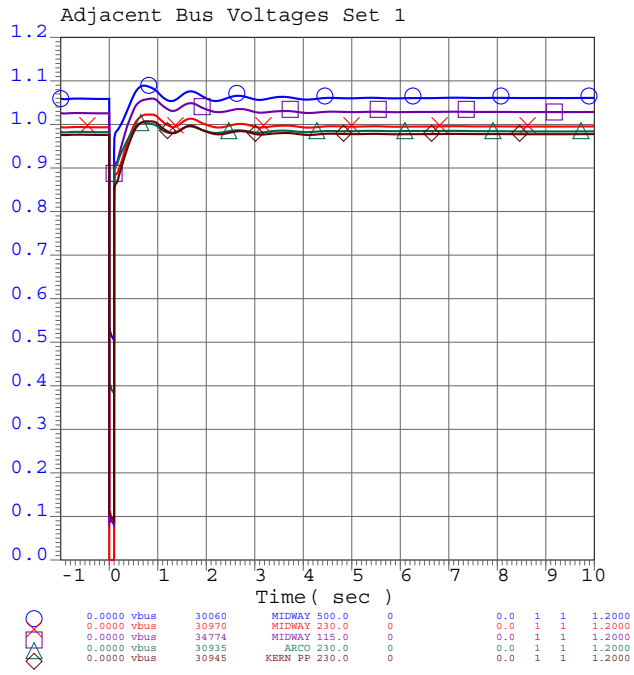


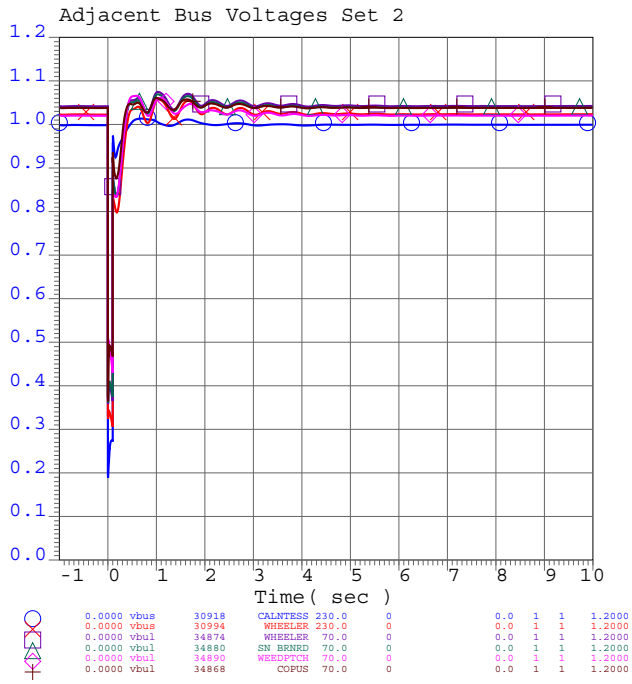
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

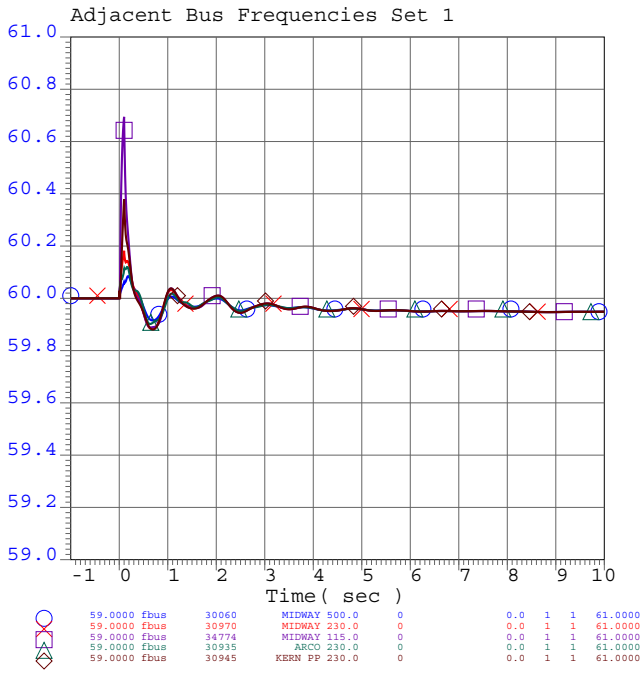
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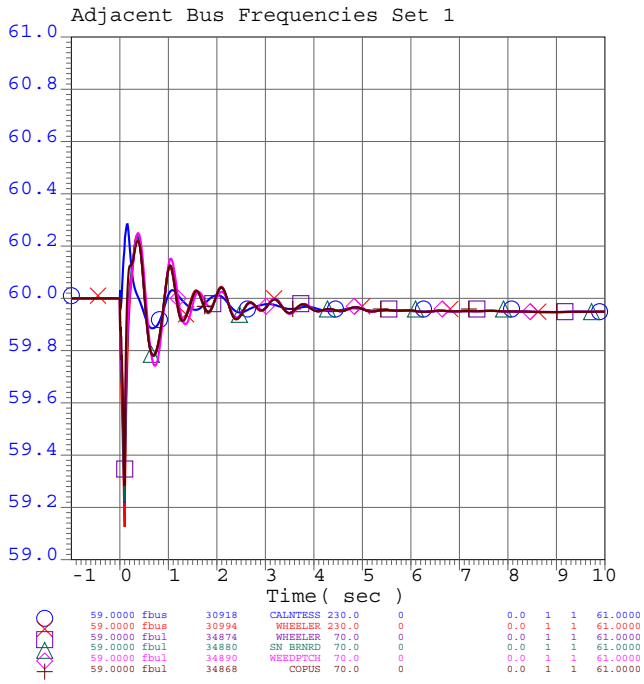
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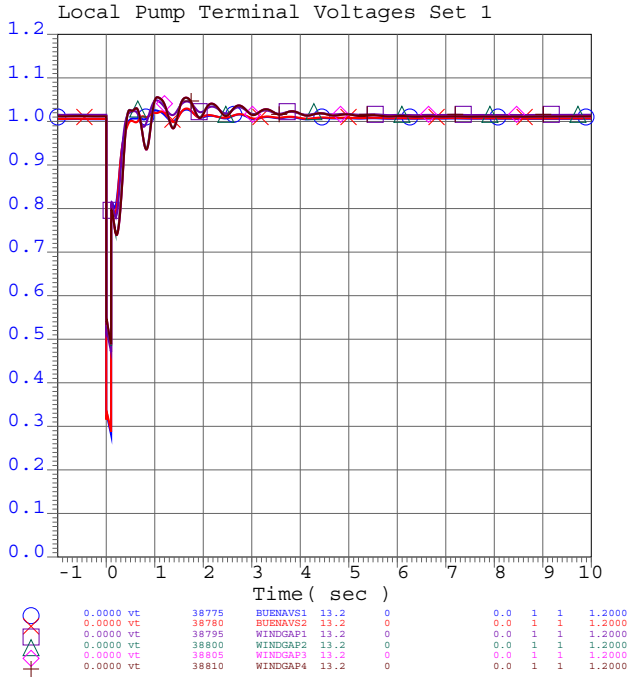




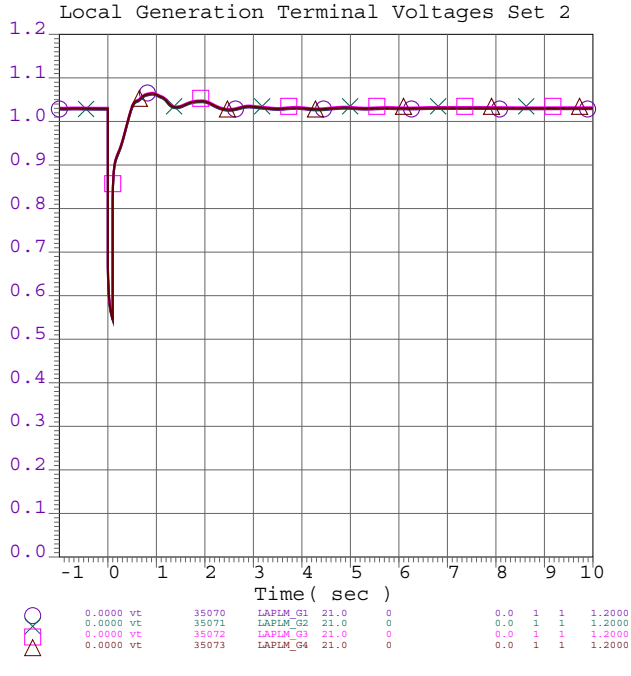


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

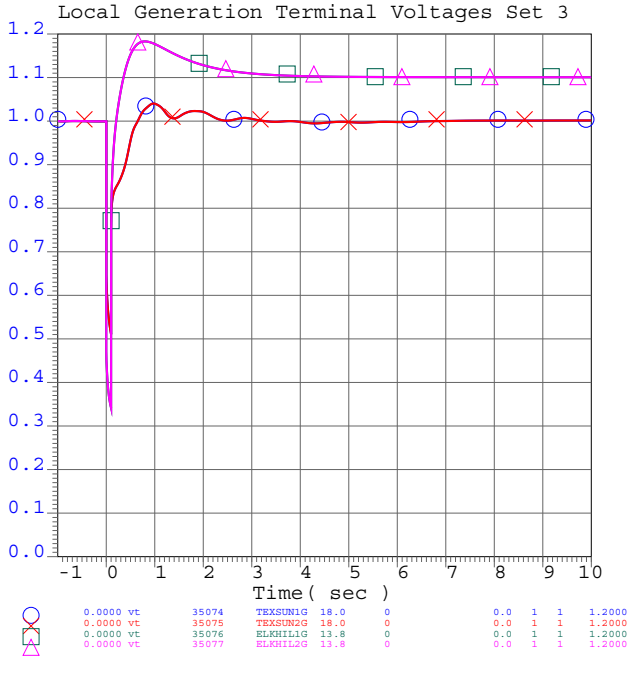
Local Pump Terminal Voltages Set 1



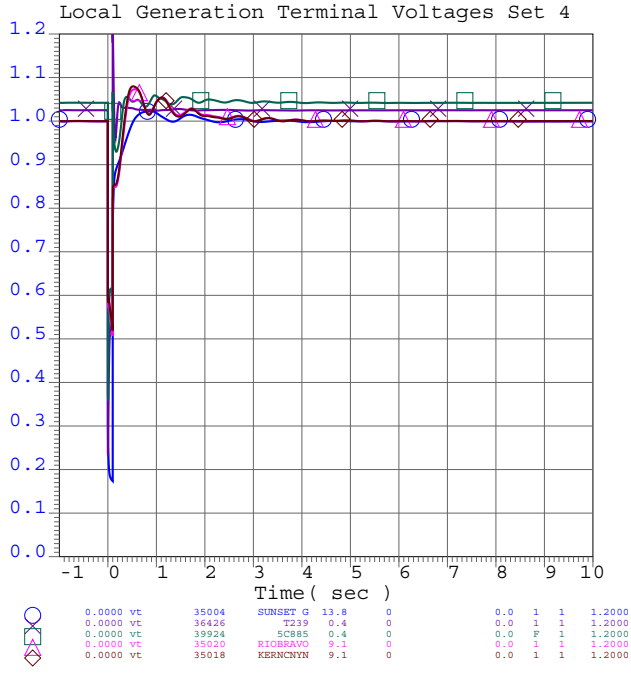
Local Generation Terminal Voltages Set 2



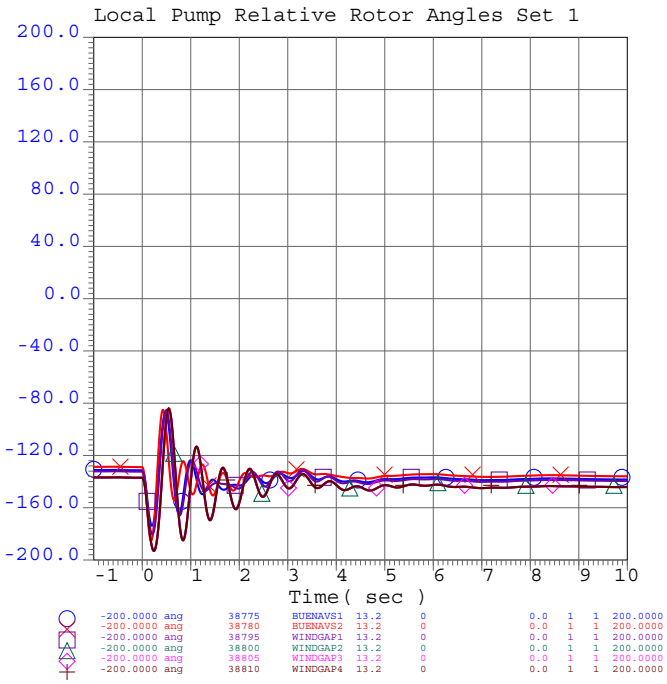
Local Generation Terminal Voltages Set 3

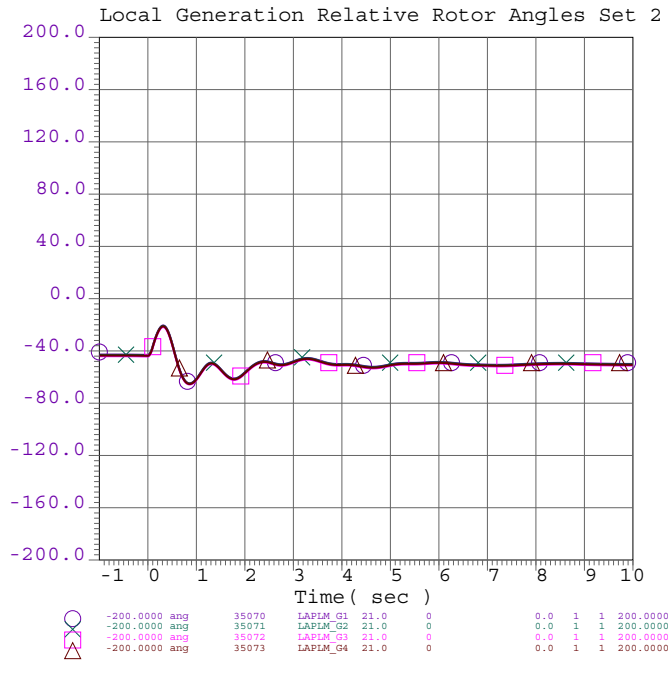


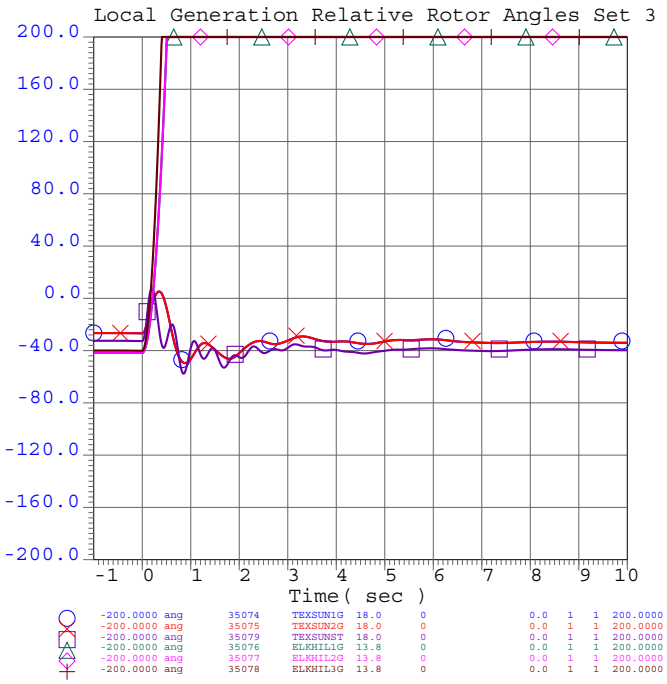
Local Generation Terminal Voltages Set 4

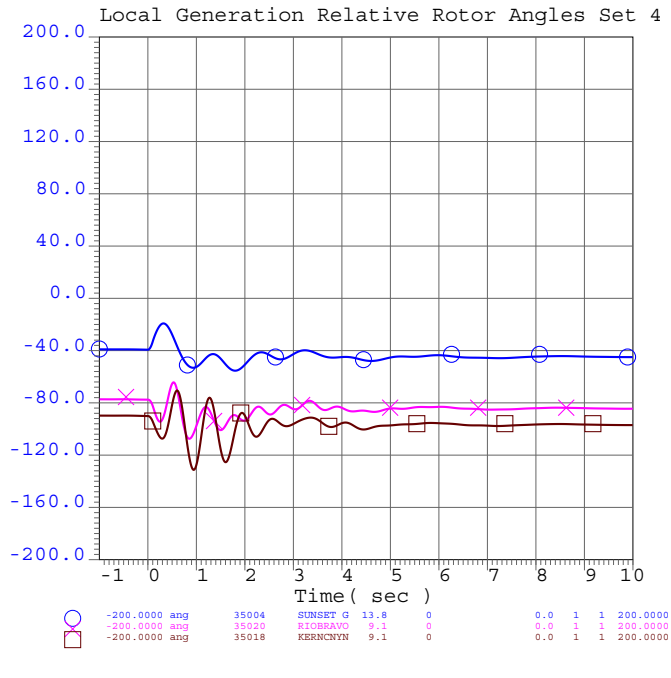


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

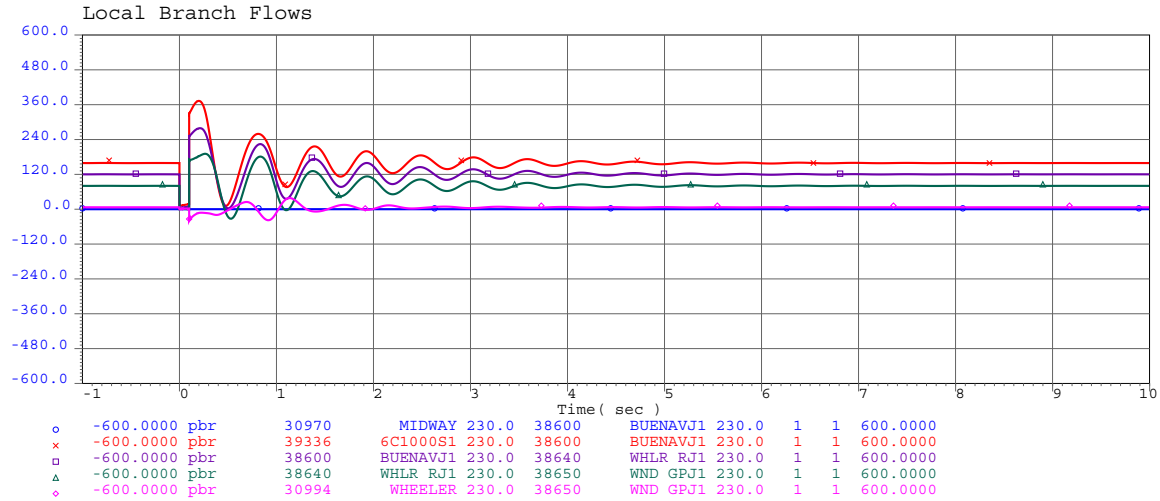




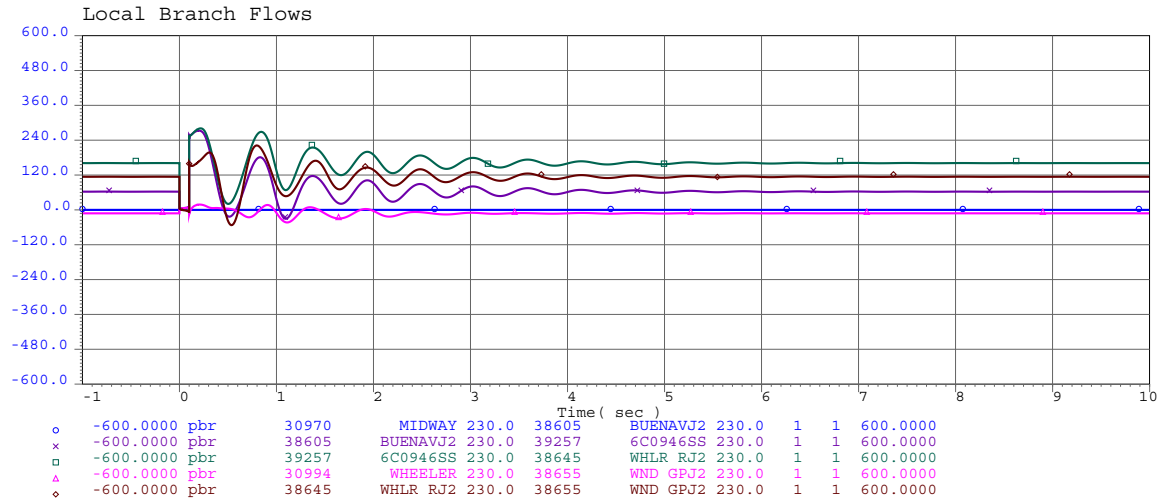




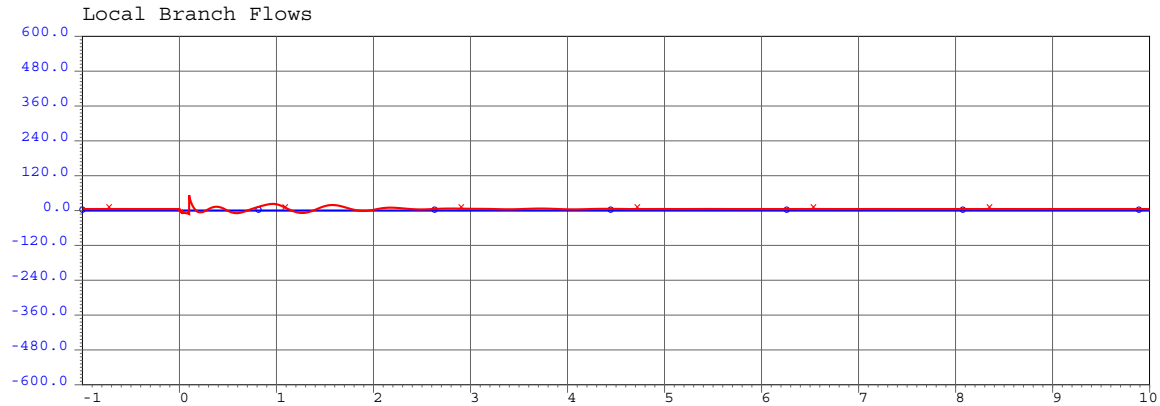
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

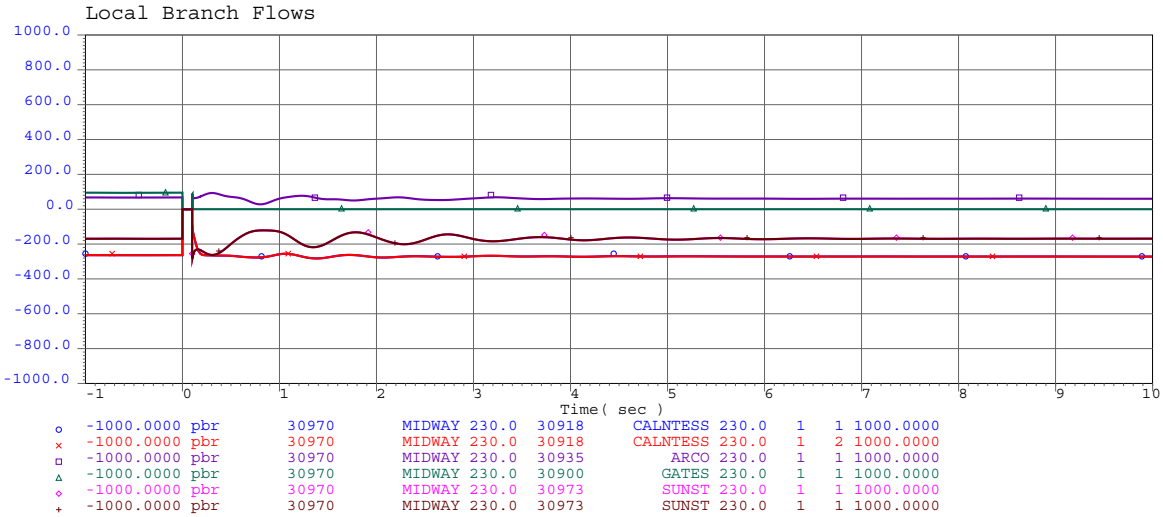


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

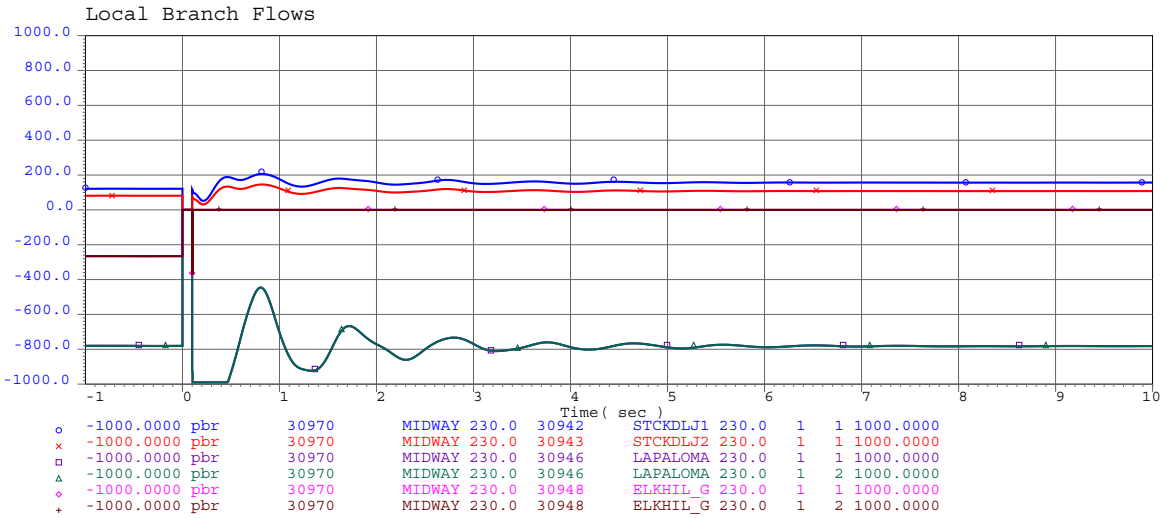


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

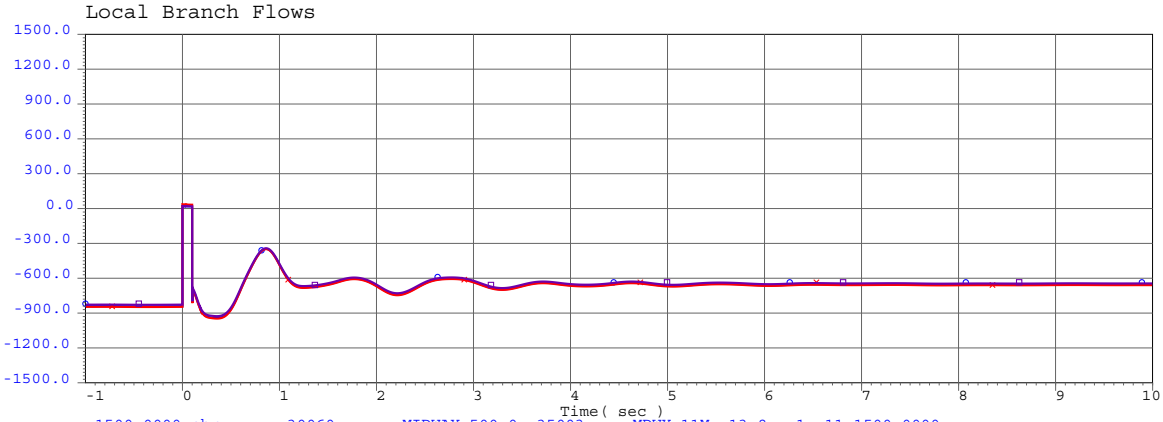
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



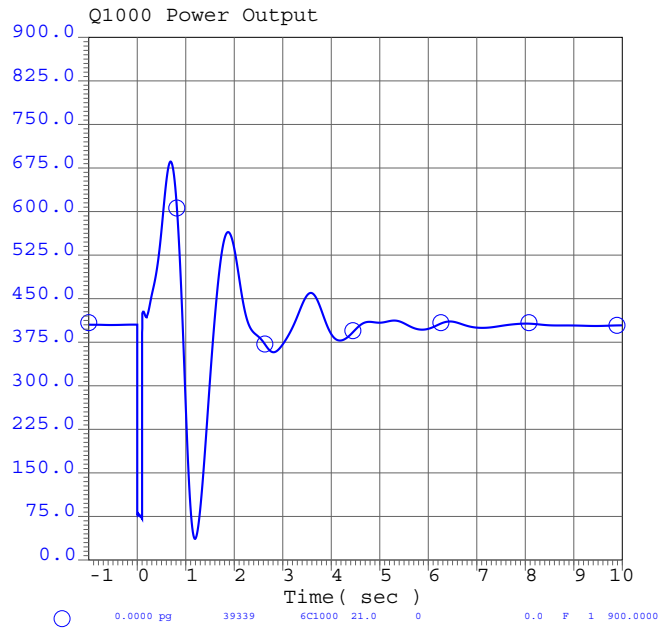
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-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

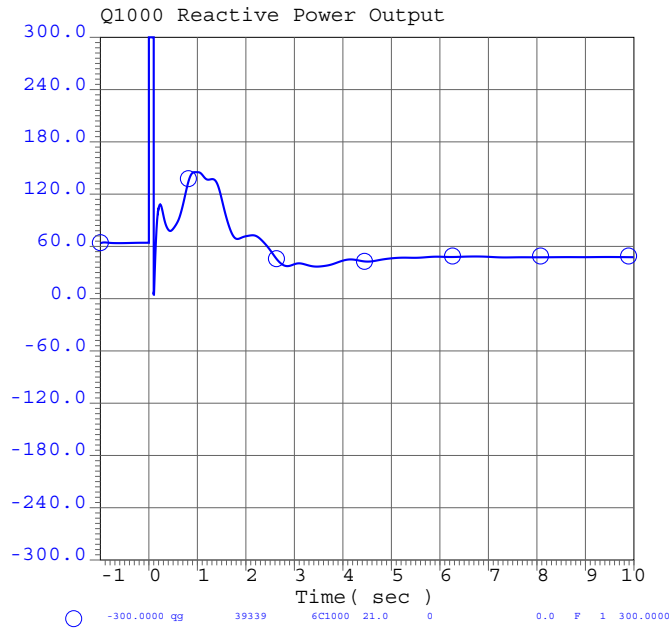


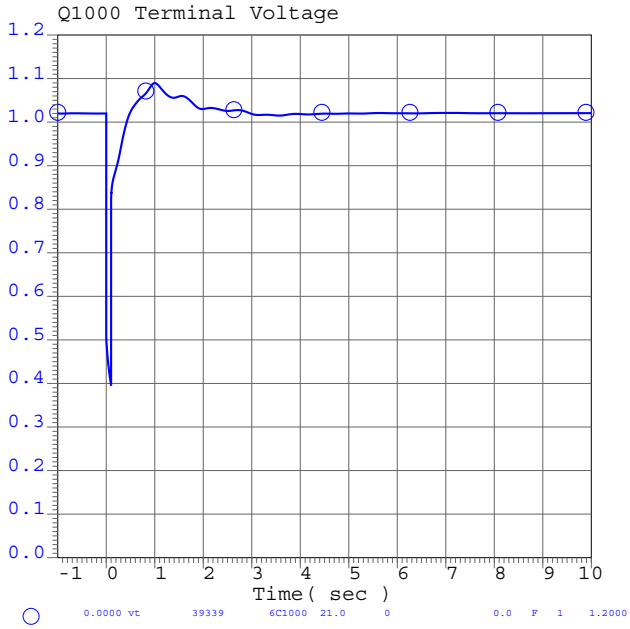
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

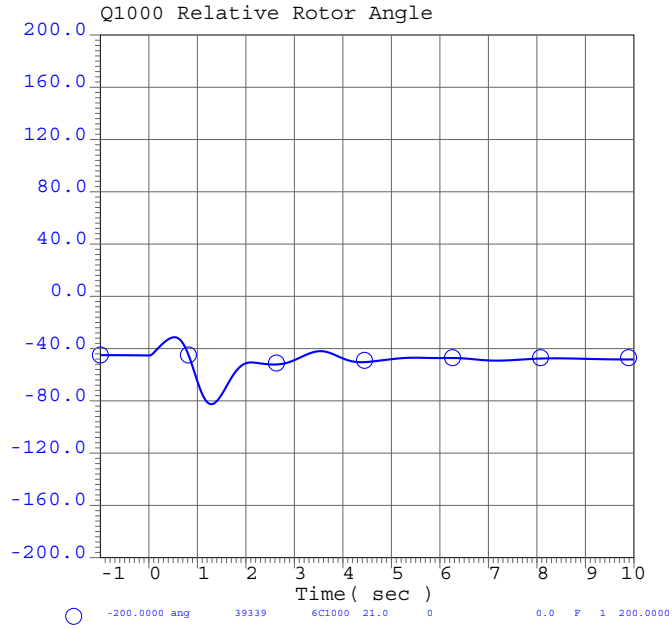
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







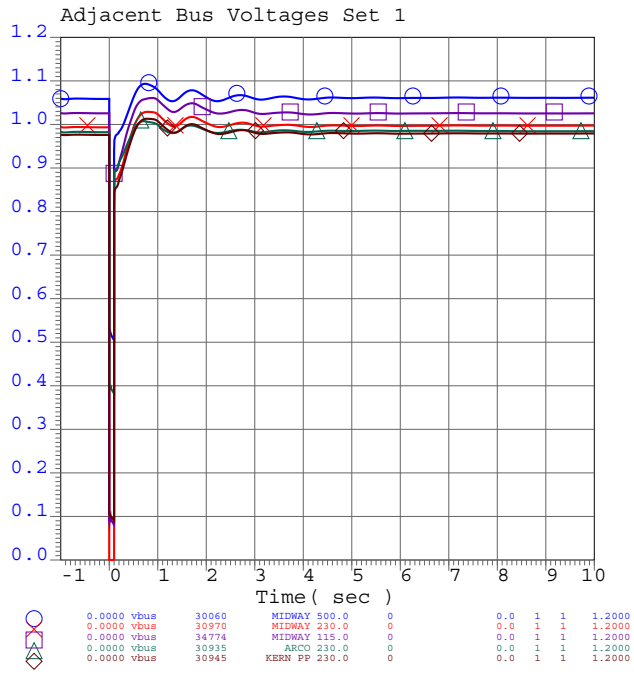


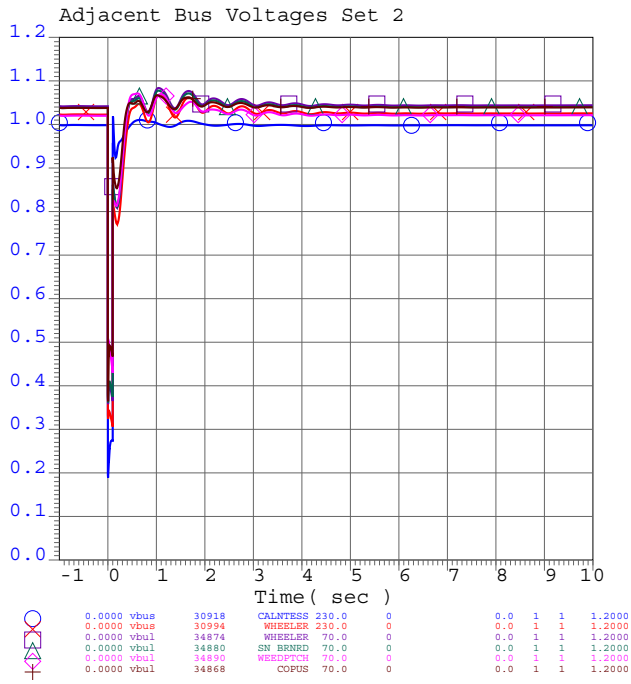
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

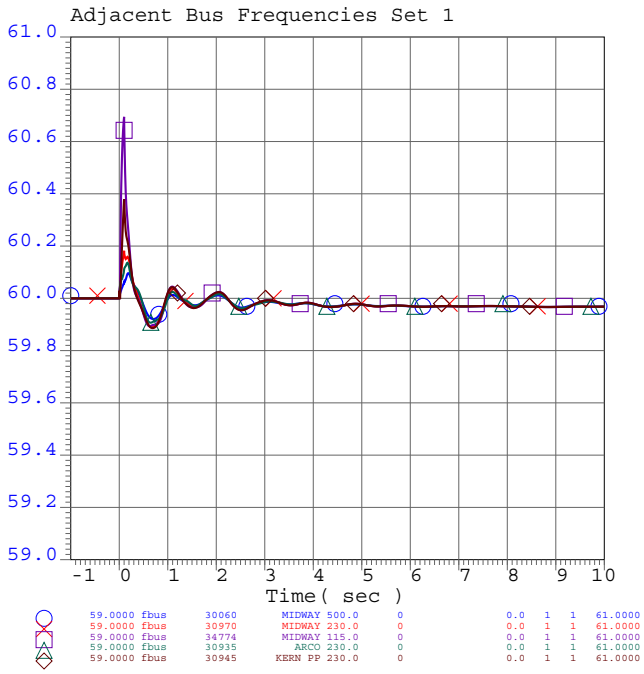
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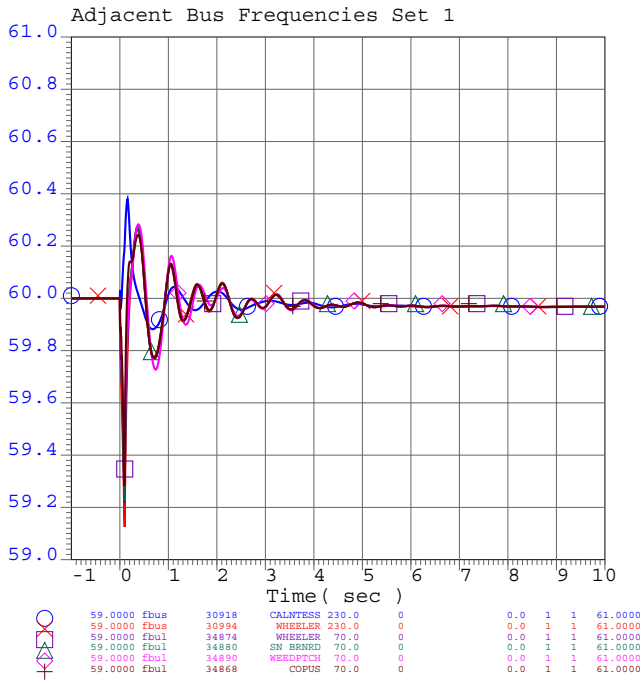
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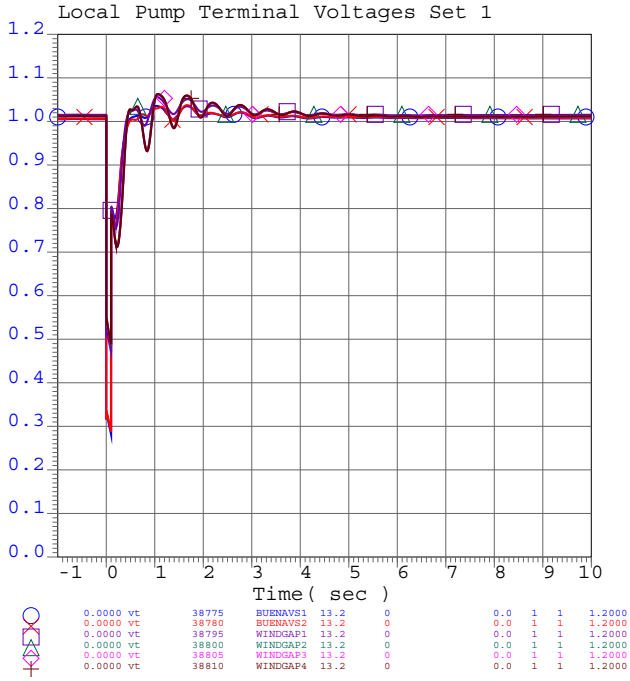




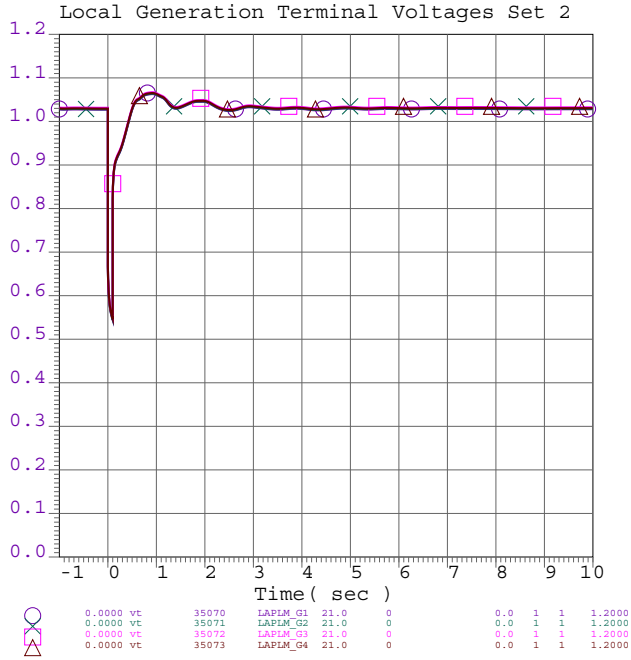


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

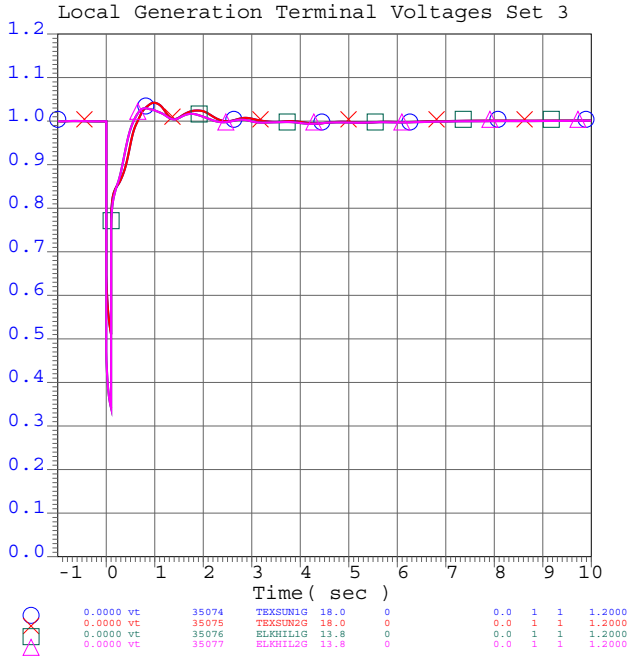
Local Pump Terminal Voltages Set 1



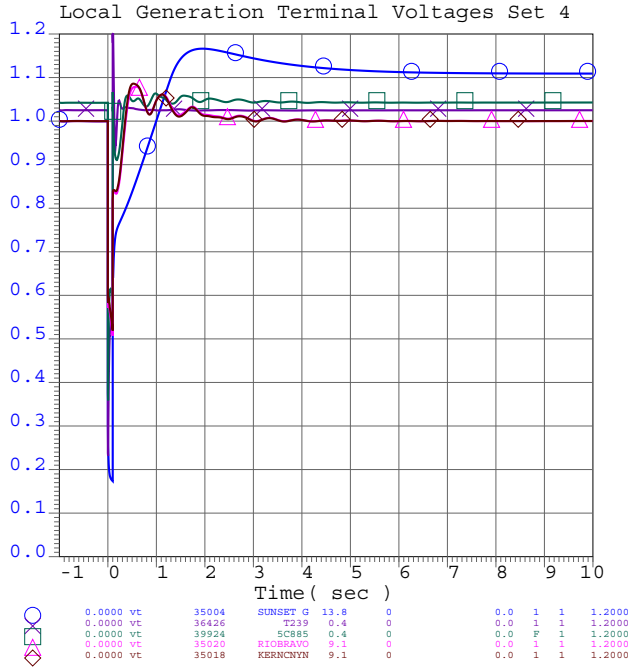
Local Generation Terminal Voltages Set 2



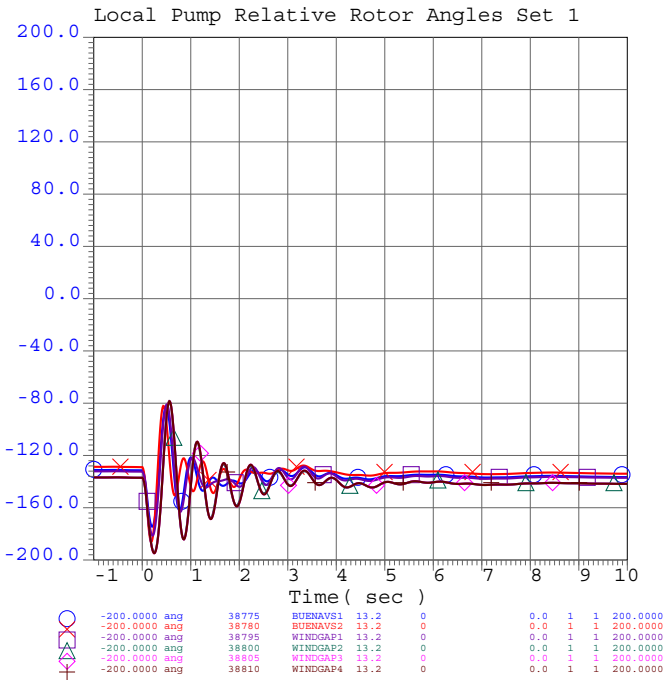
Local Generation Terminal Voltages Set 3

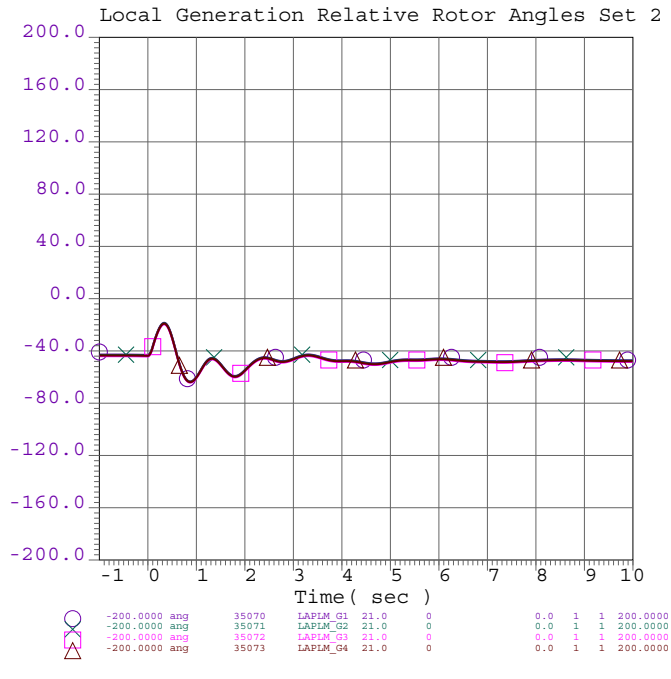


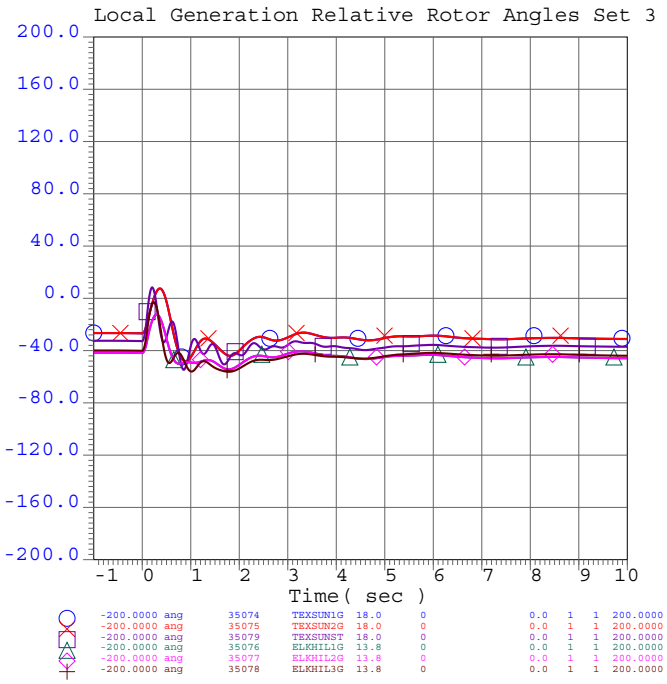
Local Generation Terminal Voltages Set 4

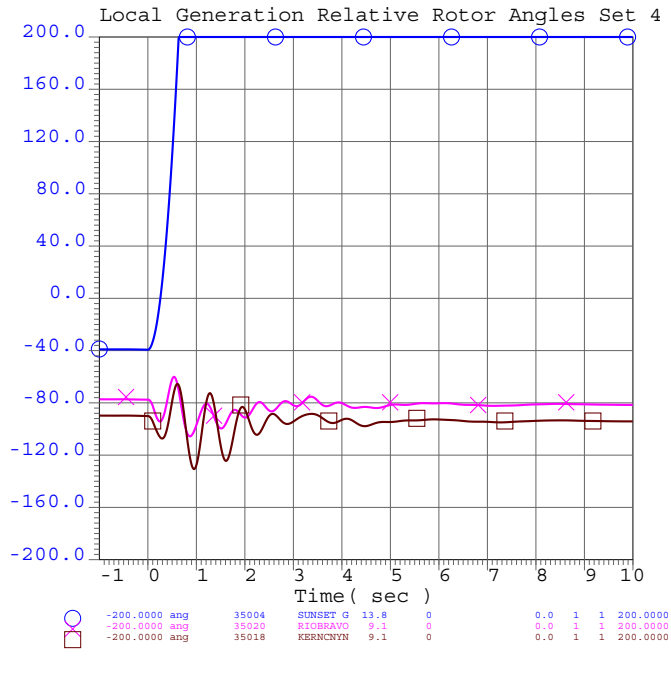


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

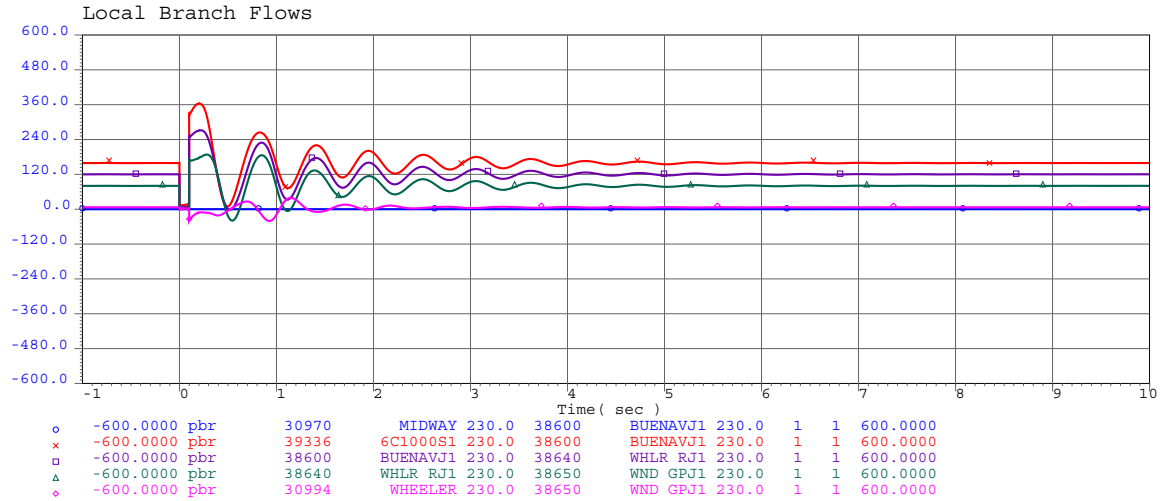




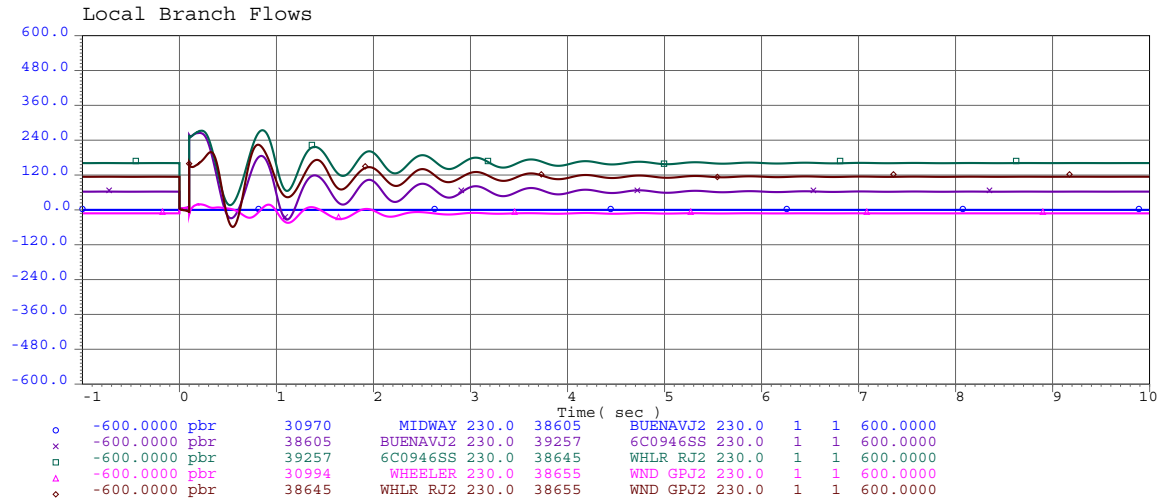




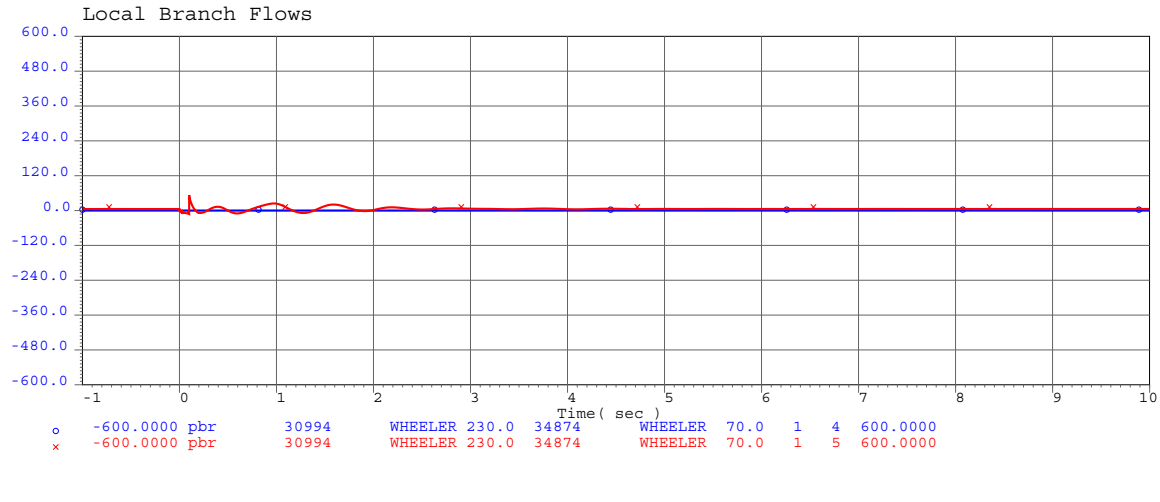
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

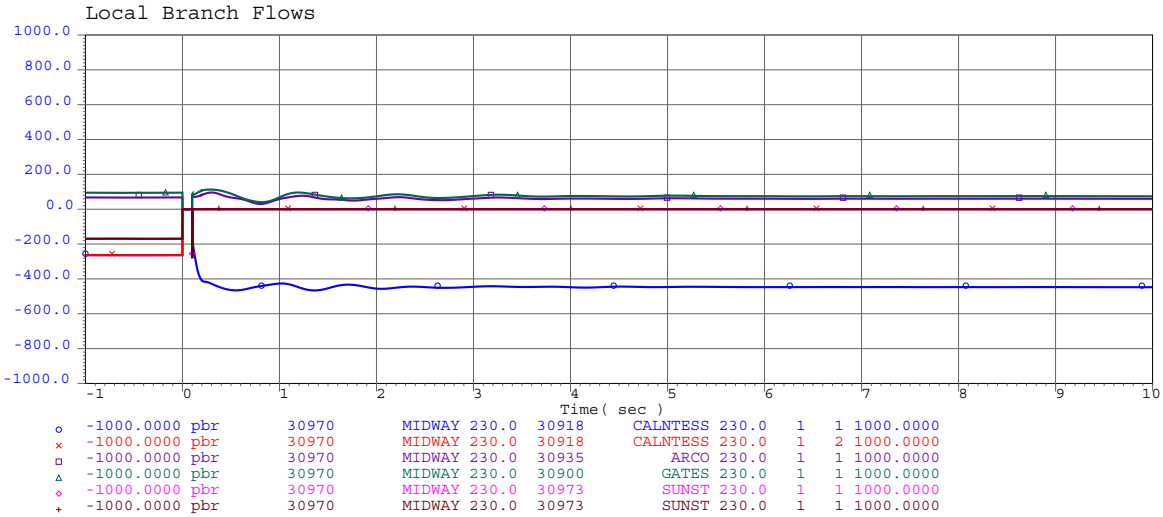


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

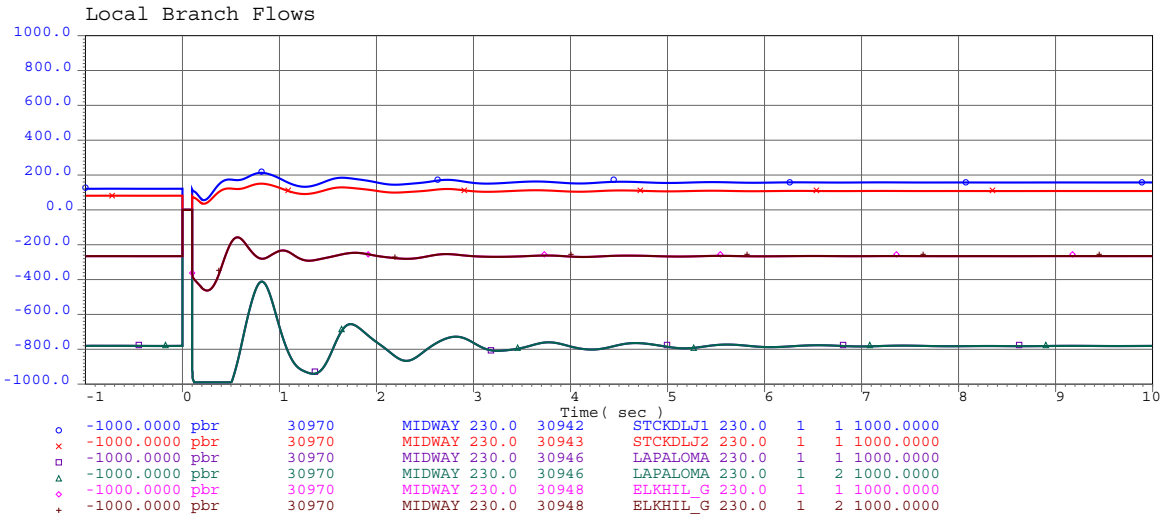


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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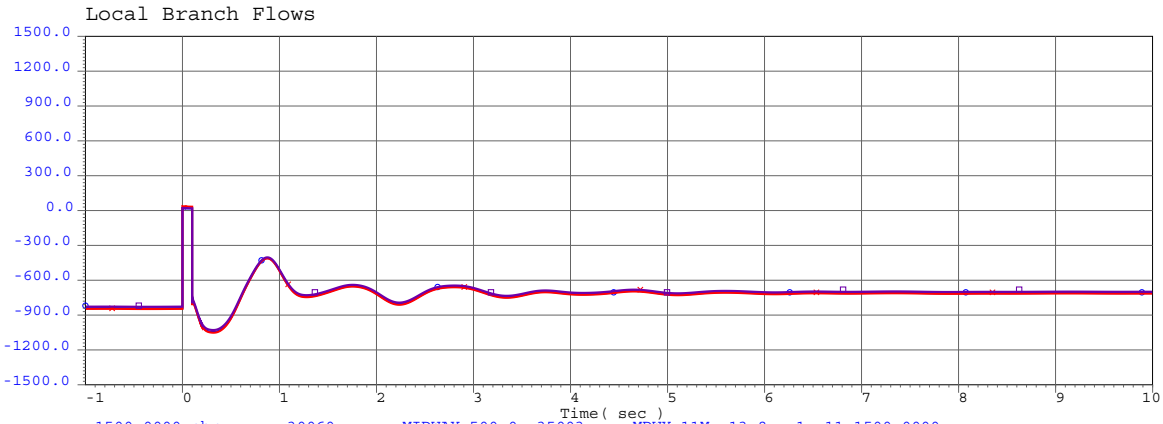
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



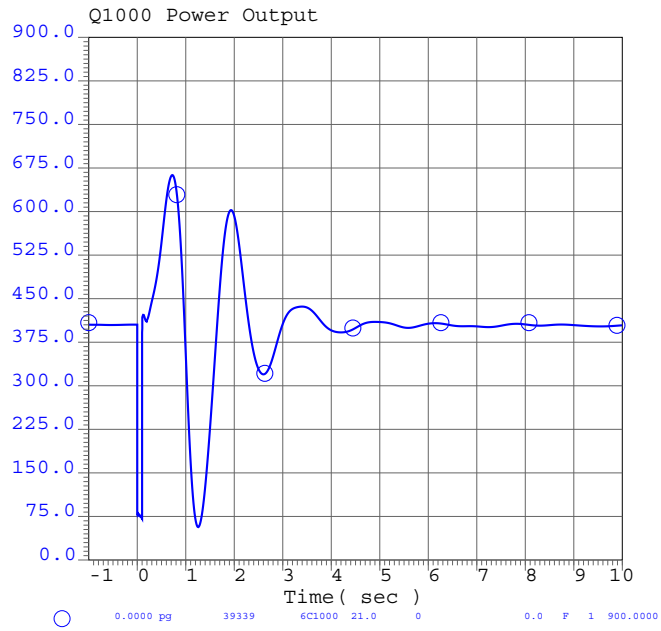
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

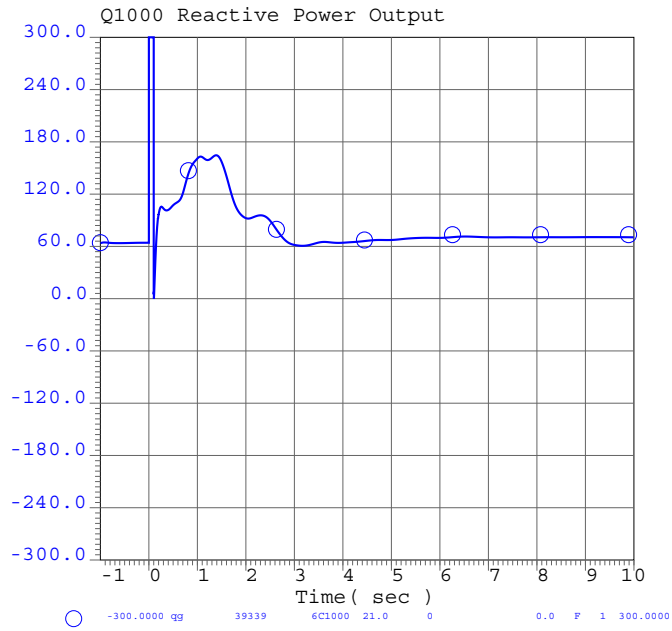


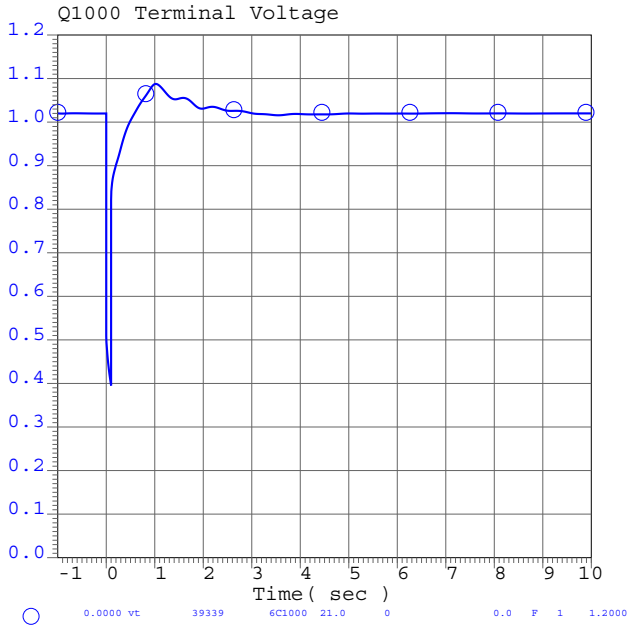
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

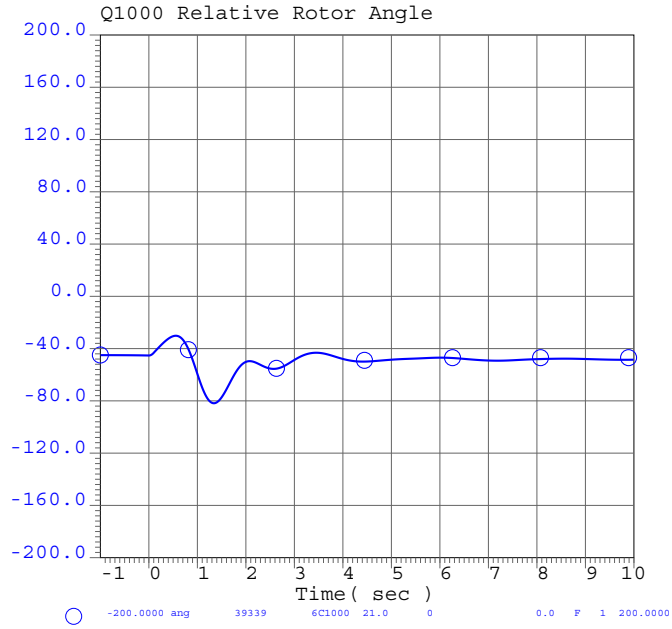
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

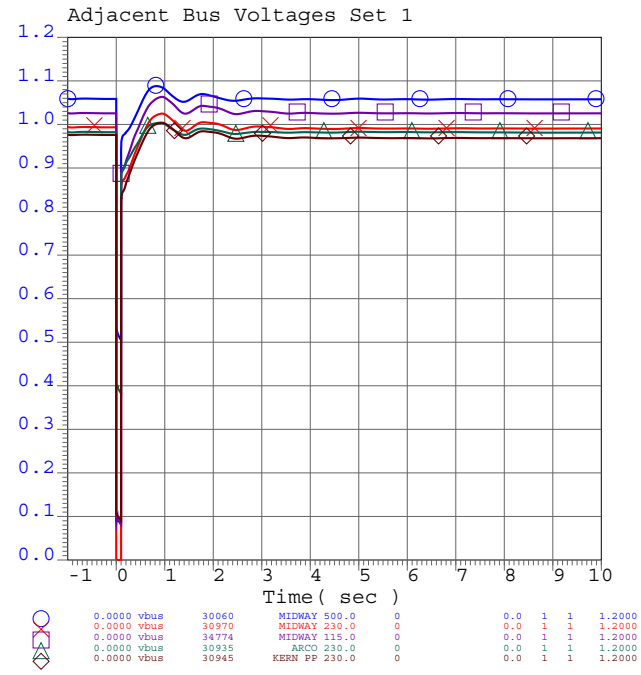


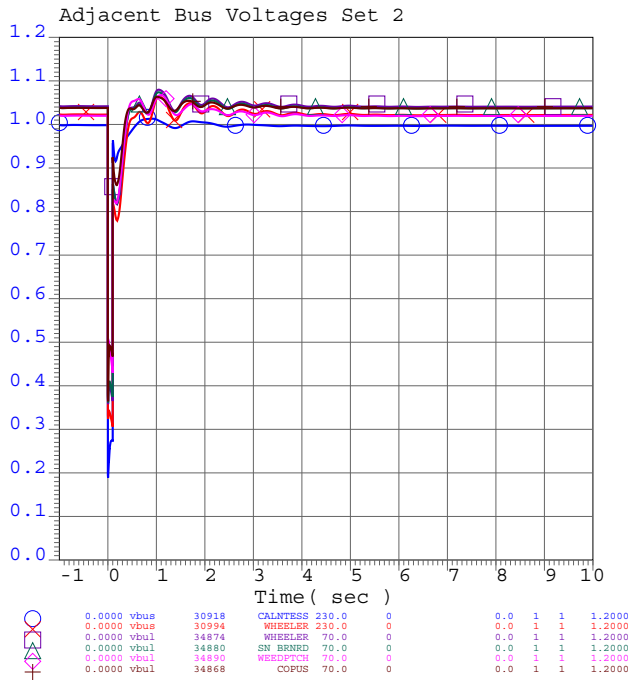


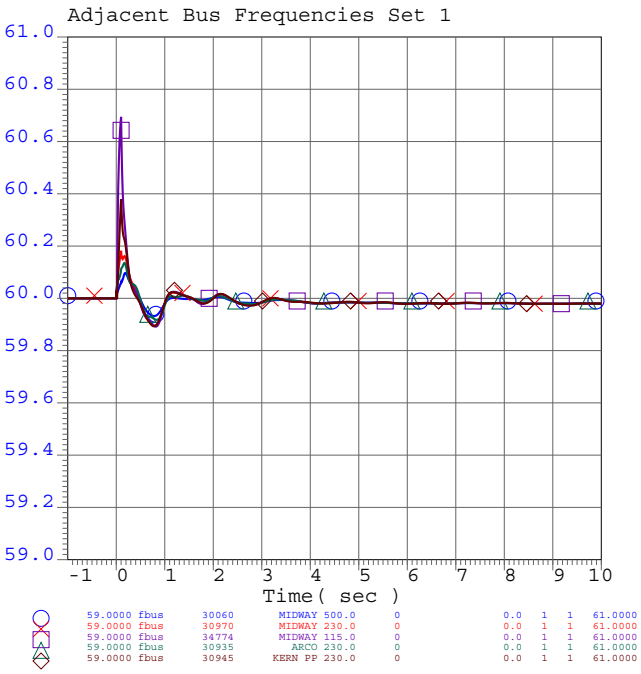


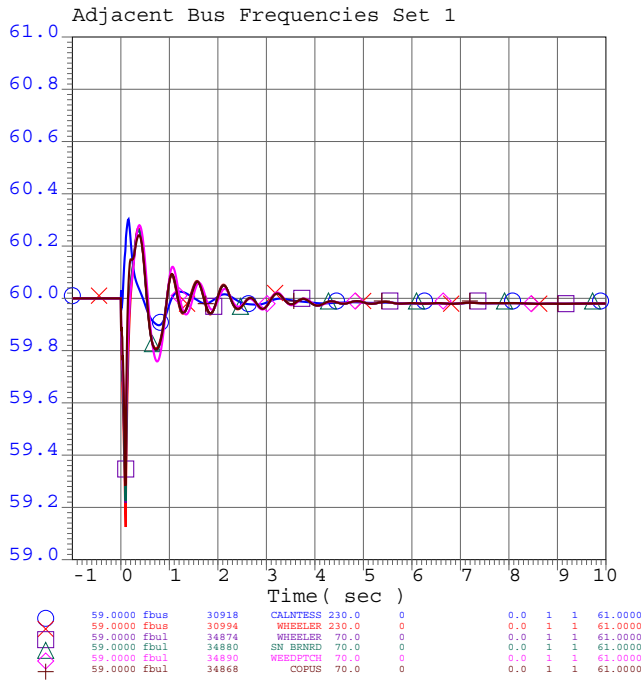


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



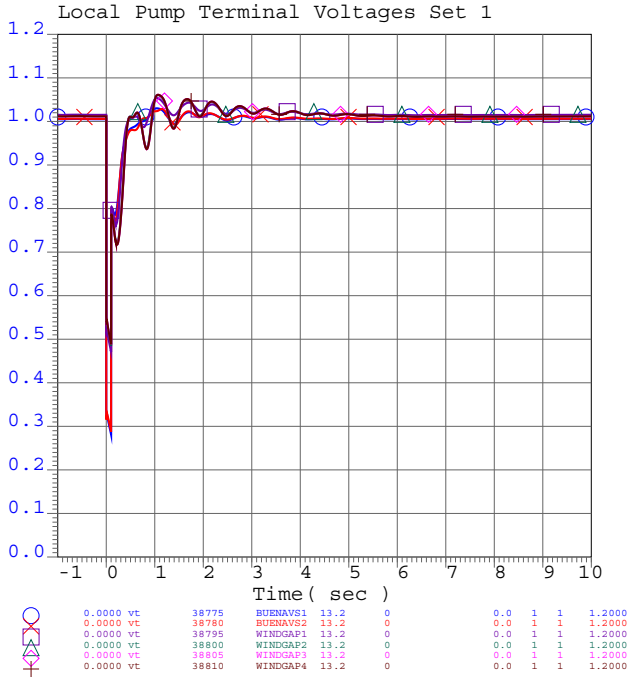




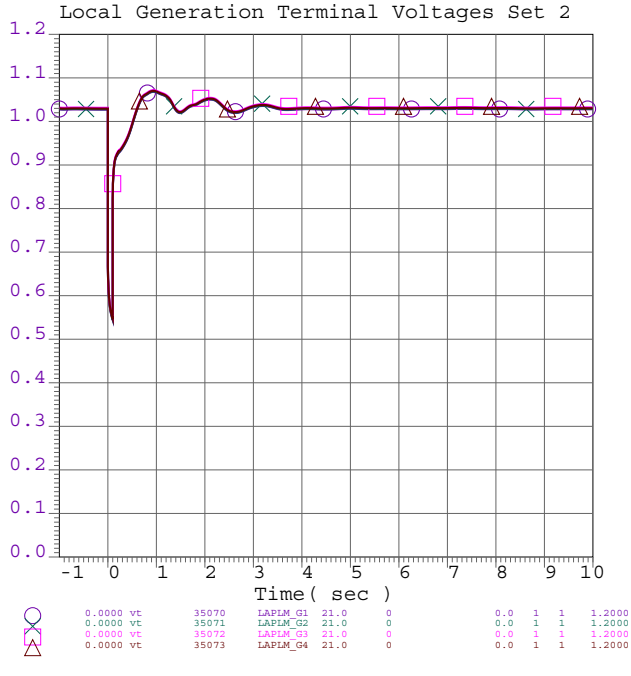


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

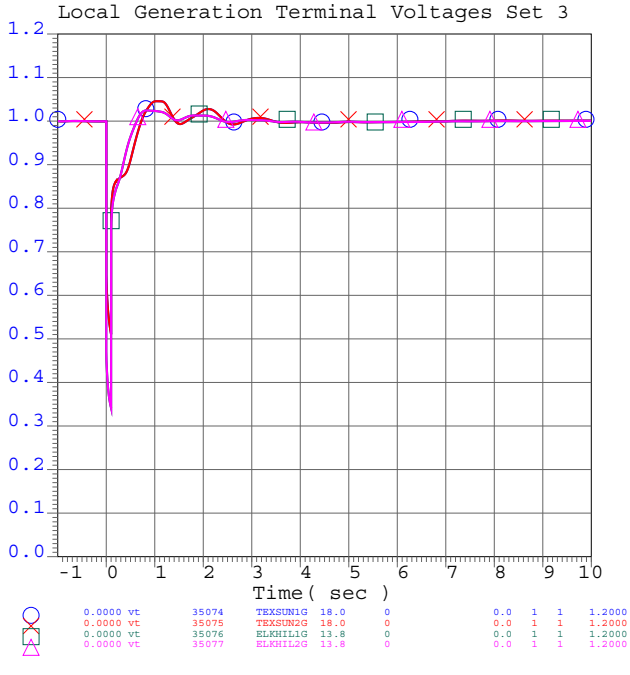
Local Pump Terminal Voltages Set 1



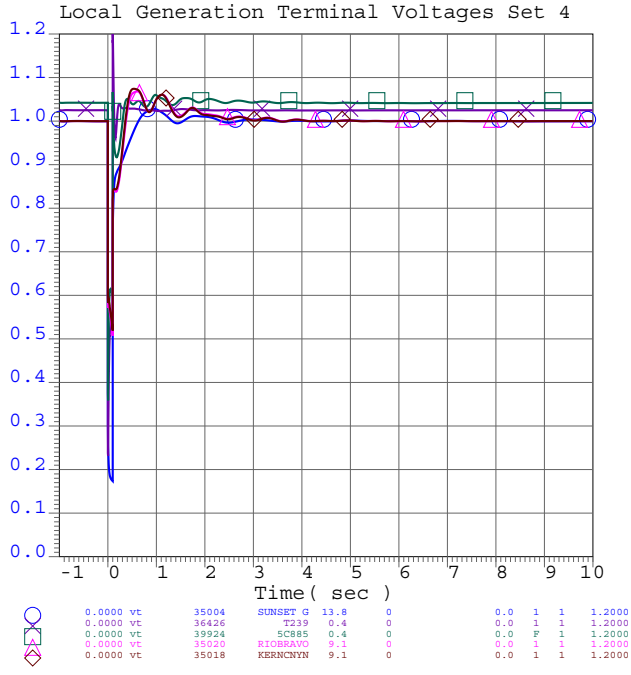
Local Generation Terminal Voltages Set 2



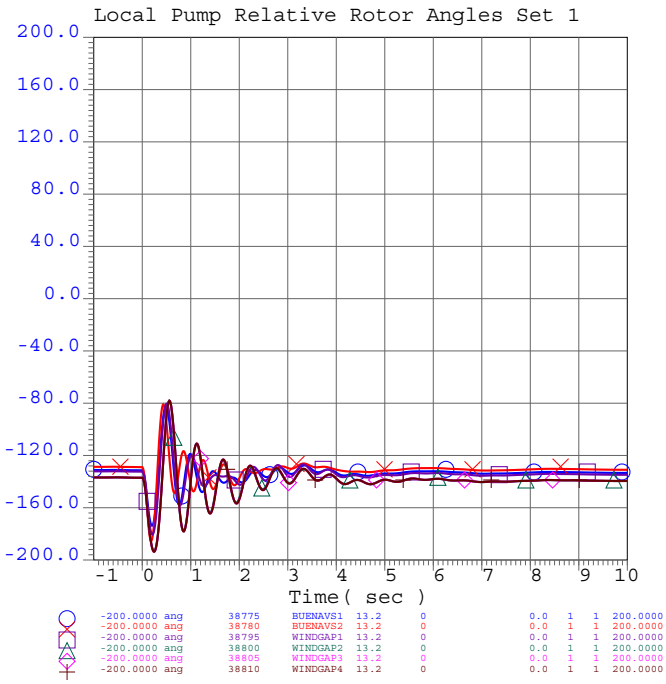
Local Generation Terminal Voltages Set 3

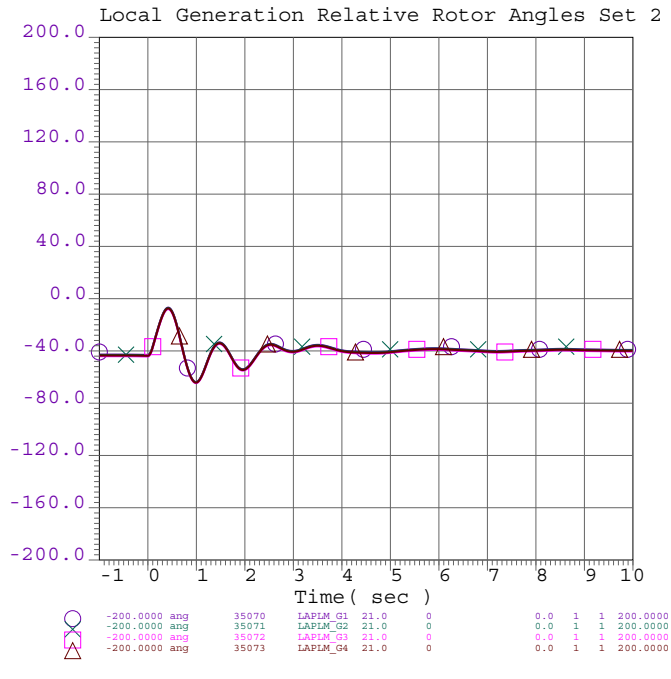


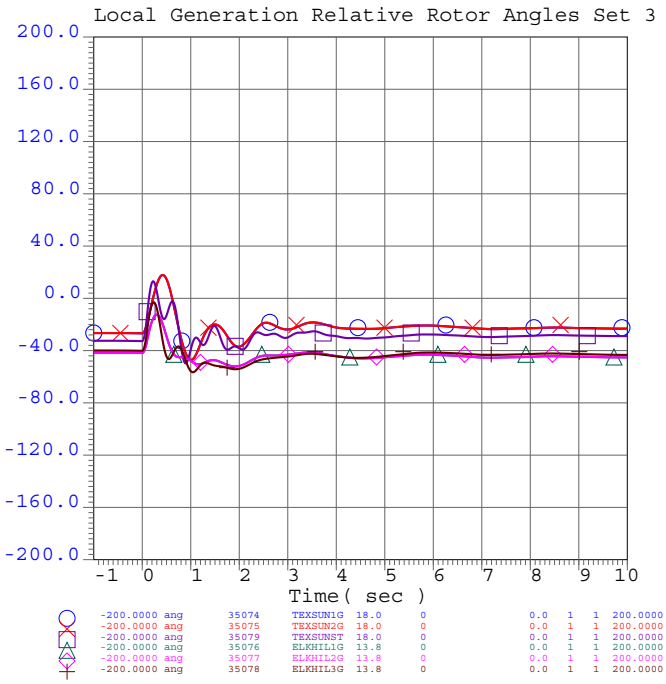
Local Generation Terminal Voltages Set 4

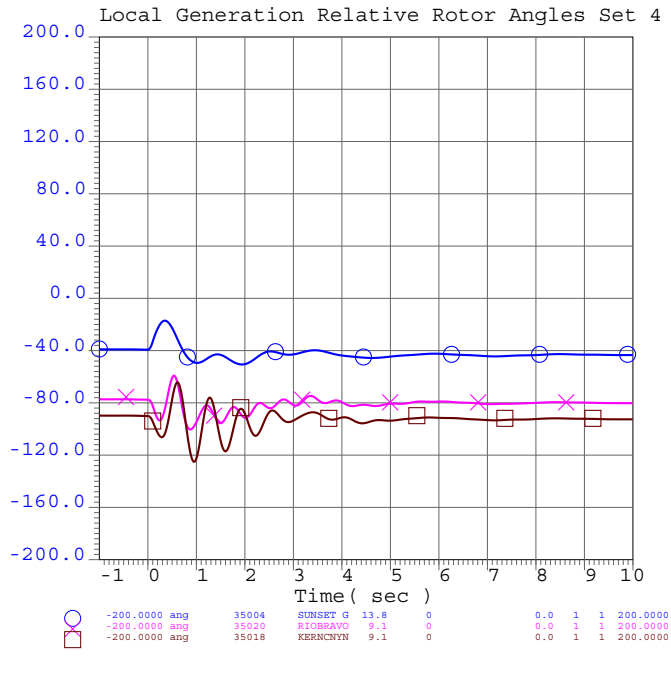


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

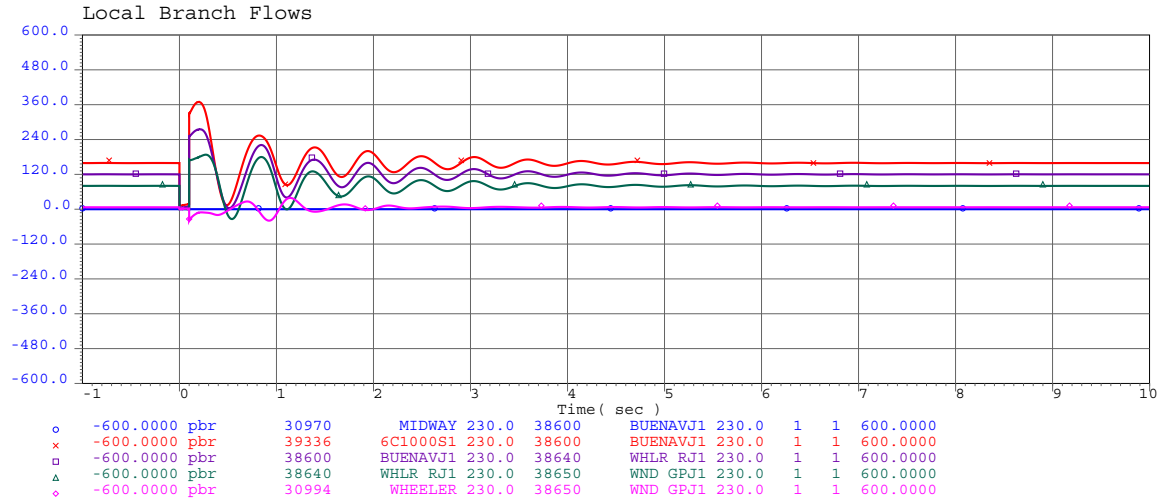


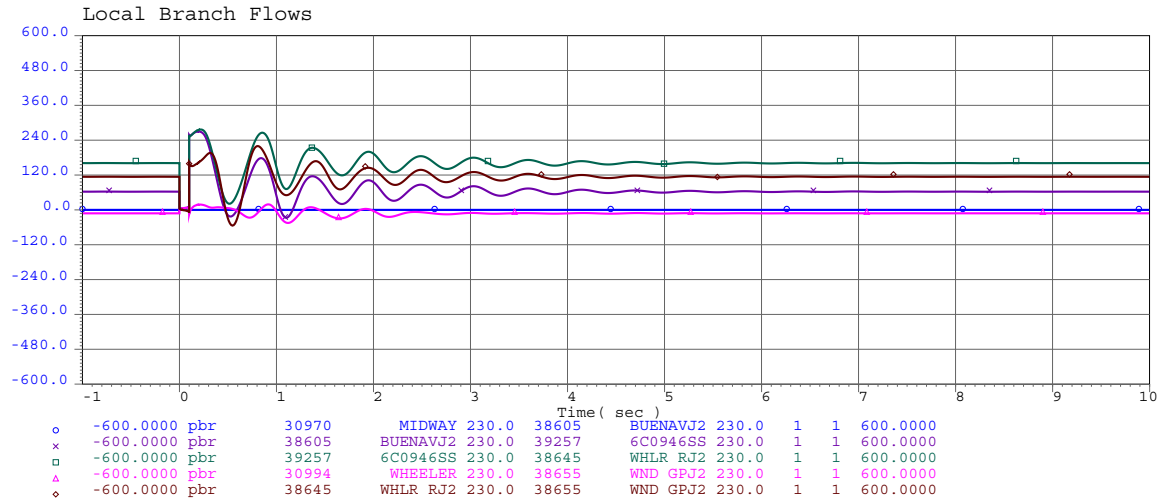


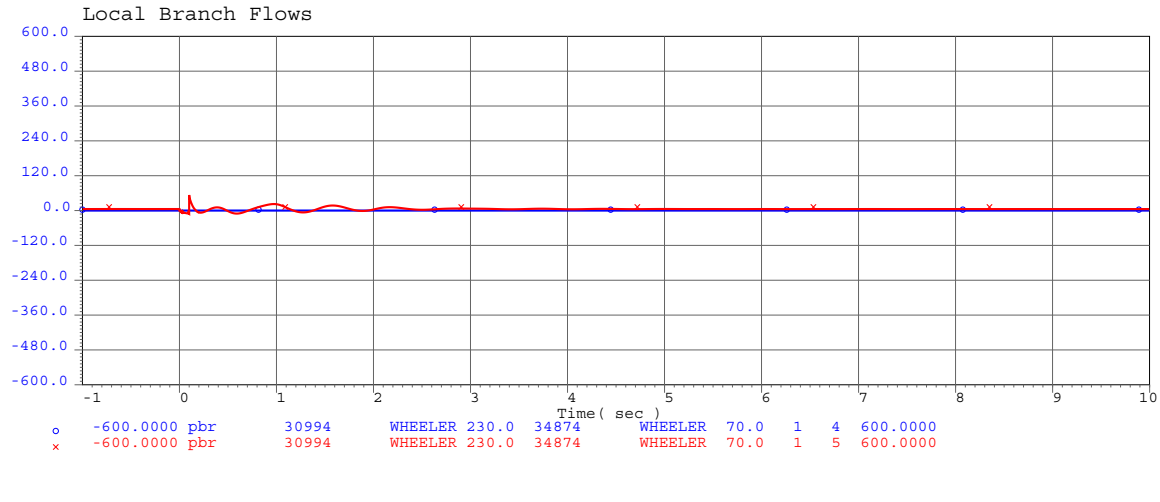




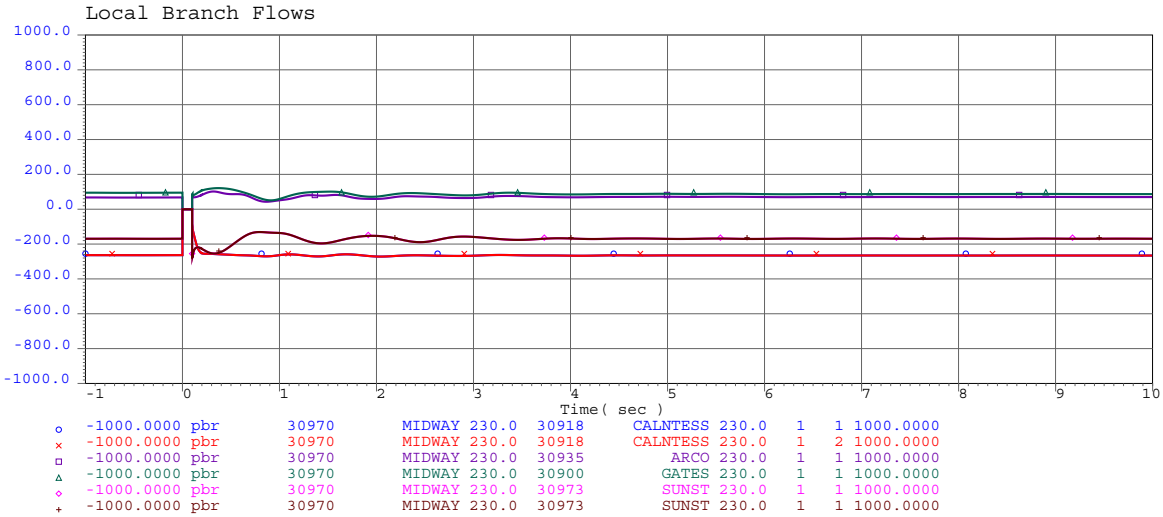
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



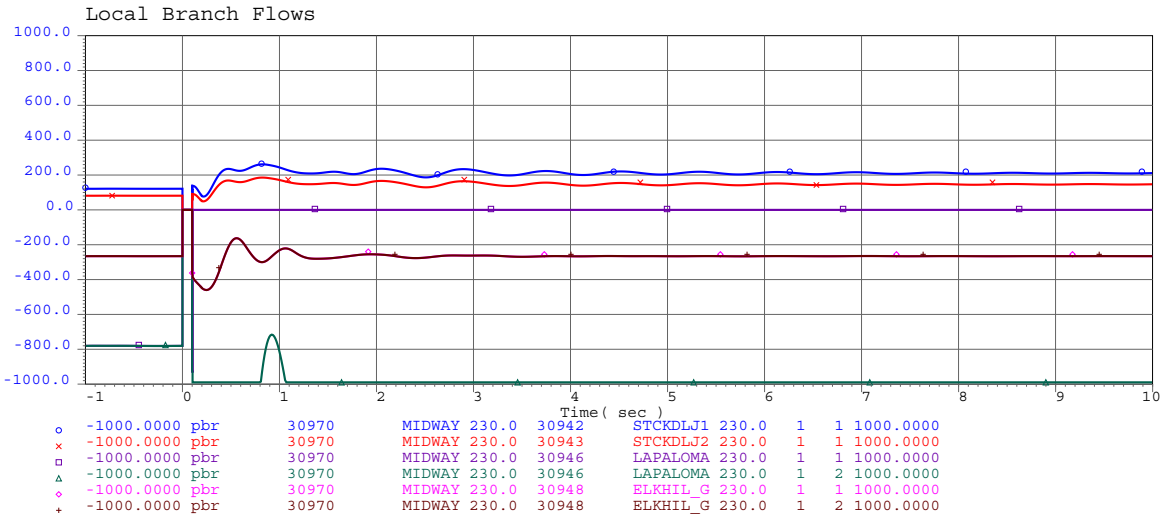




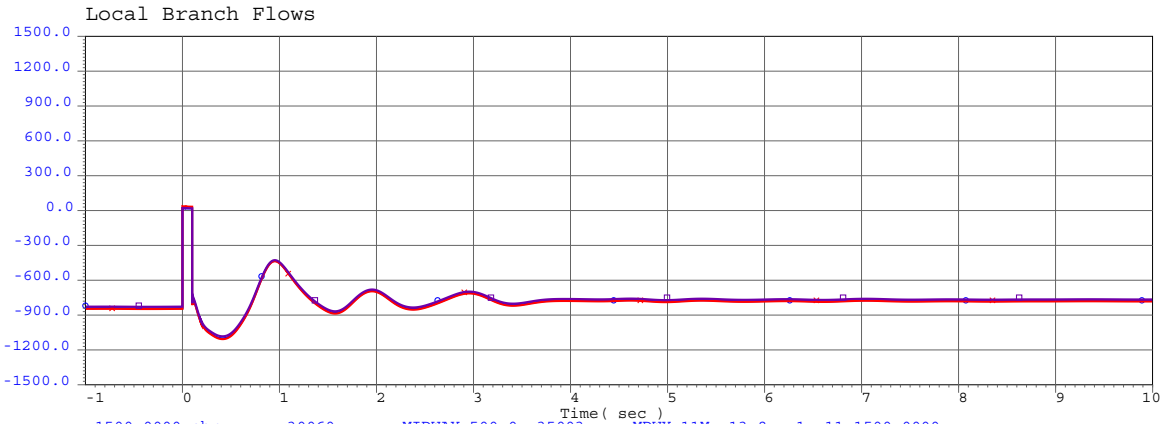
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



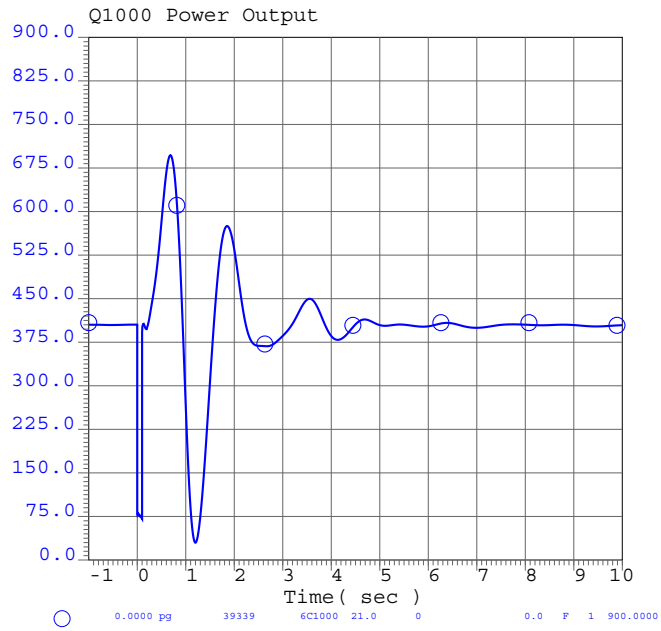
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

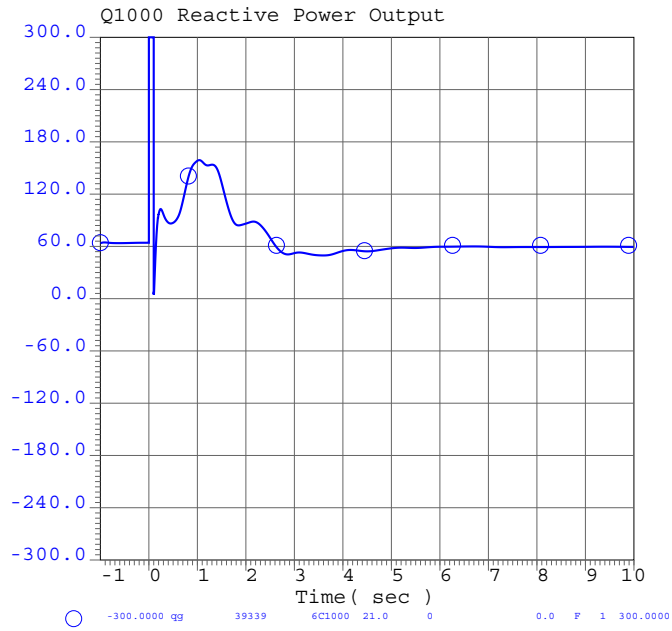


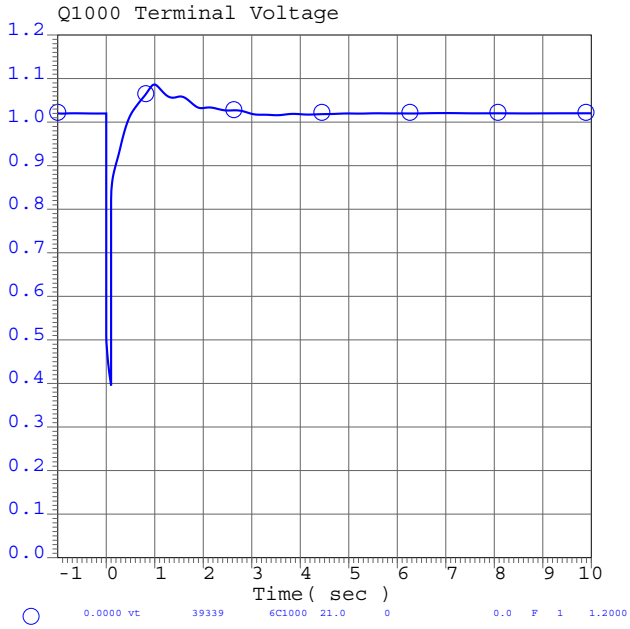
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

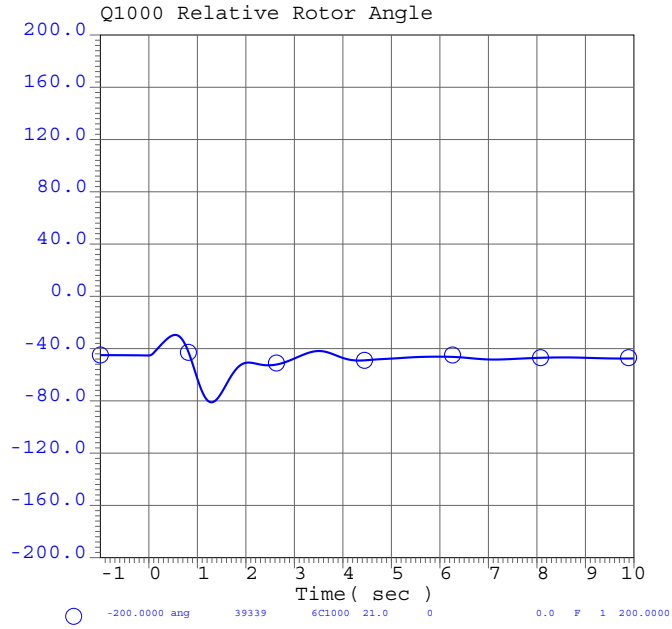
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

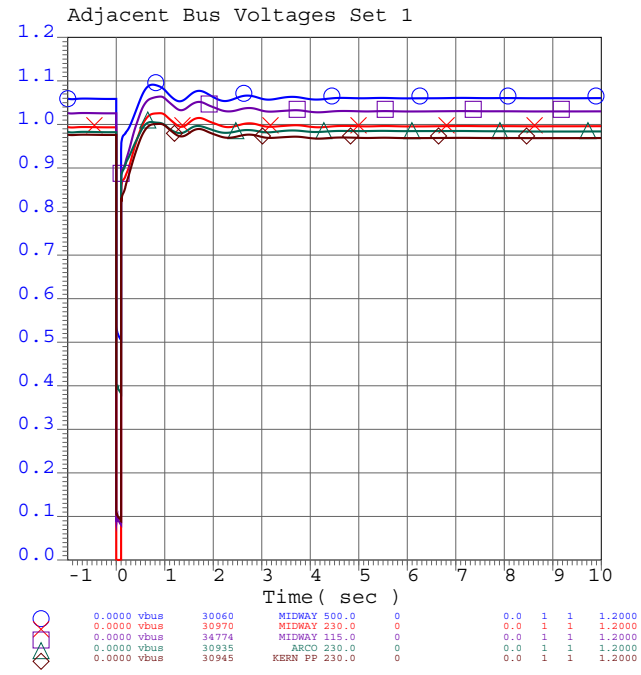


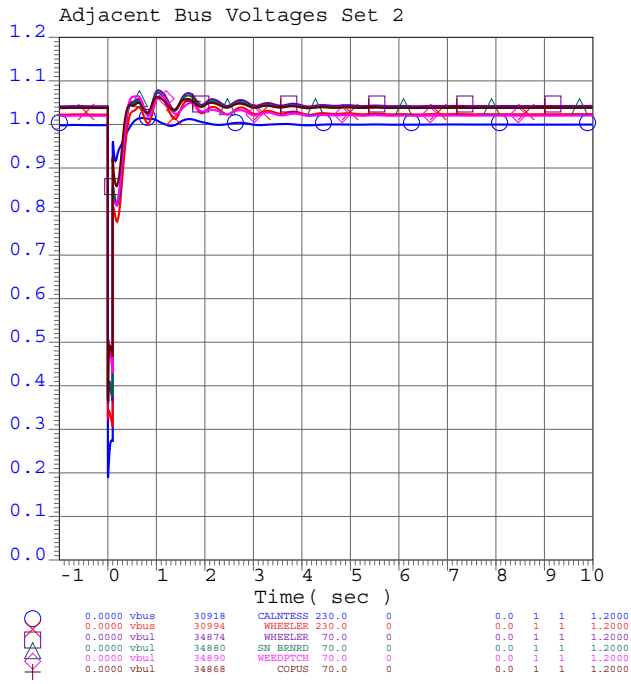


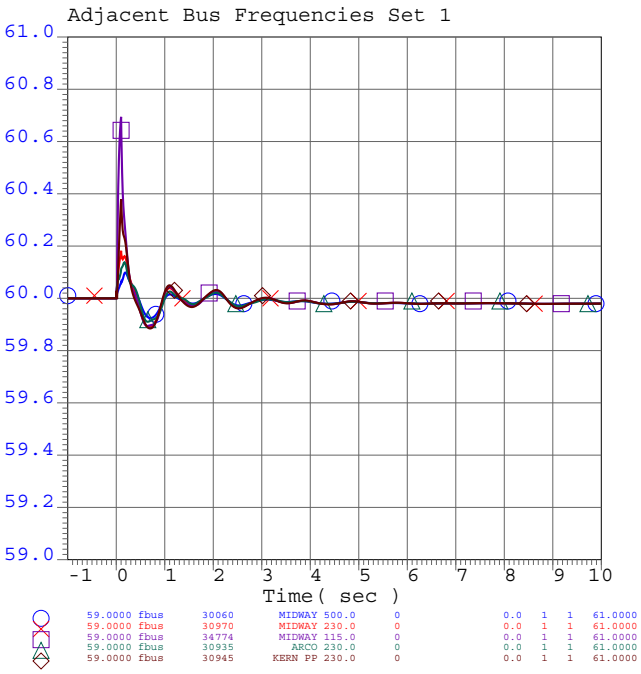


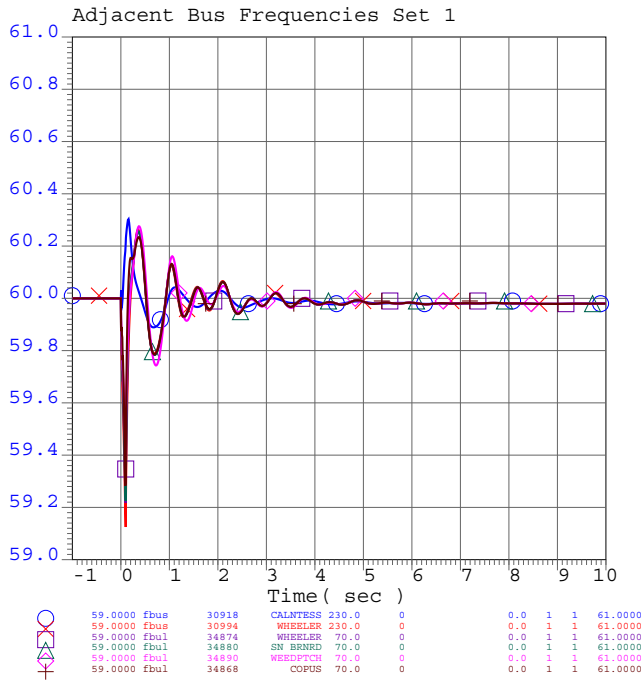


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F









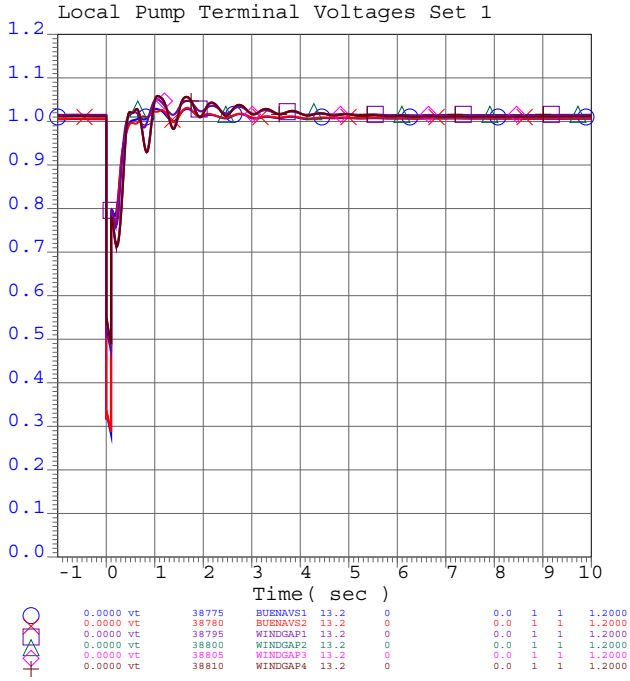
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

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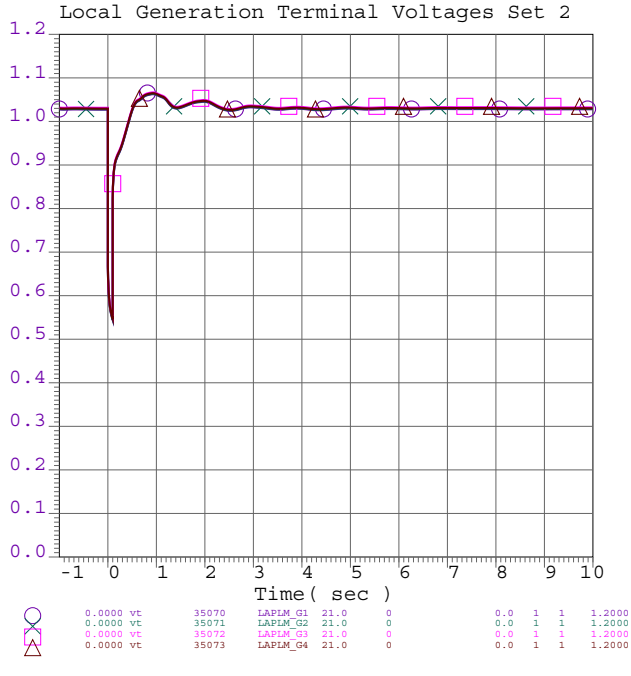
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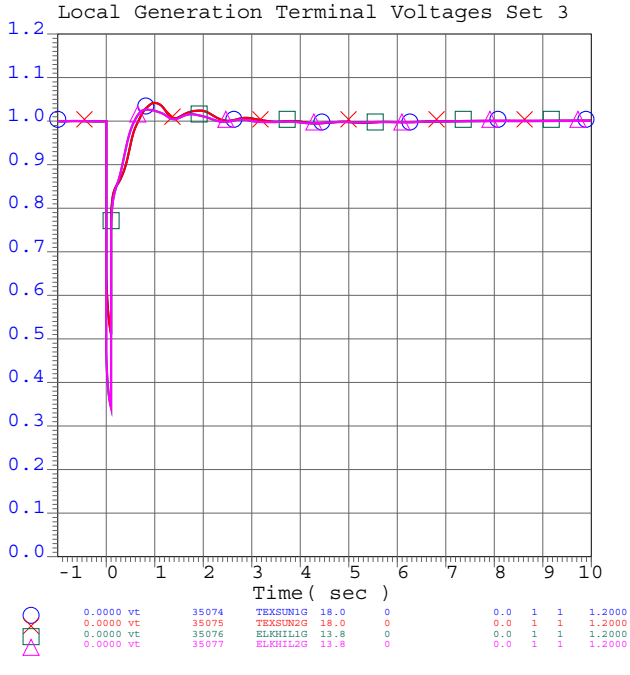
Local Pump Terminal Voltages Set 1



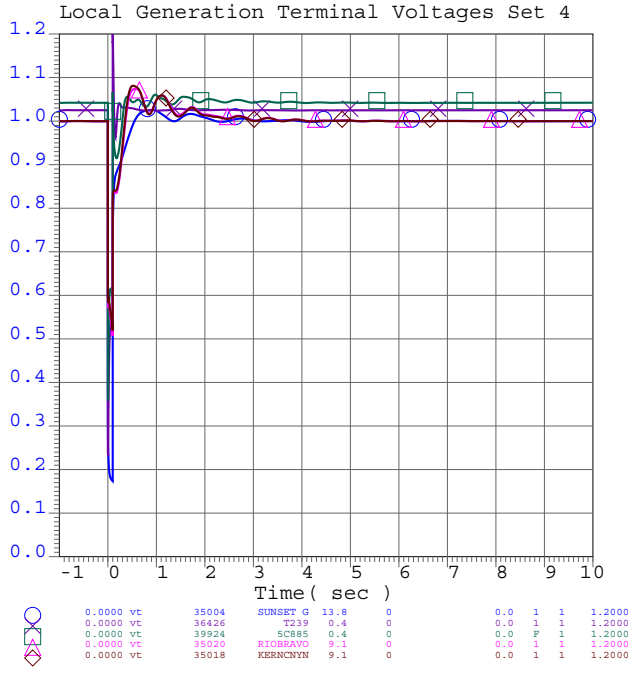
Local Generation Terminal Voltages Set 2



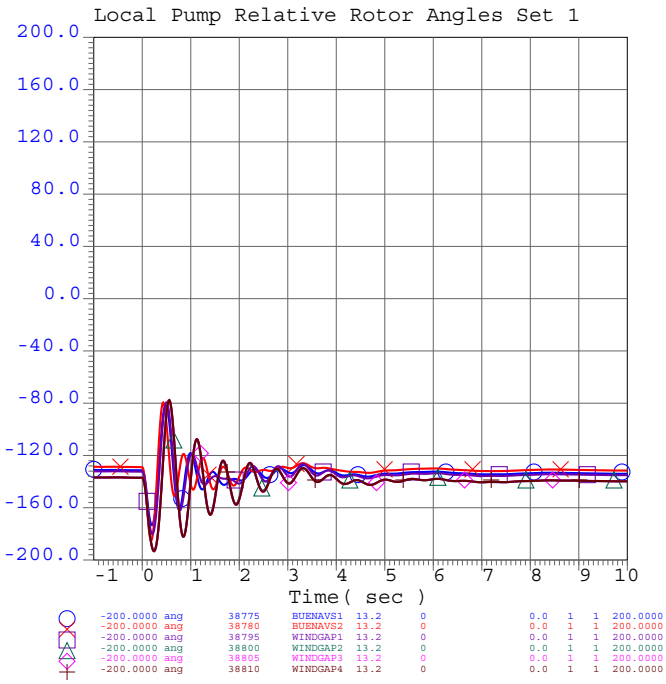
Local Generation Terminal Voltages Set 3

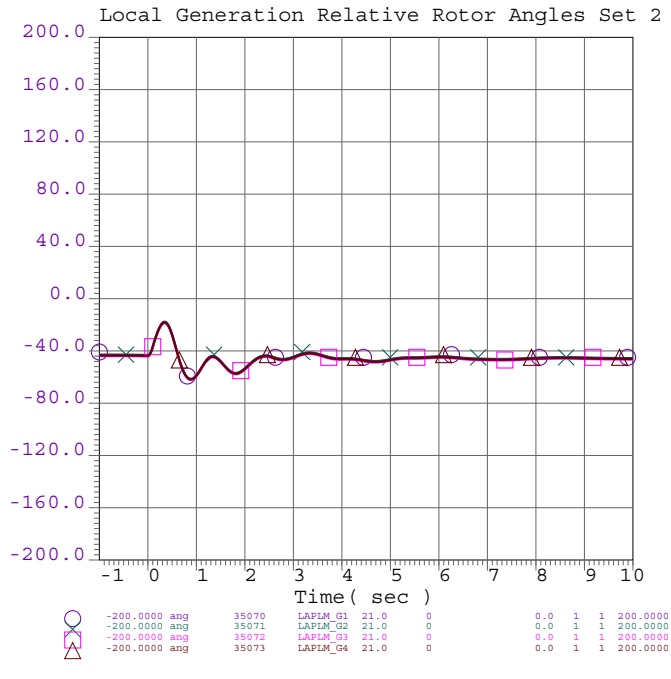


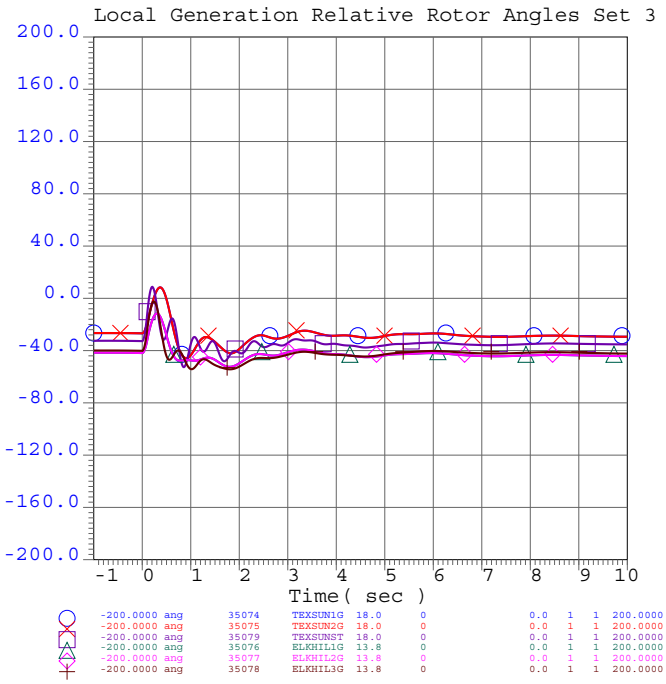
Local Generation Terminal Voltages Set 4

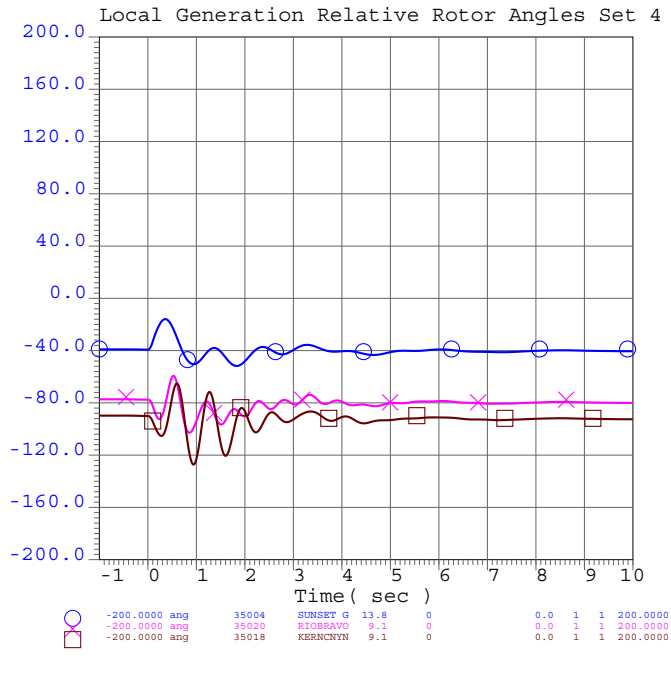


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

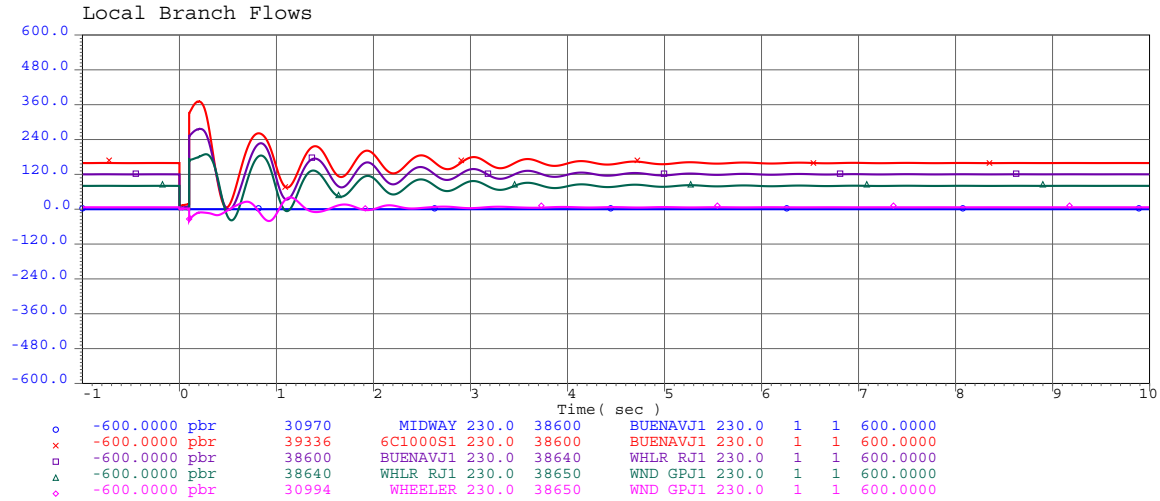




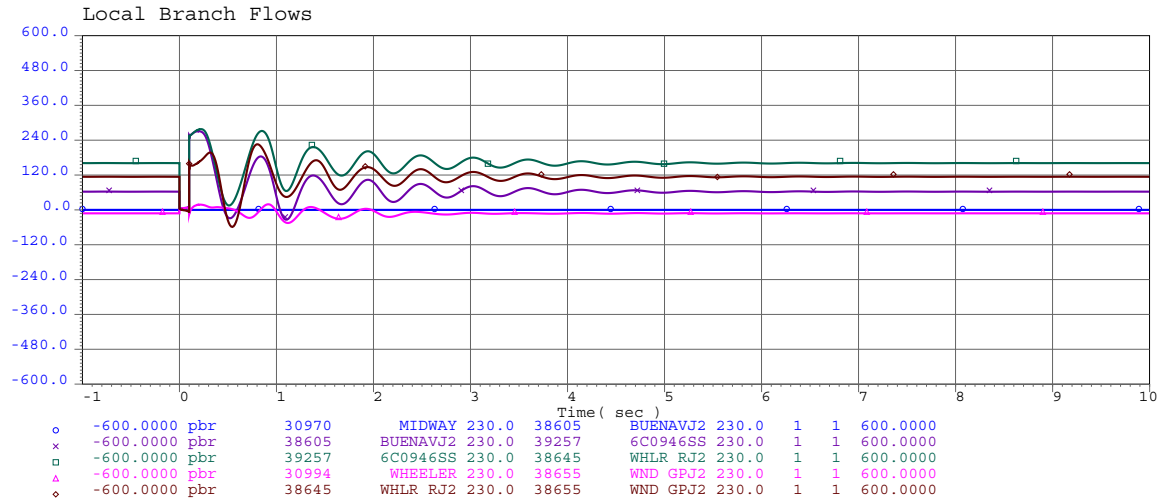




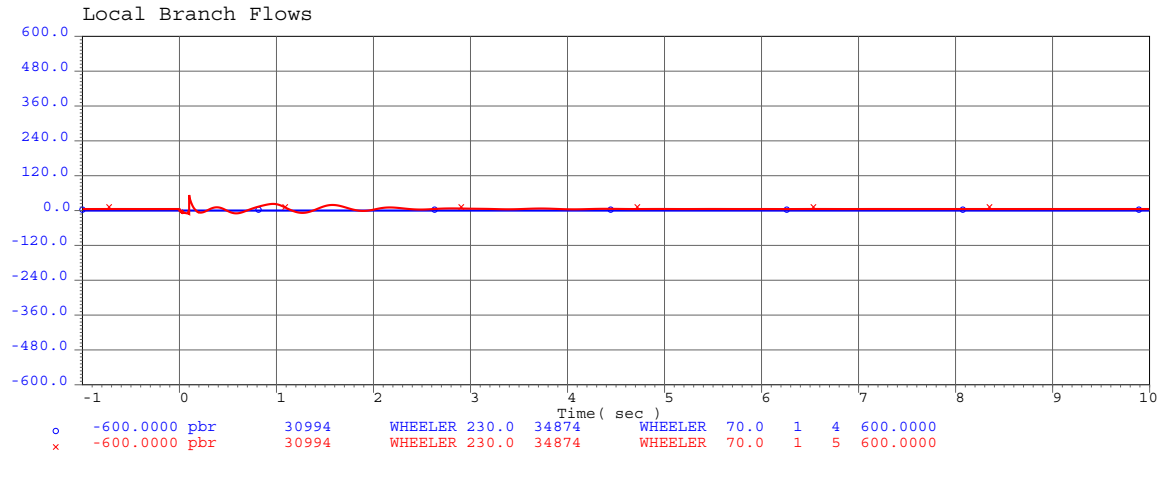
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

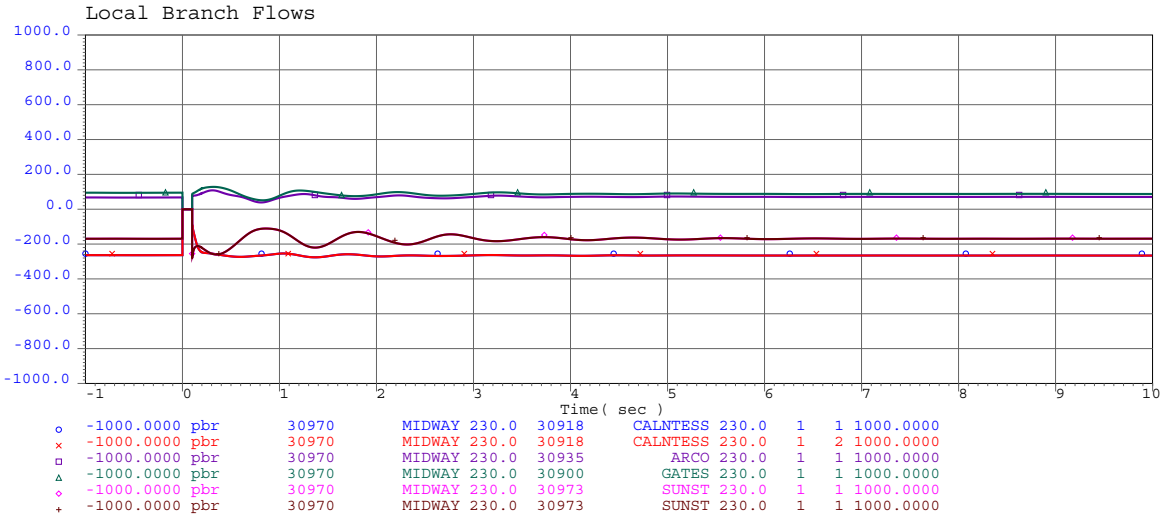


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

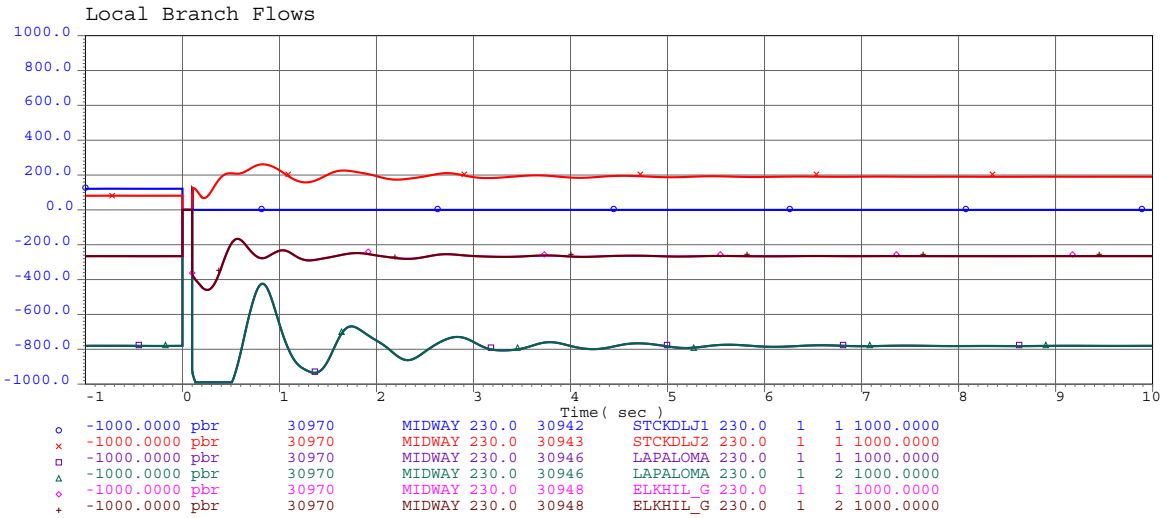


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

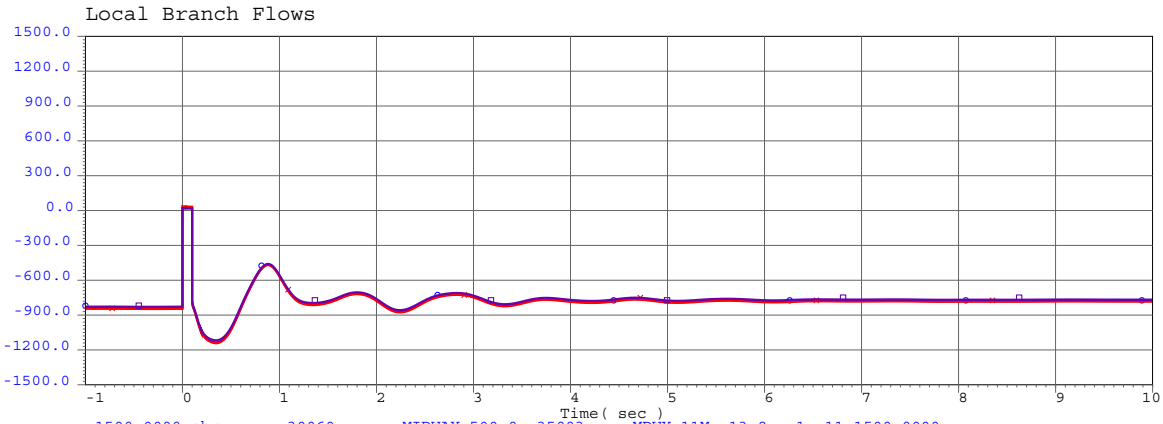
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



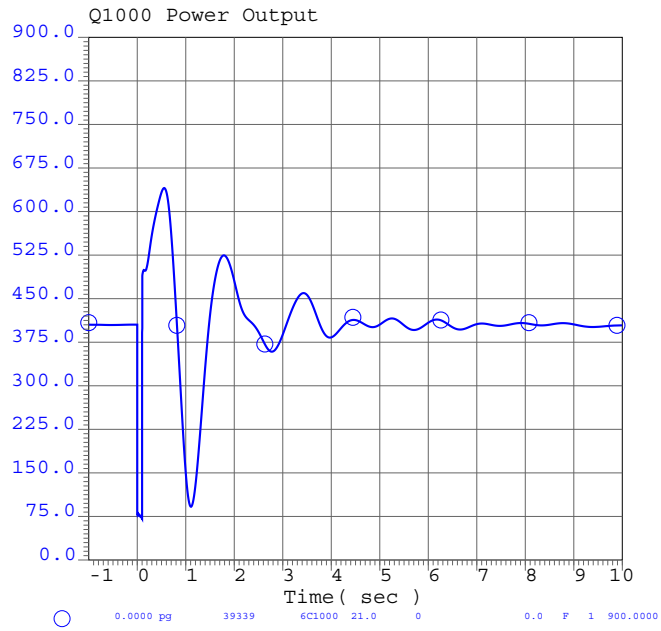
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

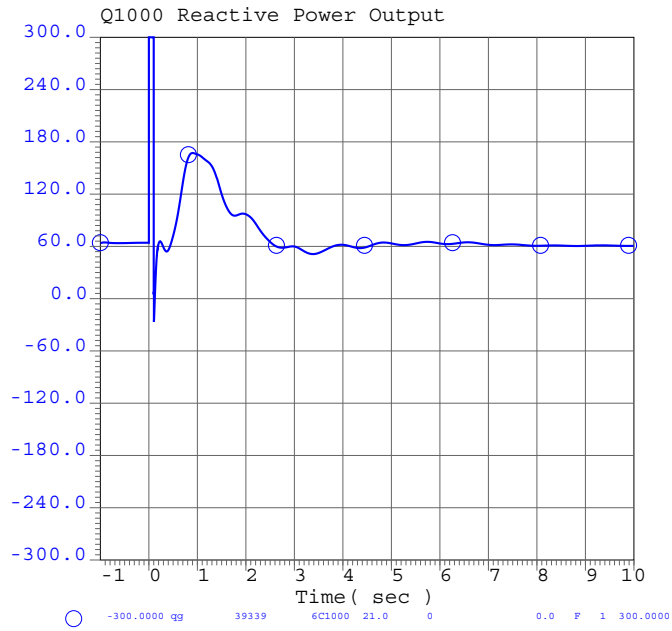


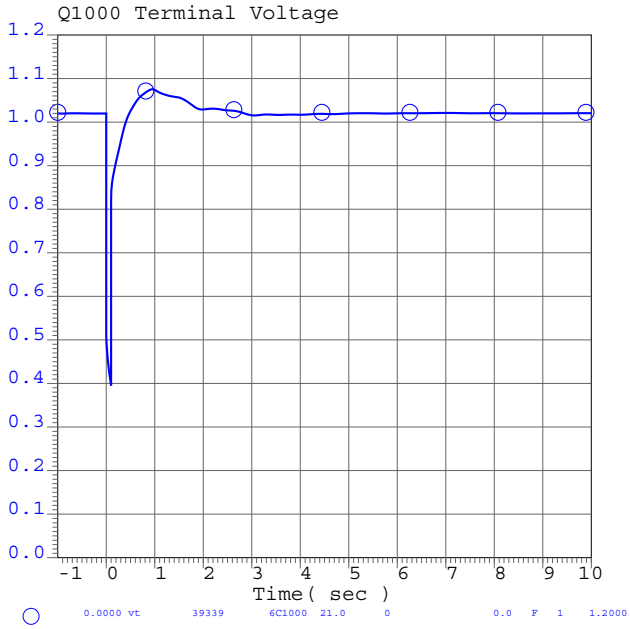
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

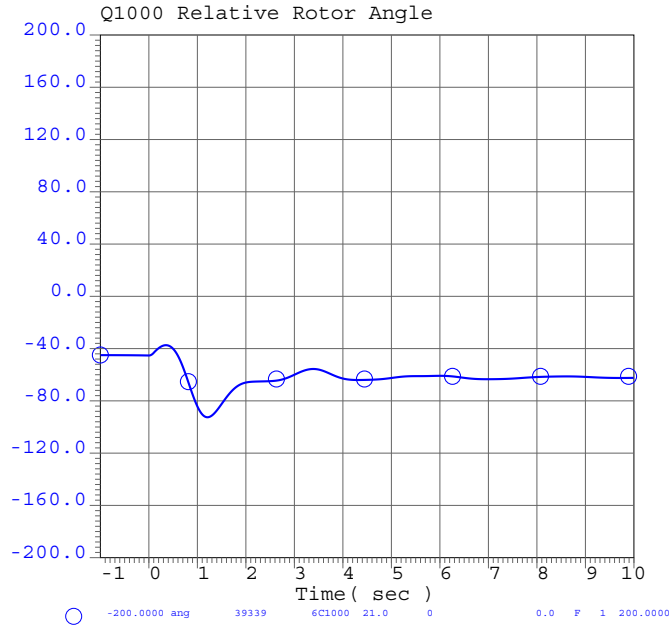
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





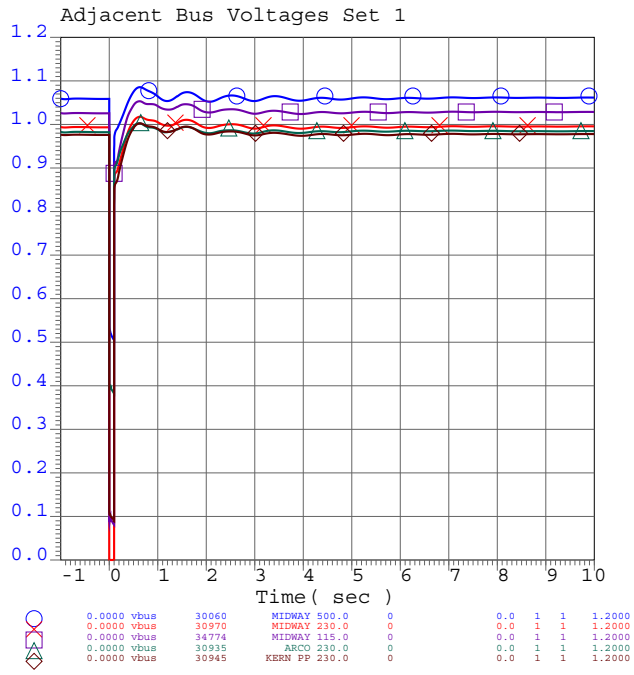


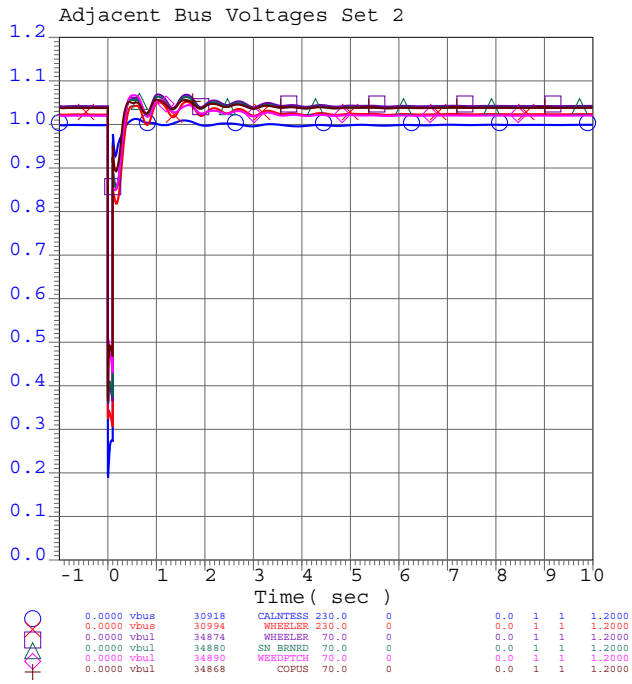


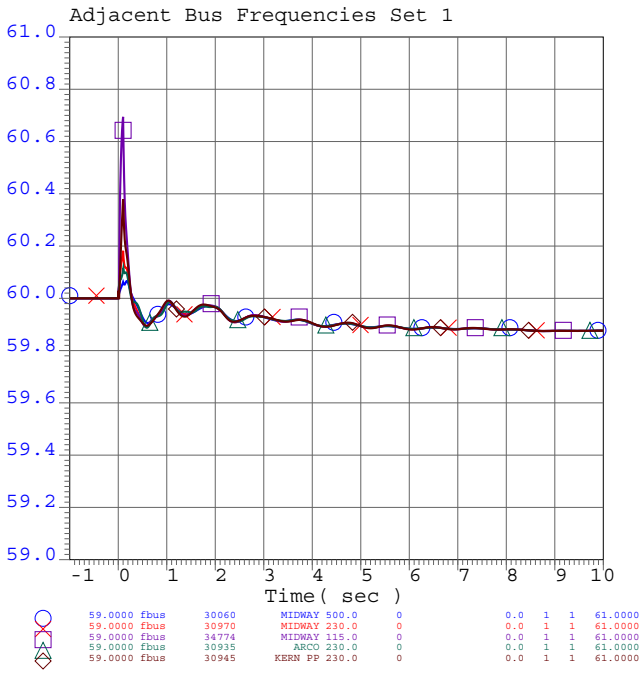
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

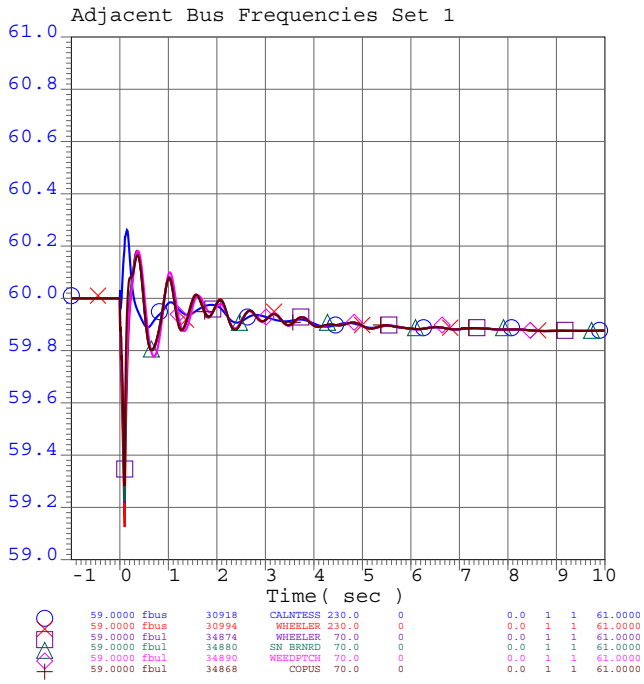
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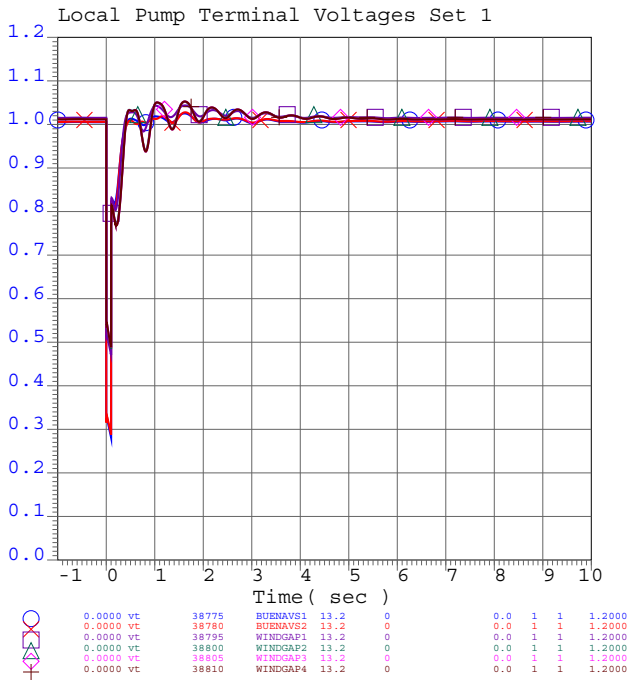


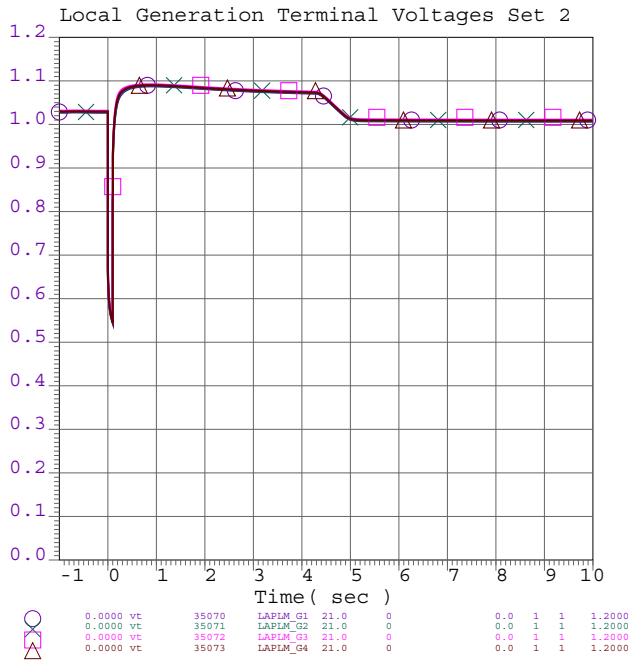


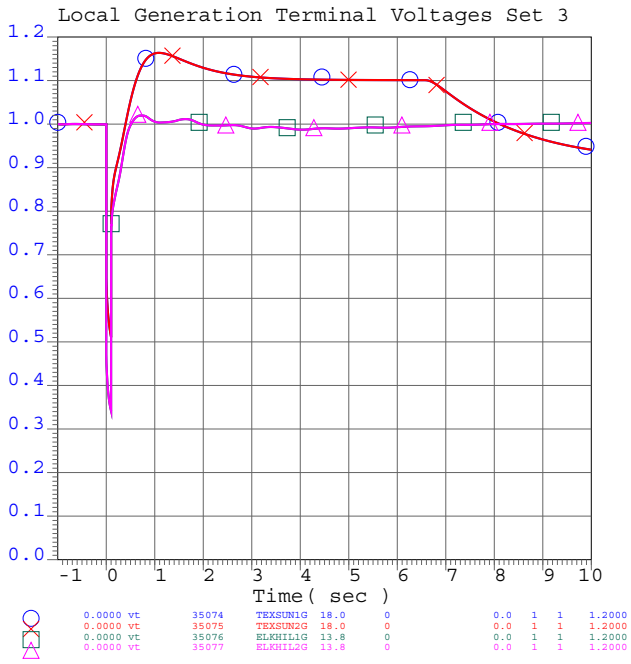


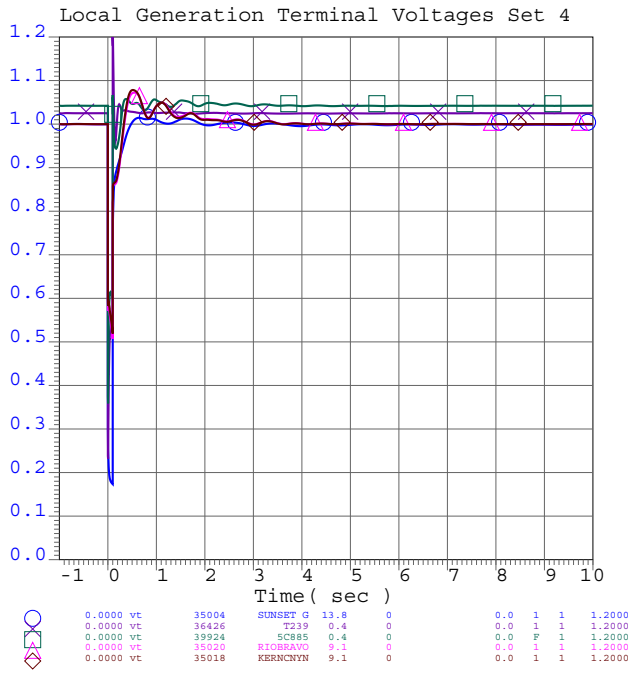


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

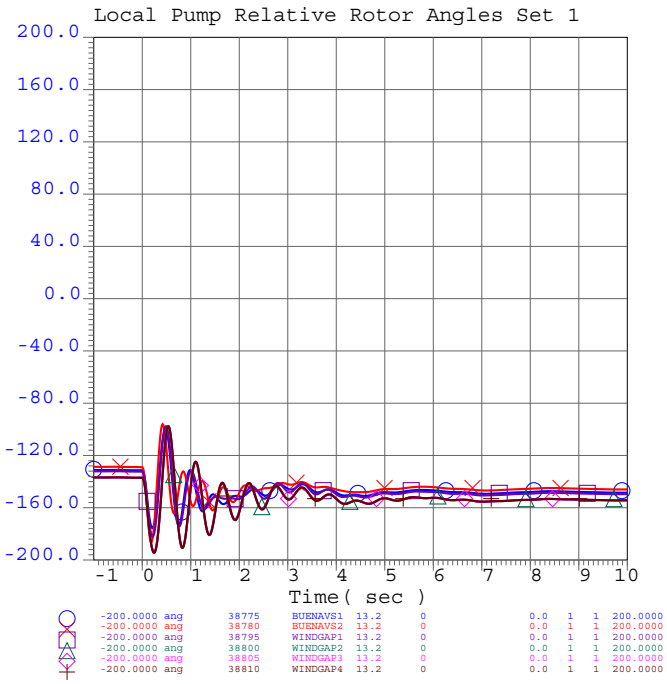


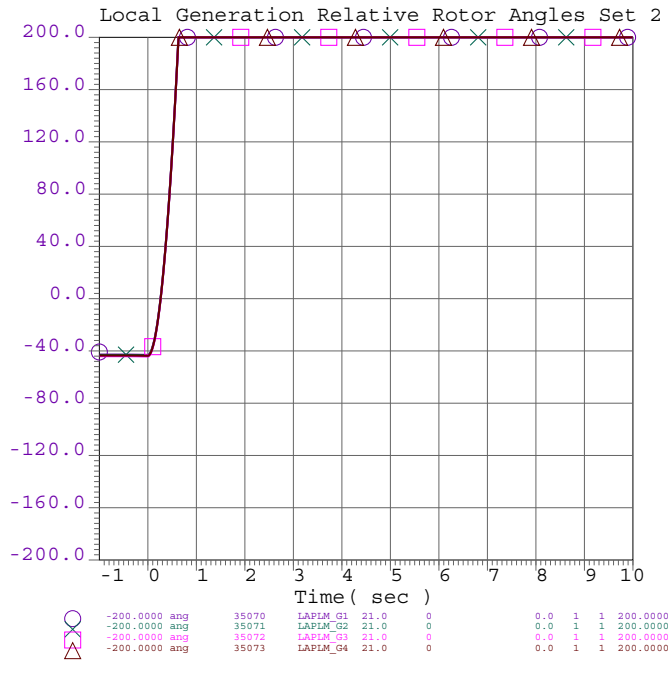


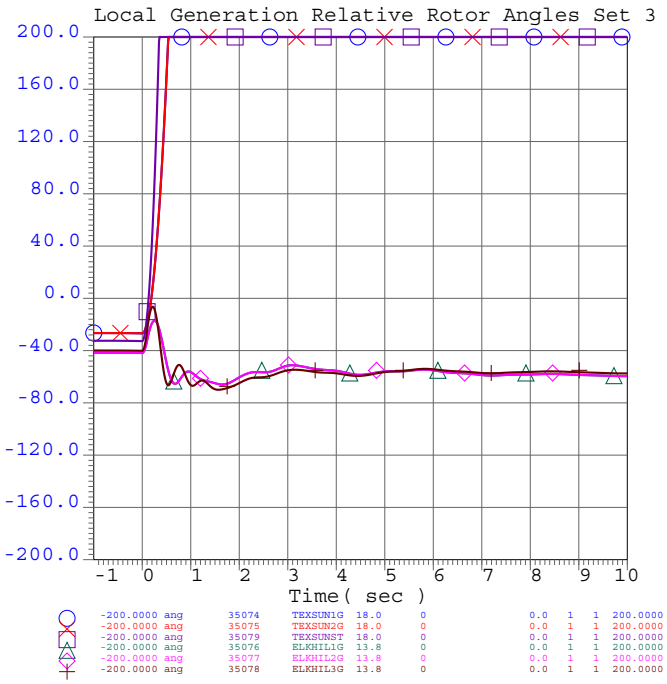


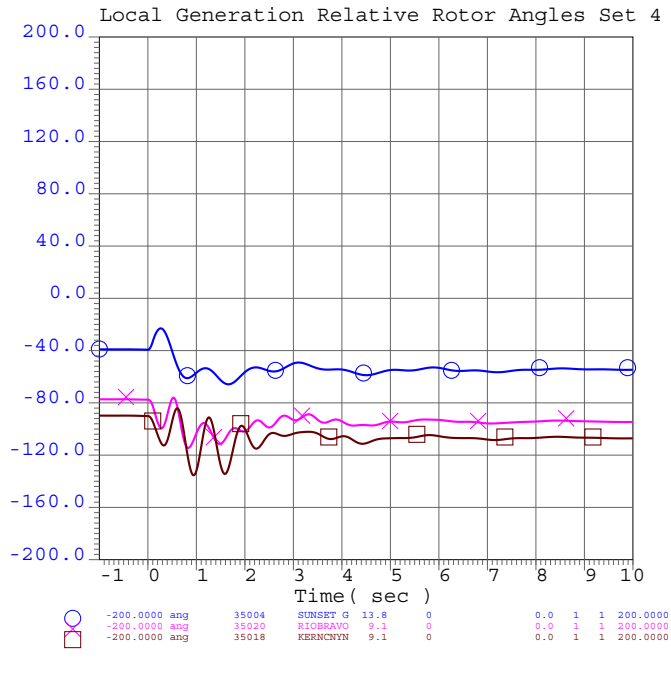


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

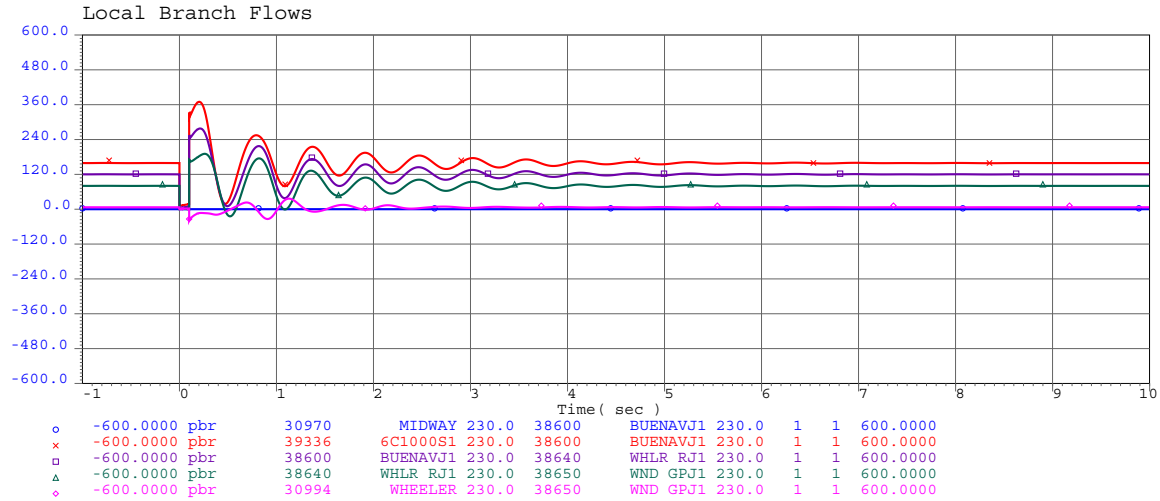


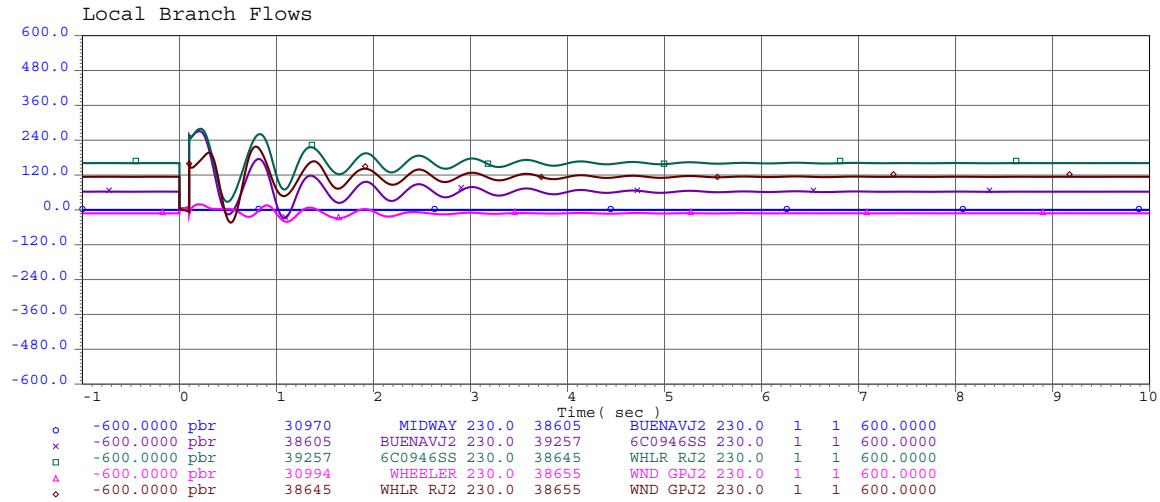


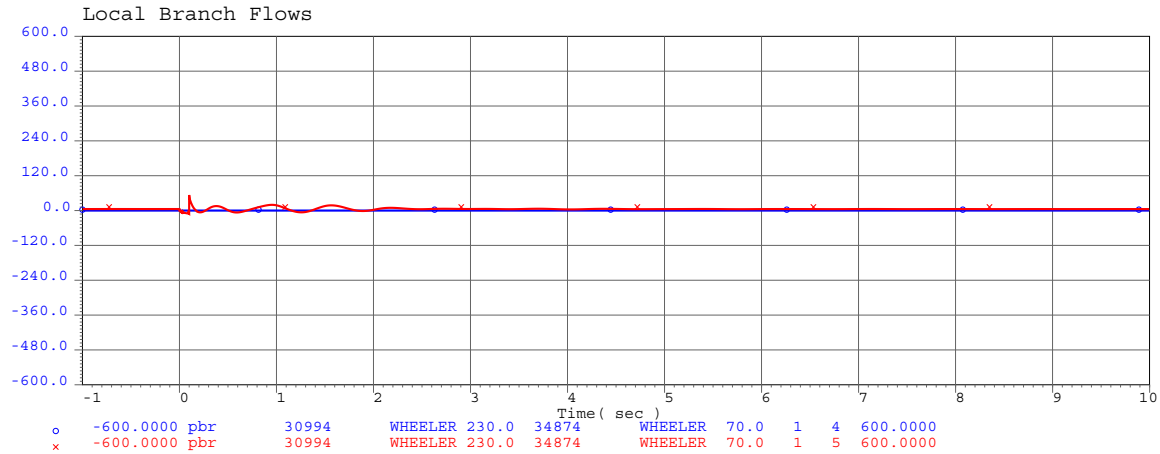




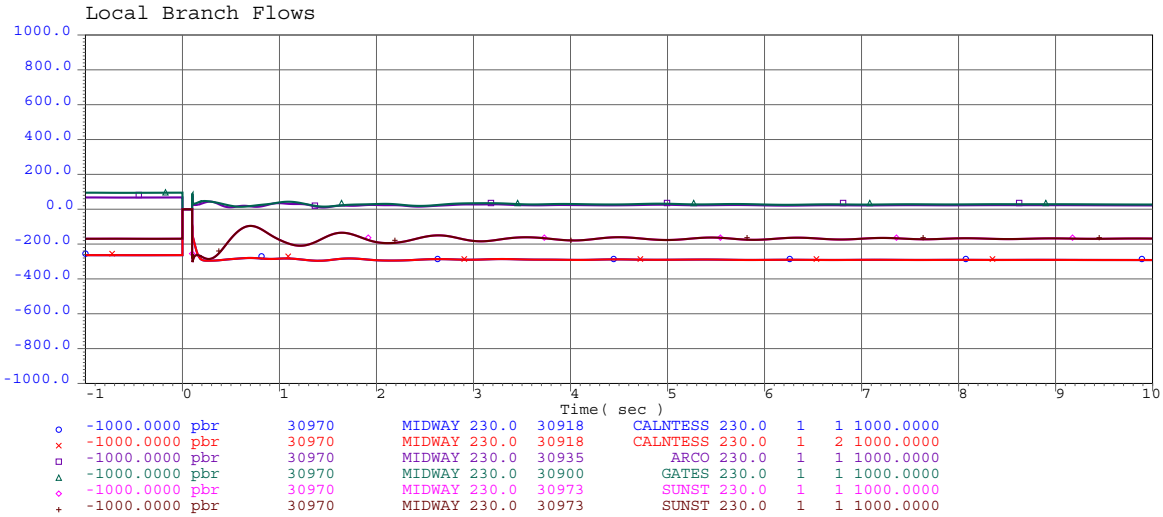
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines



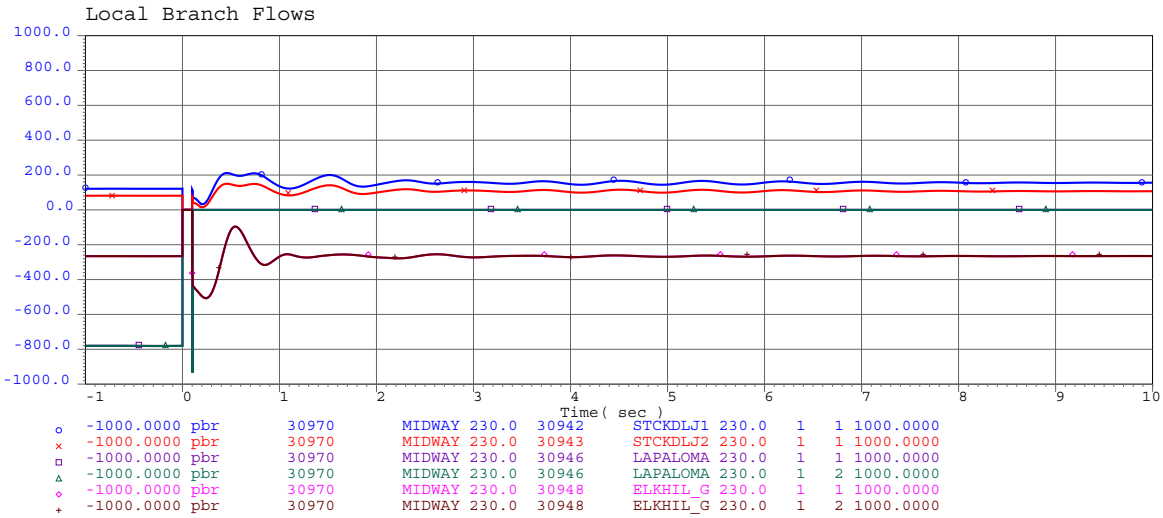




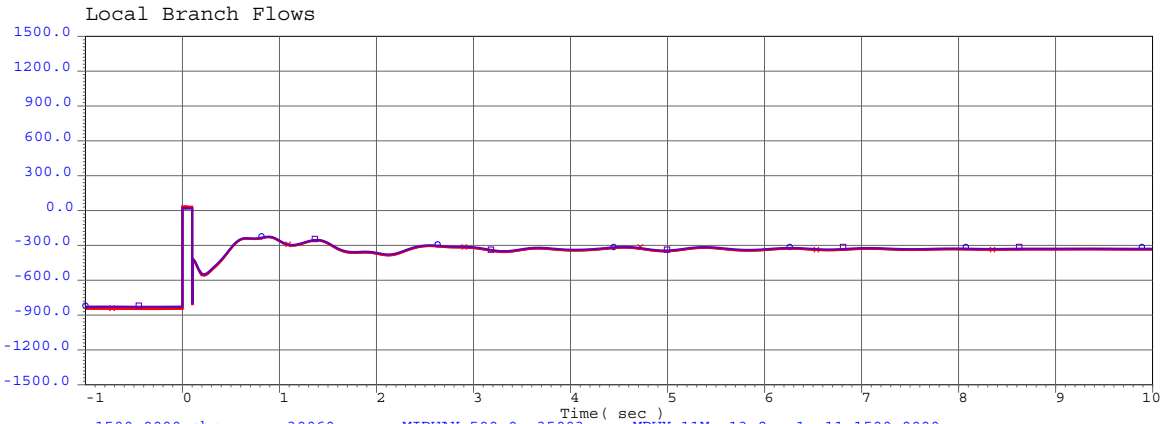
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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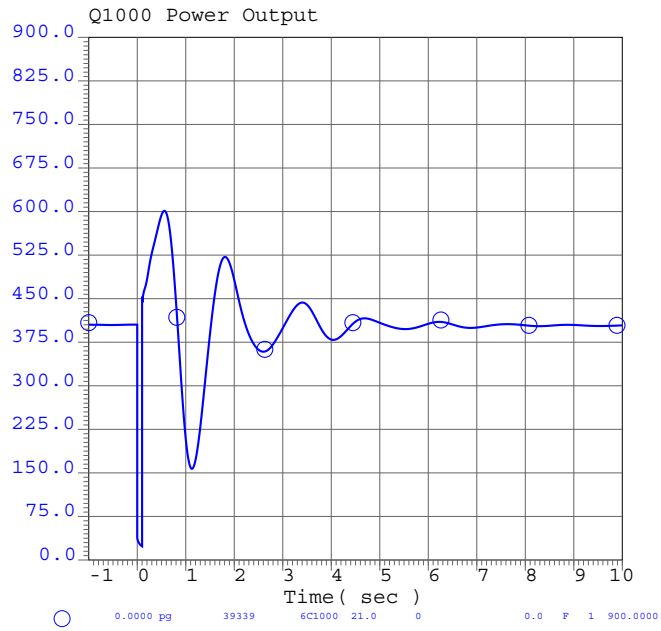
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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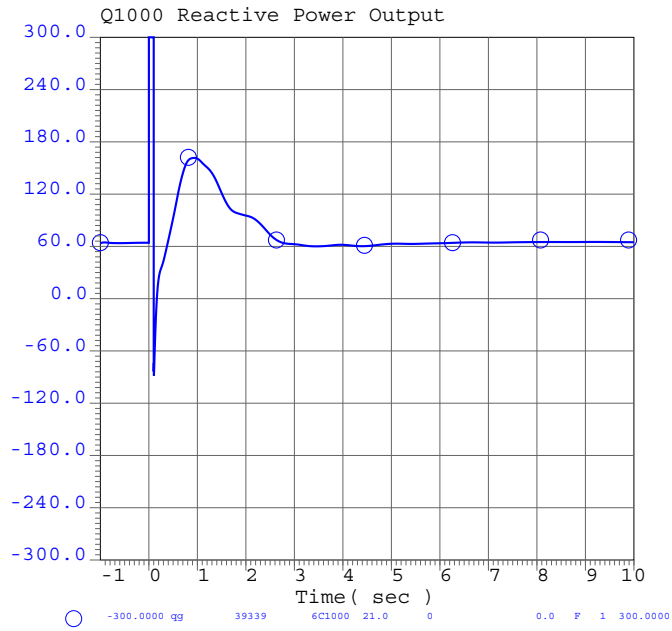


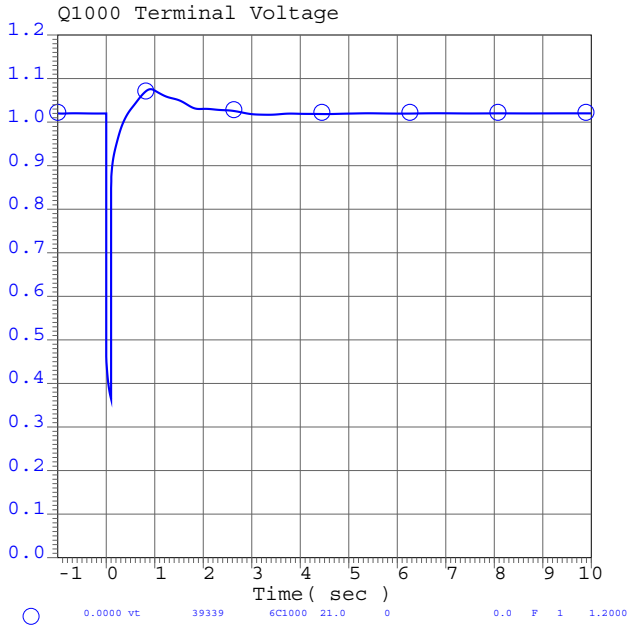
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-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

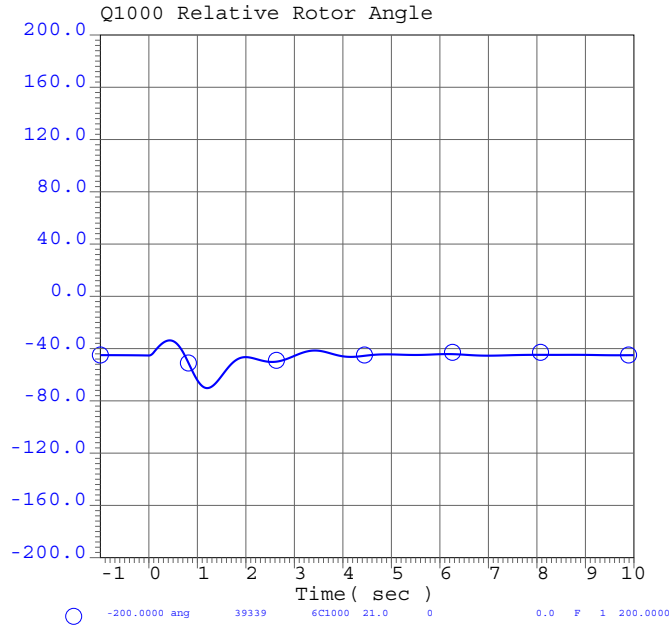
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

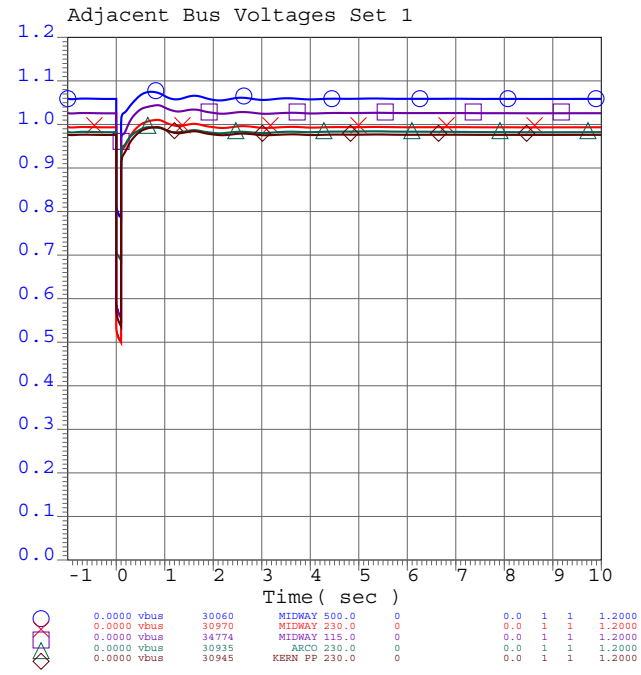


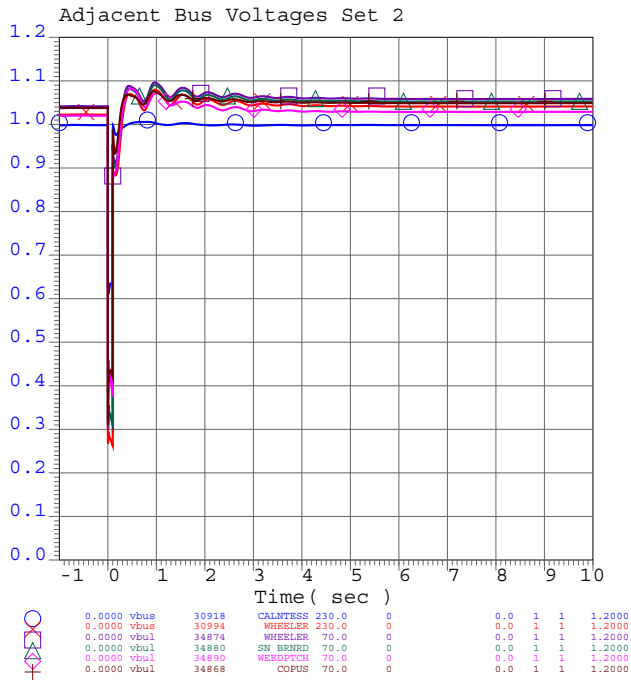


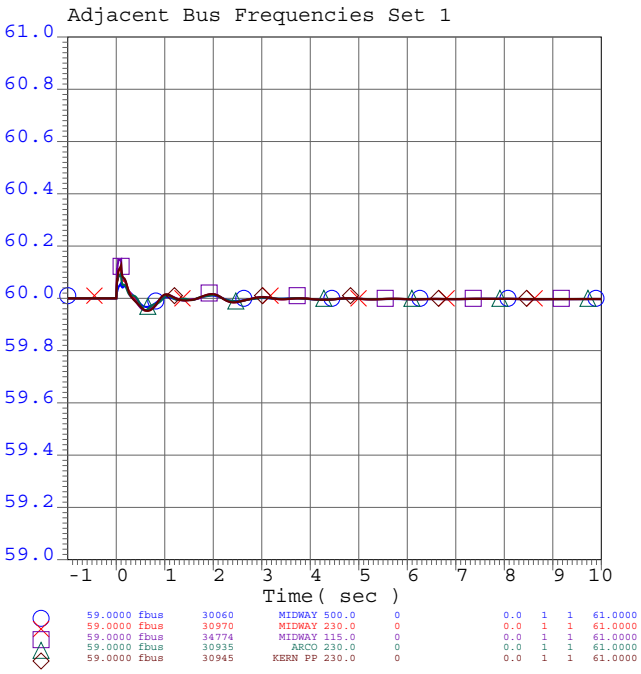


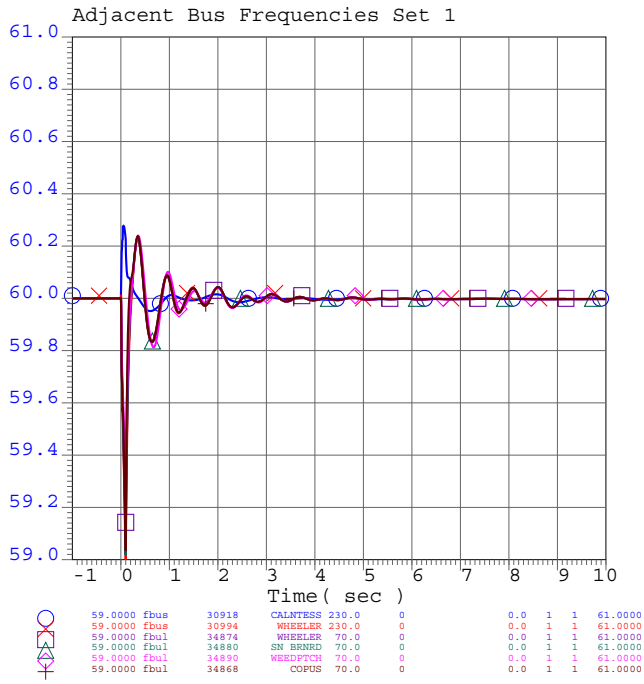


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV Bus
Clear 6C0946SS-Wheeler Ridge #2 230 kV Line

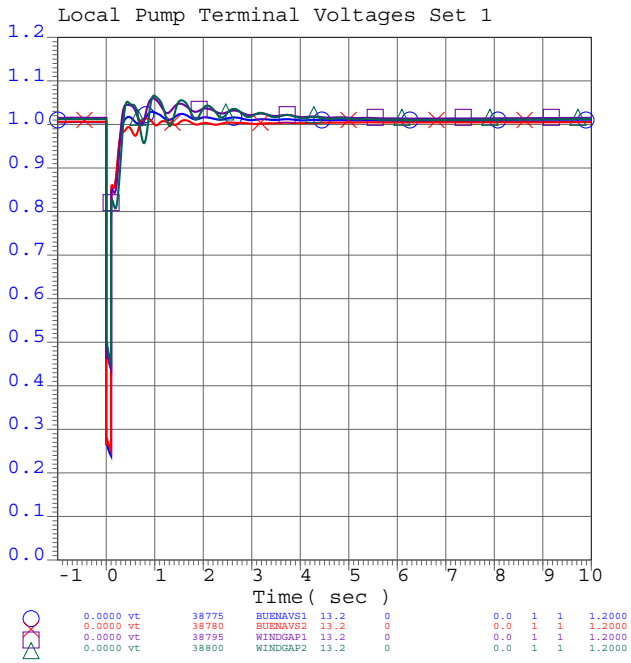


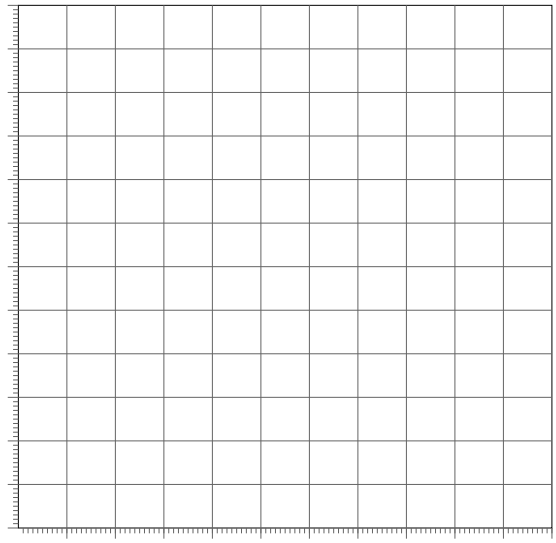


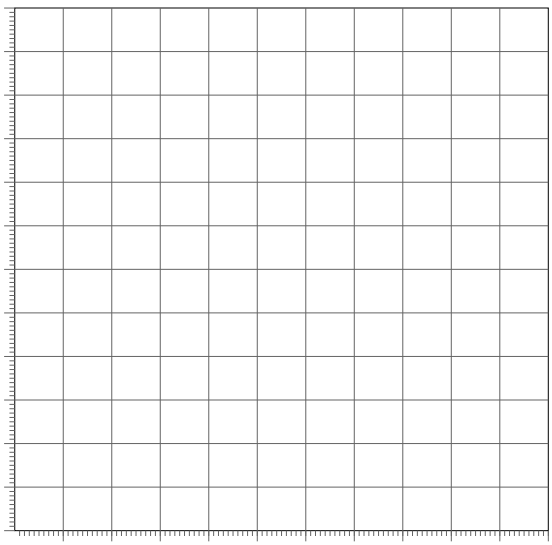


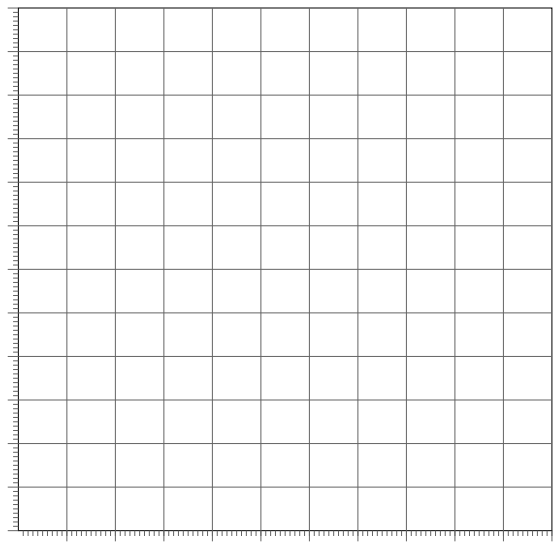


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV Bus
Clear 6C0946SS-Wheeler Ridge #2 230 kV Line



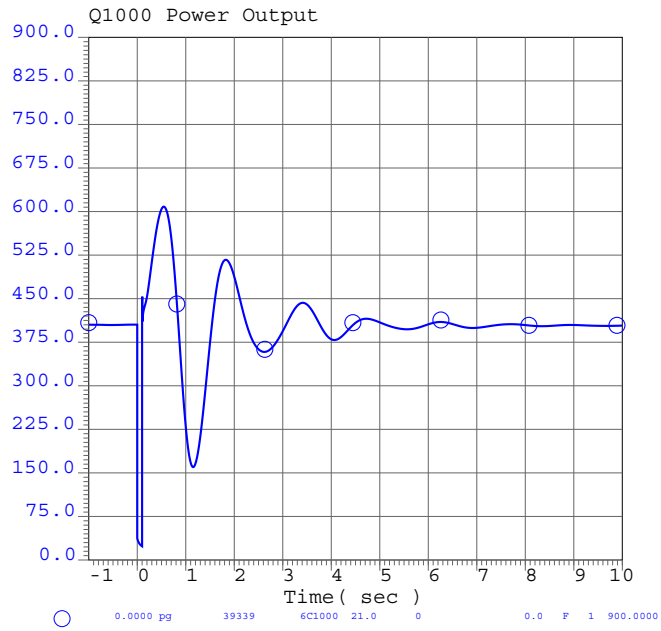


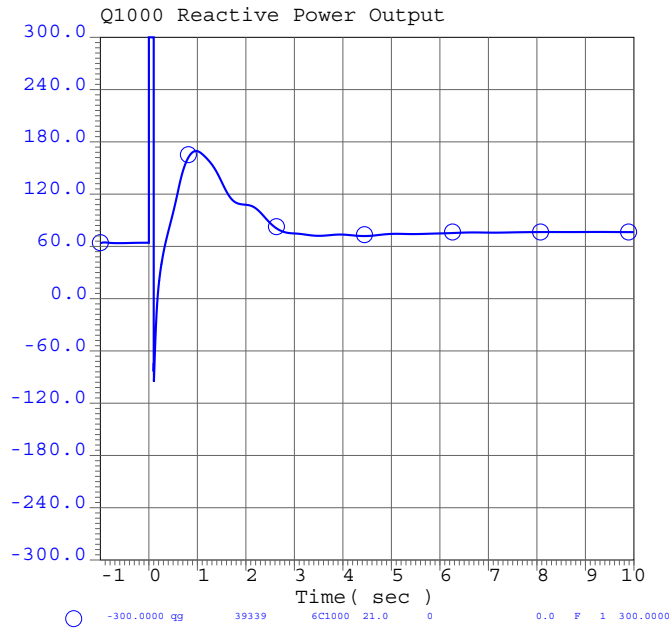


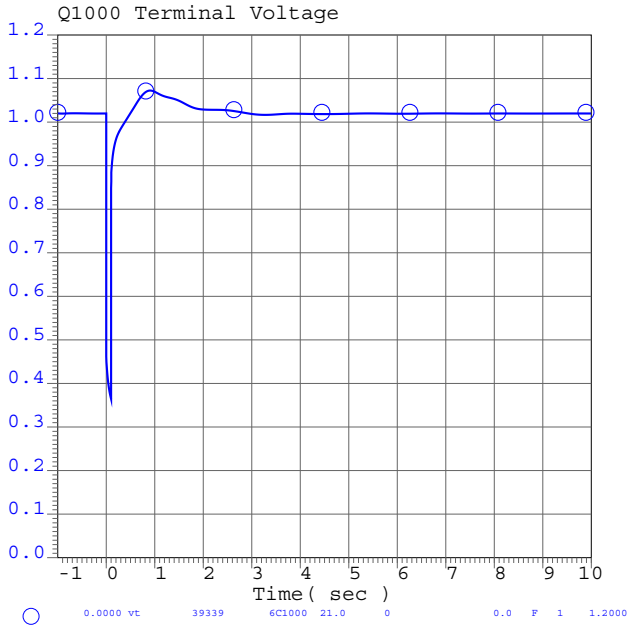


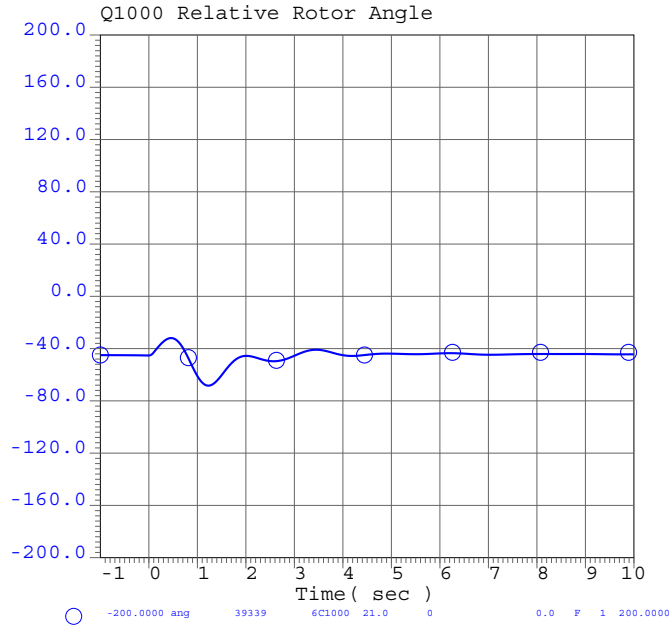
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV Bus
Clear 6C0946SS-Wheeler Ridge #2 230 kV Line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





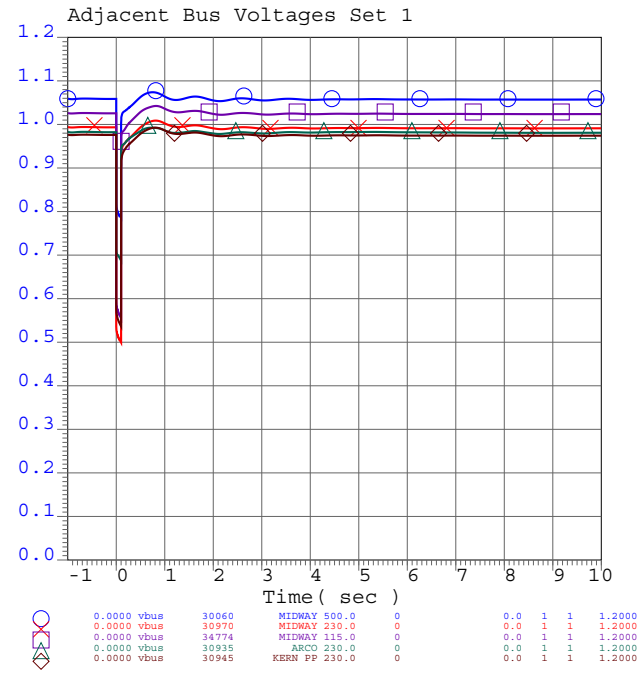


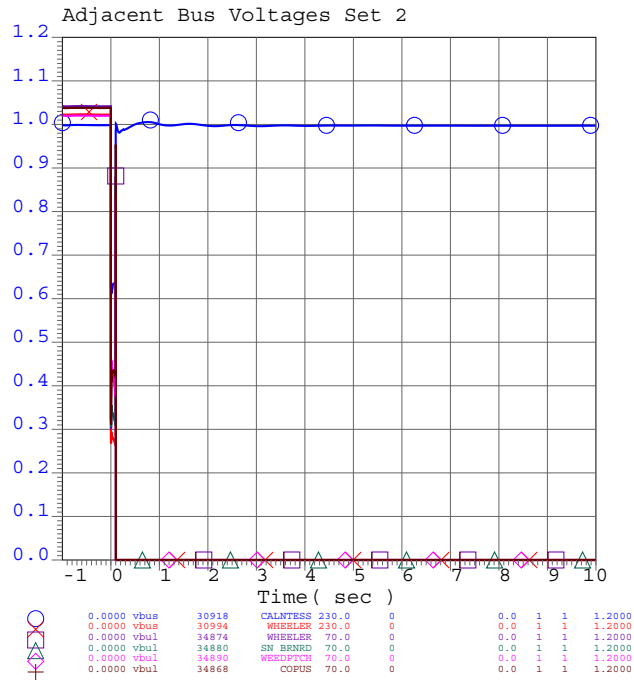


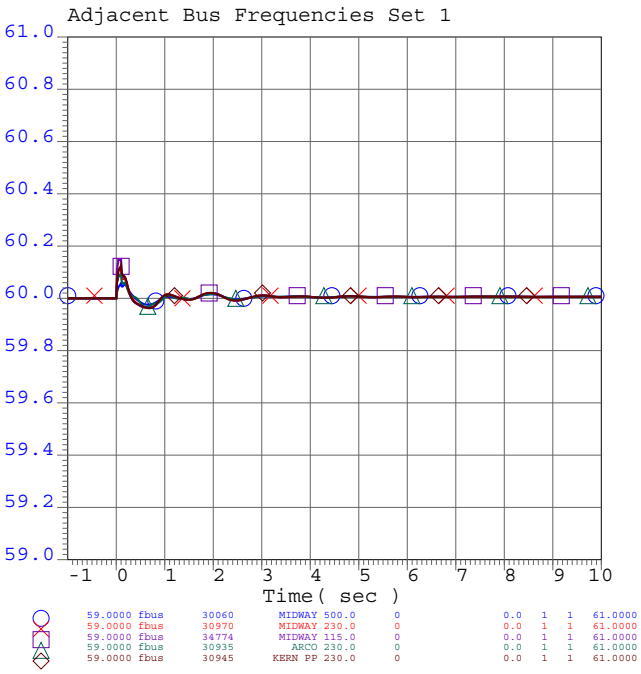
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

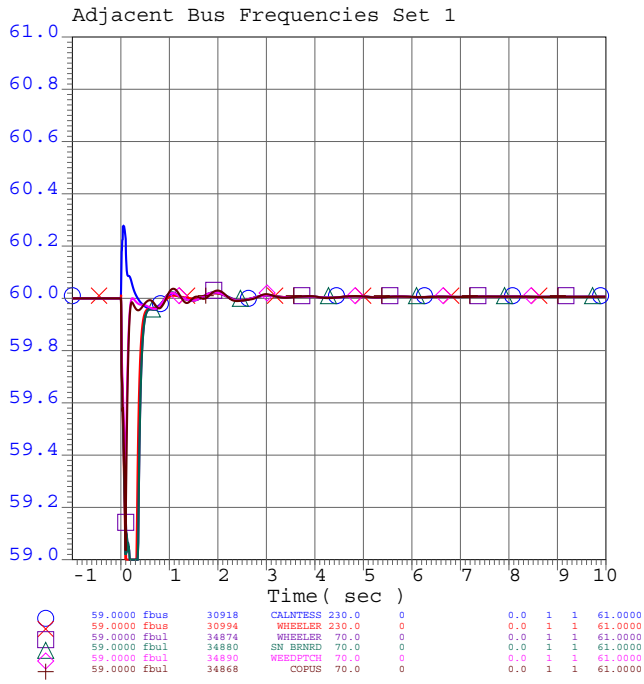
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Tue Dec 24 11:44:03 2013



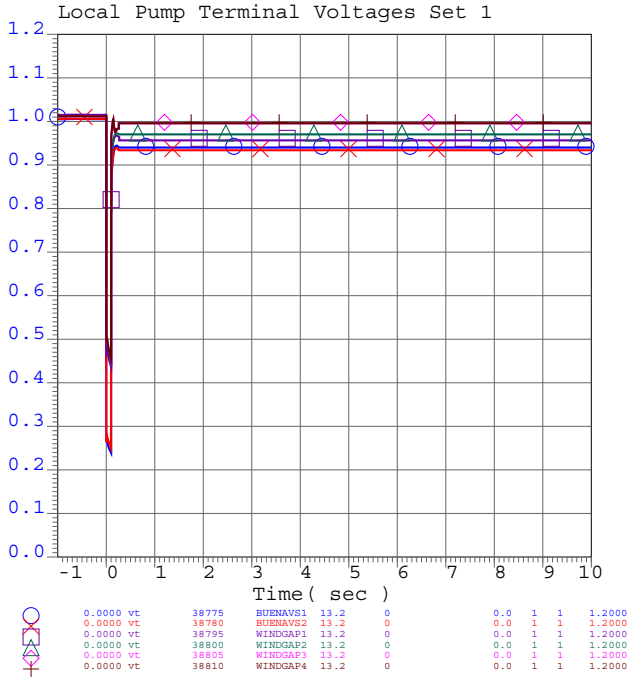




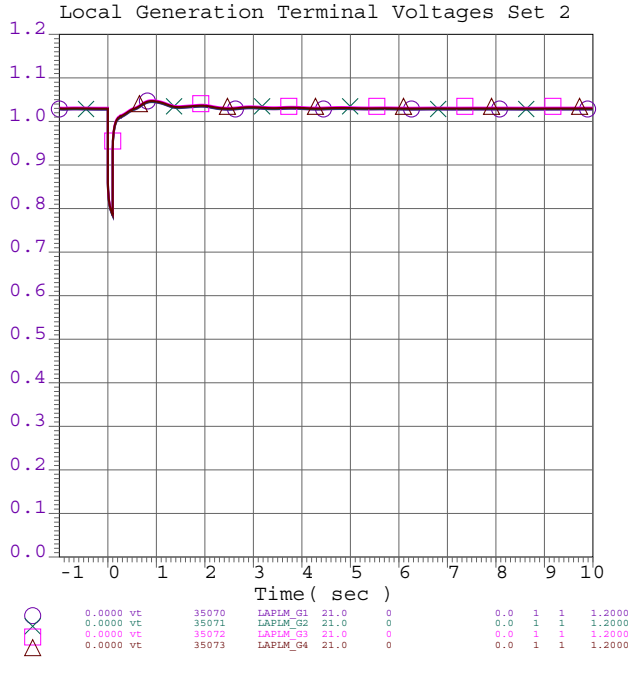


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

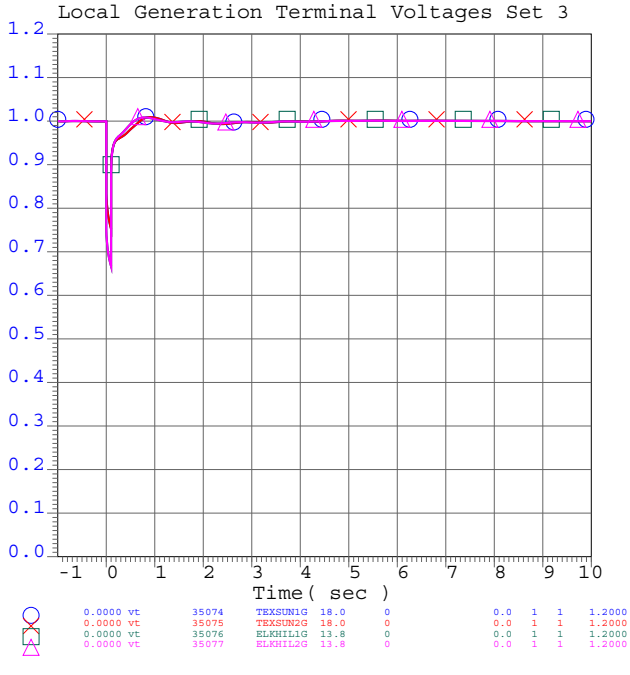
Local Pump Terminal Voltages Set 1



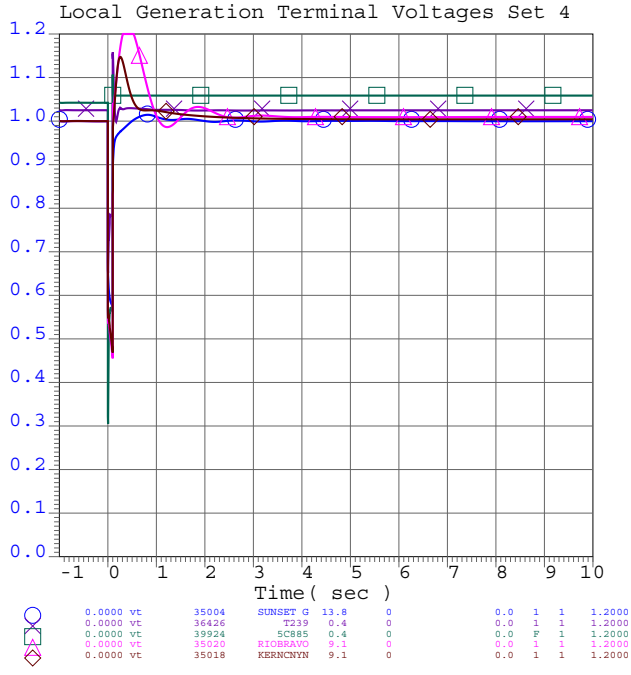
Local Generation Terminal Voltages Set 2



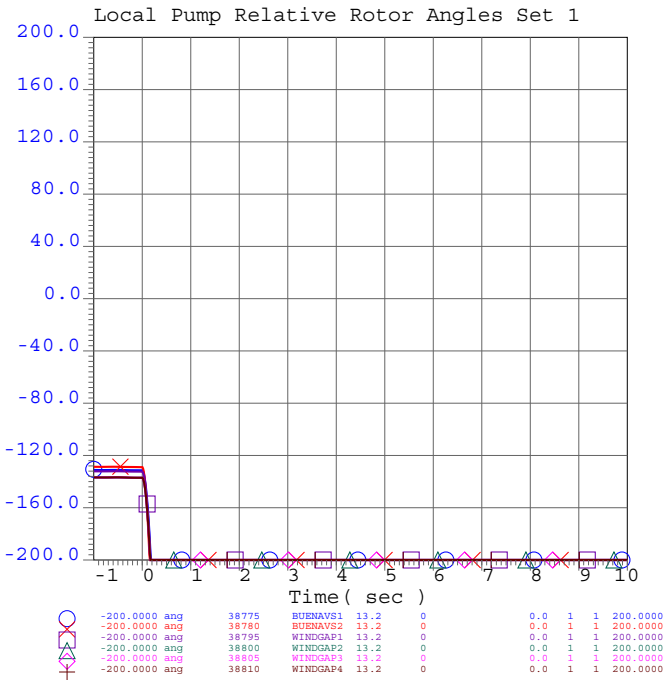
Local Generation Terminal Voltages Set 3

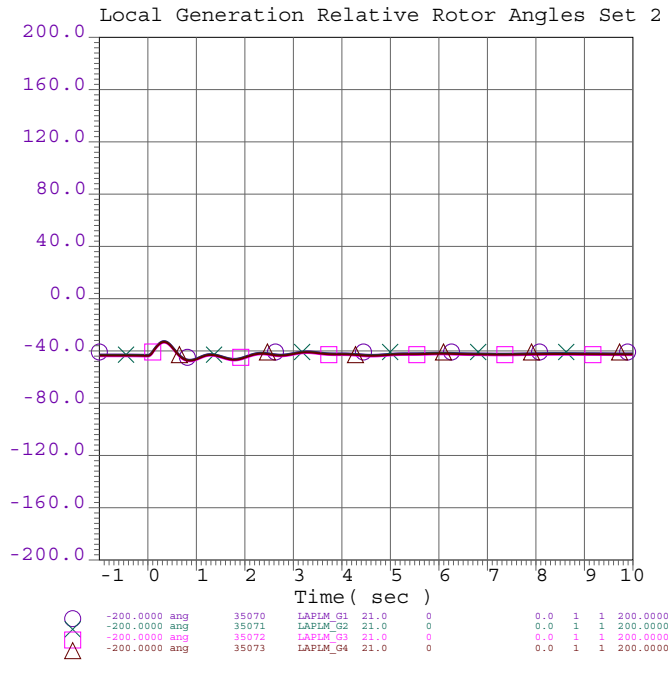


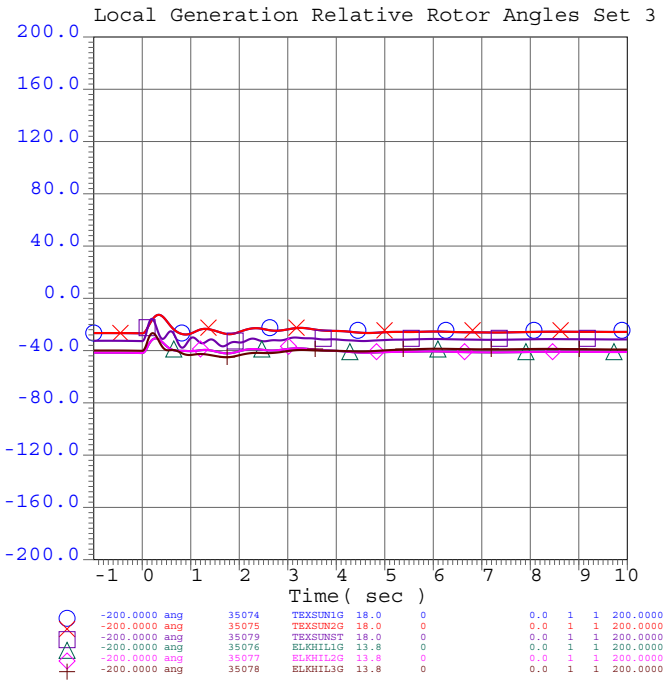
Local Generation Terminal Voltages Set 4

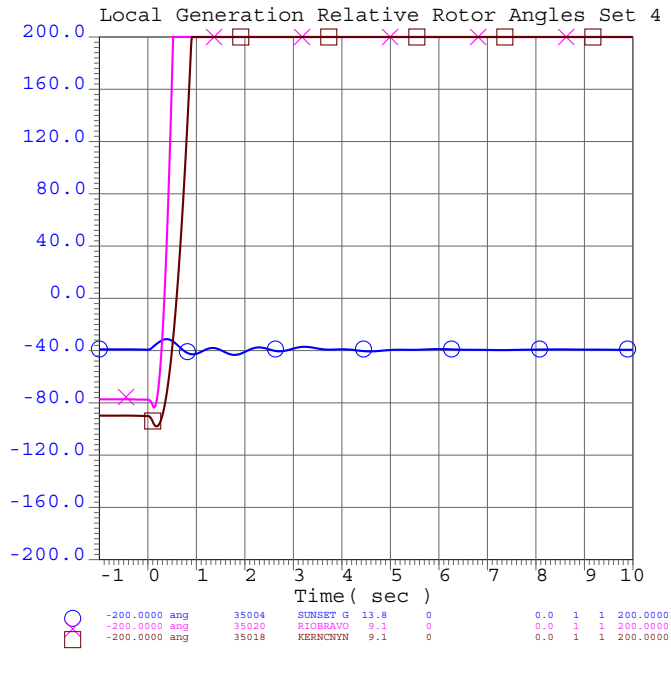


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines



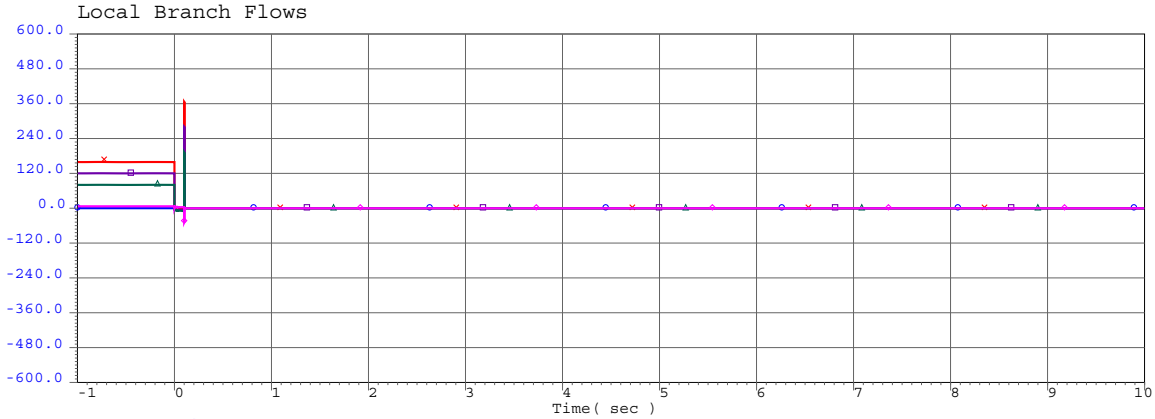






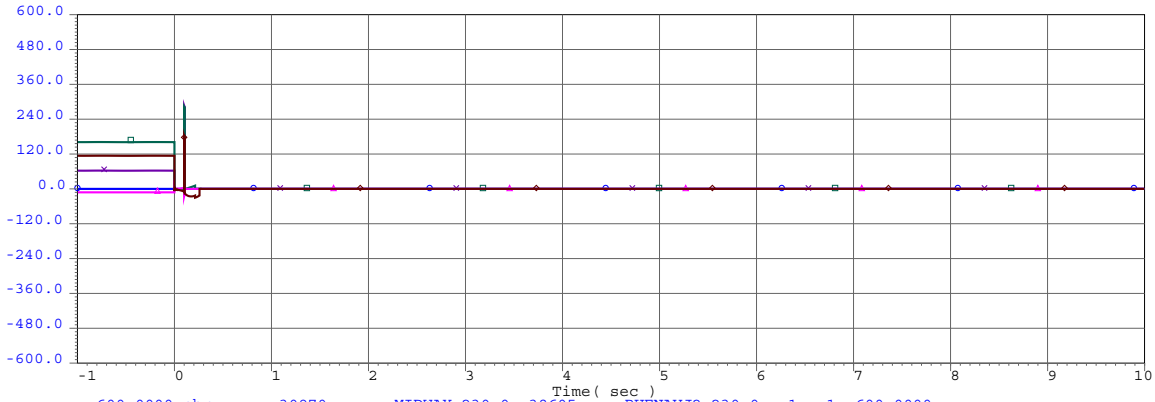
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

Local Branch Flows



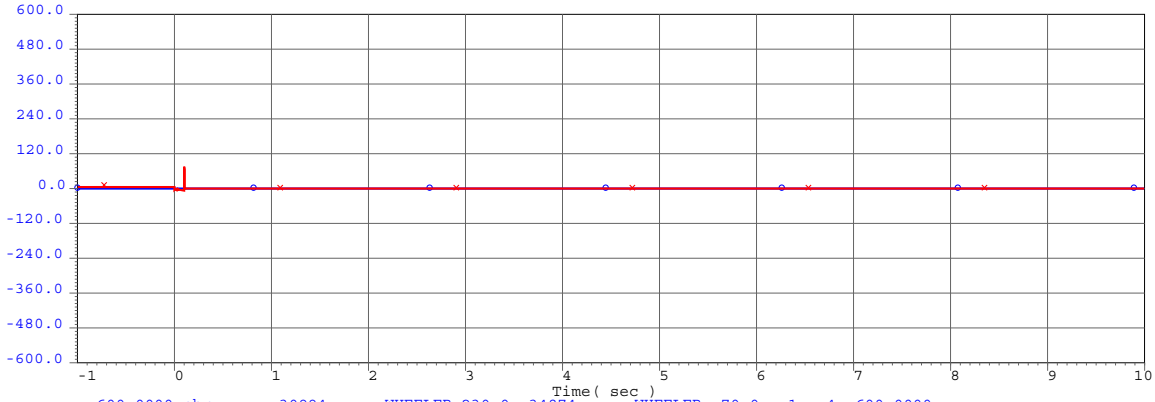
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-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

Local Branch Flows



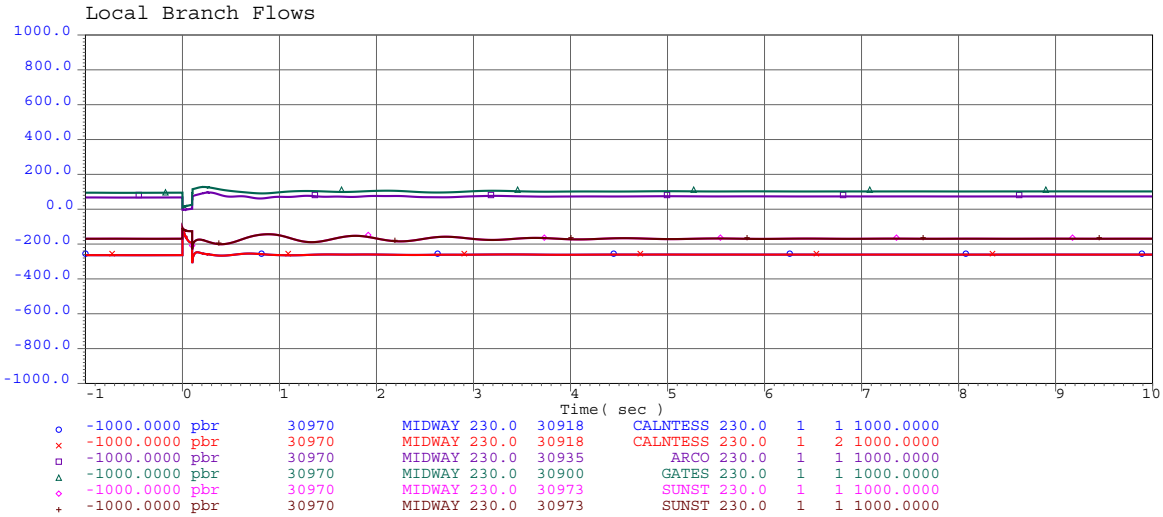
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-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

Local Branch Flows

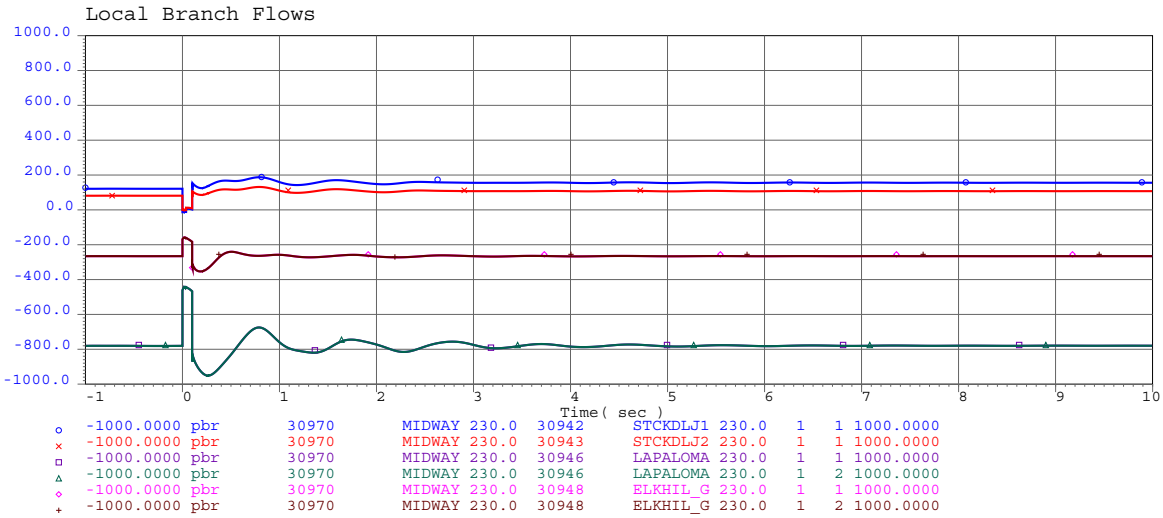


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

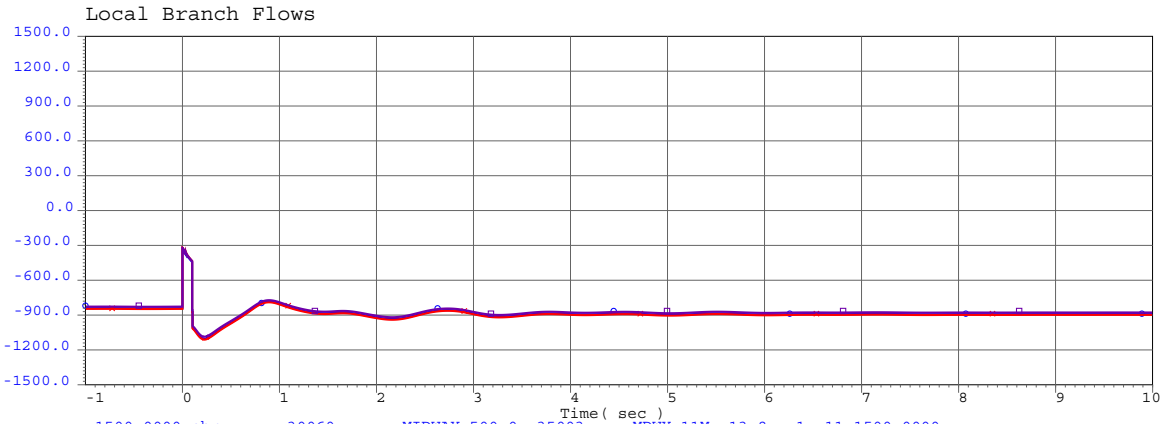
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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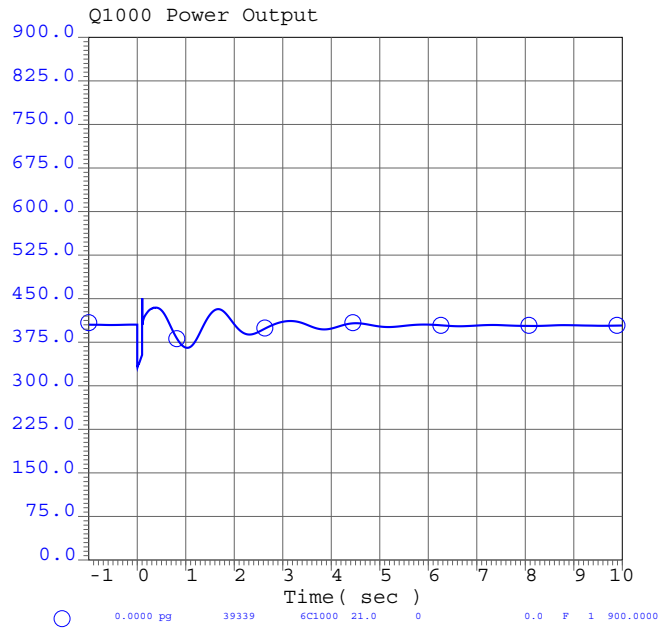
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

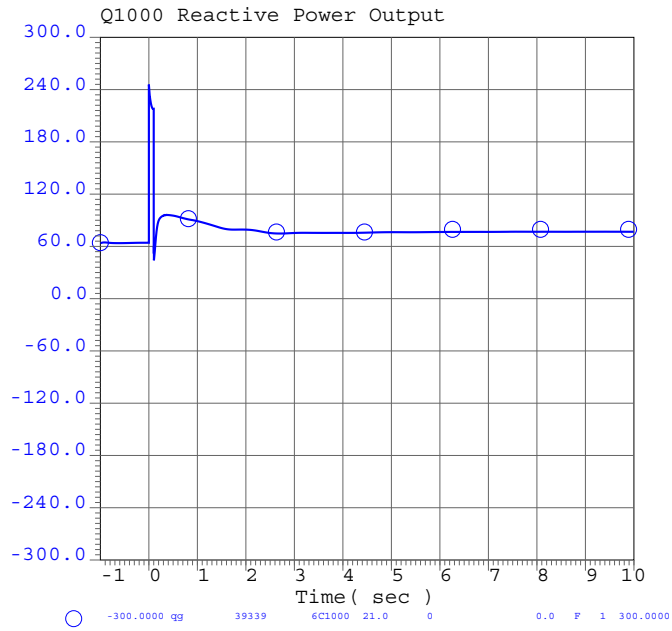


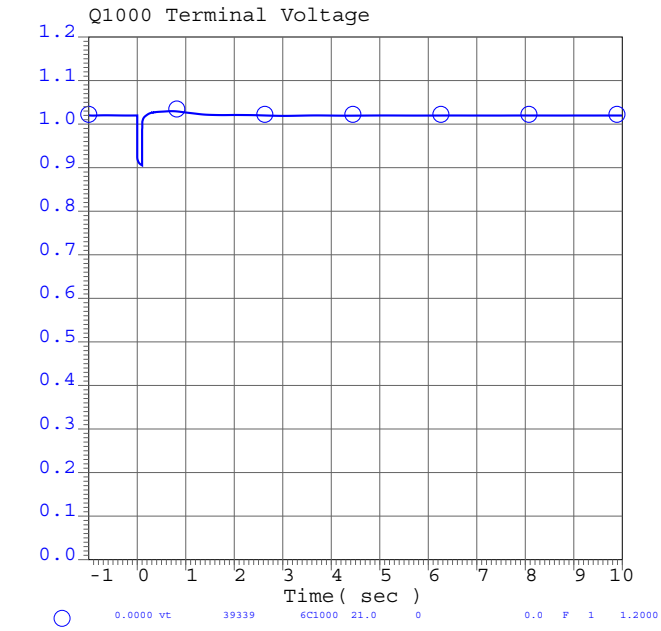
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-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

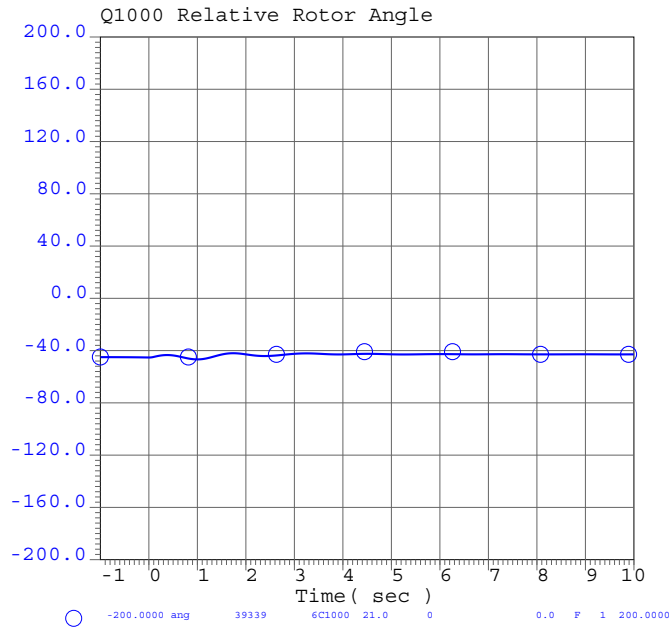
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







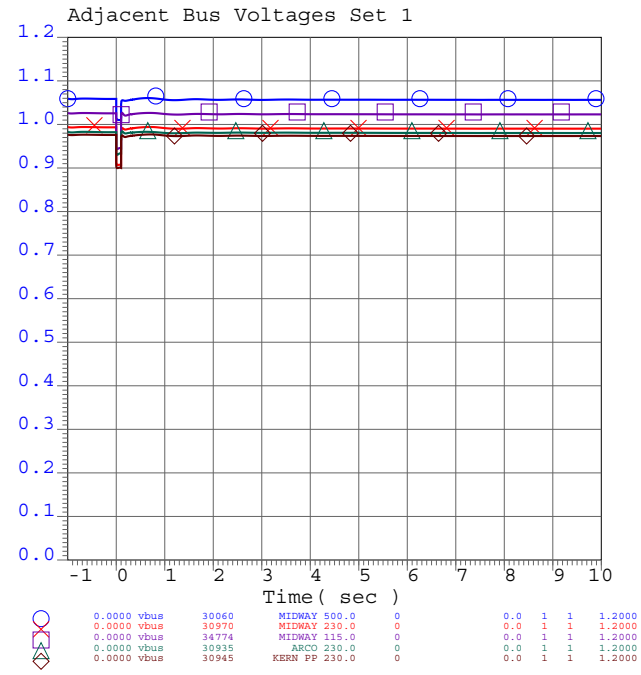


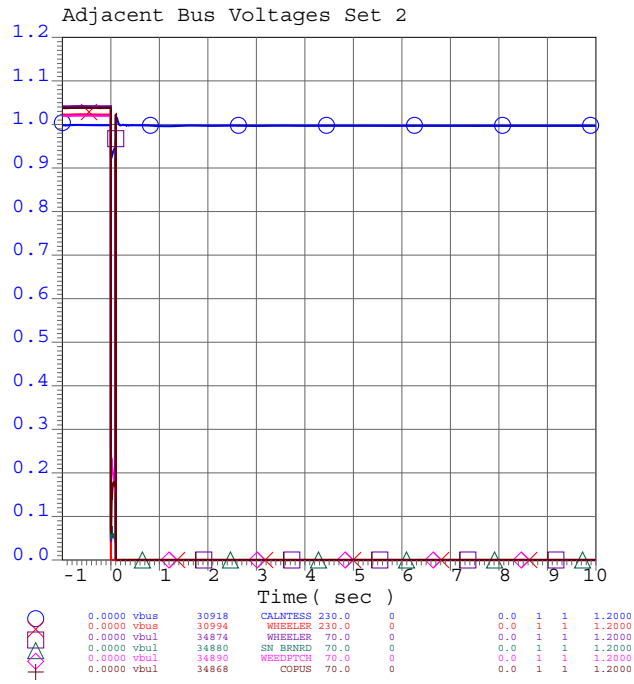
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line

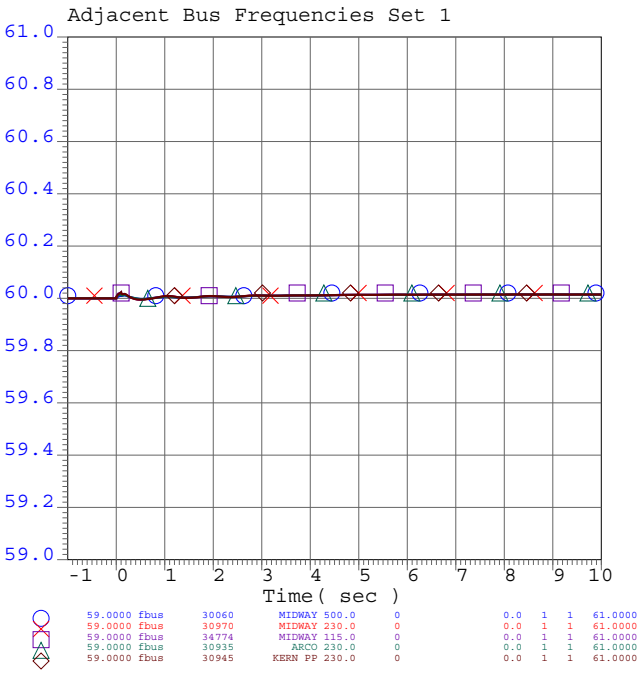
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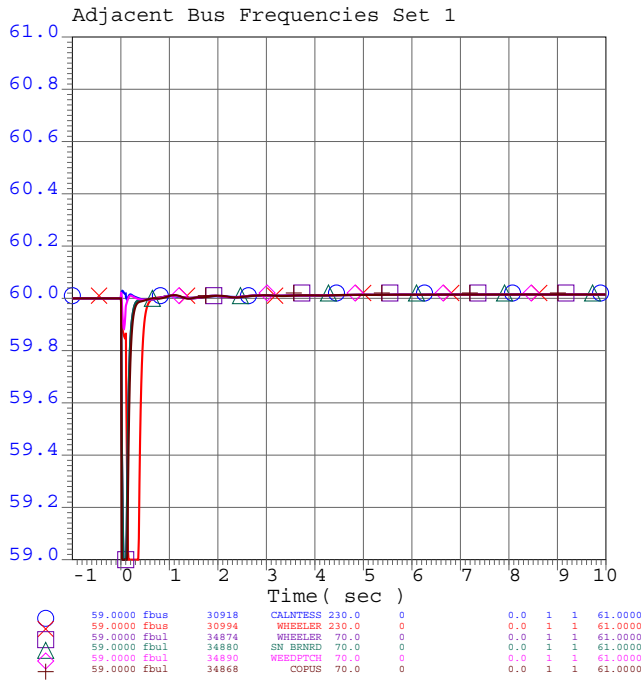
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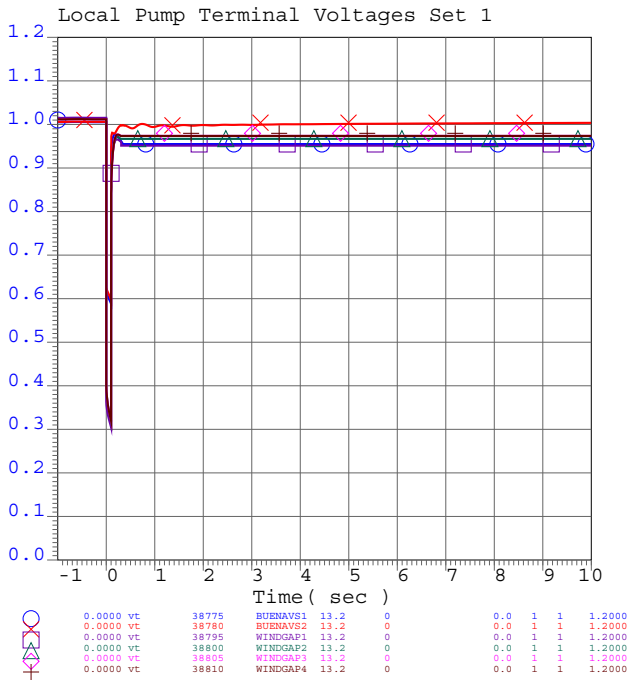


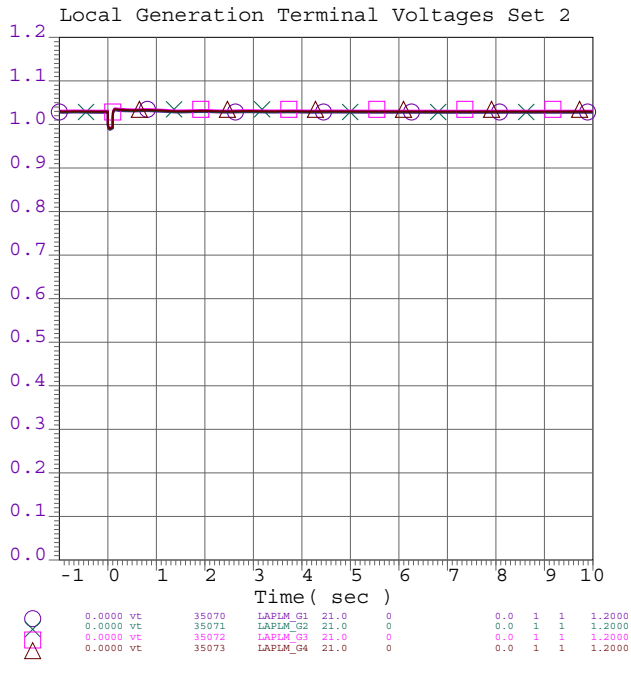


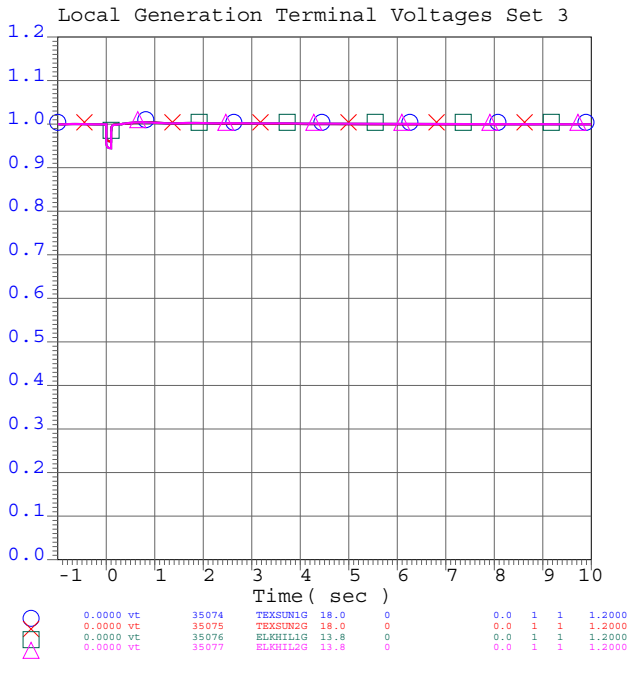


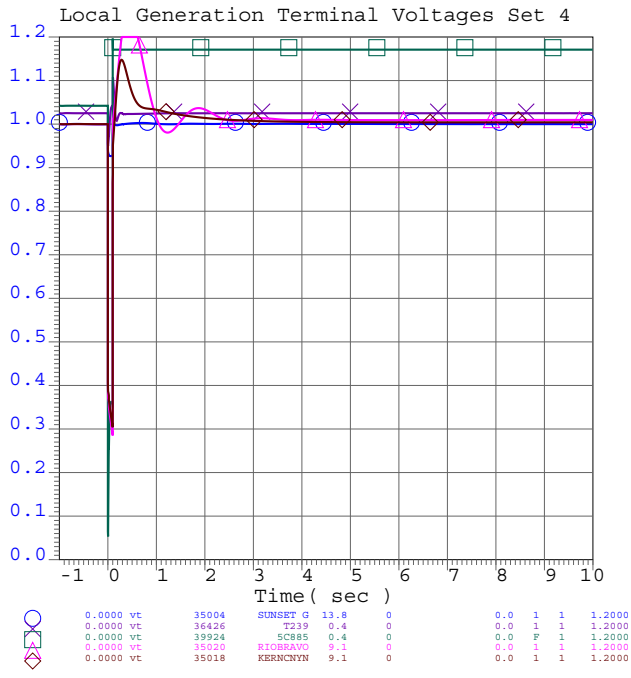


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line

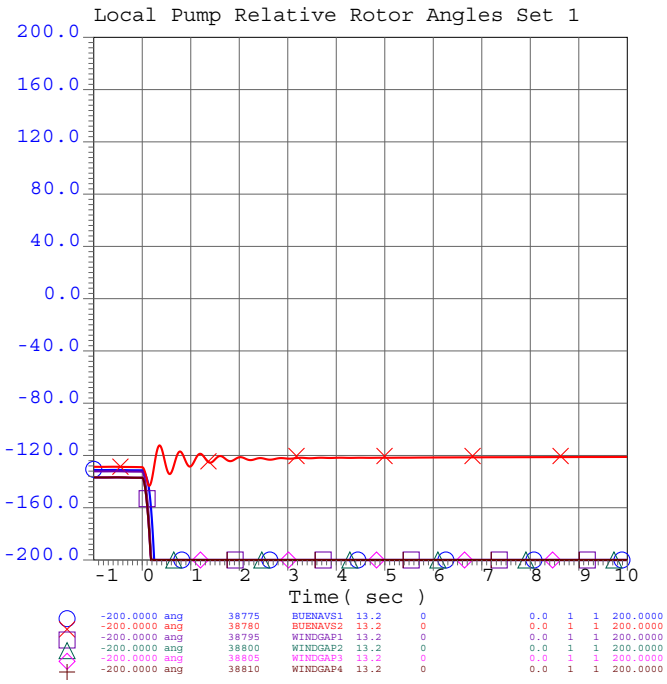


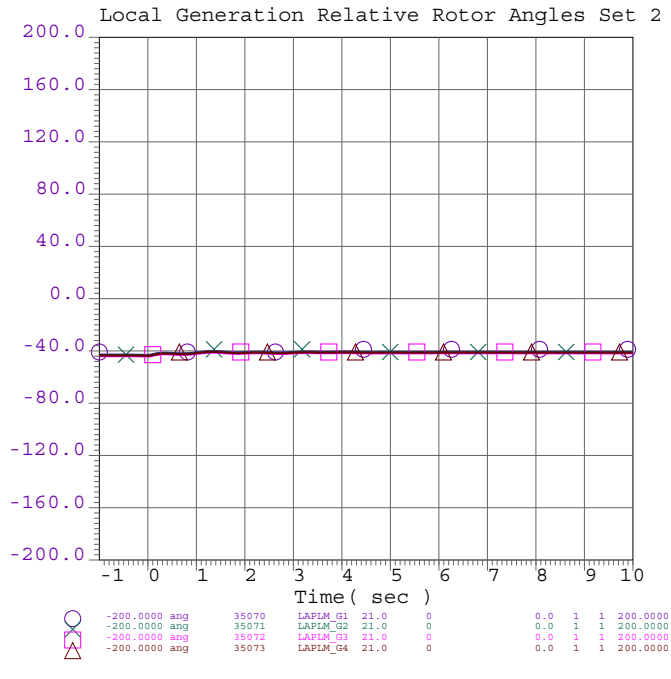


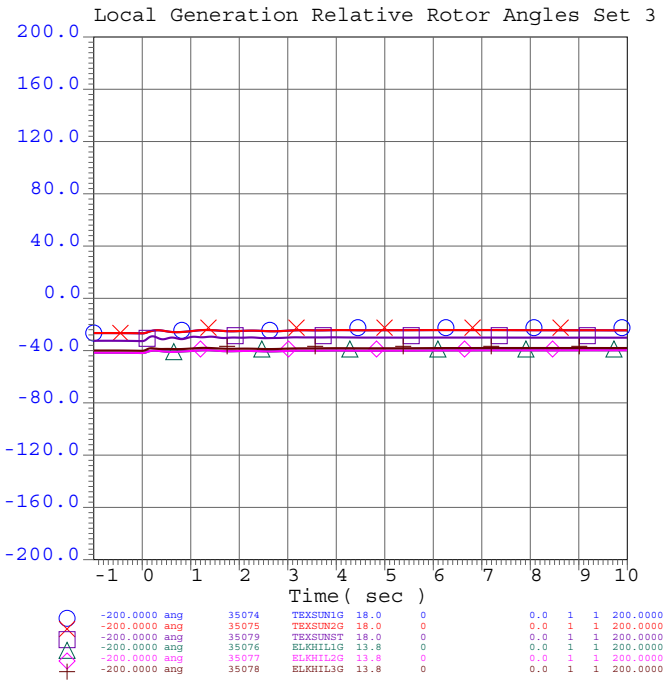


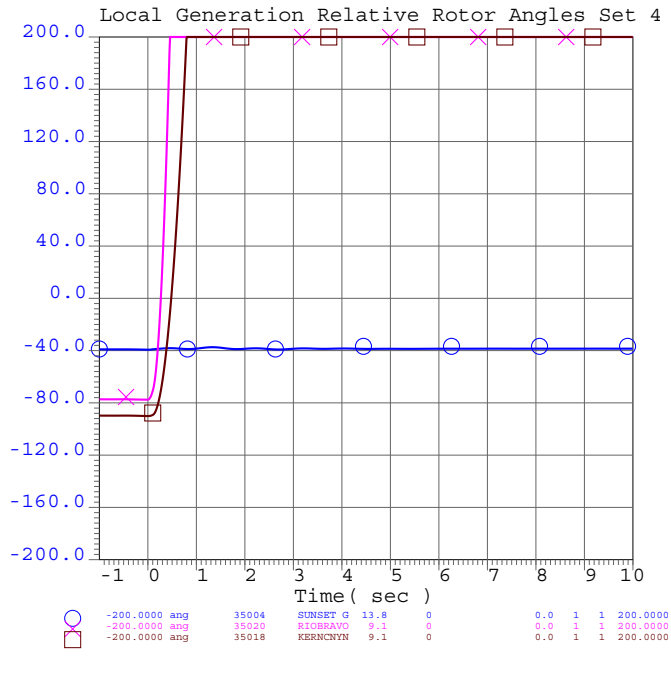


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line



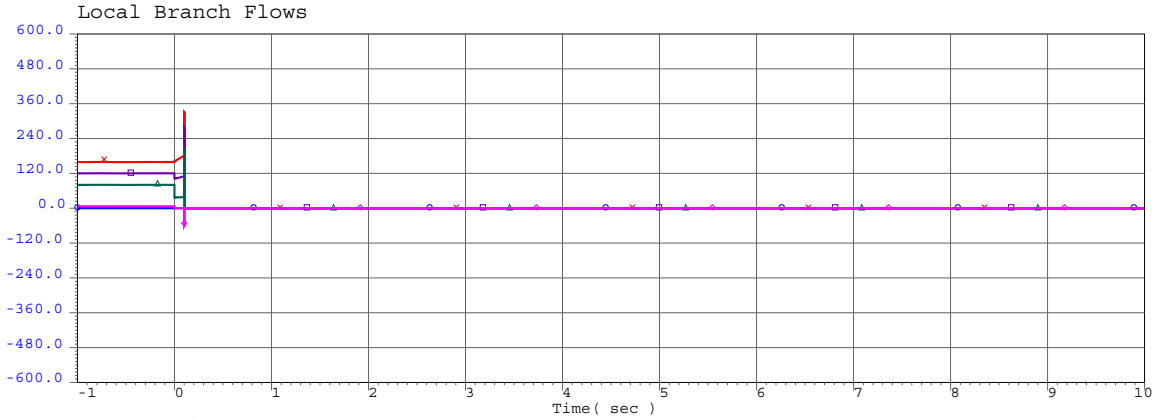






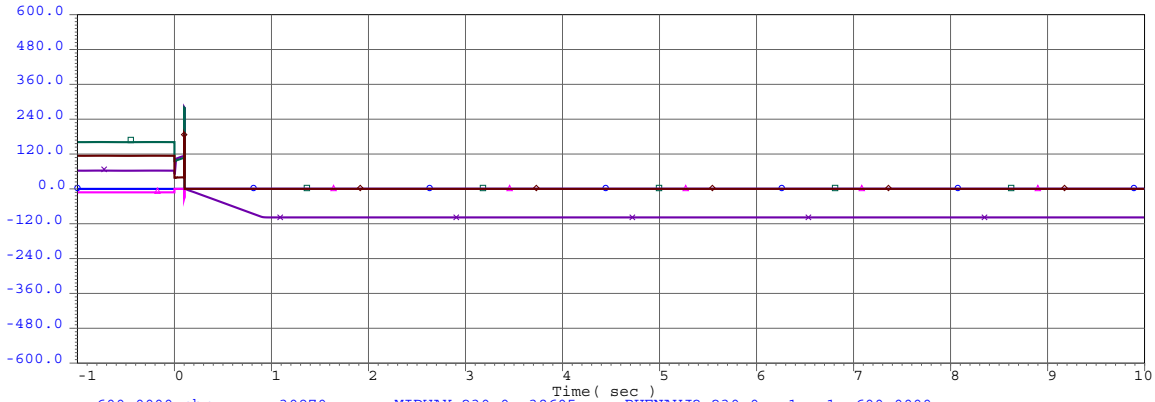
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line

Local Branch Flows



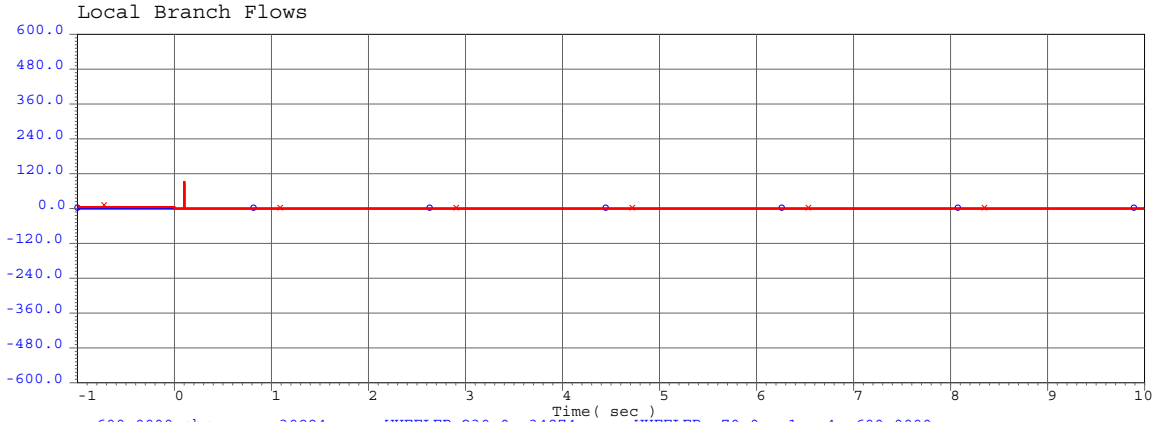
o	-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
x	-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
□	-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
△	-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
◇	-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

Local Branch Flows



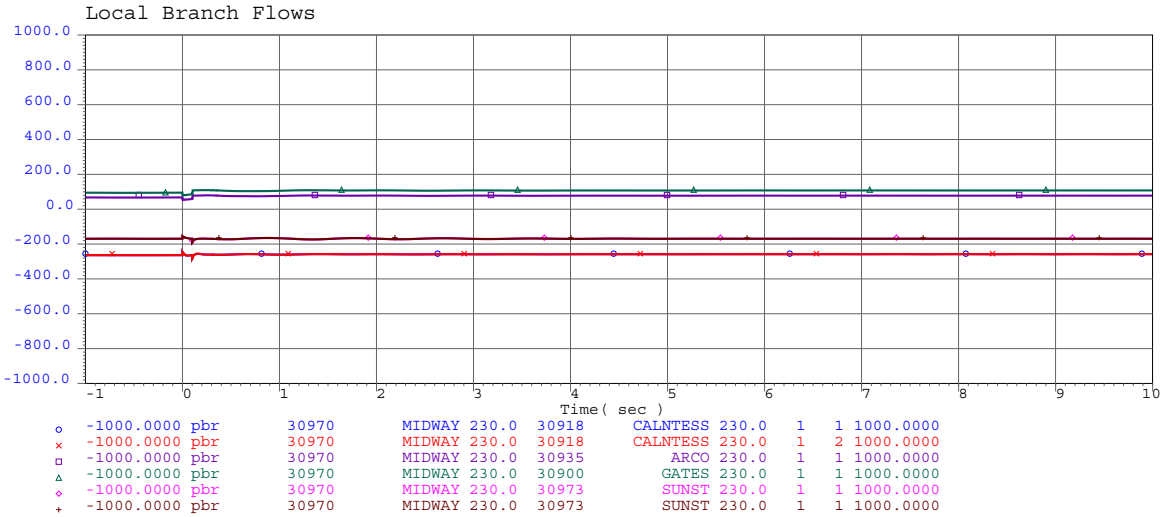
o	-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
x	-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
□	-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
△	-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
◇	-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

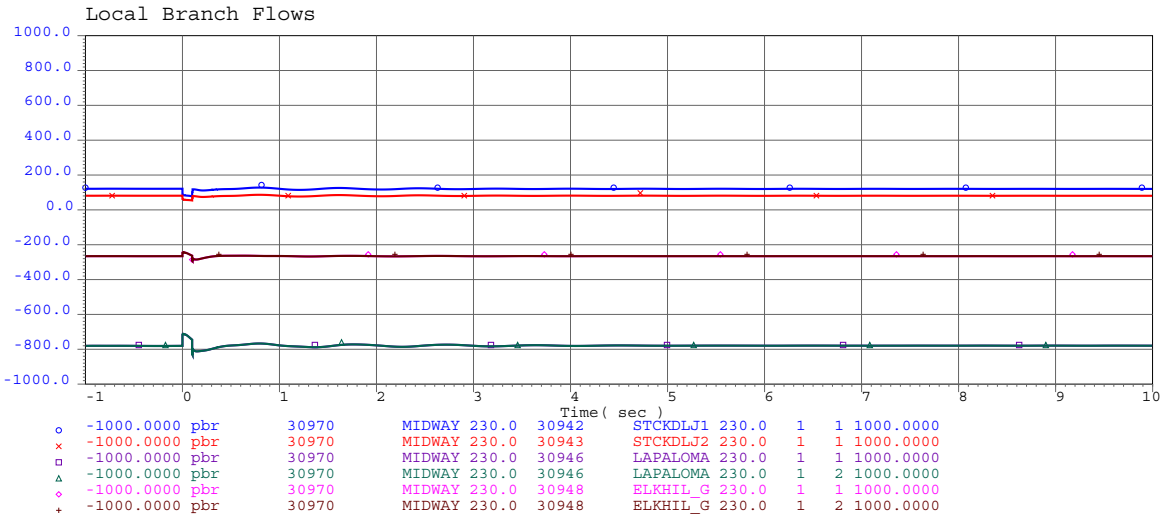
Local Branch Flows

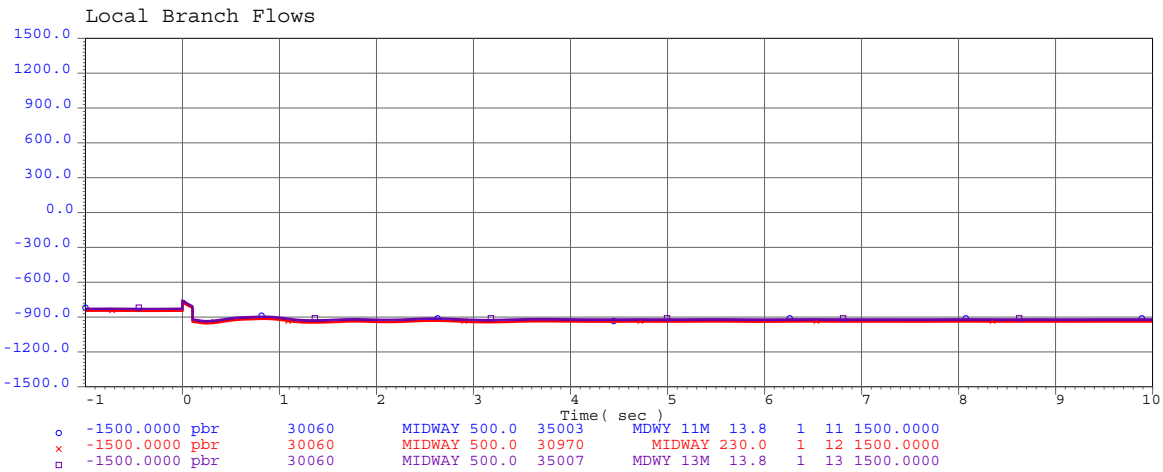


o	-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
x	-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line

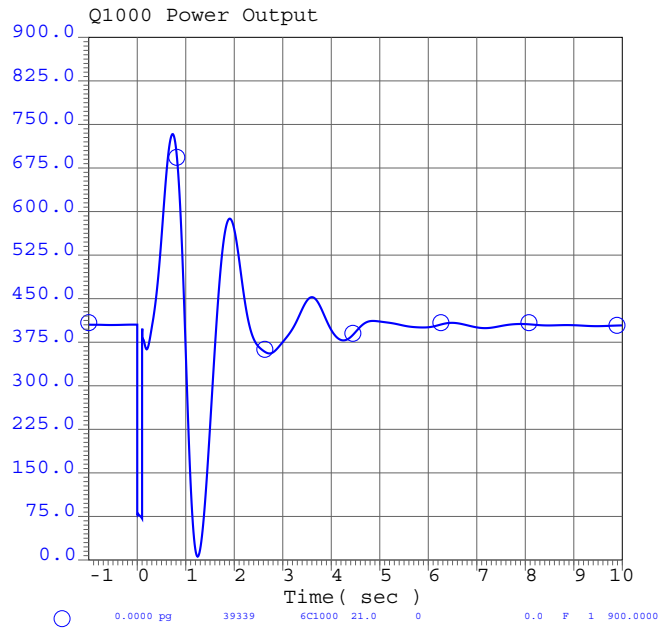


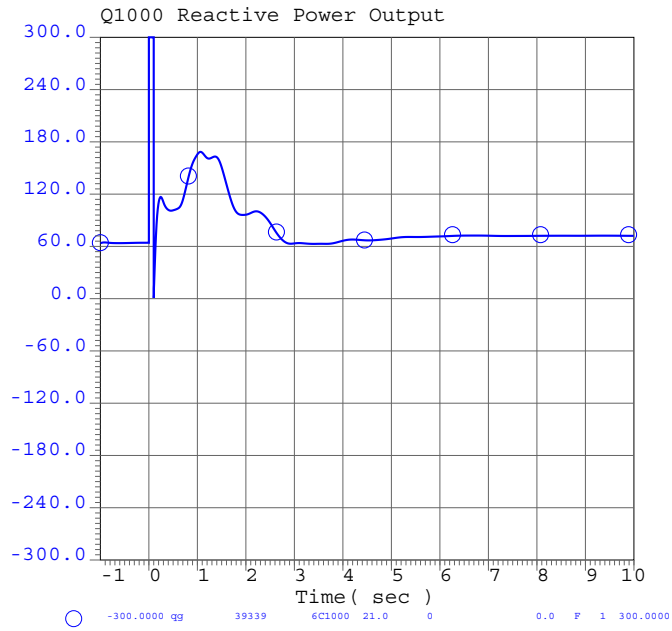


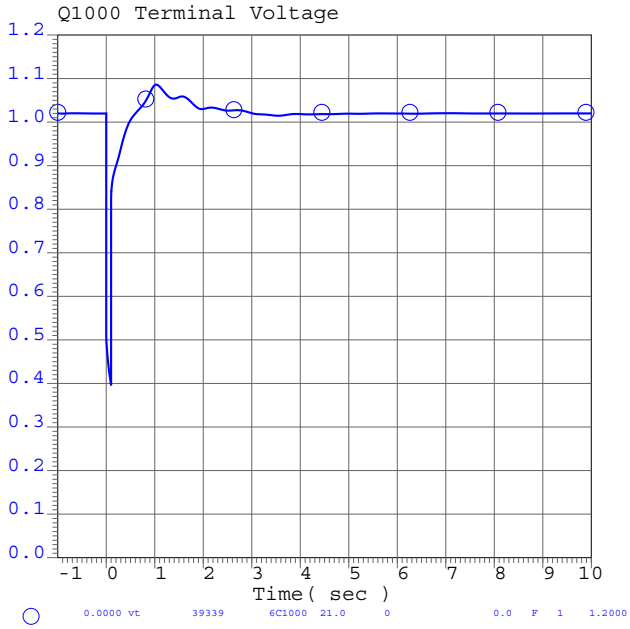


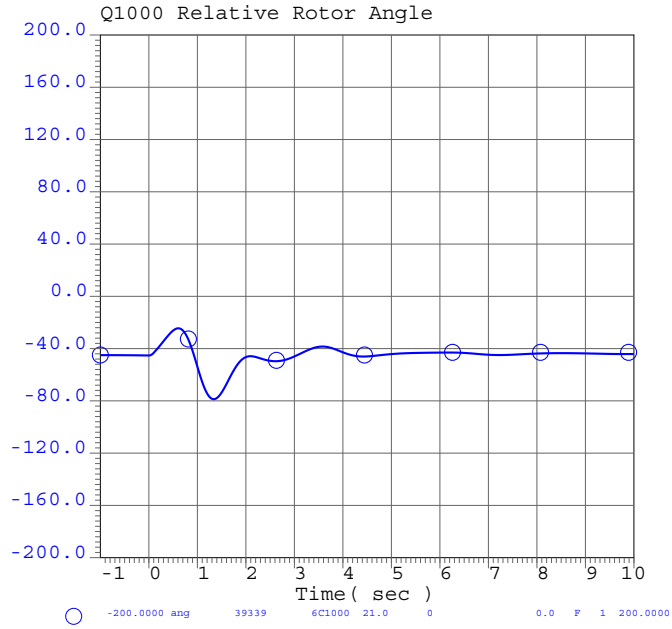
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Wheeler Ridge 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C0946SS-Wheeler Ridge #2 230 kV Line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







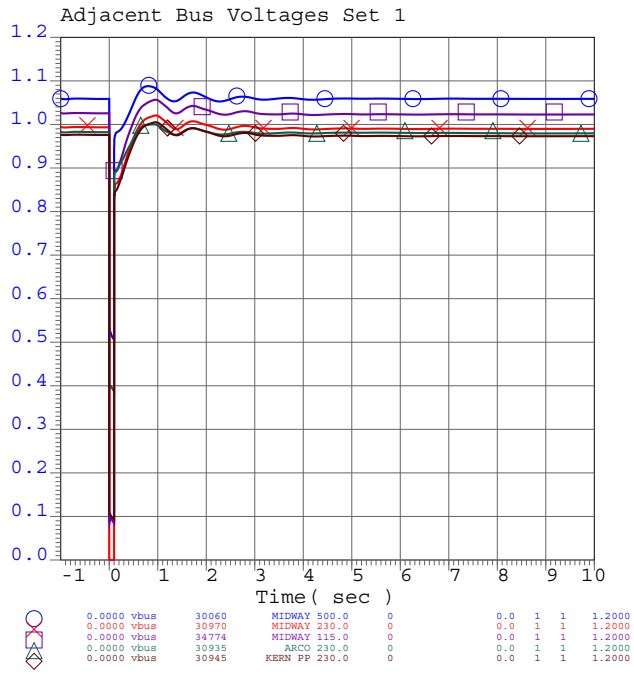


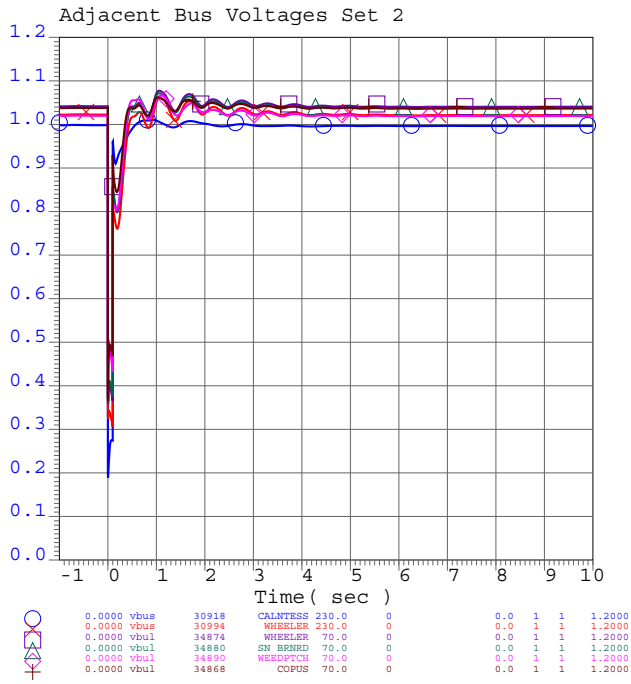
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

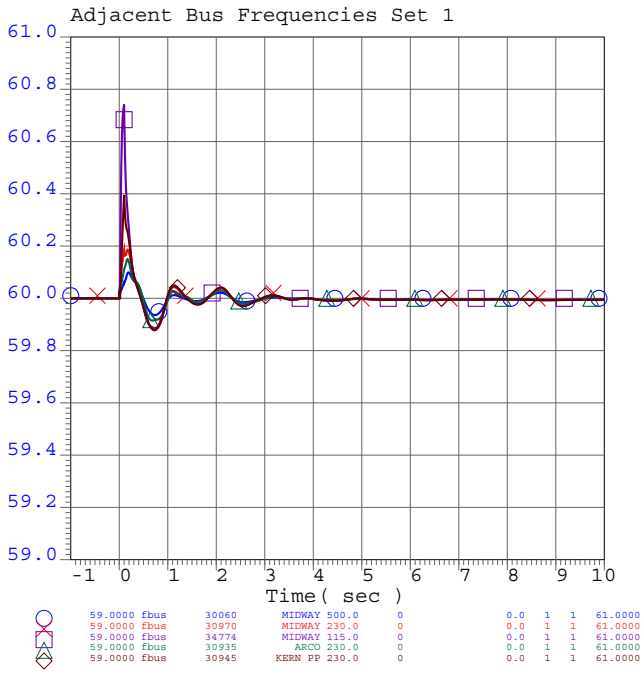
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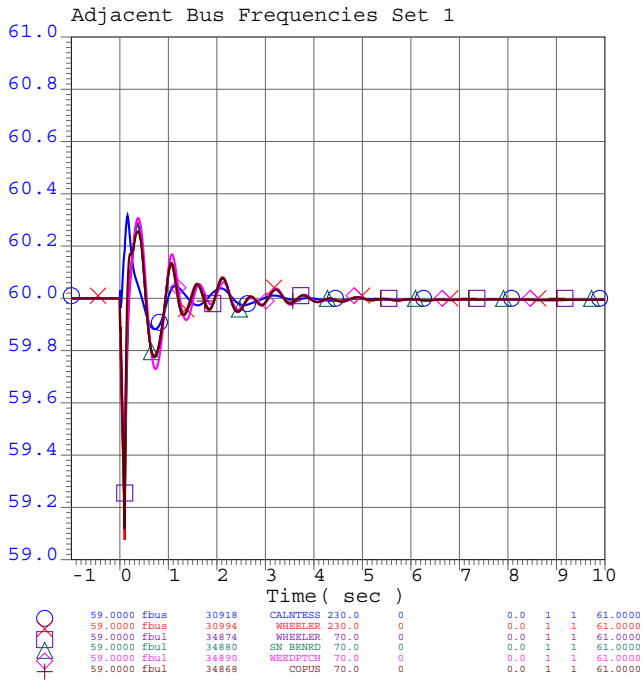
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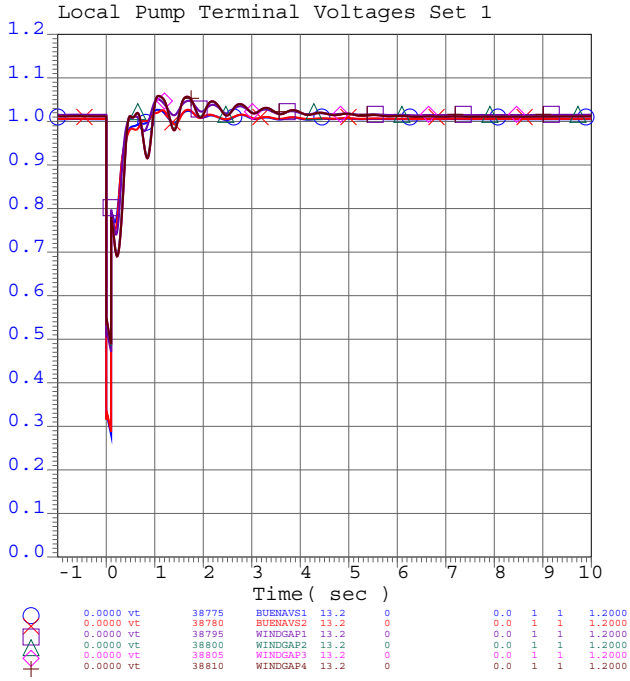






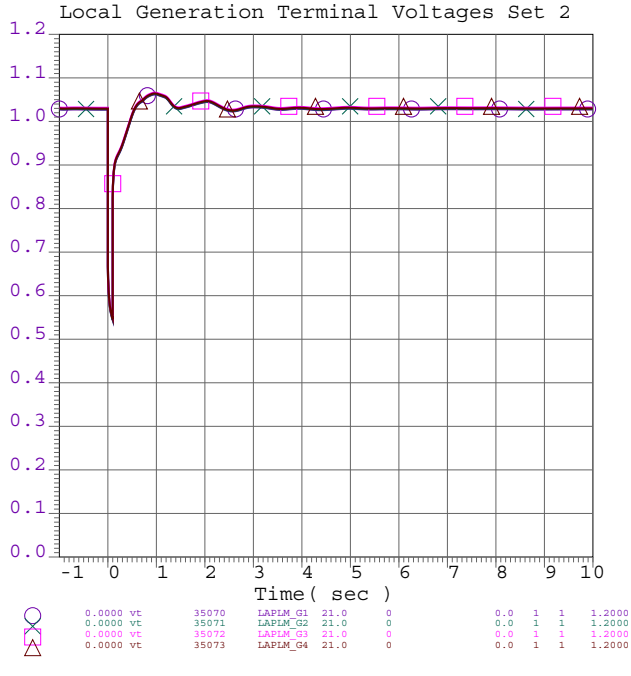
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

Local Pump Terminal Voltages Set 1



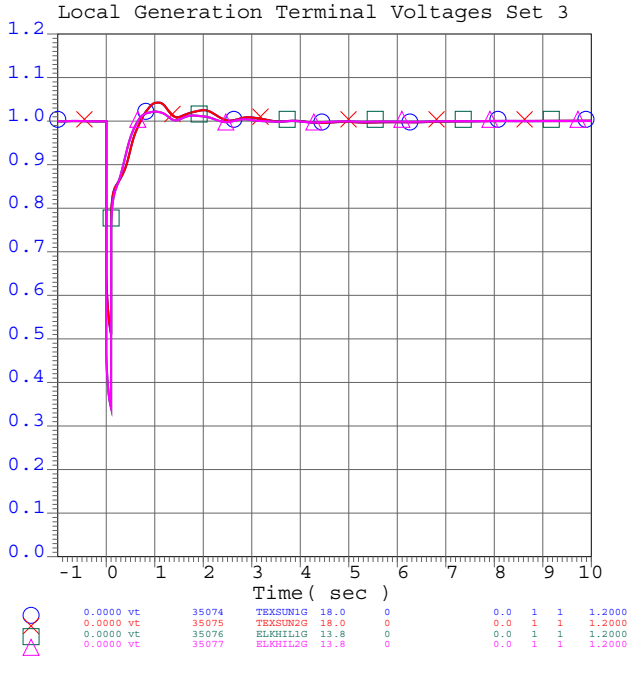
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
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Local Generation Terminal Voltages Set 2



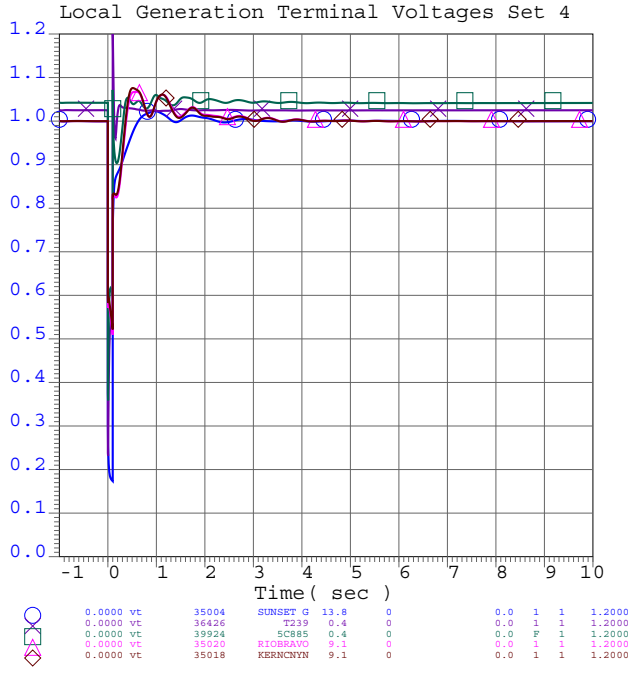
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



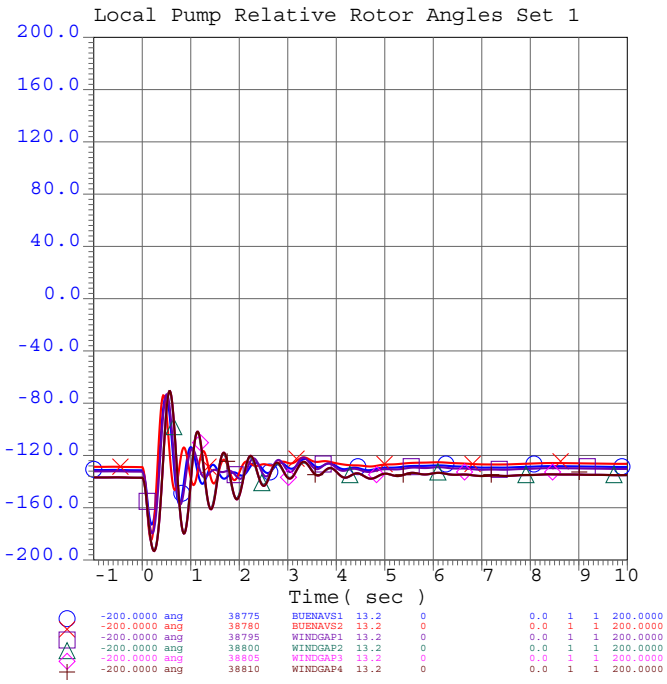
0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

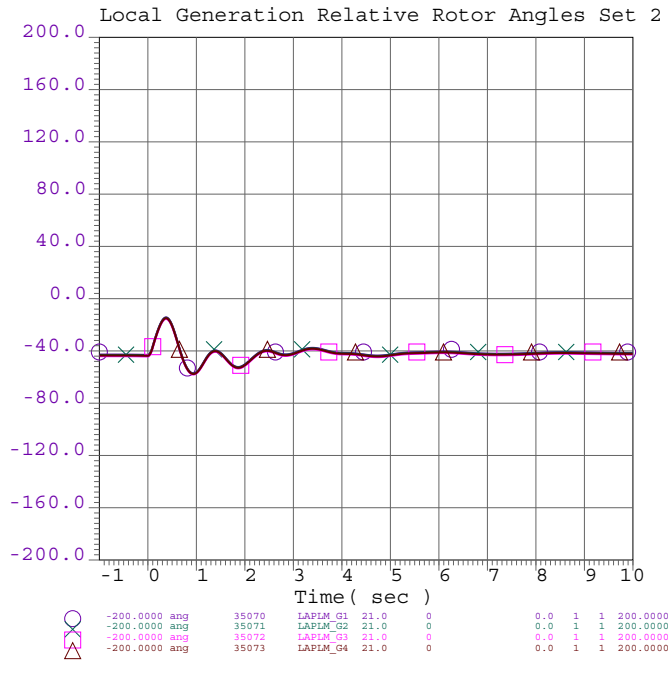
Local Generation Terminal Voltages Set 4

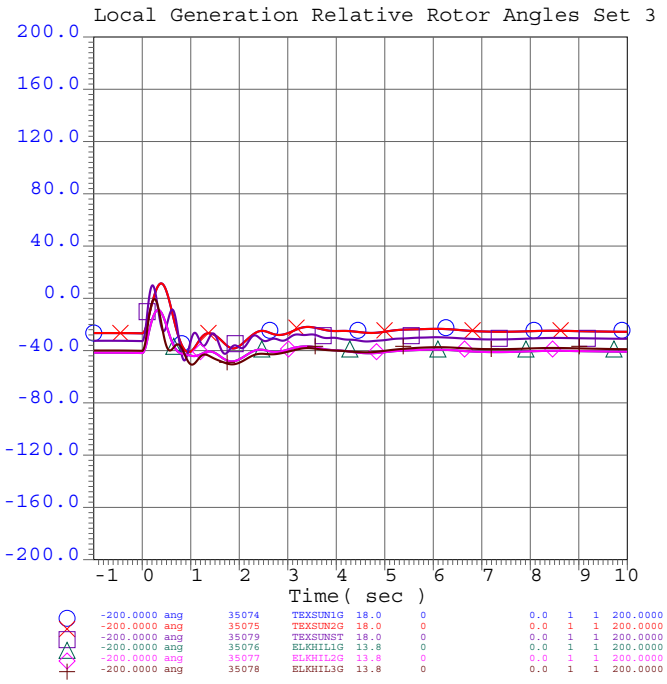


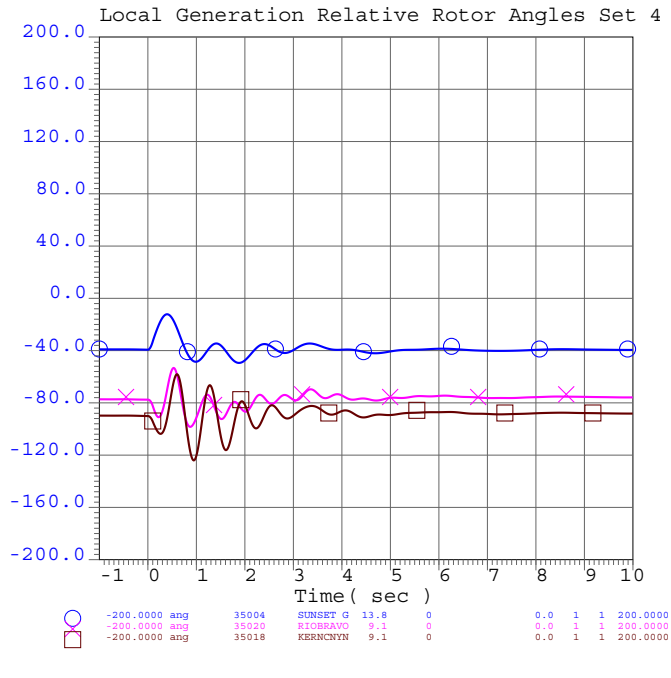
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

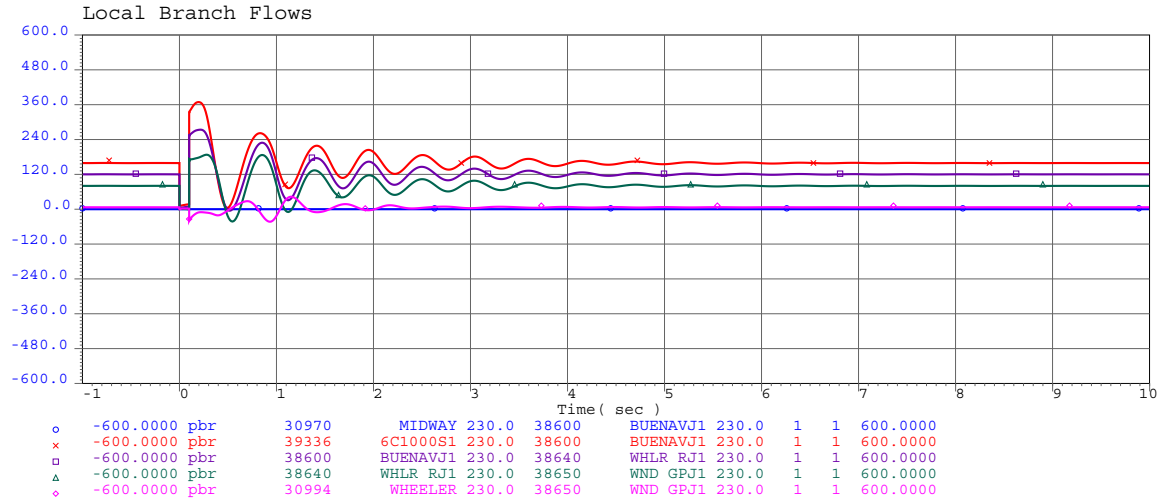




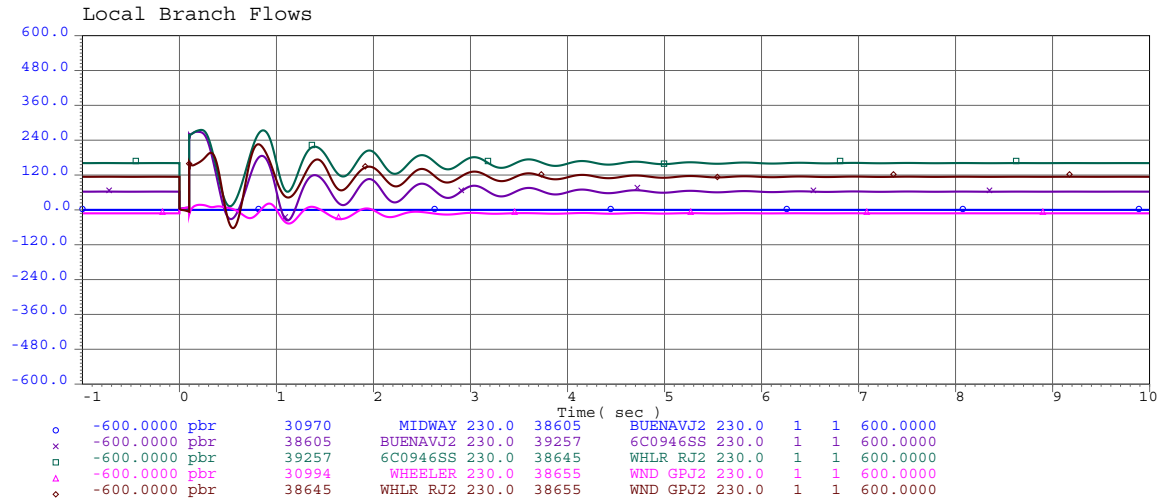




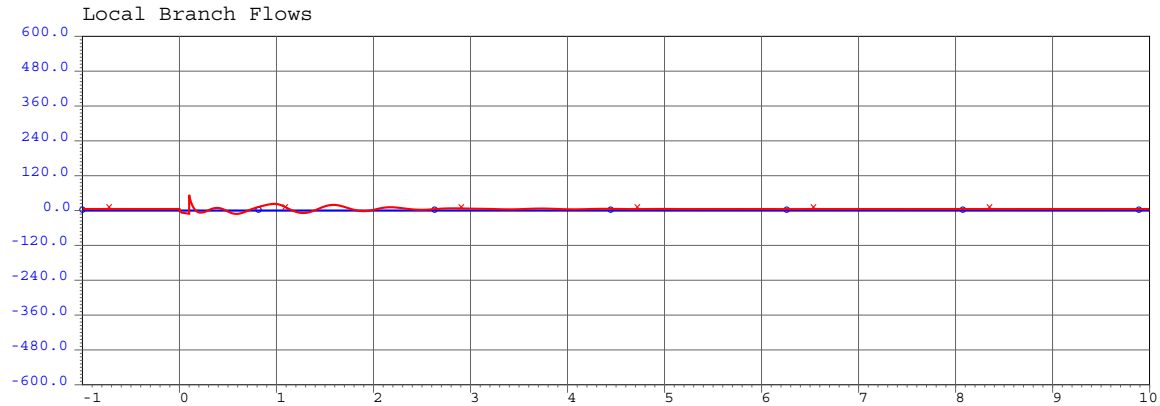
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

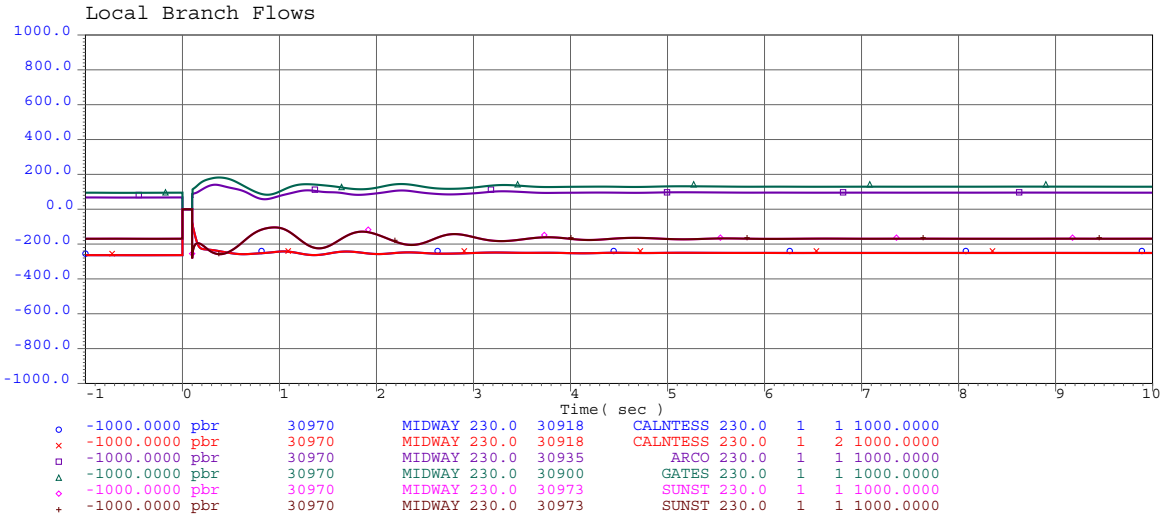


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

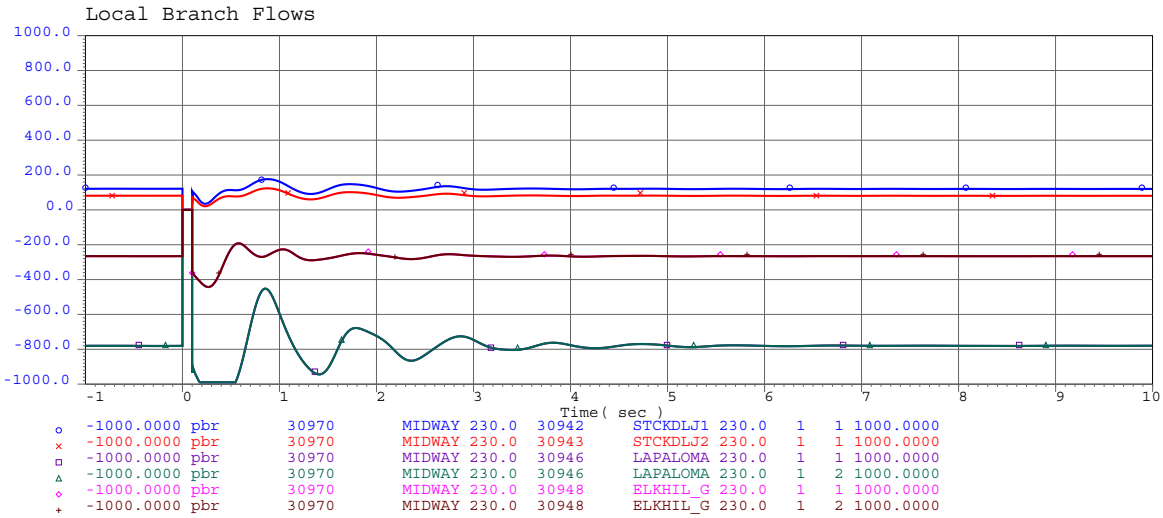


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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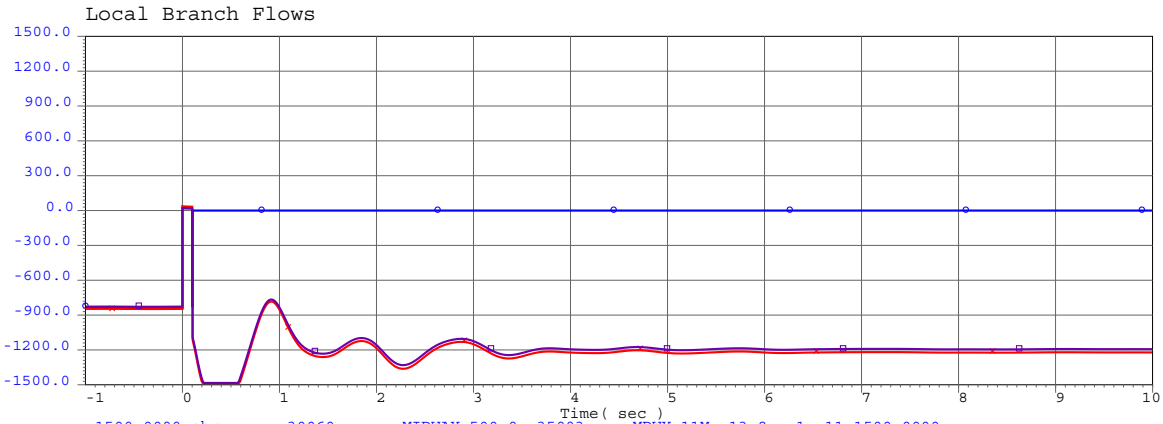
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



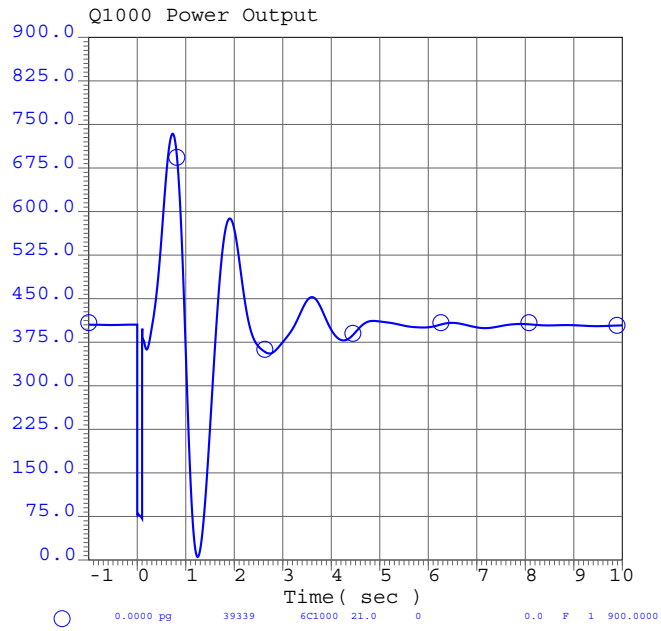
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

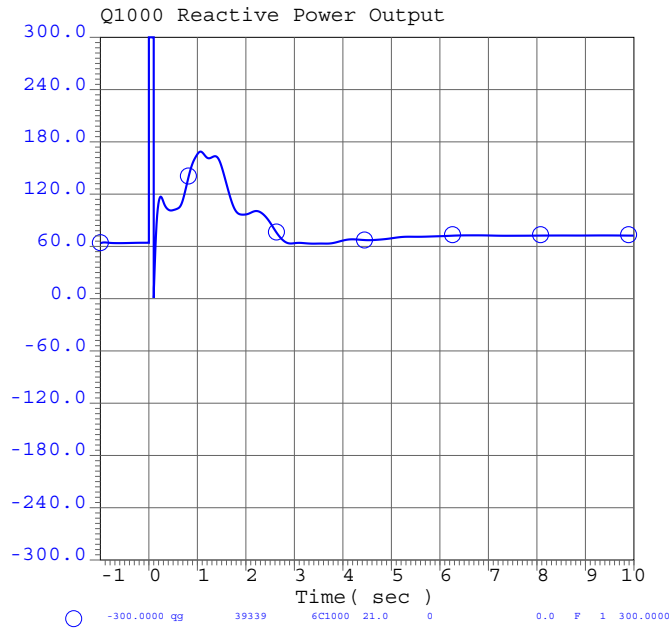


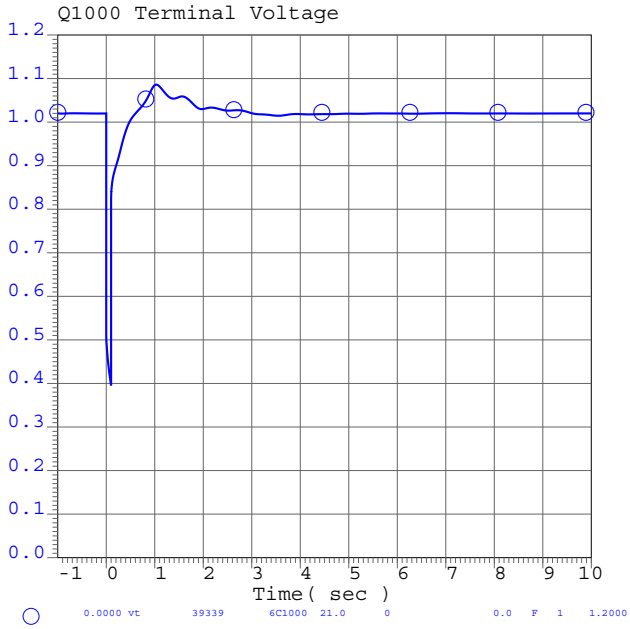
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

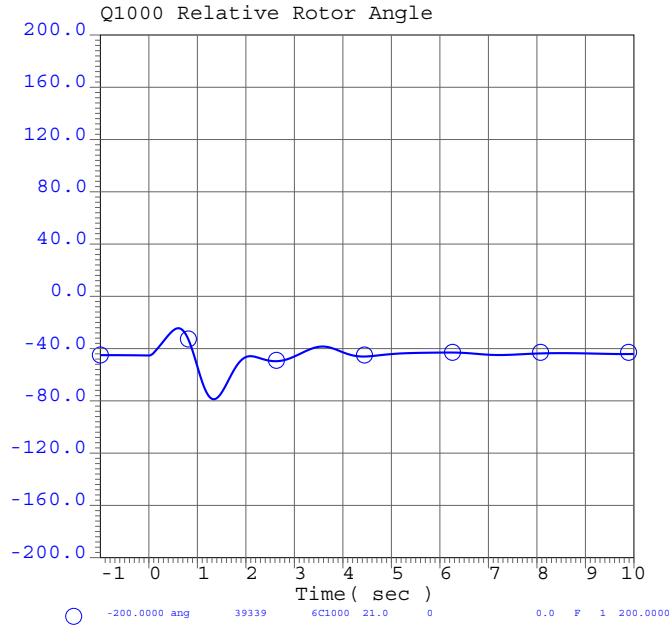
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #11

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







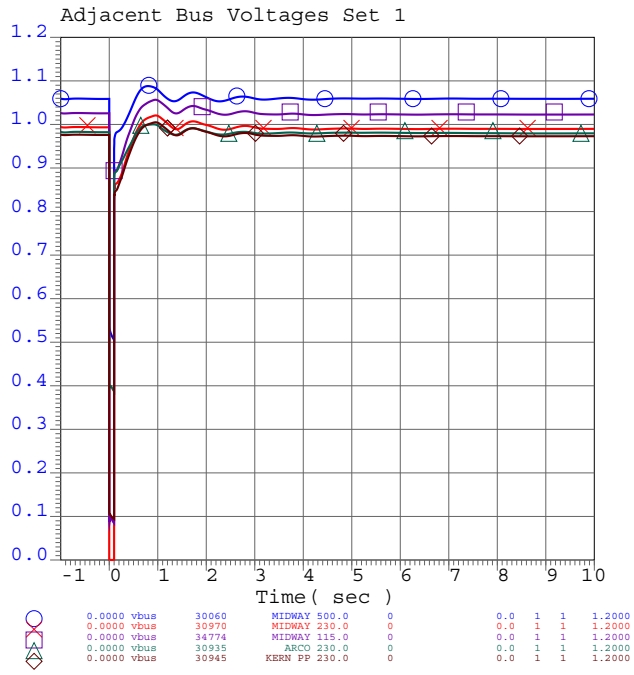


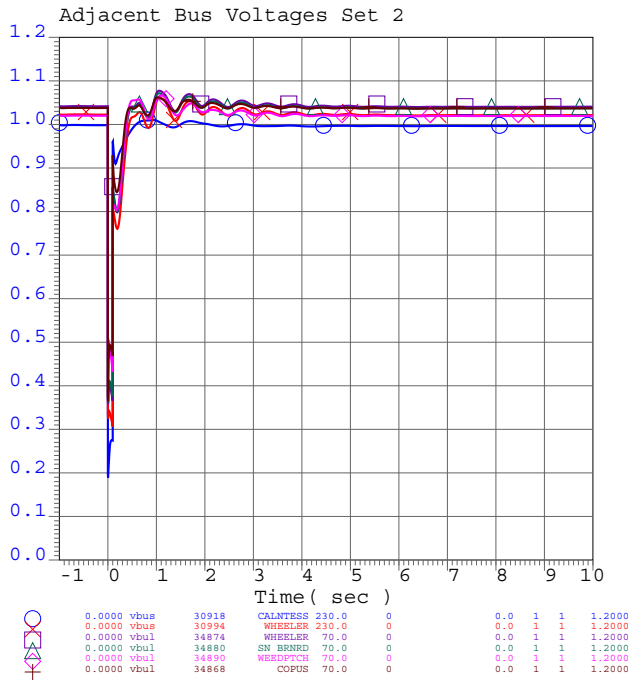
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

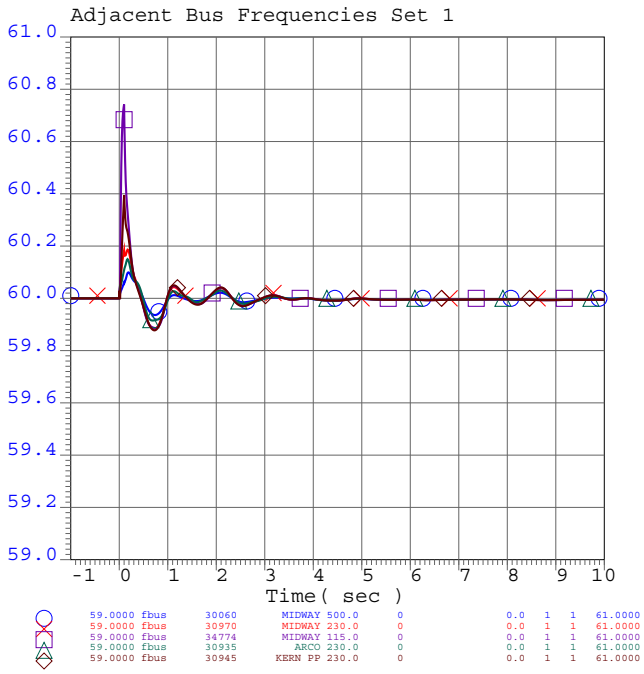
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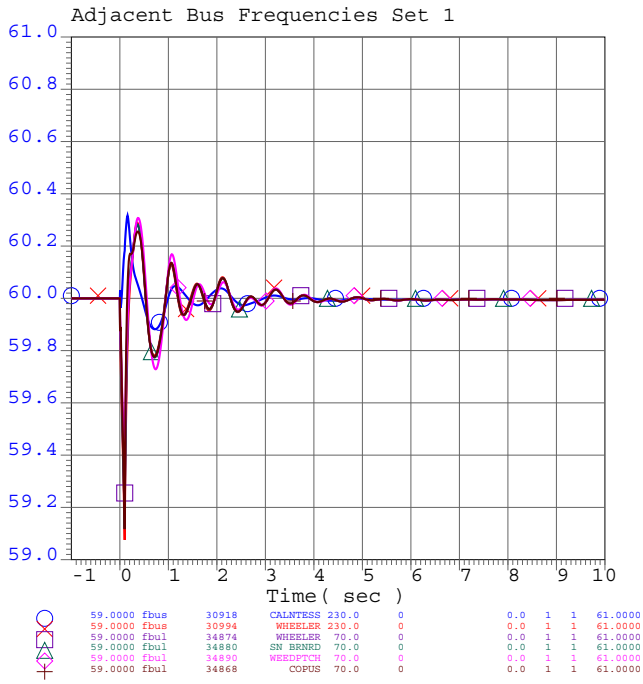
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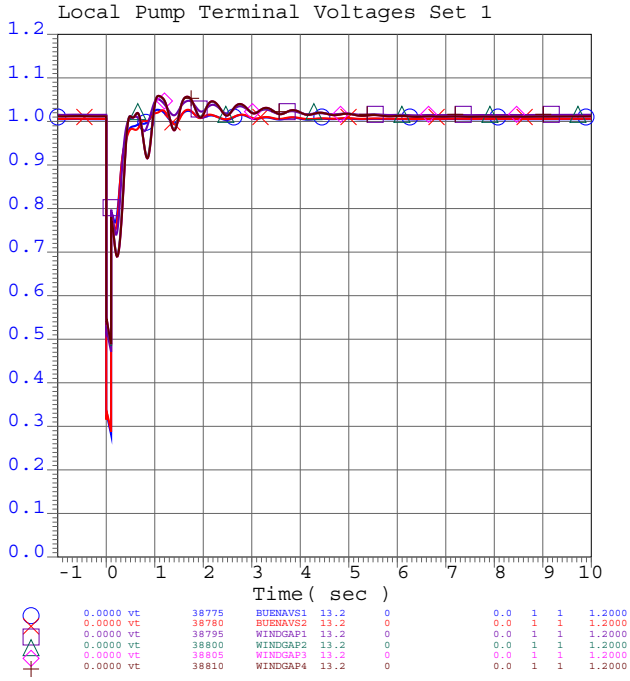




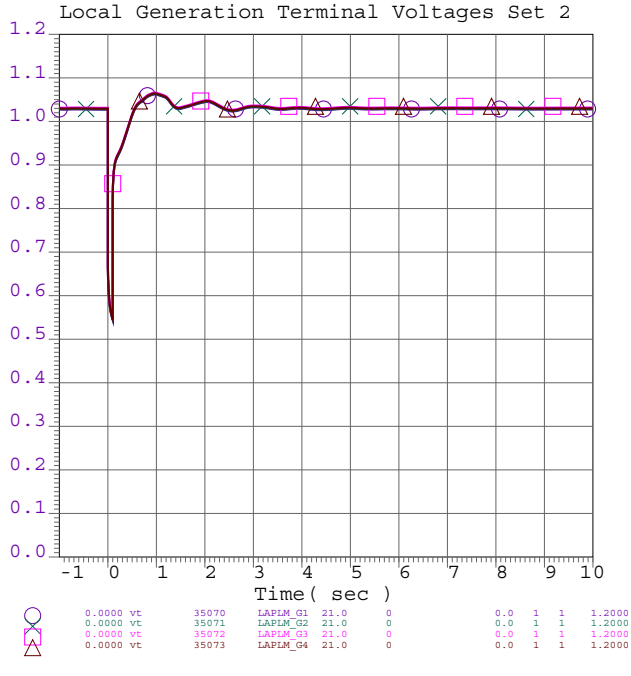


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

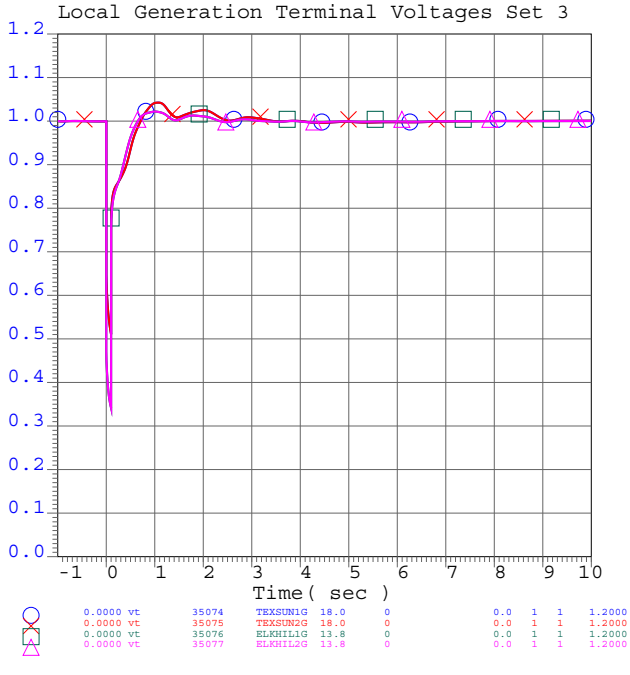
Local Pump Terminal Voltages Set 1



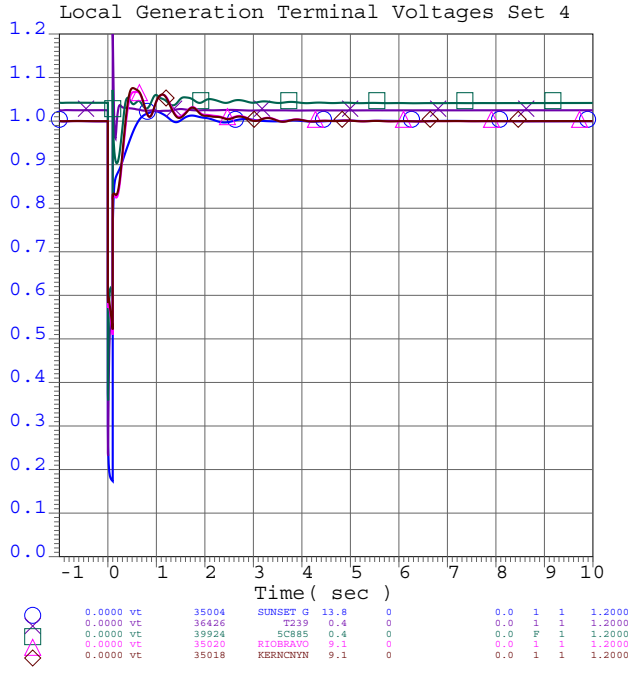
Local Generation Terminal Voltages Set 2



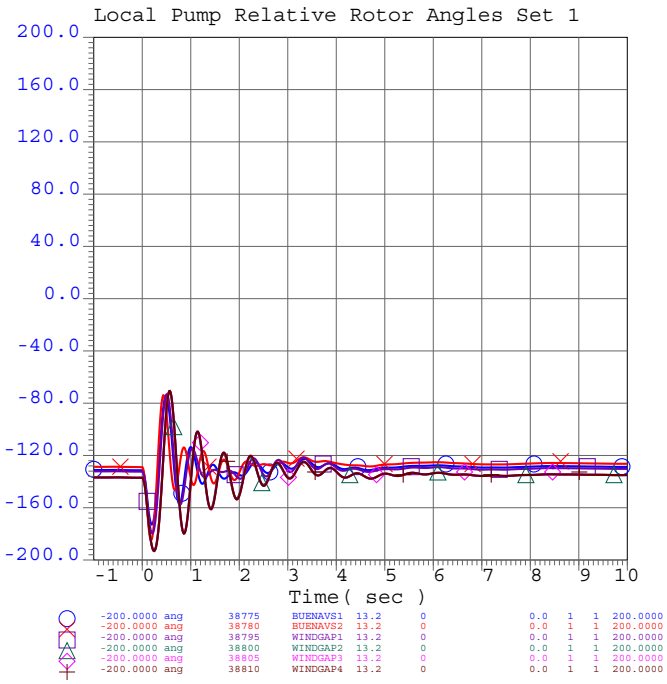
Local Generation Terminal Voltages Set 3

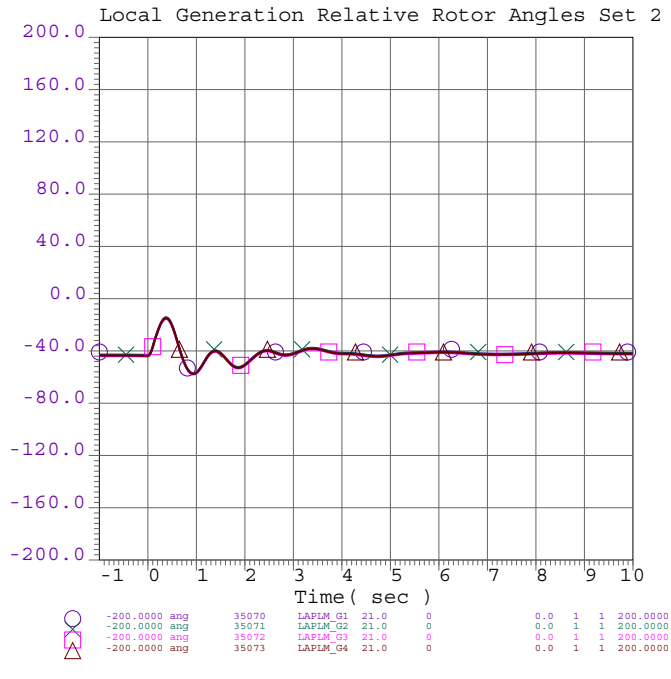


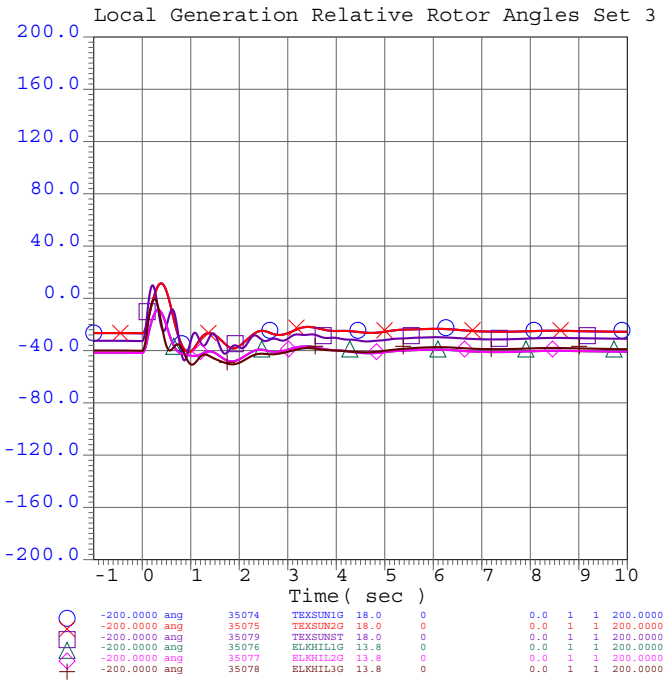
Local Generation Terminal Voltages Set 4

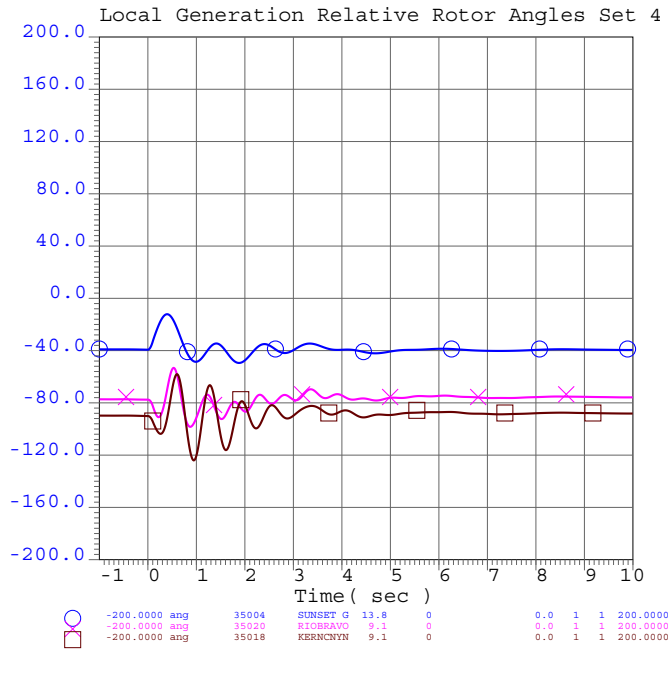


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

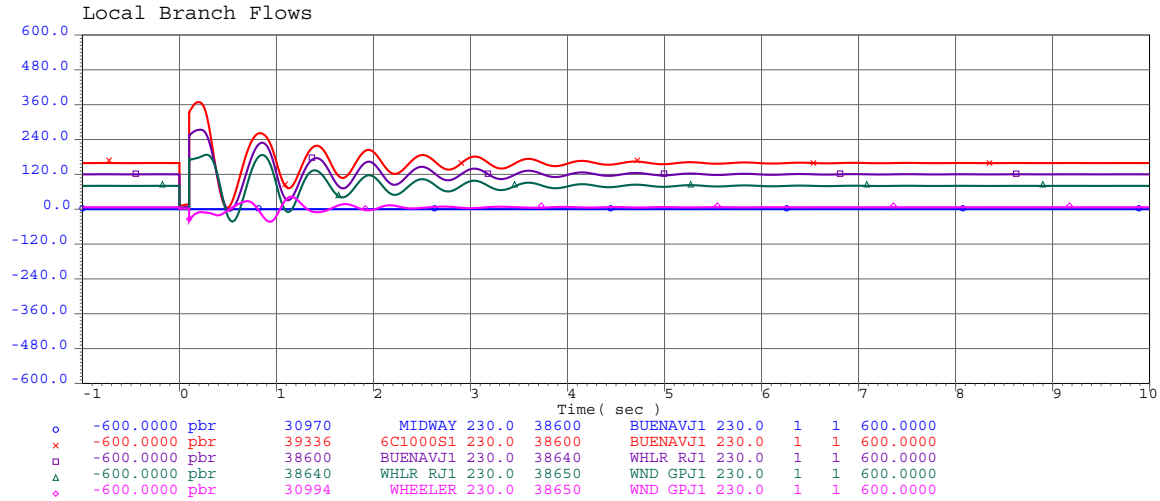




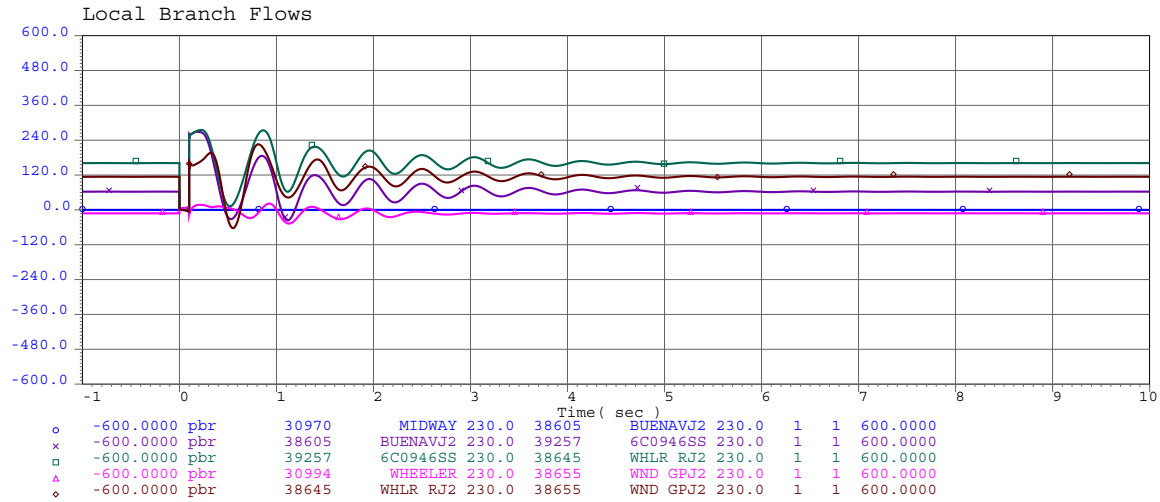




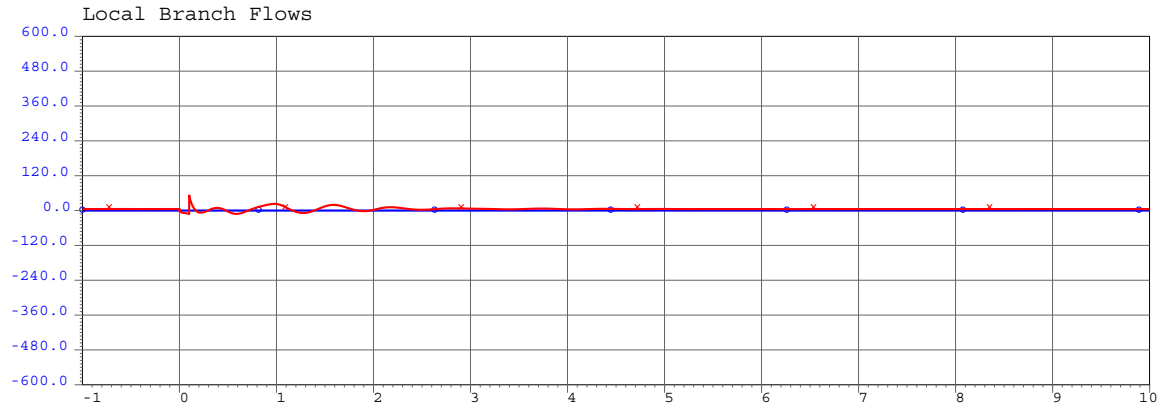
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

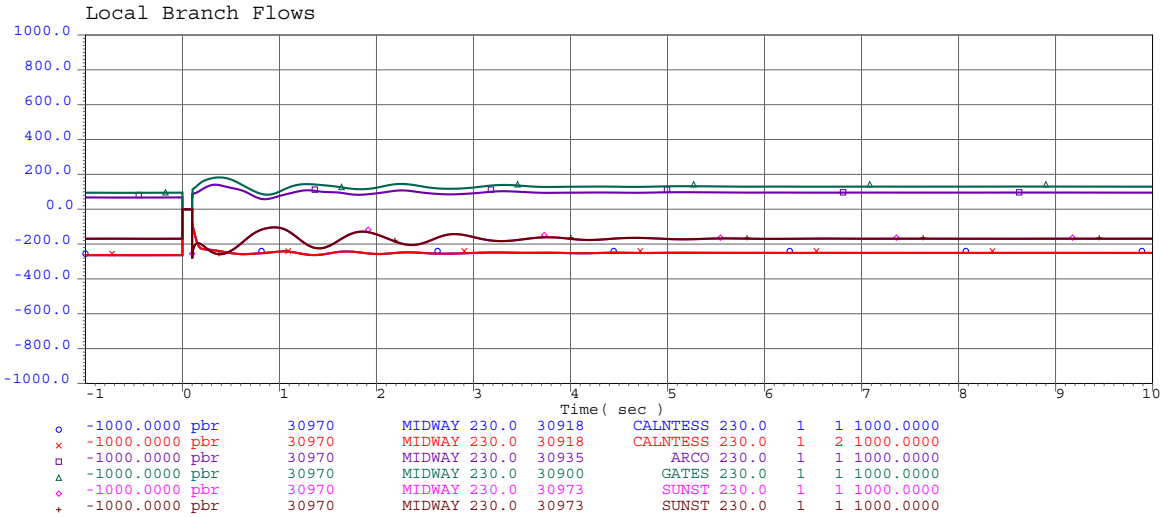


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

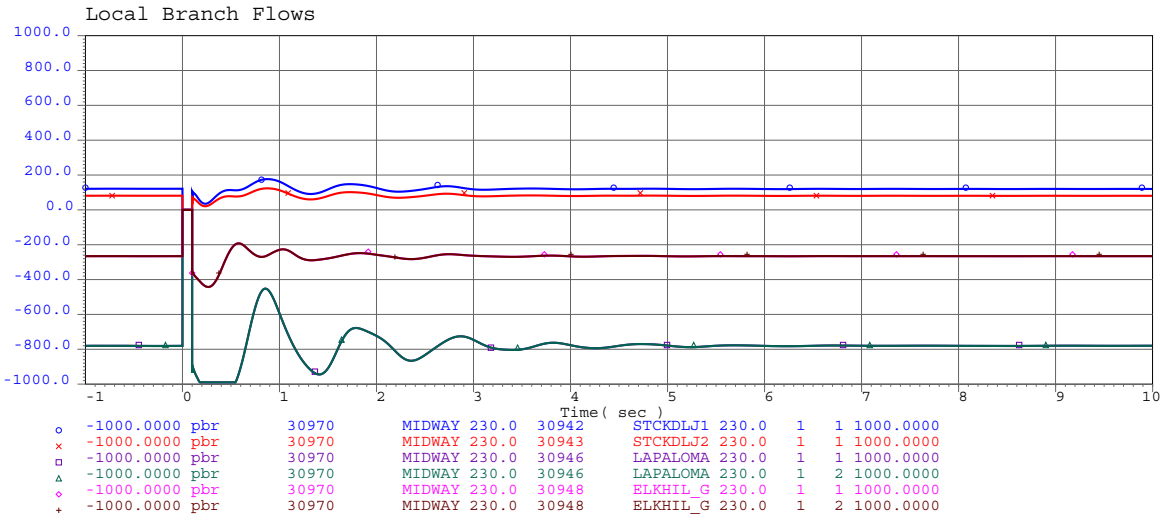


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

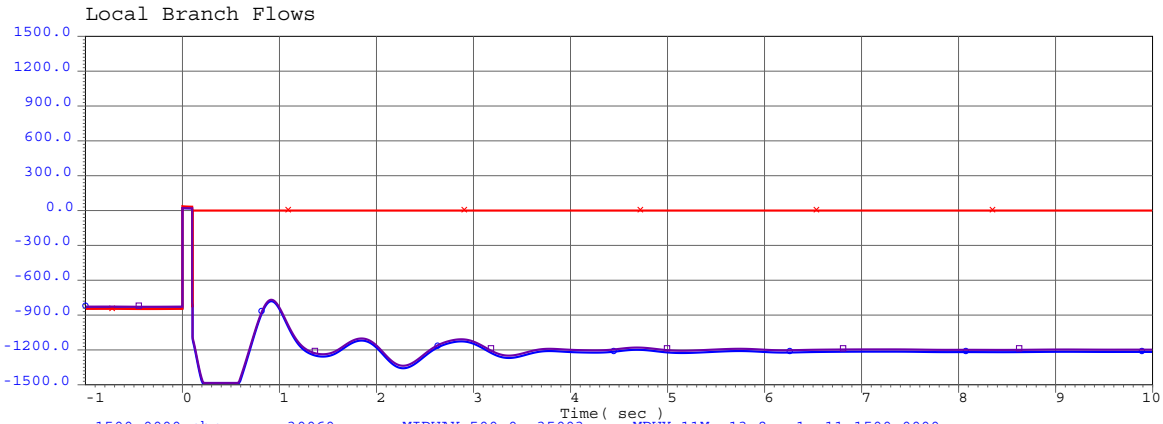
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



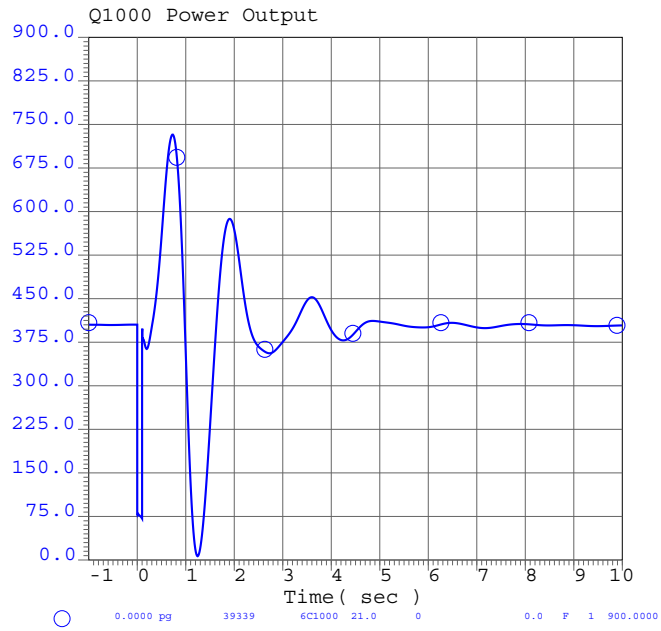
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

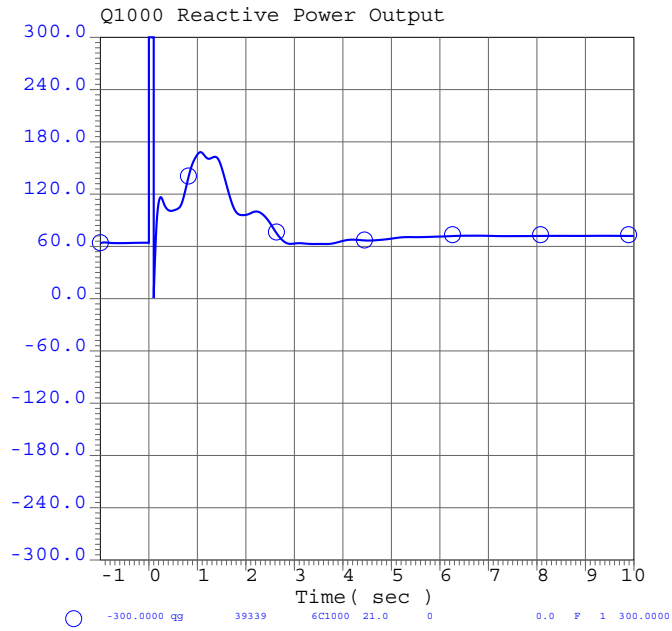


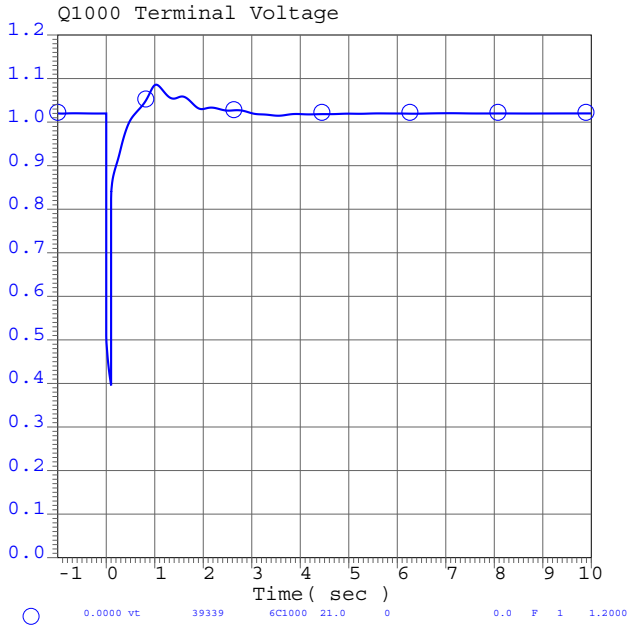
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

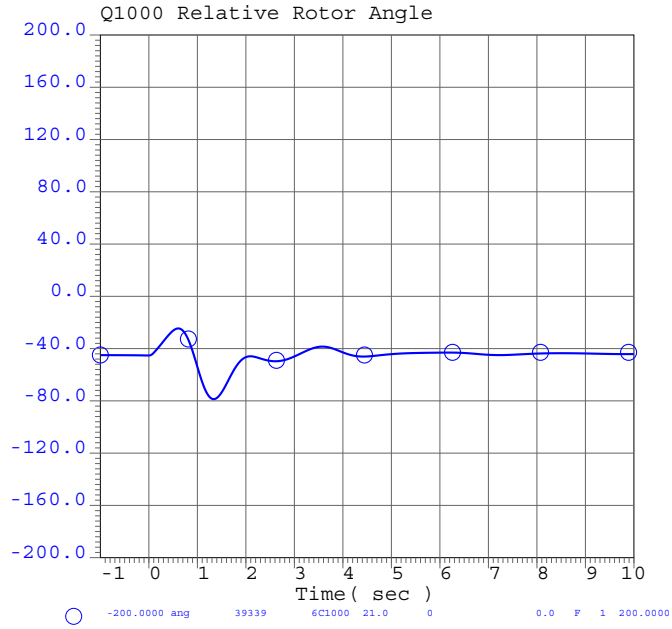
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #12

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







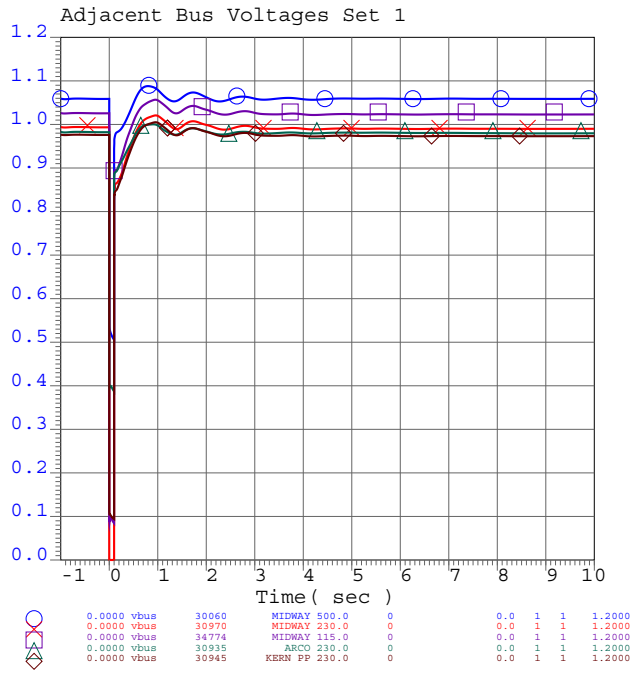


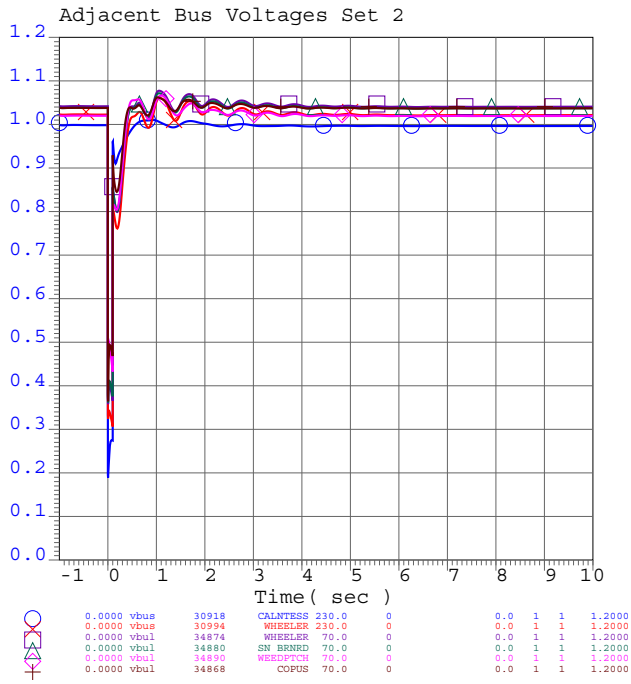
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

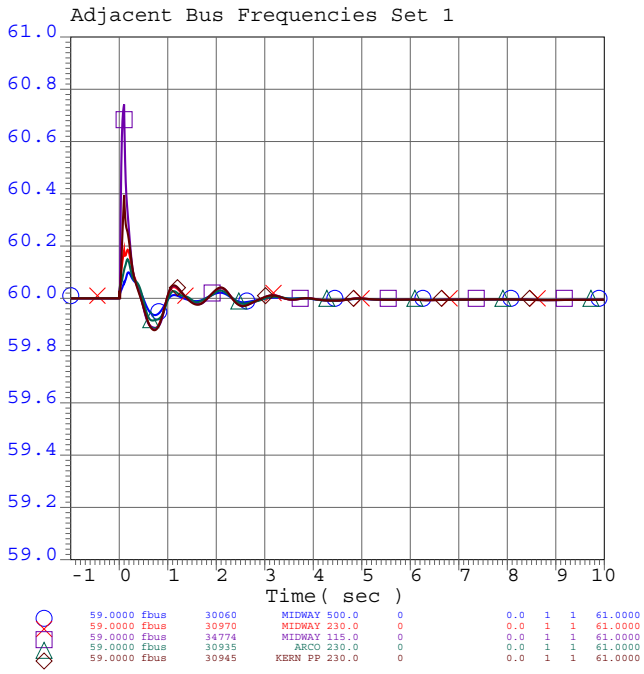
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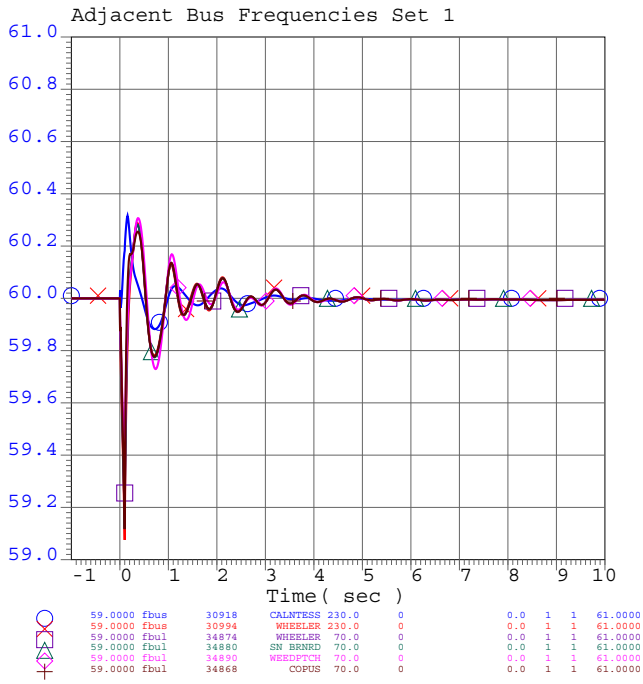
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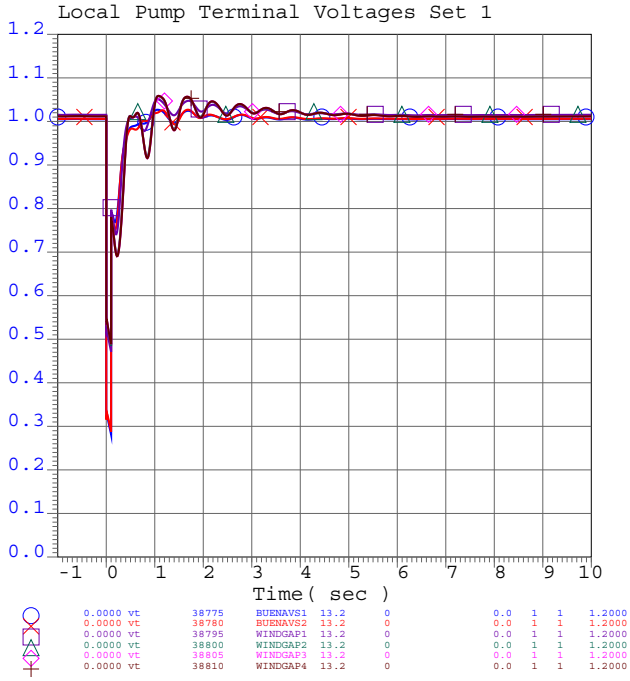






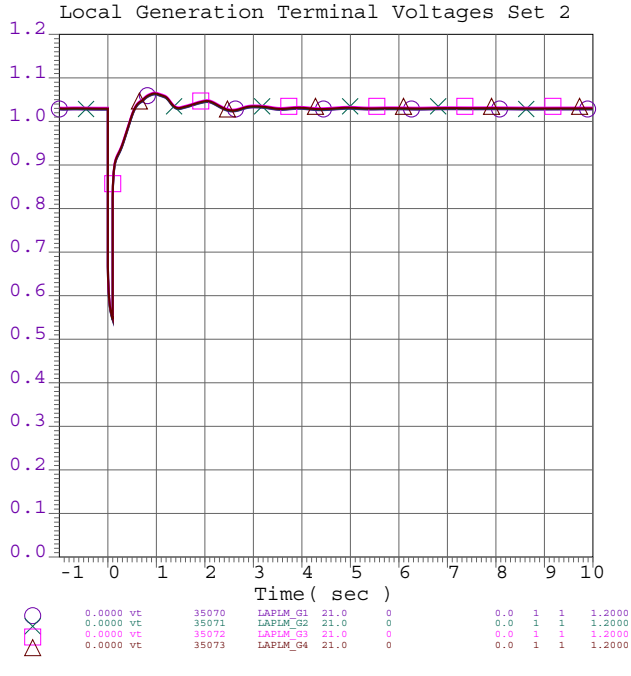
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

Local Pump Terminal Voltages Set 1



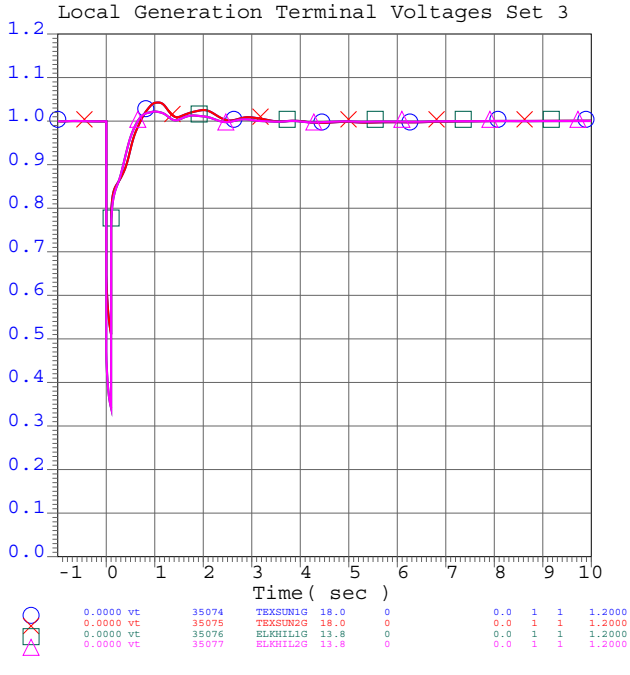
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0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



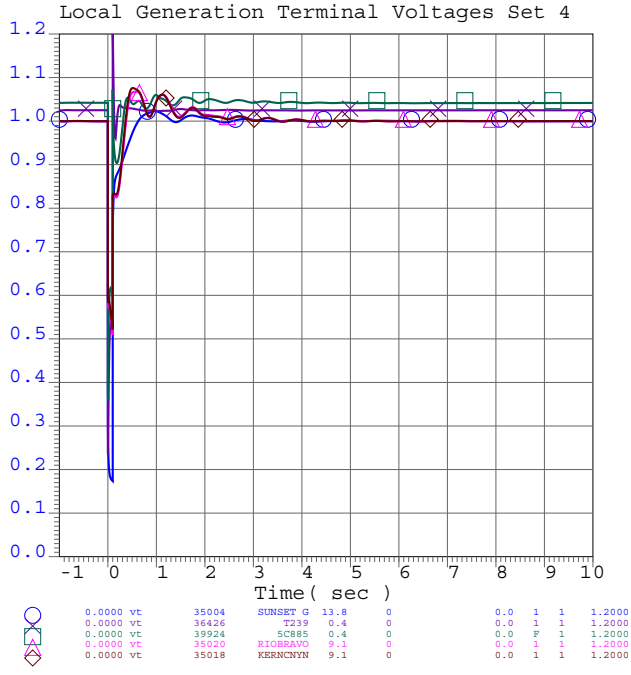
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

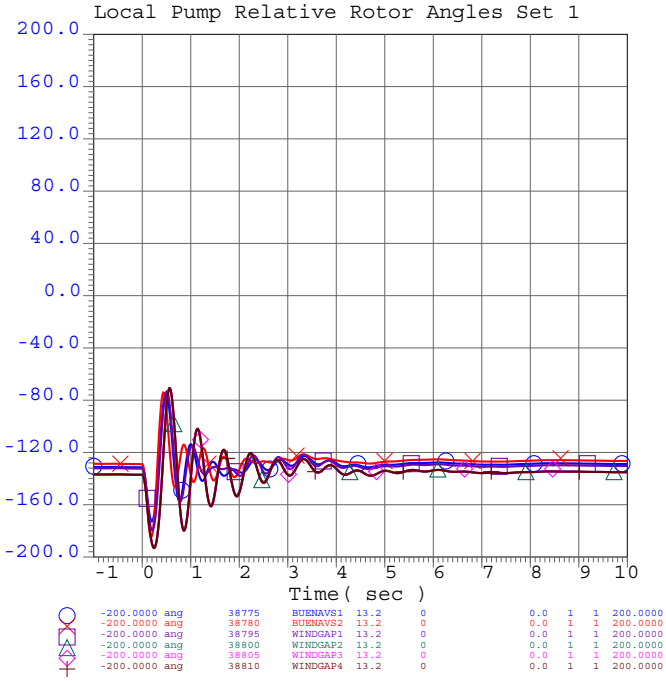
Local Generation Terminal Voltages Set 4



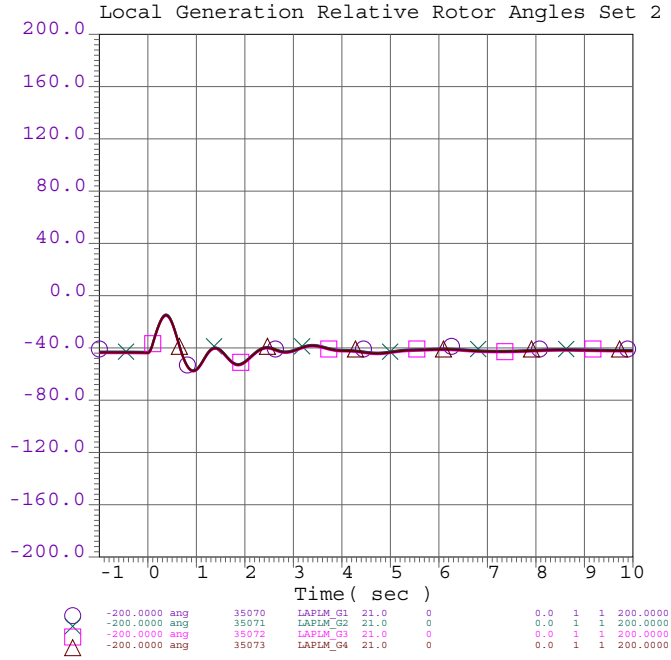
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

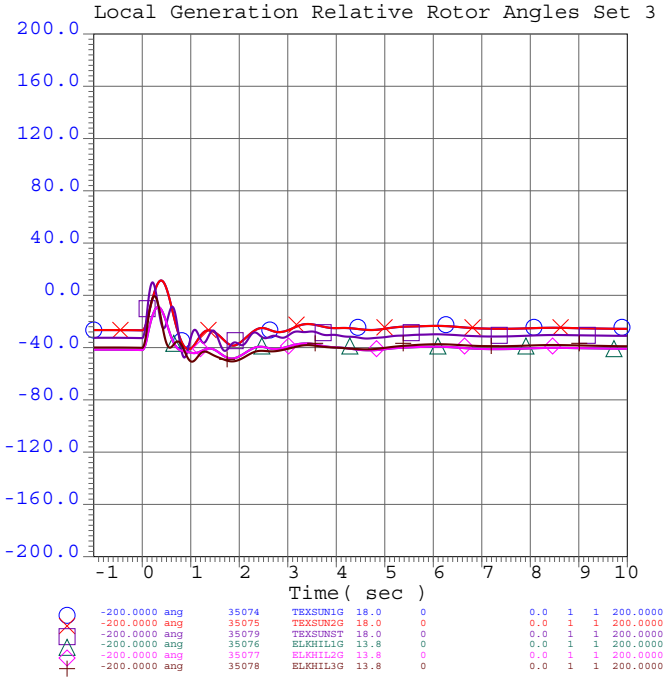
Local Pump Relative Rotor Angles Set 1



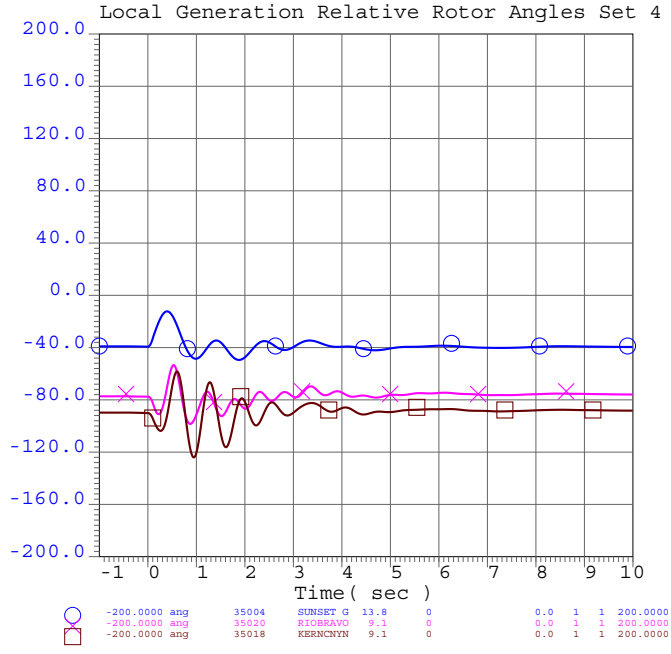
Local Generation Relative Rotor Angles Set 2



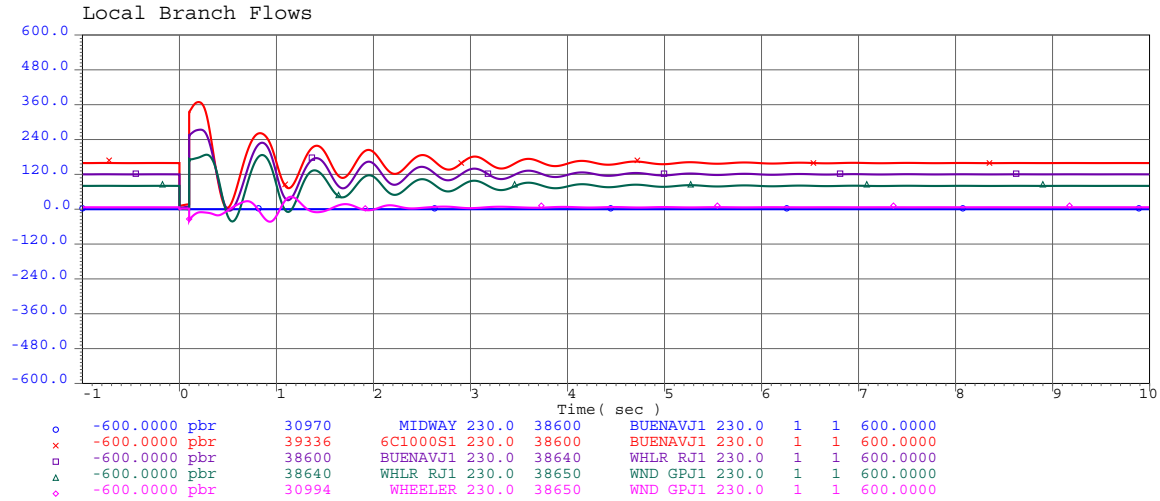
Local Generation Relative Rotor Angles Set 3



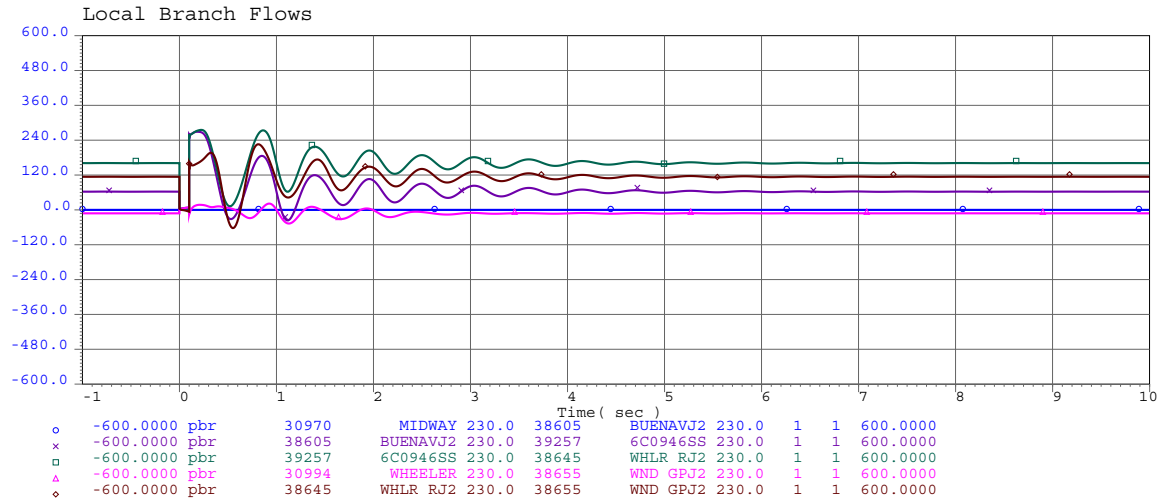
Local Generation Relative Rotor Angles Set 4



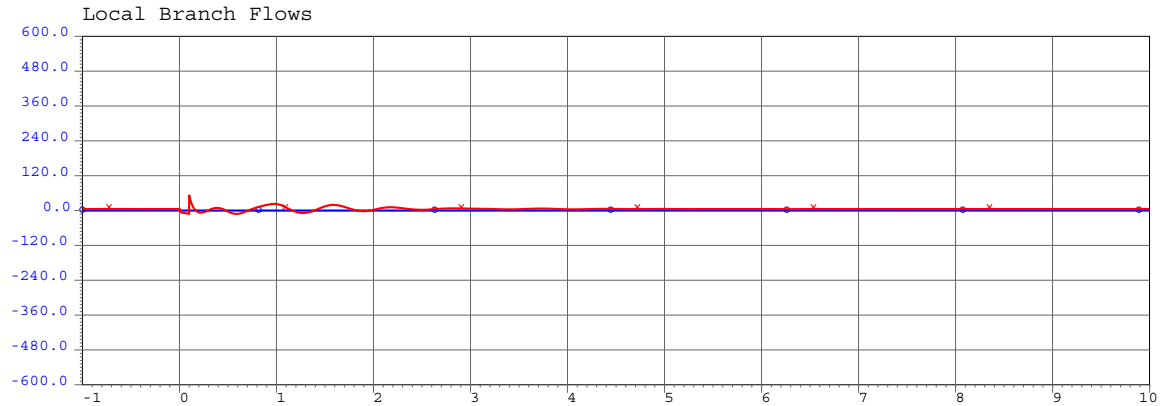
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

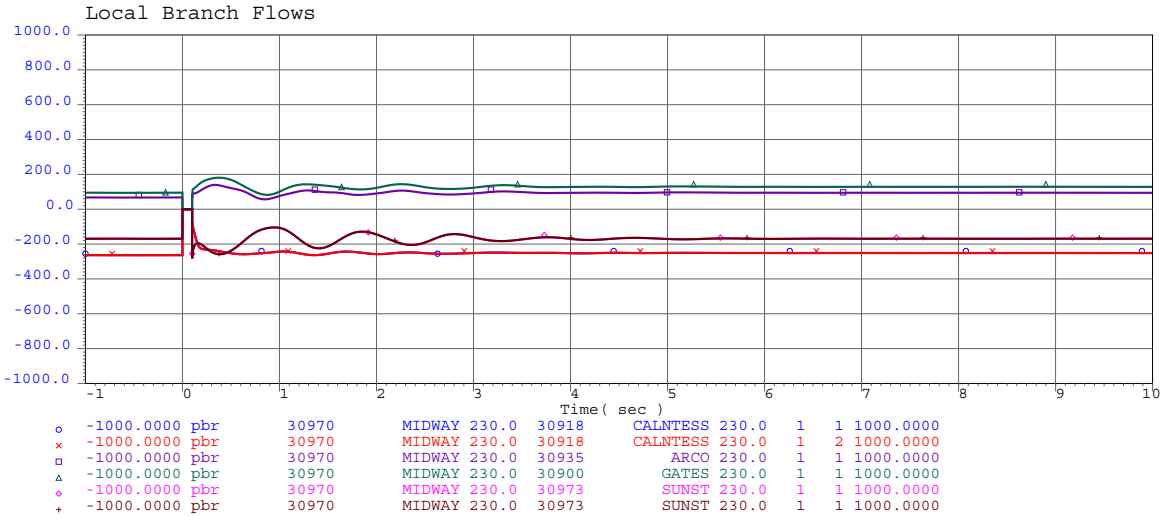


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

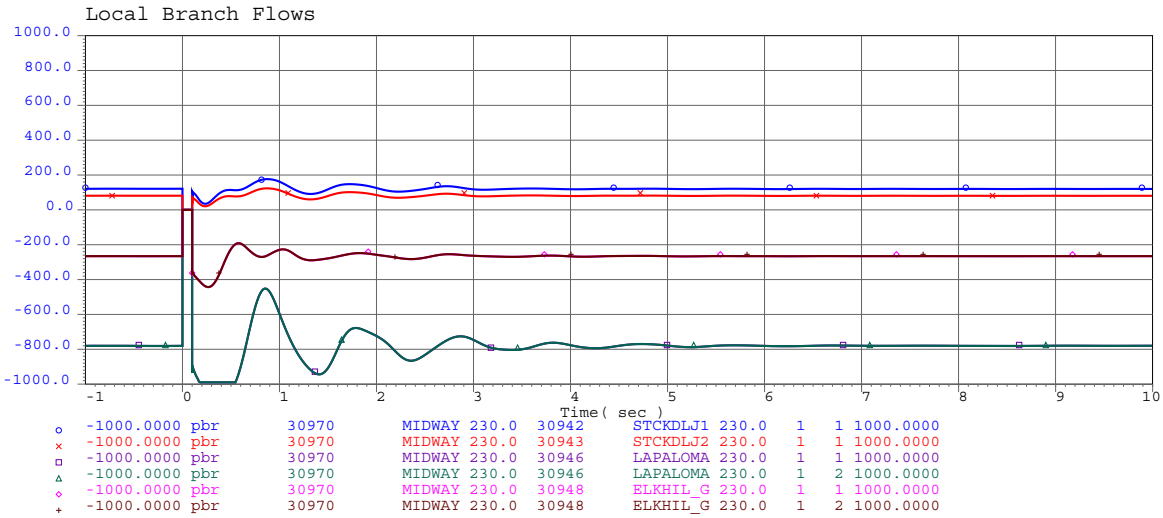


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

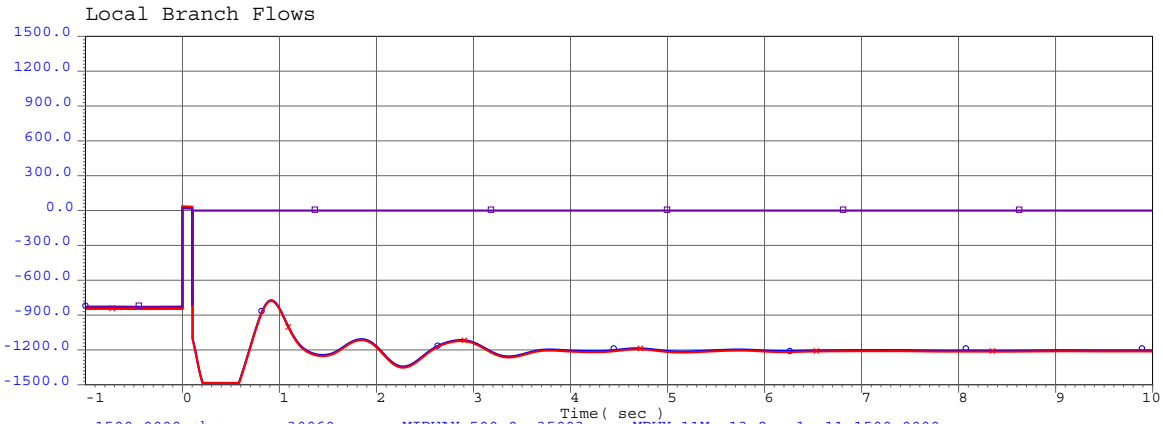
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



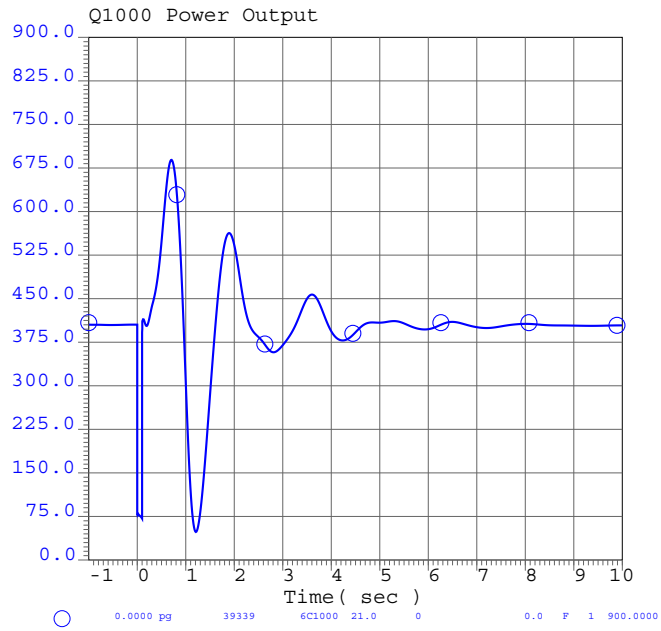
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

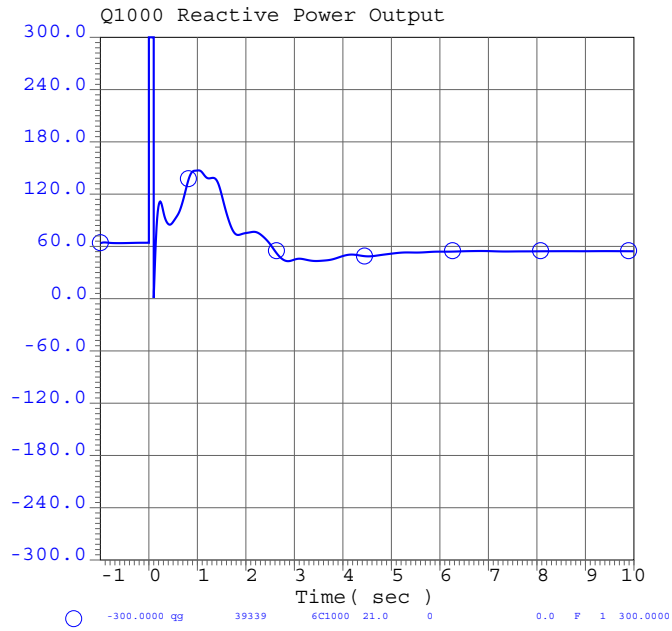


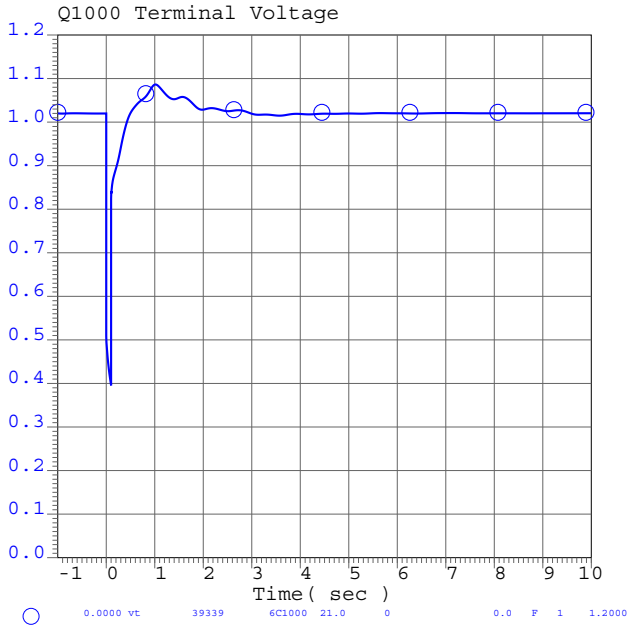
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

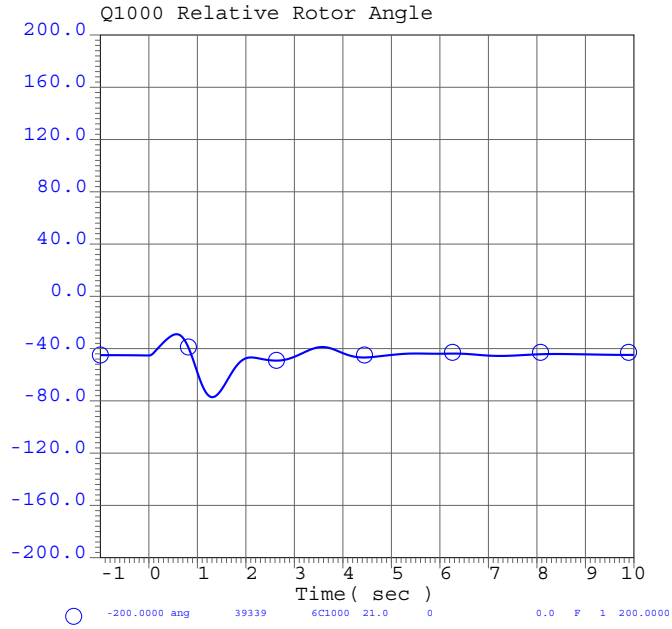
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway Substation 230kV Bus
Clear Midway 500/230 kV Xfmr #13

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







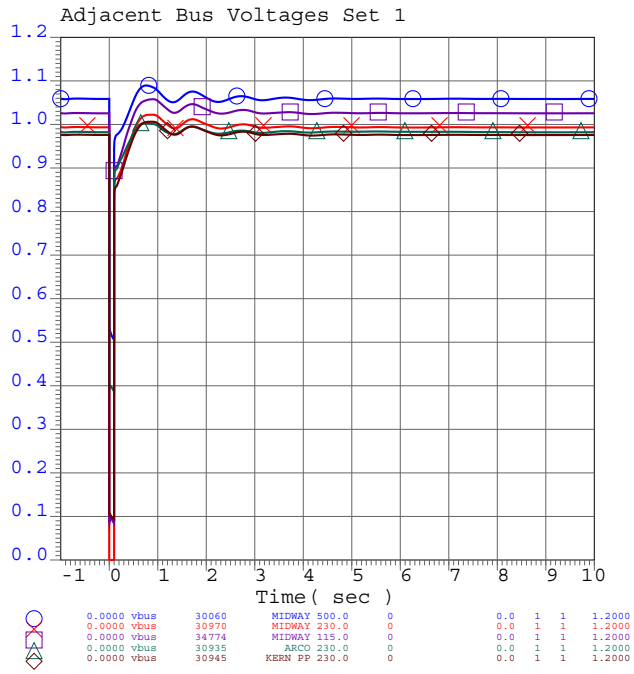


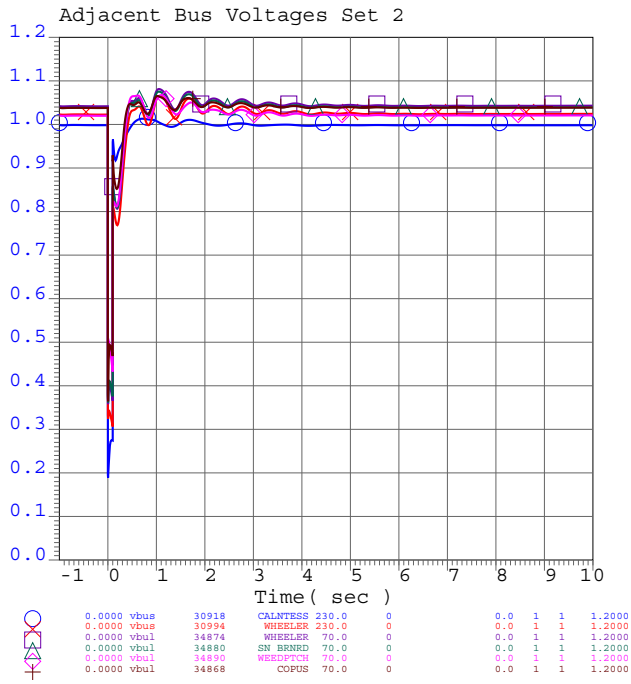
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

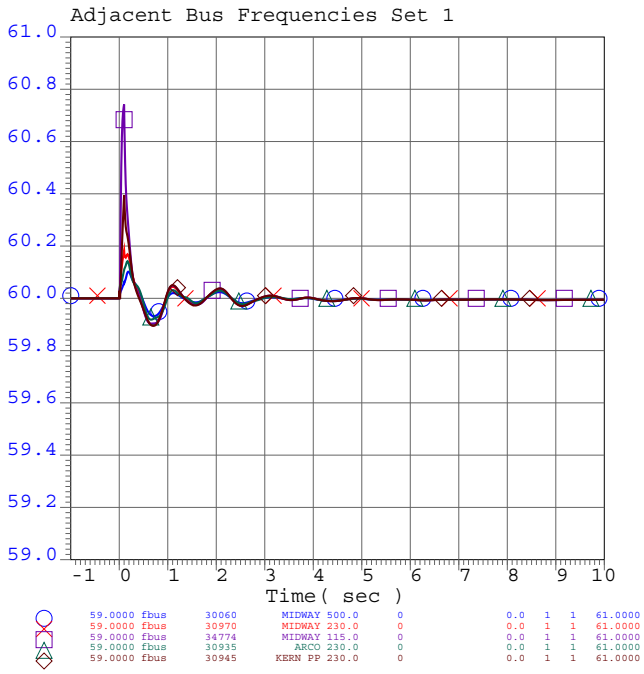
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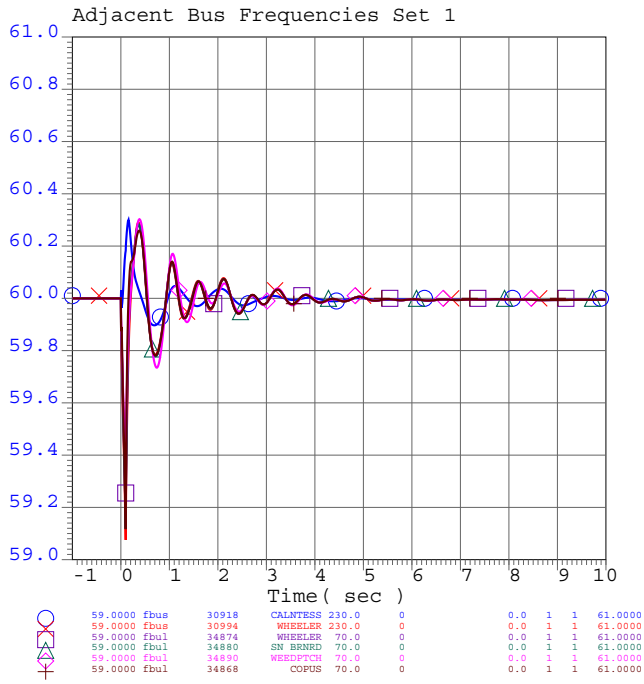
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Tue Dec 24 11:54:01 2013

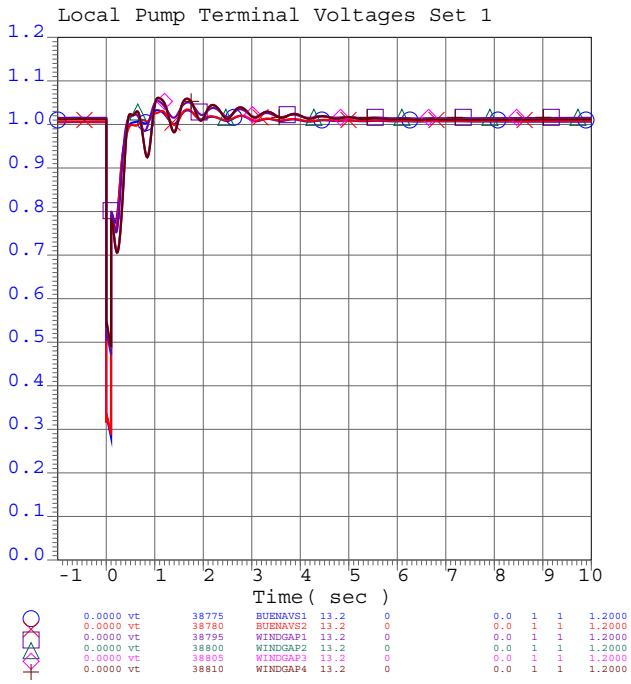


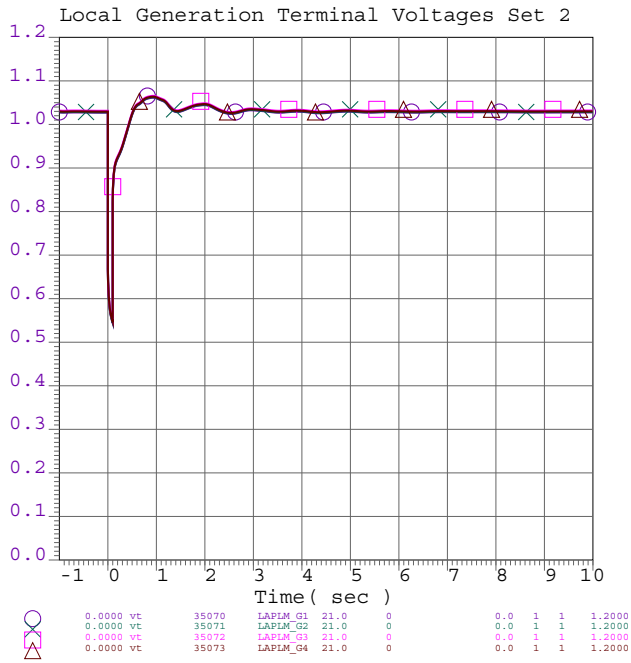


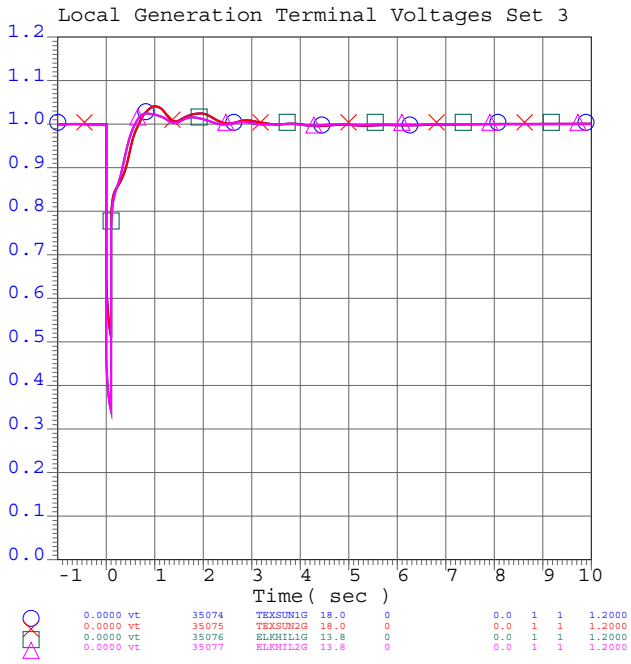


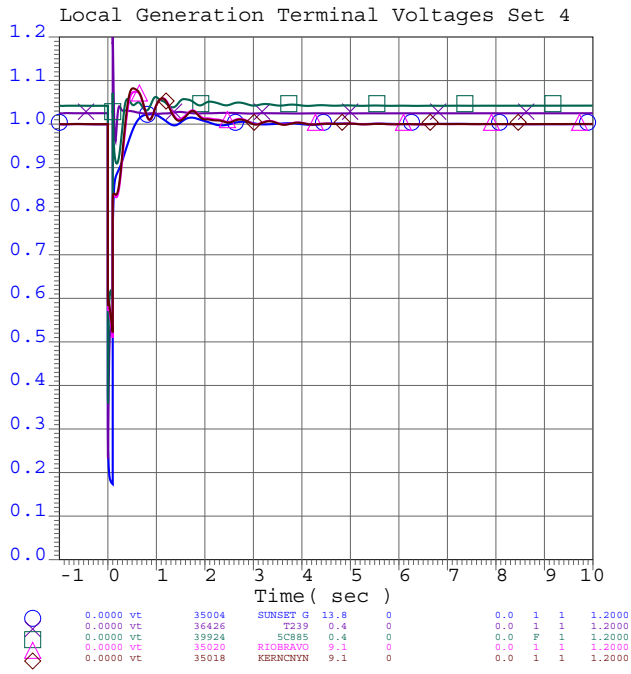


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

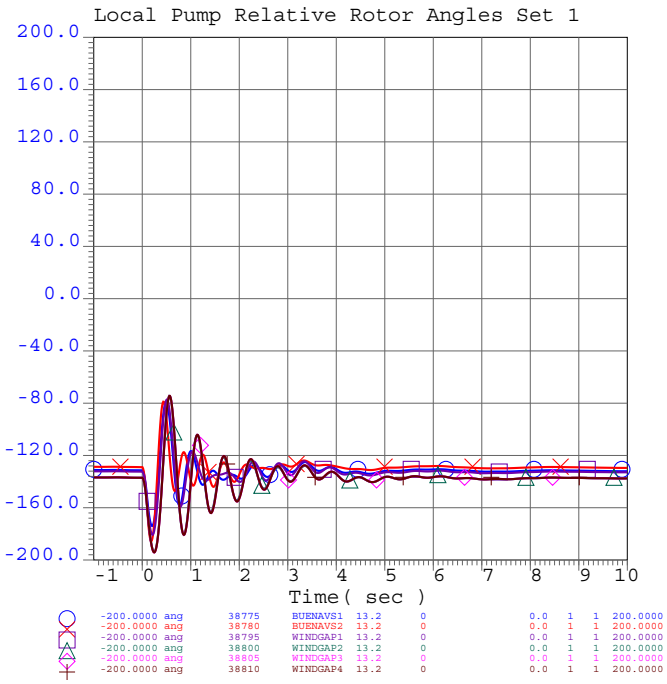


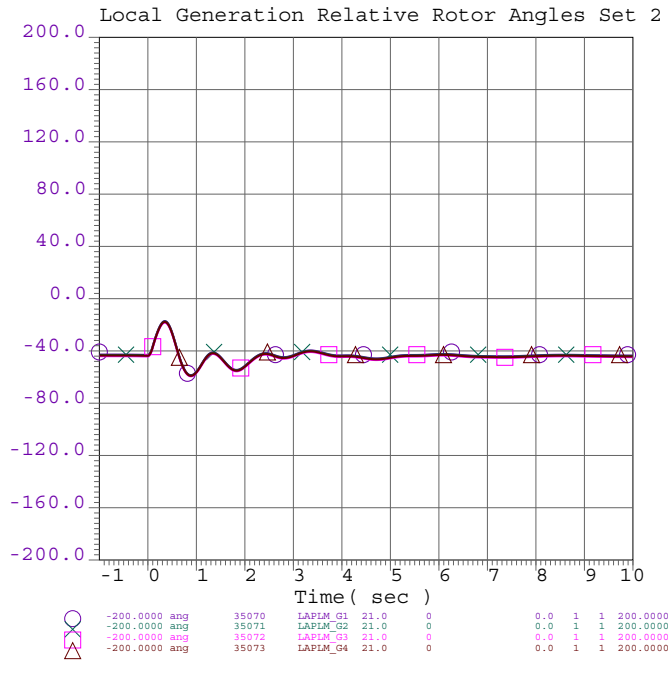


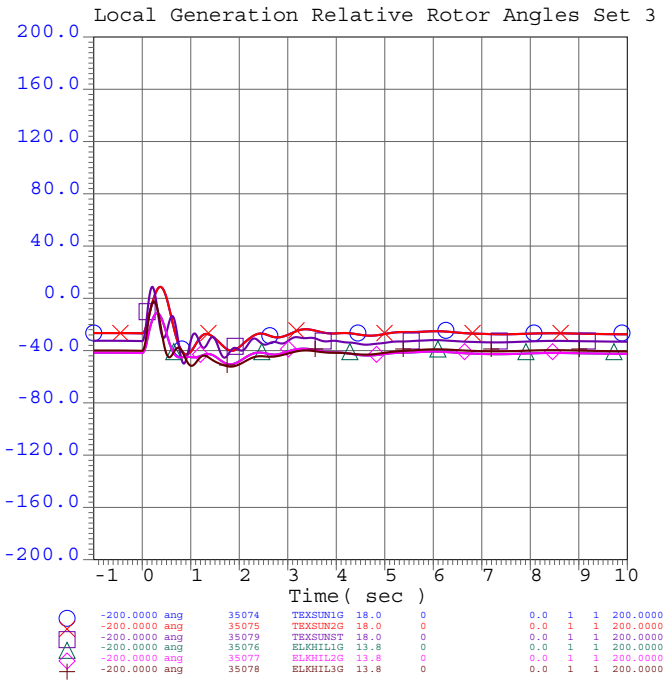


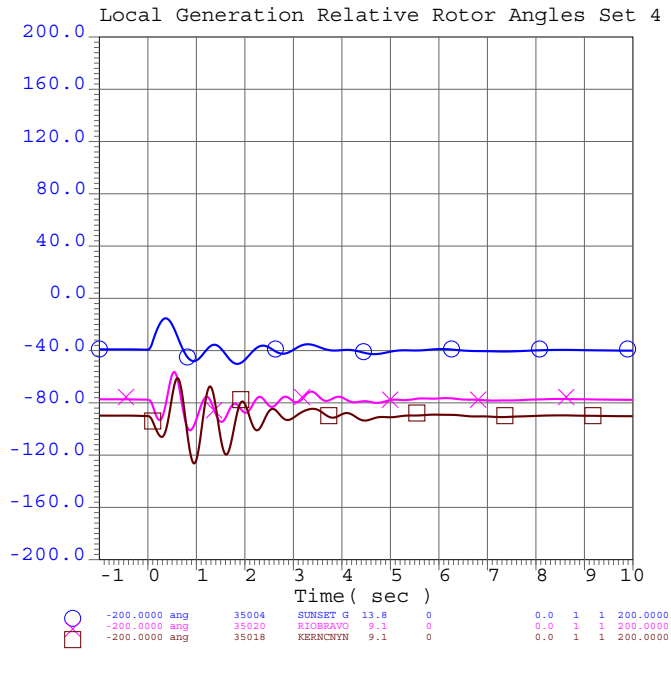


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

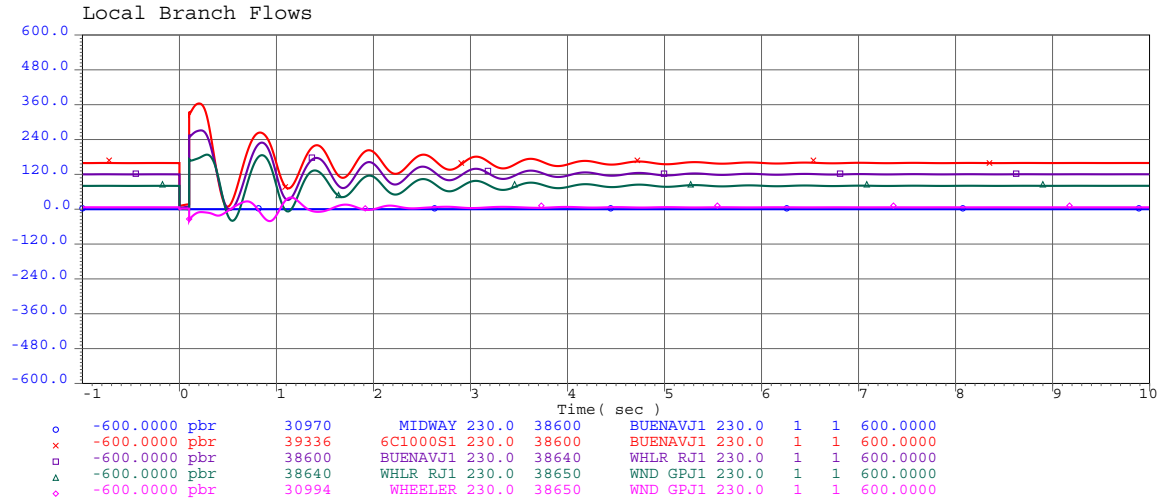




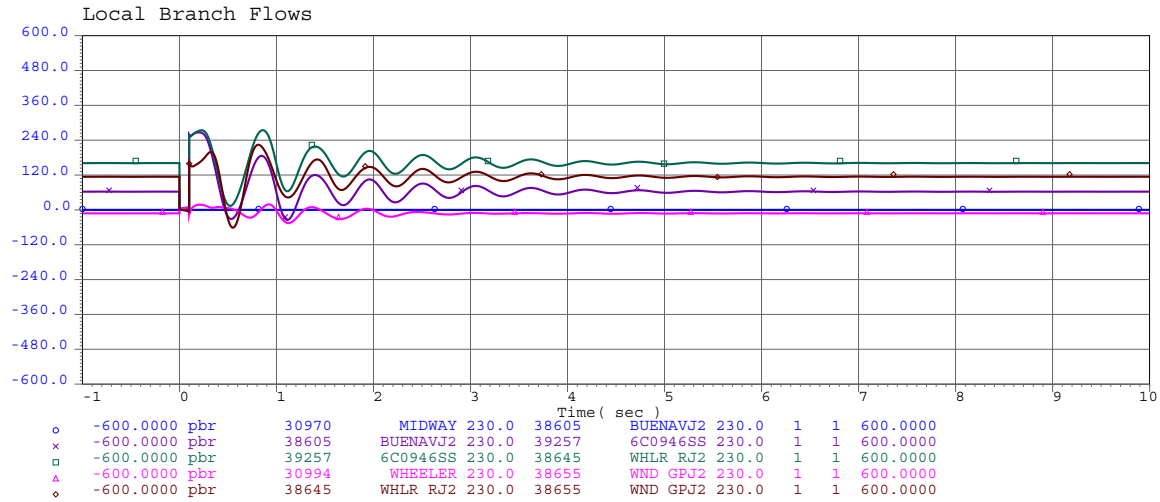




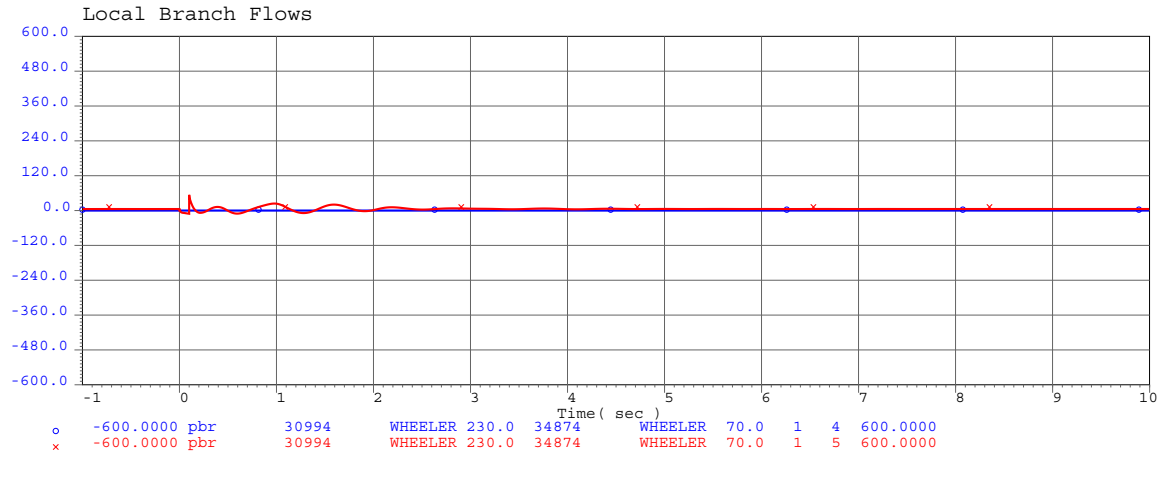
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

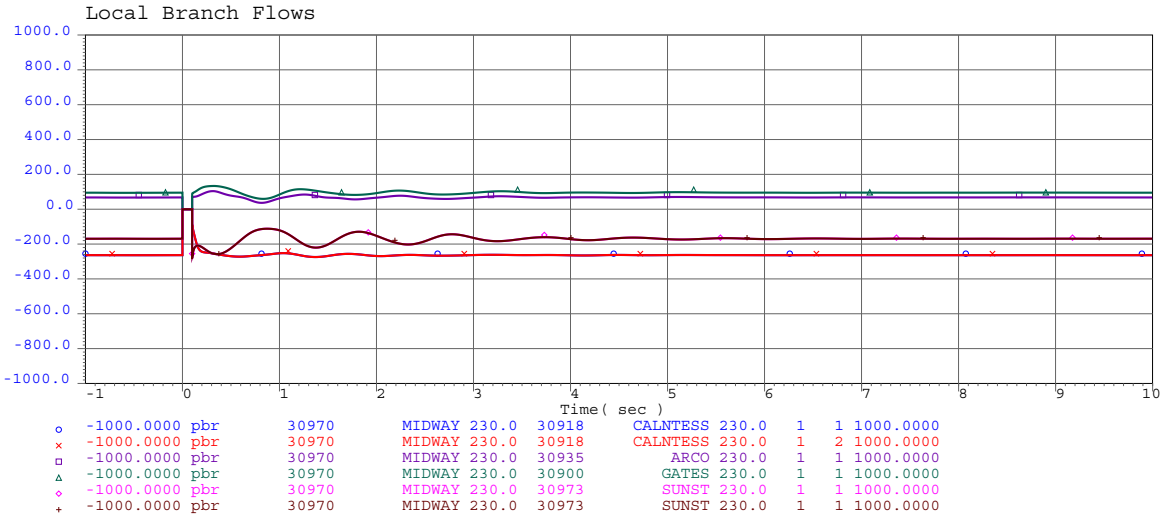


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

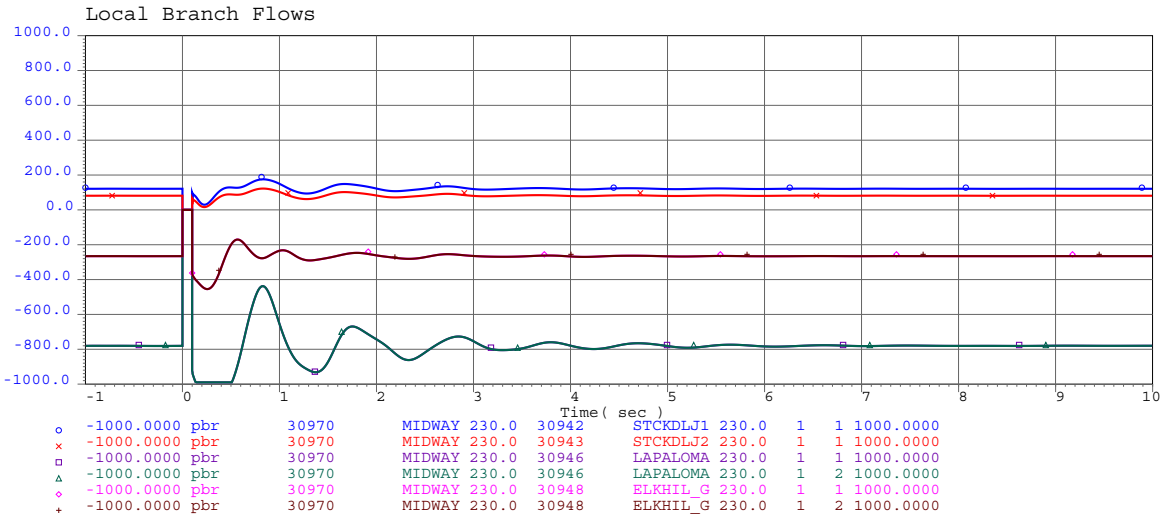


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

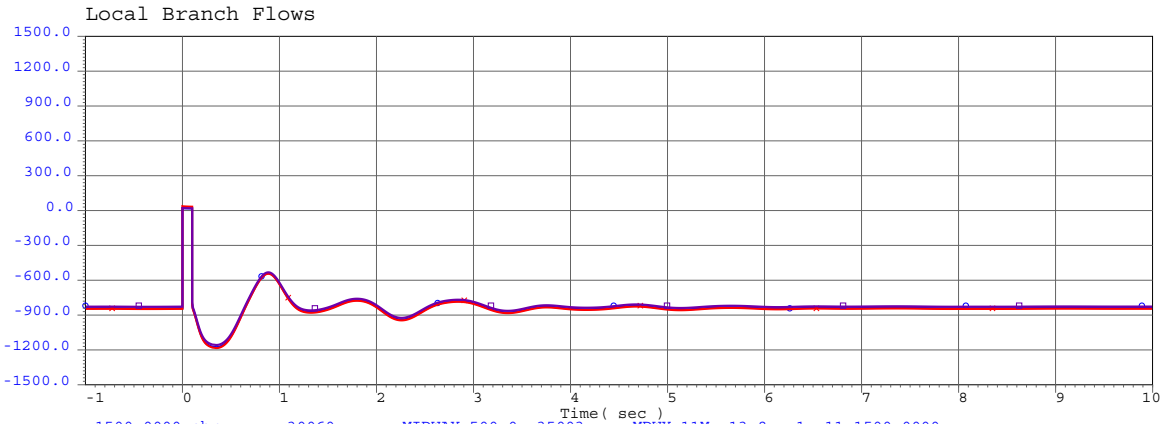
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



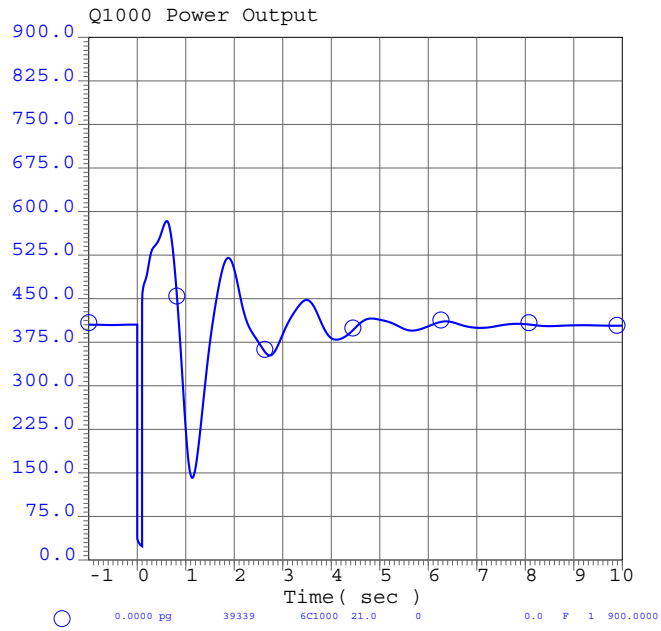
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

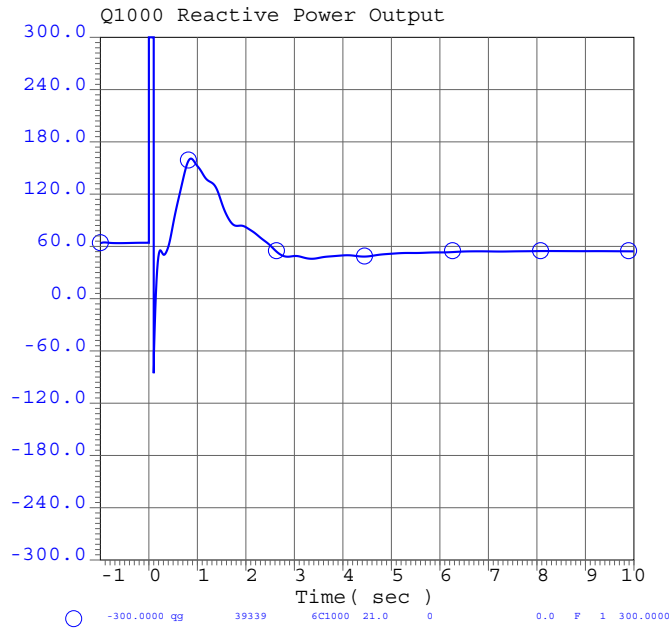


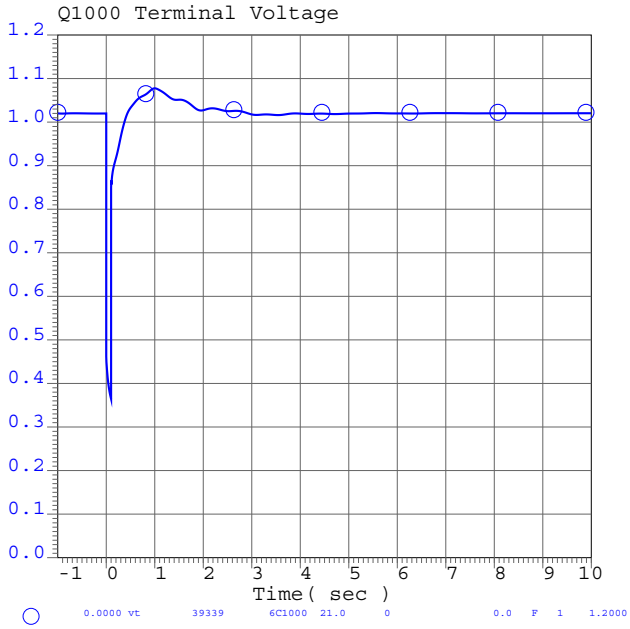
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-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

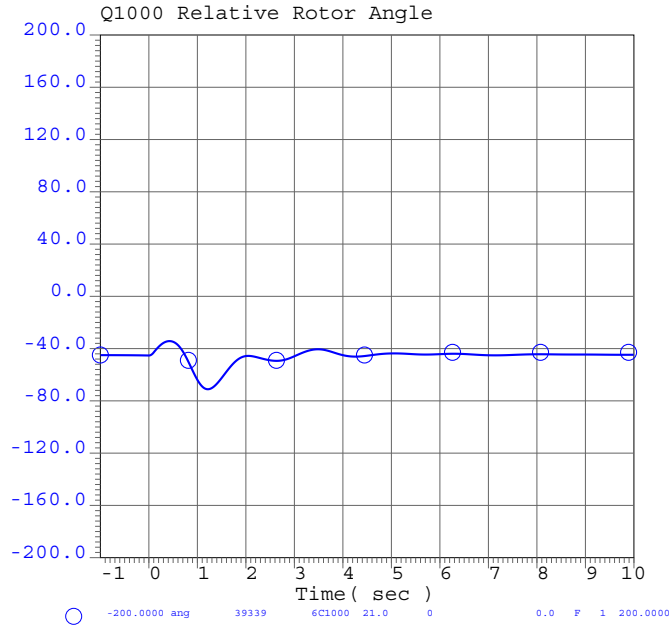
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







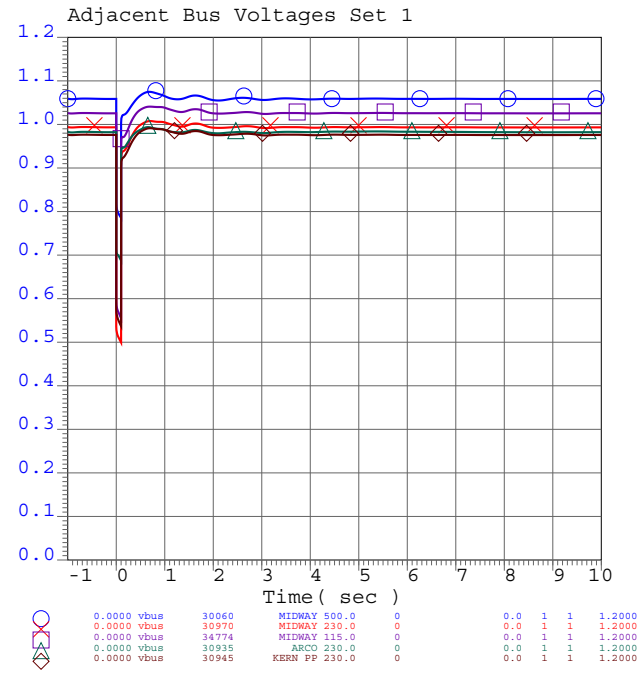


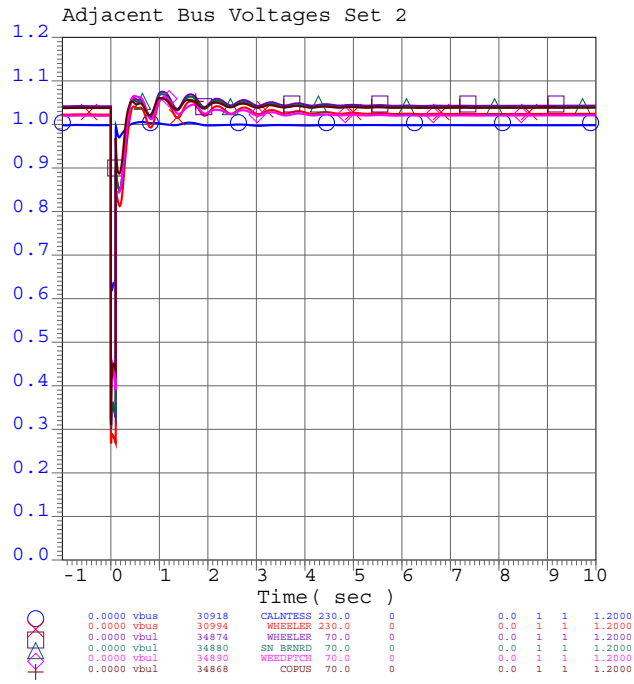
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

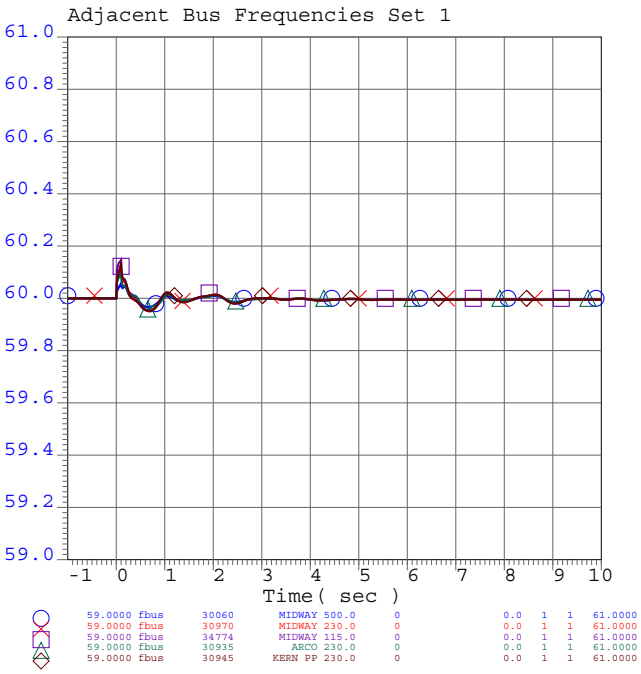
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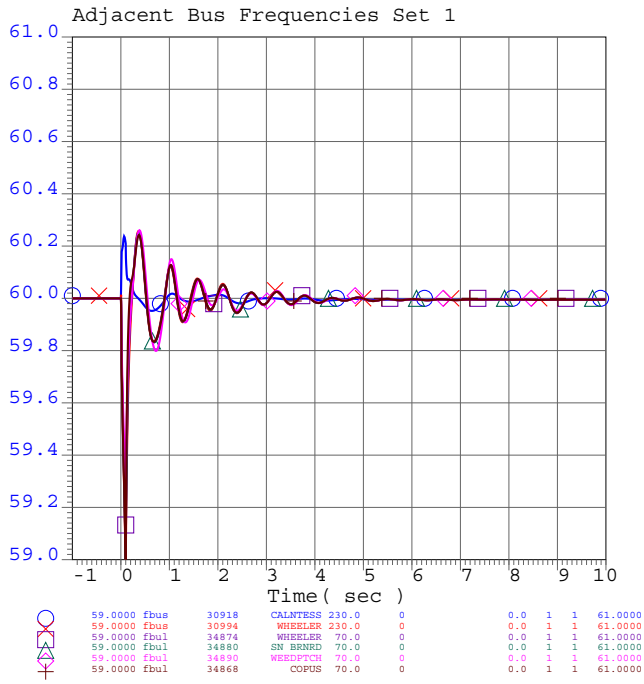
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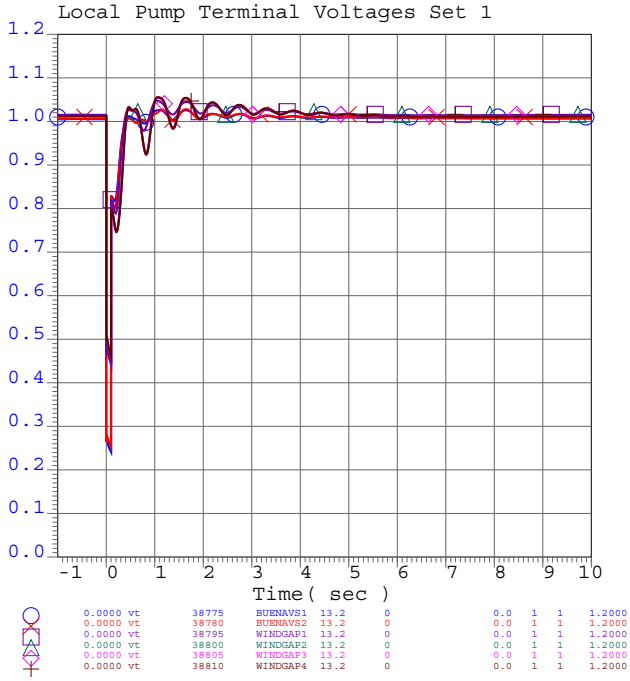




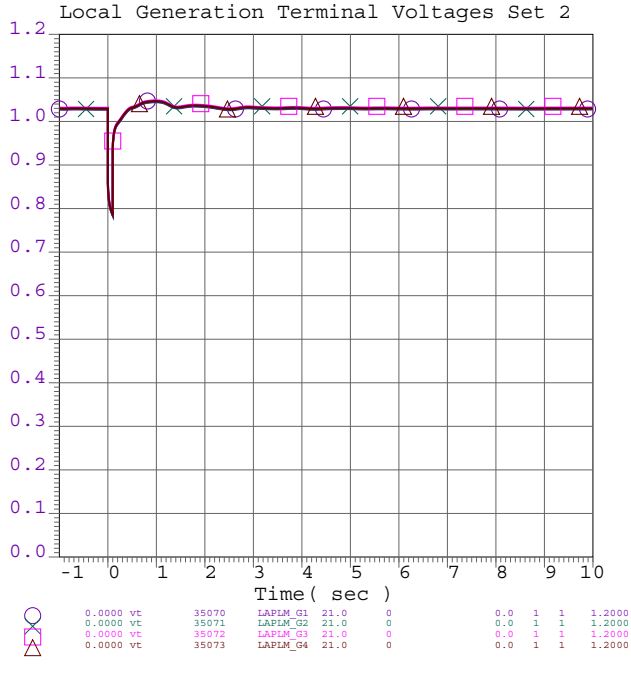


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

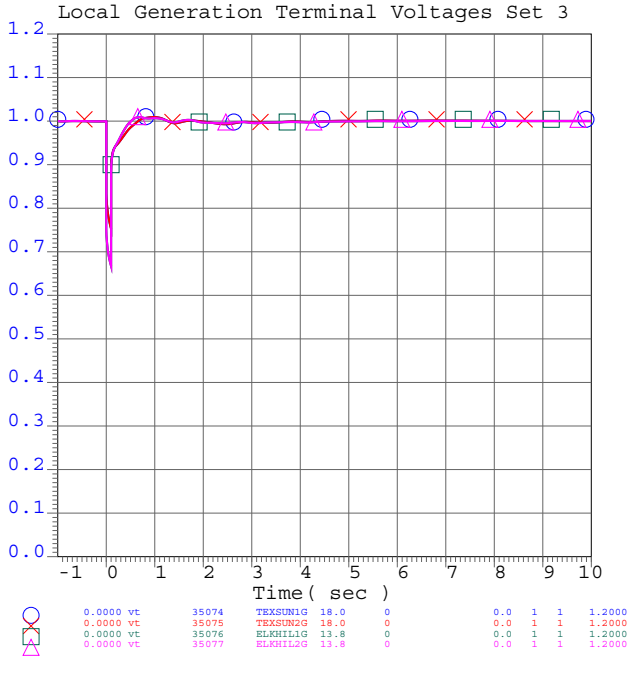
Local Pump Terminal Voltages Set 1



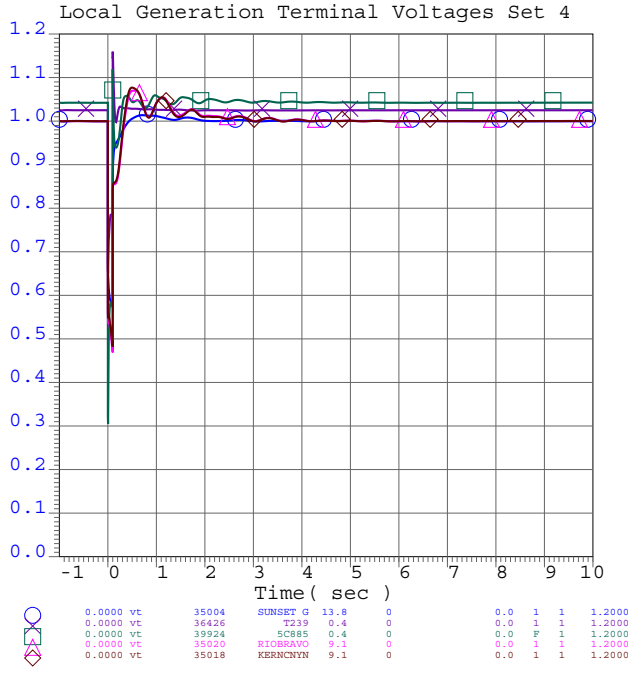
Local Generation Terminal Voltages Set 2



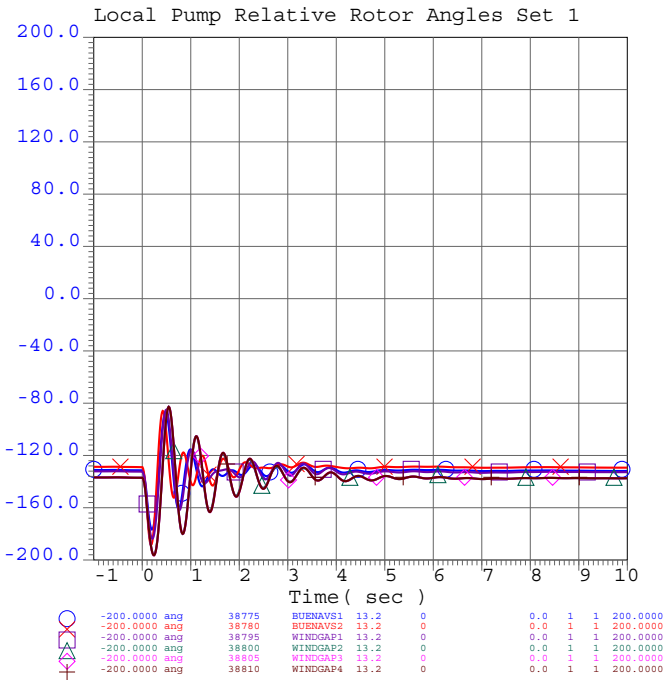
Local Generation Terminal Voltages Set 3

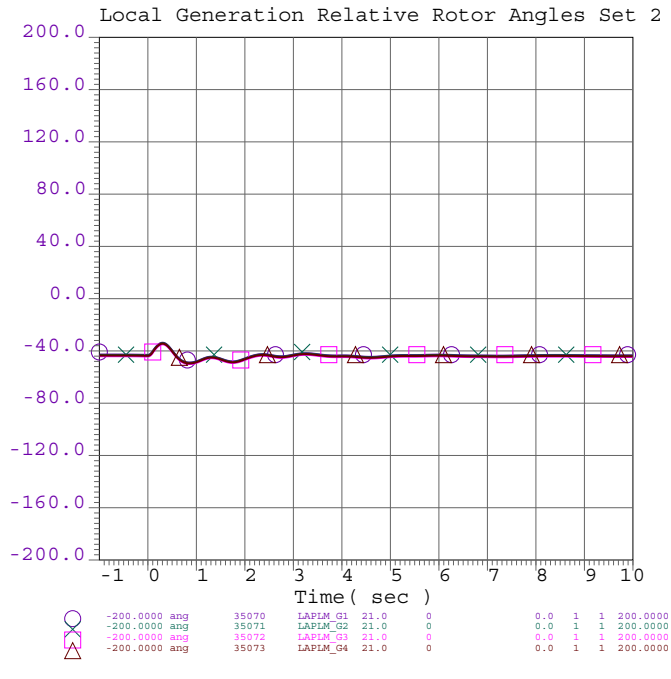


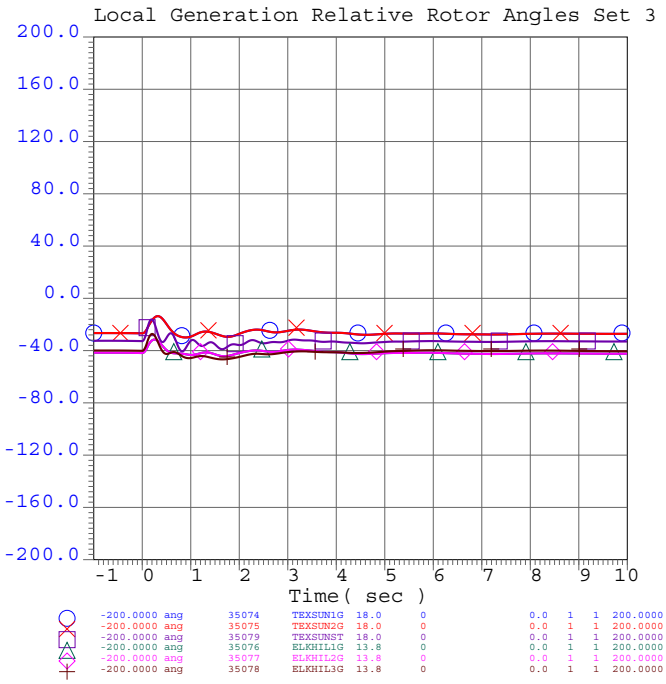
Local Generation Terminal Voltages Set 4

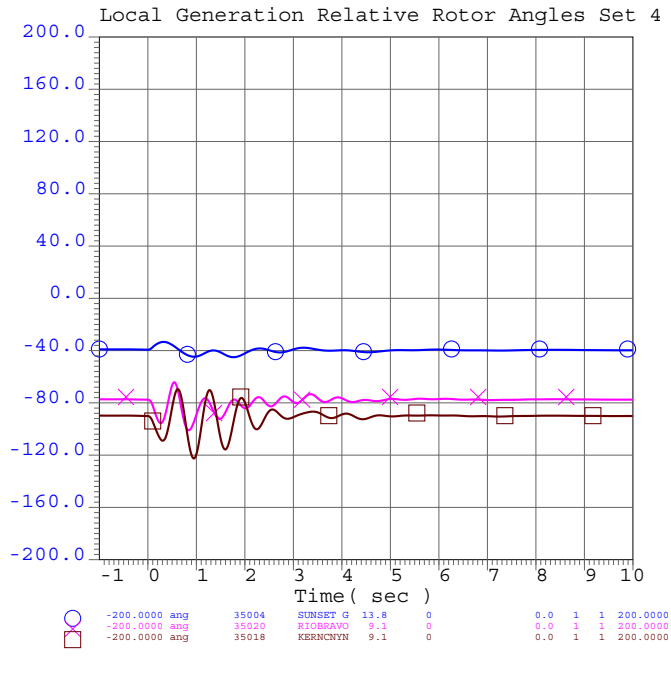


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

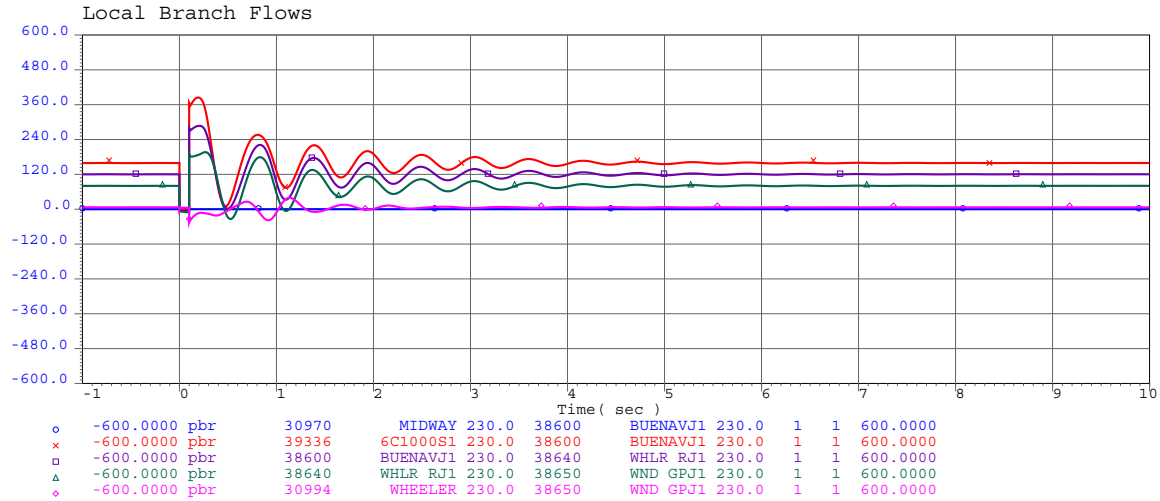




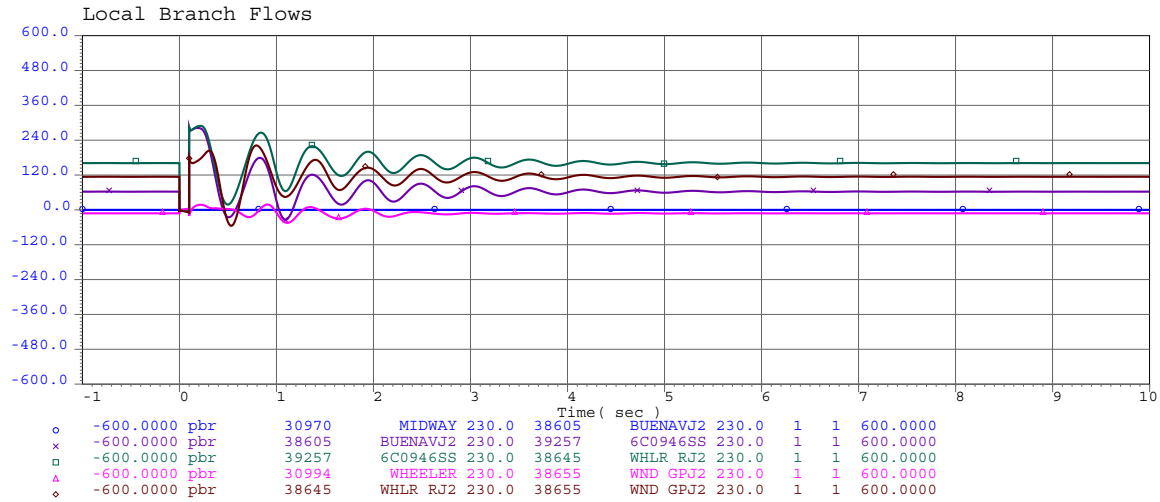




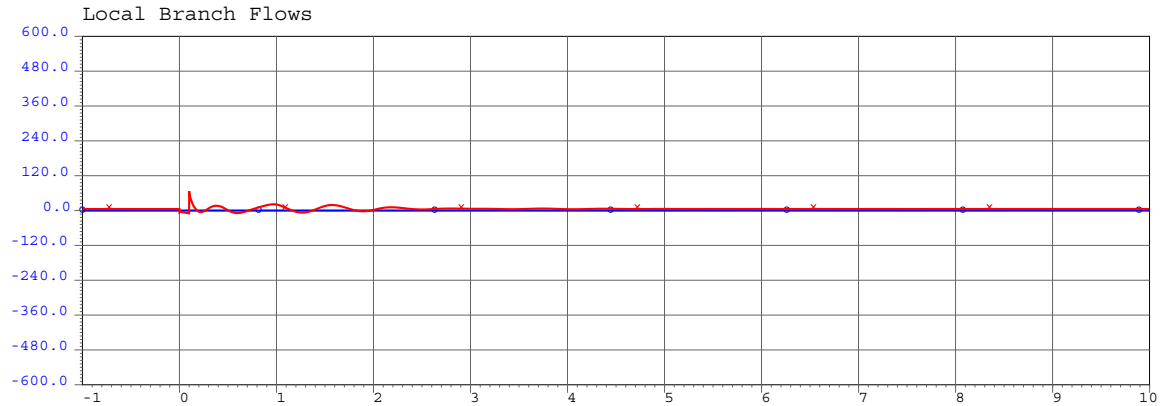
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

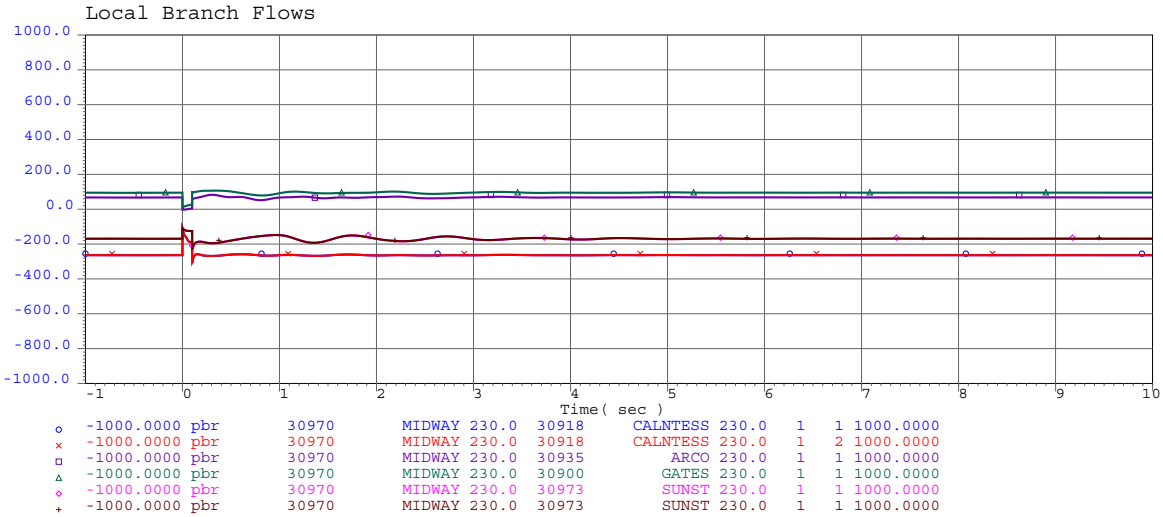


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-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

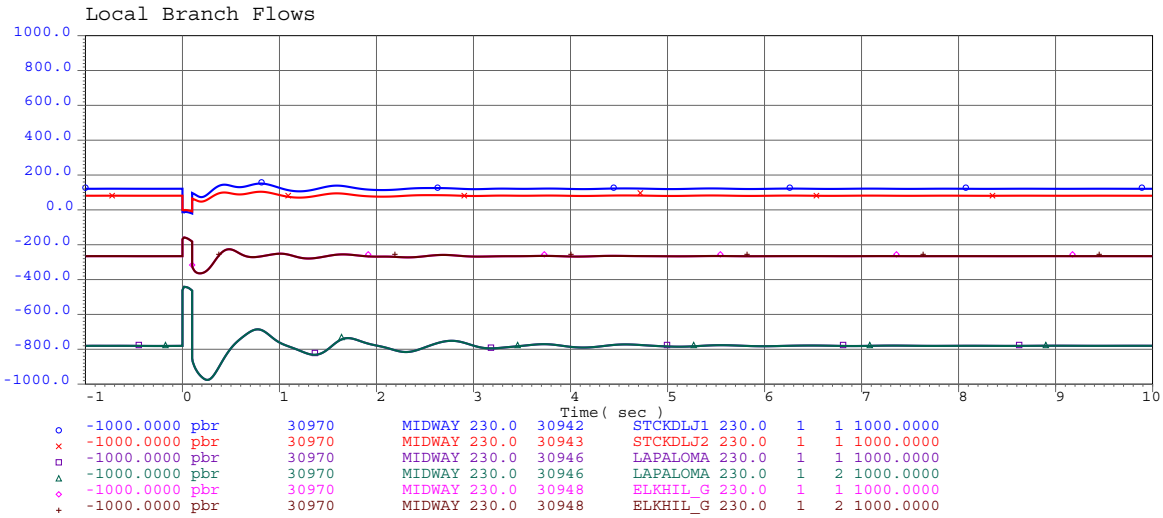


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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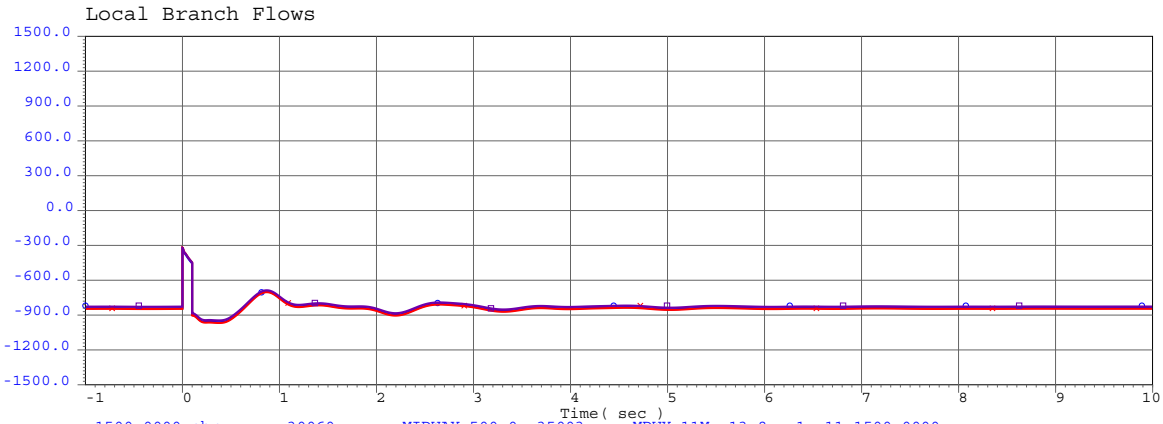
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



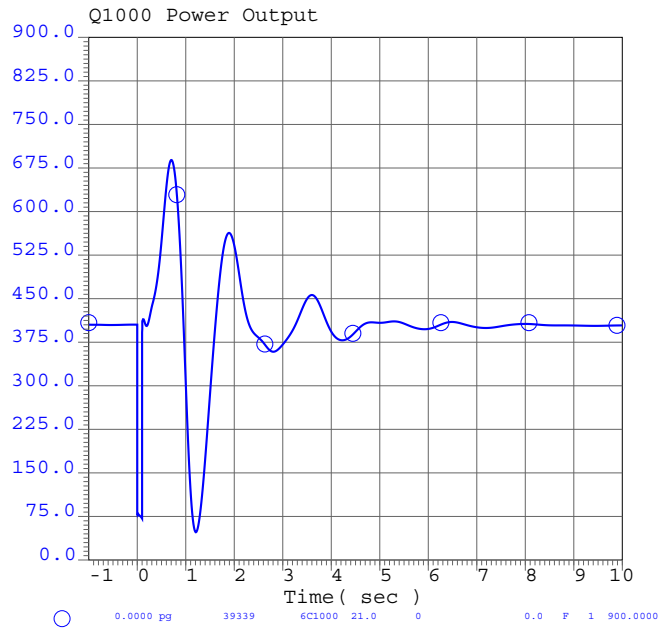
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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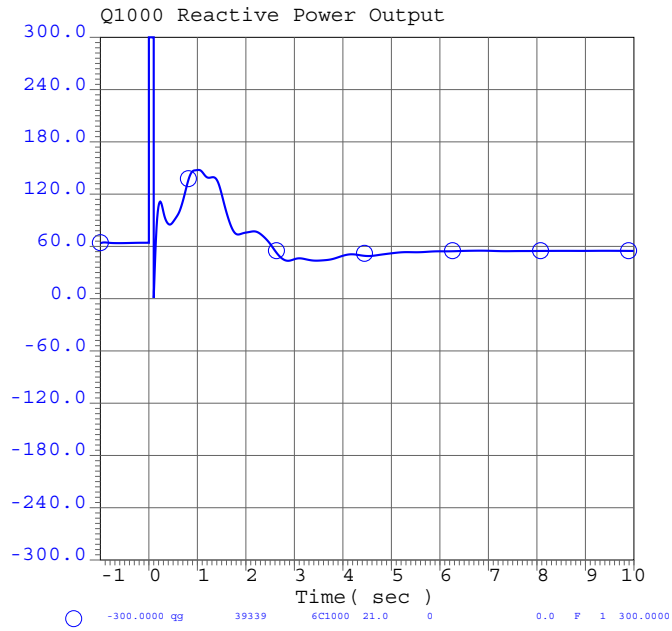


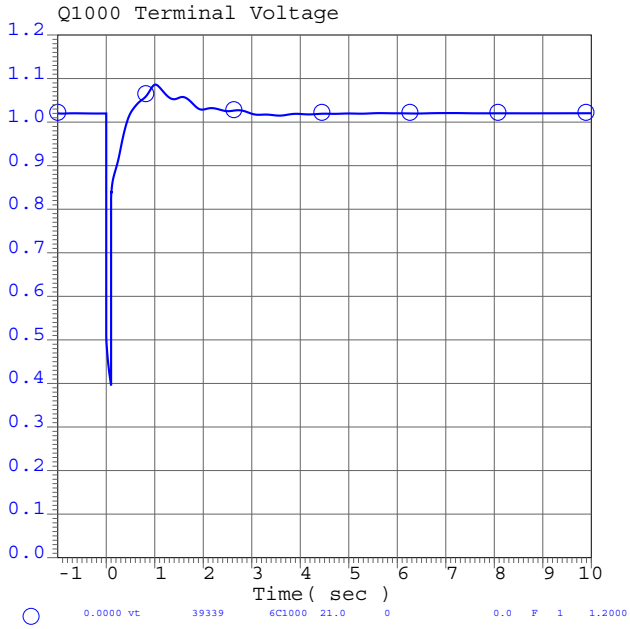
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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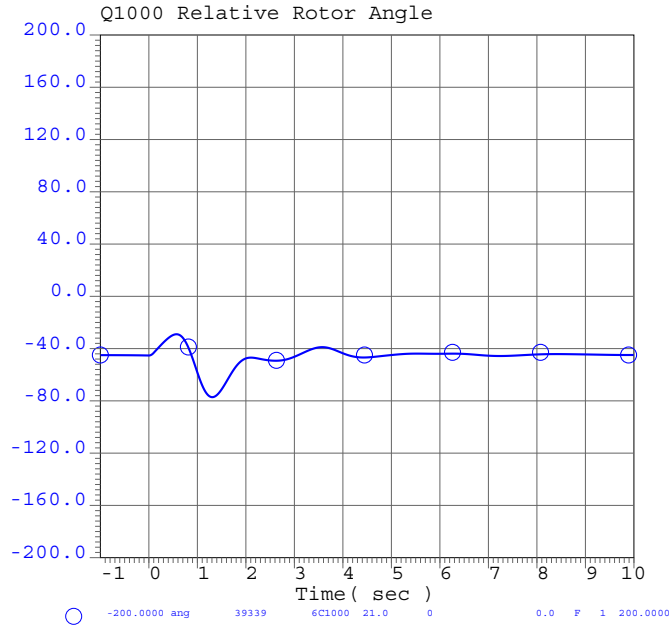
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #1 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







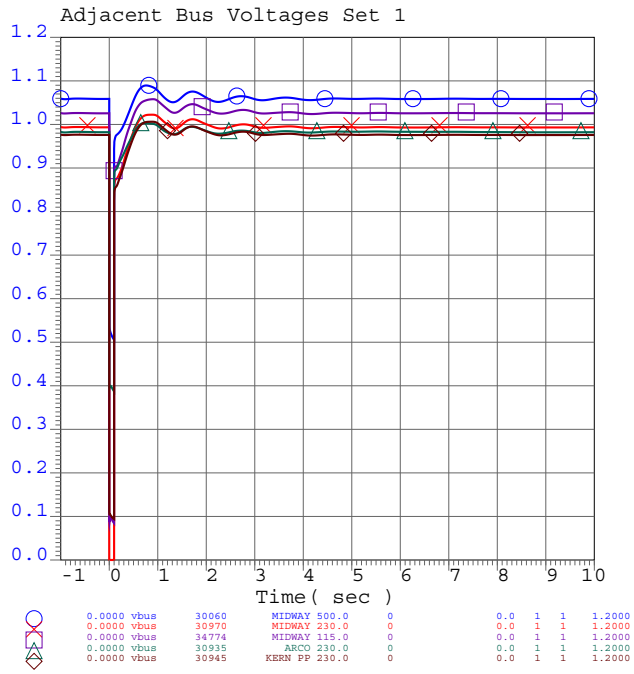


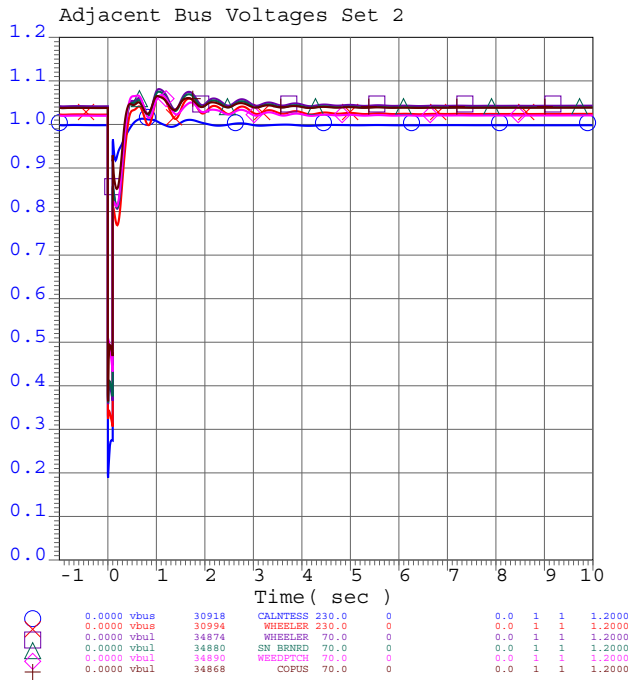
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

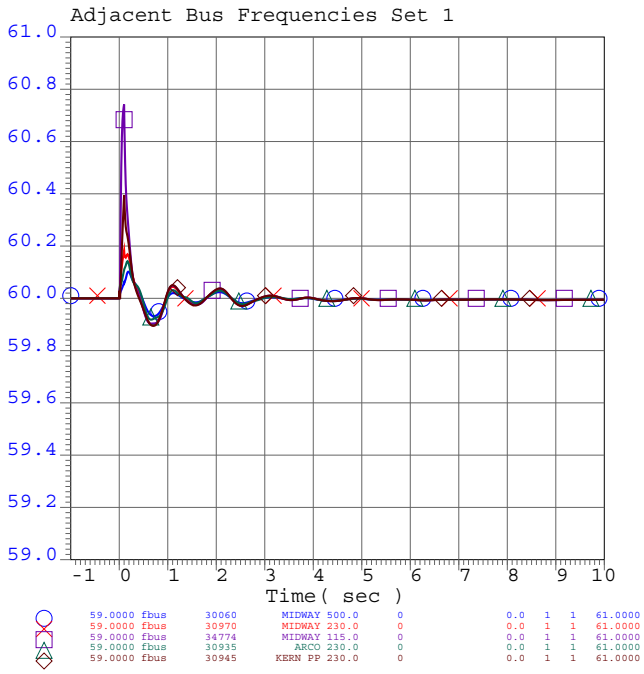
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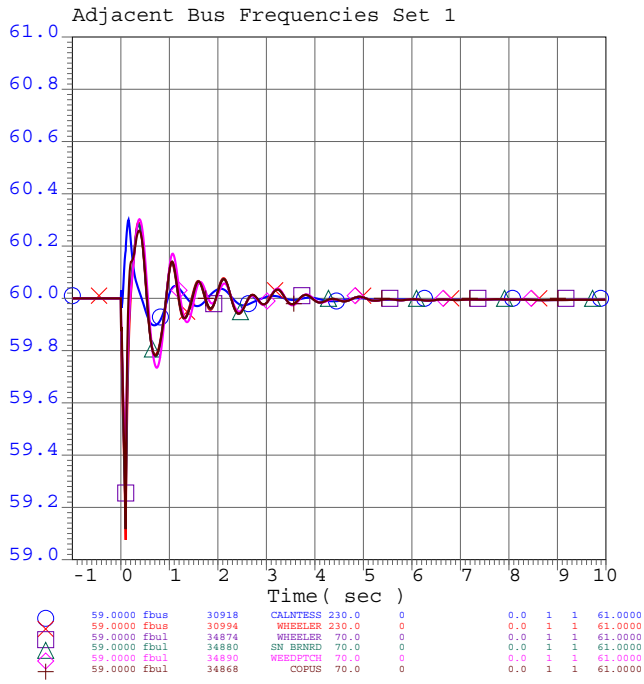
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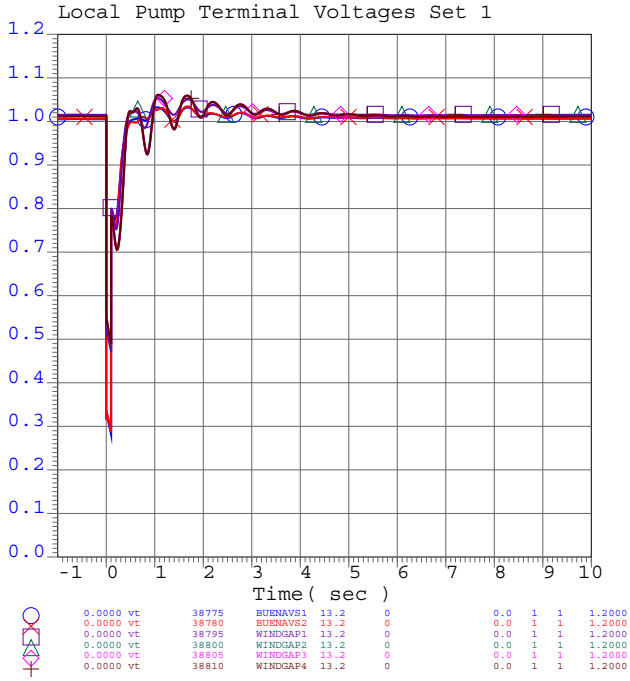




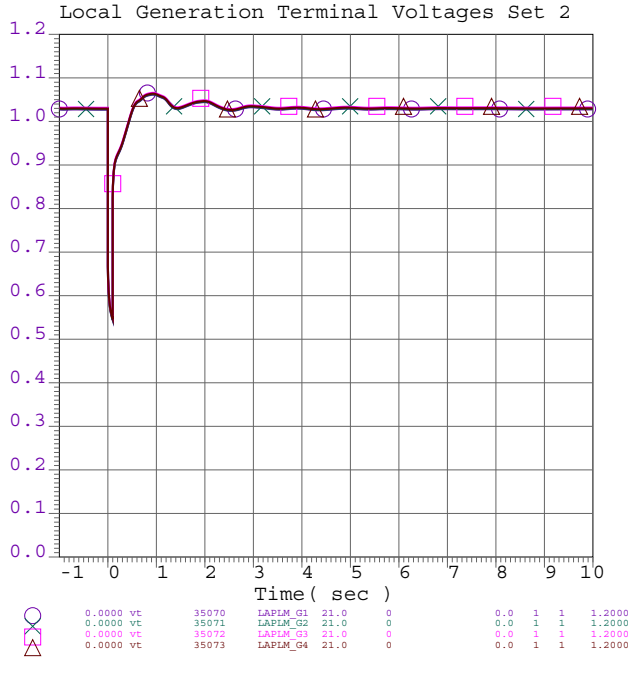


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

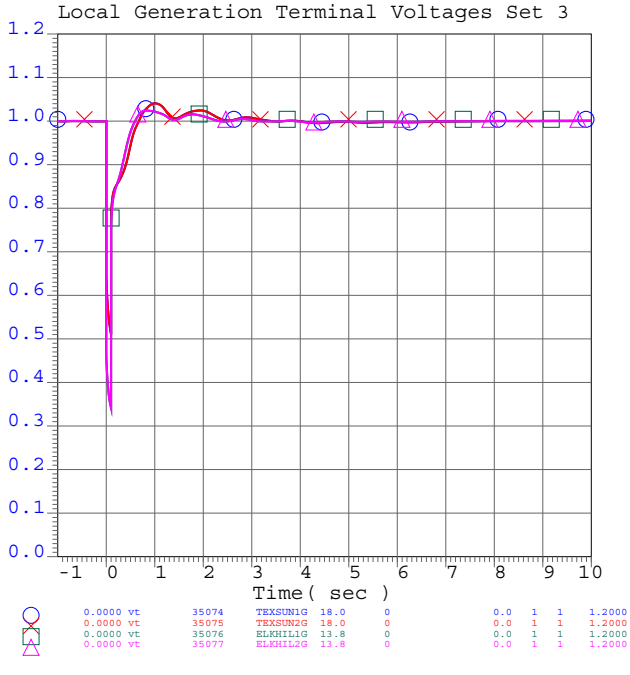
Local Pump Terminal Voltages Set 1



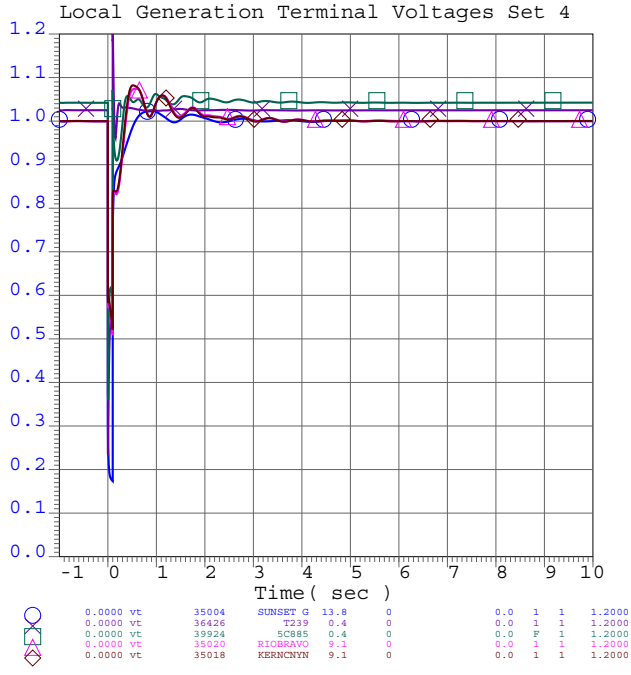
Local Generation Terminal Voltages Set 2



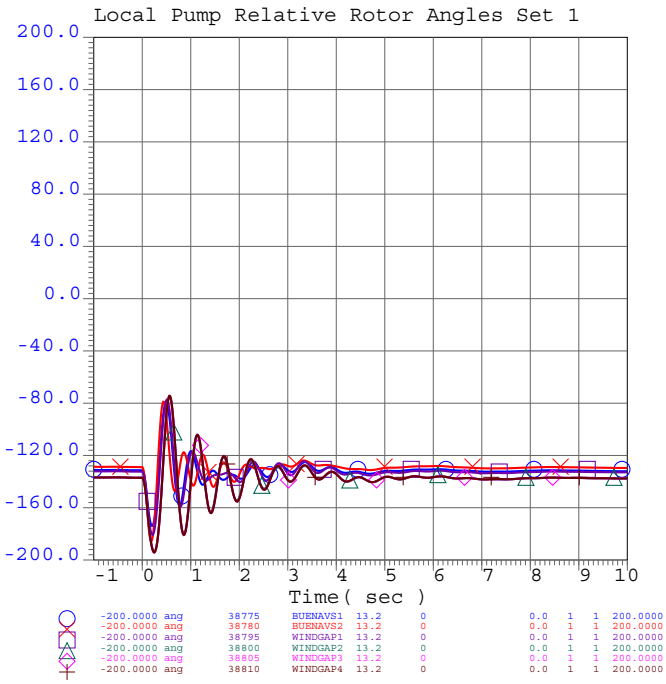
Local Generation Terminal Voltages Set 3

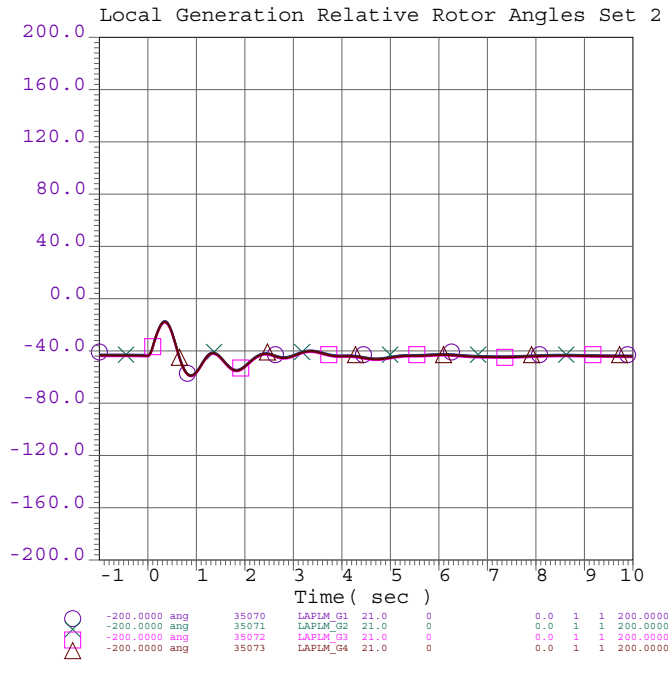


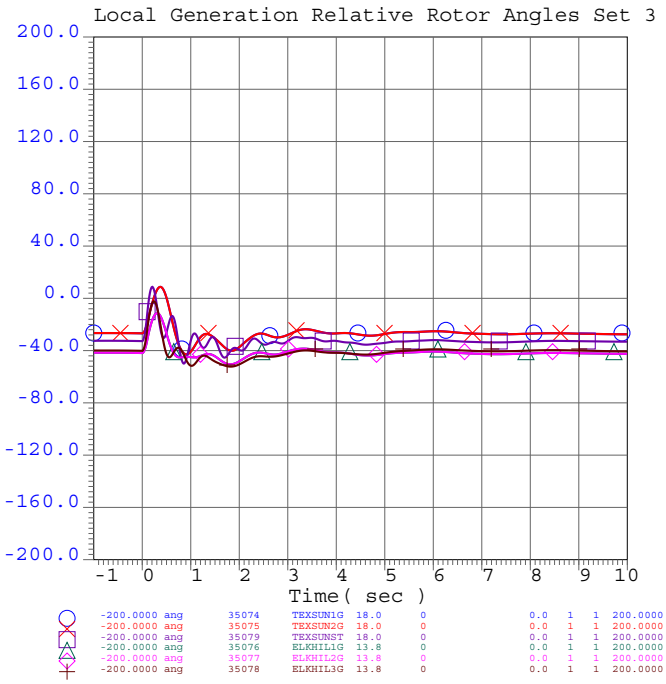
Local Generation Terminal Voltages Set 4

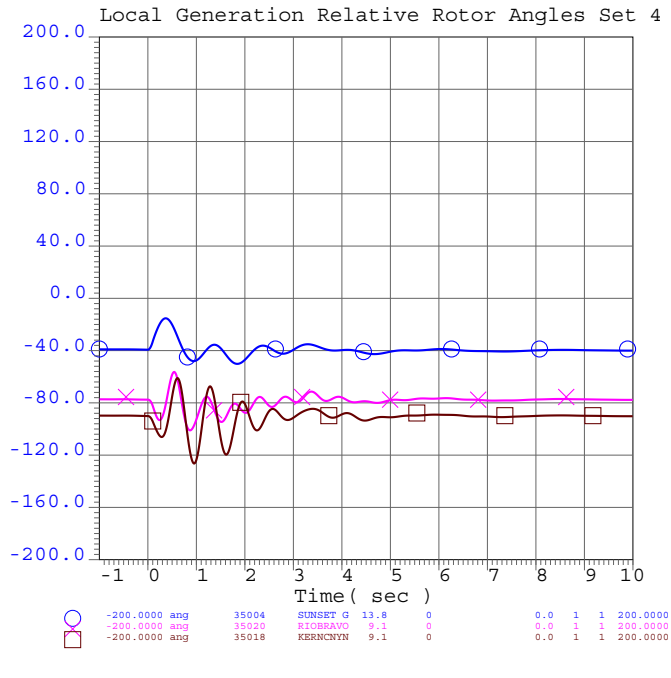


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

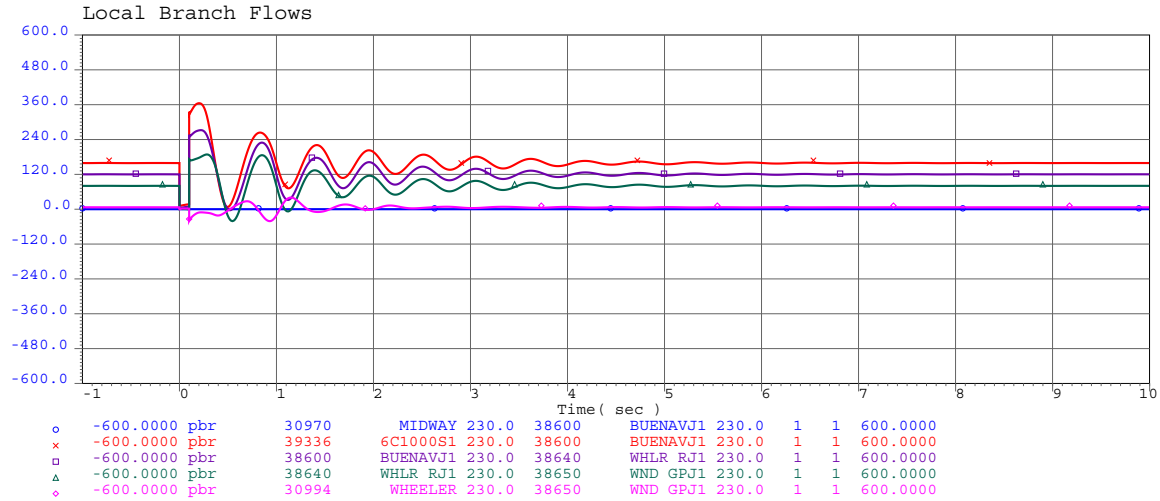




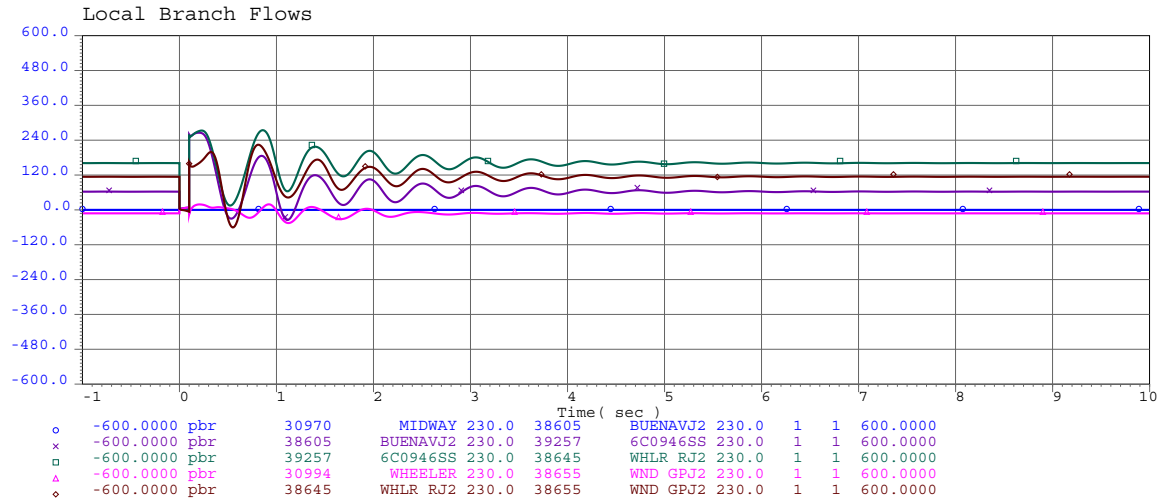




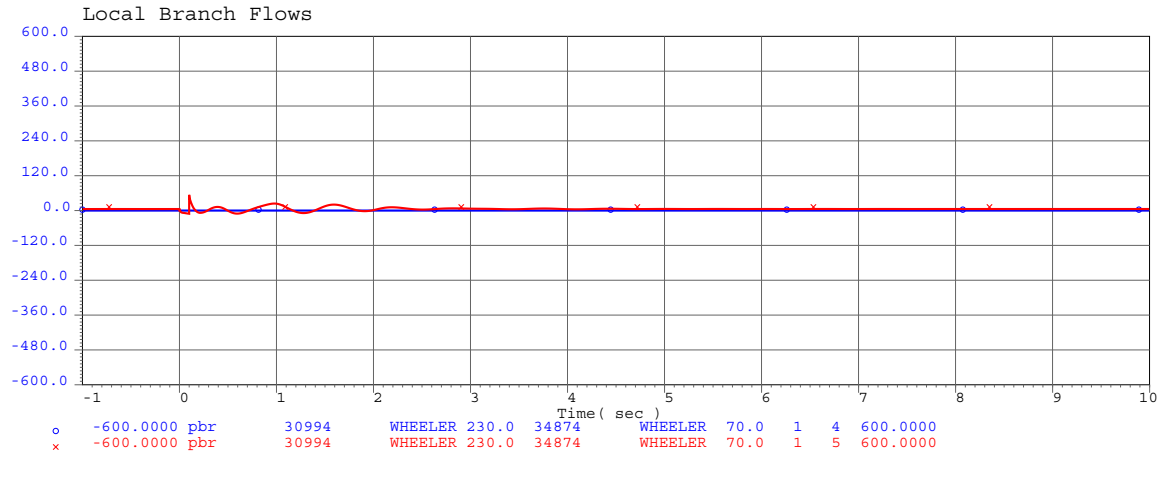
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
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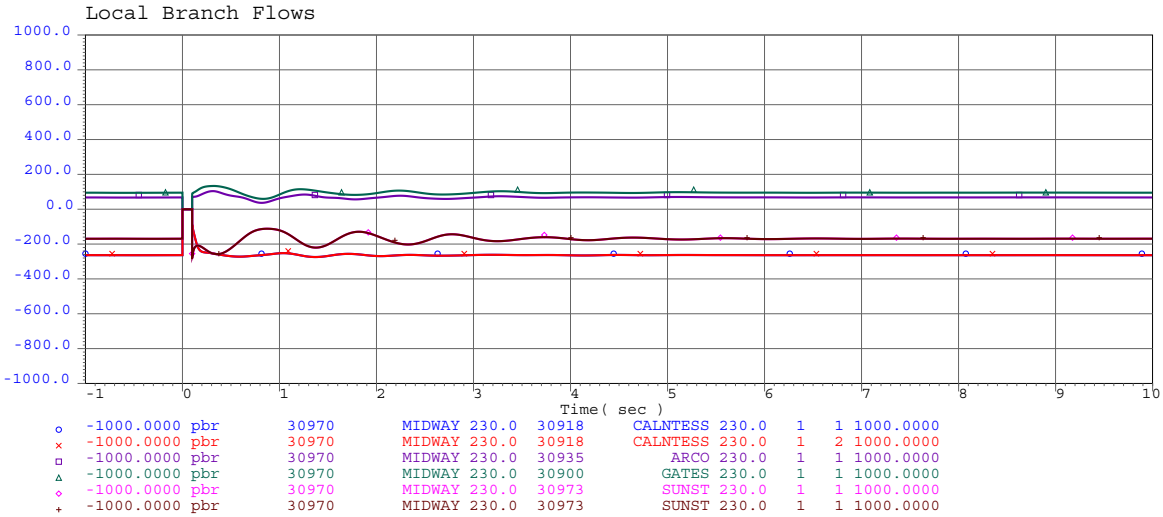


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
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-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

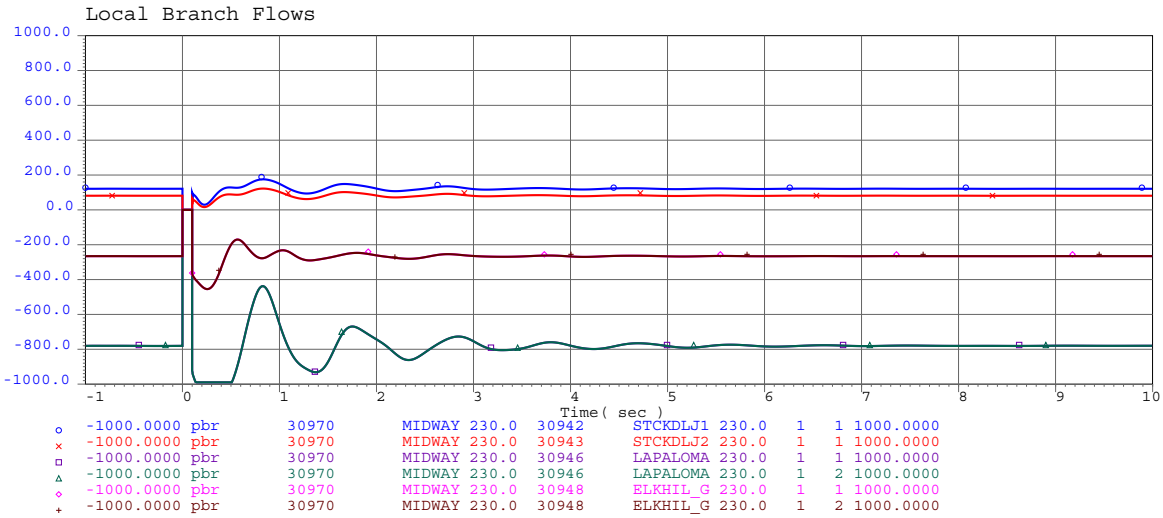


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
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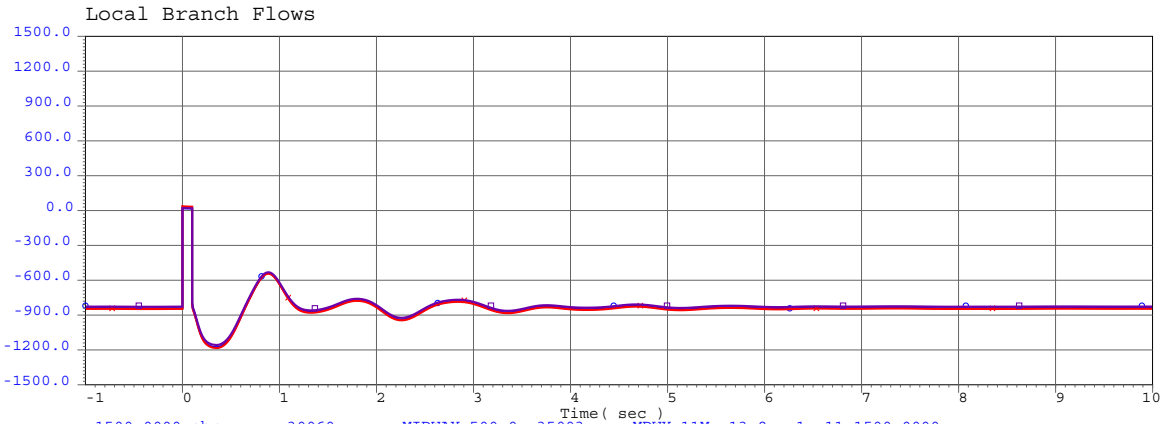
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



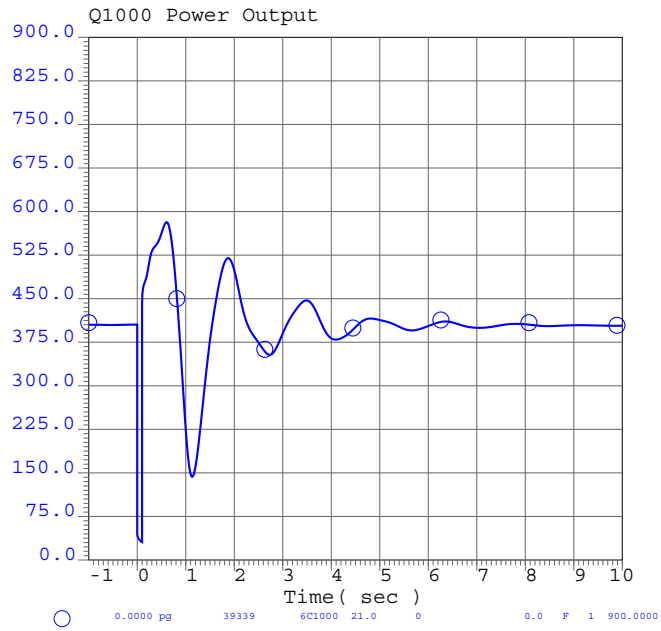
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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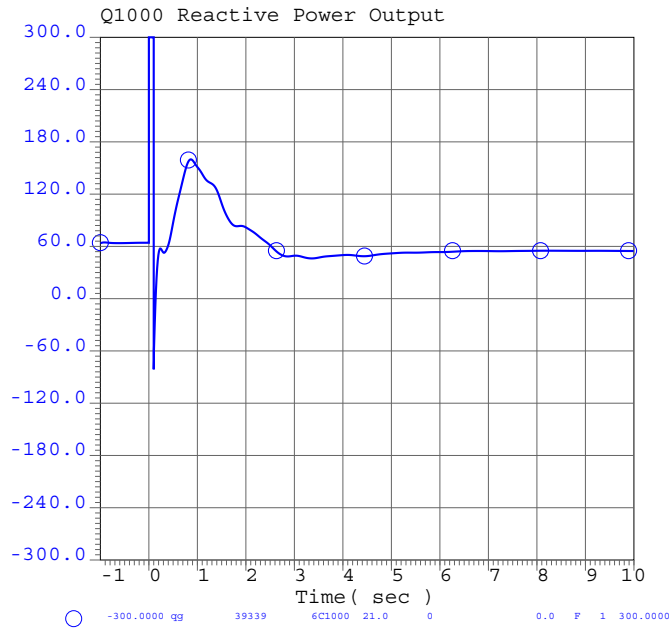


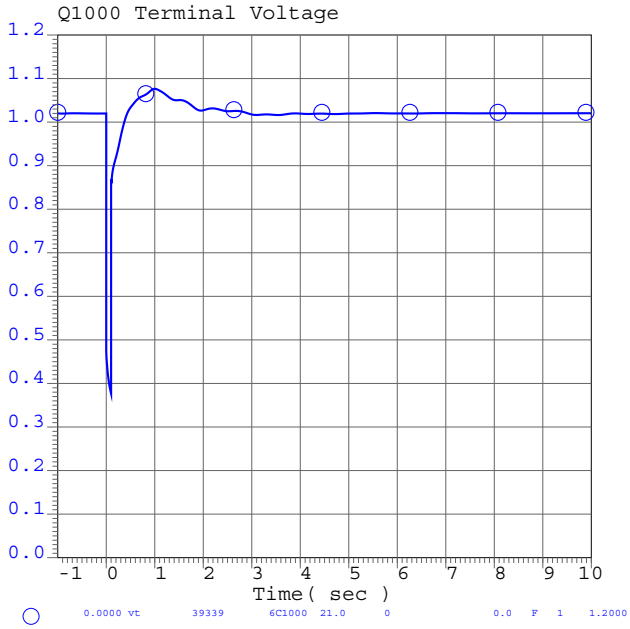
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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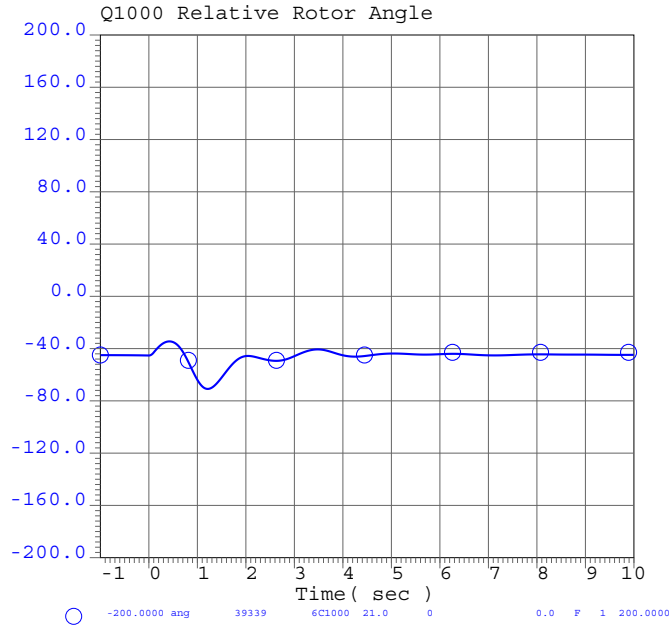
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #2 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





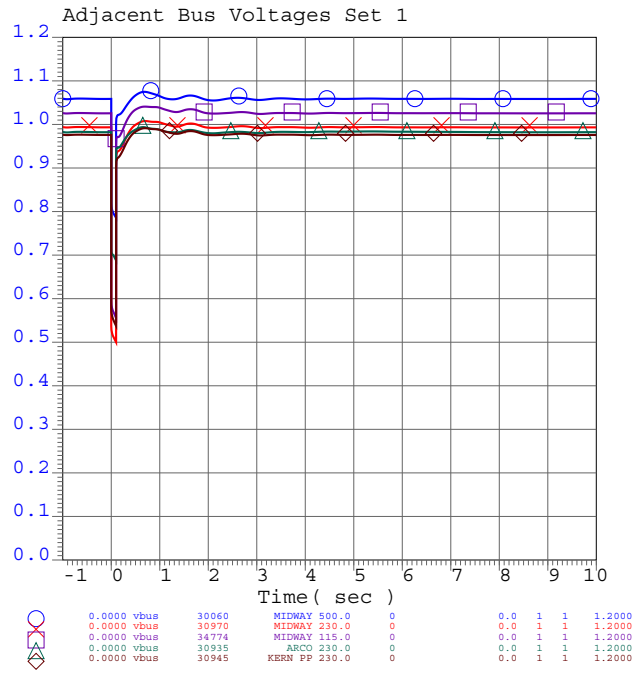


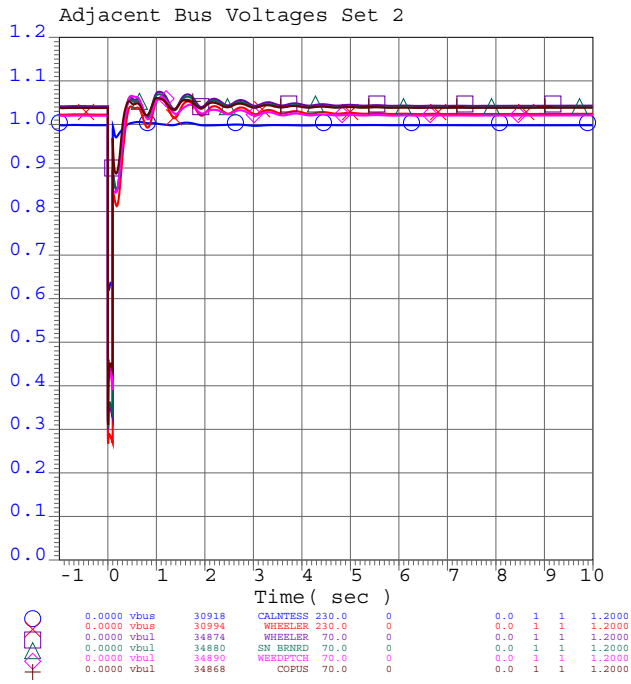


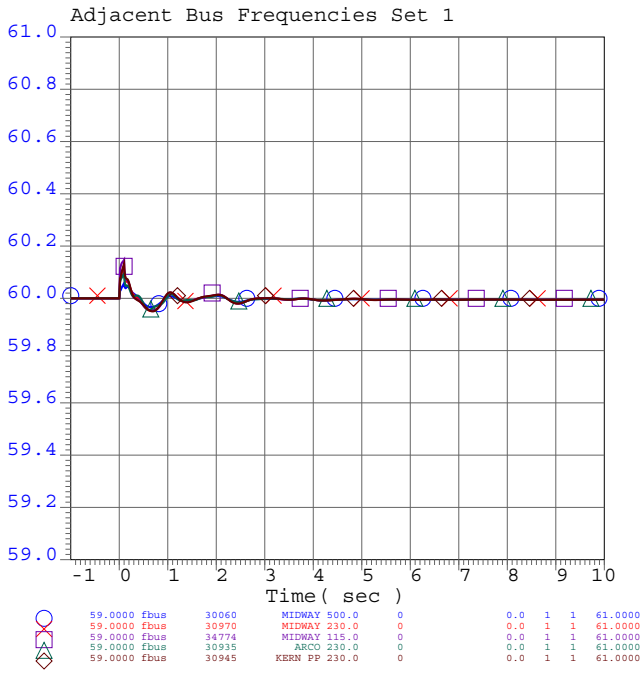
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

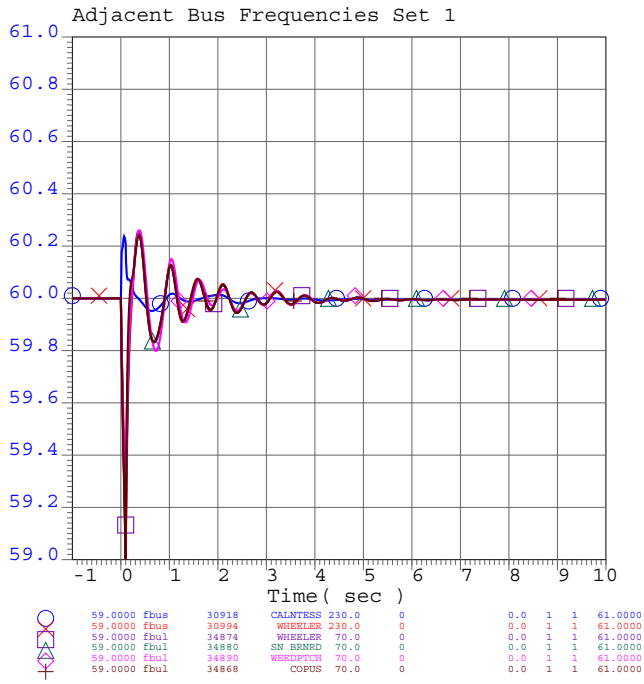
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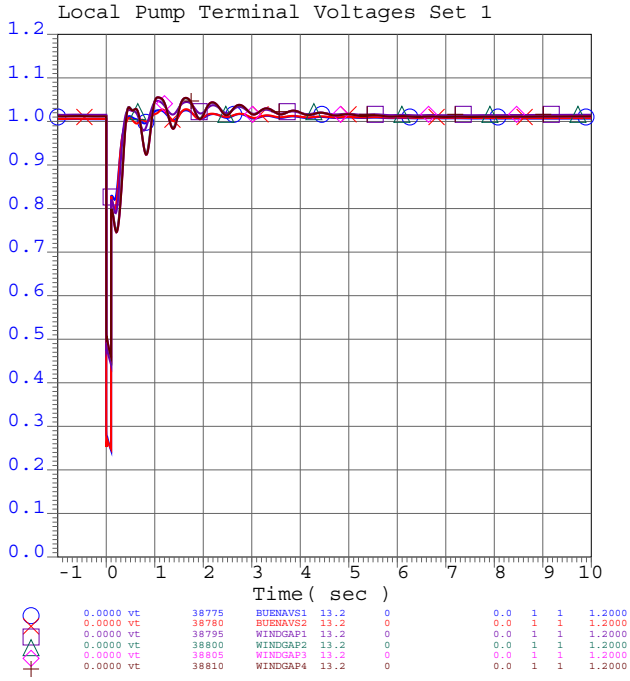




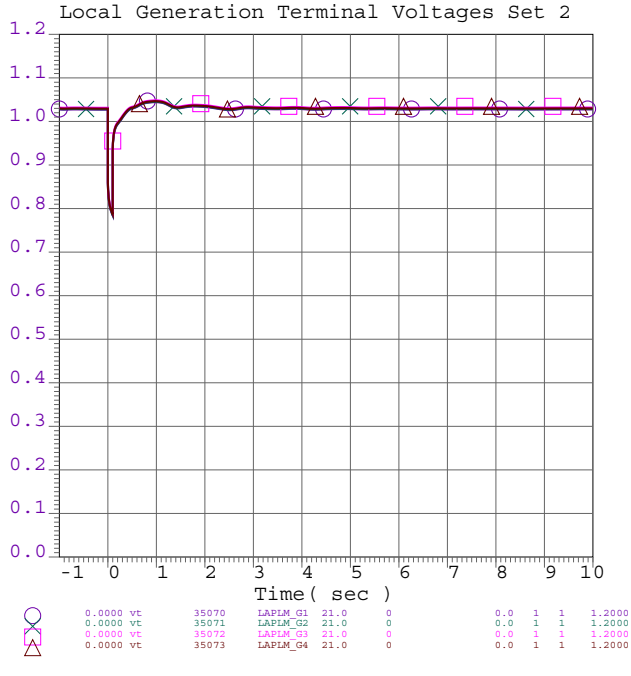


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

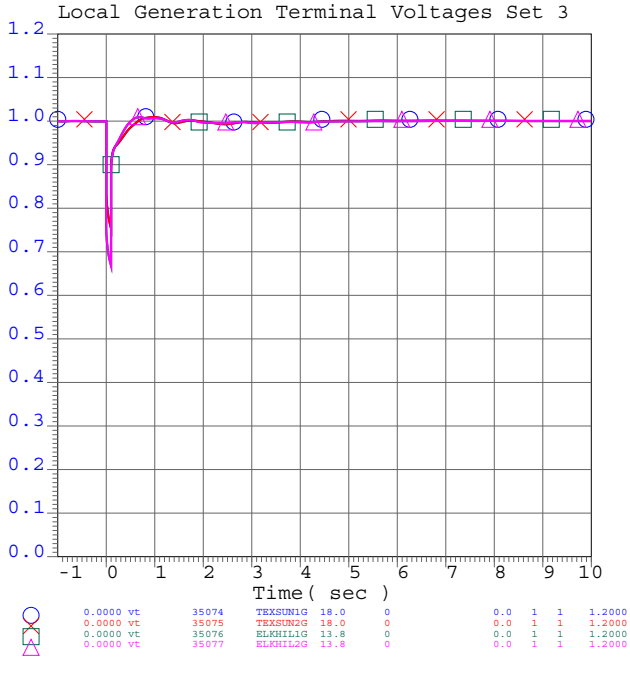
Local Pump Terminal Voltages Set 1



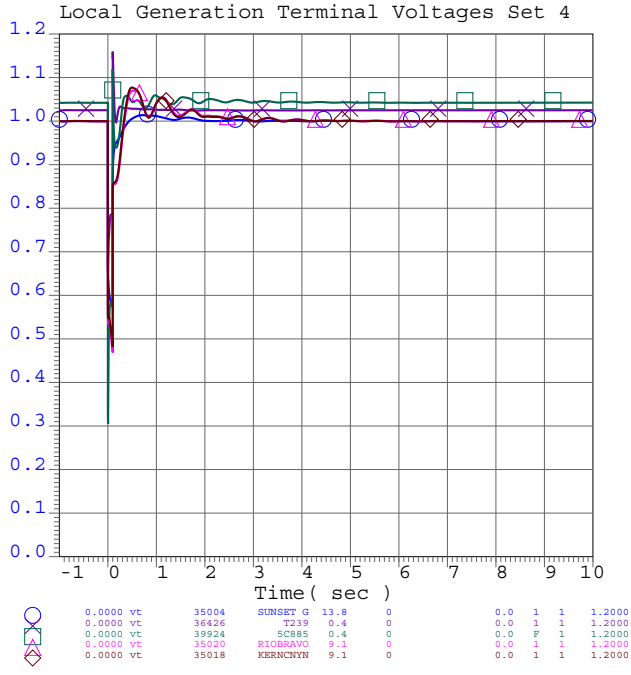
Local Generation Terminal Voltages Set 2



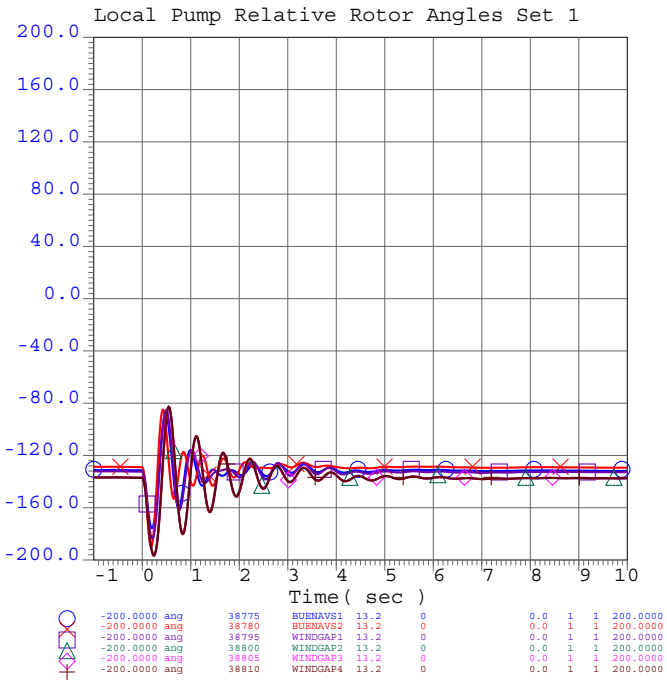
Local Generation Terminal Voltages Set 3

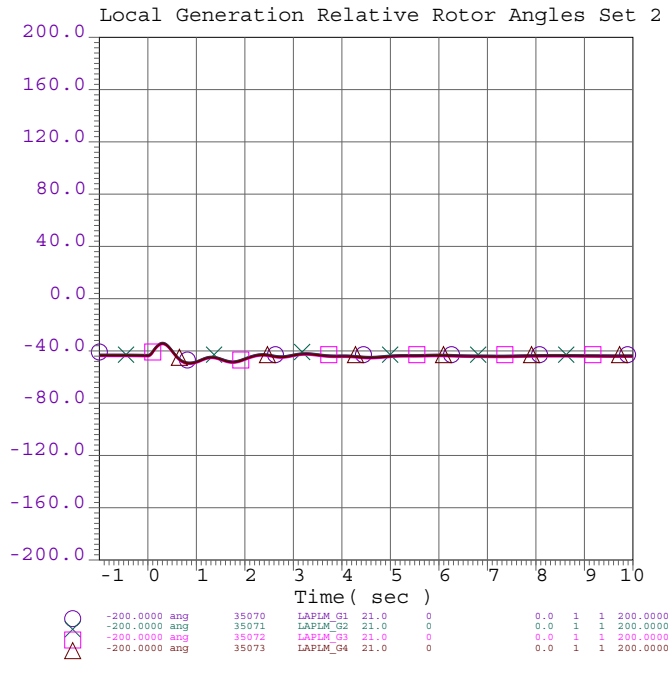


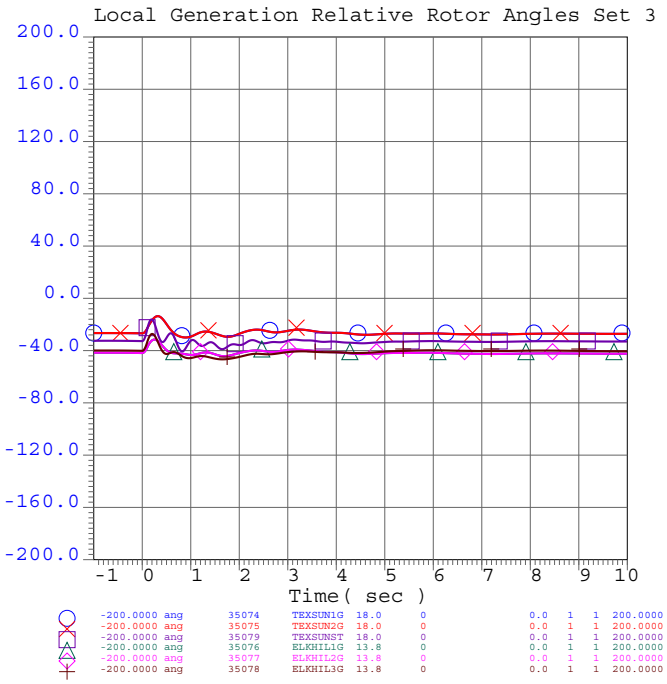
Local Generation Terminal Voltages Set 4

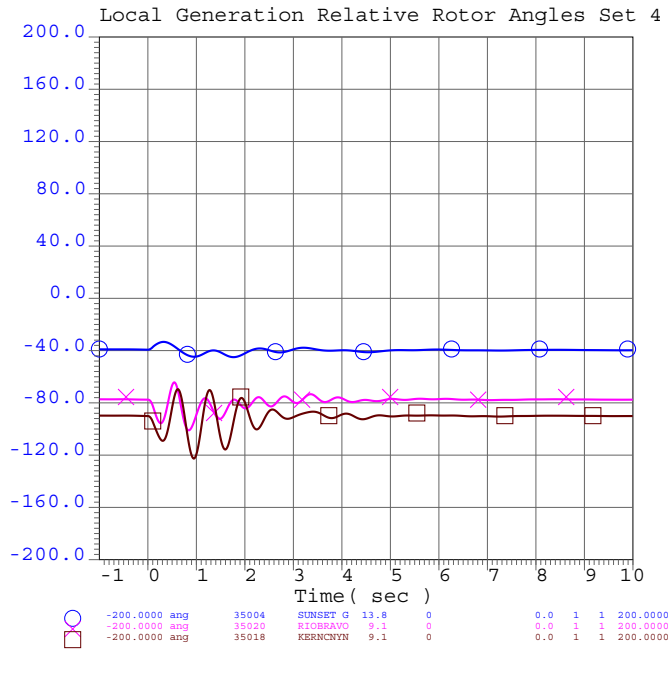


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

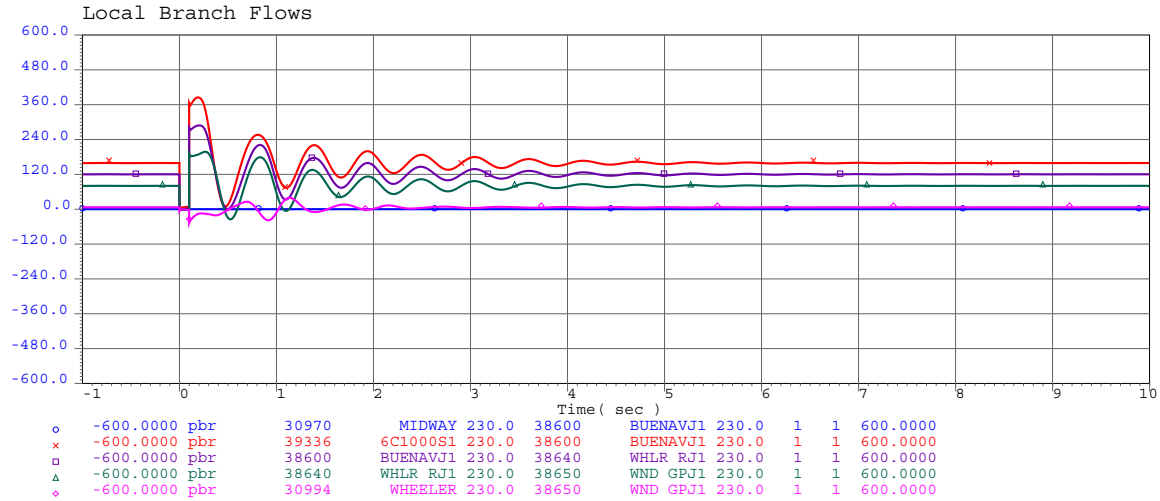




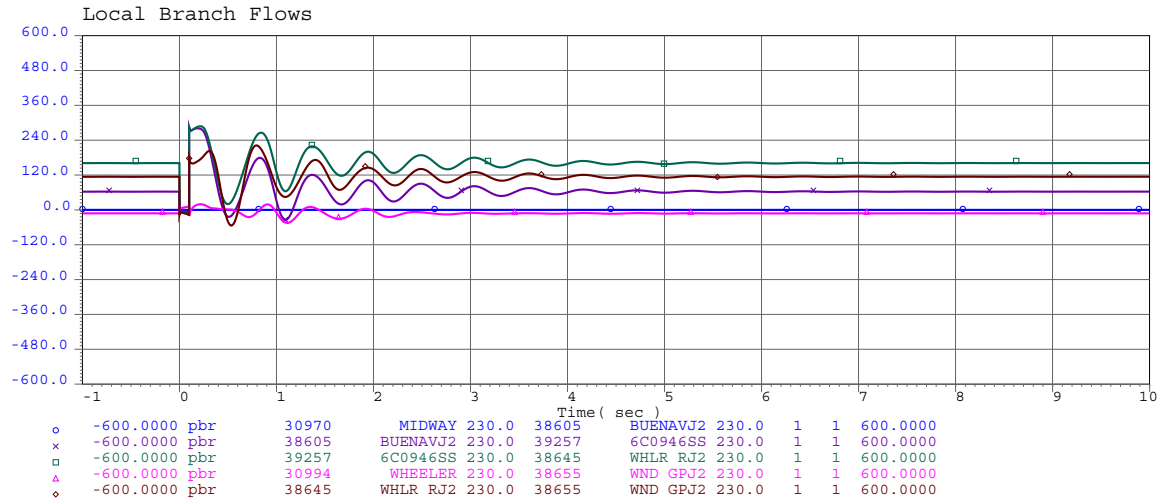




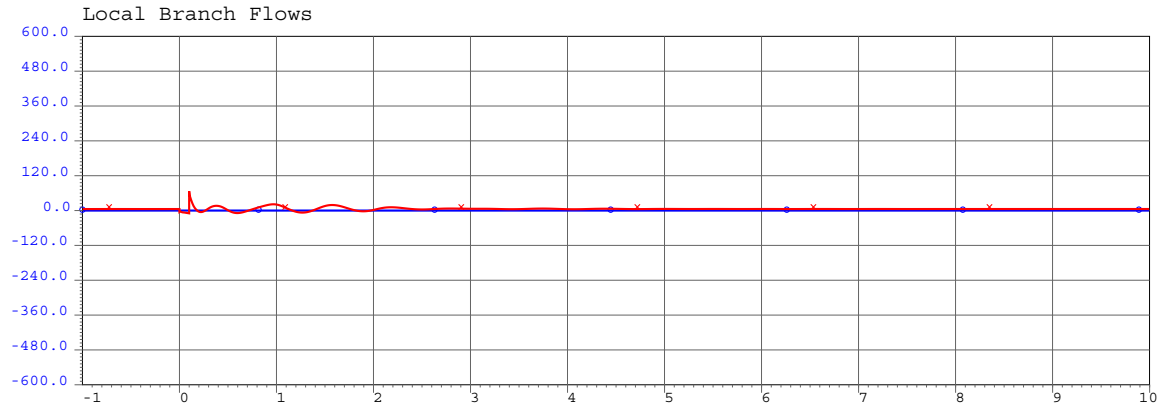
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

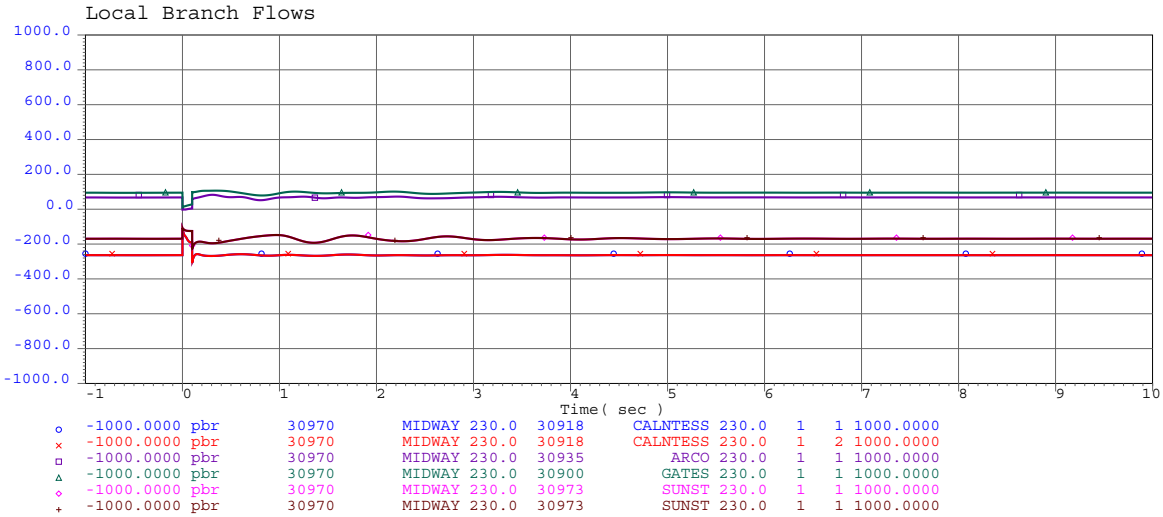


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
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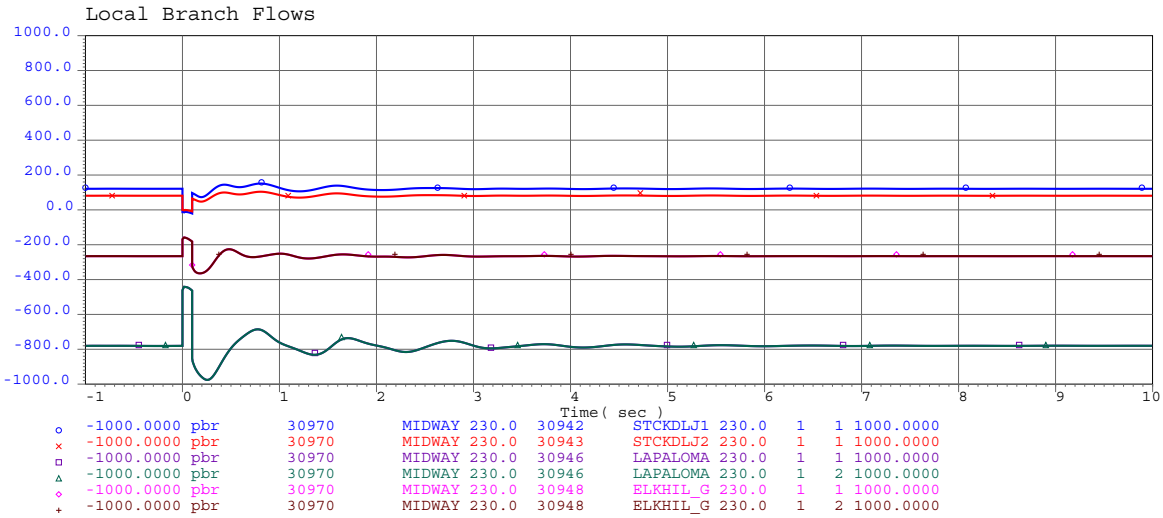


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

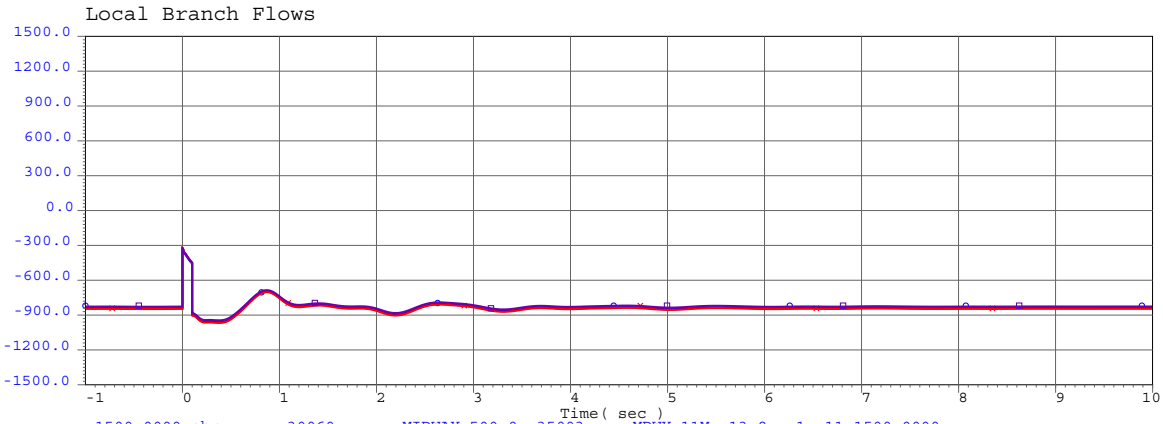
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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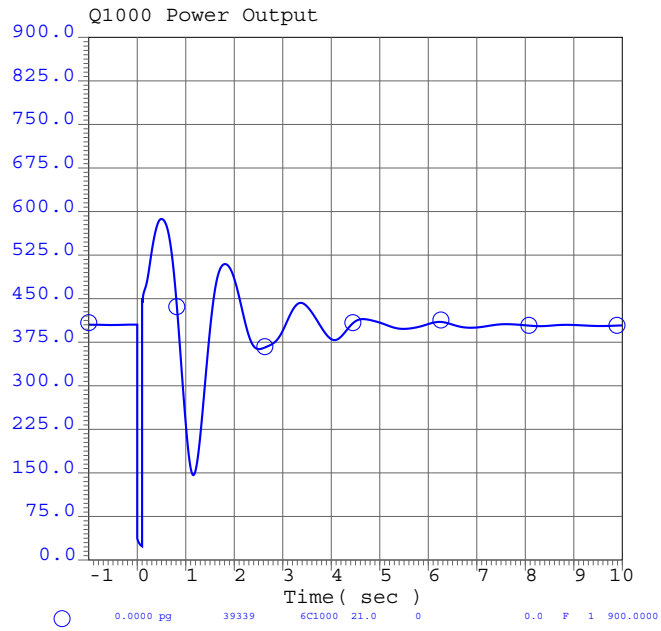
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

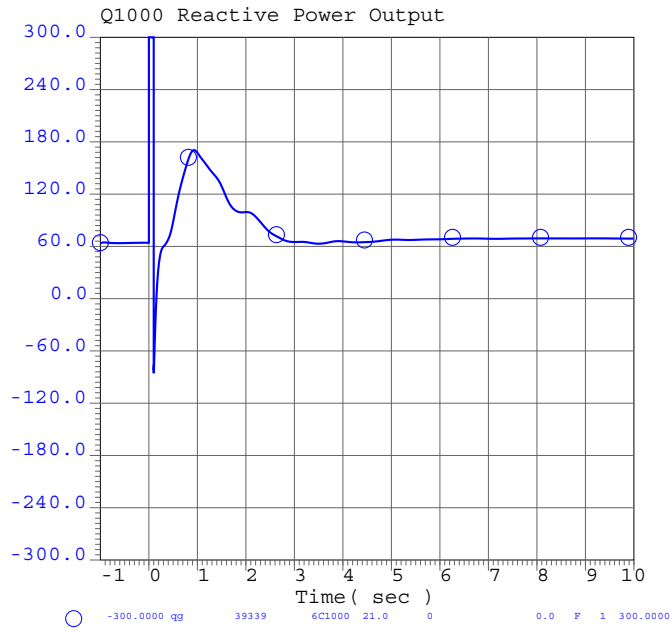


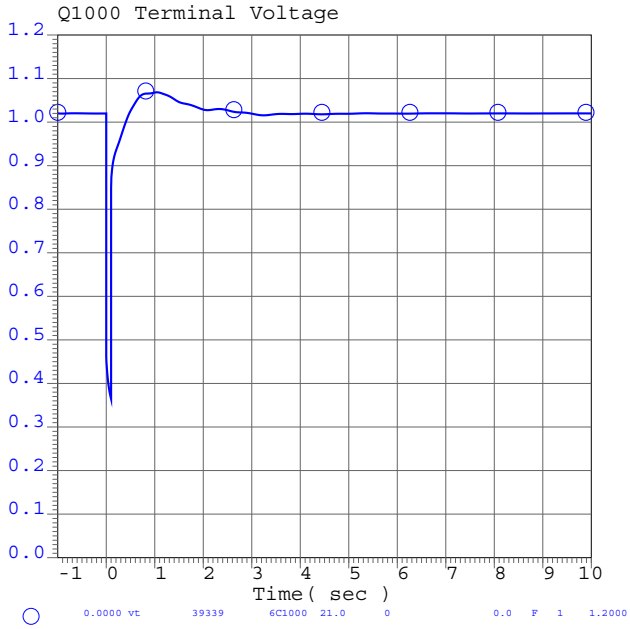
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

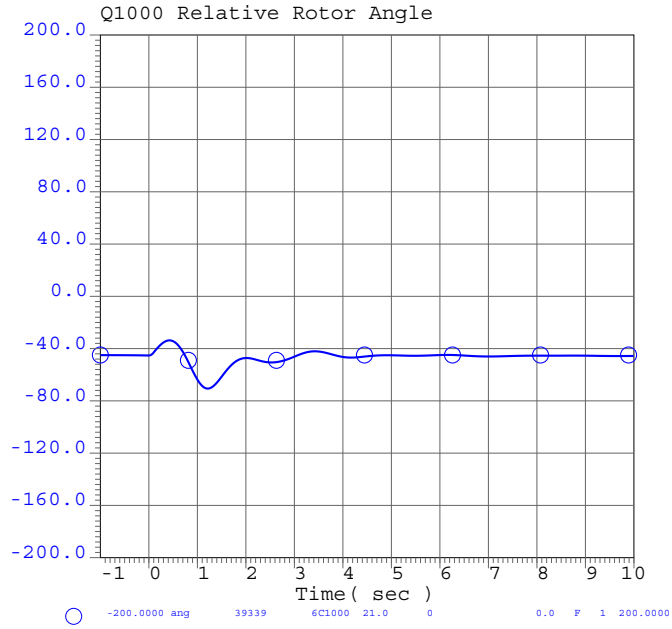
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Midway-Q1000 #2 230kV line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





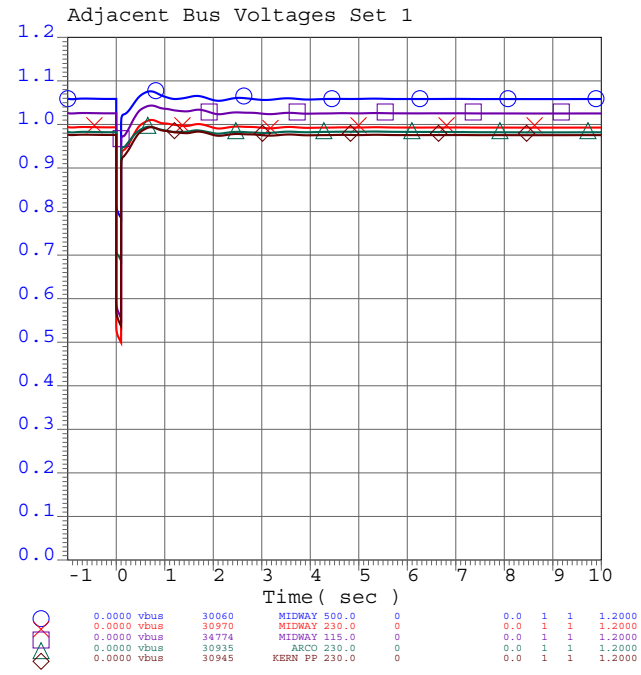


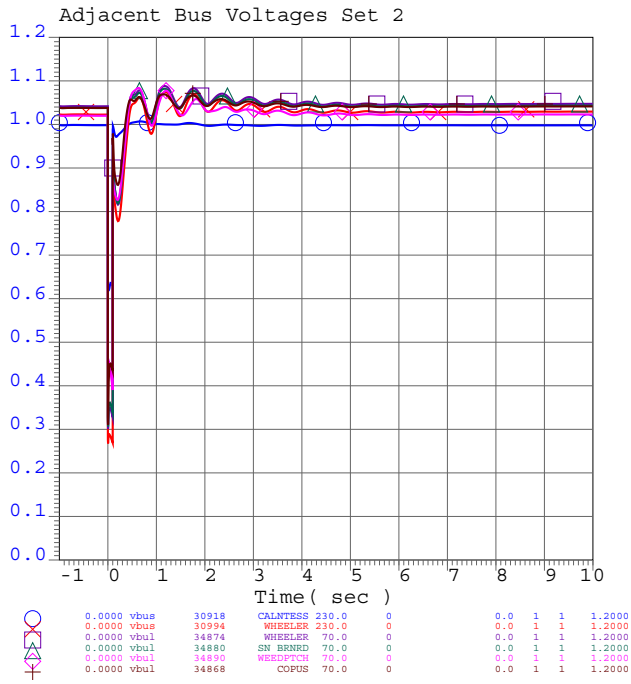


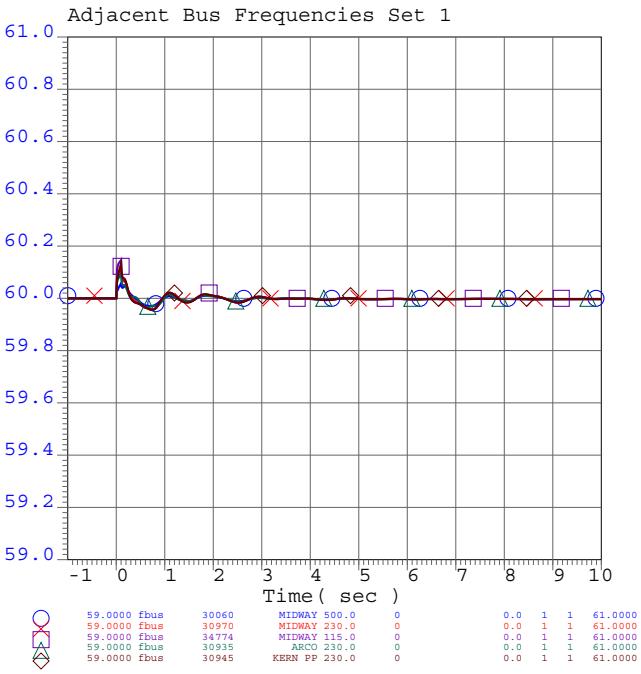
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line

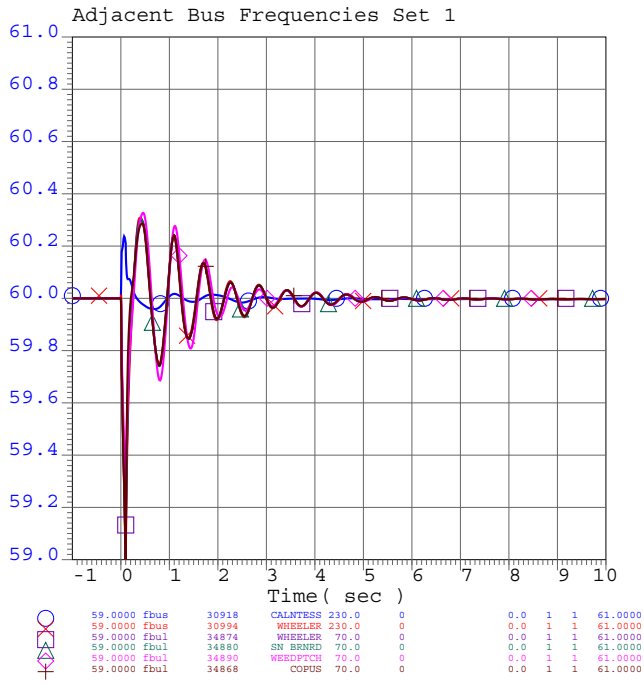
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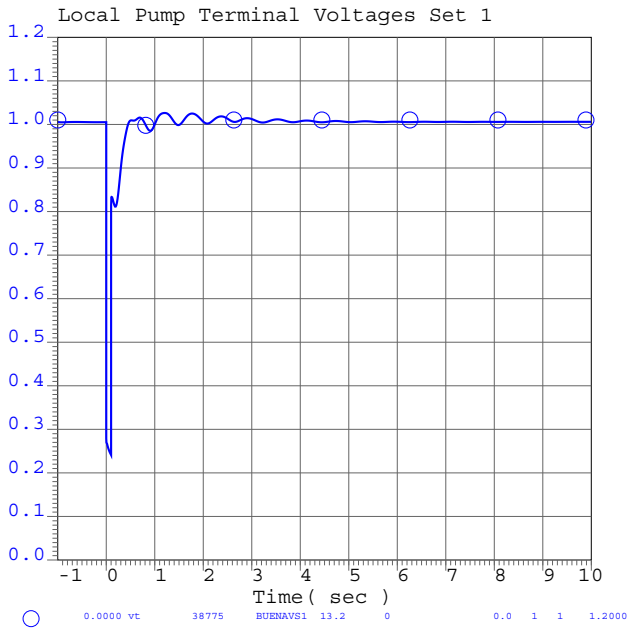


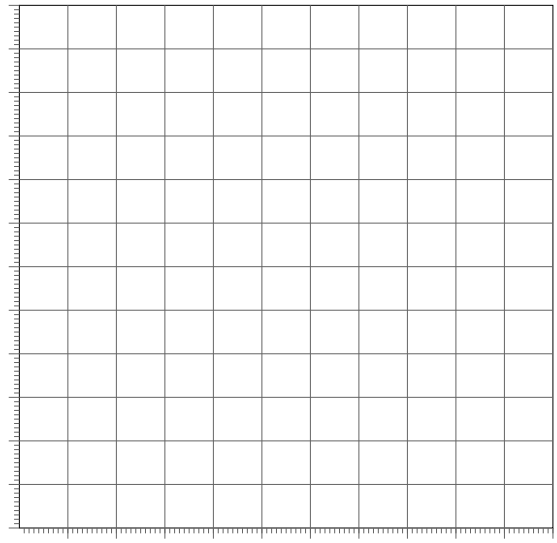


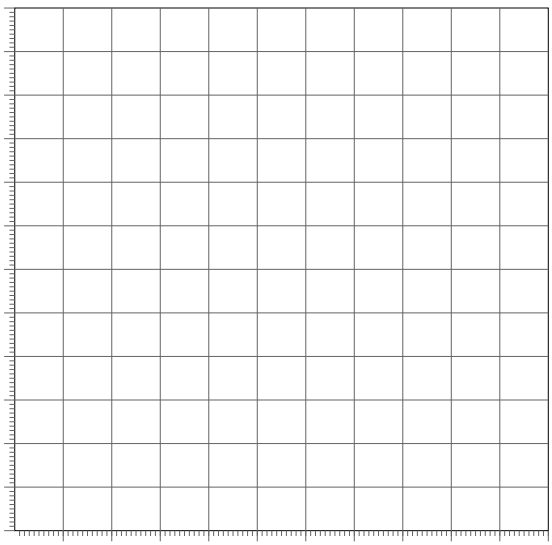


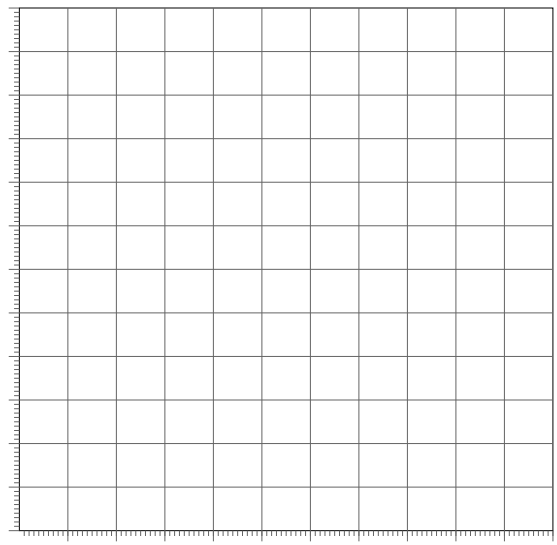


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line



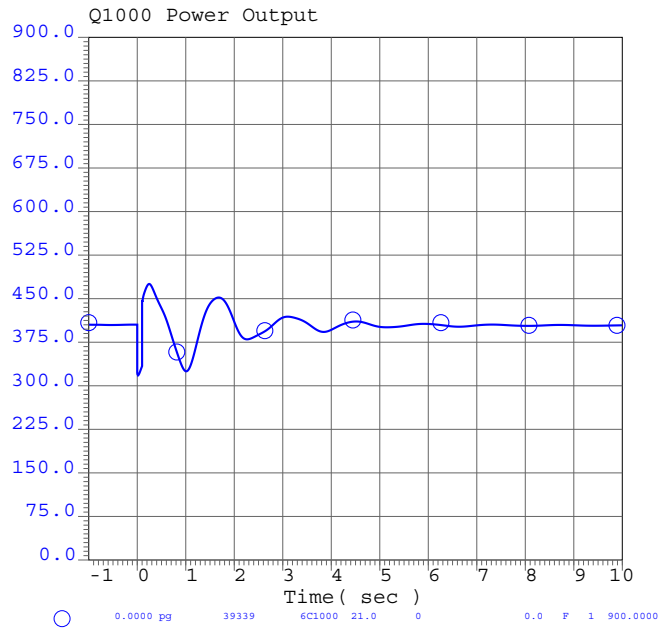


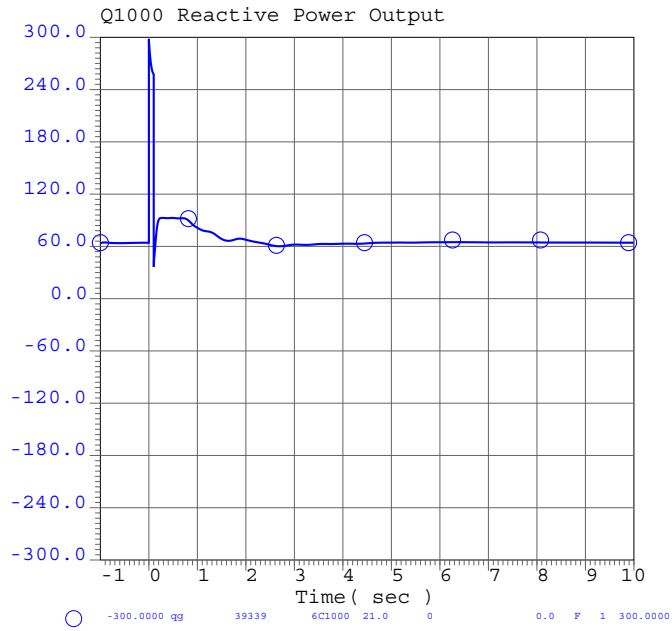


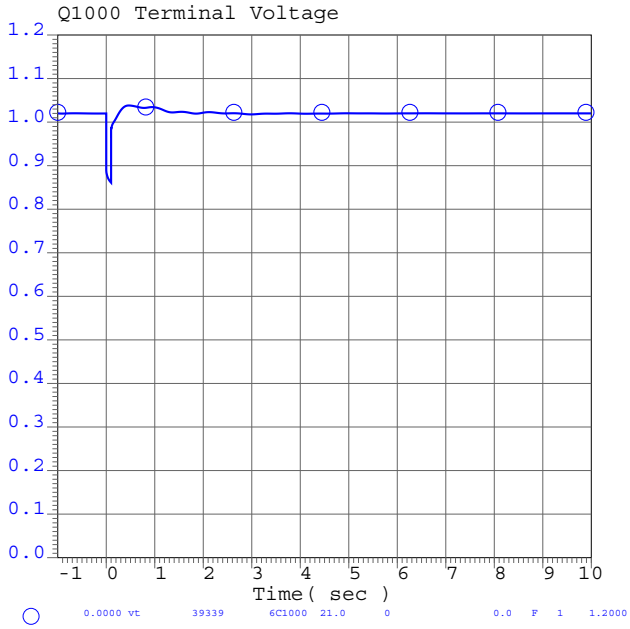


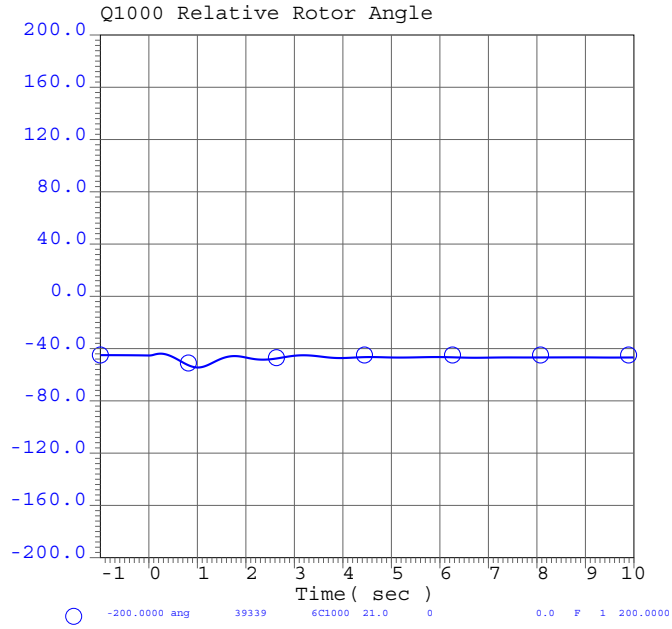
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-6C0946SS #2 230 kV Line

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







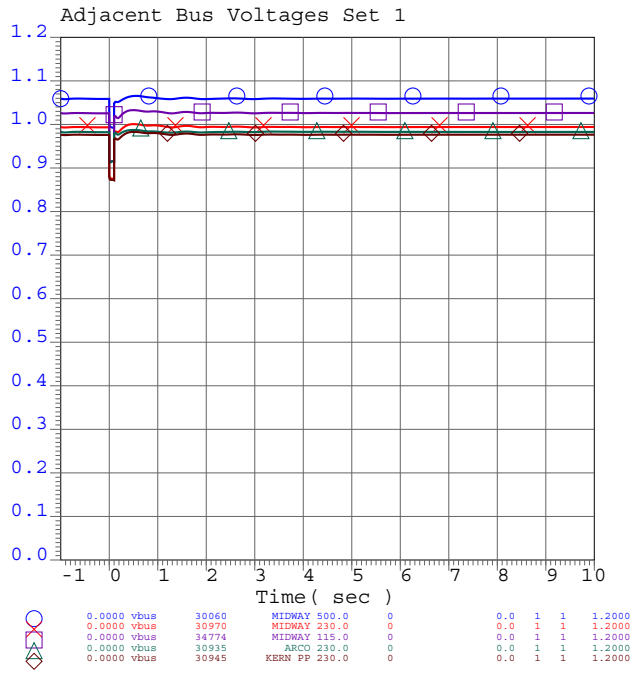


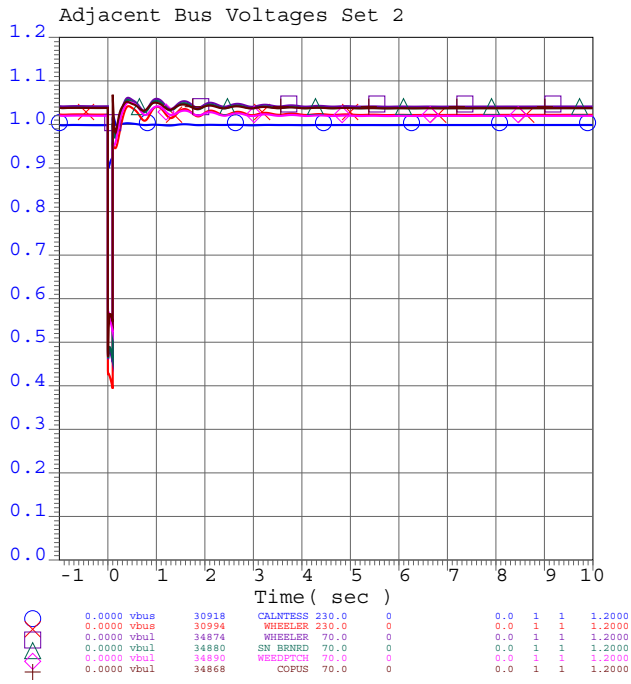
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

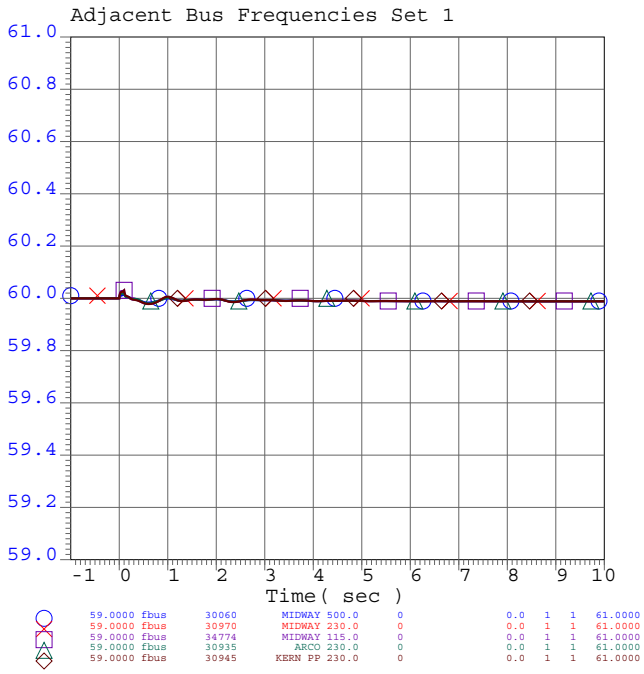
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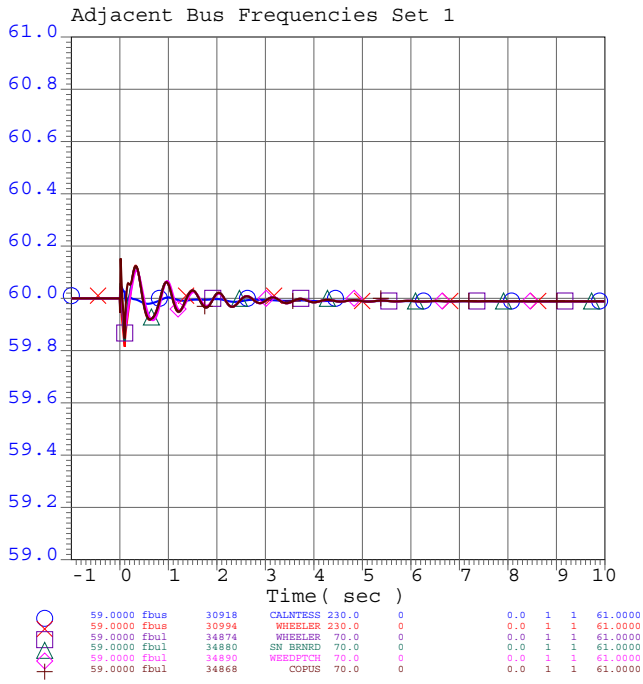
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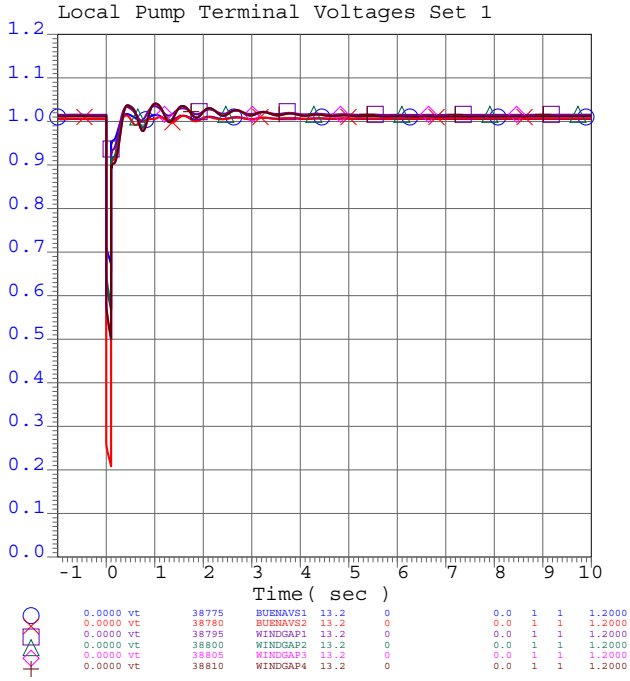




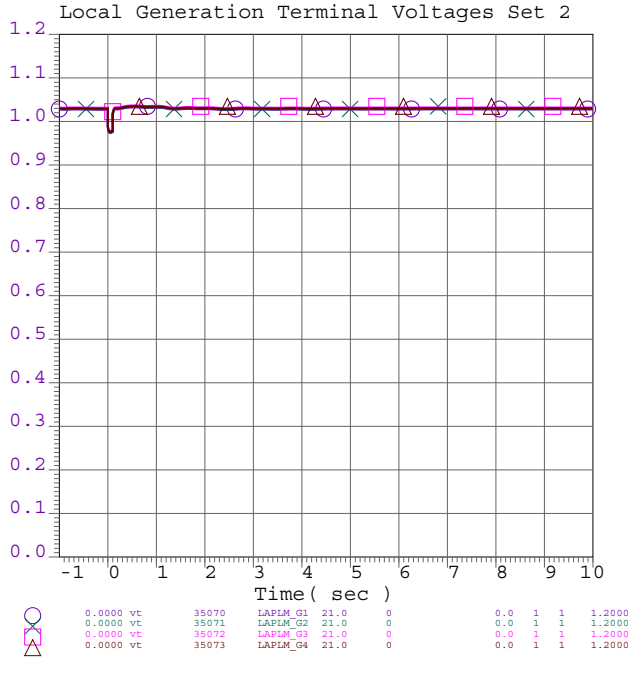


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

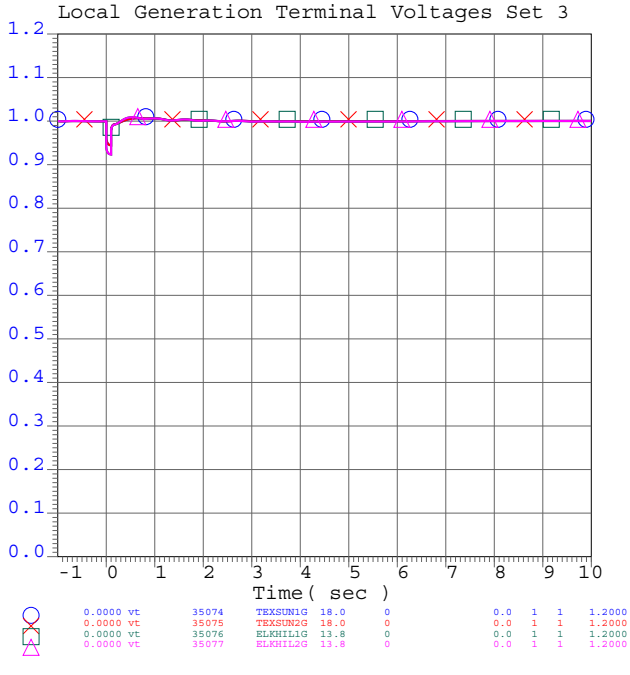
Local Pump Terminal Voltages Set 1



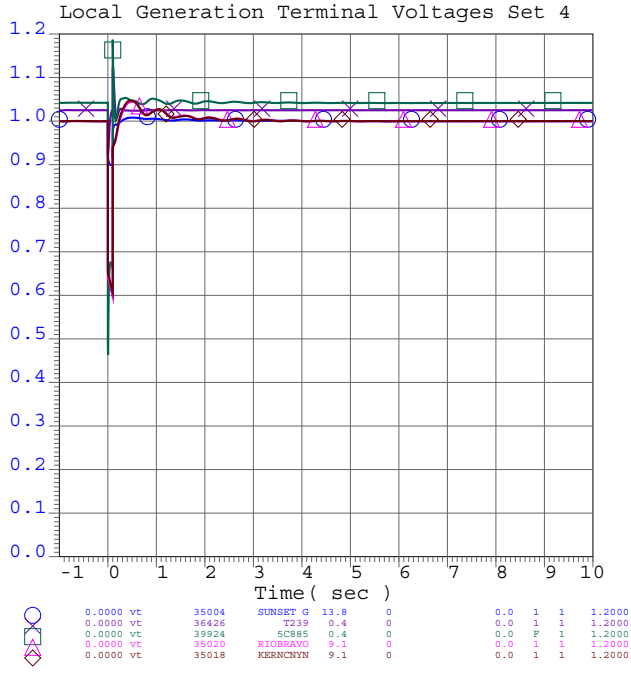
Local Generation Terminal Voltages Set 2



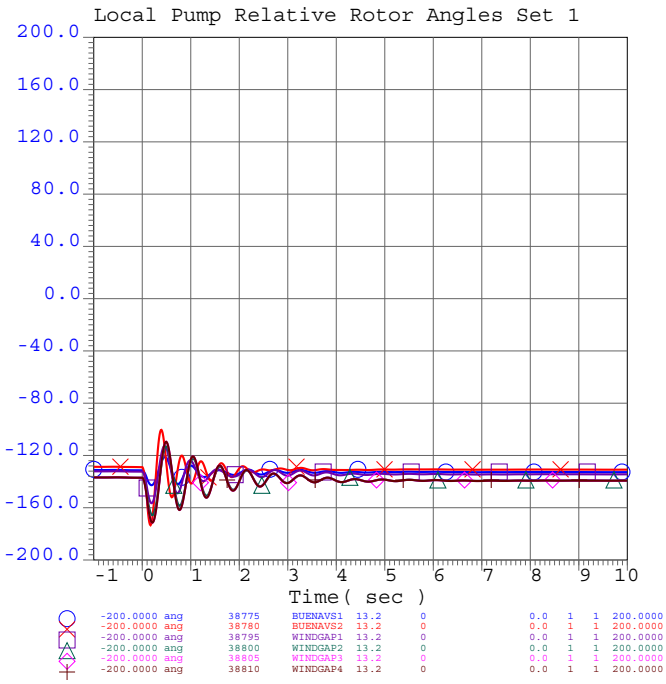
Local Generation Terminal Voltages Set 3

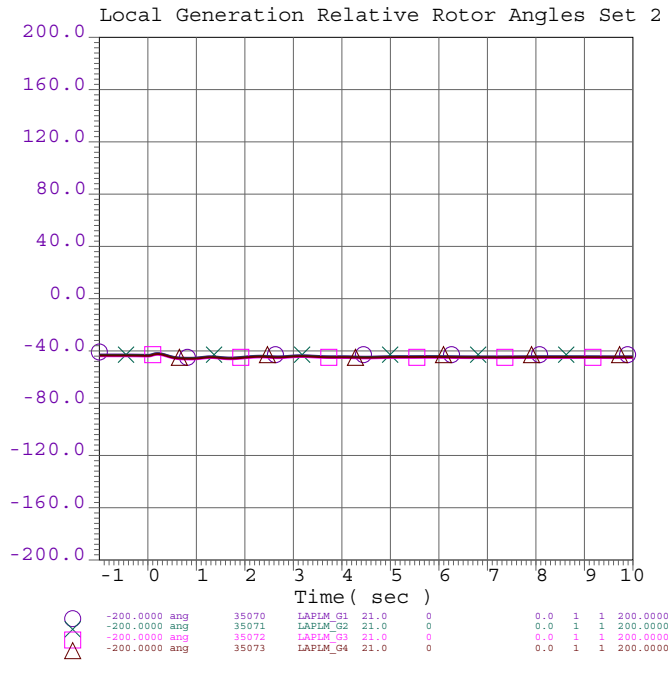


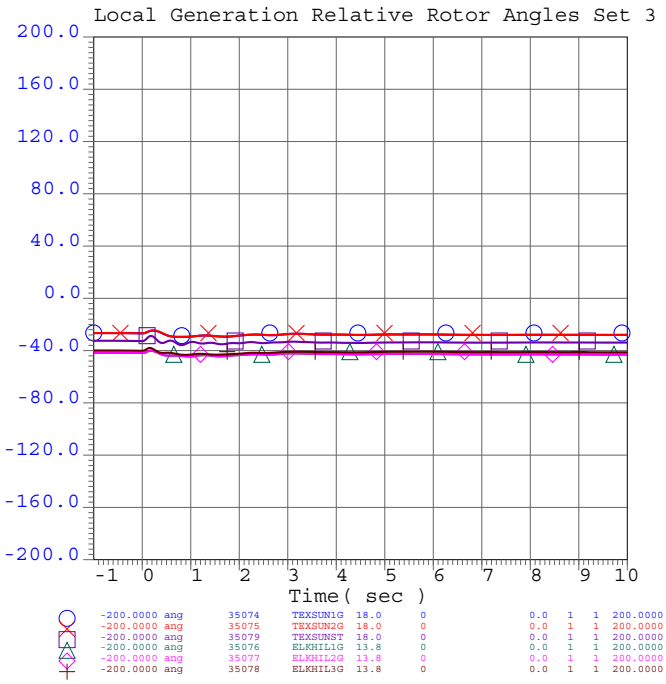
Local Generation Terminal Voltages Set 4

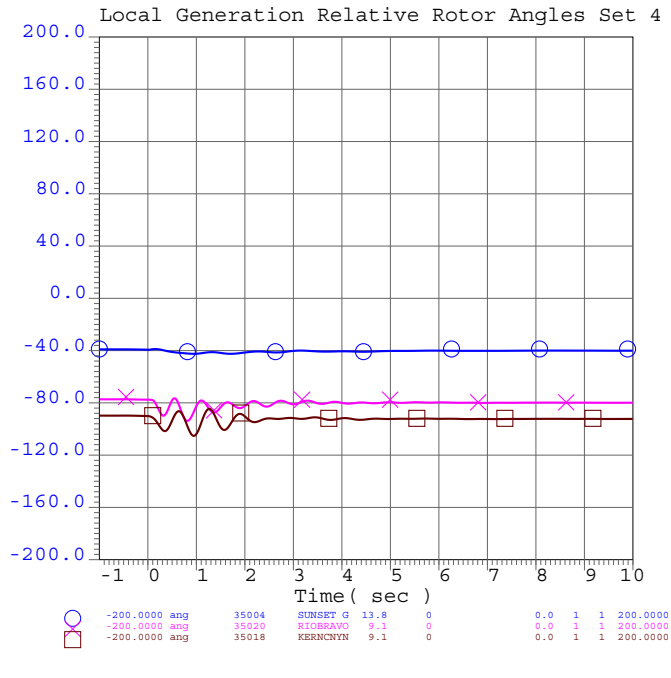


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

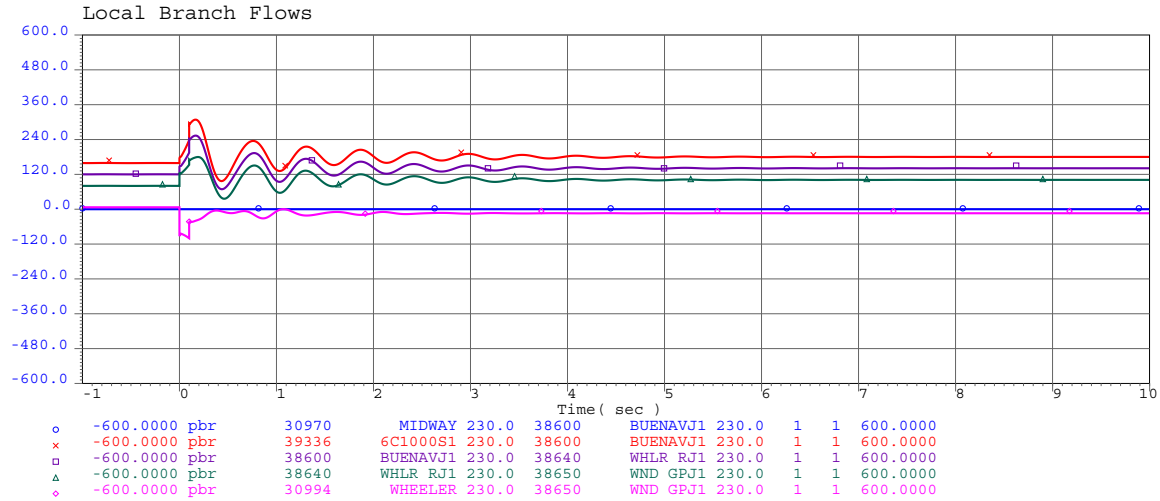


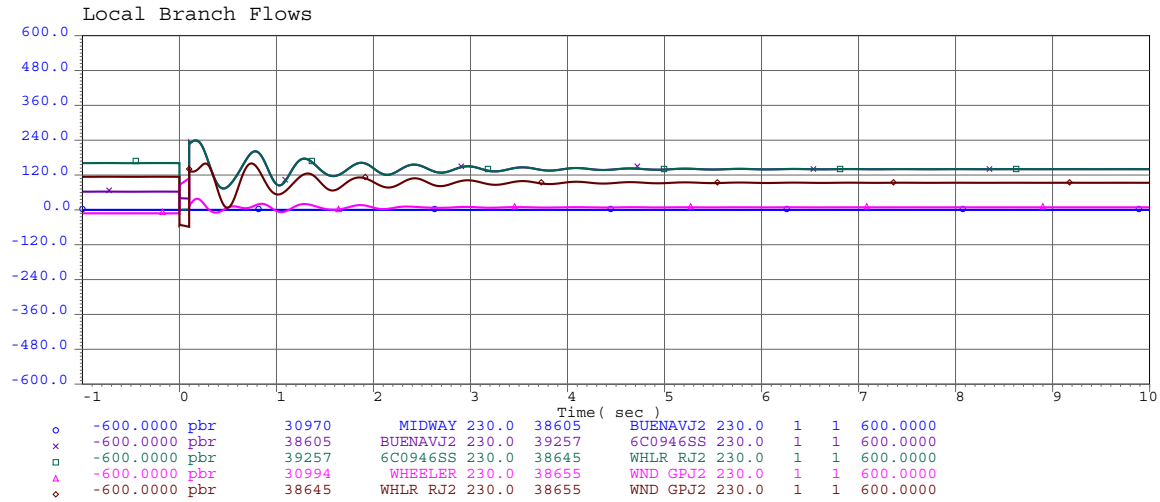


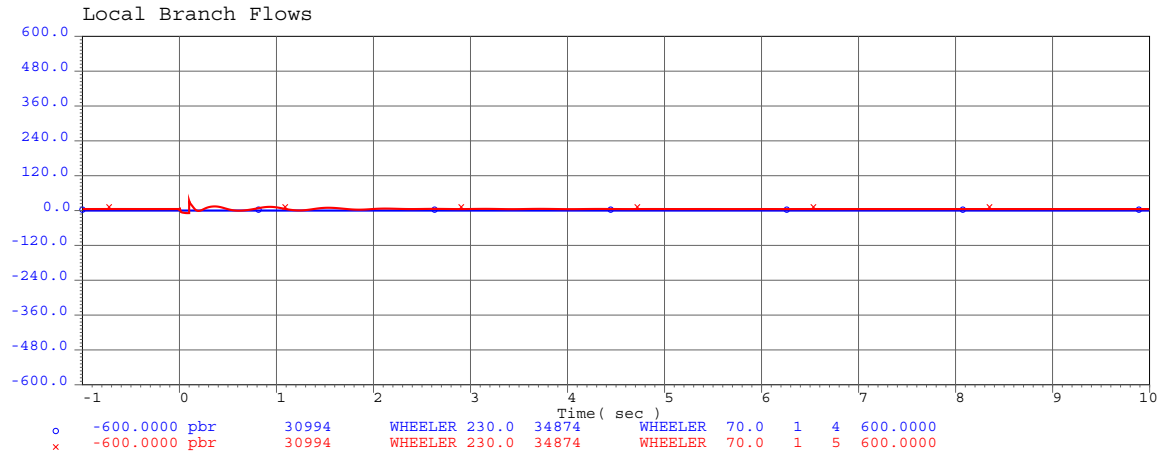




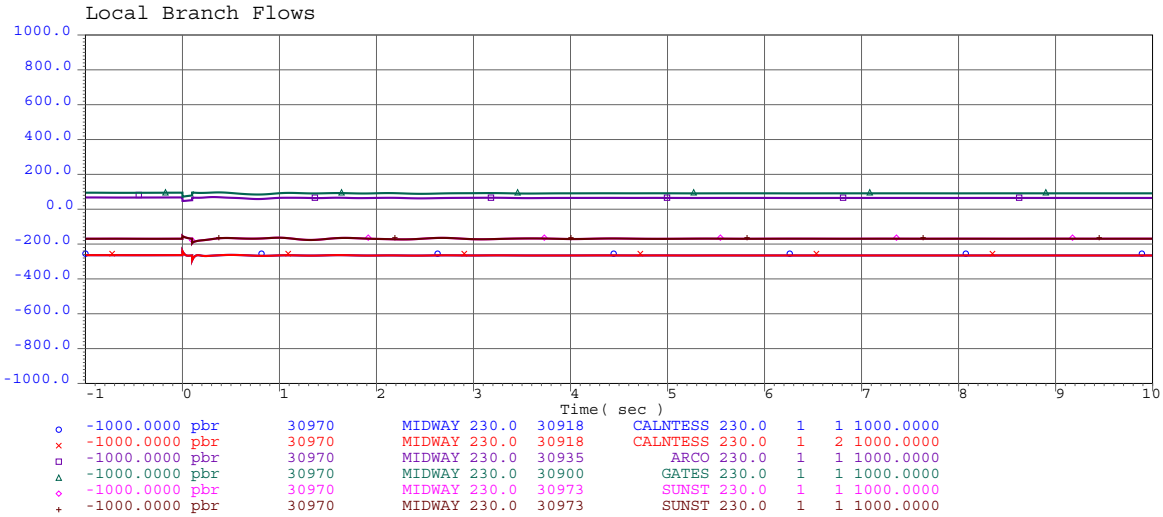
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie



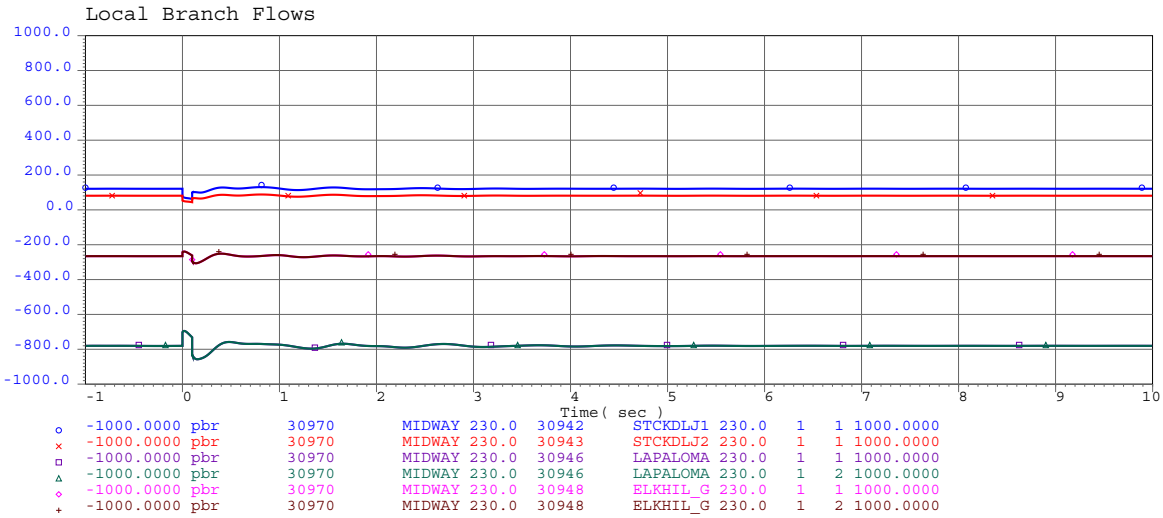




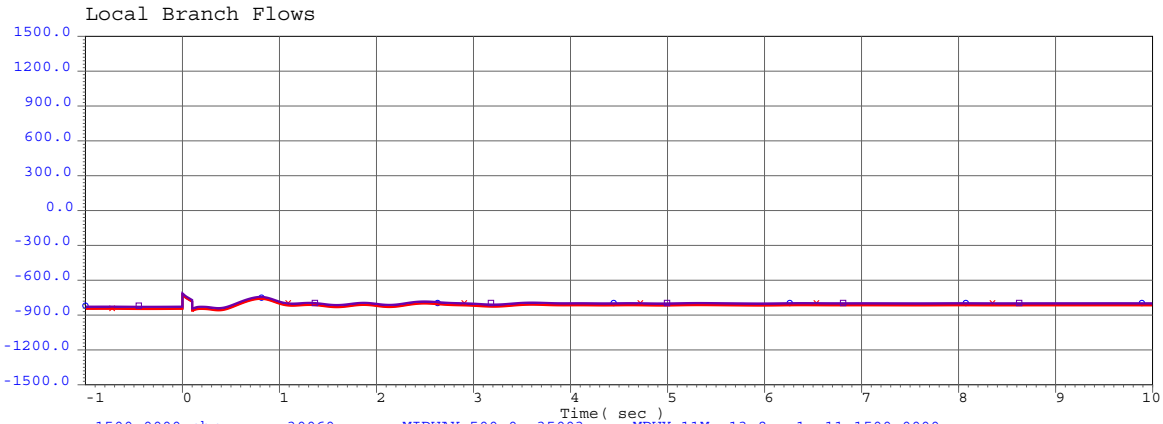
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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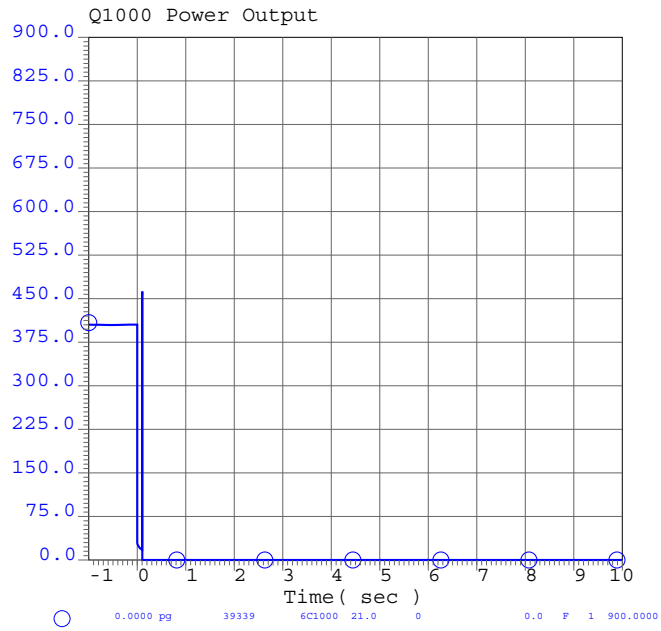
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
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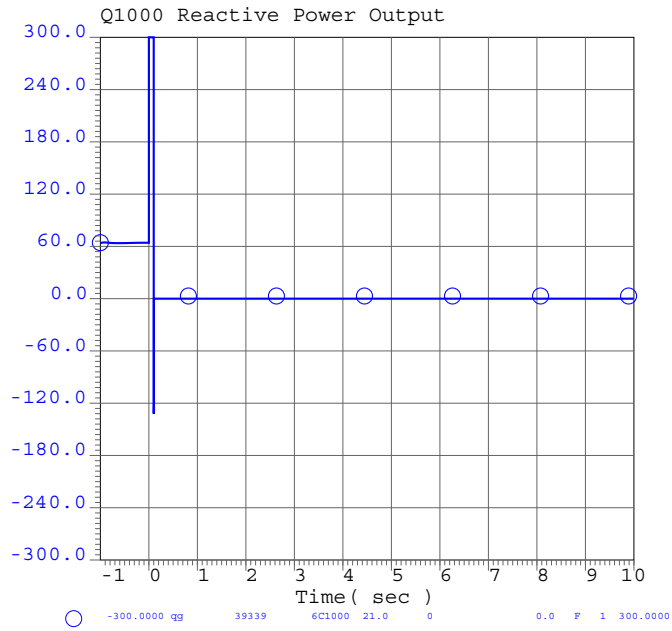


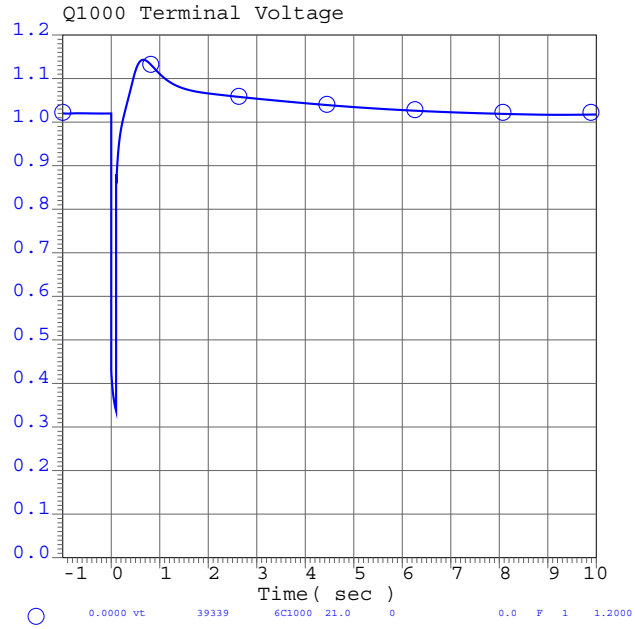
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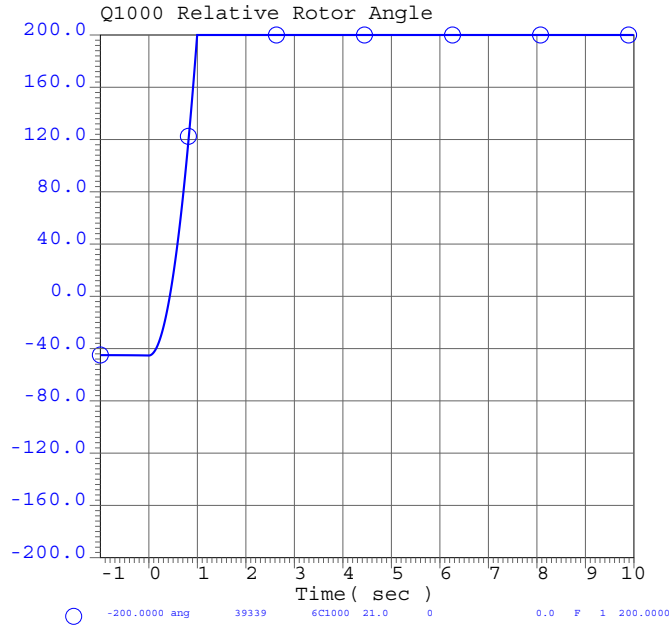
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ 5C946 230 kV bus
Clear Q946 Gen Tie

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

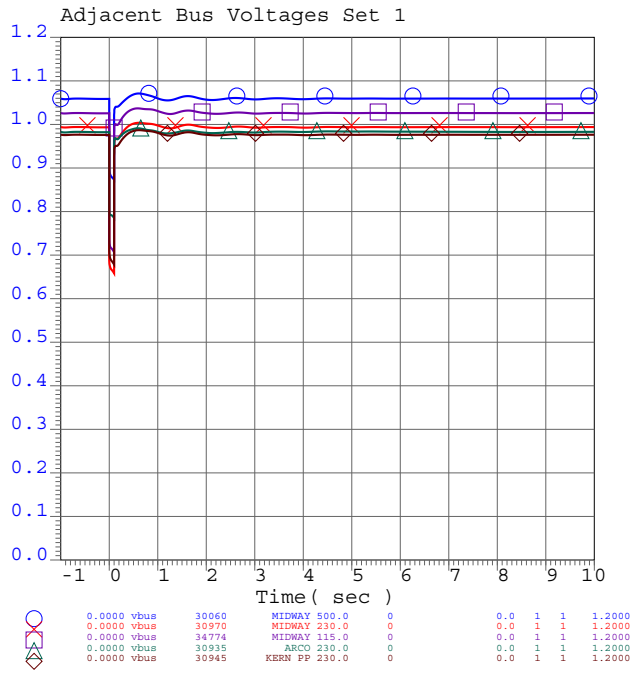


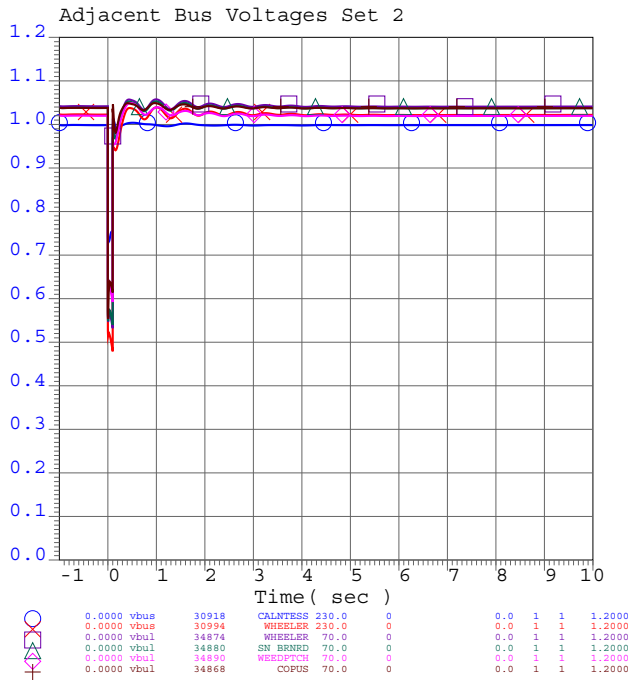


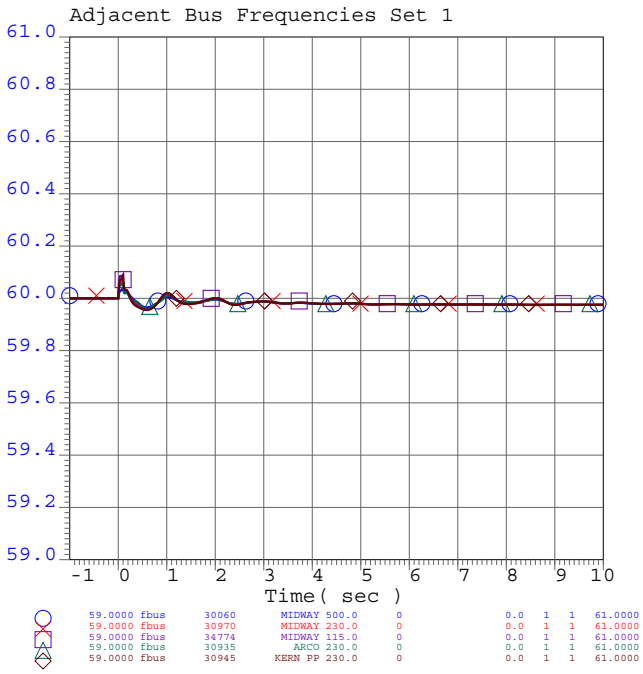


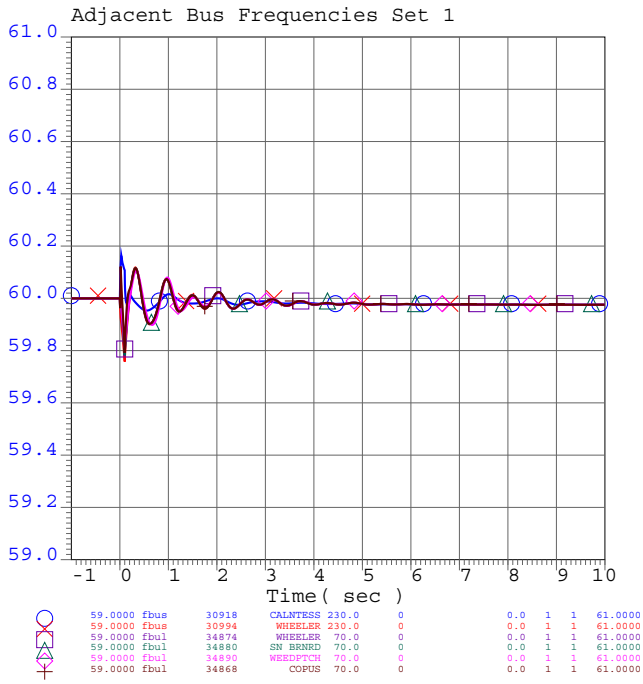


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie



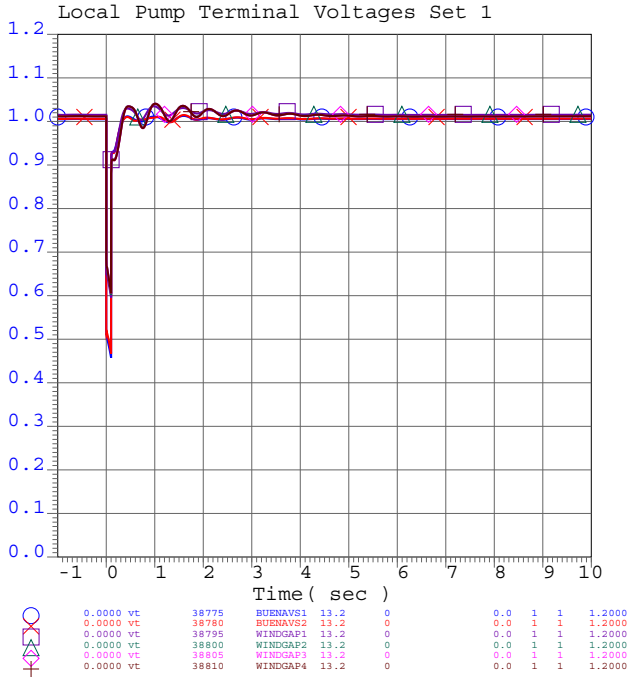




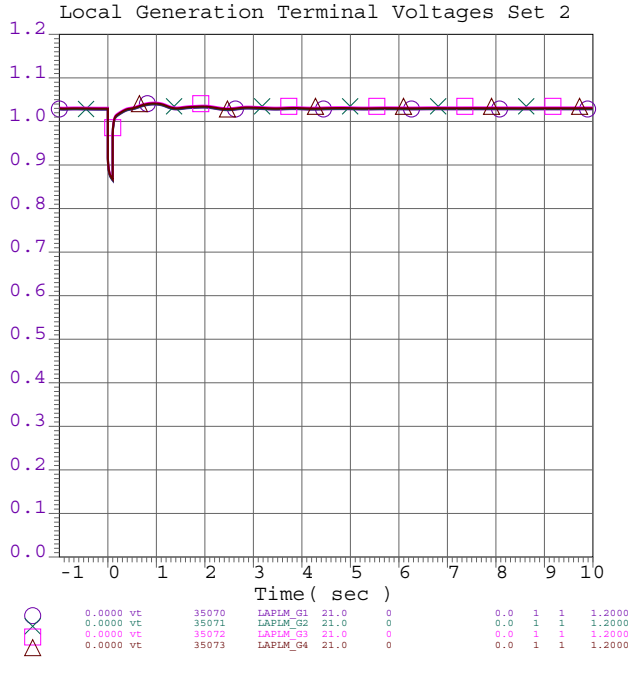


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

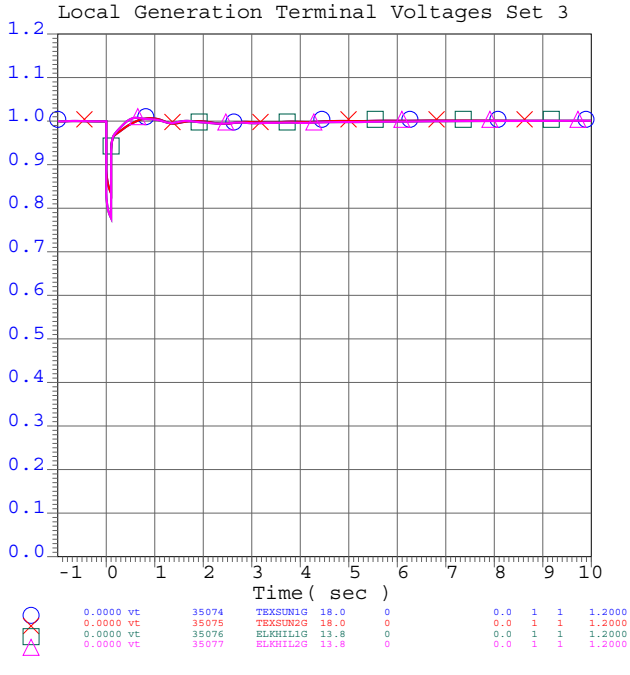
Local Pump Terminal Voltages Set 1



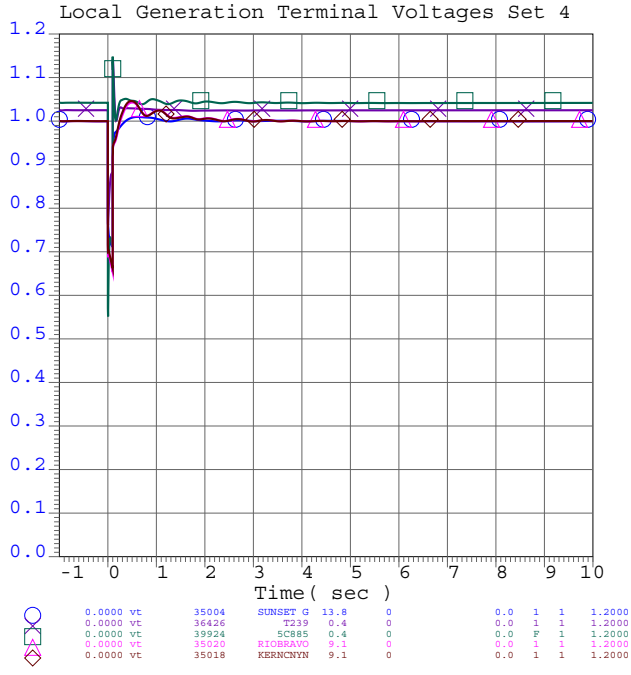
Local Generation Terminal Voltages Set 2



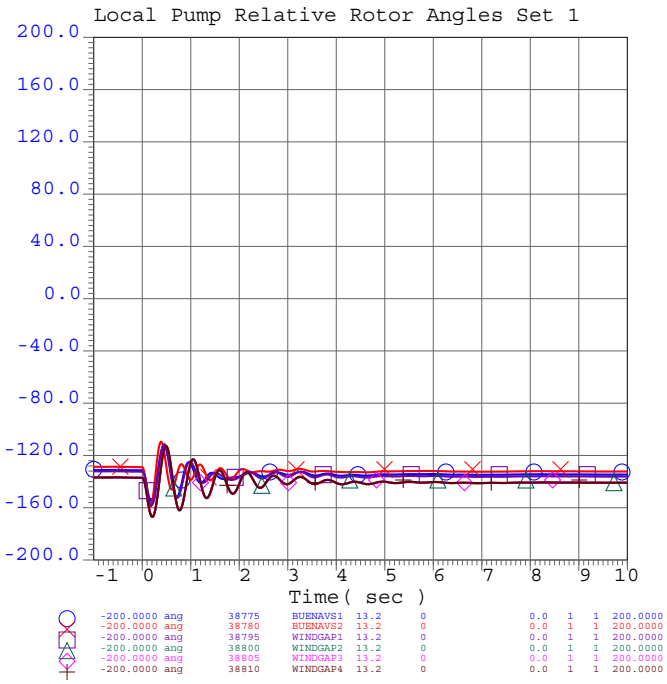
Local Generation Terminal Voltages Set 3

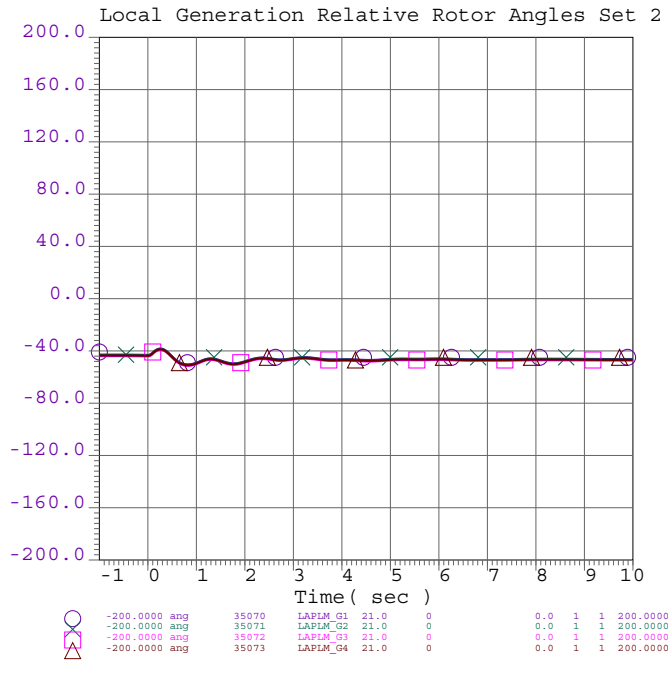


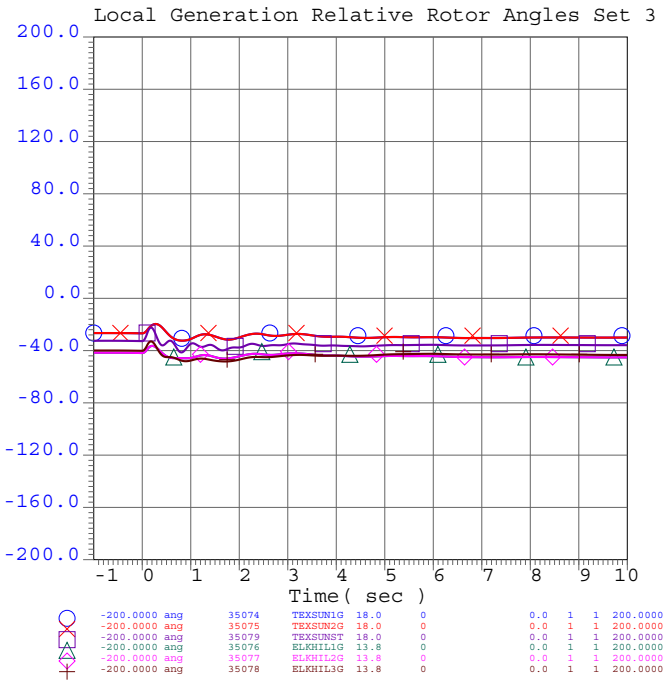
Local Generation Terminal Voltages Set 4

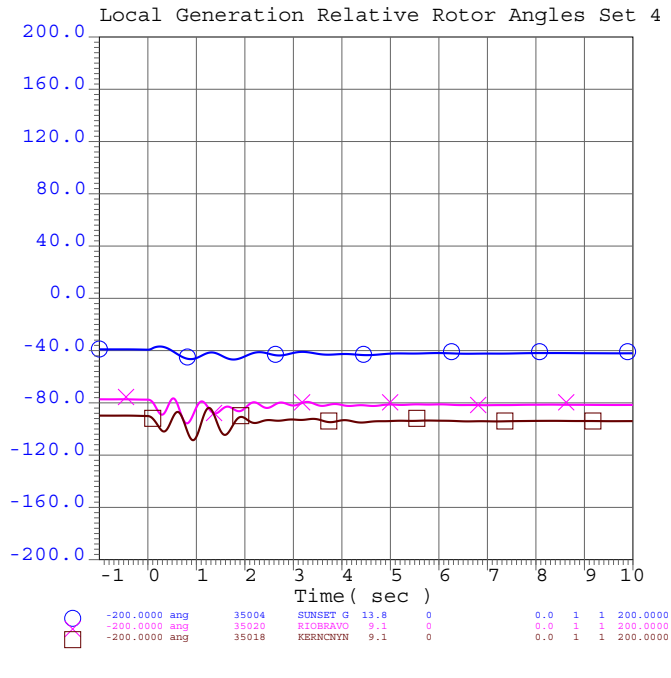


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

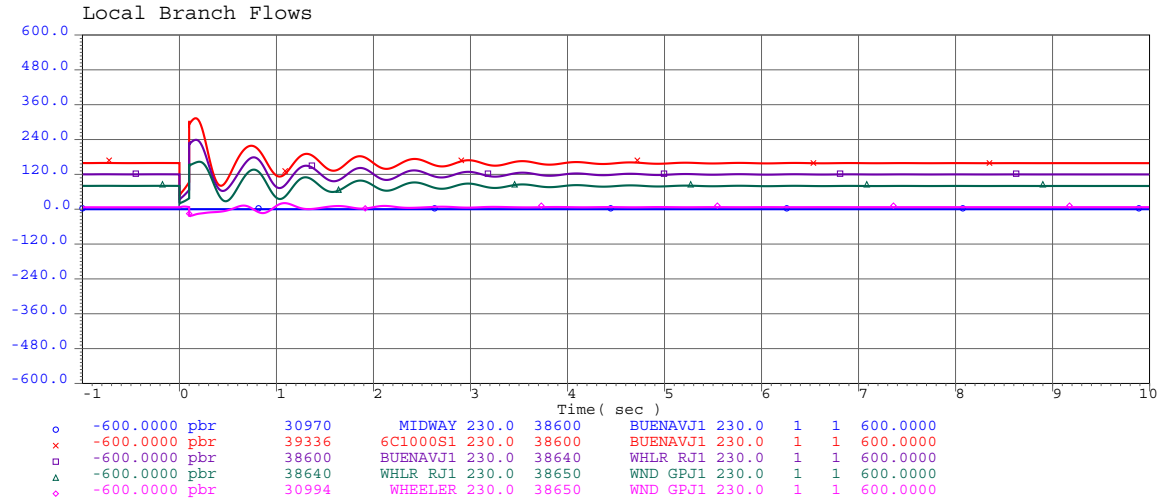


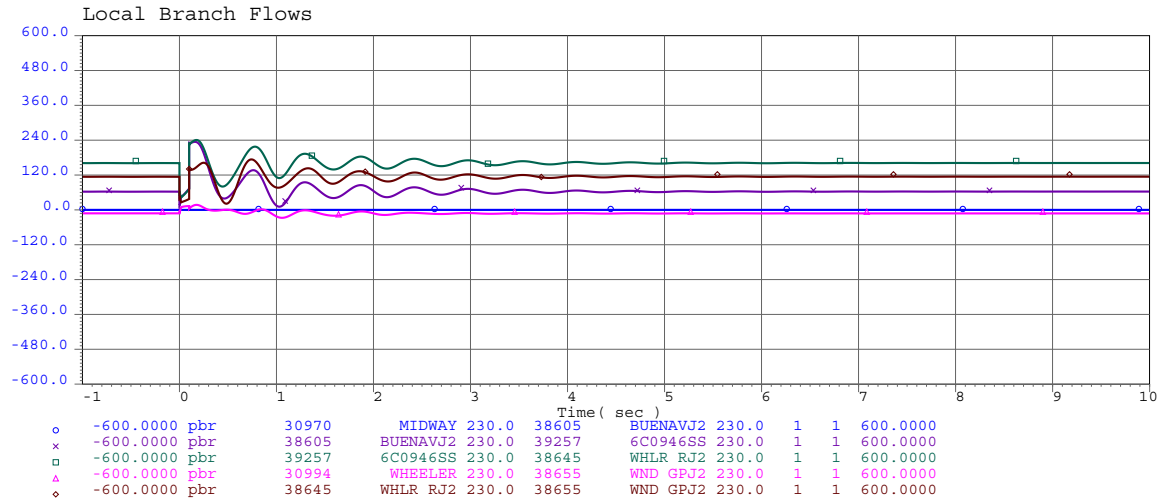


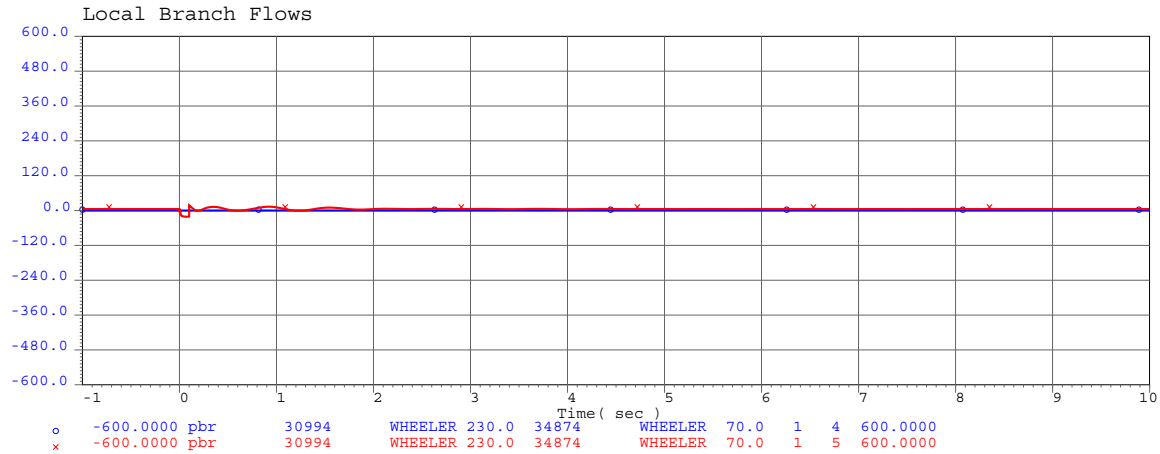




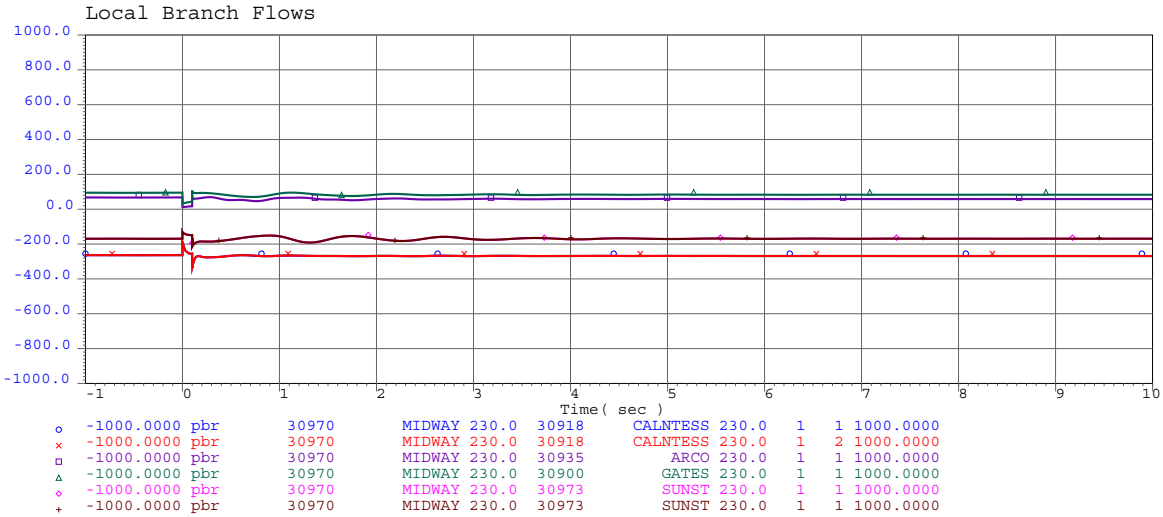
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie



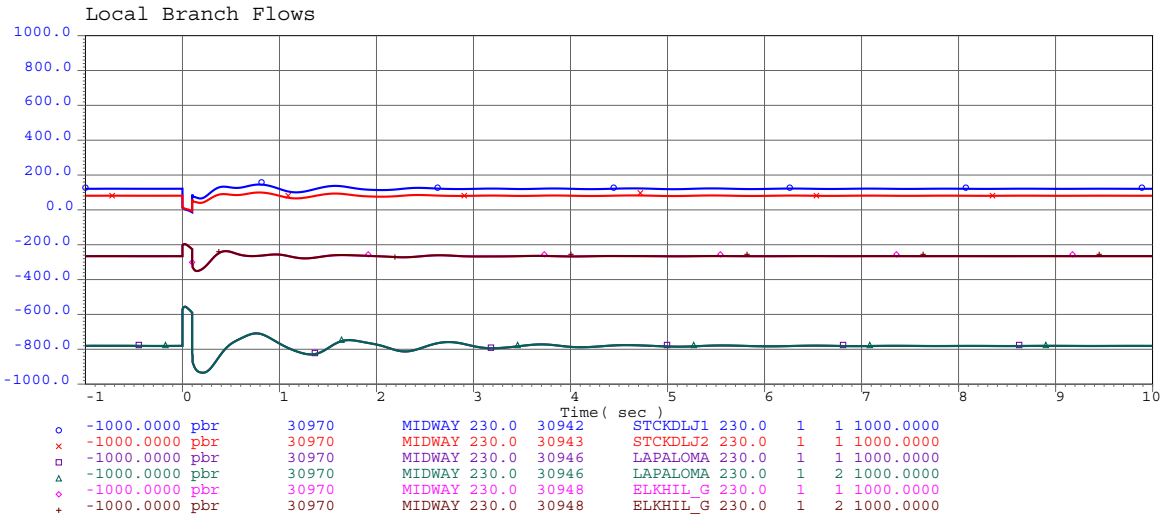




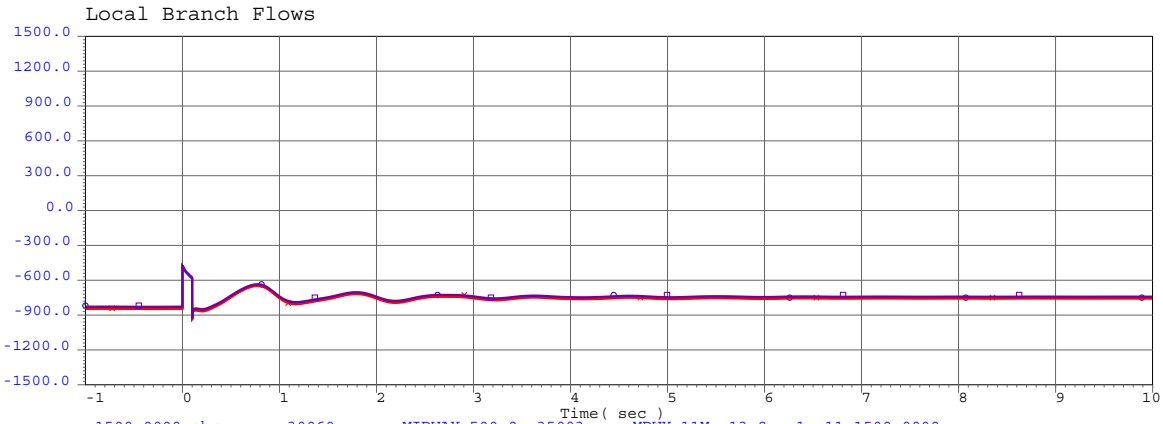
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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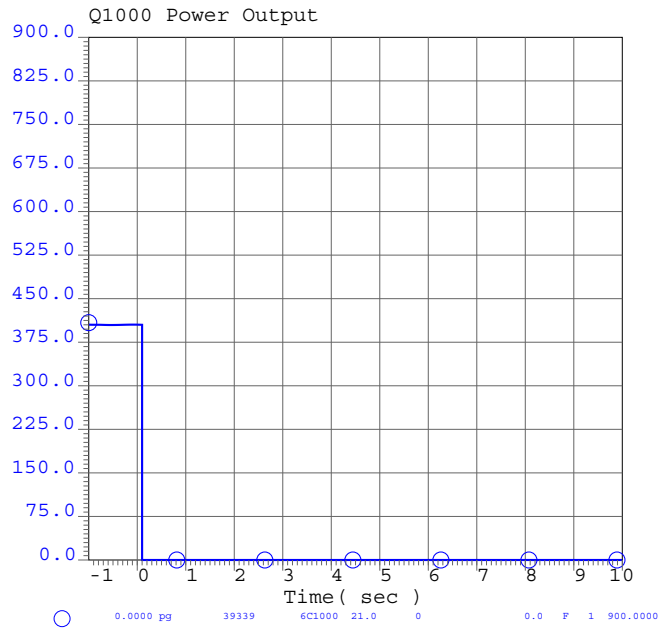
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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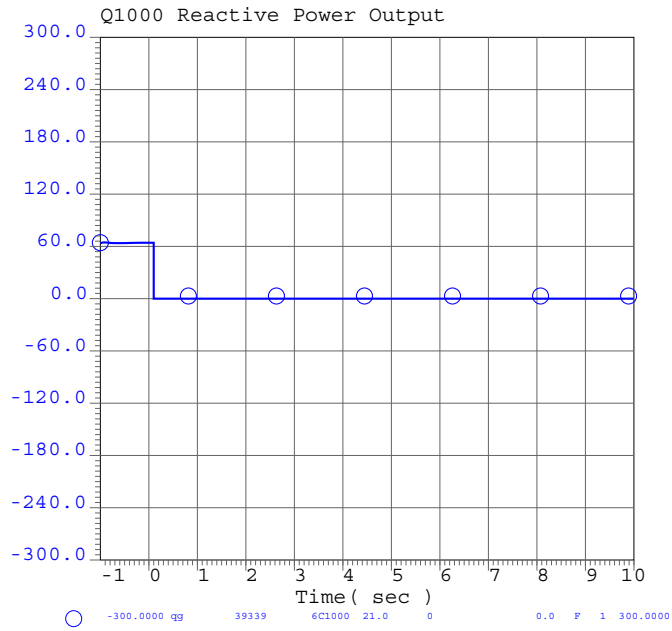


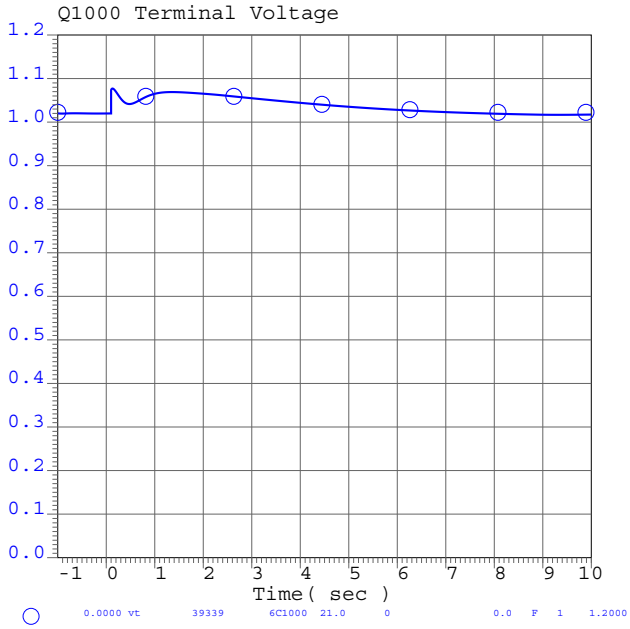
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

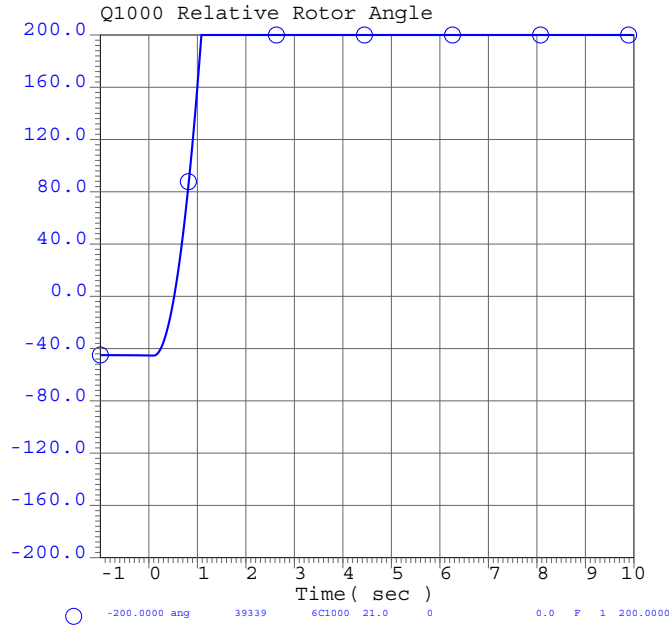
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230 kV bus
Clear Q1000 Gen Tie

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

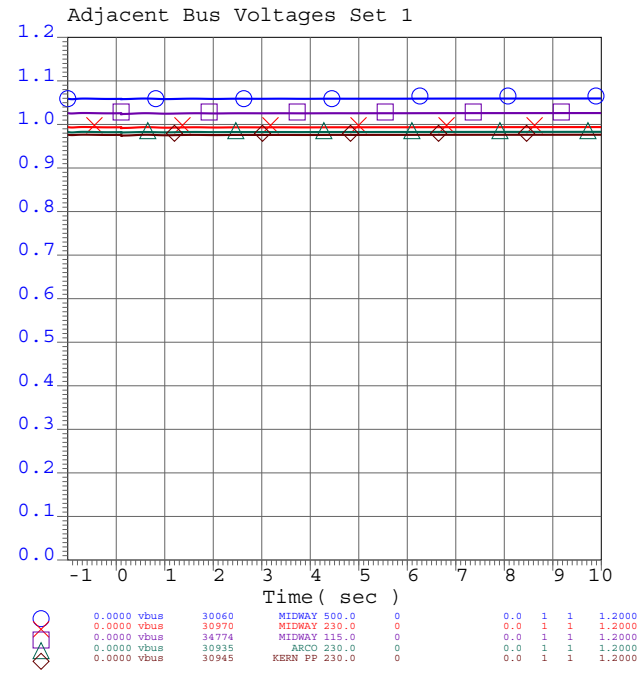


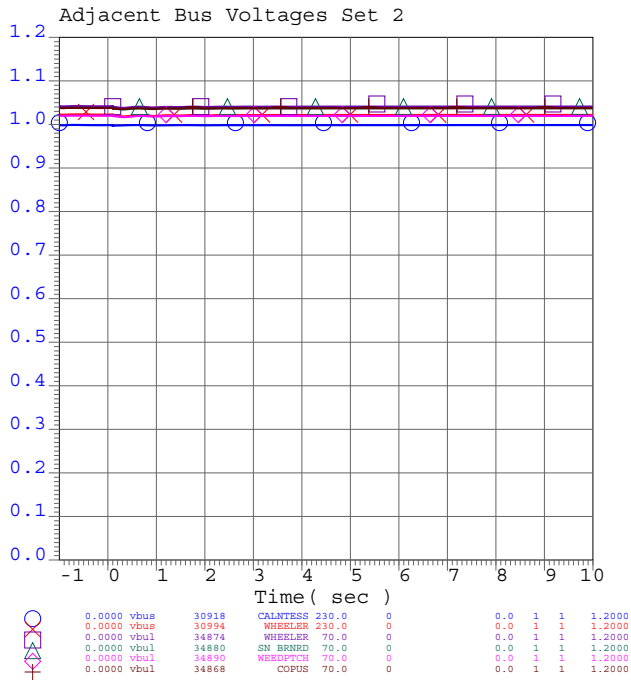


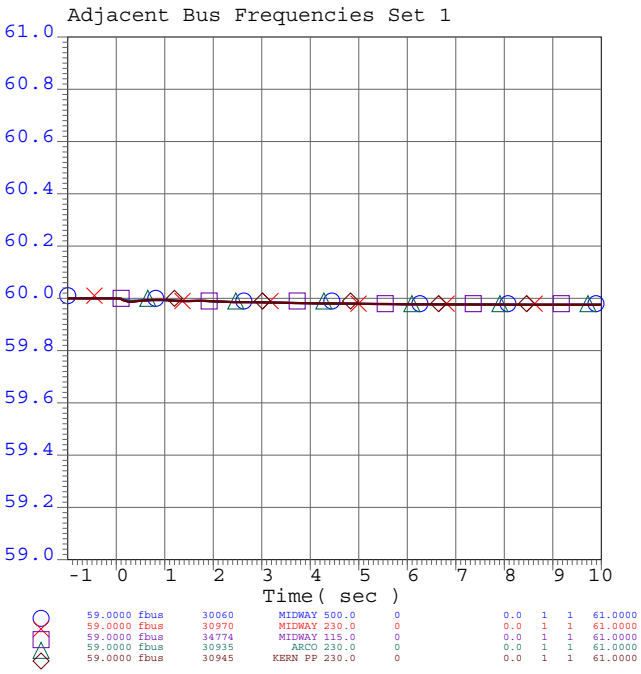


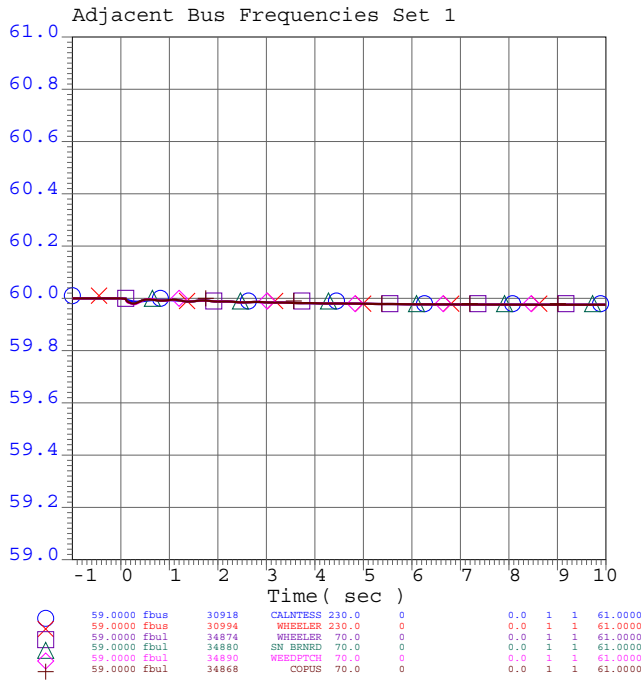


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



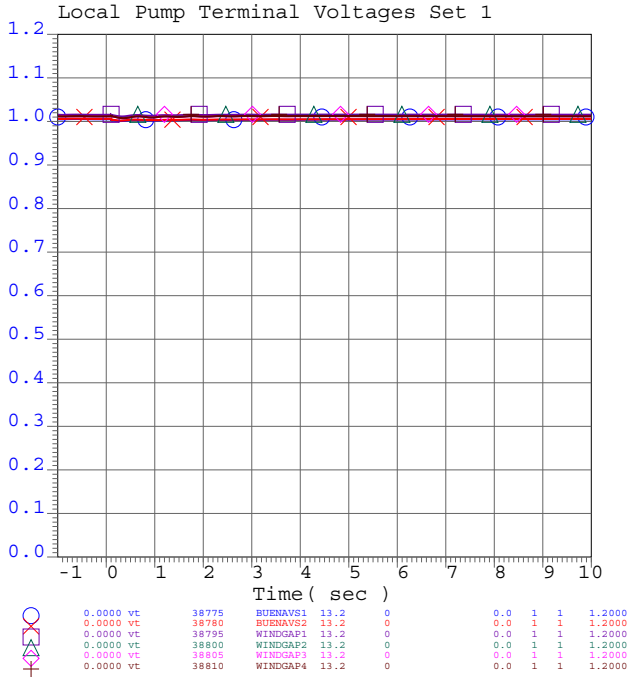






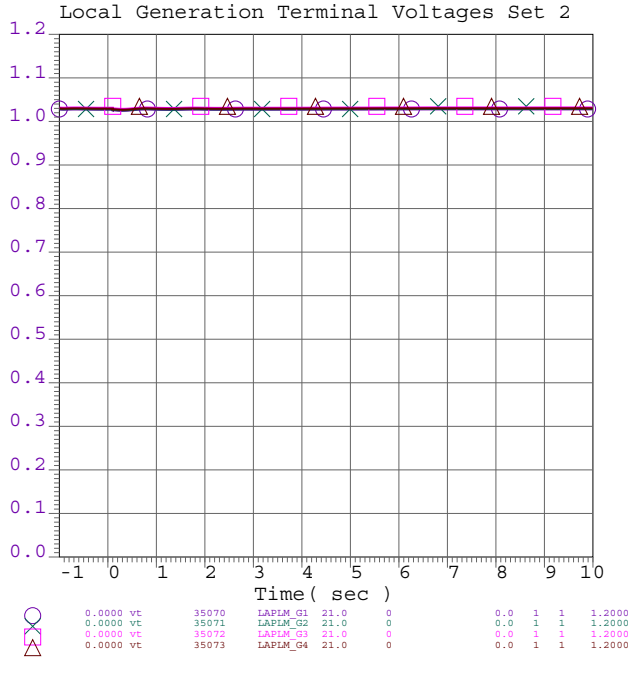
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Local Pump Terminal Voltages Set 1



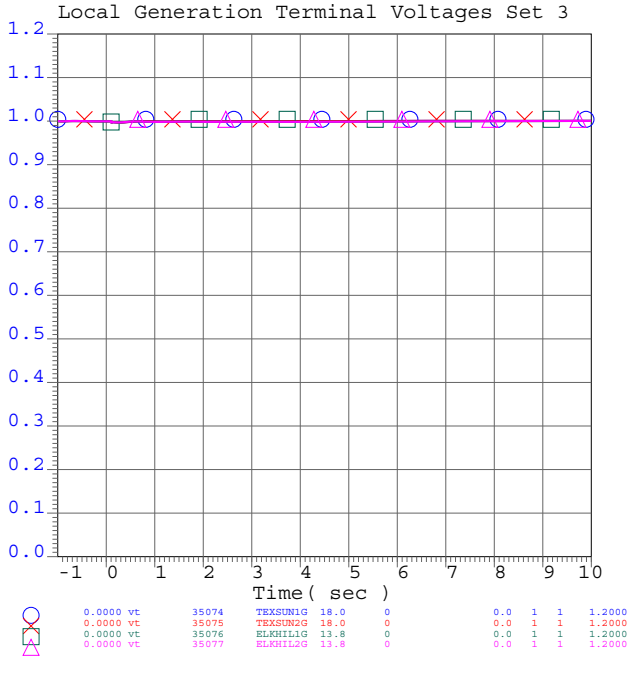
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



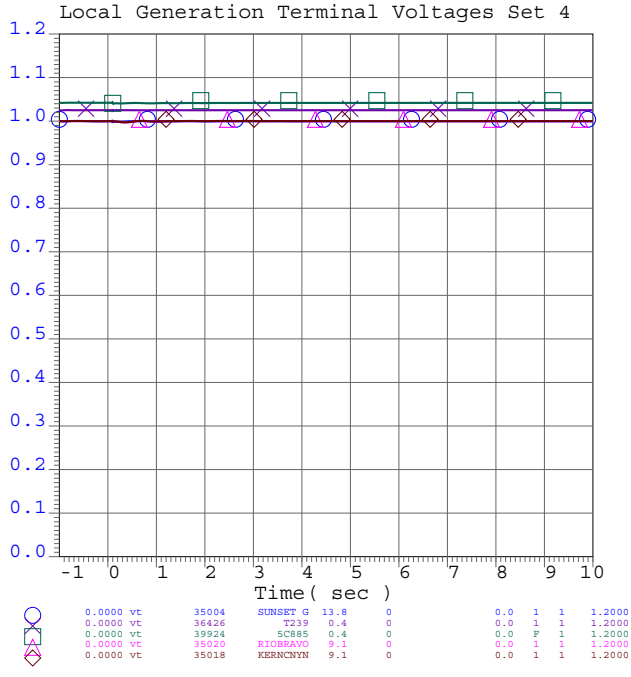
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



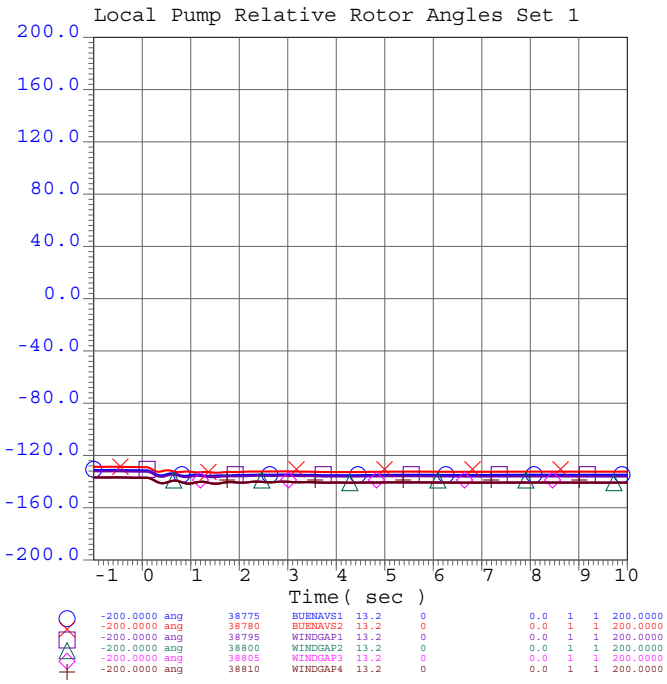
0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

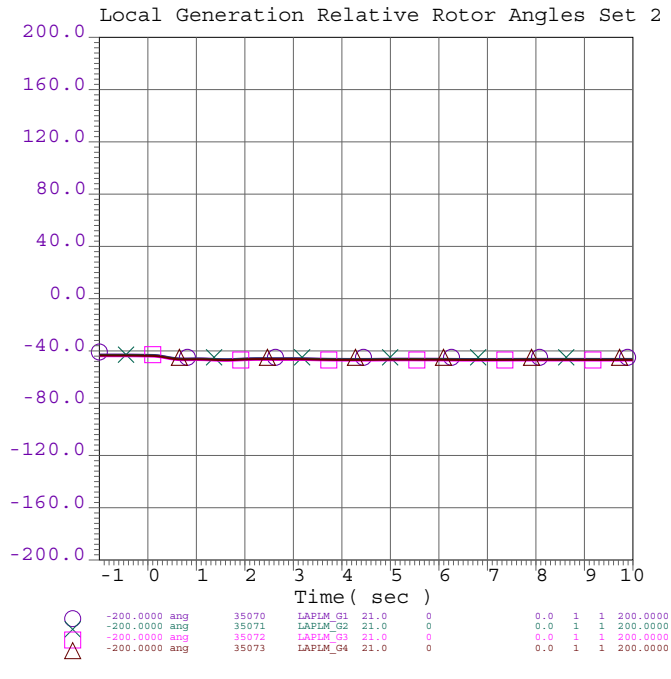
Local Generation Terminal Voltages Set 4

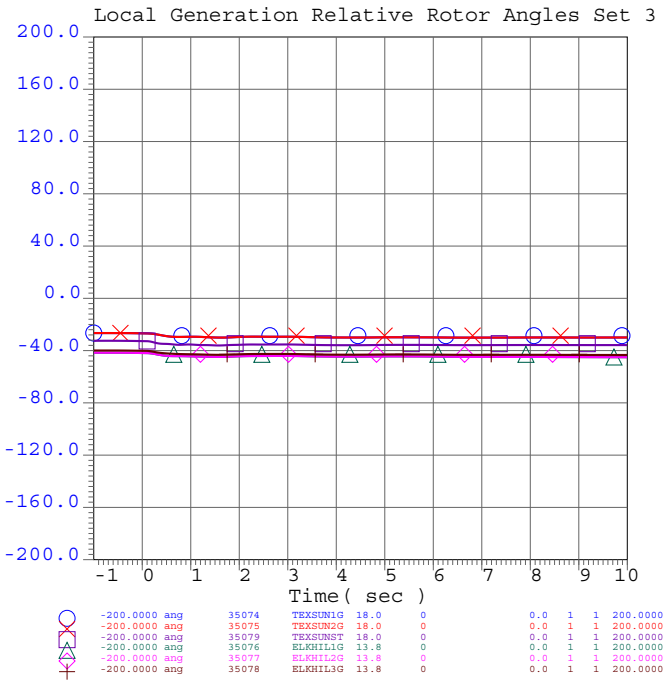


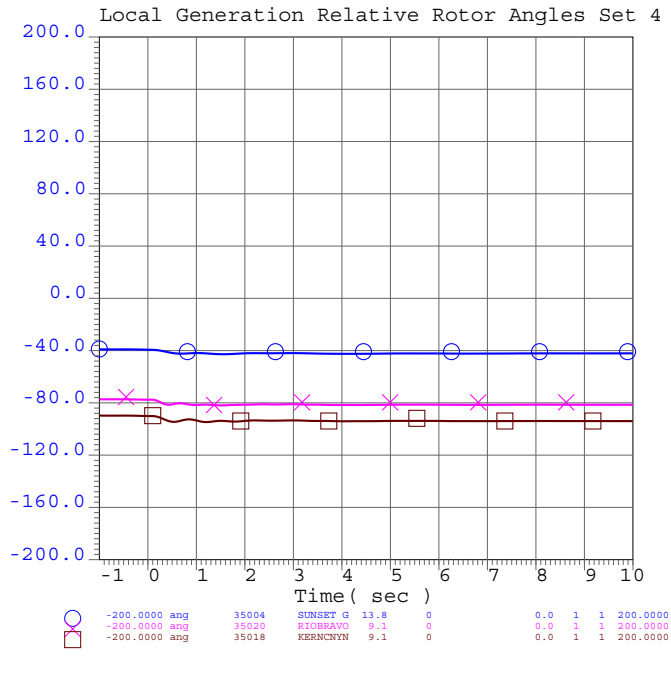
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



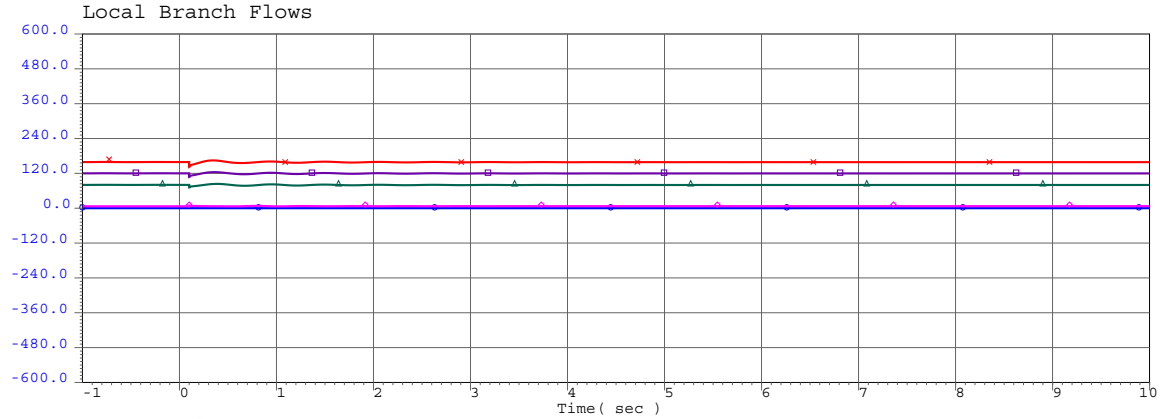






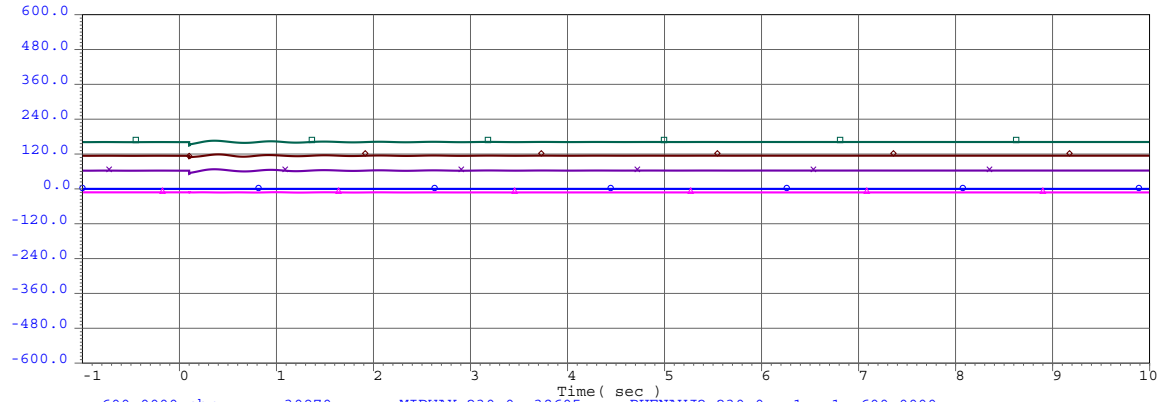
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Local Branch Flows



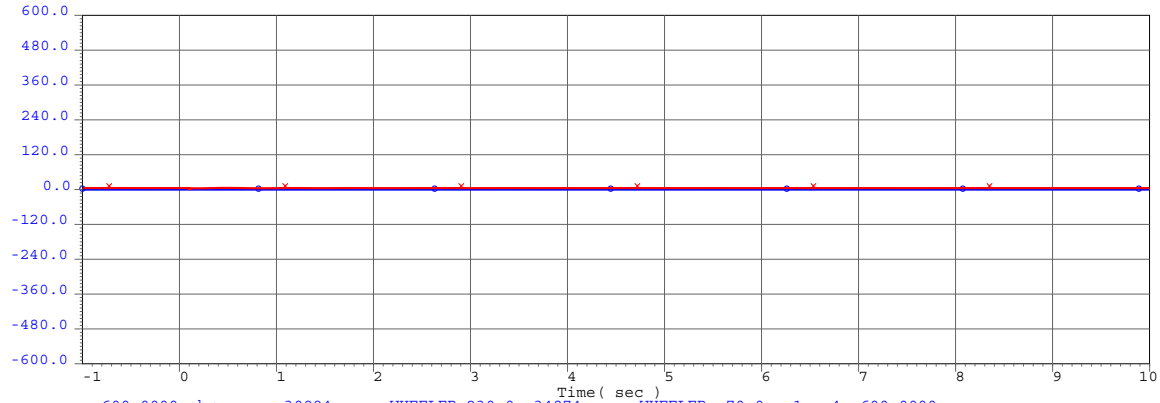
-600.0000	pbr	30970	MIDWAY 230.0	38600	BUENAVJ1 230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1 230.0	38600	BUENAVJ1 230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1 230.0	38640	WHLR RJ1 230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1 230.0	38650	WND GPJ1 230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER 230.0	38650	WND GPJ1 230.0	1	1	600.0000

Local Branch Flows



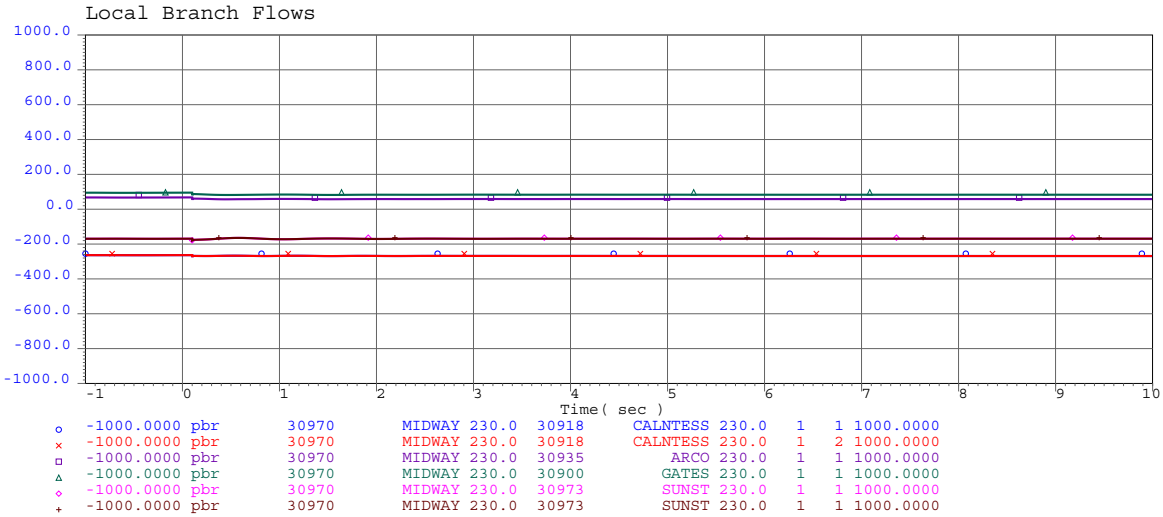
-600.0000	pbr	30970	MIDWAY 230.0	38605	BUENAVJ2 230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2 230.0	39257	6C0946SS 230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS 230.0	38645	WHLR RJ2 230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER 230.0	38655	WND GPJ2 230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2 230.0	38655	WND GPJ2 230.0	1	1	600.0000

Local Branch Flows

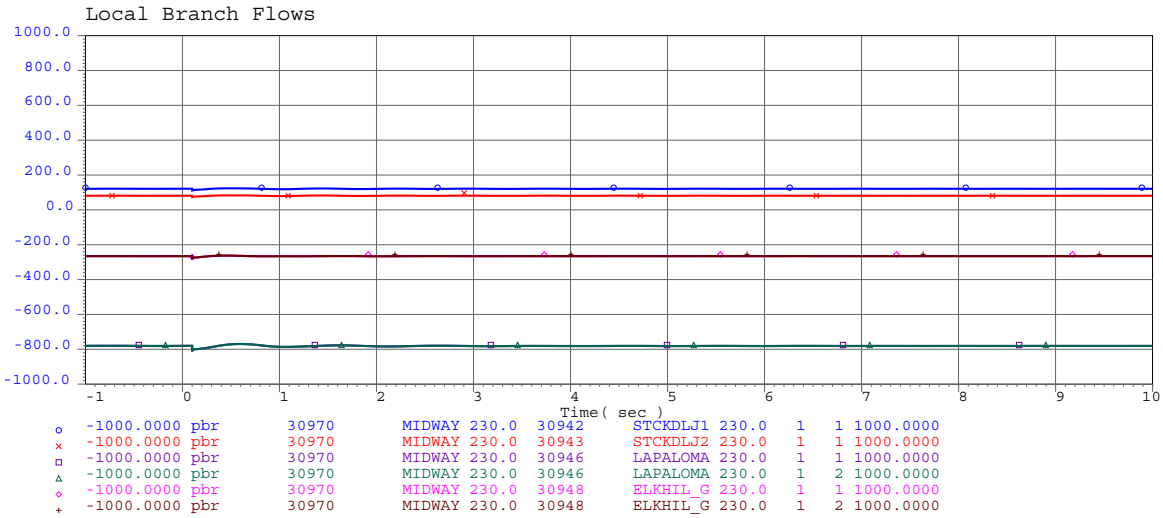


-600.0000	pbr	30994	WHEELER 230.0	34874	WHEELER 70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER 230.0	34874	WHEELER 70.0	1	5	600.0000

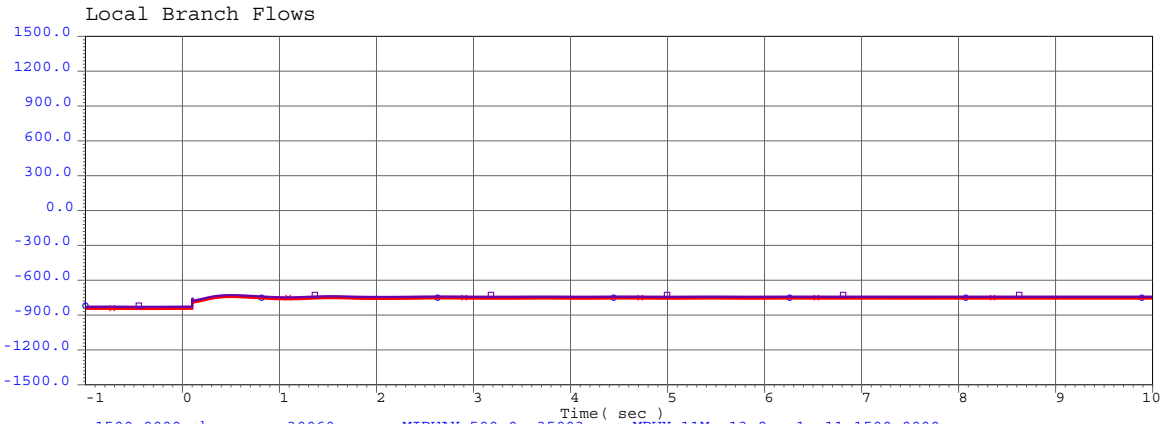
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



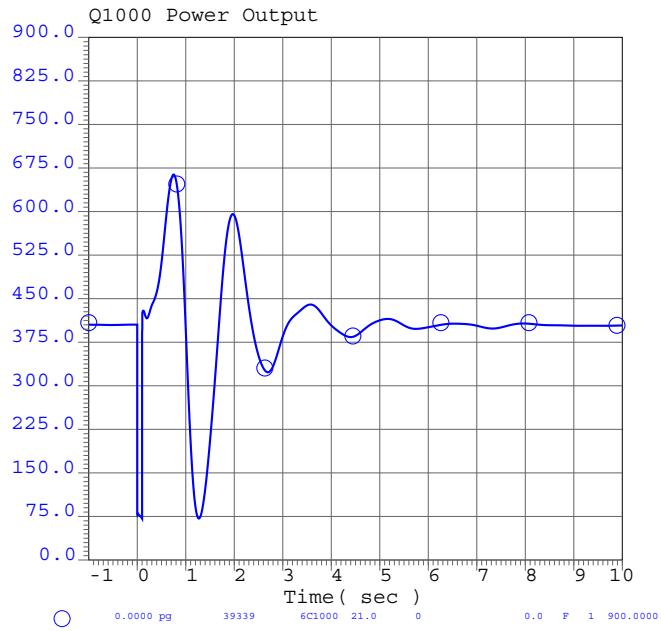
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

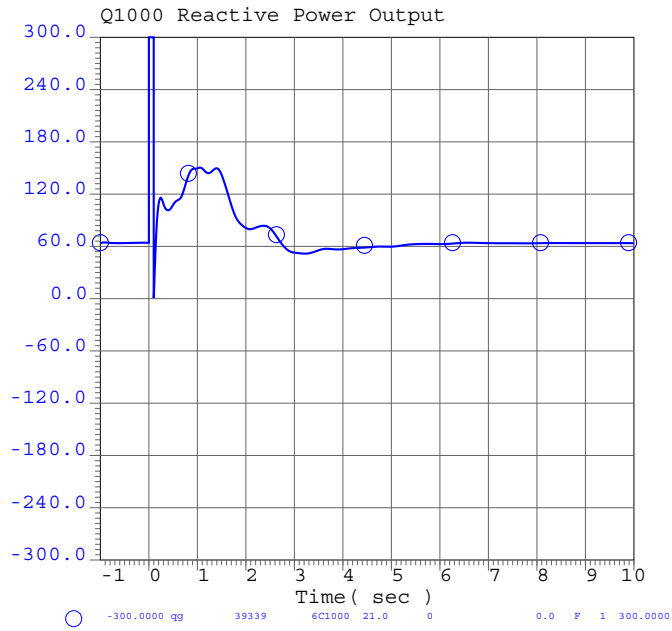


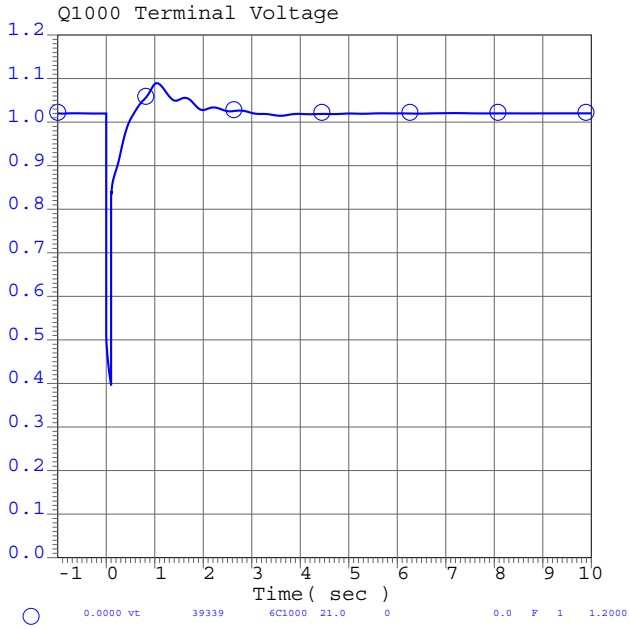
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

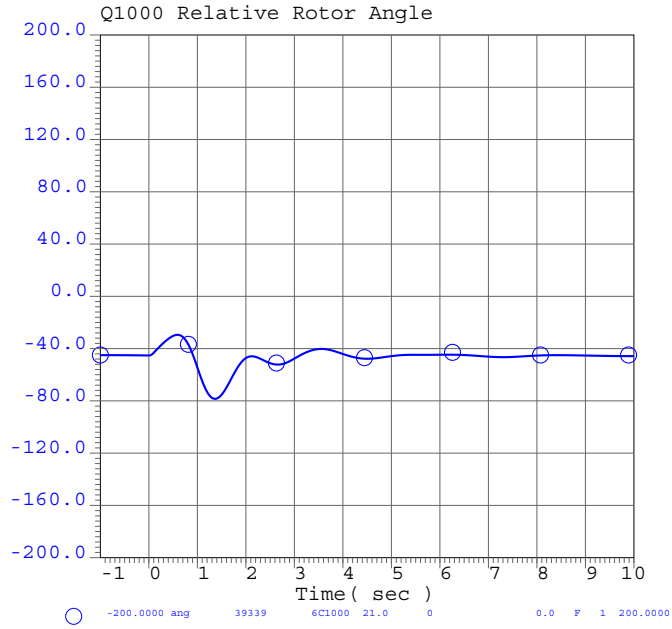
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
No Fault
Full Load Rejection of 5C1000

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







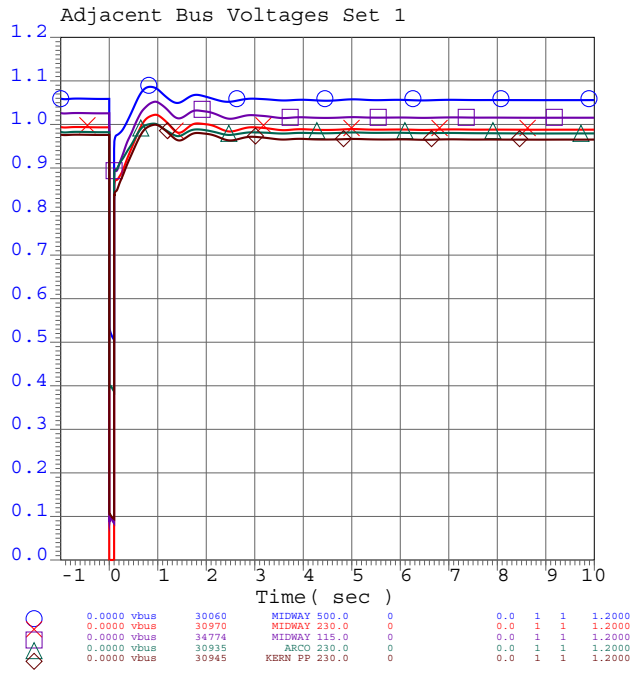


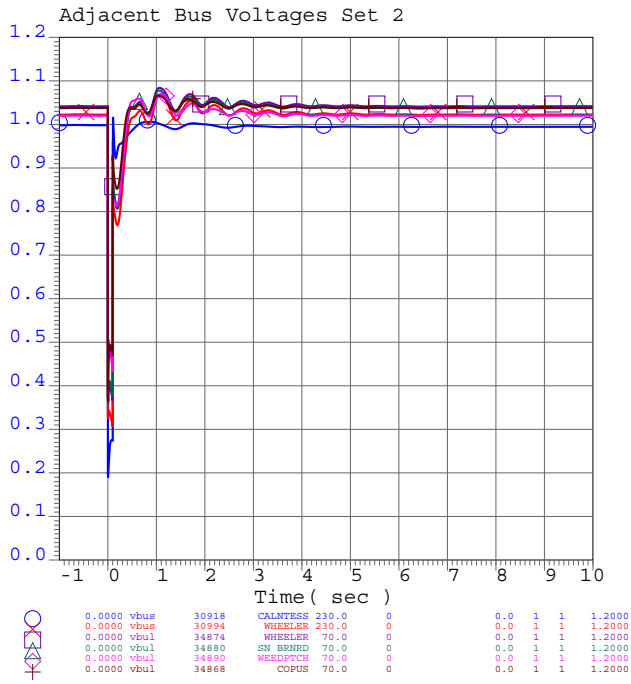
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

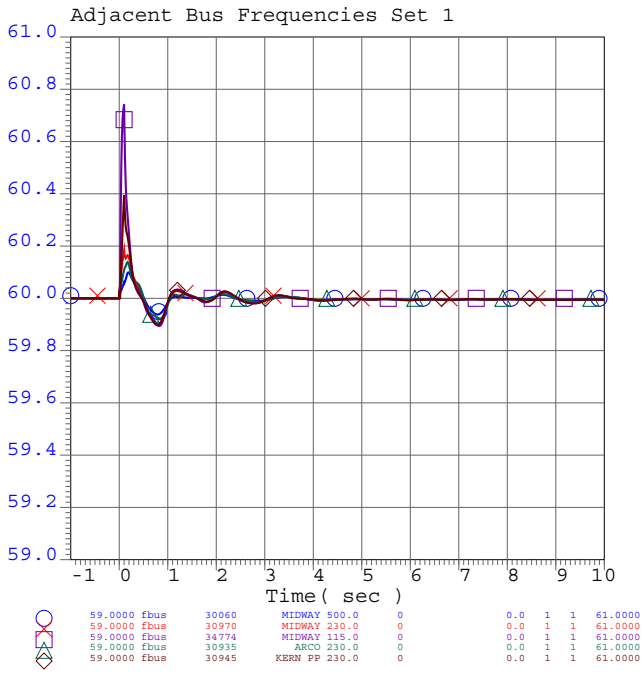
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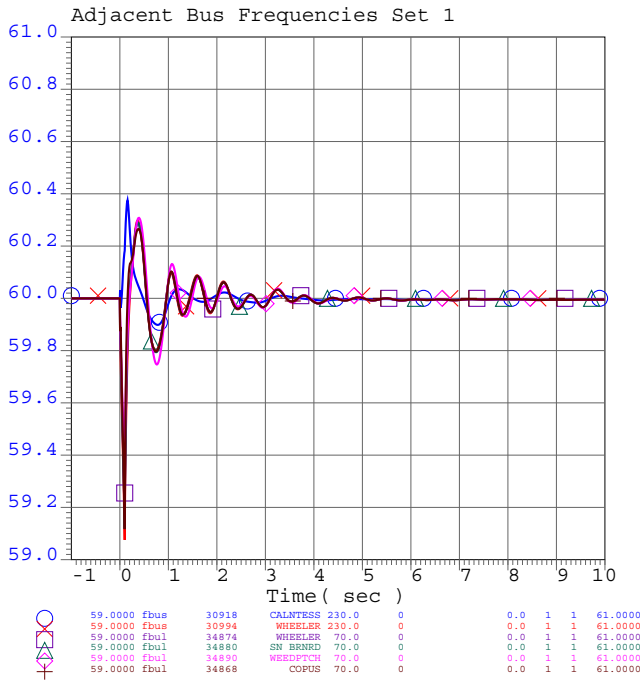
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Tue Dec 24 11:50:57 2013









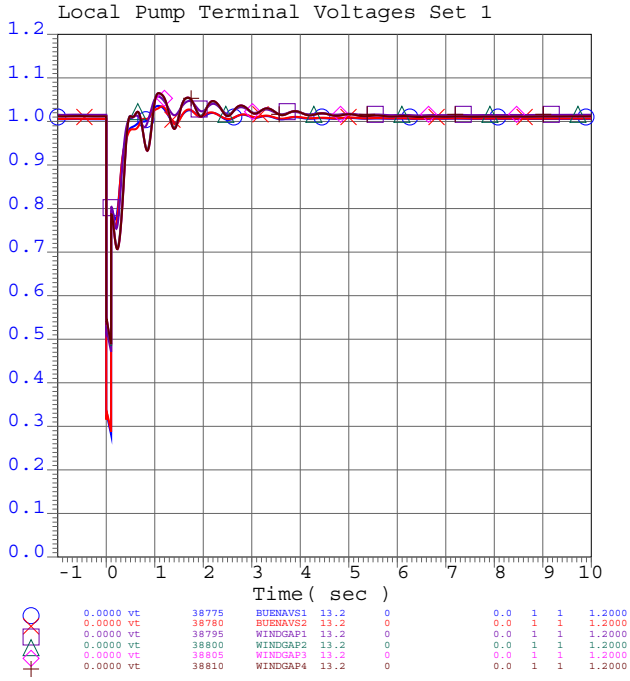
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

ts-pge-qc6p1-18sumpkmy-kern-weo-pst-r8b3-m1-ts_3pMidway230_1D.chf

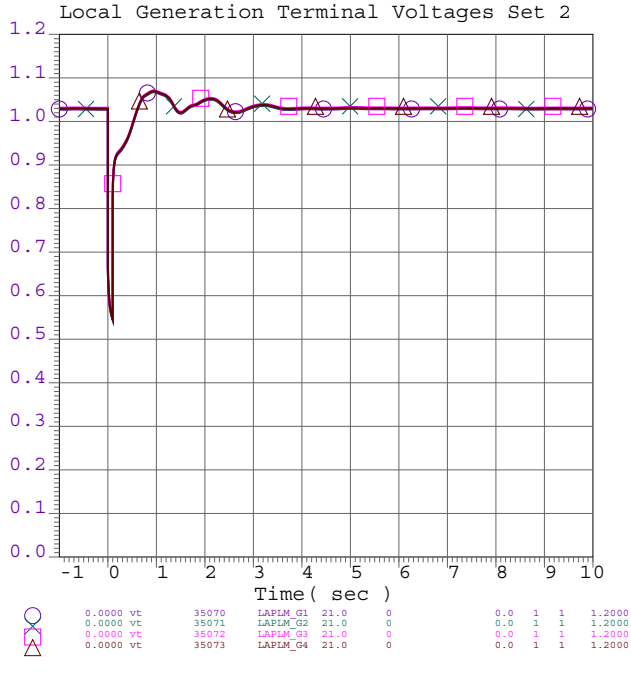
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Tue Dec 24 11:50:57 2013

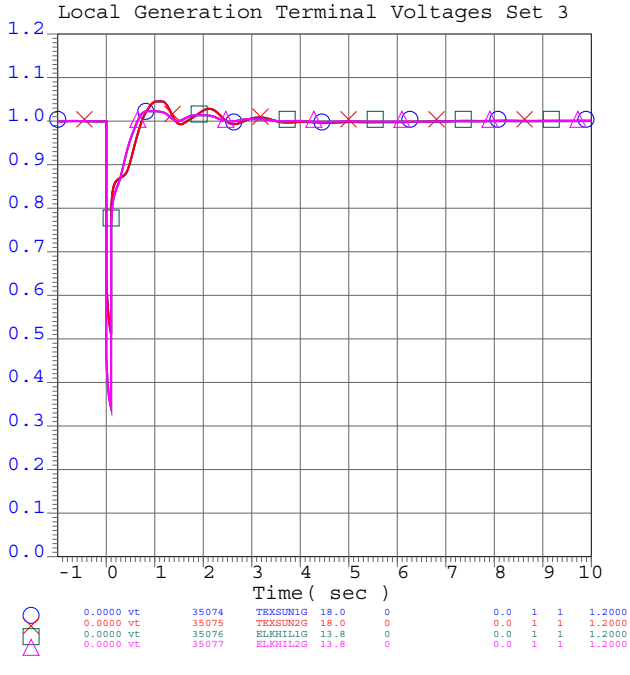
Local Pump Terminal Voltages Set 1



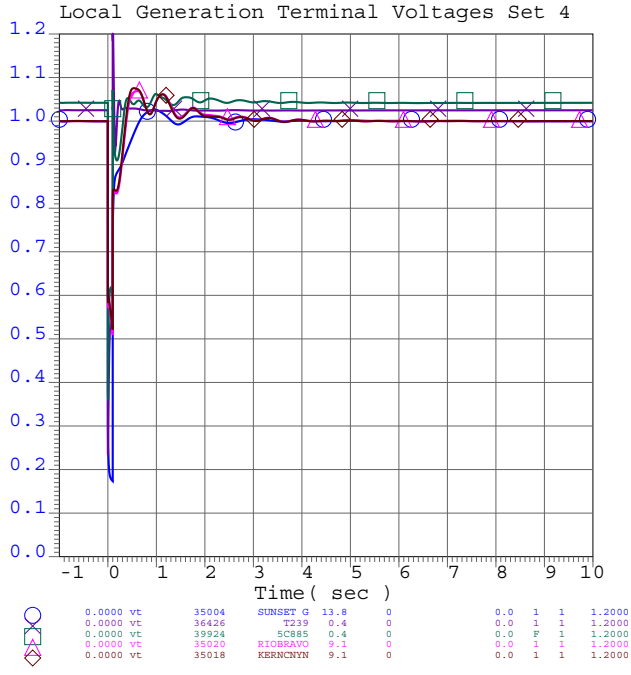
Local Generation Terminal Voltages Set 2



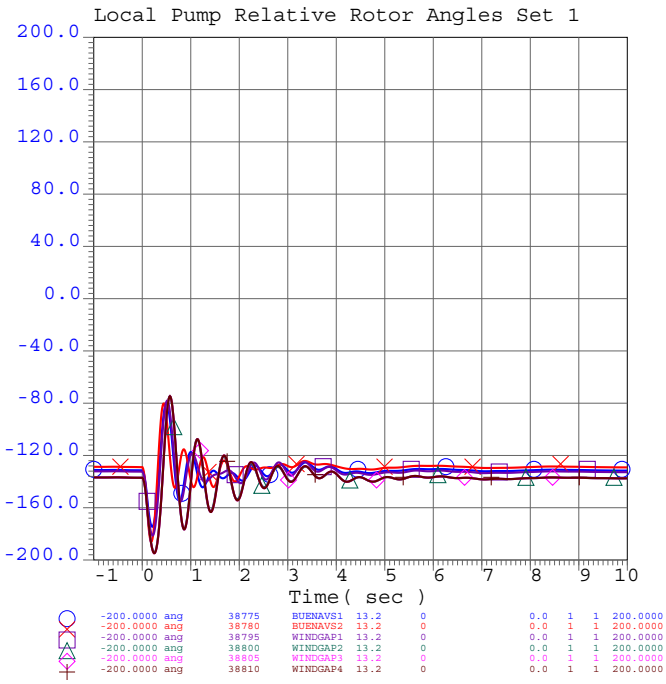
Local Generation Terminal Voltages Set 3

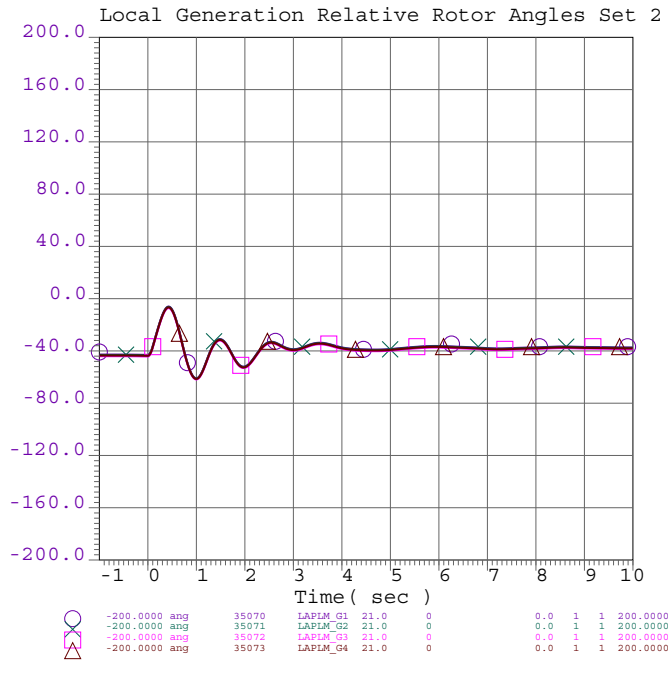


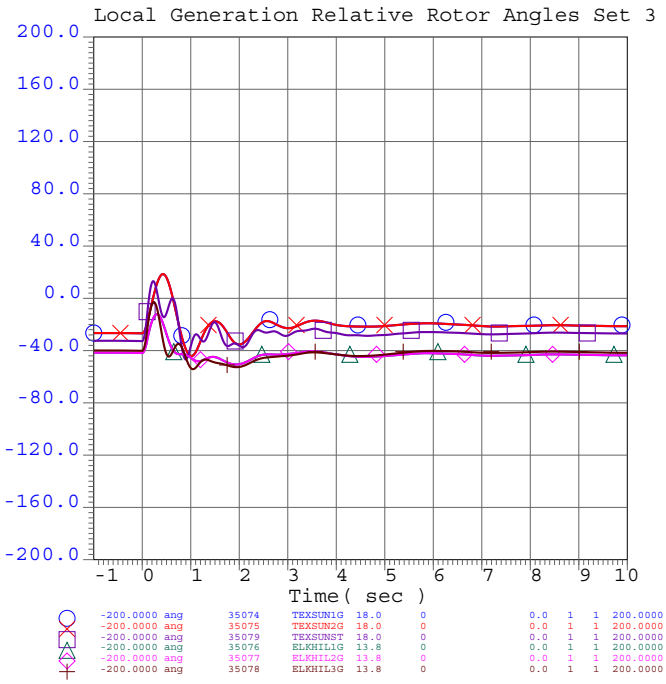
Local Generation Terminal Voltages Set 4

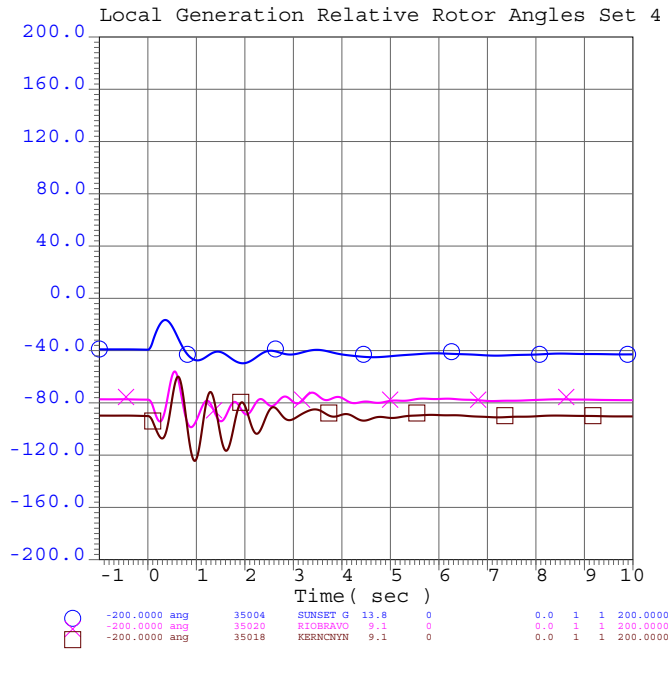


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

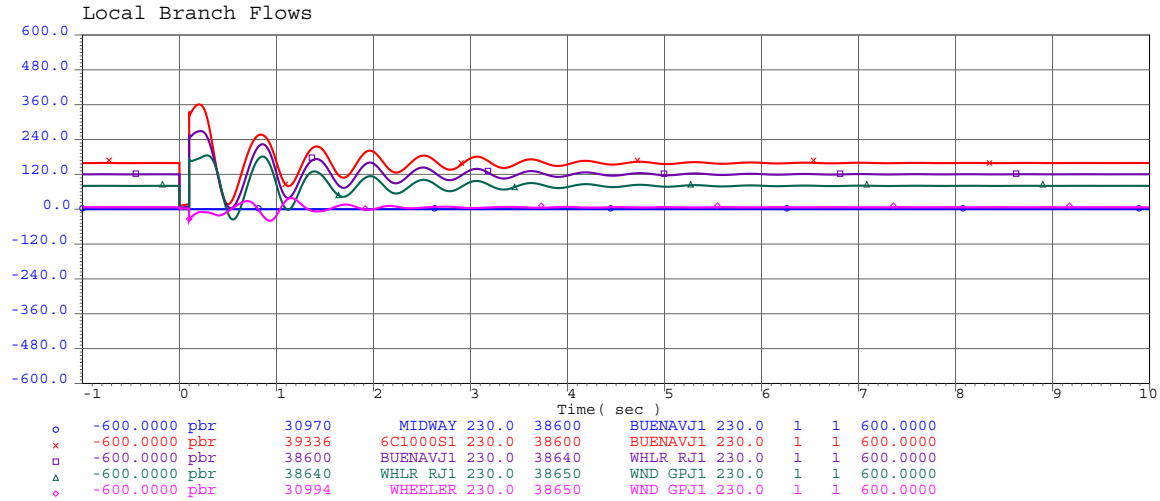




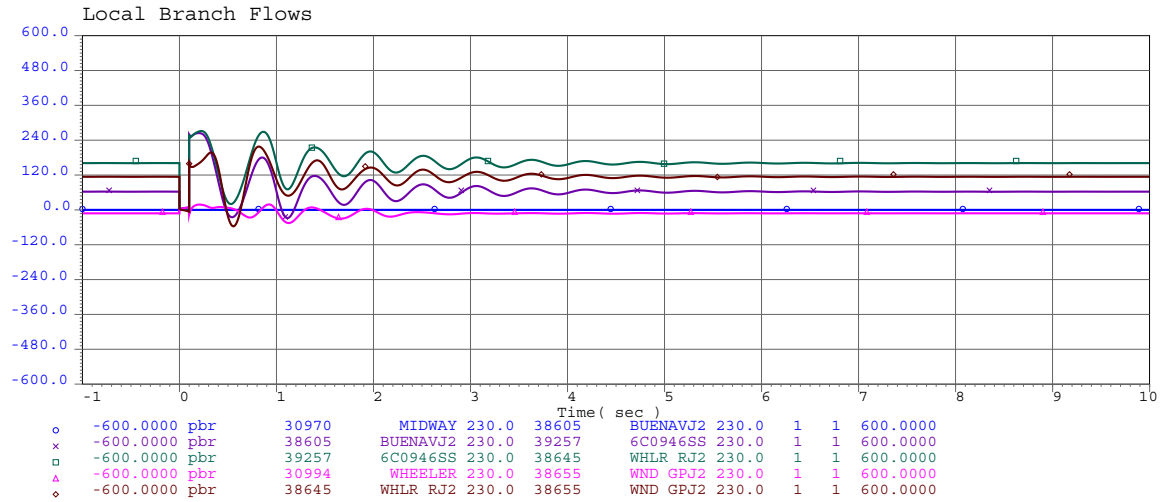




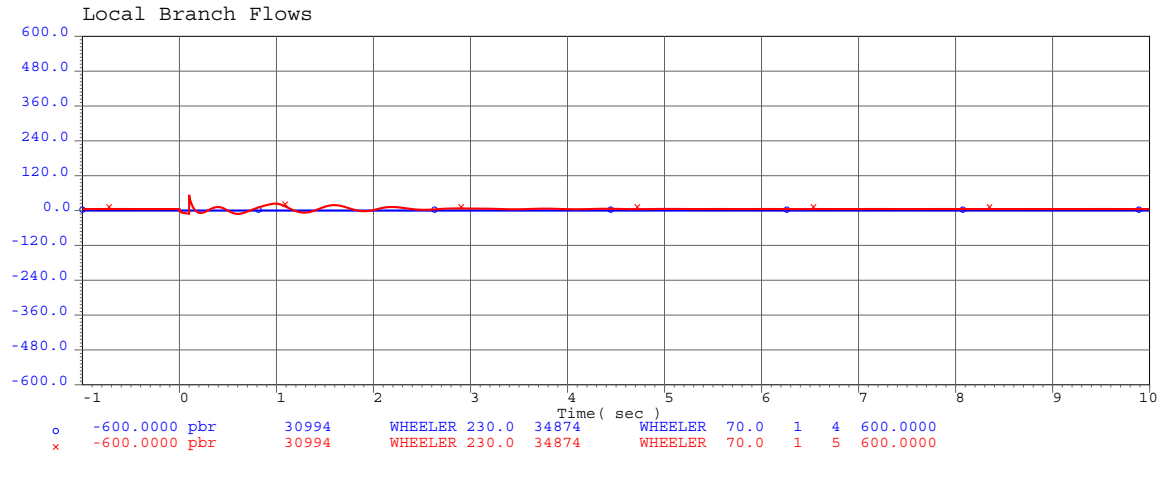
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

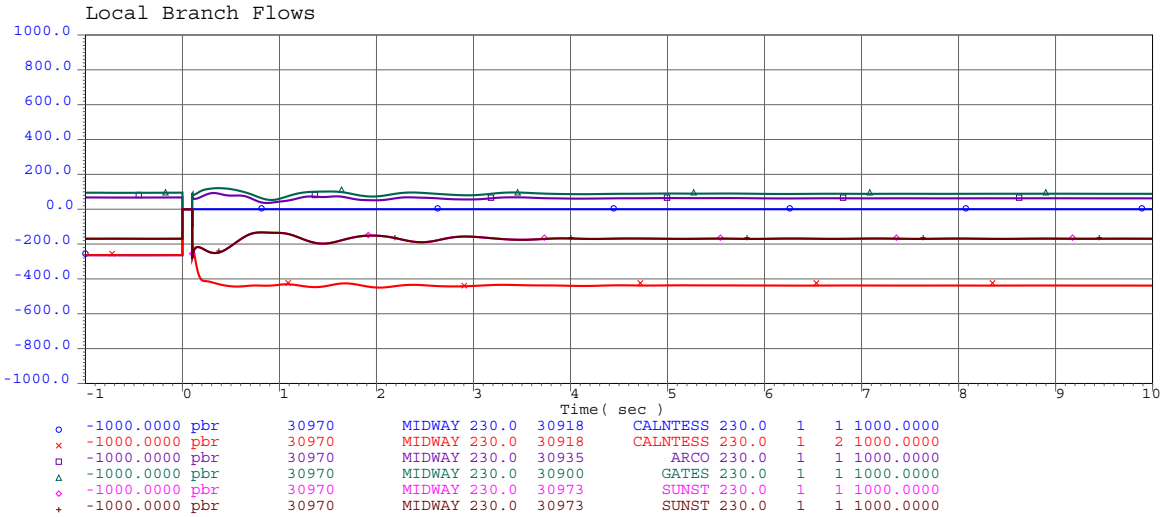


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

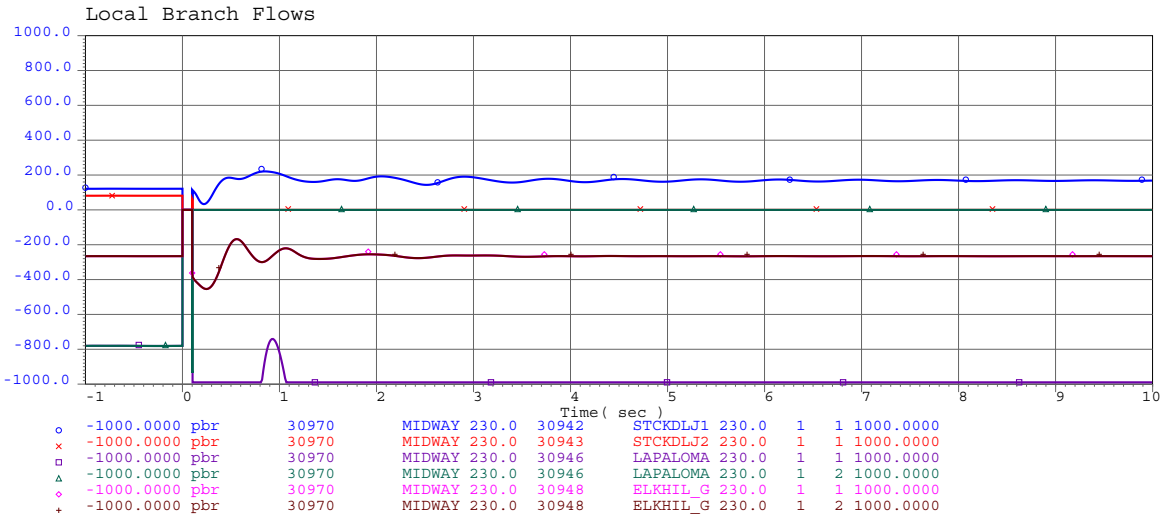


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

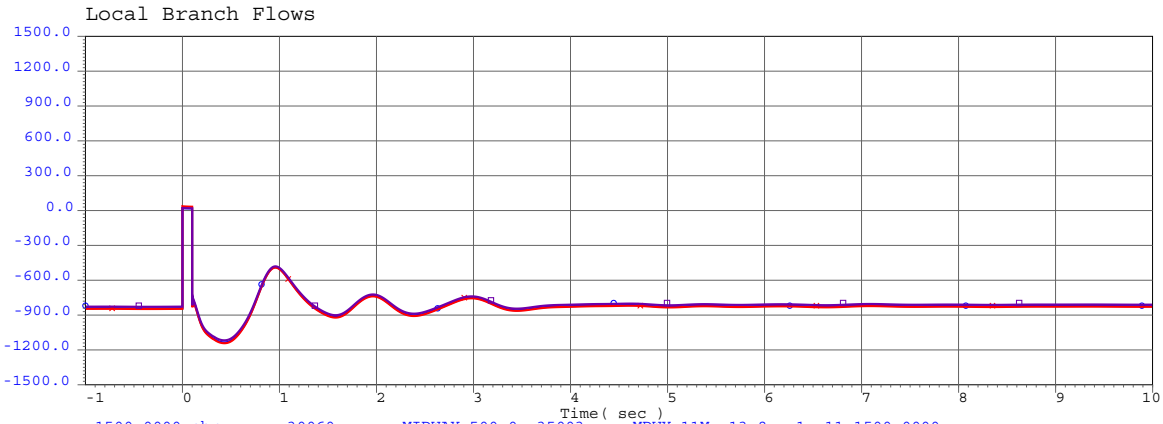
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



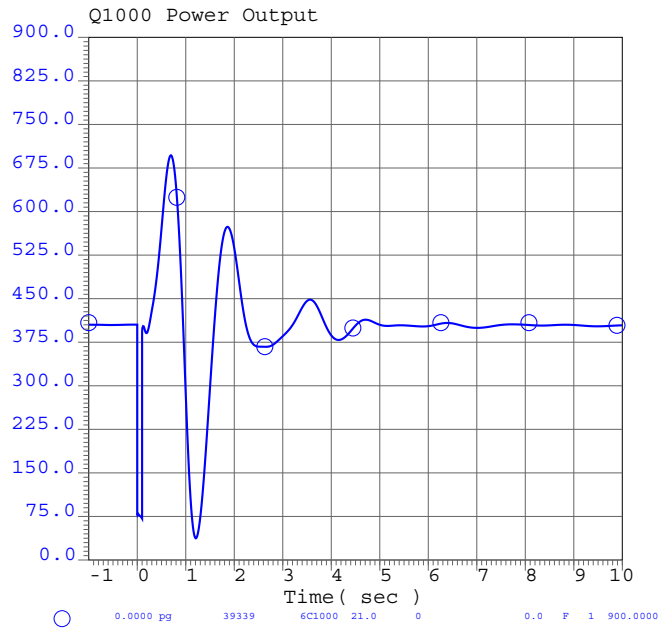
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-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

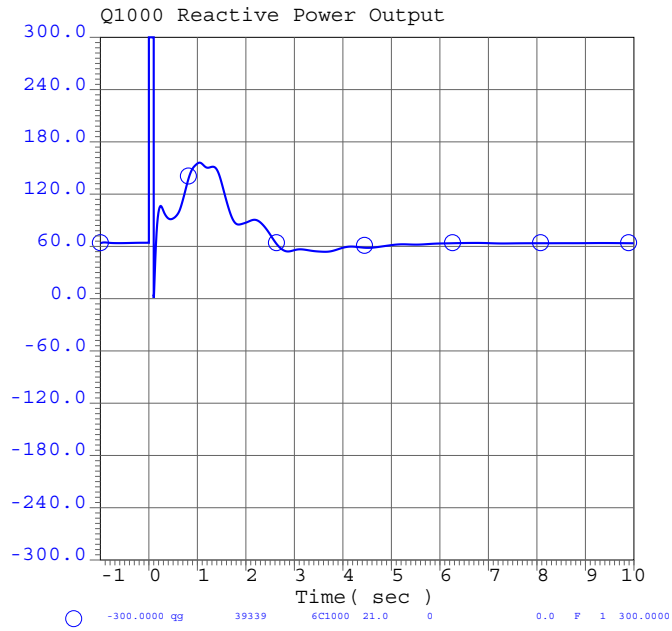


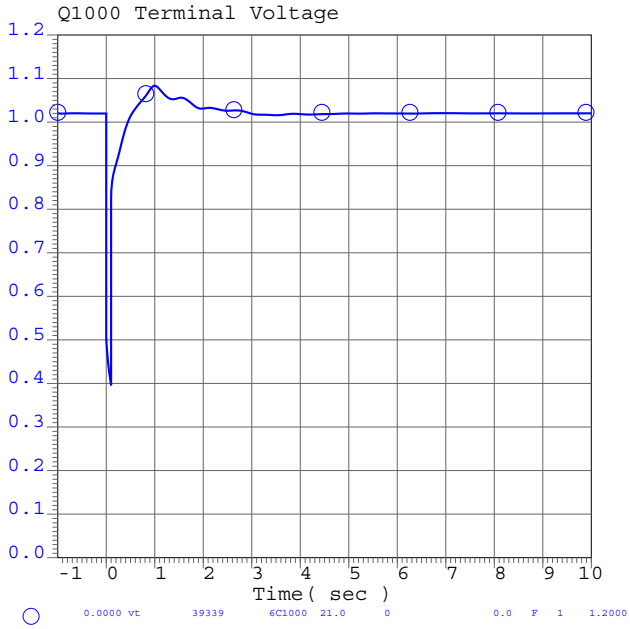
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

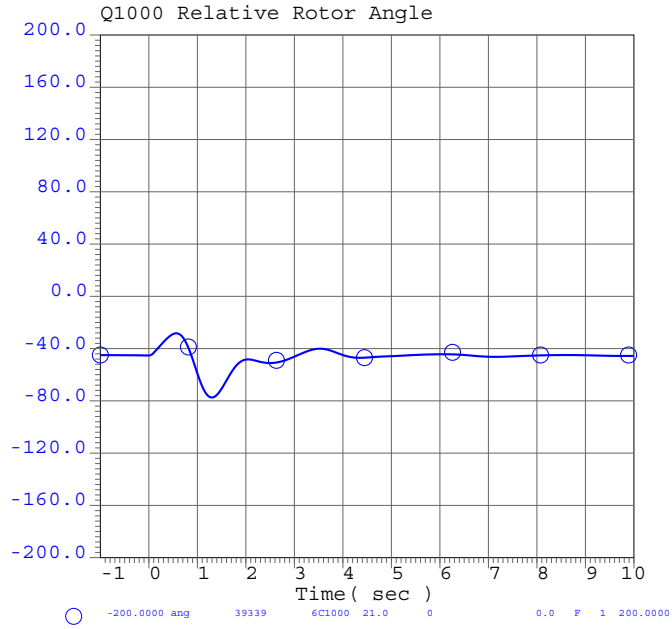
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 1D

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







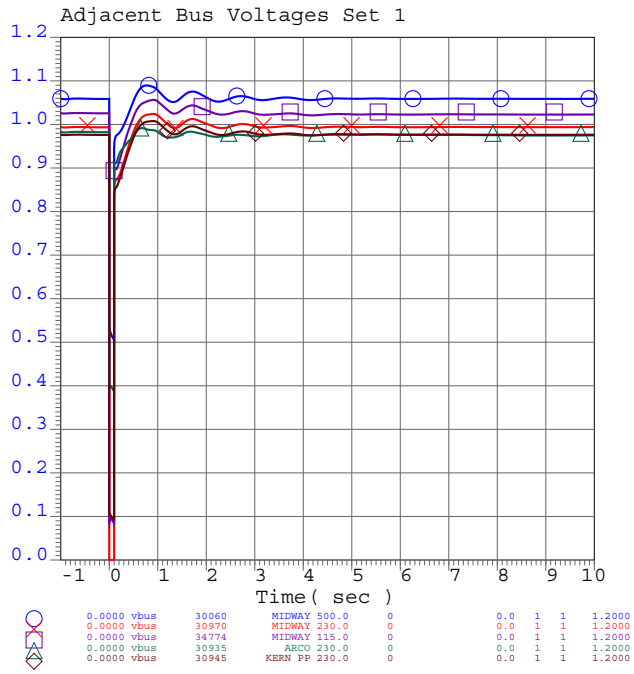


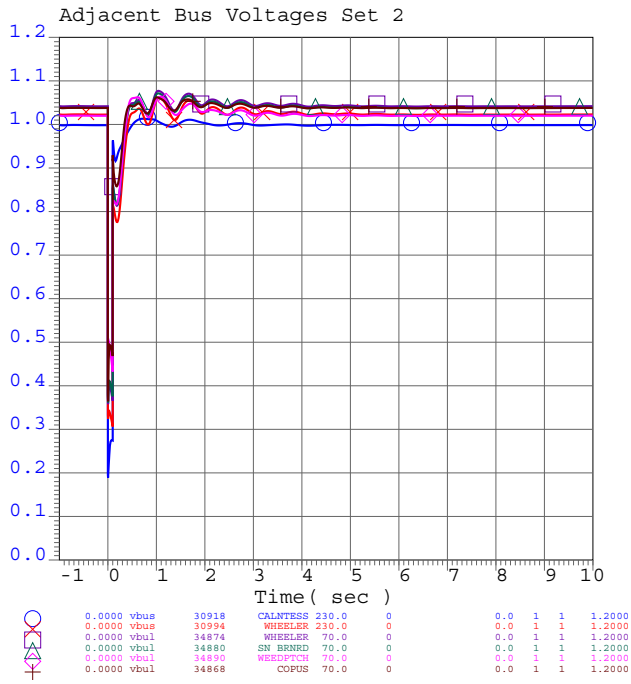
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

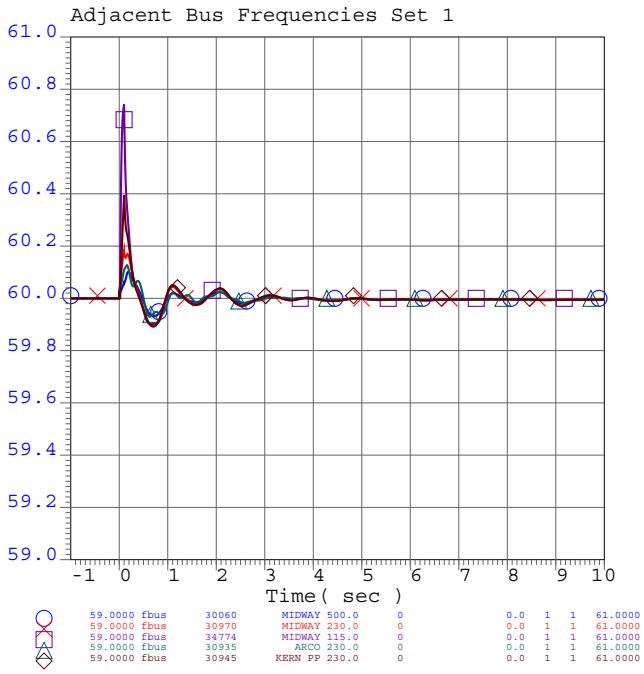
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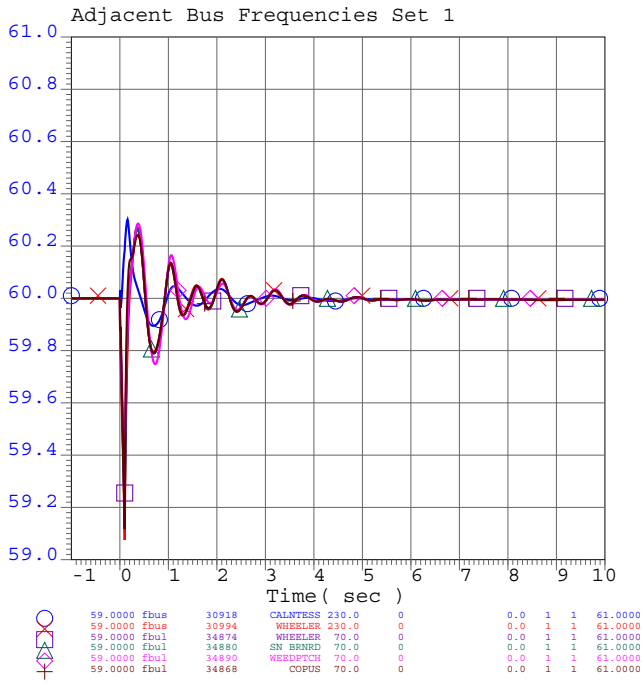
.

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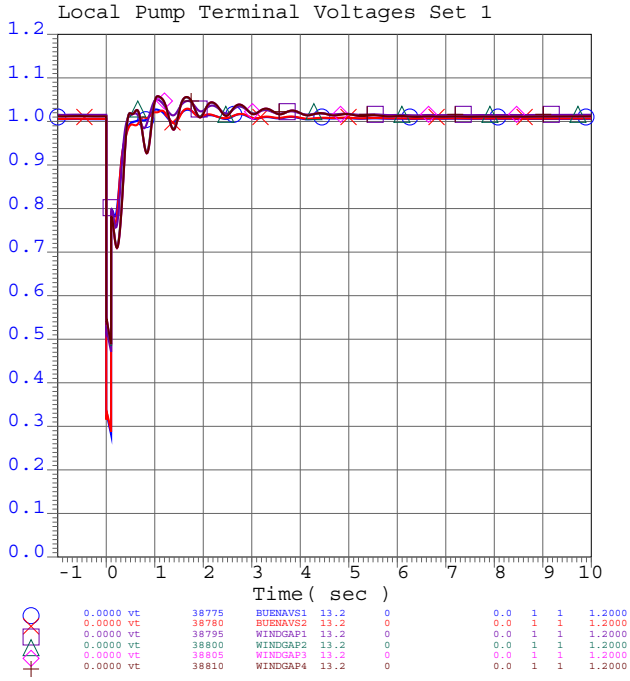




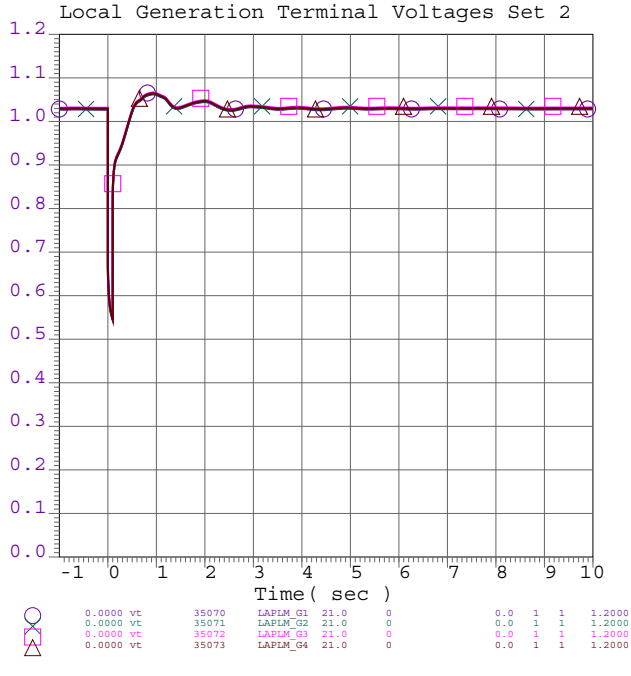


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

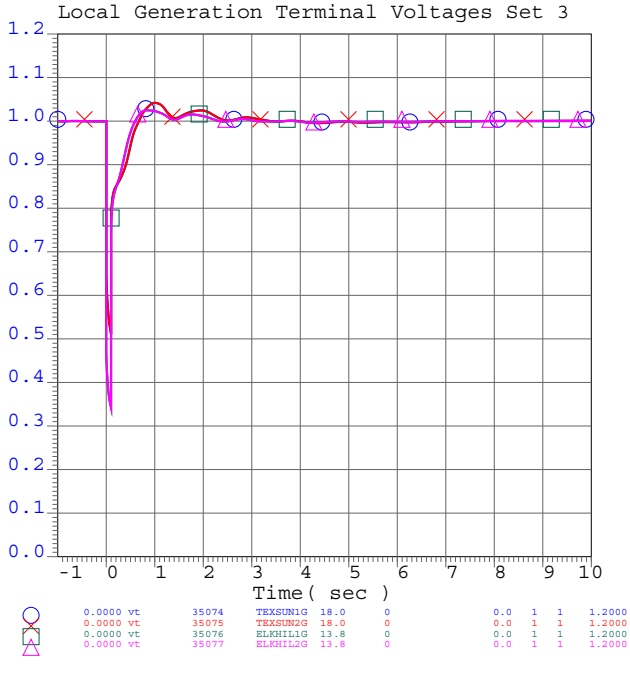
Local Pump Terminal Voltages Set 1



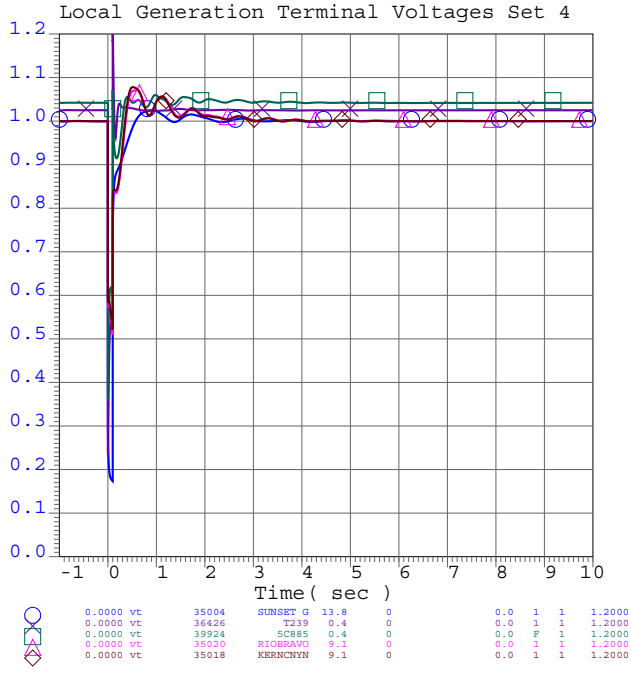
Local Generation Terminal Voltages Set 2



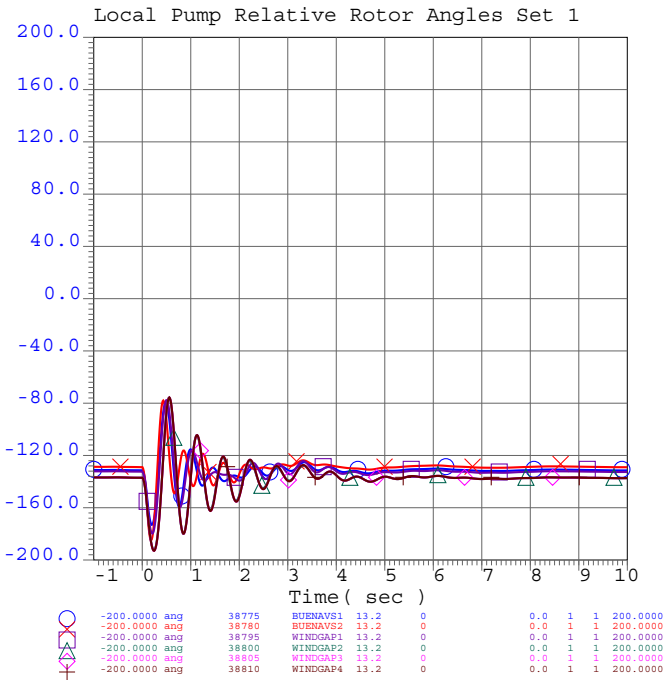
Local Generation Terminal Voltages Set 3

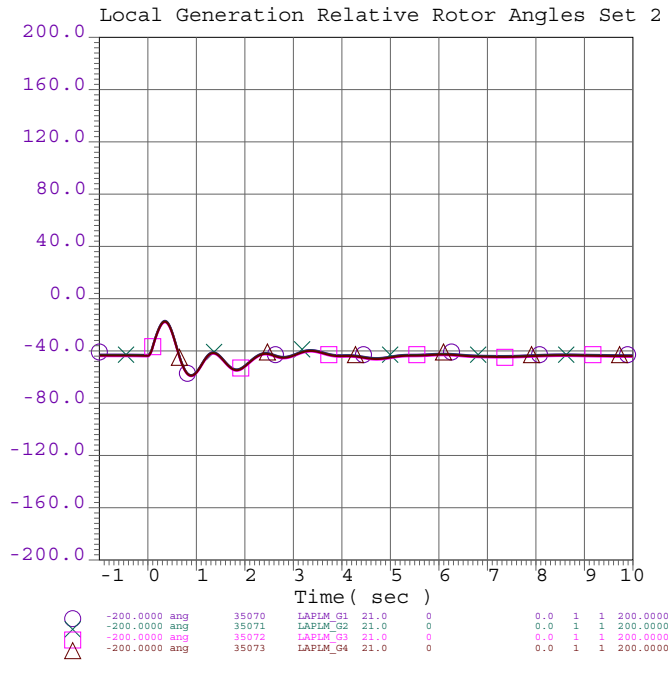


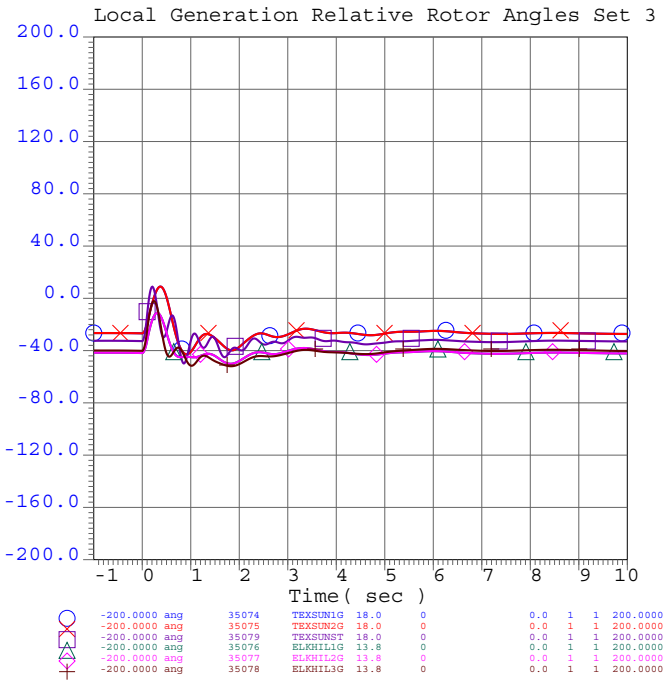
Local Generation Terminal Voltages Set 4

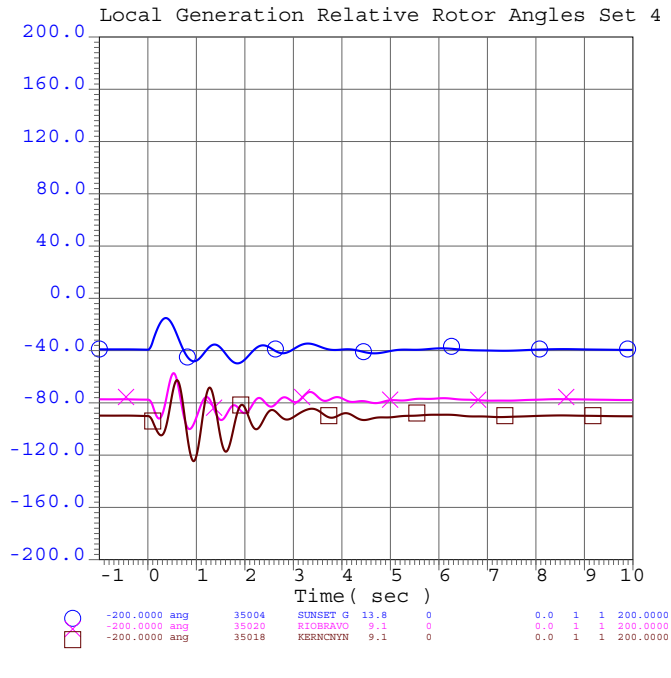


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

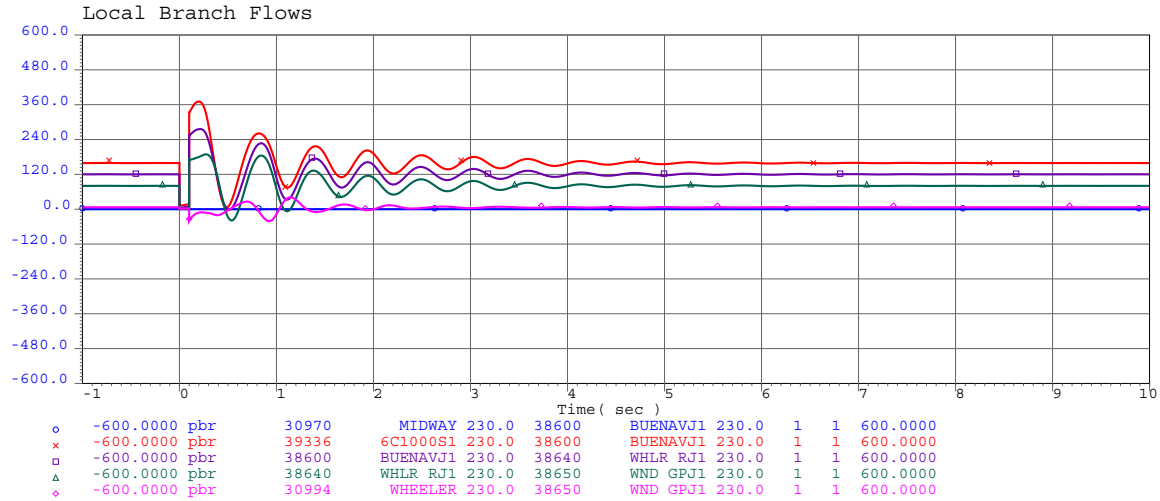




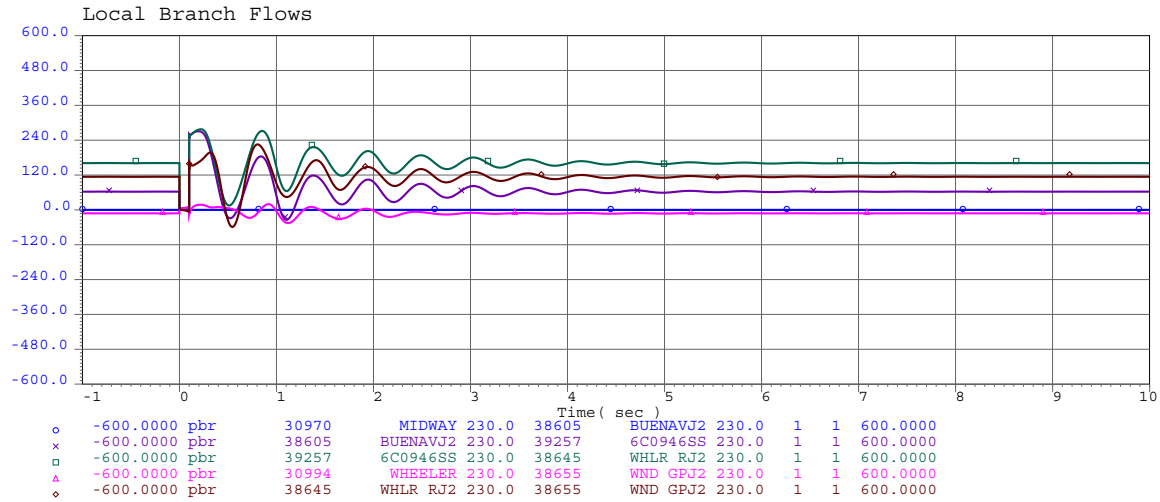




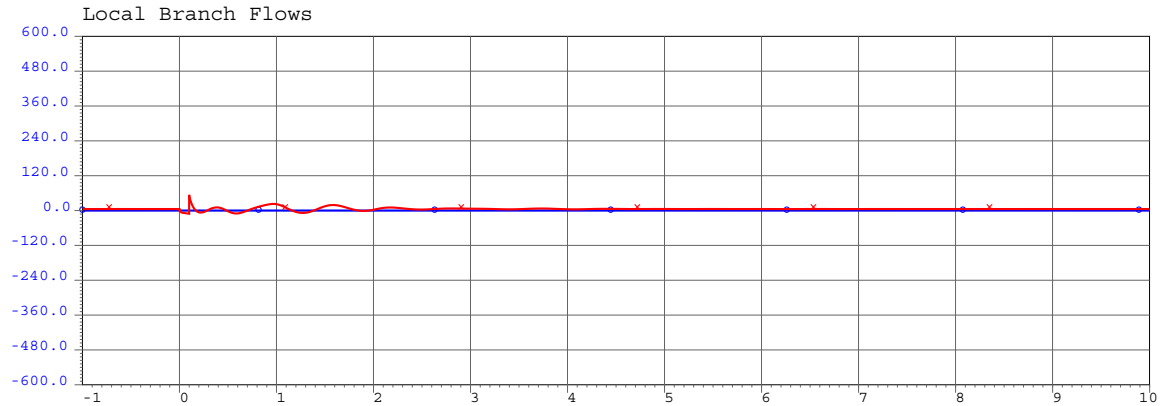
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

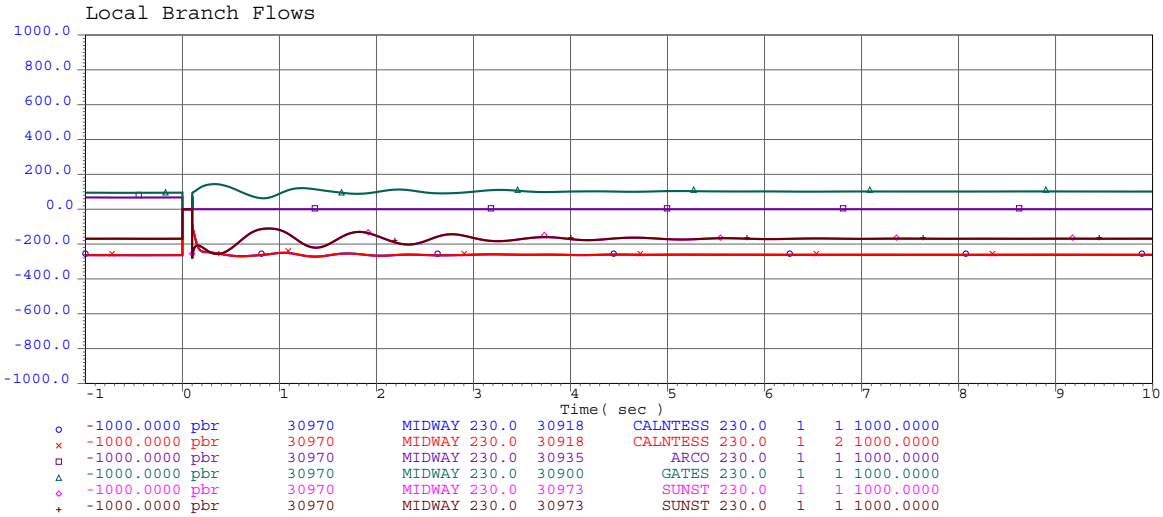


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

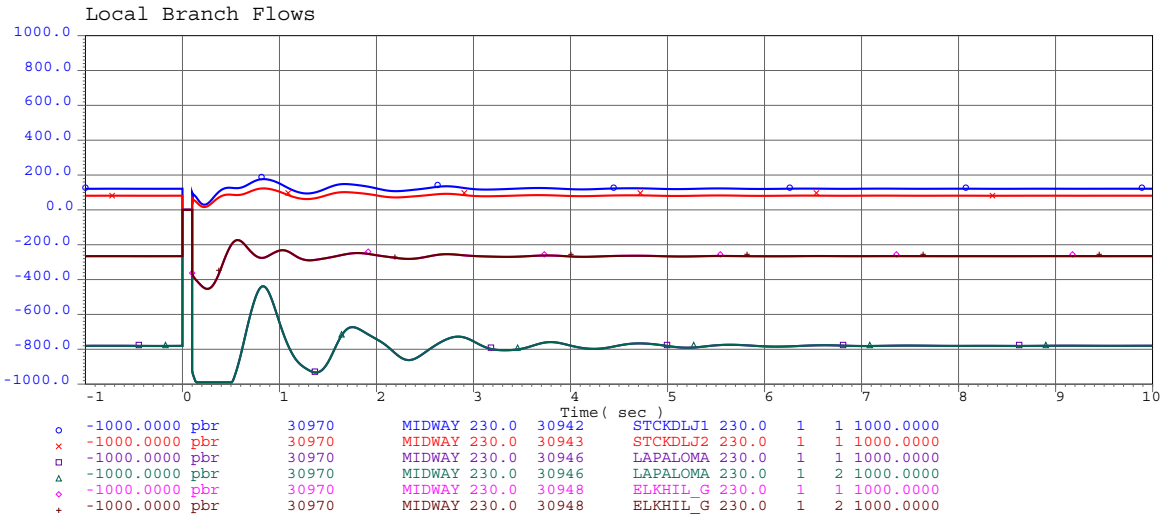


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

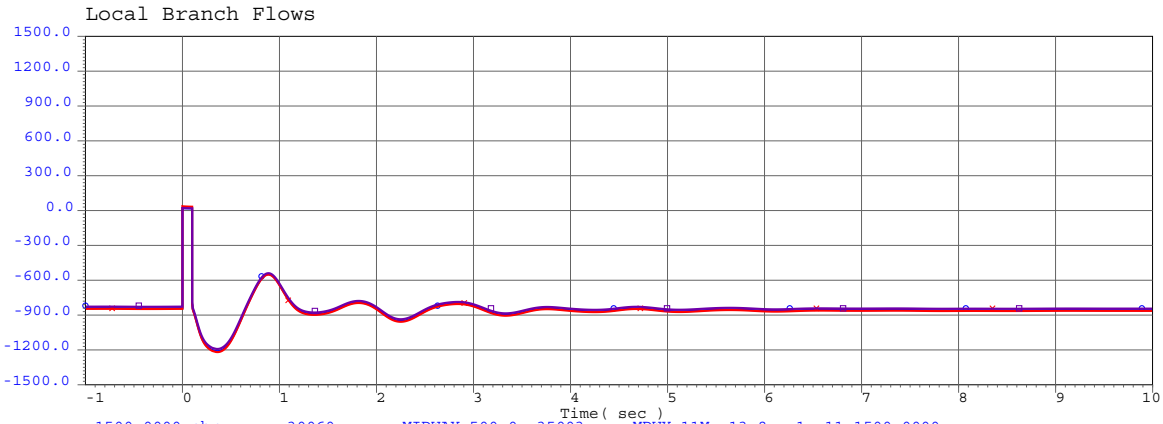
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



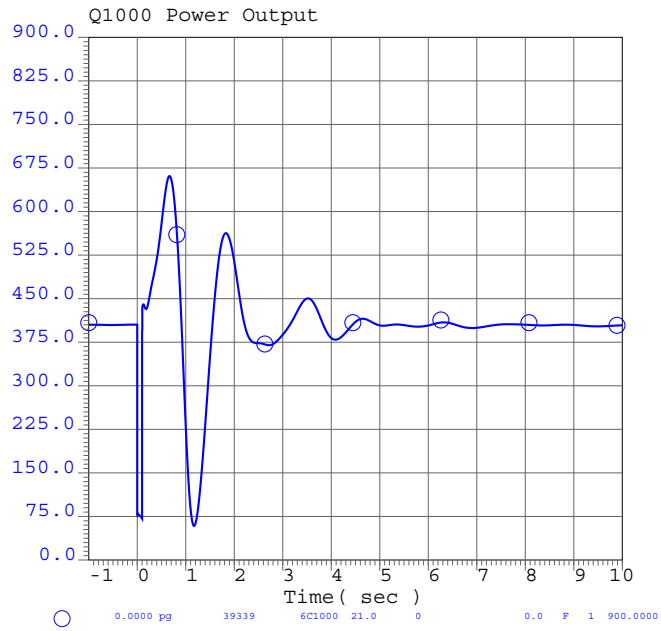
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

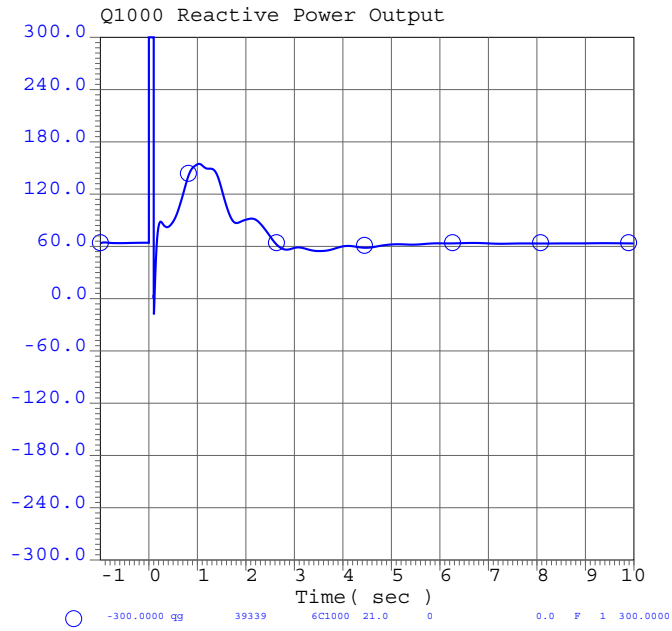


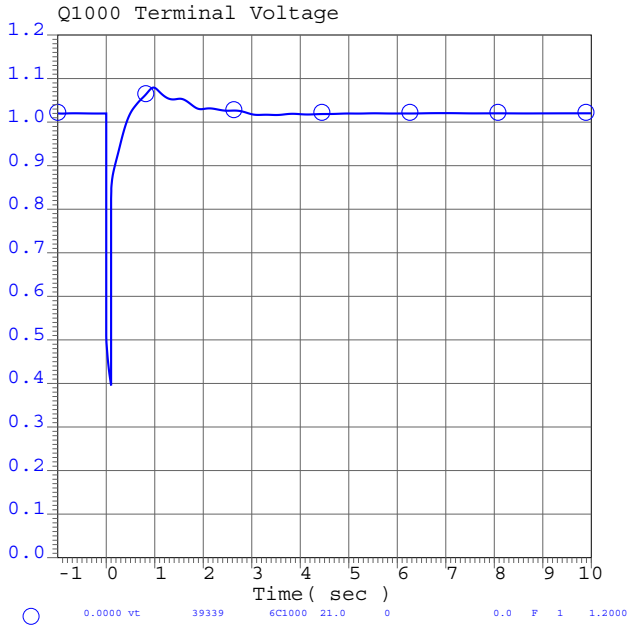
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

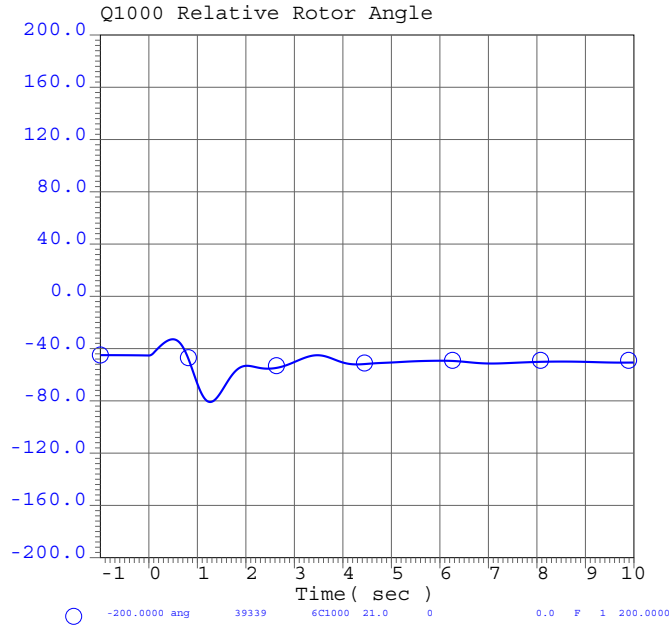
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230kV 1E bus

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

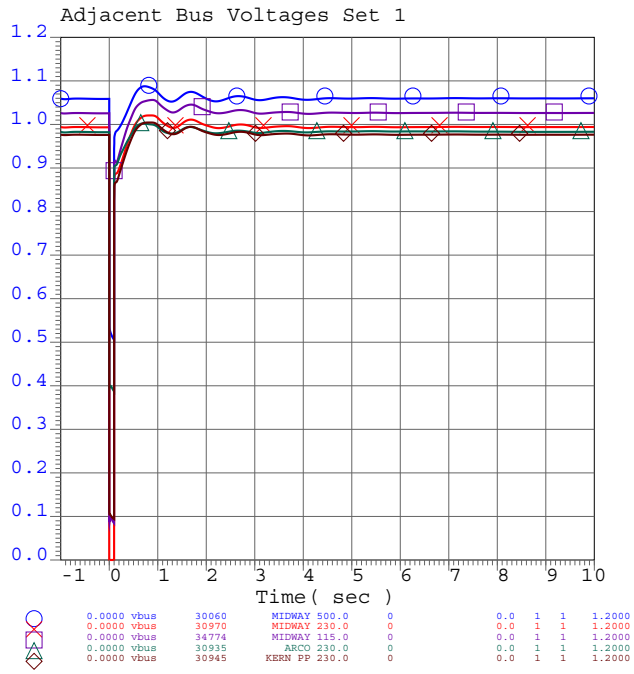


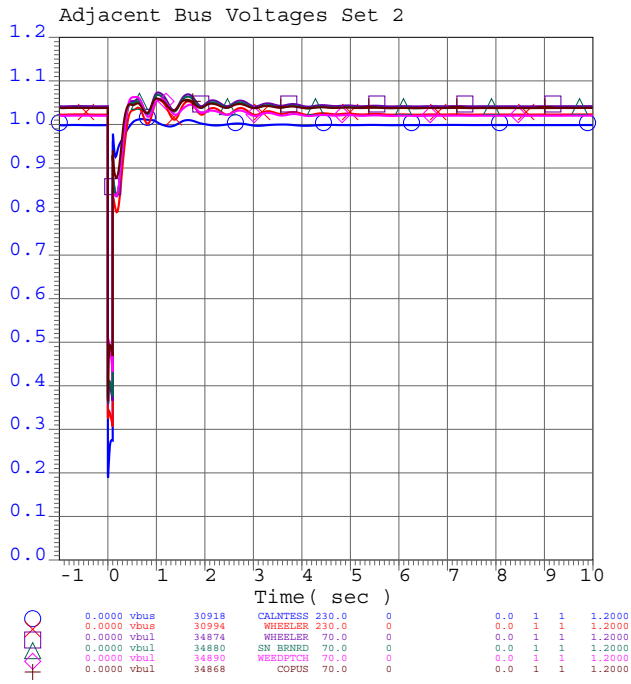


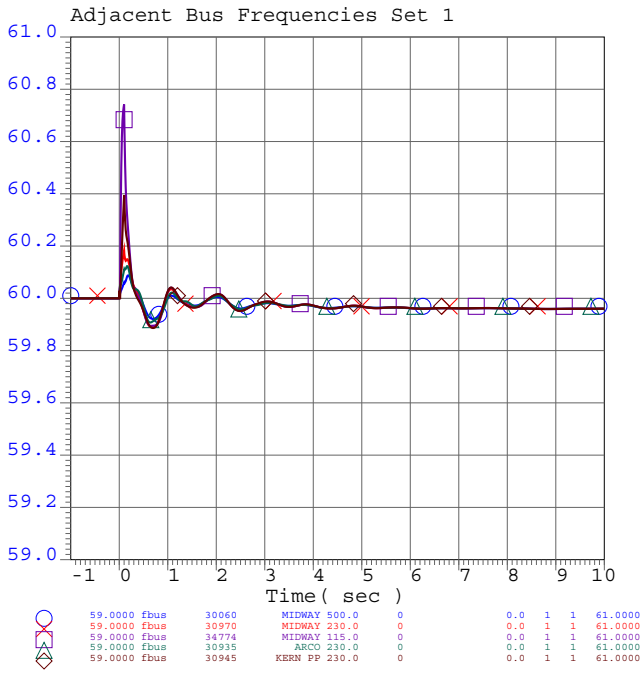


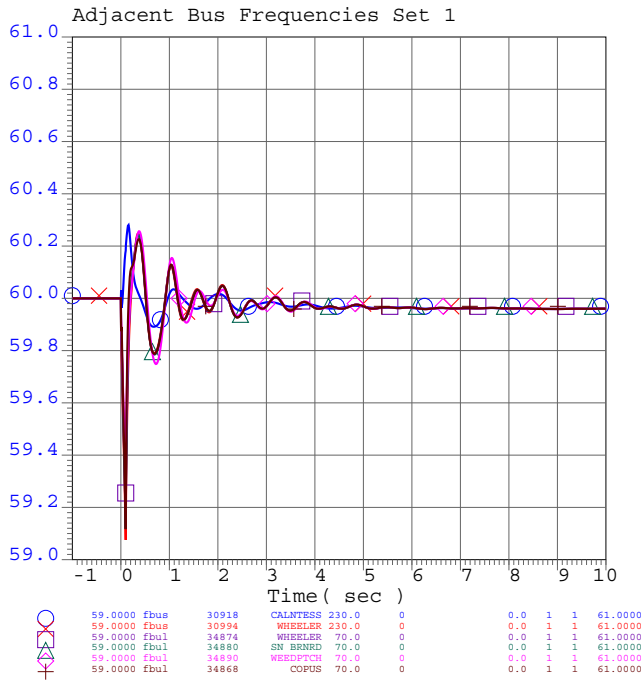


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F



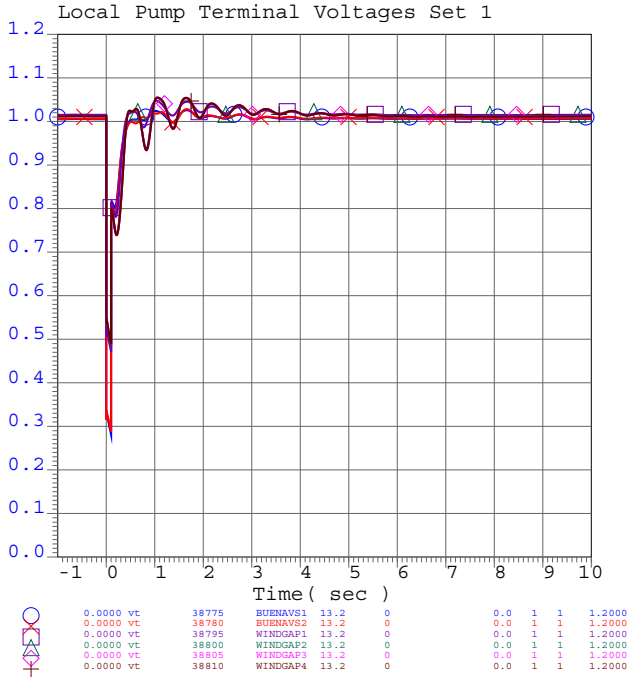






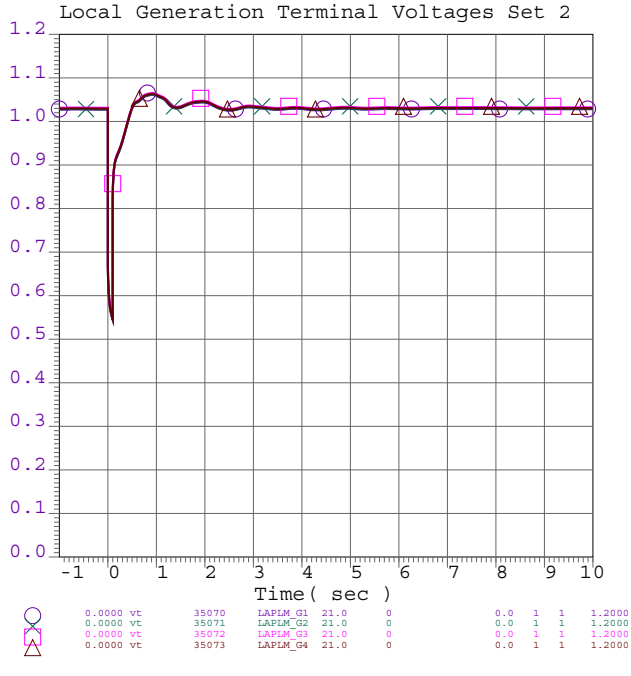
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

Local Pump Terminal Voltages Set 1



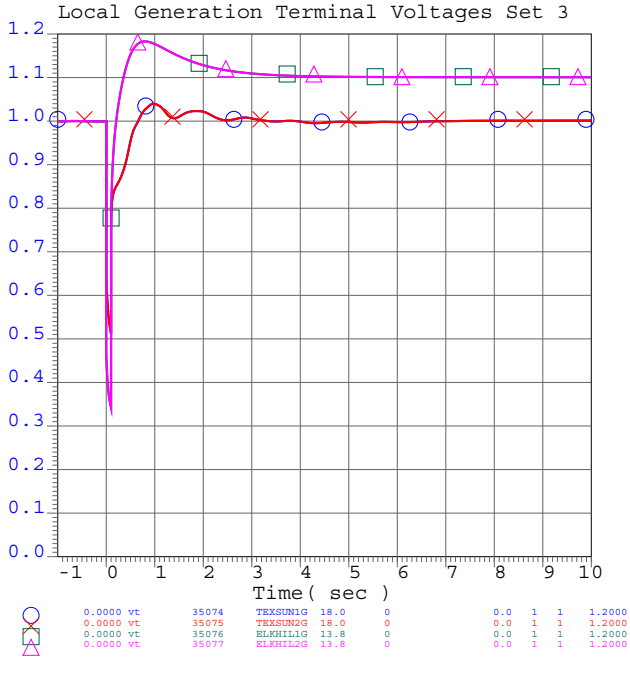
0.0000 vt	38775	BUENAVS1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38780	BUENAVS2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38795	WINDGAP1	13.2	0	0.0	1	1	1.2000
0.0000 vt	38800	WINDGAP2	13.2	0	0.0	1	1	1.2000
0.0000 vt	38805	WINDGAP3	13.2	0	0.0	1	1	1.2000
0.0000 vt	38810	WINDGAP4	13.2	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 2



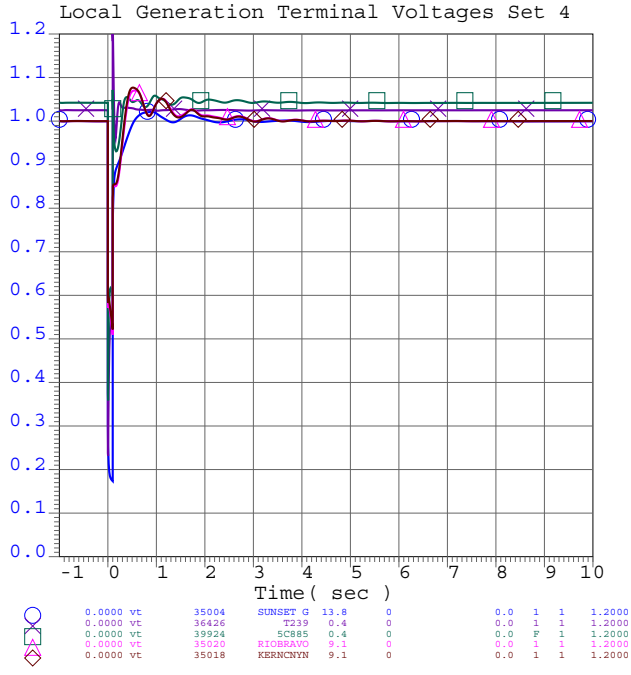
0.0000 vt	35070	LAPLM_G1	21.0	0	0.0	1	1	1.2000
0.0000 vt	35071	LAPLM_G2	21.0	0	0.0	1	1	1.2000
0.0000 vt	35072	LAPLM_G3	21.0	0	0.0	1	1	1.2000
0.0000 vt	35073	LAPLM_G4	21.0	0	0.0	1	1	1.2000

Local Generation Terminal Voltages Set 3



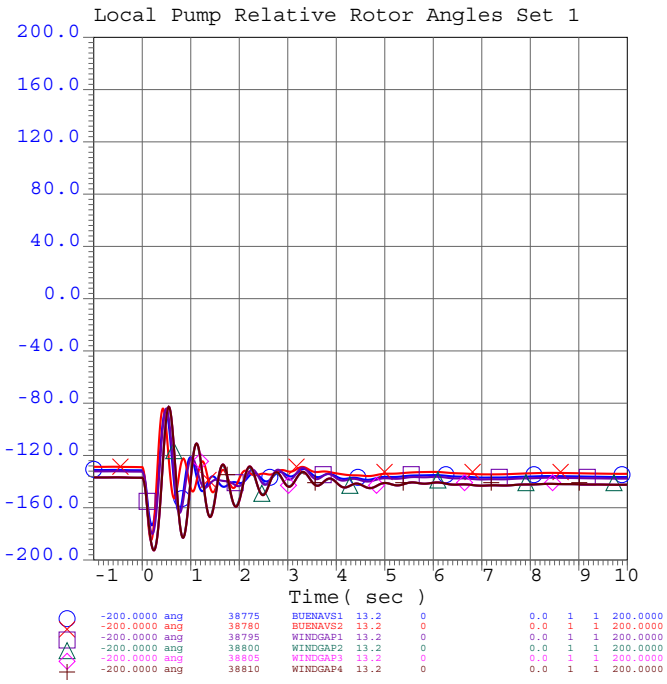
0.0000 vt	35074	TEXSUN1G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35075	TEXSUN2G	18.0	0	0.0	1	1	1.2000
0.0000 vt	35076	ELKHIL1G	13.8	0	0.0	1	1	1.2000
0.0000 vt	35077	ELKHIL2G	13.8	0	0.0	1	1	1.2000

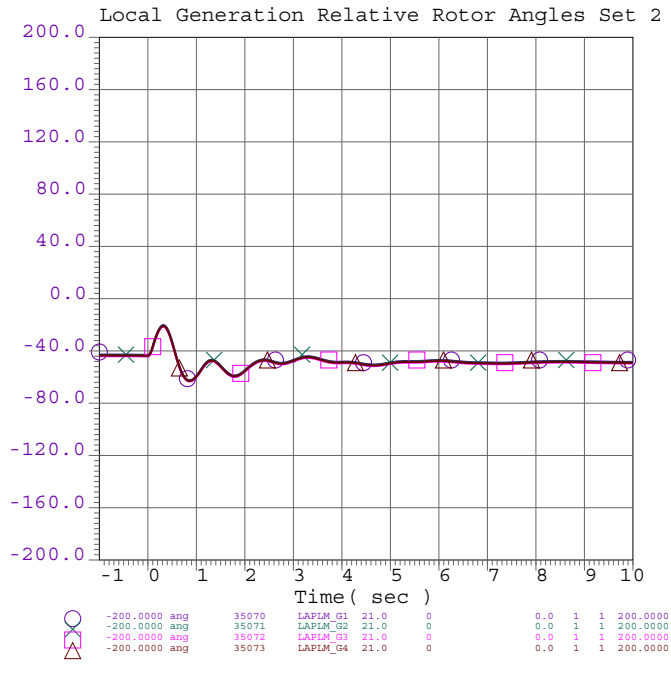
Local Generation Terminal Voltages Set 4

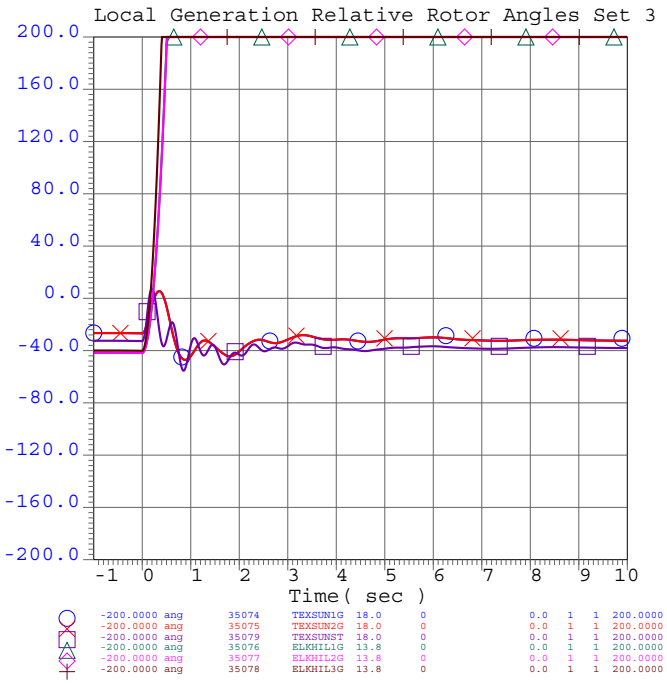


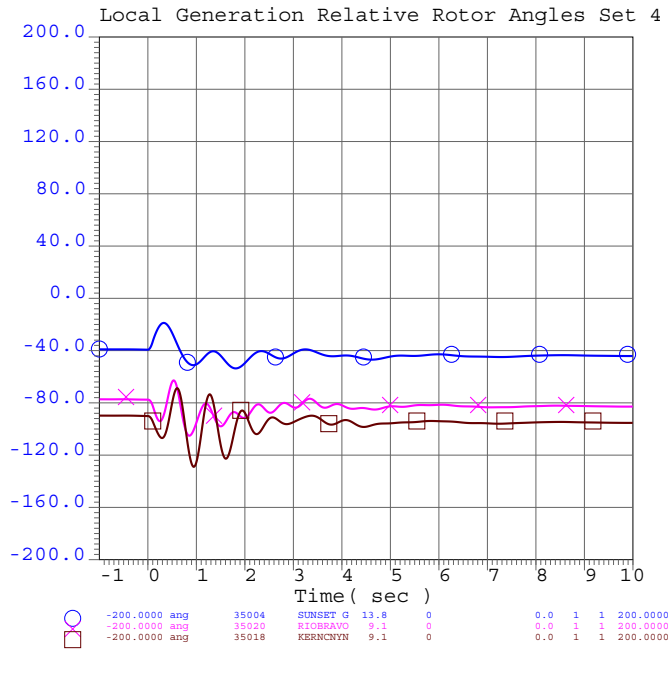
0.0000 vt	35004	SUNSET G	13.8	0	0.0	1	1	1.2000
0.0000 vt	36426	T239	0.4	0	0.0	1	1	1.2000
0.0000 vt	39924	5C885	0.4	0	0.0	F	1	1.2000
0.0000 vt	35020	RIONEAVO	9.1	0	0.0	1	1	1.2000
0.0000 vt	35018	KERNCNYN	9.1	0	0.0	1	1	1.2000

Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F



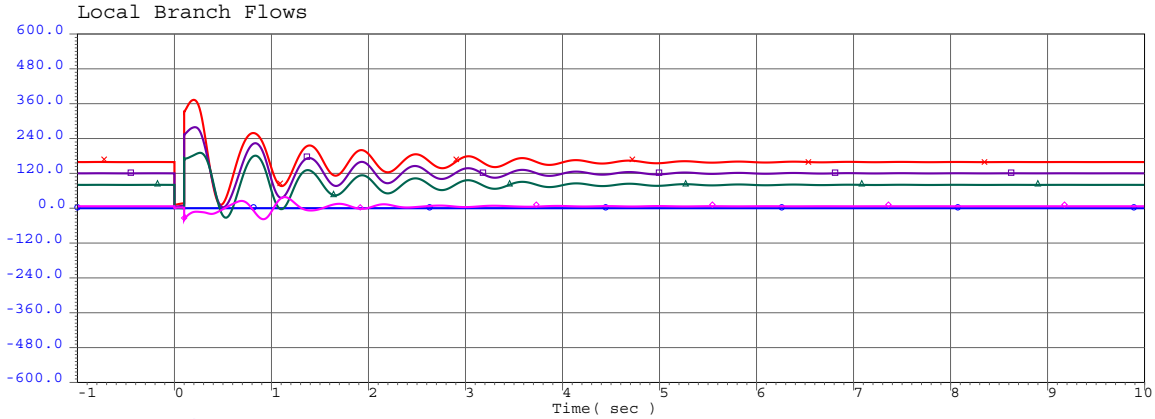






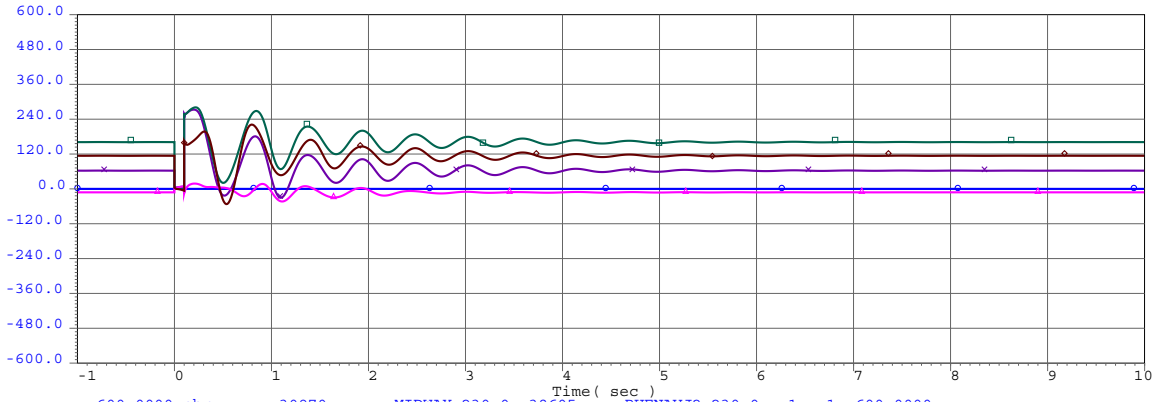
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

Local Branch Flows



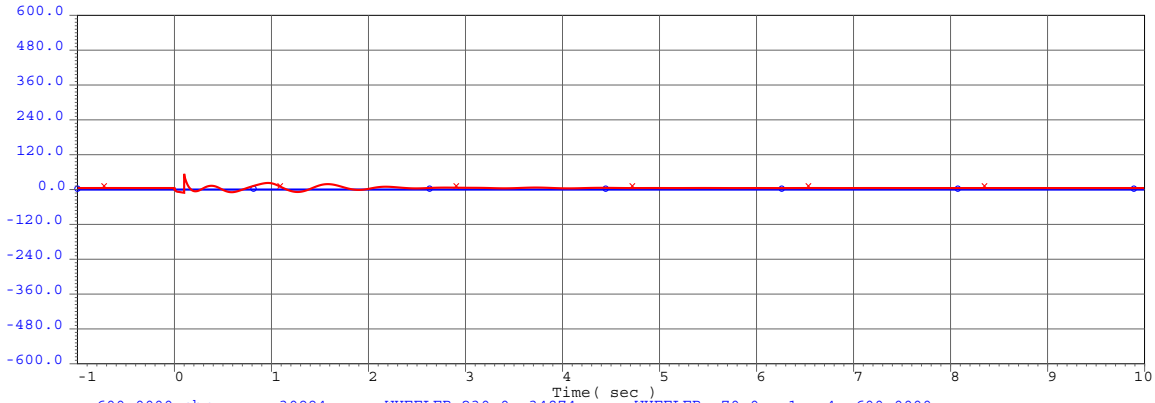
-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

Local Branch Flows



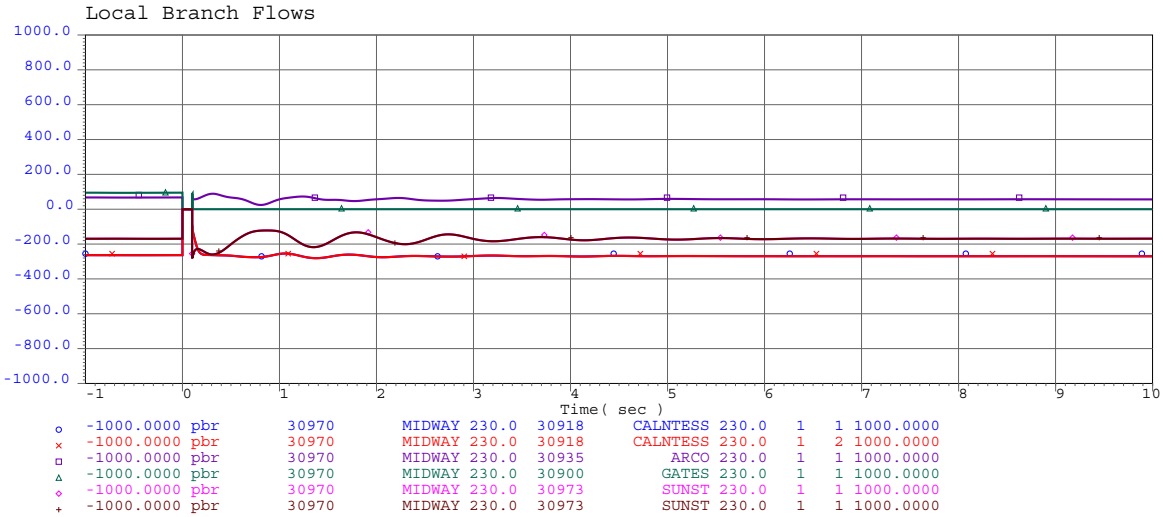
-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

Local Branch Flows

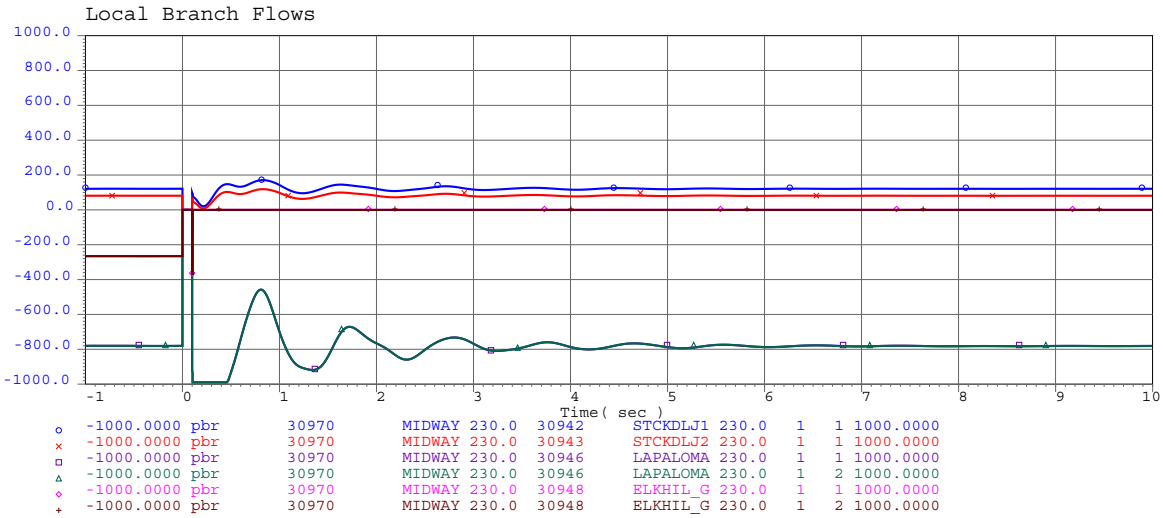


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

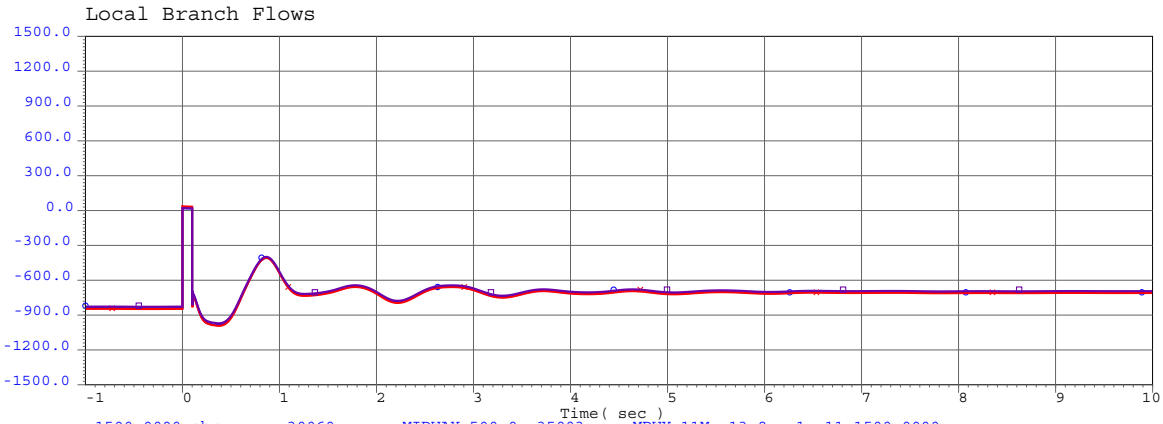
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



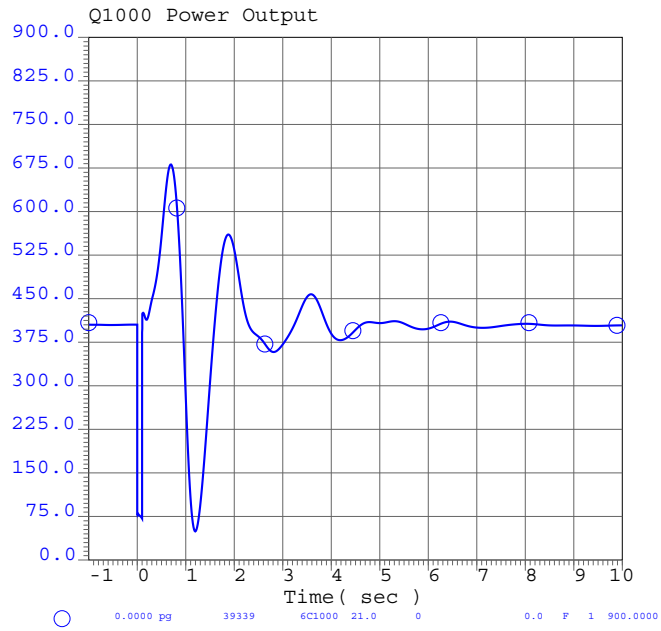
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

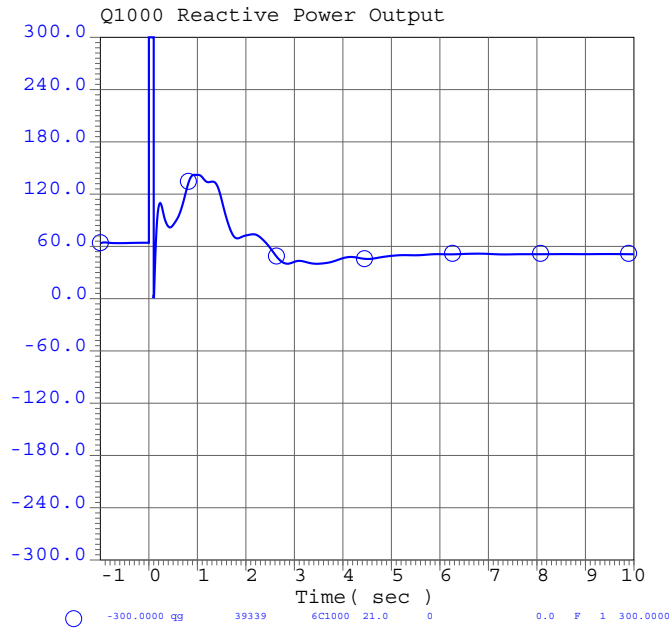


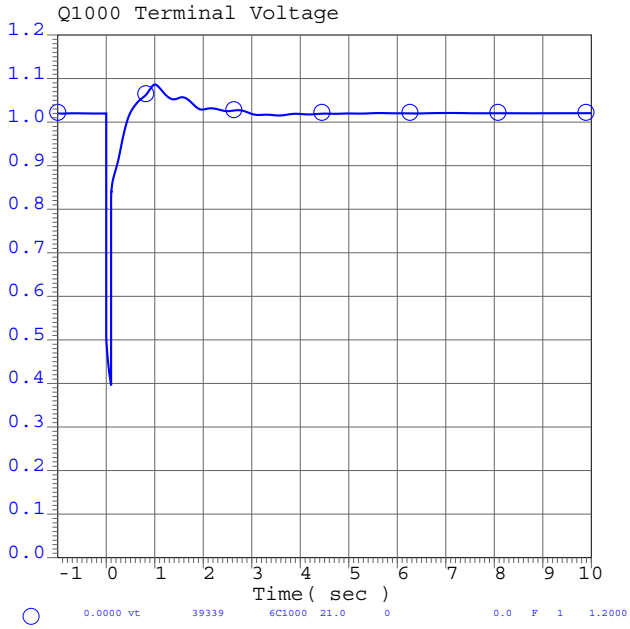
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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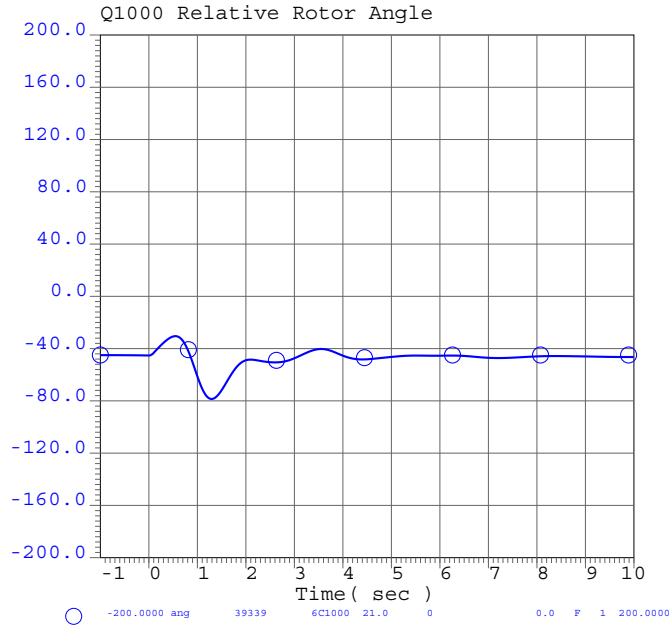
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus 1F
Clear Midway 230 kV Bus Section 1F

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







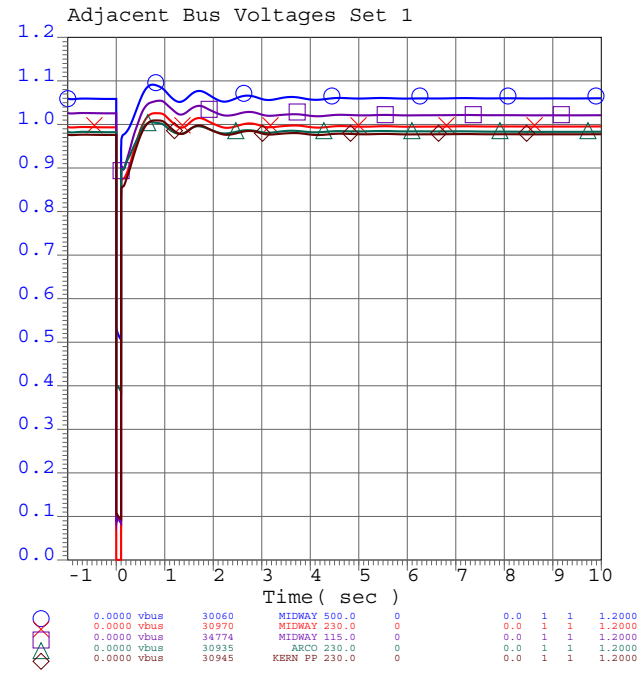


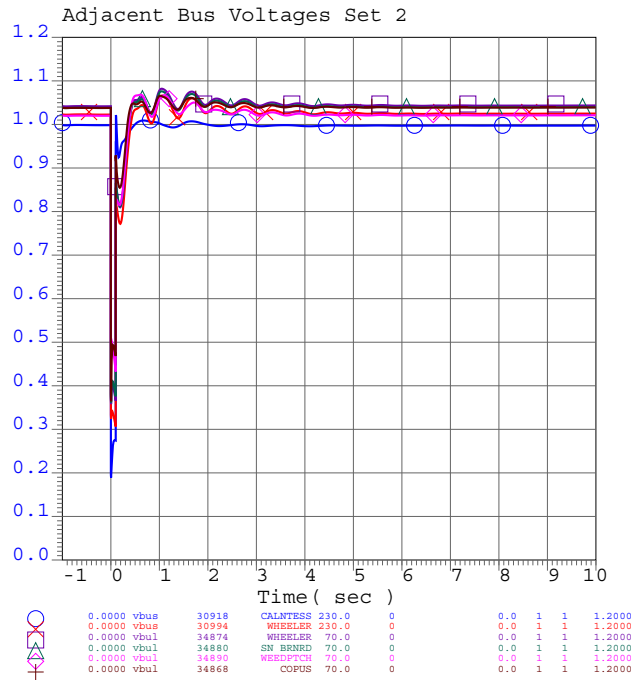
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

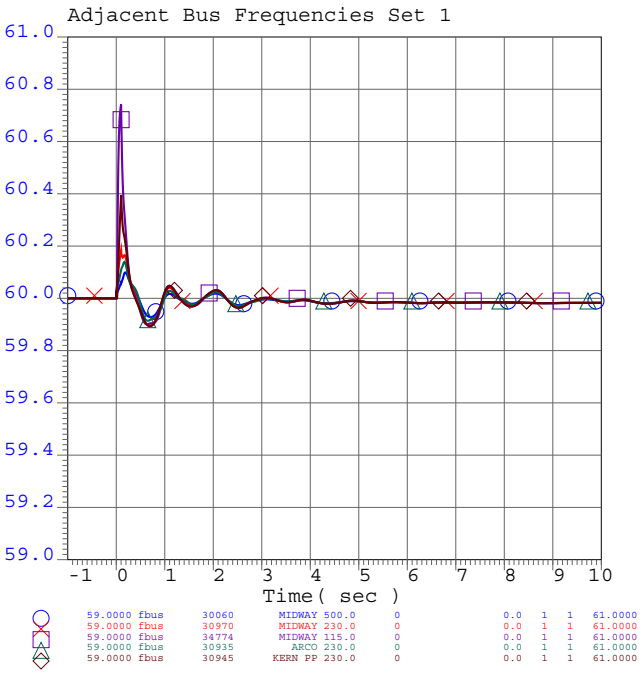
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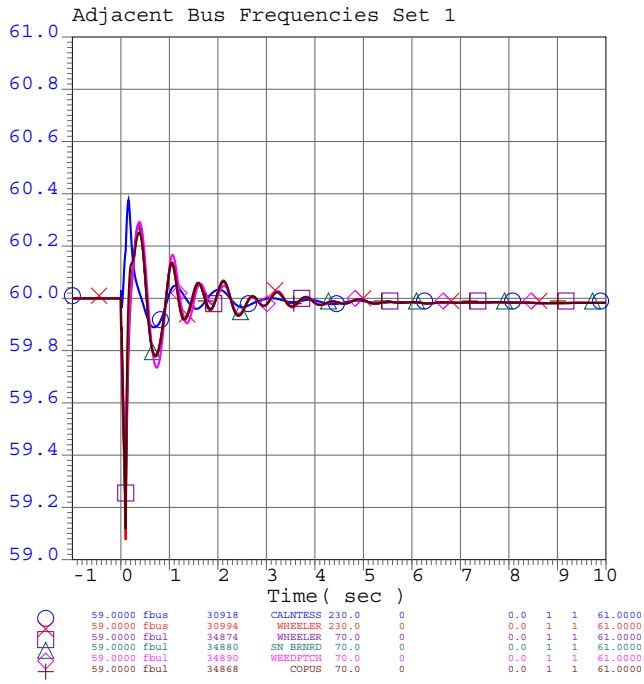
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Tue Dec 24 11:51:43 2013







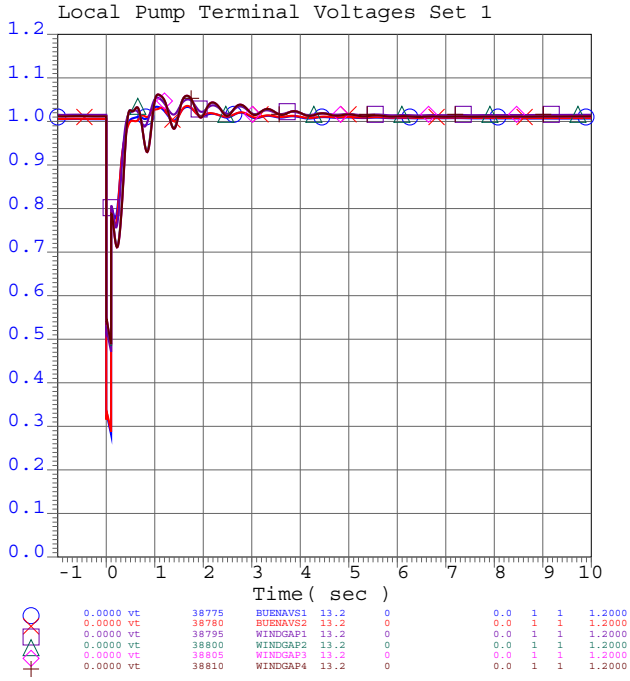


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

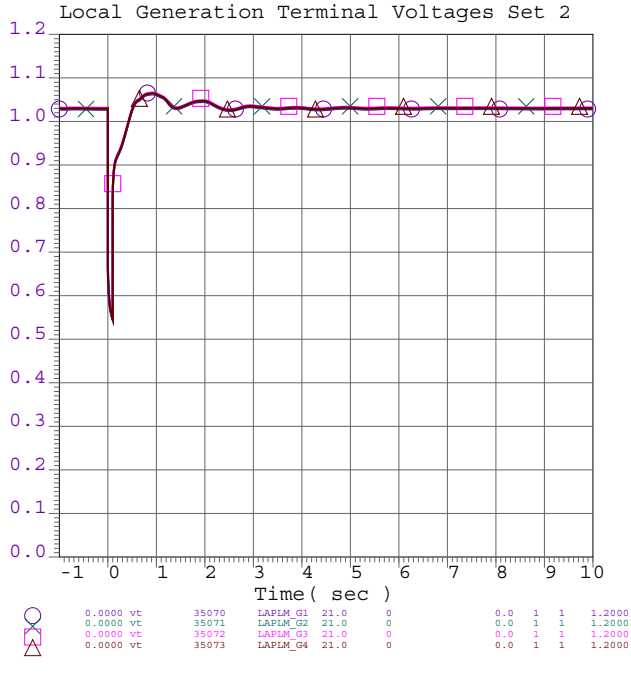
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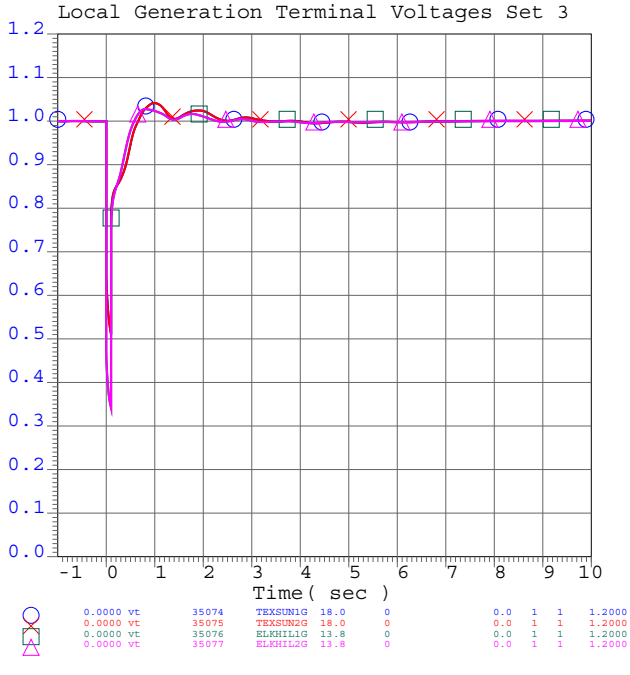
Local Pump Terminal Voltages Set 1



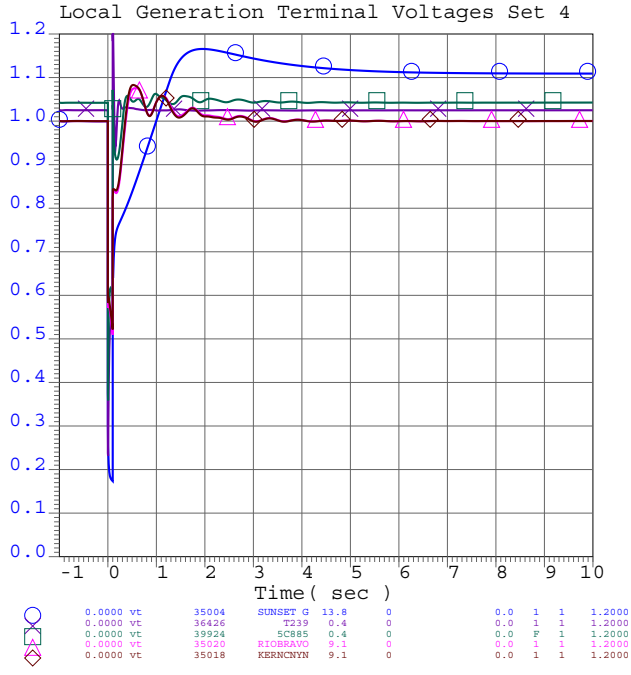
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4

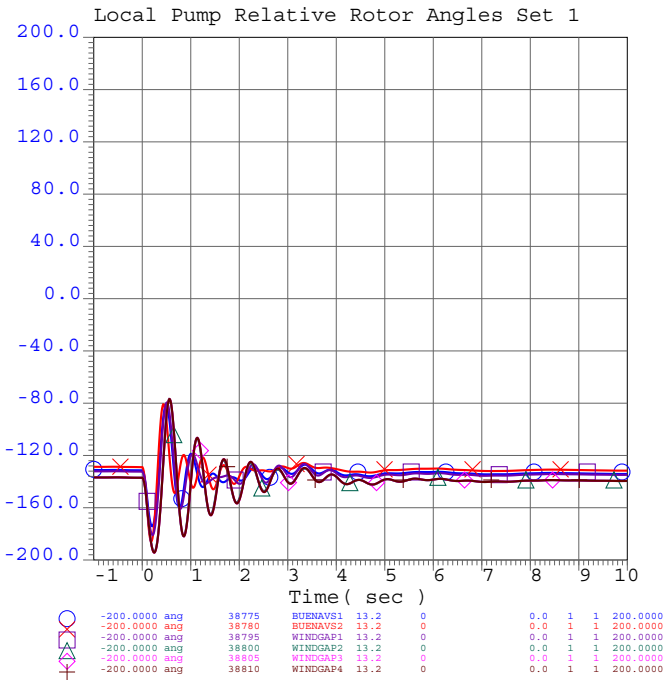


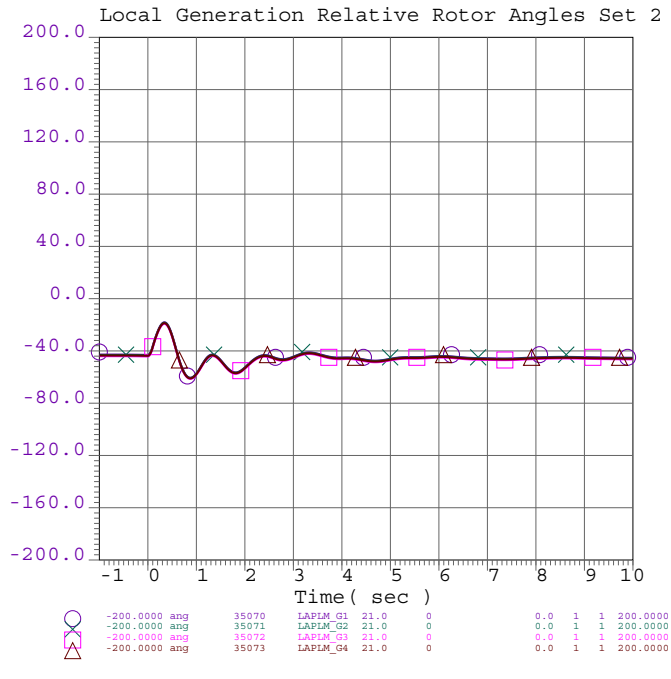
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

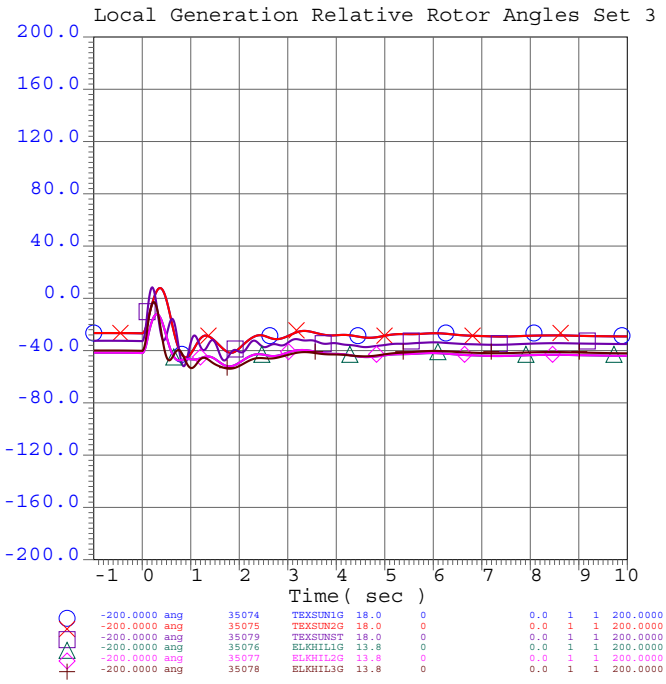
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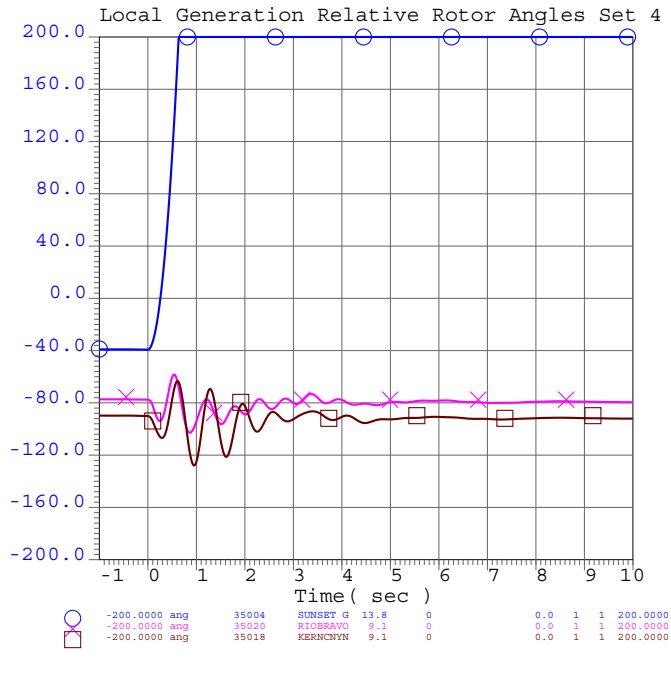
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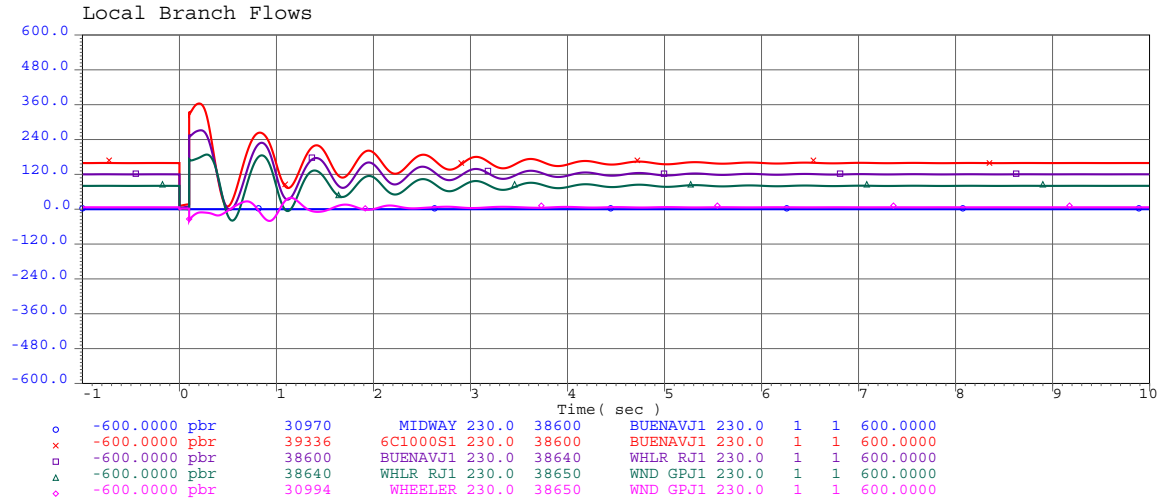




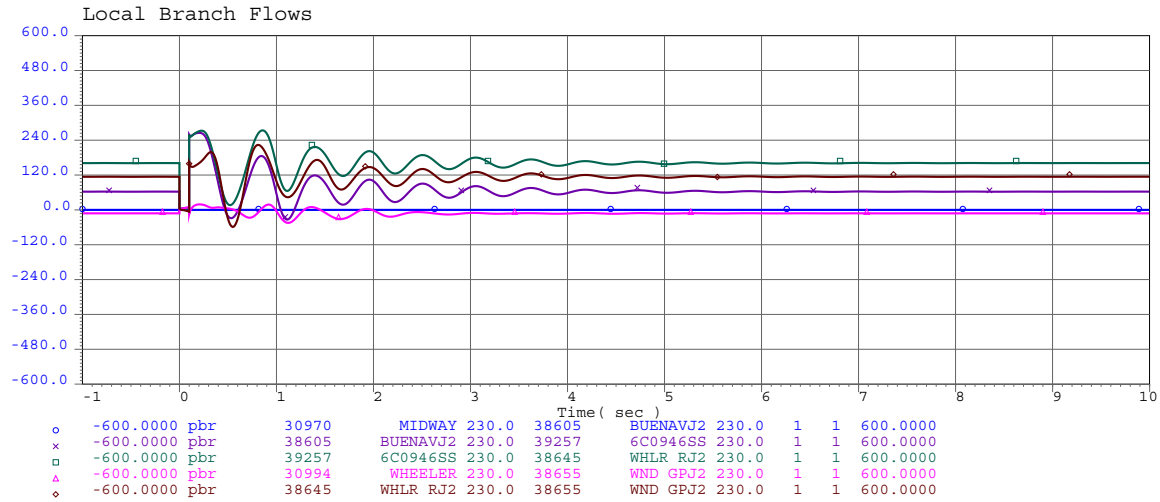




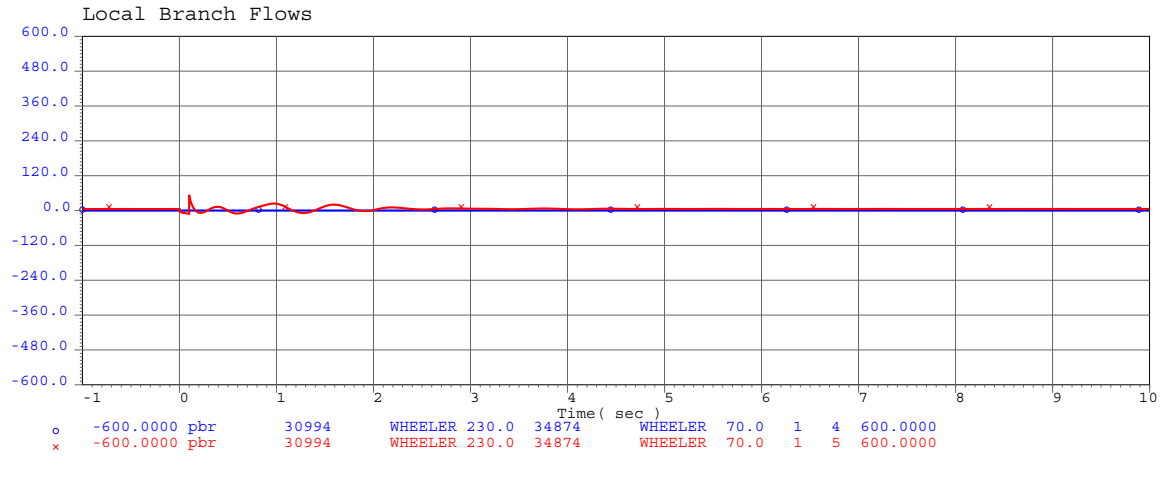
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
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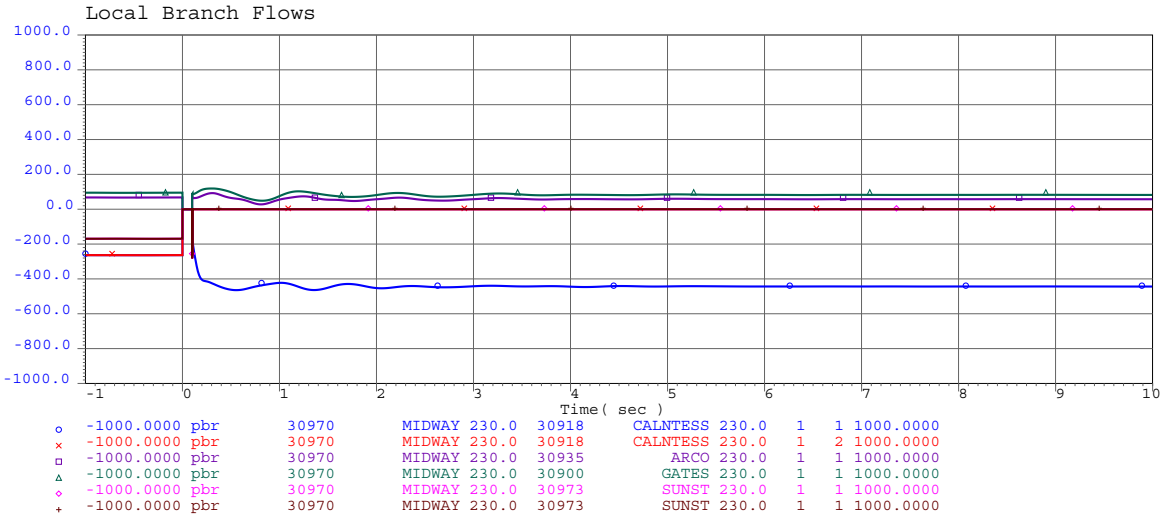


-600.0000	pbr	30970	MIDWAY	230.0	38605	BUENAVJ2	230.0	1	1	600.0000
-600.0000	pbr	38605	BUENAVJ2	230.0	39257	6C0946SS	230.0	1	1	600.0000
-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
-600.0000	pbr	38645	WHLR RJ2	230.0	38655	WND GPJ2	230.0	1	1	600.0000

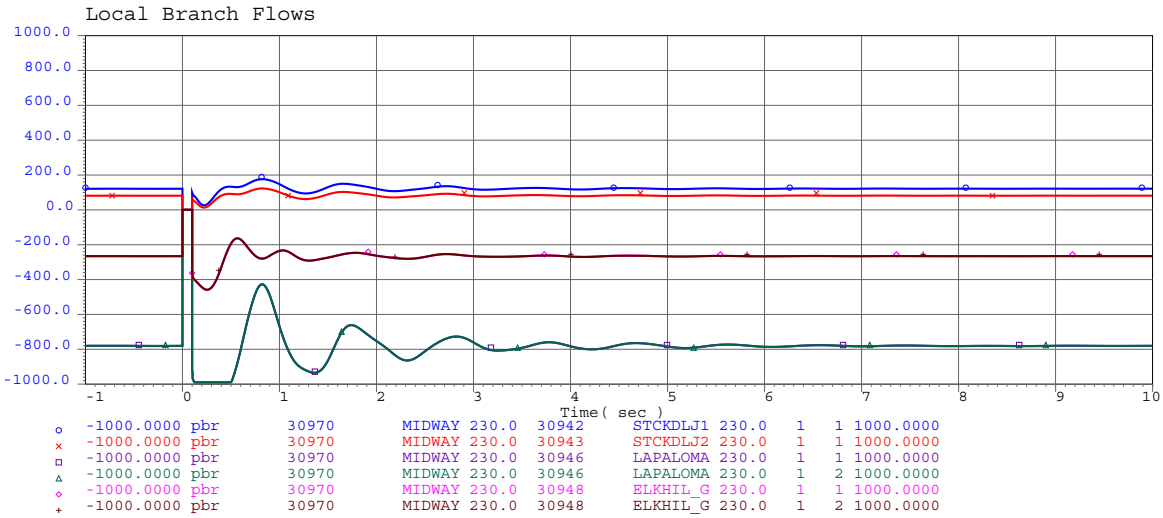


-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	4	600.0000
-600.0000	pbr	30994	WHEELER	230.0	34874	WHEELER	70.0	1	5	600.0000

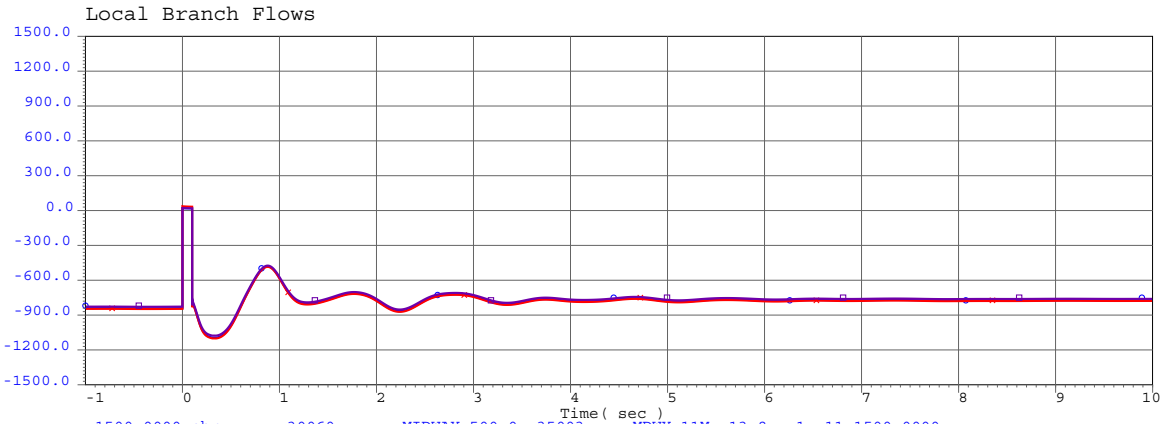
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



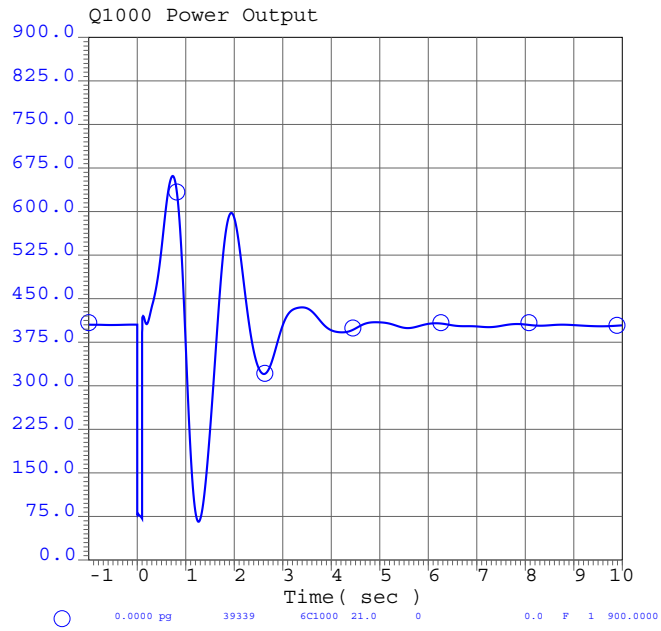
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30943	STCKDLJ2 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	2	1000.0000

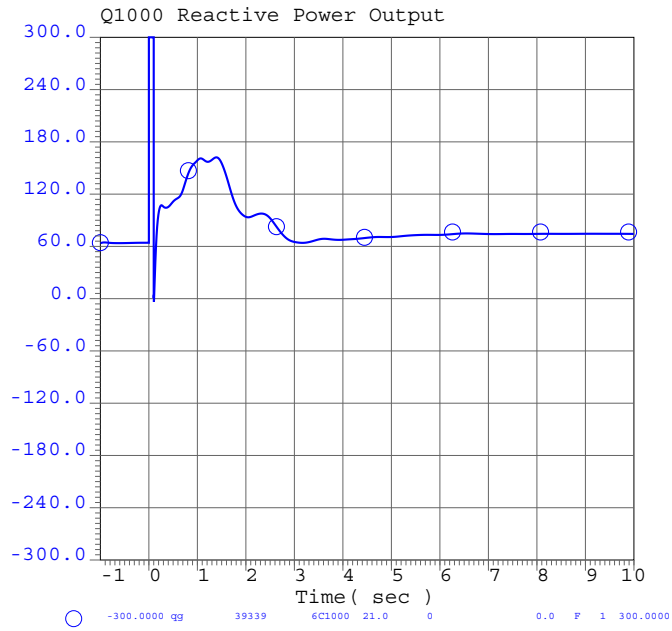


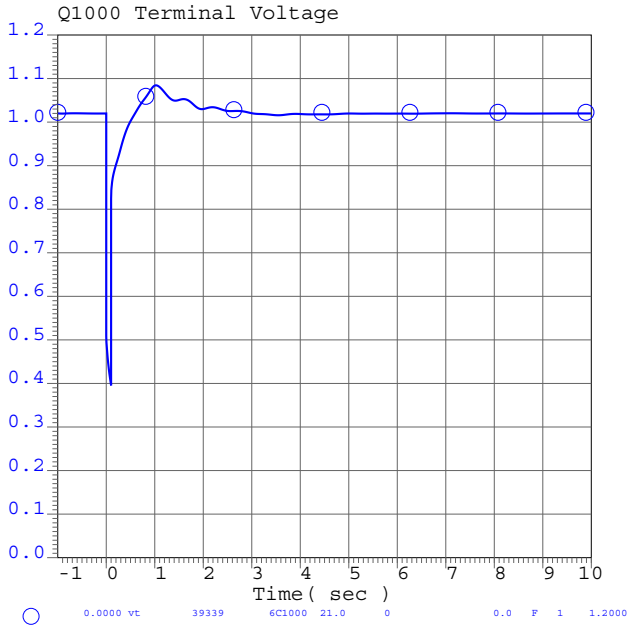
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

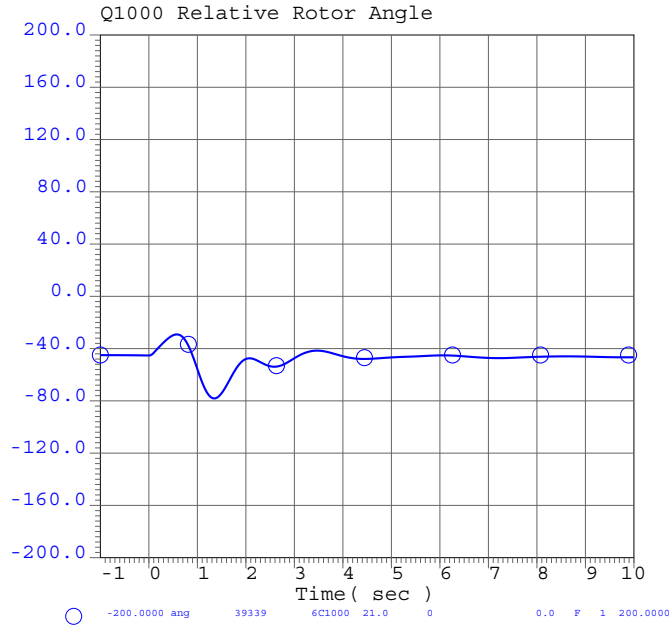
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2D

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines

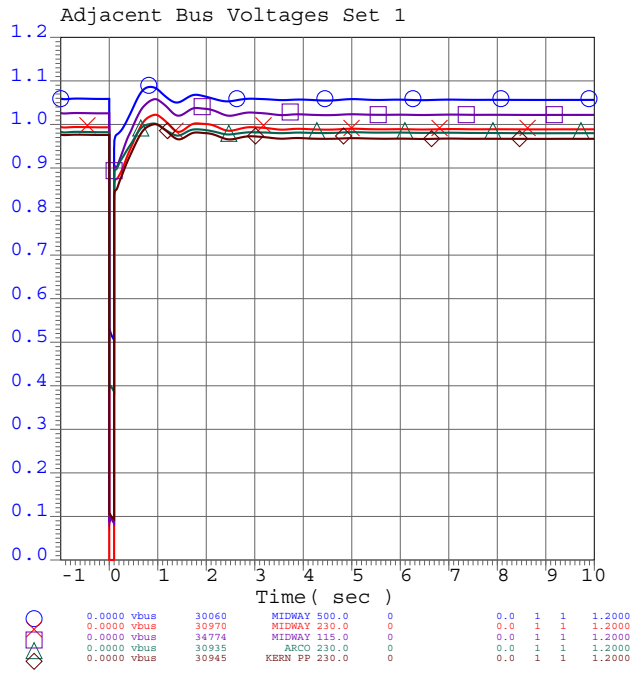


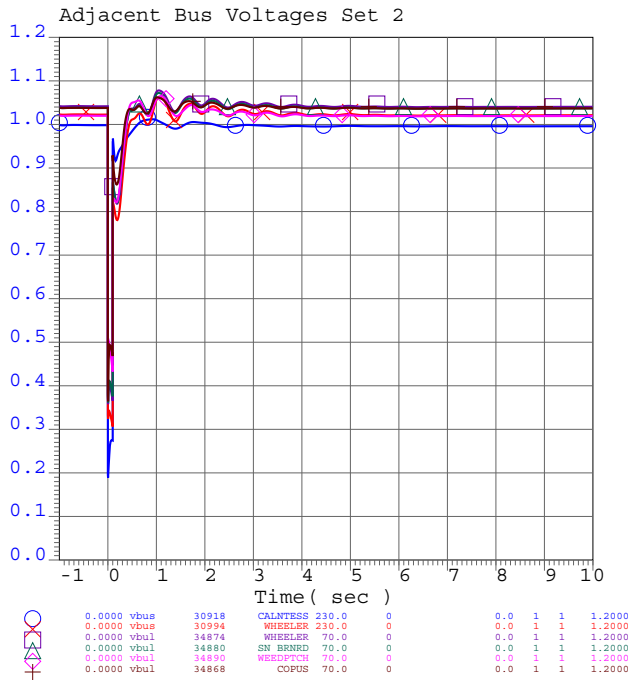


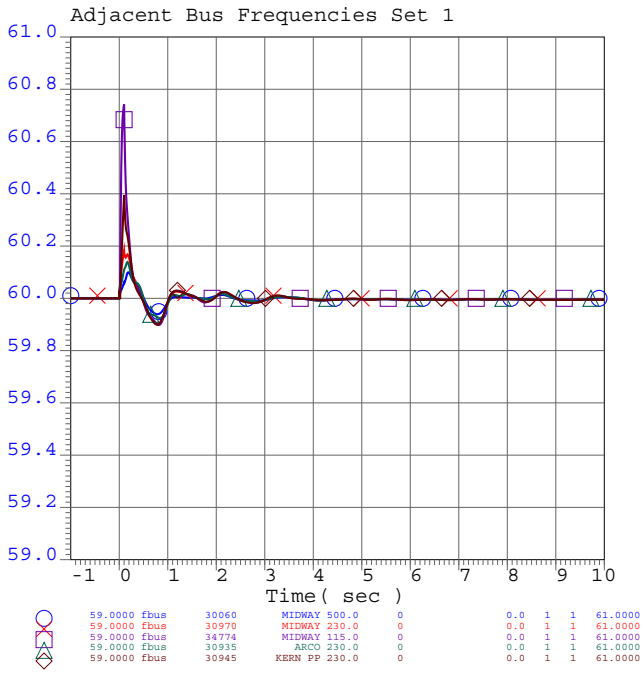


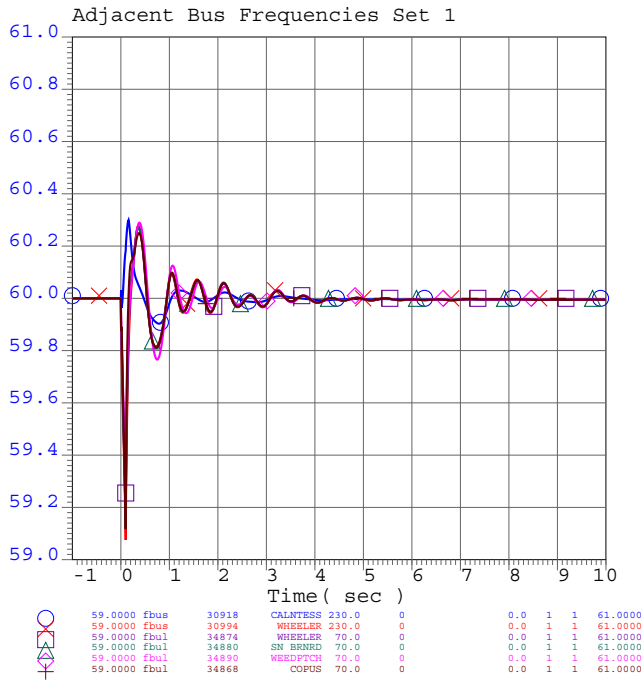


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



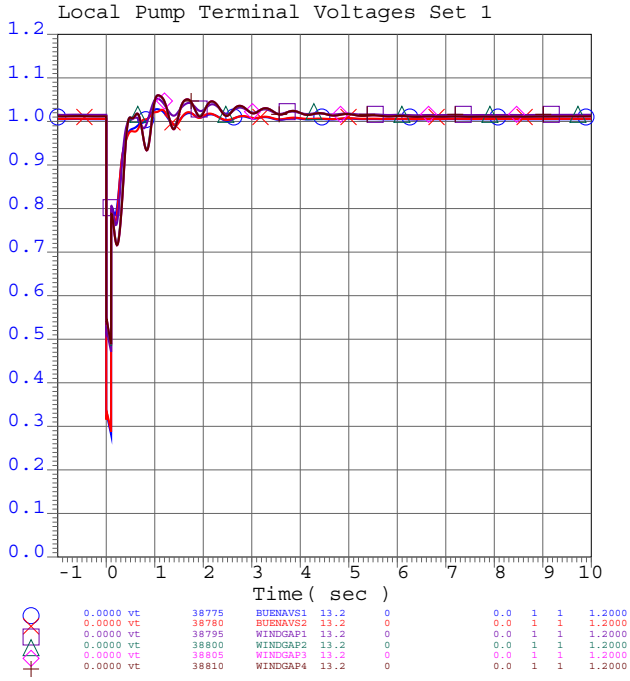




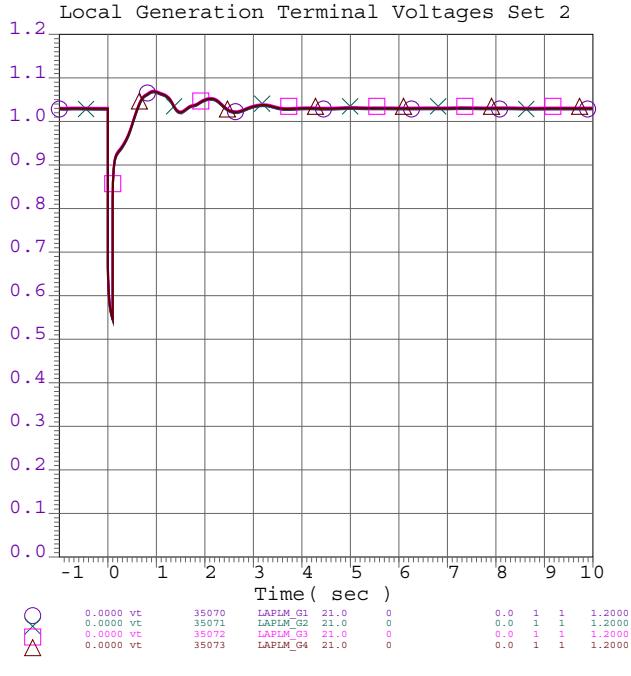


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

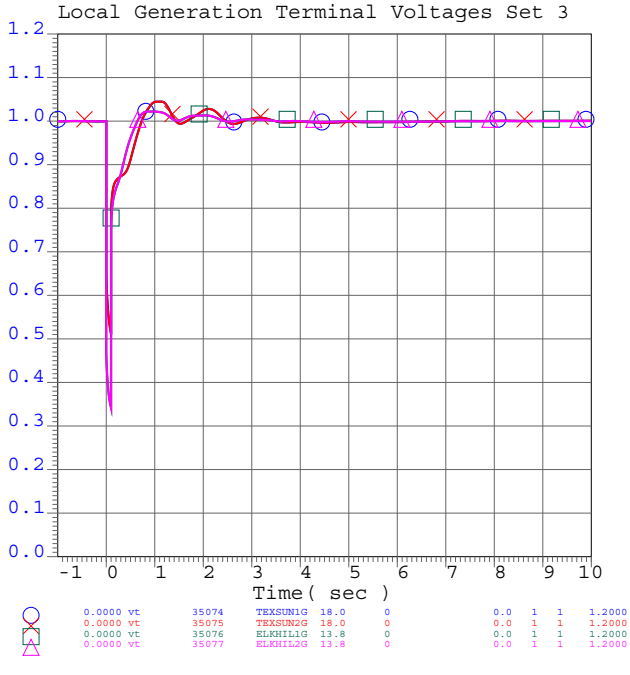
Local Pump Terminal Voltages Set 1



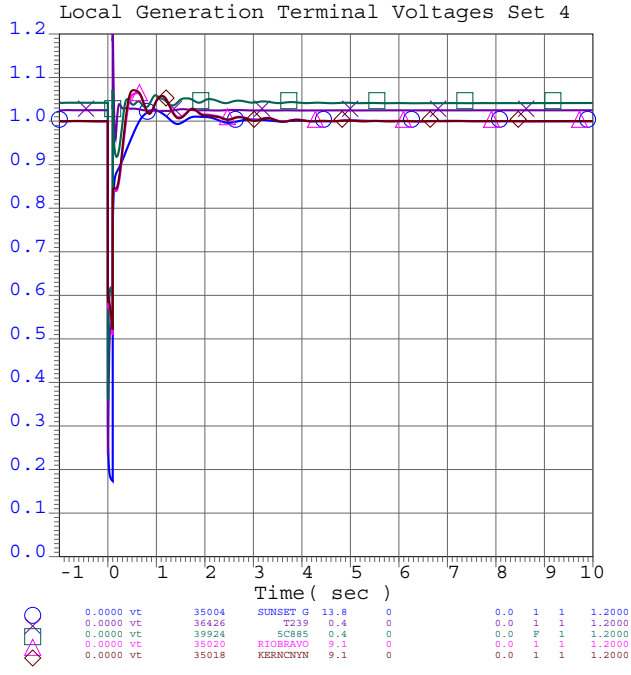
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

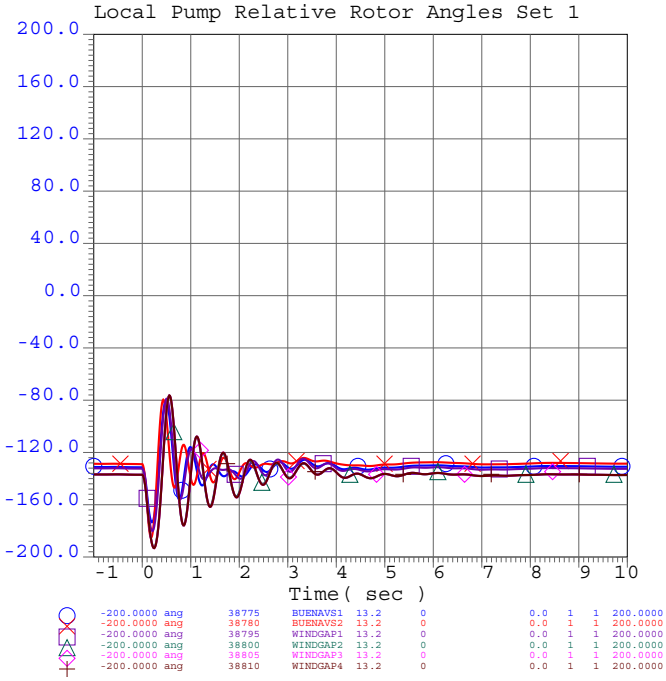


Local Generation Terminal Voltages Set 4

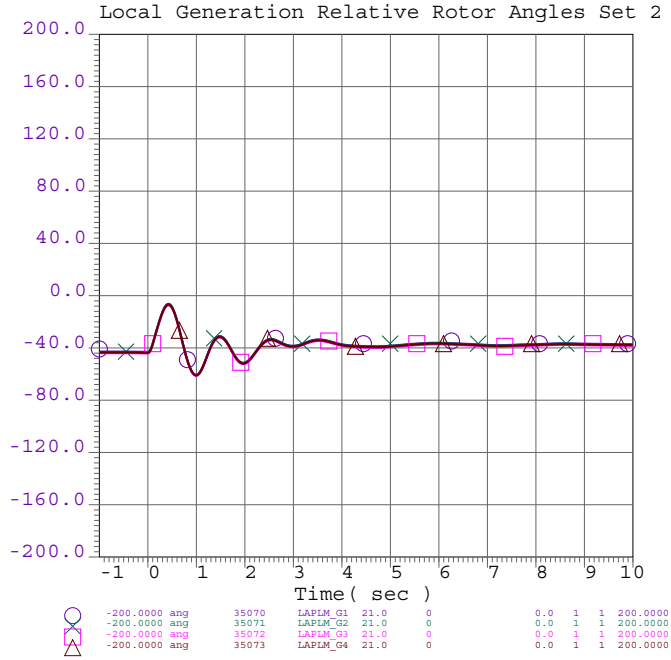


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

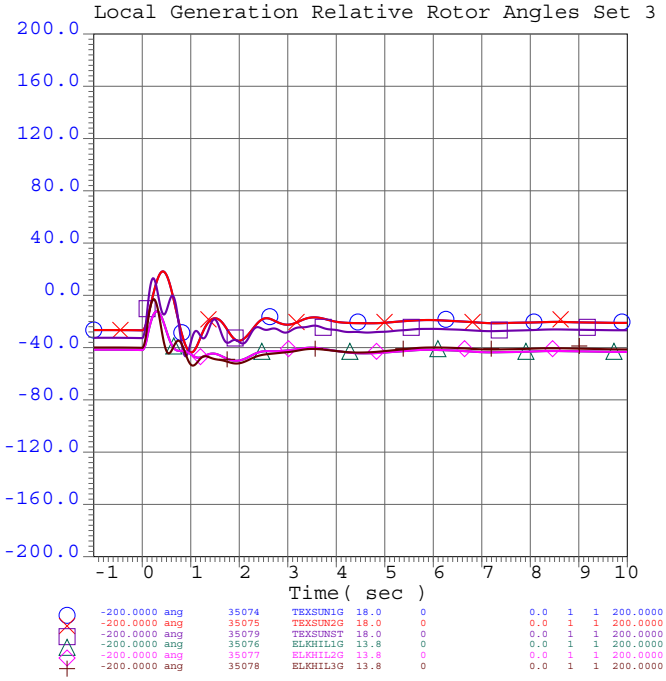
Local Pump Relative Rotor Angles Set 1



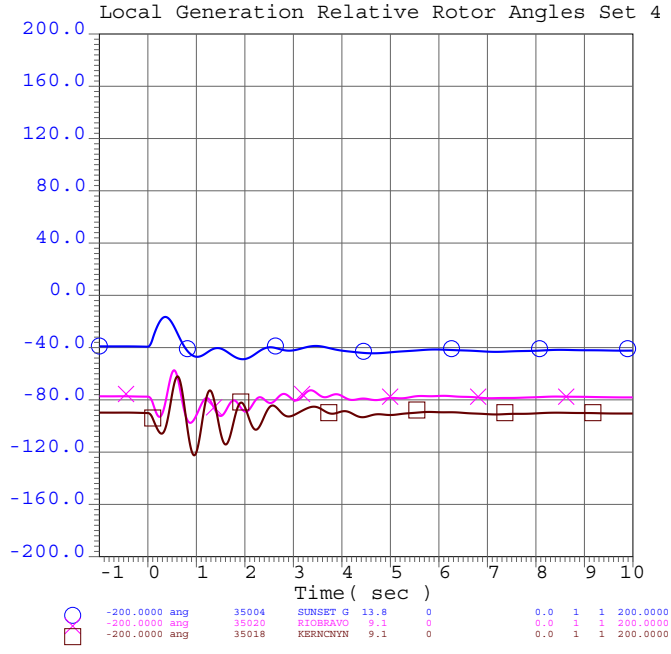
Local Generation Relative Rotor Angles Set 2



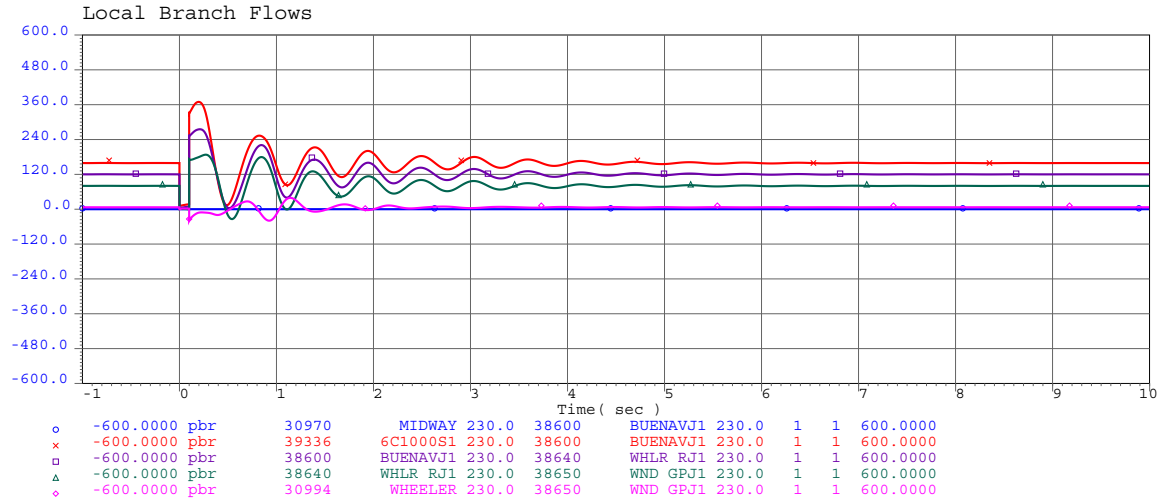
Local Generation Relative Rotor Angles Set 3

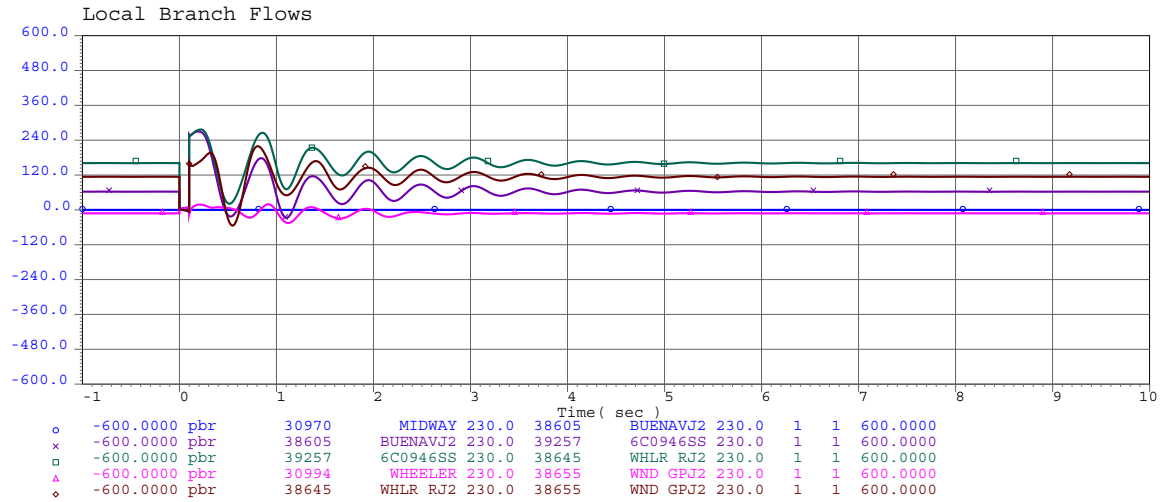


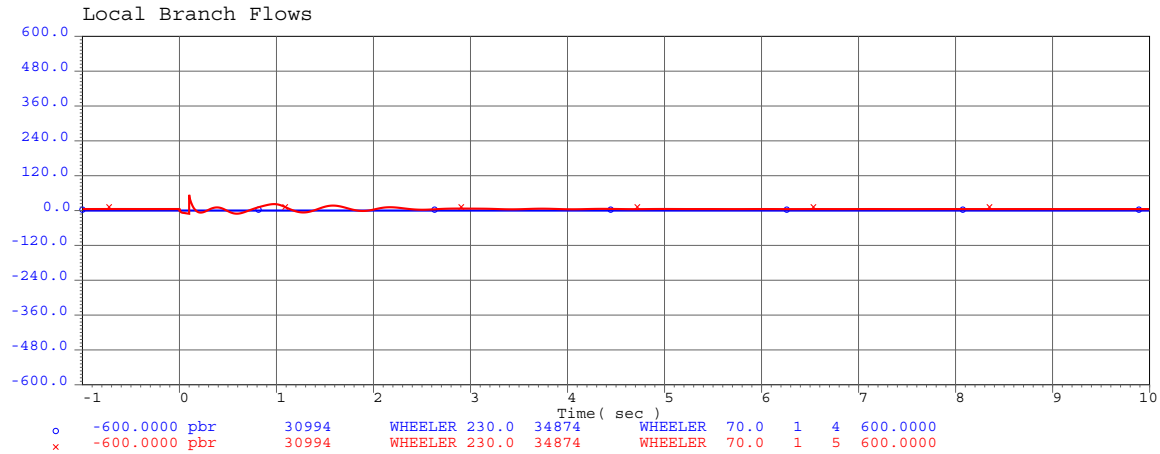
Local Generation Relative Rotor Angles Set 4



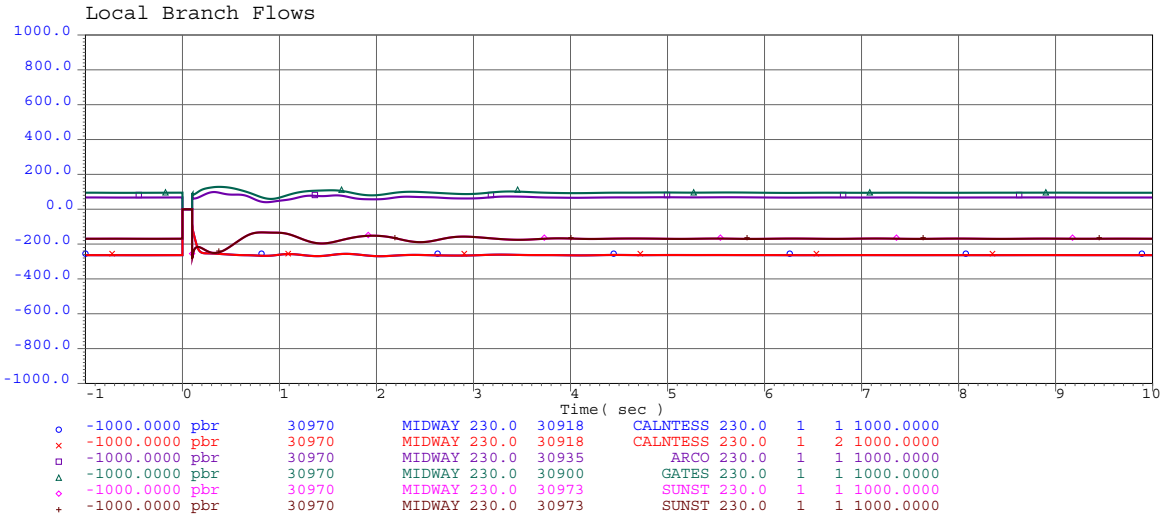
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



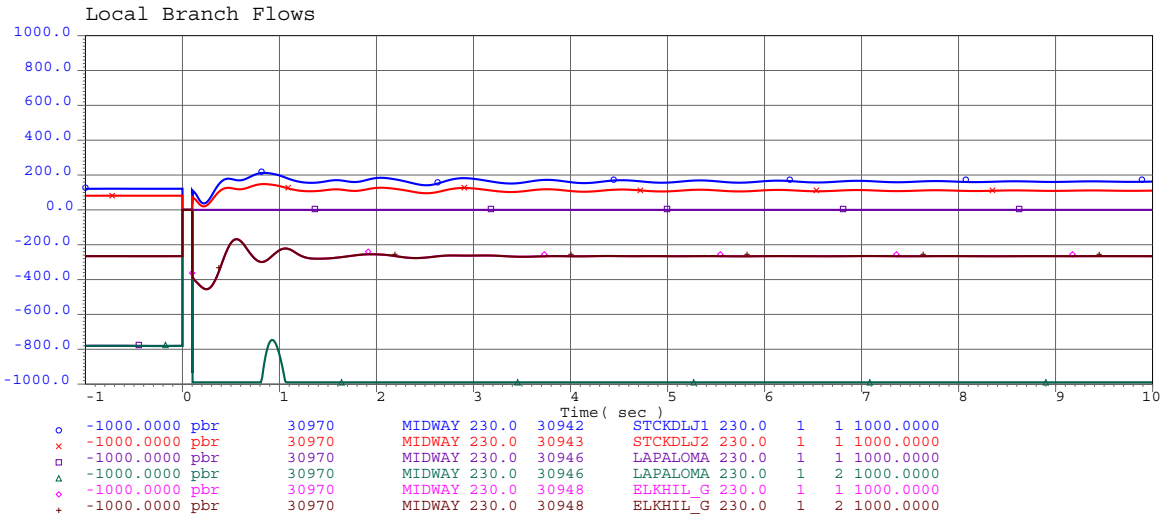




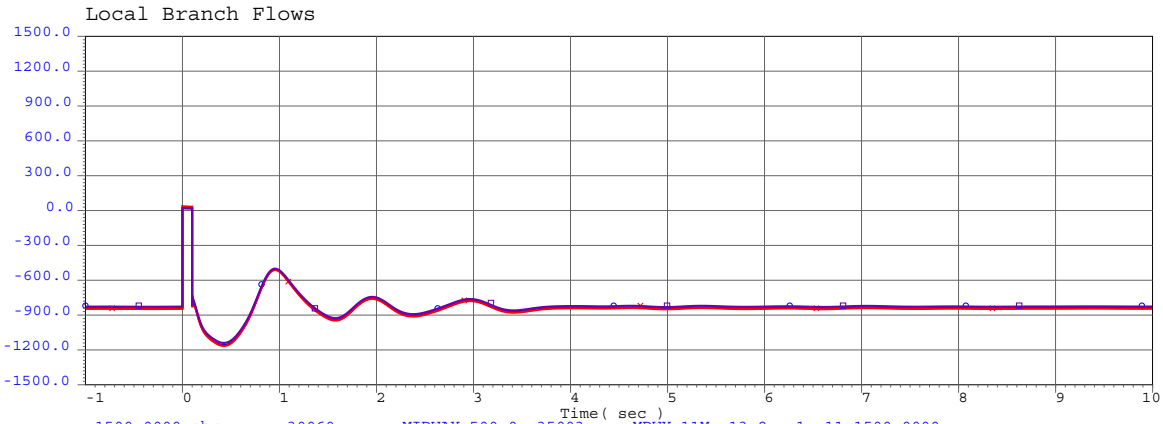
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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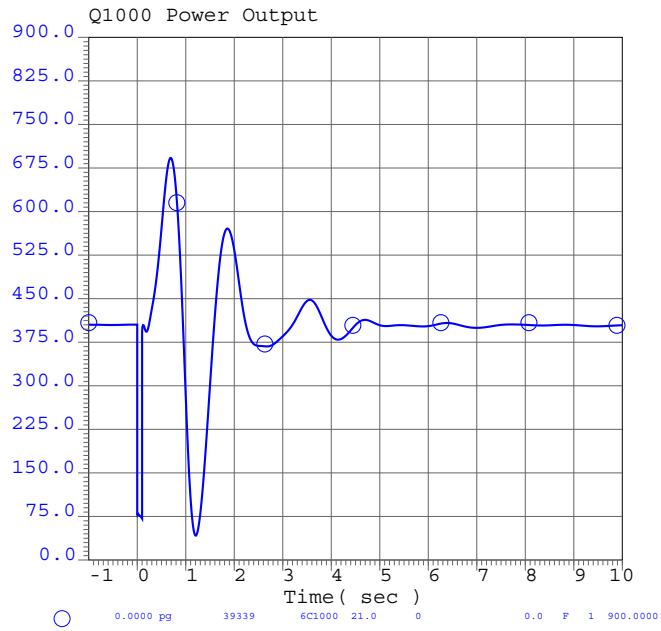
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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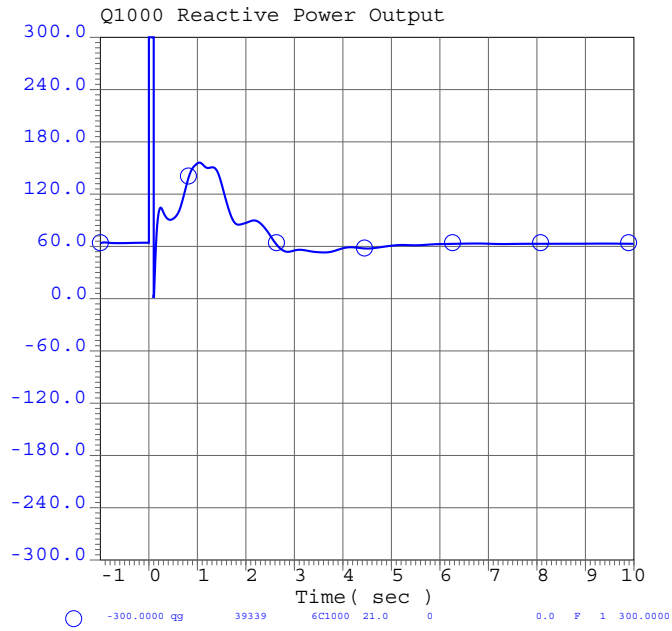


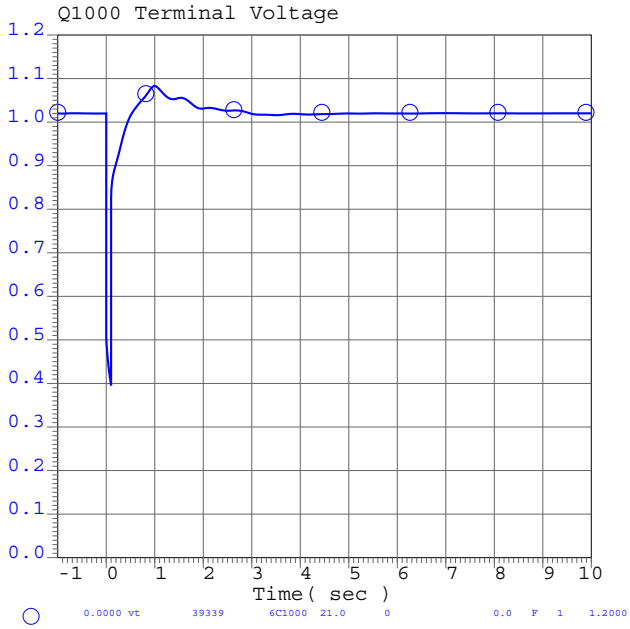
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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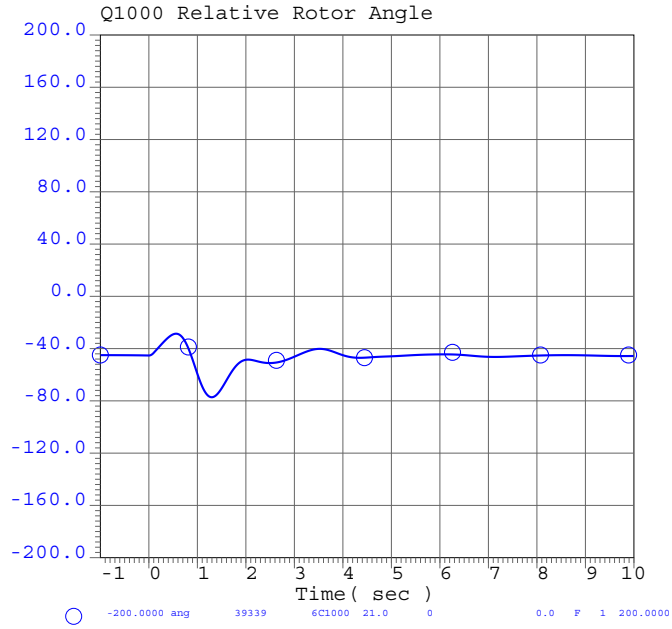
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV bus
Clear Midway 230 kV Bus Section 2E

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







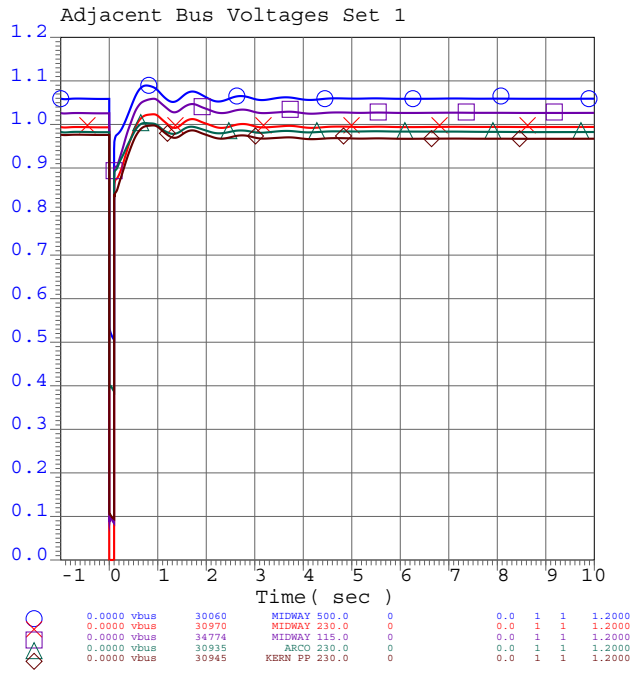


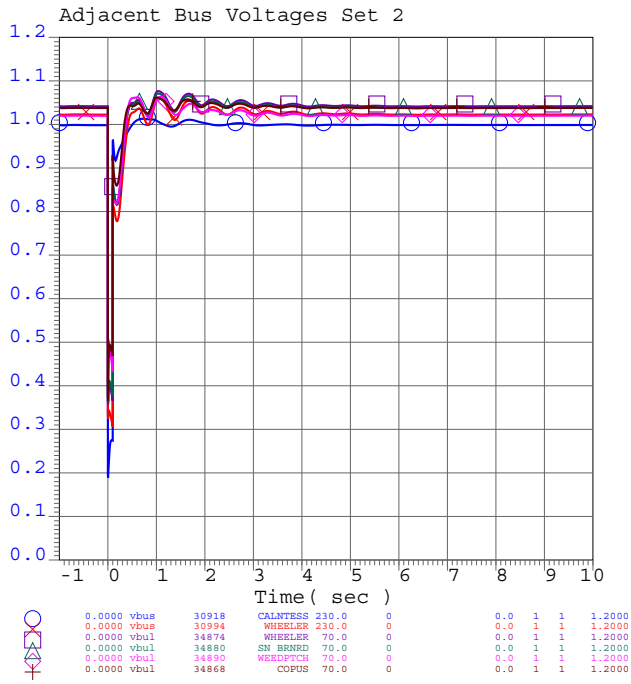
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

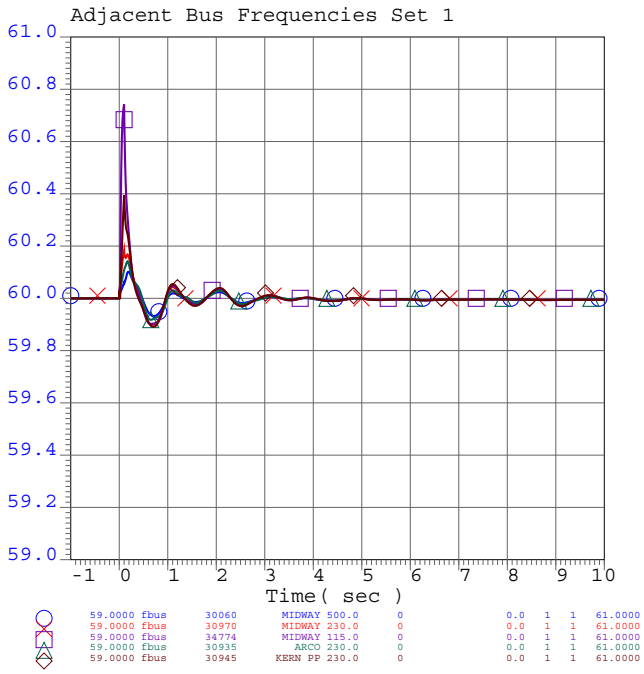
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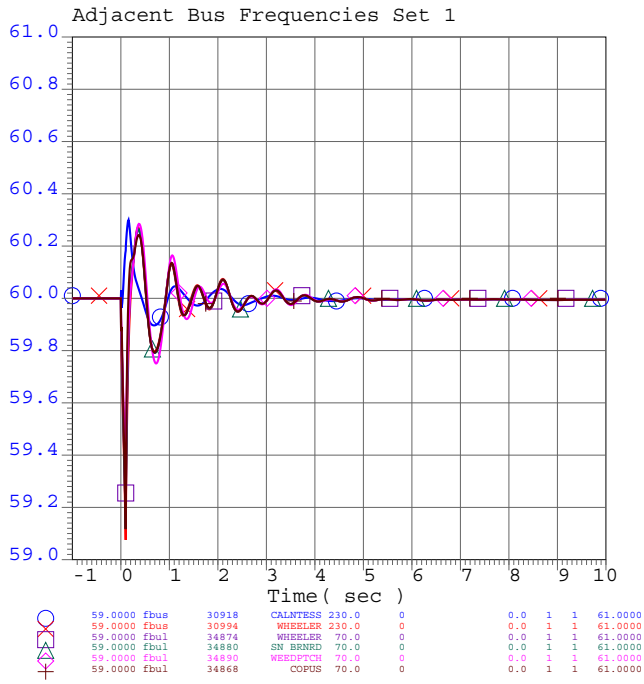
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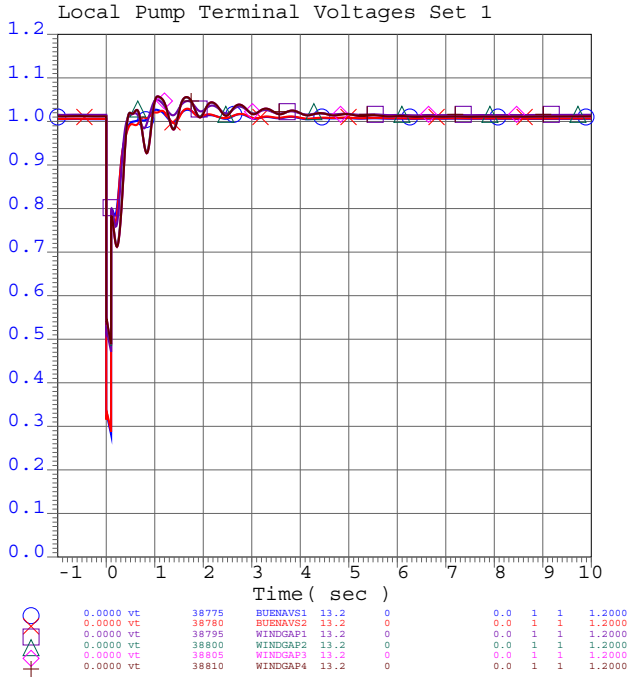




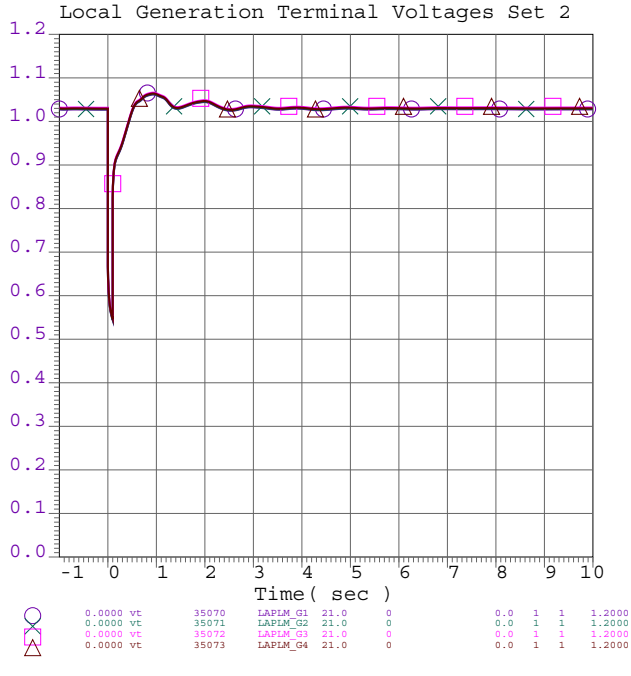


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

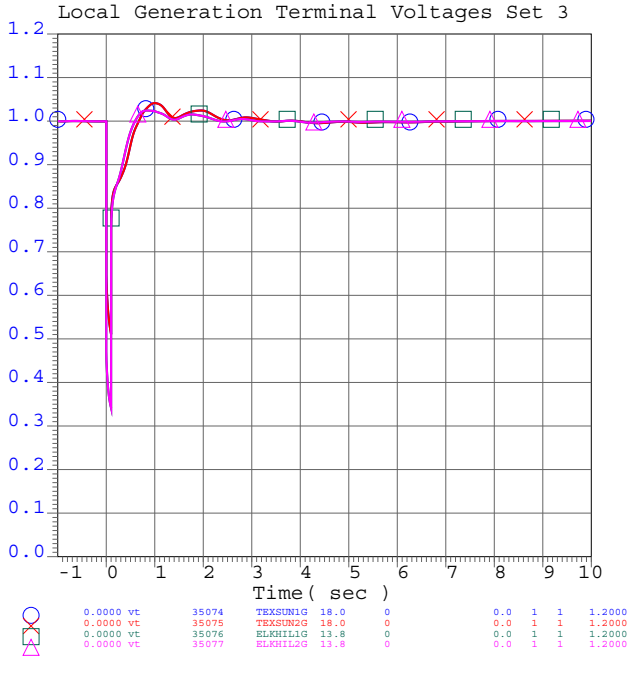
Local Pump Terminal Voltages Set 1



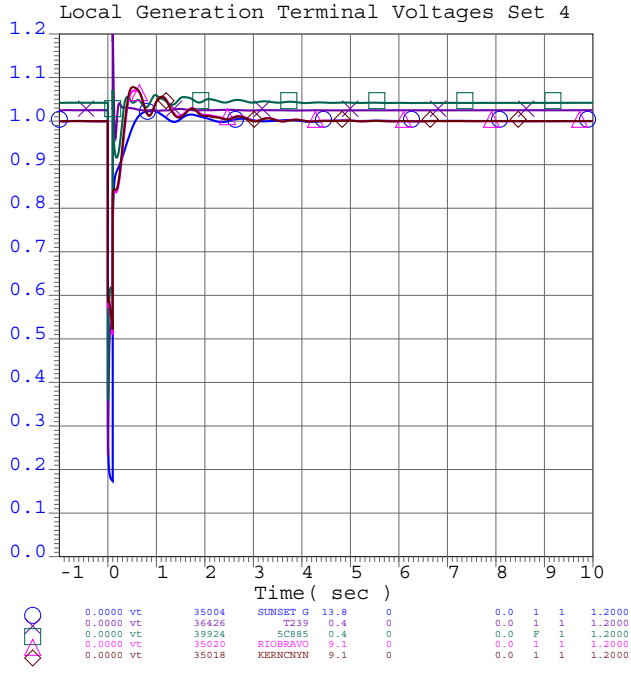
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

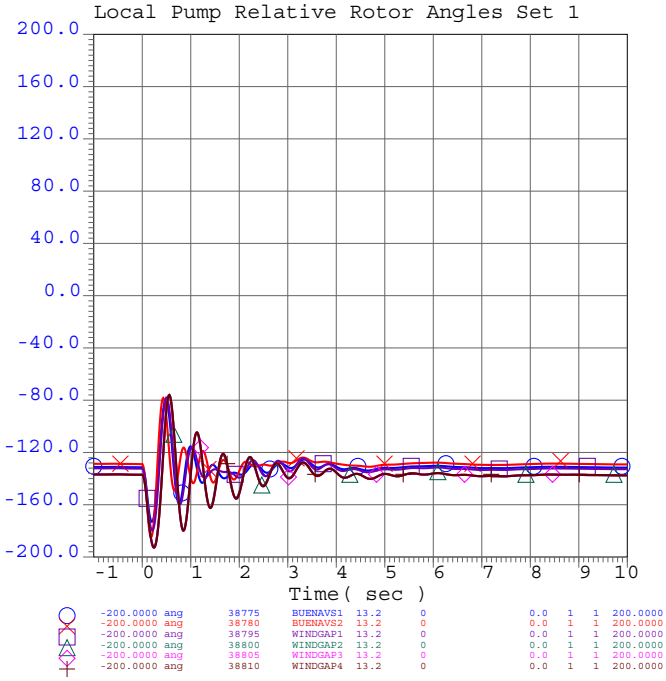


Local Generation Terminal Voltages Set 4

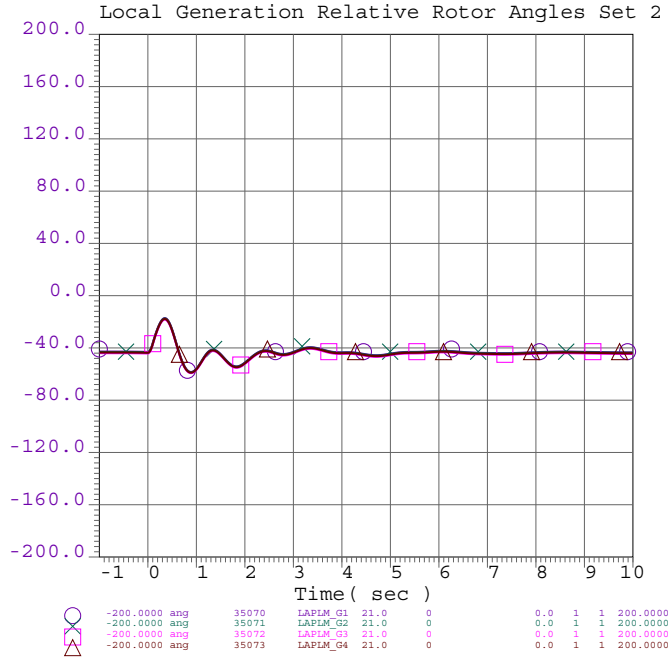


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

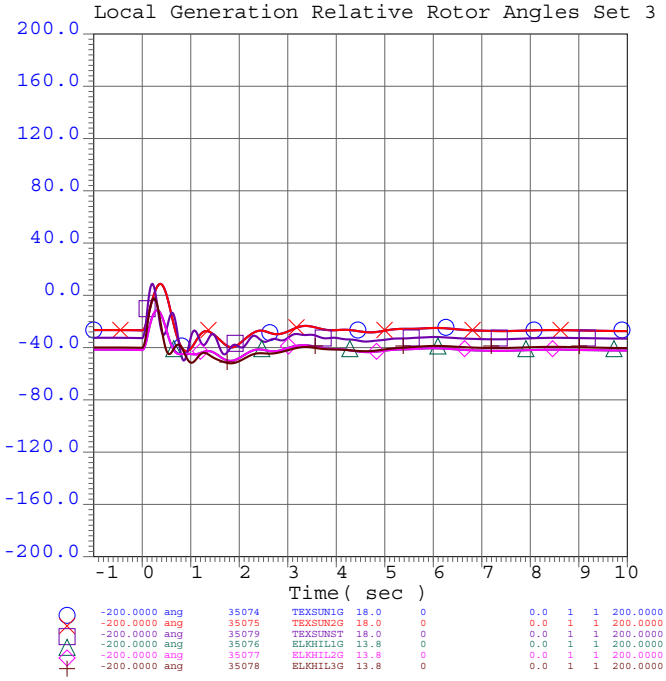
Local Pump Relative Rotor Angles Set 1



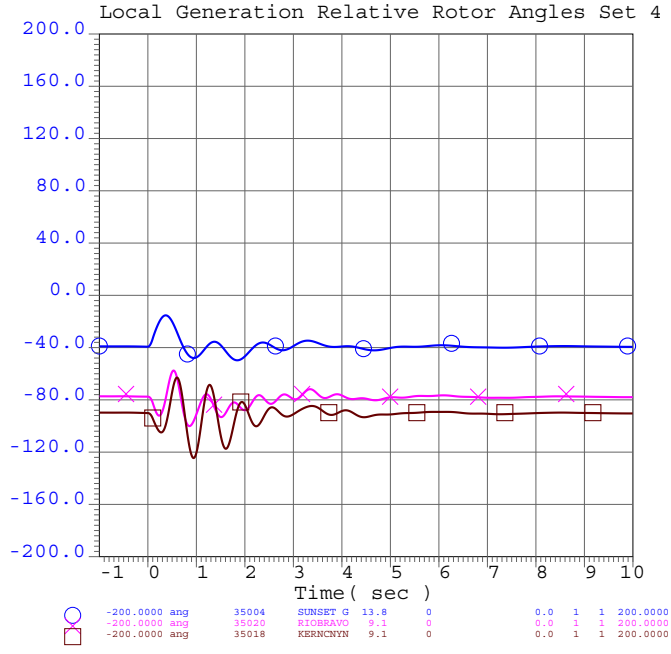
Local Generation Relative Rotor Angles Set 2



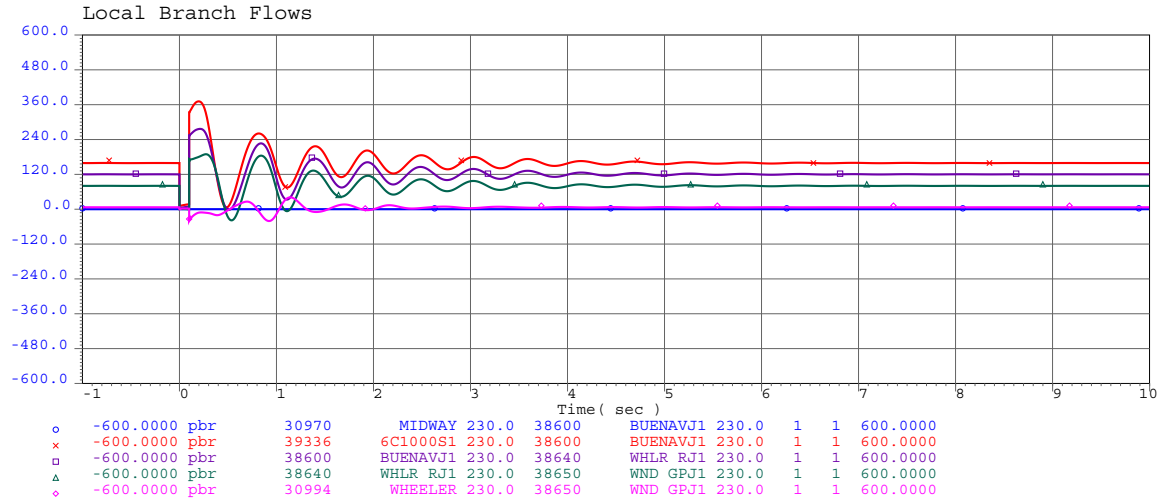
Local Generation Relative Rotor Angles Set 3

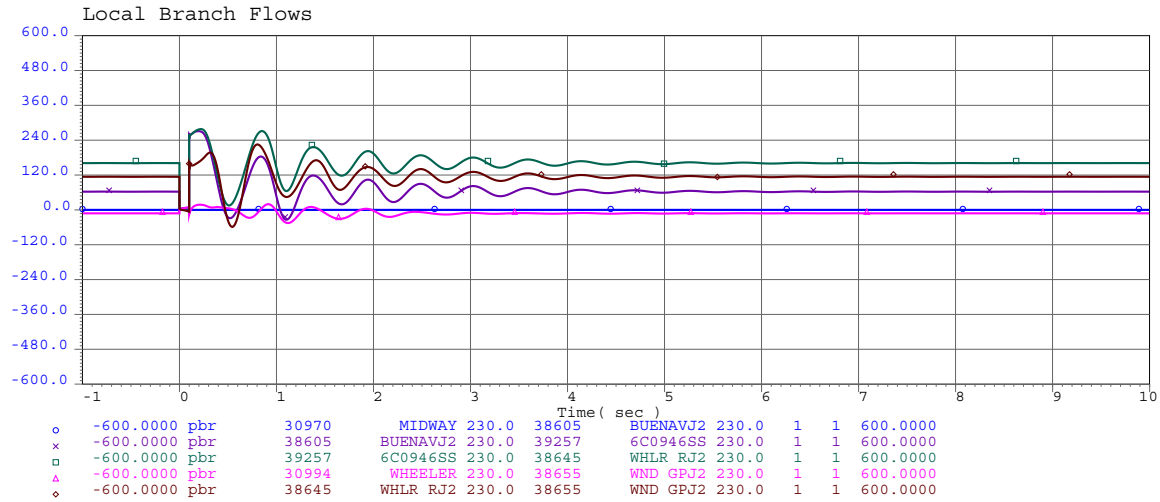


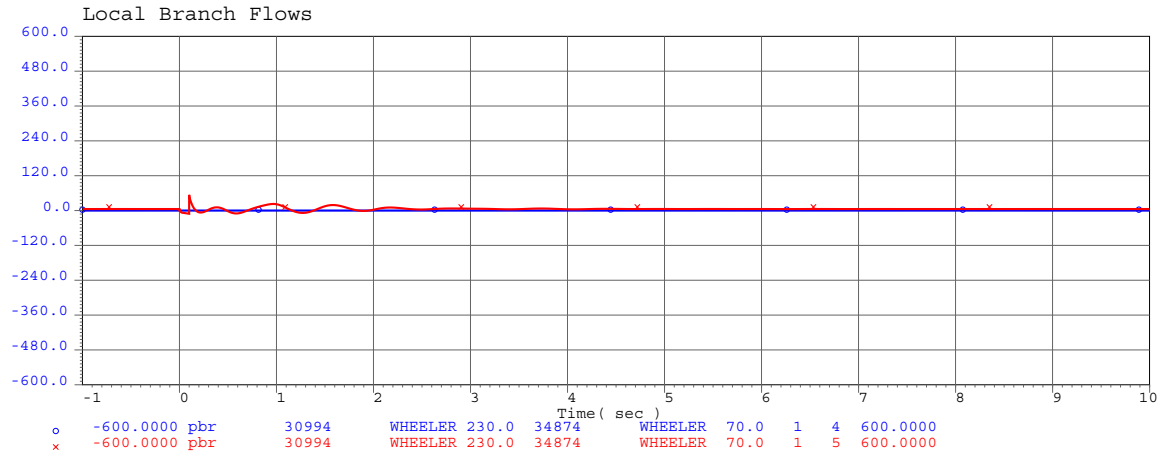
Local Generation Relative Rotor Angles Set 4



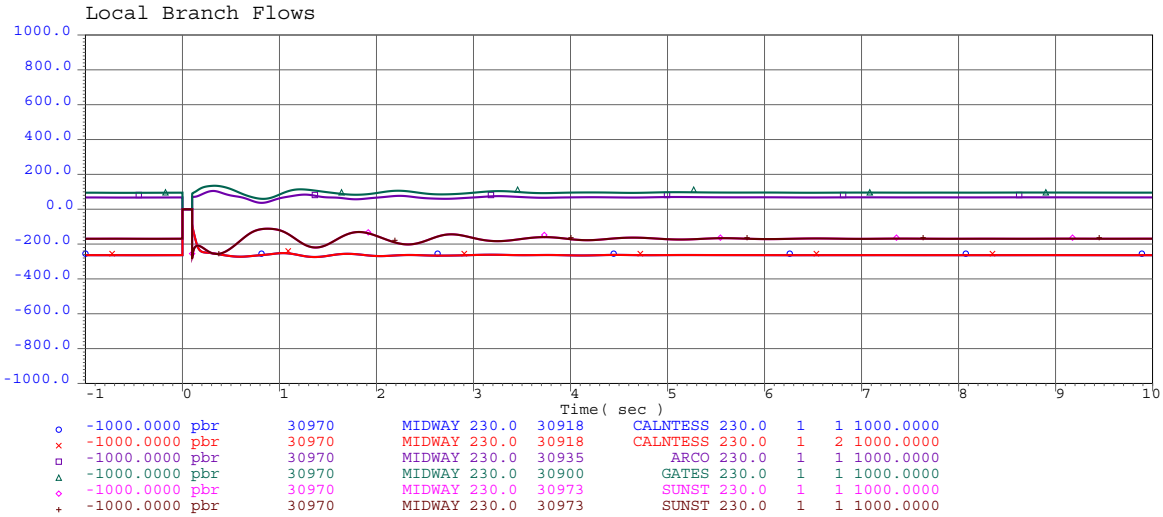
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F



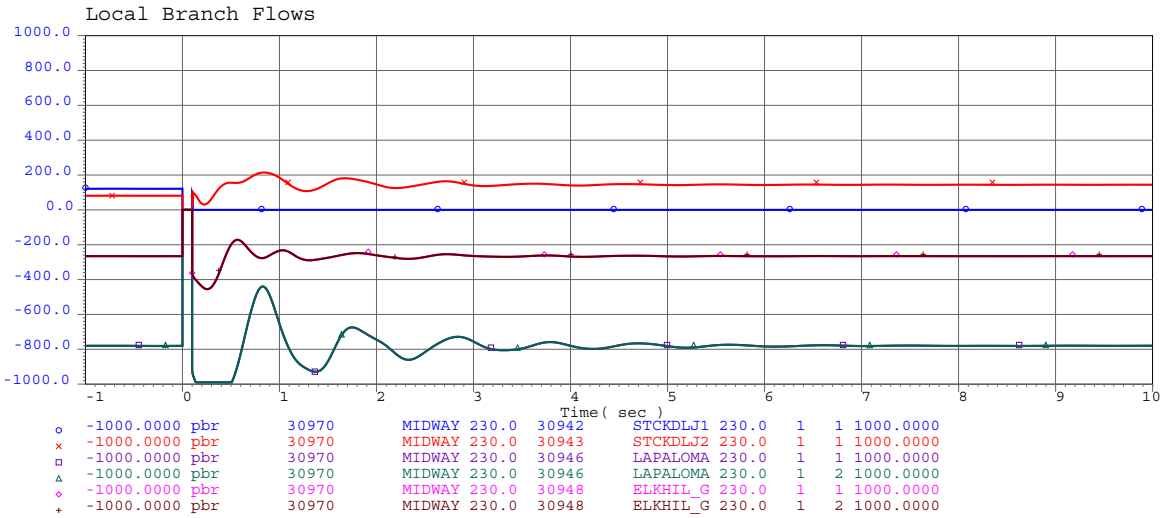




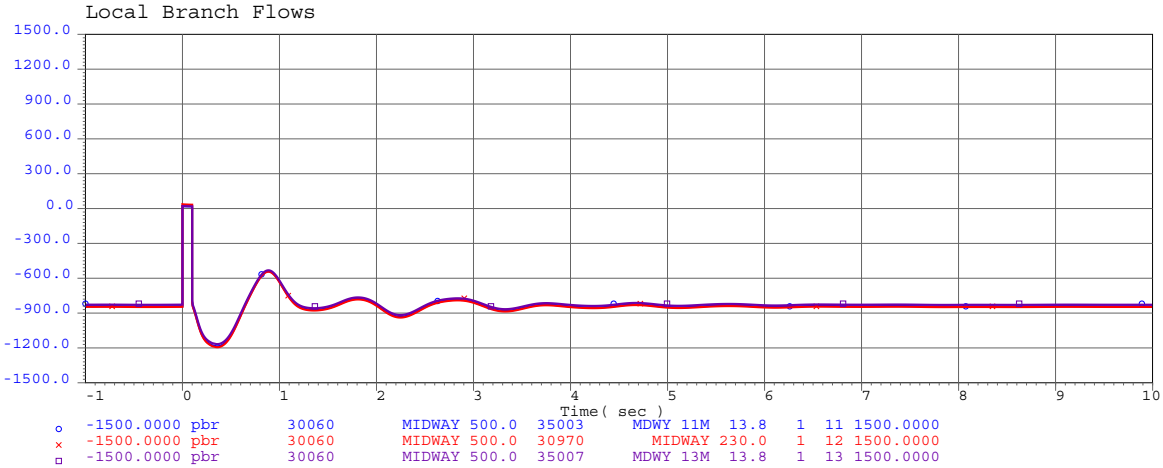
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



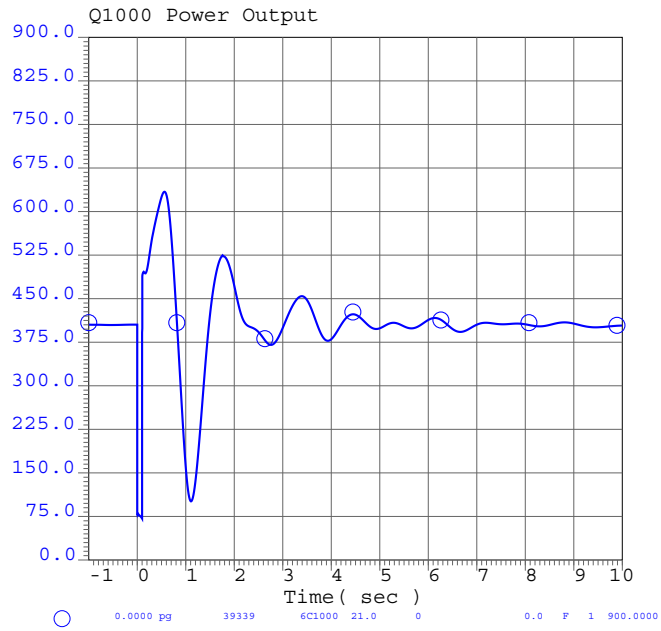
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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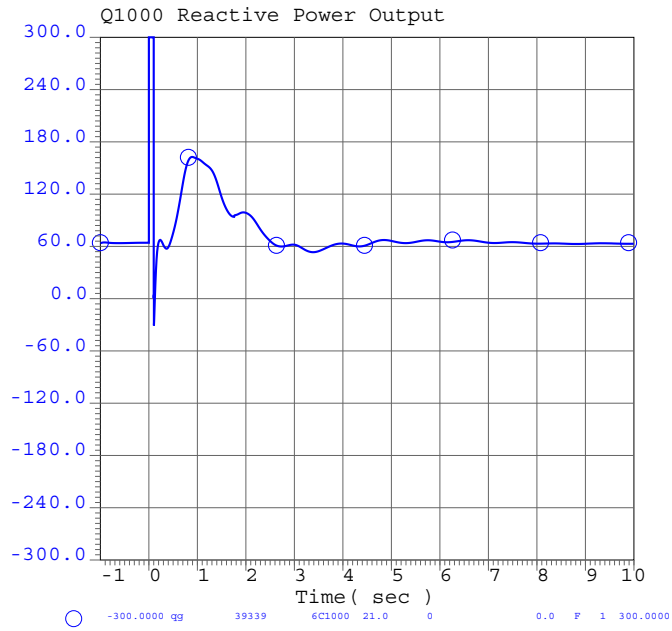


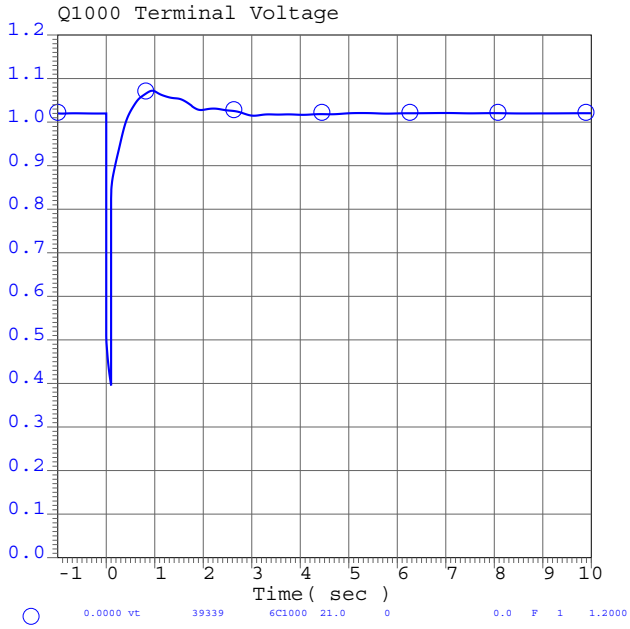
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

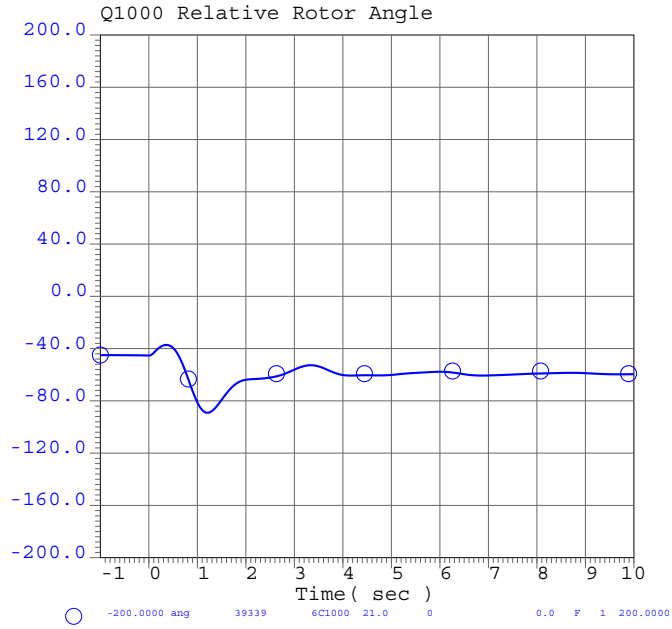
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway 230 kV Bus Section 2F

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





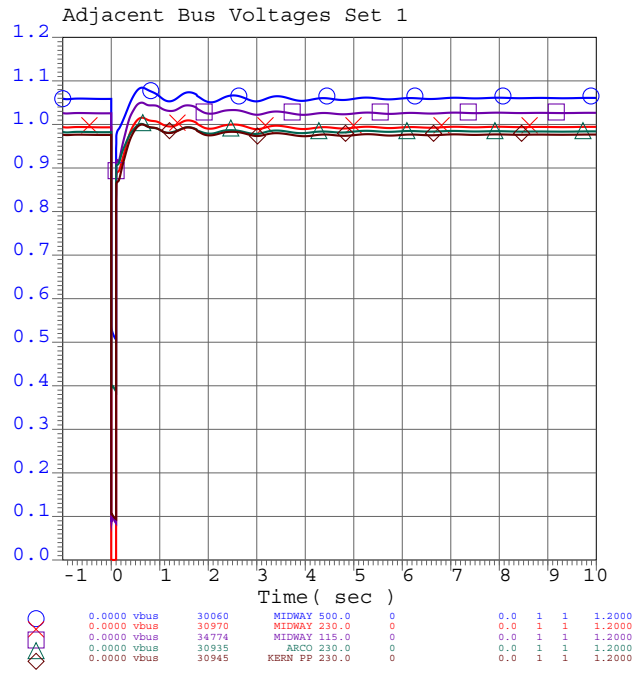


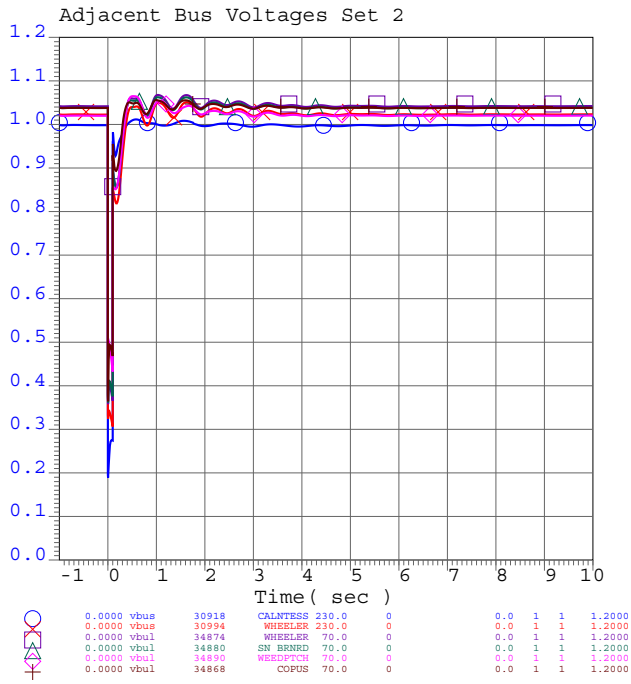


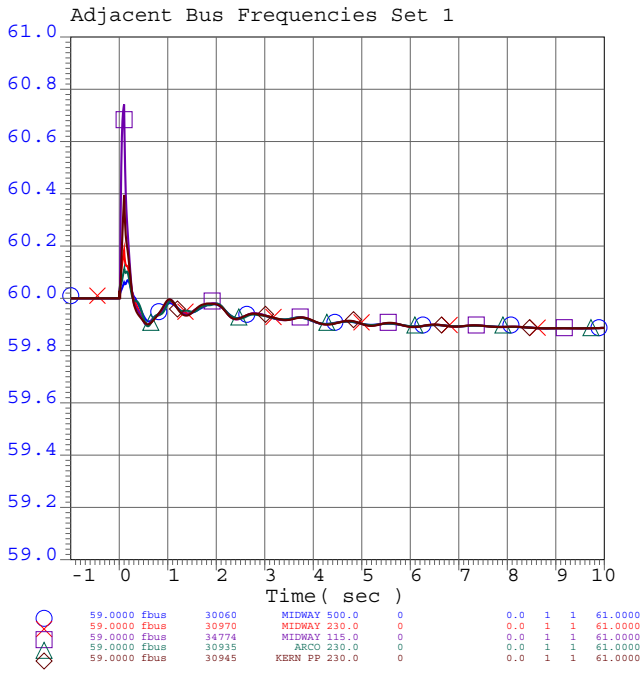
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

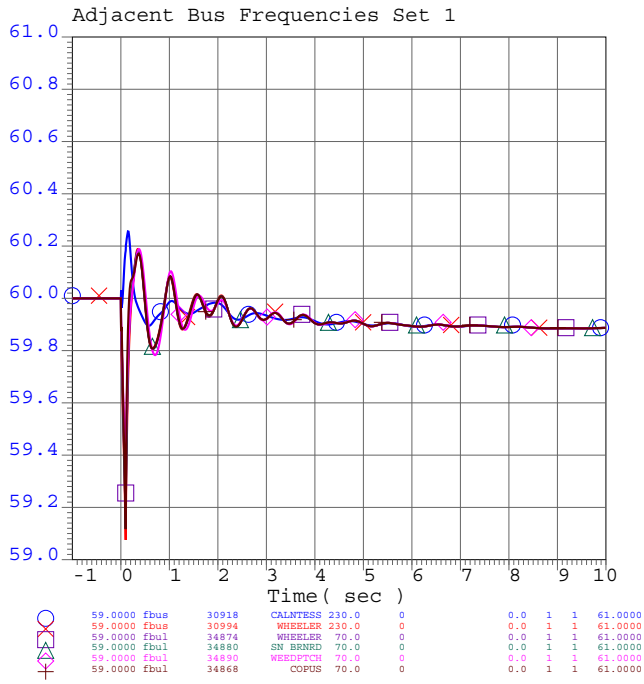
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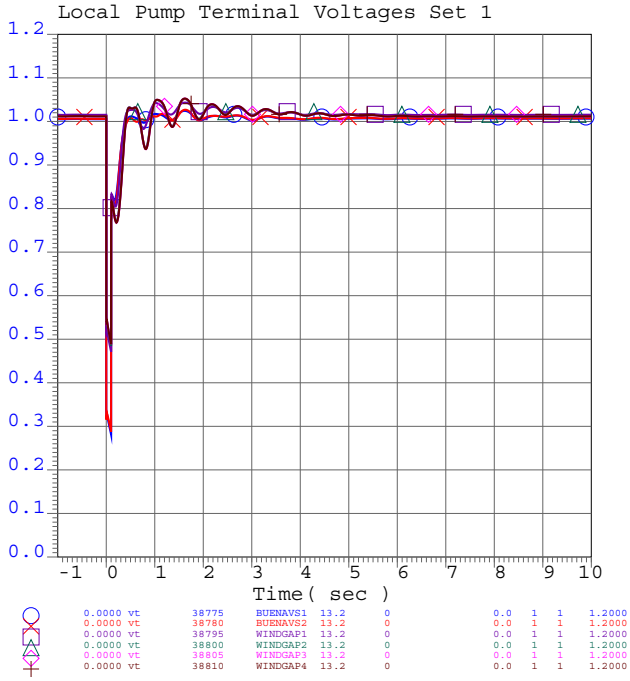


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

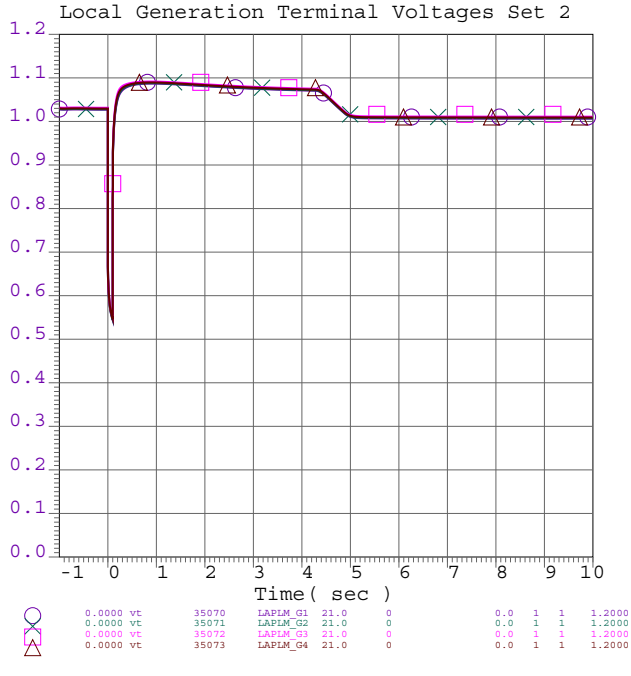
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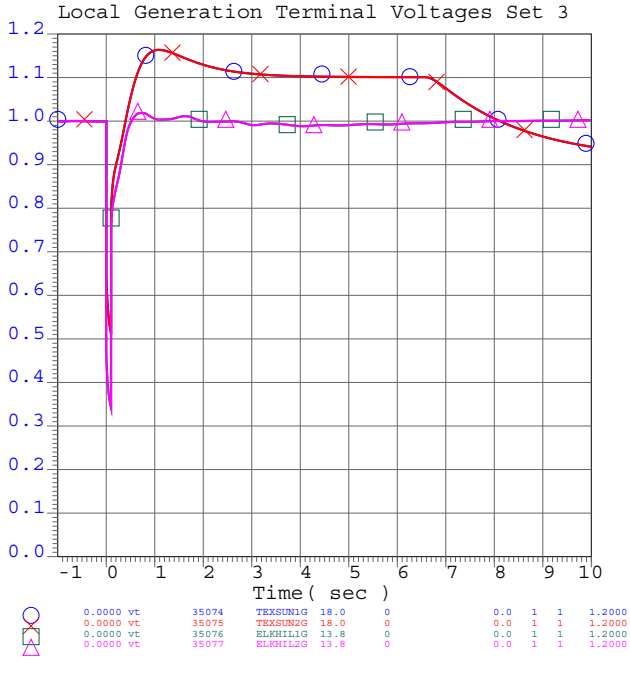
Local Pump Terminal Voltages Set 1



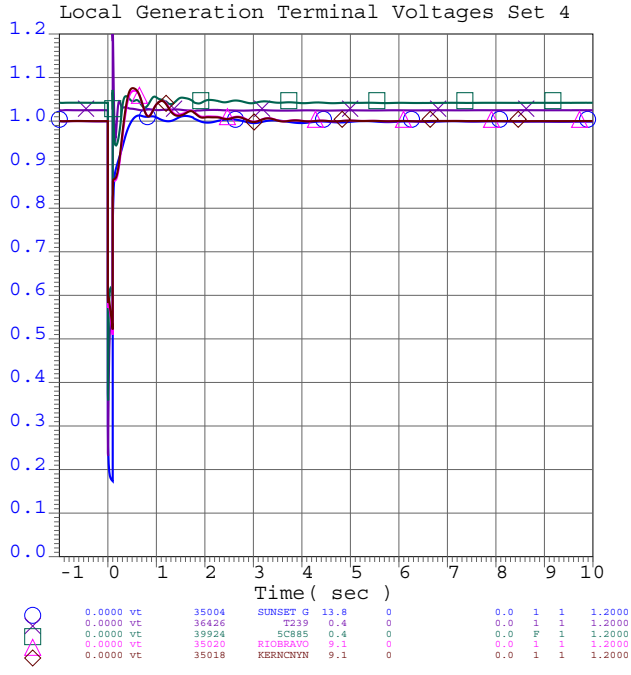
Local Generation Terminal Voltages Set 2



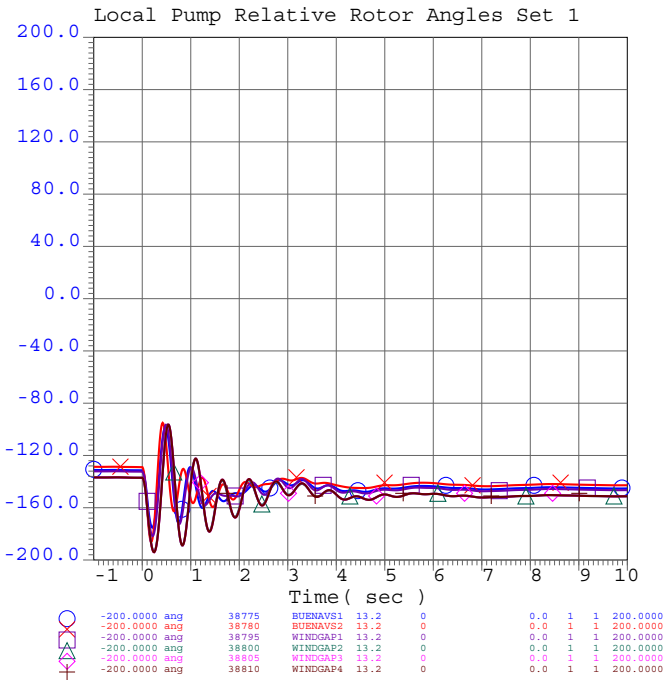
Local Generation Terminal Voltages Set 3

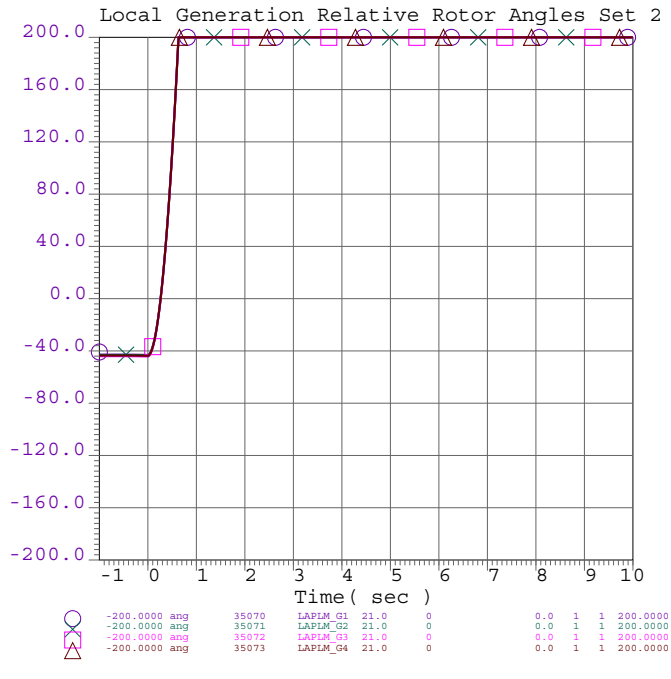


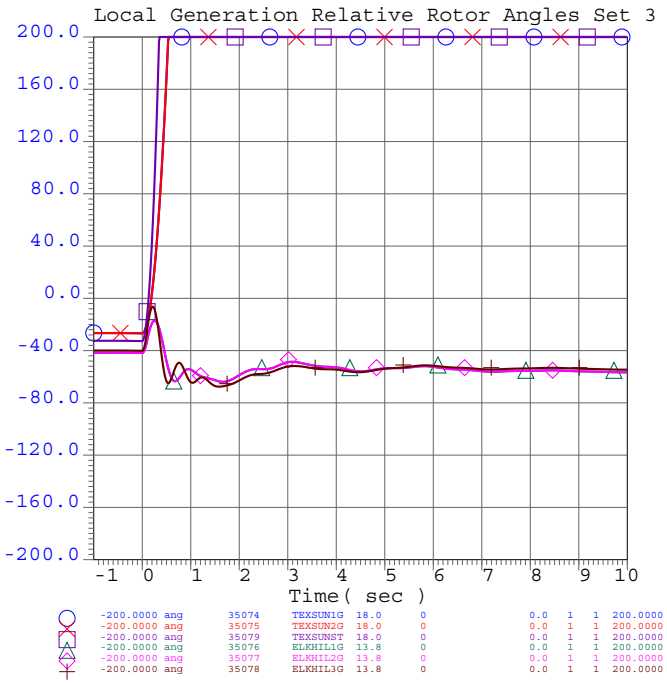
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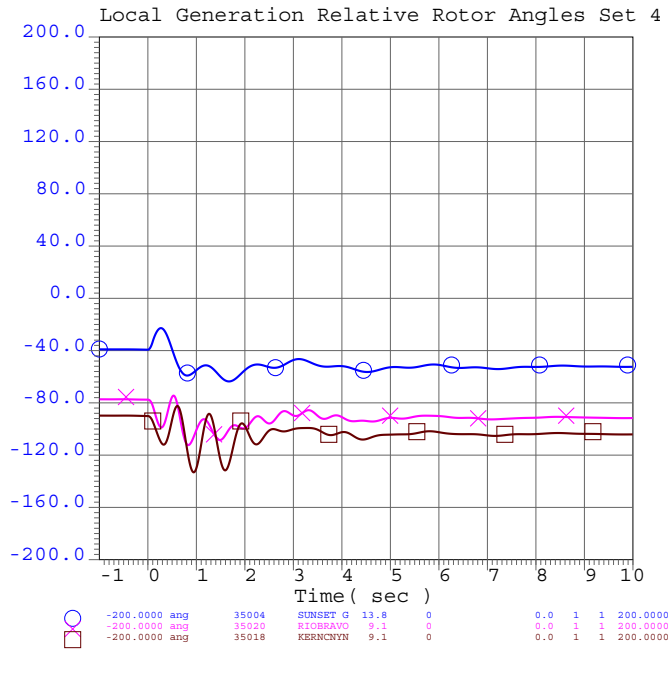


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

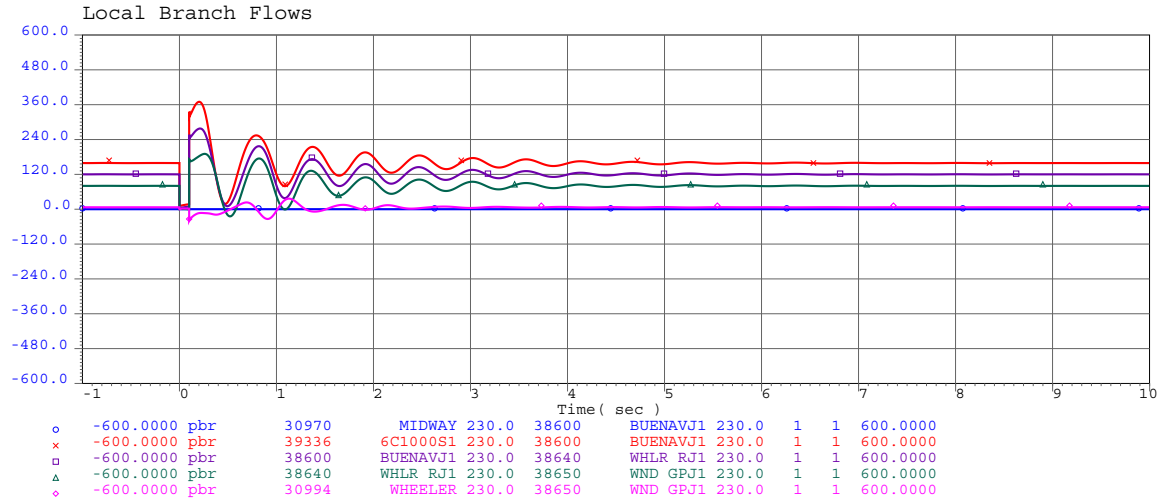




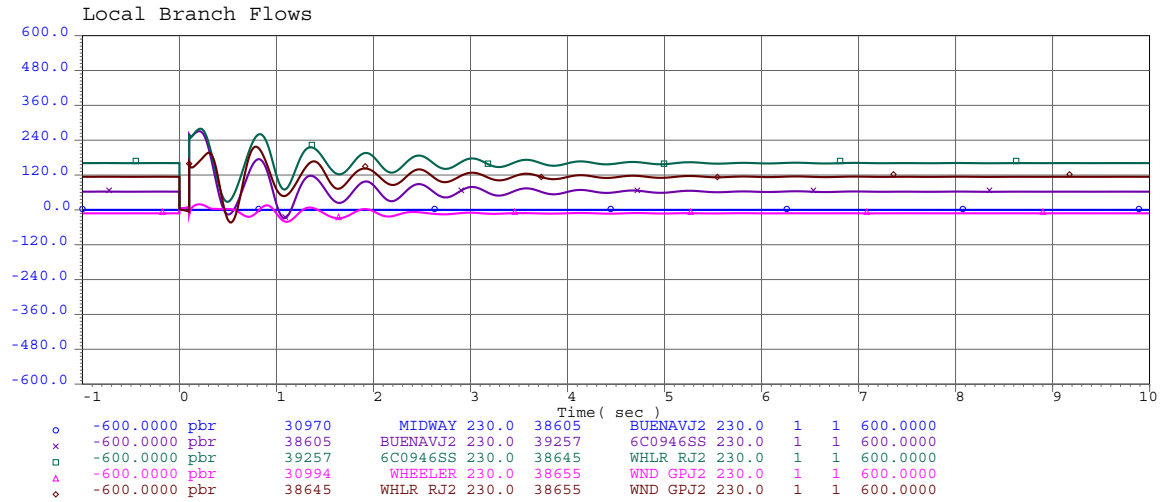




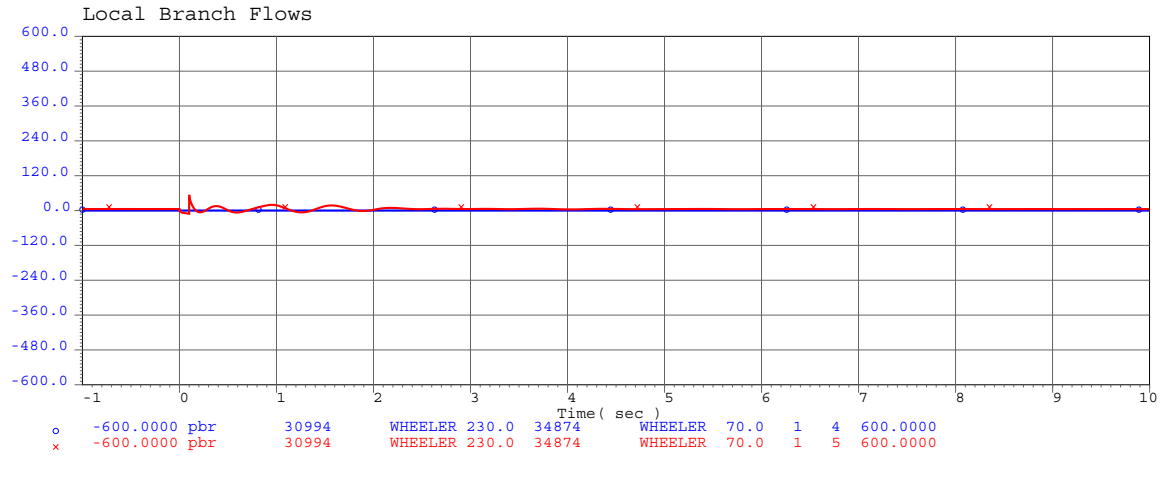
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines



-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38650	WND GPJ1	230.0	1	1	600.0000

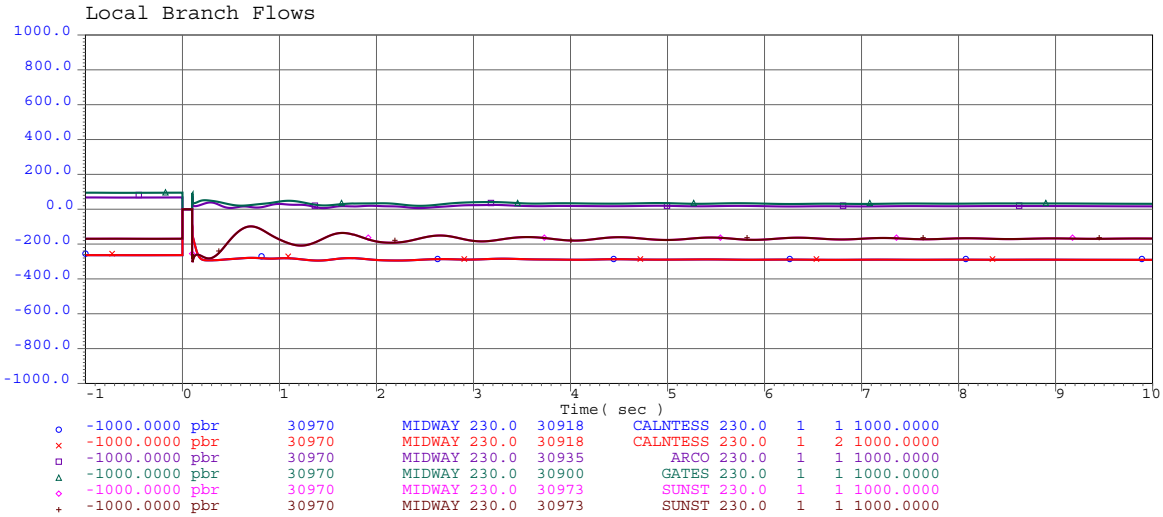


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-600.0000	pbr	39257	6C0946SS	230.0	38645	WHLR RJ2	230.0	1	1	600.0000
-600.0000	pbr	30994	WHEELER	230.0	38655	WND GPJ2	230.0	1	1	600.0000
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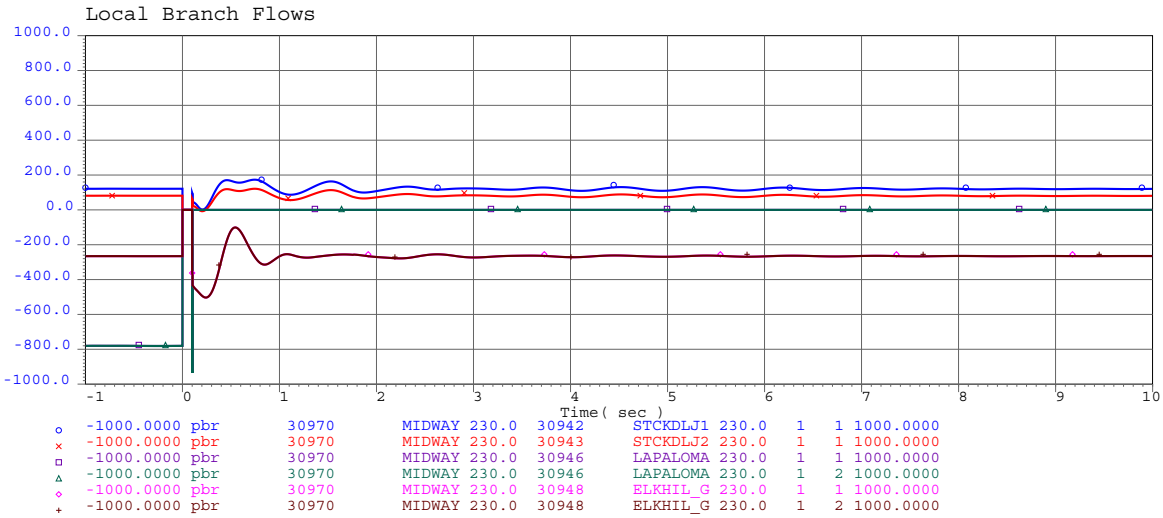


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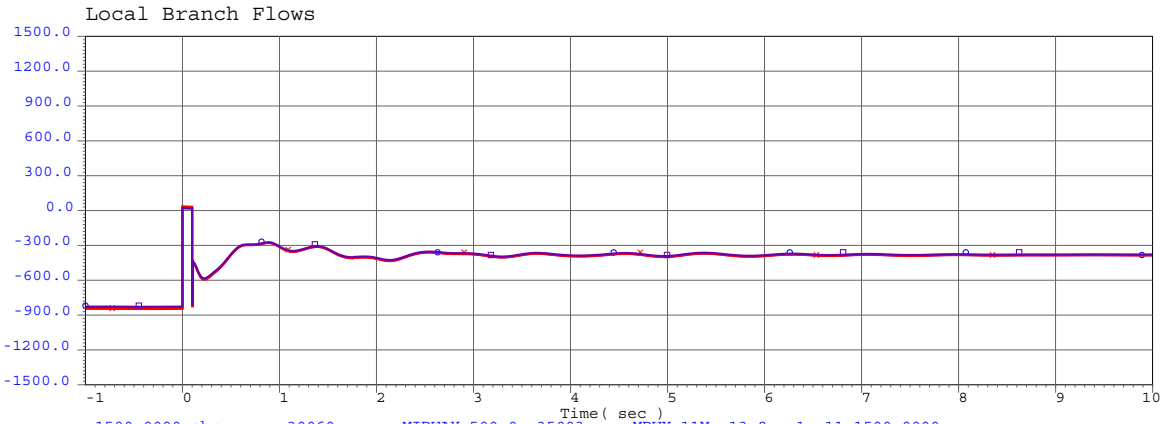
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000



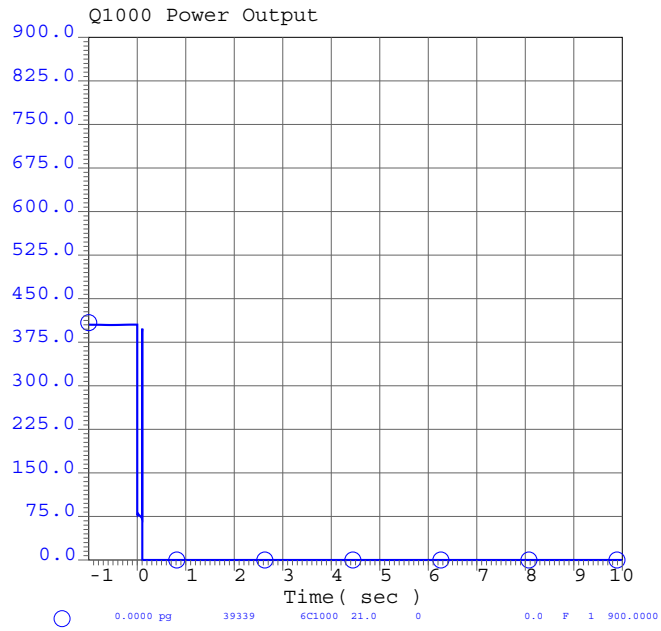
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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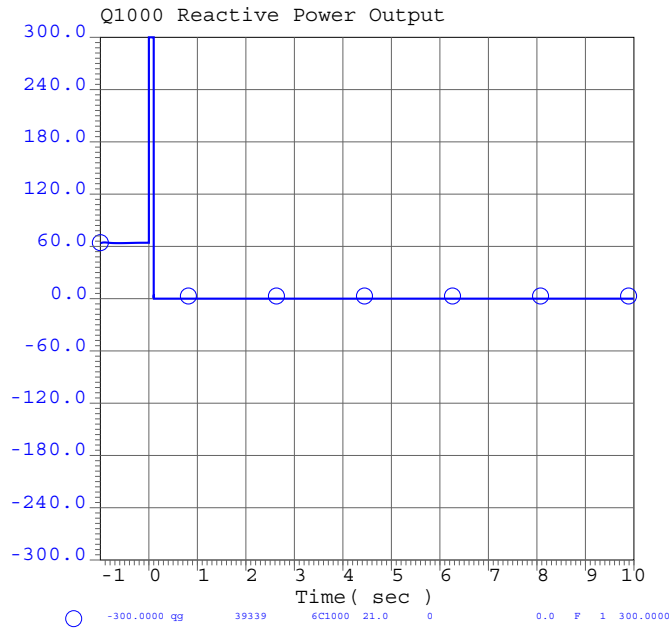


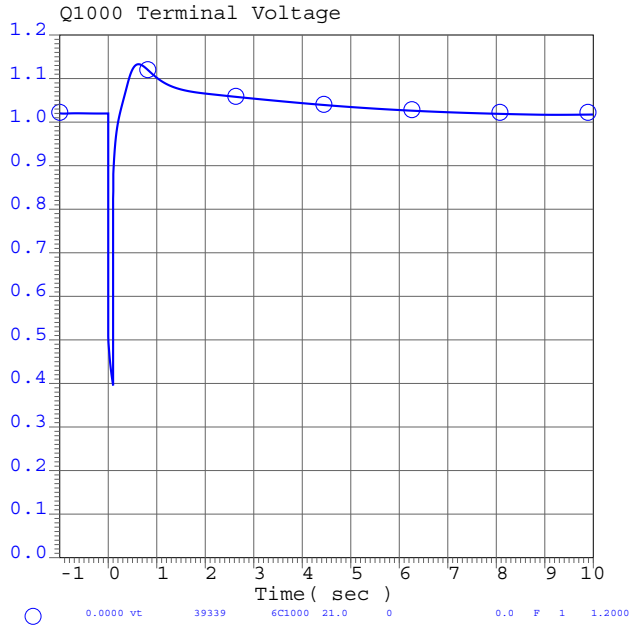
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	35007	MDWY 13M 13.8	1	13	1500.0000

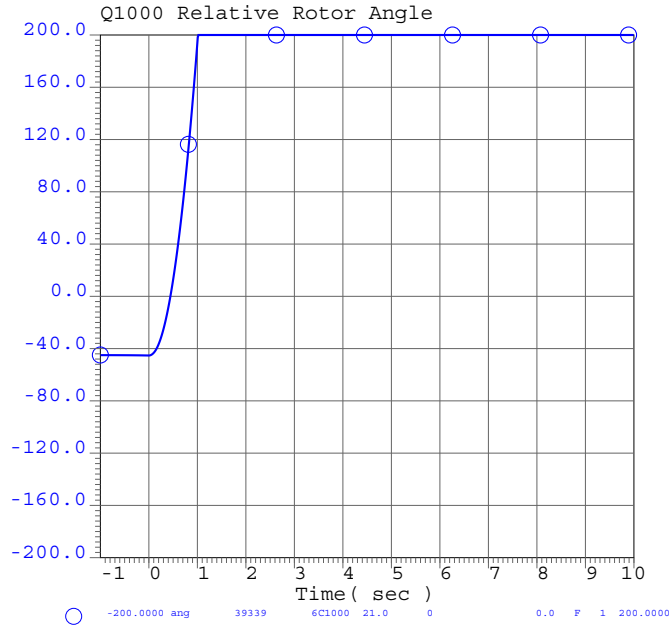
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-La Paloma #1 and #2 lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines









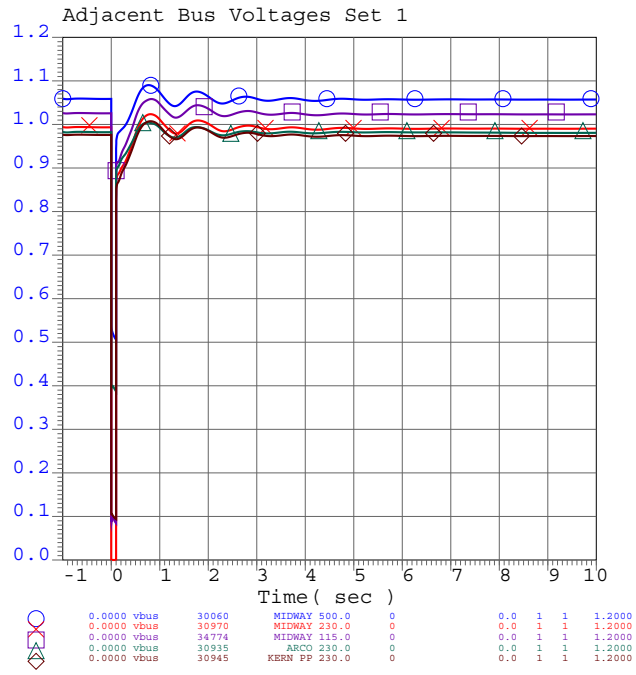
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

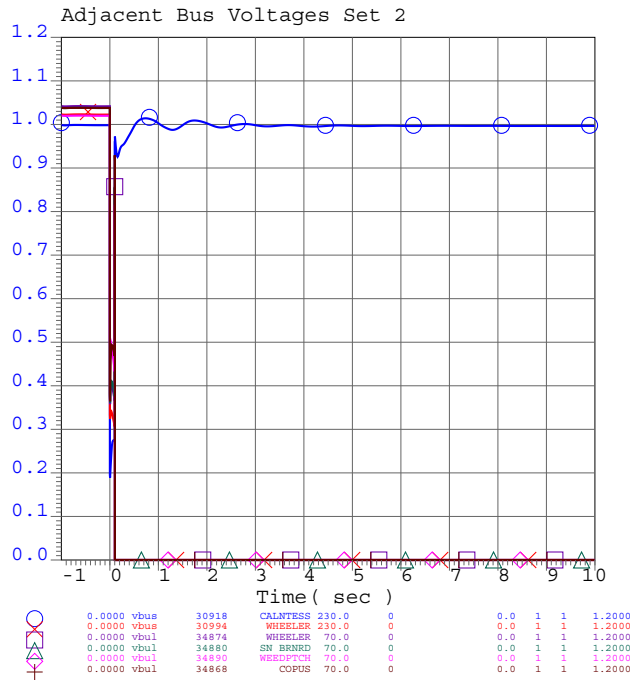
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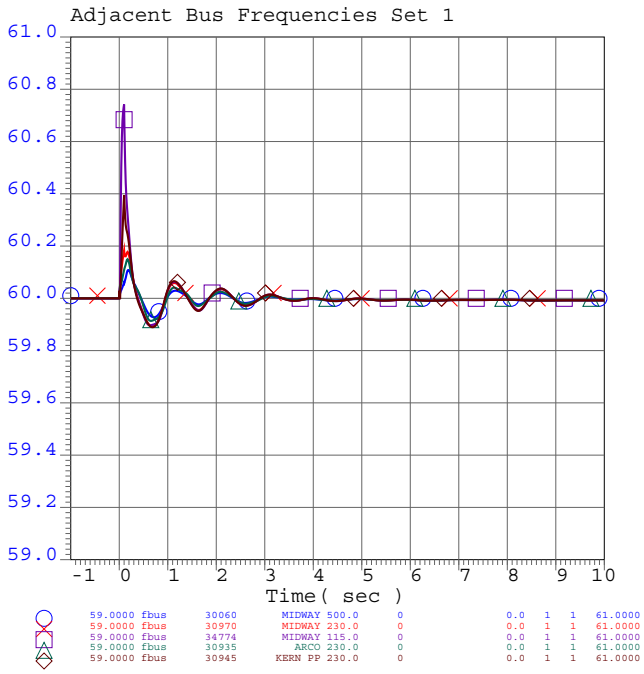
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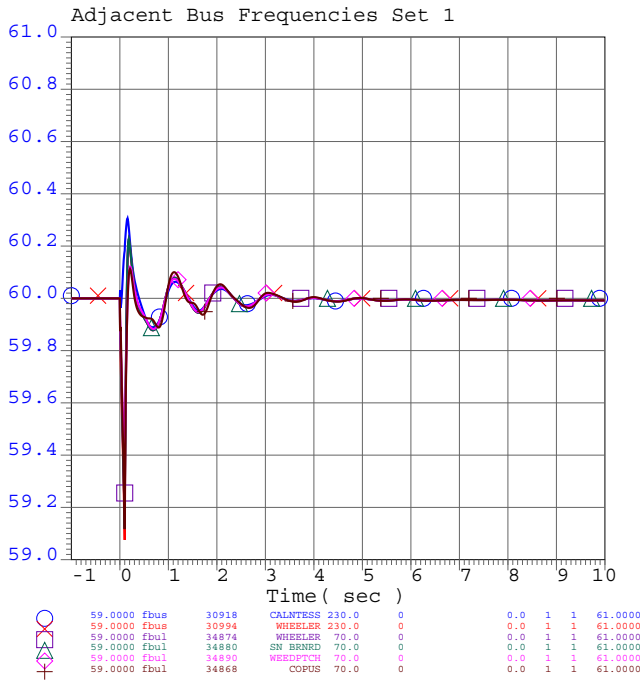
Tue Dec 24 12:07:24 2013

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







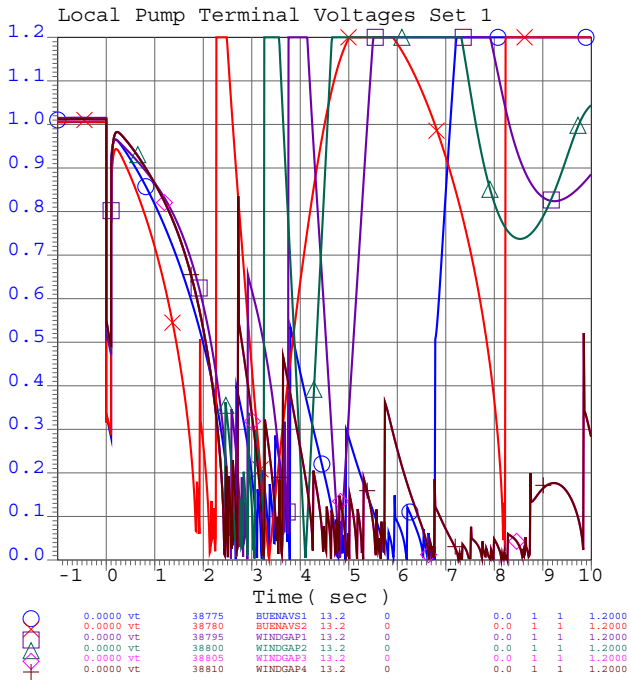


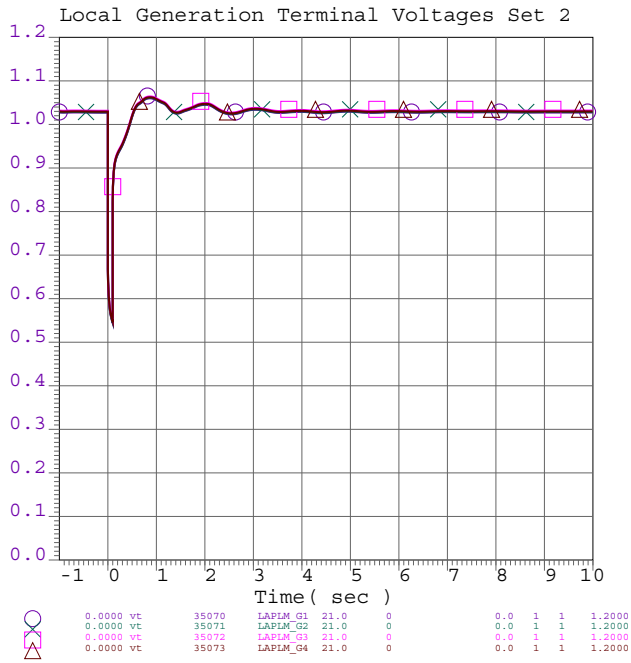
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

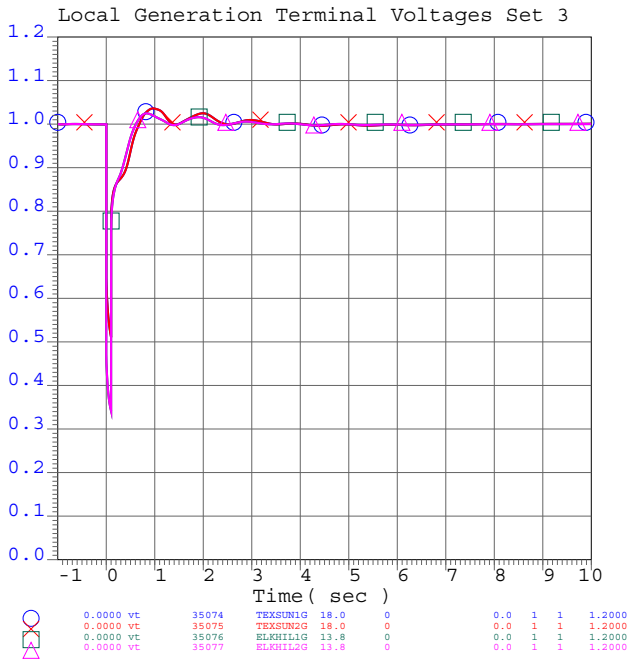
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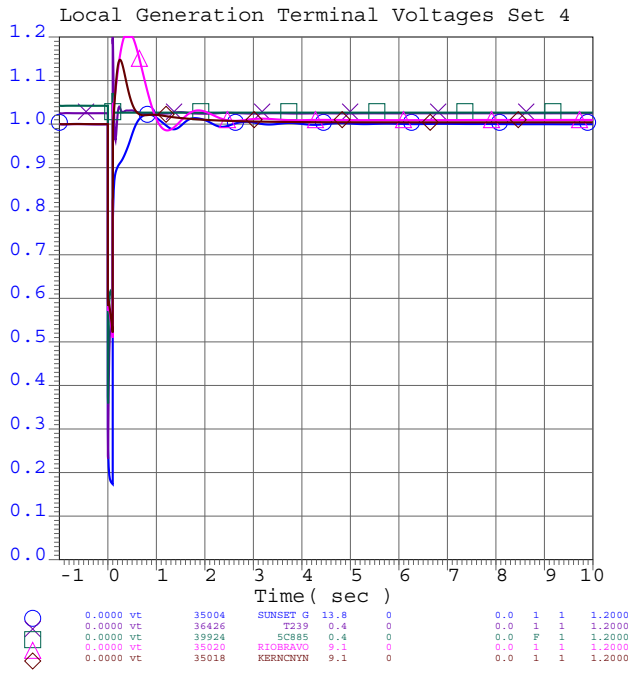
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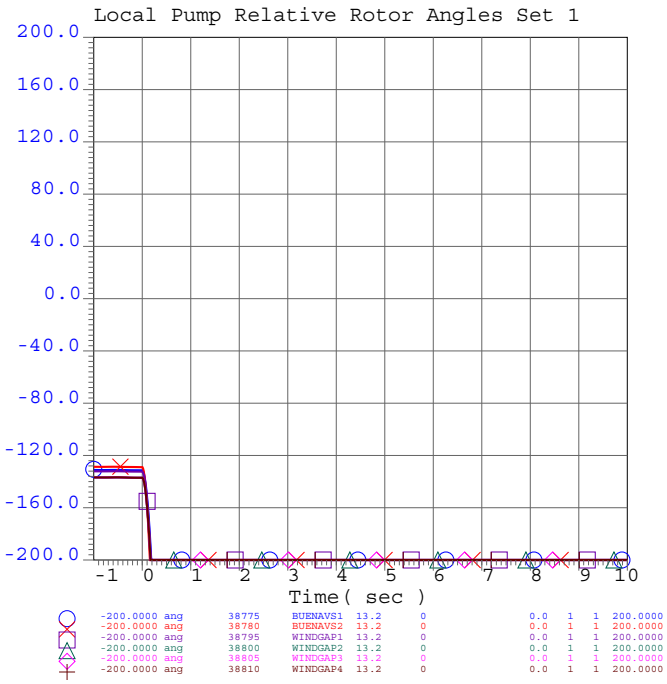


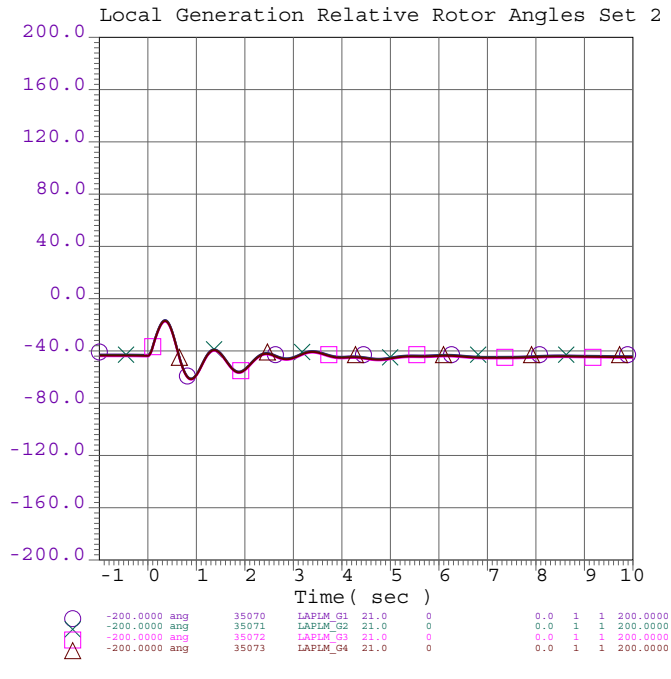


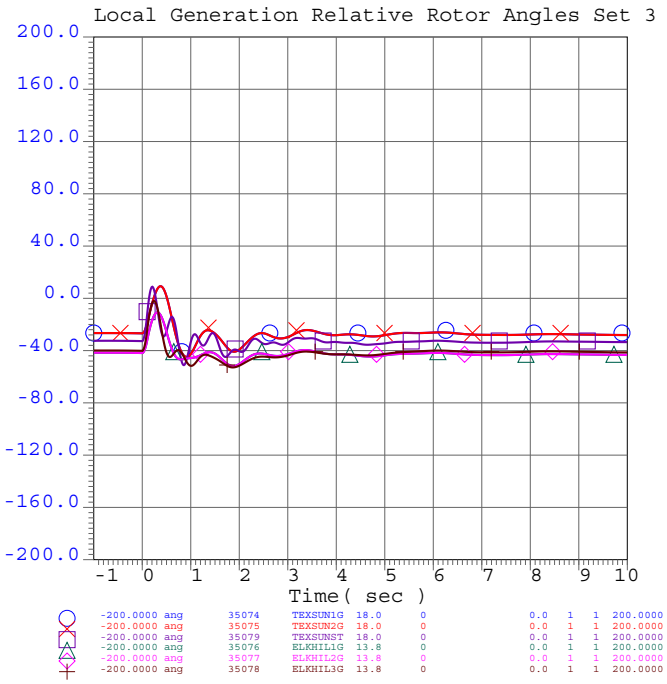


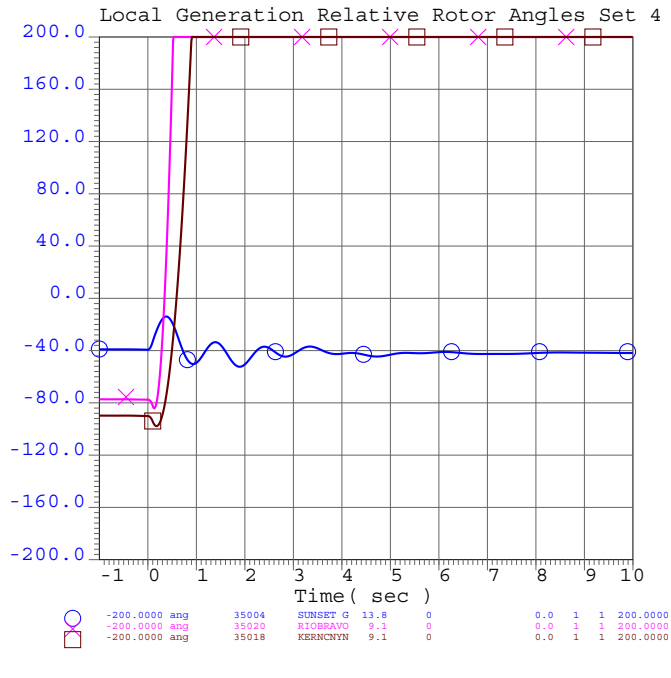


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines



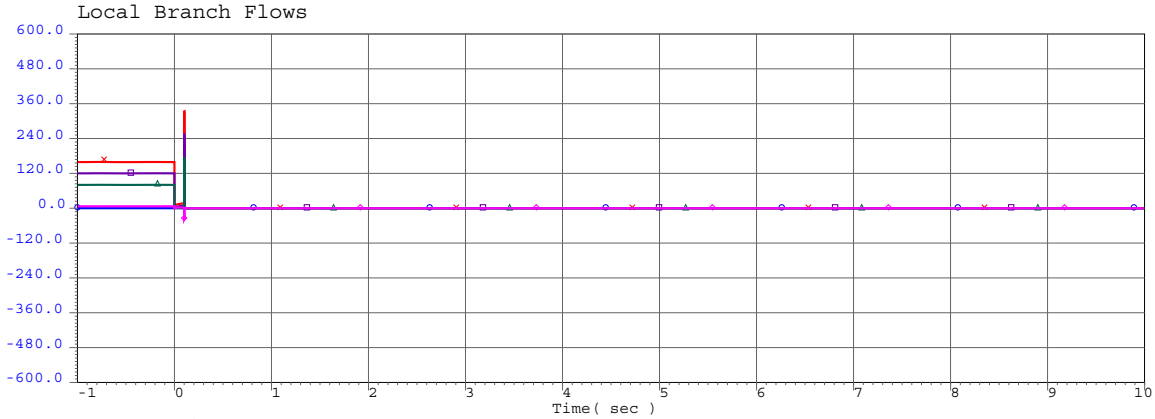






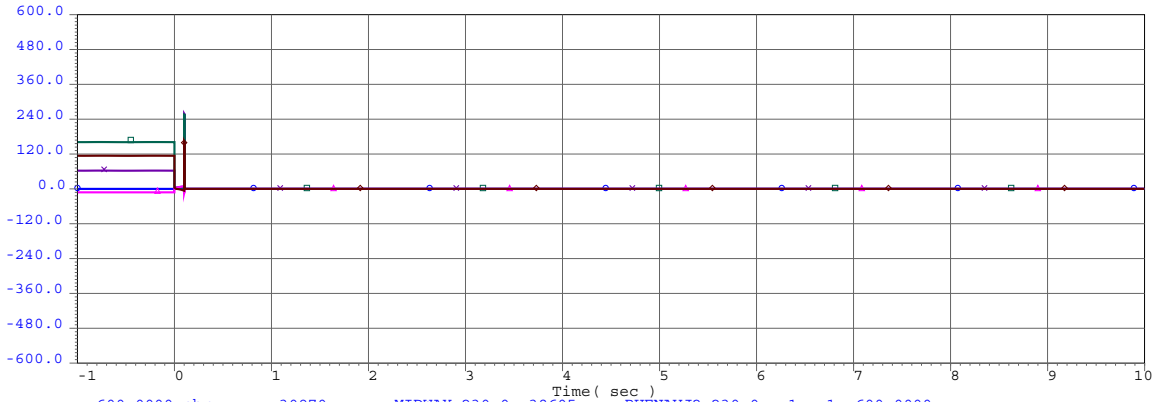
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

Local Branch Flows



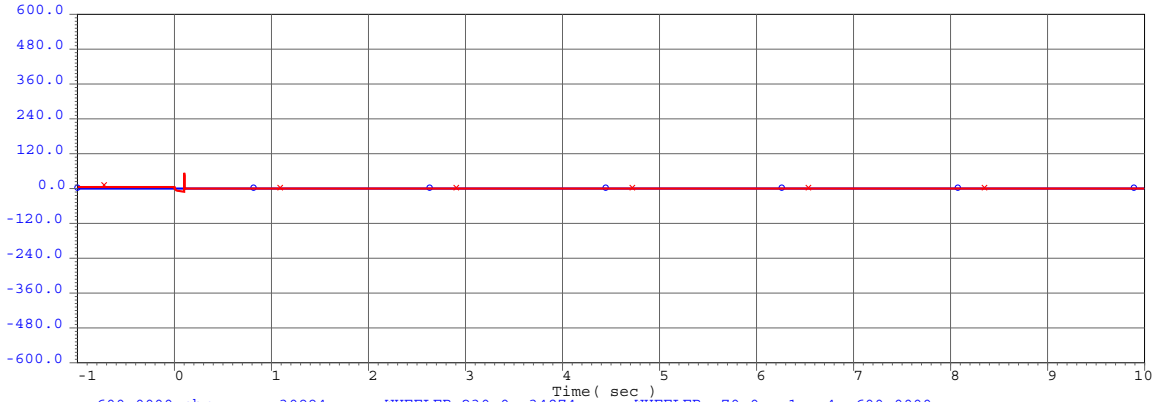
-600.0000	pbr	30970	MIDWAY	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	39336	6C1000S1	230.0	38600	BUENAVJ1	230.0	1	1	600.0000
-600.0000	pbr	38600	BUENAVJ1	230.0	38640	WHLR RJ1	230.0	1	1	600.0000
-600.0000	pbr	38640	WHLR RJ1	230.0	38650	WND GPJ1	230.0	1	1	600.0000
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Local Branch Flows



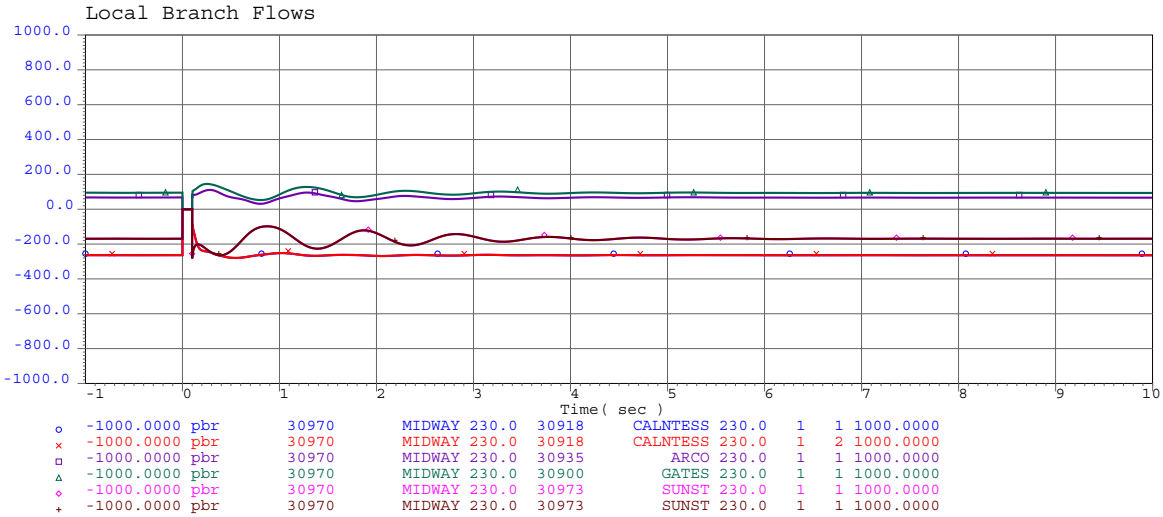
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Local Branch Flows

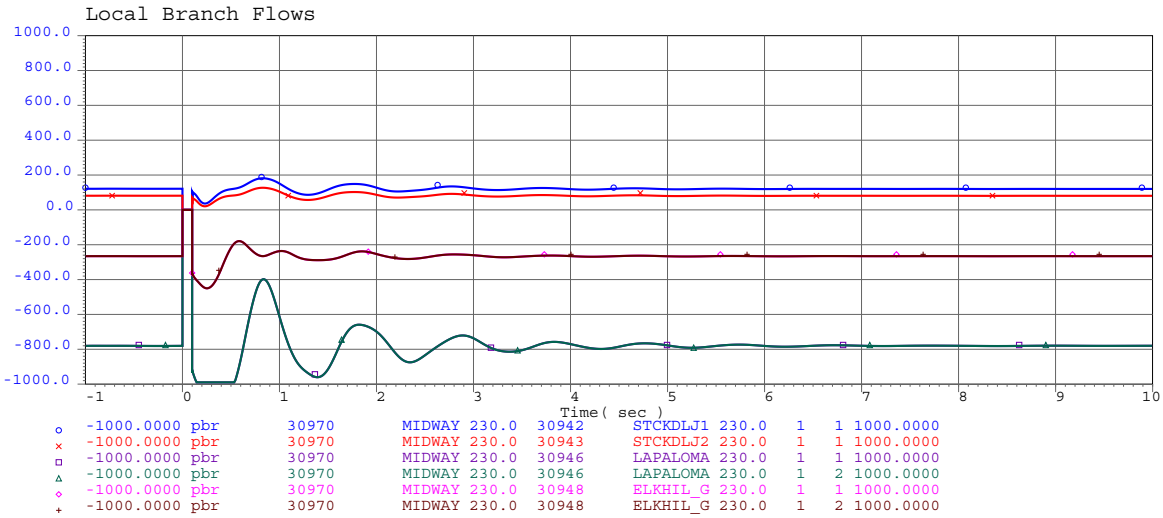


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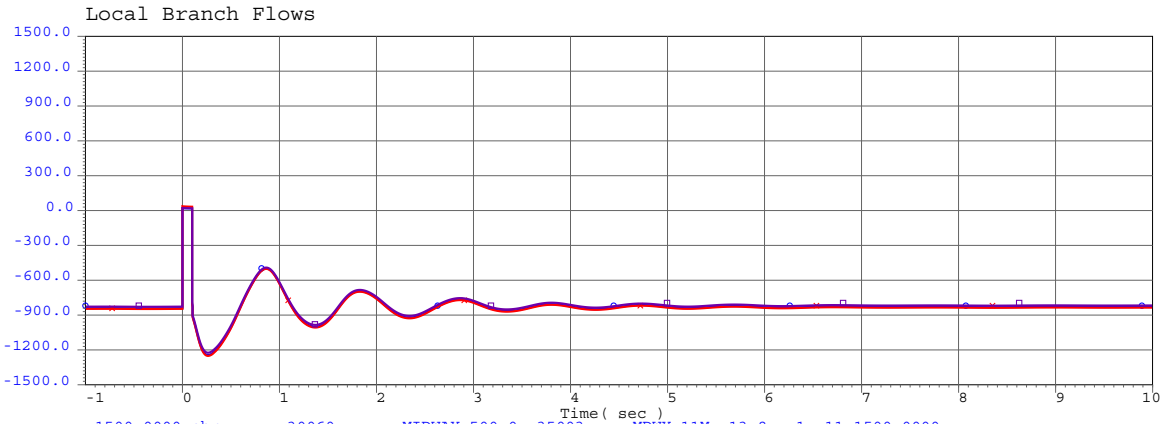
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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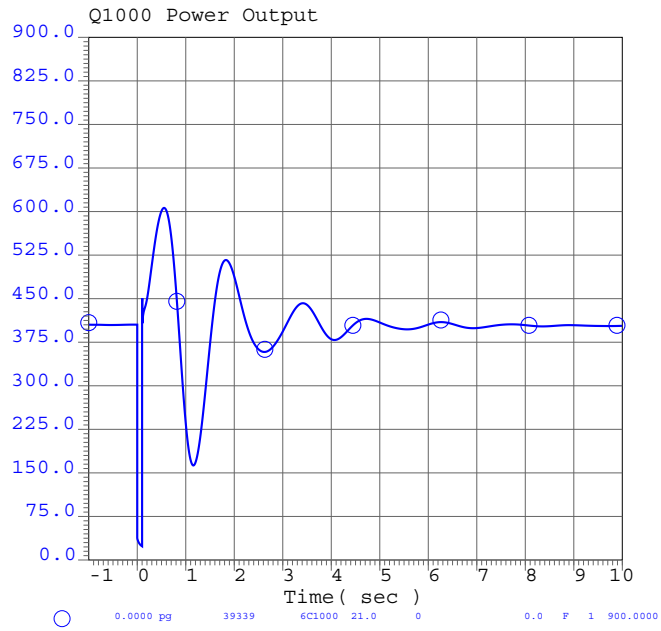
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30948	ELKHIL_G 230.0	1	1	1000.0000
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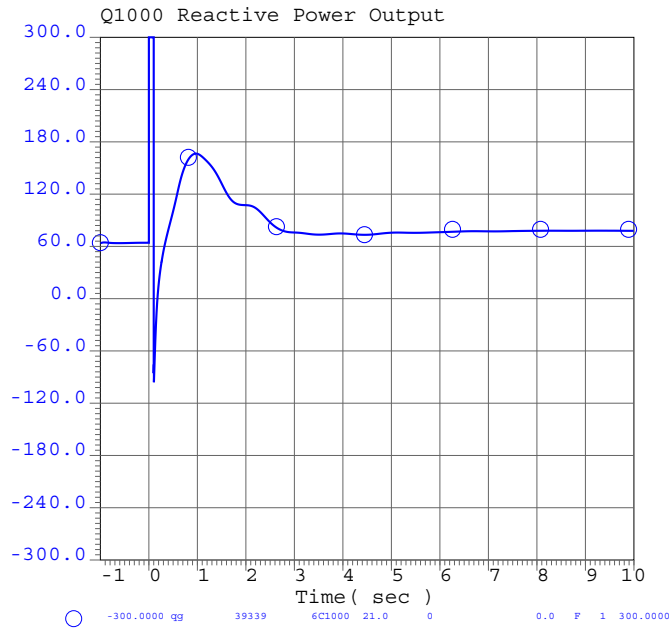


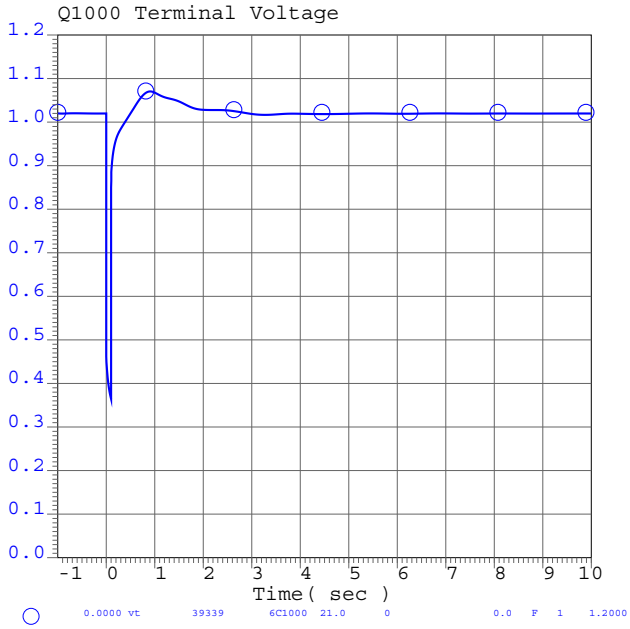
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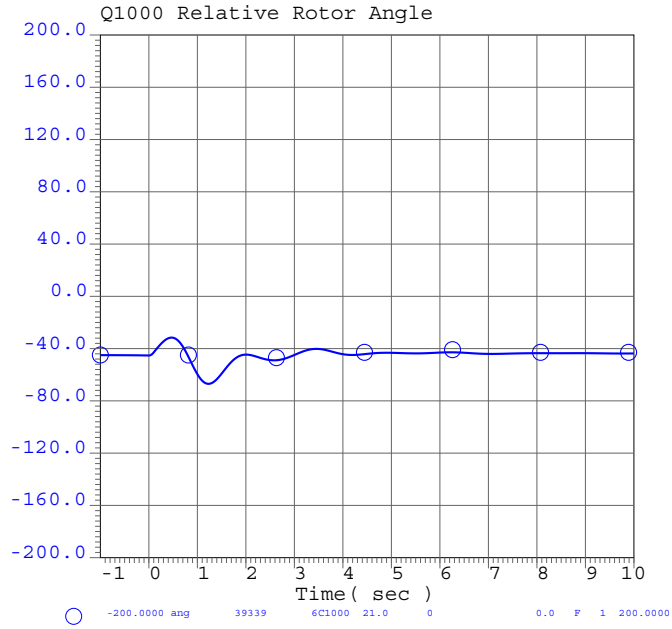
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Midway 230kV Bus
Clear Midway-Q1000 #1 & #2 230kV lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







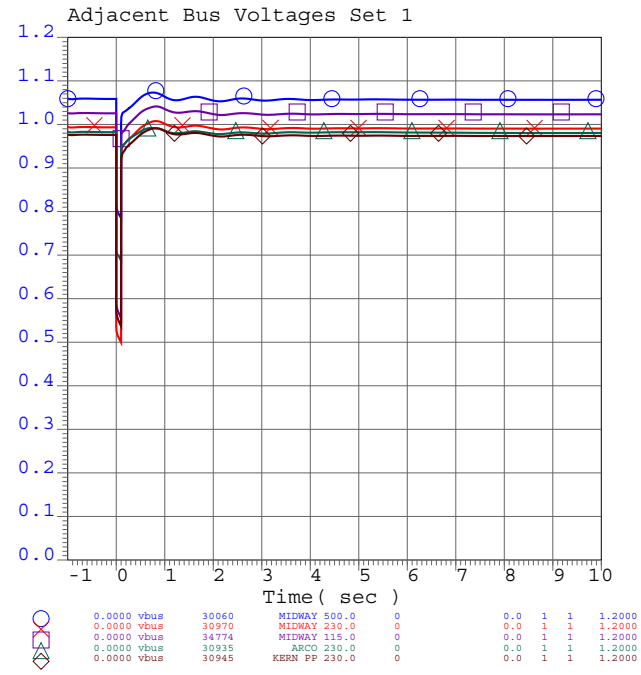


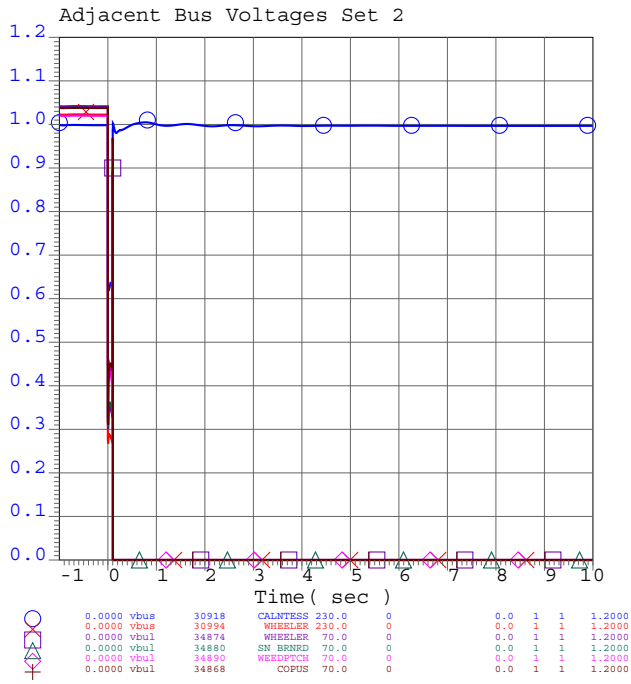
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

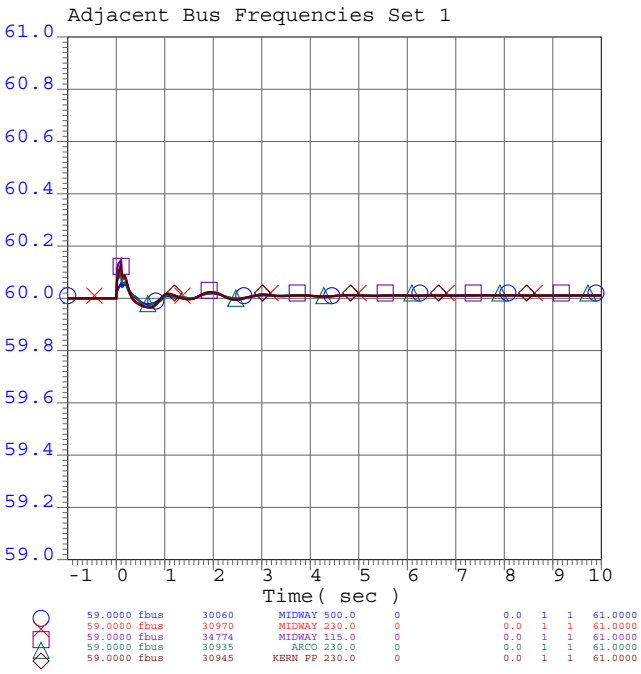
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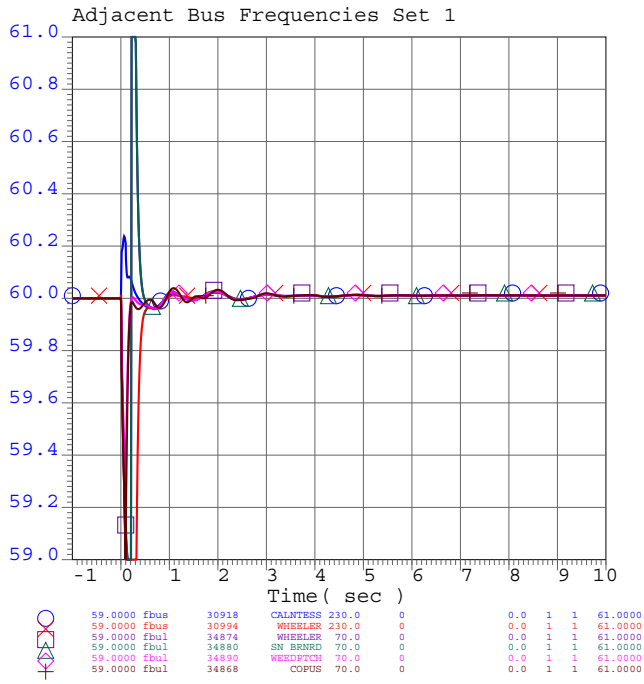
Tue Dec 24 12:08:18 2013

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines







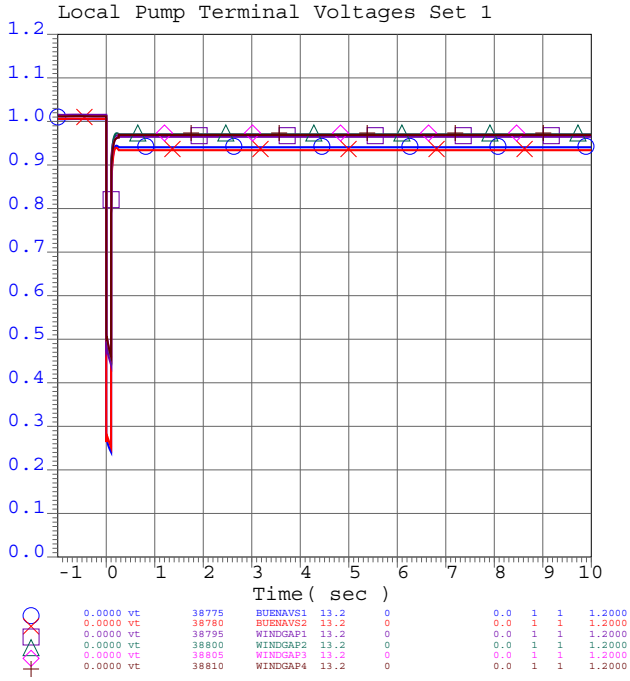


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

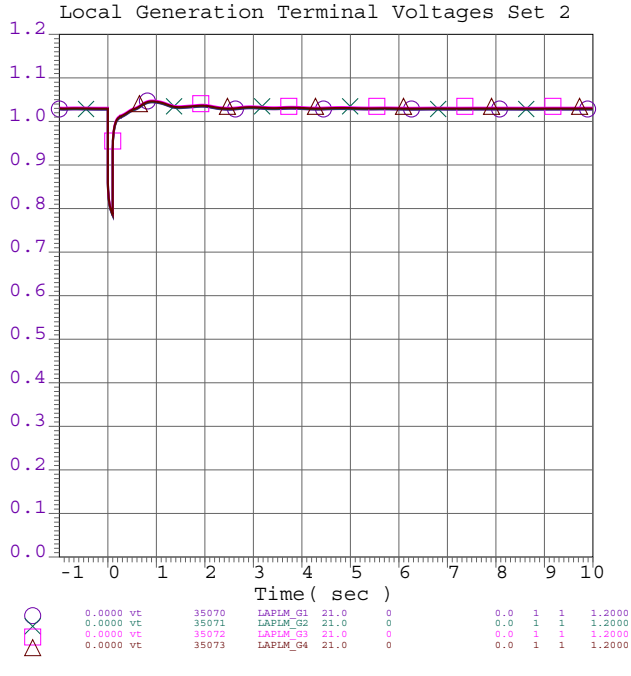
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Tue Dec 24 12:08:18 2013

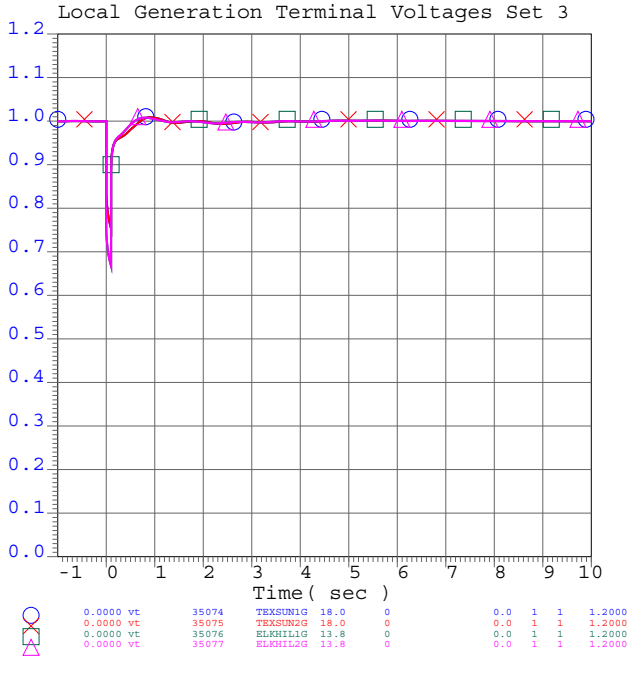
Local Pump Terminal Voltages Set 1



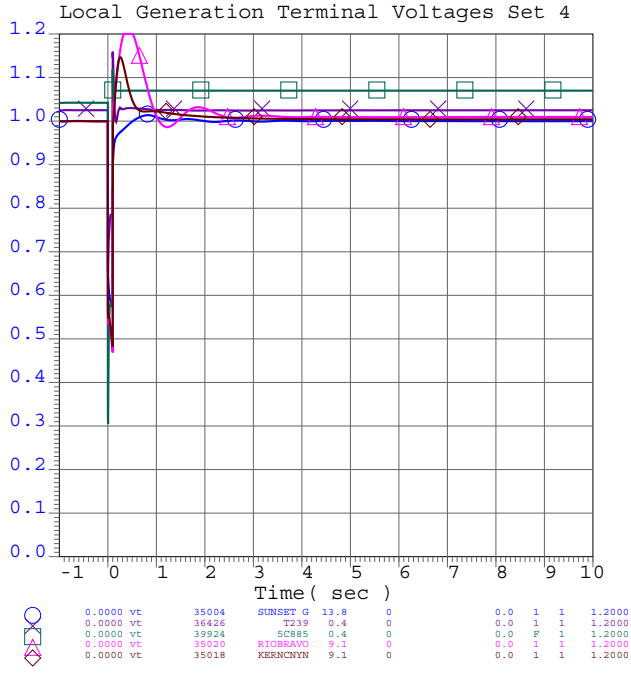
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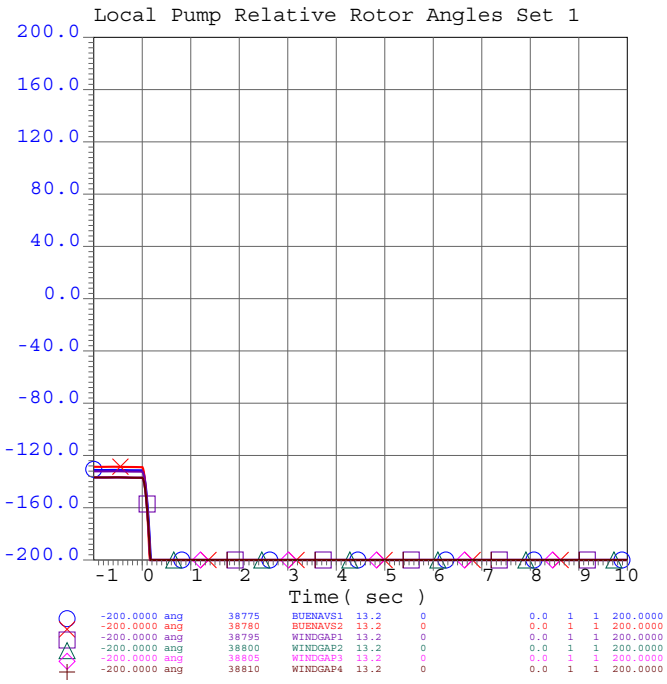
Local Generation Terminal Voltages Set 3

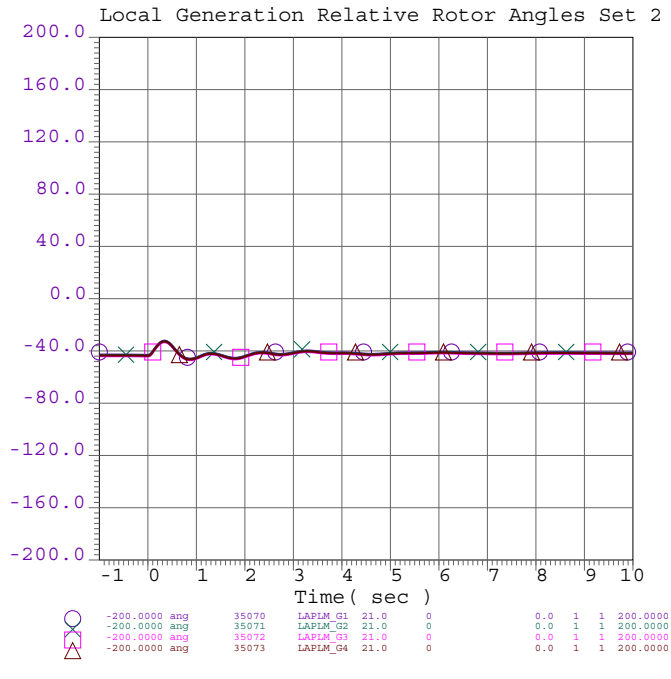


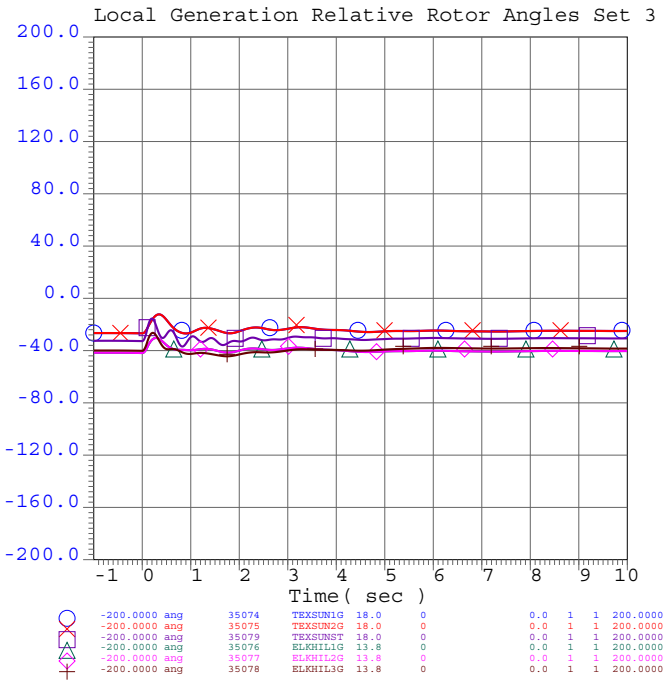
Local Generation Terminal Voltages Set 4

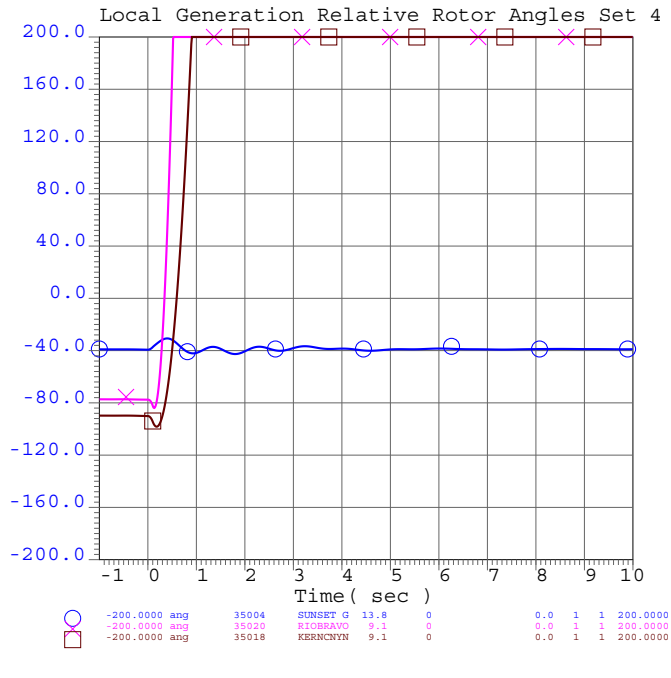


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

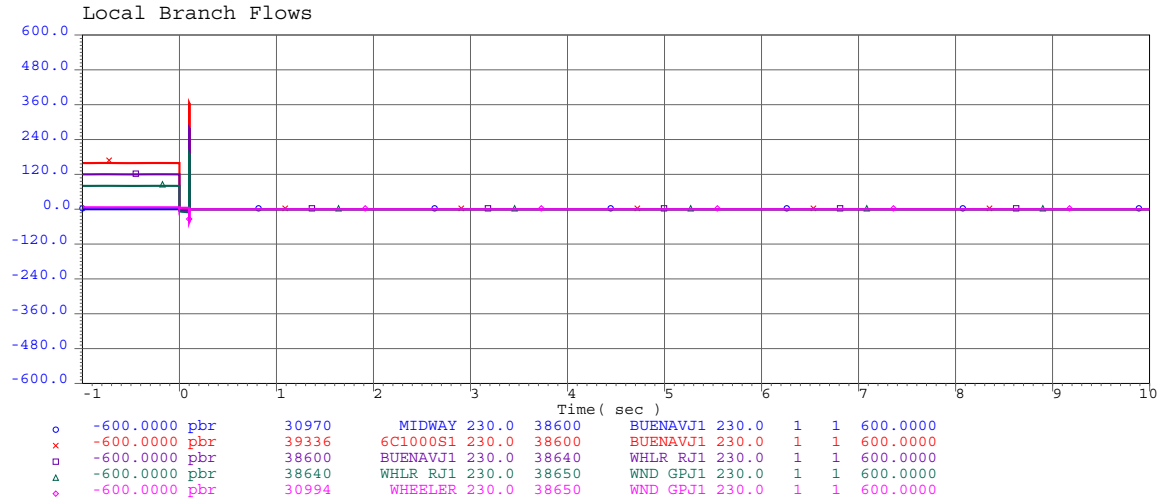


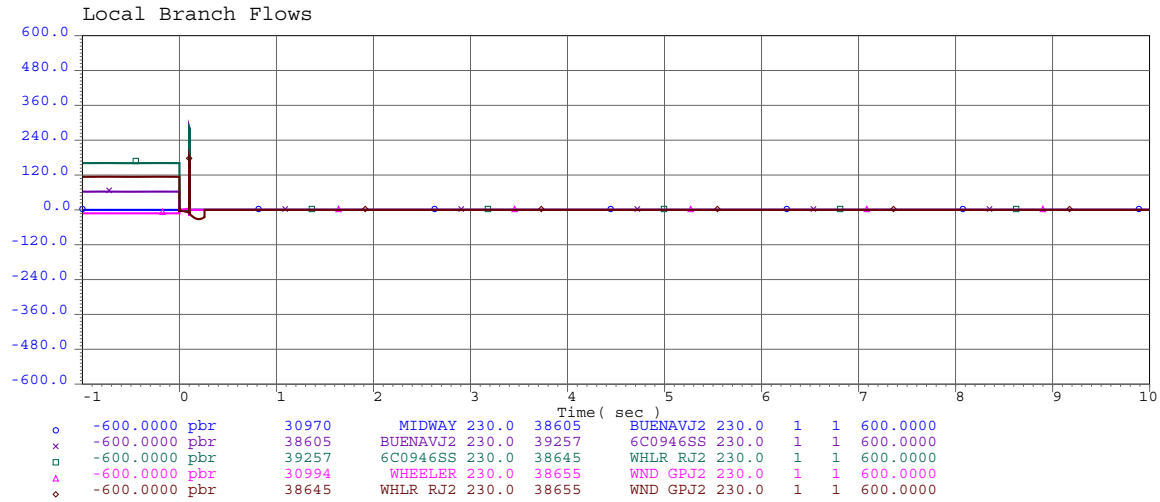


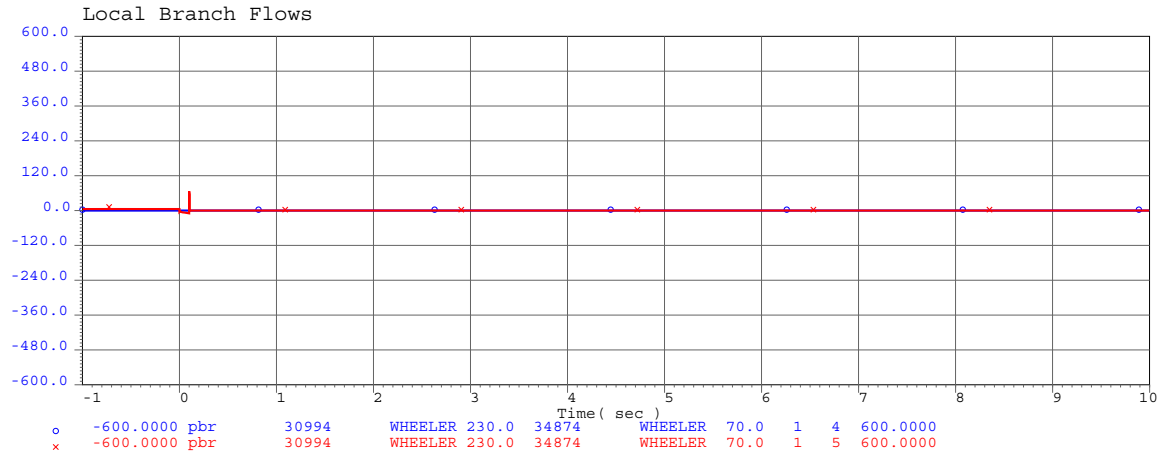




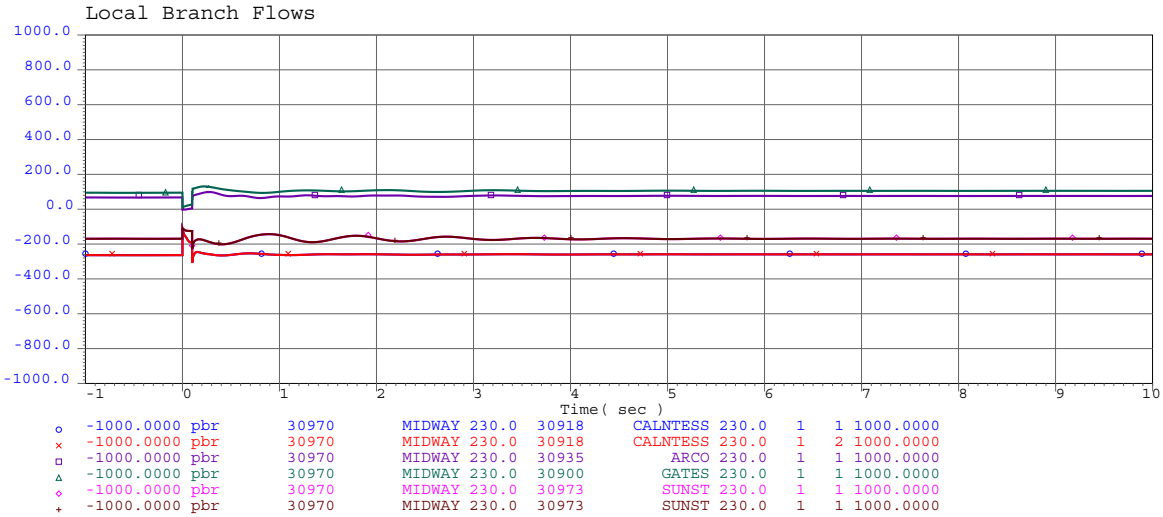
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines



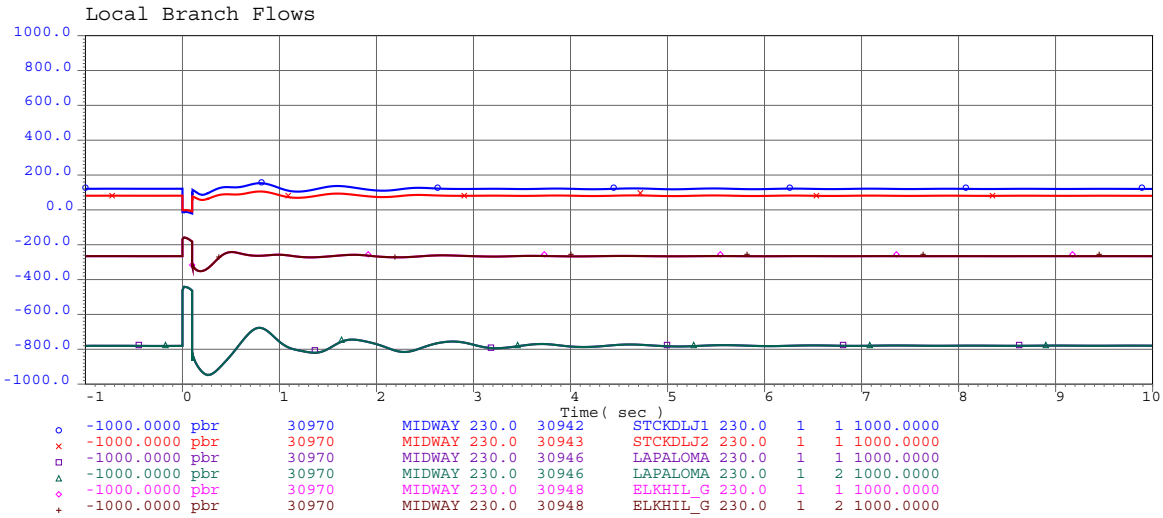




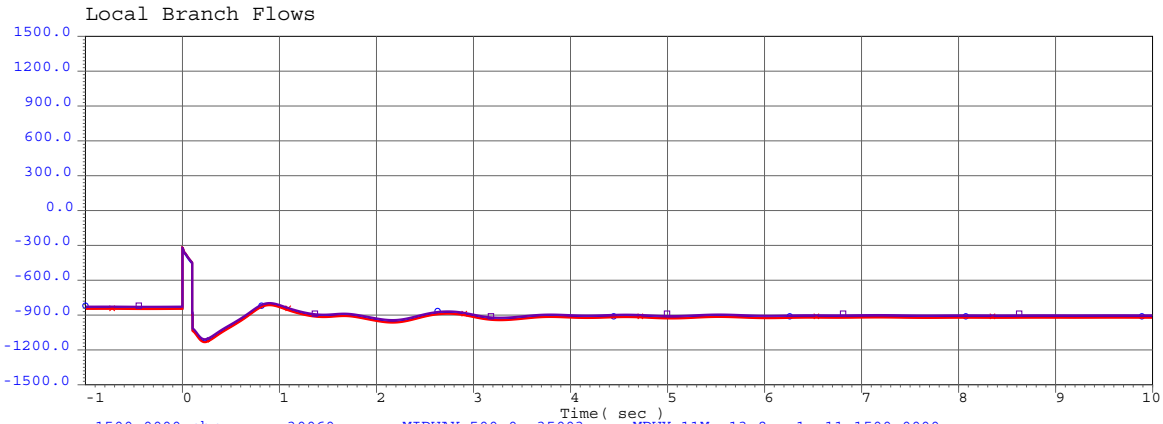
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines



-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30918	CALNTESS 230.0	1	2	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30935	ARCO 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30900	GATES 230.0	1	1	1000.0000
-1000.0000	pbr	30970	MIDWAY 230.0	30973	SUNST 230.0	1	1	1000.0000
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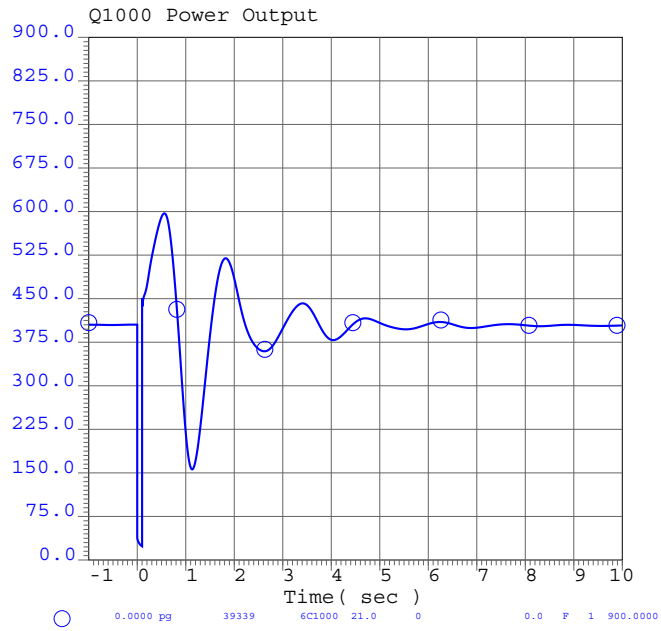
-1000.0000	pbr	30970	MIDWAY 230.0	30942	STCKDLJ1 230.0	1	1	1000.0000
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-1000.0000	pbr	30970	MIDWAY 230.0	30946	LAPALOMA 230.0	1	1	1000.0000
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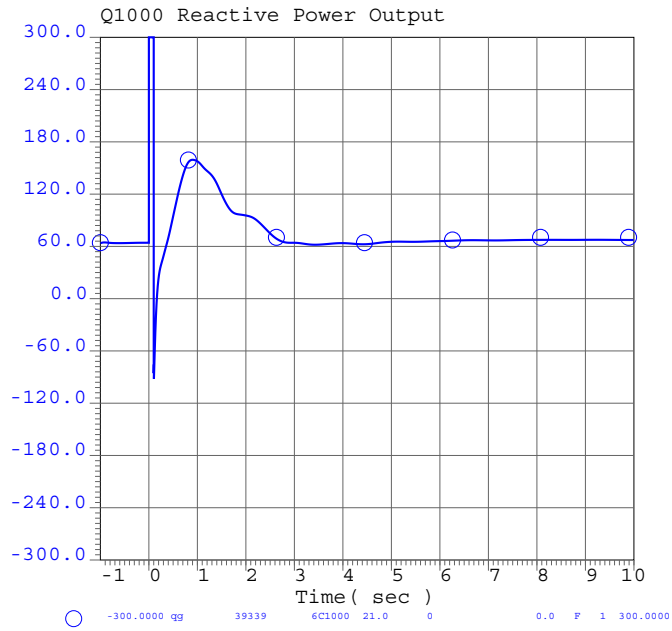


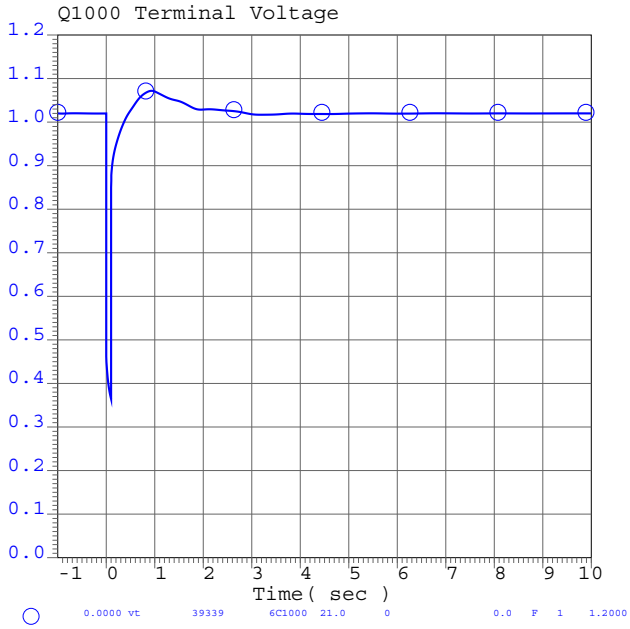
-1500.0000	pbr	30060	MIDWAY 500.0	35003	MDWY 11M 13.8	1	11	1500.0000
-1500.0000	pbr	30060	MIDWAY 500.0	30970	MIDWAY 230.0	1	12	1500.0000
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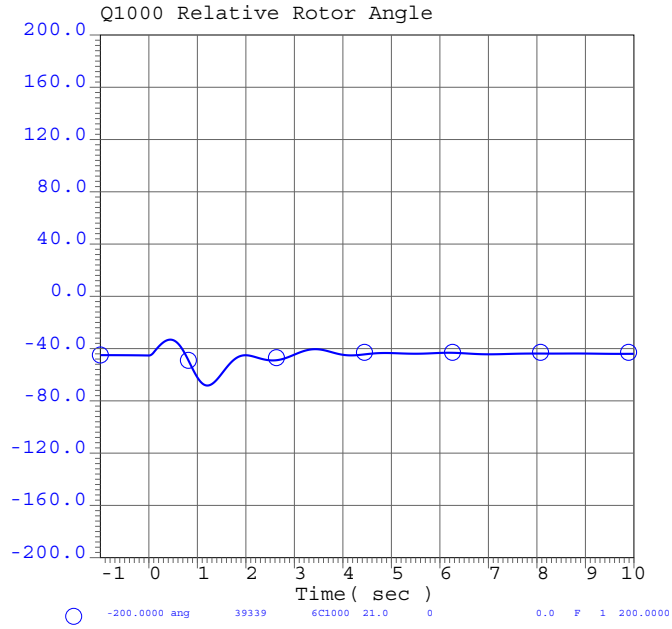
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear 6C1000SS-Wheeler Ridge #1 and 6C1000SS-6C0946SS #2 230 kV Lines

Q1000 (300 MW net): POI- Midway-Wheeler Ridge #1 and #2 230 kV Lines





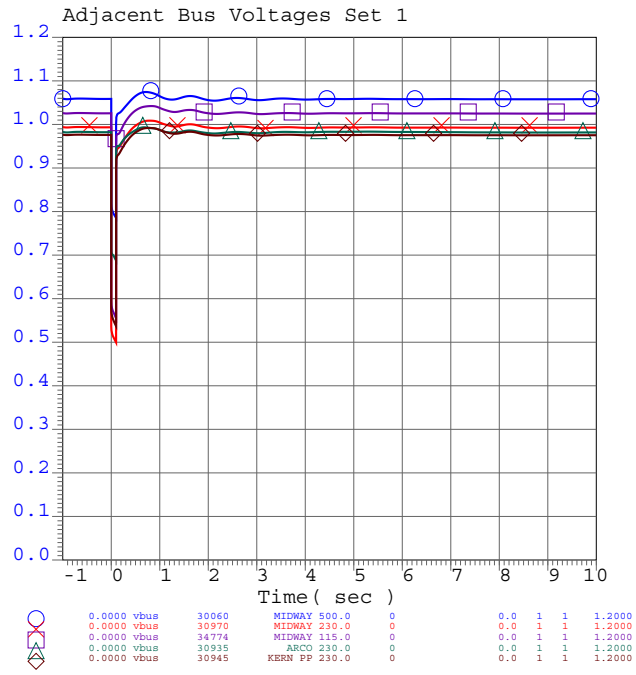


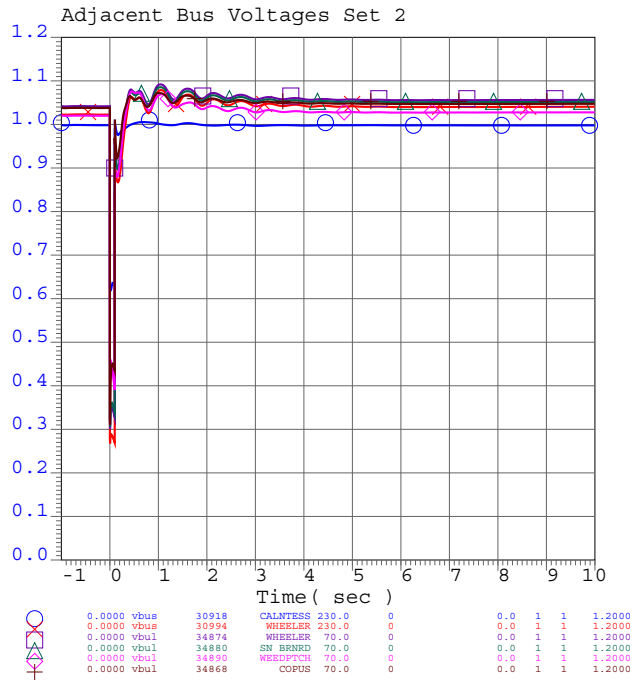


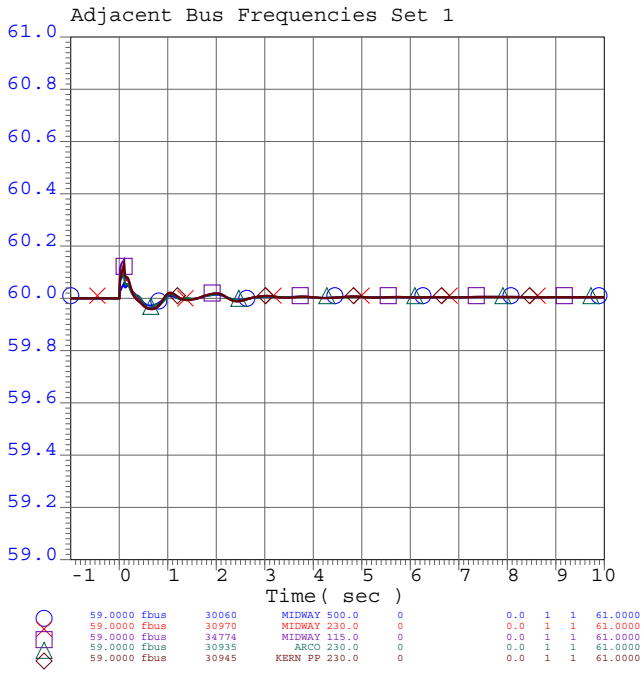
Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Q1000-Wheeler Ridge #1 230kV line

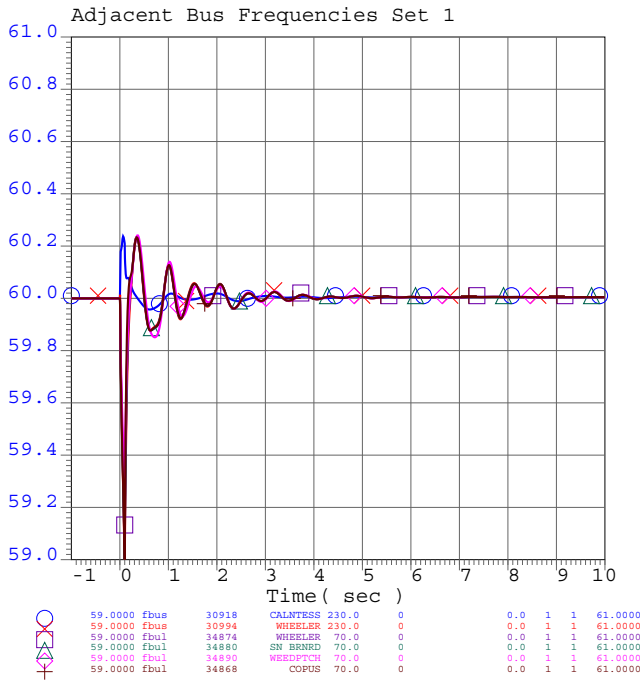
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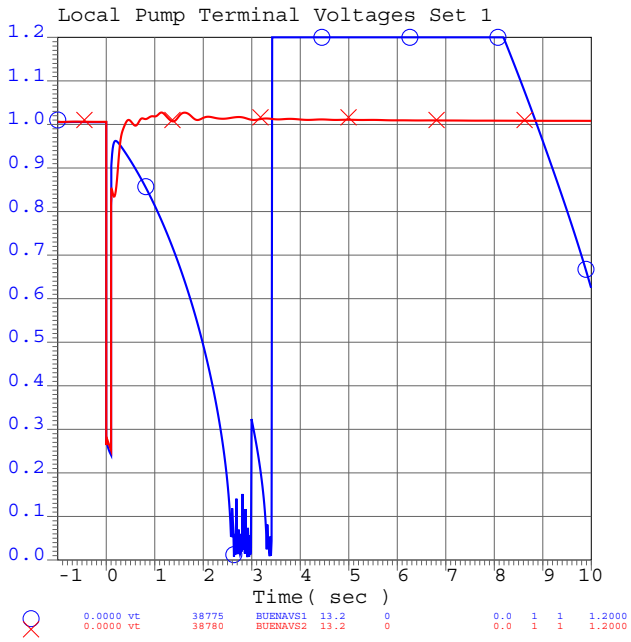


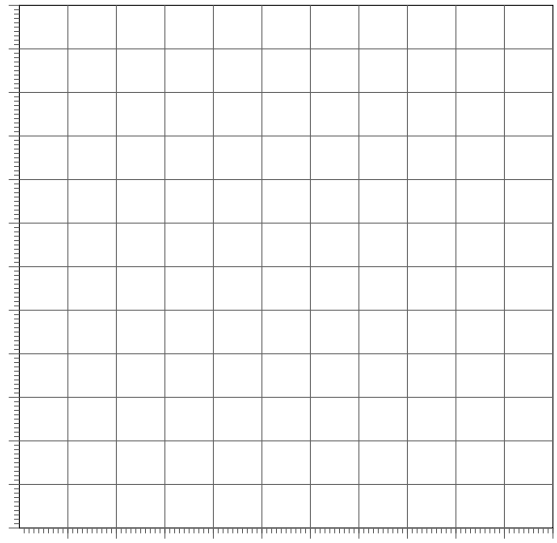


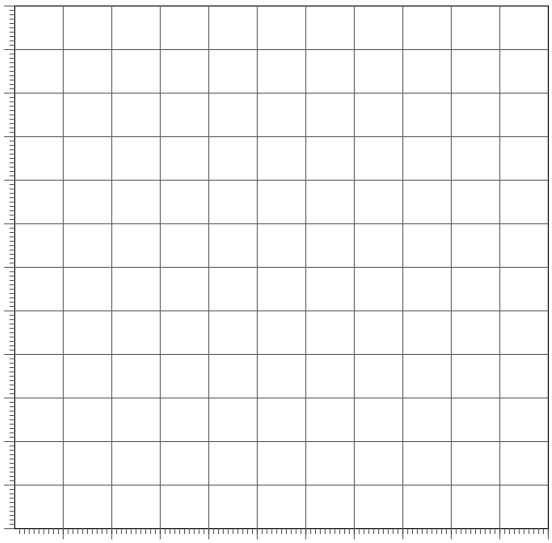


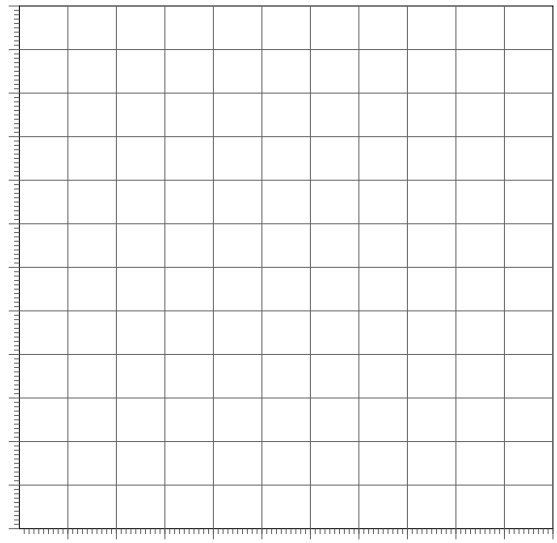


Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Q1000-Wheeler Ridge #1 230kV line









Q1000 HECA SCS 300 MW Net
2018 Summer Peak: Cluster 6 Phase 1
3-ph 6 cyc flt @ Q1000 230kV Bus
Clear Q1000-Wheeler Ridge #1 230kV line

Cluster 6 Phase I – Attachment 8

Preliminary Protection Requirements

Pacific Gas and Electric Company

Below are the protection requirements for the 300 MW generator connection on the Midway - Wheeler Ridge #1 and # 2 230kV Line. These requirements are limited to the modifications at PG&E Substations to protect PG&E facilities with the generation interconnected. Requirements relating to the generating facility, as they pertain to PG&E facility changes, will be mentioned in this document. For the remainder of the protection requirements needed for the generator to interconnect to the PG&E system the Interconnection Handbook should be referenced. Protection for generating equipment beyond that required in the Interconnection Handbook is at the Generator's discretion.

The protection requirements are based on the description provided by the IC.

1. The proposed generation consists of 1 – MHI, 409.5 MVA generator.
2. The generator will be stepped up to230 kV via 230/21kV GSU configured wye gnd/delta.
3. Build 230kV BAAH Switchyard approximately 6 Miles from Midway and 13.5 miles from Buena Vista Pumps on the Midway –Wheeler Ridge #1 and #2 230kV line.
4. The HECA Generator Facility will engineer, procure, construct, own, operate and maintain its project facility including a 230 kV generator tap line required to connect the project to the proposed 230kV Substation. This tap line is about 2.8 miles with 1272 kcmil Bittern or equivalent conductors. CBs will be required at the PG&E Facility which is the POI.
5. The tap line will terminate at the 230kV power circuit breaker with full fault interrupting capability at the third party facility. It's recommended the customer install a redundant line current differential protection scheme to protect the 2.8 mile gen tap line. All requirements shall be in accordance with the Interconnection Handbook.

Assumptions:

The protection requirements are based on the values provided by the customer:

- 230/21 kV transformer with impedance of 9% at 270 MVA rating.
- X"1 = 0.196 pu
- X2 = 0.192 pu
- X0 = 0.11 pu

The maximum symmetrical sub transient fault current on the HEAC SCS Generator Facility 230kV POI is **24911** amps for a three phase fault and **21116** amps for a single line to ground fault. The circuit breakers must be appropriately rated.

Q1000 Switchyard Protection Requirements:

1. A BAAH MPAC switching station will be constructed, creating a Midway – Q1000 Switchyard #1 and #2 line and Q1000 Switchyard – Northern Orchard Solar #1 and #2 line.
2. Install current differential line relay schemes on Q1000 Switchyard – HECA SCS Generator Facility line and Midway – Q1000 Switchyard #1 and #2 line section. The schemes will consist of GE L90 and SEL 311L relays with redundant communication paths.
3. Install Blocking Scheme on the Q1000 Switchyard – Northern Orchard Solar #1 and #2 line section. The schemes will consist of GE D60 and SEL 311C.

Midway Substation Protection Requirements:

1. Remove existing protective relay scheme Midway – Q1000 Switchyard #1 and #2 line section.
2. Install Current Differential line relay scheme on the Midway – Q1000 Switchyard #1 line:
   - Set A GE L90 and SET B SEL 311L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Q1000 Switchyard.
3. Install Current Differential line relay scheme on the Midway – Q1000 Switchyard #2 line:
   - Set A GE L90 and SET B SEL 311L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Q1000 Switchyard.

Northern Orchard Solar Substation Protection Requirements:

1. Install Blocking Scheme, over PLC, on the Q1000 Switchyard – Northern Orchard Solar #1 line.
   - Set A GE D60 and SET B SEL 311C step distance and directional ground overcurrent relays.
2. Install Blocking Scheme, over PLC, on the Q1000 Switchyard – Northern Orchard Solar #2 line.
   - Set A GE D60 and SET B SEL 311C step distance and directional ground overcurrent relays.

Note: That if Northern Orchard Solar does not go on line before or at the same time of this project then the same requirements would apply to Wheeler Ridge.

HECA SCS Generator Facility CB at POI:

1. The Project will export power through one new 450 MVA power transformers, which shall be connected wye grounded on the PG&E side per Generation Interconnection Handbook G2.5.4.1 and G2.5.4.2. Basic protective devices of the substation should be referenced to Table G2-1a and G2-1b of the Interconnection Handbook as required. All relays must be utility grade, fully redundant and PG&E approved.

2. Install Current Differential line relay scheme on the Generation Tie Line from Q1000 Switchyard:
    - Set A GE L90 and SET B SEL 311L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at 230kV Q1000 Switchyard CB.

3. Due to the complexity of this interconnection, the PG&E and the customer shall coordinate submittal and review of engineered design drawings, final relay settings and test reports to PG&E prior to Interconnection.

Bus Fault Duties

Sys. Pro. Results 6-Nov-13 Proposed Project: HECA SCS			**Short Circuit Currents on Selected Busses for the Proposed Project (AMPS)**			
			Case 1 Base Case System		**Case 2** Case 1 + Addition of Proposed Project	
	Bus Name	**kV**	**3LG (A)**	**1LG (A)**	**3LG (A)**	**1LG (A)**
1	MIDWAY	230.kV	70315	68424	72407	70873
2	WHELLER RIDGE	230.kV	7639	6629	7713	6675

Attachment 10

Substation and Transmission Line Work Scope

HECA SCS
Q1000 300 MW
CLUSTER 6 PHASE I STUDY
SUBSTATION SUMMARY

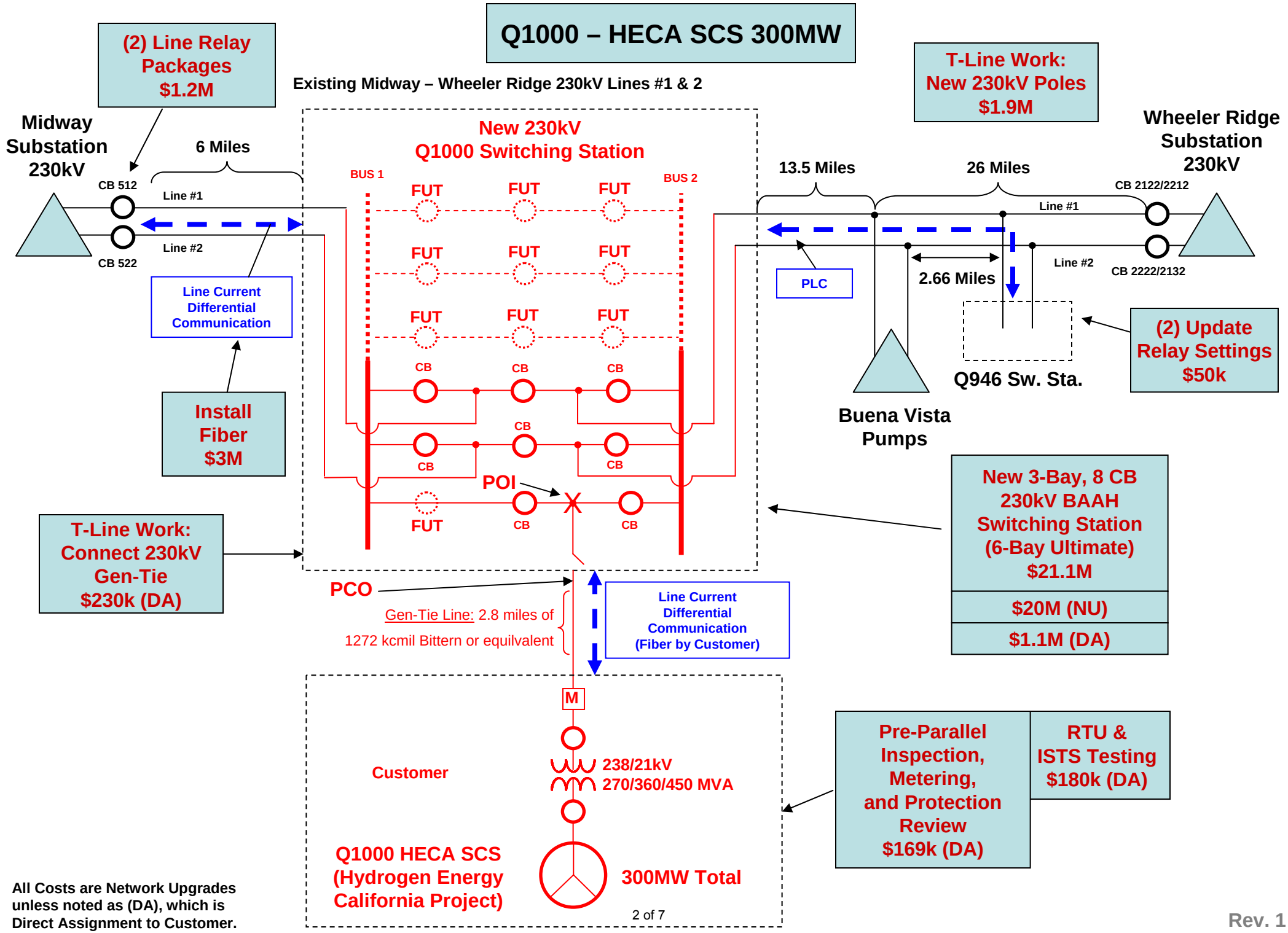


Revision 1

December 13, 2013

Report No. 13156-008-Q1000

Q1000 – HECA SCS 300MW



All Costs are Network Upgrades unless noted as (DA), which is Direct Assignment to Customer.

Rev. 1

Preliminary PG&E Substation Job Scope & Estimate
Cluster 6 Phase I Study
for
HECA SCS – Q1000
300 MW Generating Facility

Study Order No. 9718261
Date: 12/13/13
Revision 1

This document contains the substation and transmission line preliminary scope and order of magnitude cost estimates for the HECA SCS Project. The Point of Interconnection (POI) for this project will be at a new 230kV BAAH on the two Midway – Wheeler Ridge 230kV Lines. This study (Q1000) is based upon project Q946 going on line before or at the same time as this project. If Q946 does not proceed as scheduled, this study (Q1000) will need to be re-evaluated.

*See Substation Assumption #10

Interconnection Scope:

NETWORK UPGRADES (NU)

New 230kV 3-bay 8CB BAAH Switching Station

1.) Construct the Switching Station as a three-bay, eight (8) circuit breaker 230kV Breaker-and-a-Half (BAAH) Scheme. Property is required for ultimate expansion to a 6-bay, 18CB Ultimate Arrangement.

2.) ISTS will install SCADA/Fiber/Microwave for communication.

Midway Substation

1.) Remove existing protective relay schemes for the Midway – Wheeler Ridge #1 230kV Line. Install a new line relay package with line current differential, step distance, and directional ground overcurrent relays on Midway CB 512 consisting of GE L90 and SEL311L. The relays will be located in Rack #206 of the 230/115kV "New" Control Building.

2.) Remove existing protective relay schemes for the Midway – Wheeler Ridge #2 230kV Line. Install a new line relay package with line current differential, step distance, and directional ground overcurrent relays on Midway CB 522 consisting of GE L90 and SEL311L. The relays will be located in Rack #205 of the 230/115kV "New" Control Building.

3.) Fiber termination will be completed by ISTS for communication to the Q1000 New 230kV Switching Station.

Q946 New Switching Station

1.) Install a new line relay package Blocking Scheme, over PLC, on the Q1000 Switching Station – Q946 Switching Station #1 230kV Line. The relays will be located in Q946 Switching Station Control Building, and installed in parallel with Q946.

2.) Install a new line relay package Blocking Scheme, over PLC, on the Q1000 Switching Station – Q946 Switching Station #2 230kV Line. The relays will be located in Q946 Switching Station Control Building, and installed in parallel with Q946.

Transmission Line Scope of Work

1.) Loop both the 230kV Midway – Wheeler Ridge #1 & #2 lines into the New Switching Station. This is assumed to require the following items:
    a. Install three (3) double-circuit dead end TSPs ($300,000 ea)
    b. Install four (4) single-circuit dead end TSPs ($200,000 ea)
    c. Install ten (10) spans of transmission line conductor ($20,000 ea)

New Fiber from Midway to Q1000 New Switching Station

1.) Install 6 miles of fiber on the Midway – Wheeler Ridge #1 & # 2 230kV Double Circuit Tower Line from Midway Substation to the New Switching Station.

    Note: It is assumed that fiber will be overhead OPGW, but other options for telecommunication can be explored during the Phase II studies.

INTERCONNECTION FACILITIES (DA)

New 230kV 3-bay 8CB BAAH Switching Station

1.) Install a line relay package, deadend structure, 3-Phase CCVT's and disconnect switch for the generation tie line.

HECA SCS Generation Site

1.) Install metering, provide Engineering Protection reviews, pre-parallel inspection, and commissioning support at the generator substation.

2.) Install one (1) RTU and provide ISTS testing at the generator substation. The RTU scope includes the support work at the PG&E Operations Facility to connect to the RTU.

Transmission Line Scope of Work

1.) Connect the Developer's 230kV Gen-Tie Line to the New Switching Station. PG&E will connect to the Developer-owned TSP or Deadend Structure just outside of the New Switching Station's property. This is assumed to require the following items:
    a. Install one (1) span of transmission line conductor ($20,000 ea)
    b. Install one (1) single-circuit dead end TSP ($200,000 ea)
    c. PG&E review of the Customer-owned TSP/Deadend structure design data ($10,000)

Interconnection Costs:

Network Upgrades	
New Switching Station: 8 CB BAAH	$19,300,000
New Switching Station: ISTS for SCADA/Fiber/Microwave	$700,000
Midway Substation: New Line Relay Packages (2)	$1,030,000
Midway Substation: ISTS for Fiber Termination	$170,000
Q946 New Switching Station: New Line Relay Settings (2)	$50,000
T-Line: Install (3) double & (4) single-circuit TSPs and (10) spans of transmission line conductor	$1,900,000
Install New Fiber: Midway Sub to New Switching Station - 6 mi	$3,000,000
Subtotal	$26,150,000
Interconnection Facilities	
New Switching Station: Gen-Tie Line Relays, Dead-end, 3-Phase CCVT's and Disconnect Switch	$1,100,000
Gen-Site: Engineering Reviews, Metering, Pre-parallel Inspection, and PM	$169,000
Gen-Site: RTU and ISTS Testing	$180,000
T-Line: Install (1) span of conductor & (1) single-circuit TSP, and PG&E review	$230,000
Subtotal	$1,679,000
Grand Total	**$27,829,000**
Total Work Duration*	**46 months**

* See Substation Assumptions #14

Assumptions:

Substation Estimate Assumptions:

1. This proposed preliminary substation scope is based on PG&E Preliminary Protection Requirements.
2. Final scope will be developed only when this project moves to the implementation phase.
3. The Customer is responsible for redundant and separated fiber cables between the Customer Generation Facility and the new PG&E switching station.
4. The unit costs here do not include an applicable ITCC tax.
5. Unit costs assume that the project site has regular soil conditions and is not located in an extra high seismic zone as identified in PG&E DCM 073102 nor in a location consisting of the following conditions: liquefiable soils, expansive soils, unstable soils, susceptible to rupture, high ground water table (less than approximately 15 feet below finish grade), FEMA flood zone(s), excessive ground settlement due to subsidence or other geological factors, and hilly and/or rocky terrain requiring substantial grading effort.
6. Unit costs also assume that the site can be drained via customary storm water drainage infrastructure (i.e., without pump or lift stations) and not require on-site percolation basins. Costs assume including implementing Storm Water Pollution and Prevention (SWPP) and SPCC oil containment system(s).
7. Unit cost does not include any remedial work for impact on neighboring properties.
8. Unit costs assume that the on-site existing soil is adequate for engineered fill and can be reused on-site to achieve a balanced cut-fill earthwork volume. Costs do not assume removal of hazardous material or site remediation.
9. Unit costs do not assume extensive permitting effort.
10. If the installation of the Q946 Northern Orchard 230kV BAAH on the Midway – Wheeler Ridge #1 and #2 230kV Lines is withheld or postponed, then the scope of work at Q946 Switching Station will apply to Q1000.
11. The following ongoing PG&E projects are ahead of this study (Q1000). It is assumed that these projects will proceed to implementation ahead of Q1000. If this assumption becomes incorrect, portions of this study (Q1000) will need to be re-evaluated. The PG&E projects include:
    - At Midway Substation:
        i. There are over 40 ongoing projects at Midway Substation. While these existing projects may affect clearance availability, it is assumed that none of the existing projects will impact the scope for this study, Q1000.
    - At Wheeler Ridge Substation:
        i. JO 30610259 – 230/115kV Cap Bank & BAAH
        ii. JO 30769350 – 230kV MPAC

12. There are no other ongoing Interconnection Studies which would potentially affect the upgrades assigned to Q1000 in this document. However, the Cluster 1 & 2 Mitigation requires a partial conversion of the 230kV bus at Midway Substation to install current-limiting reactors. The line relay upgrades required in this study will need to be coordinated with the Mitigation work.

13. Breaker overstress will be determined in a report covering all studies in Cluster 6.

14. The Projected Work Durations are dependent upon the following:
    - Clearances being available as required
    - Getting leased lines from Telco, on which PG&E has no schedule control
    - Permitting being completed in parallel with Engineering. The schedule may be modified at the Interconnection Agreement stage to incorporate any non-parallel path permit durations in the total timeframe.
    - PG&E Construction has not reviewed this study to provide concurrence for these durations.

Transmission Line Estimate Assumptions:

1. This cost estimate has not been based on any field walkdown or feedback from general construction. It is assumed that there are no field-installation issues with the proposed structure locations.
2. This cost estimate does not include any costs associated with permitting, environmental costs, TES, biological costs or any land or right-of-way acquisition.
3. This cost estimate is based on standard auger-type foundations. If soil conditions require the use of pile foundations, cost may increase.
4. This cost estimate does not include handling or disposal of hazardous material or soil contamination found at the site locations.
5. This cost estimate does not include removal fees for existing lines.
6. This cost estimate assumes adequate space will be available for construction equipment during installation of new structures.
7. This cost estimate does not include any costs associated with possible required reconductoring due to generator overload of existing facilities, as they have not been identified at this point.

ISTS Assumptions:

1. The Developer is responsible for all communication circuits terminating at the Developer's Gen-Site.
2. ISTS scope is at a high level. The upgrades required are based on the Preliminary Protection Requirements (PPR). Site visits are not conducted in Phase 1 studies.
3. ISTS scope assumes T1 communication circuits. The Developer may select alternative mediums as outlined in the Transmission Interconnection Handbook (TIH), however, the PG&E cost may need to adjust.