DOCKETED	
Docket Number:	21-AFC-01
Project Title:	Pecho Energy Storage Center
TN #:	240712-28
Document Title:	Pecho Energy Center's Application for Certification-Appendix 3A Phase 1
Description:	N/A
Filer:	Chester Hong
Organization:	Golder
Submitter Role:	Applicant Consultant
Submission Date:	11/23/2021 4:49:00 PM
Docketed Date:	11/23/2021

APPENDIX 3A

Phase I Interconnection Study Documents

INTERCONNECT STUDY AGREEMENT

California ISO

CLUSTER
MINIMUM REQUIREMENTS FOR AN INTERCONNECTION REQUEST (IR) APPLICATION:

All elements listed below must be submitted by the close of a cluster window for a project to qualify to be validated. **IRs that do not meet this criteria by the close of the cluster window will be deemed incomplete with no opportunity to cure and will not be included in the cluster study**.

☒ 1. $150,000 Interconnection Study Deposit

☒ 2. Completed Appendix 1 (Interconnection Request - attached)

☒ 3. Completed Attachment A to Appendix 1 (Generator Technical Data – Excel):

- ☒ **Technical Data Tab:** Must contain no errors and all warnings must be explained
- ☒ **IR Validation and Comments Tab:** Column A must be filled in the "Yes" or "N/A" on all items

☒ 4. Evidence of Site Exclusivity or Deposit in Lieu of Site Exclusivity

☒ 5. Load Flow Model (.epc)

☒ 6. Dynamic Model (.dyd)

☒ 7. Reactive Power capability document

☒ 8. Site Drawing

☒ 9. Single Line Diagram

☒ 10. Plot showing flat run and bump test (fault at bus and clear after 4-6 cycles) from PSLF (screenshot okay)

☒ 11. Plot showing requested MW at POI from PSLF (screenshot okay)

California ISO

Appendix 1 Interconnection Request
INTERCONNECTION REQUEST

NO HARD COPY REQUIRED FOR INTERCONNECTION REQUESTS SUBMITTED ELECTRONICALLY VIA RIMS

Provide **one hard copy** of this completed form pursuant to Section 7 of this Appendix 1 below for non-electronic submissions.

1. The undersigned Interconnection Customer submits this request to interconnect its Generating Facility with the CAISO Controlled Grid pursuant to the CAISO Tariff (**check only one**):
   - ☒ Queue Cluster Process.
   - ☐ Deliverability from Non-Participating TOs pursuant to GIDAP Section 9.4.

2. This Interconnection Request is for (**check only one**):
   - ☒ A proposed new Generating Facility.
   - ☐ An increase in the generating capacity, repowering, or a Material Modification to an existing Generating Facility.

3. Requested Deliverability Statuses are:

   On-Peak (for purposes of Net Qualifying Capacity) (**check one**):
   - ☒ Full Capacity
   - ☐ Partial Deliverability for ☐ % of electrical output
   - ☐ Energy Only

   Off-Peak Deliverability Status for Solar and Wind Projects (**check one**):
   - ☐ Off-Peak Deliverability
   - ☐ Economic Only

   Comments: ☐

4. The Interconnection Customer provides the following information:

   a. Address or location, including the county, of the proposed new Generating Facility site or, in the case of an existing Generating Facility, the name and specific location, including the county, of the existing Generating Facility;

   Project Name: **Pecho Energy Storage**

   Project Location:

   Street Address: **Teresa Dr.**

   City: **n/a**

   County: **San Luis Obispo**

   State: **CA**

   Zip Code: **93442**

GPS Coordinates (**decimal format**):

Latitude: **35.370369** Longitude: **-120.828165**

b. Provide the following project megawatt values.
- **If project is an increase to an existing project, provide values based on the MW increase only**.

Total Generating Facility Gross Capacity: **770MVA**
This value equals the total installed MW capacity at unity power factor

Total Generating Facility Gross Output: **511.6MW**
Gross output achieving desired net MW at POI described below

Generating Facility Auxiliary Load: **9.58MW**

Maximum Net Megawatt Electrical Output: **502.02 MW***
*This is for a **proposed new Generating Facility**, Total Generating Facility Gross Output less Generating Facility Auxiliary Load*

OR

Net Megawatt increase: ____ **MW****
*This is for an **increase or Material Modification to an existing Generating Facility**, Total Generating Facility Gross Output less Generating Facility Auxiliary Load*

Anticipated losses between the Generating Facility and POI: **2.02MW**
Include all transformer and line losses between the generating units and the POI

Requested Interconnection Service Capacity (Desired Net MW at POI) **500MW**
Maximum Net Megawatt Electrical Output less Anticipated Losses
This MW value is the basis for delineation between large (>20 MW) and small projects (≤20 MW), and the pro rata basis for cost allocations of Reliability Network Upgrades (RNUs) except short circuit related RNUs in the Cluster Phase I and Phase II interconnection studies. This is the value that will appear in the ISO Generation Interconnection Queue Report. Your TP Deliverability Allocations will not be able to exceed this value.

Provide a description of any automatic control scheme which will be installed to ensure that the Requested Interconnection Service Capacity does not exceed the above desired value.
A plant controller will be installed to limit the output of the project at the POI to no more than 500 MW.

c. Type of project (i.e., gas turbine, hydro, wind, etc.) and general description of the equipment configuration (if more than one type is chosen include **gross** installed **MW for each**).
- **If project is an increase to an existing project, provide values based on the MW increase only**.

☐ Cogeneration	Select Fuel Type	____ (MW)
☐ Combined Cycle	Select Fuel Type	____ (MW)
☐ Fuel Cell	Select Fuel Type	____ (MW)
☐ Gas Turbine		____ (MW)
☐ Hydro		____ (MW)
☐ Photovoltaic		____ (MW)

☐ Reciprocating Engine	Select Fuel Type	(MW)
☐ Solar Thermal		(MW)
☐ Steam Turbine	Select Fuel Type	(MW)
	If more than one: Select Fuel Type	(MW)
☐ Wind Turbine		(MW)
☒ Storage	Battery **108** (MW)	
☒ Other (please describe):		**520** (MW)

Generator Type: Storage Fuel Type: Other

Comments:

General description of the equipment configuration (e.g. number, size, type, etc):
Generation consists of 10 65 MVA 0.8 p.f. machines powered by compressed air. Compression is achieved through 10 separate machines of similar size operated as compressor motors. A 120 MVA, 108 MW Battery Energy Storage System will also be installed on site. A plant controller will limit output of the plant to 500 MW at the POI.

d. Proposed In-Service Date (first date transmission is needed to the facility), Trial Operation Commencement date and Commercial Operation Date in MM/DD/YYYY format and term of service (**dates must be sequential, proposed Commercial Operation Date may not be more than seven (7) years from date of application**):

	(MM/DD/YYYY)
Proposed In-Service Date:	**01/01/2023**
Proposed Trial Operation Commencement Date:	**03/01/2023**
Proposed Commercial Operation Date:	**06/01/2023**
Proposed Term of Service (years):	**30**

e. Name, address, telephone number, and e-mail address of the Interconnection Customer's contact person (primary person who will be contacted);

First Name:	**Tri**
Last Name:	**Luu**
Title:	**Senior Manager, Business Development**
Company Name:	**Hydrostor Inc.**
Street Address:	**365 Bay Street, Suite 300**

City: **Toronto, Ontario, Canada**

State: **CA**

Zip Code: **00000**

Phone Number: **416-417-2000**

Fax Number: **N/A**

Email Address: **tri.luu@hydrostor.ca**

f. Approximate location of the proposed Point of Interconnection (i.e., specify transmission facility interconnection point name, voltage level, and the location of interconnection);

Substation or Transmission Line Name: **Morro Bay Switching Station** Voltage Level: **230 kV**

g. Interconnection Customer data (set forth in Attachment A)

The Interconnection Customer shall provide to the CAISO the technical data called for in GIDAP Appendix 1, Attachment A (link: http://www.caiso.com/PublishedDocuments/GeneratingFacilityData-AttachmentAtoAppendix1.xlsm)

5. Applicable deposit amount made payable to California ISO. Send check or wire funds to CAISO (see section 7 for details) along with the:
   a. Interconnection Request for processing.
   b. Attachment A (Interconnection Request Generating Facility Data).

6. Evidence of Site Exclusivity as specified in the GIDAP and name(s), address(es) and contact information of site owner(s) (check one):

☐ Is attached to this Interconnection Request

If attaching evidence of Site Exclusivity, please answer the following:

a. Type of Site Exclusivity Provided:
   (Note that letters of intent or similar agreements are not acceptable as proof of Site Exclusivity)
   - ☐ Proof of Ownership (Deed)
   - ☐ Lease Agreement
   - ☐ Option to Purchase
   - ☐ Option to Lease
   - ☐ Other? Please Explain

b. Is Site Exclusivity granted to the Interconnection Customer (i.e. to the same entity with the same name) identified in Section 9 of this Interconnection Request?
   - ☐ Yes
   - ☐ No
   - ☐ If No, please explain relationship between entities:

c. Term of Agreement? Including agreement effective upon and execution of option (If applicable)? Years

d. Term of Option, including renewals? (If applicable) Years

e. Acreage acquired or reserved for project site?

☒ Deposit in lieu of Site Exclusivity via check or Fed Wire, Site Exclusivity will be provided at a later date in accordance with this GIDAP

7. This Interconnection Request shall be submitted to the CAISO via https://rimspub.caiso.com/rims5/logon.do.

California ISO
Attn: Grid Assets
P.O. Box 639014
Folsom, CA 95763-9014

OR

Overnight address:
California ISO
Attn: Grid Assets
250 Outcropping Way
Folsom, CA 95630

Deposit can be made via Fed Wire transfer, ACH or check. Please be sure and reference the project name in the notes area of wire transfer or check for easy matching. Wiring information:

Wells Fargo Bank (LGIP)
ABA 121000248
Acct 4122041825
Federal Tax ID # 94-3274043

CAISO is a Corporation.
Funds must be received no later than close of cluster window for cluster projects.

8. Representative of the Interconnection Customer to contact:

[To be completed by the Interconnection Customer]

First Name:	**Tri**
Last Name:	**Luu**
Title:	**Senior Manager, Business Development**
Company Name:	**Hydrostor Inc.**
Street Address:	**365 Bay Street, Suite 300**
City:	**Toronto, Ontario, Canada**
State:	**CA**
Zip Code:	**00000**
Phone Number:	**416-417-2000**
Fax Number:	**N/A**
Email Address:	**tri.luu@hydrostor.ca**

9. This Interconnection Request is submitted by:

Legal name of the Interconnection Customer: **Hydrostor A-CAES USA Inc.**
(Punctuation and spelling of Legal name must match Secretary of State document exactly)

State of Origin for Secretary of State Document: **DE**

Name of Parent Company (if applicable): **Hydrostor Inc.**

☒ ***By executing this Interconnection Request, Interconnection Customer hereby consents to CAISO's disclosure of its confidential information during the evaluation of this request to those Affected Systems who have entered into an***

appropriate non-disclosure agreement with CAISO and pursuant to Appendix DD of the CAISO Tariff, including Sections 3.7 and 15.1.2.

☒ ***Your electronic signature below indicates your agreement with the following statement: By typing my name in the following line and clicking on the submission box below, the Interconnection Customer identified above certifies that the information contained in this Interconnection Request and Generator Interconnection Study Process Agreement for Queue Clusters is true and correct to the best of its knowledge. The Generator Interconnection Study Process Agreement for Queue Clusters becomes effective upon submittal of this form to the CAISO.***

First Name:	**Curtis**
Last Name:	**VanWalleghem**
Title:	**CEO**
Date (MM/DD/YYYY):	**04/15/2020**

Upload the following items using the document type of "Other":

- ***The Generating Facility Data (Attachment A to Appendix 1) is a separate Excel file (.xlsm) and is a required element of a project's Interconnection Request submission. Link:*** **http://www.caiso.com/PublishedDocuments/GeneratingFacilityData-AttachmentAtoAppendix1.xlsm**
- ***Secretary of State Certification for the Interconnection Customer***
- ***Proof that signatory is an authorized representative of the Interconnection Customer***

GENERATOR INTERCONNECTION STUDY PROCESS AGREEMENT FOR QUEUE CLUSTERS

THIS AGREEMENT is made and entered into this **15** day of **April**, 20**20** by and between **Hydrostor A-CAES USA Inc.**, a **corporation** organized and existing under the laws of the State of **DE**, ("Interconnection Customer") and the California Independent System Operator Corporation, a California nonprofit public benefit corporation existing under the laws of the State of California, ("CAISO"). The Interconnection Customer and the CAISO each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Generating Facility or generating capacity addition to an existing Generating Facility consistent with the Interconnection Request submitted by the Interconnection Customer dated **04/15/2020**; and

WHEREAS, the Interconnection Customer desires to interconnect the Generating Facility with the CAISO Controlled Grid pursuant to Appendix DD to the CAISO Tariff; and

WHEREAS, the Interconnection Customer has requested the CAISO to conduct or cause to be performed Interconnection Studies to assess the system impact of interconnecting the Generating Facility to the CAISO Controlled Grid and to specify and estimate the cost of the equipment, engineering, procurement and construction work needed on the Participating TO's electric system in accordance with Good Utility Practice to physically and electrically connect the Generating Facility to the CAISO Controlled Grid;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in the CAISO's FERC-approved Generation Interconnection and Deliverability Allocation Procedures in CAISO Tariff Appendix DD "GIDAP" or the Master Definitions Supplement, Appendix A to the CAISO Tariff, as applicable.

2.0 The Interconnection Customer elects and the CAISO shall conduct or cause to be performed Interconnection Studies, including any accelerated Interconnection Study, in accordance with the CAISO Tariff.

3.0 The scope of the Interconnection Studies shall be subject to the assumptions set forth in Appendices A and B to this Agreement.

4.0 The Interconnection Studies will be based upon the technical information provided by the Interconnection Customer in the Interconnection Request, as may be modified under the CAISO Tariff. The CAISO reserves the right to request additional technical information from the Interconnection Customer as may reasonably become necessary consistent with Good Utility Practice during the course of the Interconnection Studies.

5.0 [NOT USED]

6.0 Consistent with the GIDAP and CAISO Tariff, the Interconnection Customer will provide deposits and pay its share of actual costs of applicable studies, including in excess of provided deposits. The CAISO and Participating TO will provide invoices and refunds on a timely basis required by the GIDAP and the CAISO Tariff.

Following the issuance of an Interconnection Study report, the CAISO shall charge and the Interconnection Customer shall pay its share of the actual costs of the Interconnection Study pursuant to Section 3.5.1 of the GIDAP.

Any difference between the deposits made toward the Interconnection Study process and associated administrative costs, including any accelerated studies, and the actual cost of the Interconnection Studies and associated administrative costs shall be paid by or refunded to the Interconnection Customer, in the appropriate allocation, in accordance with Section 3.5.1 of the GIDAP.

7.0 Pursuant to Section 3.7 of the GIDAP, the CAISO will coordinate the conduct of any studies required to determine the impact of the Interconnection Request on Affected Systems. The CAISO may provide a copy of the Interconnection Studies or other assessments to an Affected System Operator and the Western Electricity Coordinating Council. Requests for review and input from Affected System Operators or the Western Electricity Coordinating Council may arrive at any time prior to interconnection.

8.0 Substantial portions of technical data and assumptions used to perform the Phase I Interconnection Study, such as system conditions, existing and planned generation, and unit modeling, may change after the CAISO provides the Interconnection Study results to the Interconnection Customer. Interconnection Study results will reflect available data at the time the CAISO provides the Phase I Interconnection Study report to the Interconnection Customer. The CAISO shall not be responsible for any additional costs, including, without limitation, costs of new or additional facilities, system upgrades, or schedule changes, that may be incurred by the Interconnection Customer as a result of changes in such data and assumptions.

9.0 [NOT USED]

10.0 The CAISO and Participating TO(s) shall maintain records and accounts of all costs incurred in performing the Interconnection Study in sufficient detail to allow verification of all costs incurred, including associated overheads. The Interconnection Customer shall have the right, upon reasonable notice, within a reasonable time at the CAISO's offices and at its own expense, to audit the CAISO's records as necessary and as appropriate in order to verify costs incurred by the CAISO. Any audit requested by the Interconnection Customer shall be completed, and written notice of any audit dispute provided to the CAISO representative, within one hundred eighty (180) calendar days following receipt by the Interconnection Customer of the CAISO's notification of the final costs of the Interconnection Study.

11.0 In accordance with Section 3.8 of the GIDAP, the Interconnection Customer may withdraw its Interconnection Request at any time by written notice to the CAISO. Upon receipt of such notice, this Agreement shall terminate, subject to the requirements of Section 3.5.1 and 11.4 of the GIDAP.

12.0 This Agreement shall become effective upon submission to the CAISO. If the CAISO does not receive the executed Agreement and deposit or other Interconnection Financial Security pursuant to Section 3.5.1 of the GIDAP from the Interconnection Customer, then the Interconnection Request will be deemed withdrawn upon the Interconnection Customer's receipt of written notice by the CAISO pursuant to Section 3.8 of the GIDAP.

13.0 Miscellaneous.

13.1 Dispute Resolution. Any dispute, or assertion of a claim, arising out of or in connection with this Agreement, shall be resolved in accordance with Section 15.5 of the GIDAP.

13.2 Confidentiality. Confidential Information shall be treated in accordance with Section 15.1 of the GIDAP.

13.3 Binding Effect. This Agreement and the rights and obligations hereof, shall be binding upon and shall inure to the benefit of the successors and assigns of the Parties hereto.

13.4 Conflicts. In the event of a conflict between the body of this Agreement and any attachment, appendices or exhibits hereto, the terms and provisions of the body of this Agreement shall prevail and be deemed the final intent of the Parties.

13.5 Rules of Interpretation. This Agreement, unless a clear contrary intention appears, shall be construed and interpreted as follows: (1) the singular number includes the plural number and vice versa; (2) reference to any person includes such person's successors and assigns but, in the case of a Party, only if such successors and assigns are permitted by this Agreement, and reference to a person in a particular capacity excludes such person in any other capacity or individually; (3) reference to any agreement (including this Agreement), document, instrument or tariff means such agreement, document, instrument, or tariff as amended or modified and in effect from time to time in accordance with the terms thereof and, if applicable, the terms hereof; (4) reference to any applicable laws and regulations means such applicable laws and regulations as amended, modified, codified, or reenacted, in whole or in part, and in effect from time to time, including, if applicable, rules and regulations promulgated thereunder; (5) unless expressly stated otherwise, reference to any Article, Section or Appendix means such Article or Section of this Agreement or such Appendix to this Agreement, or such Section of the GIDAP or such Appendix to the GIDAP, as the case may be; (6) "hereunder", "hereof", "herein", "hereto" and words of similar import shall be deemed references to this Agreement as a whole and not to any particular Article, Section, or other provision hereof or thereof; (7) "including" (and with correlative meaning "include") means including without limiting the generality of any description preceding such term; and (8) relative to the determination of any period of time, "from" means "from and including", "to" means "to but excluding" and "through" means "through and including".

13.6 Entire Agreement. This Agreement, including all Appendices and Schedules attached hereto, constitutes the entire agreement between the Parties with reference to the subject matter hereof, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement. There are no other agreements, representations, warranties, or covenants which constitute any part of the consideration for, or any condition to, any Party's compliance with its obligations under this Agreement.

13.7 No Third Party Beneficiaries. This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

13.8 Waiver. The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by the Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the

Participating TO or CAISO. Any waiver of this Agreement shall, if requested, be provided in writing.

Any waivers at any time by any Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.

13.9 Headings. The descriptive headings of the various Articles and Sections of this Agreement have been inserted for convenience of reference only and are of no significance in the interpretation or construction of this Agreement.

13.10 [NOT USED]

13.11 Amendment. The Parties may by mutual agreement amend this Agreement by a written instrument duly executed by both of the Parties.

13.12 Modification by the Parties. The Parties may by mutual agreement amend the Appendices to this Agreement by a written instrument duly executed by both of the Parties. Such amendment shall become effective and a part of this Agreement upon satisfaction of all applicable laws and regulations.

13.13 Reservation of Rights. The CAISO shall have the right to make a unilateral filing with FERC to modify this Agreement with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation under section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder, and Interconnection Customer shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to section 206 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by another Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under sections 205 or 206 of the Federal Power Act and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

13.14 No Partnership. This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon any Party. No Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, another Party.

13.15 Assignment. This Agreement may be assigned by a Party only with the written consent of the other Party; provided that a Party may assign this Agreement without the consent of the other Party to any Affiliate of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement; and provided further that the Interconnection Customer shall have the right to assign this Agreement, without the consent of the other Party, for collateral security purposes to aid in providing financing for the Generating Facility, provided that the Interconnection Customer will require any secured party, trustee or mortgagee to notify the other Party of any such assignment. Any financing arrangement entered into by the Interconnection Customer pursuant to this Section will provide that prior to or upon the exercise of the secured party's, trustee's or mortgagee's

assignment rights pursuant to said arrangement, the secured creditor, the trustee or mortgagee will notify the other Party of the date and particulars of any such exercise of assignment right(s). Any attempted assignment that violates this Section is void and ineffective. Any assignment under this Agreement shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof. Where required, consent to assignment will not be unreasonably withheld, conditioned or delayed.

[Signature moved to Interconnection Request section for online submissions]

IN WITNESS THEREOF, the Party has caused this Agreement to be duly executed by its duly authorized officers or agents on the day and year first above written.

Interconnection Customer:_____

By:_____

Printed Name:_____

Title:

Date:_____

Appendix A

[NOT USED]

Appendix B

DATA FORM TO BE PROVIDED BY THE INTERCONNECTION CUSTOMER PRIOR TO COMMENCEMENT OF THE PHASE II INTERCONNECTION STUDY

Provide one copy of this completed form and other required plans and diagrams in accordance with Section 7 of the GIDAP.

Generating Facility name: _____ ISO Queue Position: _____

Project Megawatt Values:

Total Generating Facility Gross Output: _____ **MW**

Generating Facility Auxiliary Load: _____ **MW**

Maximum Net Megawatt Electrical Output: _____ **MW*** OR Net Megawatt increase: _____ **MW****

Total Generating Facility Output less Generating Facility Auxiliary Load
**This is for an increase or Material Modification to an existing Generating Facility*
**This is for a proposed new Generating Facility*

Anticipated losses between the Generating Facility and POI: _____ **MW**

Requested Interconnection Service Capacity (Desired Net MW at POI) _____ **MW**

Maximum Net Megawatt Electrical Output less Anticipated Losses
This MW value is the basis for delineation between large (>20 MW) and small projects (≤20 MW), and the pro rata basis for cost allocations of Reliability Network Upgrades (RNUs) except short circuit related RNUs in the Cluster Phase I and Phase II interconnection studies. This is the value that will appear in the ISO Generation Interconnection Queue Report. Your TP Deliverability Allocations will not be able to exceed this value.

Provide location plan and one-line diagram of the plant and station facilities. For staged projects, please indicate future generation, transmission circuits, etc.

One set of metering is required for each generation connection to the new bus or existing CAISO Controlled Grid station.
Number of generation connections: _____

On the one line indicate the generation capacity attached at each metering location. (Maximum load on CT/PT)

On the one line indicate the location of auxiliary power. (Minimum load on CT/PT)

Will an alternate source of auxiliary power be available during CT/PT maintenance?
_____ Yes _____ No

Will a transfer bus on the generation side of the metering require that each meter set be designed for the total plant generation? _____ Yes _____ No
(Please indicate on one line).

What type of control system or PLC will be located at the Interconnection Customer's Generating Facility?

_____

What protocol does the control system or PLC use? _____

Please provide a 7.5-minute quadrangle of the site. Sketch the plant, station, transmission line, and property line.

Physical dimensions of the proposed interconnection station: _____

Bus length from generation to interconnection station: _____

Line length from interconnection station to the Participating TO's transmission line: _____

Tower number observed in the field. (Painted on tower leg)*: _____

Number of third party easements required for transmission lines*: _____
* To be completed in coordination with the Participating TO or CAISO.

Is the Large Generating Facility in the Participating TO's service area?
_____ Yes _____ No

Local service provider for auxiliary and other power: _____

Please provide **achievable** schedule dates (format MM/DD/YYYY):

Environmental survey start: _____

Environmental impact report submittal: _____

Procurement of project equipment: _____

Begin Construction Date: _____

In-Service Date (ISD): _____

Trial Operation Date: _____

Commercial Operation Date (COD): _____

Note: ISD and COD must be achievable dates for the project. Tendering of the GIA is based on the following methodology:
The sum of (i) 180 calendar days and (ii) the estimated time to construct the Interconnection Facilities and Network Upgrades indicated in the applicable study report needed by this or any dependent project, prior to the In-Service Date.

Calculation:
ISD *(future date)*
- 120 CD *(GIA negotiation)*
- 60 CD *(for GIA execution and notice to proceed)*
- longest lead time facility or upgrade
= tender date for GIA *(must be no sooner than 1 month after the Phase II results meeting)*

On-Peak Deliverability Status: Choose one of the following:

_____ Energy Only

_____ Full Capacity

_____ Partial Deliverability for _____ % of electrical output

Off-Peak Deliverability Status: Choose one of the following:

_____ Off-Peak Deliverability

_____ Economic Only

Comments: _____

TP Deliverability (not applicable for Energy Only Deliverability Status): Choose one of the following:

_____ Option (A), which means that the Generating Facility requires TP Deliverability to be able to continue to commercial operation.

_____ Option (B), which means that the Interconnection Customer will continue to commercial operation without an allocation of TP Deliverability.

Comments:

_____

CAISO PHASE I INTERCONNECTION STUDY

February 12, 2021

Tri Luu
Hydrostor A-CAES USA, Inc.
365 Bay Street, Suite 300
Toronto, ON
Canada M5H 2V1

Dear Mr. Luu;

Re: Q1739 – Pecho Energy Storage Project
Cluster 13 Phase I Interconnection Study

Attached is the Cluster 13 Phase I Interconnection Study Report for the interconnection of the proposed Pecho Energy Storage 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 coordinated and scheduled within 30 calendar days following receipt of this Phase I Interconnection Study report.

Sincerely,

Binaya Shrestha
Manager, Regional Transmission – North

Attachment(s)

Cluster 13 Phase I

Attachment 1

Allocation of Network Upgrade Cost Estimates

Q1739

Table 1: C13P1 PG&E Kern Group Projects - Allocation of Network Upgrades for Cost Estimates

ID	Overloaded Facility Name	Upgrades	Upgrade Type	Needed For	Group	Flow Impact on Network Upgrade (MW)	Cost Allocation Factor		DFAX	Pre-Mit DFAX
					Gen ID		Total Flow Impact (MW)	Cost Share (%)		
C13P1-FLD02	Coalinga 1-Coalinga 2 70 kV Line (Tornado Jct-Pennzier Jct)	Re-conductorCoalinga 1-Coalinga 2 70 kV Line (Tornado Jct-Pennzier Jct) 3.3 miles with 1113 AAC	Delieverability	GATES D-13C1721SWST #1 230kV [0] & CALIFORNIA FLATS SW STA-GATES 230kV [5281] Lines w/ Carrizo RAS	1739	5.1	29.27	17.4239836	0.0102	0.0292
C13P1-FLD03	Gates-Jayne Sw Sta 70 kV Line	Re-conductor Gates-Jayne Sw Sta 70 kV Line 0.68 miles with 1113 AAC	Delieverability	GATES D-13C1721SWST #1 230kV [0] & CALIFORNIA FLATS SW STA-GATES 230kV [5281] Lines w/ Carrizo RAS	1739	5.25	29.315	17.90892035	0.0105	0.035
C13P1-FLD04	Jayne Sw Sta-Coalinga #1 70 kV Line (Jayne Sw Sta-Jacalito-Coalinga #1)	Re-conductor Jayne Sw Sta-Coalinga #1 70 kV Line (Jayne Sw Sta-Jacalito-Coalinga #1) 11.8 miles with 1113 AAC	Delieverability	GATES D-13C1721SWST #1 230kV [0] & CALIFORNIA FLATS SW STA-GATES 230kV [5281] Lines w/ Carrizo RAS	1739	5.25	29.315	17.90892035	0.0105	0.035

Note:

(1) Delivery Network Upgrades are shared based on the flow impact of each project on the Network Upgrade

(2) DFAX values less than 5% but greater than 2% indicate that the flow impact is greater than 5%

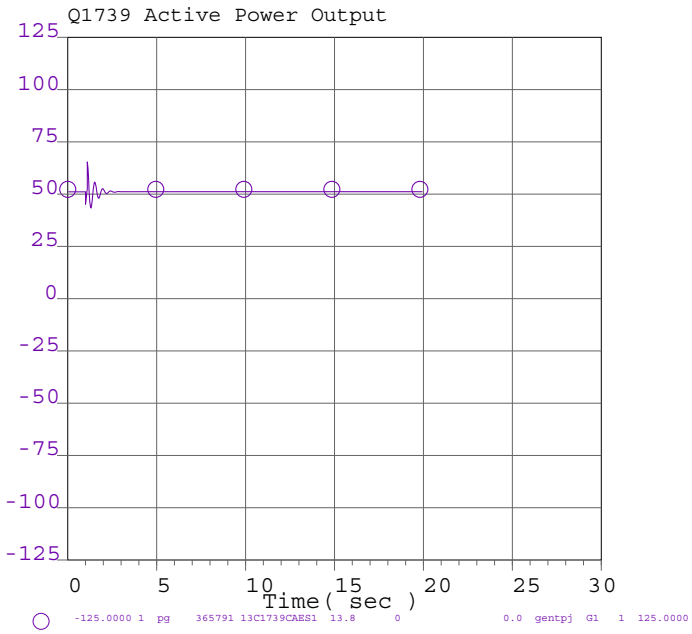
Cluster 13 Phase I

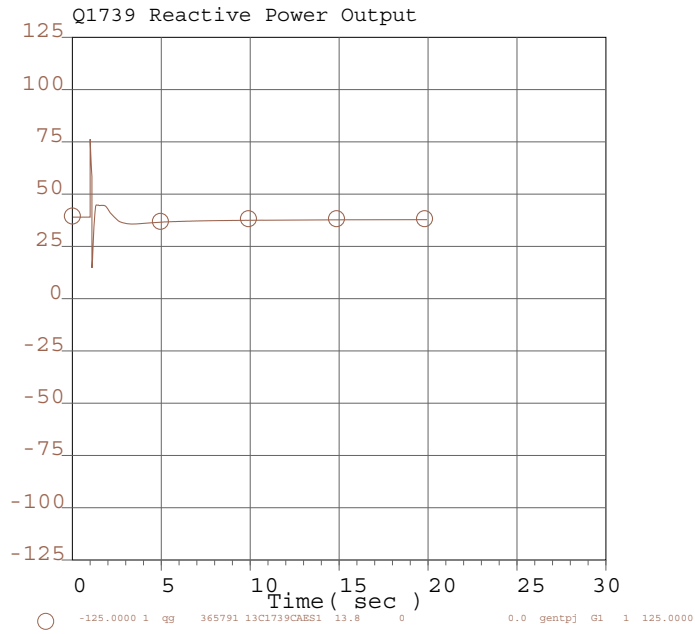
Attachment 7

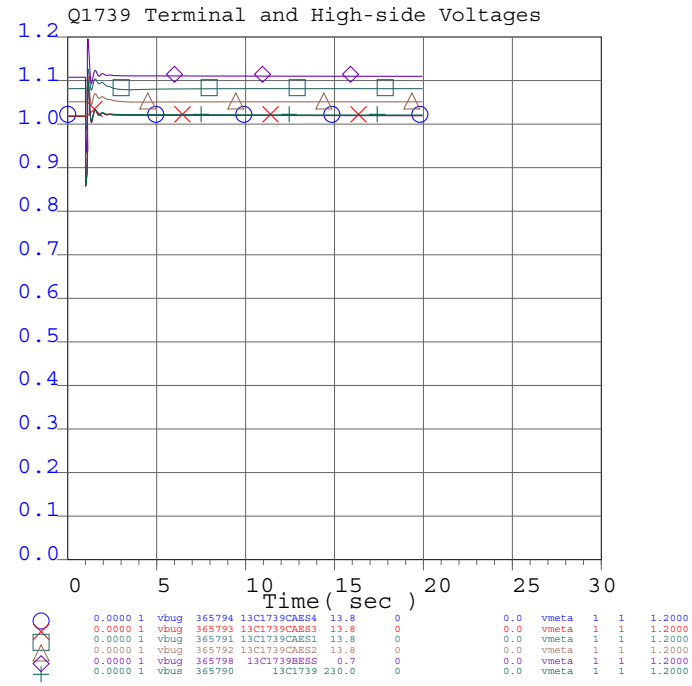
Transient Stability Plots

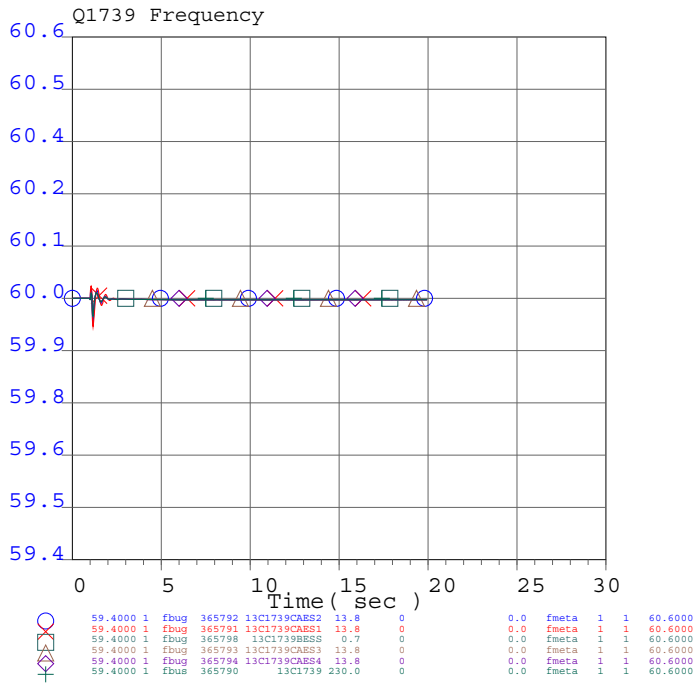
Confidential - Subject to Transmission Planning NDA

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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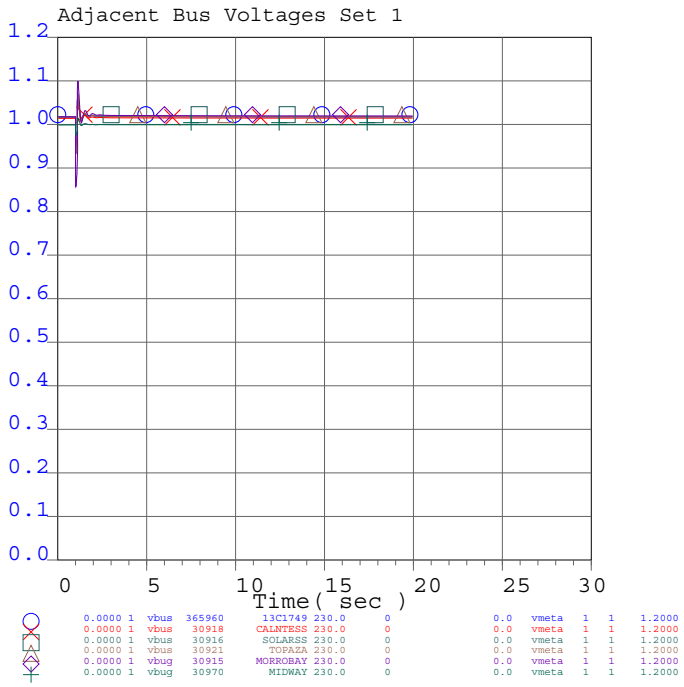

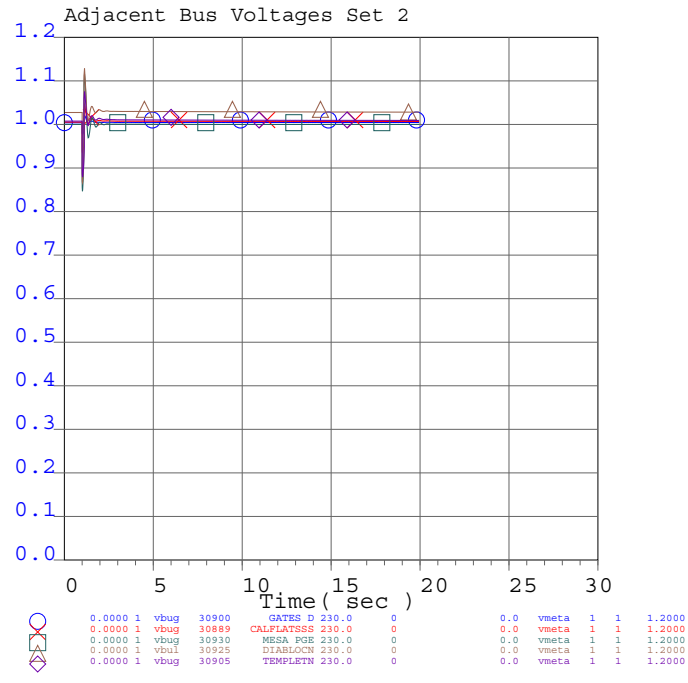

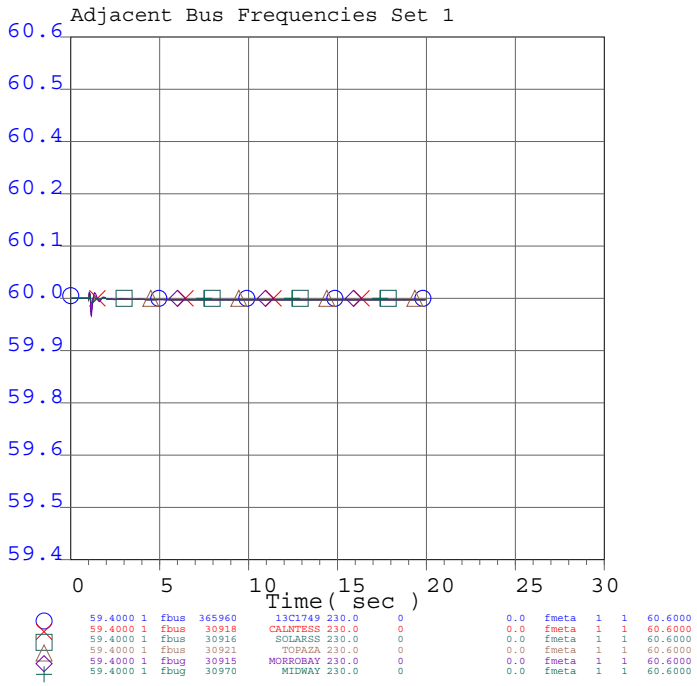

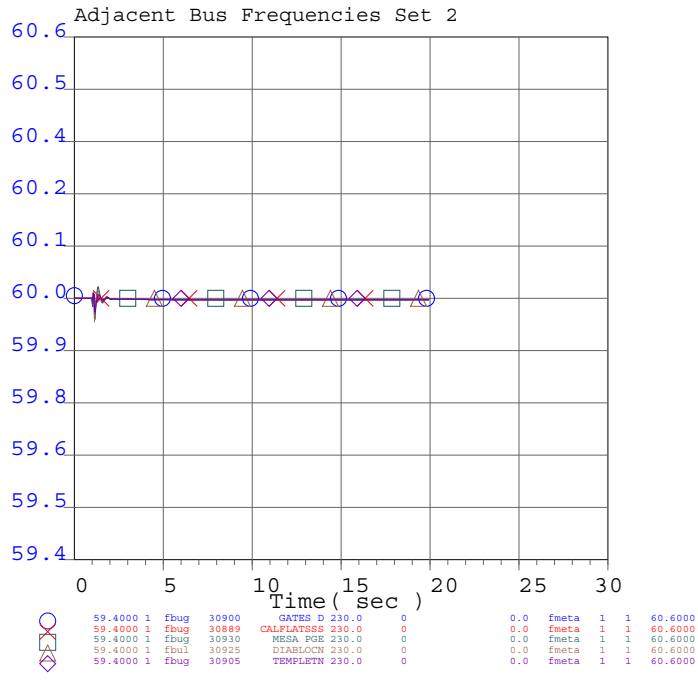

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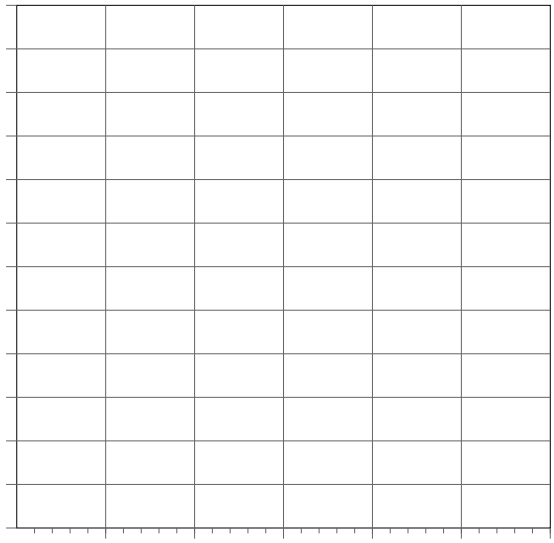
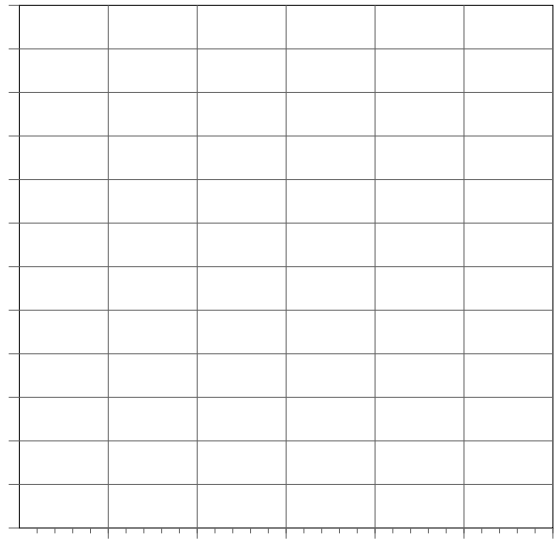
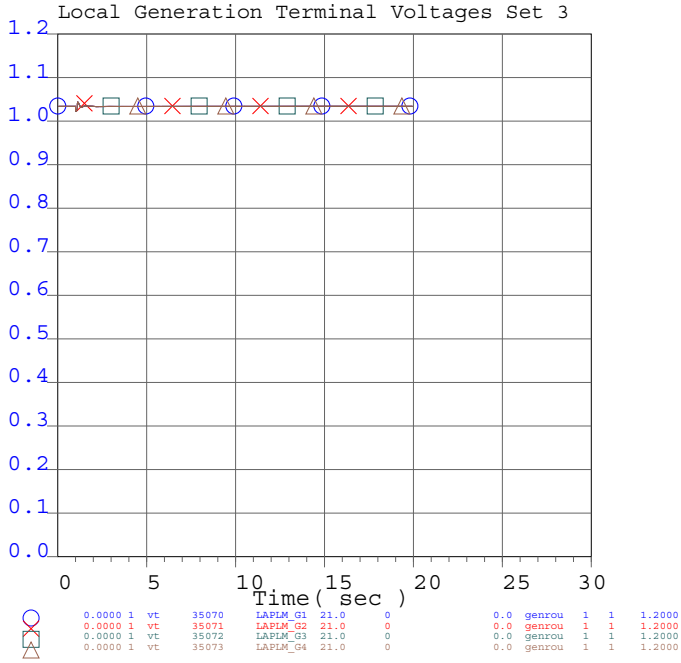
Local Generation Terminal Voltages Set 1



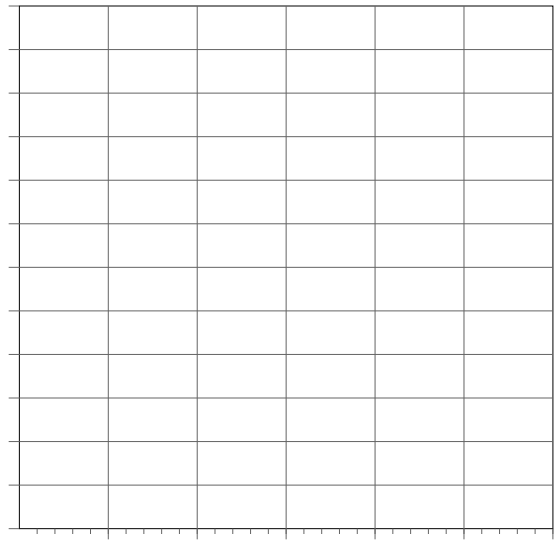
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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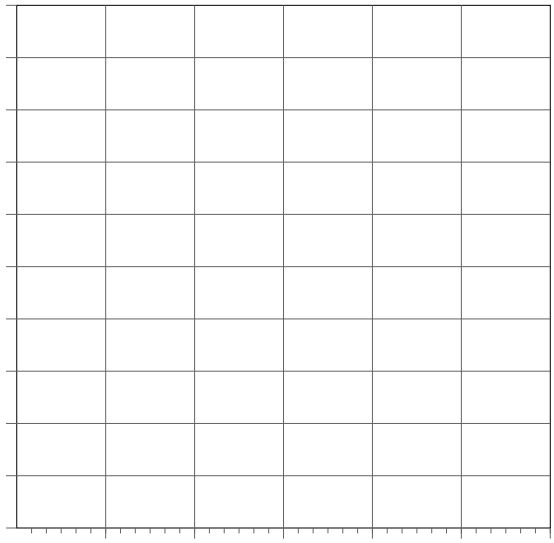
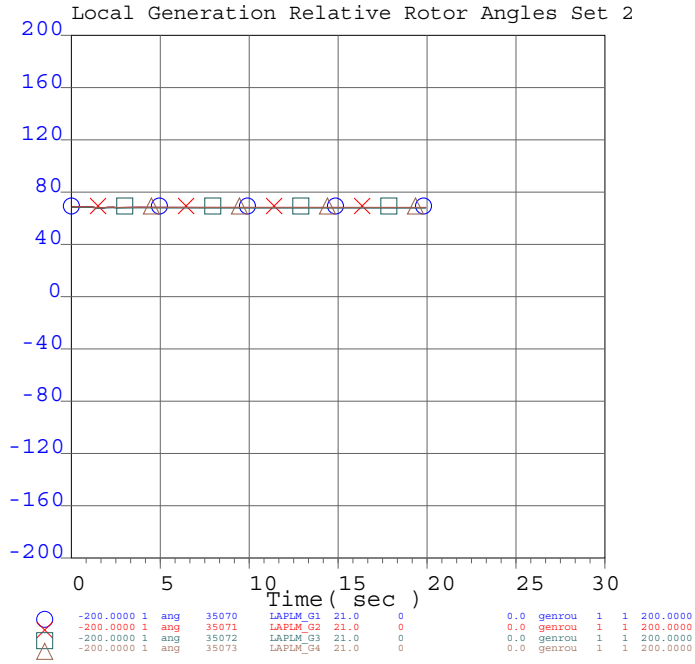
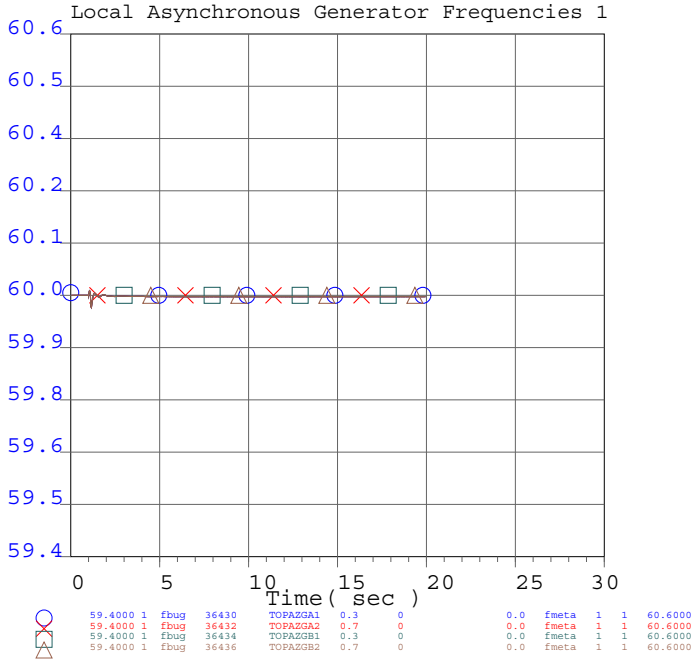
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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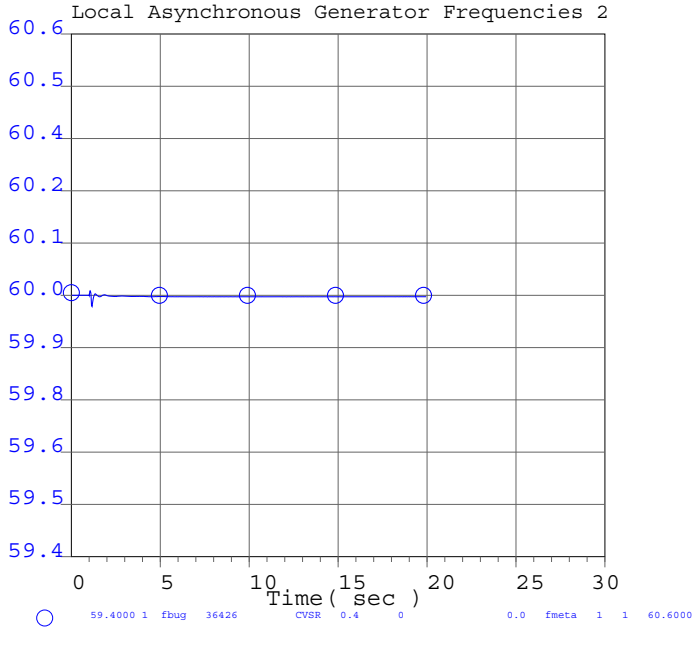

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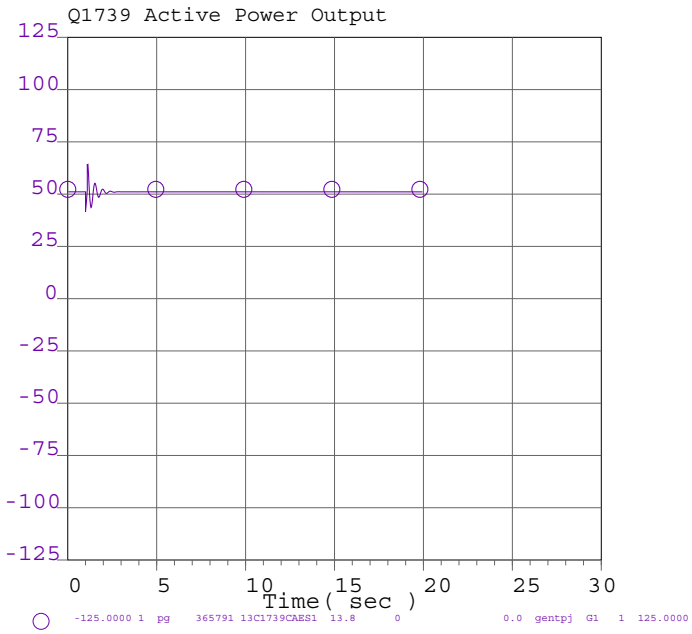
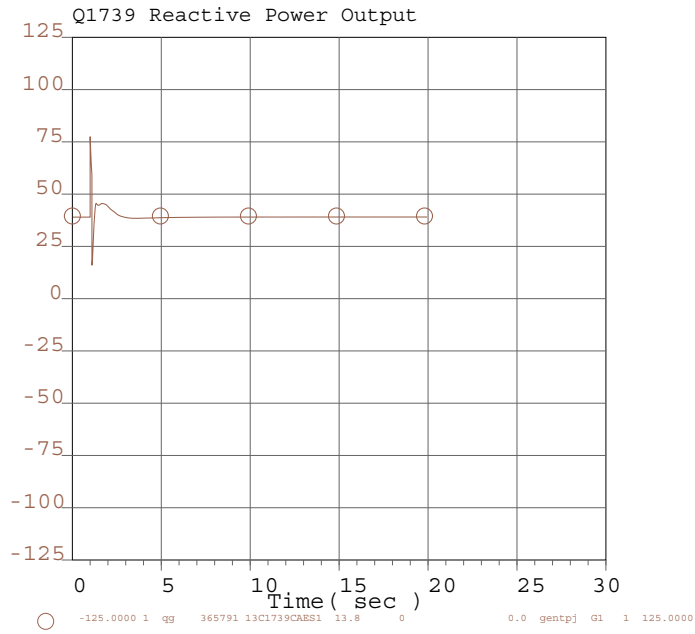
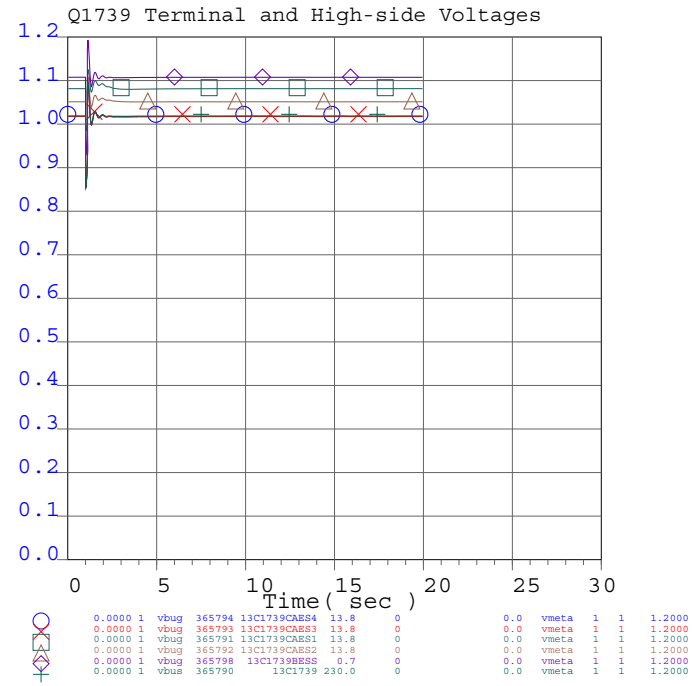
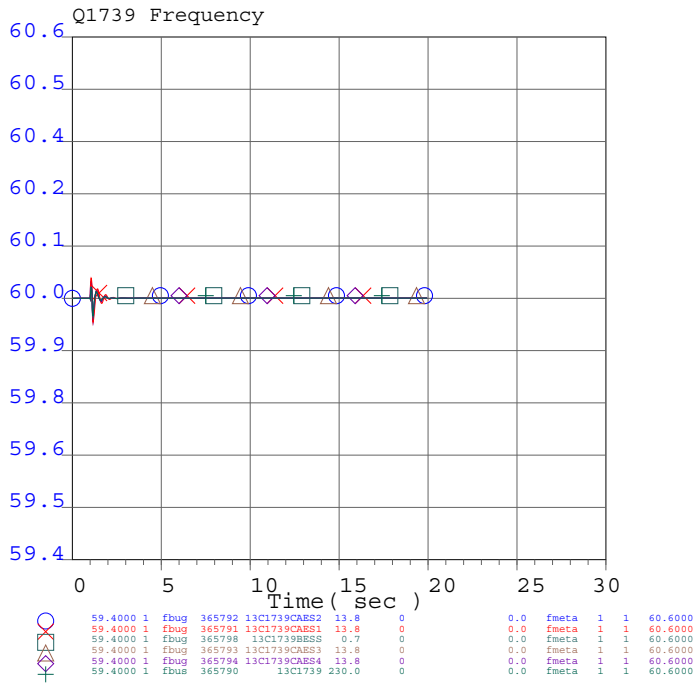
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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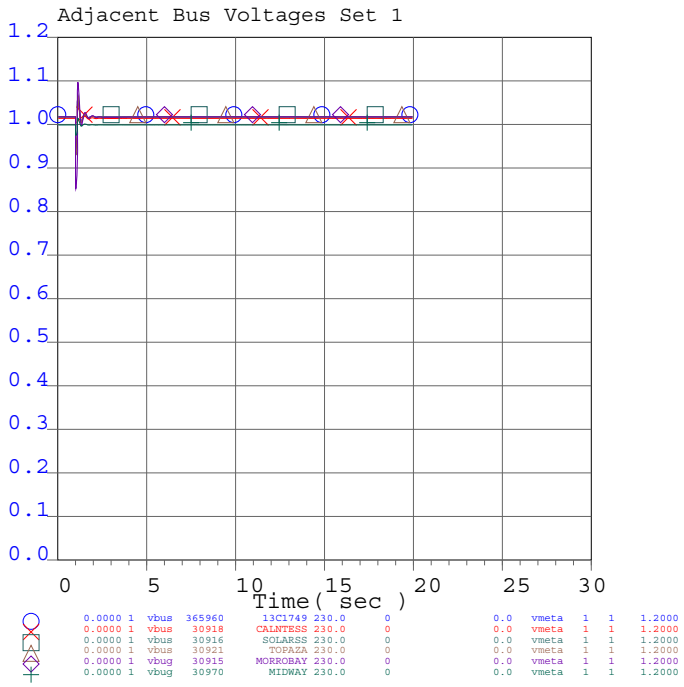

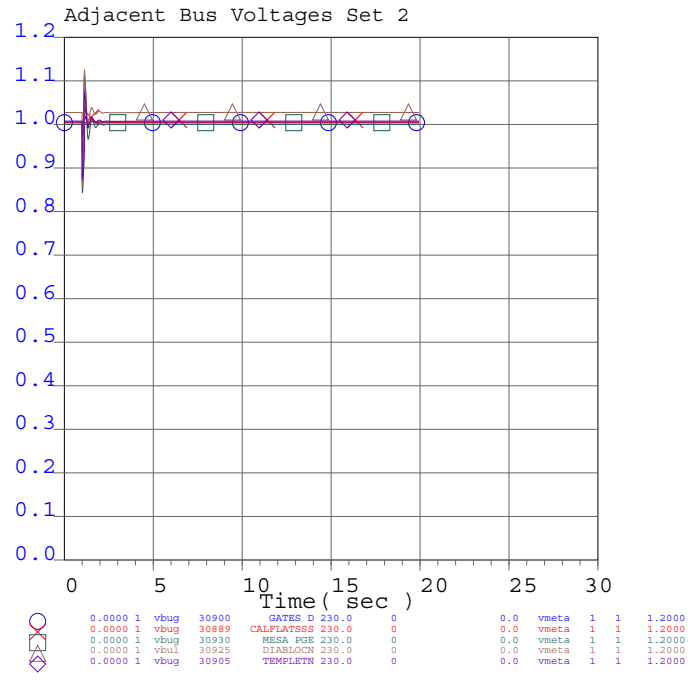

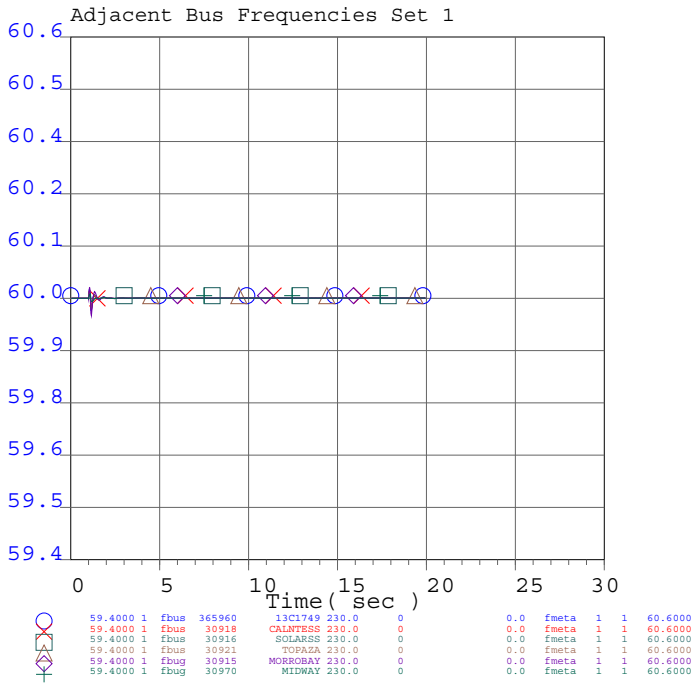

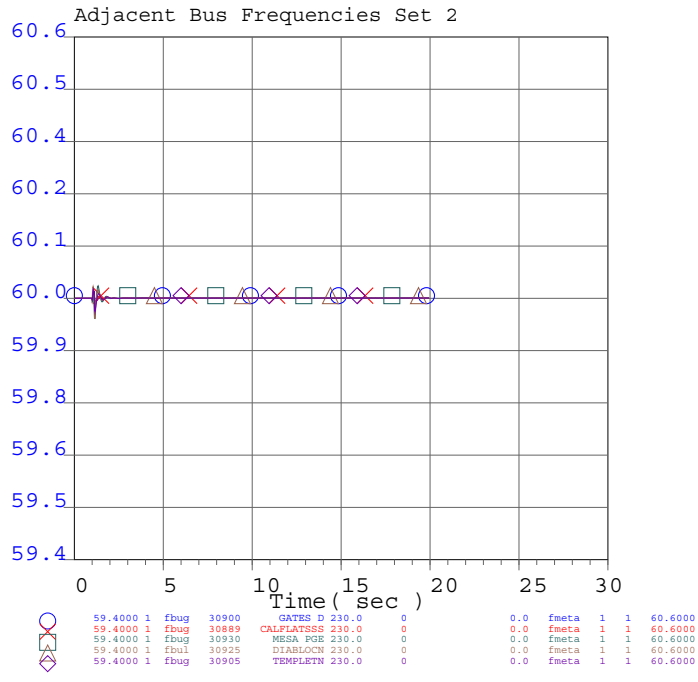

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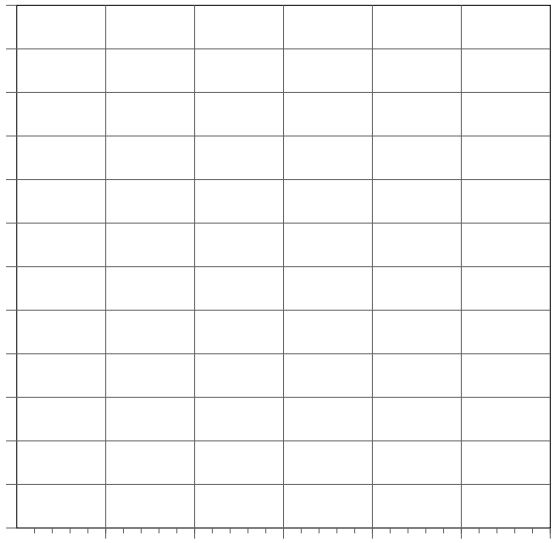
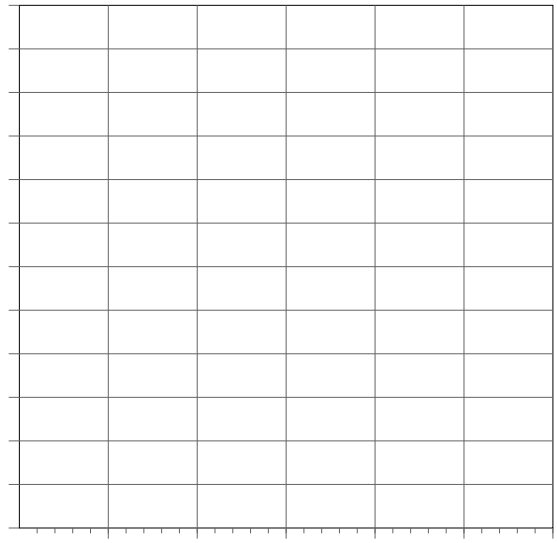
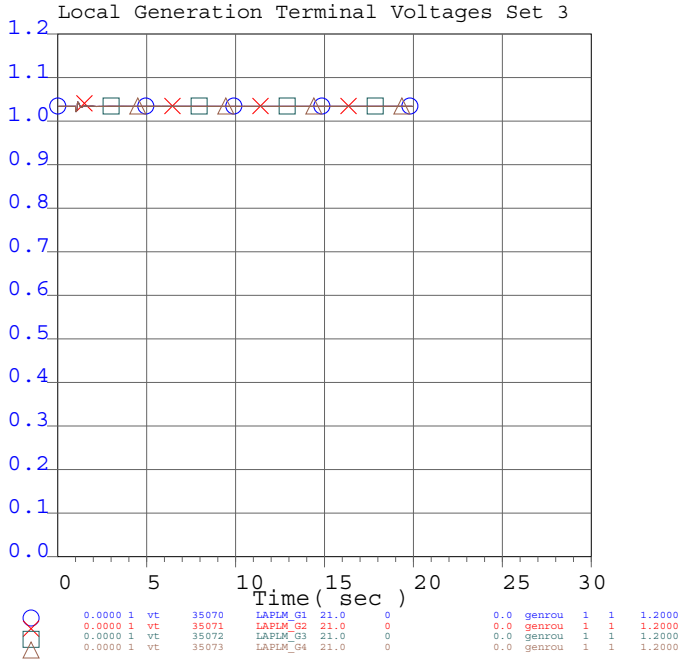
Local Generation Terminal Voltages Set 1



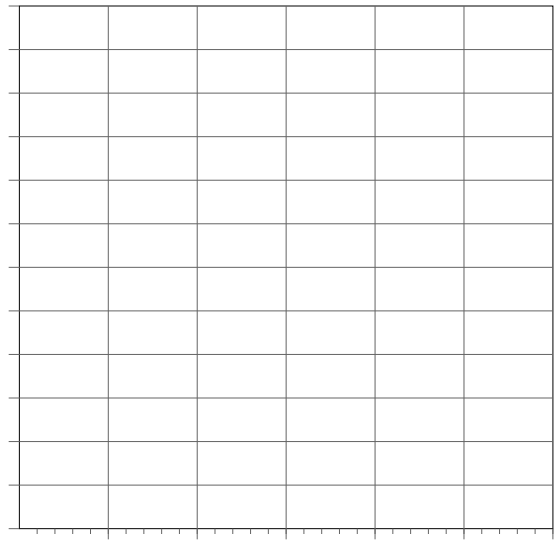
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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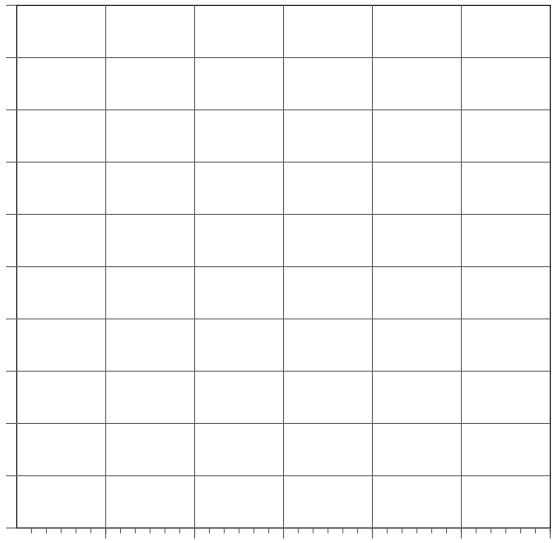
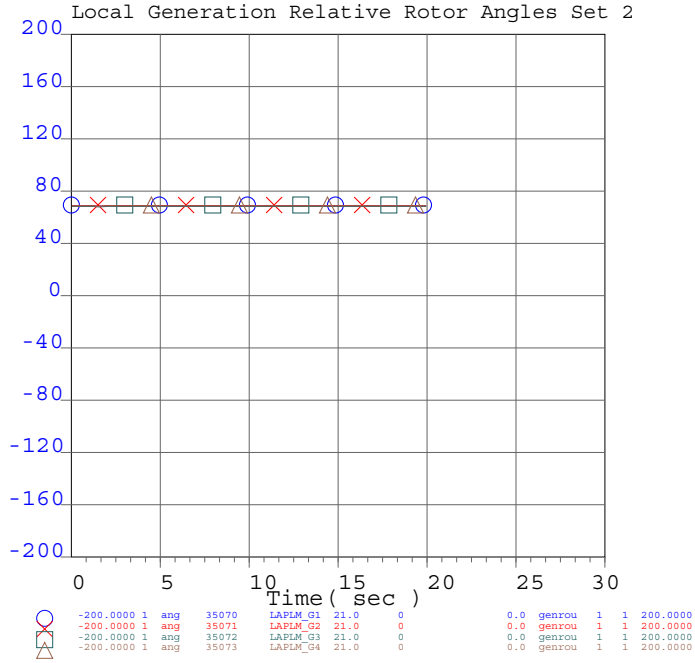
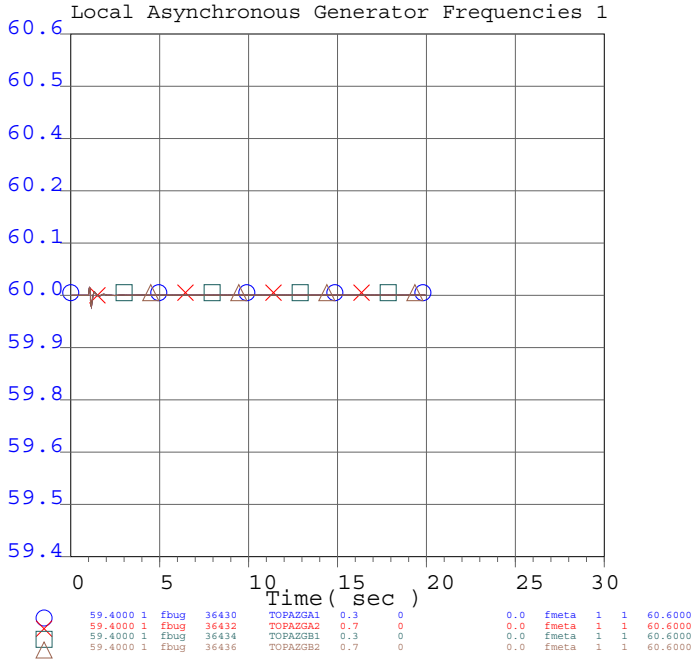
Local Generation Relative Rotor Angles Set 1



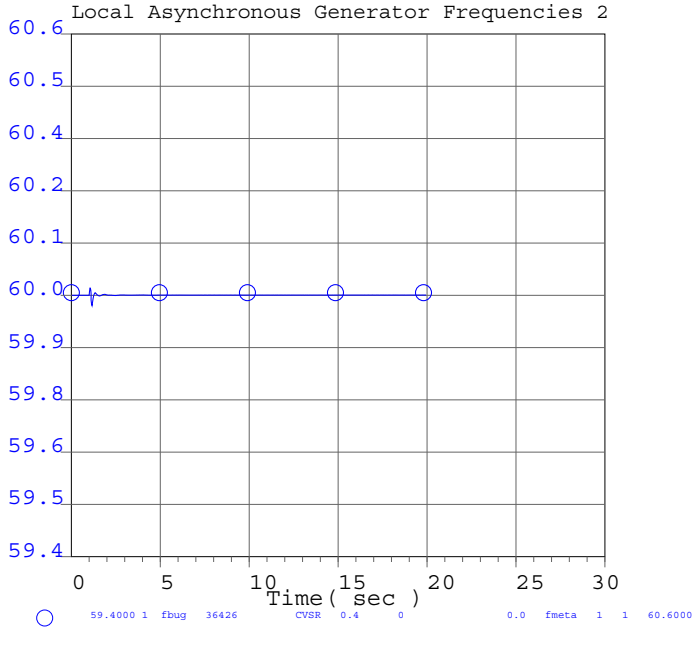
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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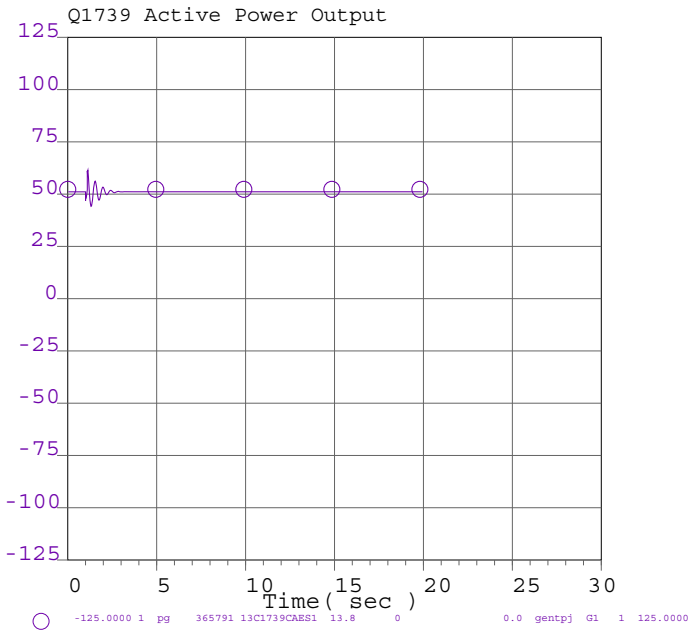

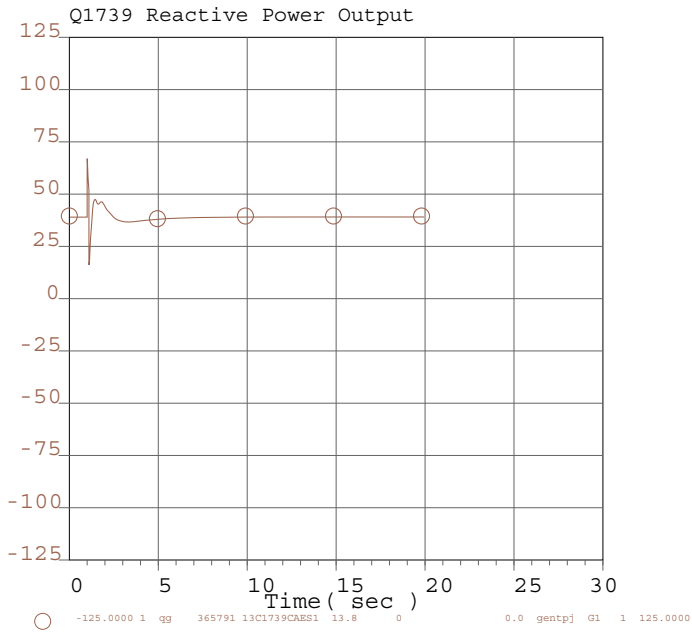

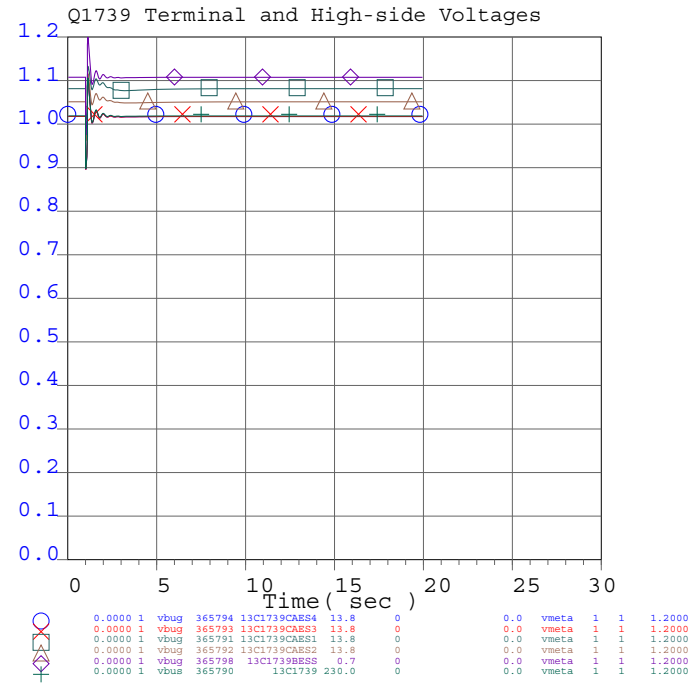

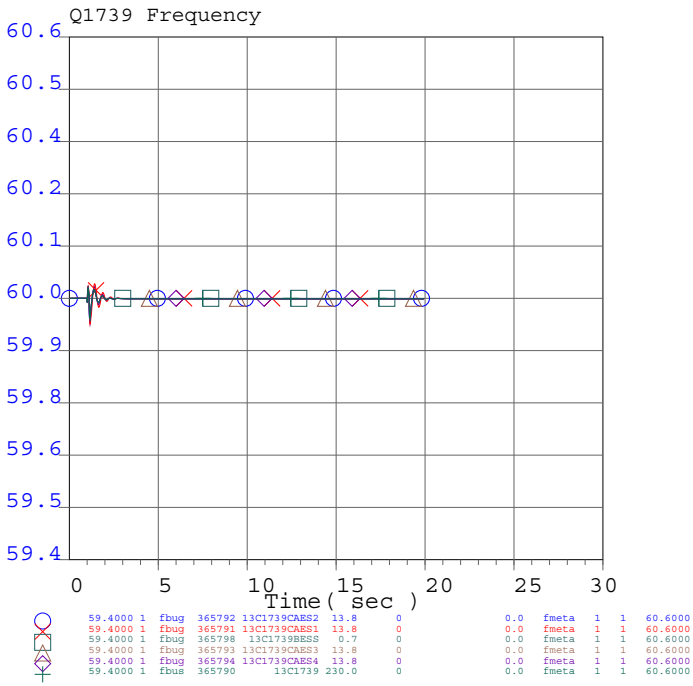

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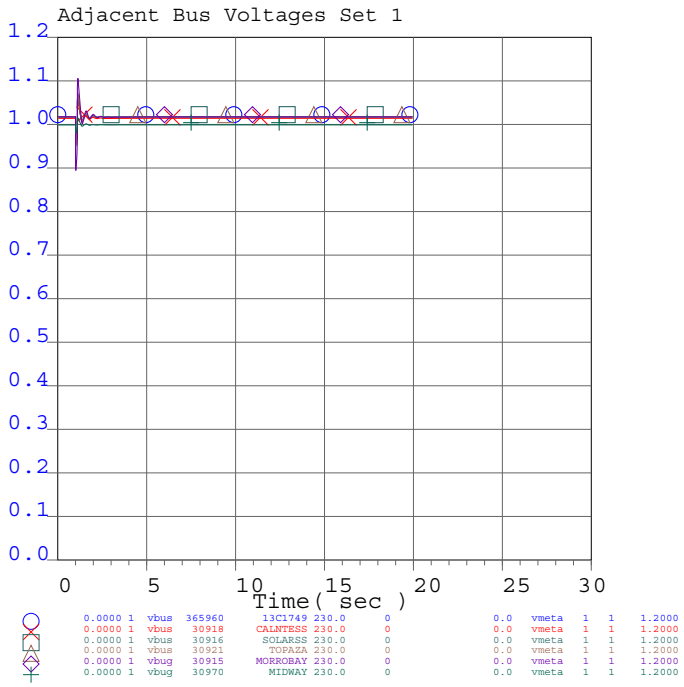

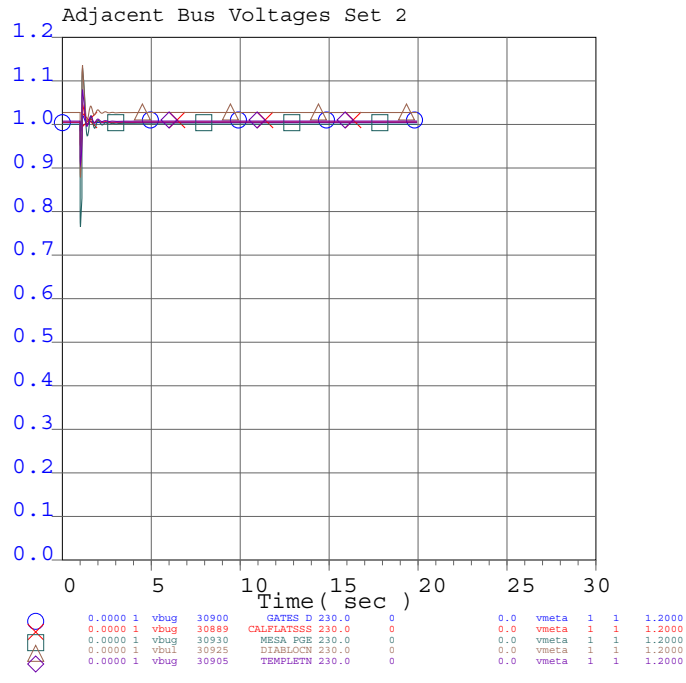

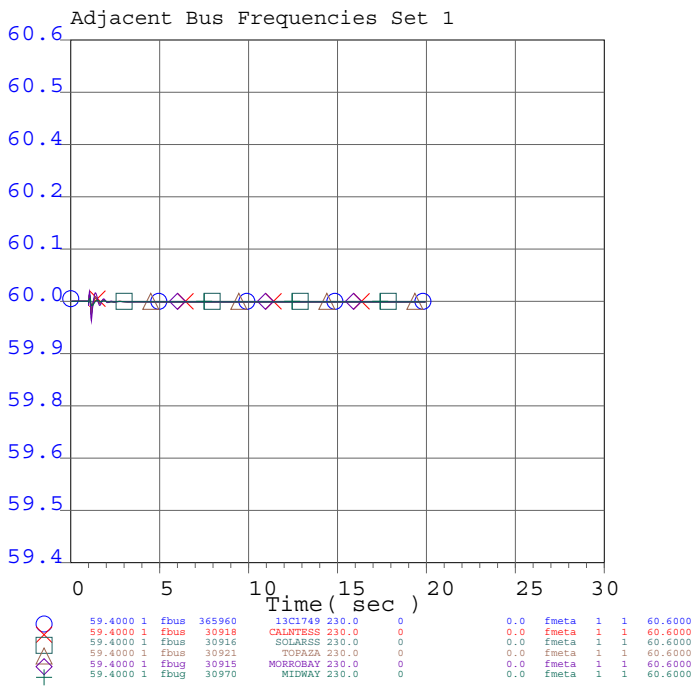

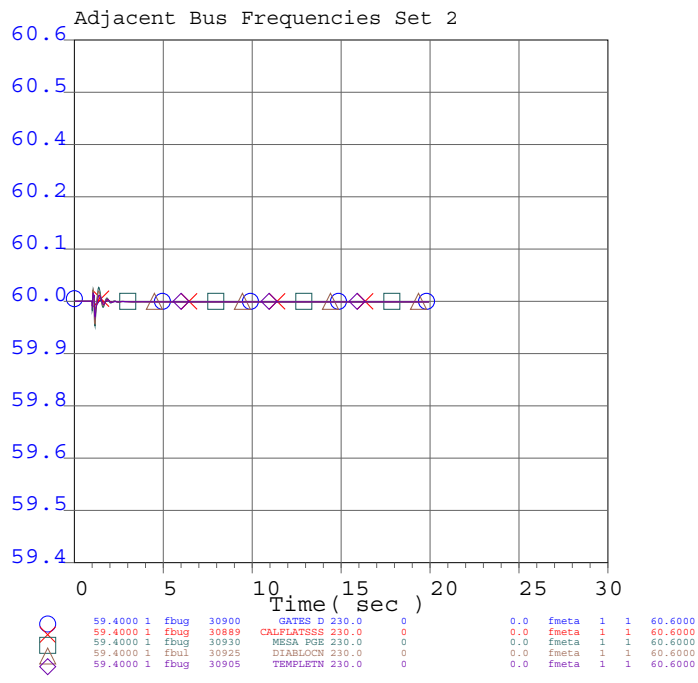

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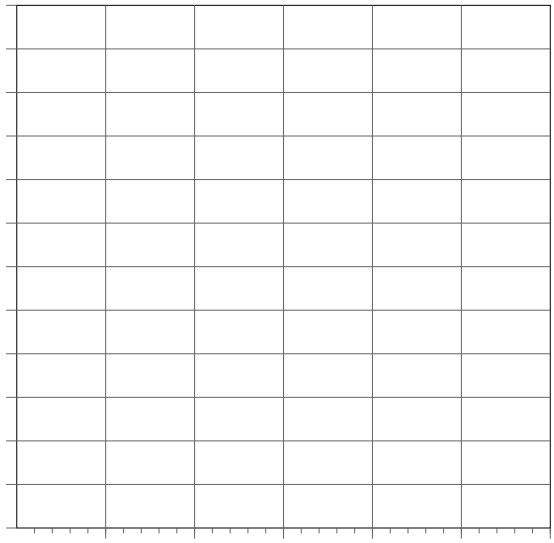
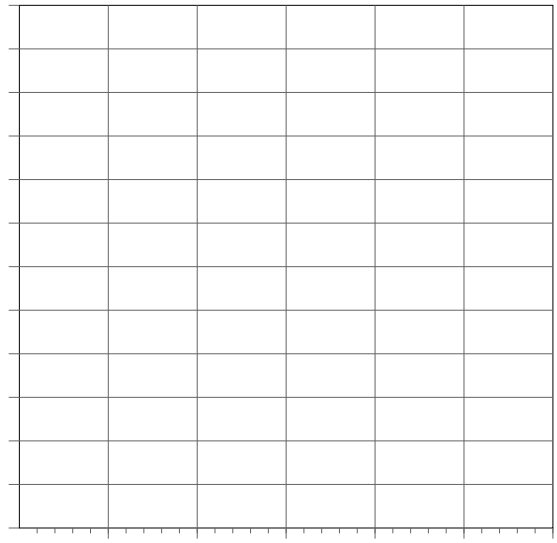
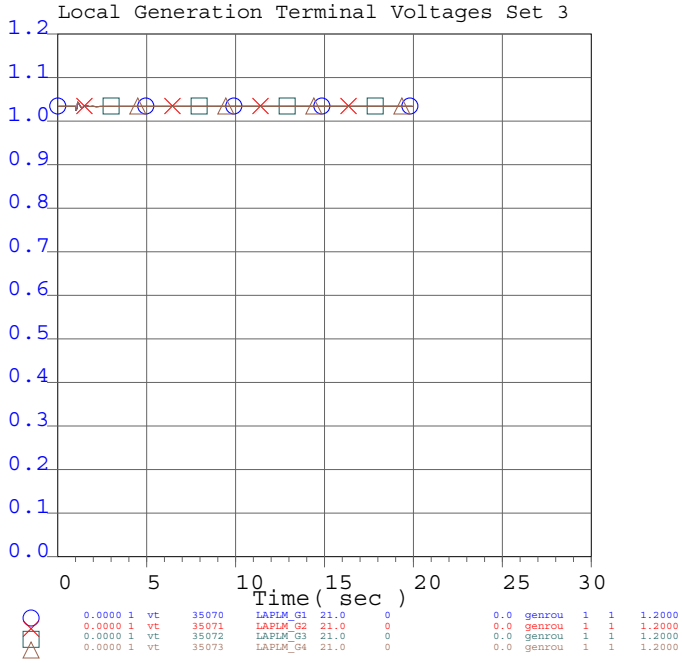
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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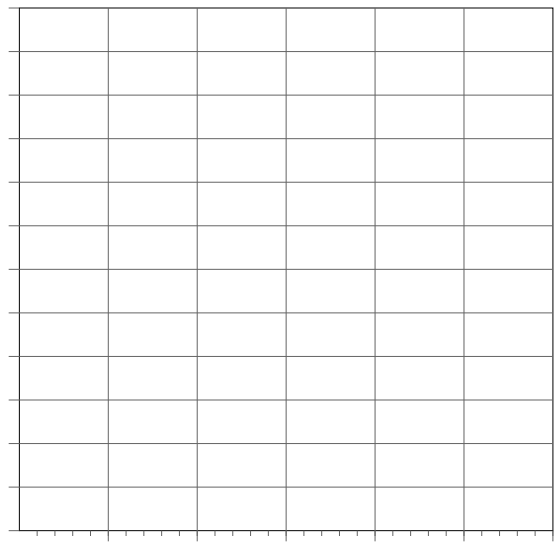

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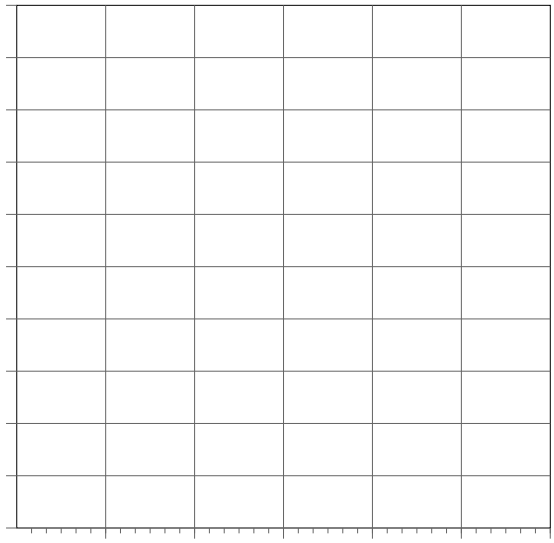
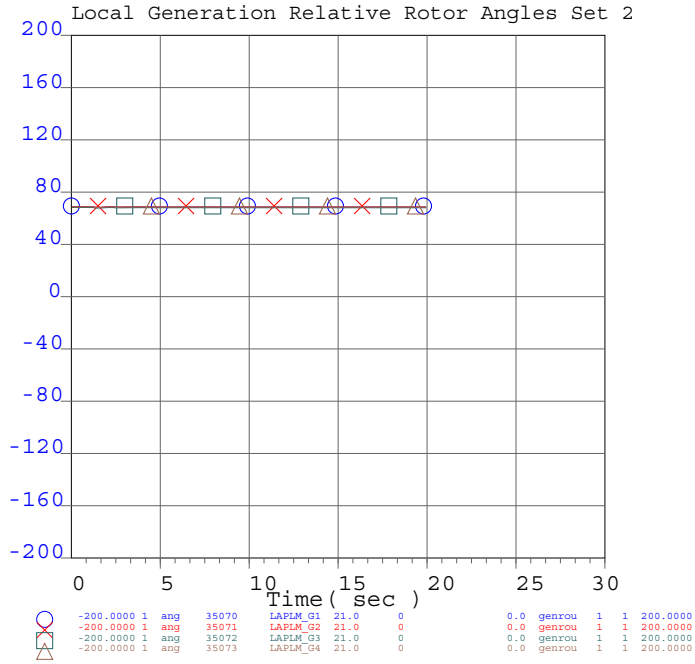
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

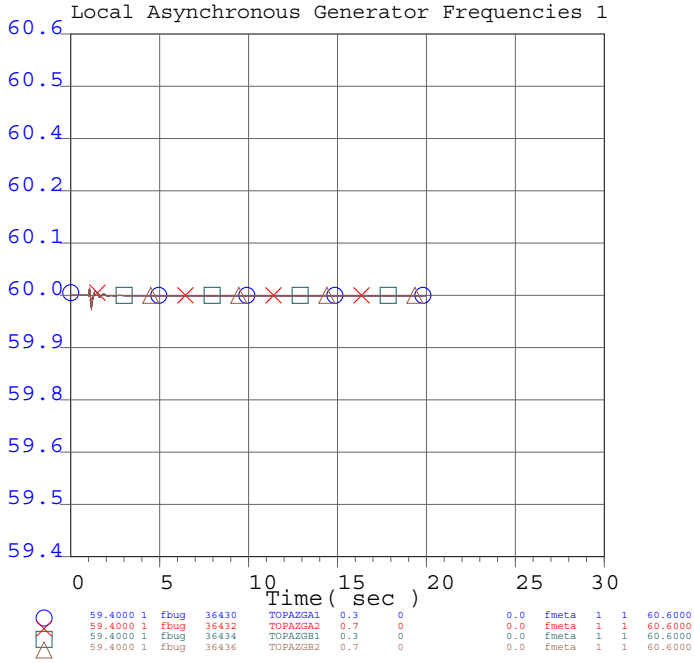
Local Generation Relative Rotor Angles Set 1



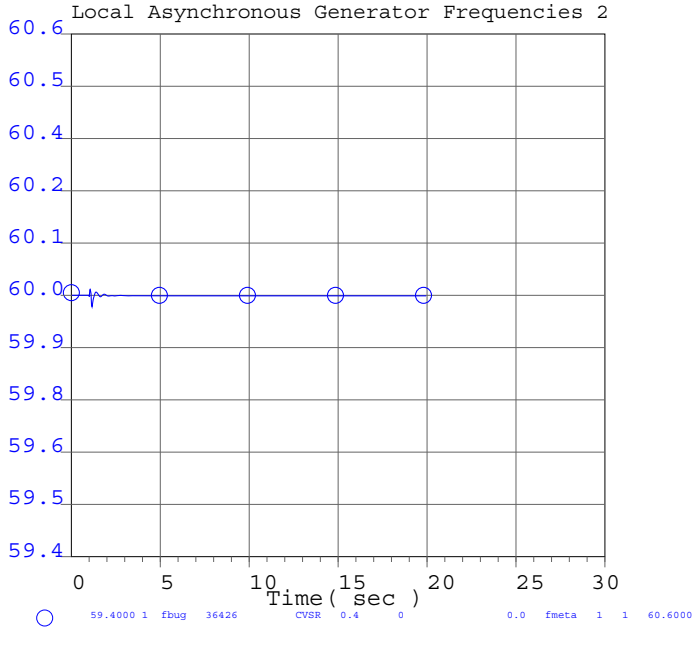
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

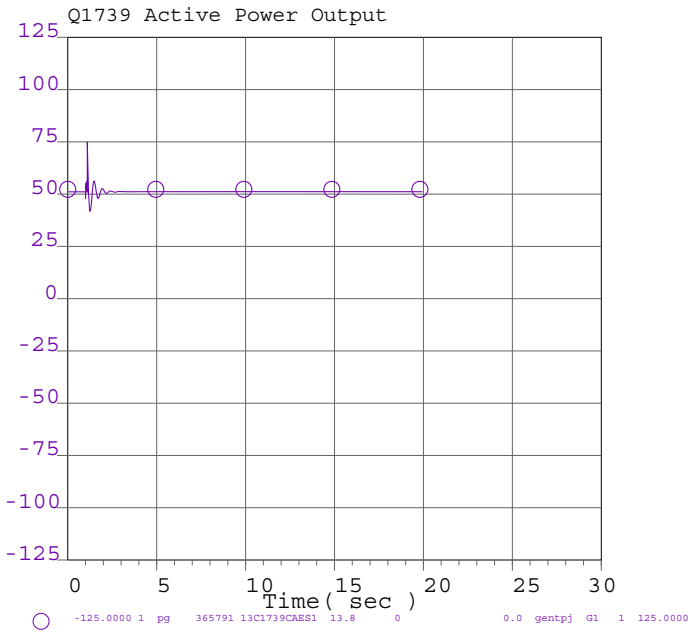


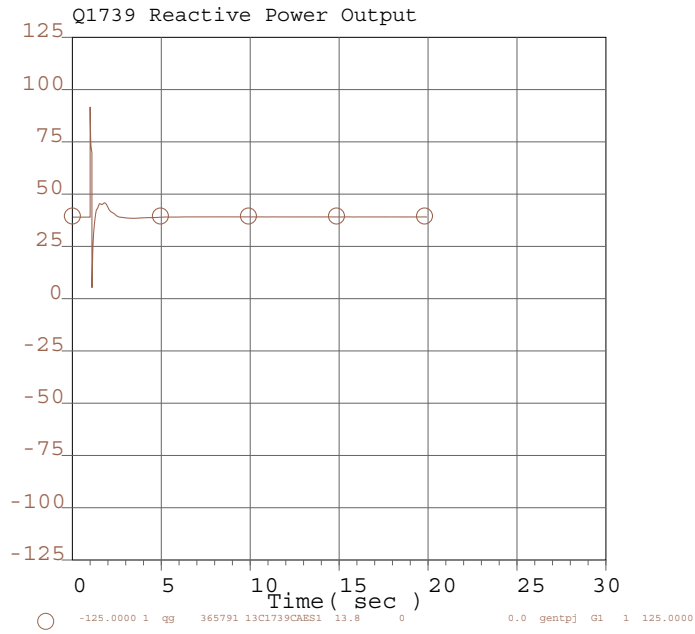
Local Asynchronous Generator Frequencies 2

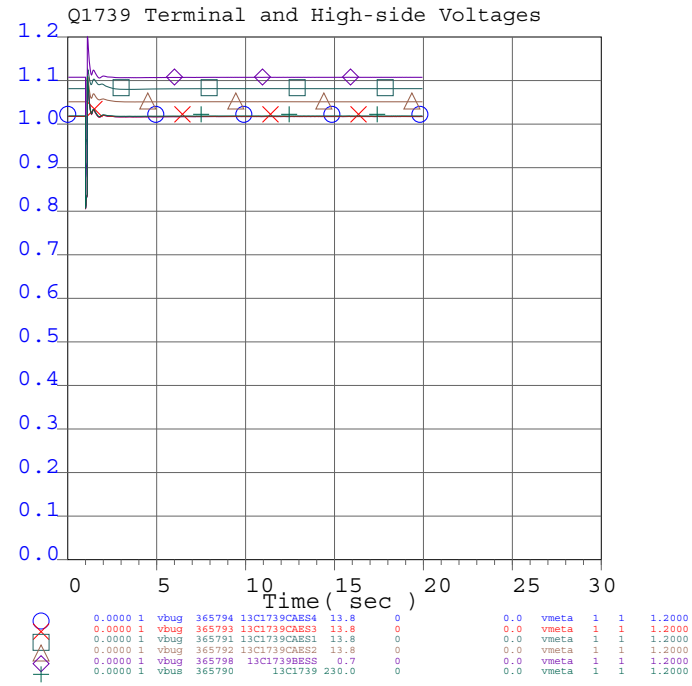


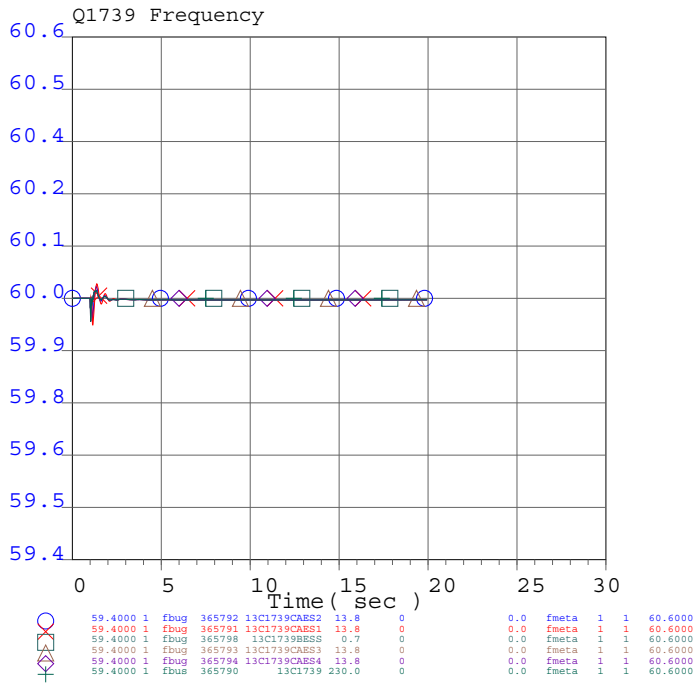
PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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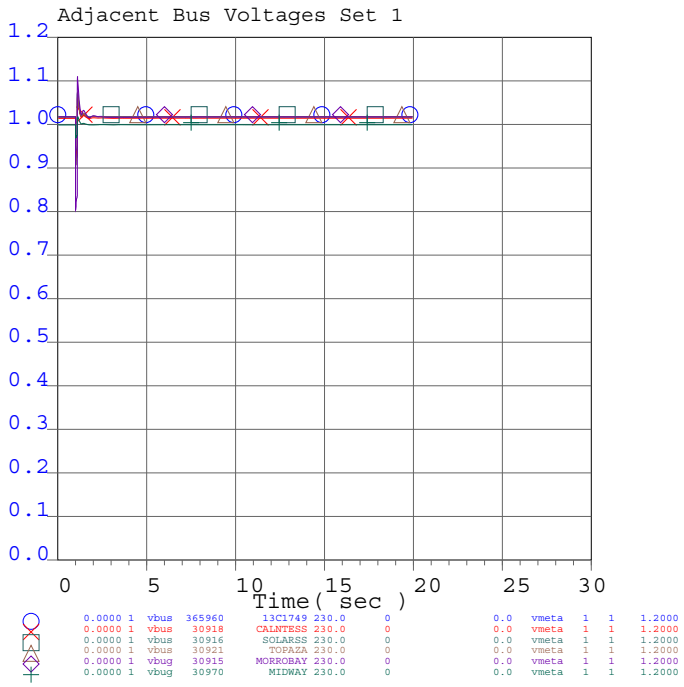

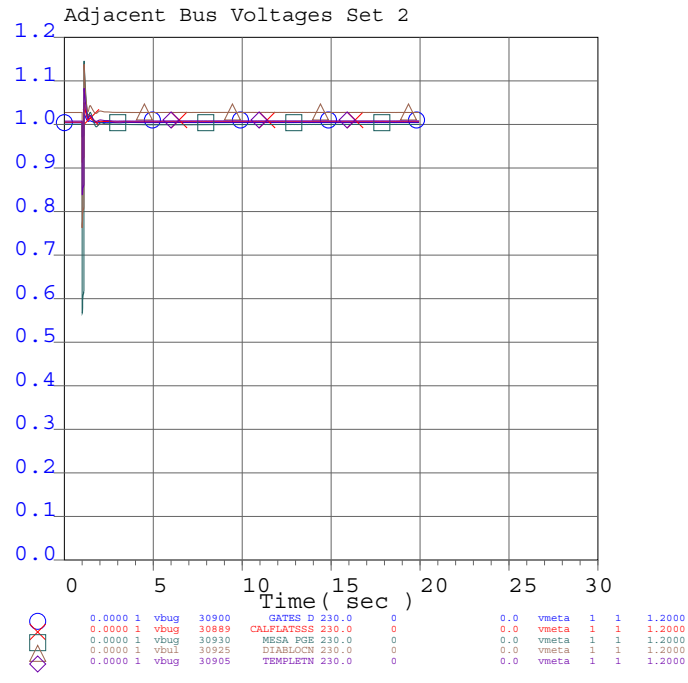

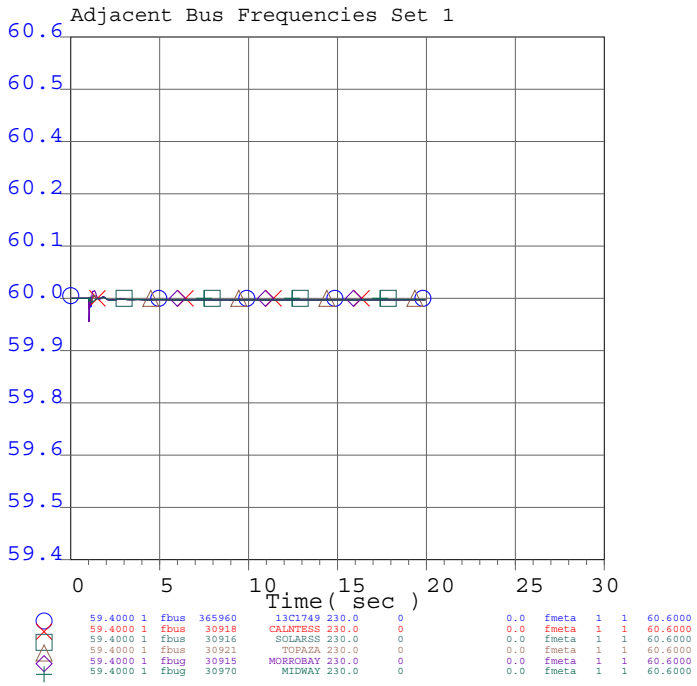

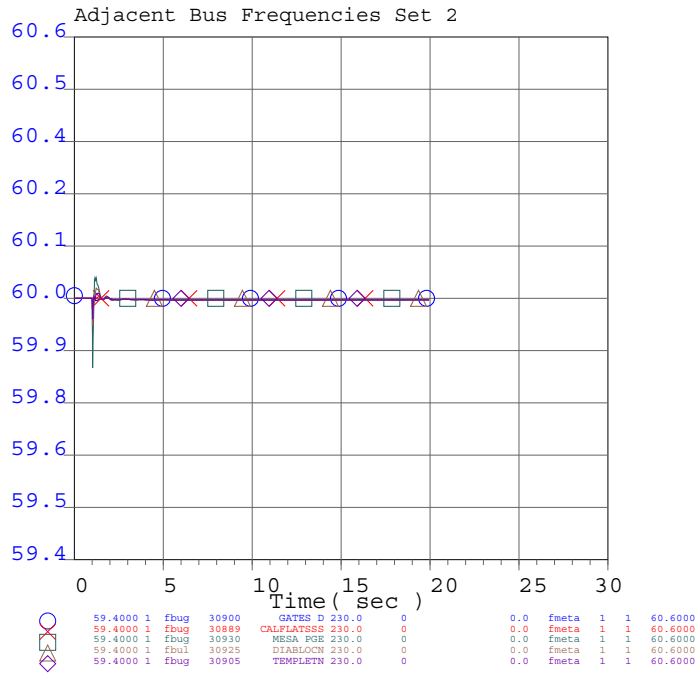

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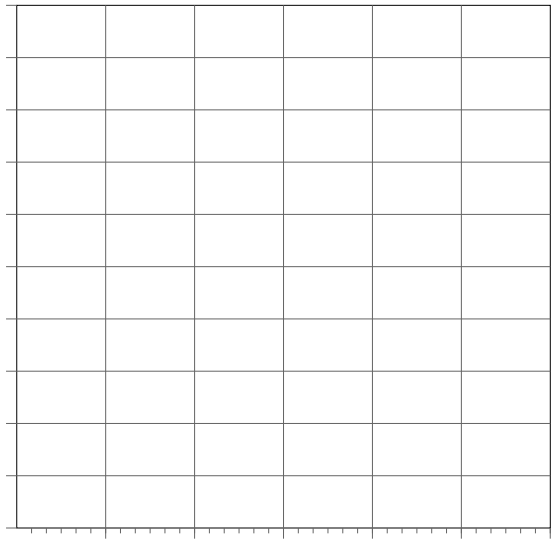
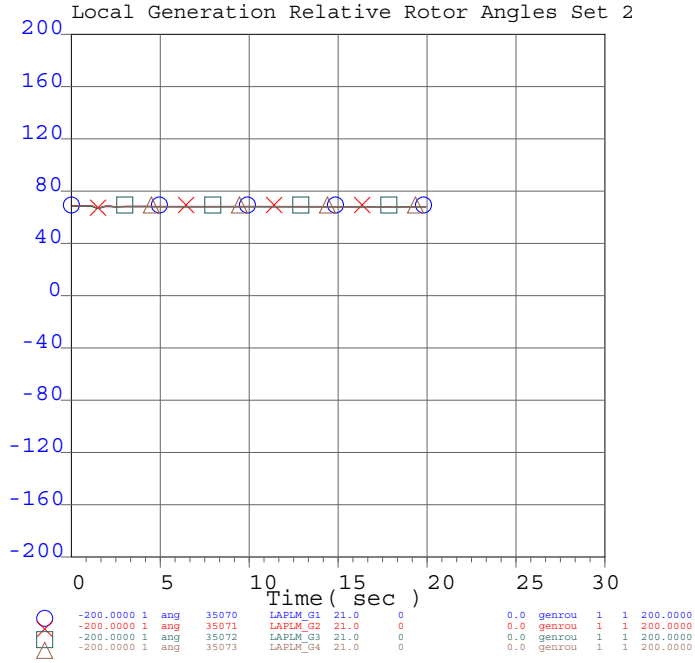
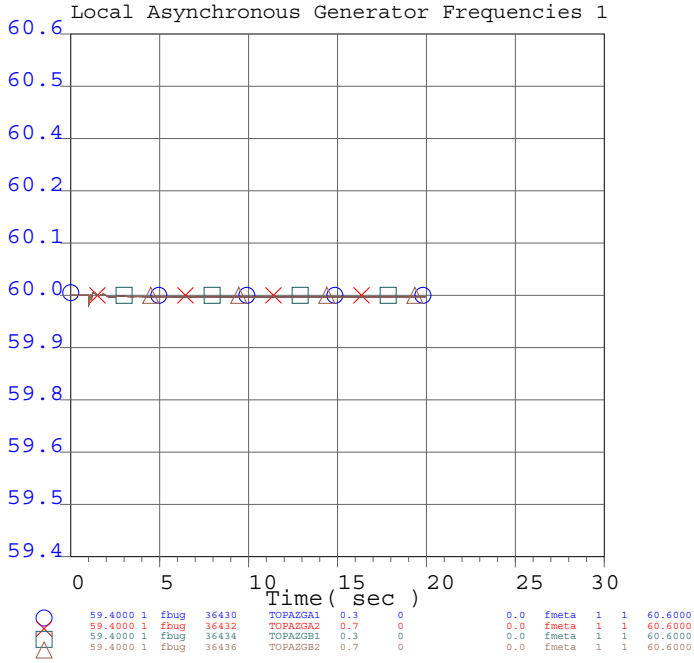
Local Generation Relative Rotor Angles Set 1



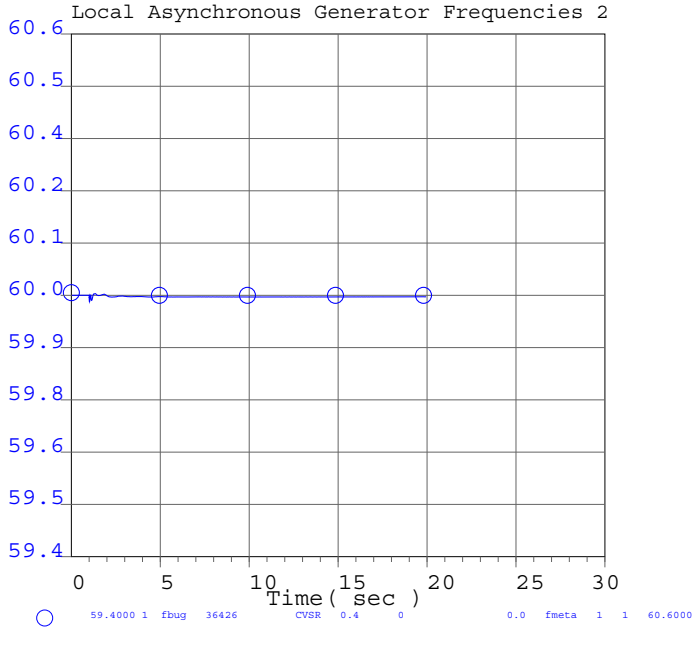
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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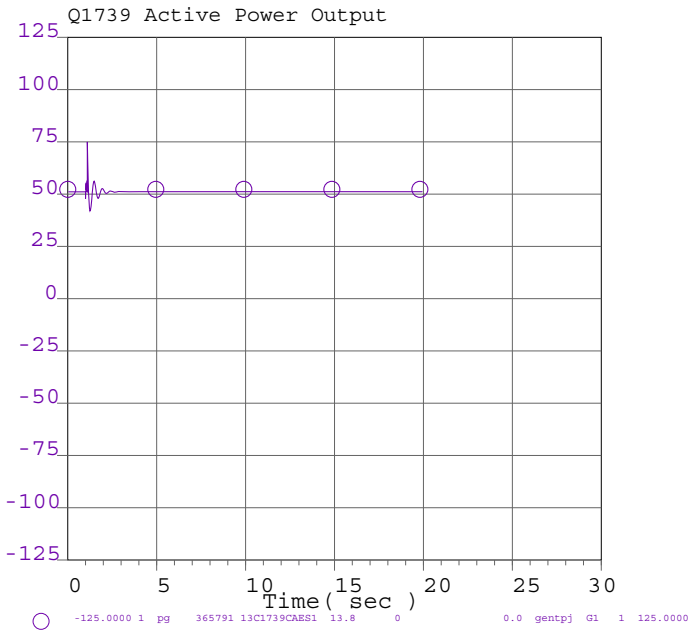
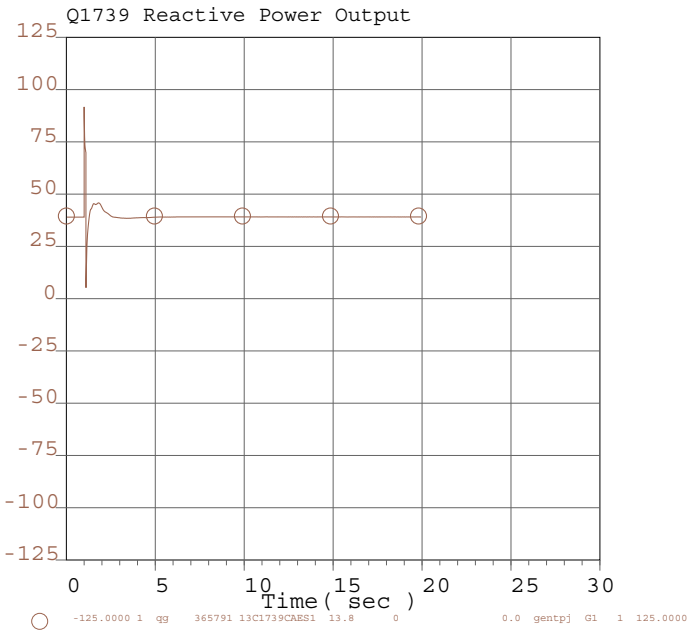
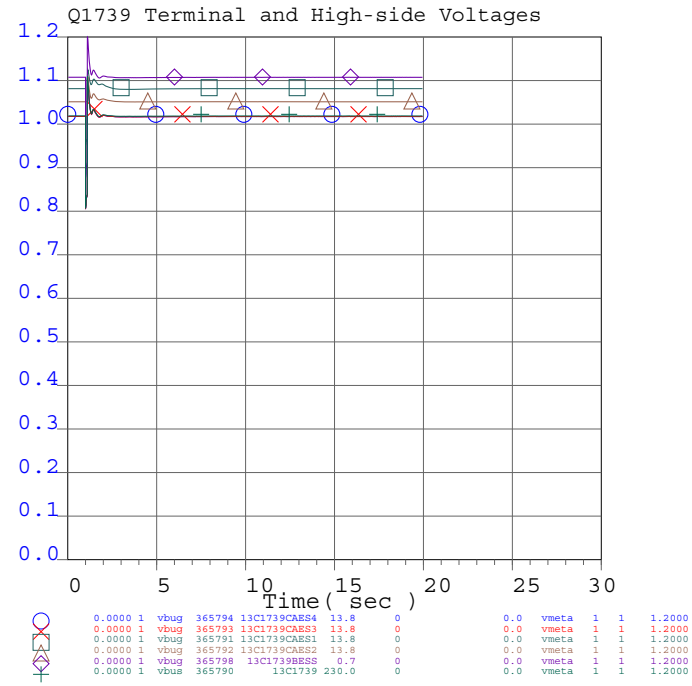
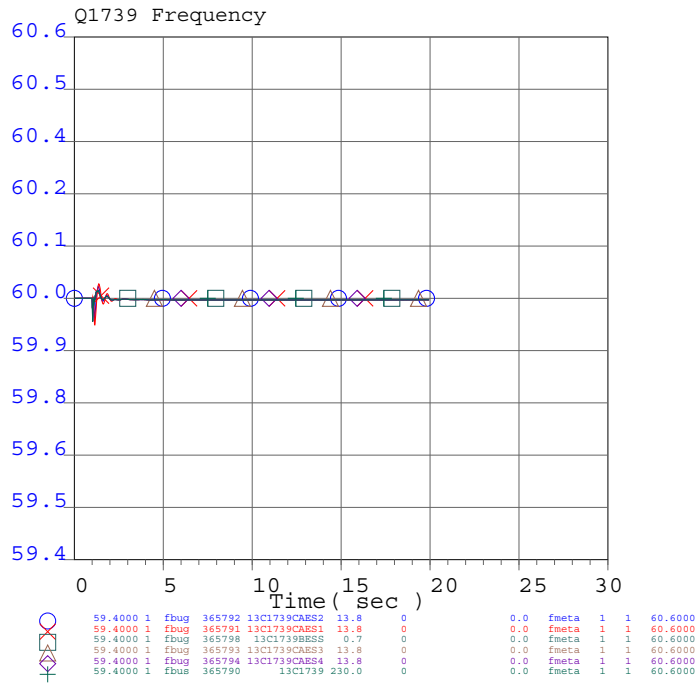
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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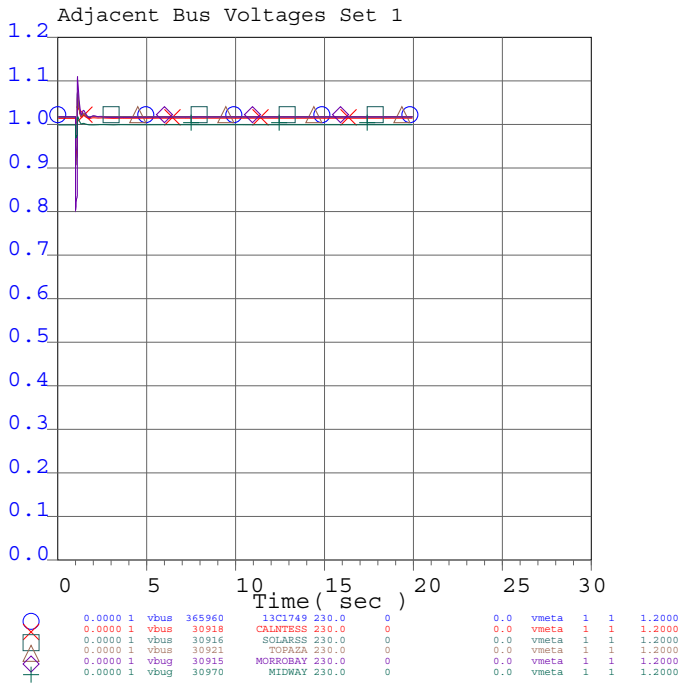

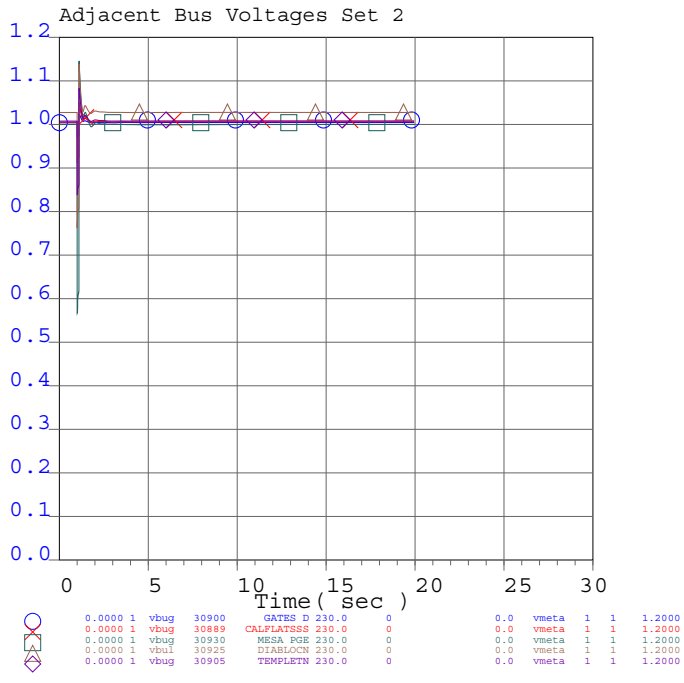

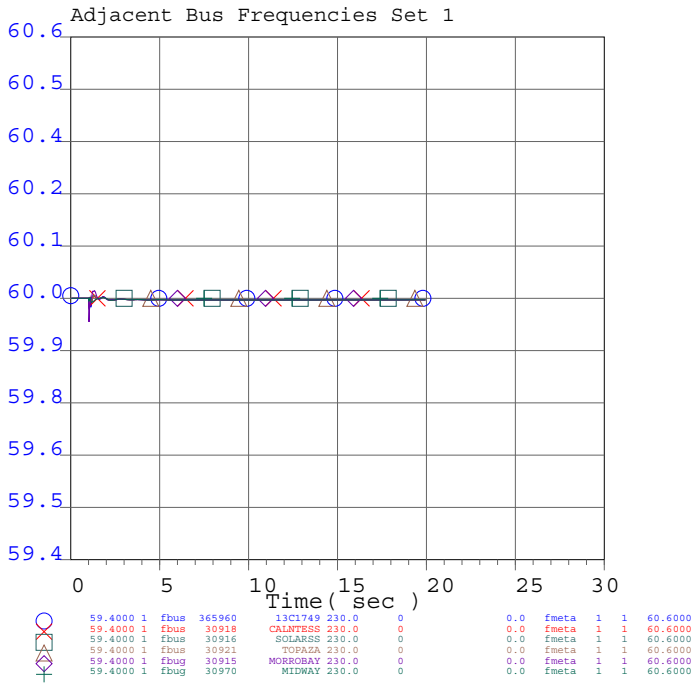

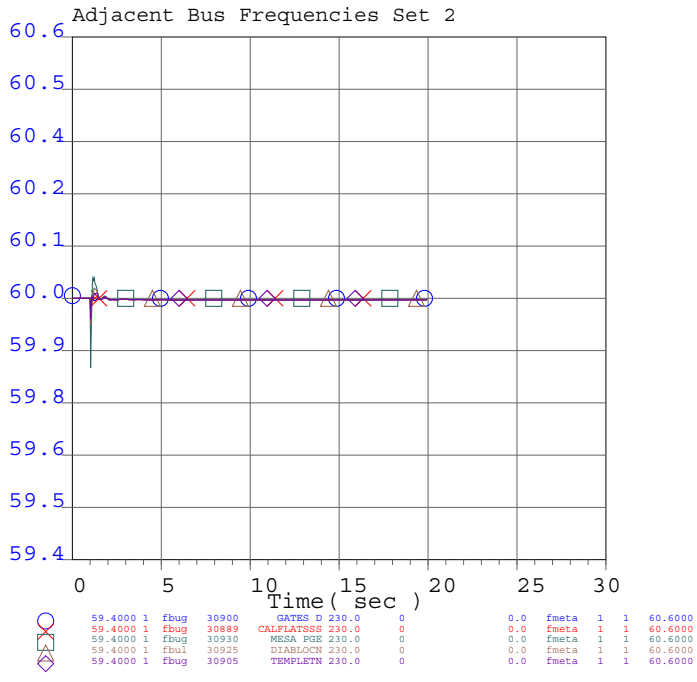

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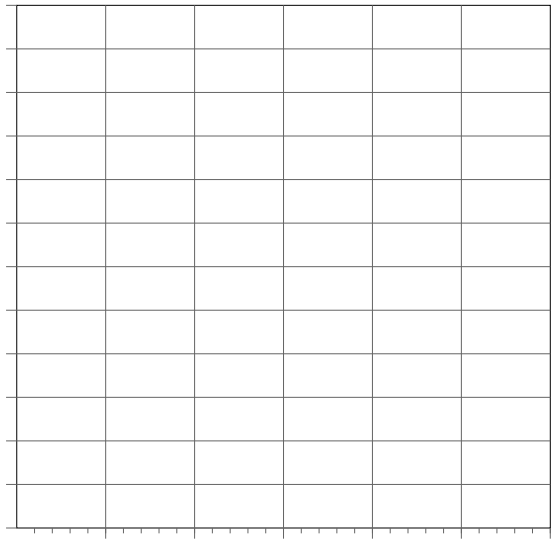
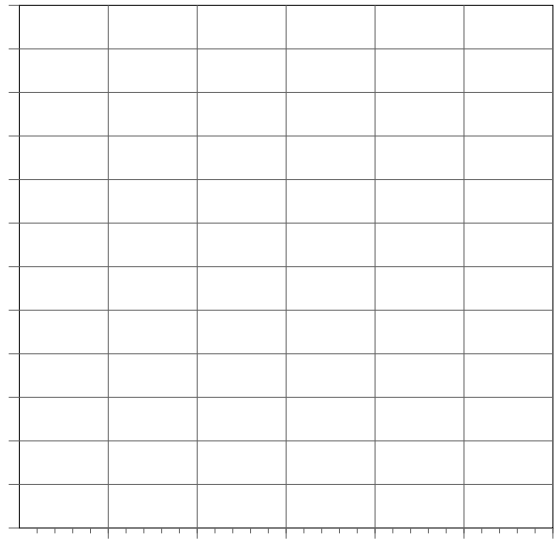
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

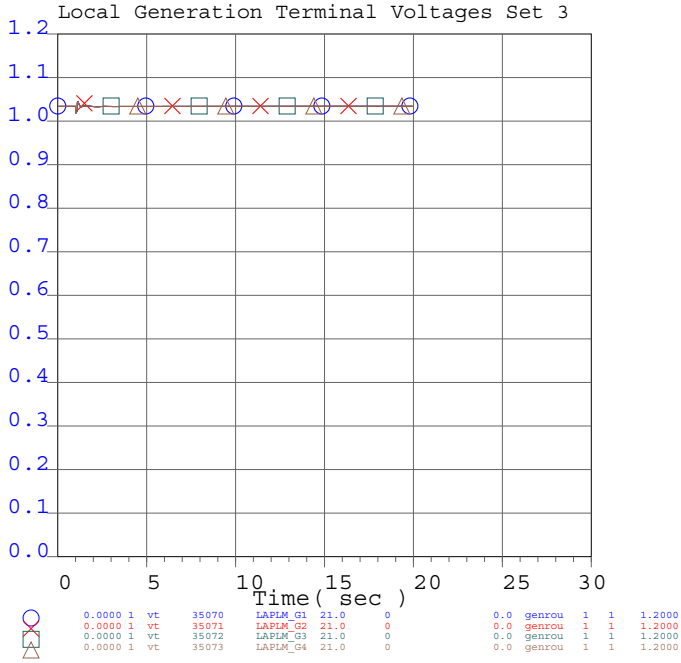
Local Generation Terminal Voltages Set 1



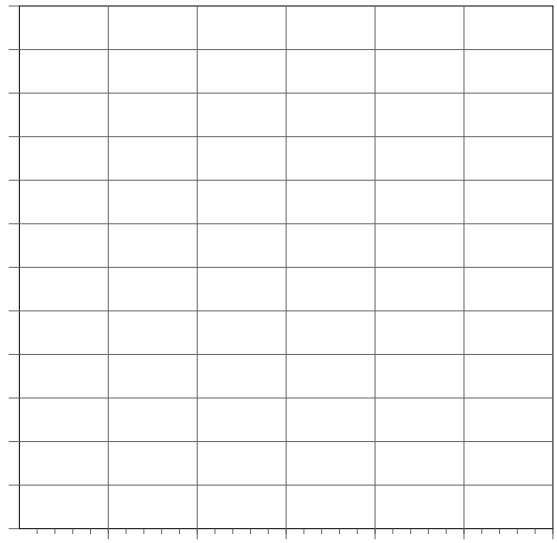
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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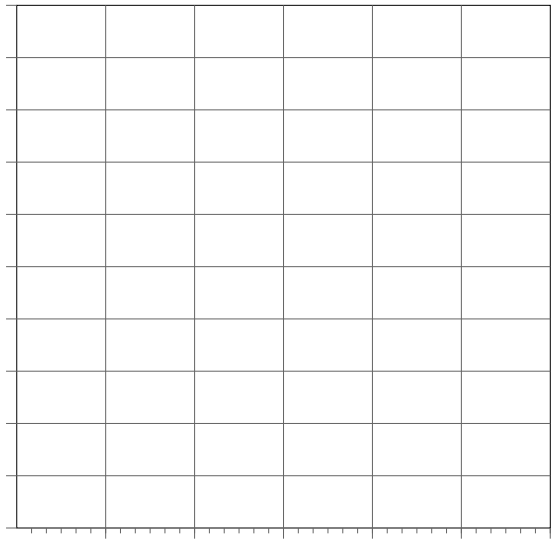
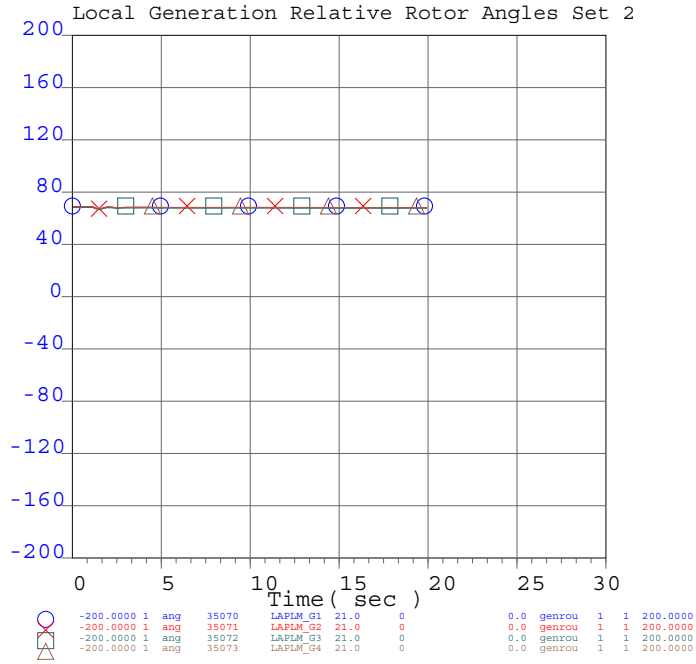
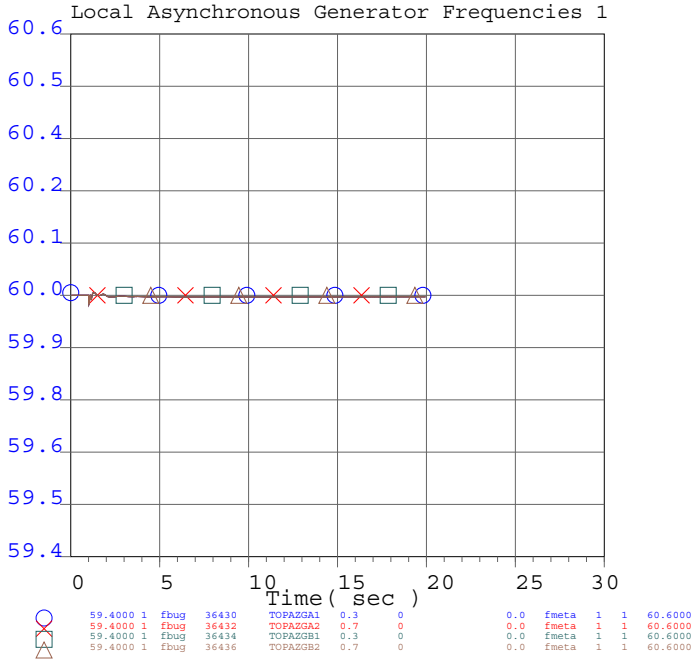
Local Generation Relative Rotor Angles Set 1



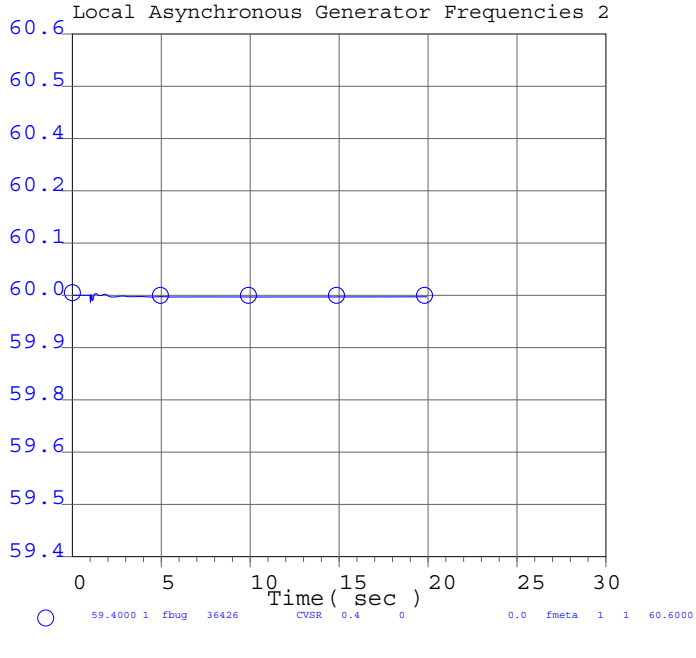
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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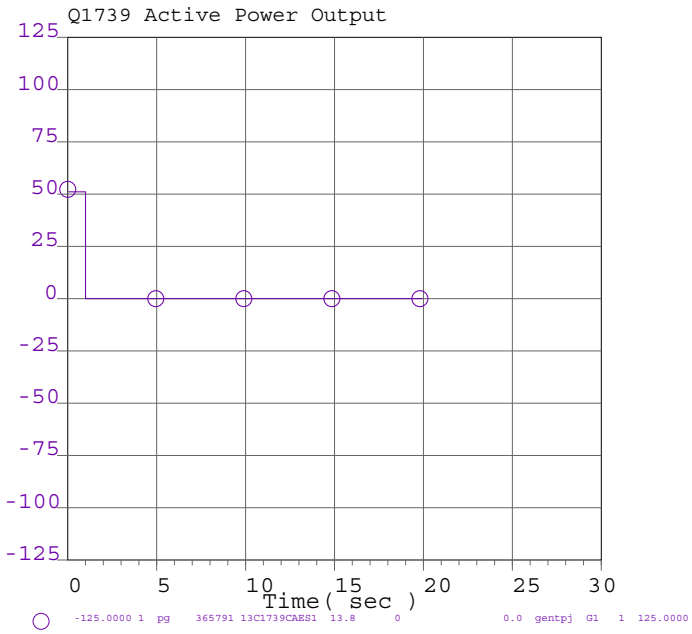

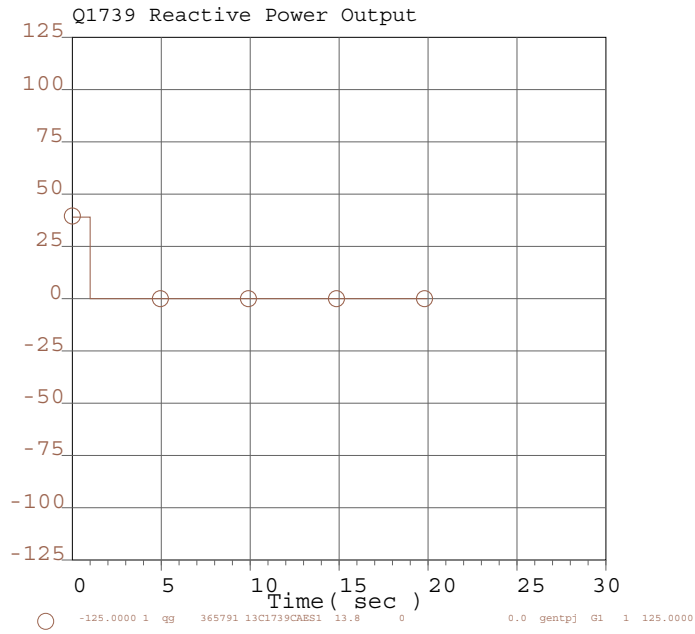

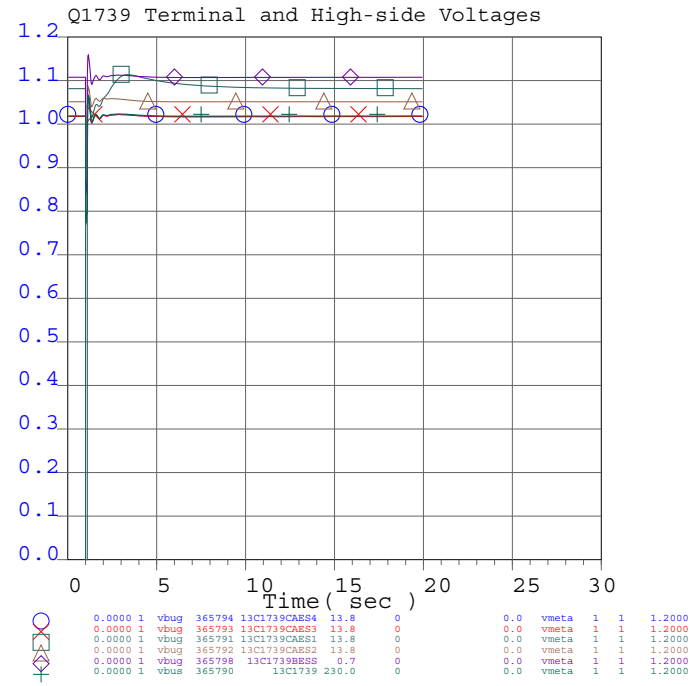

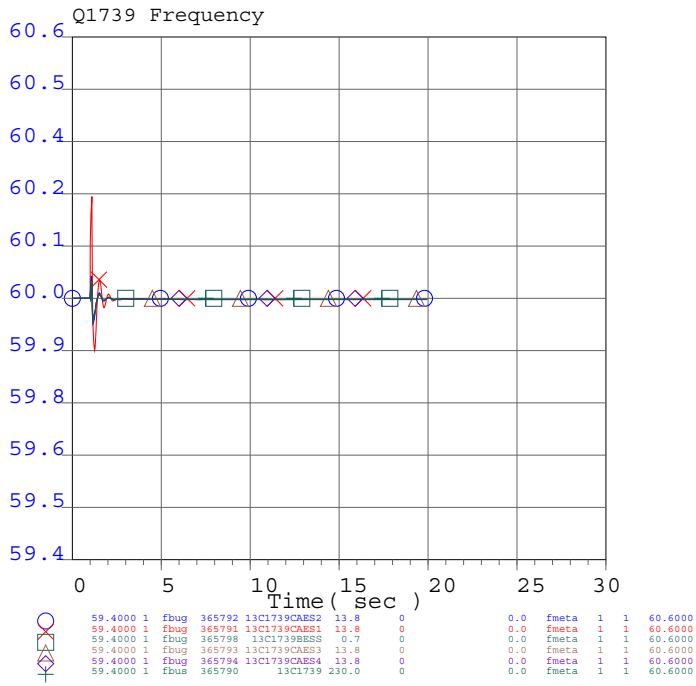

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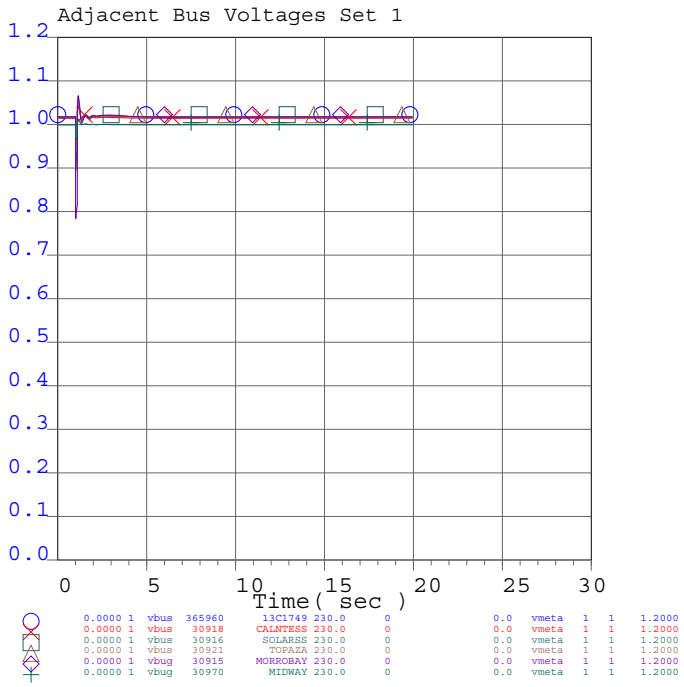

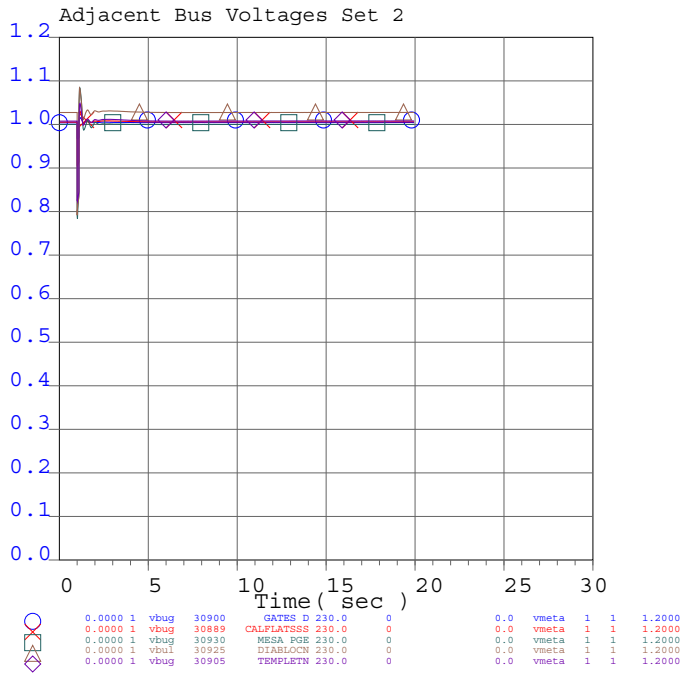

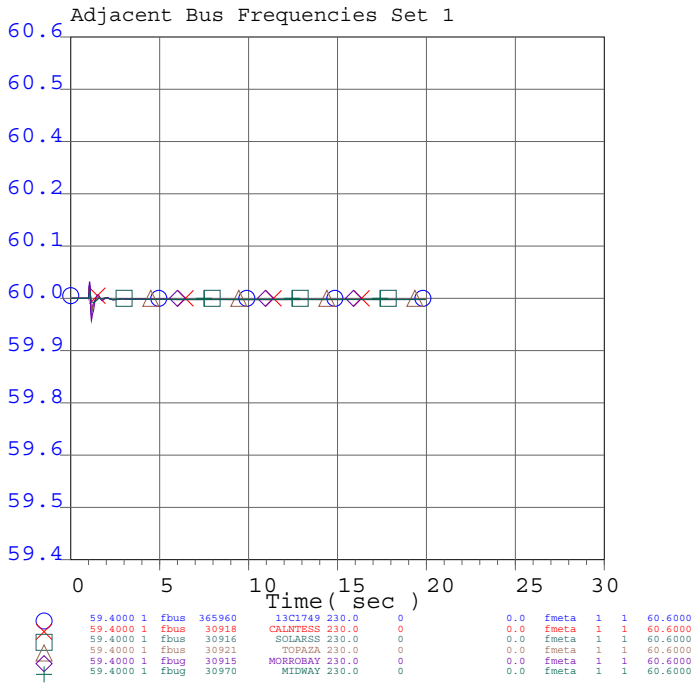

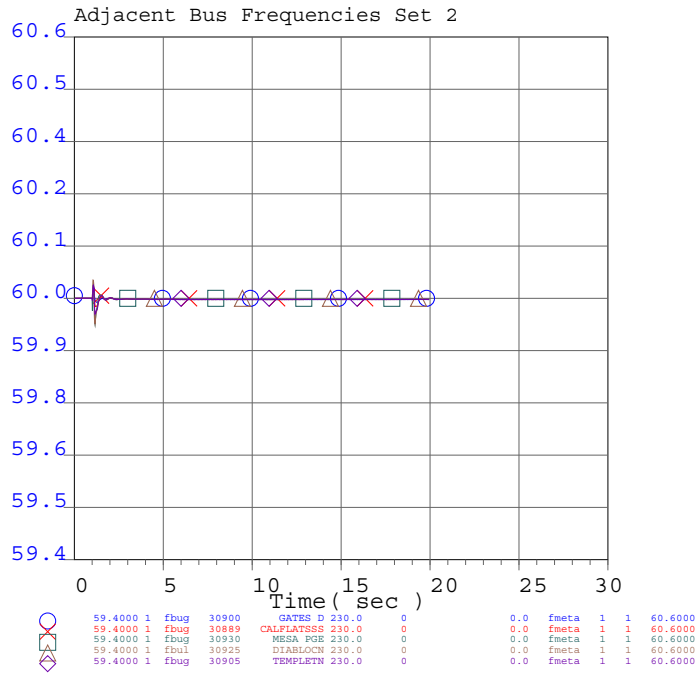

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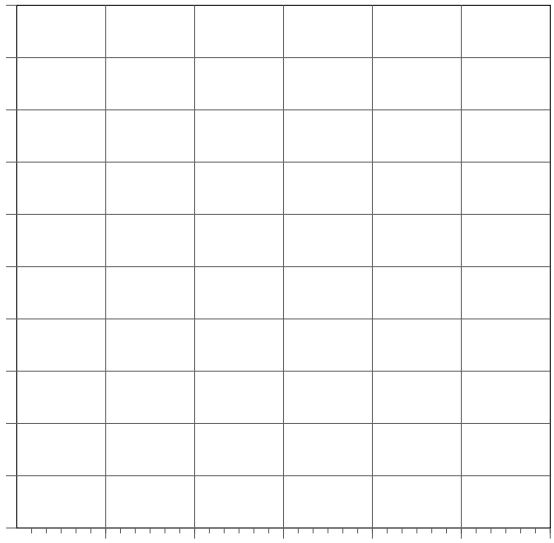
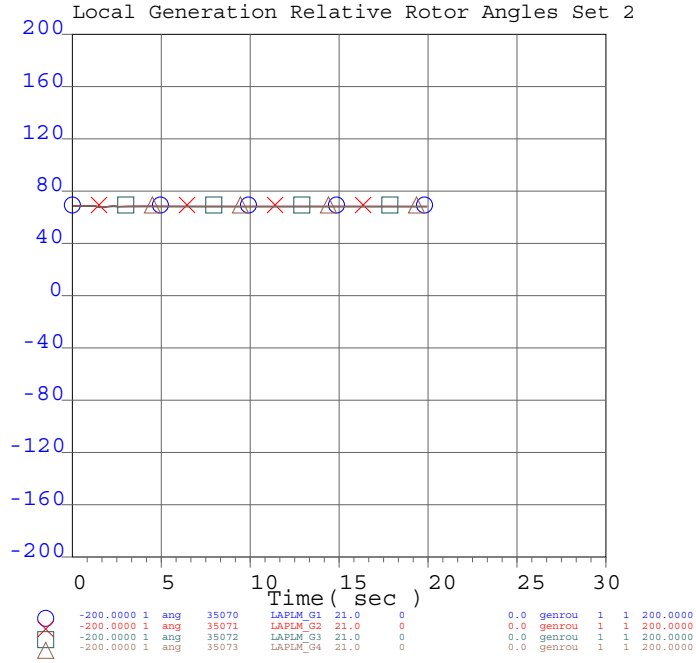
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



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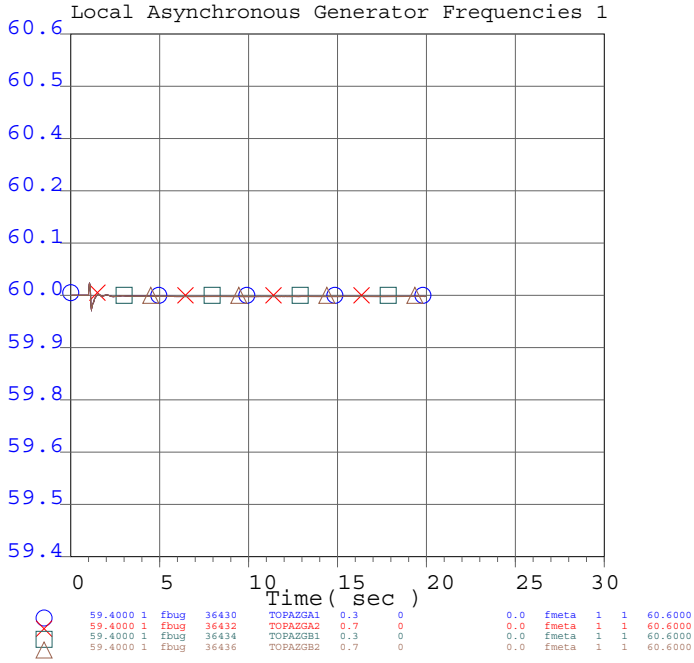

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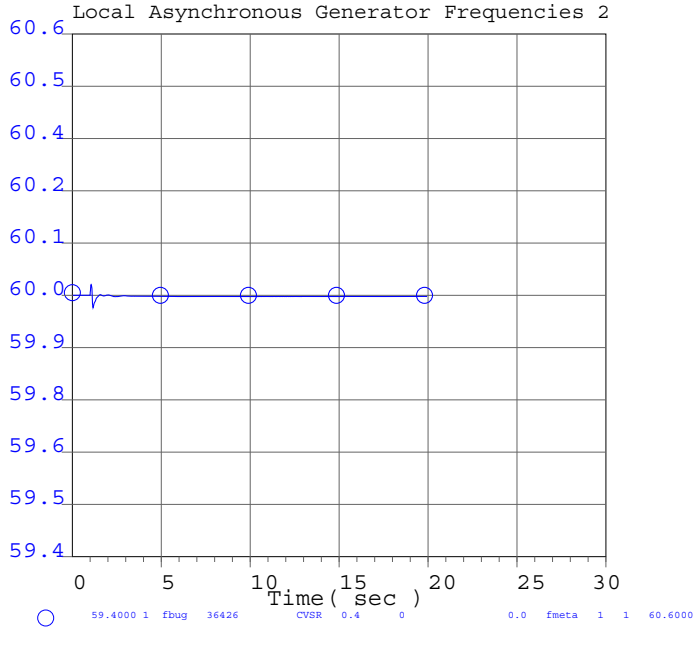

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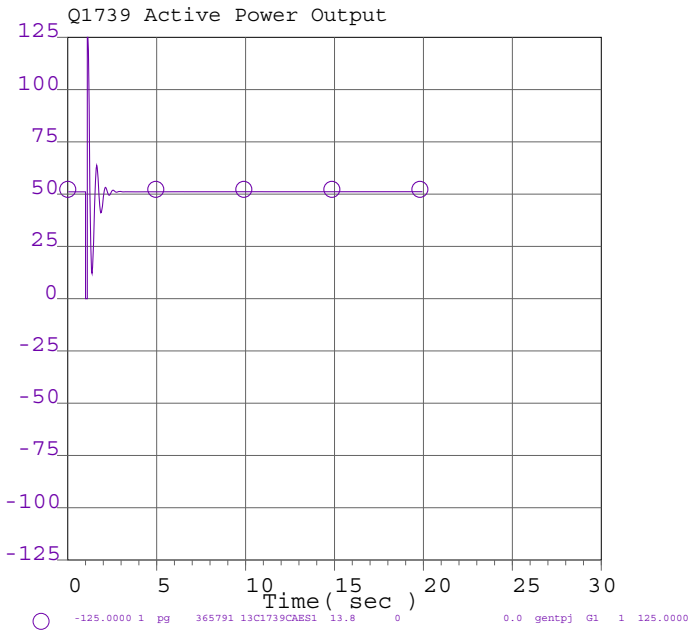

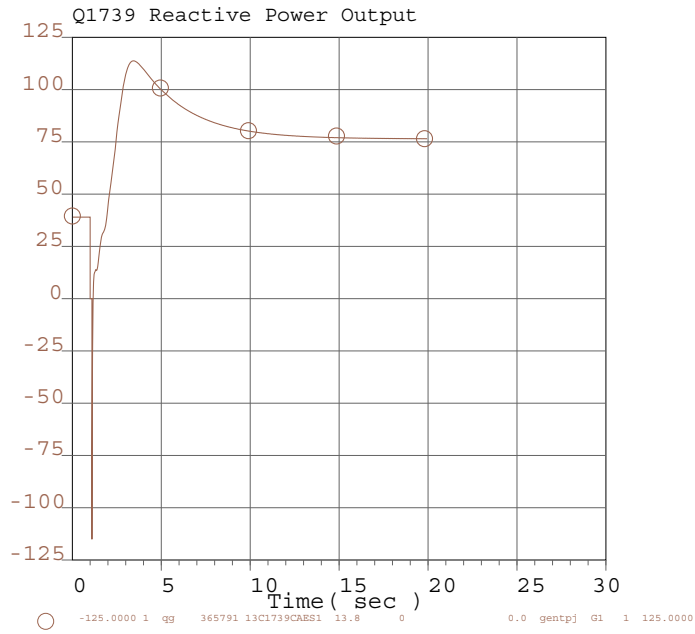

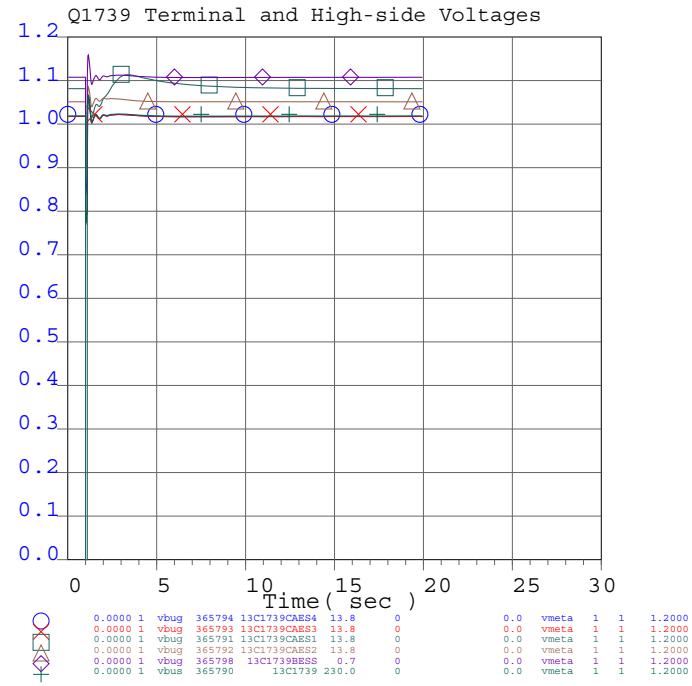

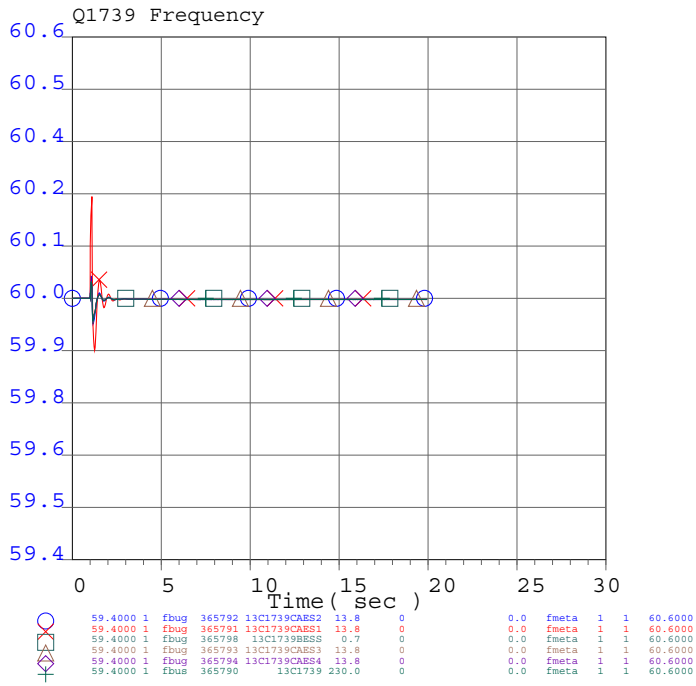

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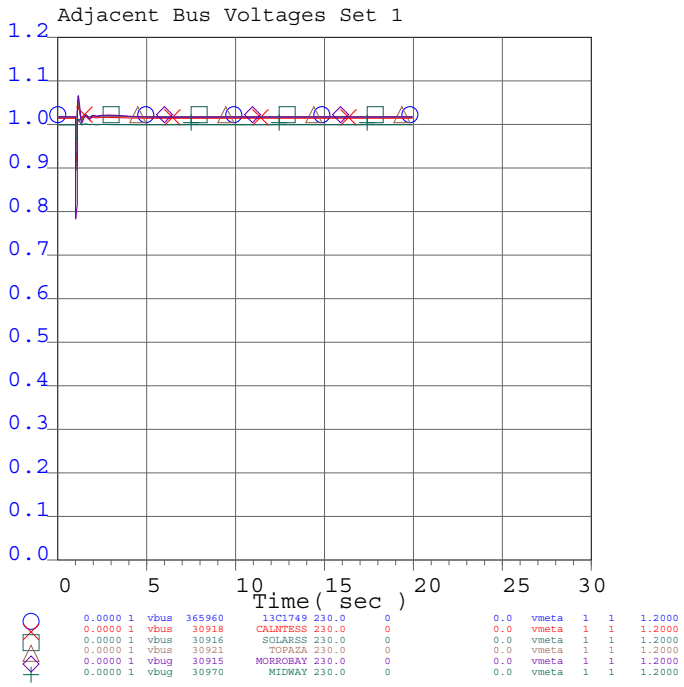
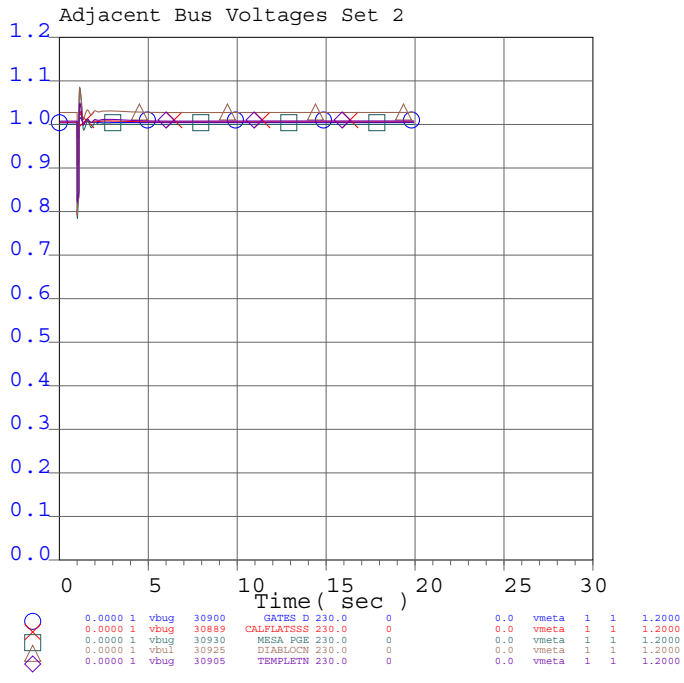
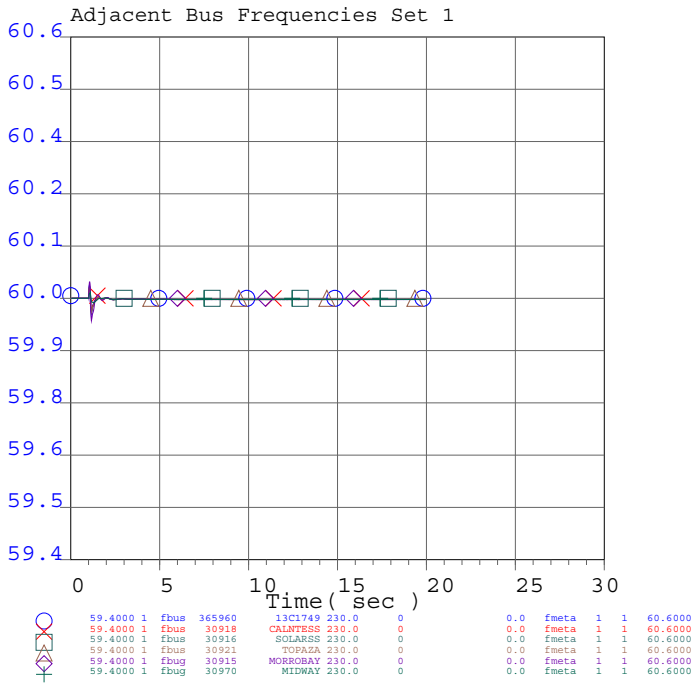
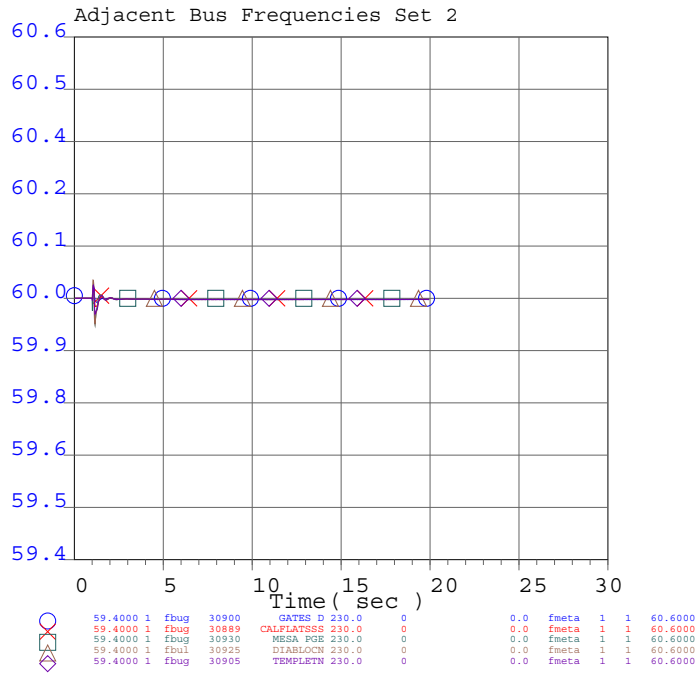
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd









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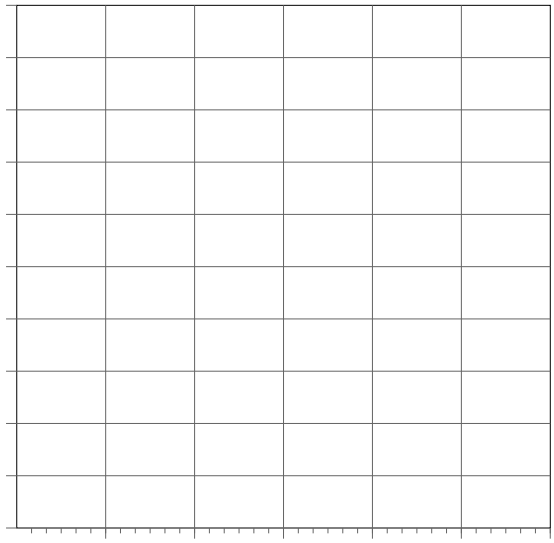
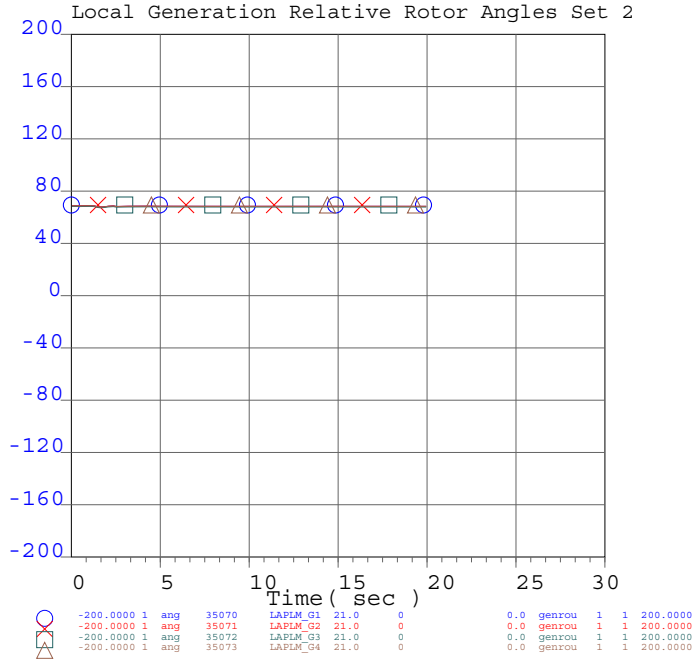
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

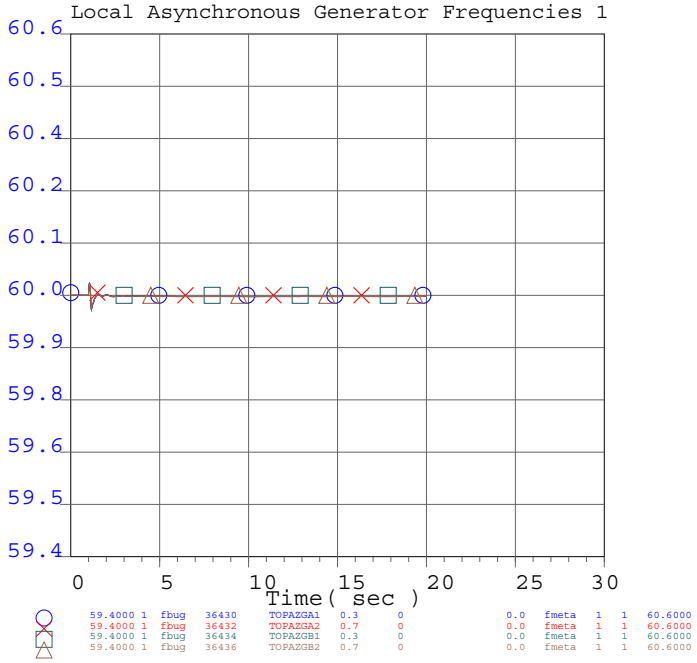
Local Generation Relative Rotor Angles Set 1



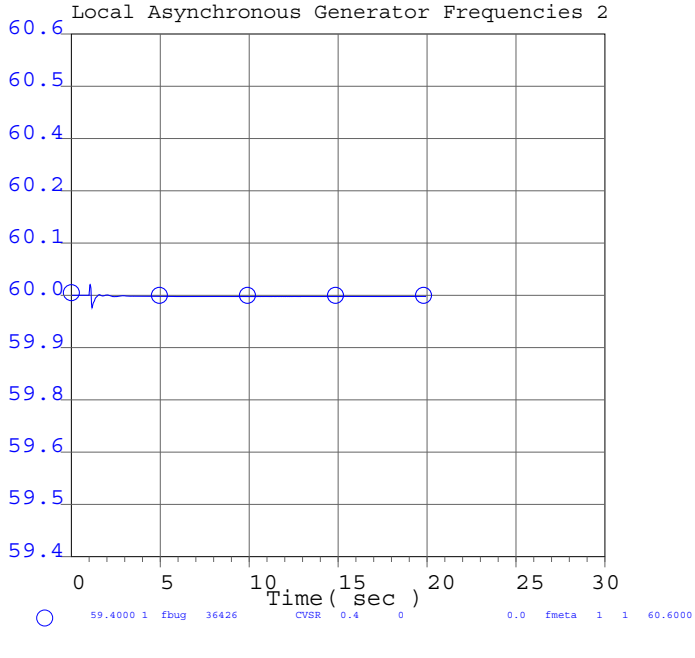
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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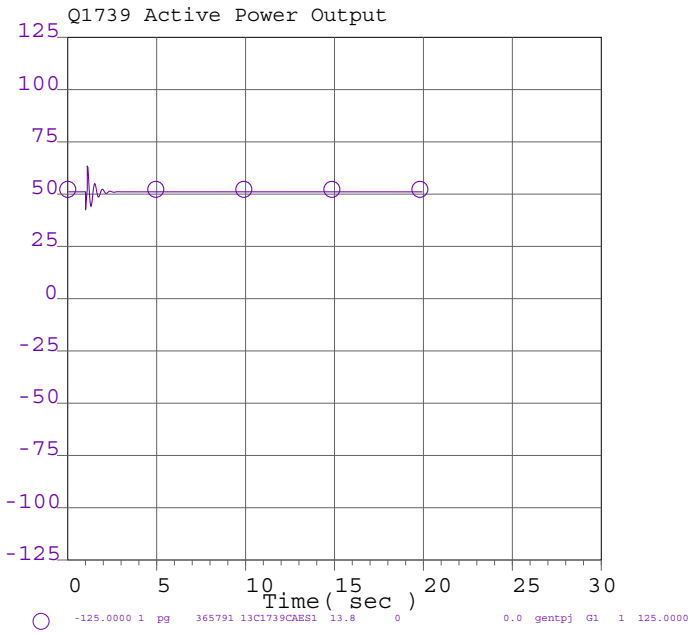
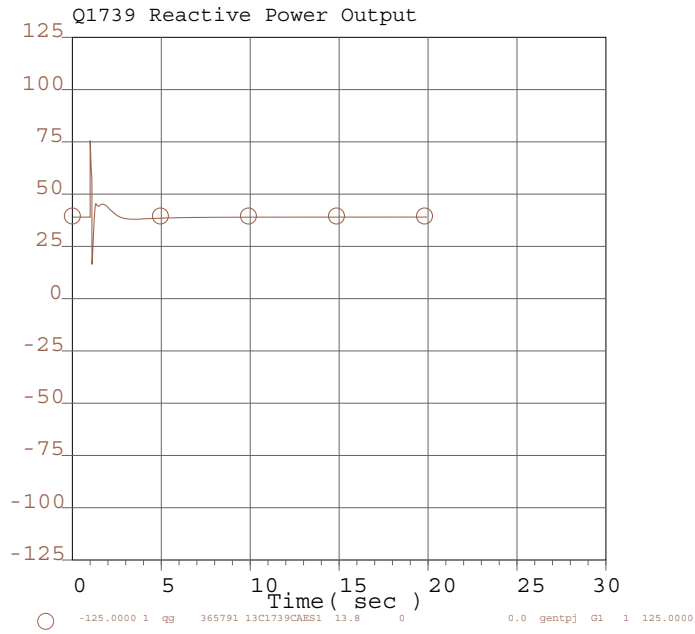
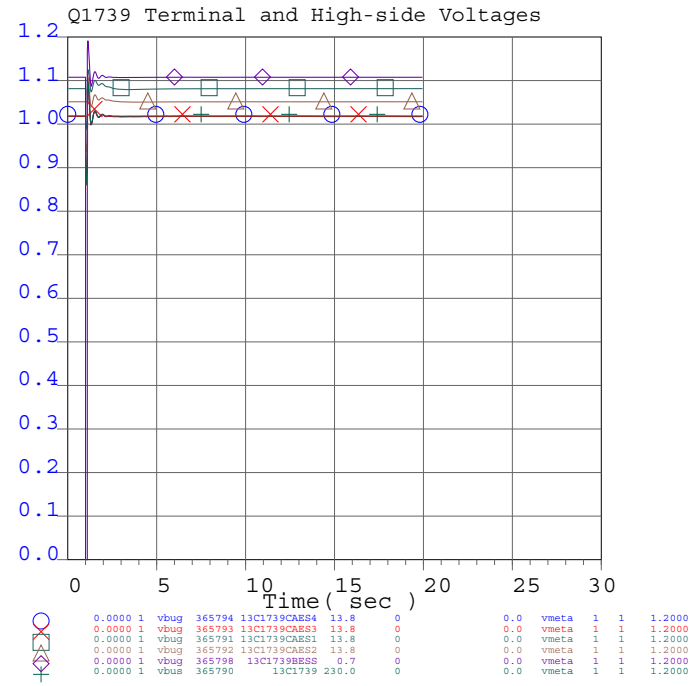
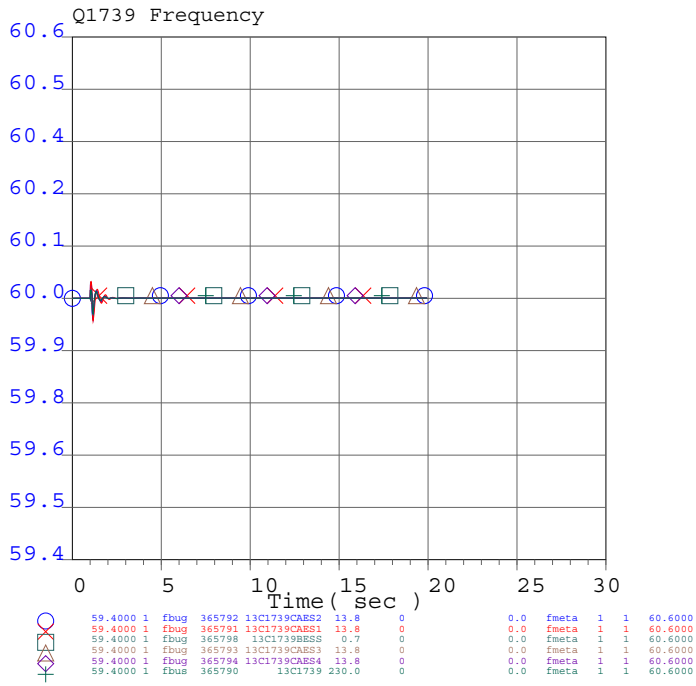
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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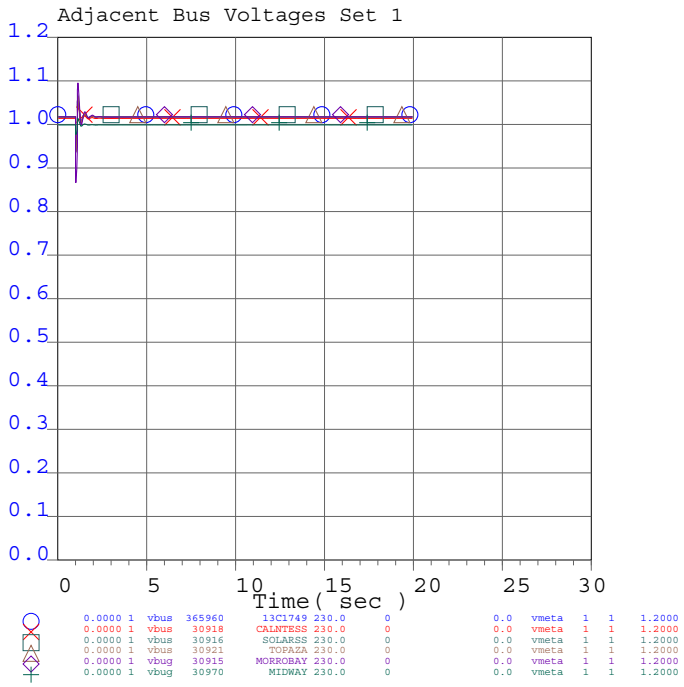

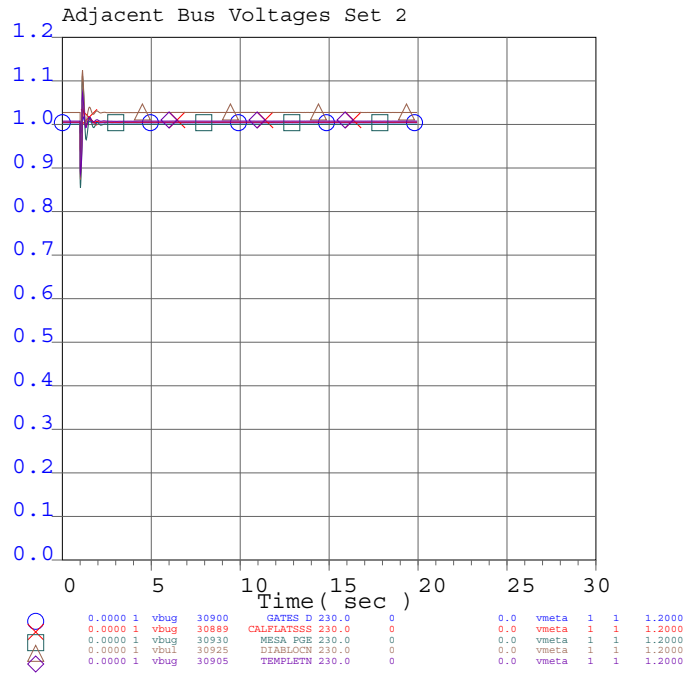

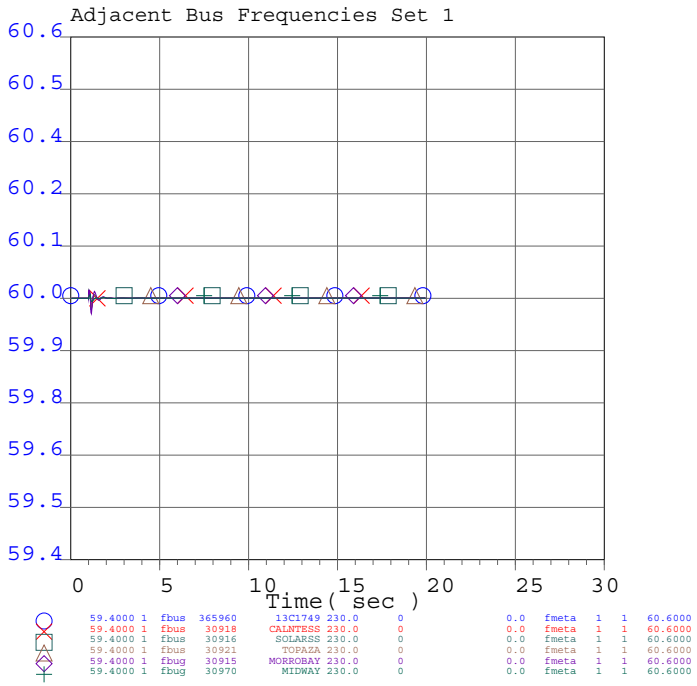

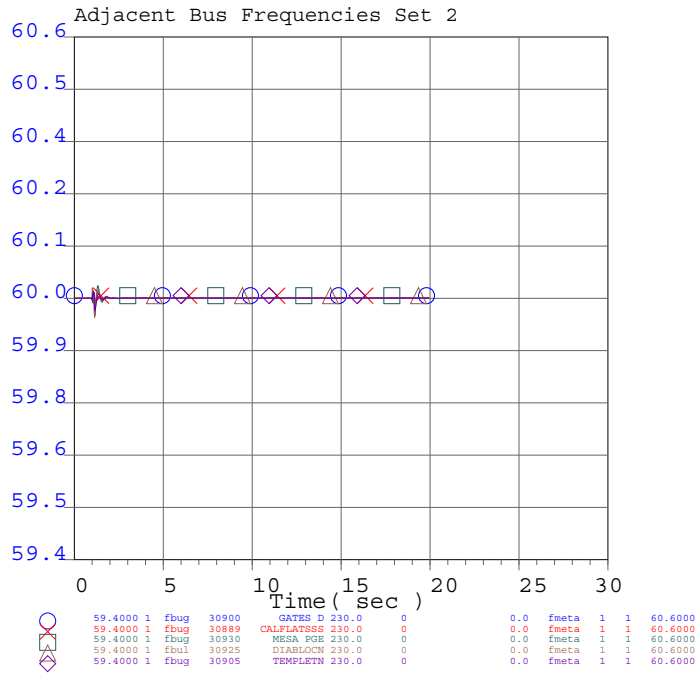

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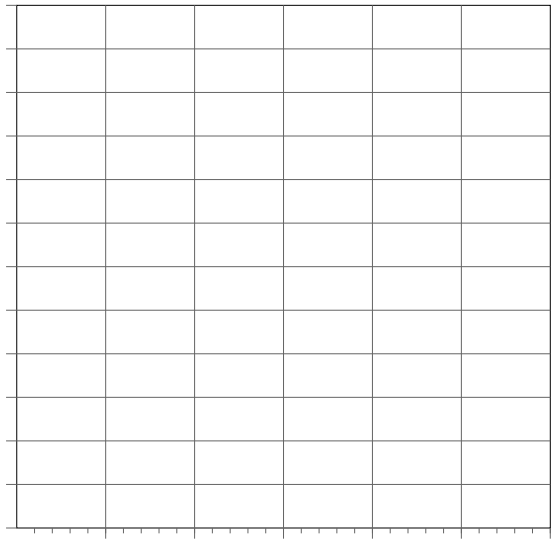
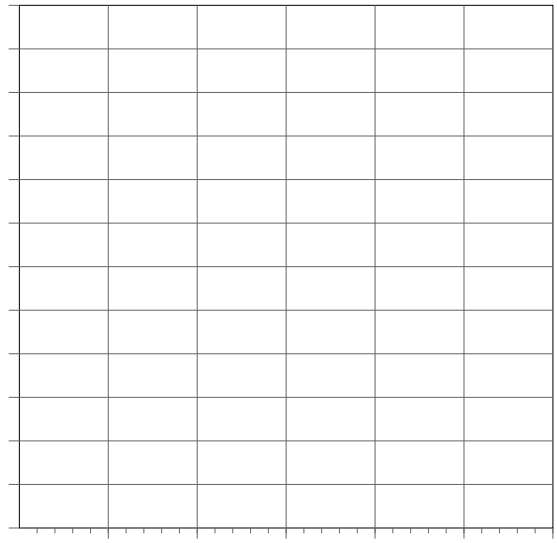
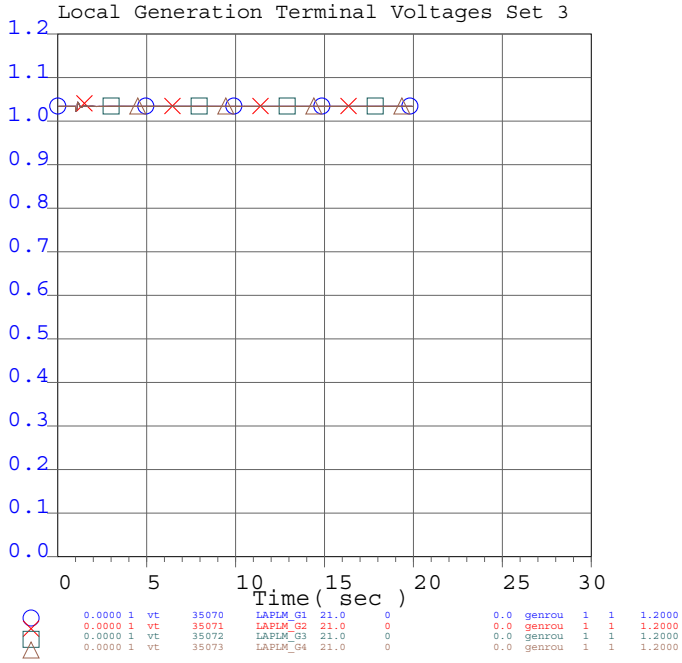
Local Generation Terminal Voltages Set 1



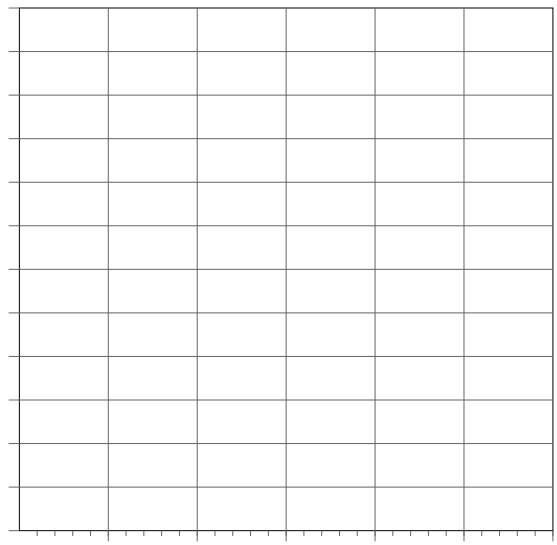
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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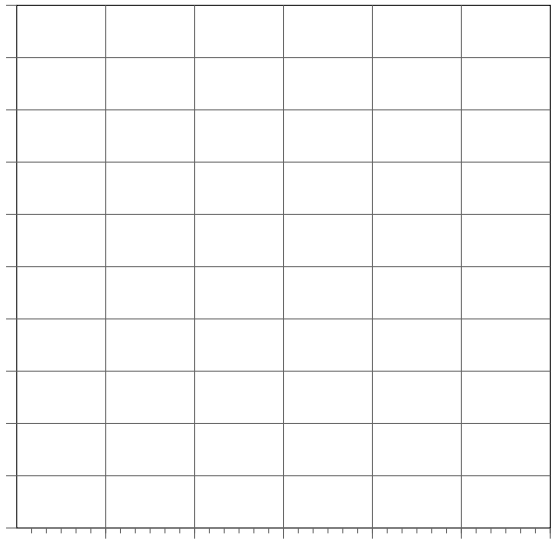
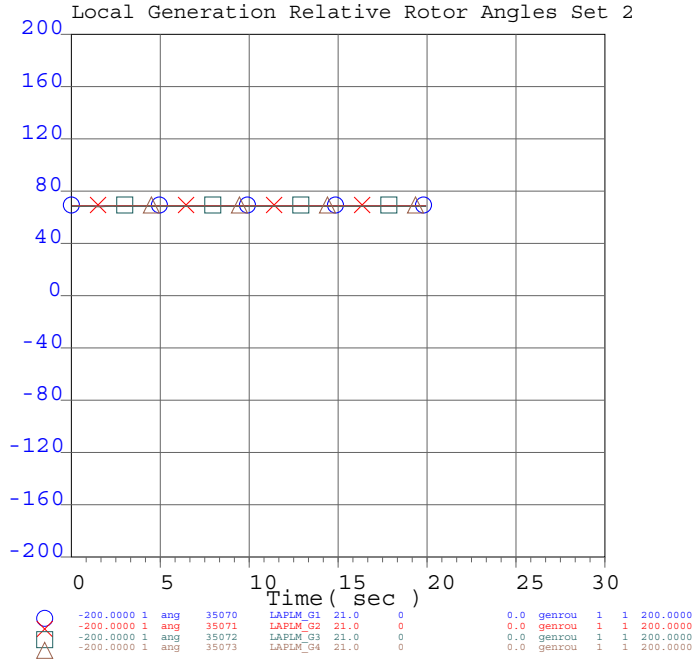
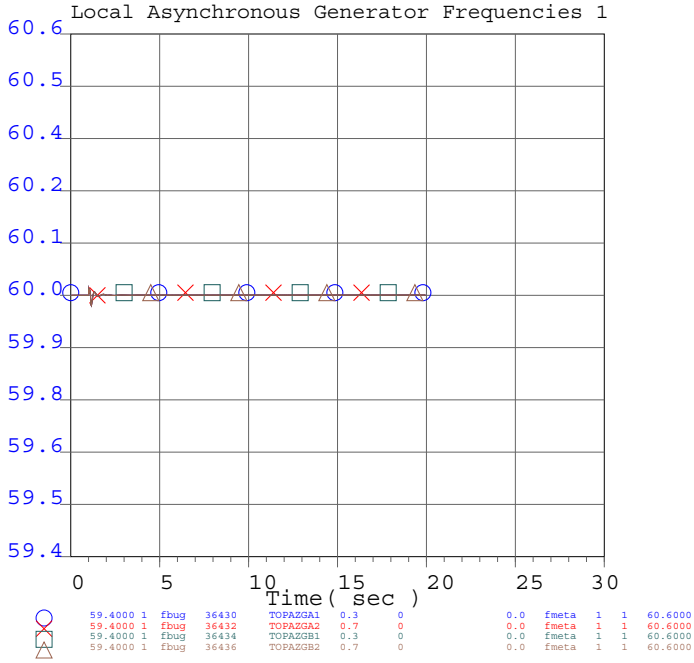
Local Generation Relative Rotor Angles Set 1



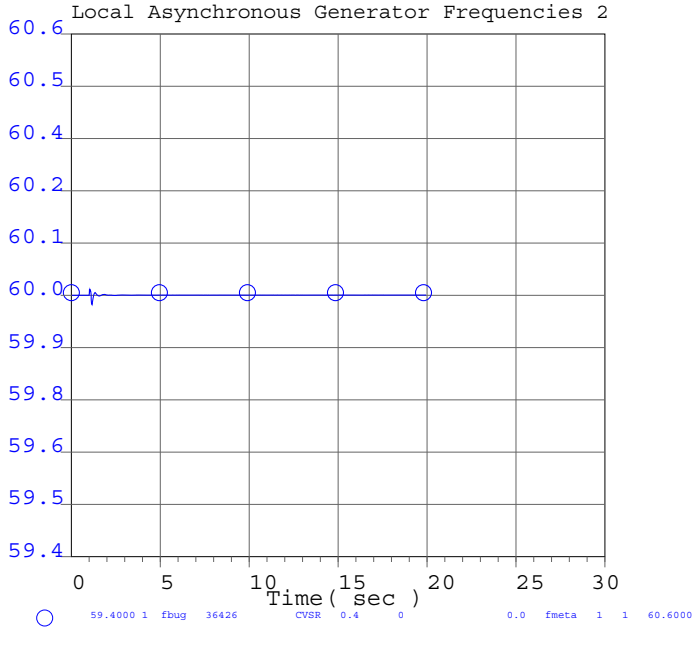
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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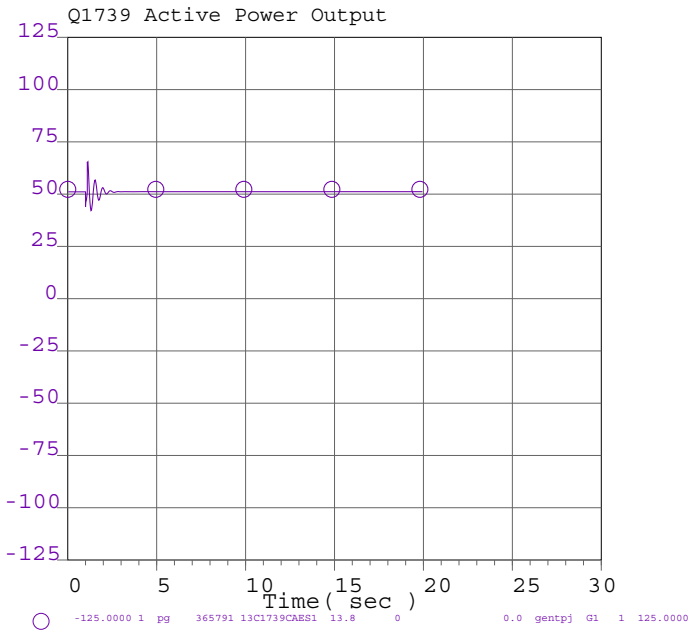

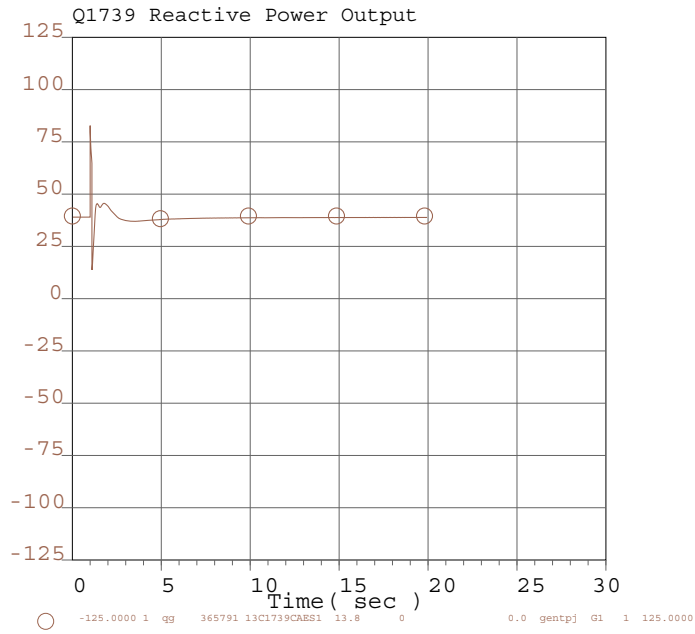

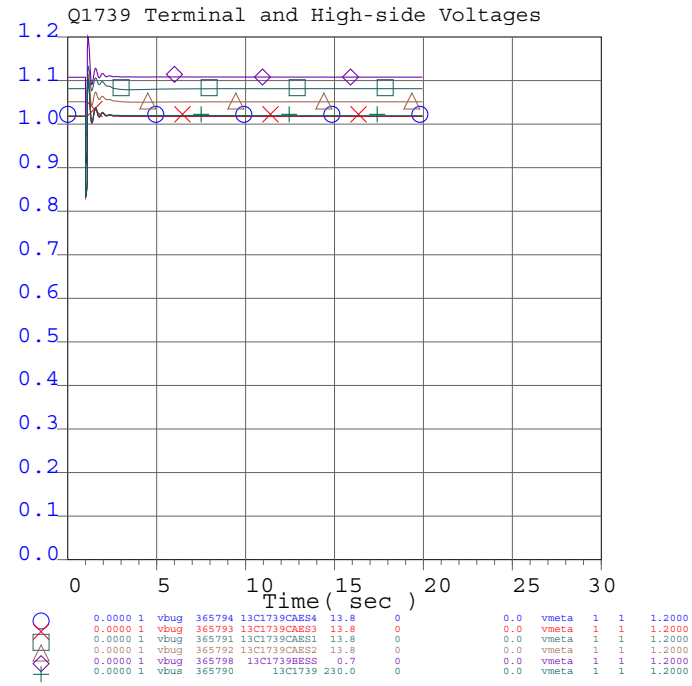

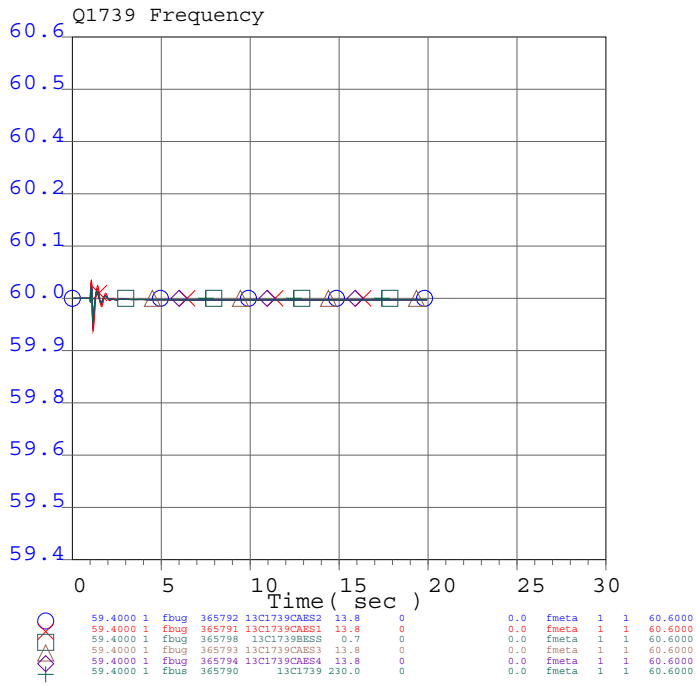

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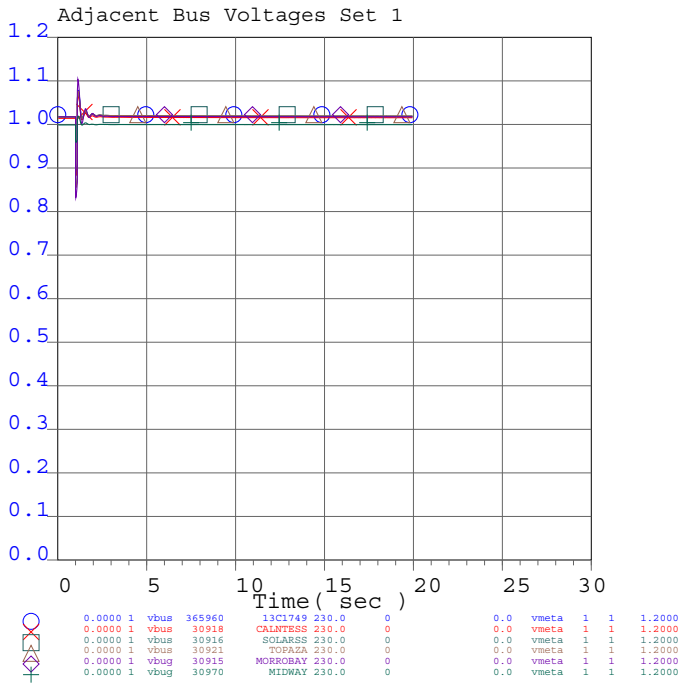

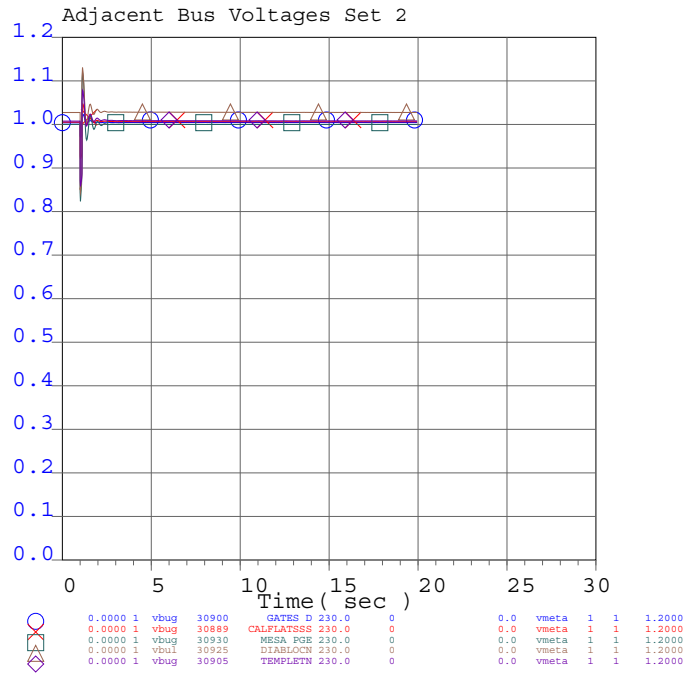

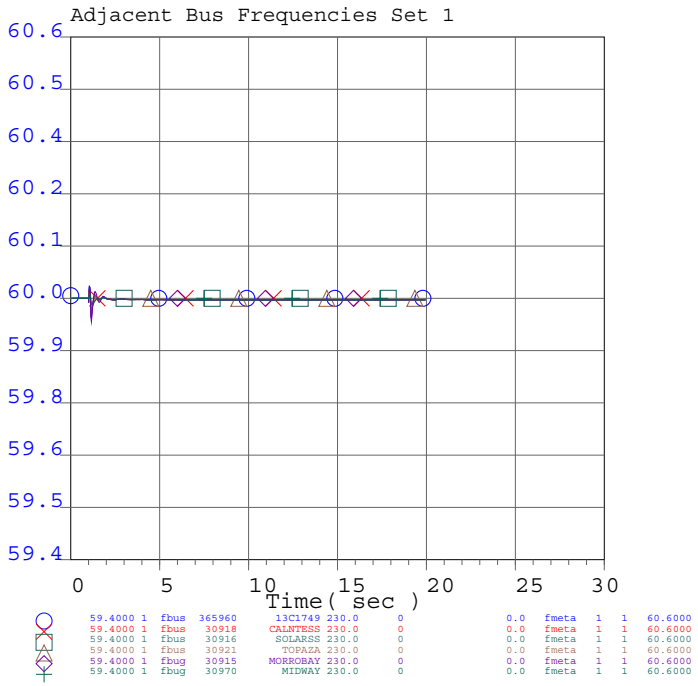

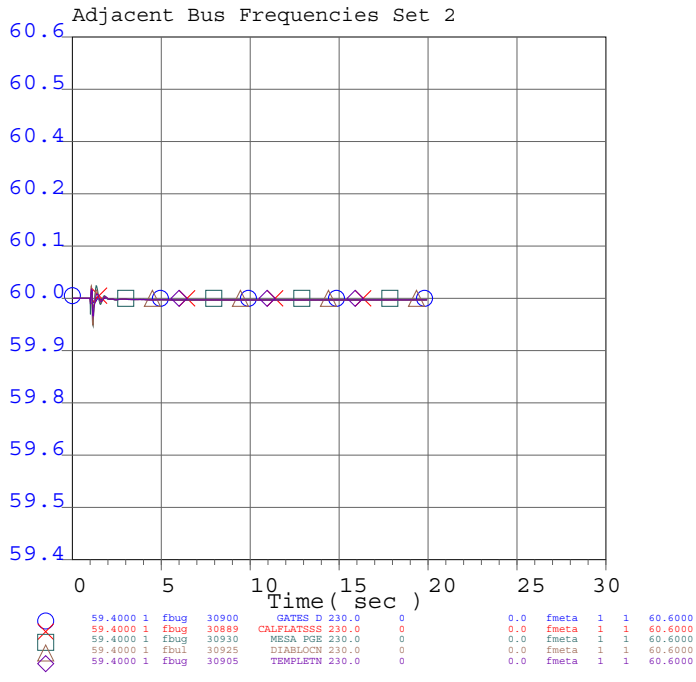

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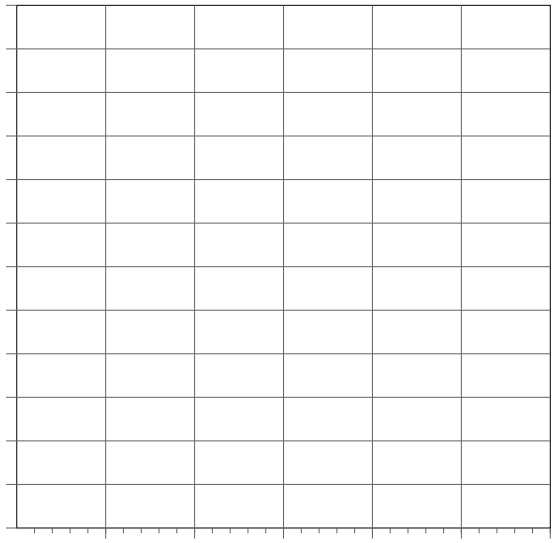
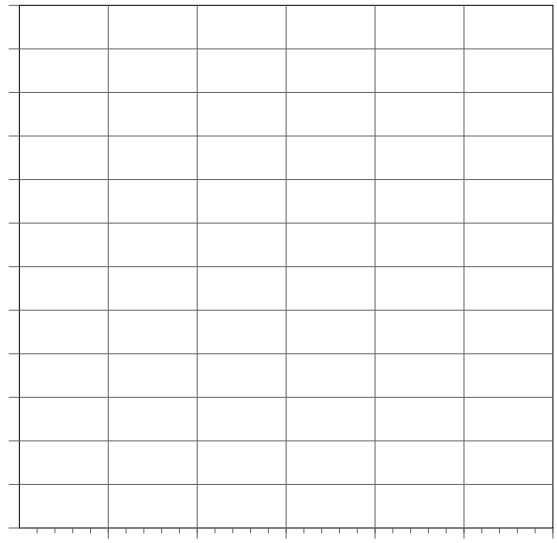
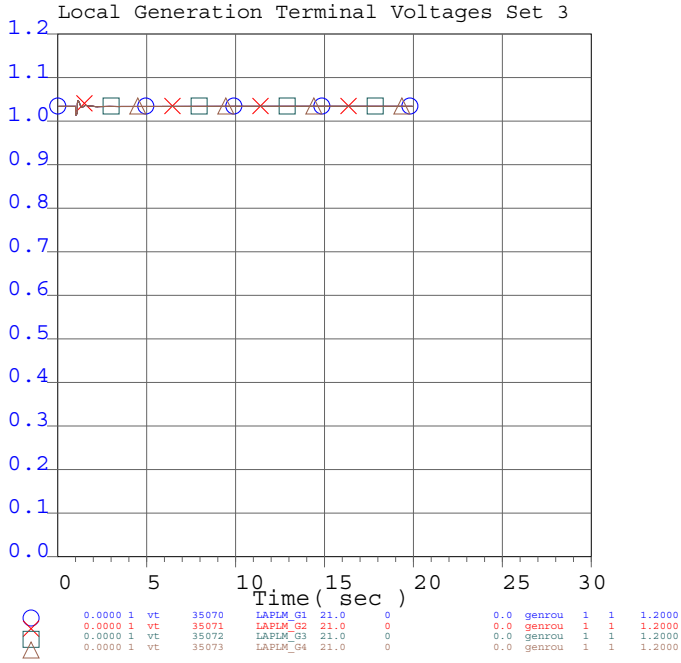
Local Generation Terminal Voltages Set 1



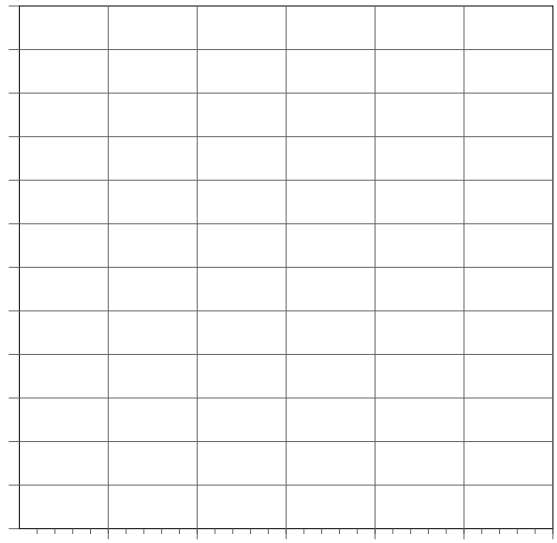
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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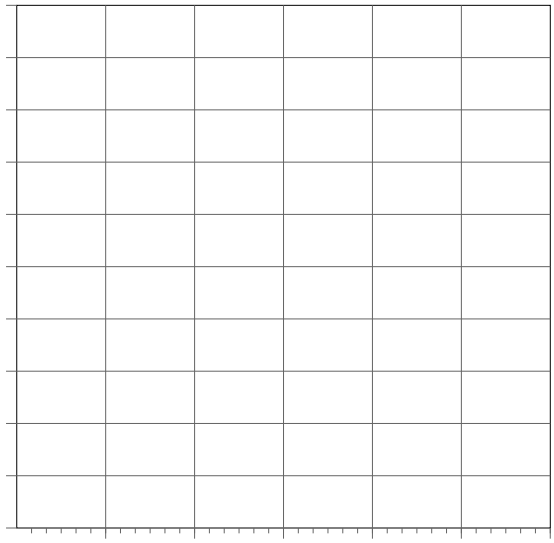
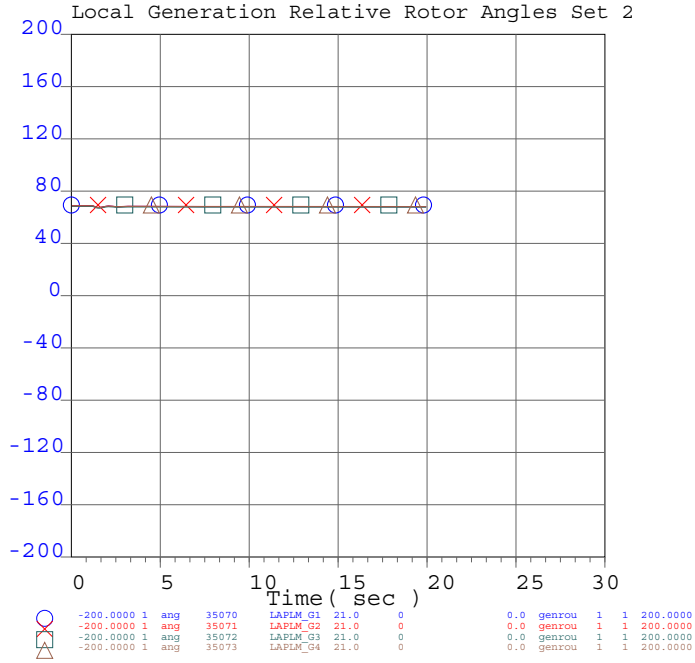


Local Generation Relative Rotor Angles Set 2



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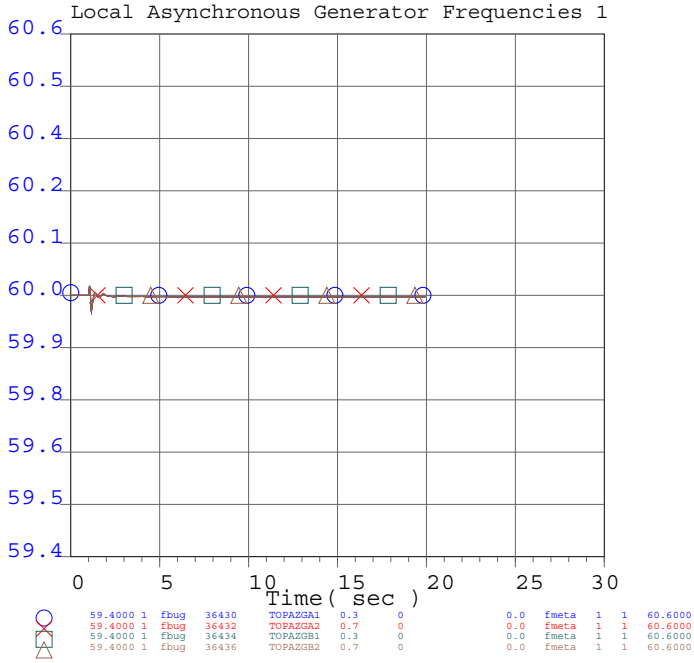

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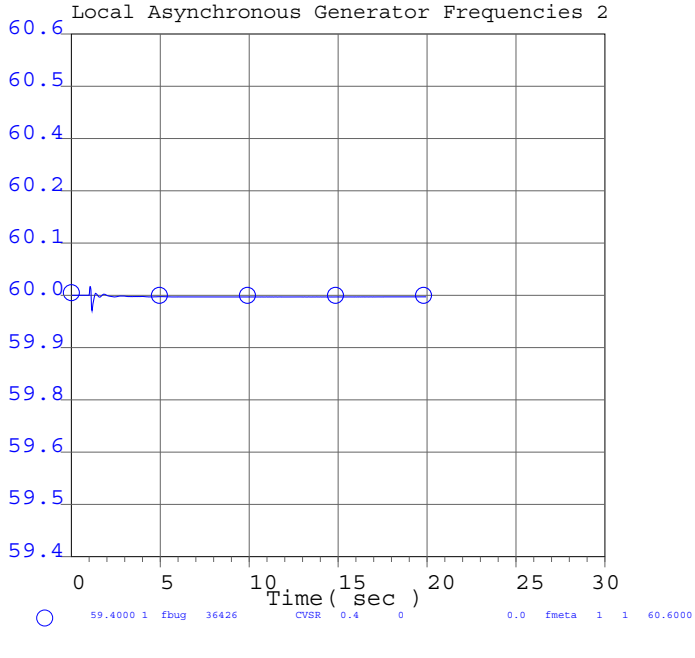

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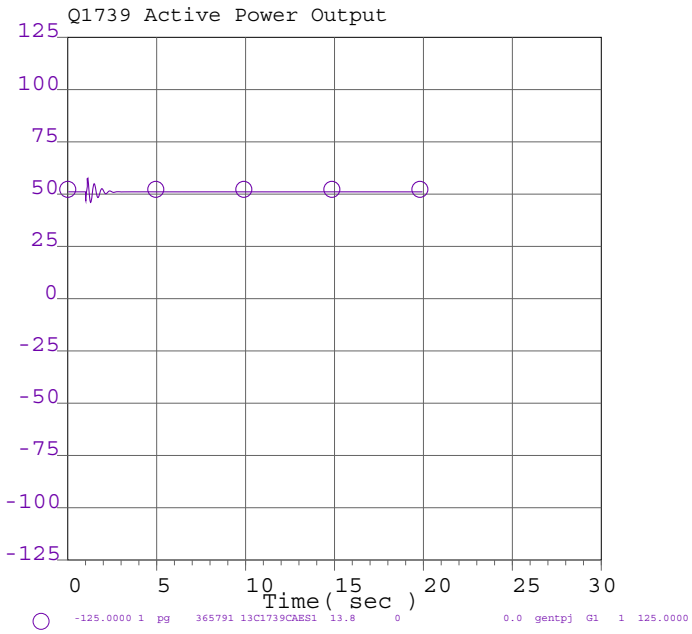

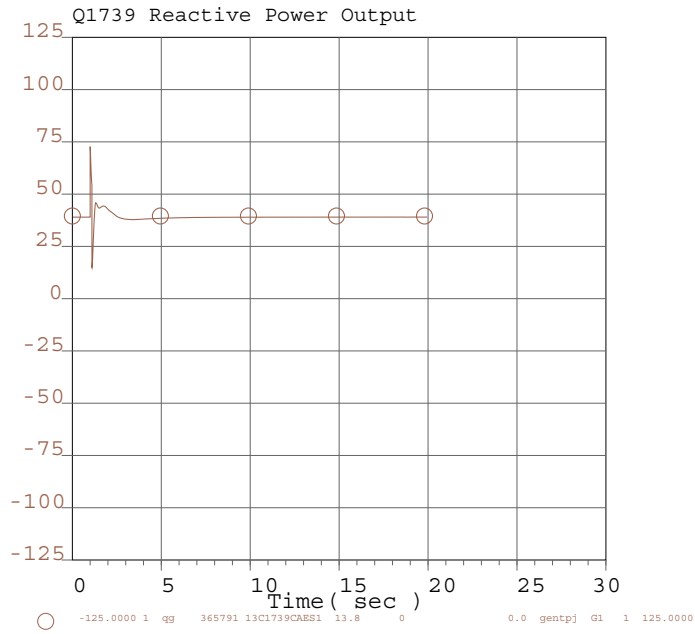

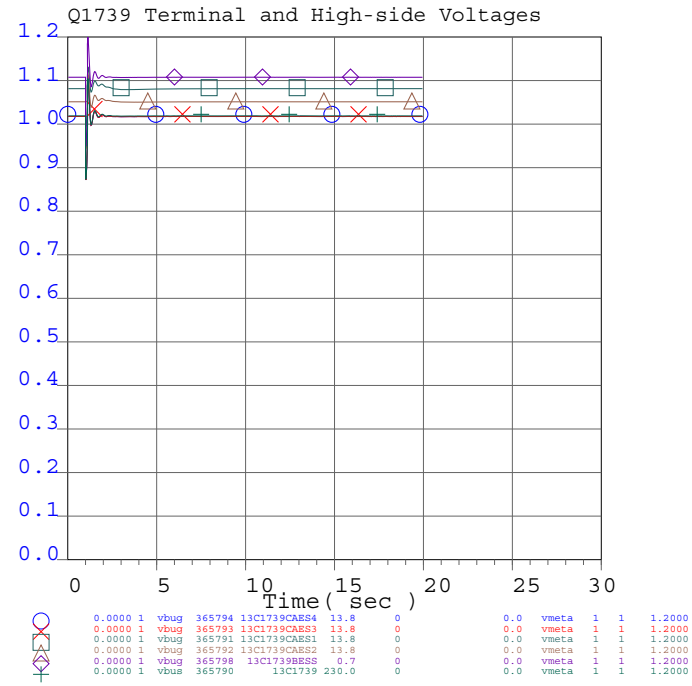

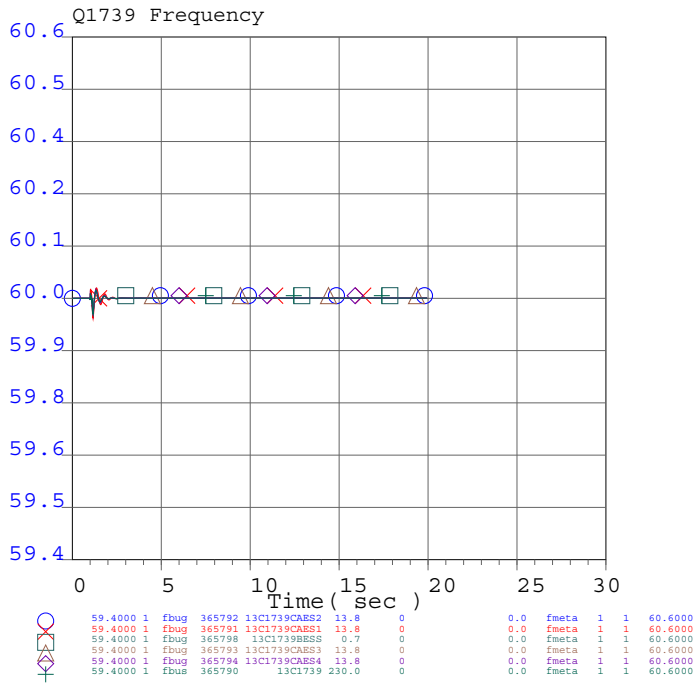

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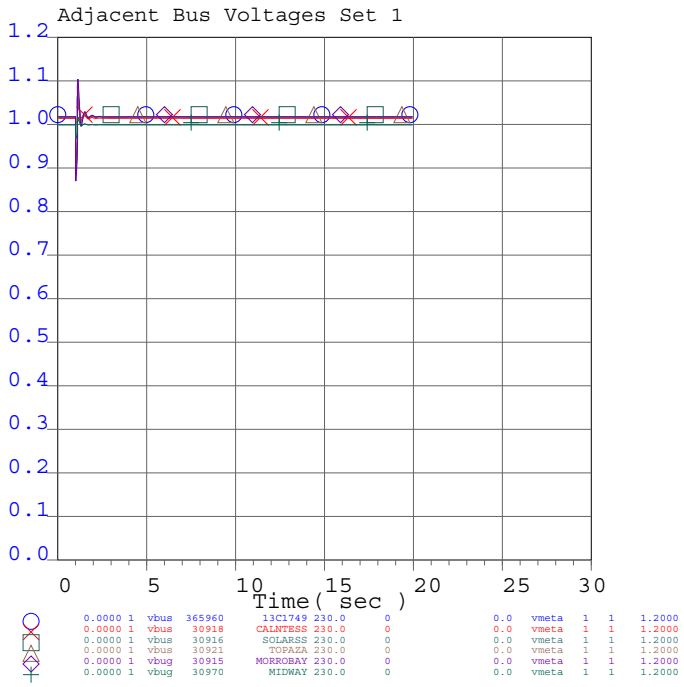
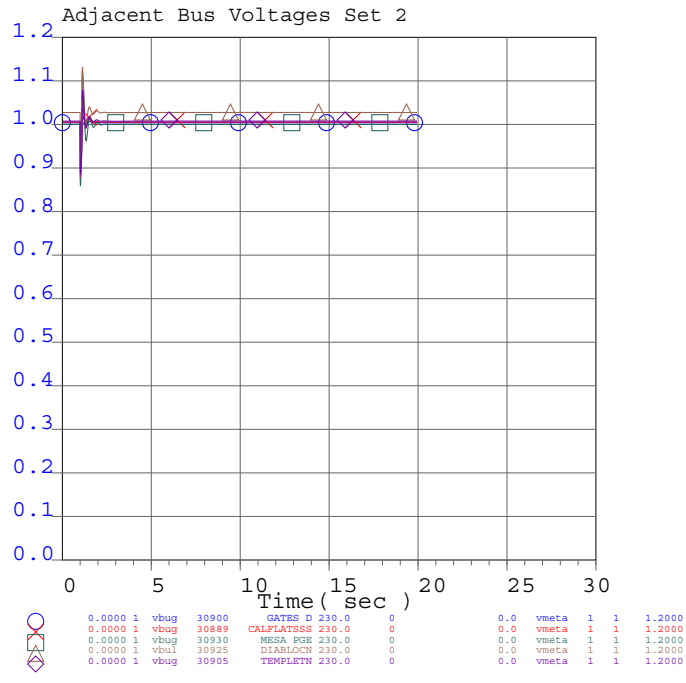
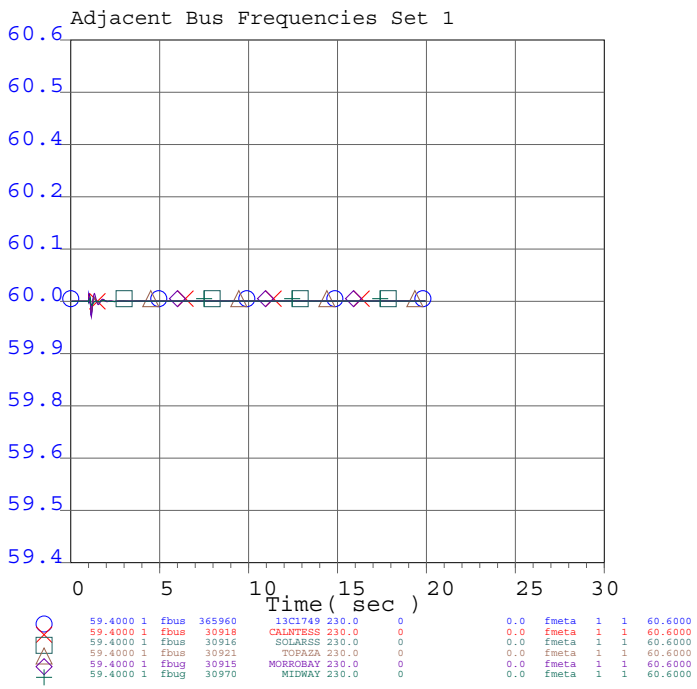
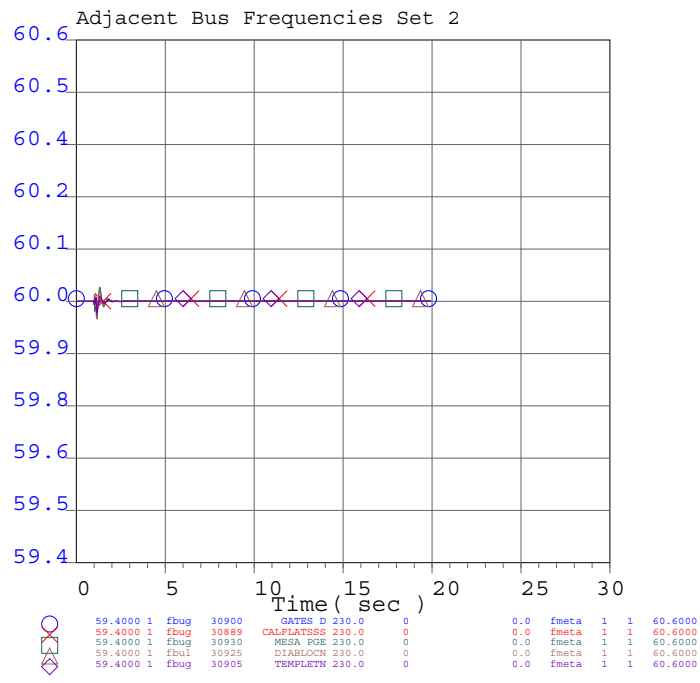


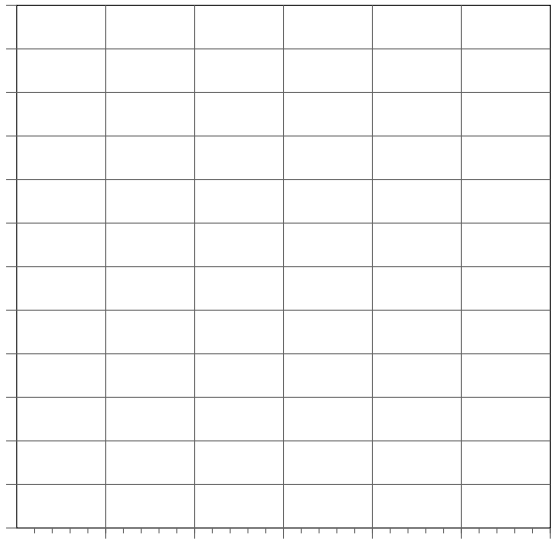




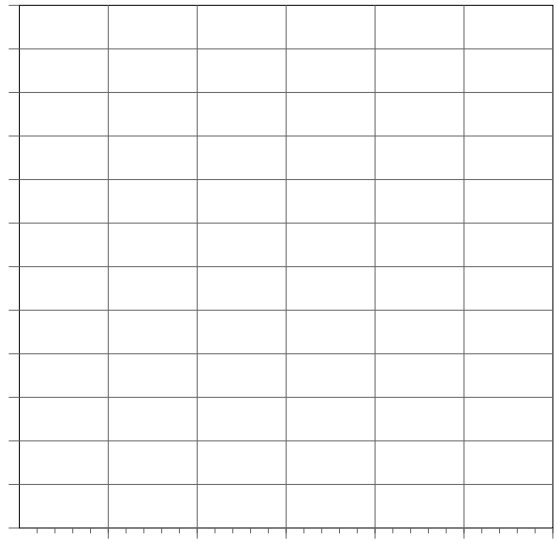


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

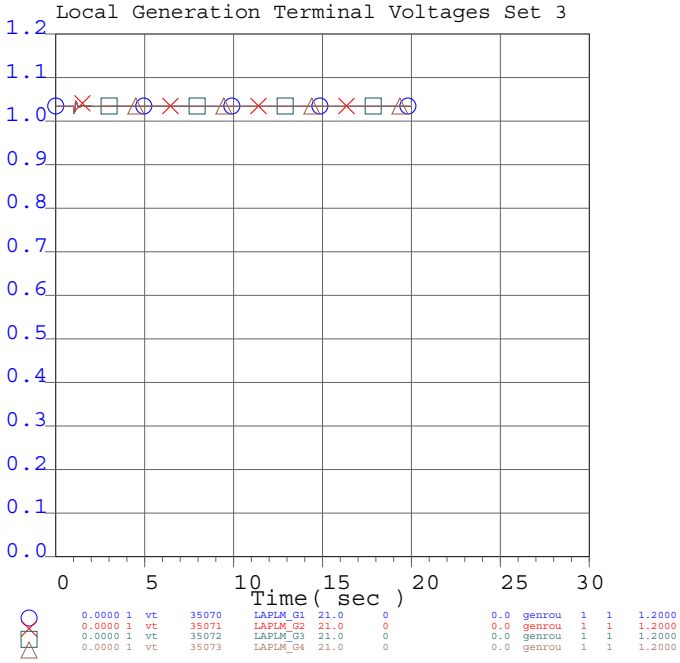
Local Generation Terminal Voltages Set 1



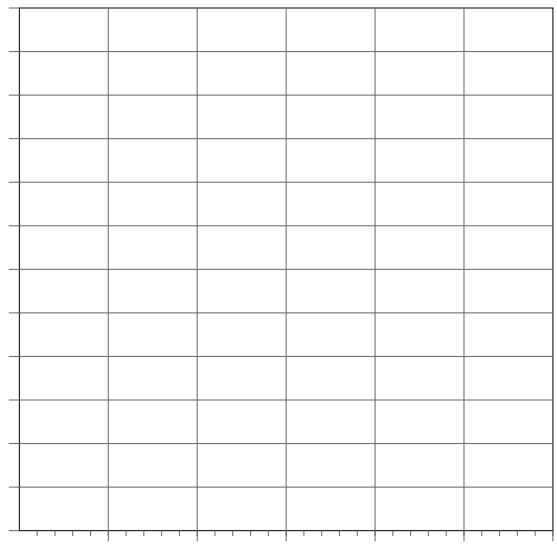
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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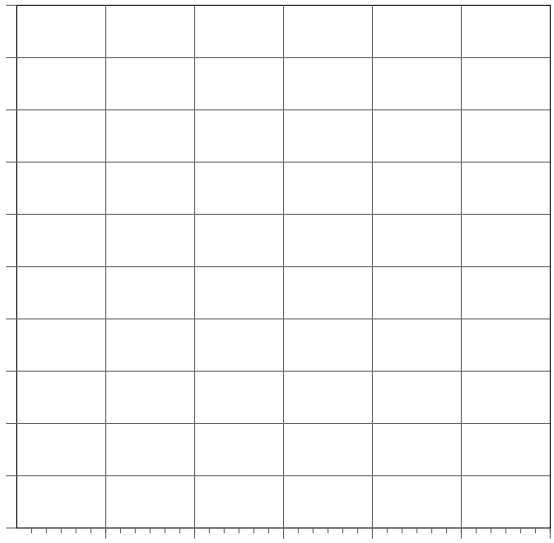
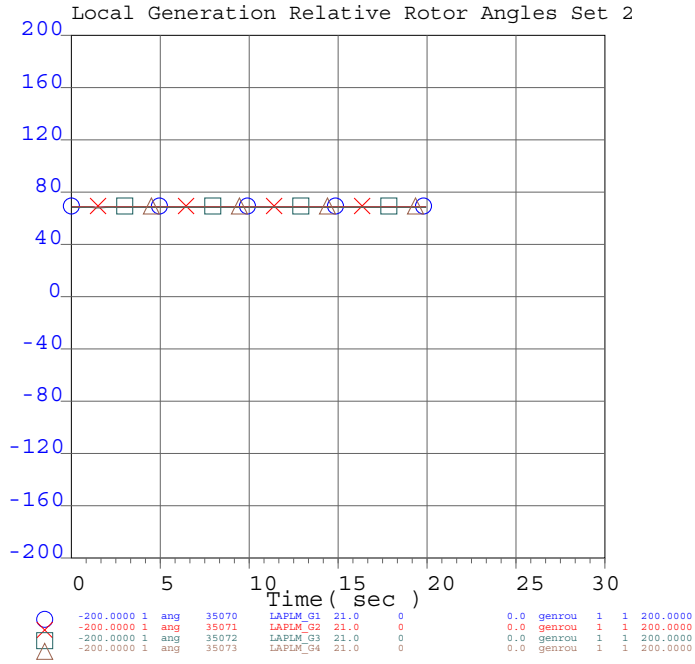
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

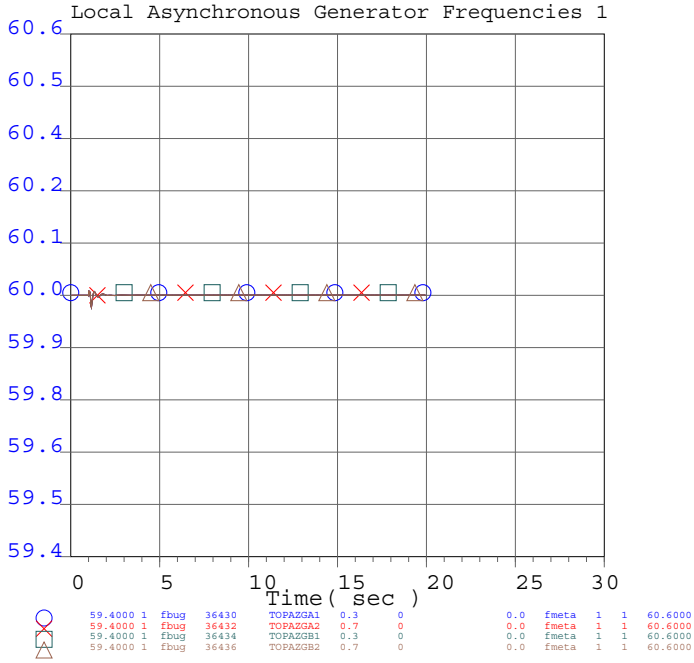
Local Generation Relative Rotor Angles Set 1



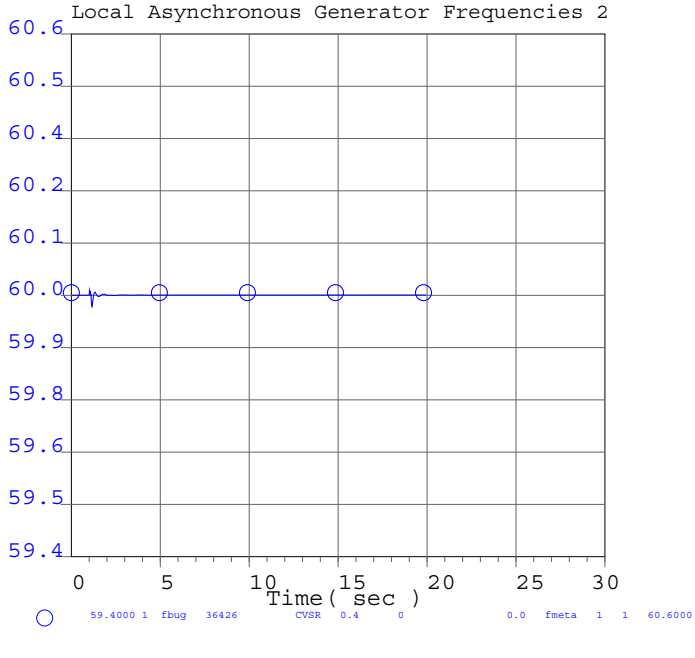
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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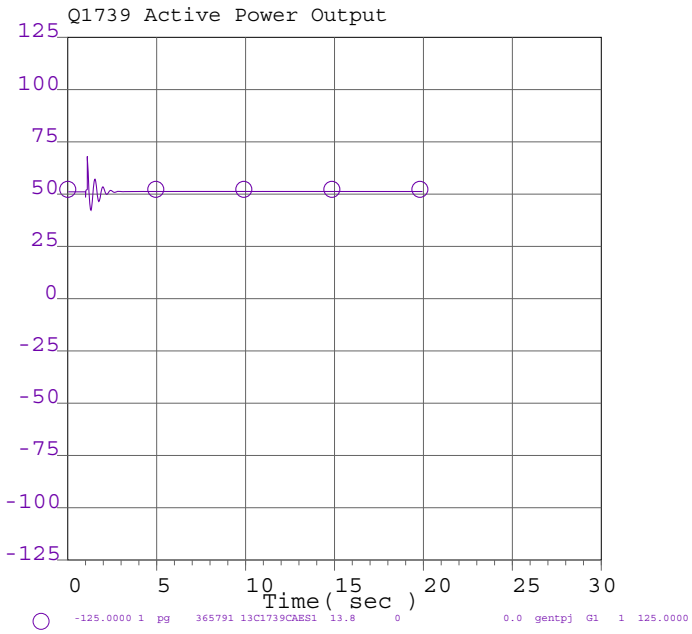
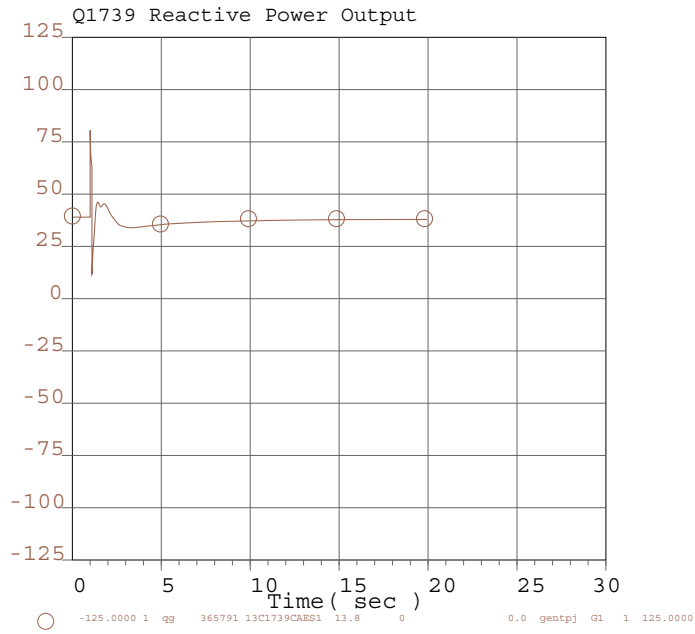
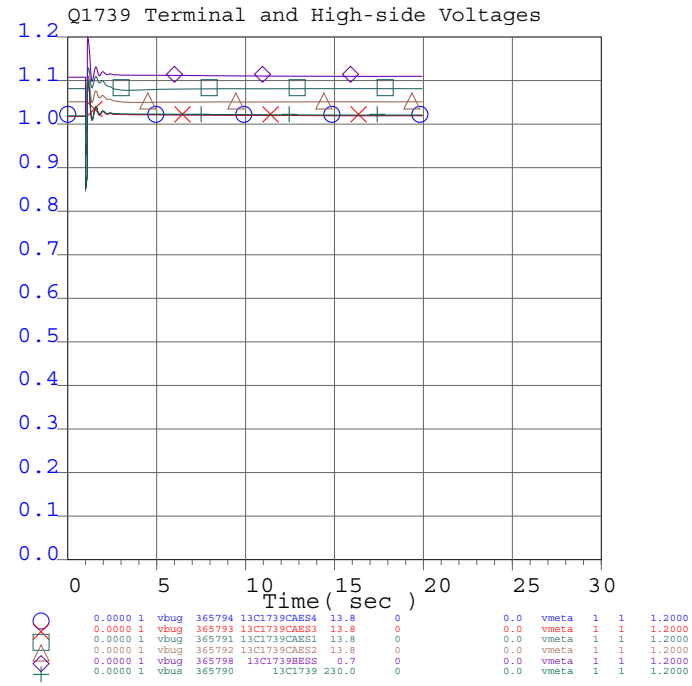
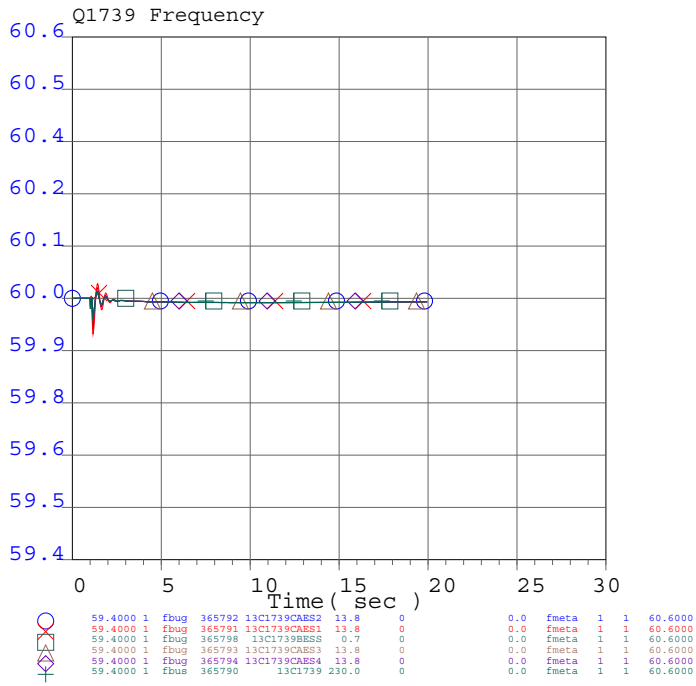
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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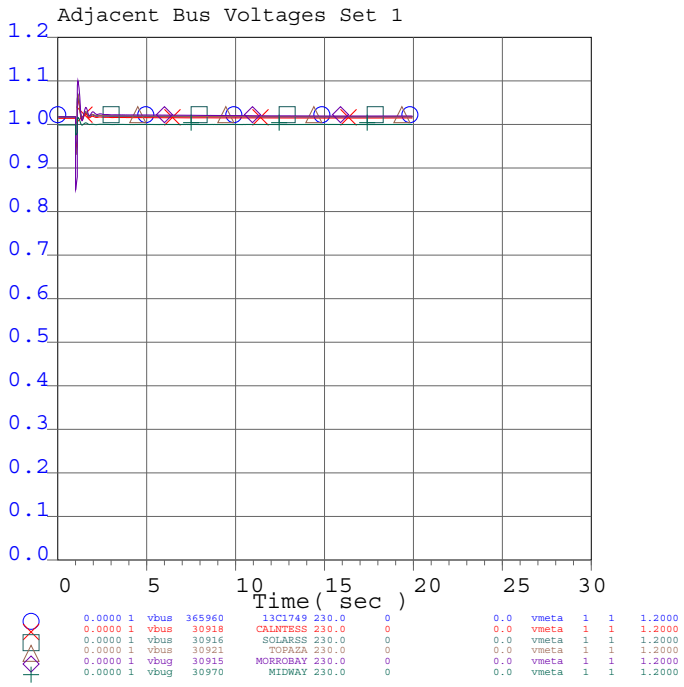

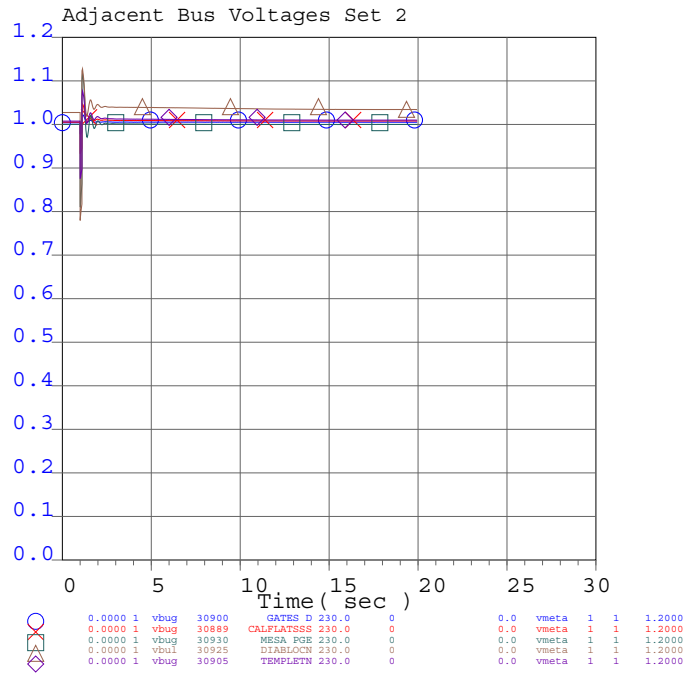

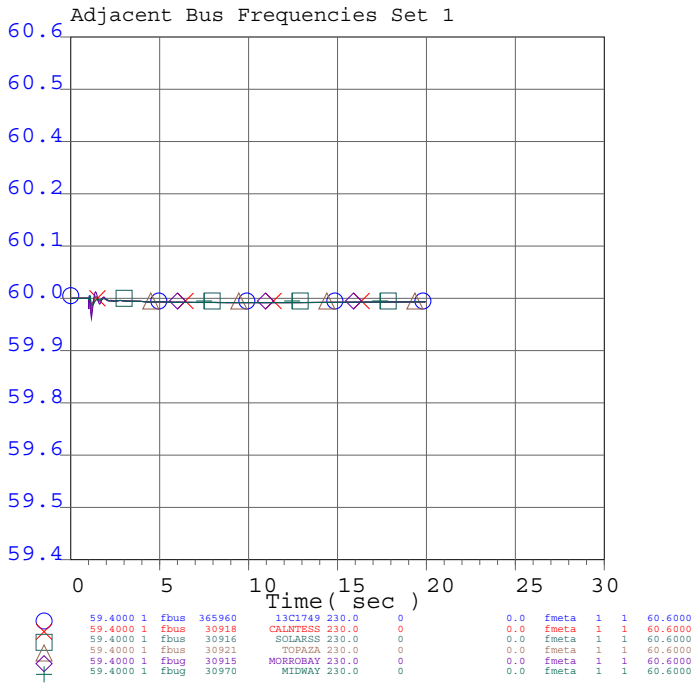

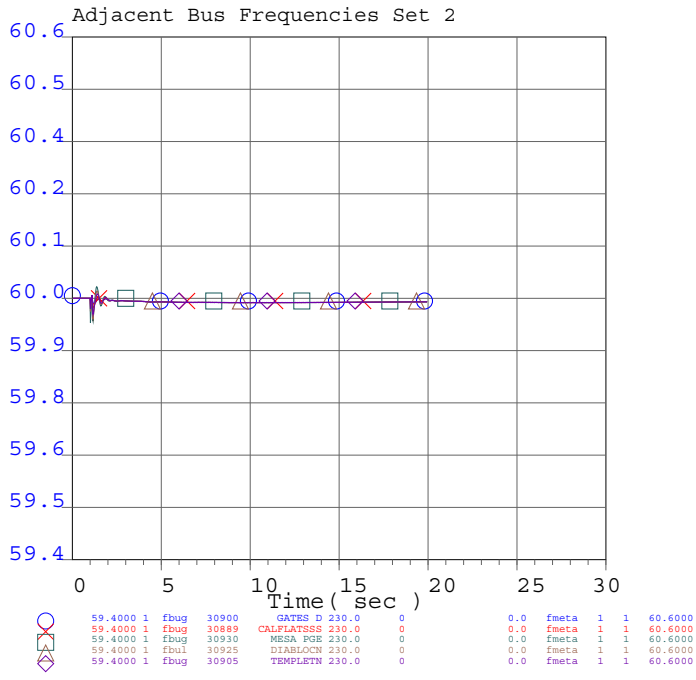

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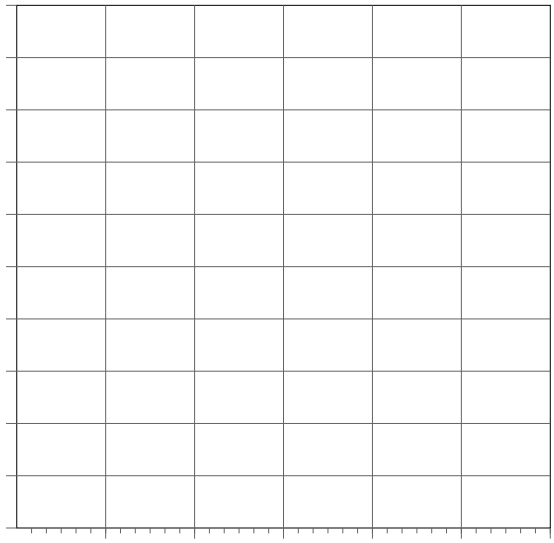
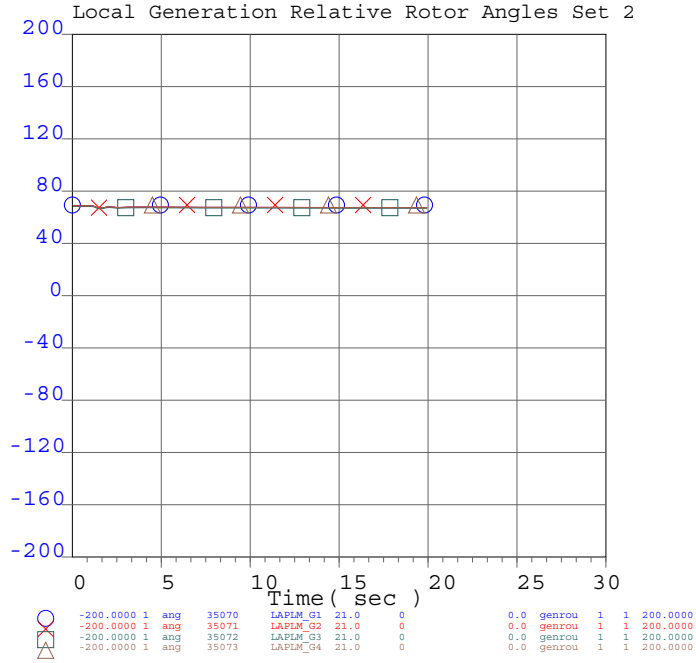
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

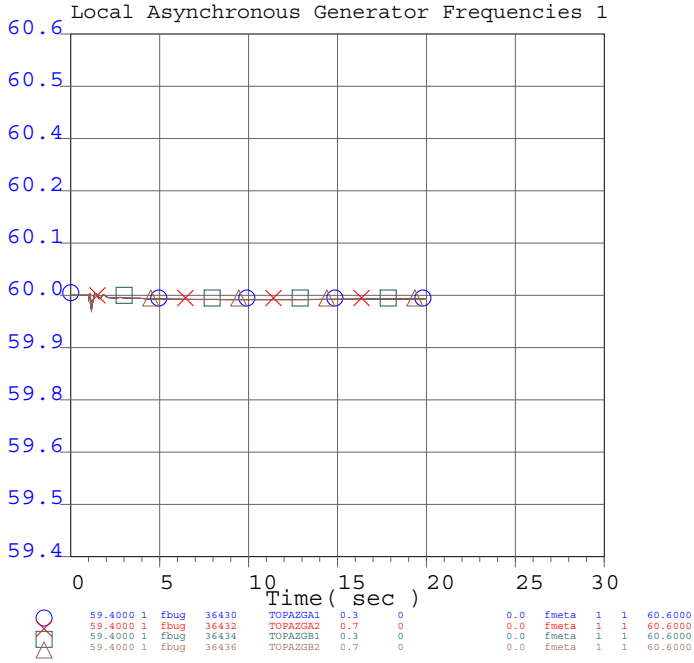
Local Generation Relative Rotor Angles Set 1



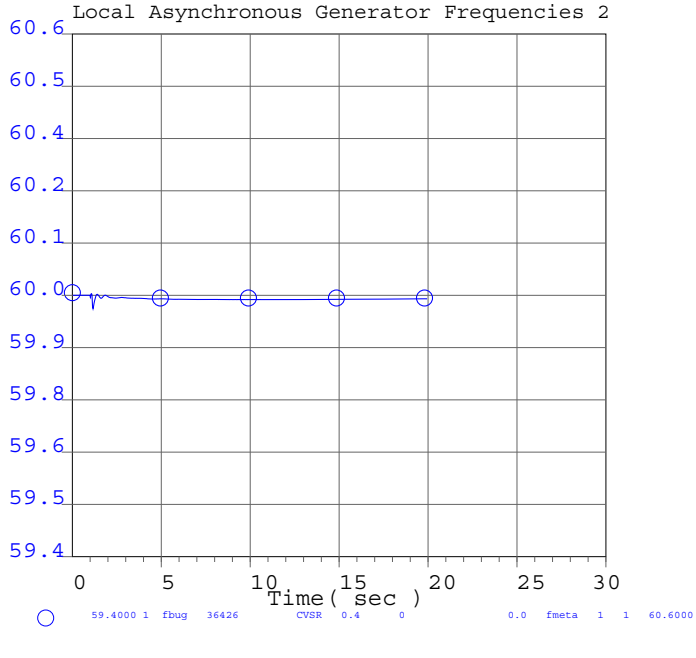
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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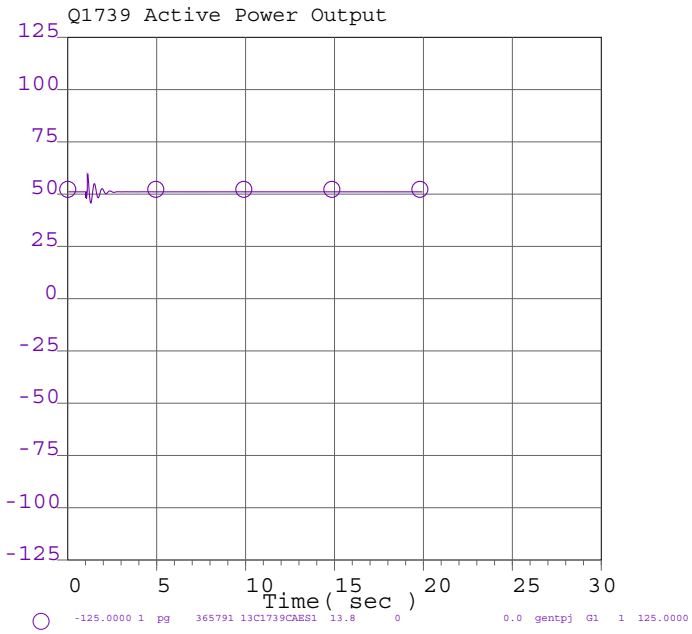
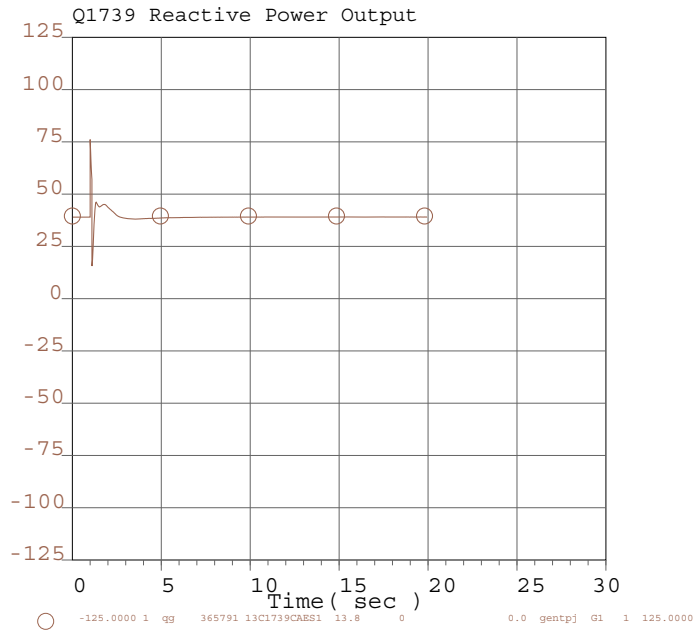
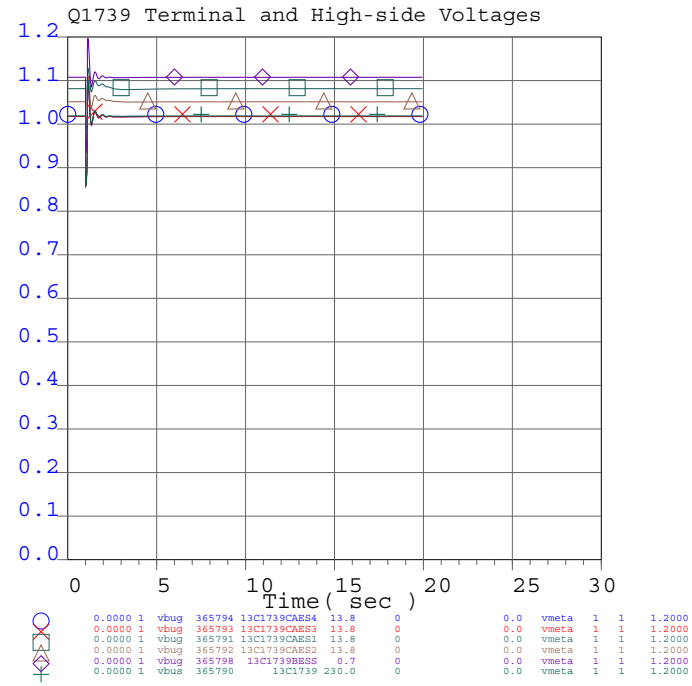
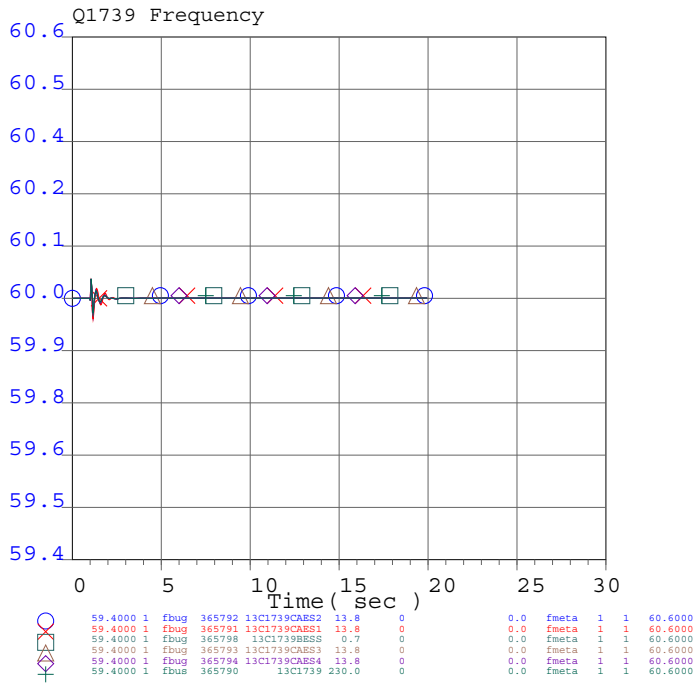
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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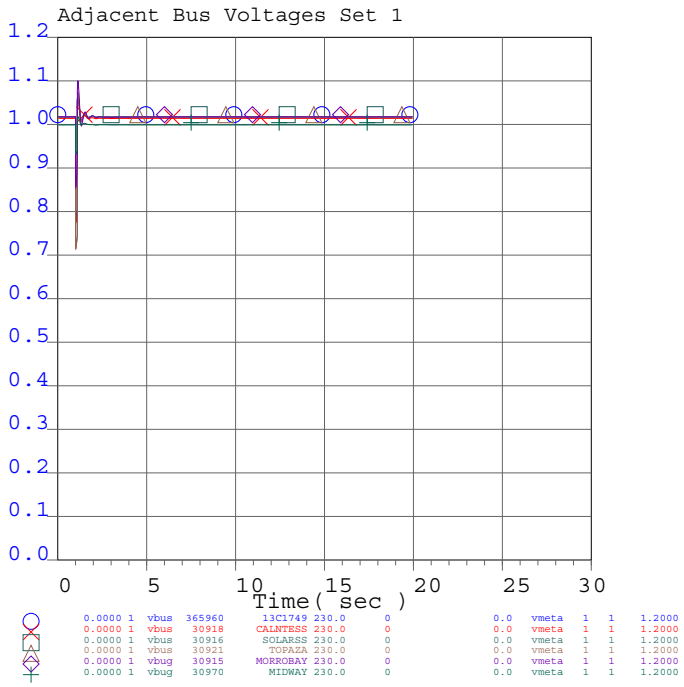

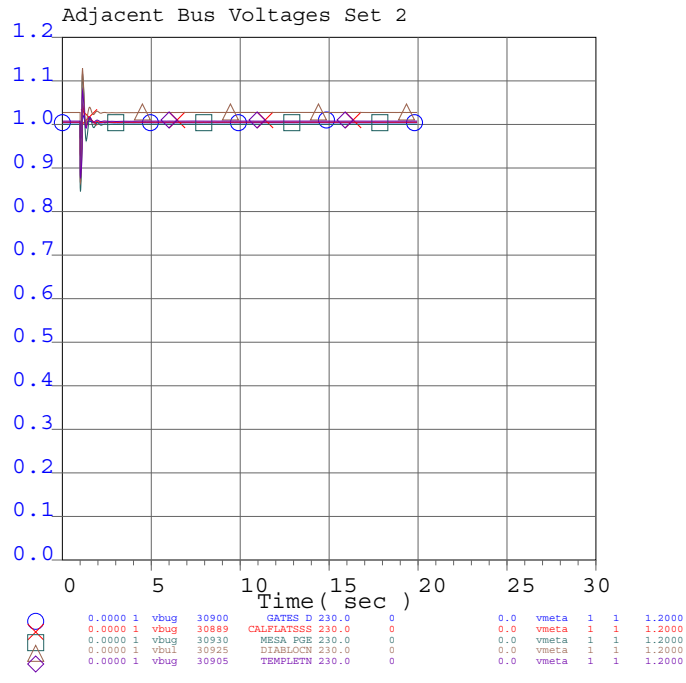

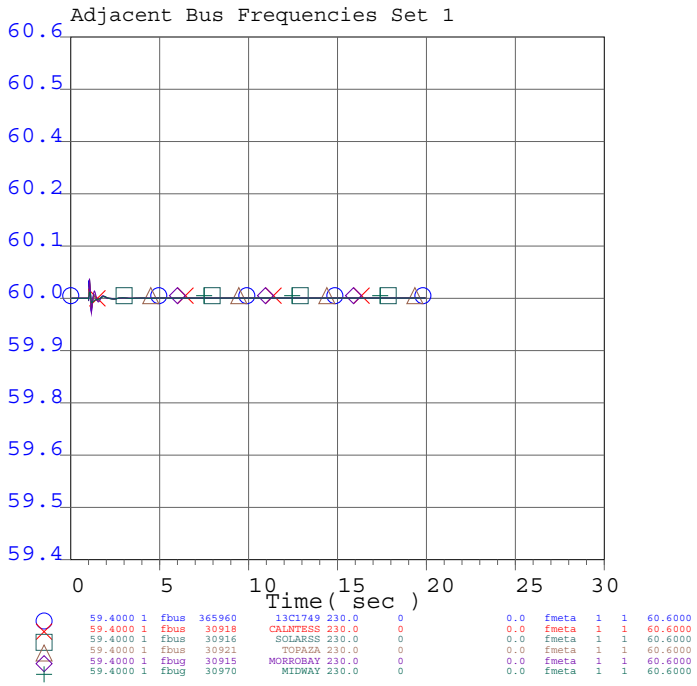

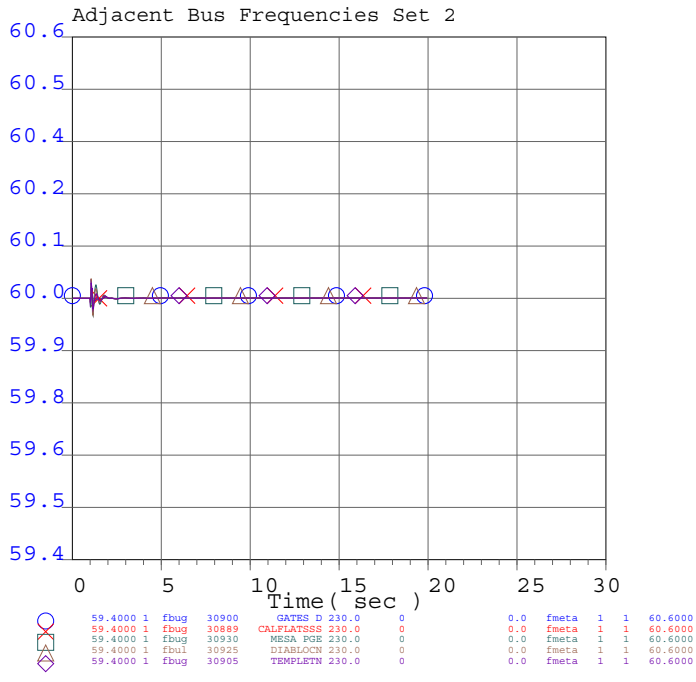

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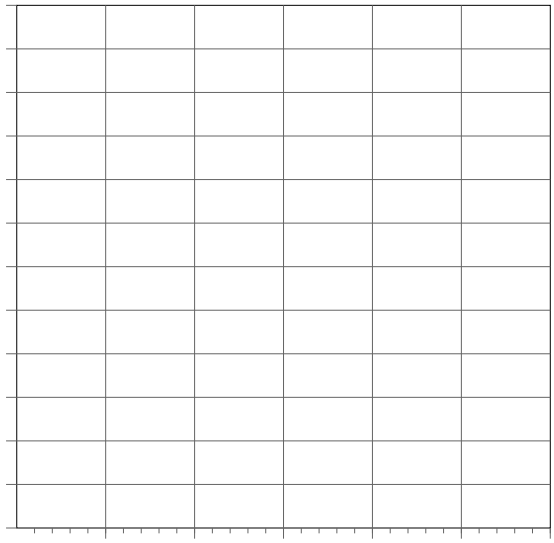
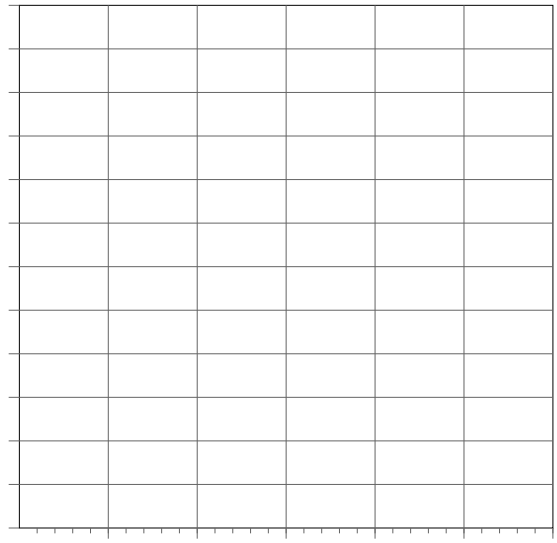
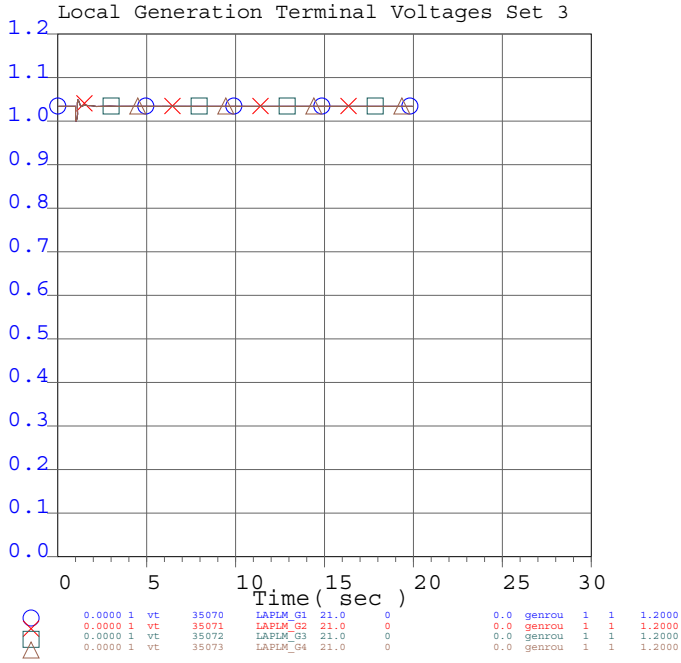
Local Generation Terminal Voltages Set 1



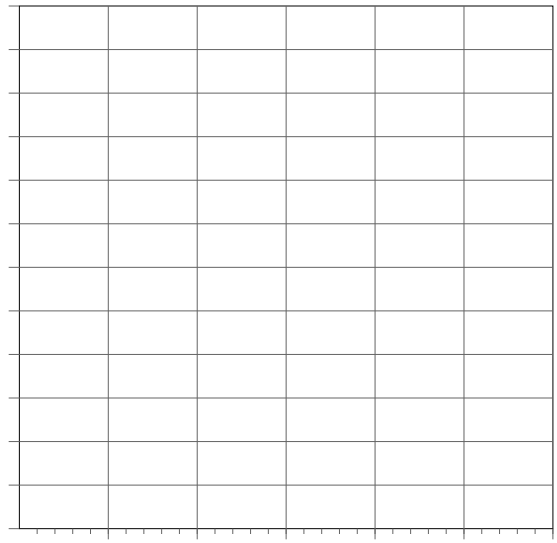
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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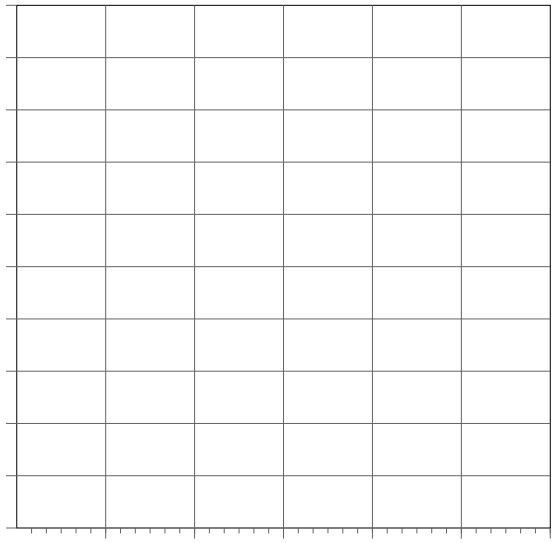
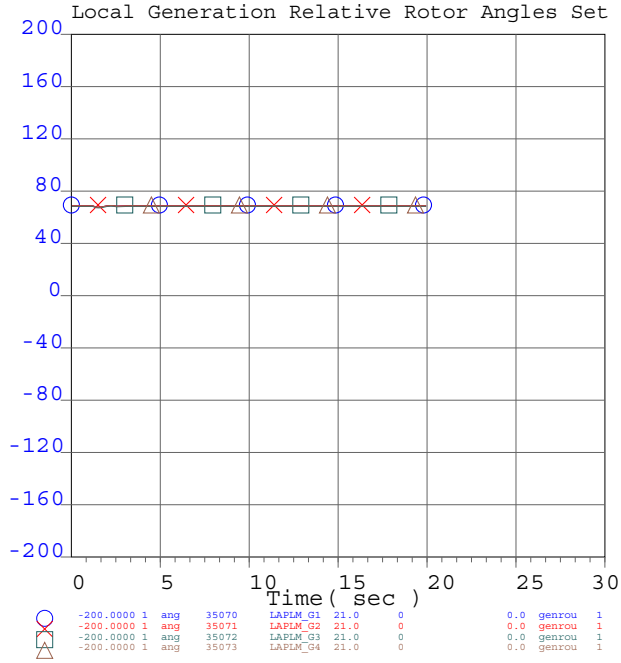
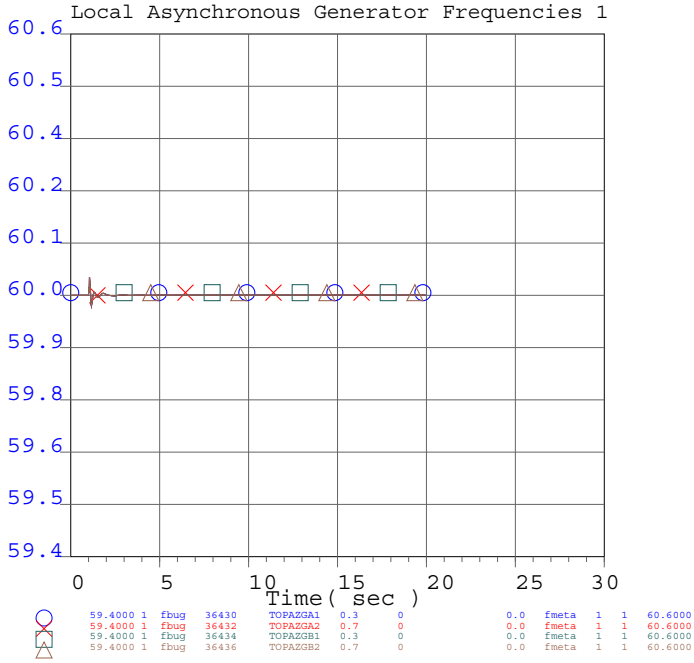
Local Generation Relative Rotor Angles Set 1



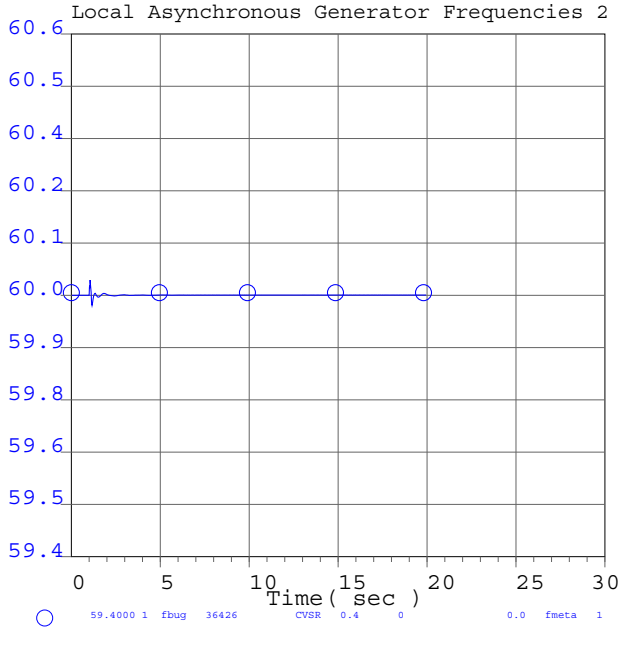
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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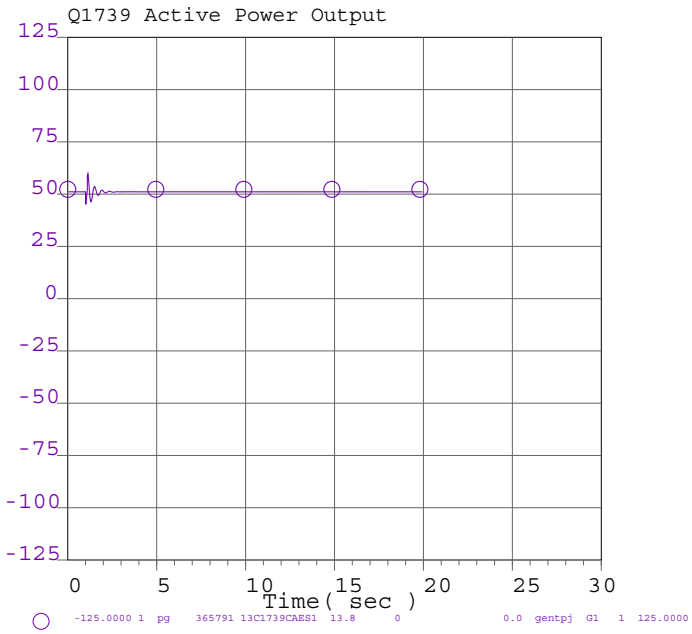

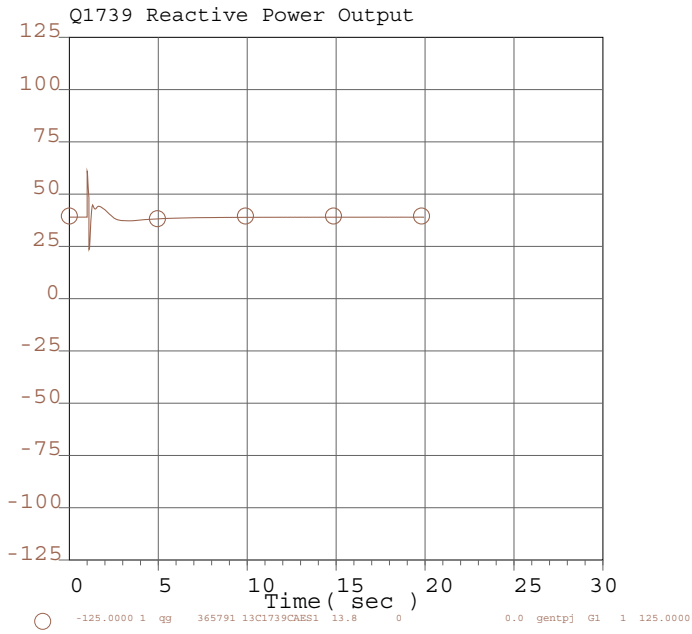

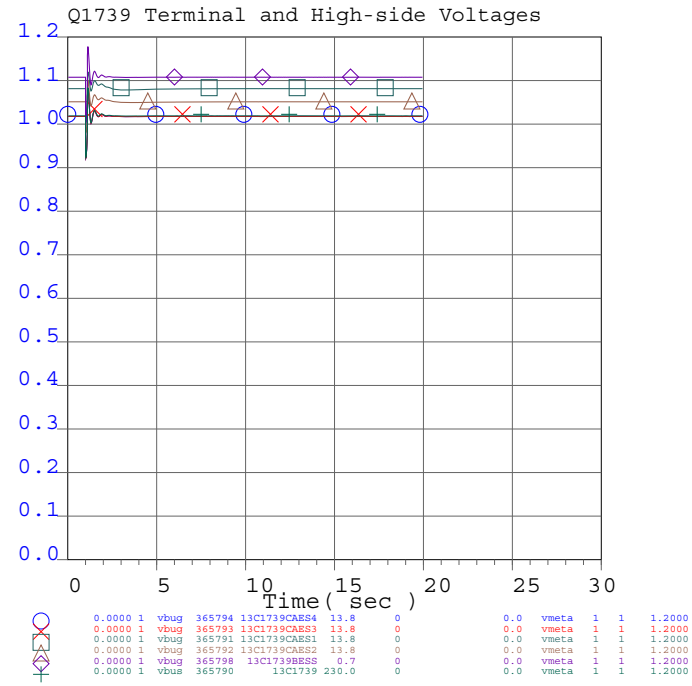

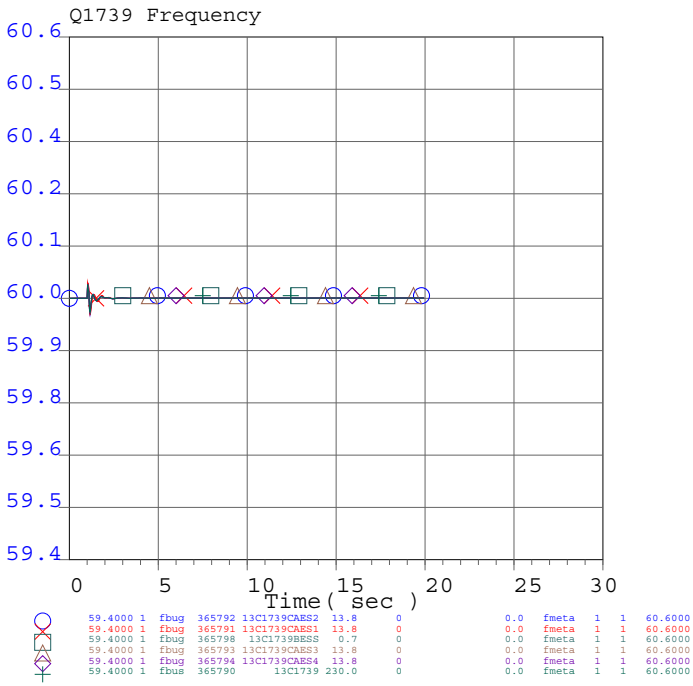

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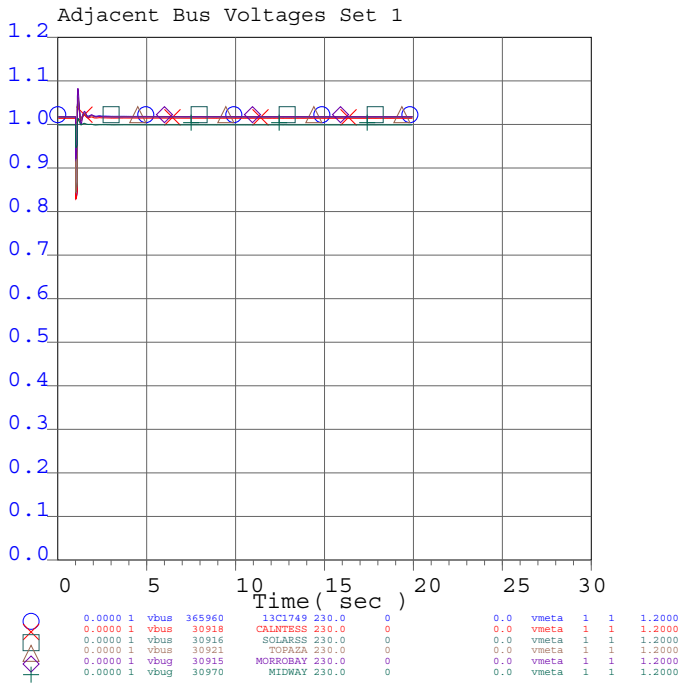

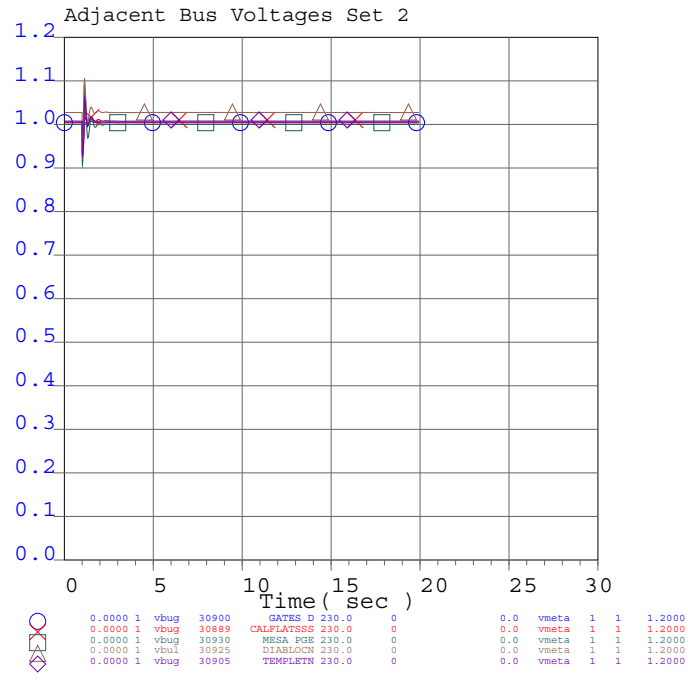

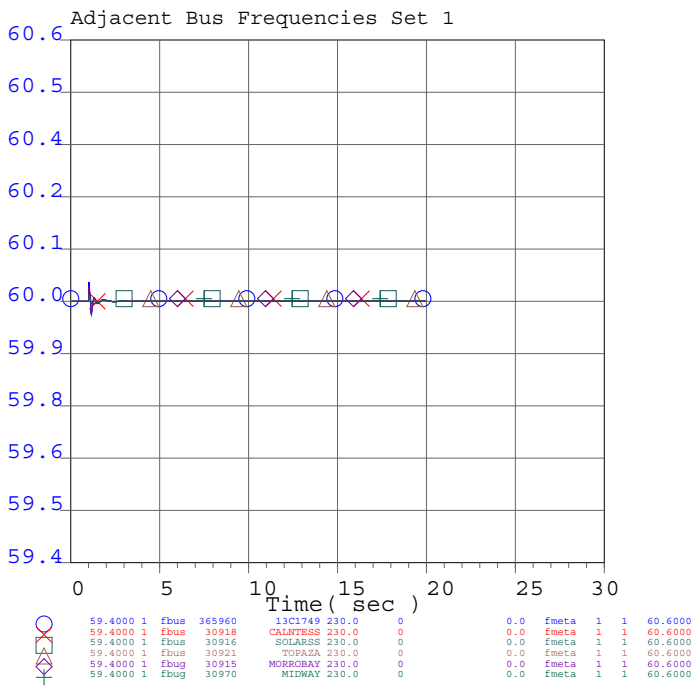

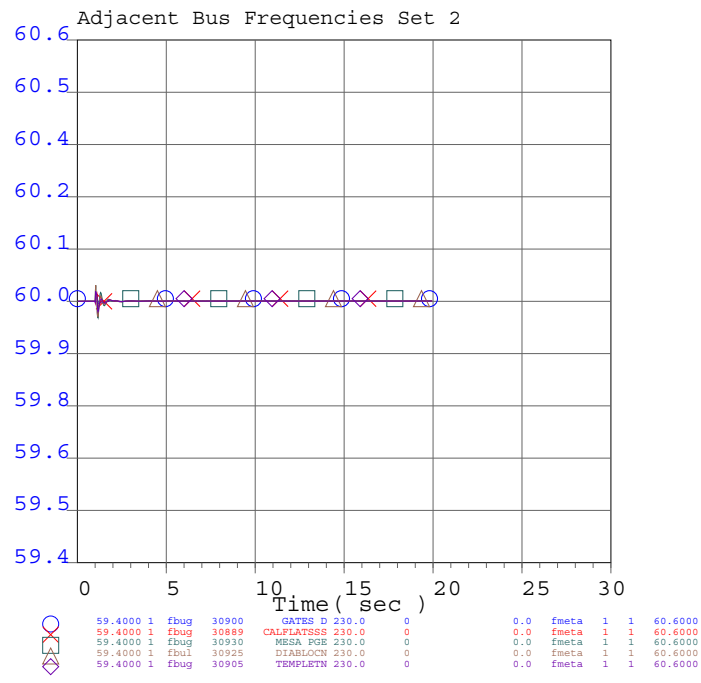

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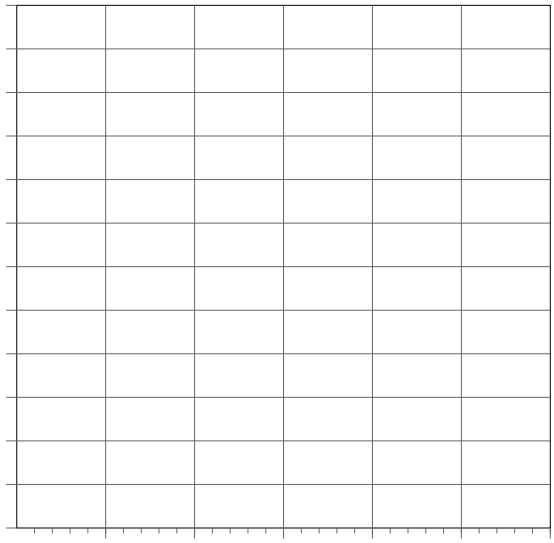
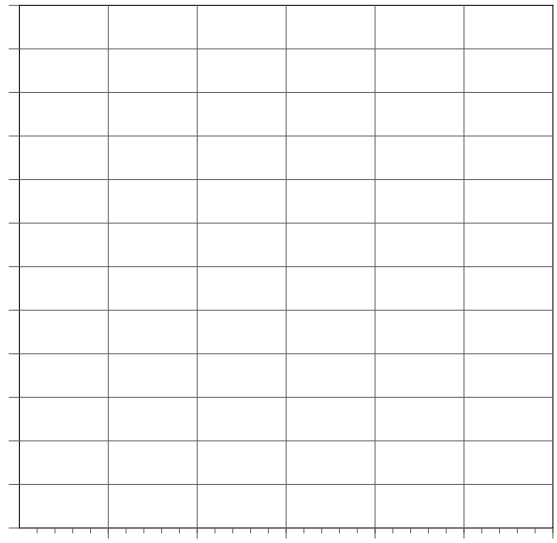
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

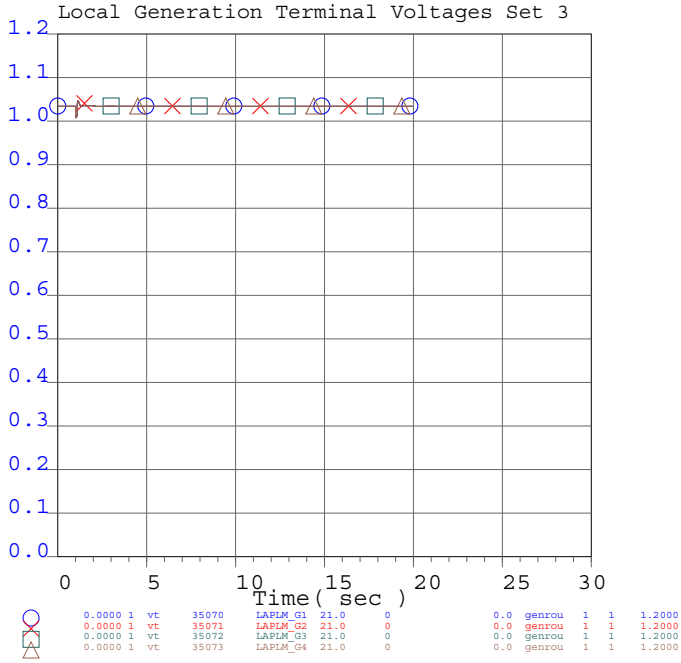
Local Generation Terminal Voltages Set 1



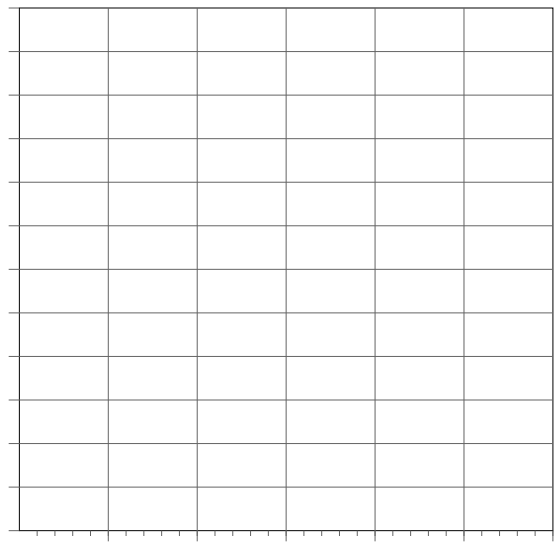
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

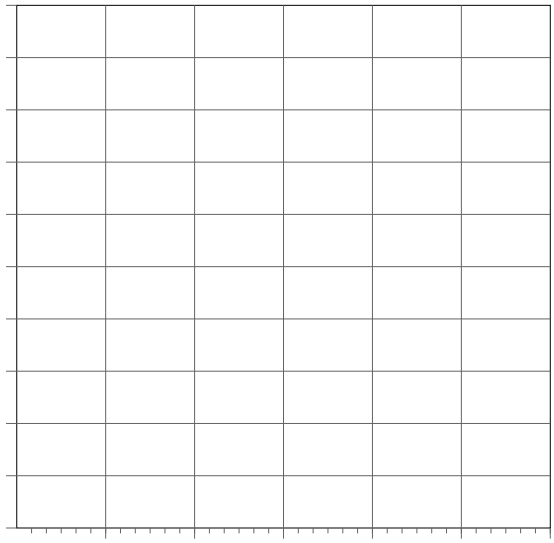


Local Generation Terminal Voltages Set 4

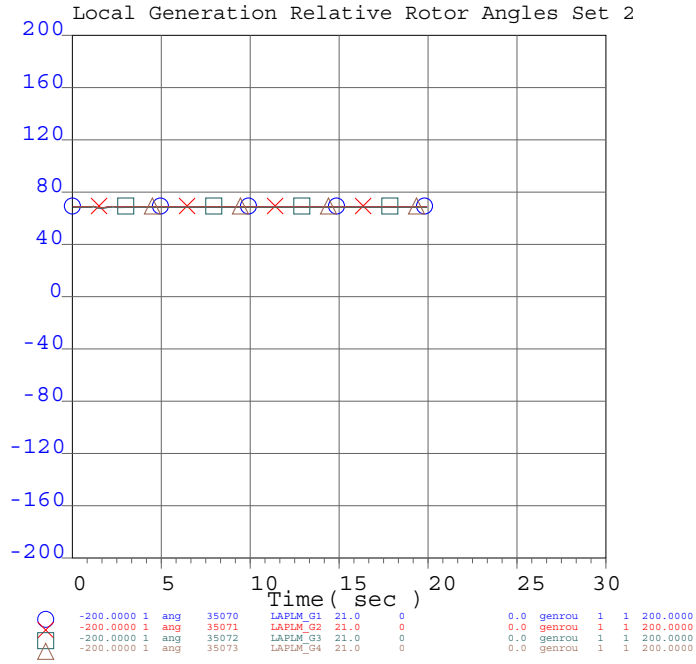


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

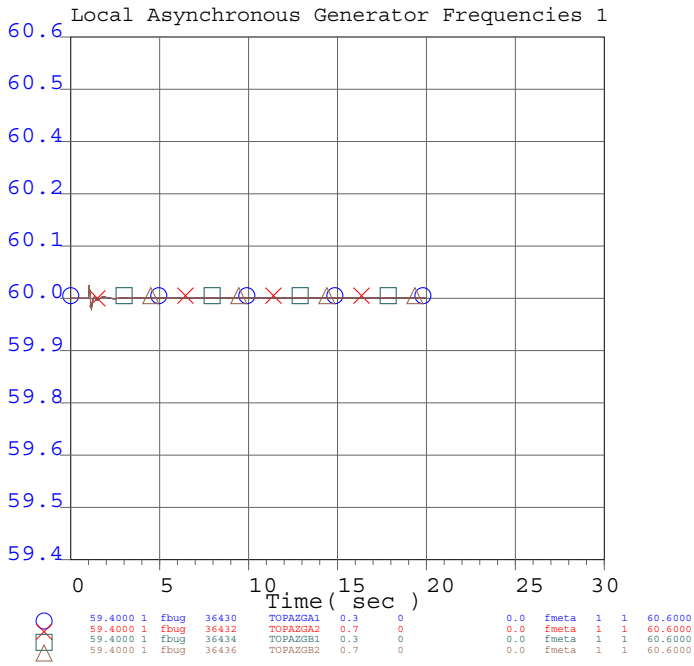
Local Generation Relative Rotor Angles Set 1



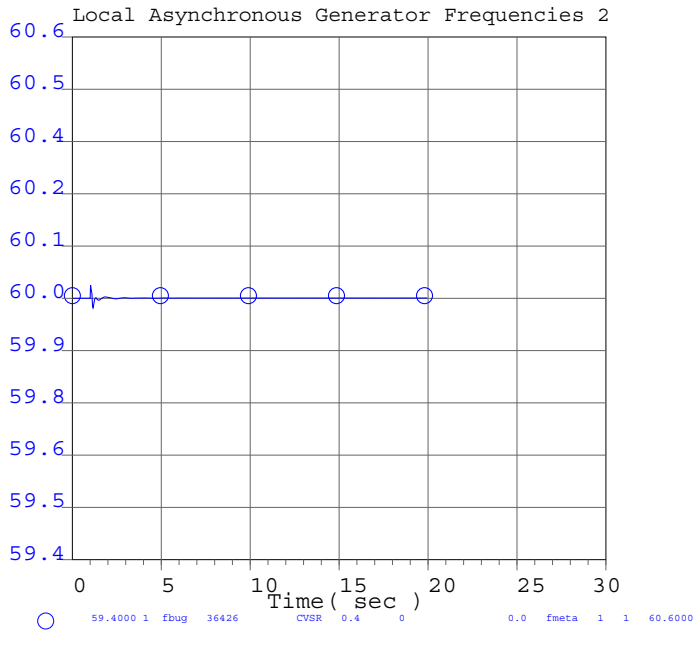
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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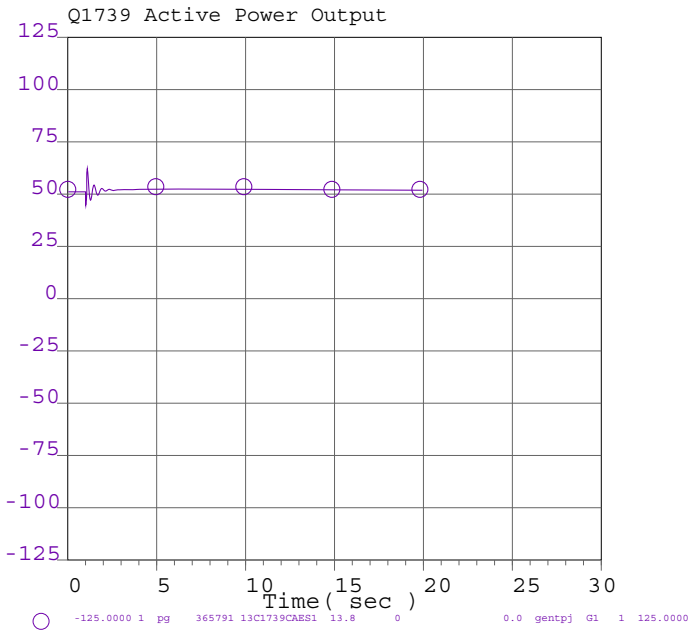
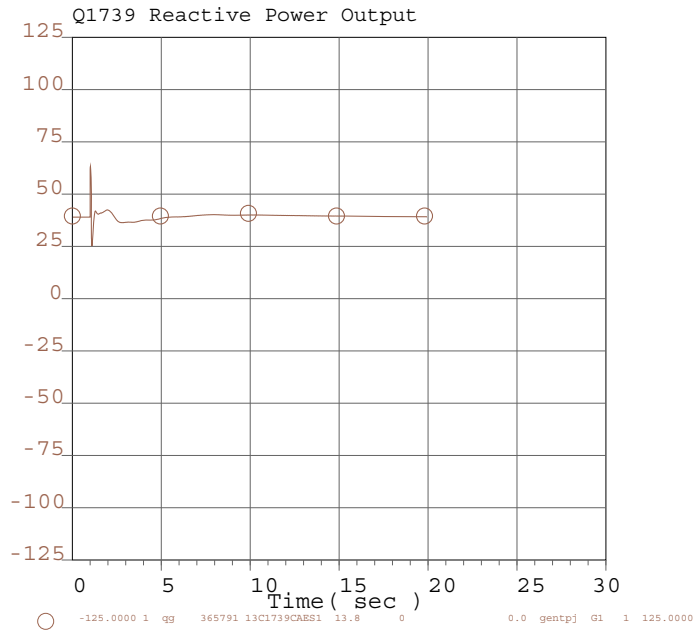
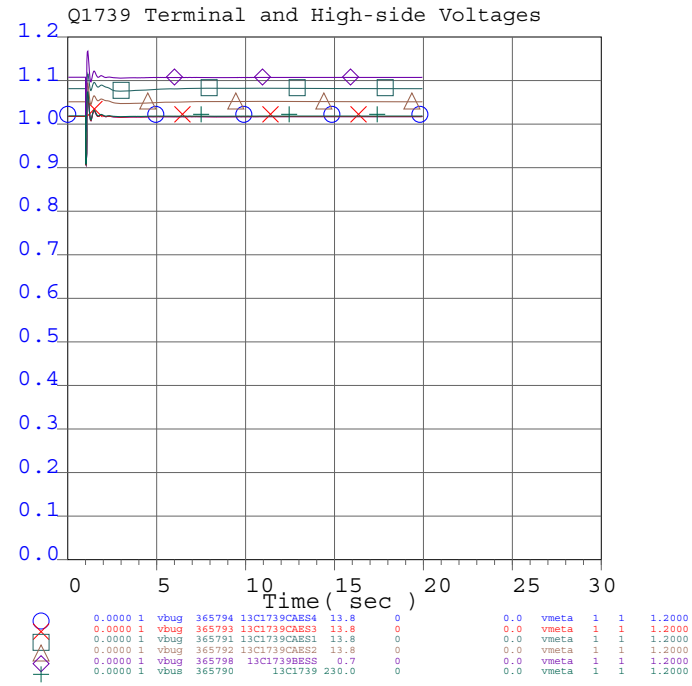
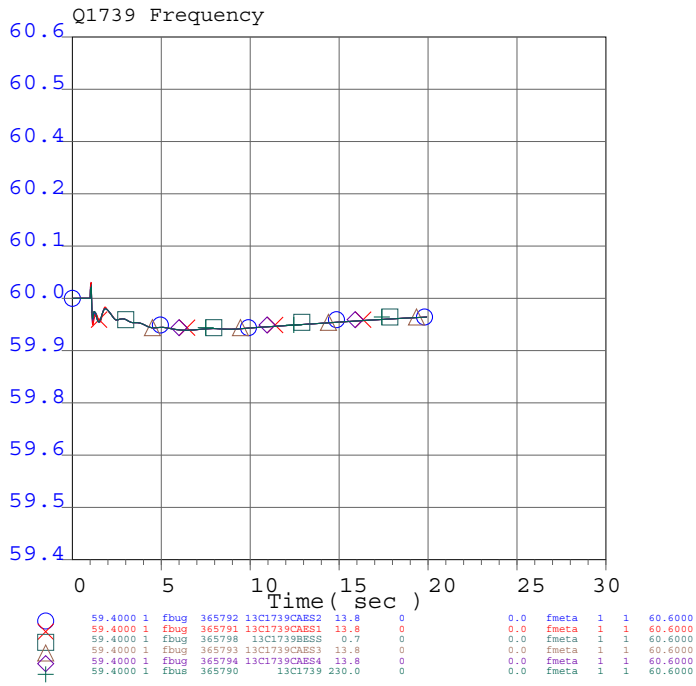
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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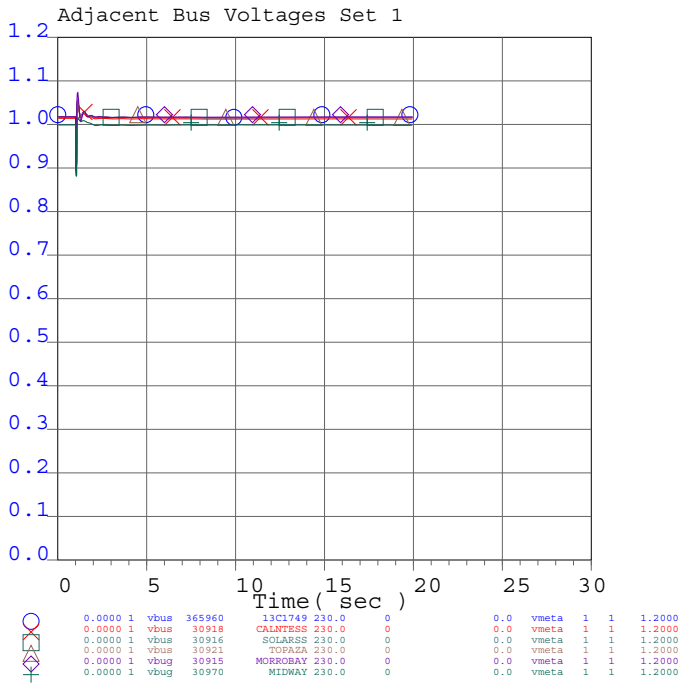

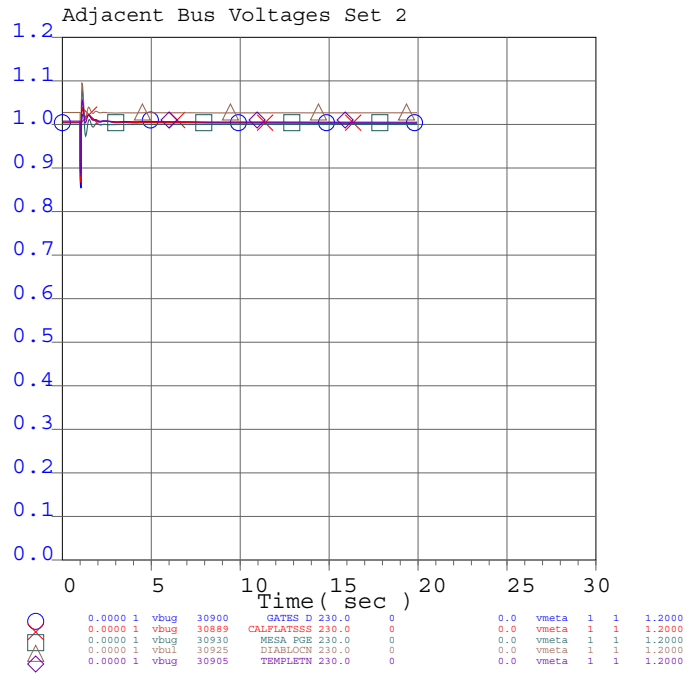

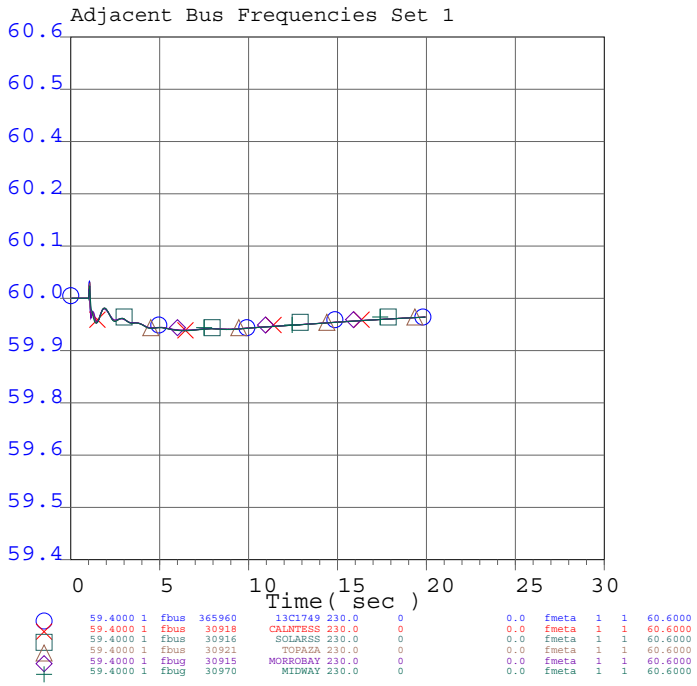

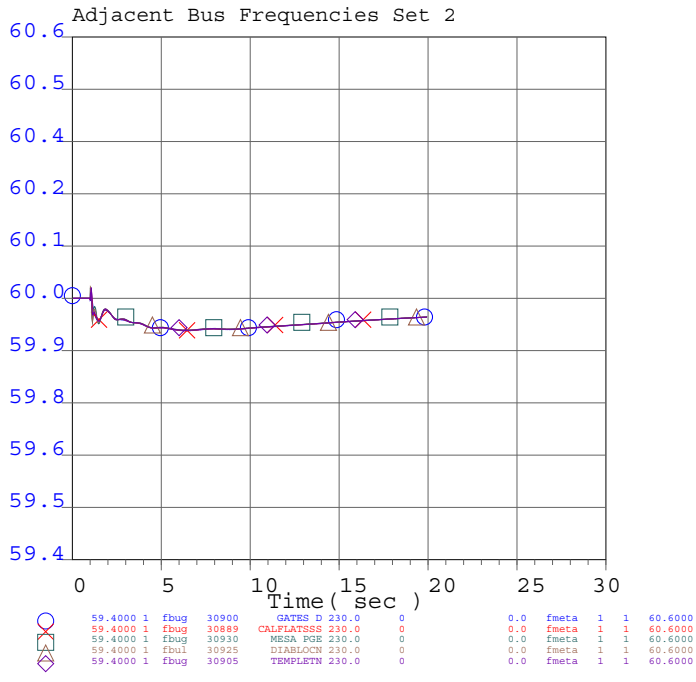

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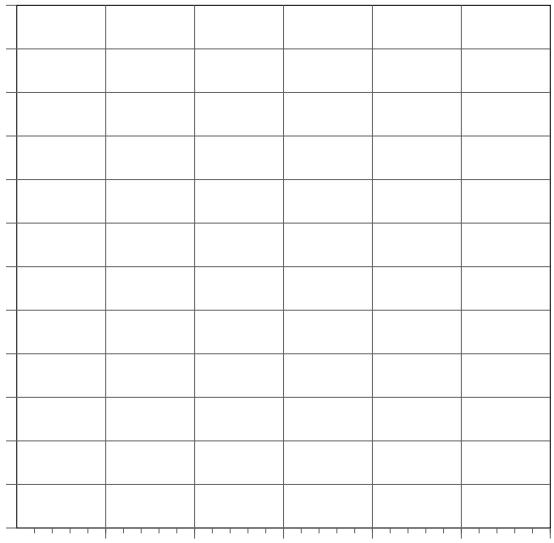
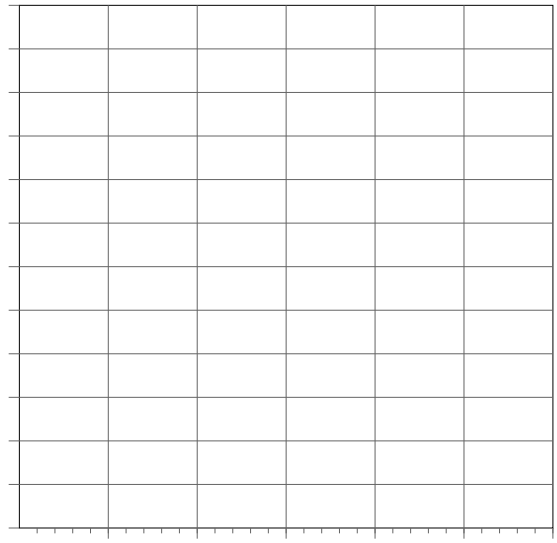
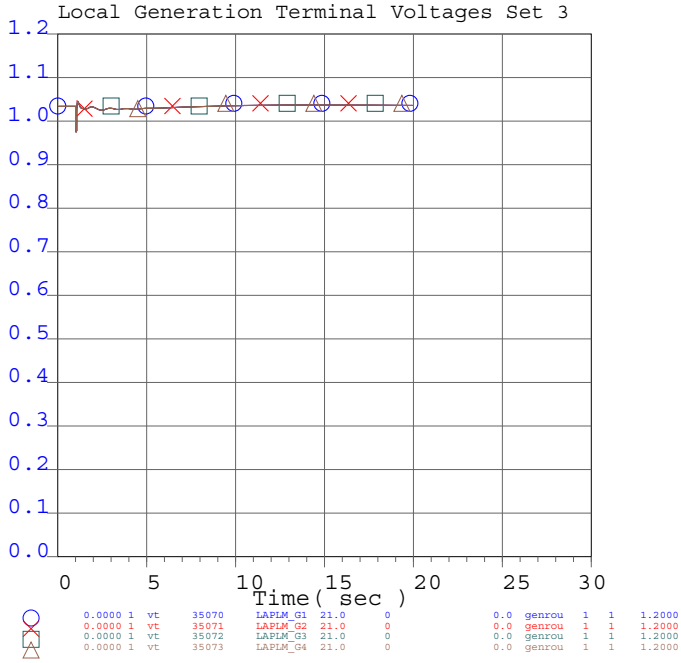
Local Generation Terminal Voltages Set 1



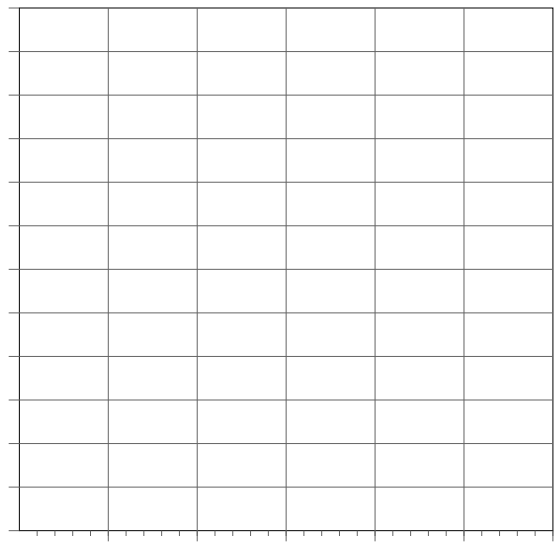
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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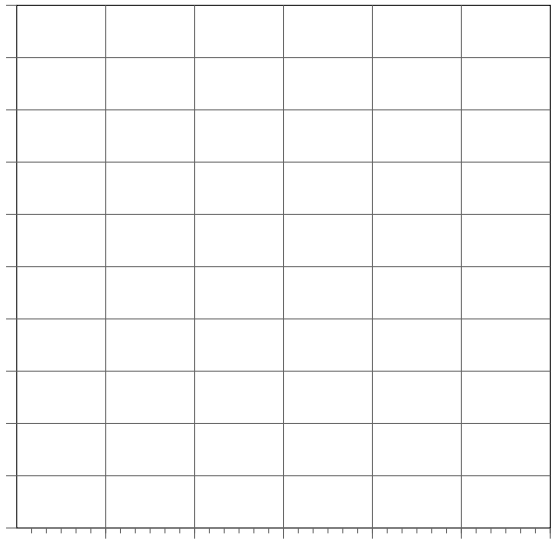
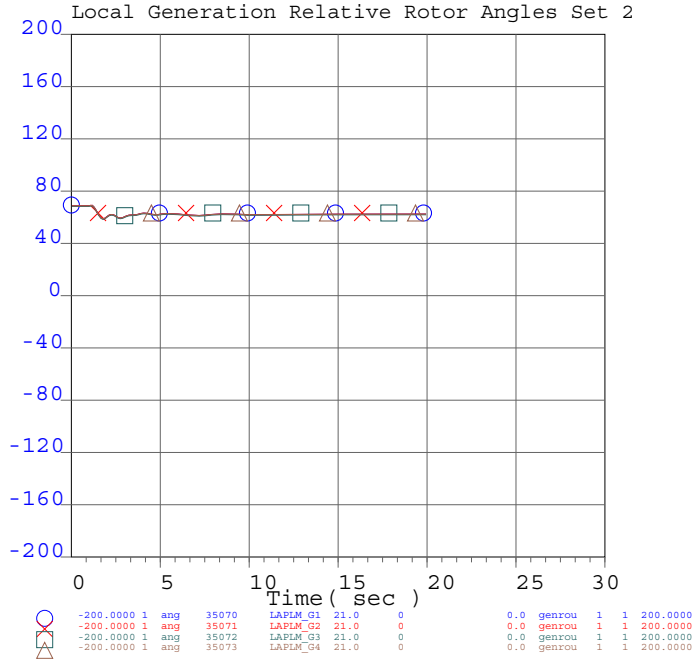
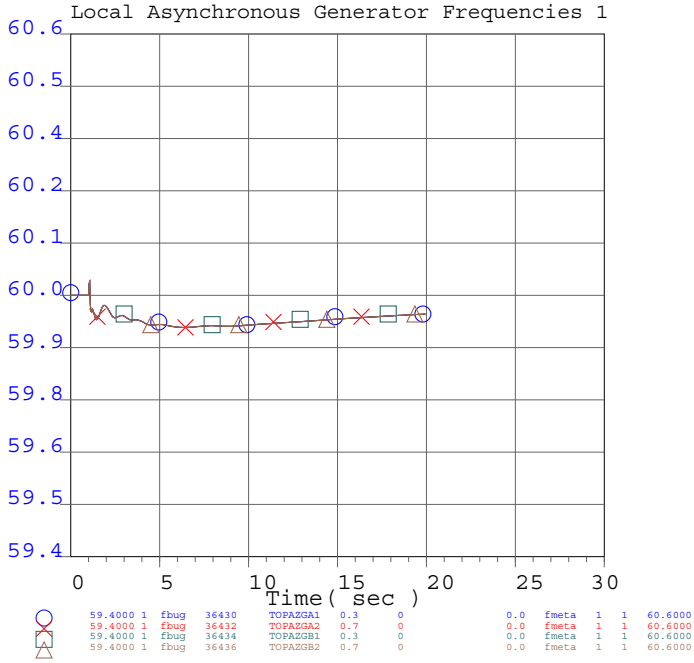
Local Generation Relative Rotor Angles Set 1



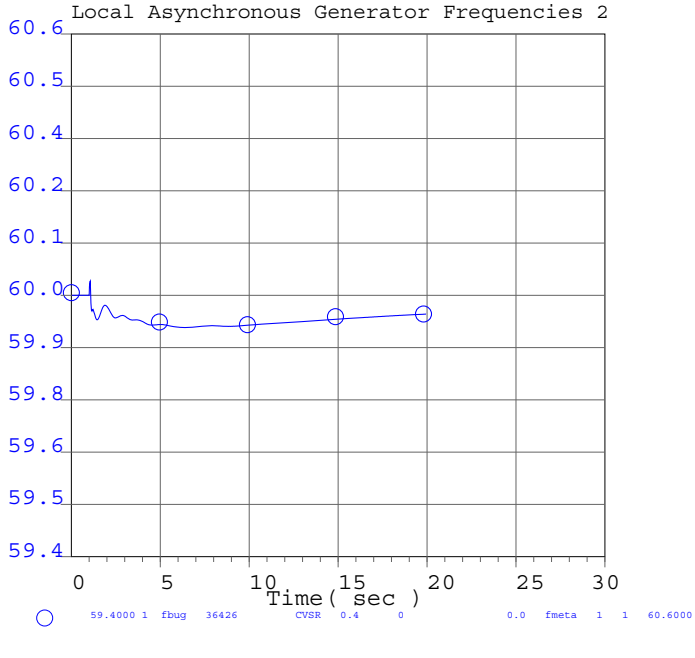
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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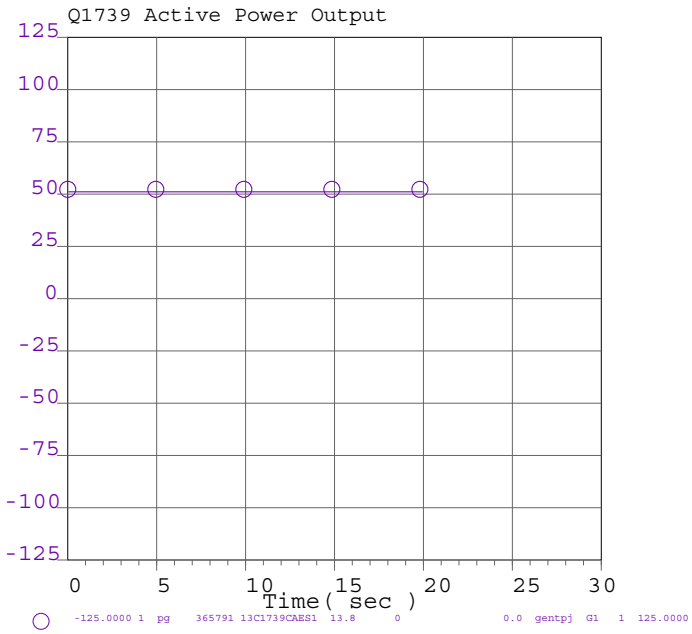
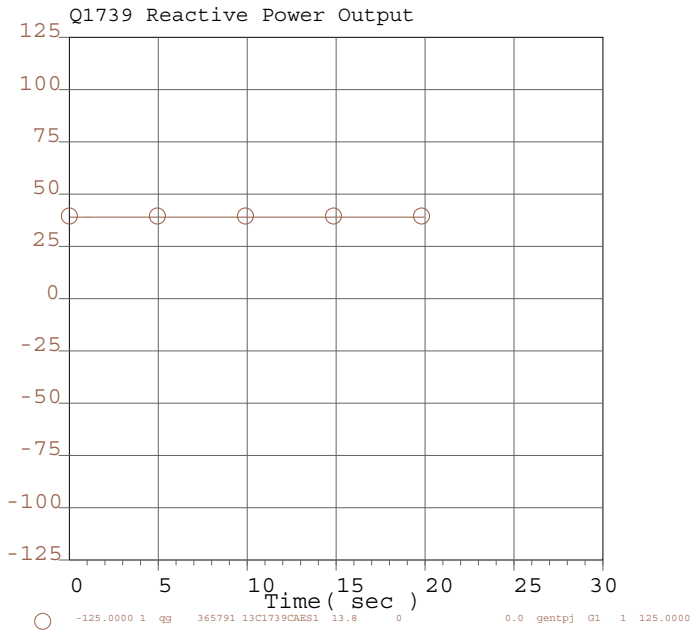
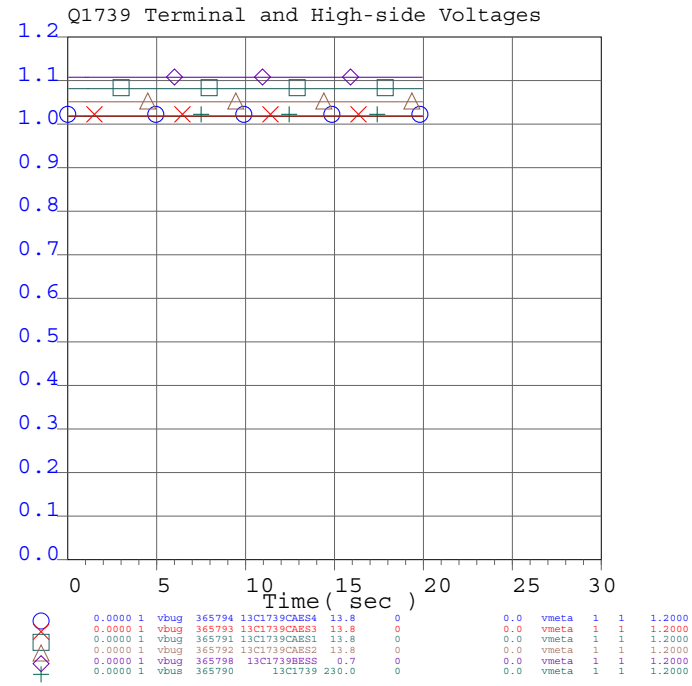
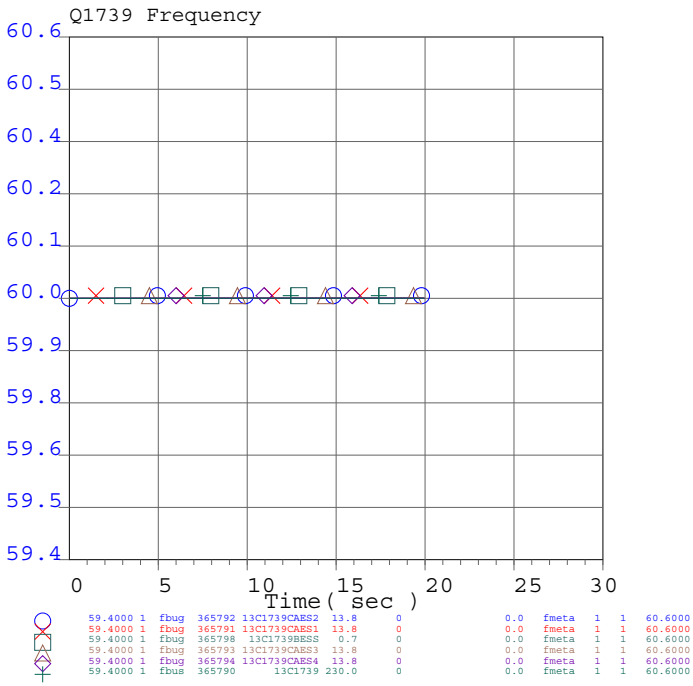
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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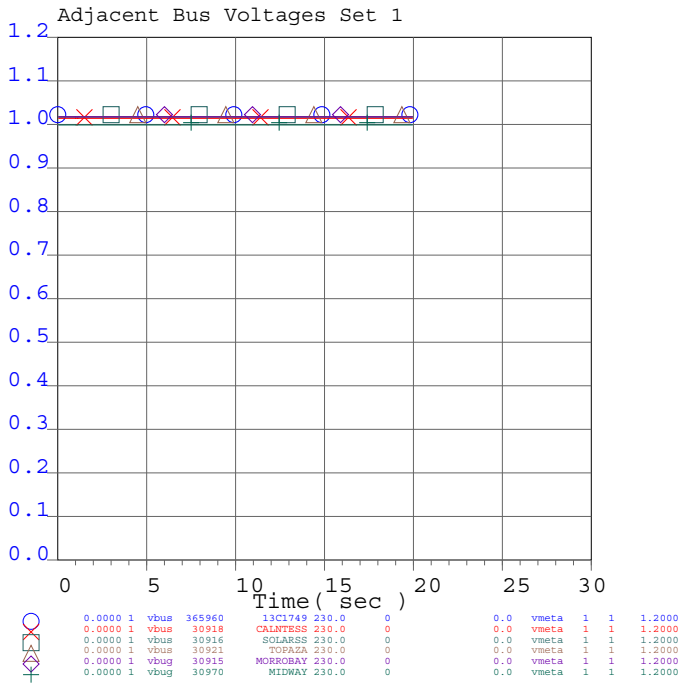

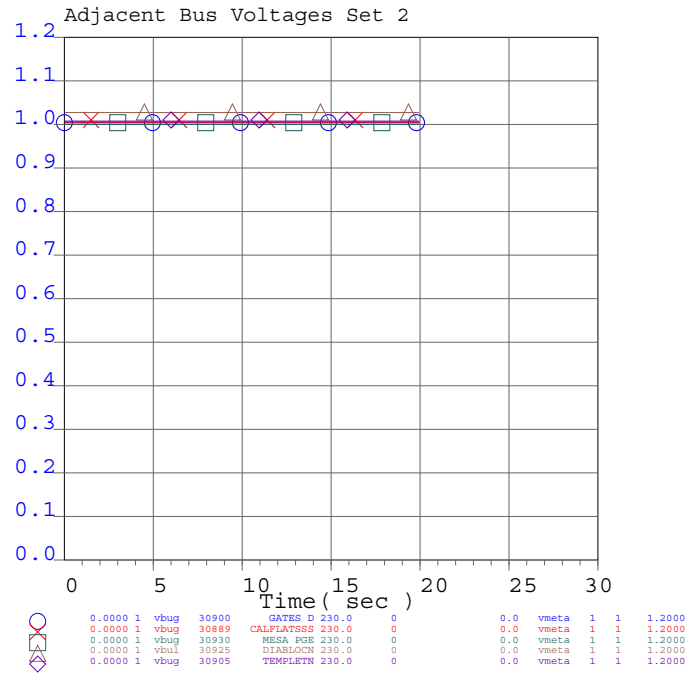

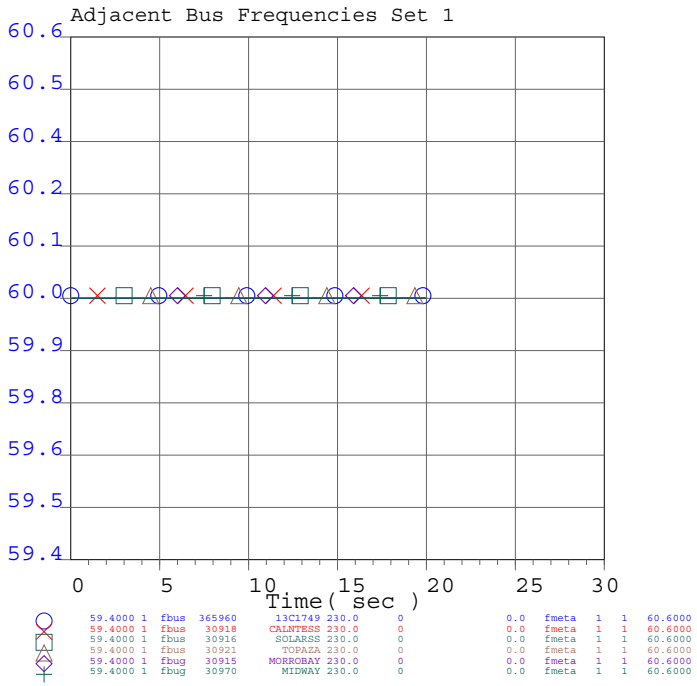

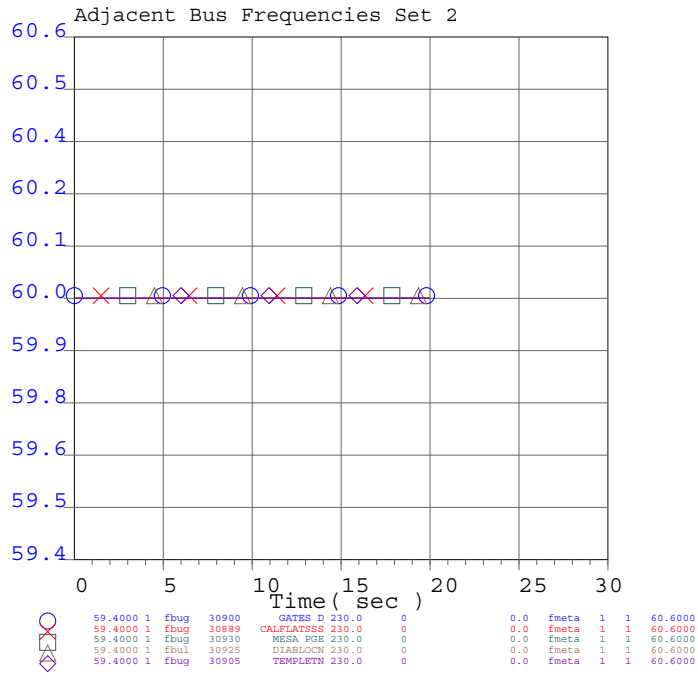

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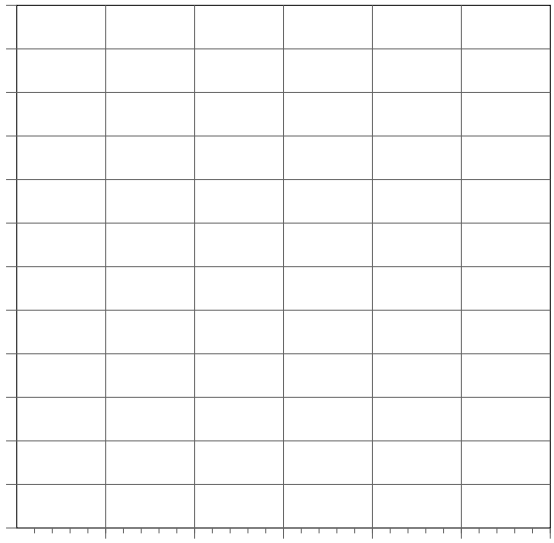
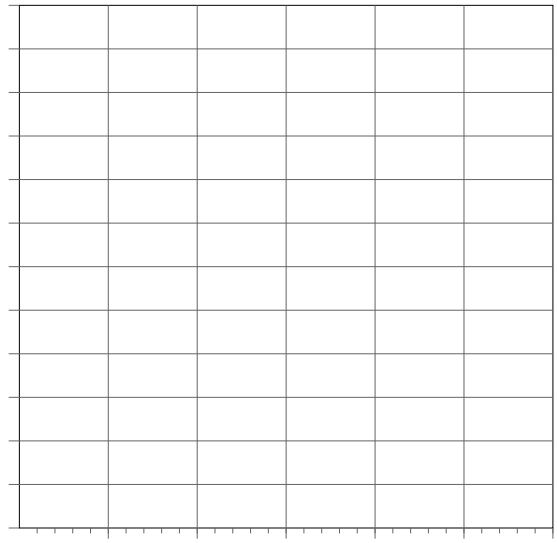
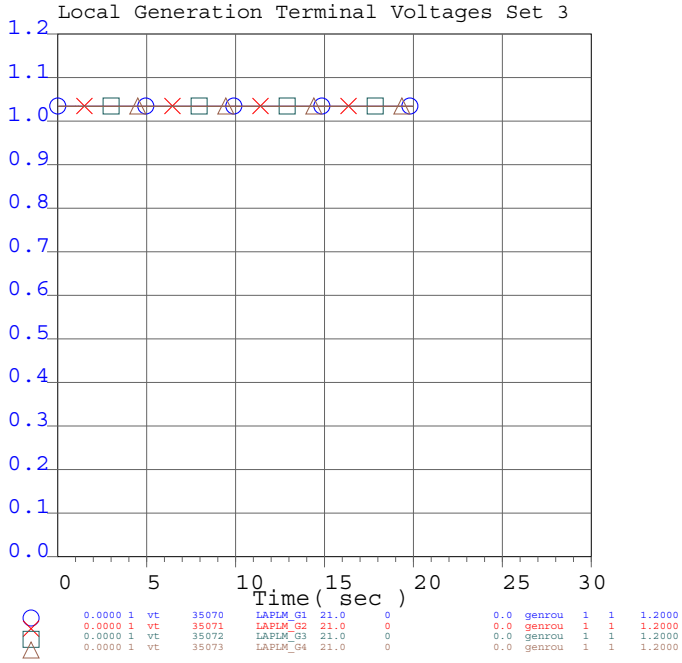
Local Generation Terminal Voltages Set 1



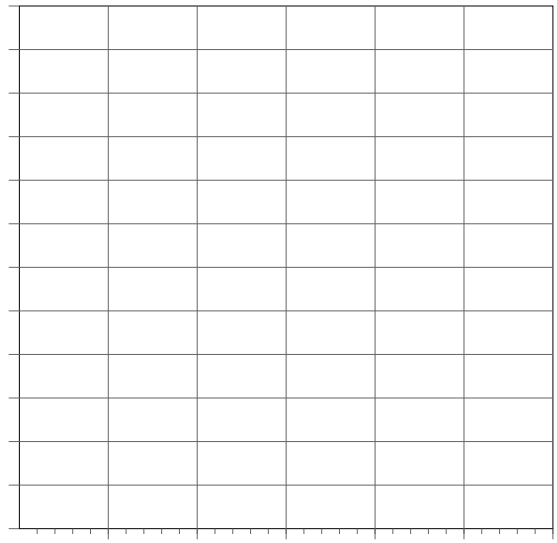
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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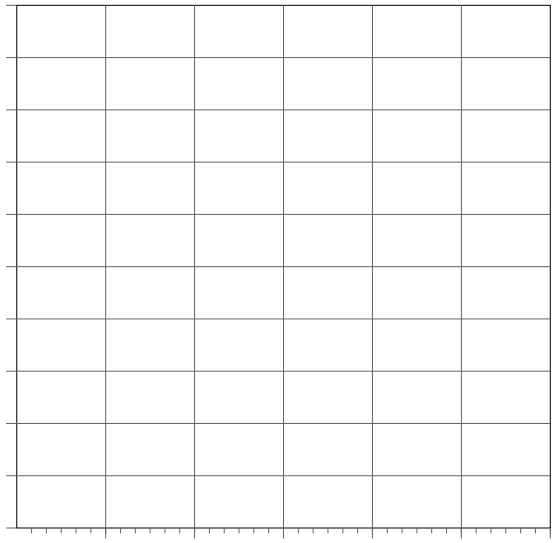
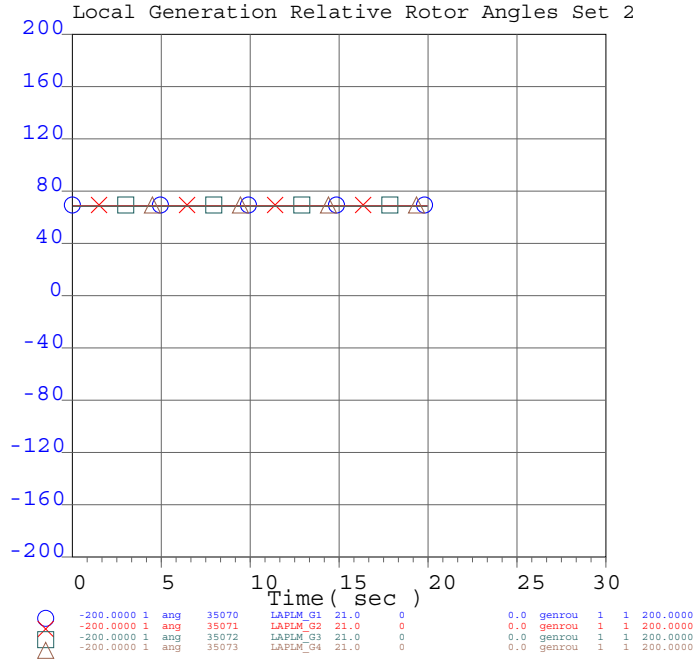
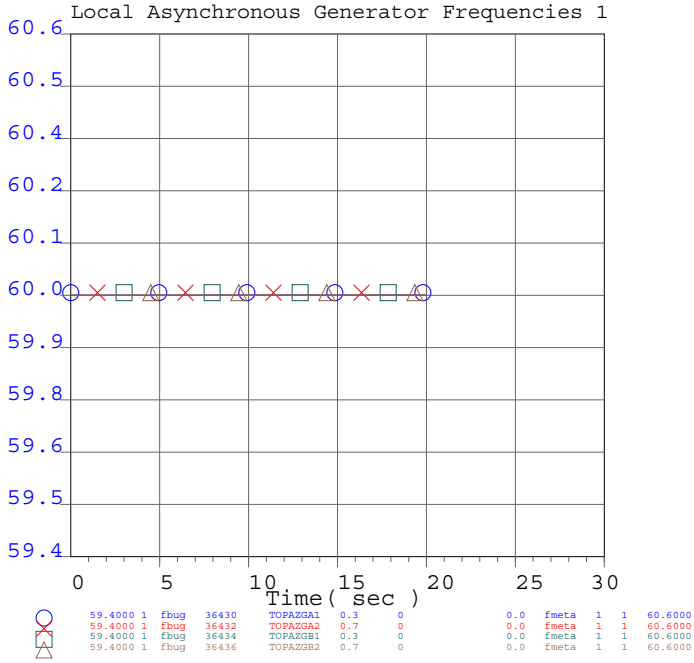
Local Generation Relative Rotor Angles Set 1



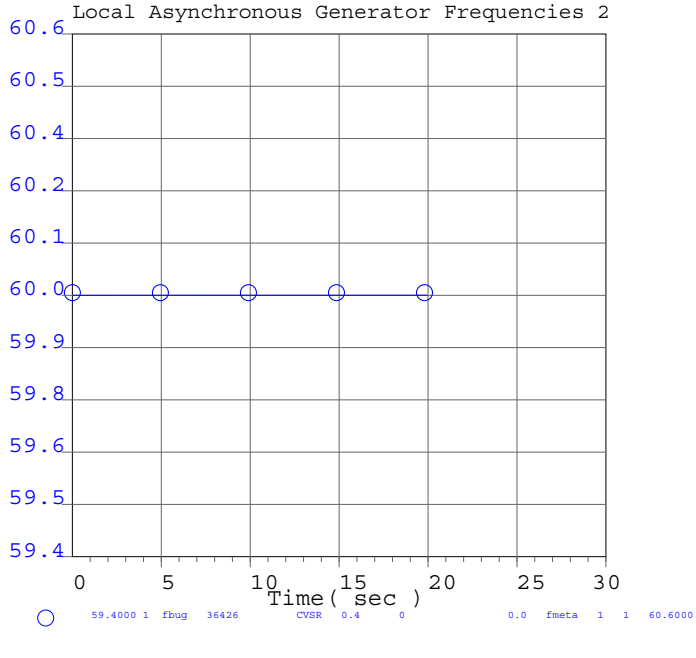
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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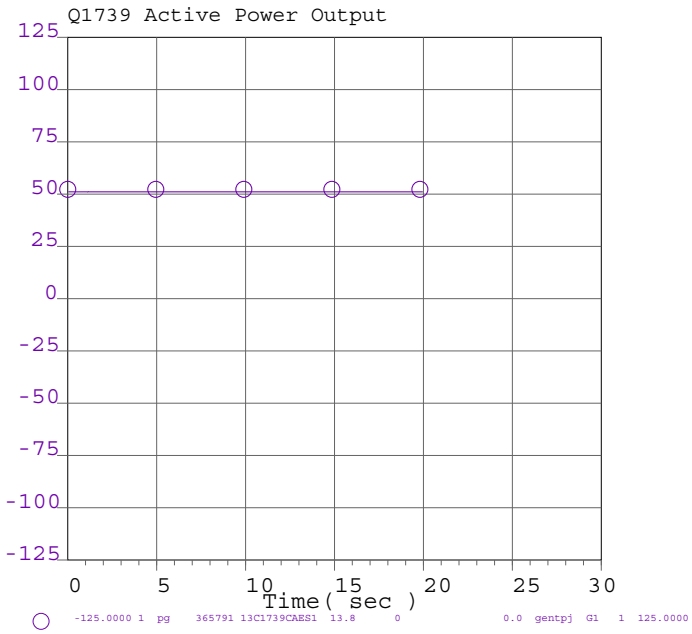

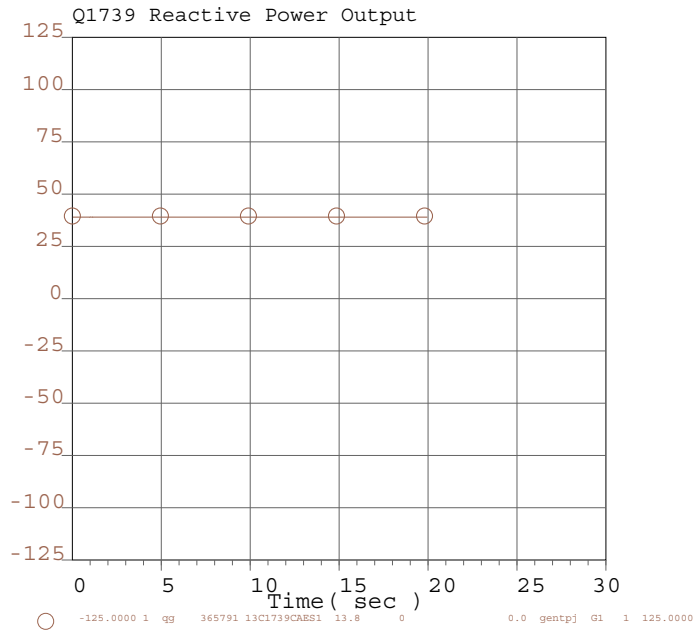

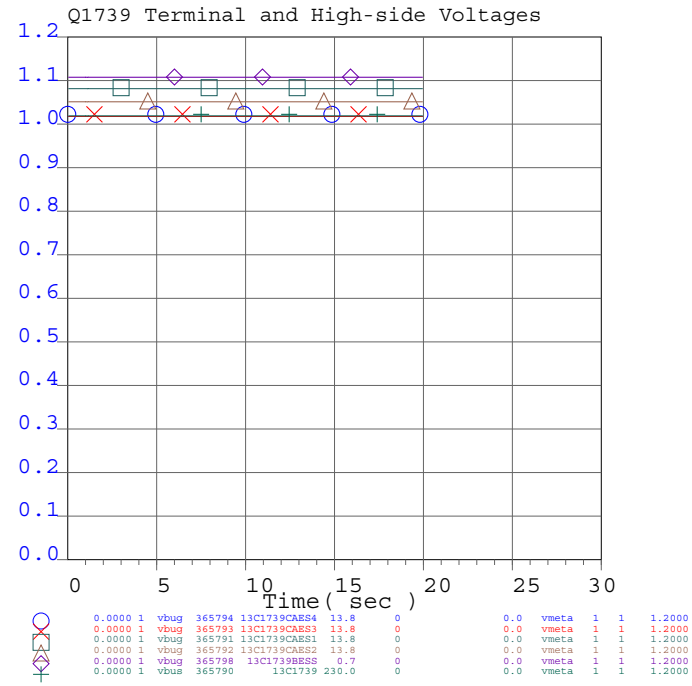

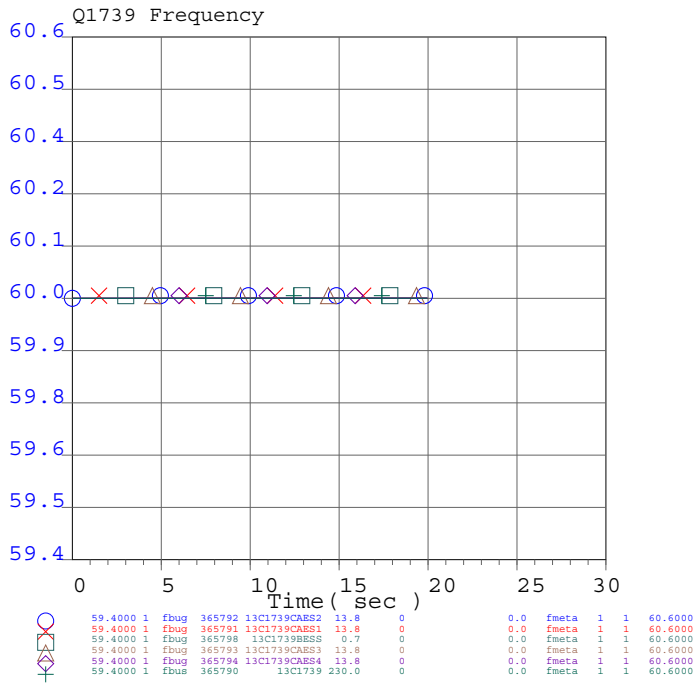

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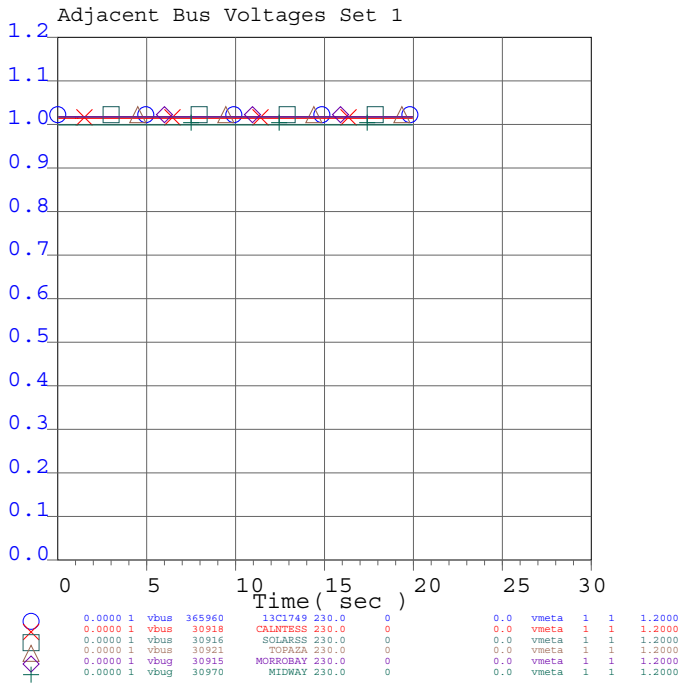

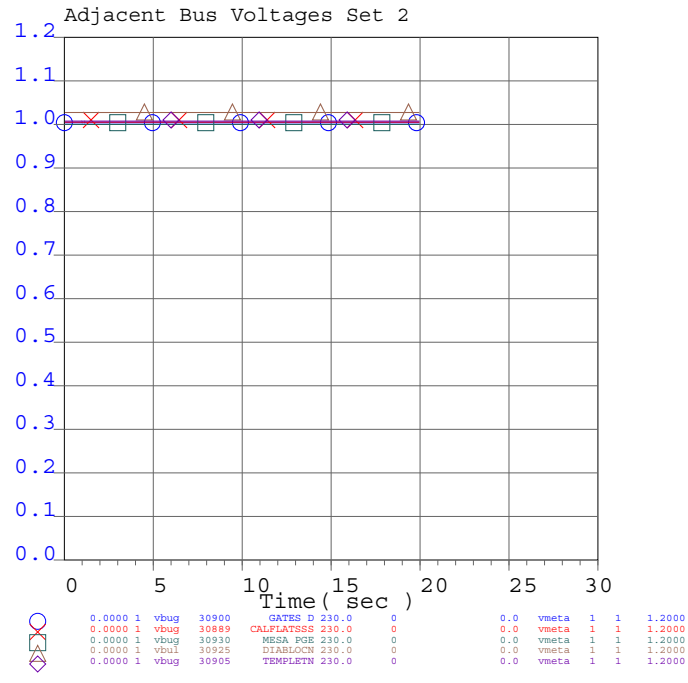

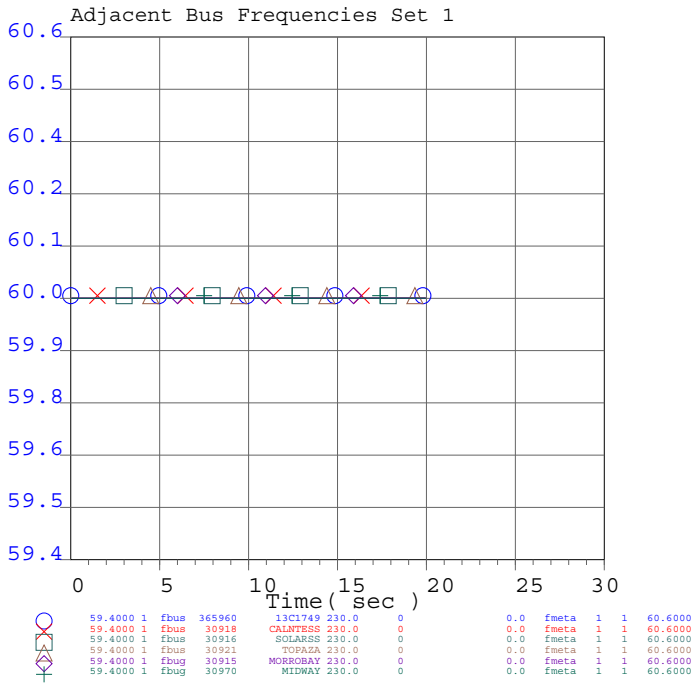

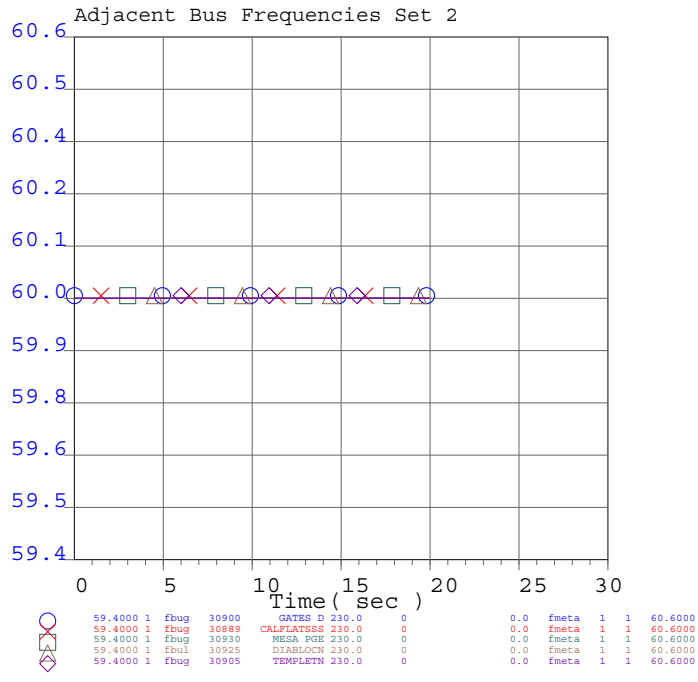

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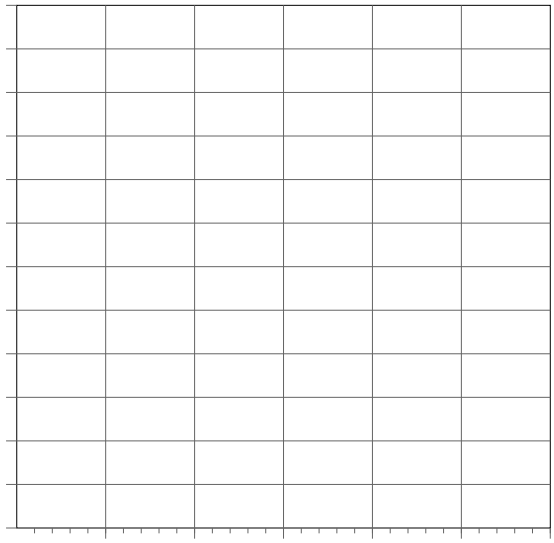
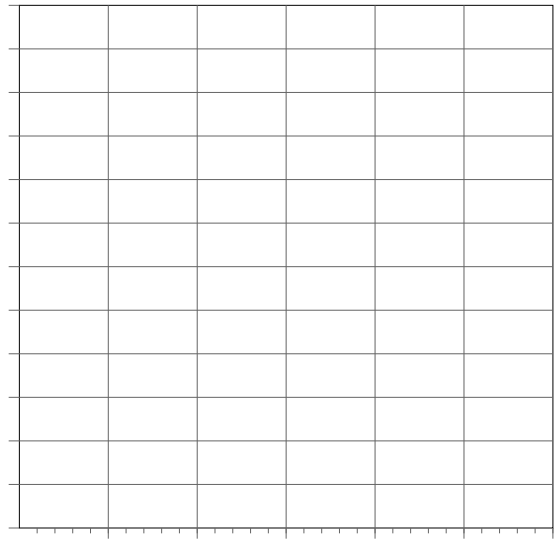
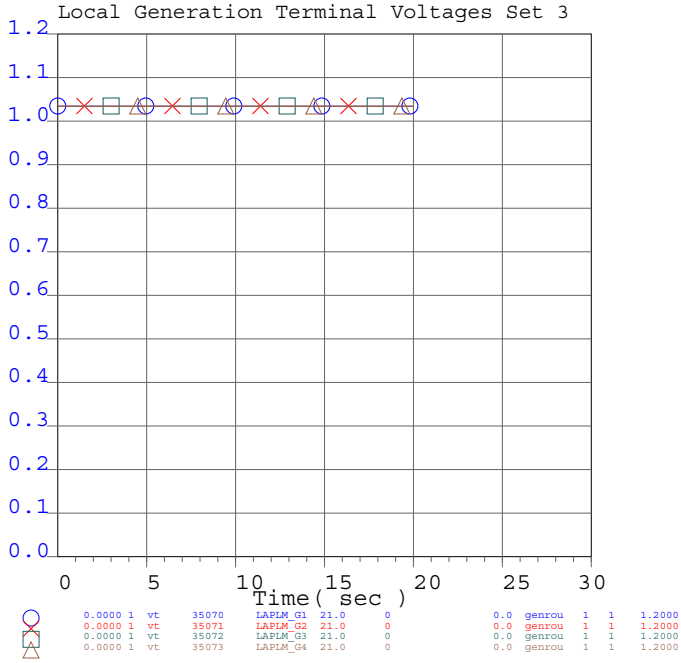
Local Generation Terminal Voltages Set 1



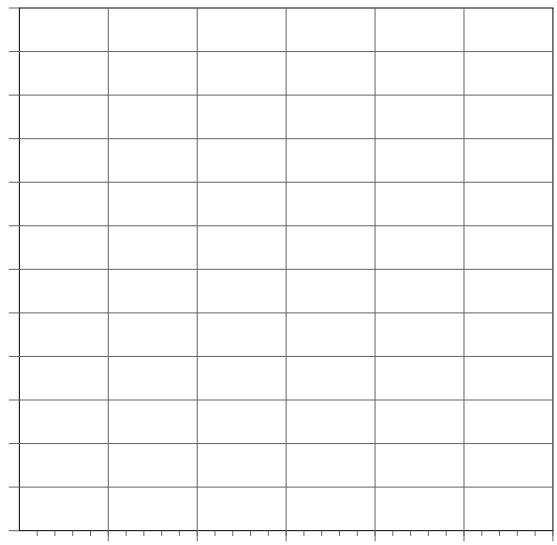
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

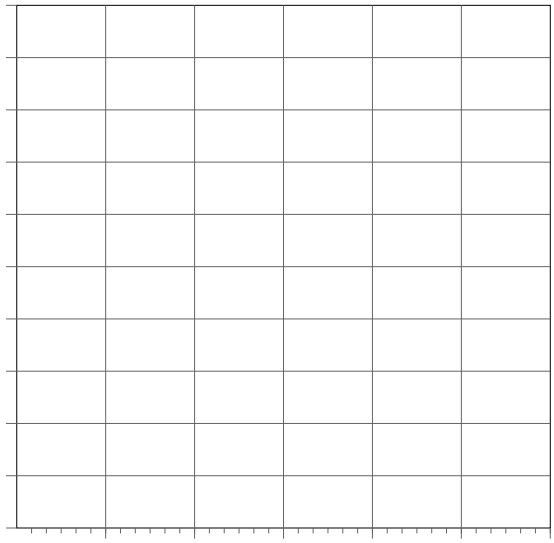


Local Generation Terminal Voltages Set 4

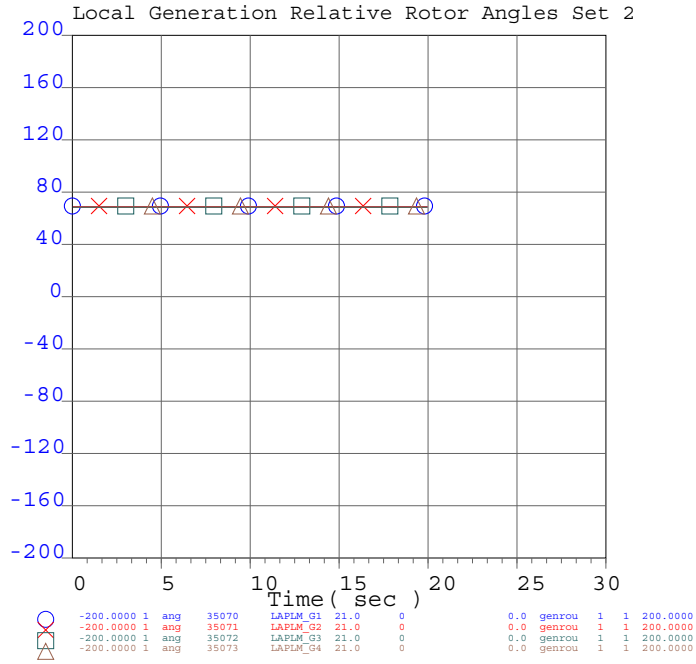


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

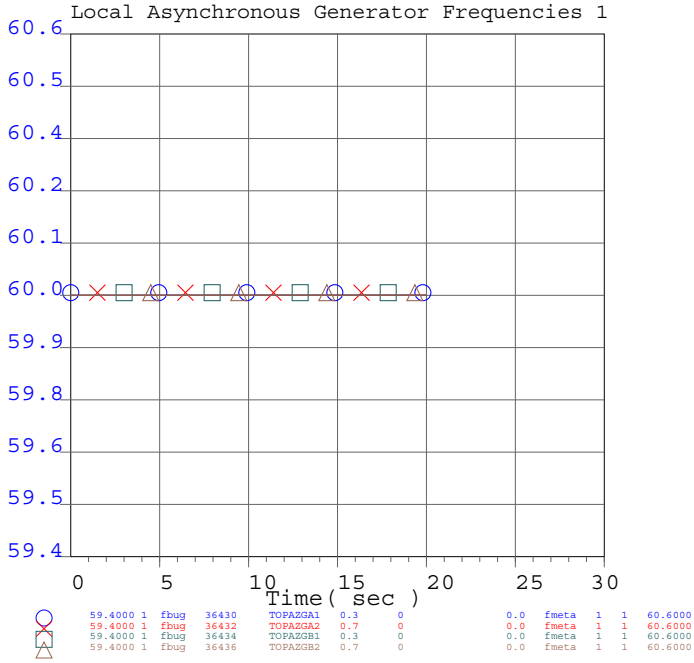
Local Generation Relative Rotor Angles Set 1



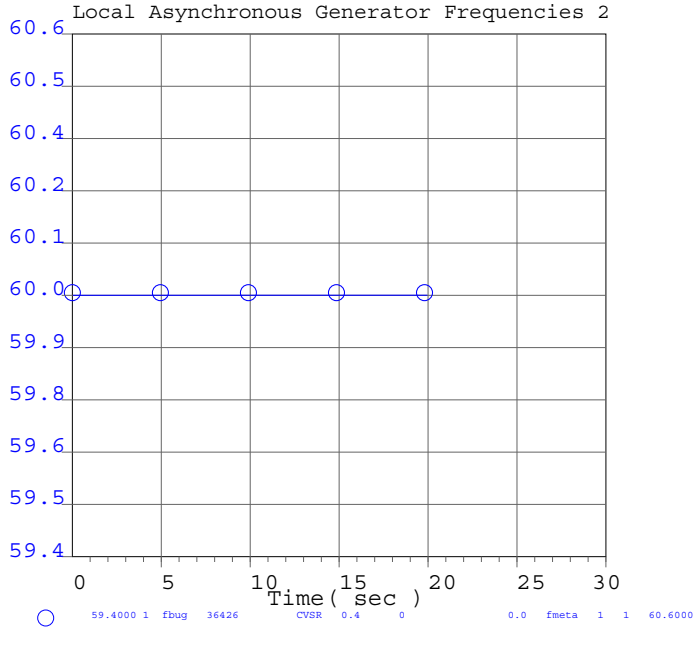
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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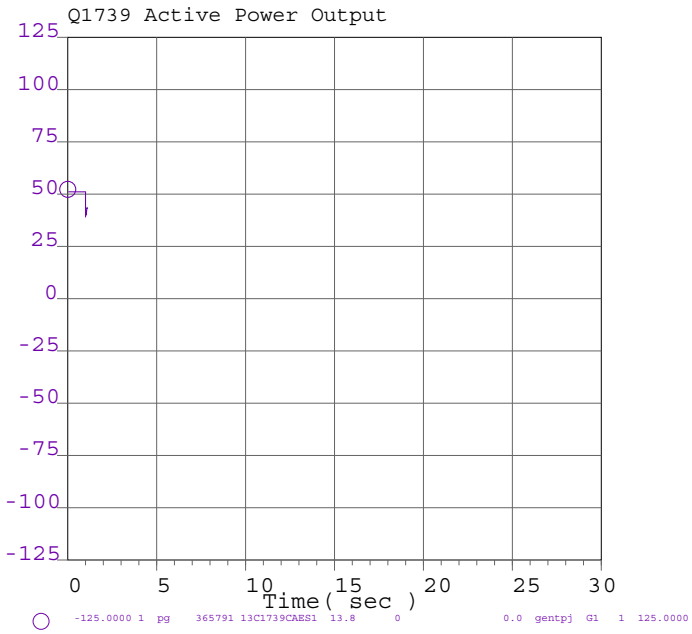
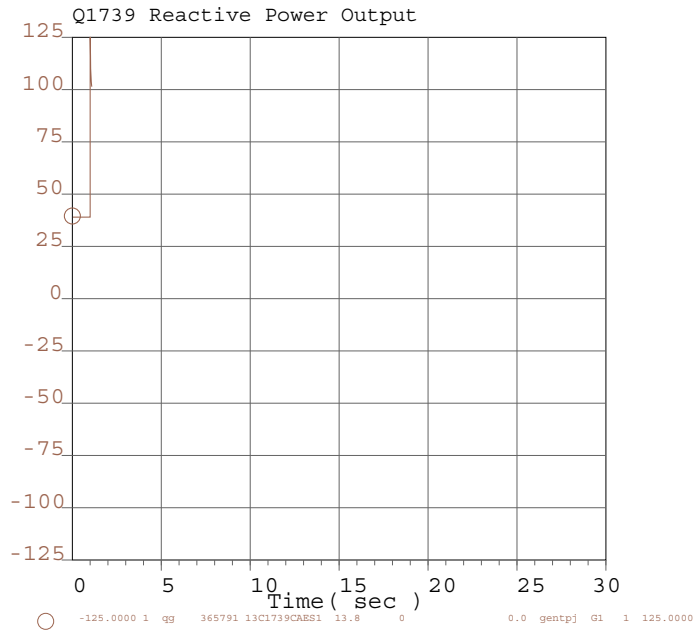
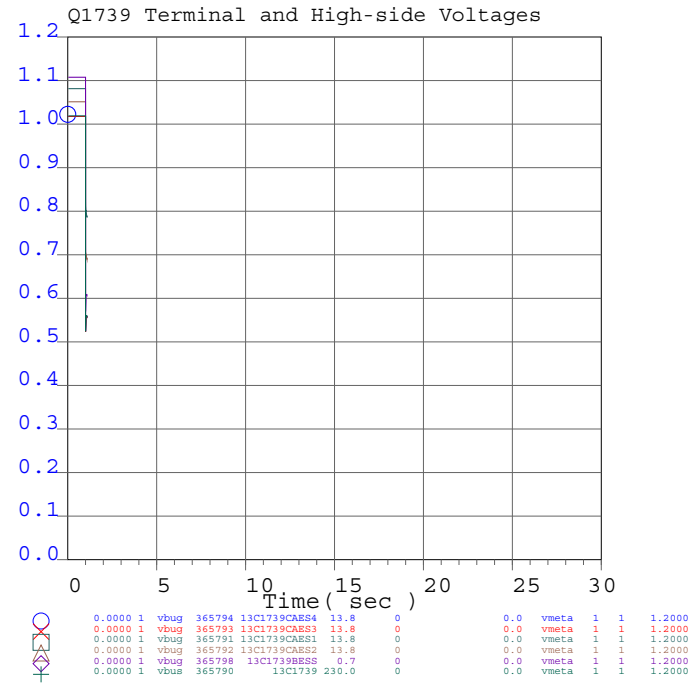
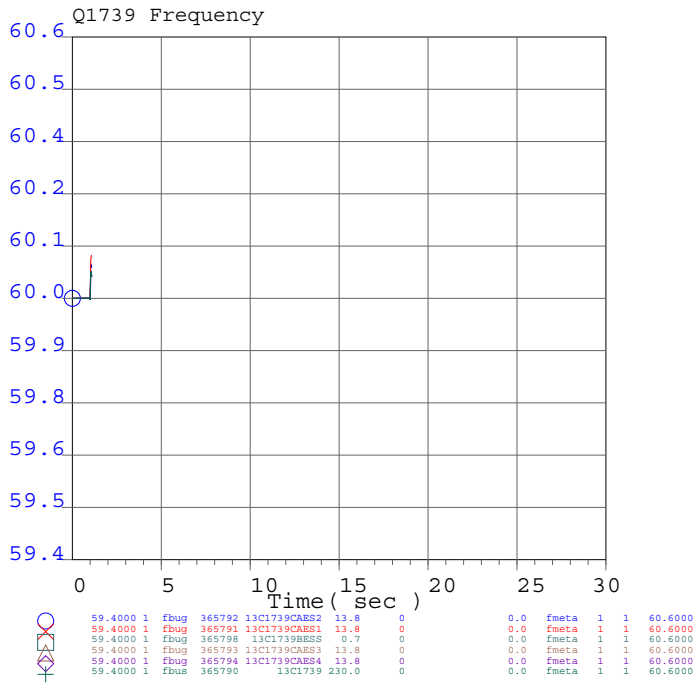
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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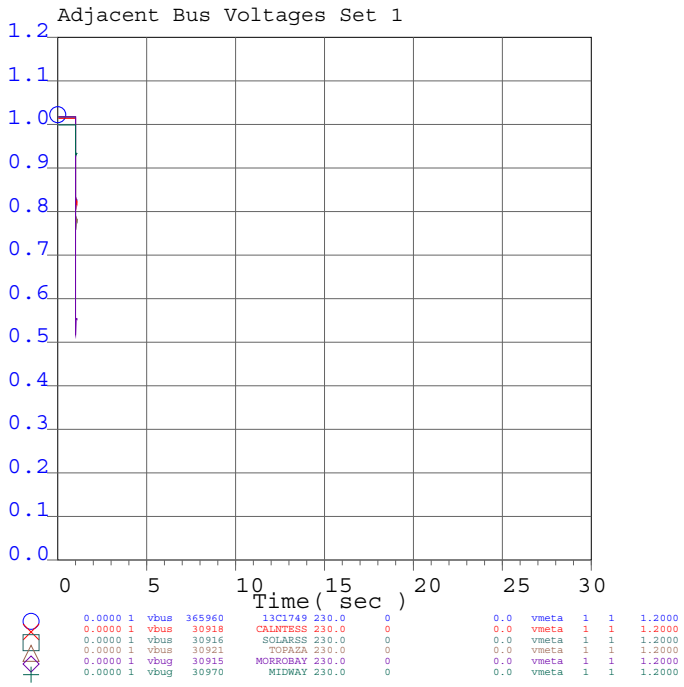

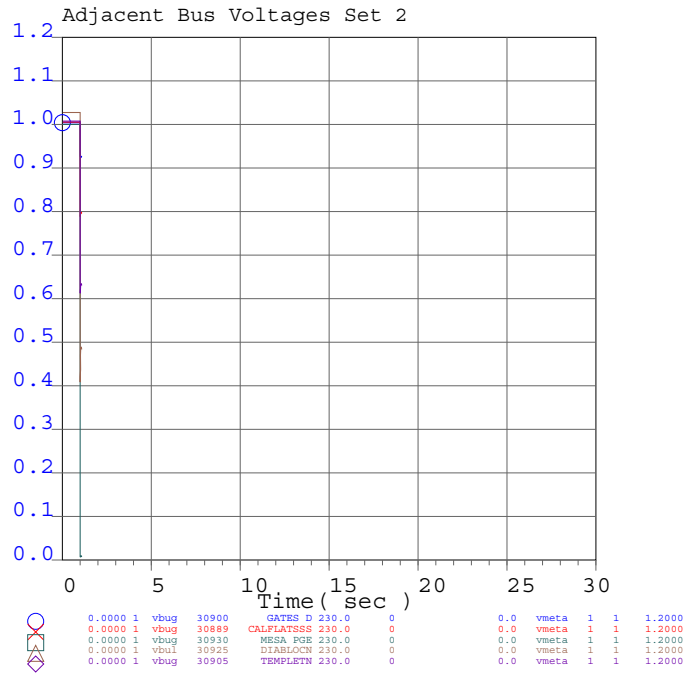

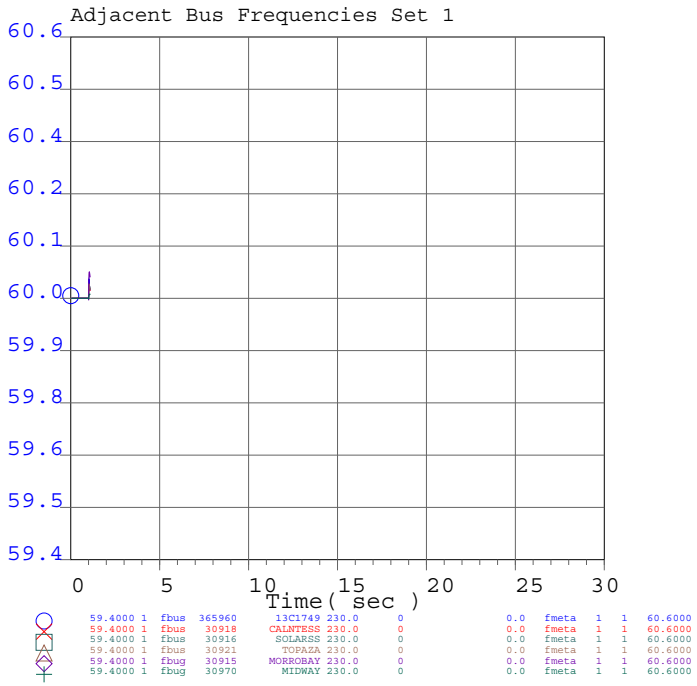

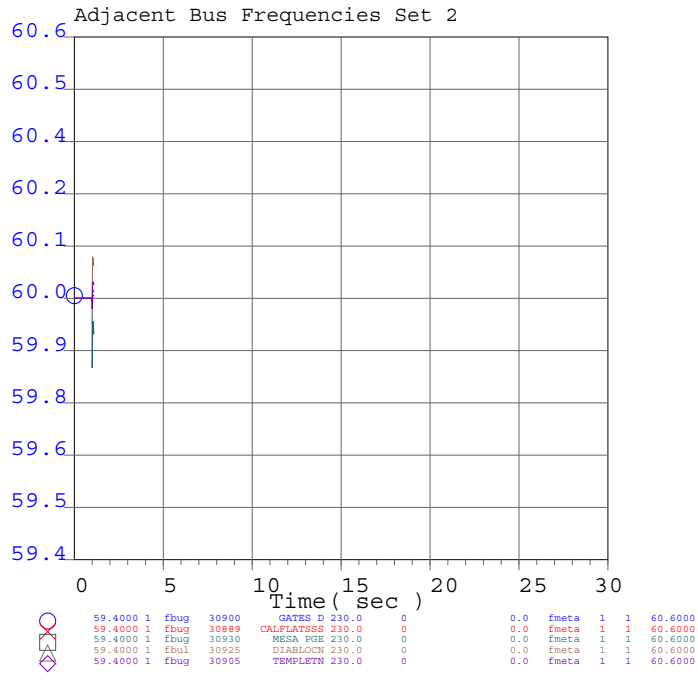

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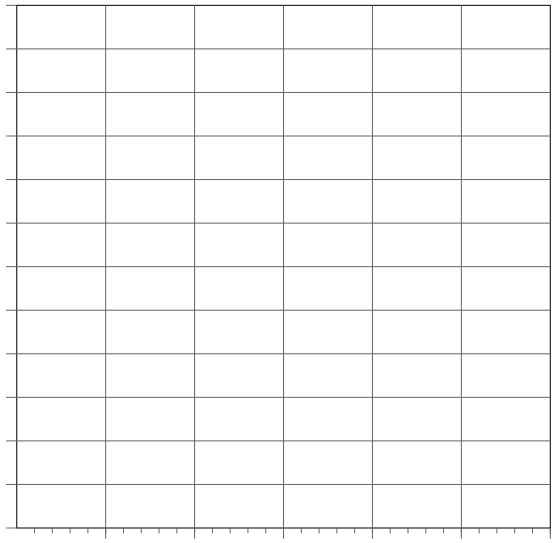
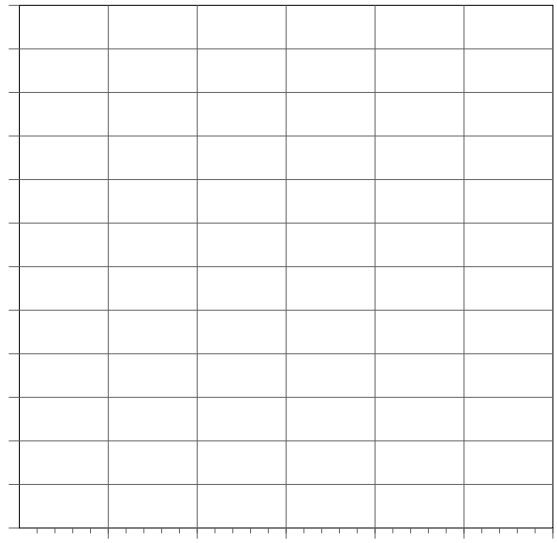
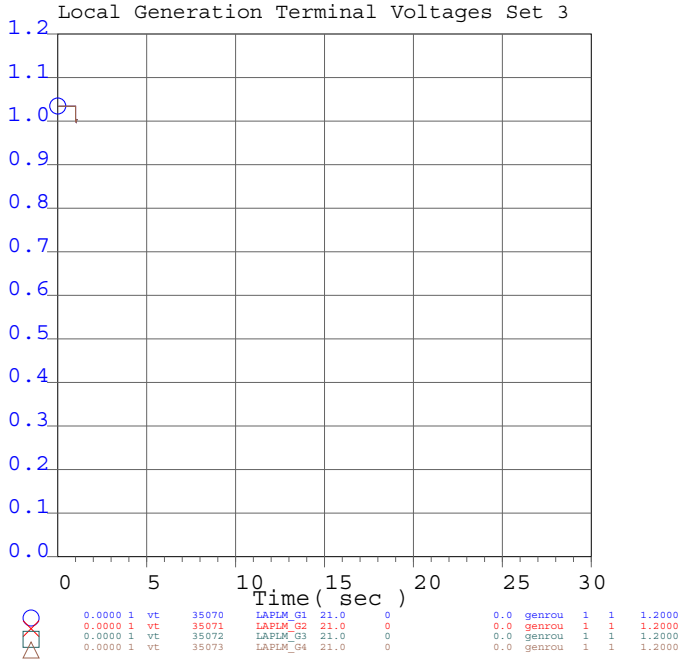
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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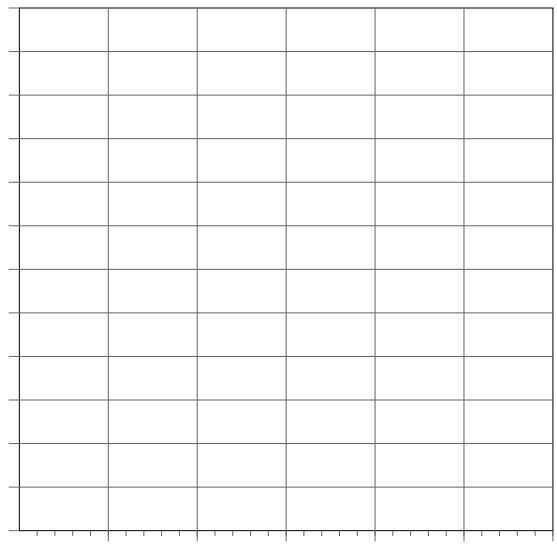
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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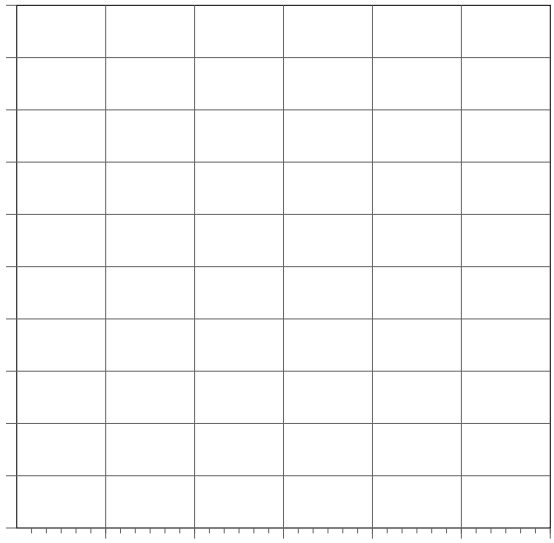
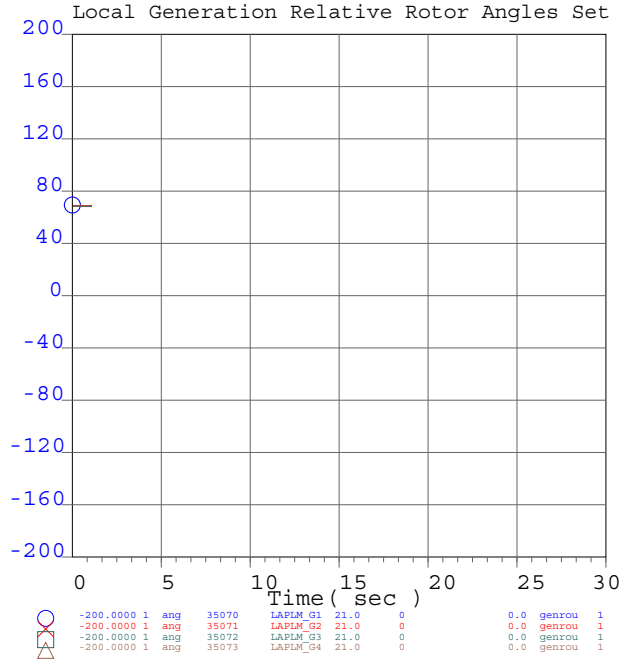
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

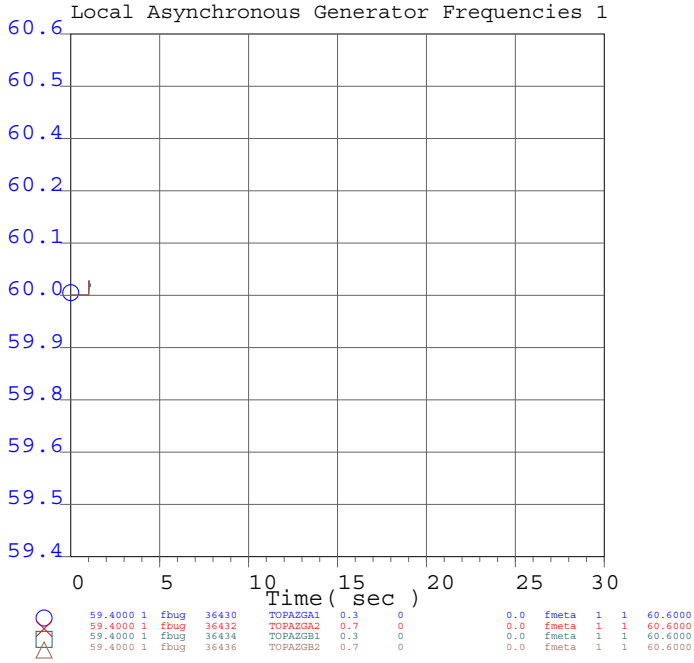
Local Generation Relative Rotor Angles Set 1



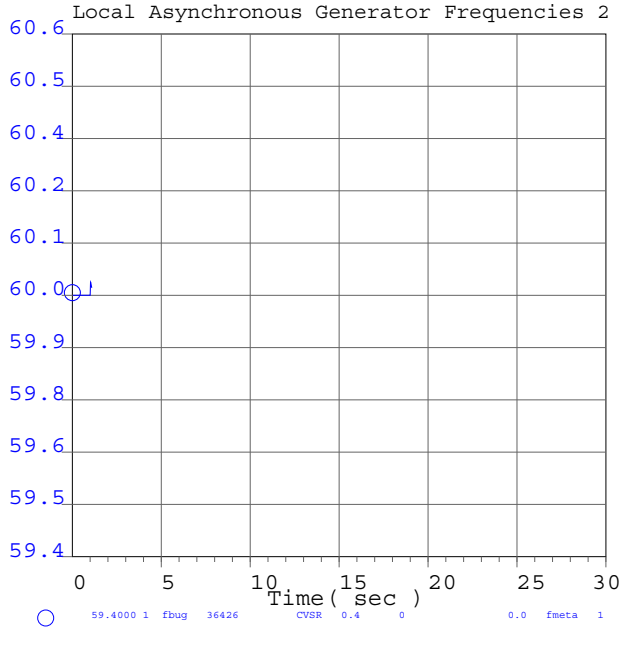
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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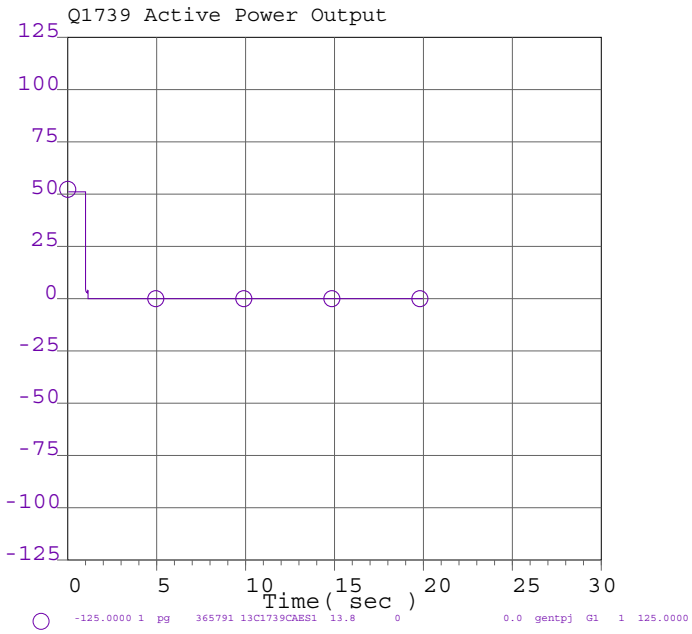
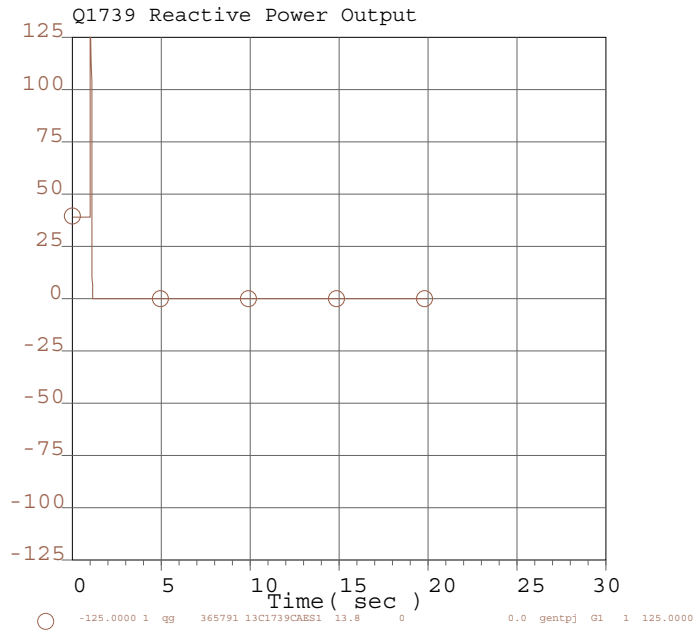
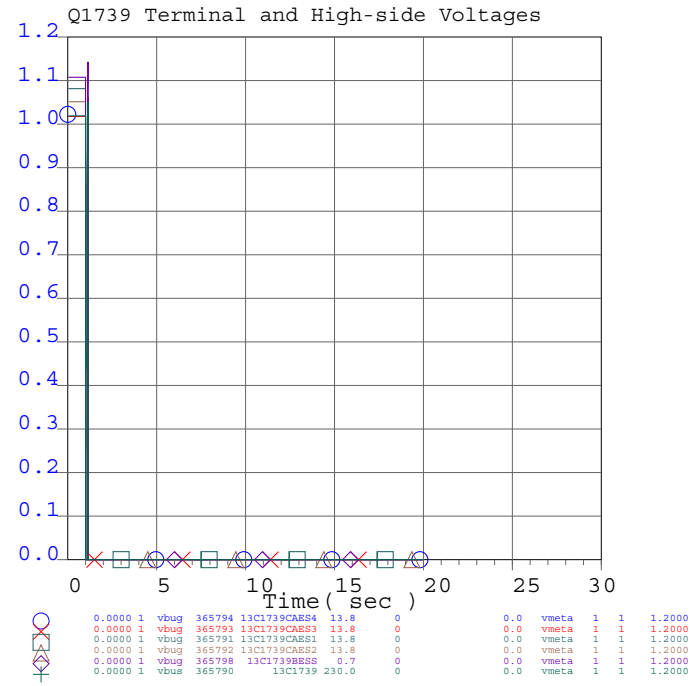
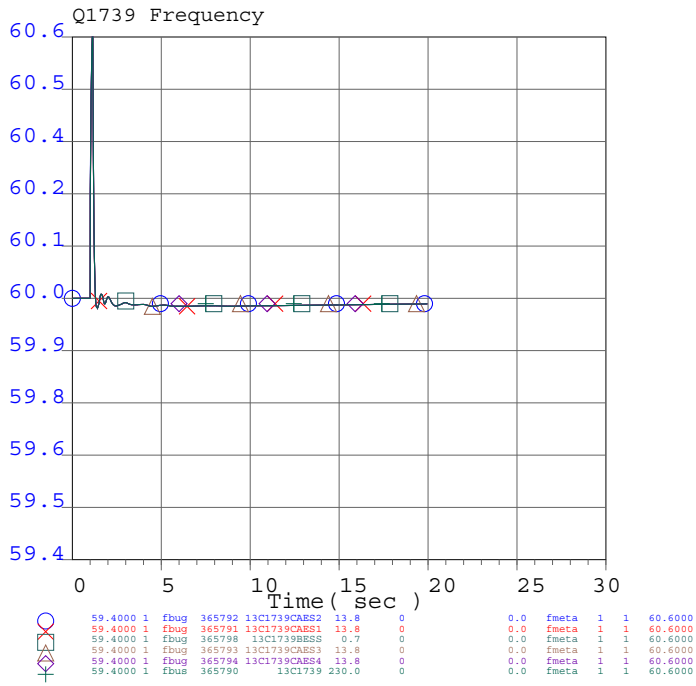
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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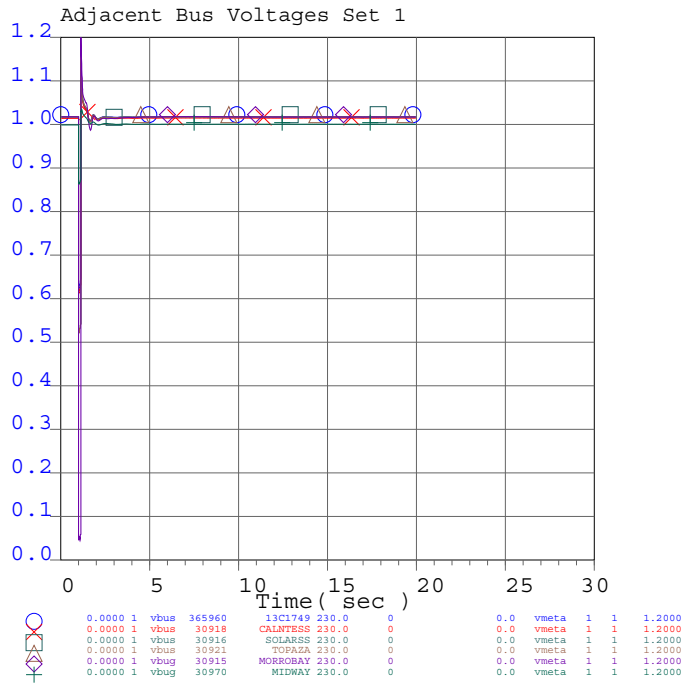

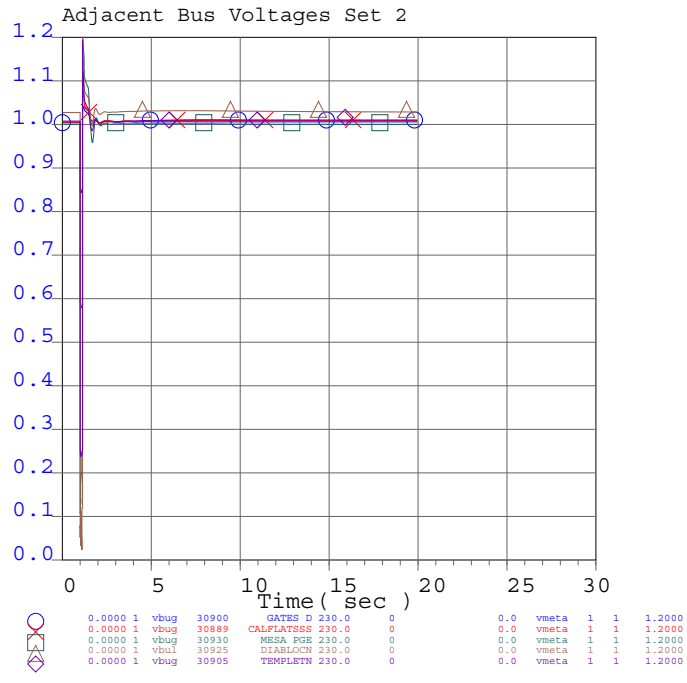

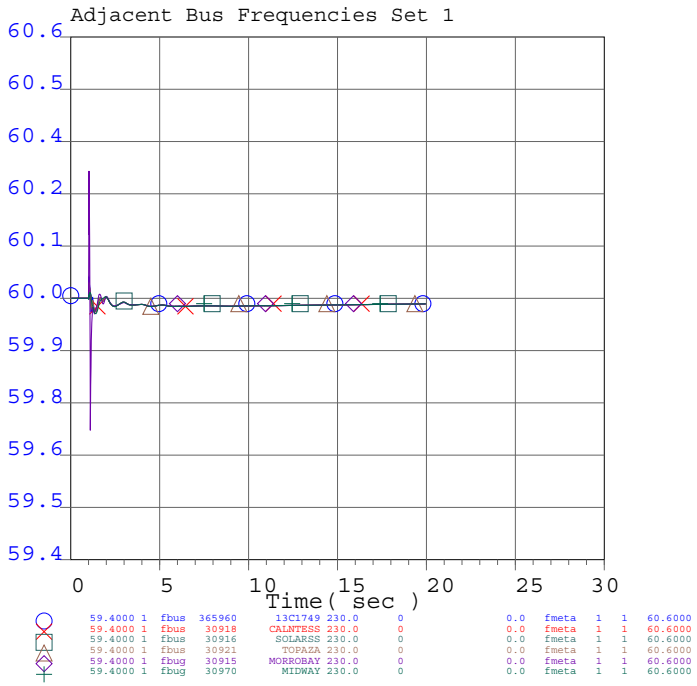

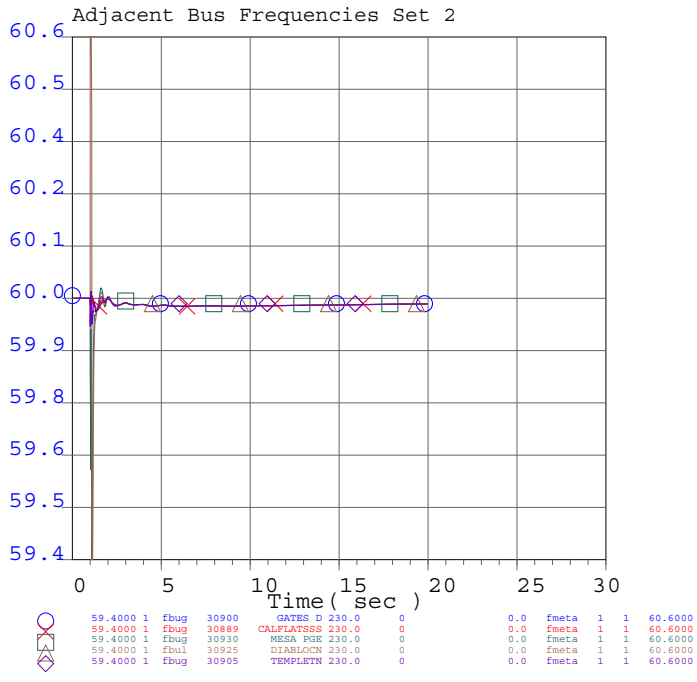

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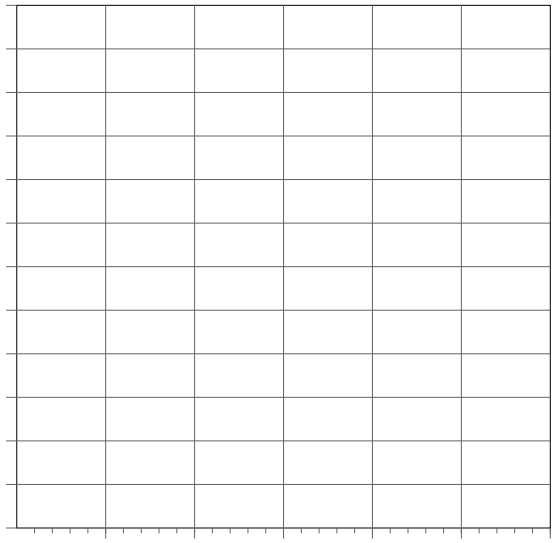
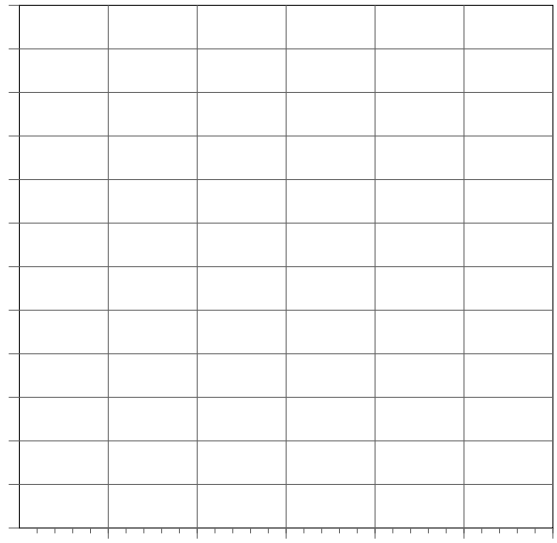
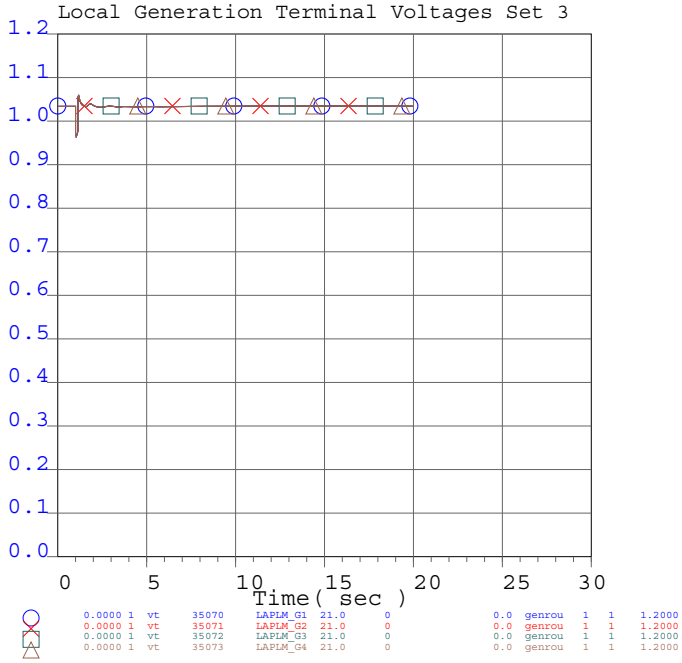
Local Generation Terminal Voltages Set 1



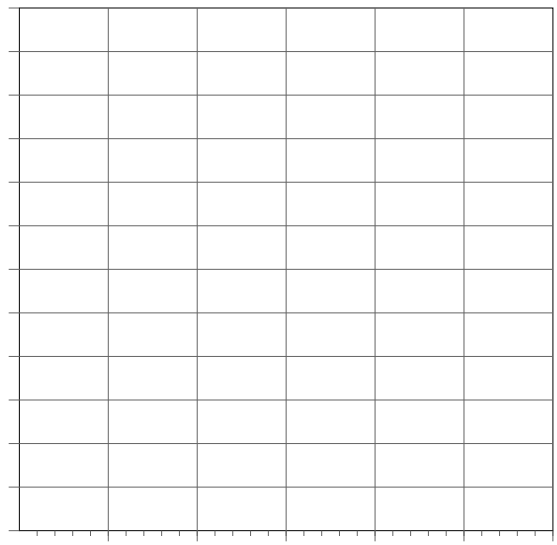
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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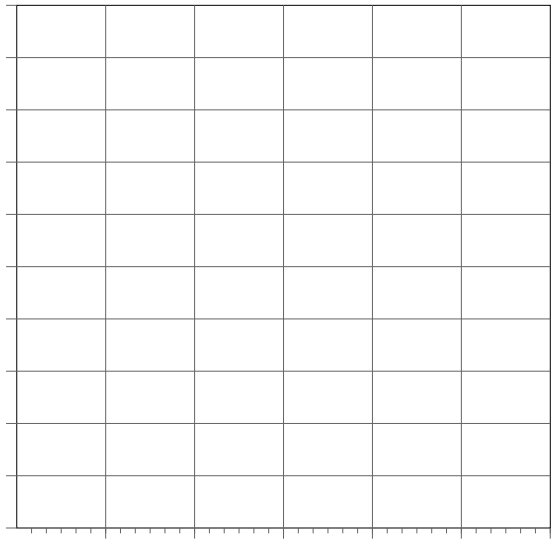
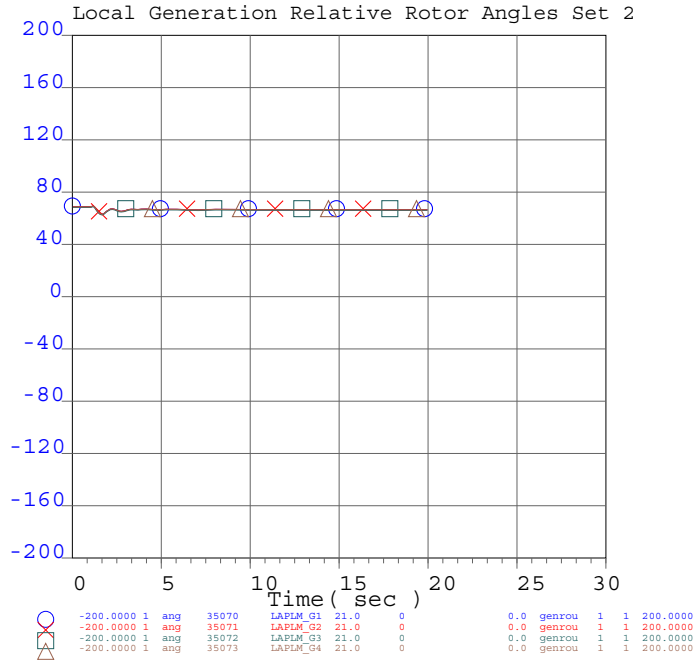
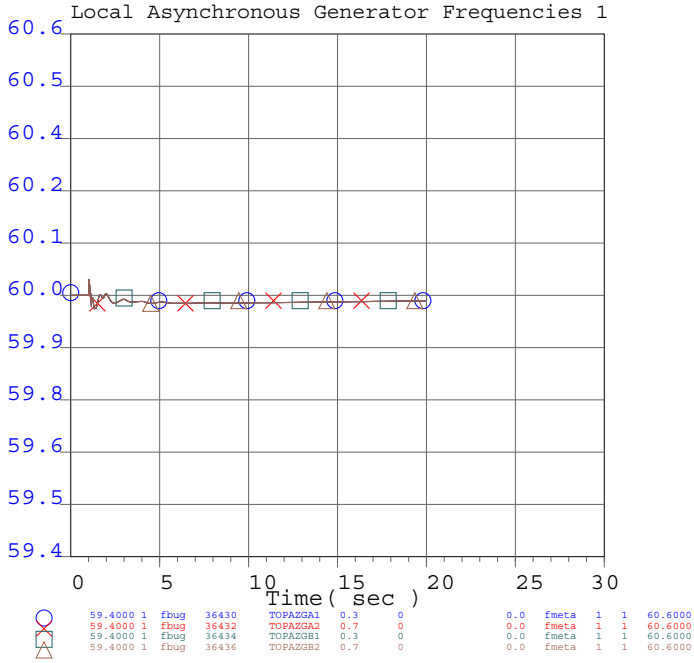
Local Generation Relative Rotor Angles Set 1



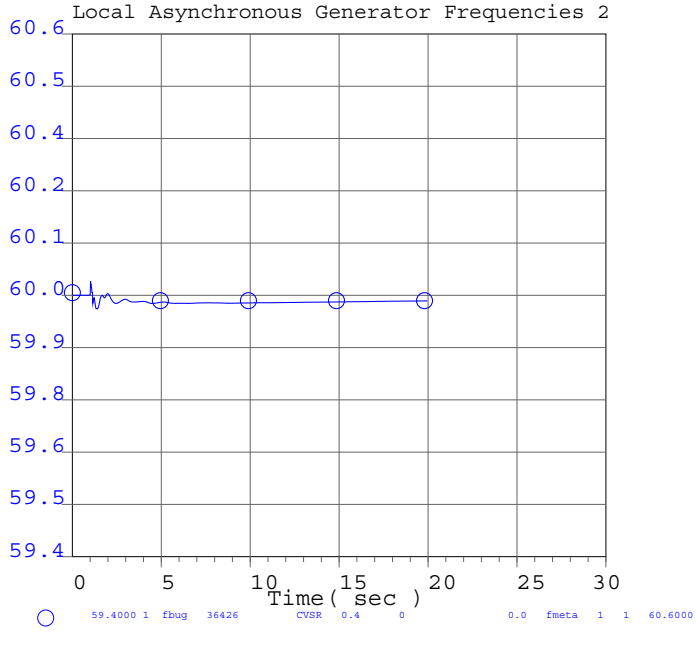
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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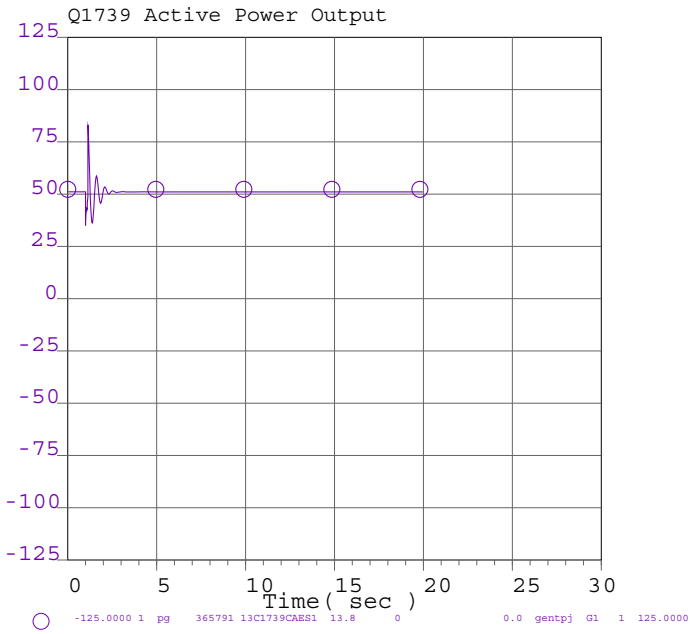

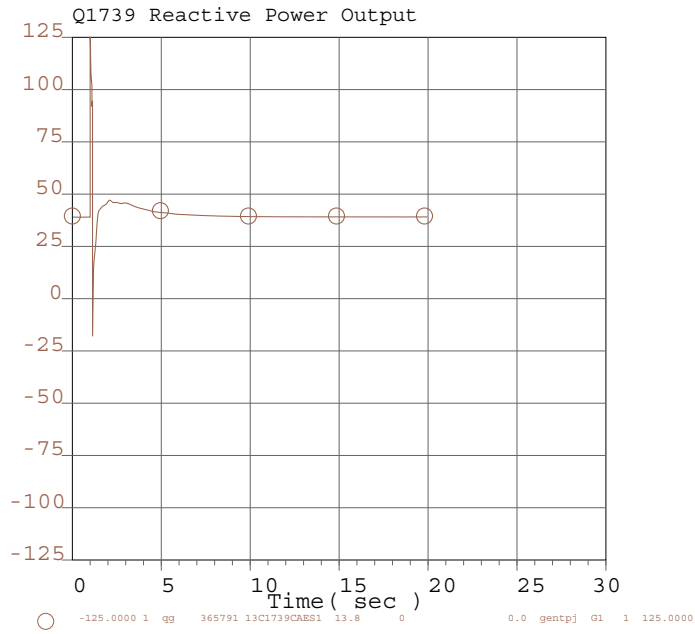

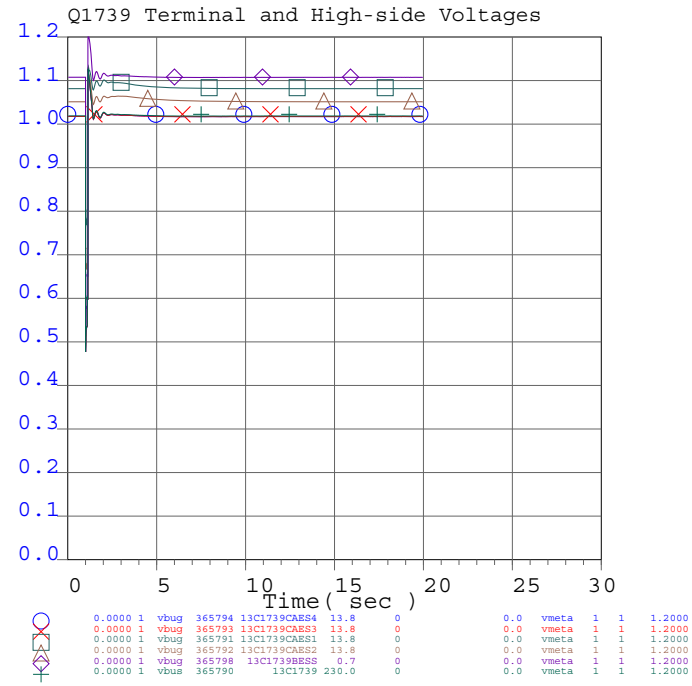

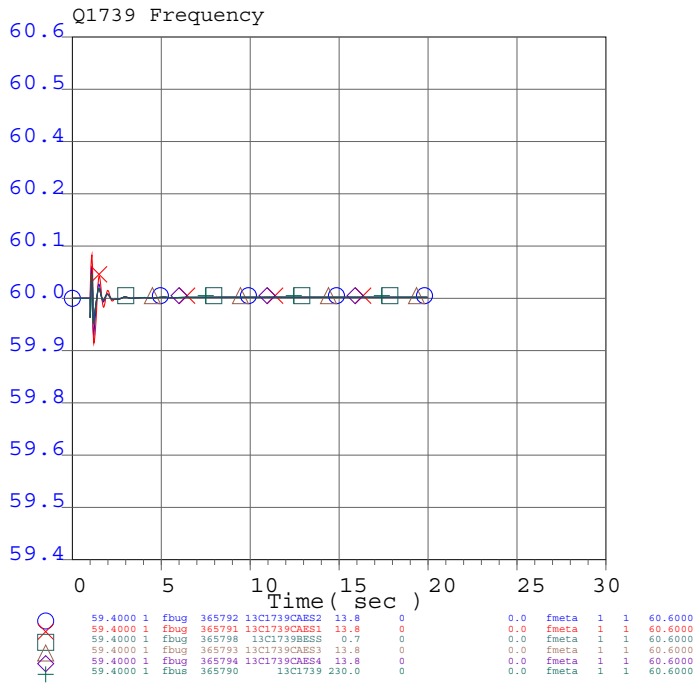

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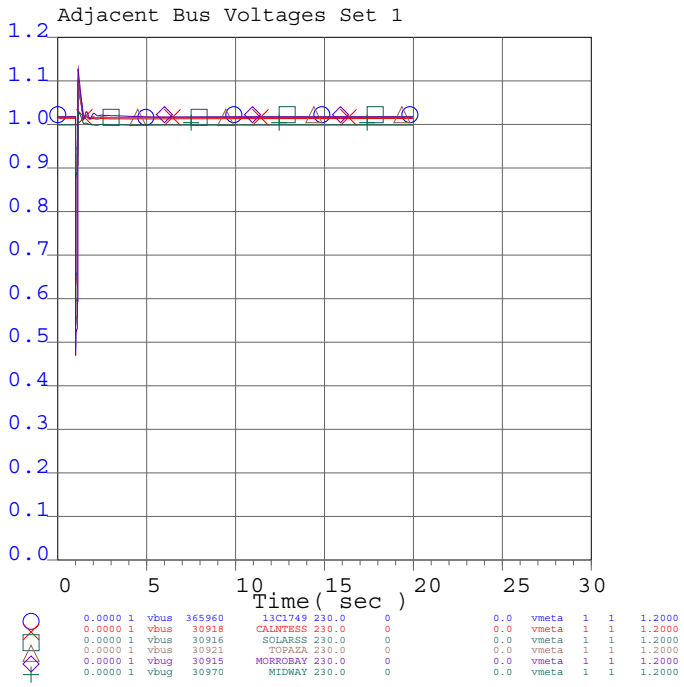

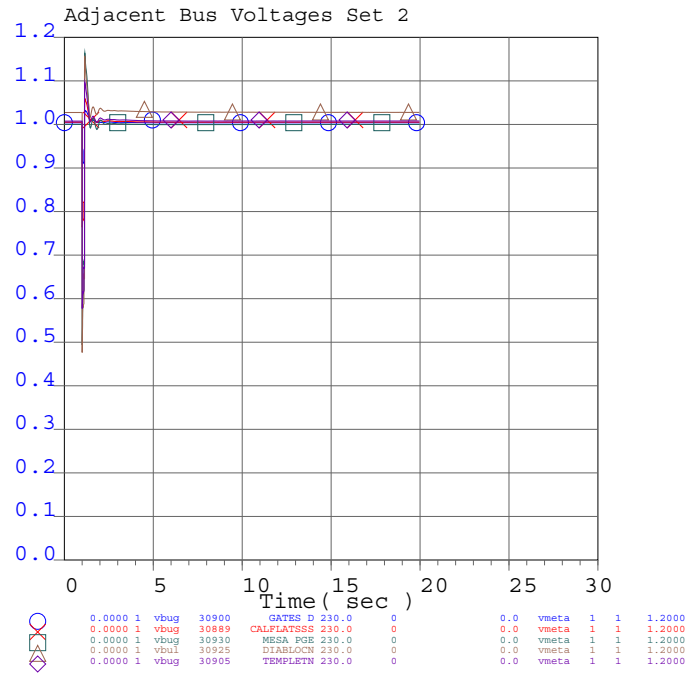

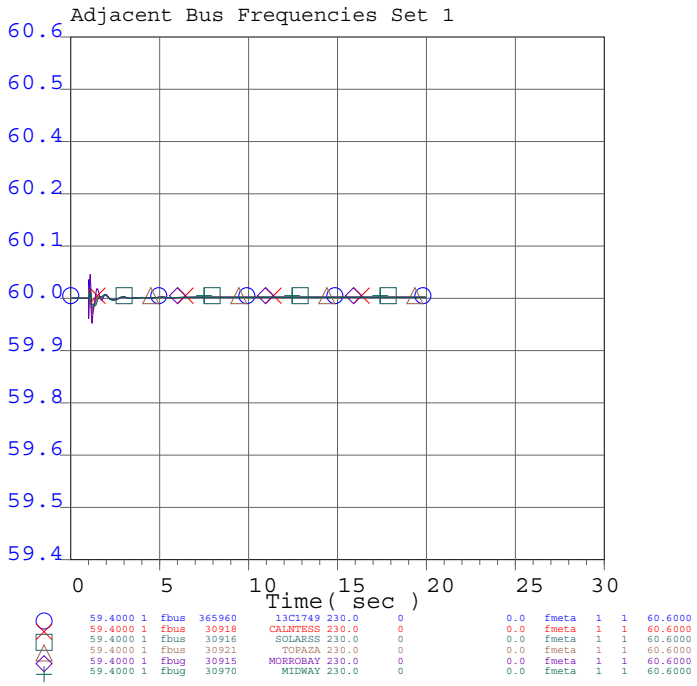

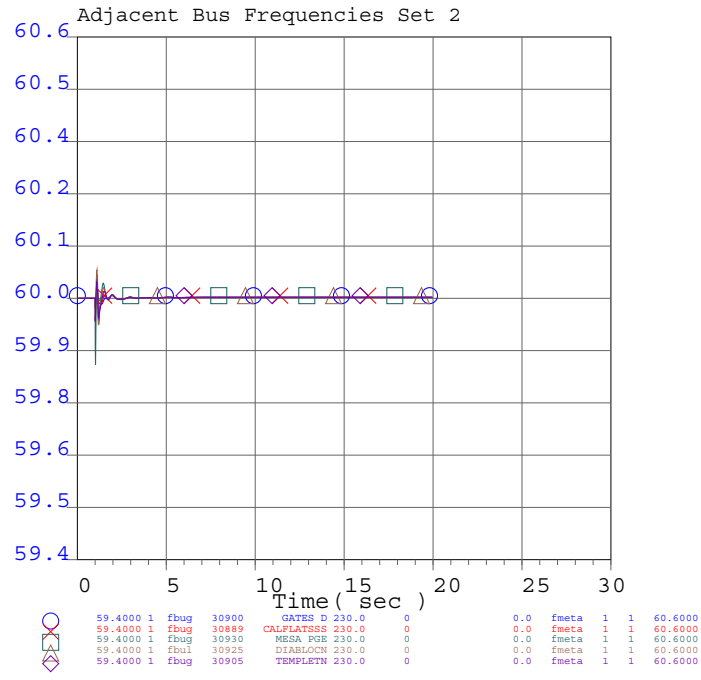

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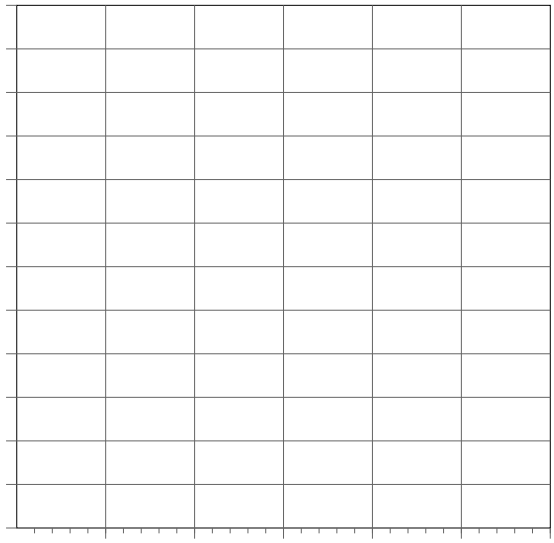
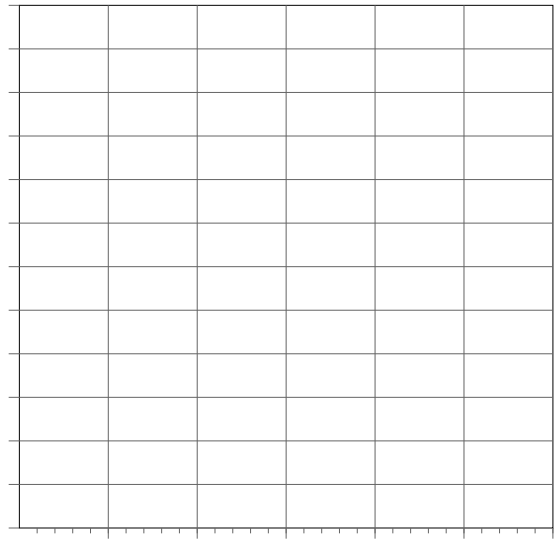
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

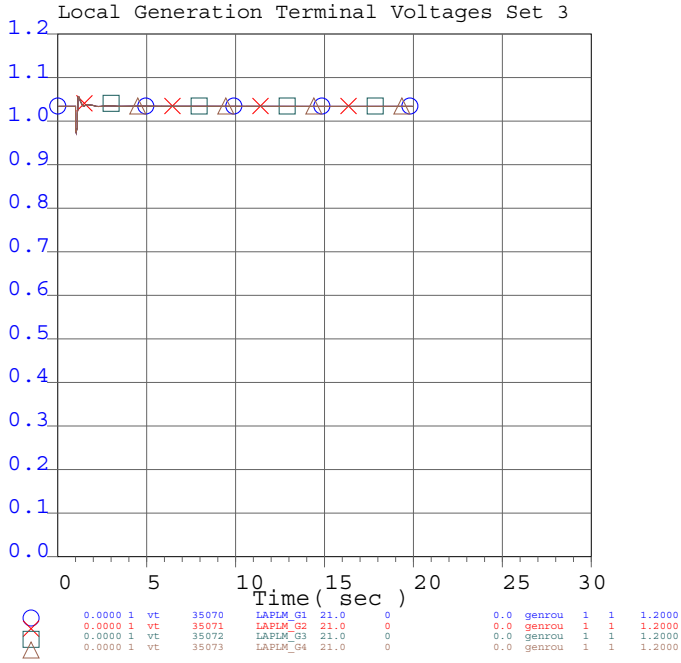
Local Generation Terminal Voltages Set 1



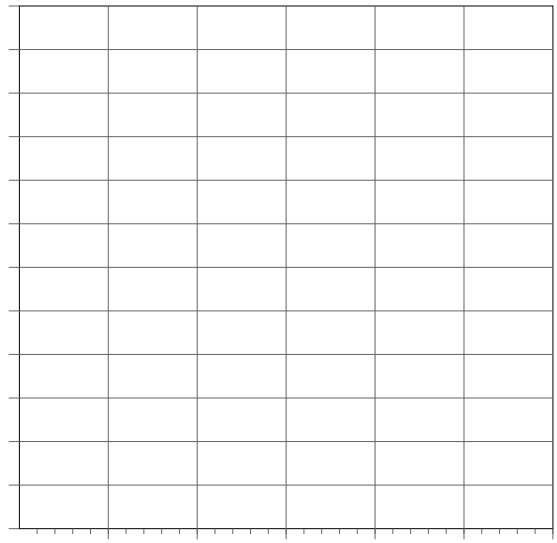
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

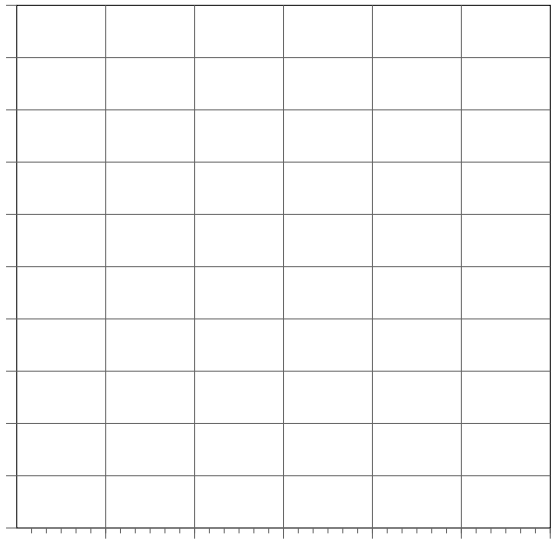


Local Generation Terminal Voltages Set 4

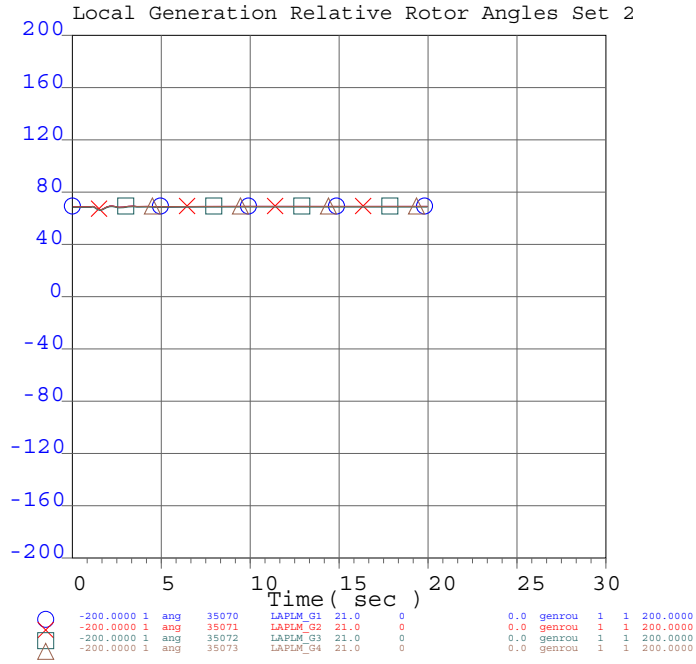


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

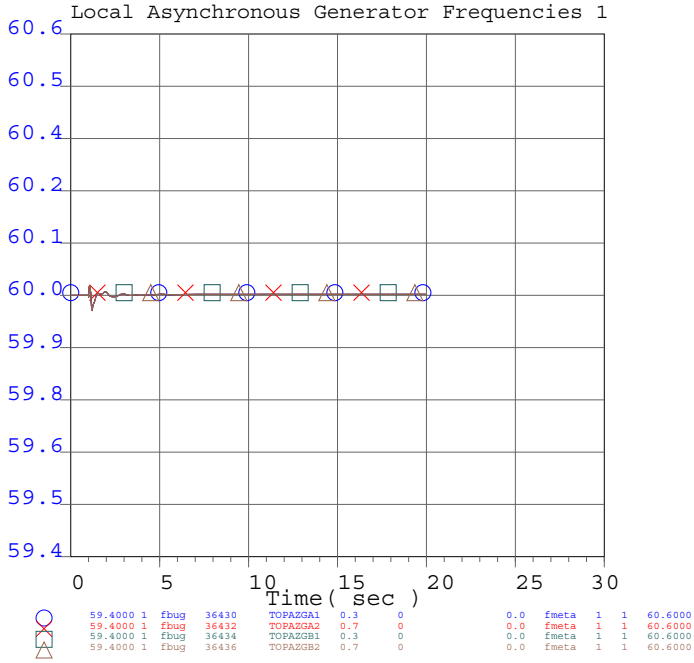
Local Generation Relative Rotor Angles Set 1



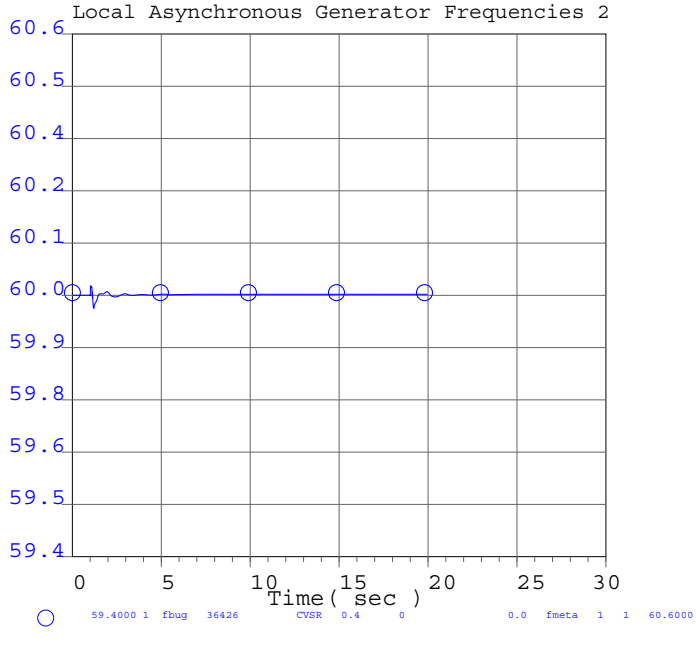
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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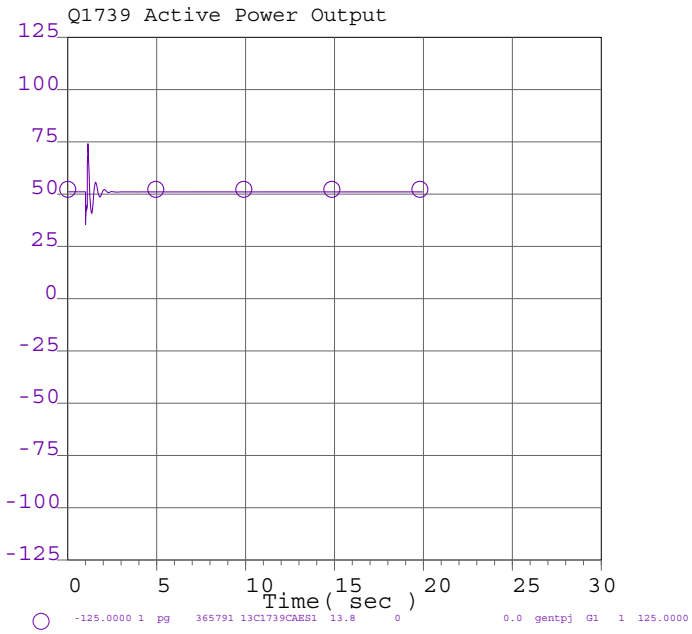
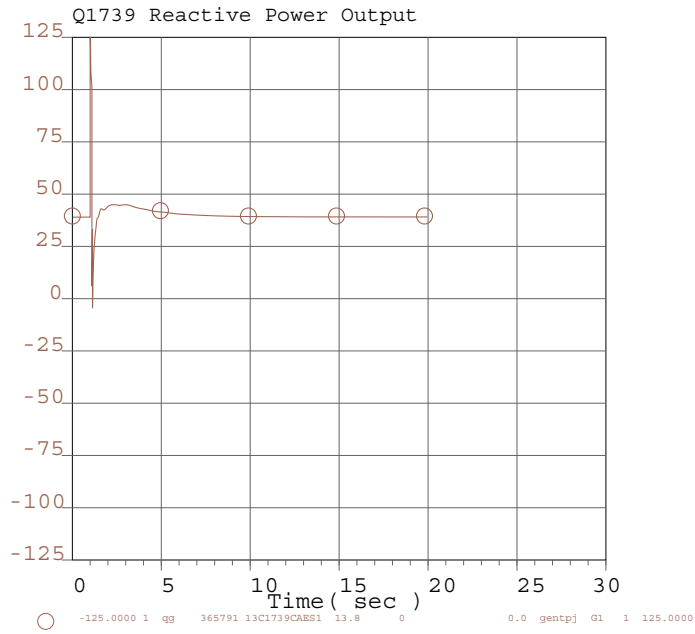
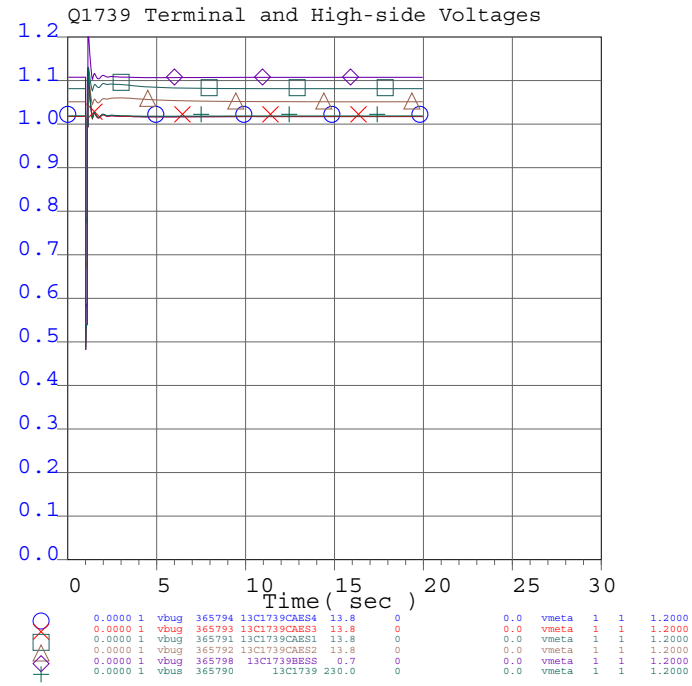
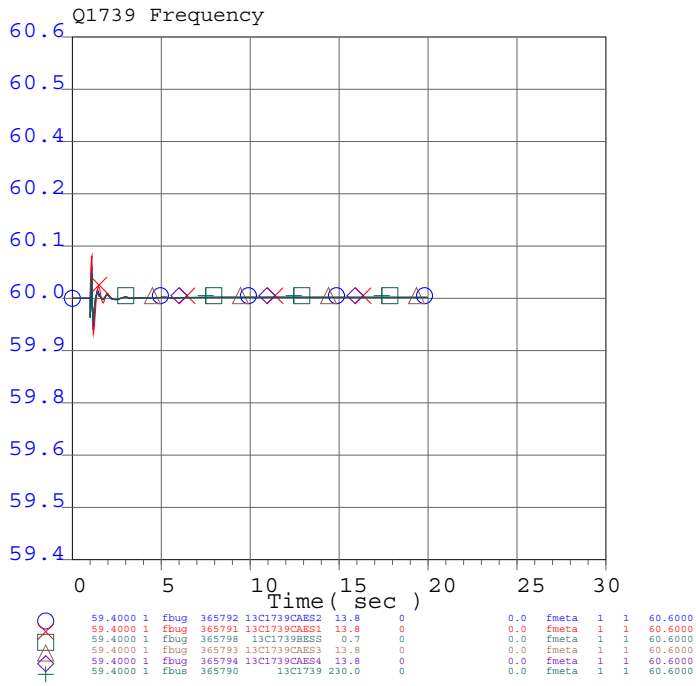
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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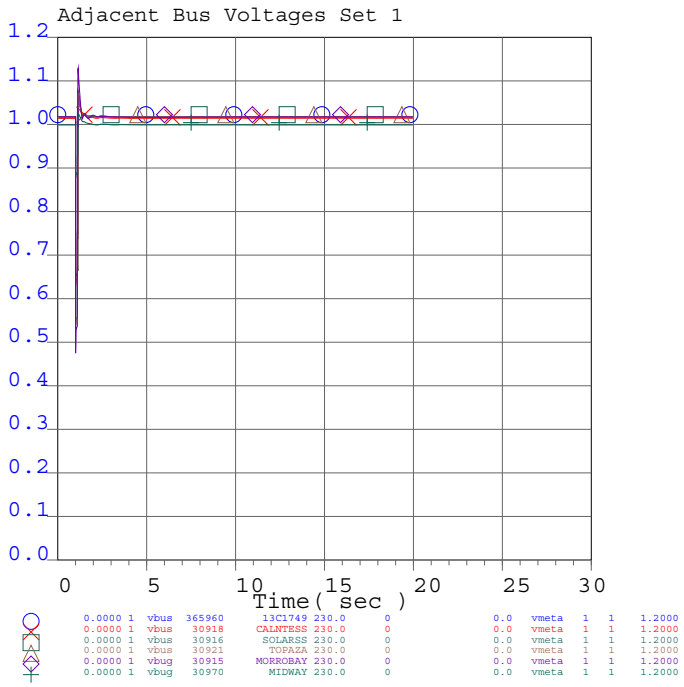

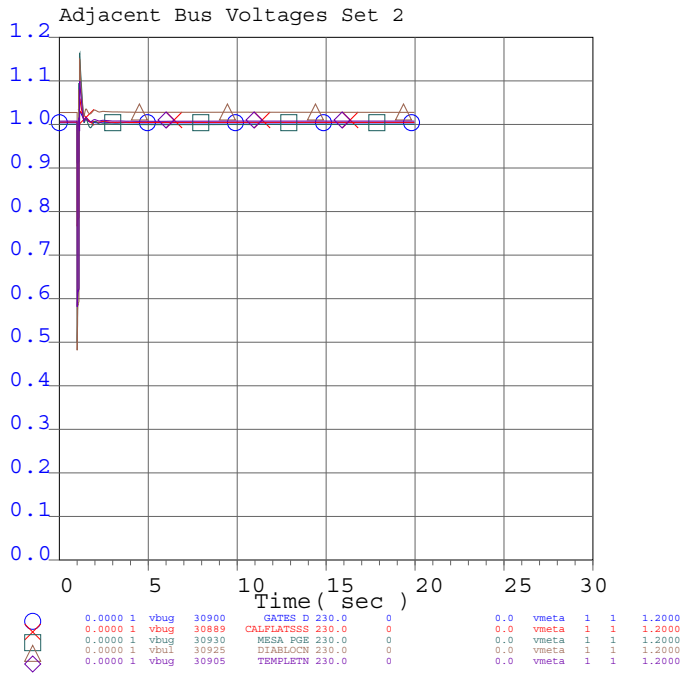

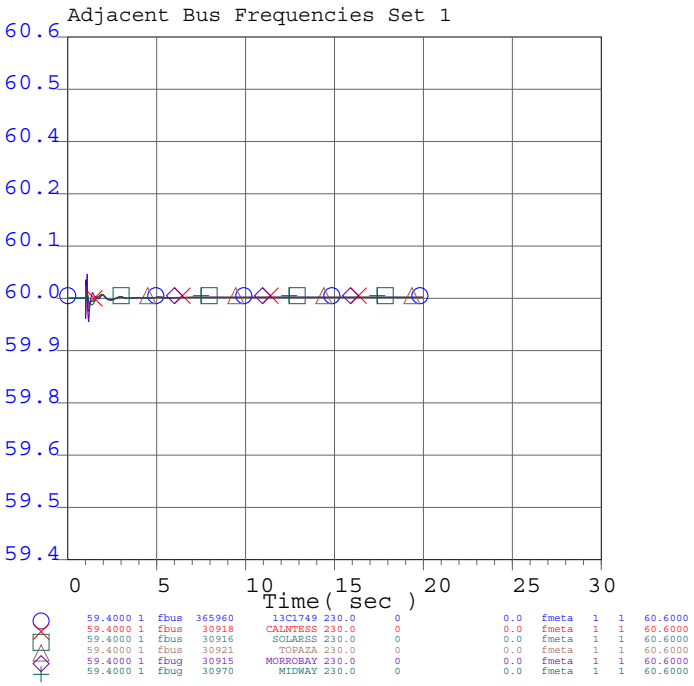

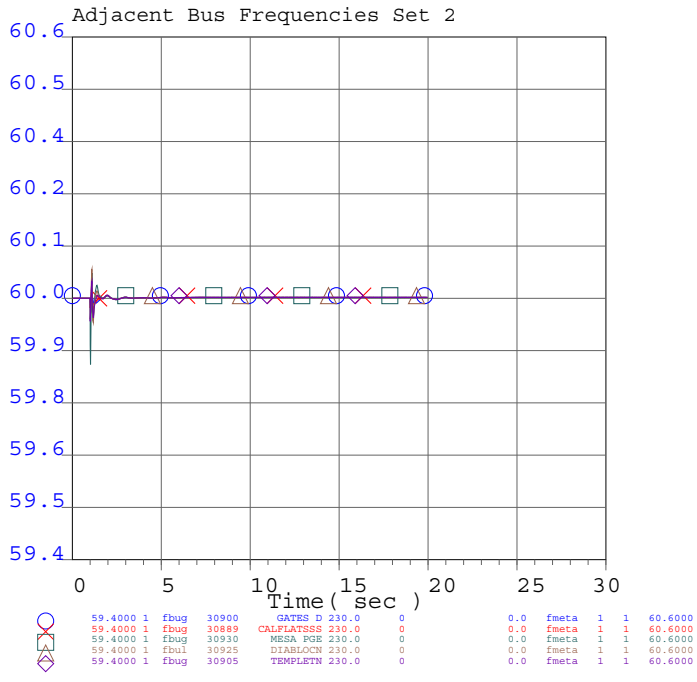

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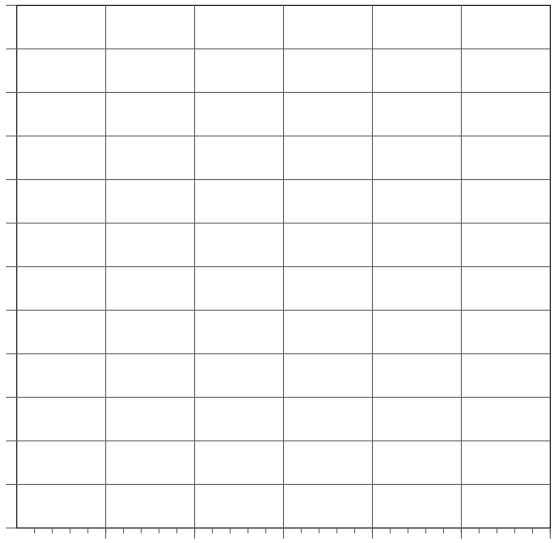
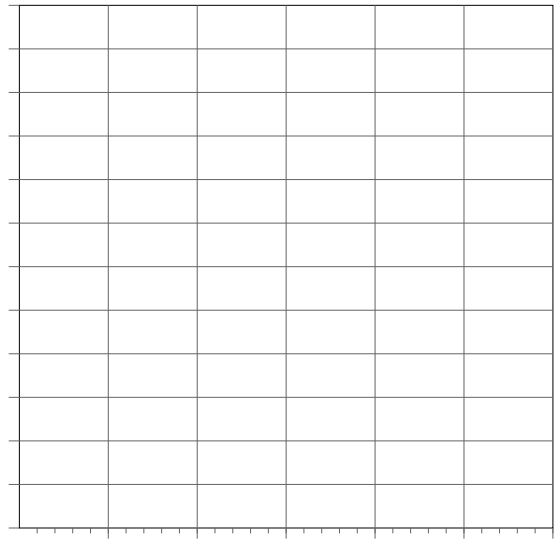
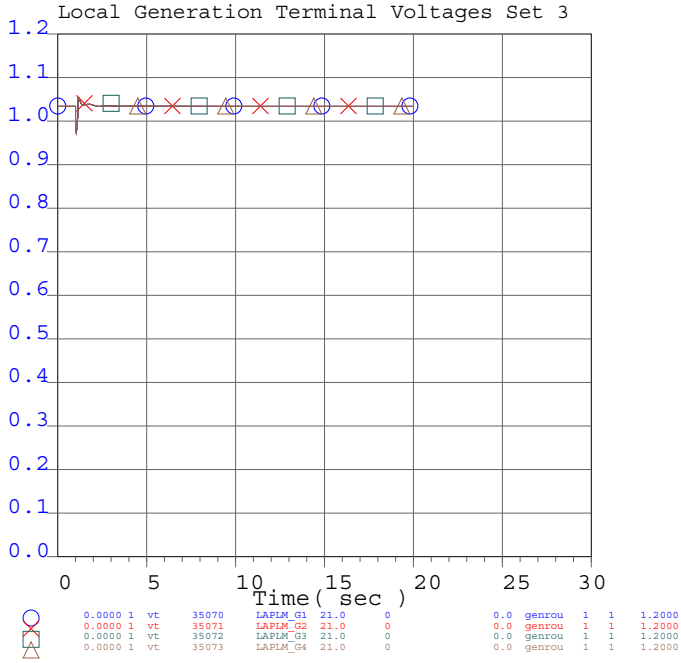
Local Generation Terminal Voltages Set 1



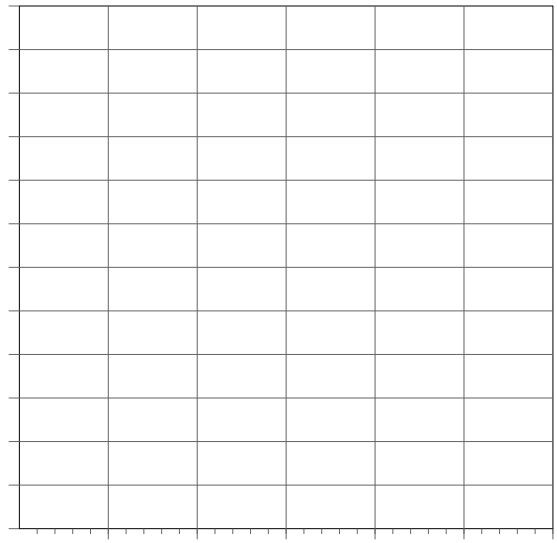
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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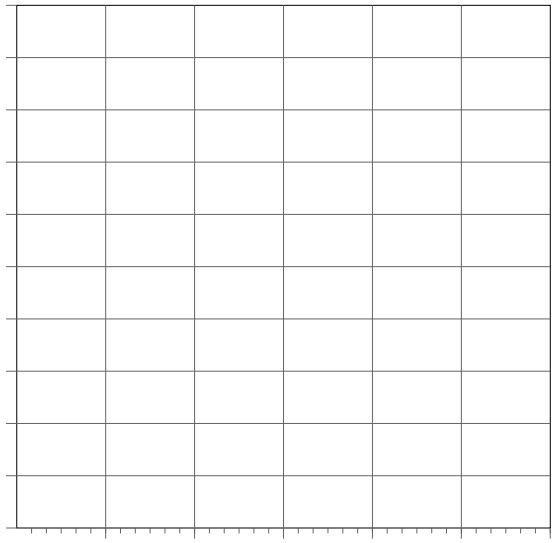
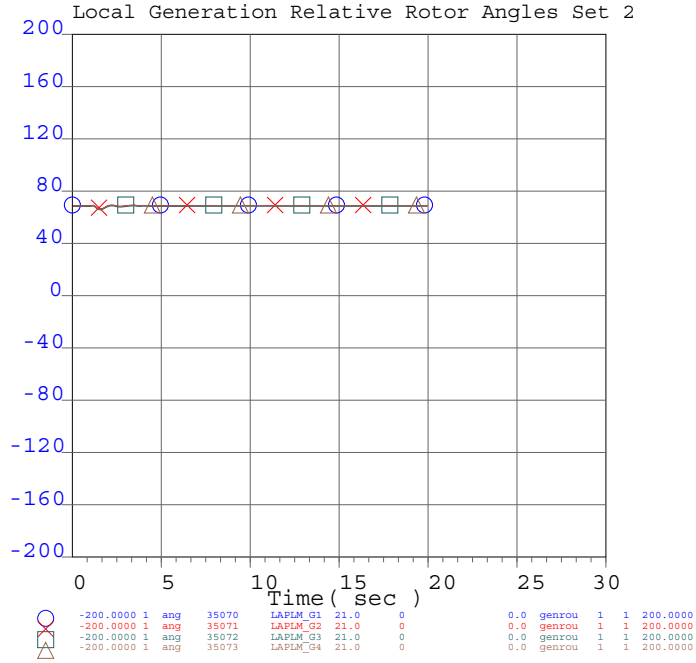
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

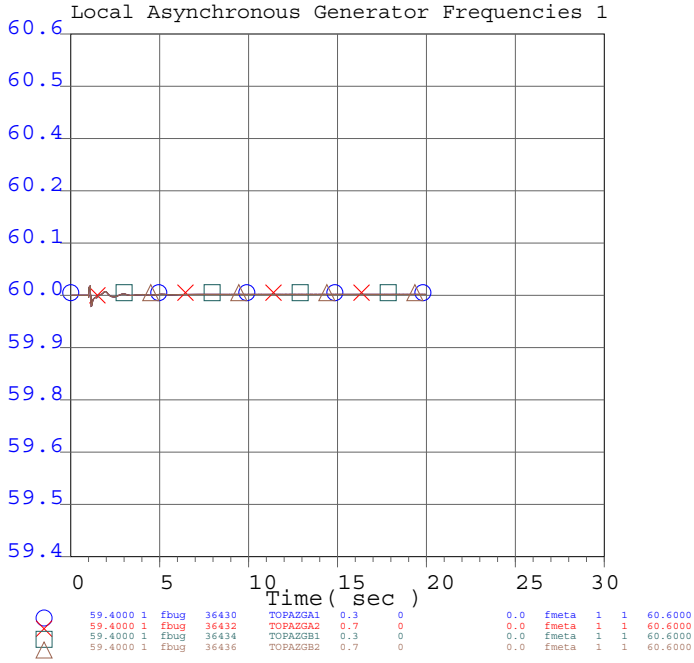
Local Generation Relative Rotor Angles Set 1



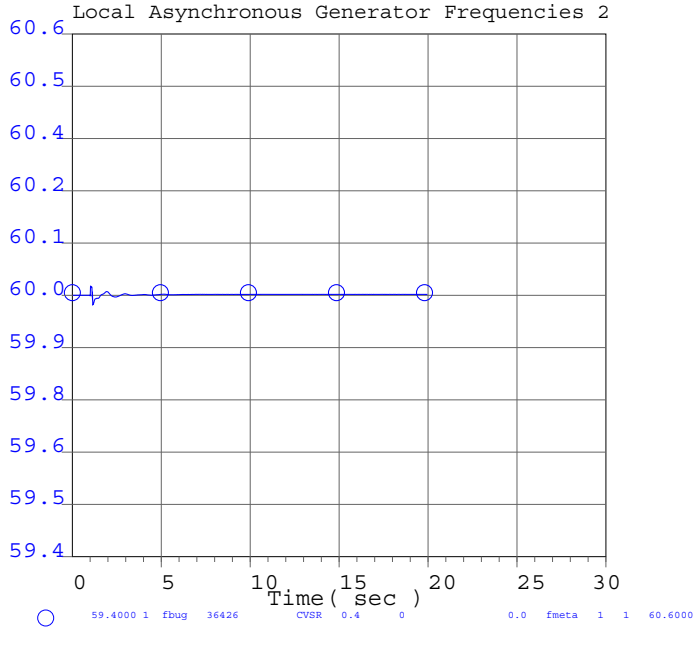
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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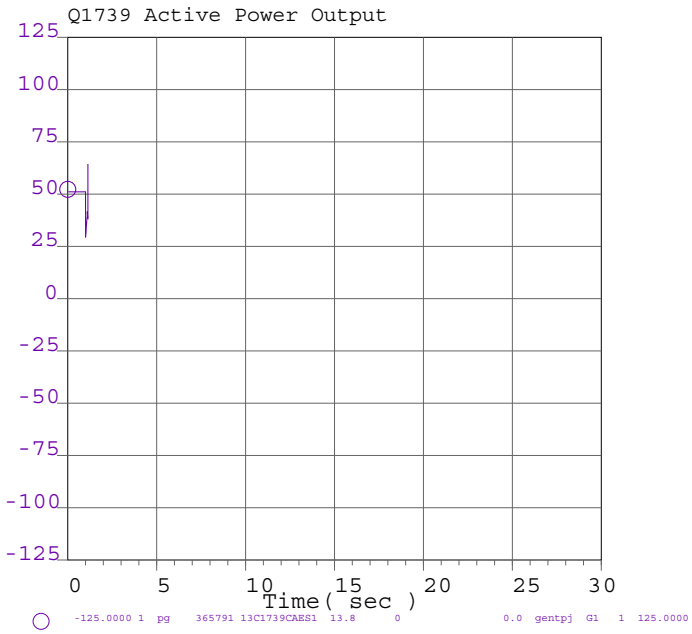

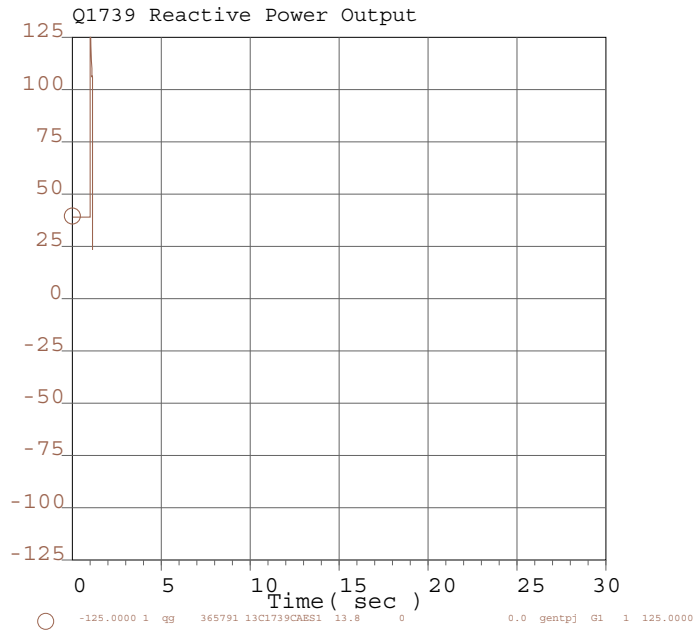

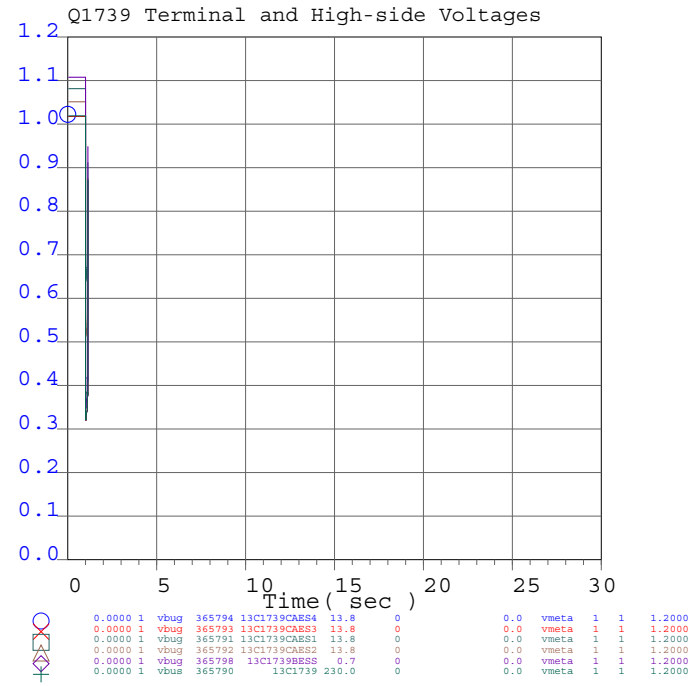

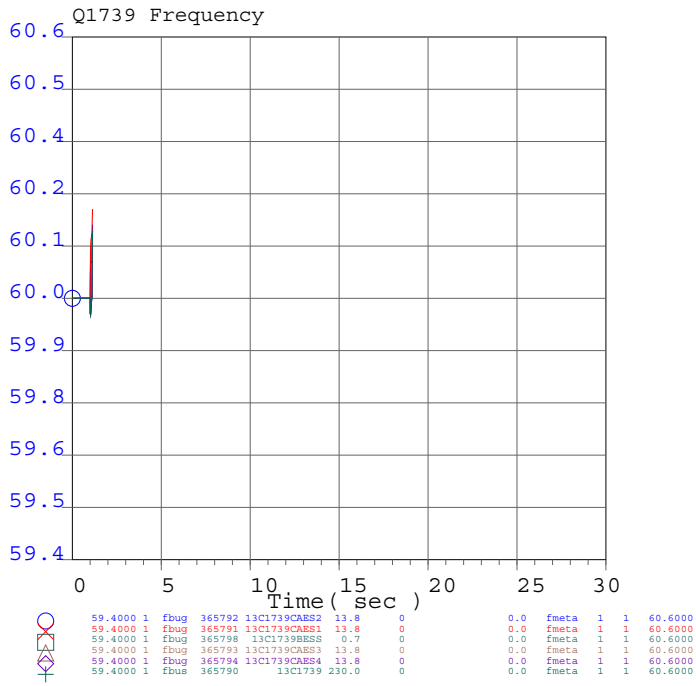

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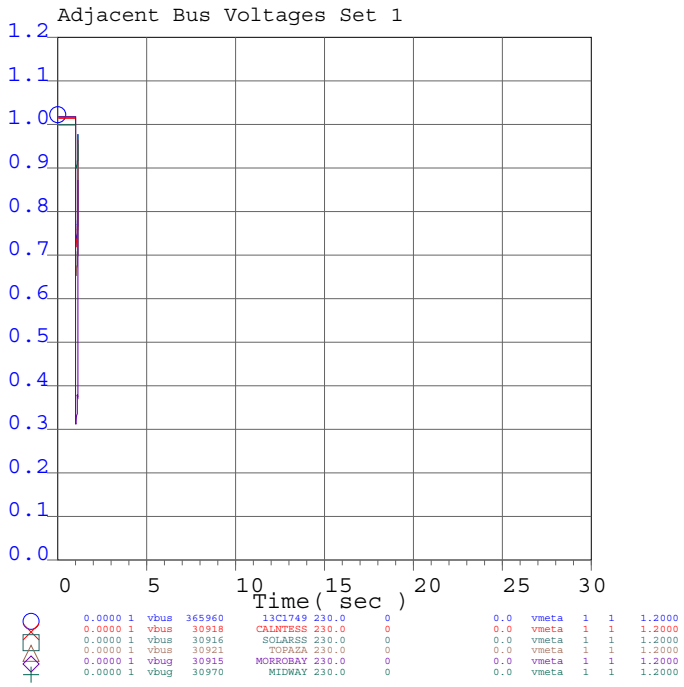

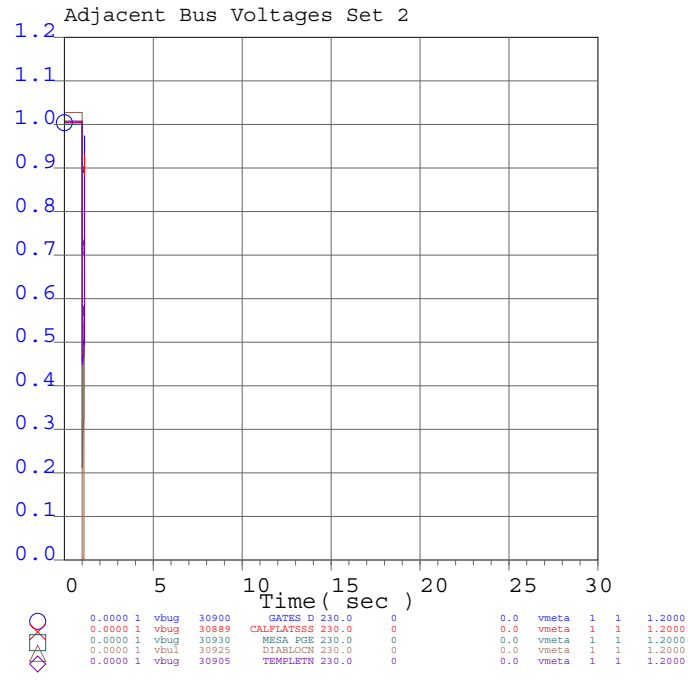

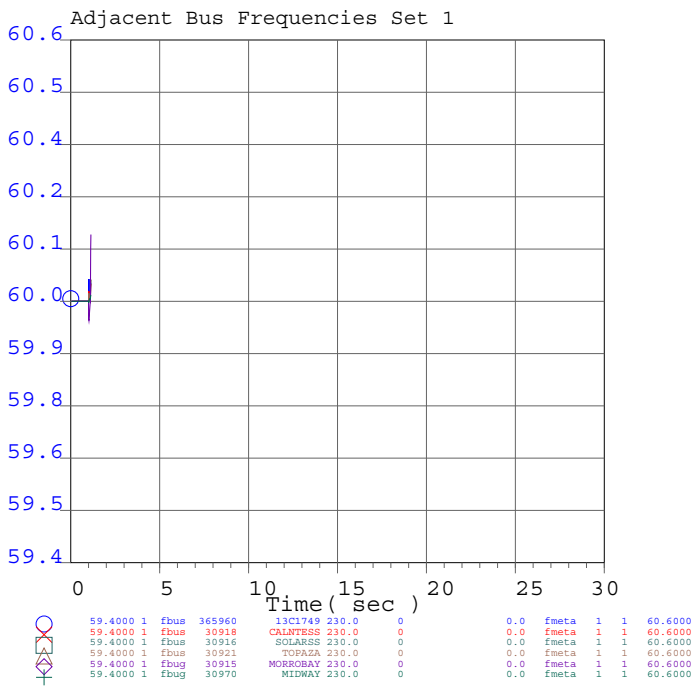

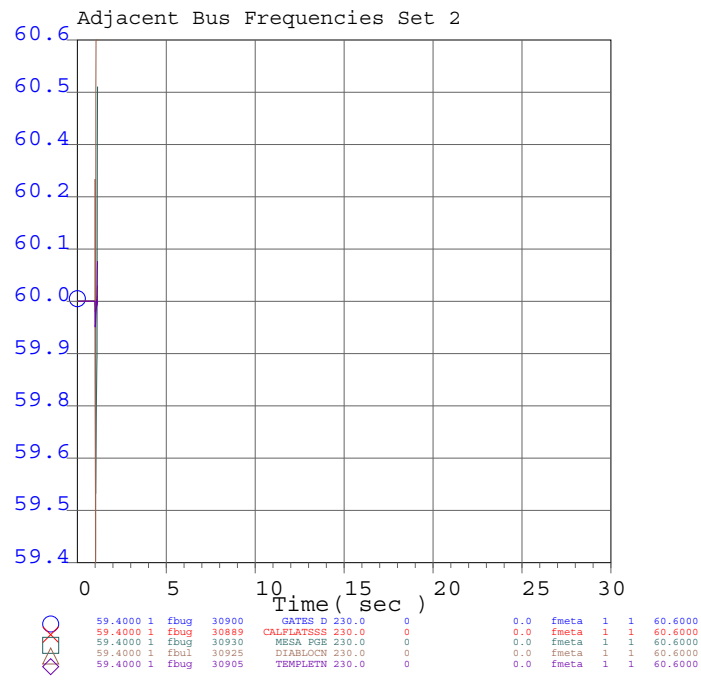

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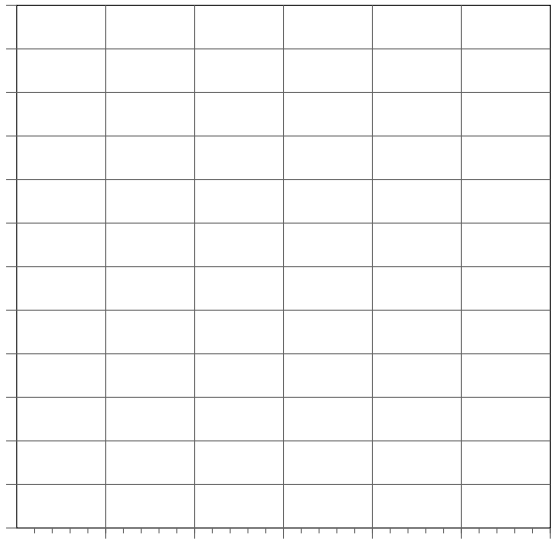
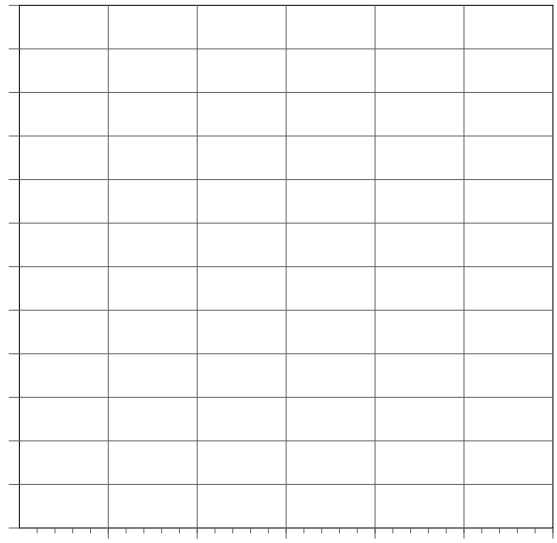
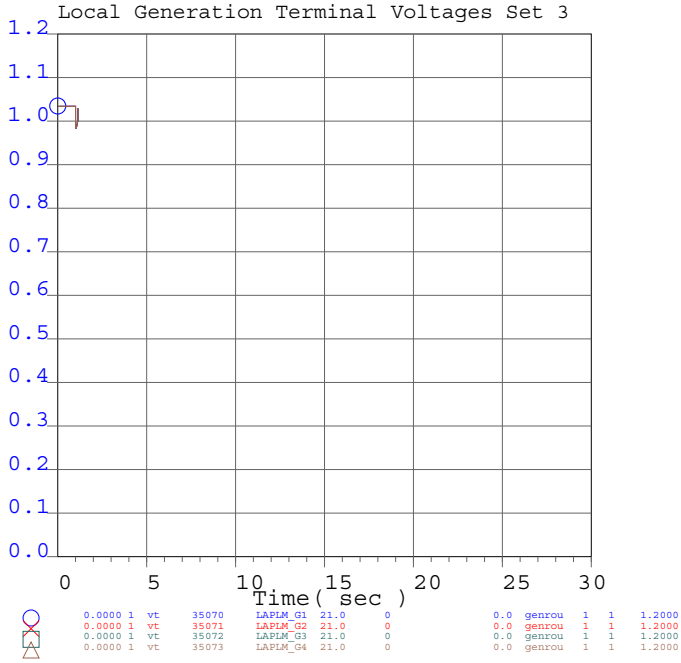
Local Generation Terminal Voltages Set 1



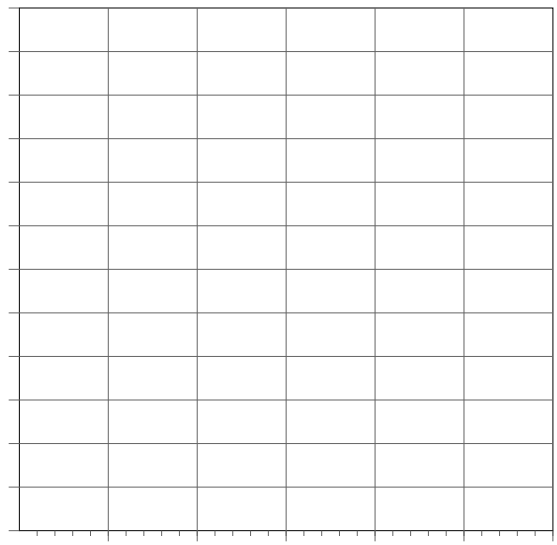
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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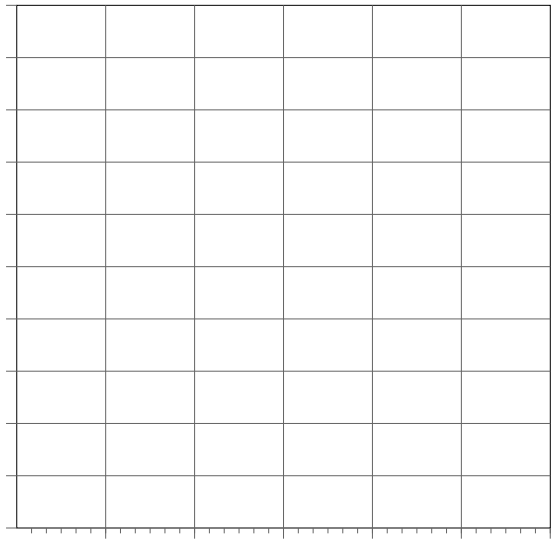
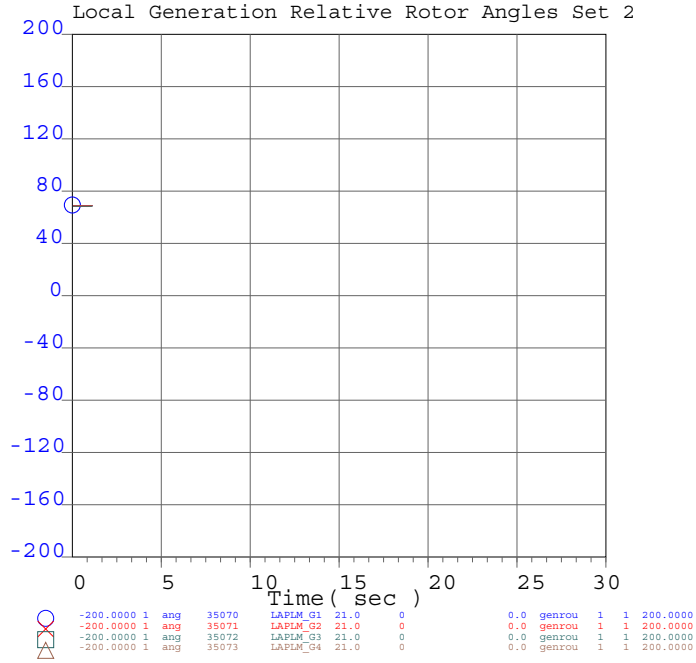
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



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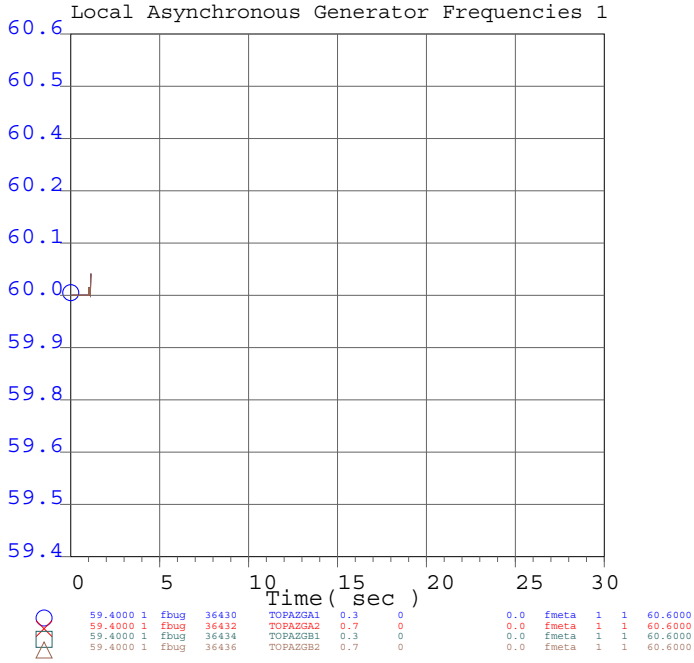
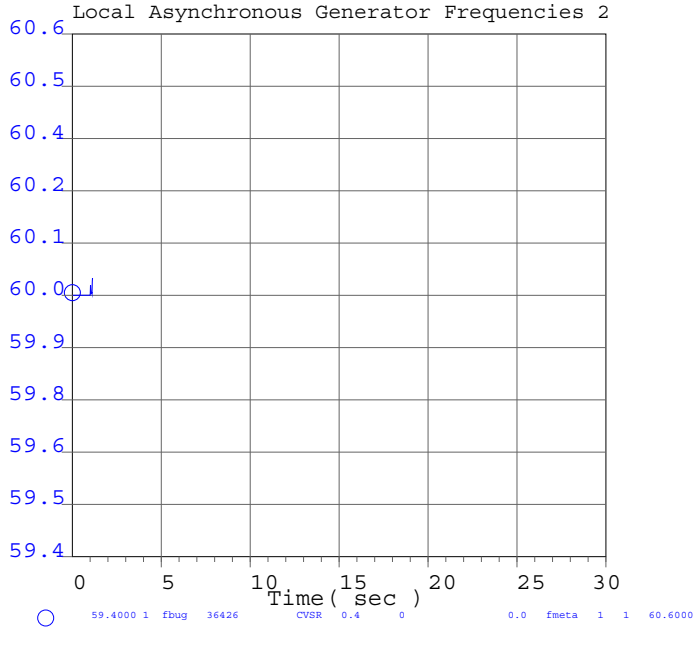


Local Asynchronous Generator Frequencies 2



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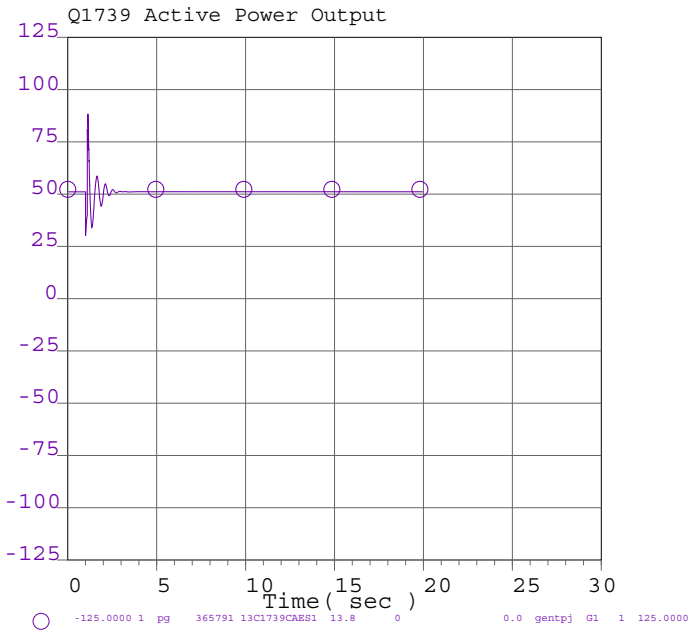

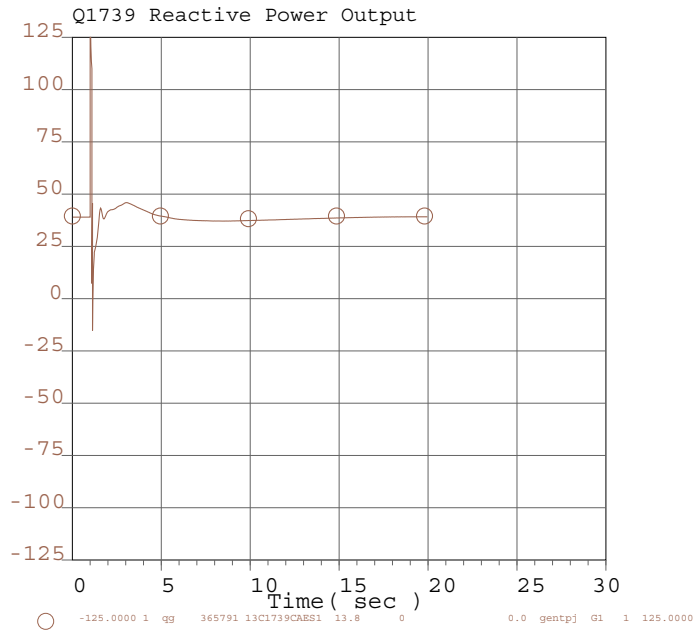

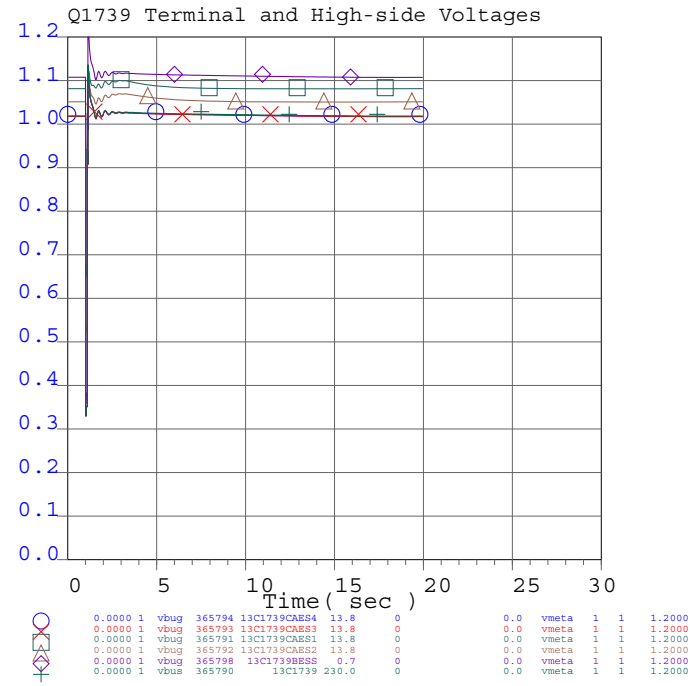

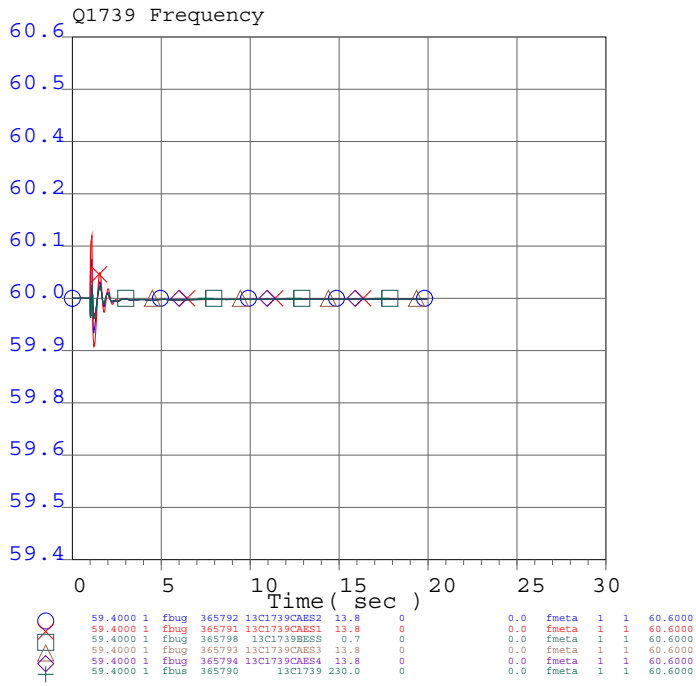

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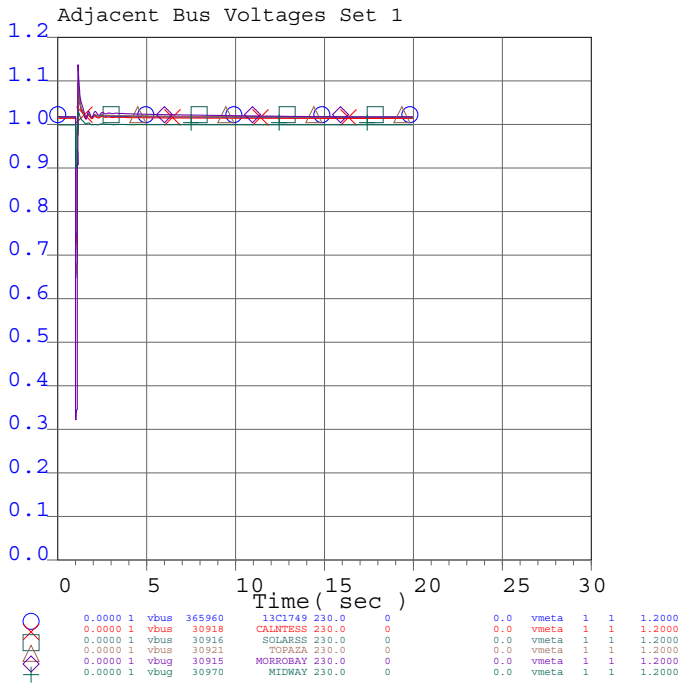

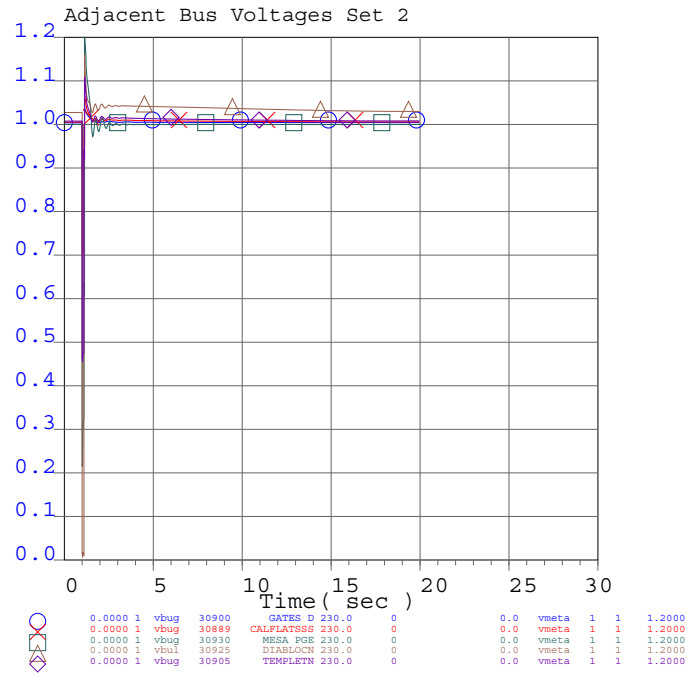

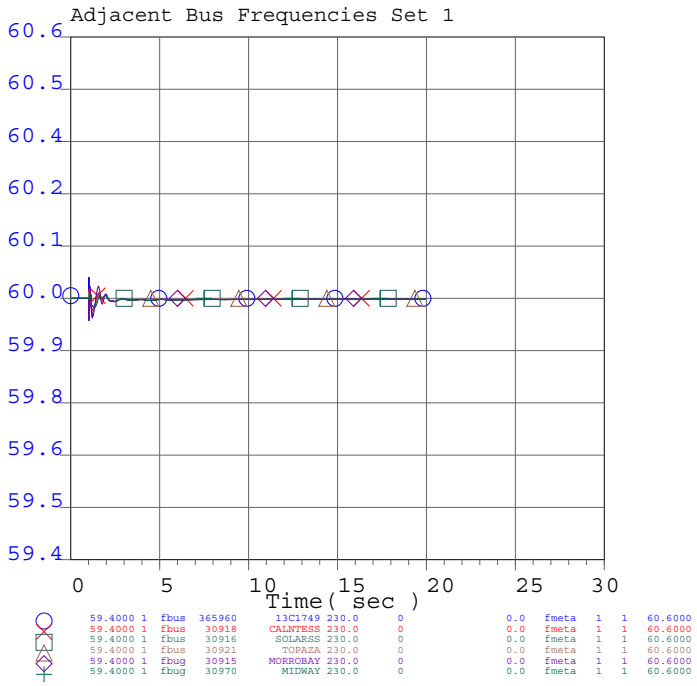

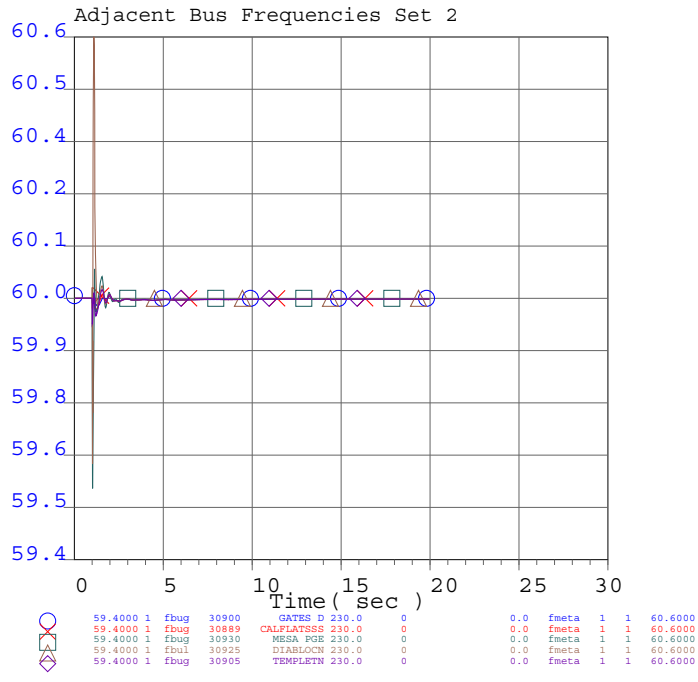

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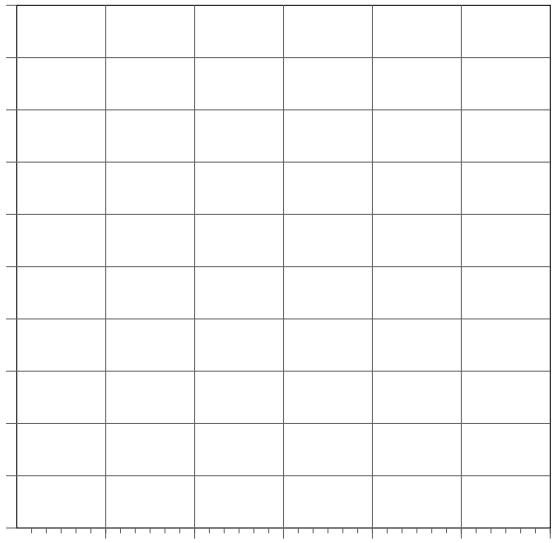
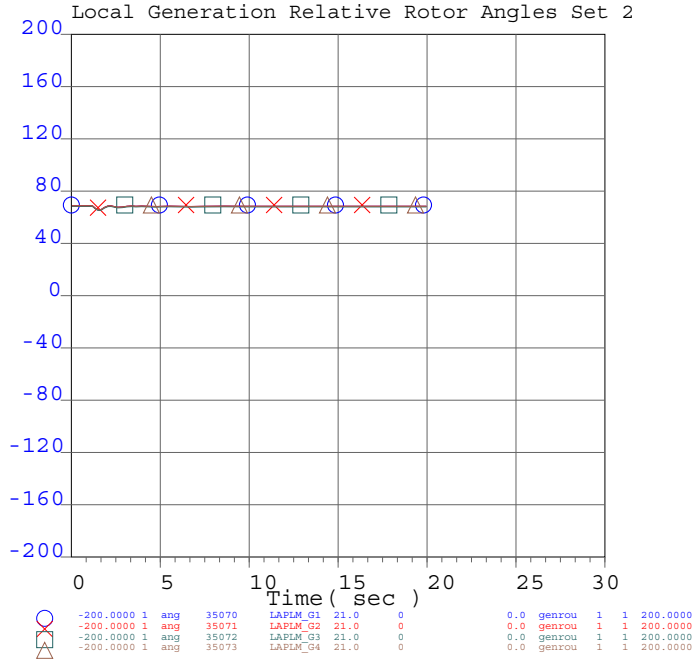
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

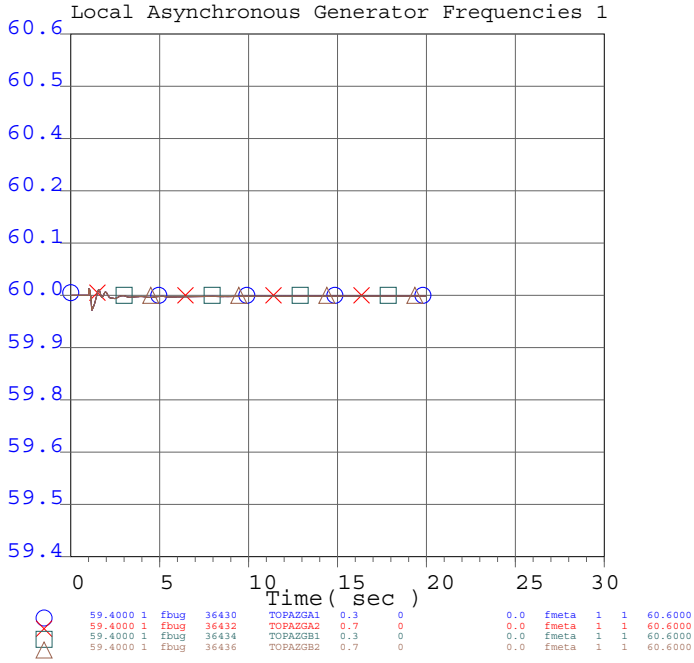
Local Generation Relative Rotor Angles Set 1



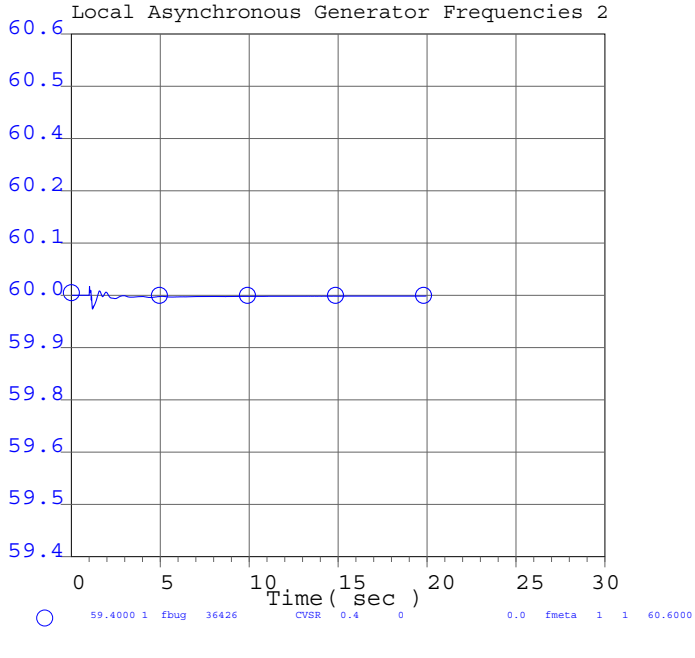
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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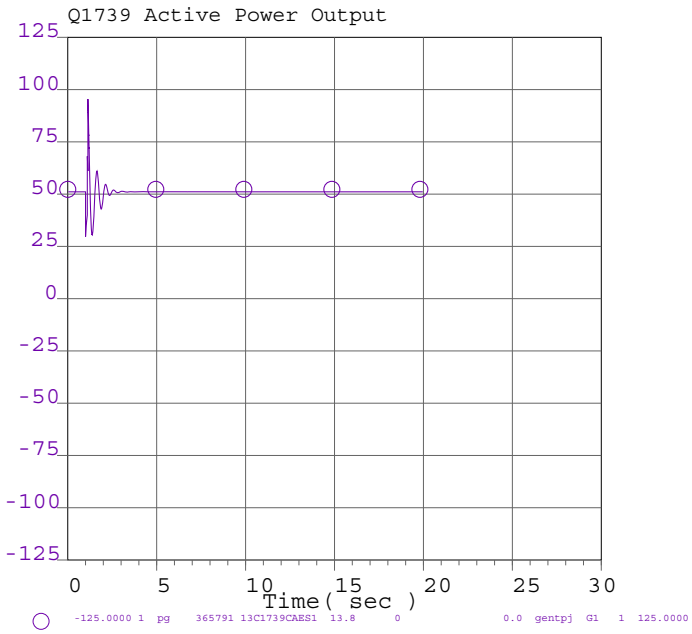
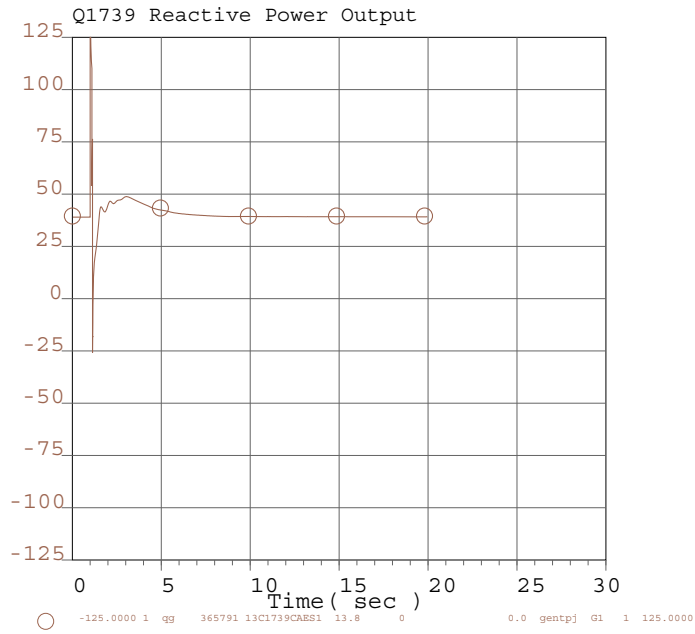
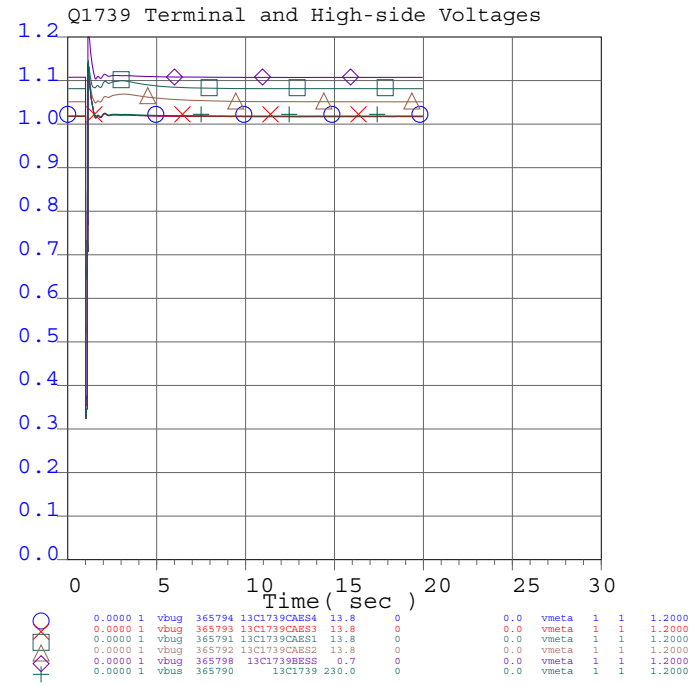
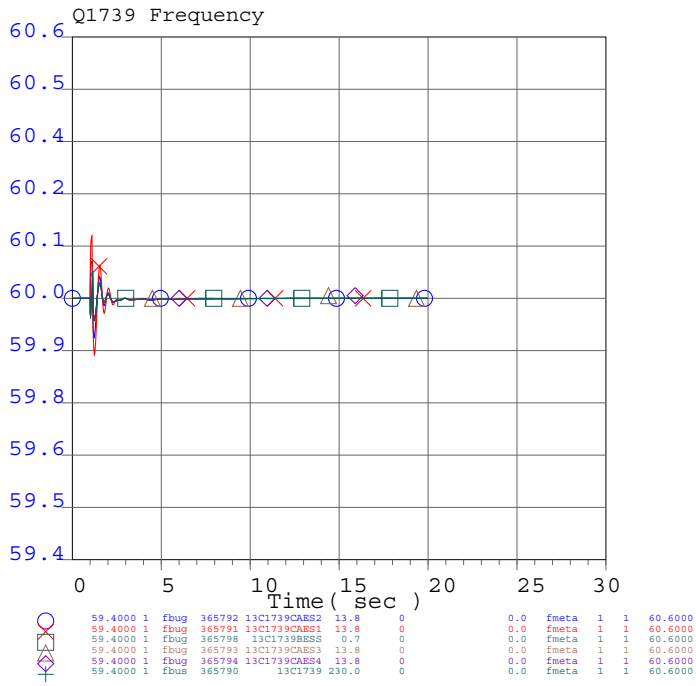
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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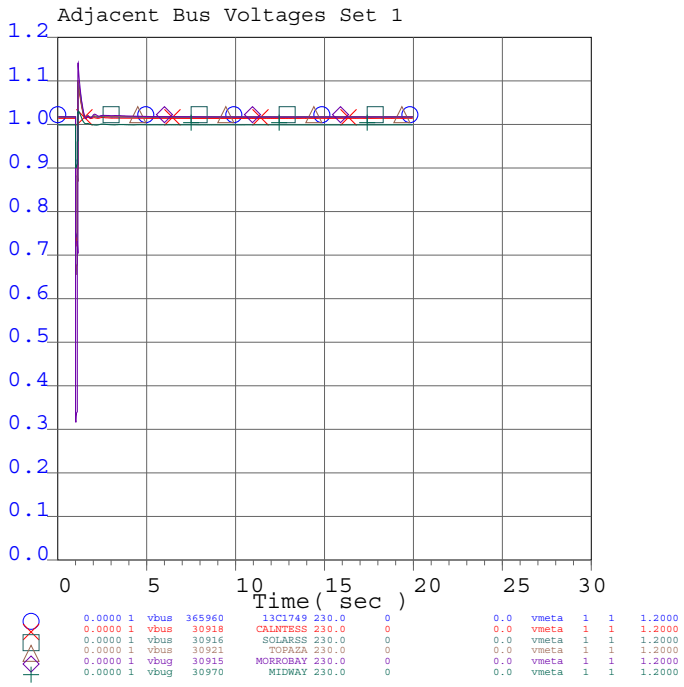

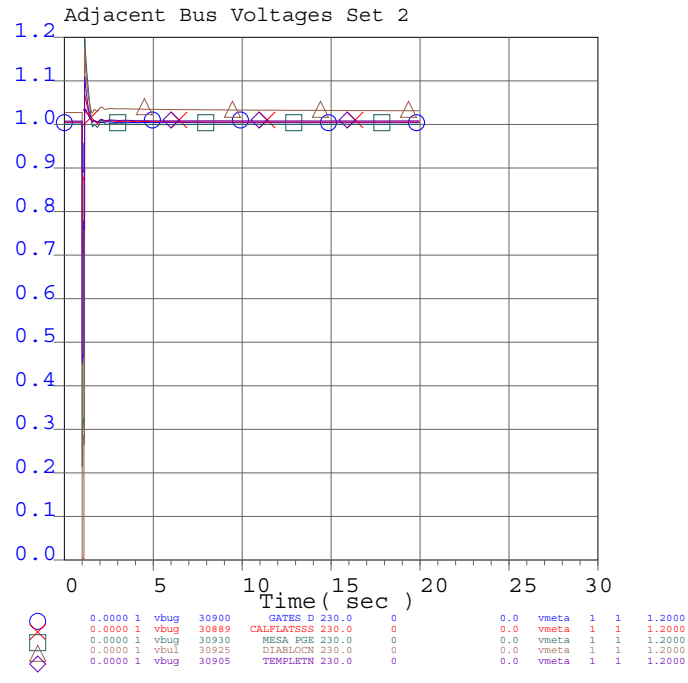

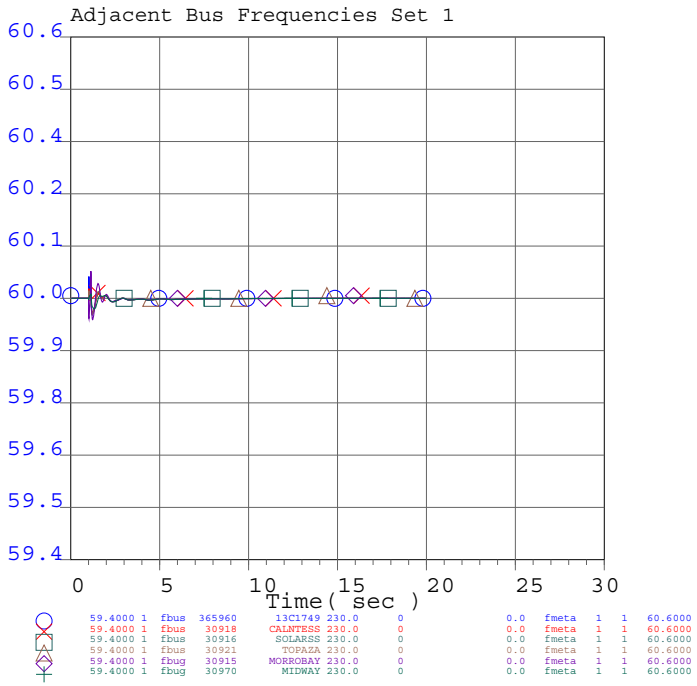

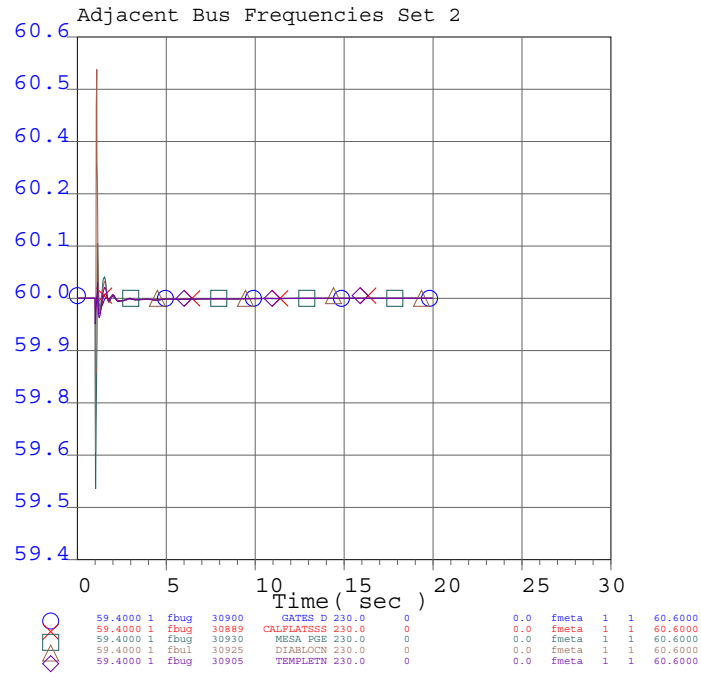

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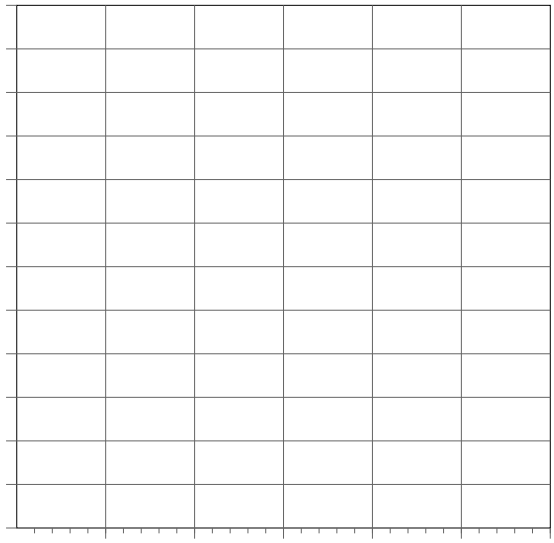
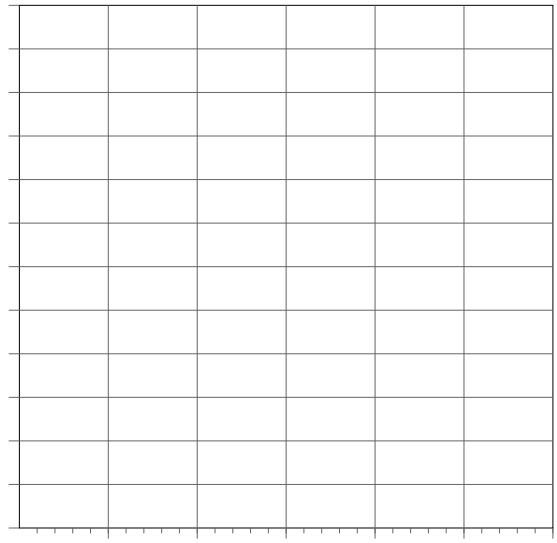
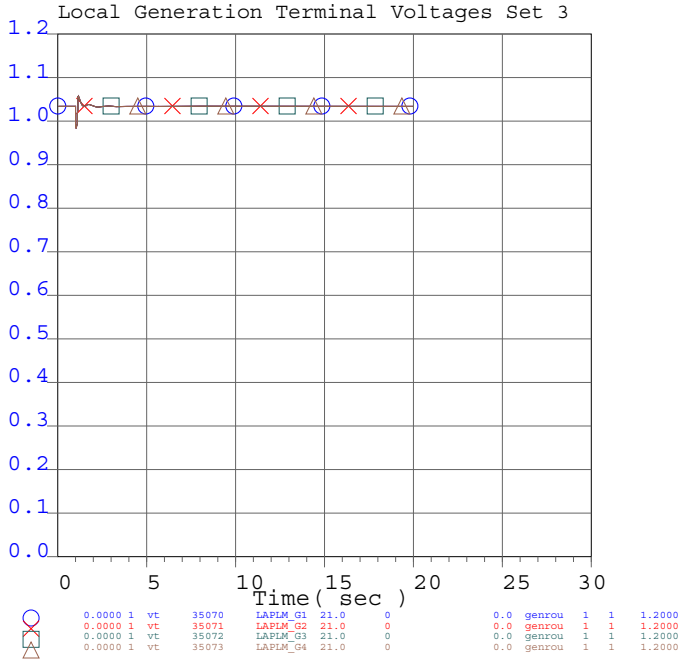
Local Generation Terminal Voltages Set 1



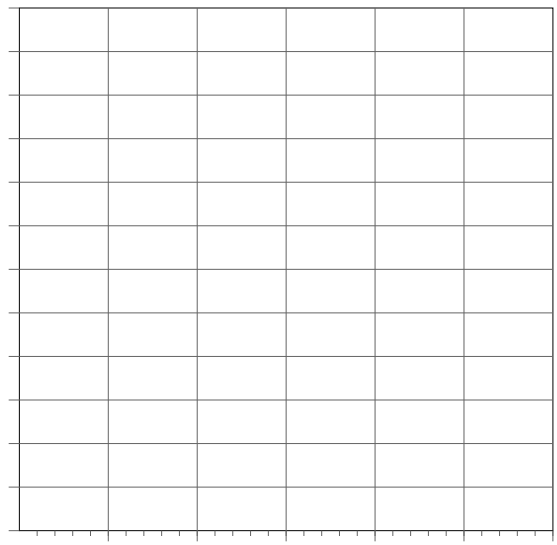
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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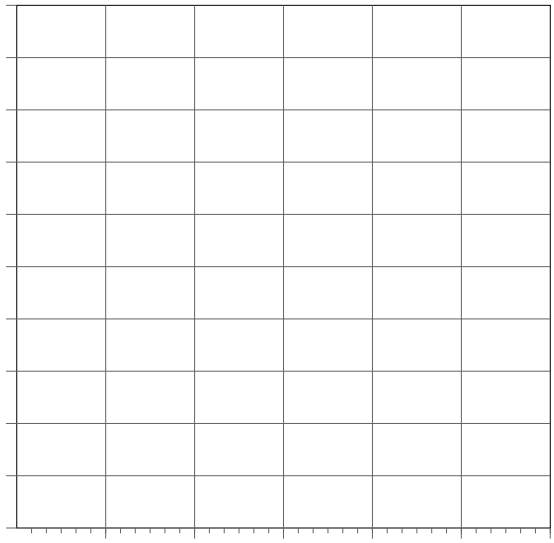
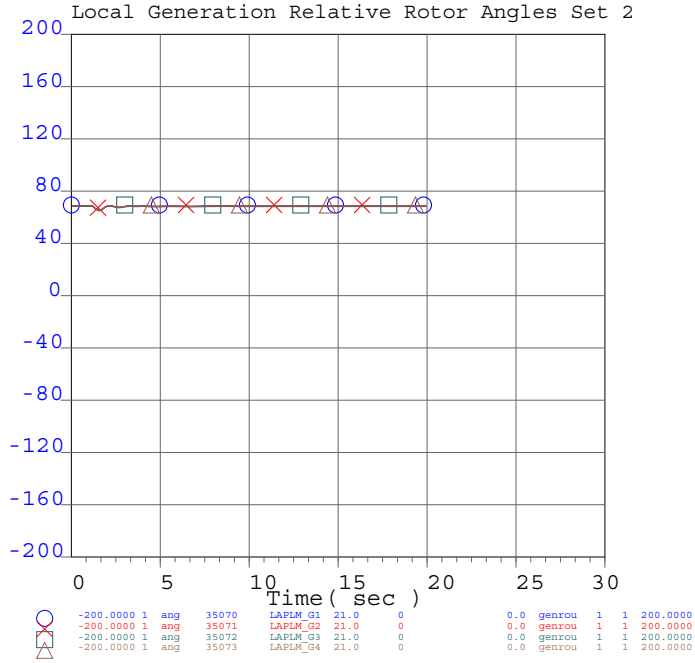
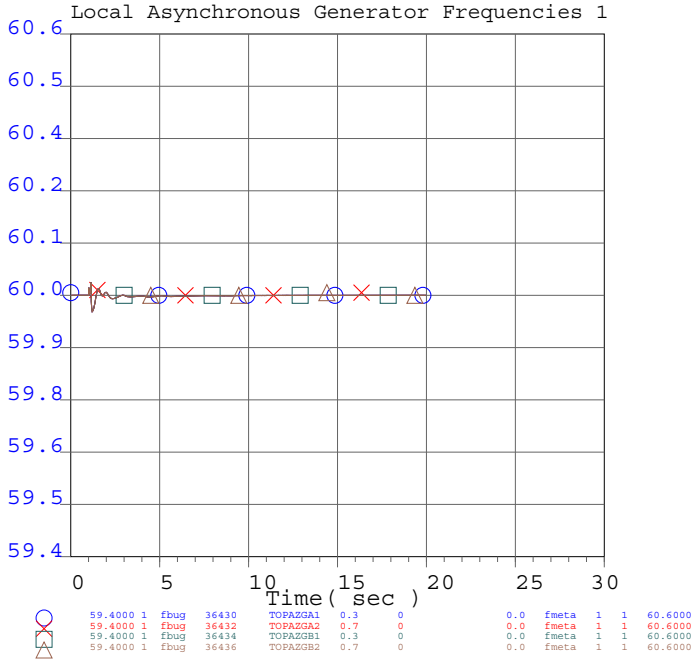
Local Generation Relative Rotor Angles Set 1



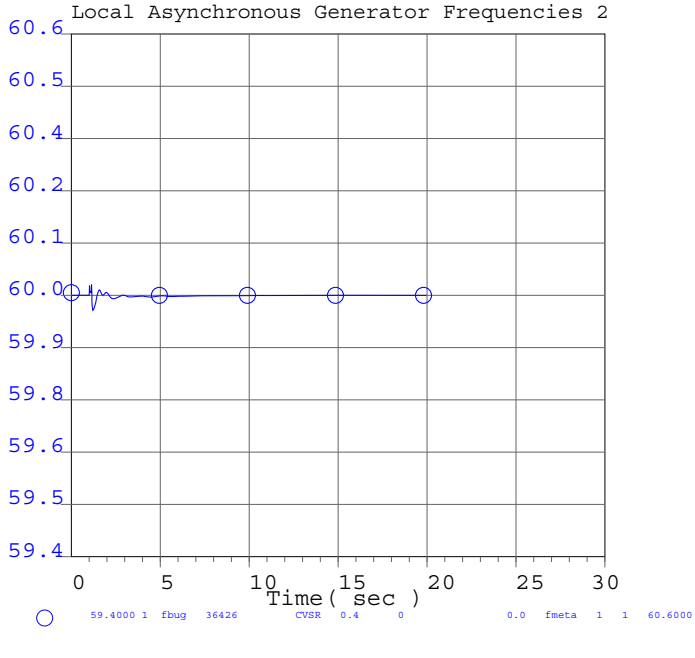
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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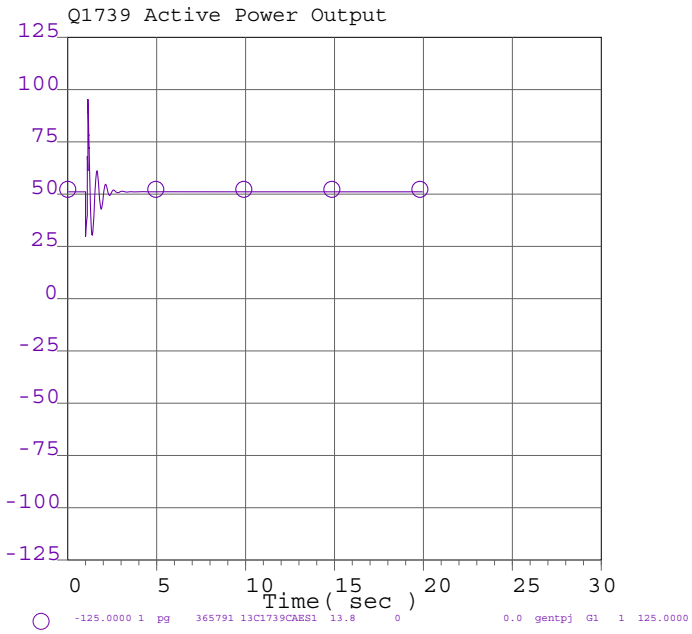

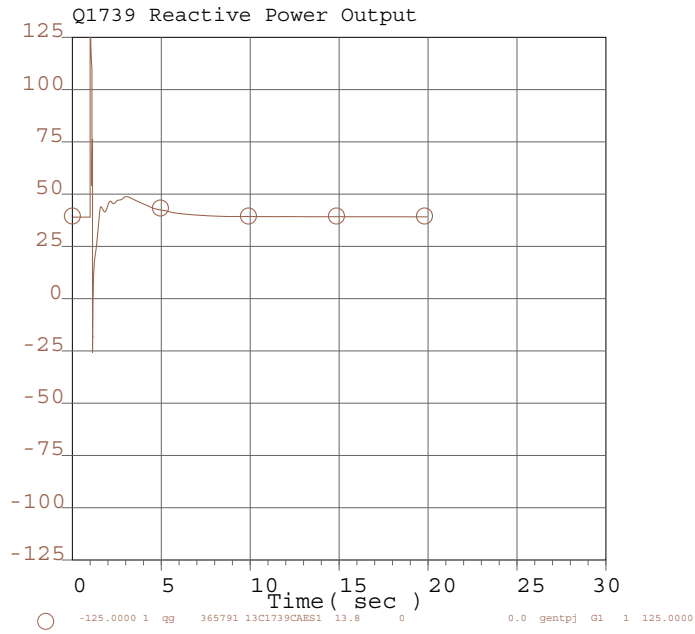

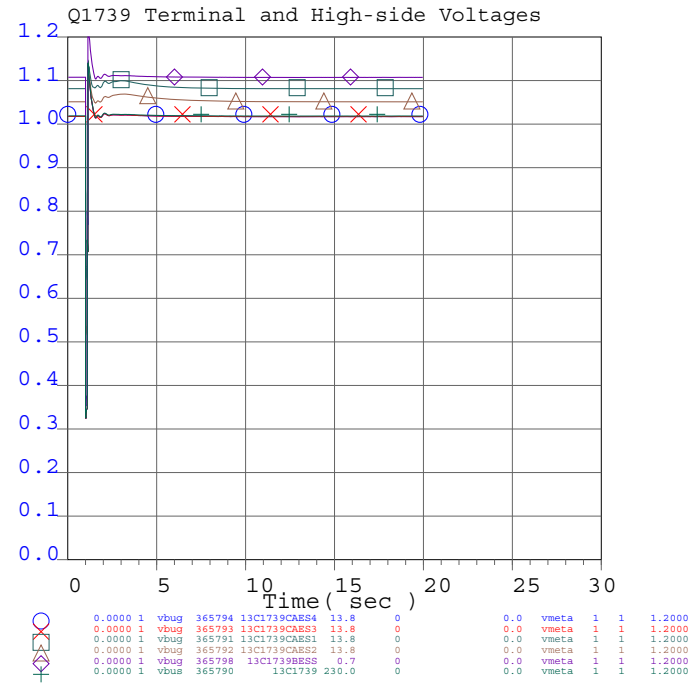

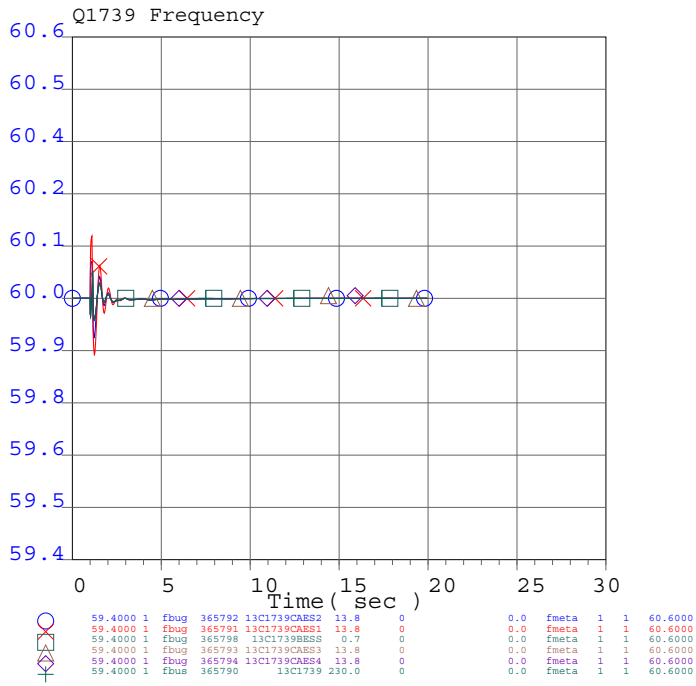

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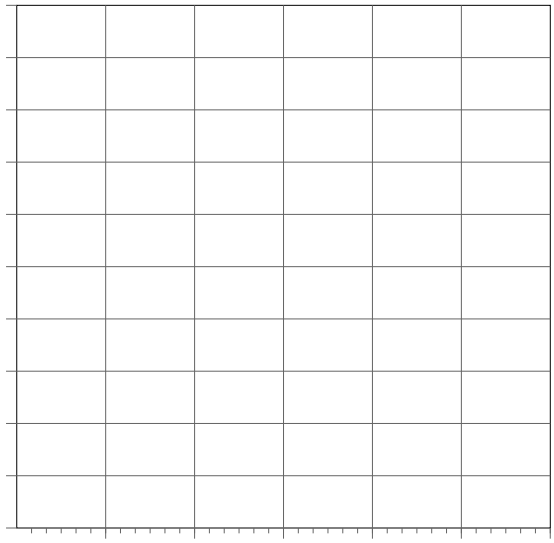
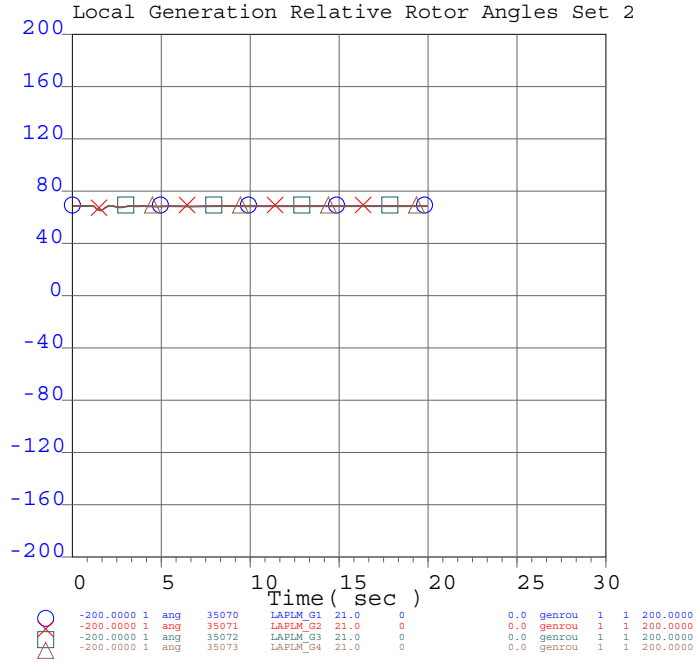


Local Generation Relative Rotor Angles Set 2



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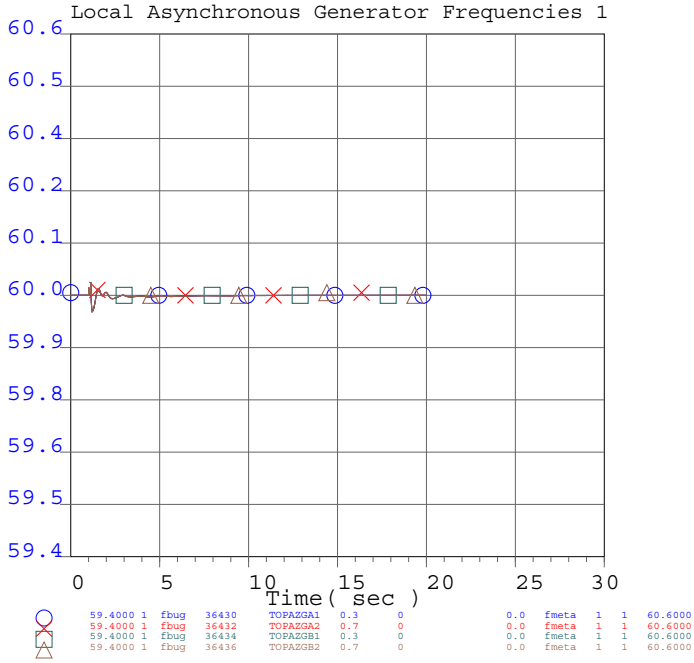
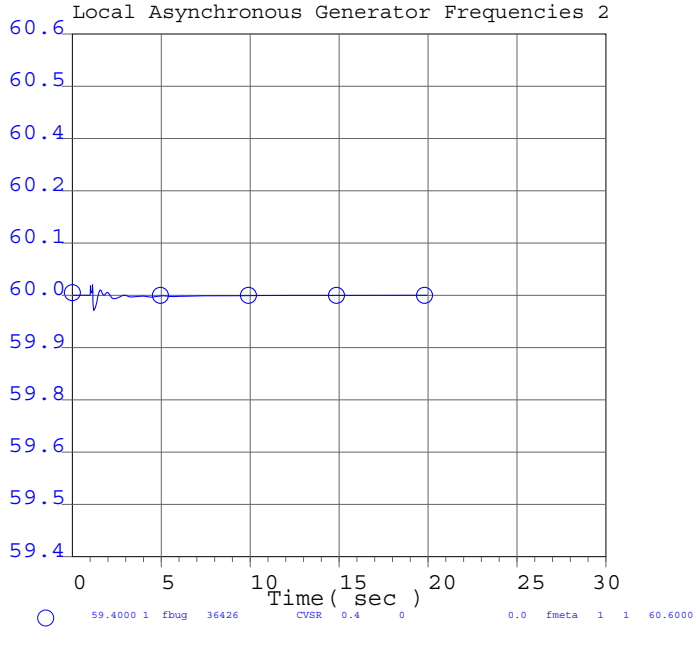


Local Asynchronous Generator Frequencies 2



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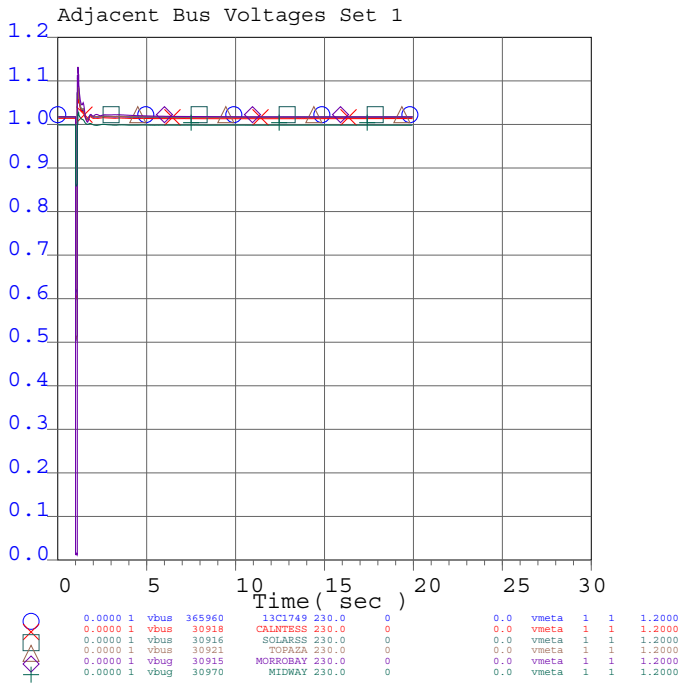

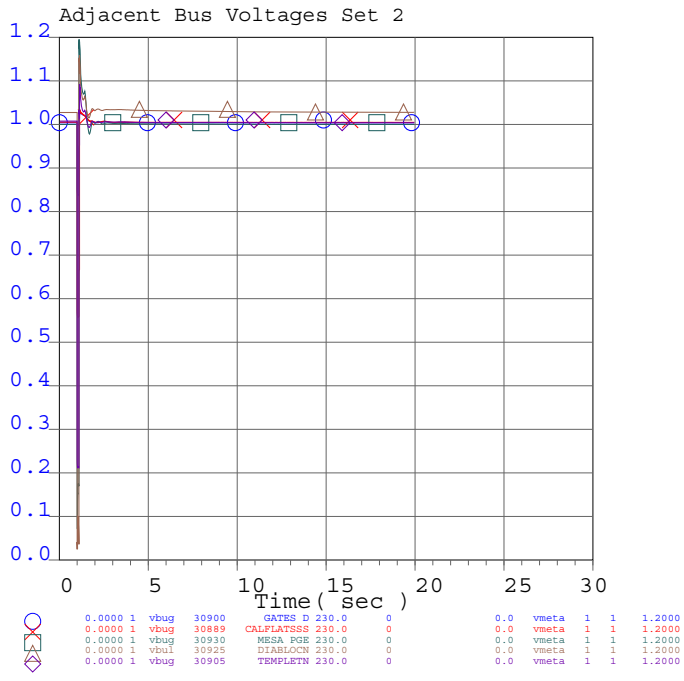

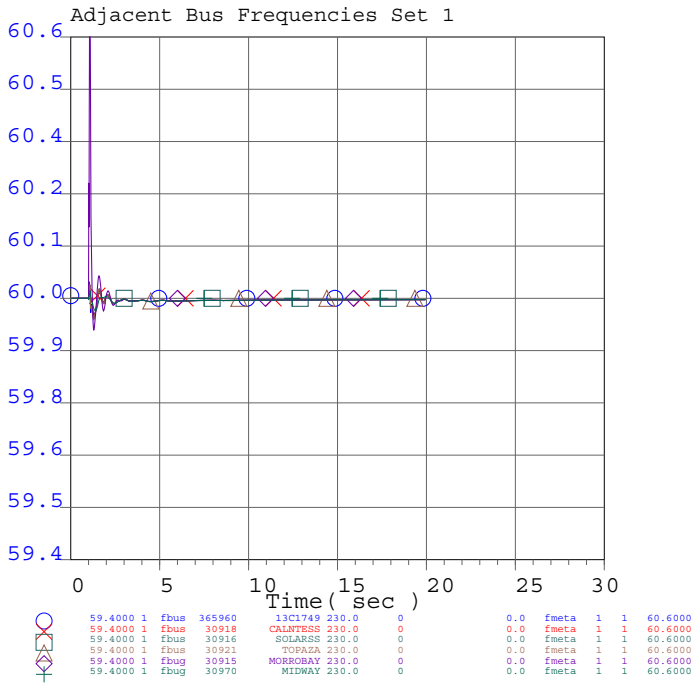

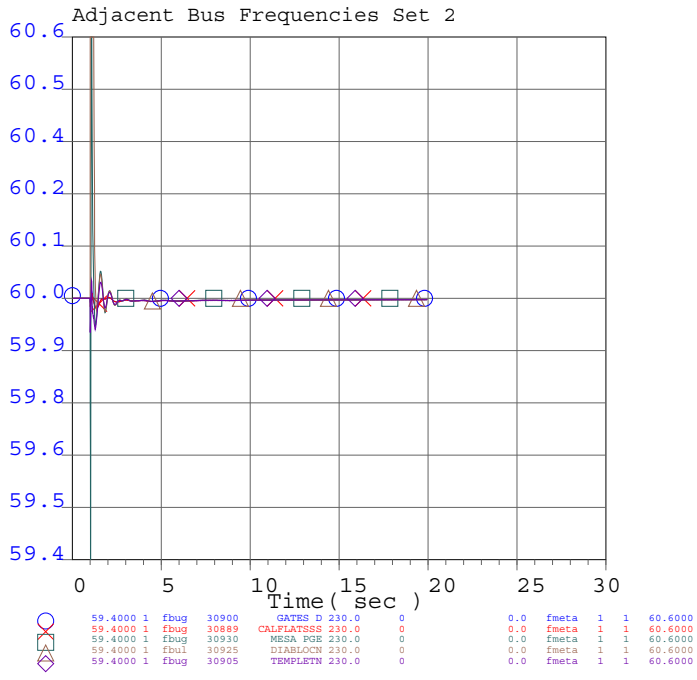

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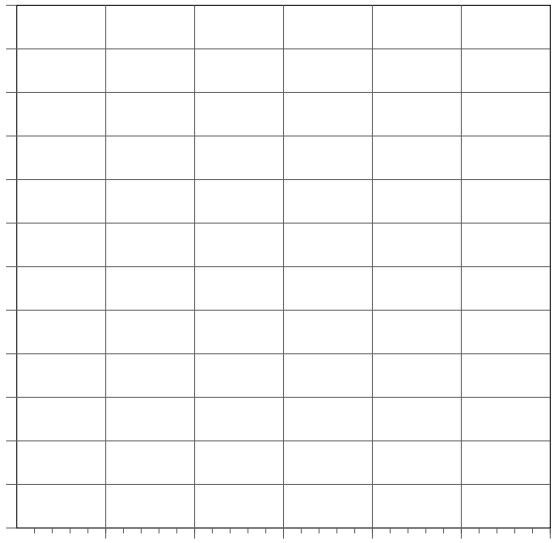
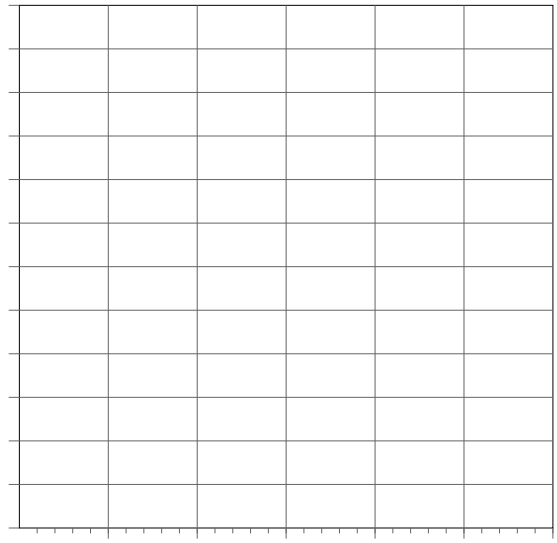
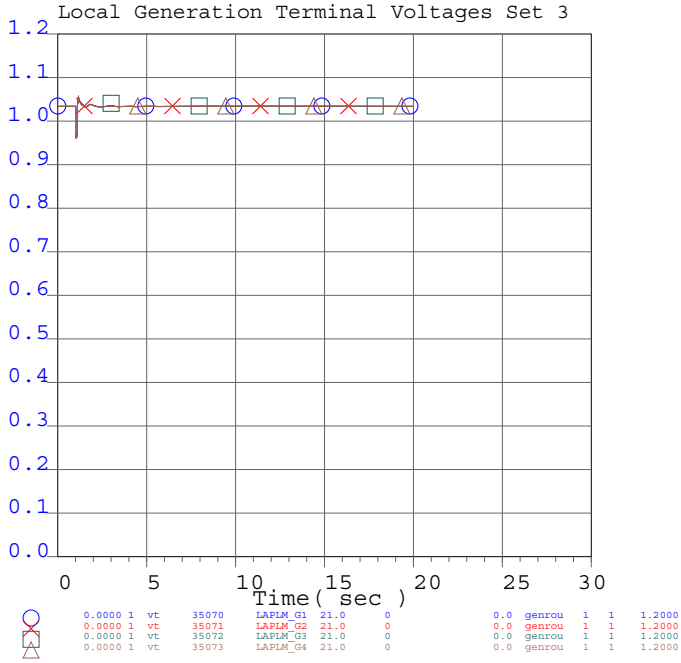
Local Generation Terminal Voltages Set 1



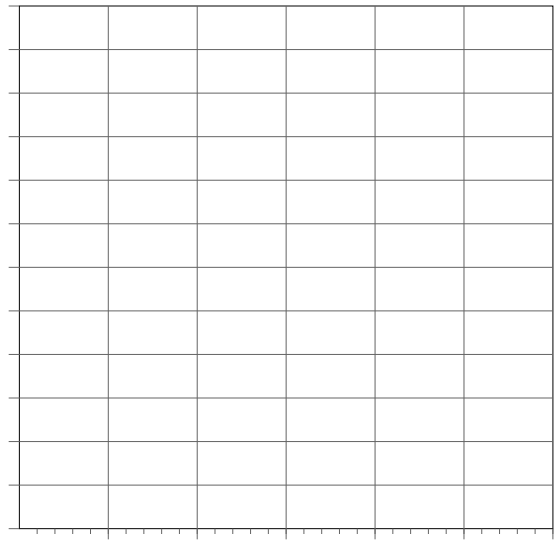
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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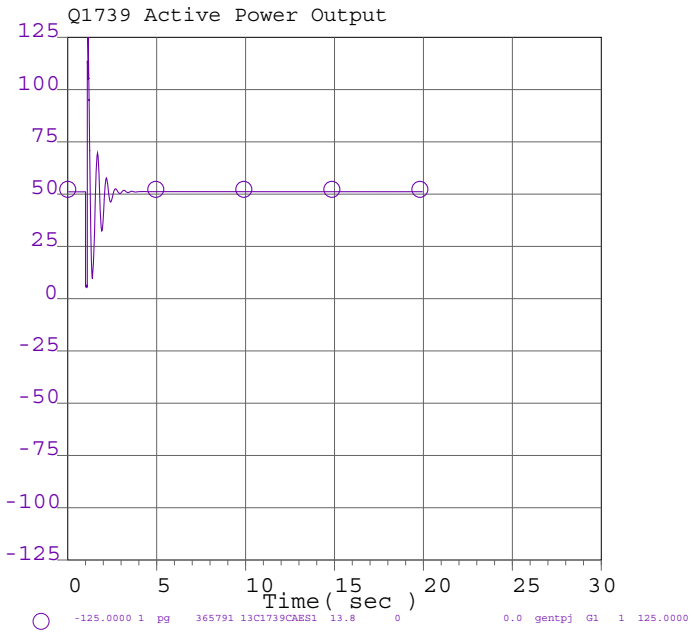

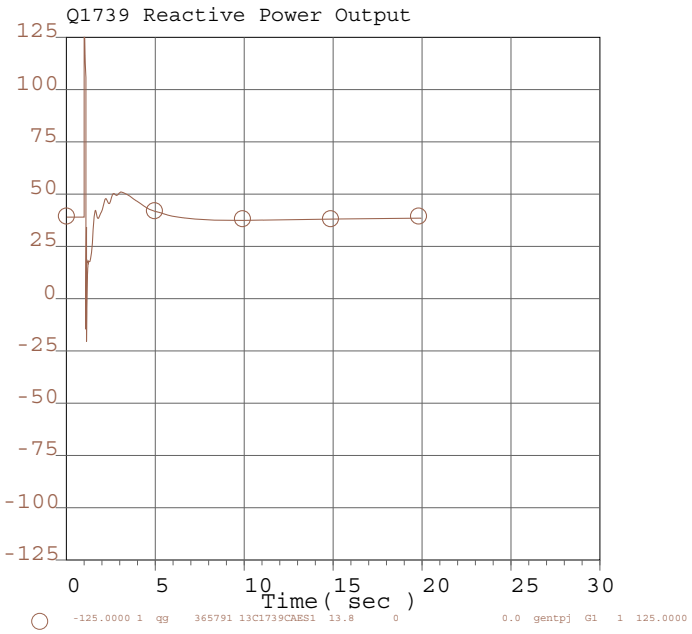

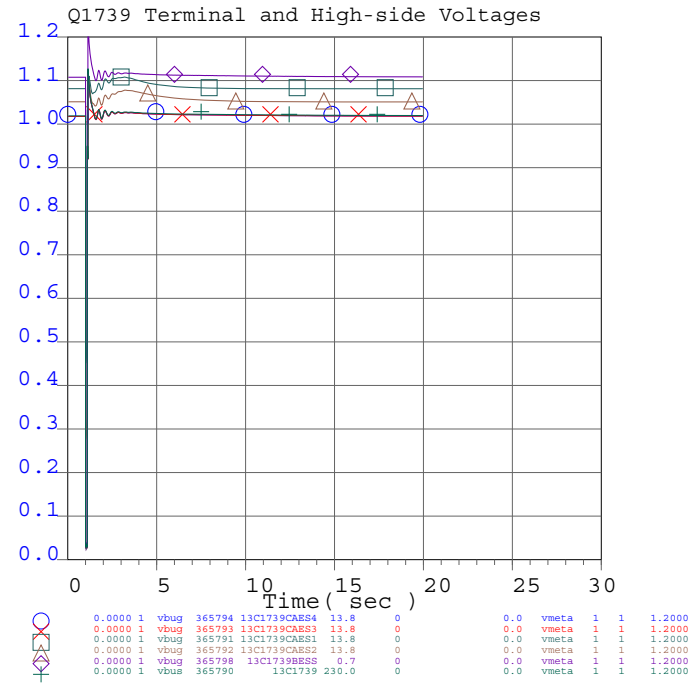

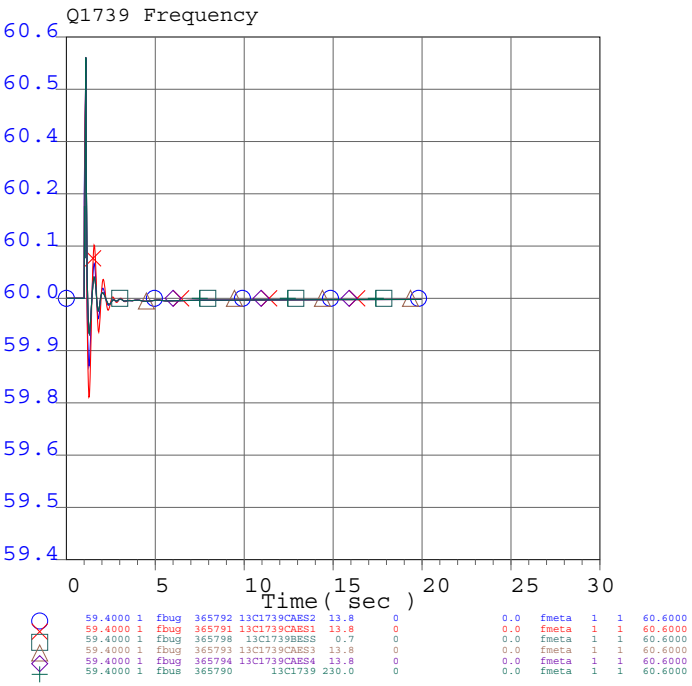

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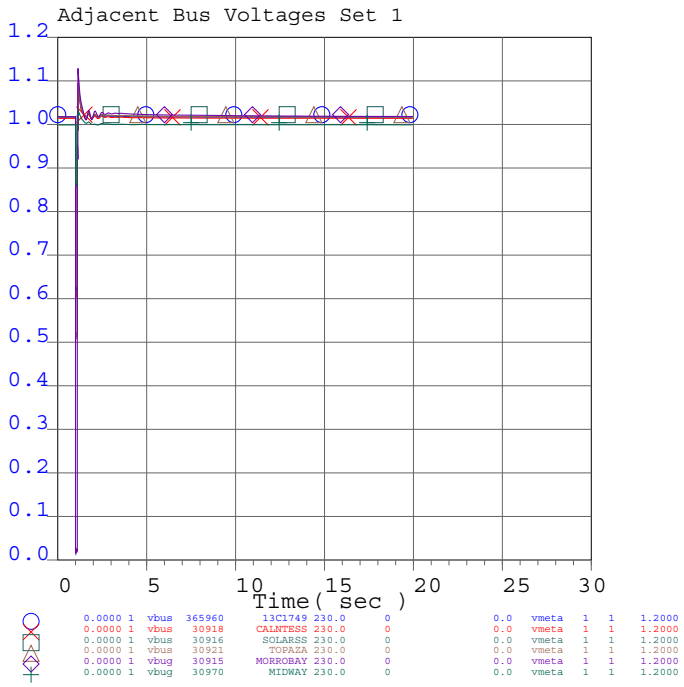

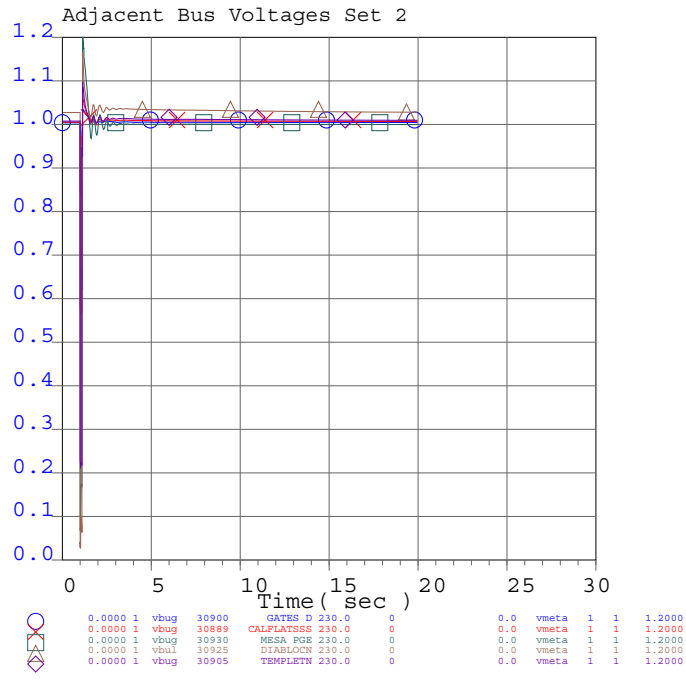

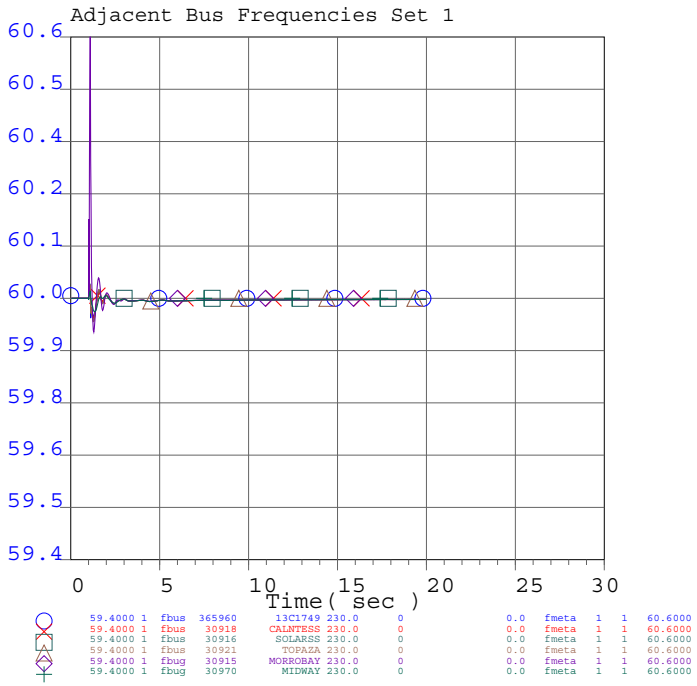

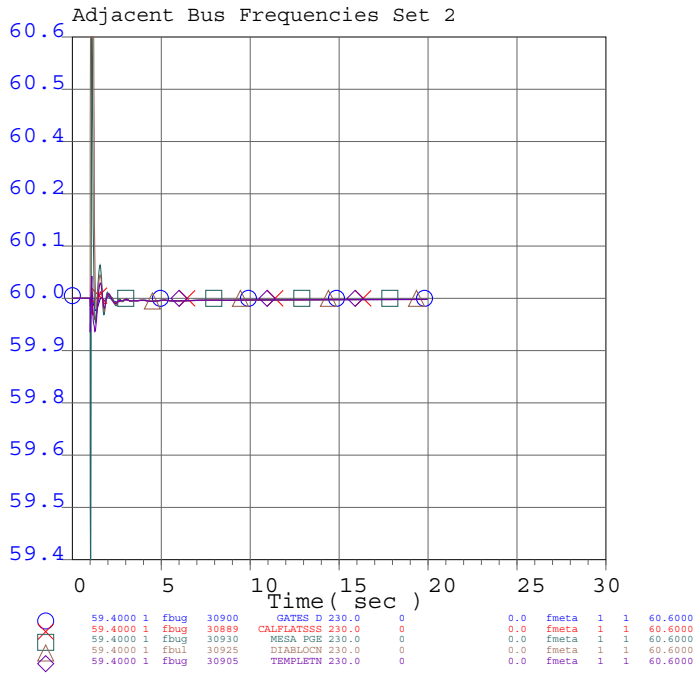

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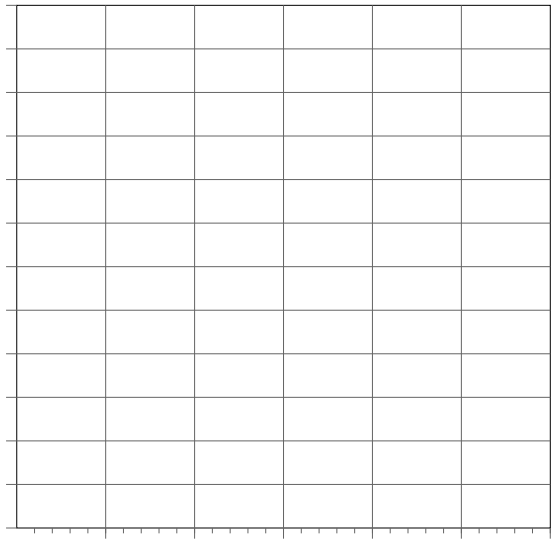
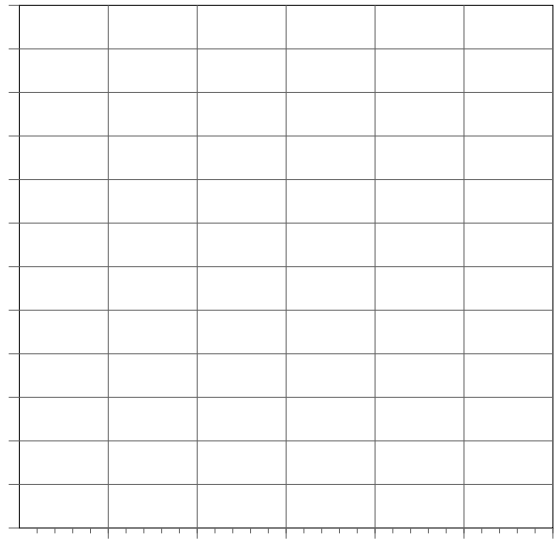
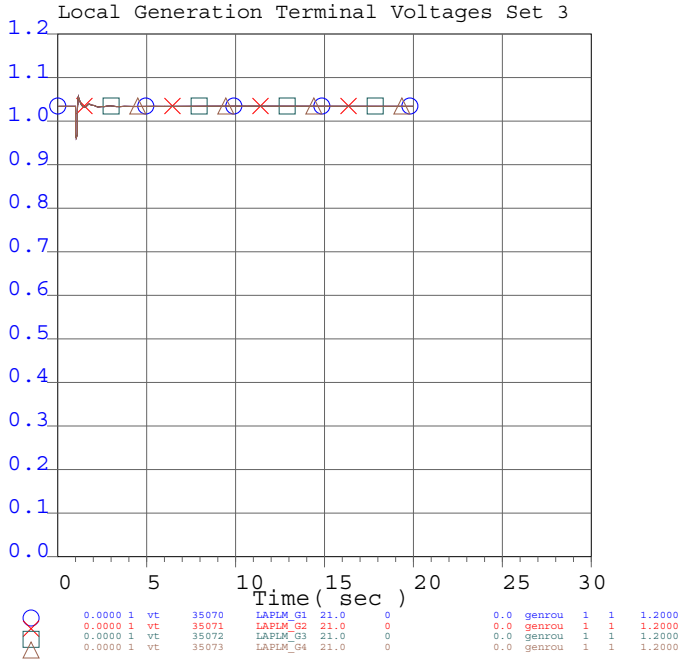
Local Generation Terminal Voltages Set 1



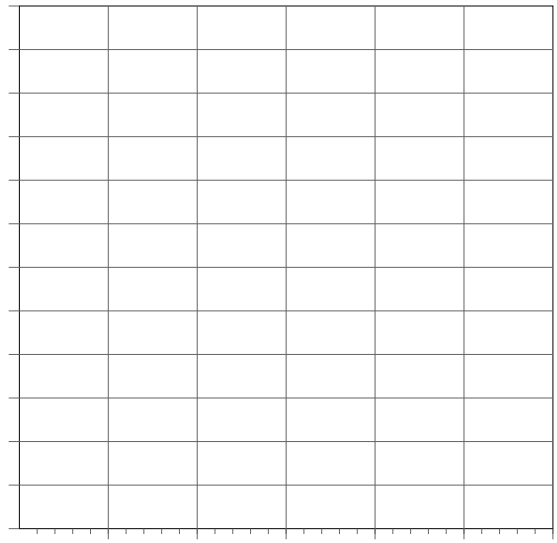
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

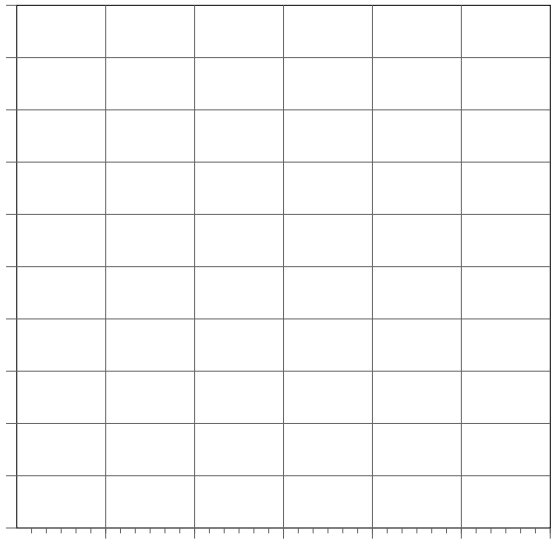


Local Generation Terminal Voltages Set 4

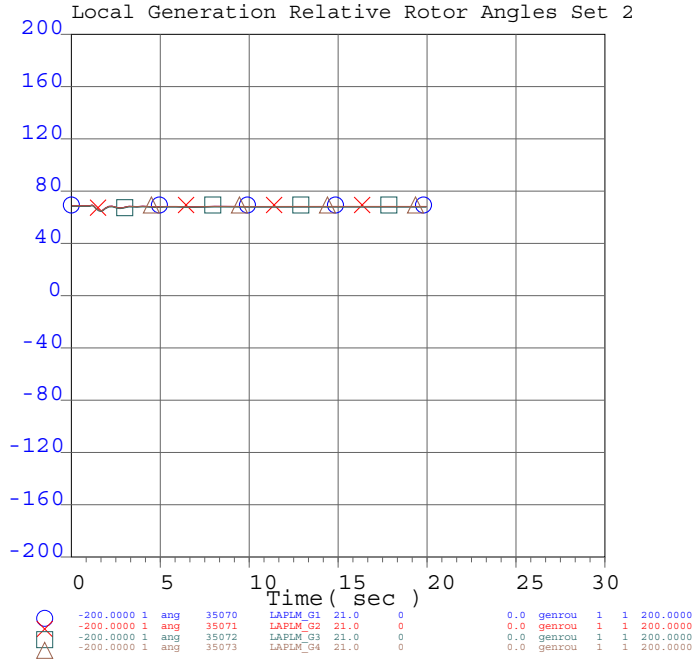


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

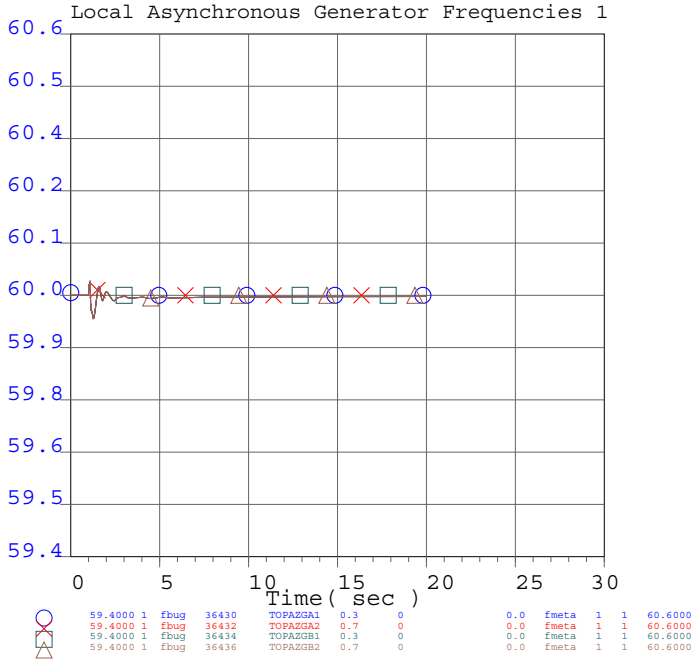
Local Generation Relative Rotor Angles Set 1



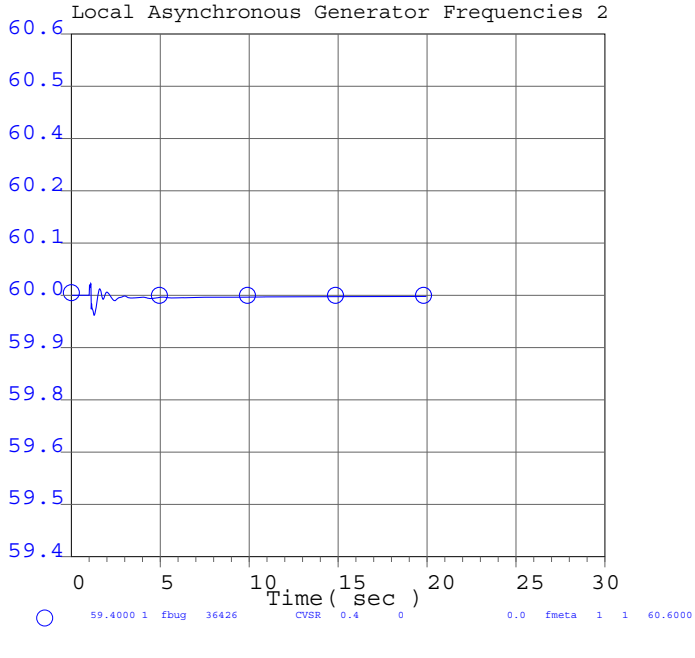
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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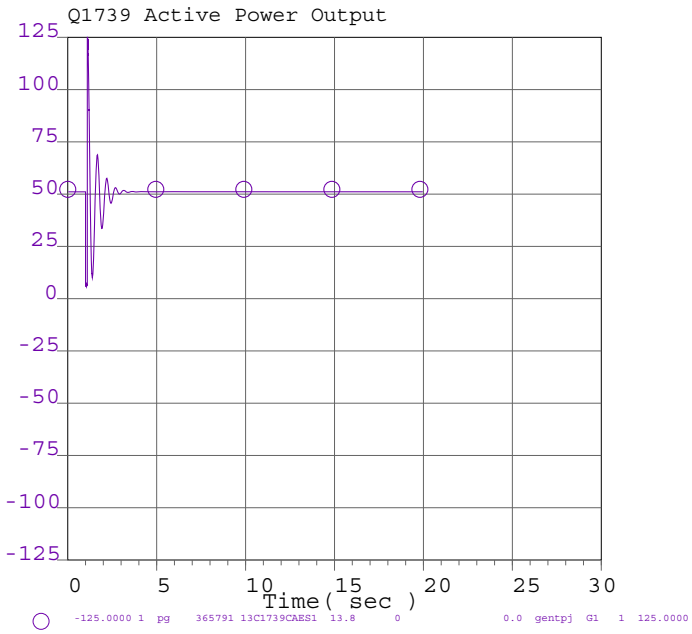
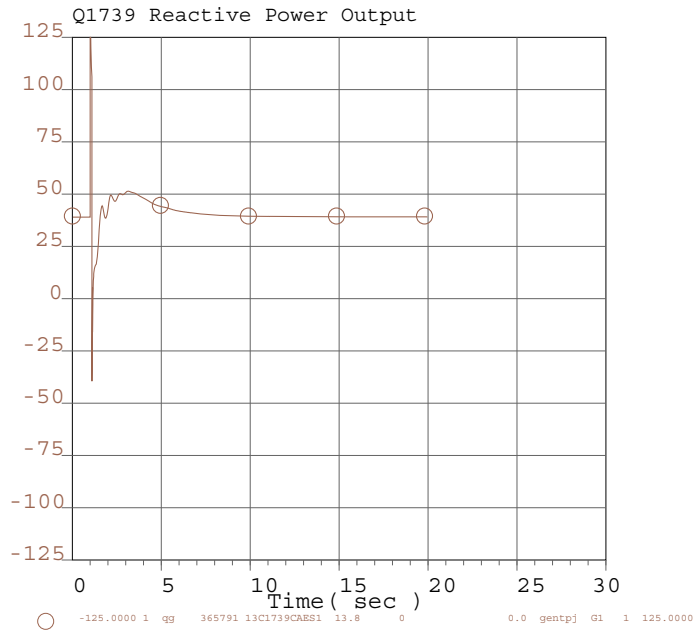
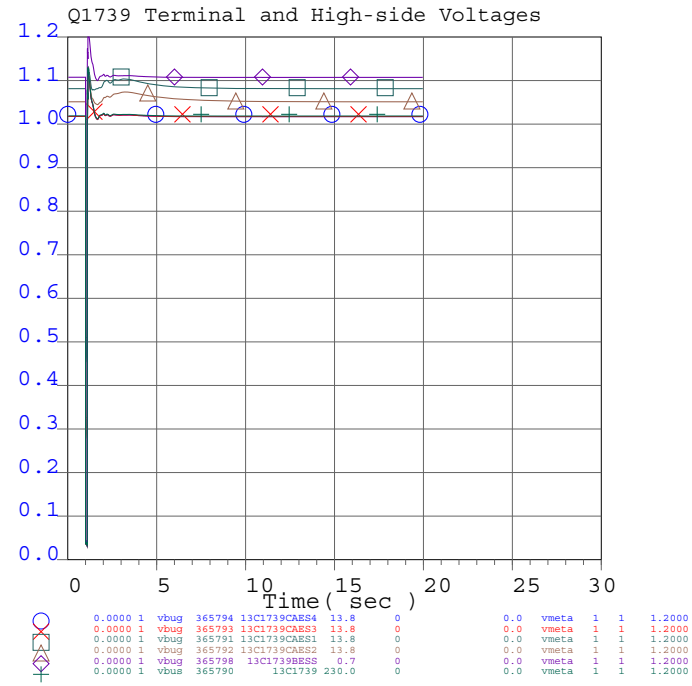
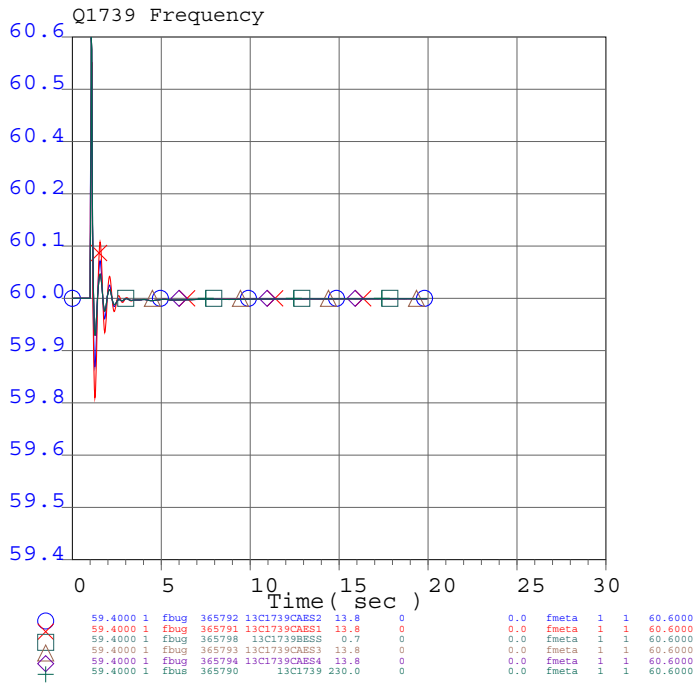
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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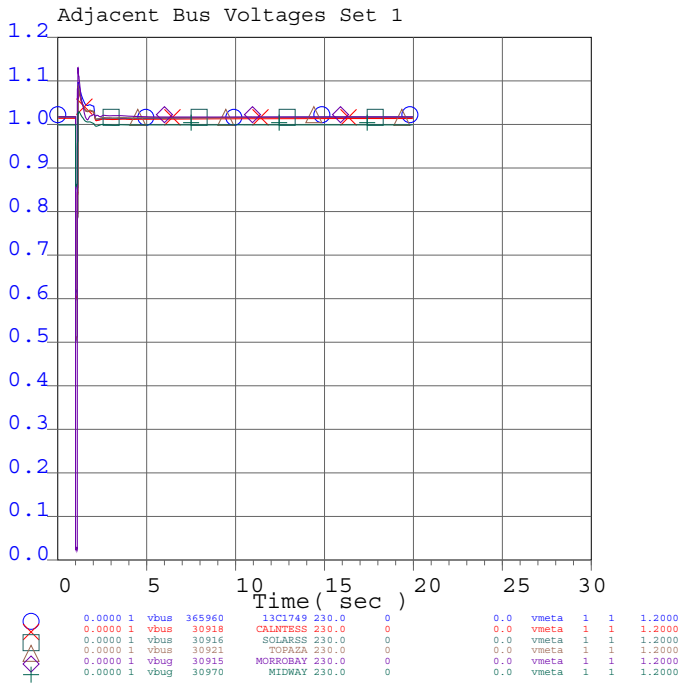

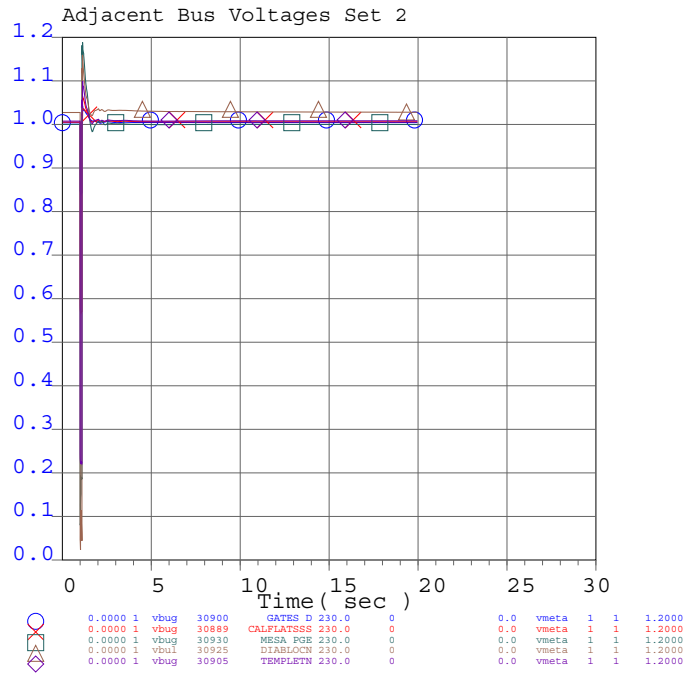

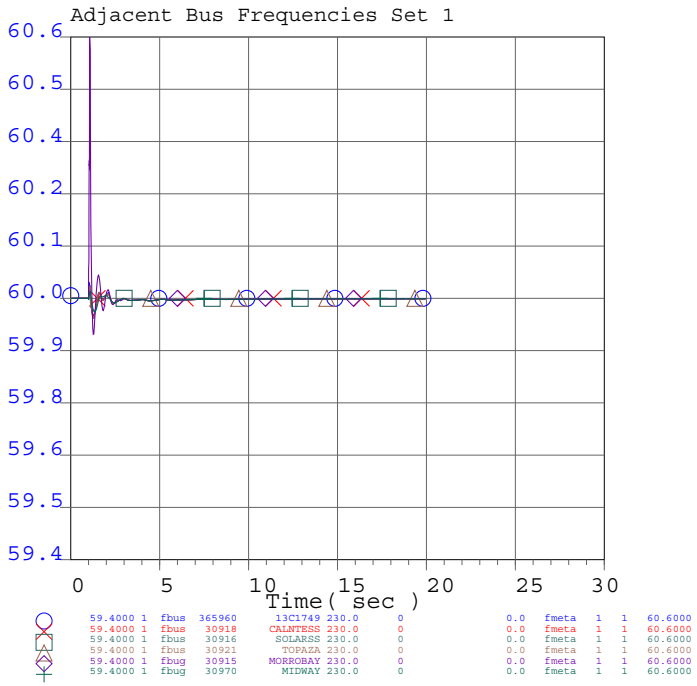

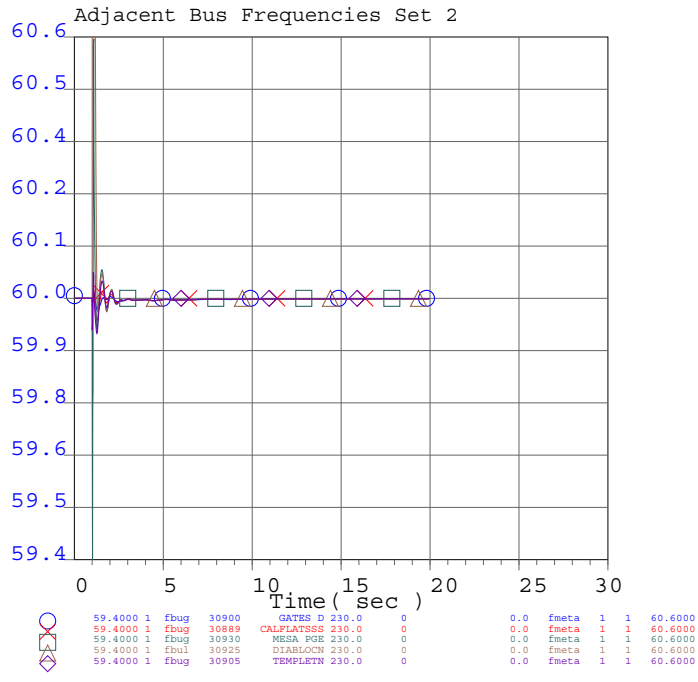

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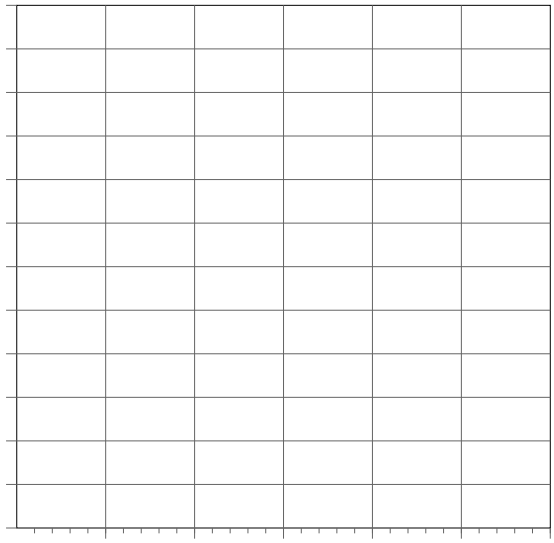
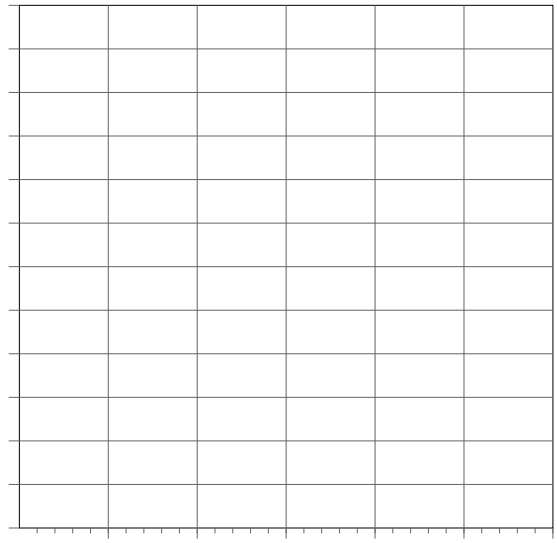
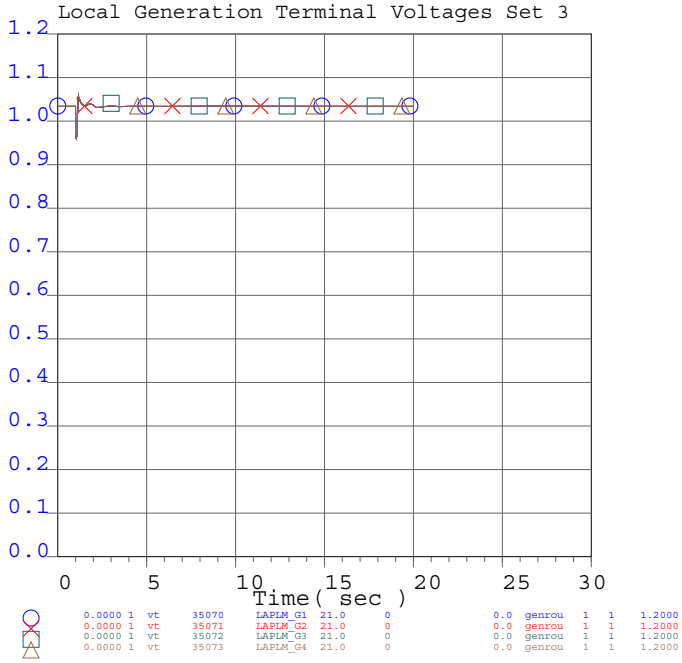
Local Generation Terminal Voltages Set 1



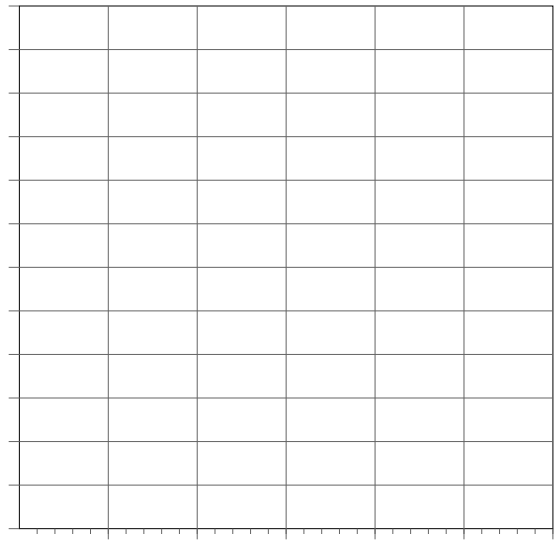
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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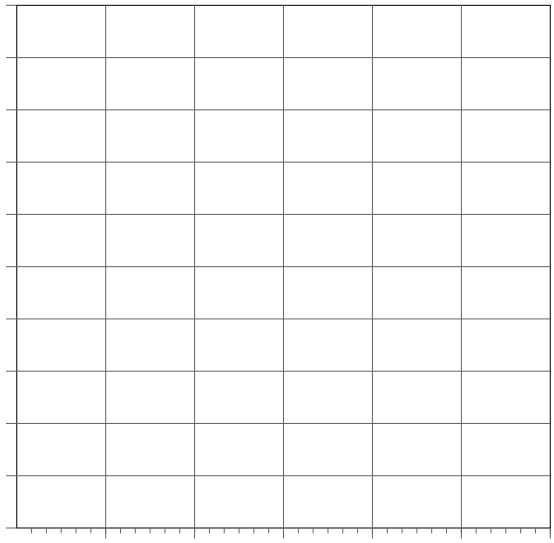
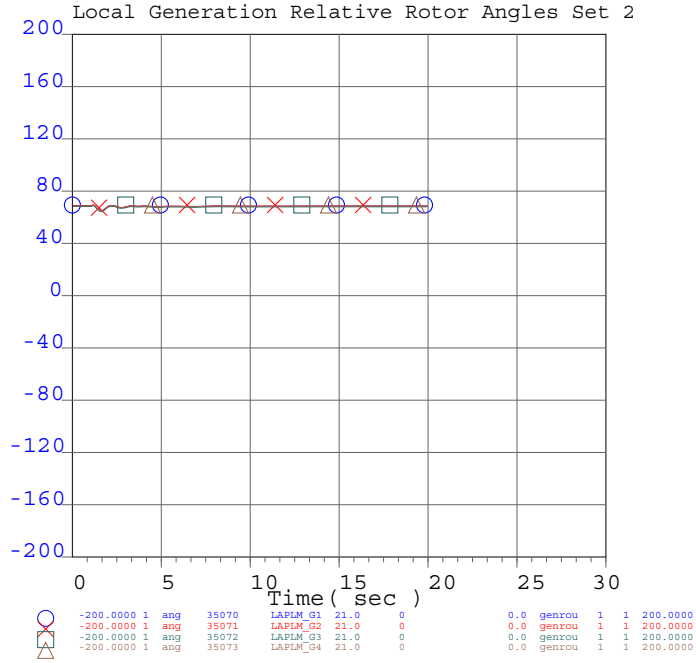
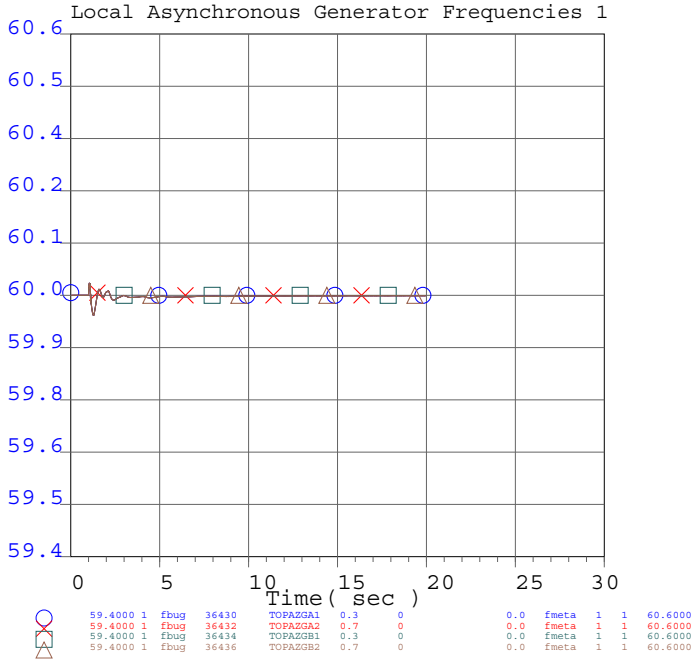
Local Generation Relative Rotor Angles Set 1



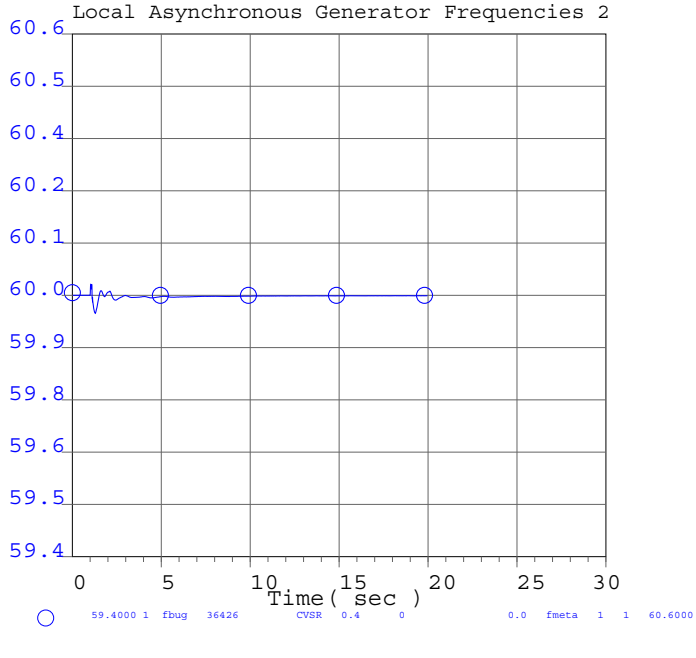
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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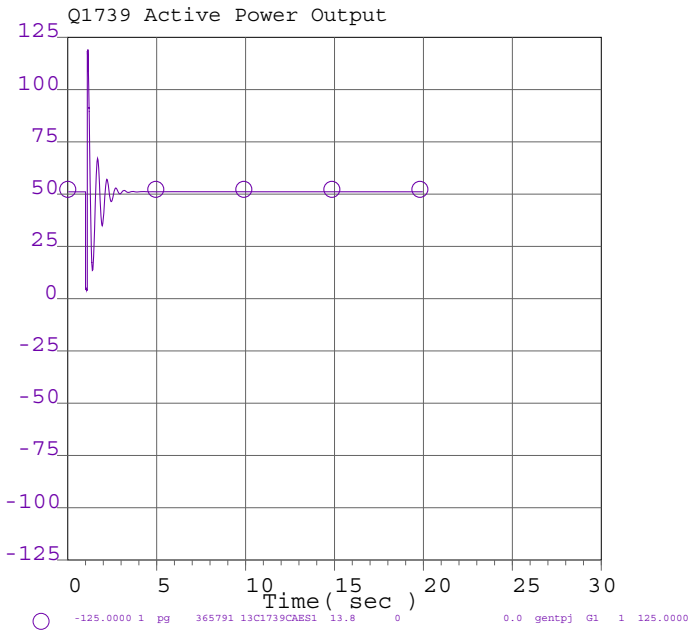
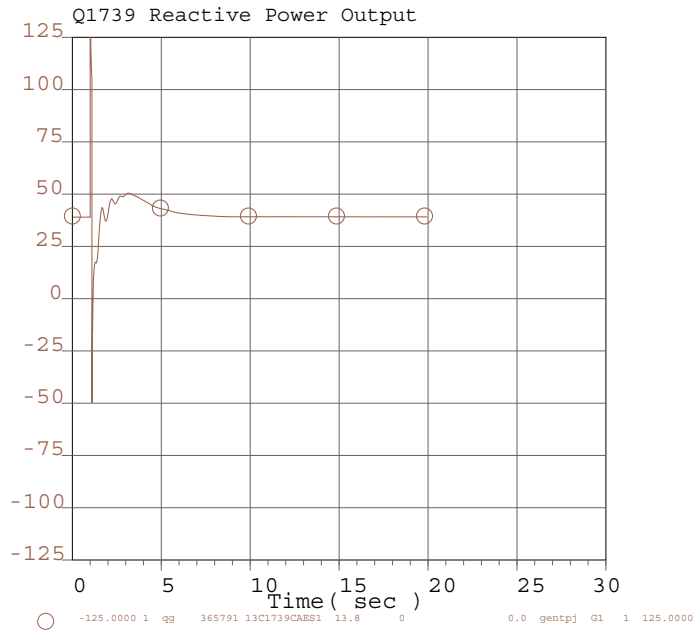
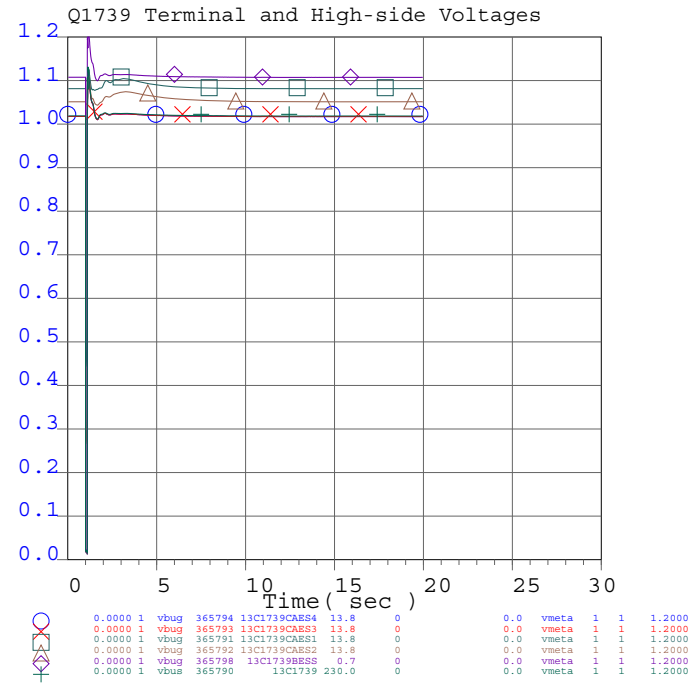
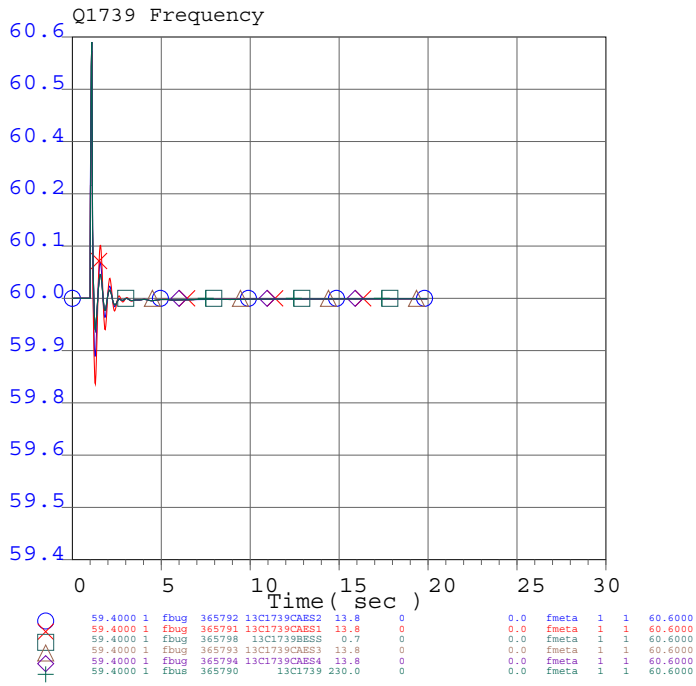
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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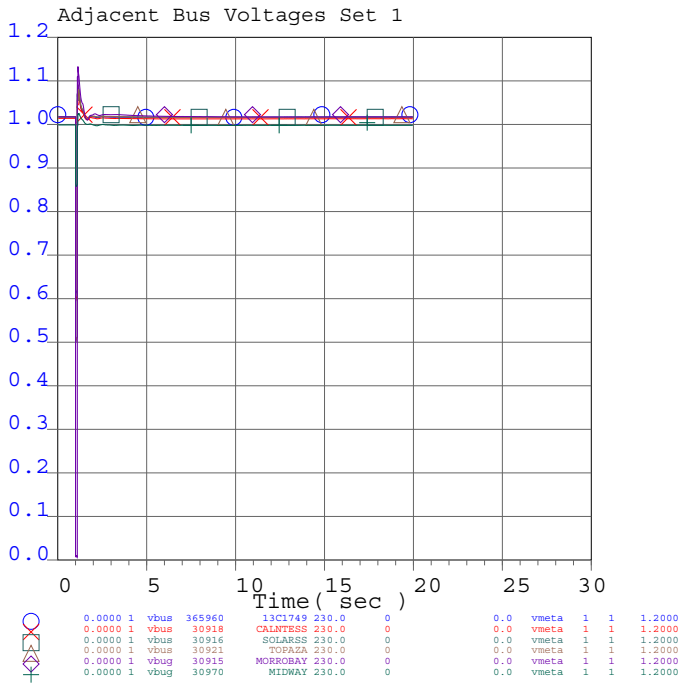

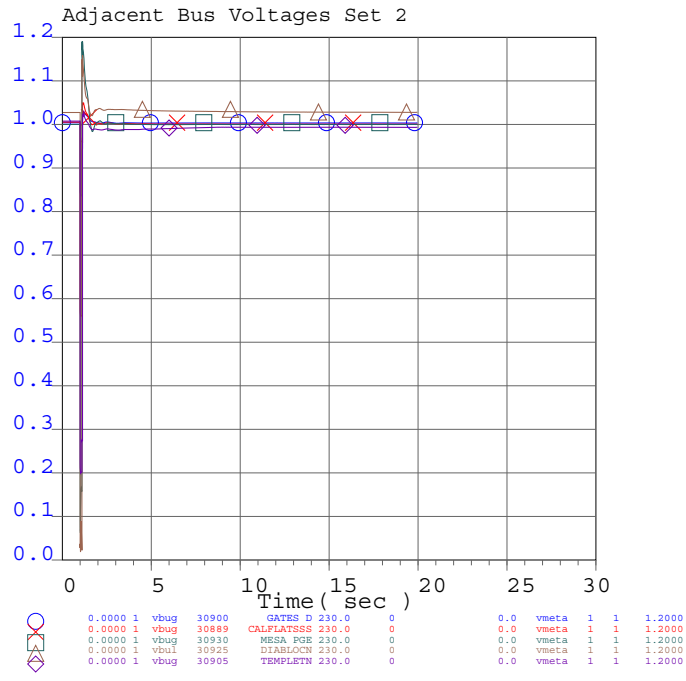

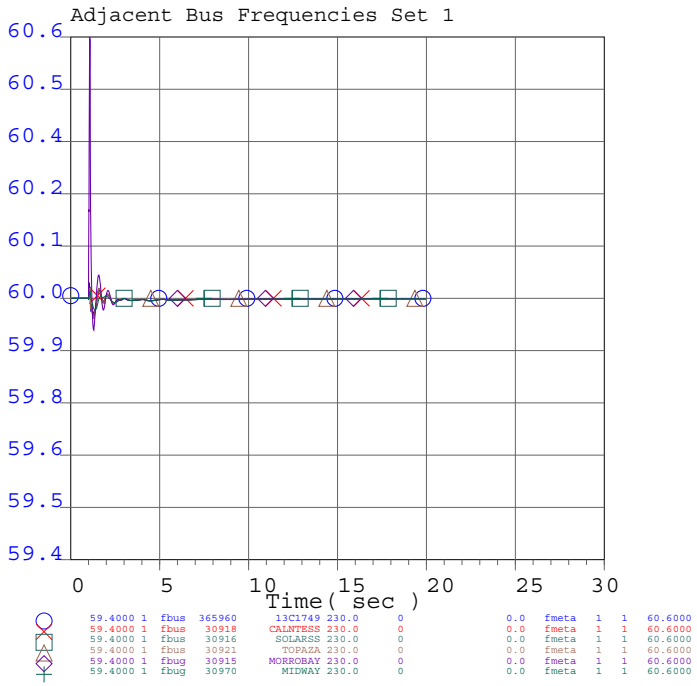

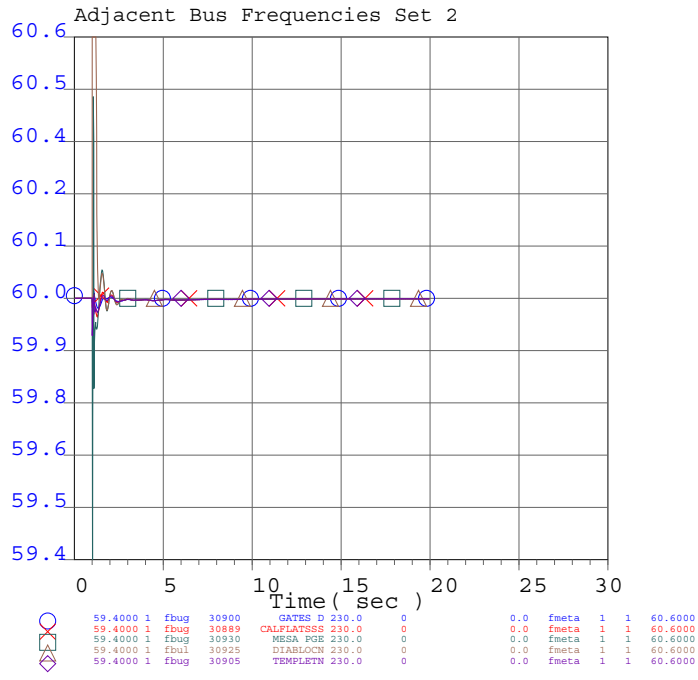

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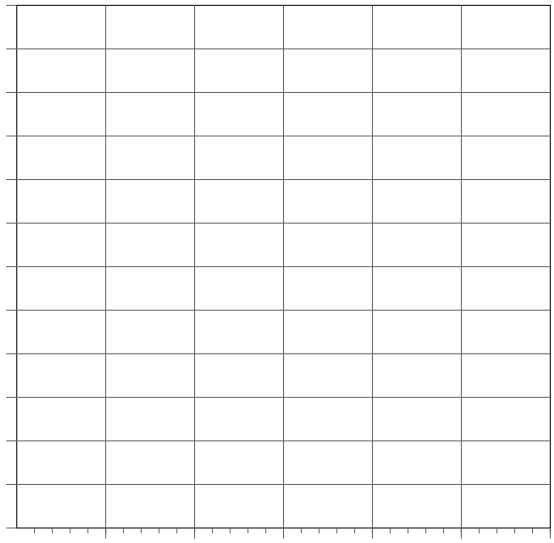
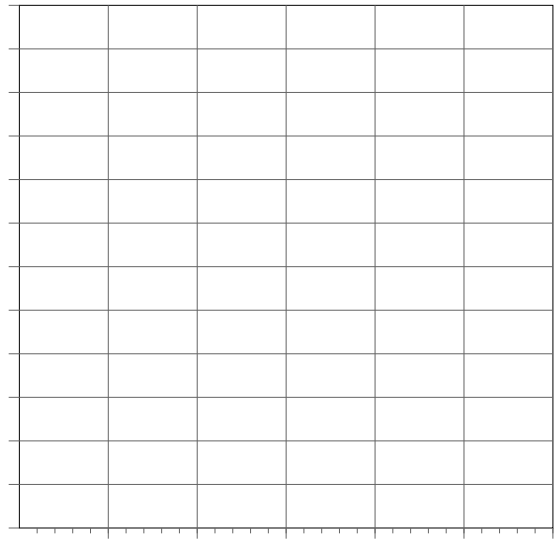
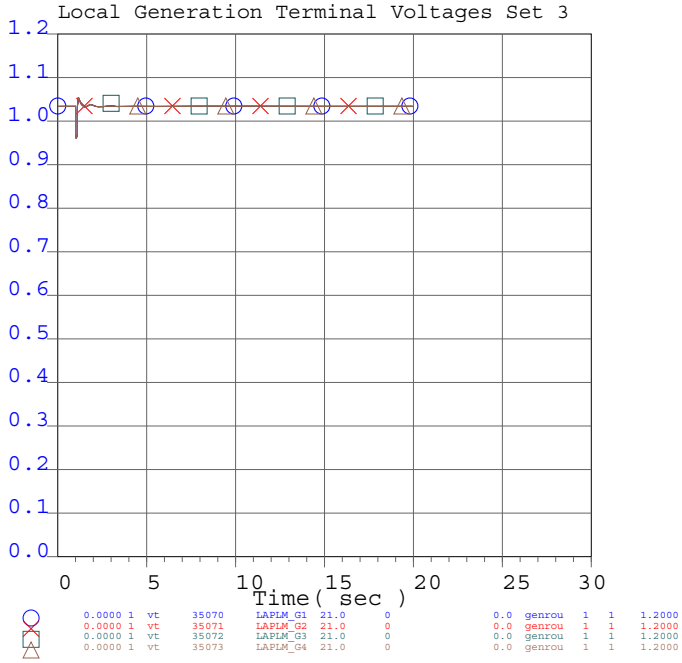
Local Generation Terminal Voltages Set 1



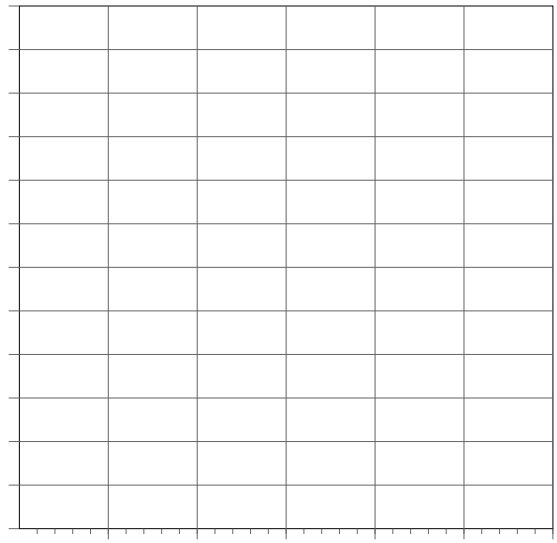
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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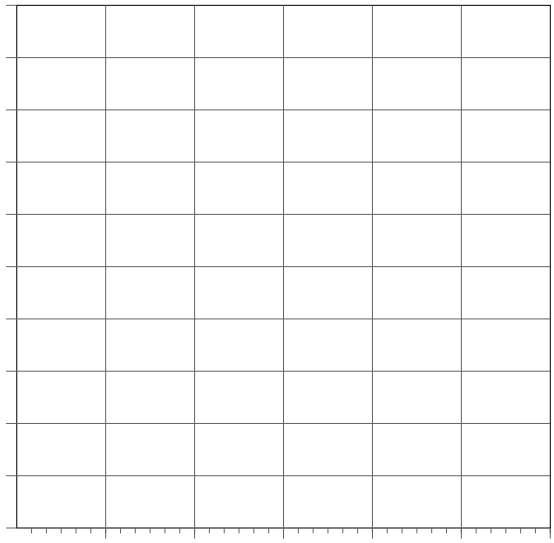
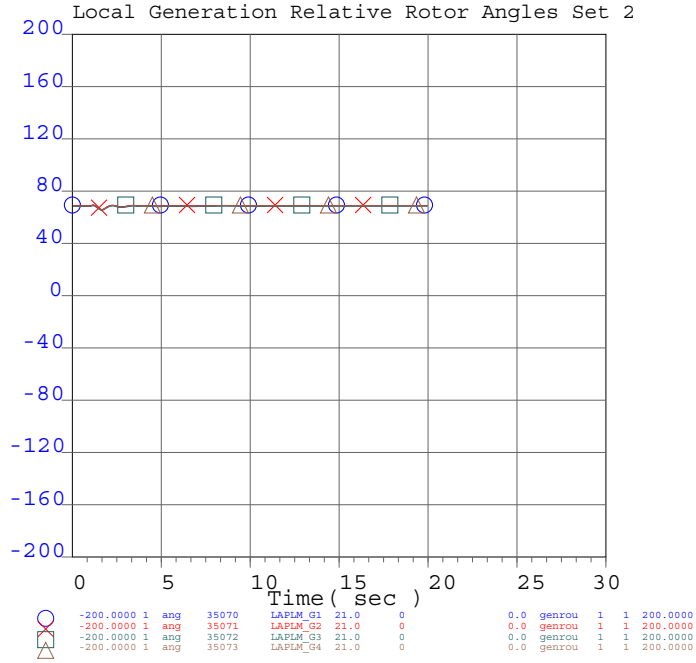
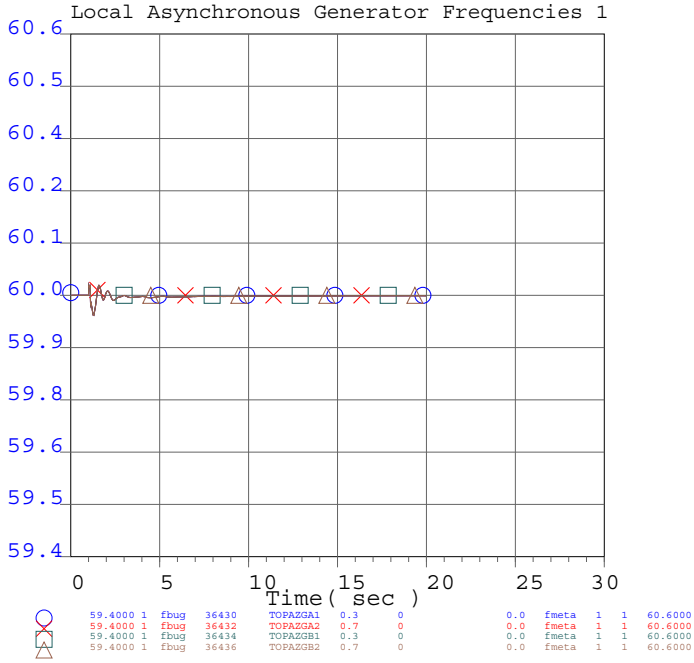
Local Generation Relative Rotor Angles Set 1



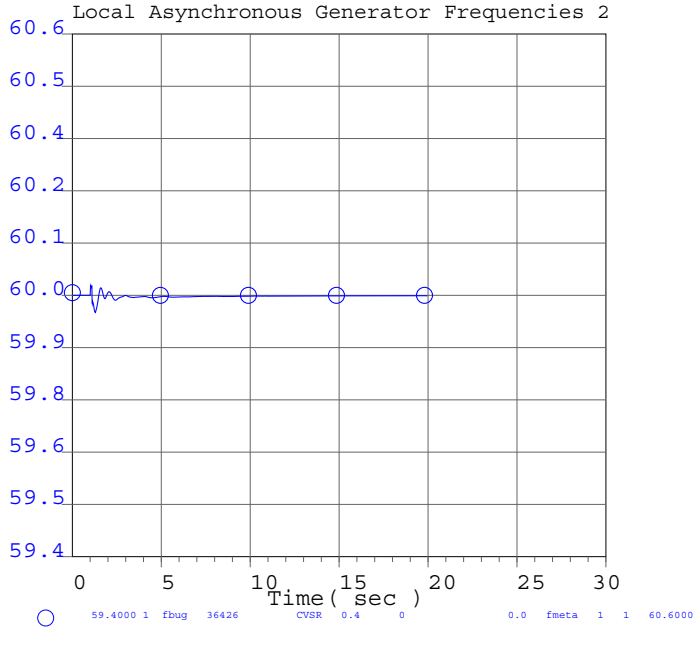
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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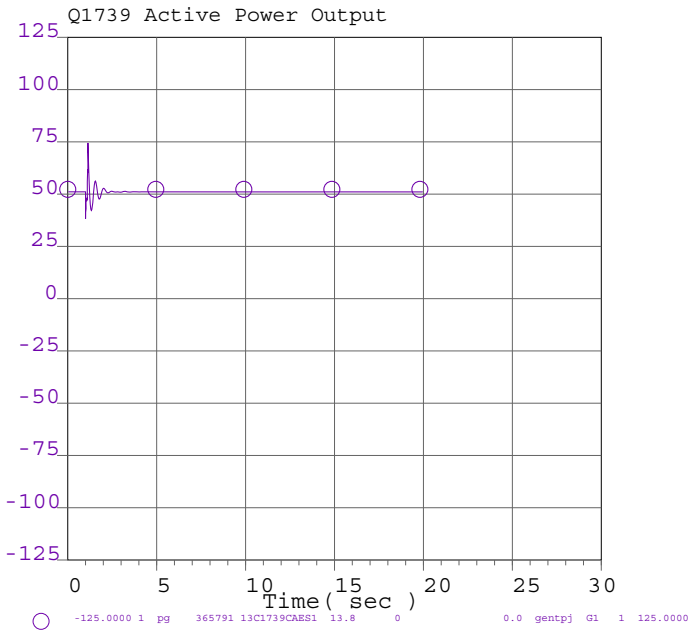

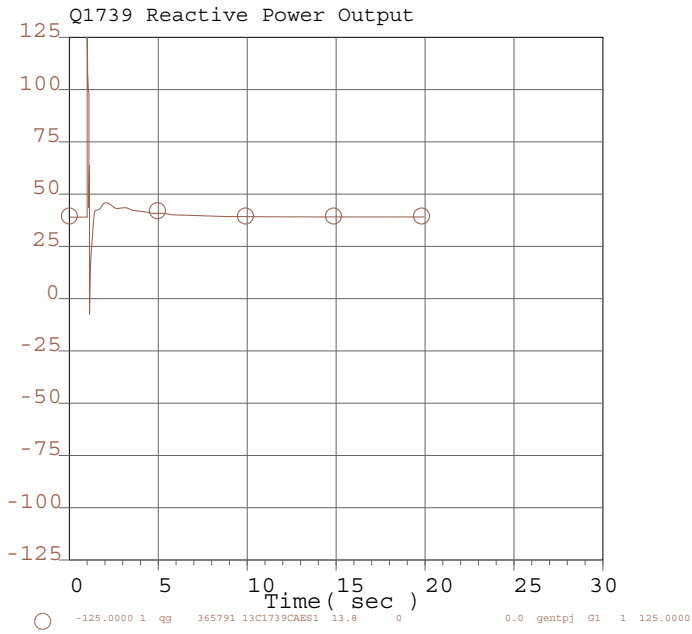

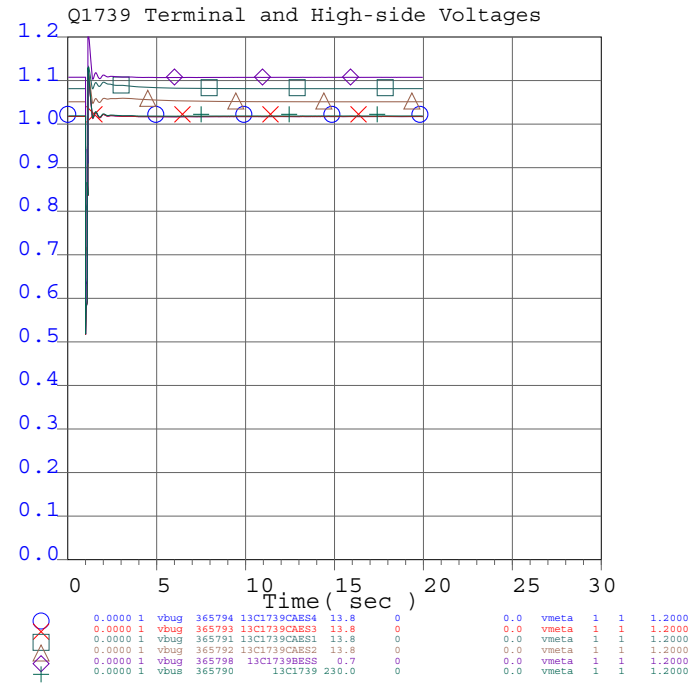

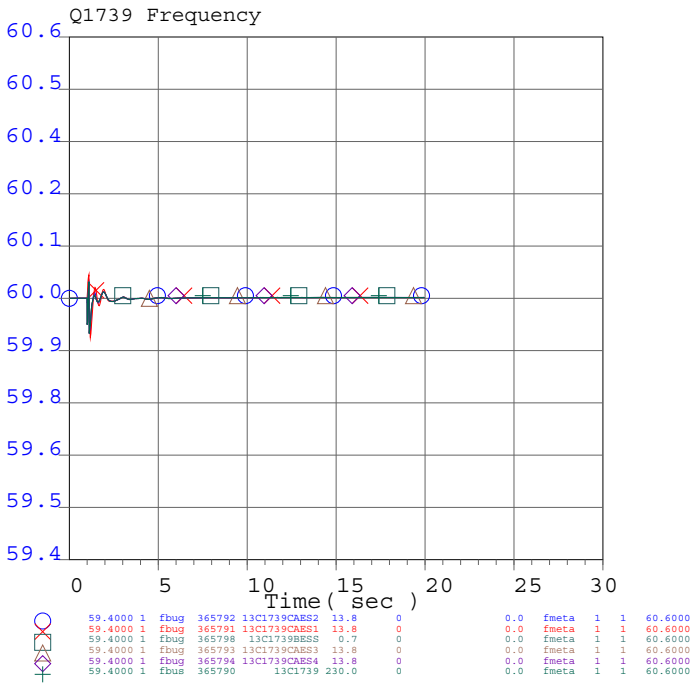

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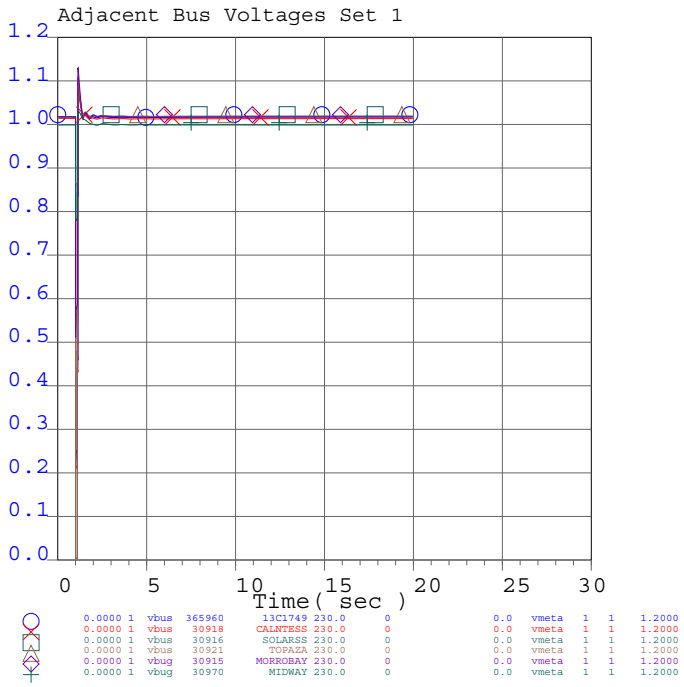

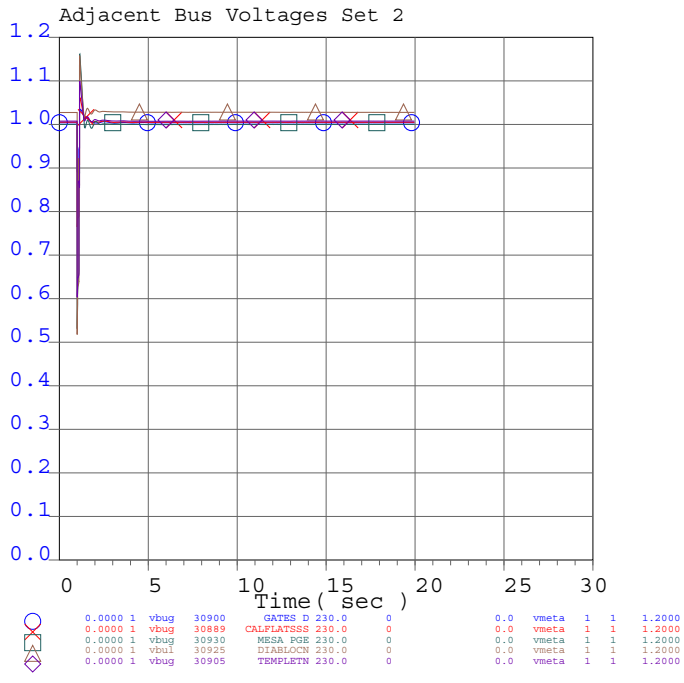

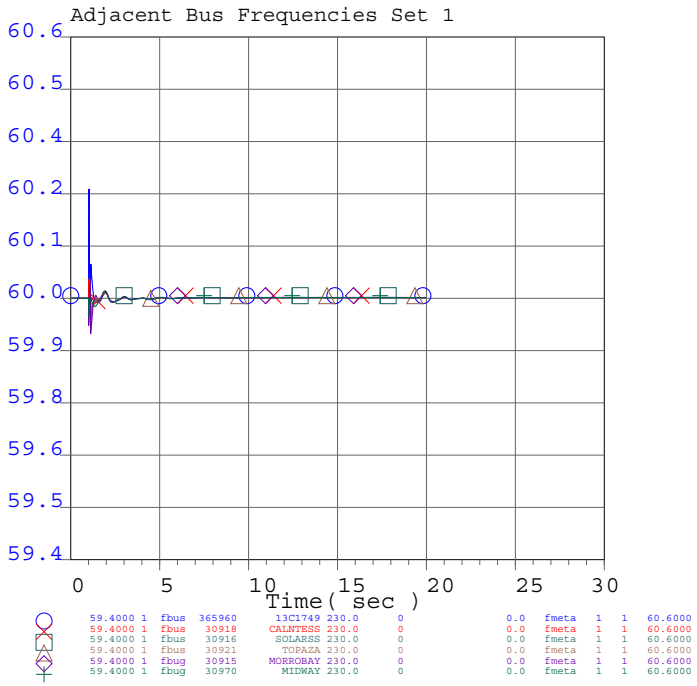

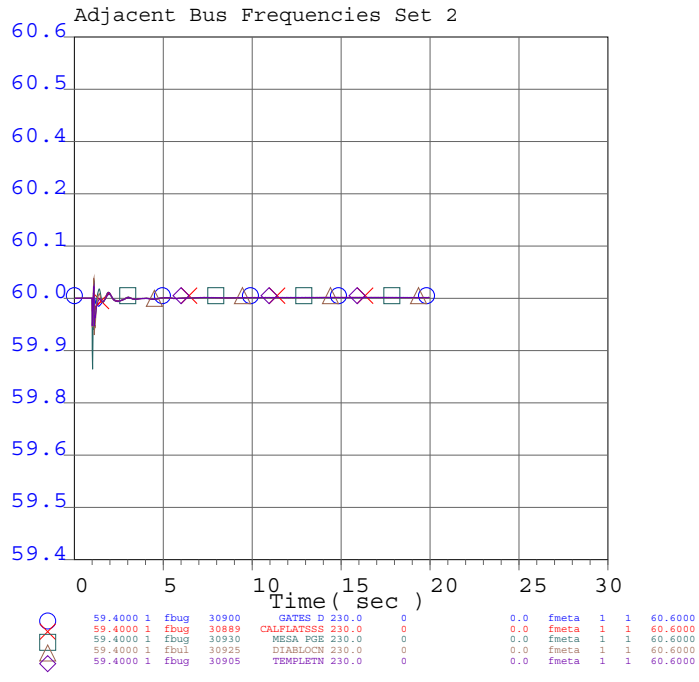

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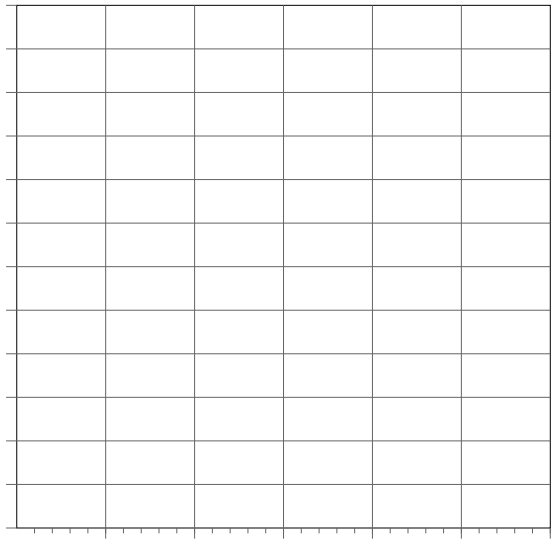
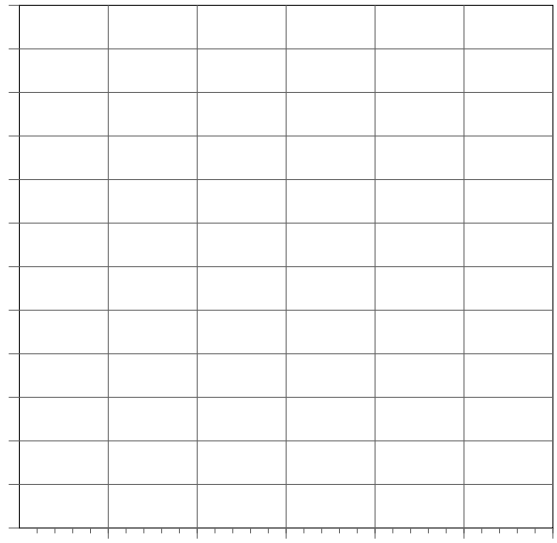
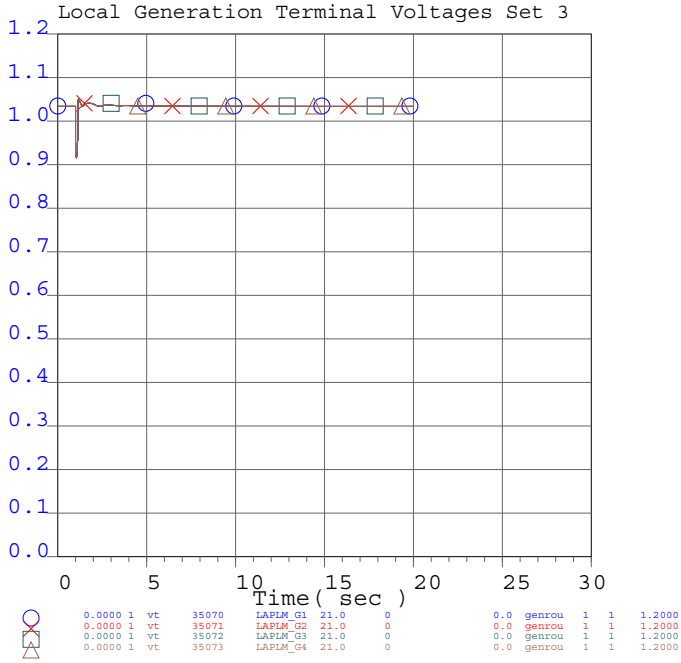
Local Generation Terminal Voltages Set 1



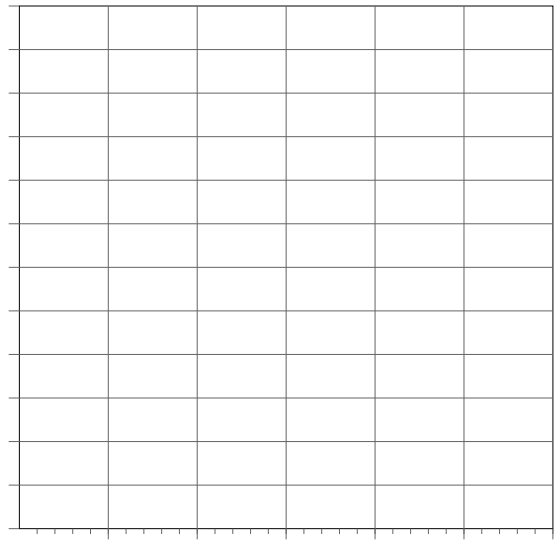
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

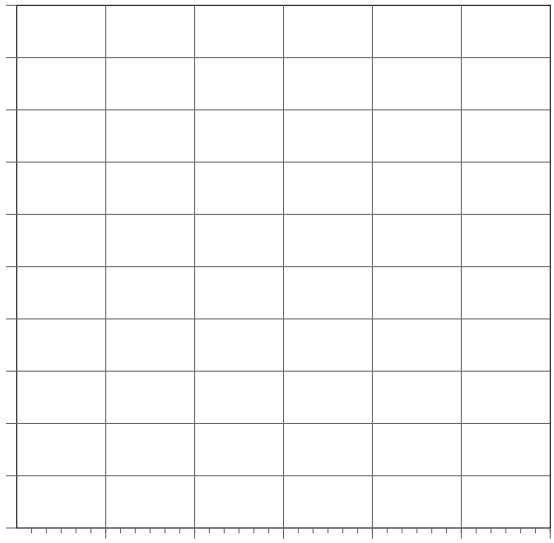


Local Generation Terminal Voltages Set 4

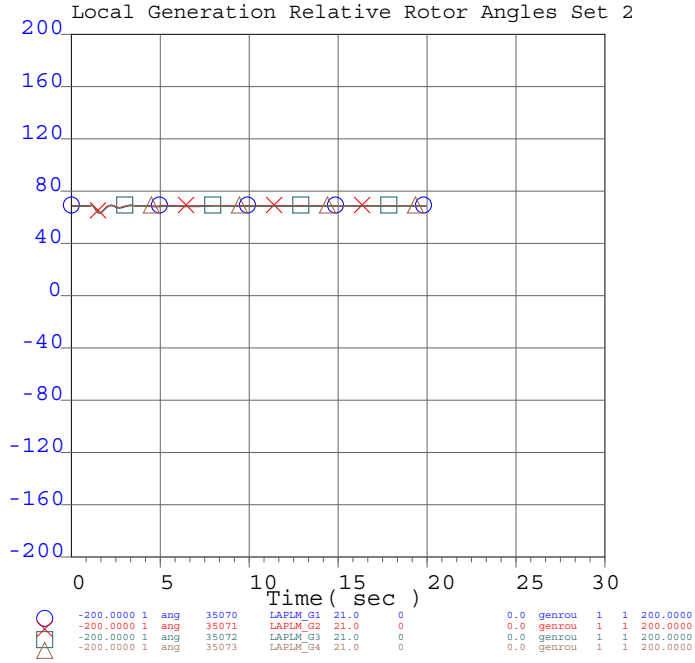


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

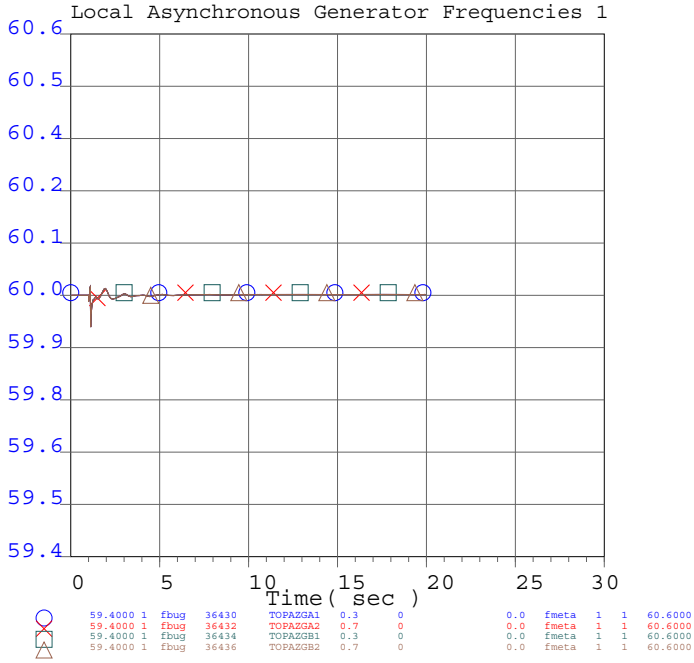
Local Generation Relative Rotor Angles Set 1



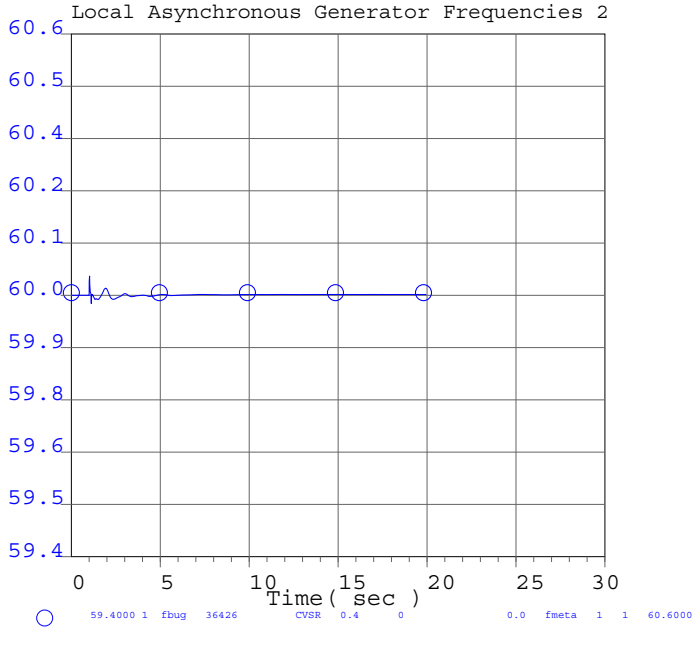
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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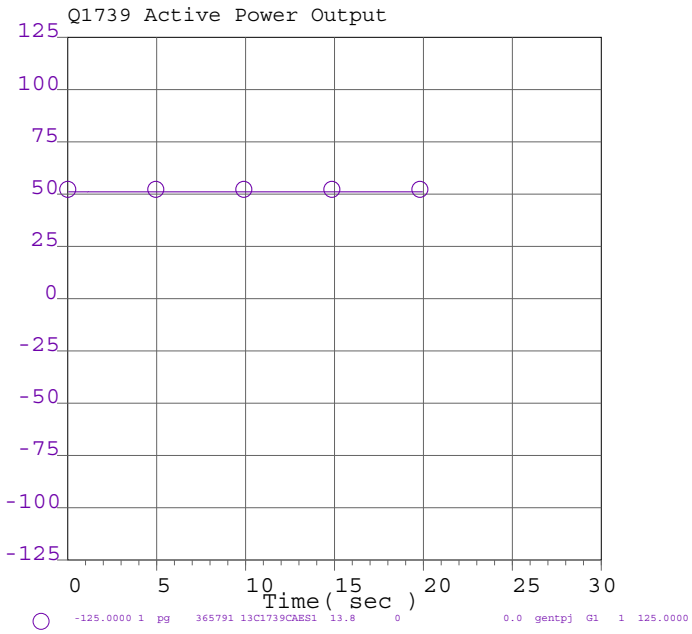
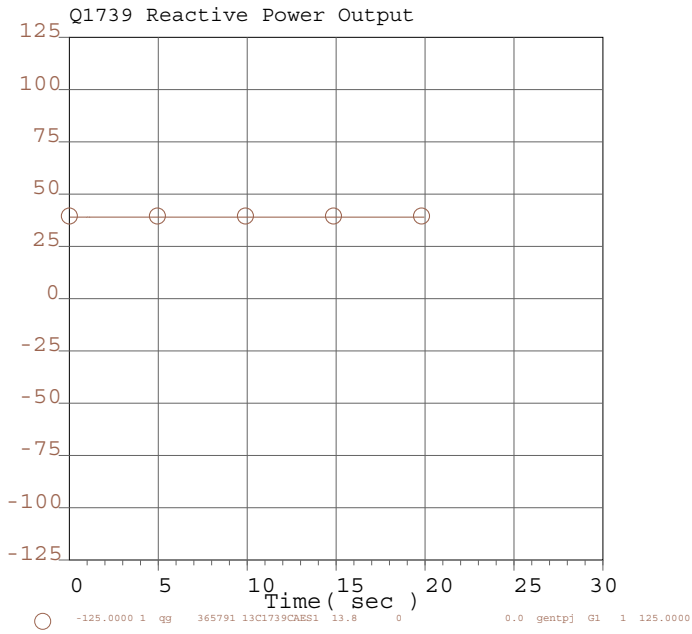
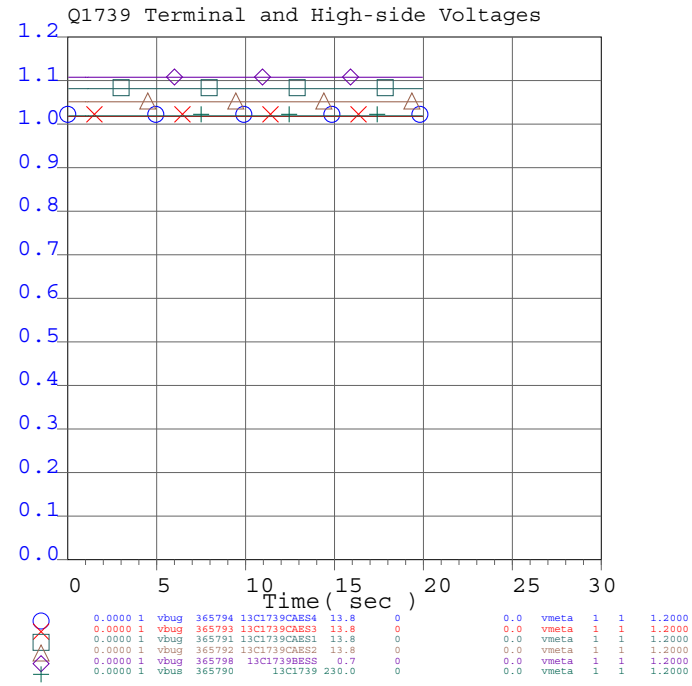
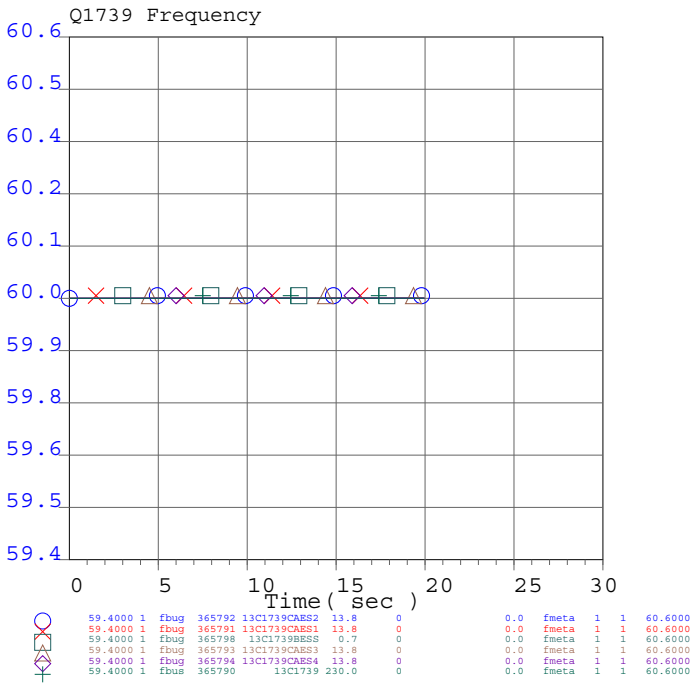
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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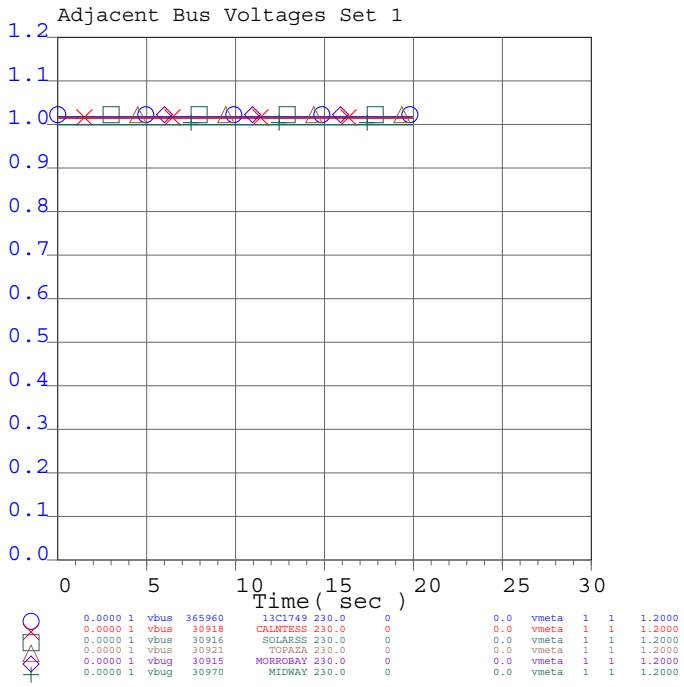

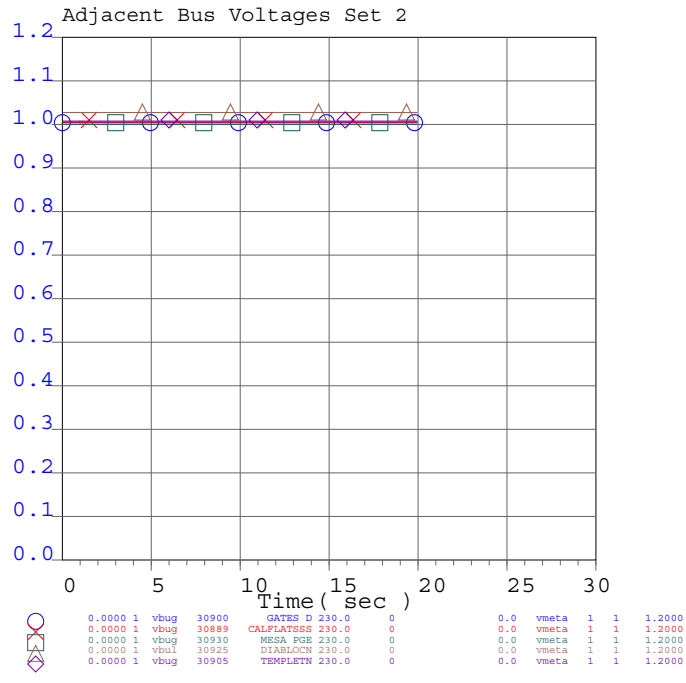

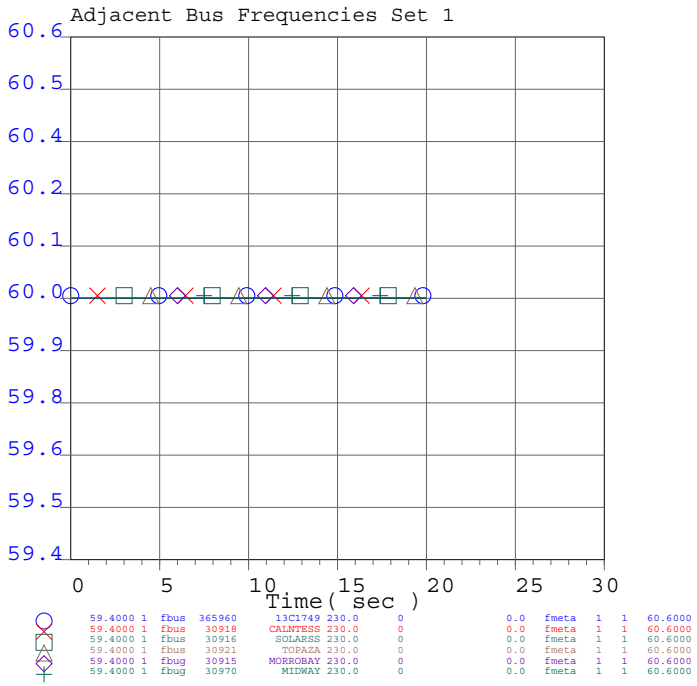

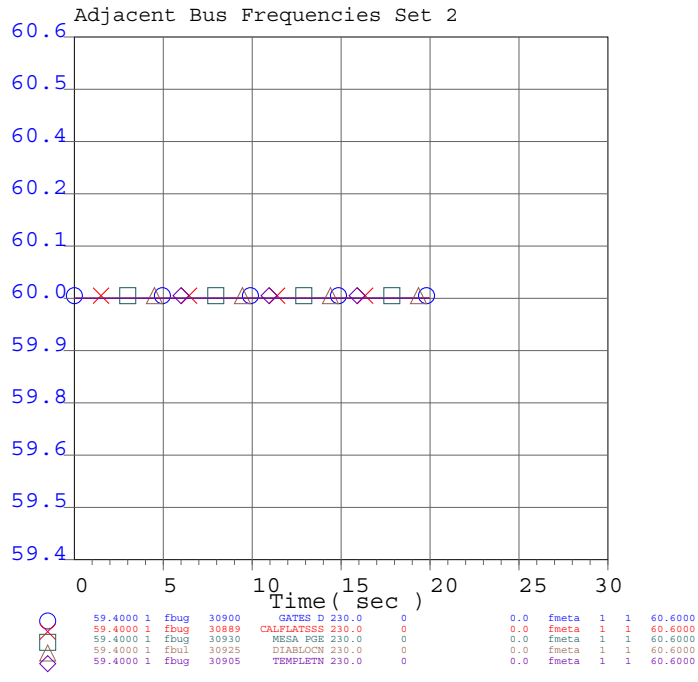

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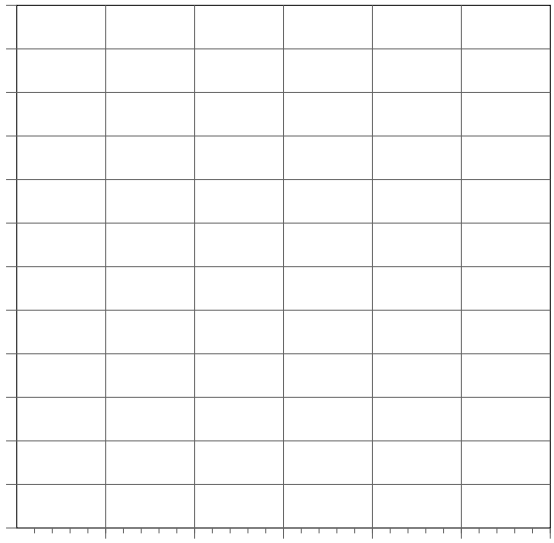
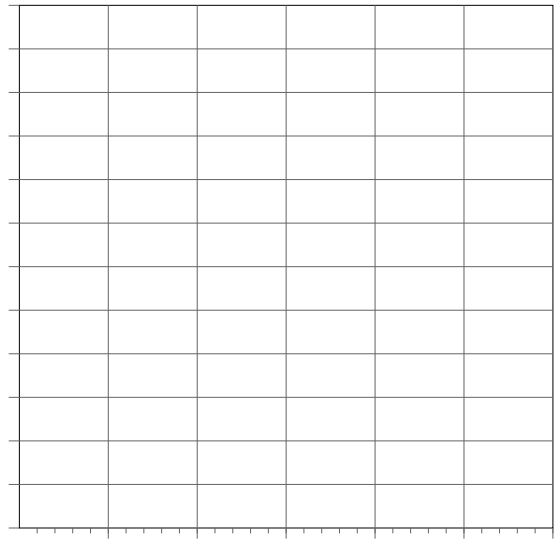
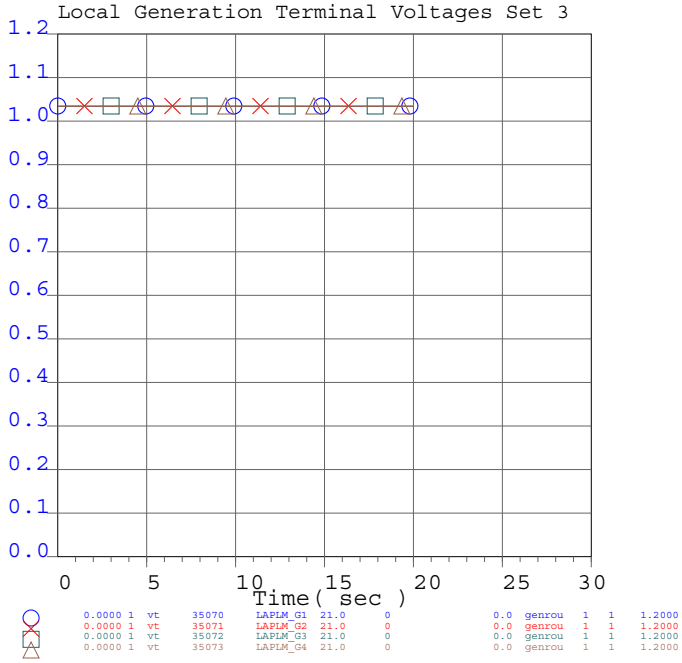
Local Generation Terminal Voltages Set 1



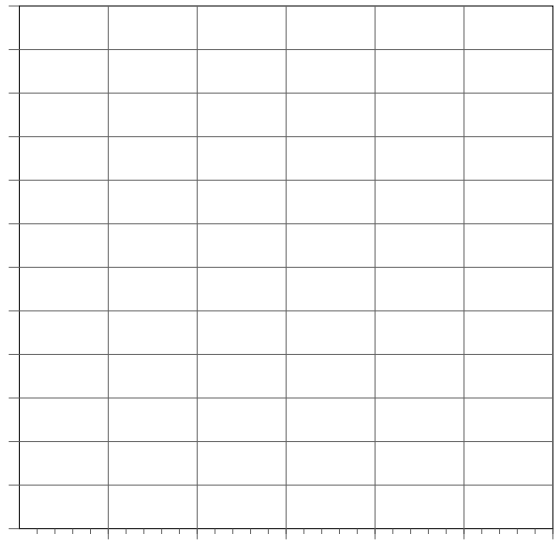
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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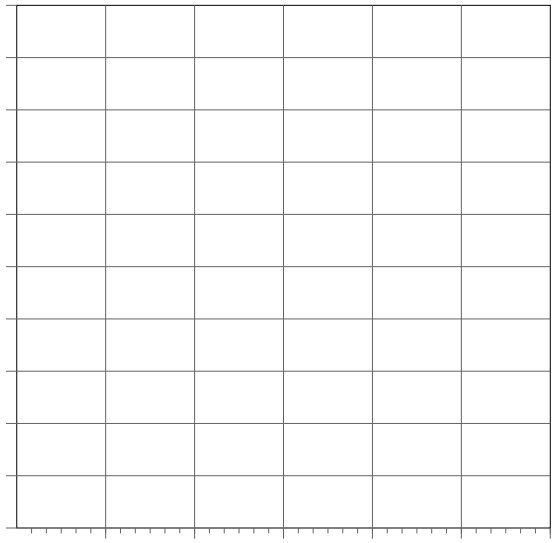
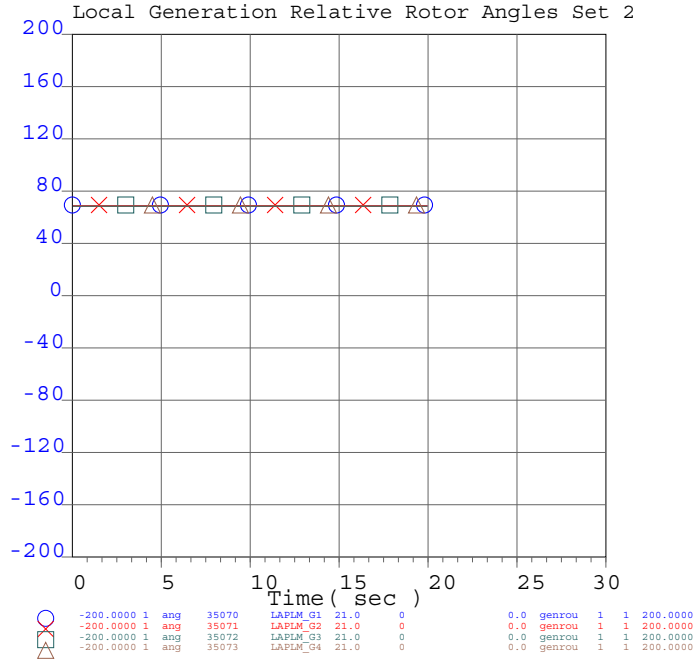
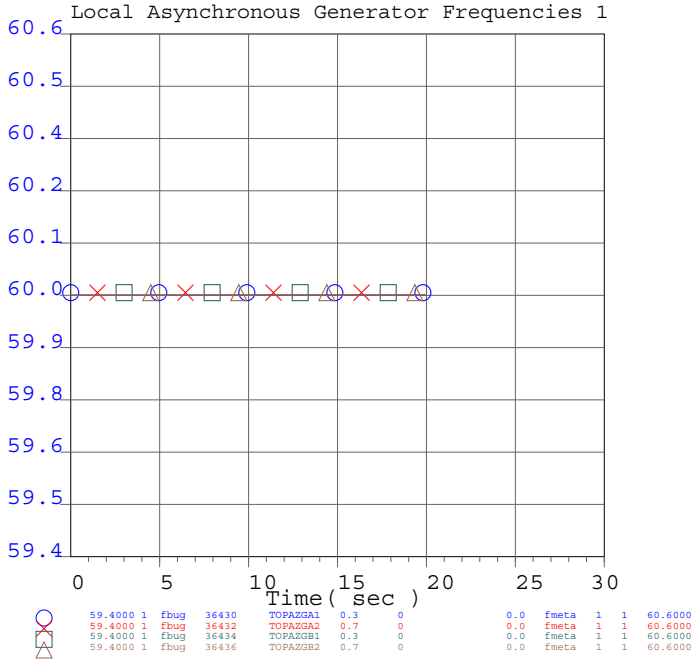
Local Generation Relative Rotor Angles Set 1



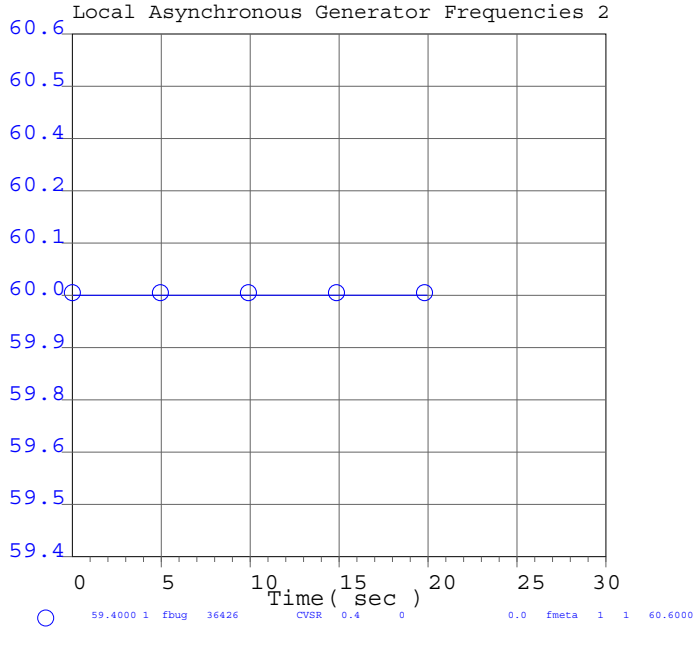
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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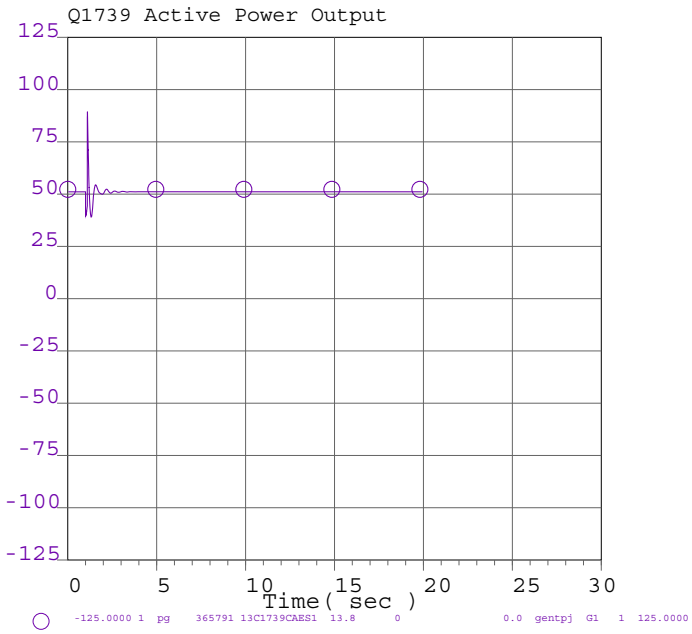
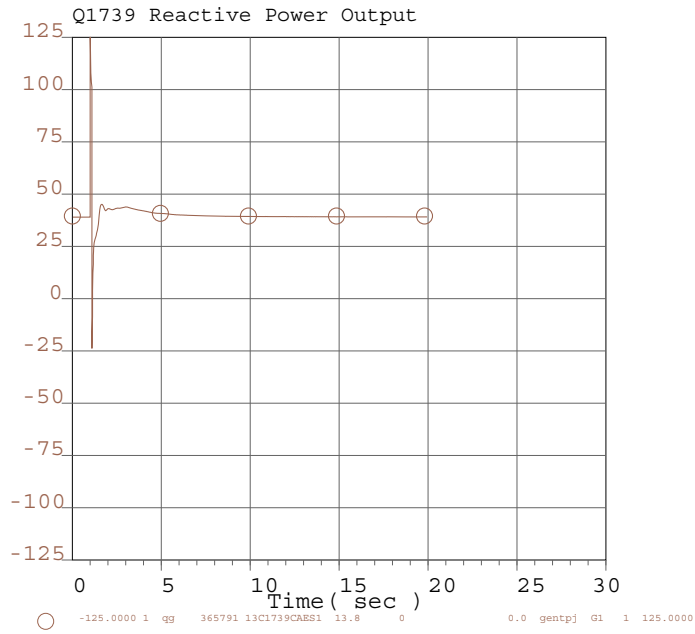
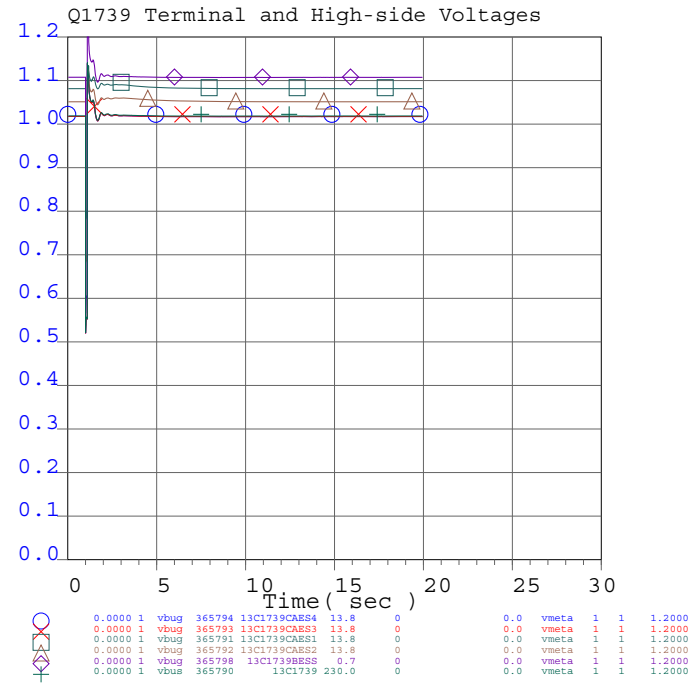
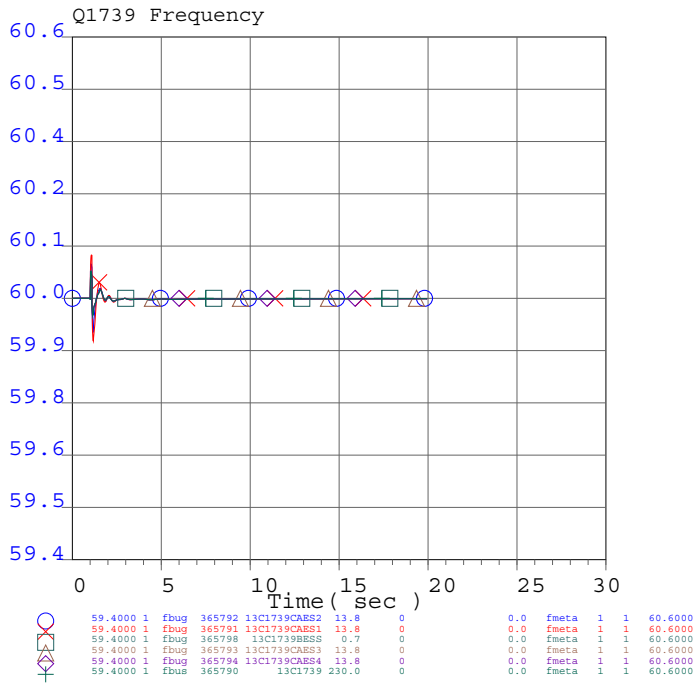
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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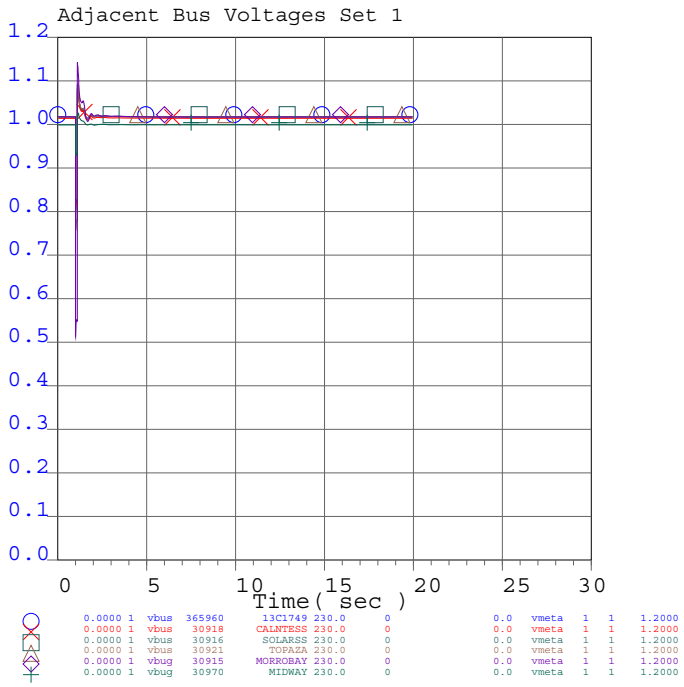

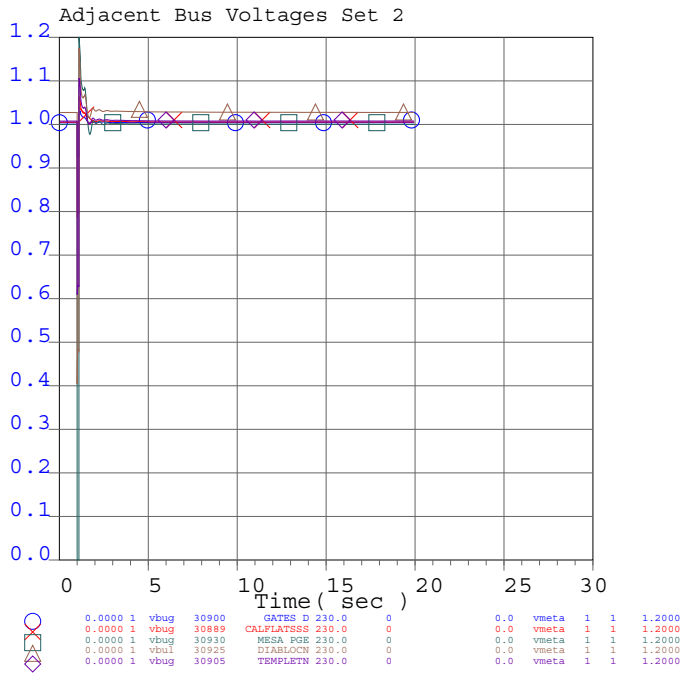

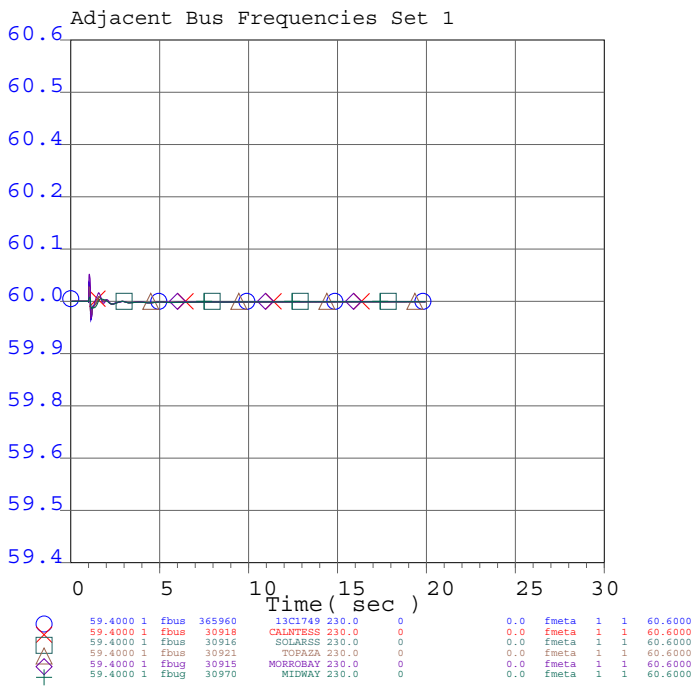

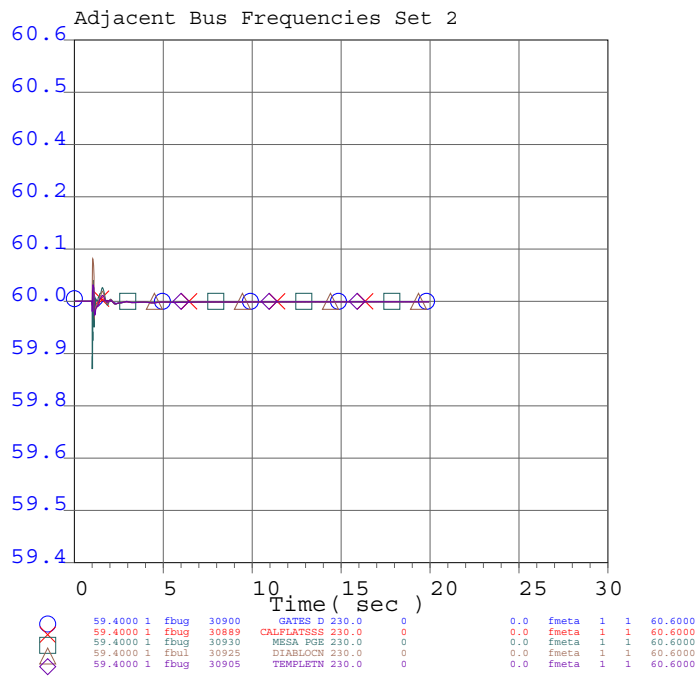

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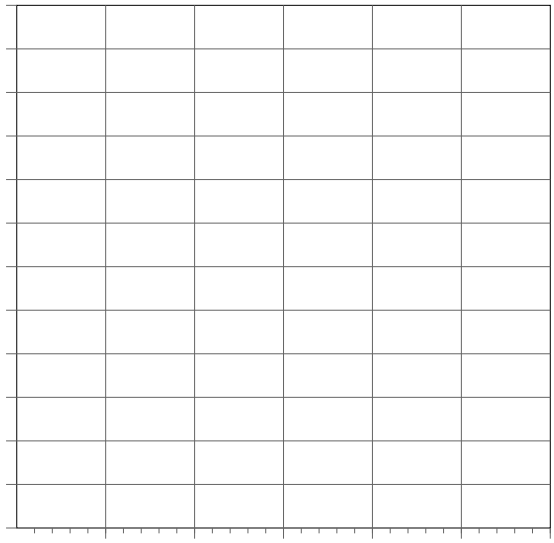
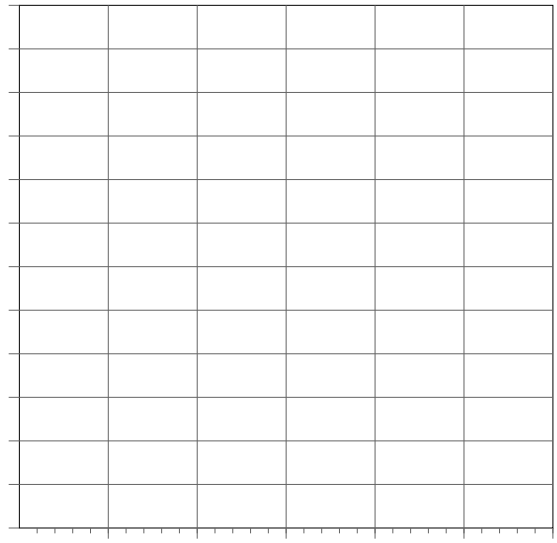
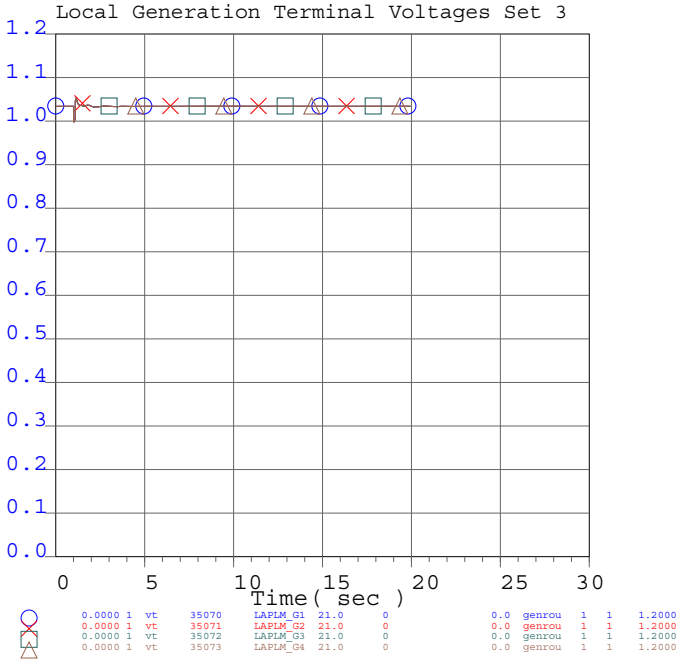
Local Generation Terminal Voltages Set 1



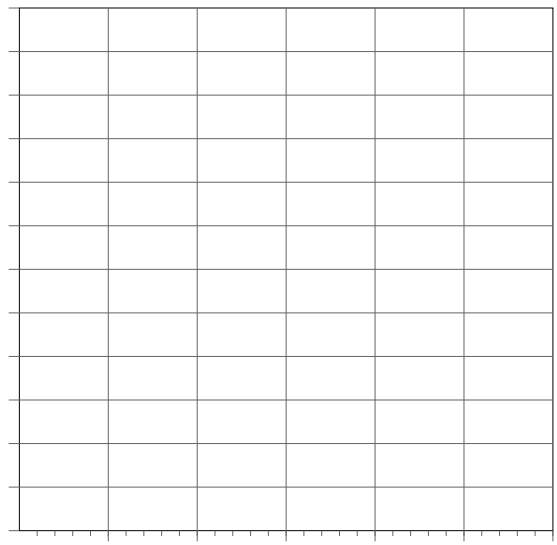
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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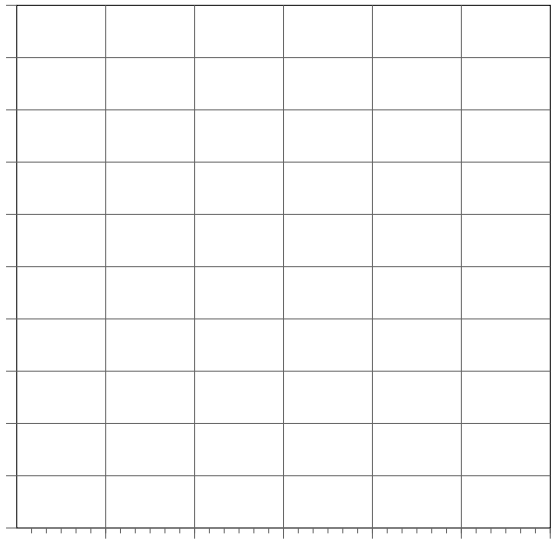
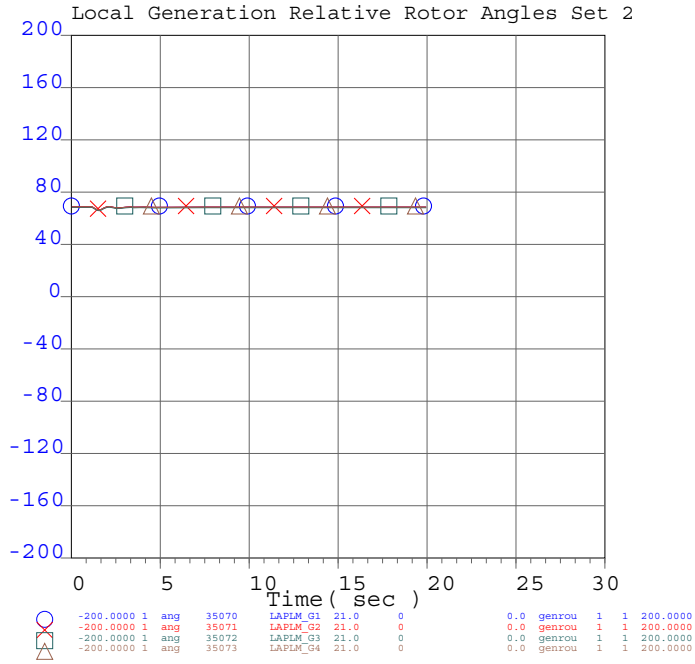
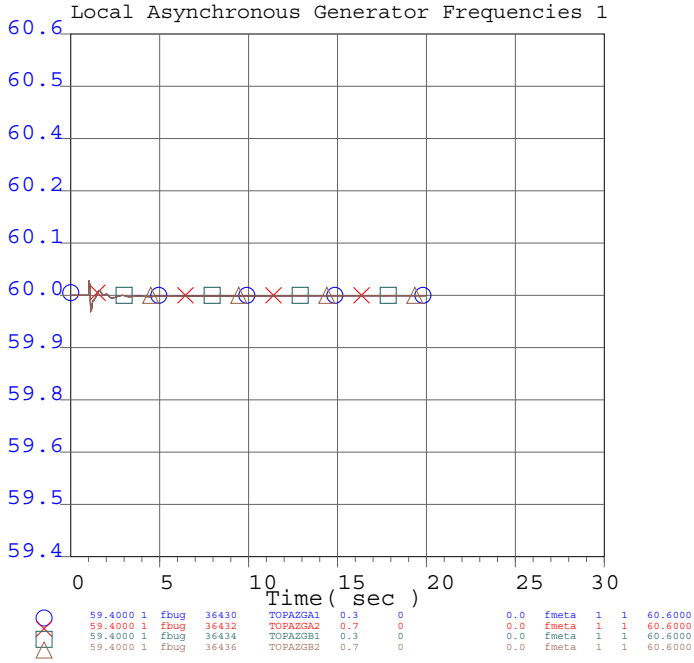
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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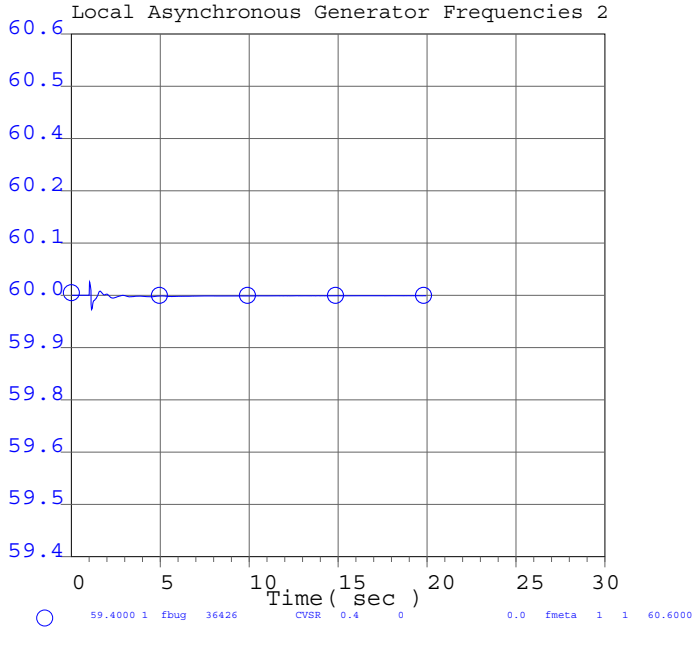

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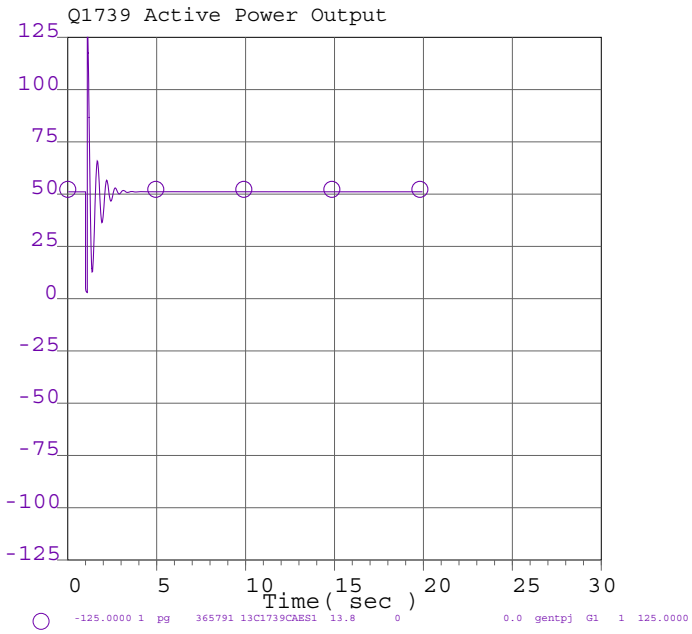

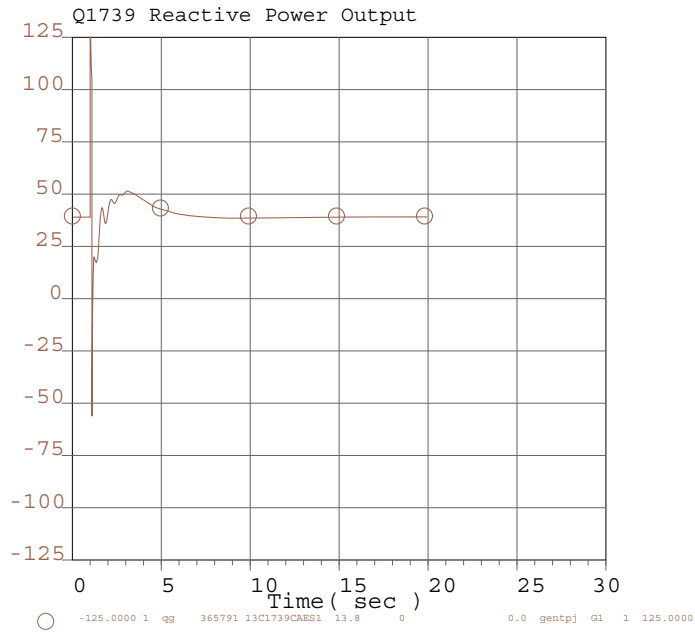

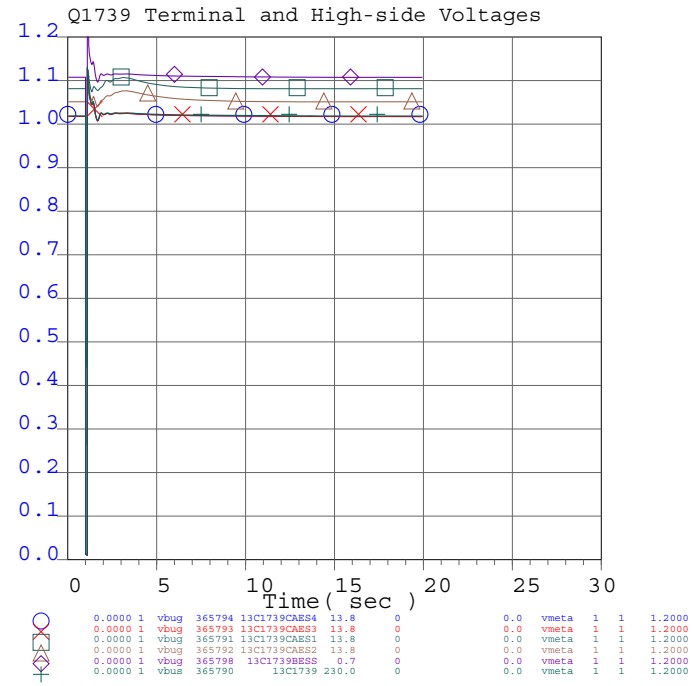

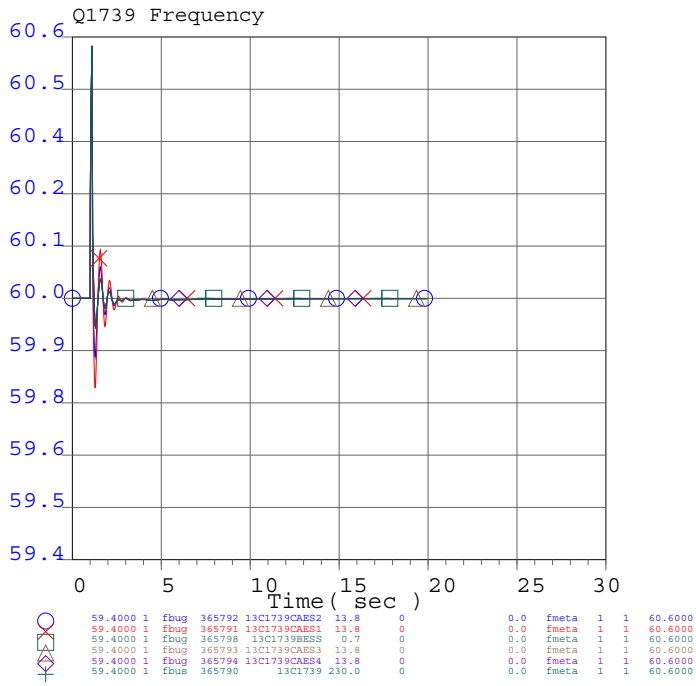

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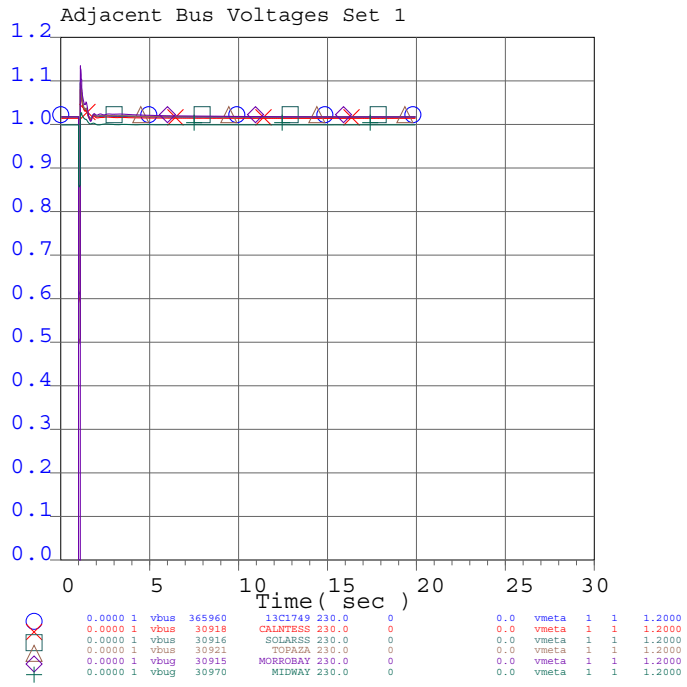

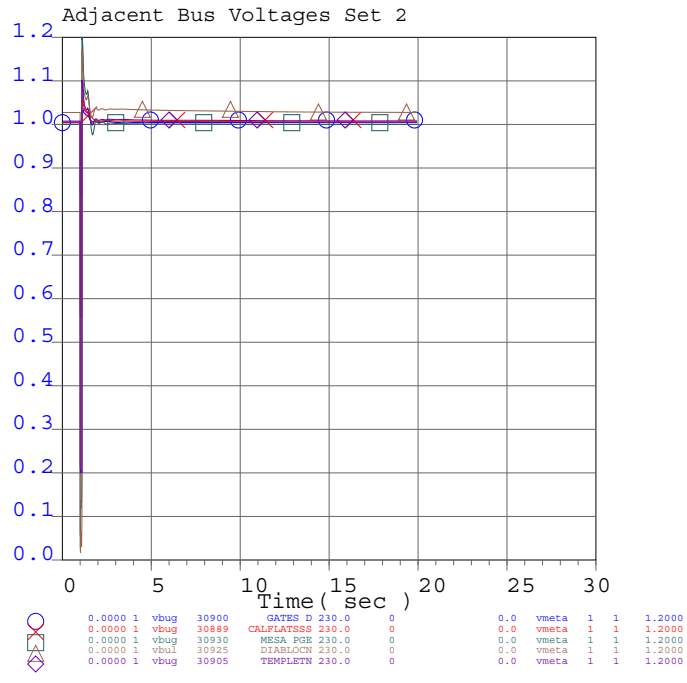

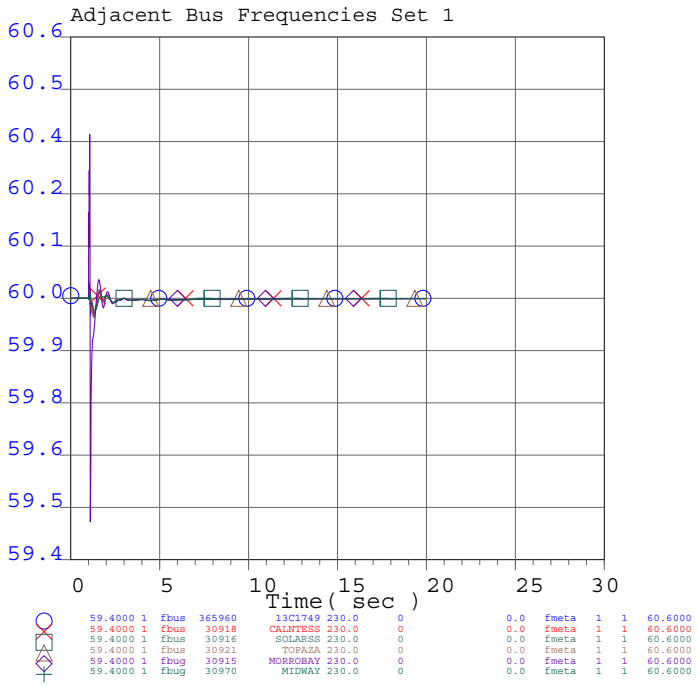

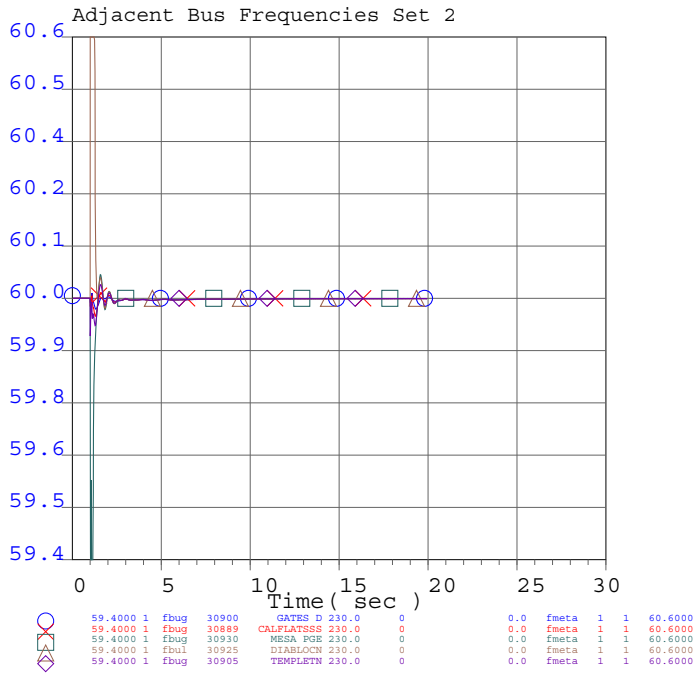

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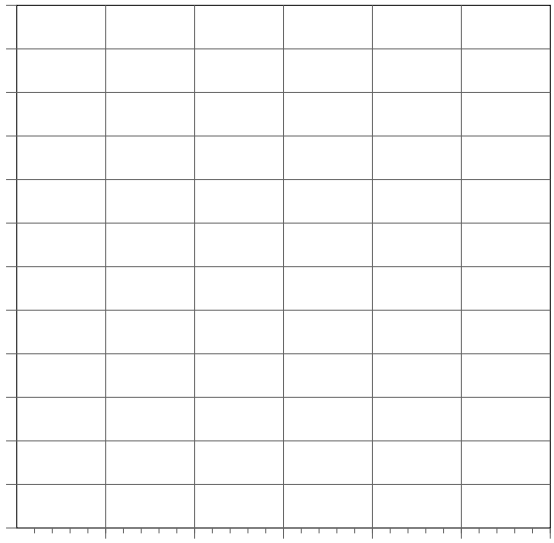
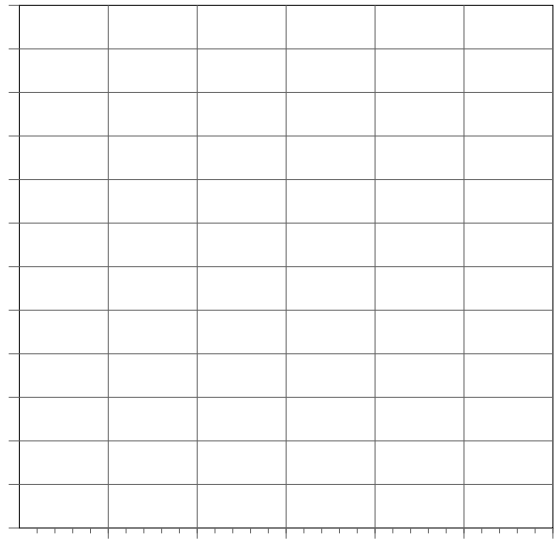
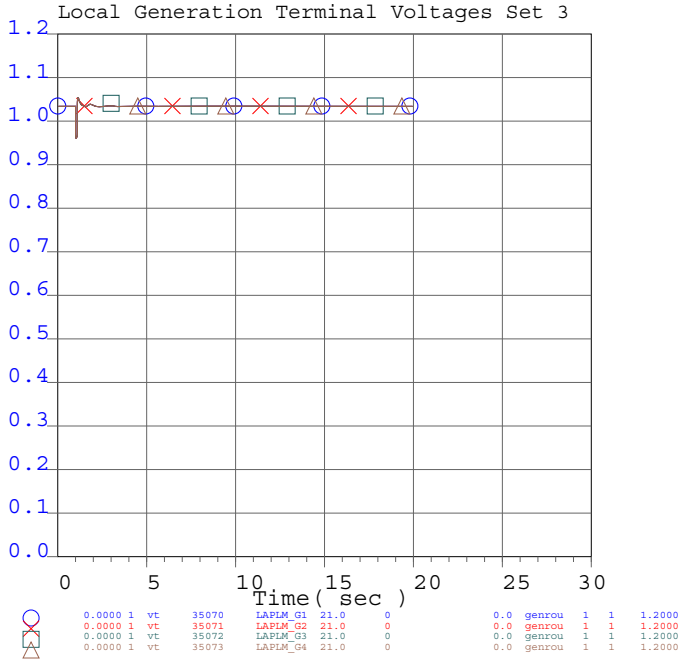
Local Generation Terminal Voltages Set 1



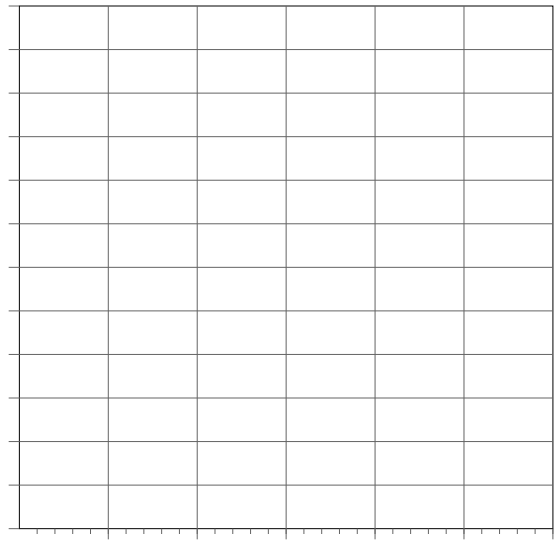
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

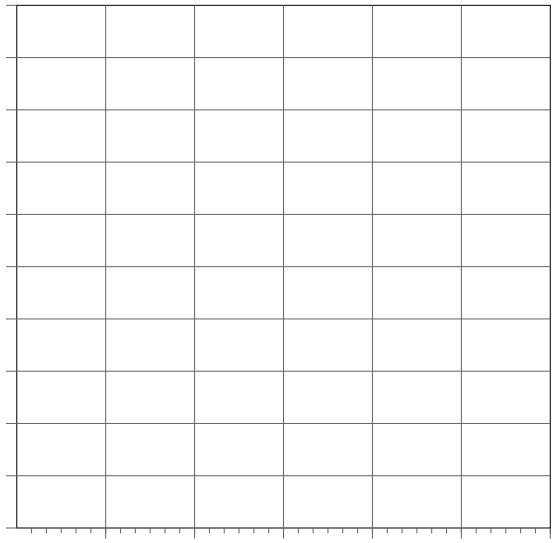


Local Generation Terminal Voltages Set 4

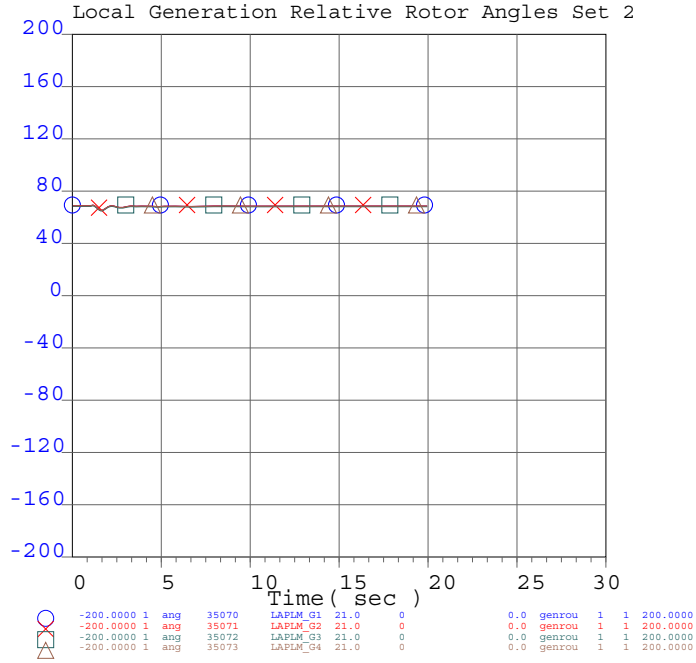


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

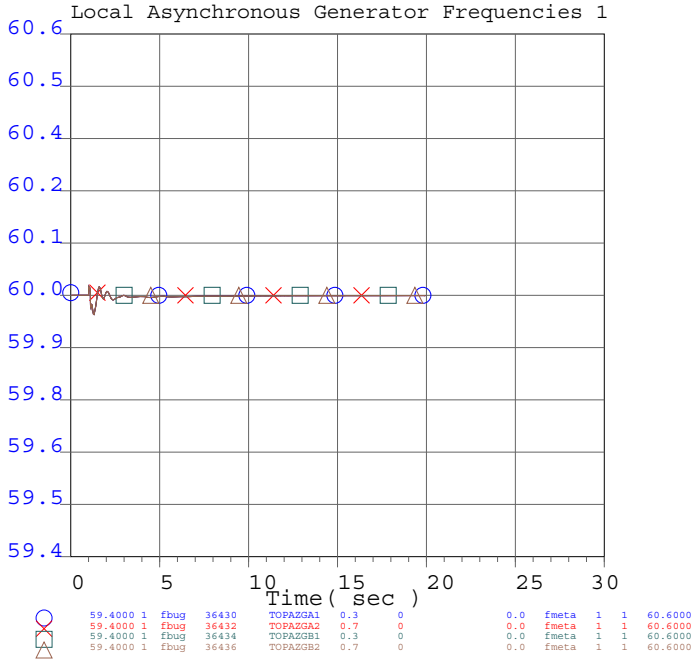
Local Generation Relative Rotor Angles Set 1



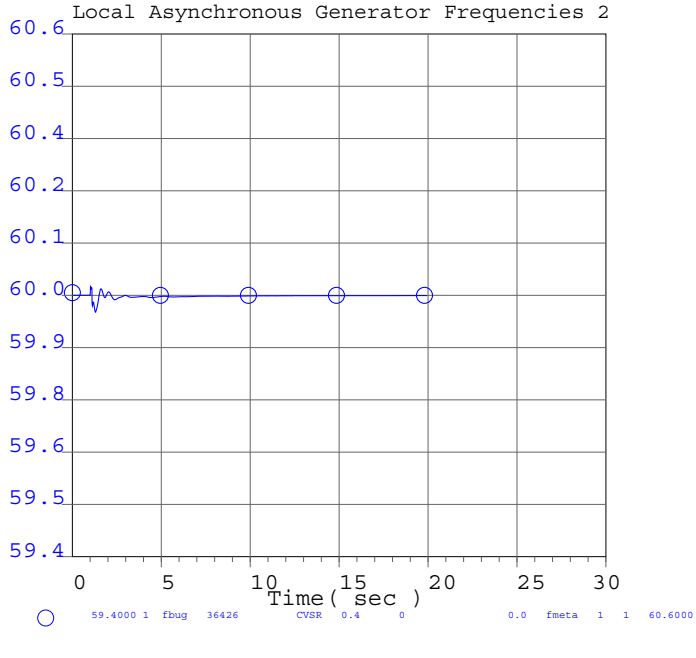
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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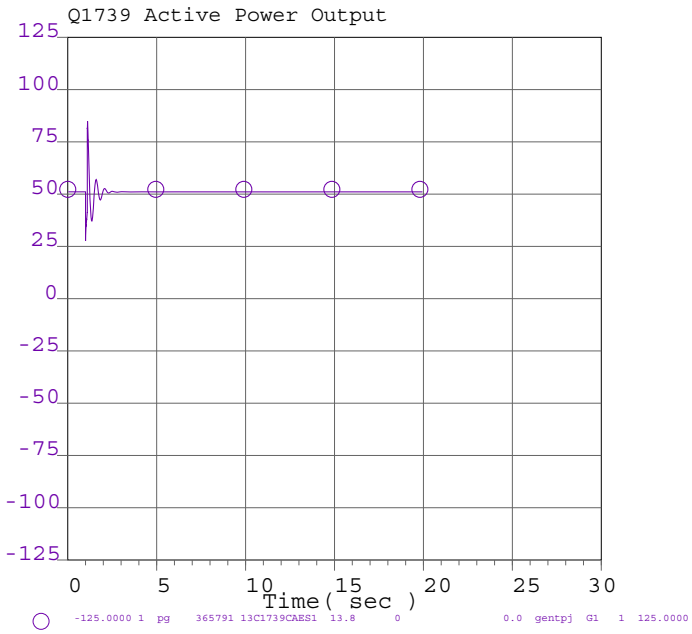
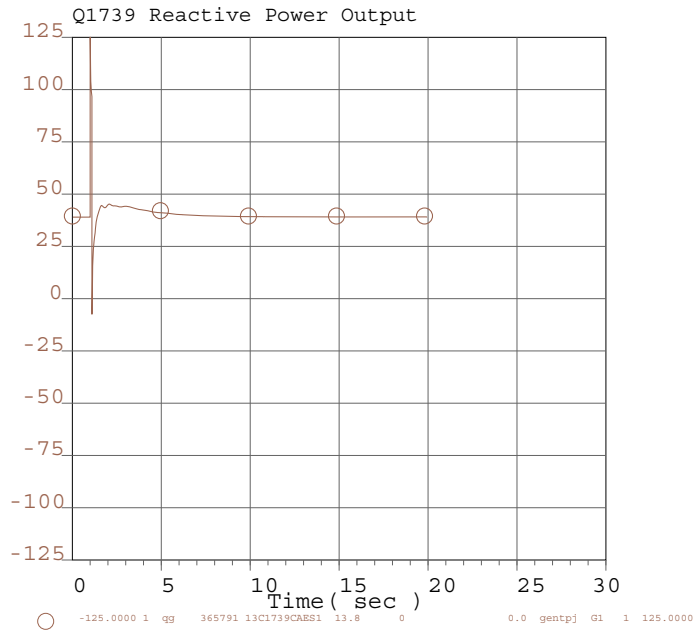
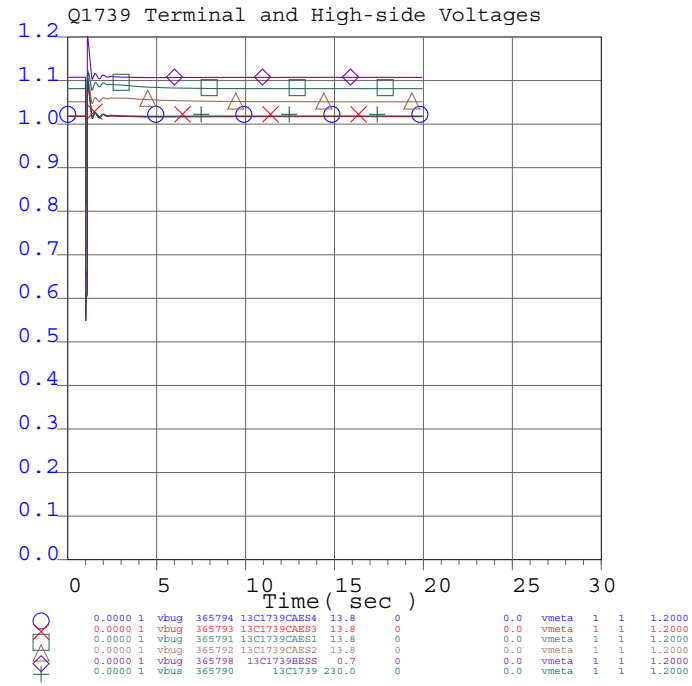
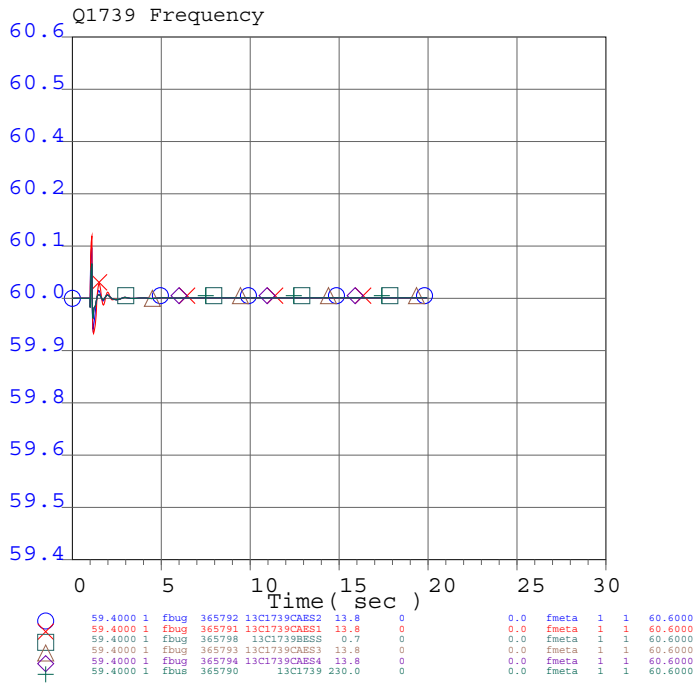
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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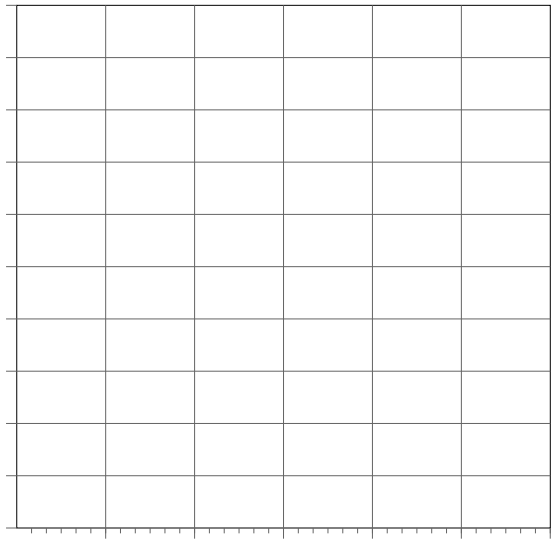
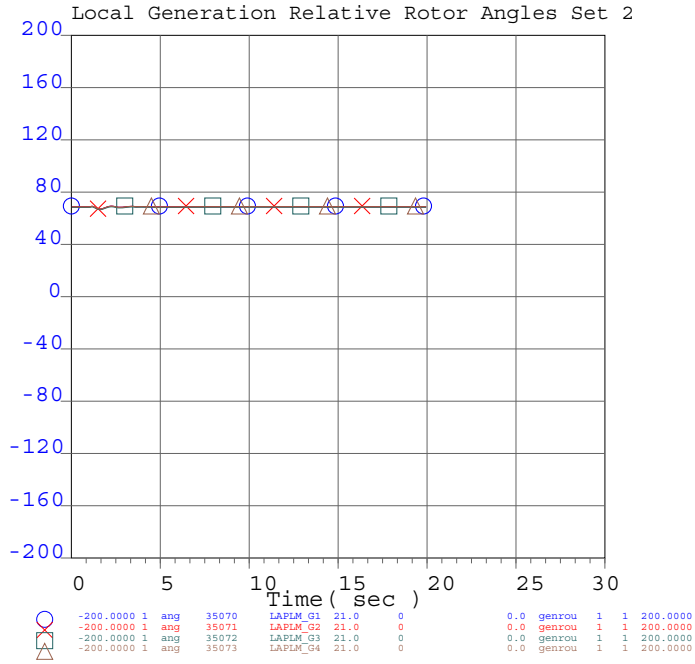
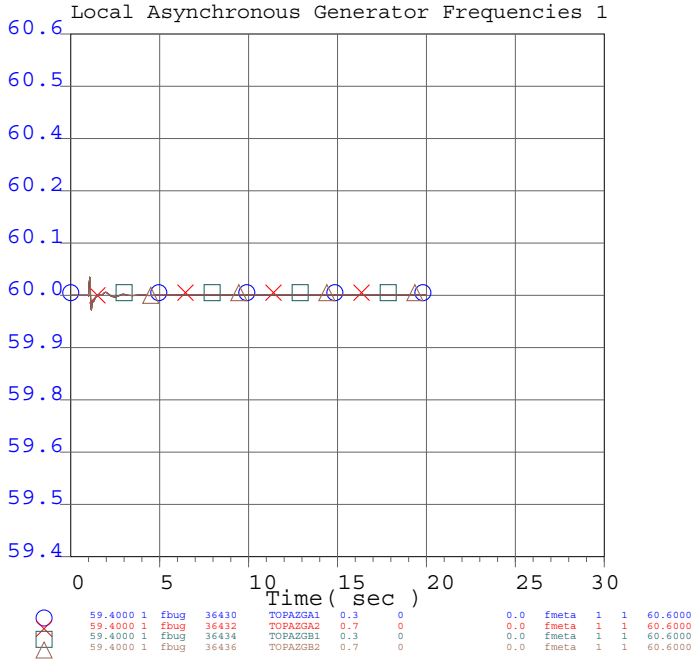
Local Generation Relative Rotor Angles Set 1



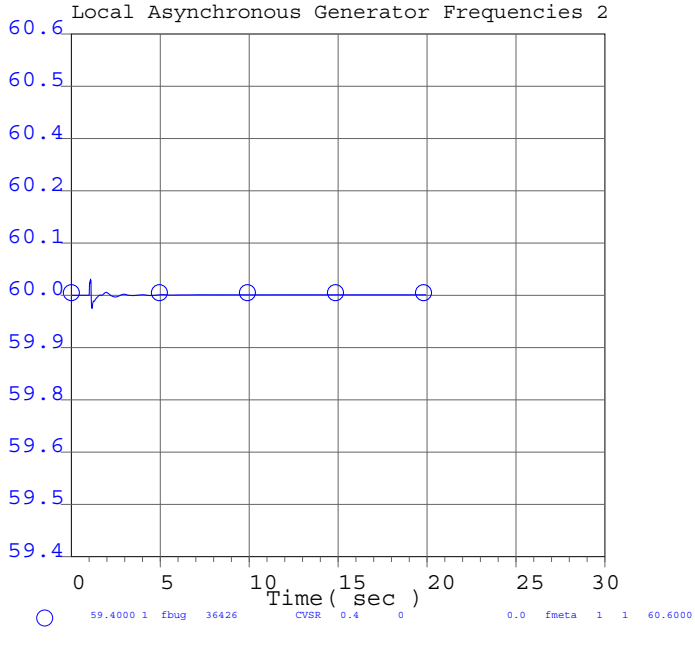
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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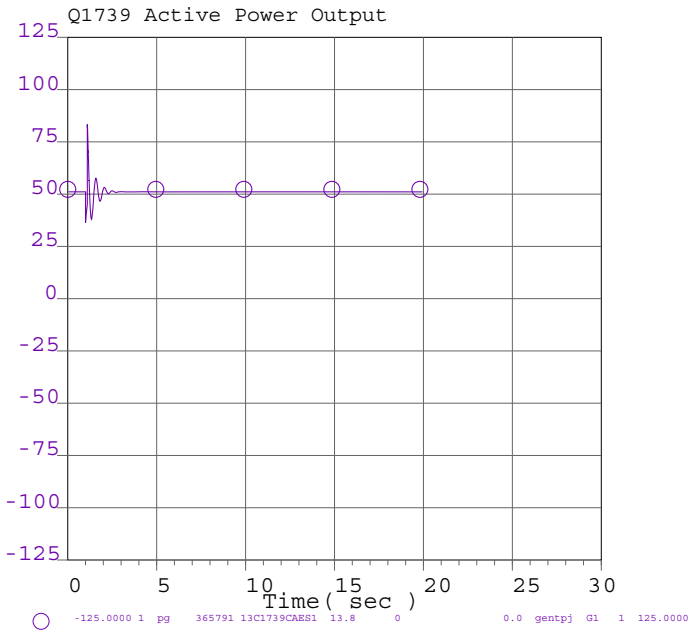
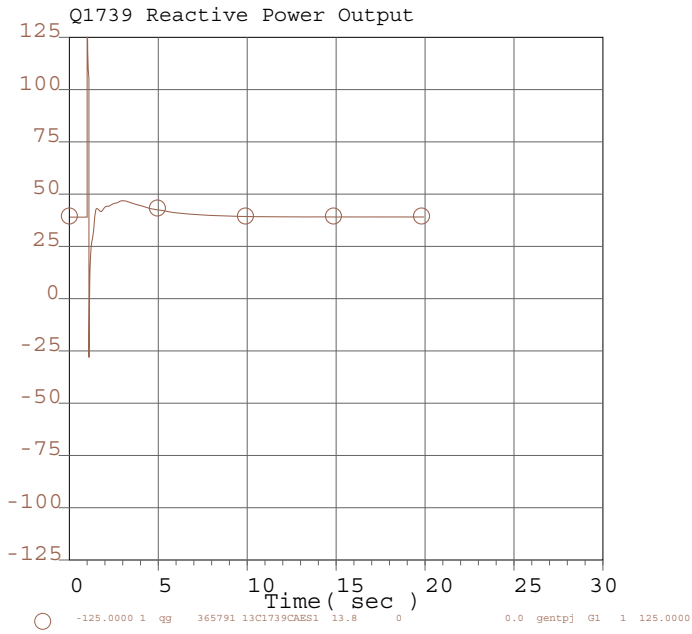
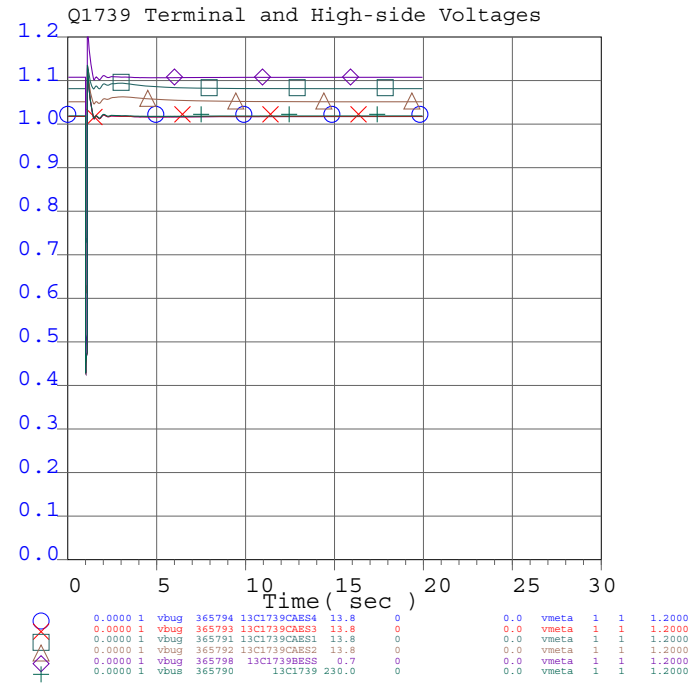
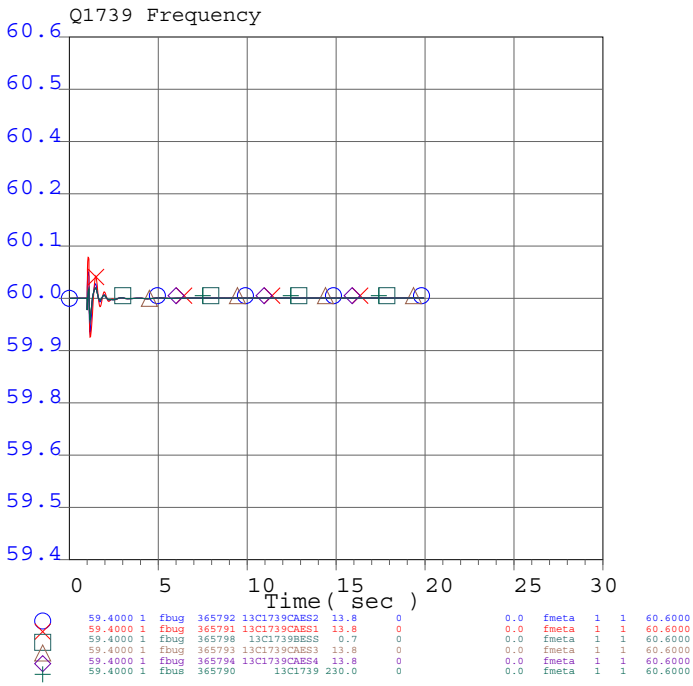
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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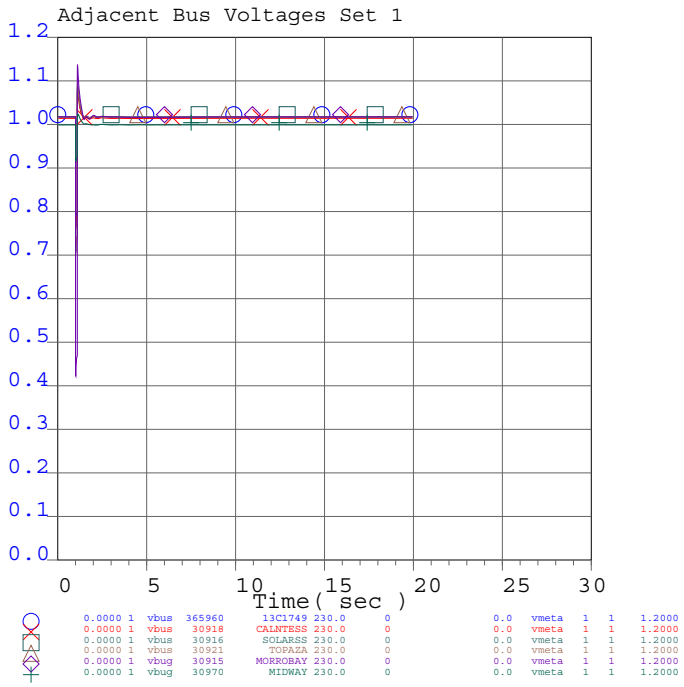

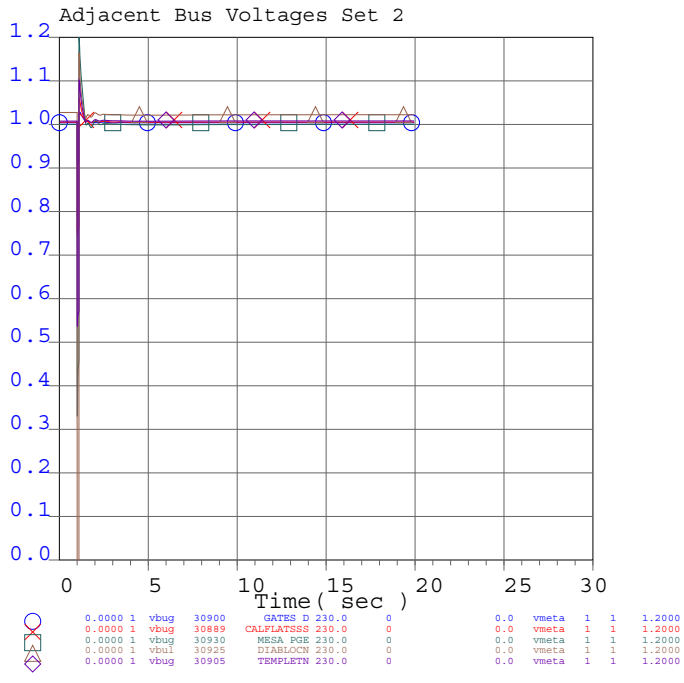

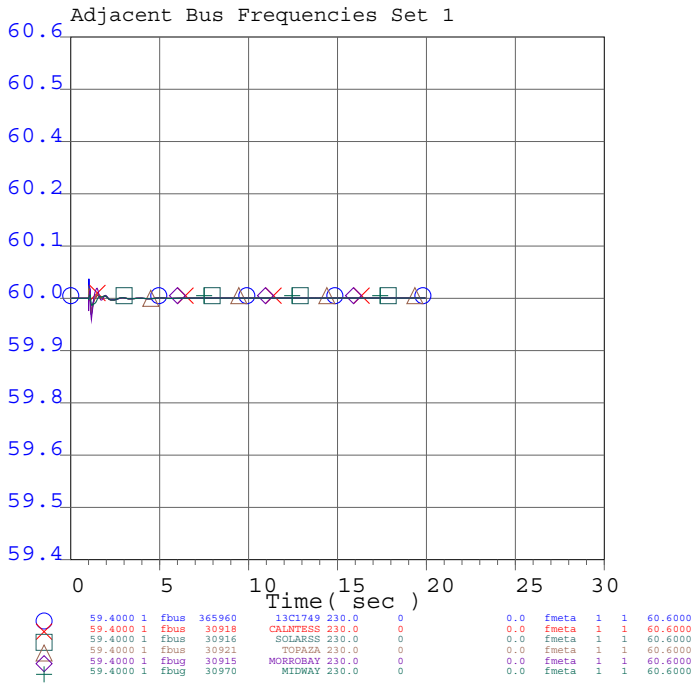

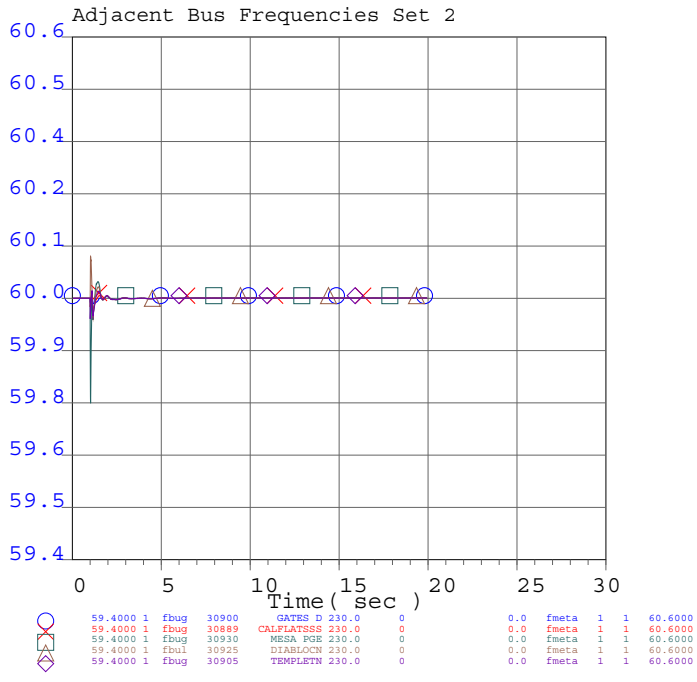

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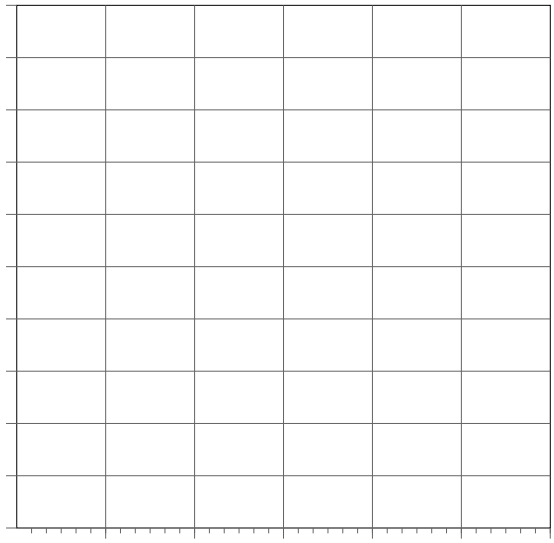
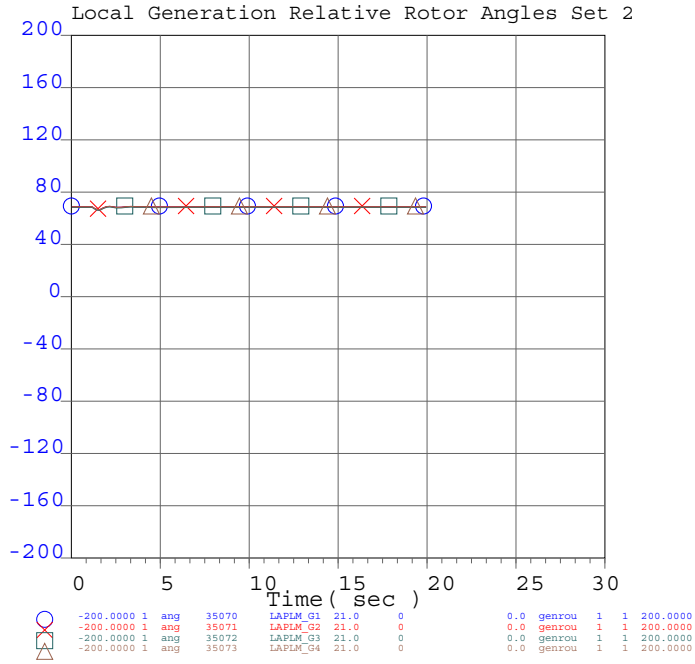
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

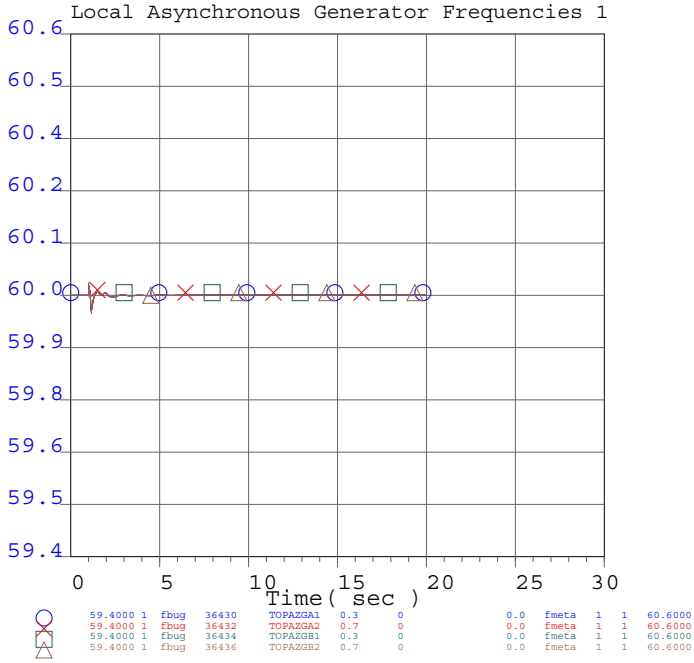
Local Generation Relative Rotor Angles Set 1



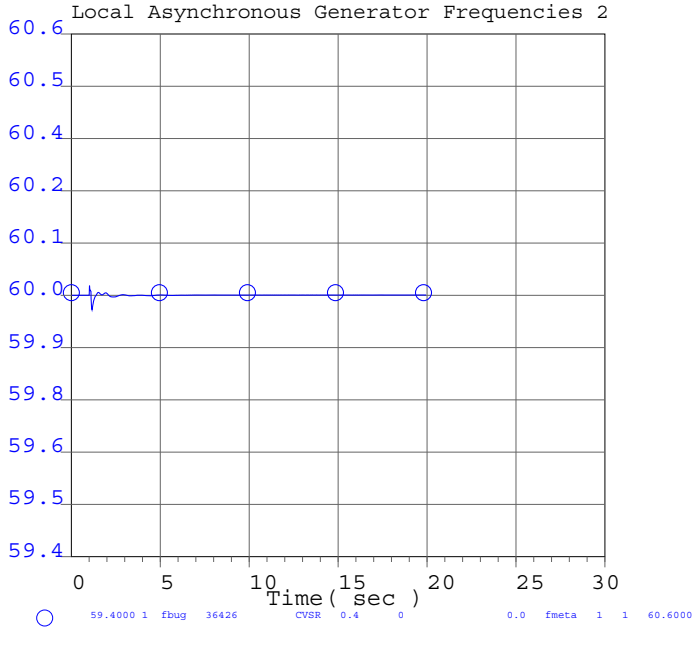
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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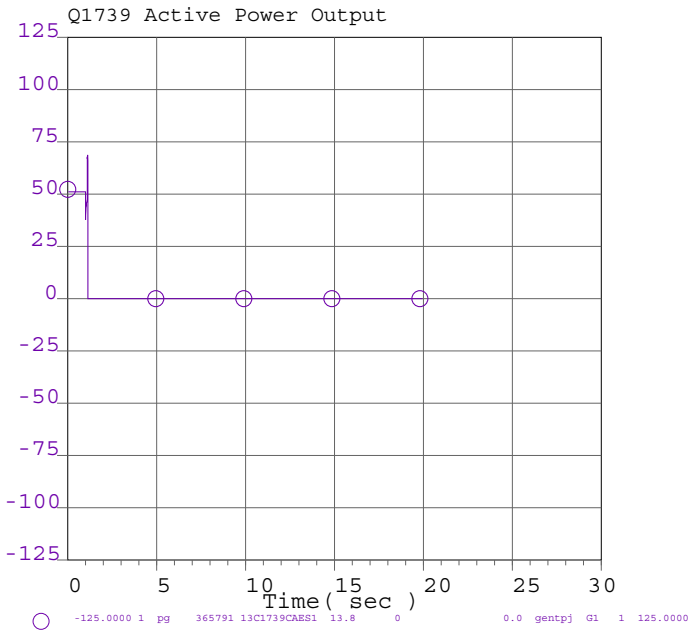

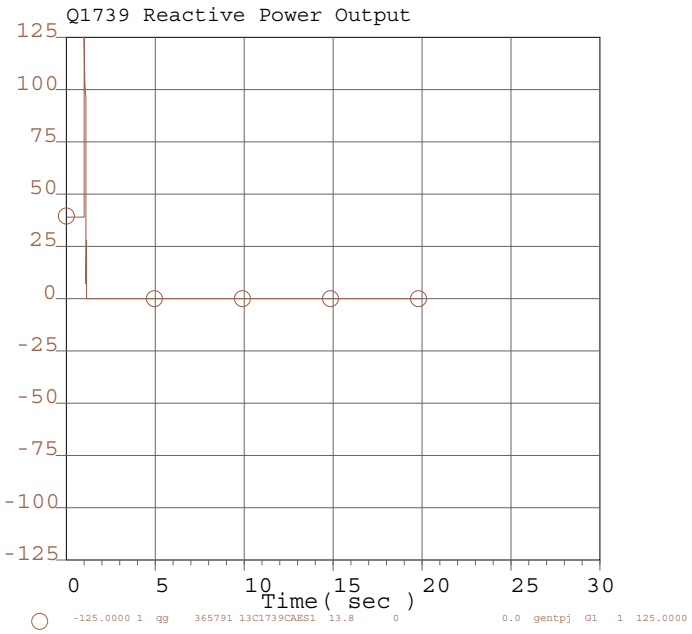

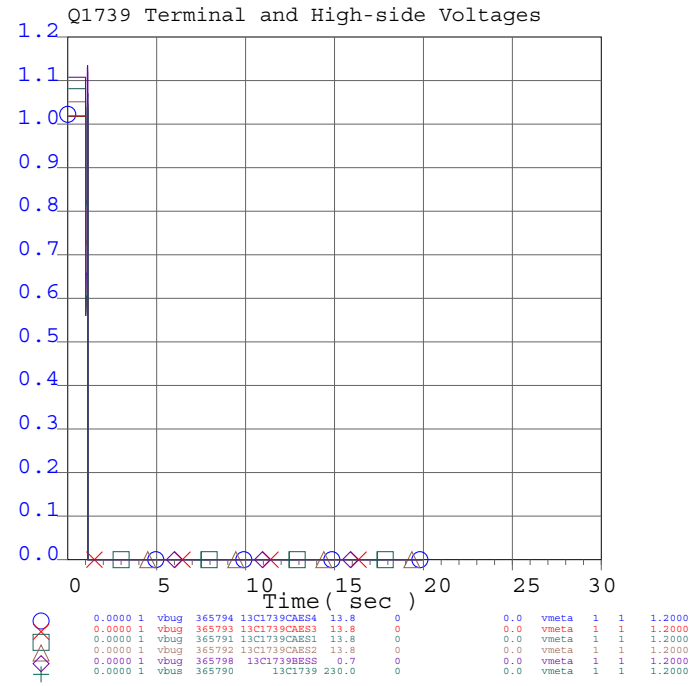

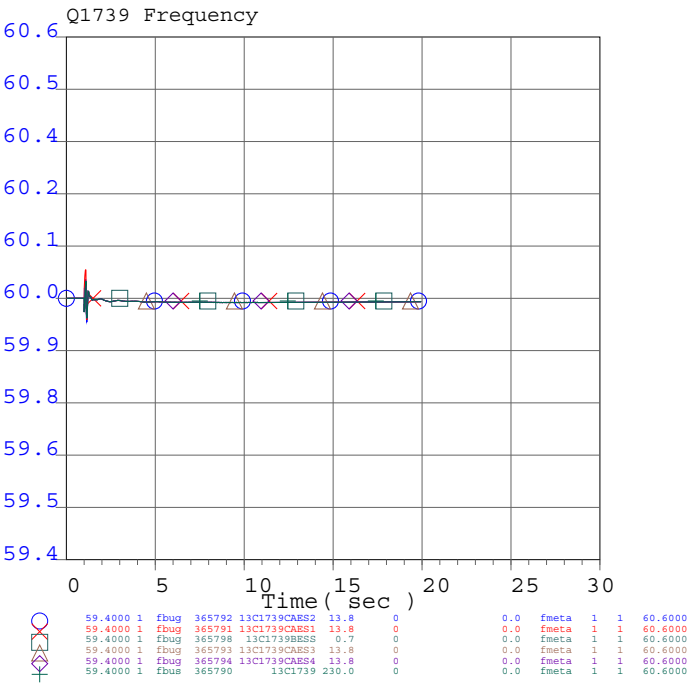

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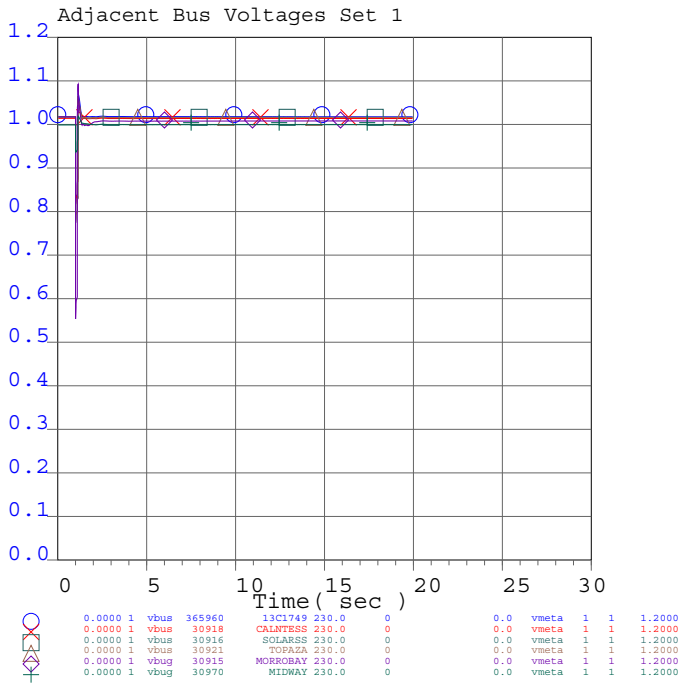

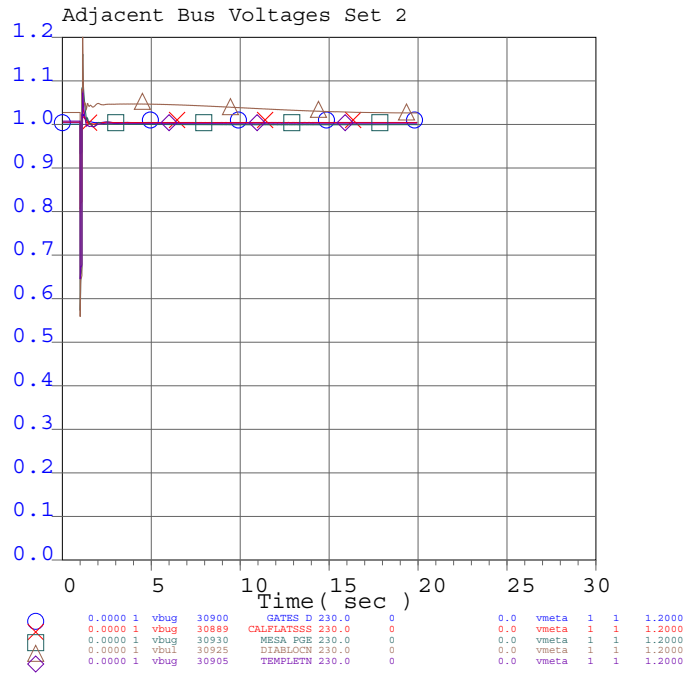

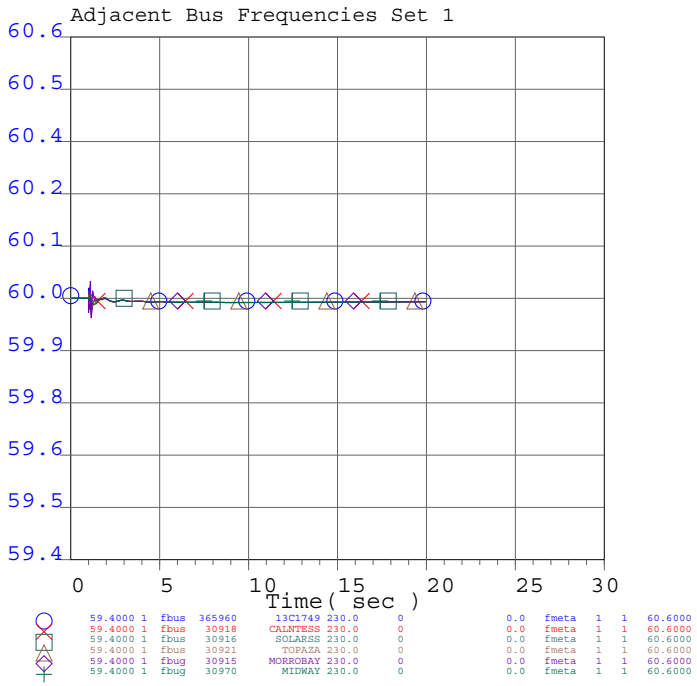

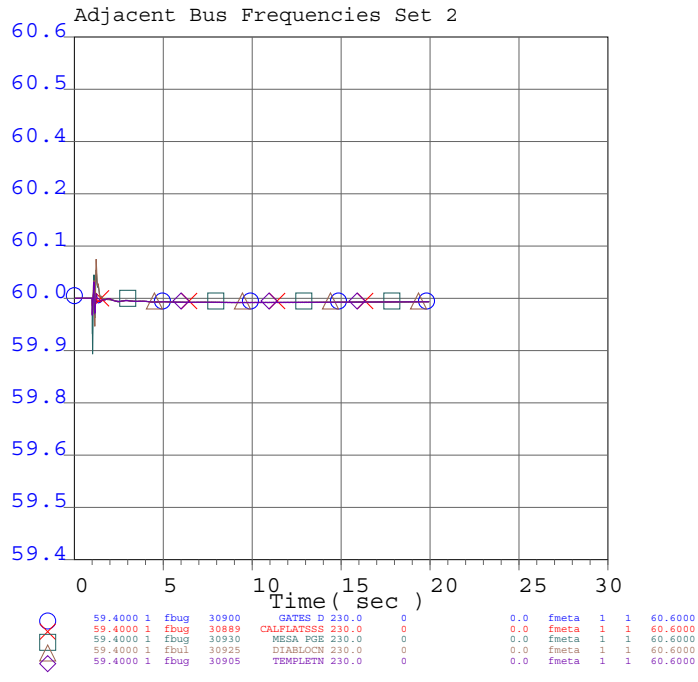

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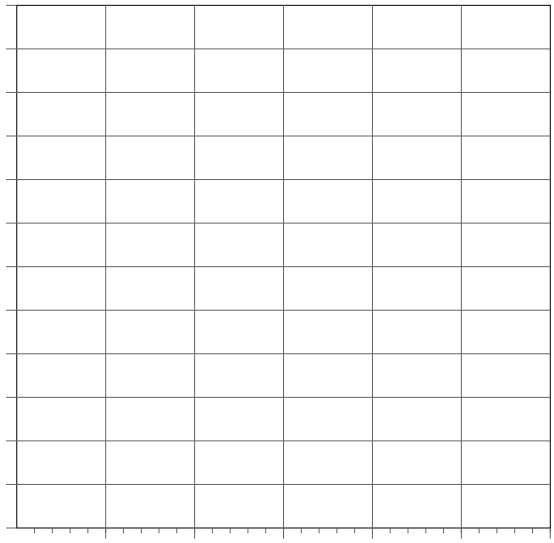
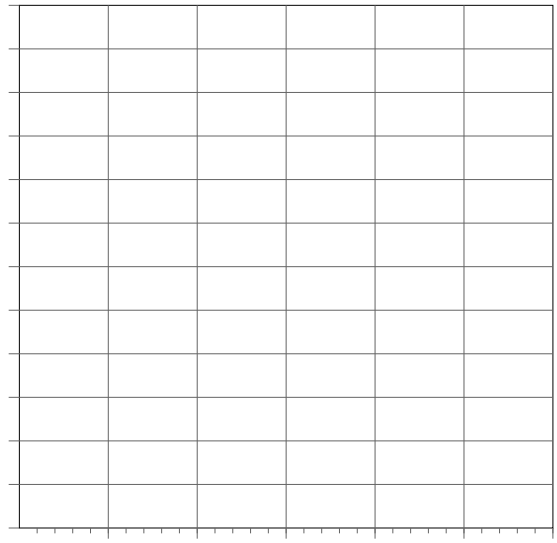
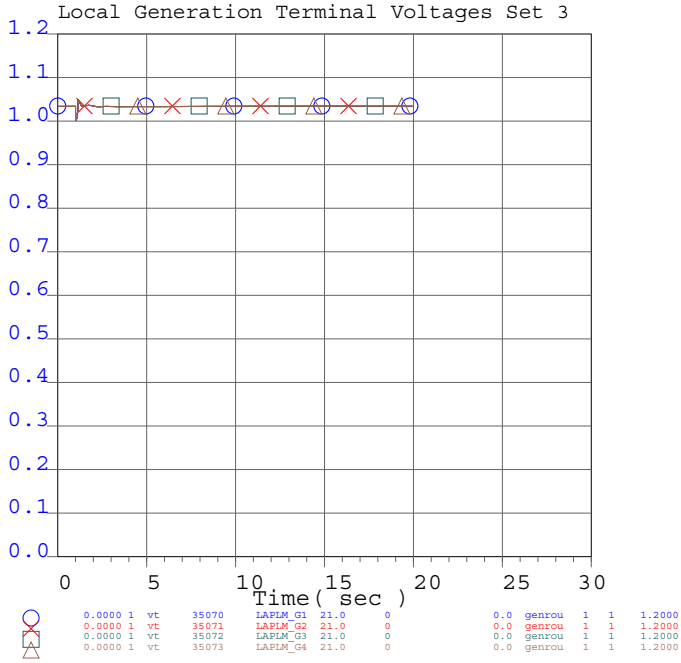
Local Generation Terminal Voltages Set 1



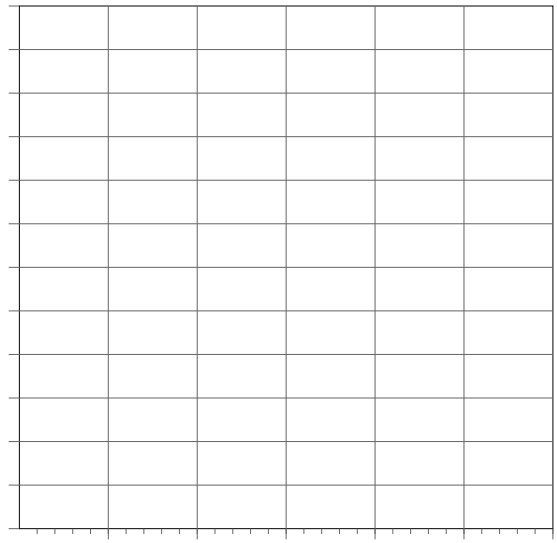
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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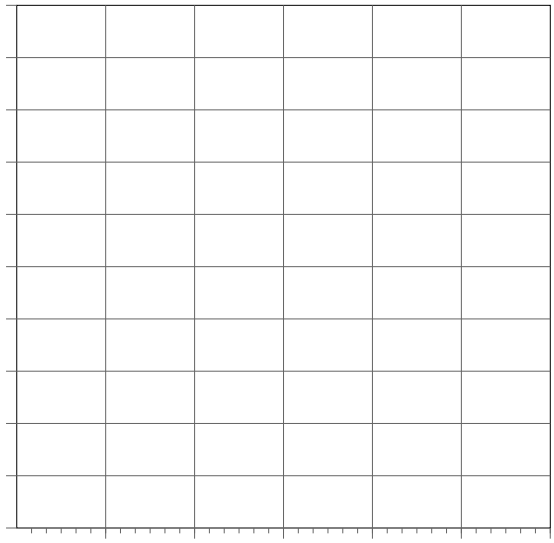
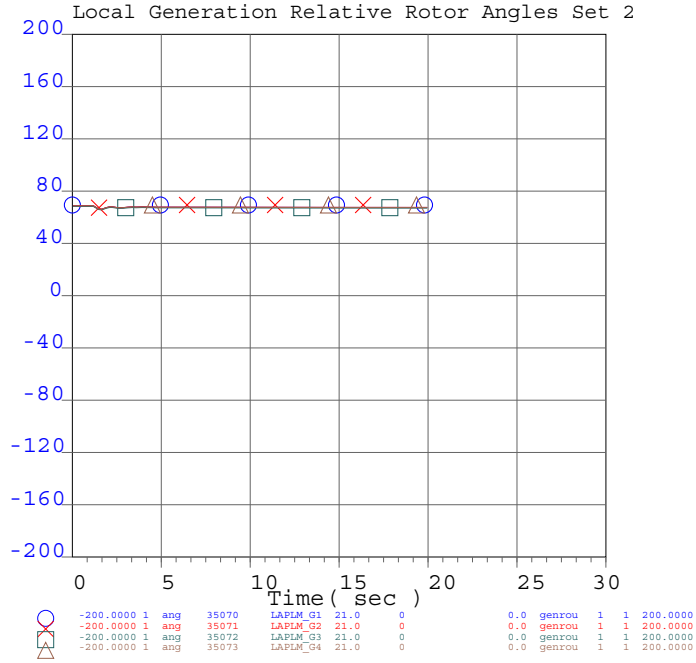
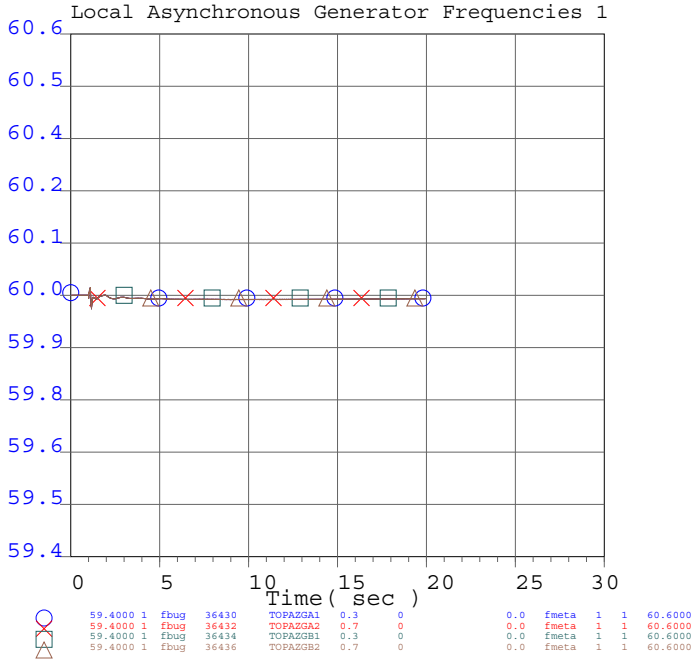
Local Generation Relative Rotor Angles Set 1



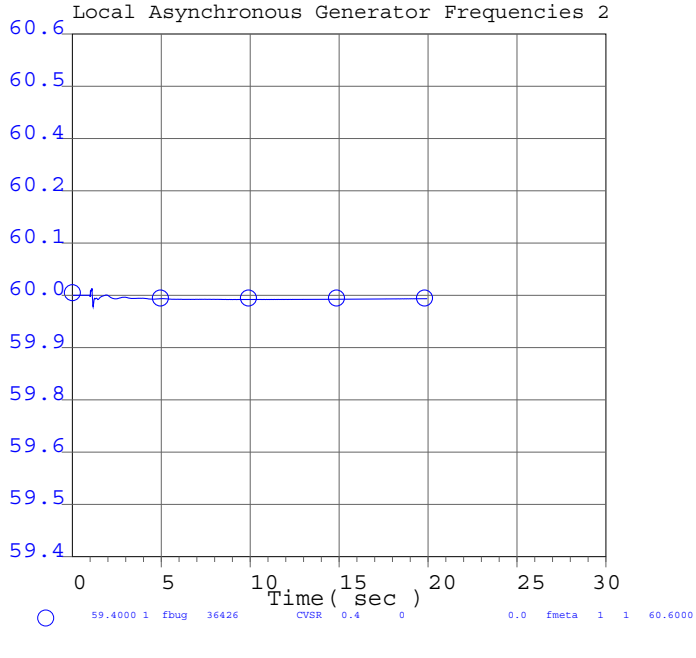
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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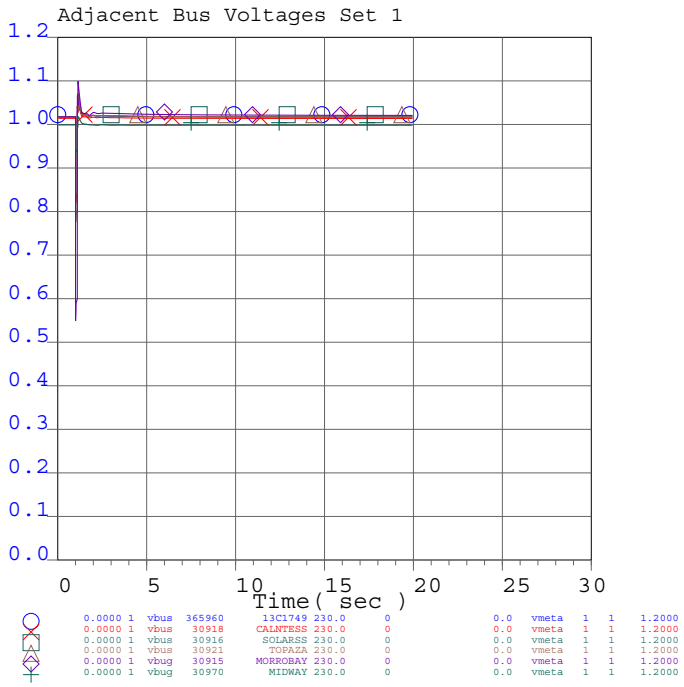

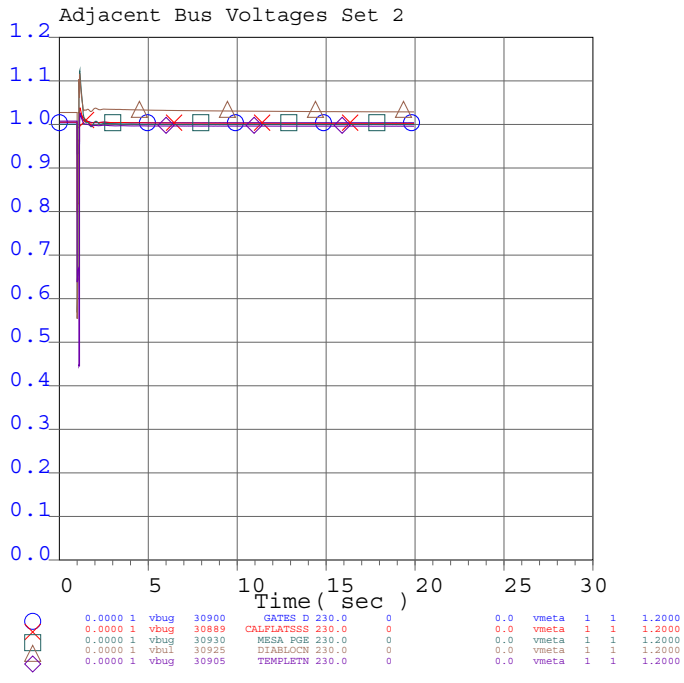

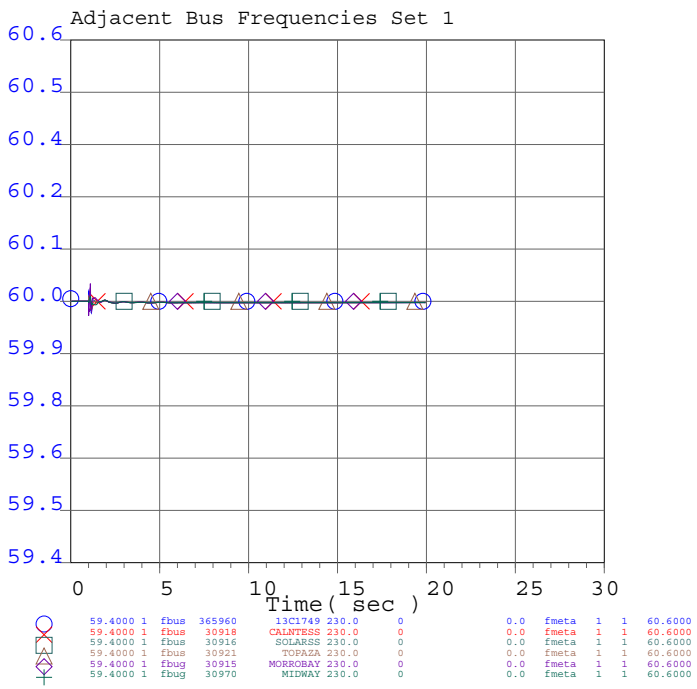

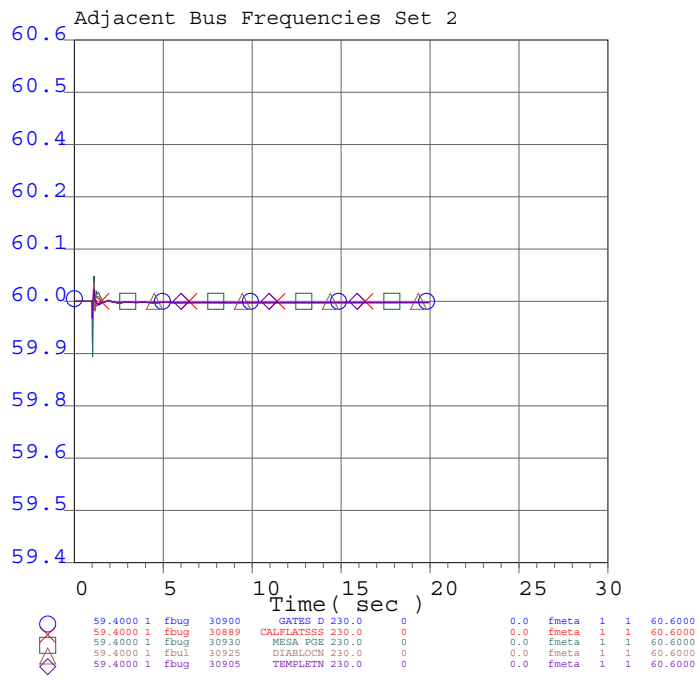

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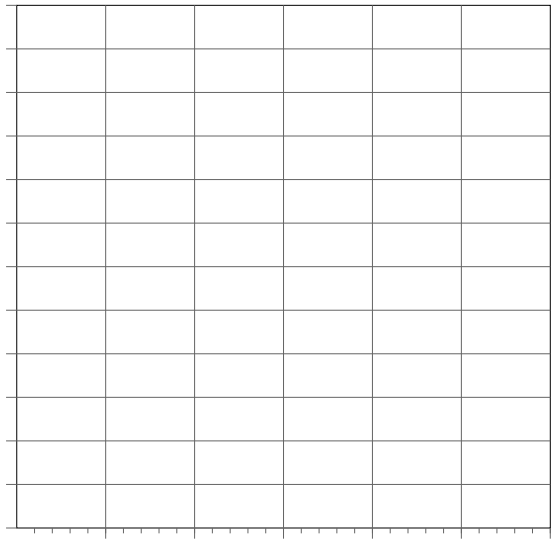
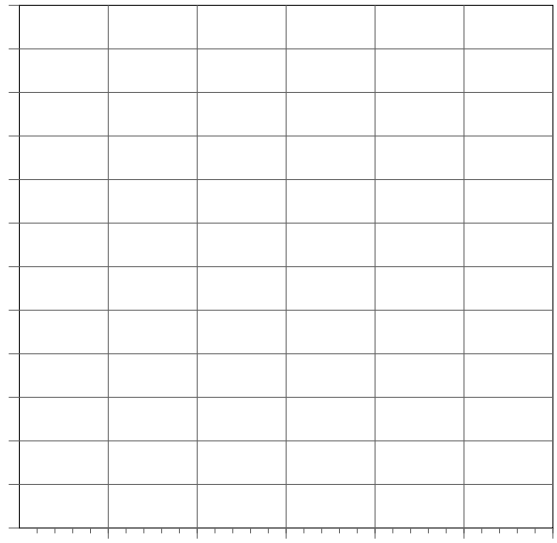
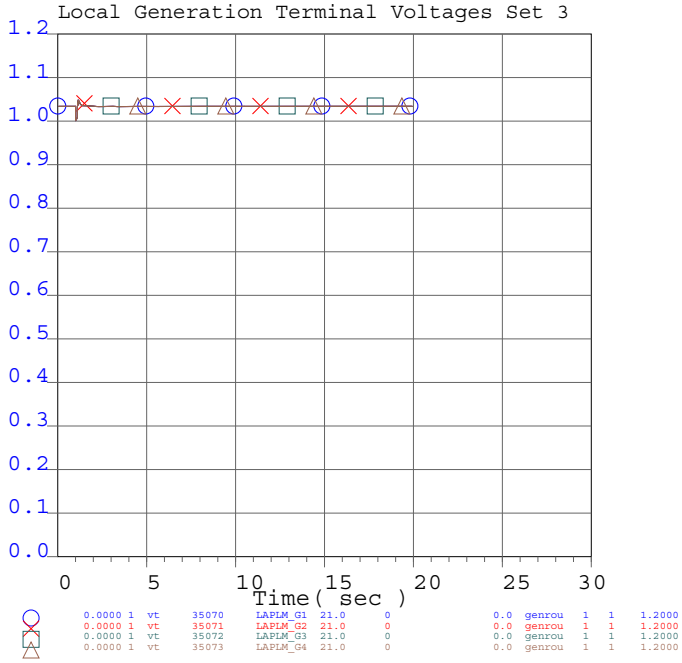
Local Generation Terminal Voltages Set 1



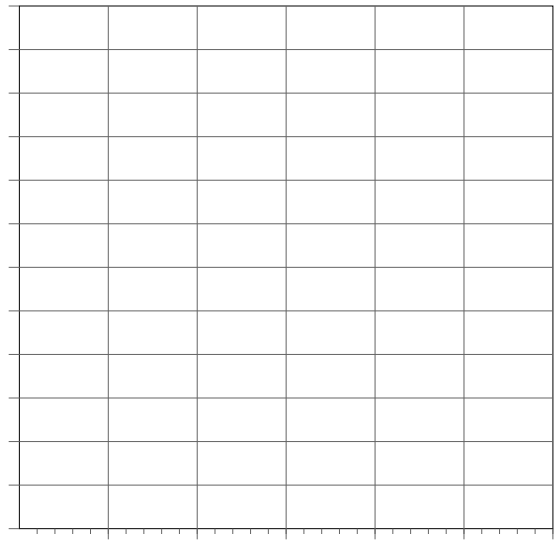
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

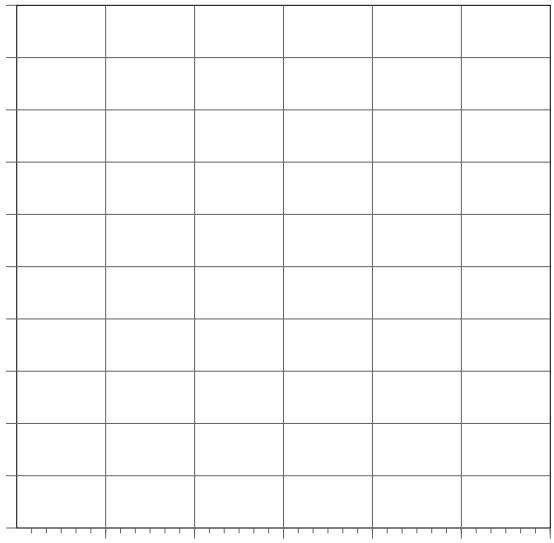


Local Generation Terminal Voltages Set 4

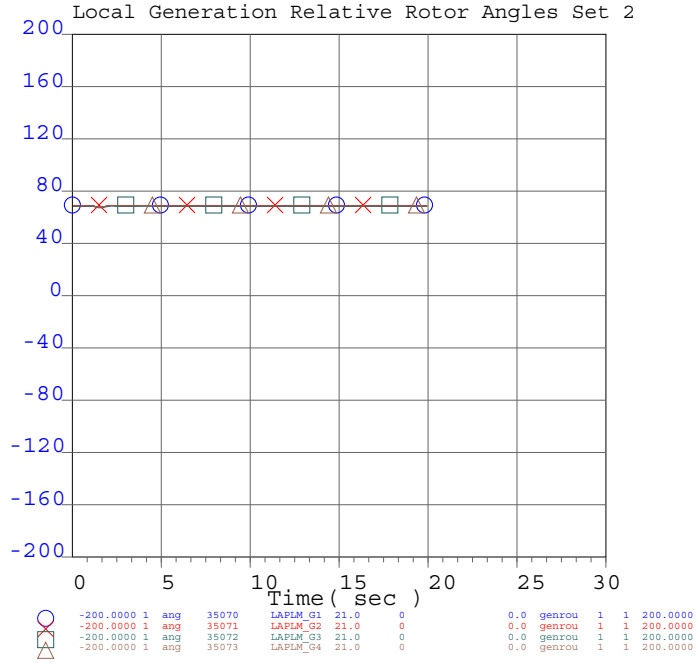


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

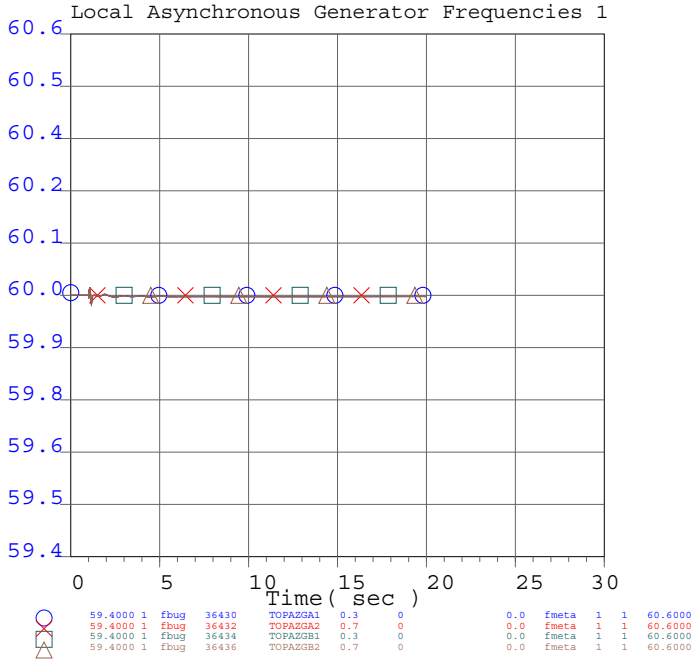
Local Generation Relative Rotor Angles Set 1



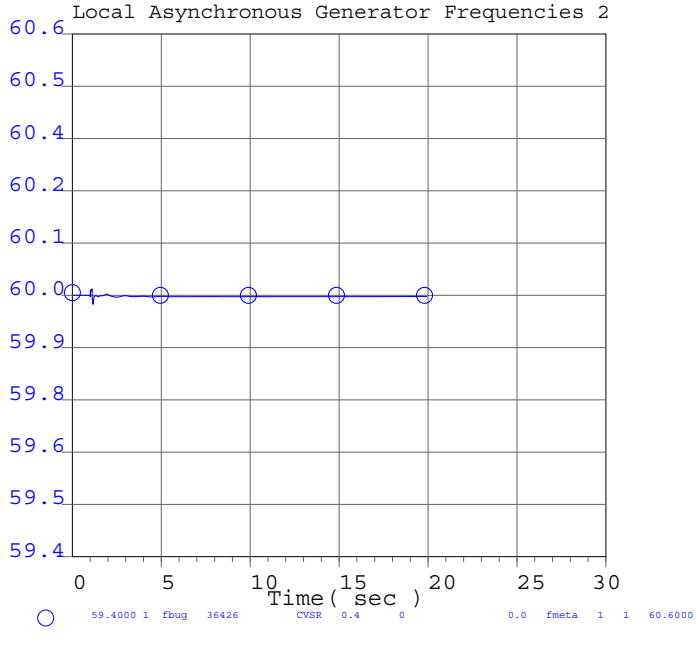
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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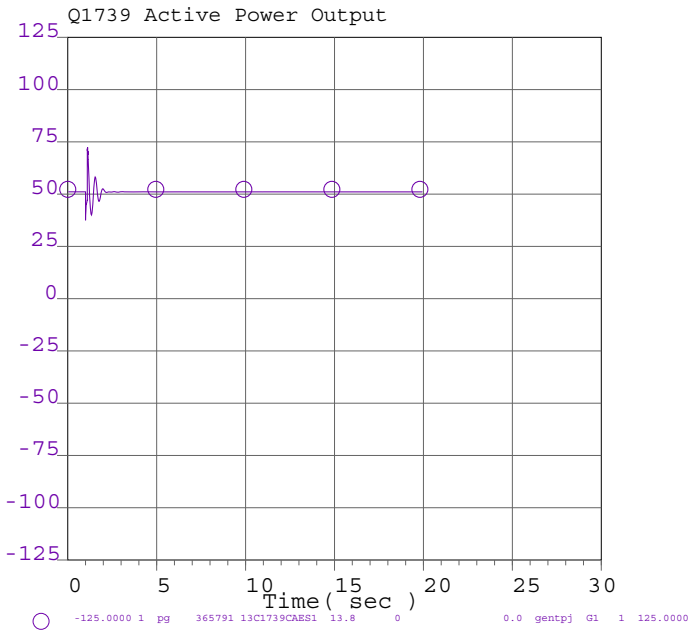
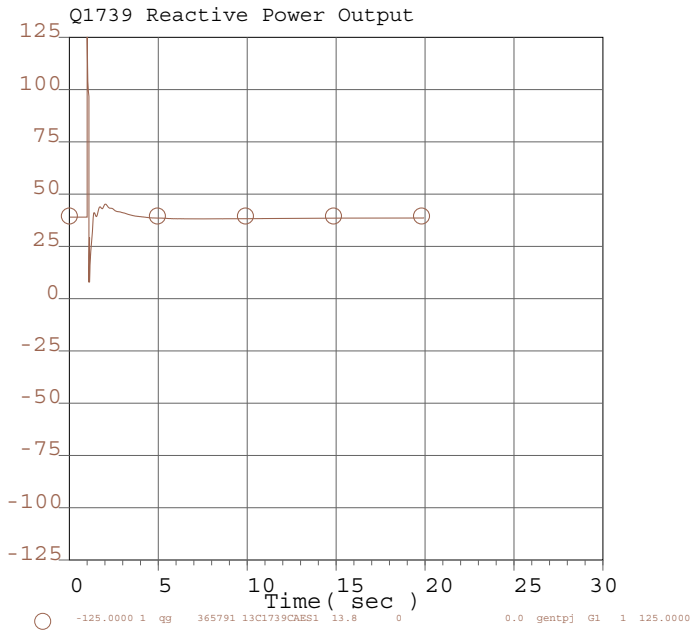
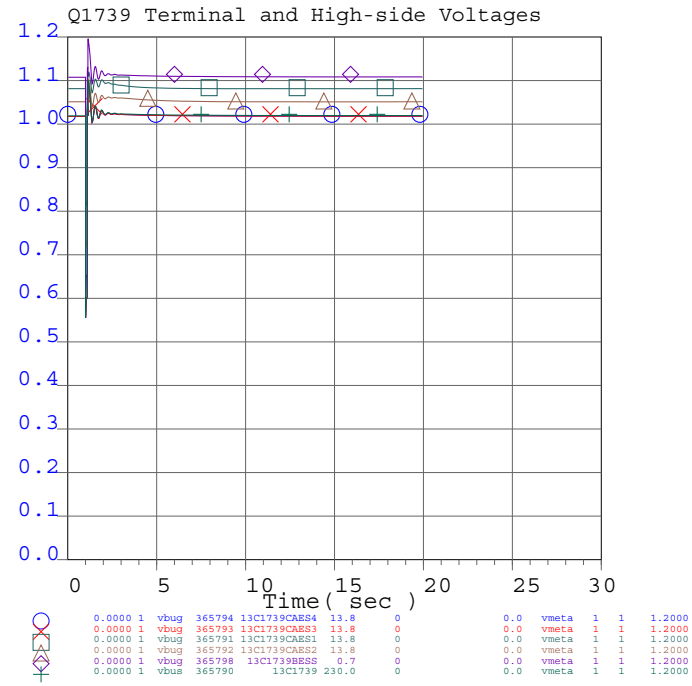
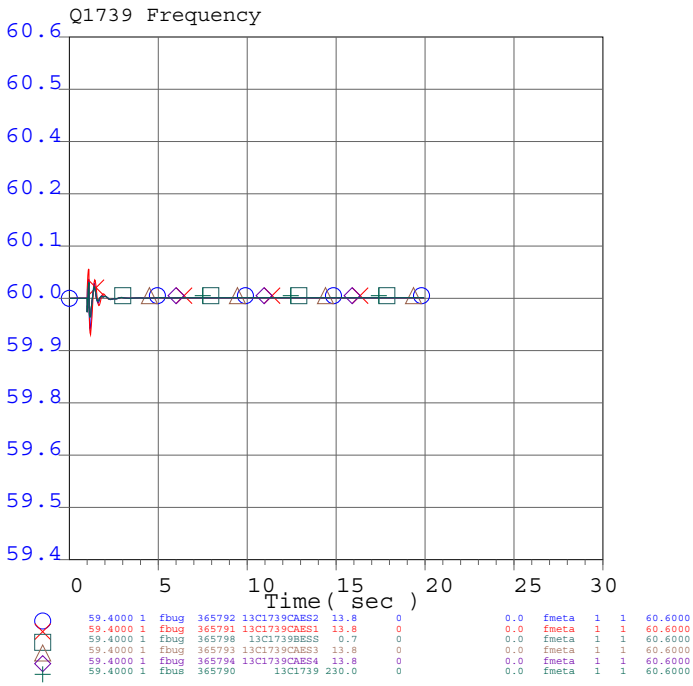
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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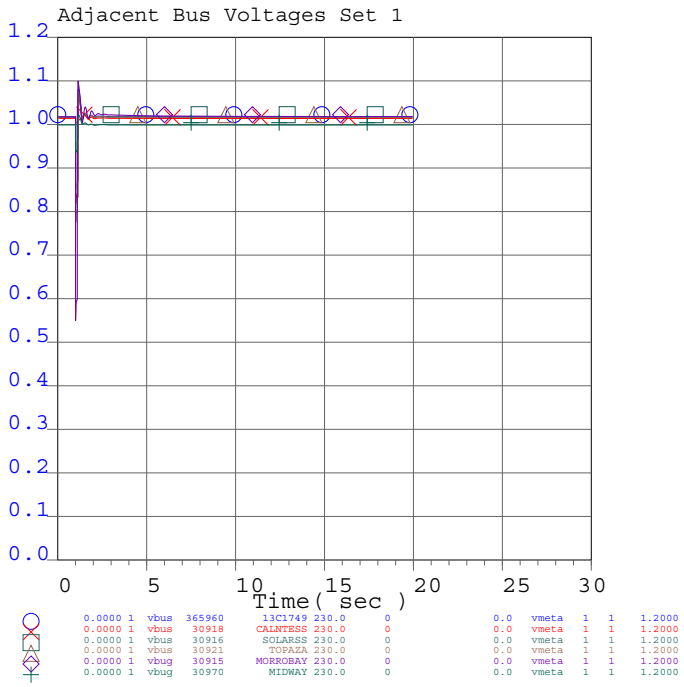

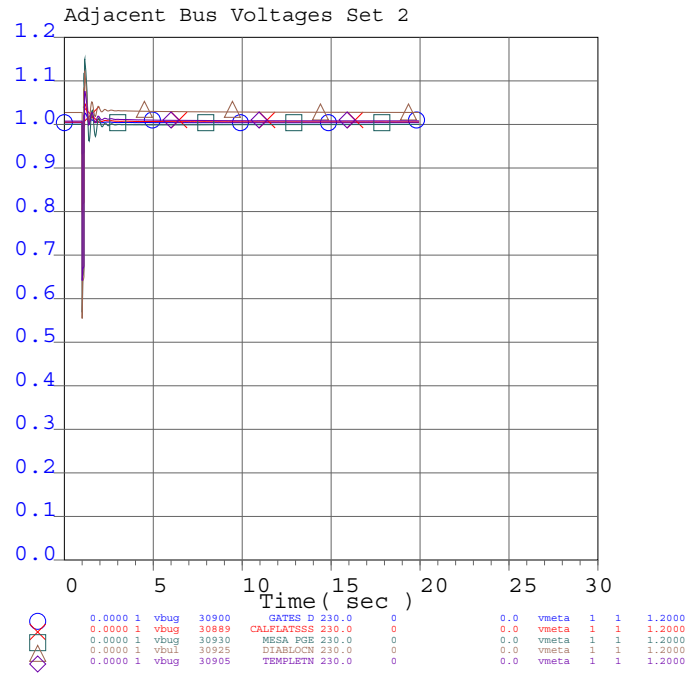

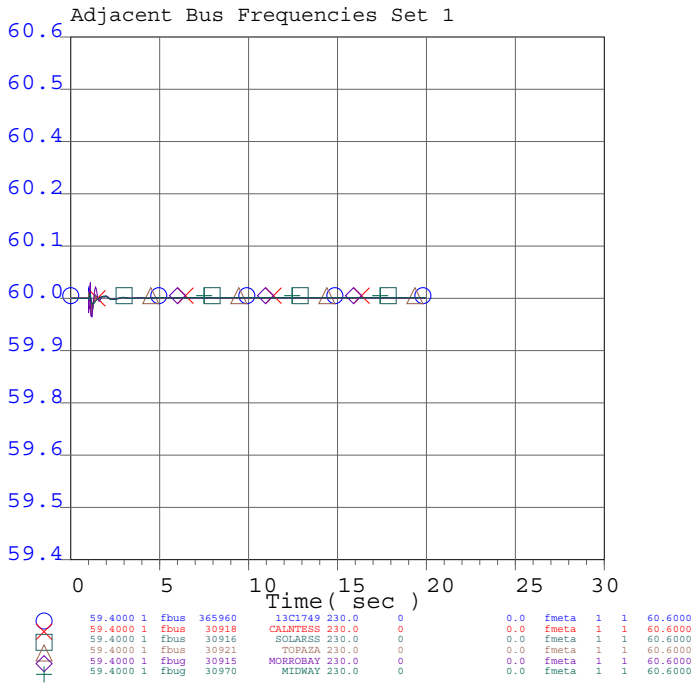

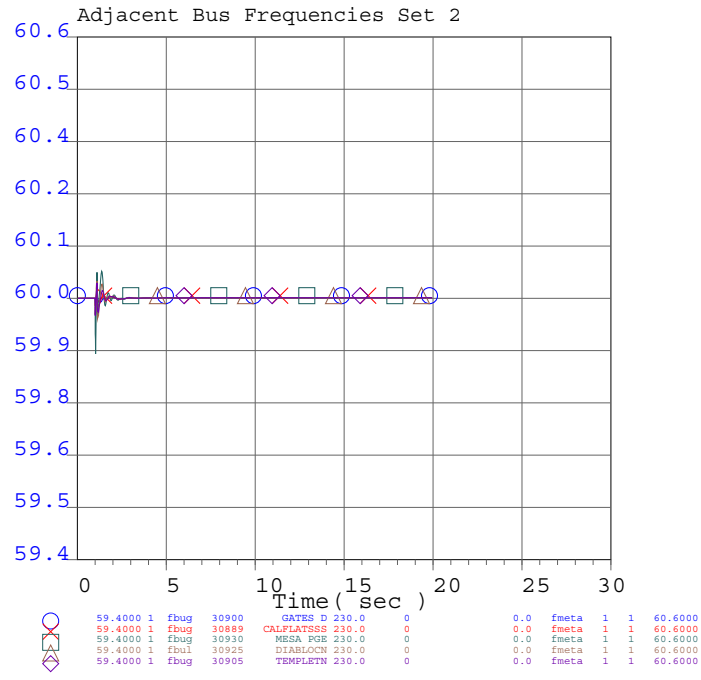

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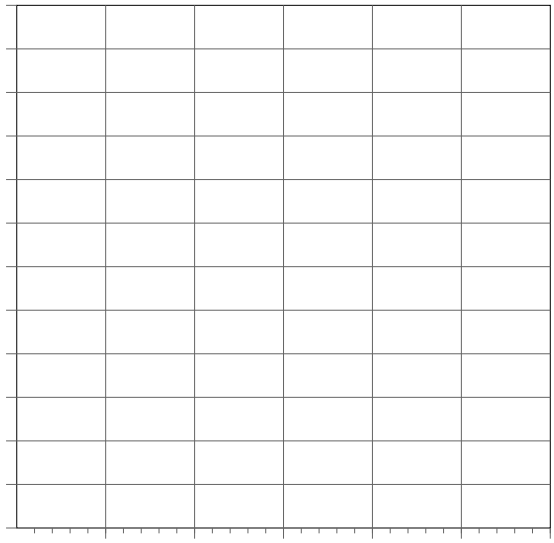
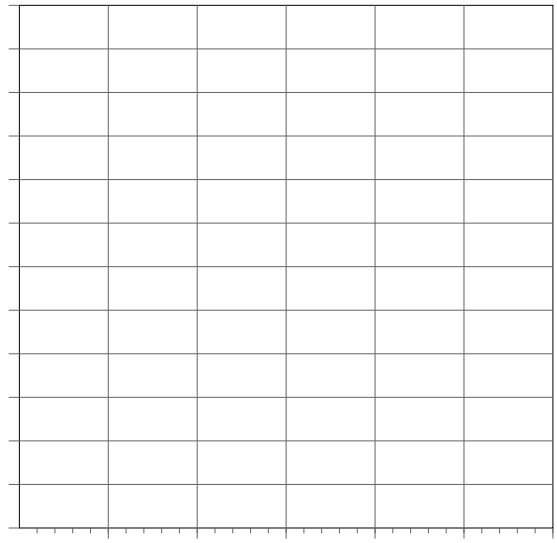
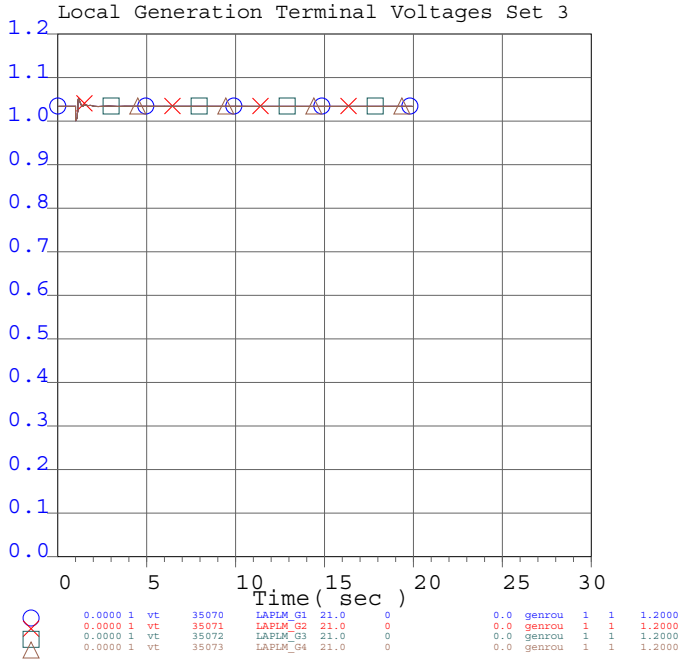
Local Generation Terminal Voltages Set 1



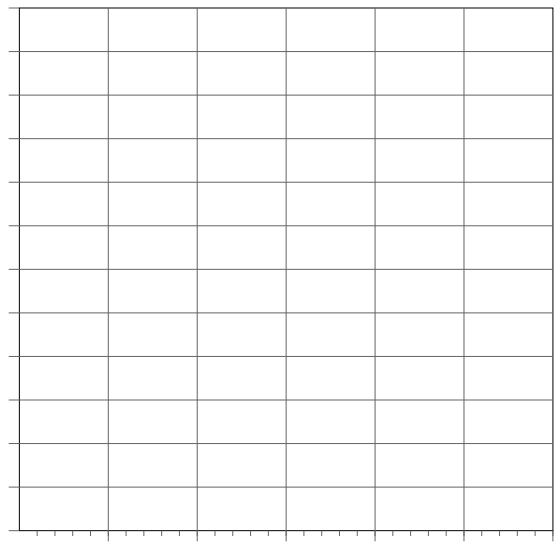
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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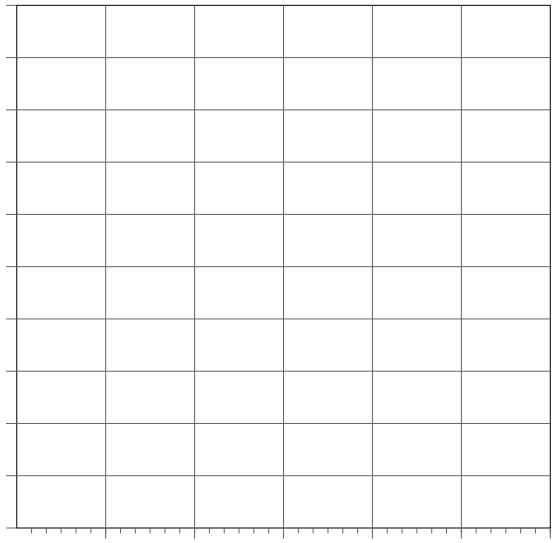
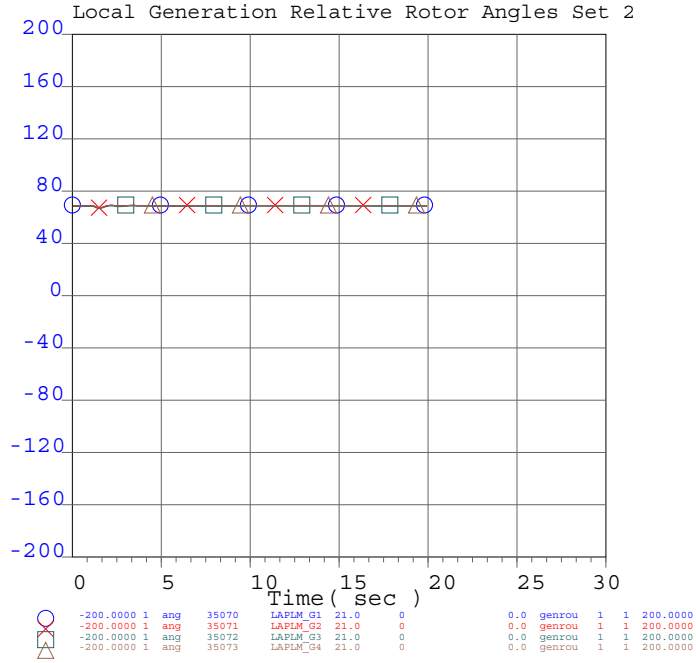
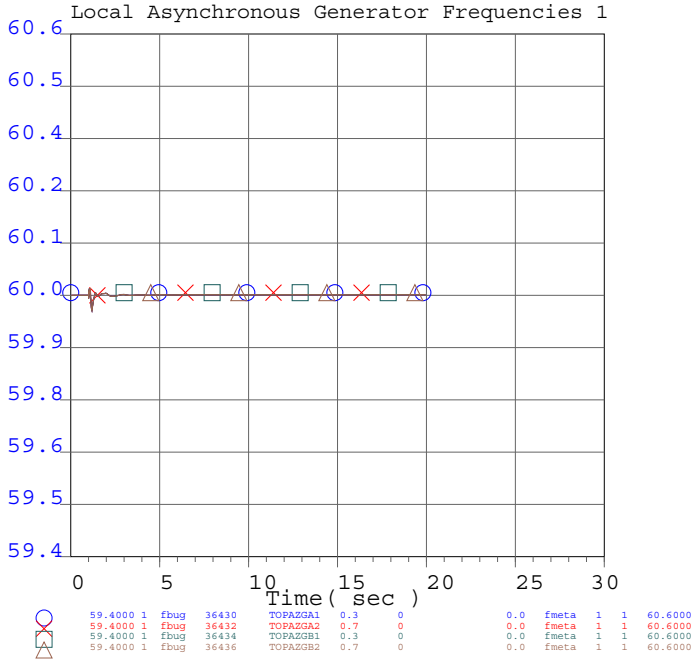
Local Generation Relative Rotor Angles Set 1



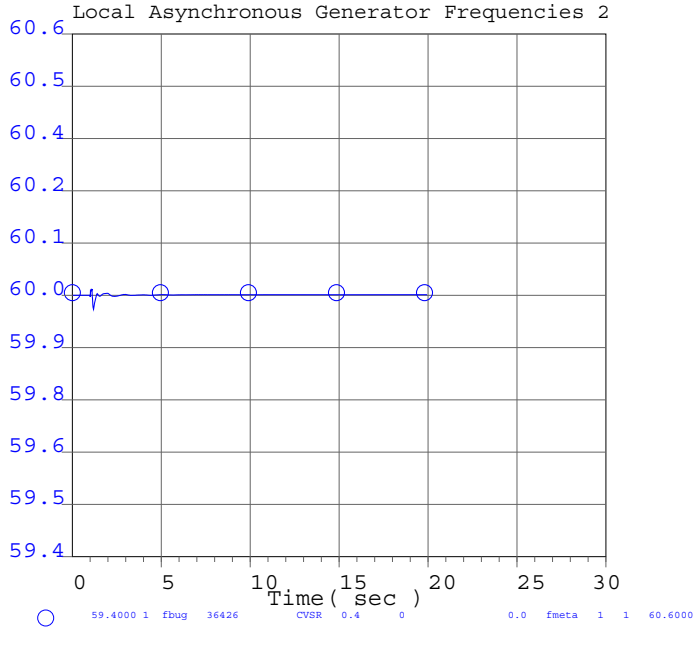
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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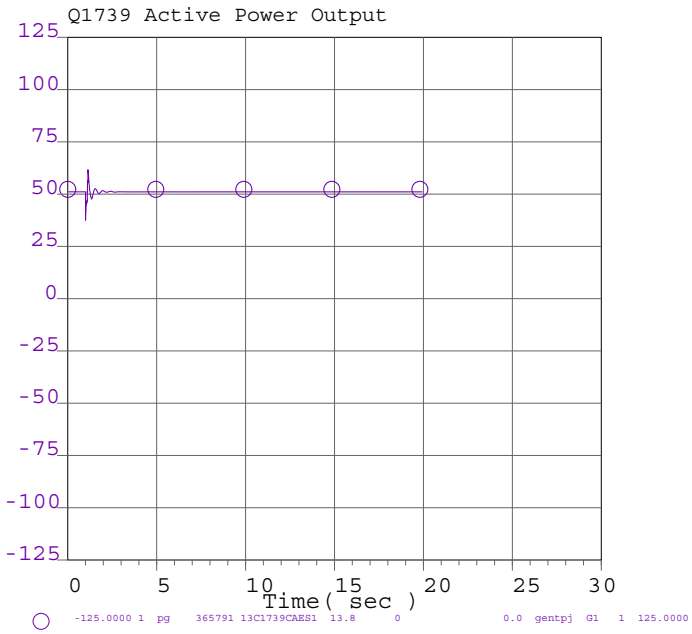
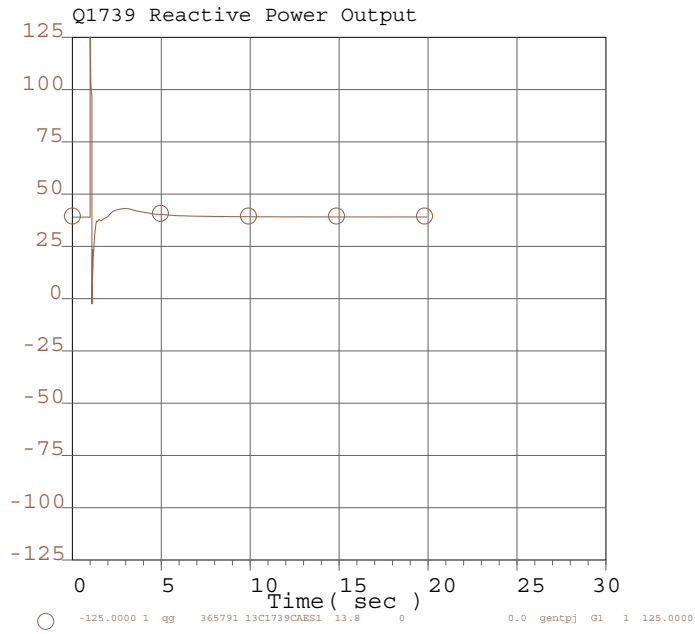
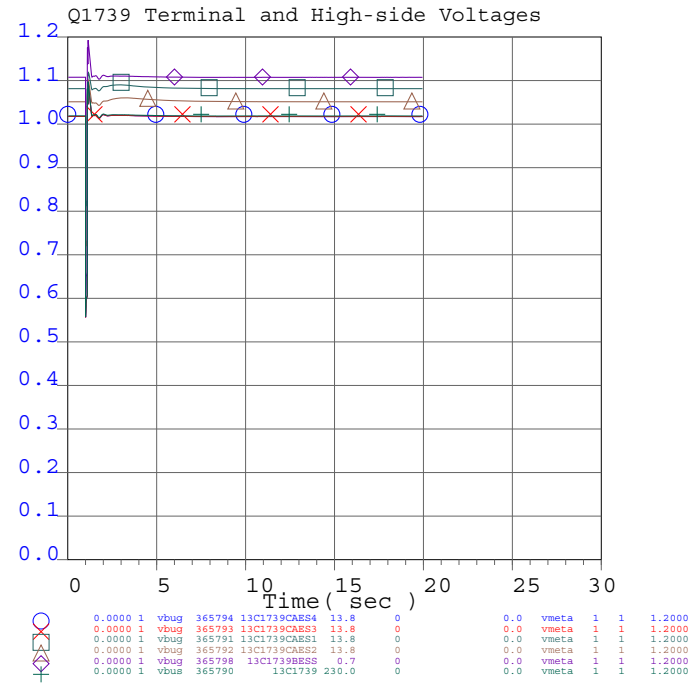
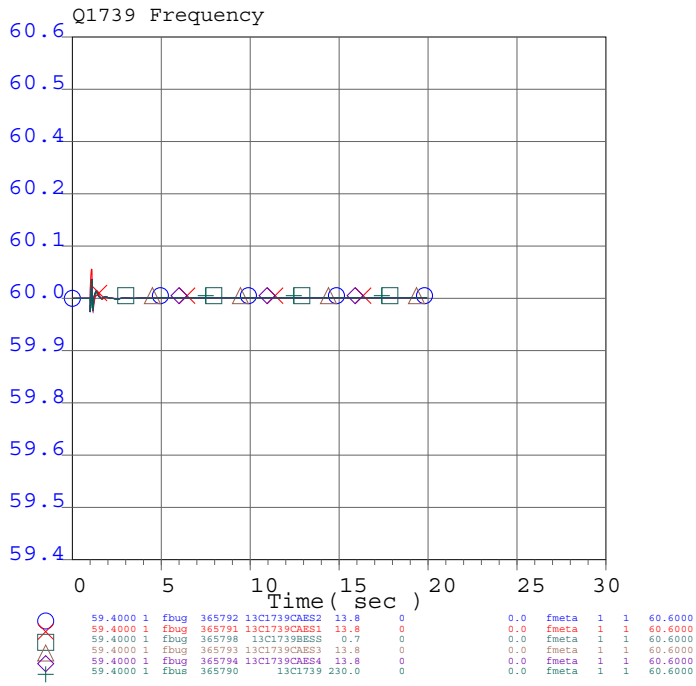
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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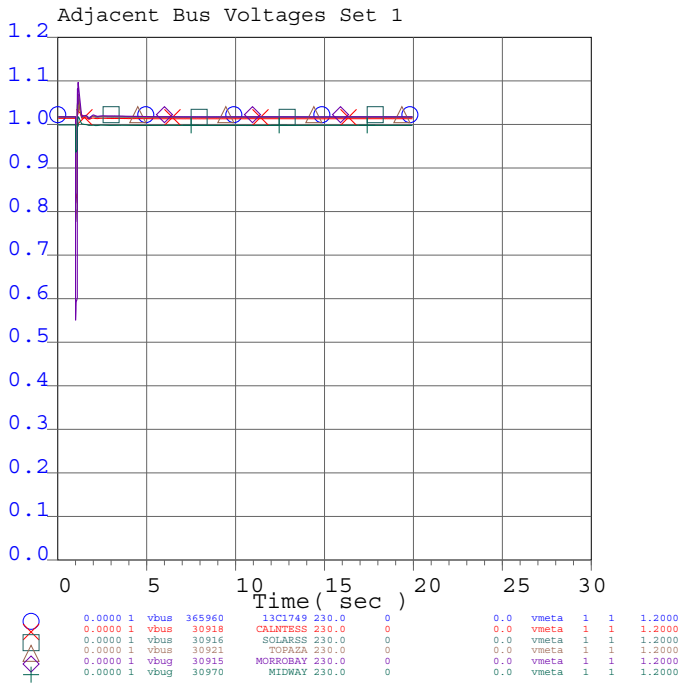

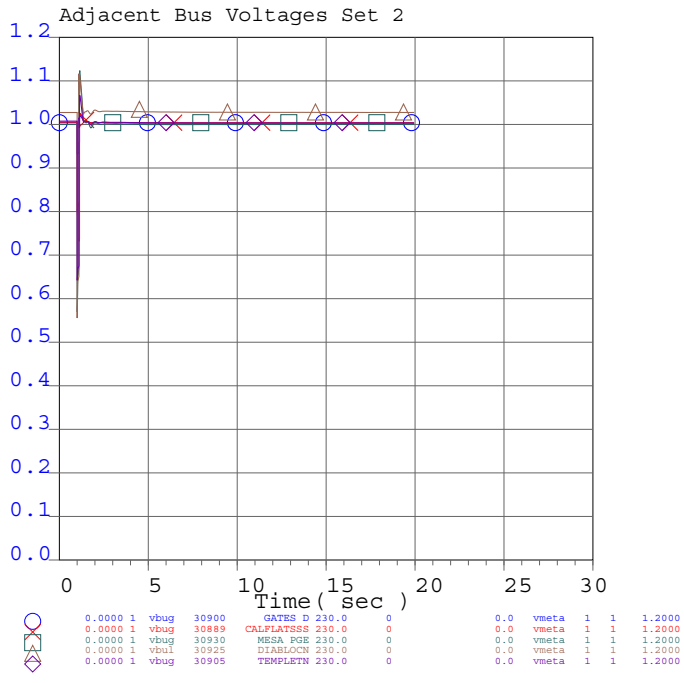

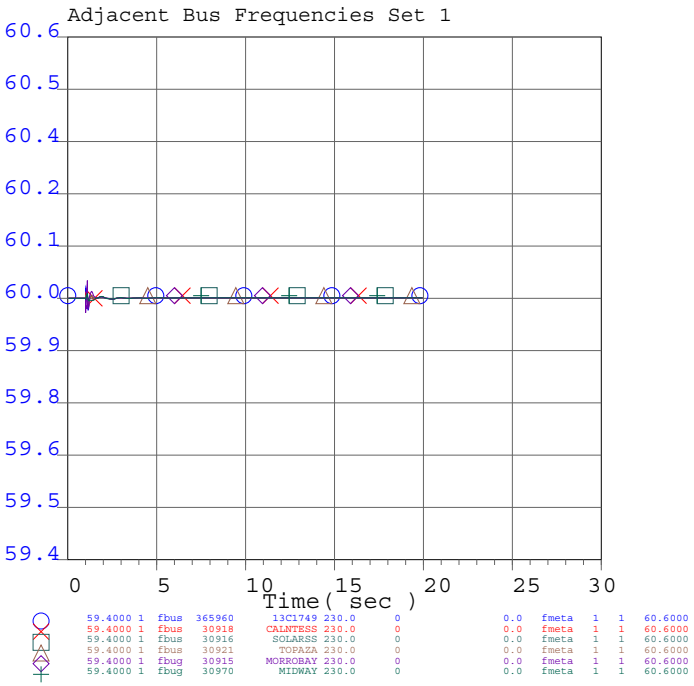

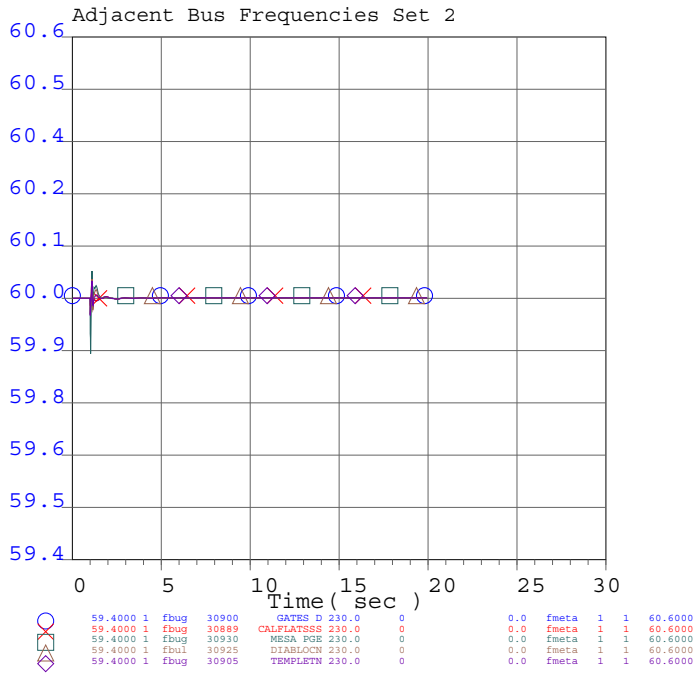

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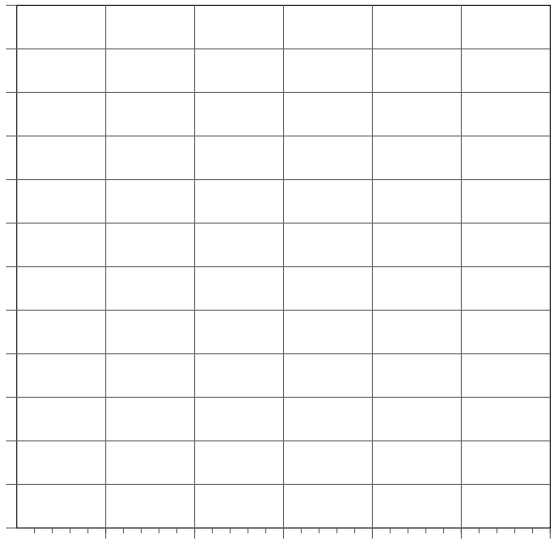
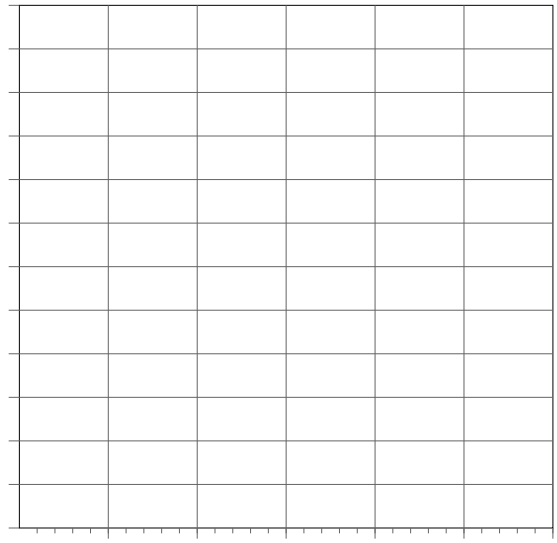
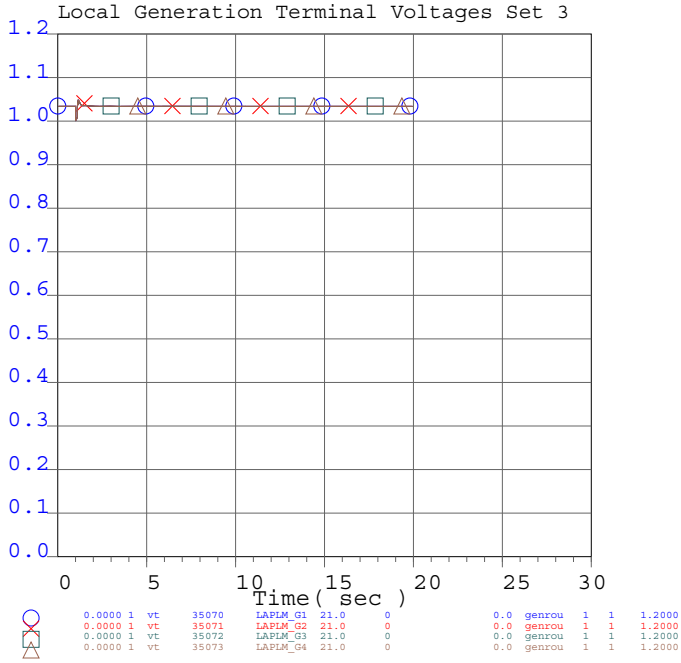
Local Generation Terminal Voltages Set 1



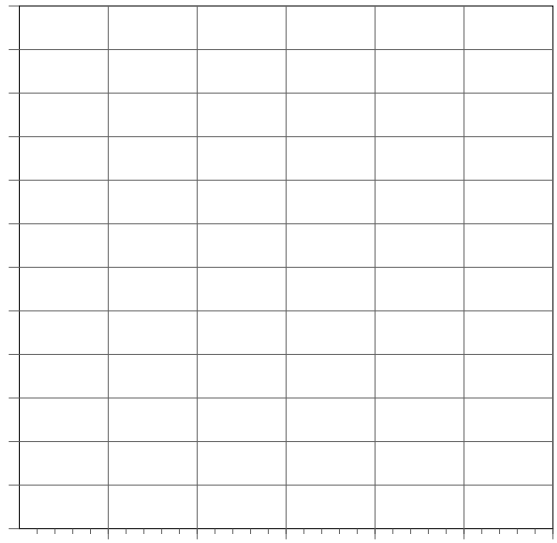
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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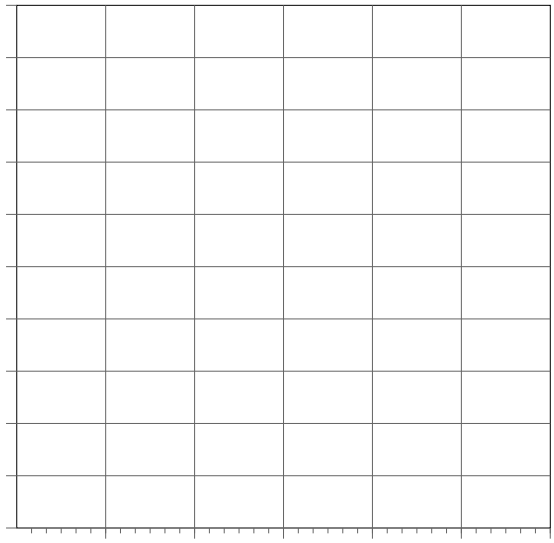
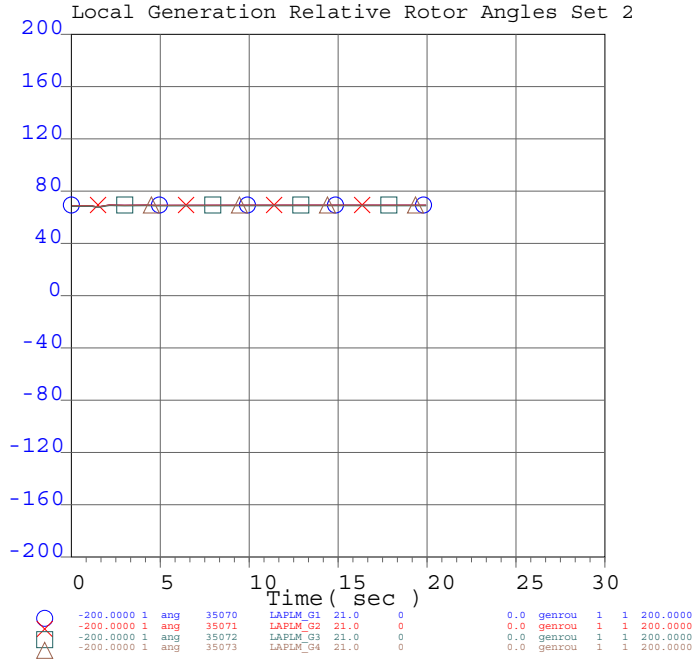
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



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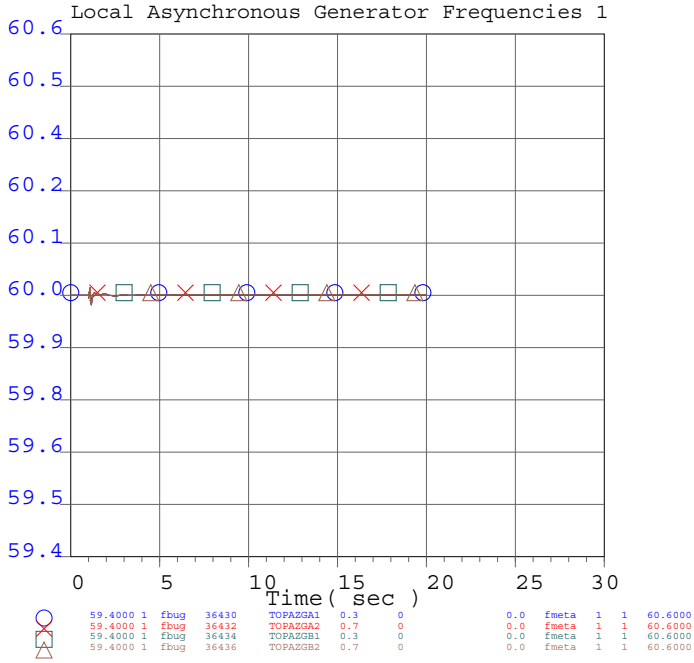
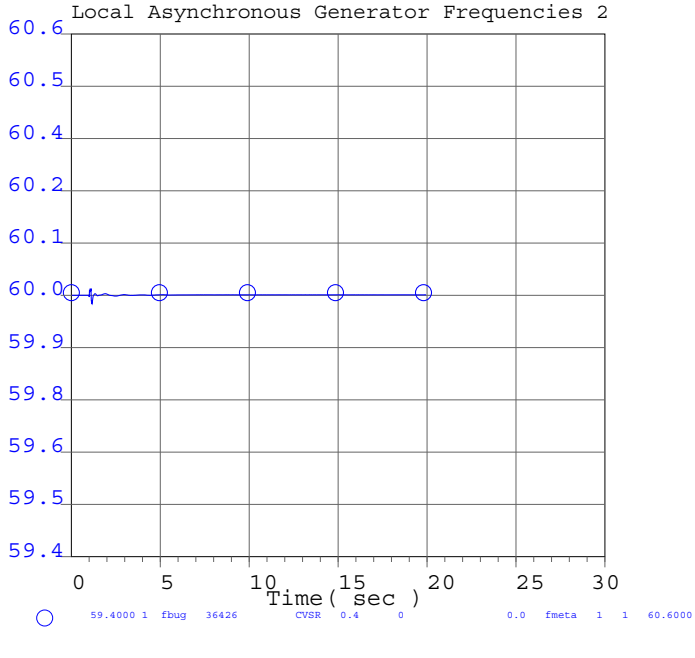


Local Asynchronous Generator Frequencies 2



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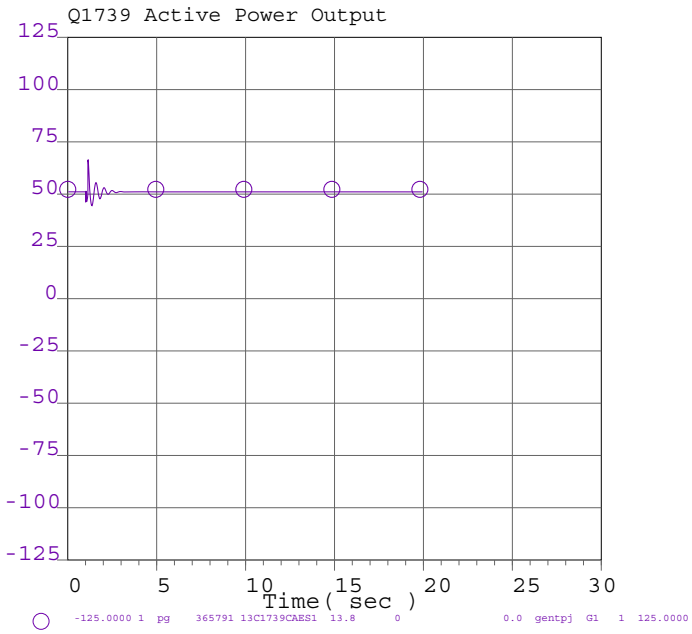

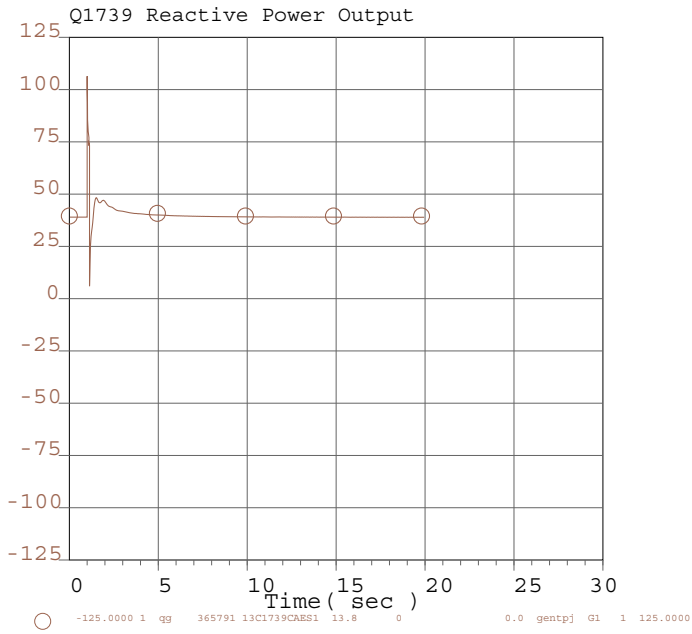

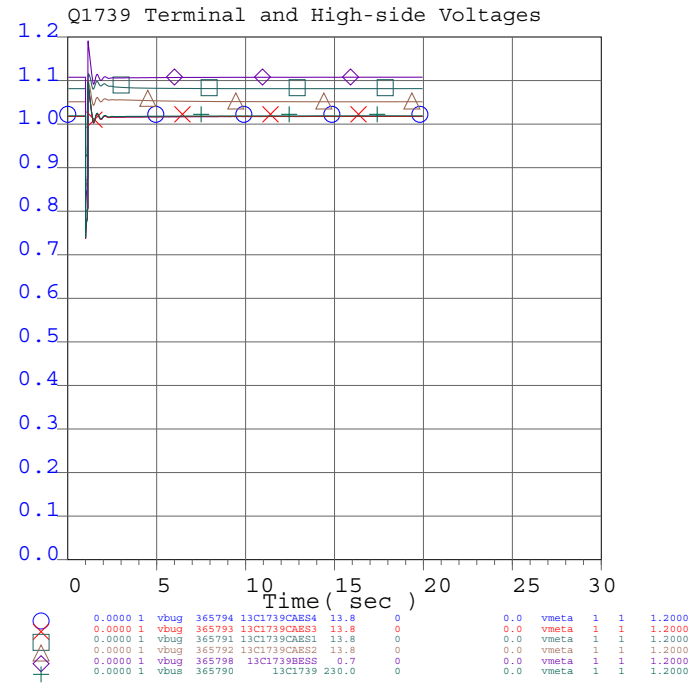

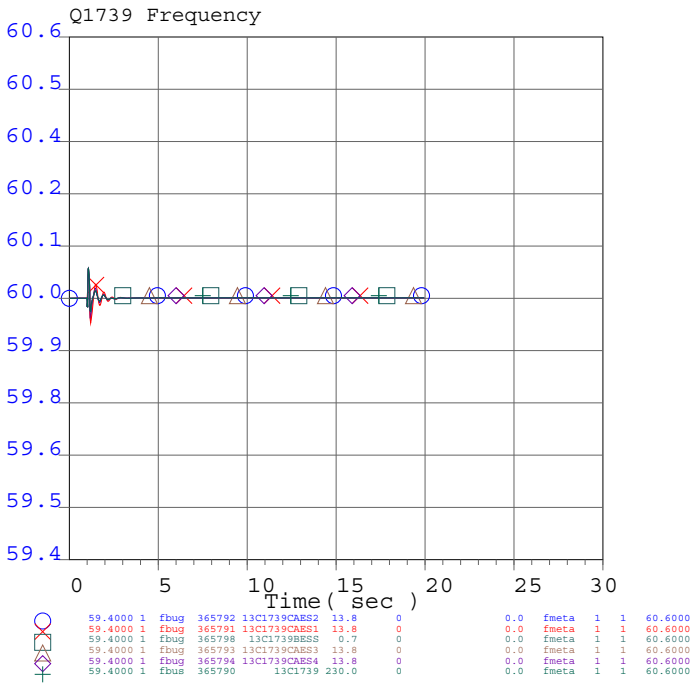

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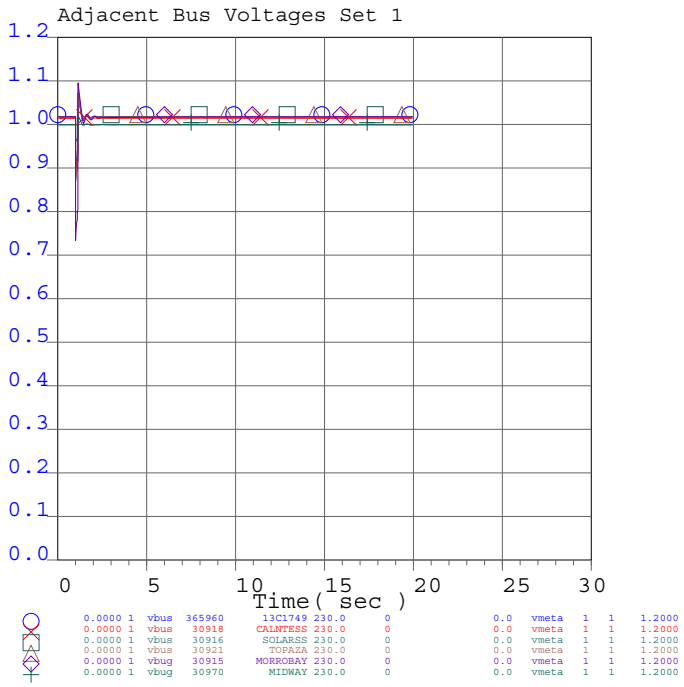

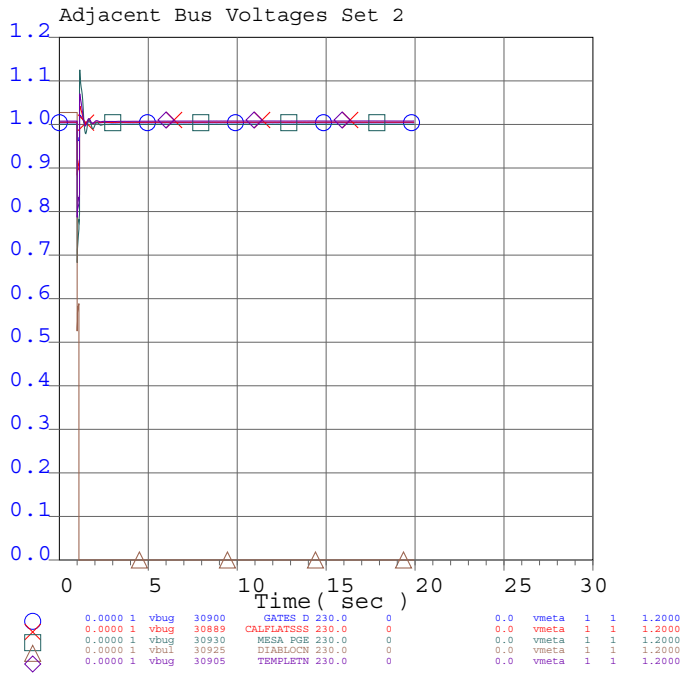

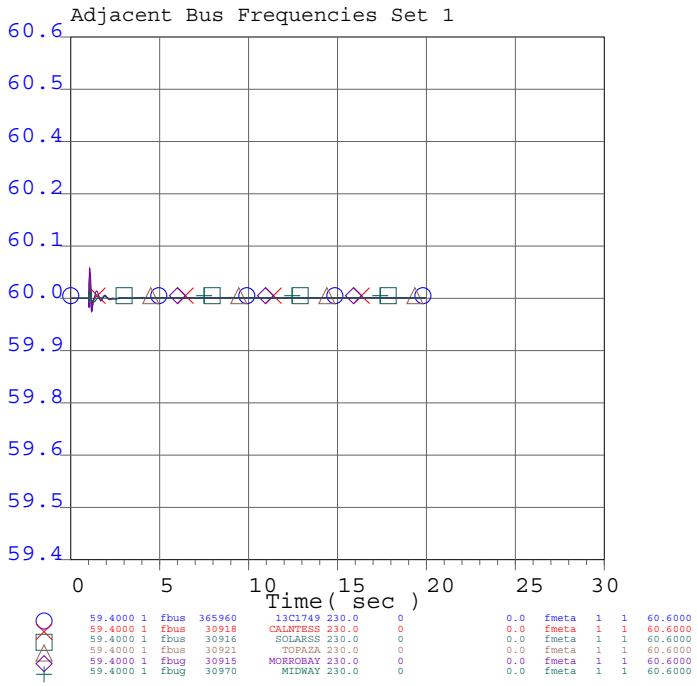

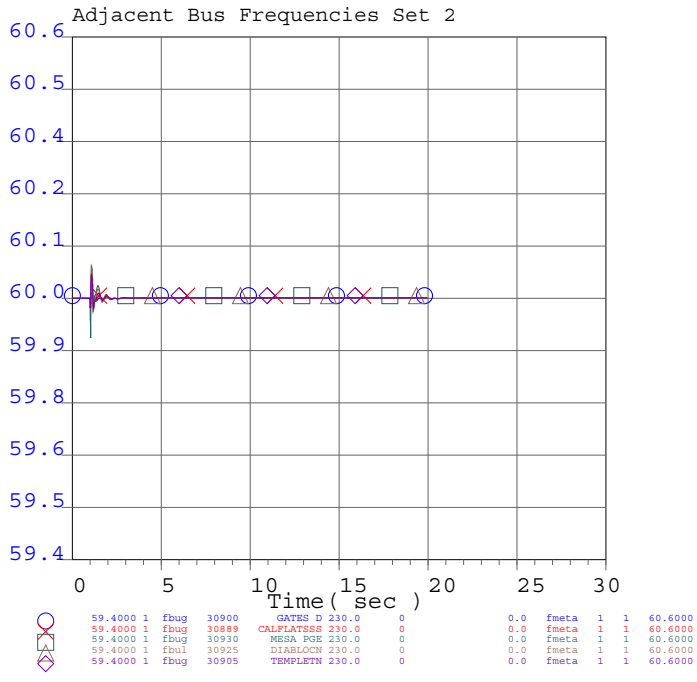

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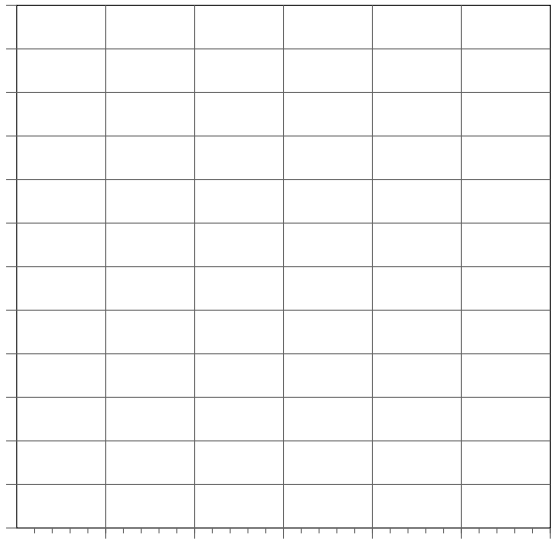
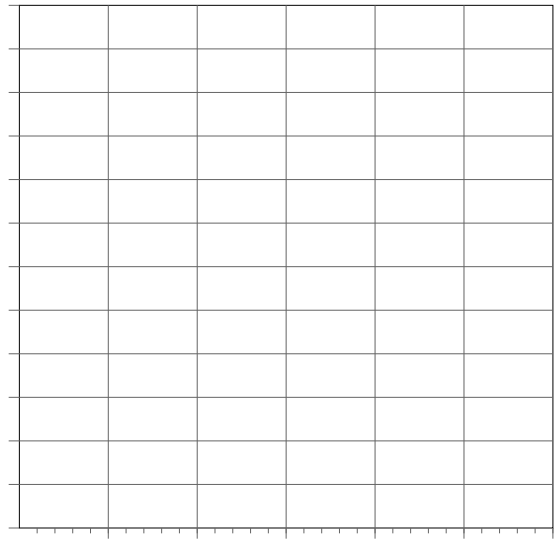
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

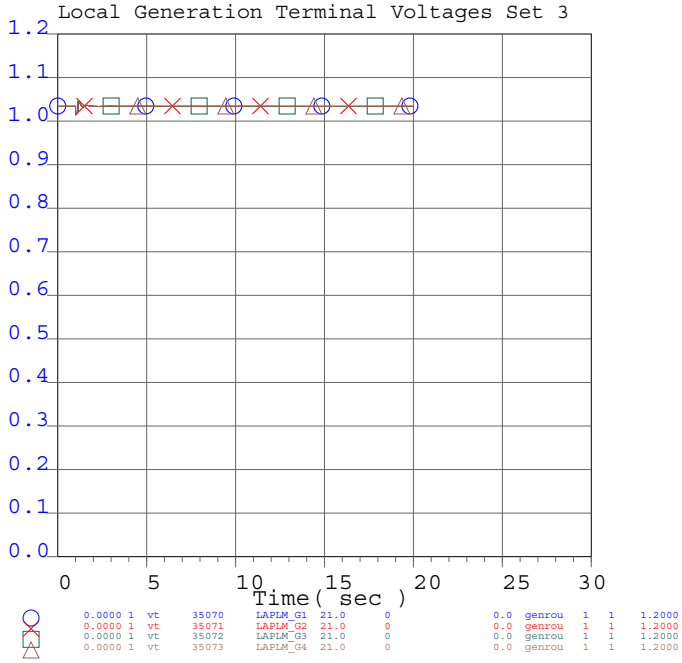
Local Generation Terminal Voltages Set 1



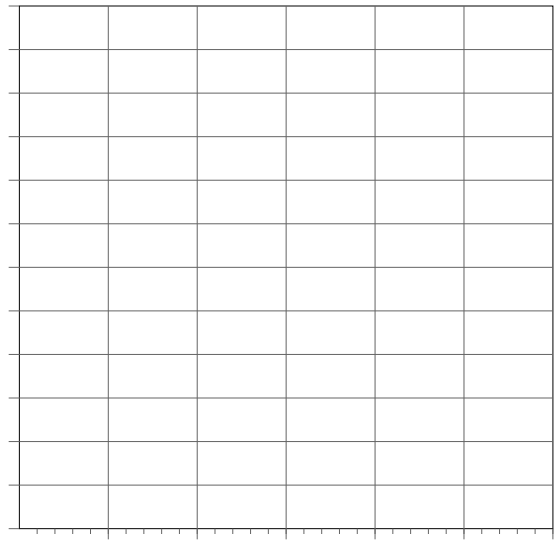
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

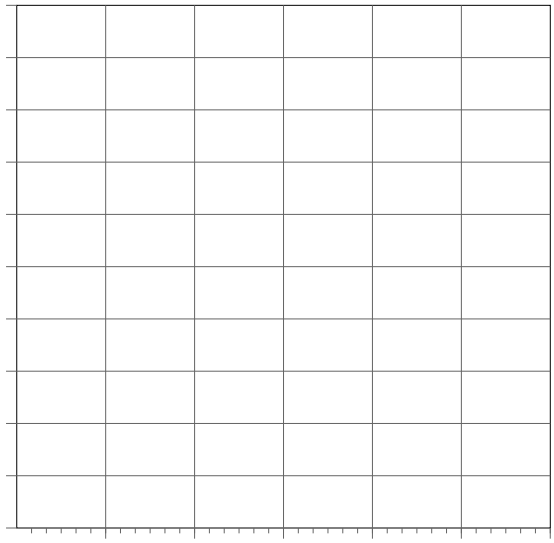


Local Generation Terminal Voltages Set 4

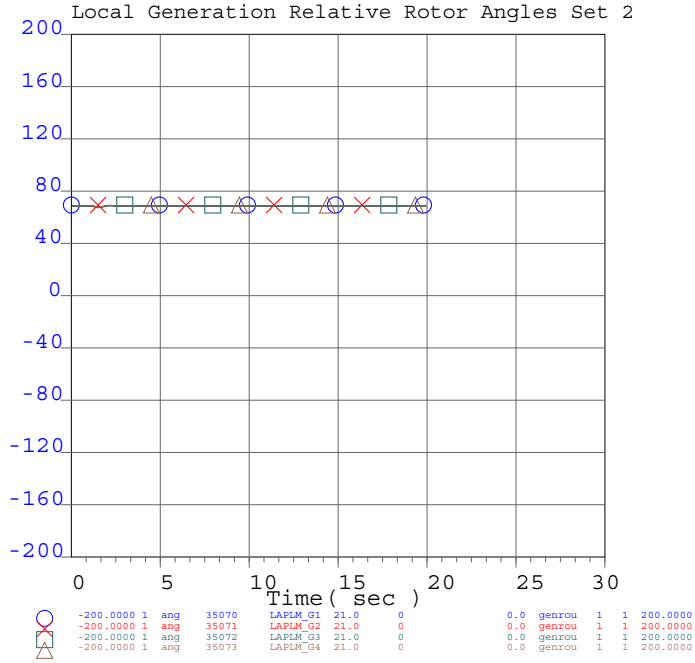


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

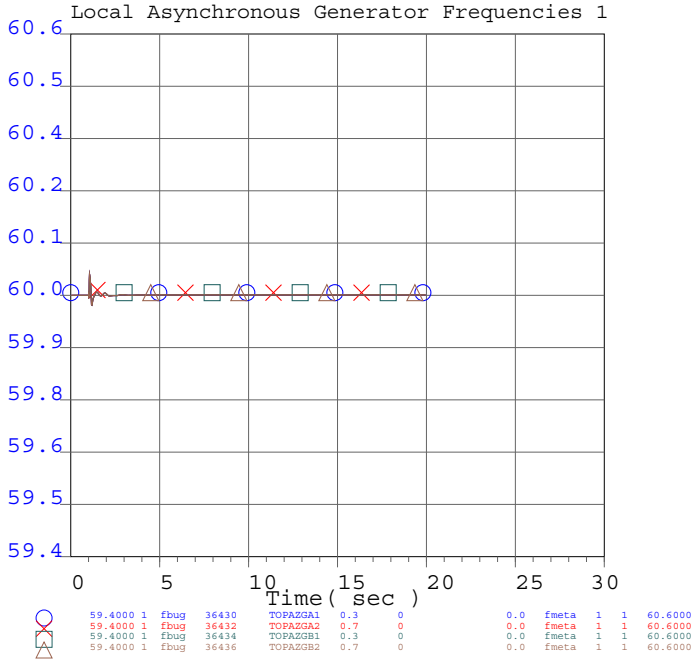
Local Generation Relative Rotor Angles Set 1



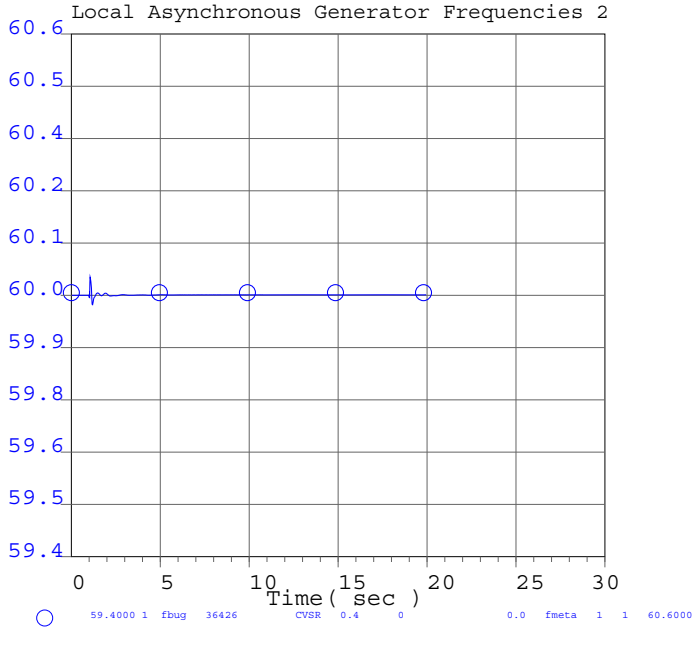
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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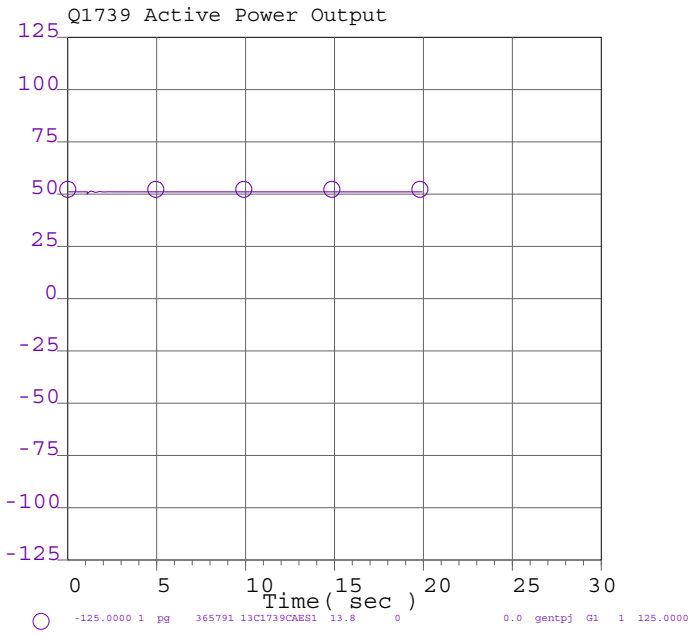
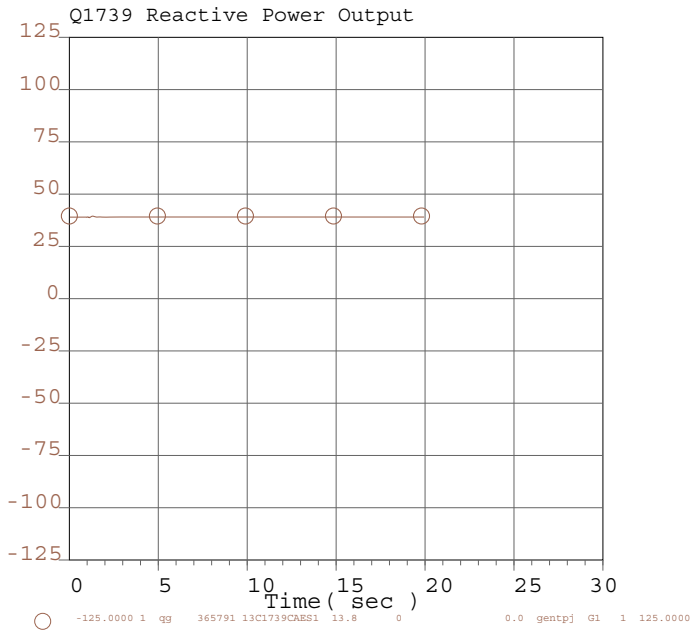
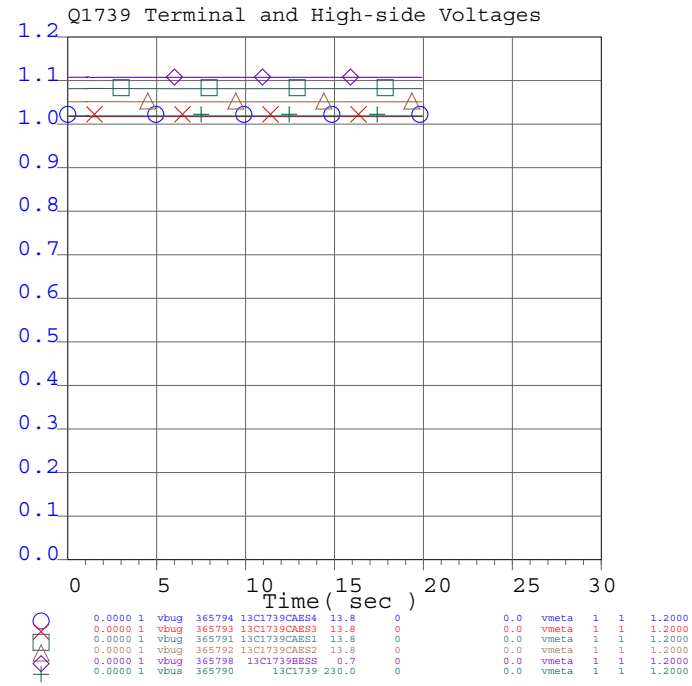
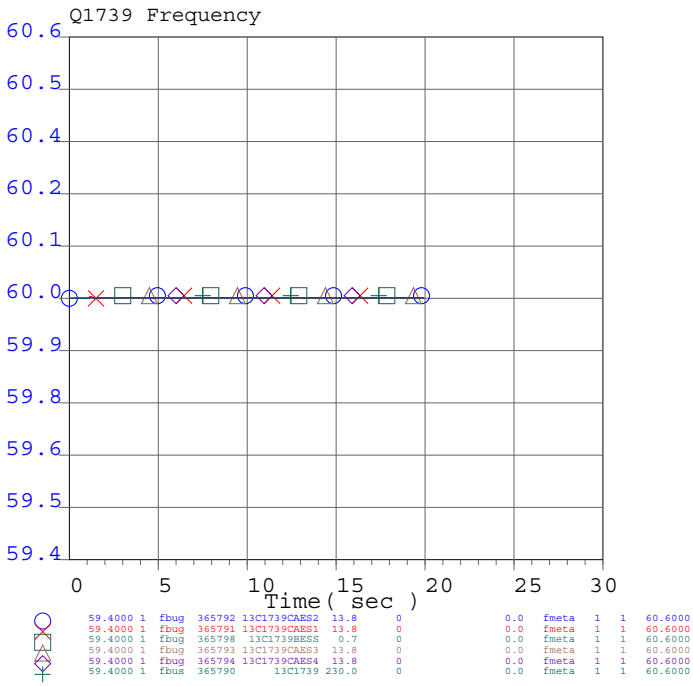
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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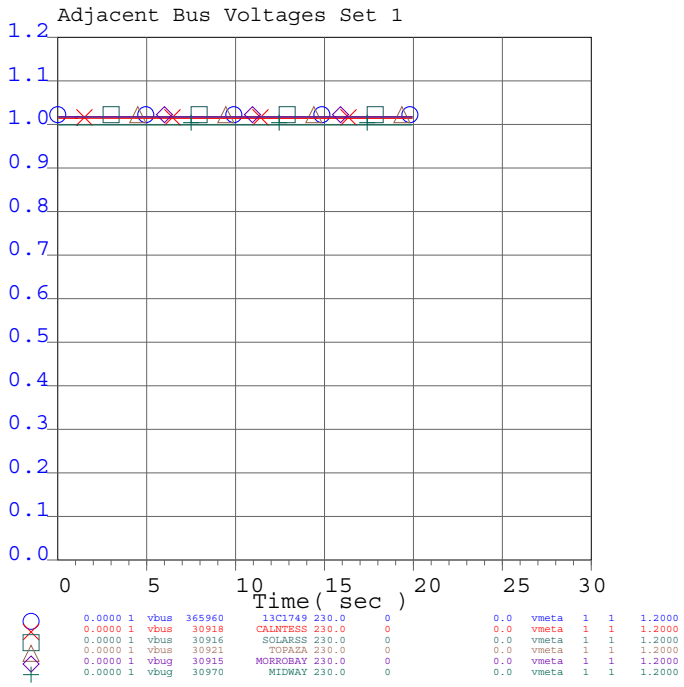

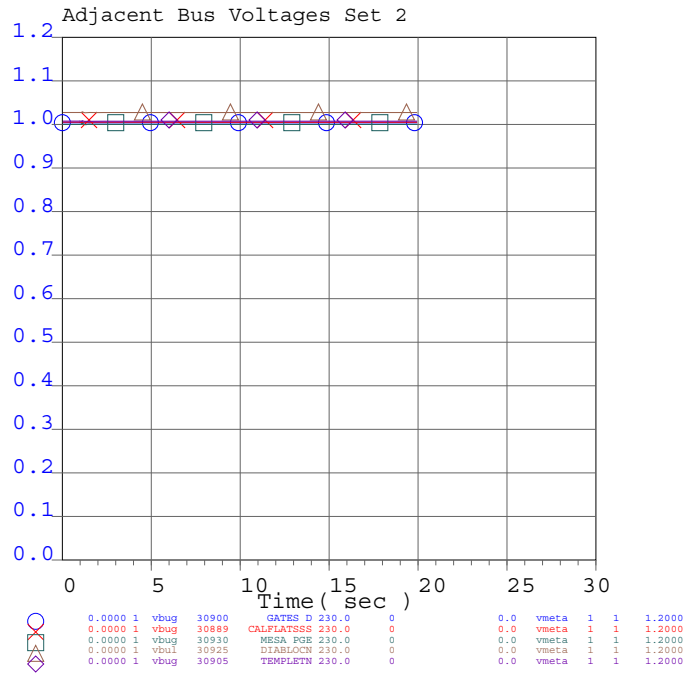

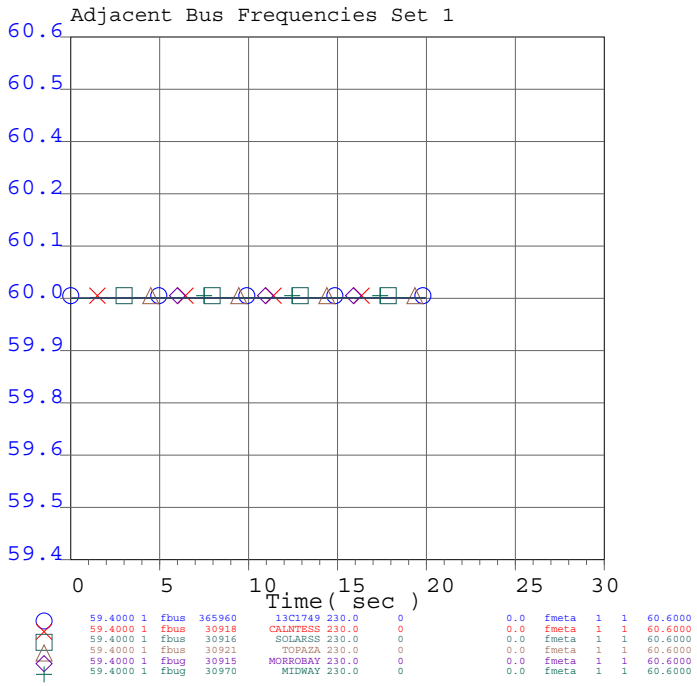

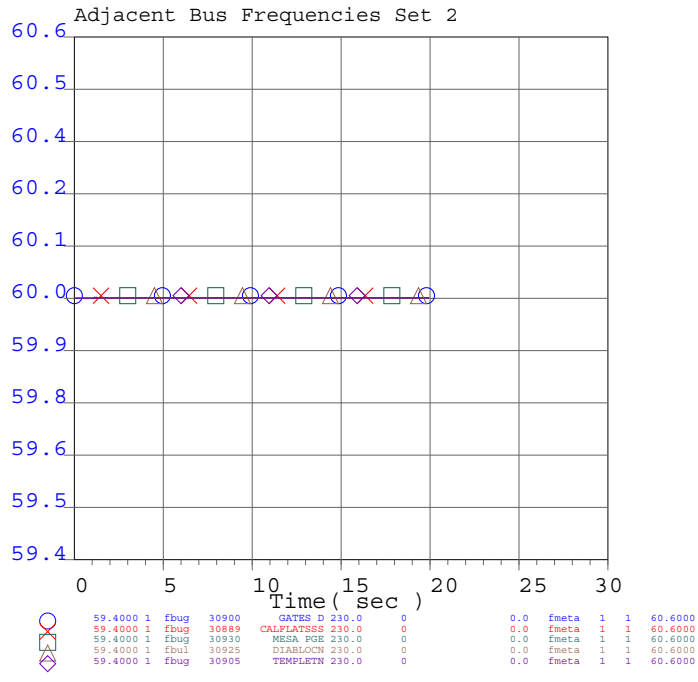

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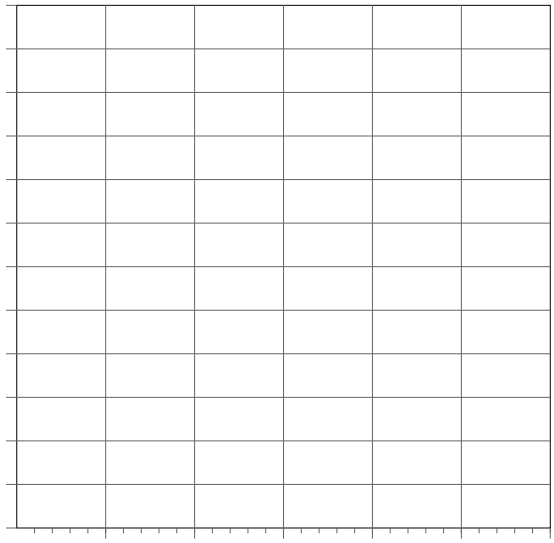
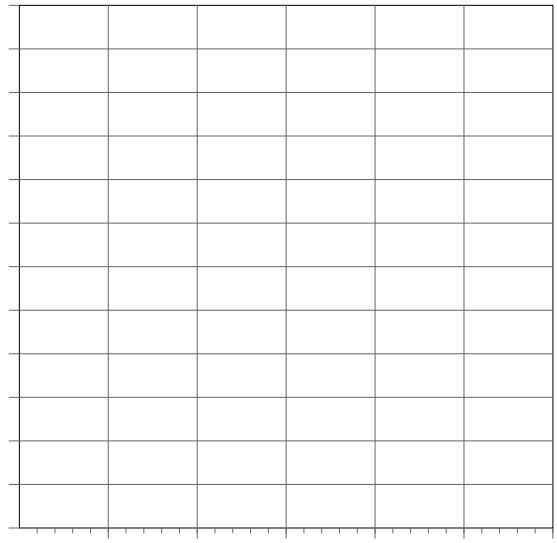
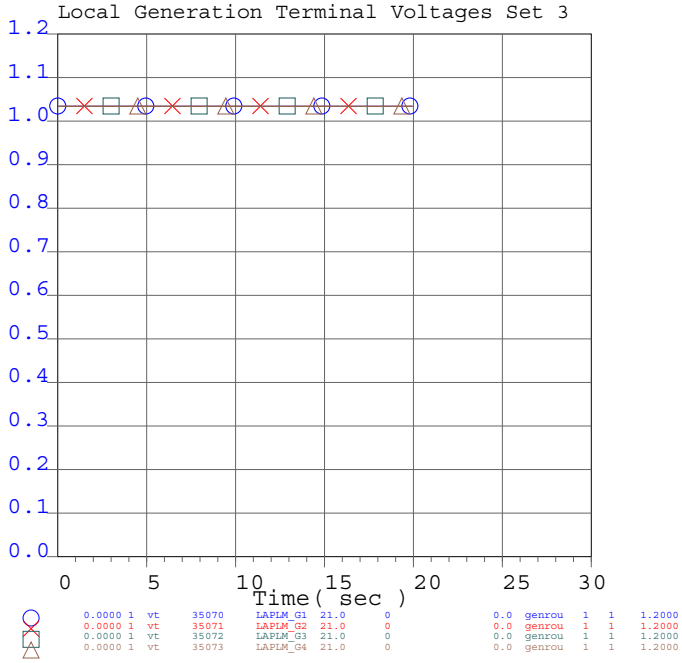
Local Generation Terminal Voltages Set 1



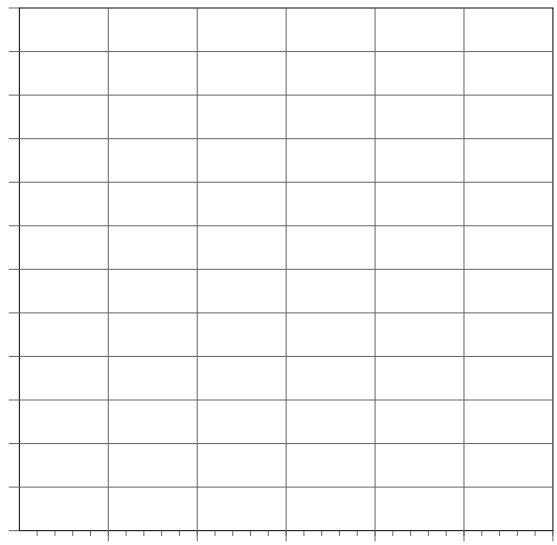
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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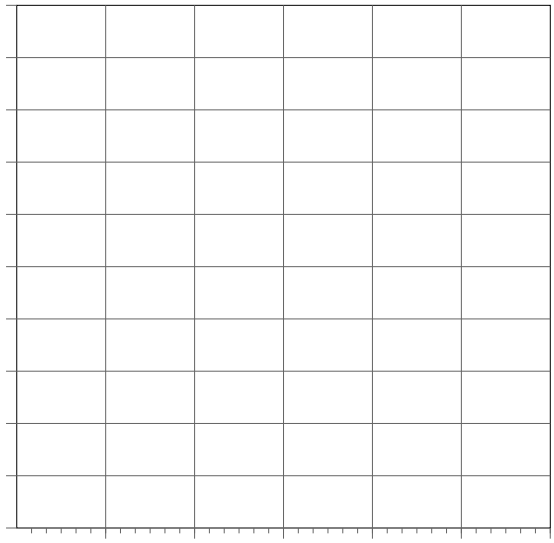
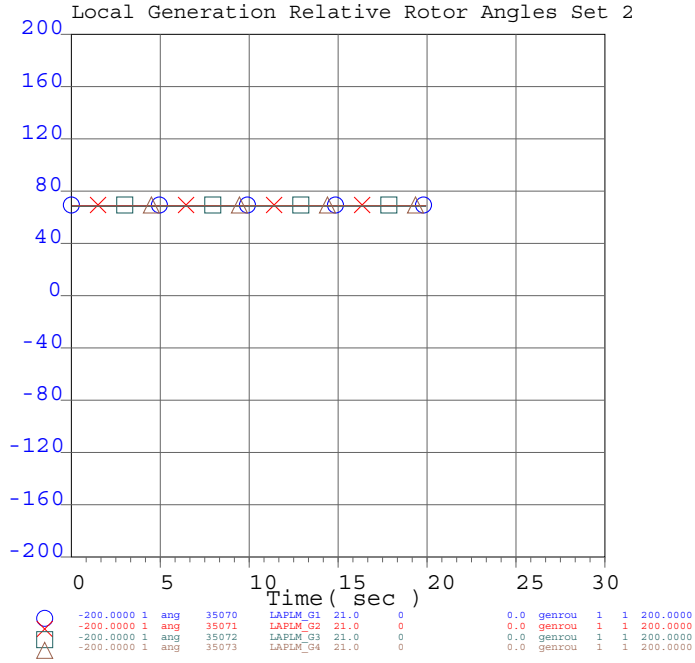
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

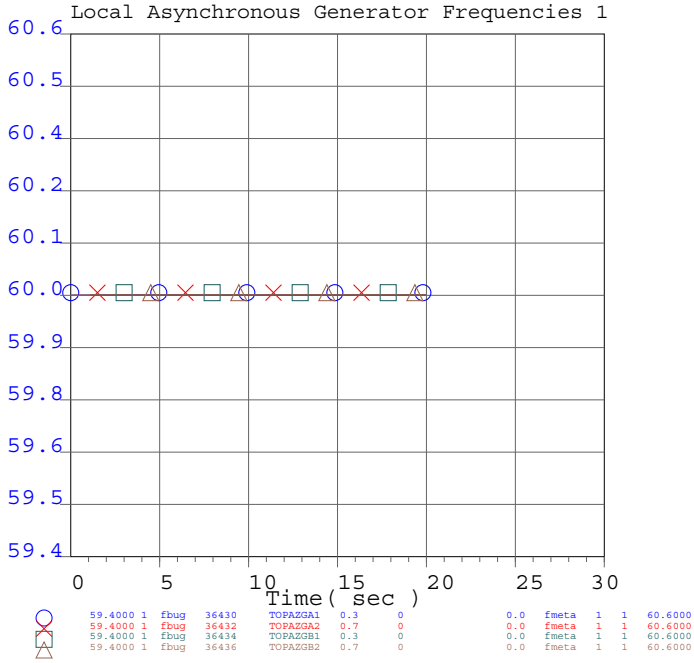
Local Generation Relative Rotor Angles Set 1



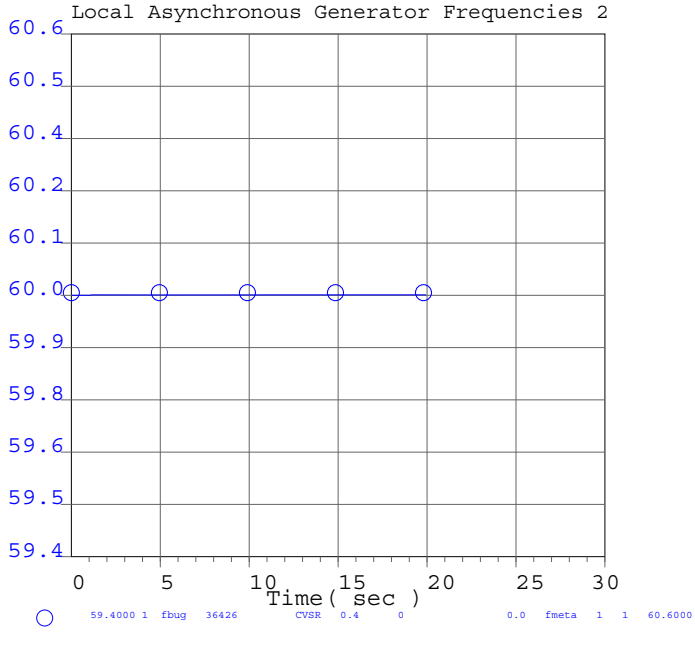
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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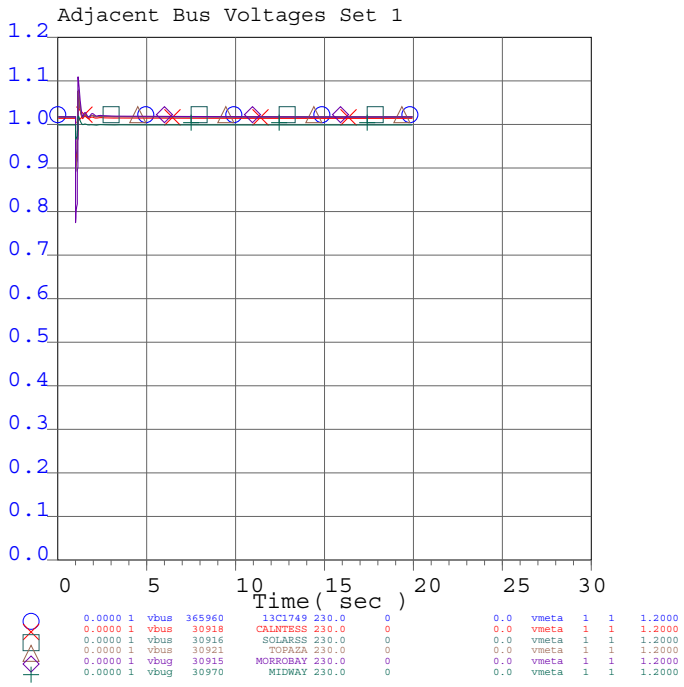

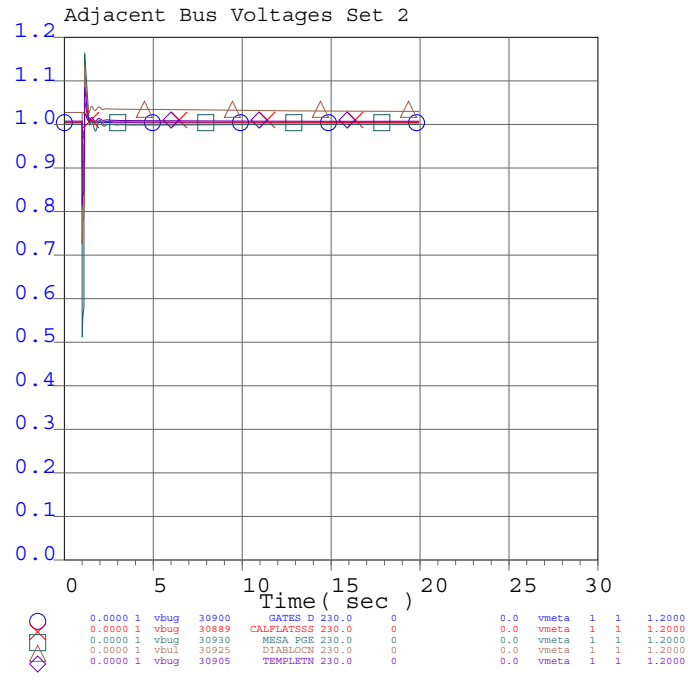

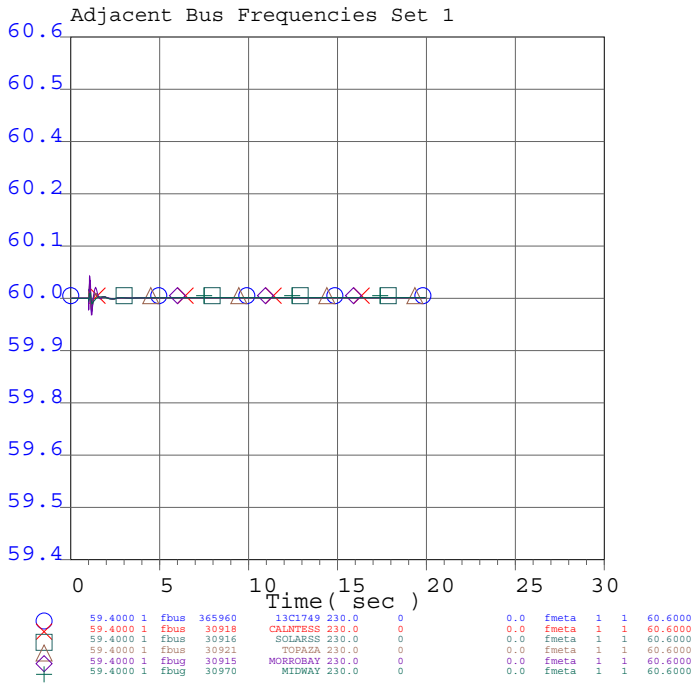

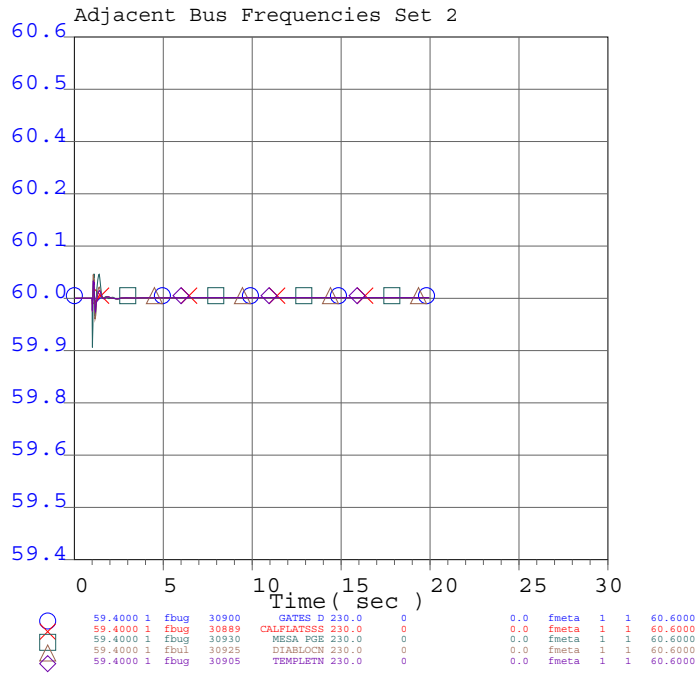

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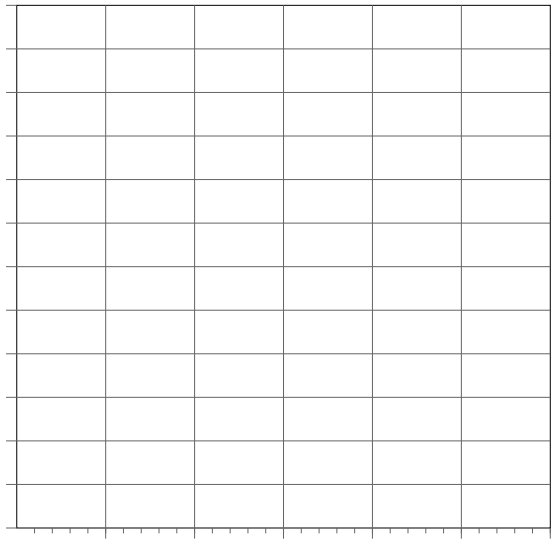
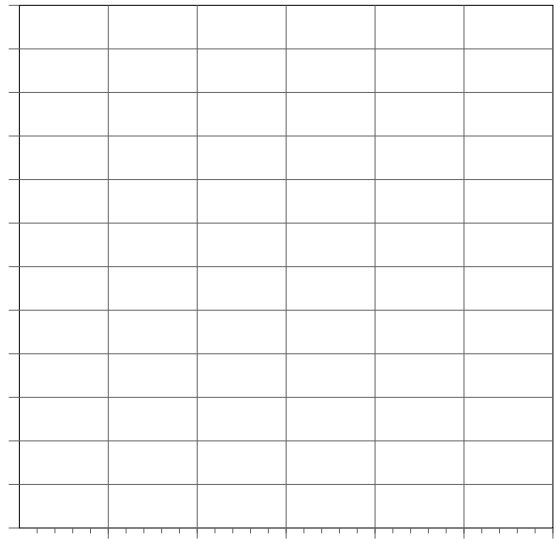
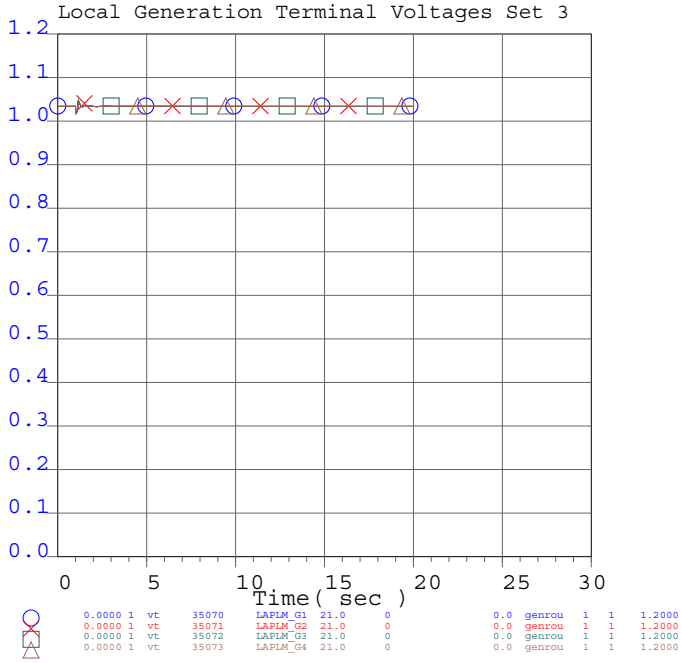
Local Generation Terminal Voltages Set 1



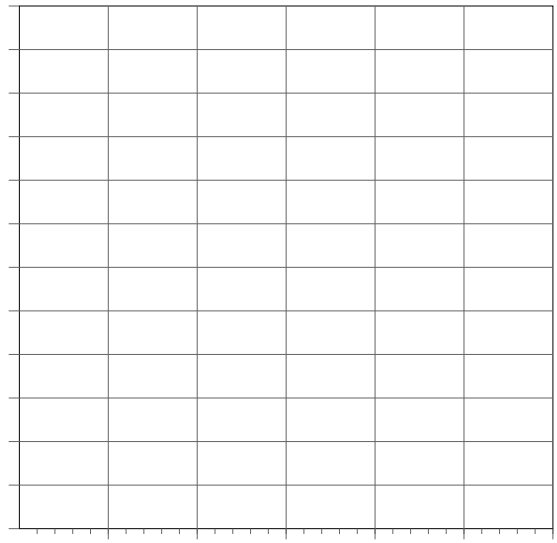
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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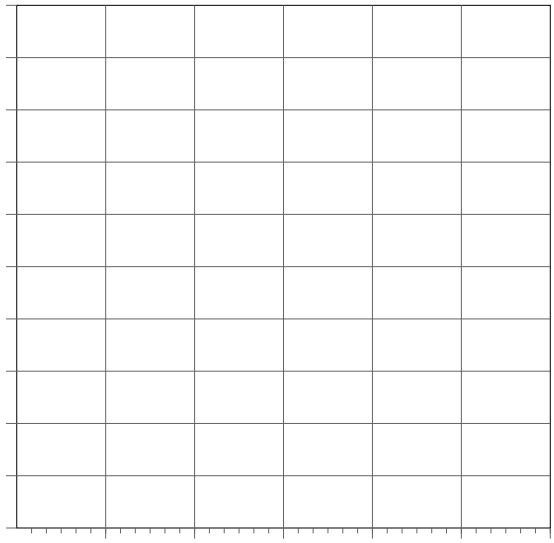
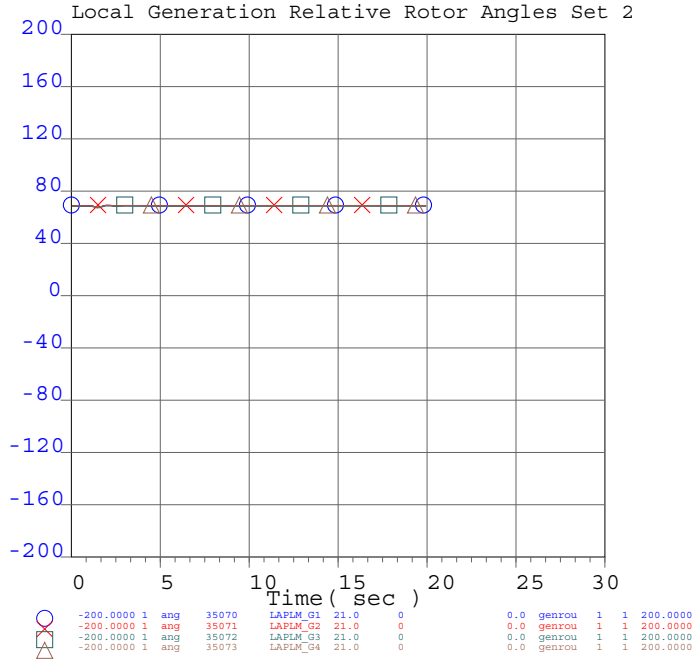
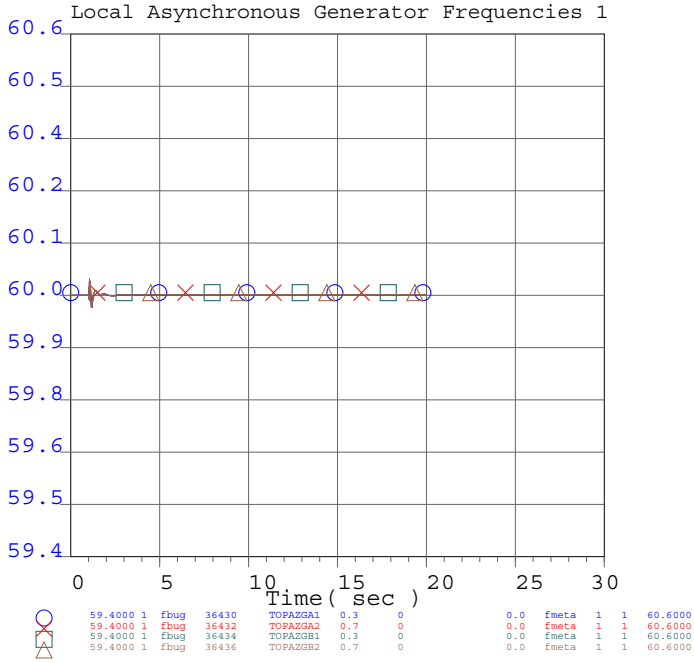
Local Generation Relative Rotor Angles Set 1



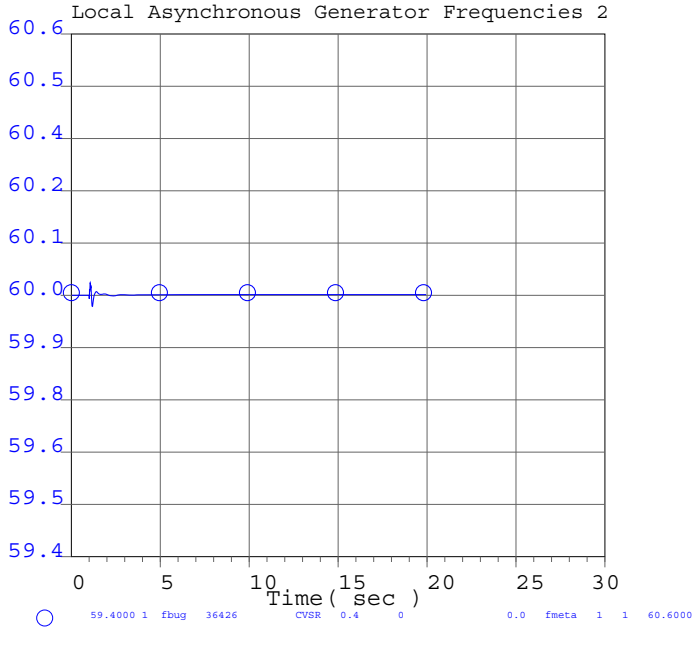
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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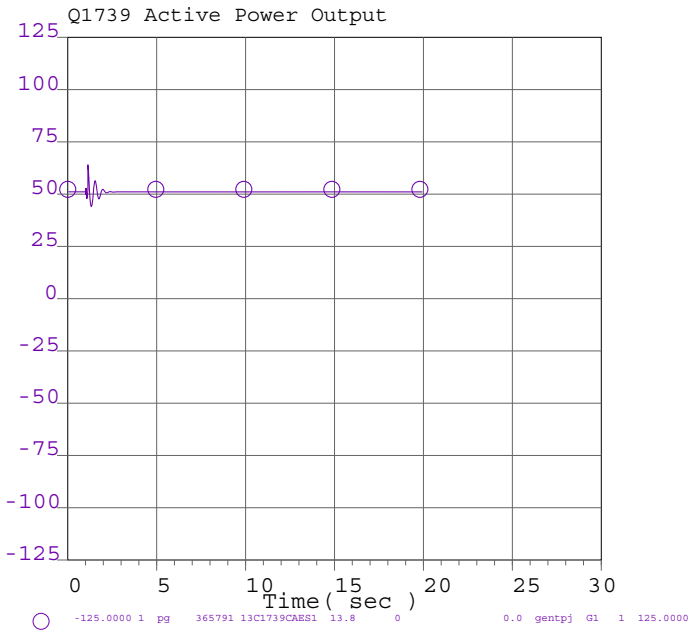

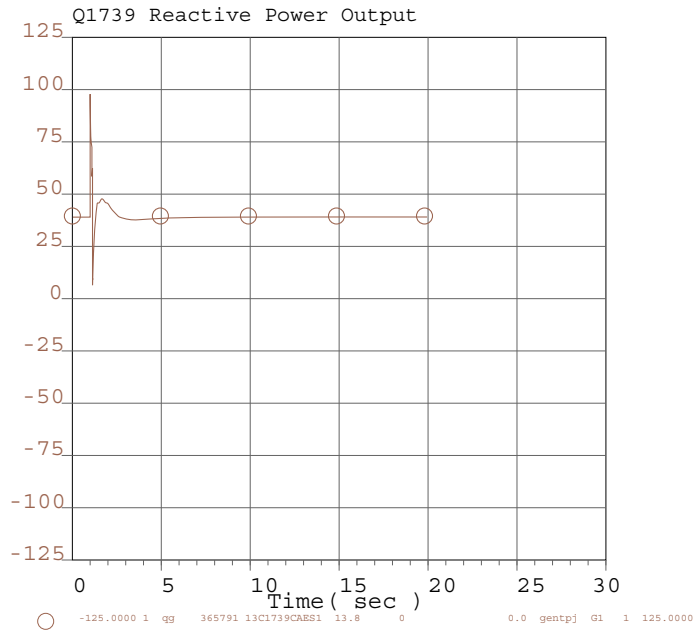

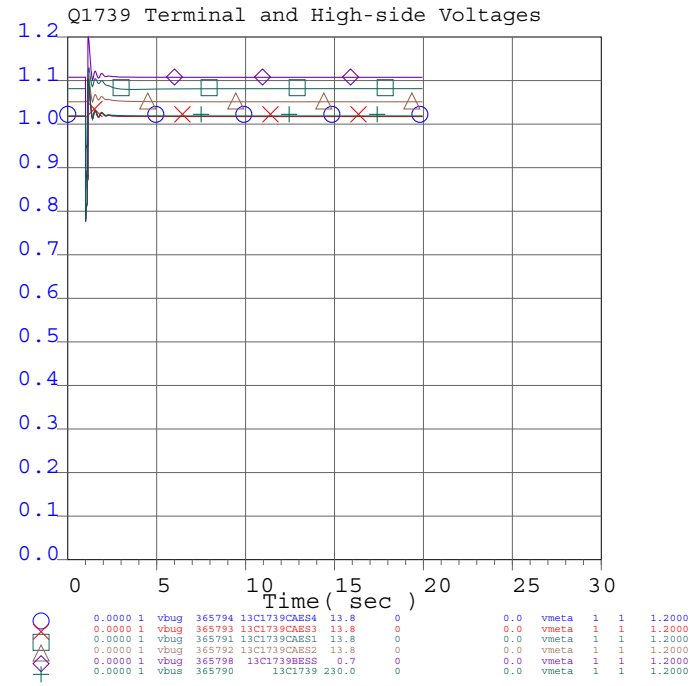

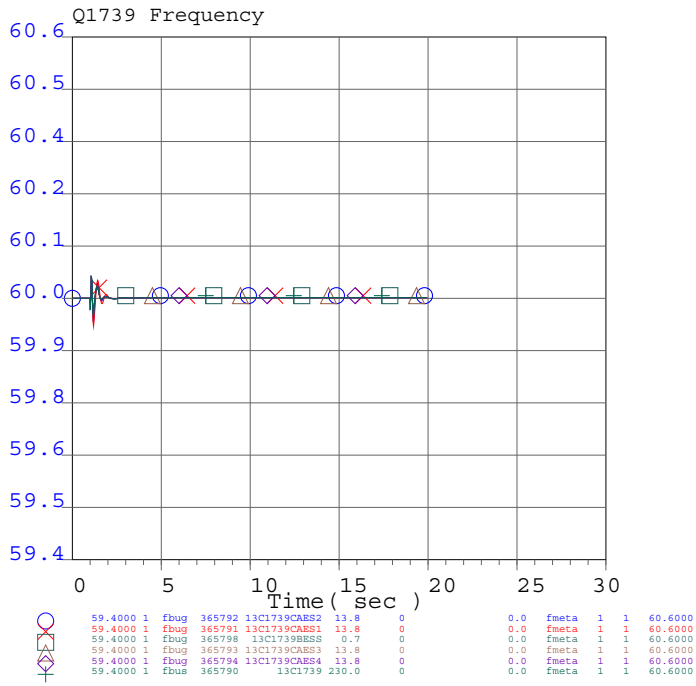

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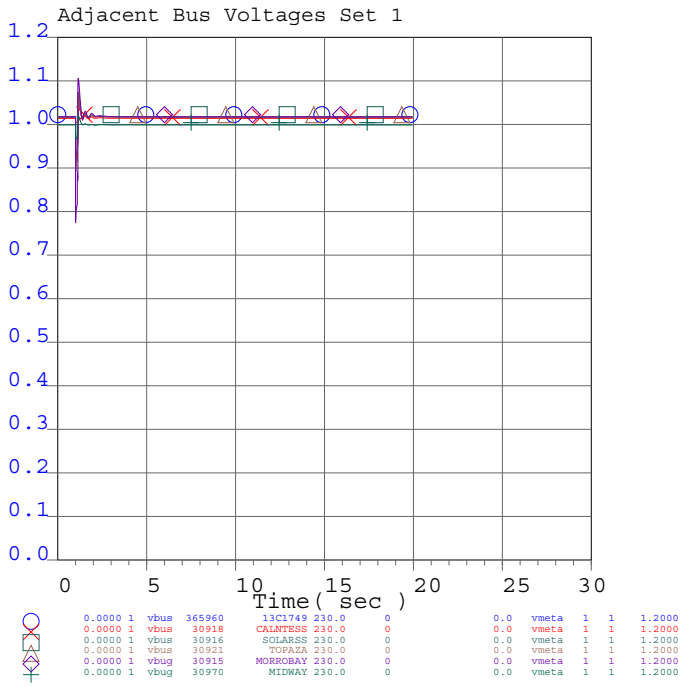

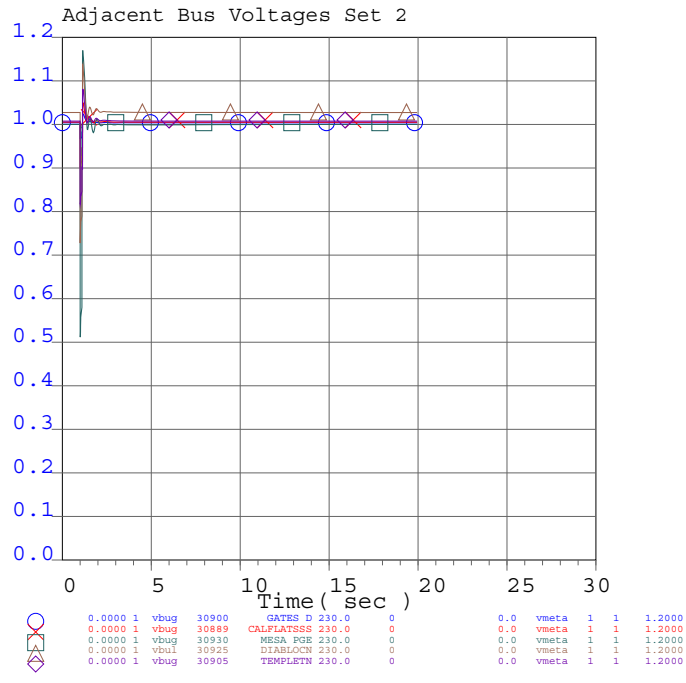

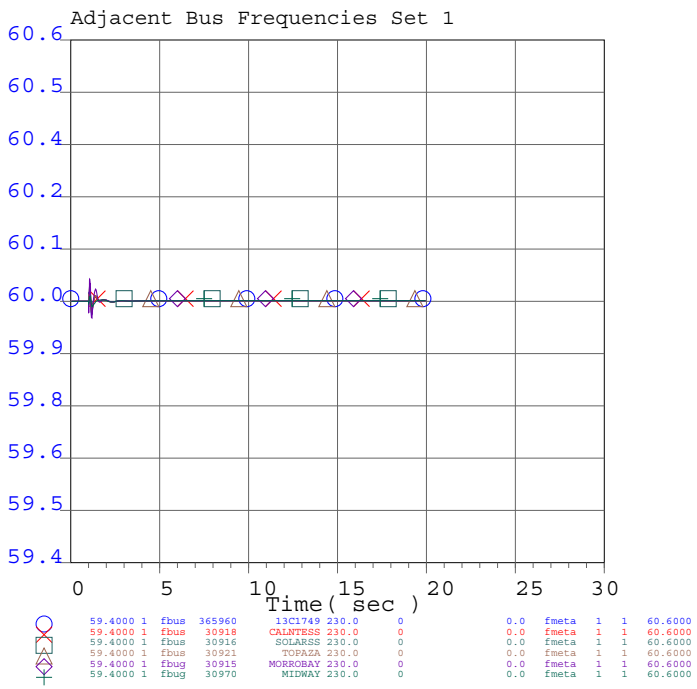

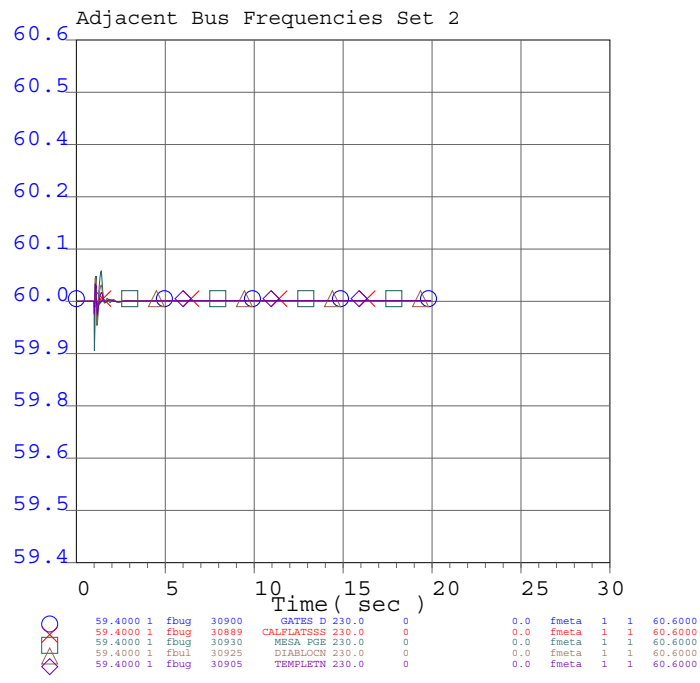

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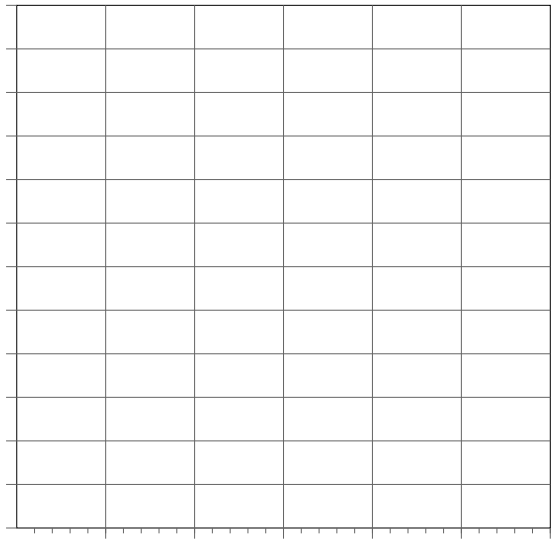
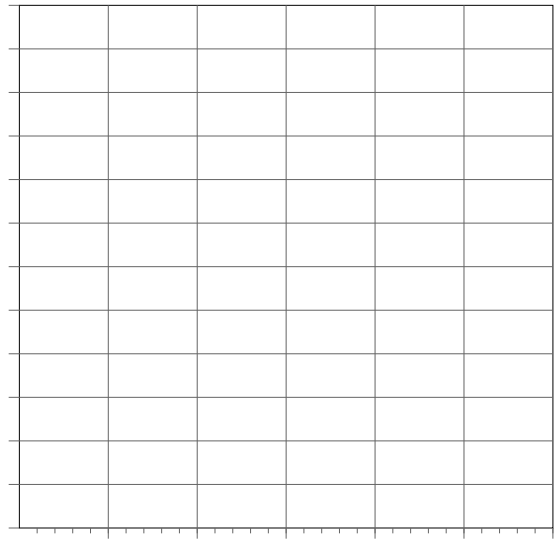
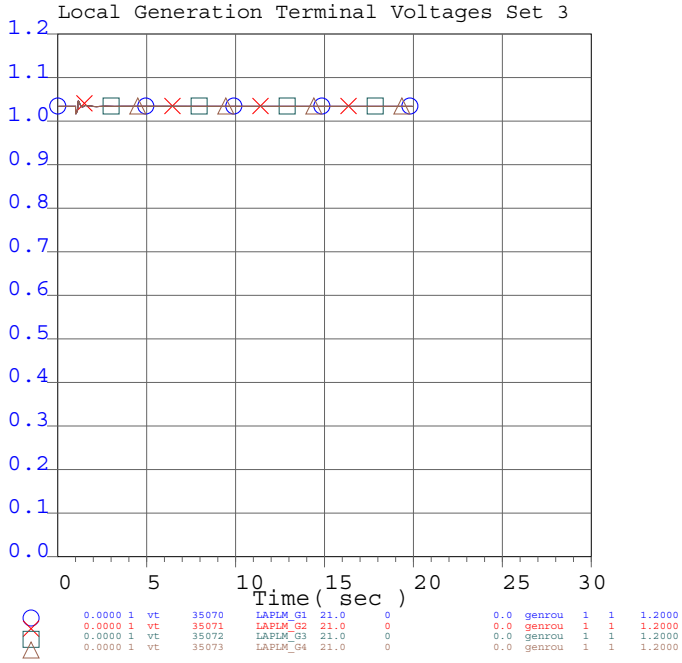
Local Generation Terminal Voltages Set 1



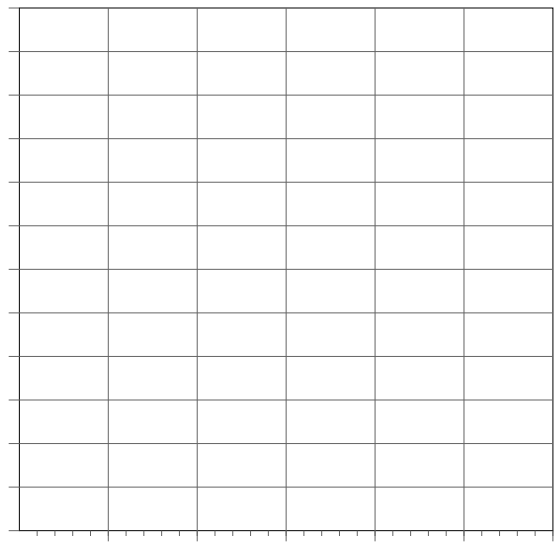
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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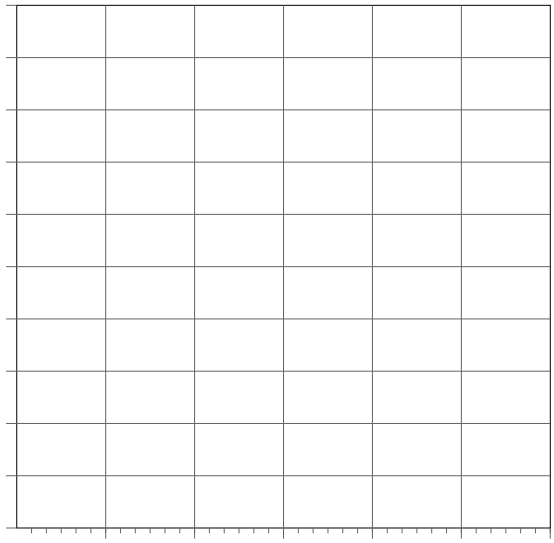
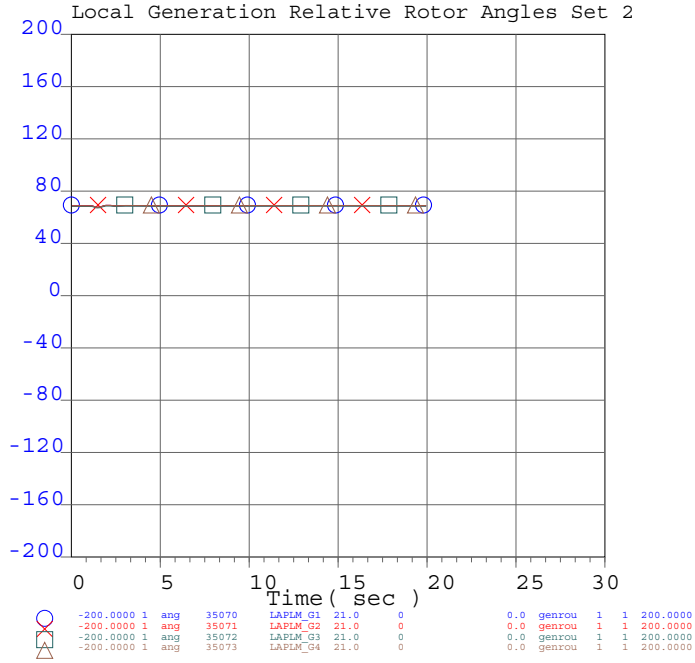
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

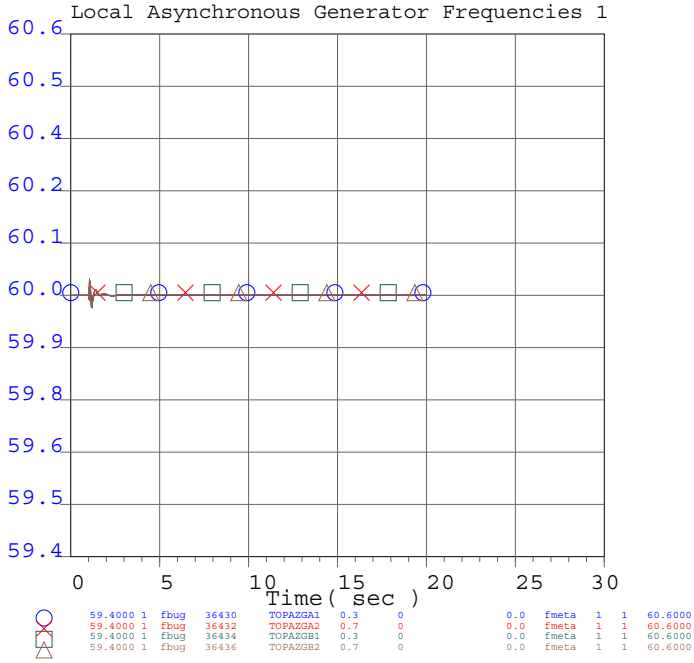
Local Generation Relative Rotor Angles Set 1



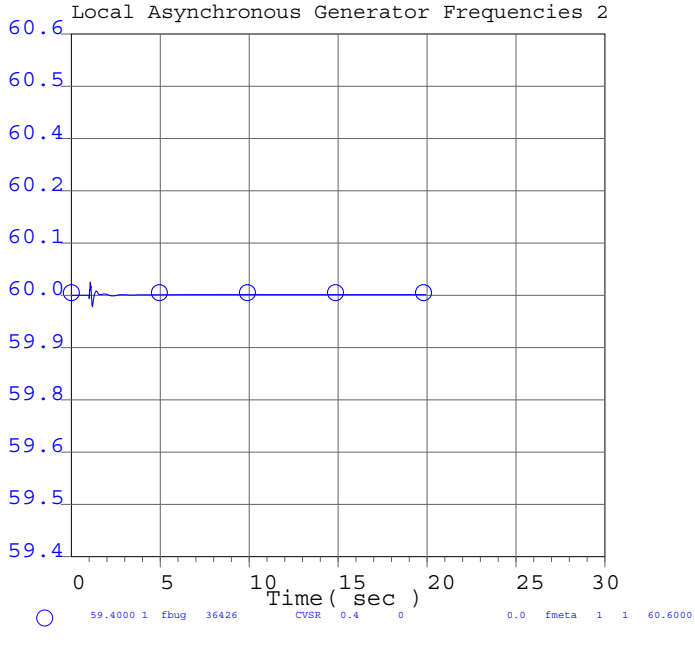
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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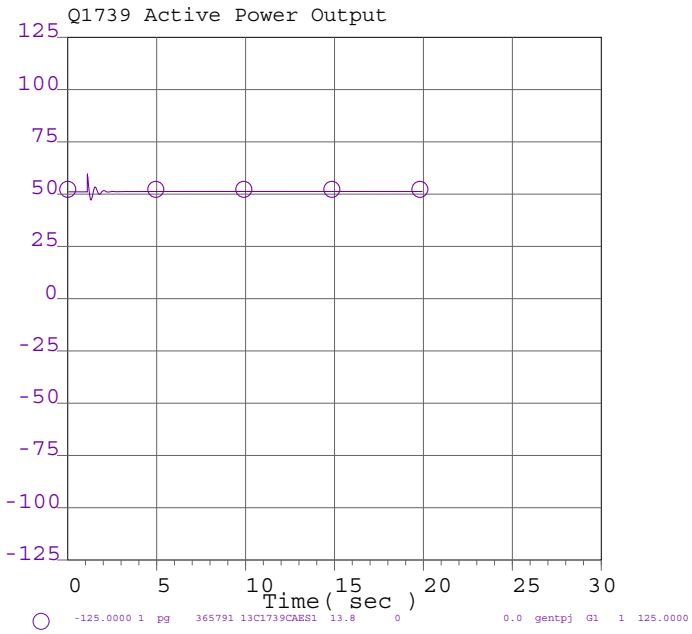
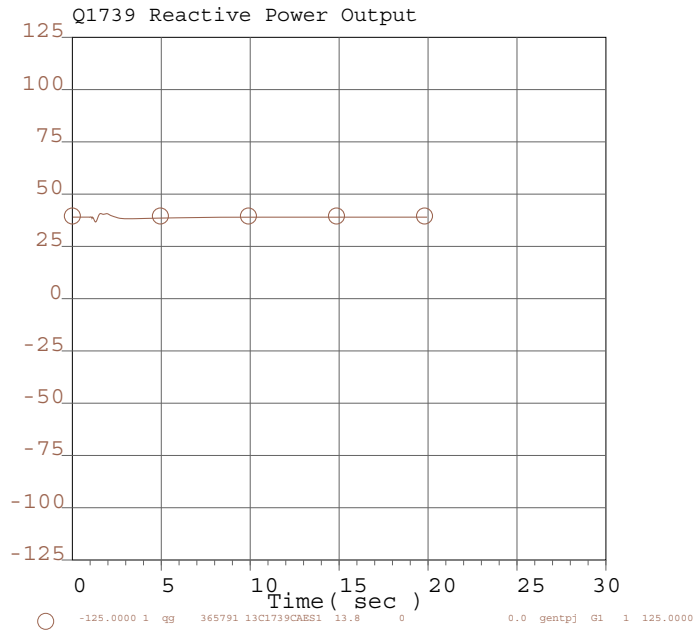
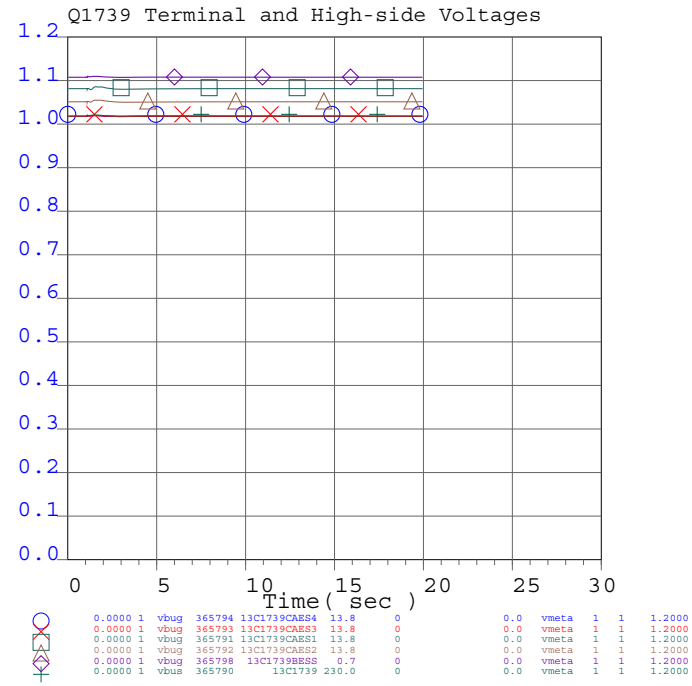
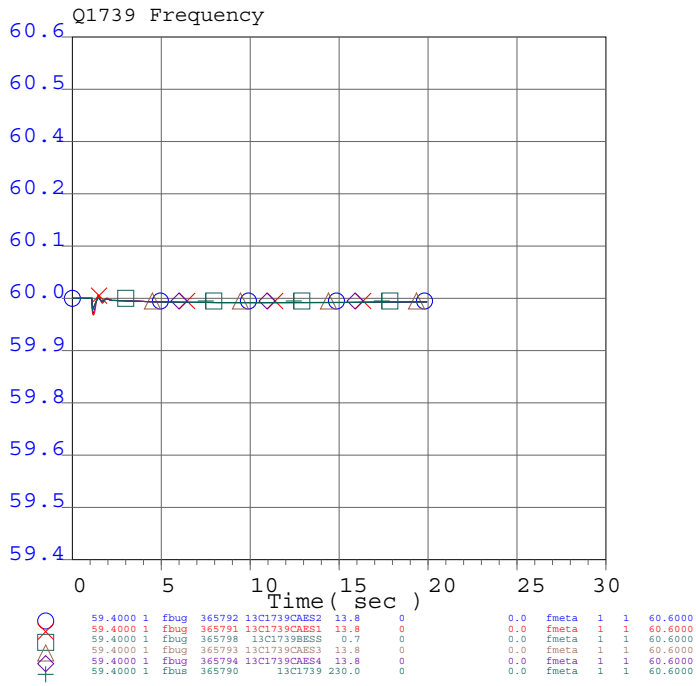
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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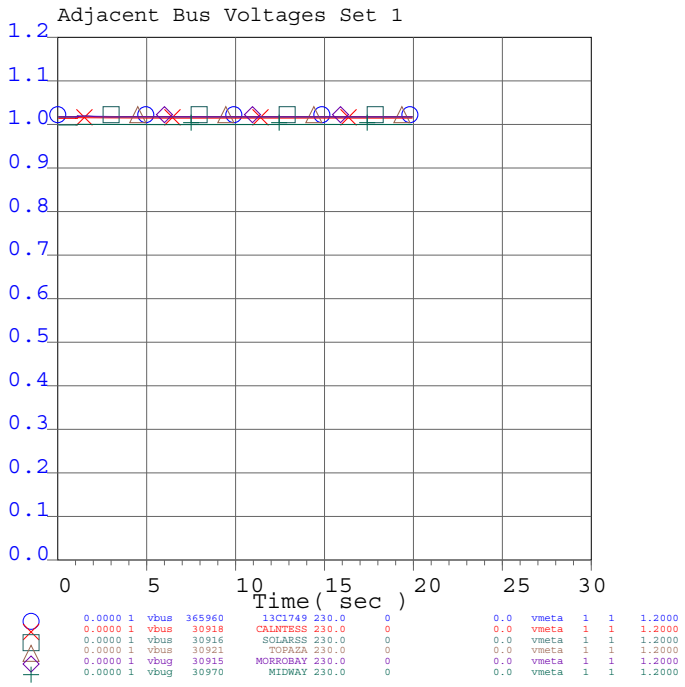

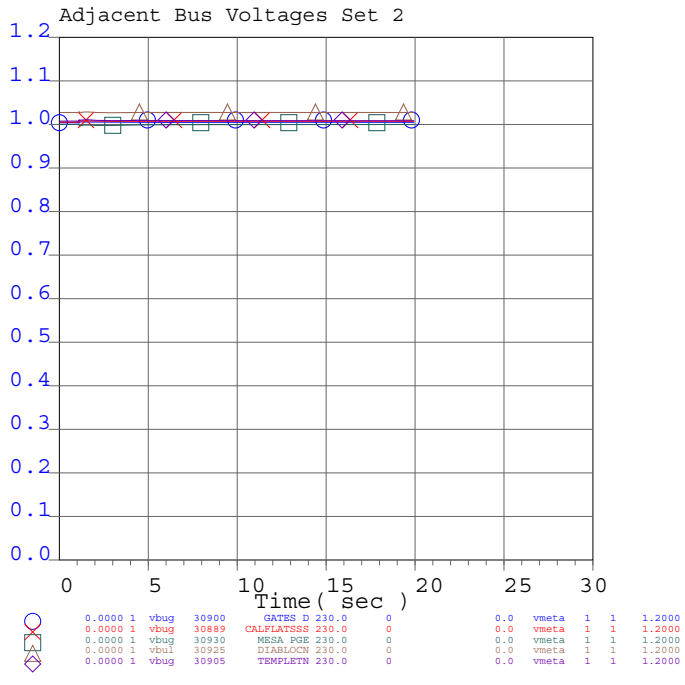

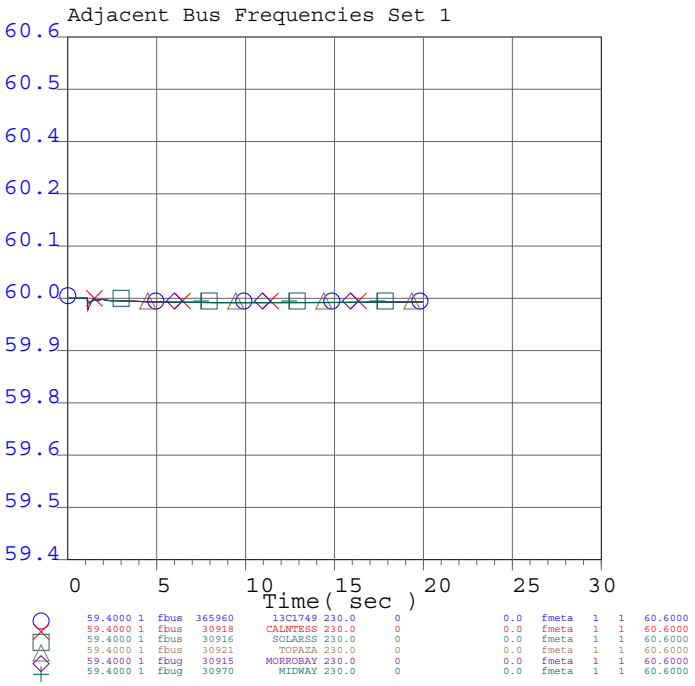

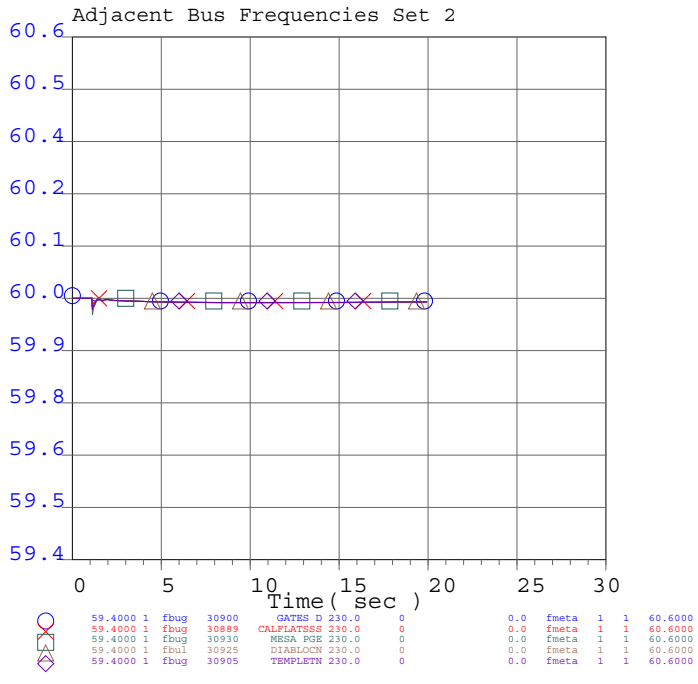

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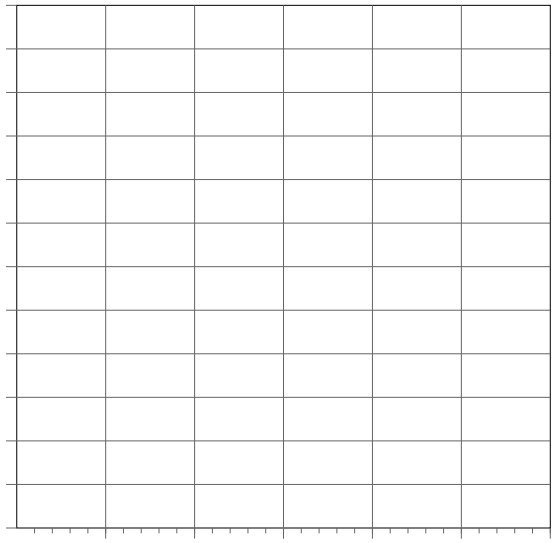
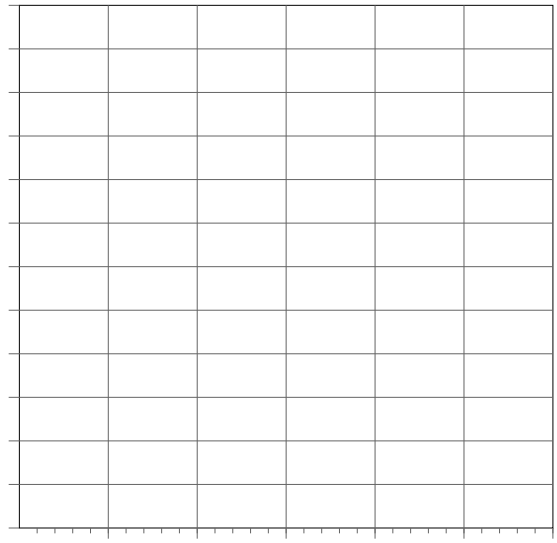
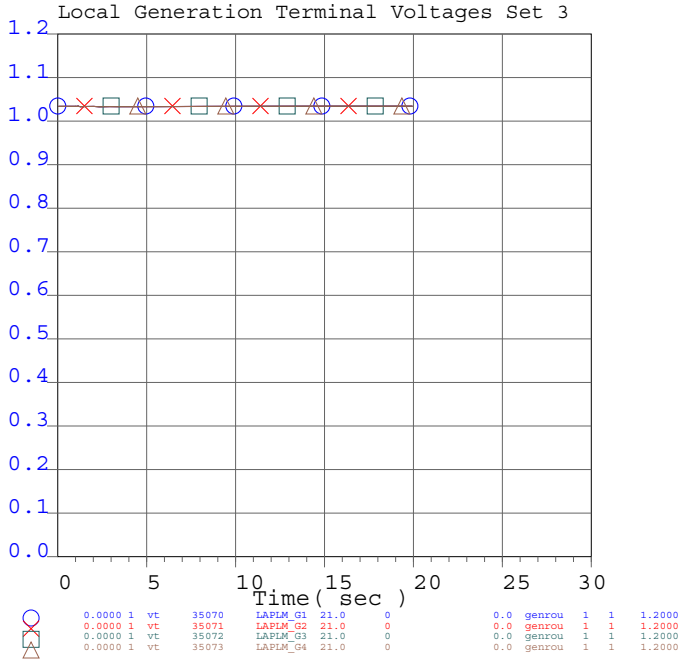
Local Generation Terminal Voltages Set 1



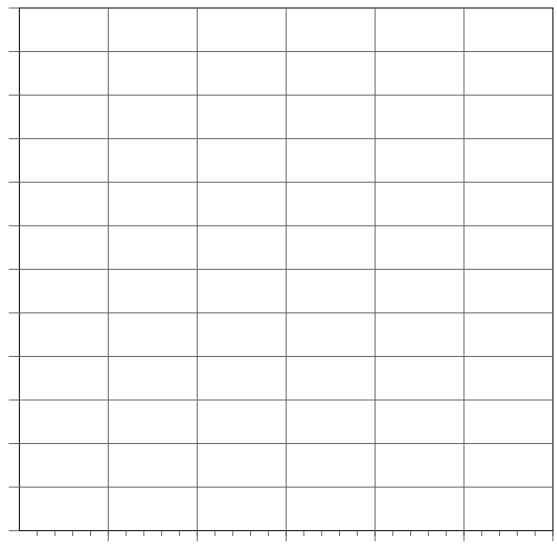
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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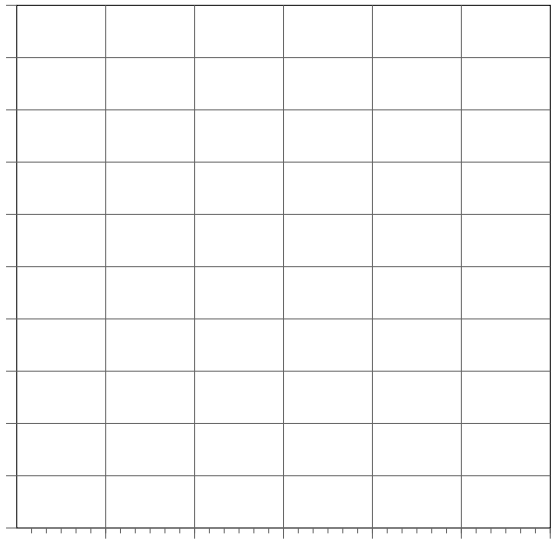
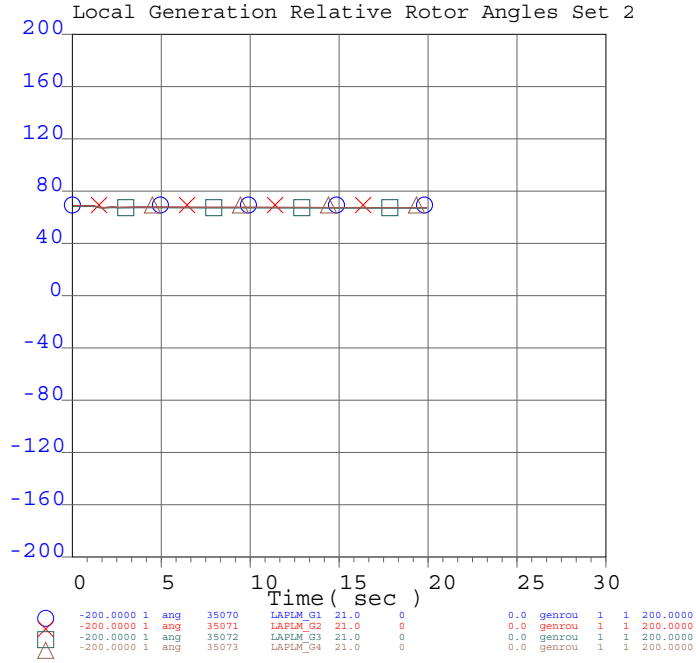
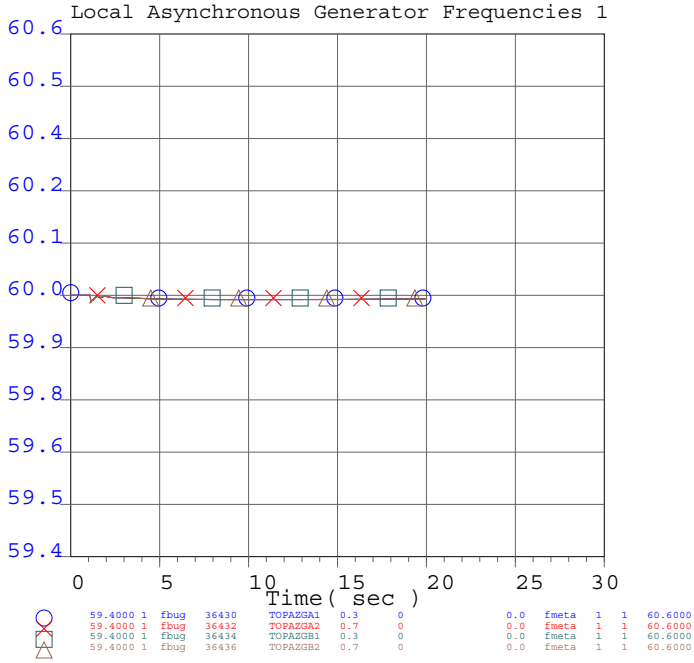
Local Generation Relative Rotor Angles Set 1



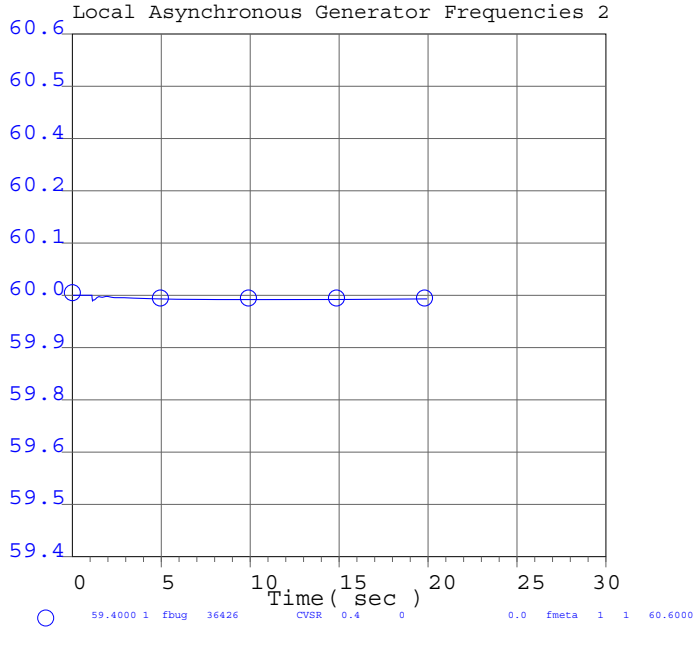
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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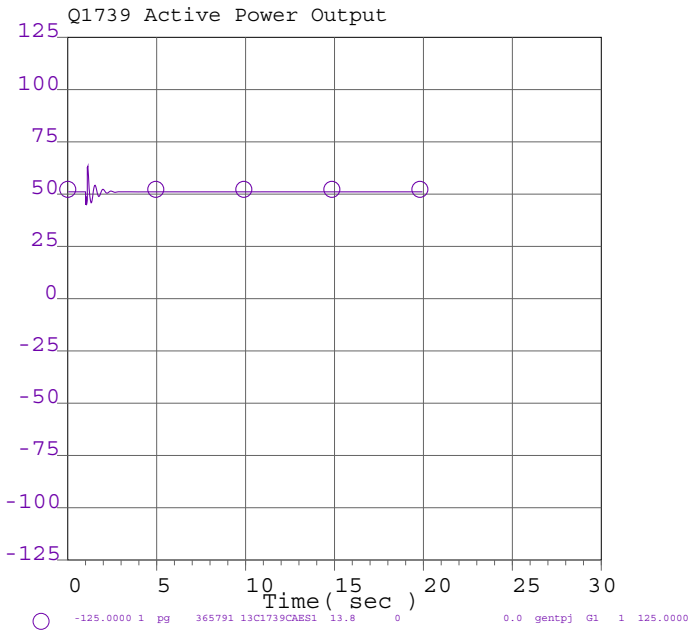

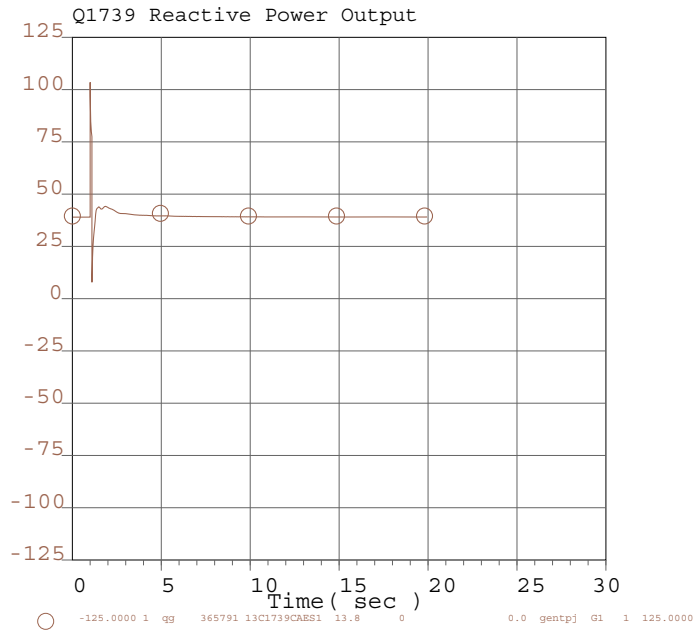

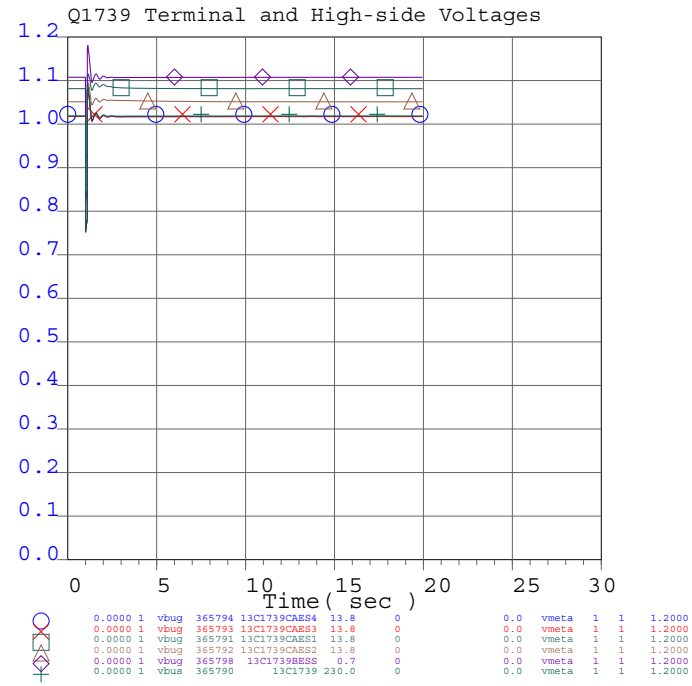

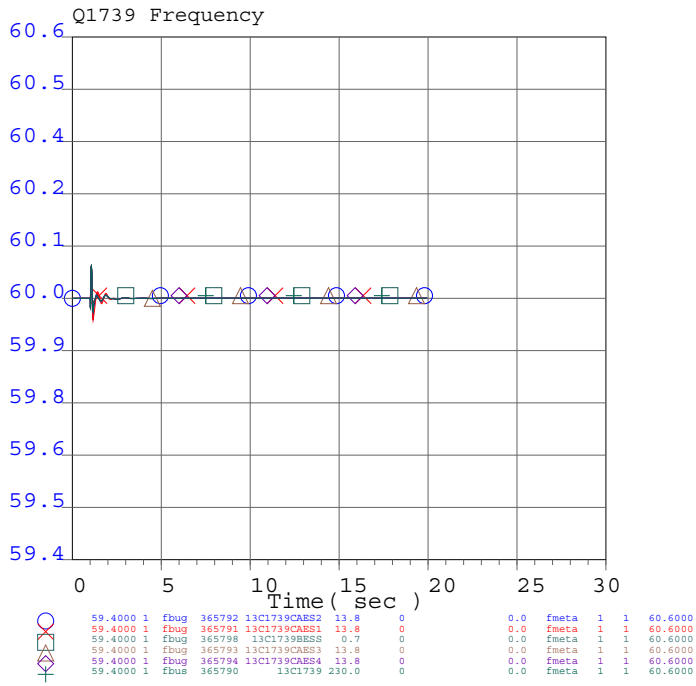

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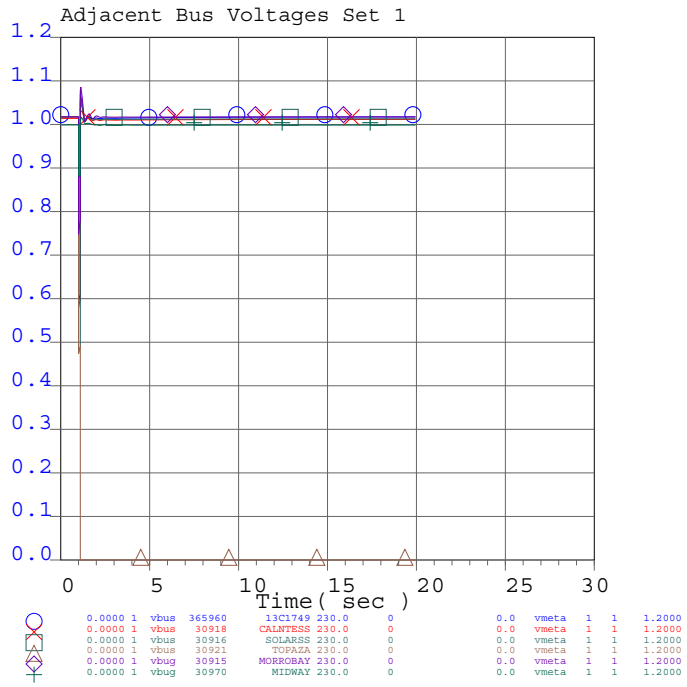

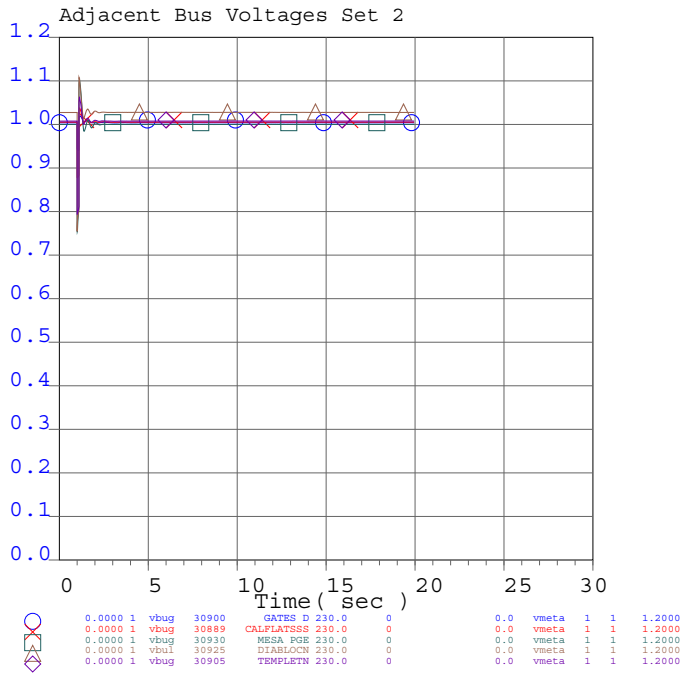

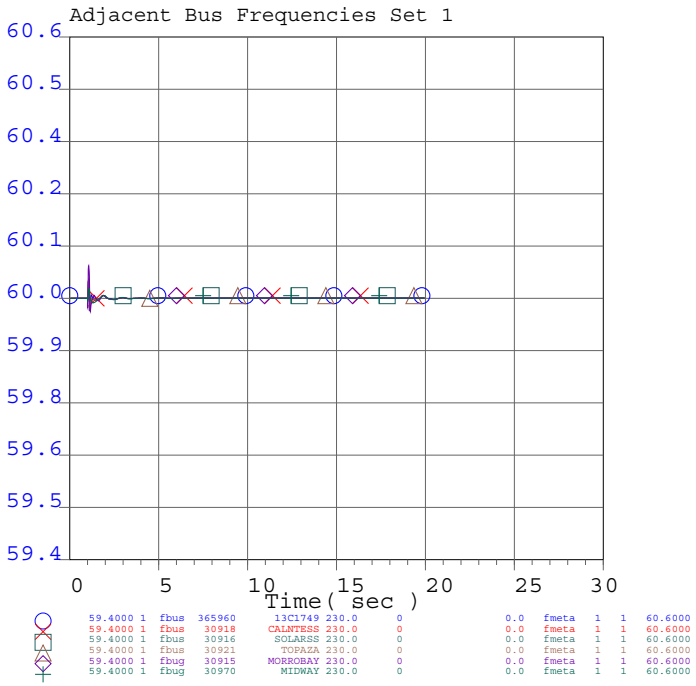

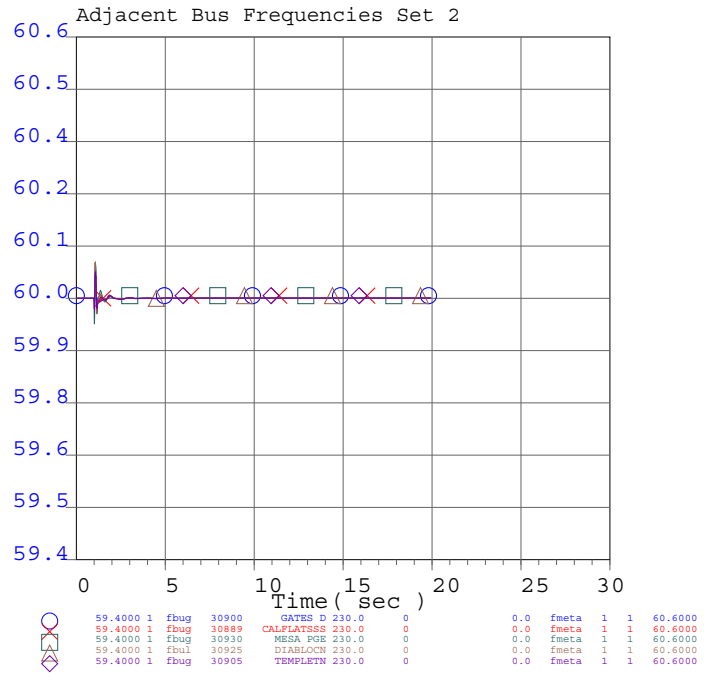

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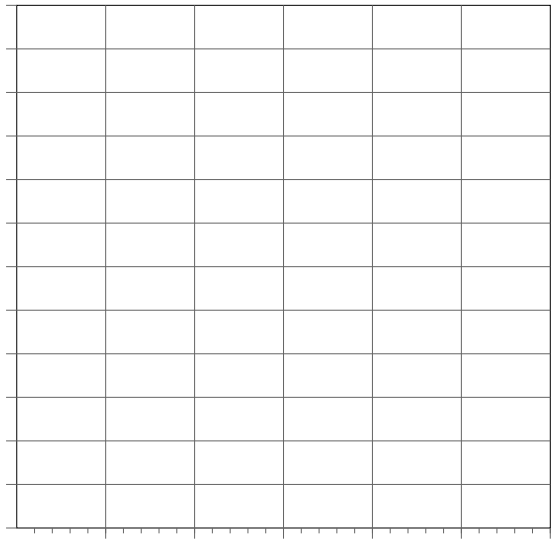
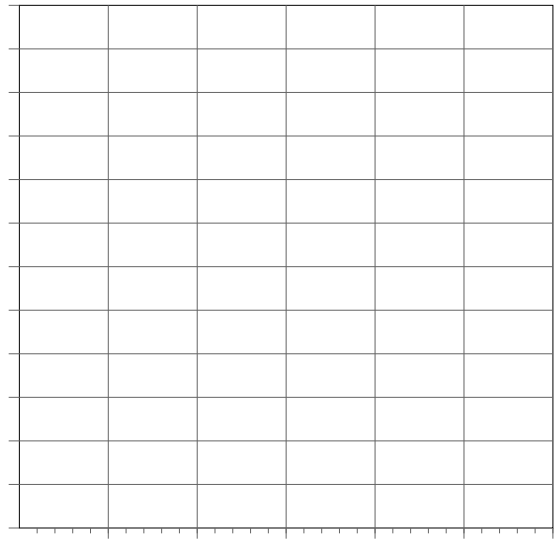
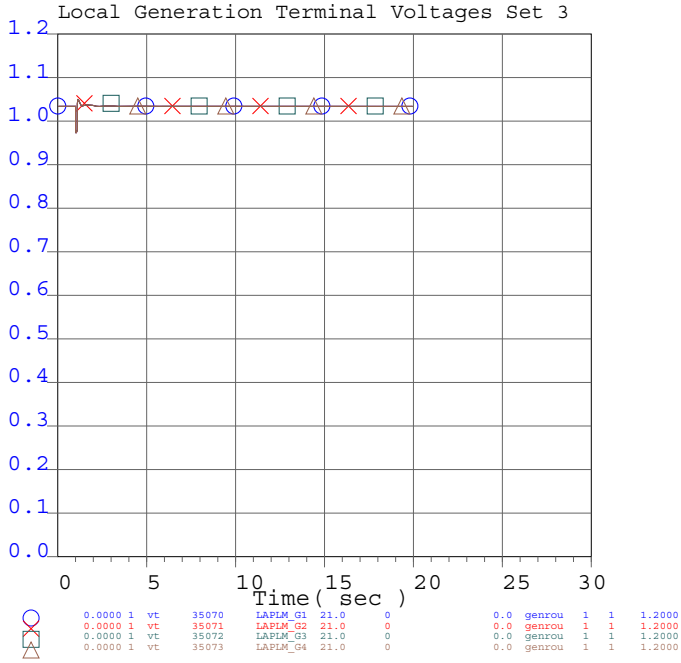
Local Generation Terminal Voltages Set 1



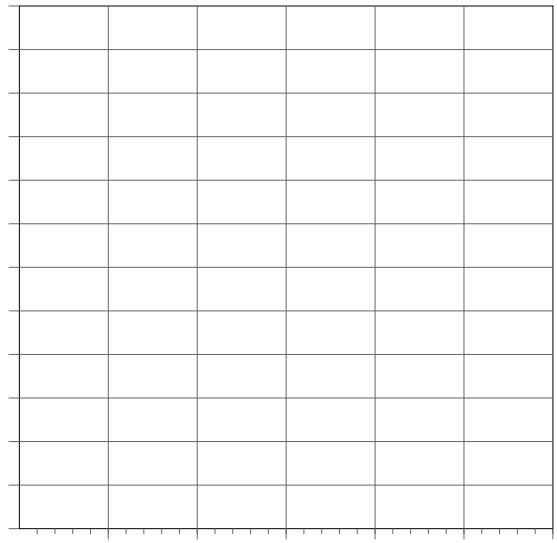
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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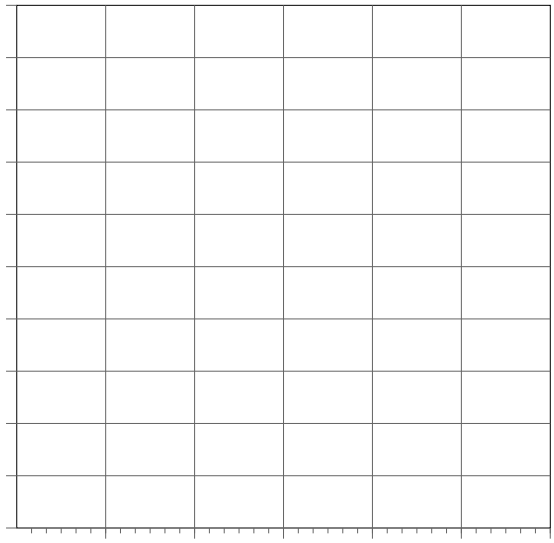
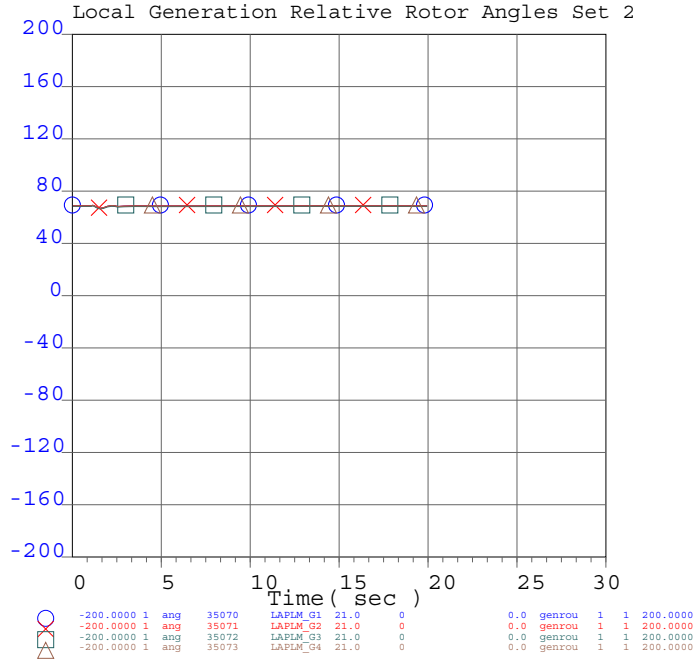
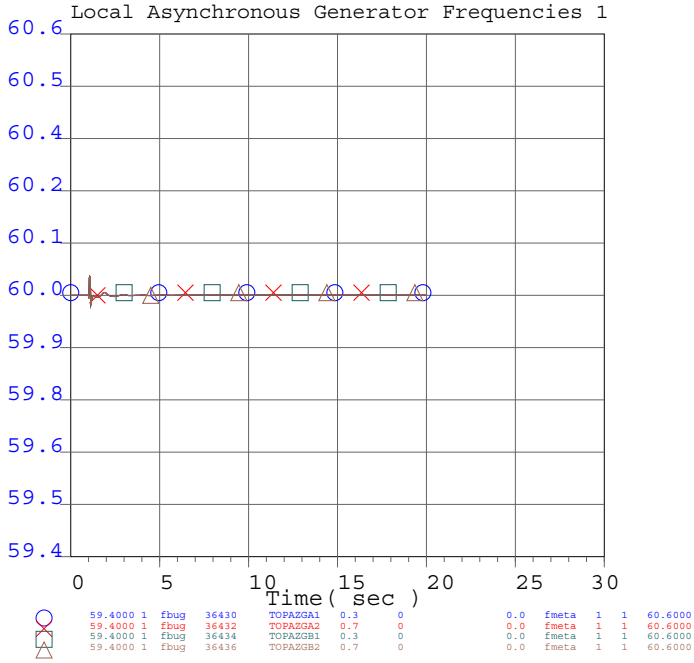
Local Generation Relative Rotor Angles Set 1



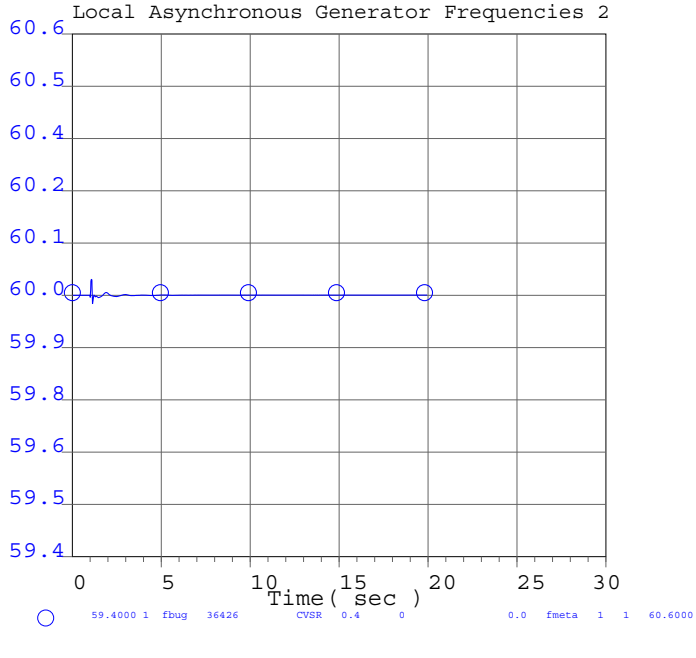
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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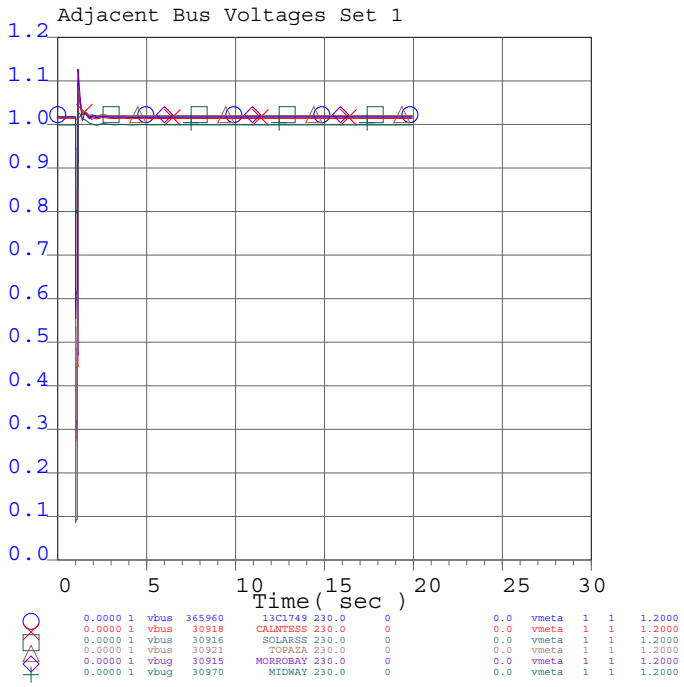

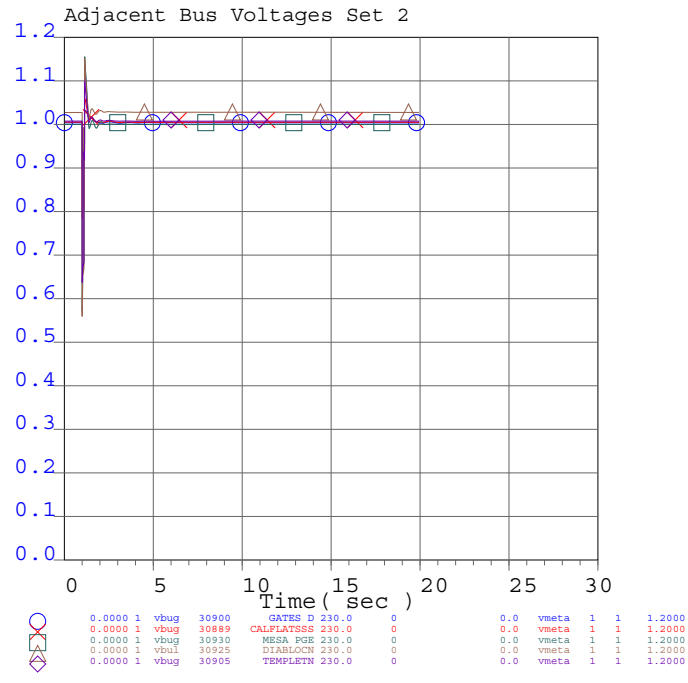

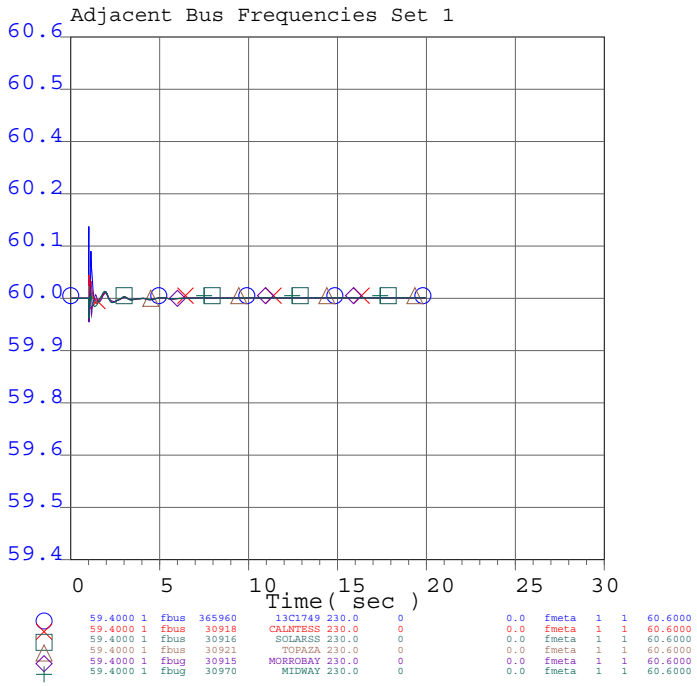

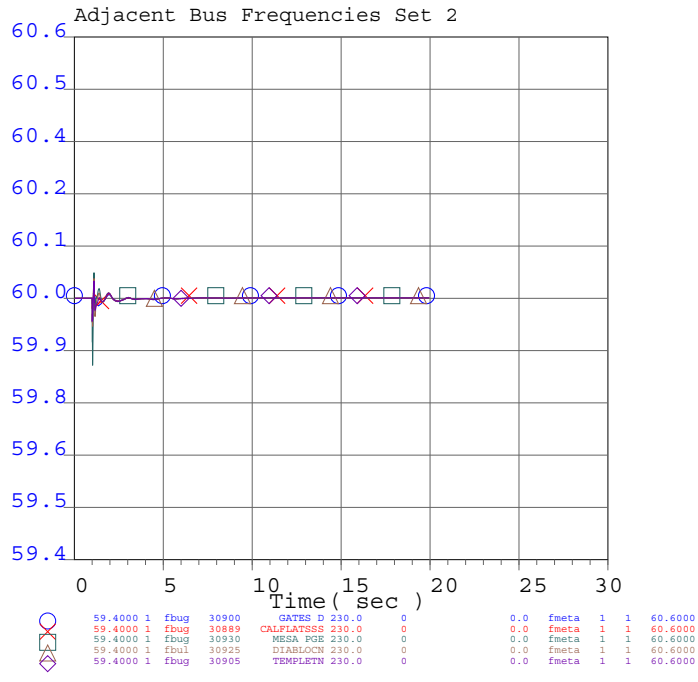

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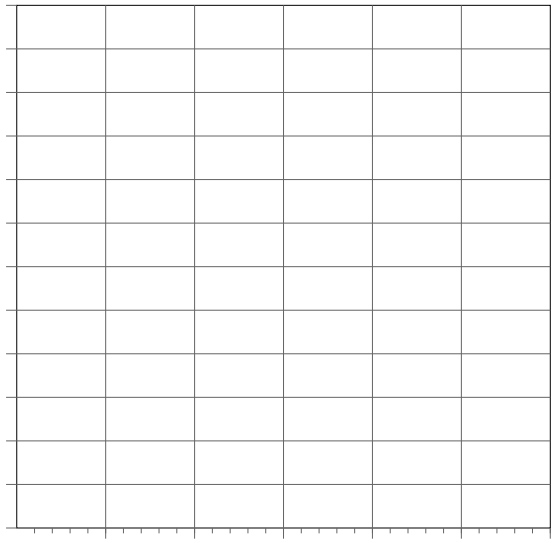
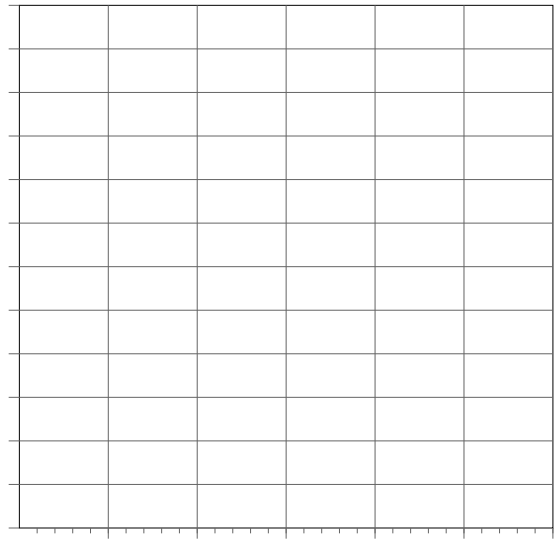
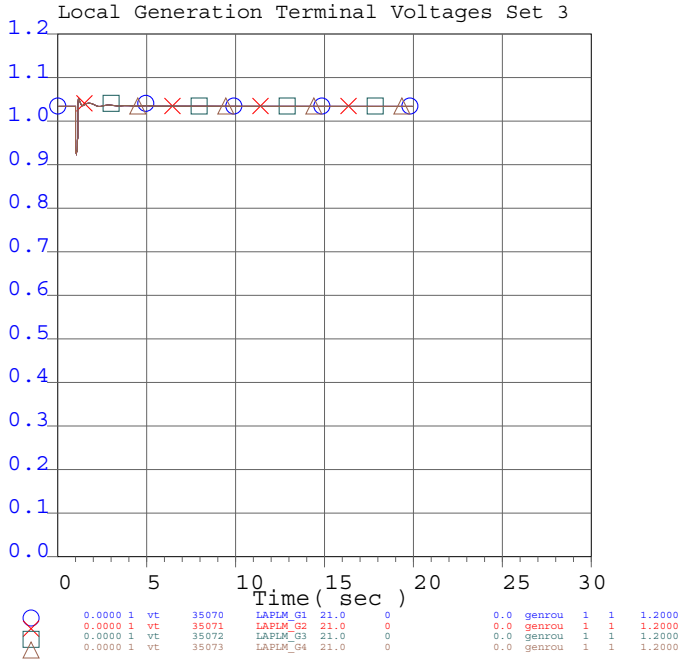


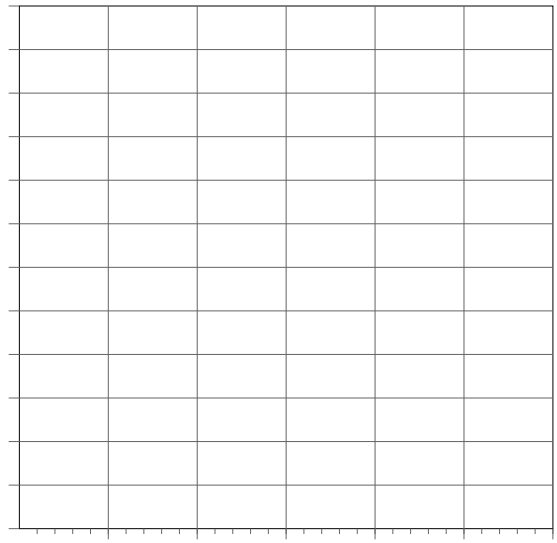
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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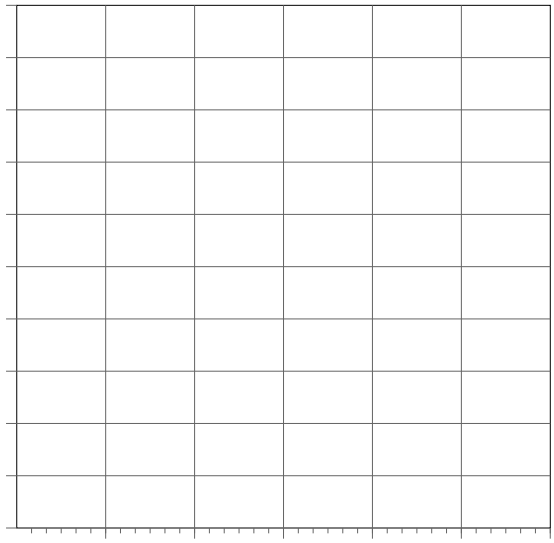
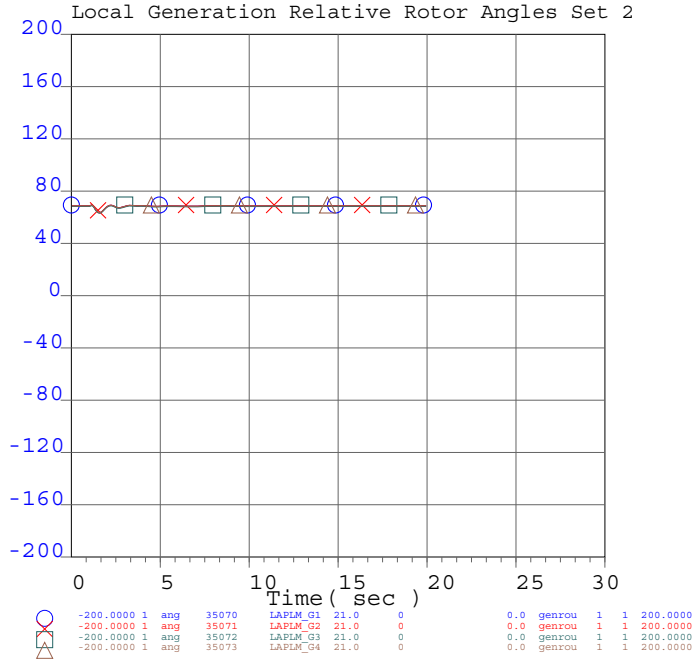
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



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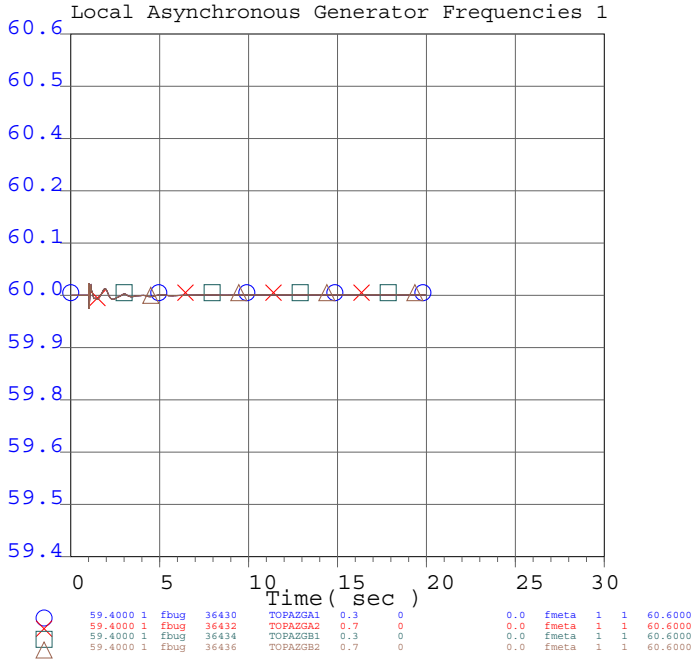
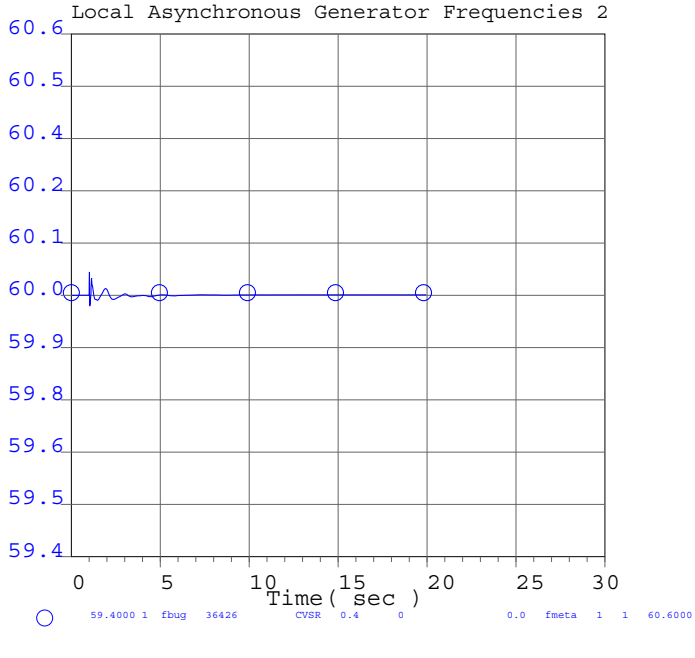
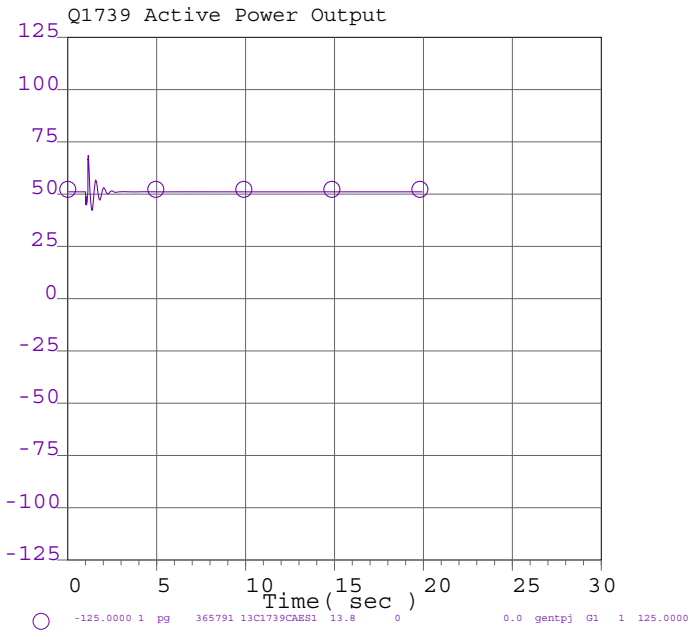


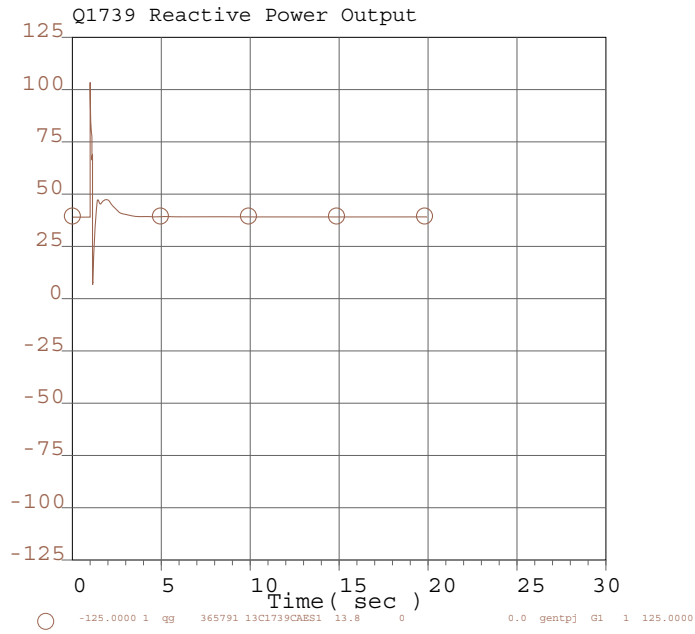
Local Asynchronous Generator Frequencies 2

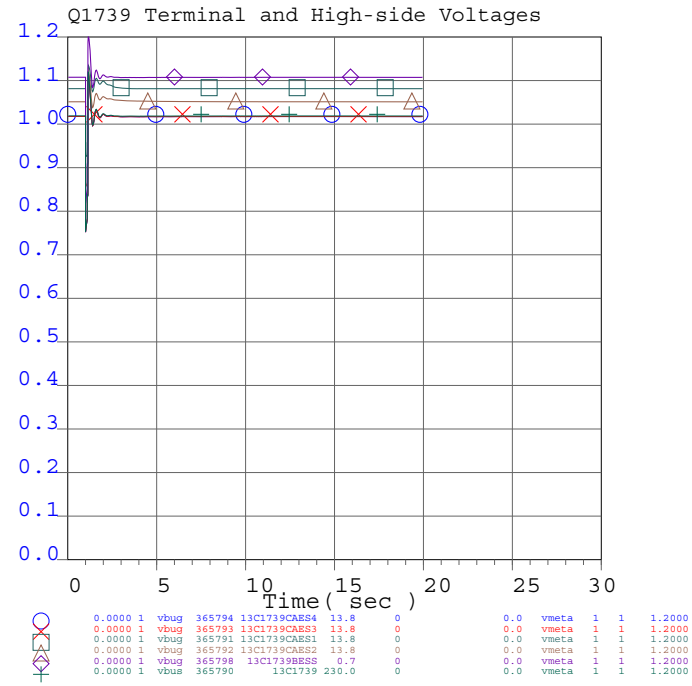


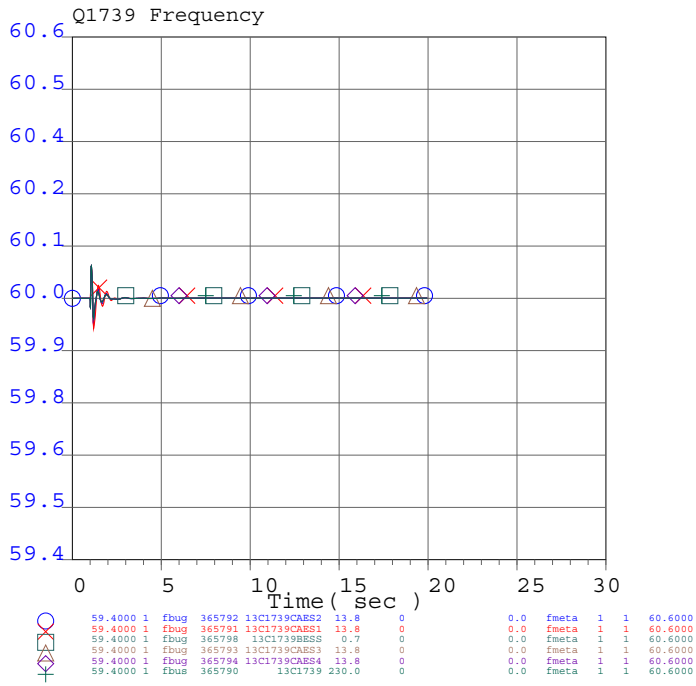
PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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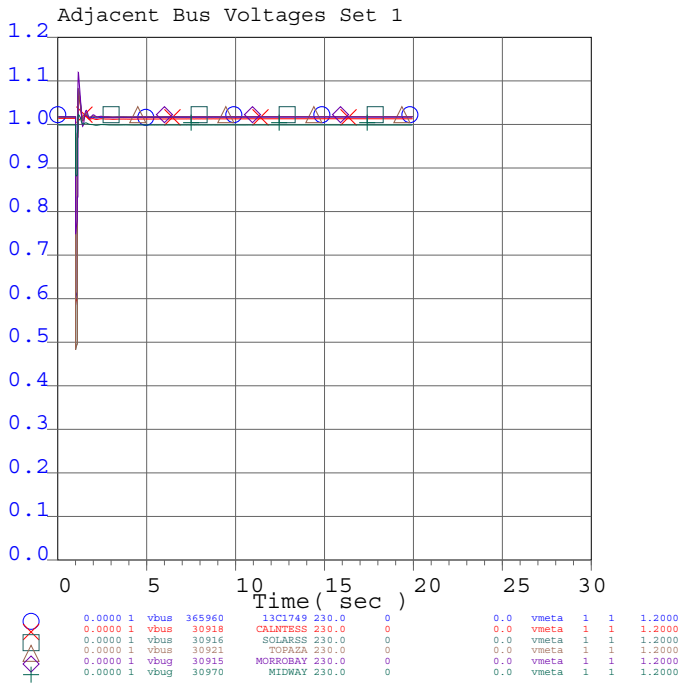

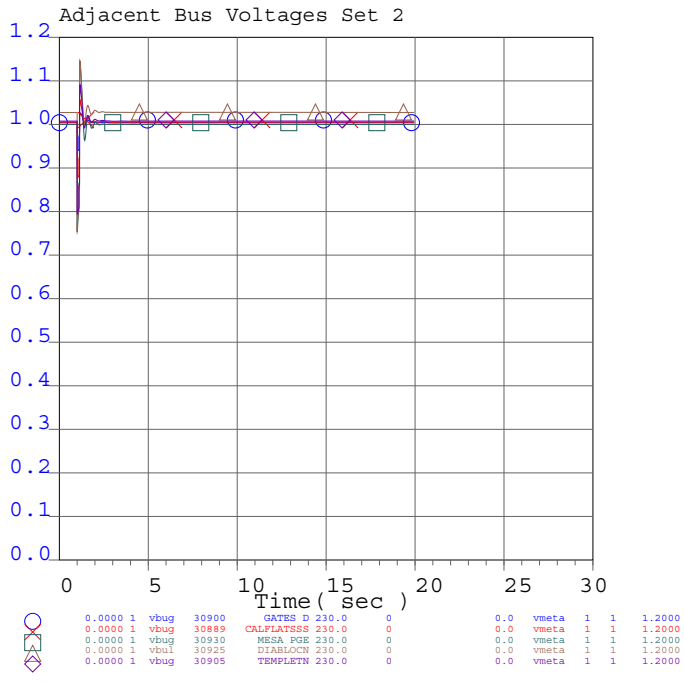

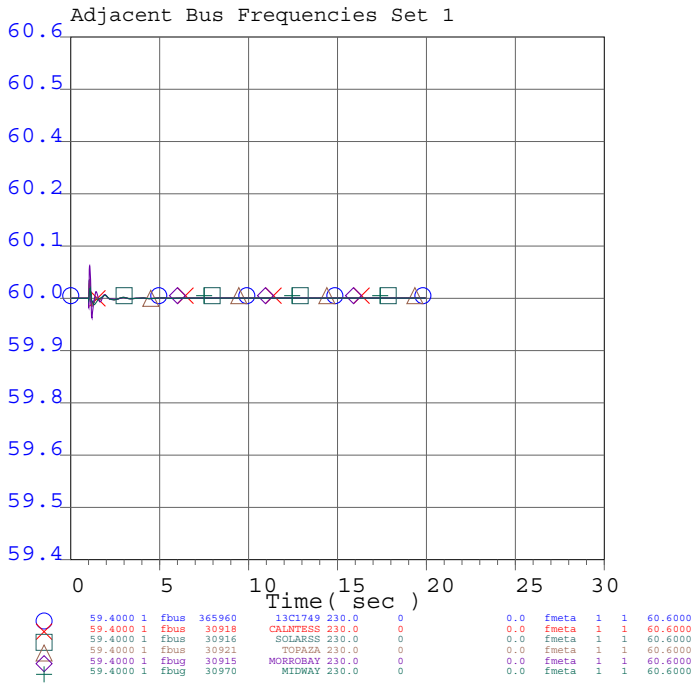

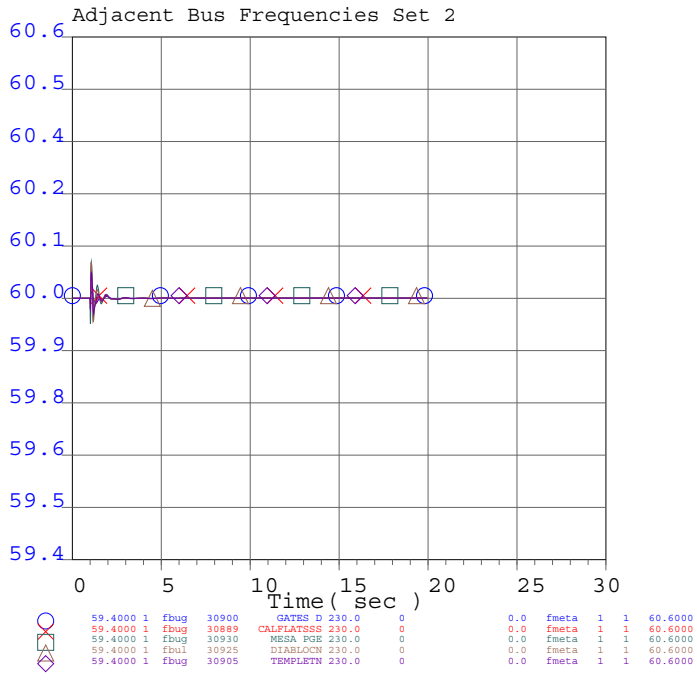

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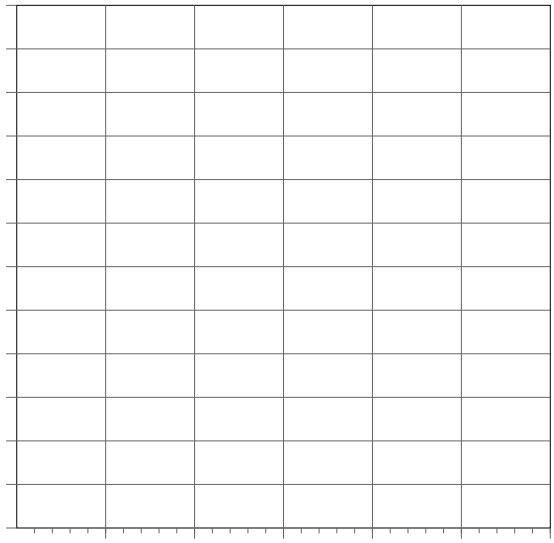
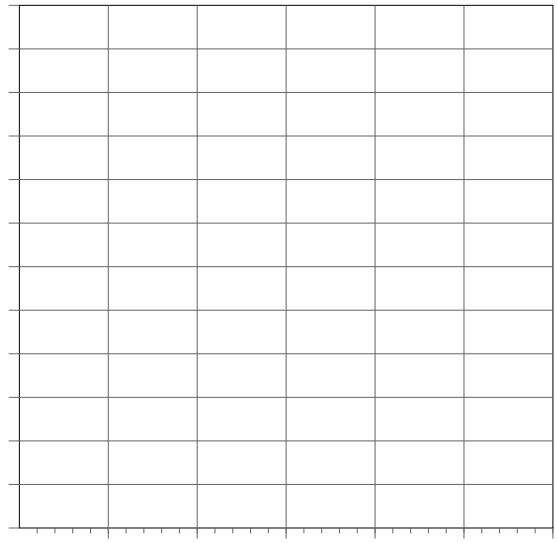
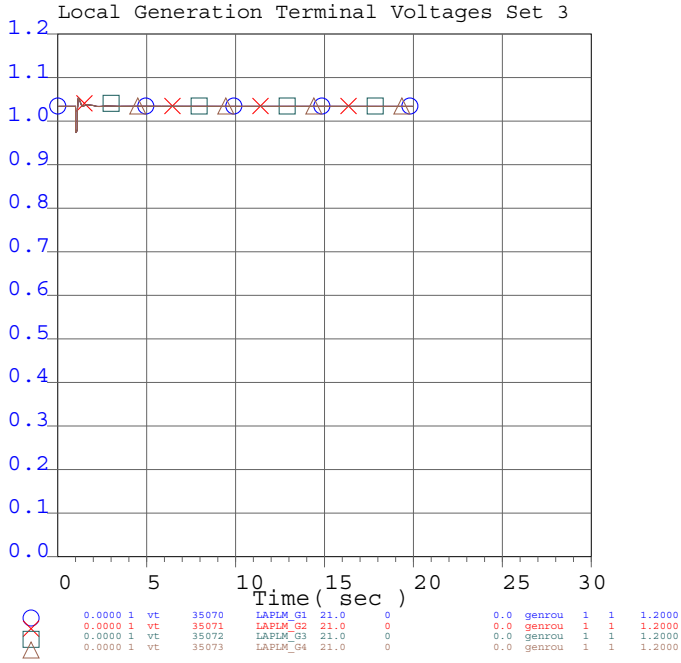
Local Generation Terminal Voltages Set 1



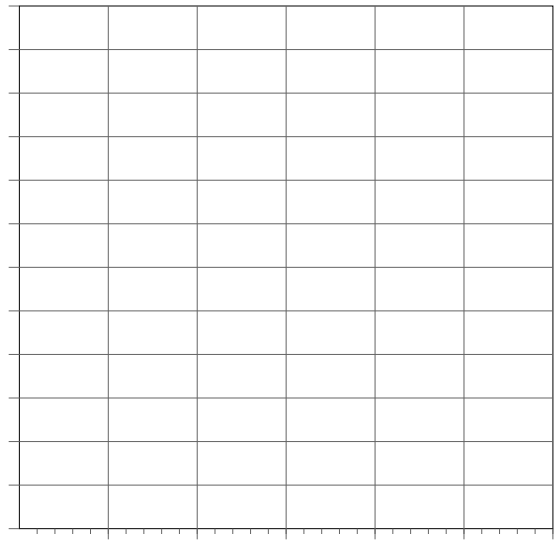
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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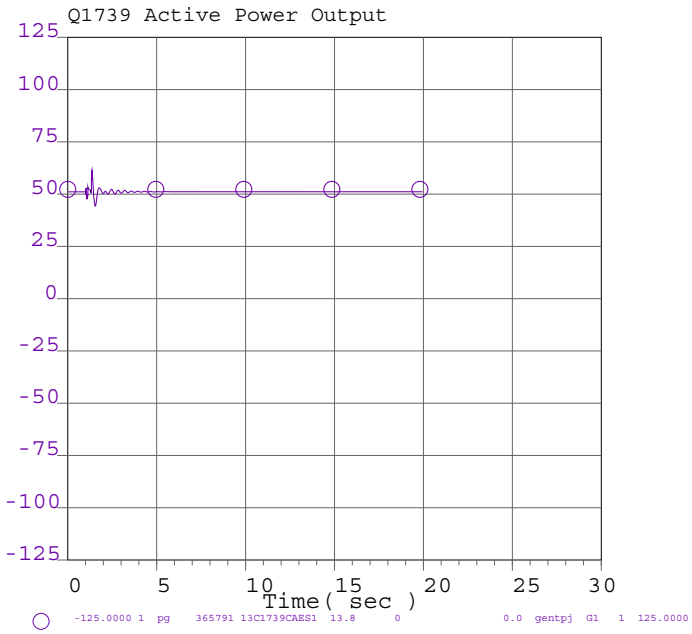
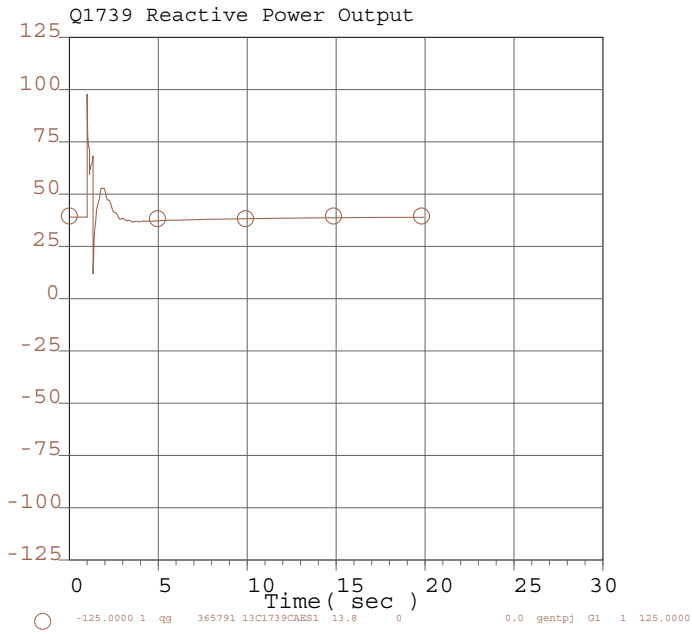
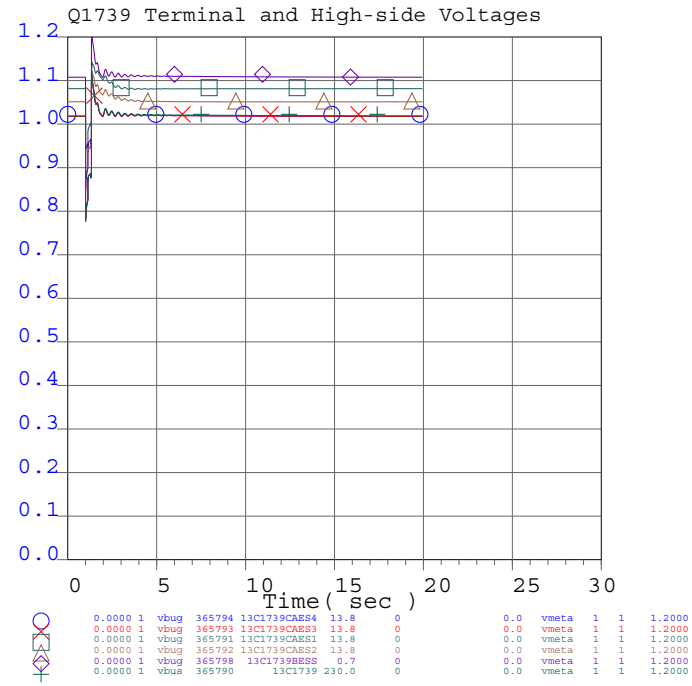
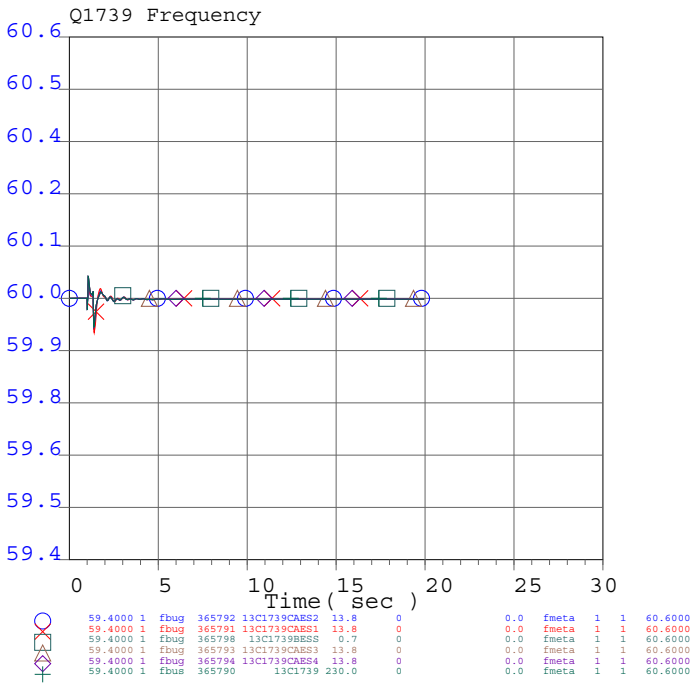
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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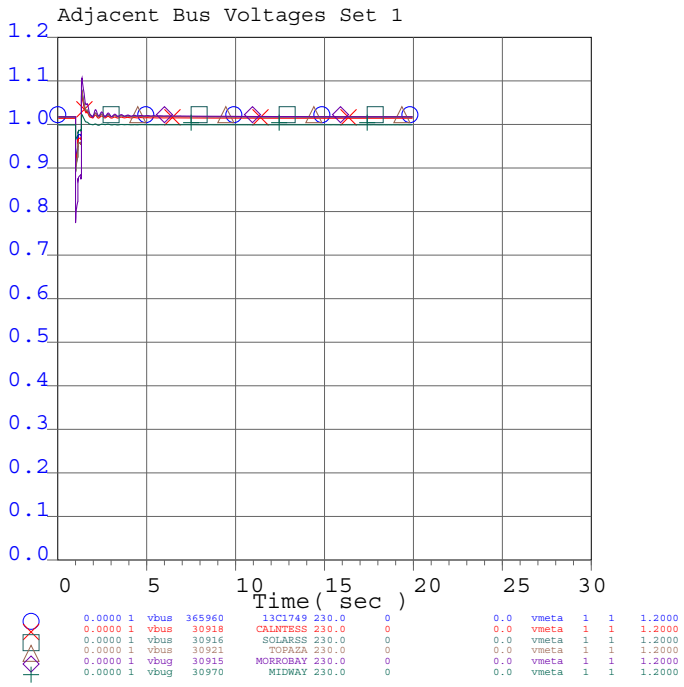

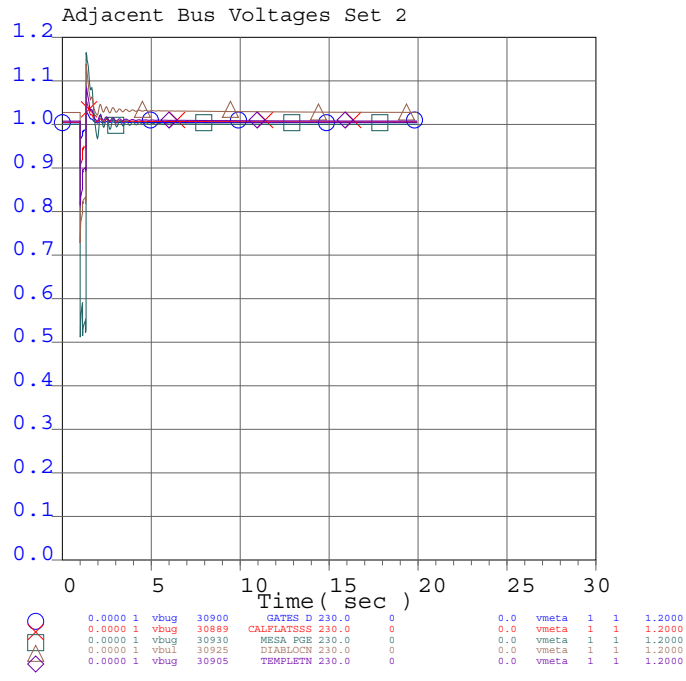

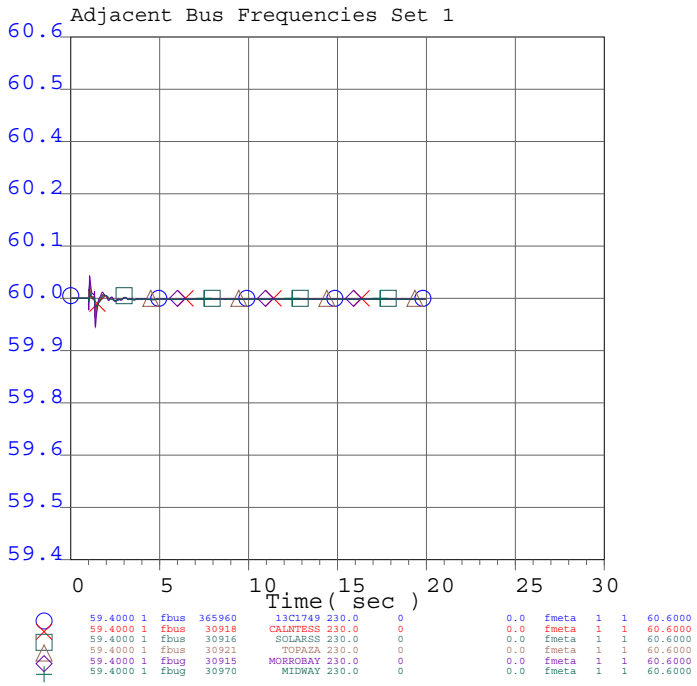

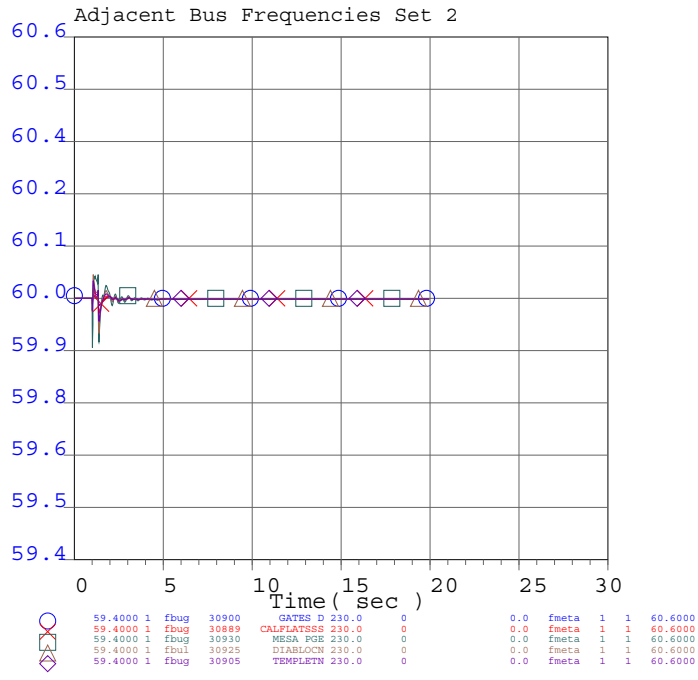

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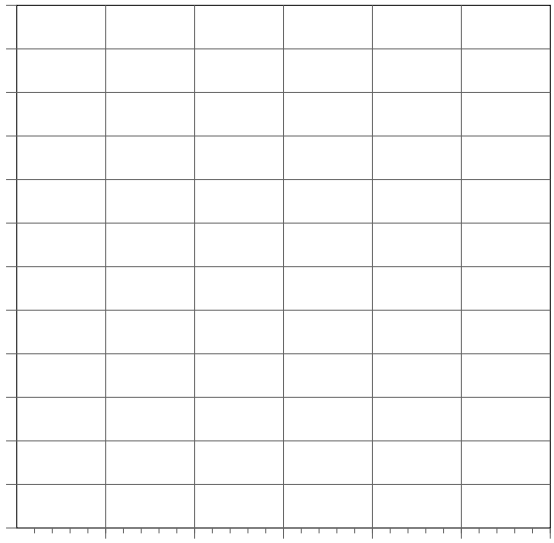
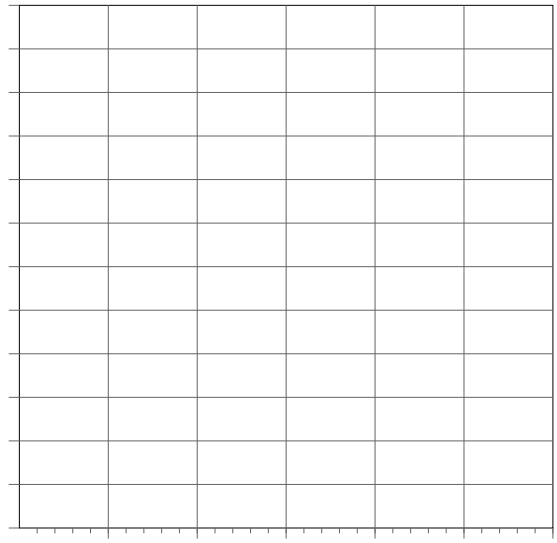
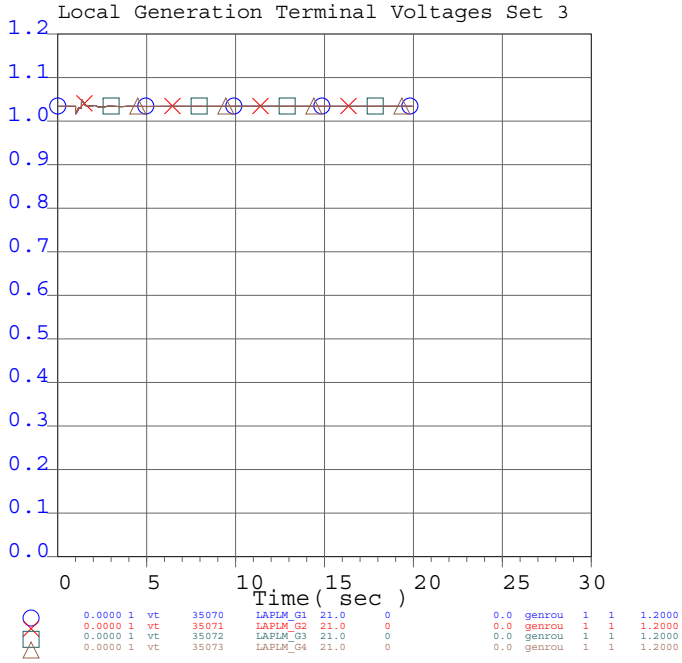
Local Generation Terminal Voltages Set 1



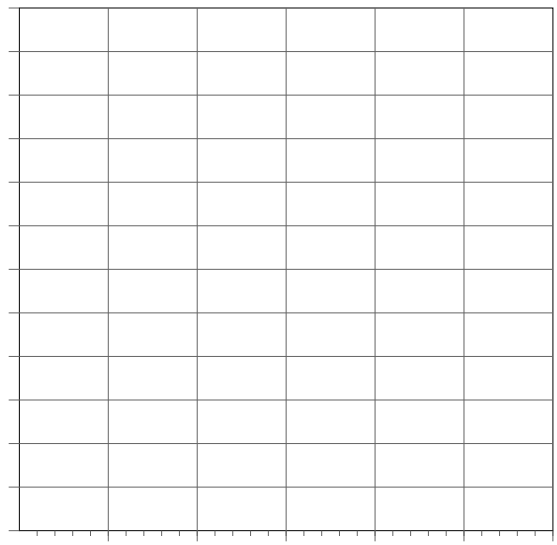
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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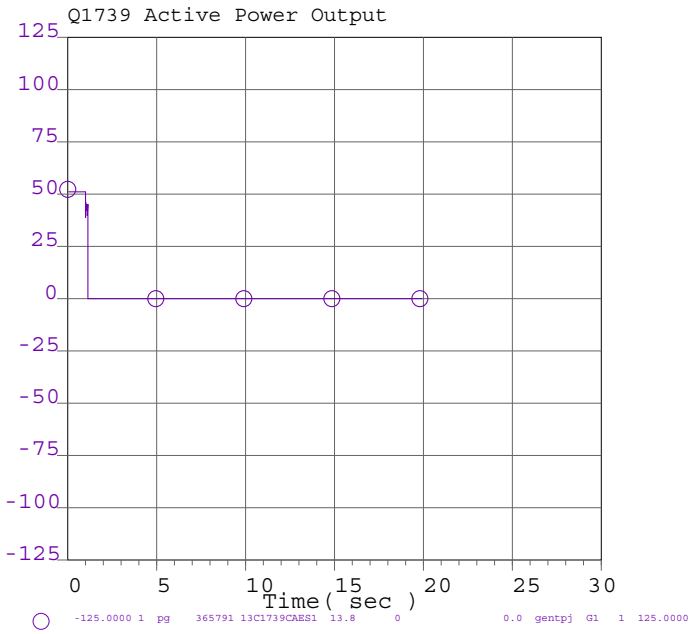
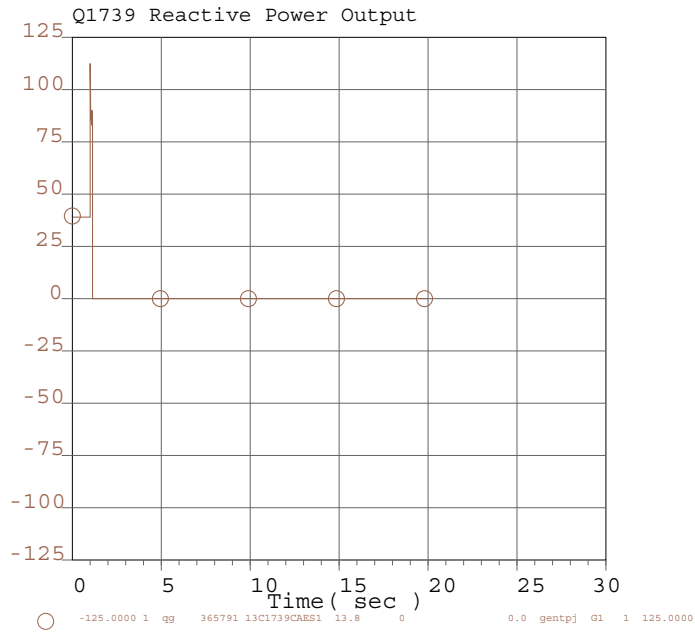
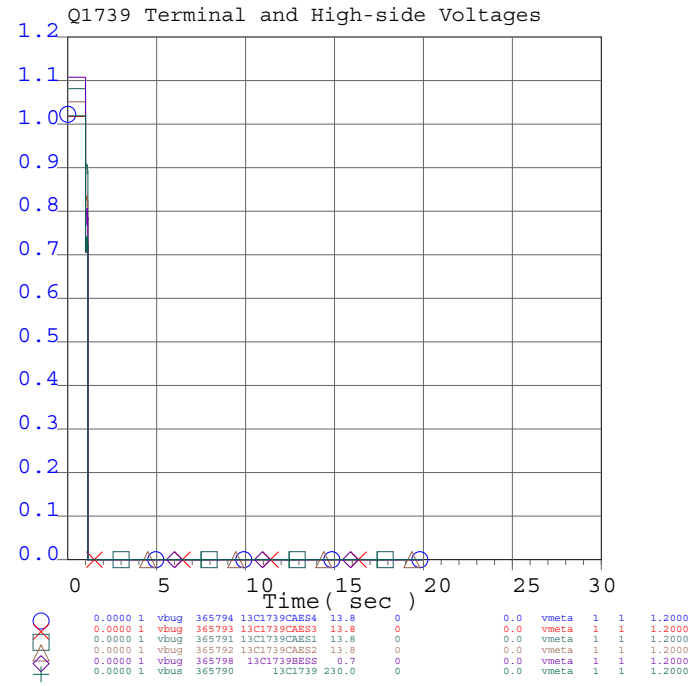
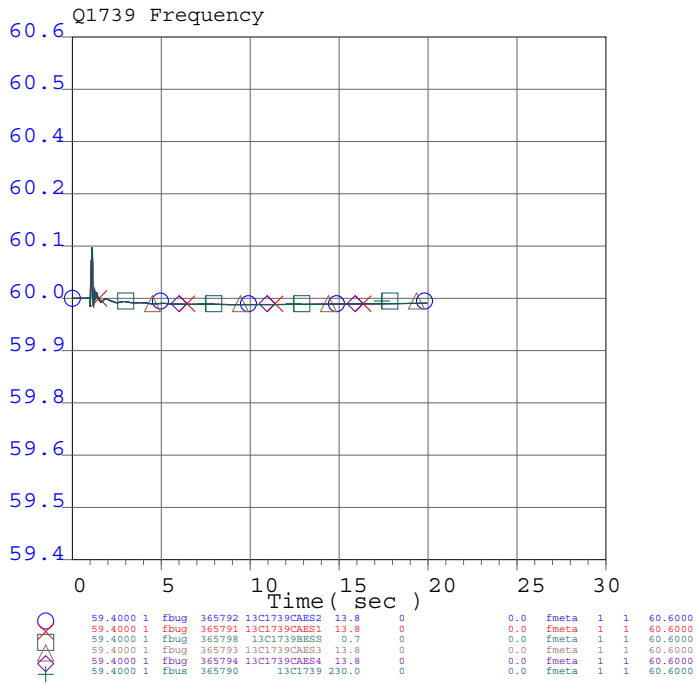
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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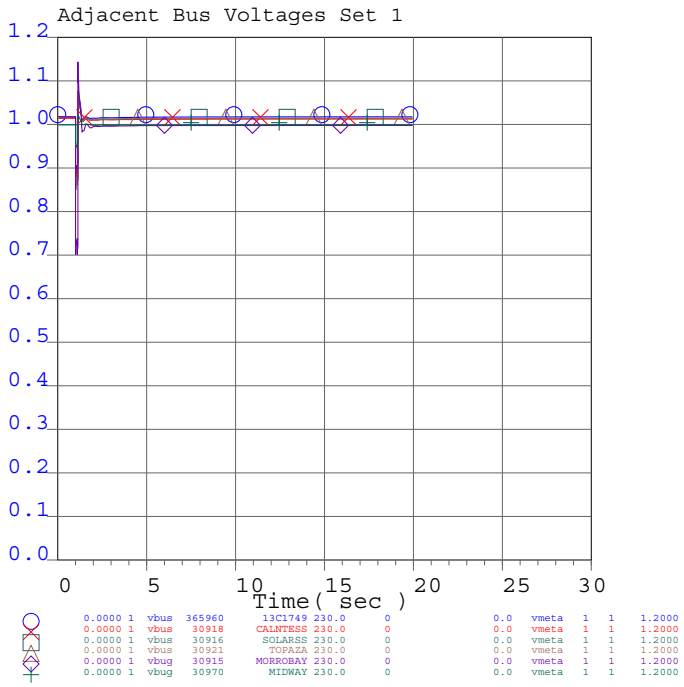

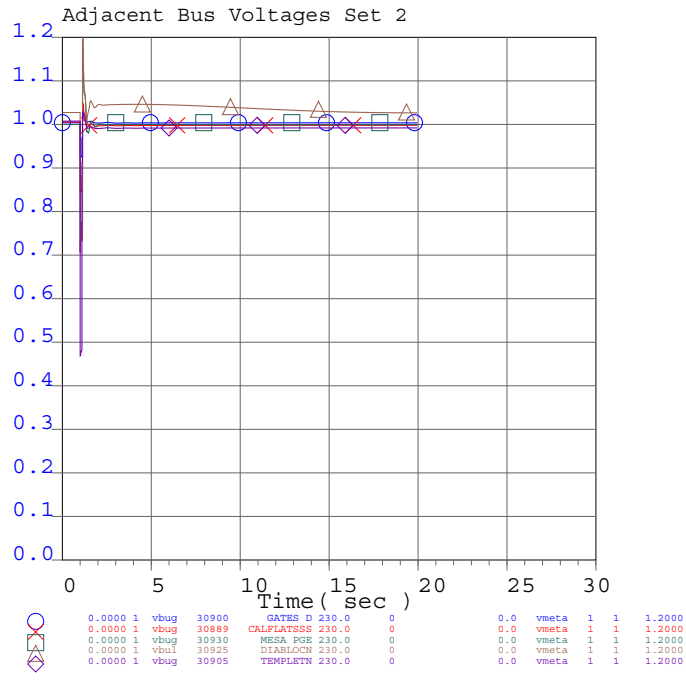

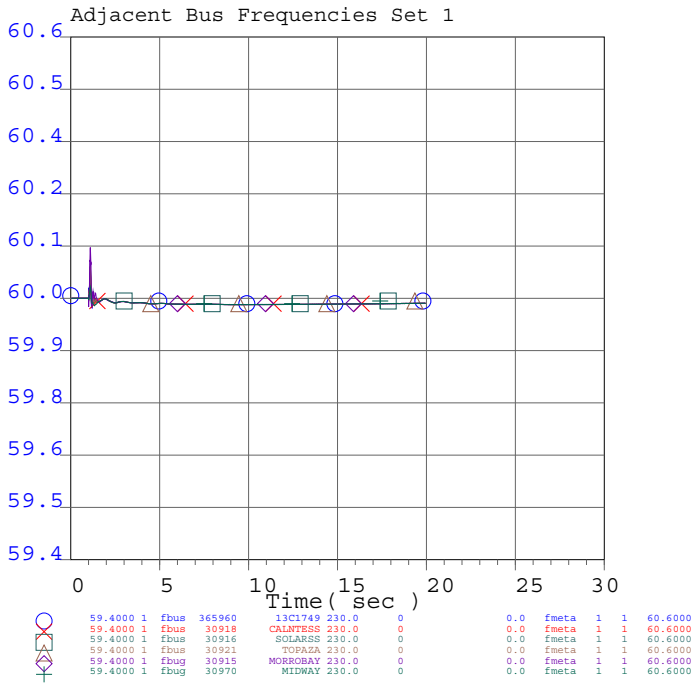

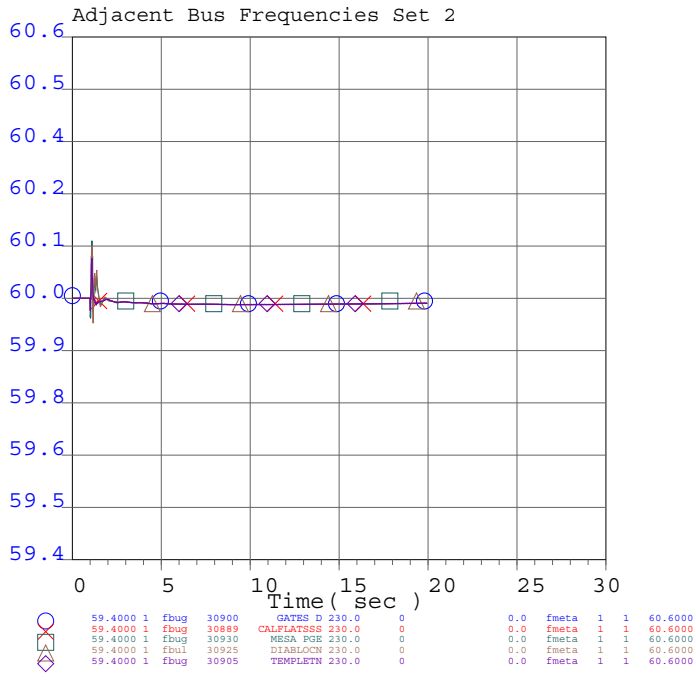

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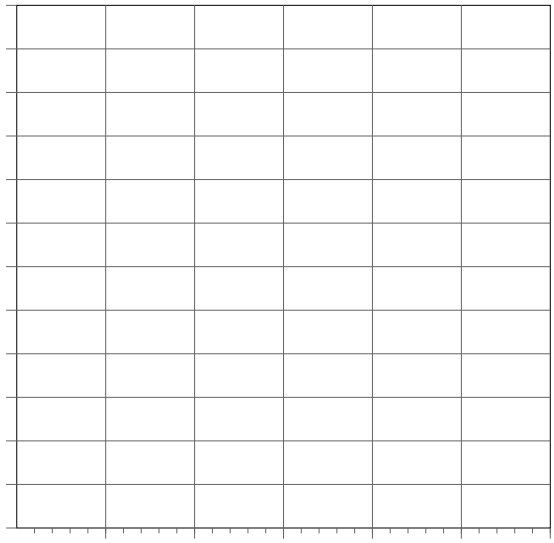
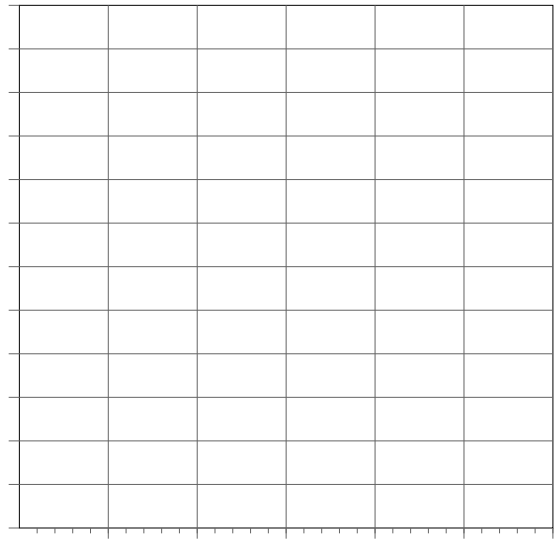
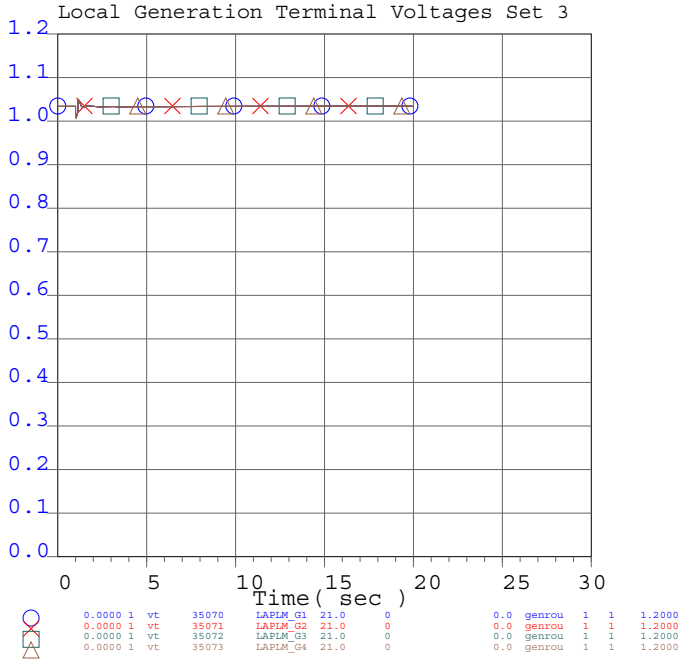


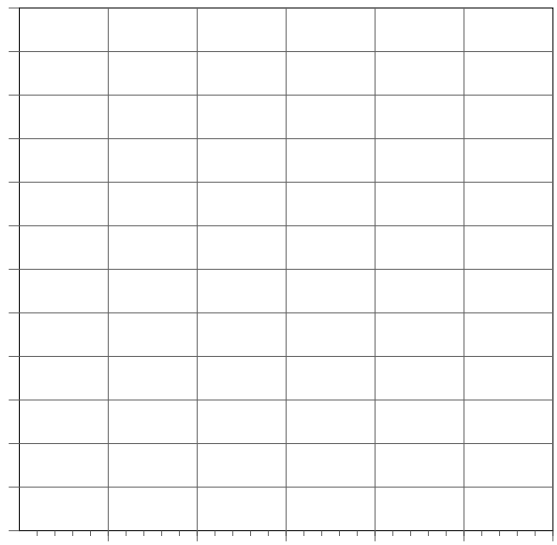
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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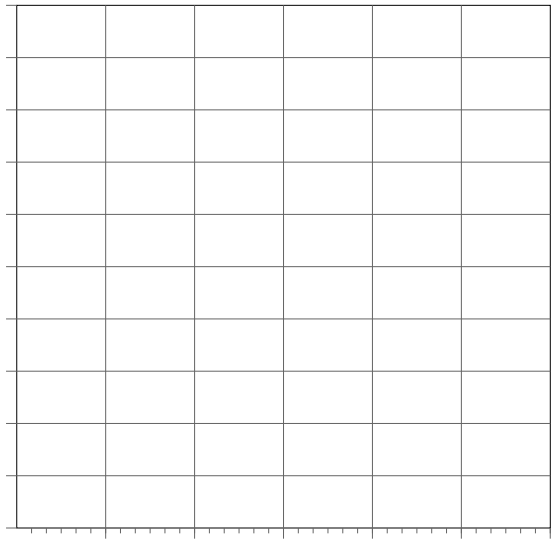
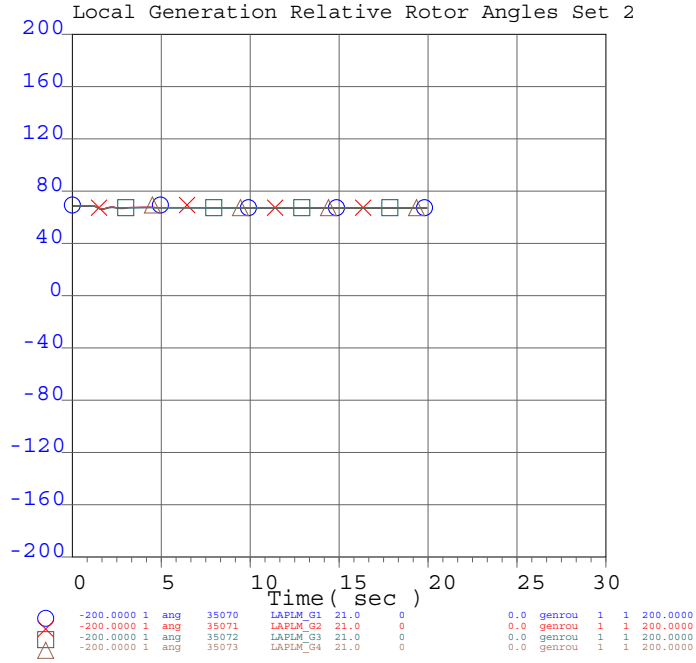
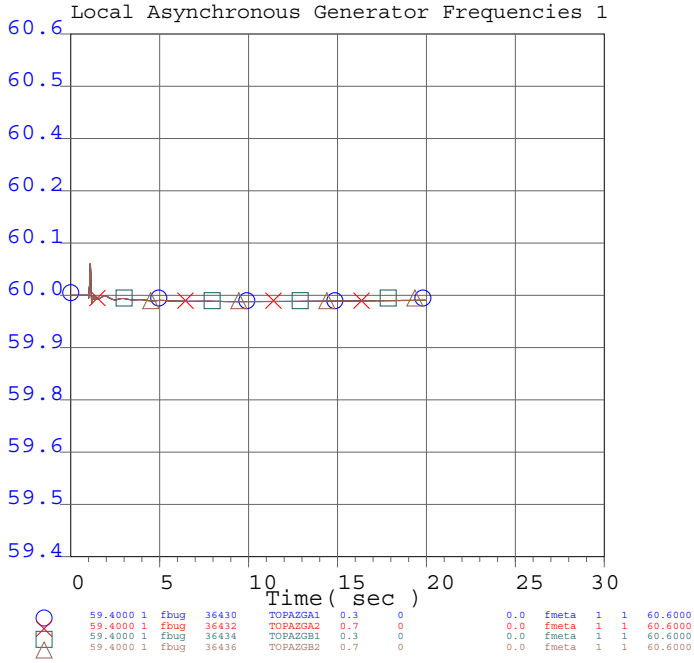
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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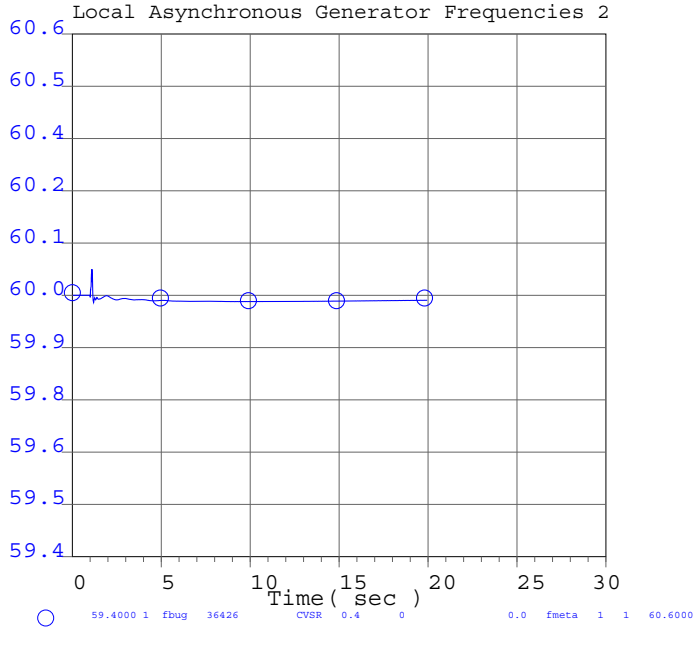

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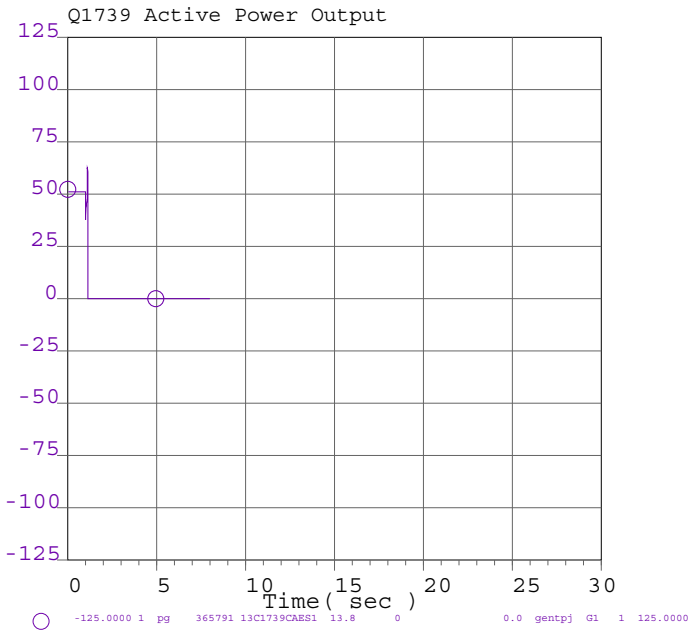

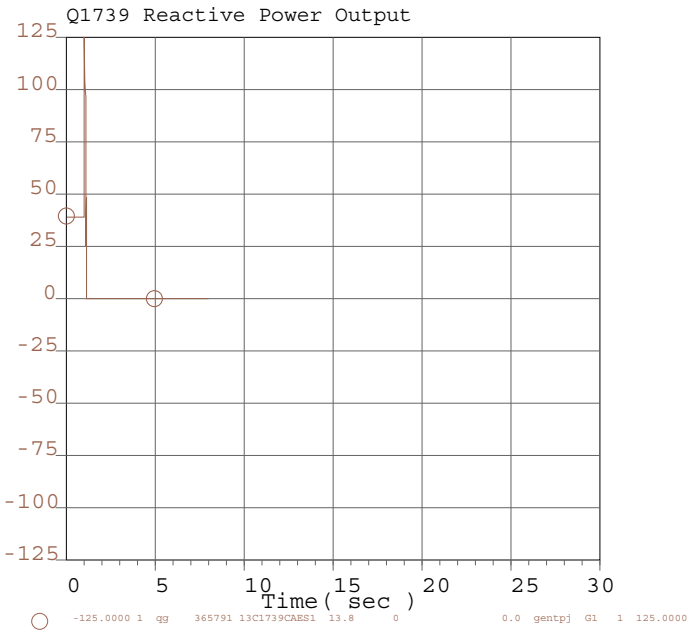

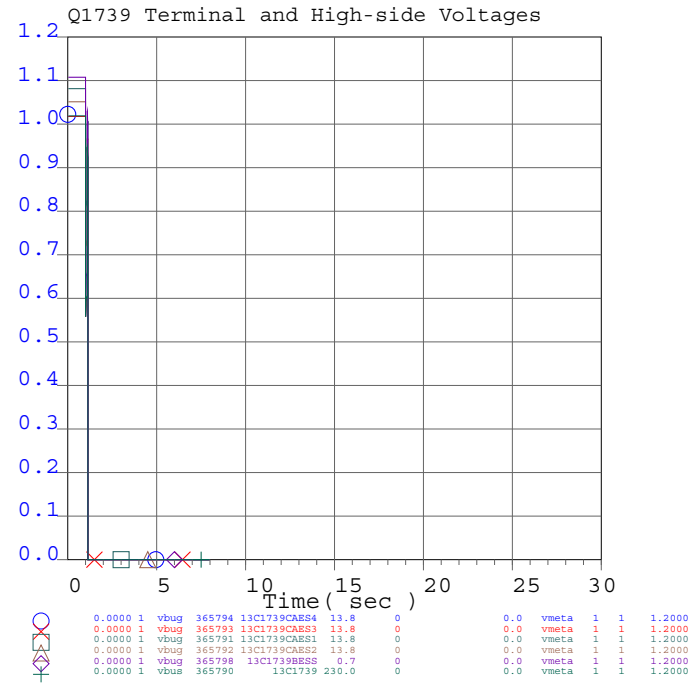

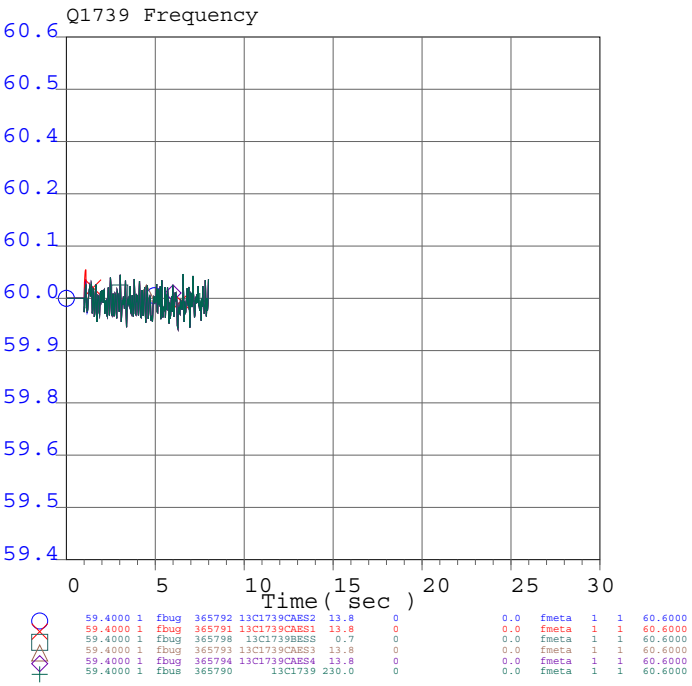

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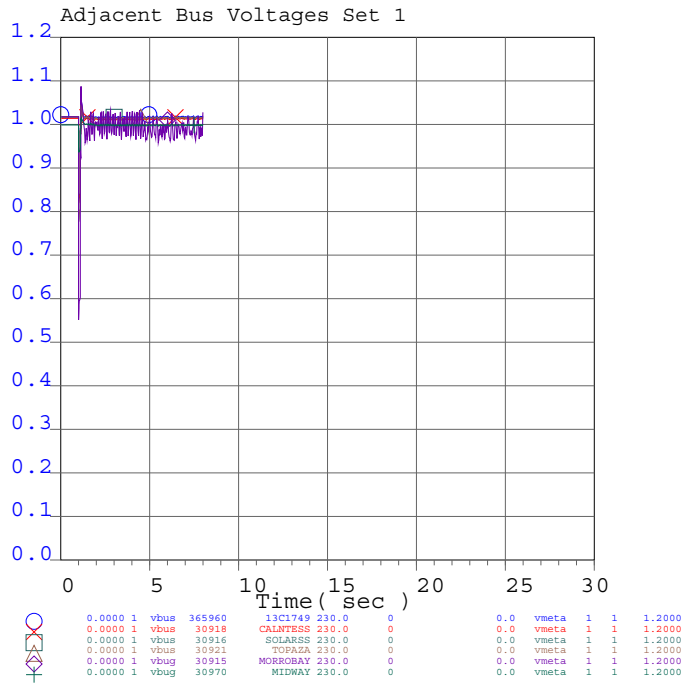
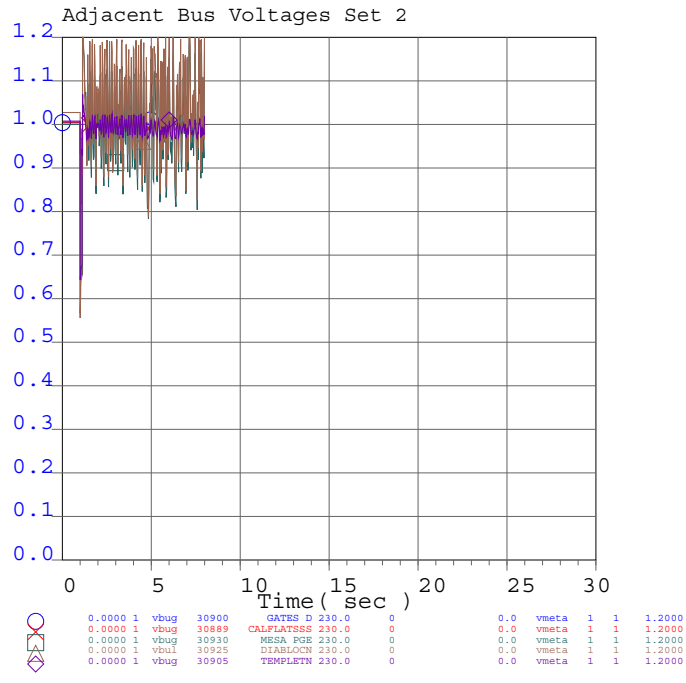
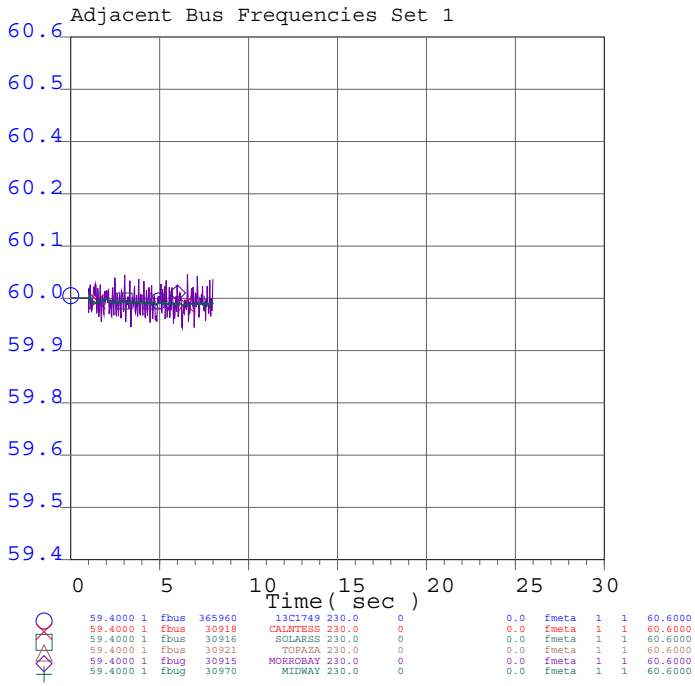
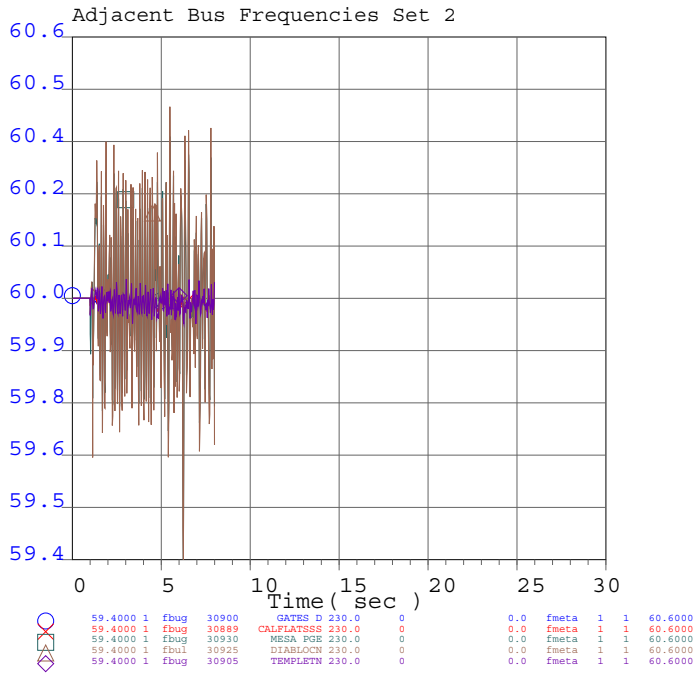


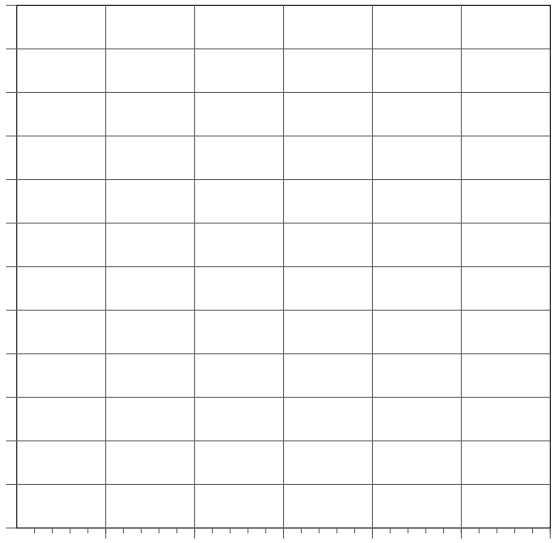




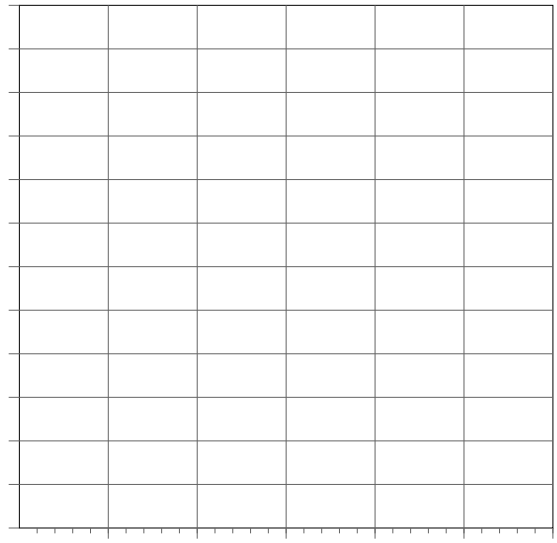


PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

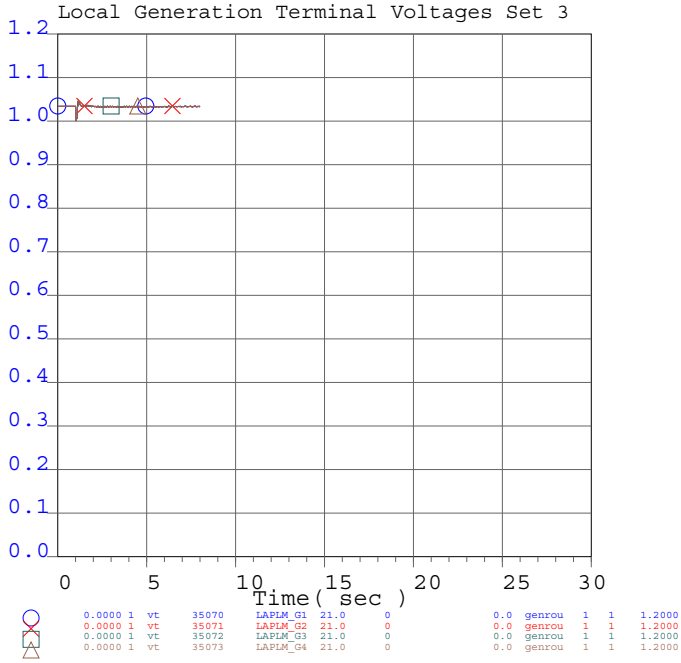
Local Generation Terminal Voltages Set 1



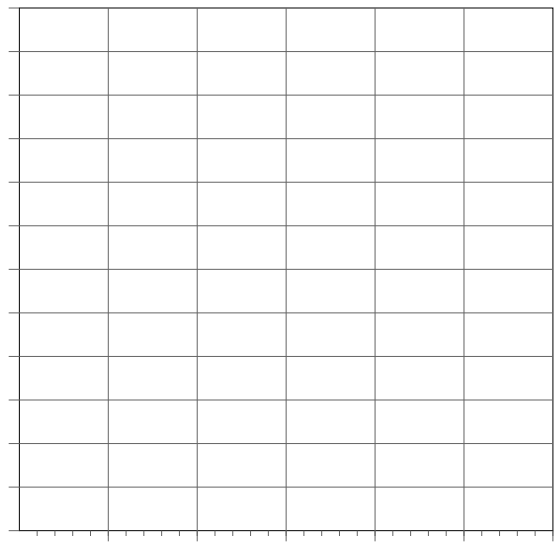
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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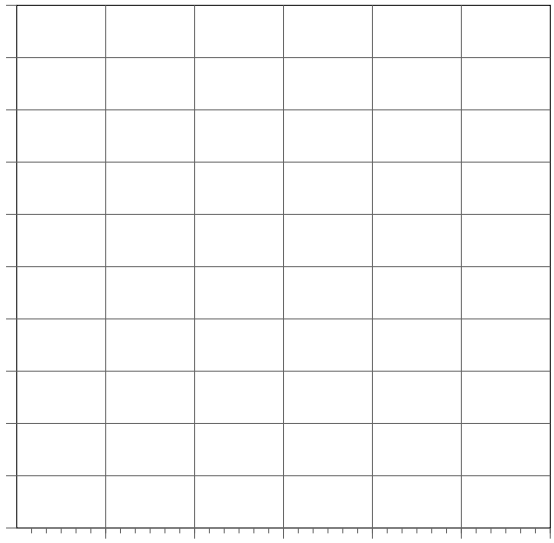
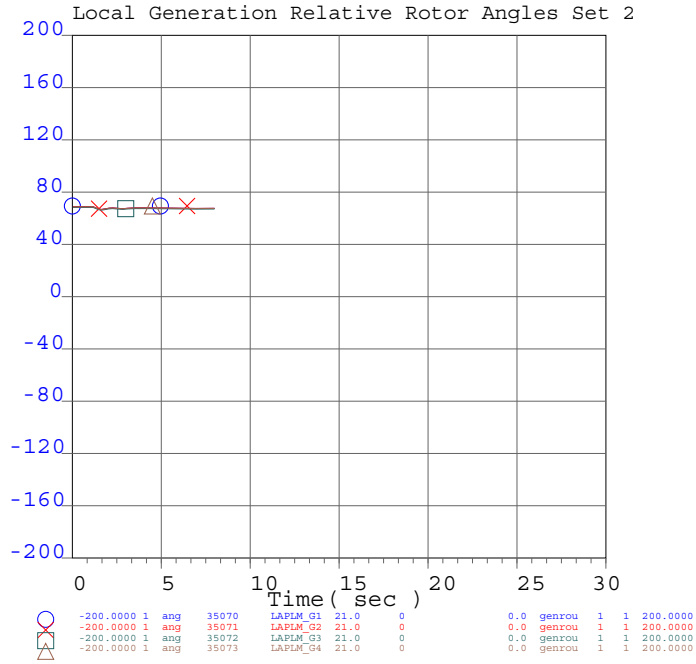
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

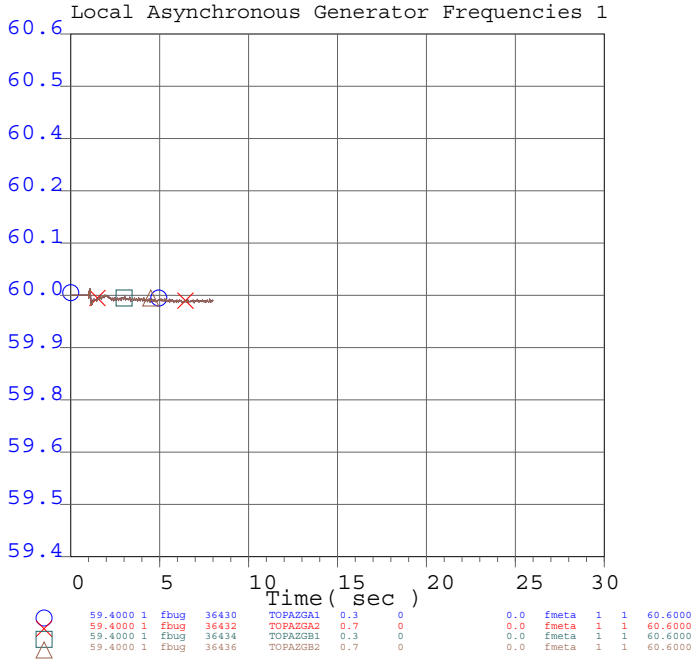
Local Generation Relative Rotor Angles Set 1



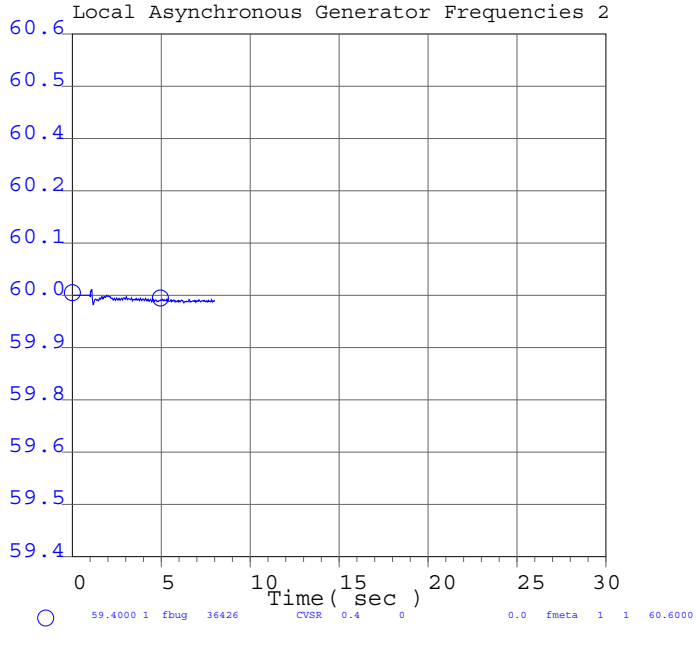
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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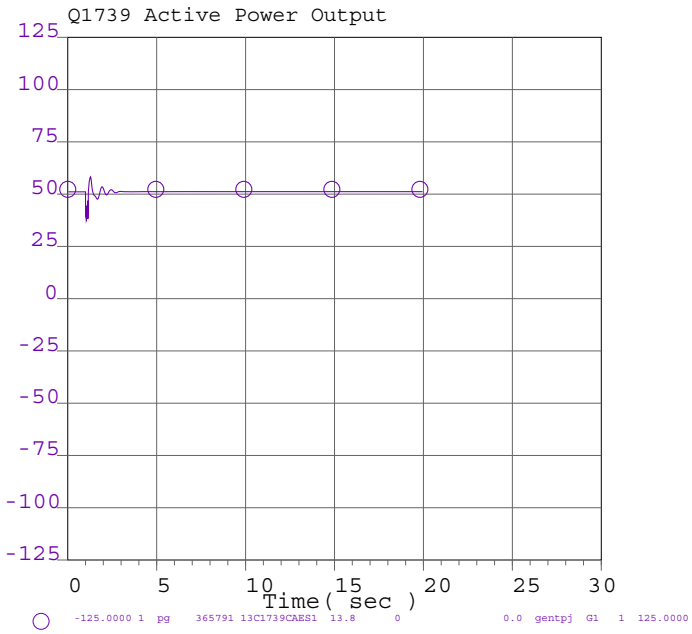
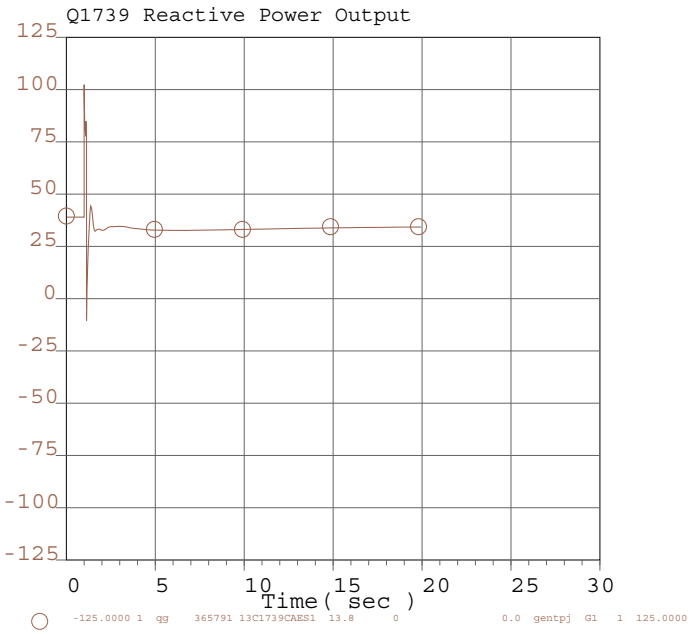
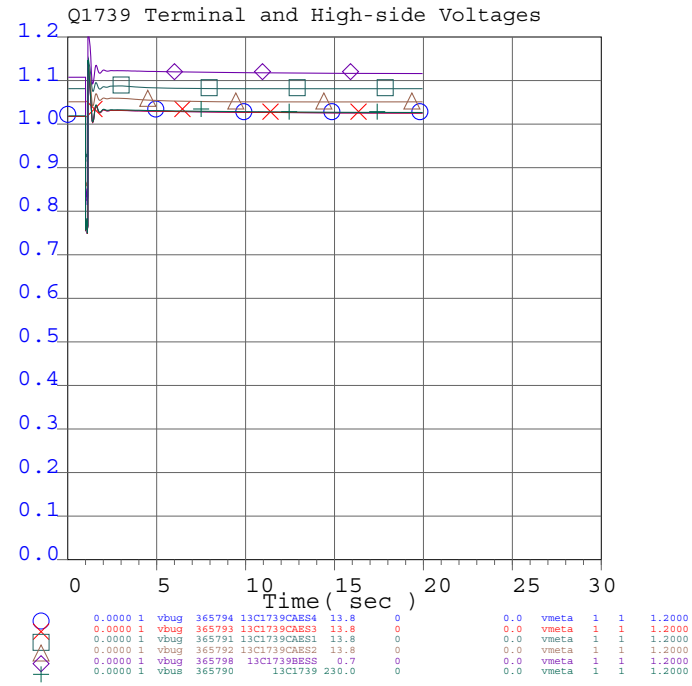
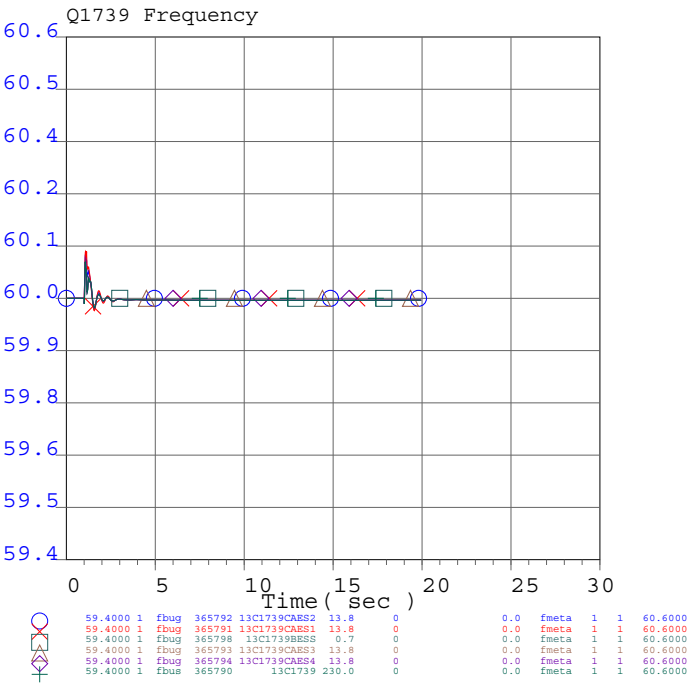
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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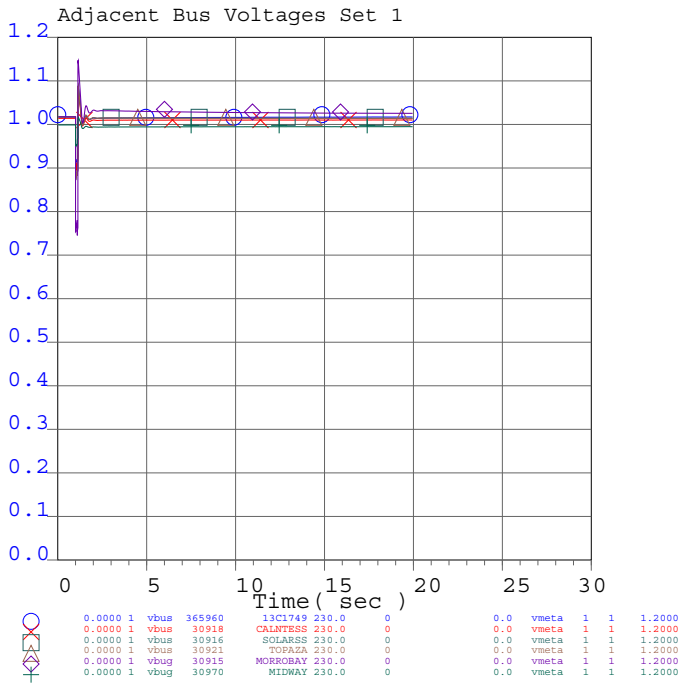

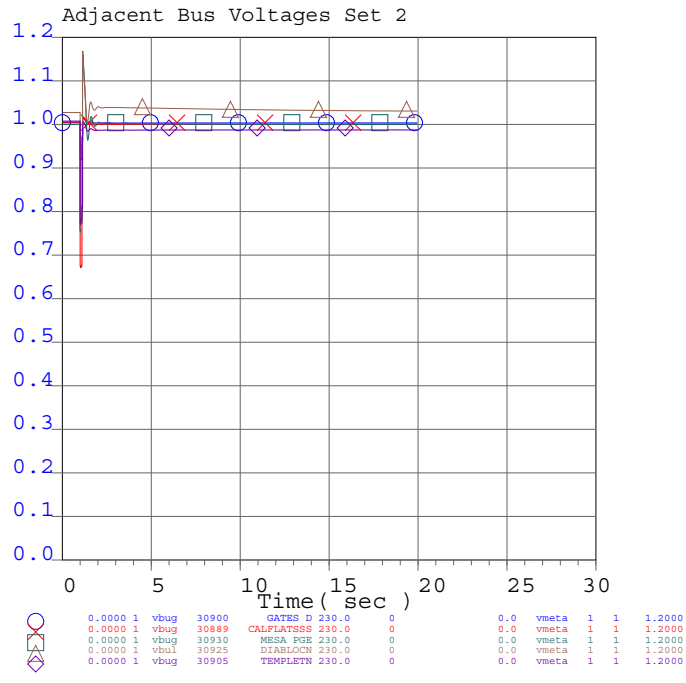

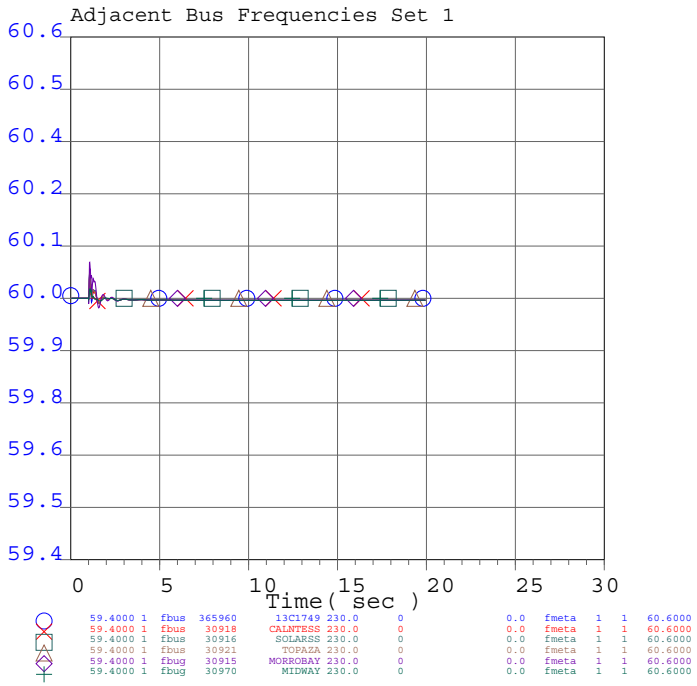

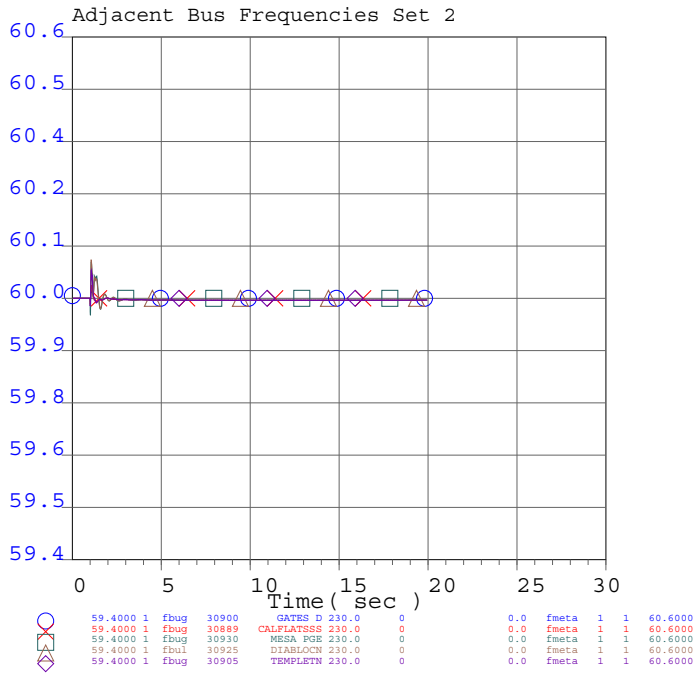

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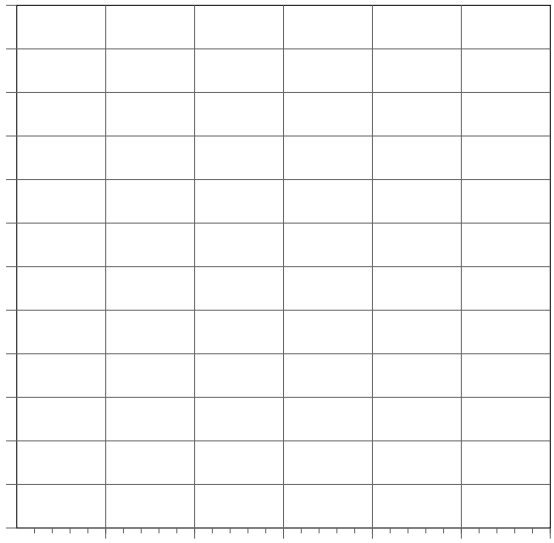
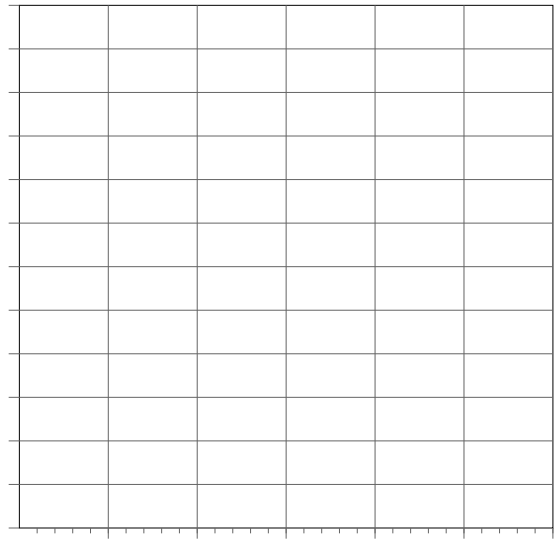
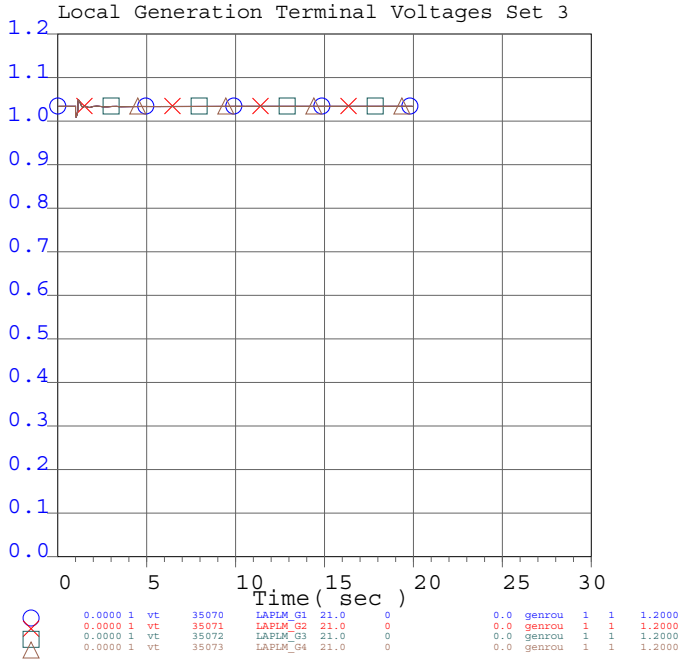
Local Generation Terminal Voltages Set 1



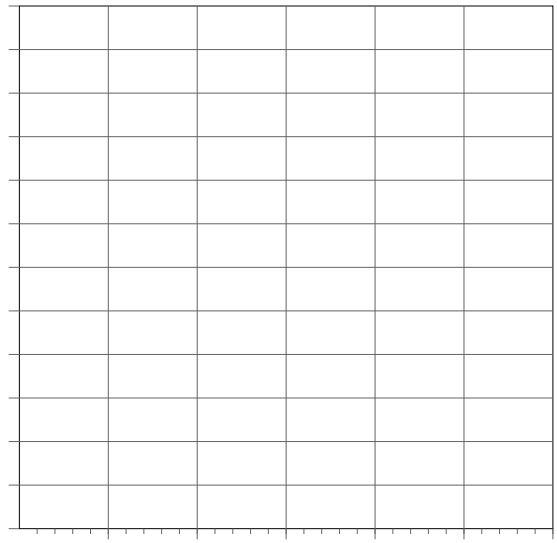
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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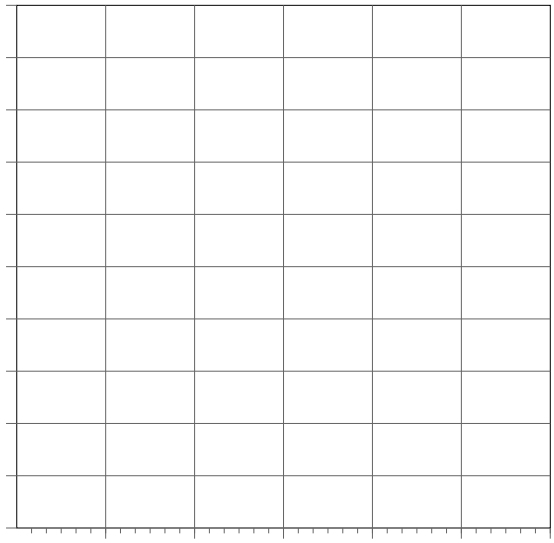
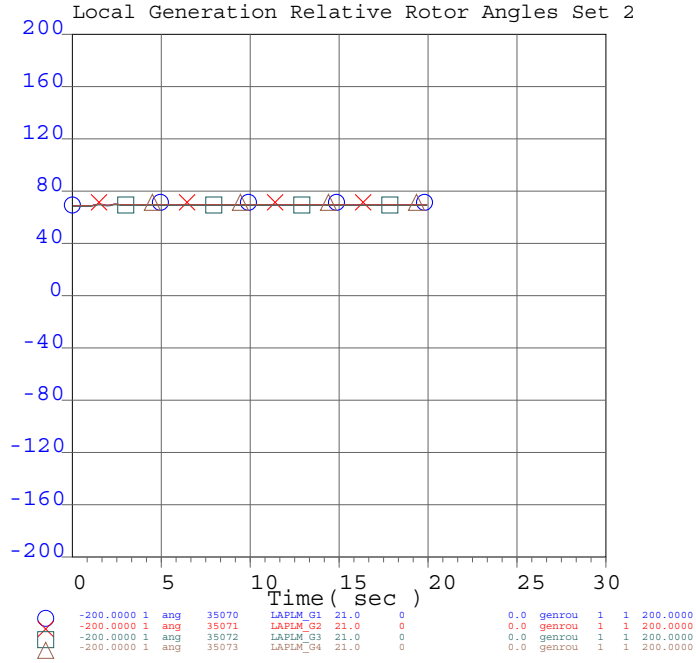
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

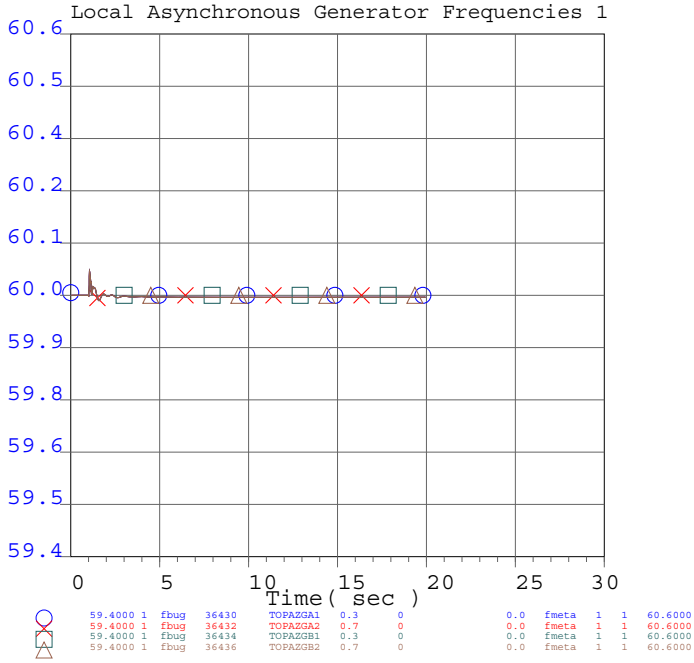
Local Generation Relative Rotor Angles Set 1



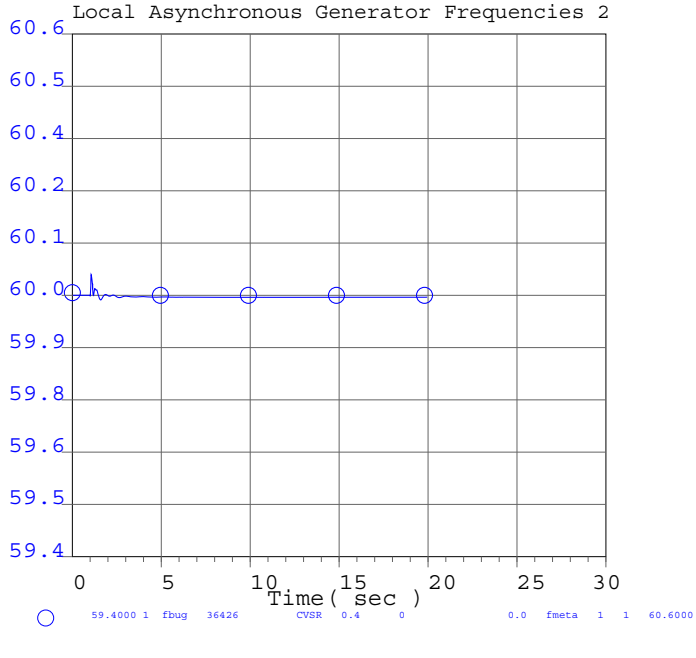
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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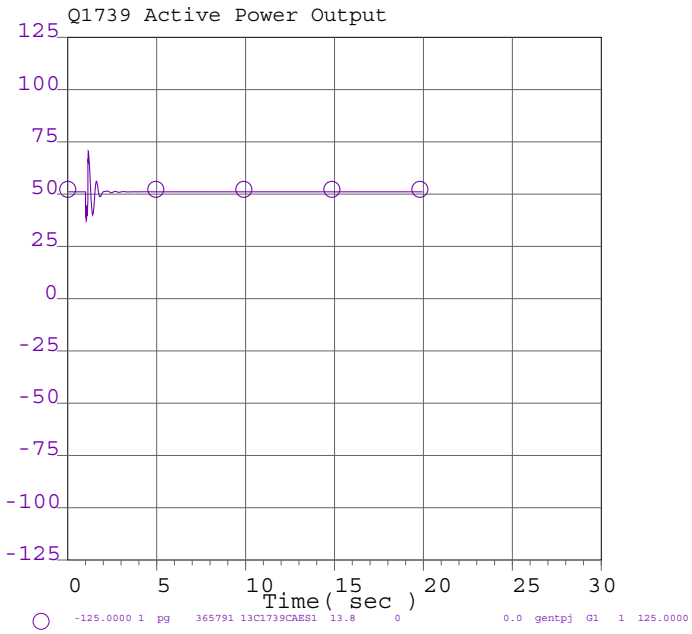
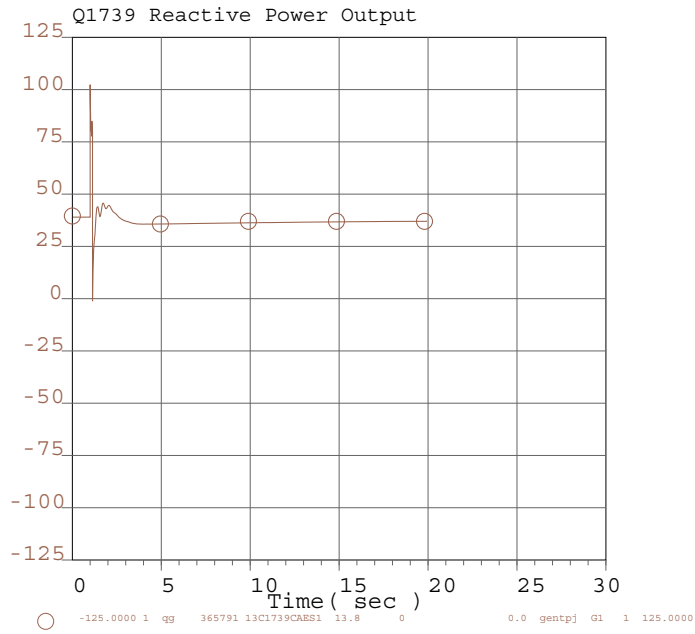
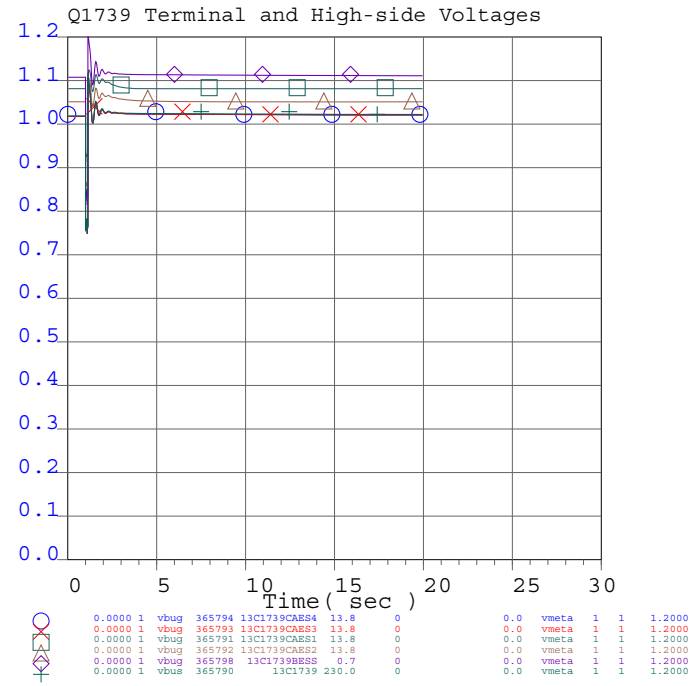
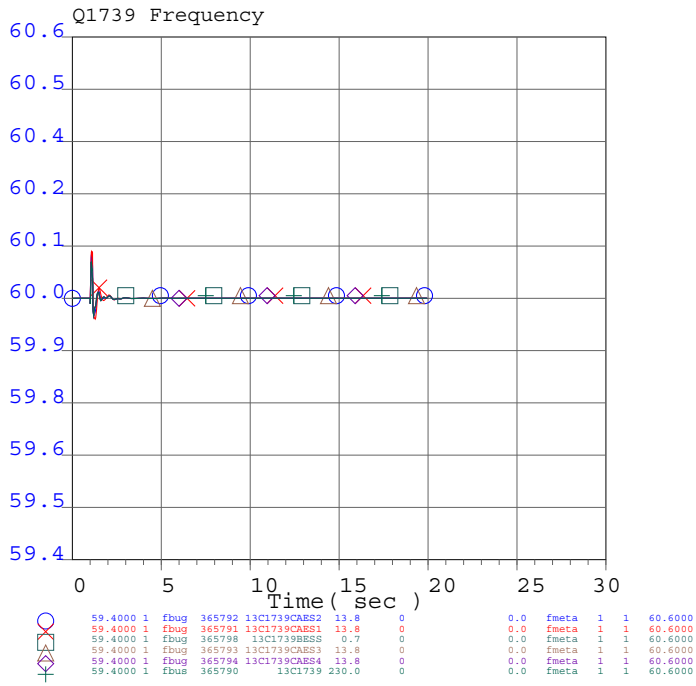
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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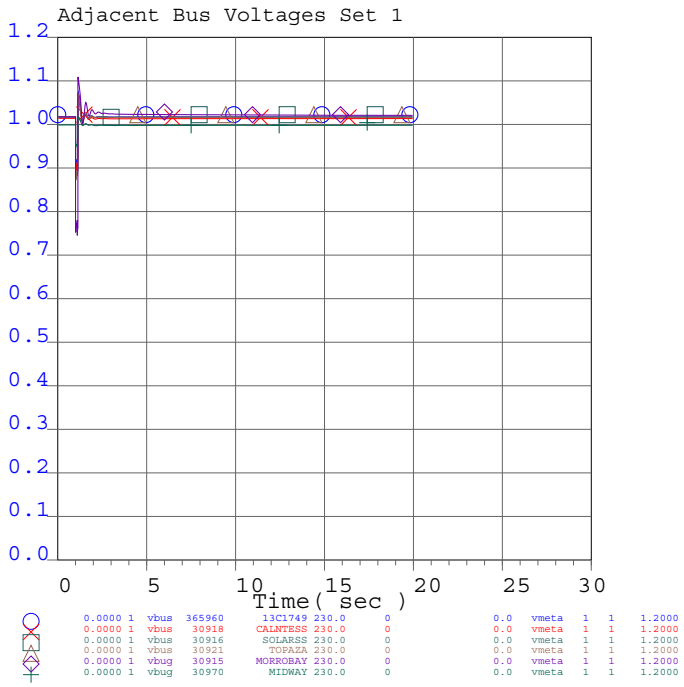

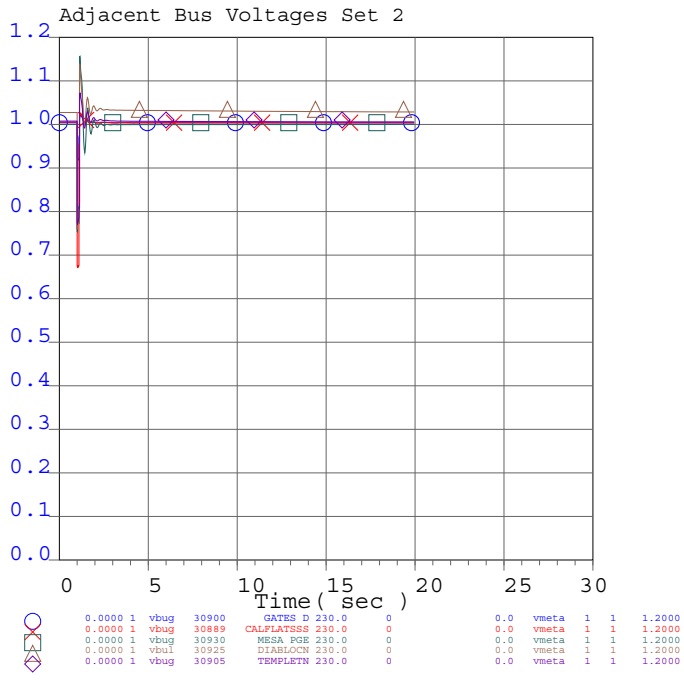

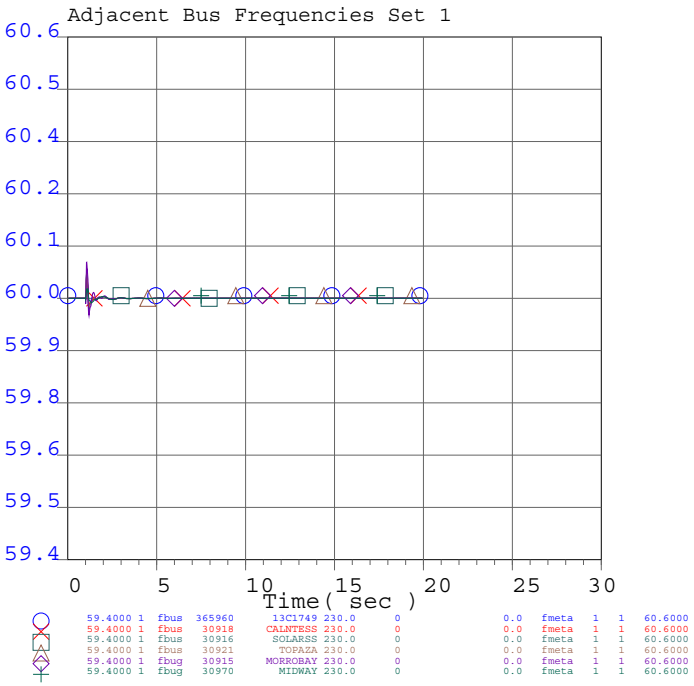

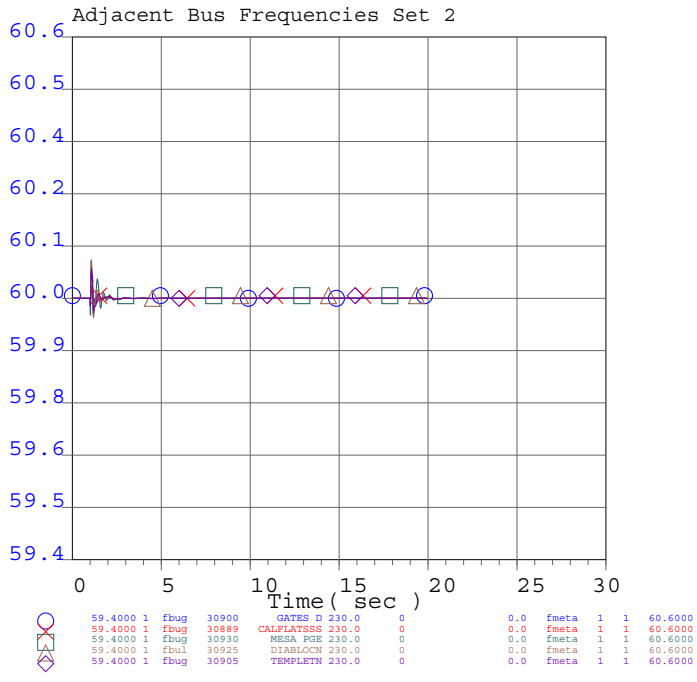

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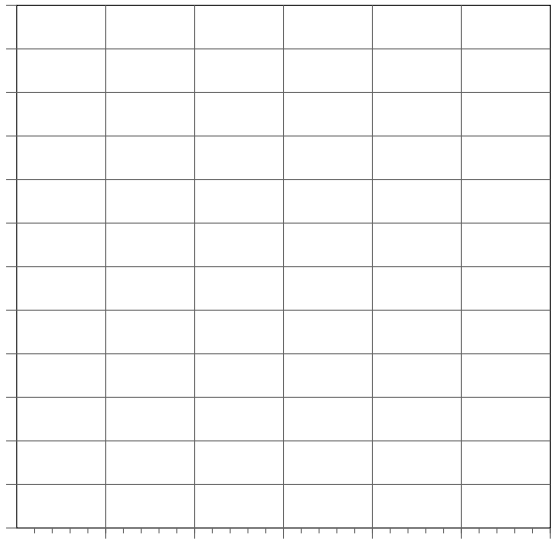
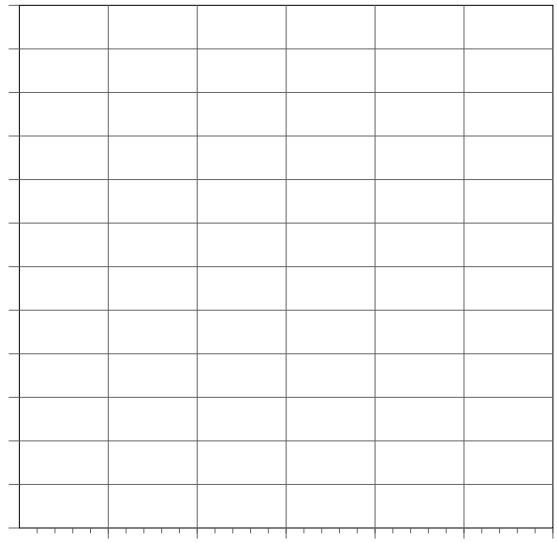
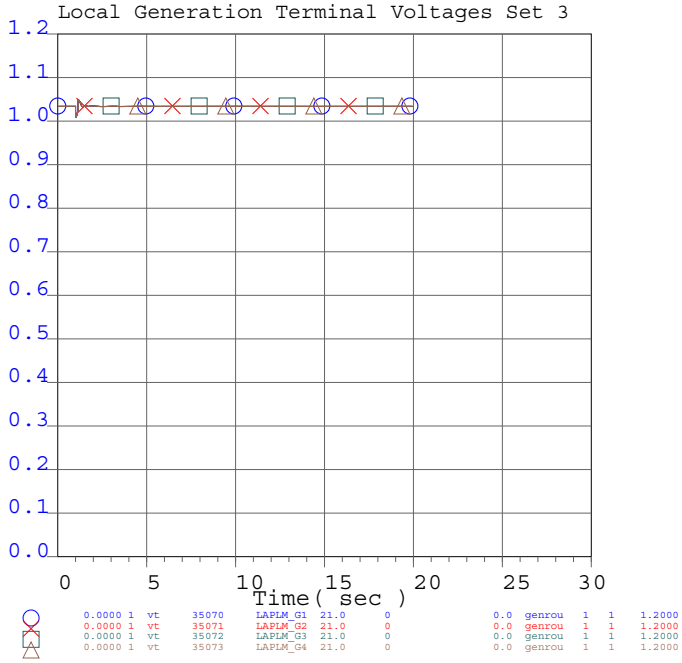
Local Generation Terminal Voltages Set 1



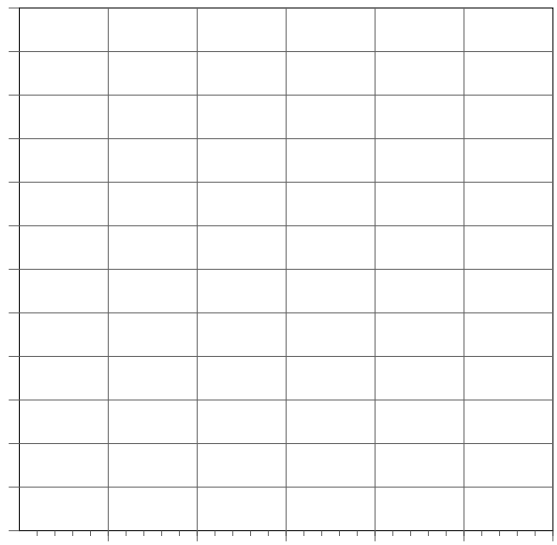
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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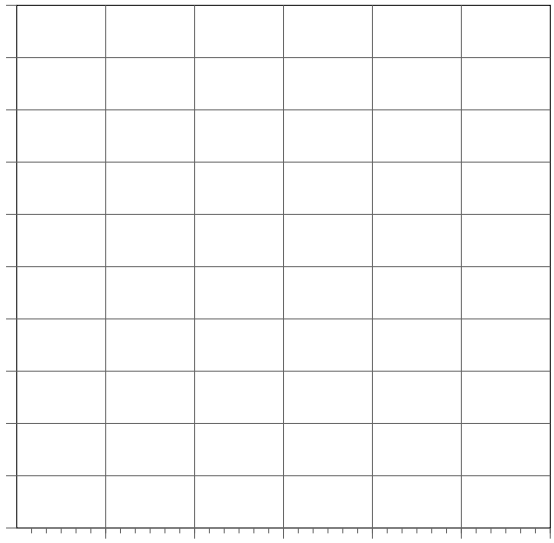
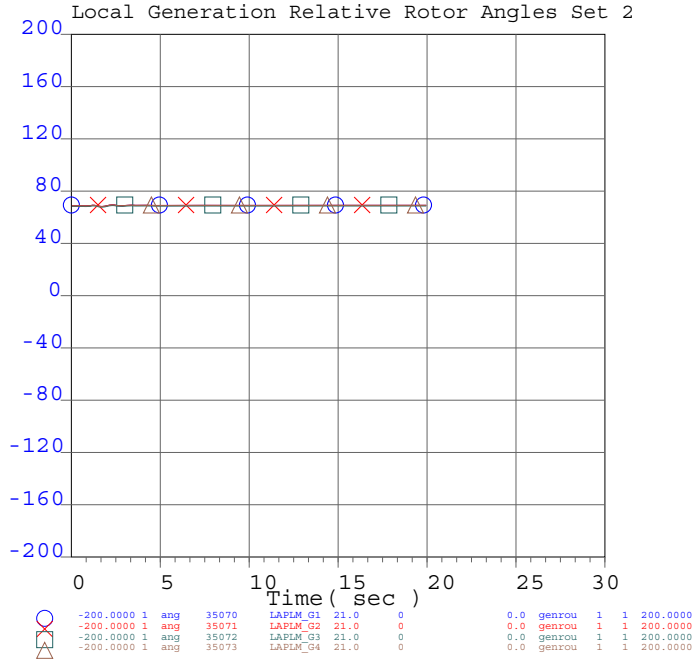
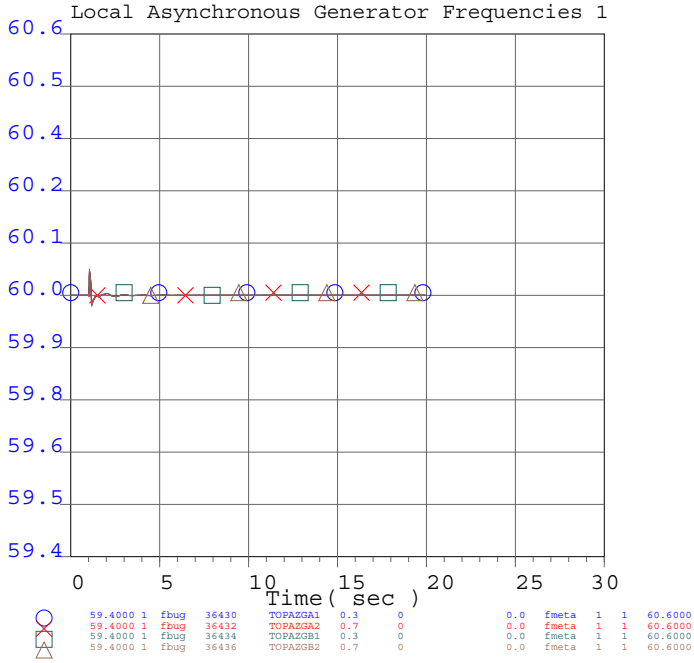
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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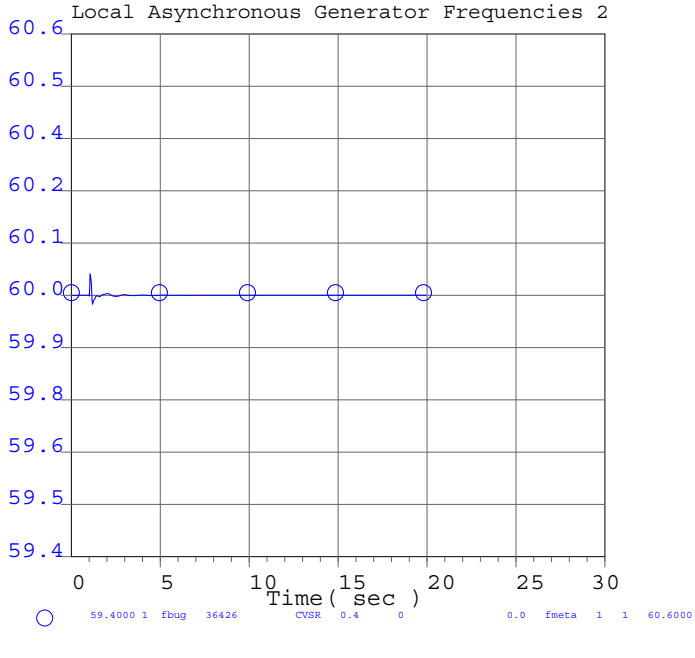

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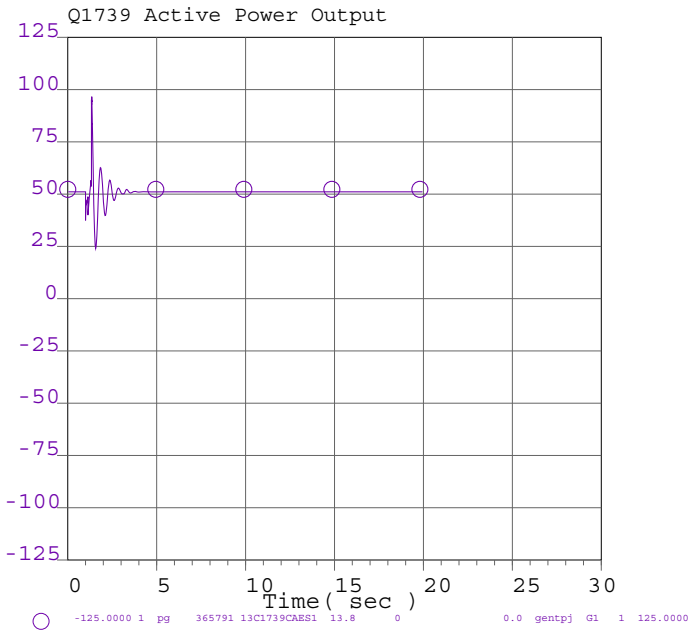

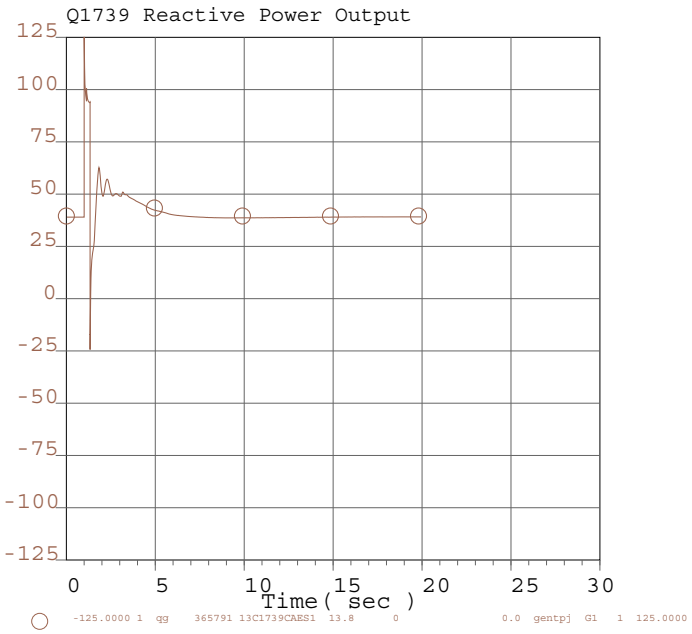

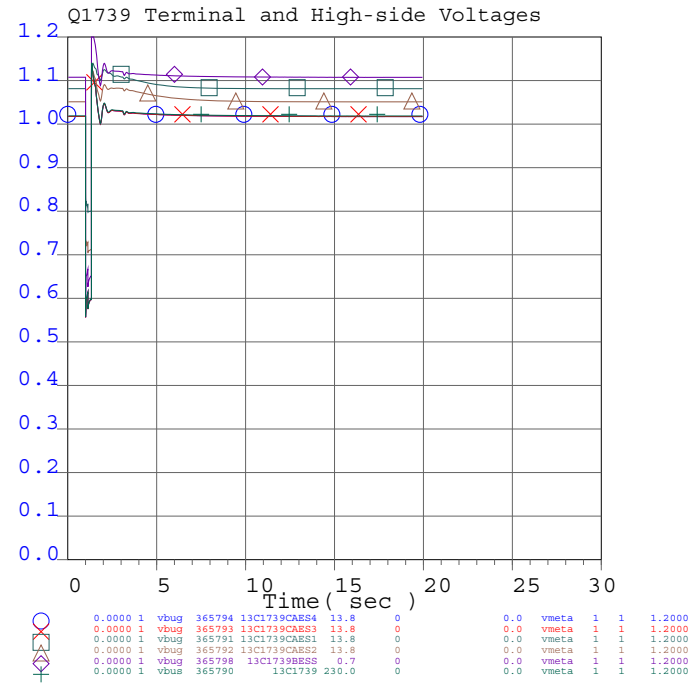

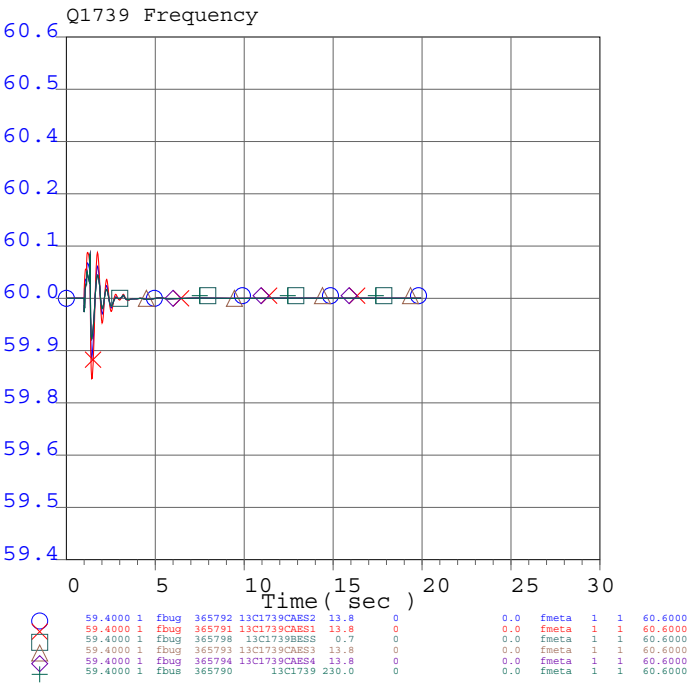

PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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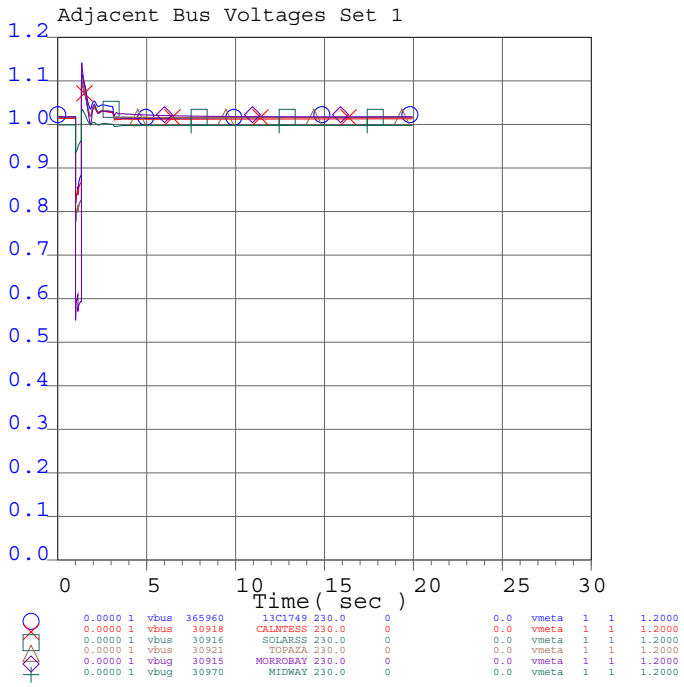
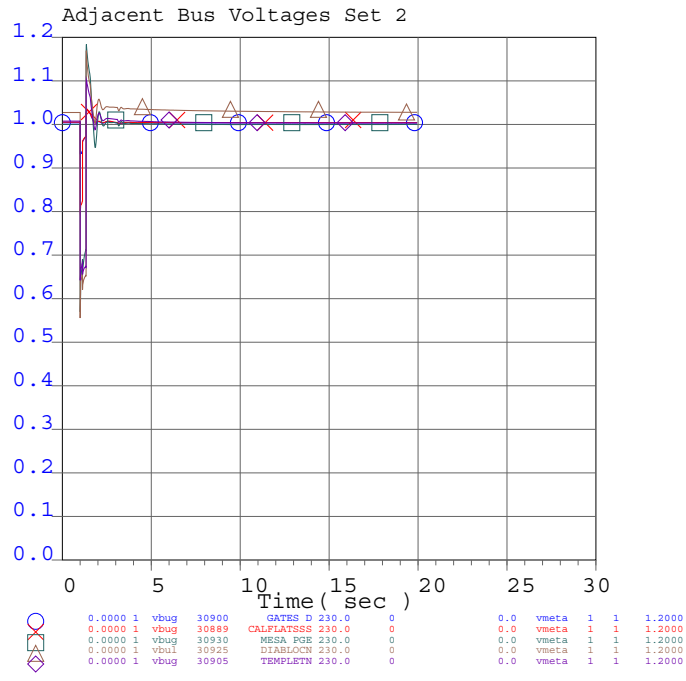
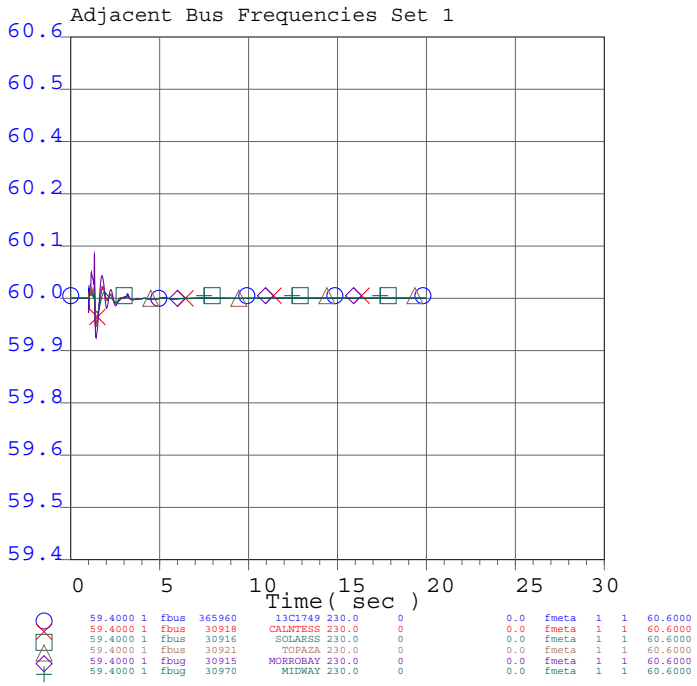
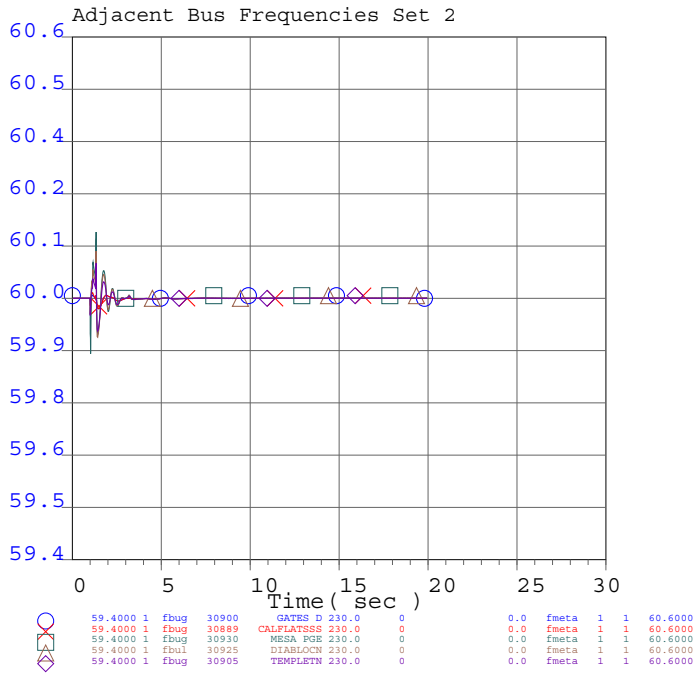
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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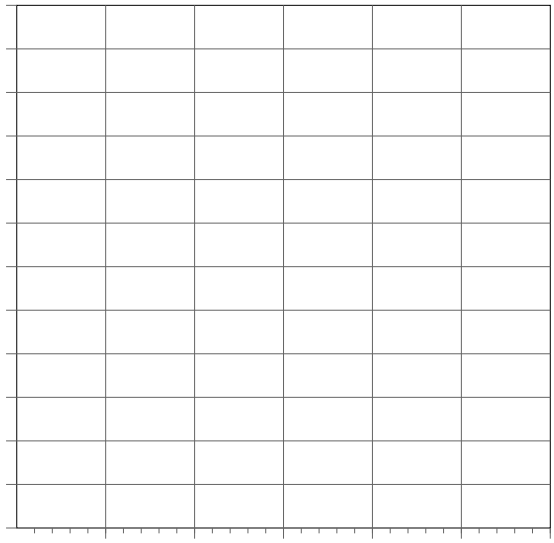
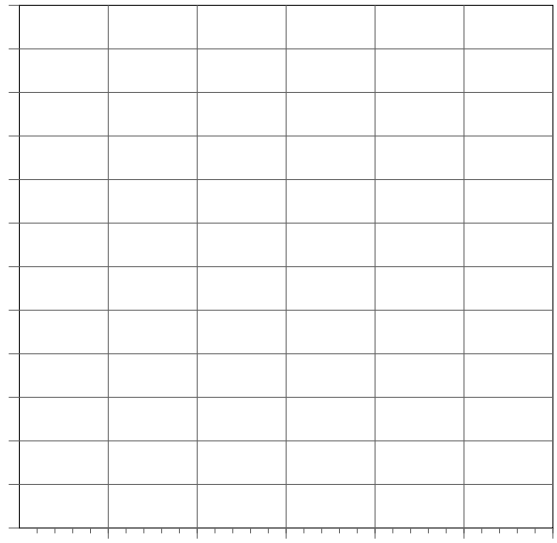
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

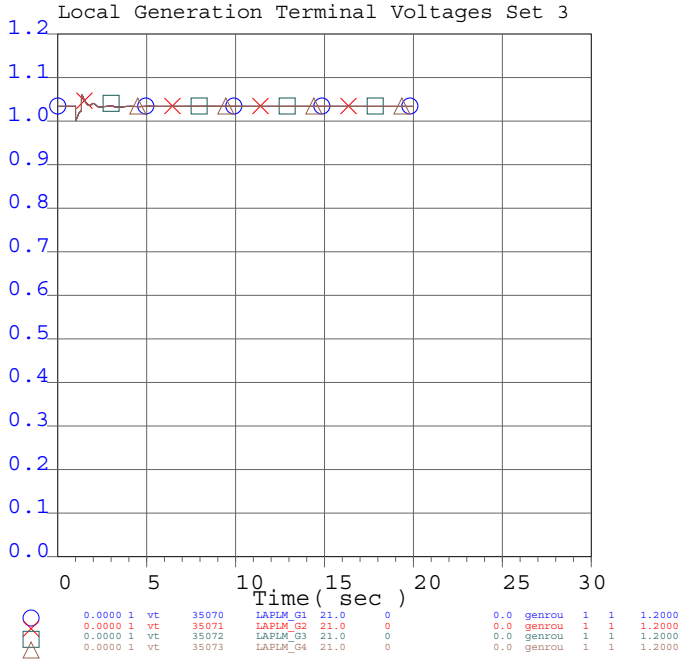
Local Generation Terminal Voltages Set 1



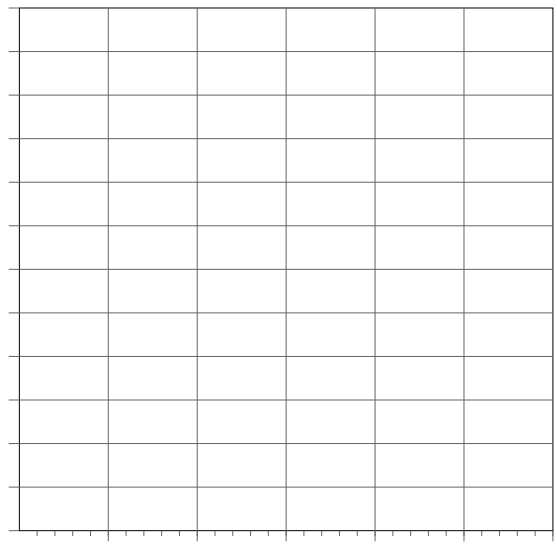
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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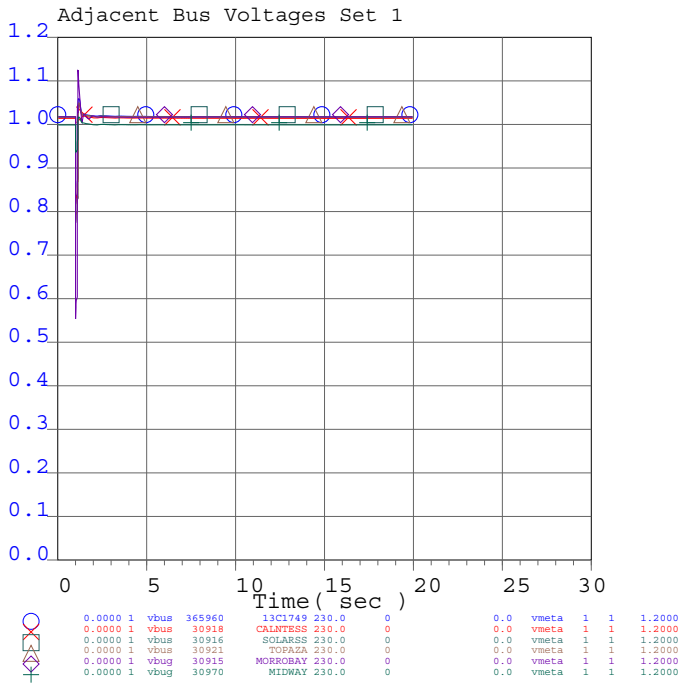

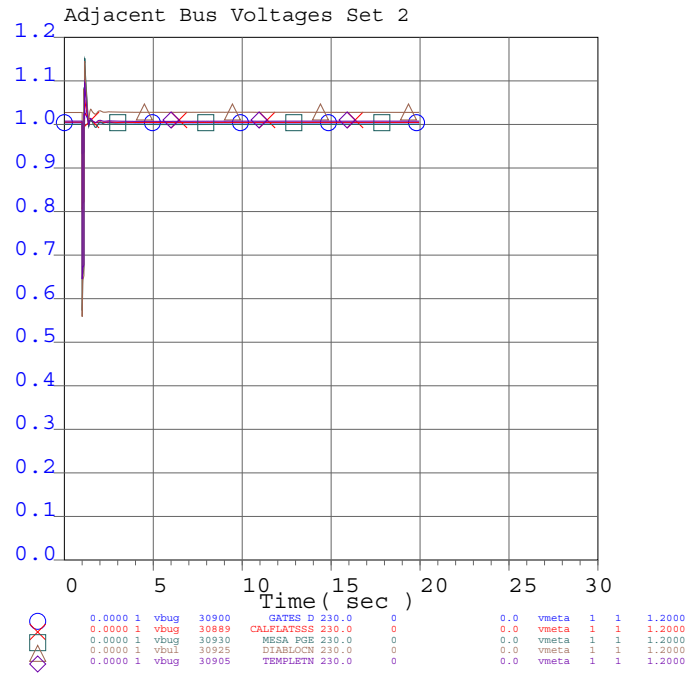

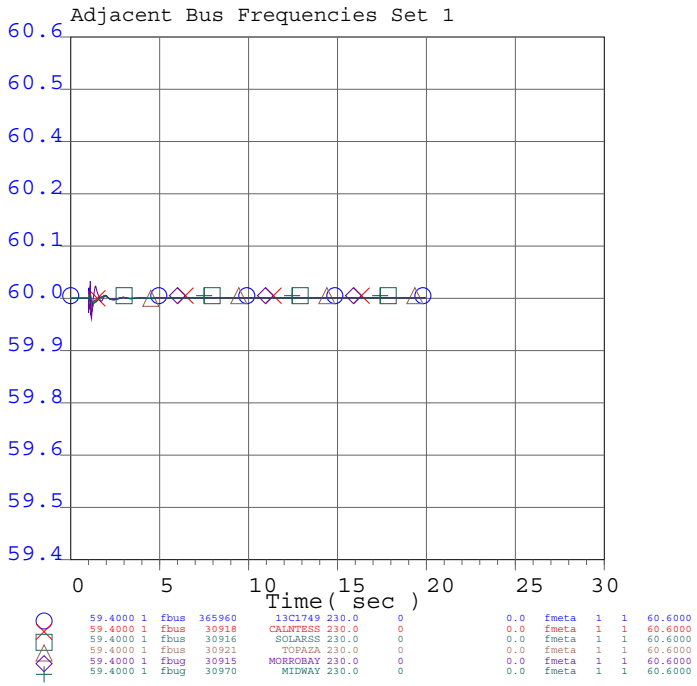

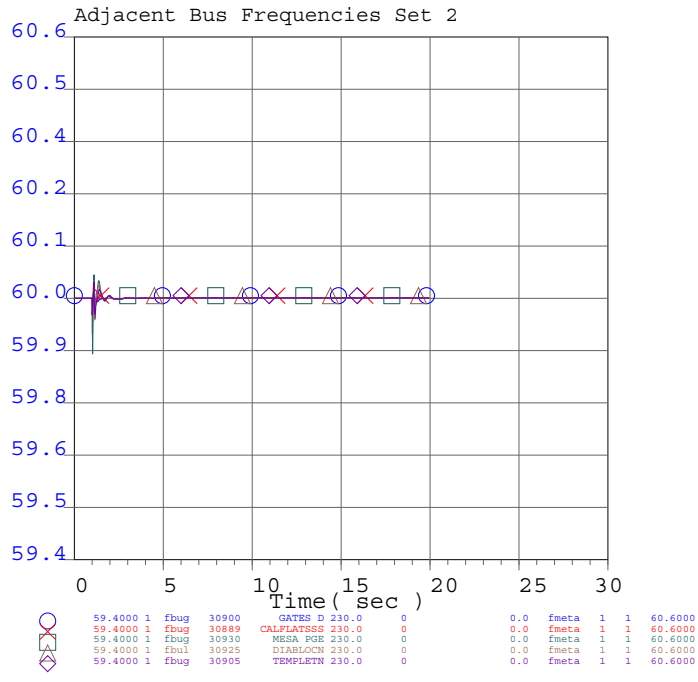

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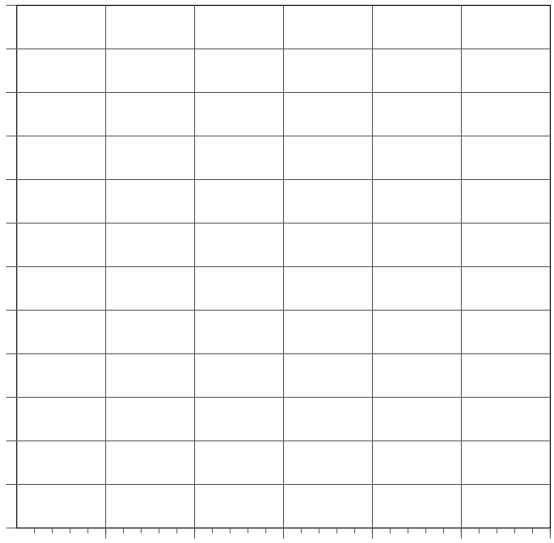
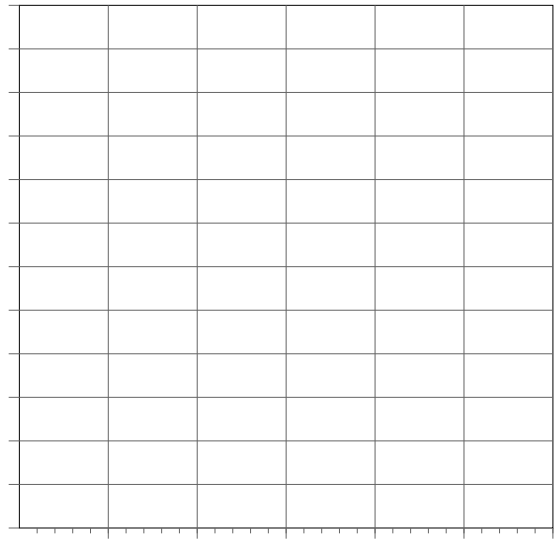
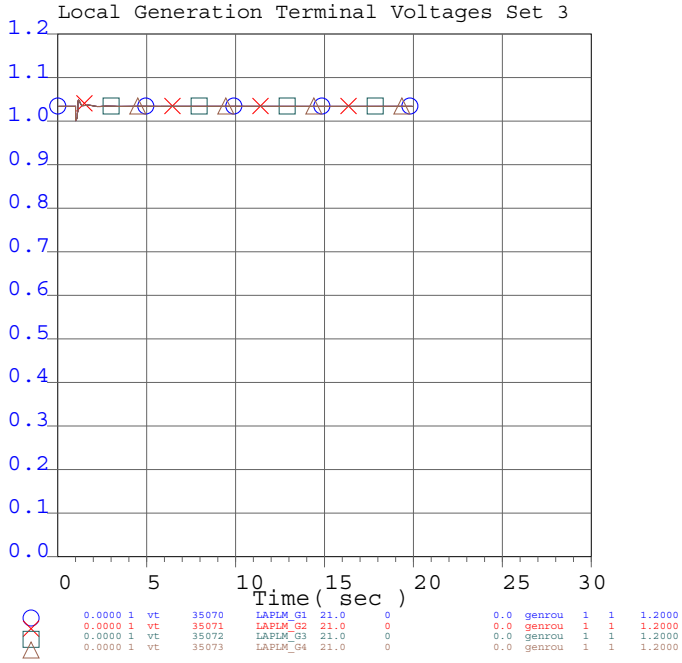
Local Generation Terminal Voltages Set 1



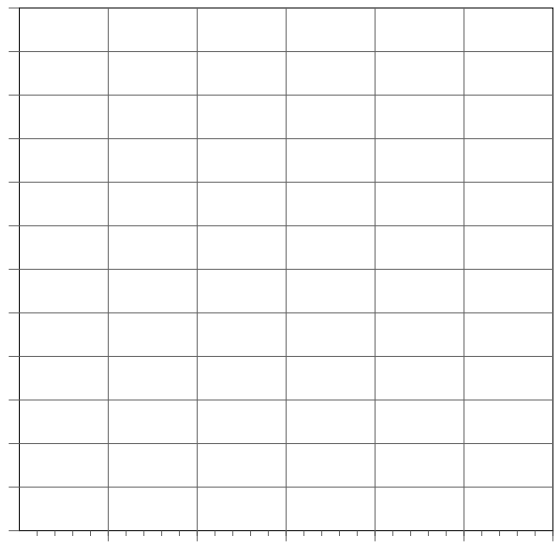
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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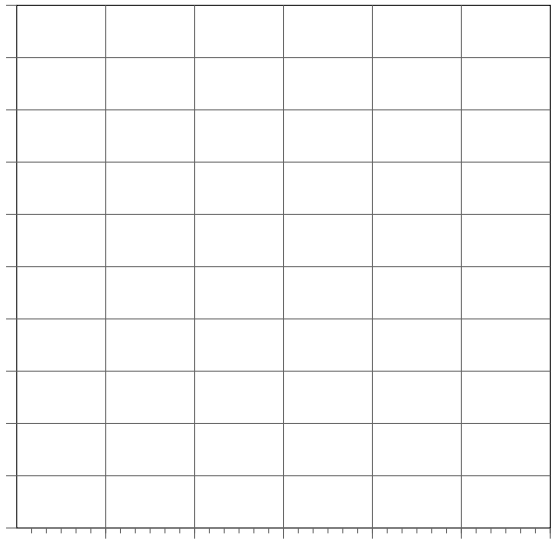
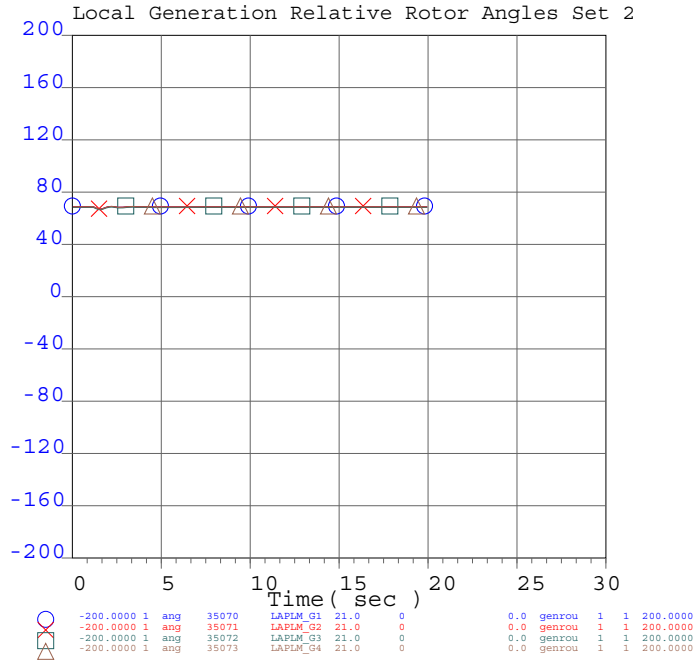
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

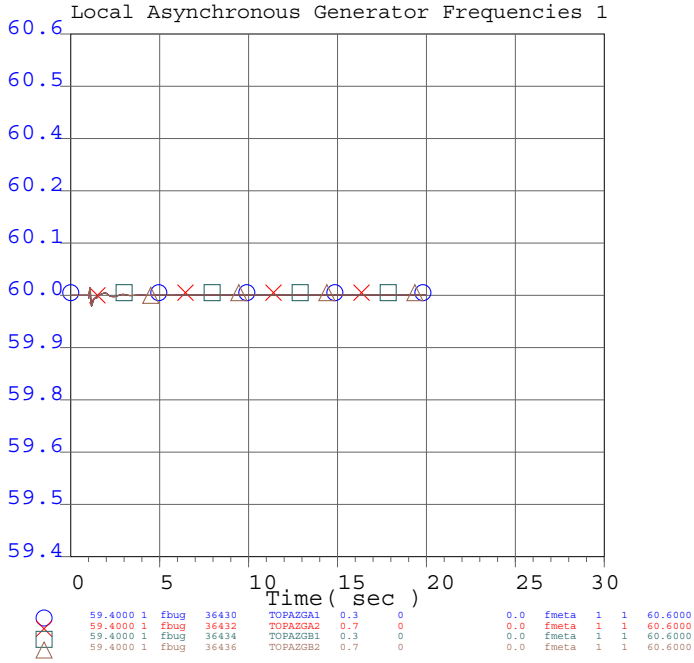
Local Generation Relative Rotor Angles Set 1



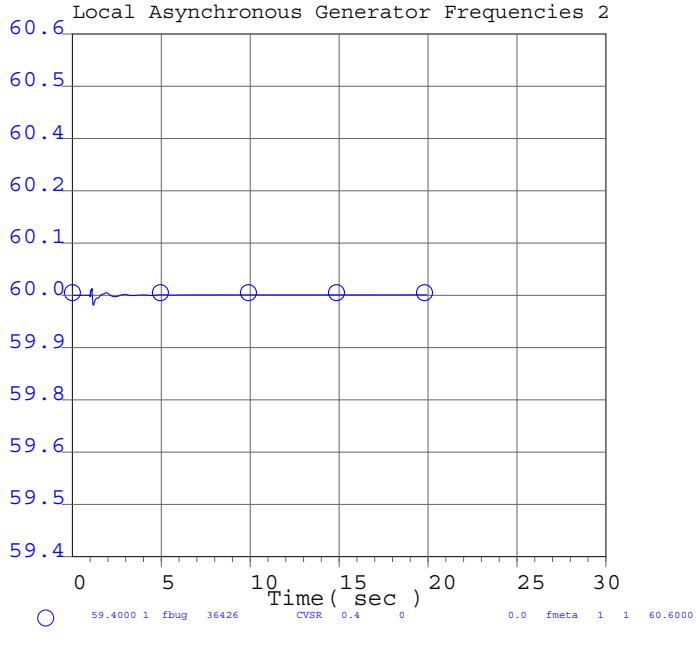
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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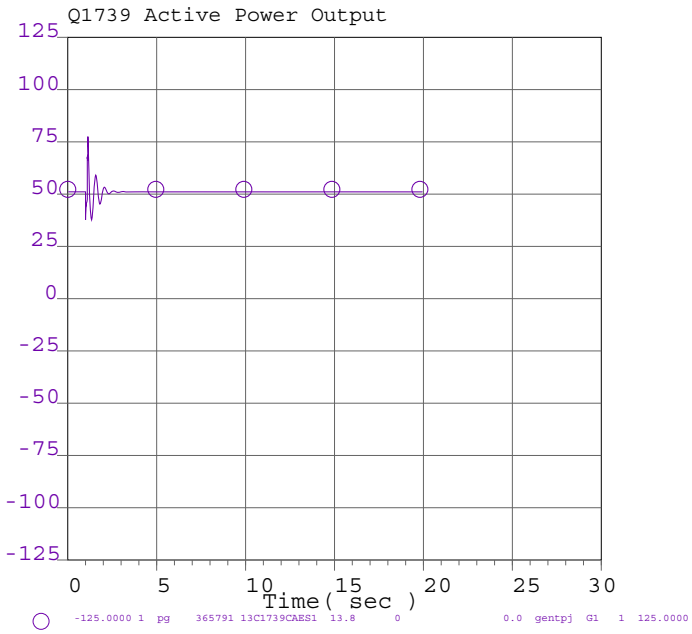
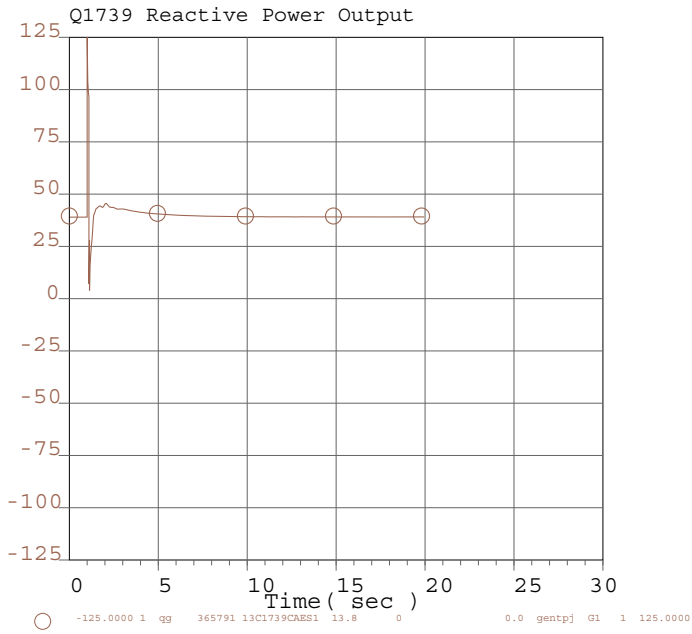
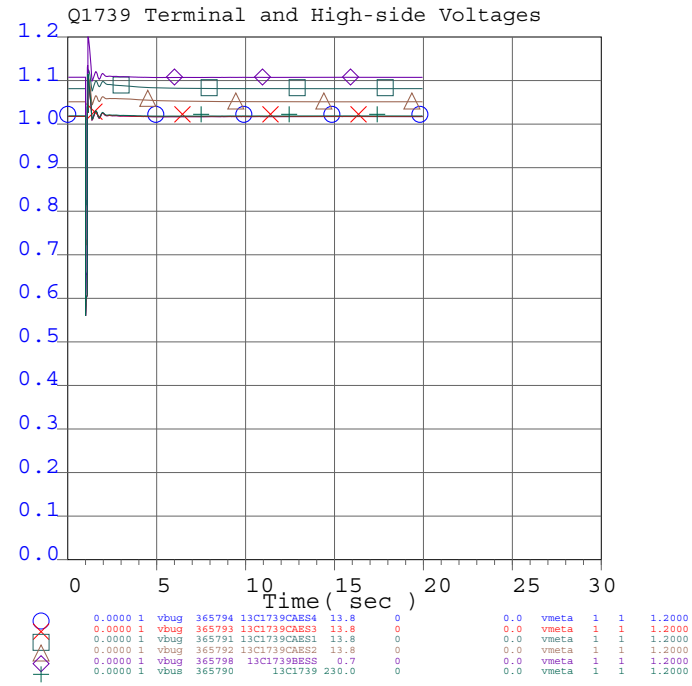
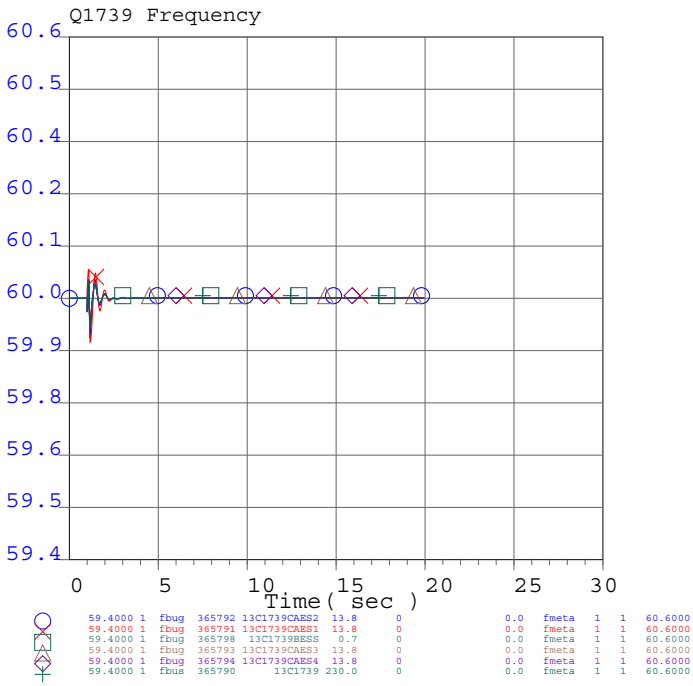
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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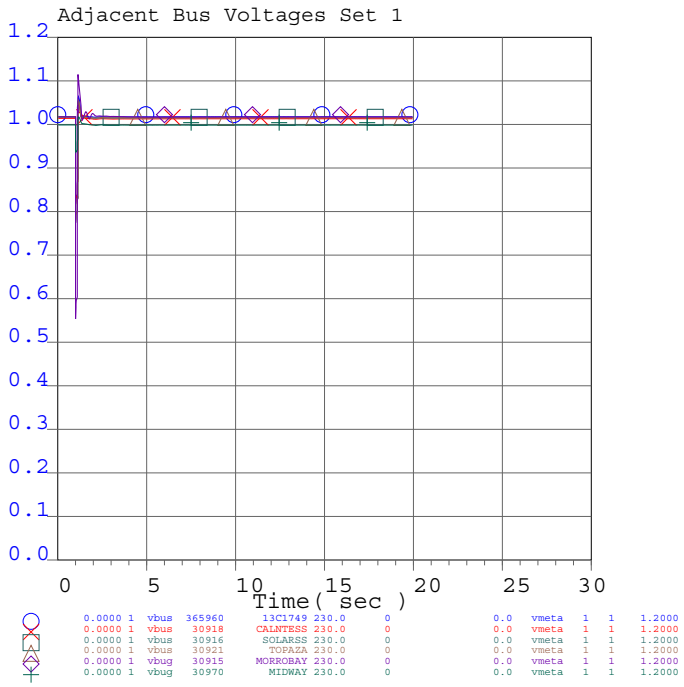

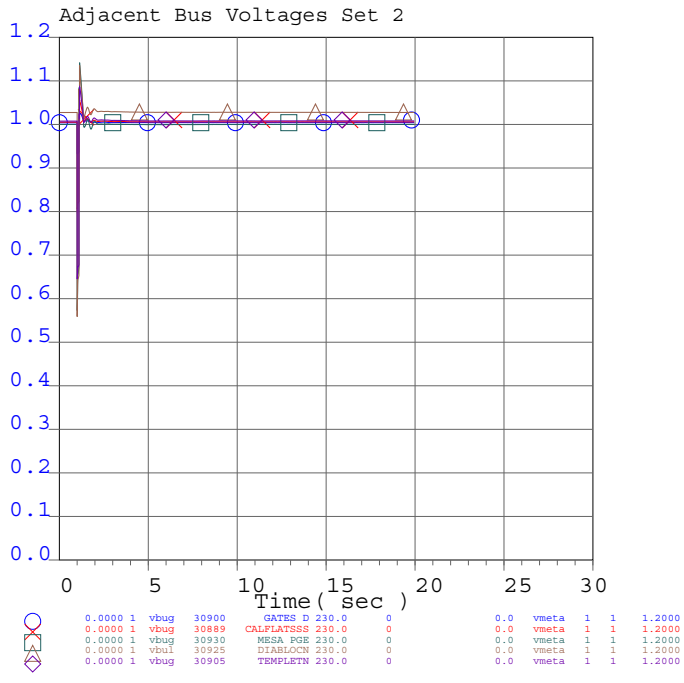

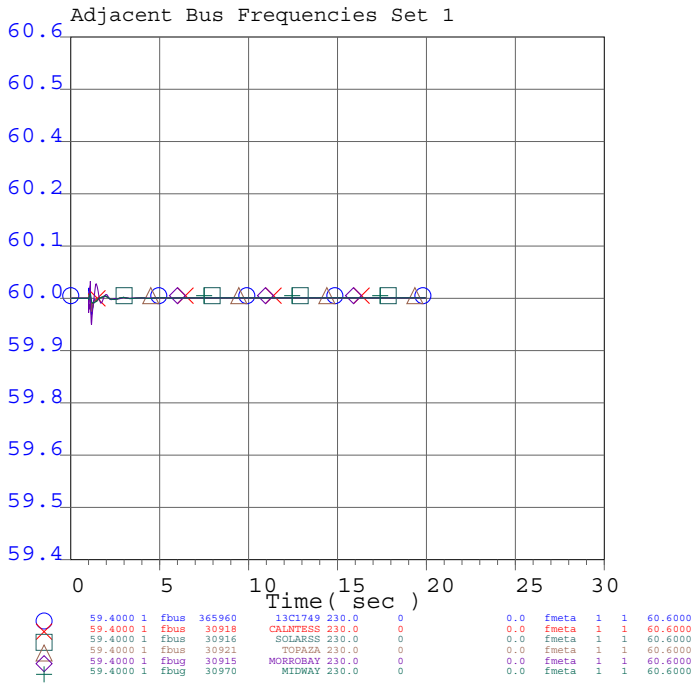

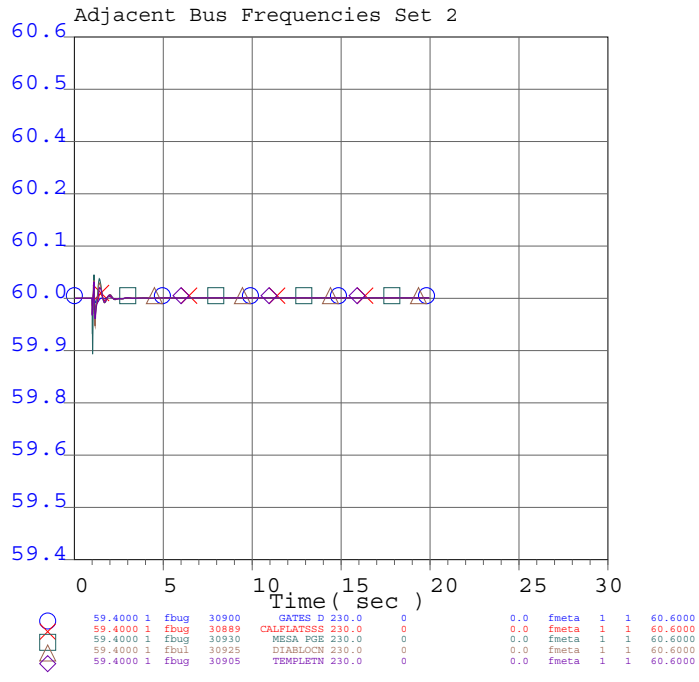

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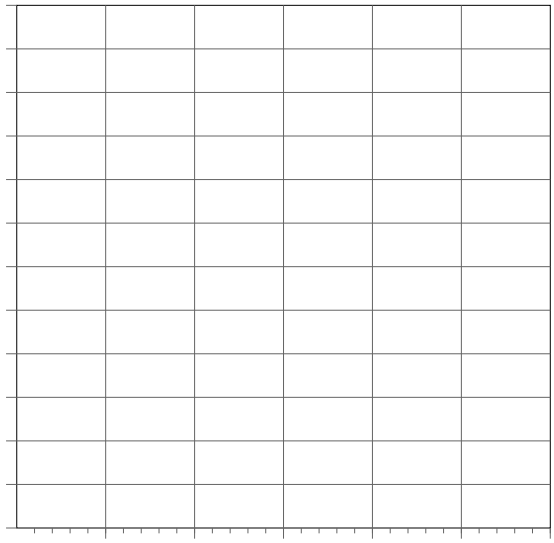
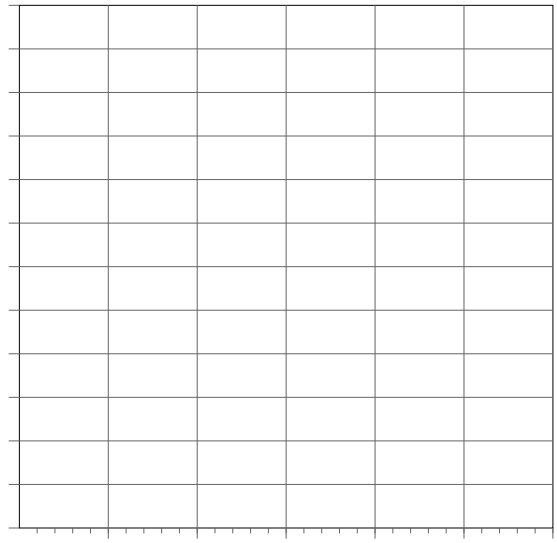
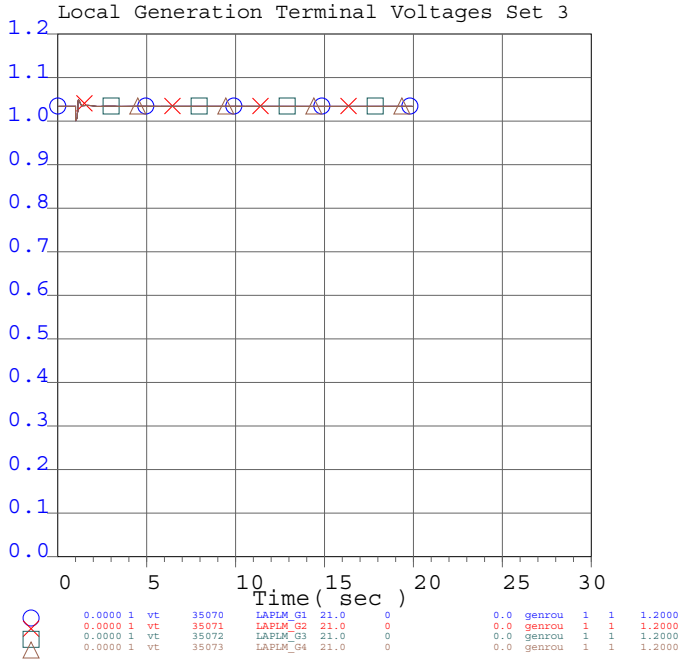
Local Generation Terminal Voltages Set 1



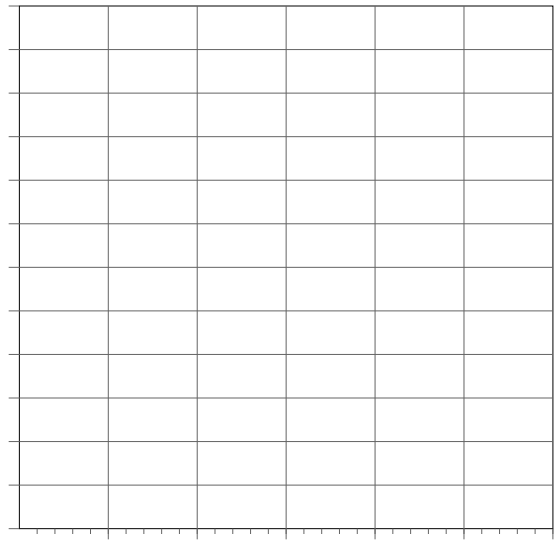
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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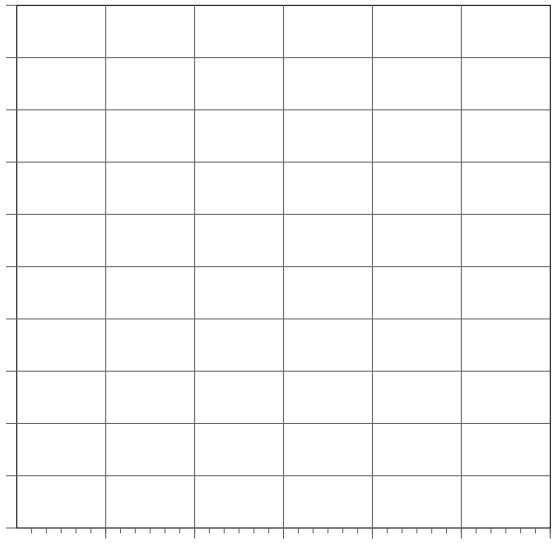
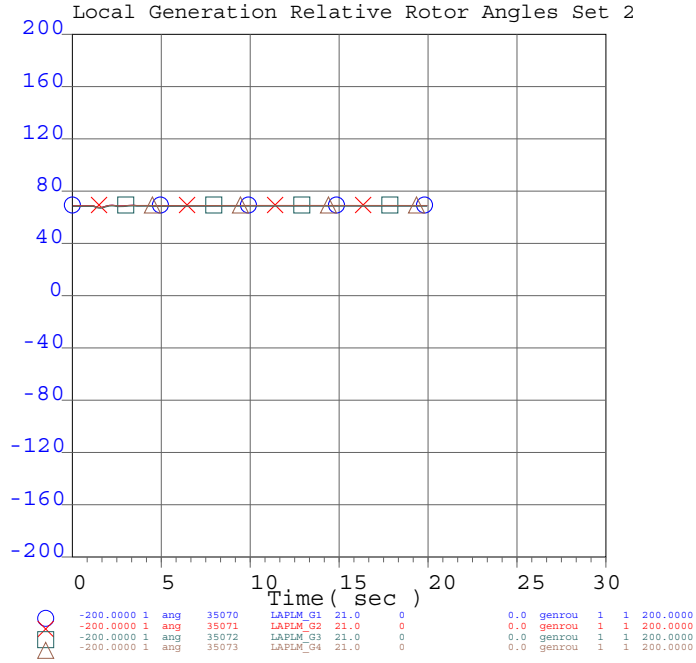
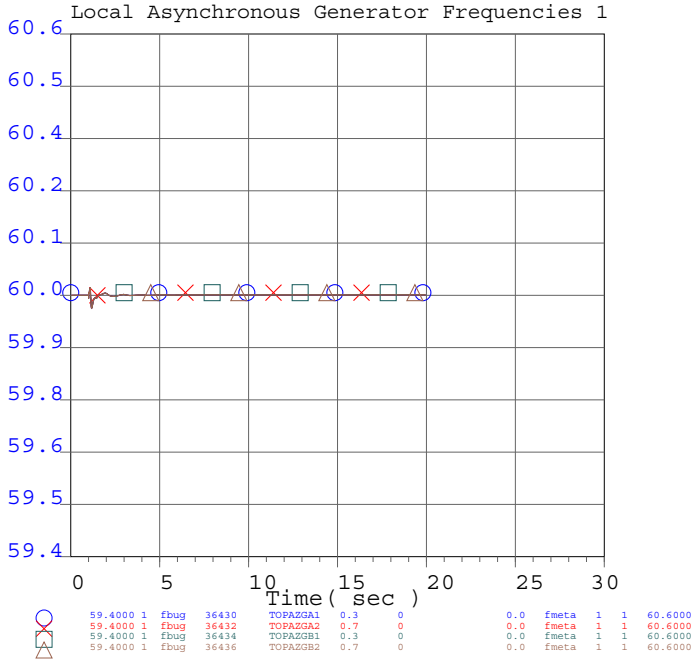
Local Generation Relative Rotor Angles Set 1



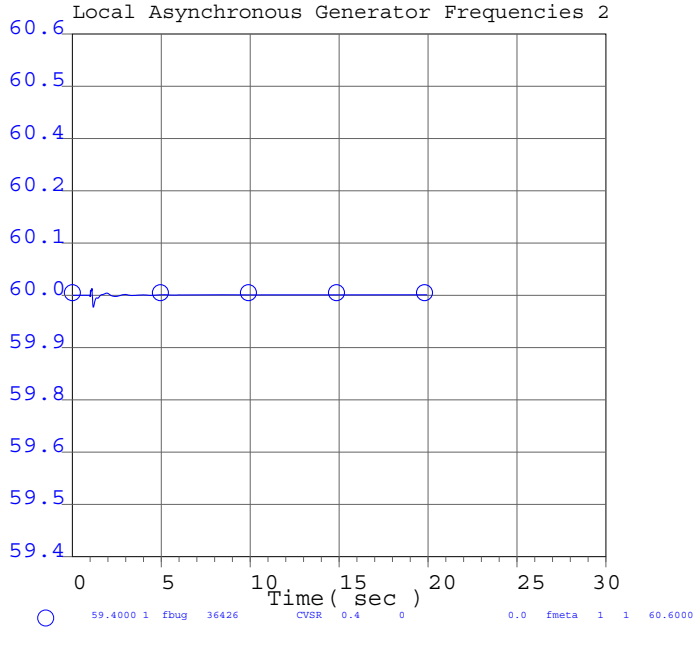
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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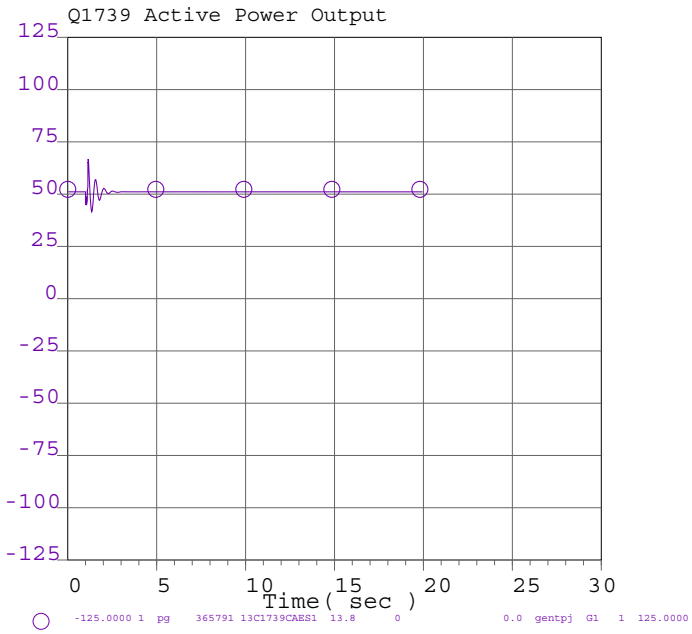

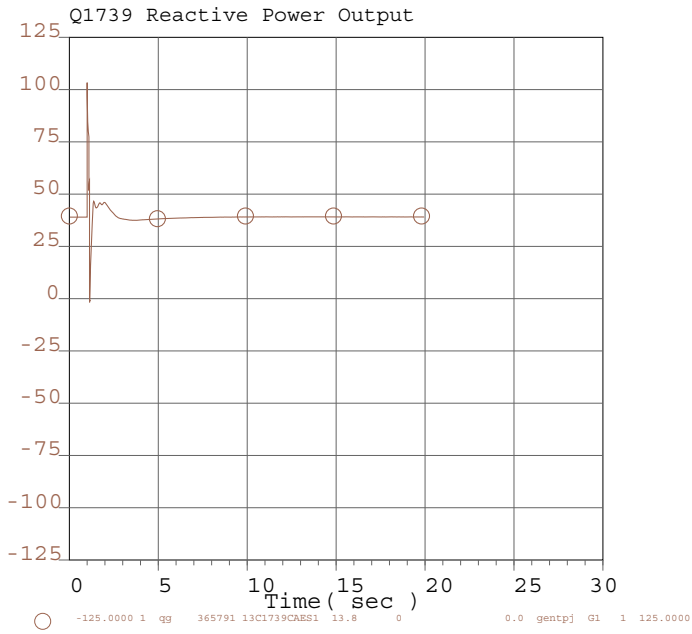

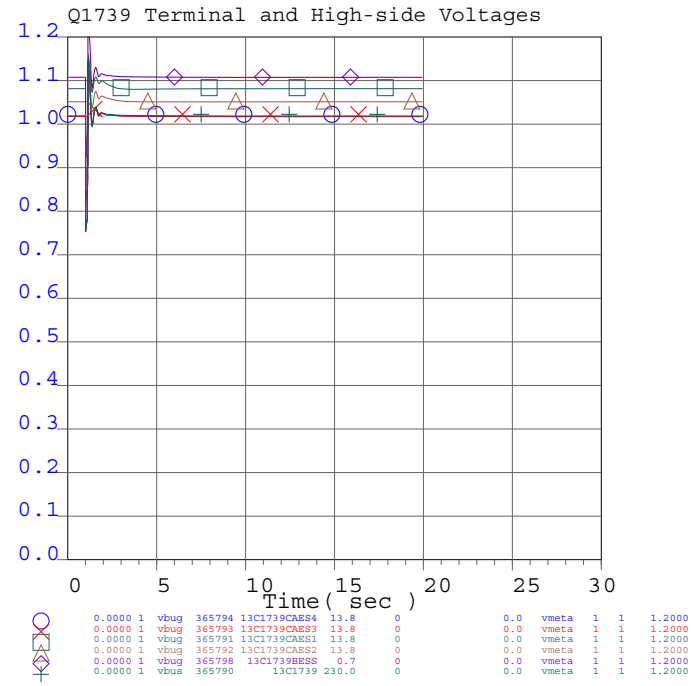

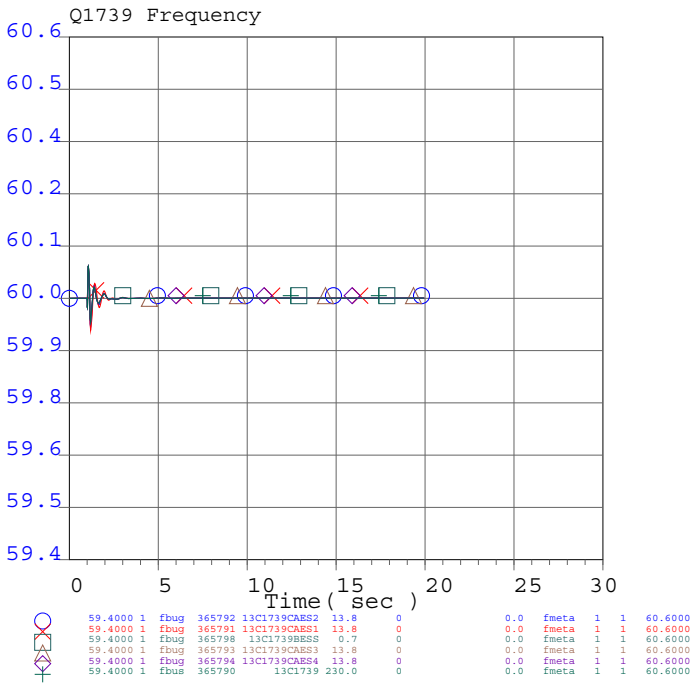

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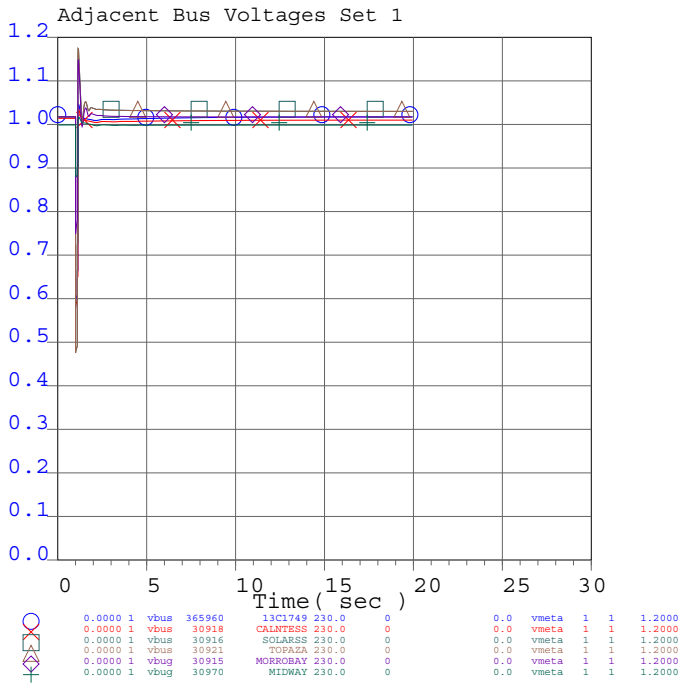

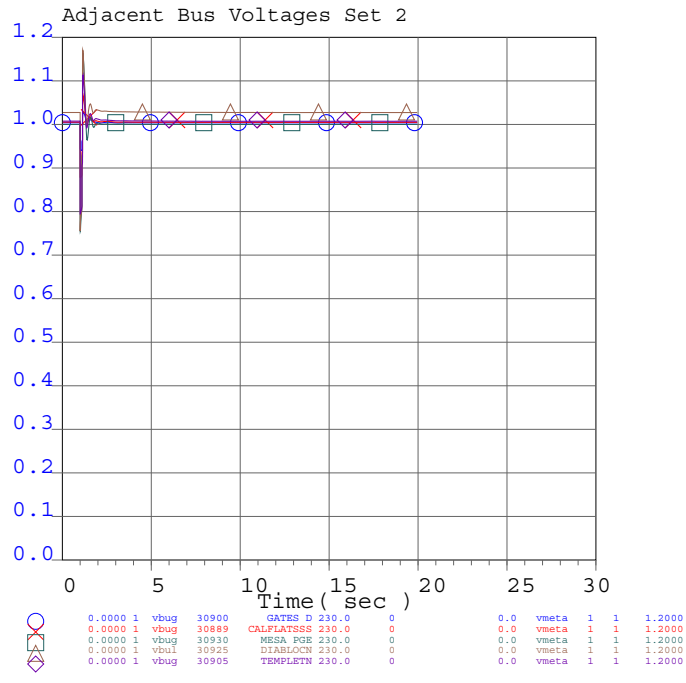

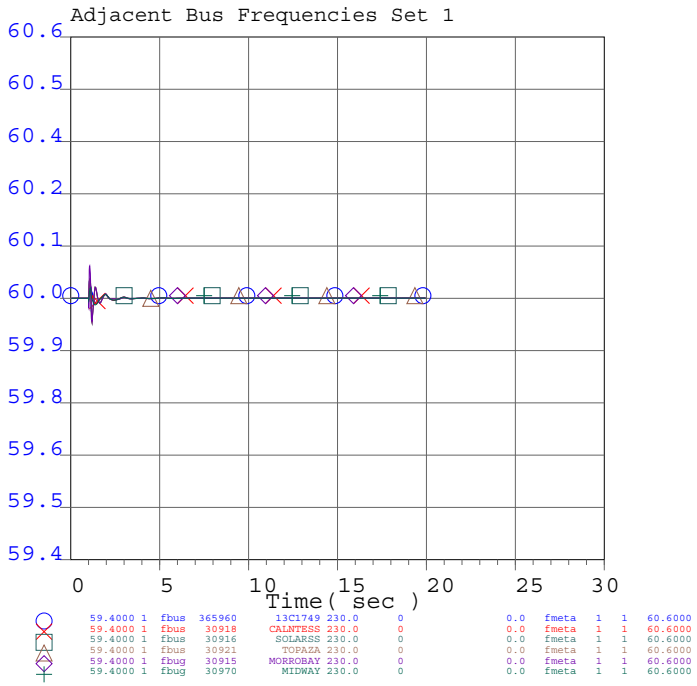

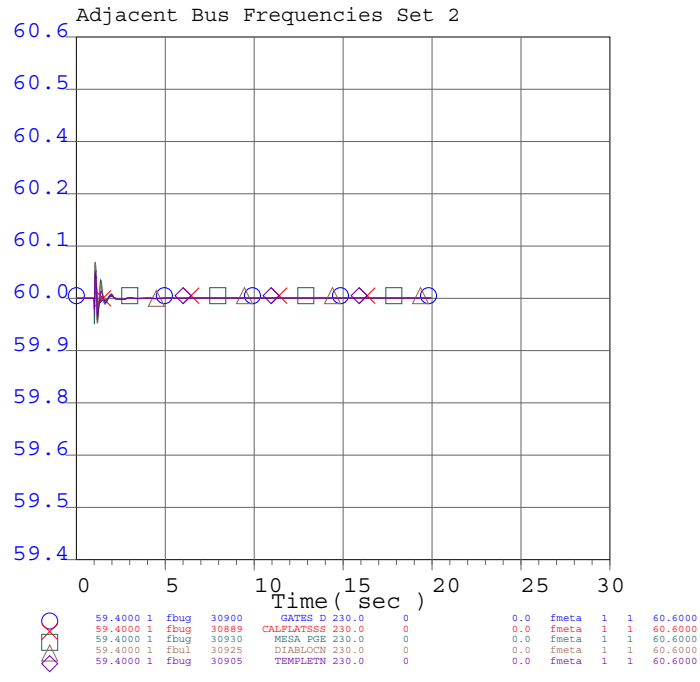

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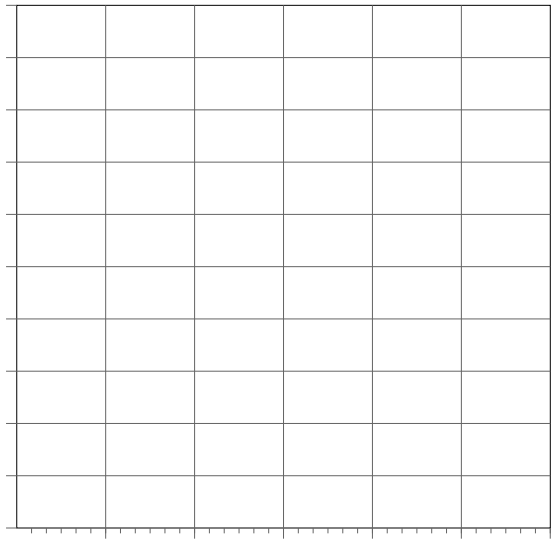
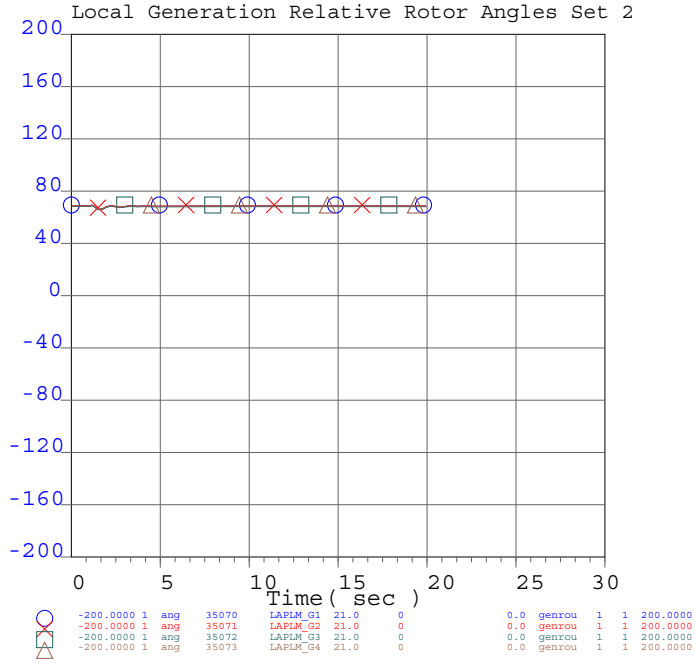
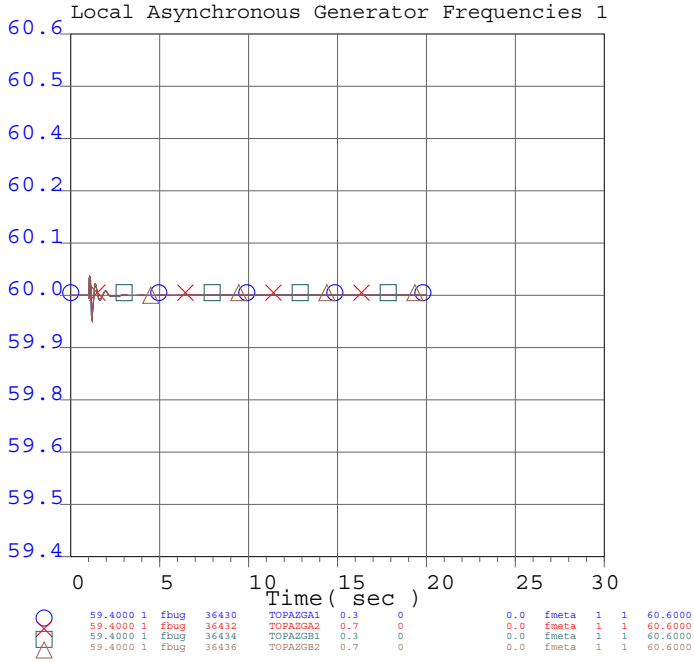
Local Generation Relative Rotor Angles Set 1



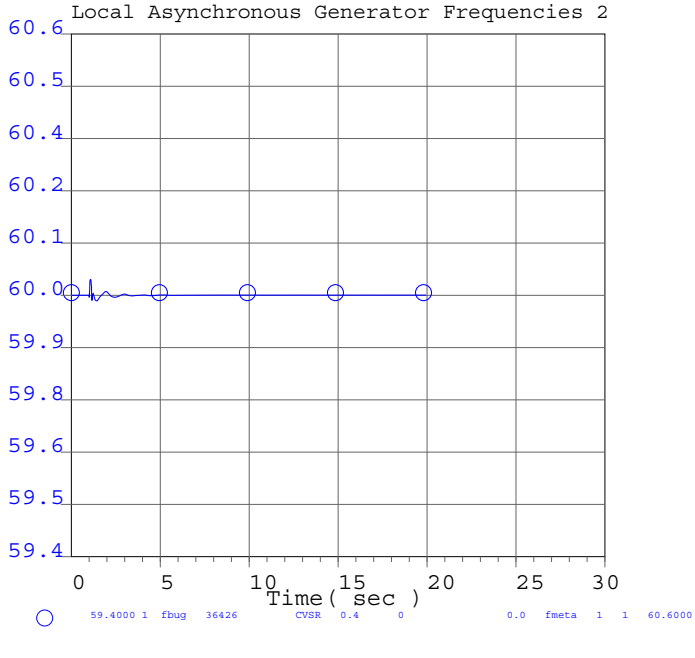
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

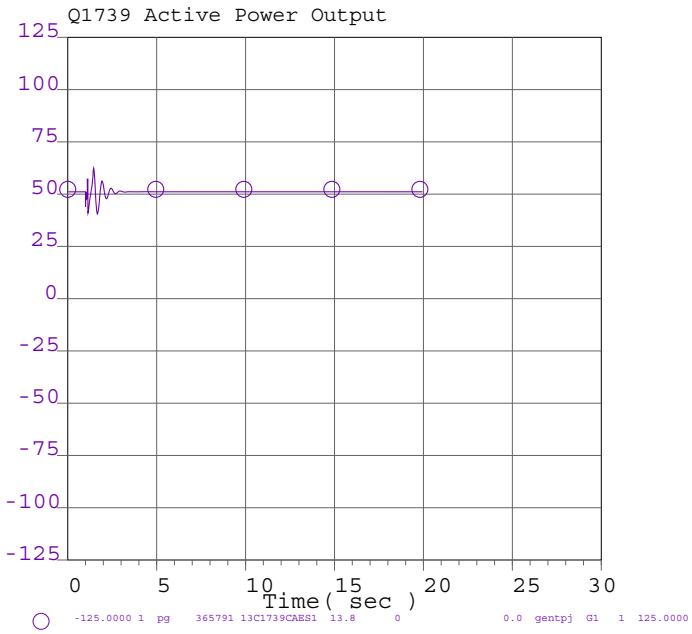


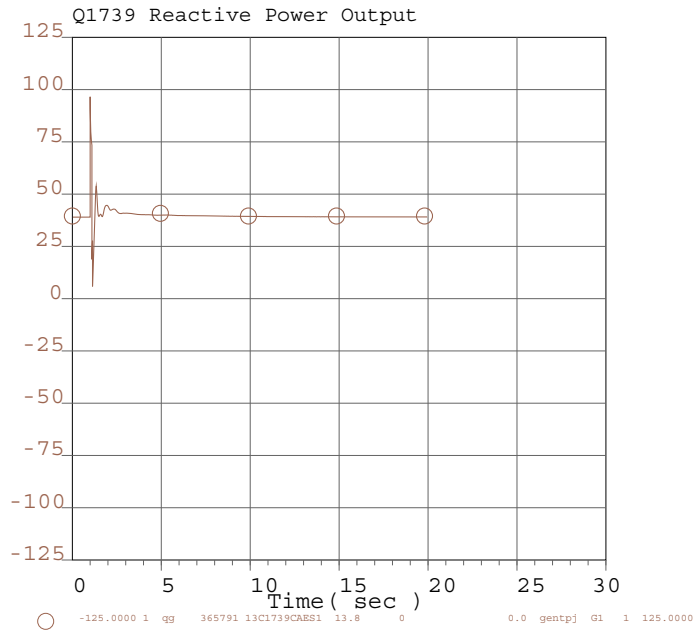
Local Asynchronous Generator Frequencies 2

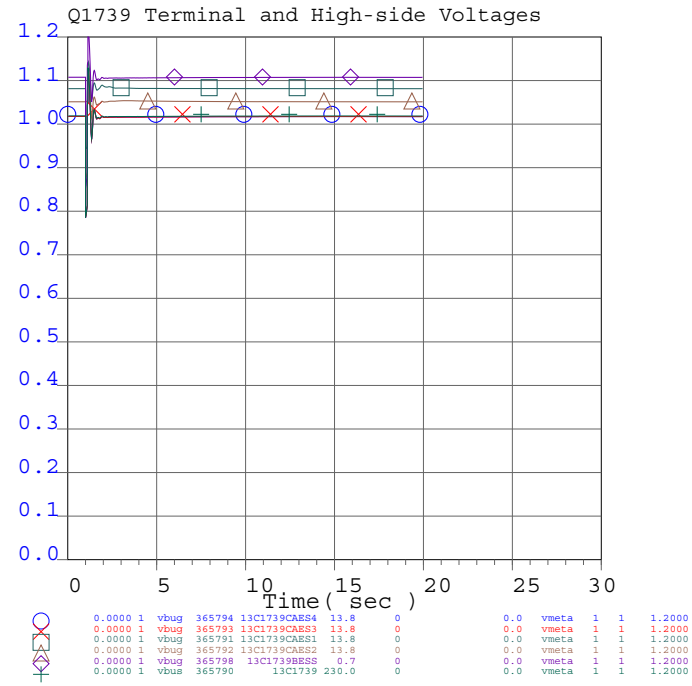


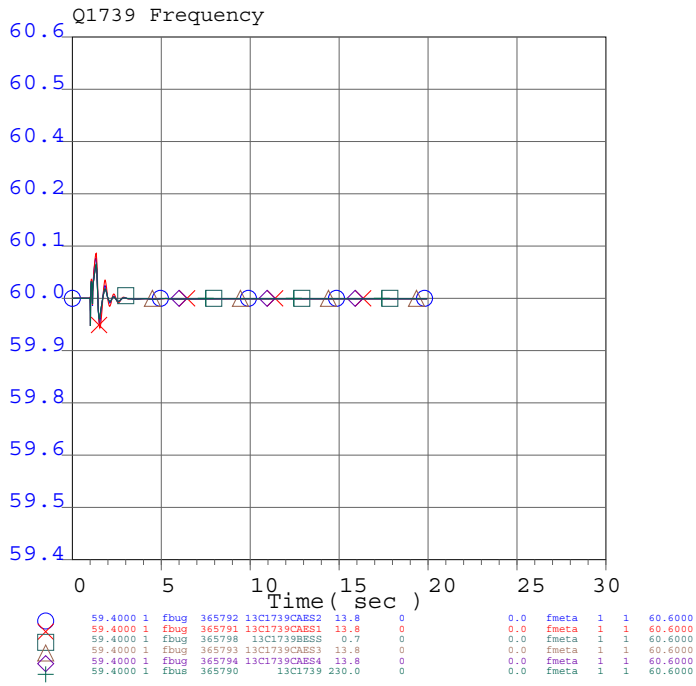
PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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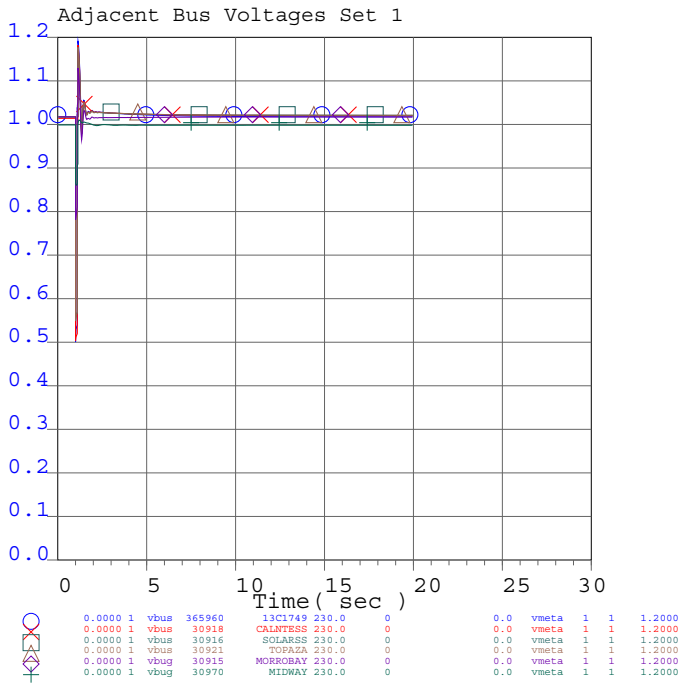

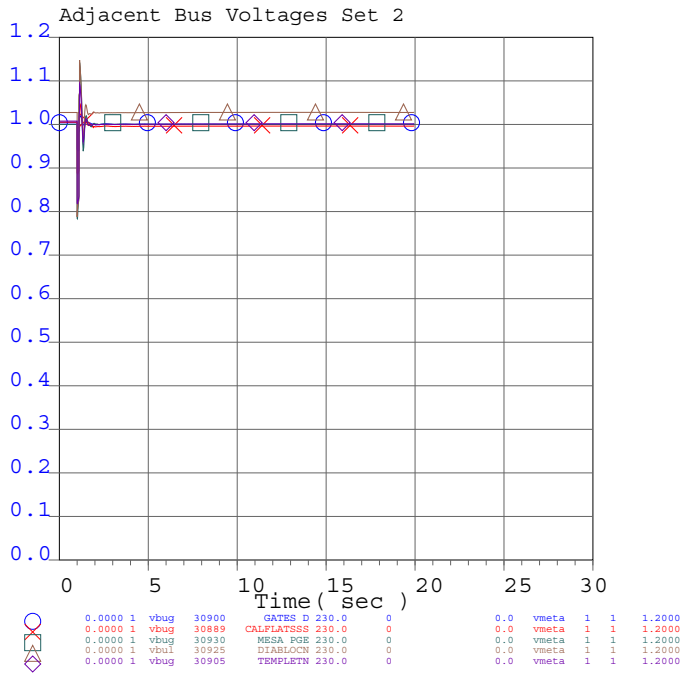

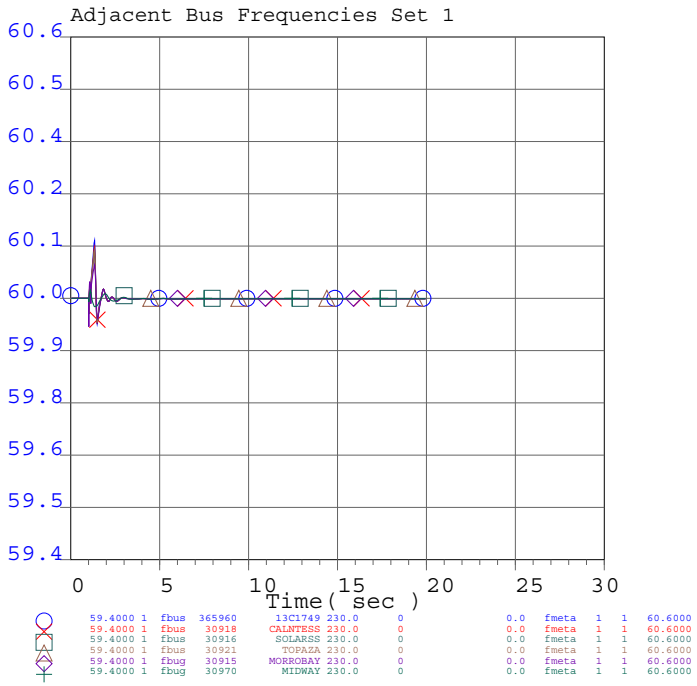

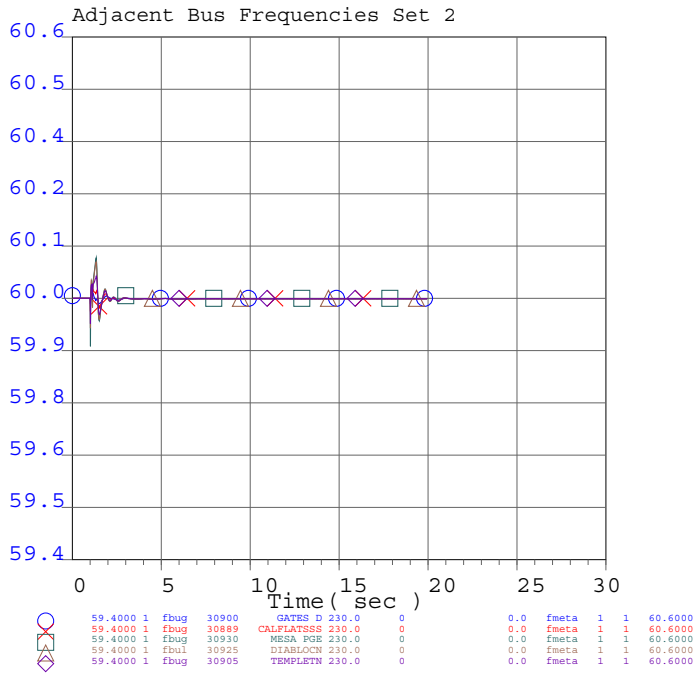

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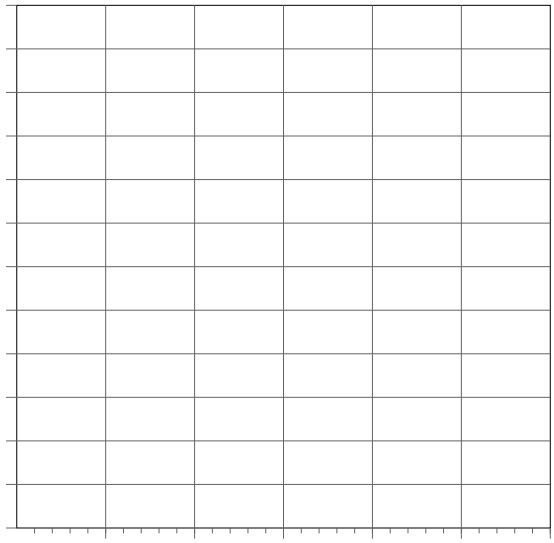
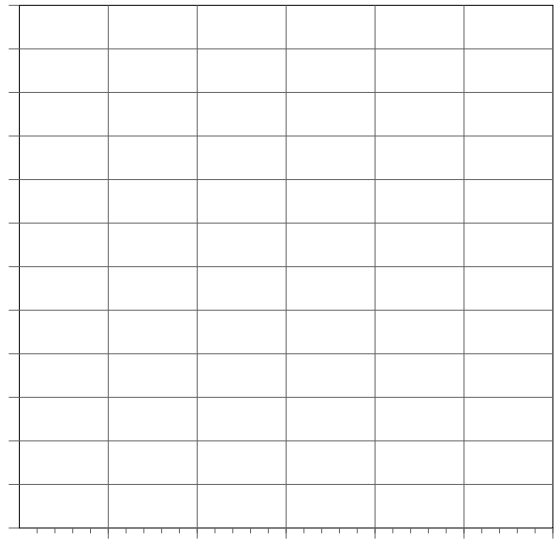
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

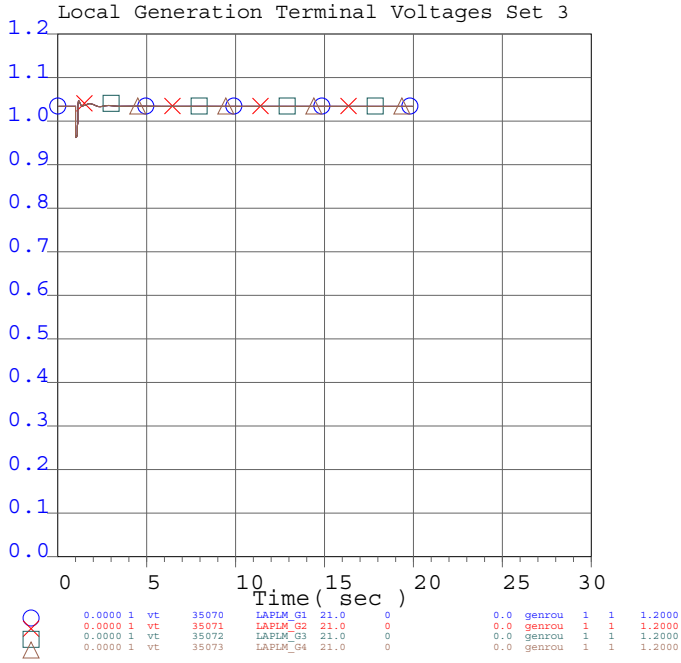
Local Generation Terminal Voltages Set 1



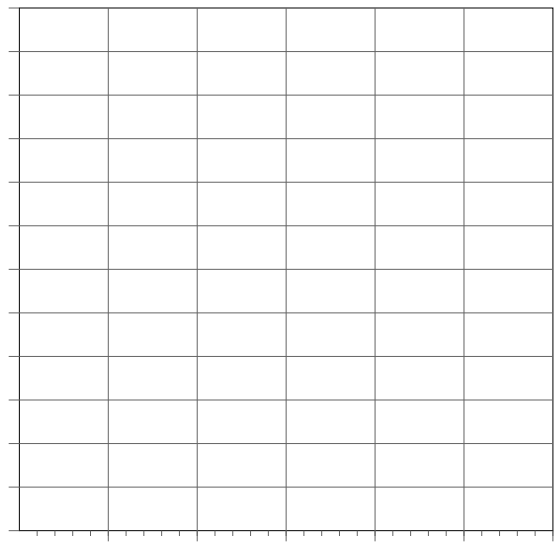
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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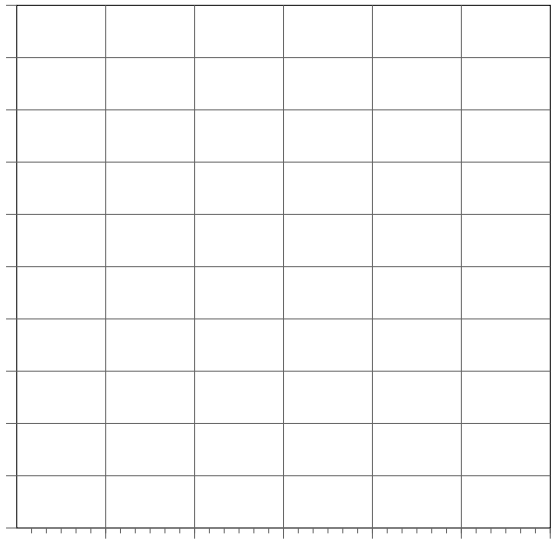
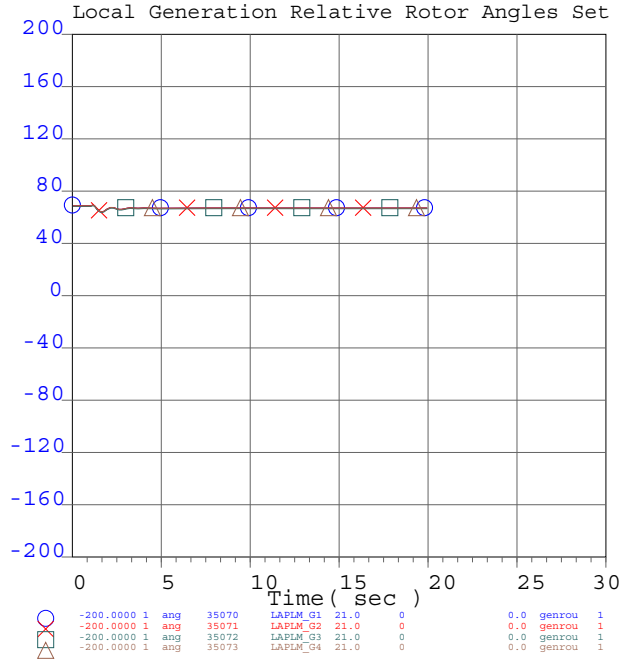
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

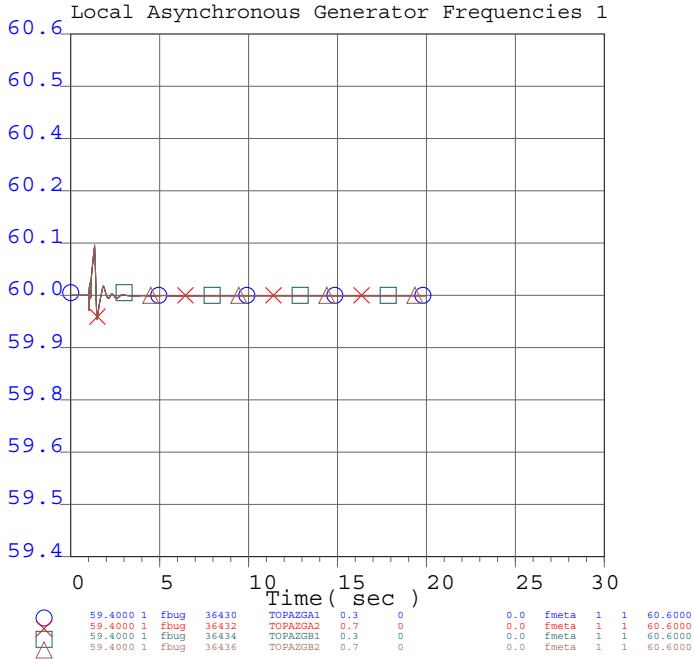
Local Generation Relative Rotor Angles Set 1



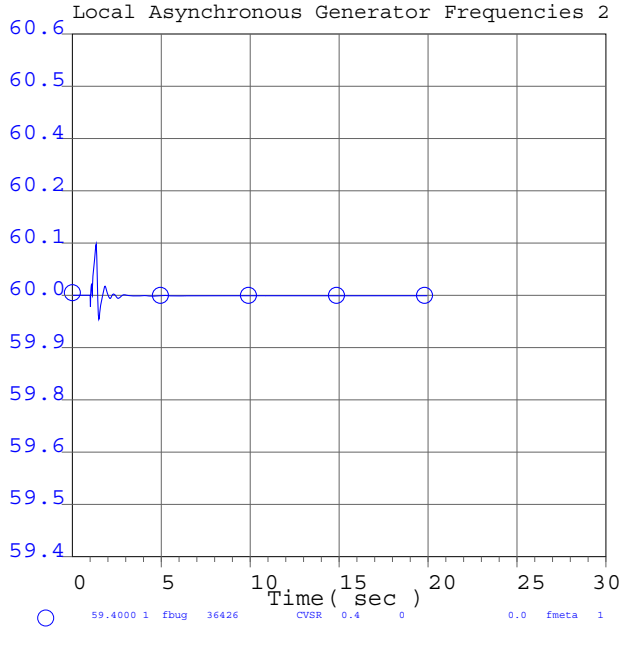
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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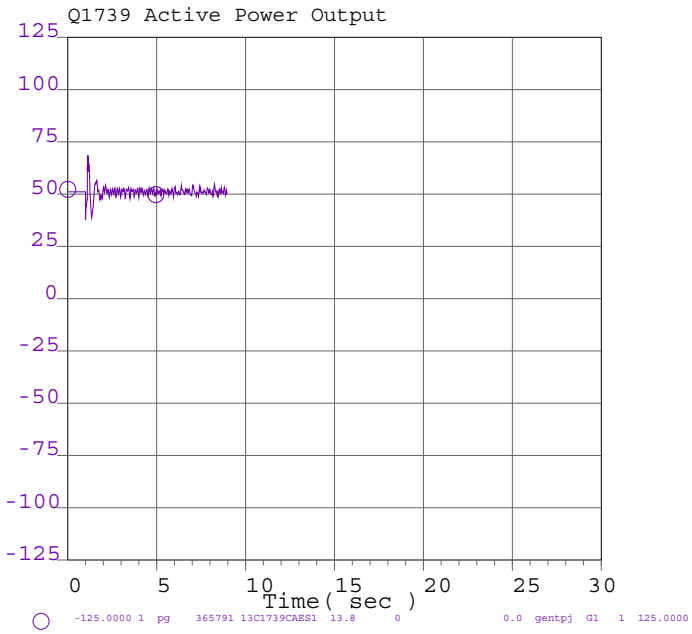
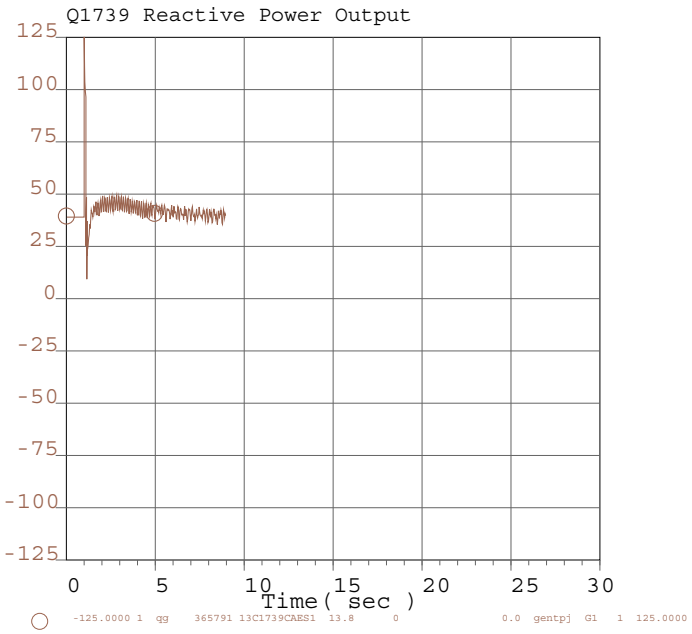
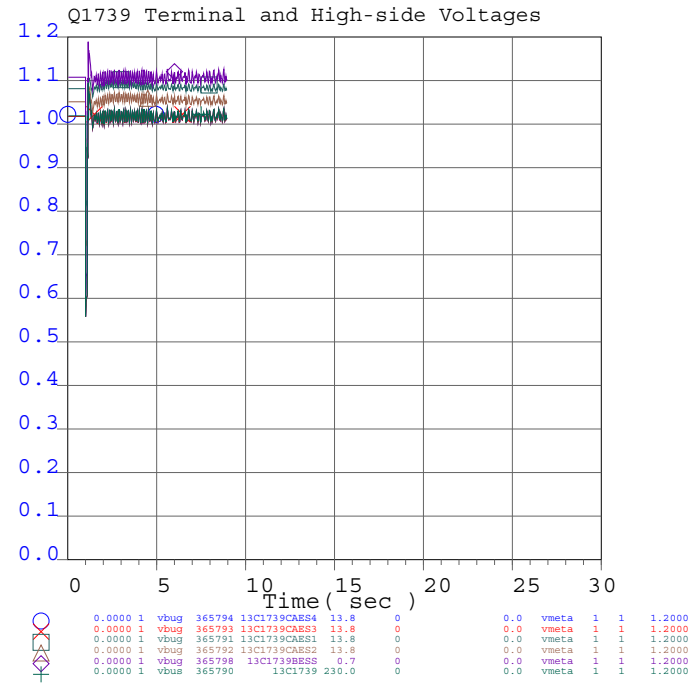
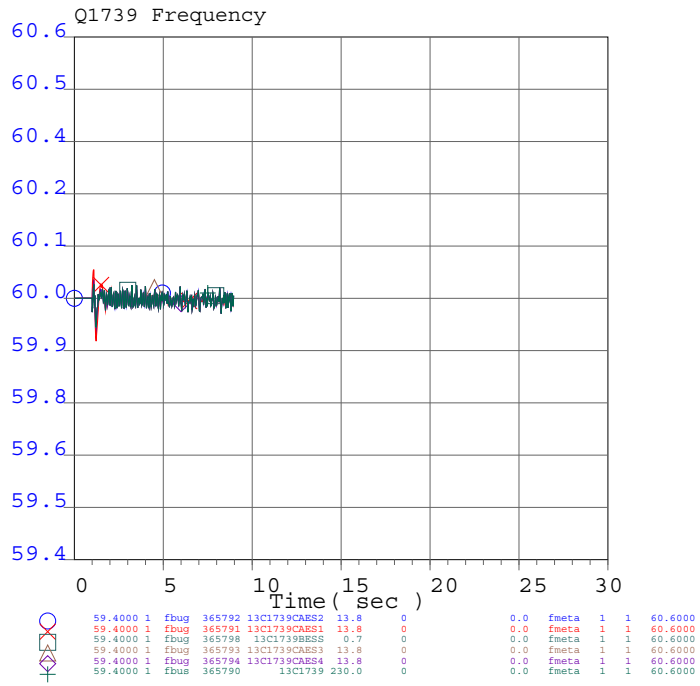
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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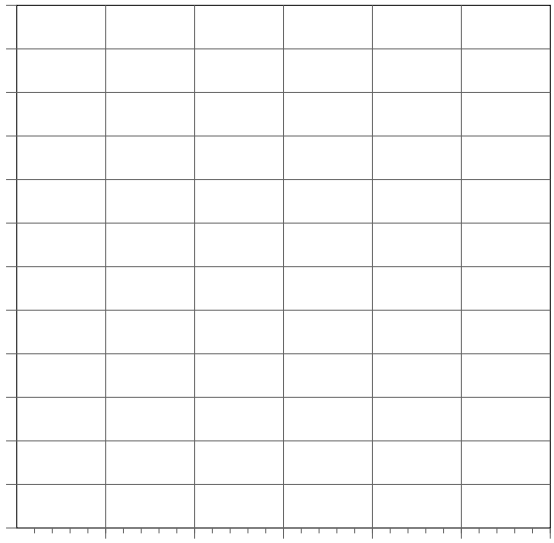
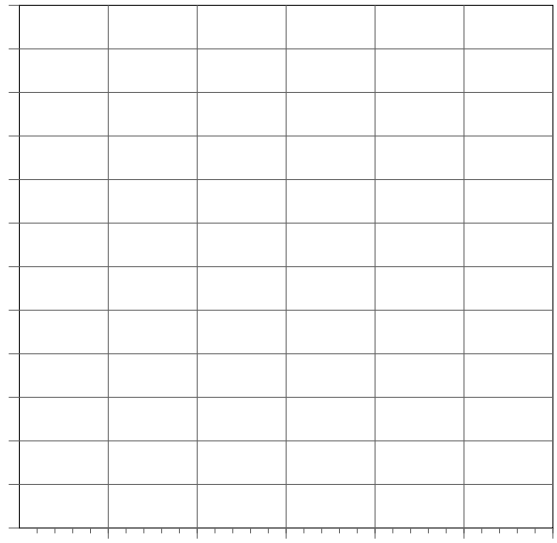
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

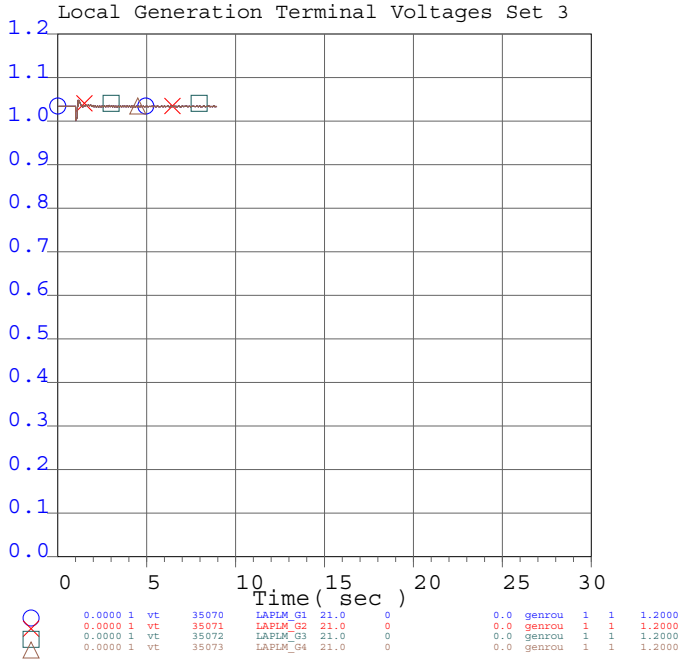
Local Generation Terminal Voltages Set 1



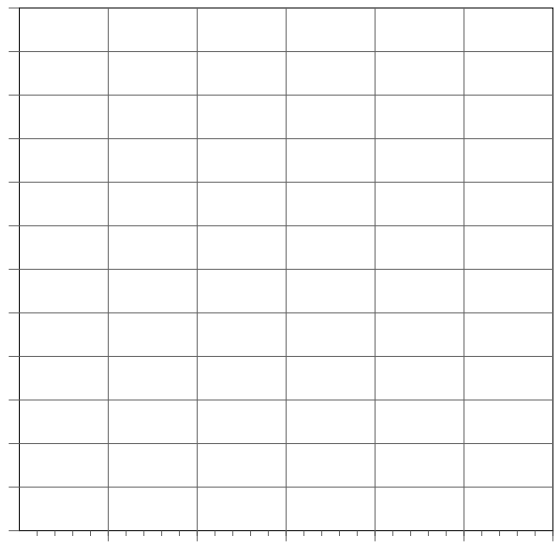
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
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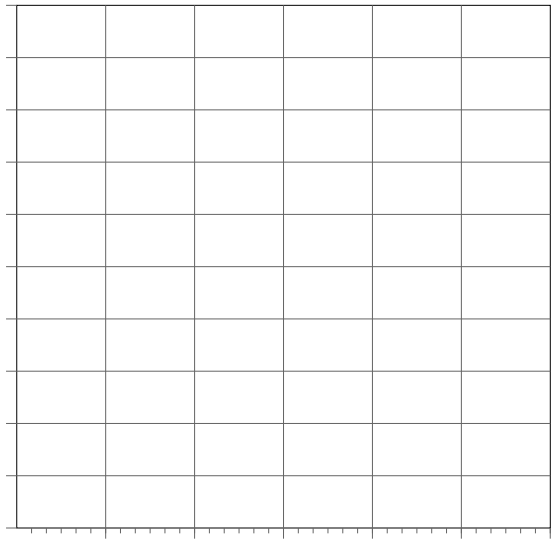
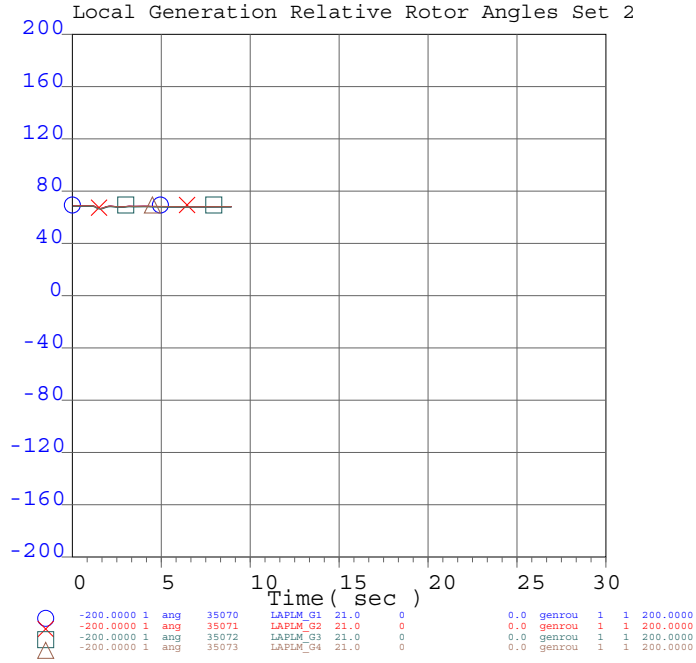
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

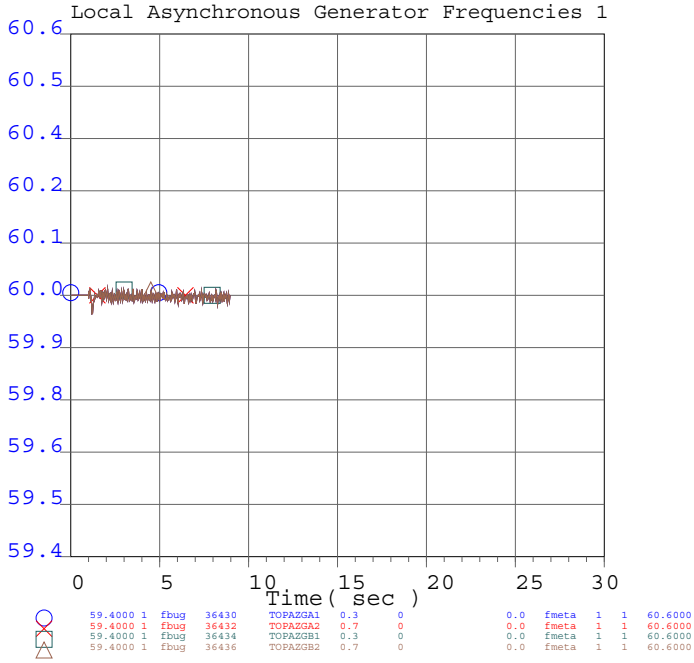
Local Generation Relative Rotor Angles Set 1



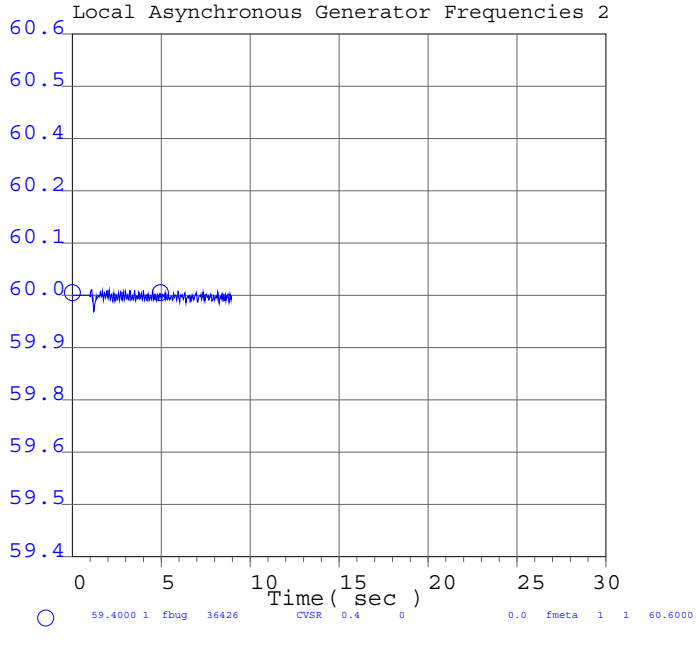
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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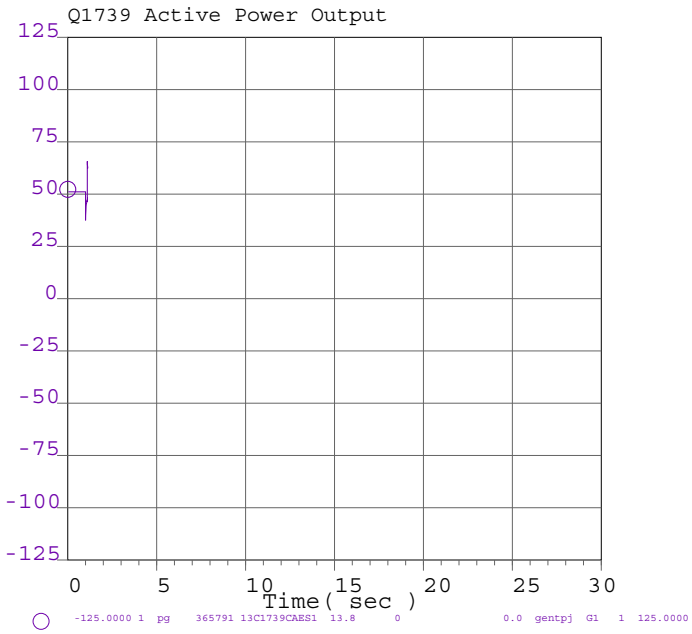
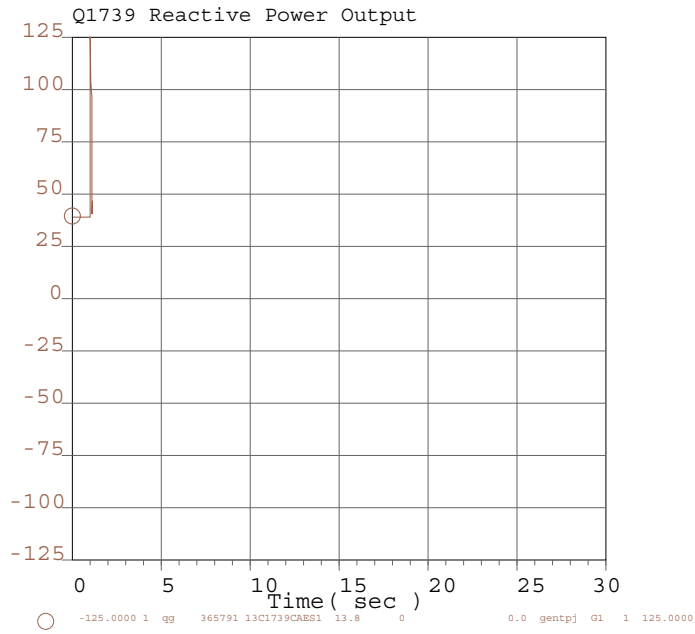
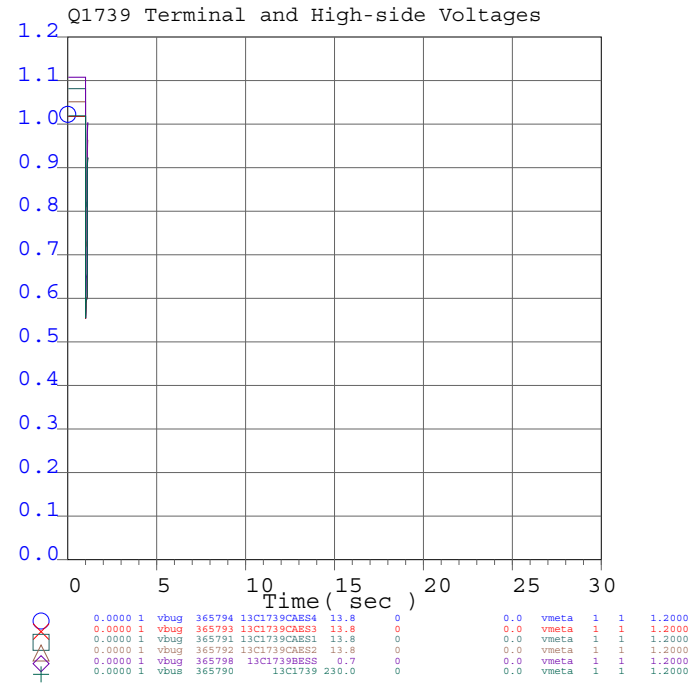
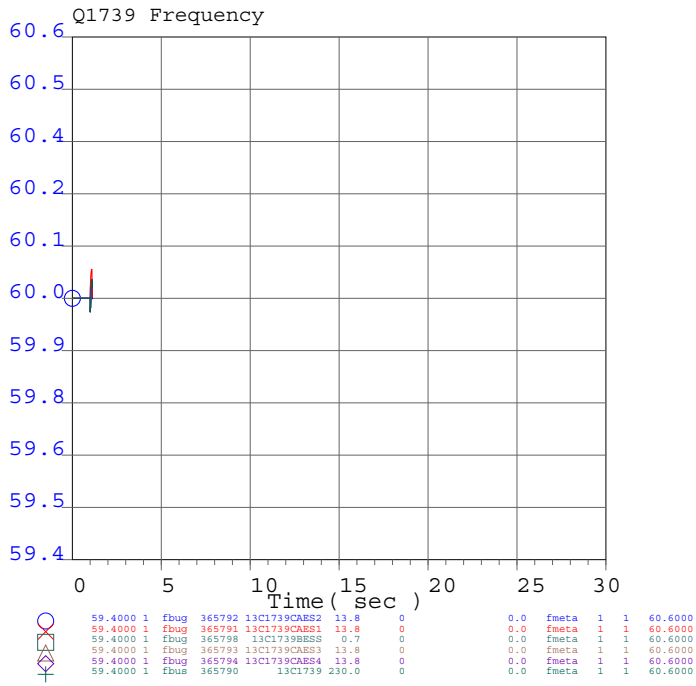
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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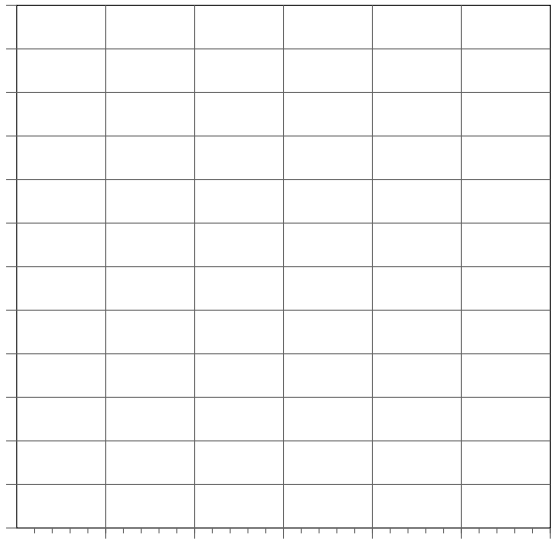
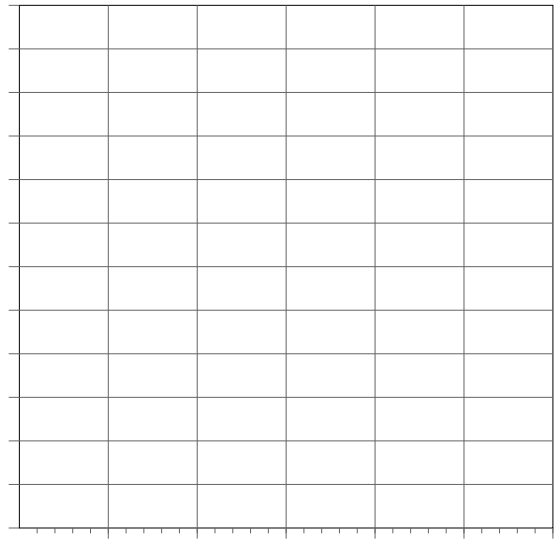
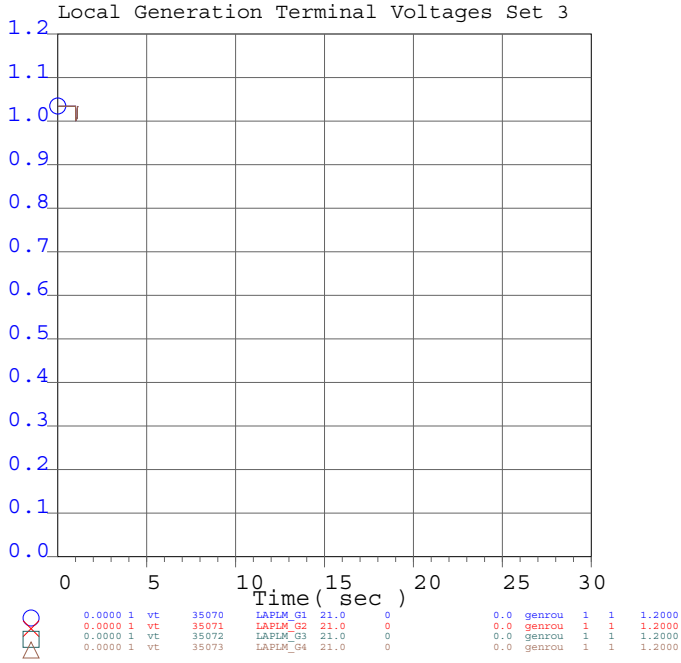
Local Generation Terminal Voltages Set 1



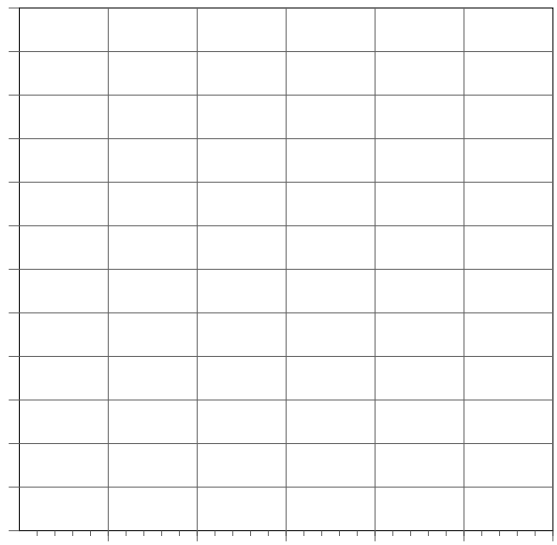
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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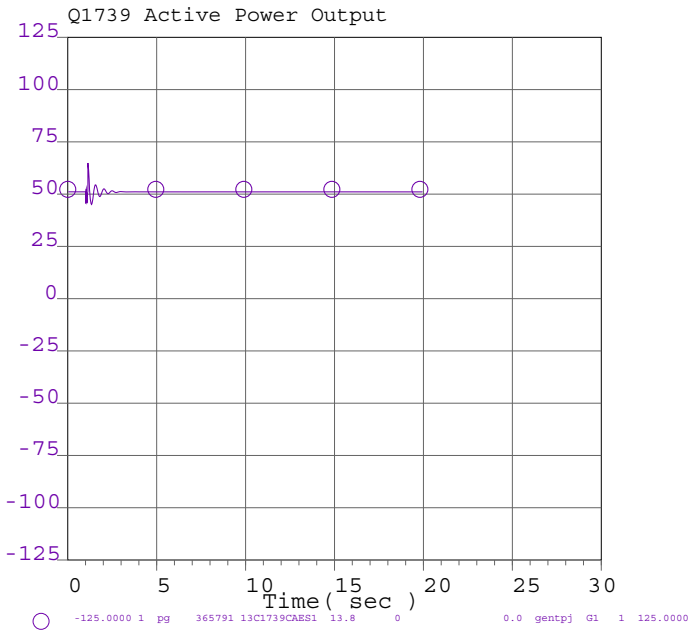

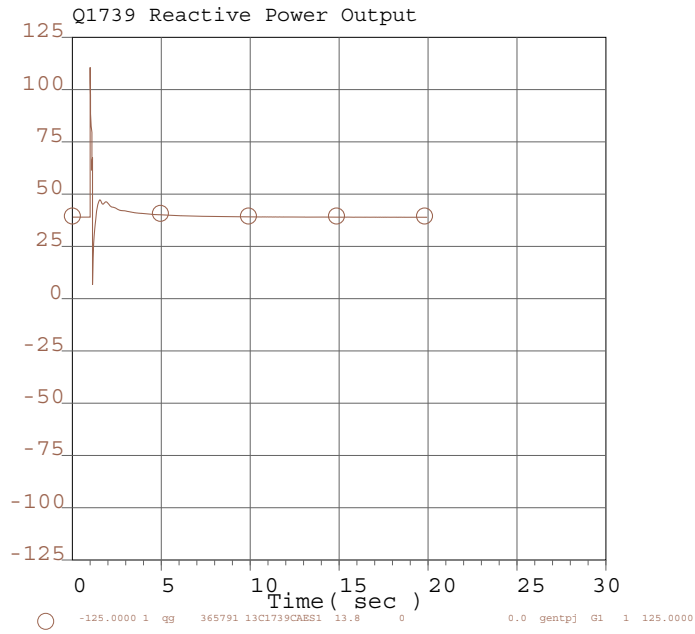

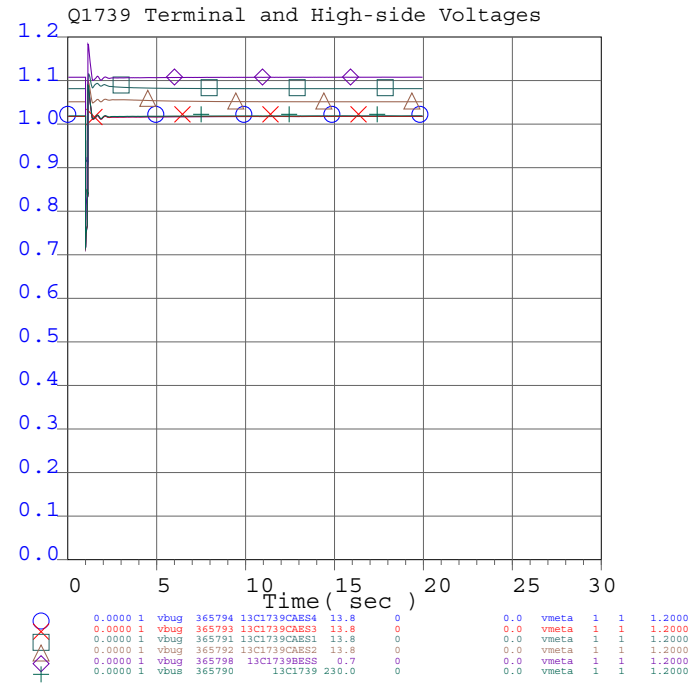

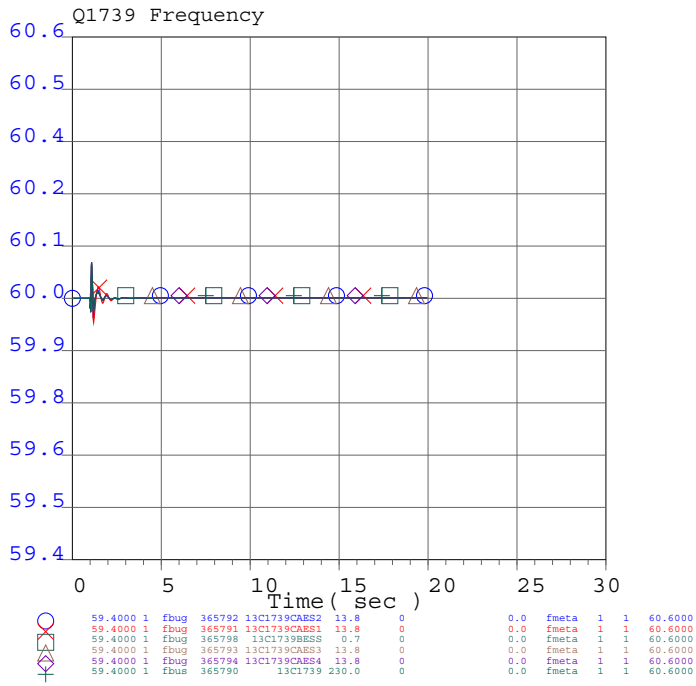

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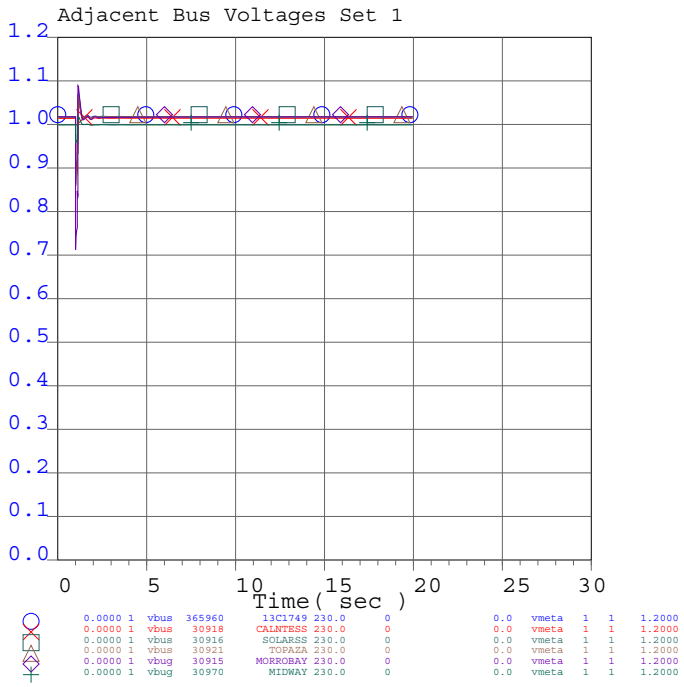

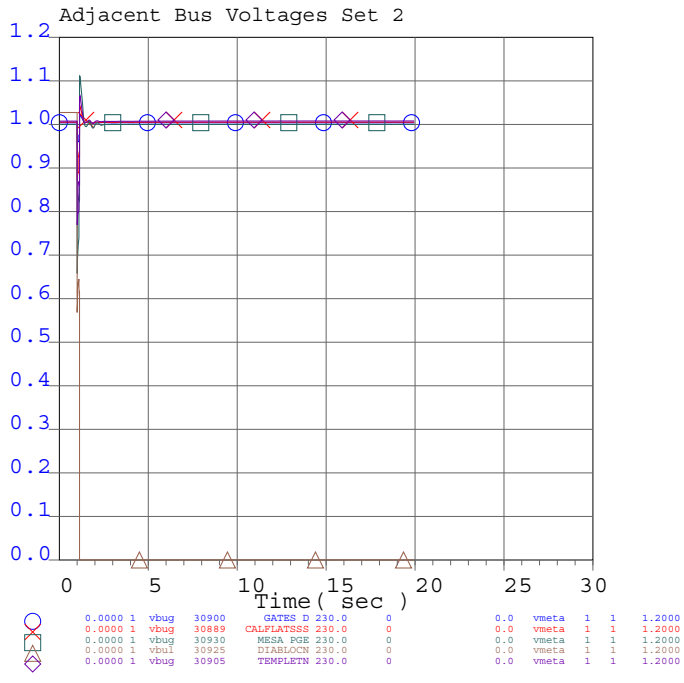

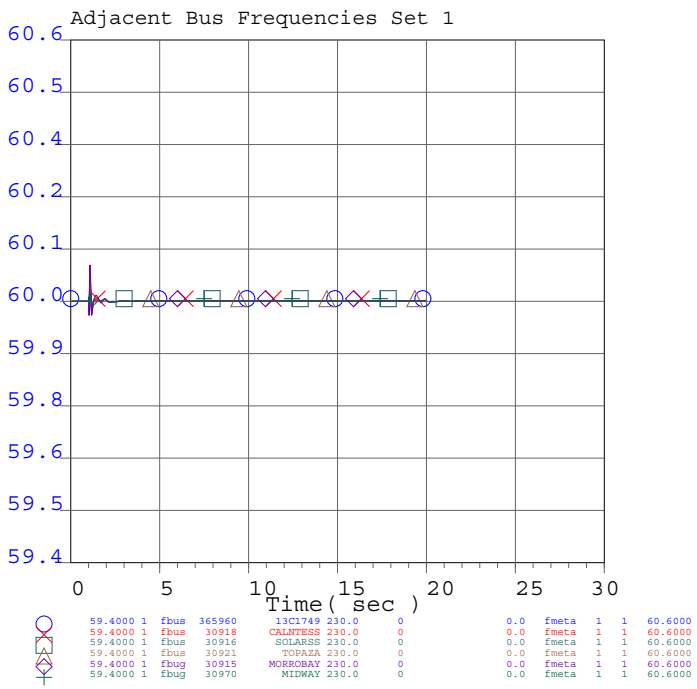

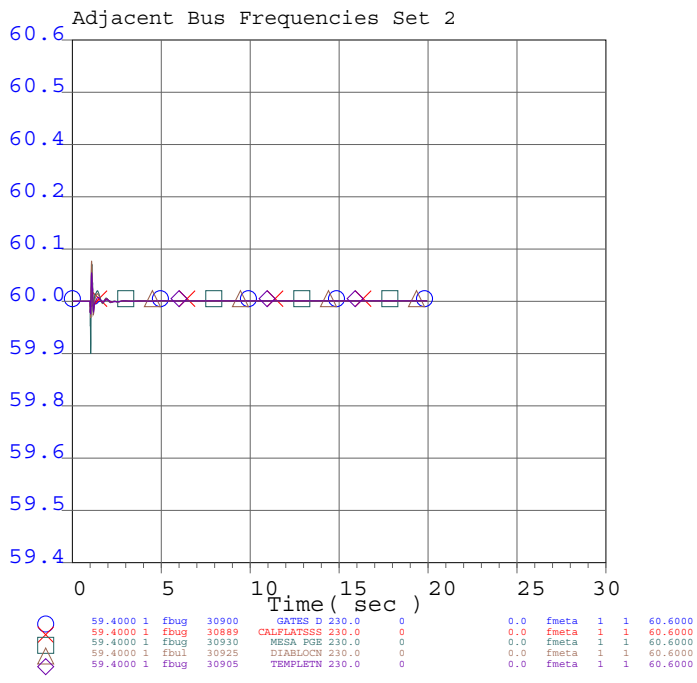

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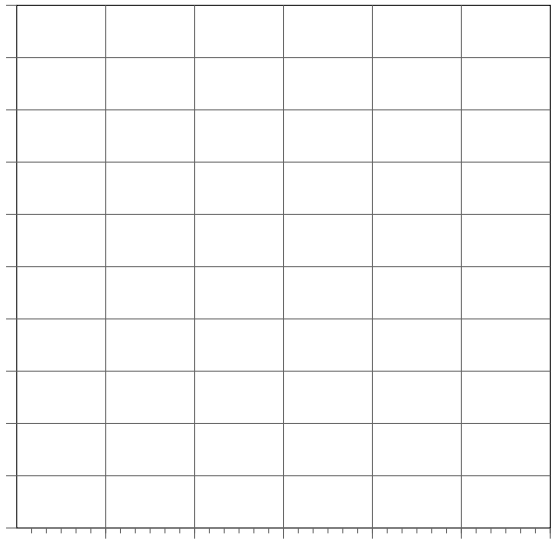
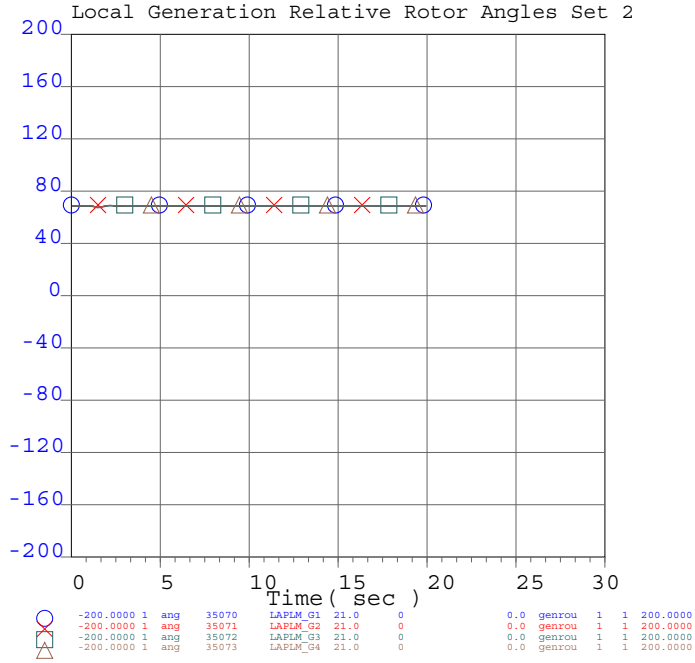
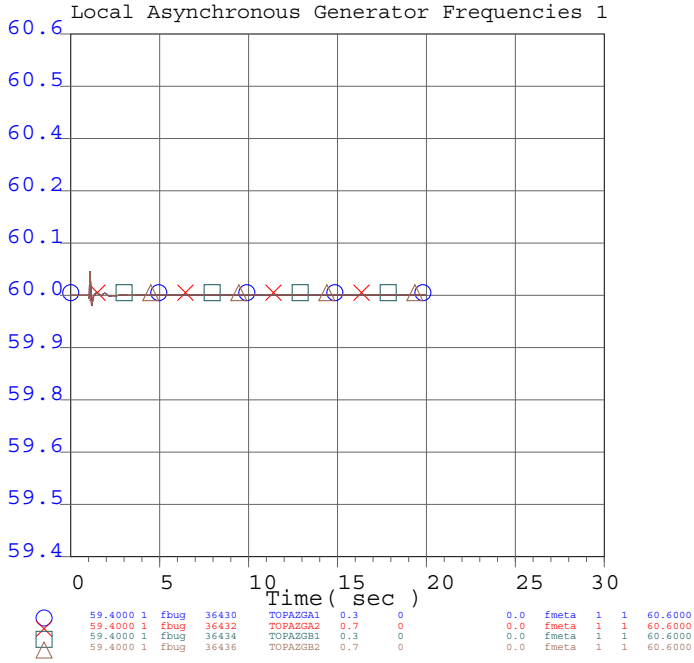
Local Generation Relative Rotor Angles Set 1



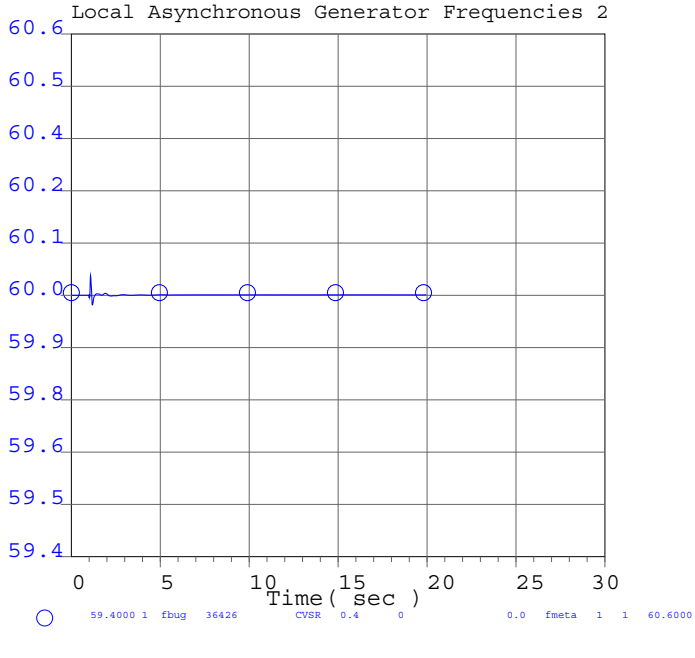
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

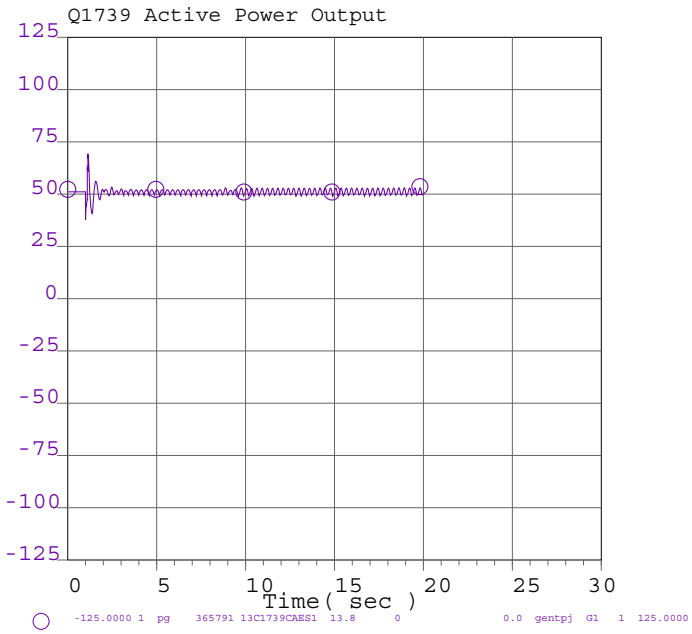


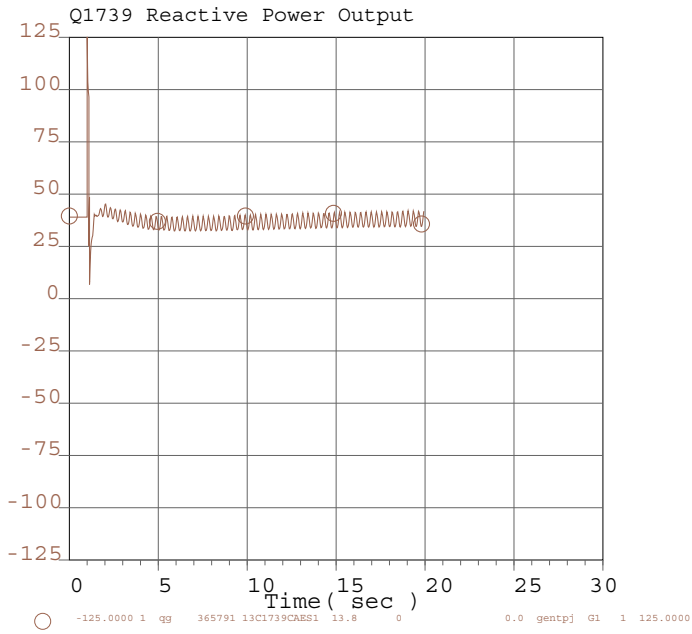
Local Asynchronous Generator Frequencies 2

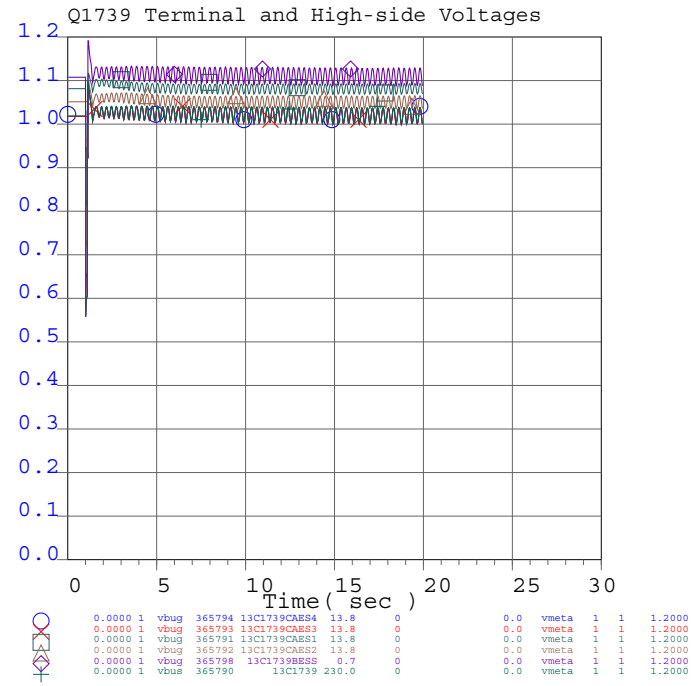


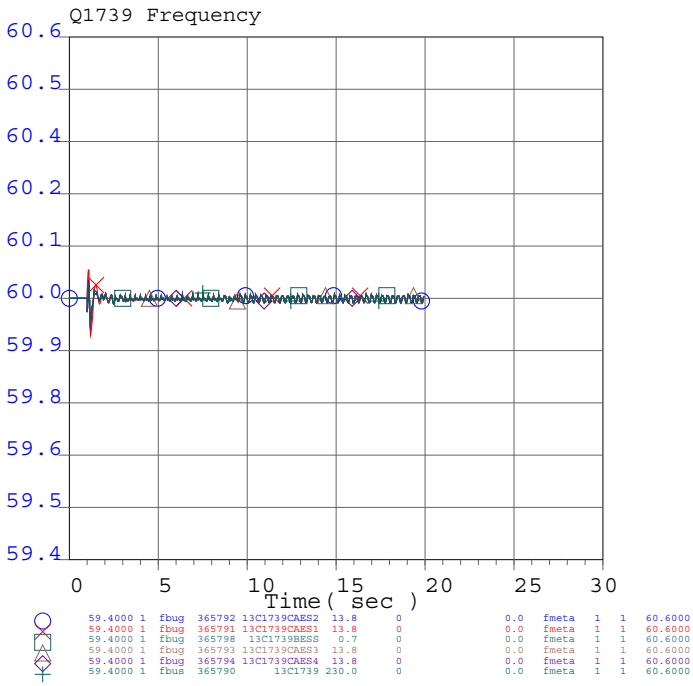
PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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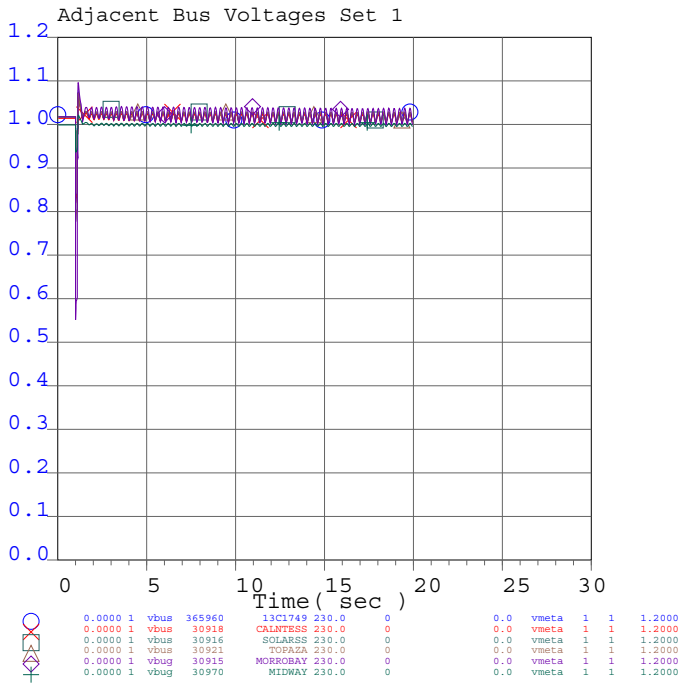

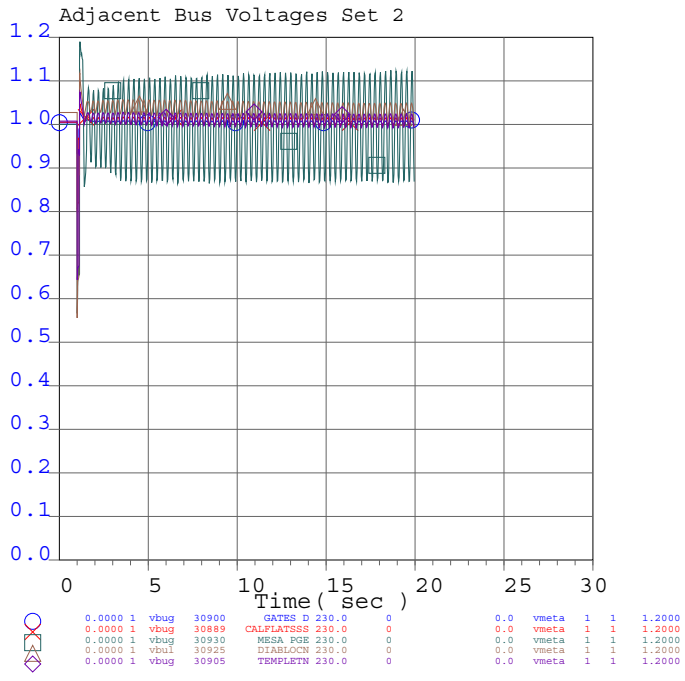

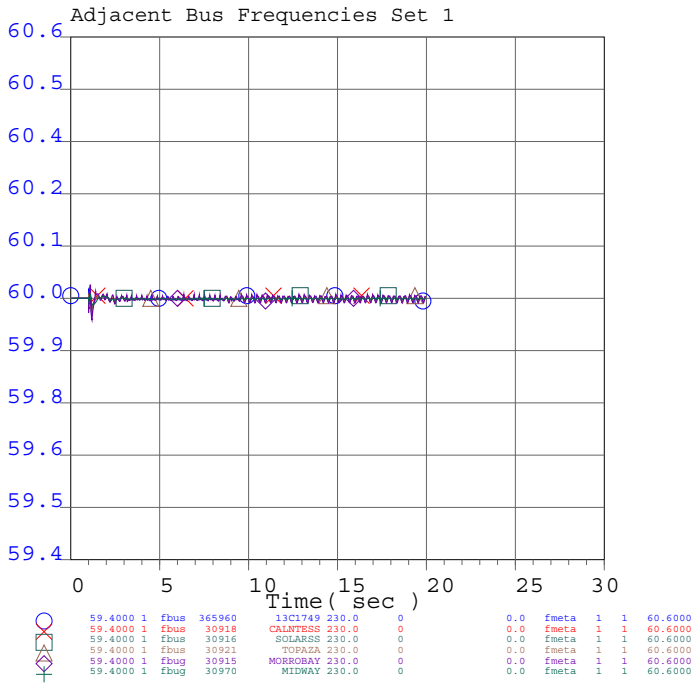

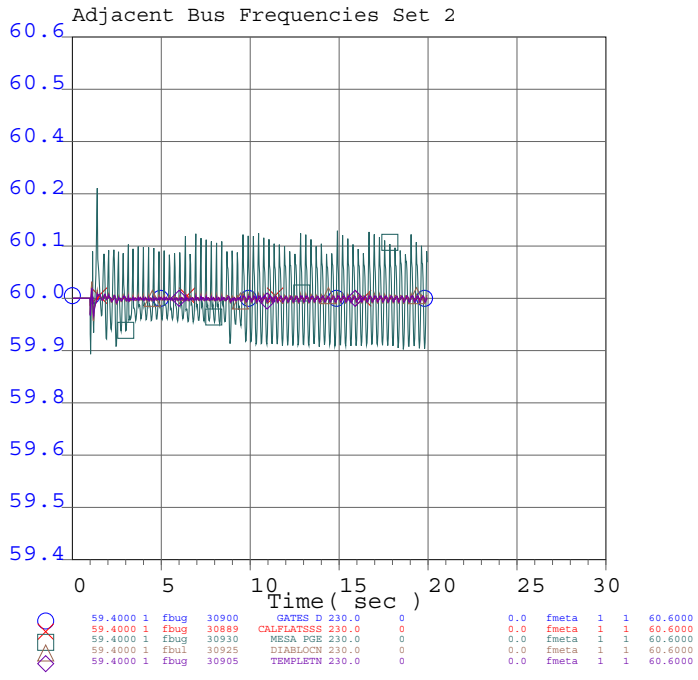

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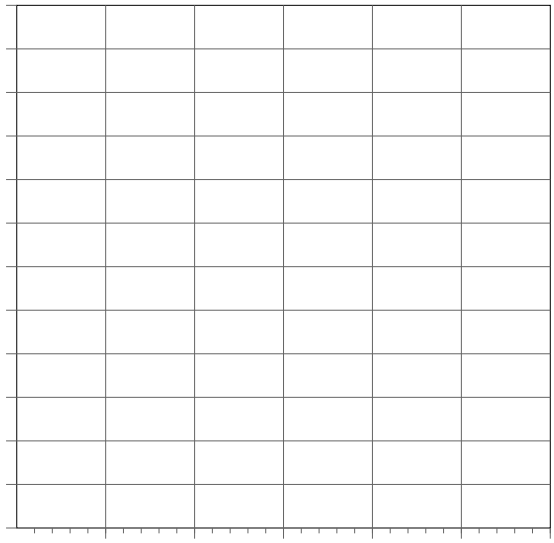
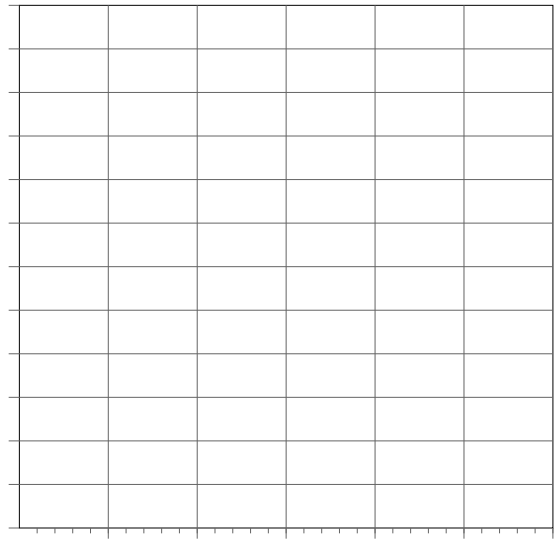
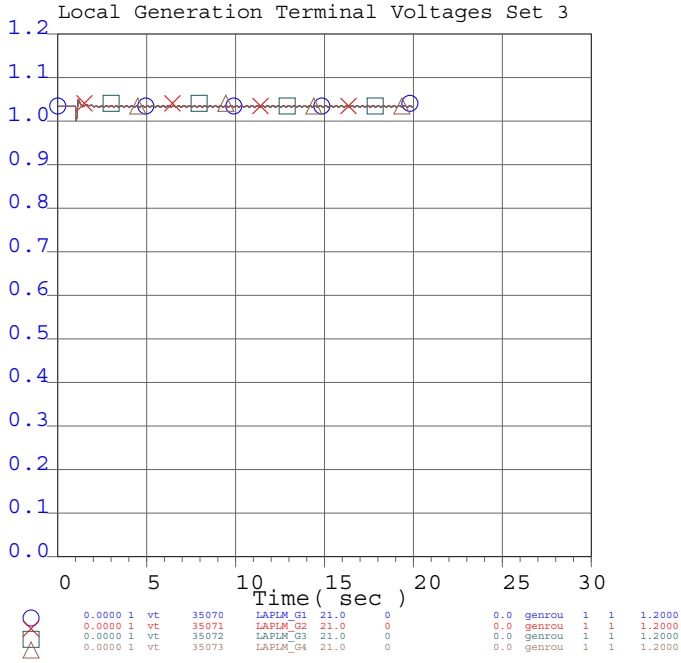
Local Generation Terminal Voltages Set 1



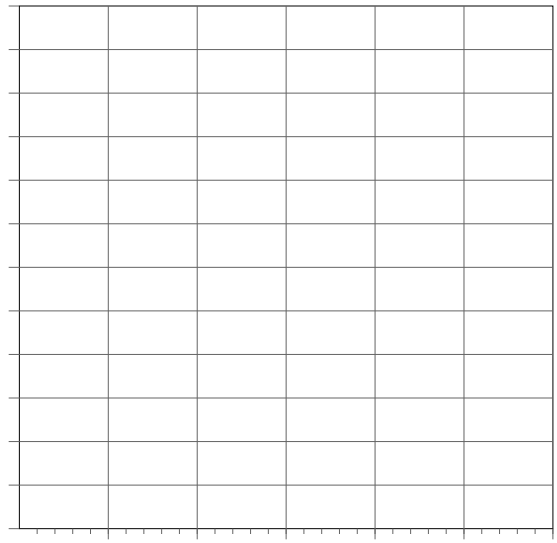
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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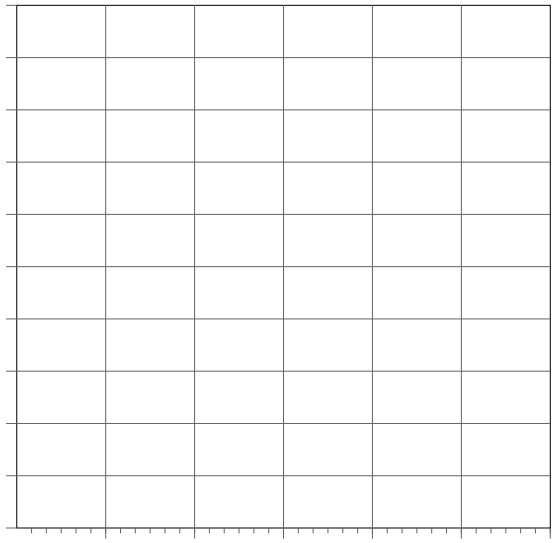
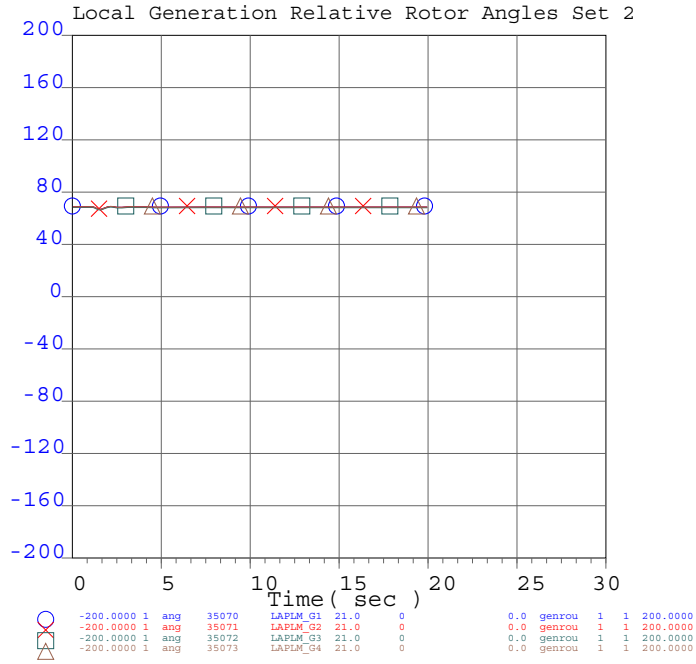
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

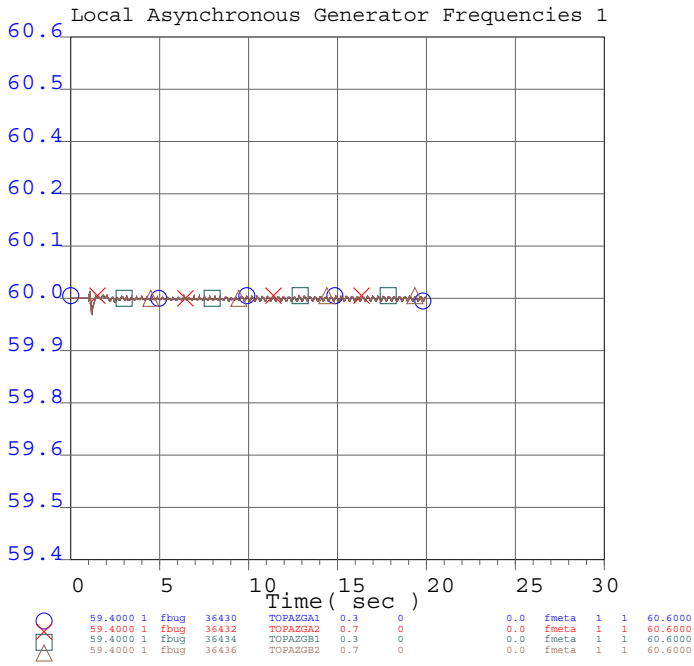
Local Generation Relative Rotor Angles Set 1



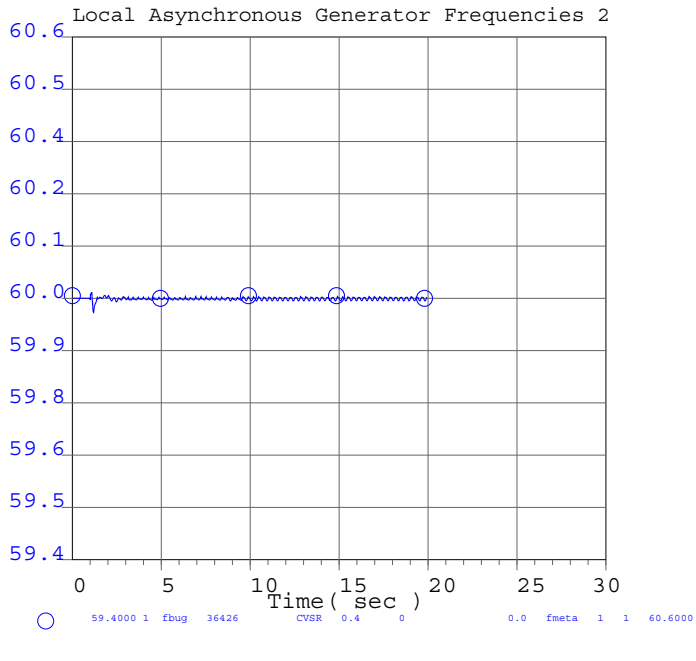
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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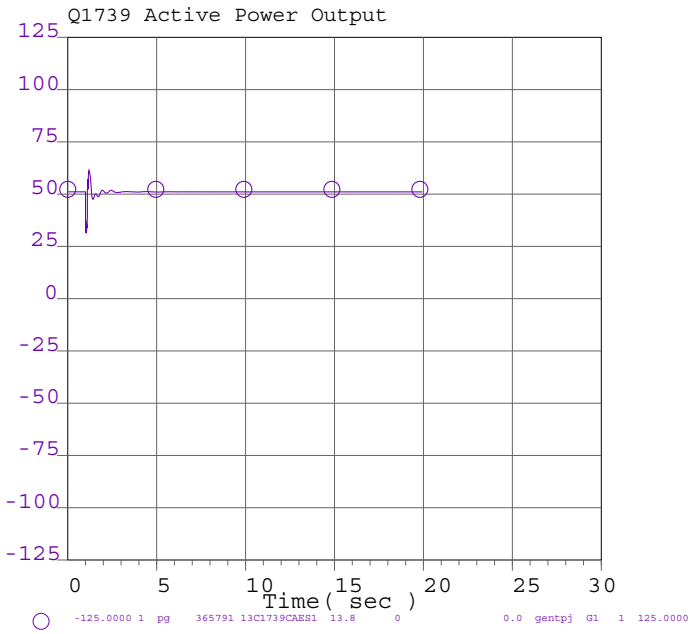

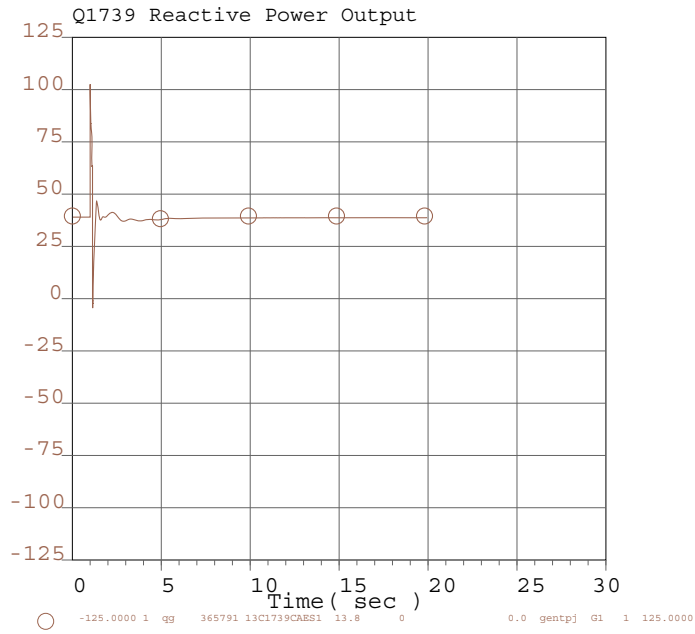

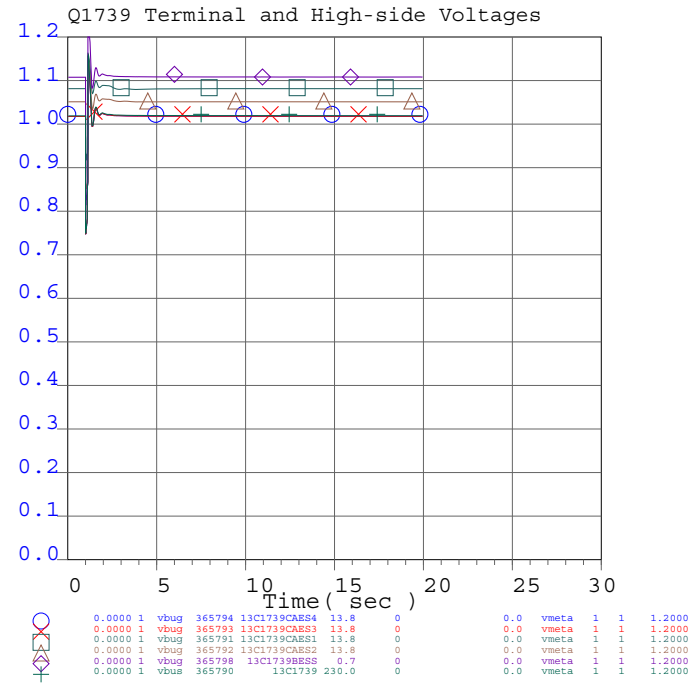

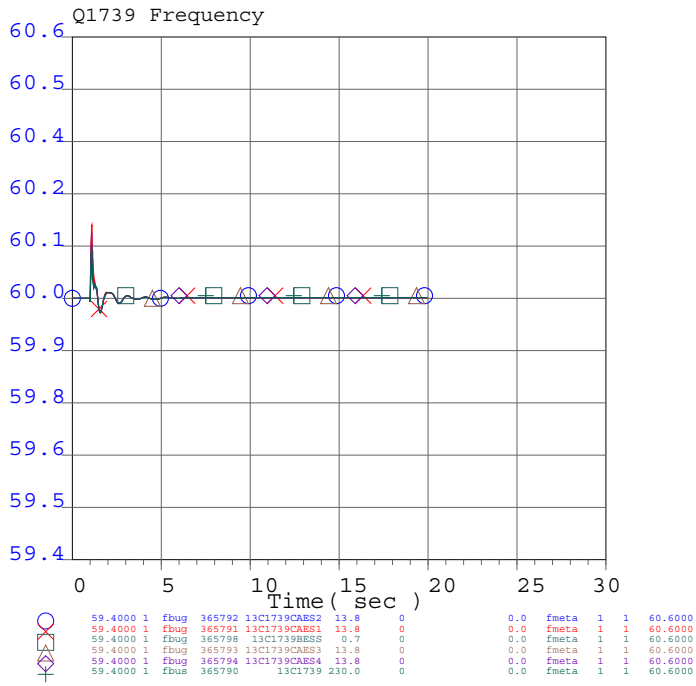

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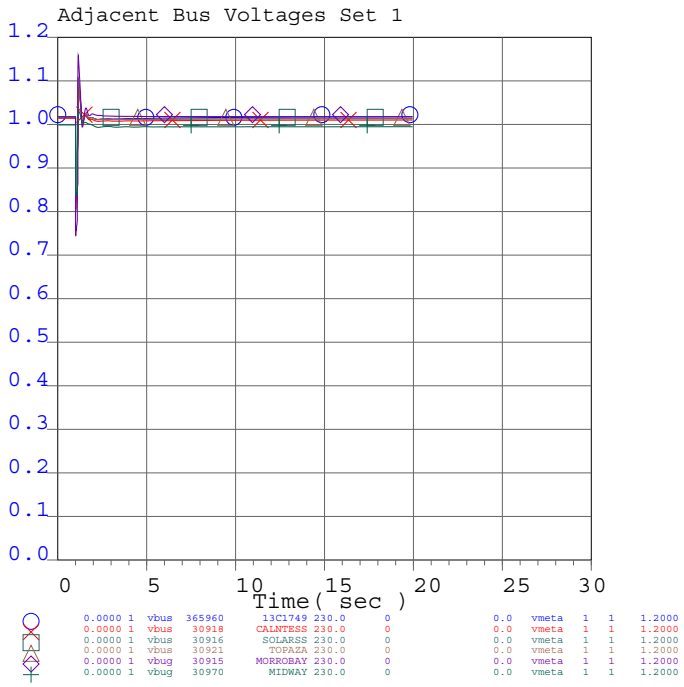

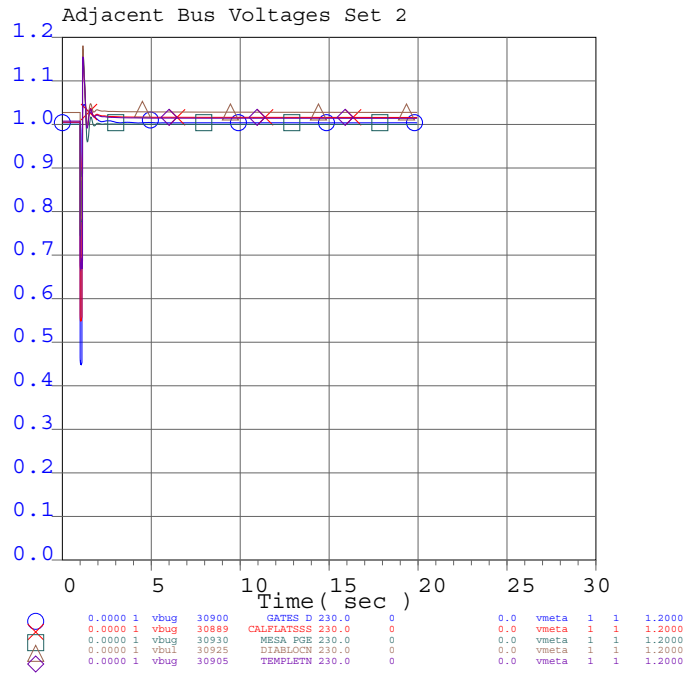

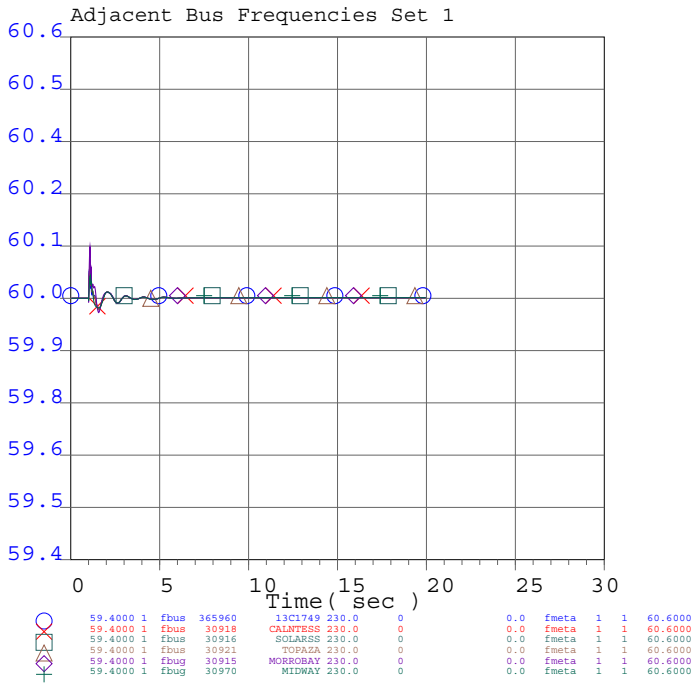

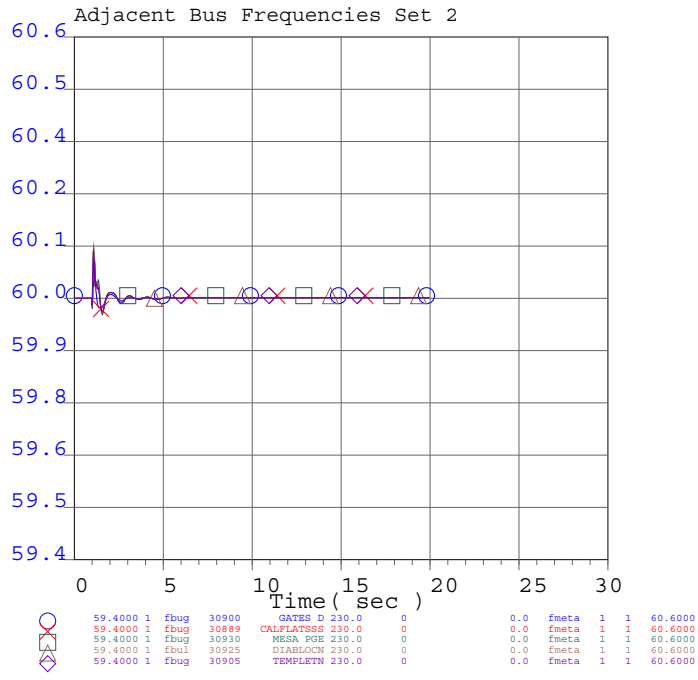

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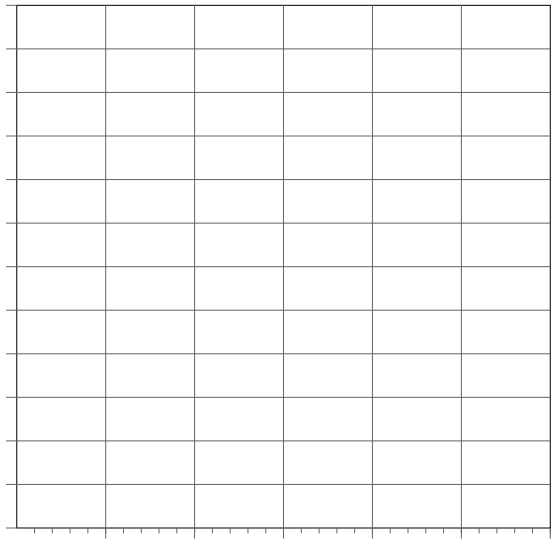
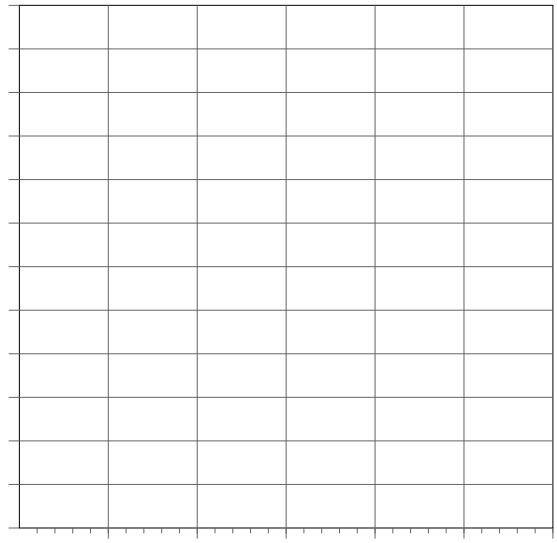
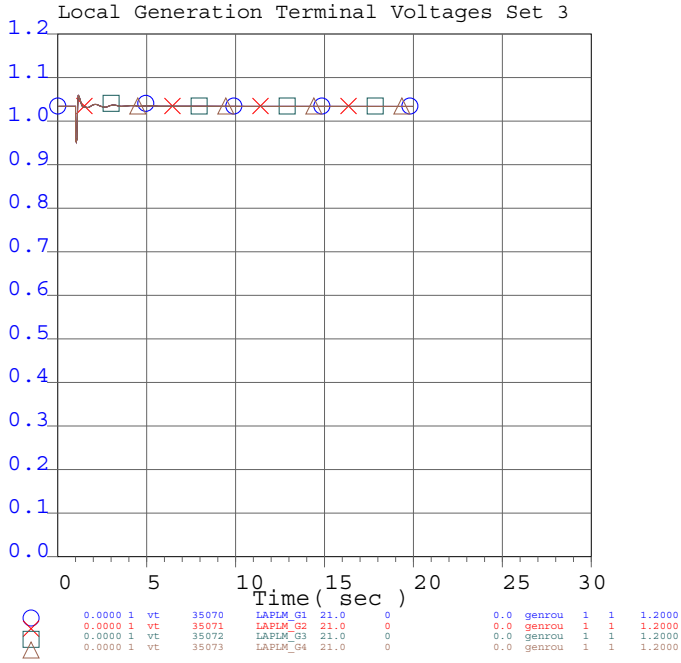
Local Generation Terminal Voltages Set 1



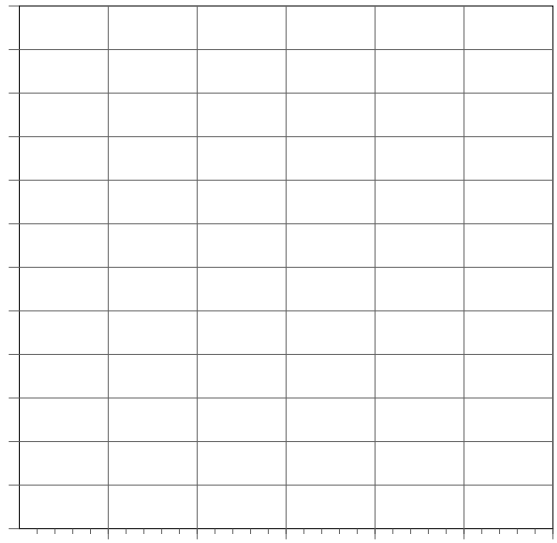
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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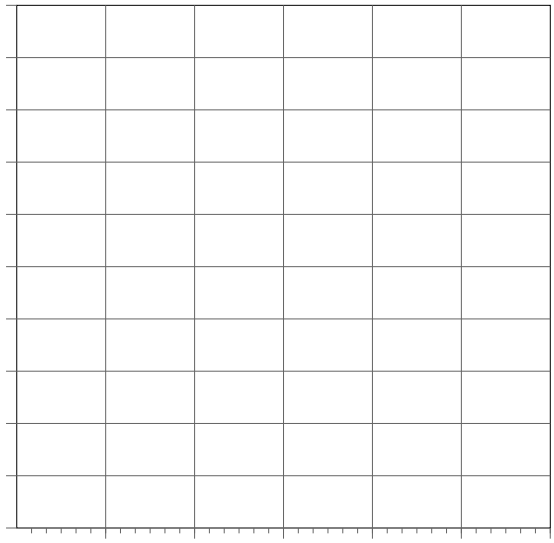
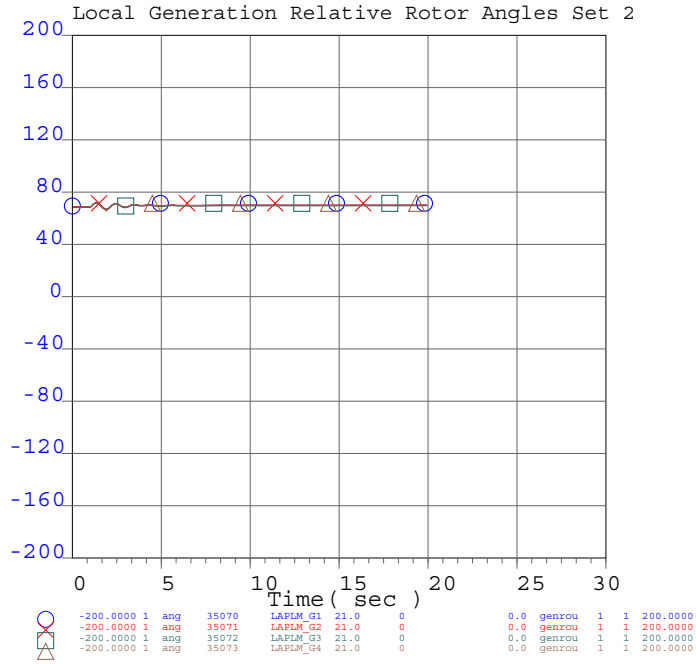
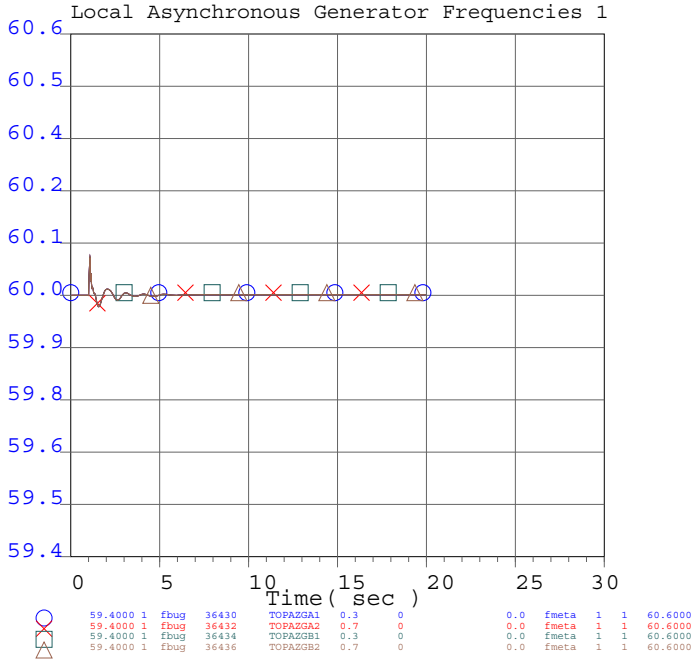
Local Generation Relative Rotor Angles Set 1



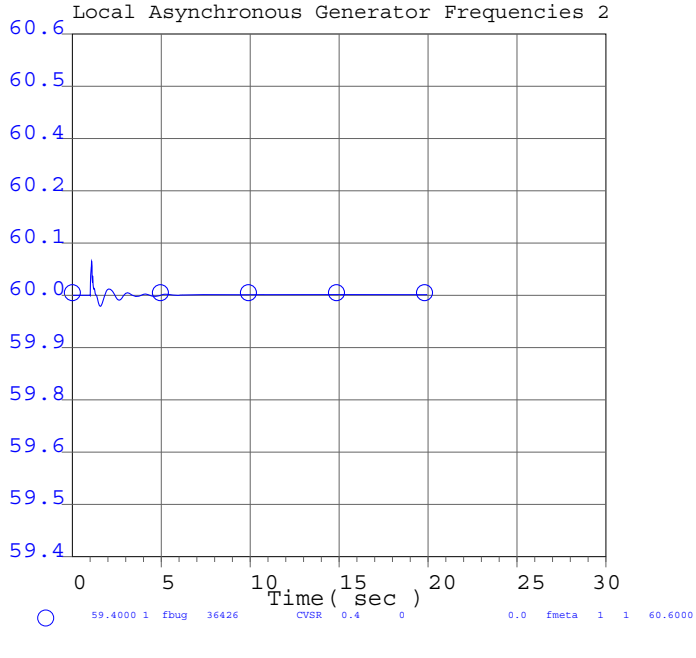
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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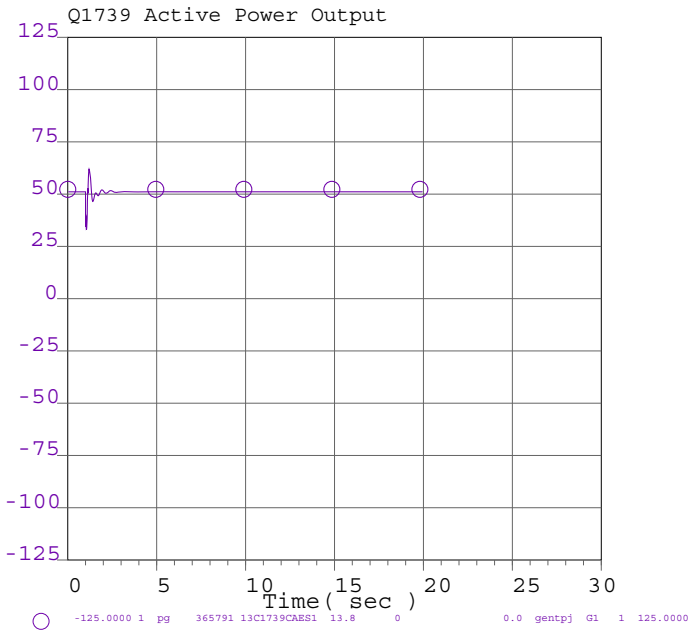
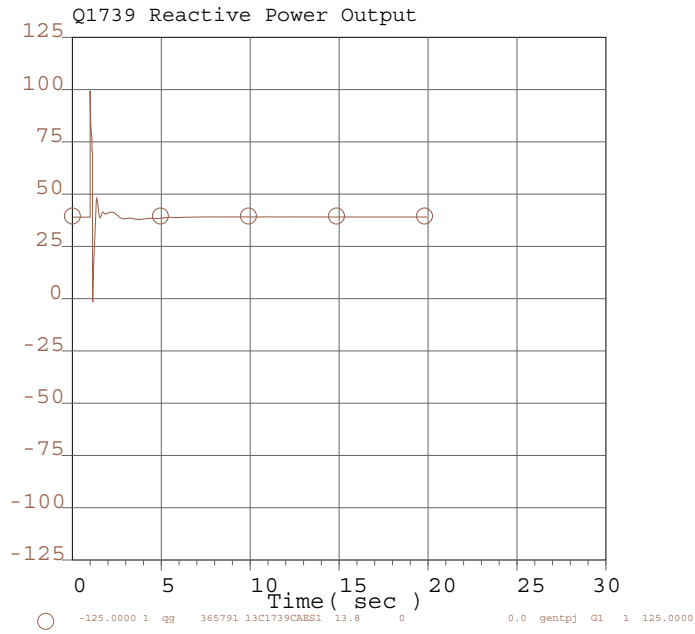
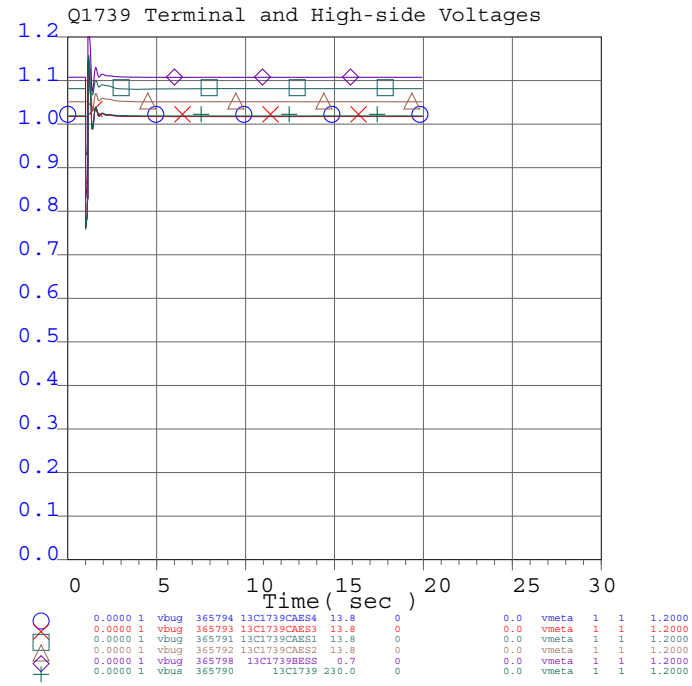
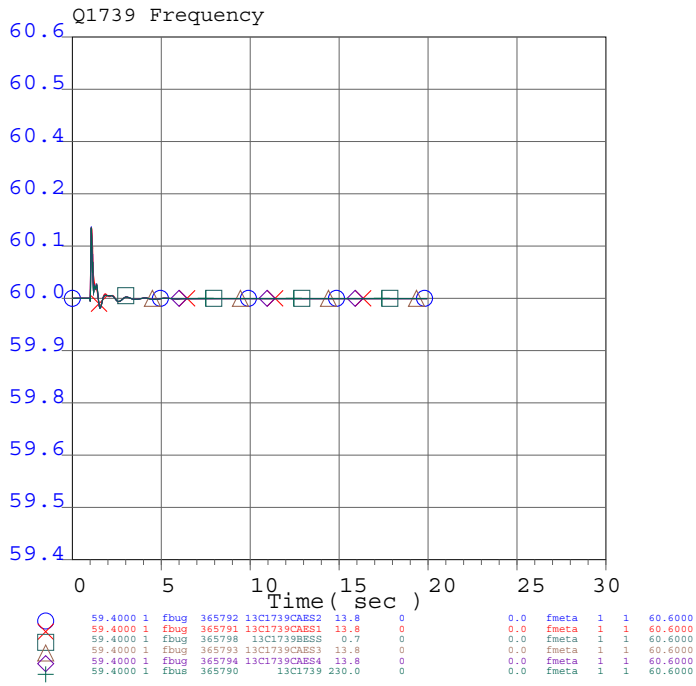
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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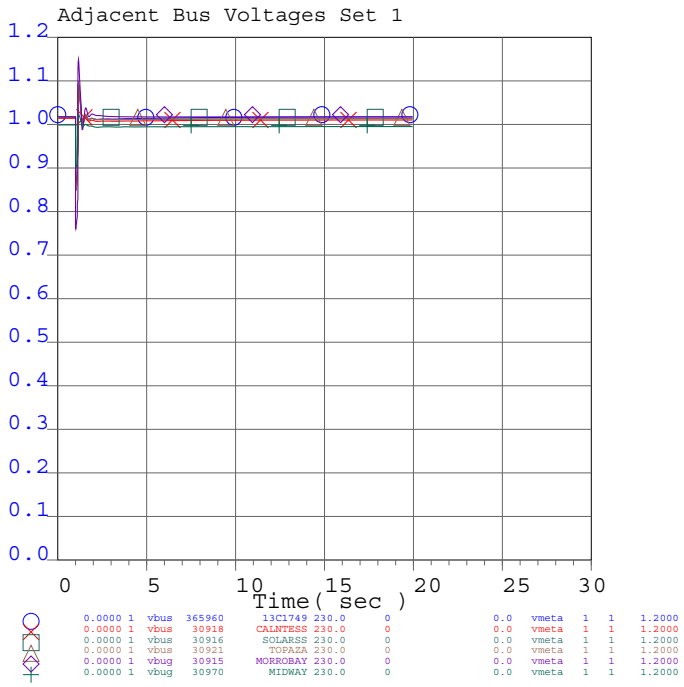

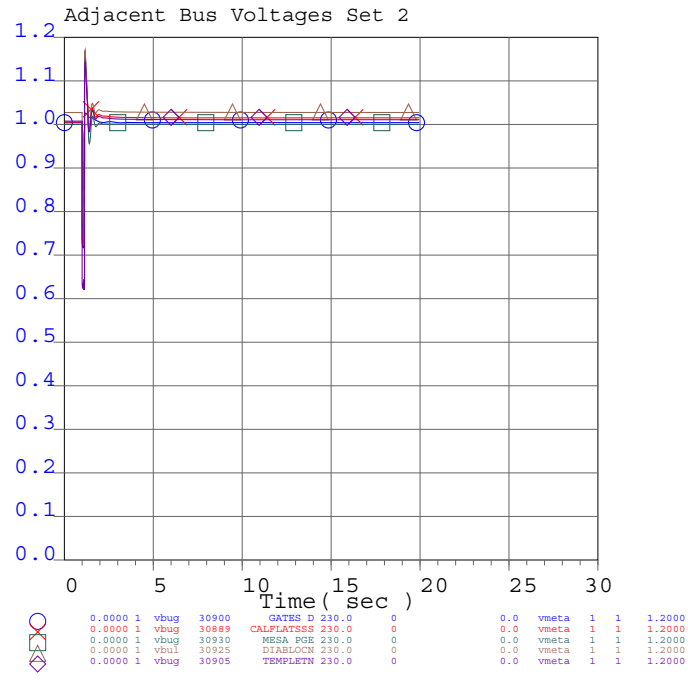

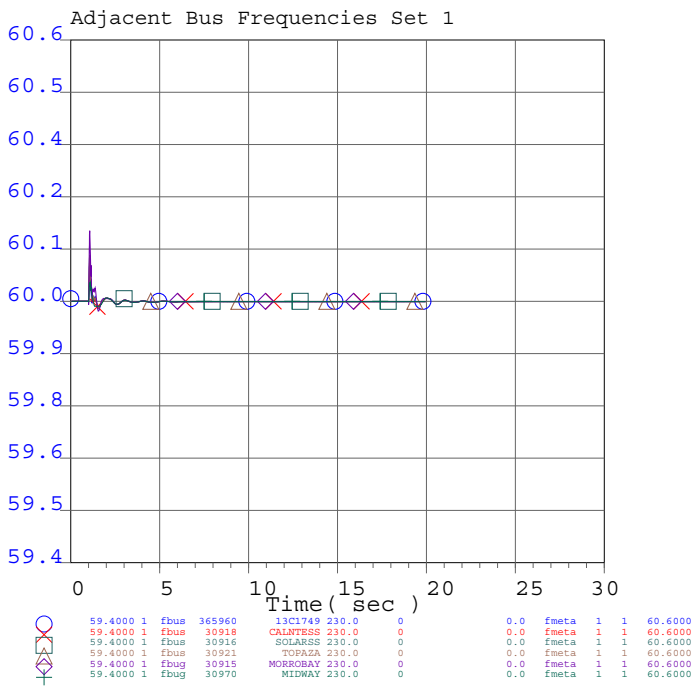

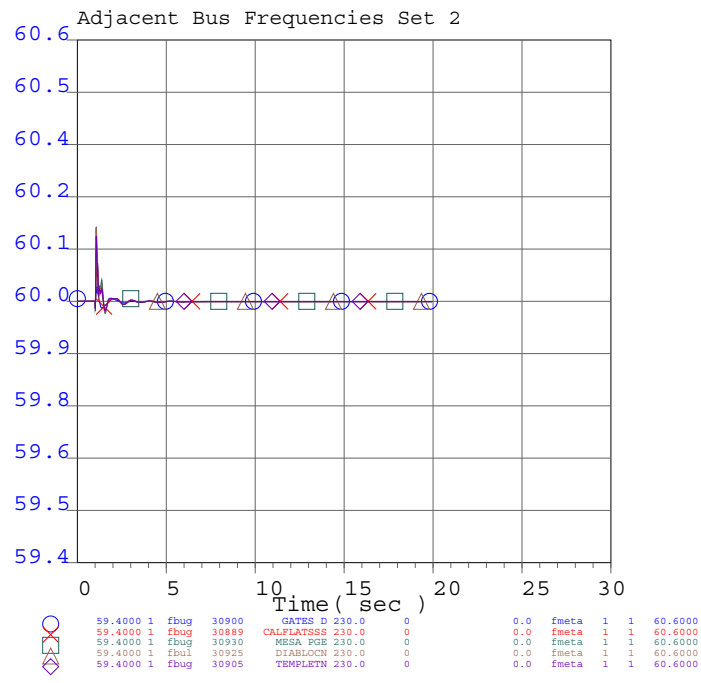

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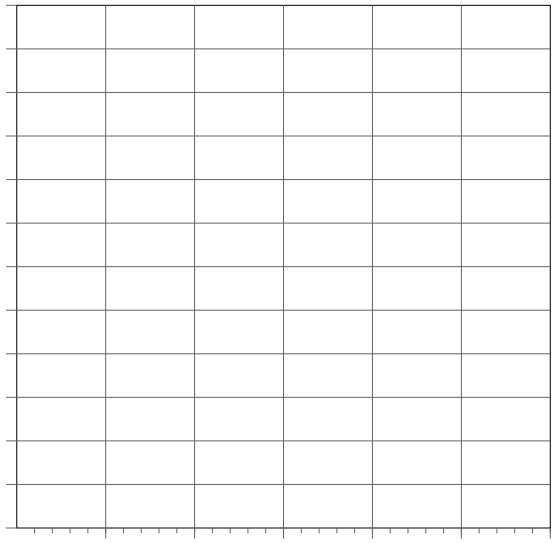
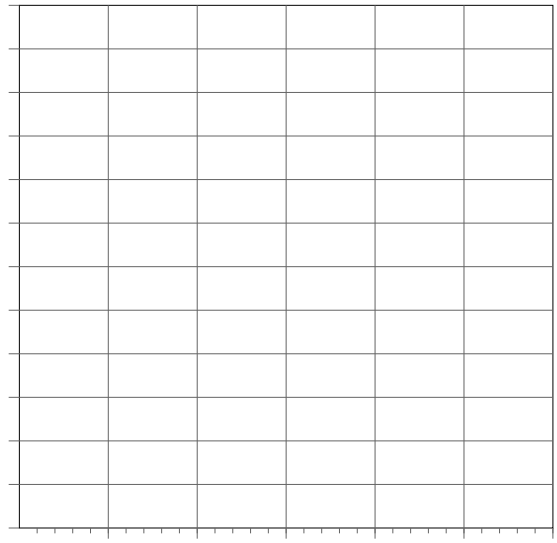
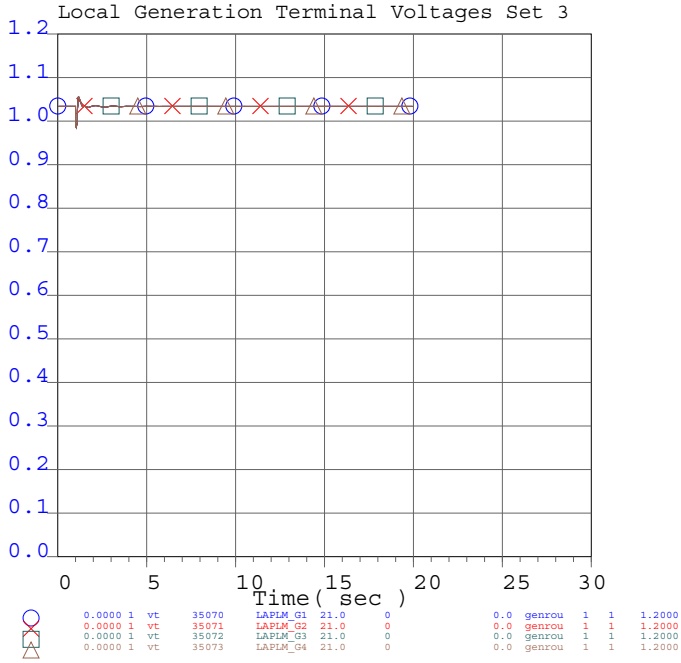


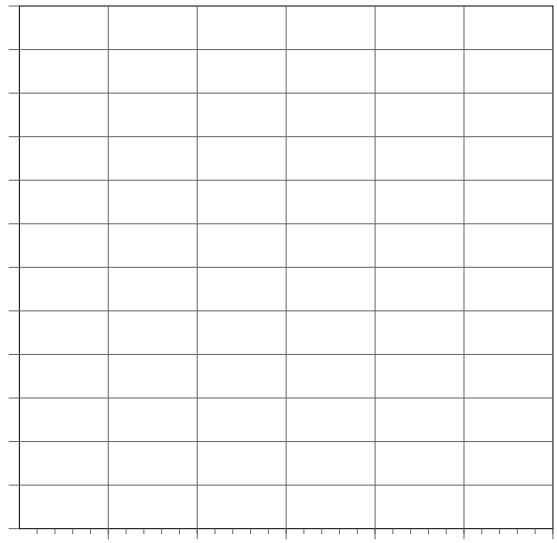
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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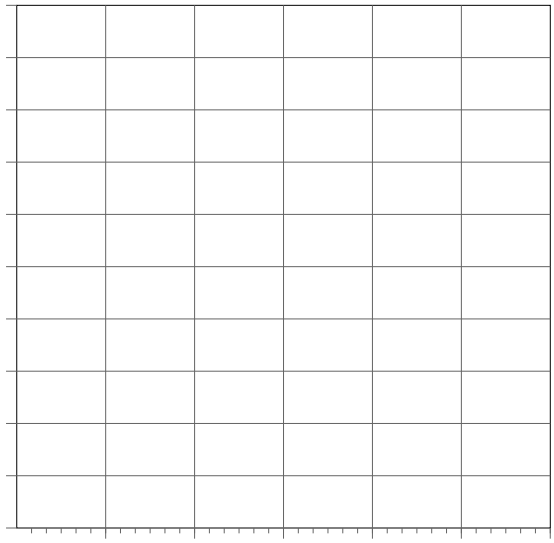
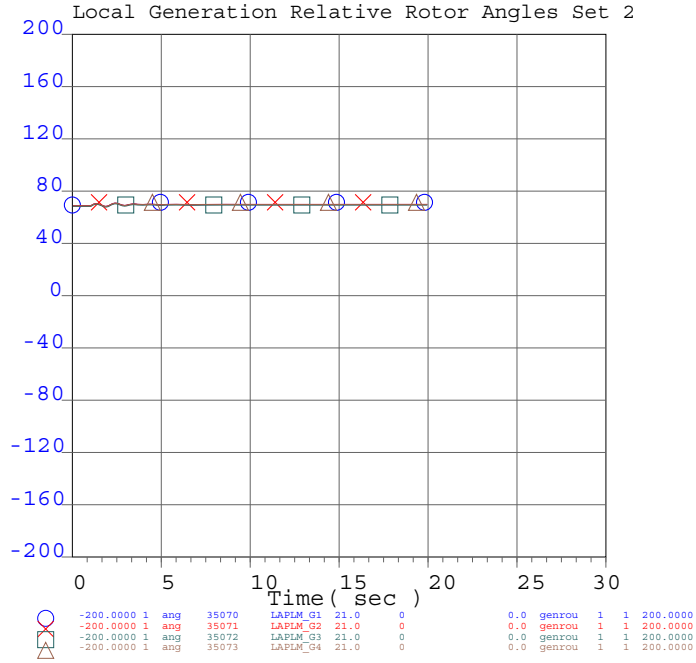
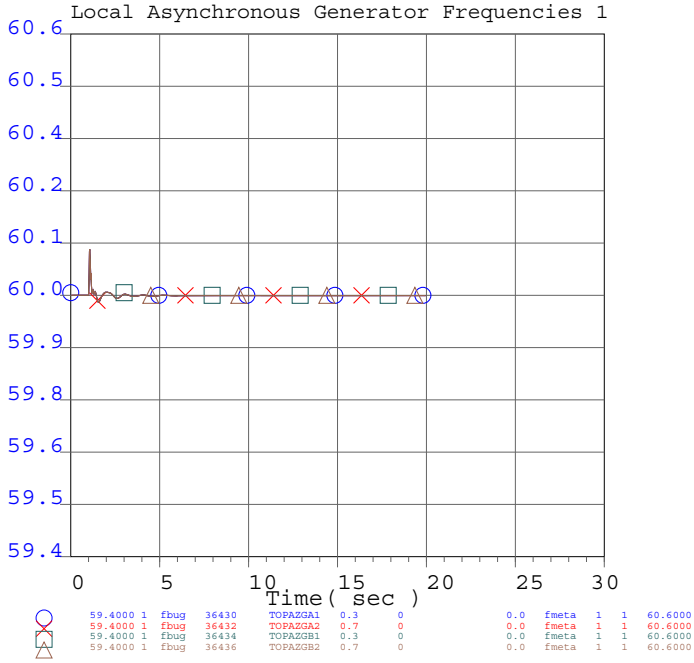


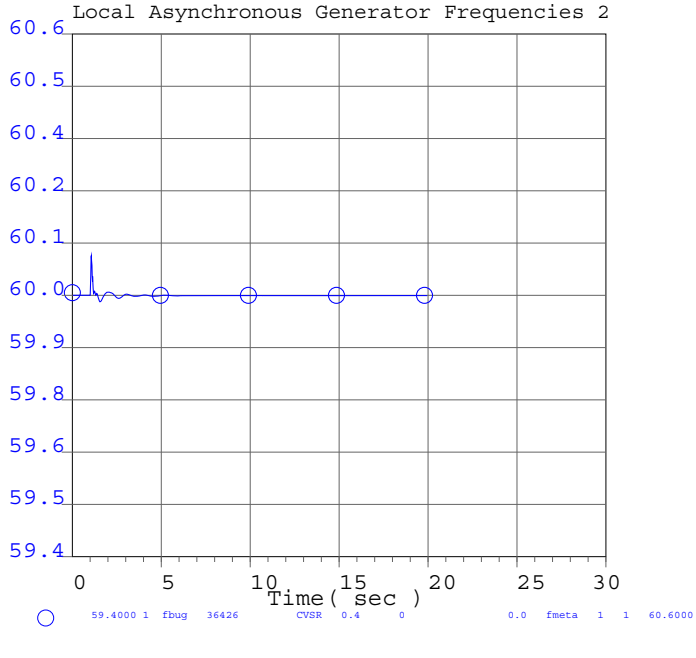
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

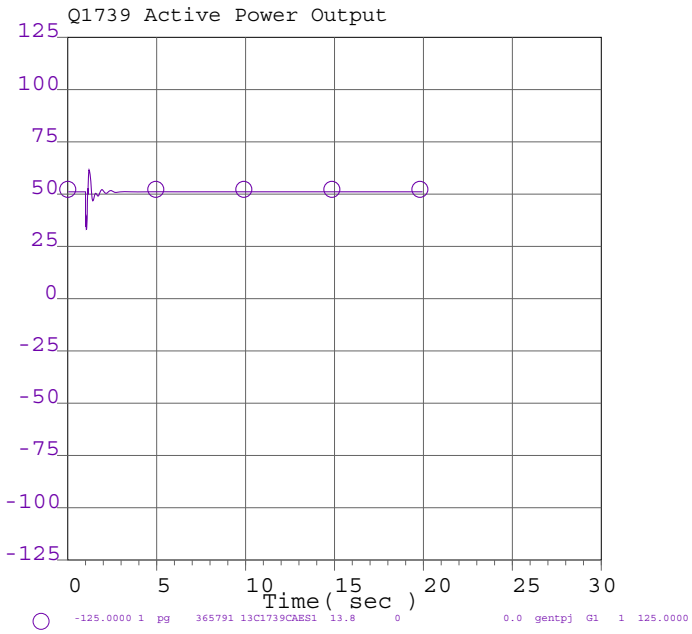


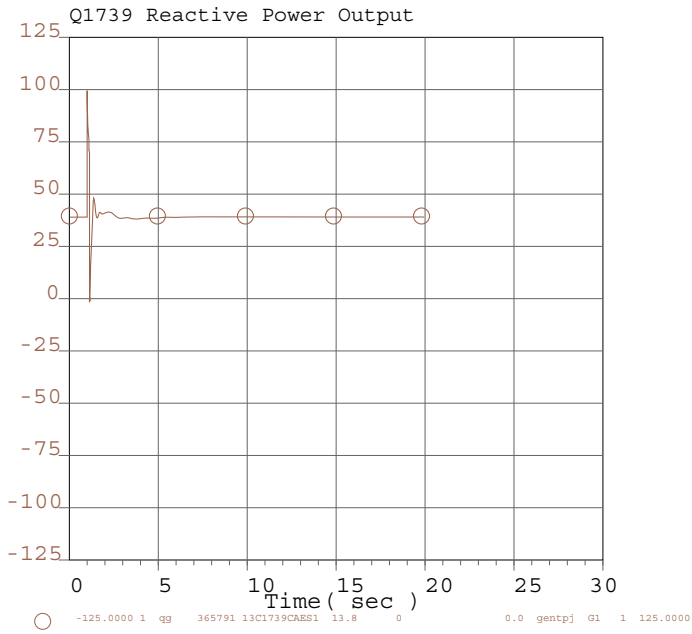
Local Asynchronous Generator Frequencies 2

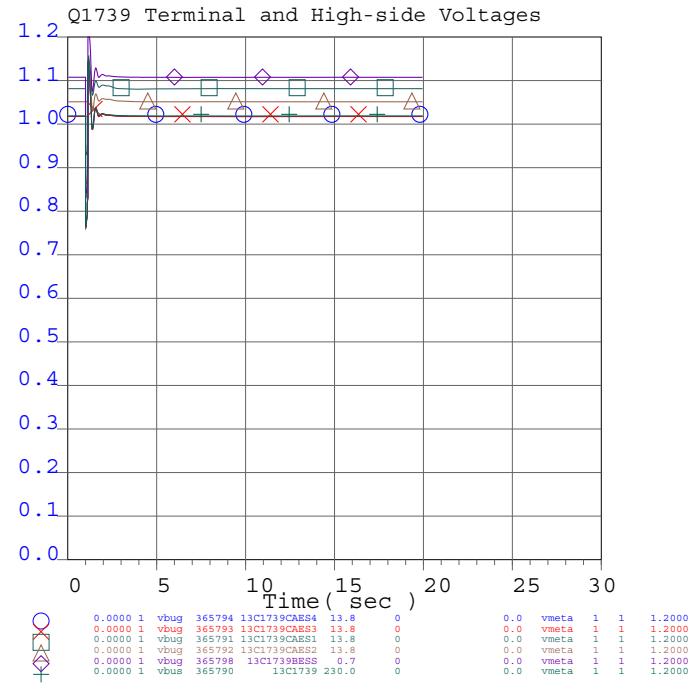


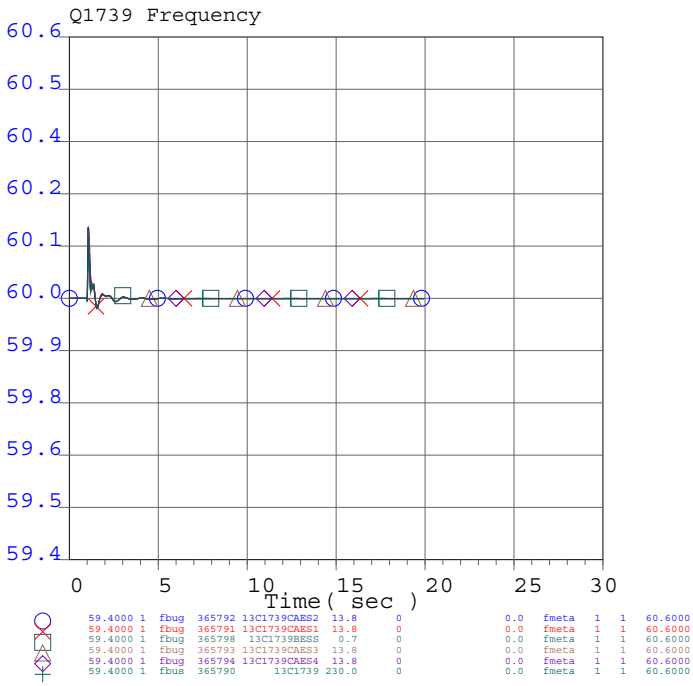
PGAE 2019 ASSESSMENT SERIES: 2025 Spring Off-Peak S-N case
PATH15= 2684 MW(S-N) PATH26= 1859 MW(N-S) PDCI= -159 MW(N-S) COI=-2447 MW(N-S)
PGAE qc13p1 2025 spring off-peak west kern post-proj case r6c1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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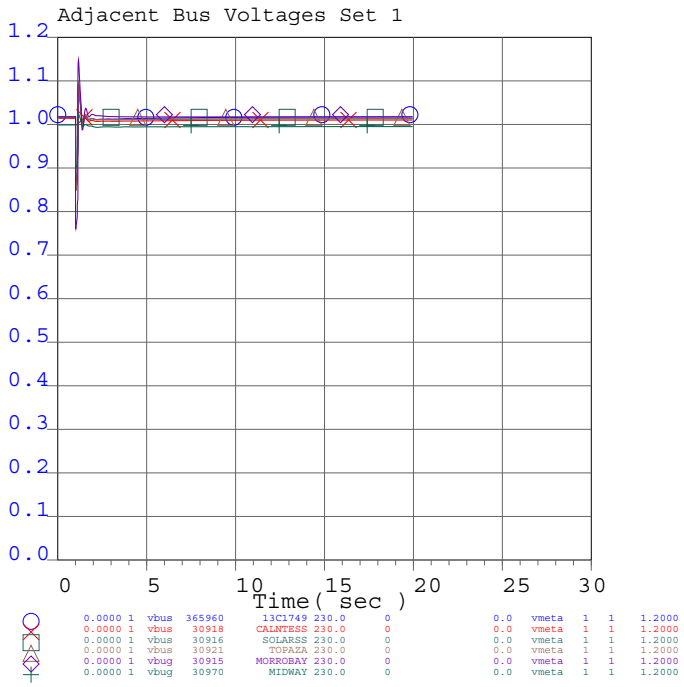

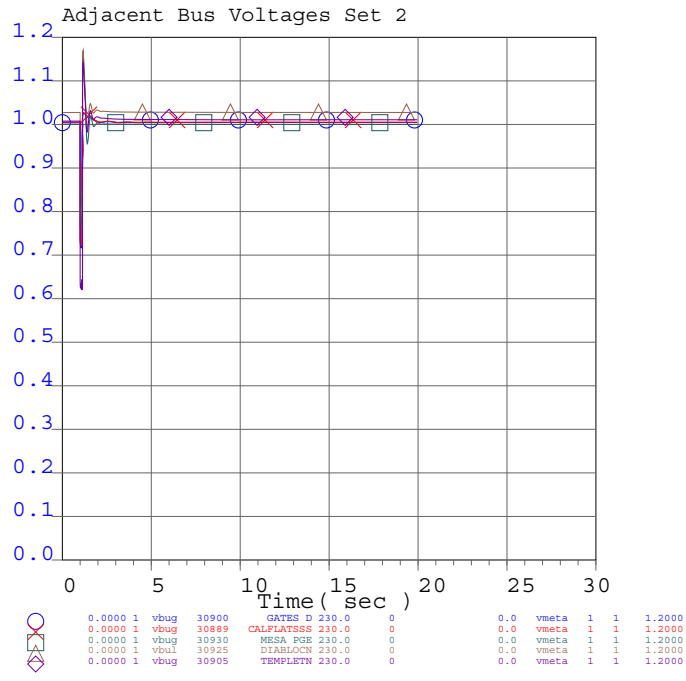

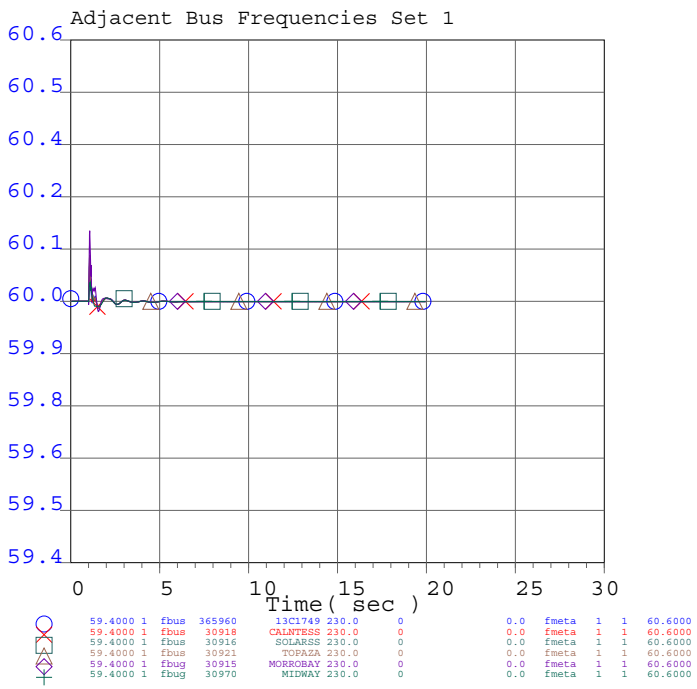

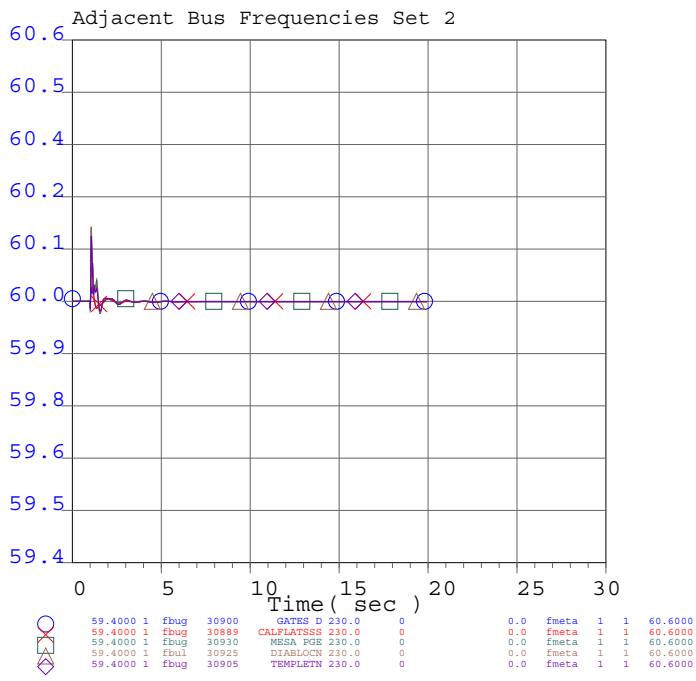

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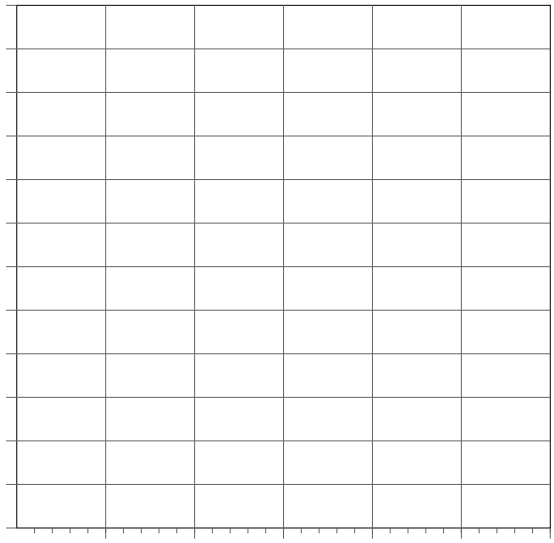
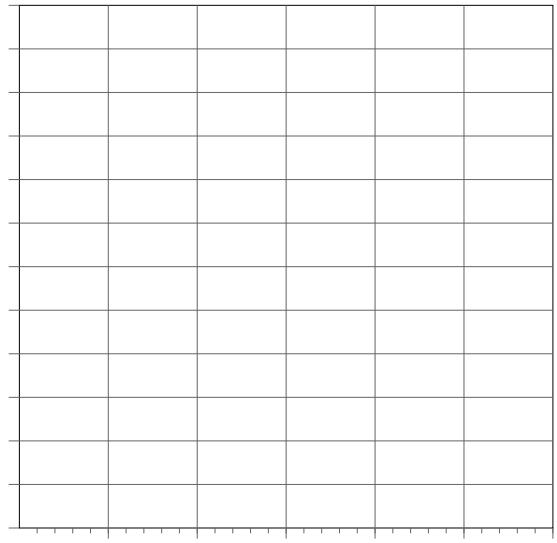
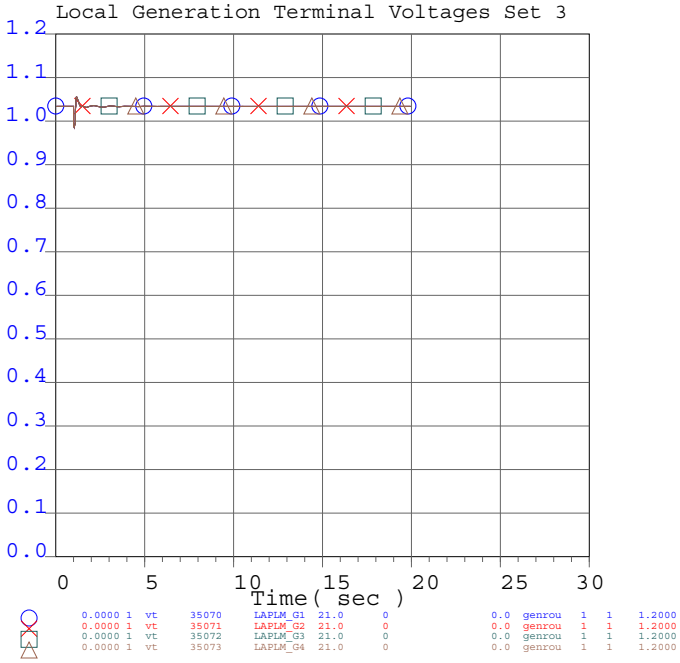
Local Generation Terminal Voltages Set 1



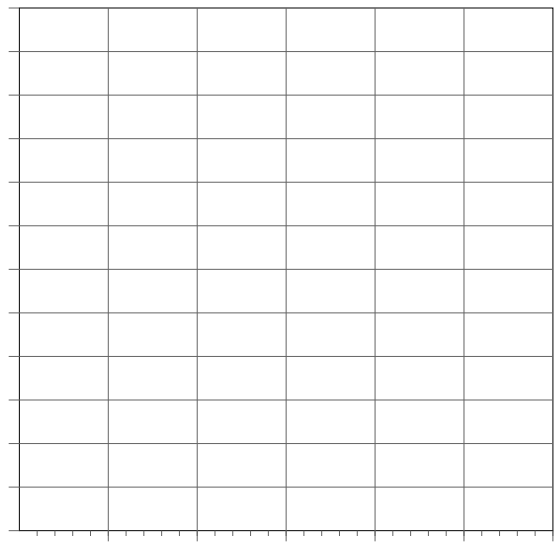
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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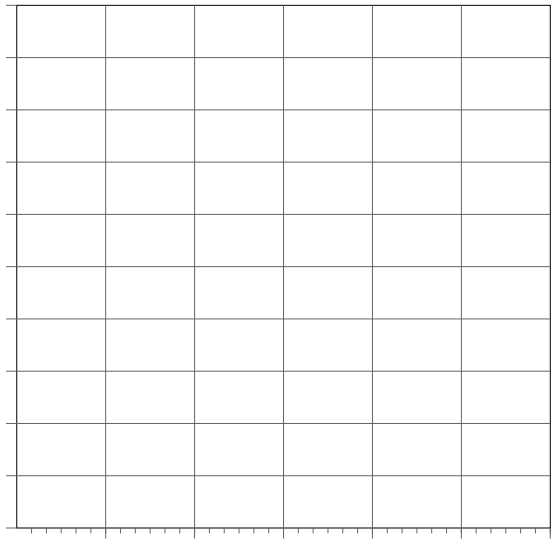
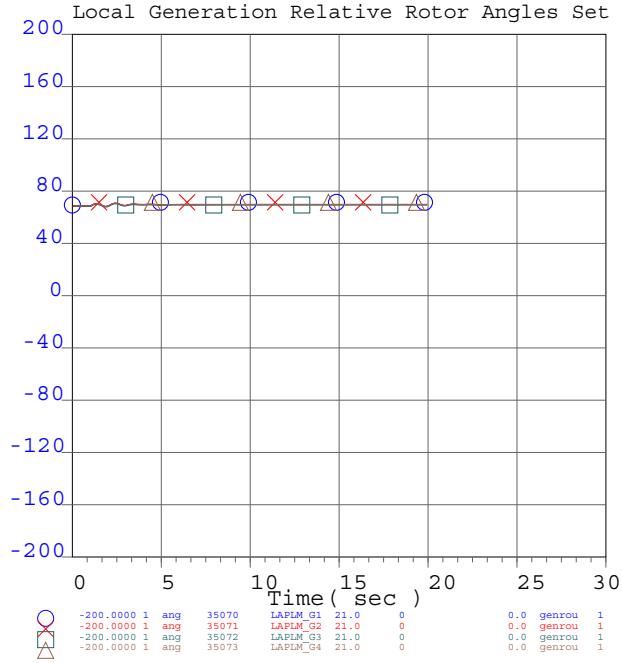
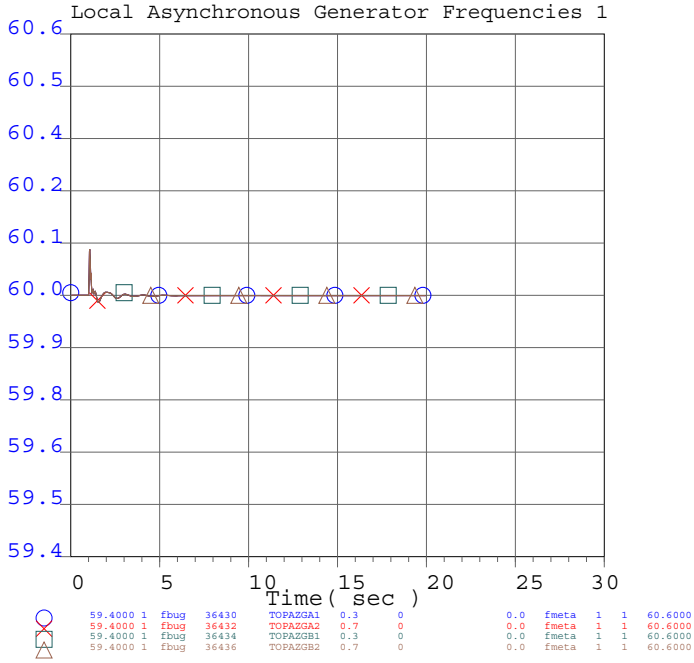
Local Generation Relative Rotor Angles Set 1



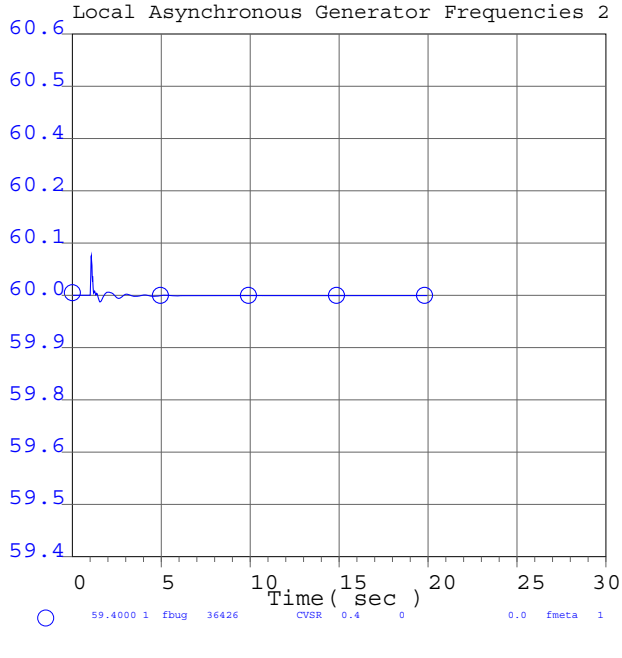
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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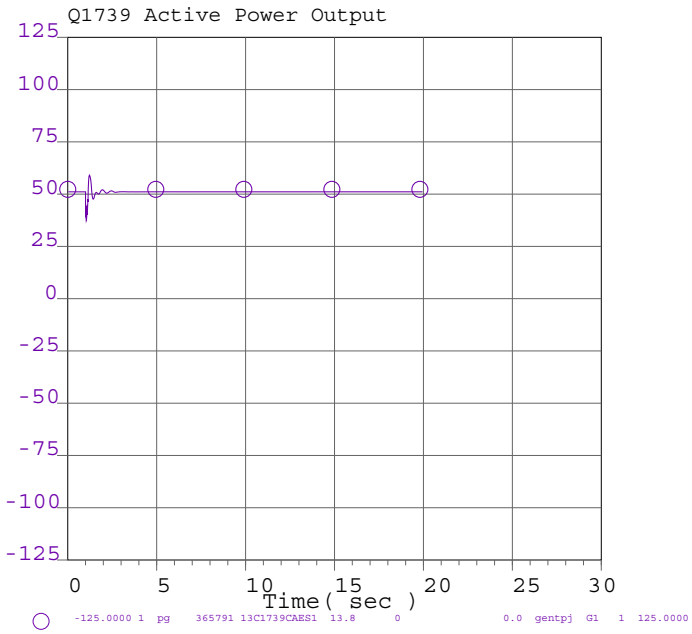
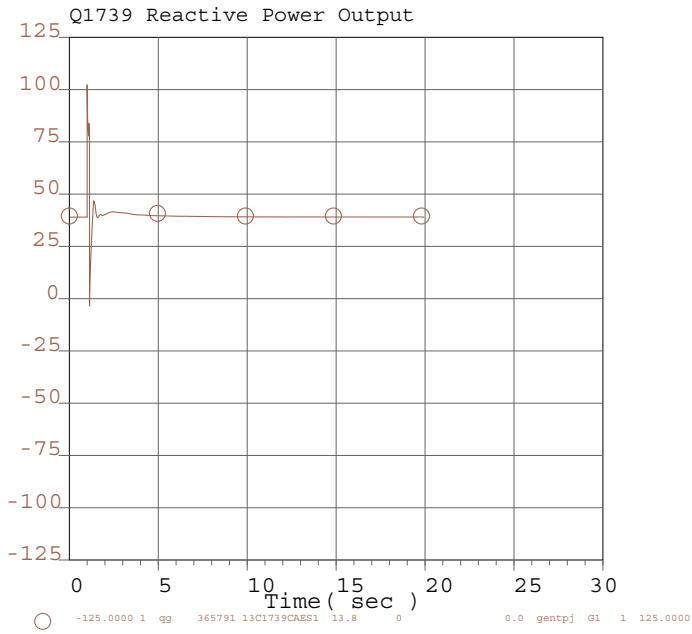
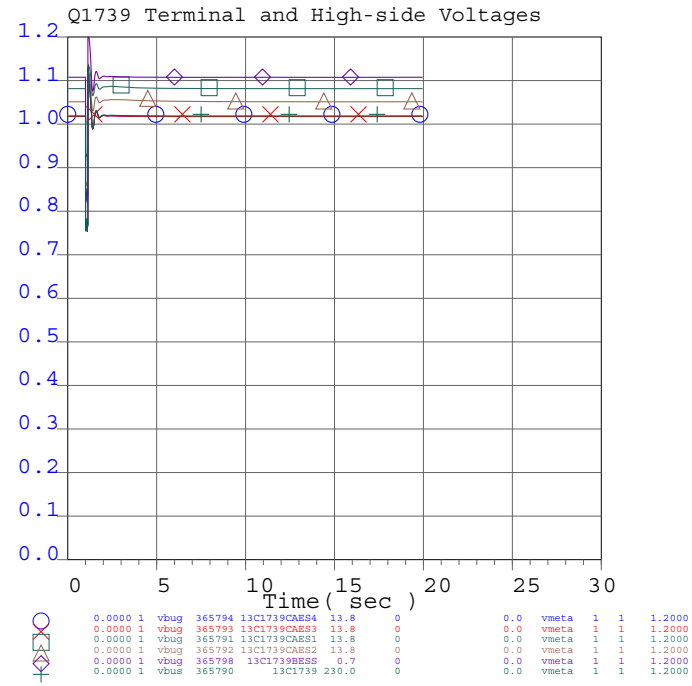
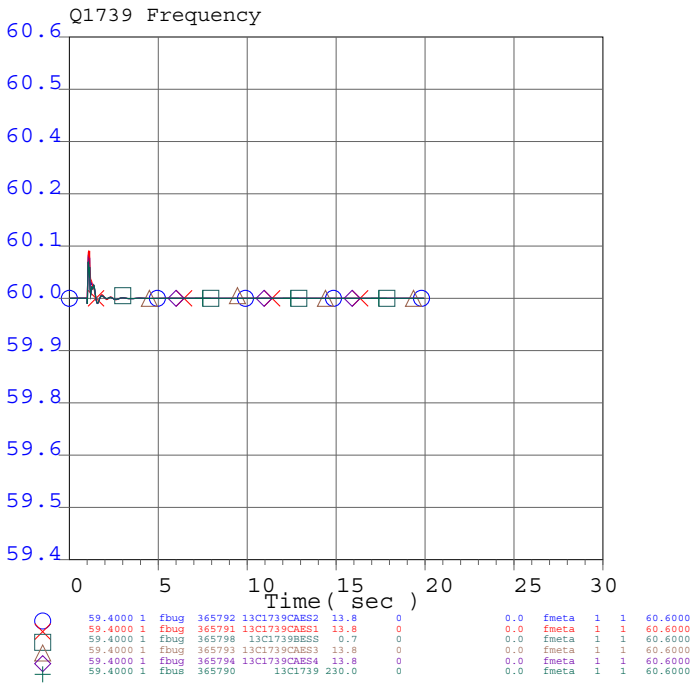
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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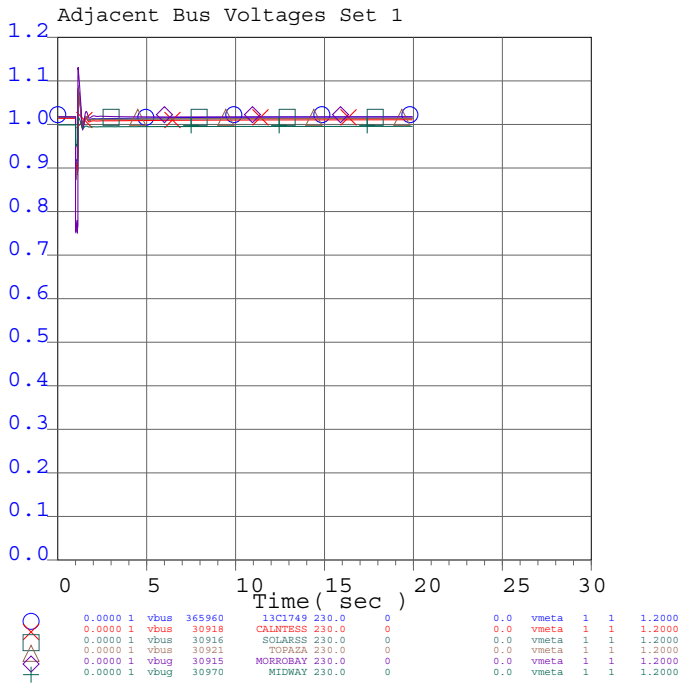

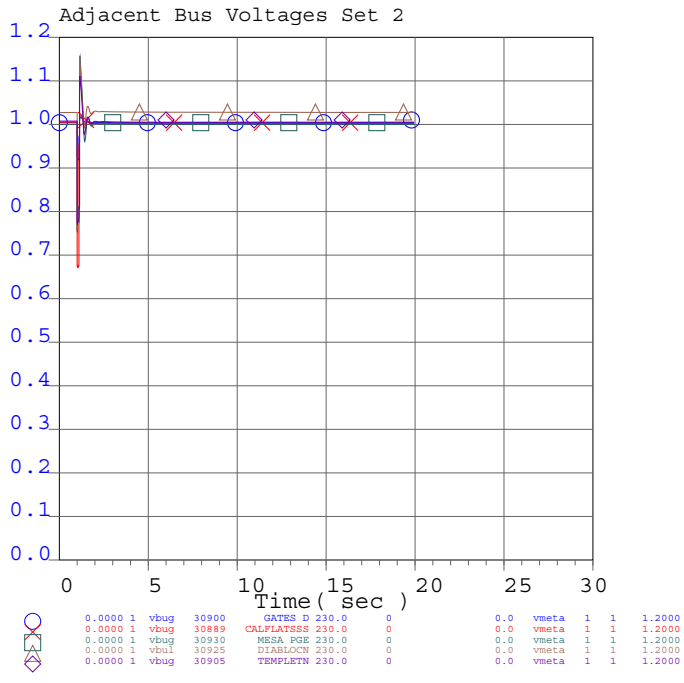

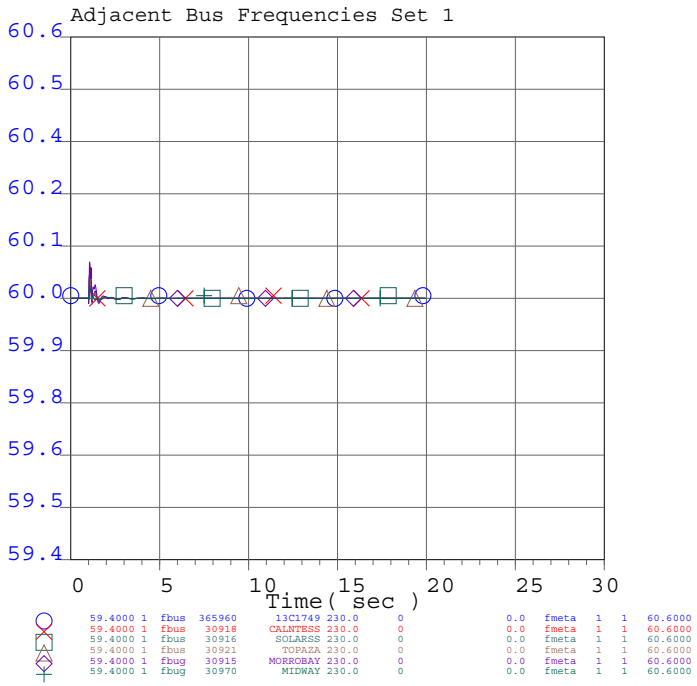

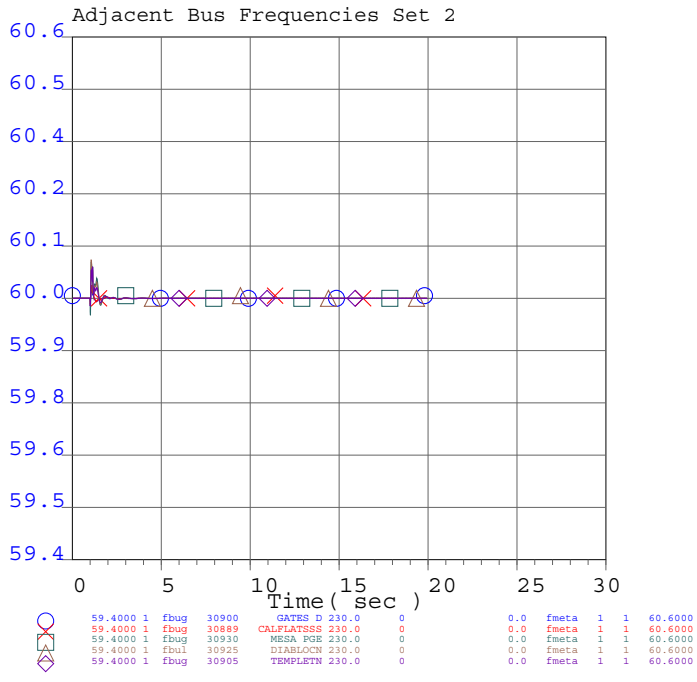

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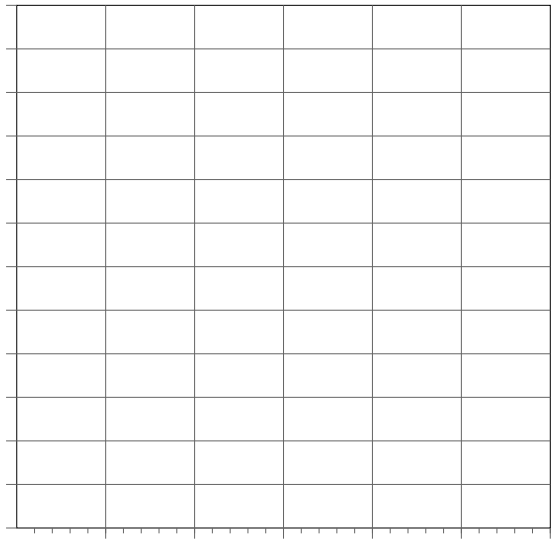
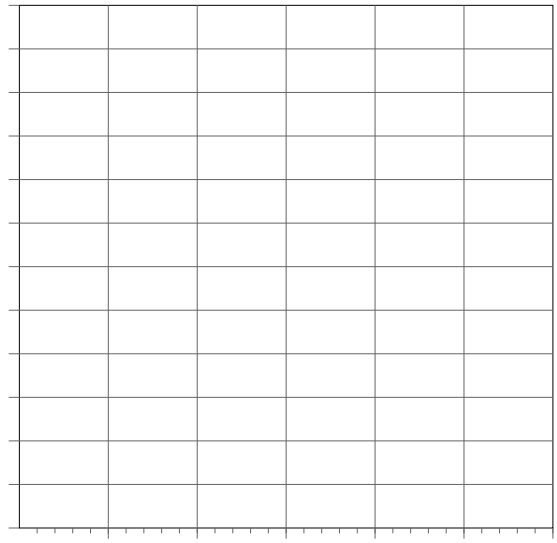
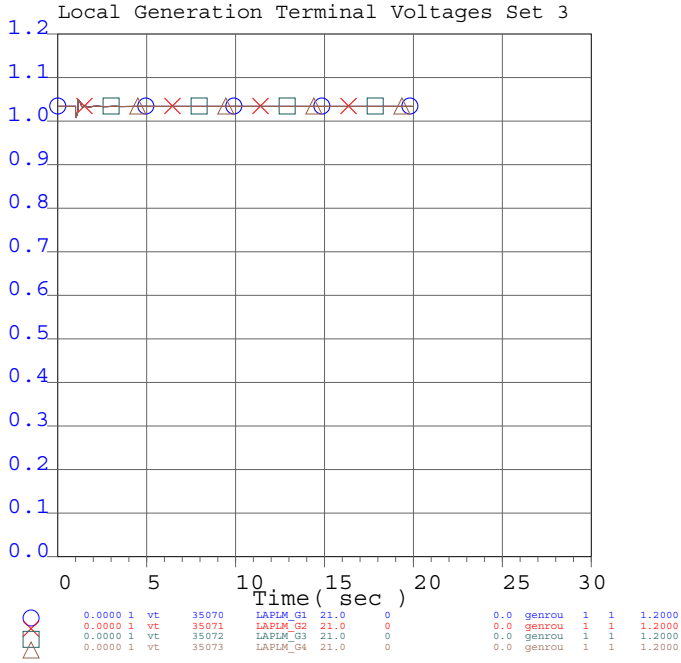
Local Generation Terminal Voltages Set 1



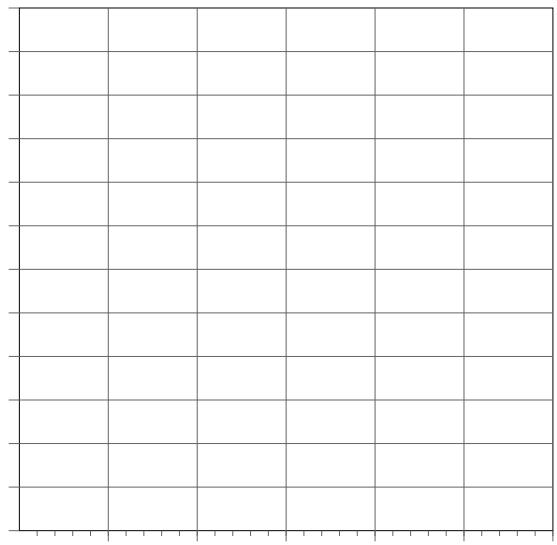
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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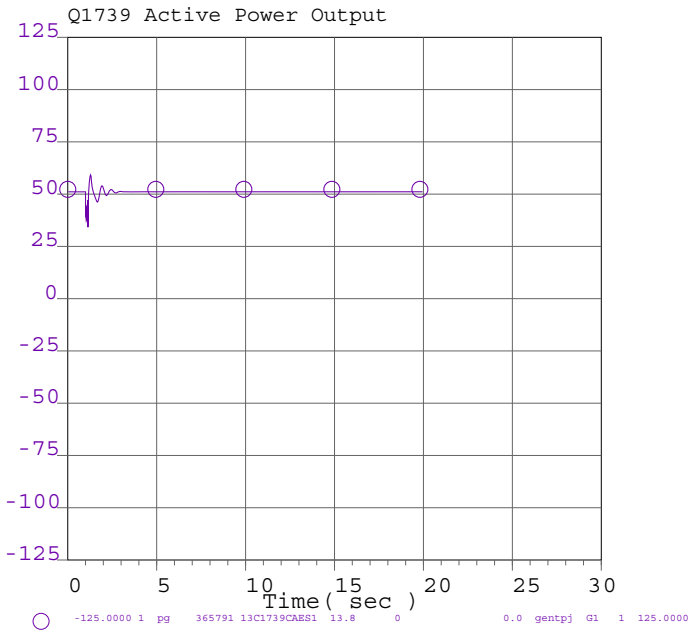
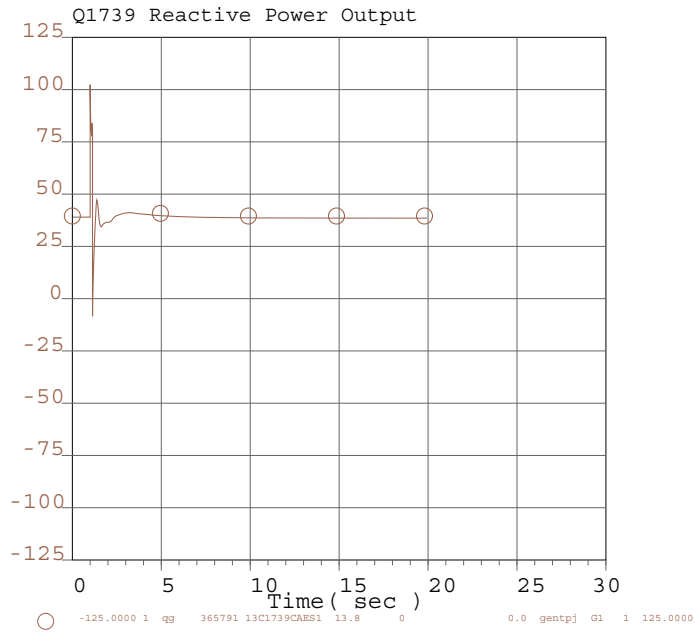
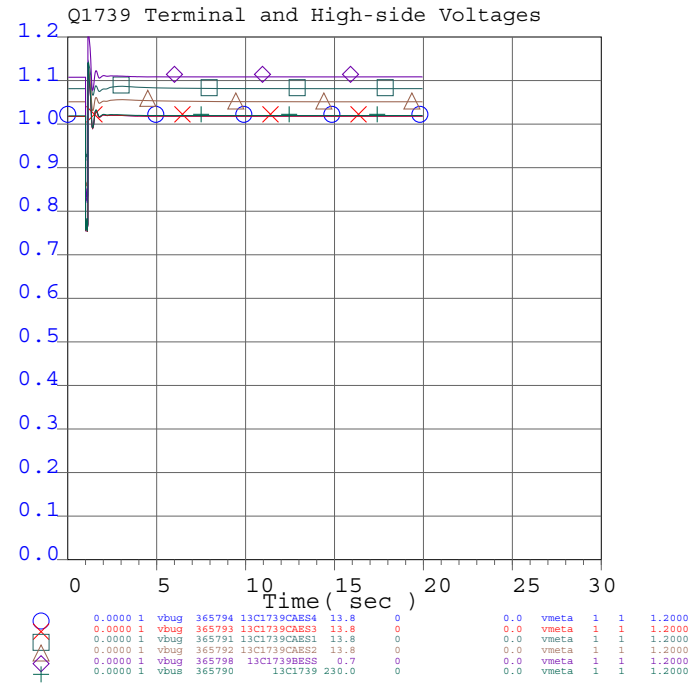
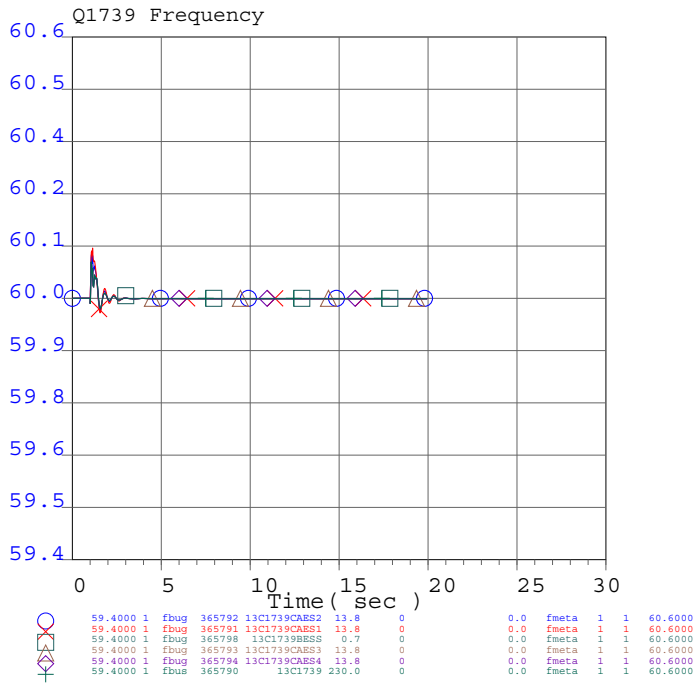
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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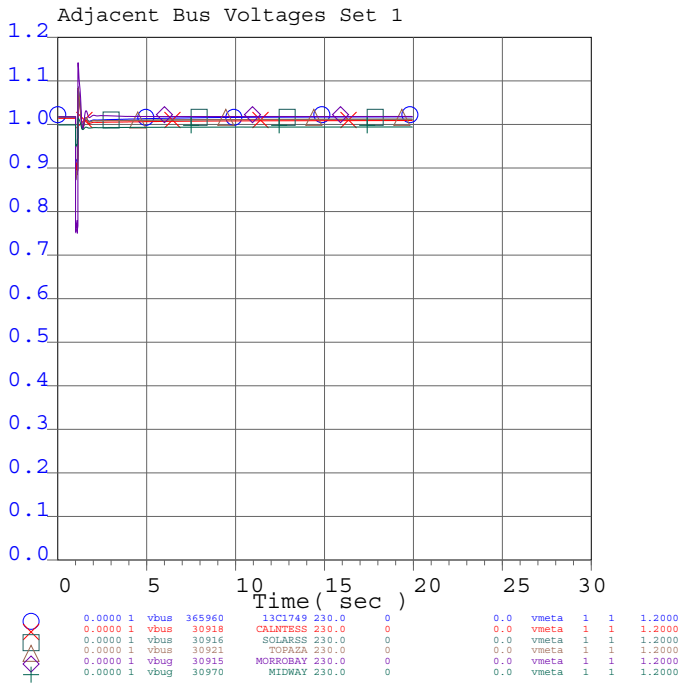

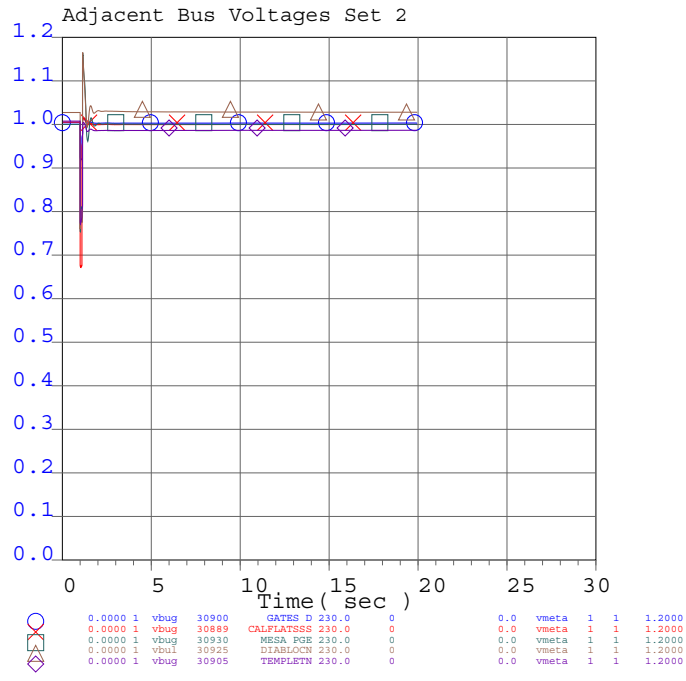

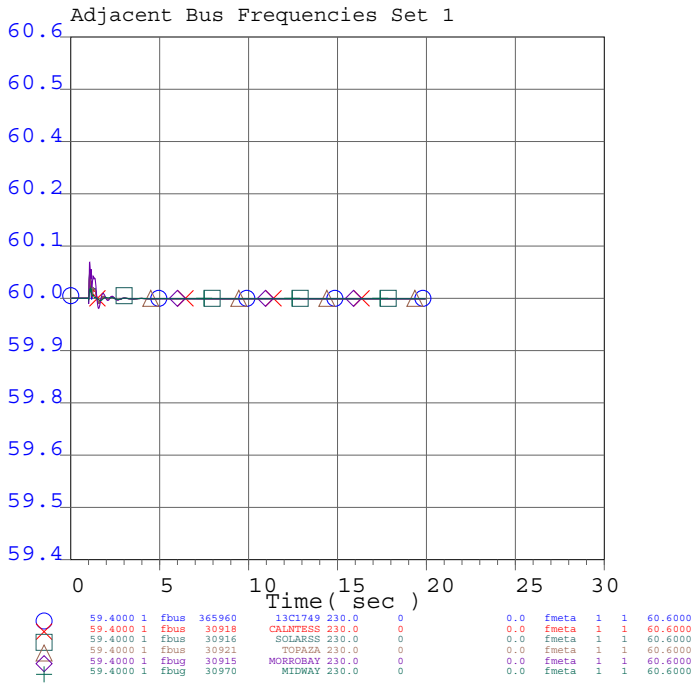

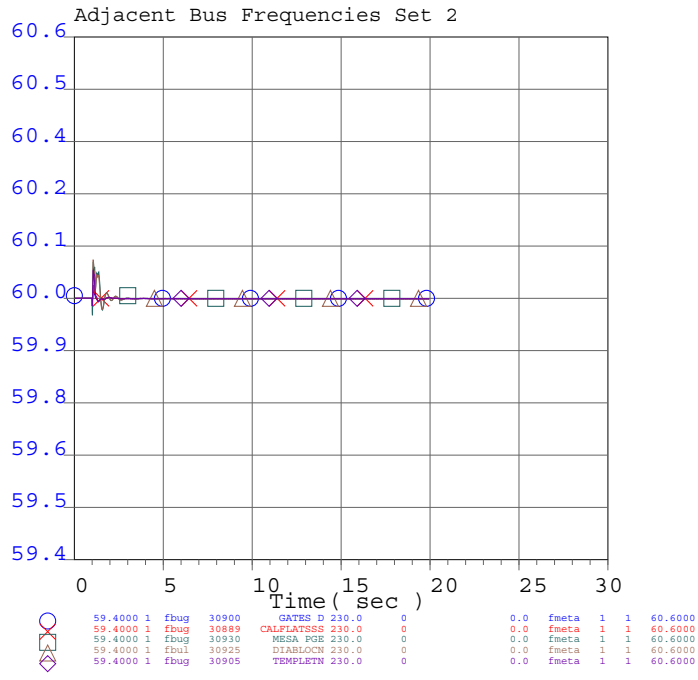

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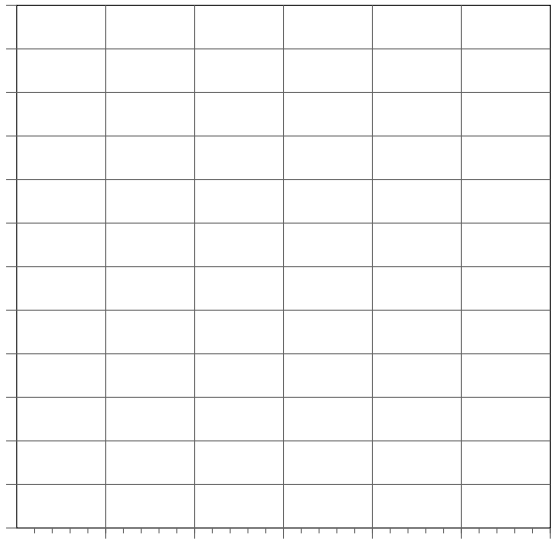
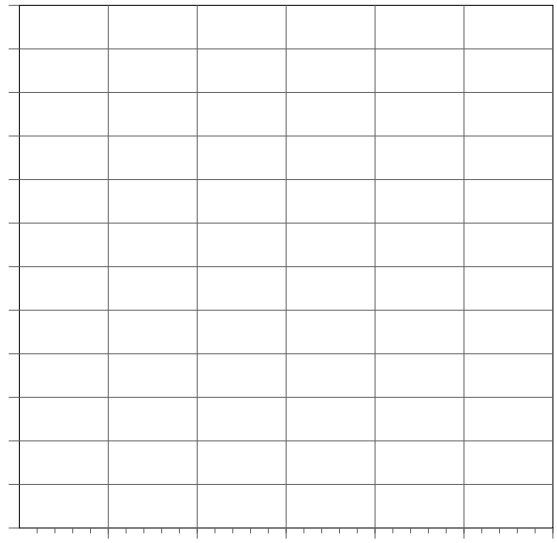
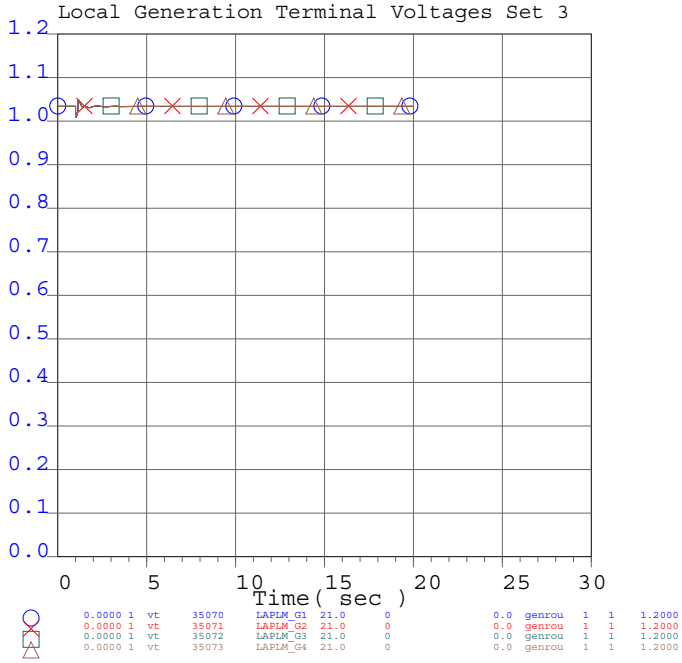
Local Generation Terminal Voltages Set 1



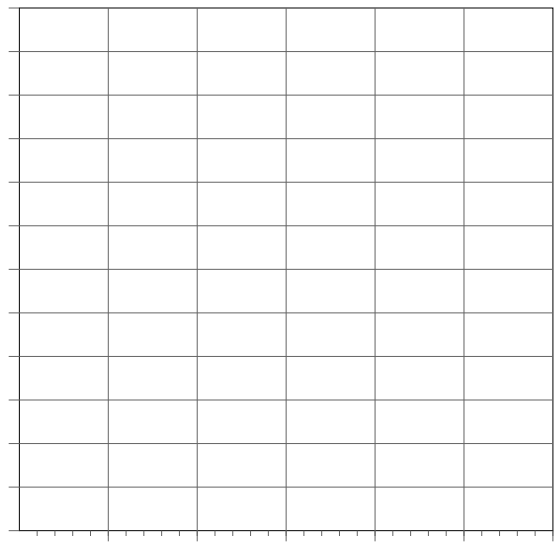
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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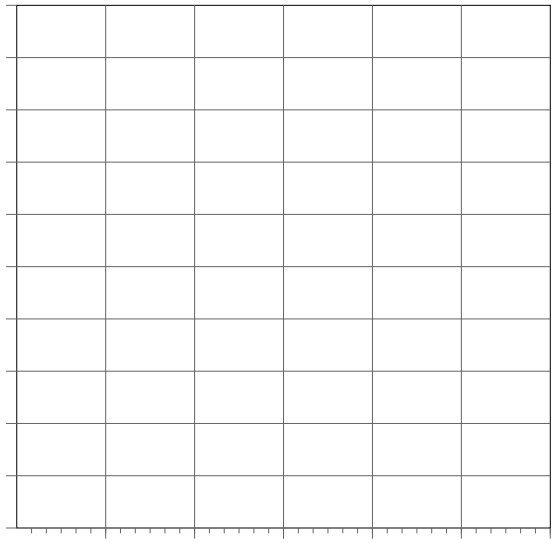
Local Generation Relative Rotor Angles Set 1



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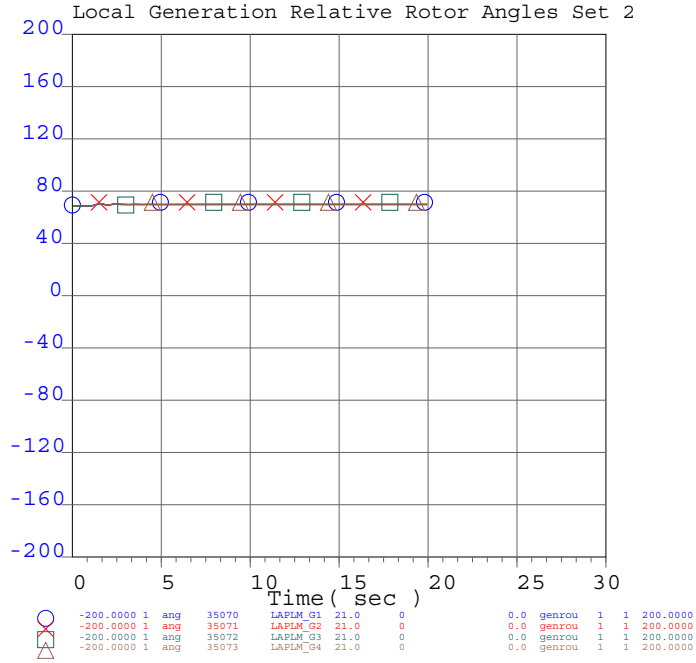
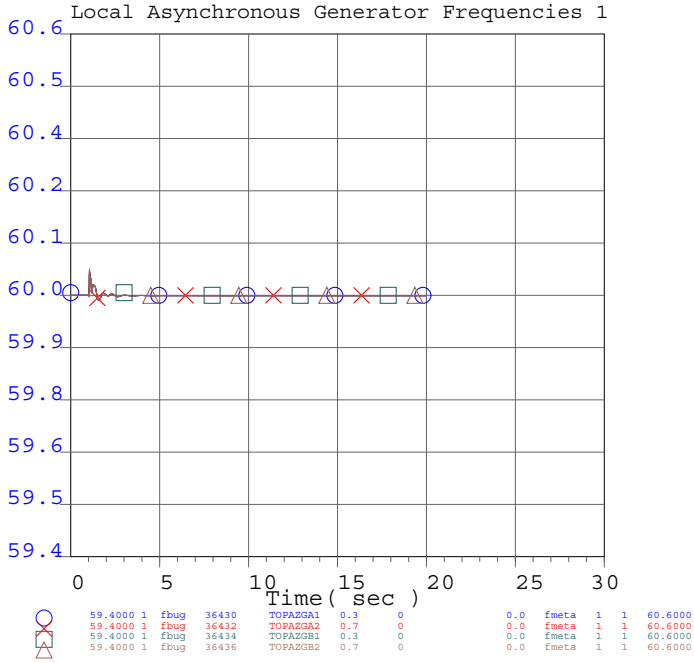
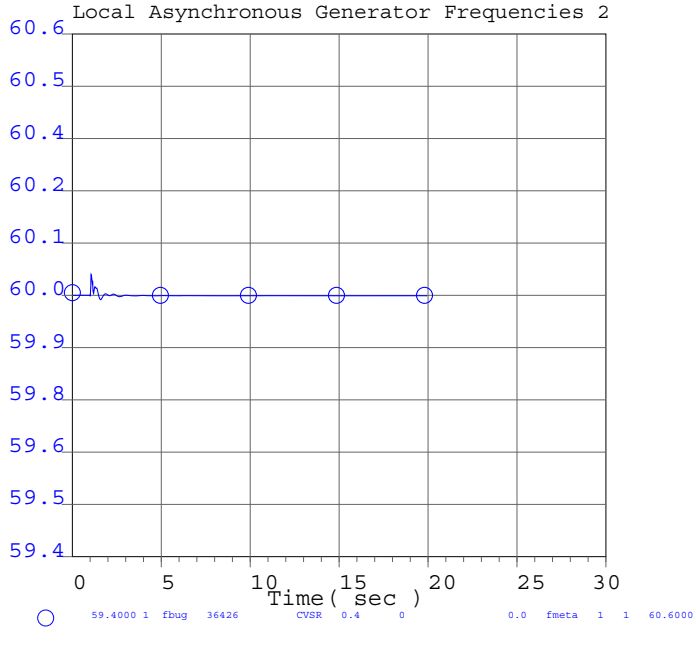


Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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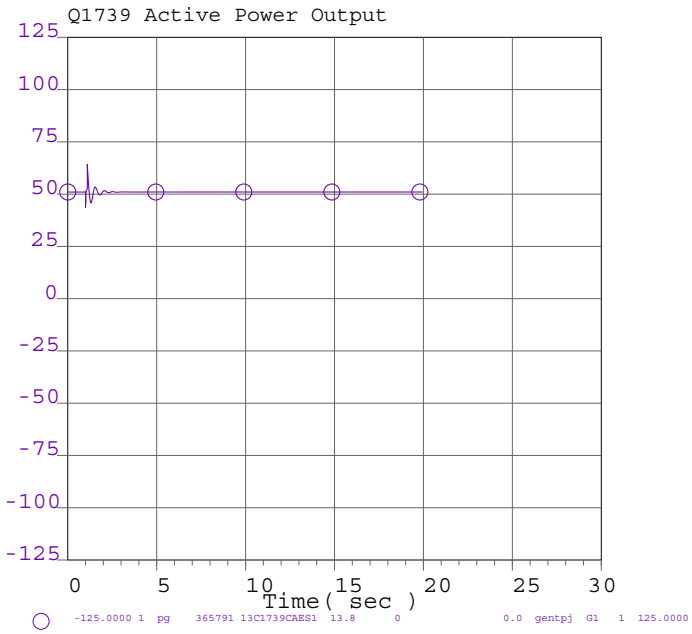
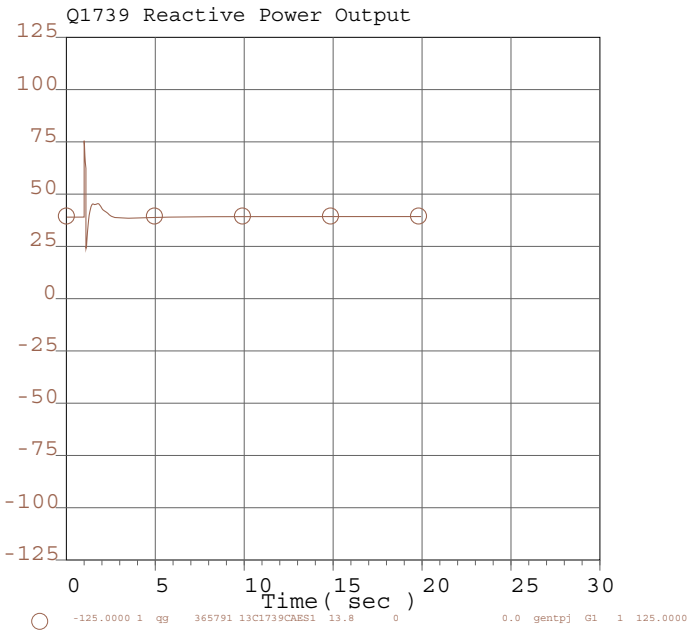
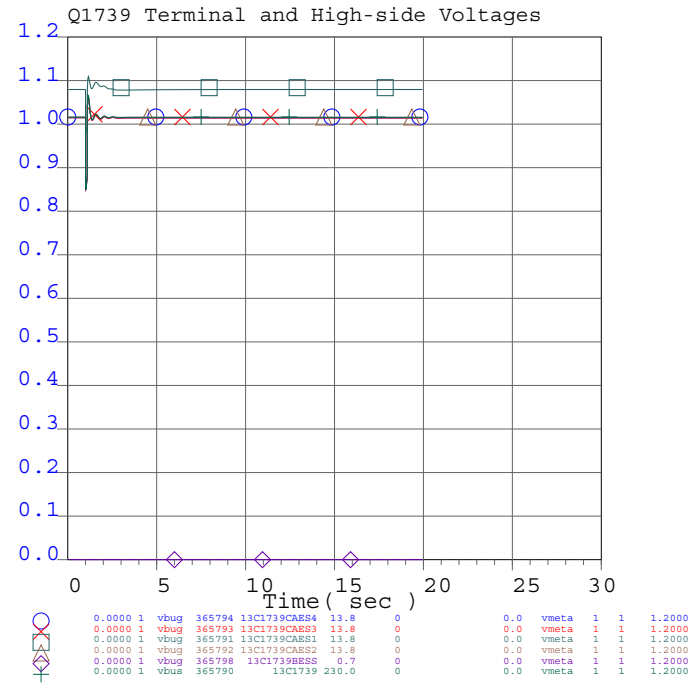
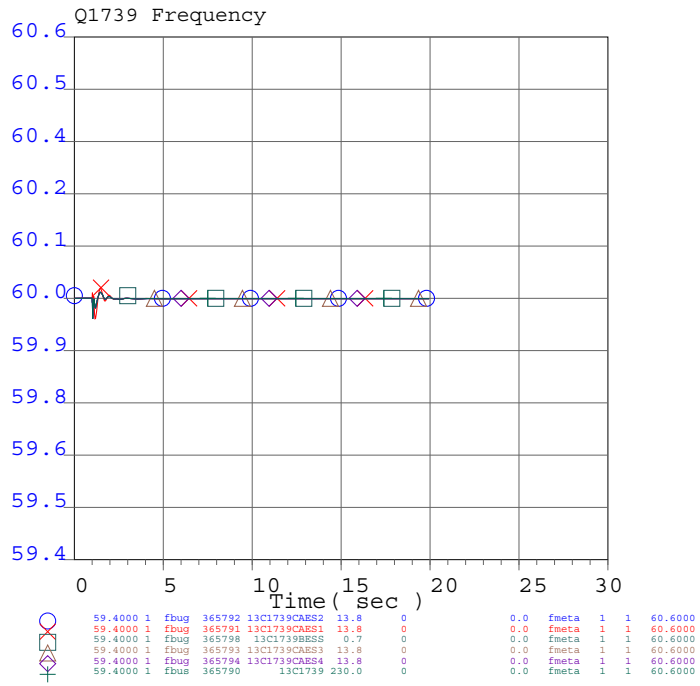
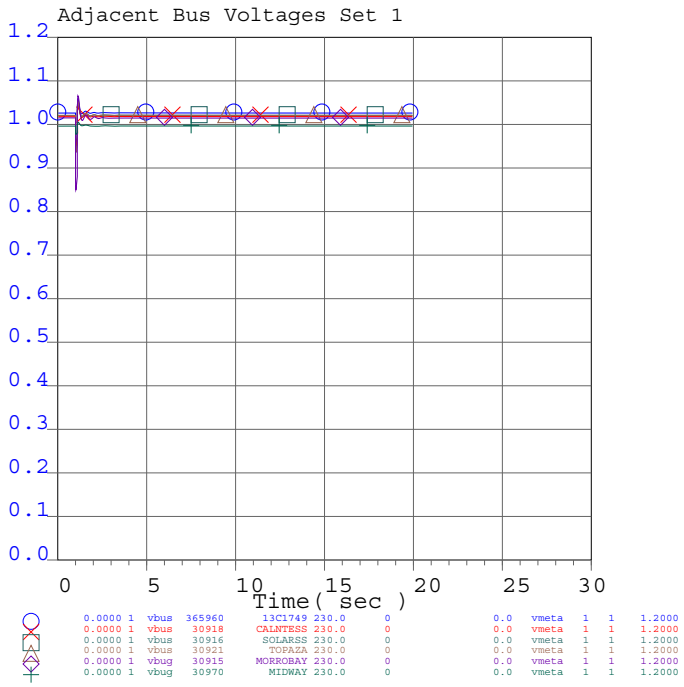


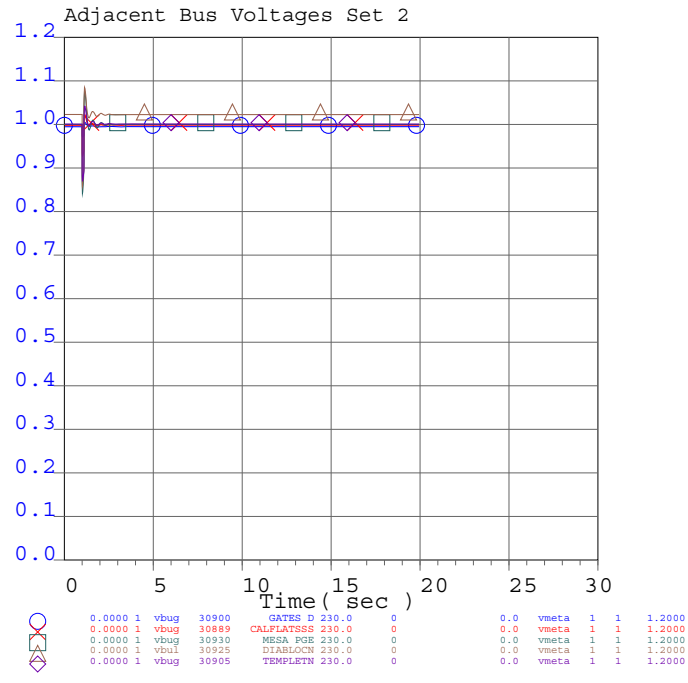


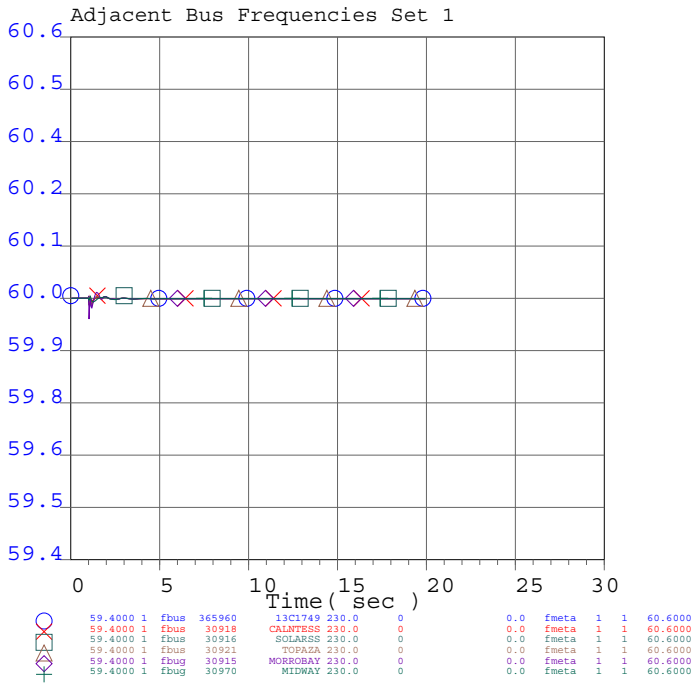


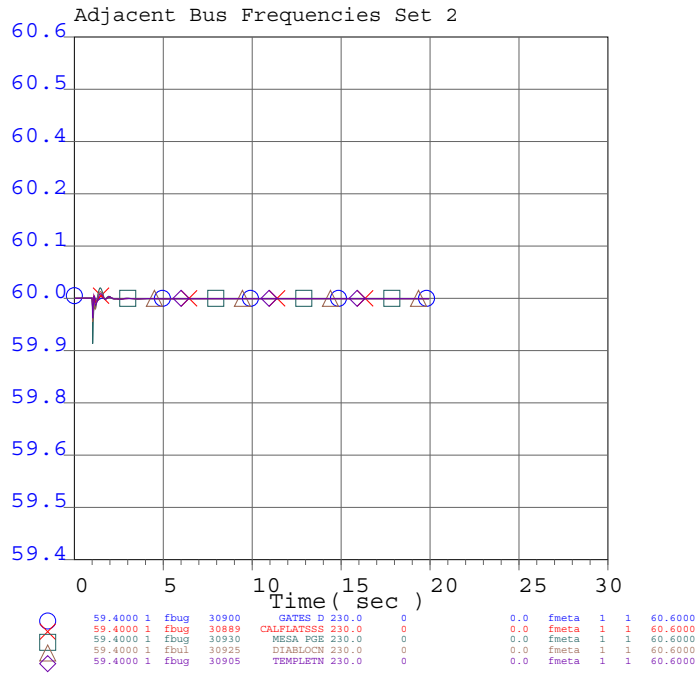


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



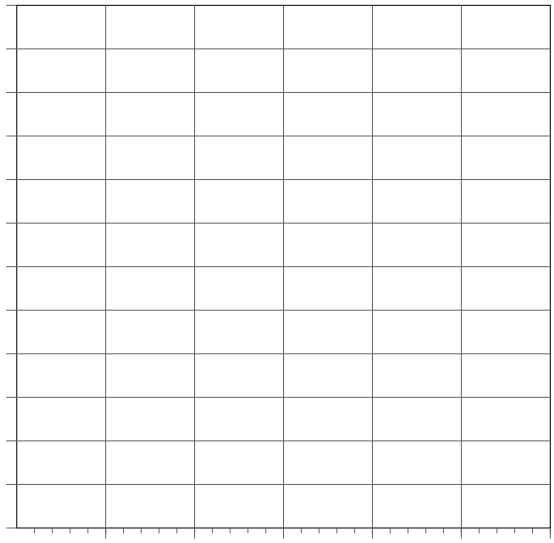




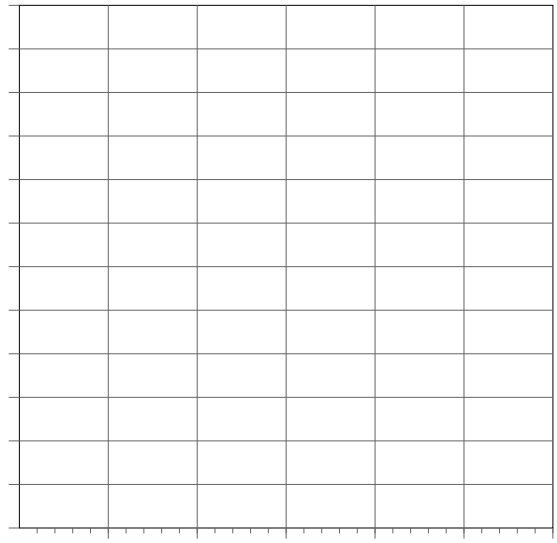


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

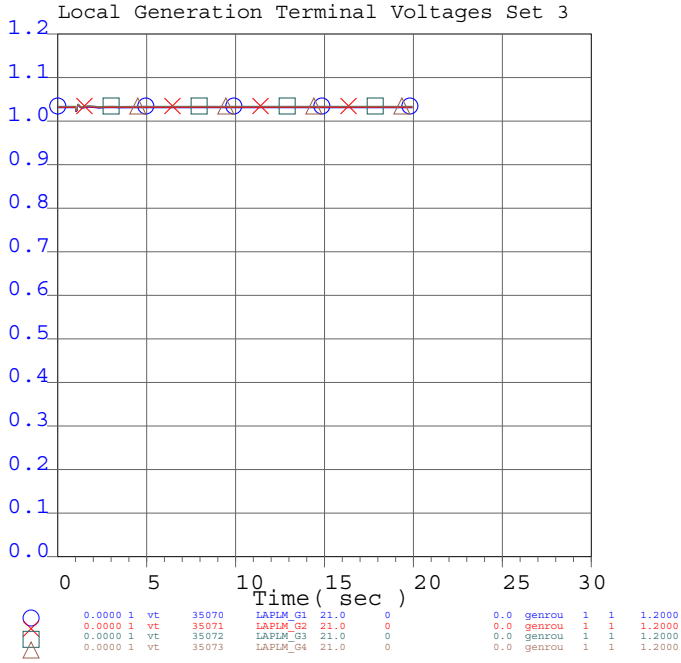
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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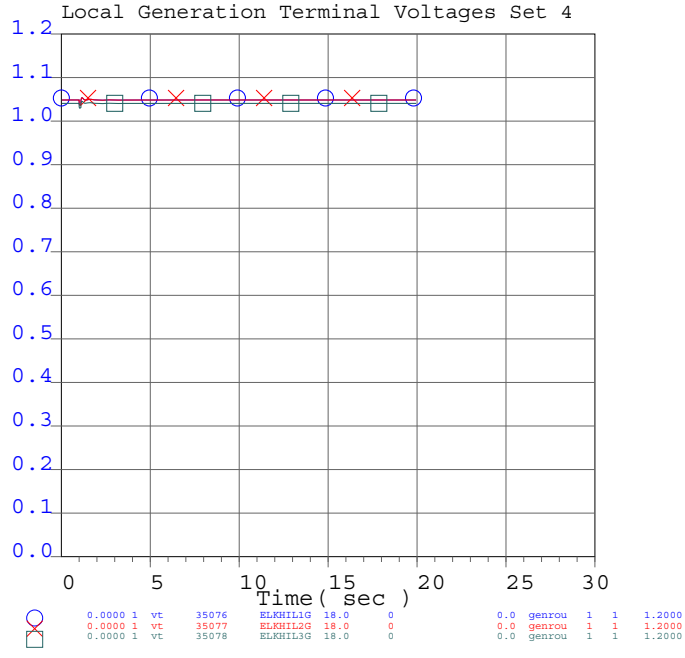
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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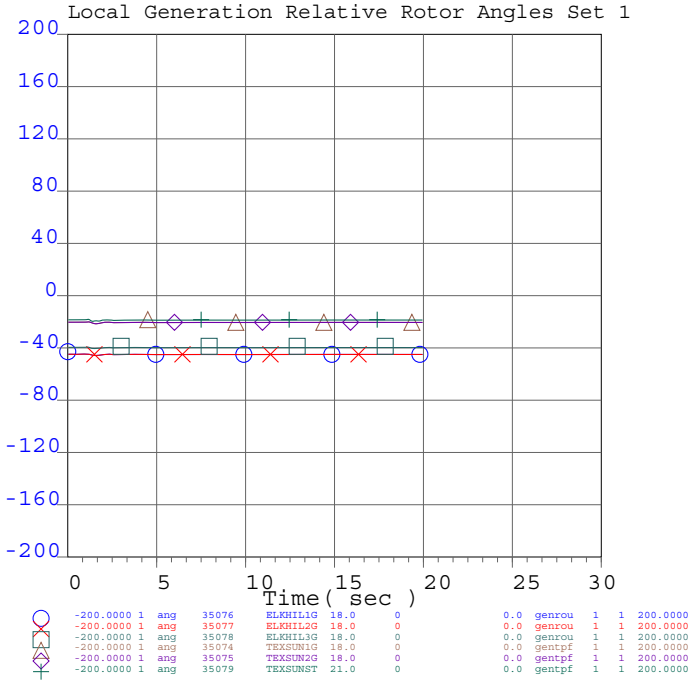
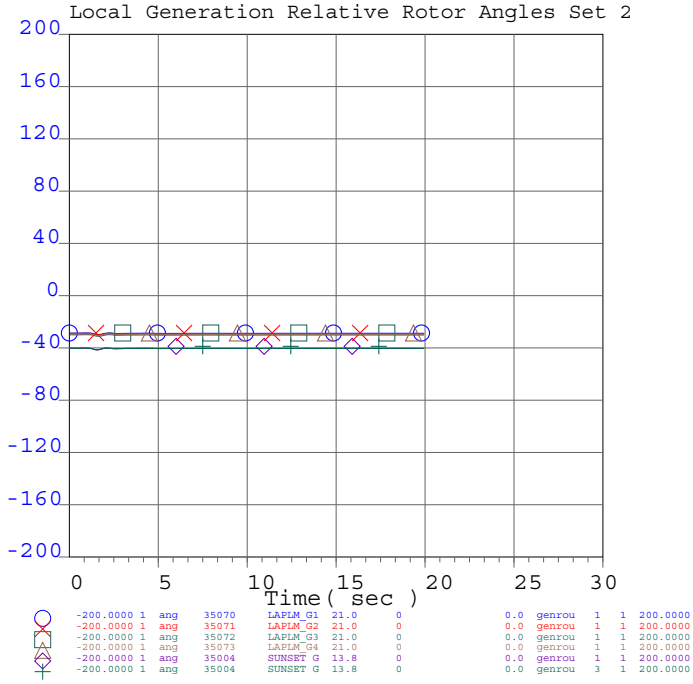
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

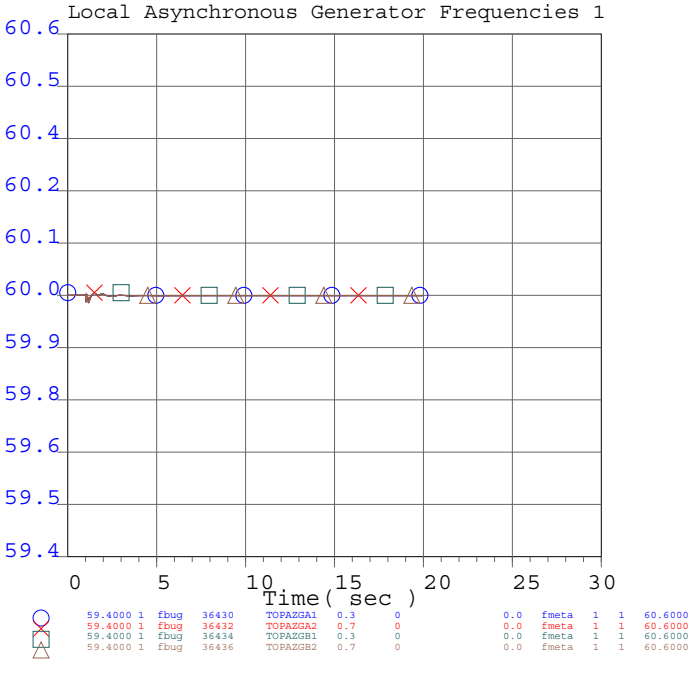
Local Generation Relative Rotor Angles Set 1



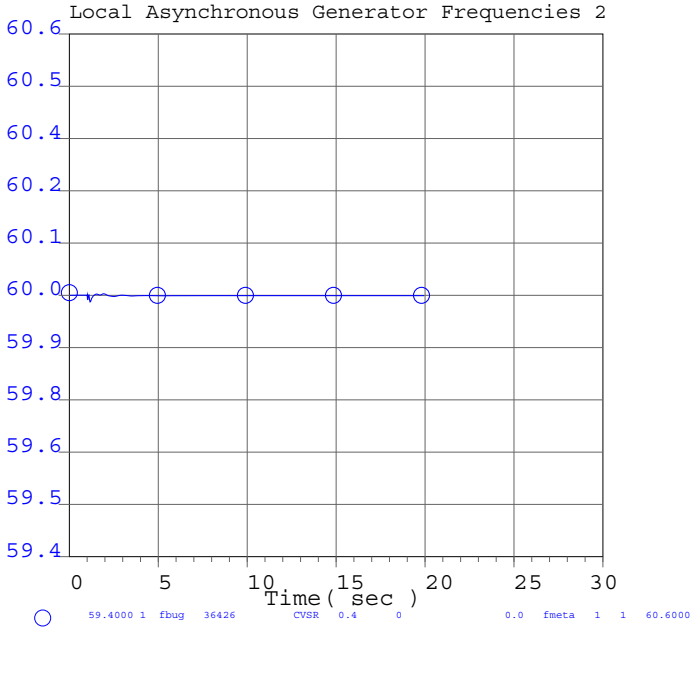
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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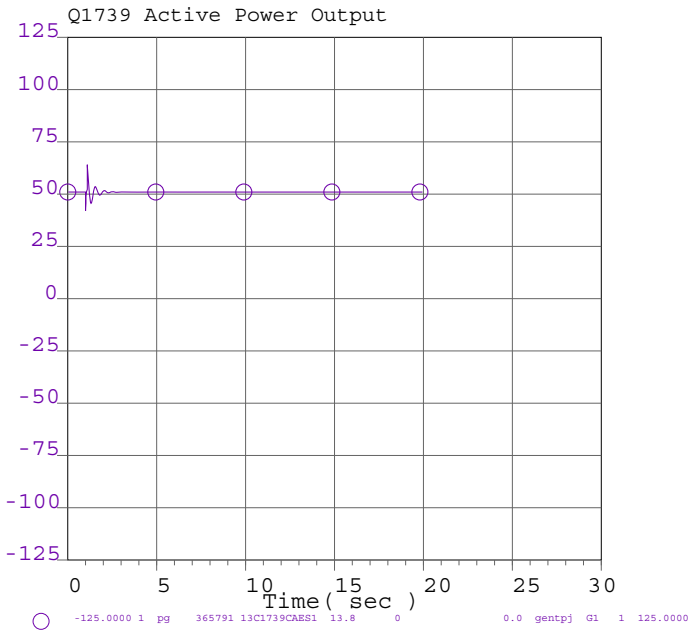
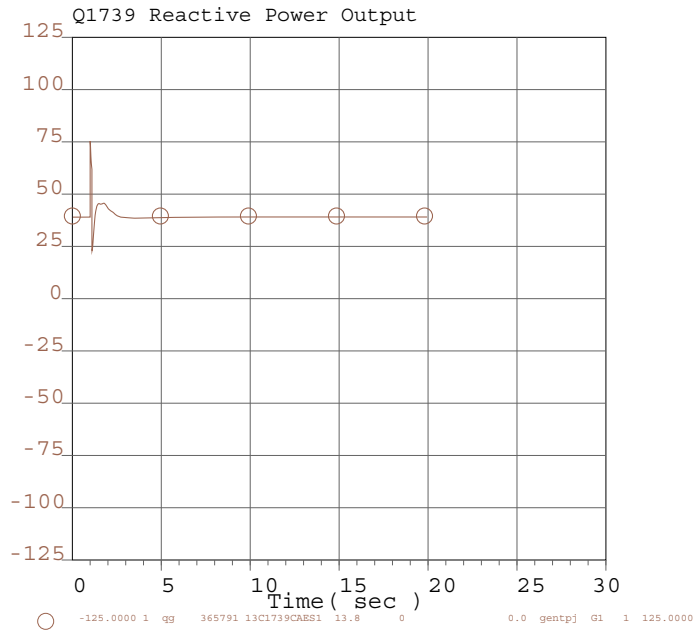
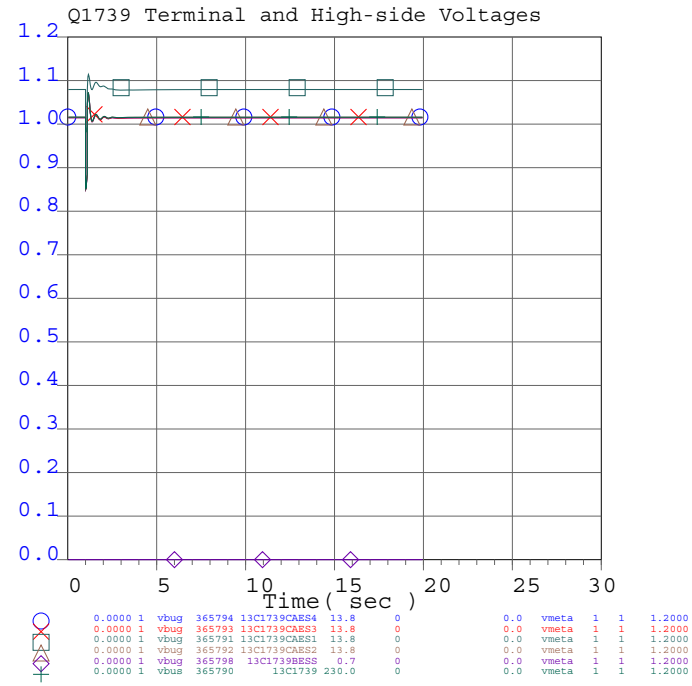
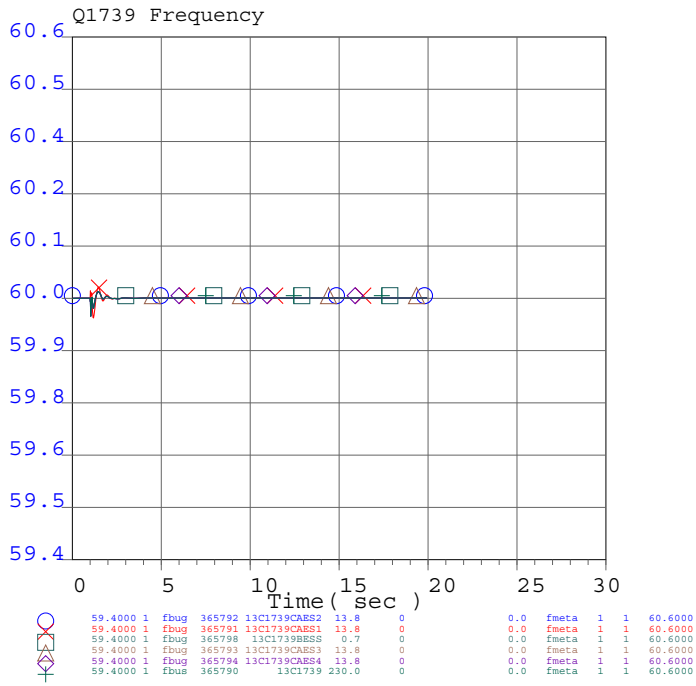
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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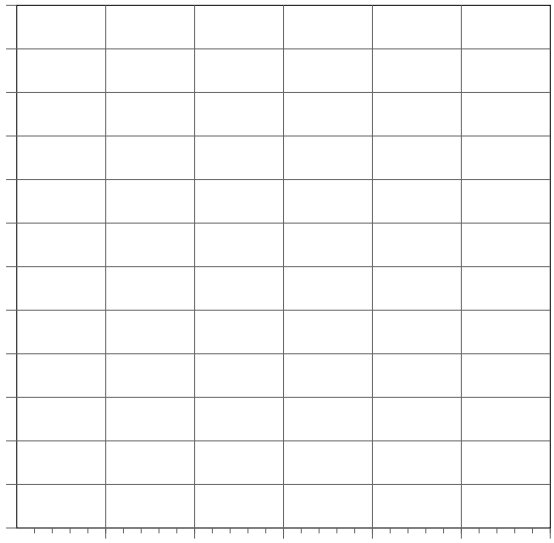
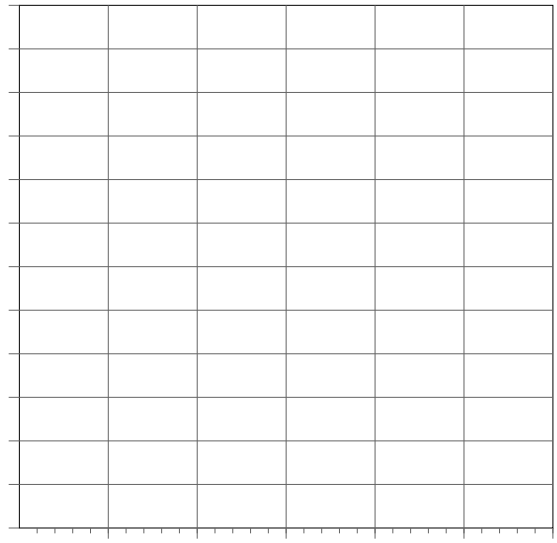
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

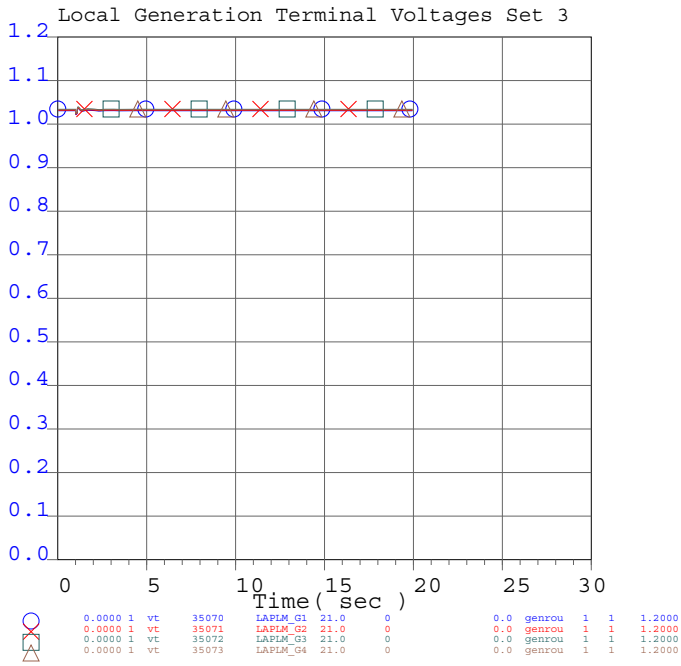
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
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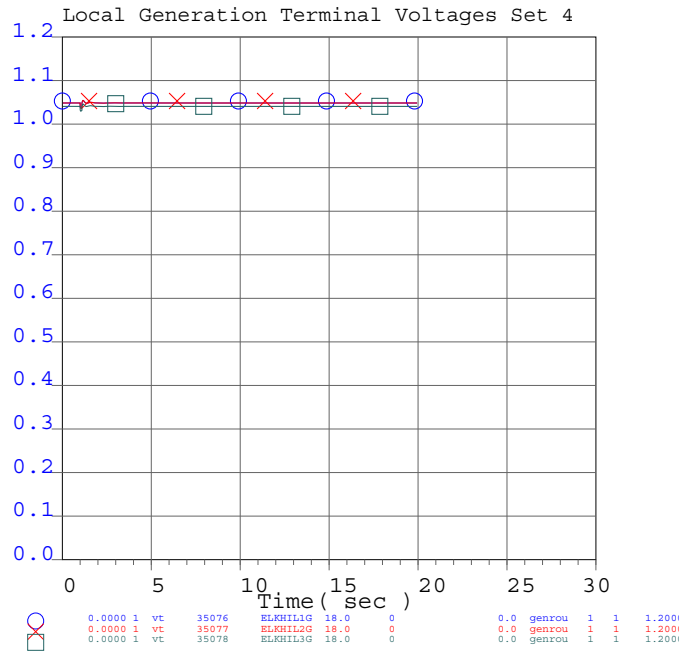
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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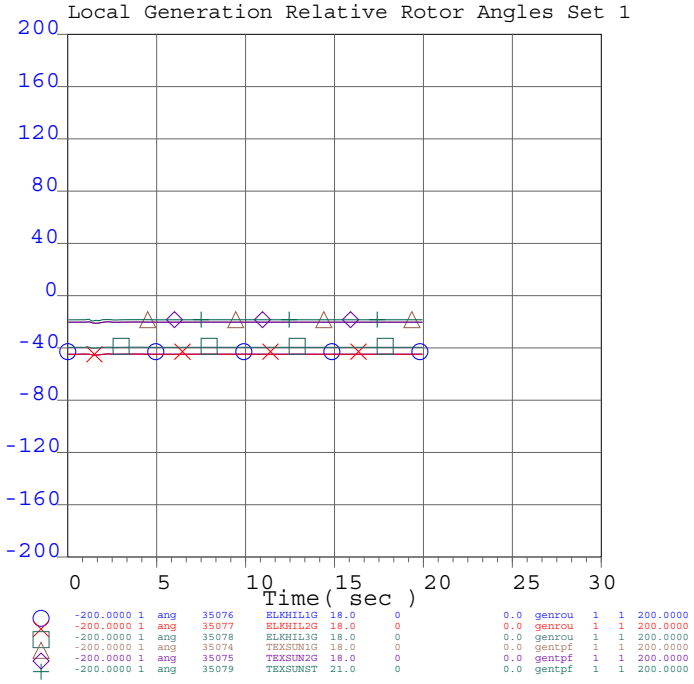
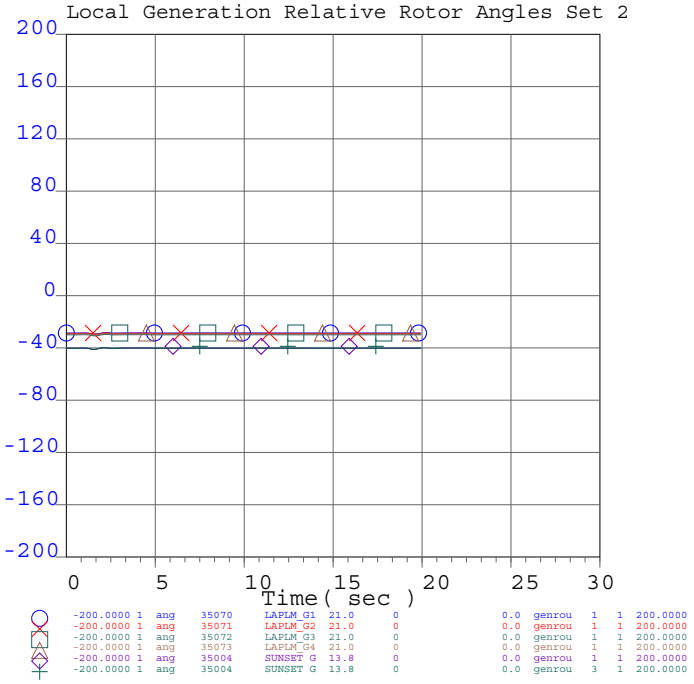
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

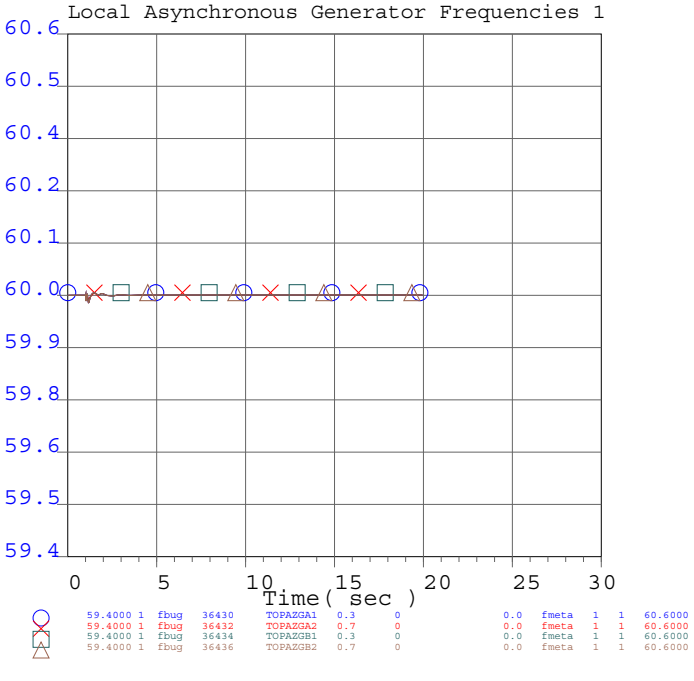
Local Generation Relative Rotor Angles Set 1



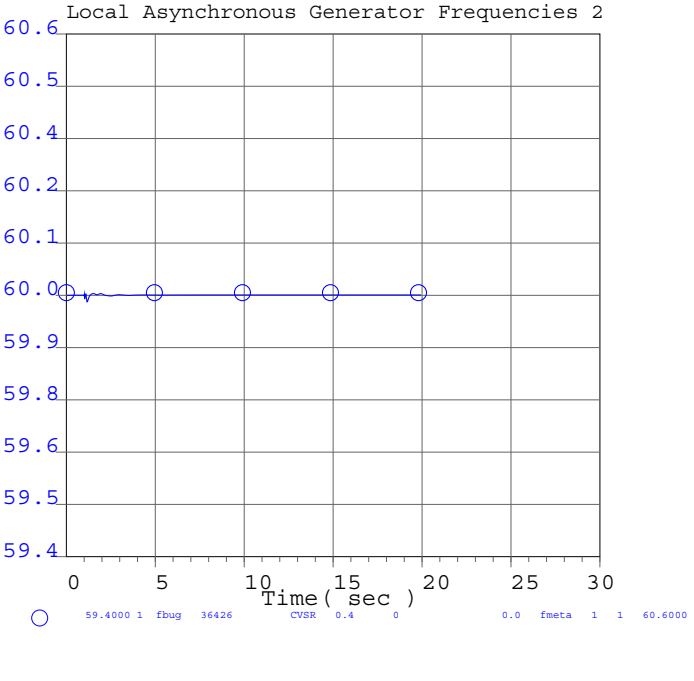
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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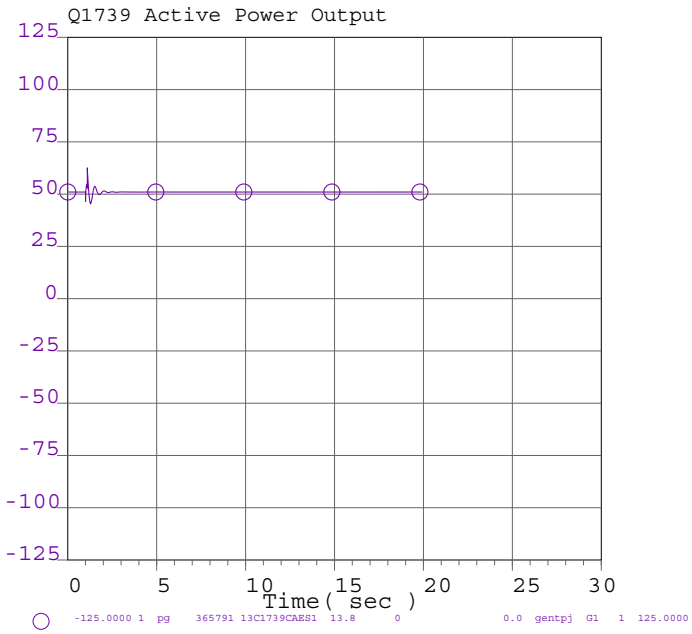
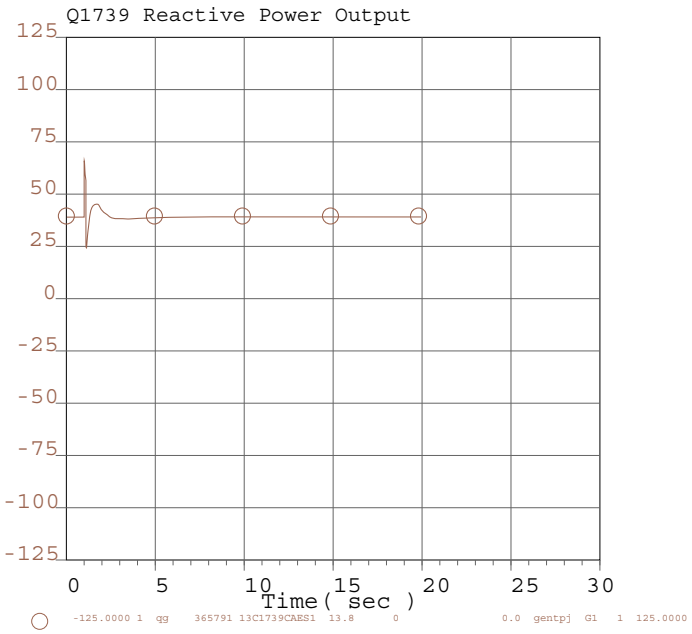
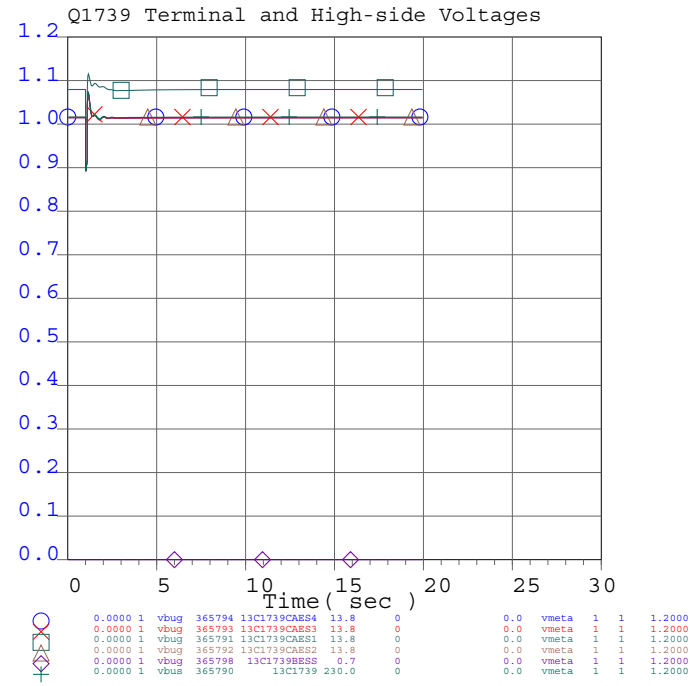
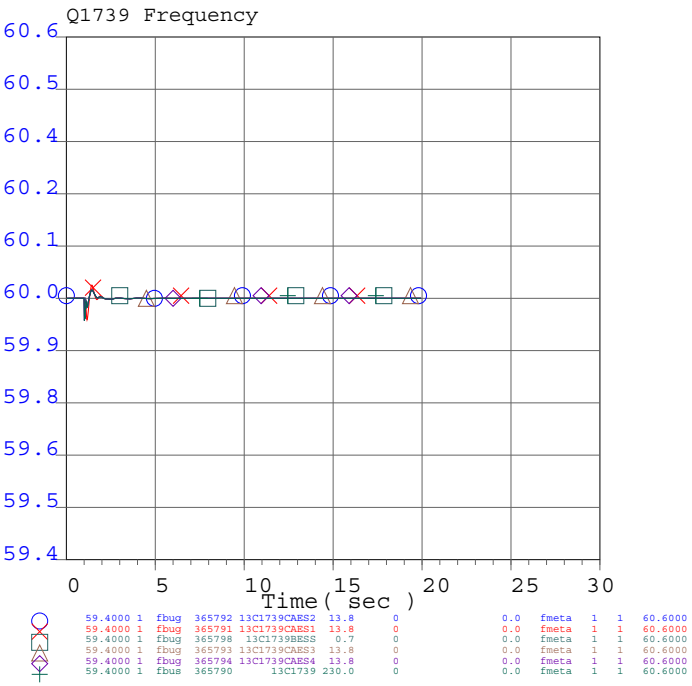
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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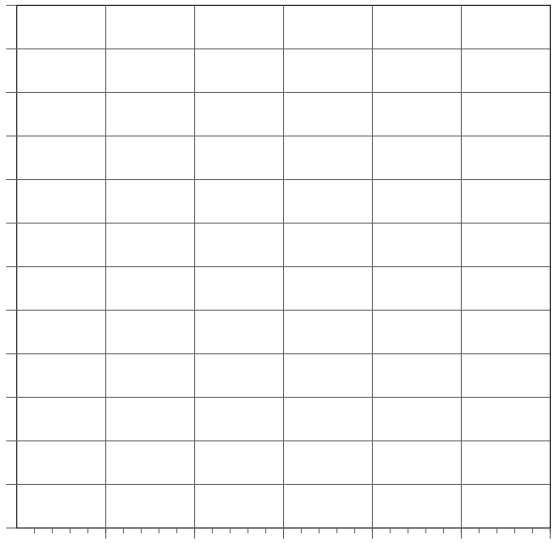
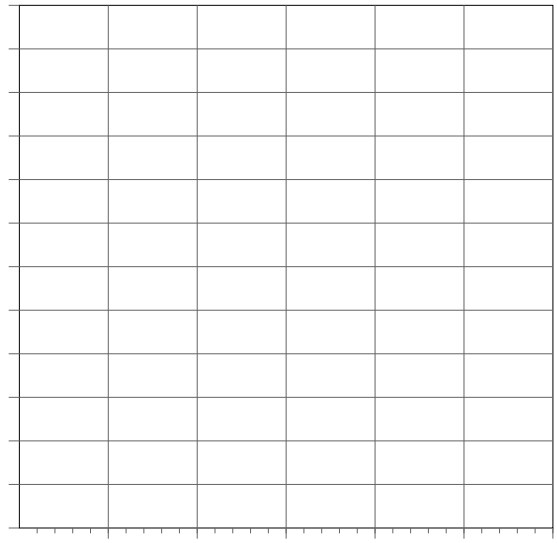
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

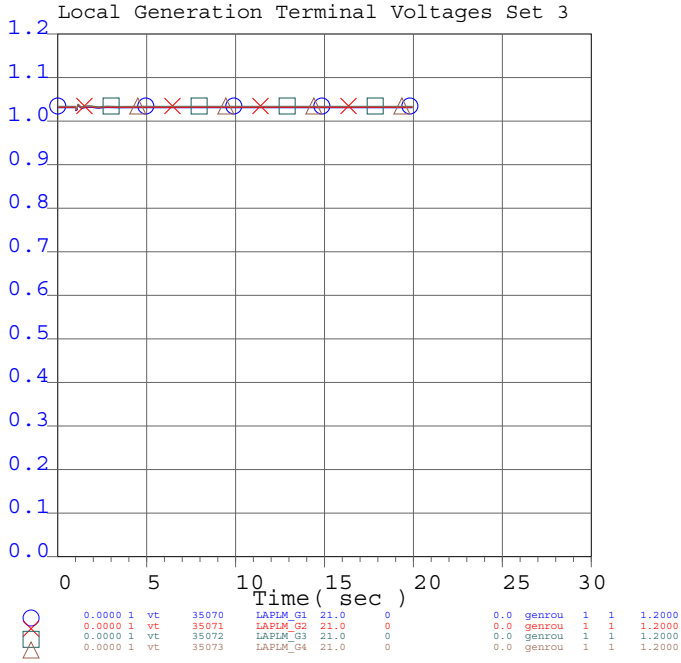
Local Generation Terminal Voltages Set 1



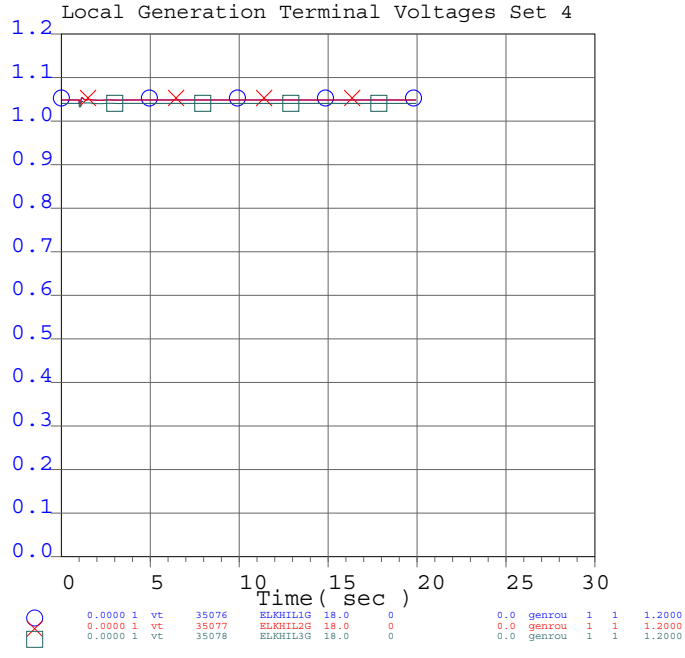
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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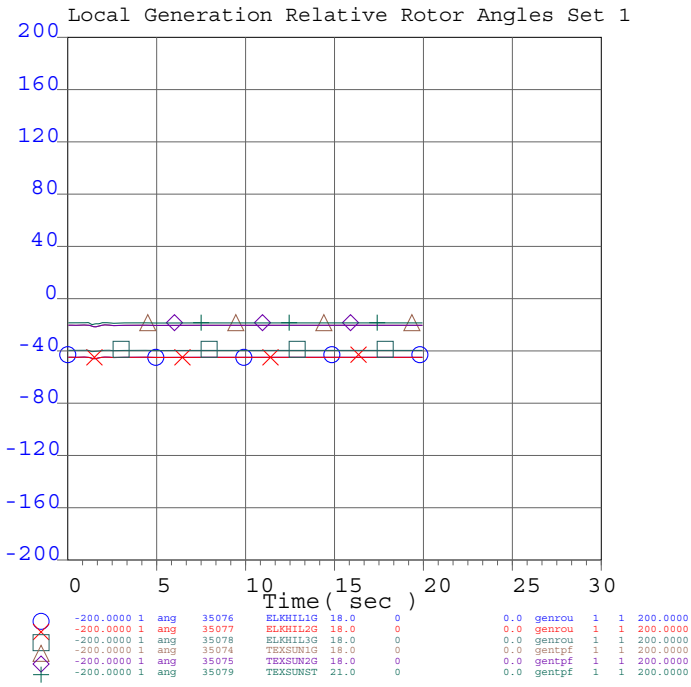

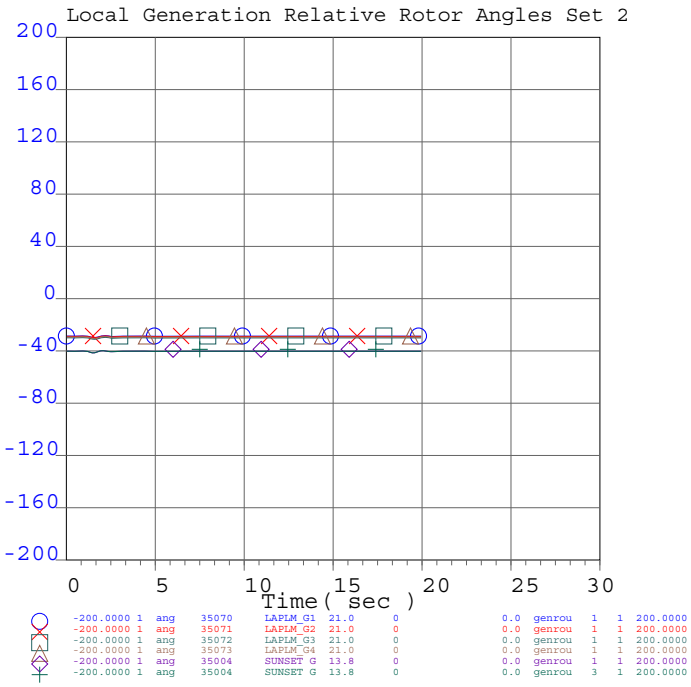

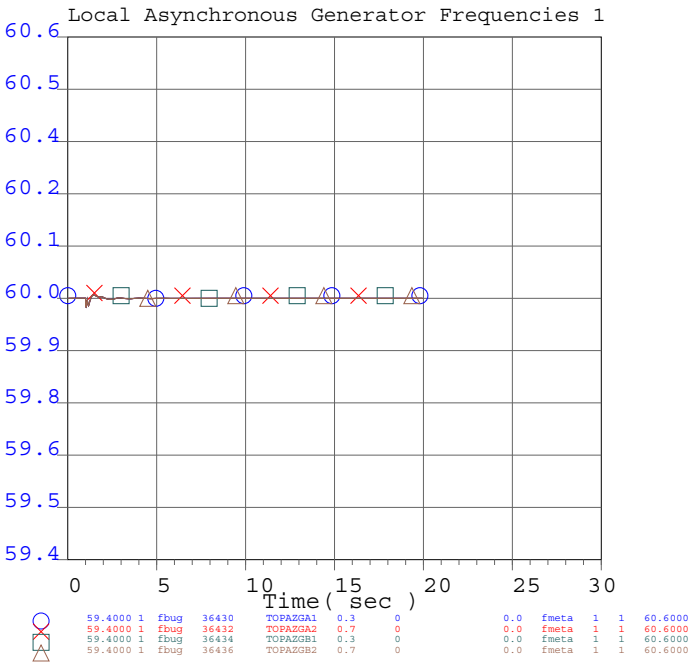

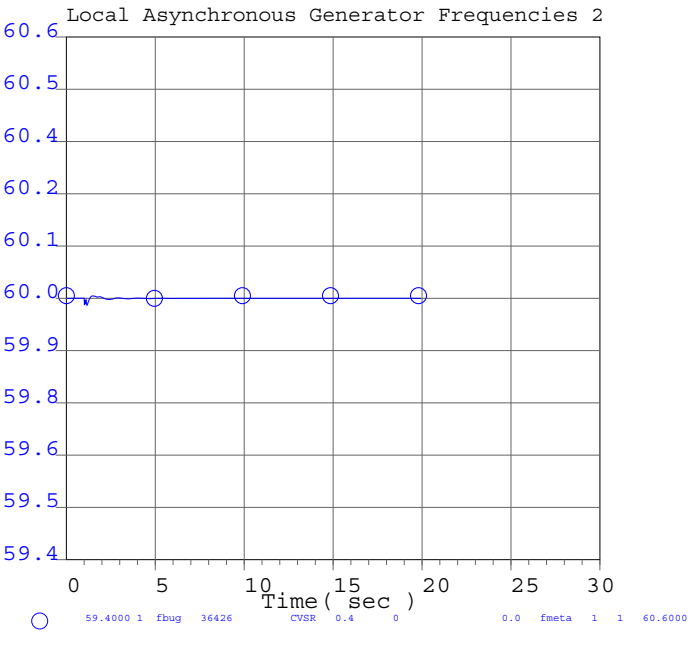

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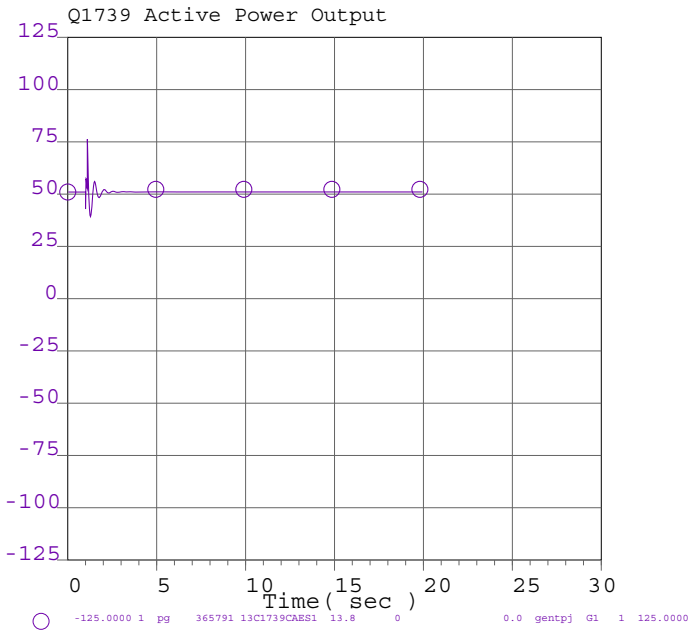
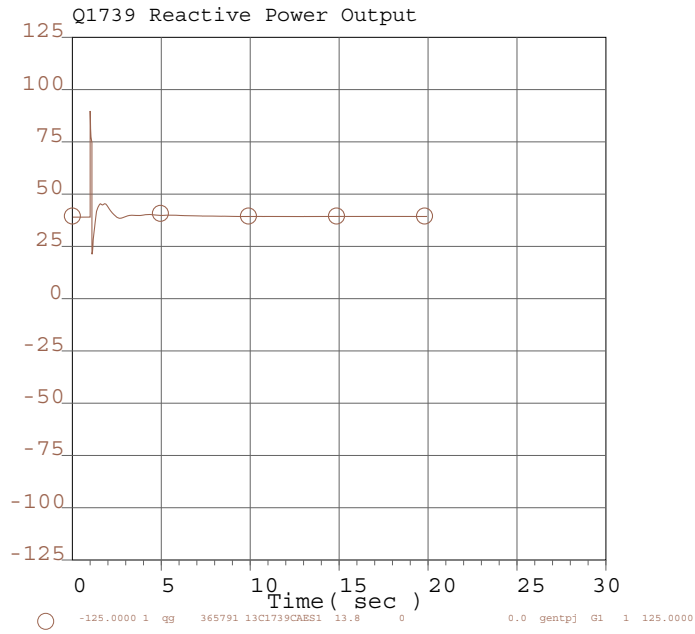
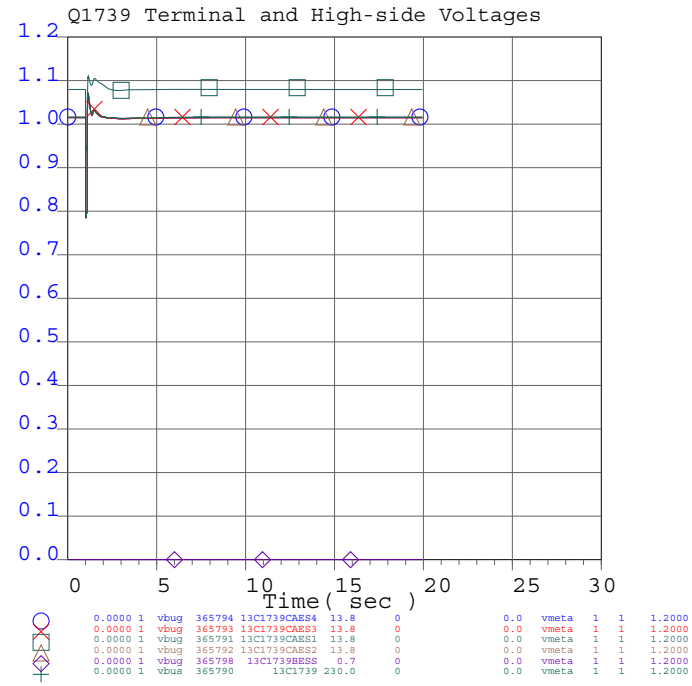
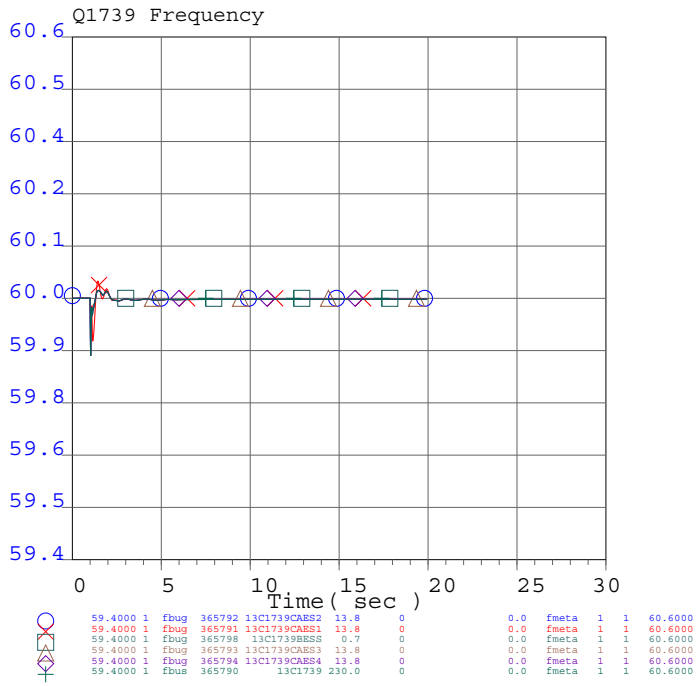
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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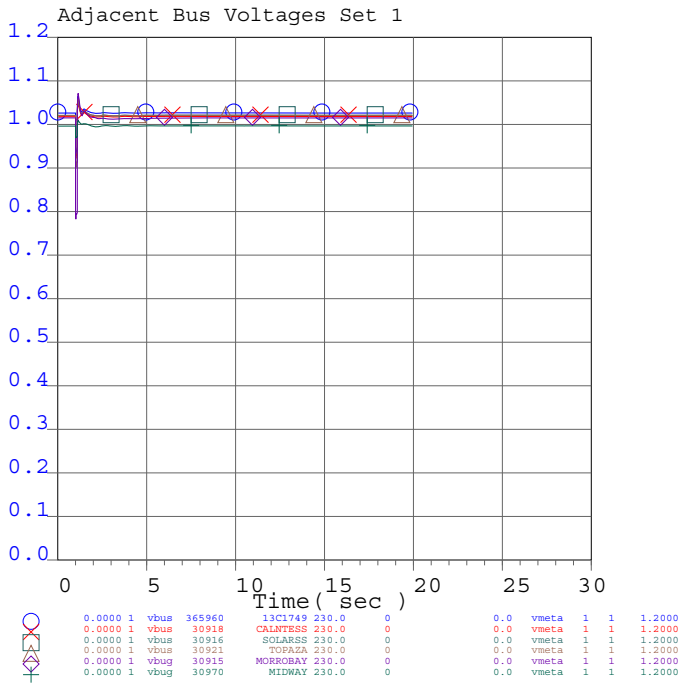
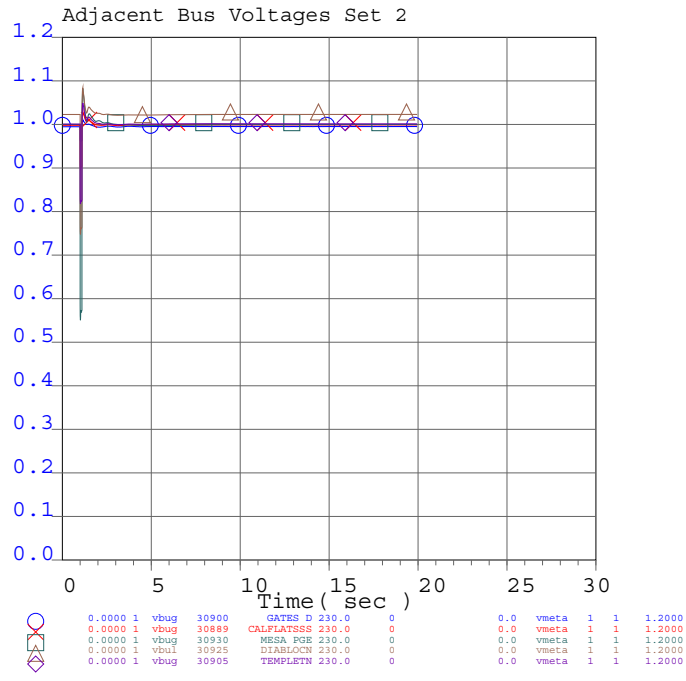
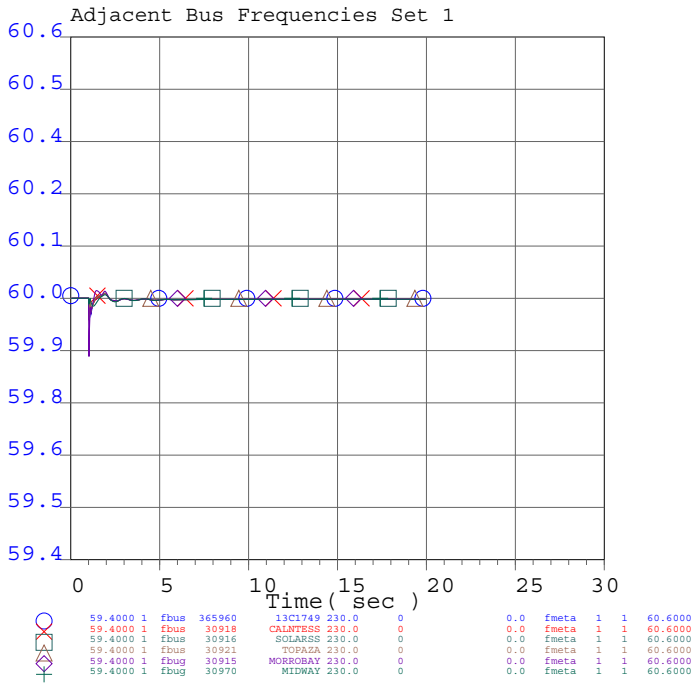
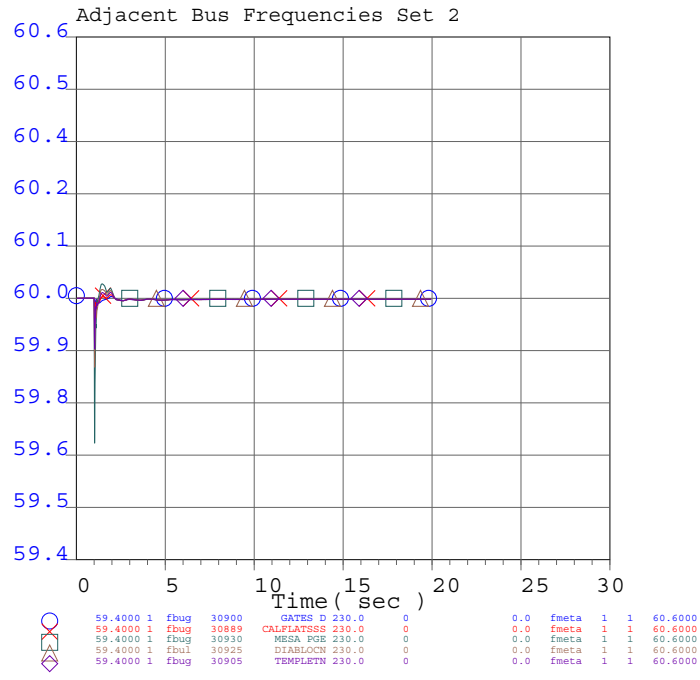
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



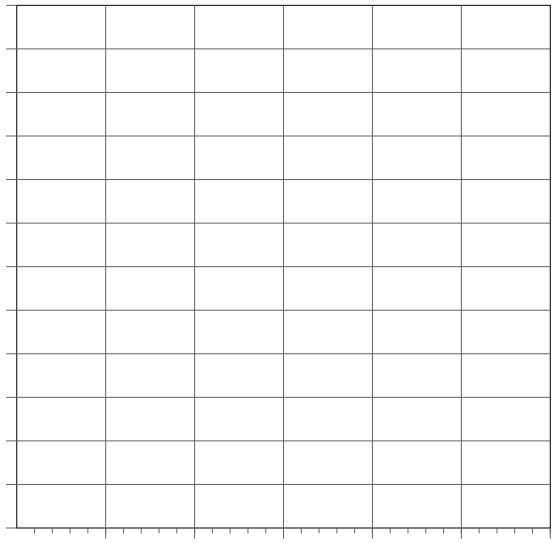




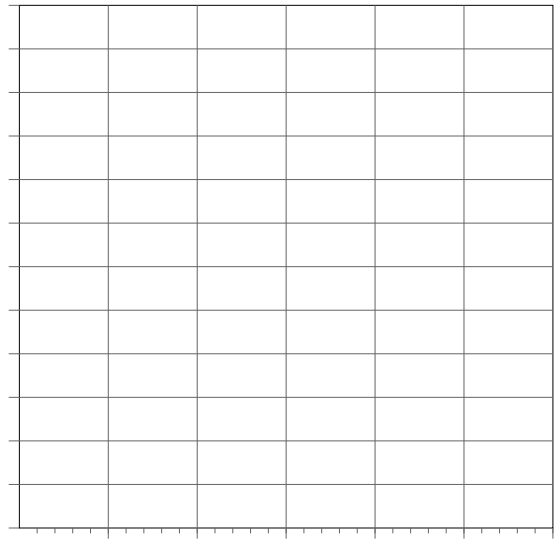


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

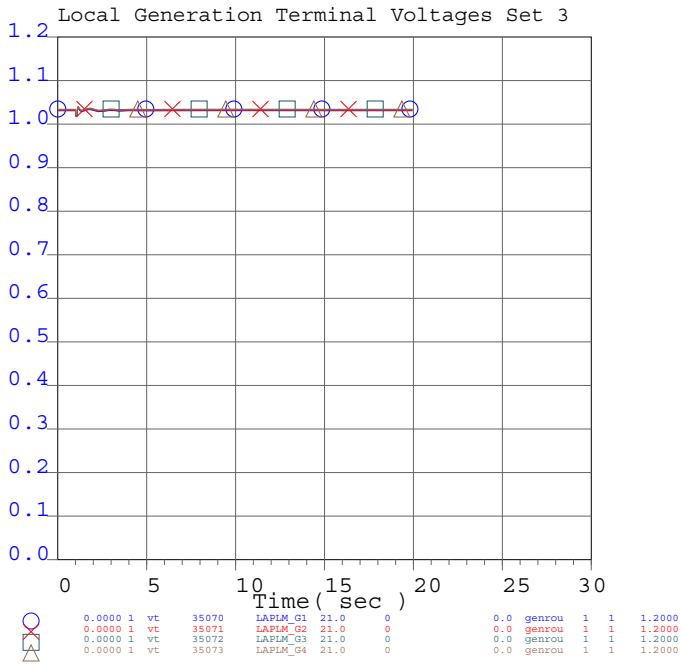
Local Generation Terminal Voltages Set 1



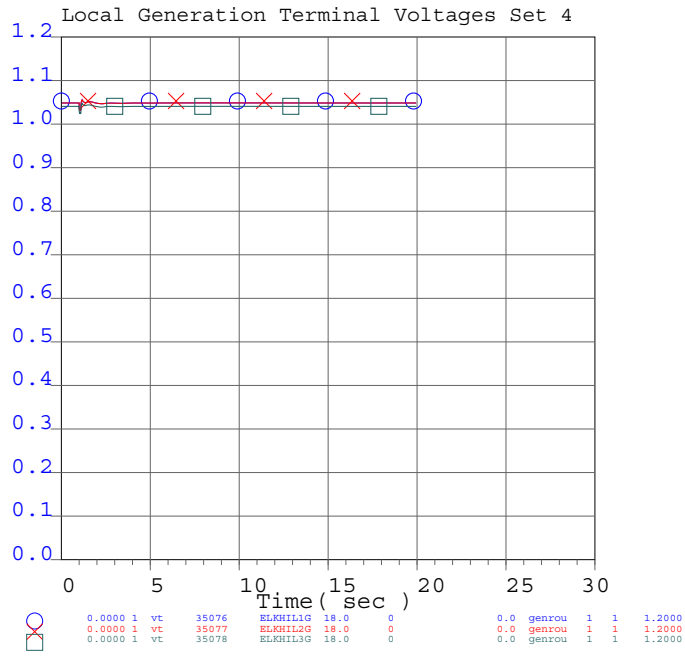
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

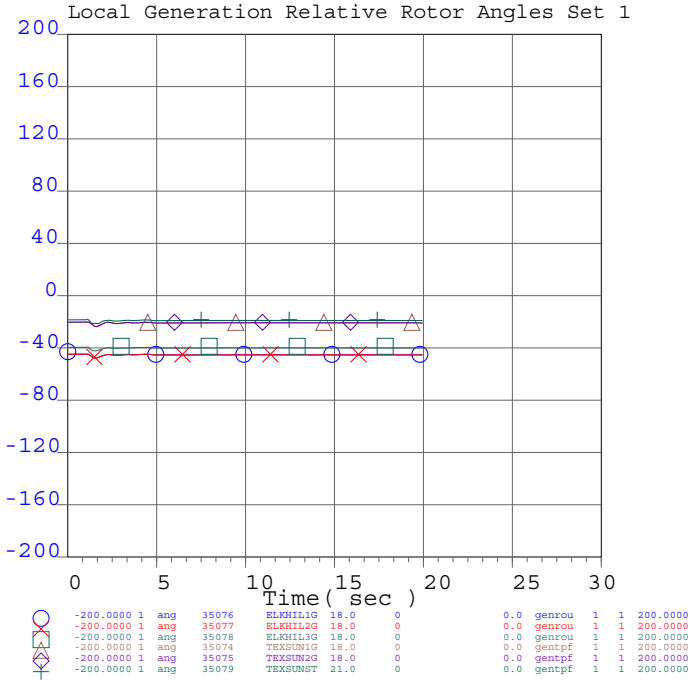


Local Generation Terminal Voltages Set 4



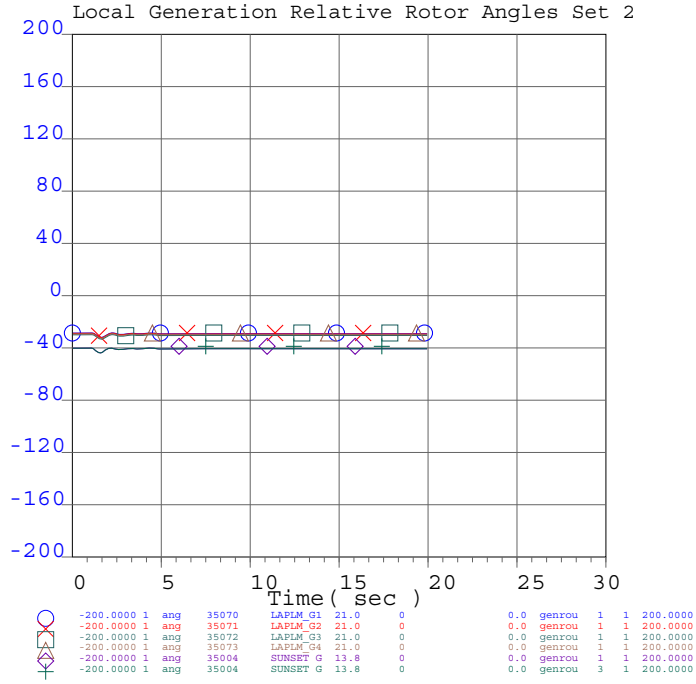
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Local Generation Relative Rotor Angles Set 1



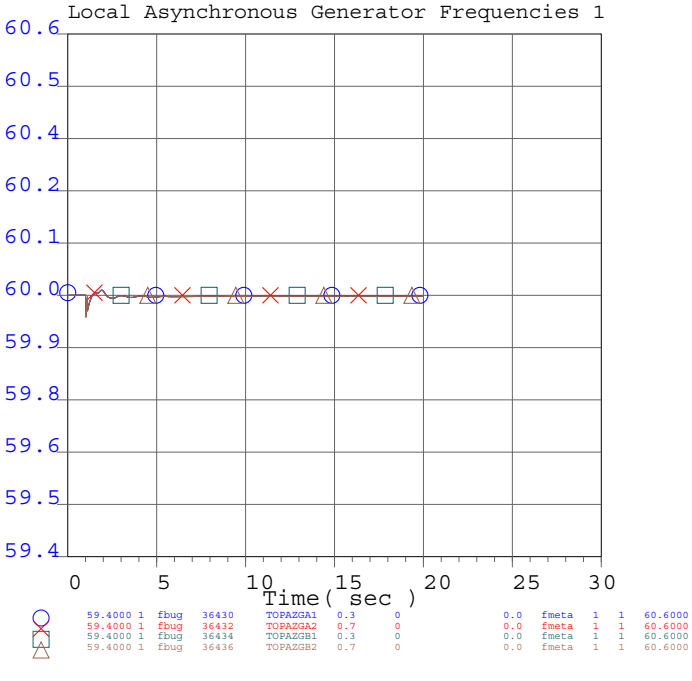
-200.0000 1 ang 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35074 TEXSUN1G 18.0 0 0.0 gentpf 1 1 200.0000
-200.0000 1 ang 35075 TEXSUN2G 18.0 0 0.0 gentpf 1 1 200.0000
-200.0000 1 ang 35079 TEXSUNST 21.0 0 0.0 gentpf 1 1 200.0000

Local Generation Relative Rotor Angles Set 2



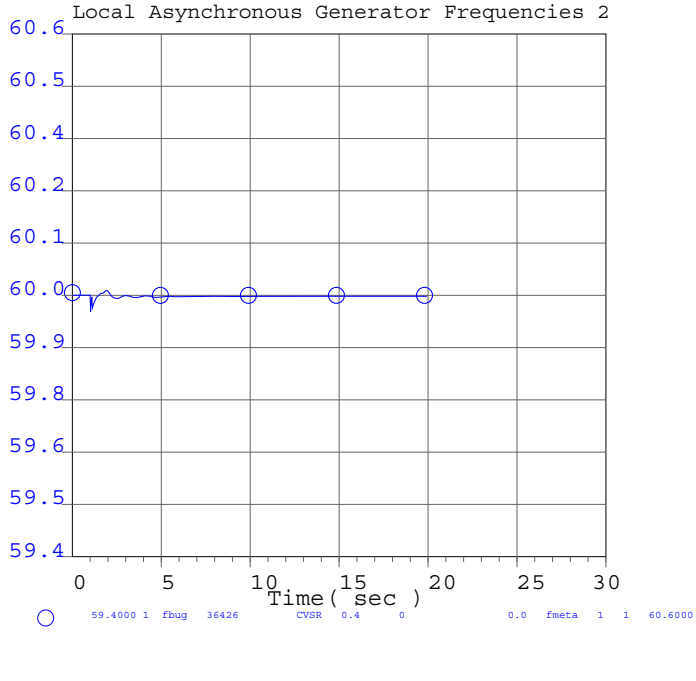
-200.0000 1 ang 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35004 SUNSET G 13.8 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35004 SUNSET G 13.8 0 0.0 genrou 3 1 200.0000

Local Asynchronous Generator Frequencies 1



59.4000 1 fbug 36430 TOPAZGA1 0.3 0 0.0 fmeta 1 1 60.6000
59.4000 1 fbug 36432 TOPAZGA2 0.7 0 0.0 fmeta 1 1 60.6000
59.4000 1 fbug 36434 TOPAZGB1 0.3 0 0.0 fmeta 1 1 60.6000
59.4000 1 fbug 36436 TOPAZGB2 0.7 0 0.0 fmeta 1 1 60.6000

Local Asynchronous Generator Frequencies 2



59.4000 1 fbug 36426 CVSR 0.4 0 0.0 fmeta 1 1 60.6000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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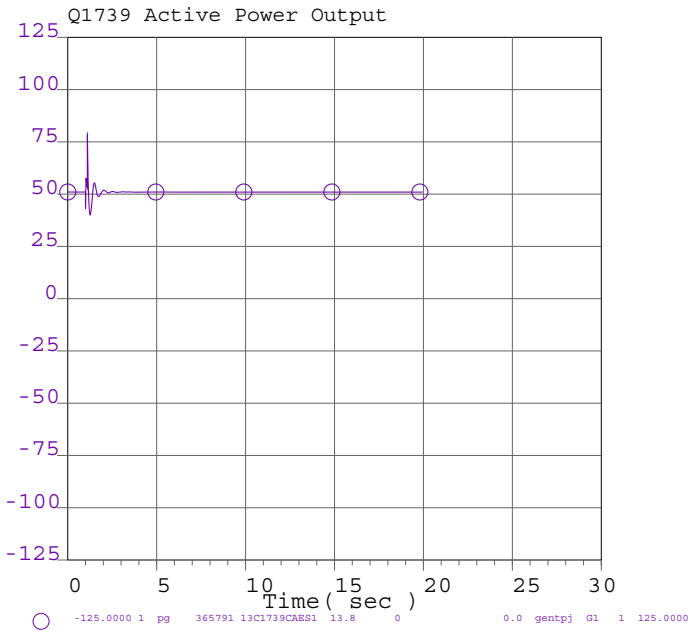
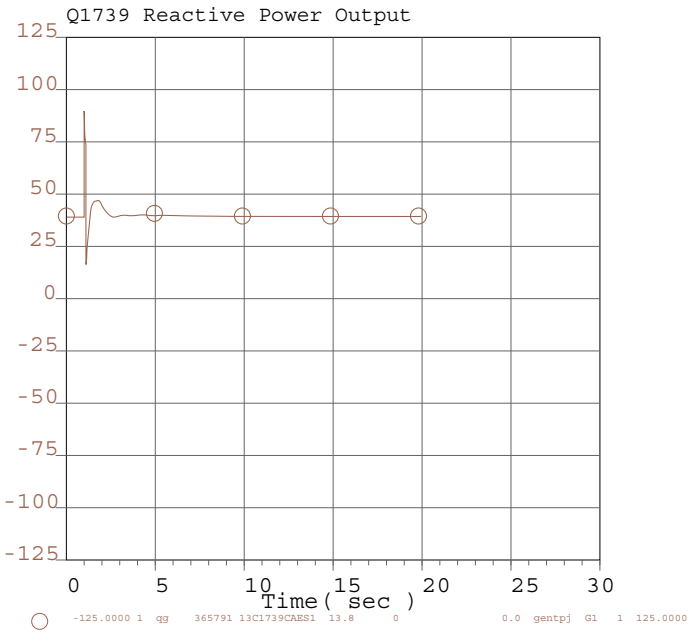
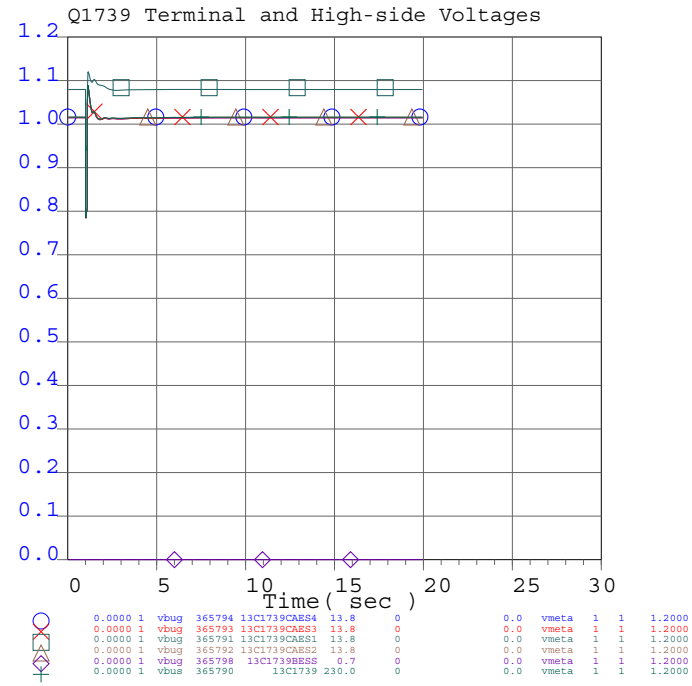
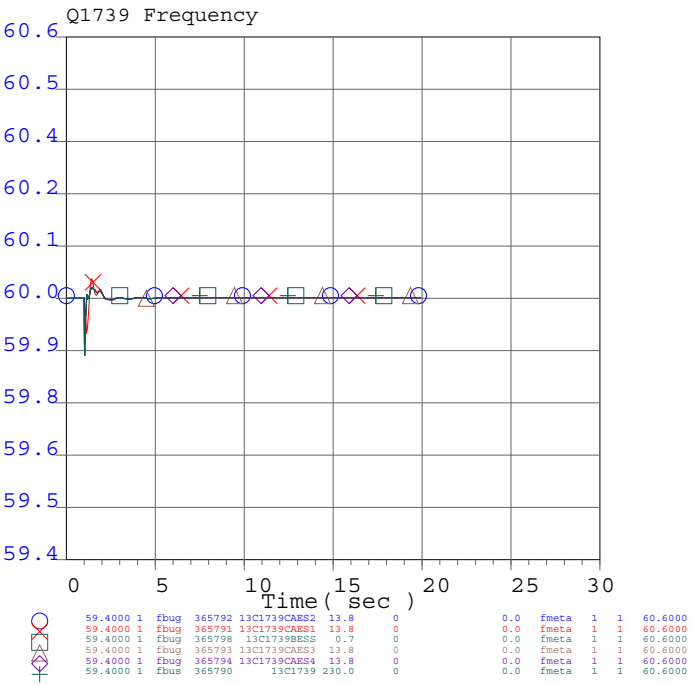
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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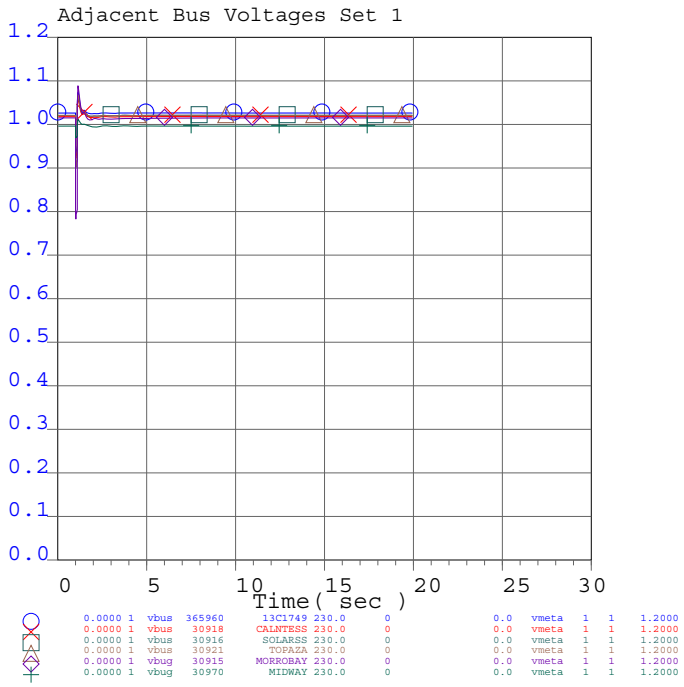
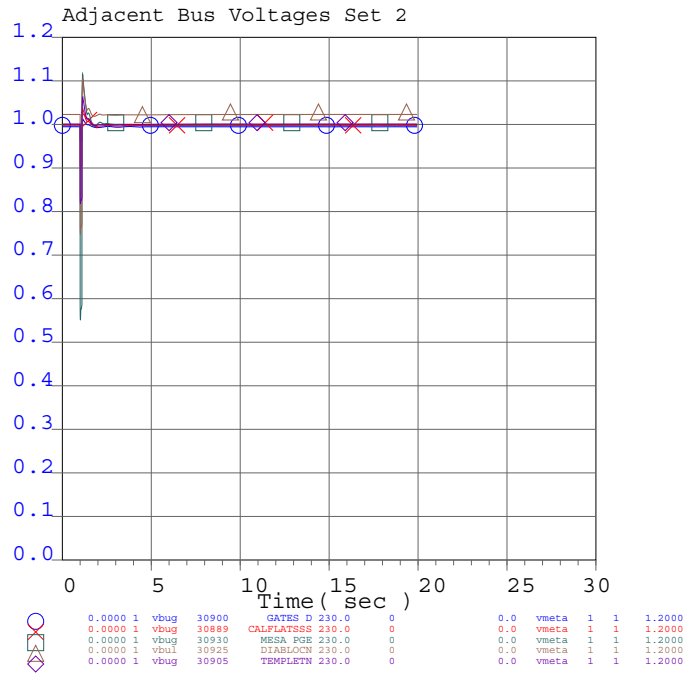
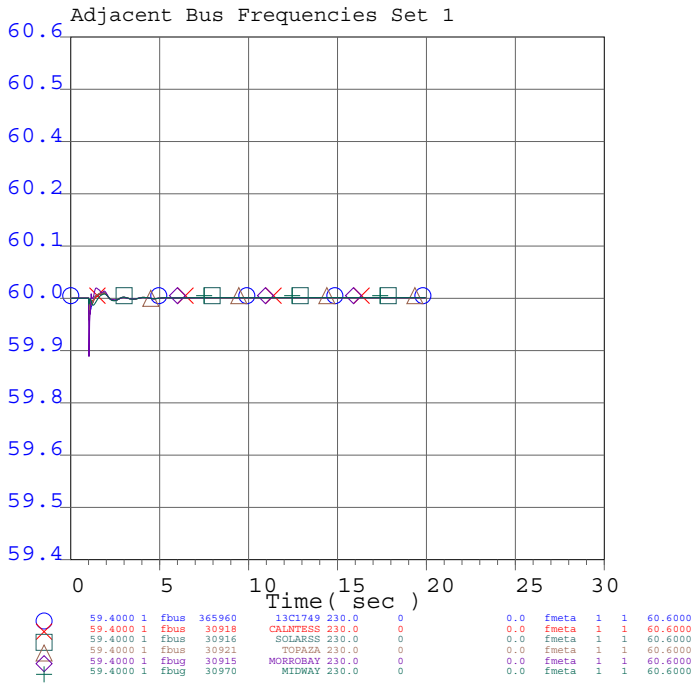
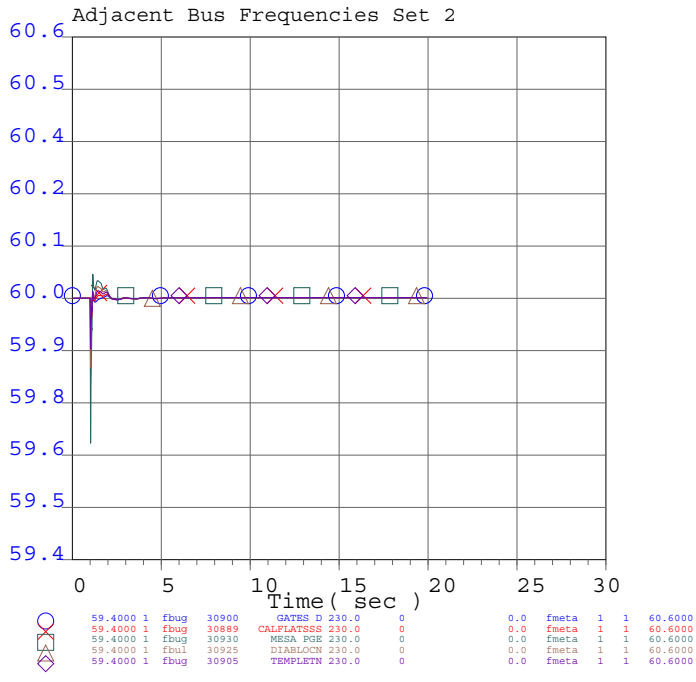
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



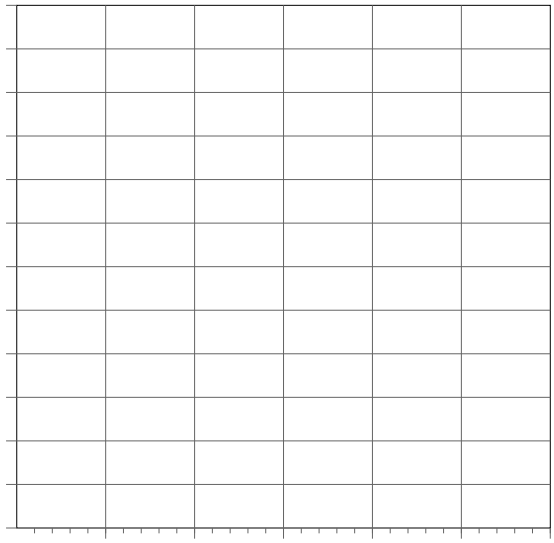




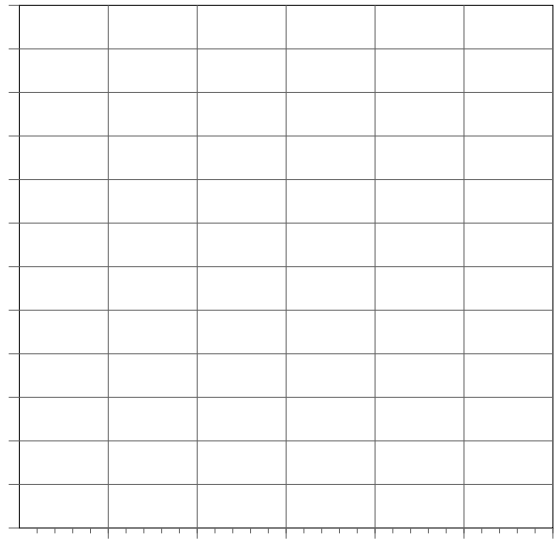


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

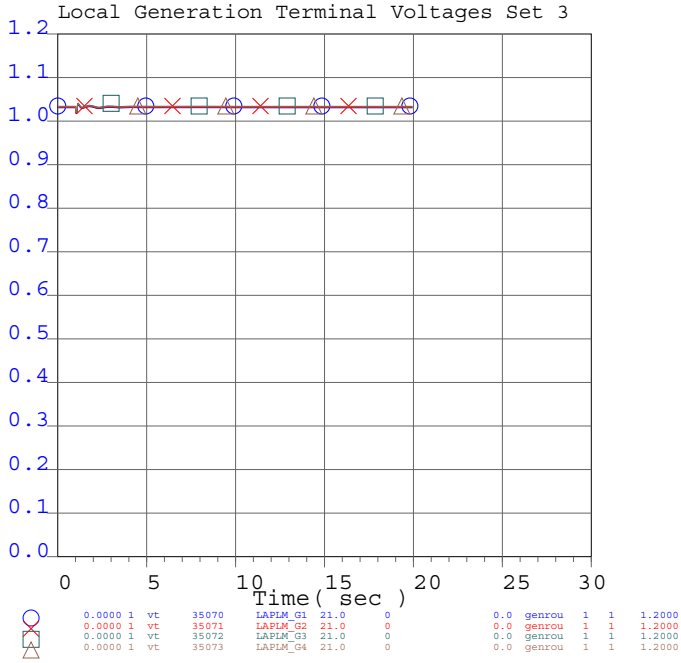
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

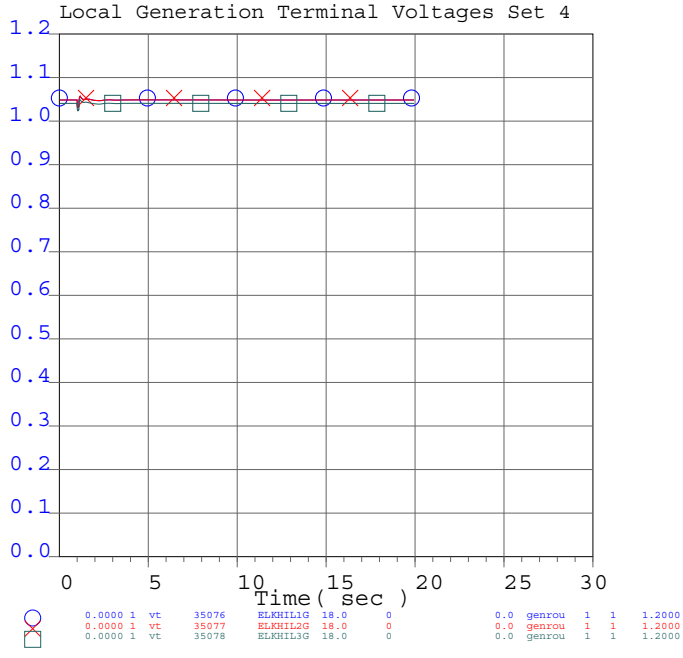


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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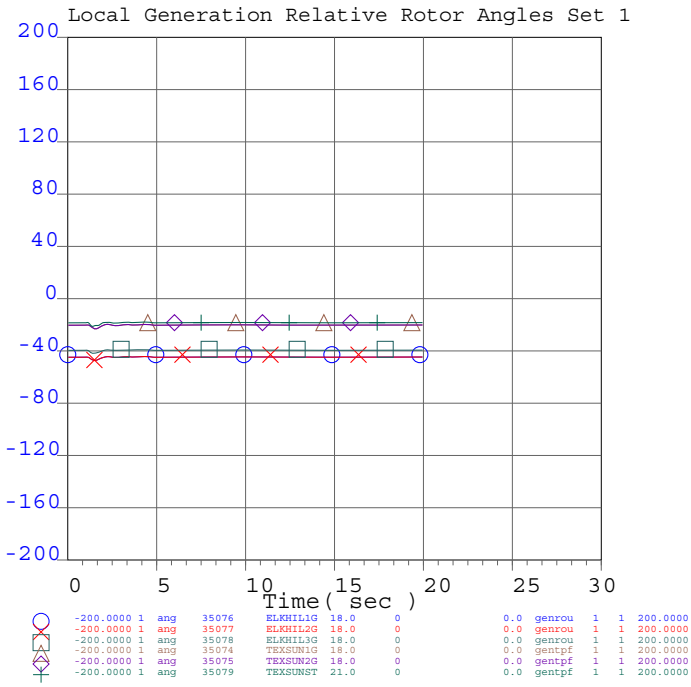
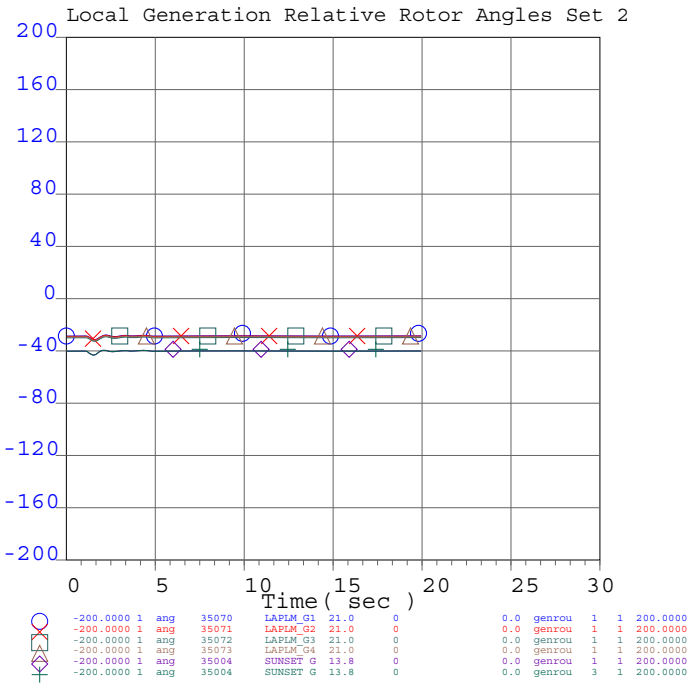
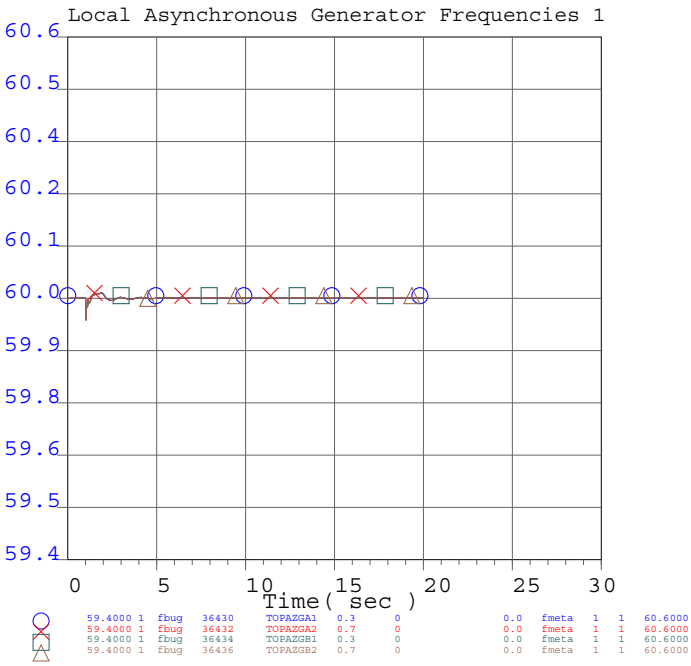
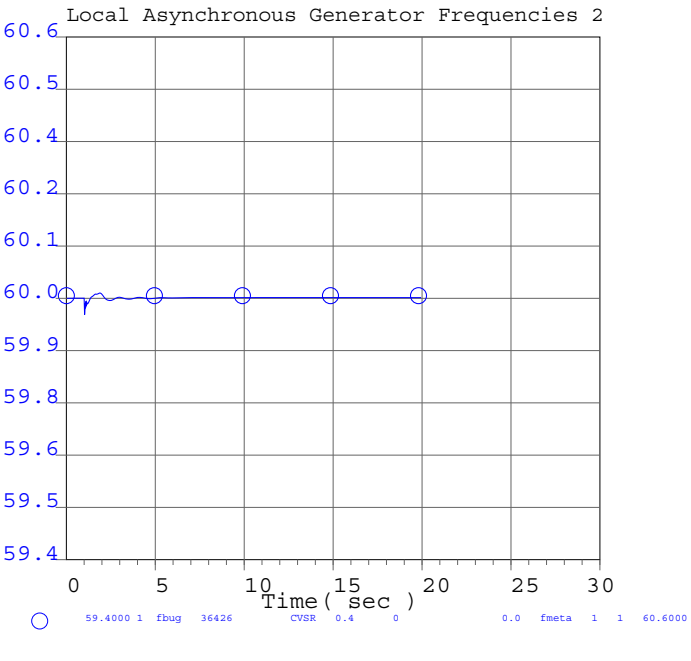
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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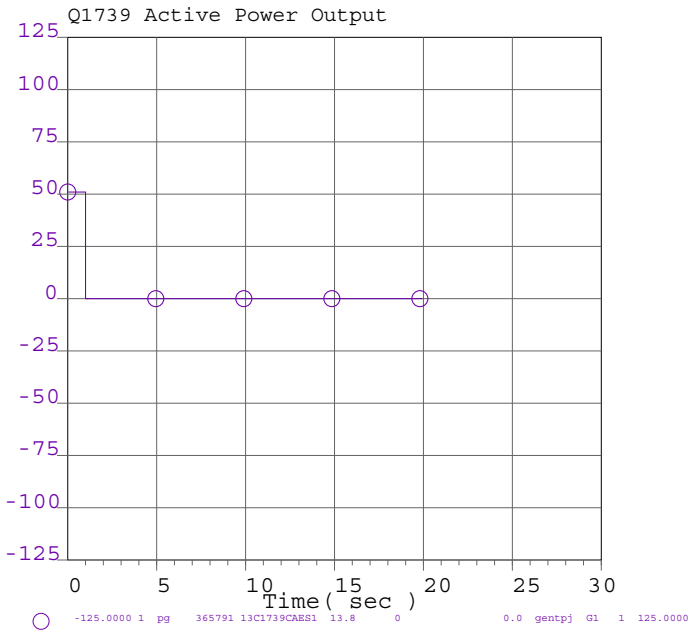
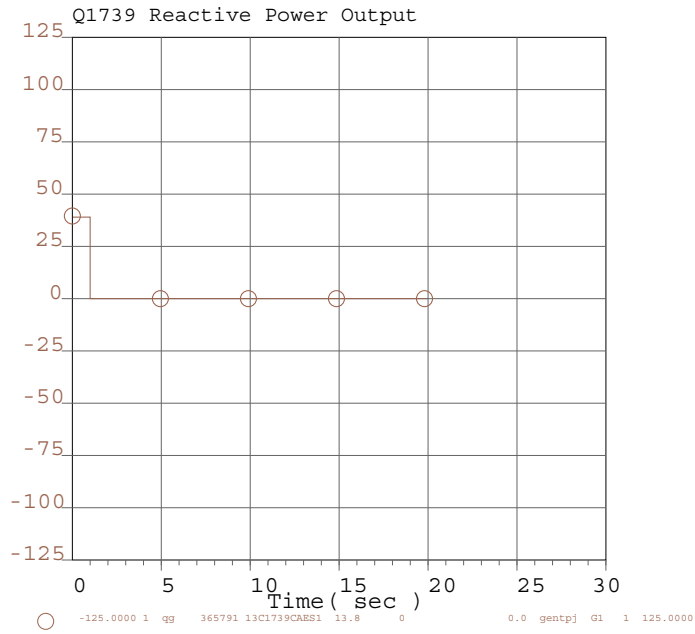
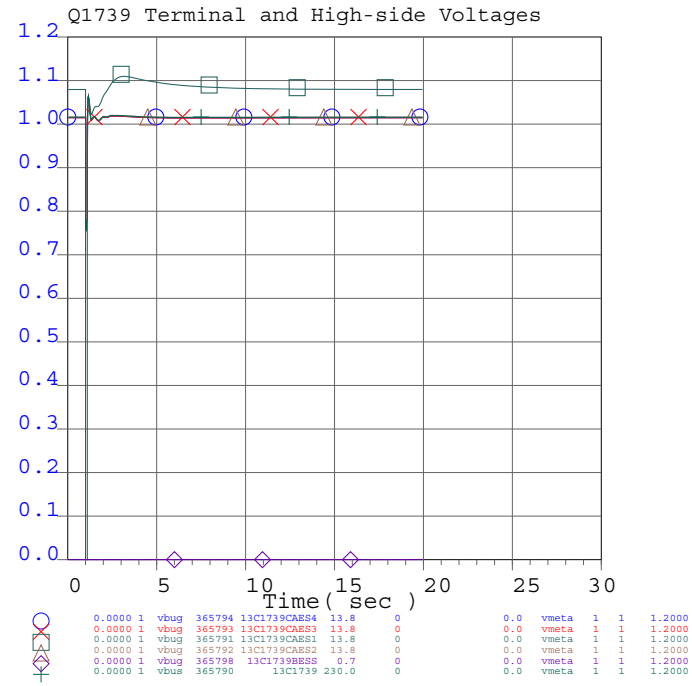
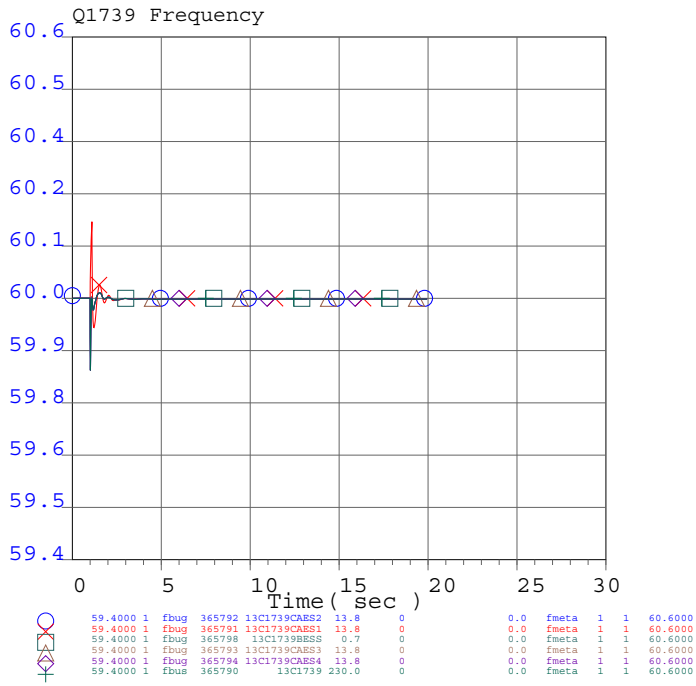
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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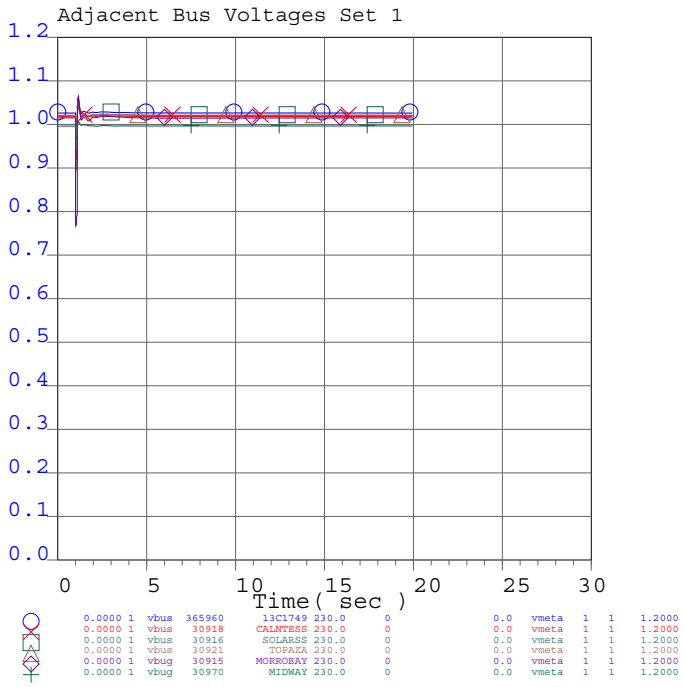
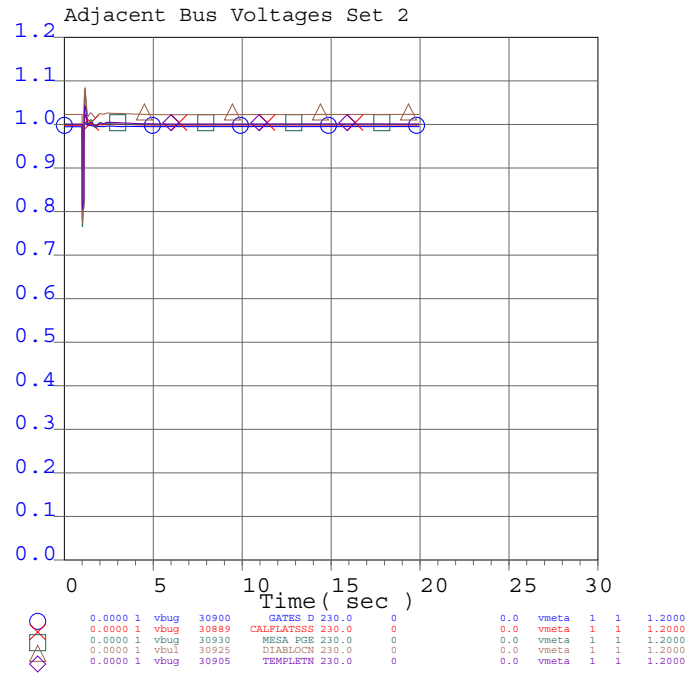
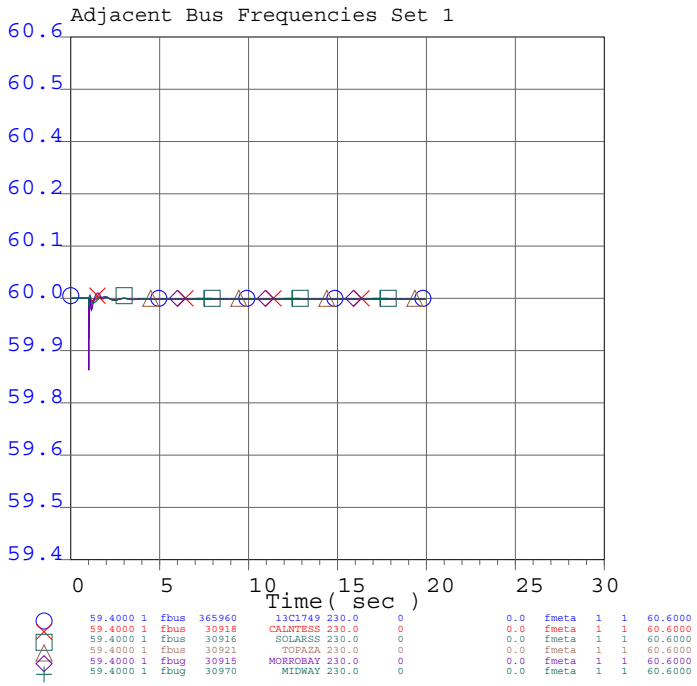
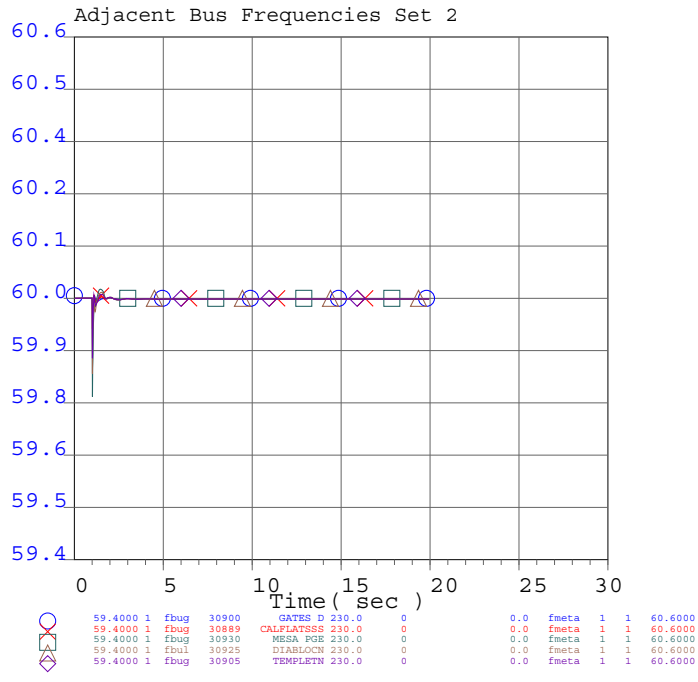
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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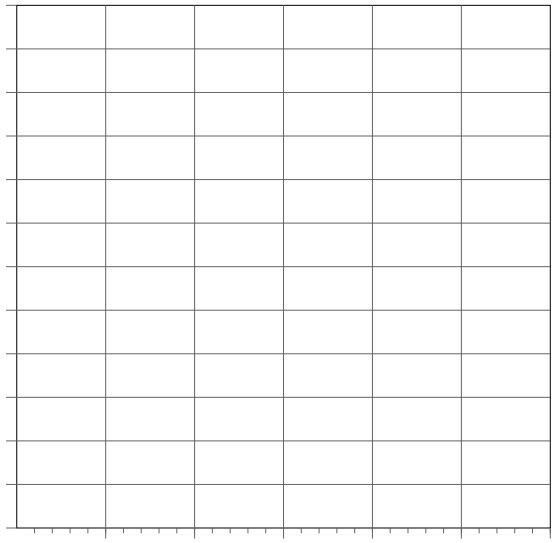
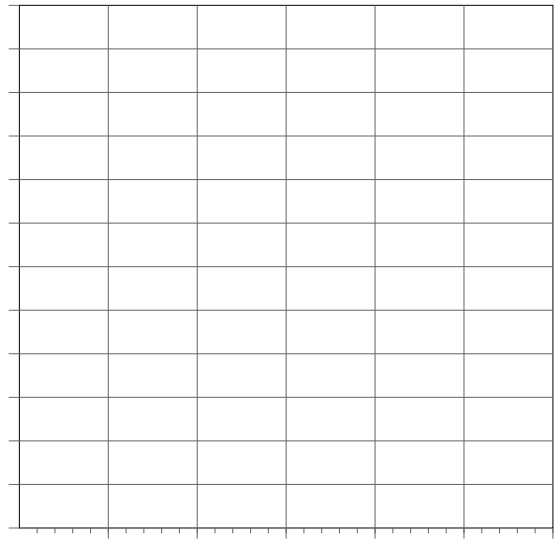
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

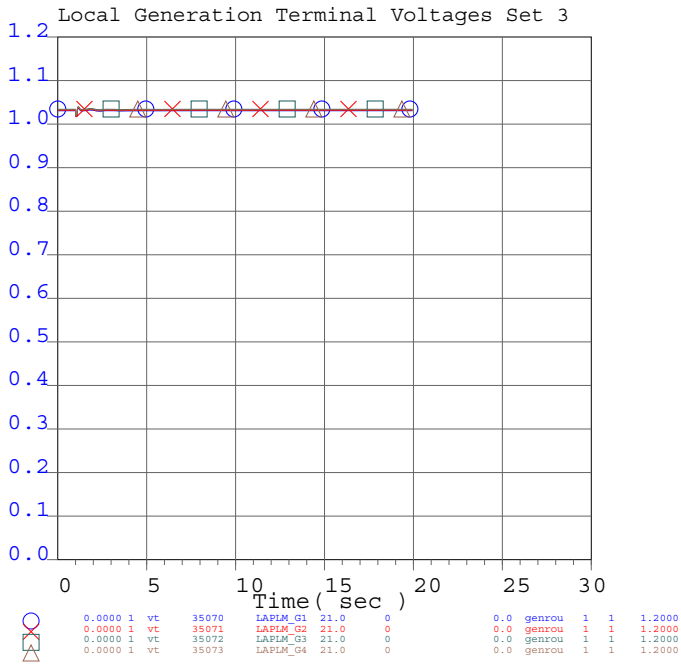
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

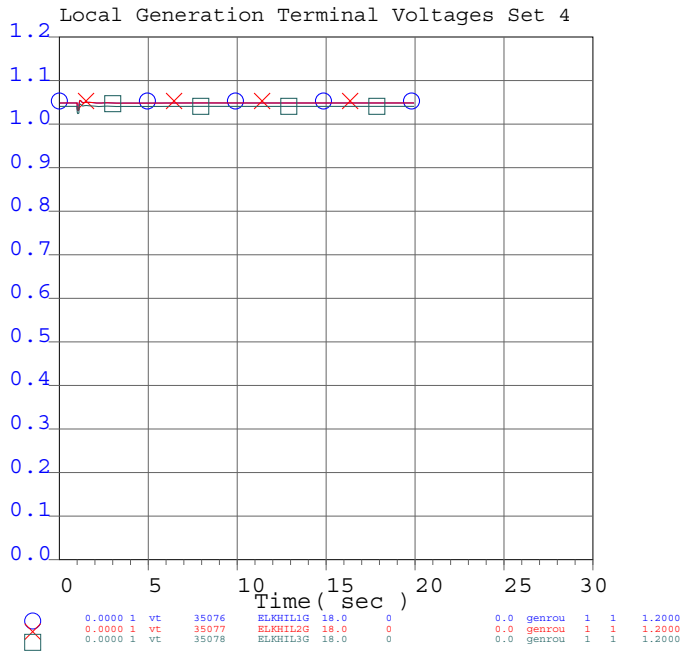


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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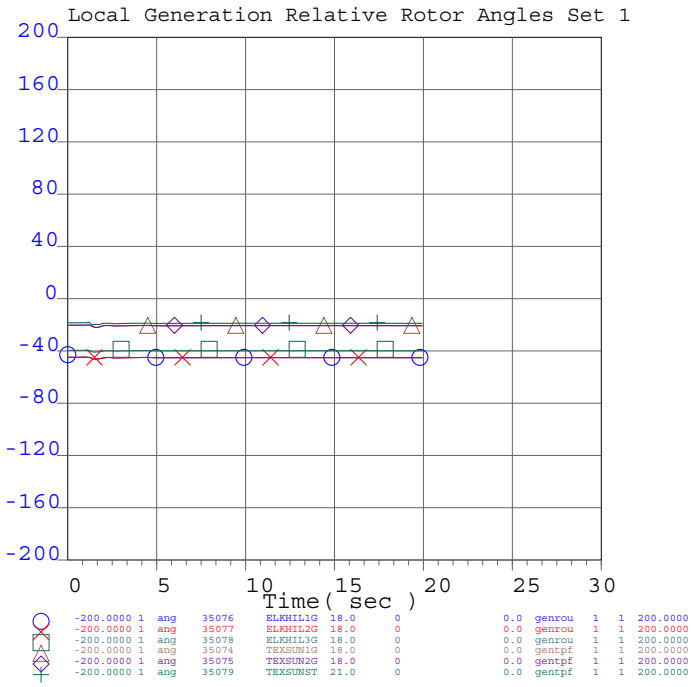
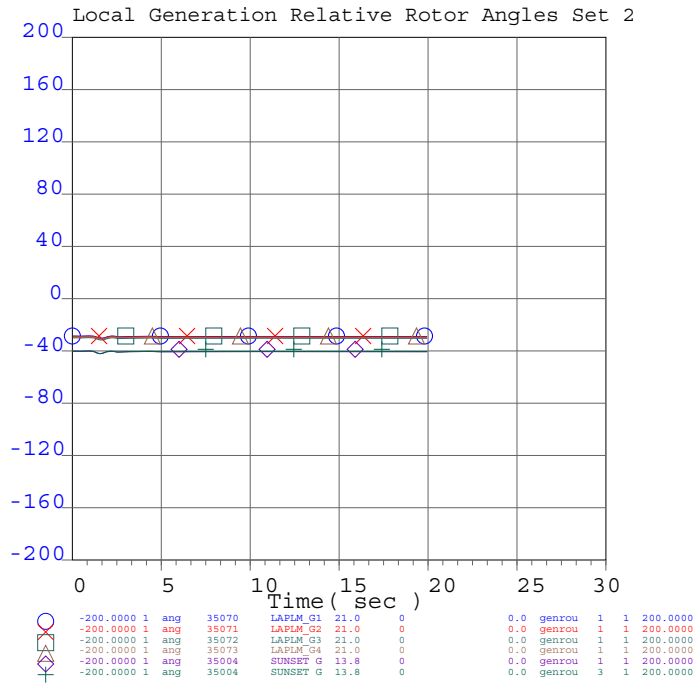
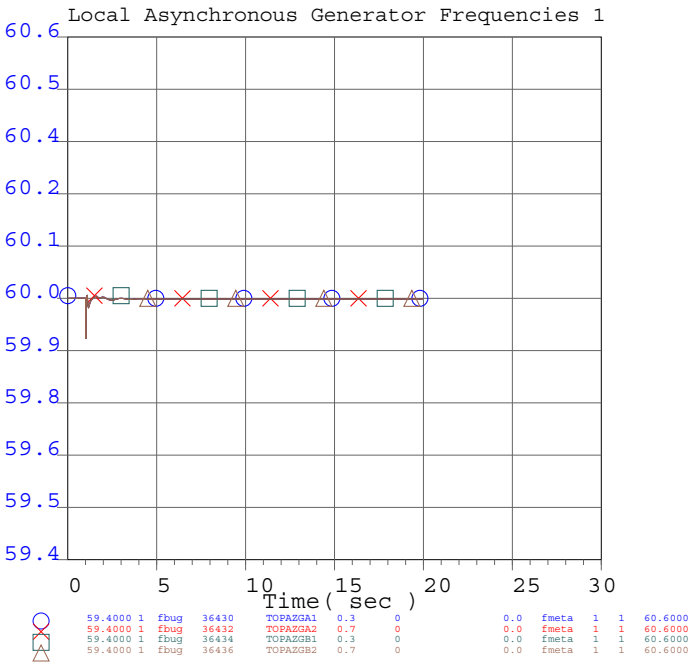
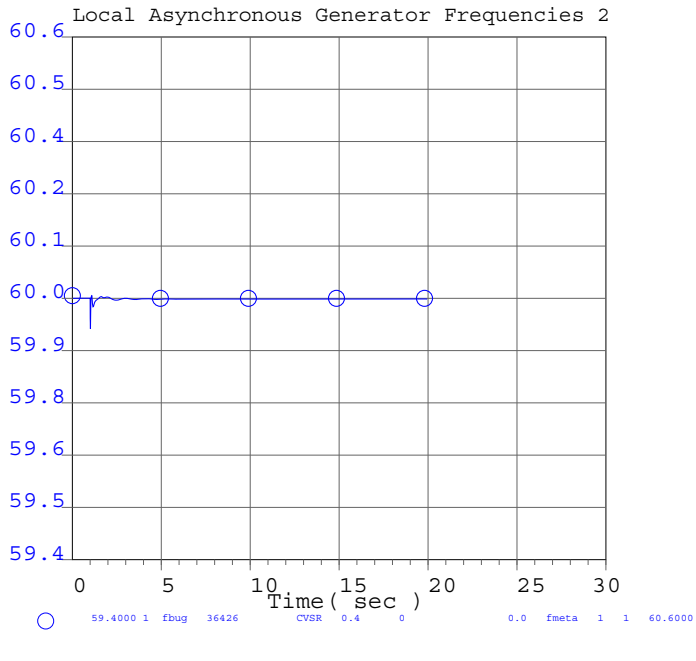


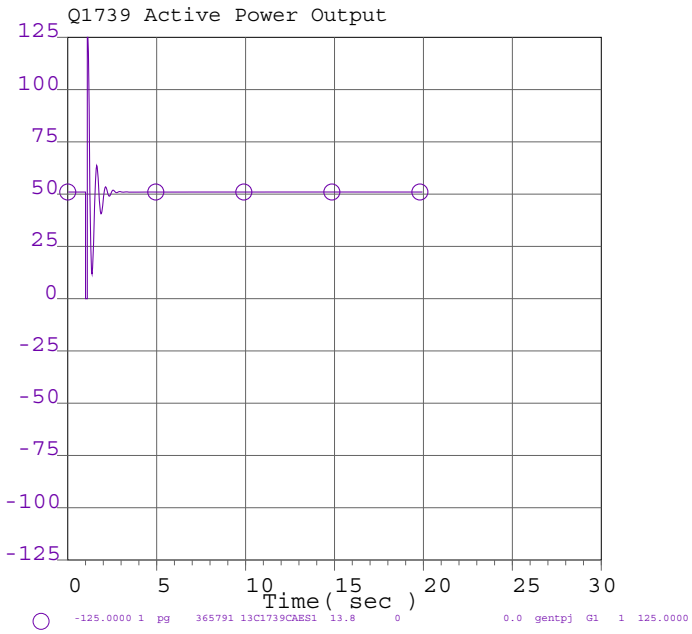


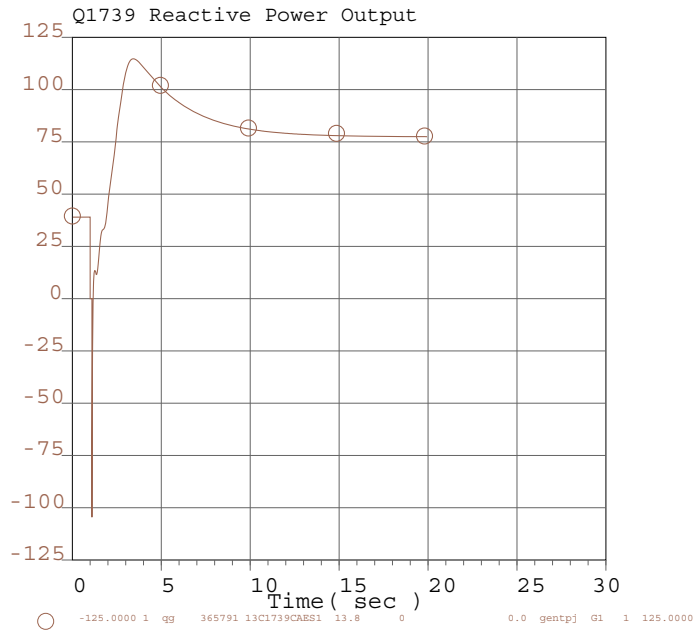


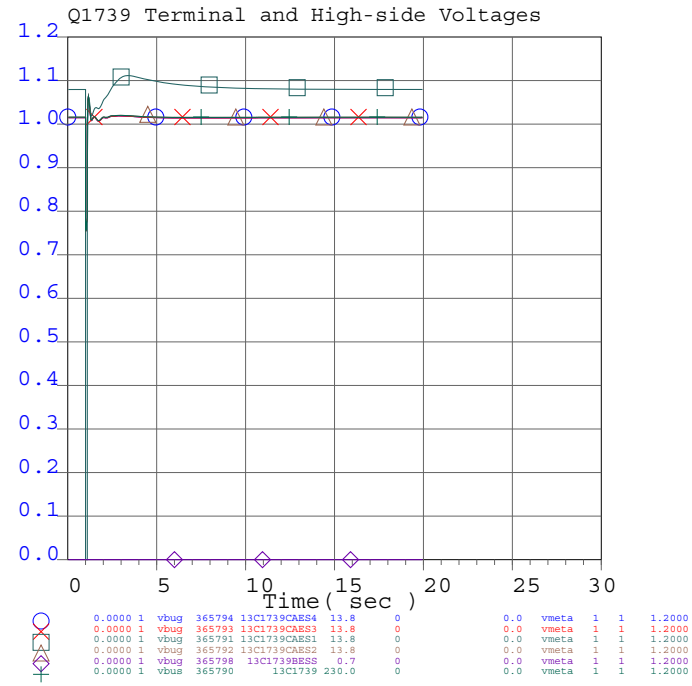


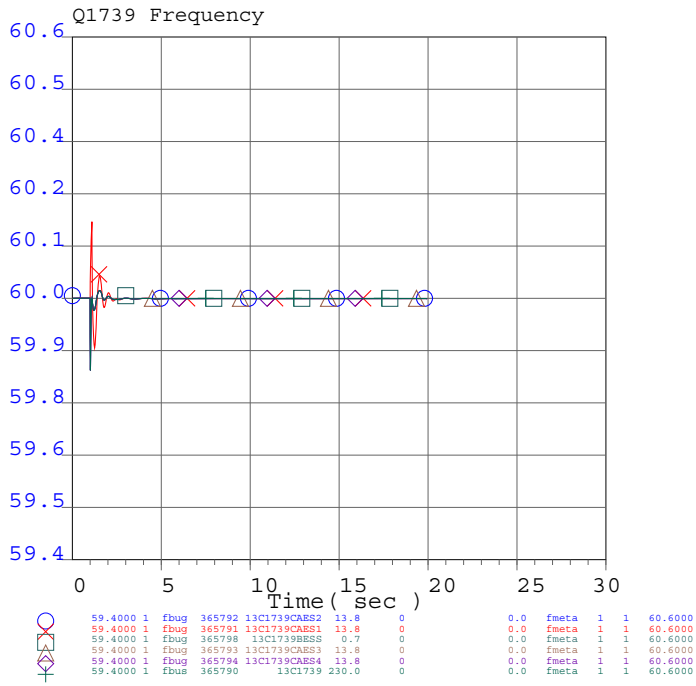
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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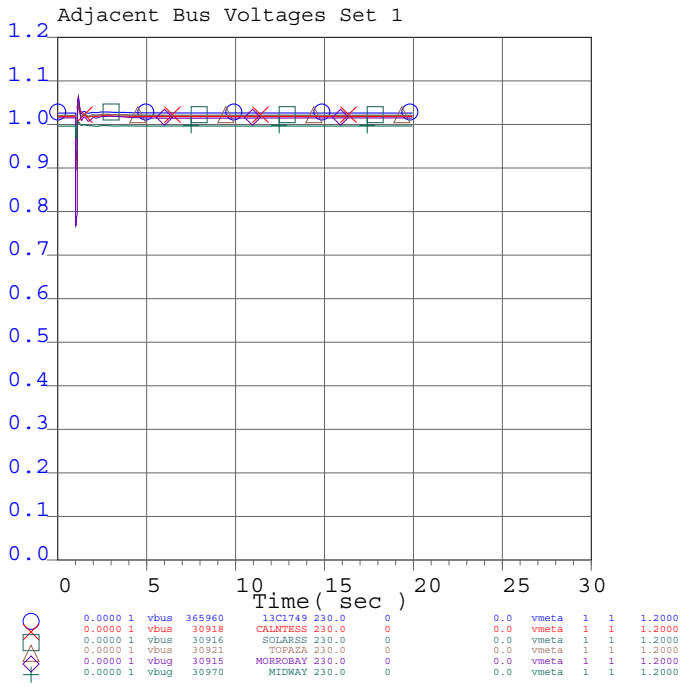

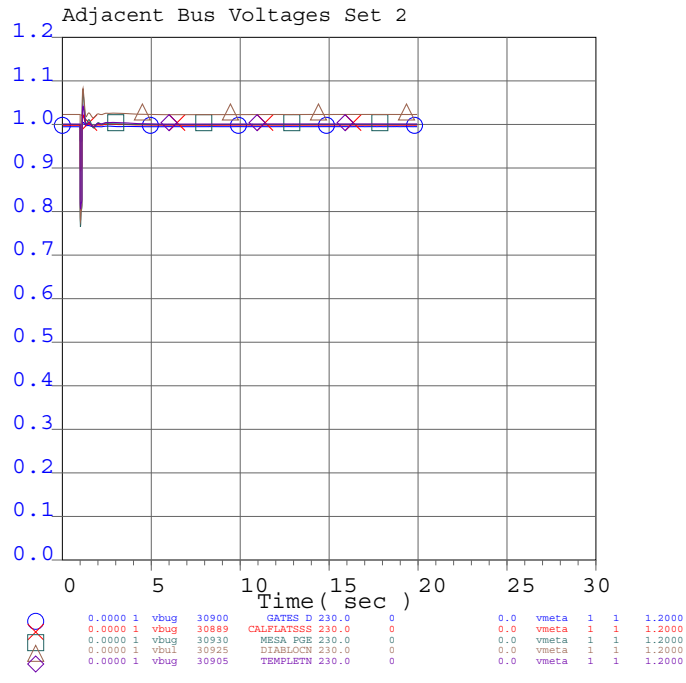

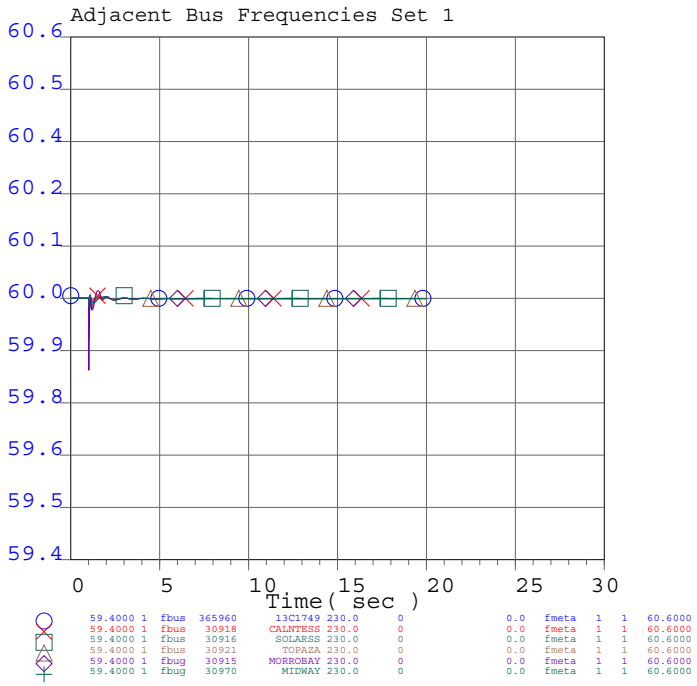

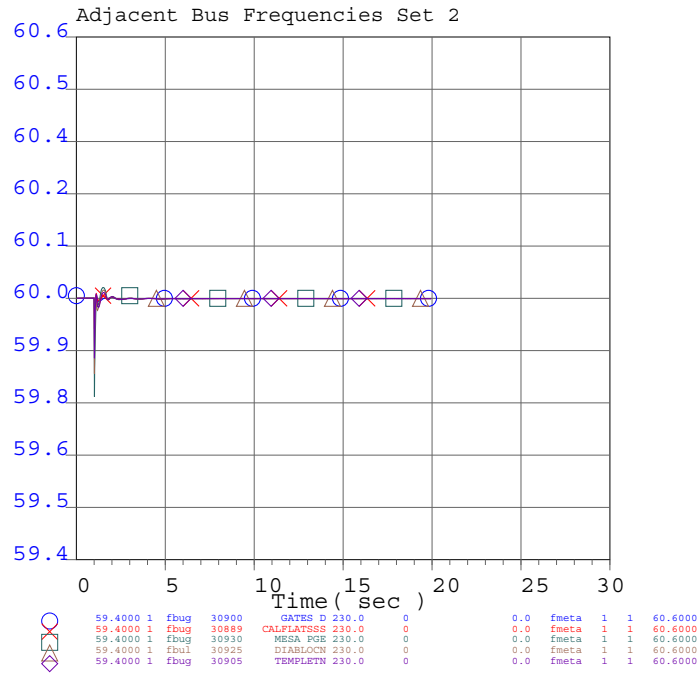

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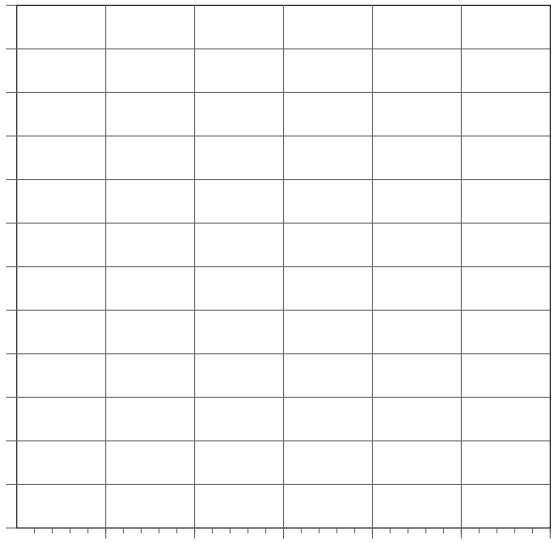
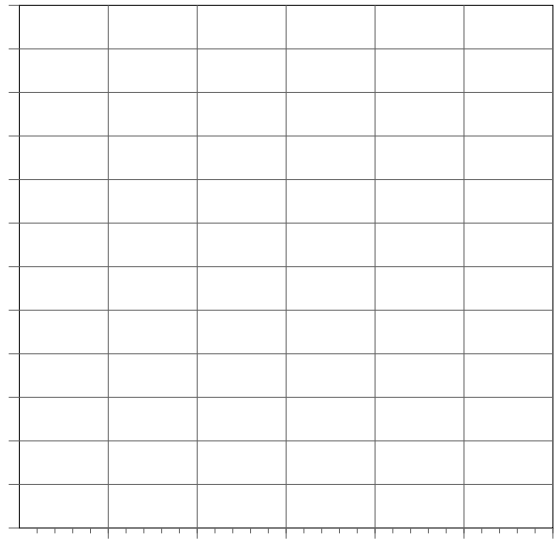
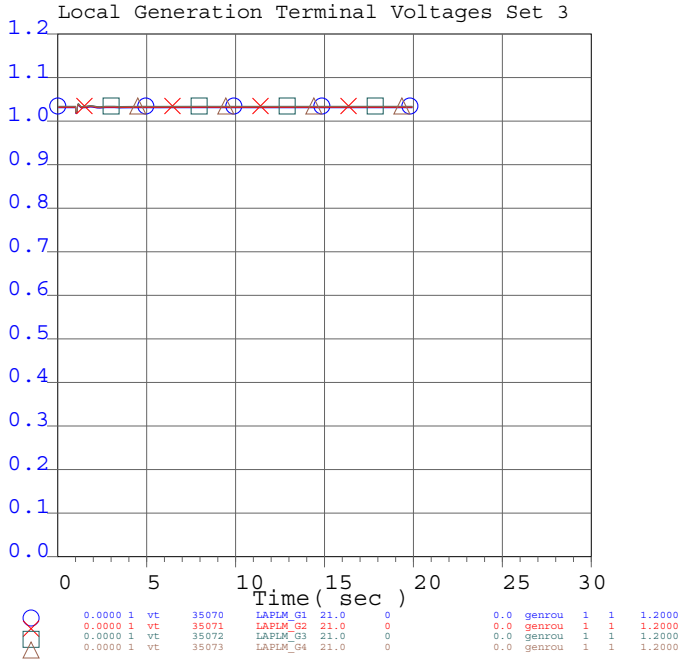
Local Generation Terminal Voltages Set 1



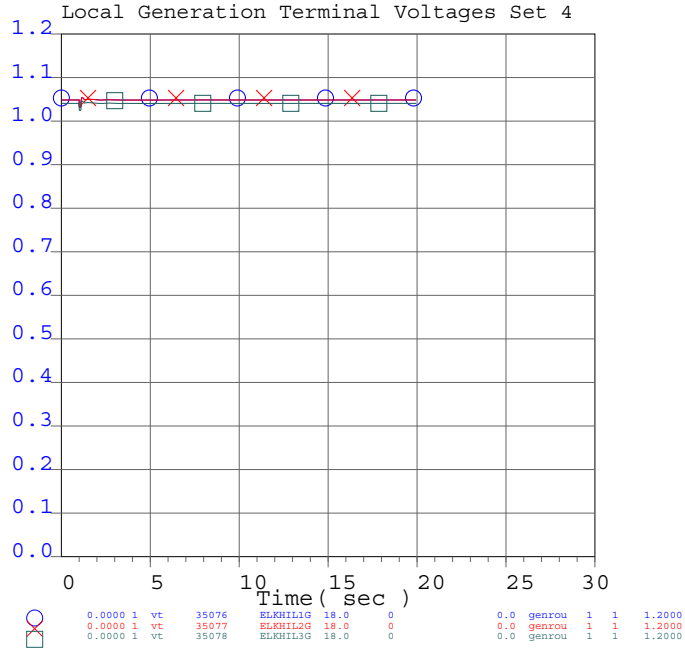
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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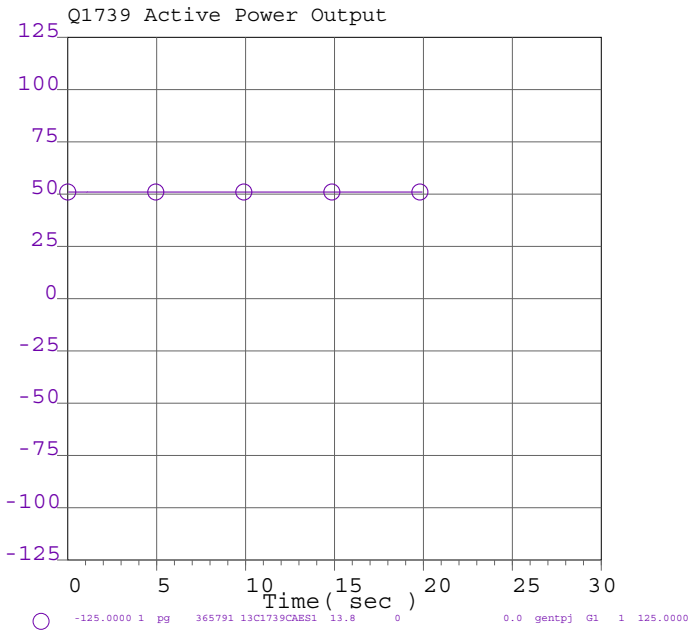
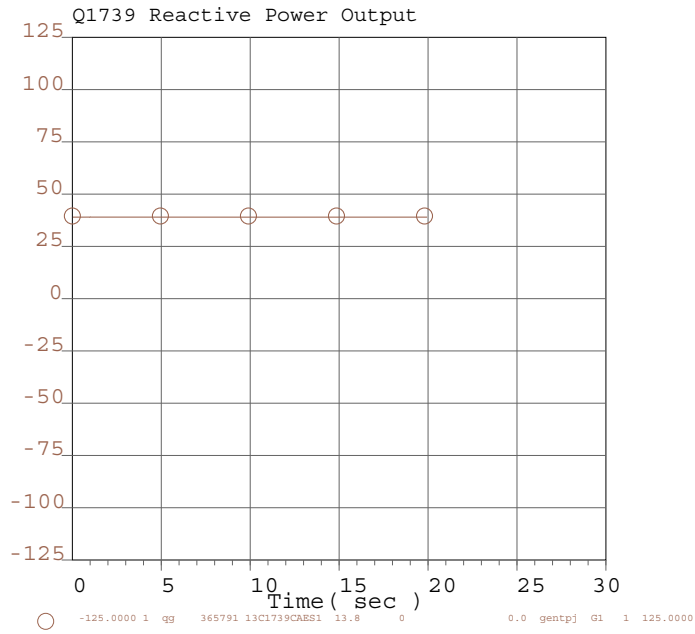
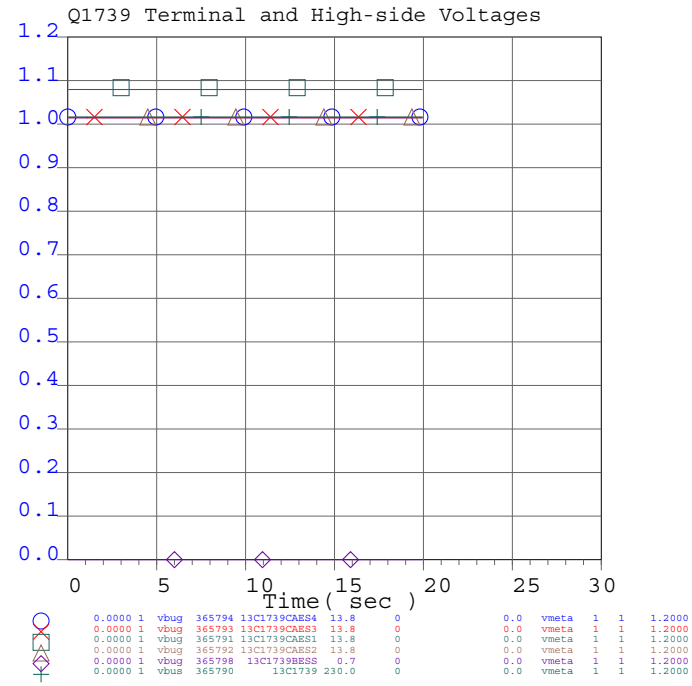
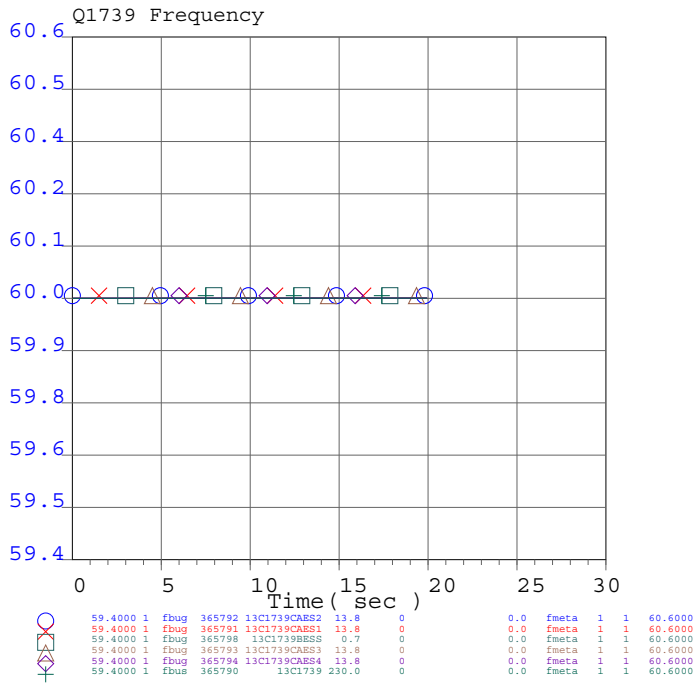
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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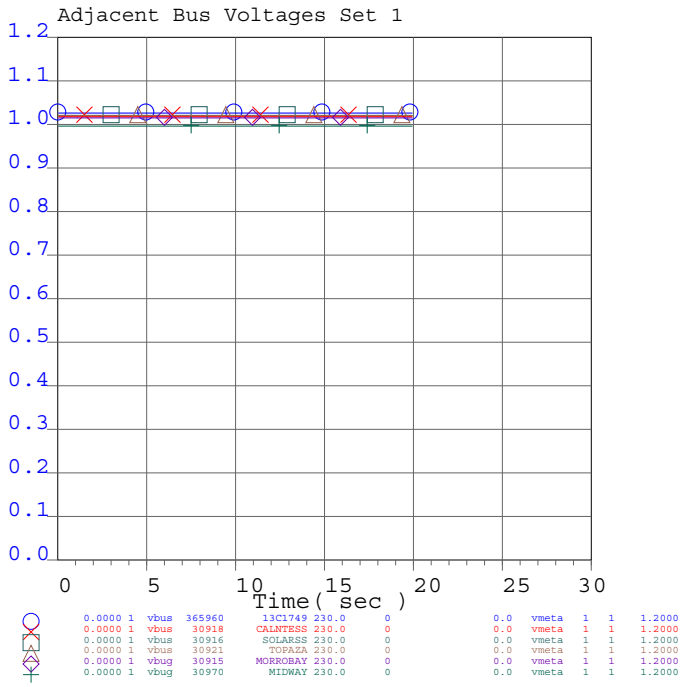

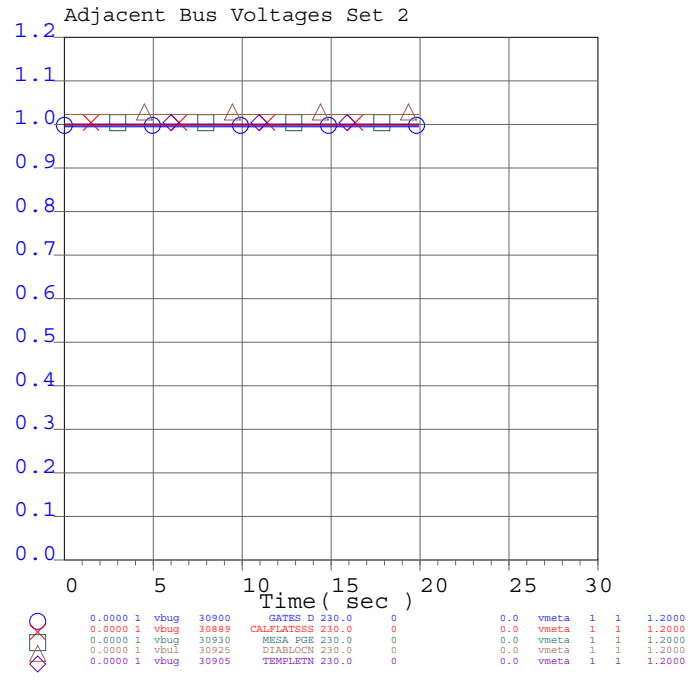

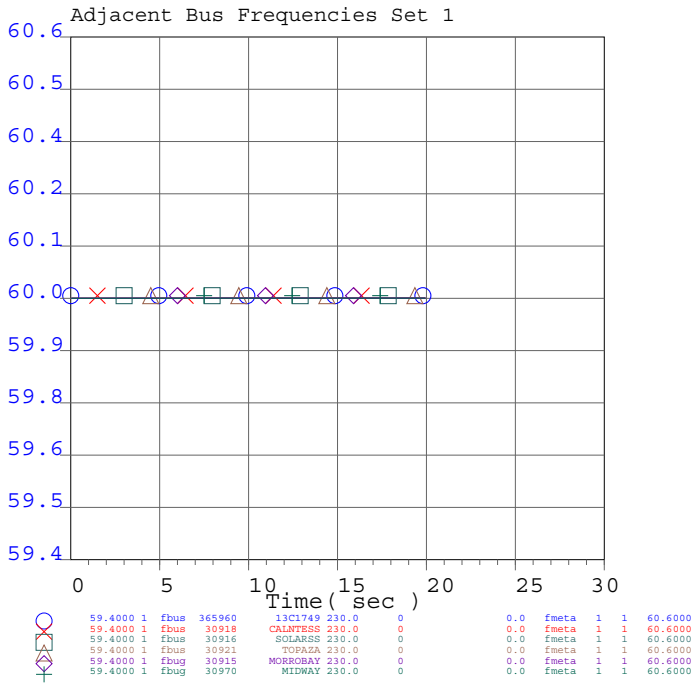

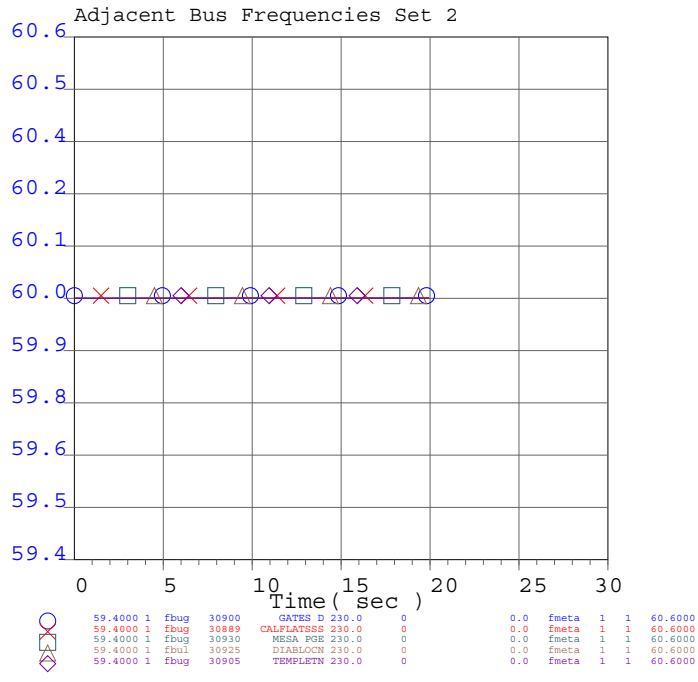

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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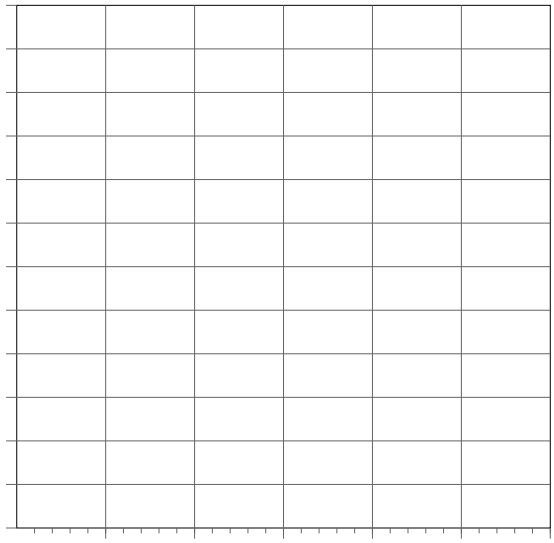
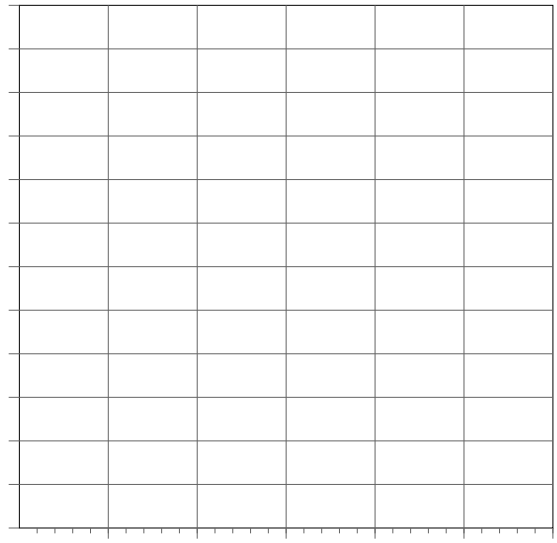
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

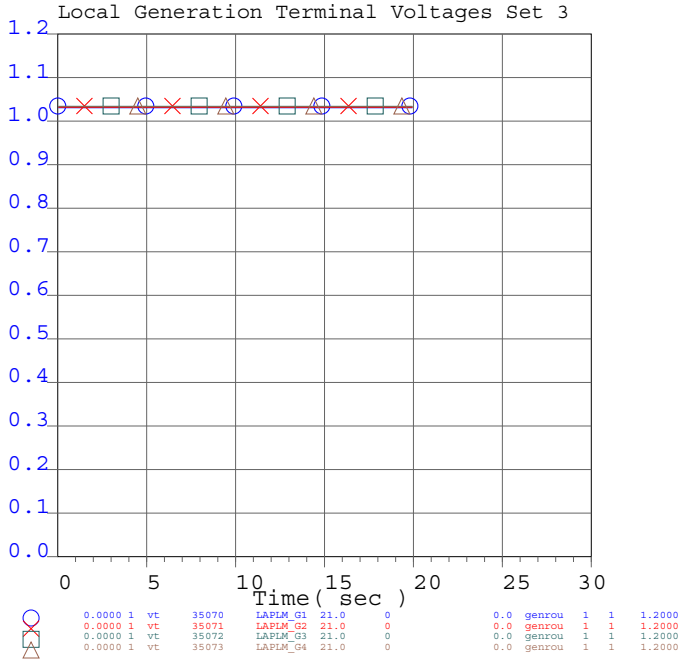
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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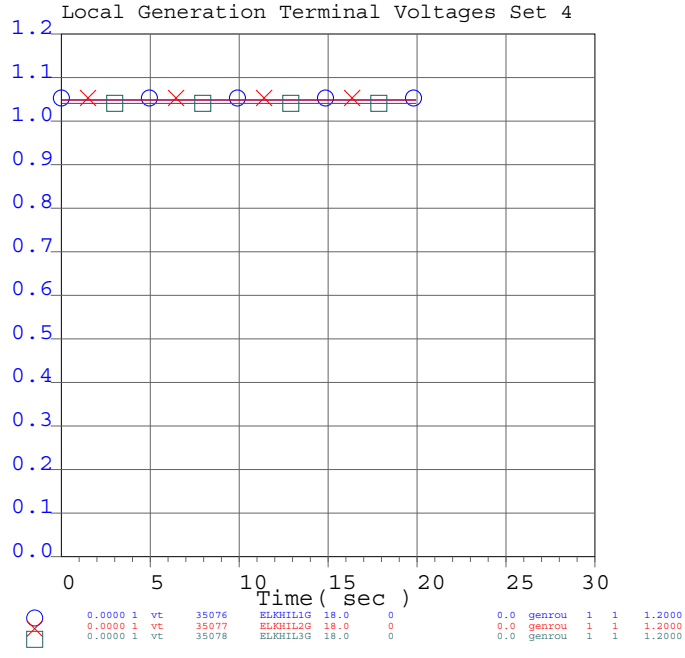
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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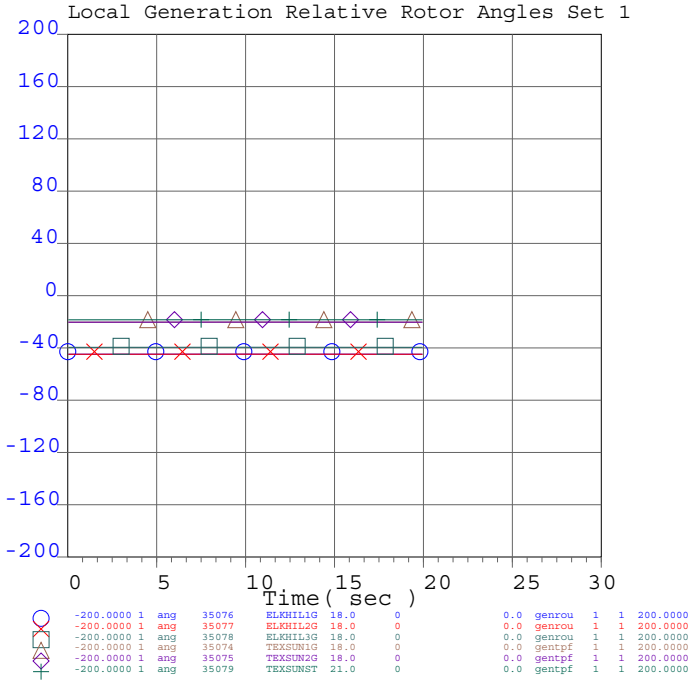
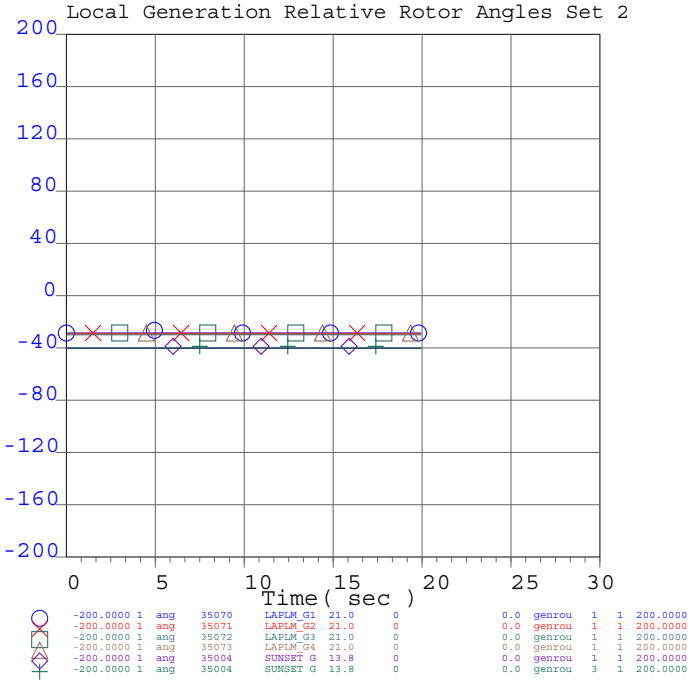
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

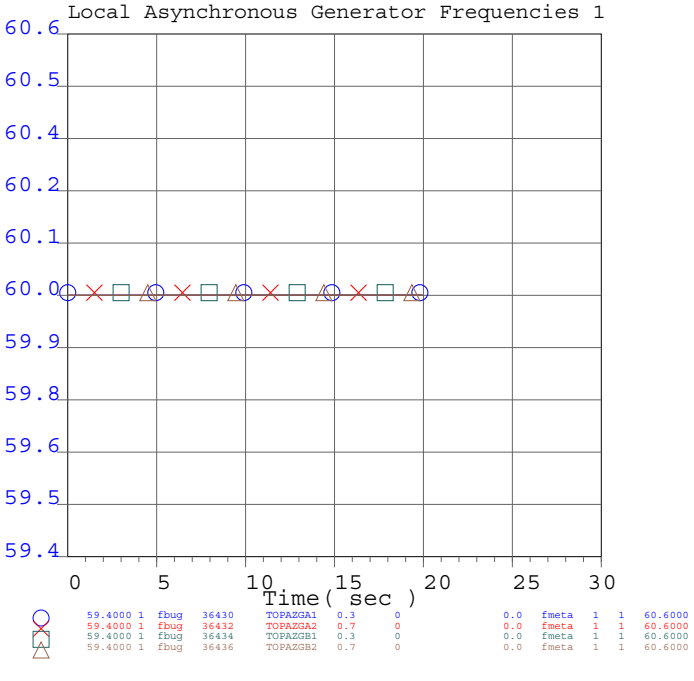
Local Generation Relative Rotor Angles Set 1



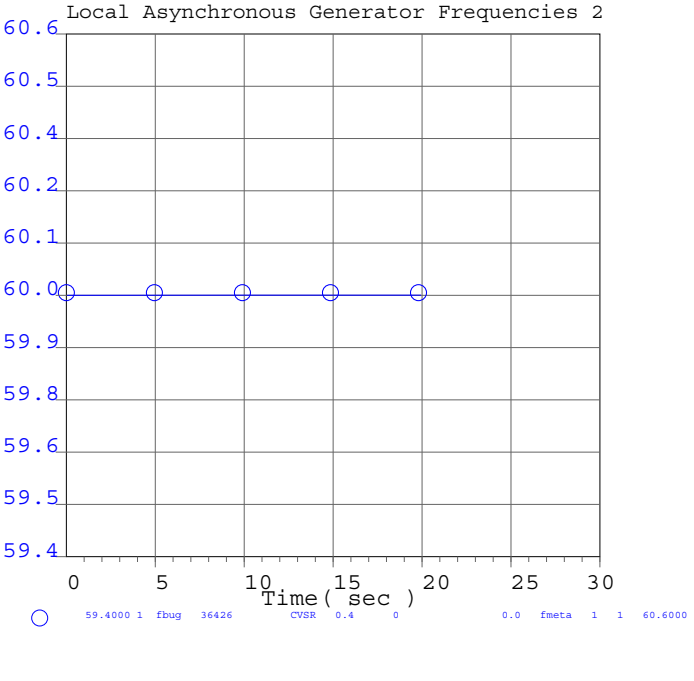
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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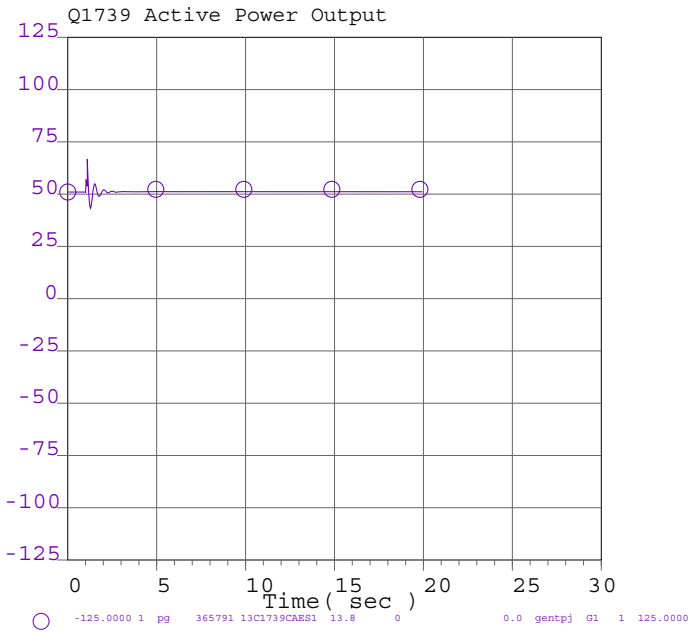
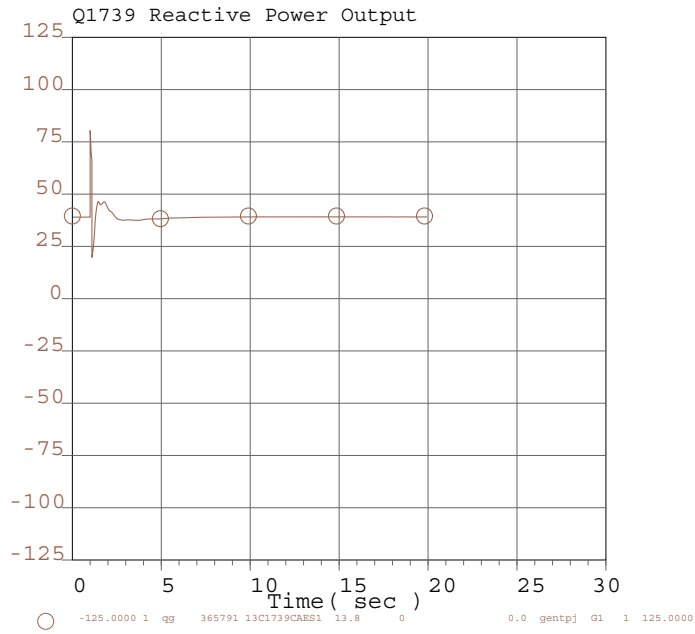
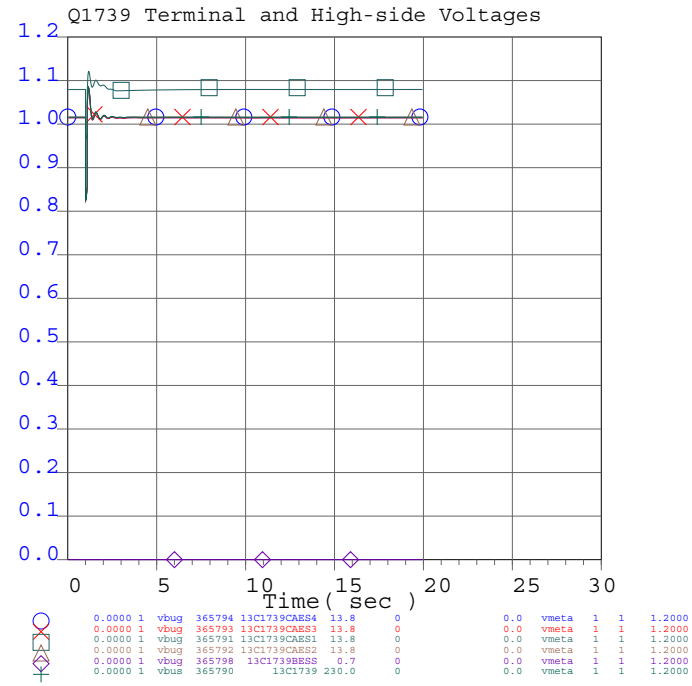
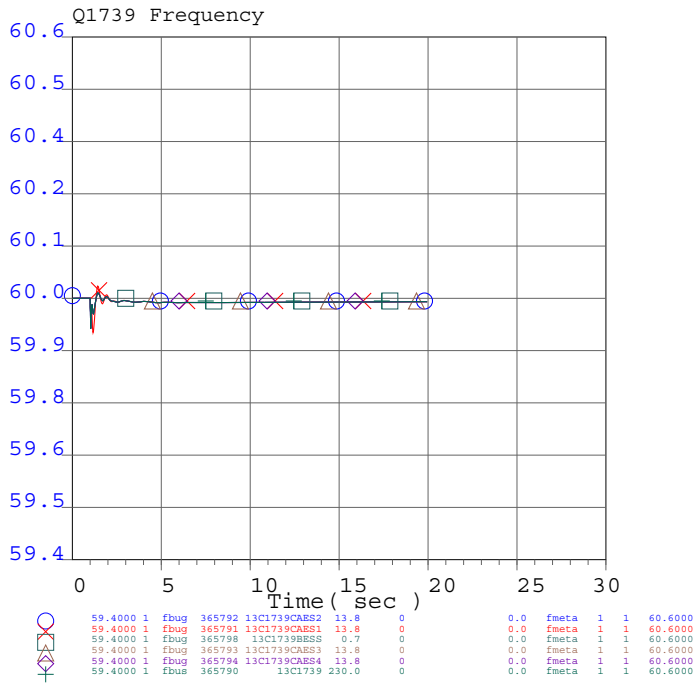
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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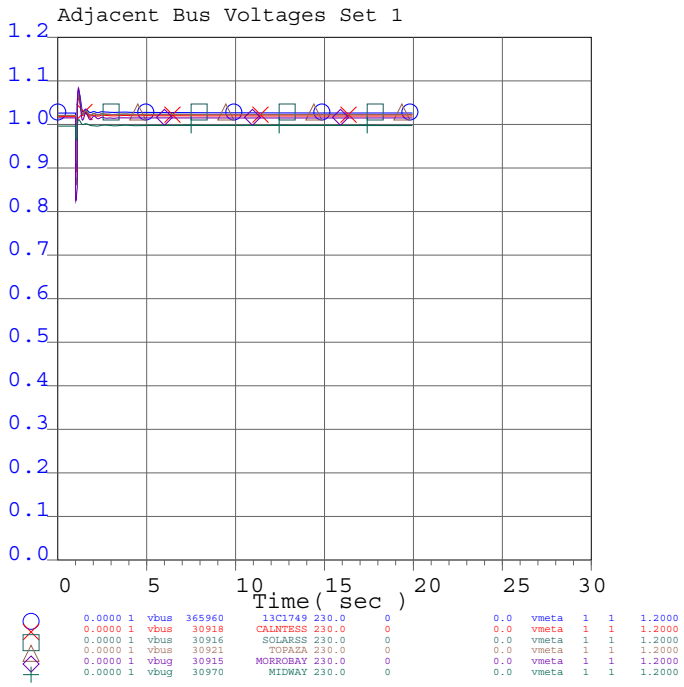

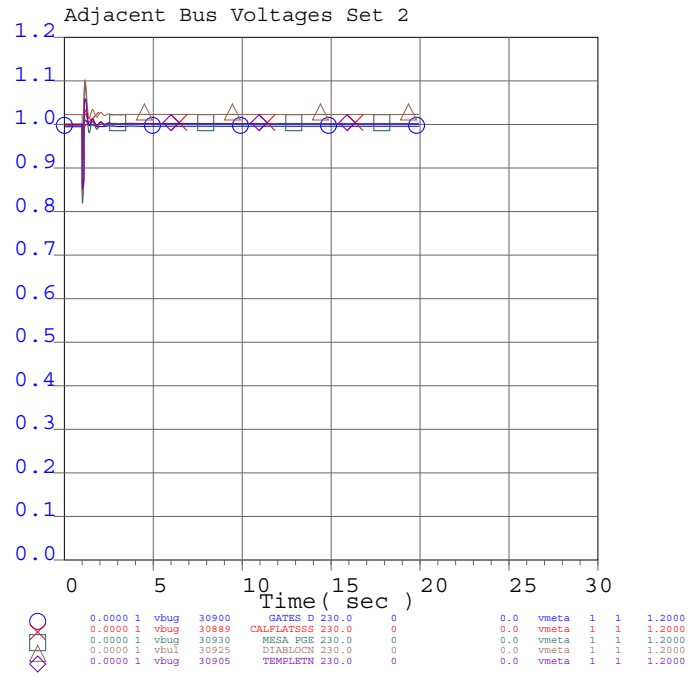

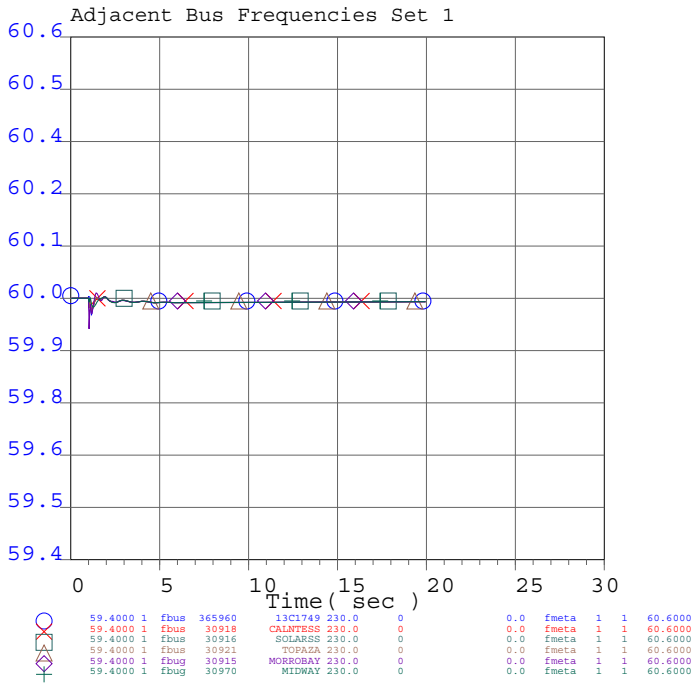

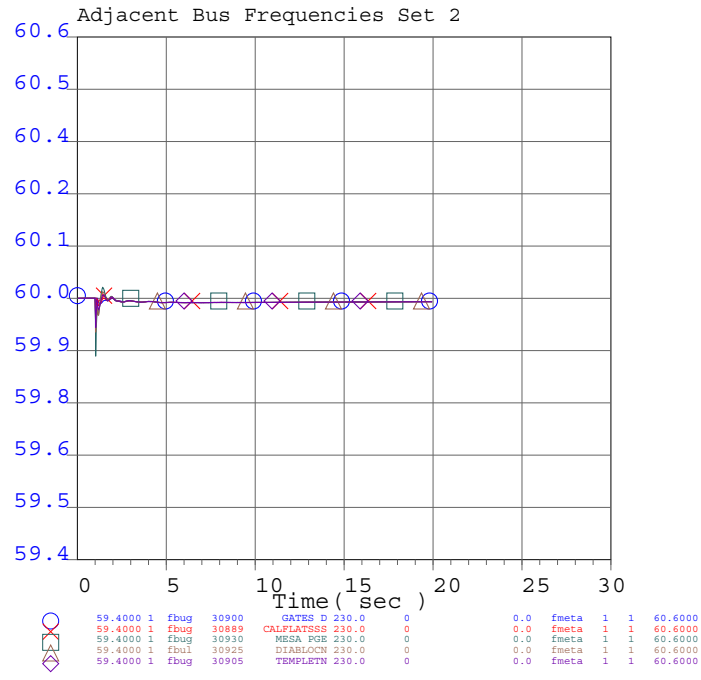

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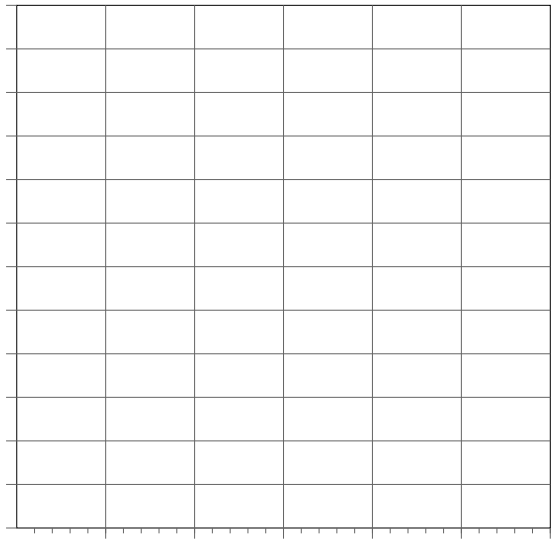
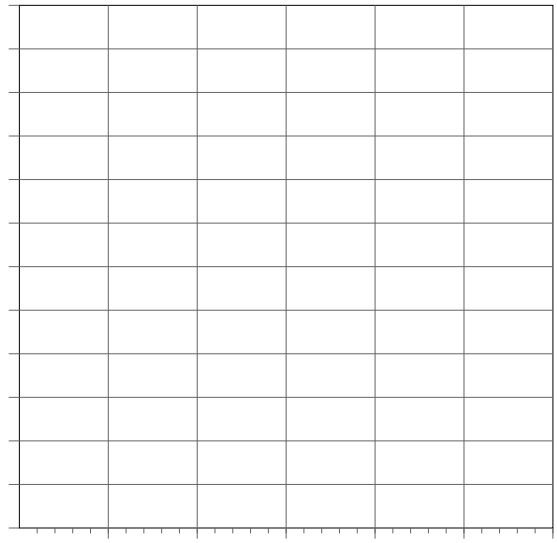
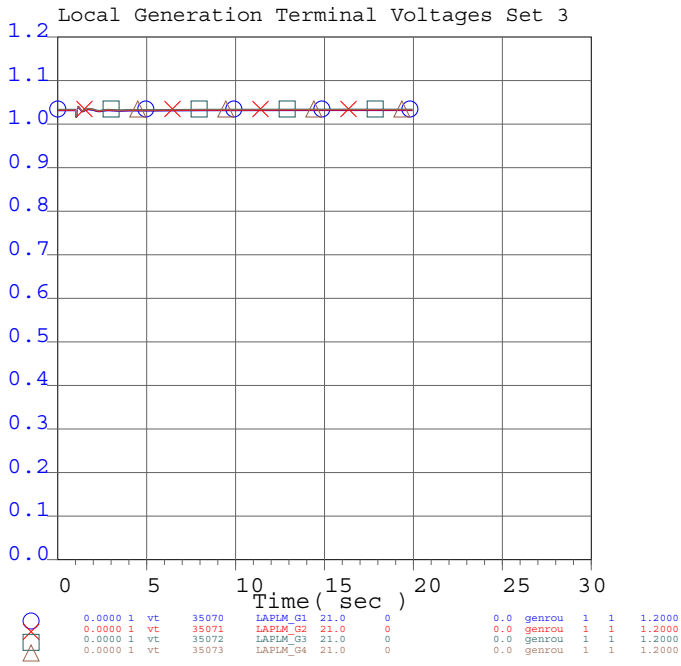
Local Generation Terminal Voltages Set 1



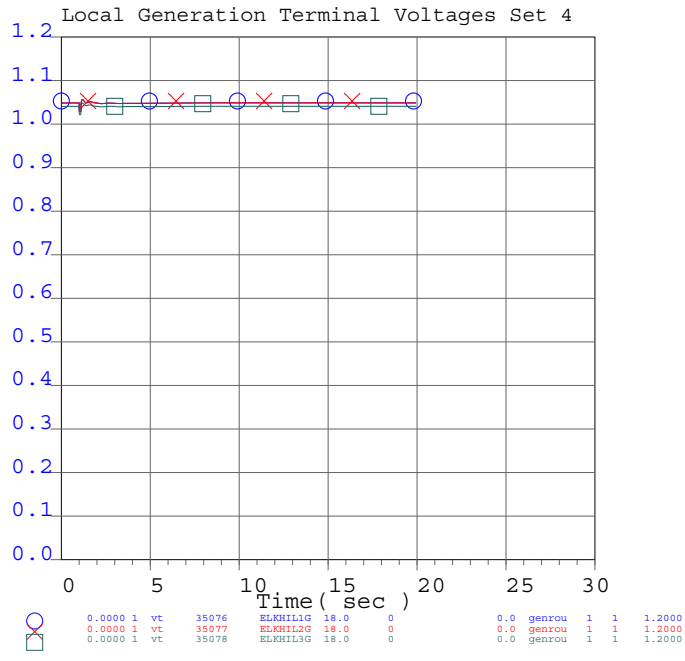
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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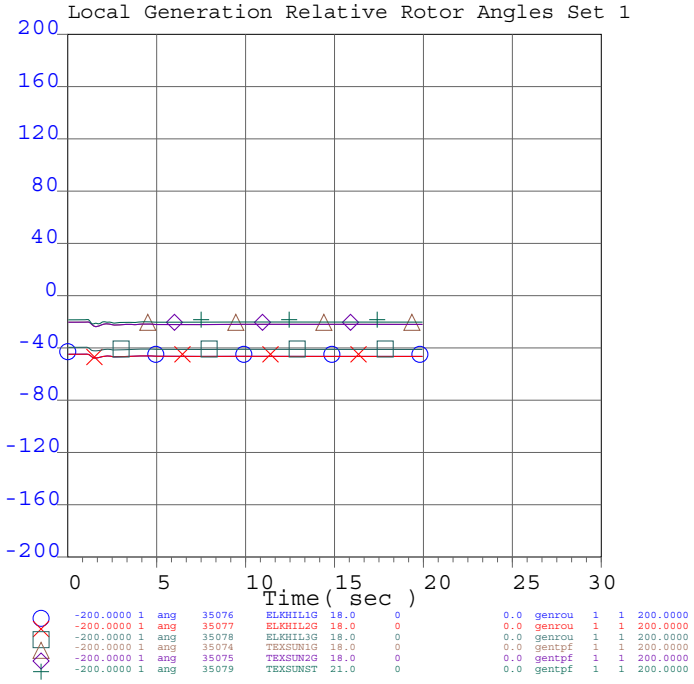
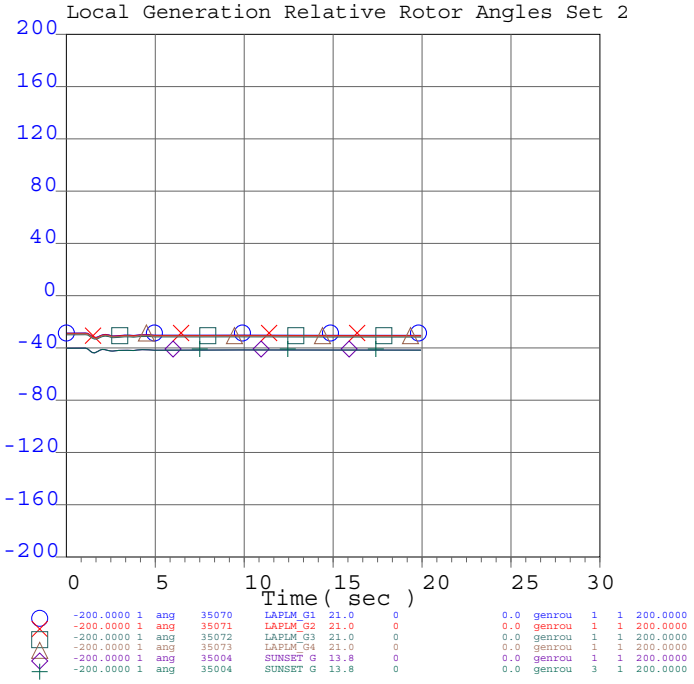
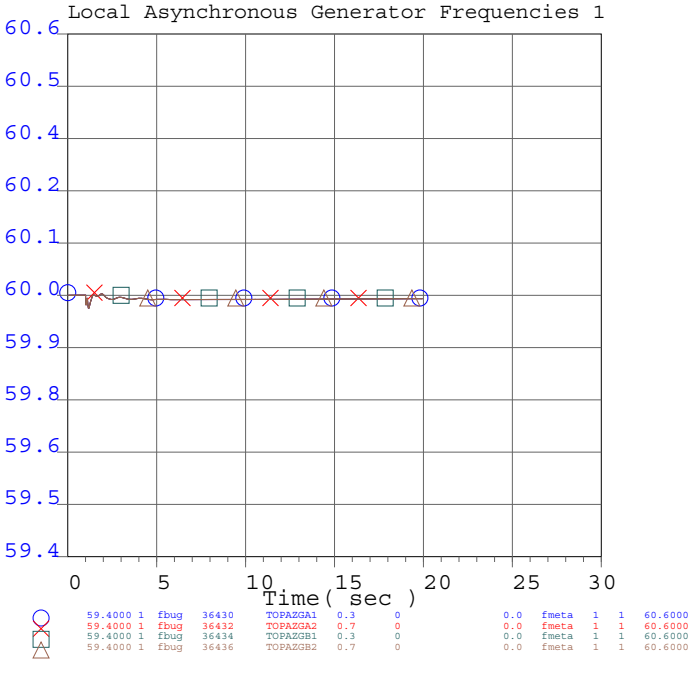
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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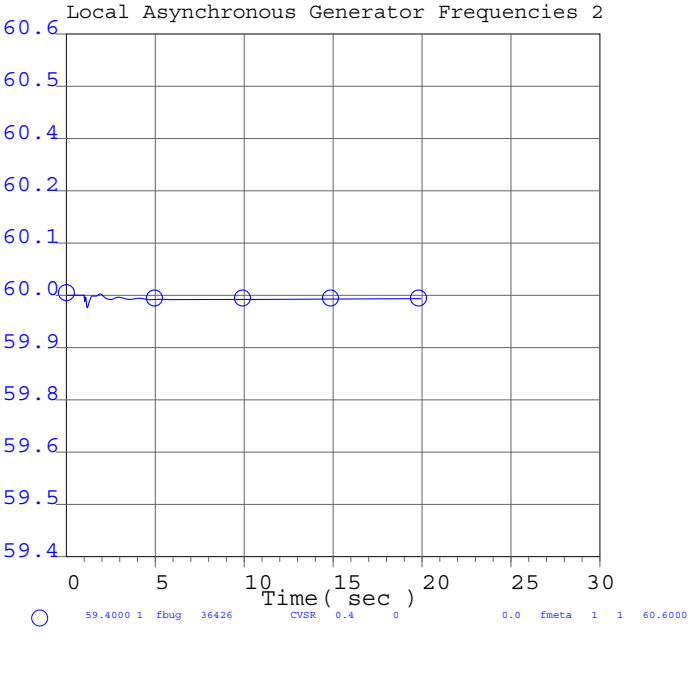
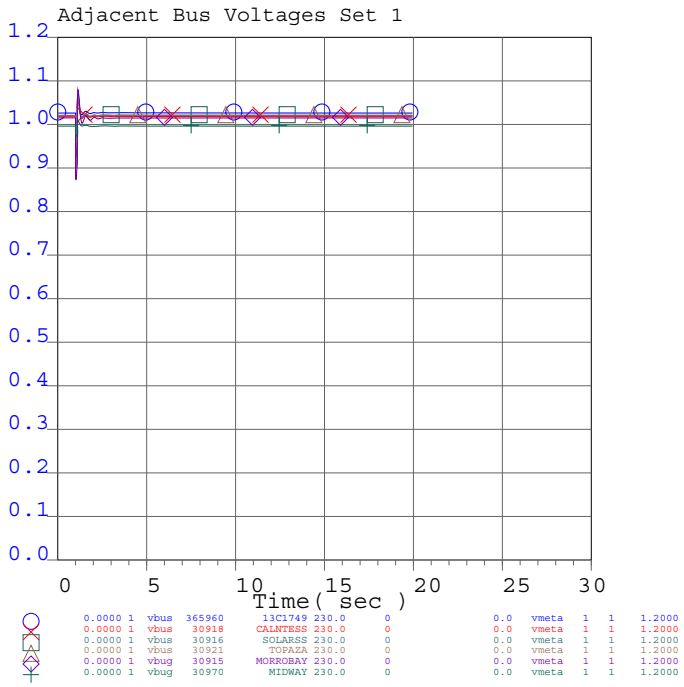
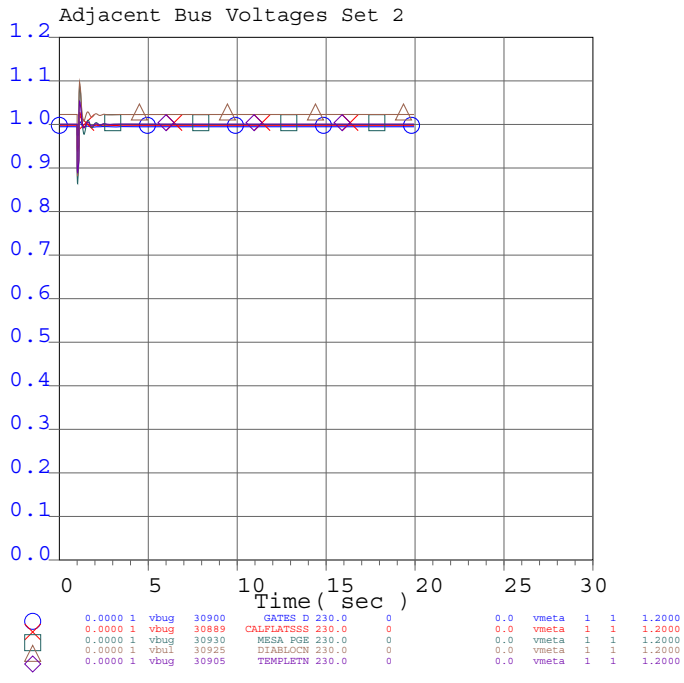
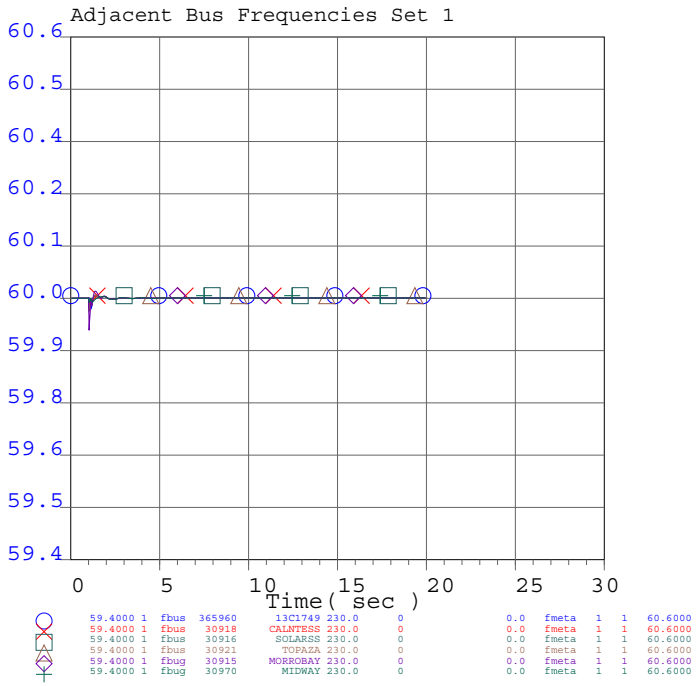


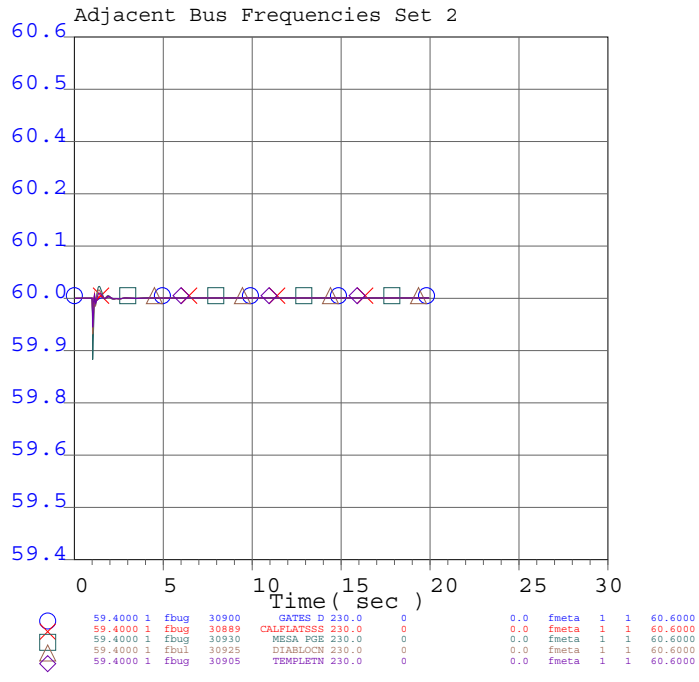
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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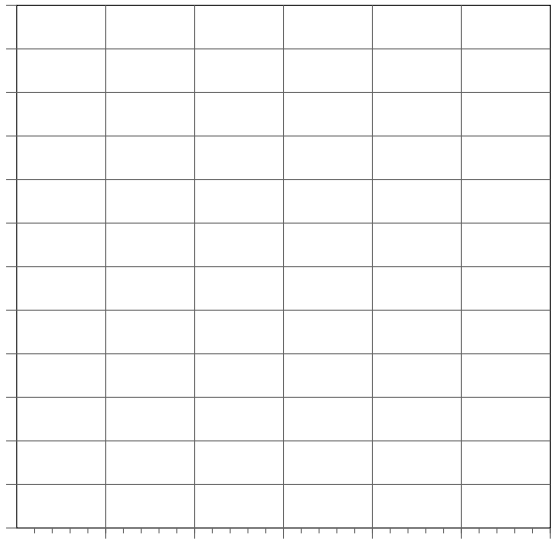
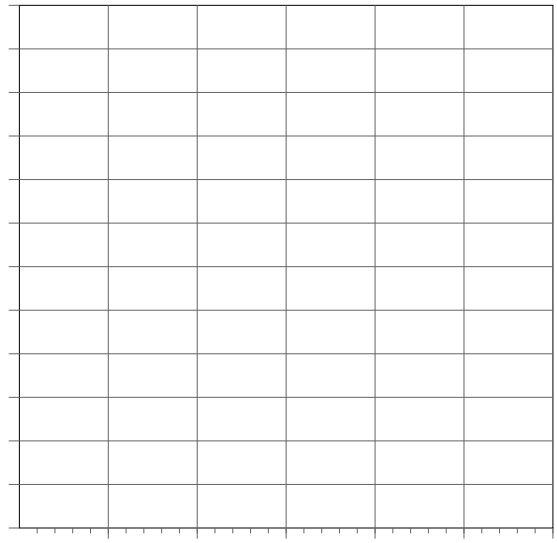
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

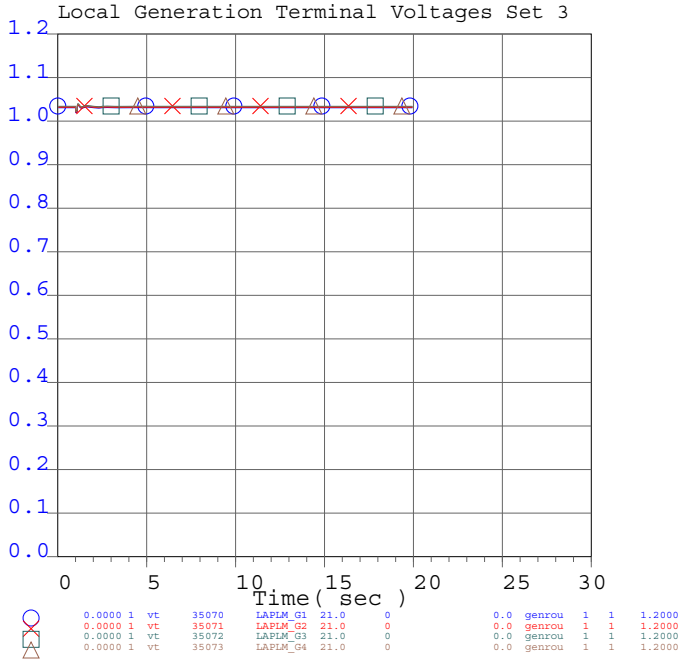
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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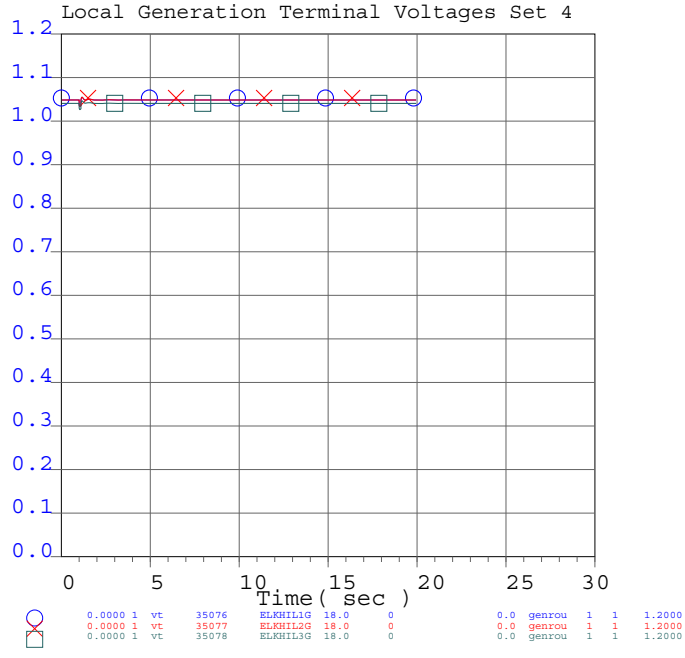
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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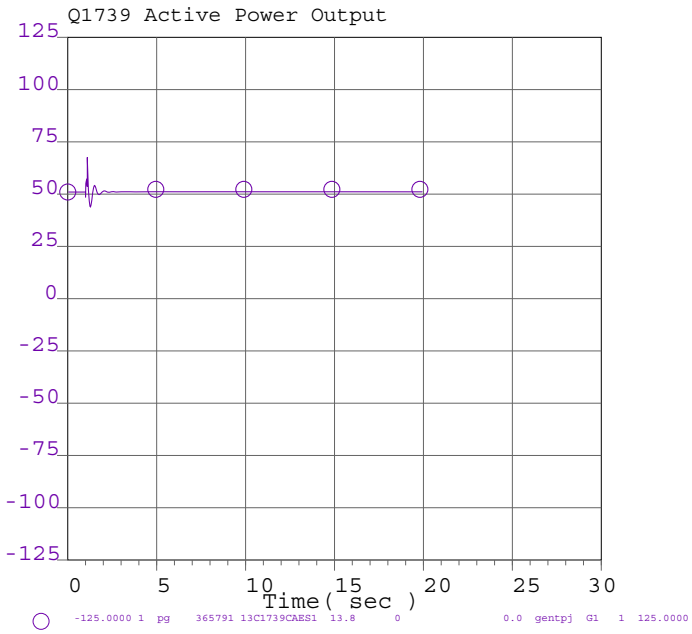
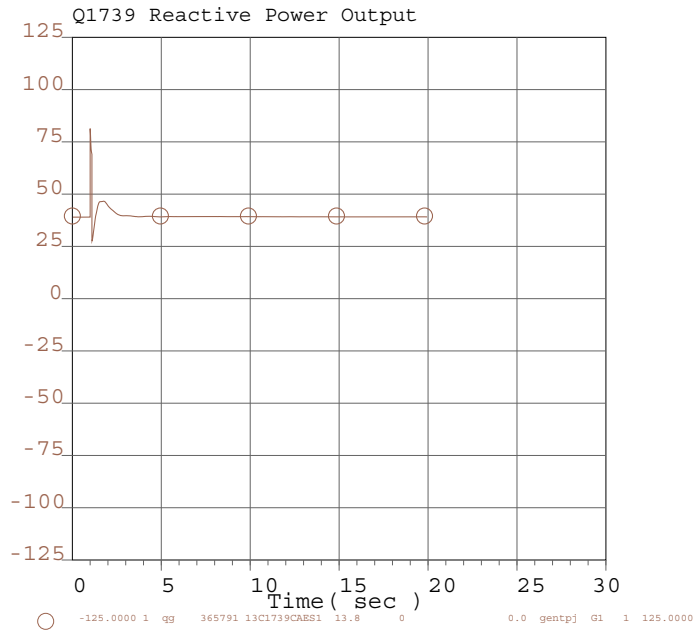
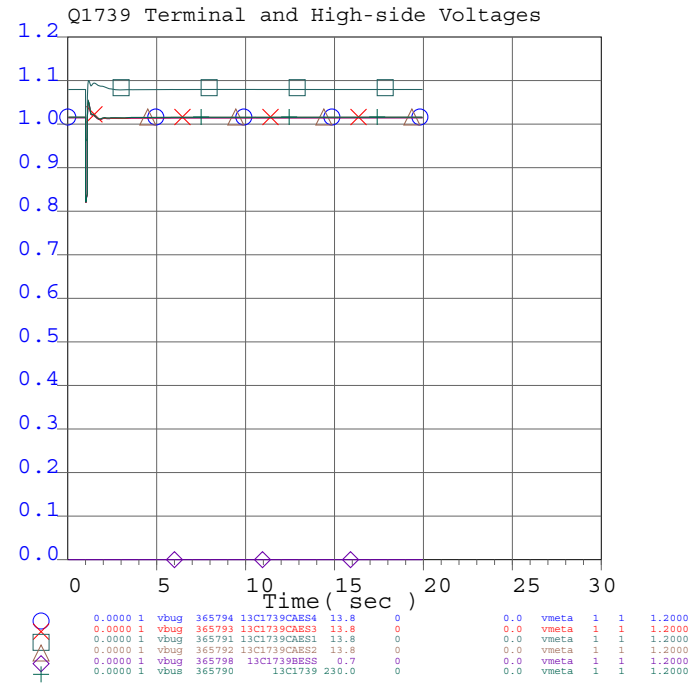
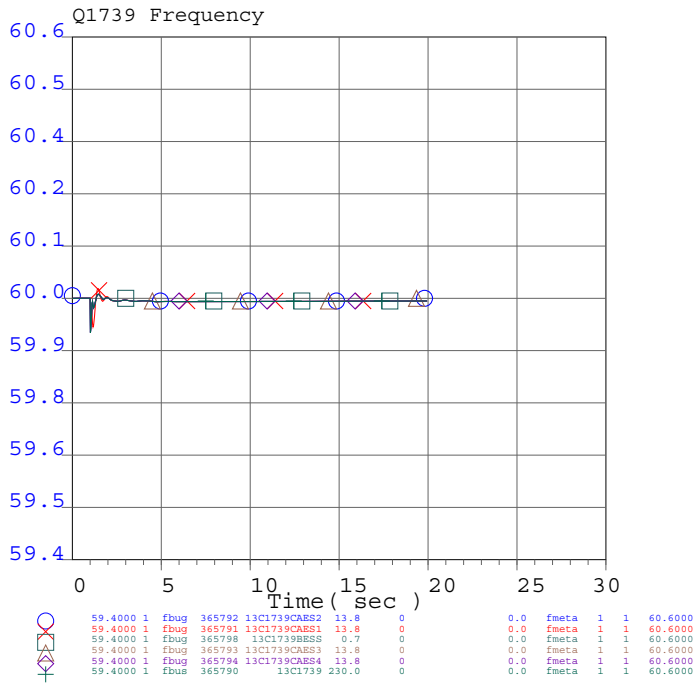
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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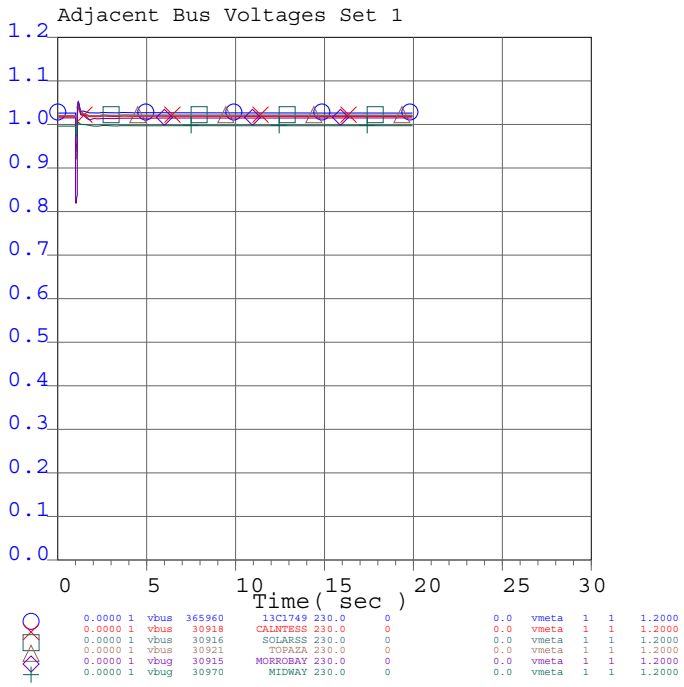

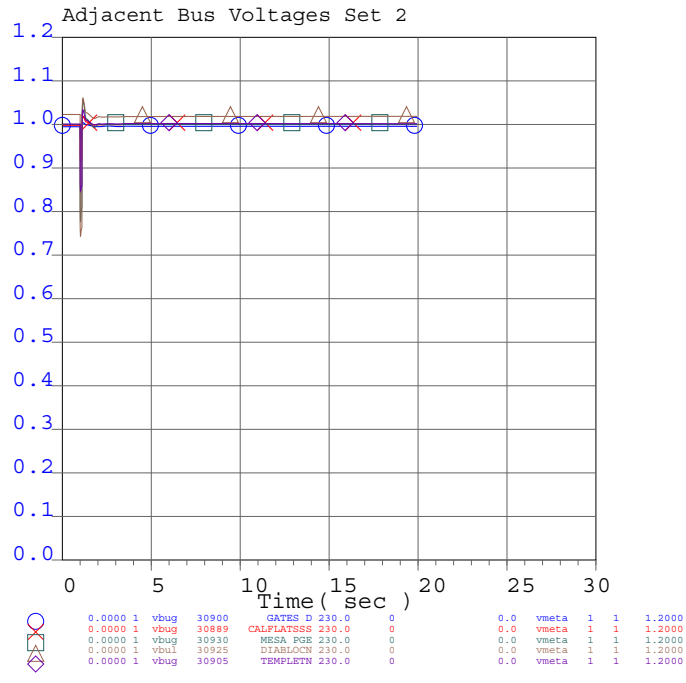

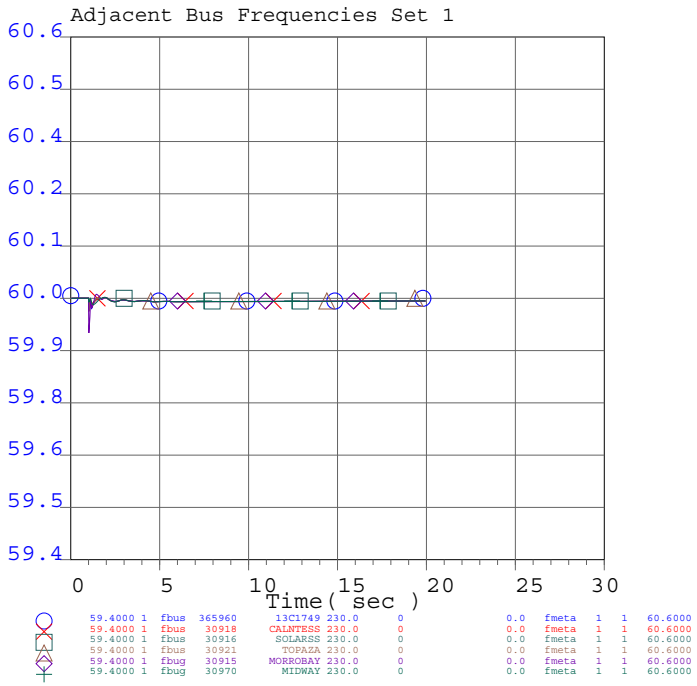

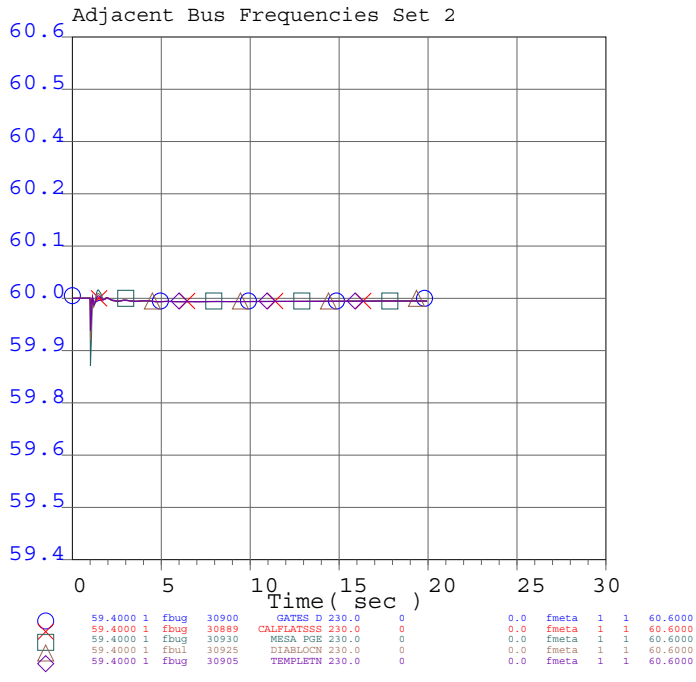

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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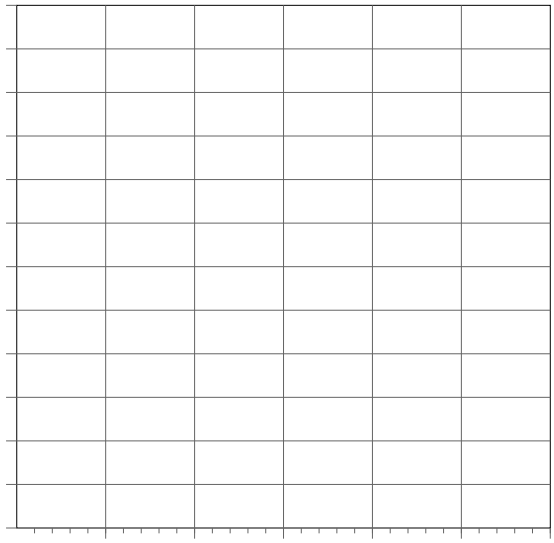
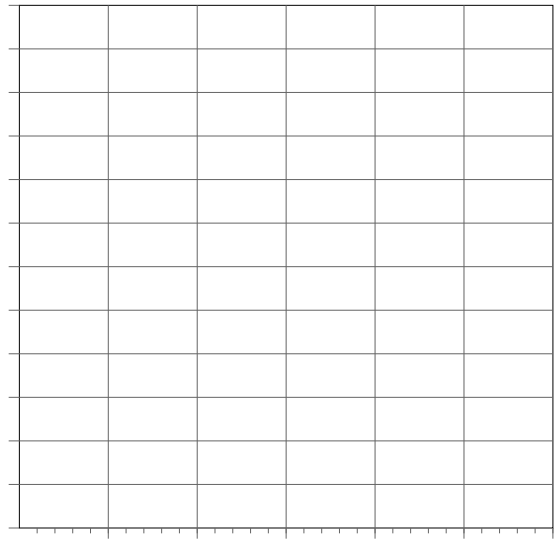
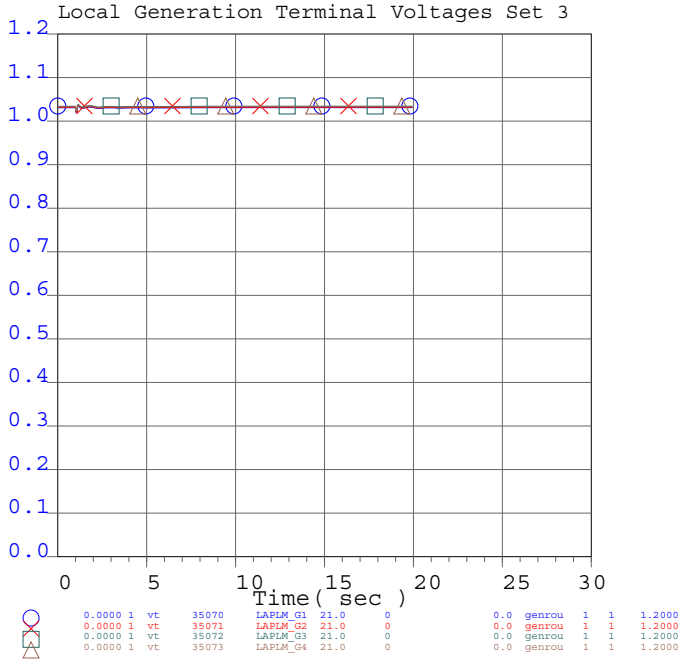
Local Generation Terminal Voltages Set 1



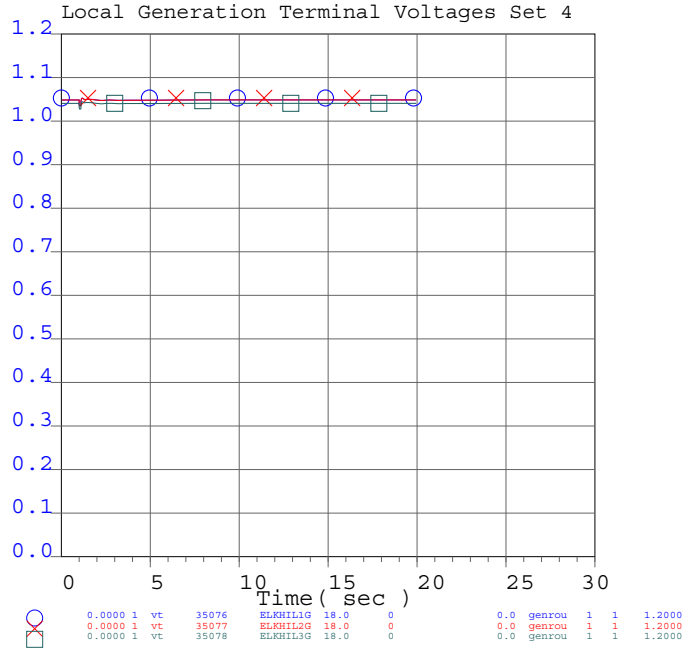
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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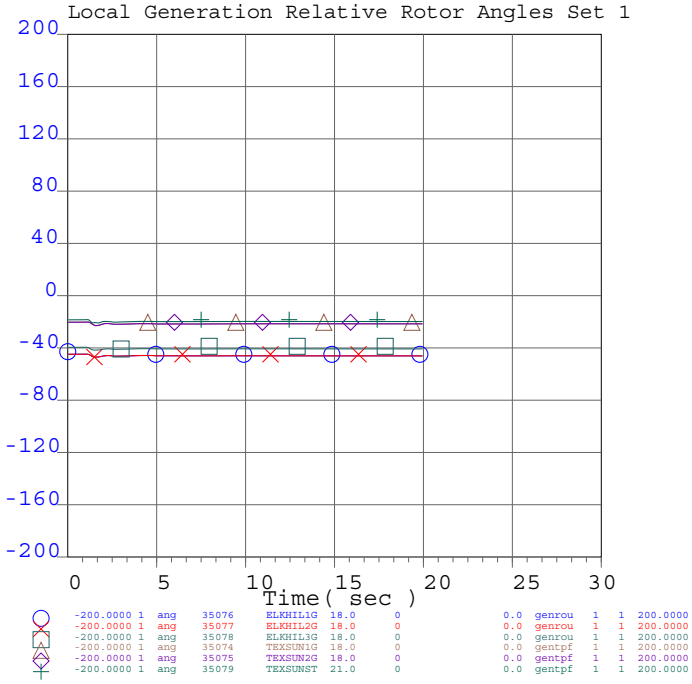
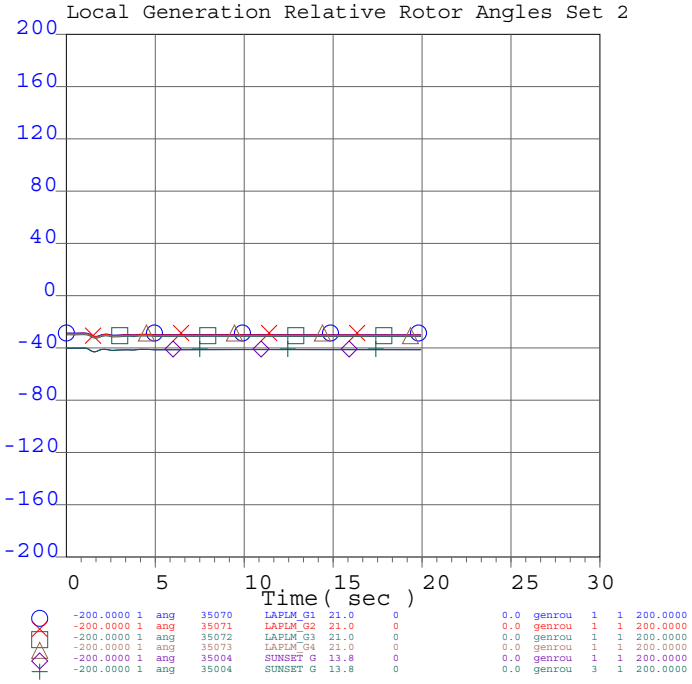
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

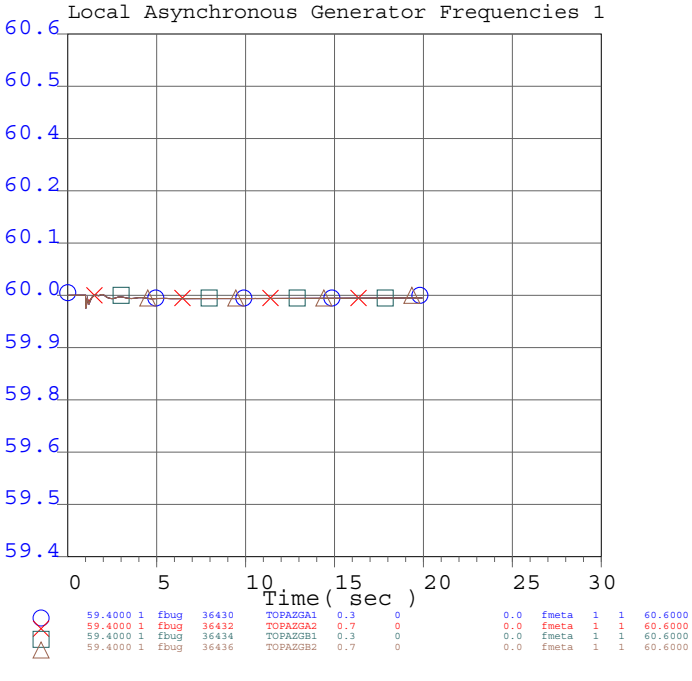
Local Generation Relative Rotor Angles Set 1



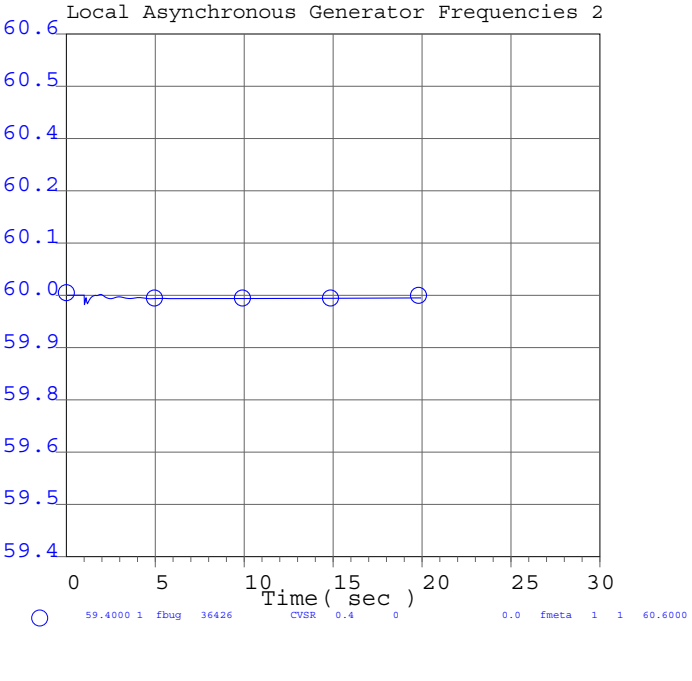
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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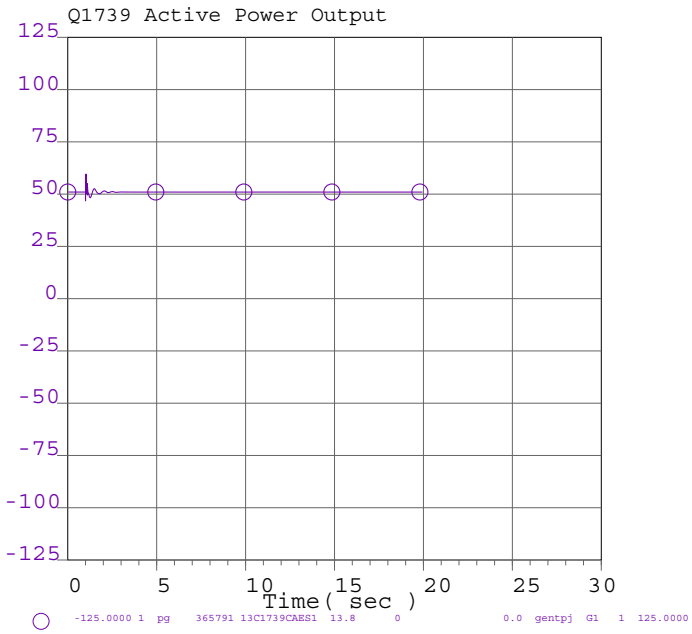
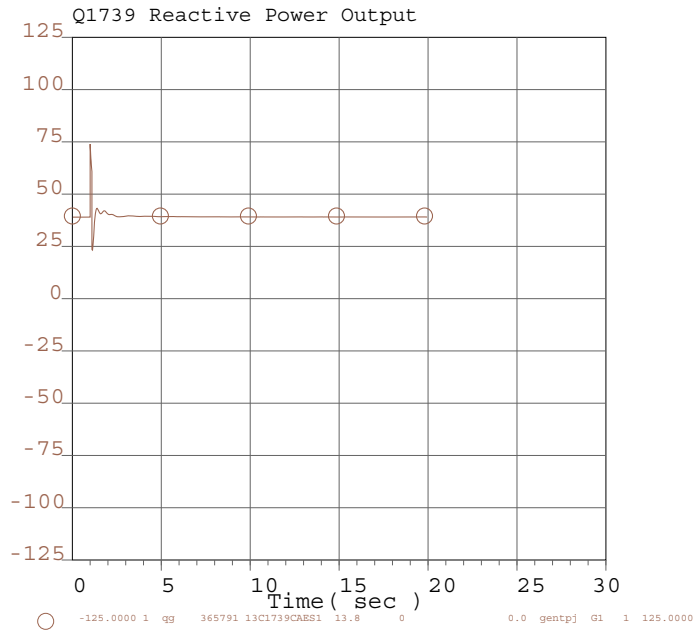
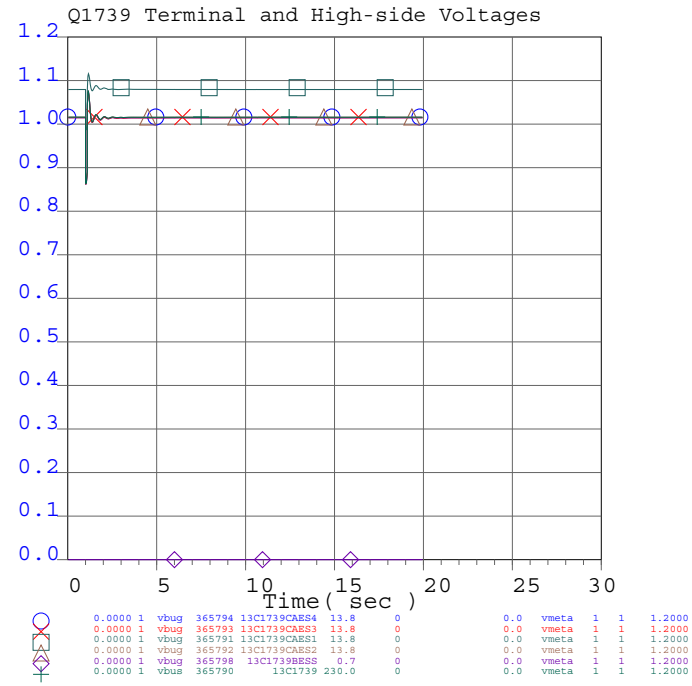
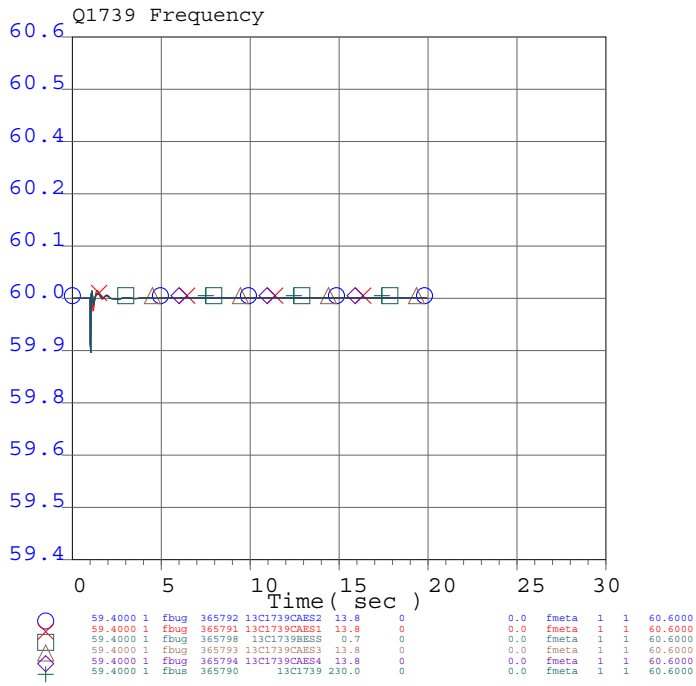
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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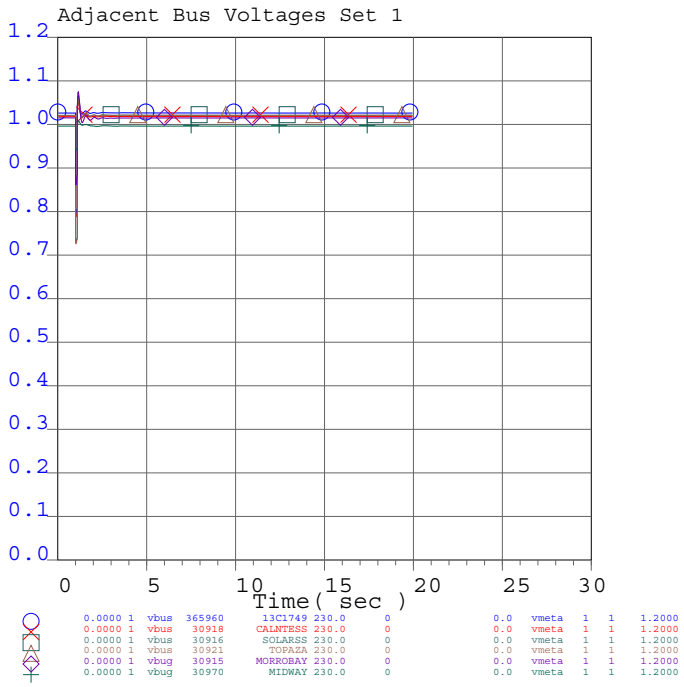

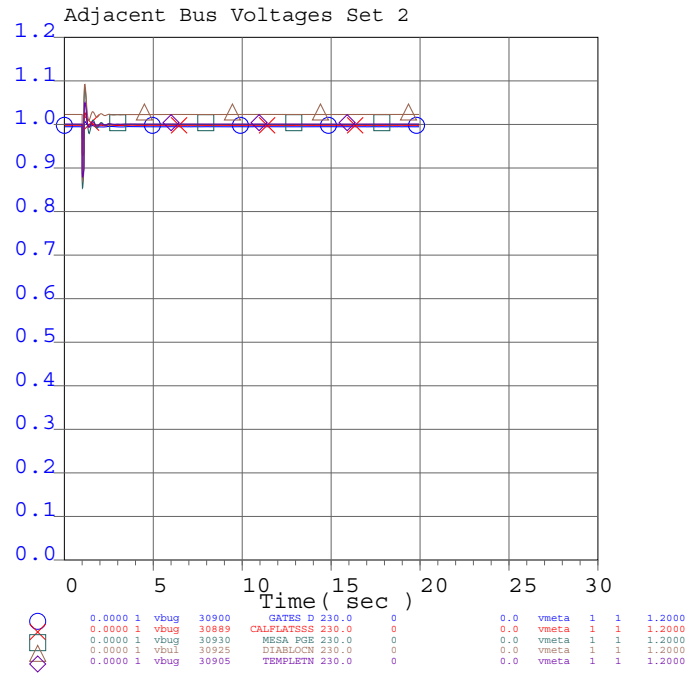

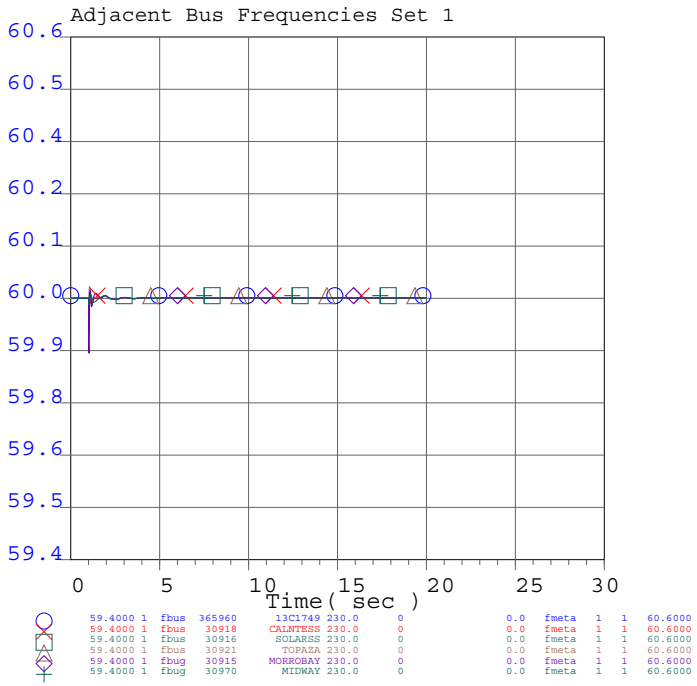

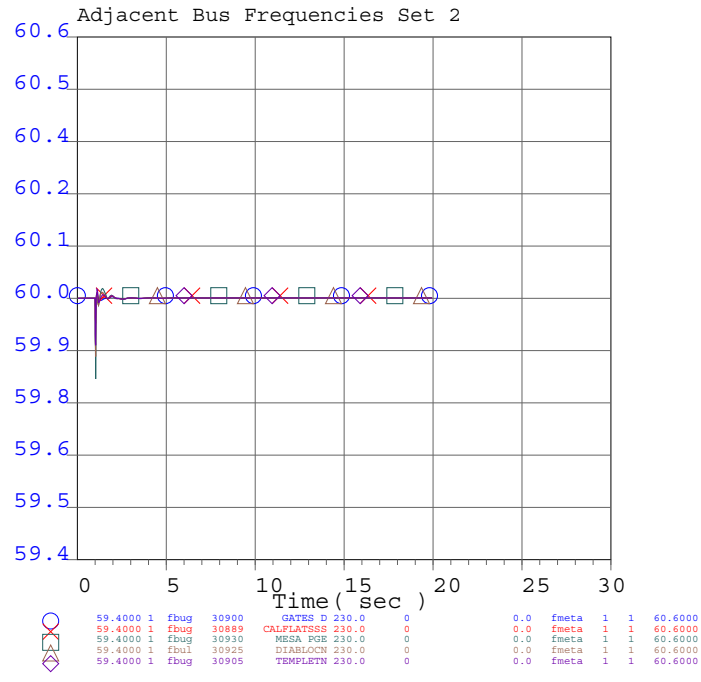

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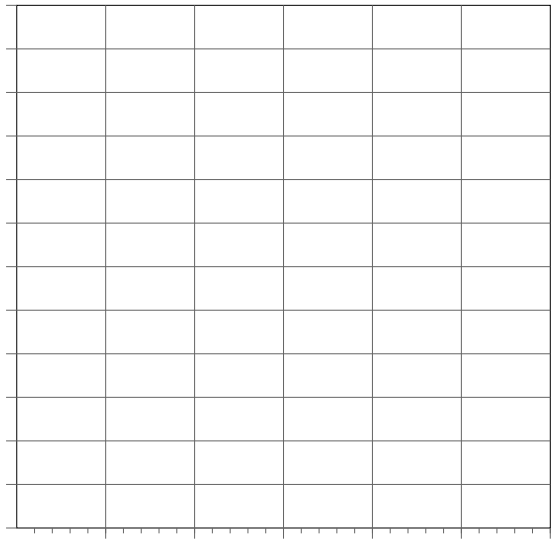
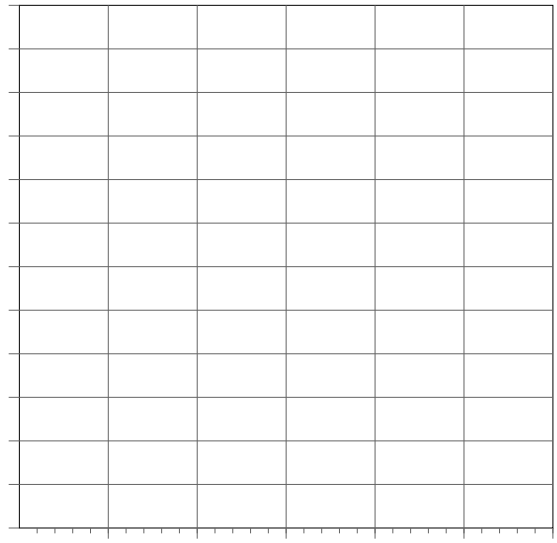
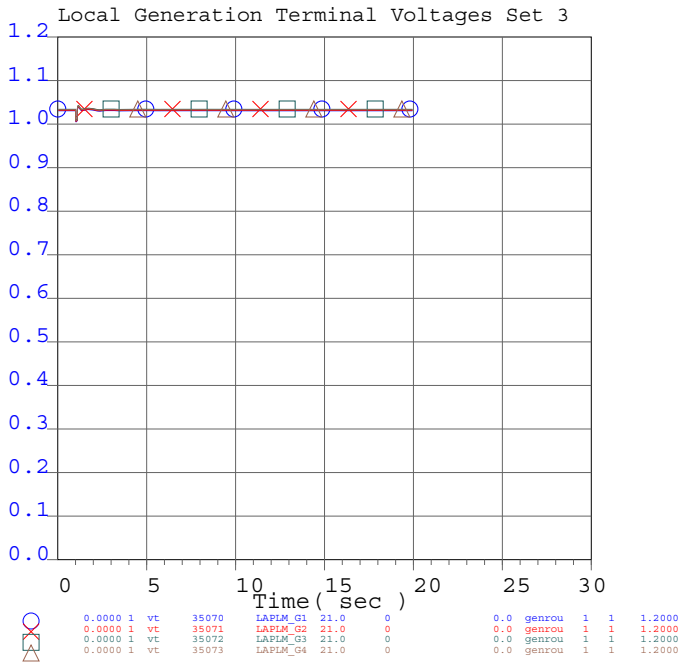
Local Generation Terminal Voltages Set 1



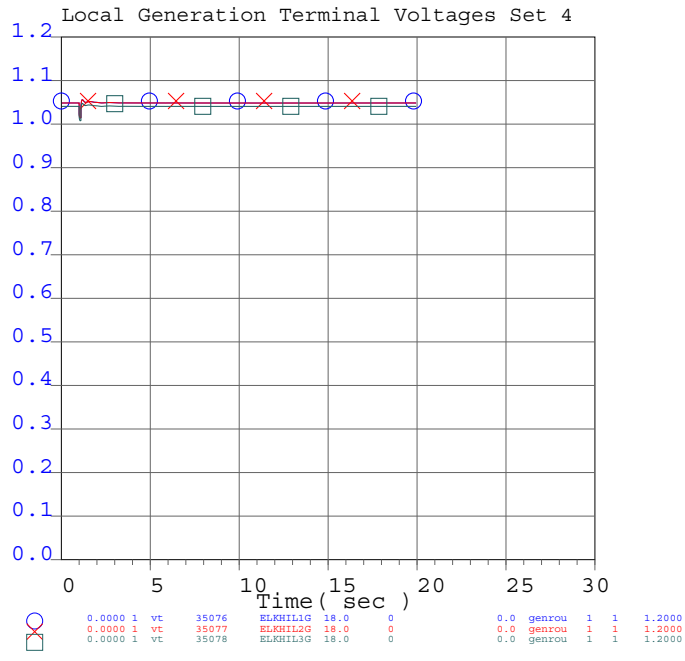
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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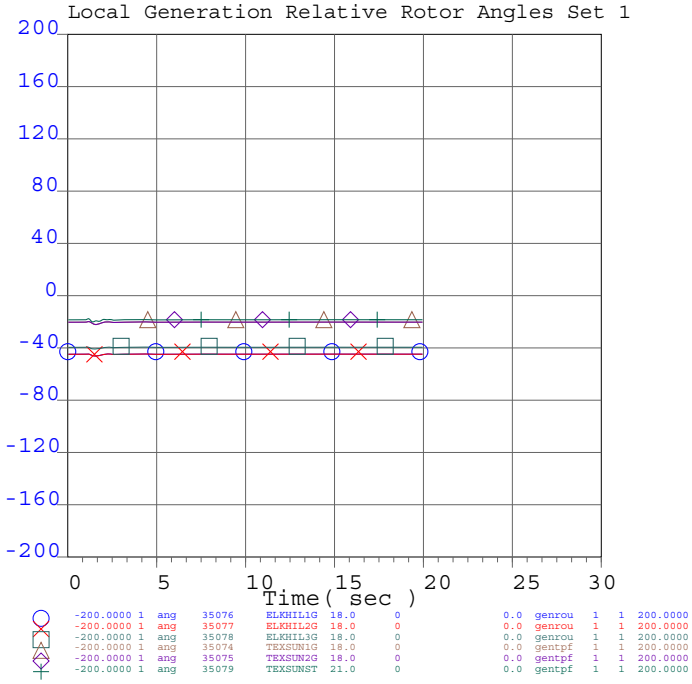
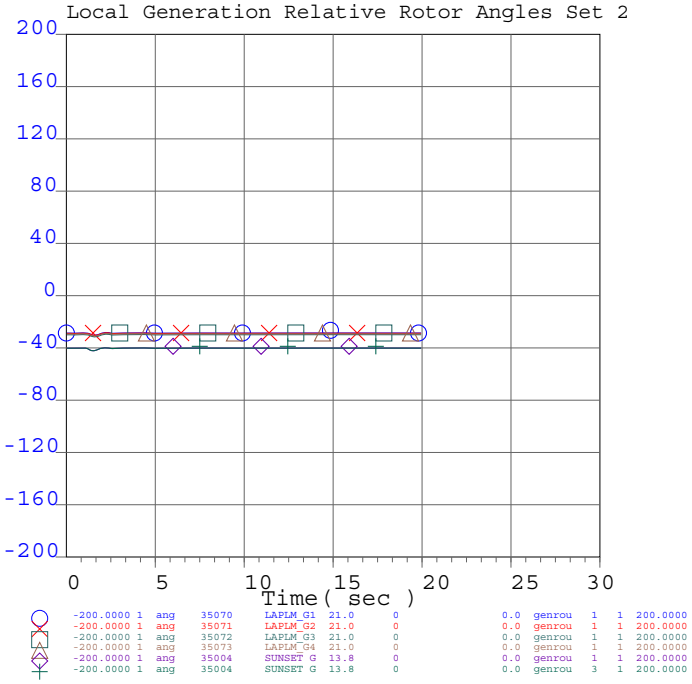
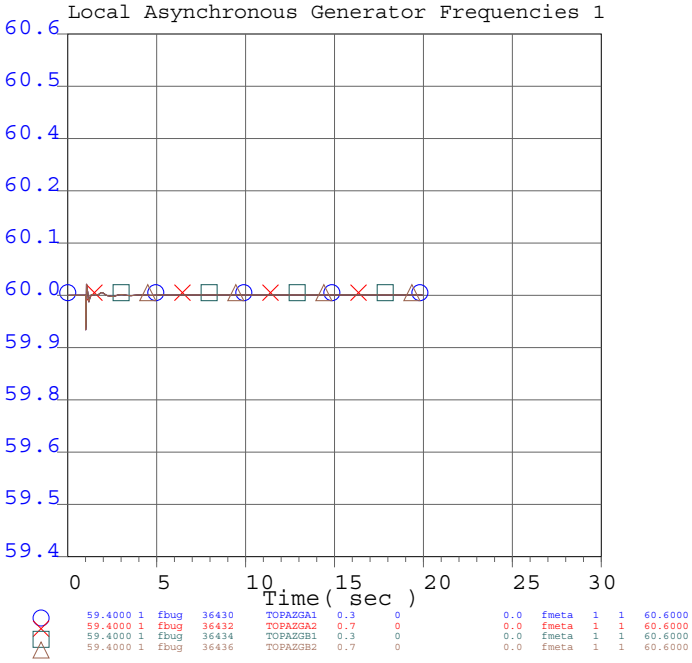
Local Generation Relative Rotor Angles Set 1



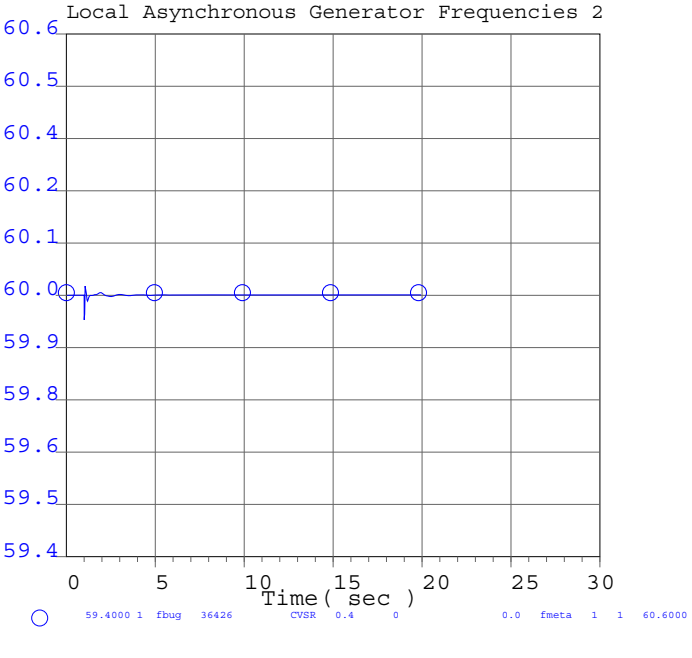
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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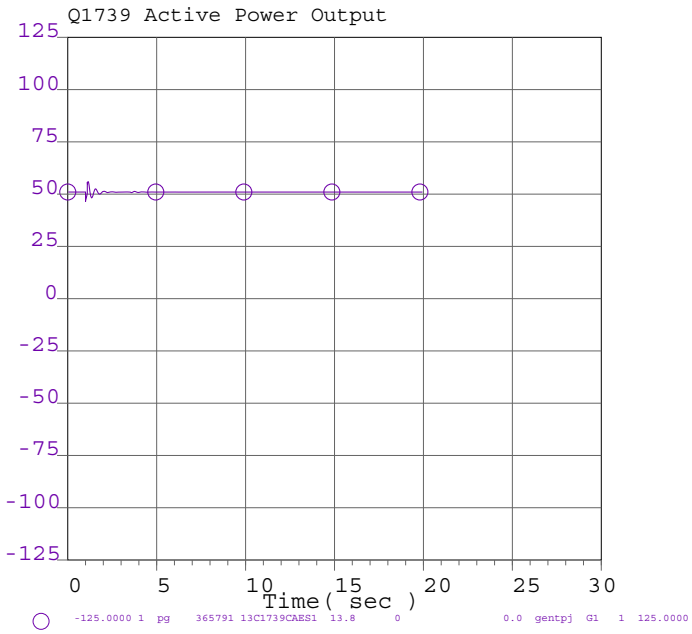

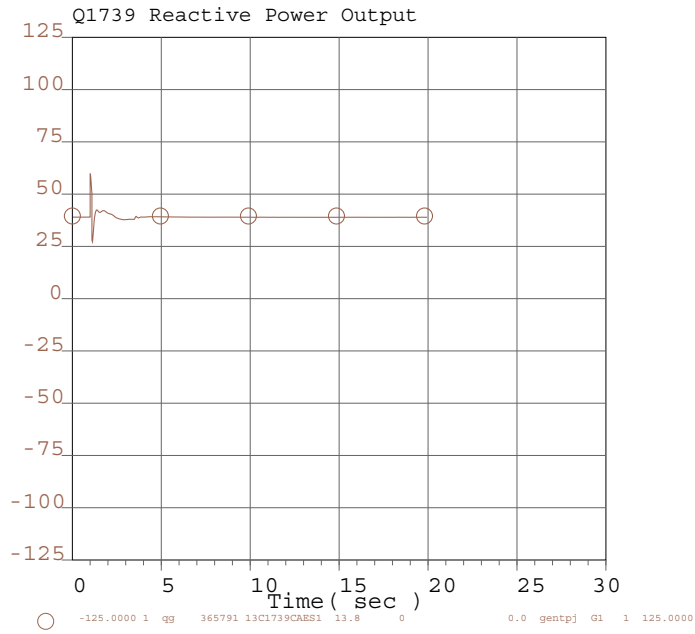

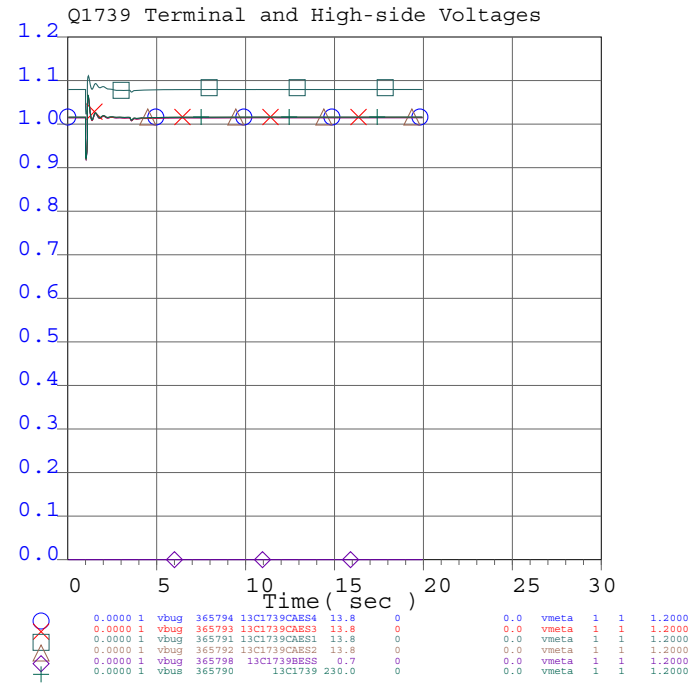

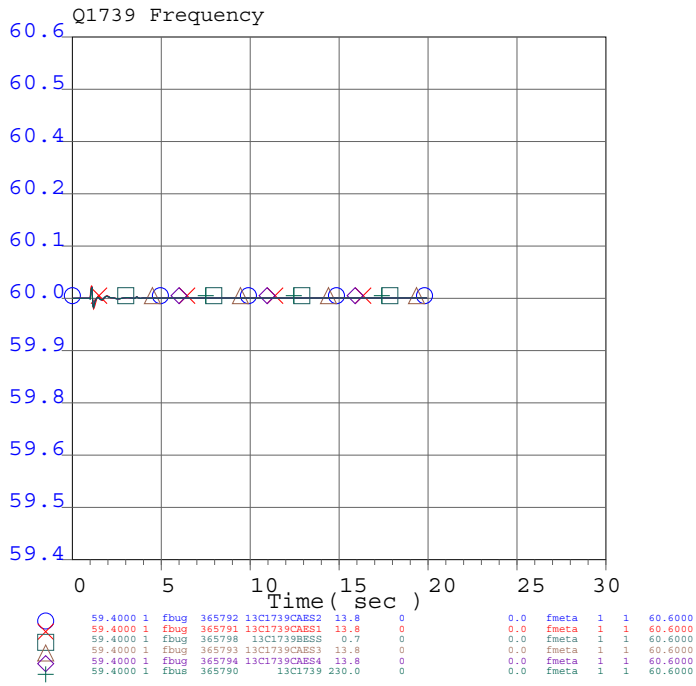

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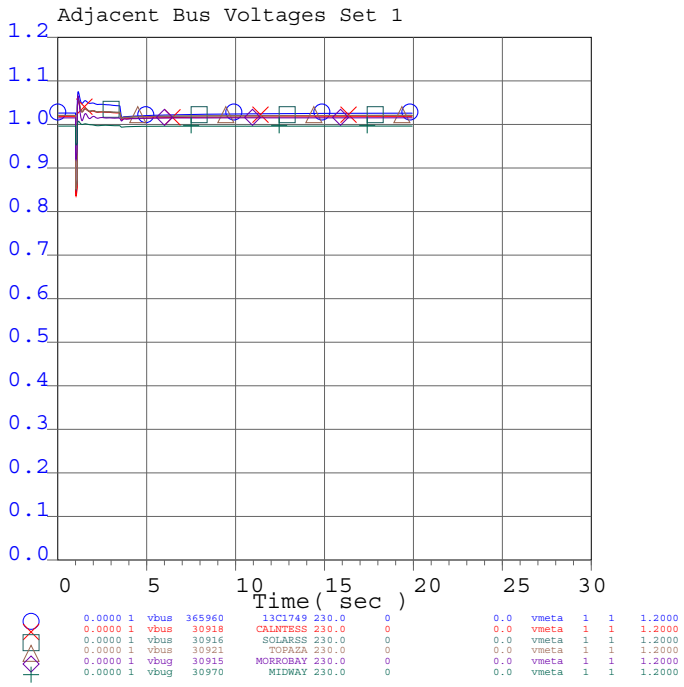
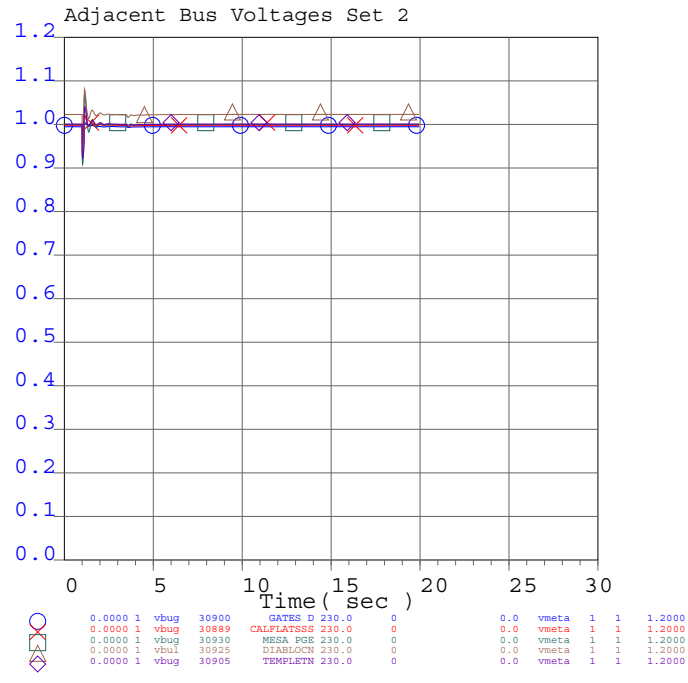
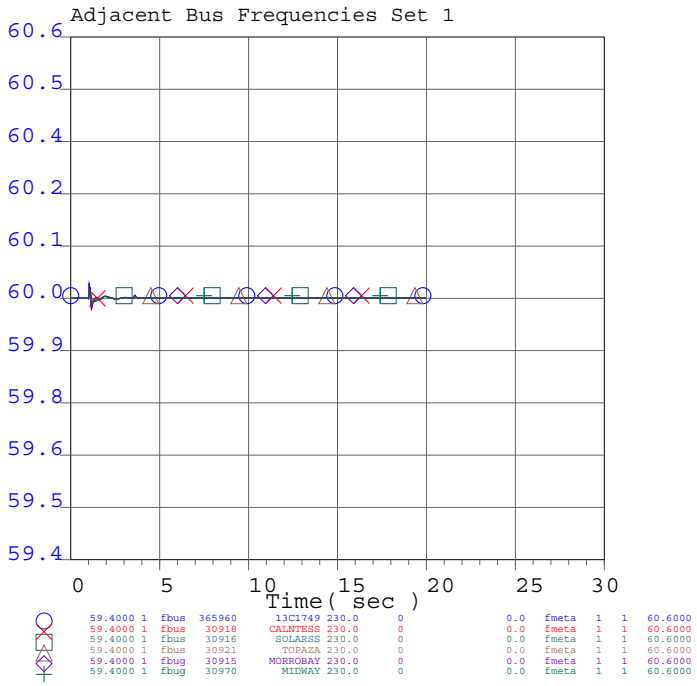
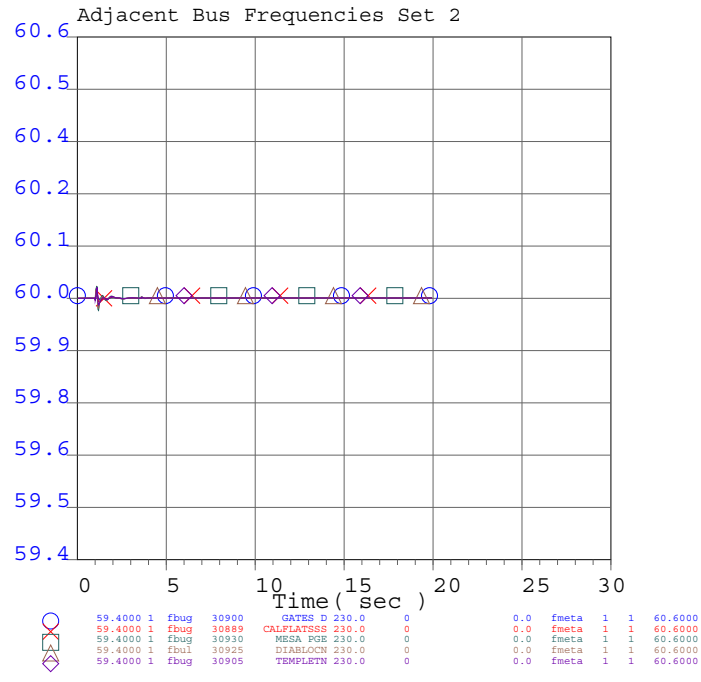
Q1739 (500 MW net): POI- Morro Bay 230 kV substation



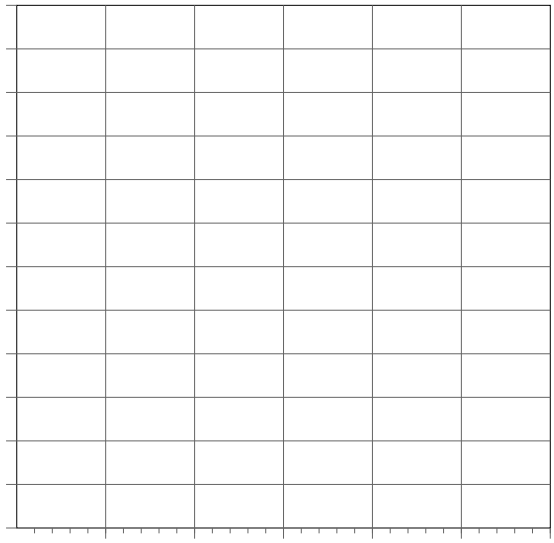




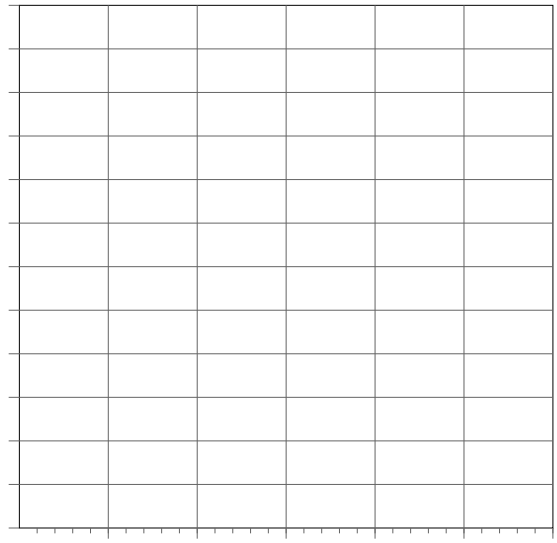


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

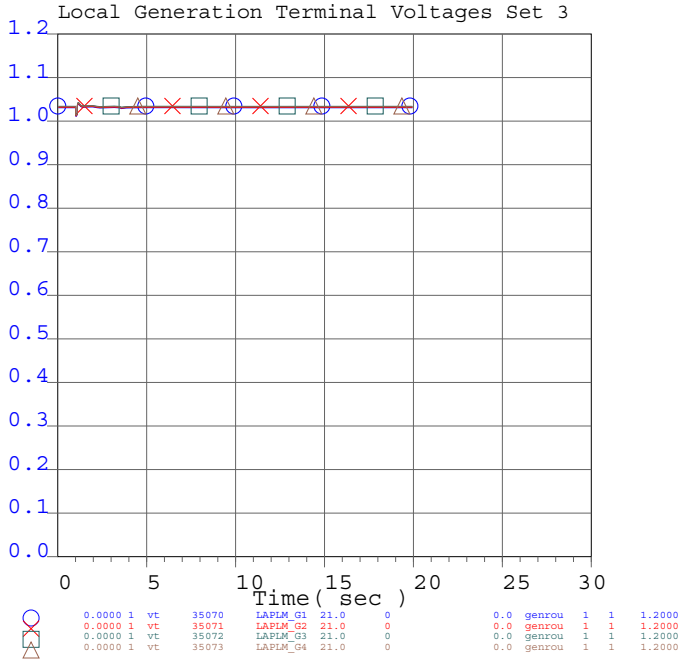
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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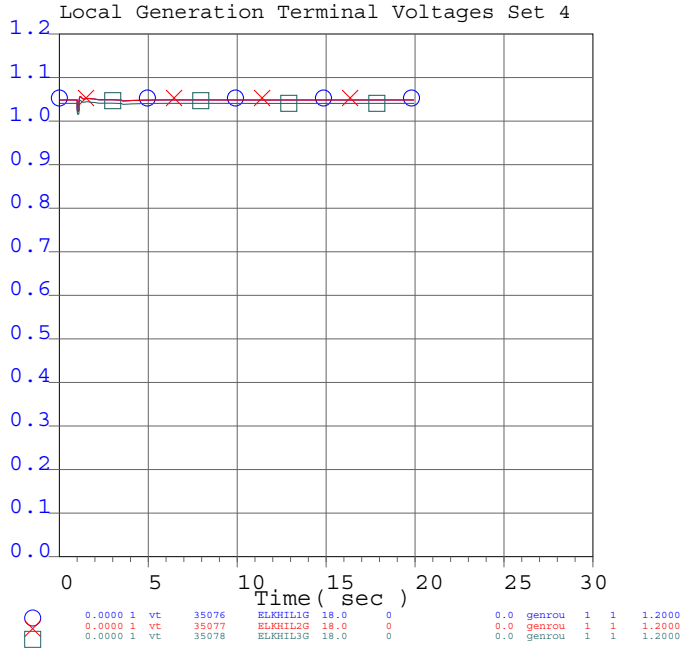
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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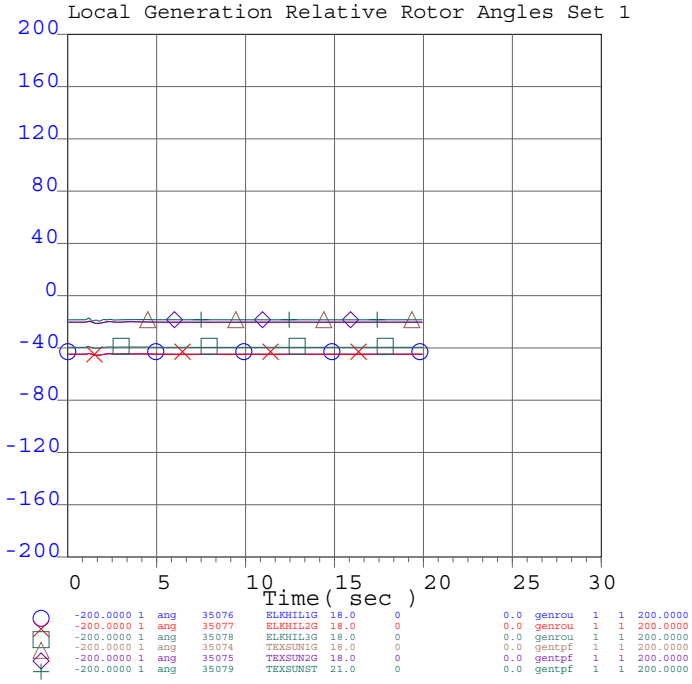
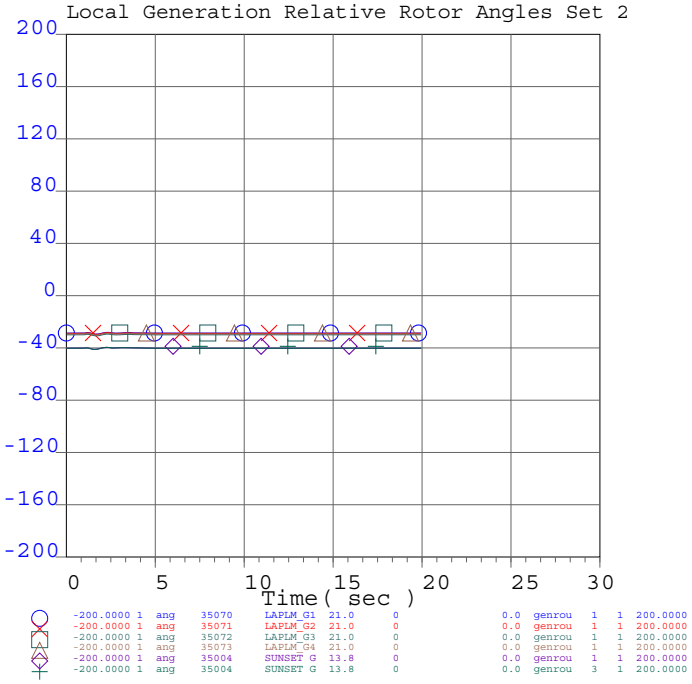
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

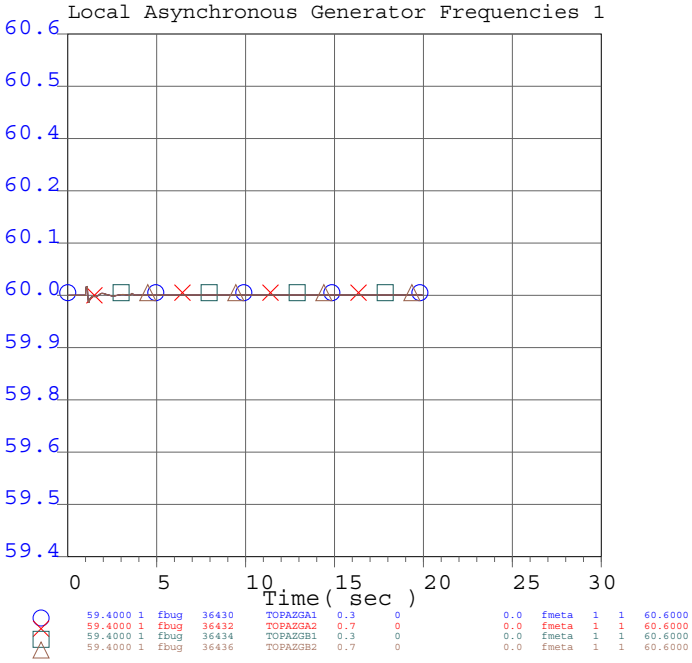
Local Generation Relative Rotor Angles Set 1



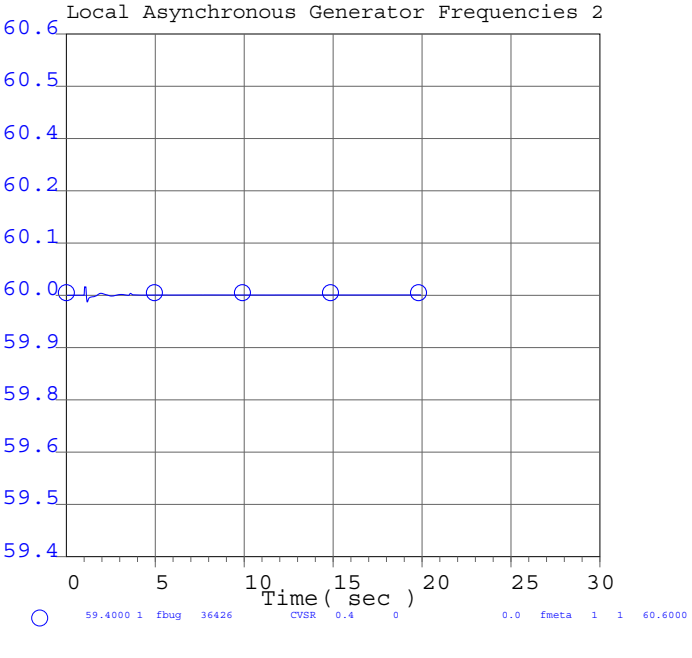
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

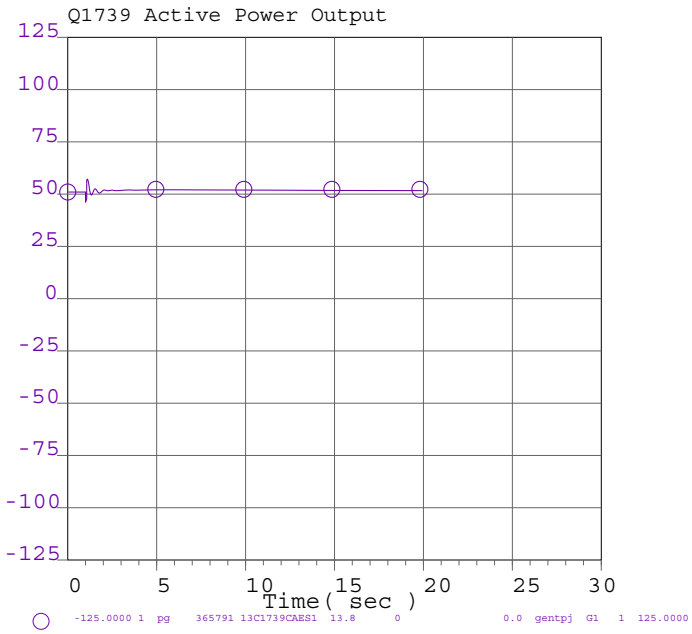


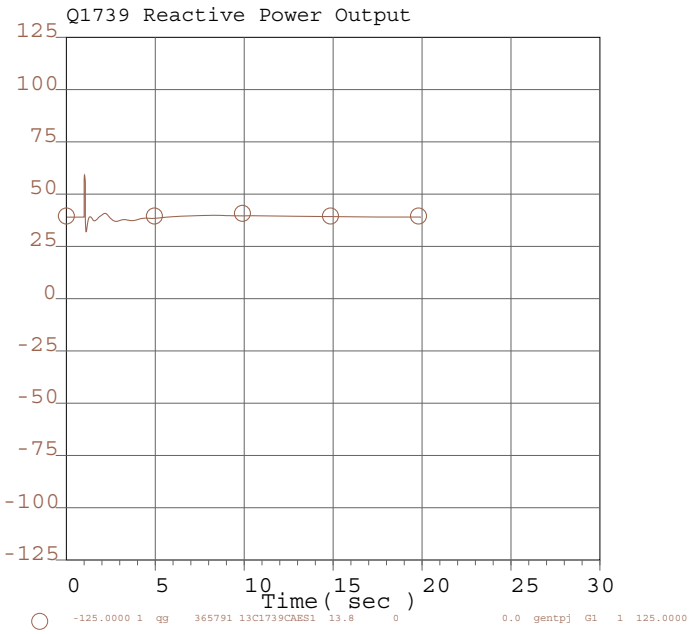
Local Asynchronous Generator Frequencies 2

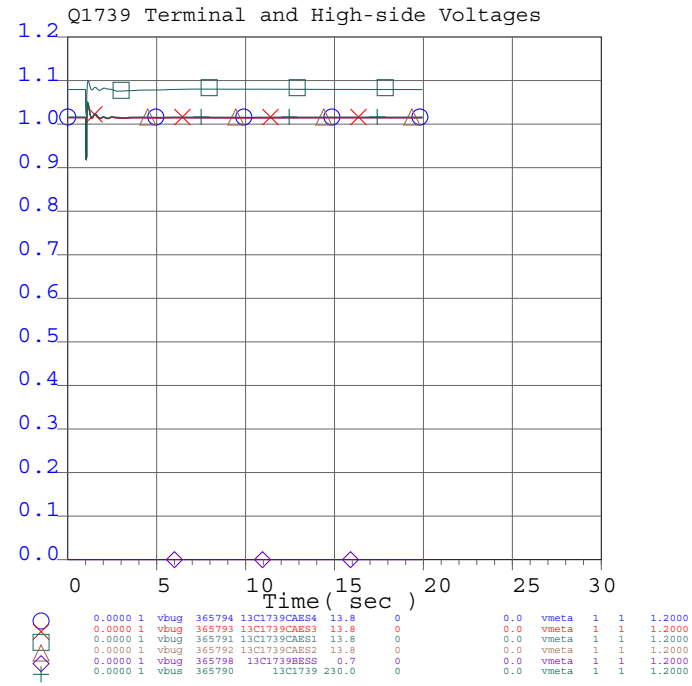


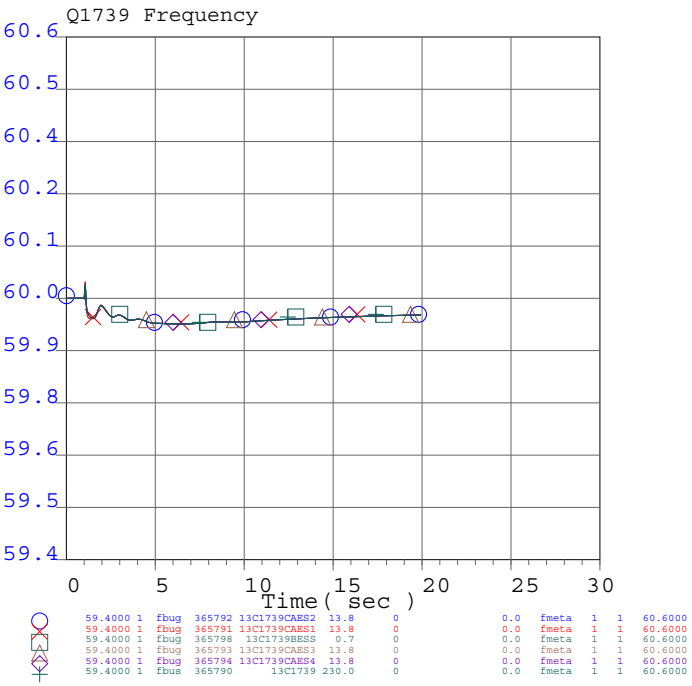
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation

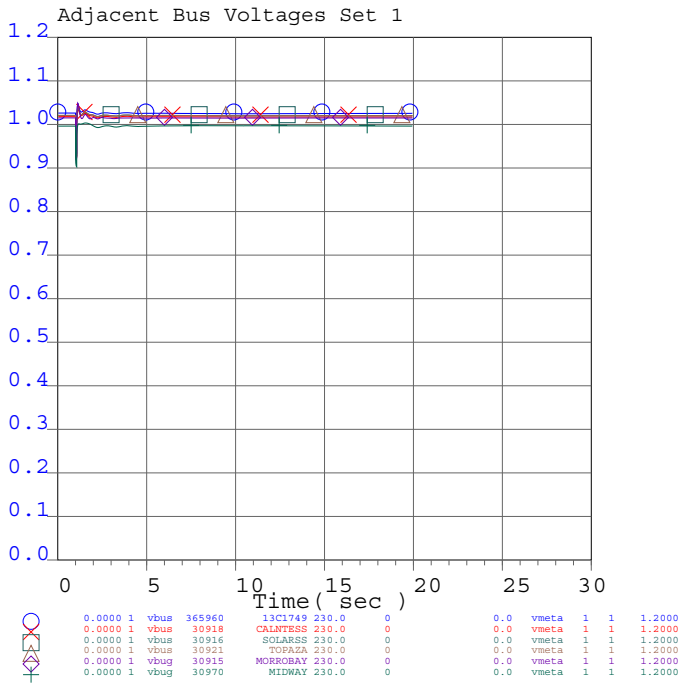


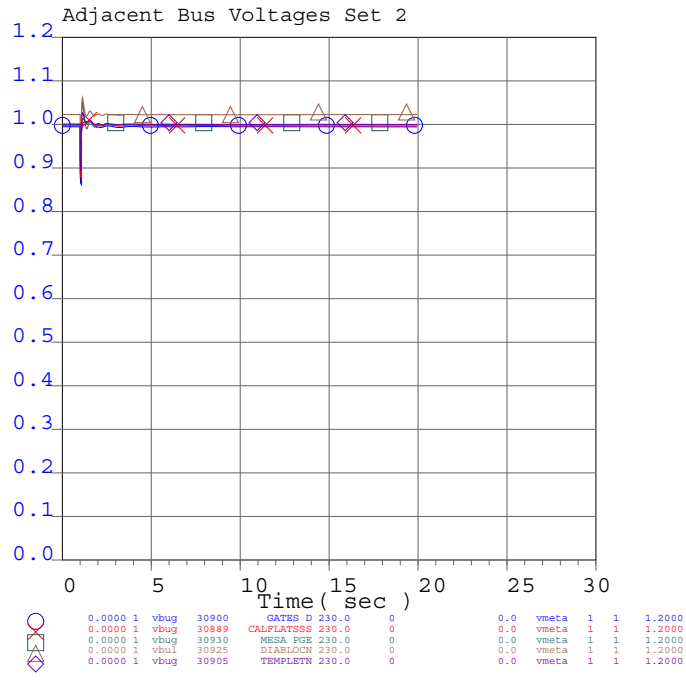


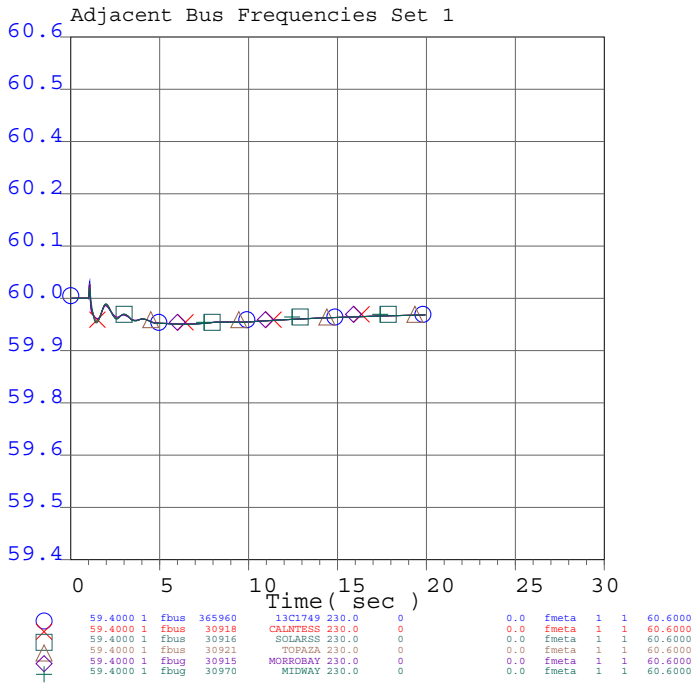


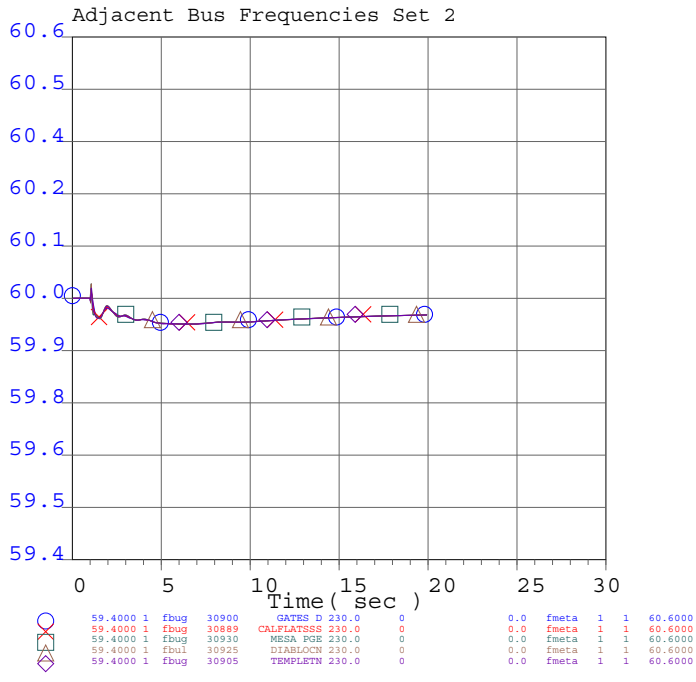


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



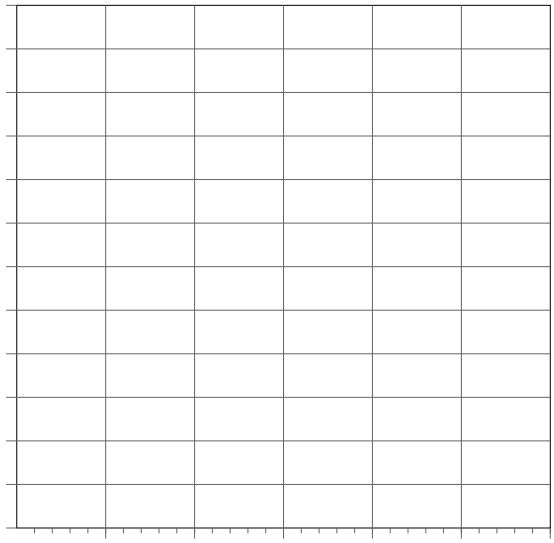




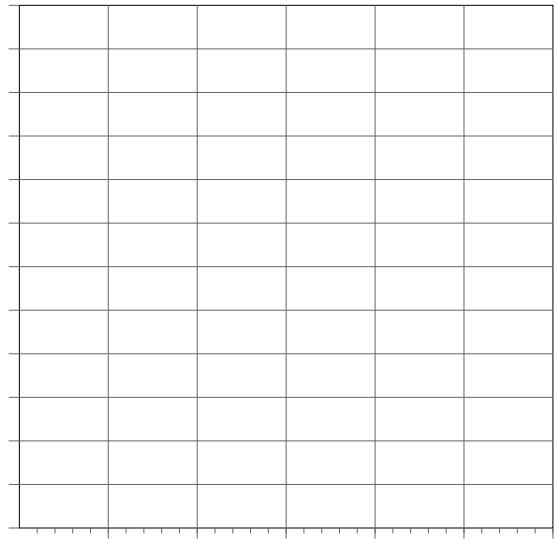


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

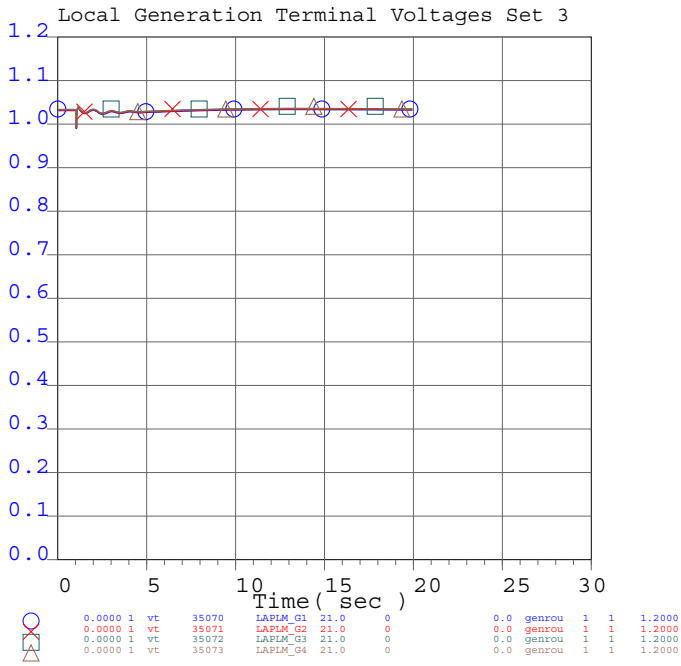
Local Generation Terminal Voltages Set 1



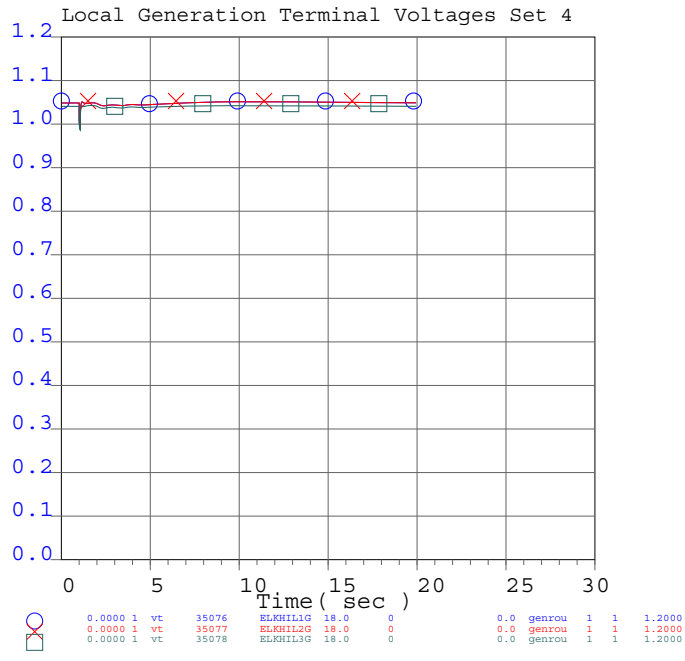
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

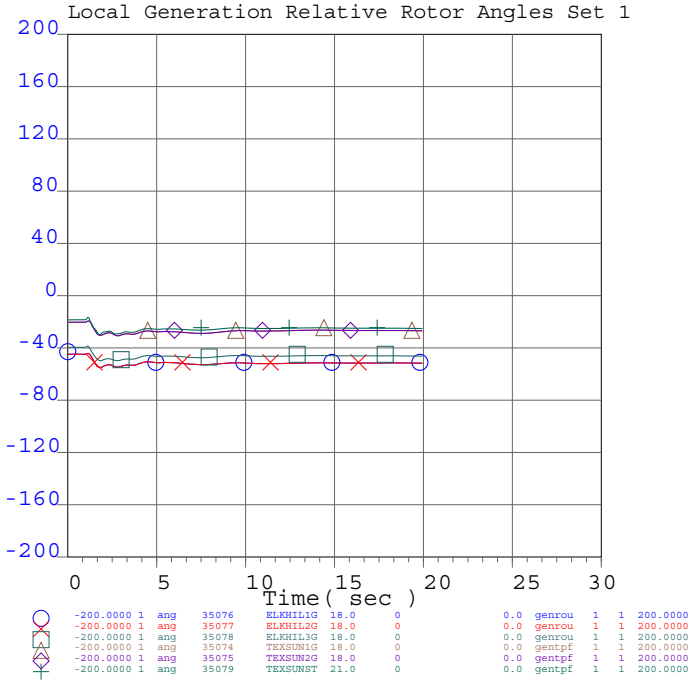


Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Local Generation Relative Rotor Angles Set 1



-200.0000 1 ang 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 200.0000
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-200.0000 1 ang 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35074 TEXSUN1G 18.0 0 0.0 gentpf 1 1 200.0000
-200.0000 1 ang 35075 TEXSUN2G 18.0 0 0.0 gentpf 1 1 200.0000
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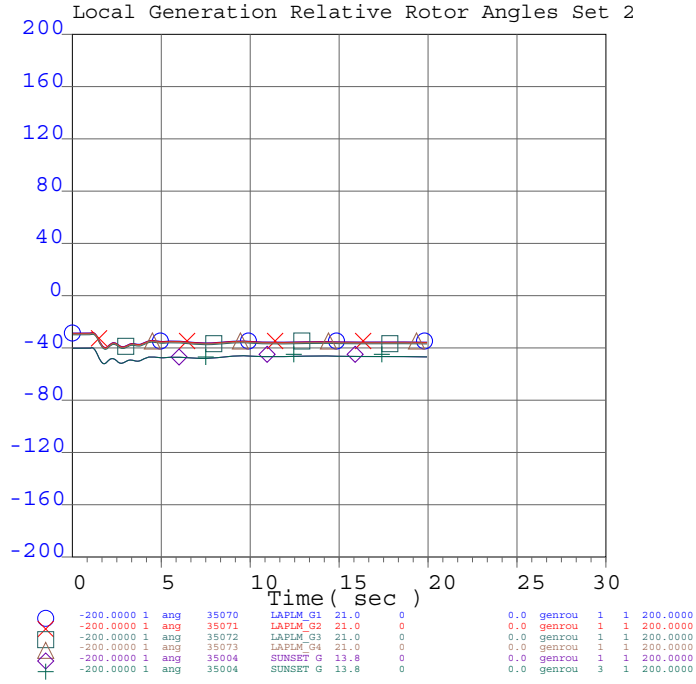
Local Generation Relative Rotor Angles Set 2



-200.0000 1 ang 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 200.0000
-200.0000 1 ang 35004 SUNSET G 13.8 0 0.0 genrou 1 1 200.0000
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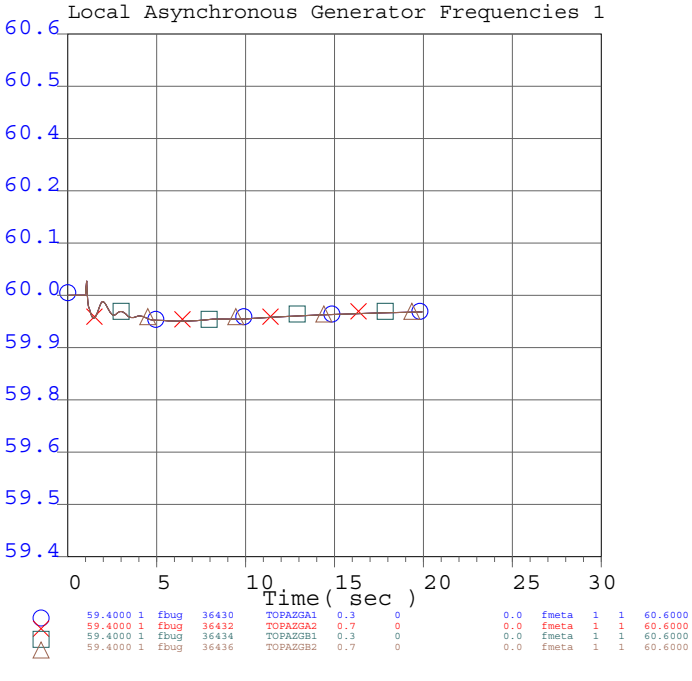
Local Asynchronous Generator Frequencies 1



59.4000 1 fbug 36430 TOPAZGA1 0.3 0 0.0 fmeta 1 1 60.6000
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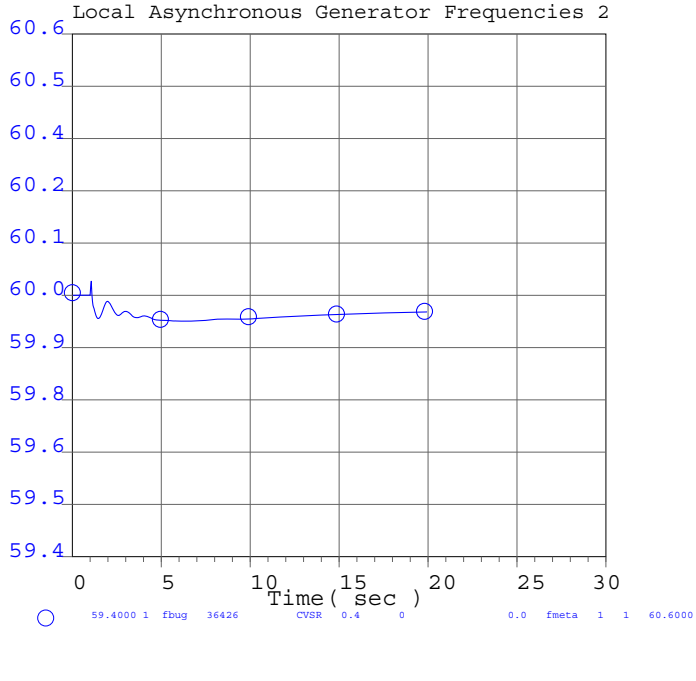
Local Asynchronous Generator Frequencies 2



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PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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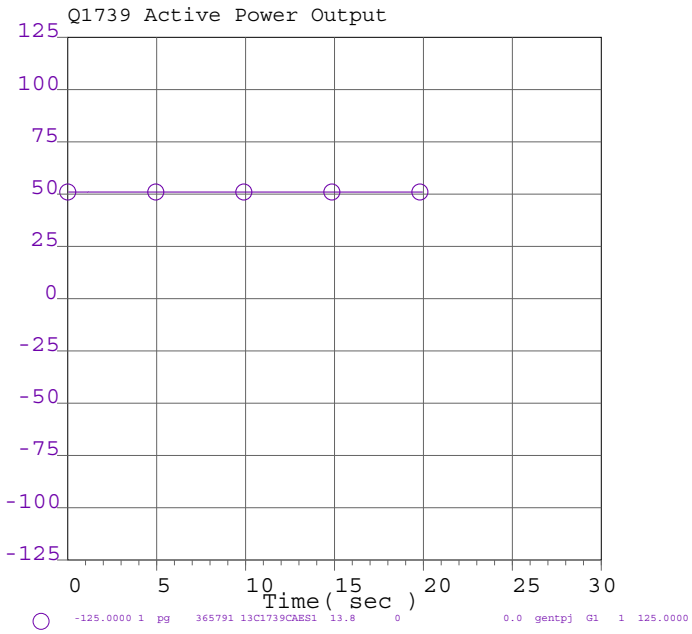
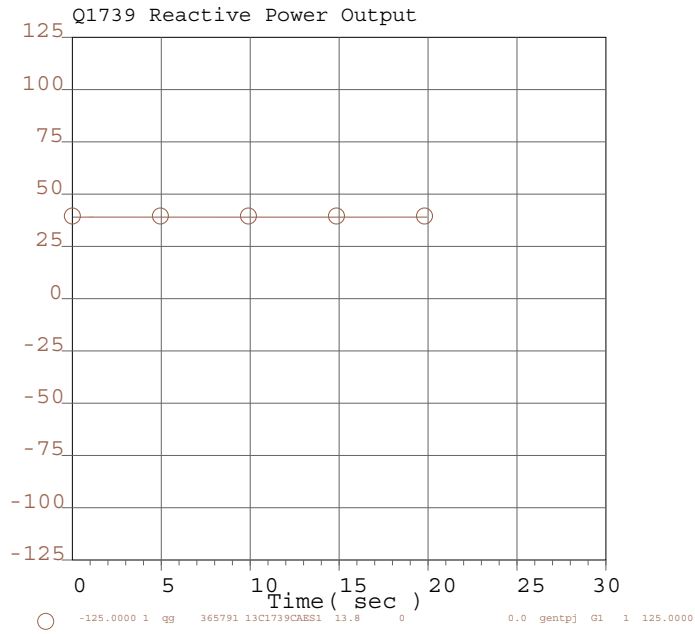
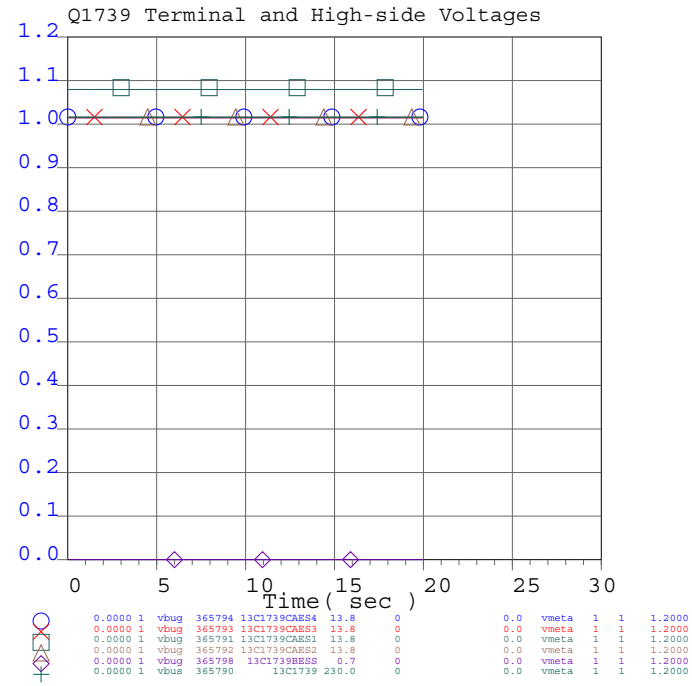
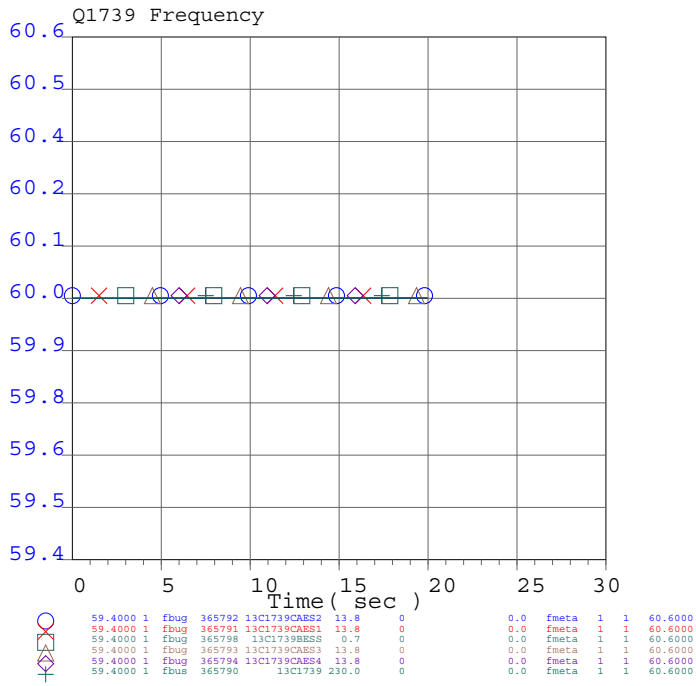
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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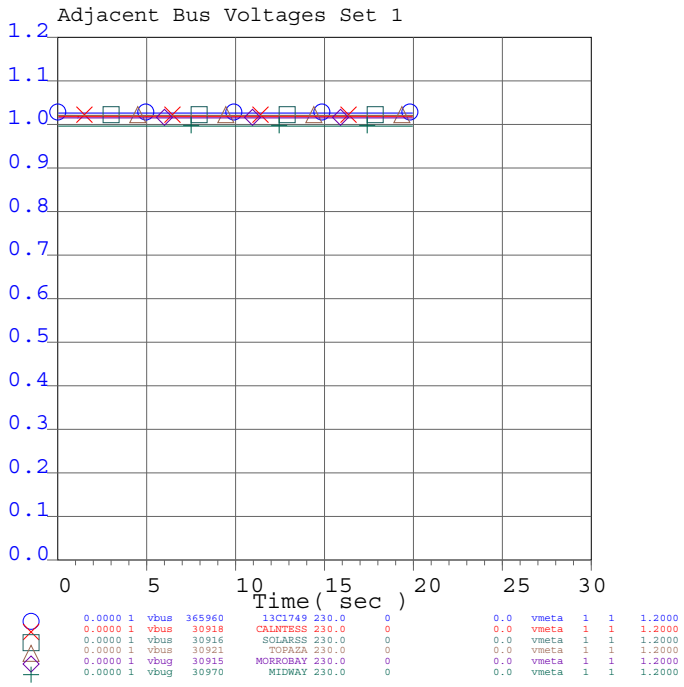
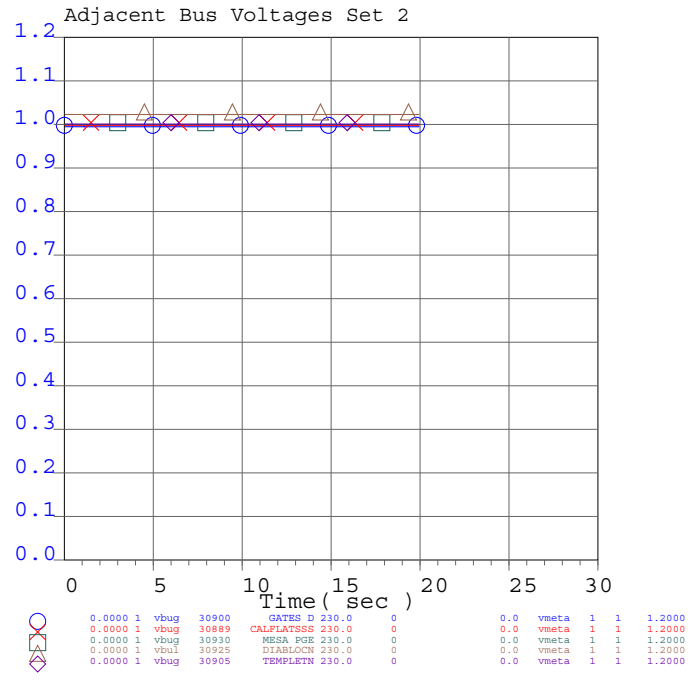
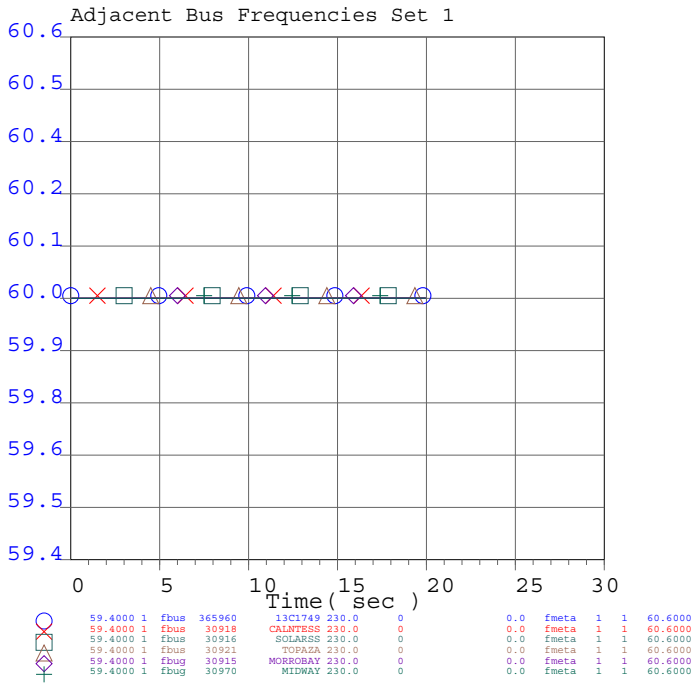
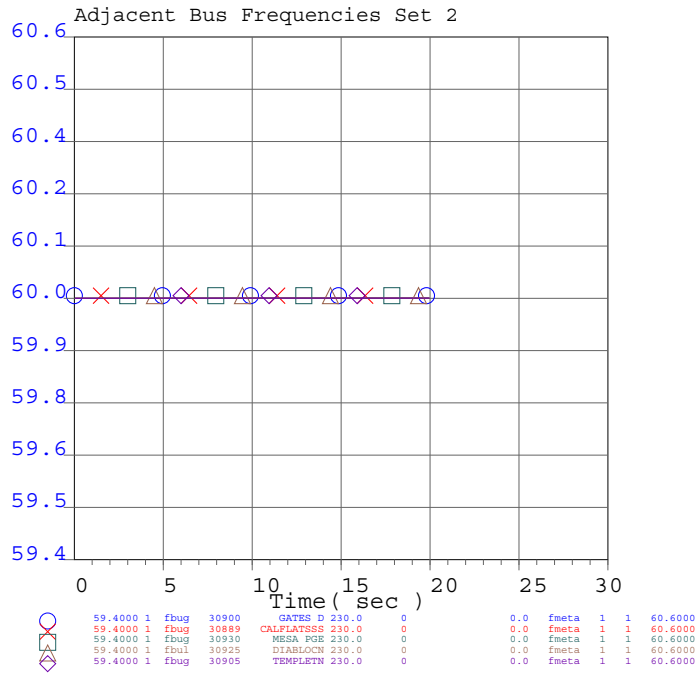
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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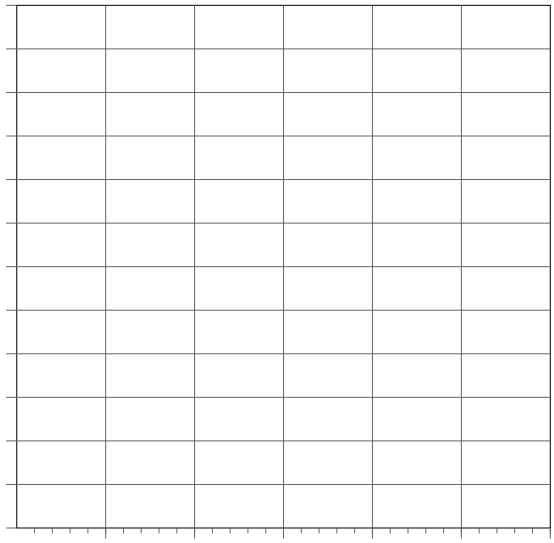
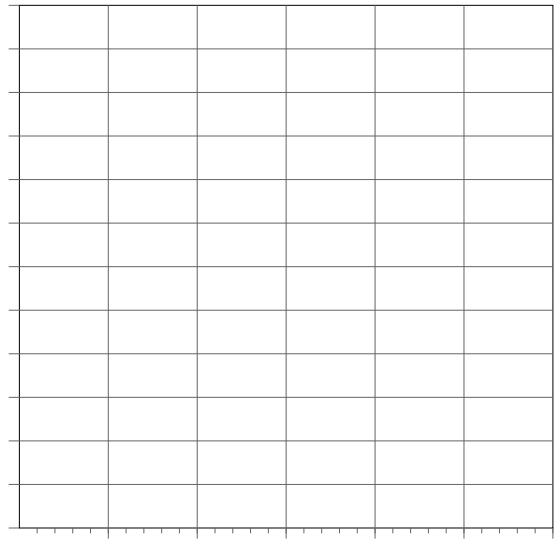
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

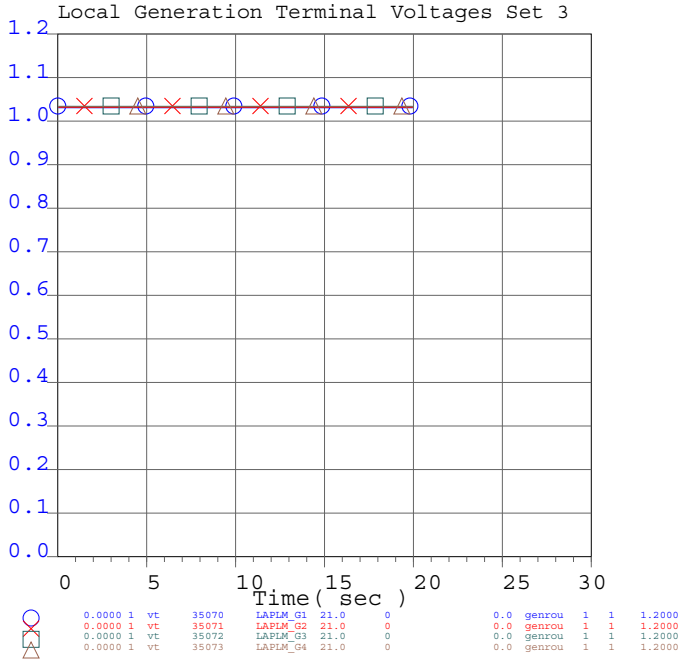
Local Generation Terminal Voltages Set 1



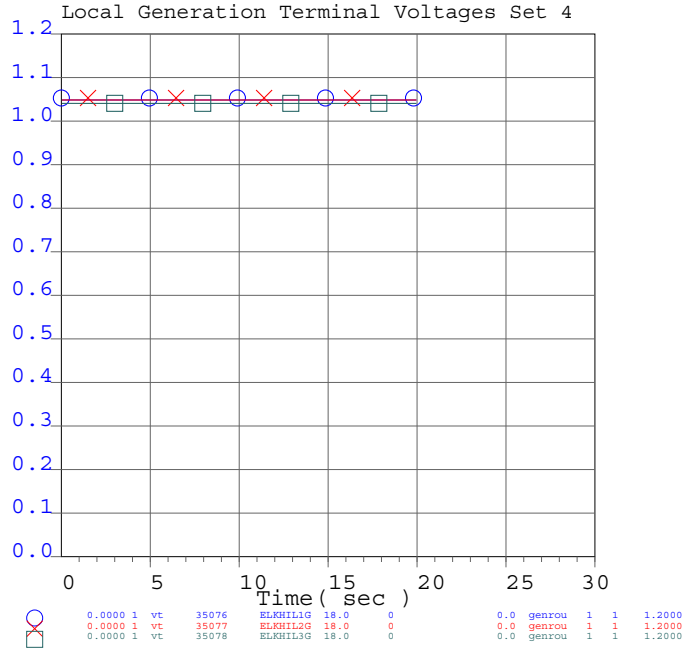
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

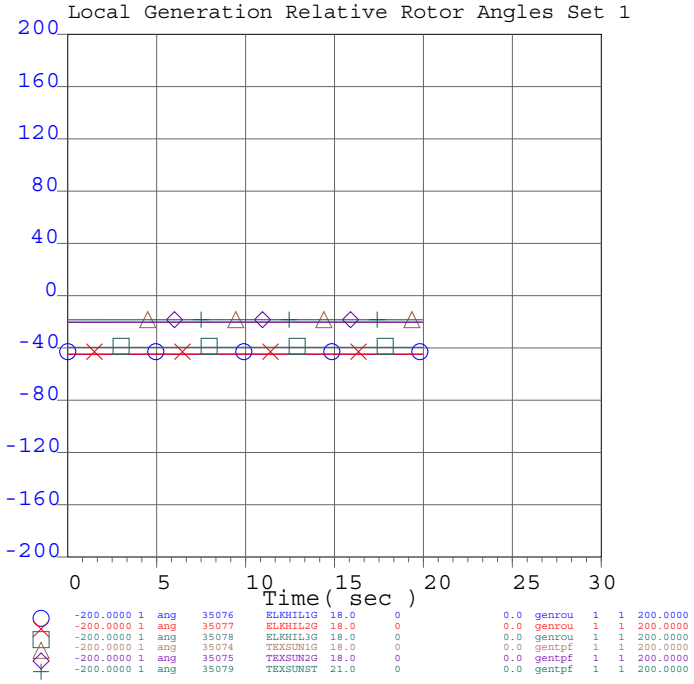


Local Generation Terminal Voltages Set 4

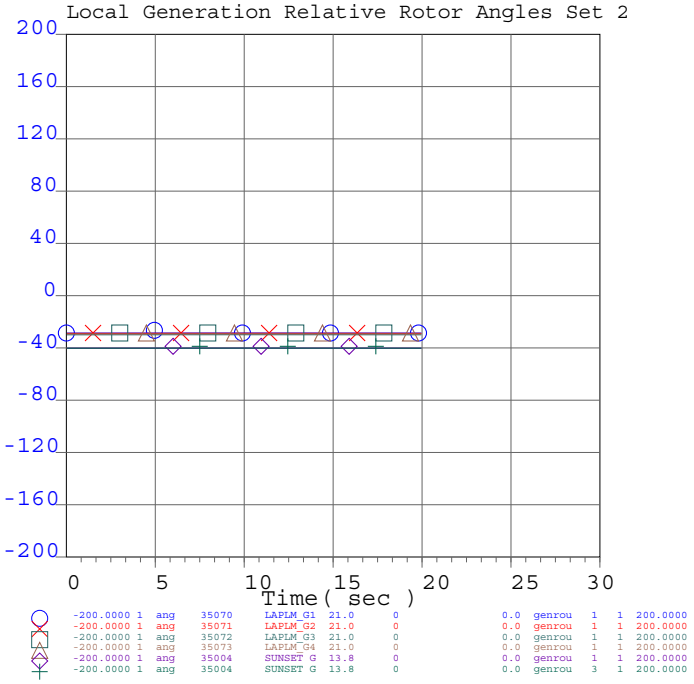


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

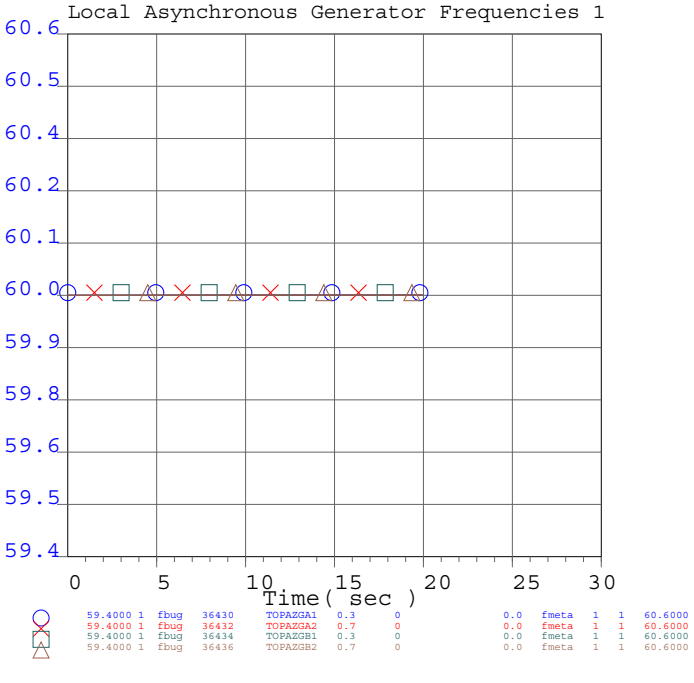
Local Generation Relative Rotor Angles Set 1



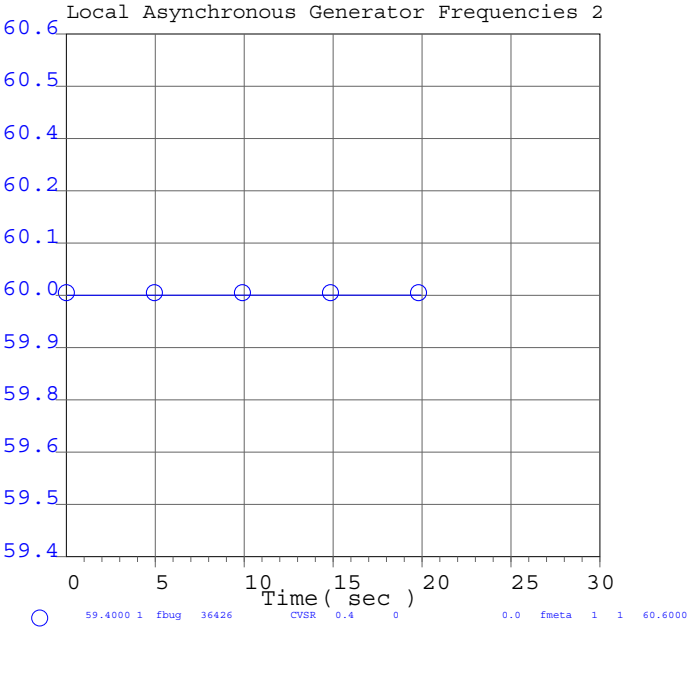
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

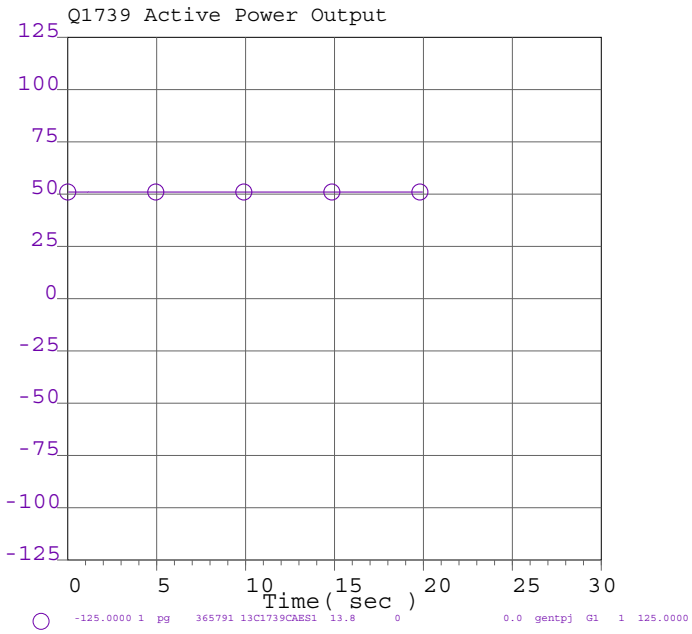


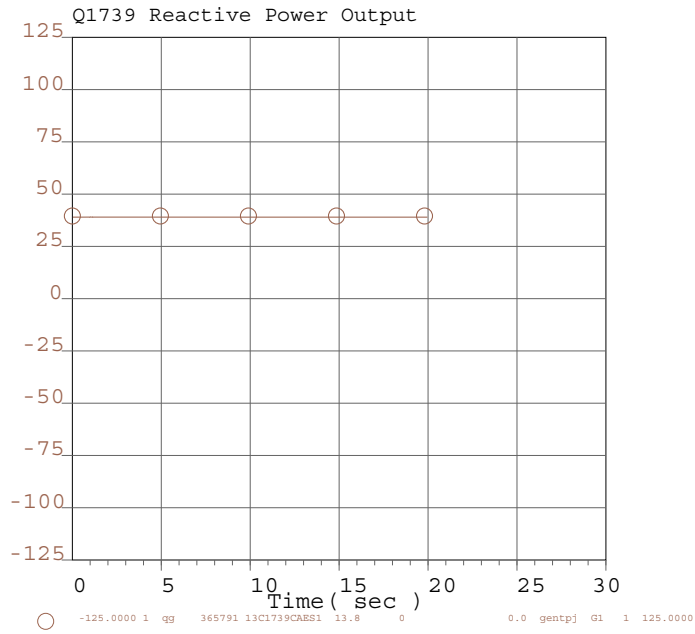
Local Asynchronous Generator Frequencies 2

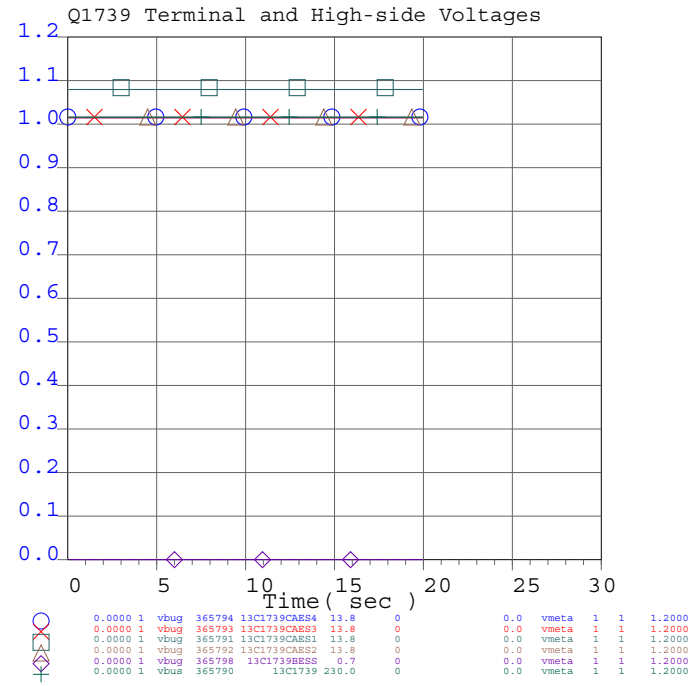


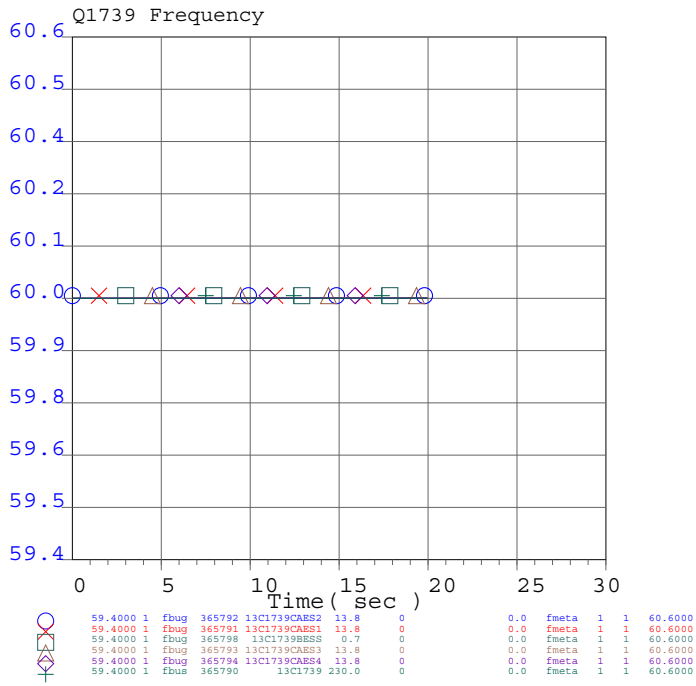
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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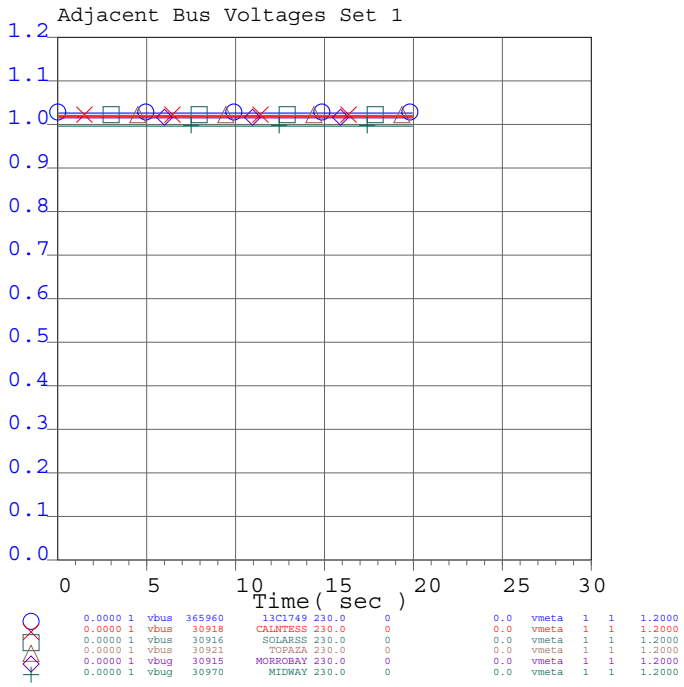

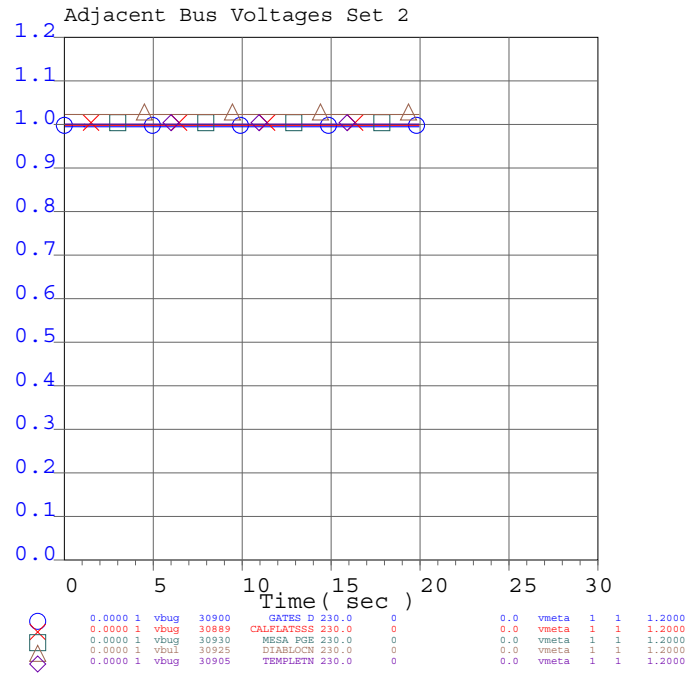

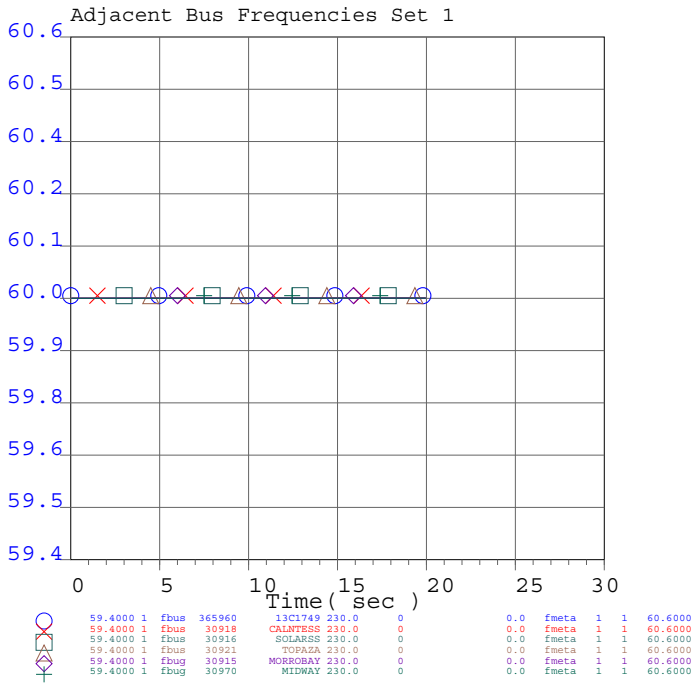

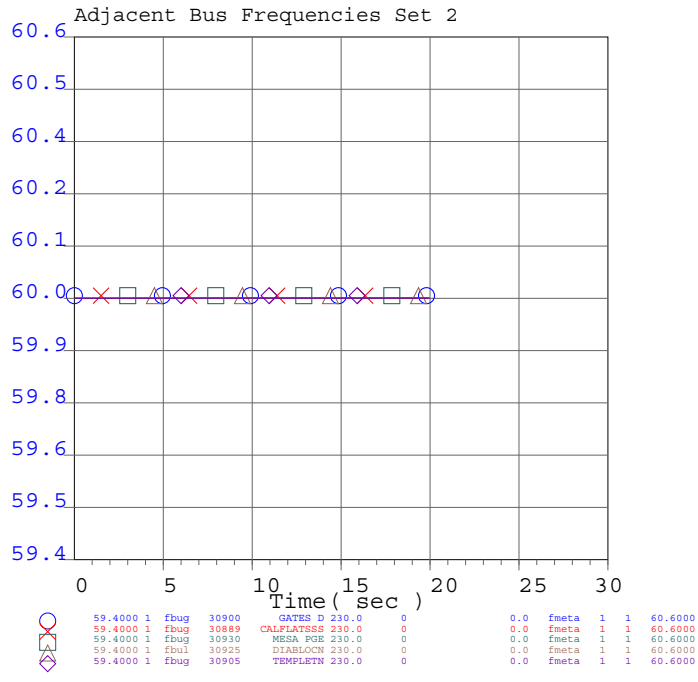

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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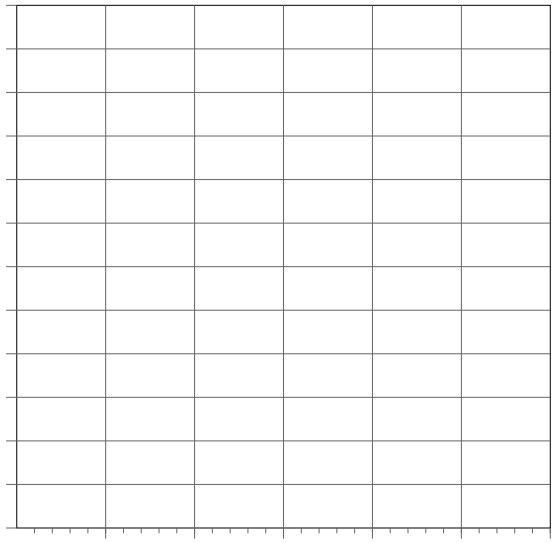
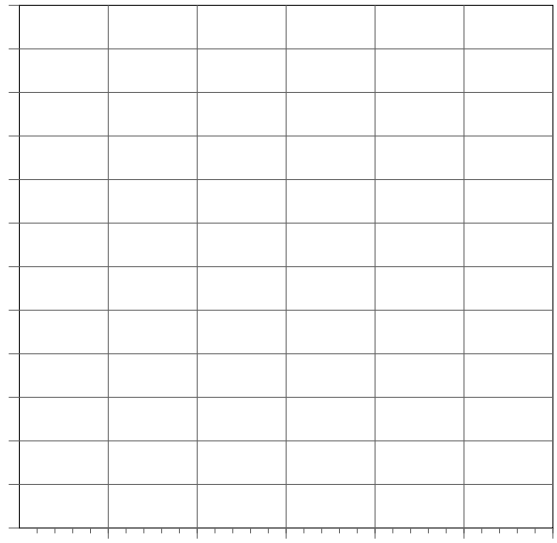
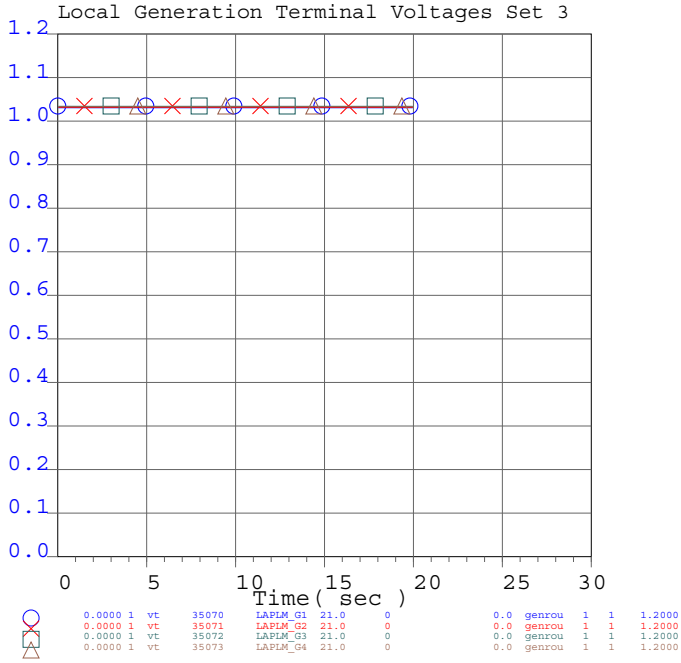
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

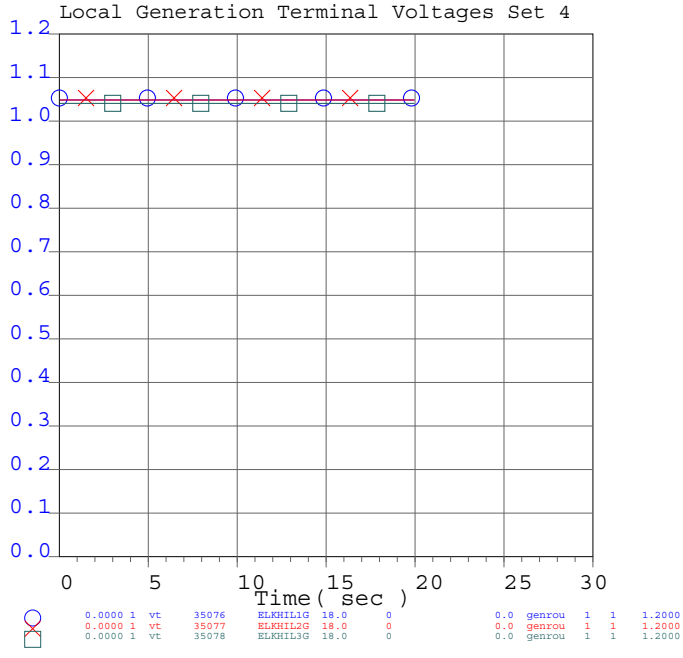


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
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0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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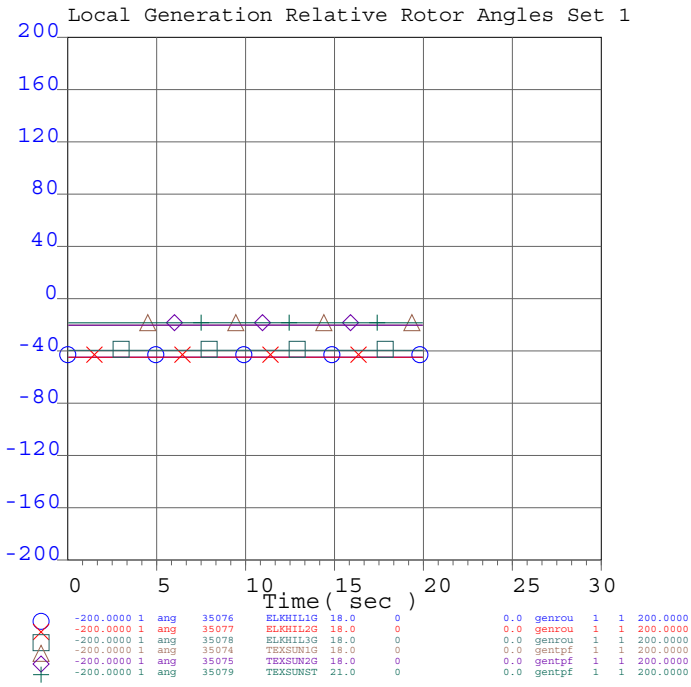

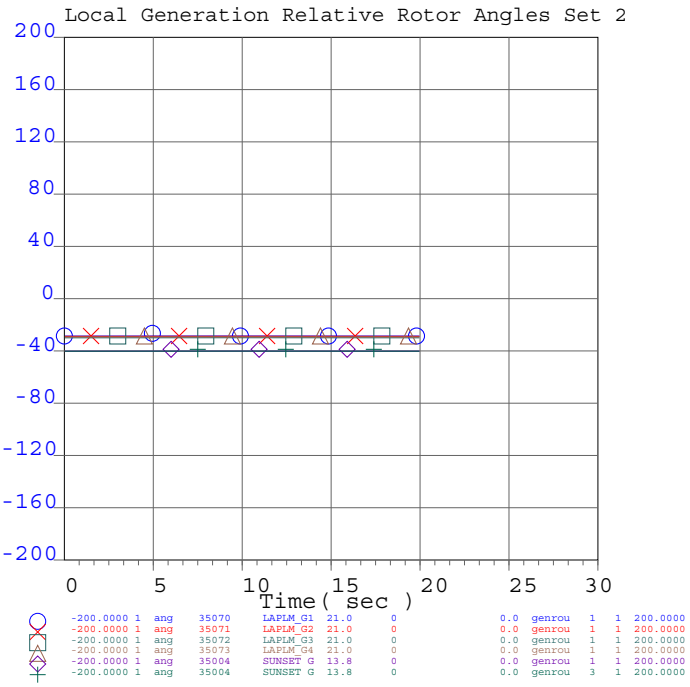

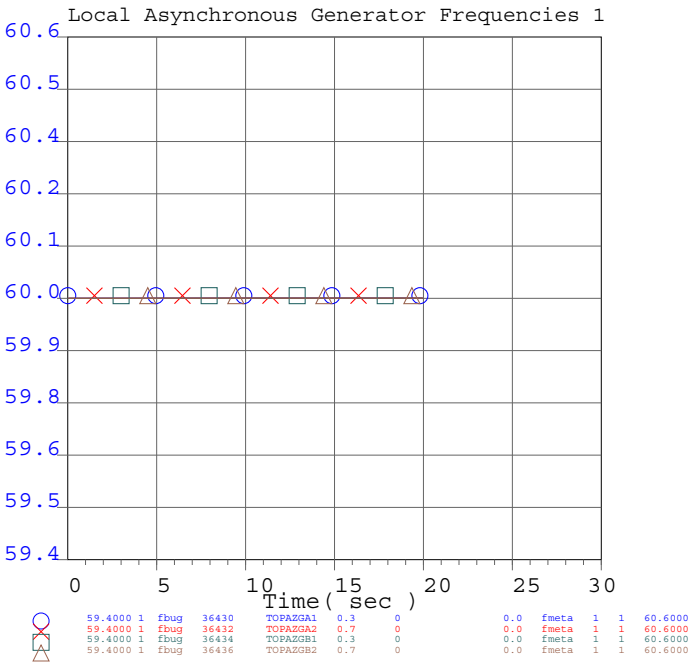

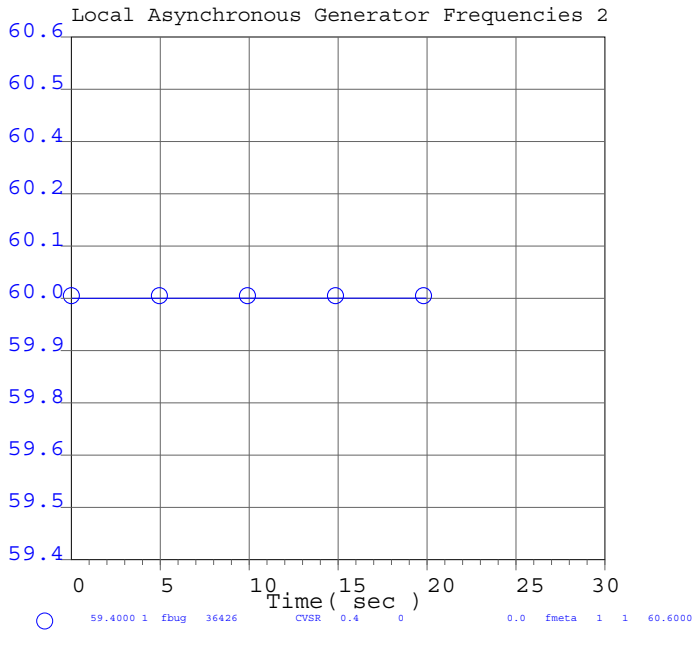

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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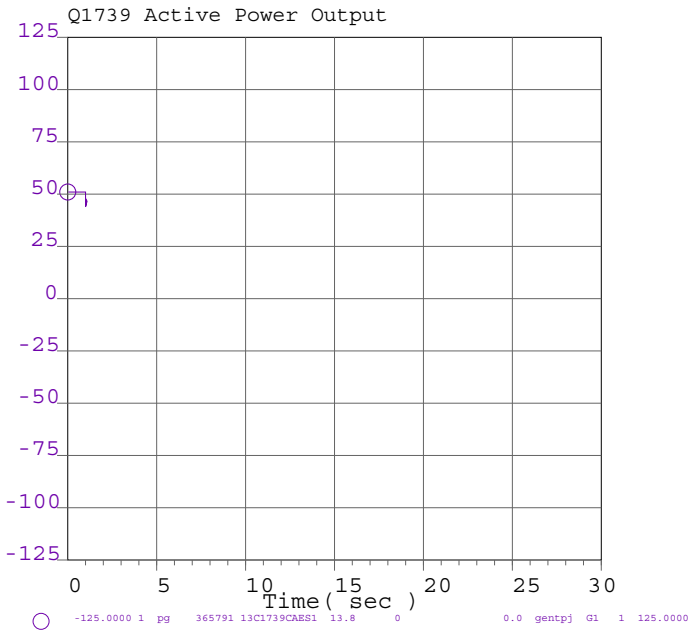
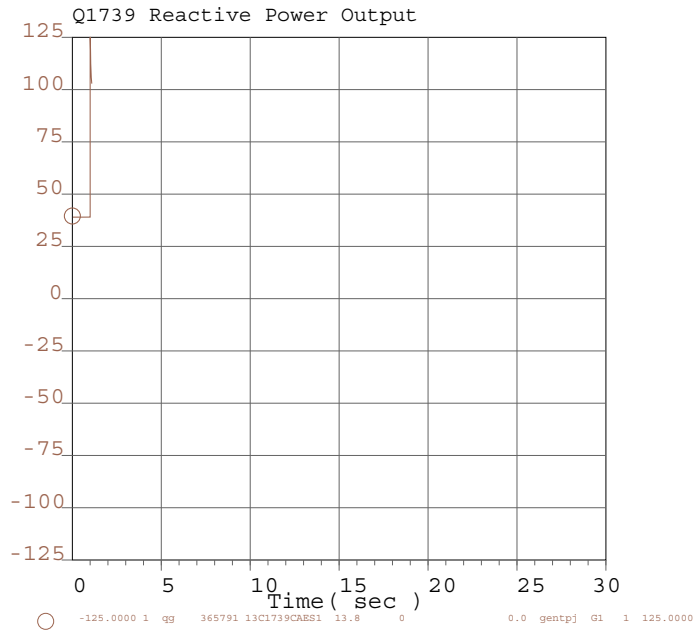
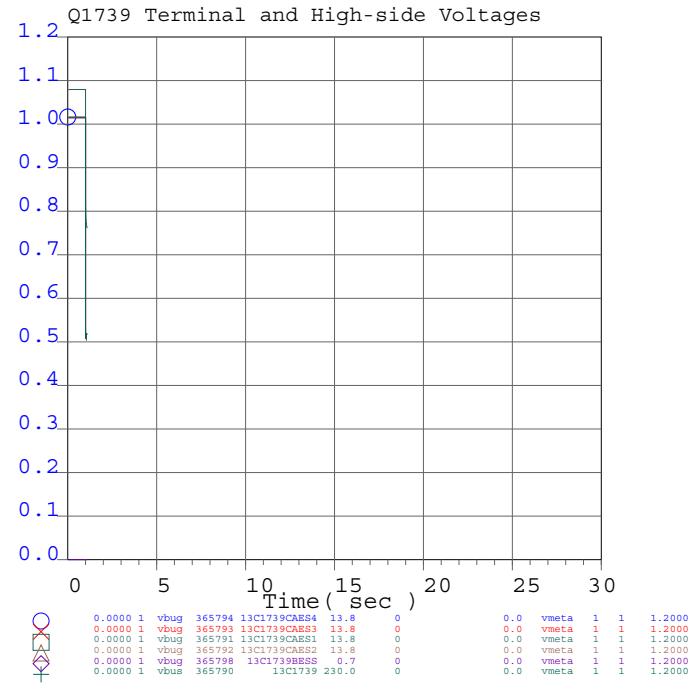
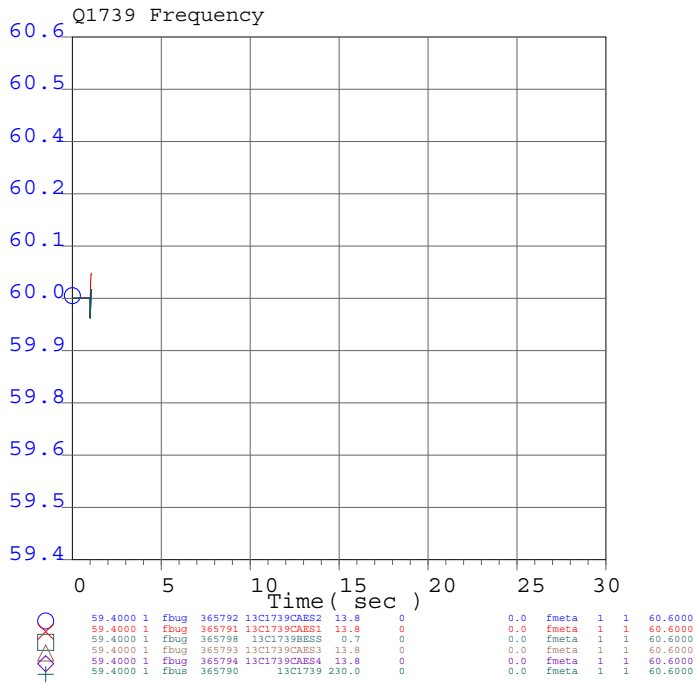
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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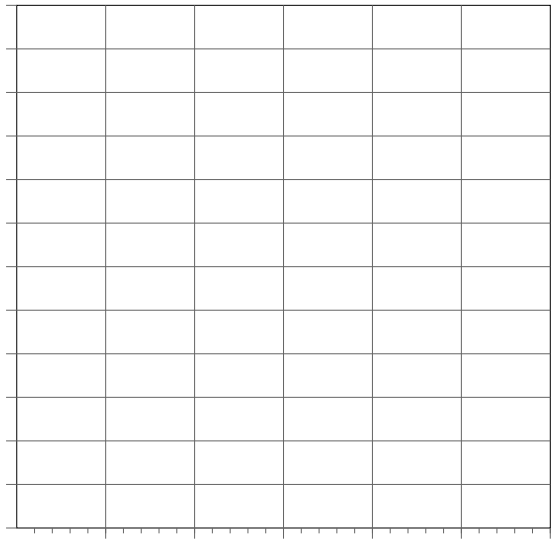
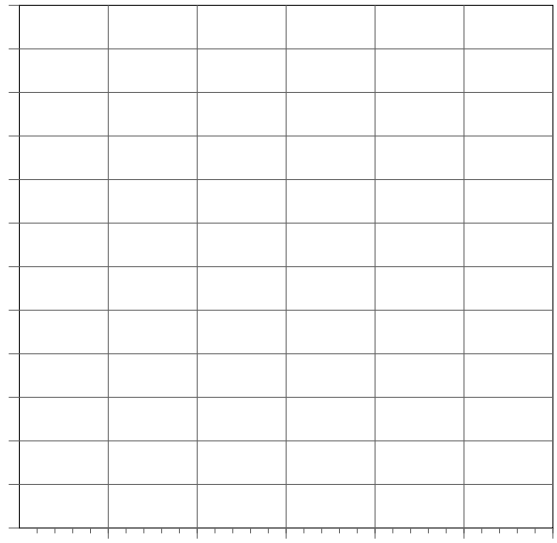
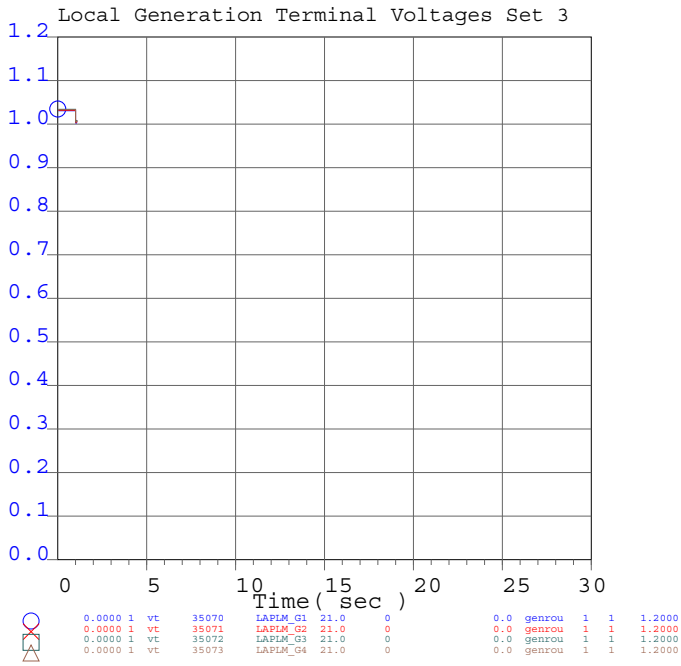
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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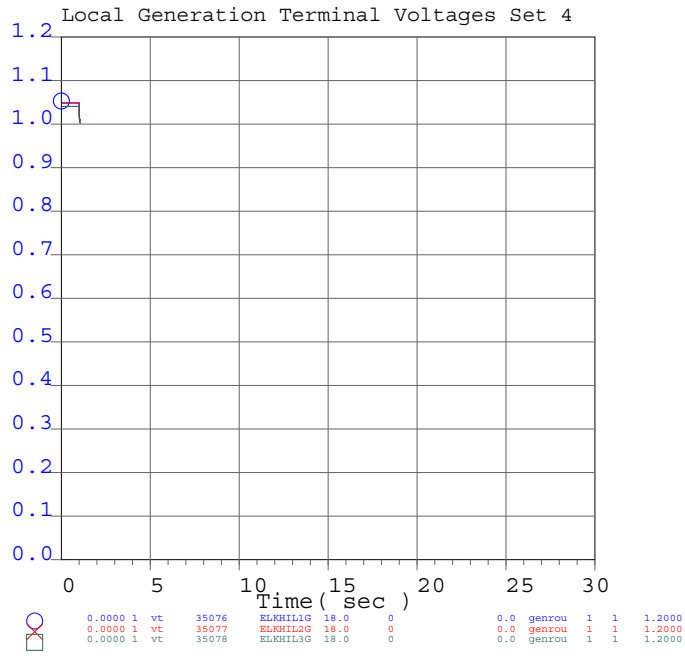
Local Generation Terminal Voltages Set 4



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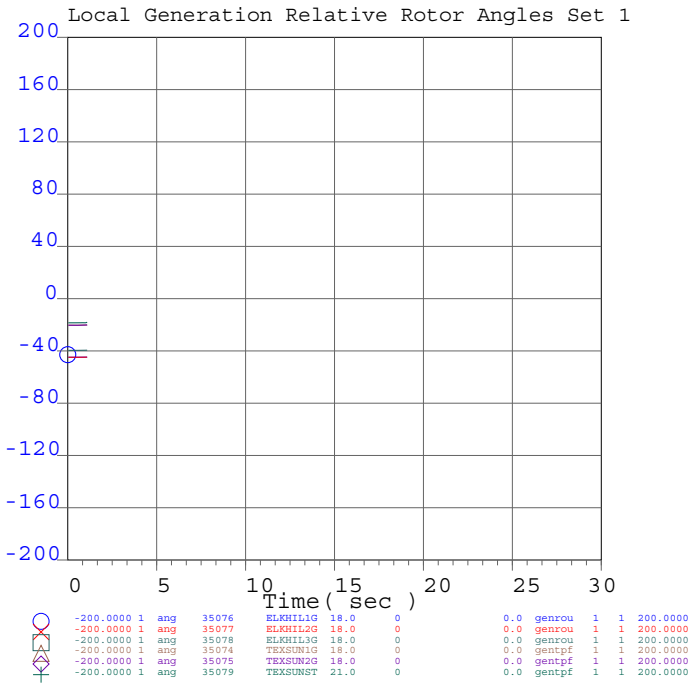

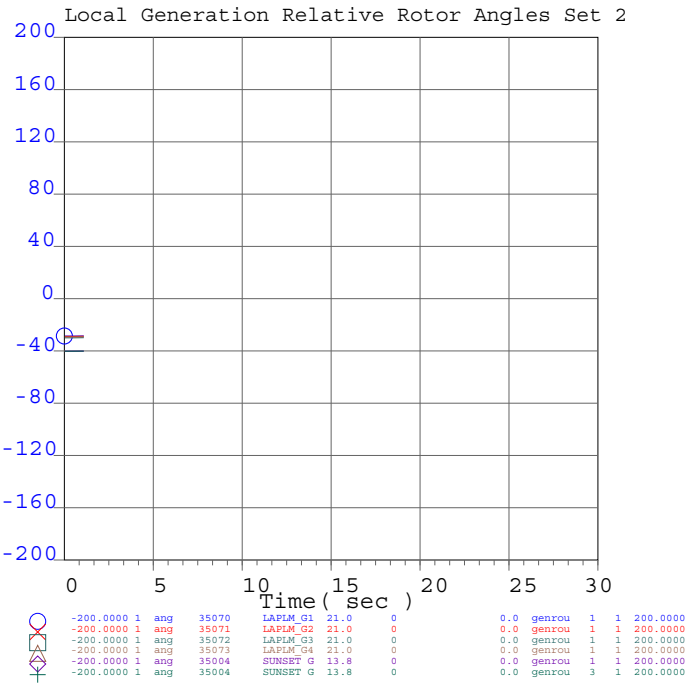

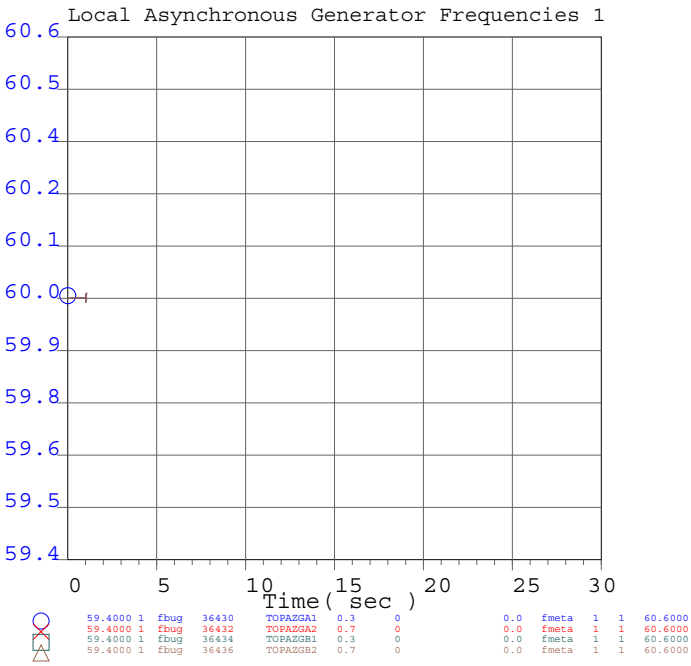

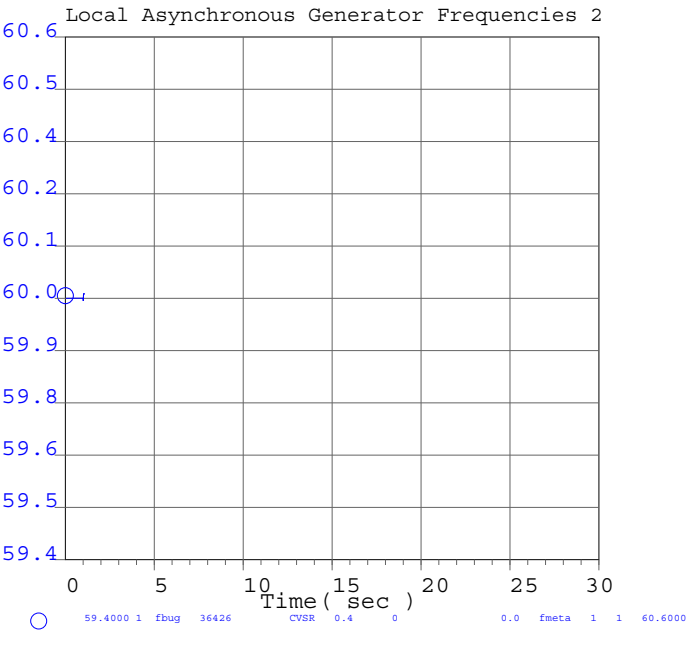

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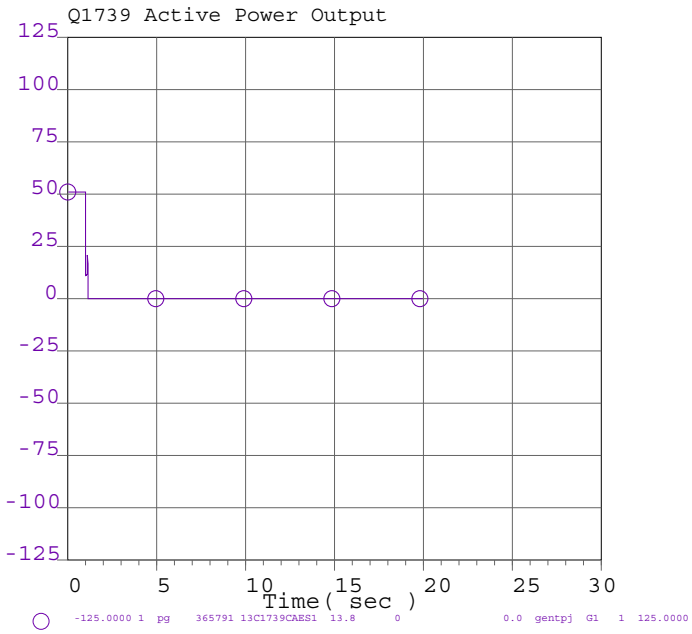

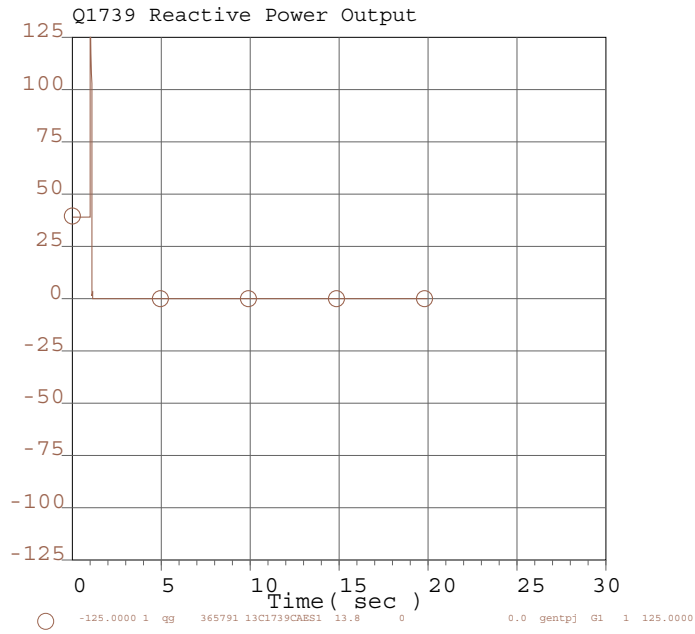

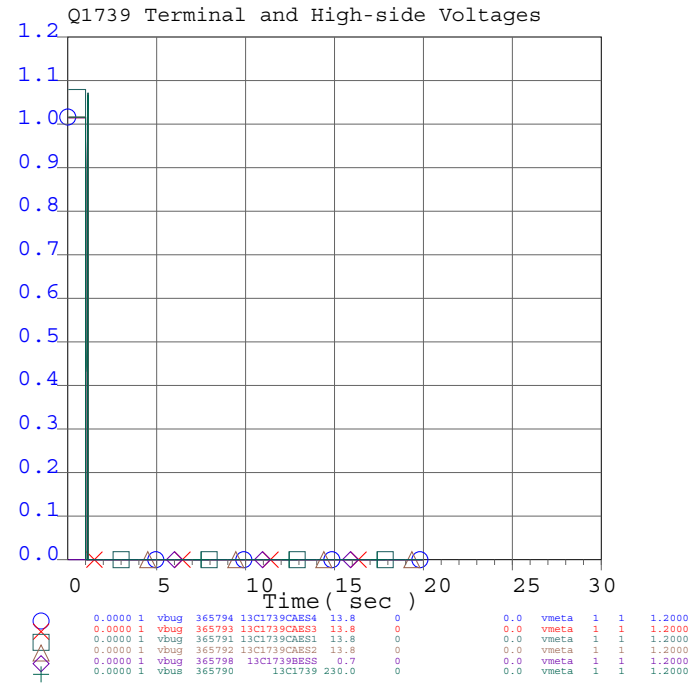

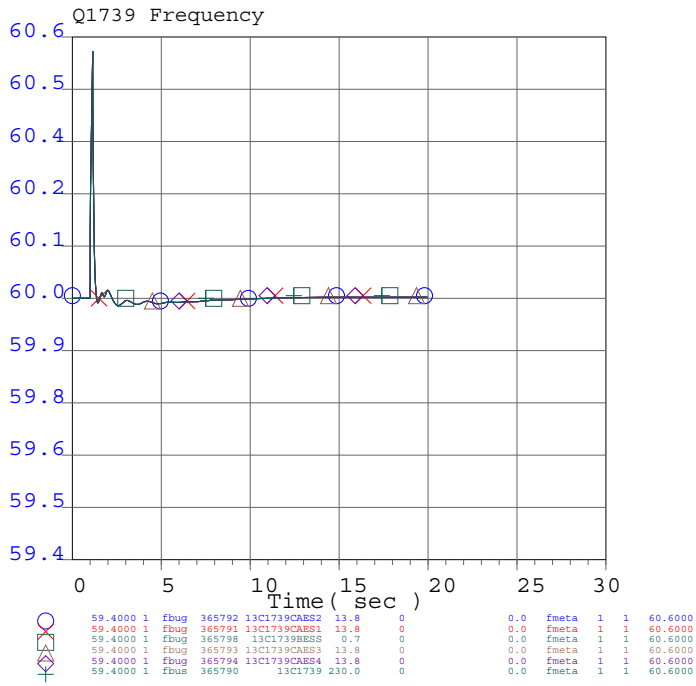

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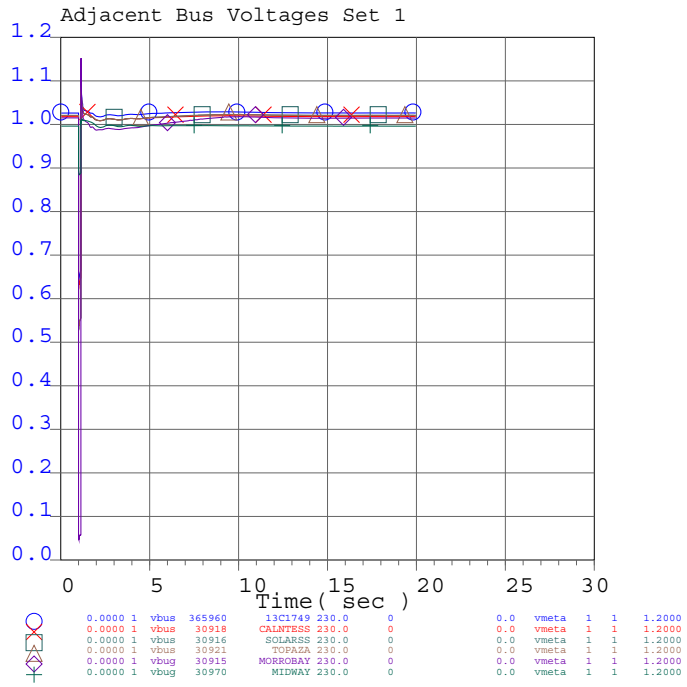

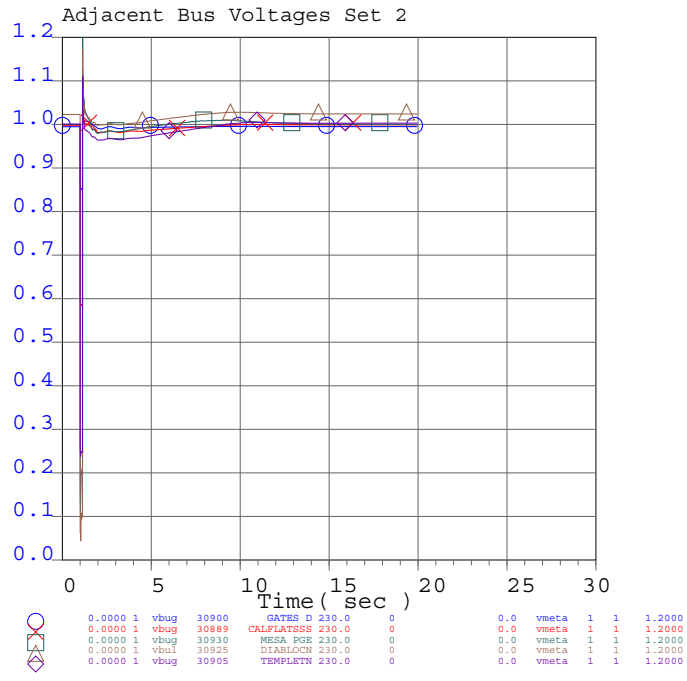

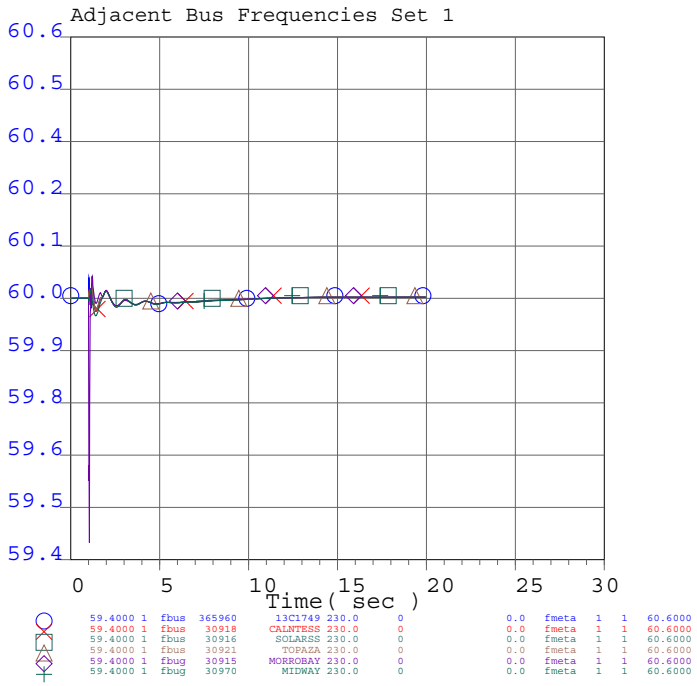

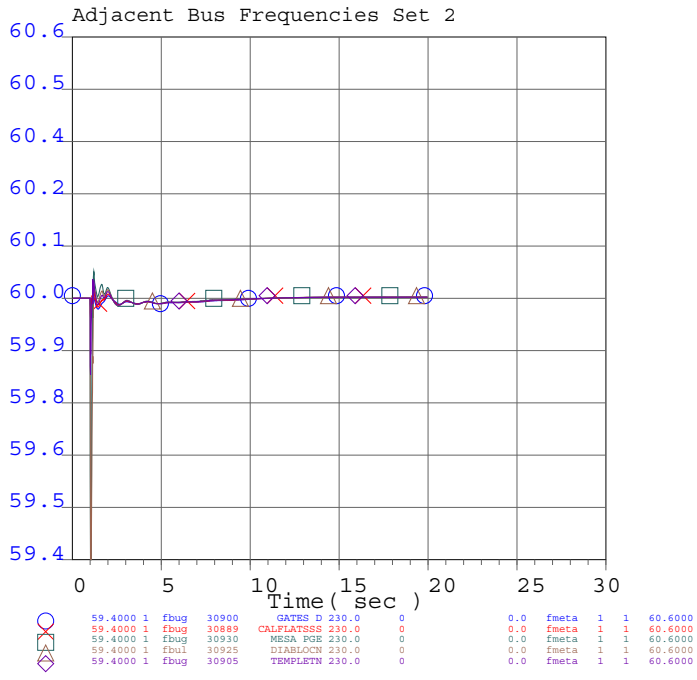

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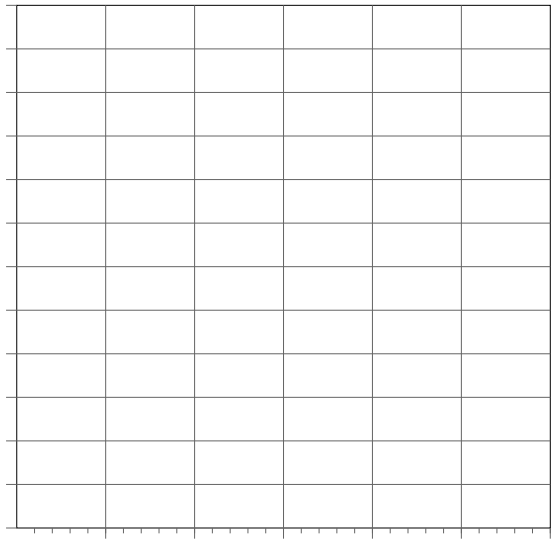
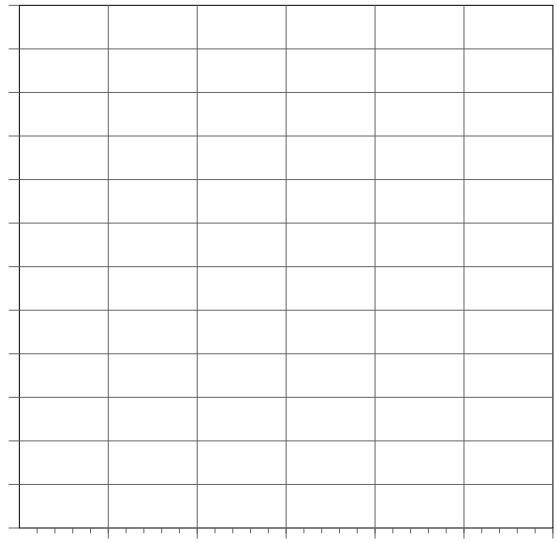
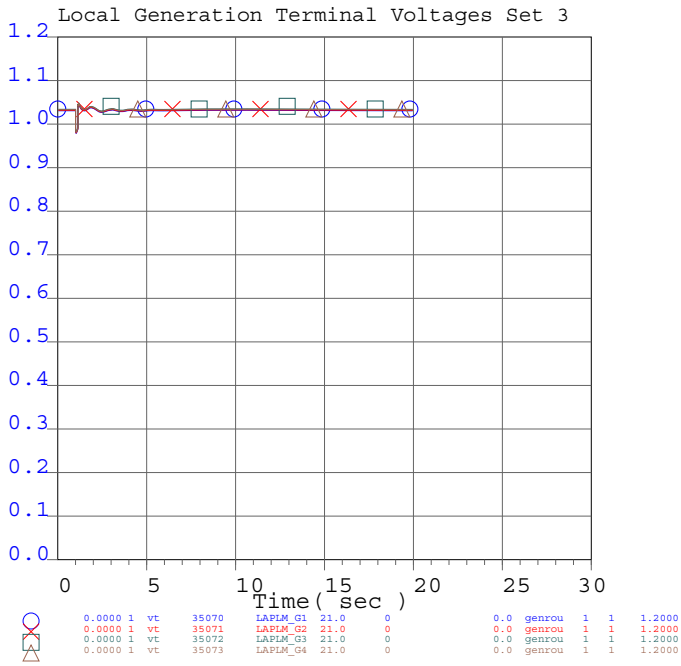


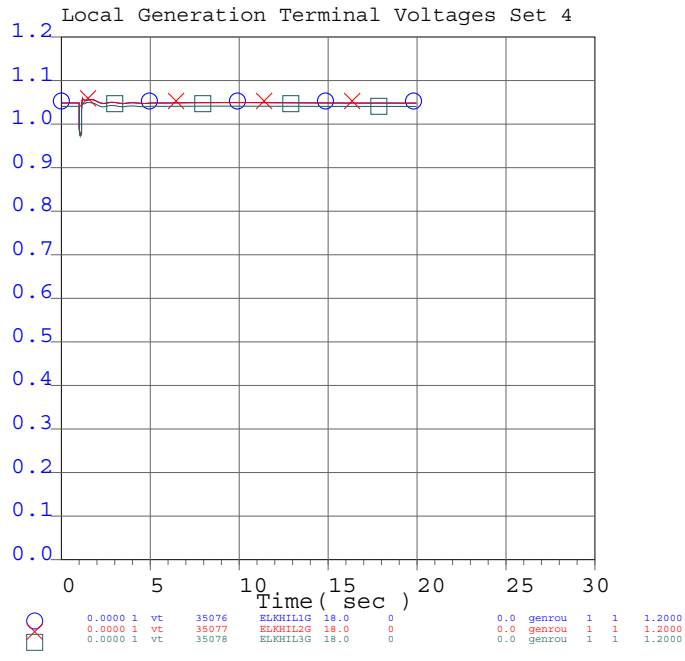
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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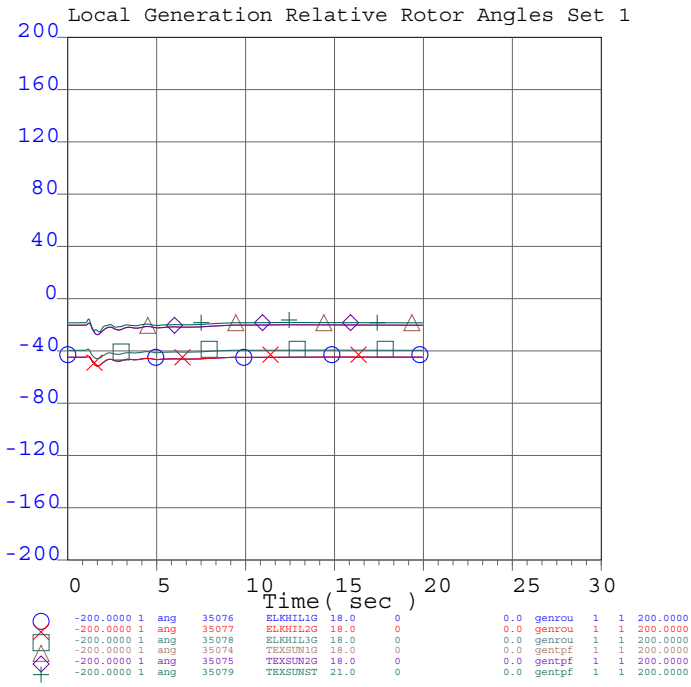

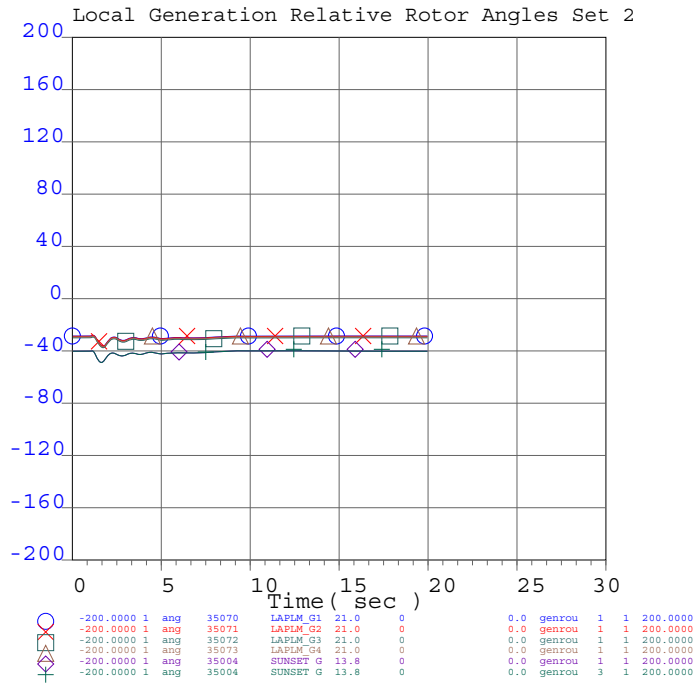

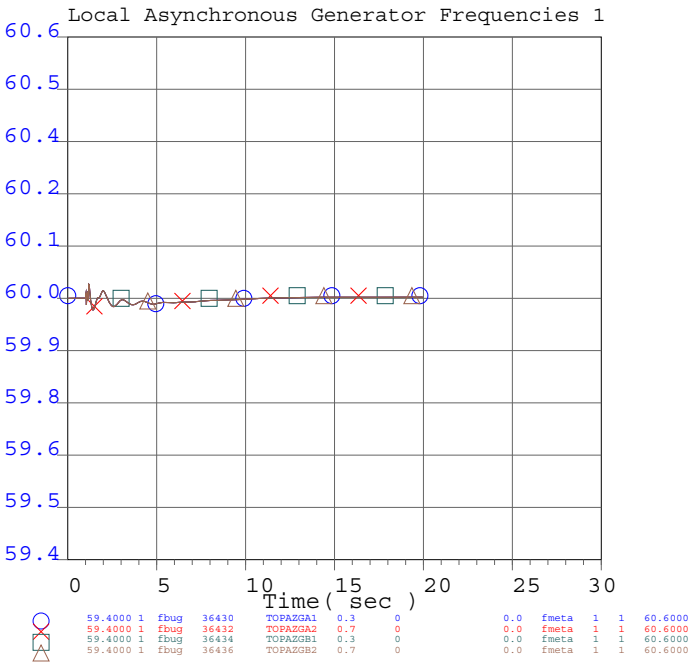

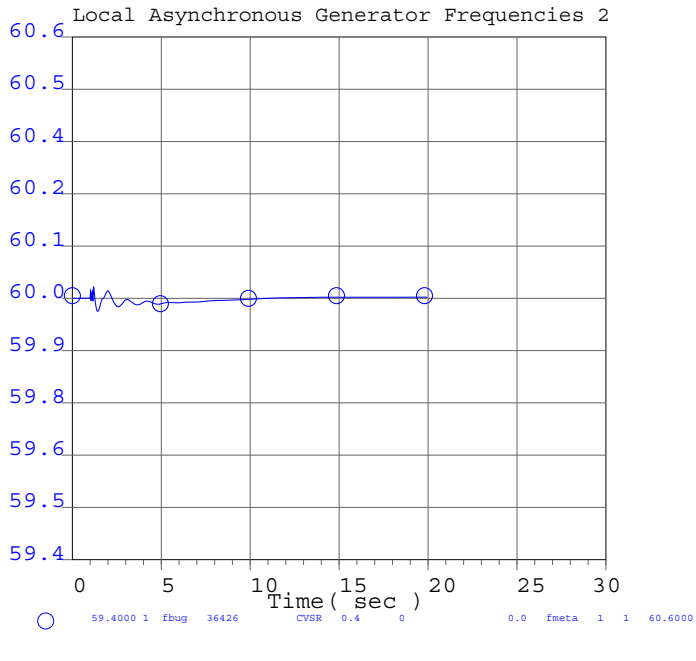

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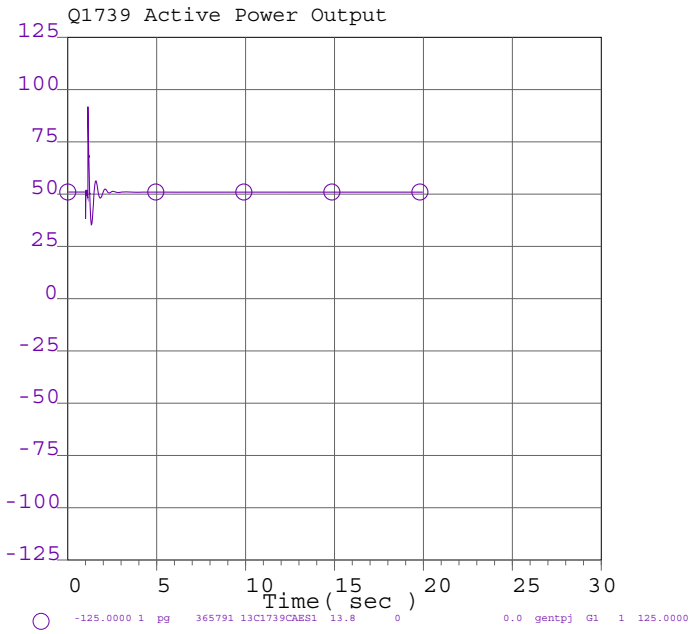
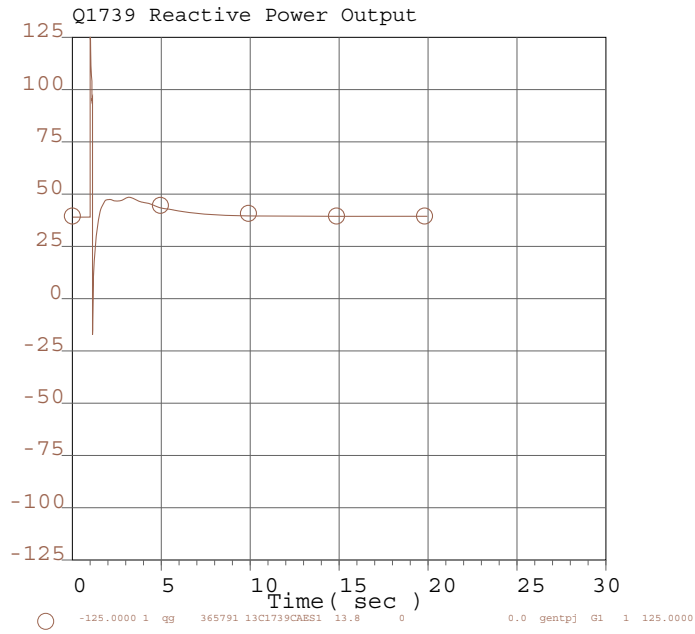
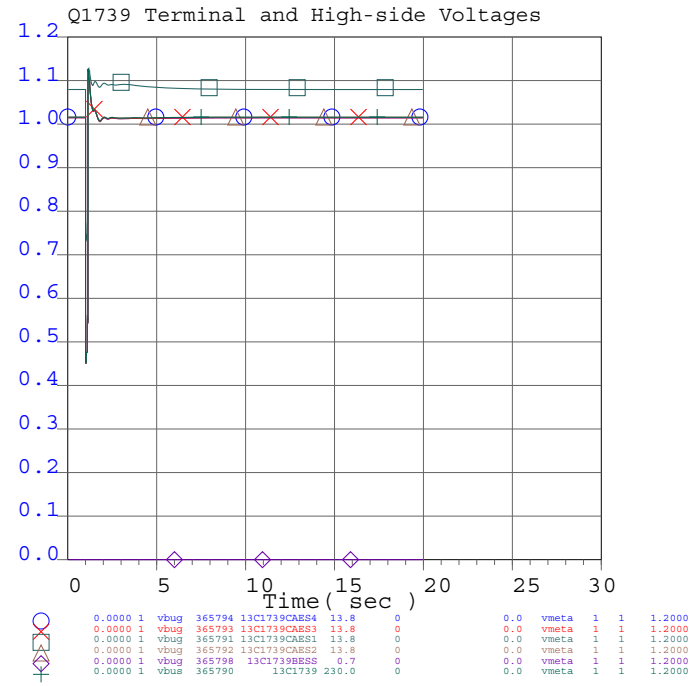
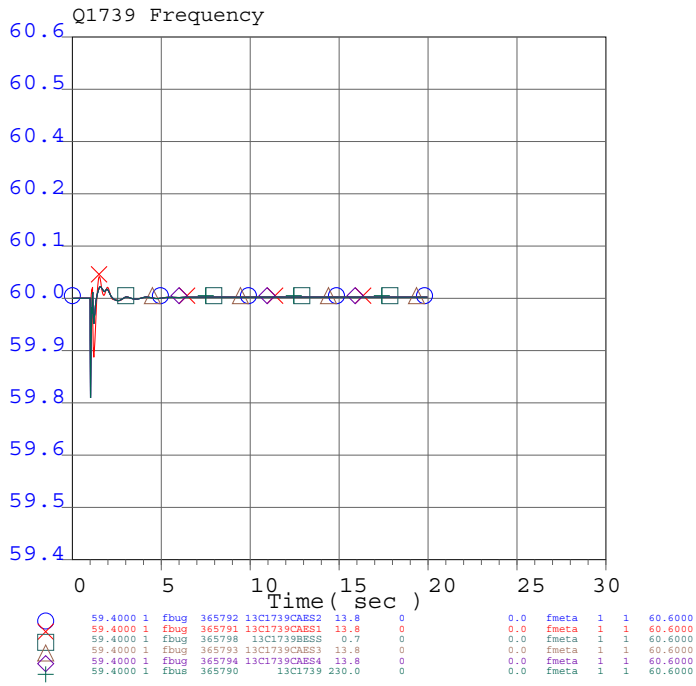
Q1739 (500 MW net): POI- Morro Bay 230 kV substation

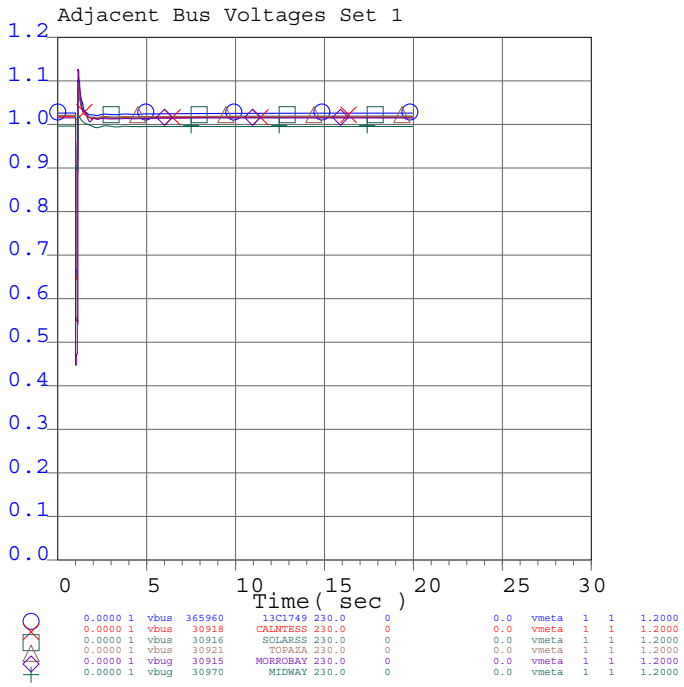


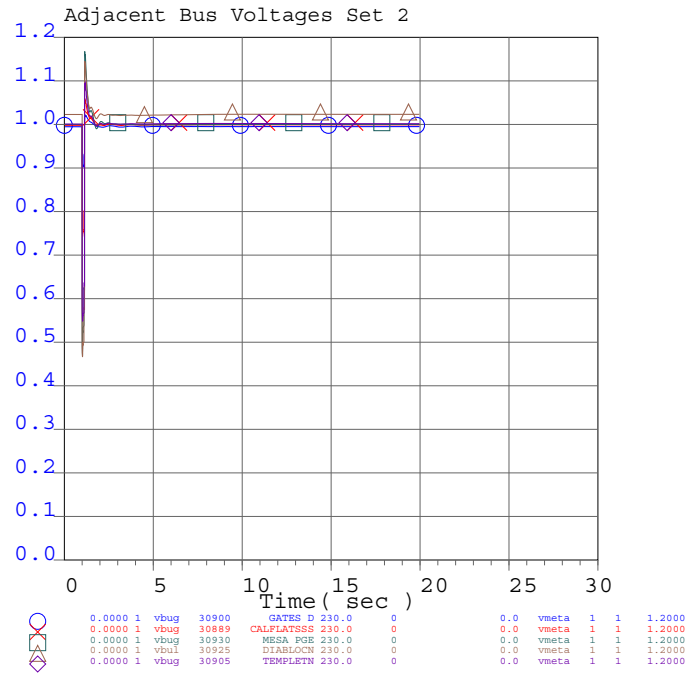


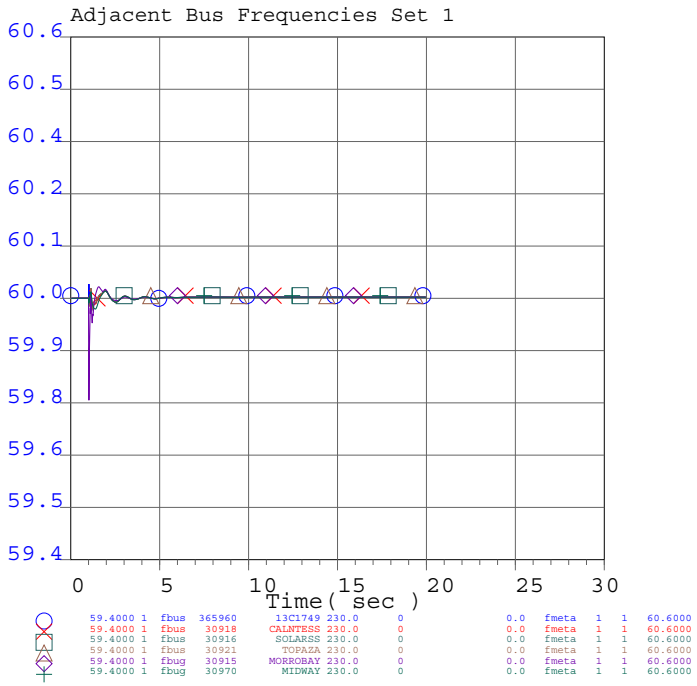


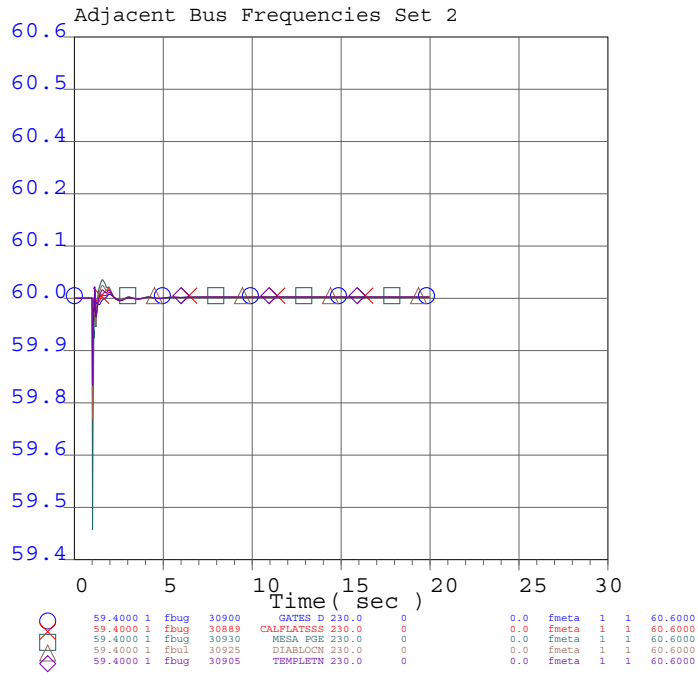


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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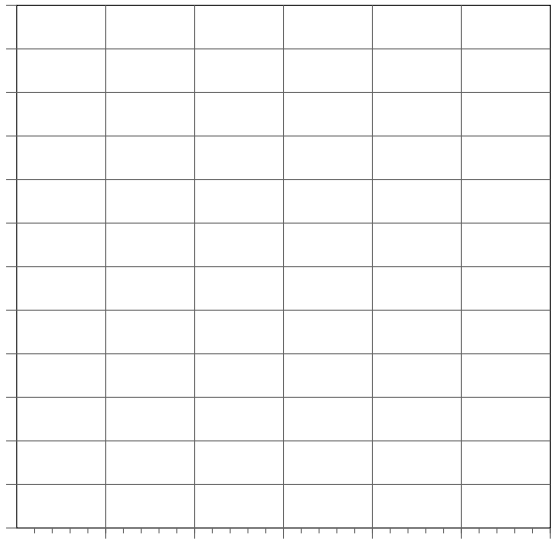
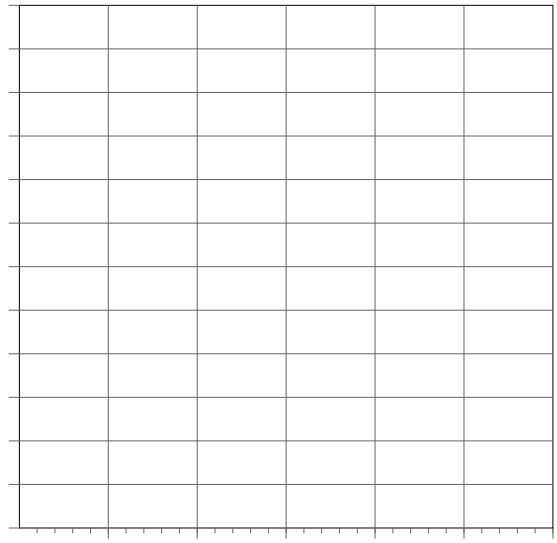
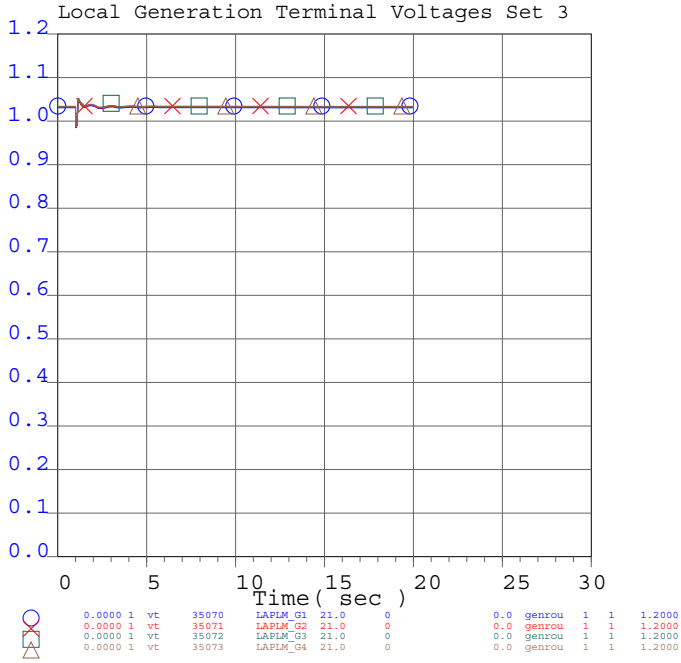
Local Generation Terminal Voltages Set 1



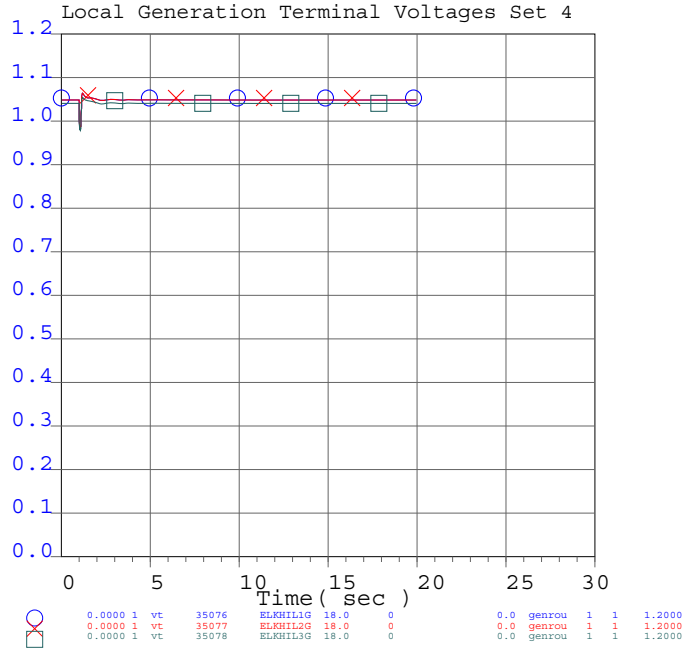
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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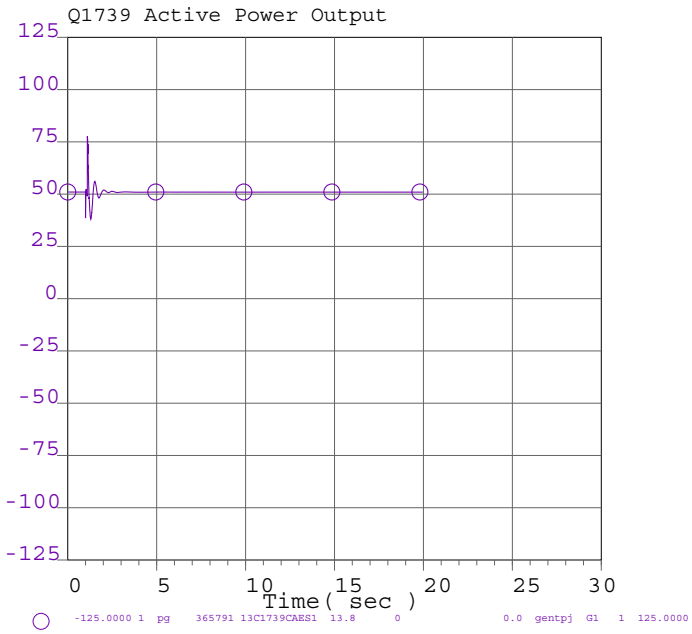
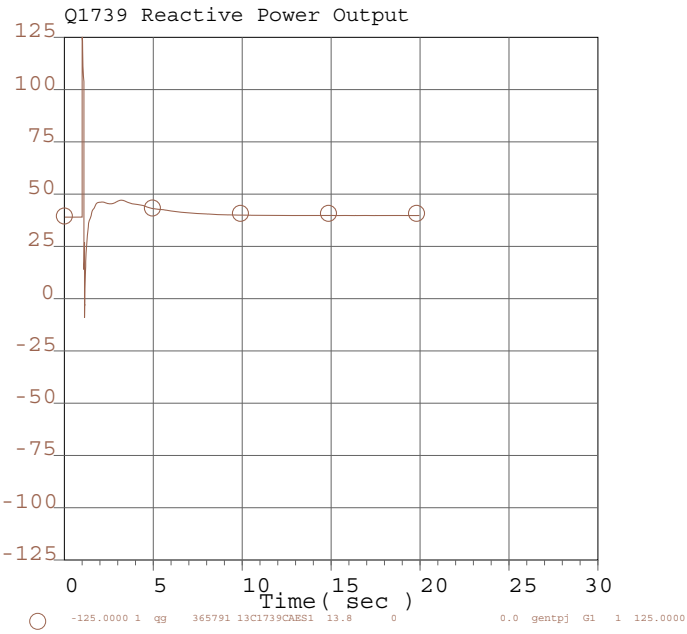
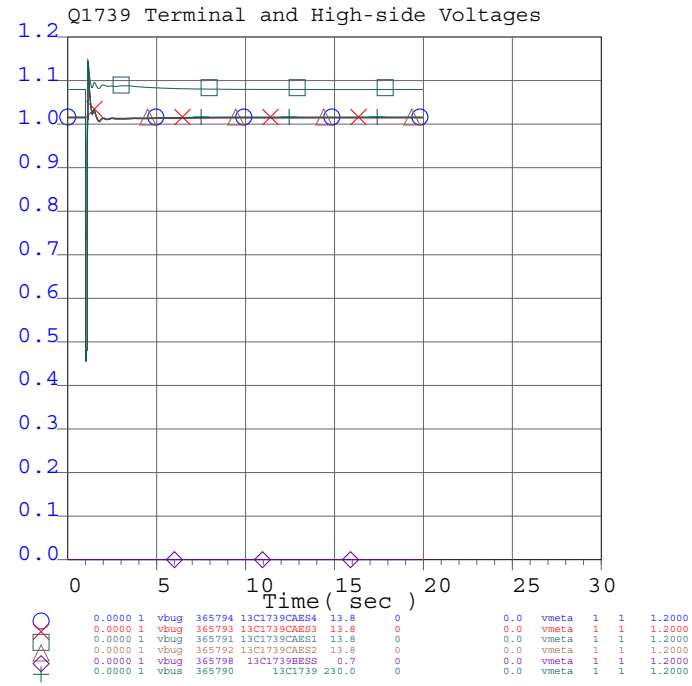
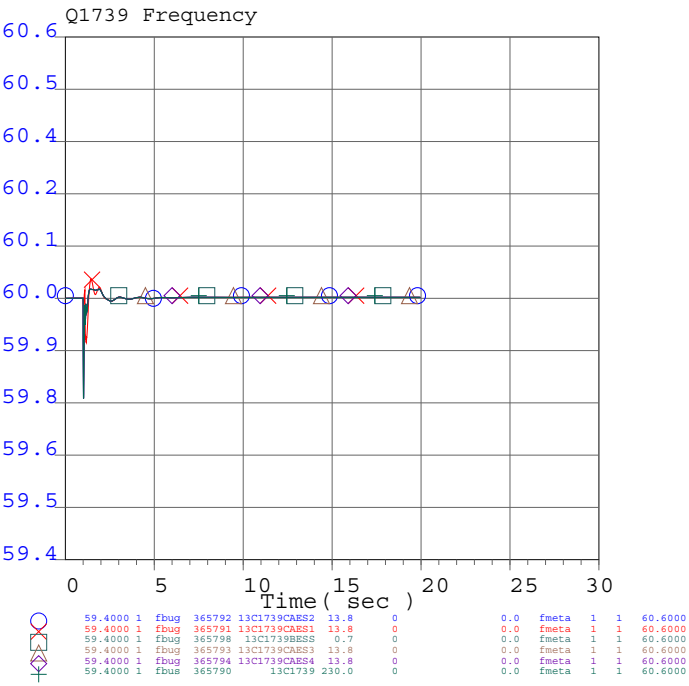
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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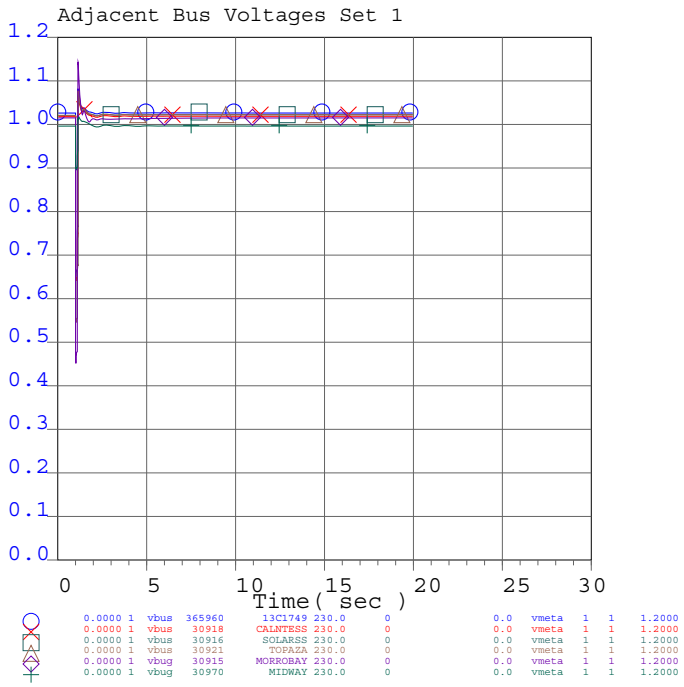

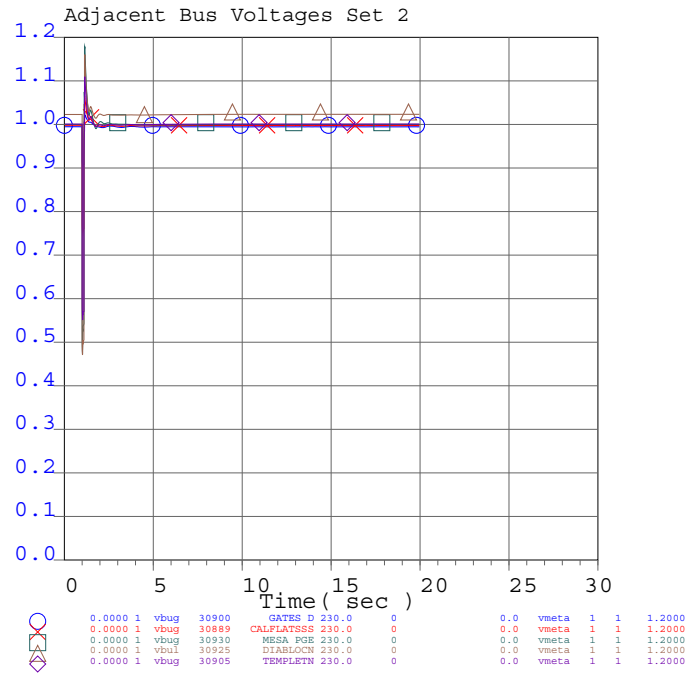

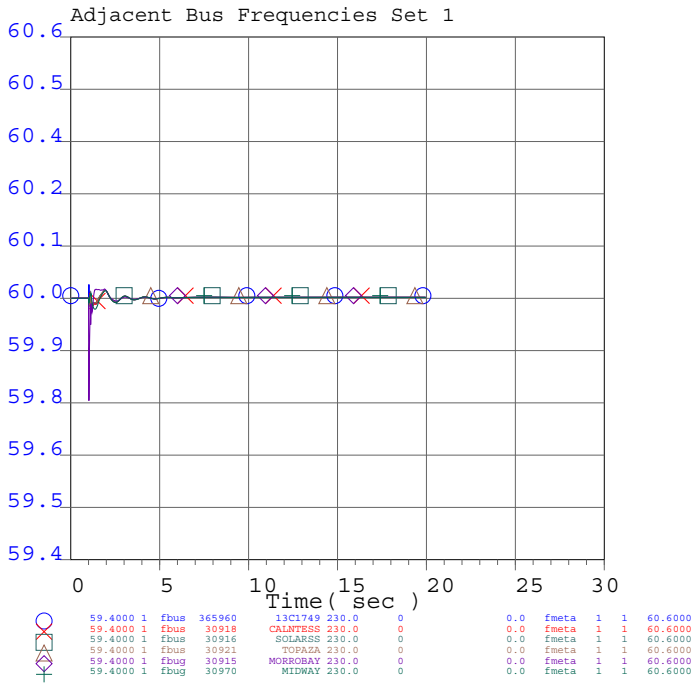

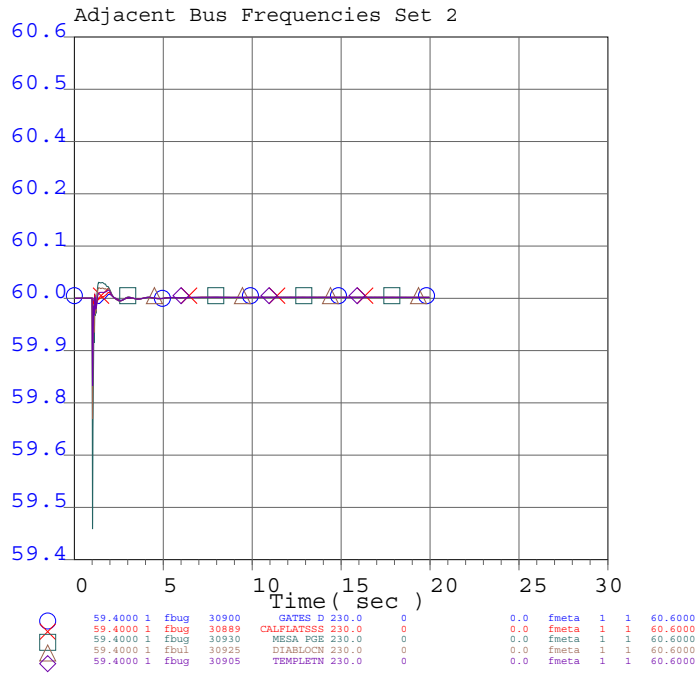

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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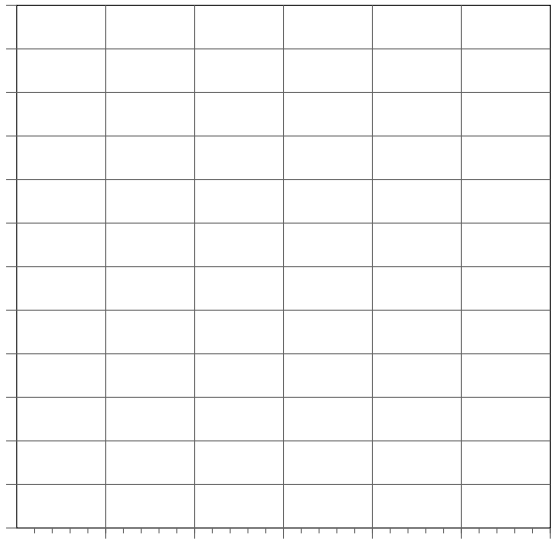
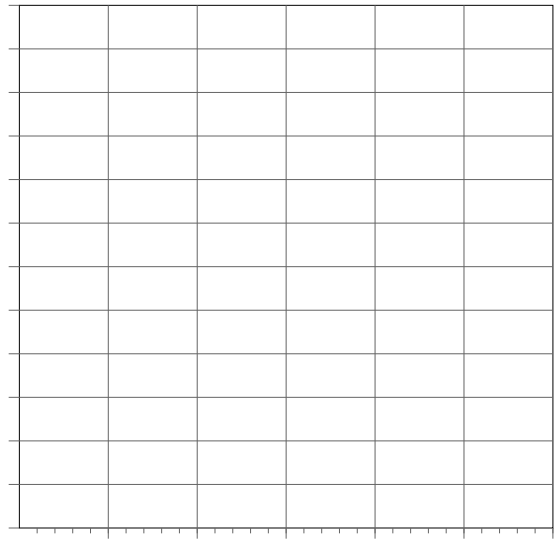
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

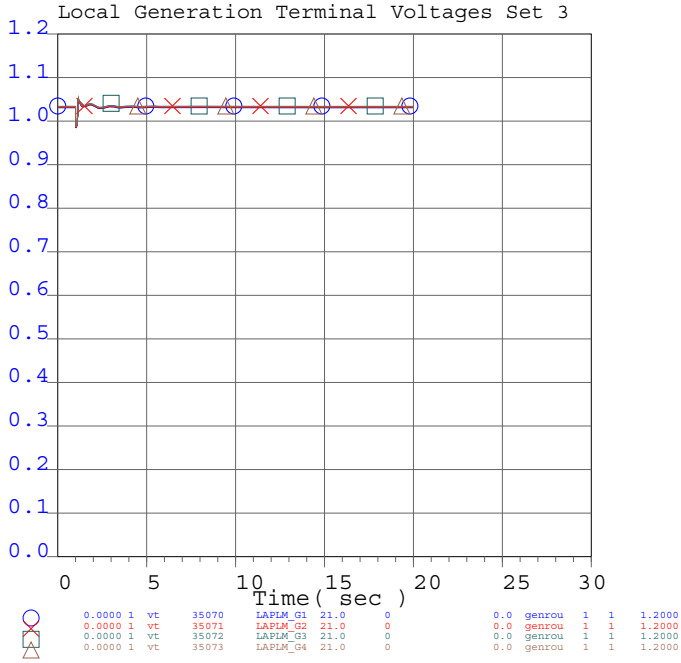
Local Generation Terminal Voltages Set 1



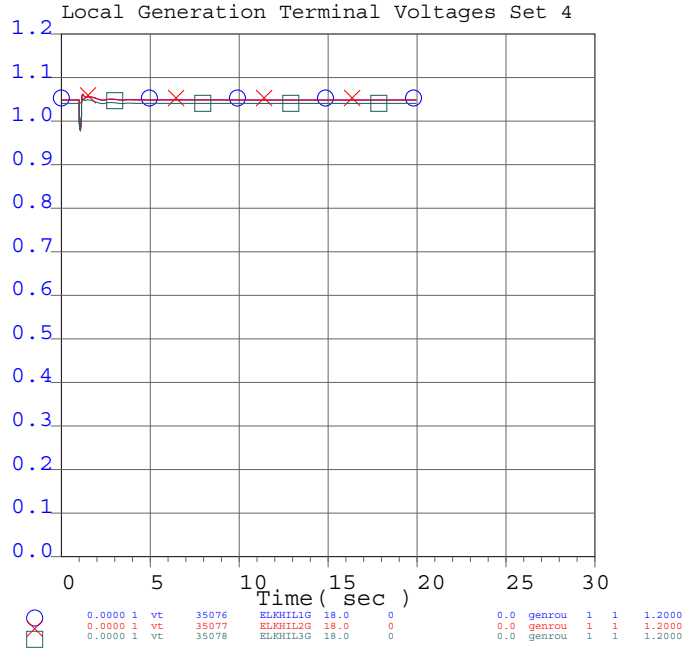
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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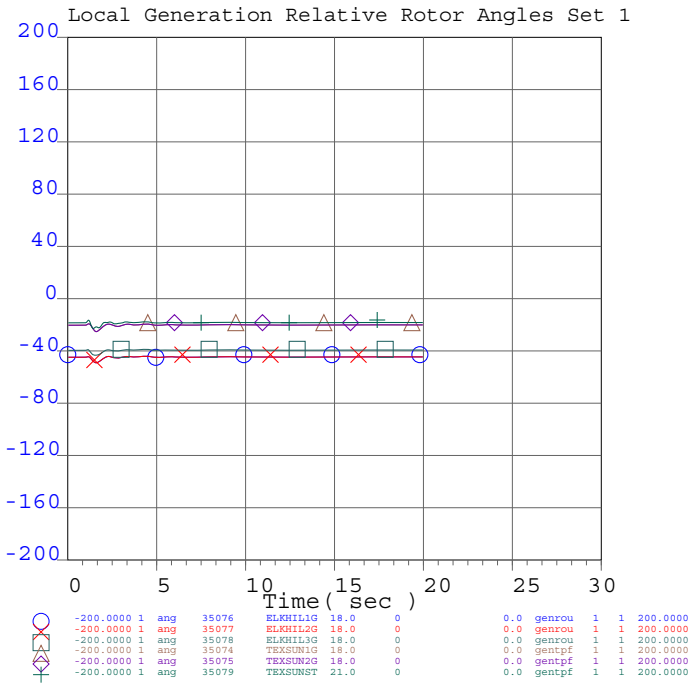

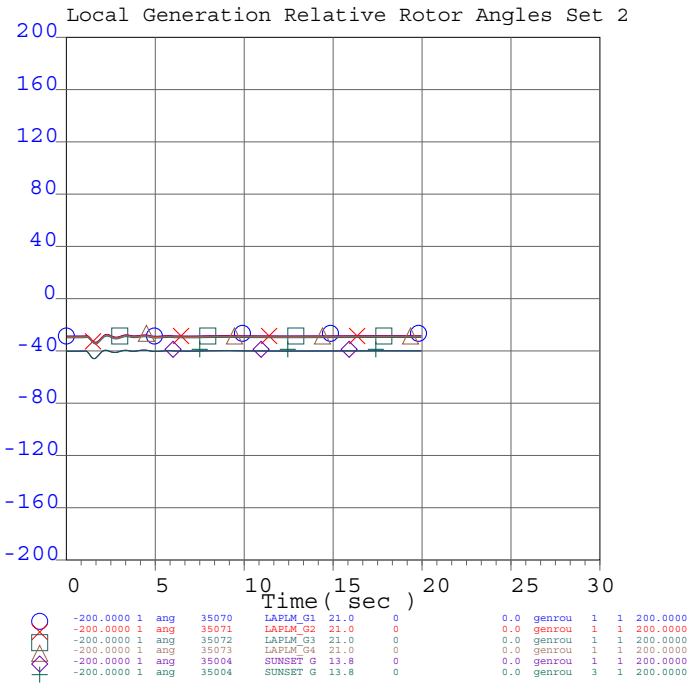

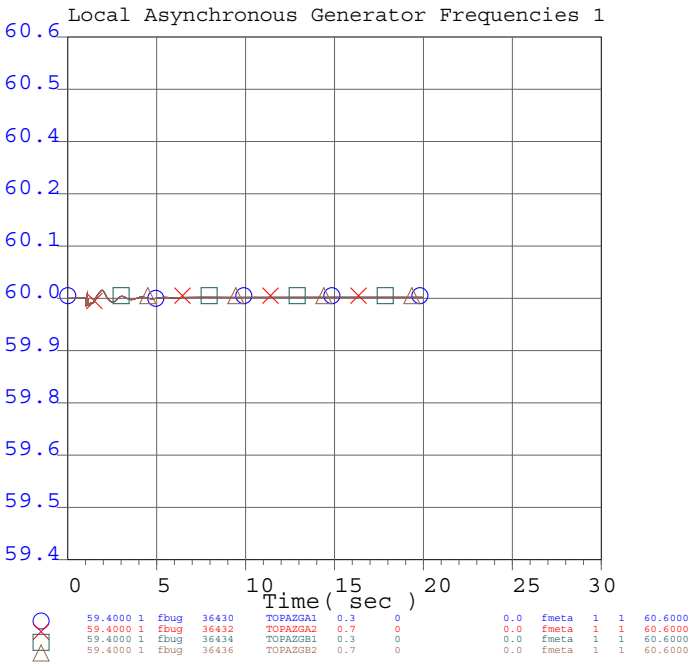

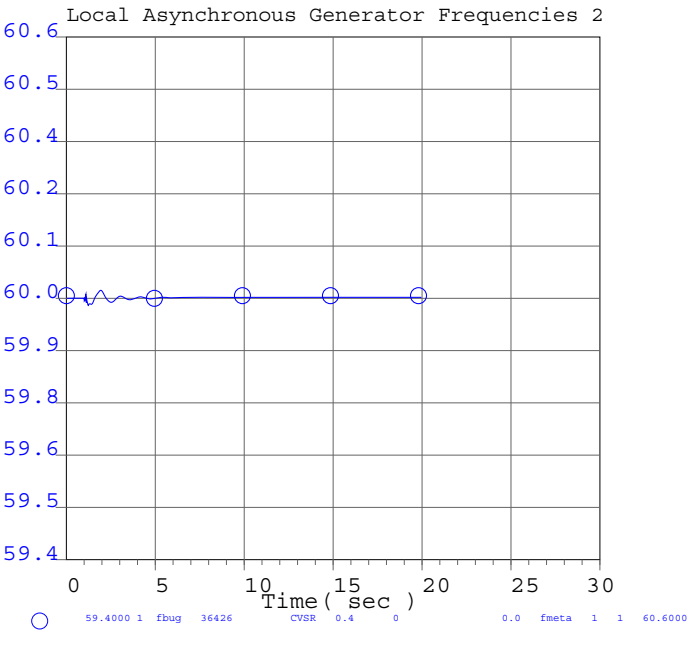

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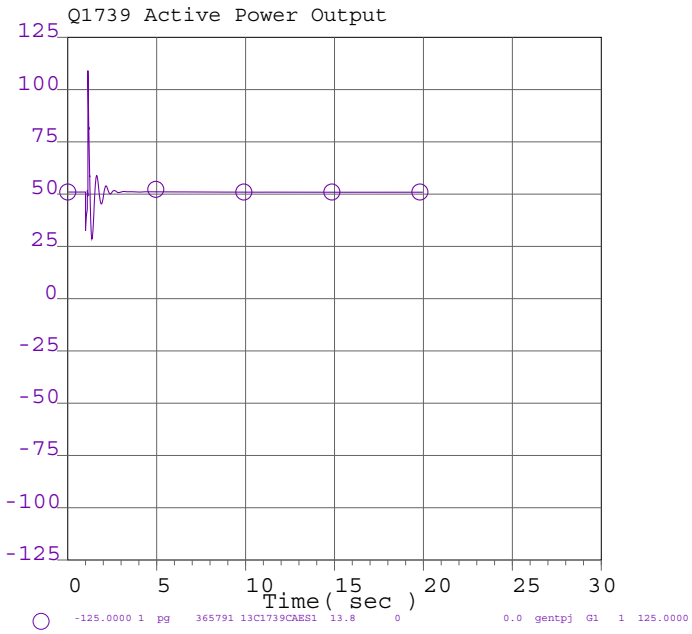

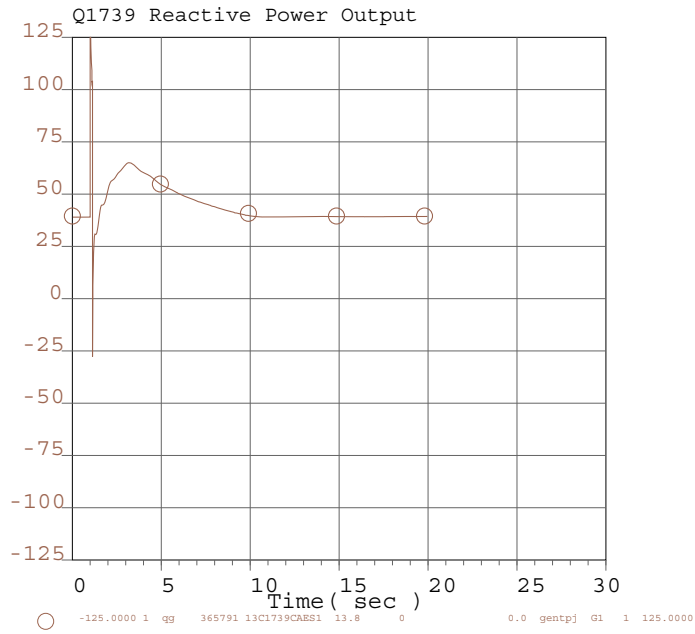

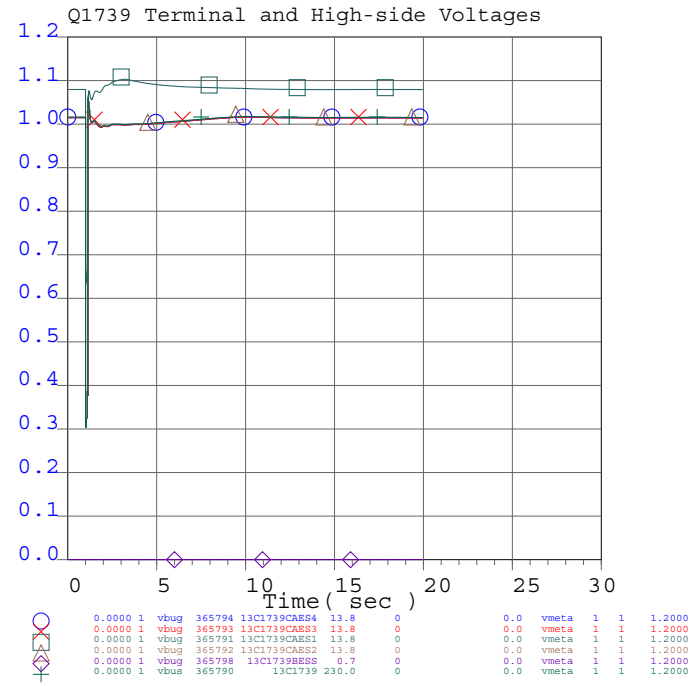

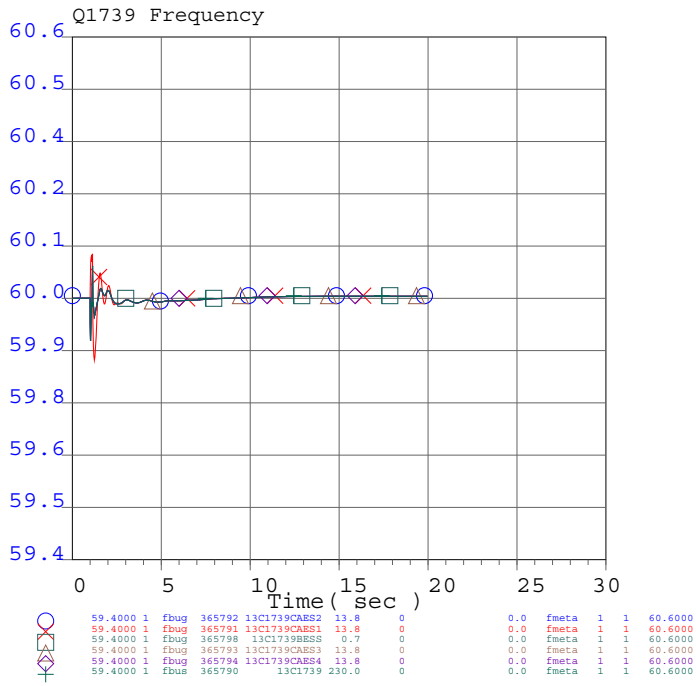

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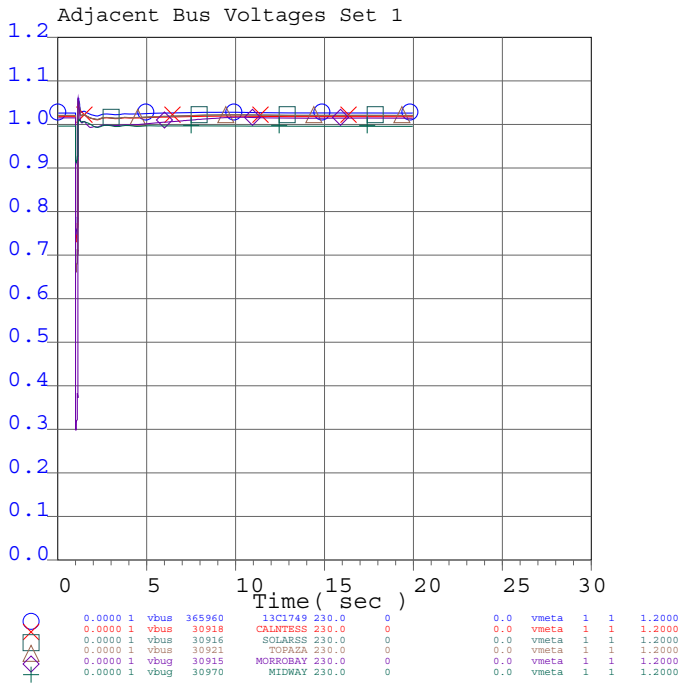

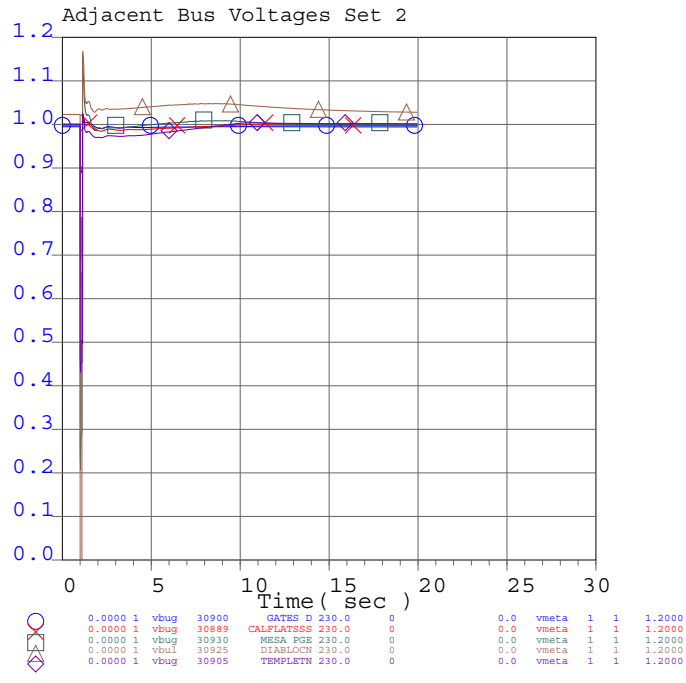

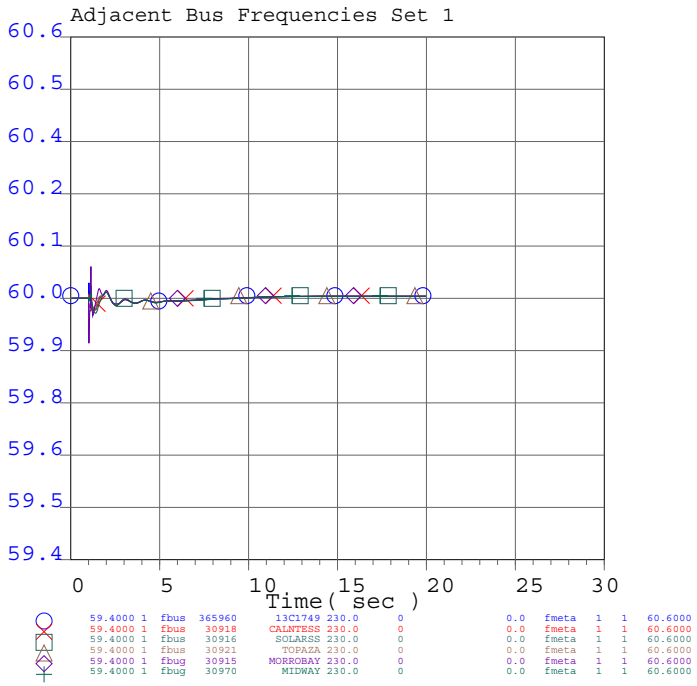

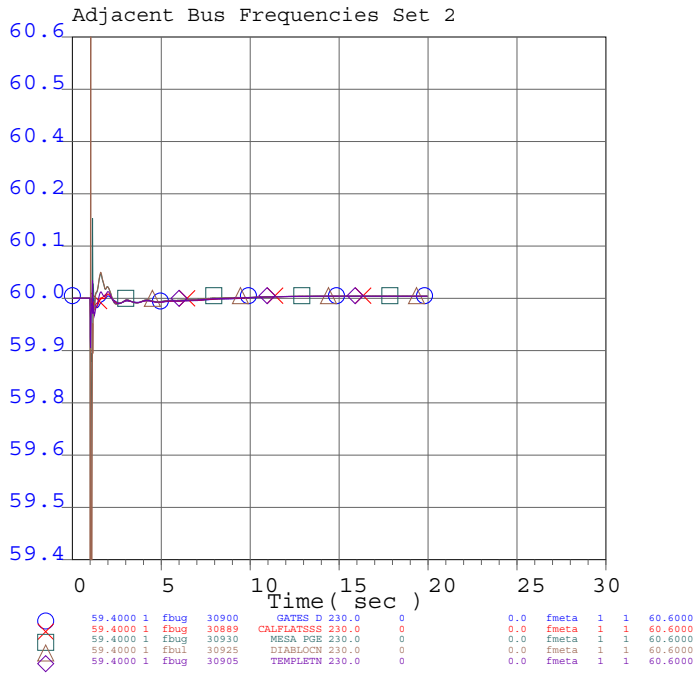

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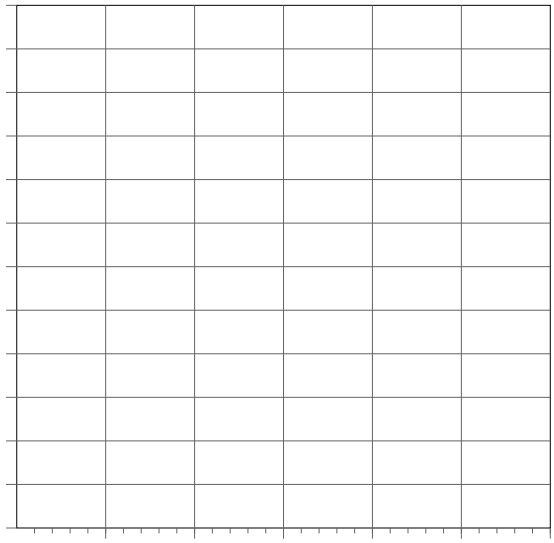
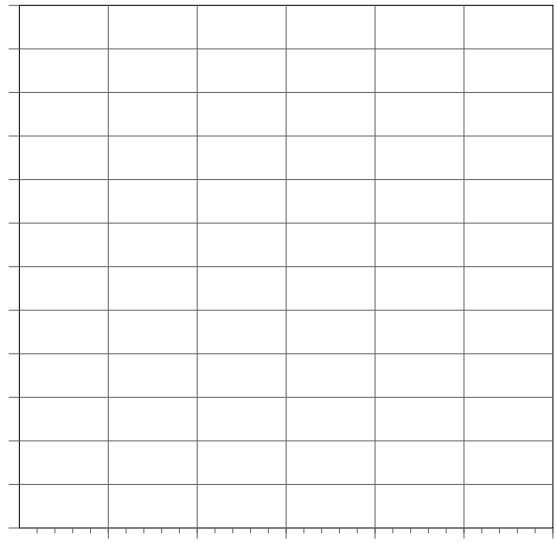
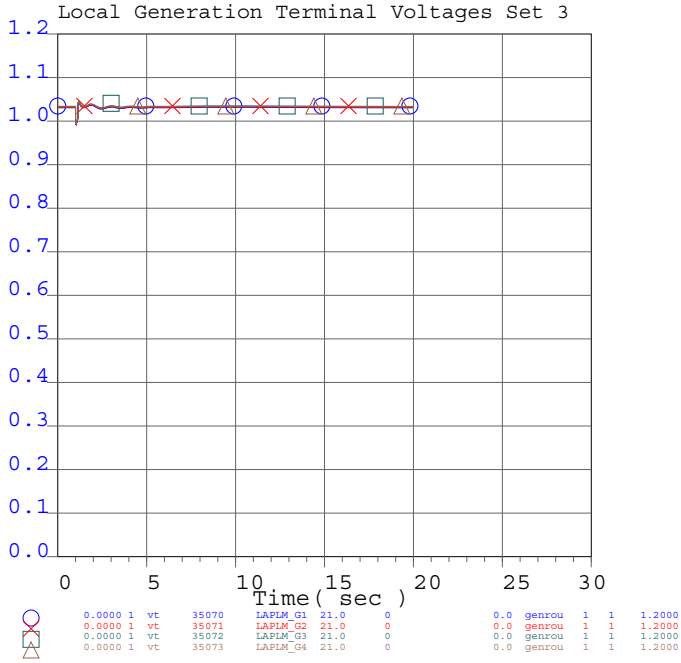
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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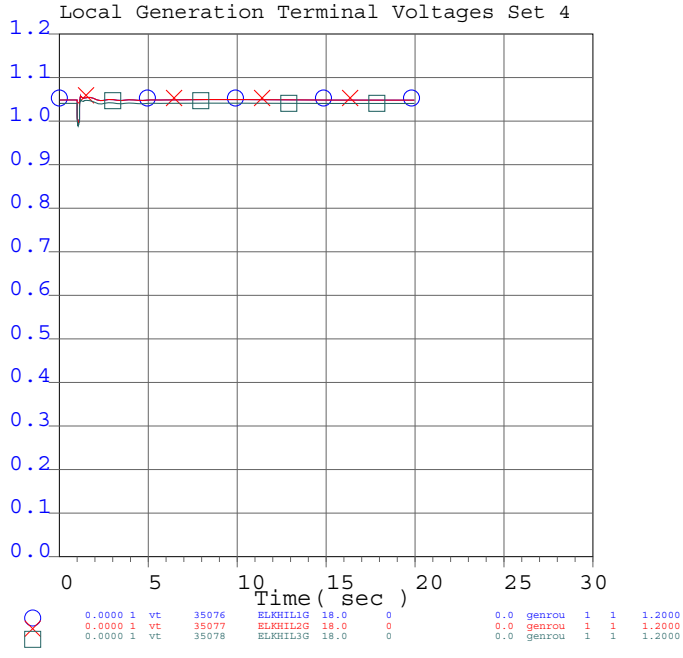
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
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0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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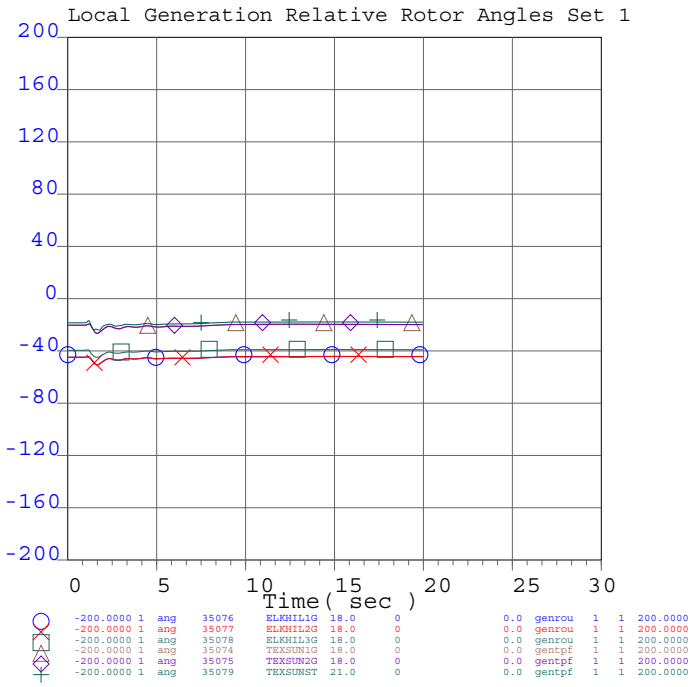

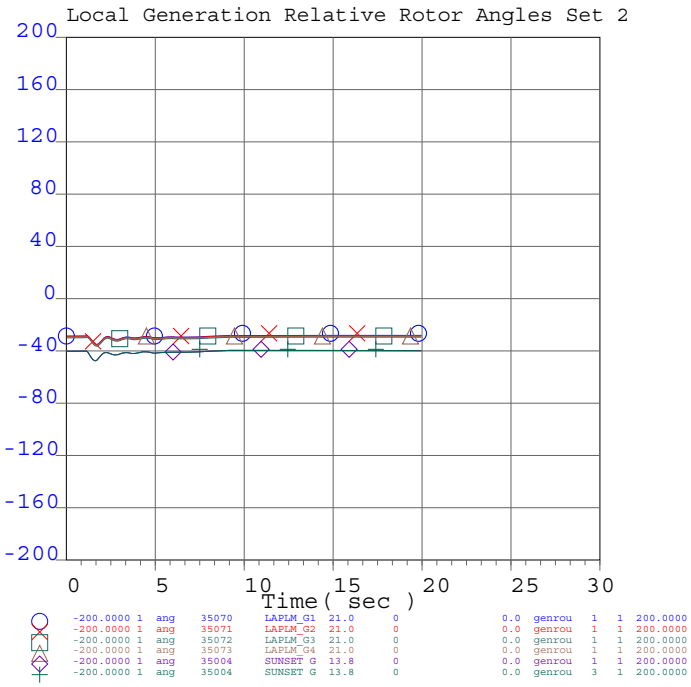

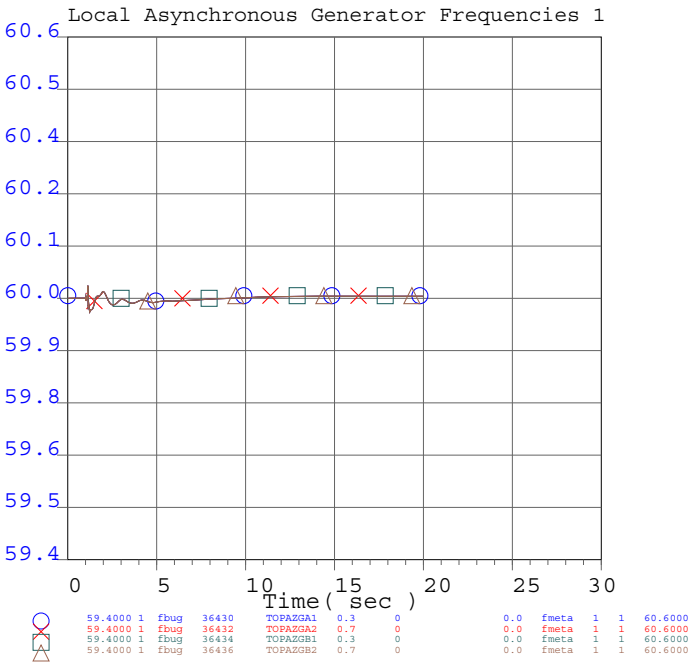

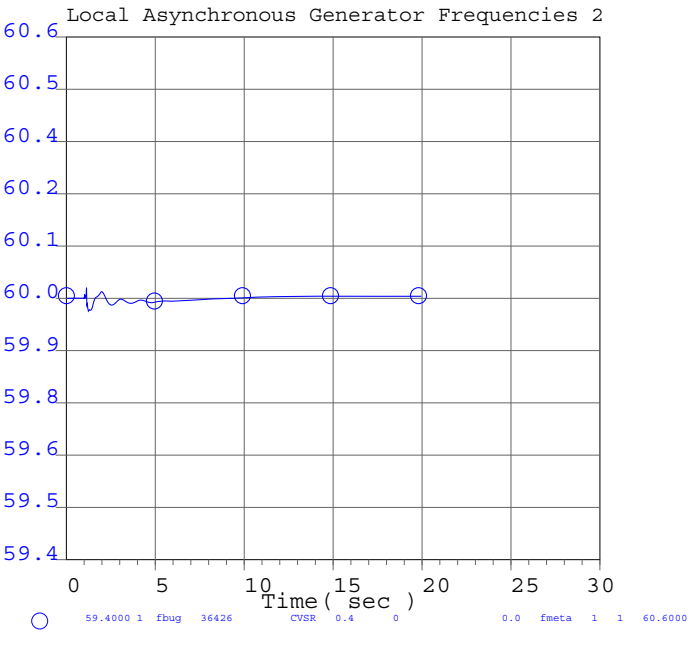

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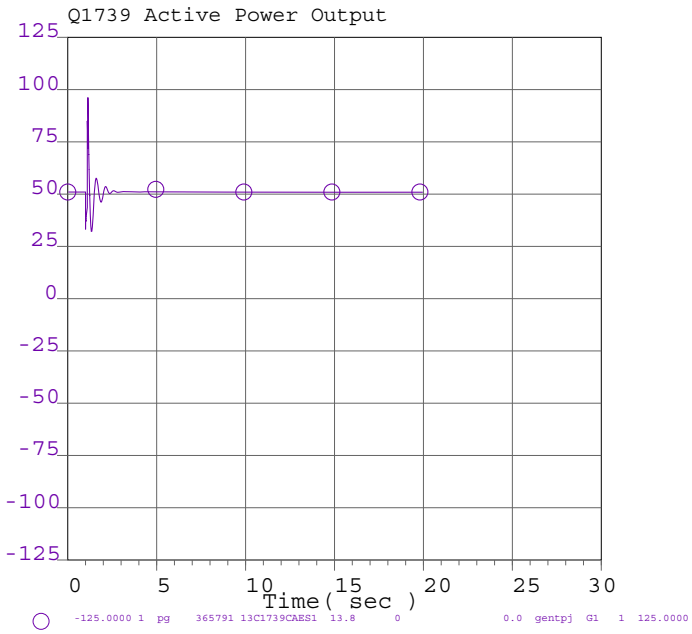
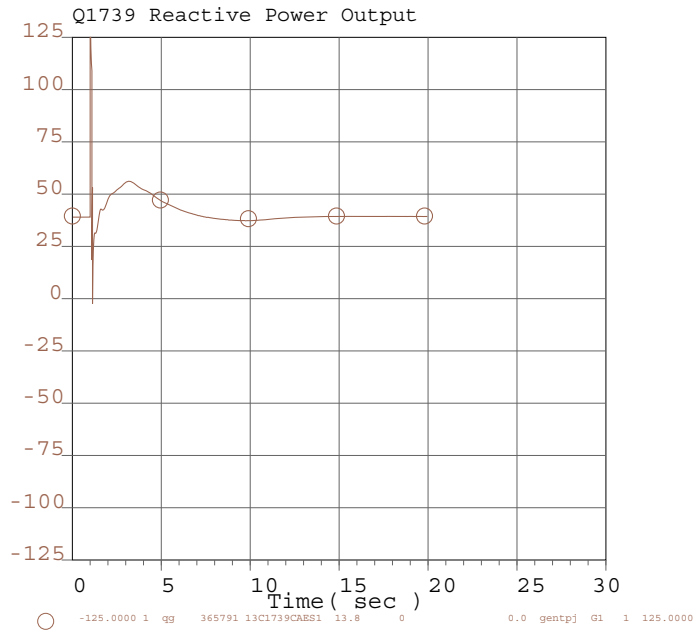
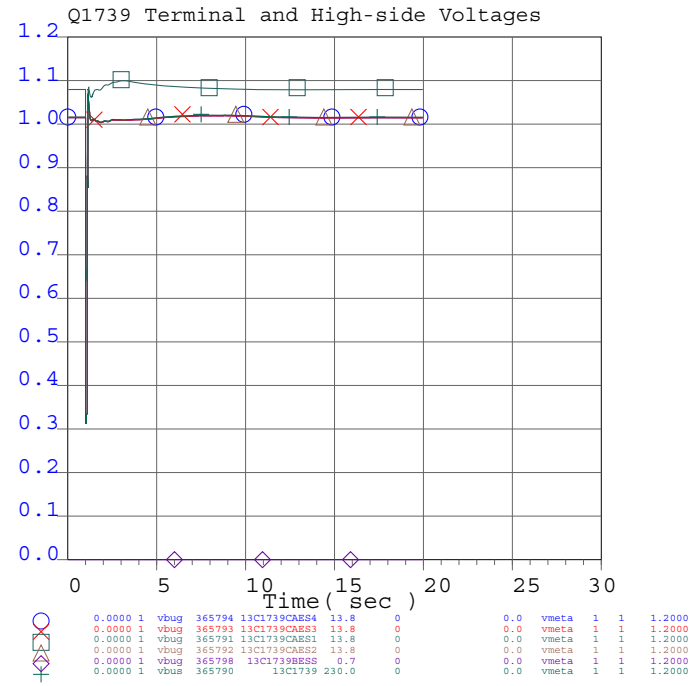
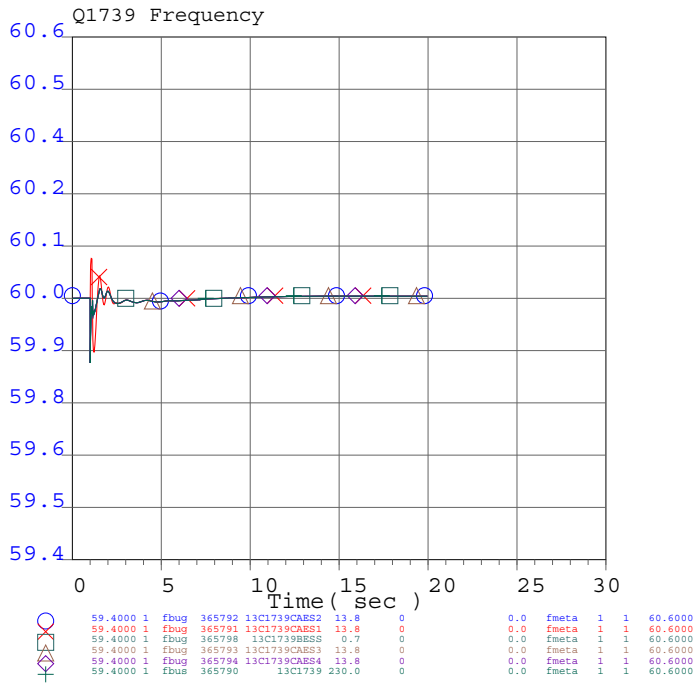
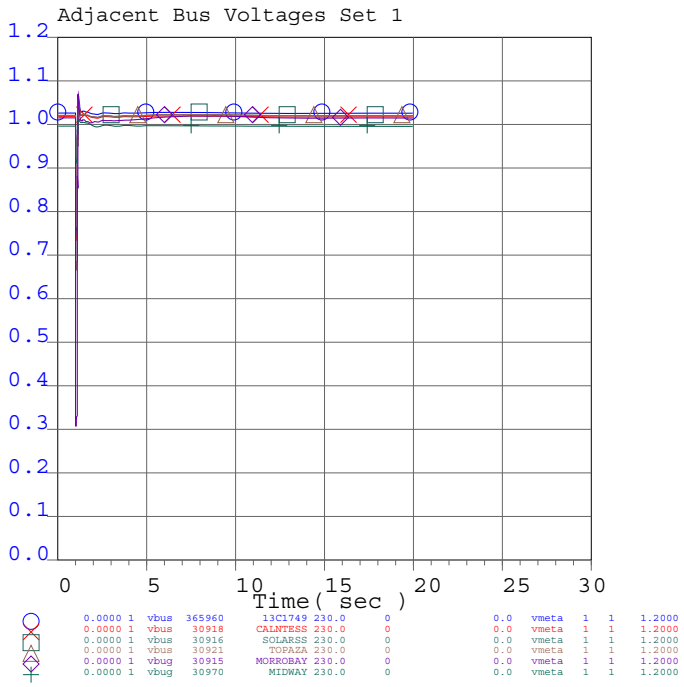


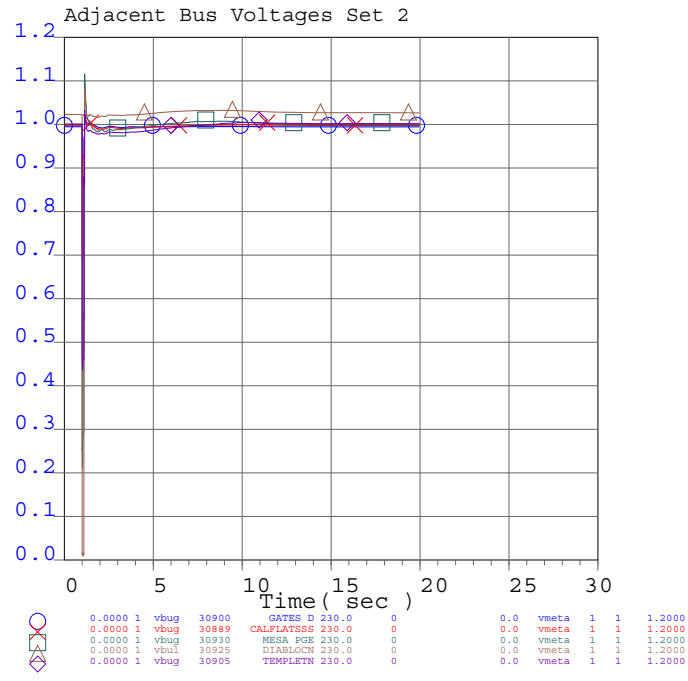


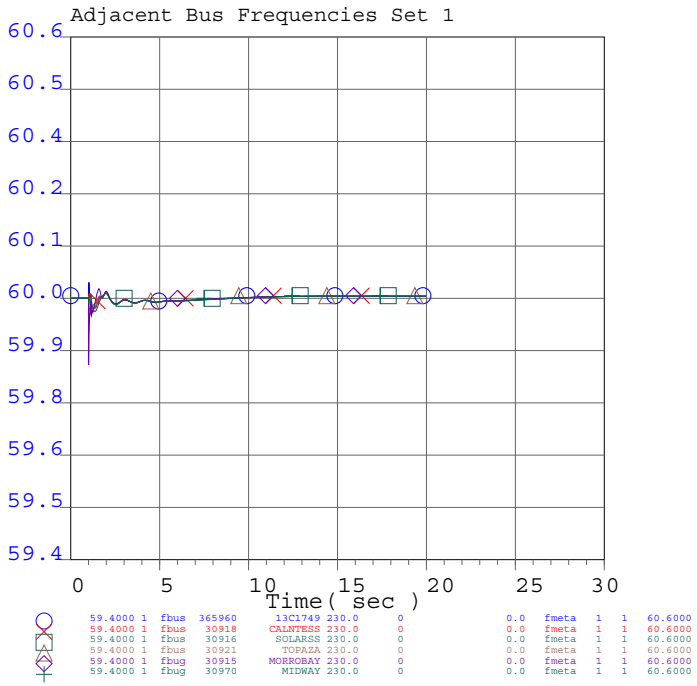


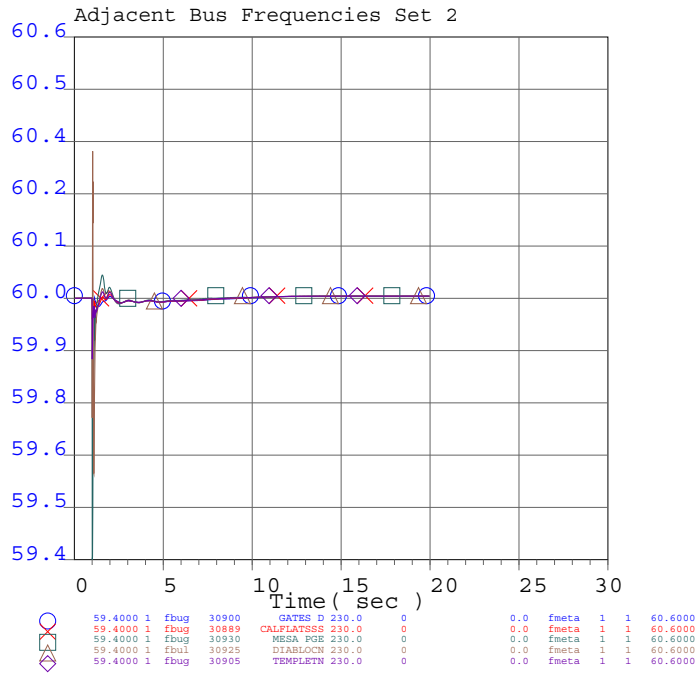


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



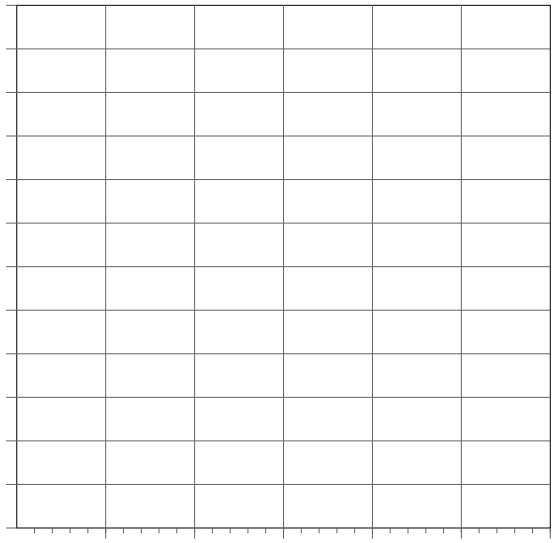




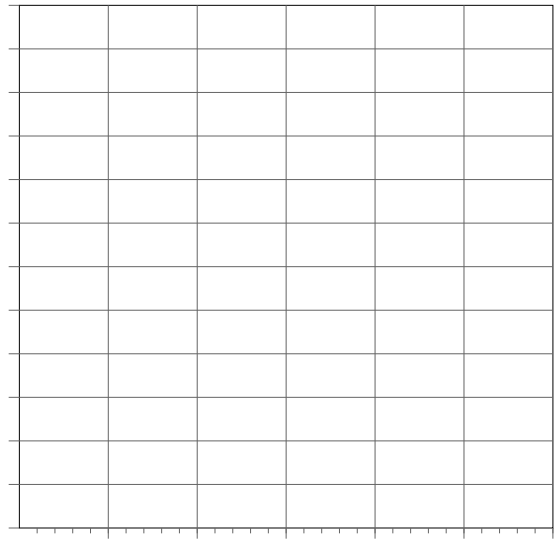


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

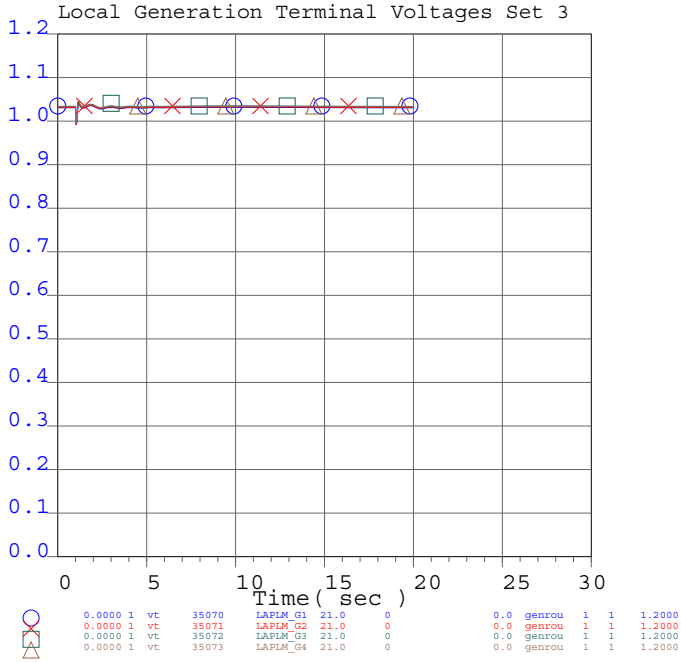
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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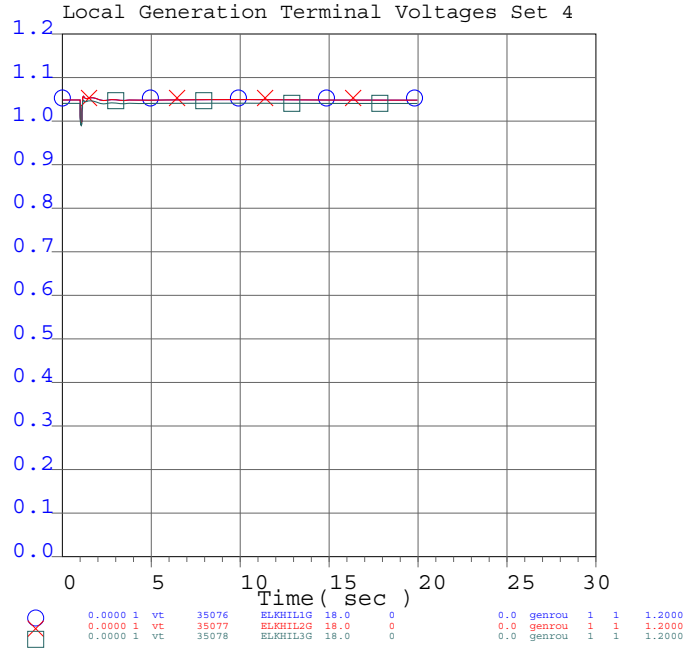
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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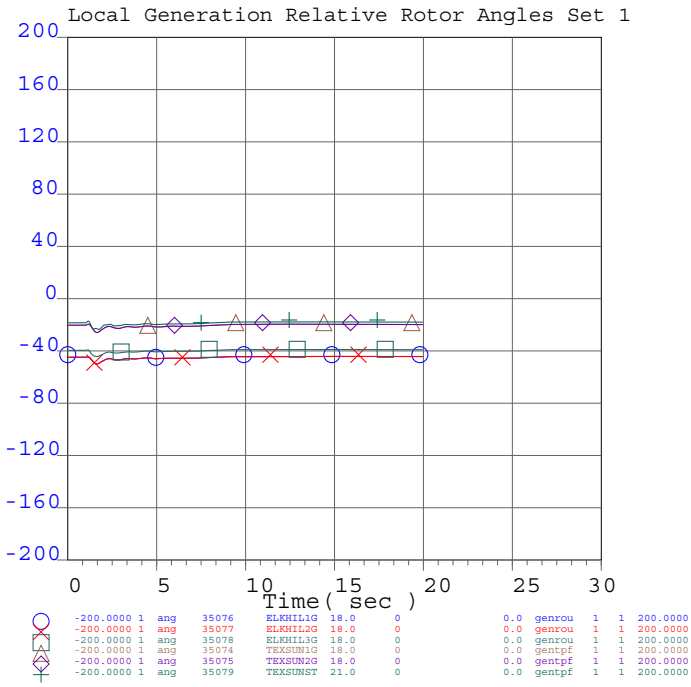
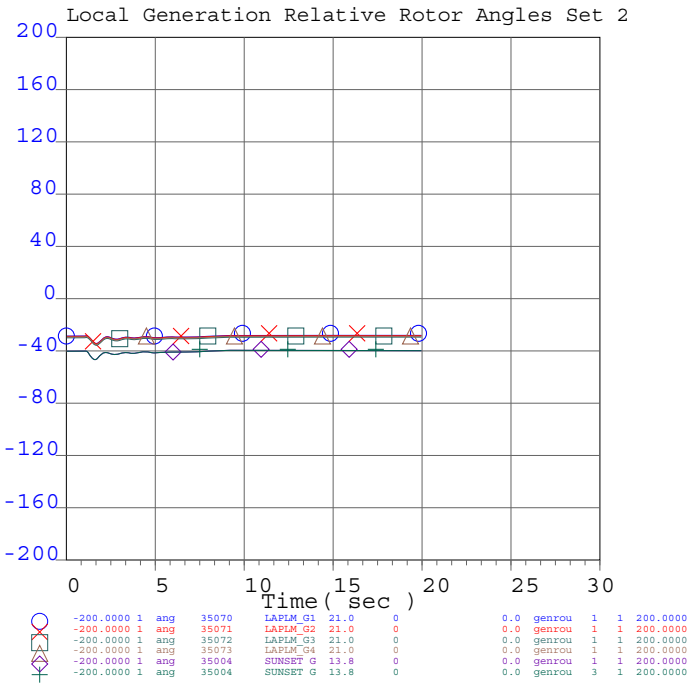
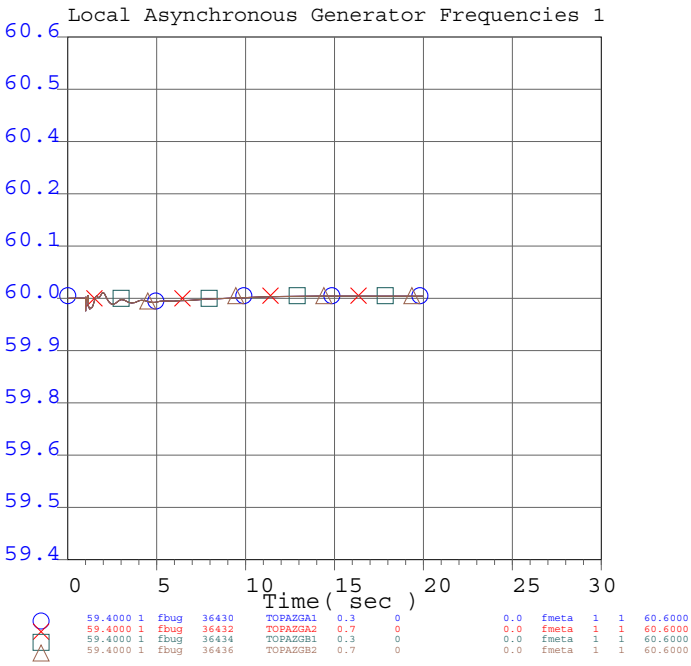
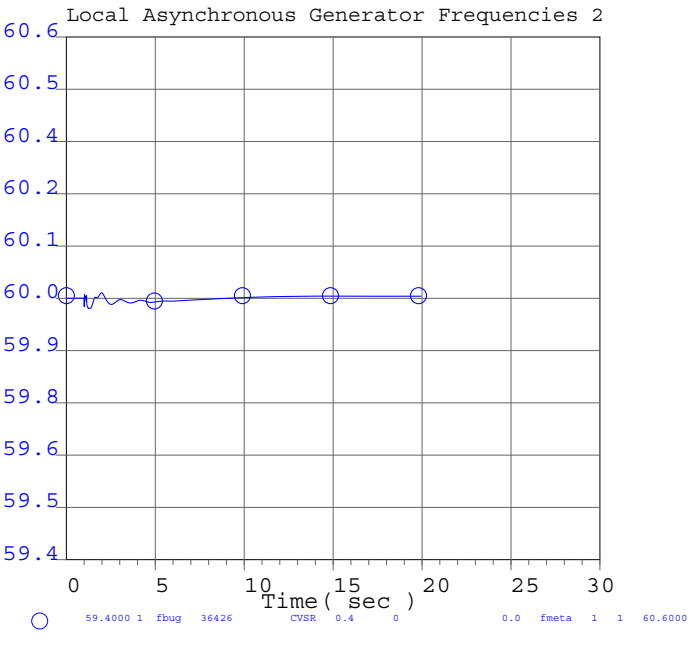
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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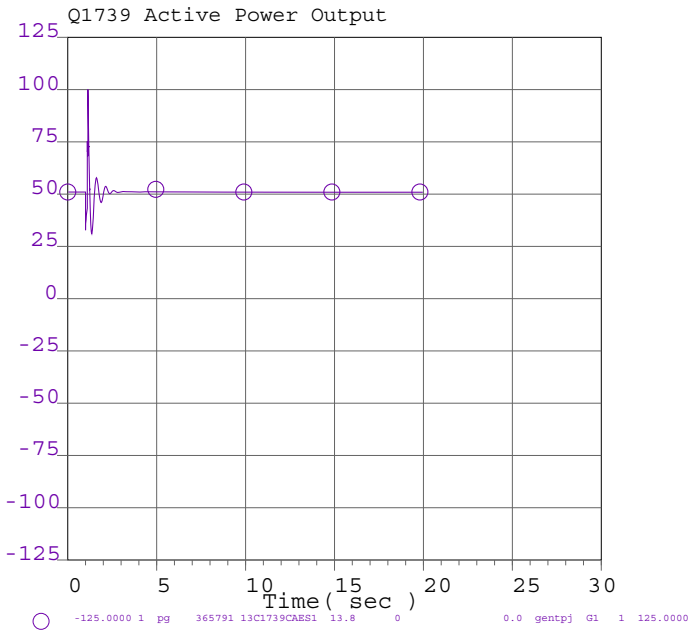
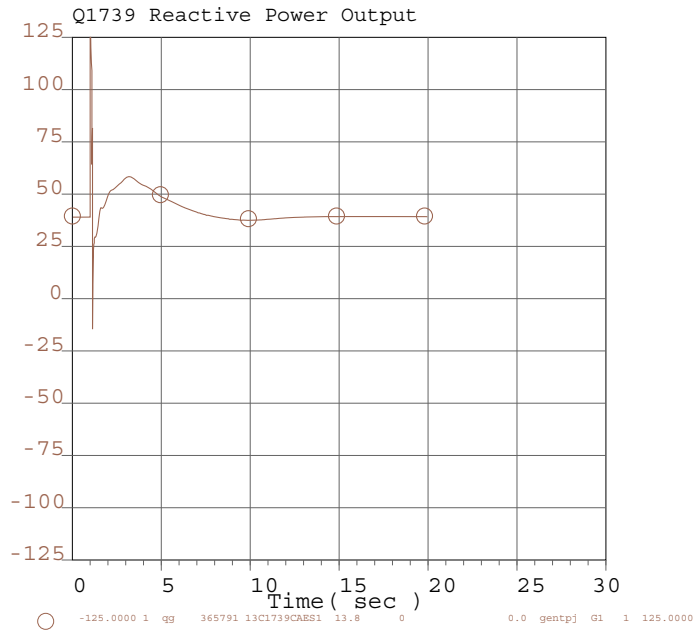
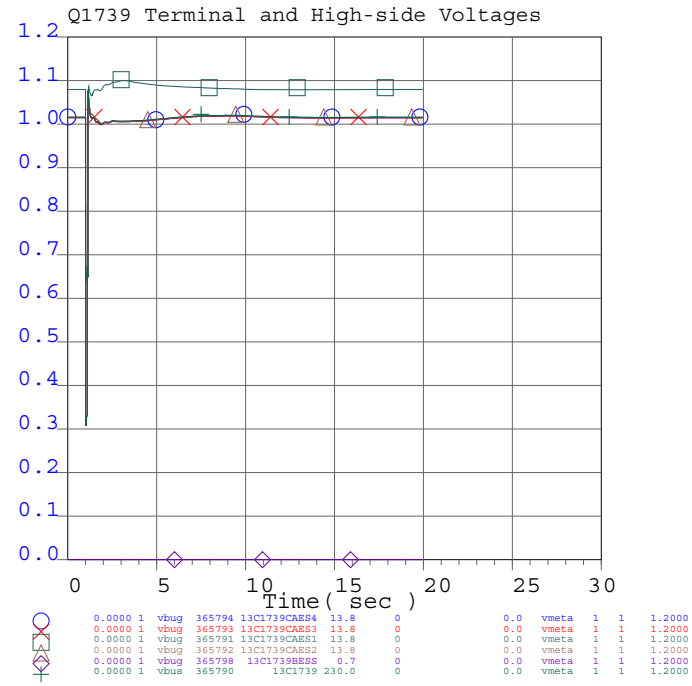
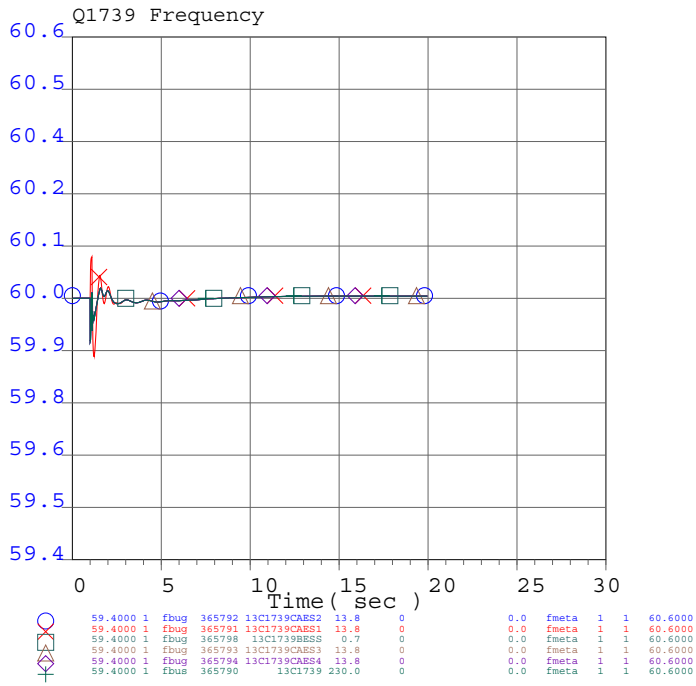
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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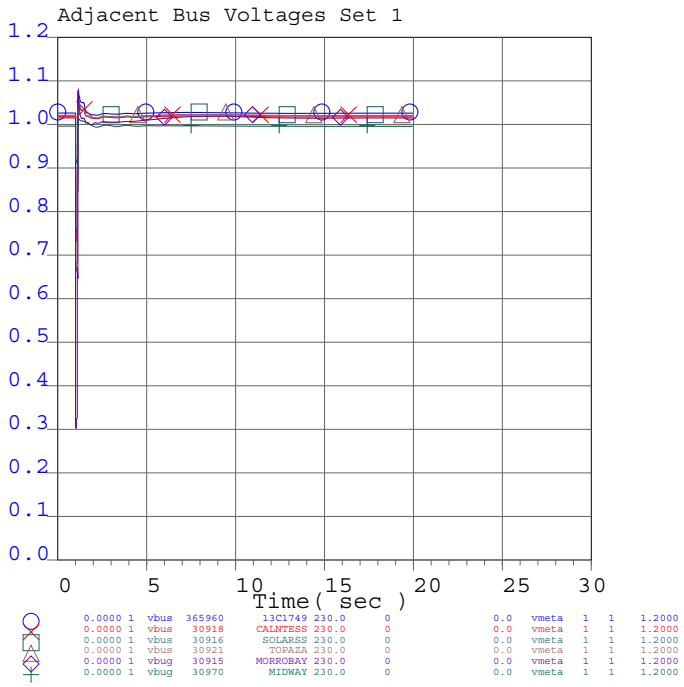
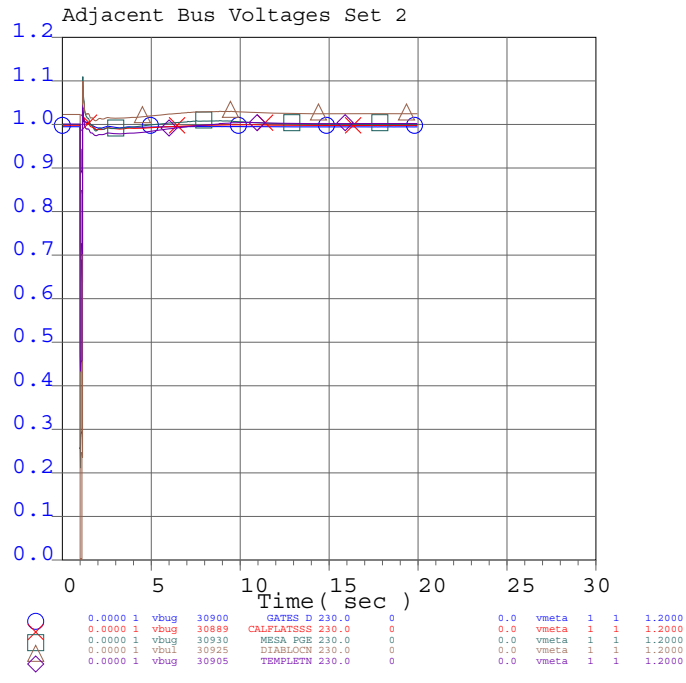
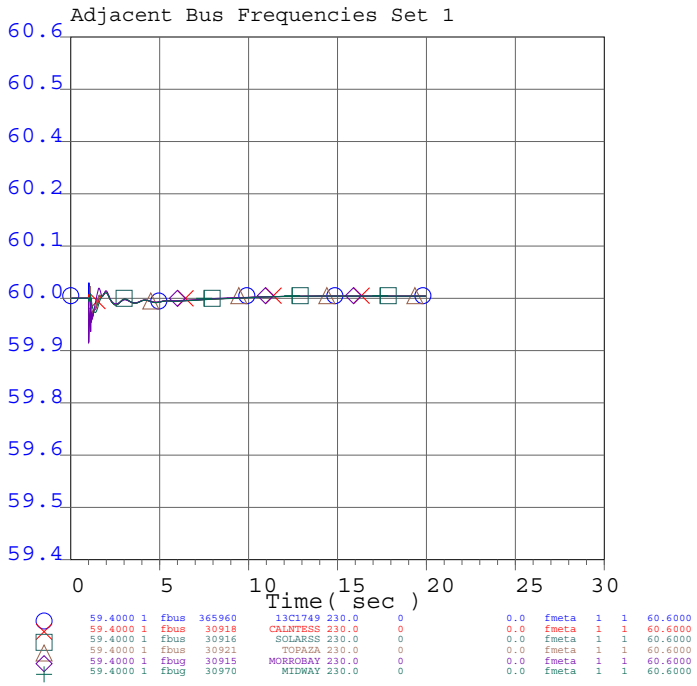
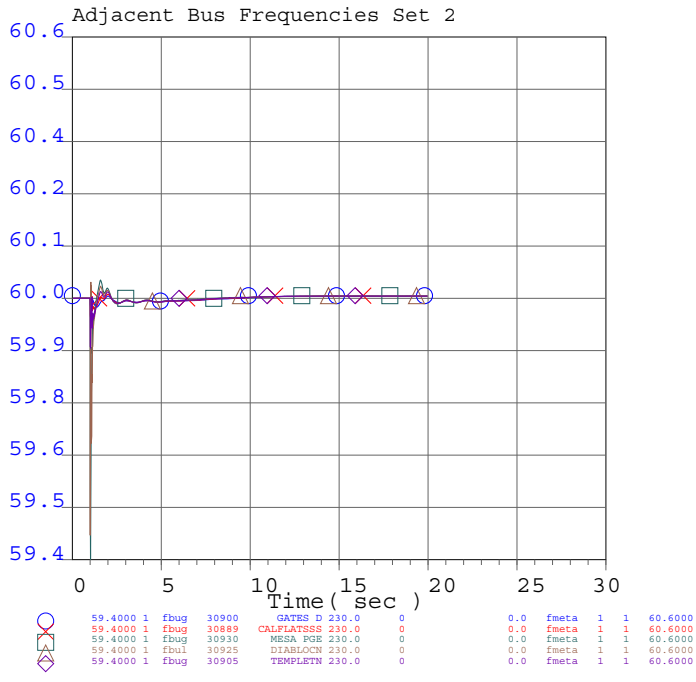
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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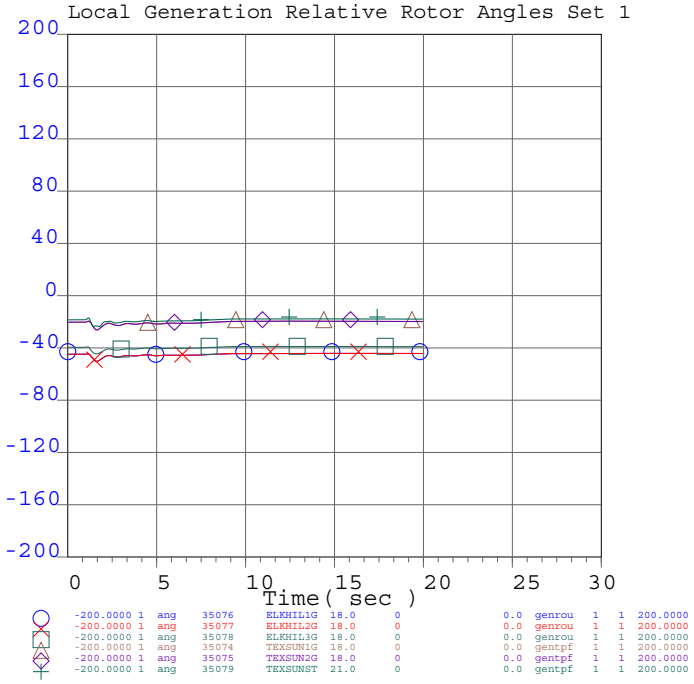
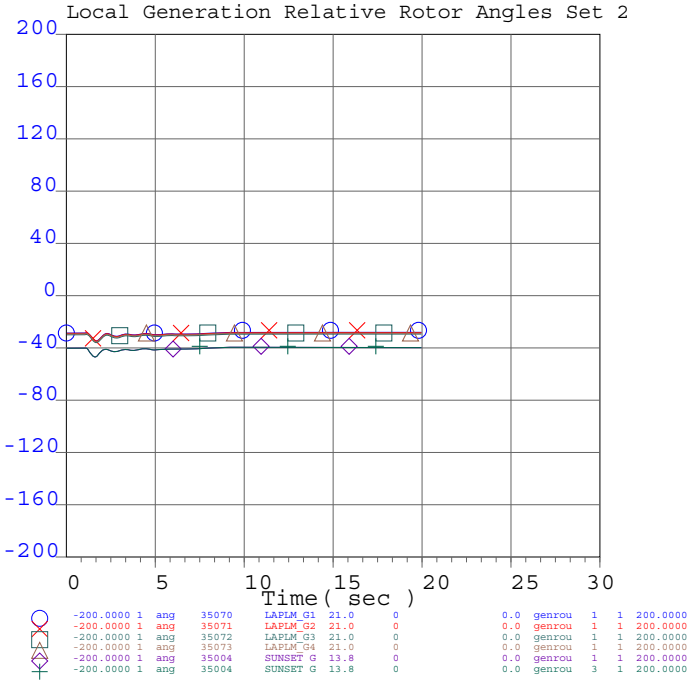
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

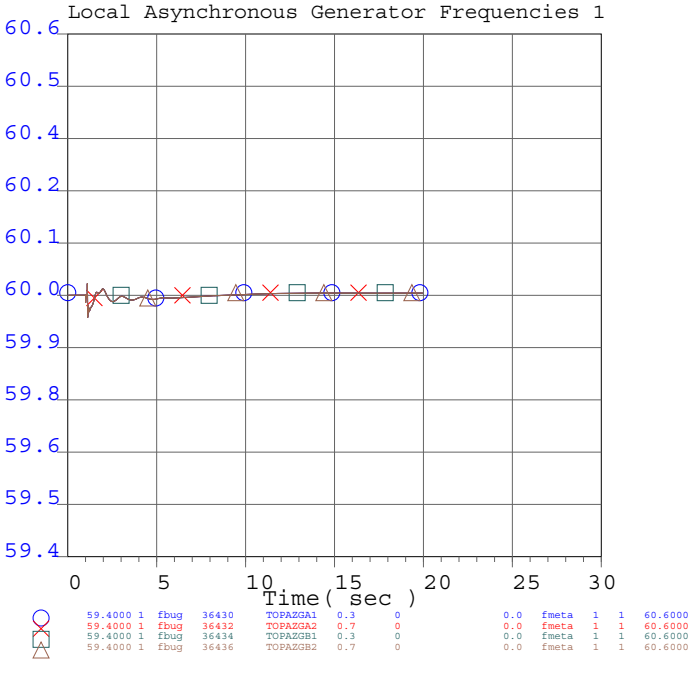
Local Generation Relative Rotor Angles Set 1



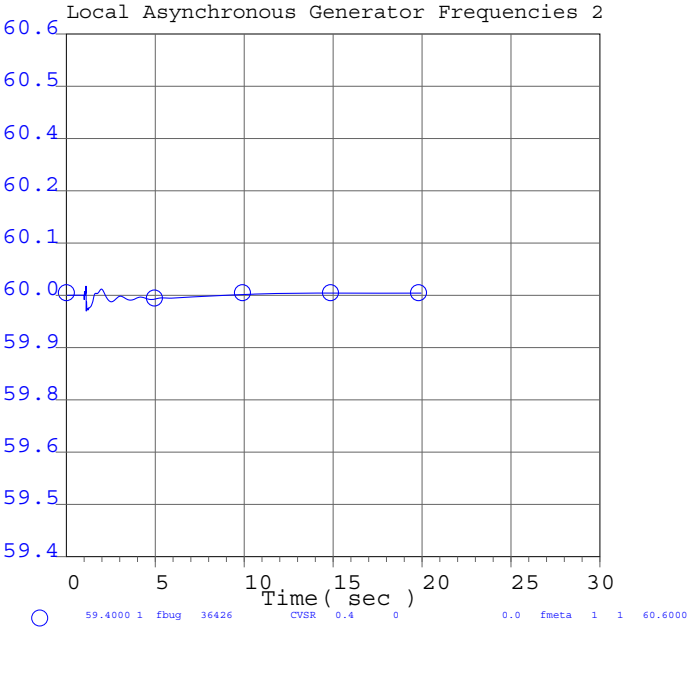
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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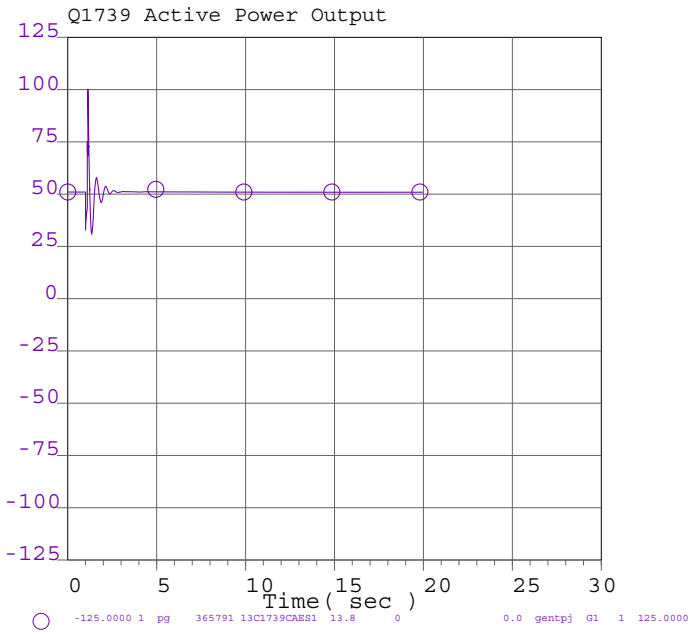
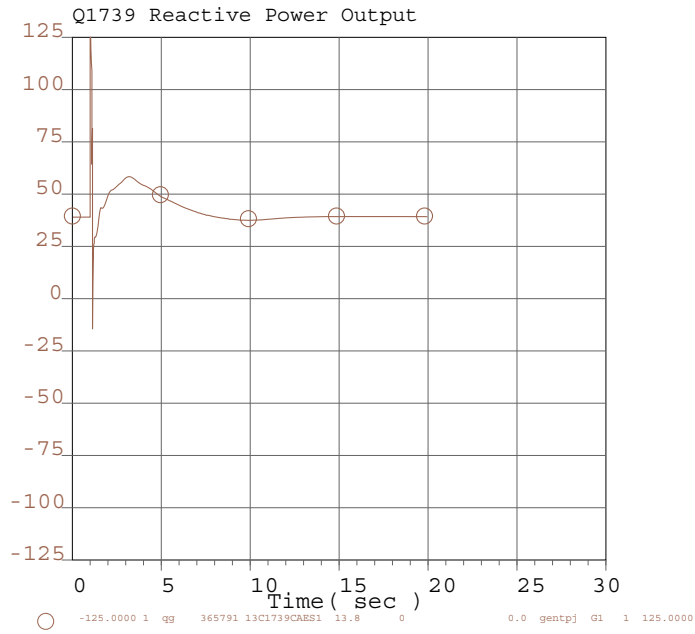
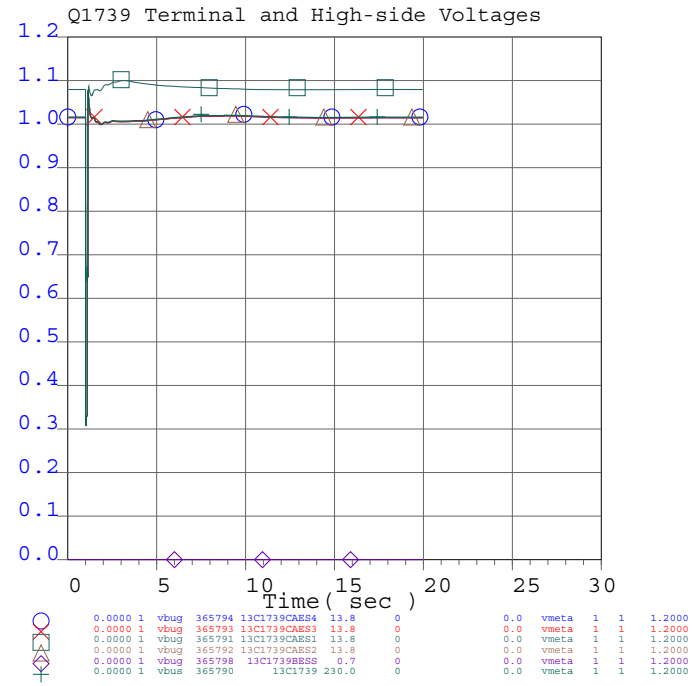
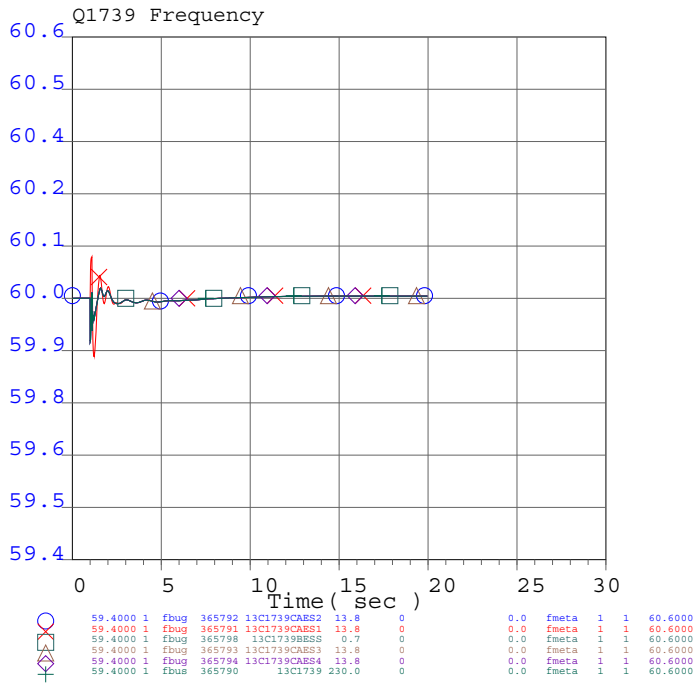
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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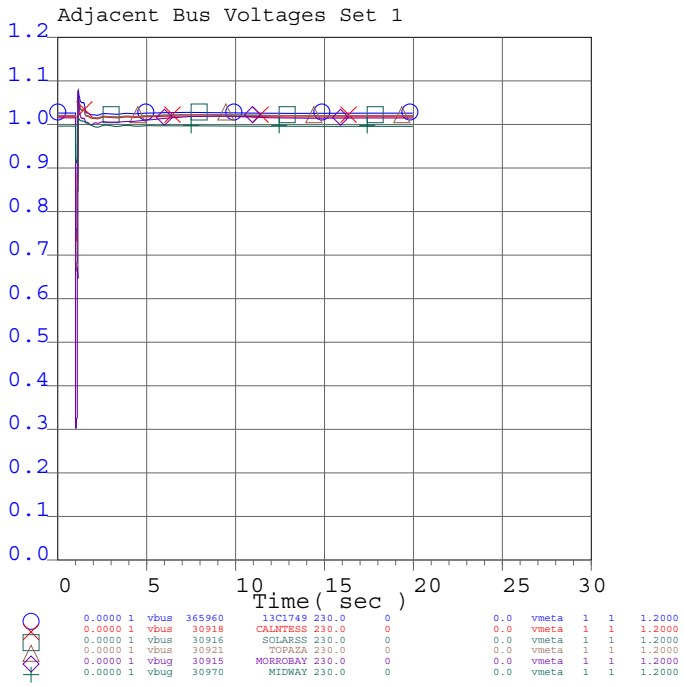

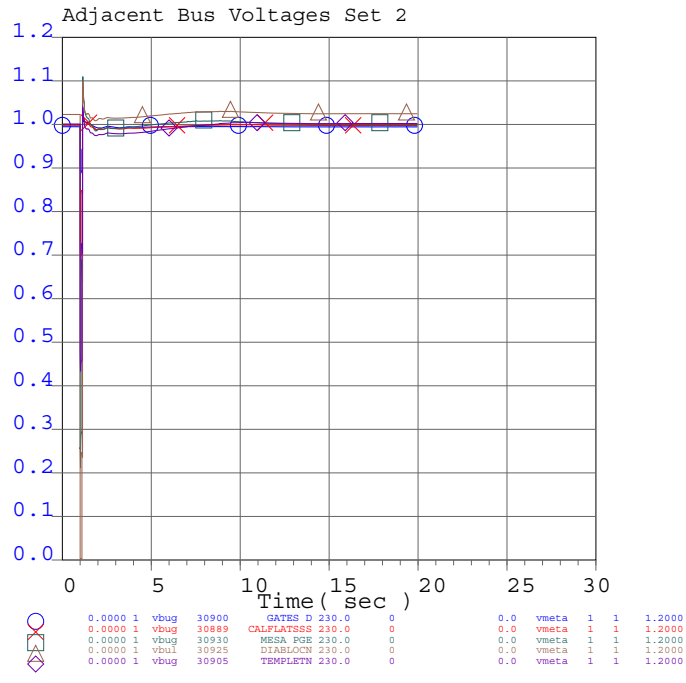

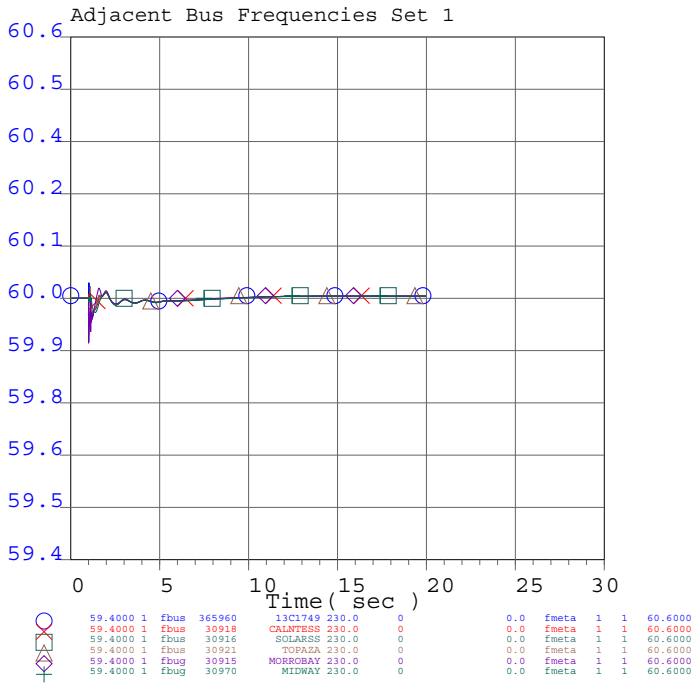

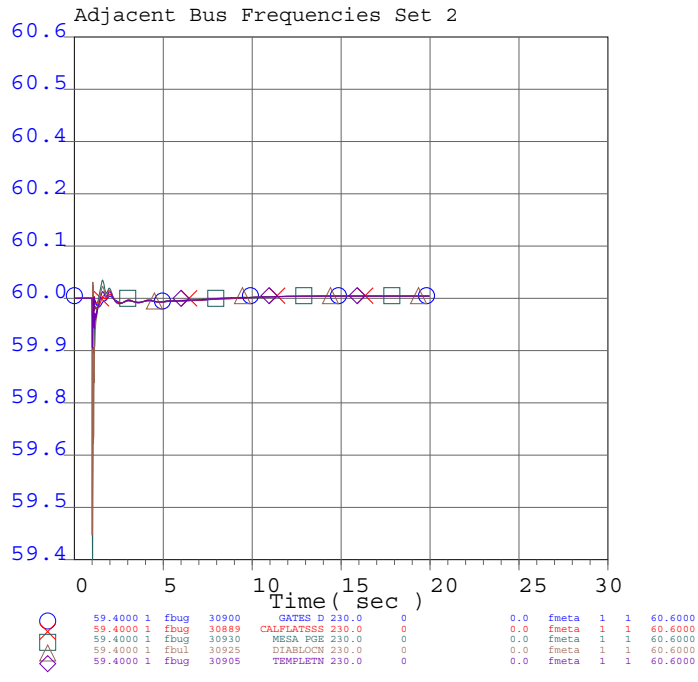

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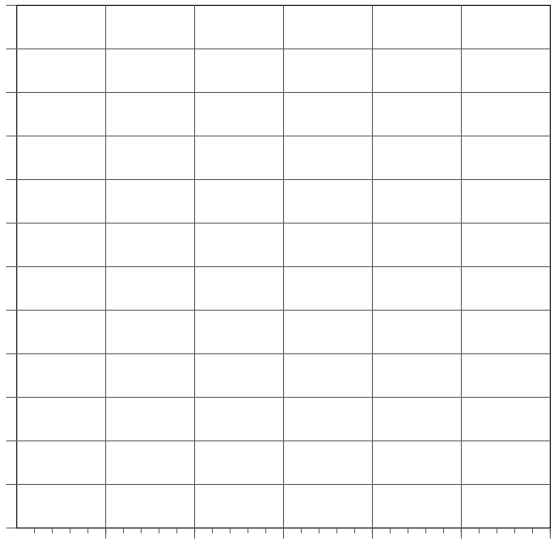
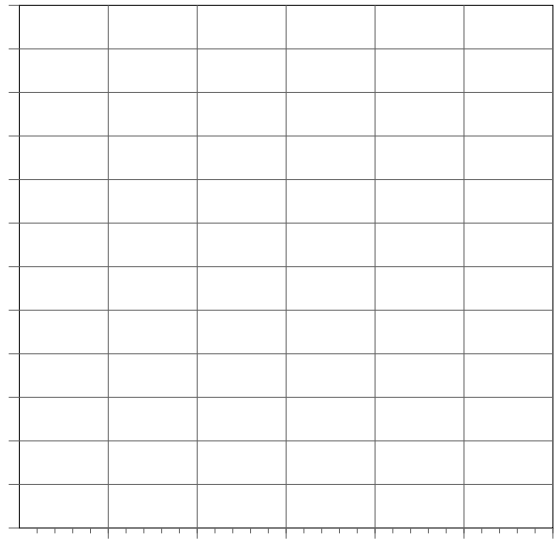
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

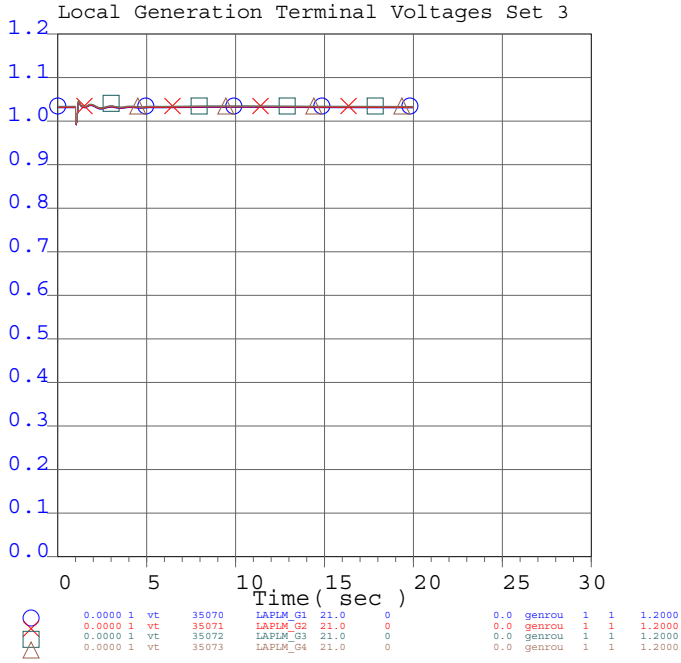
Local Generation Terminal Voltages Set 1



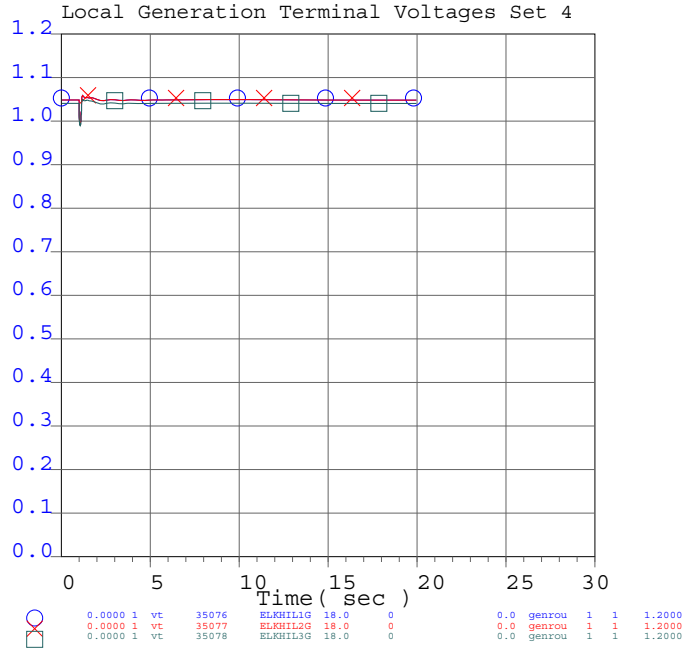
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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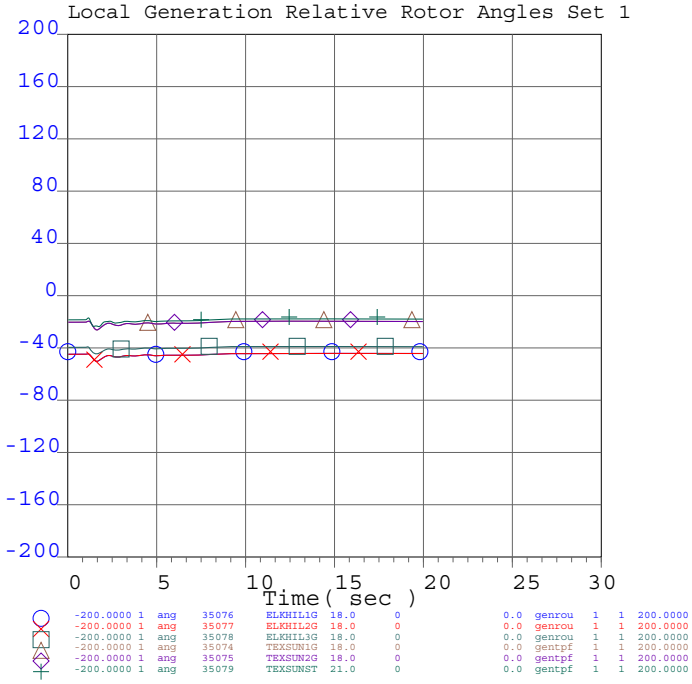
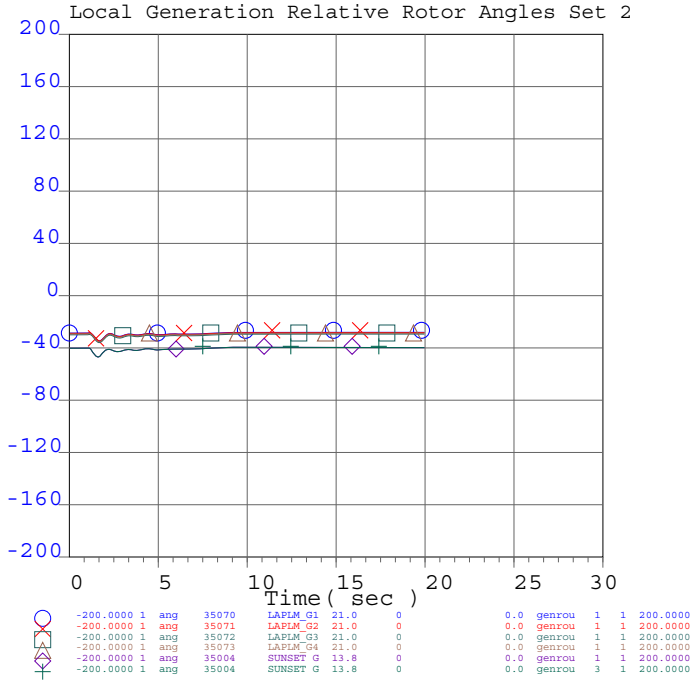
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

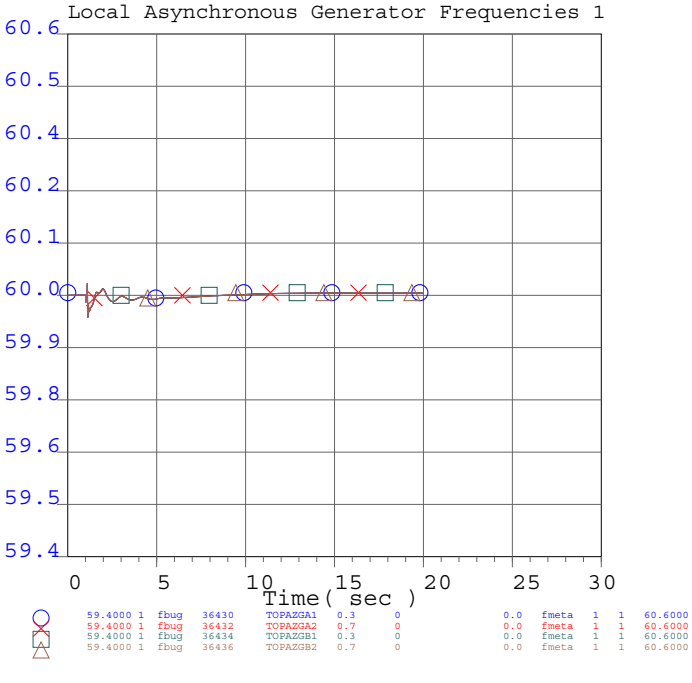
Local Generation Relative Rotor Angles Set 1



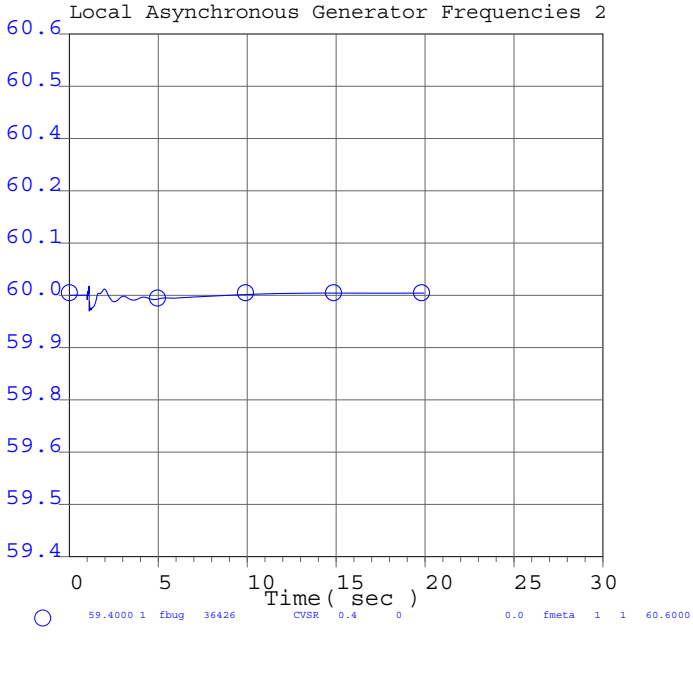
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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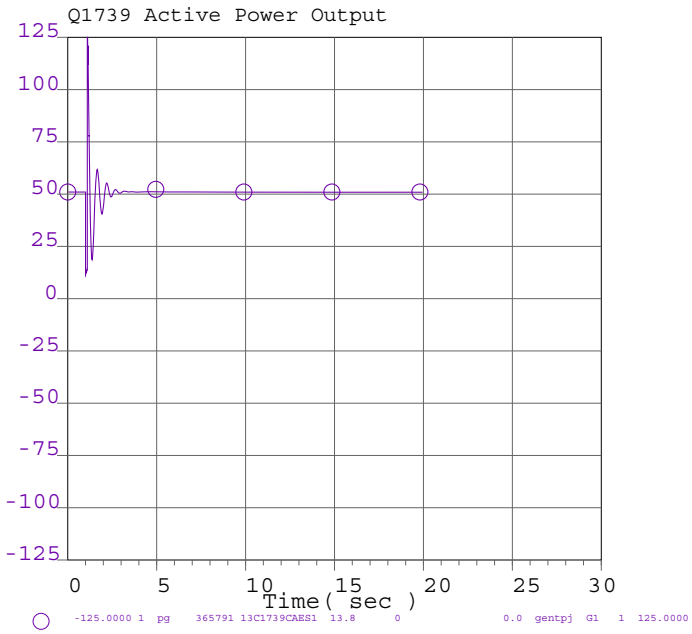

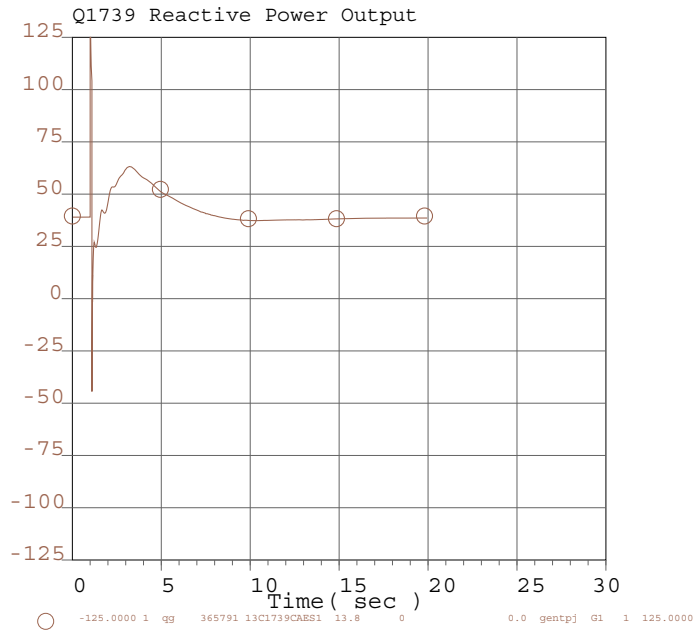

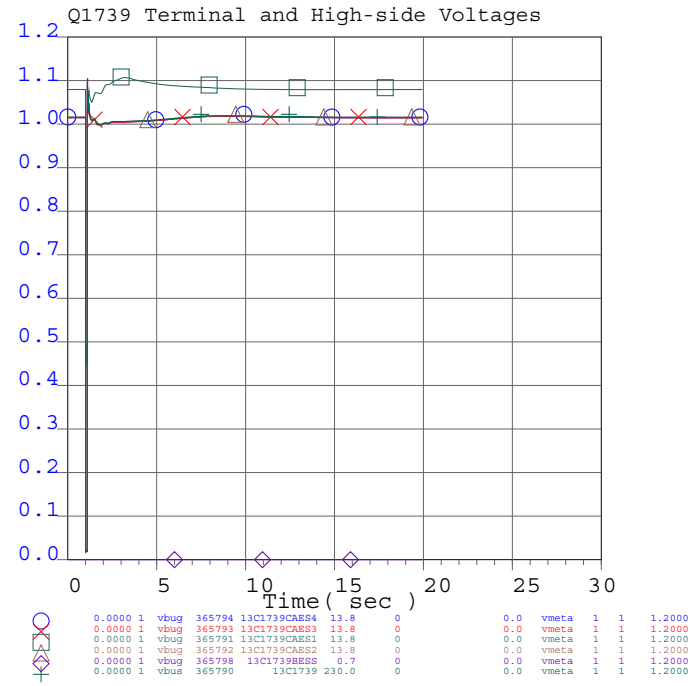

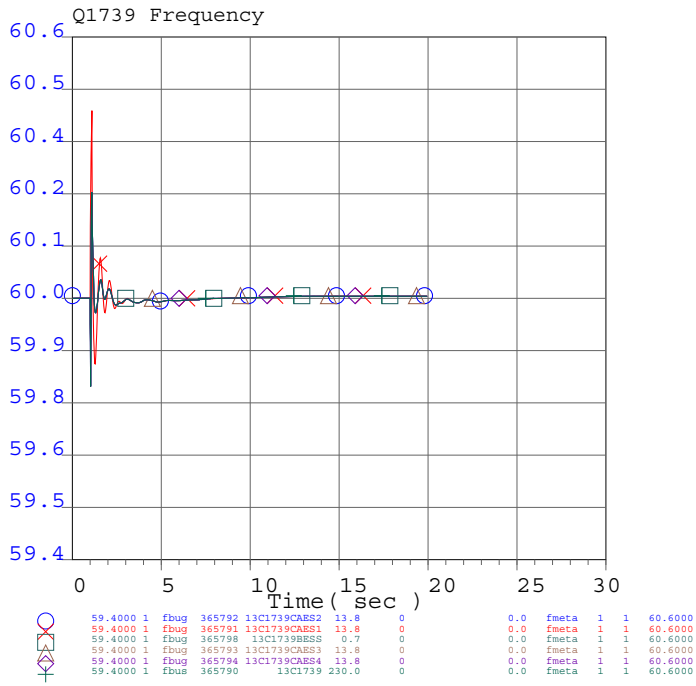

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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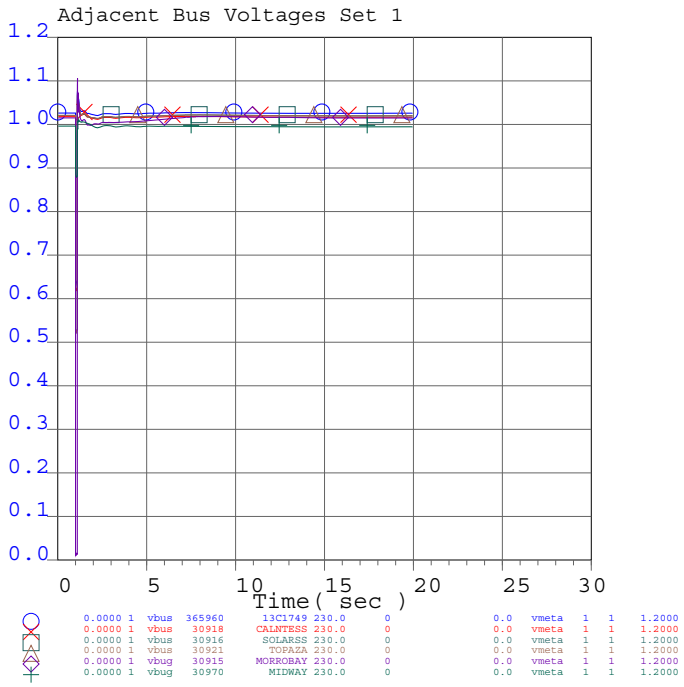
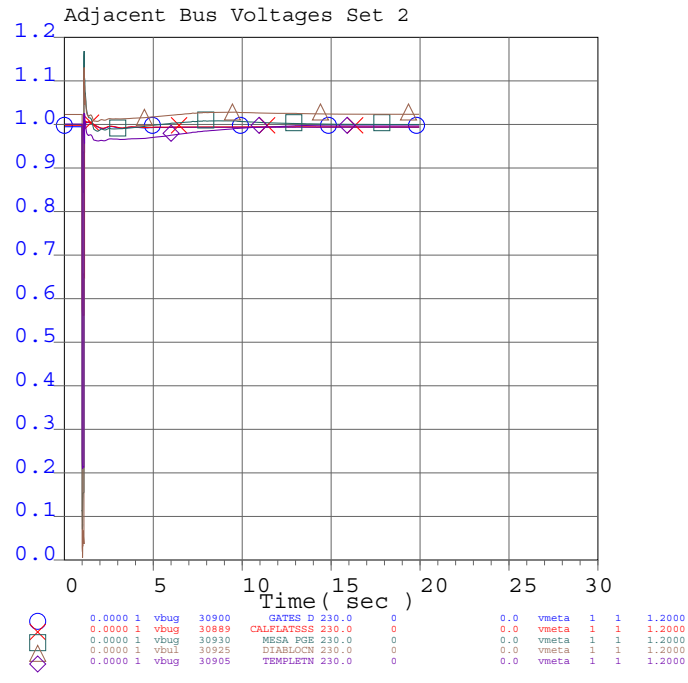
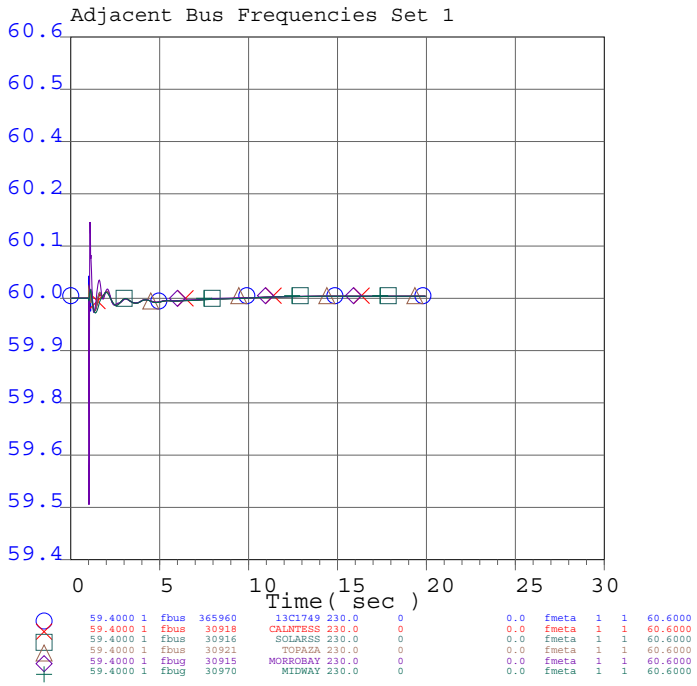
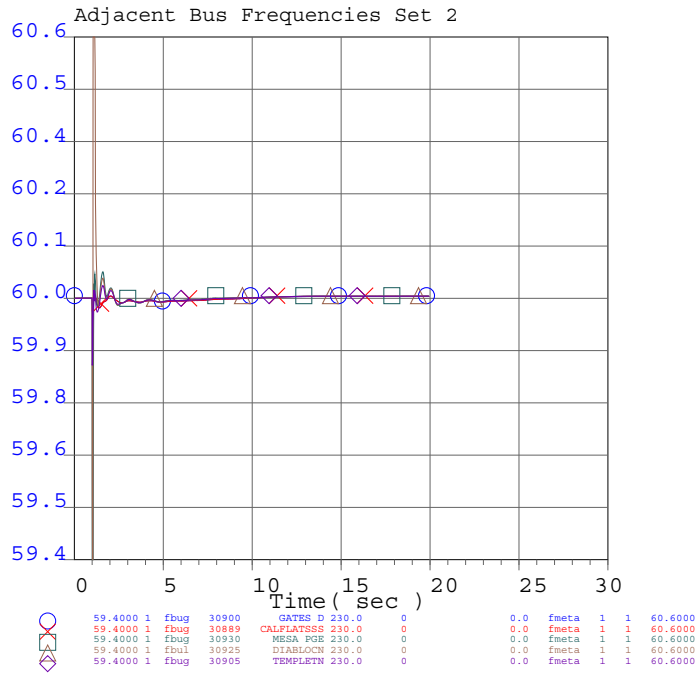
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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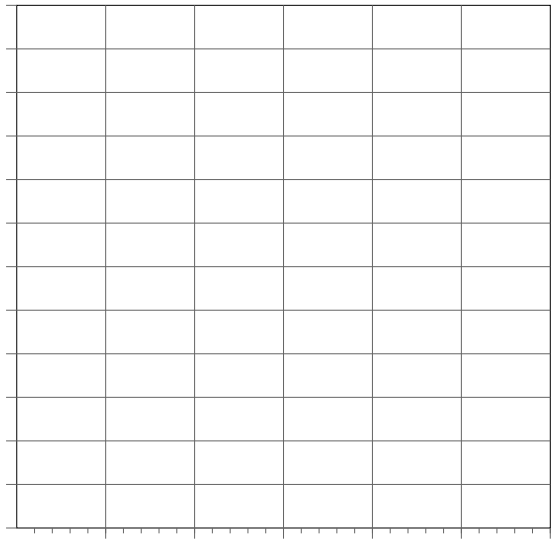
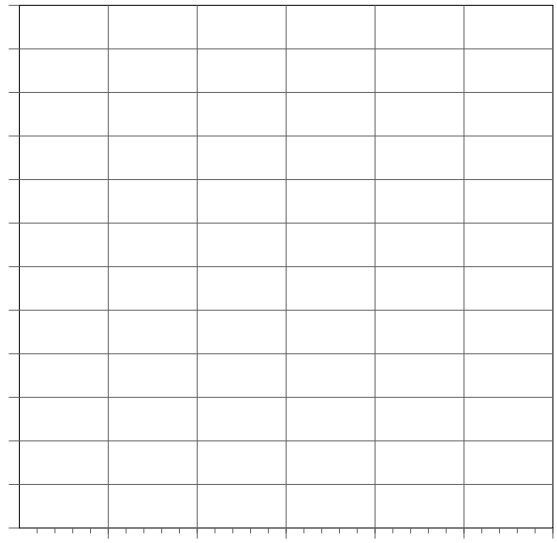
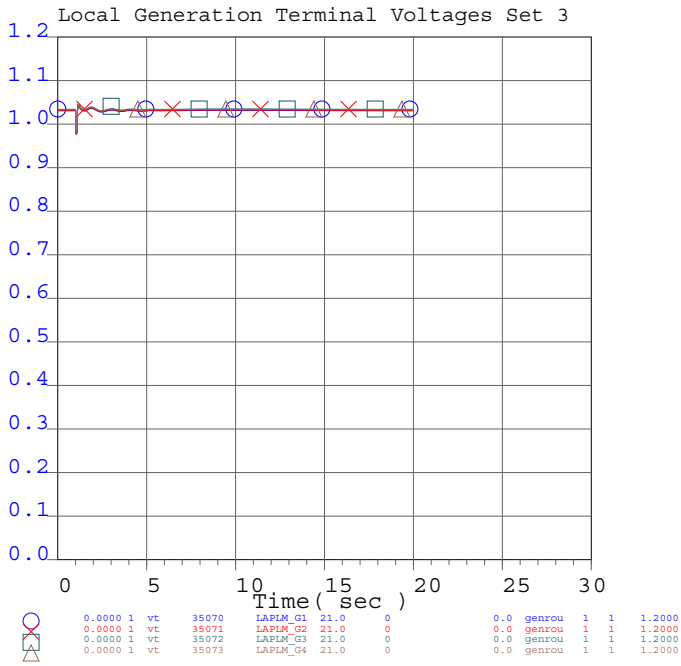
Local Generation Terminal Voltages Set 1



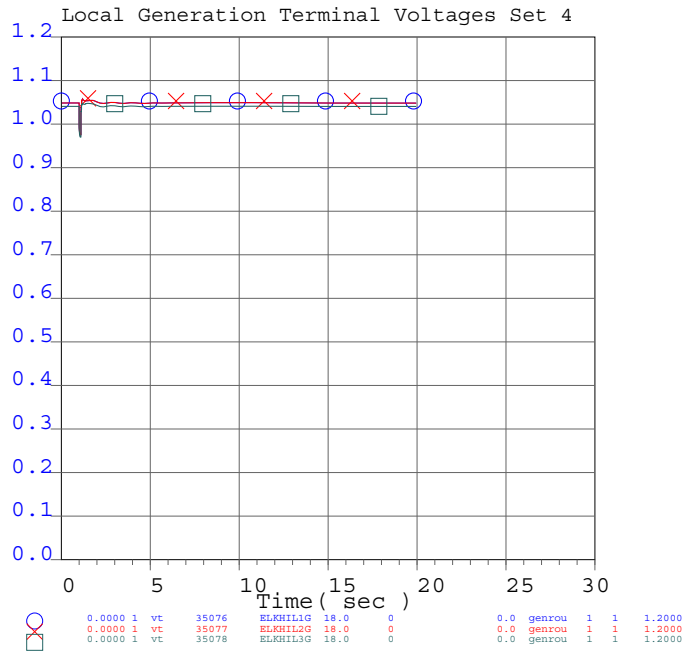
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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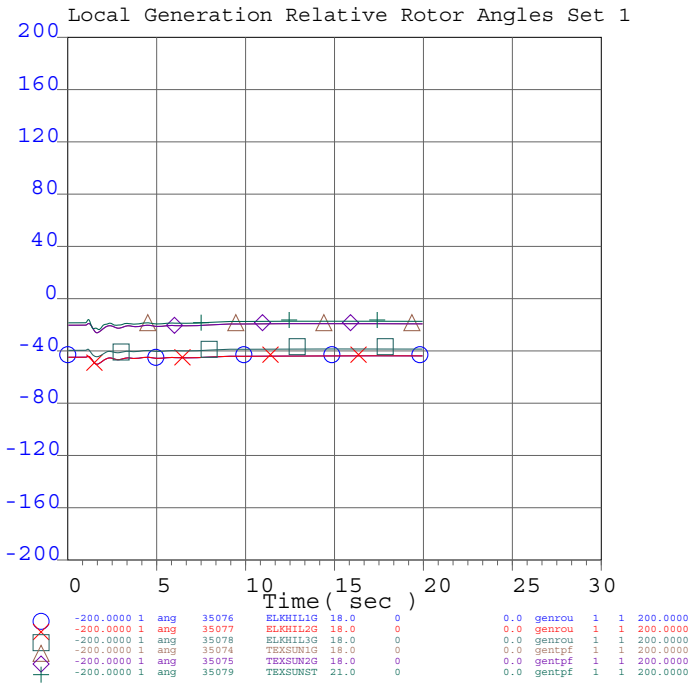

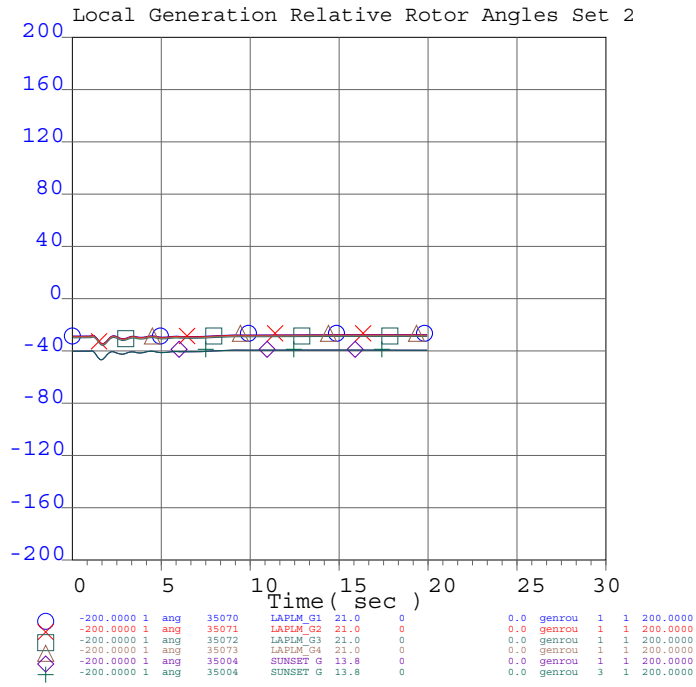

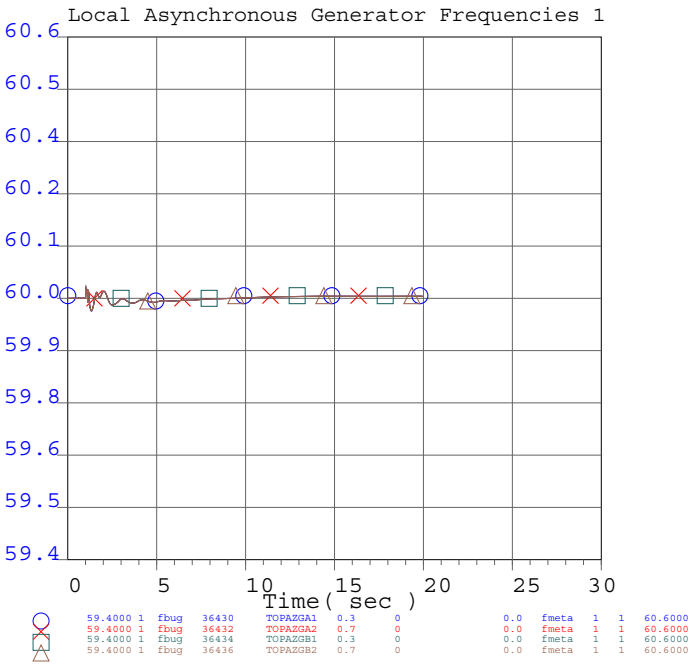

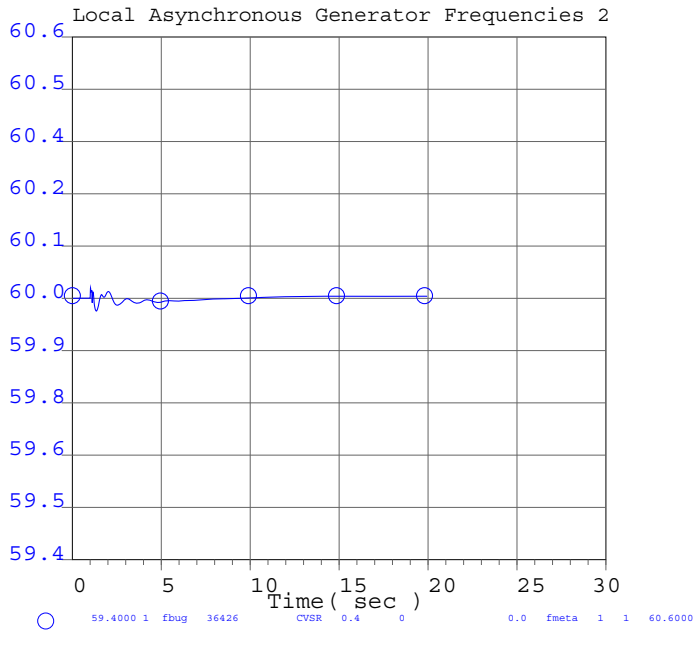

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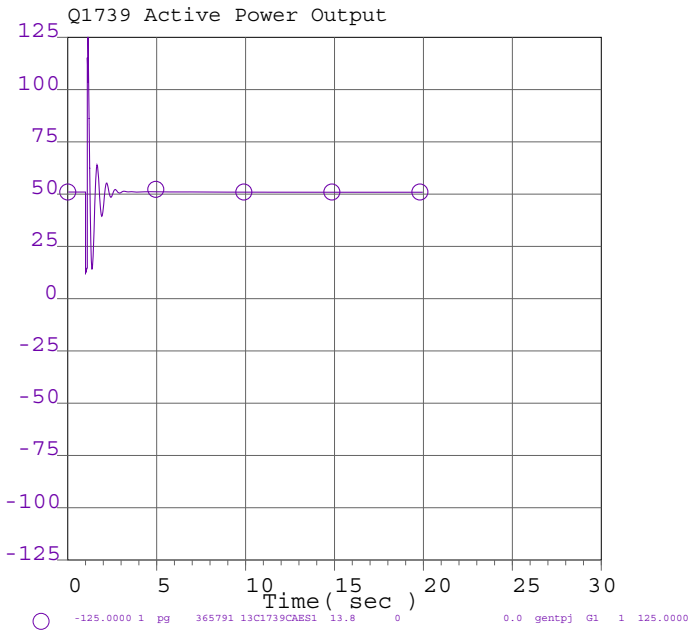
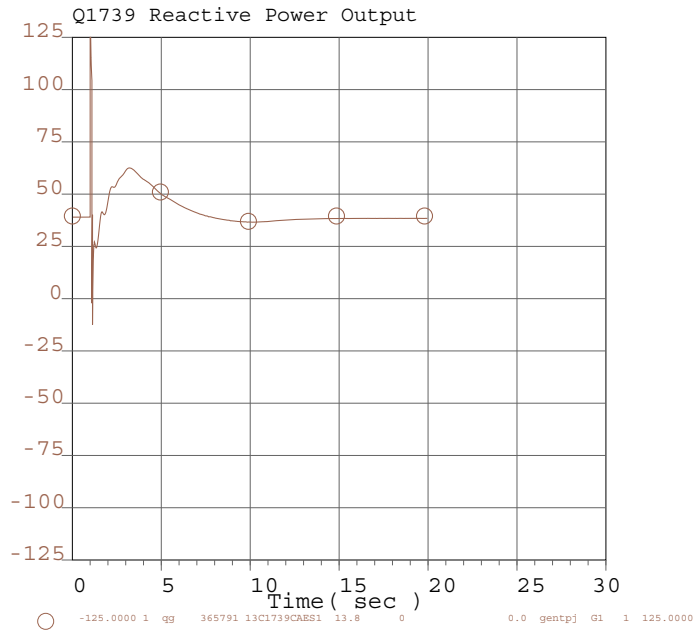
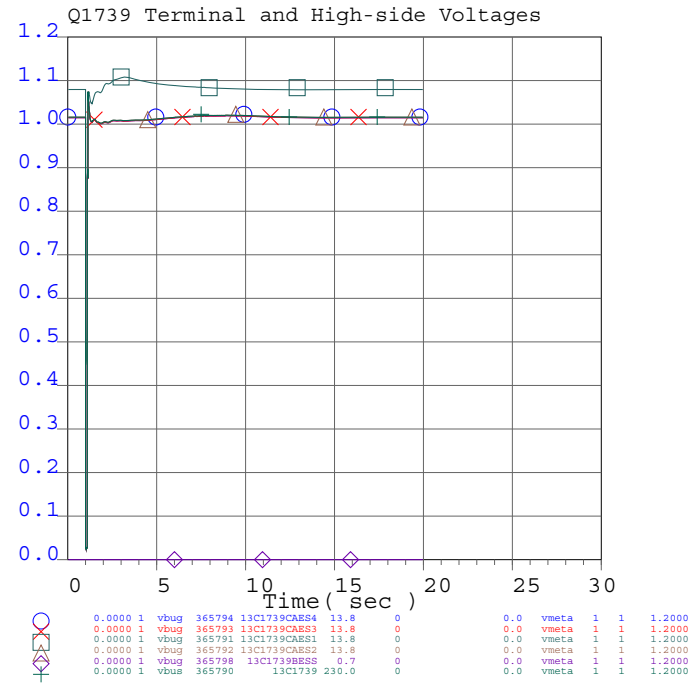
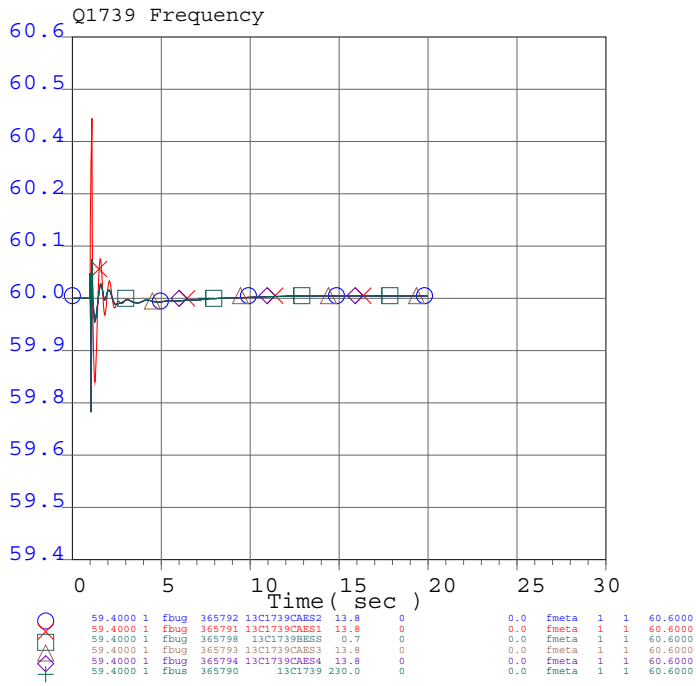
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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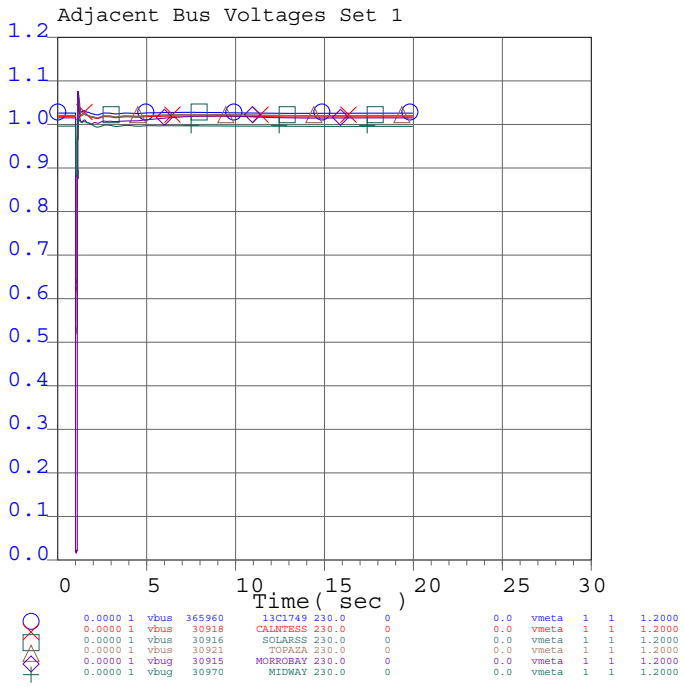

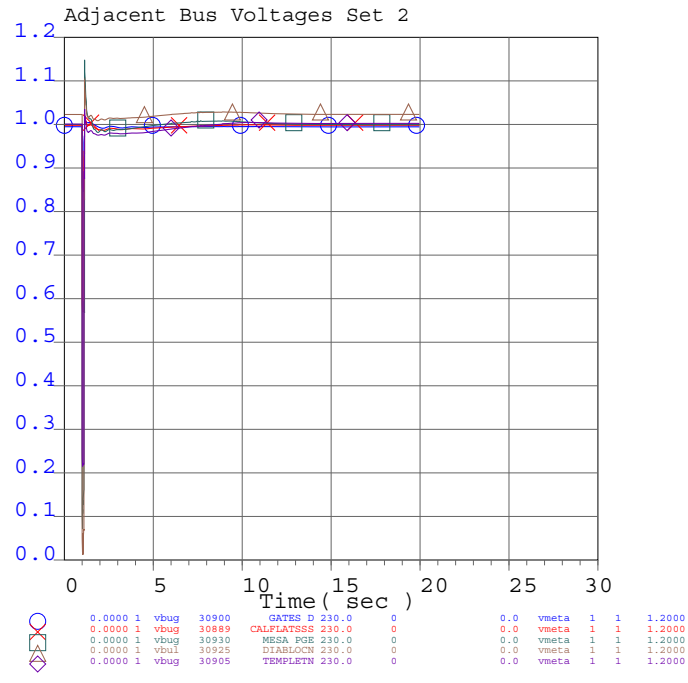

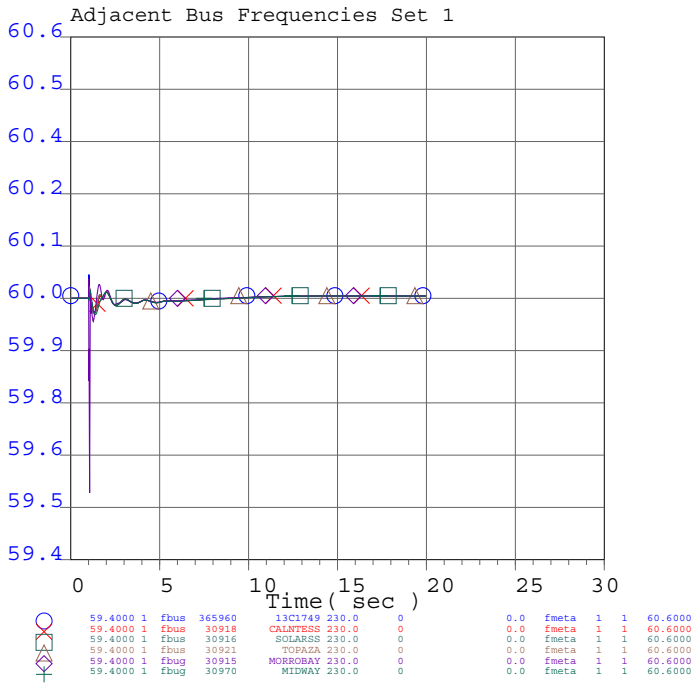

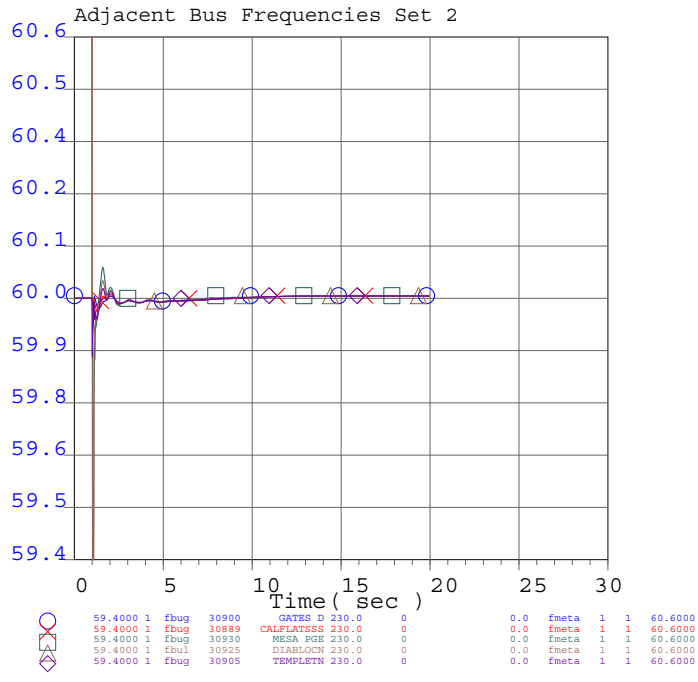

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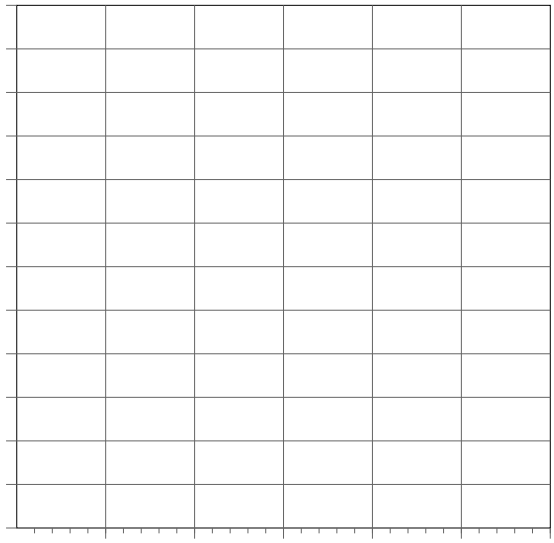
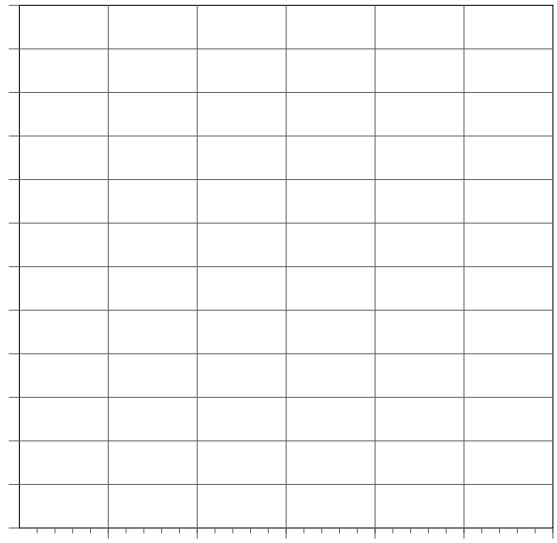
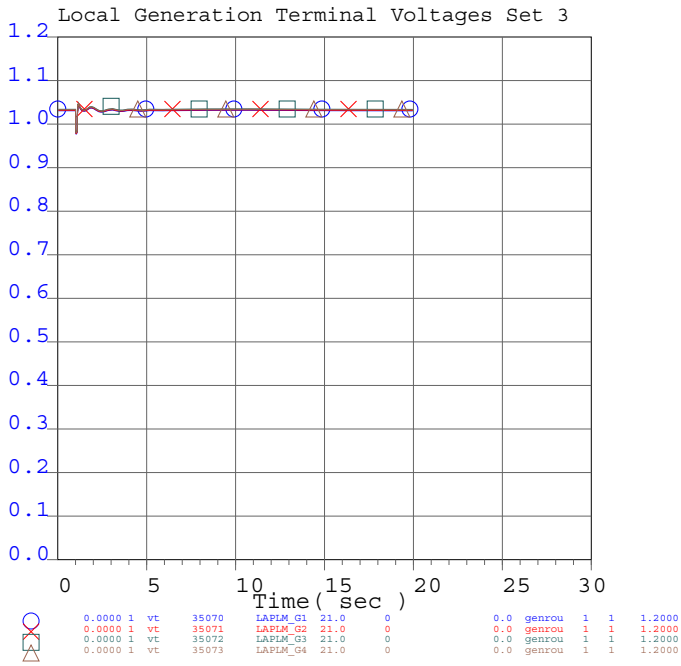
Local Generation Terminal Voltages Set 1



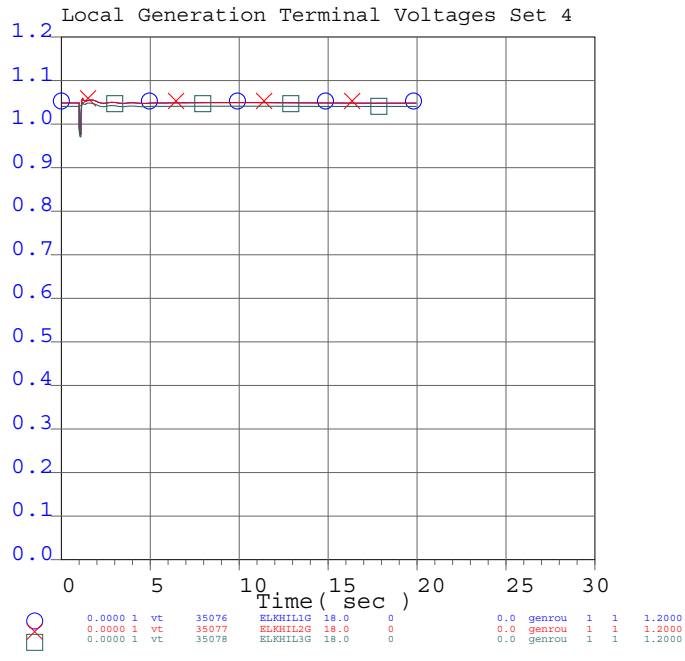
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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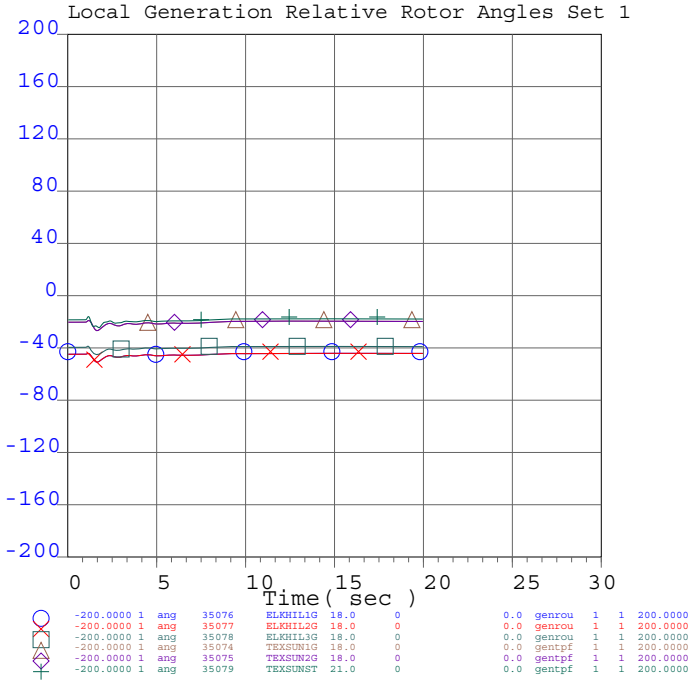
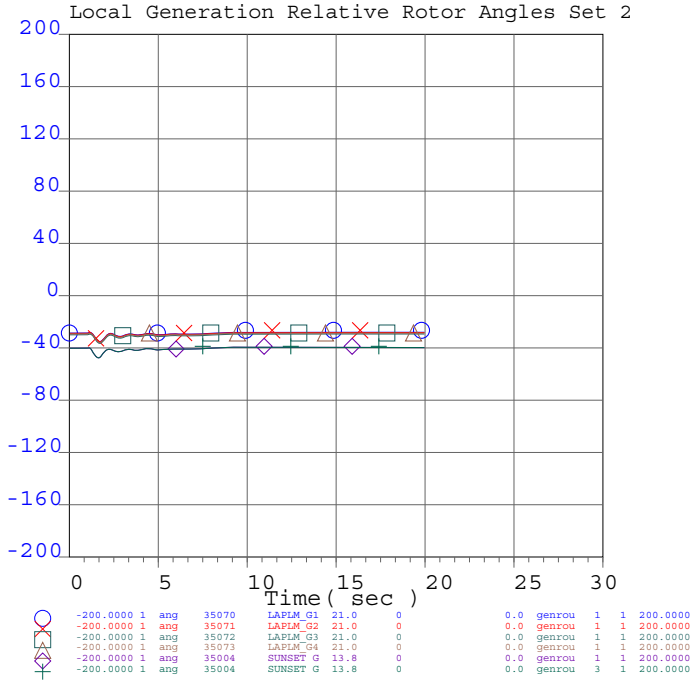
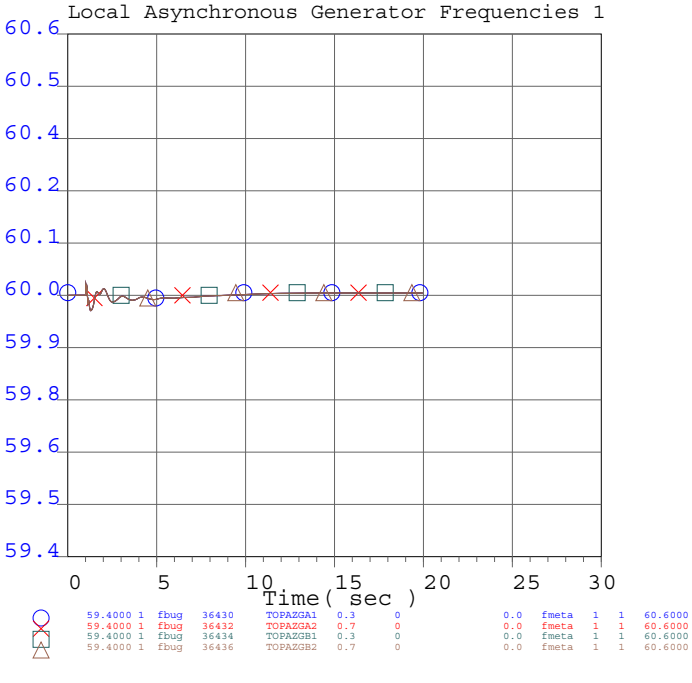
Local Generation Relative Rotor Angles Set 1



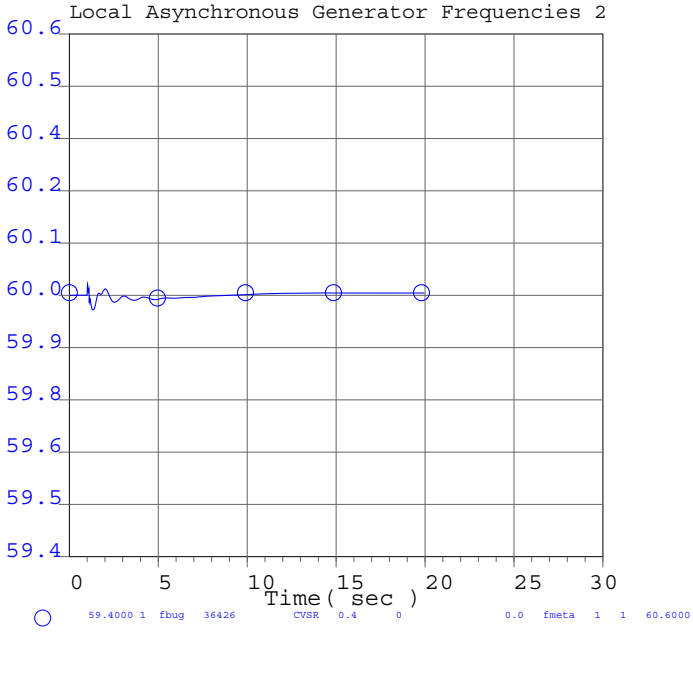
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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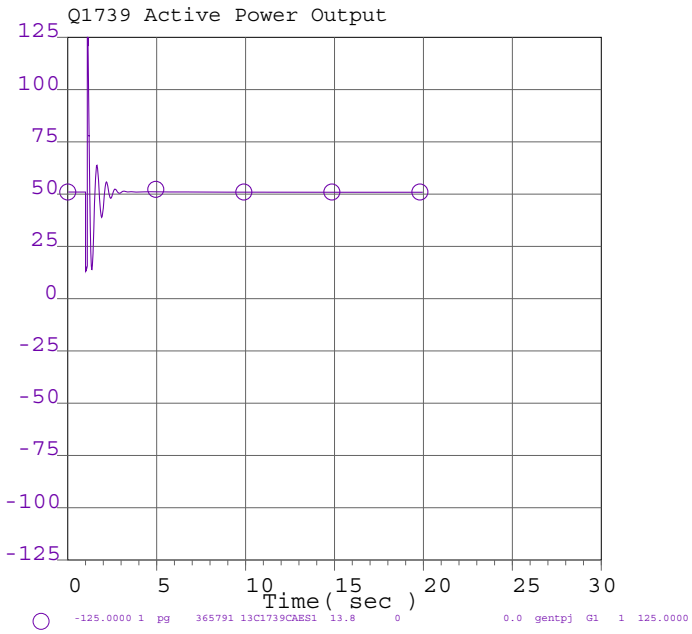

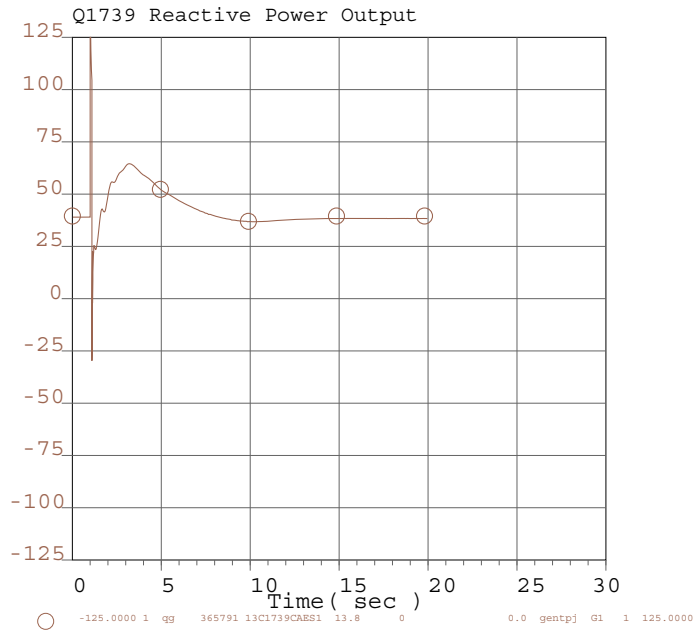

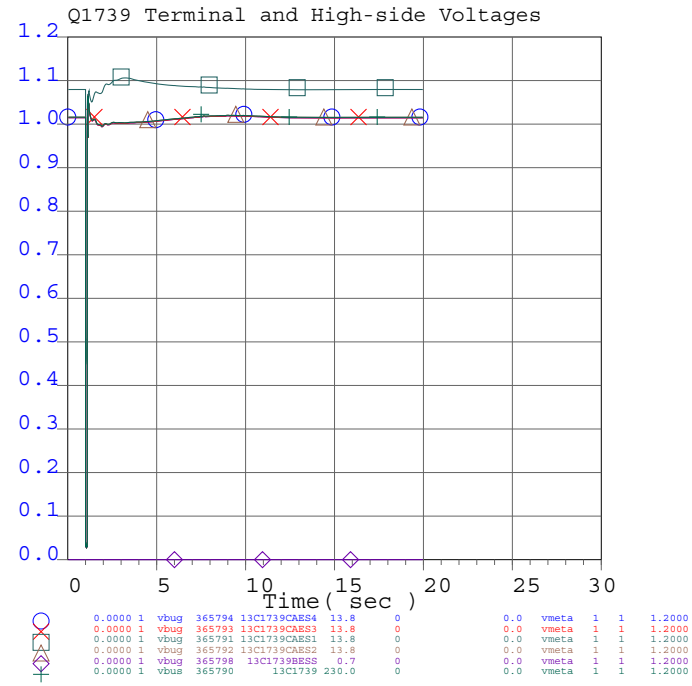

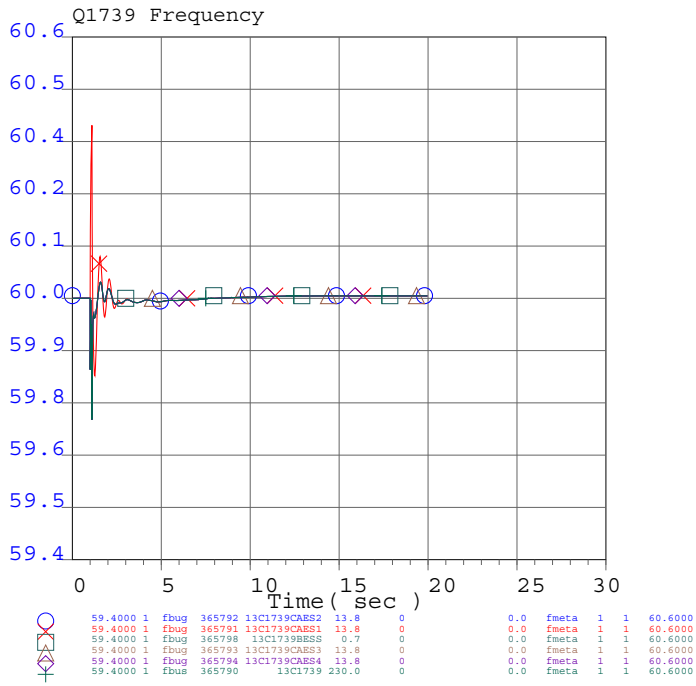

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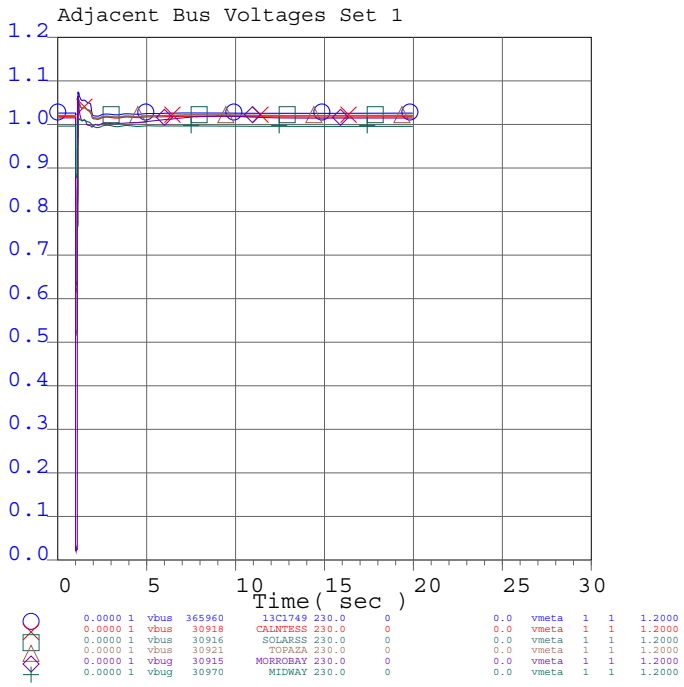

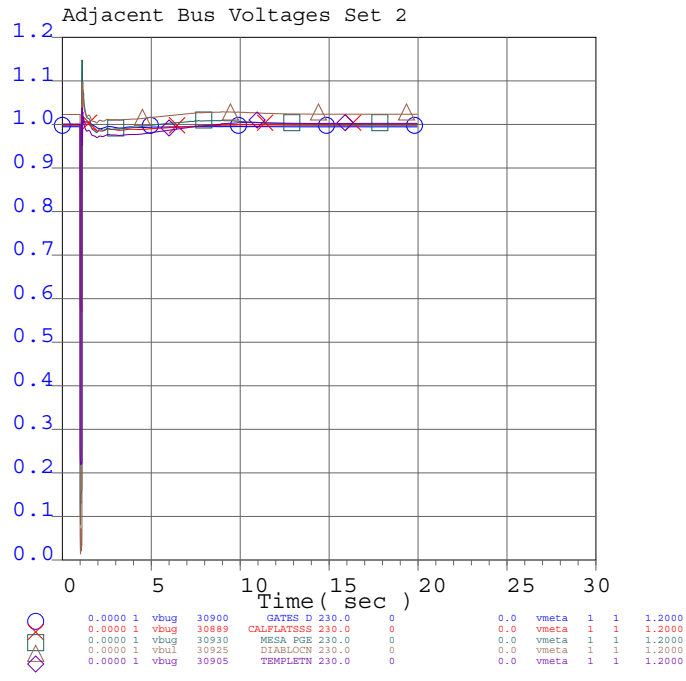

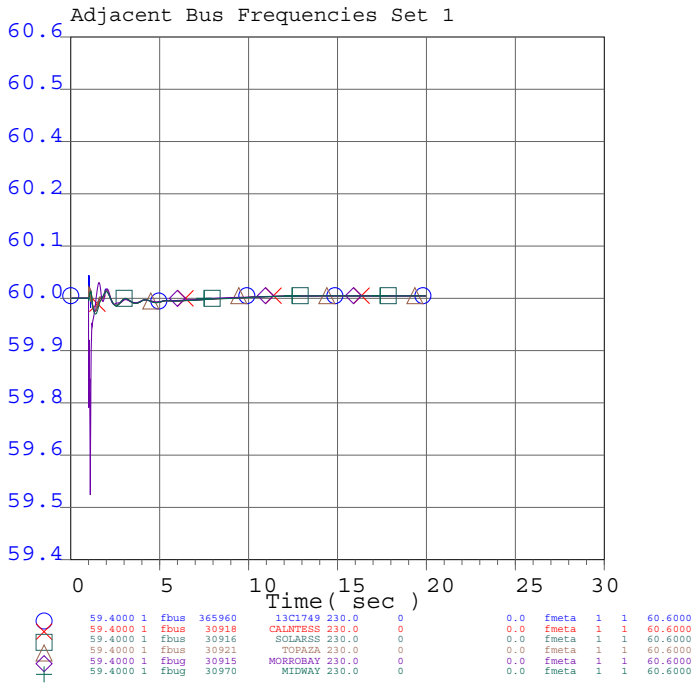

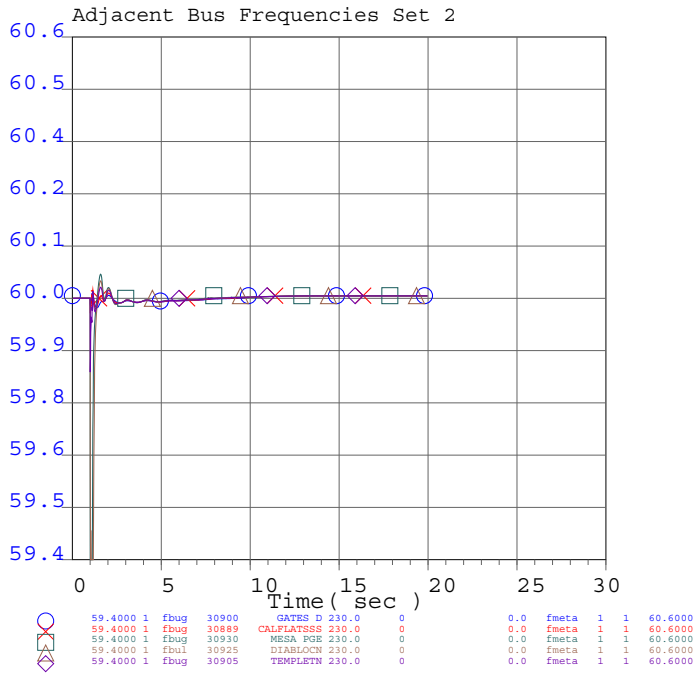

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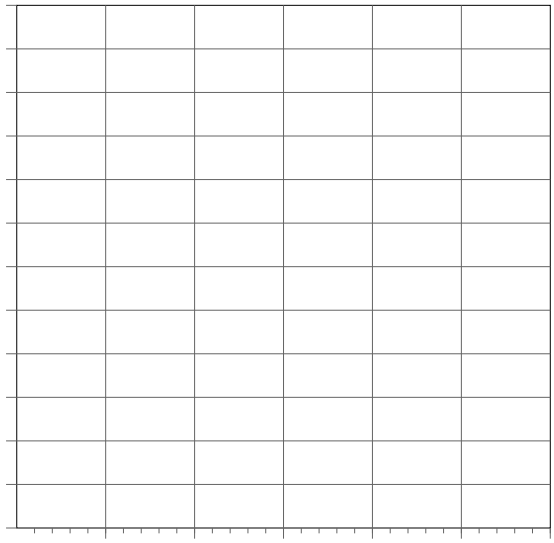
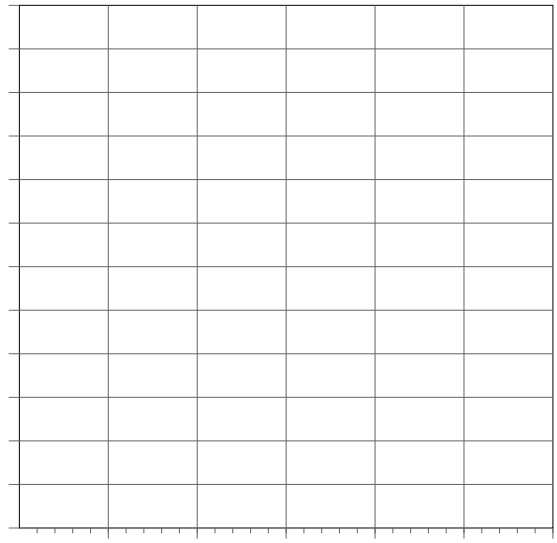
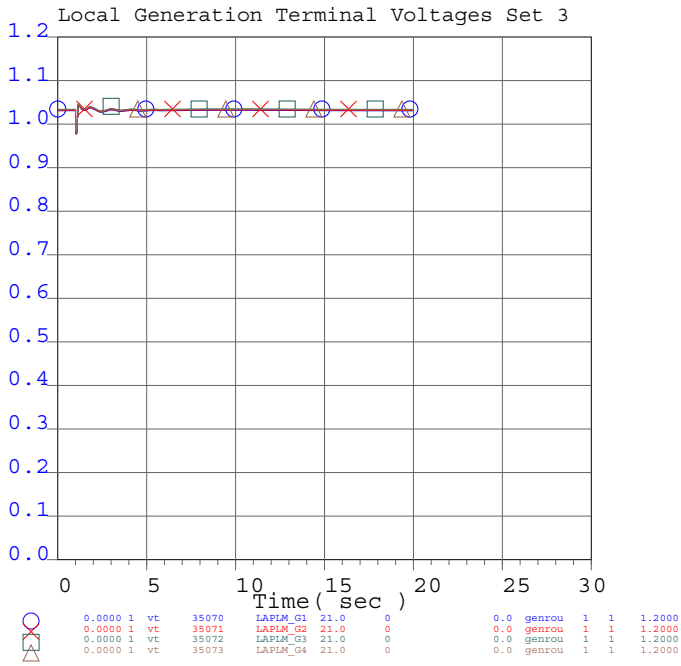


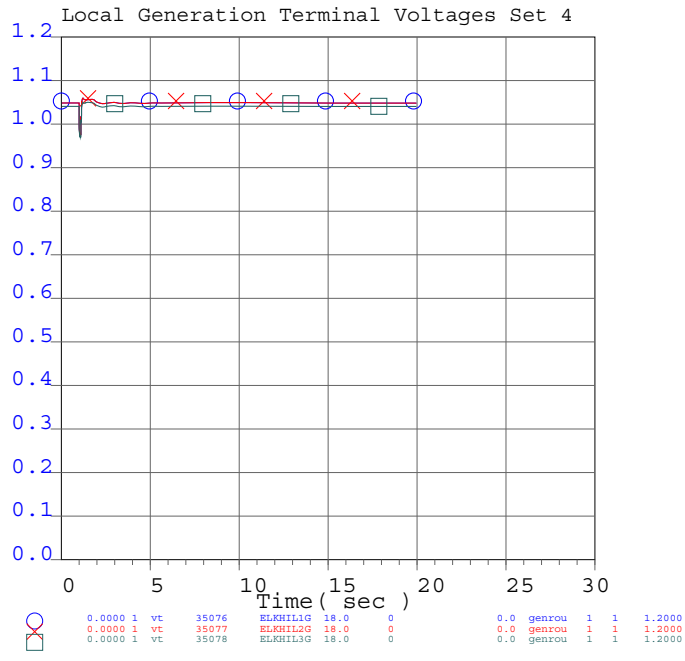
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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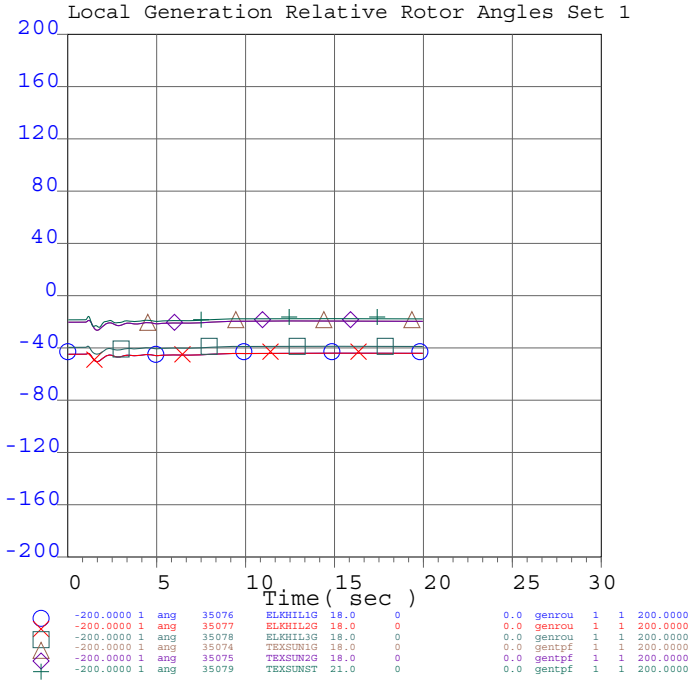
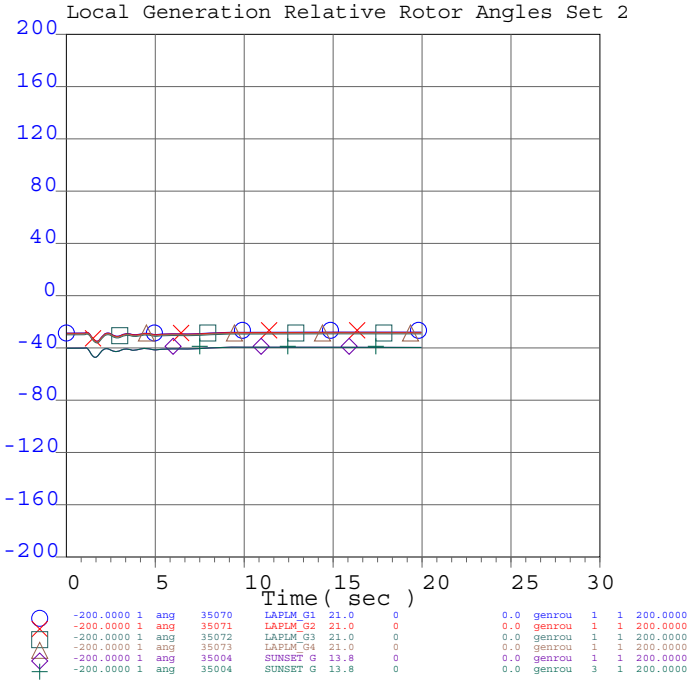


Local Generation Relative Rotor Angles Set 2



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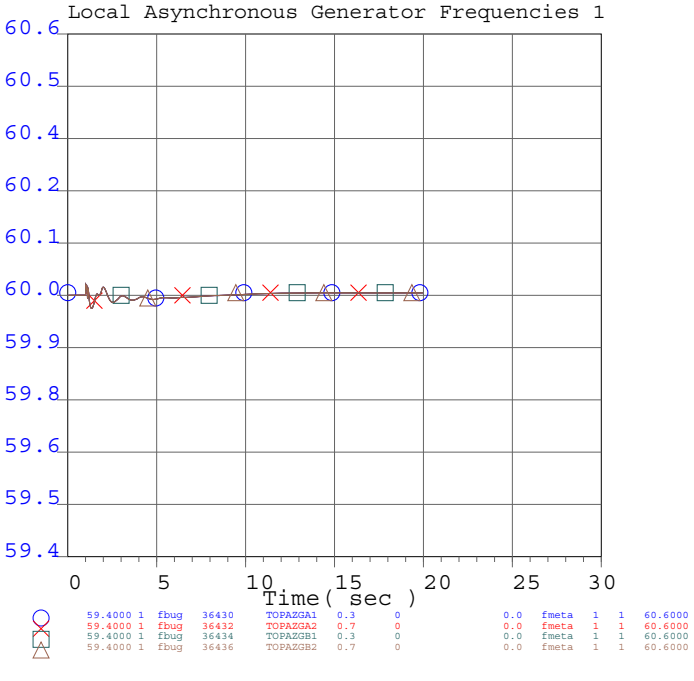
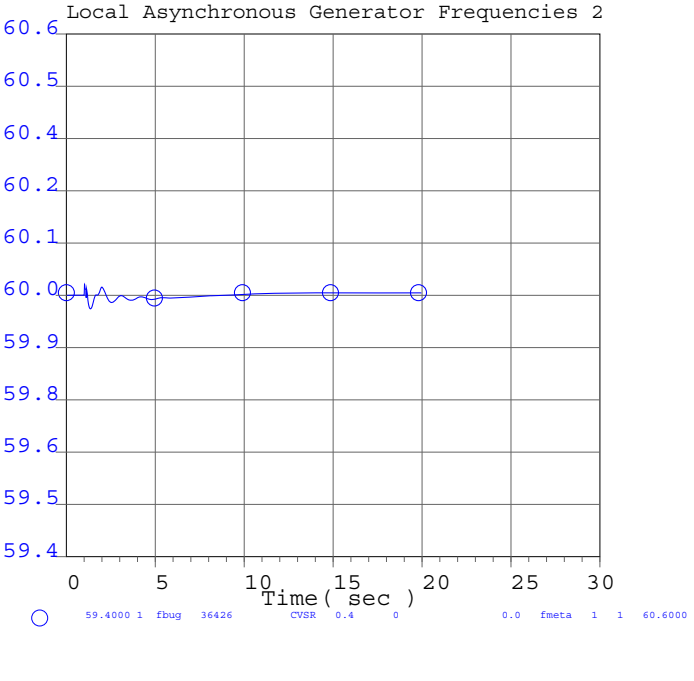


Local Asynchronous Generator Frequencies 2



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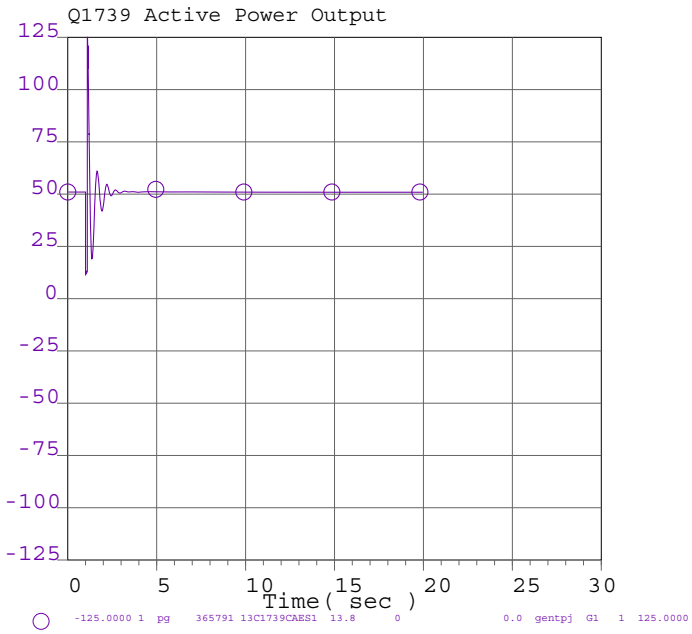
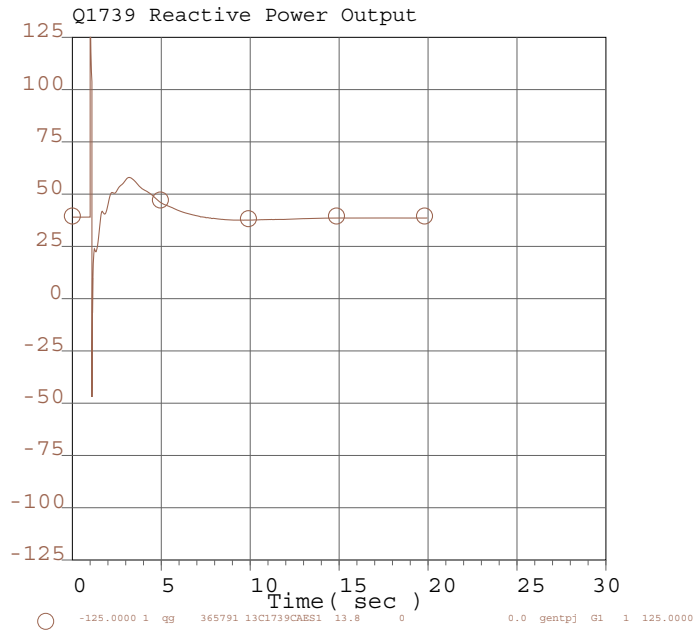
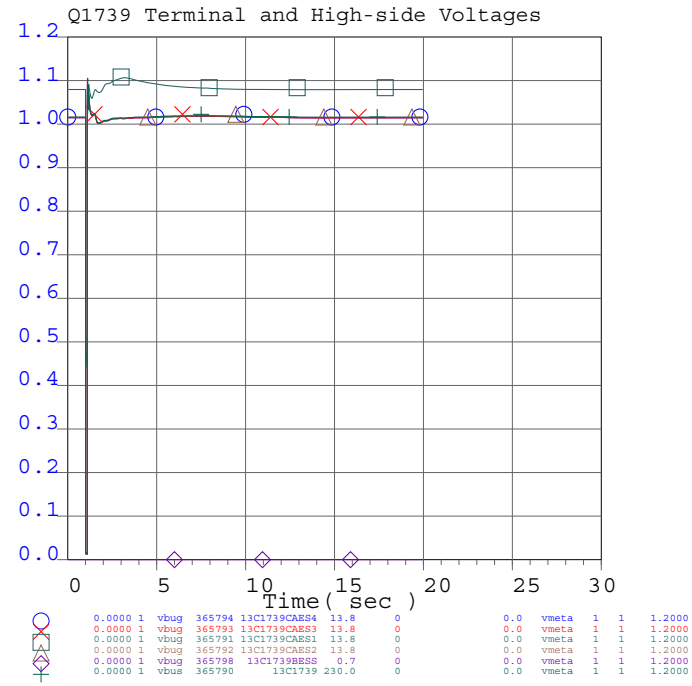
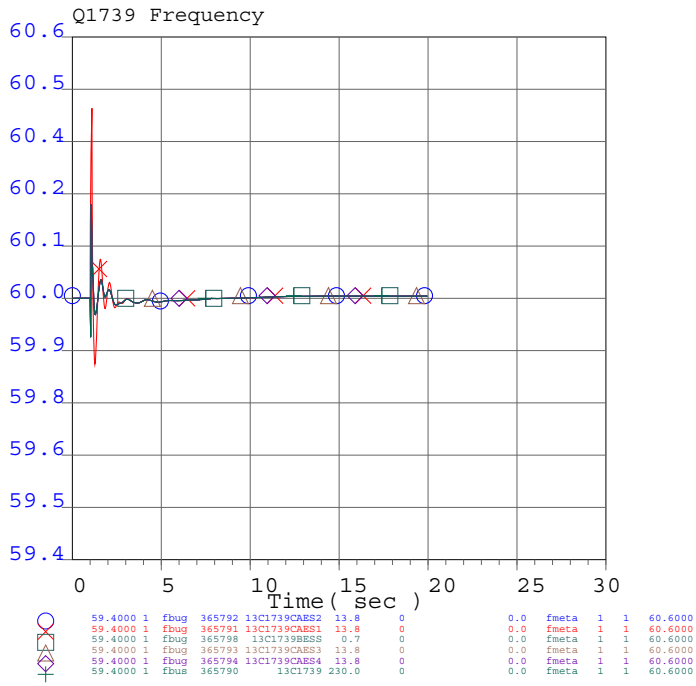
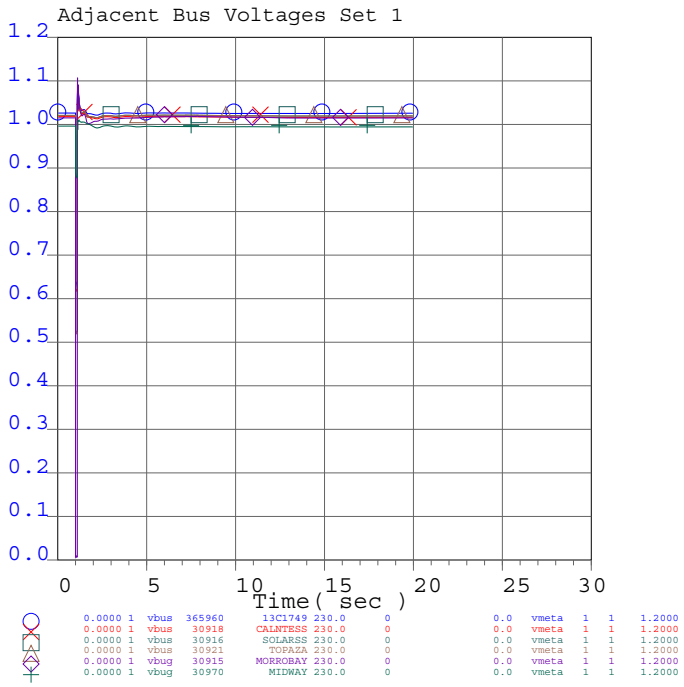


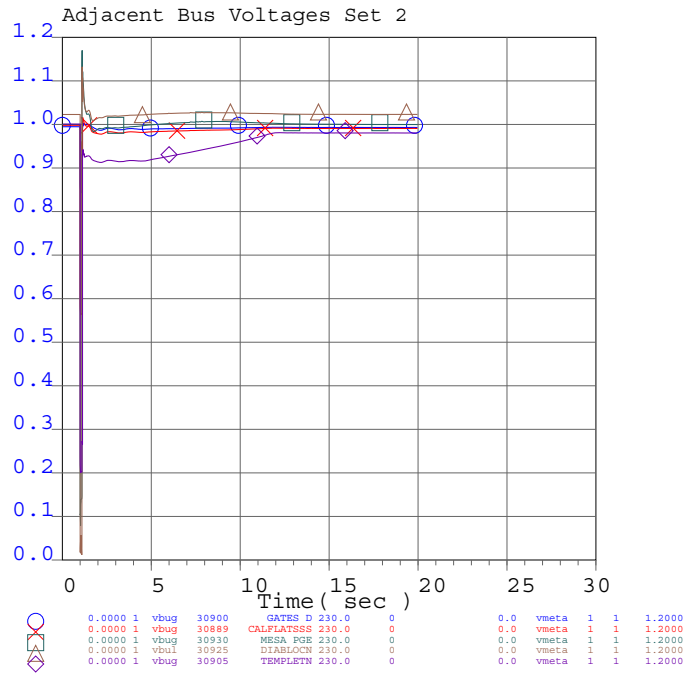


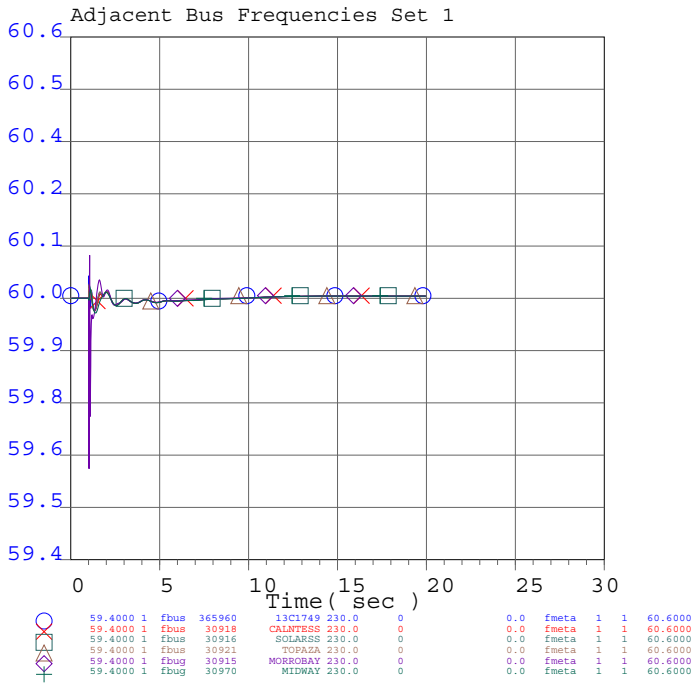


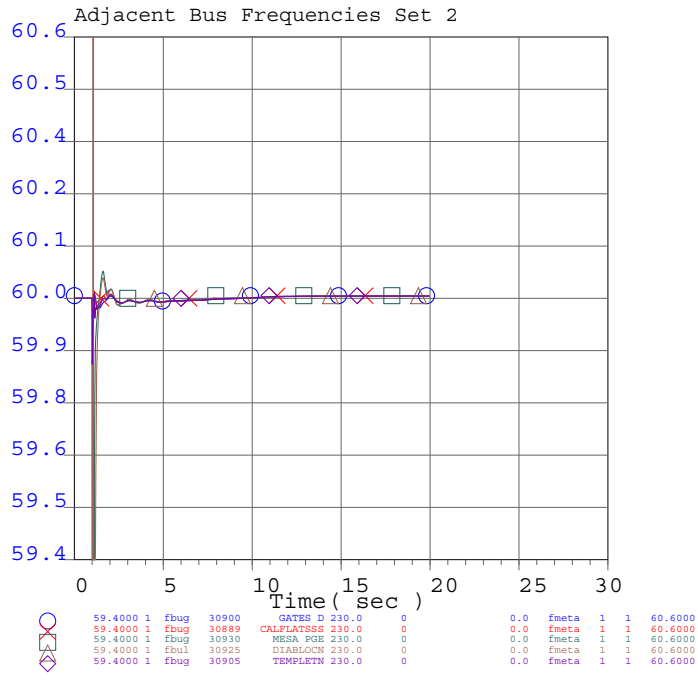


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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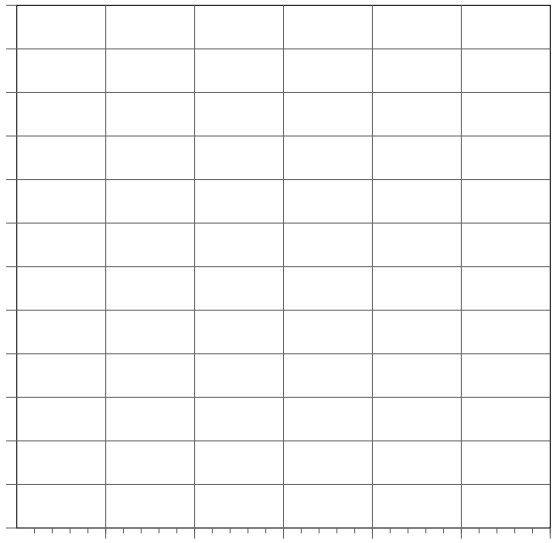
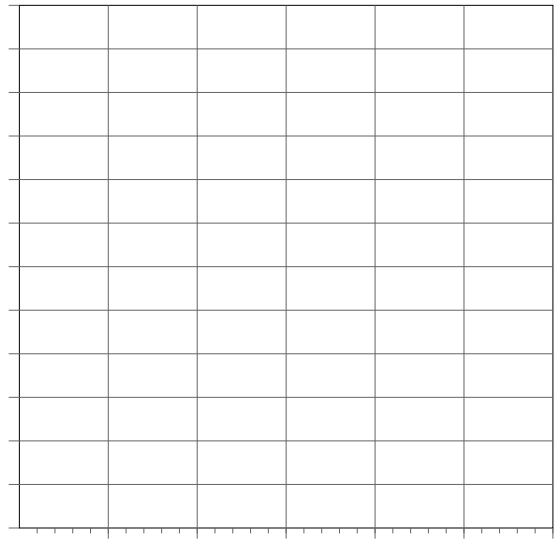
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

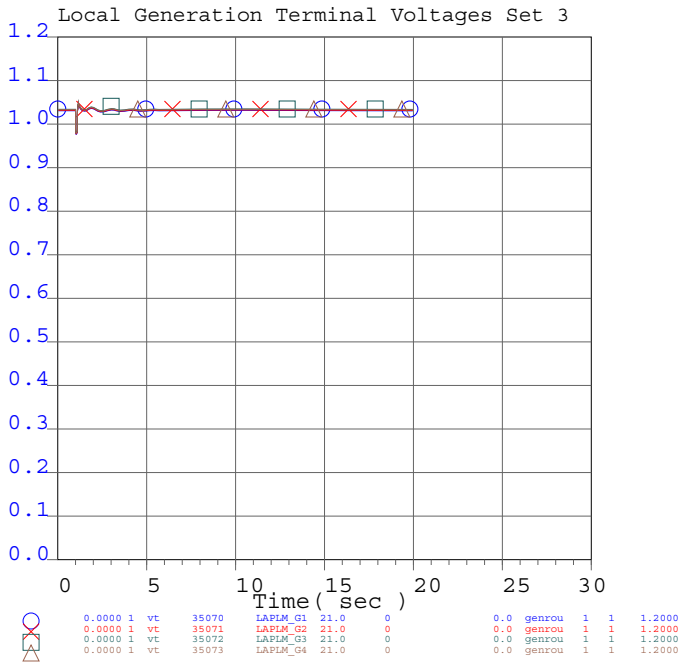
Local Generation Terminal Voltages Set 1



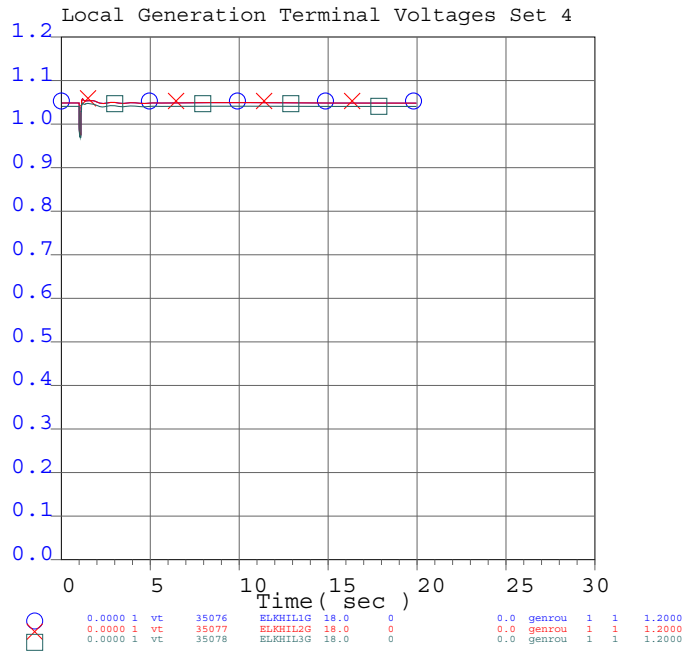
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

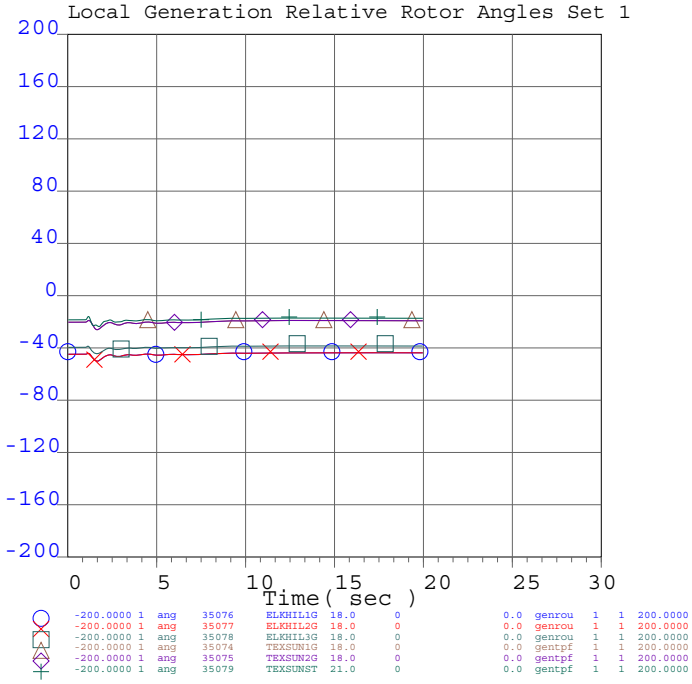


Local Generation Terminal Voltages Set 4

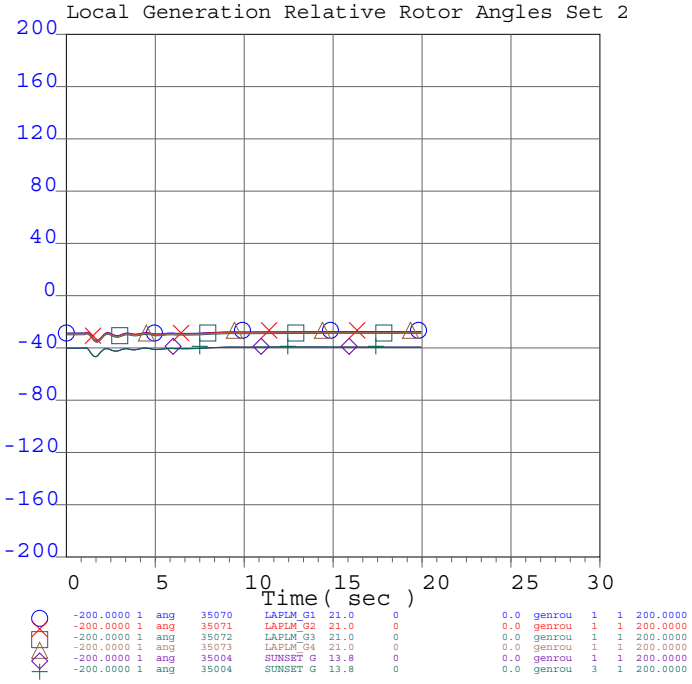


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

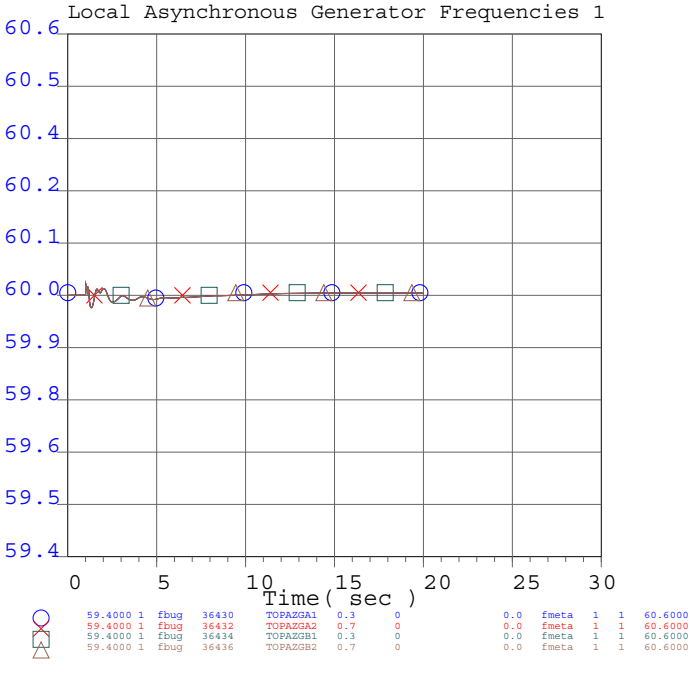
Local Generation Relative Rotor Angles Set 1



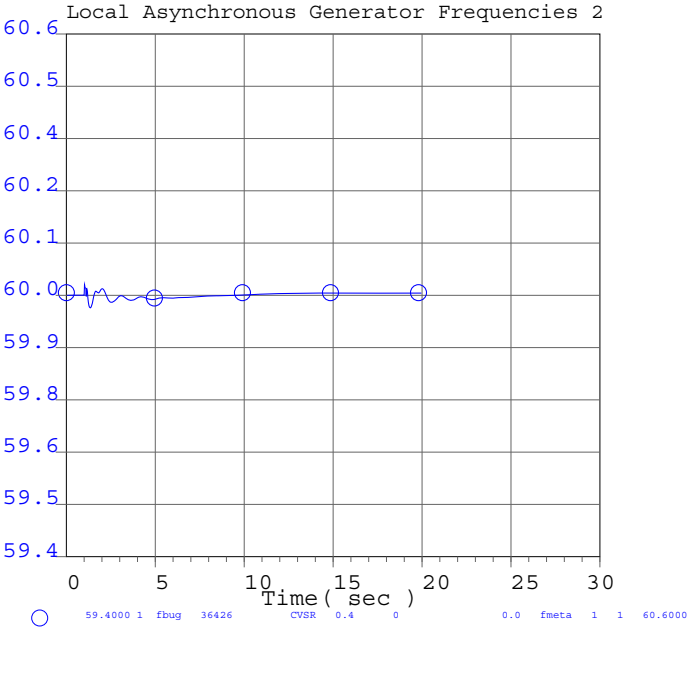
Local Generation Relative Rotor Angles Set 2



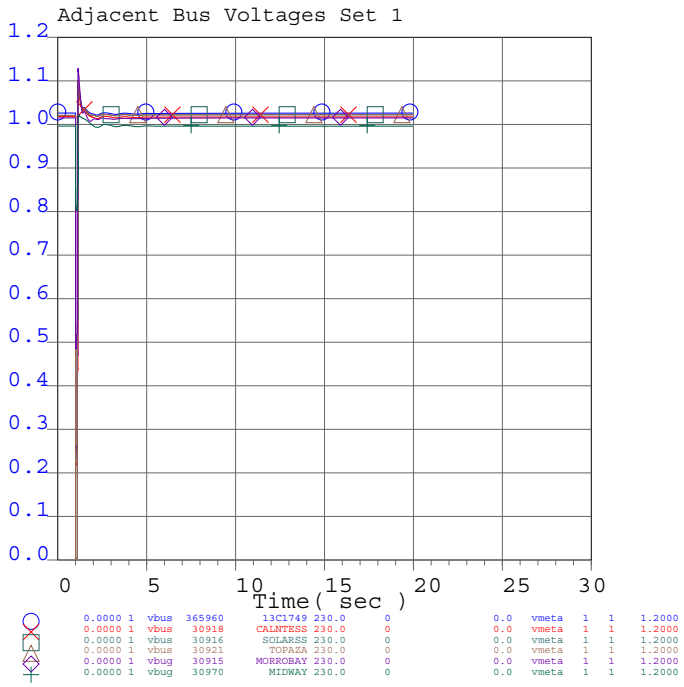
Local Asynchronous Generator Frequencies 1

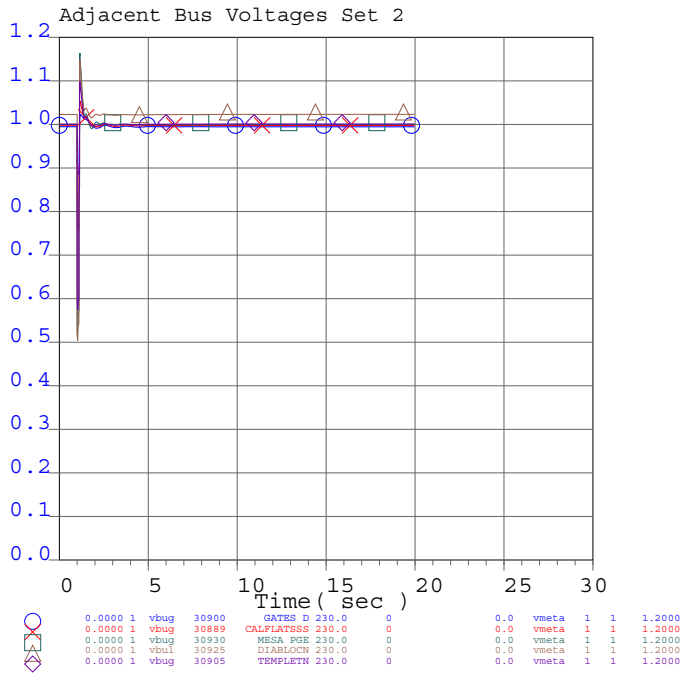


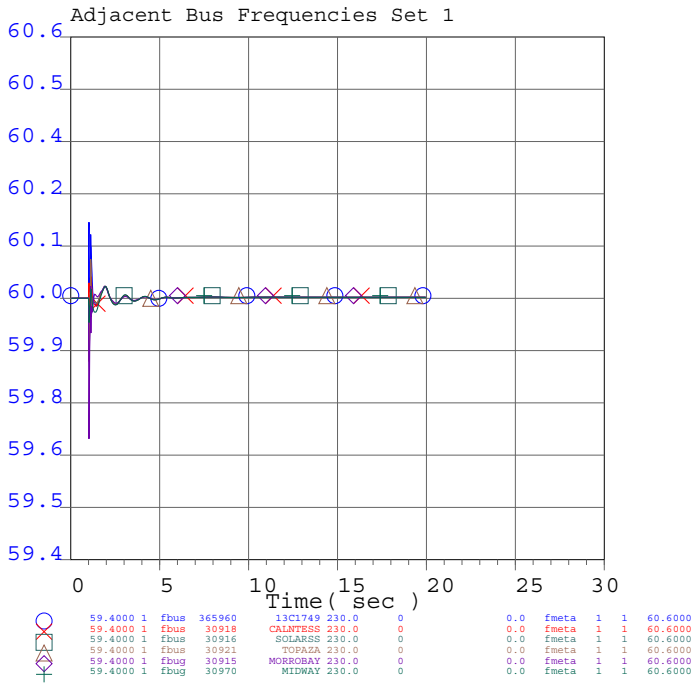
Local Asynchronous Generator Frequencies 2

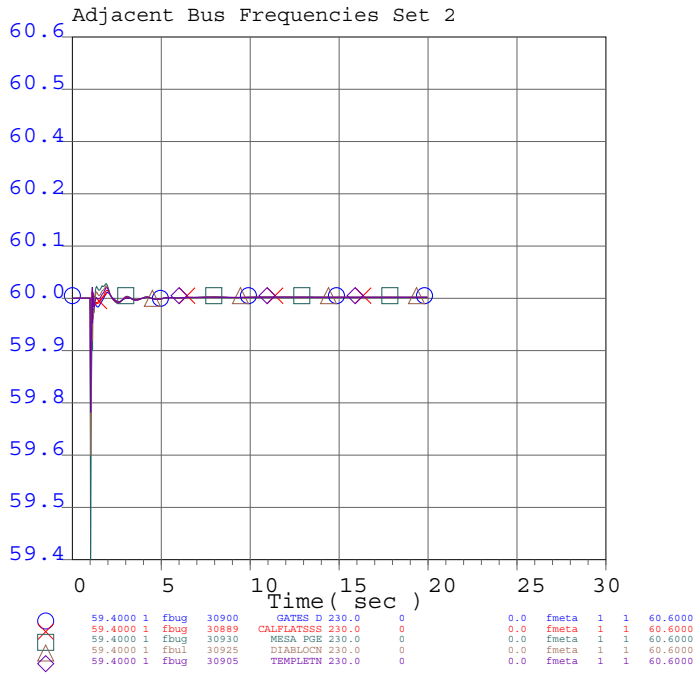


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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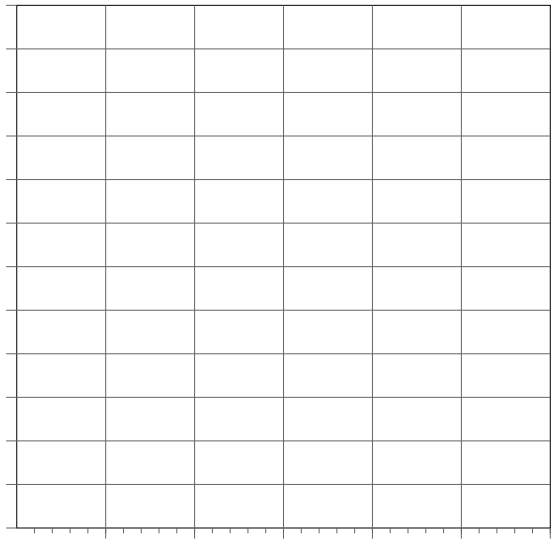
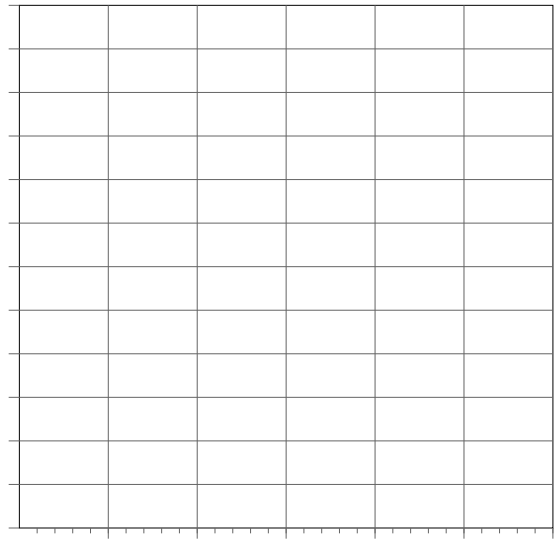
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

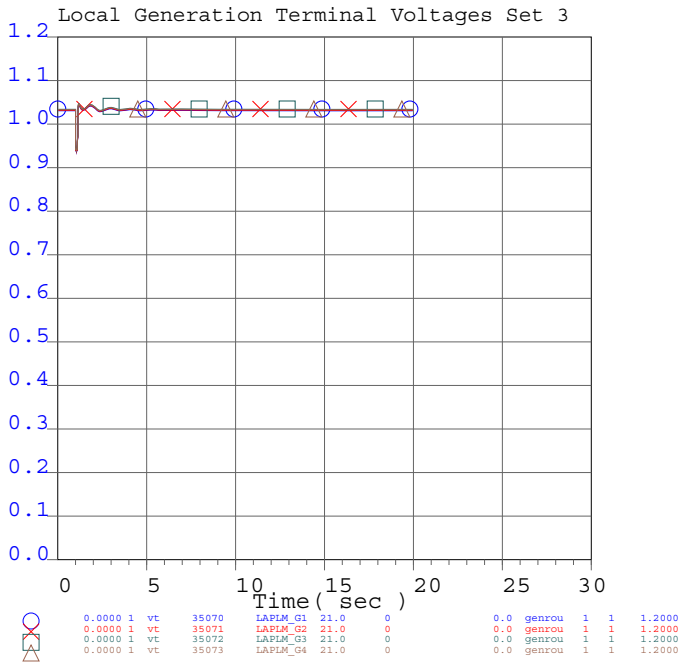
Local Generation Terminal Voltages Set 1



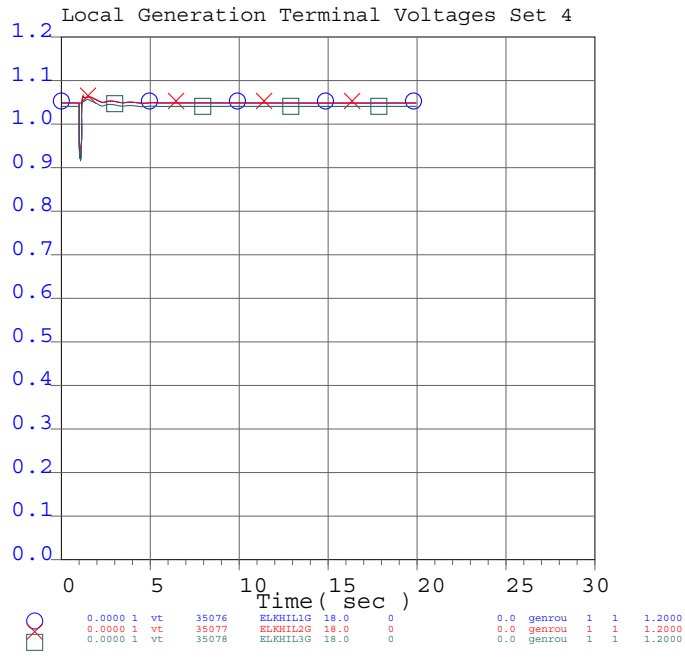
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

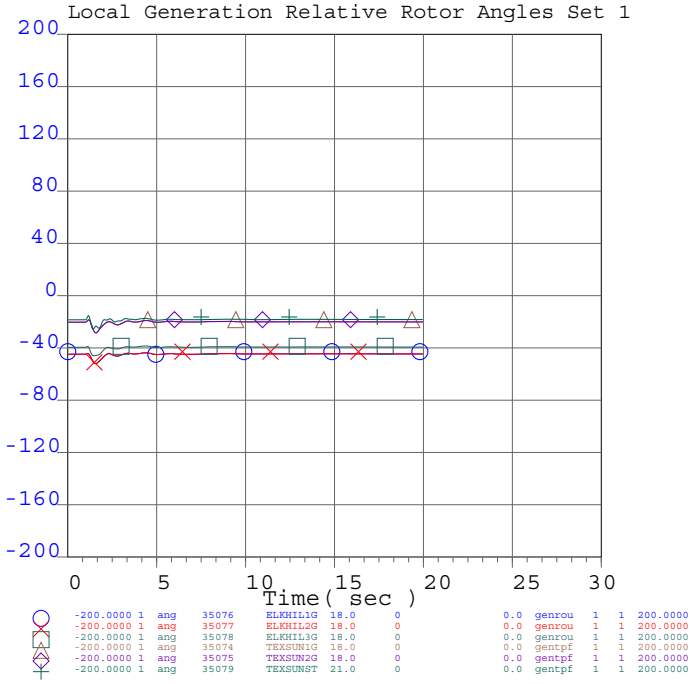


Local Generation Terminal Voltages Set 4

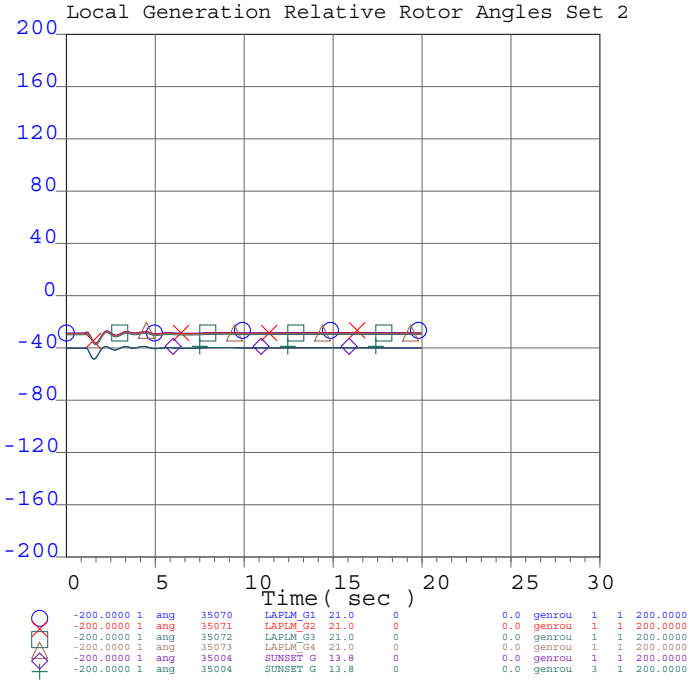


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

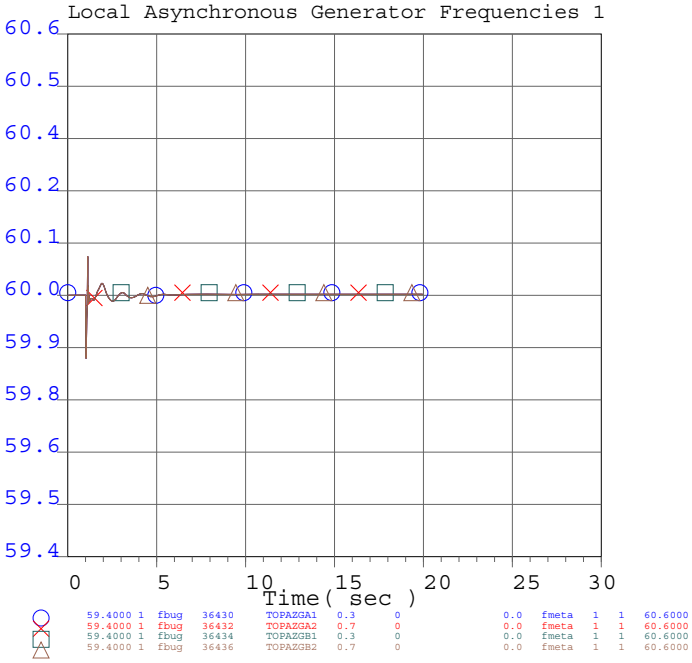
Local Generation Relative Rotor Angles Set 1



Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



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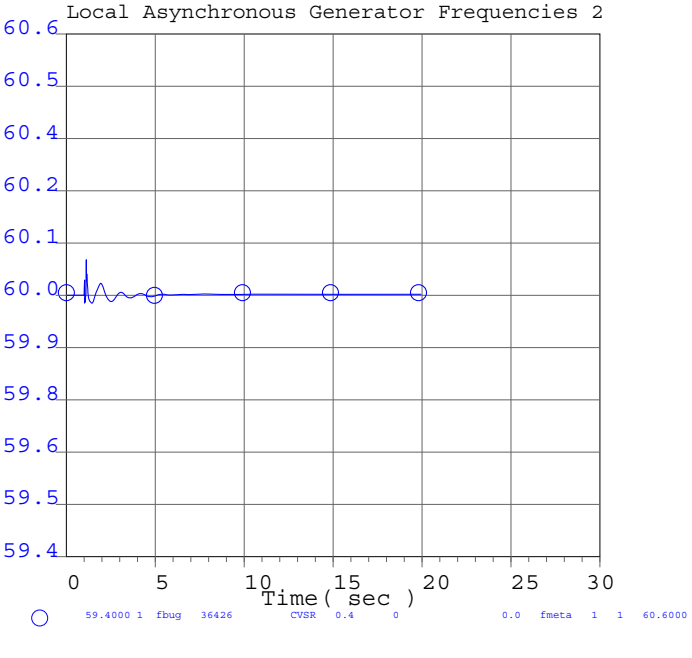

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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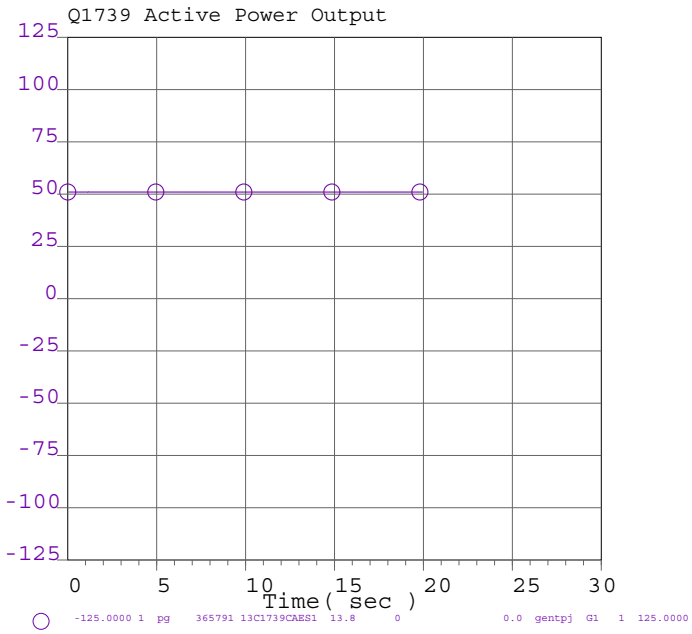
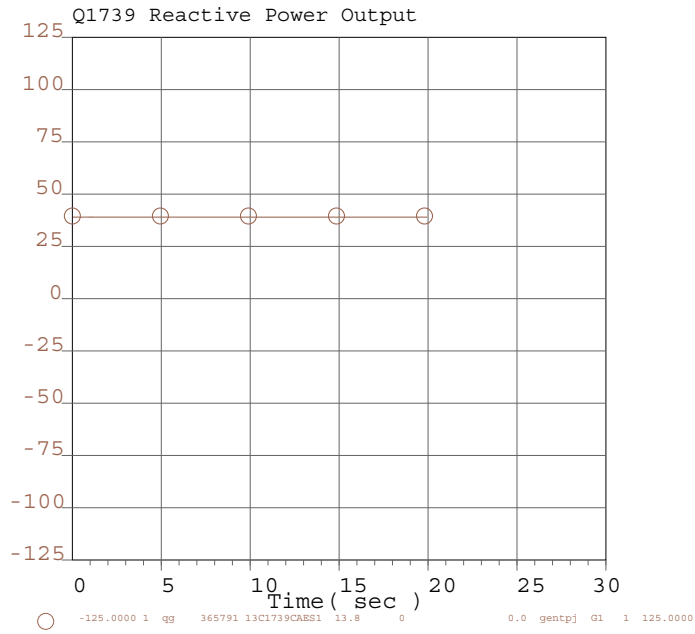
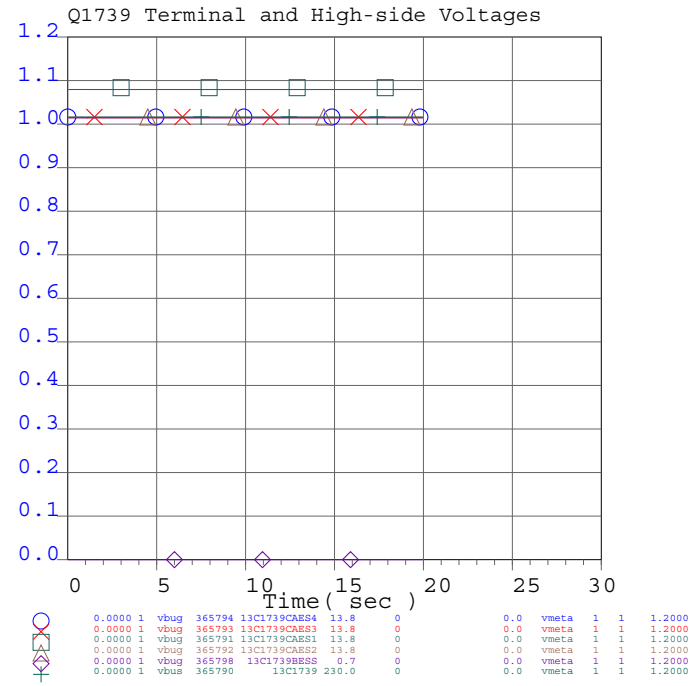
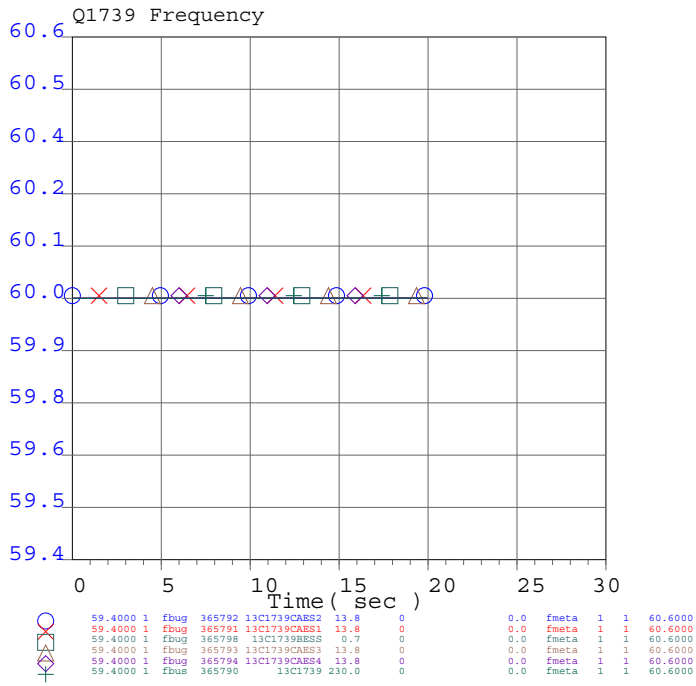
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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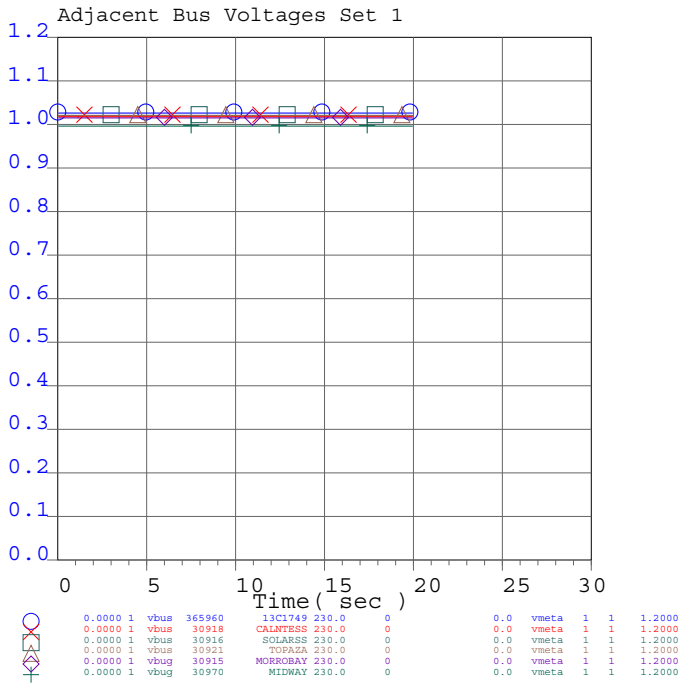
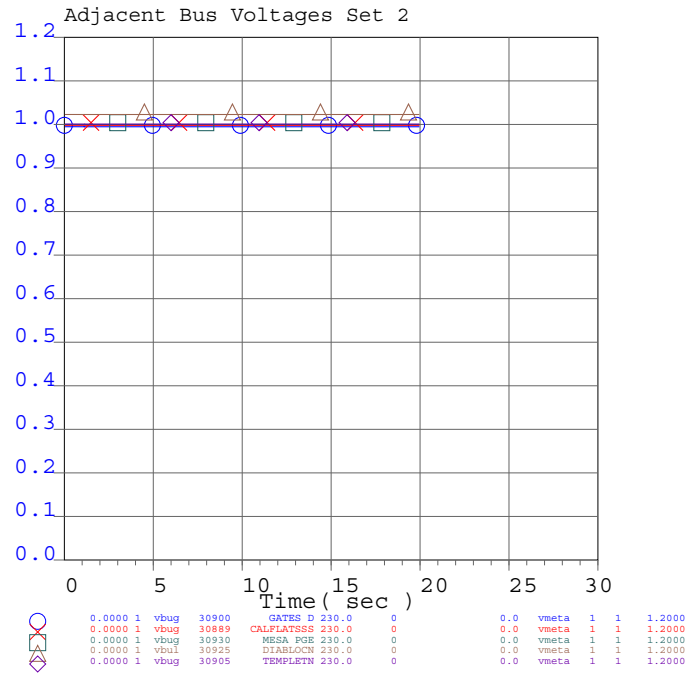
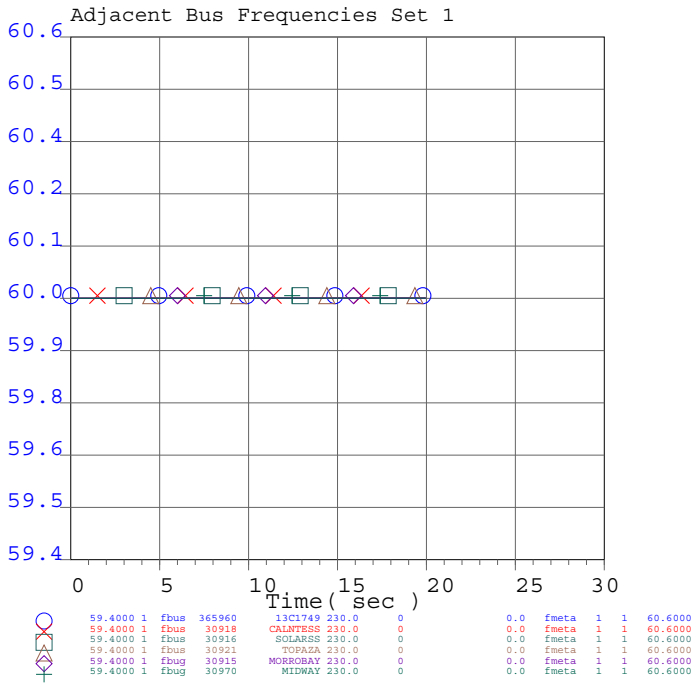
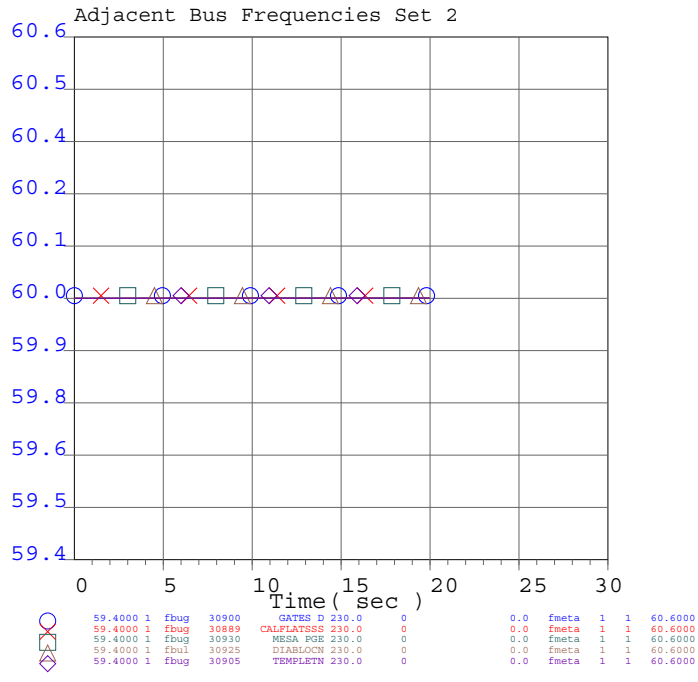
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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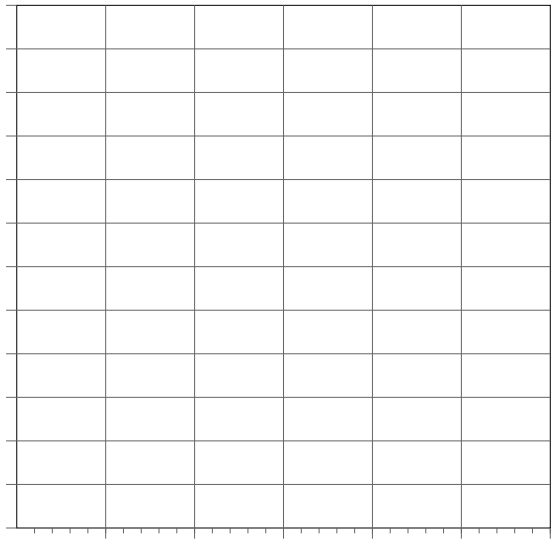
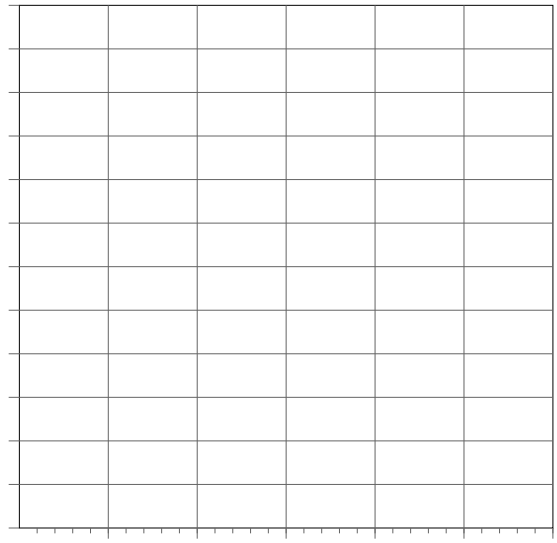
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

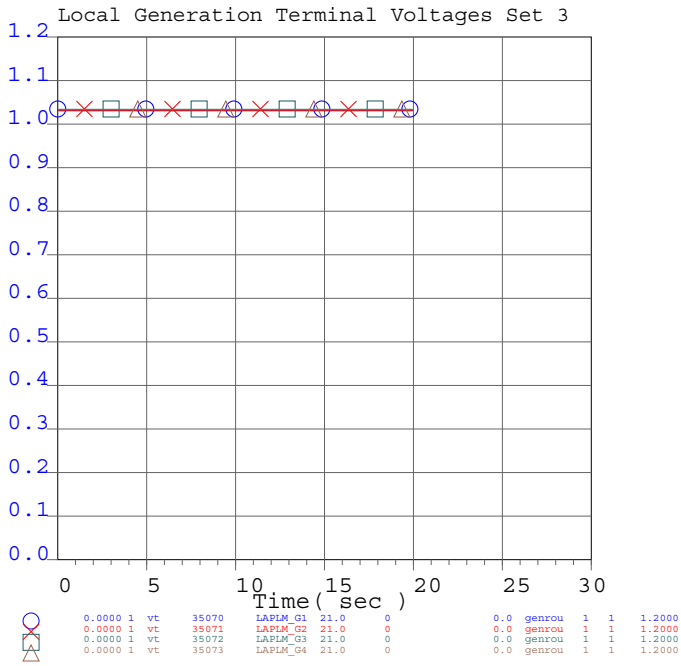
Local Generation Terminal Voltages Set 1



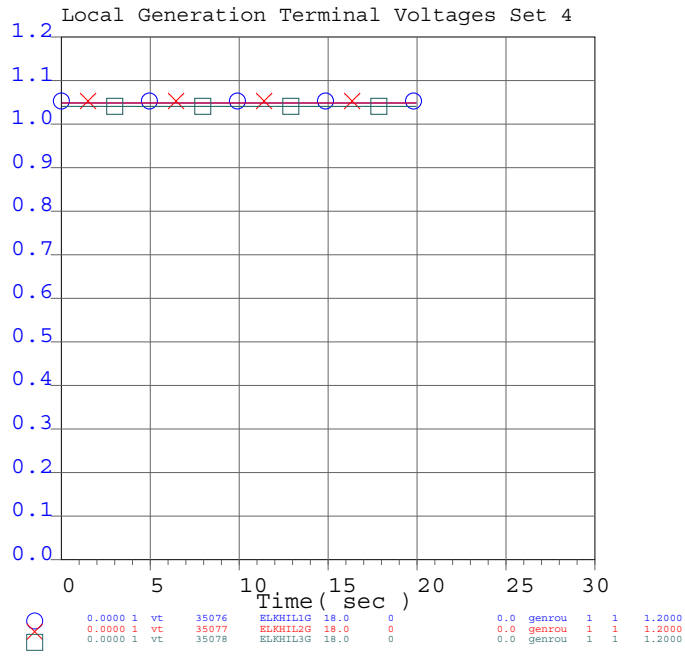
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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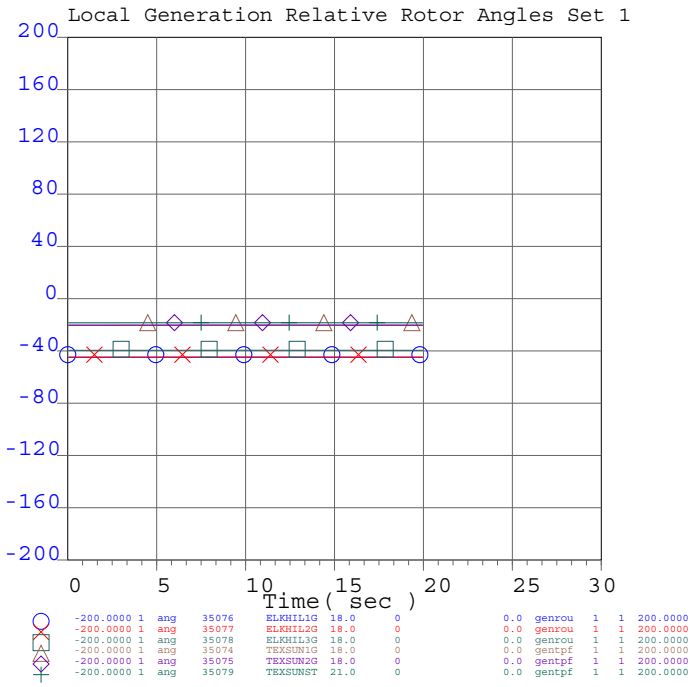
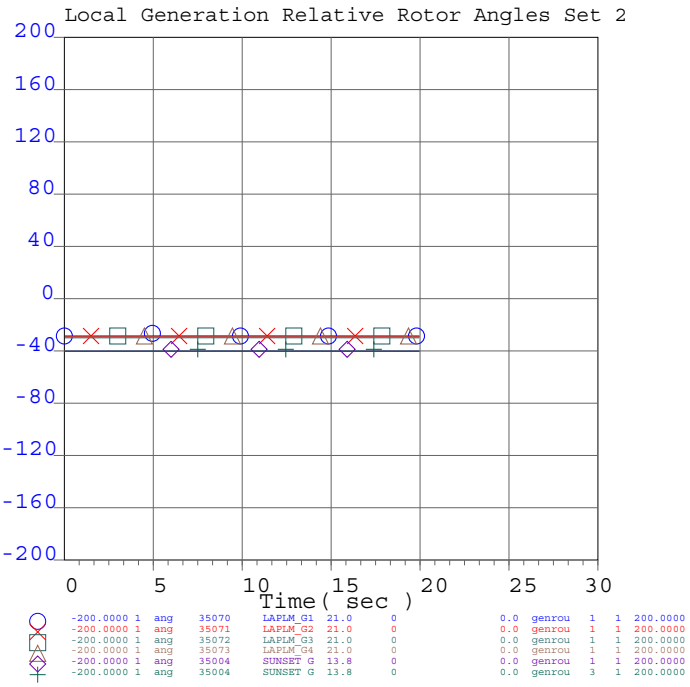
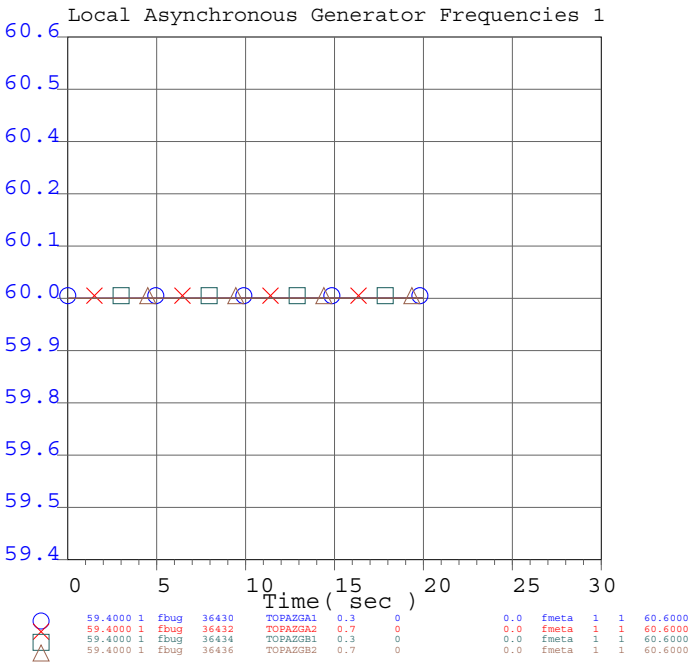
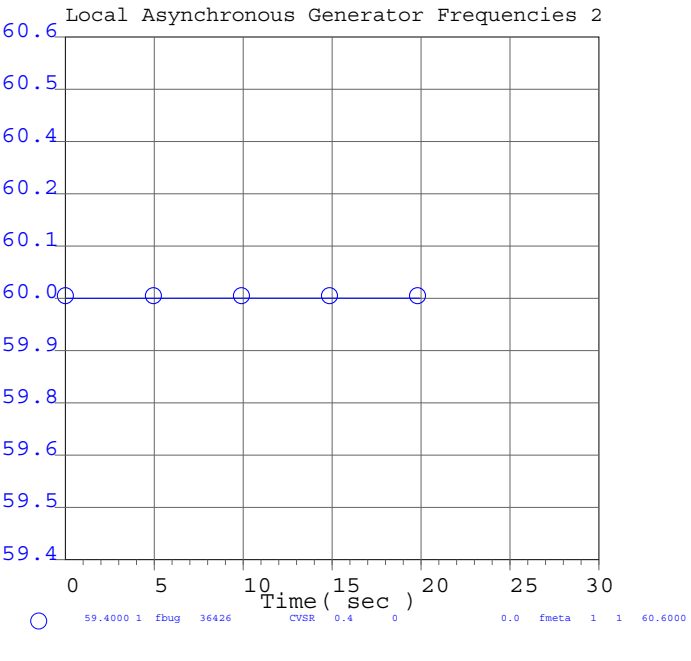
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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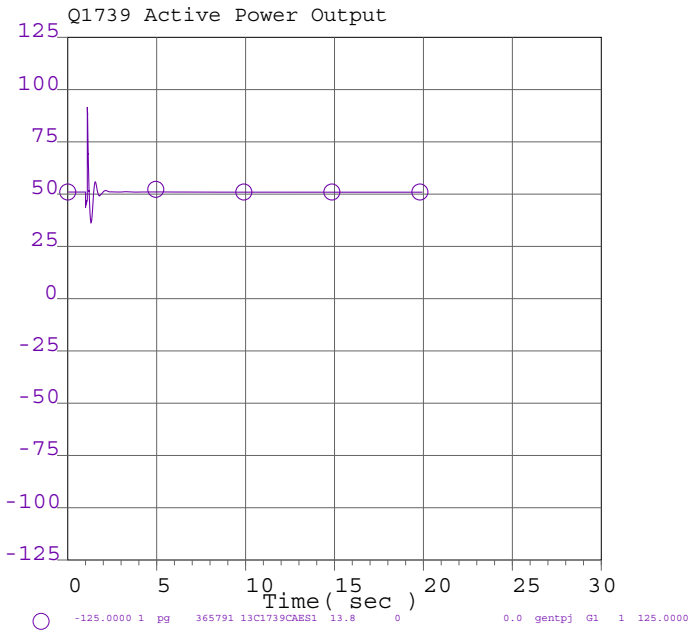
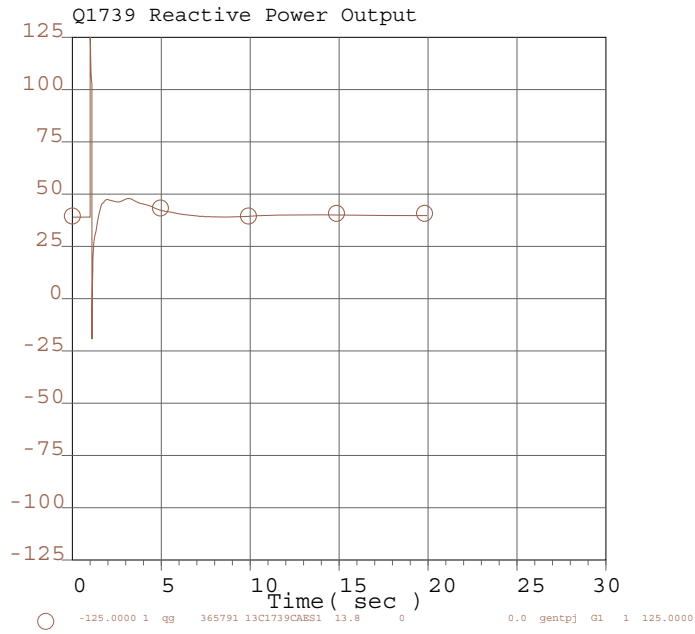
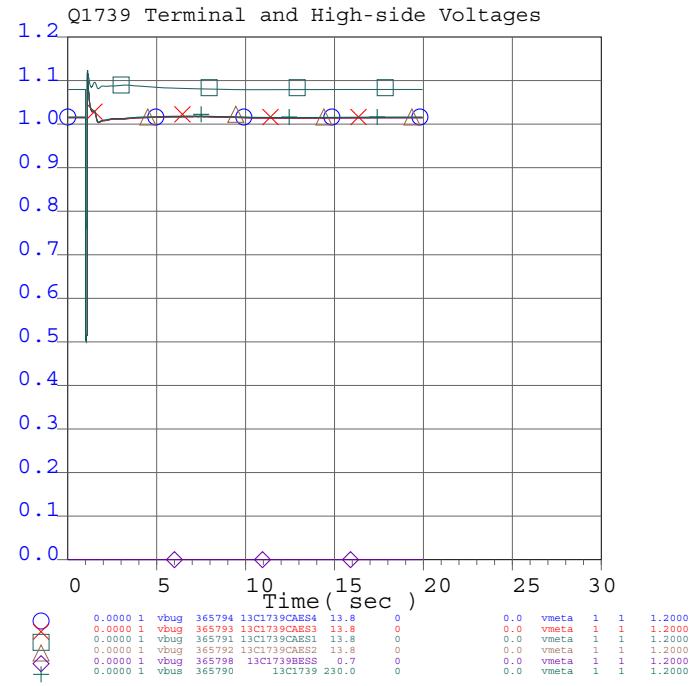
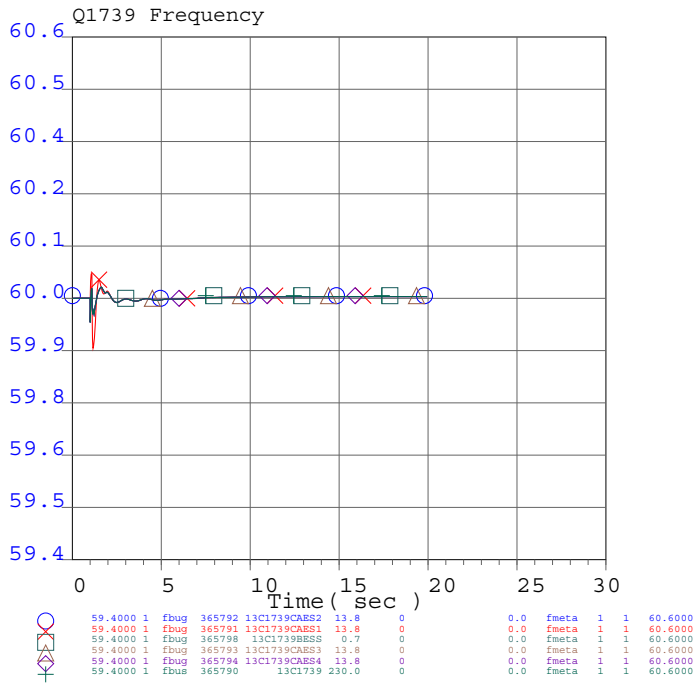
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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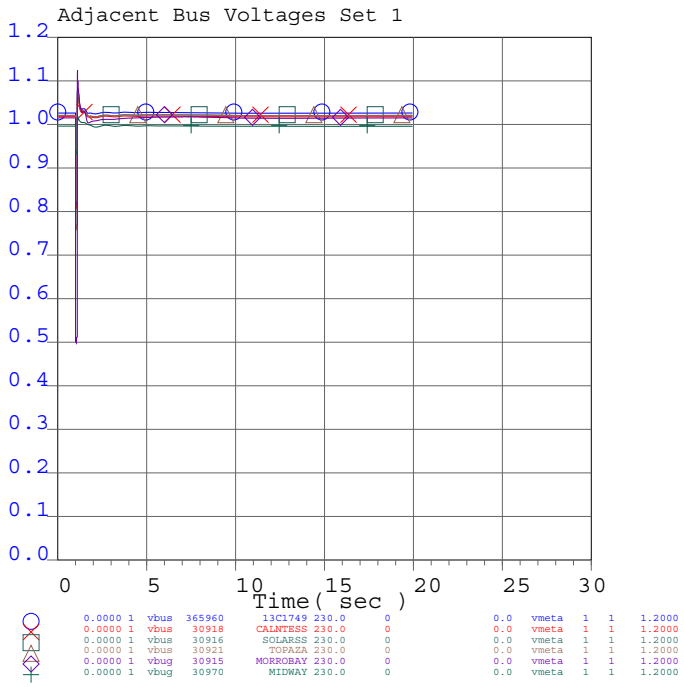
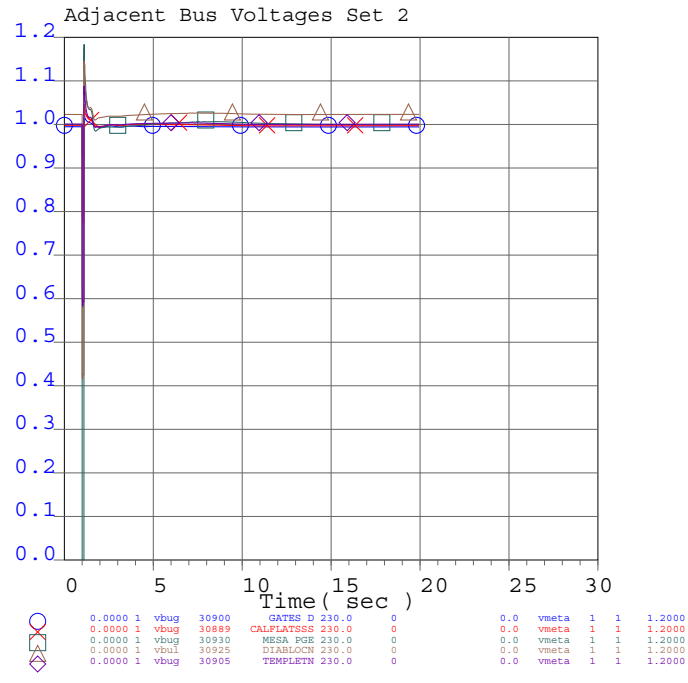
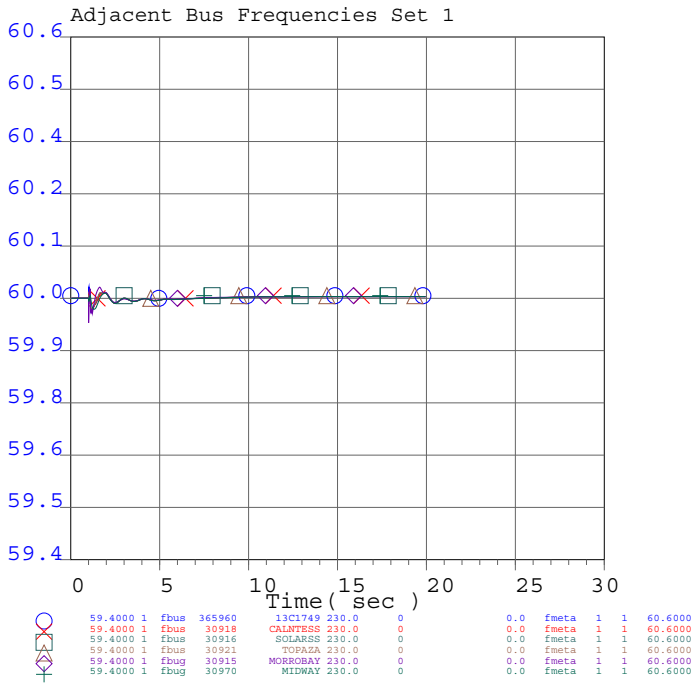
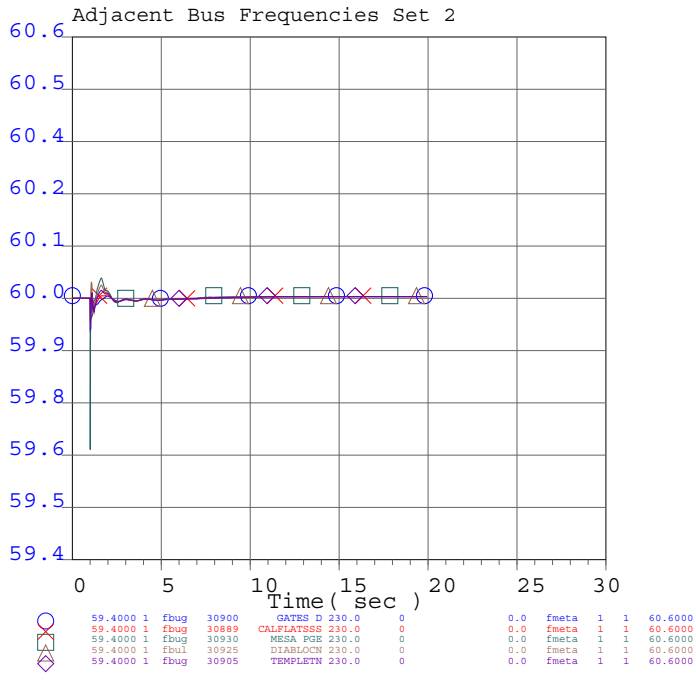


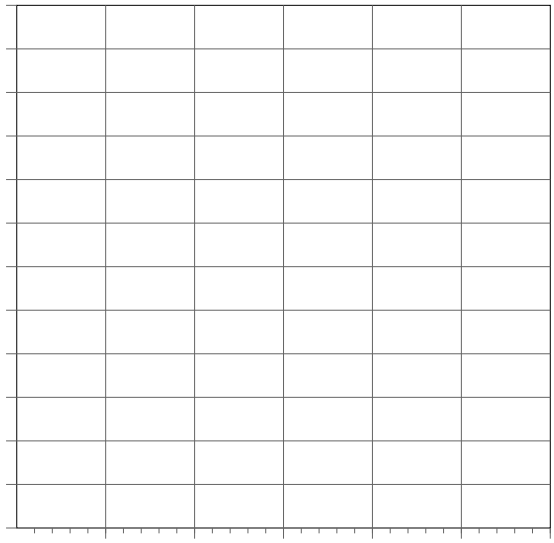




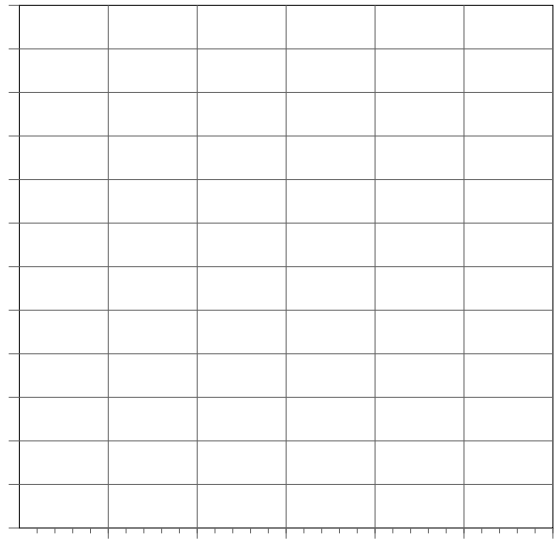


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

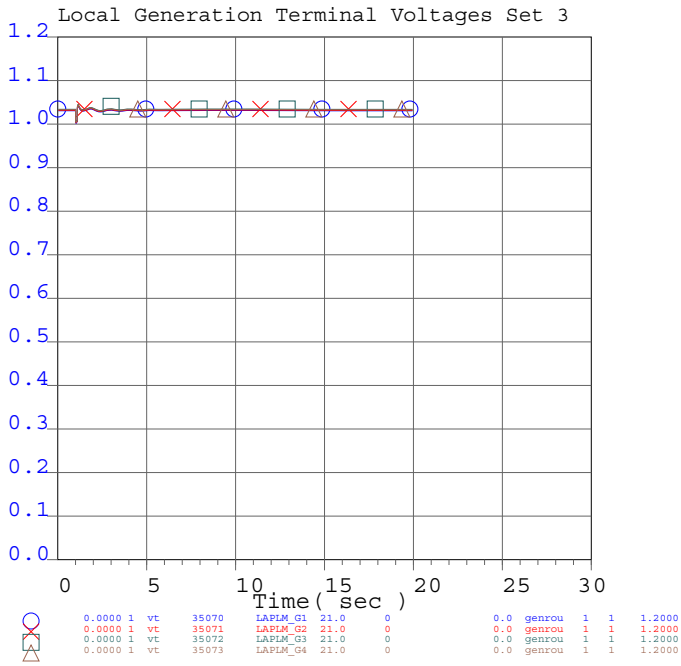
Local Generation Terminal Voltages Set 1



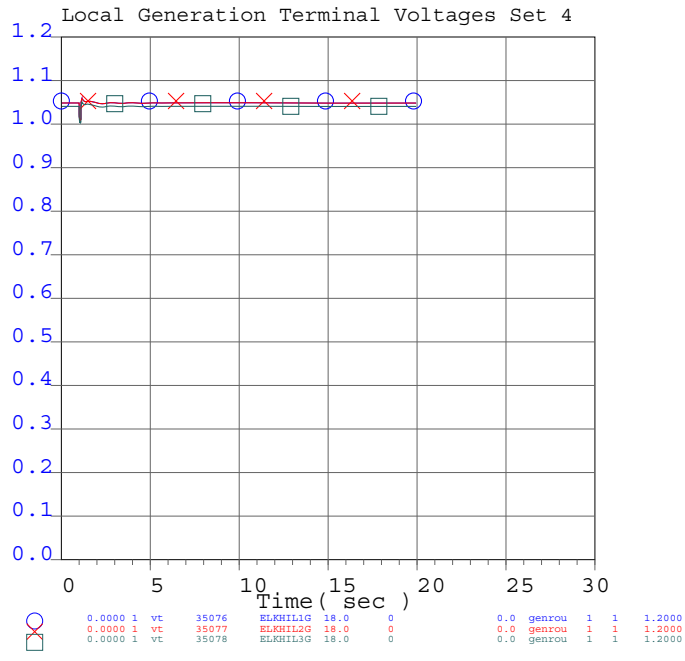
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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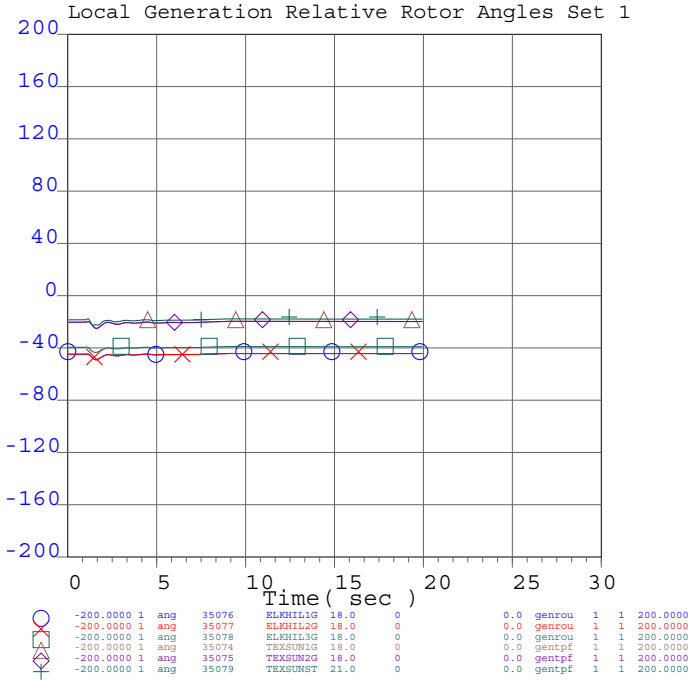
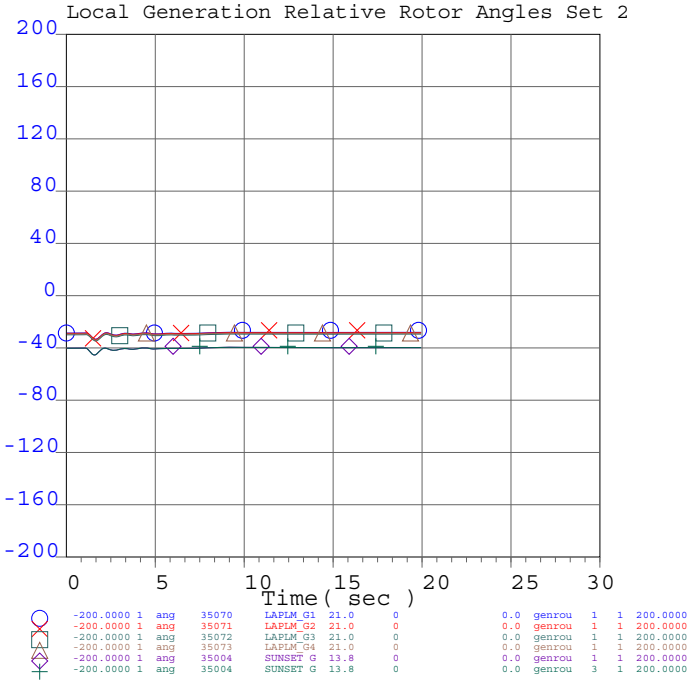
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

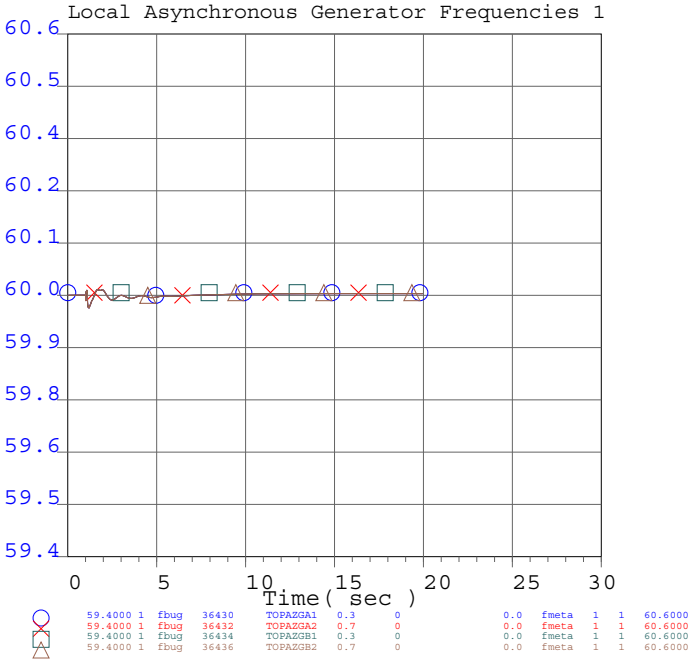
Local Generation Relative Rotor Angles Set 1



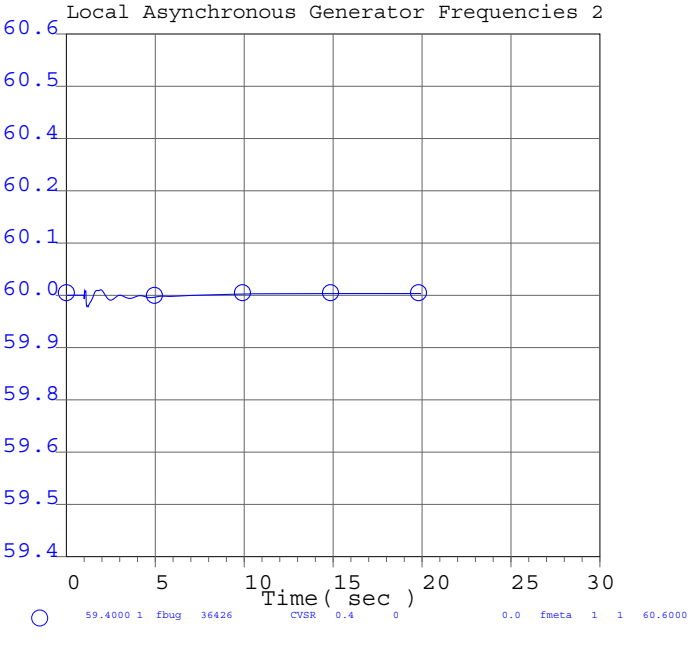
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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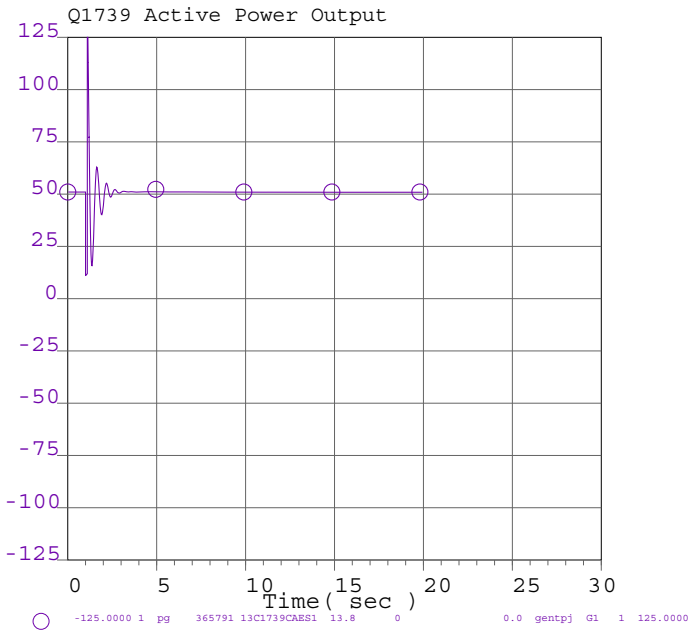
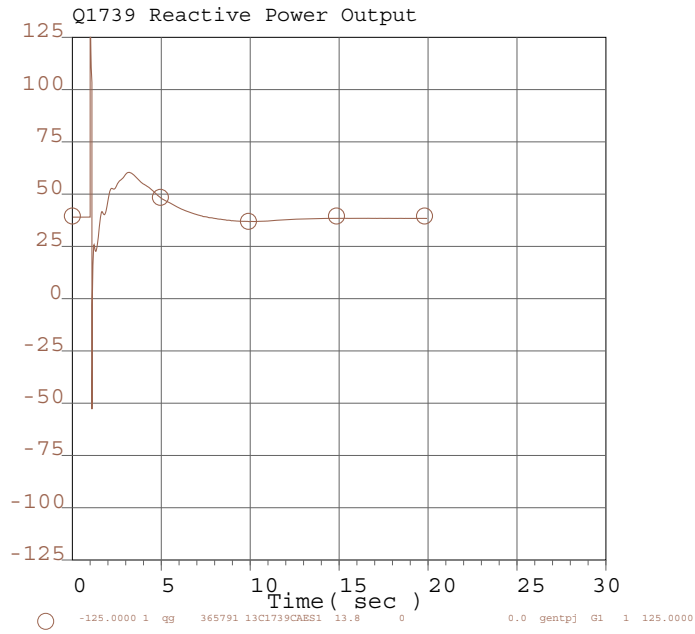
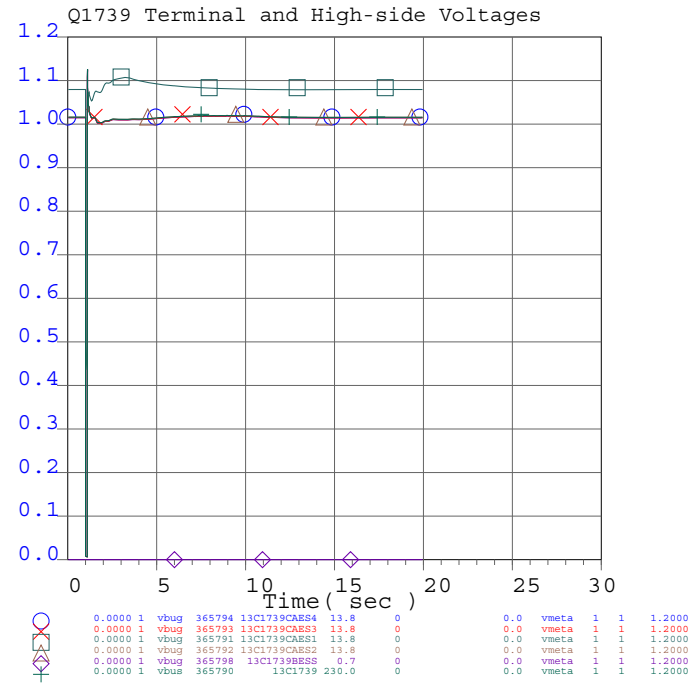
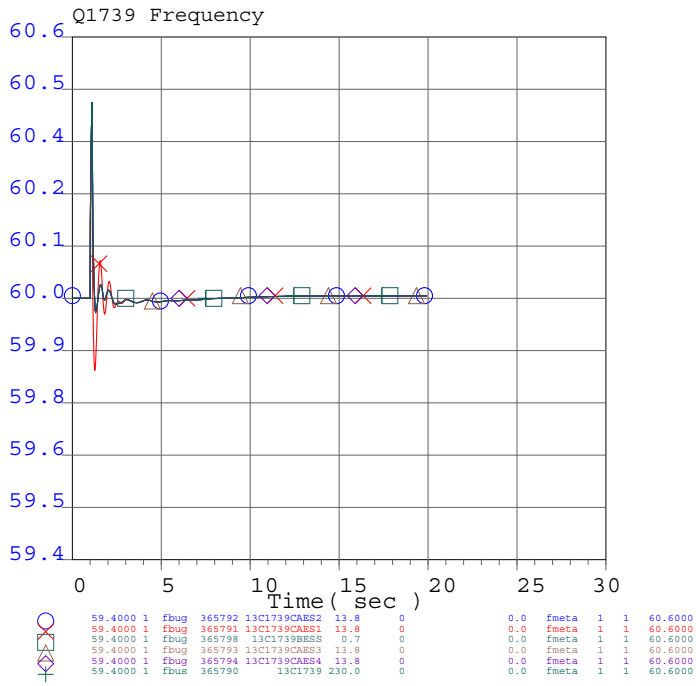
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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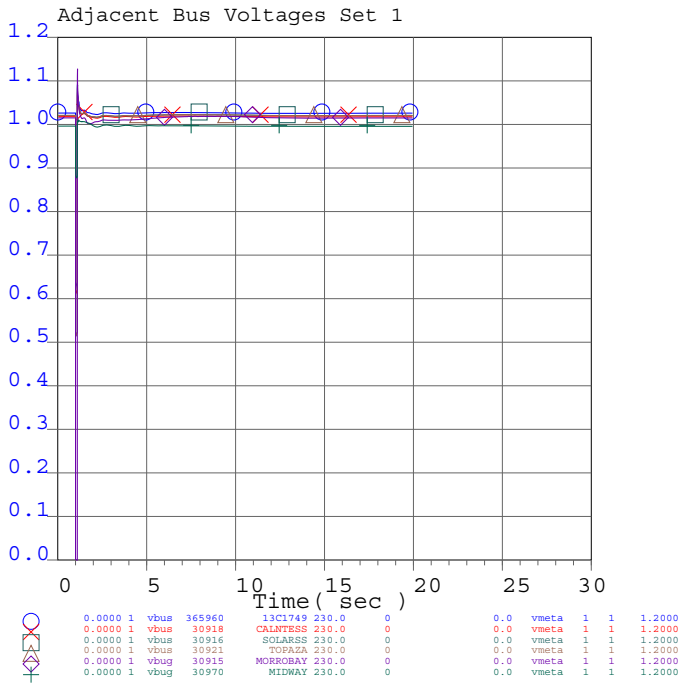

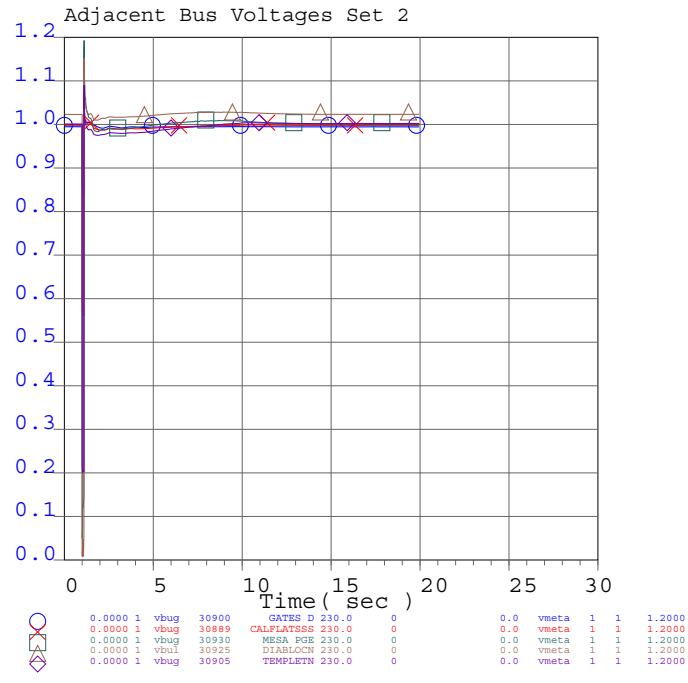

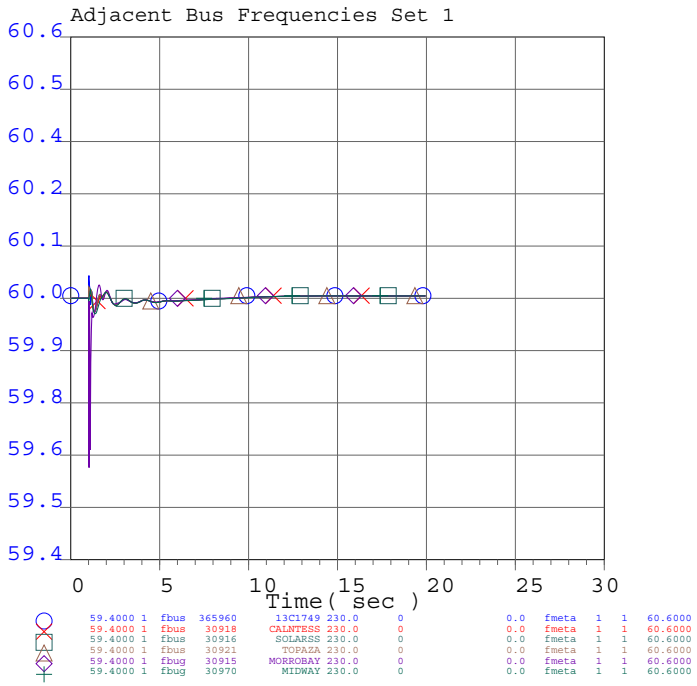

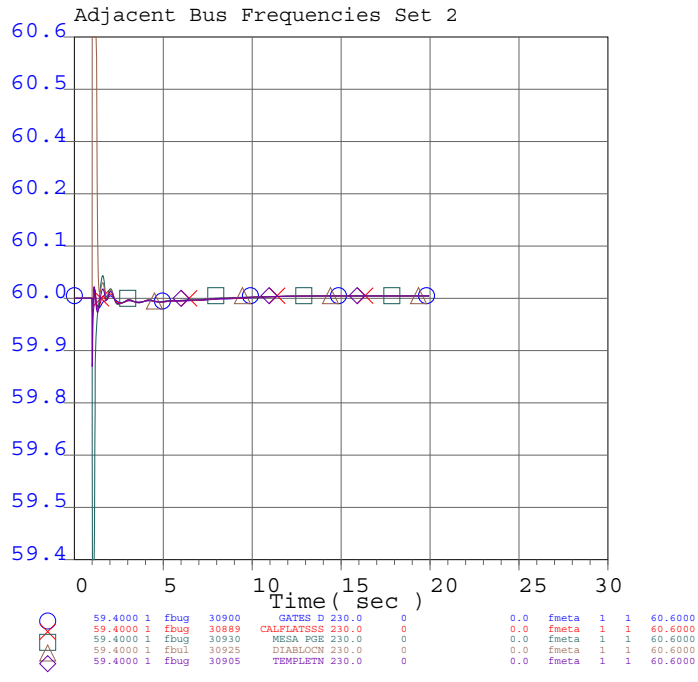

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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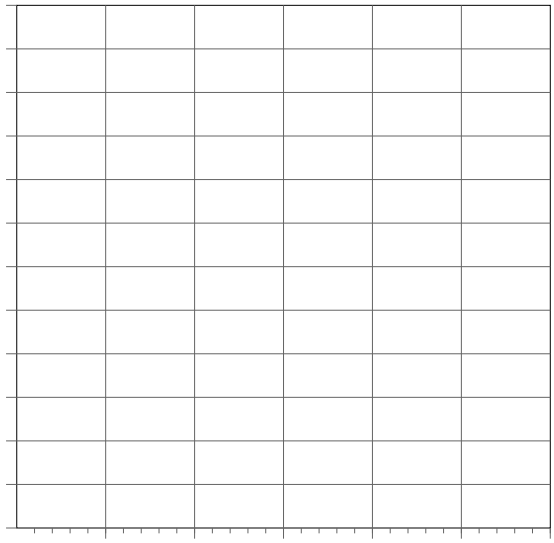
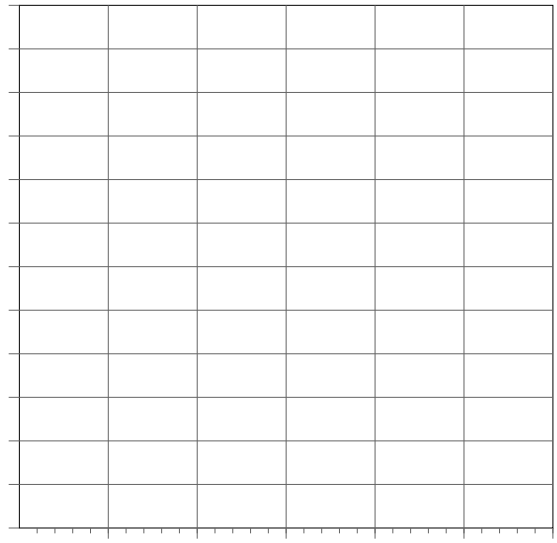
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

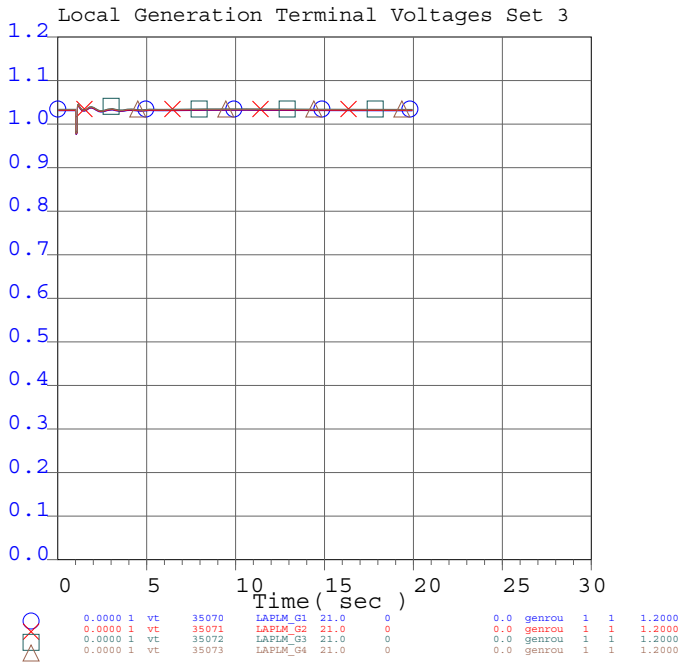
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

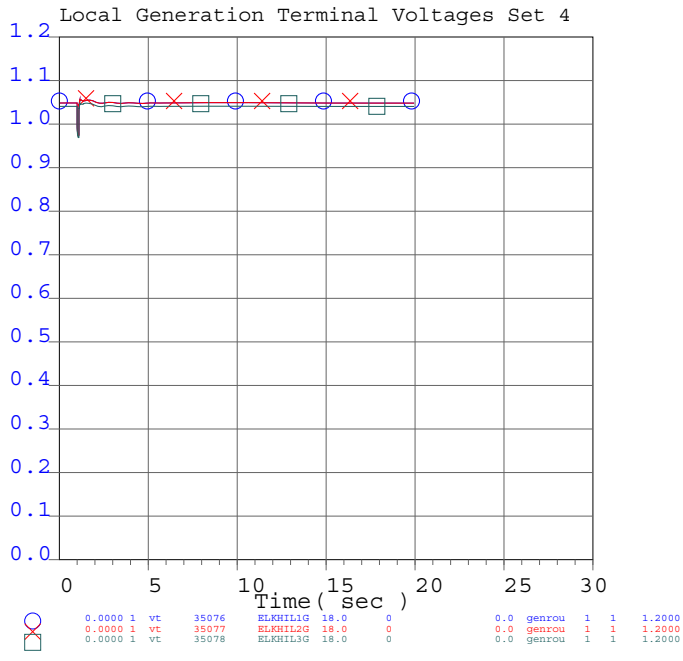


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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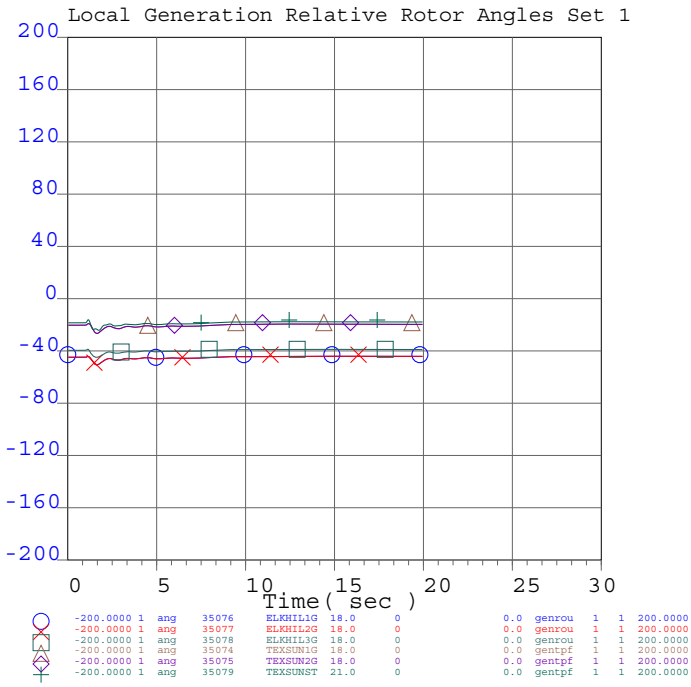
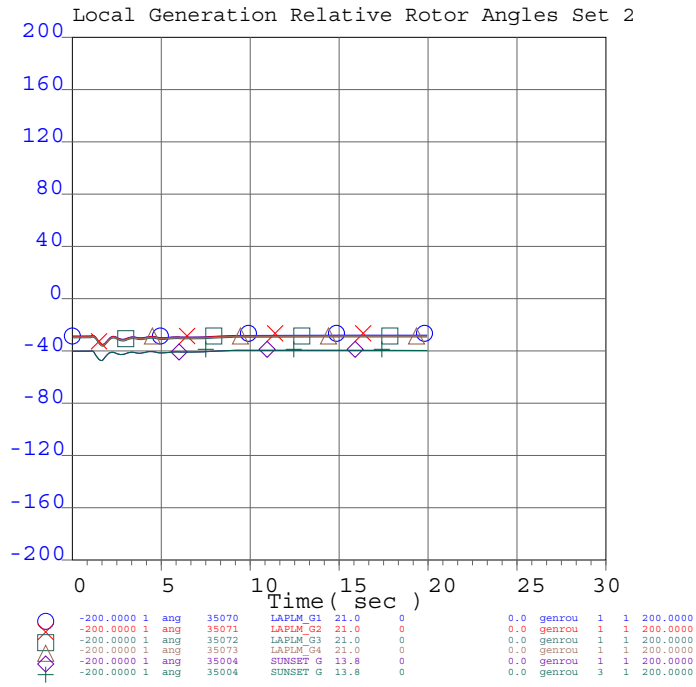
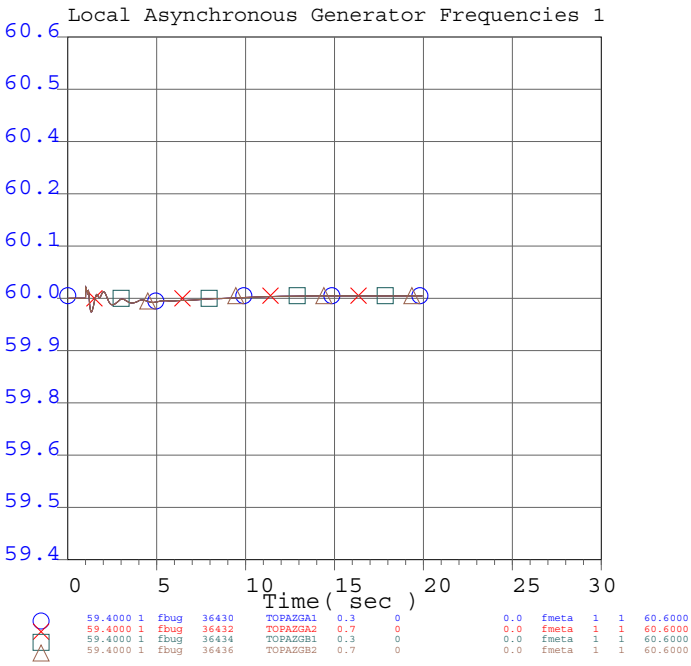
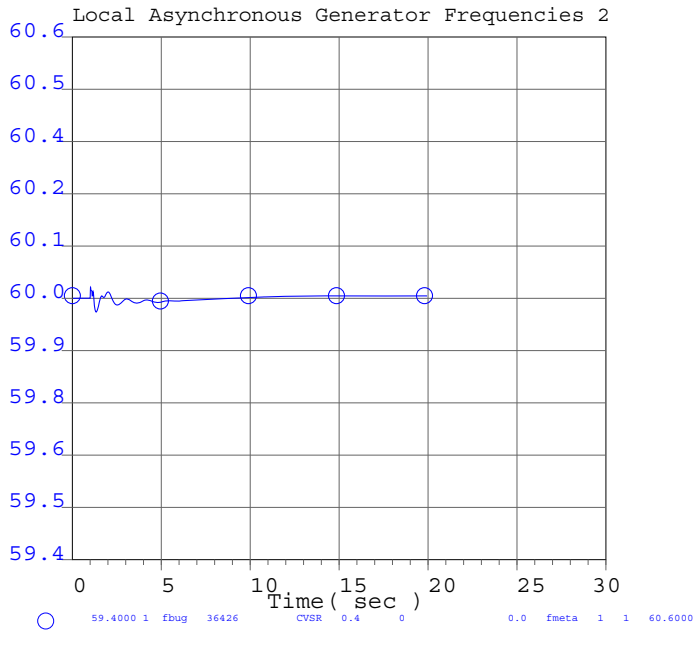
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



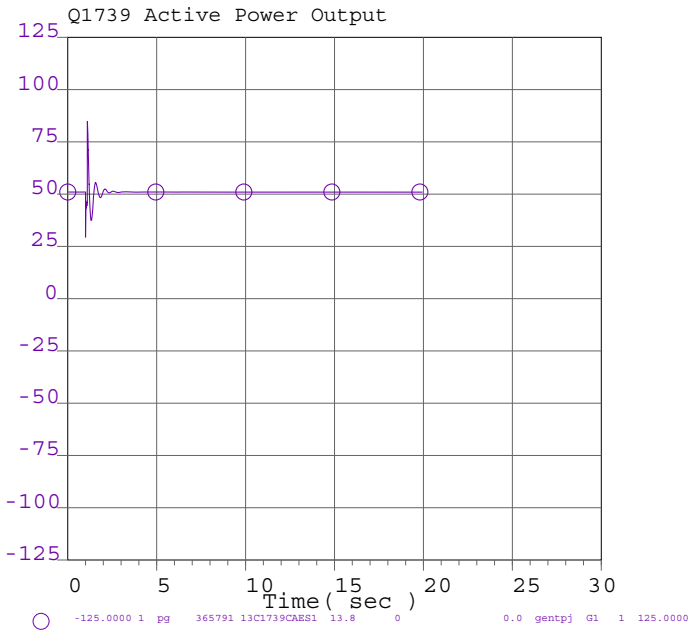


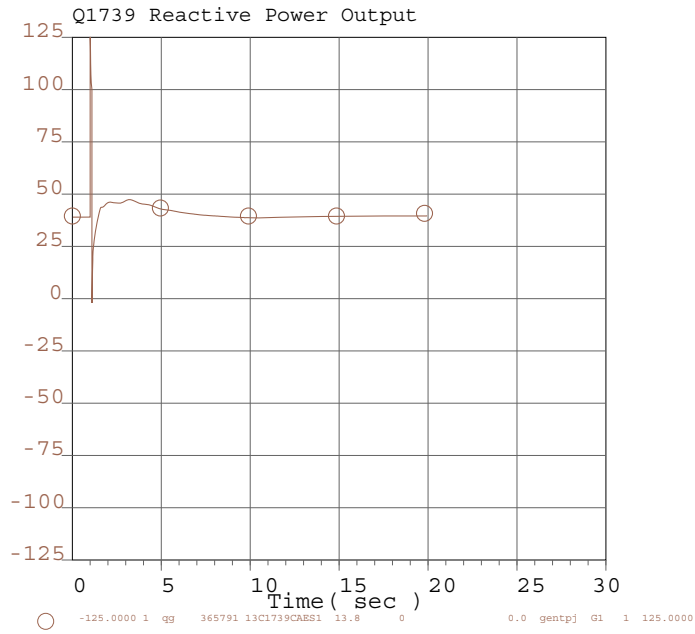


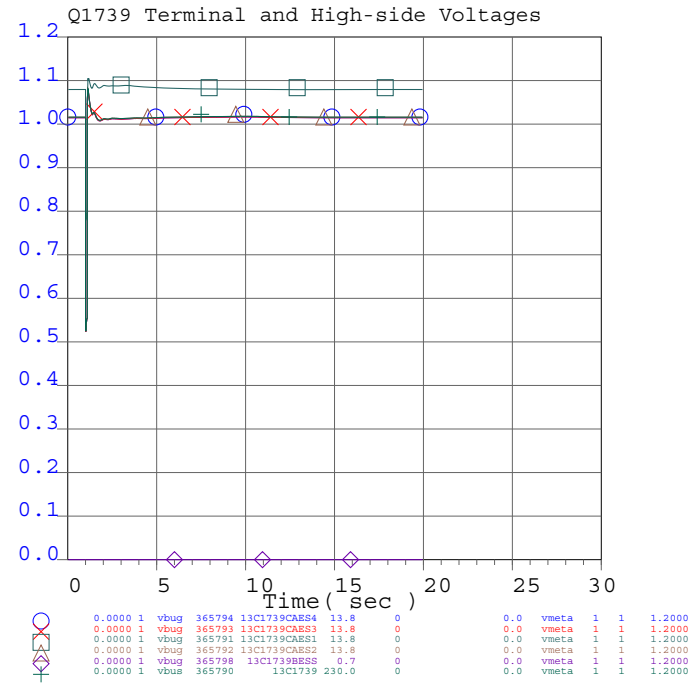


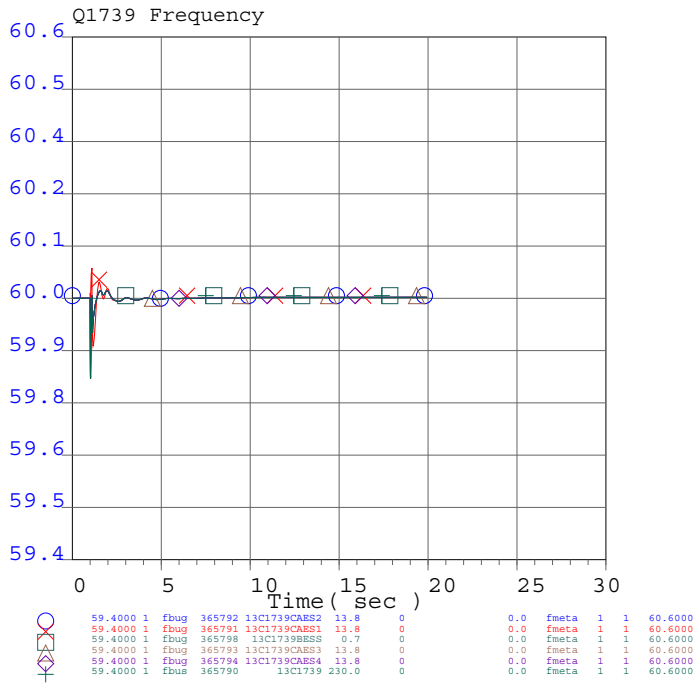
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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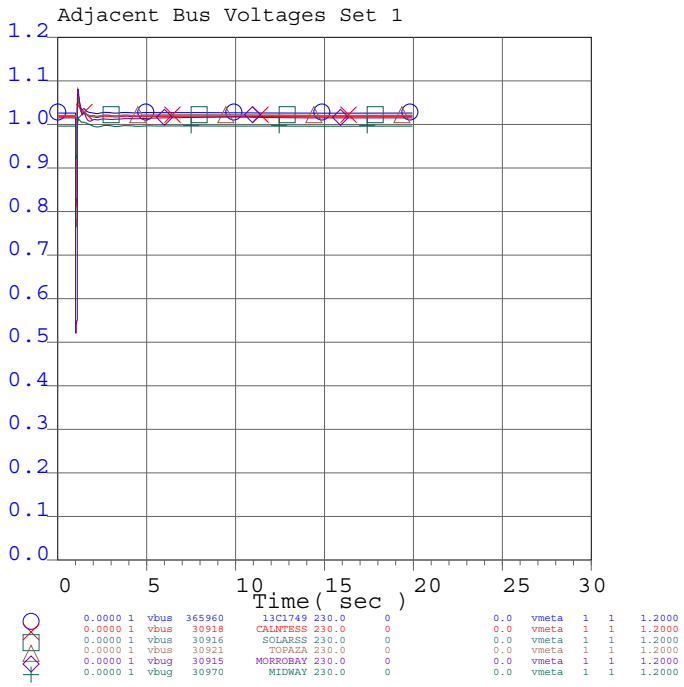
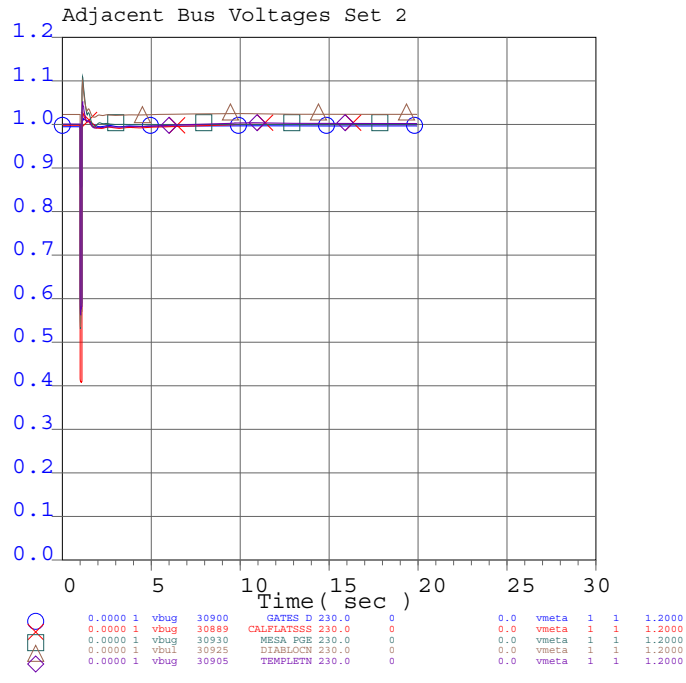
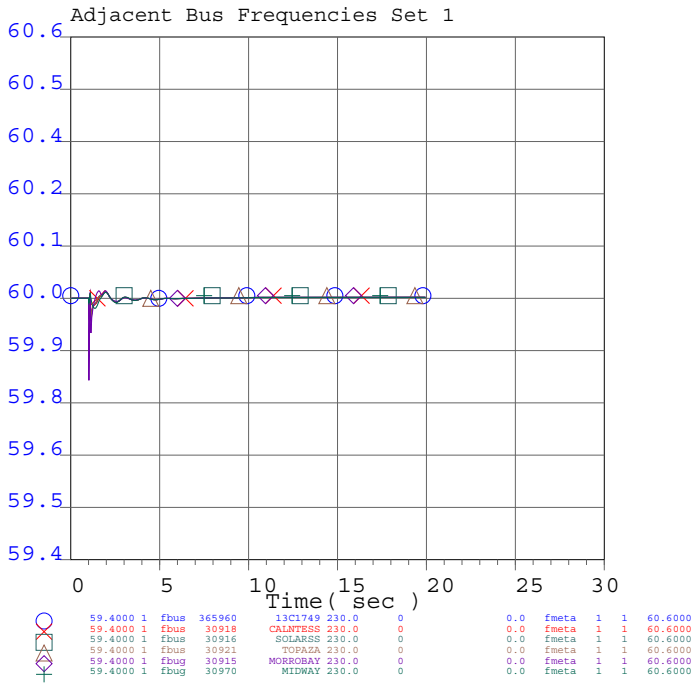
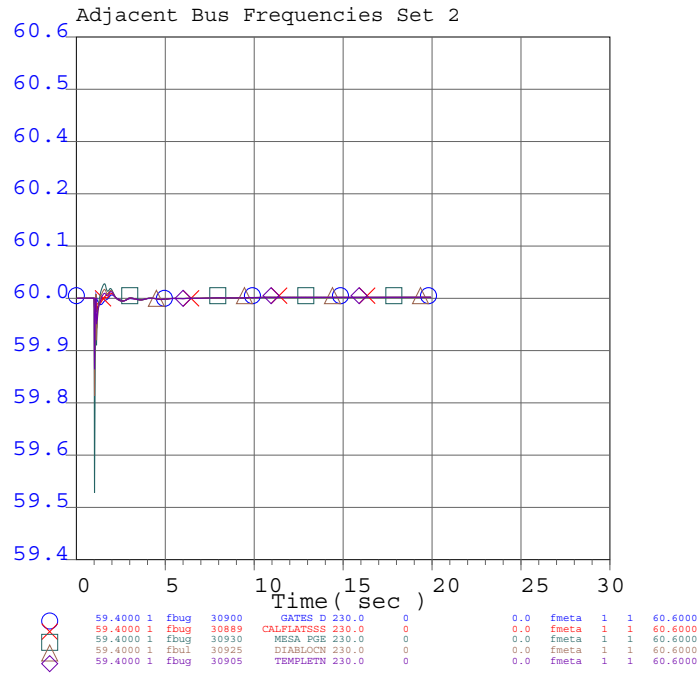
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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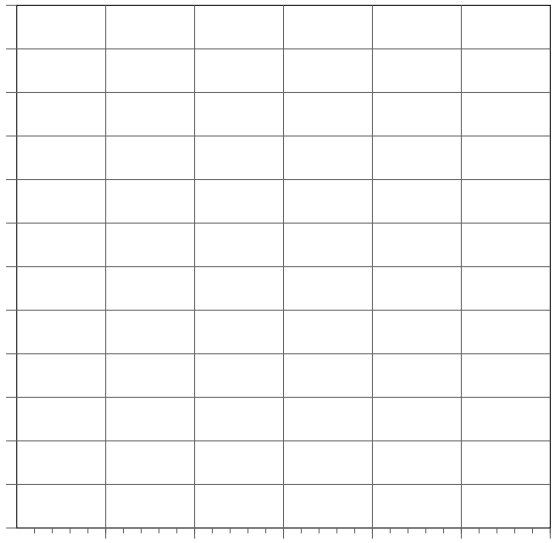
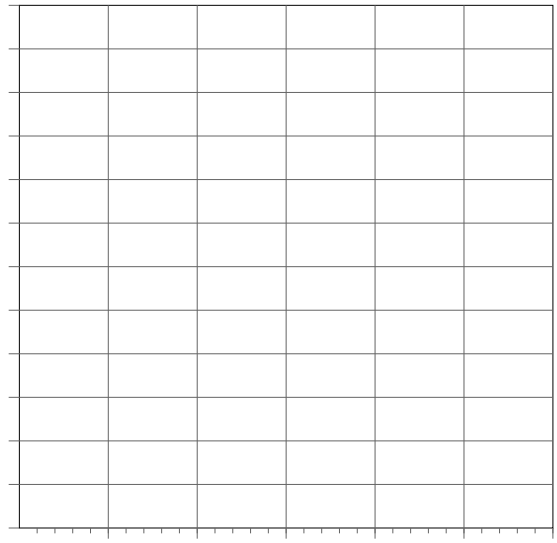
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

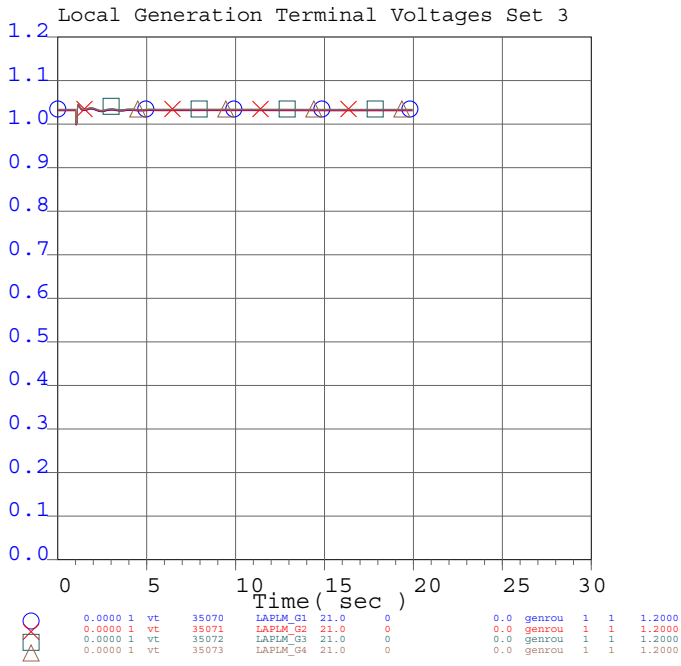
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
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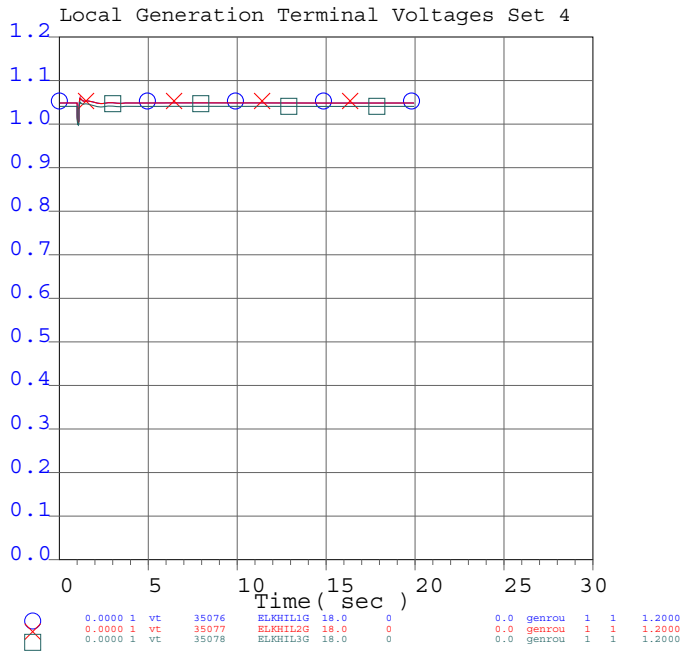
Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
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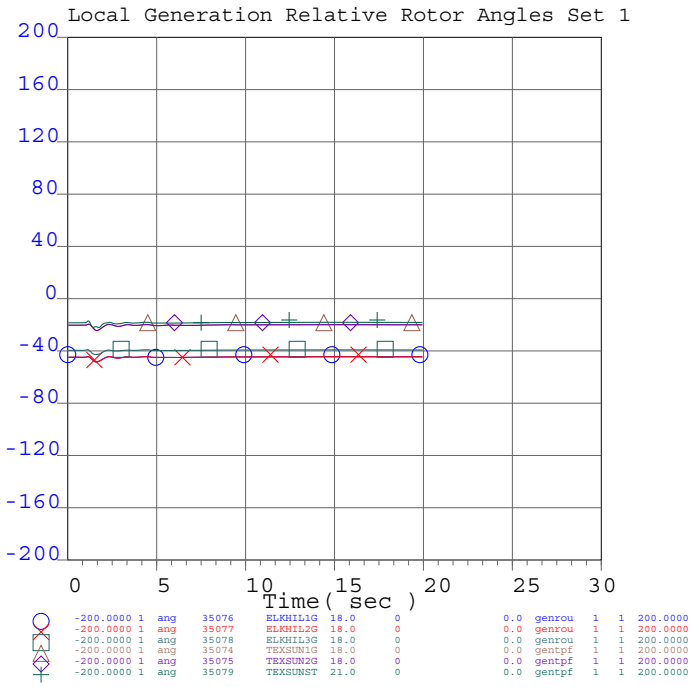

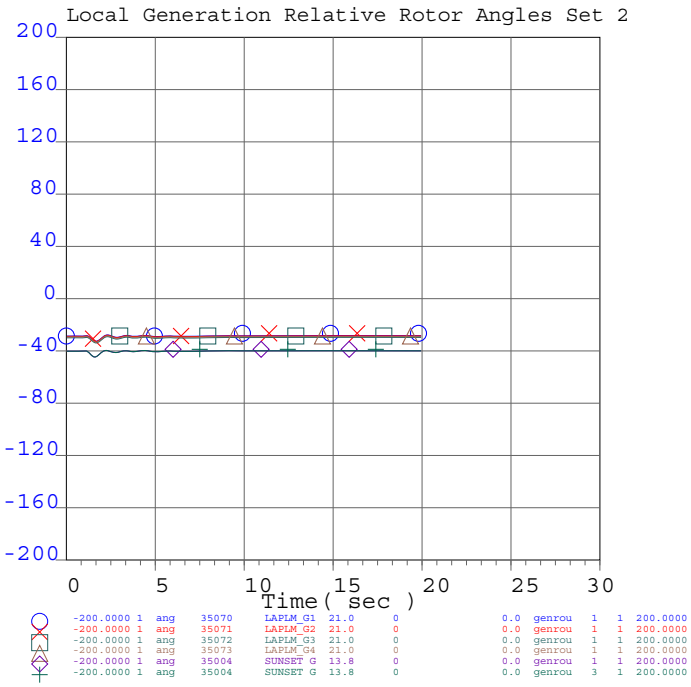

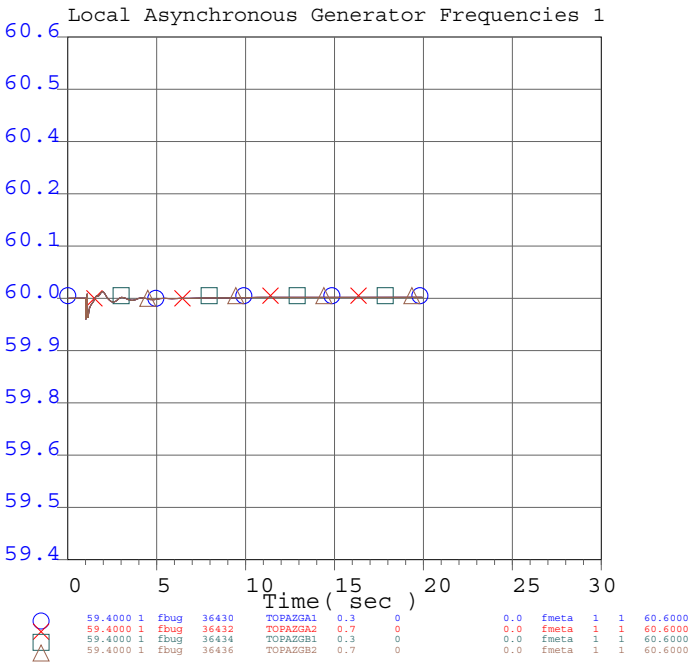

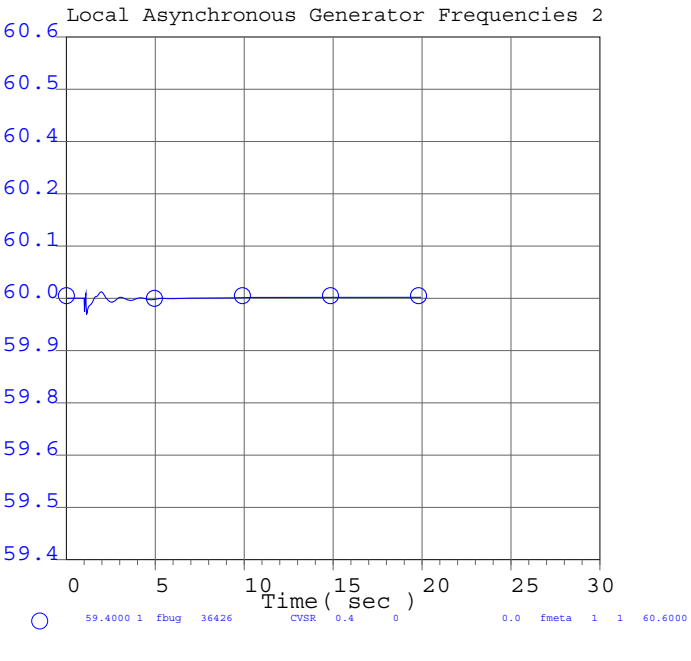

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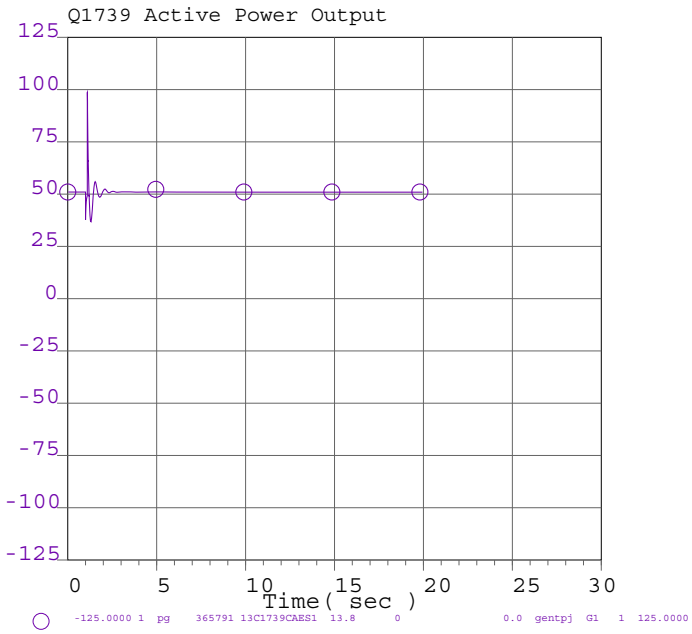
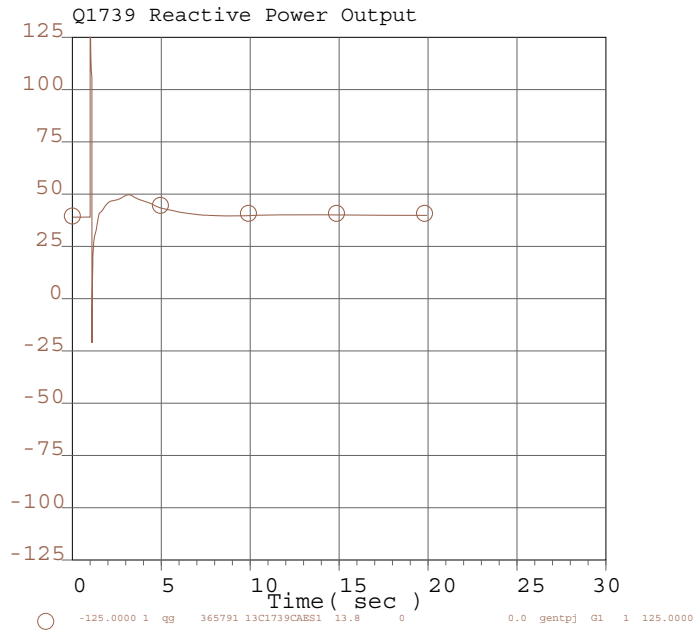
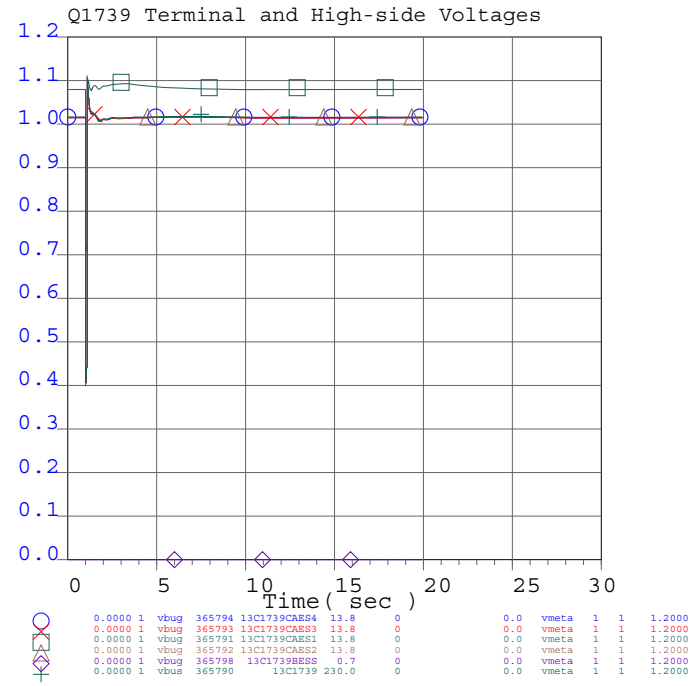
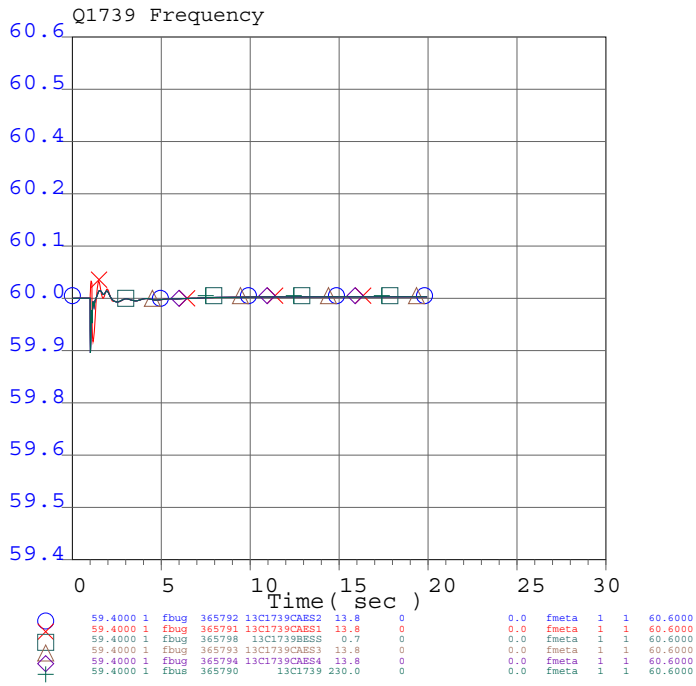
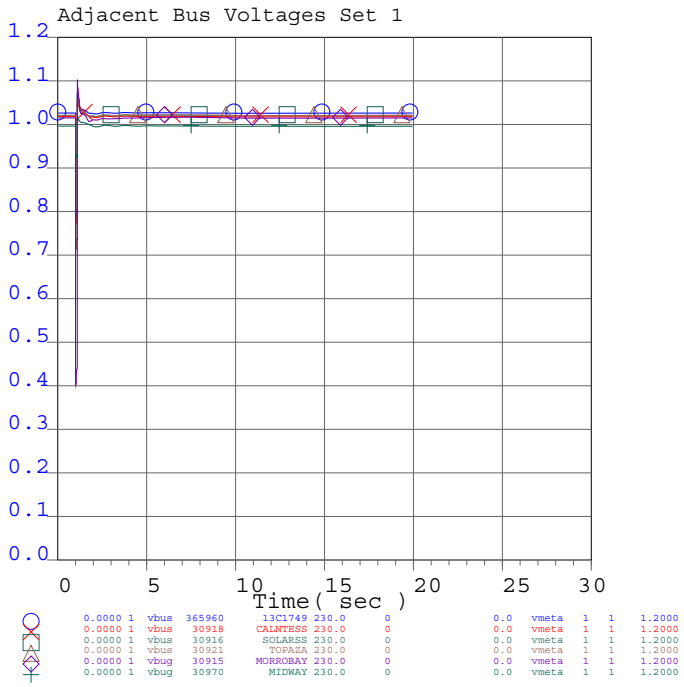


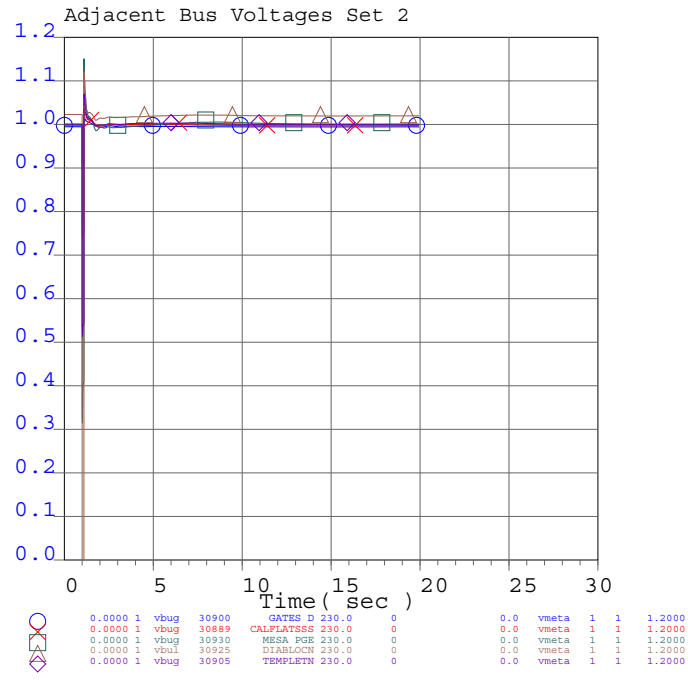


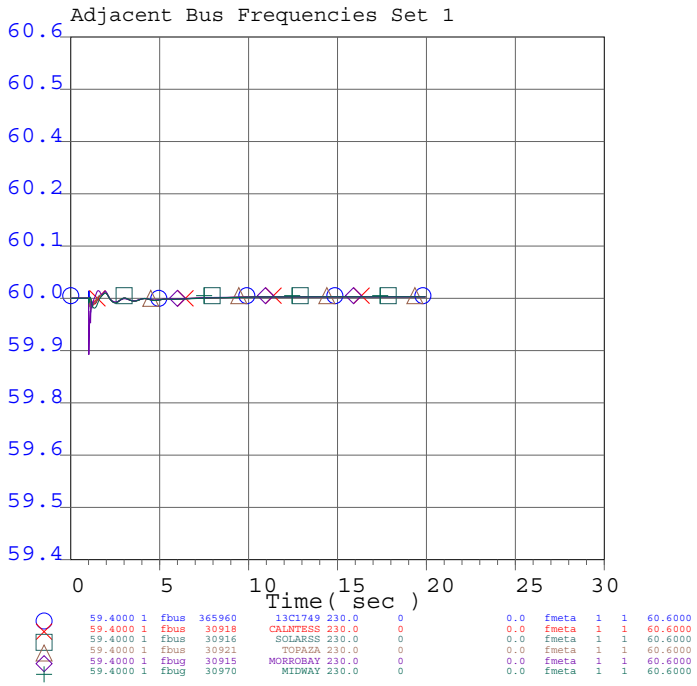


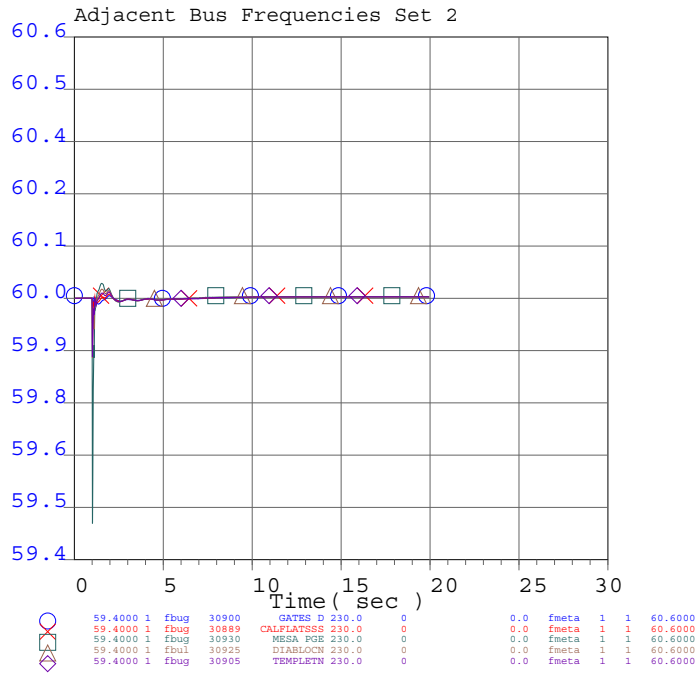


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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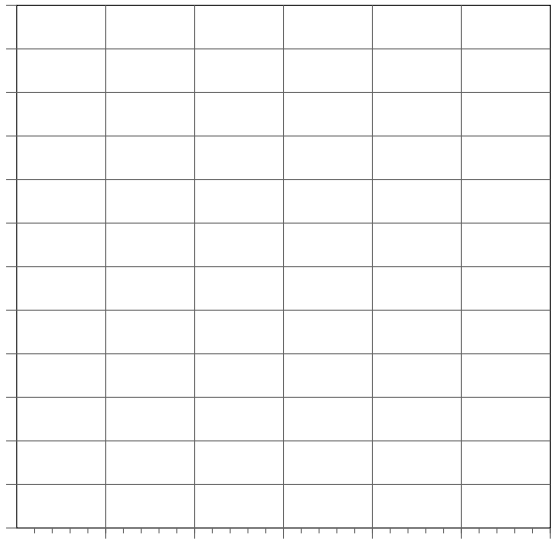
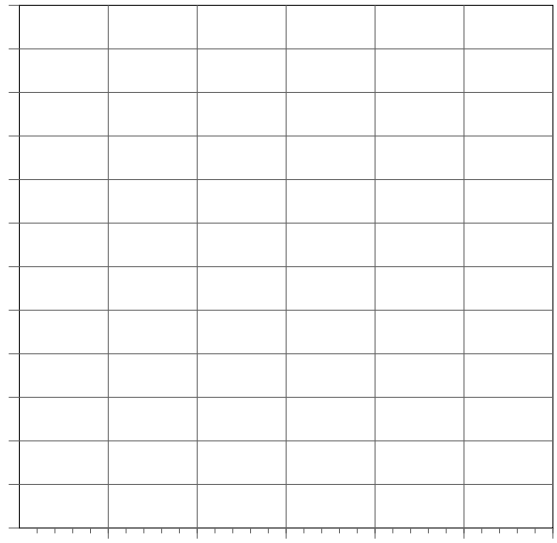
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

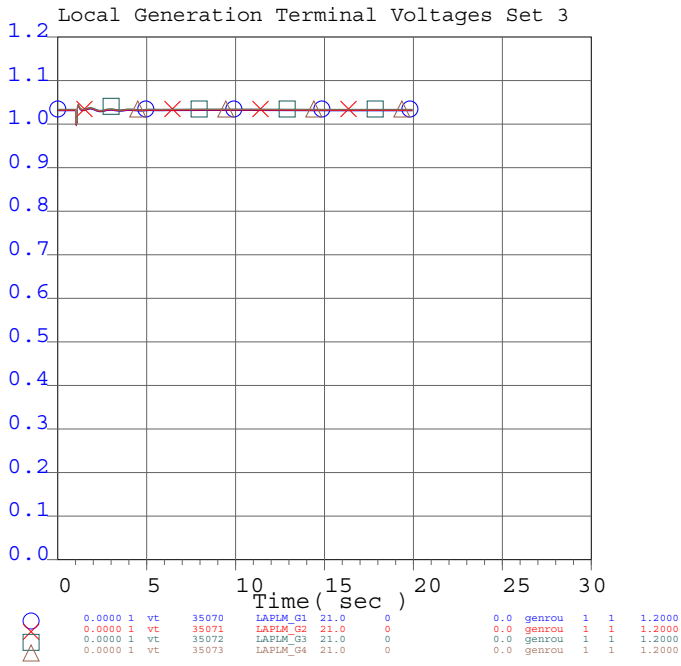
Local Generation Terminal Voltages Set 1



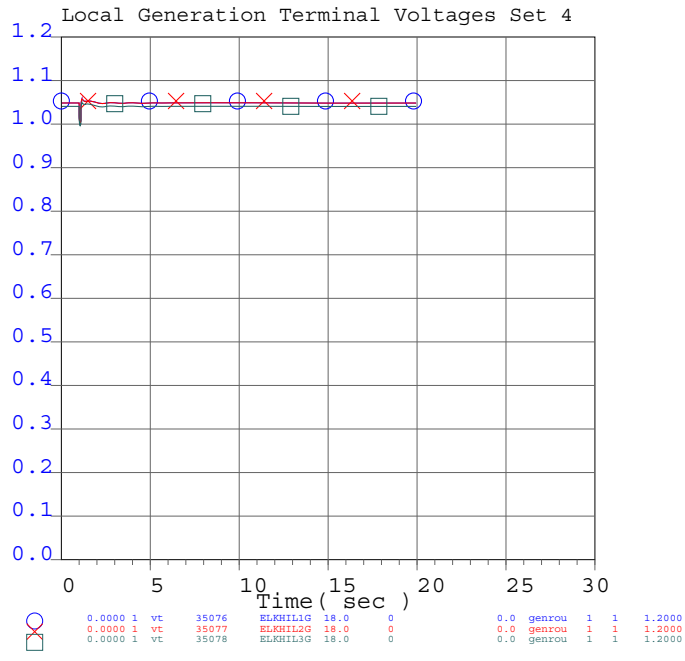
Local Generation Terminal Voltages Set 2



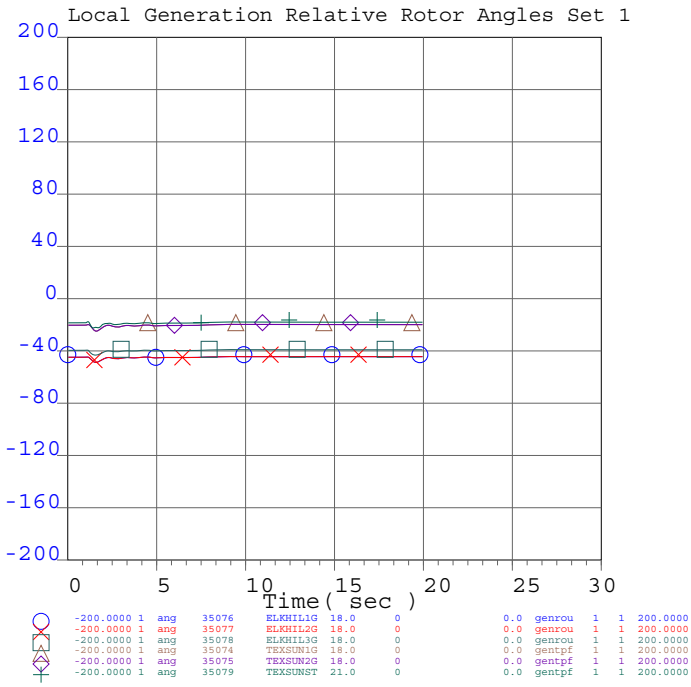
Local Generation Terminal Voltages Set 3

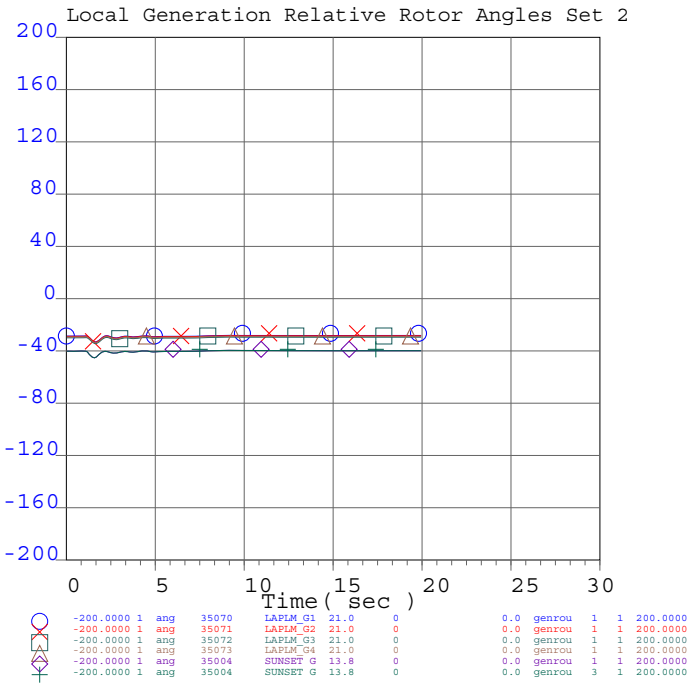


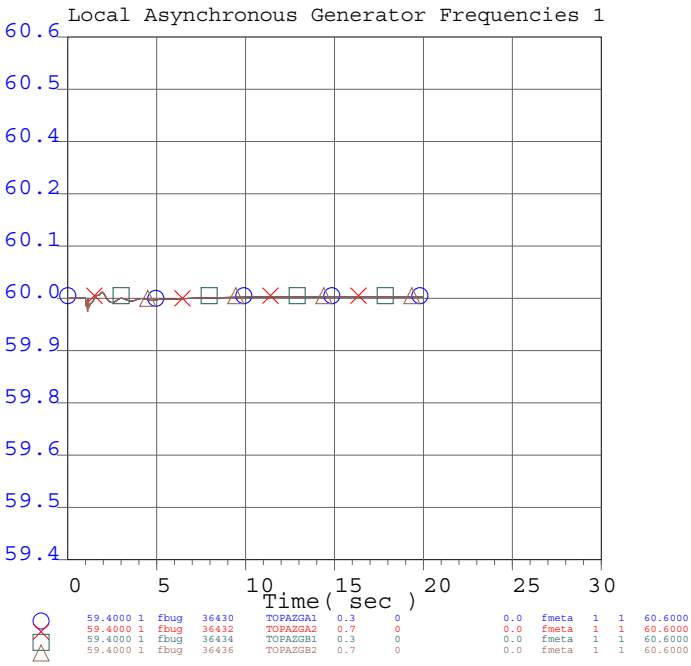
Local Generation Terminal Voltages Set 4

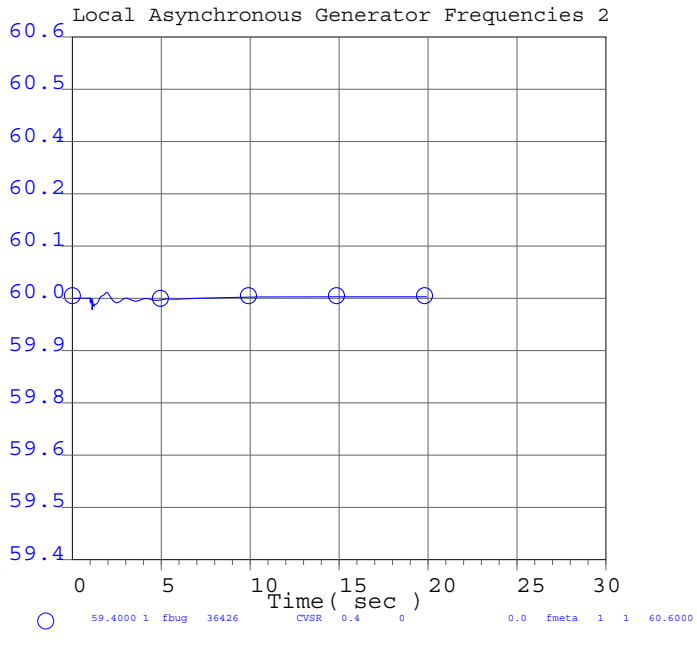


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



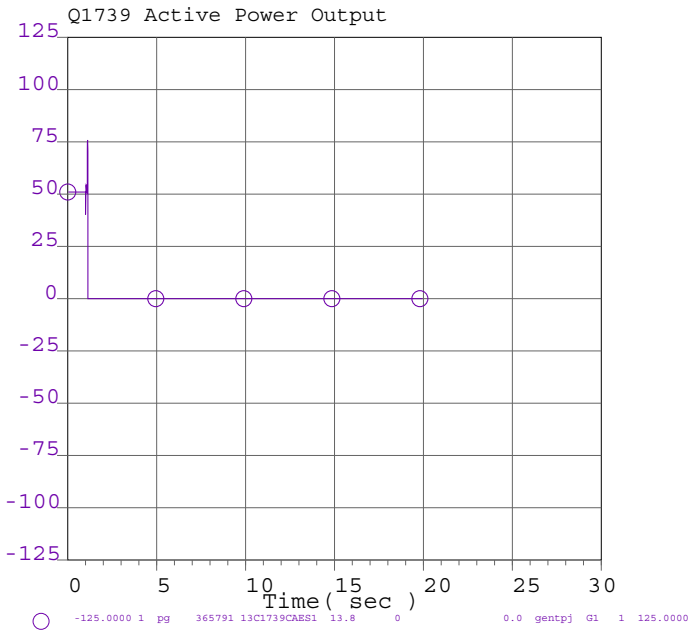


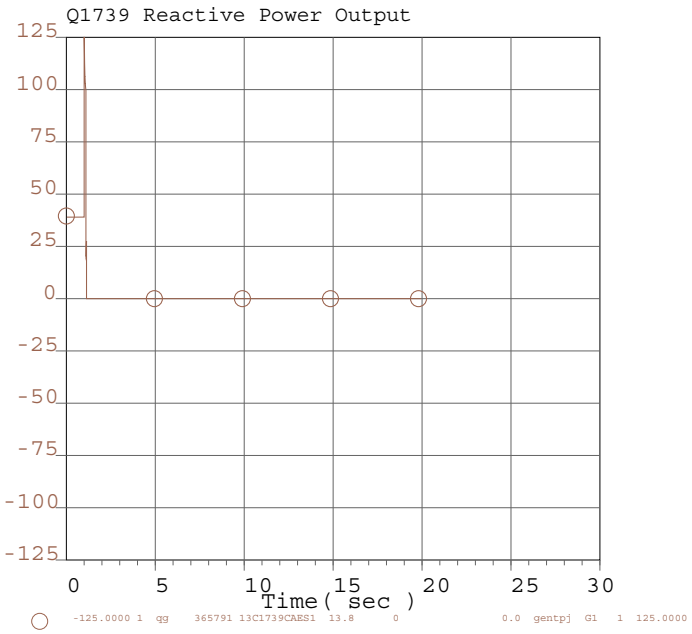


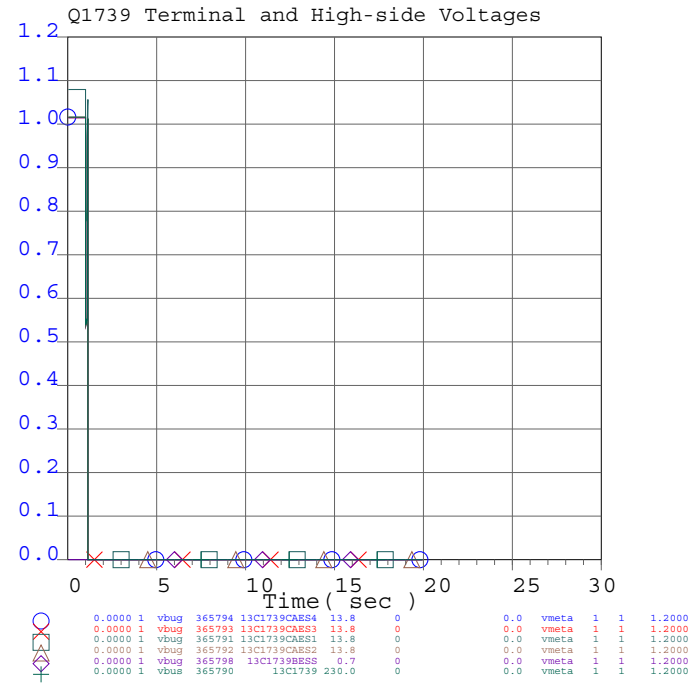


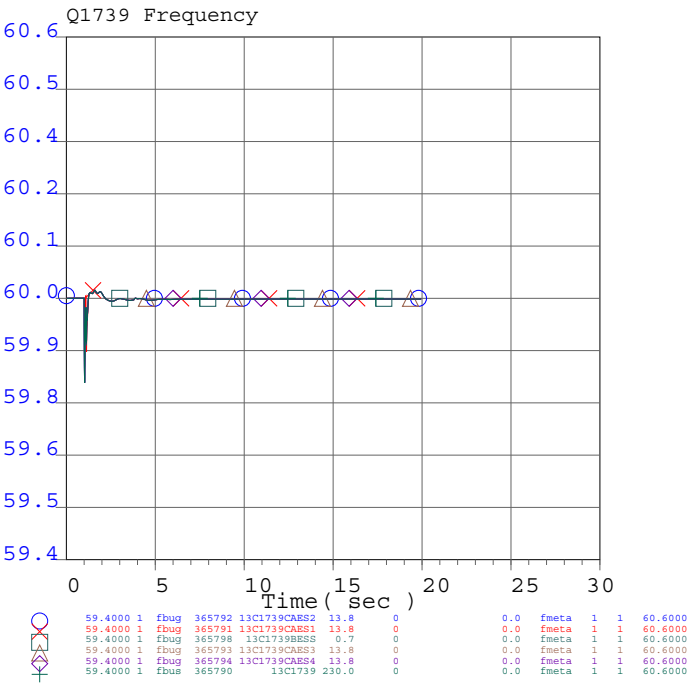
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation

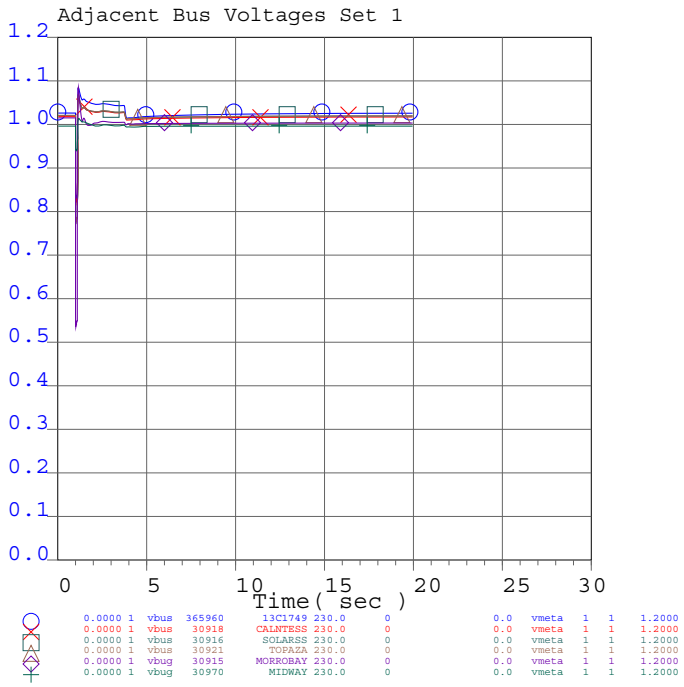


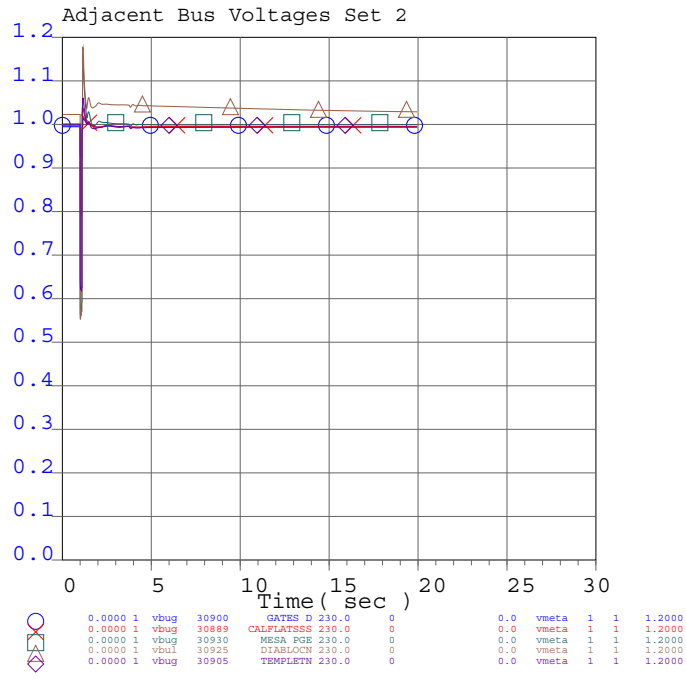


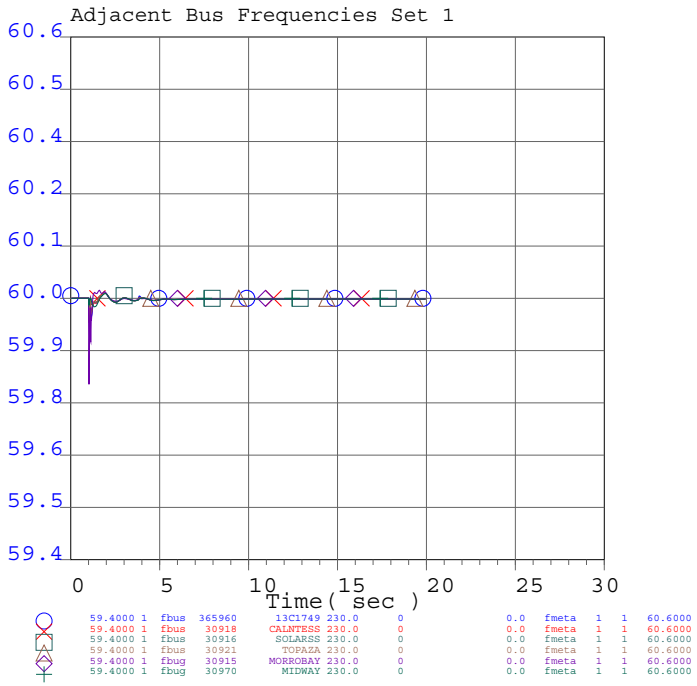


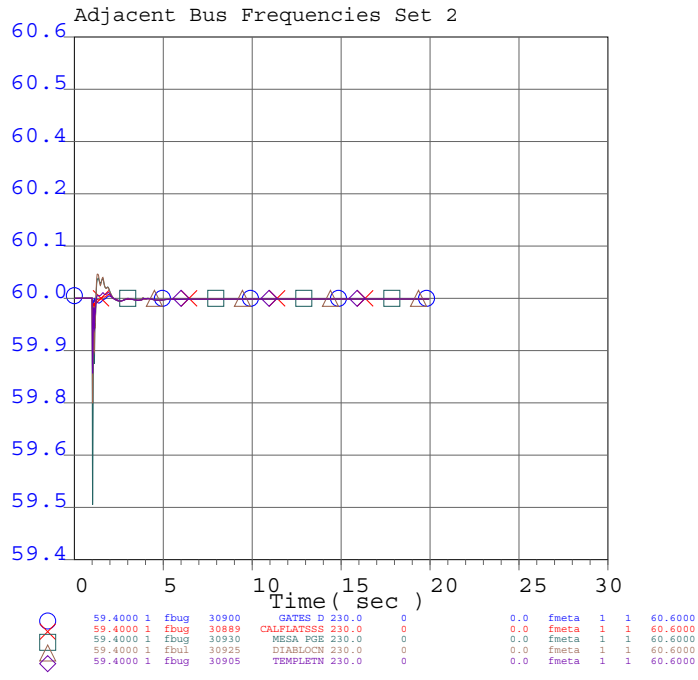


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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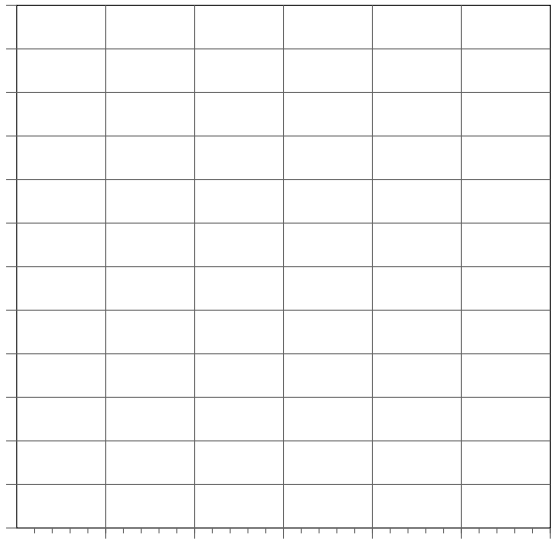
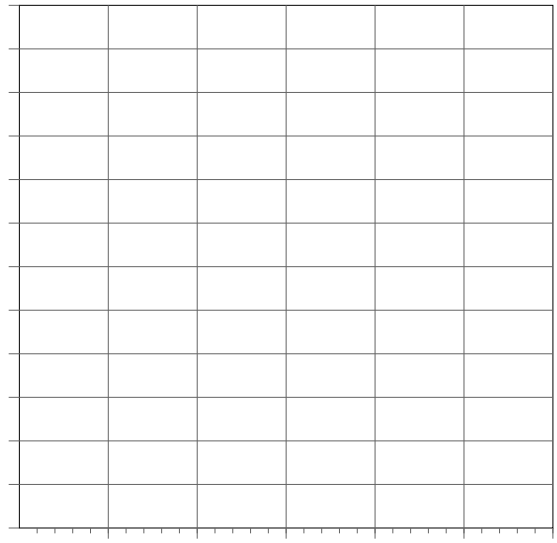
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

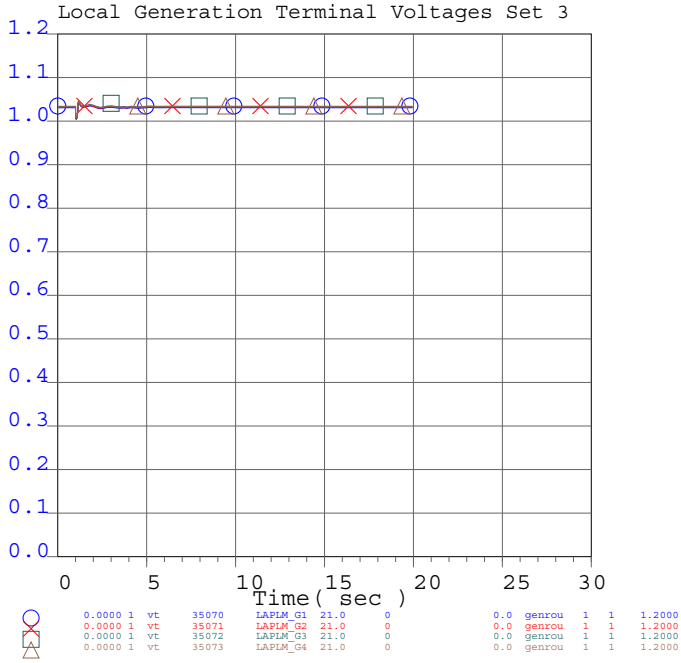
Local Generation Terminal Voltages Set 1



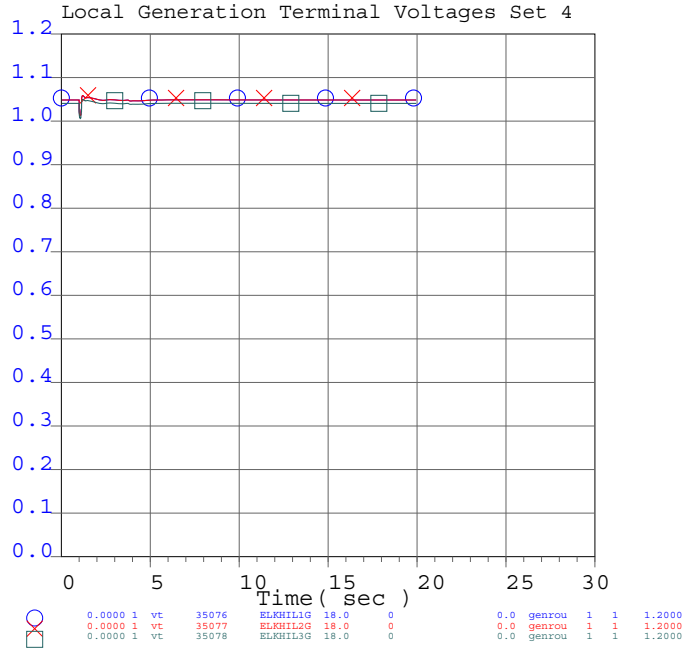
Local Generation Terminal Voltages Set 2



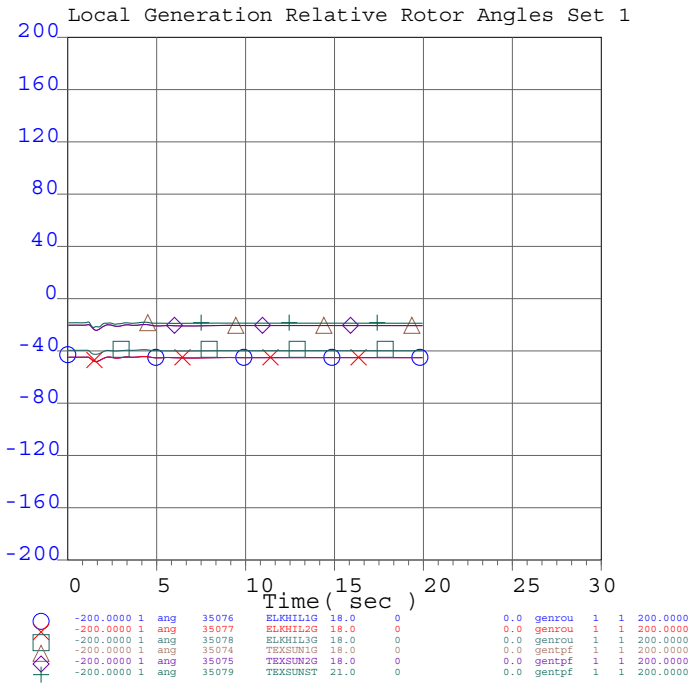
Local Generation Terminal Voltages Set 3

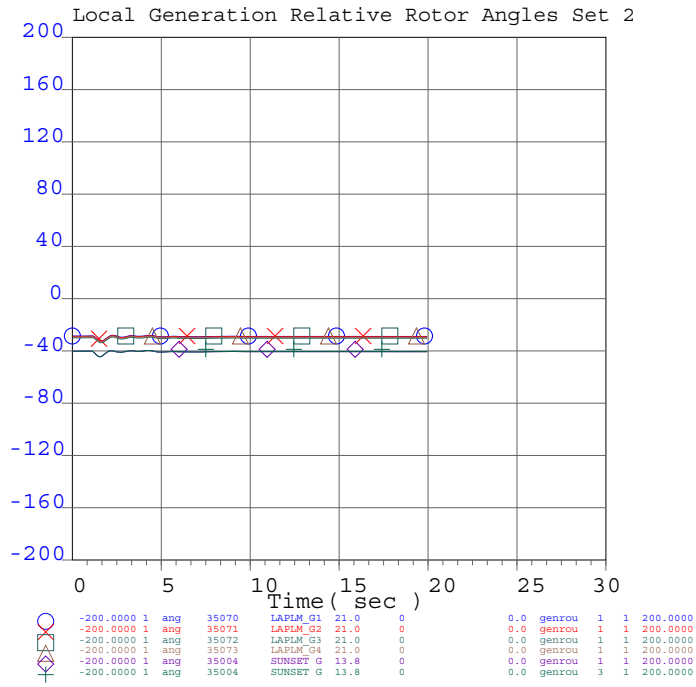


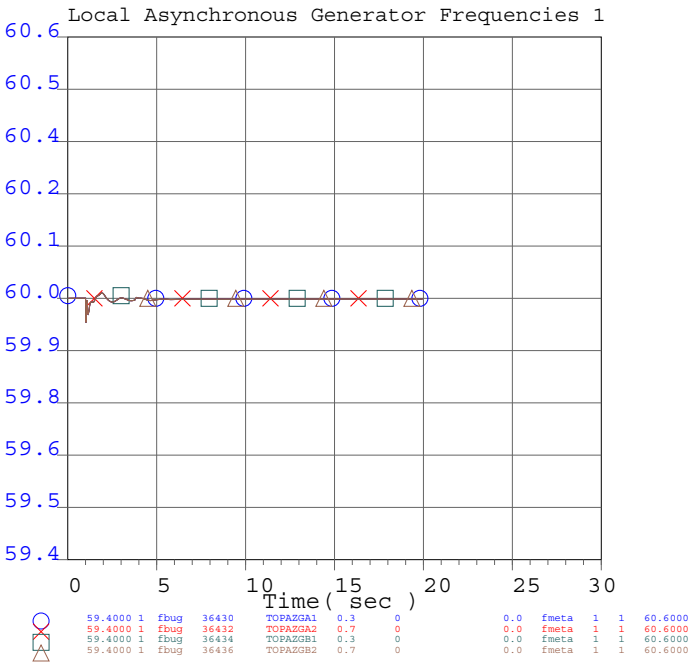
Local Generation Terminal Voltages Set 4

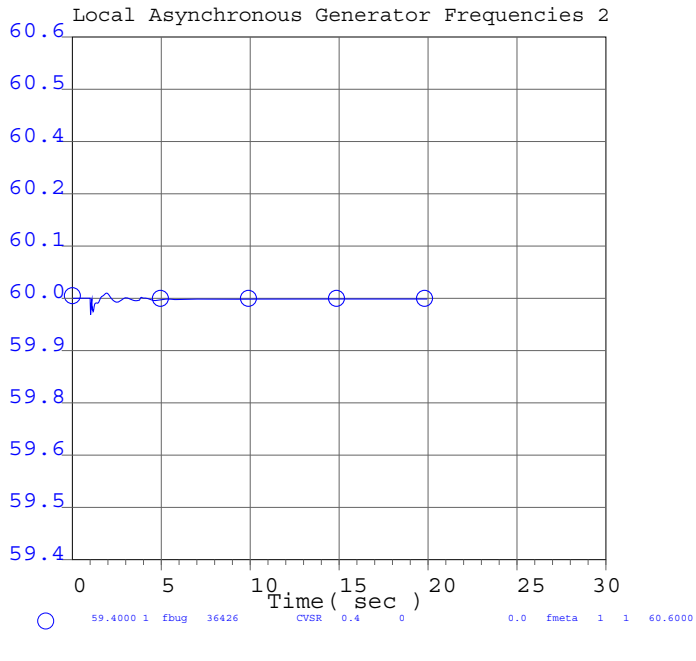


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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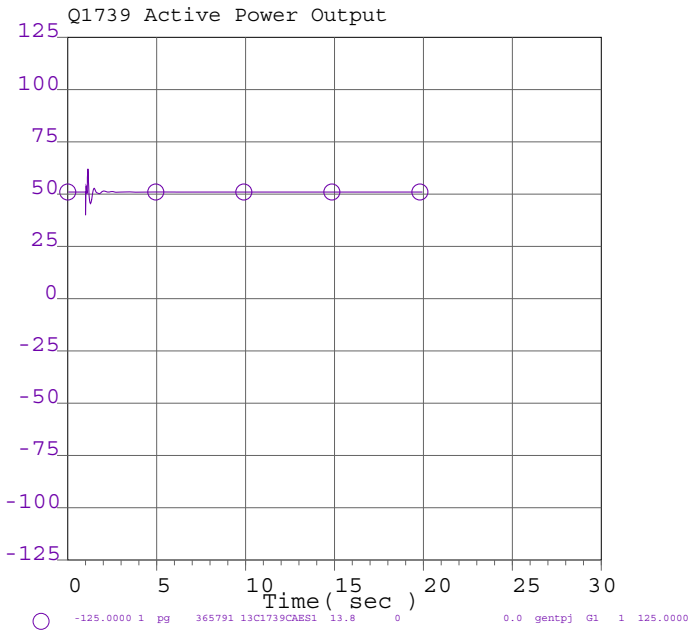
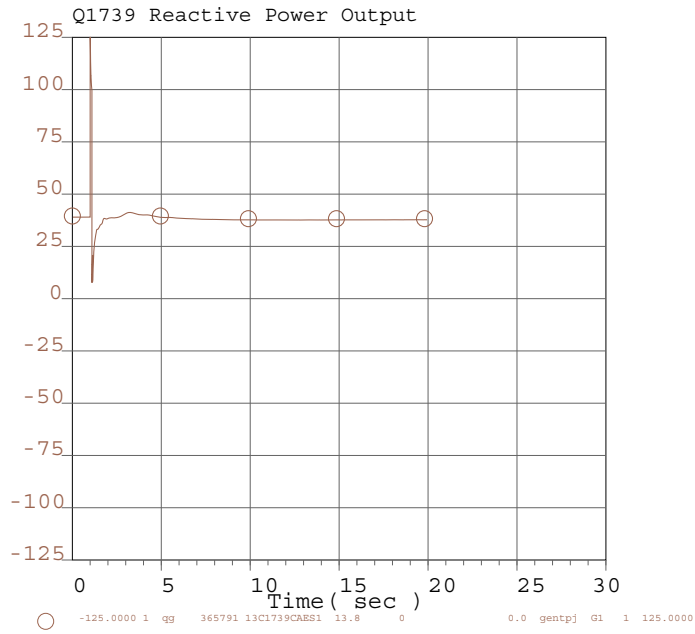
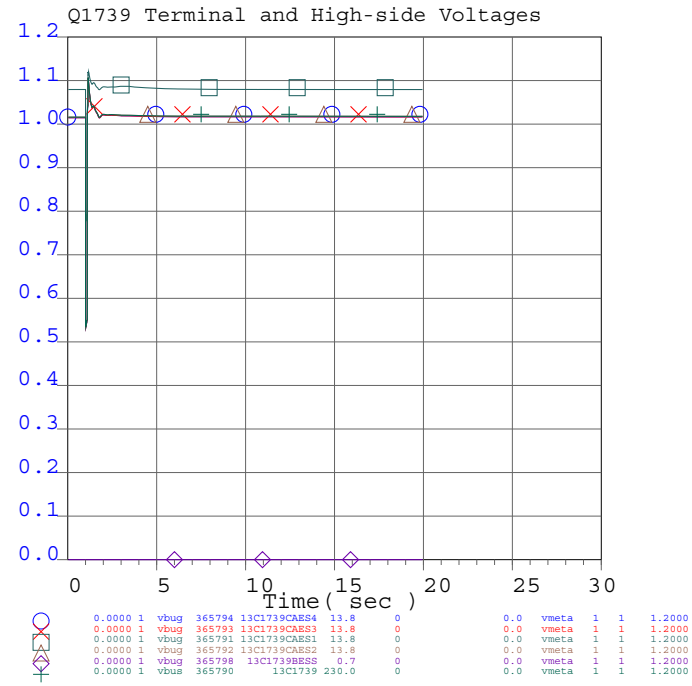
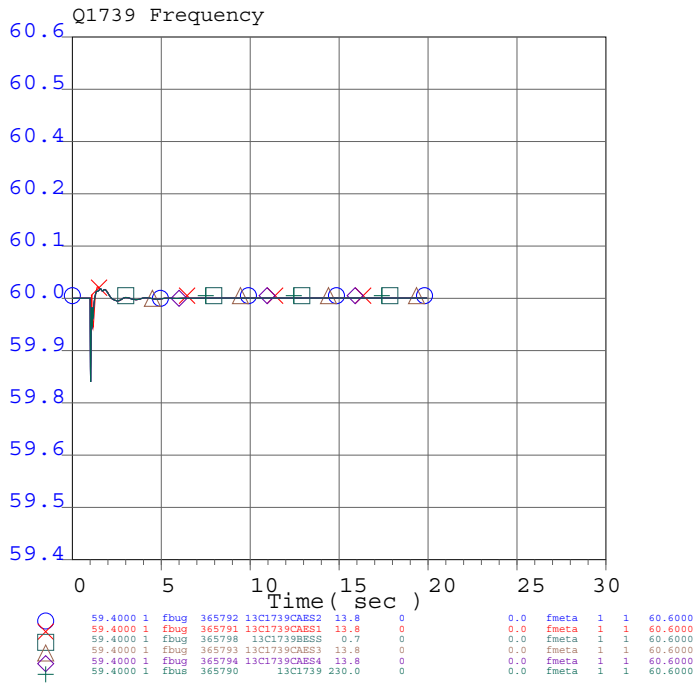
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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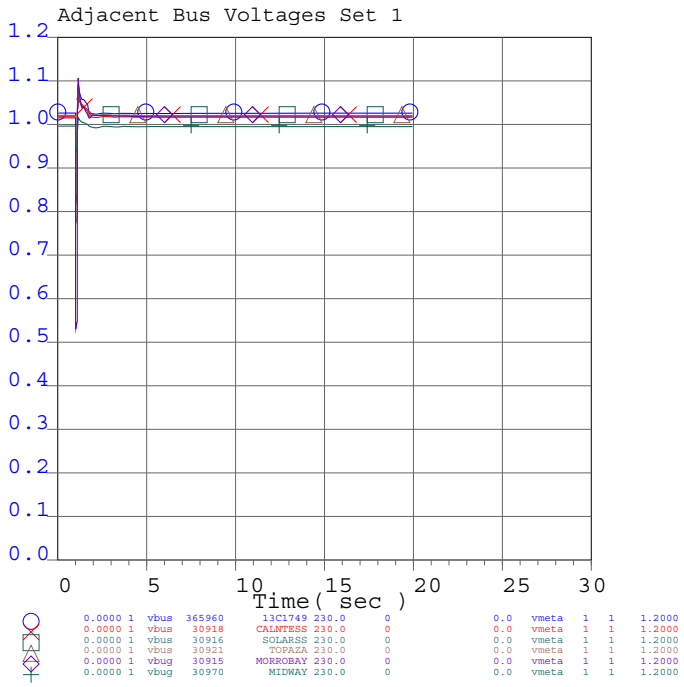

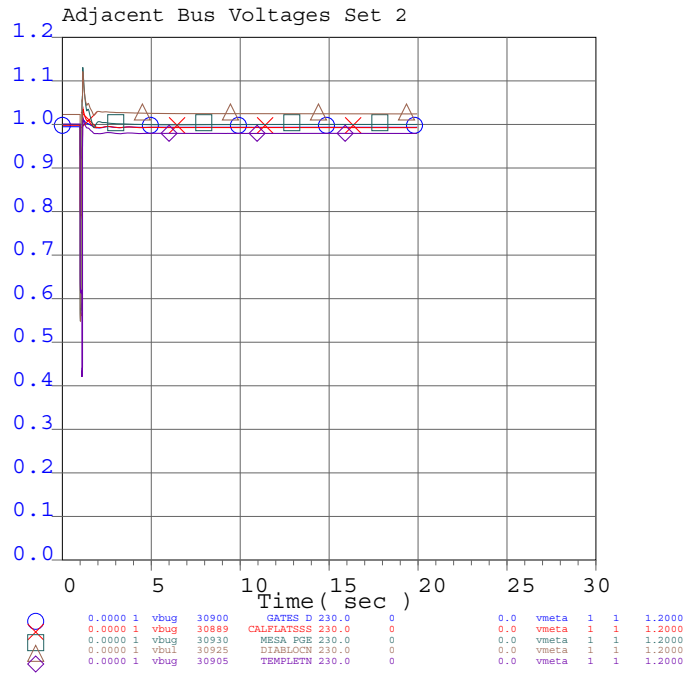

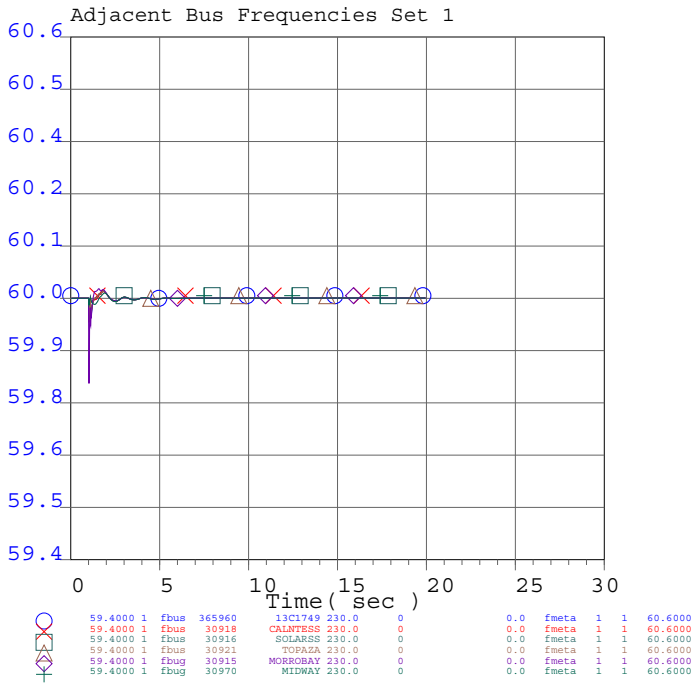

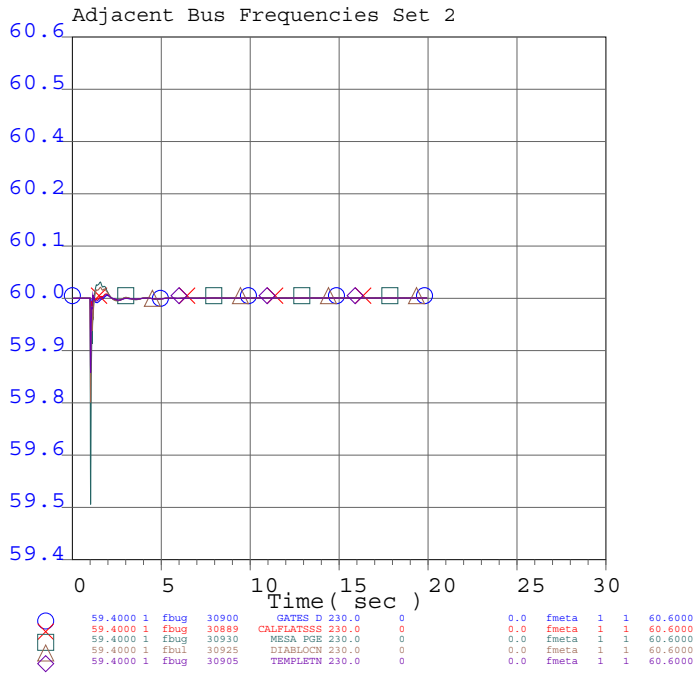

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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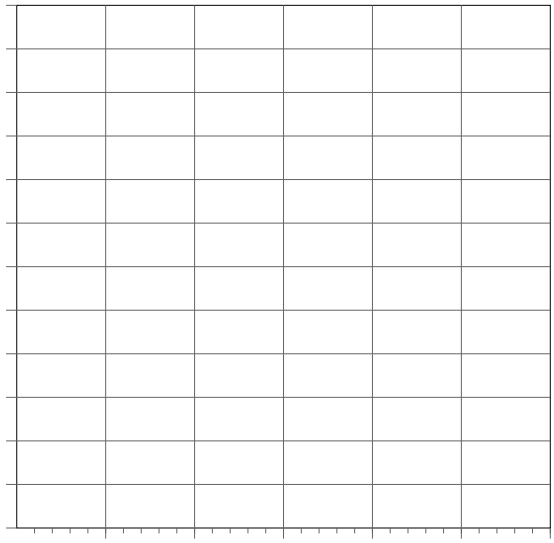
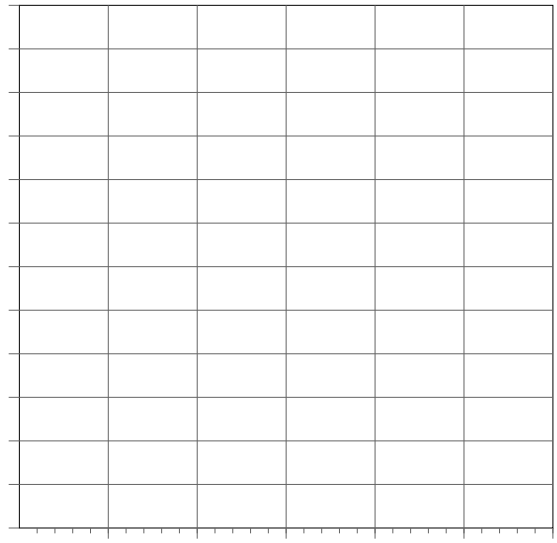
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

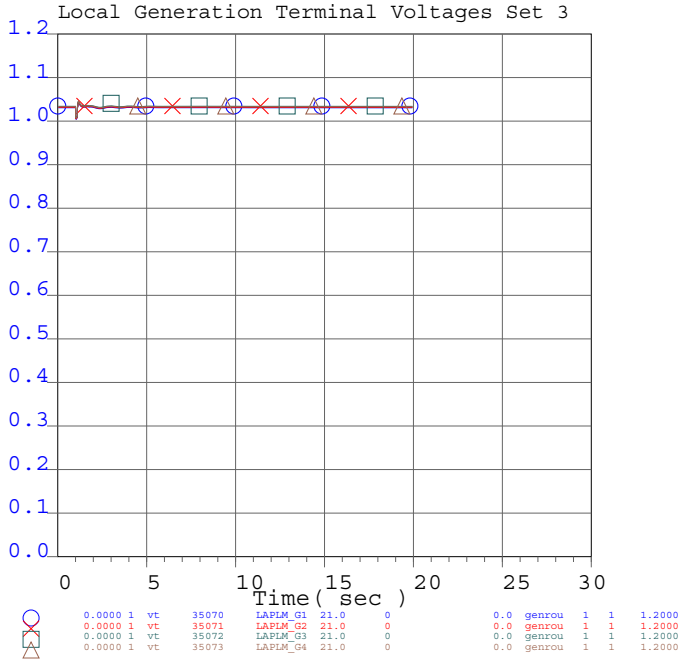
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

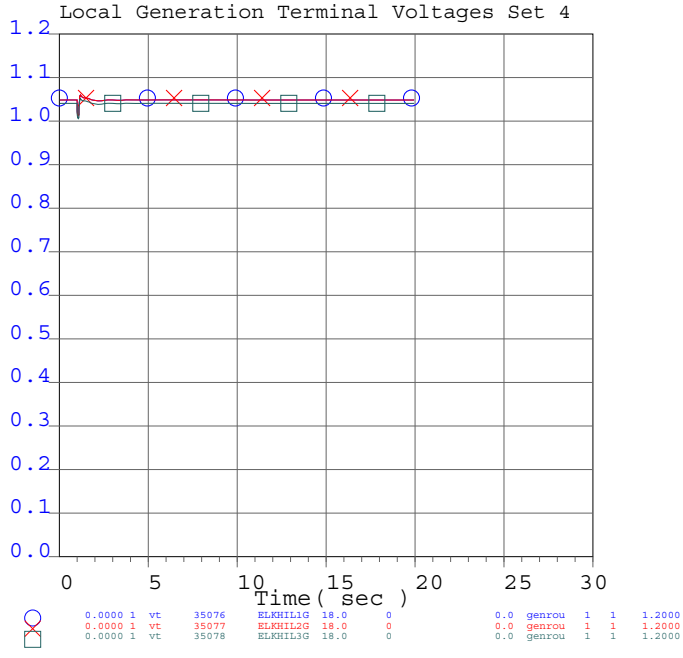


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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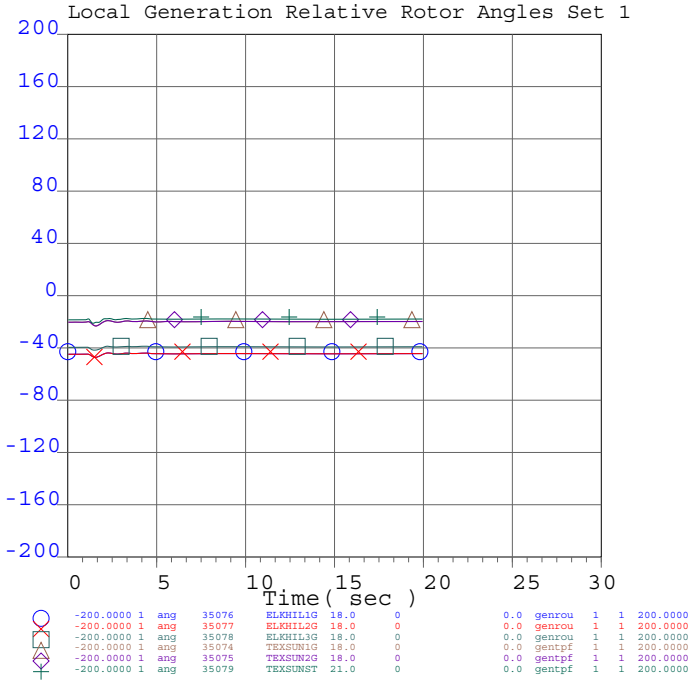
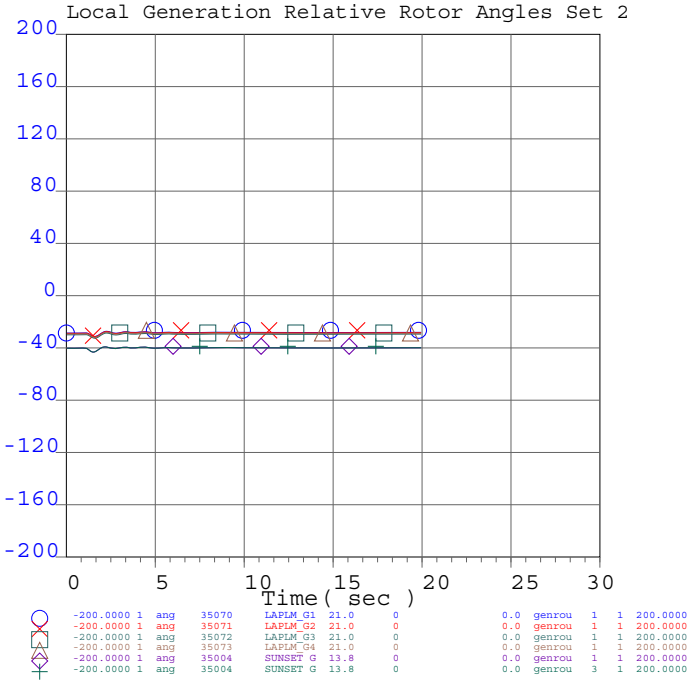
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

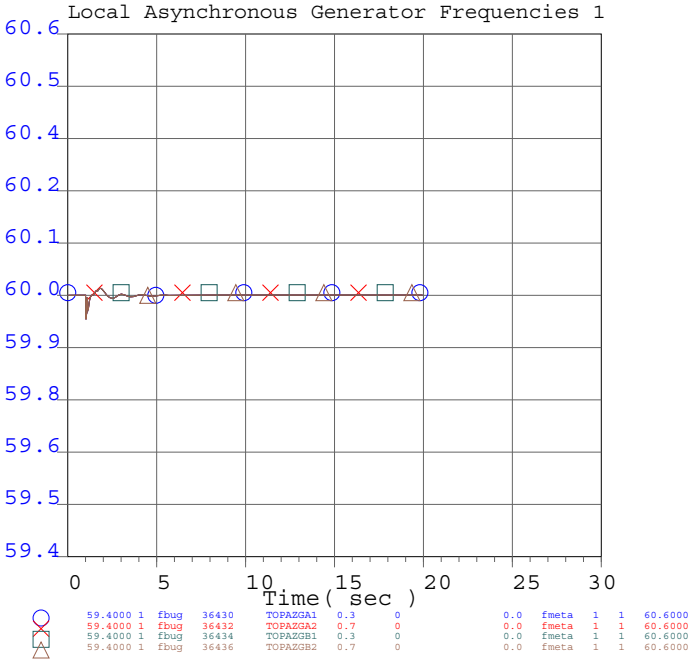
Local Generation Relative Rotor Angles Set 1



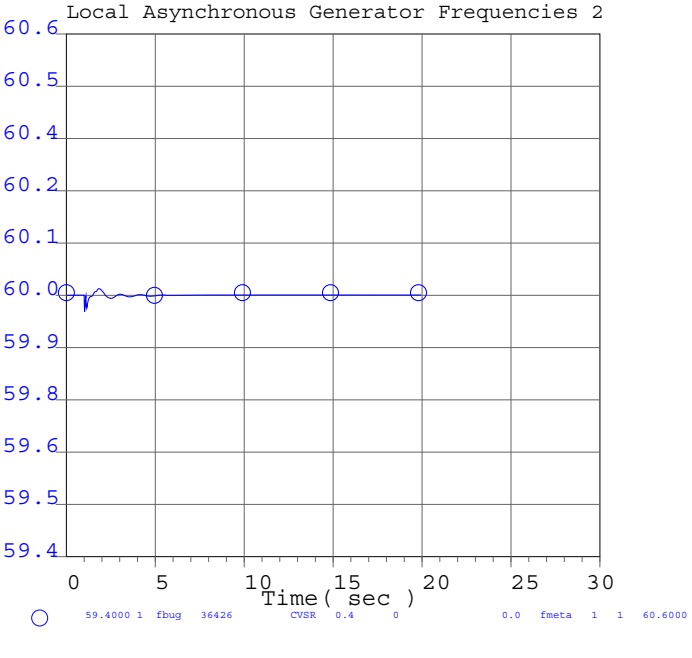
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

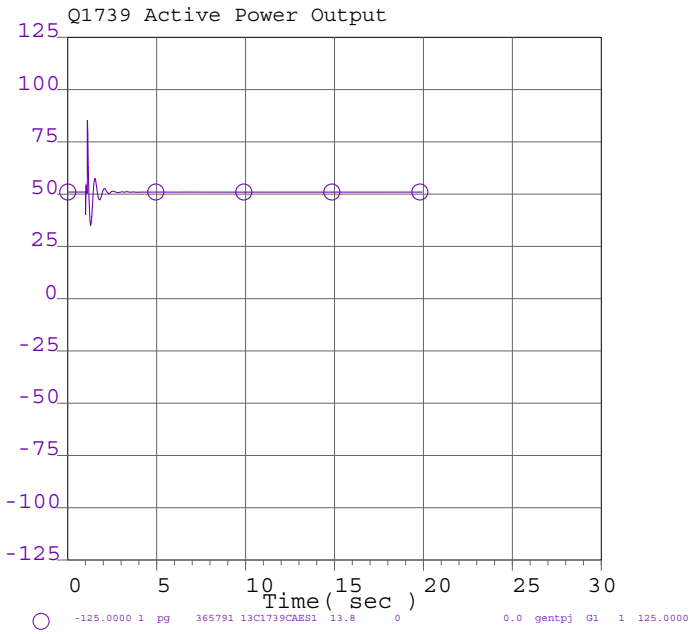


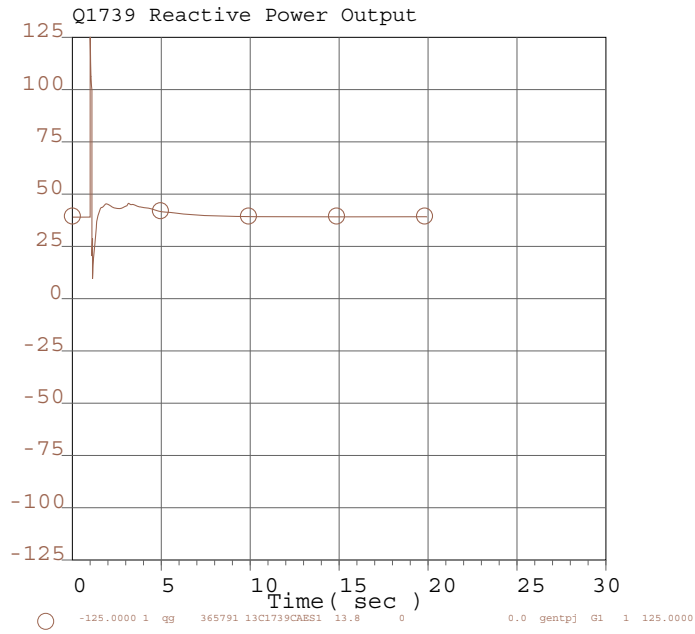
Local Asynchronous Generator Frequencies 2

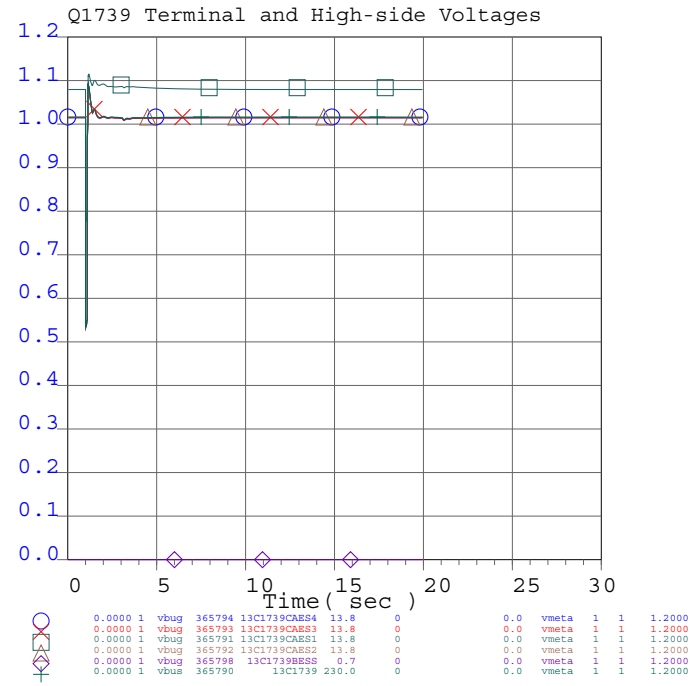


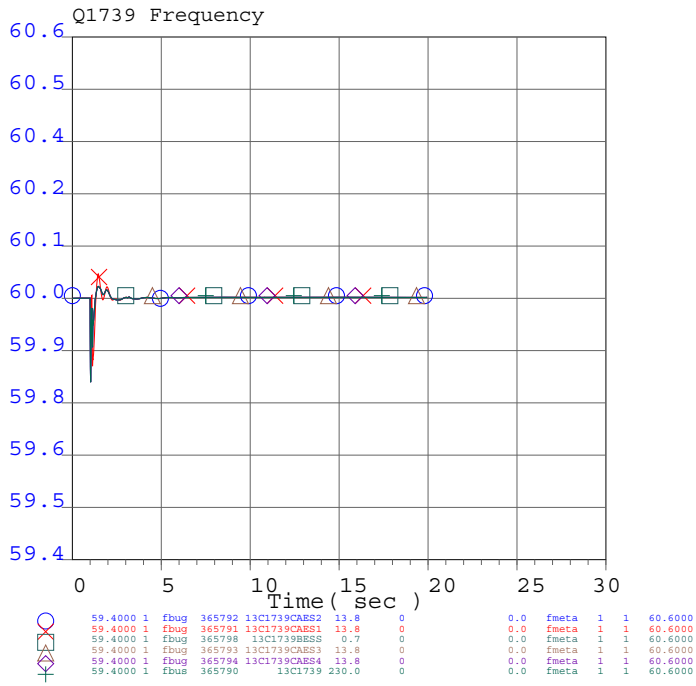
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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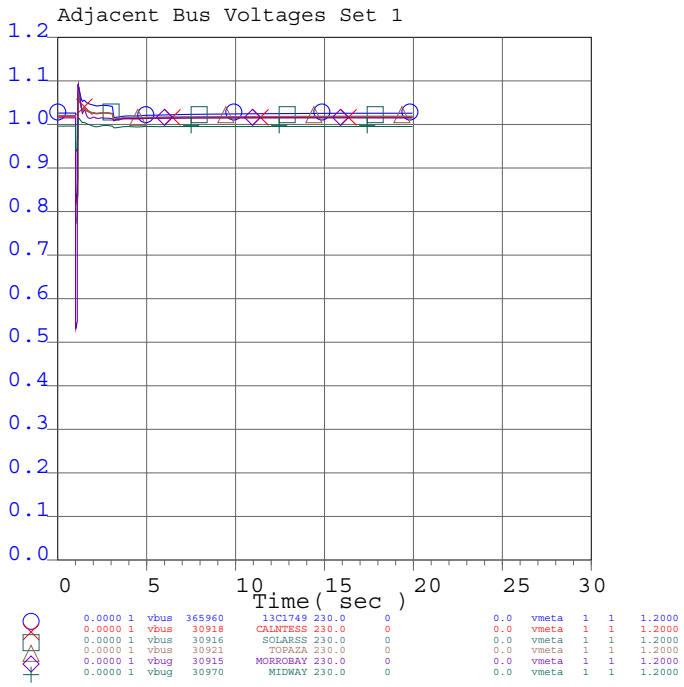

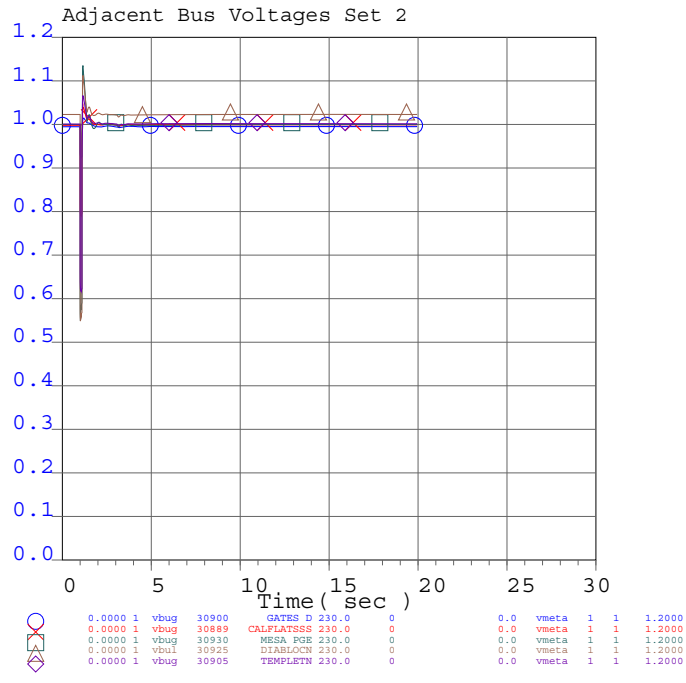

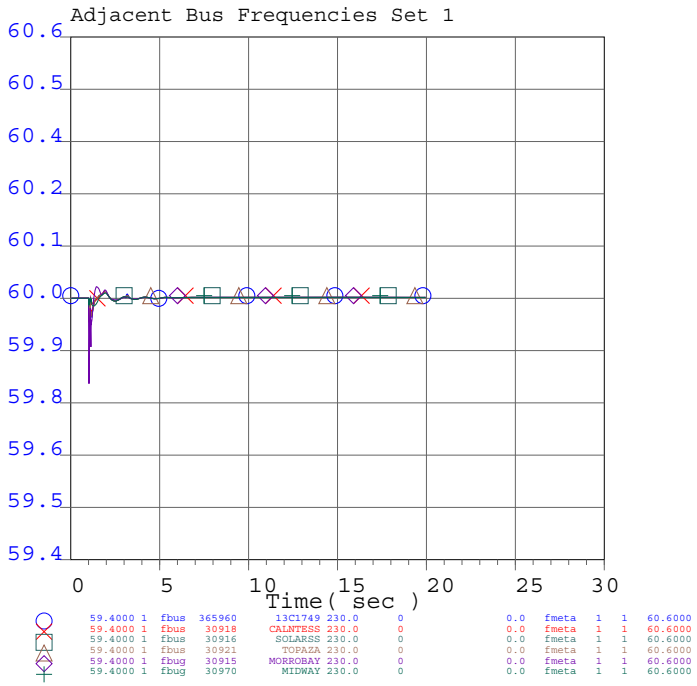

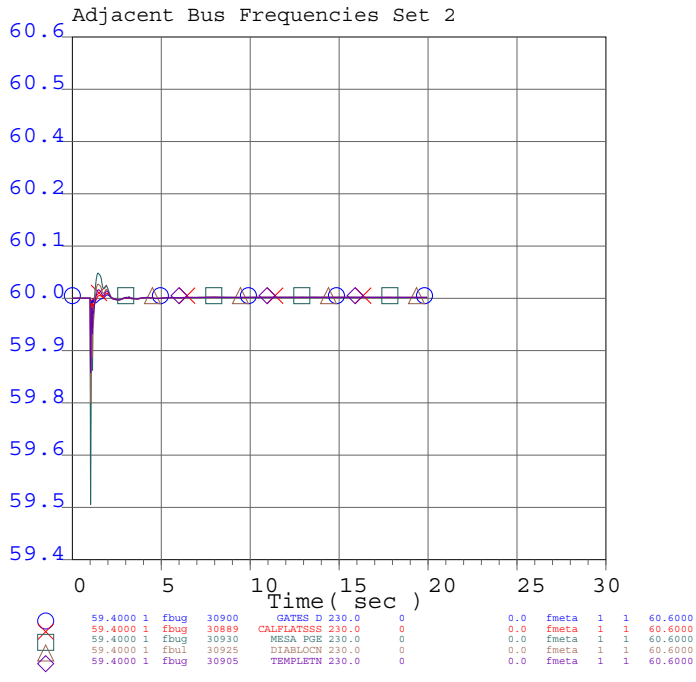

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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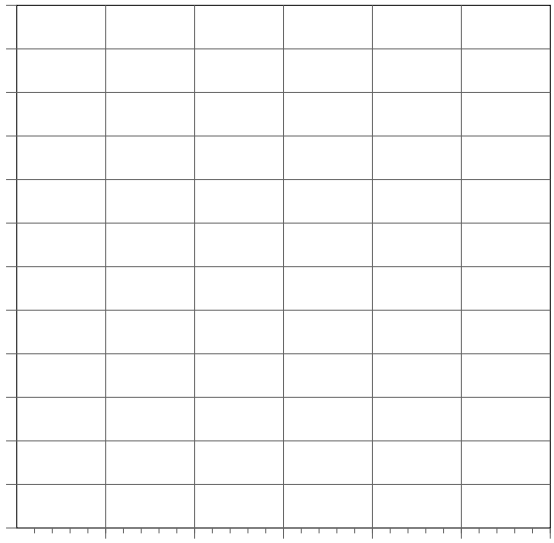
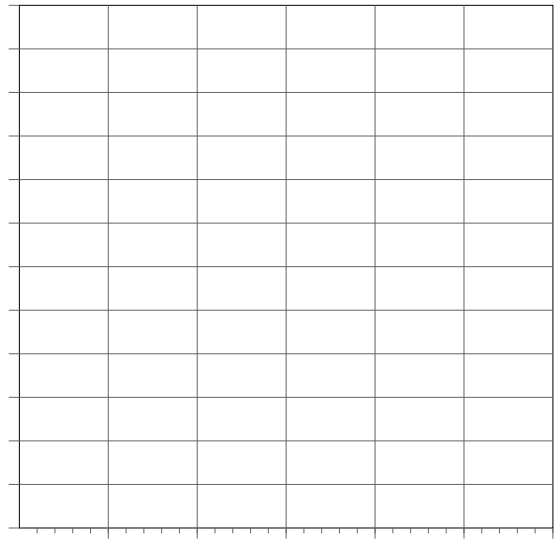
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

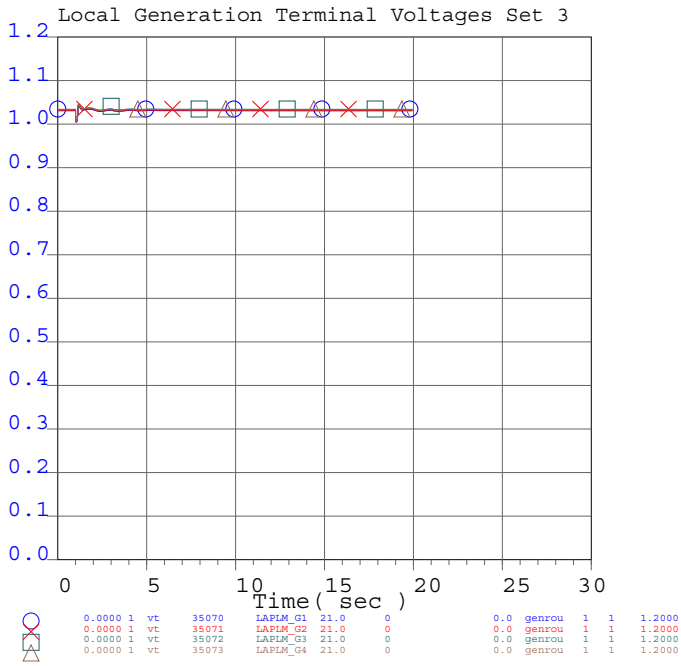
Local Generation Terminal Voltages Set 1



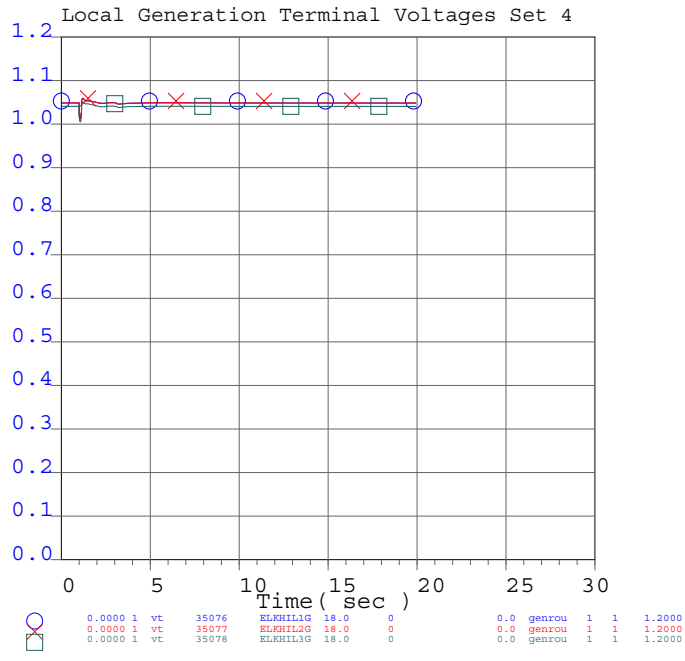
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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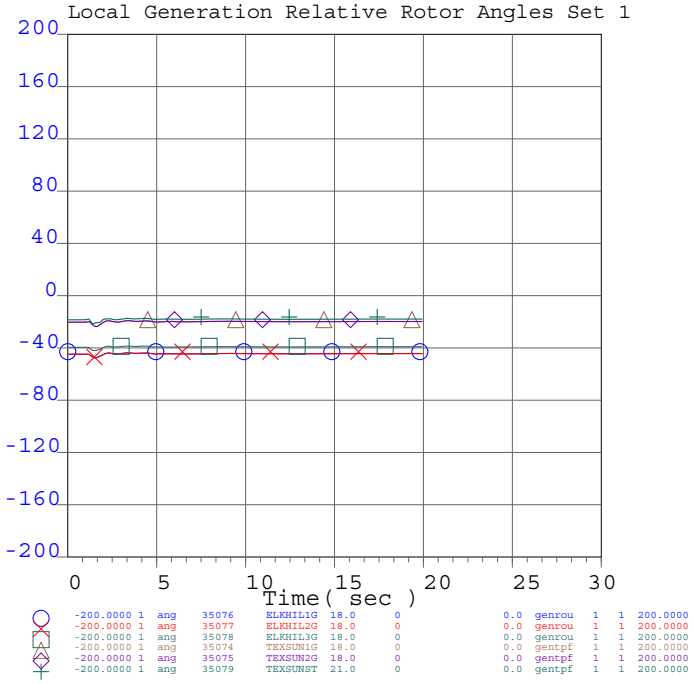
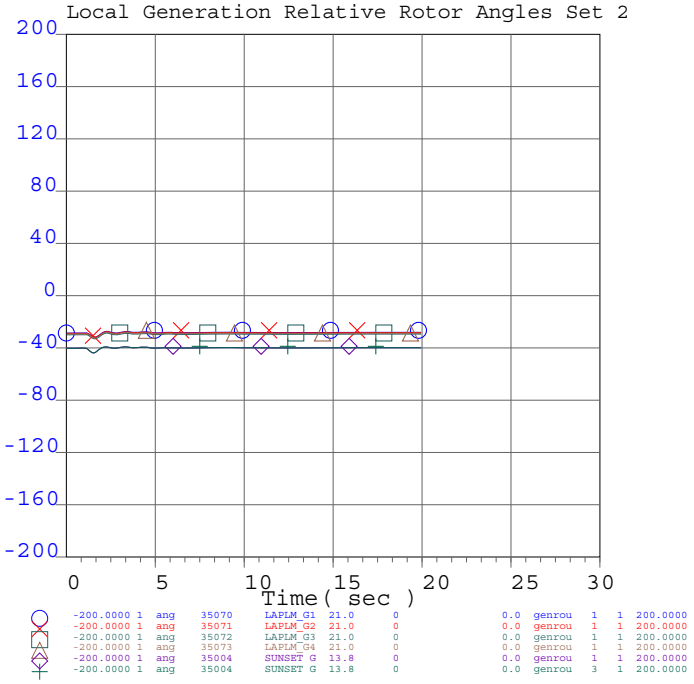
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

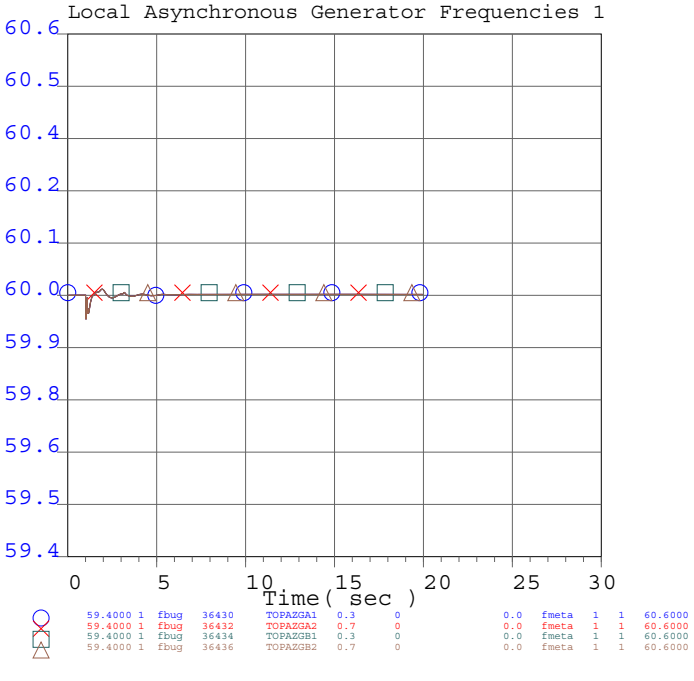
Local Generation Relative Rotor Angles Set 1



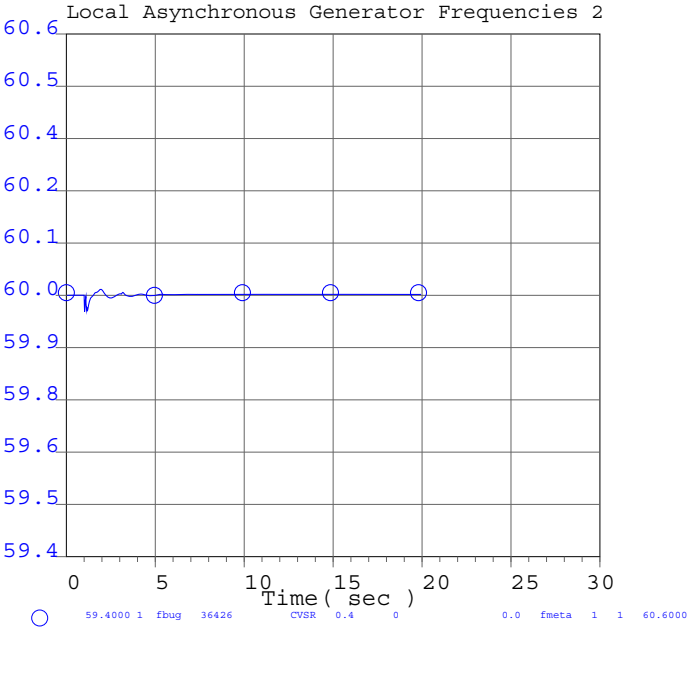
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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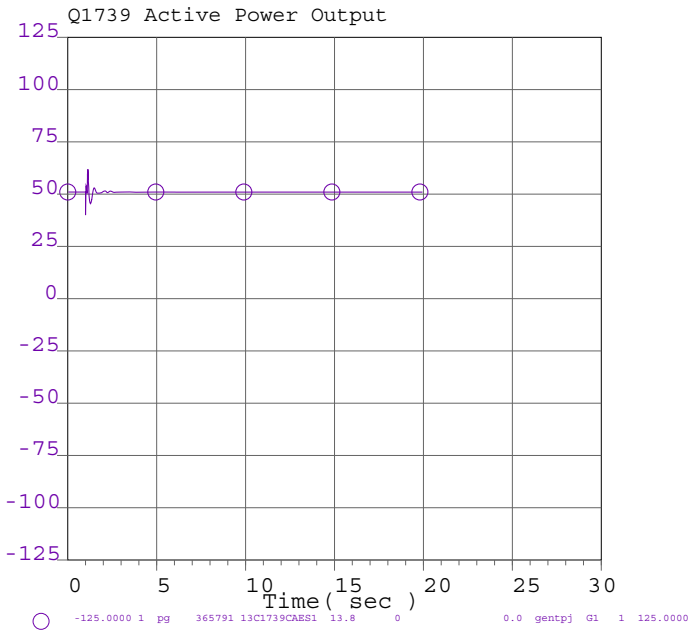
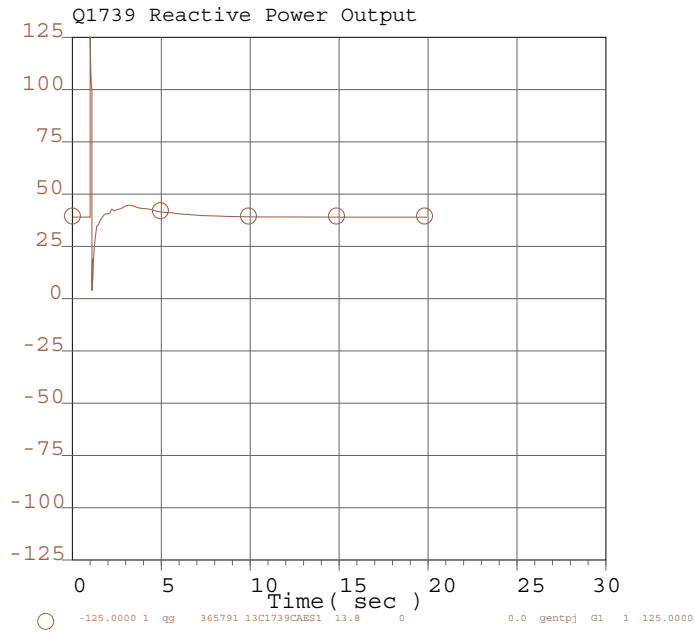
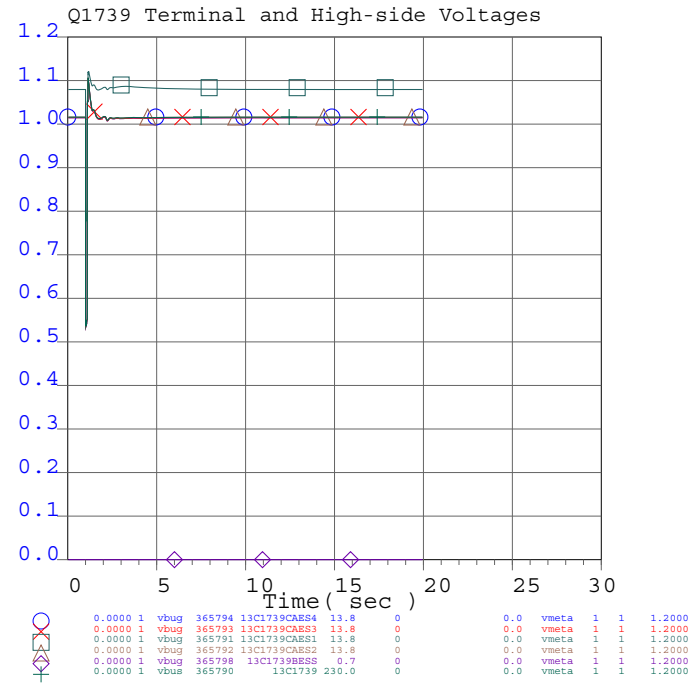
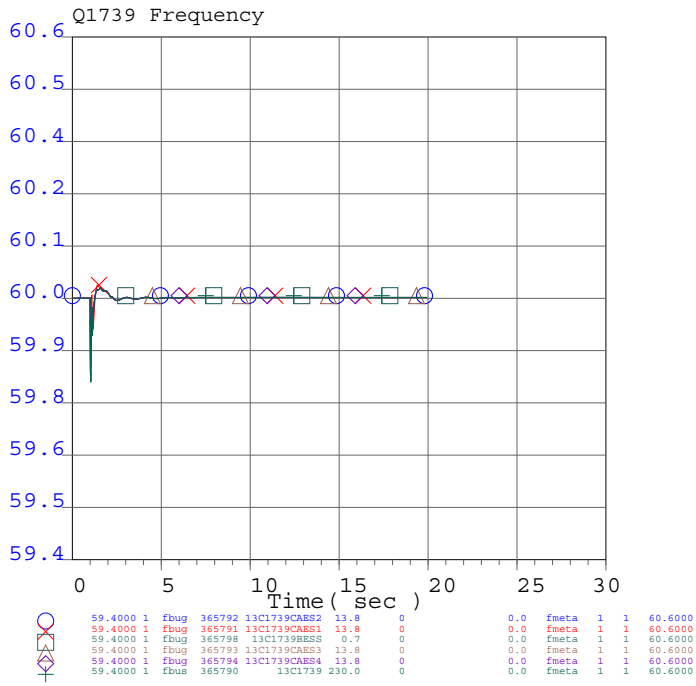
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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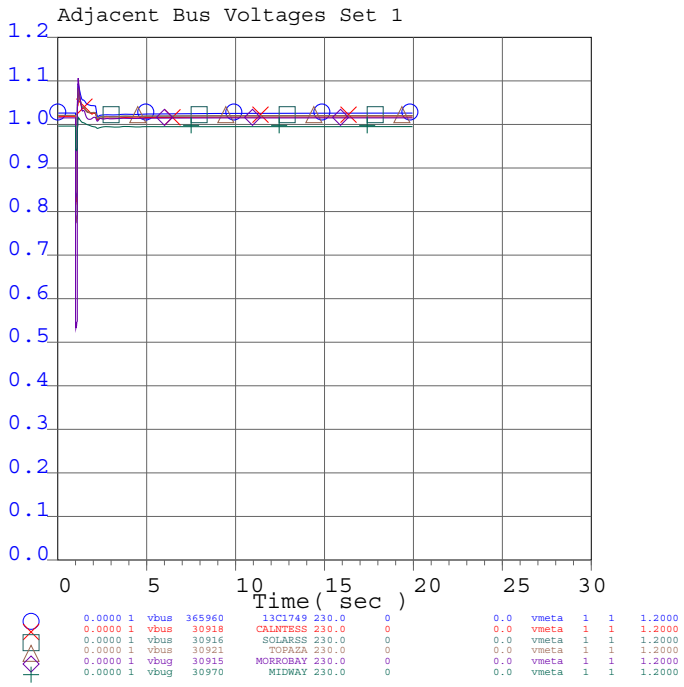

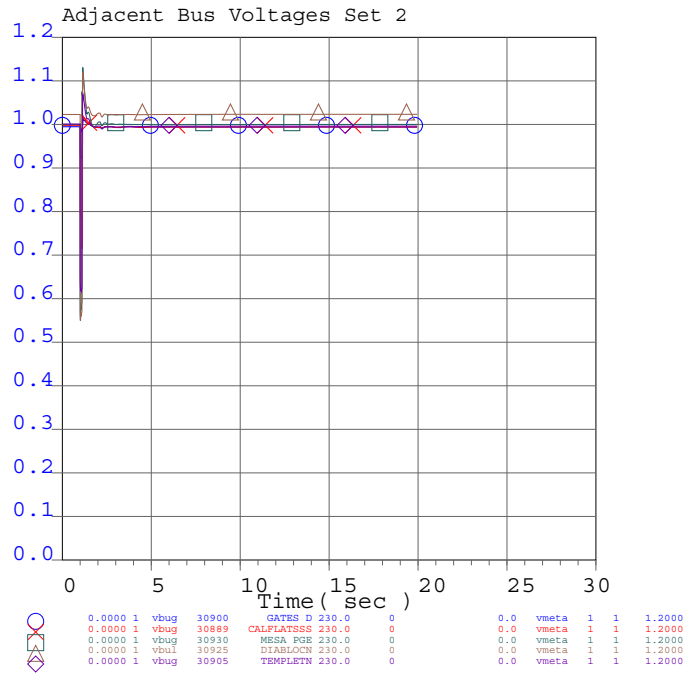

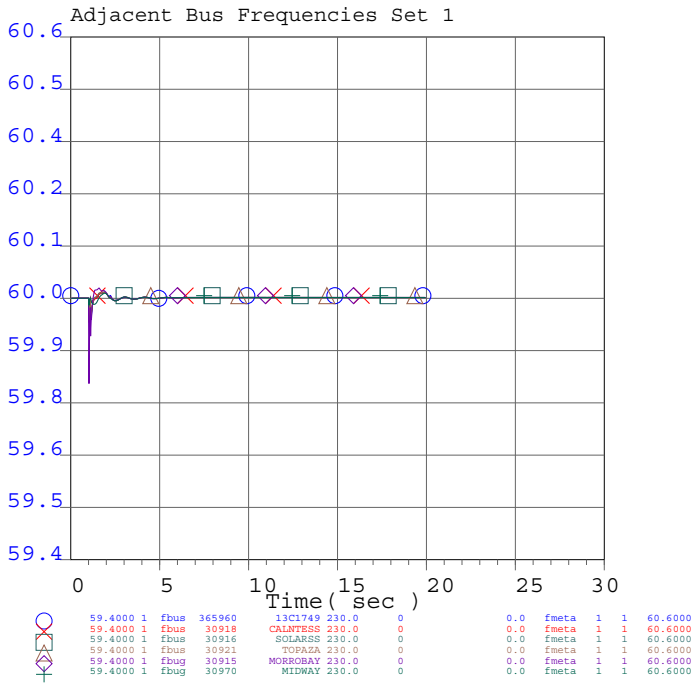

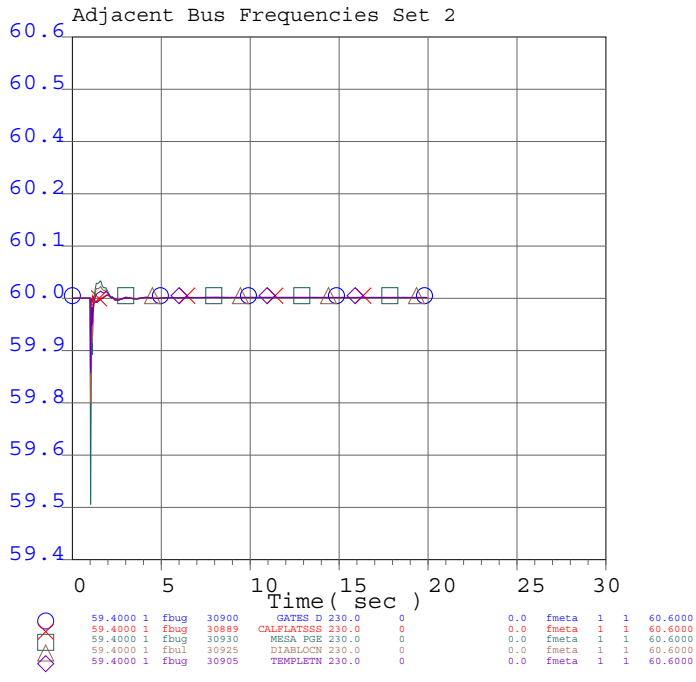

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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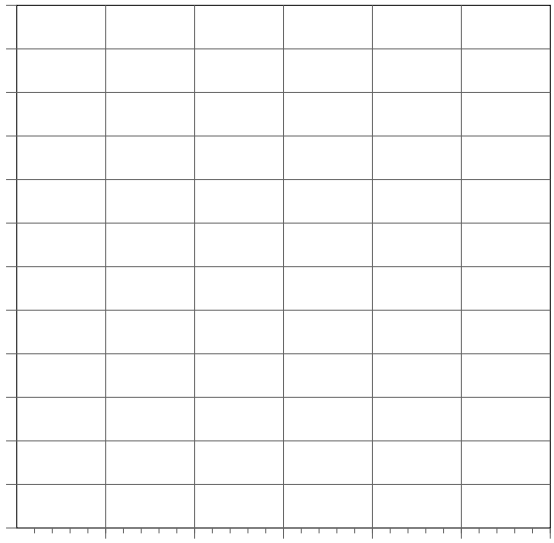
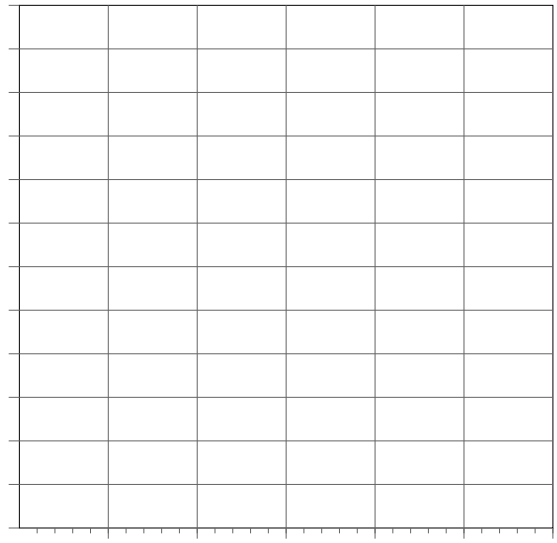
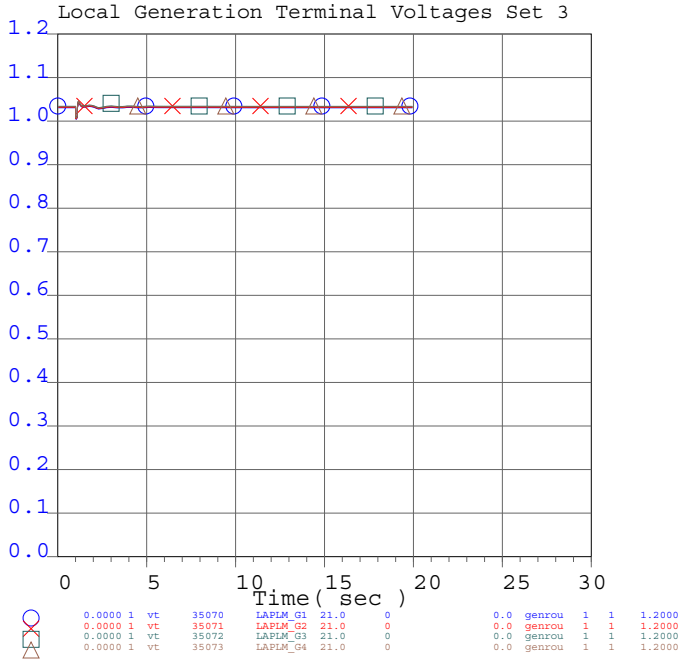
Local Generation Terminal Voltages Set 1



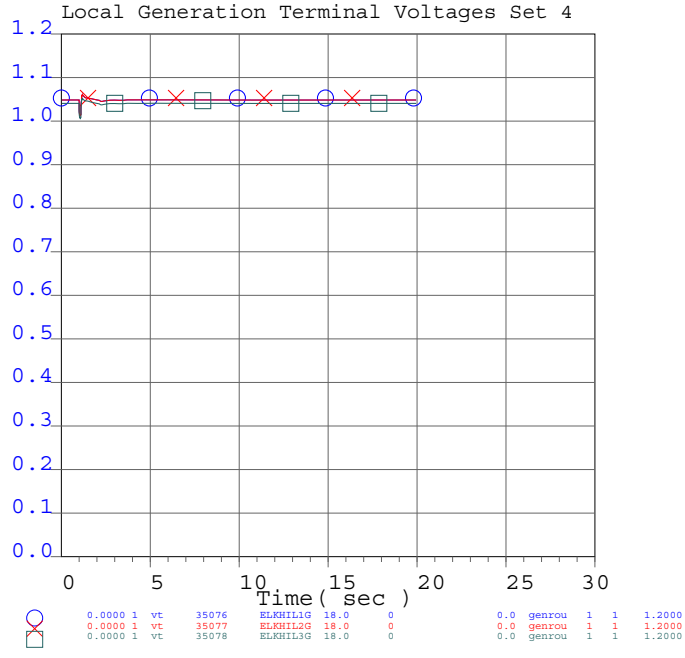
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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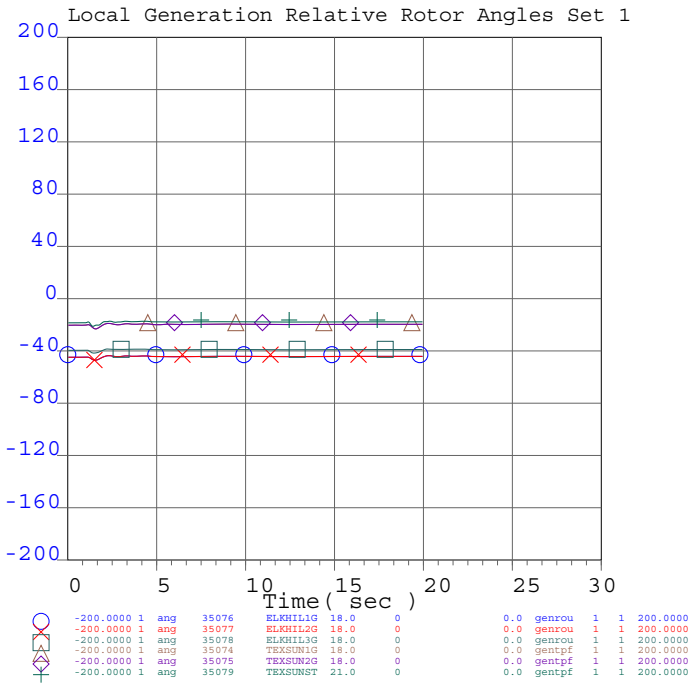

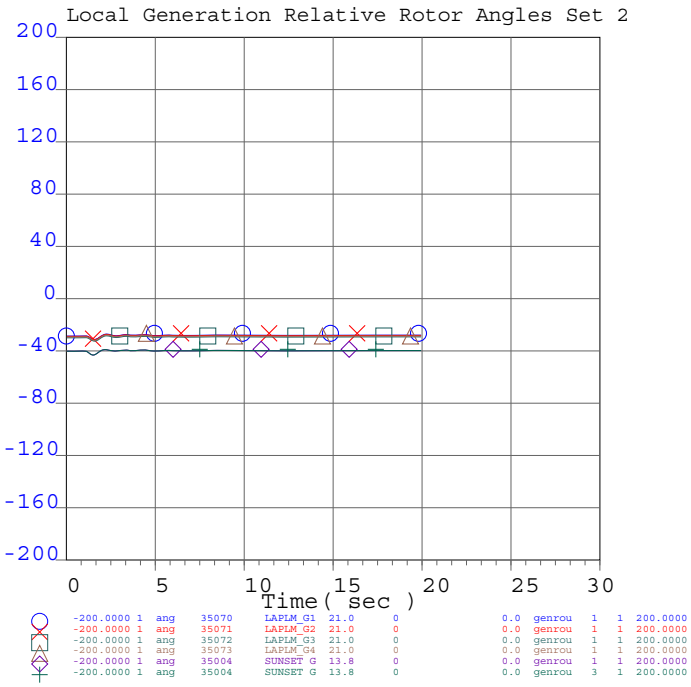

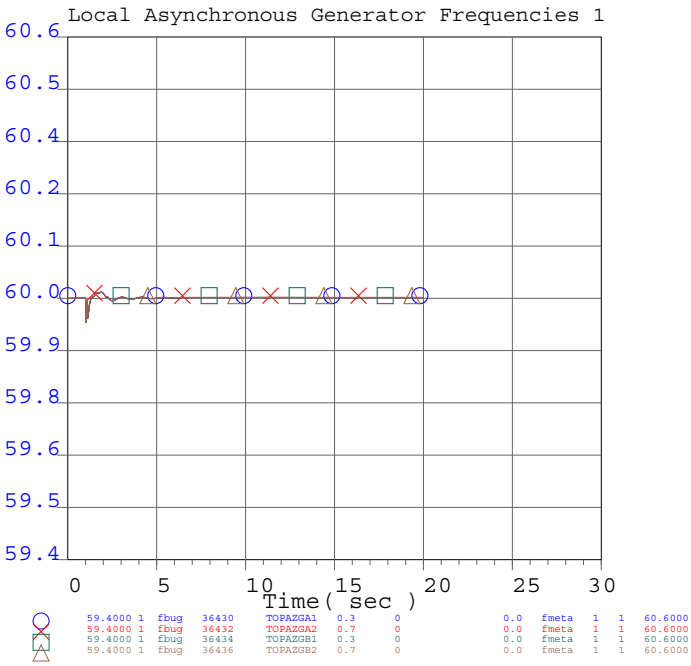

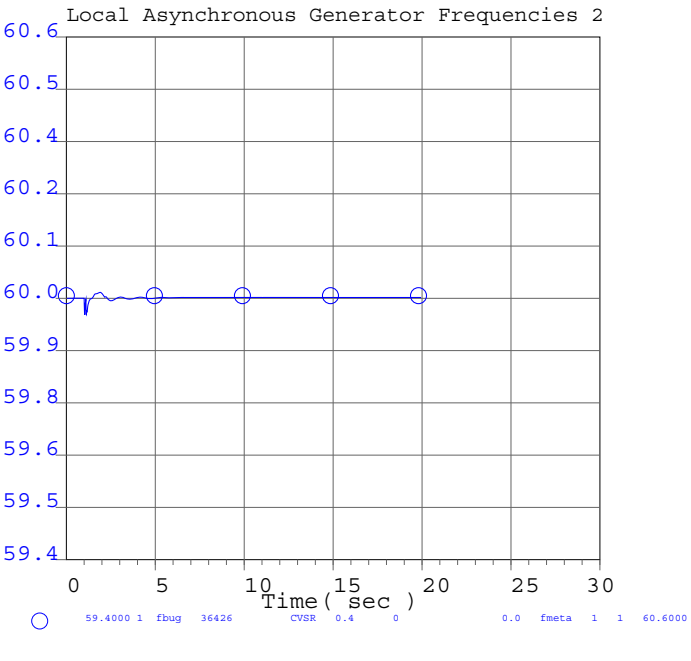

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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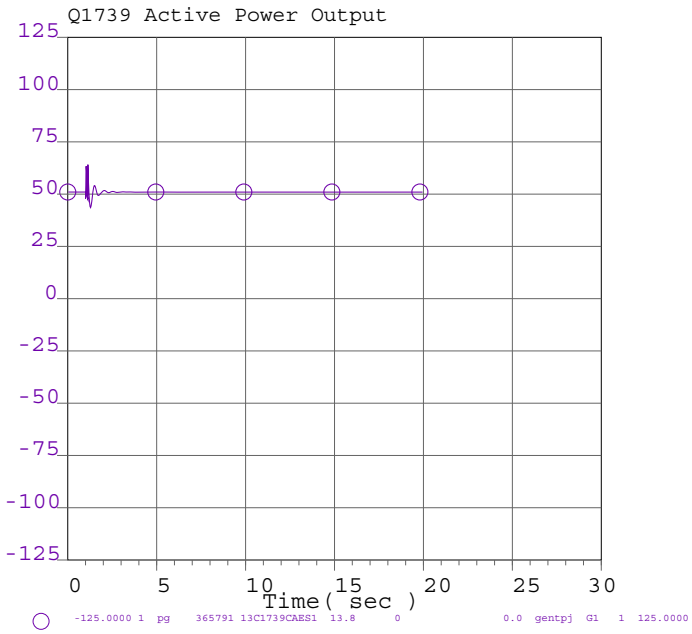

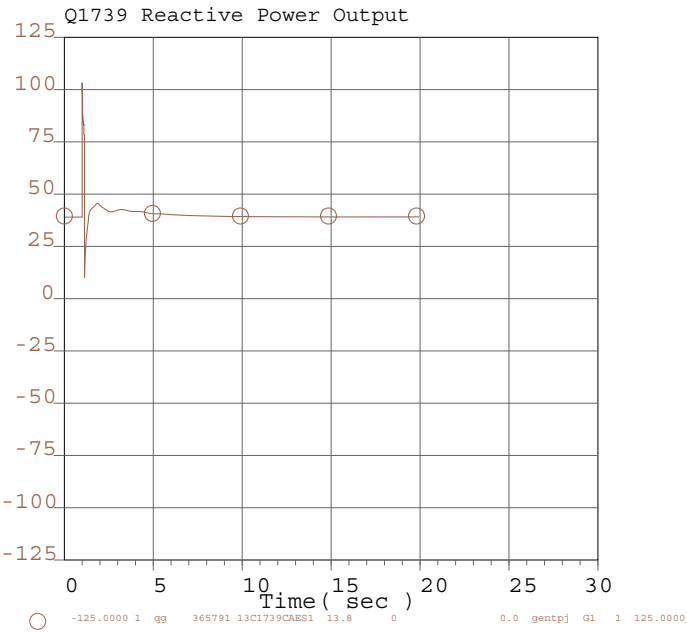

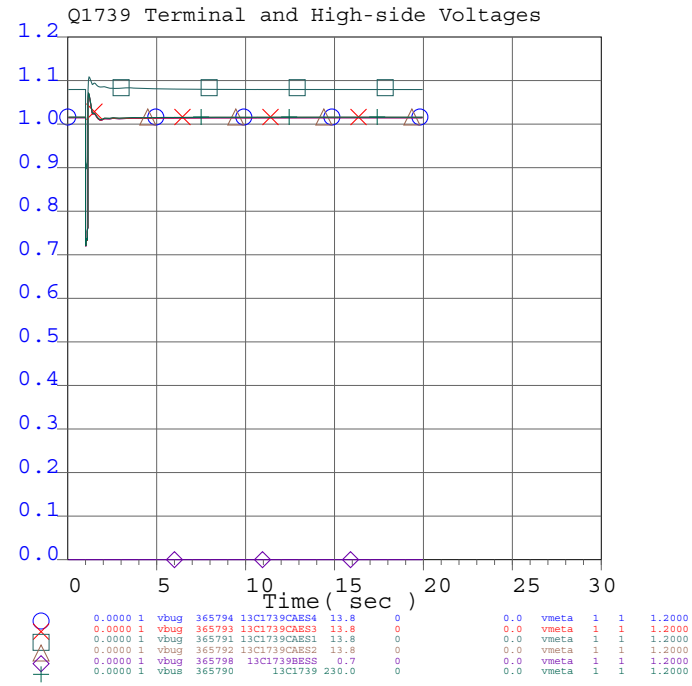

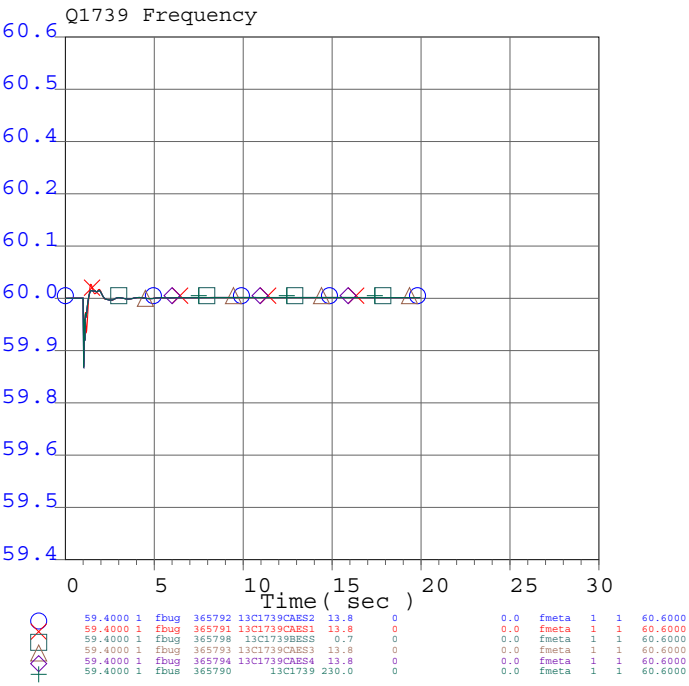

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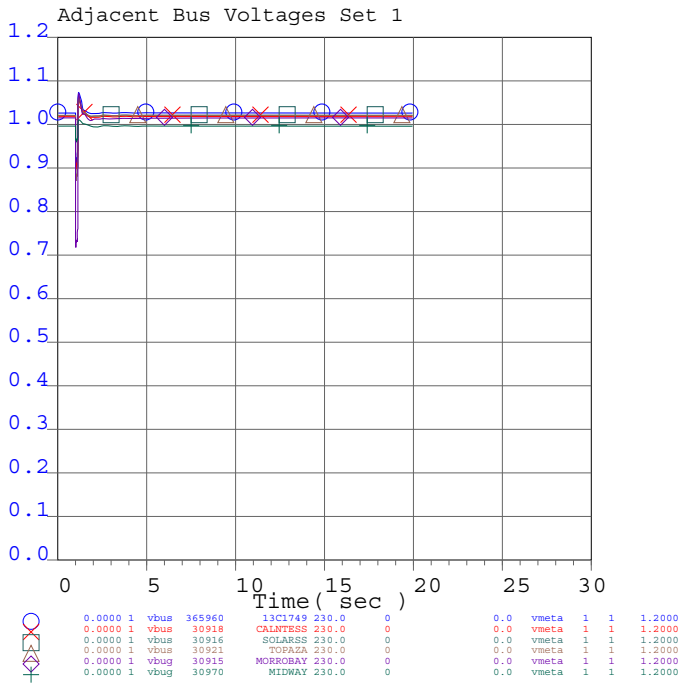

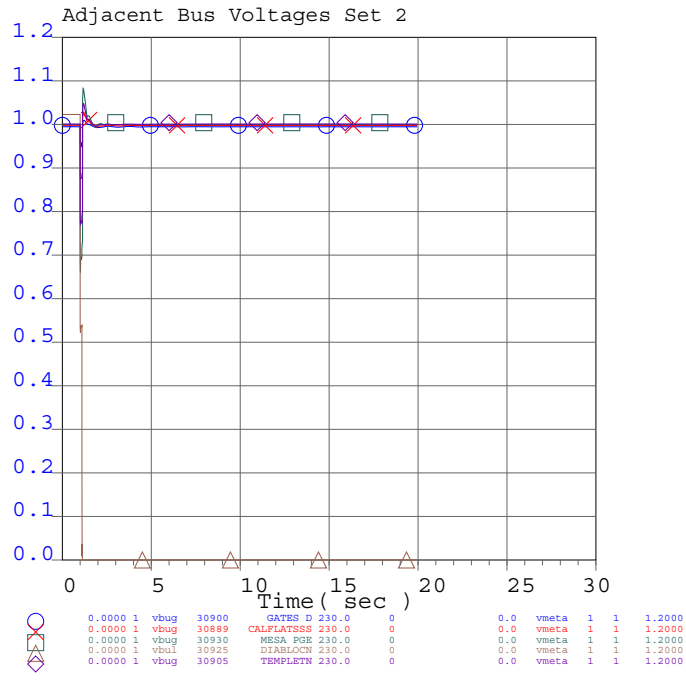

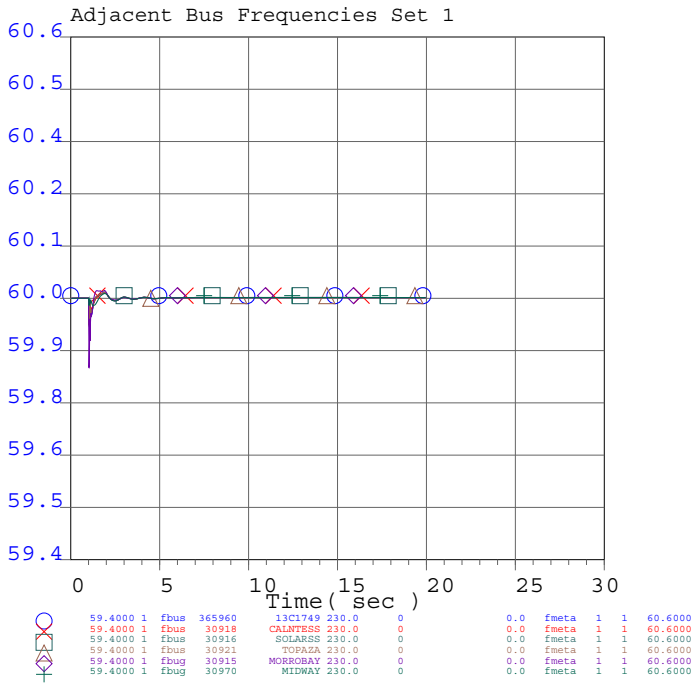

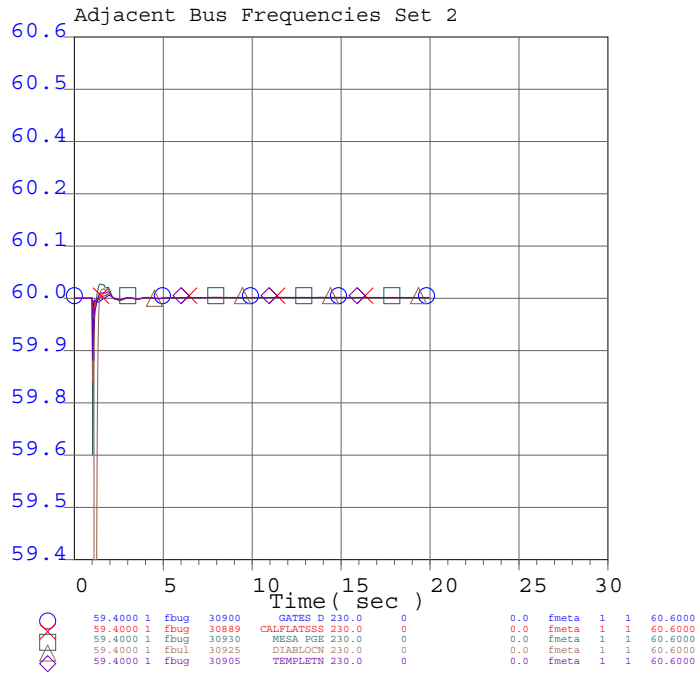

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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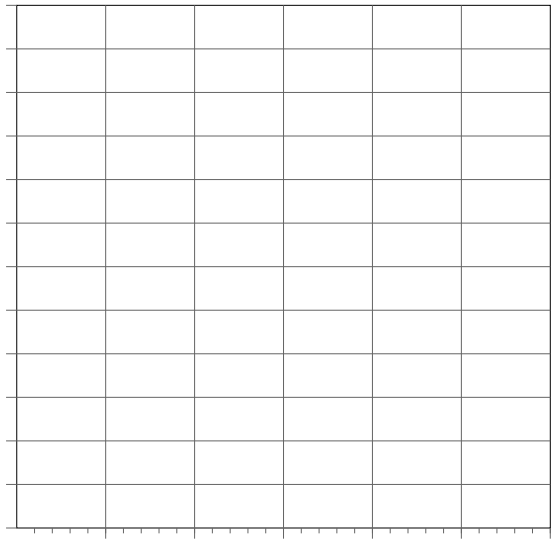
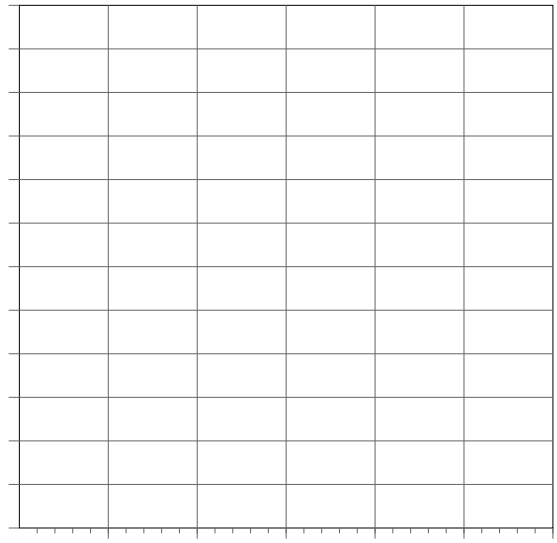
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

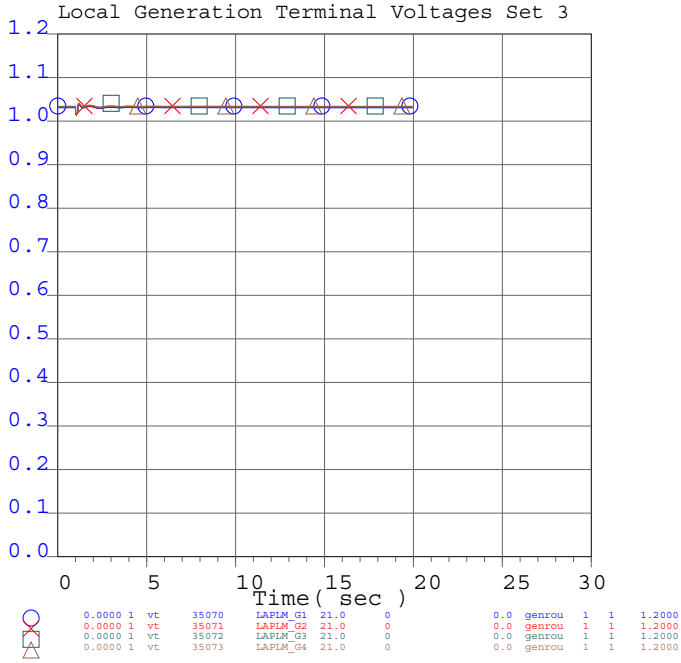
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

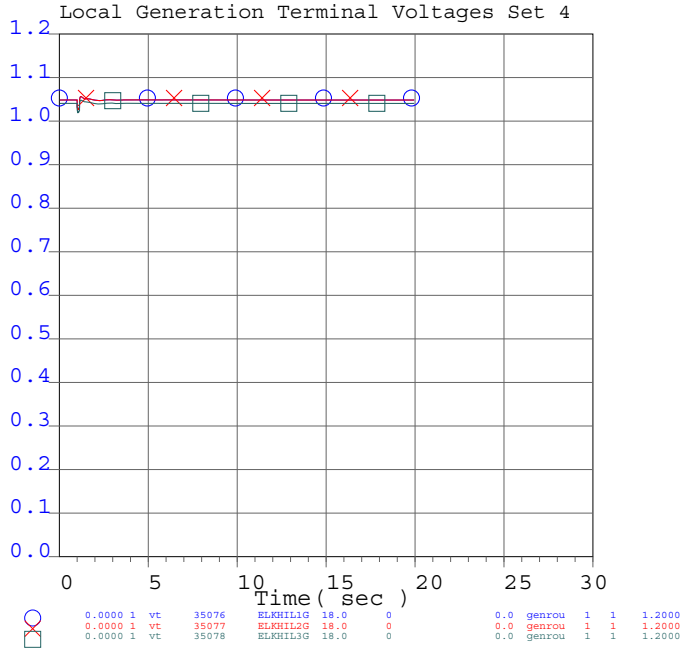


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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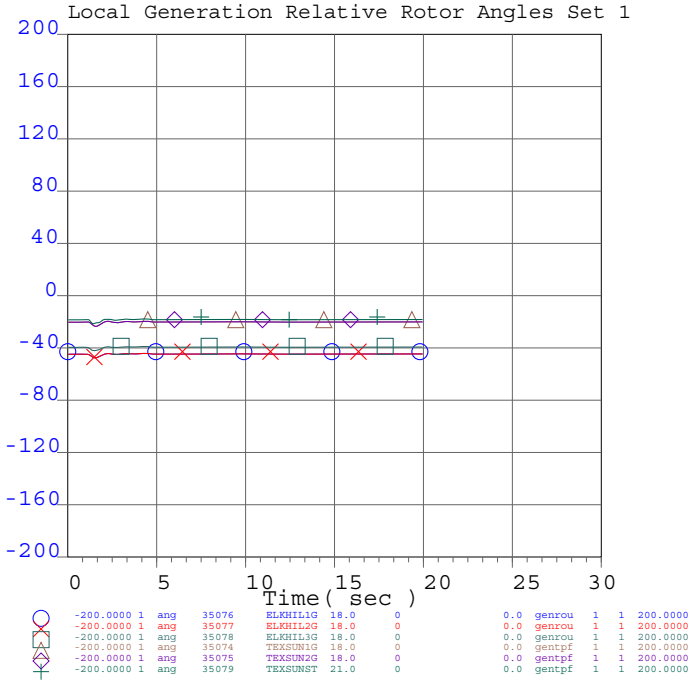
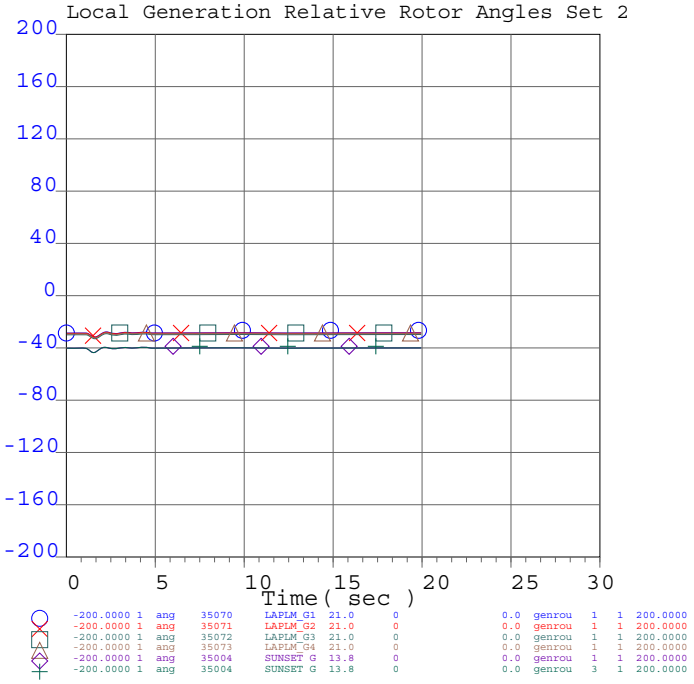
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

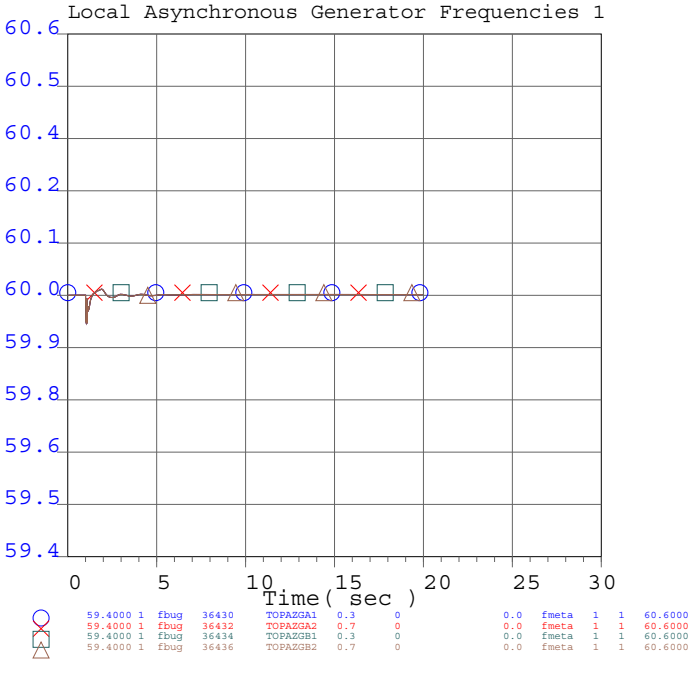
Local Generation Relative Rotor Angles Set 1



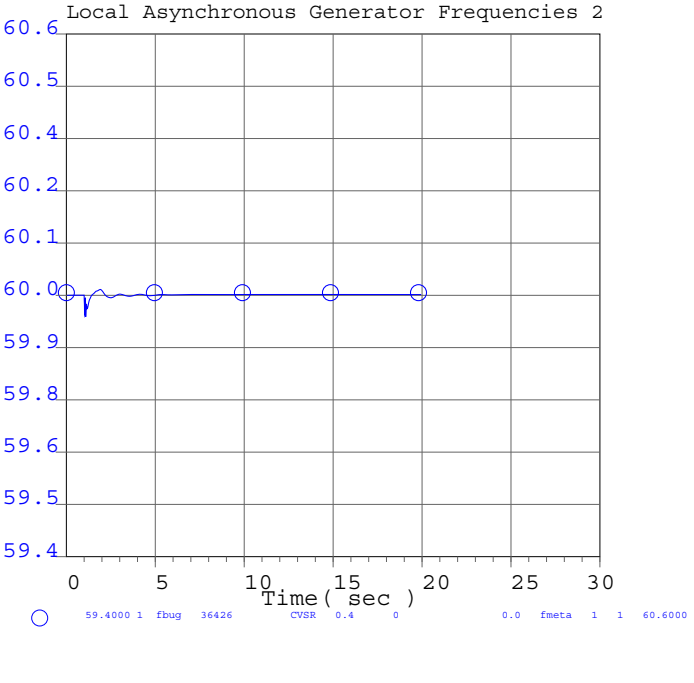
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

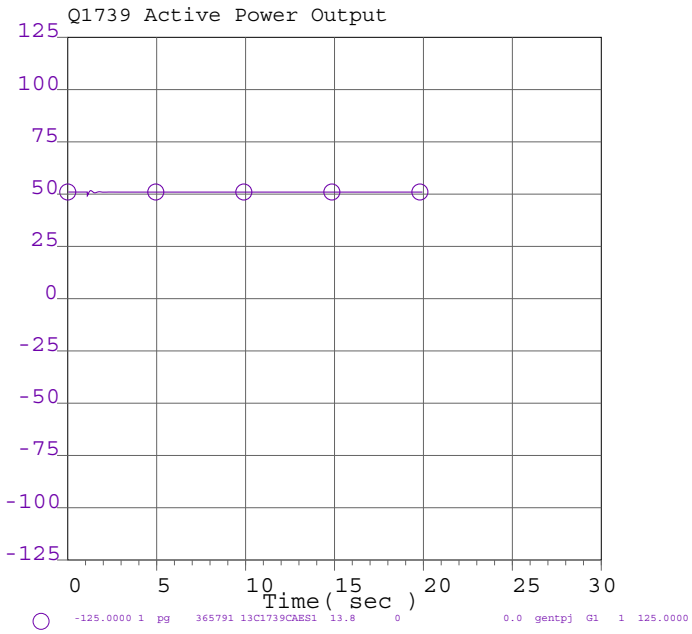


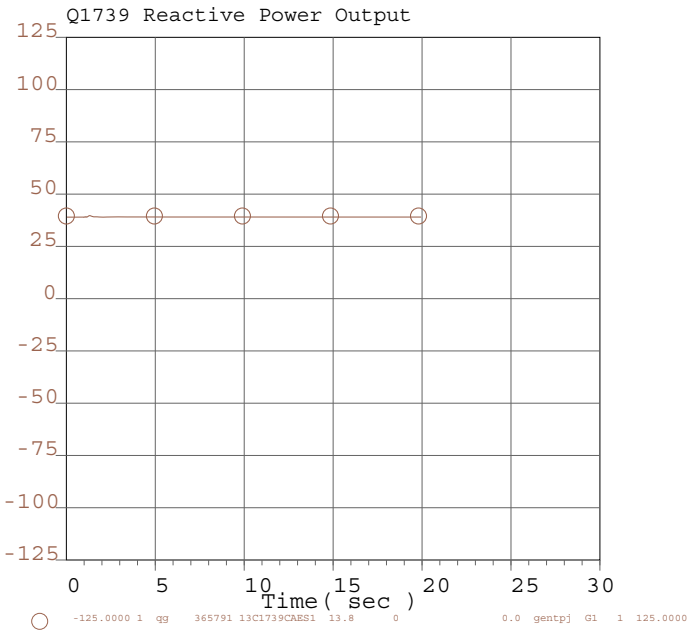
Local Asynchronous Generator Frequencies 2

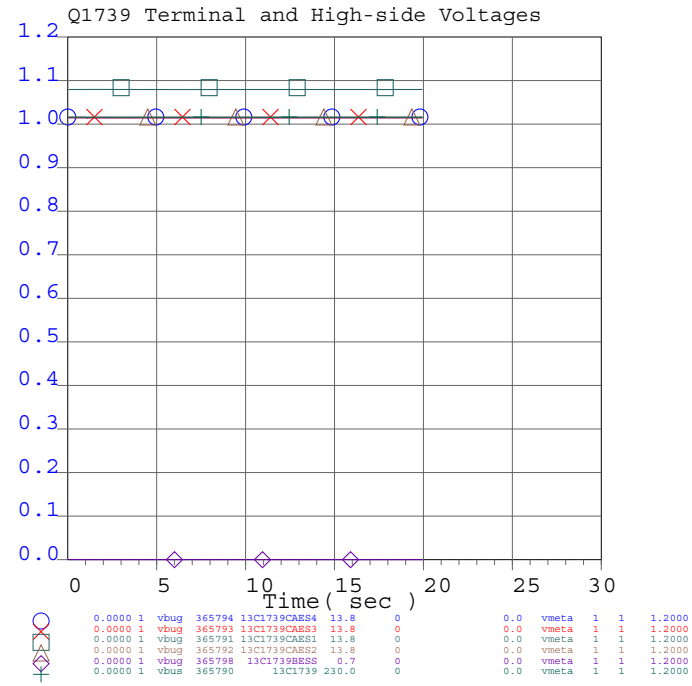


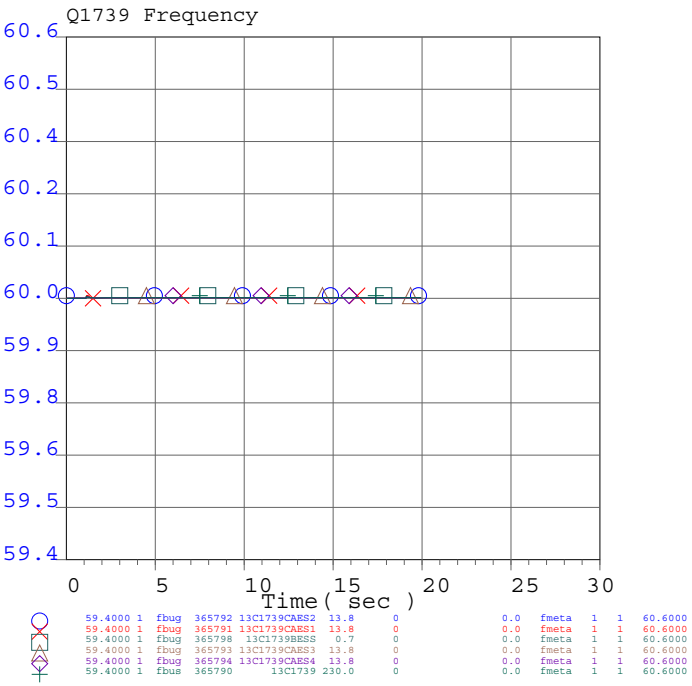
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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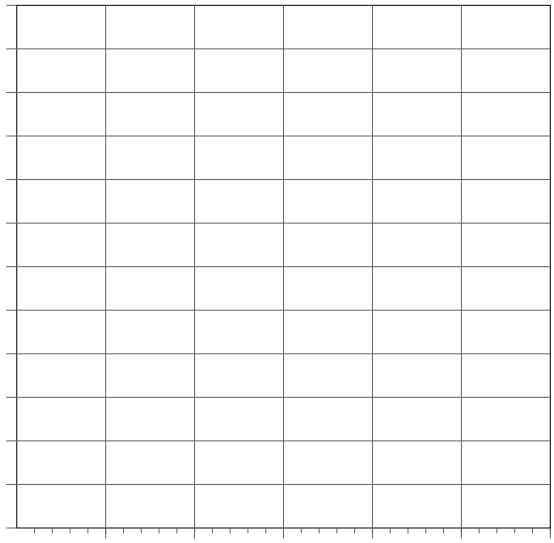
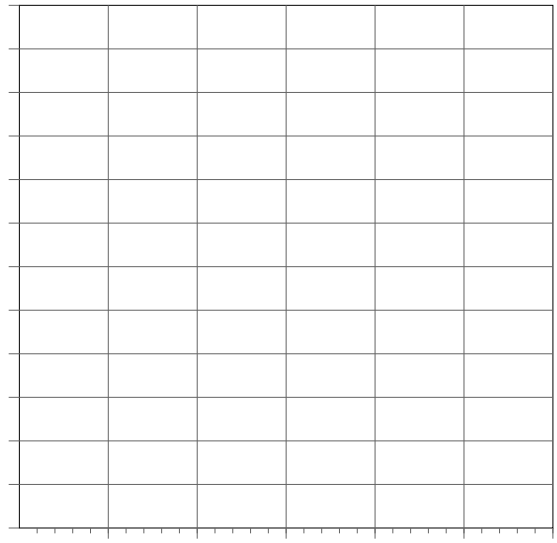
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

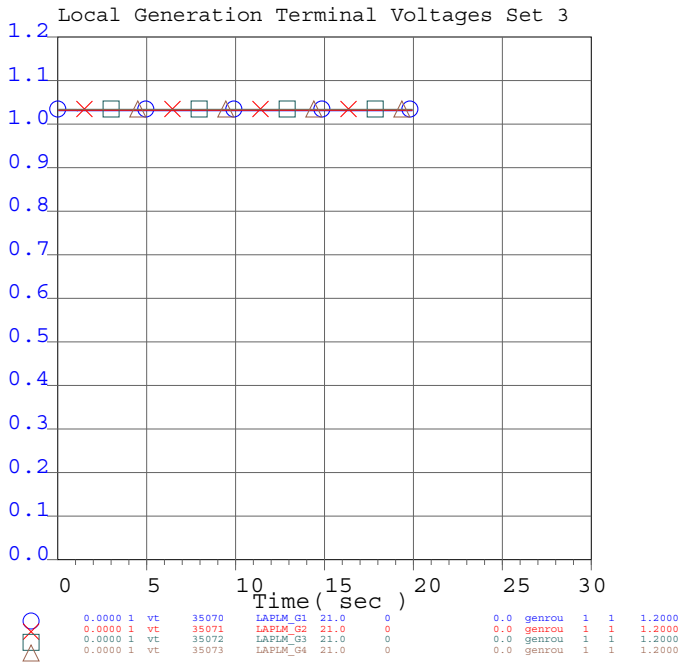
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

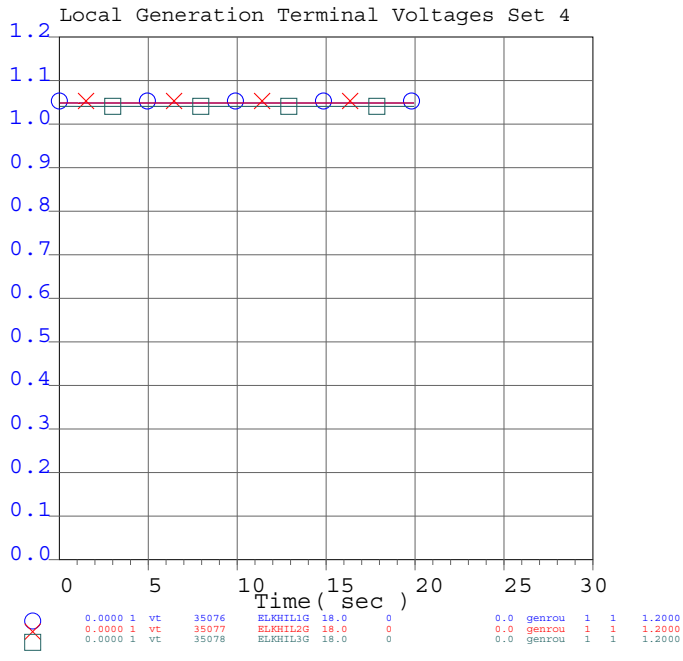


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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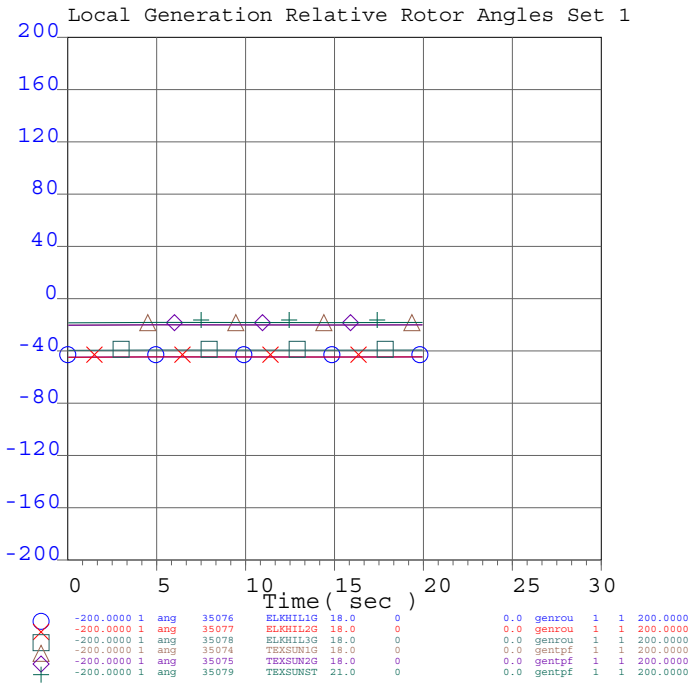

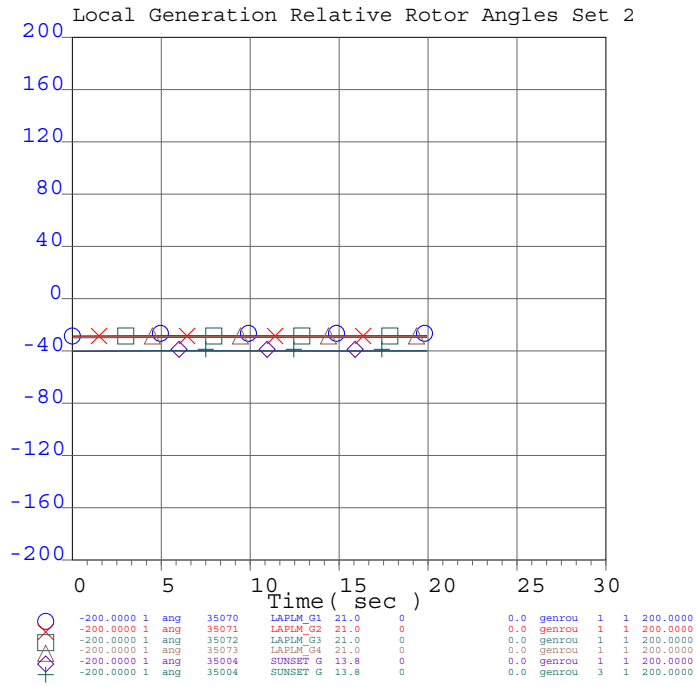

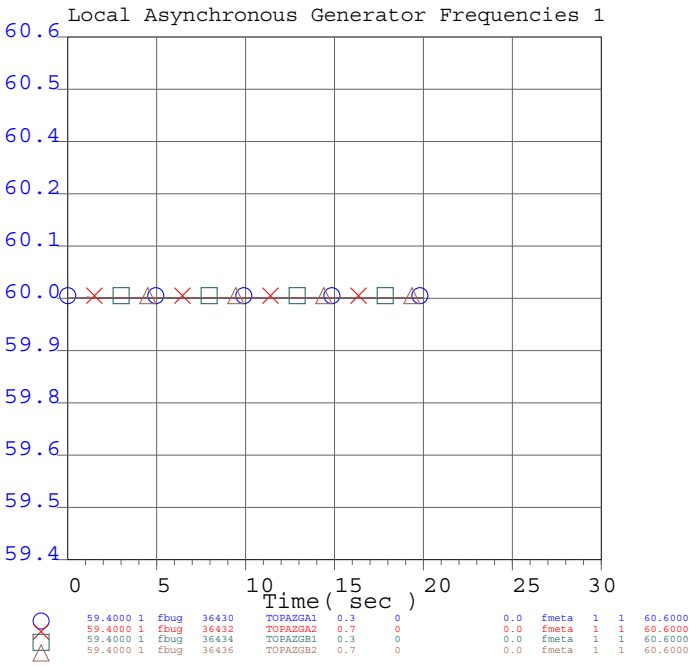

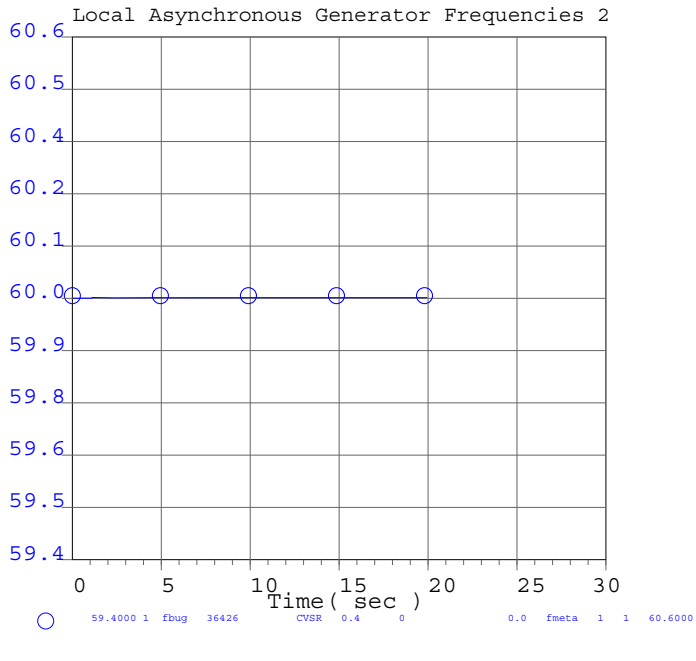

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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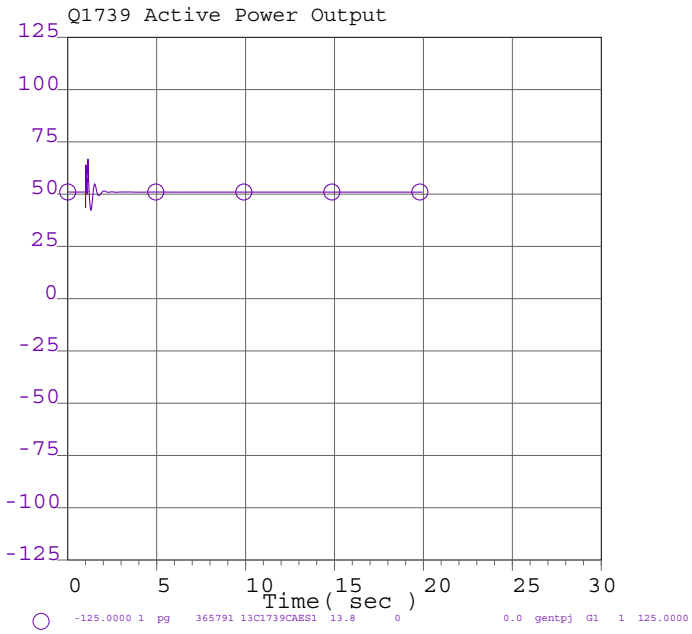
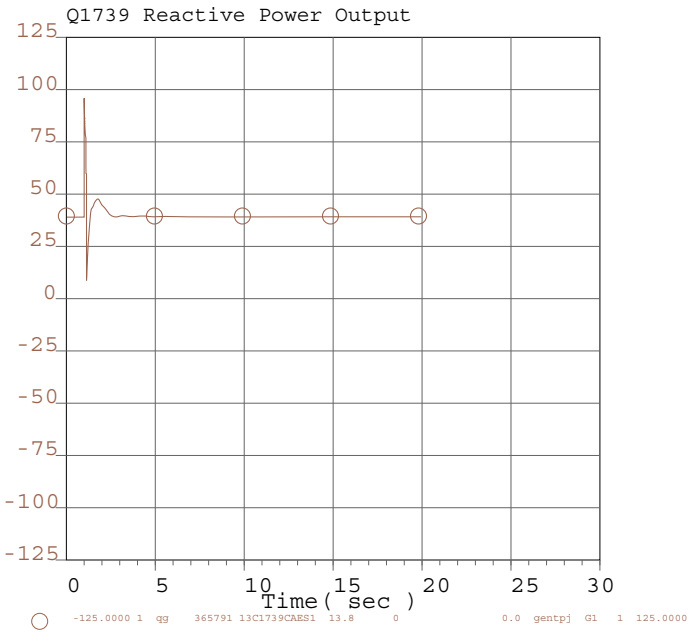
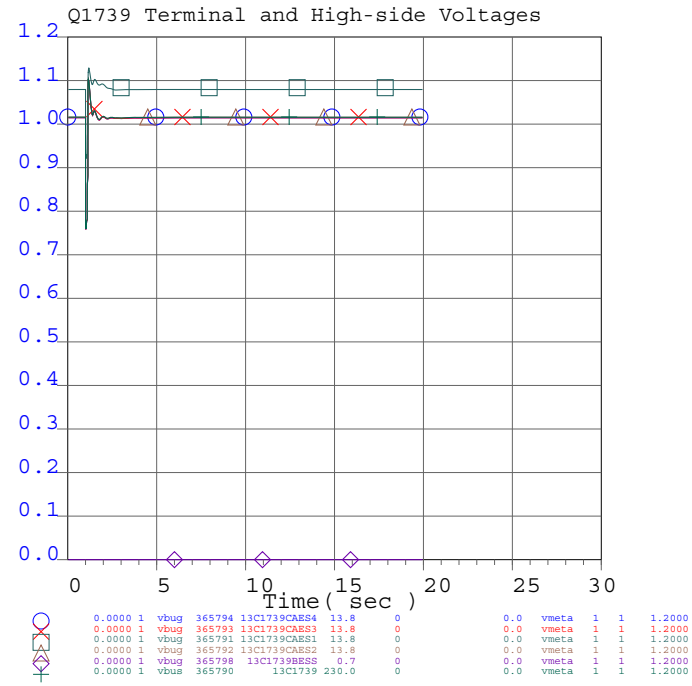
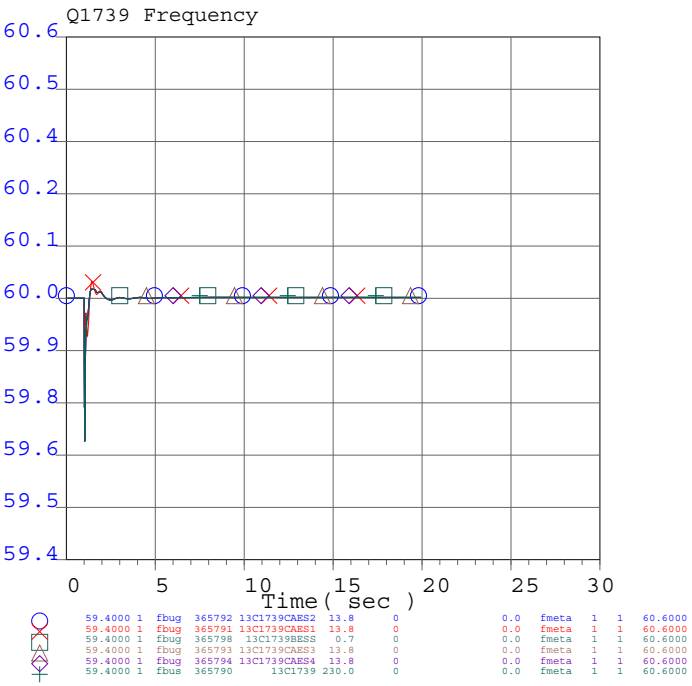
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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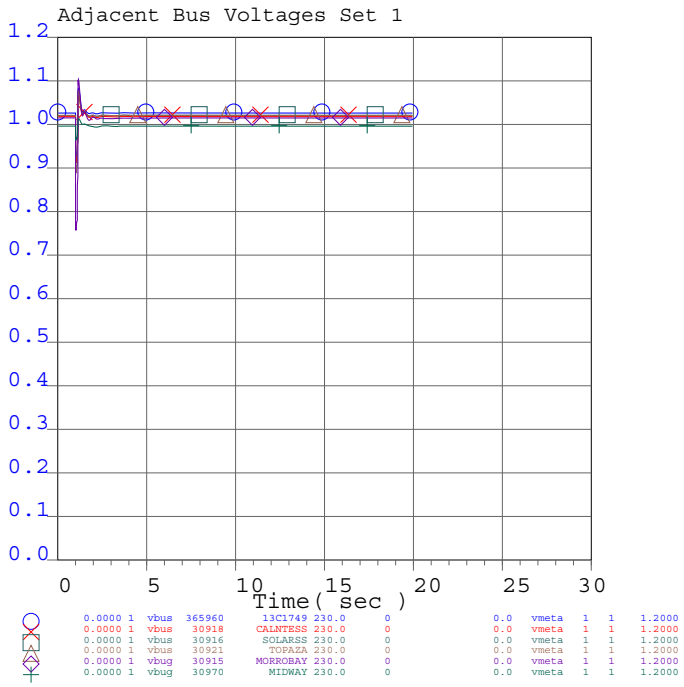

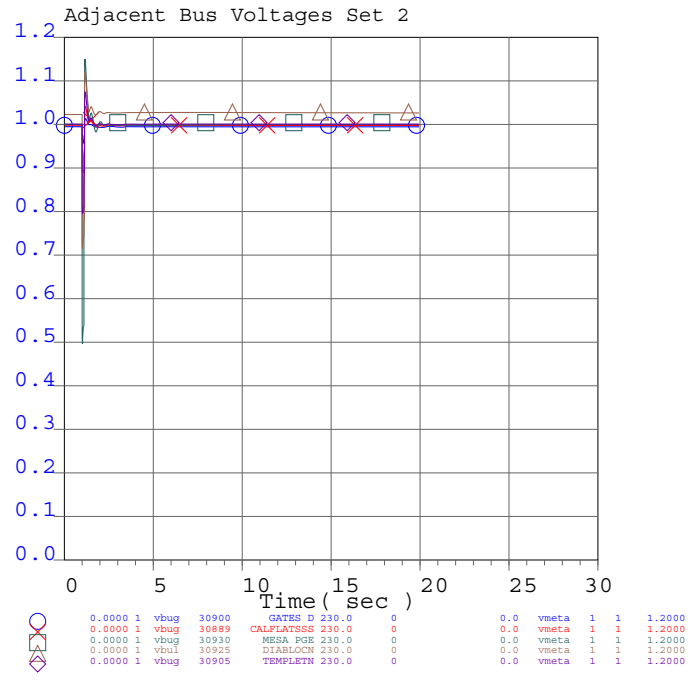

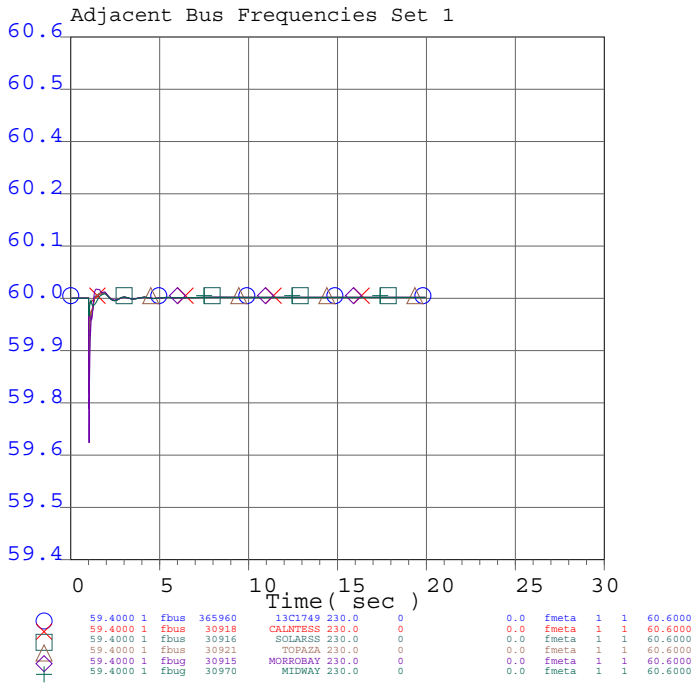

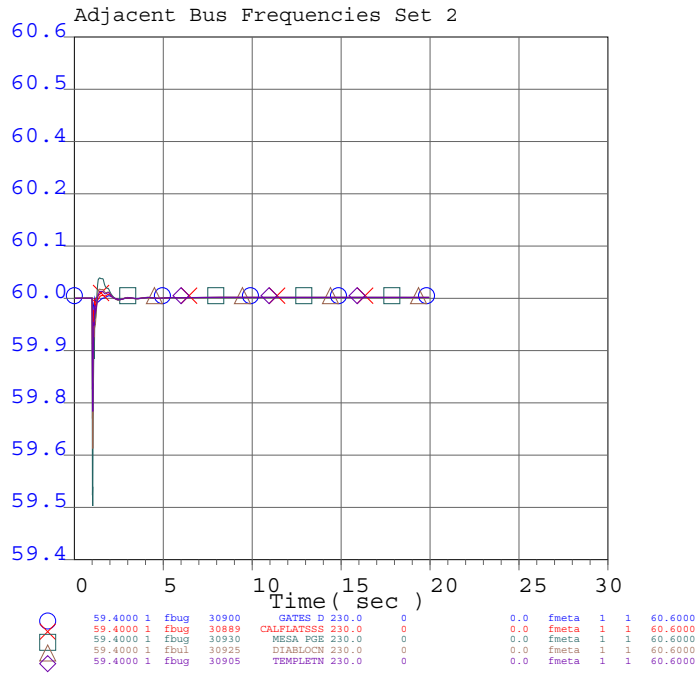

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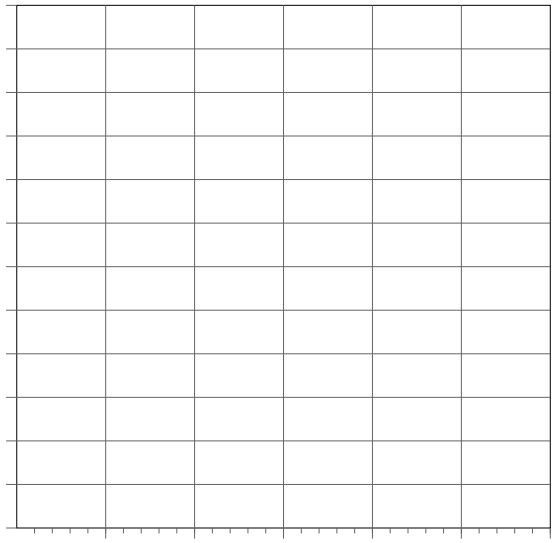
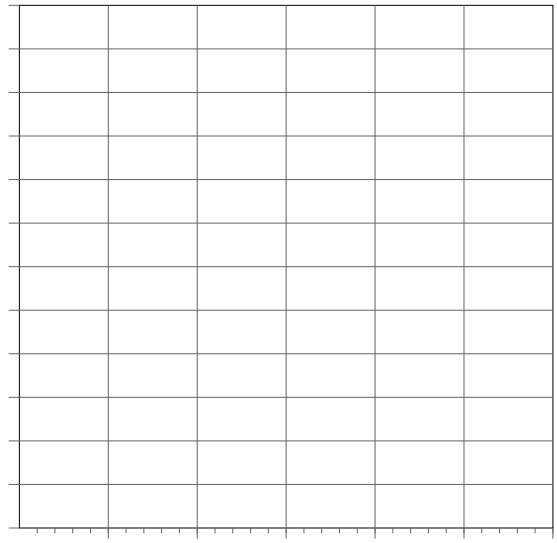
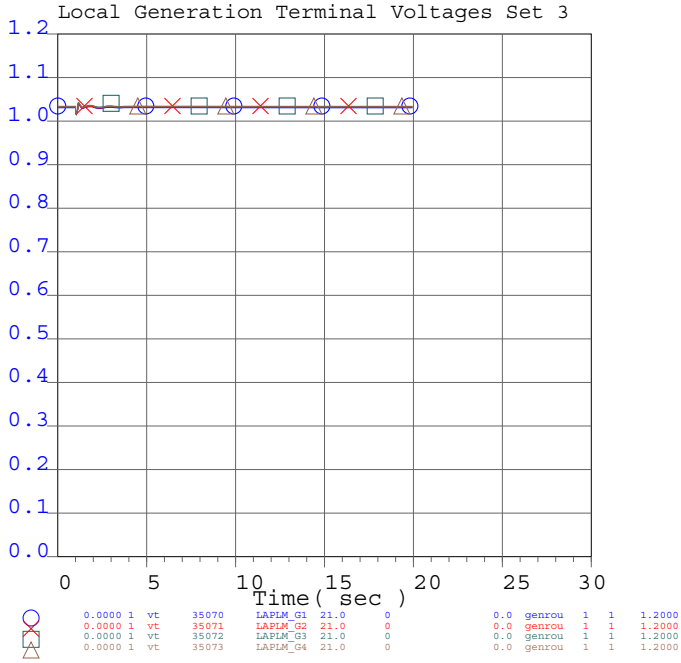
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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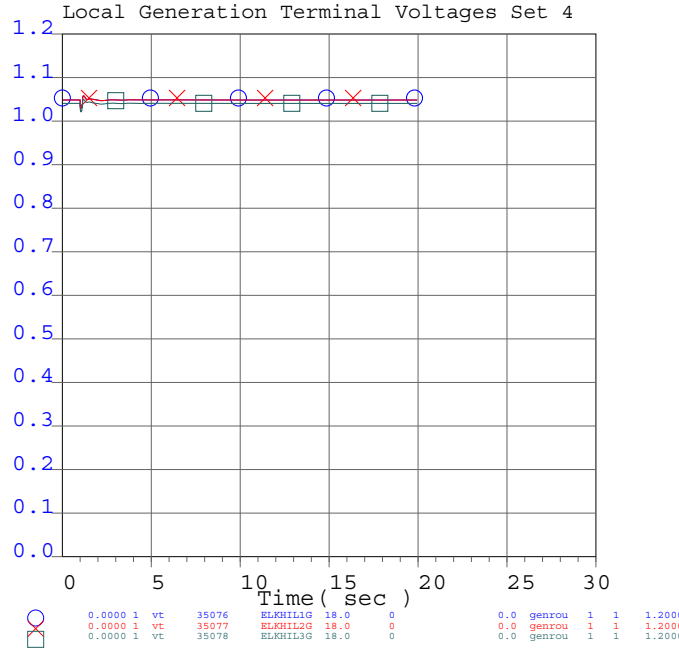
Local Generation Terminal Voltages Set 4



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PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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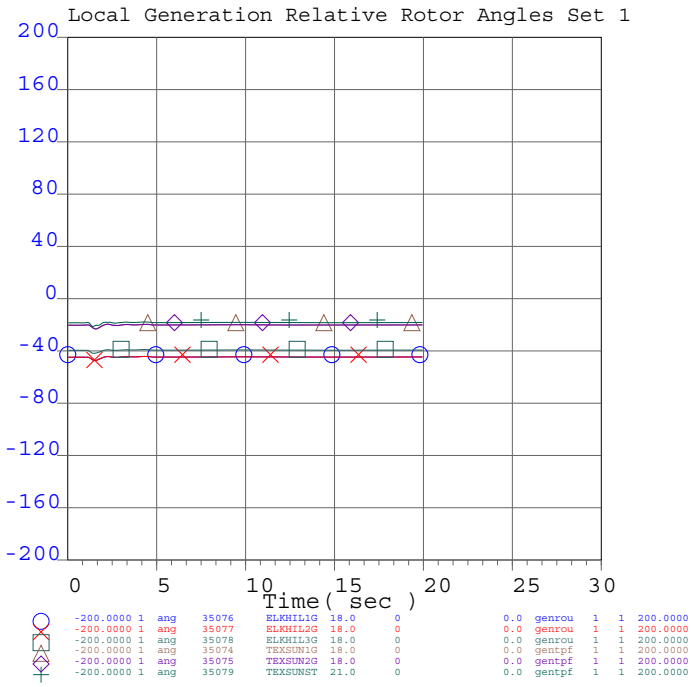

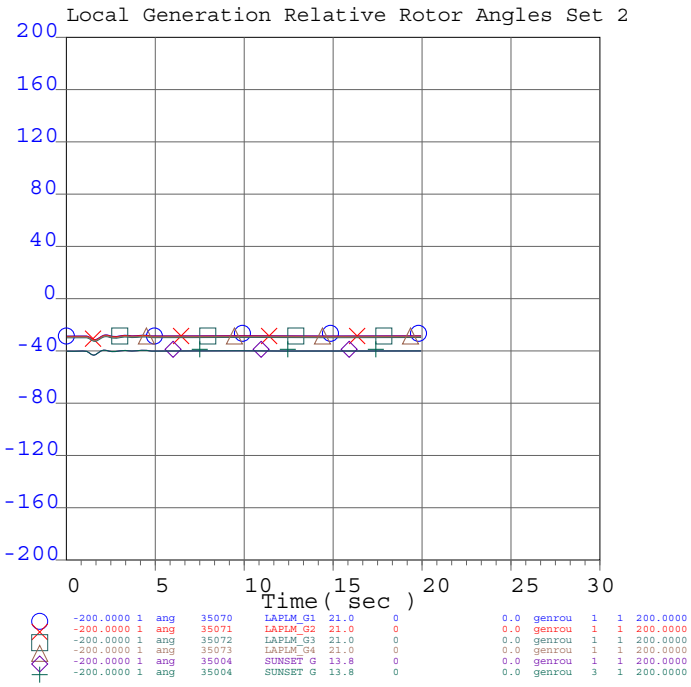

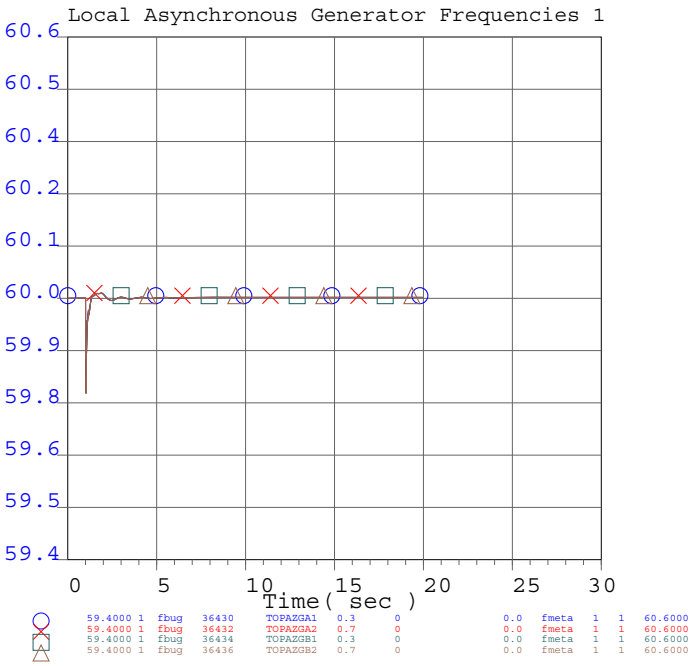

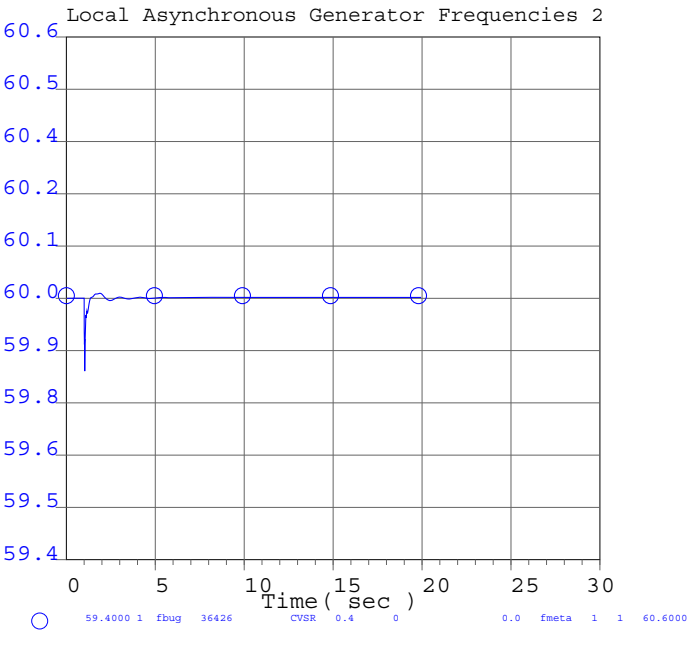

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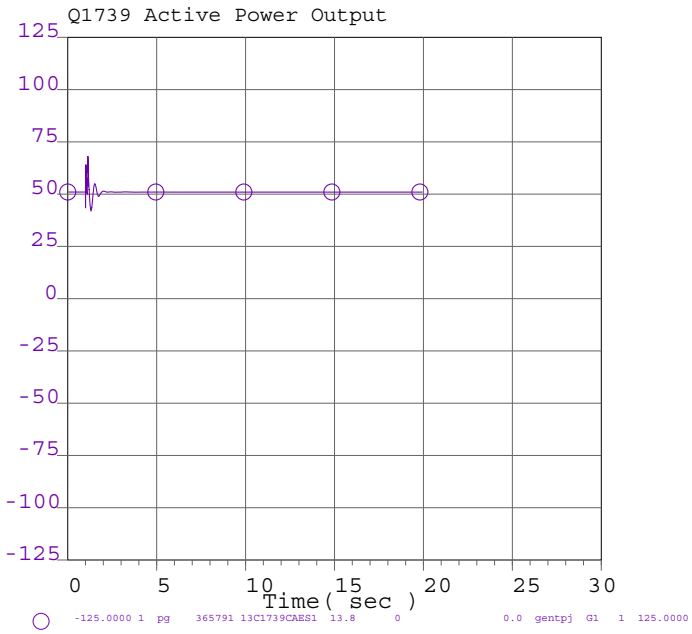
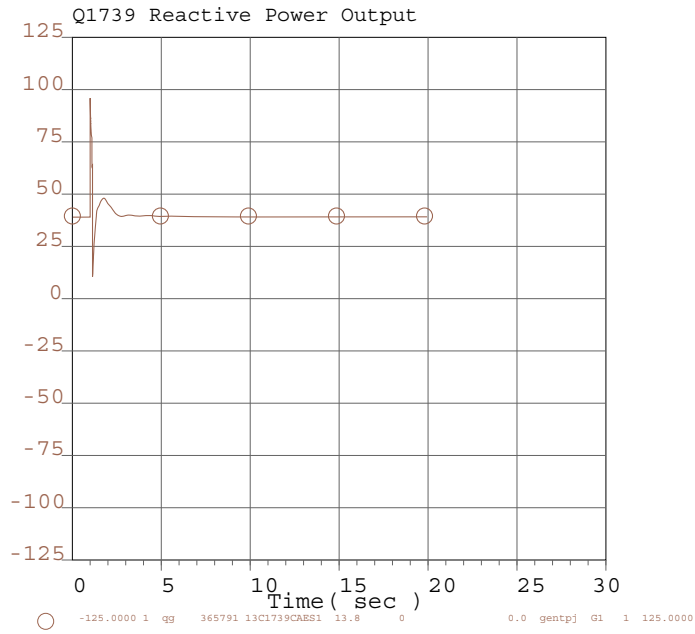
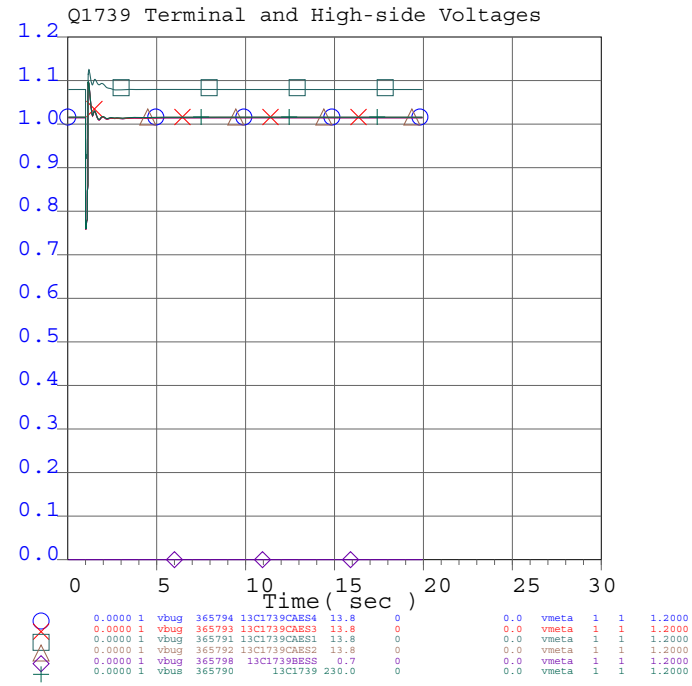
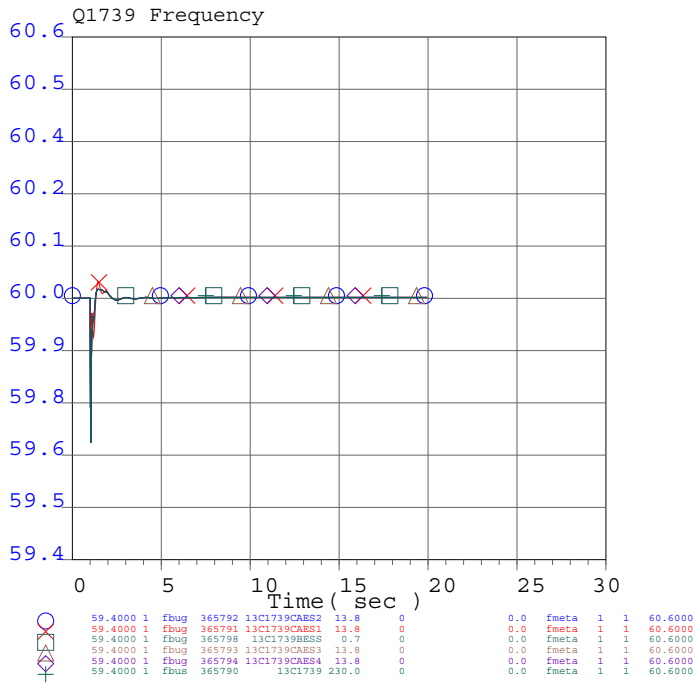
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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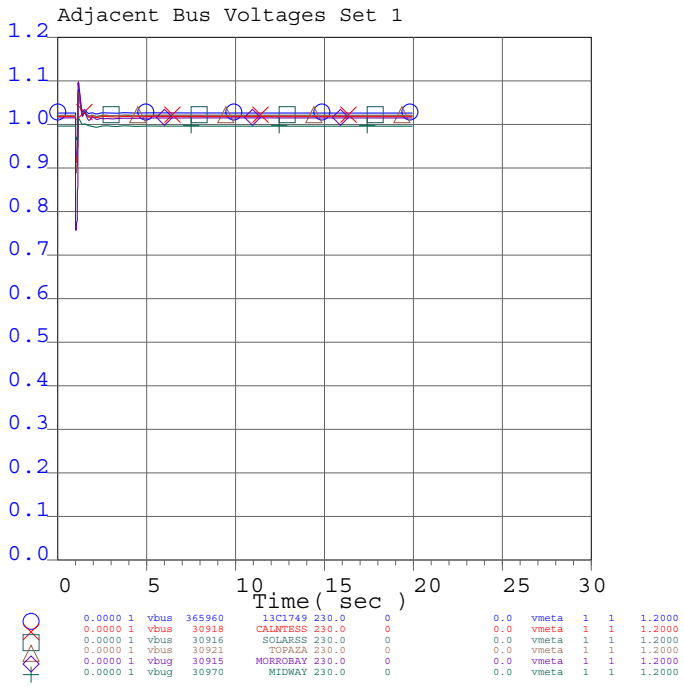

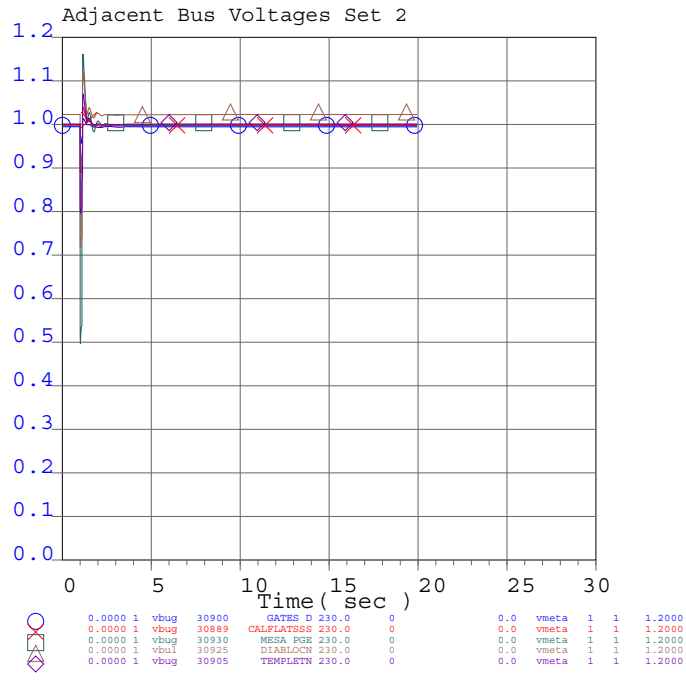

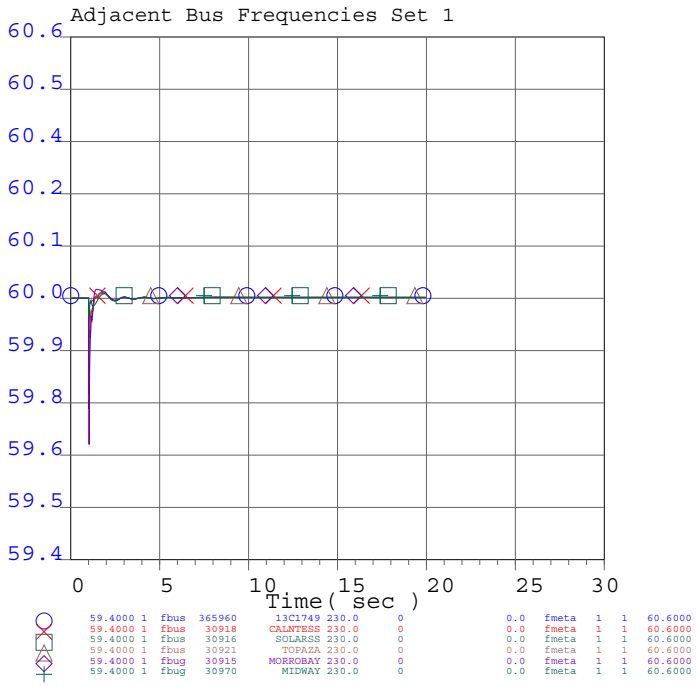

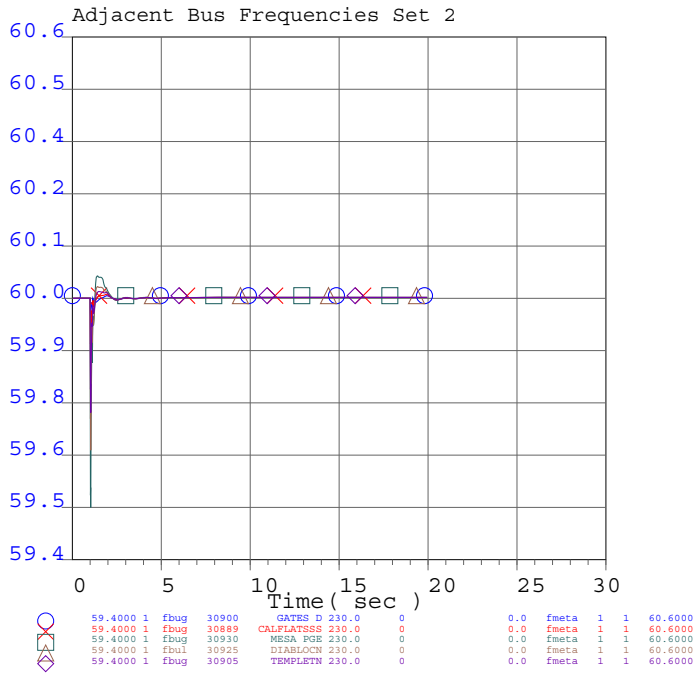

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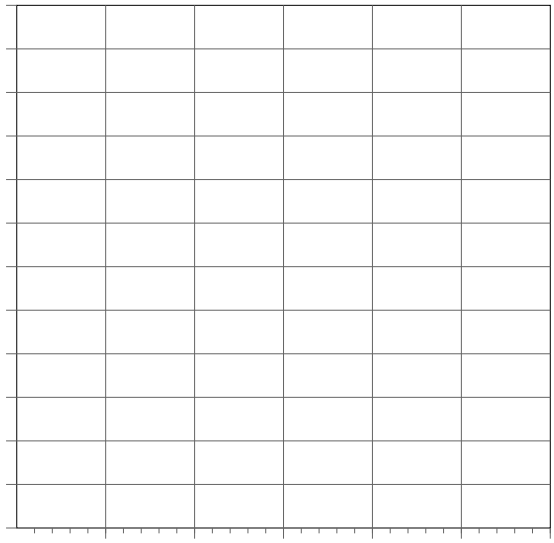
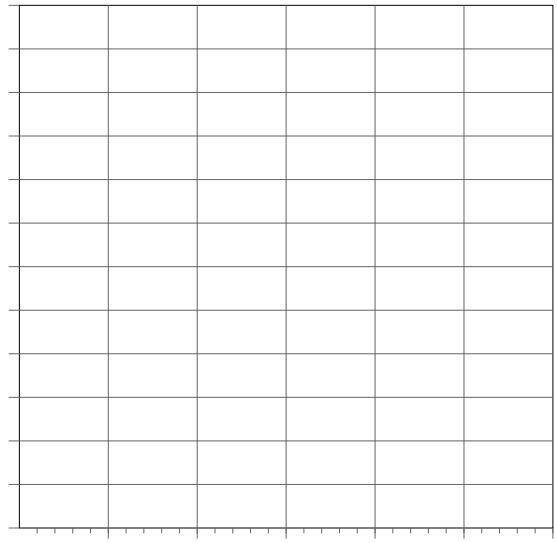
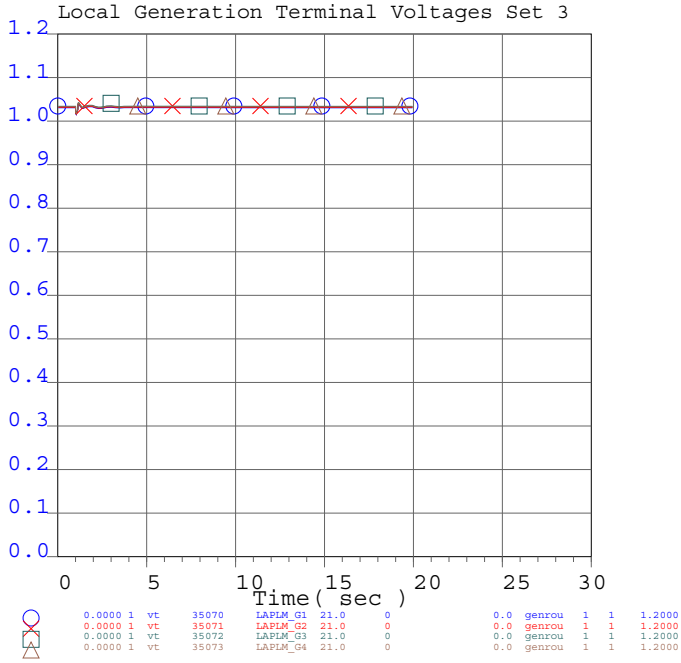


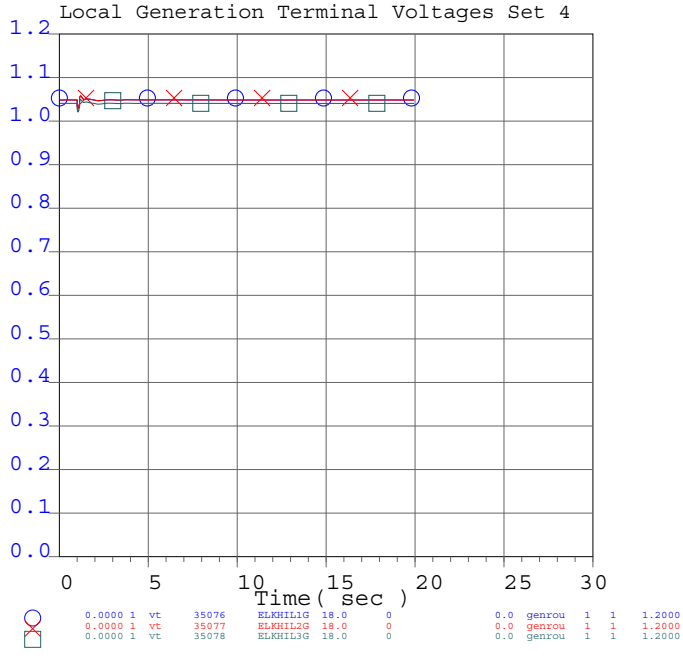
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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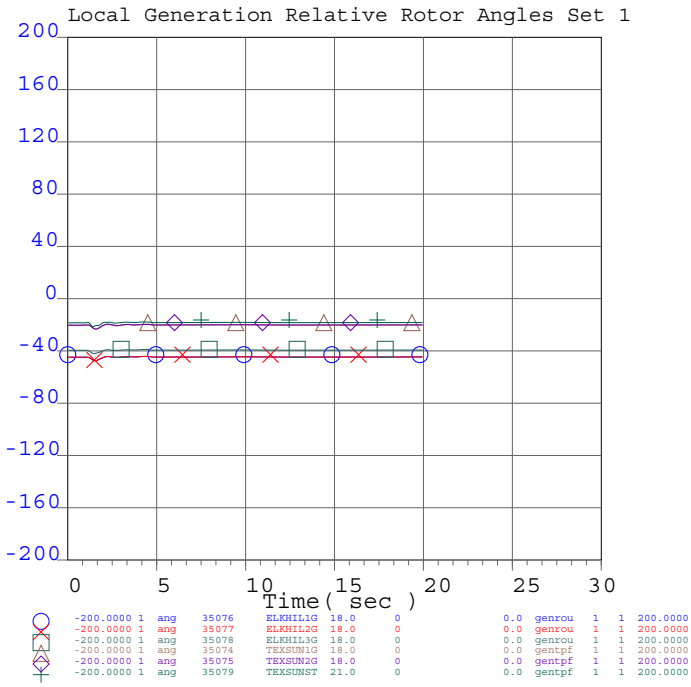
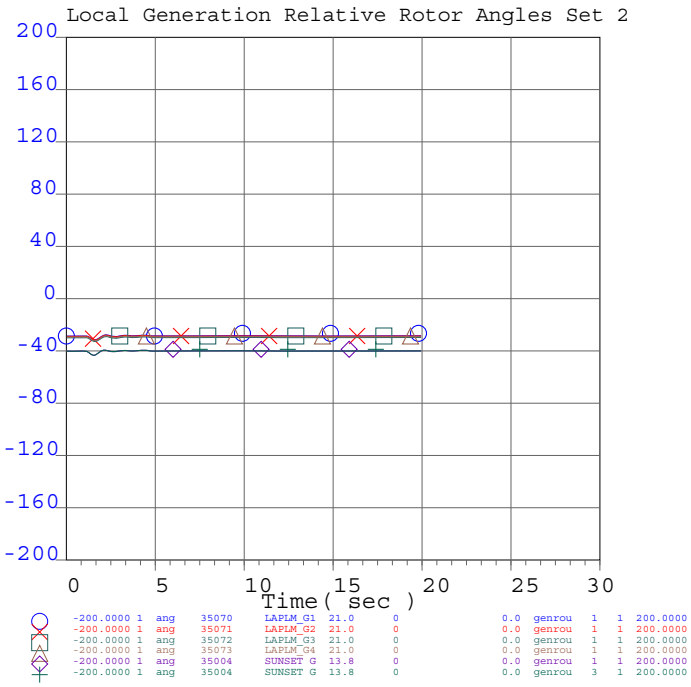
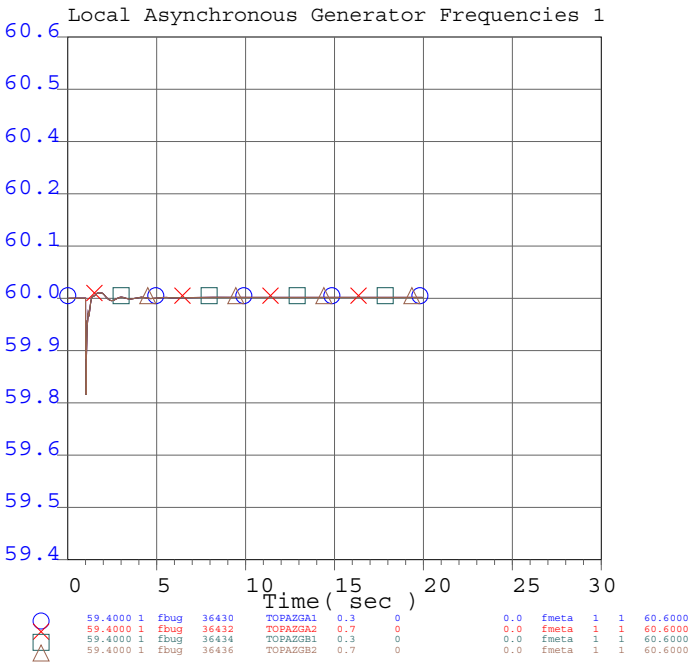
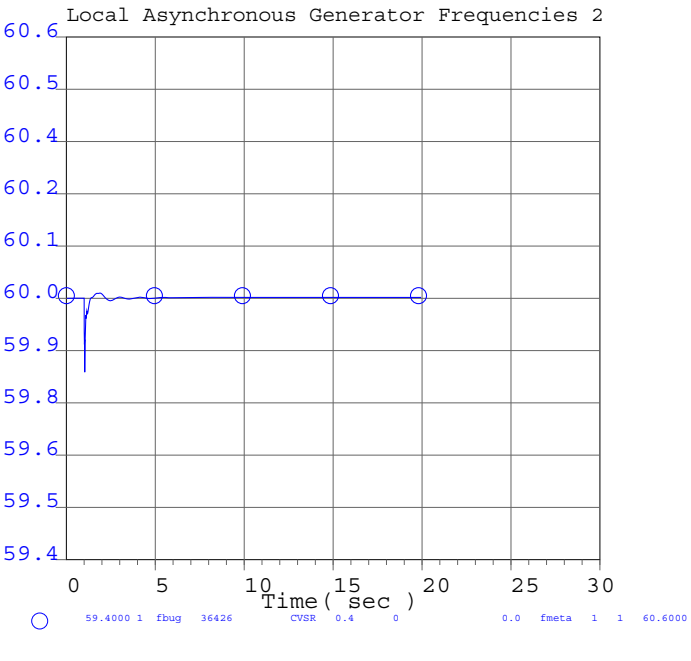


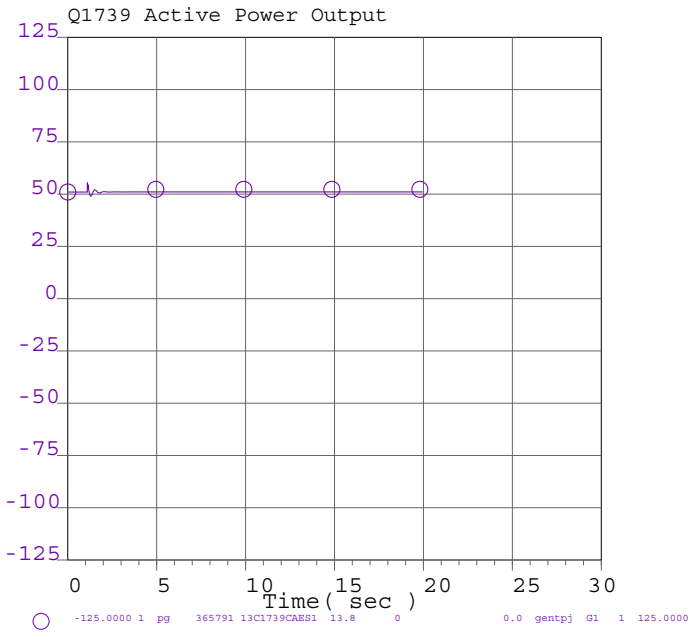


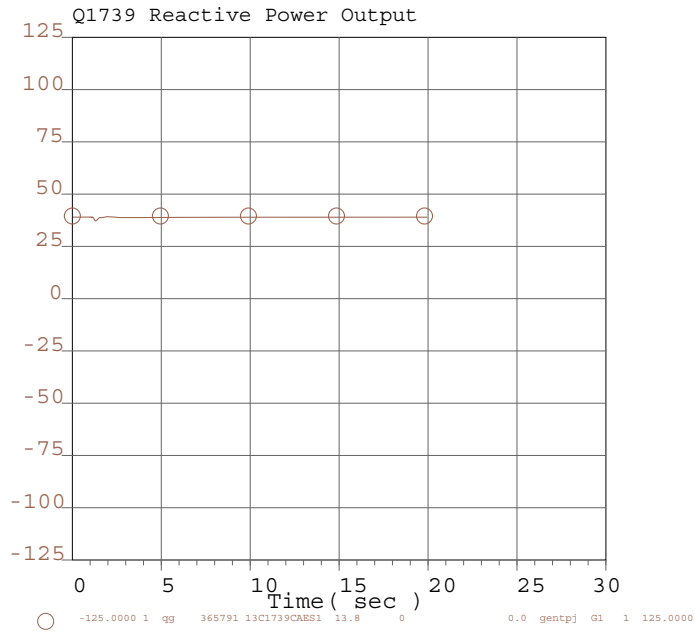


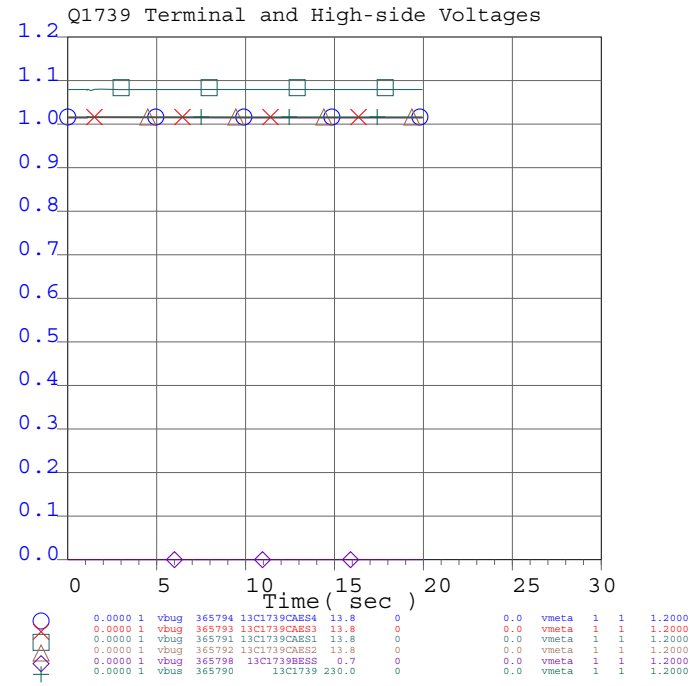


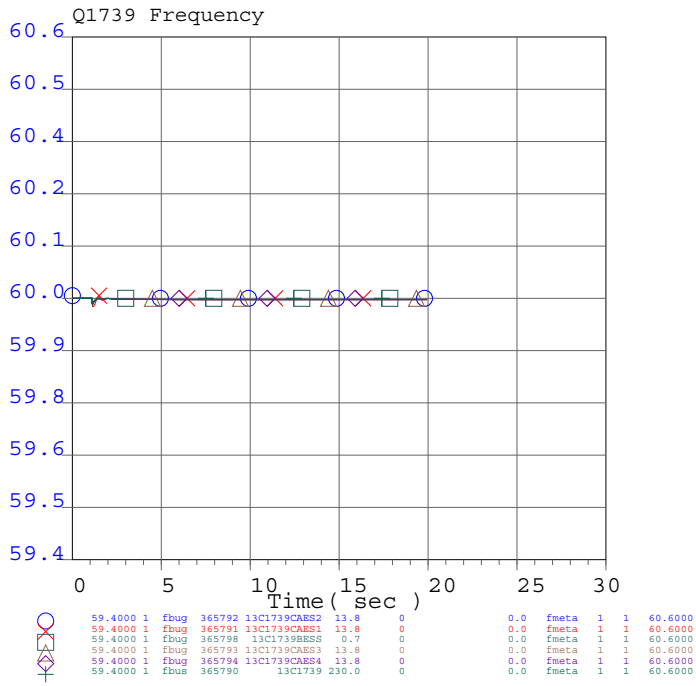
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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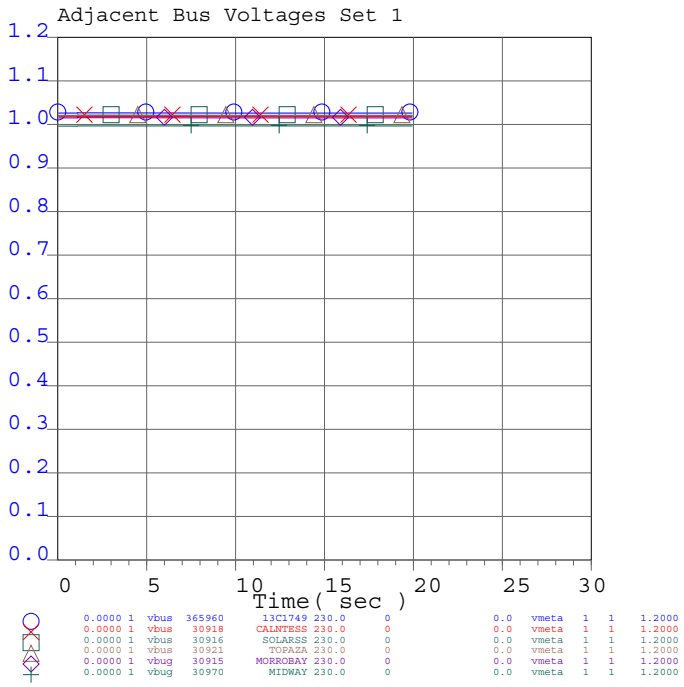

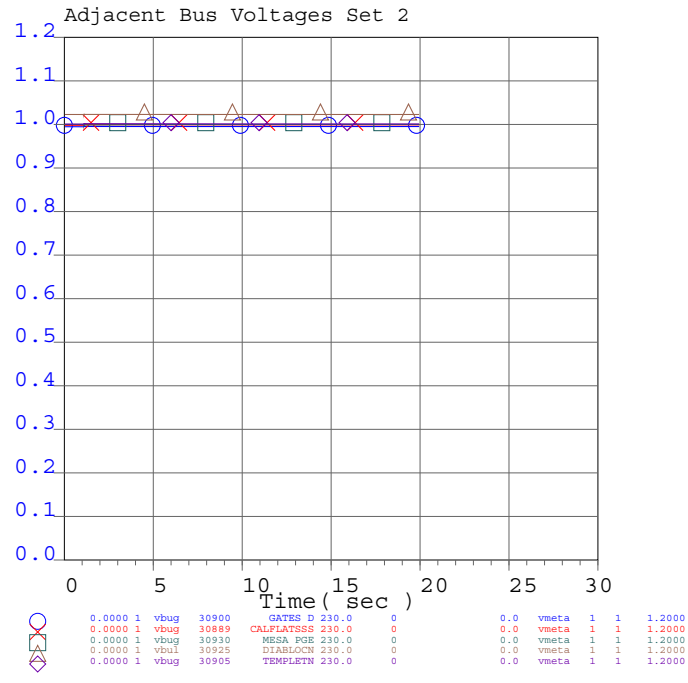

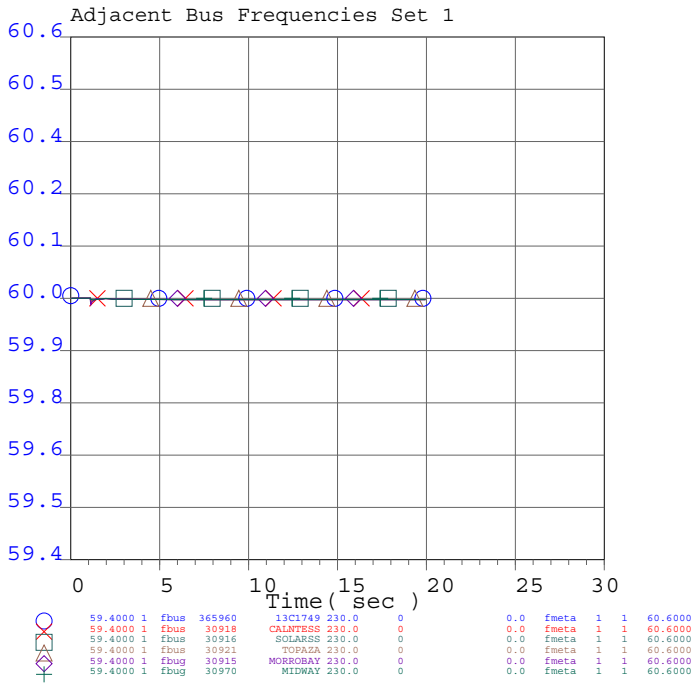

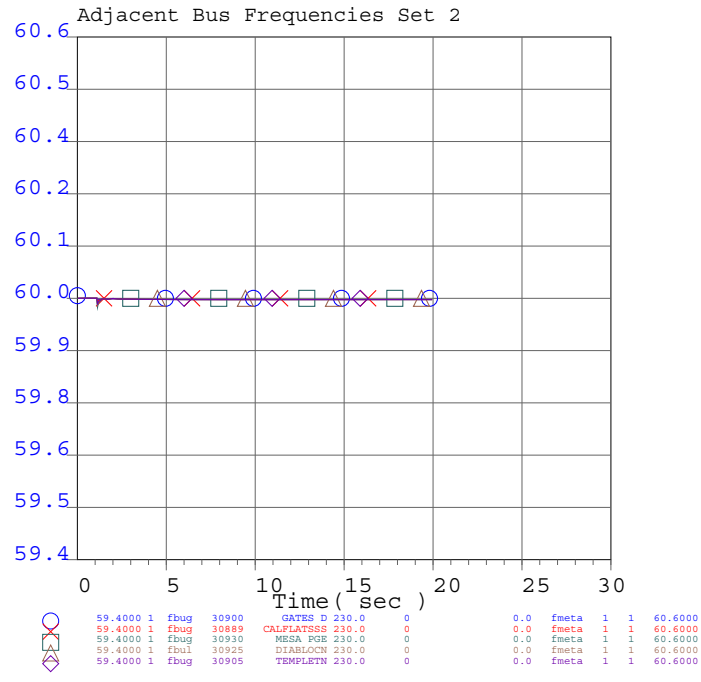

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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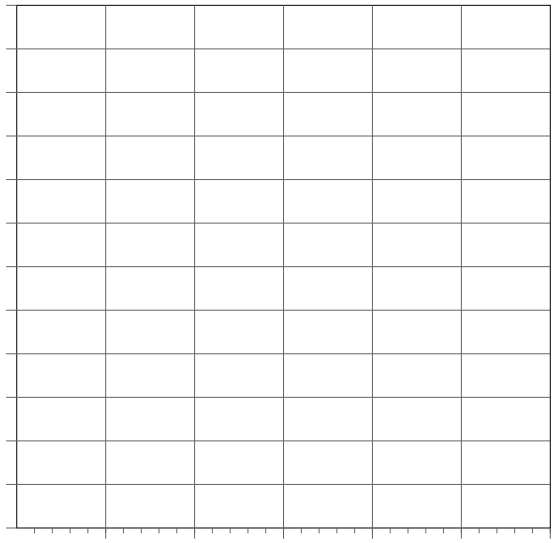
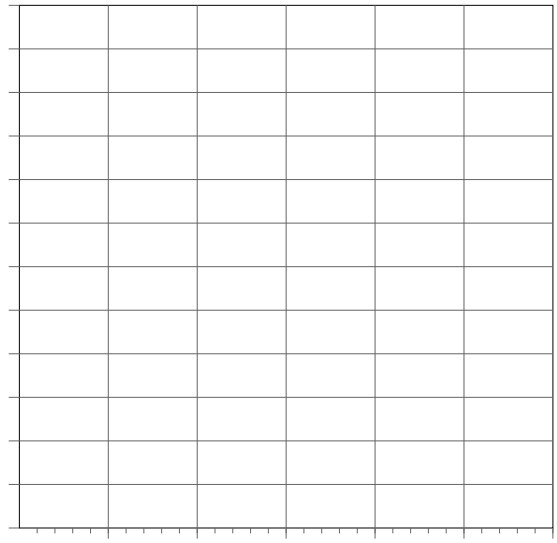
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

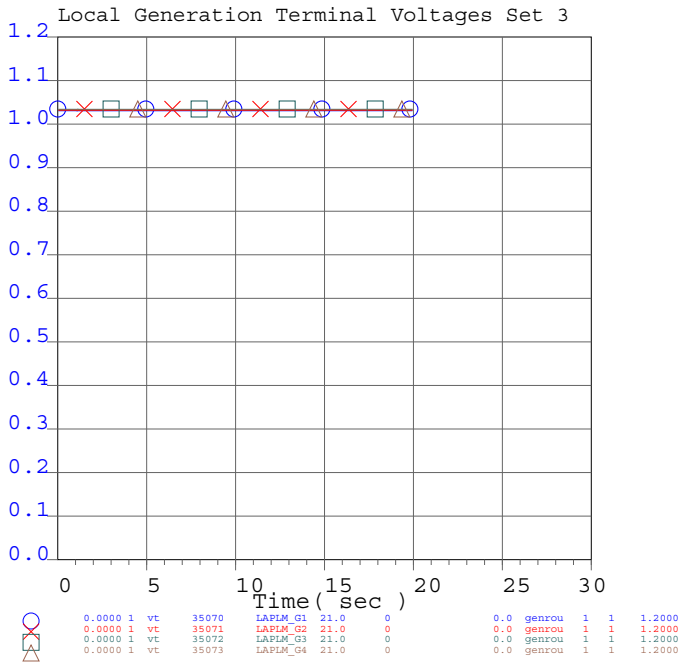
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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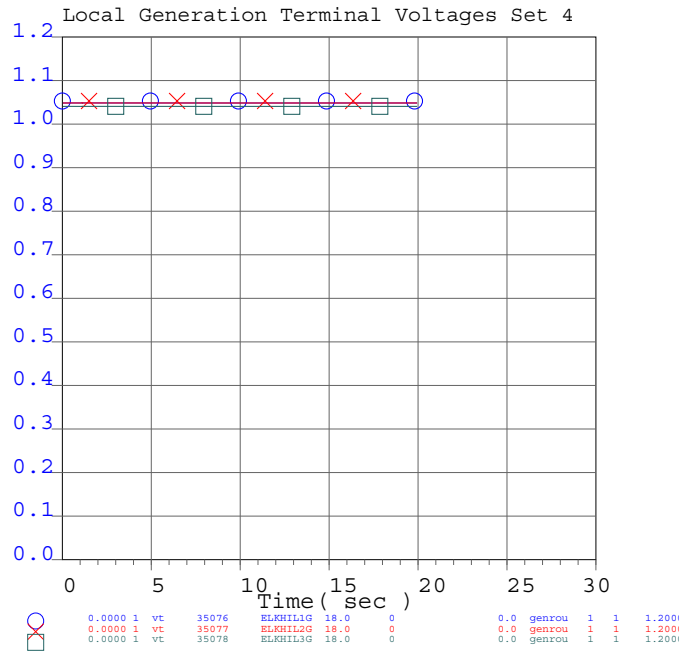
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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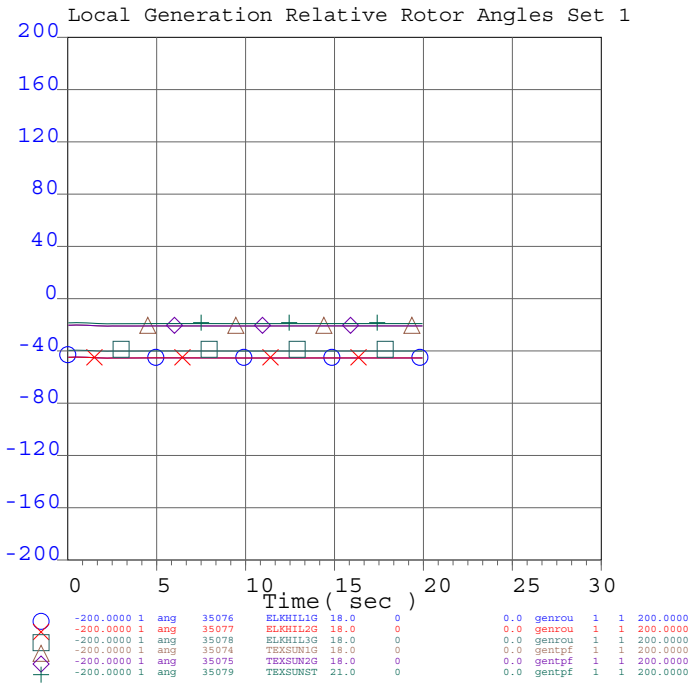
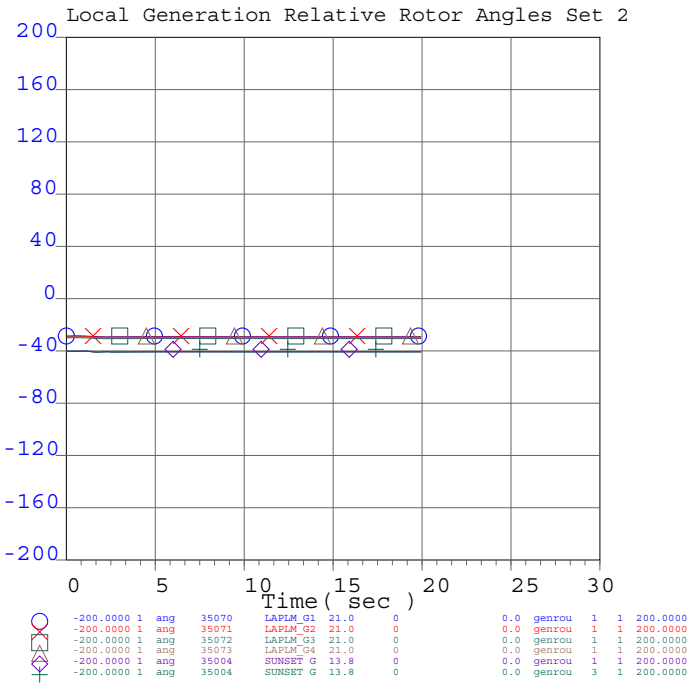
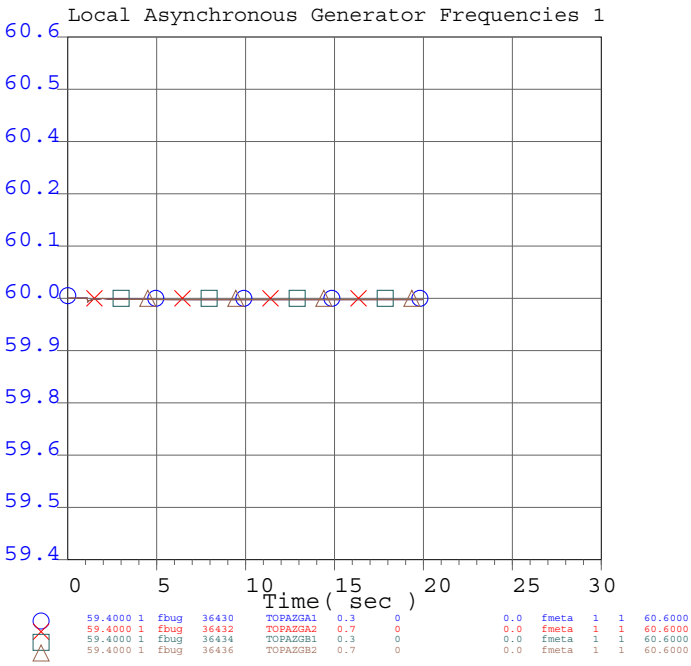
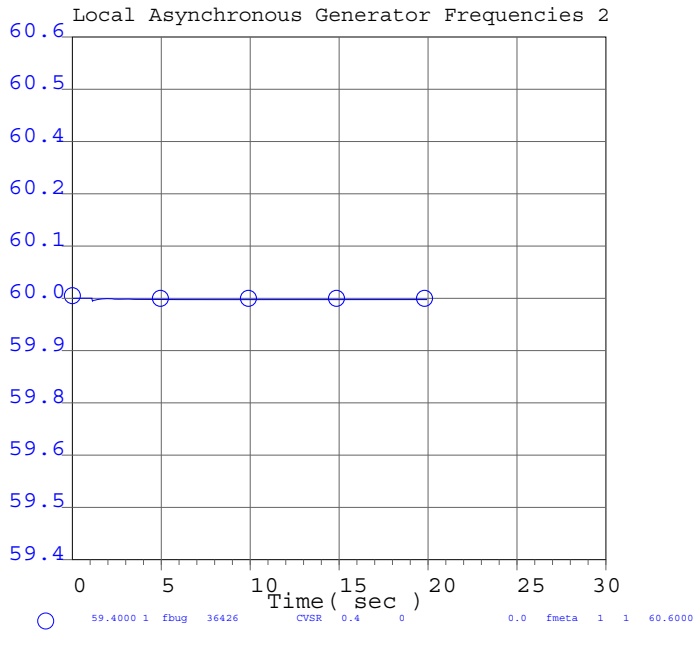
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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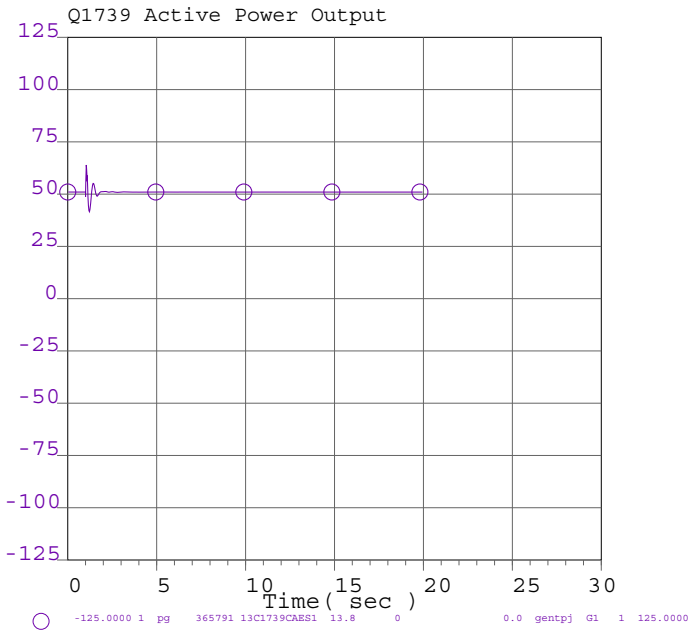
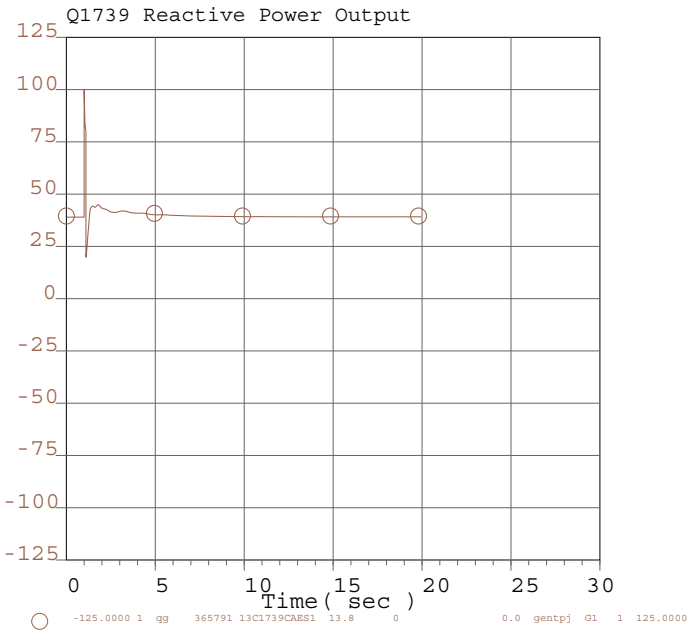
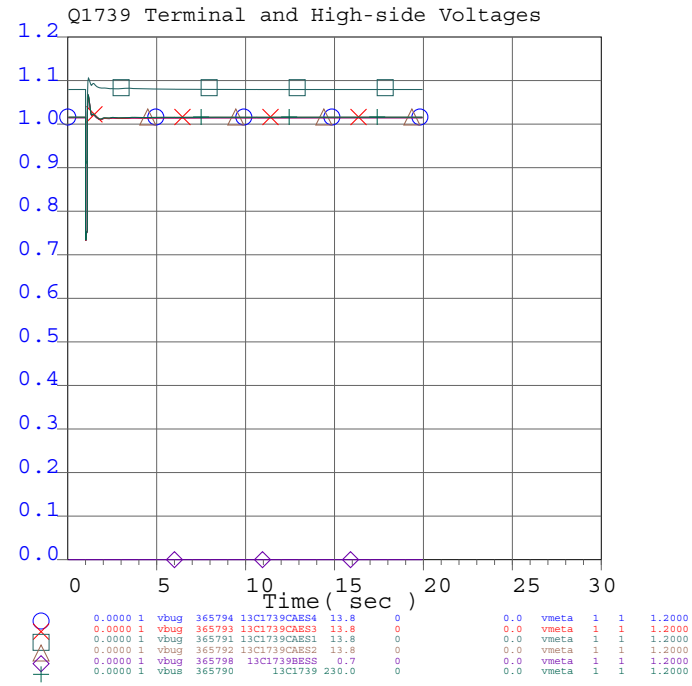
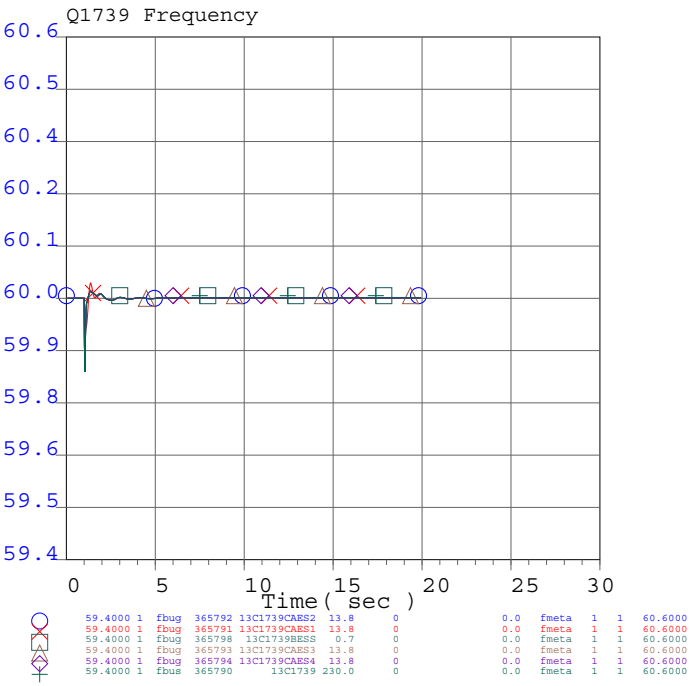
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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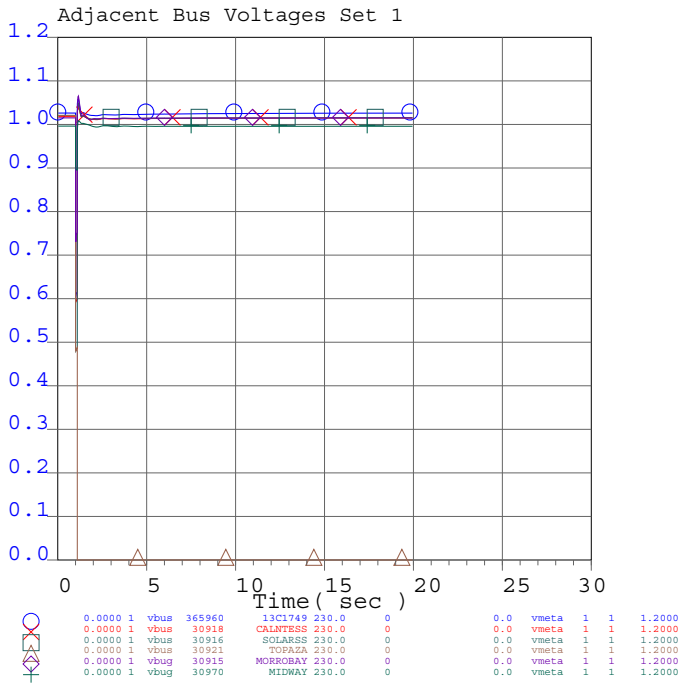
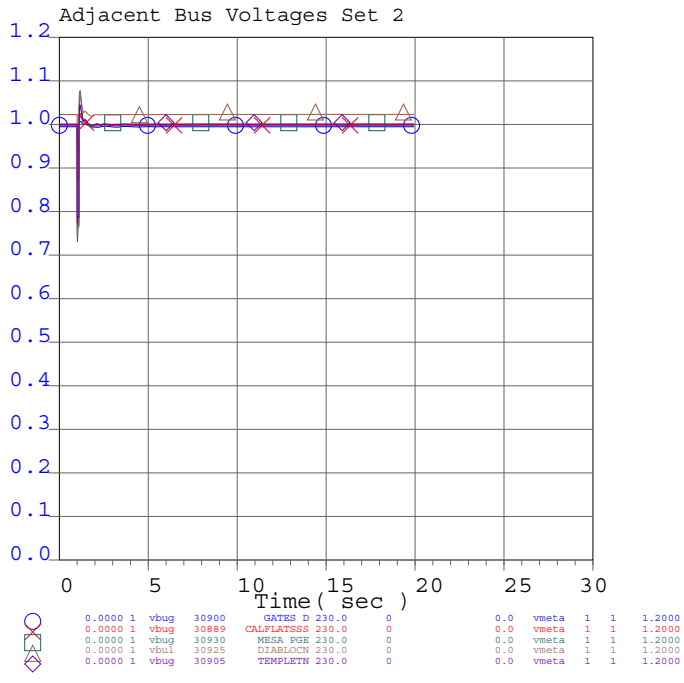
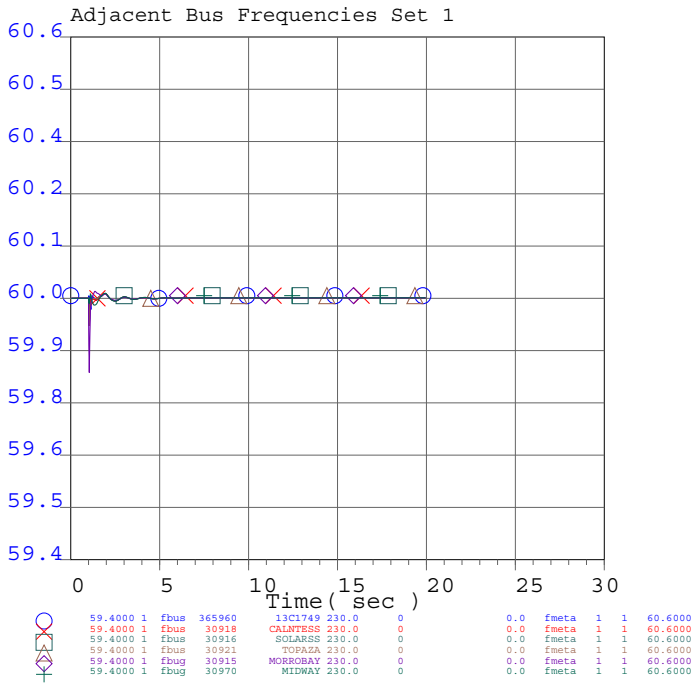
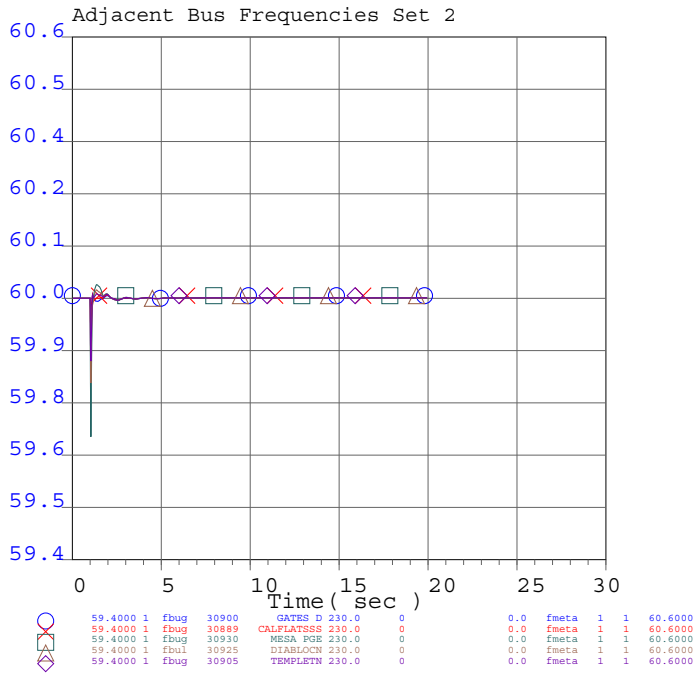
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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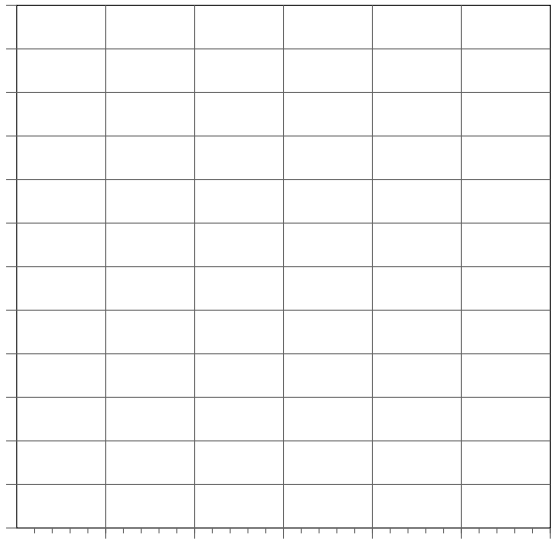
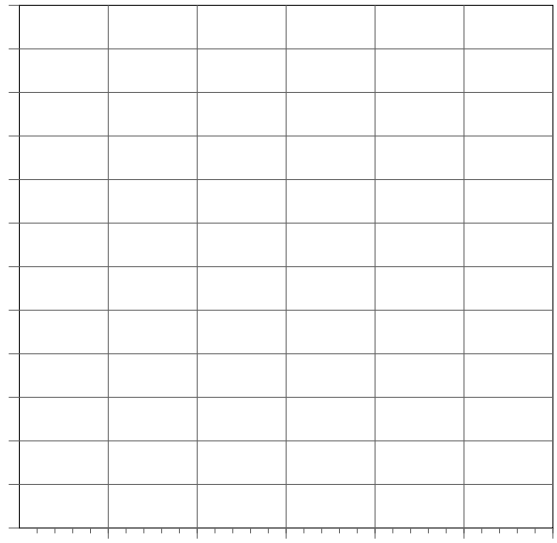
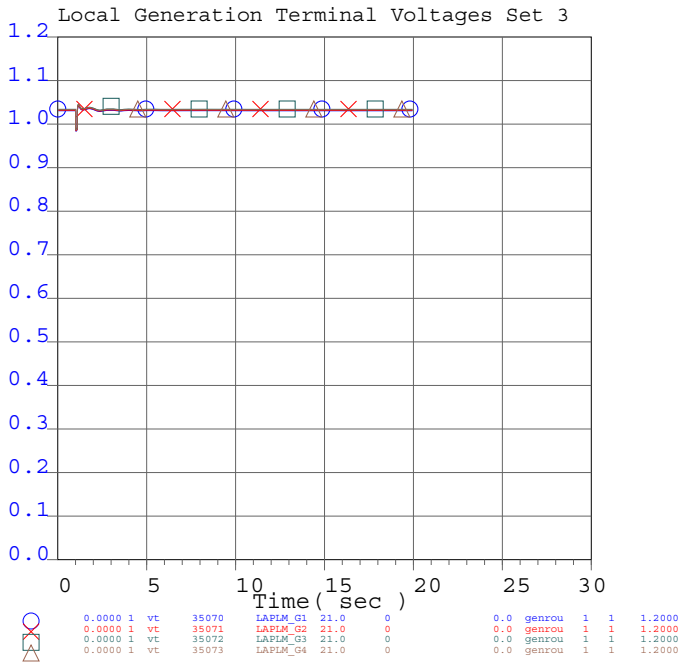
Local Generation Terminal Voltages Set 1



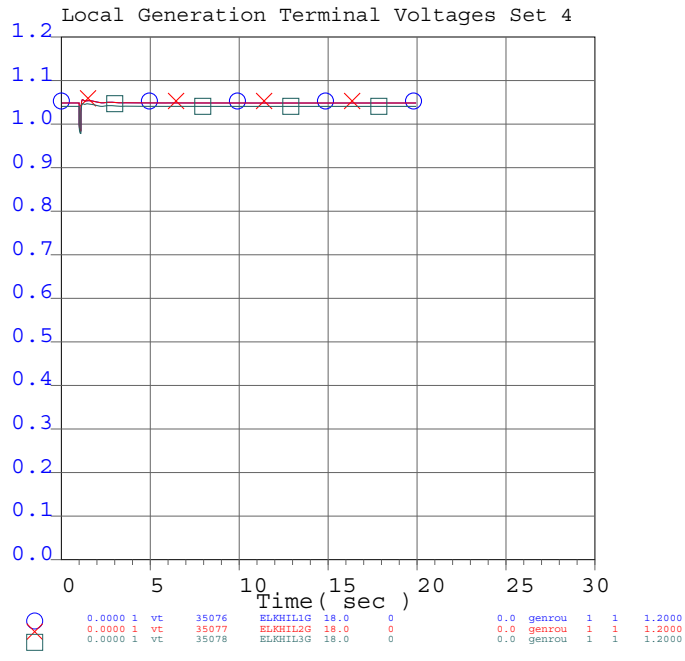
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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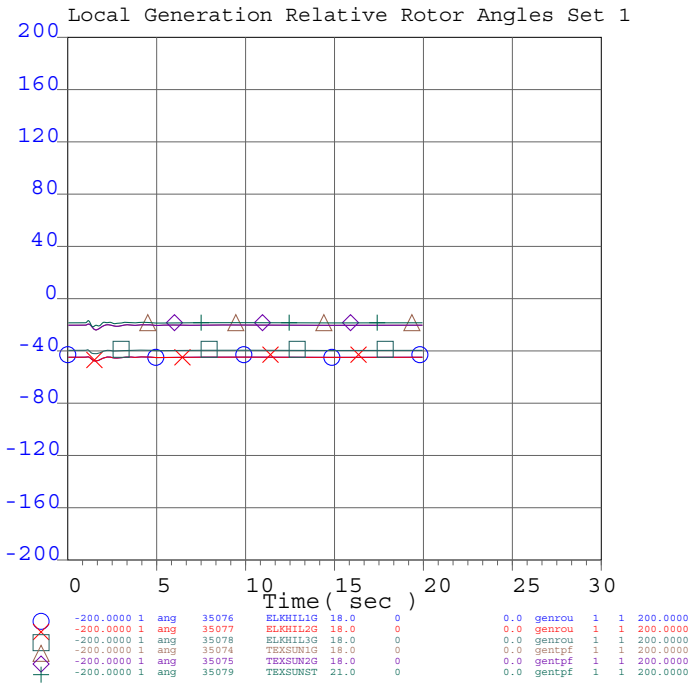

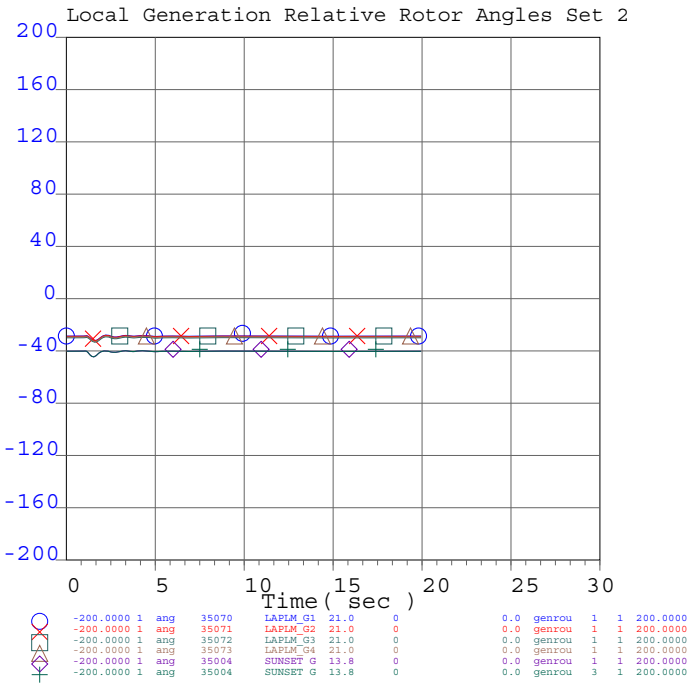

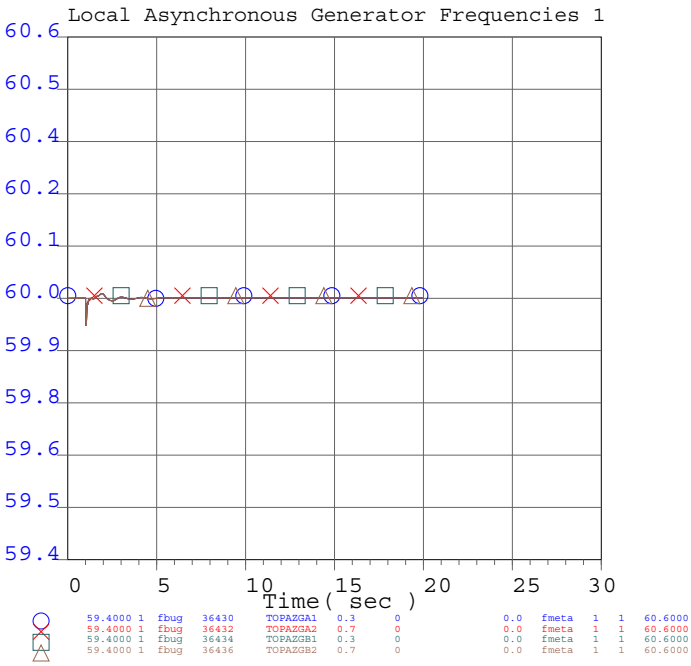

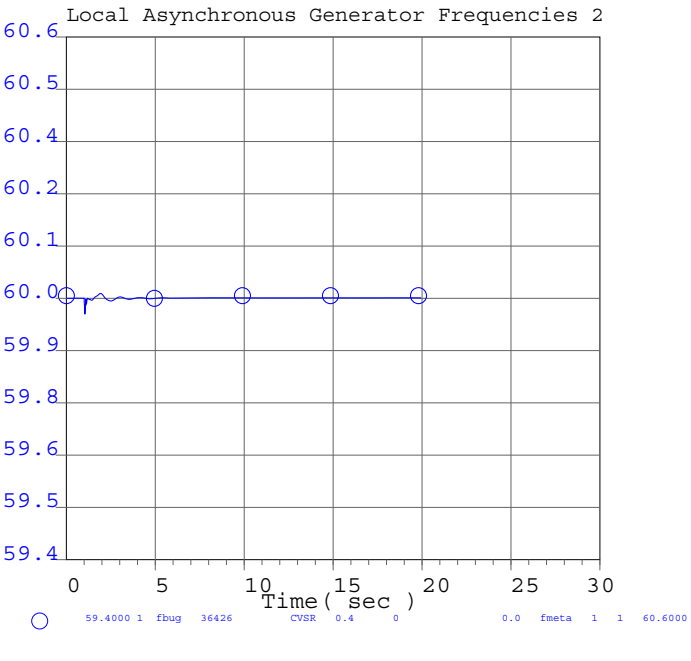

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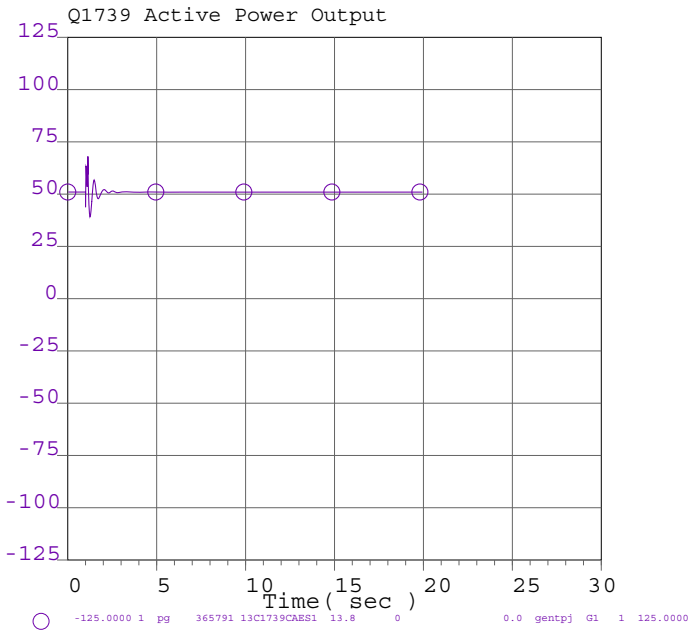

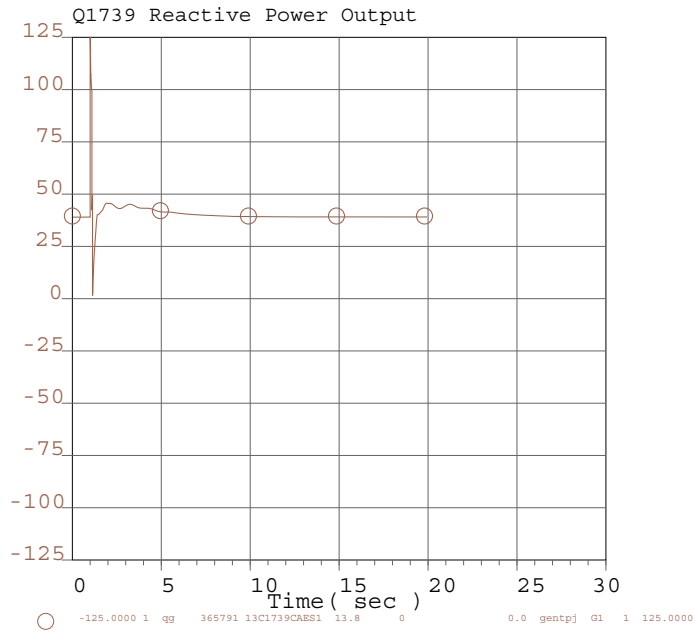

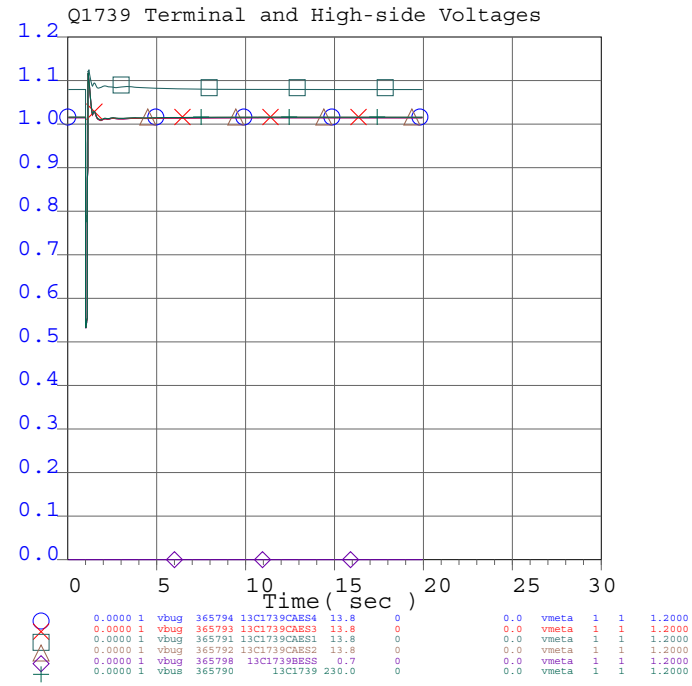

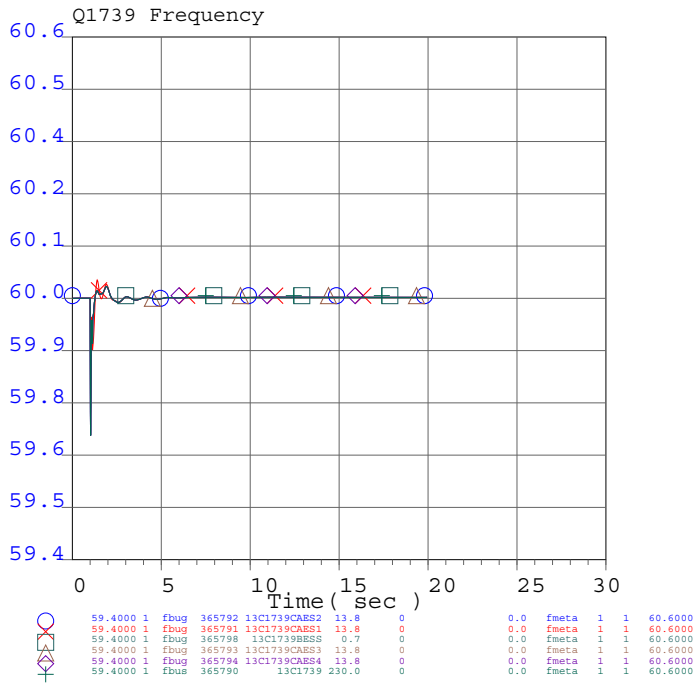

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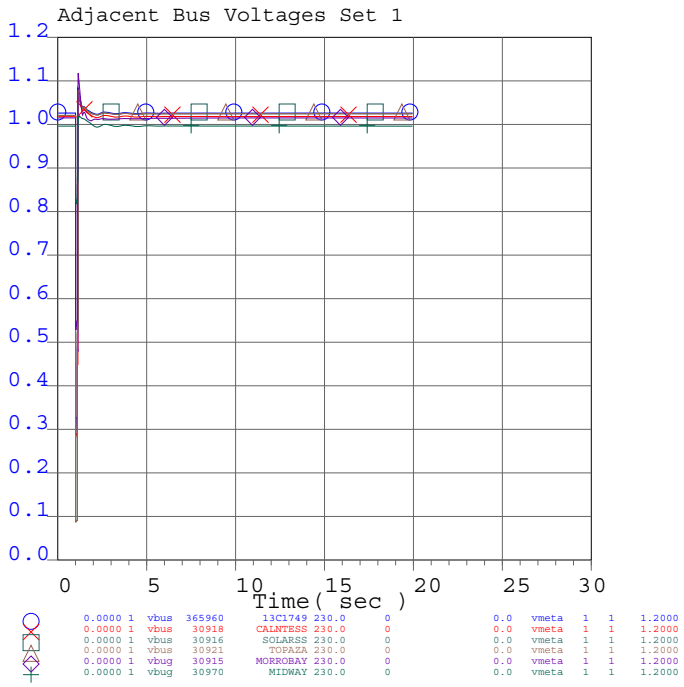

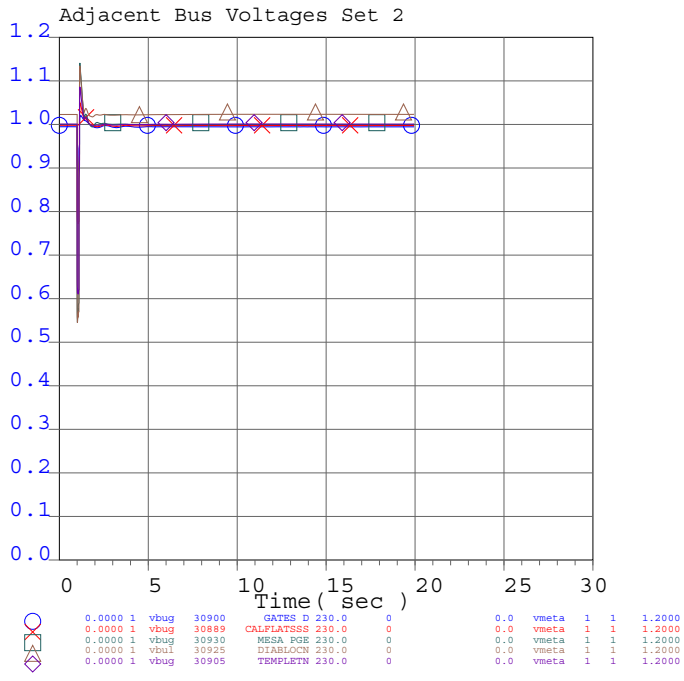

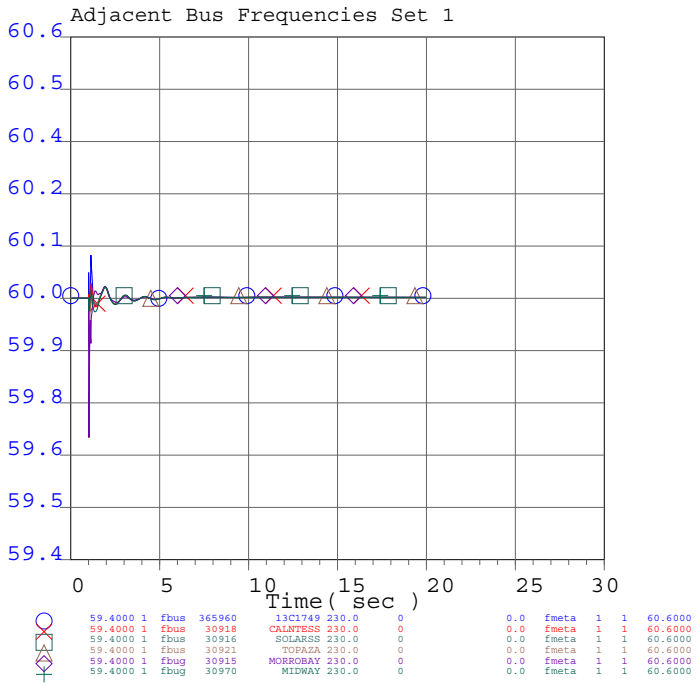

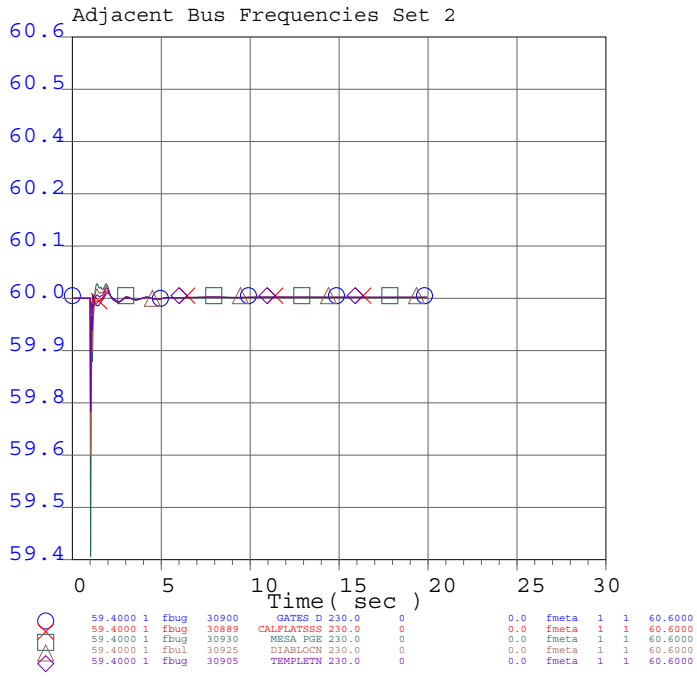

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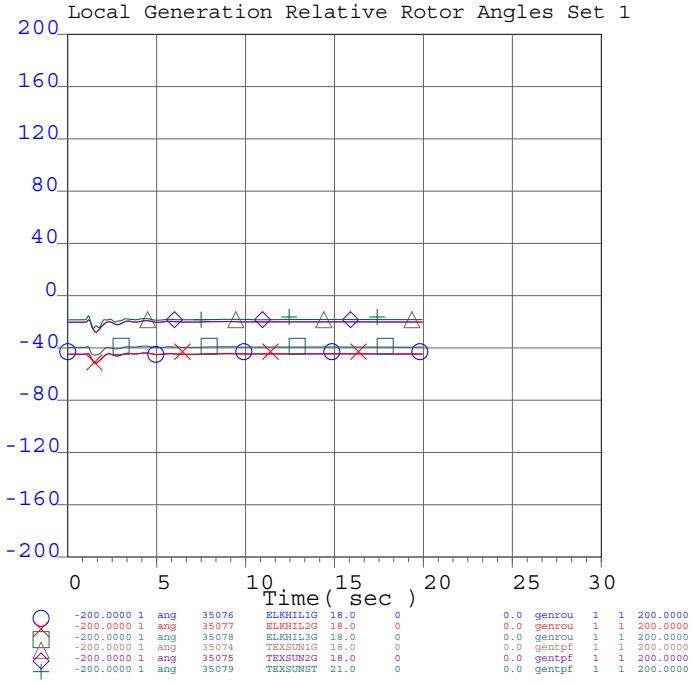
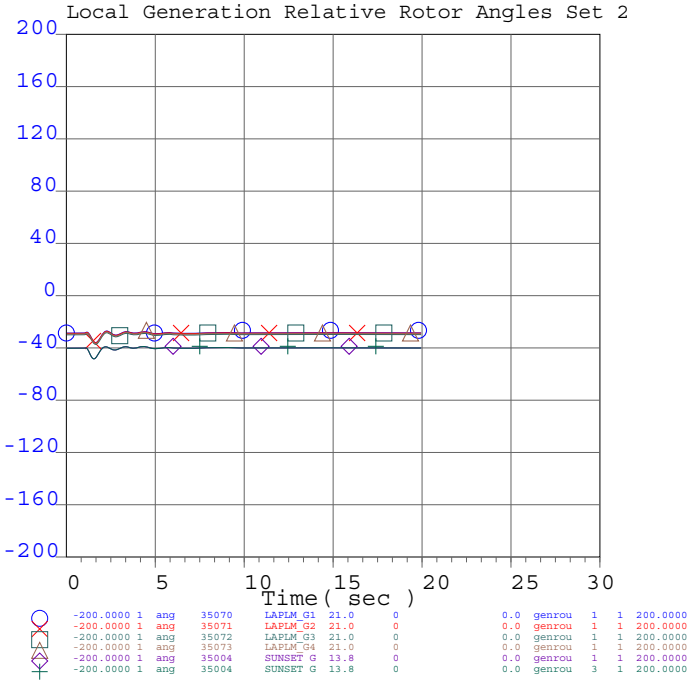
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

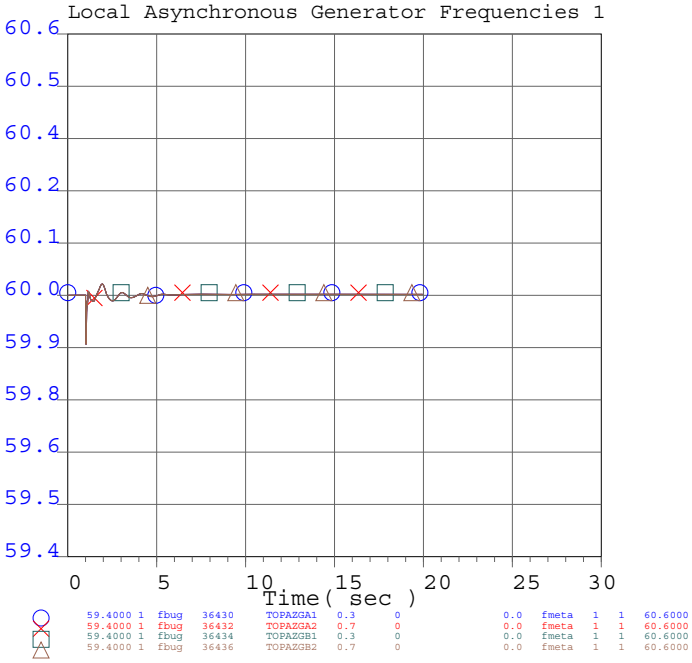
Local Generation Relative Rotor Angles Set 1



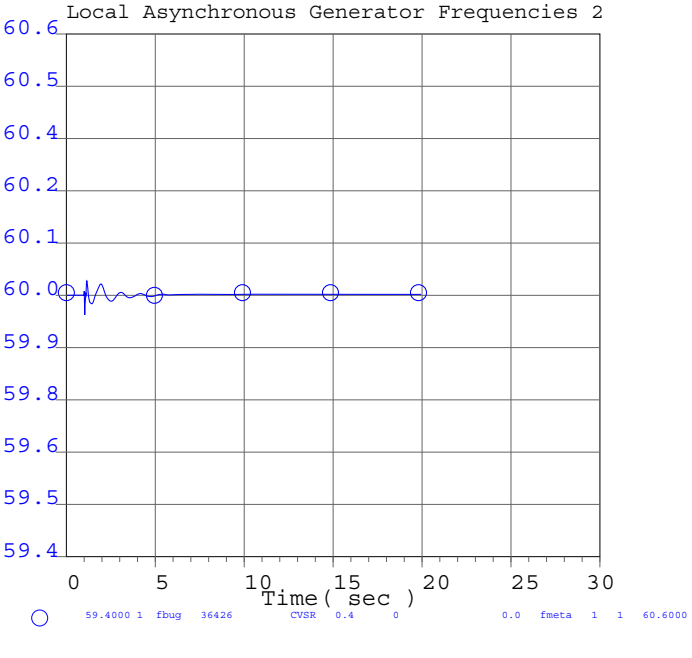
Local Generation Relative Rotor Angles Set 2



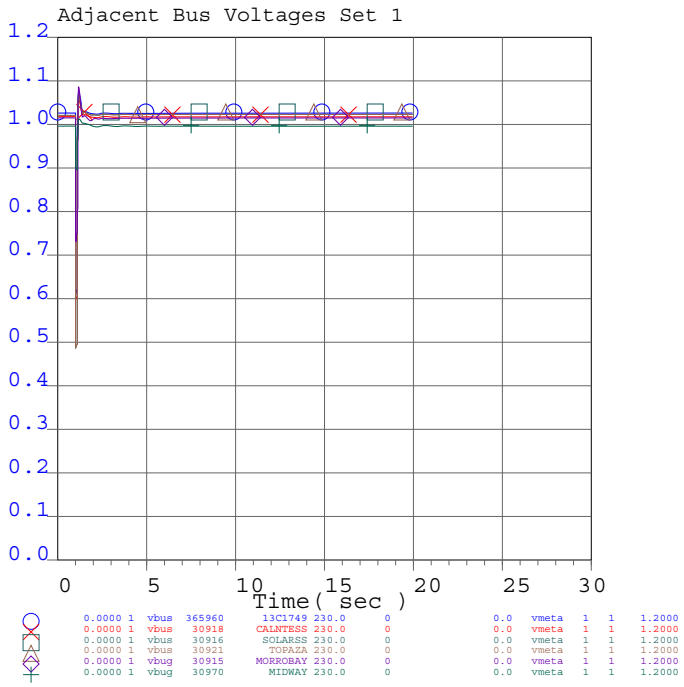
Local Asynchronous Generator Frequencies 1

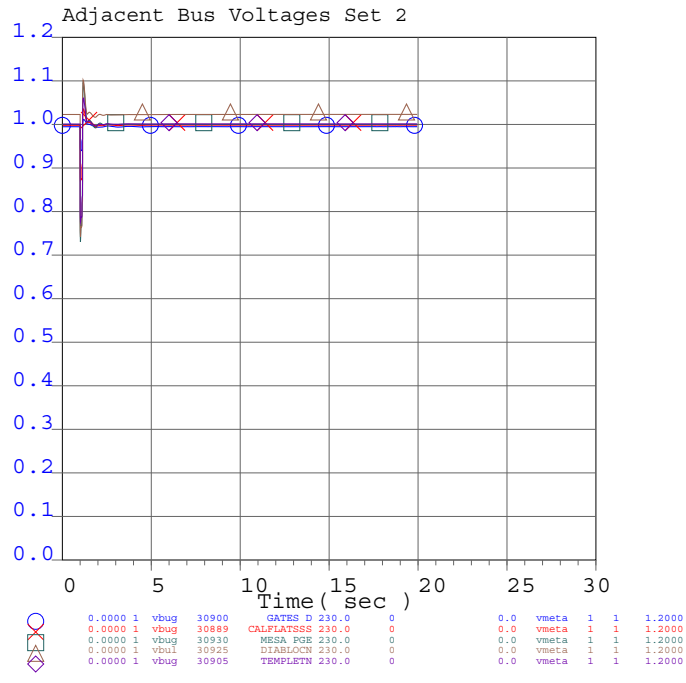


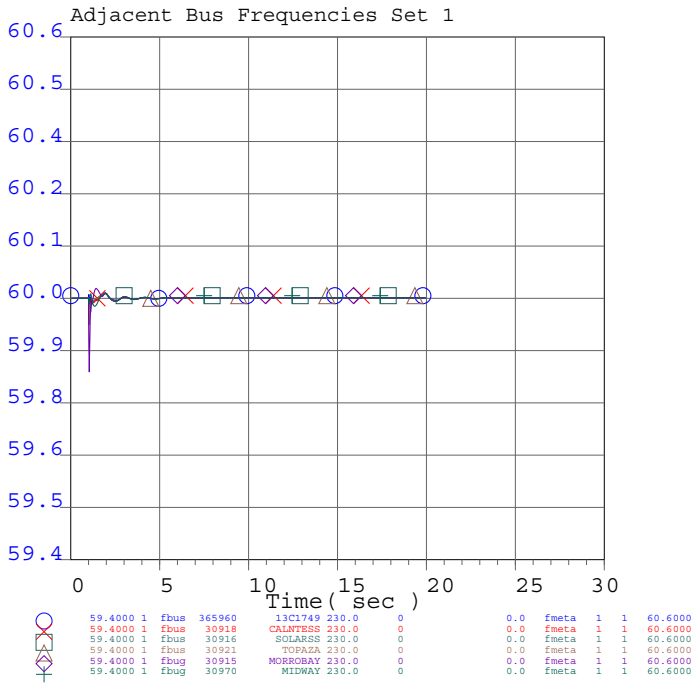
Local Asynchronous Generator Frequencies 2

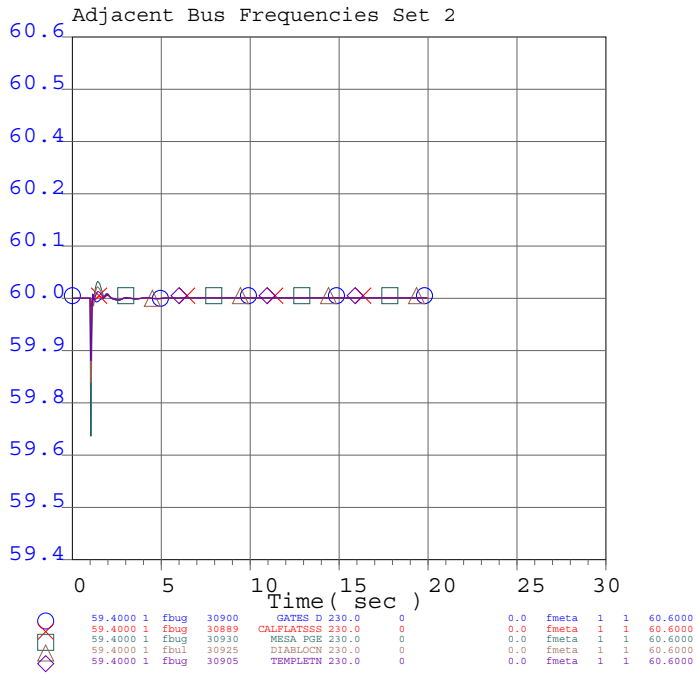


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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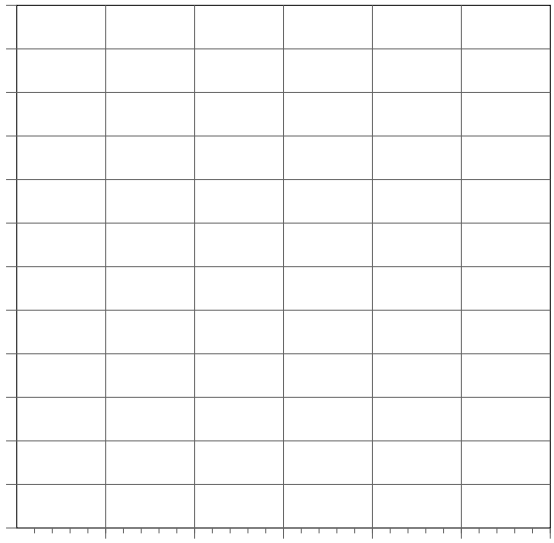
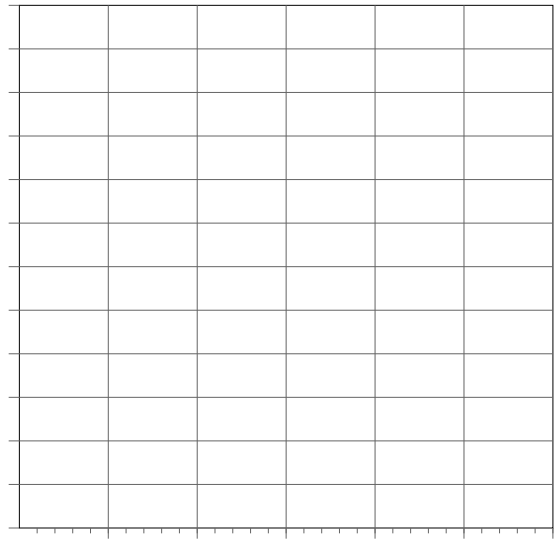
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

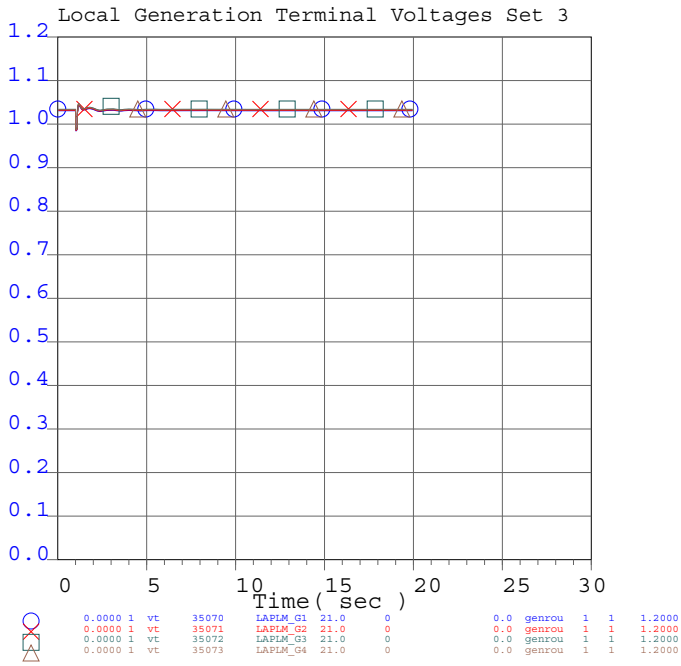
Local Generation Terminal Voltages Set 1



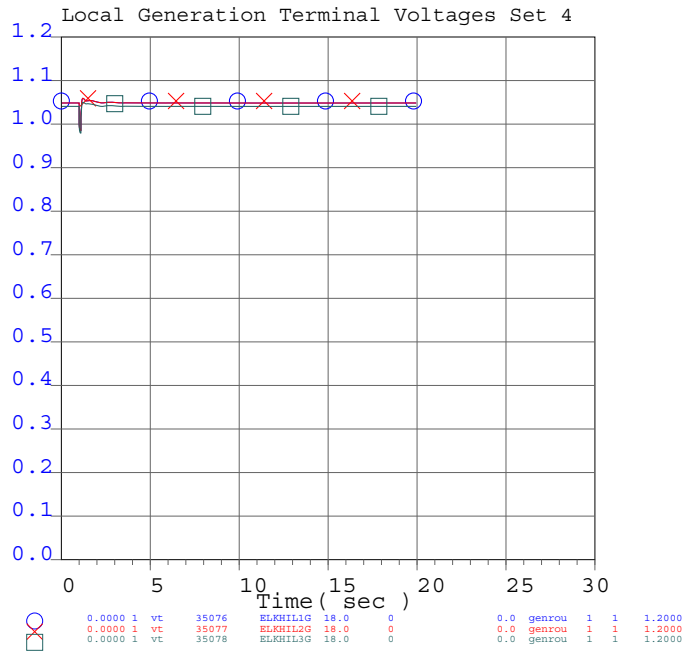
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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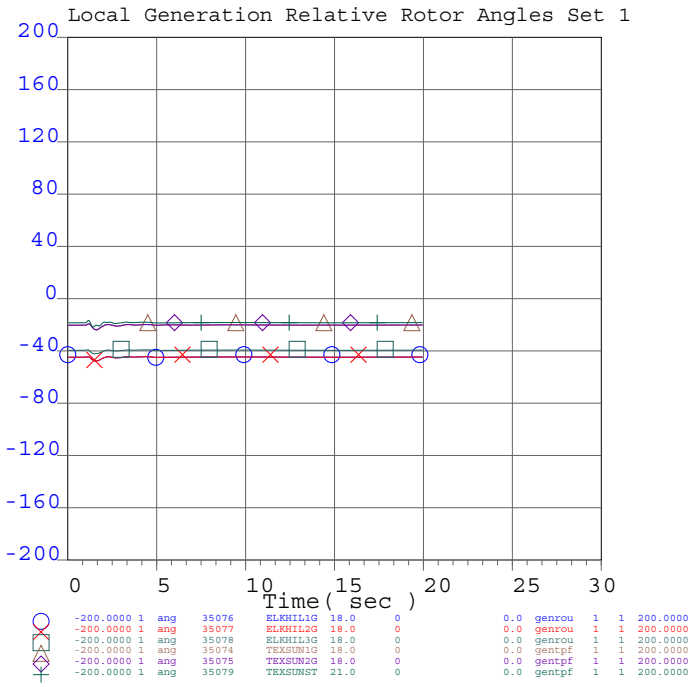
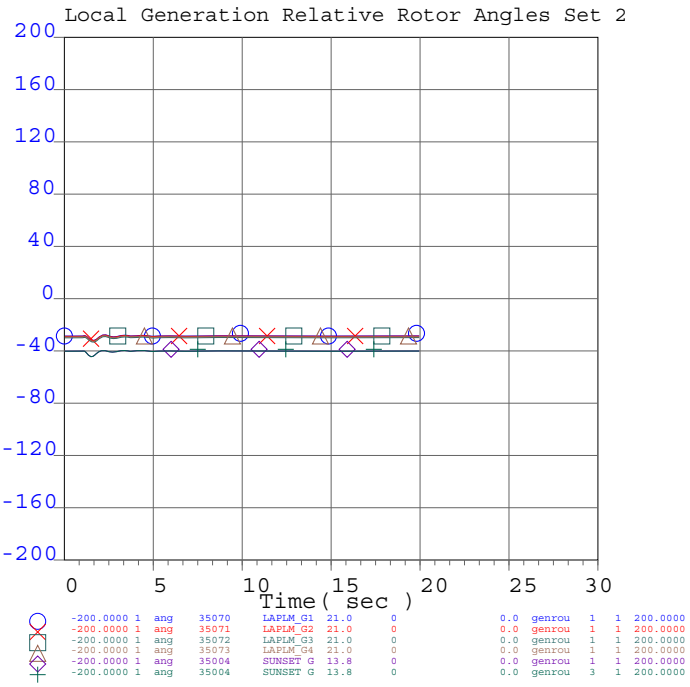
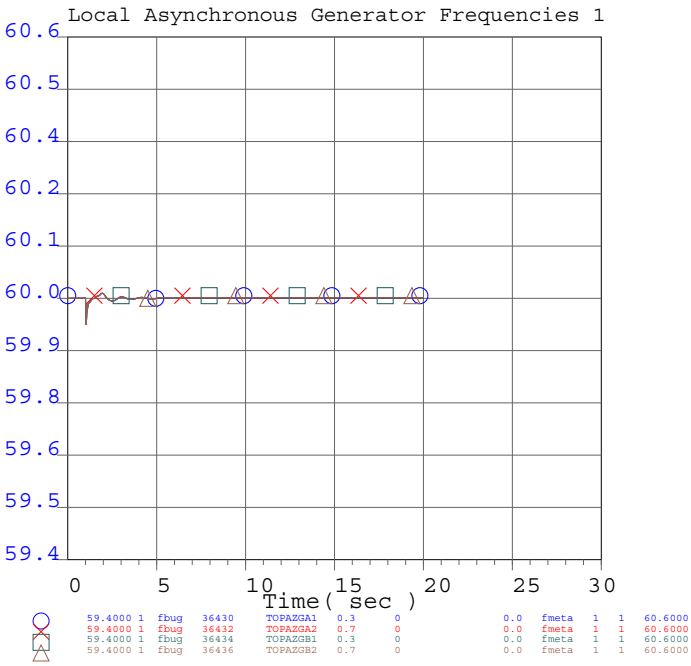
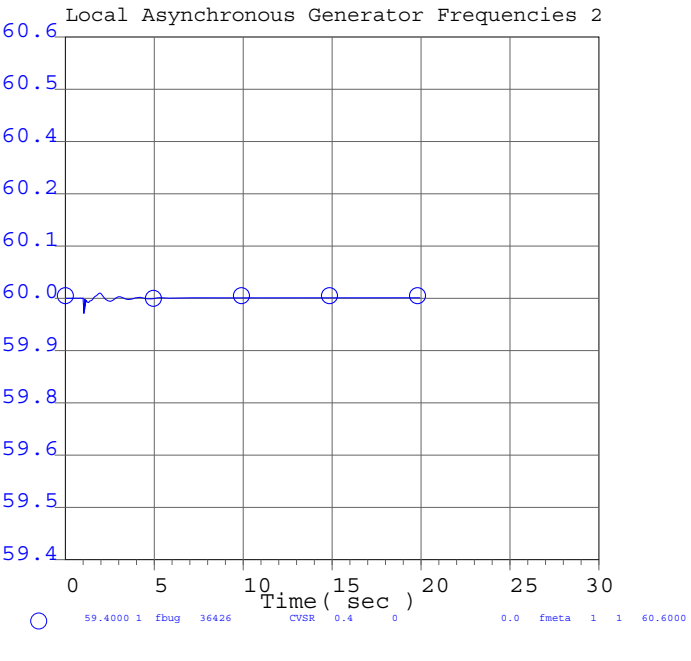
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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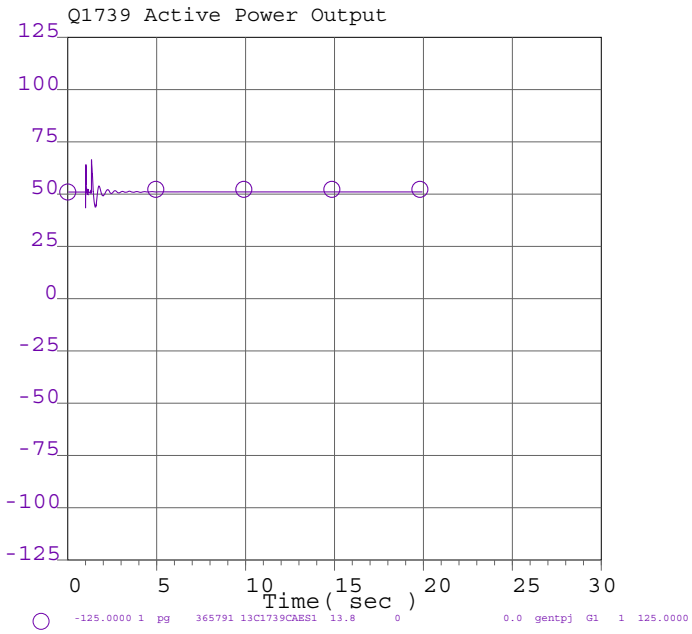
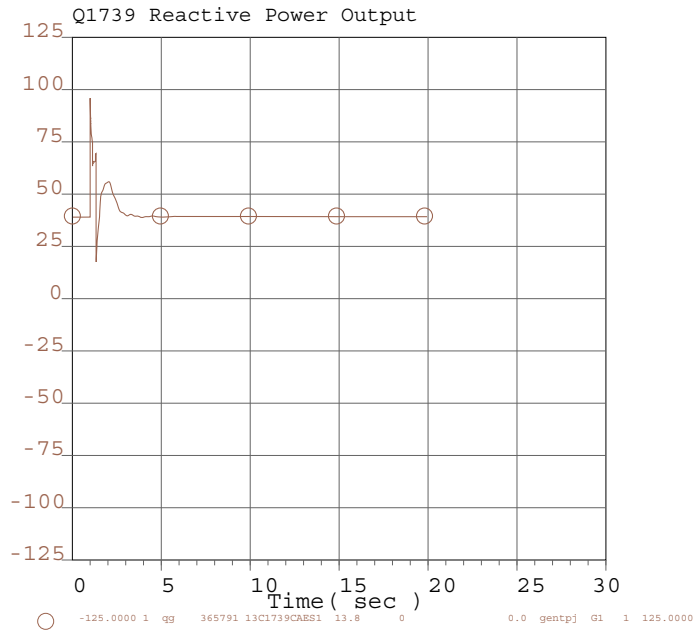
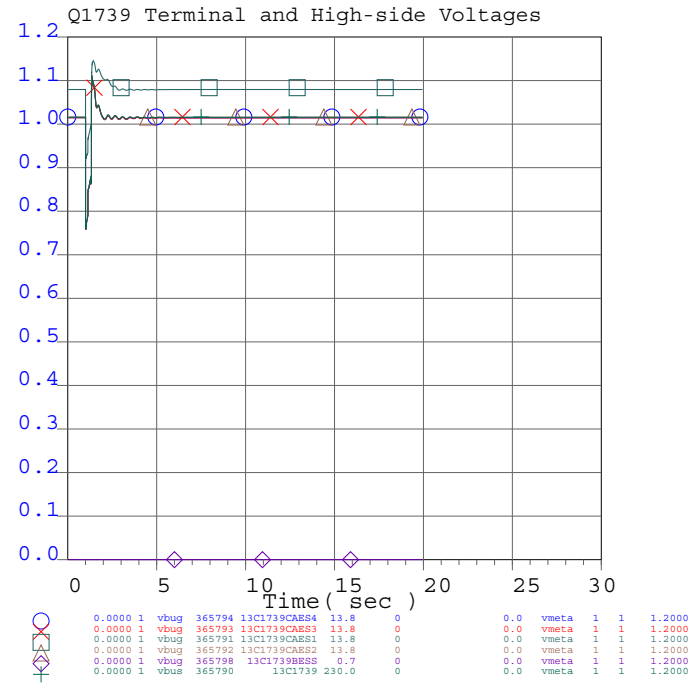
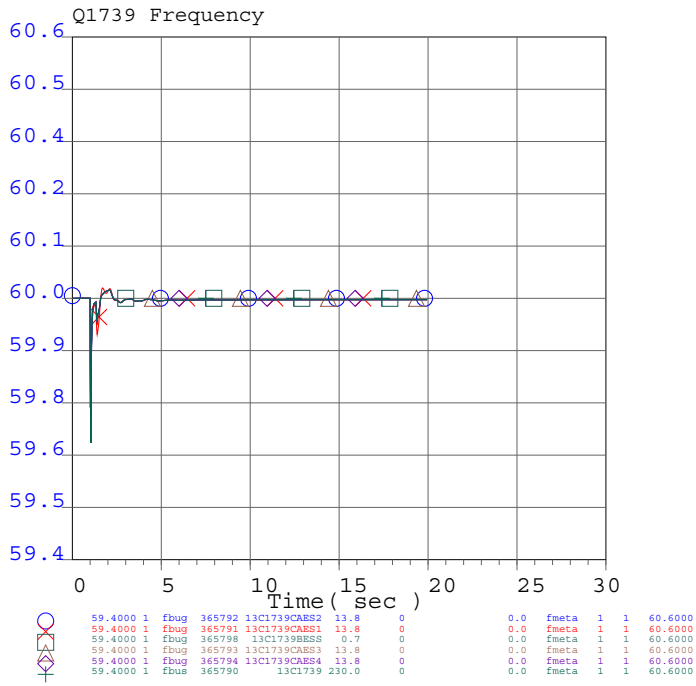
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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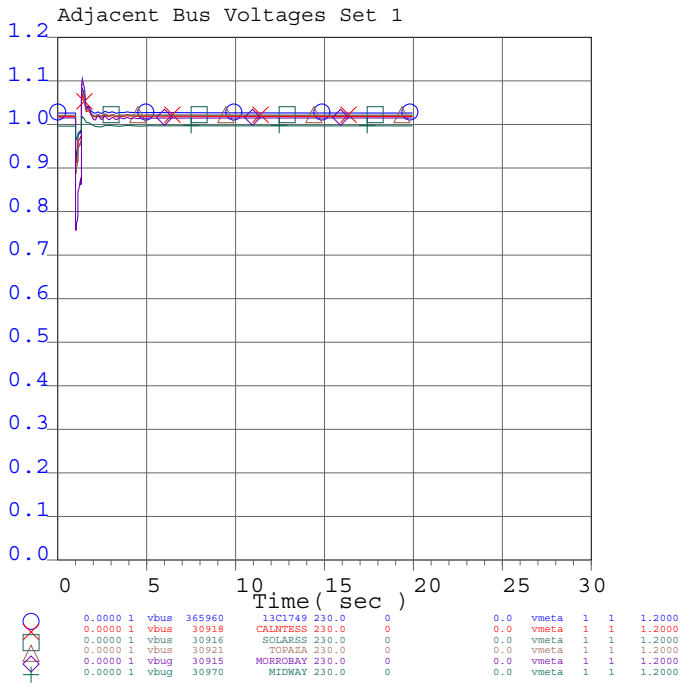

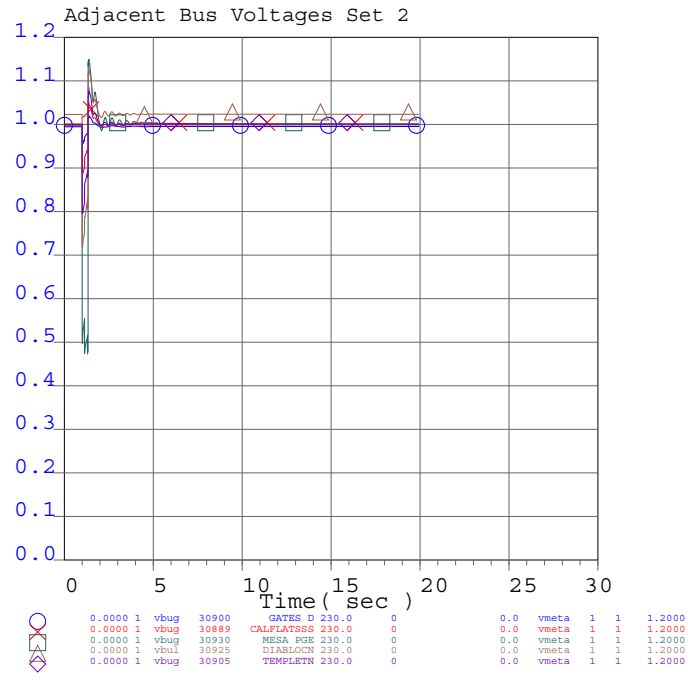

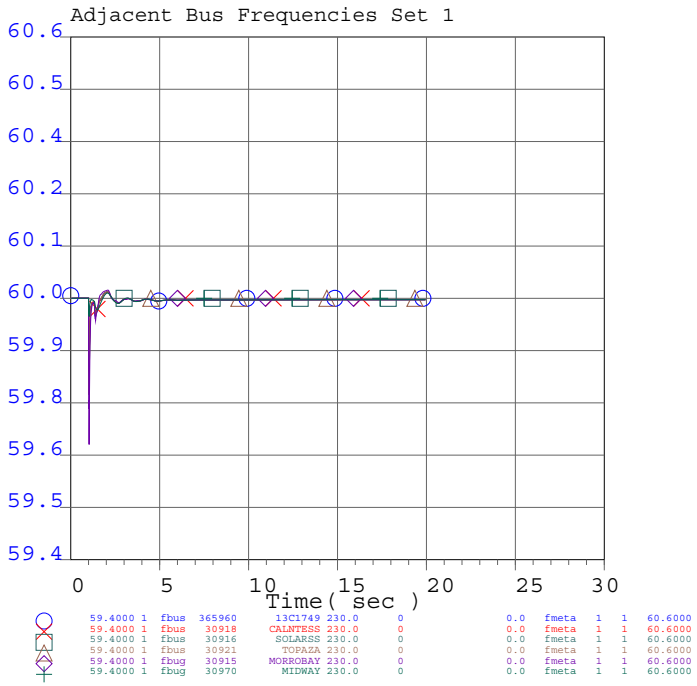

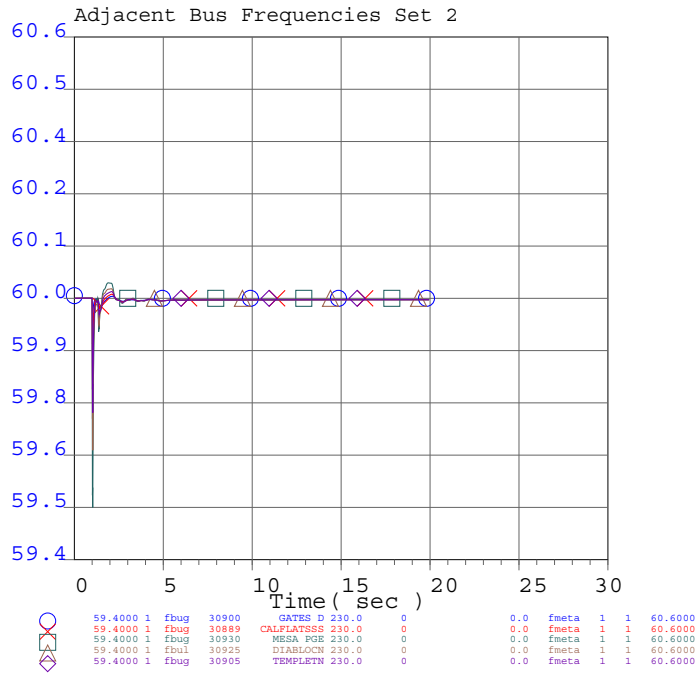

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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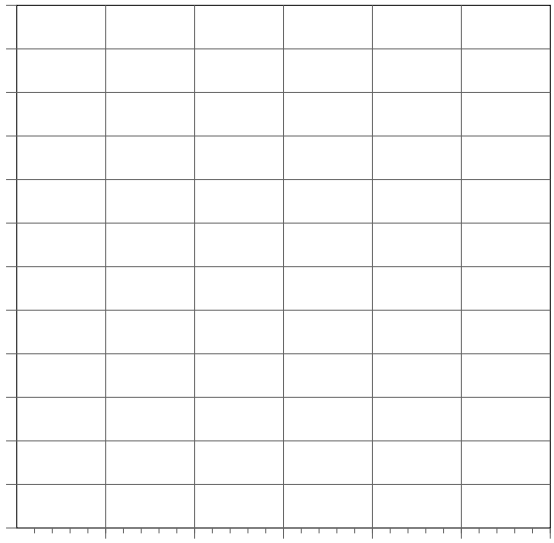
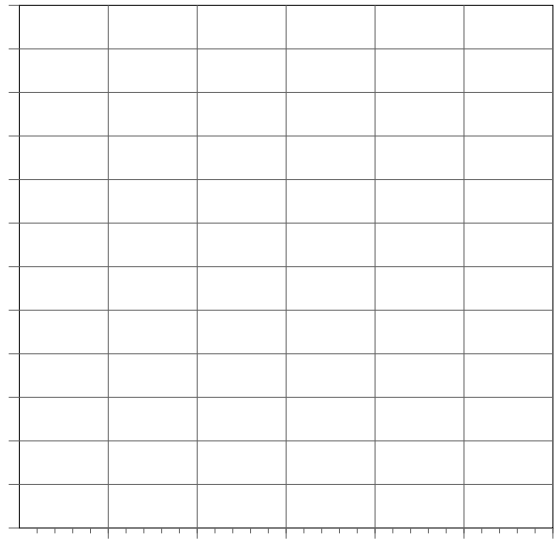
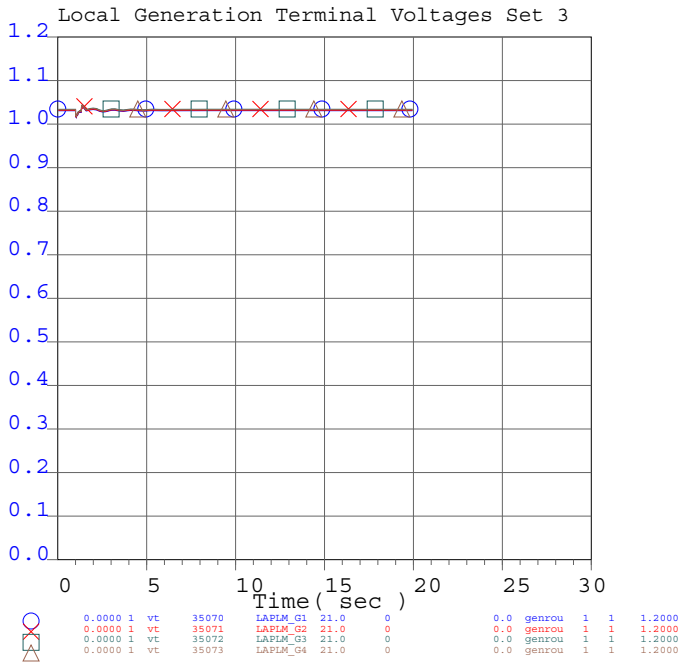
Local Generation Terminal Voltages Set 1



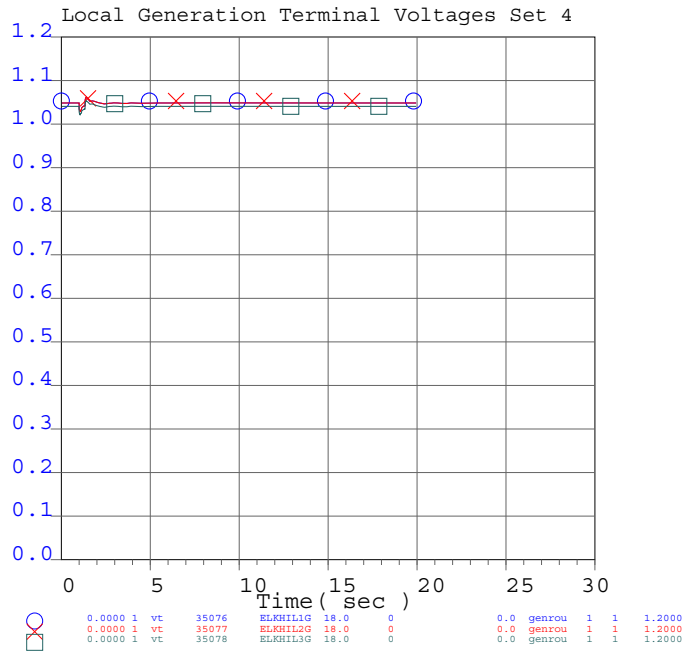
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



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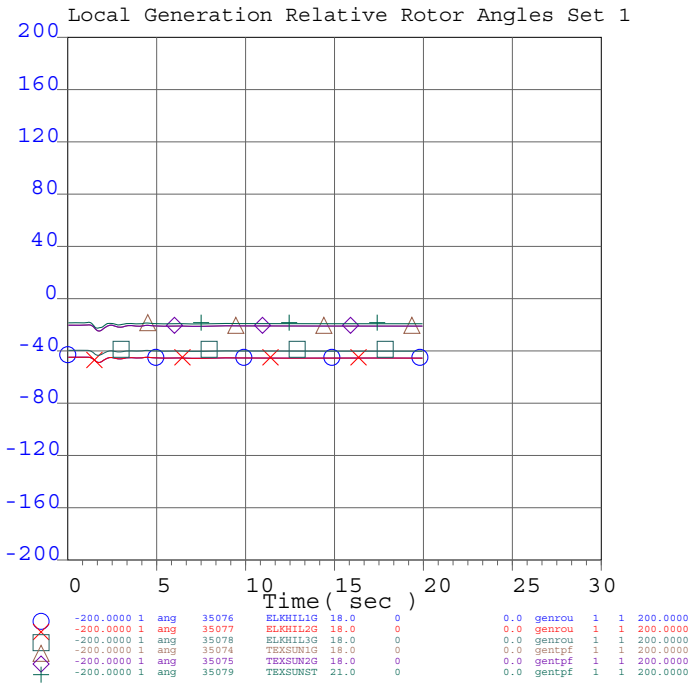

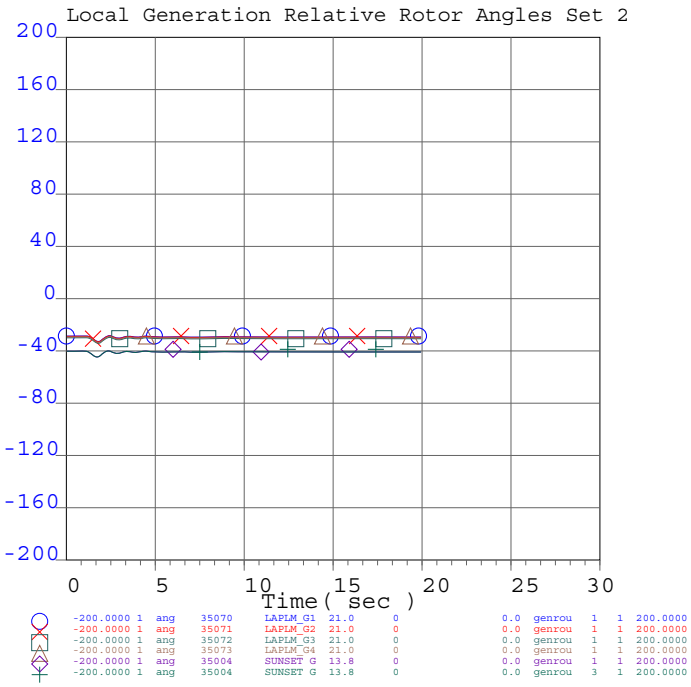

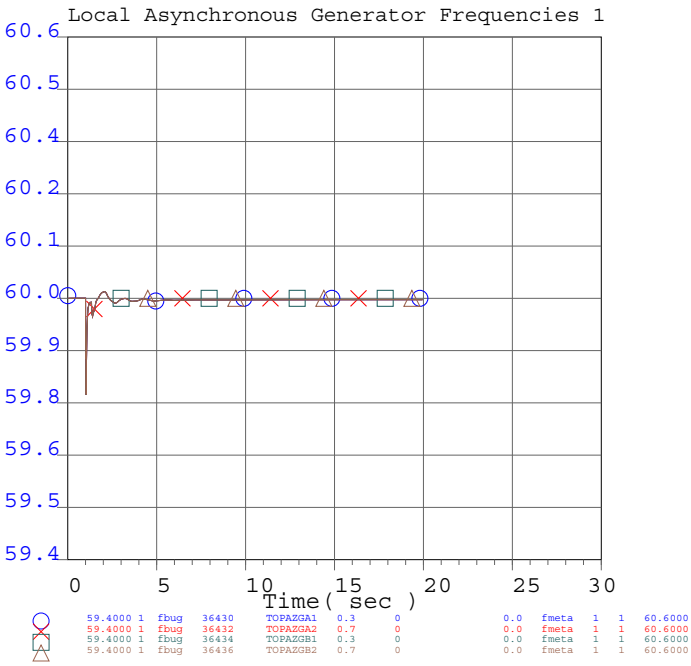

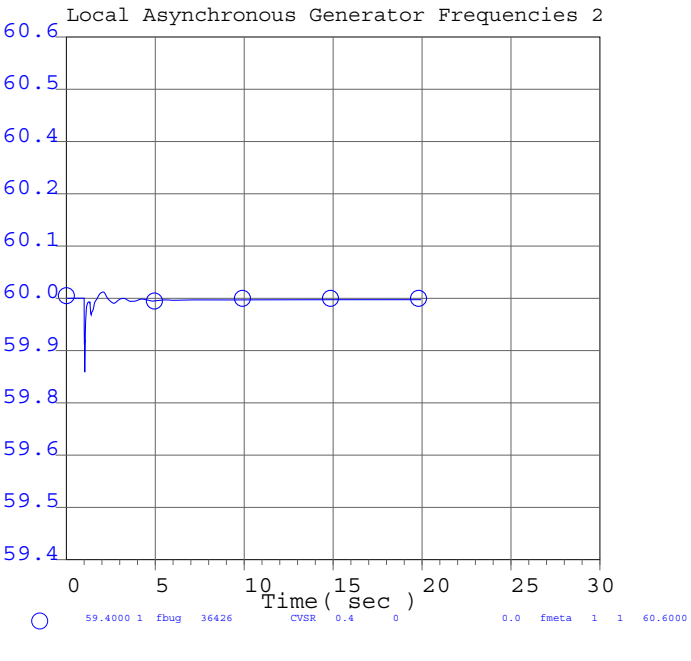

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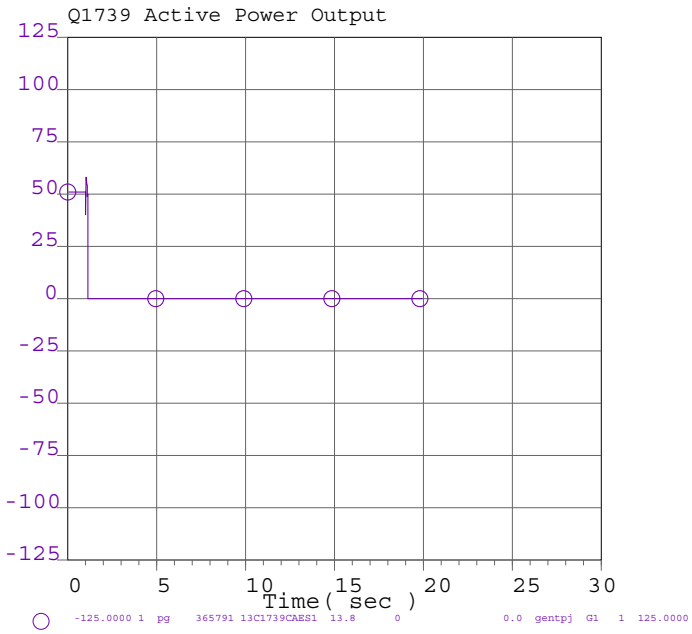
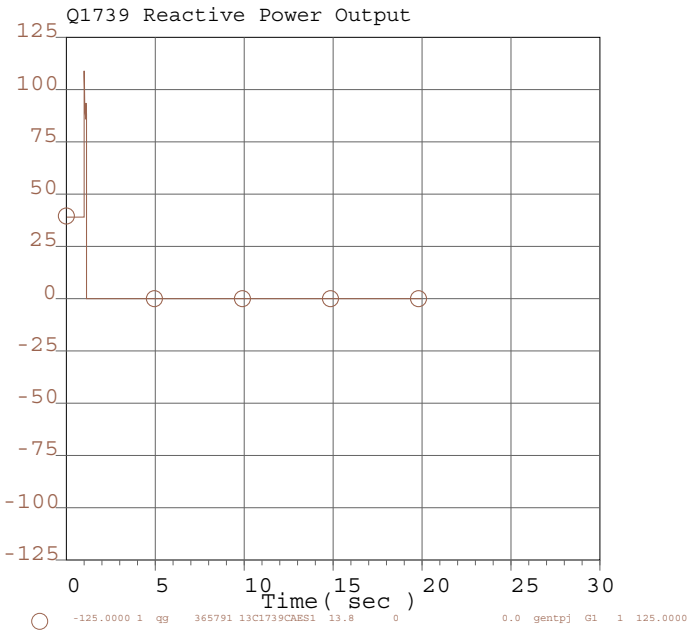
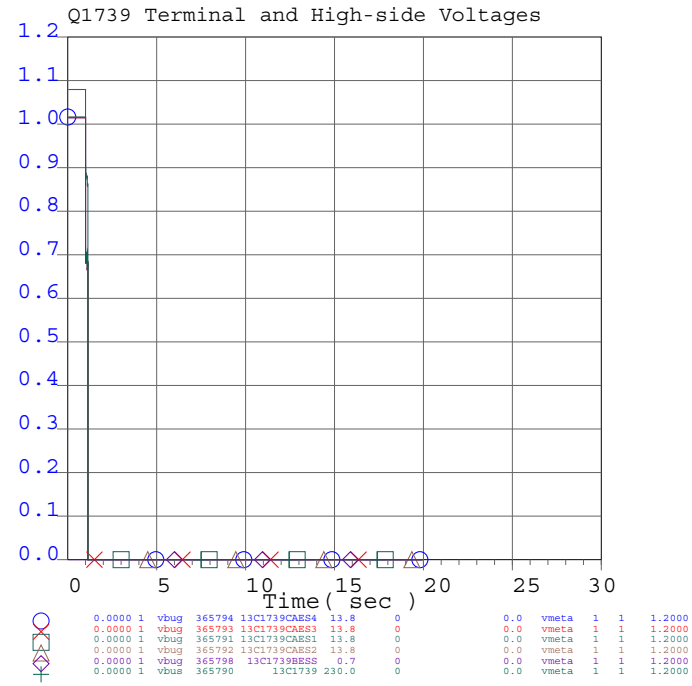
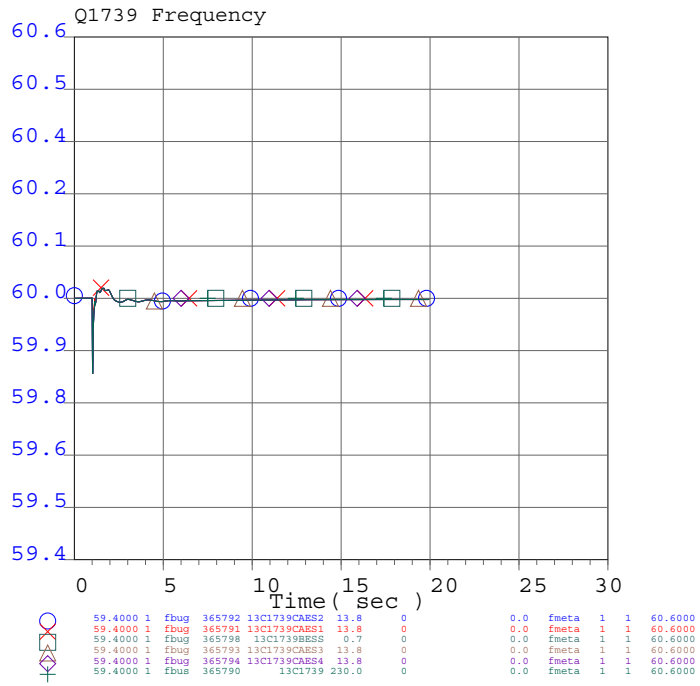
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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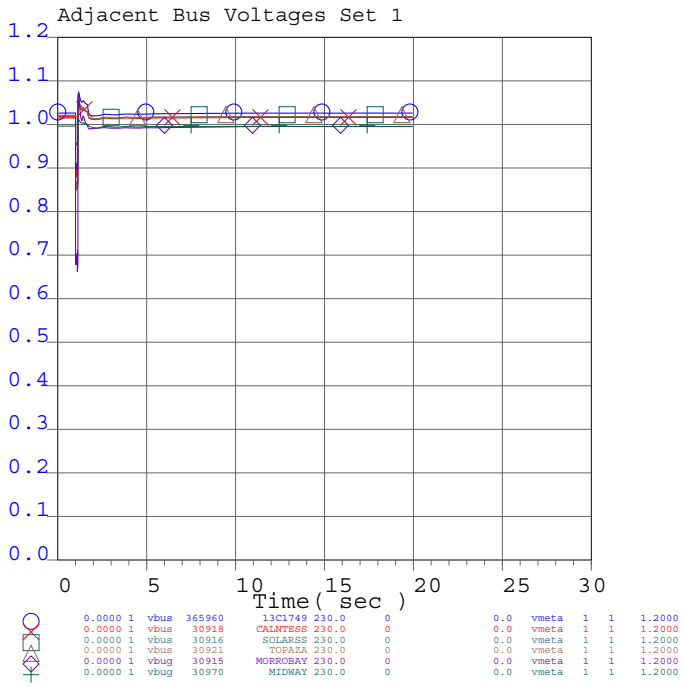

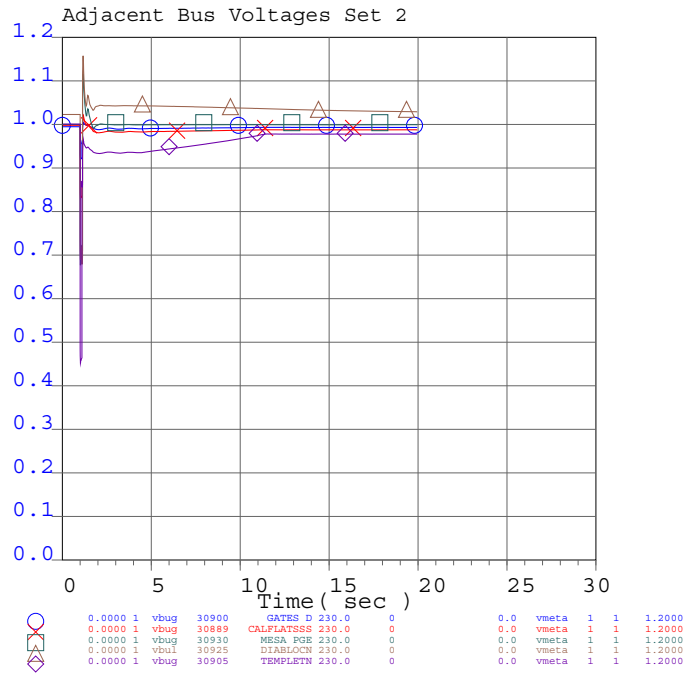

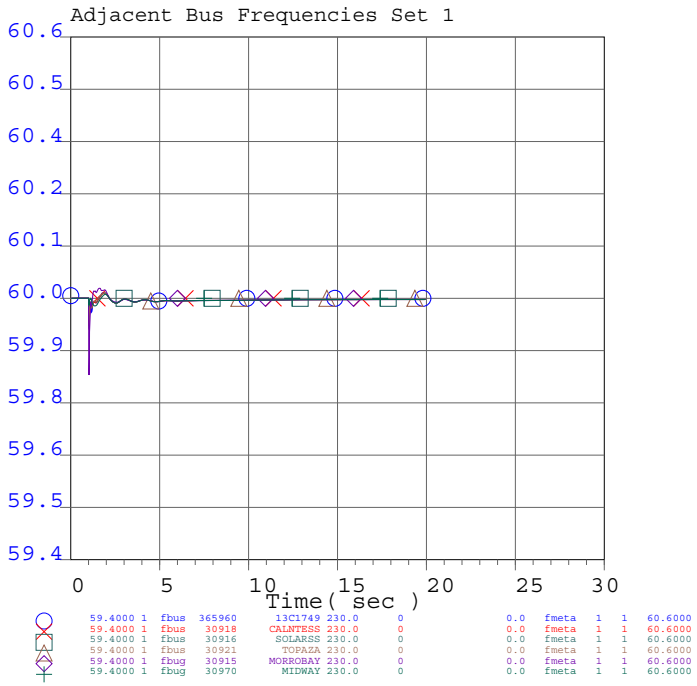

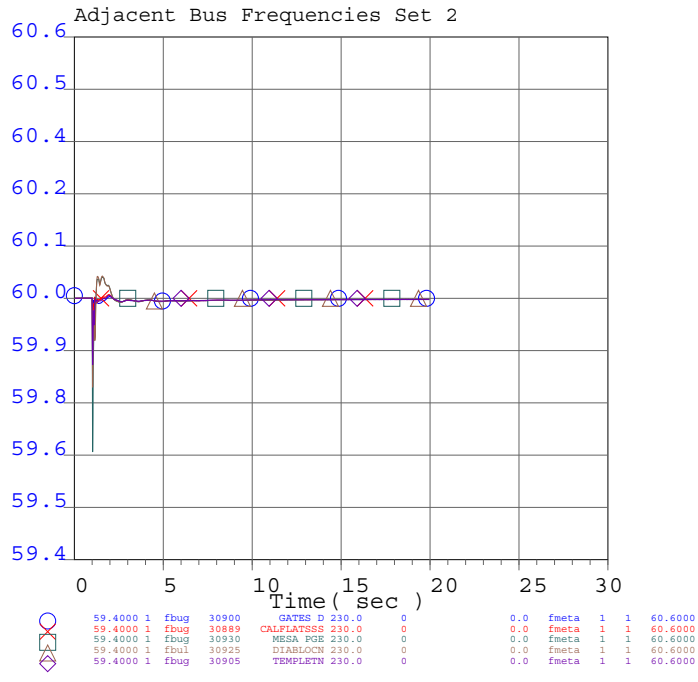

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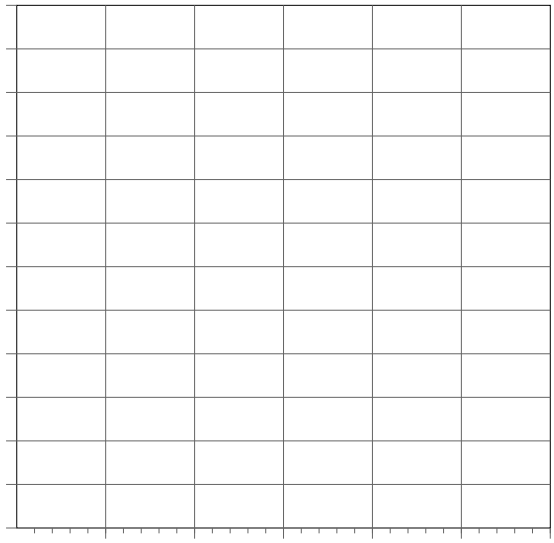
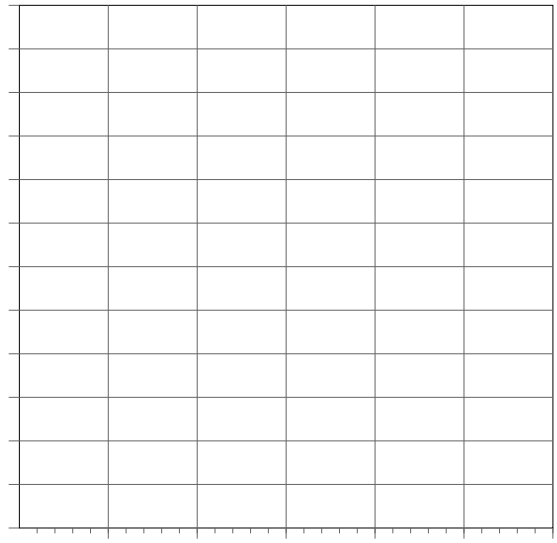
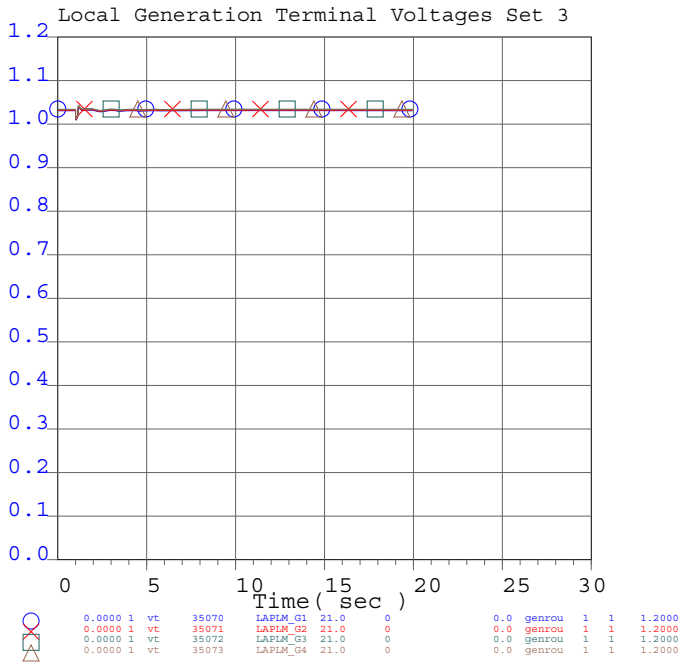
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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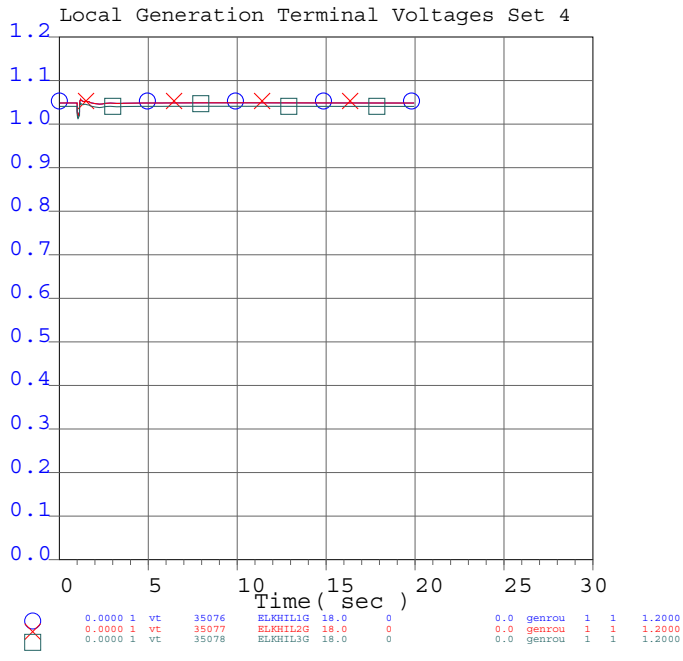
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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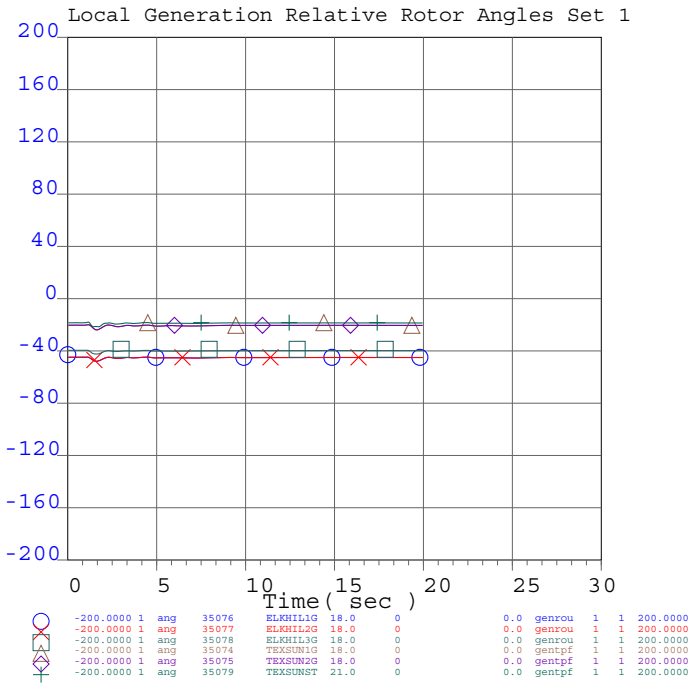

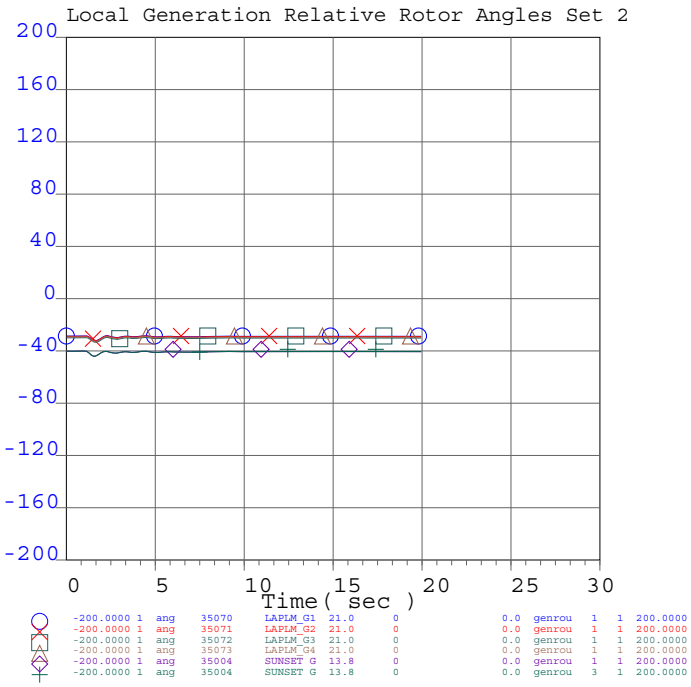

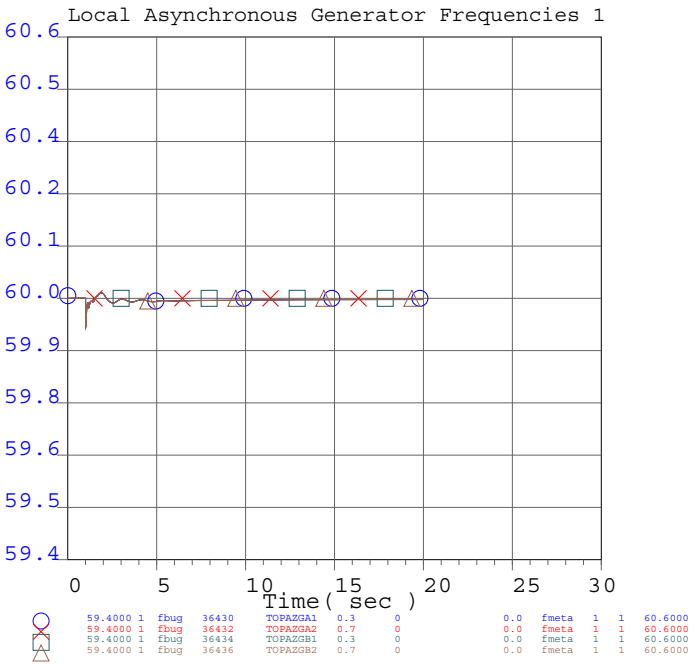

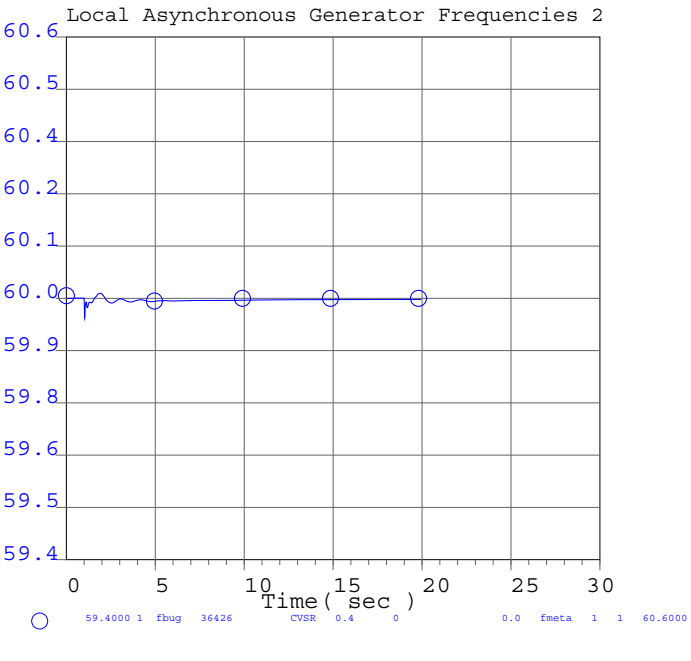

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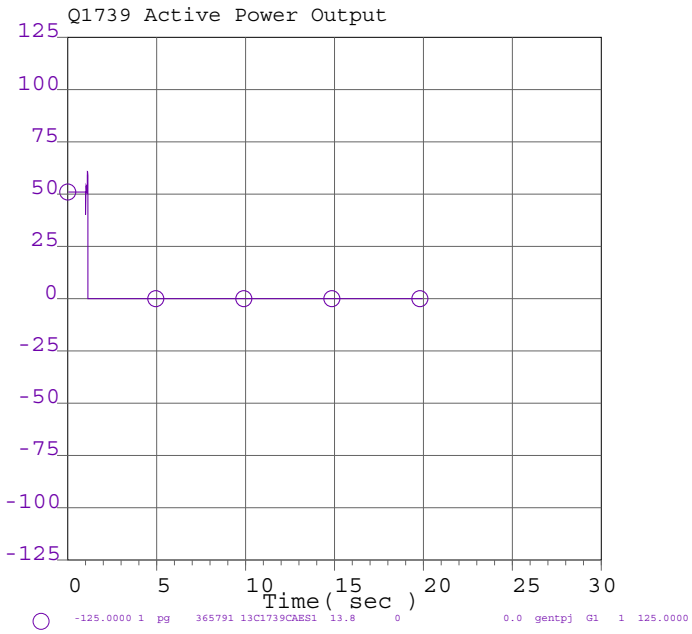
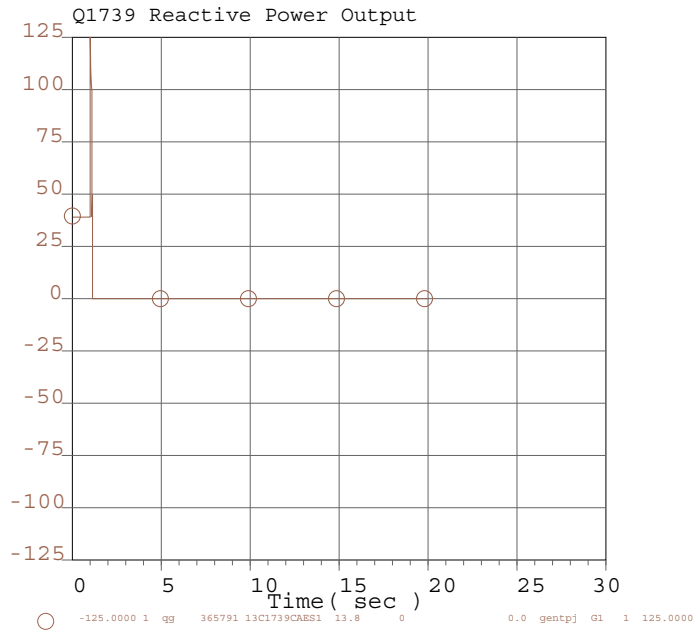
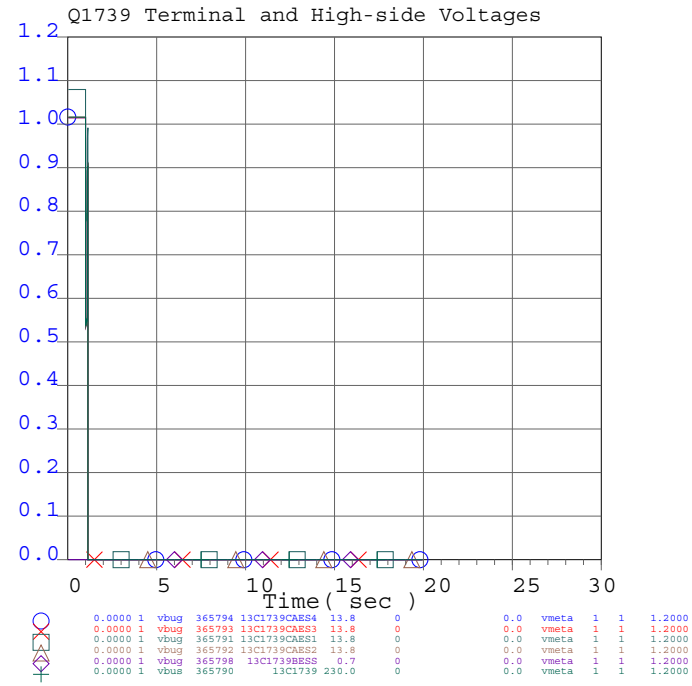
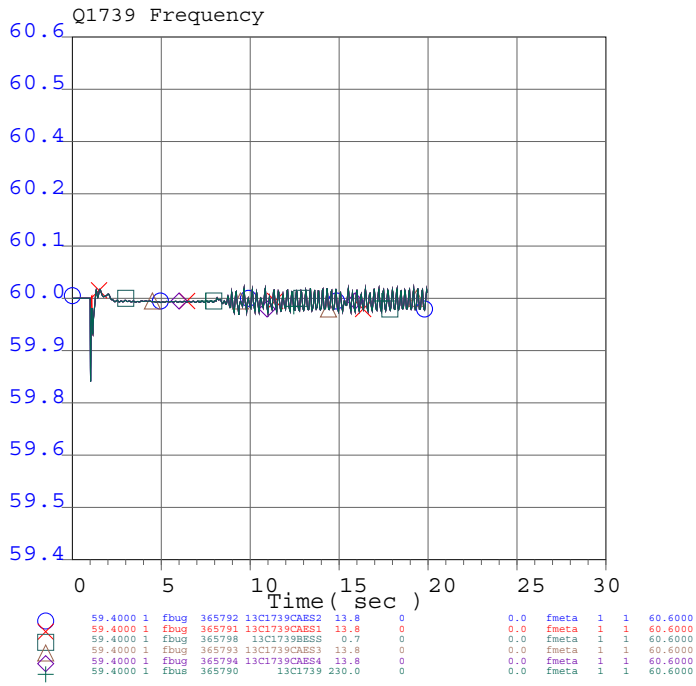
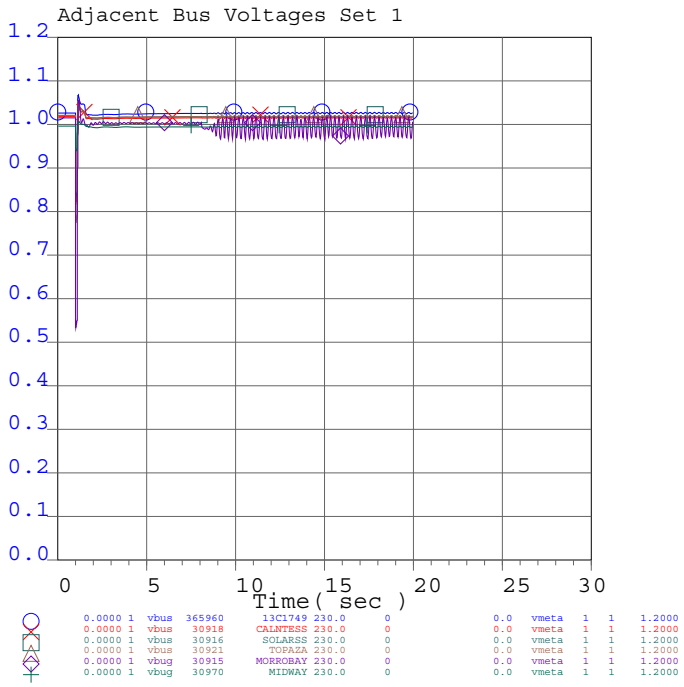


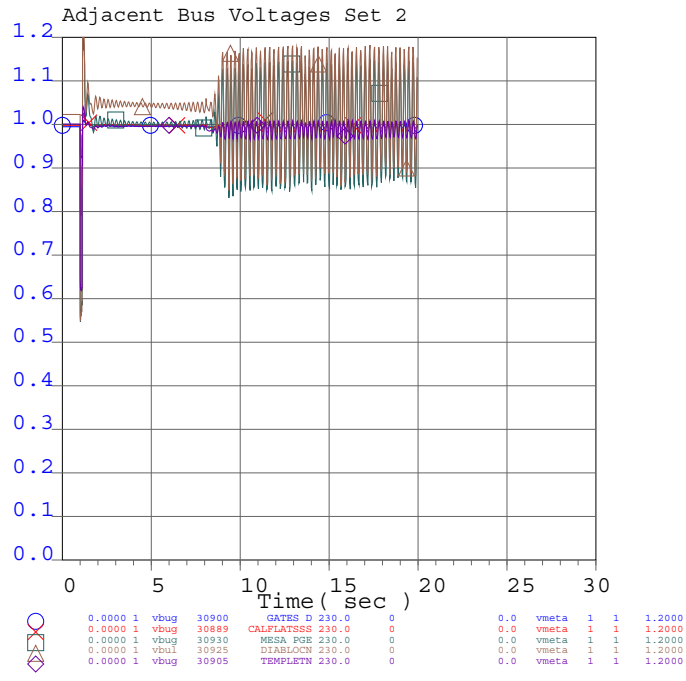


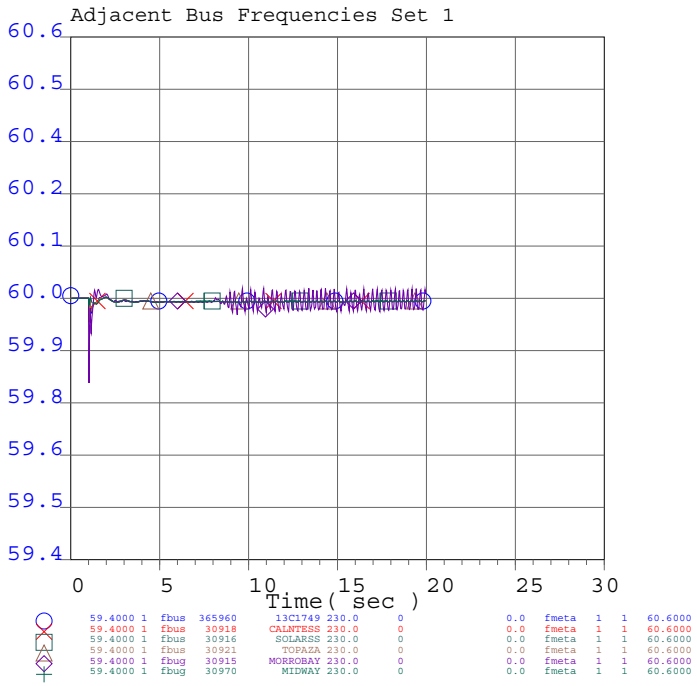


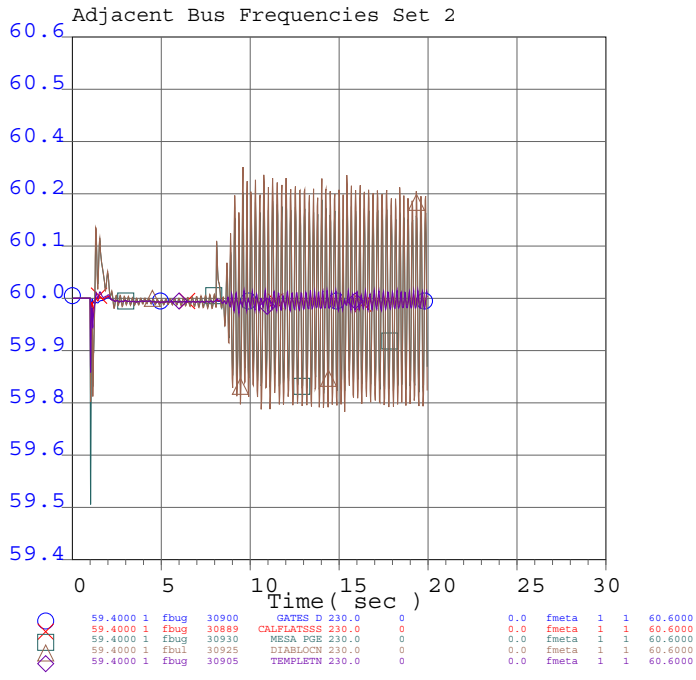


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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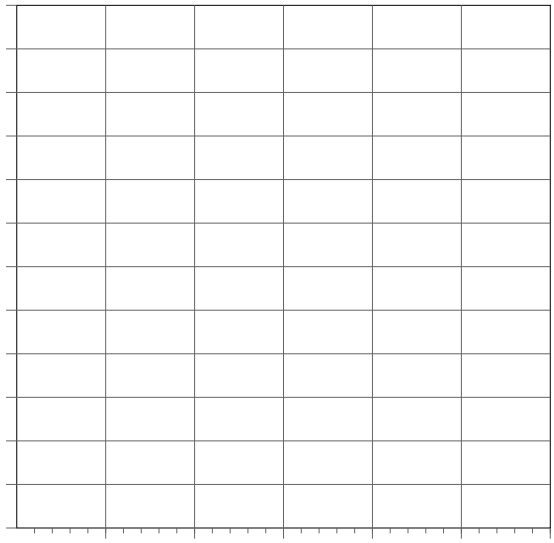
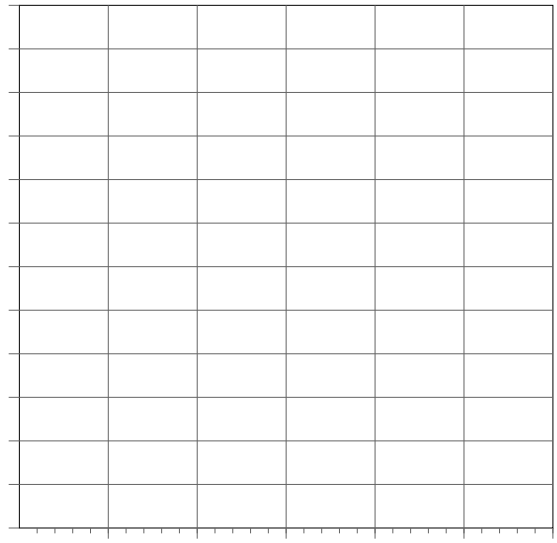
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

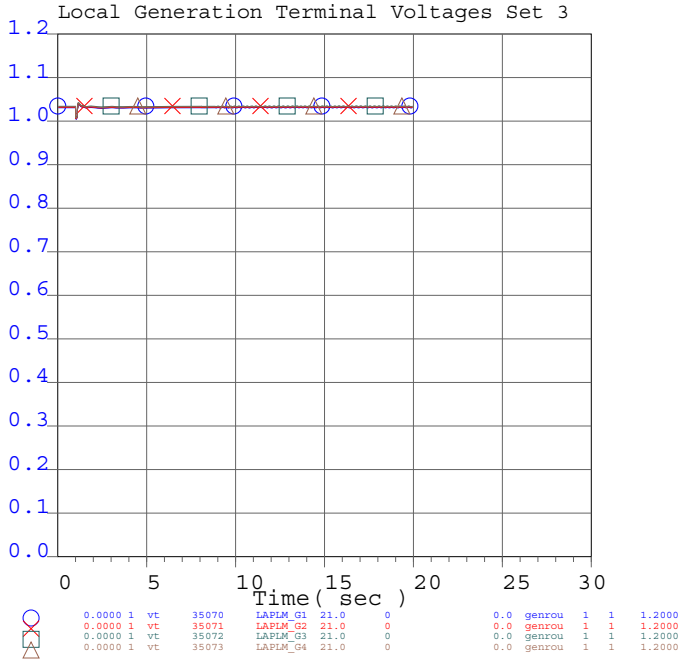
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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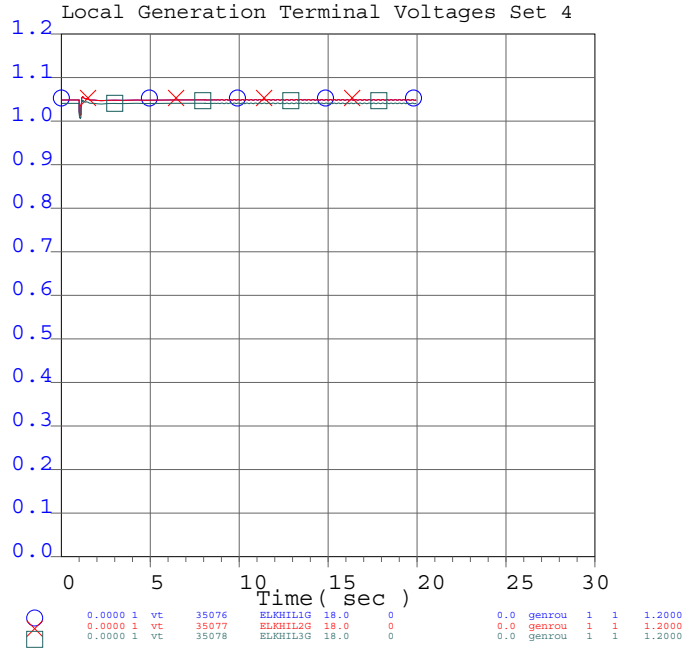
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



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0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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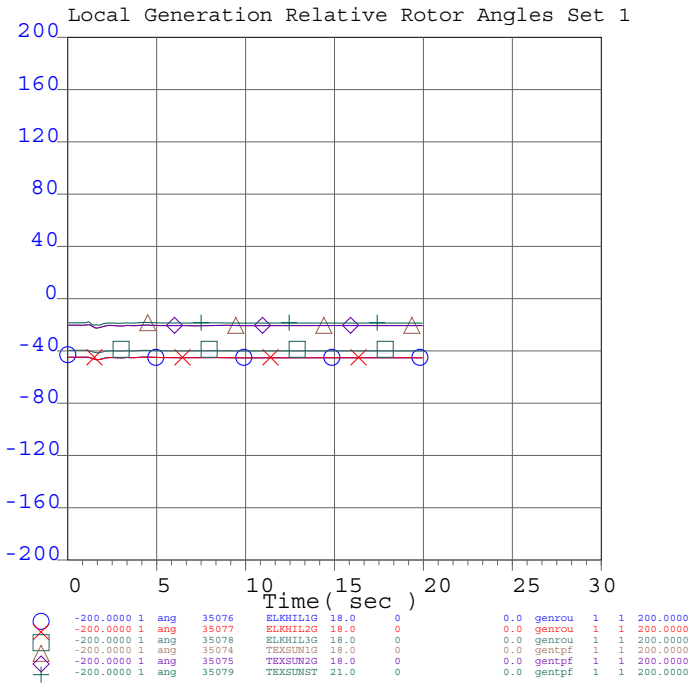
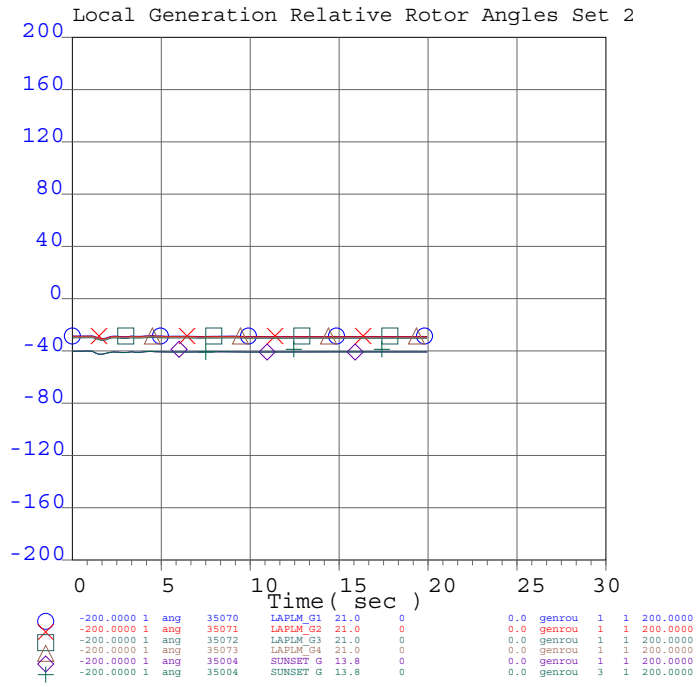
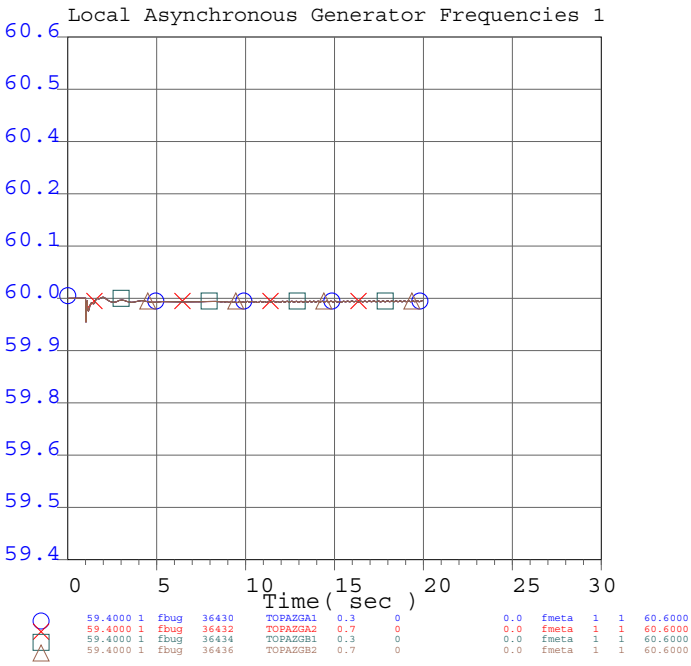
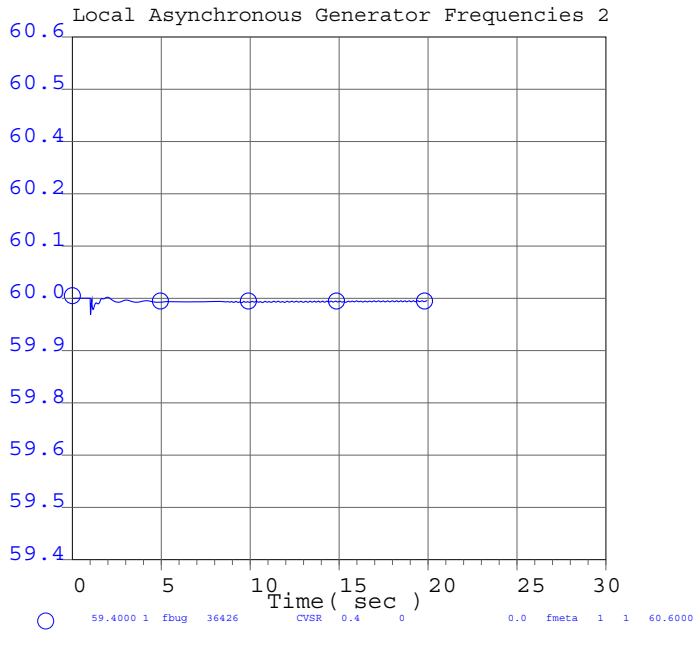
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



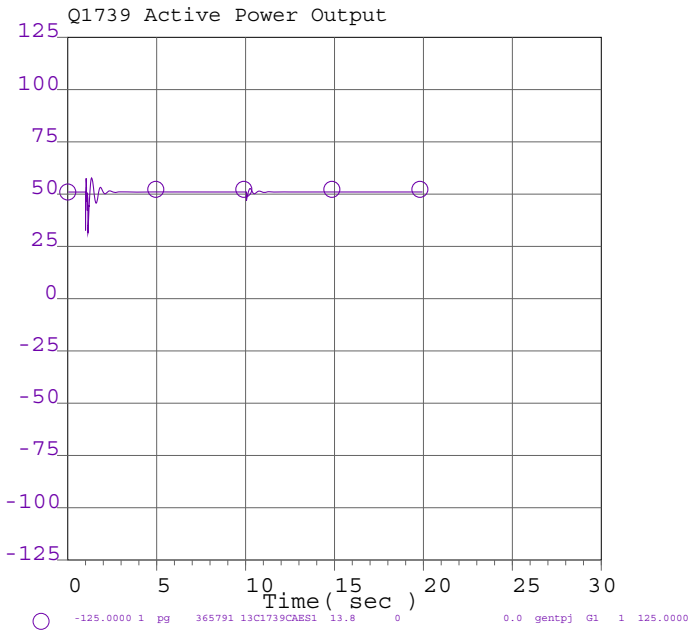


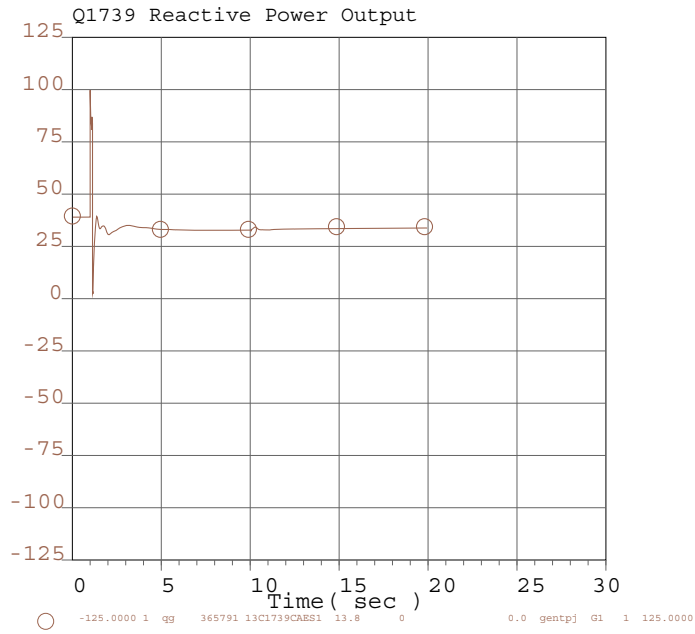


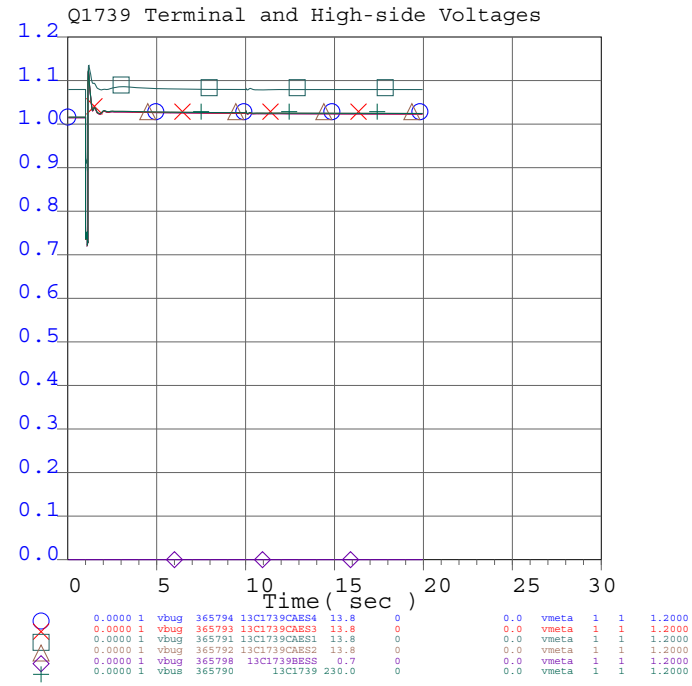


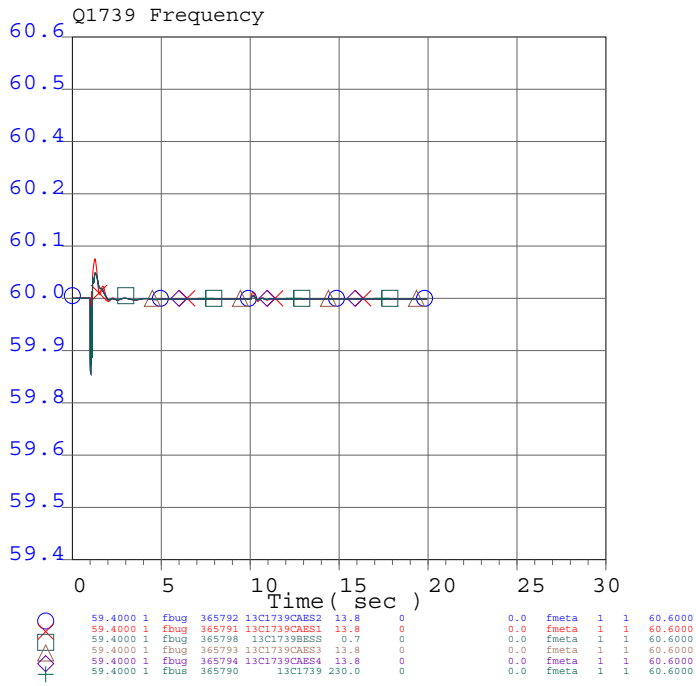
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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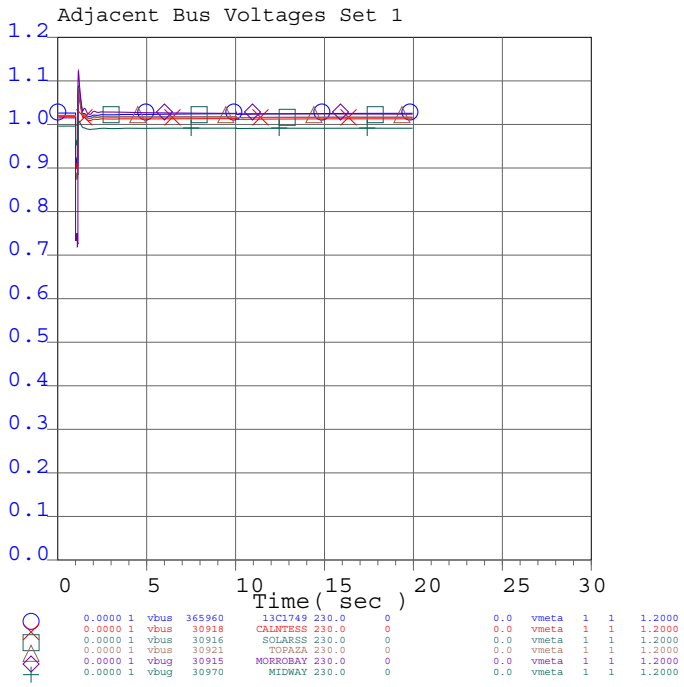
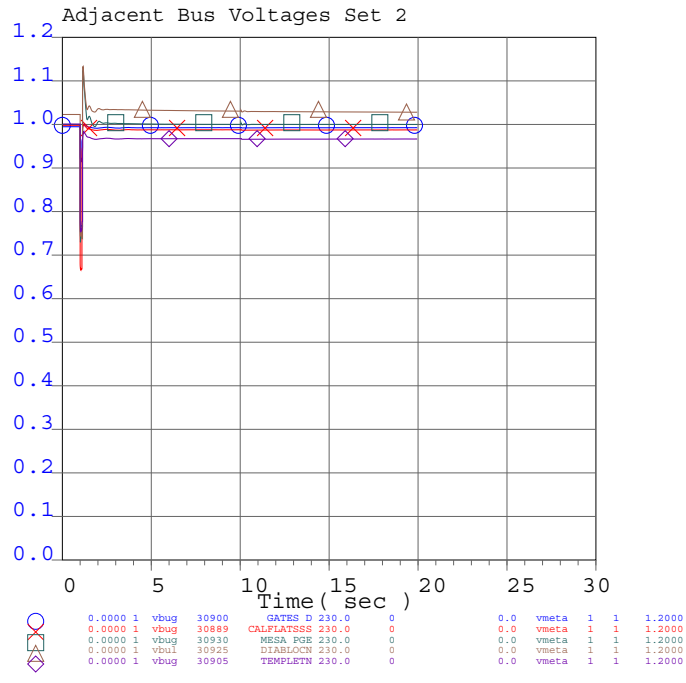
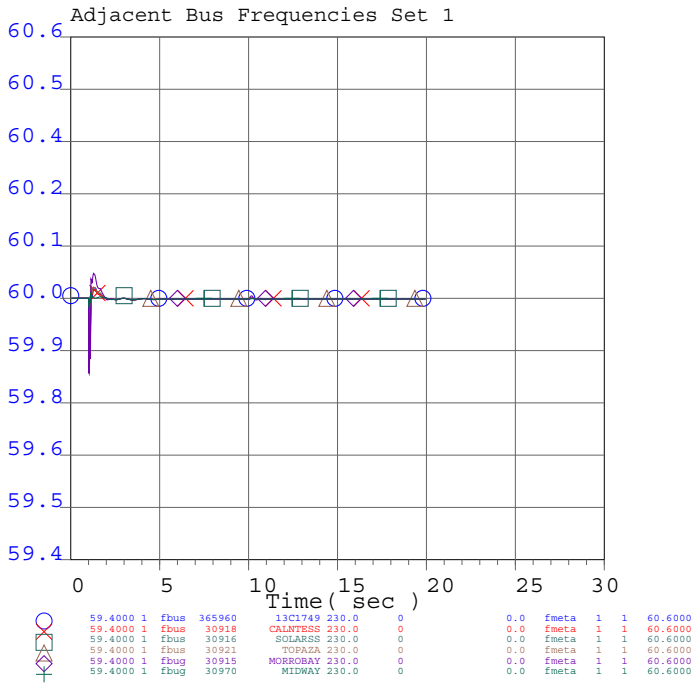
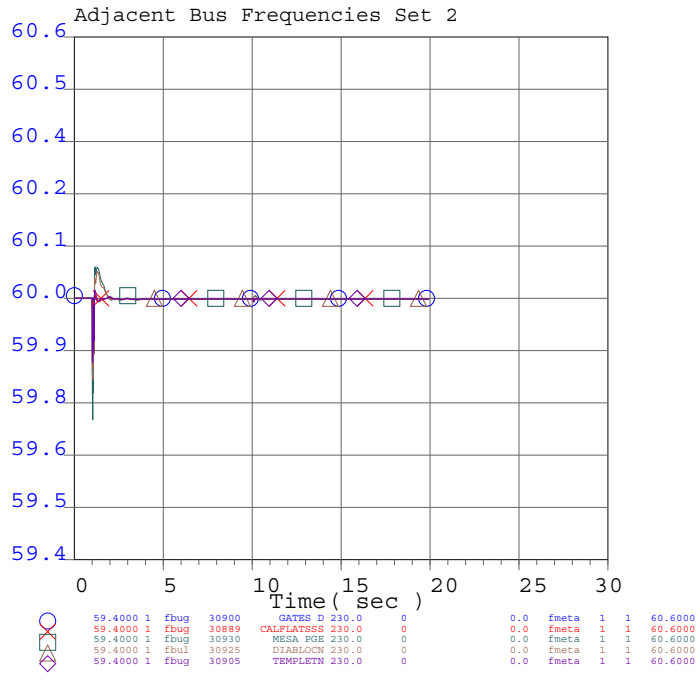
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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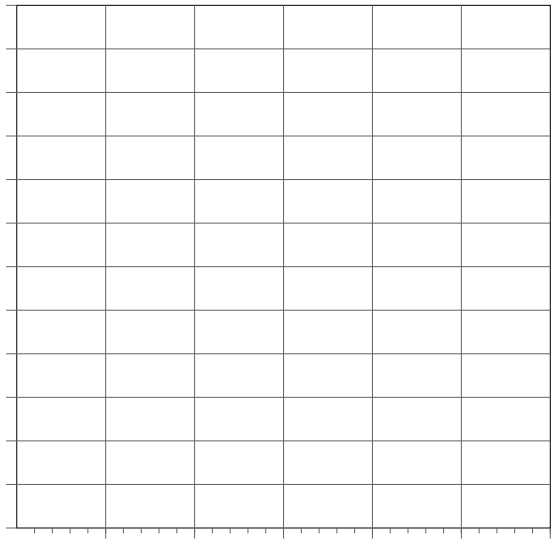
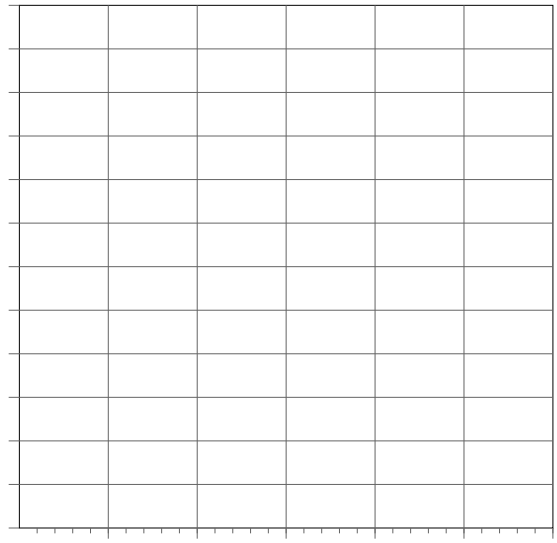
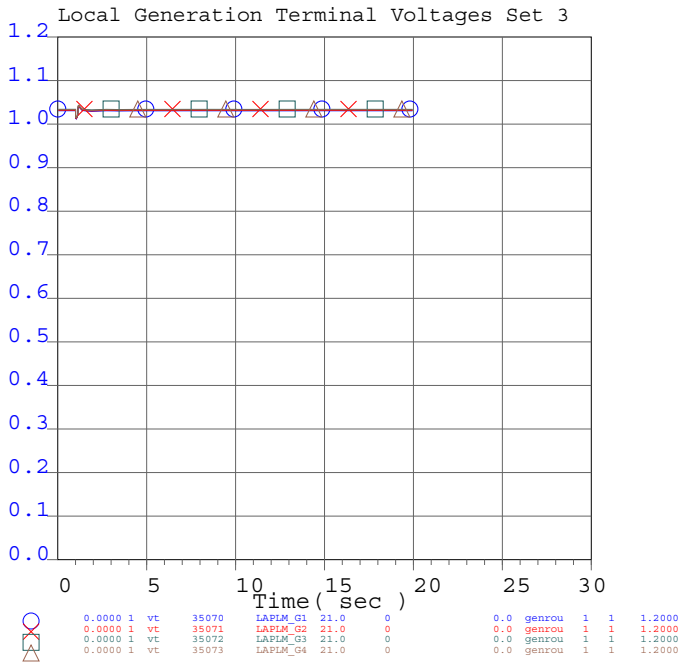
Local Generation Terminal Voltages Set 1



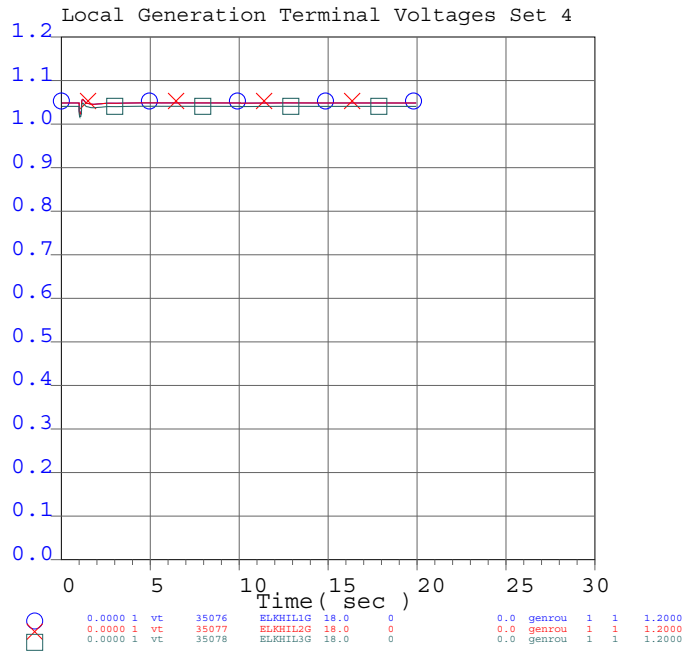
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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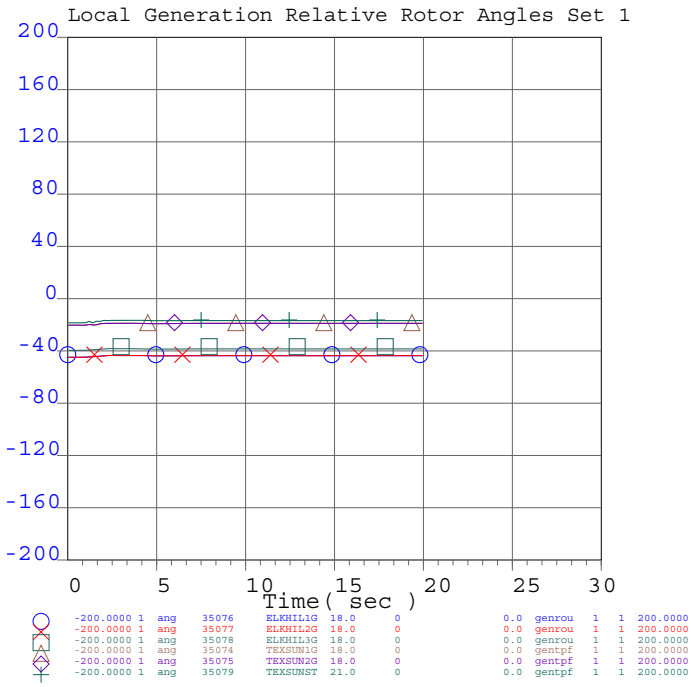

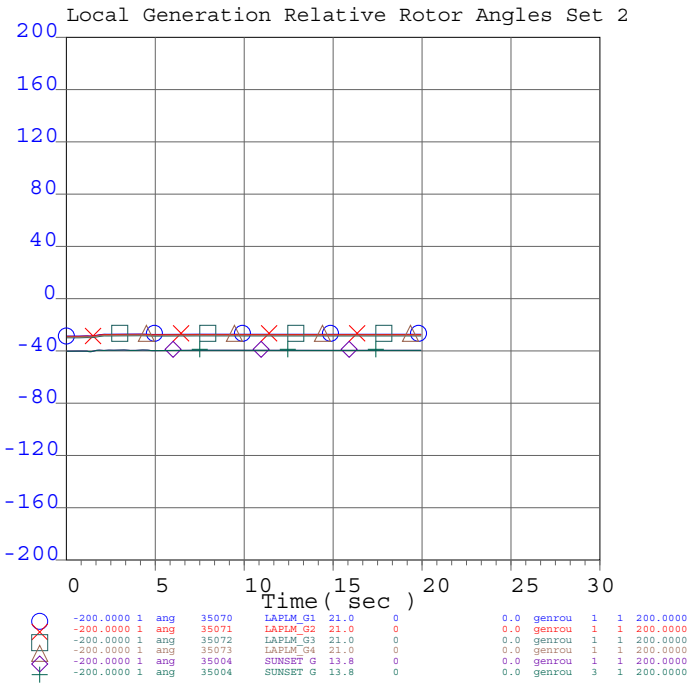

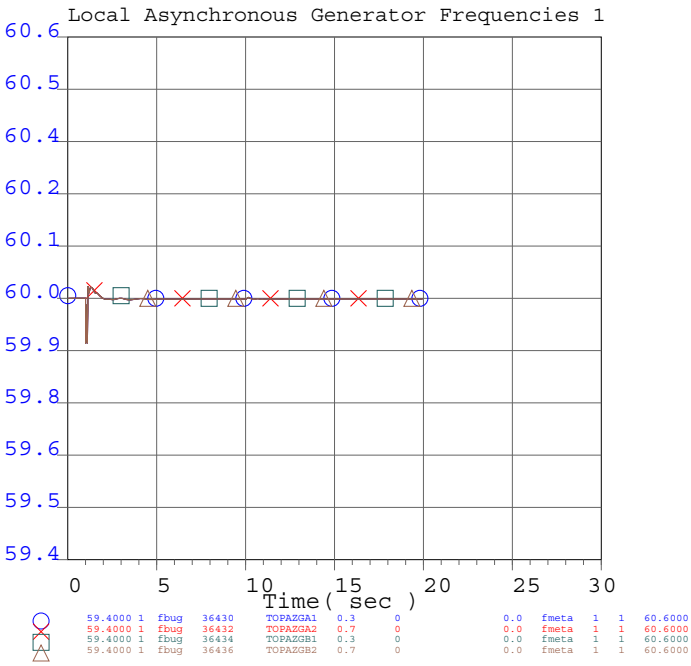

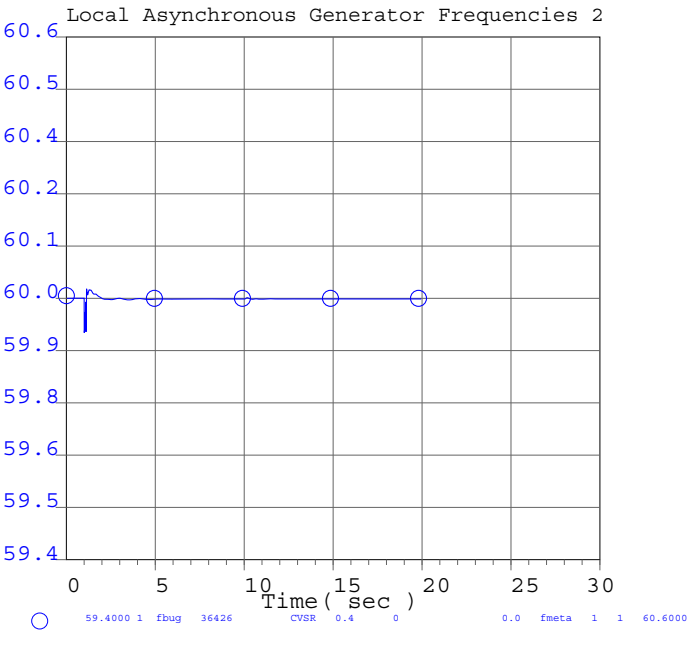

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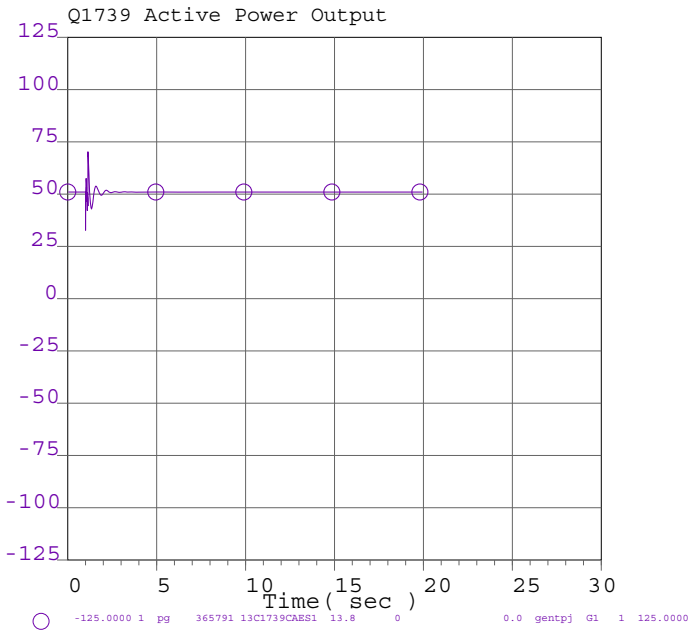
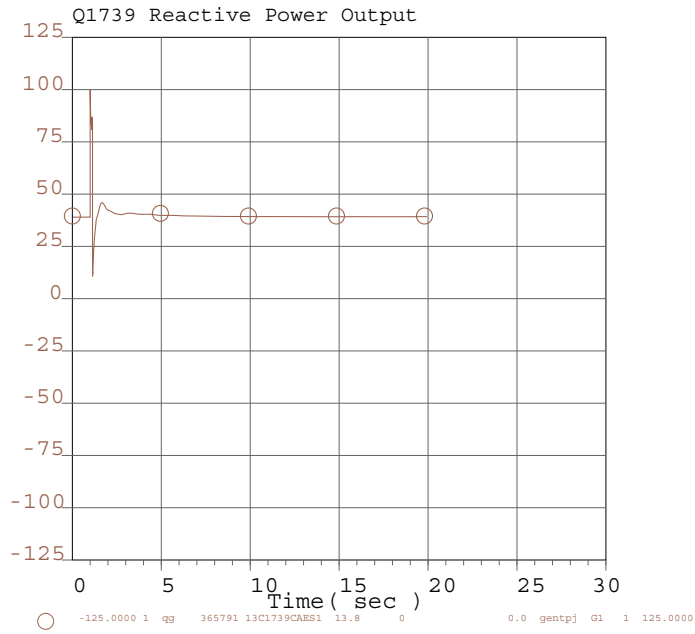
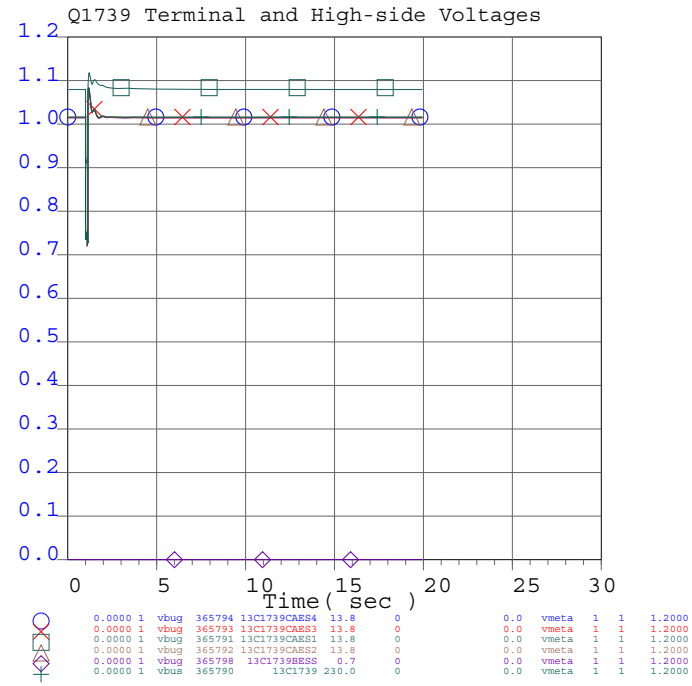
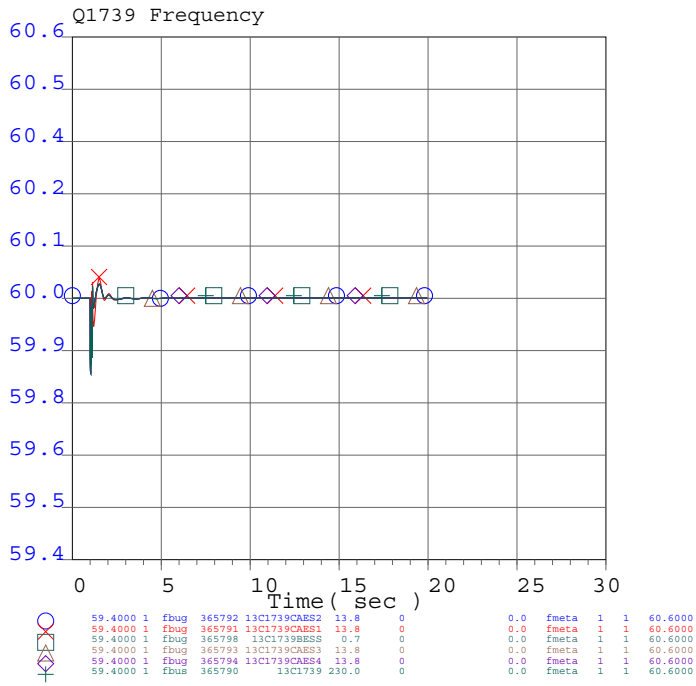
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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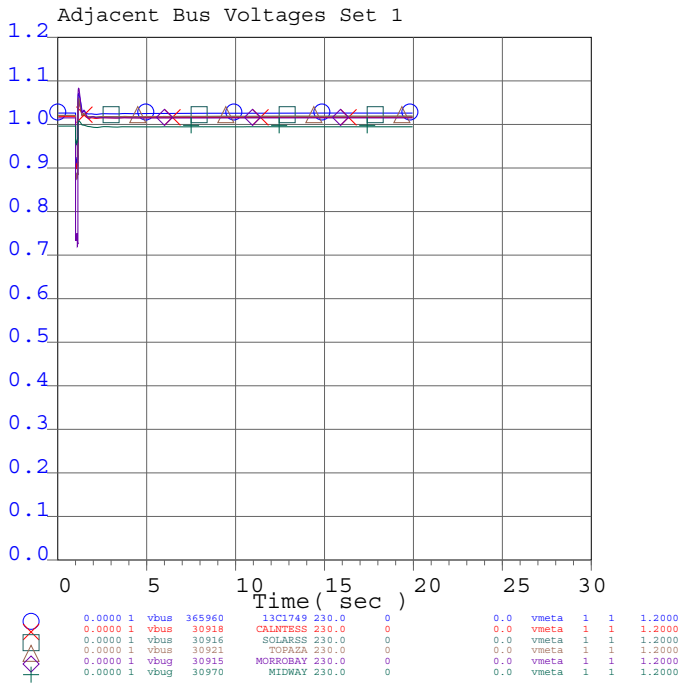

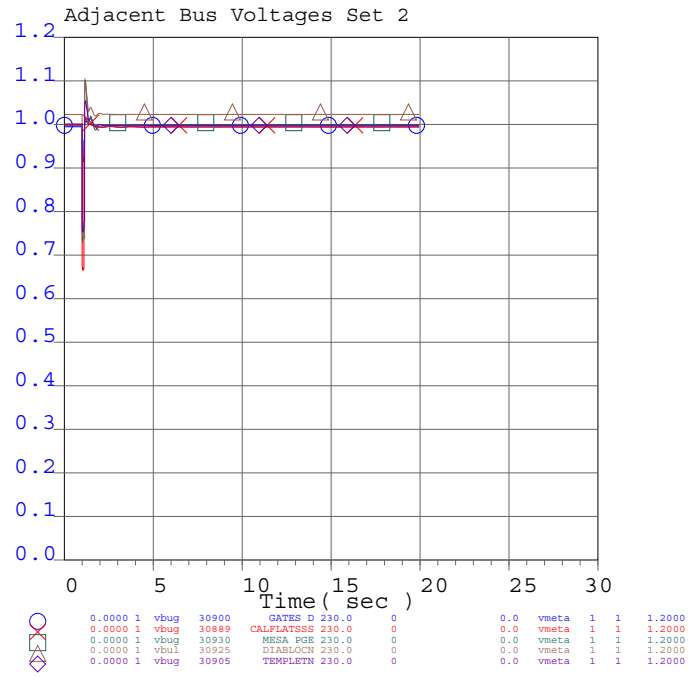

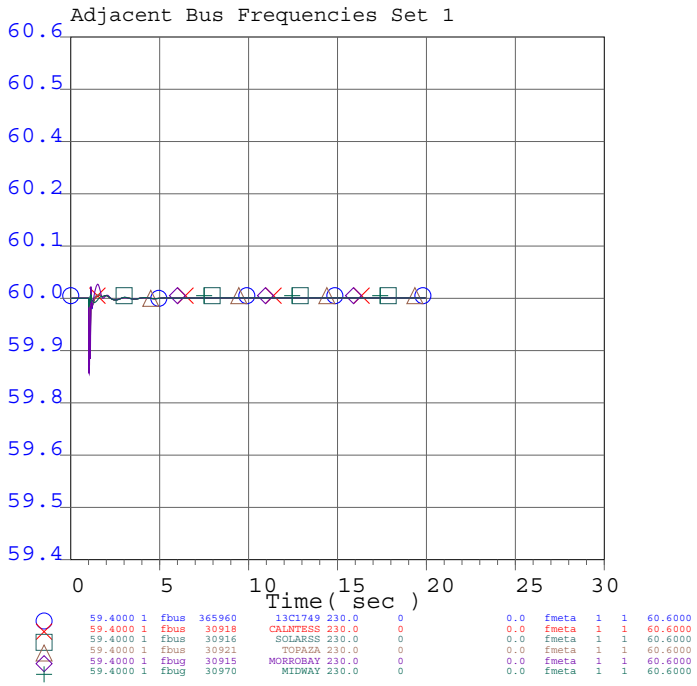

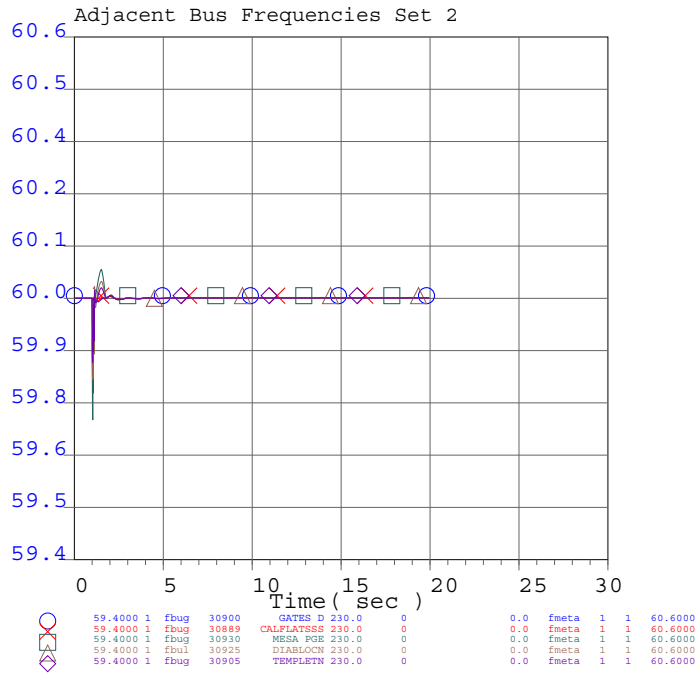

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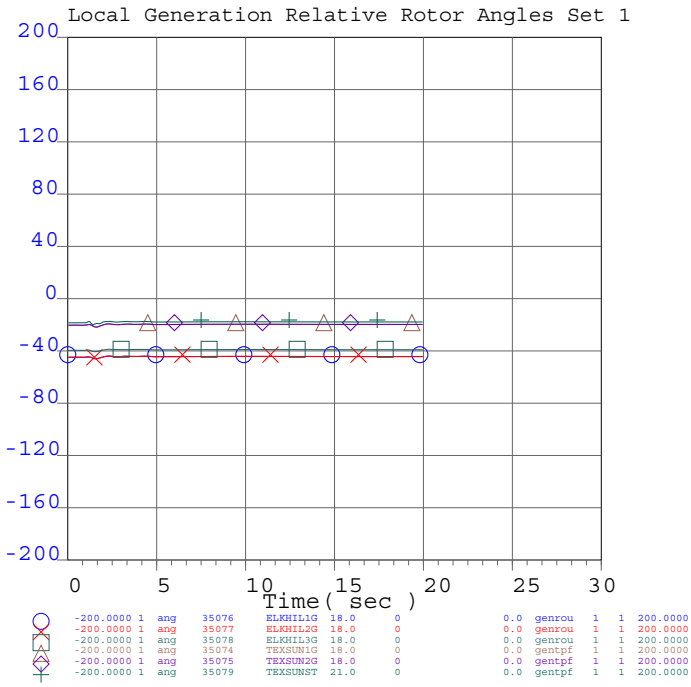

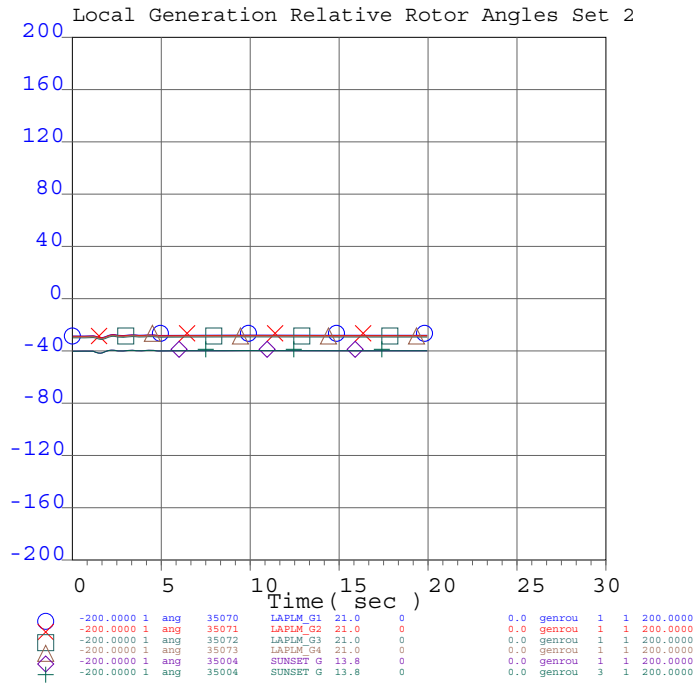

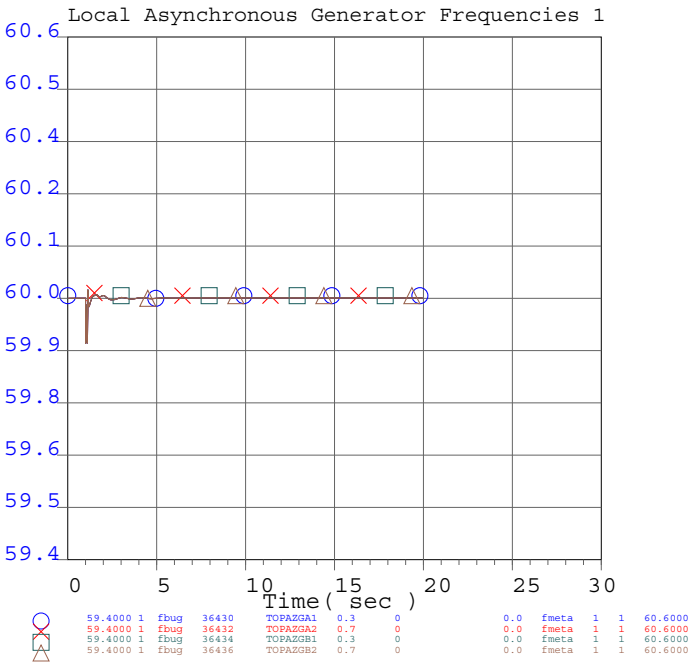

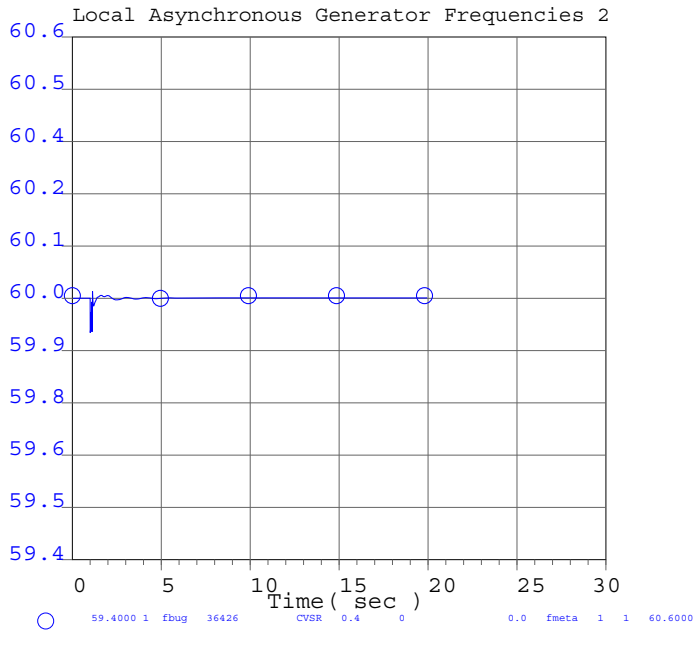

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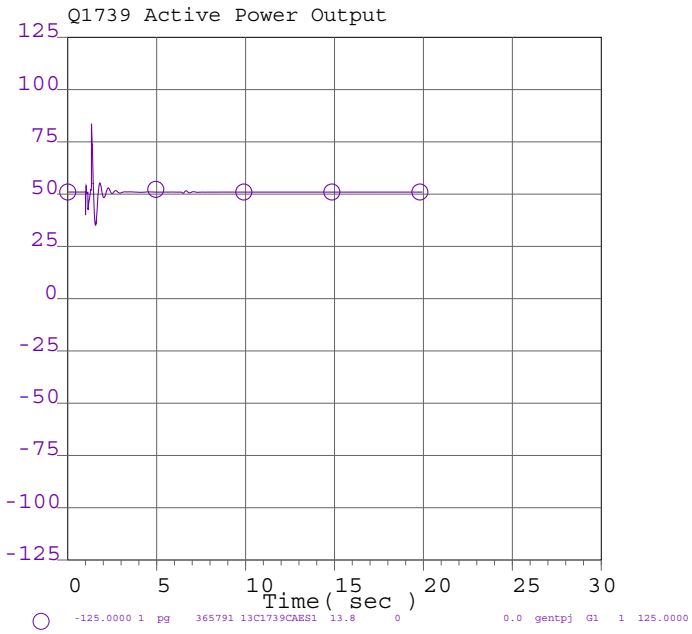
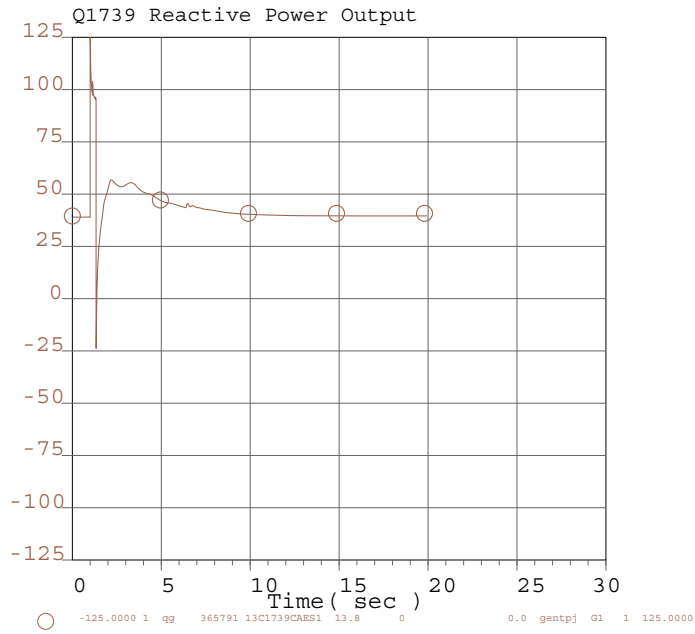
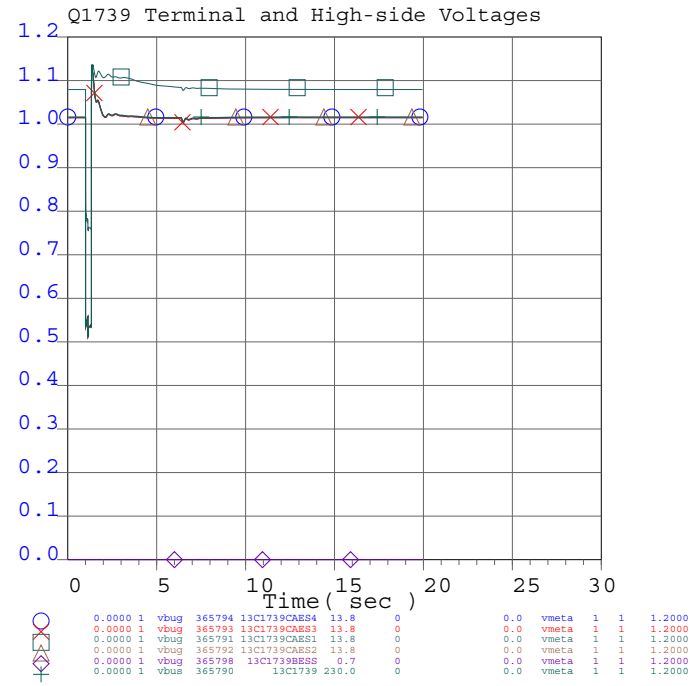
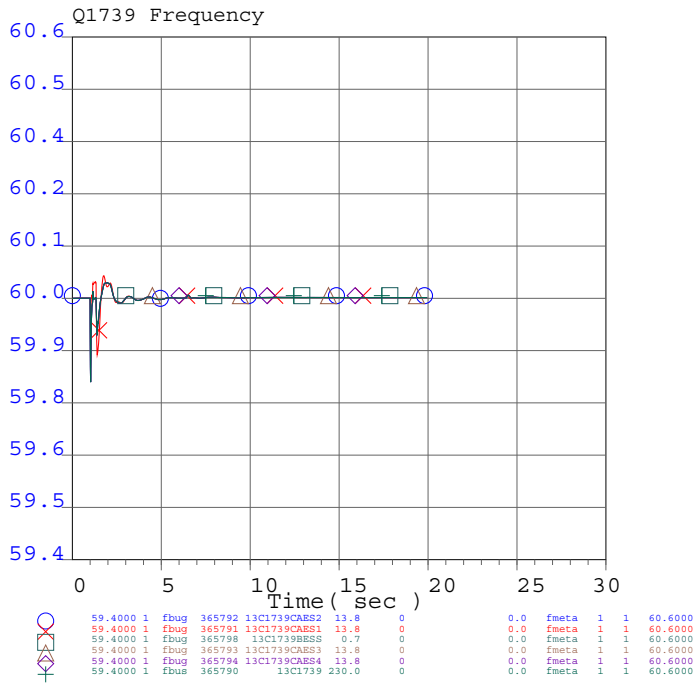
Q1739 (500 MW net): POI- Morro Bay 230 kV substation

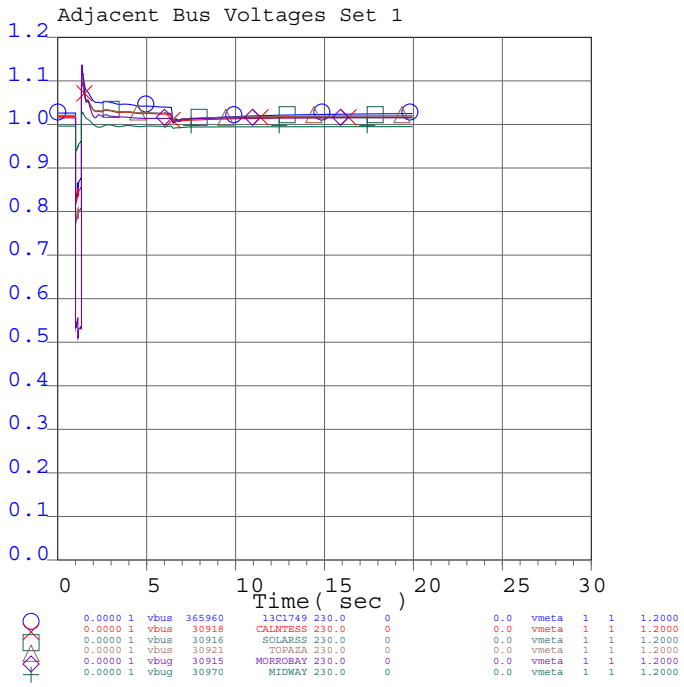


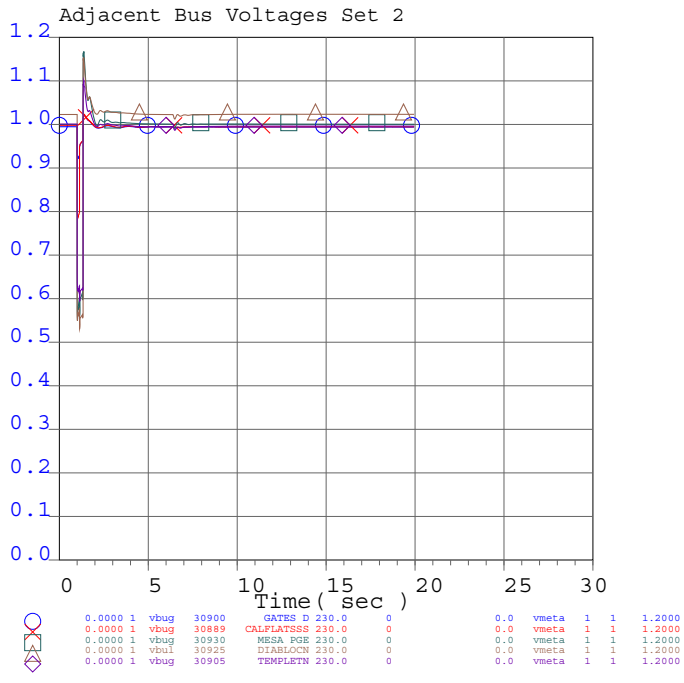


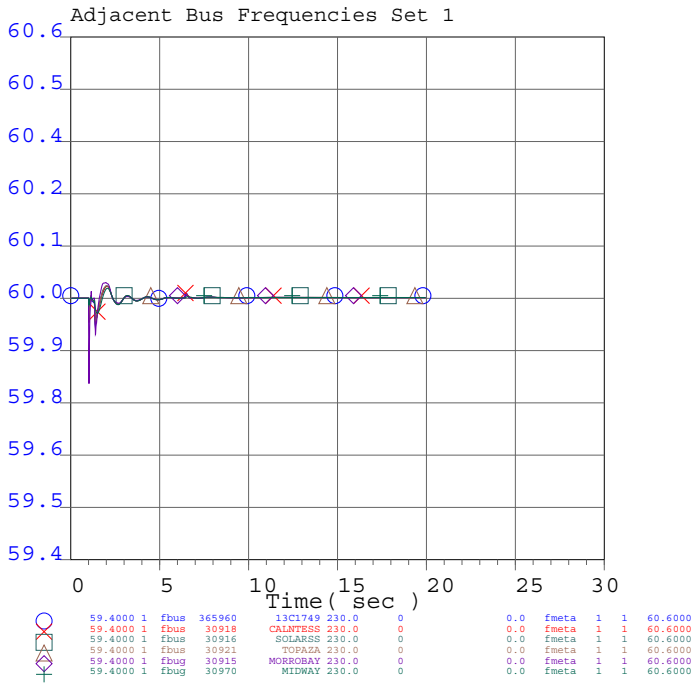


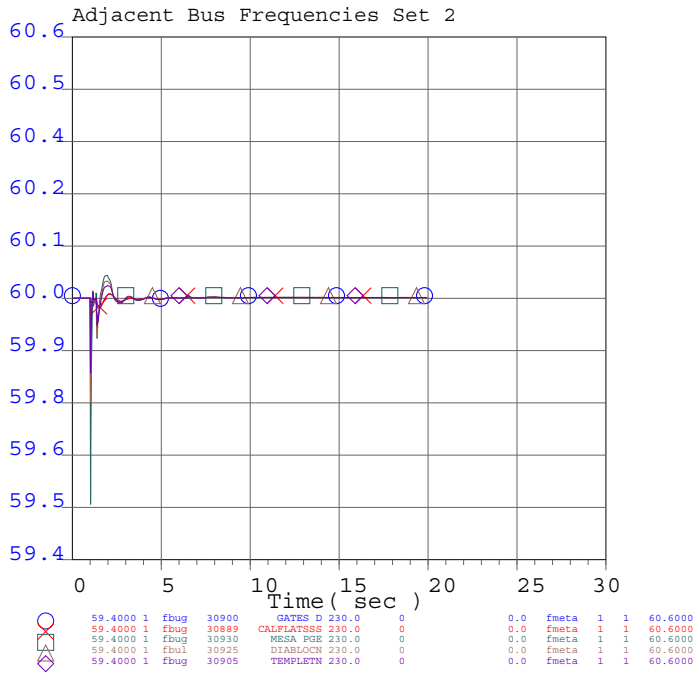


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



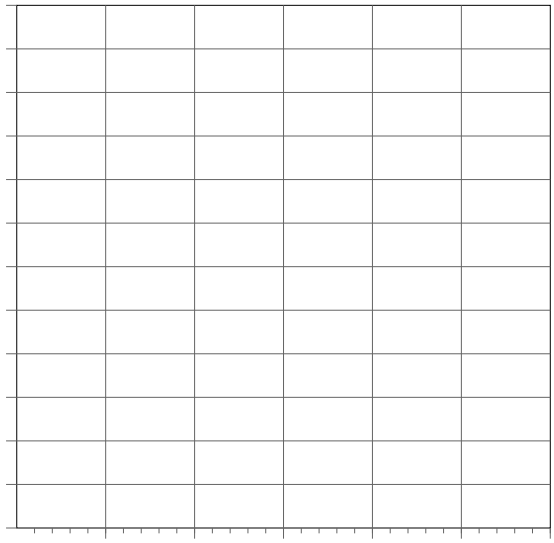




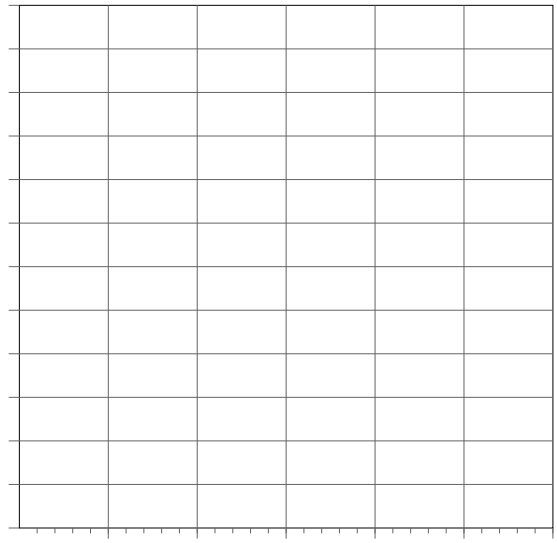


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

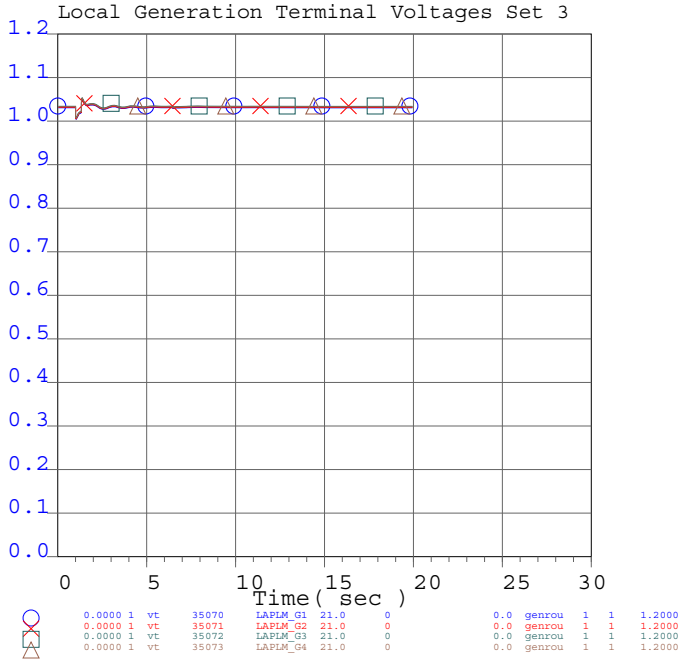
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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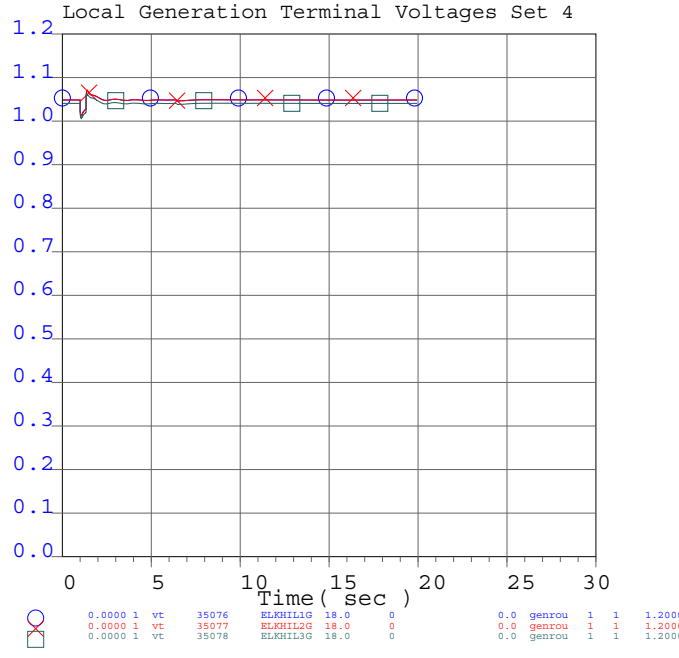
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

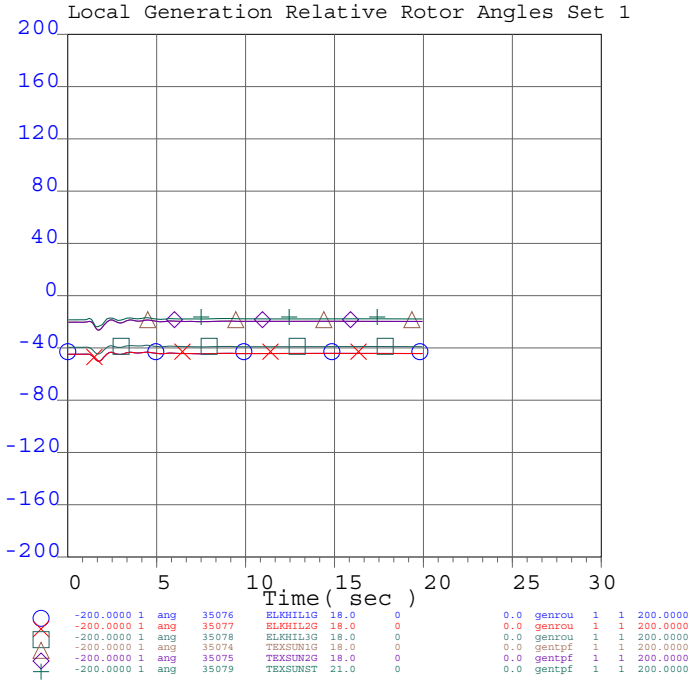
Local Generation Terminal Voltages Set 4



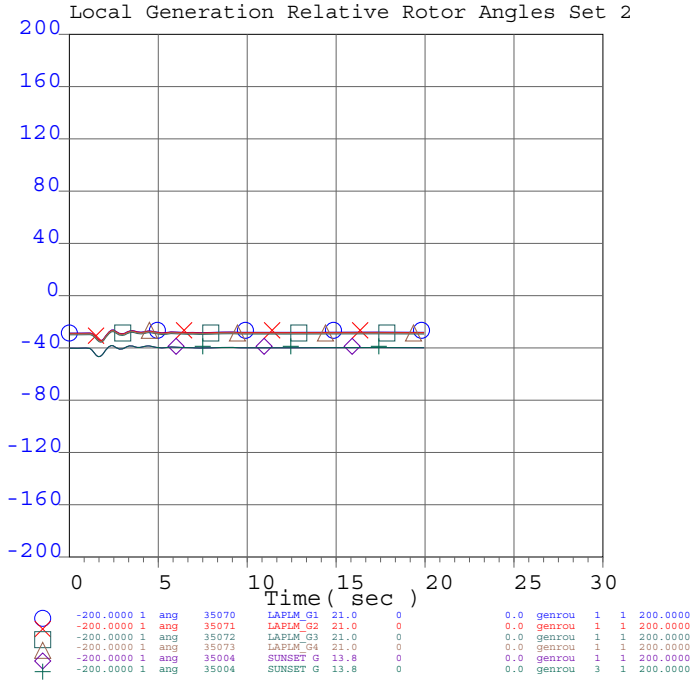
0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

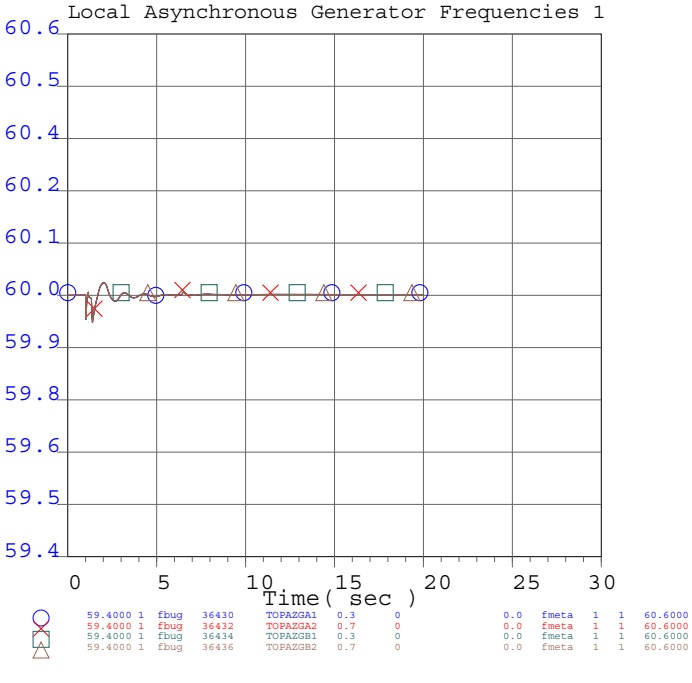
Local Generation Relative Rotor Angles Set 1



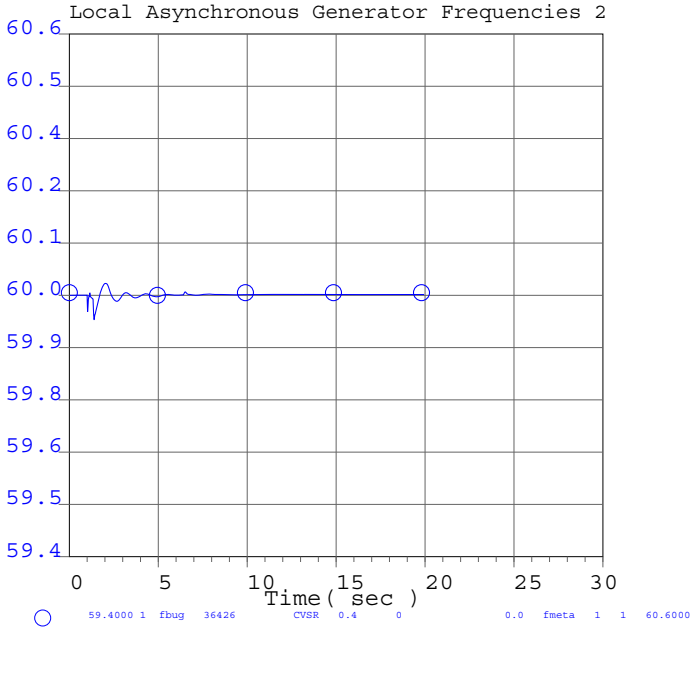
Local Generation Relative Rotor Angles Set 2



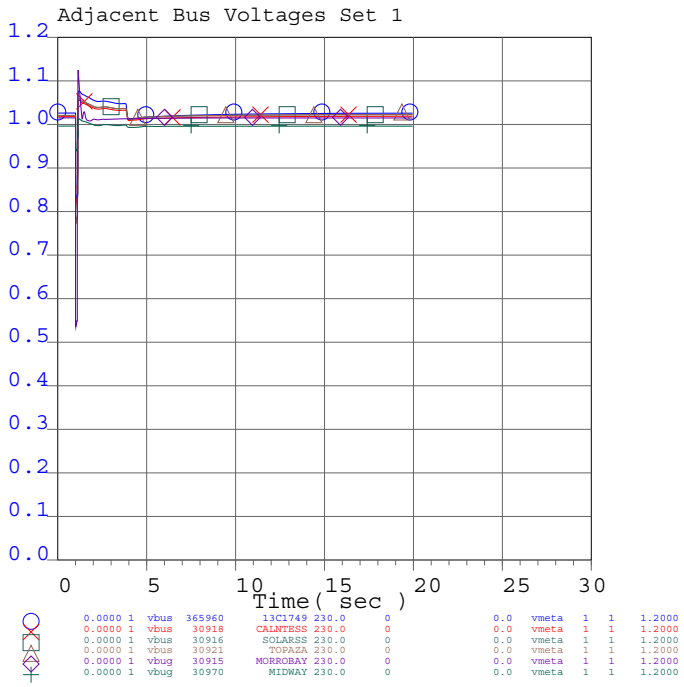
Local Asynchronous Generator Frequencies 1

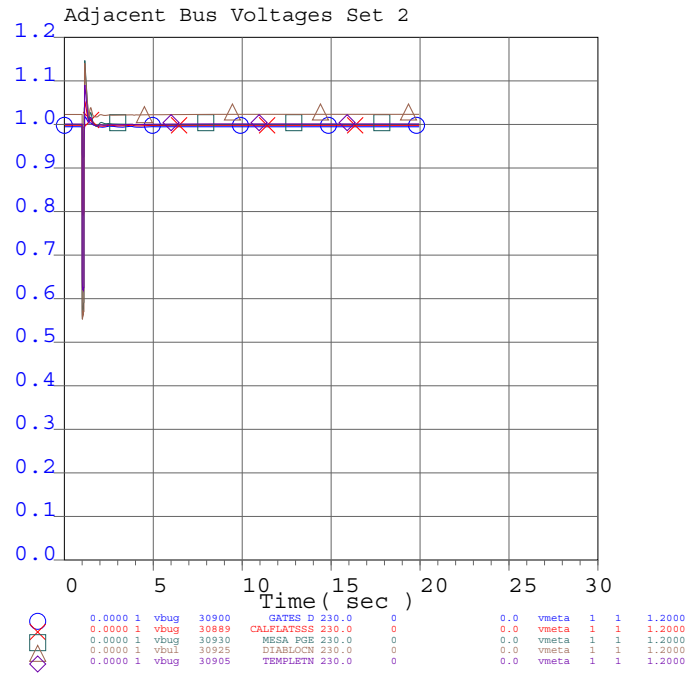


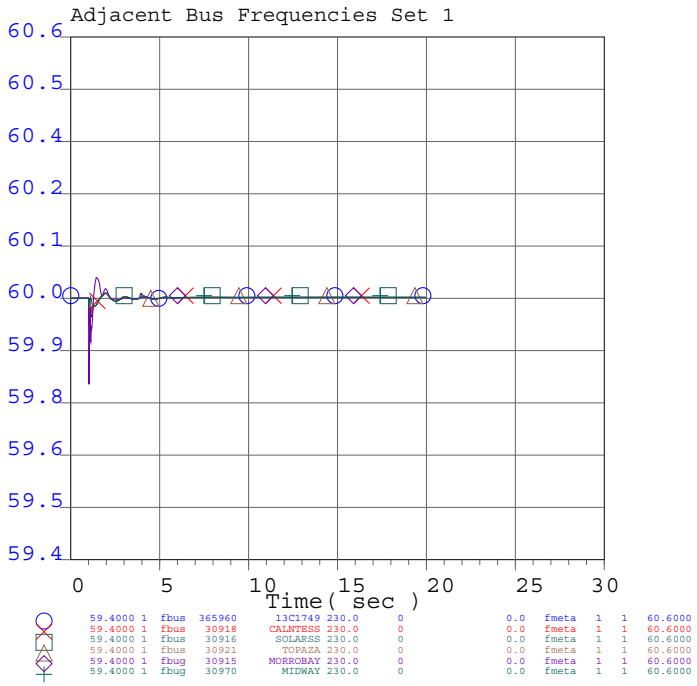
Local Asynchronous Generator Frequencies 2

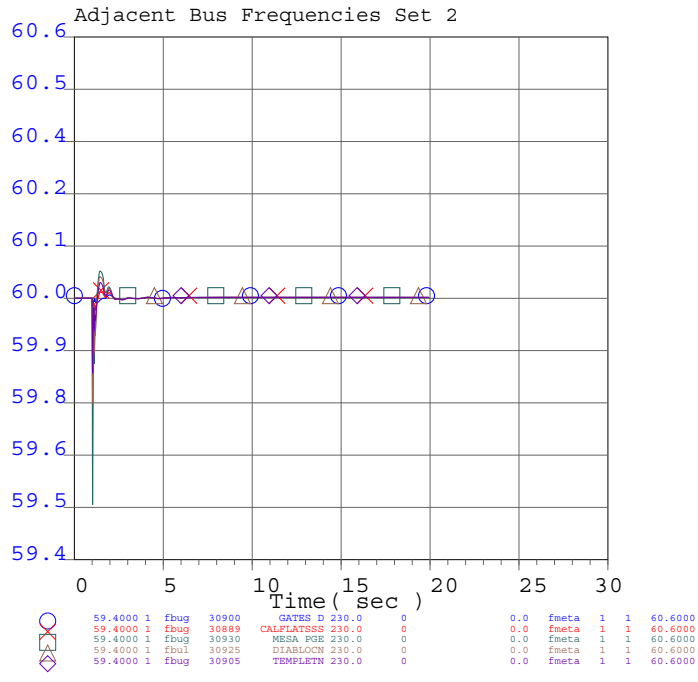


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



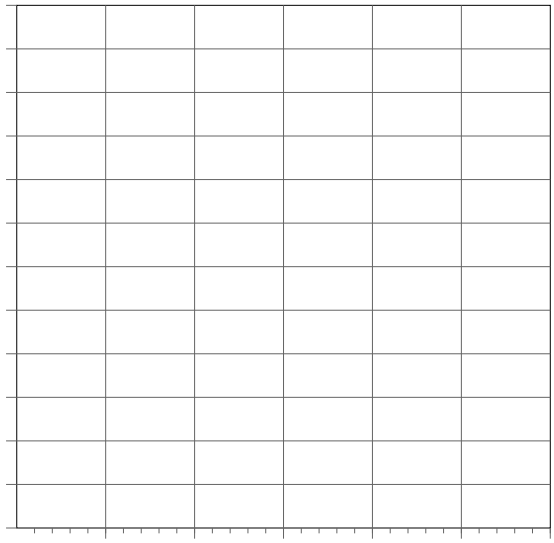




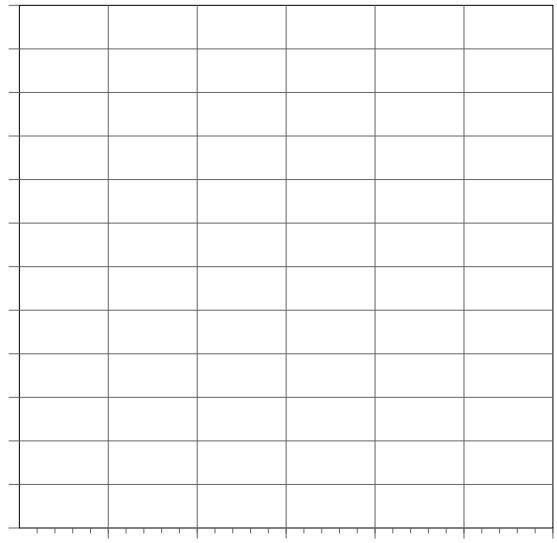


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

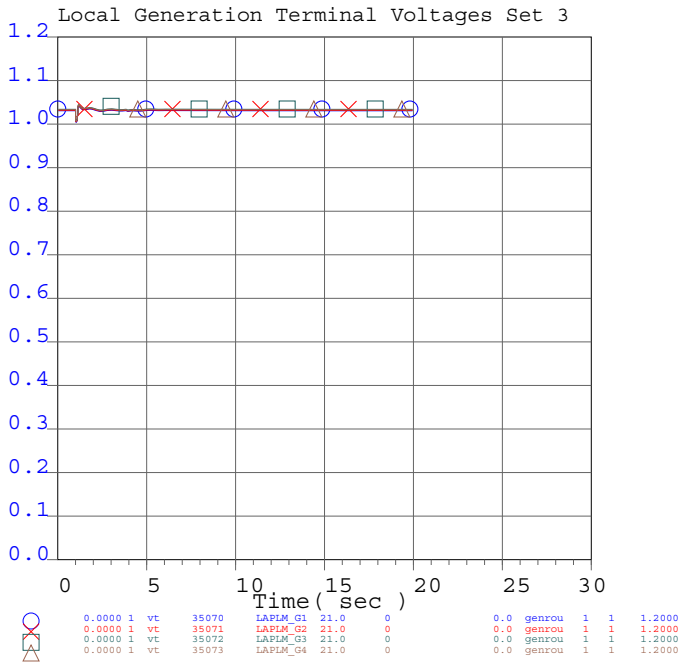
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
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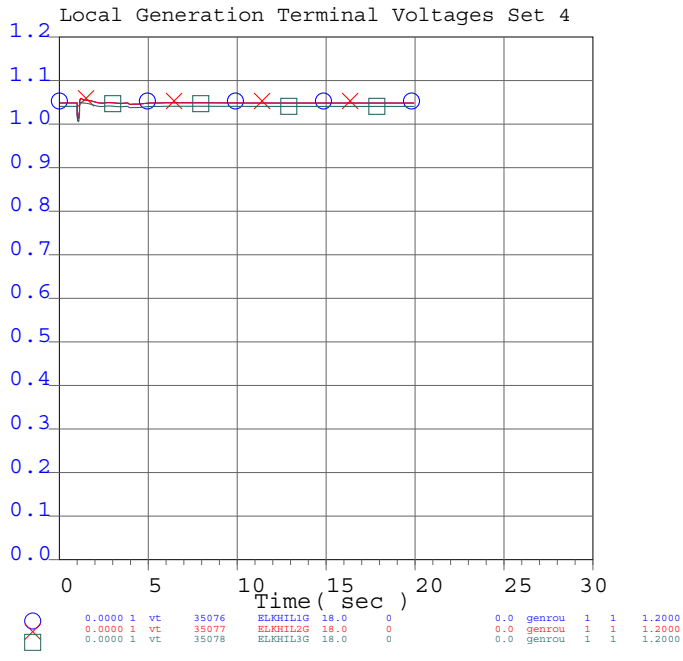
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

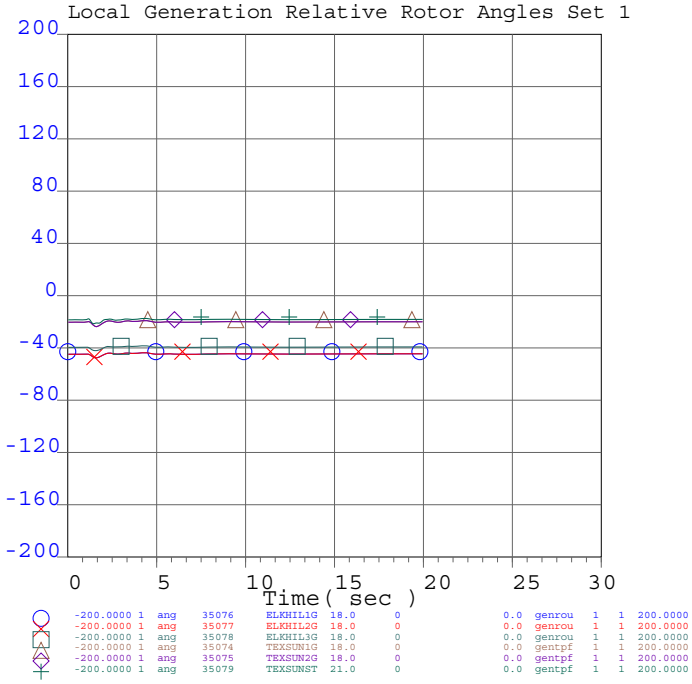
Local Generation Terminal Voltages Set 4



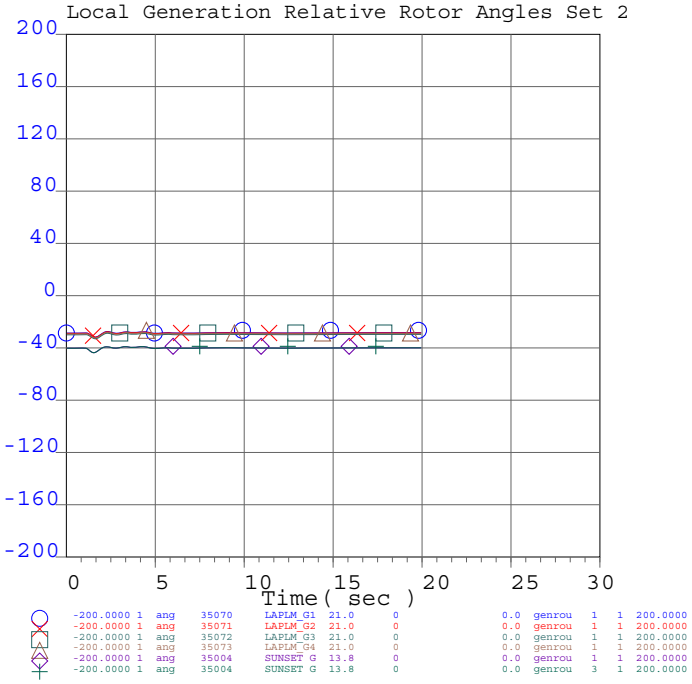
0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

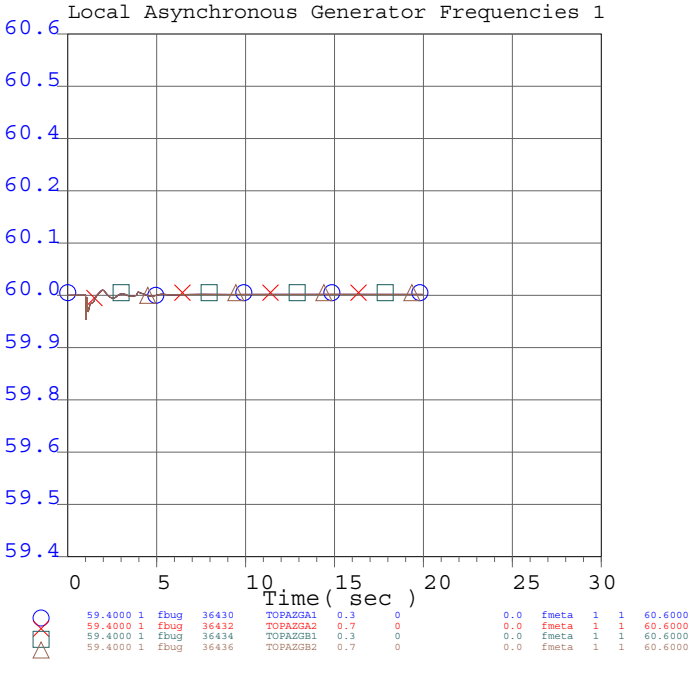
Local Generation Relative Rotor Angles Set 1



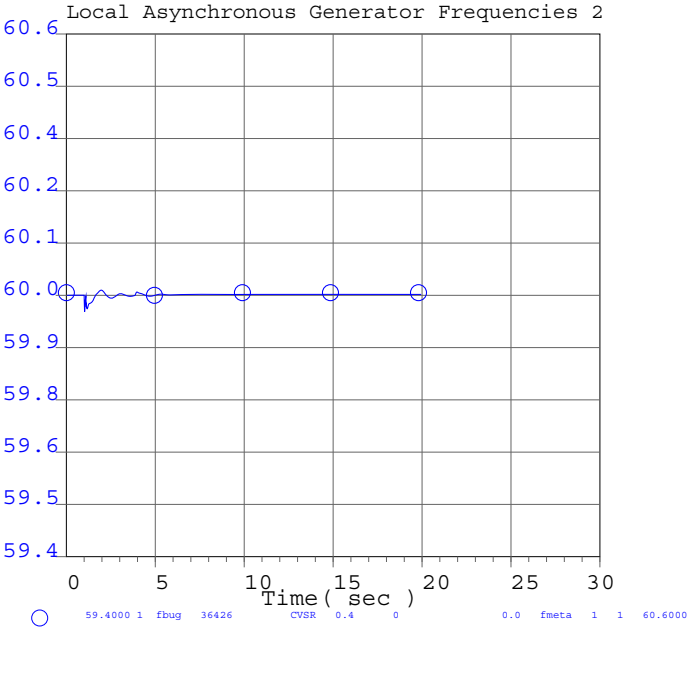
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

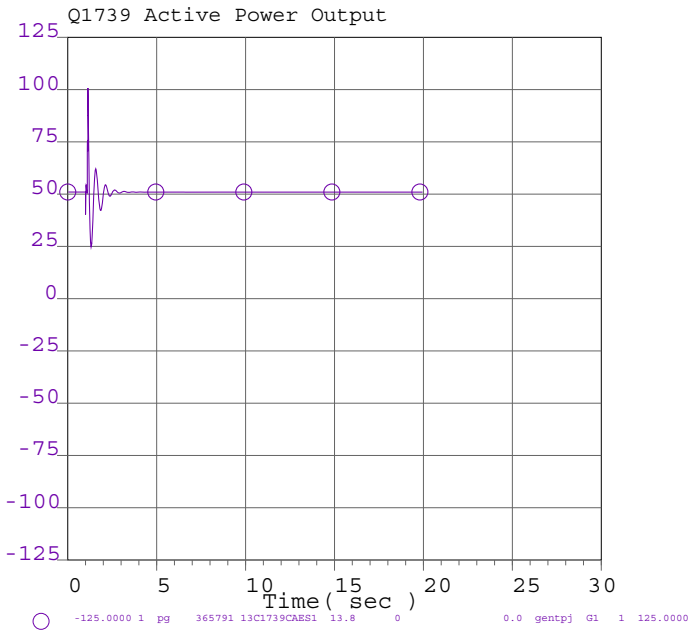


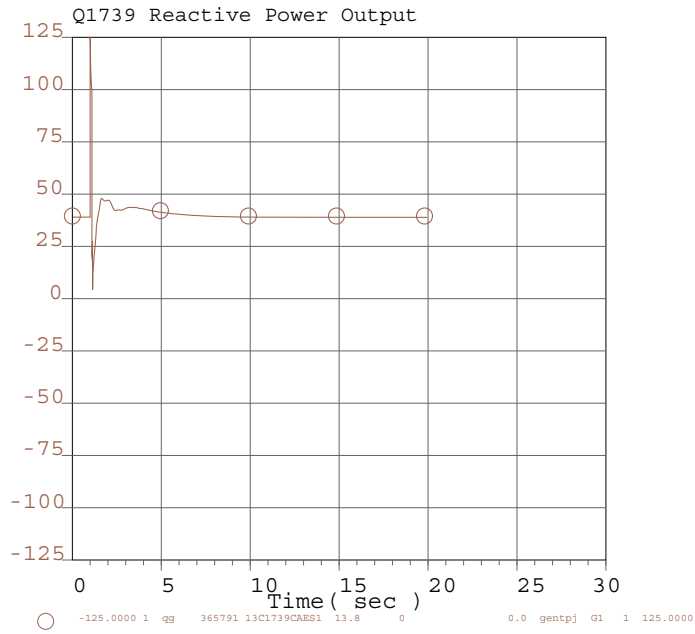
Local Asynchronous Generator Frequencies 2

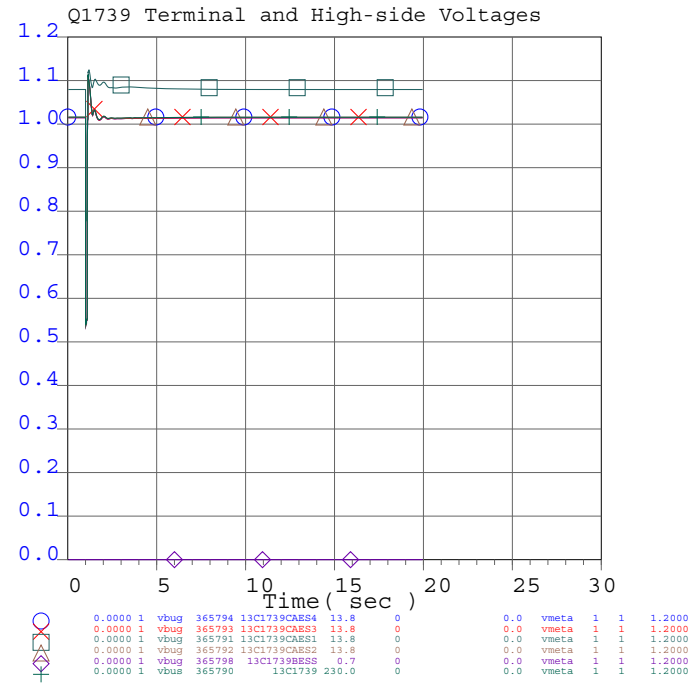


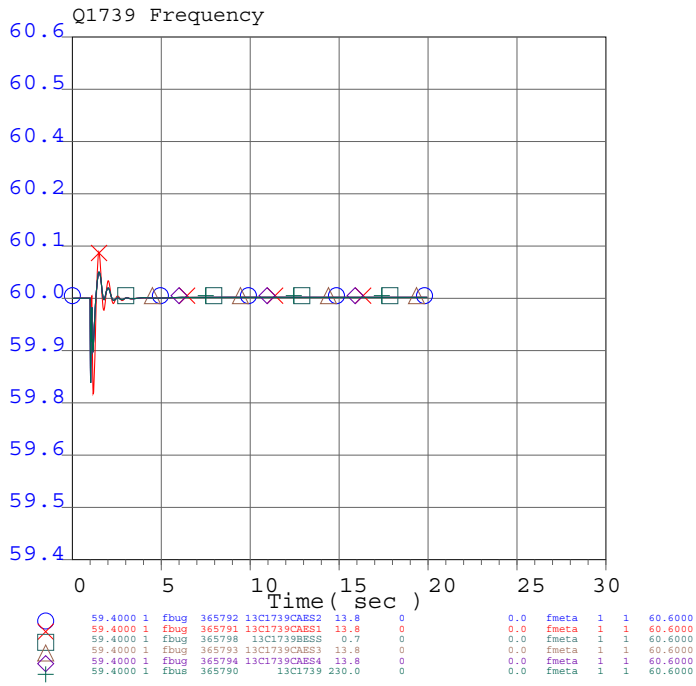
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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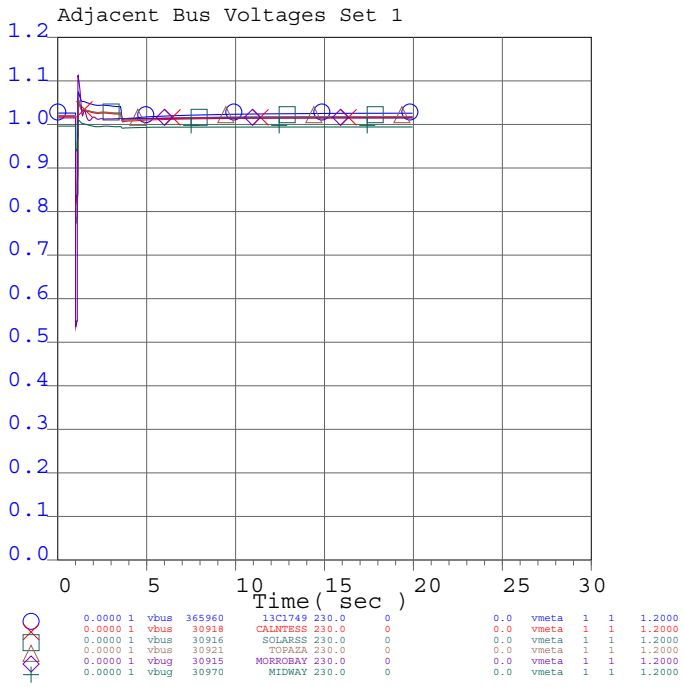
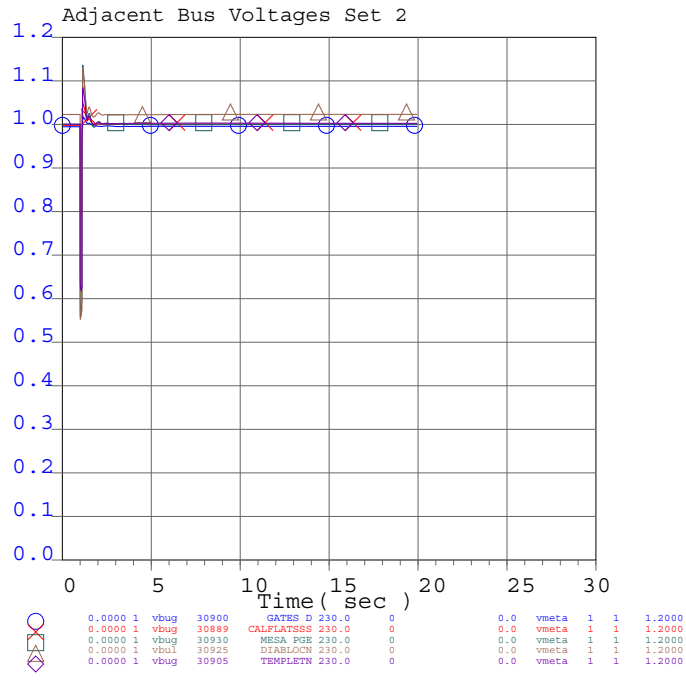
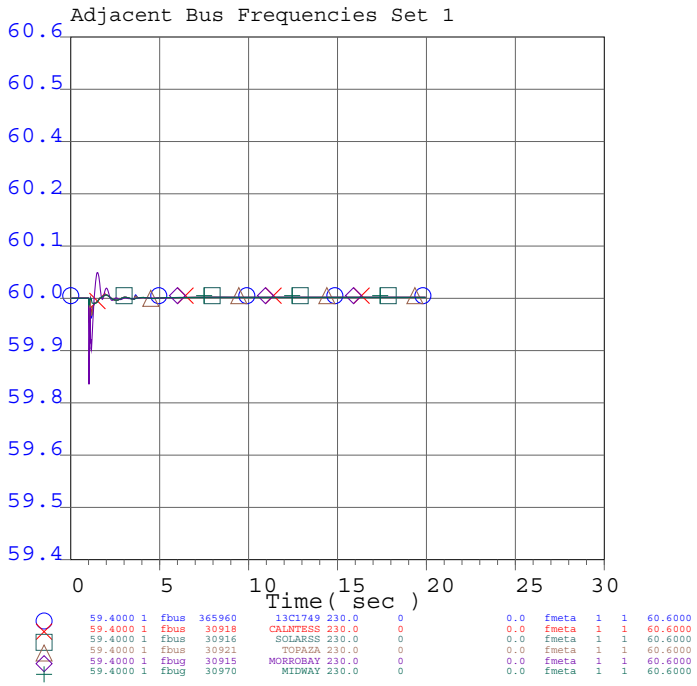
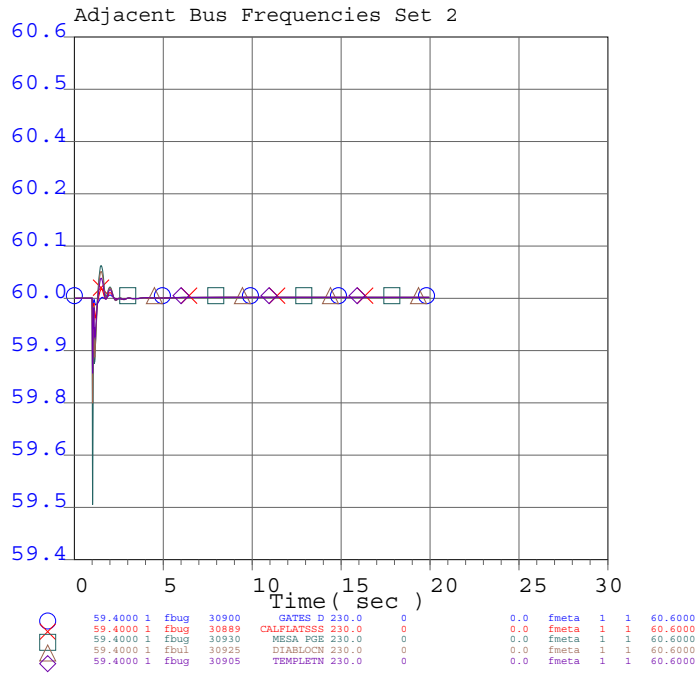
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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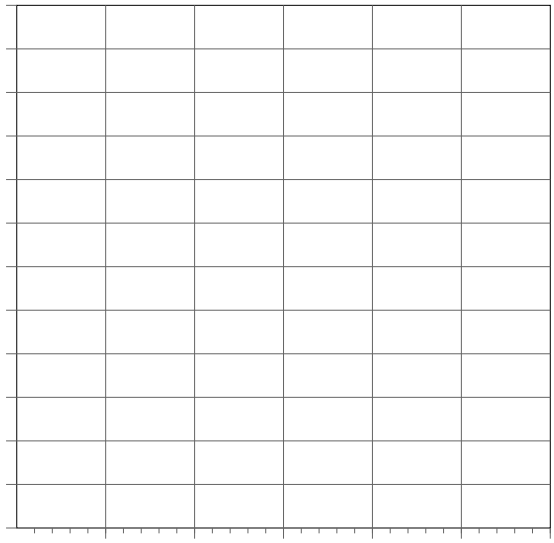
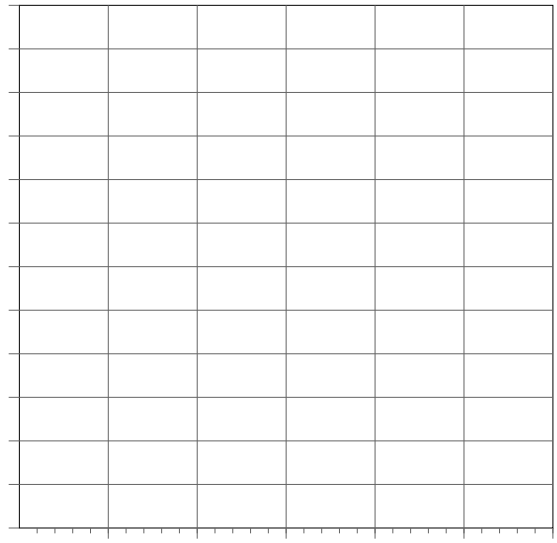
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

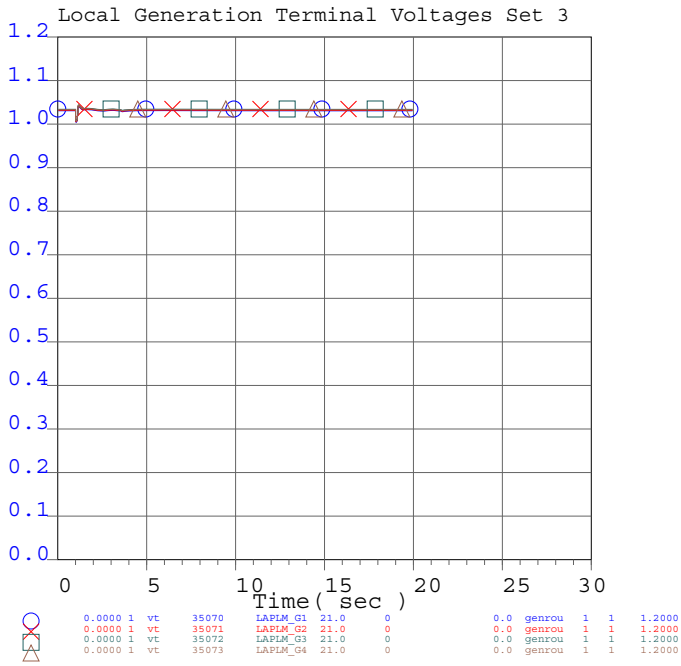
Local Generation Terminal Voltages Set 1



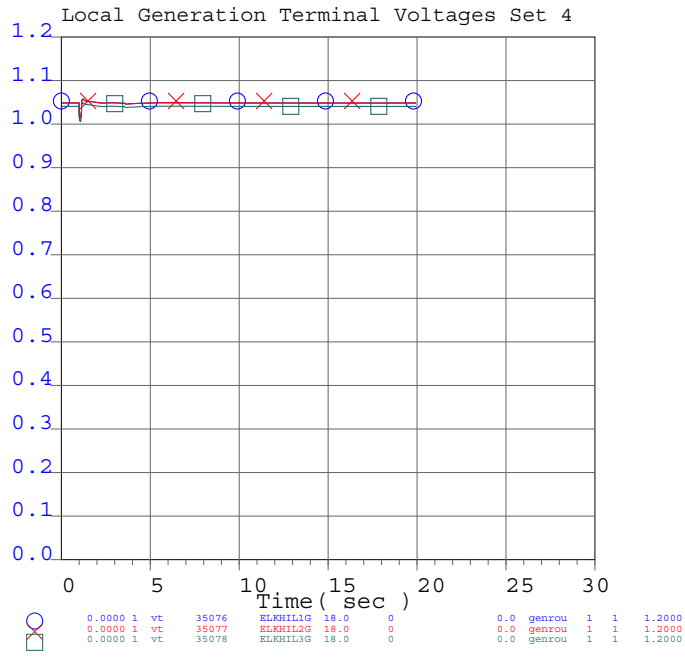
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3

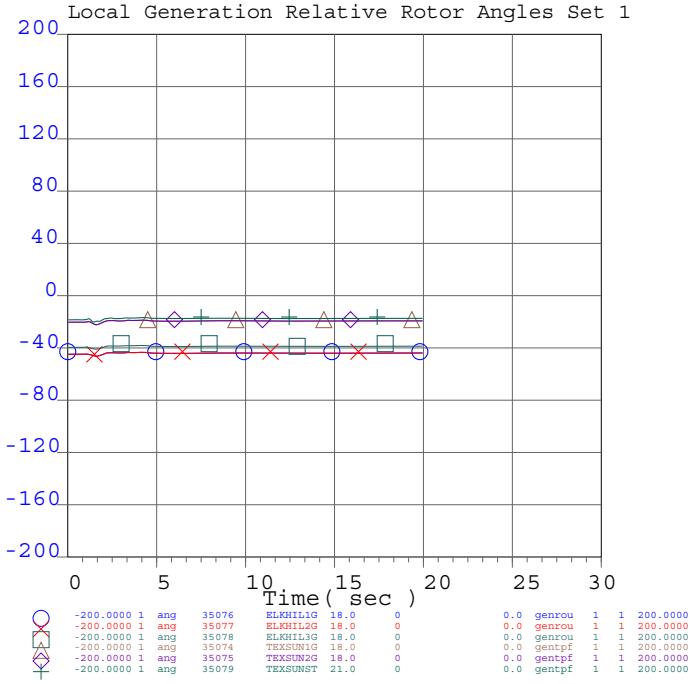


Local Generation Terminal Voltages Set 4

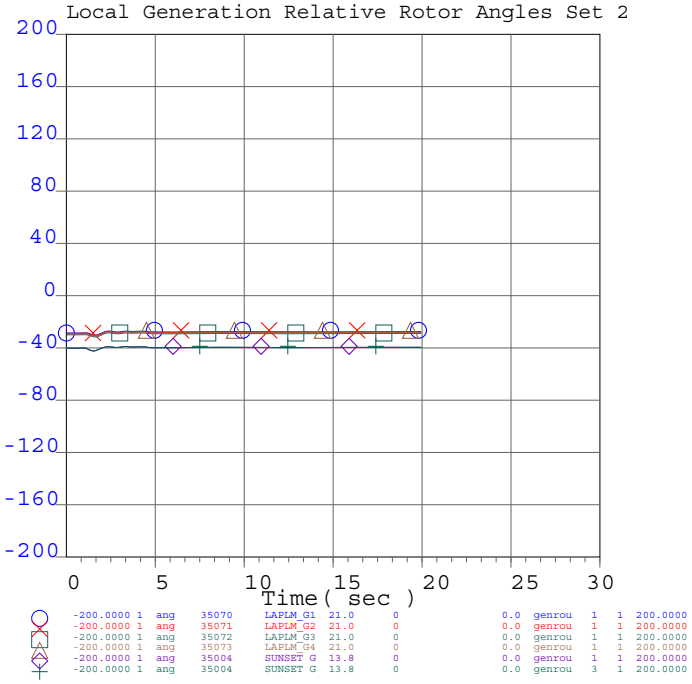


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

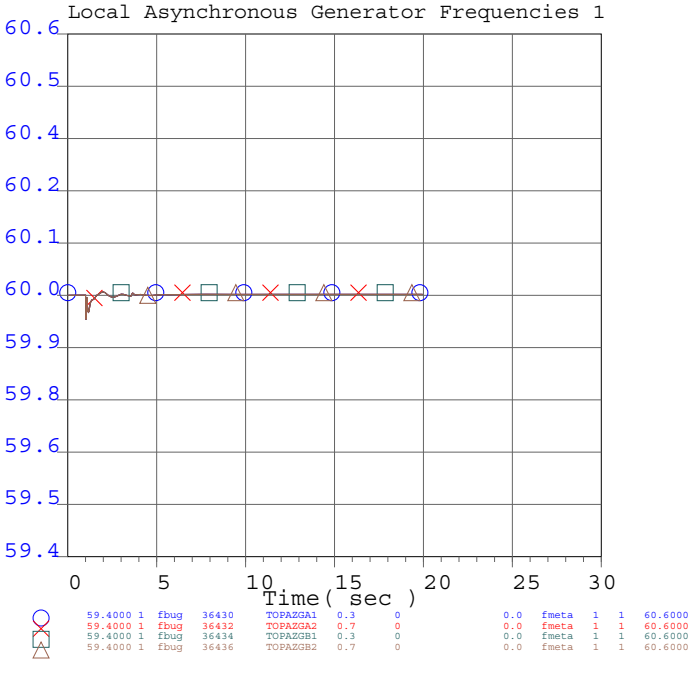
Local Generation Relative Rotor Angles Set 1



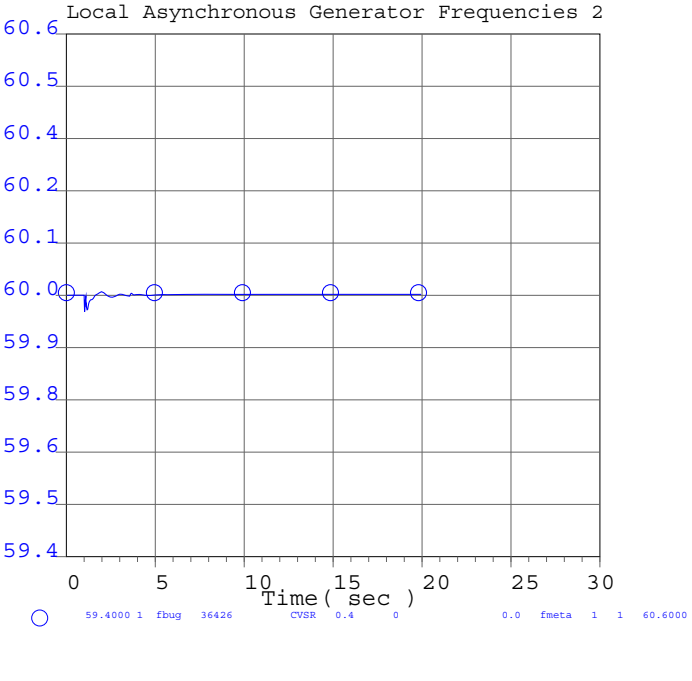
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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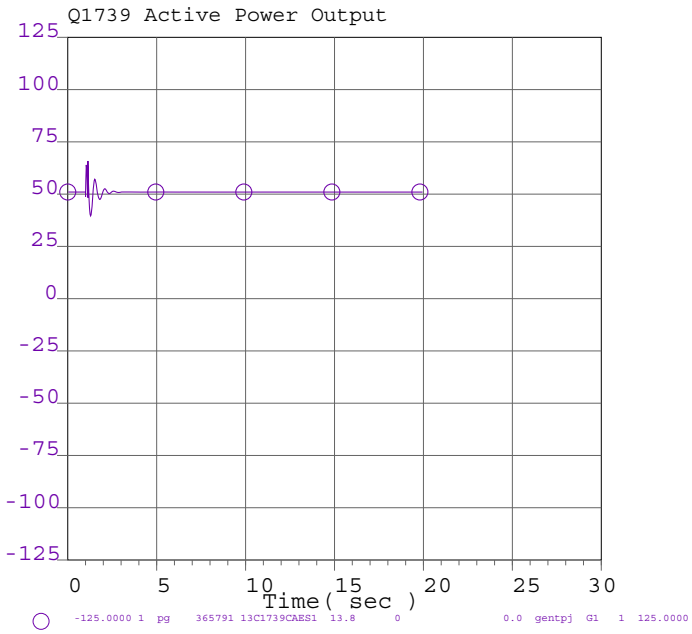
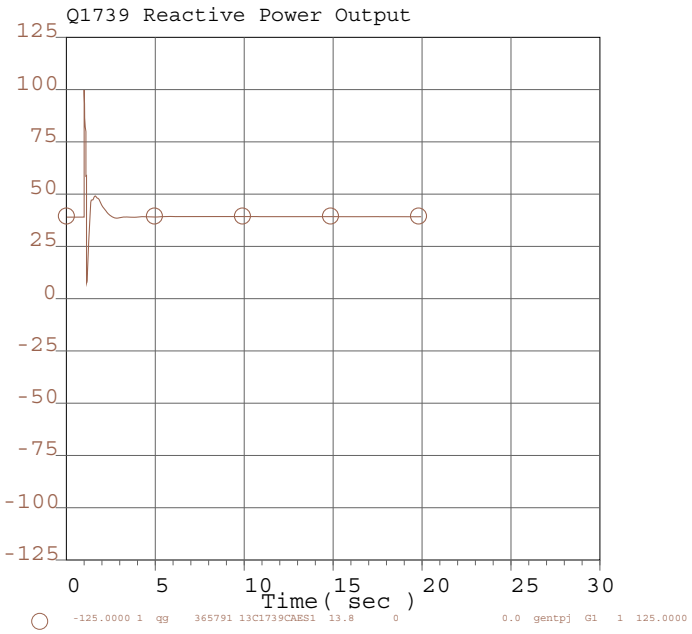
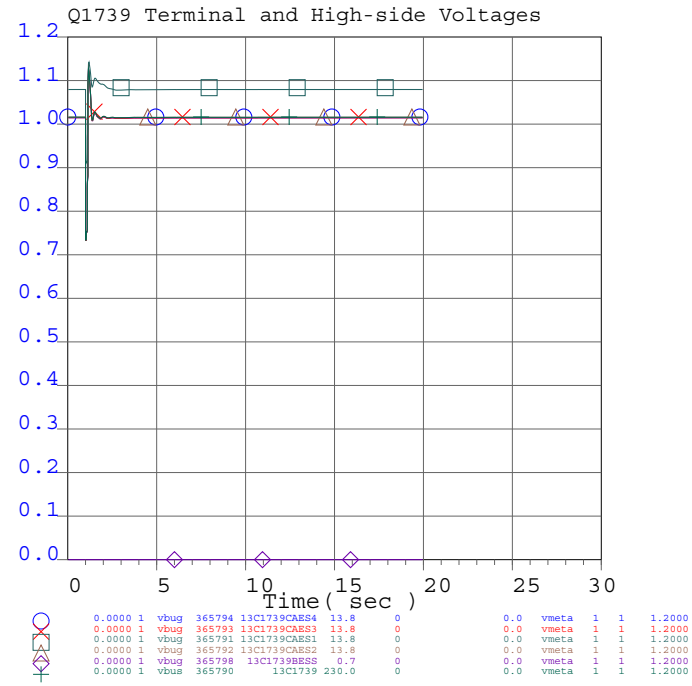
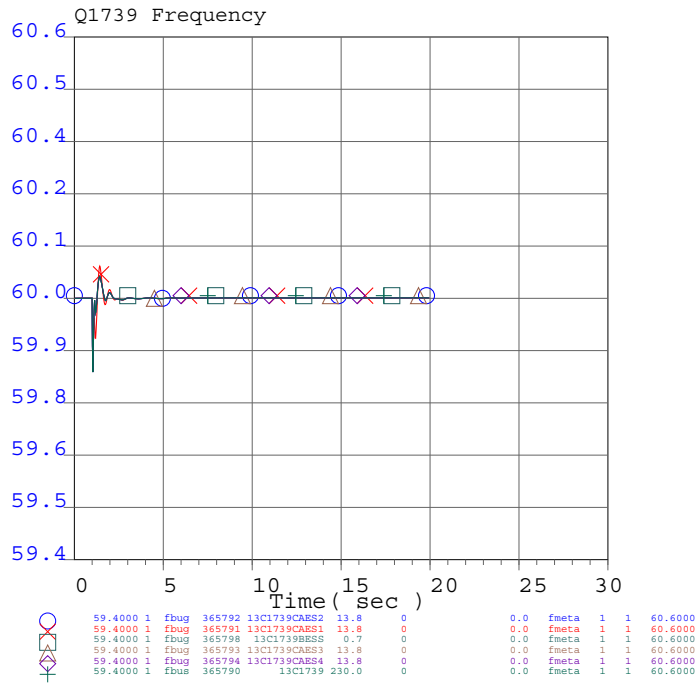
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation

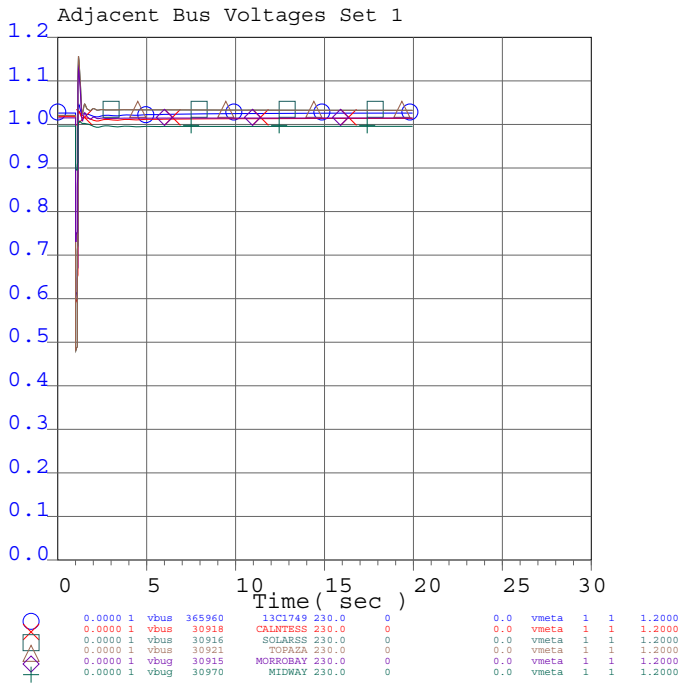


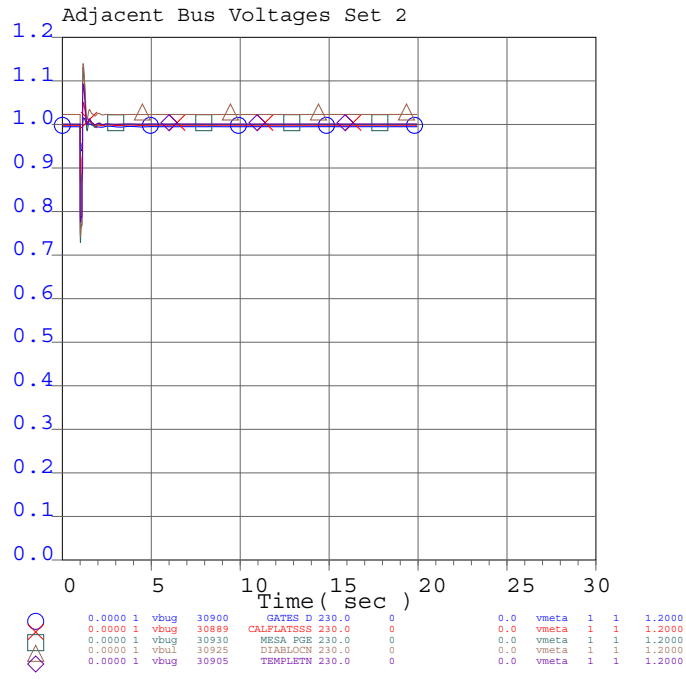


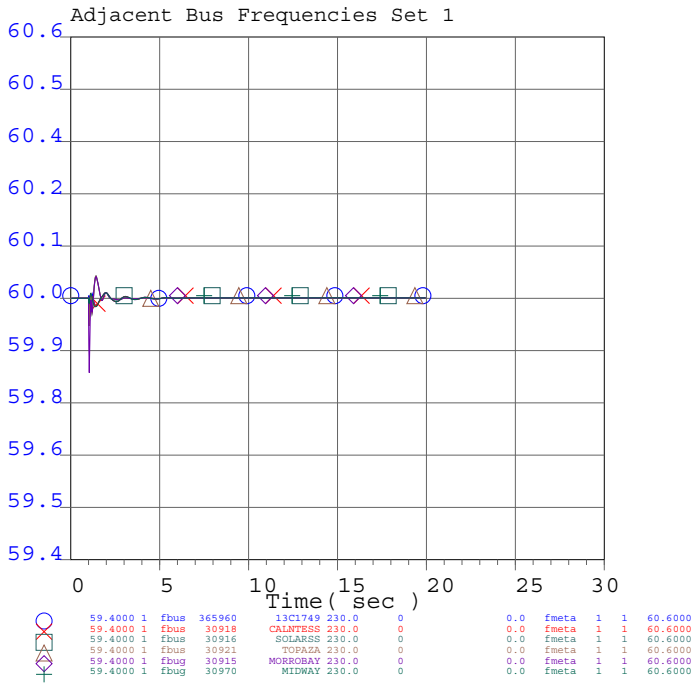


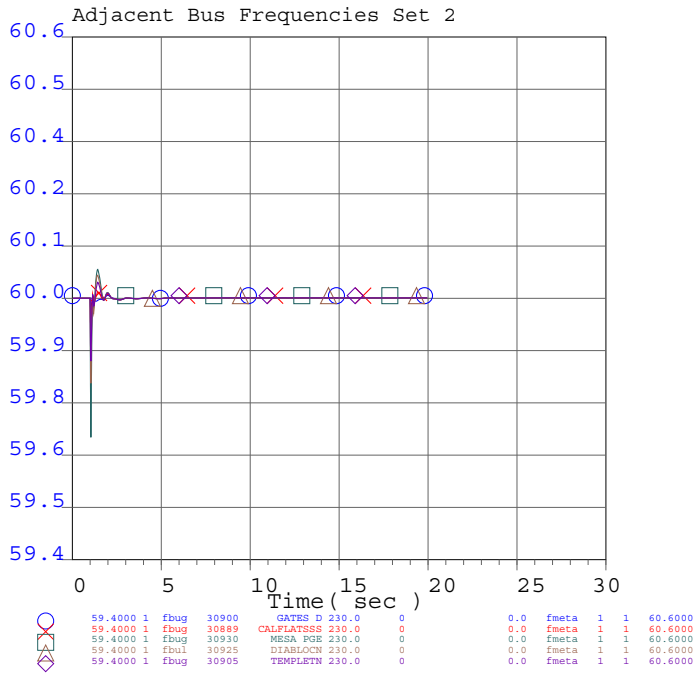


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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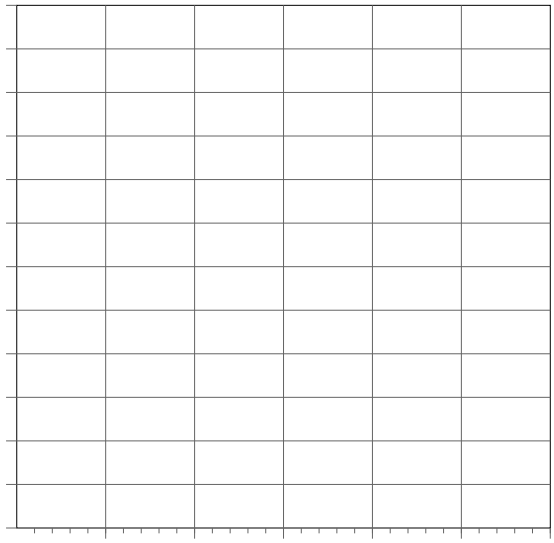
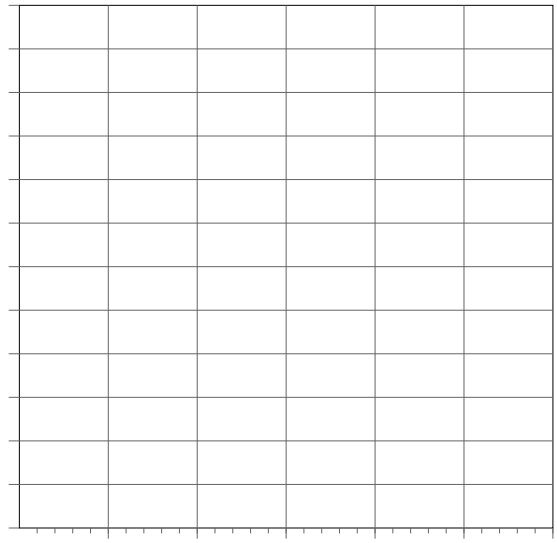
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

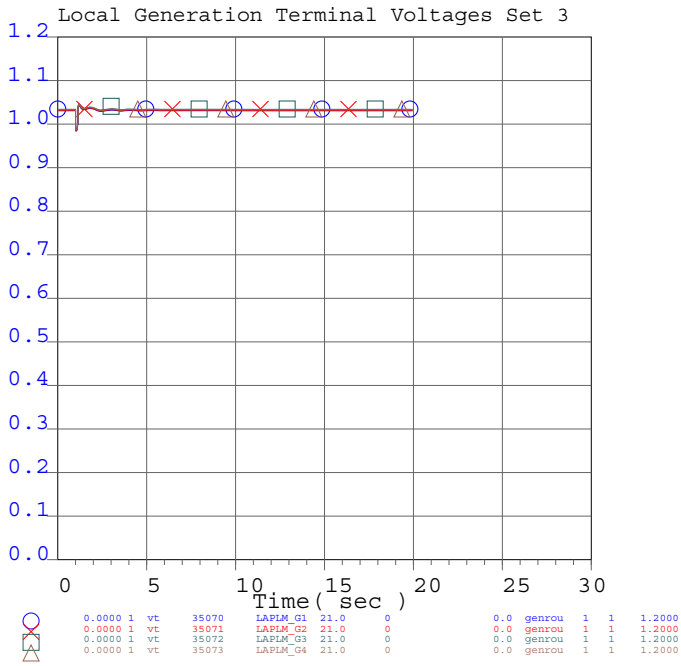
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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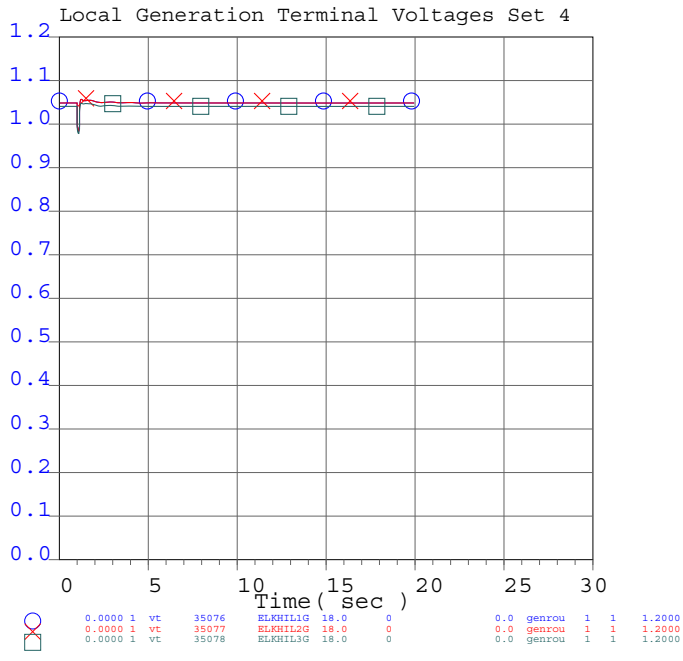
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

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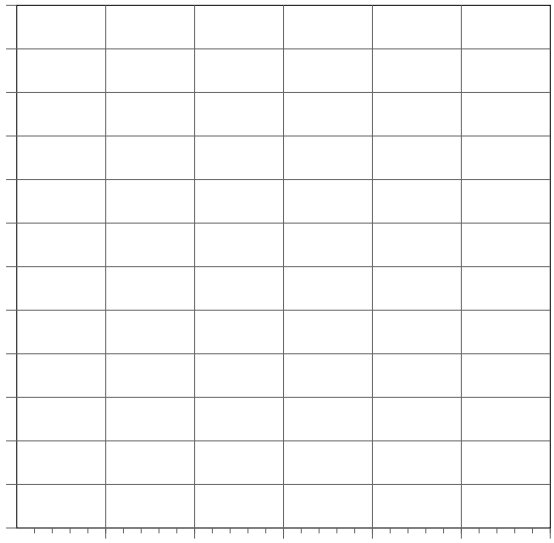
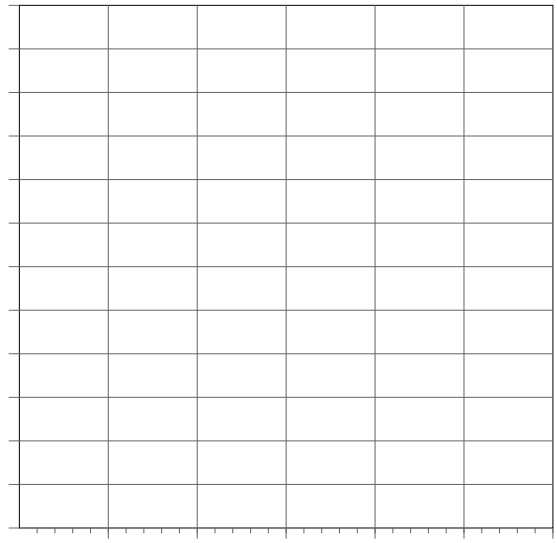
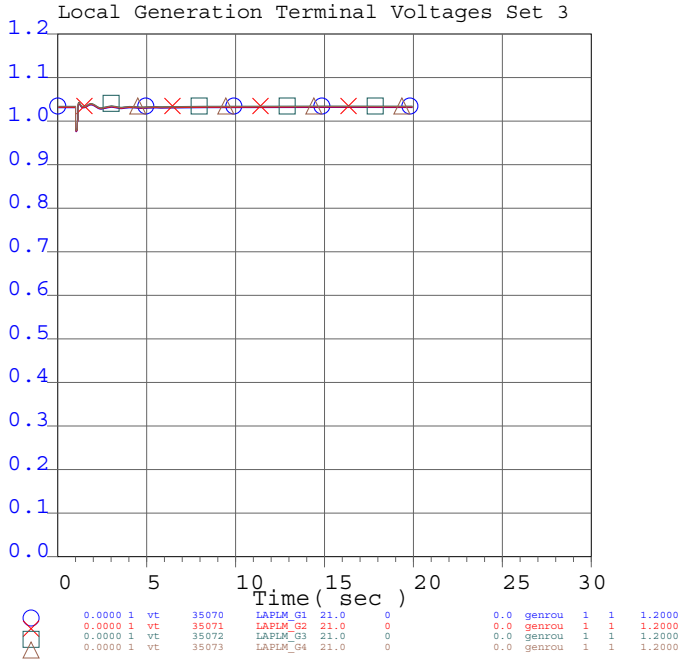


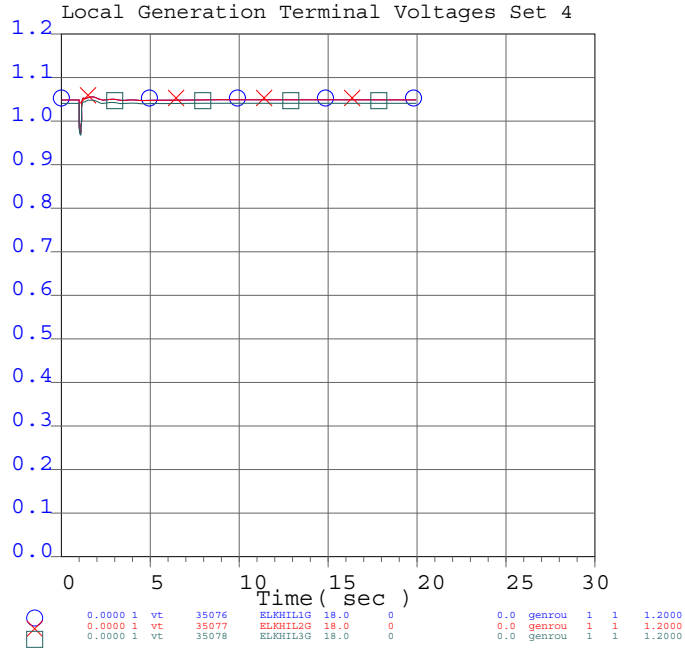
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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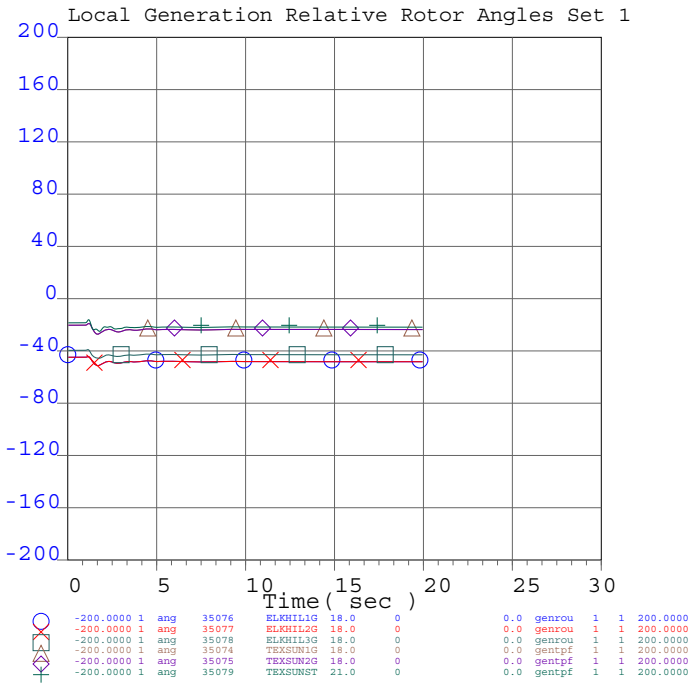

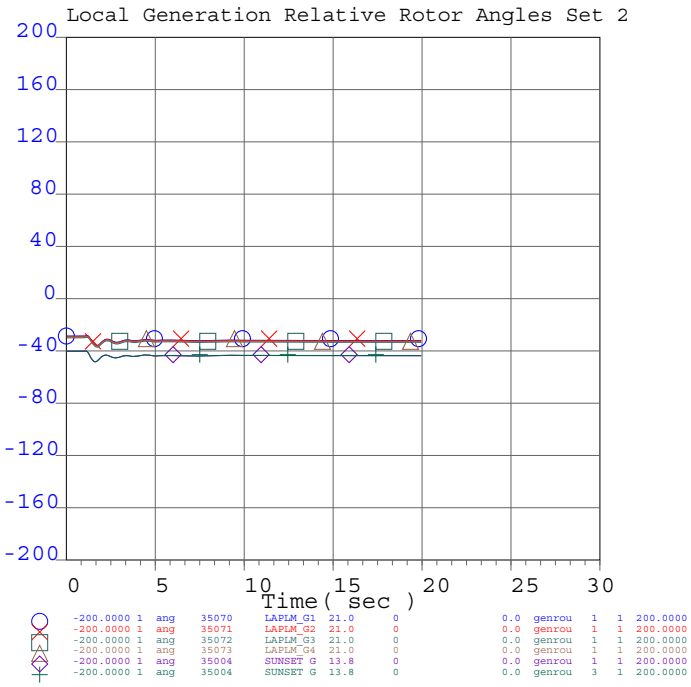

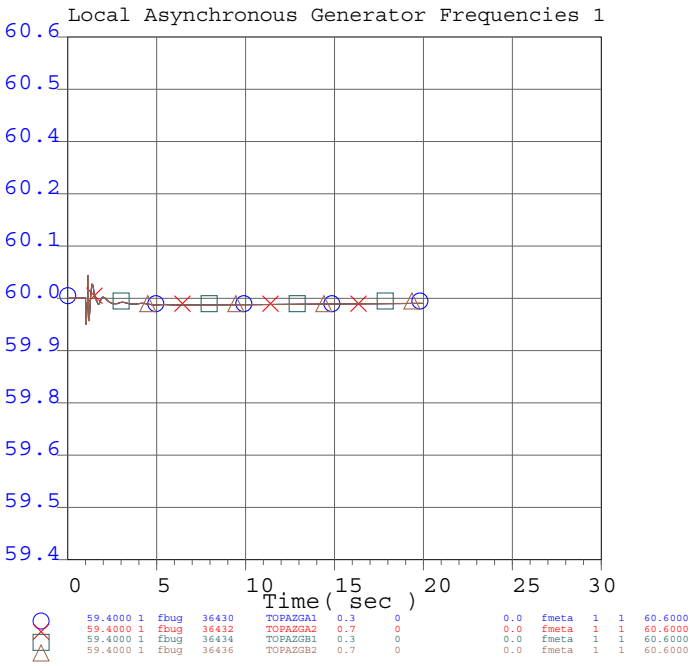

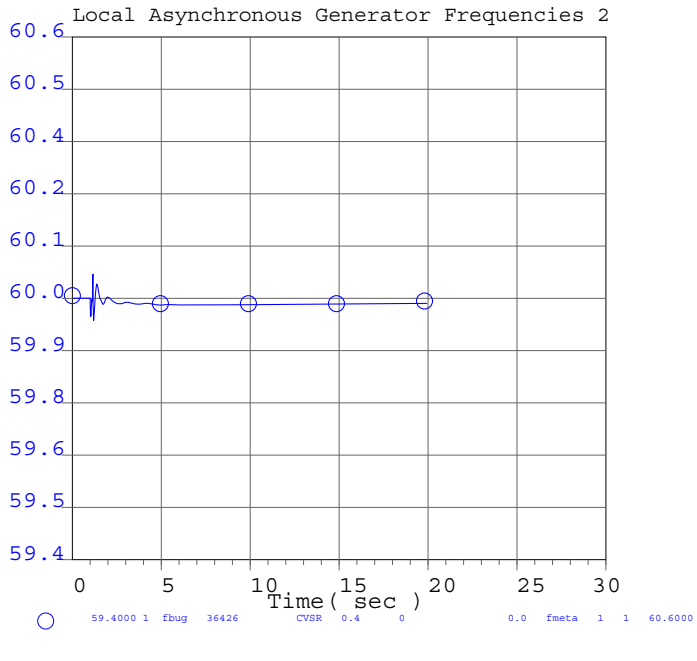

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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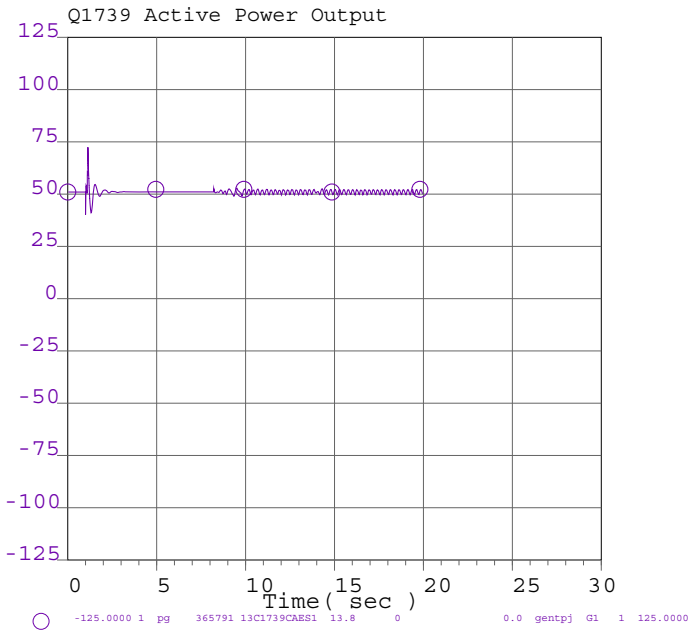
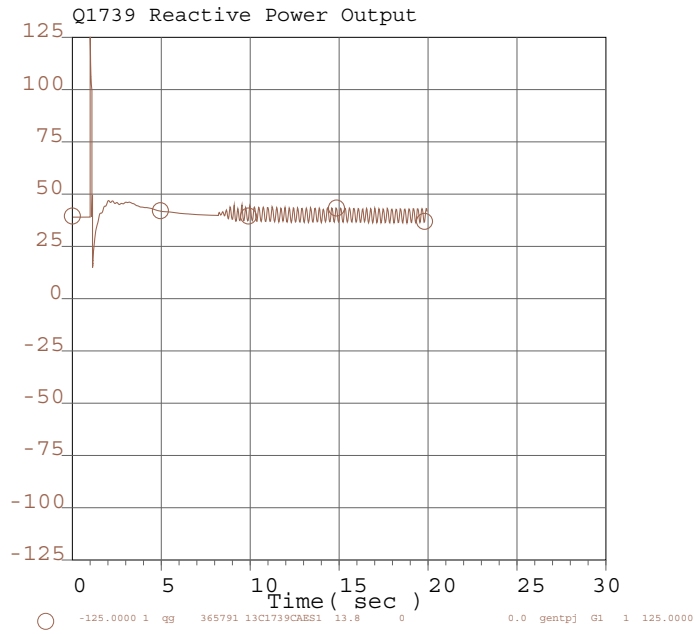
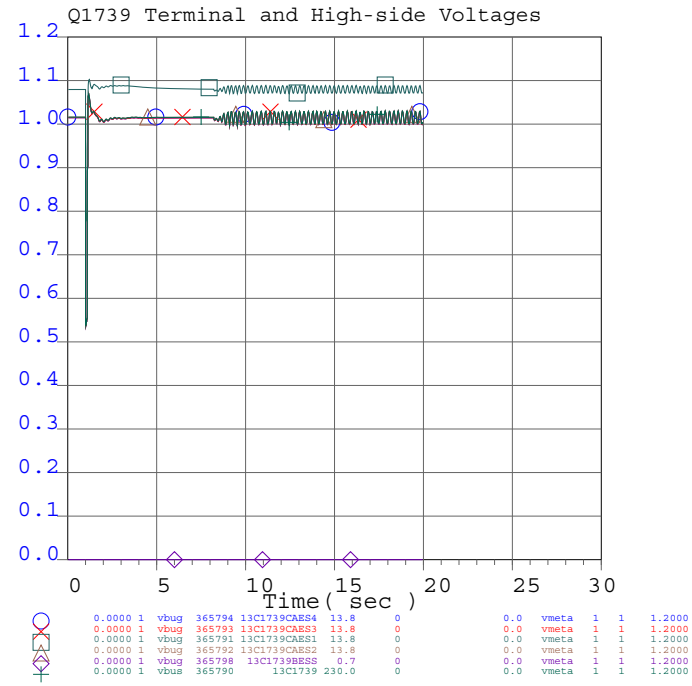
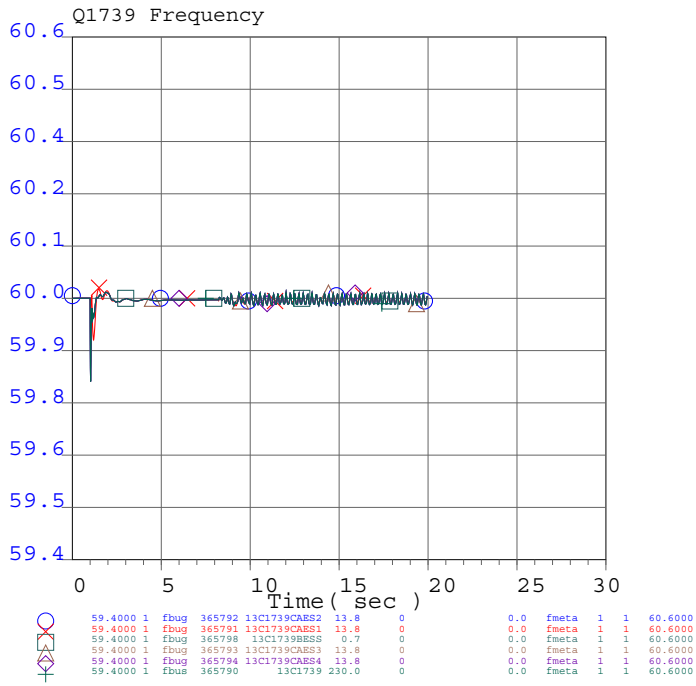
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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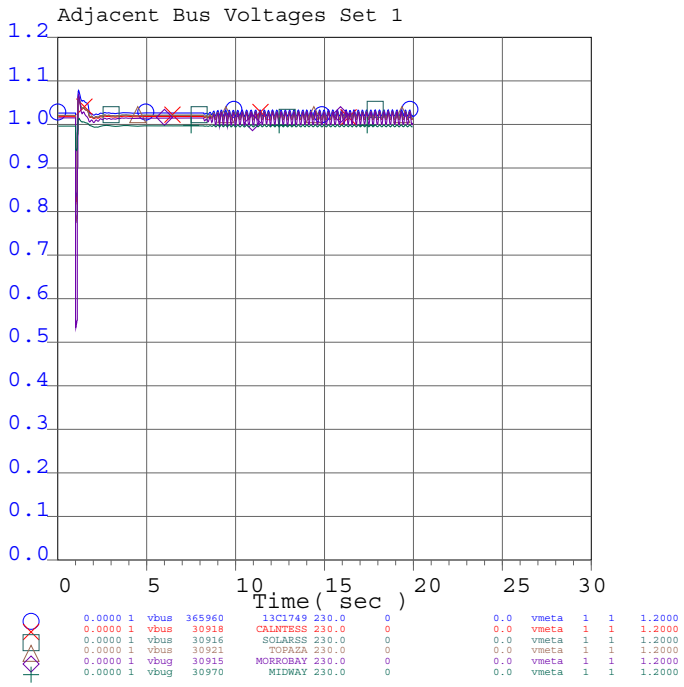

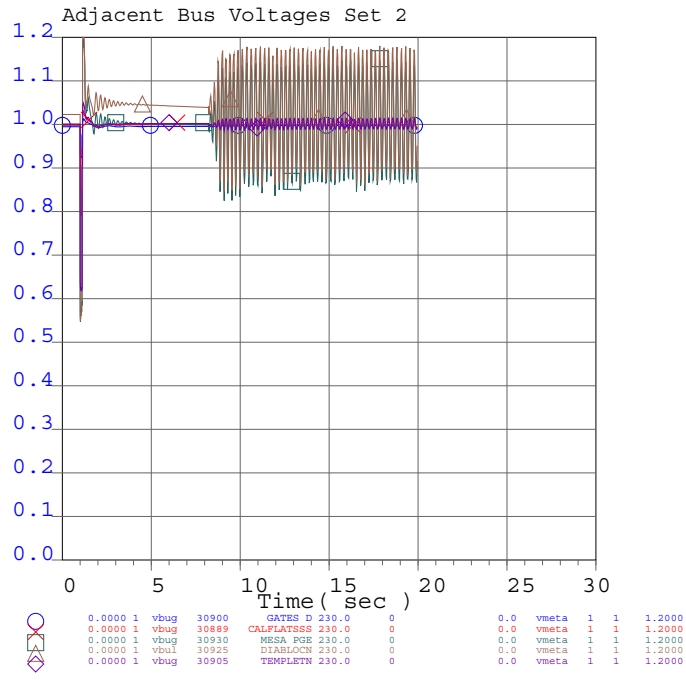

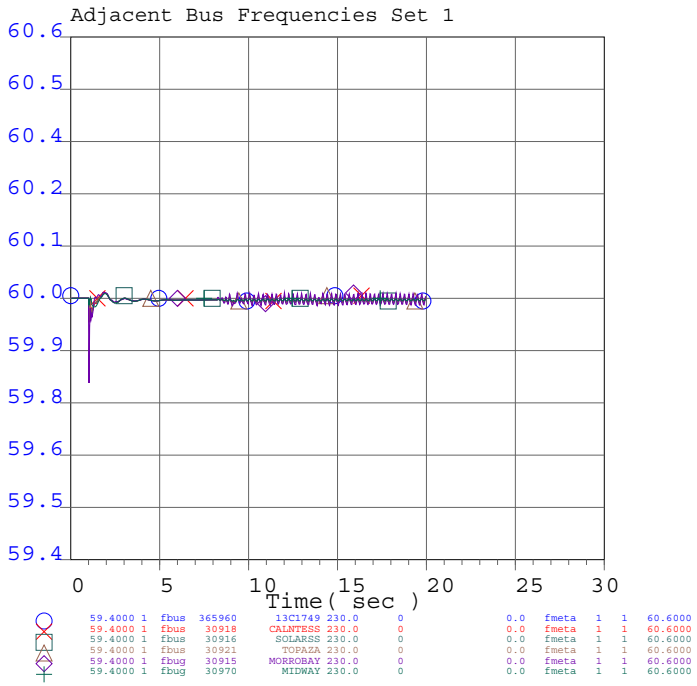

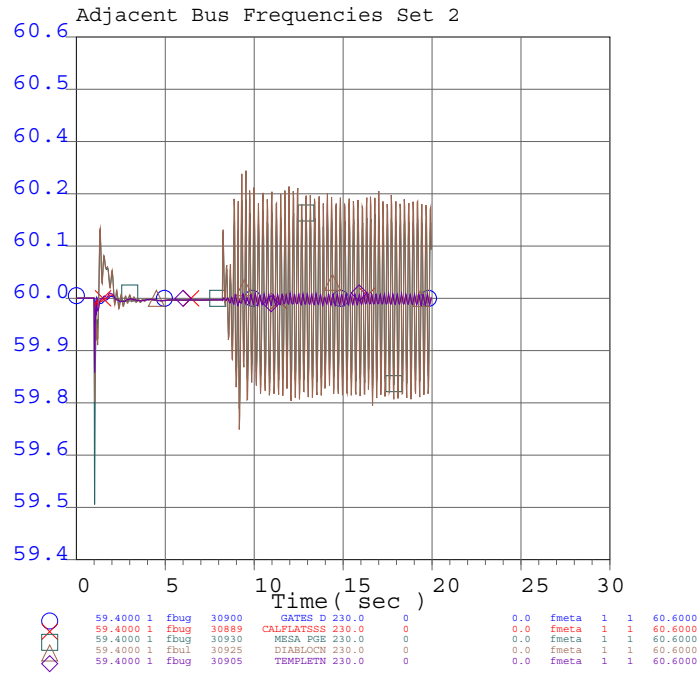

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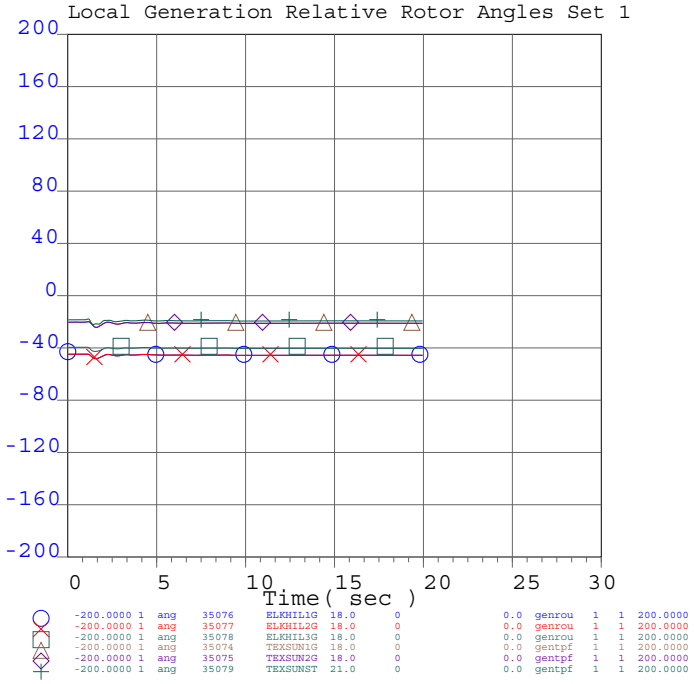
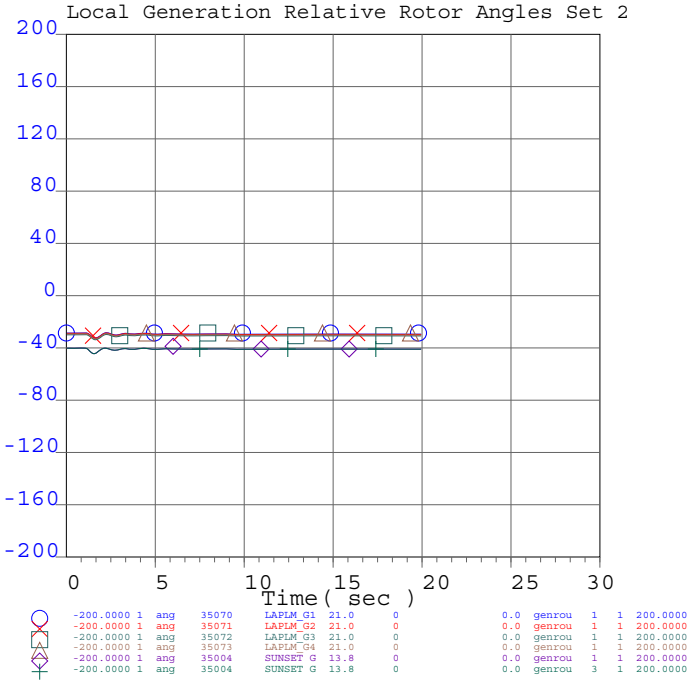
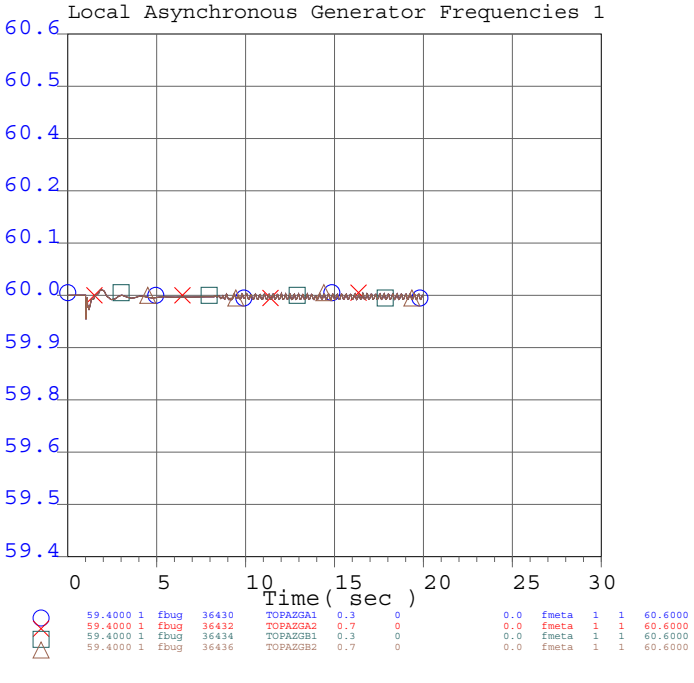
Local Generation Relative Rotor Angles Set 1



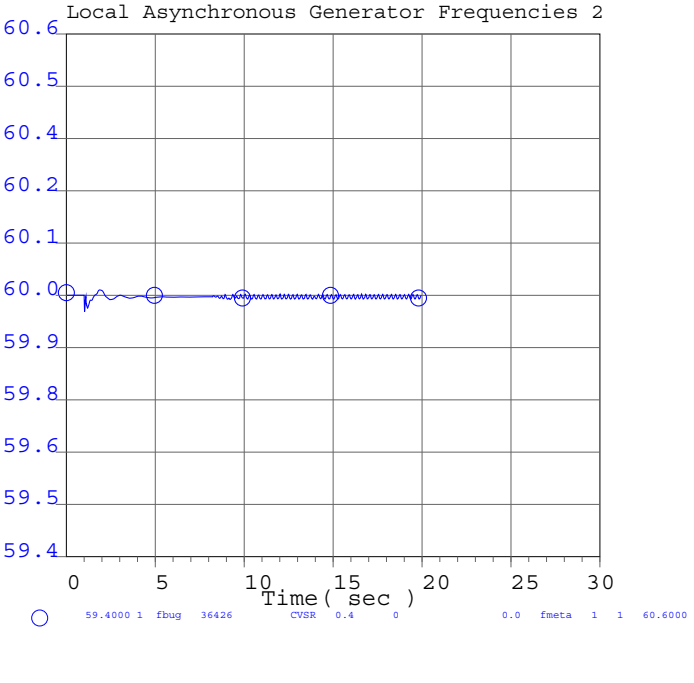
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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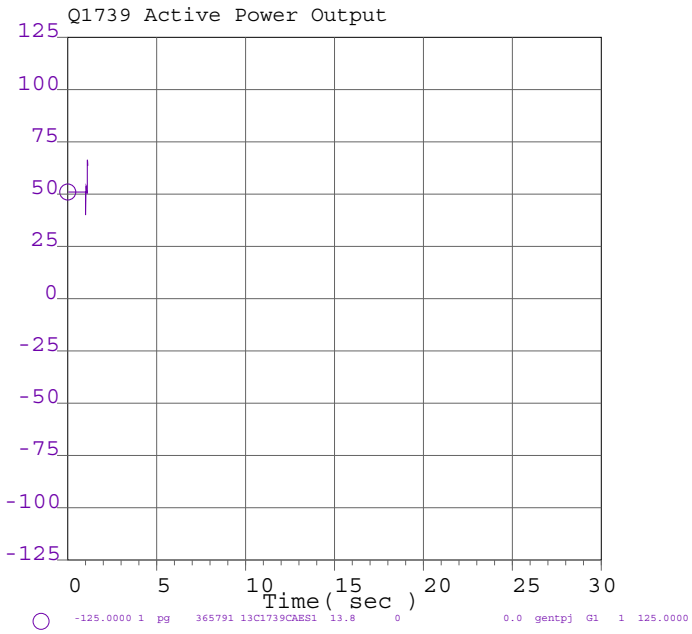
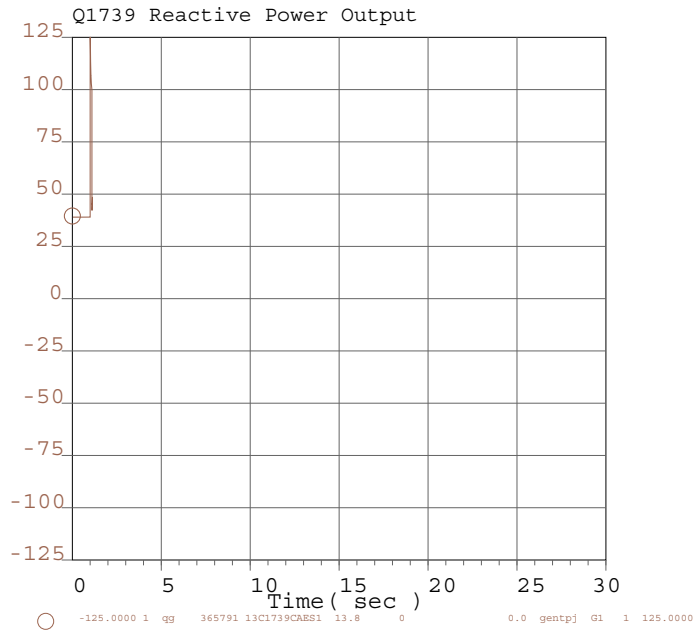
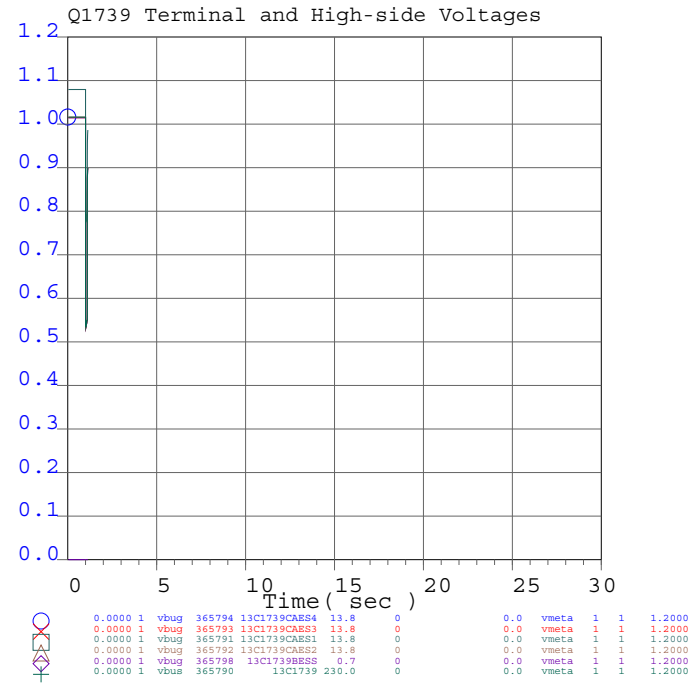
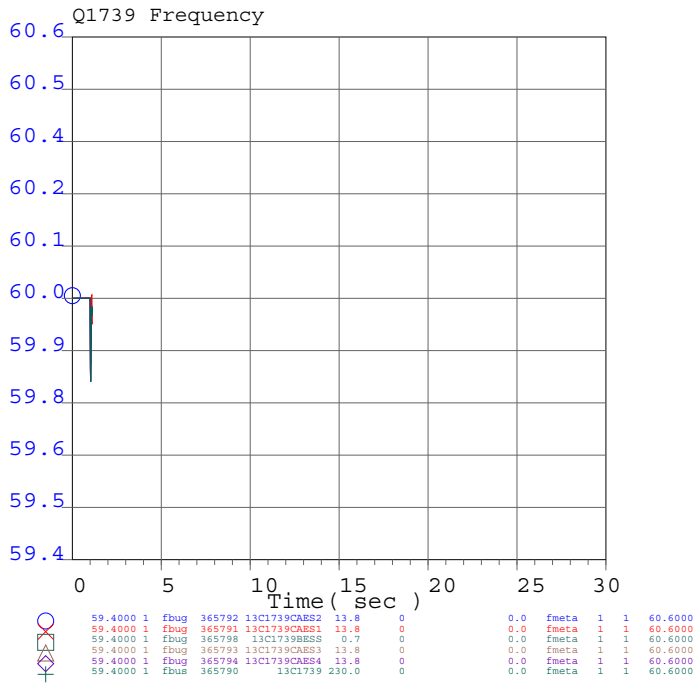
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









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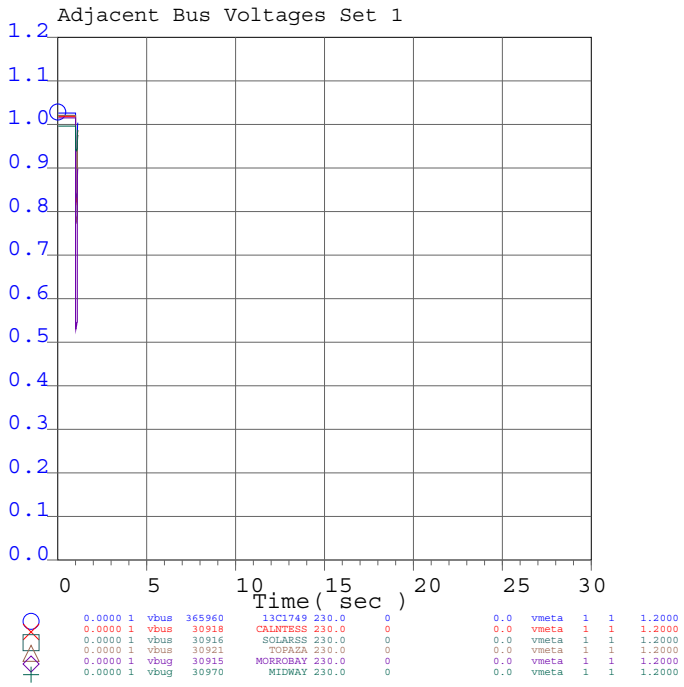

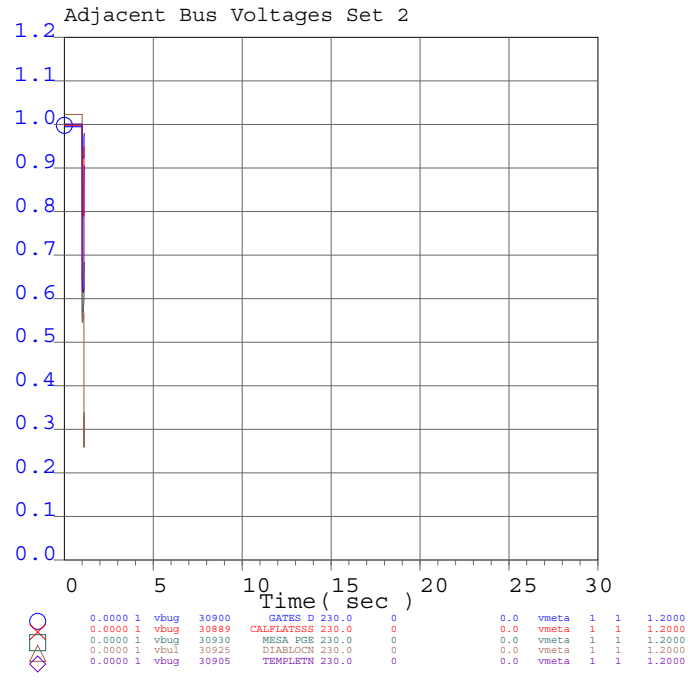

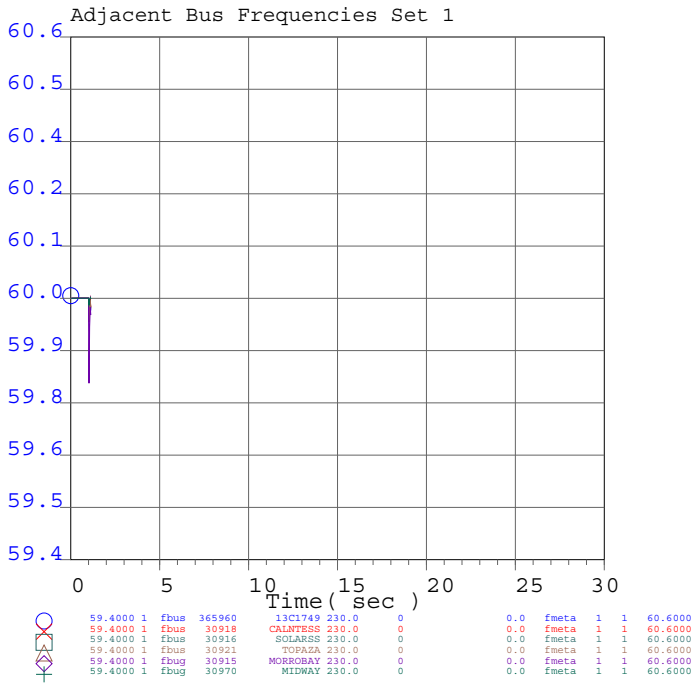

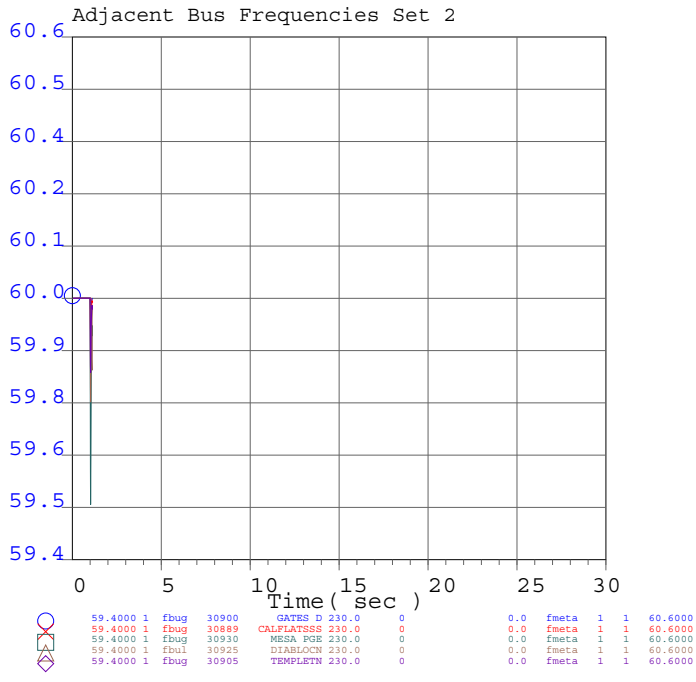

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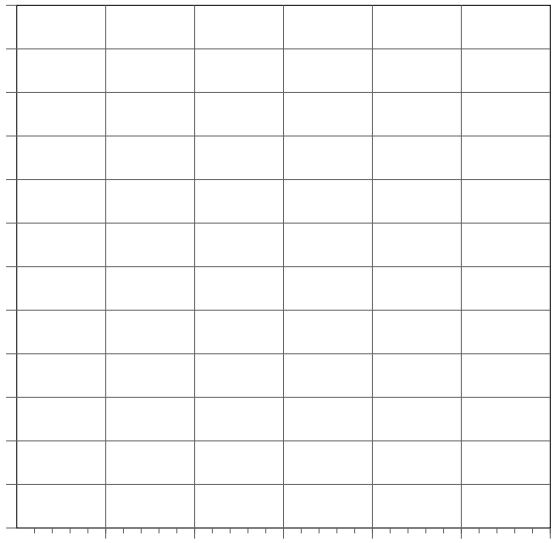
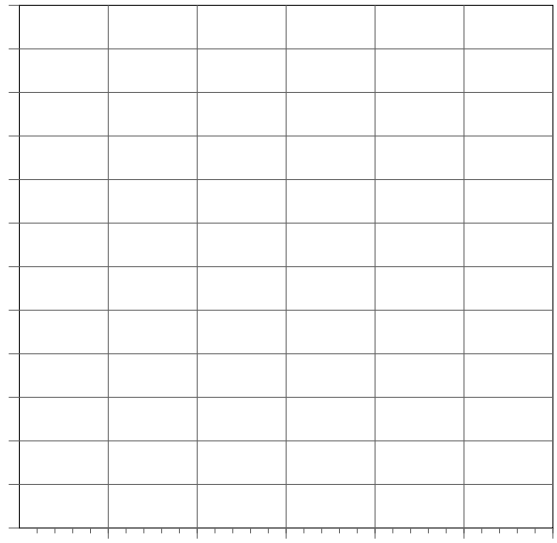
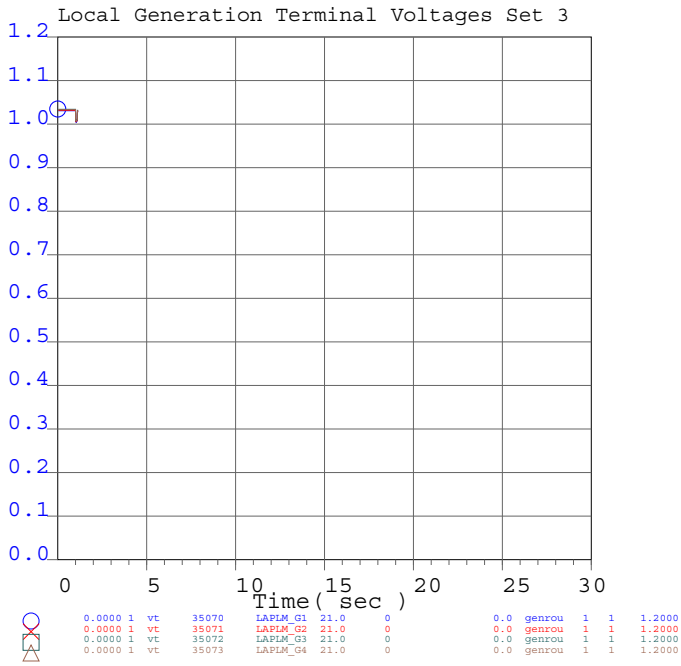
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
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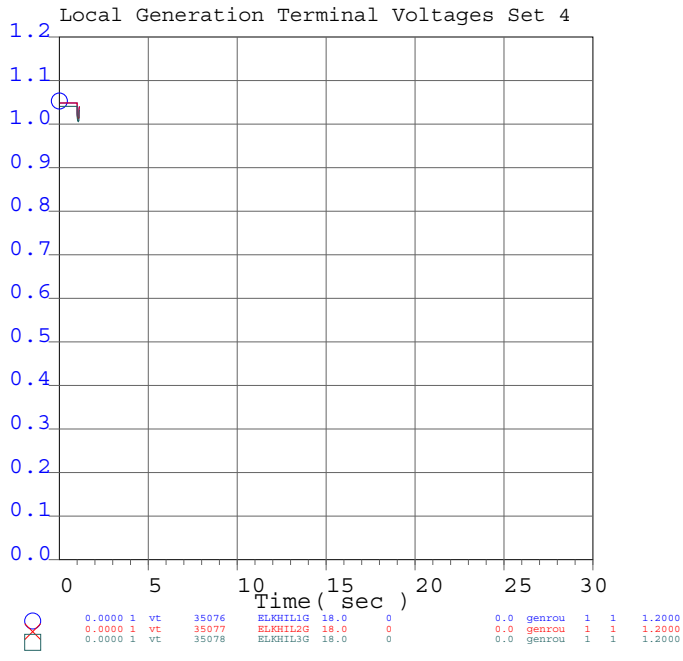
Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
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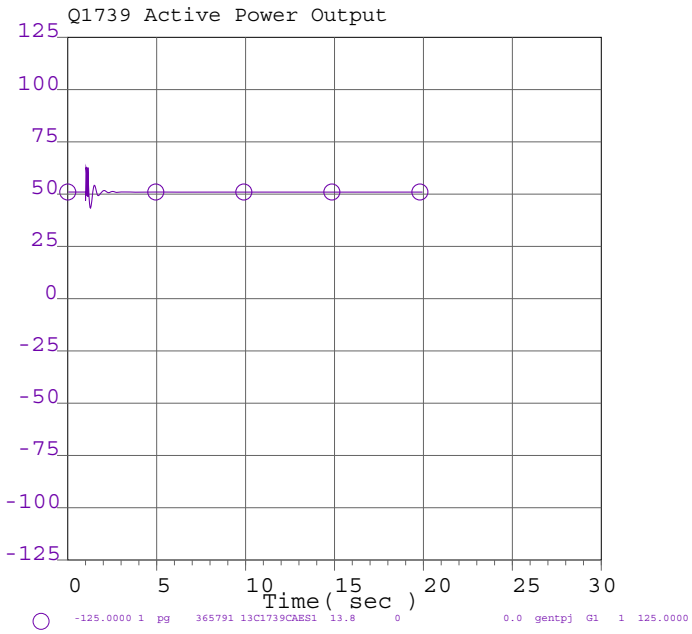

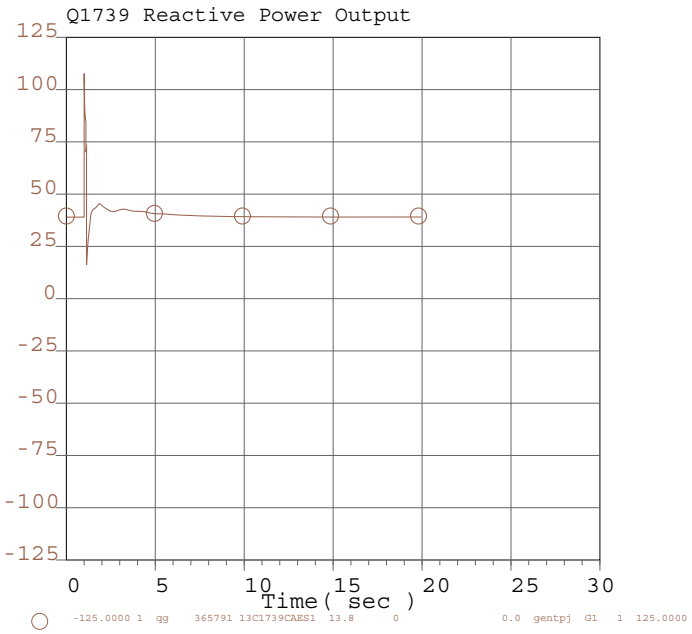

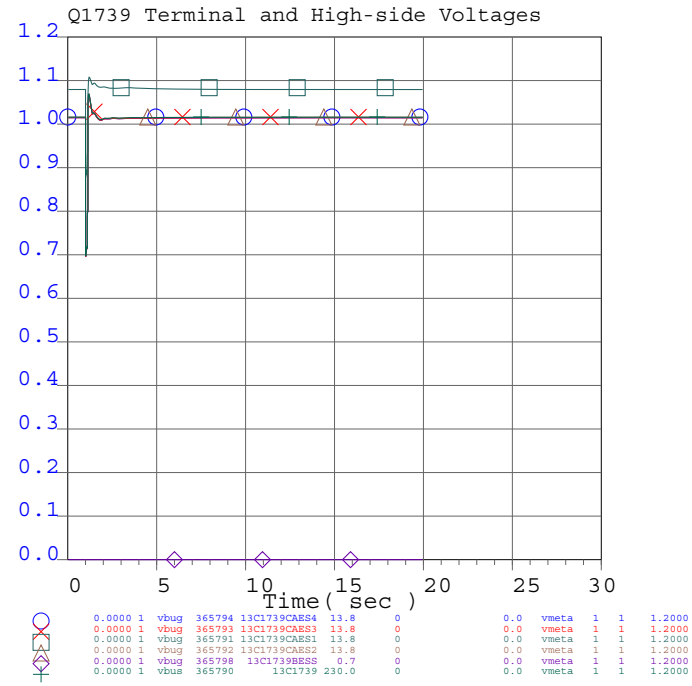

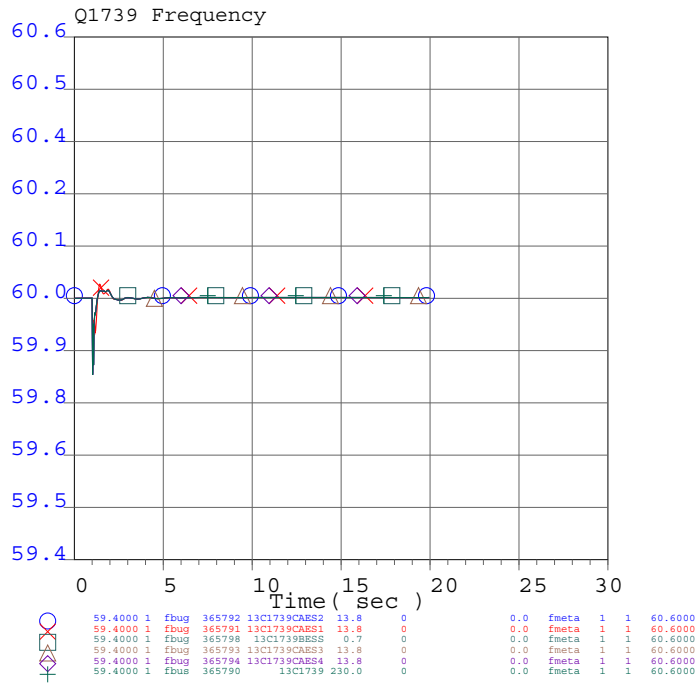

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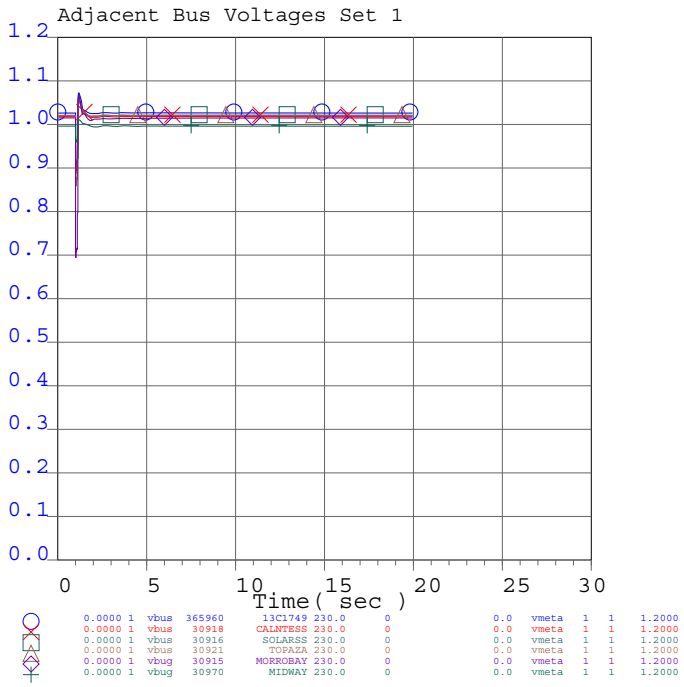
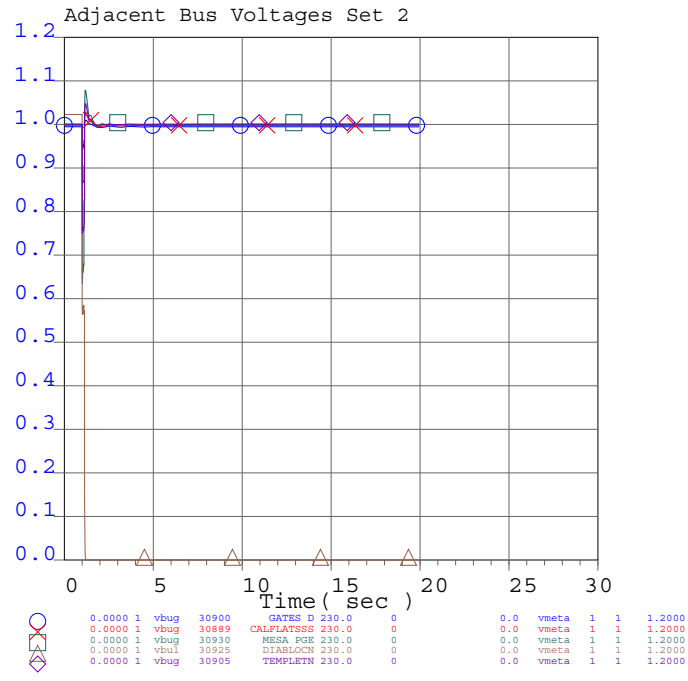
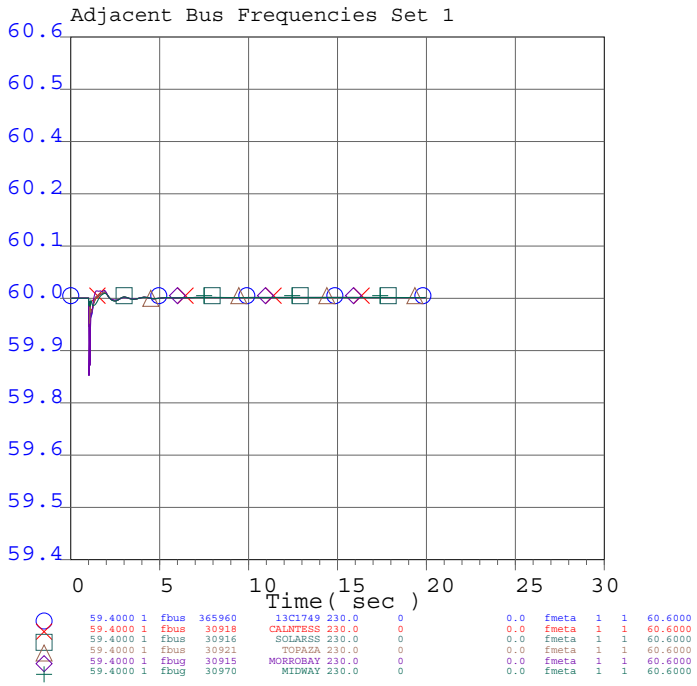
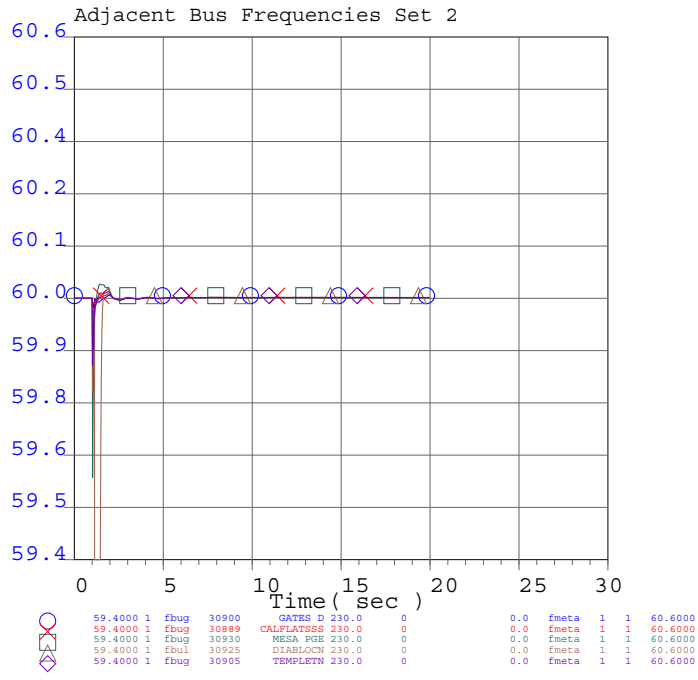
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd



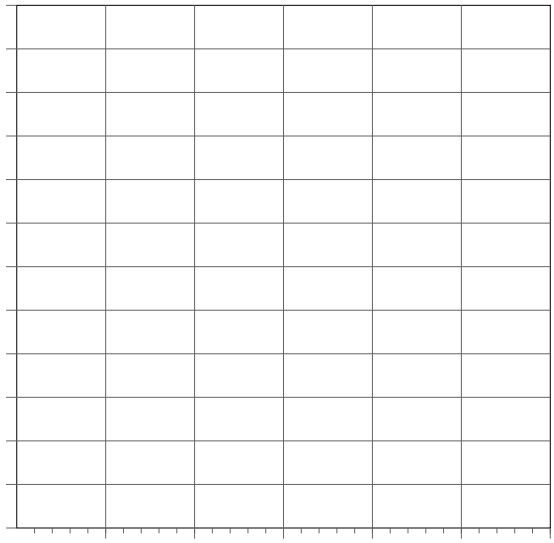




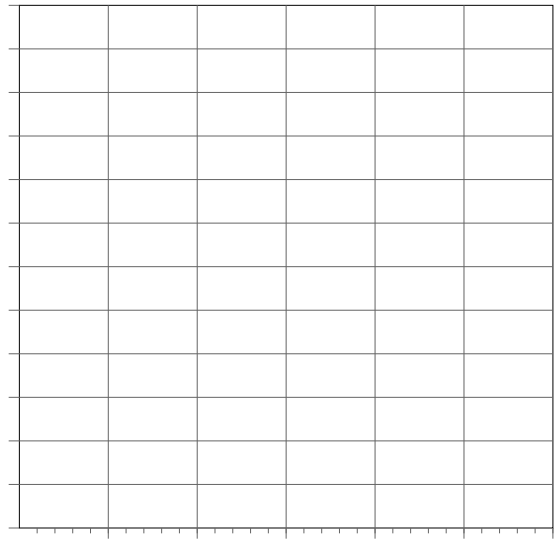


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

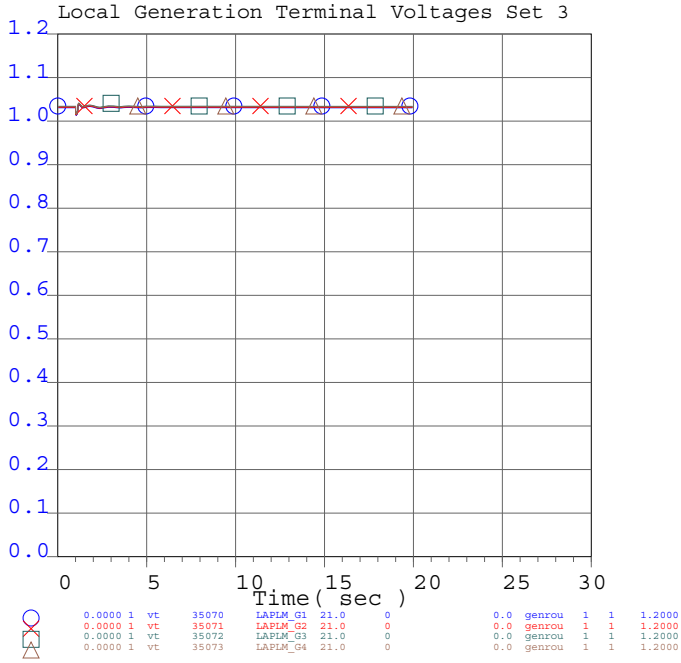
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2

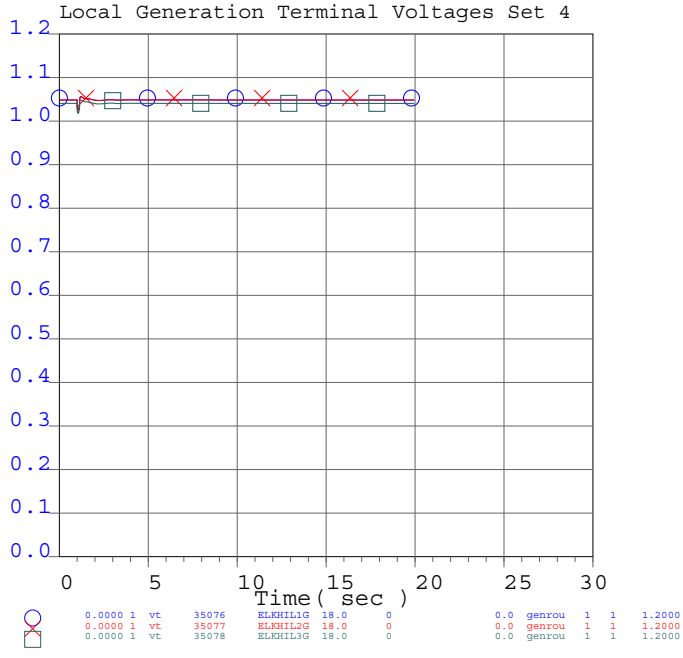


Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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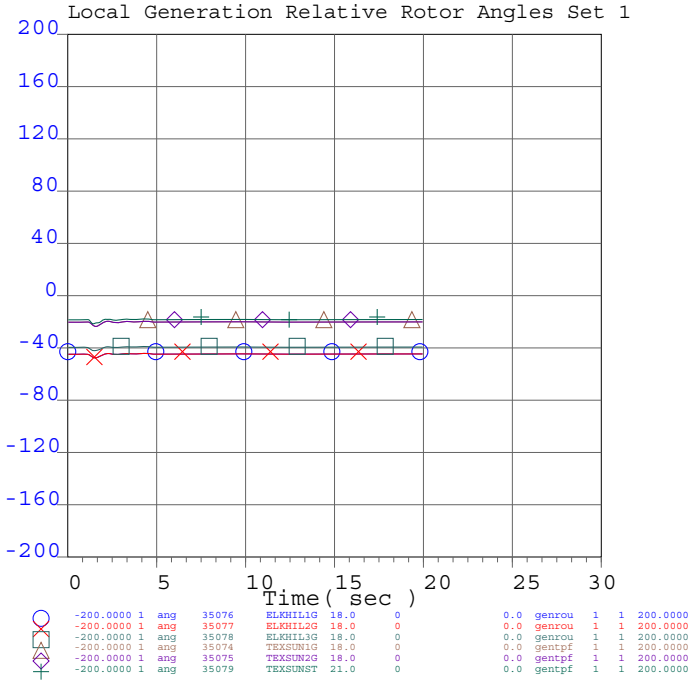
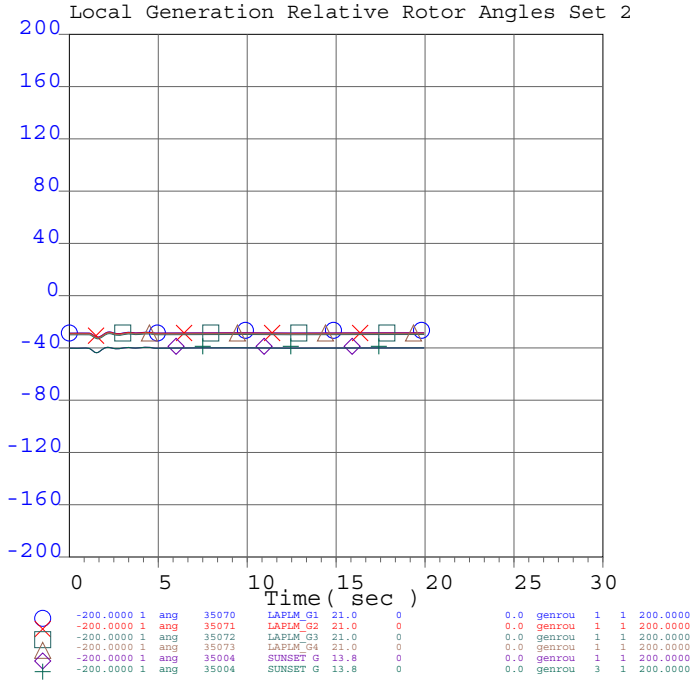
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

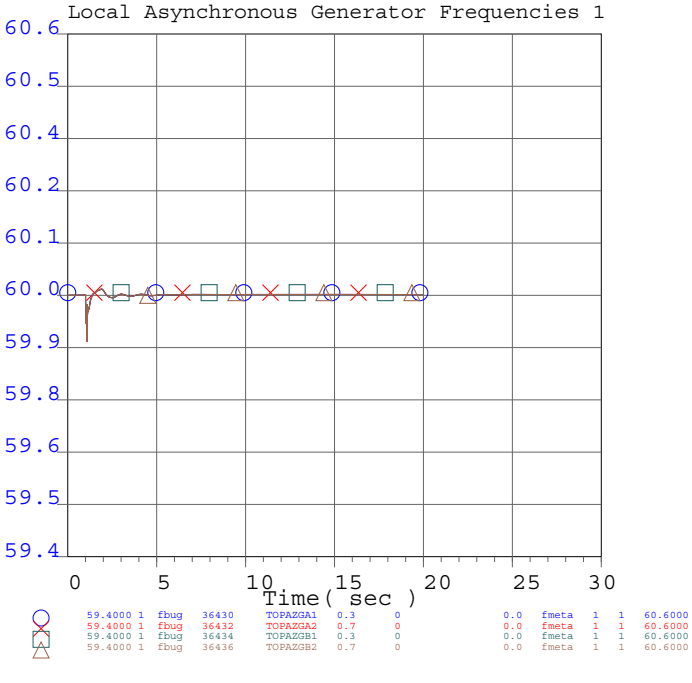
Local Generation Relative Rotor Angles Set 1



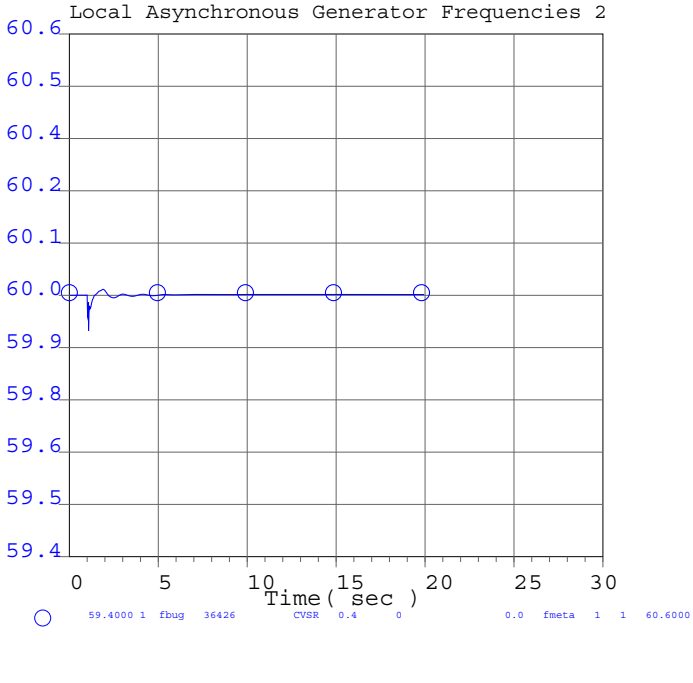
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1

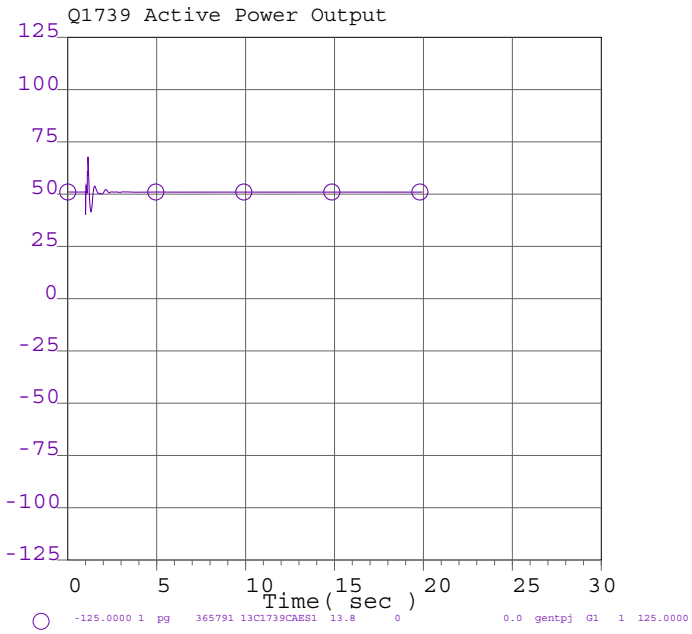


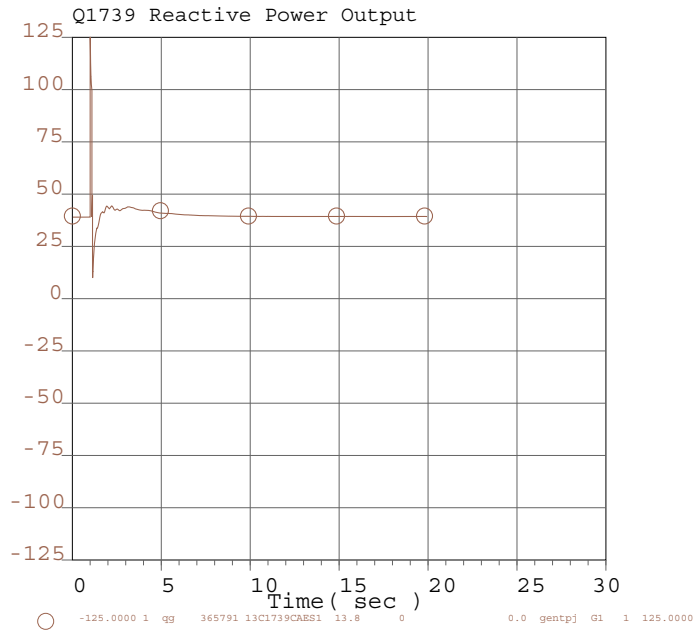
Local Asynchronous Generator Frequencies 2

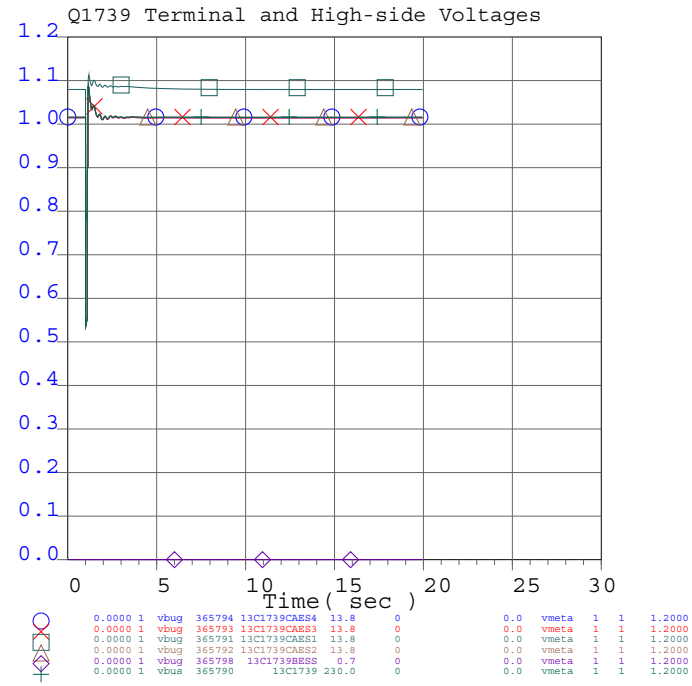


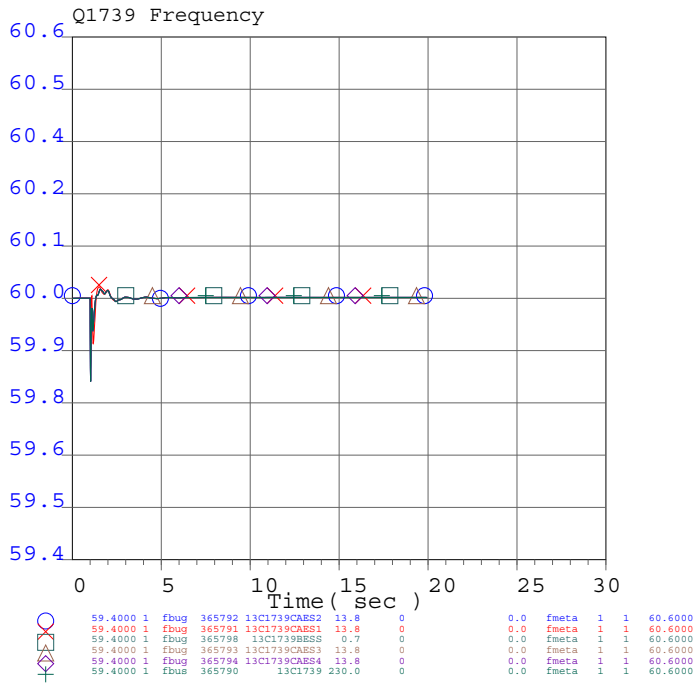
PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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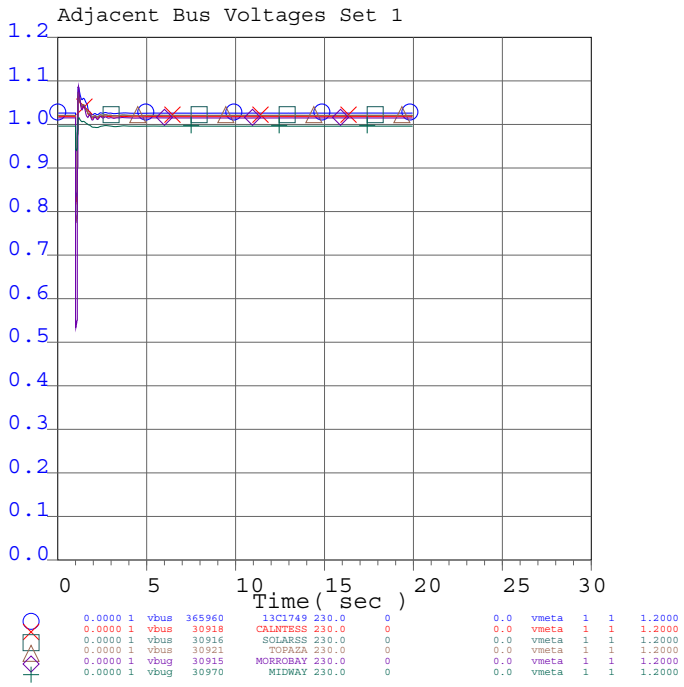
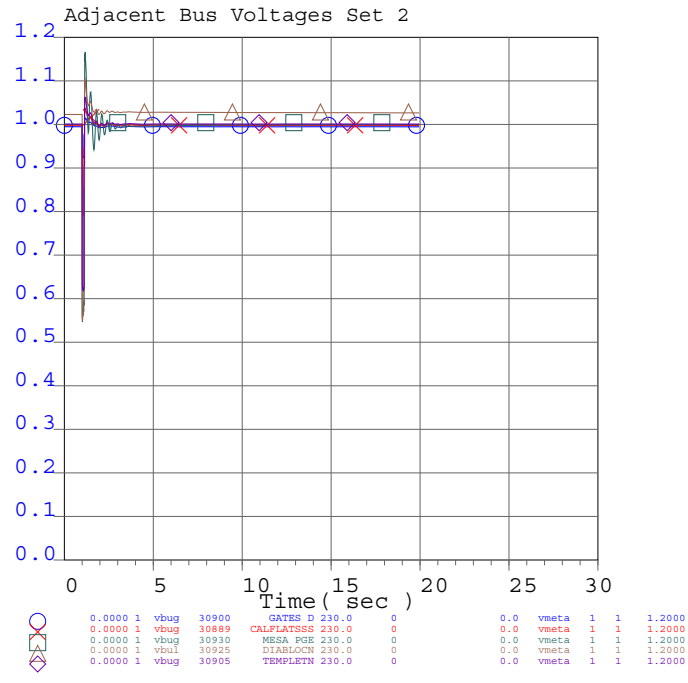
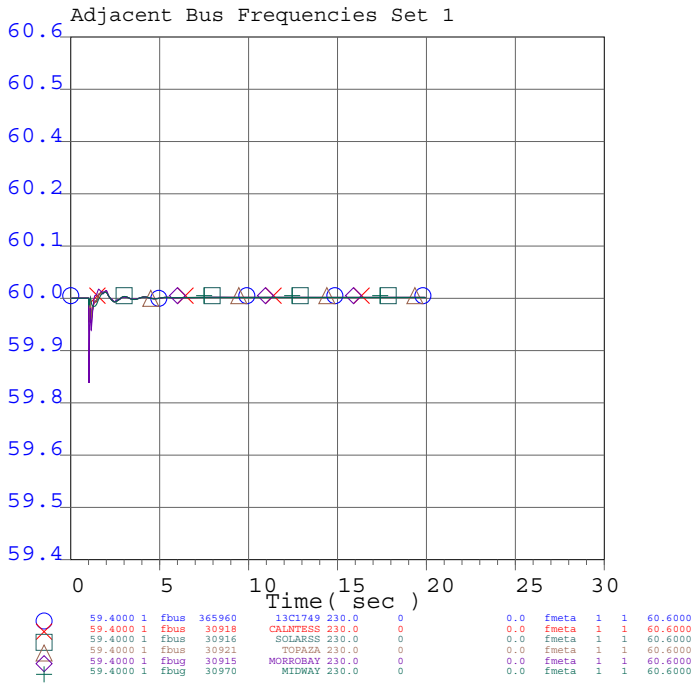
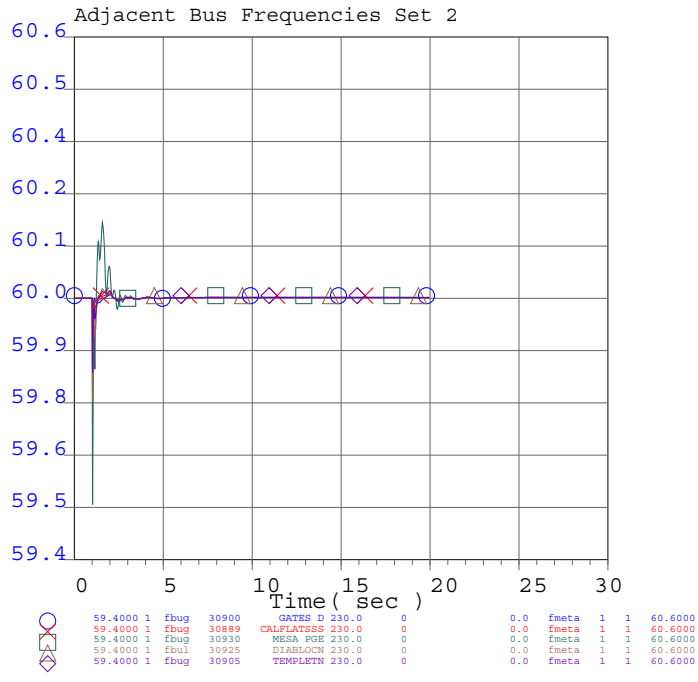
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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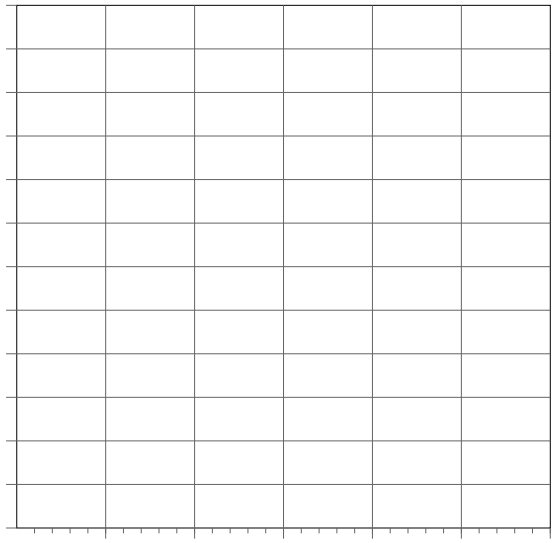
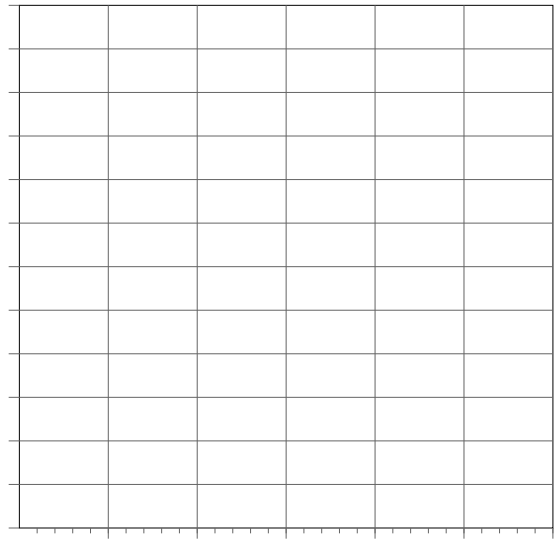
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

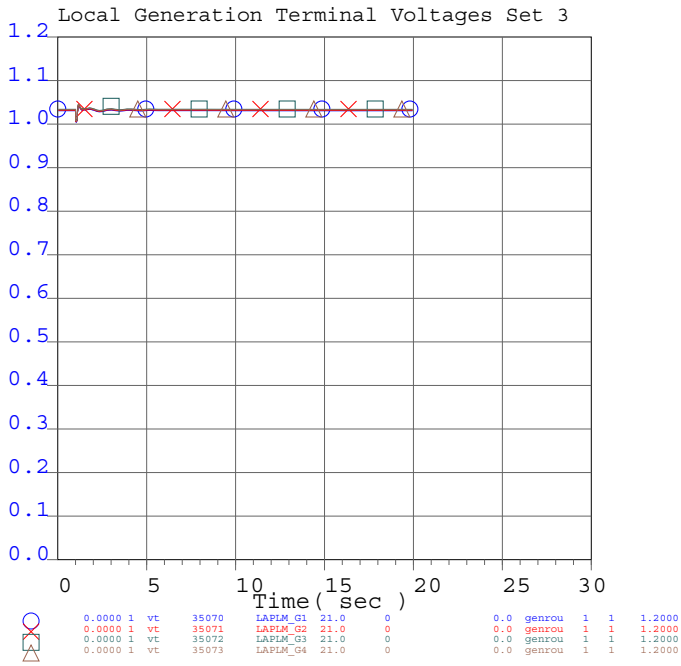
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



0.0000 1 vt 35070 LAPLM_G1 21.0 0 0.0 genrou 1 1 1.2000
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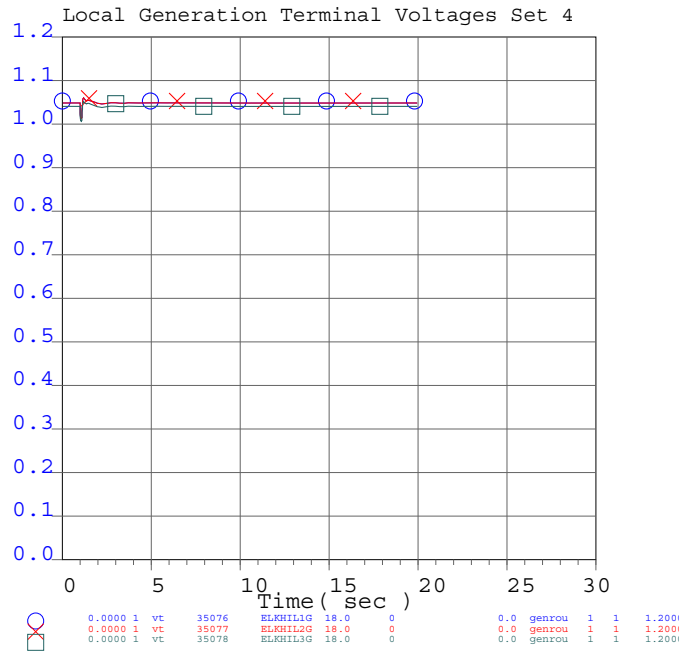
Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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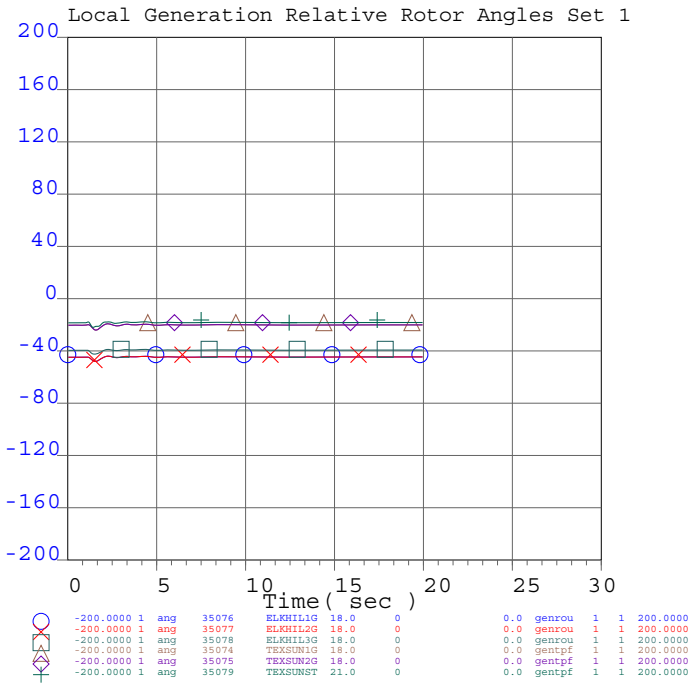

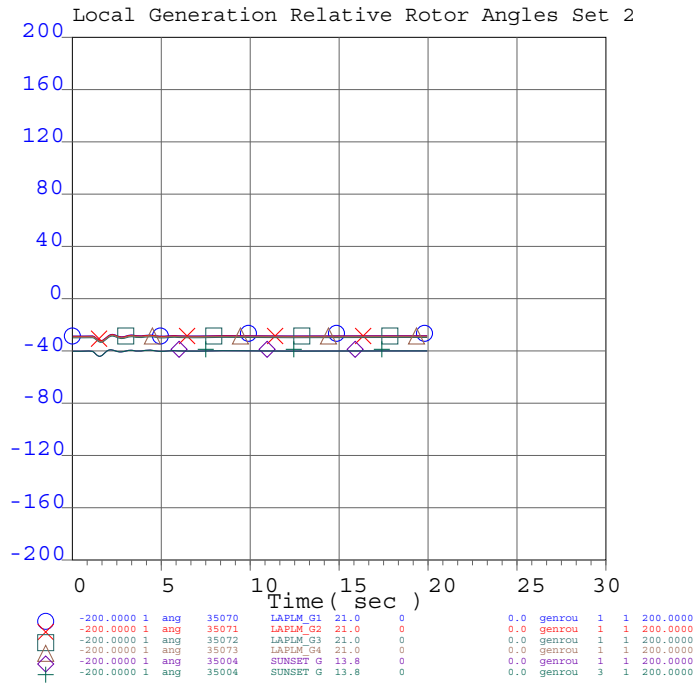

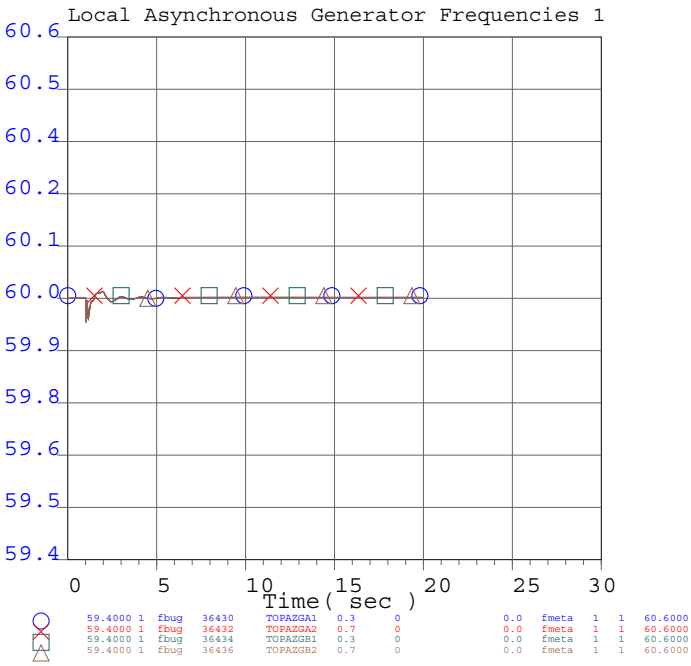

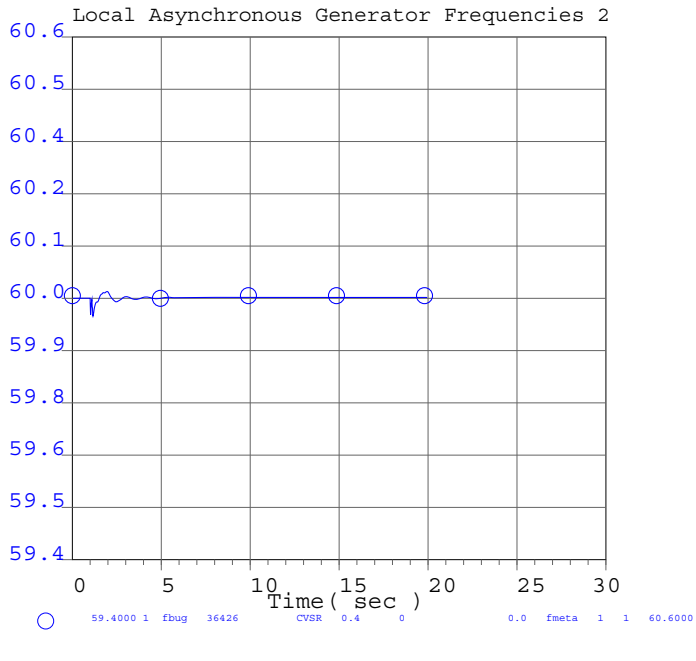

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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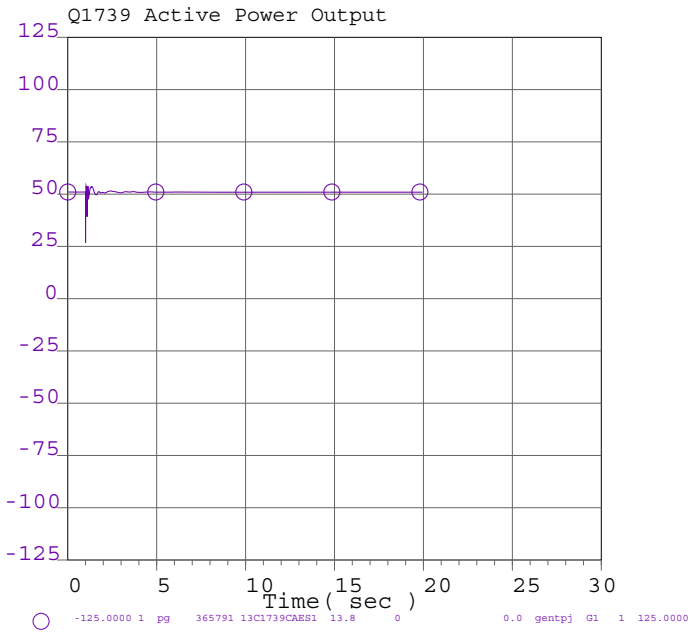
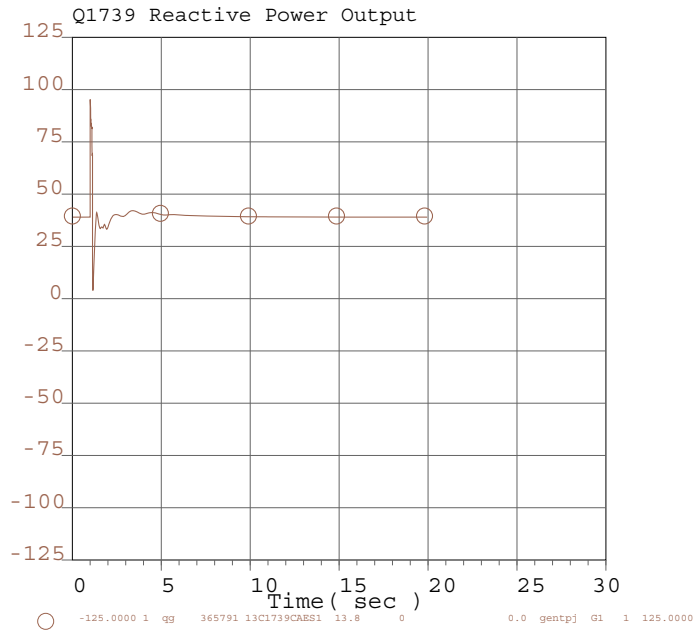
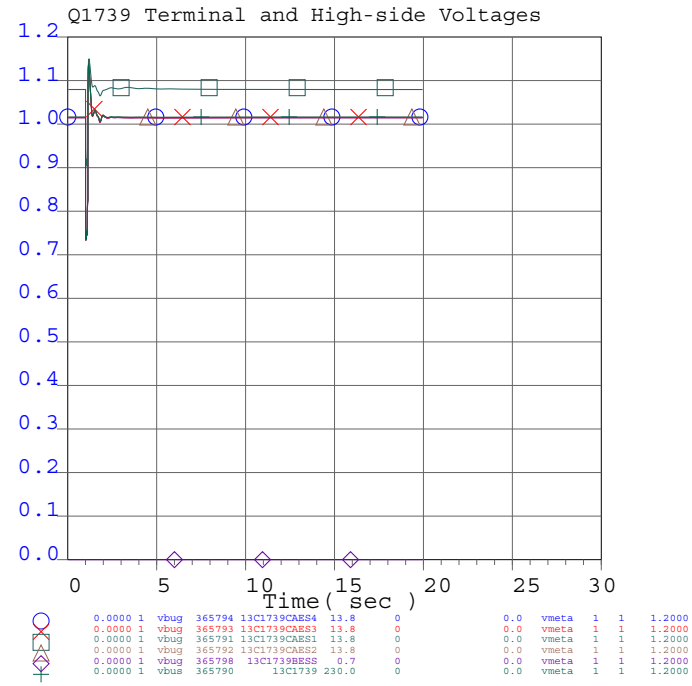
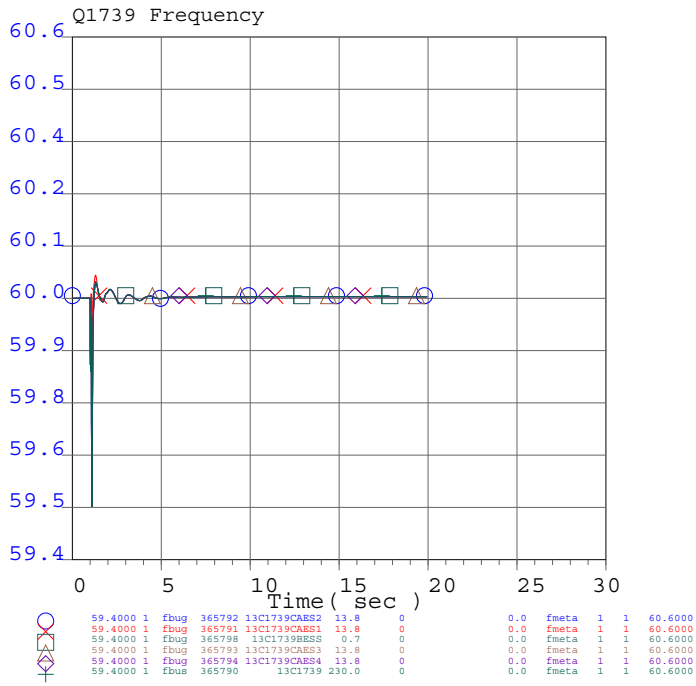
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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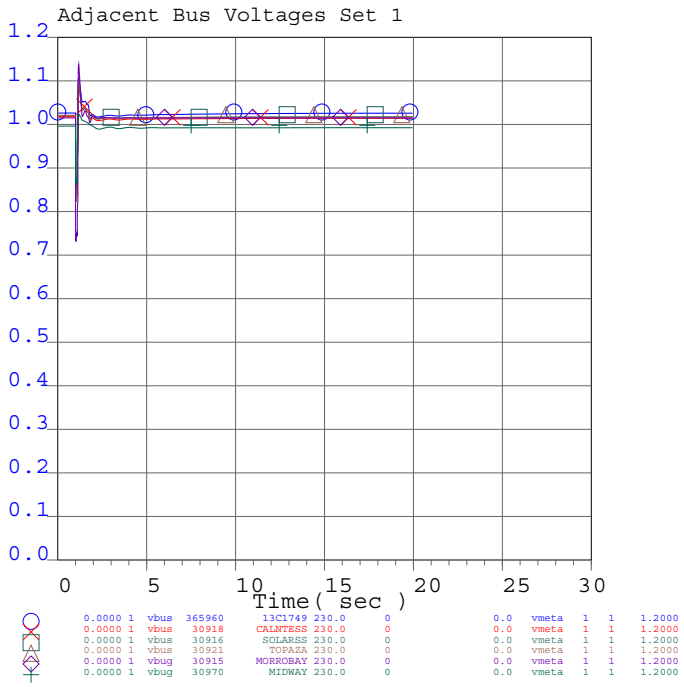

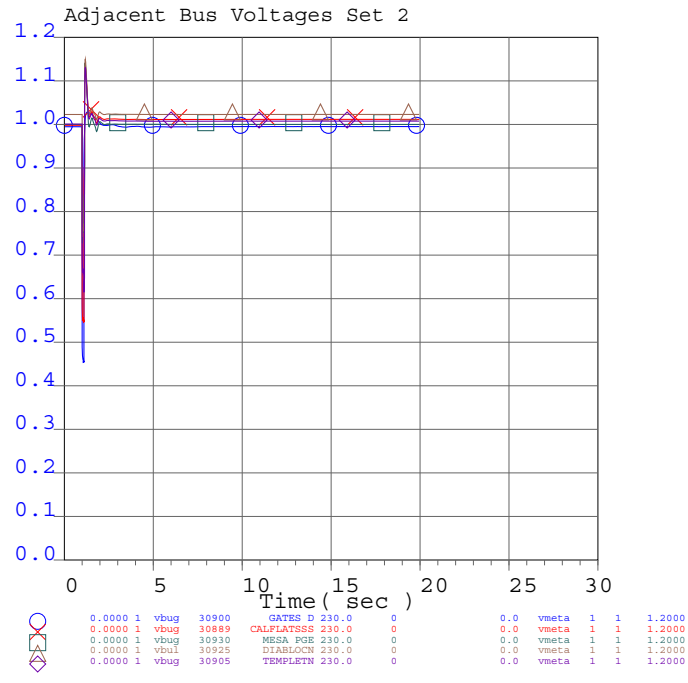

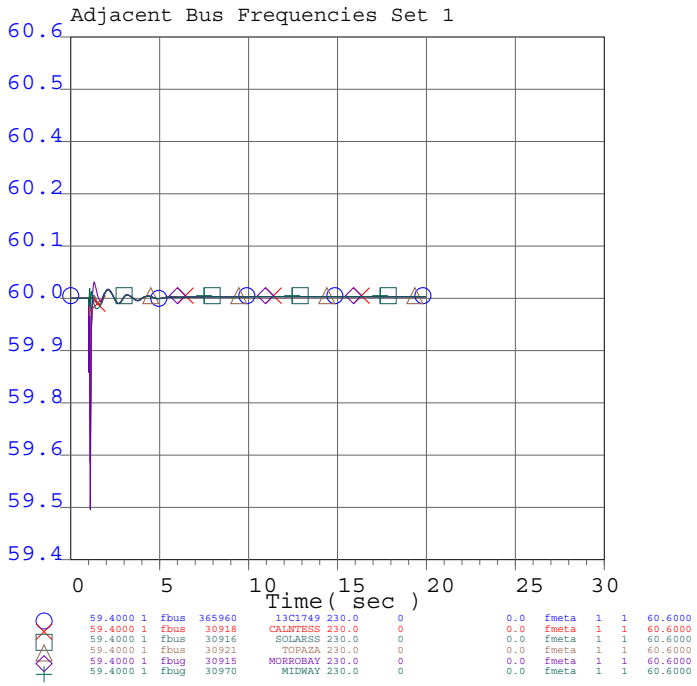

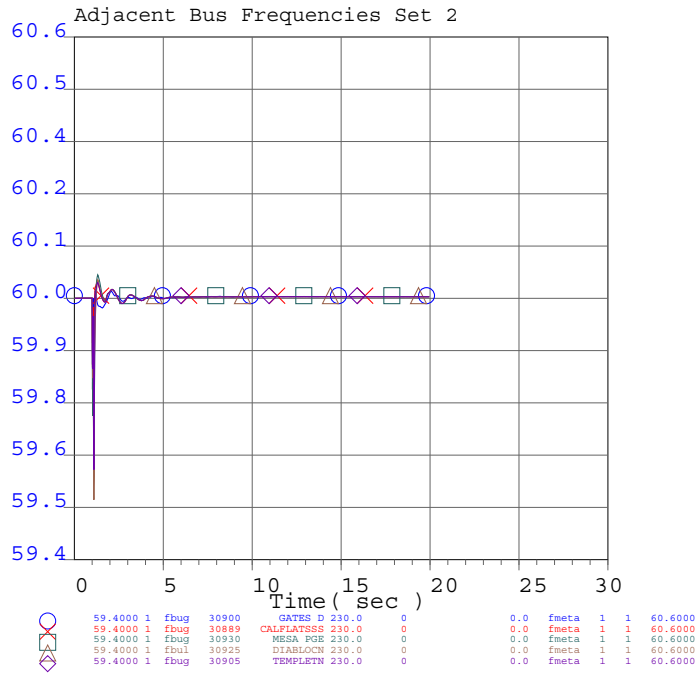

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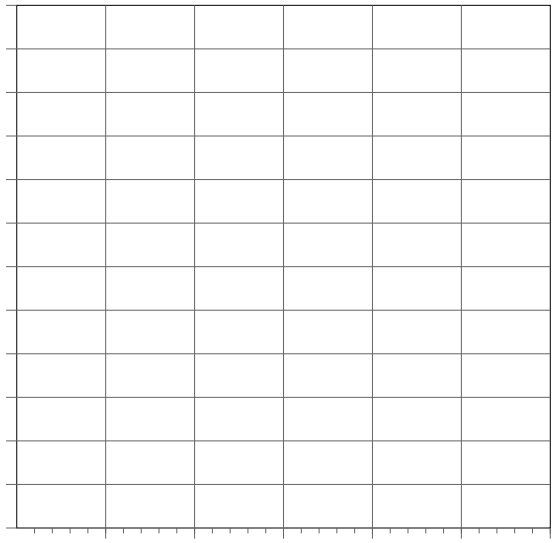
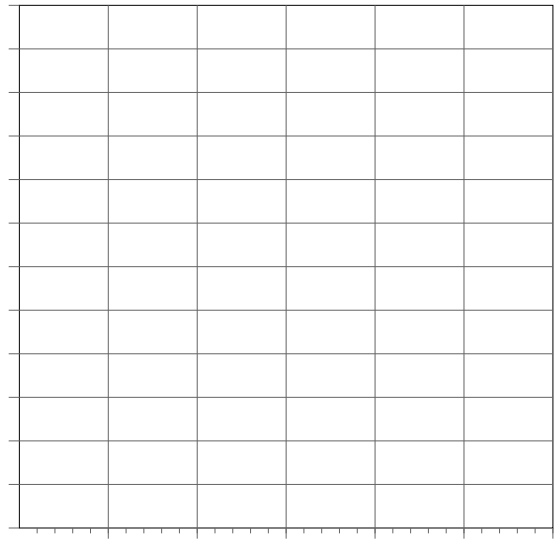
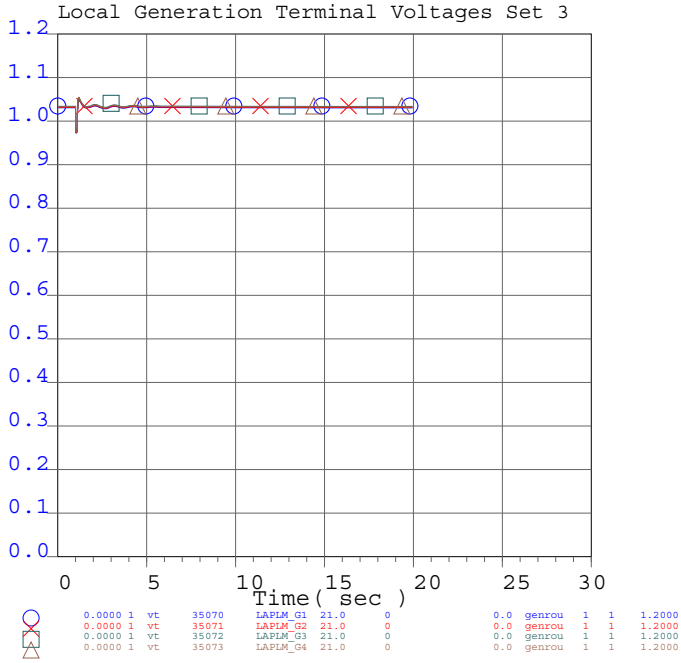
Local Generation Terminal Voltages Set 1



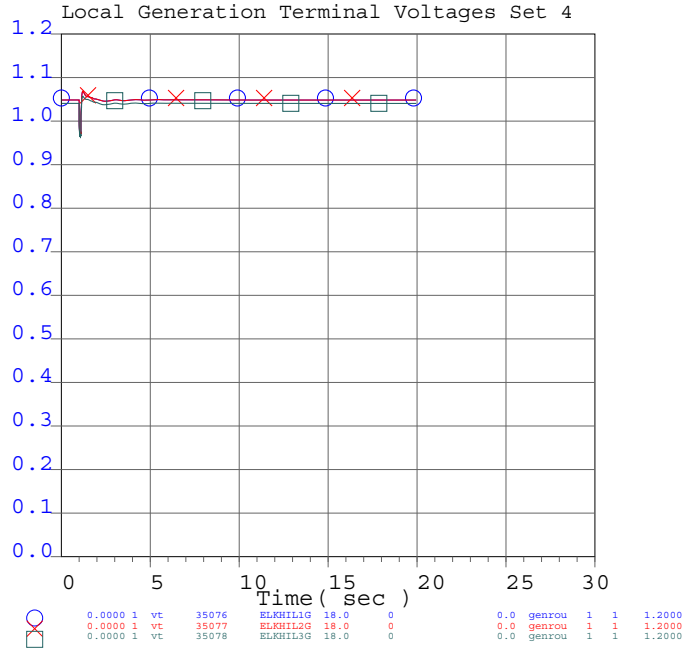
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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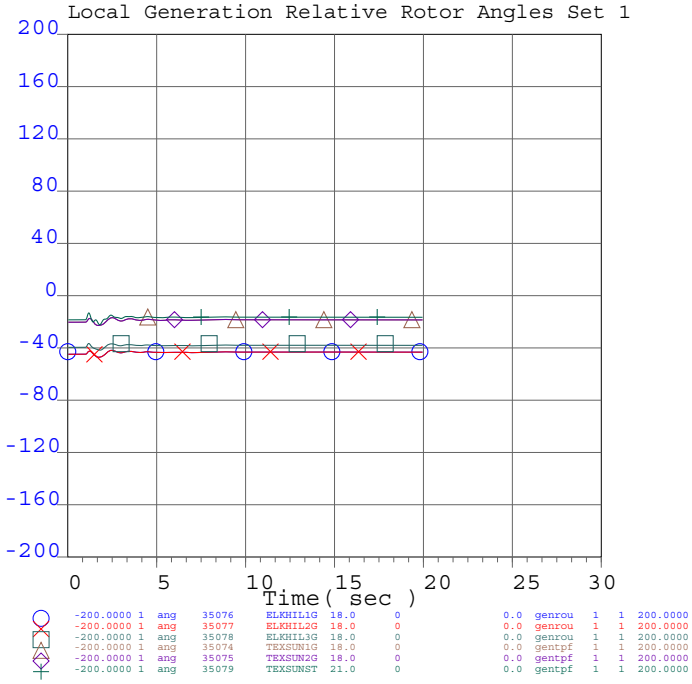
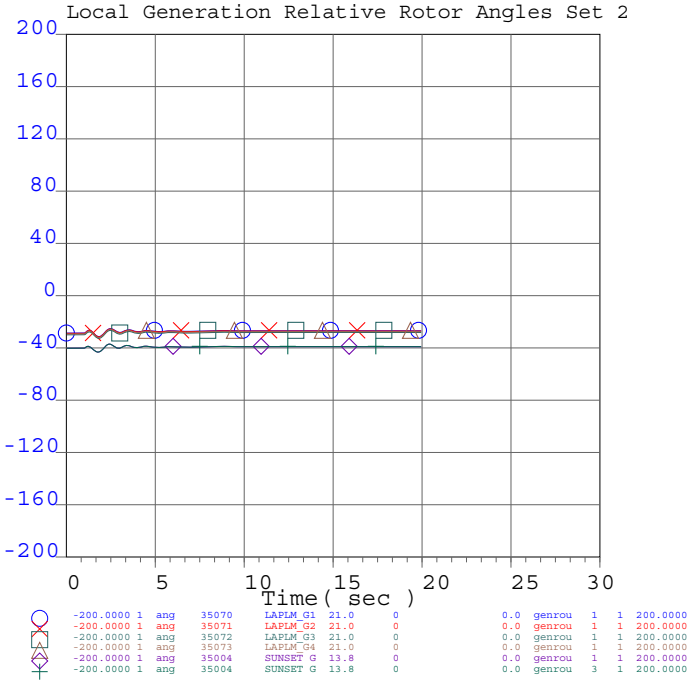
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

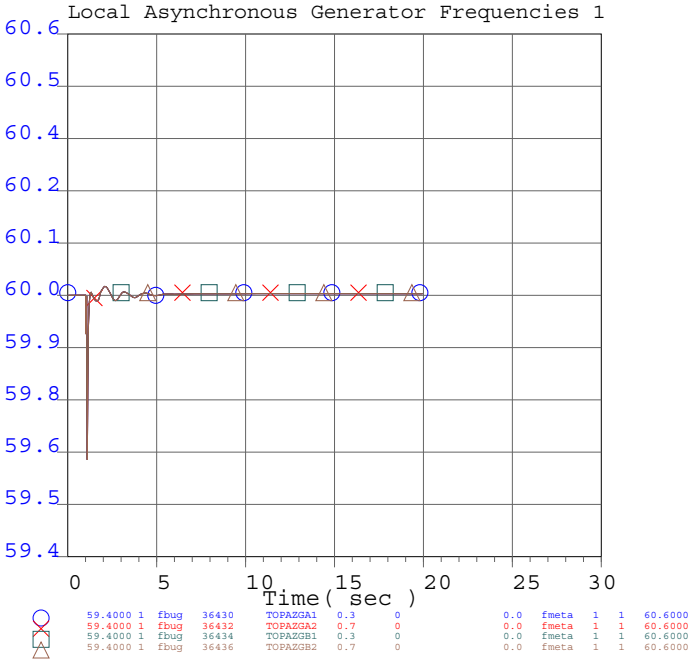
Local Generation Relative Rotor Angles Set 1



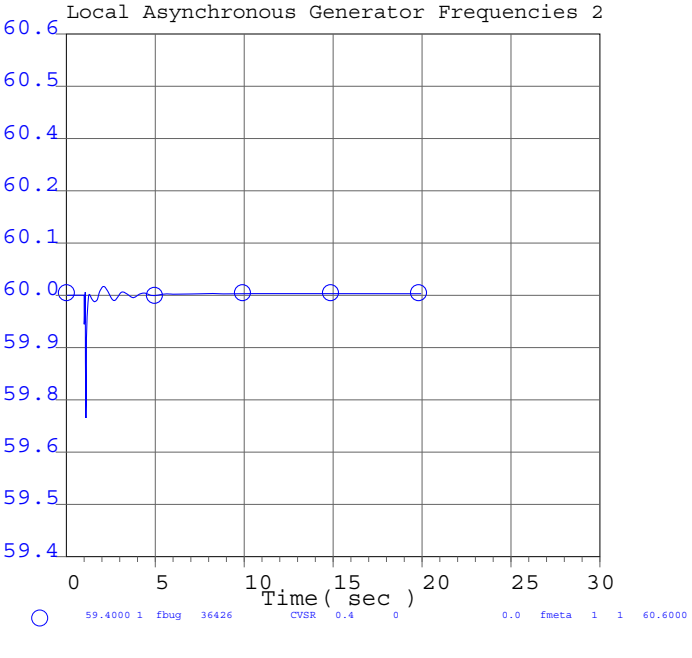
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



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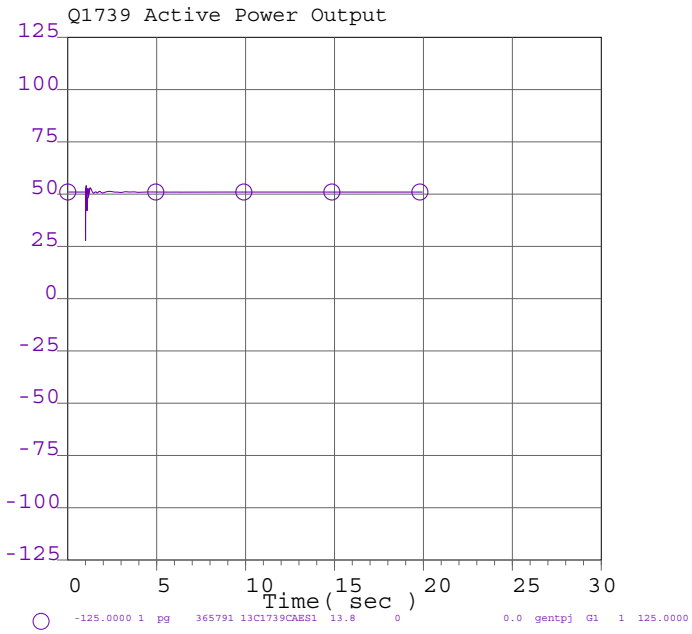
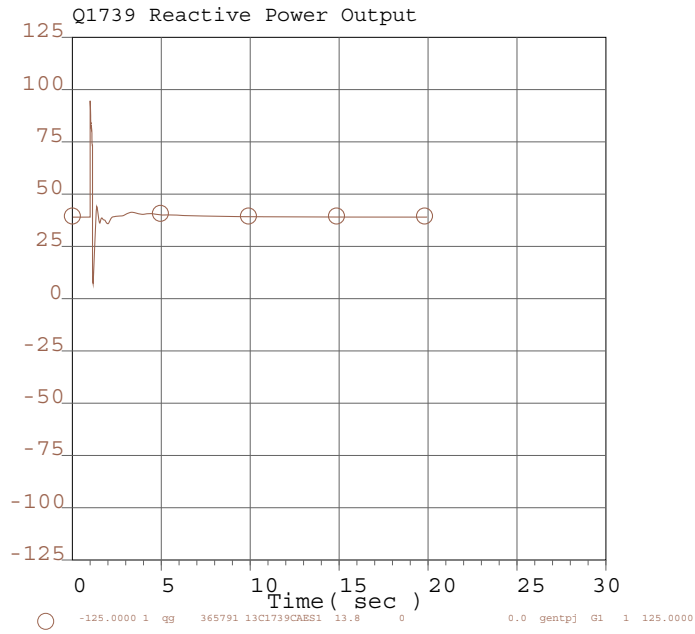
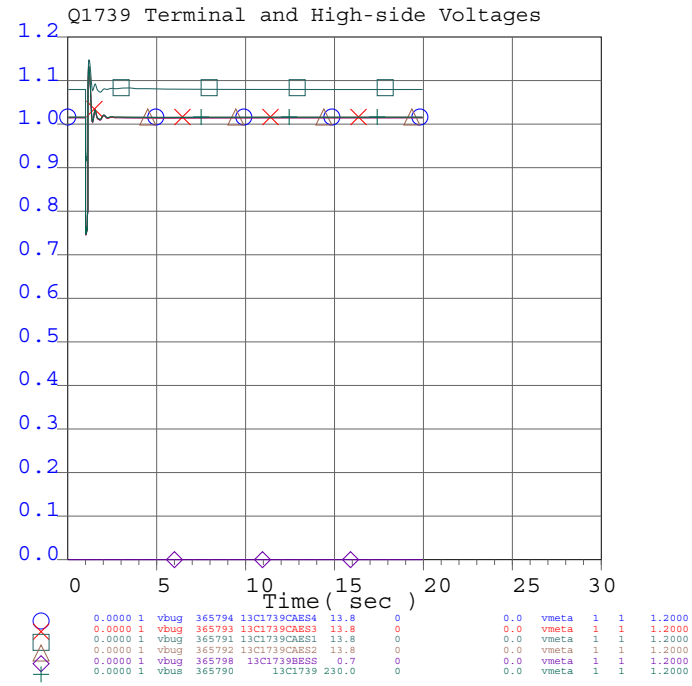
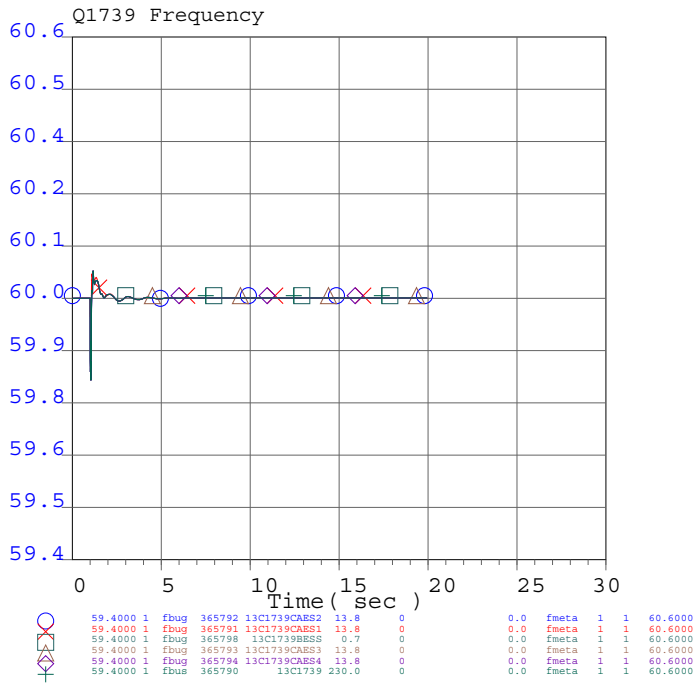
Q1739 (500 MW net): POI- Morro Bay 230 kV substation

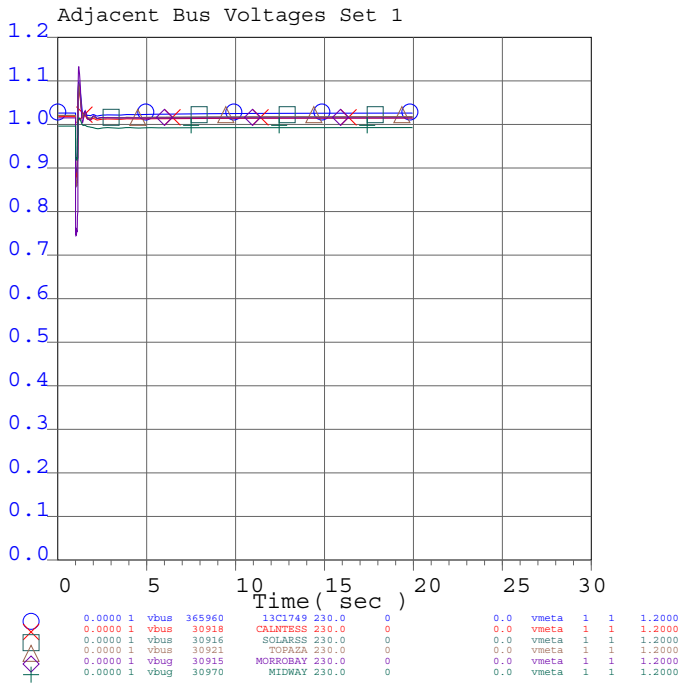


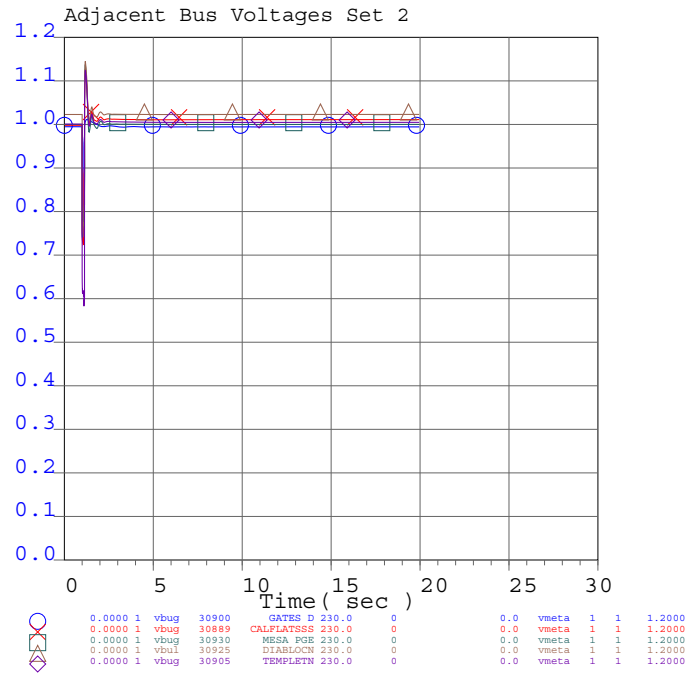


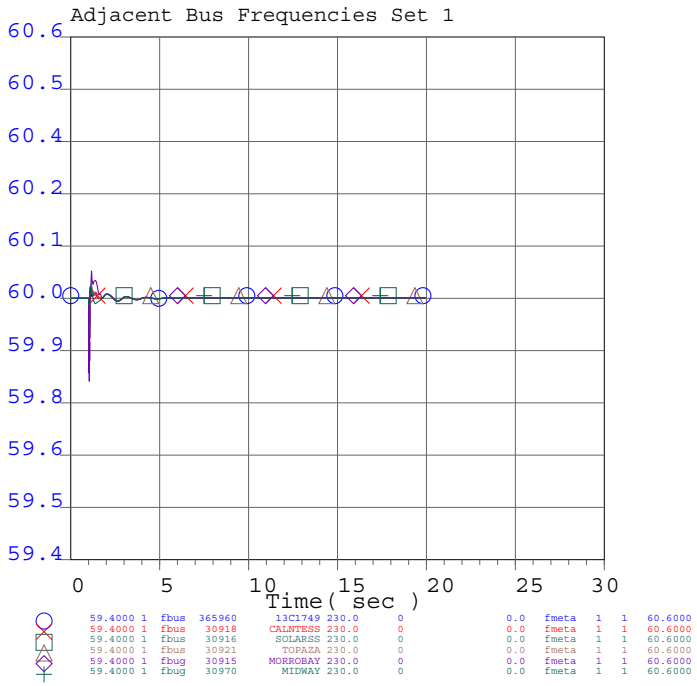


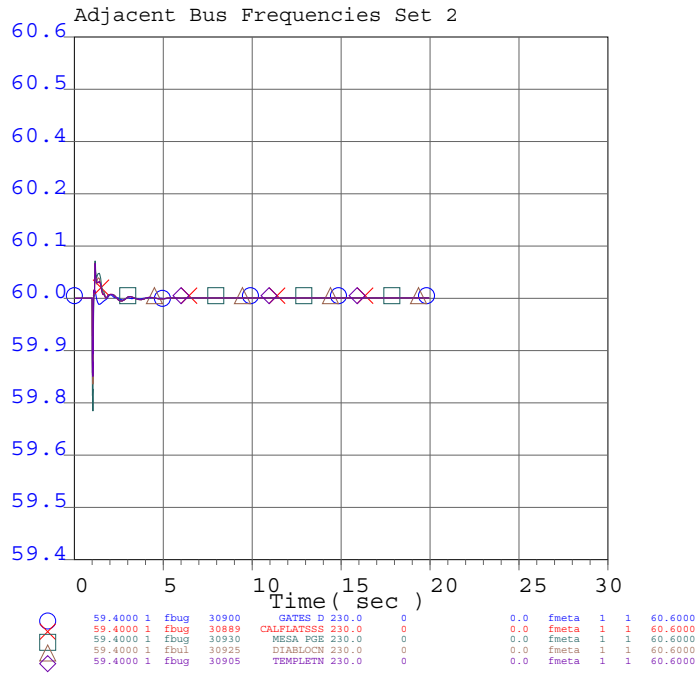


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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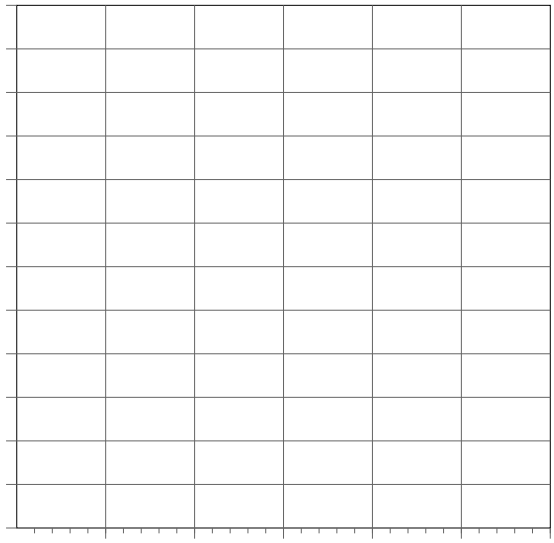
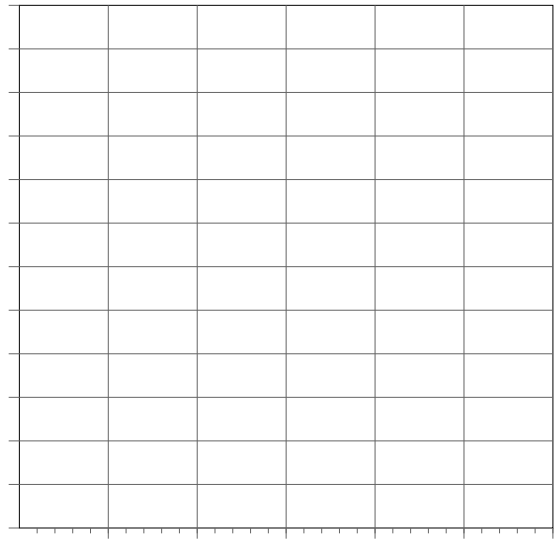
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

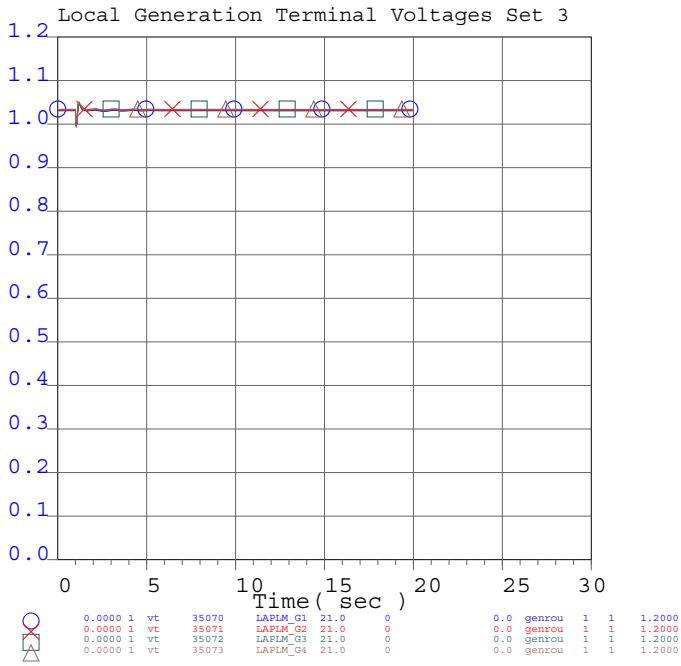
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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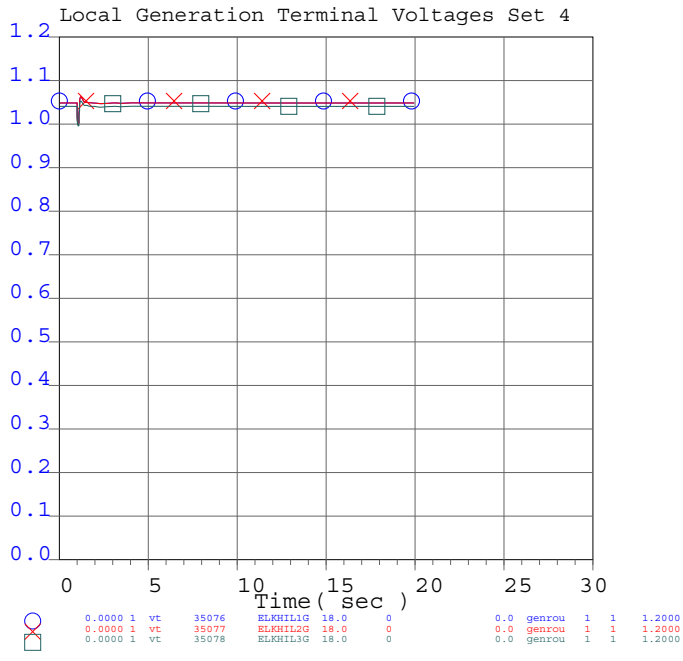
0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35073 LAPLM_G4 21.0 0 0.0 genrou 1 1 1.2000

Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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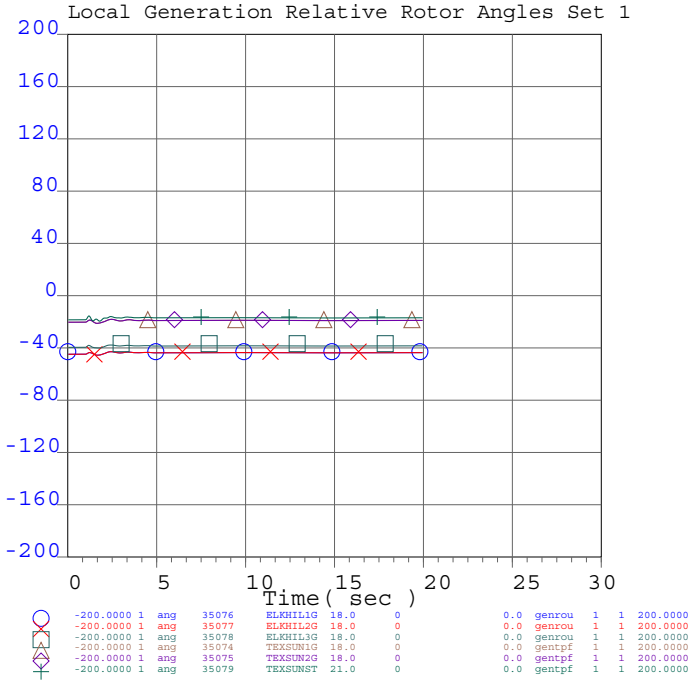
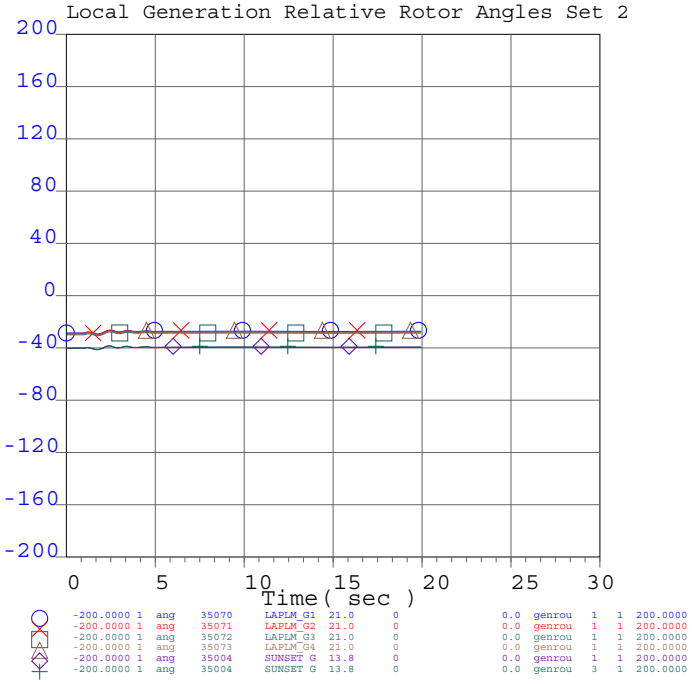
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

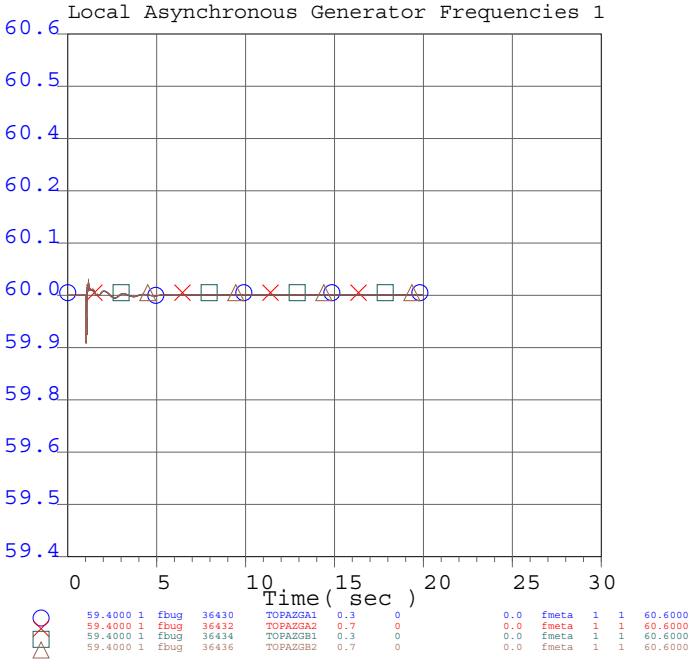
Local Generation Relative Rotor Angles Set 1



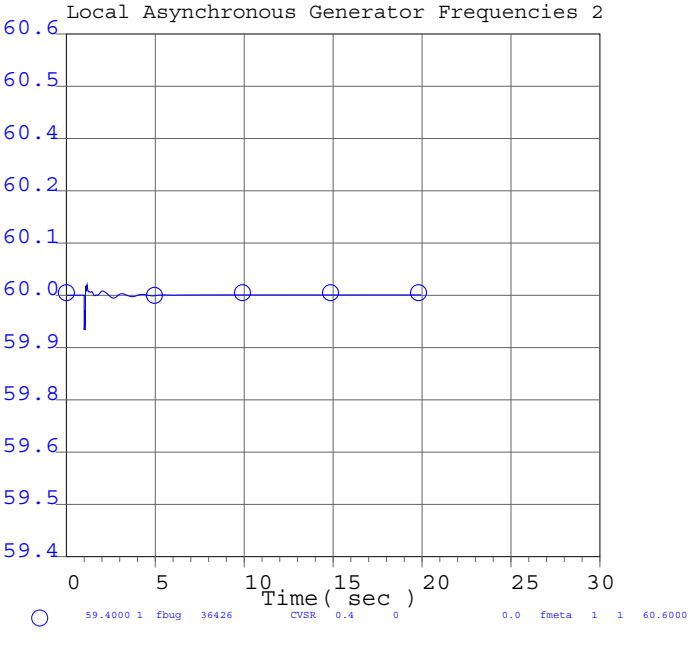
Local Generation Relative Rotor Angles Set 2



Local Asynchronous Generator Frequencies 1



Local Asynchronous Generator Frequencies 2



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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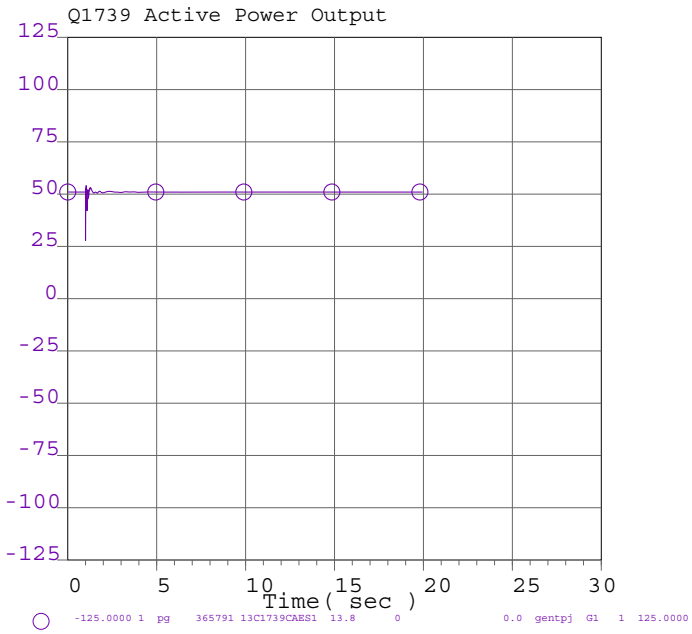
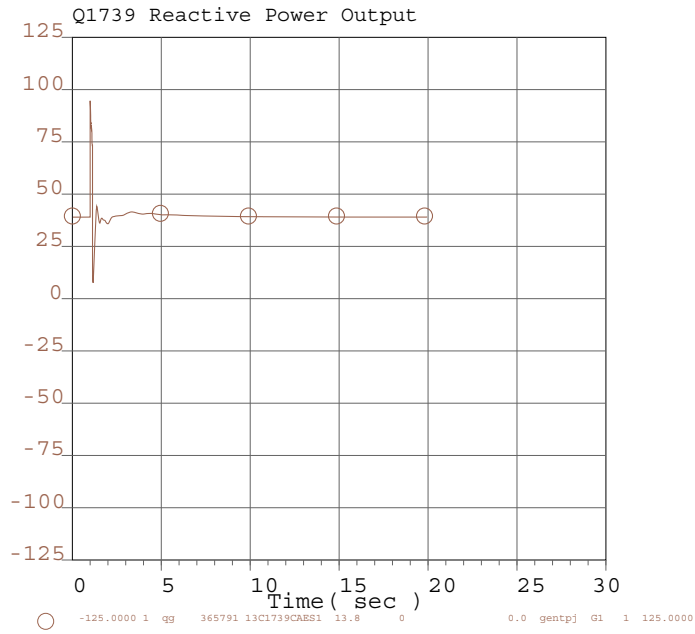
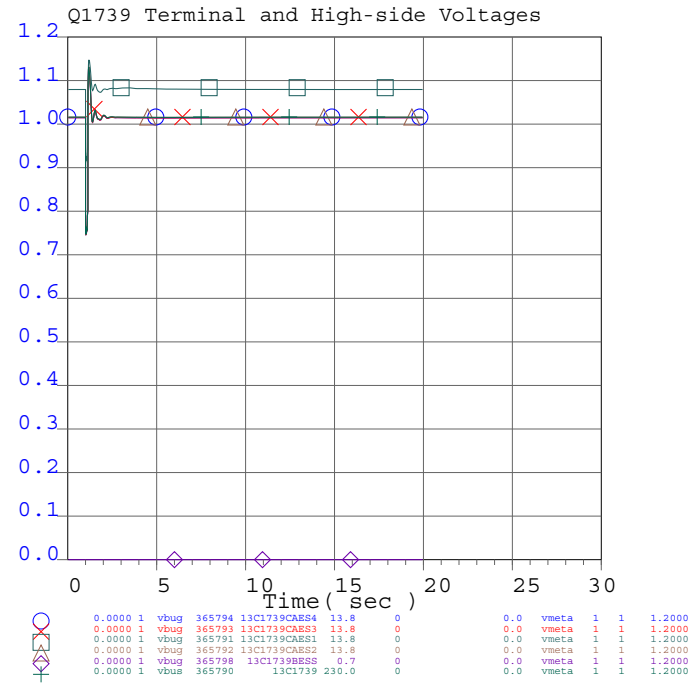
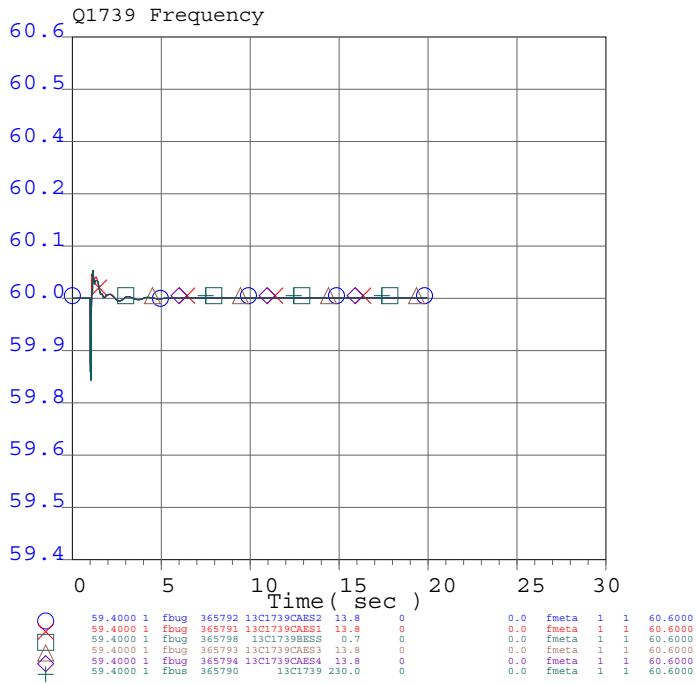
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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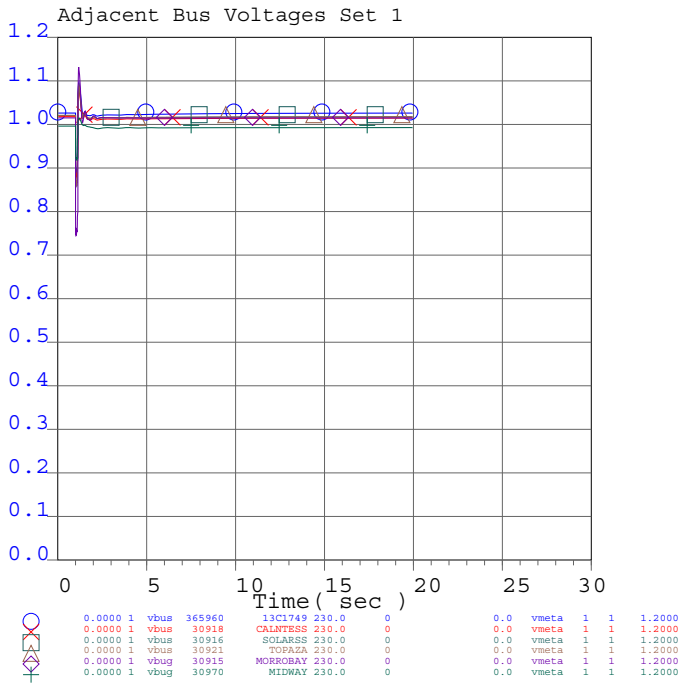
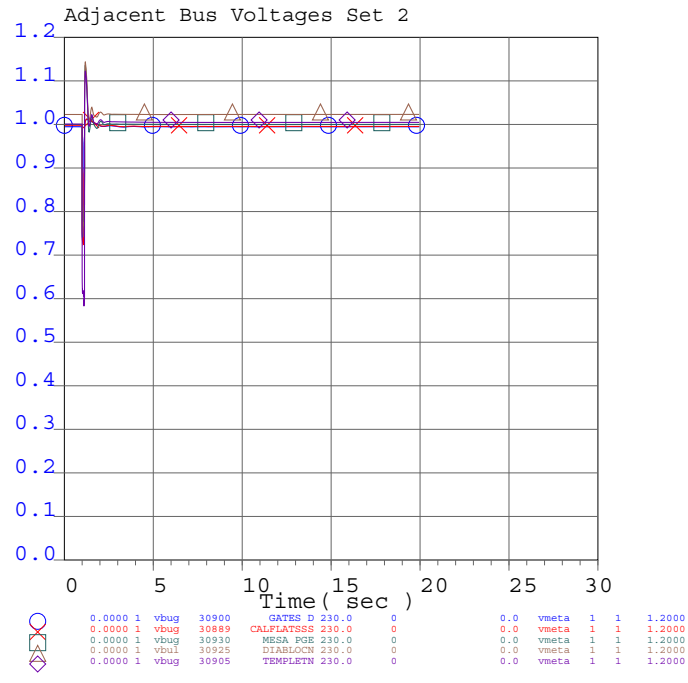
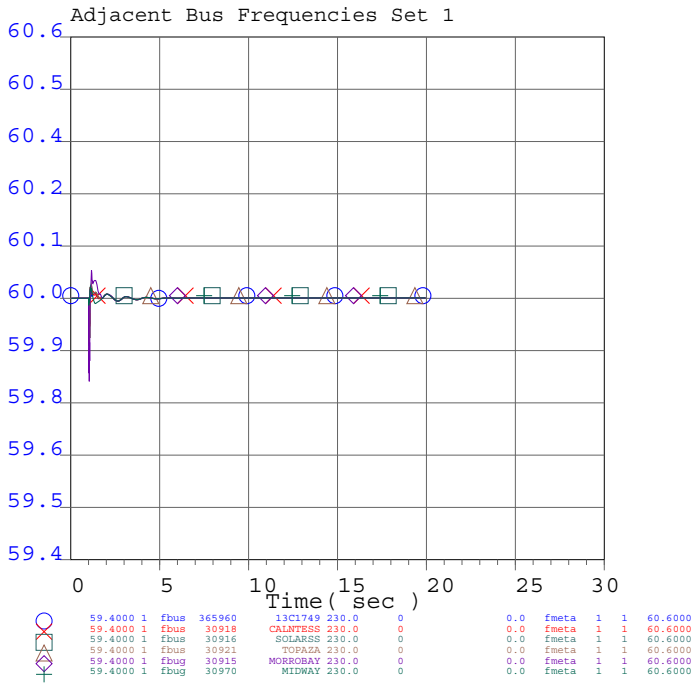
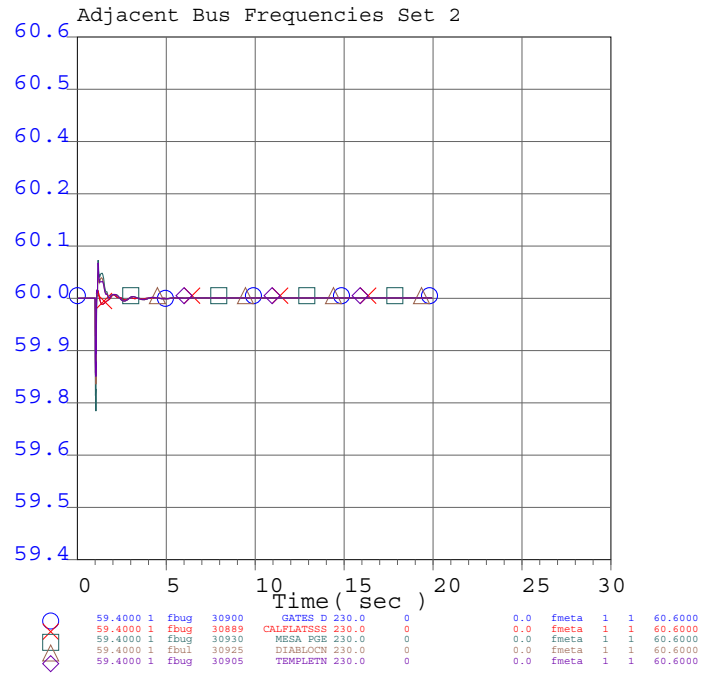
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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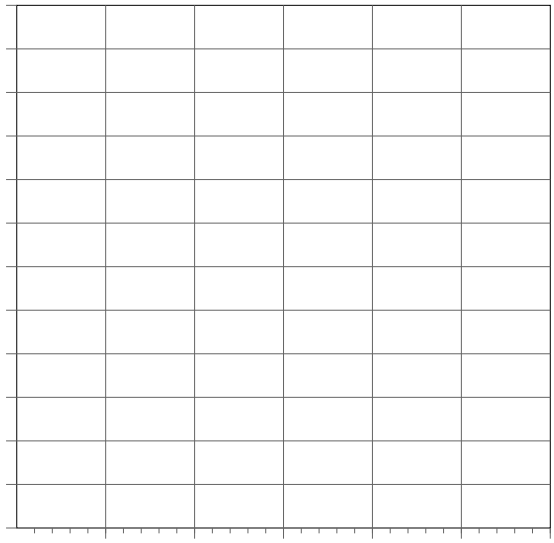
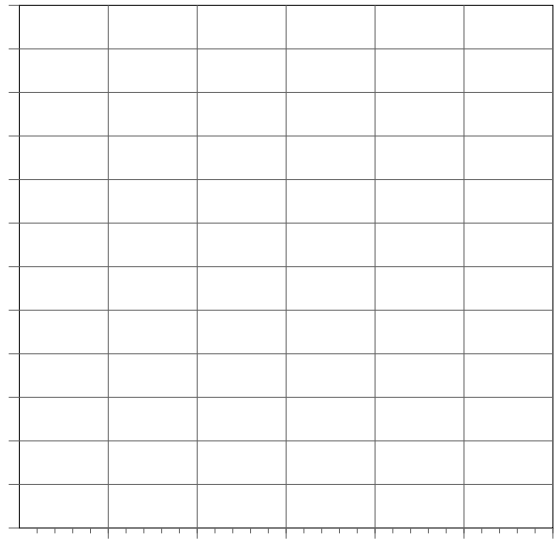
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

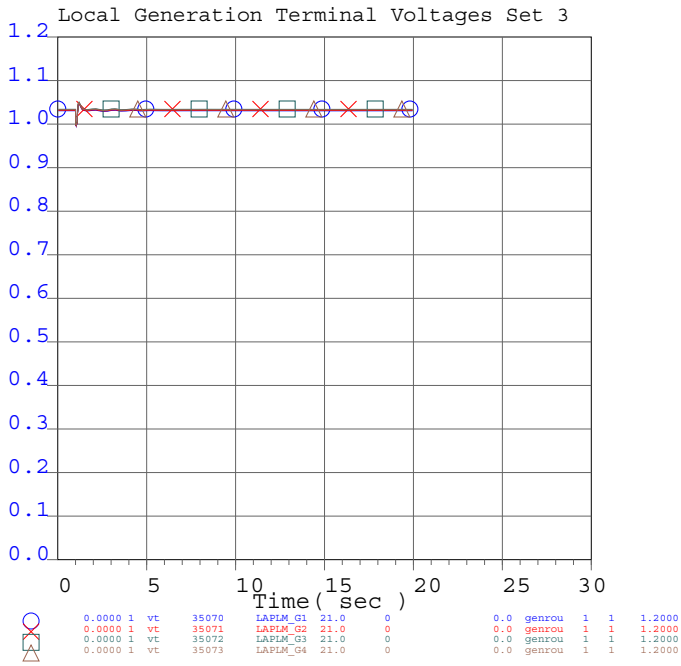
Local Generation Terminal Voltages Set 1



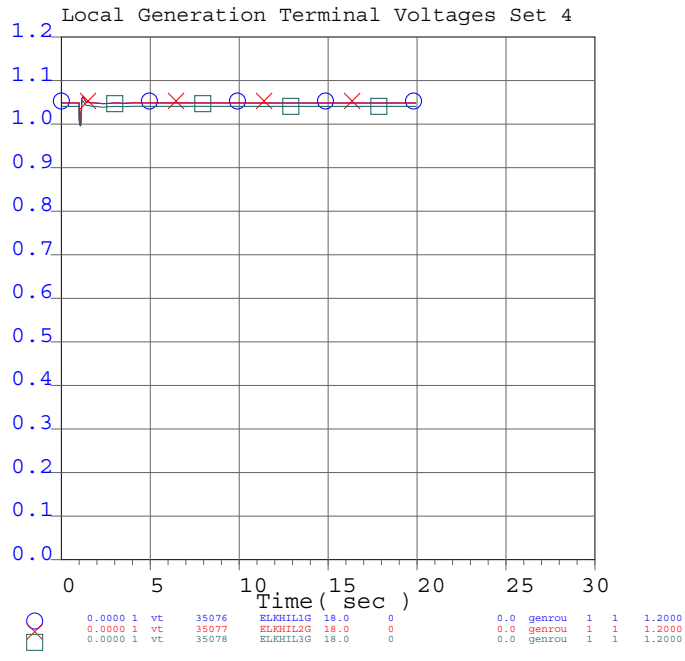
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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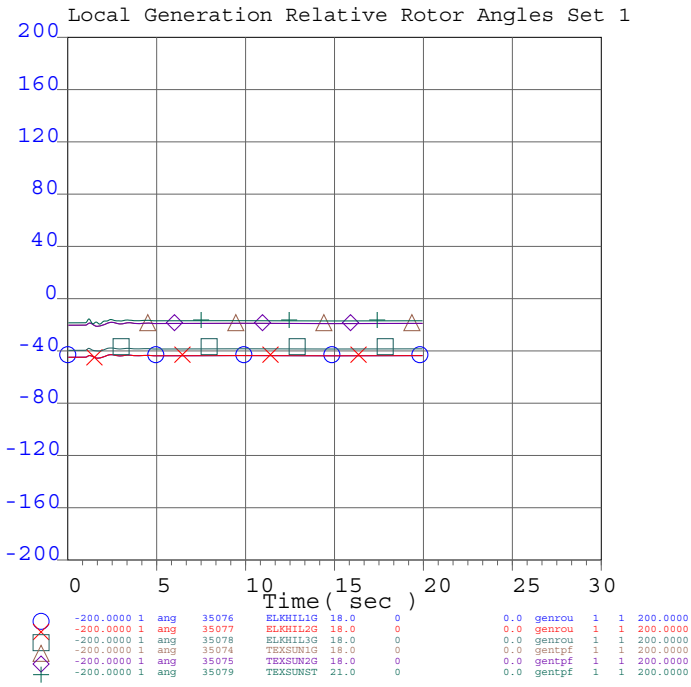
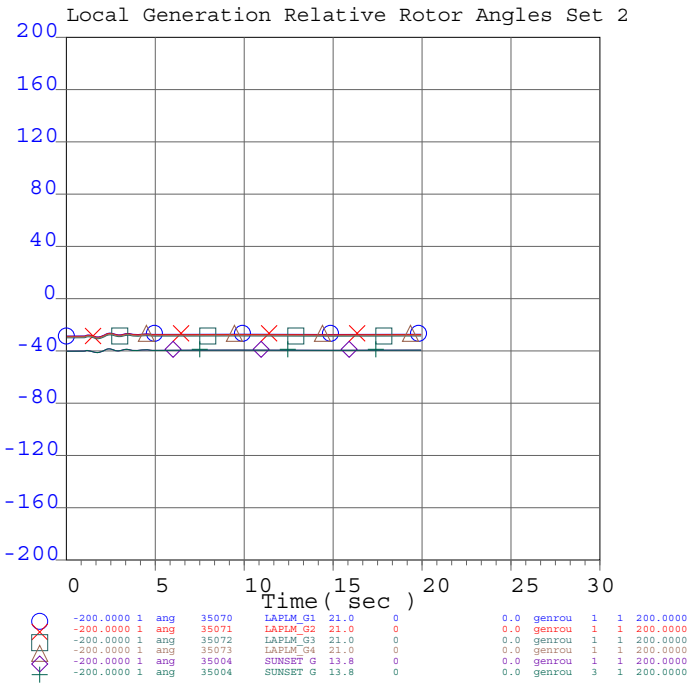
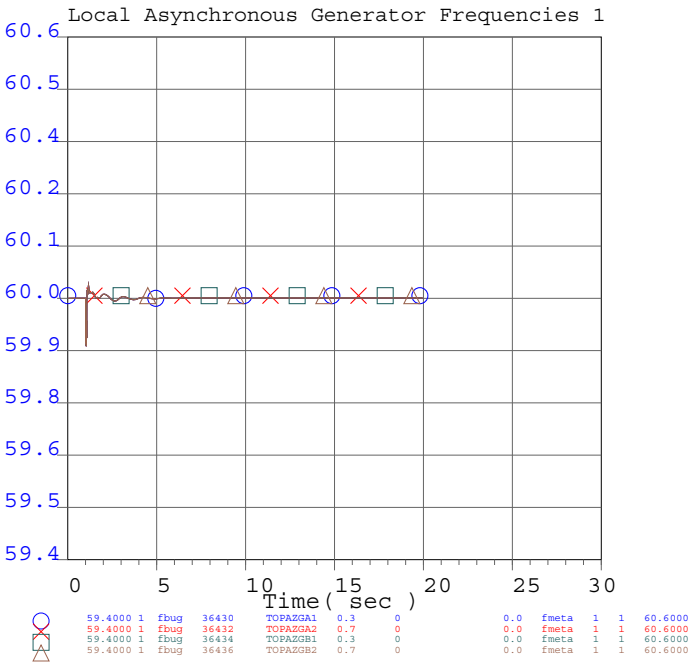
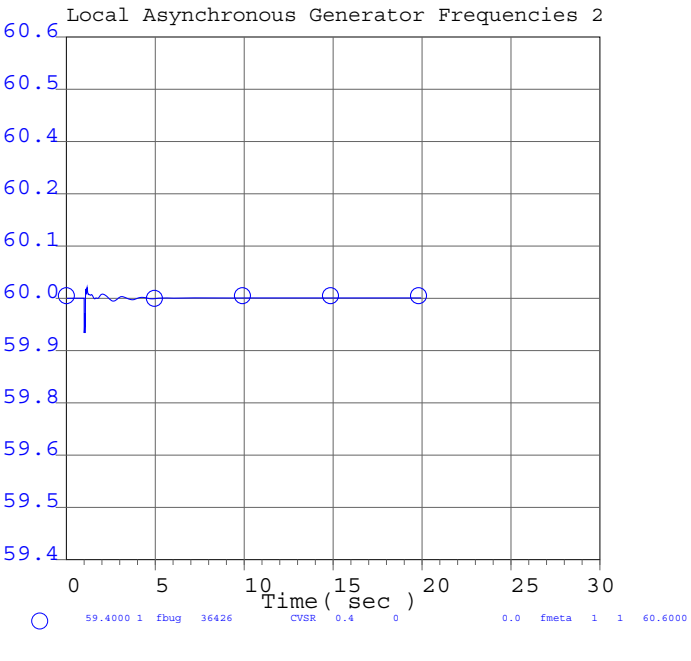
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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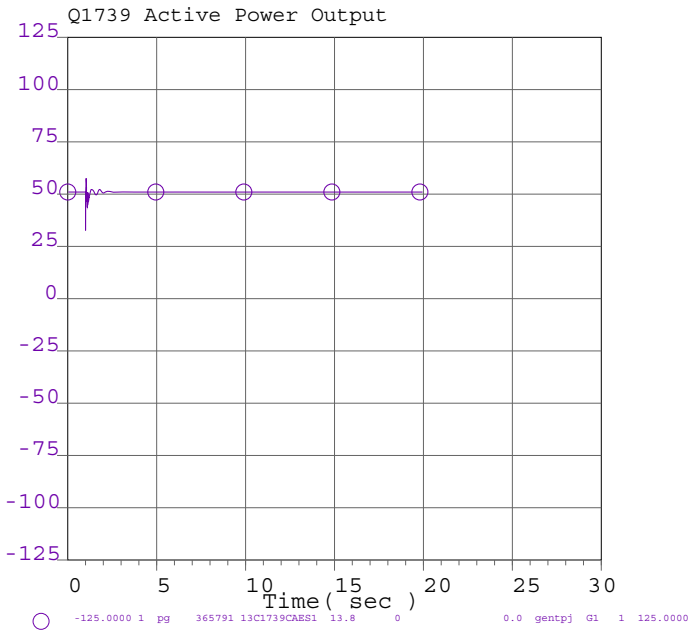
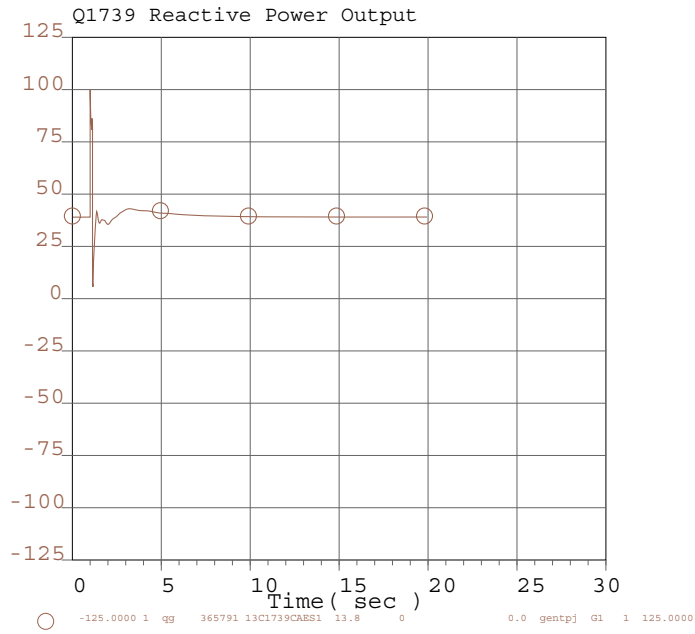
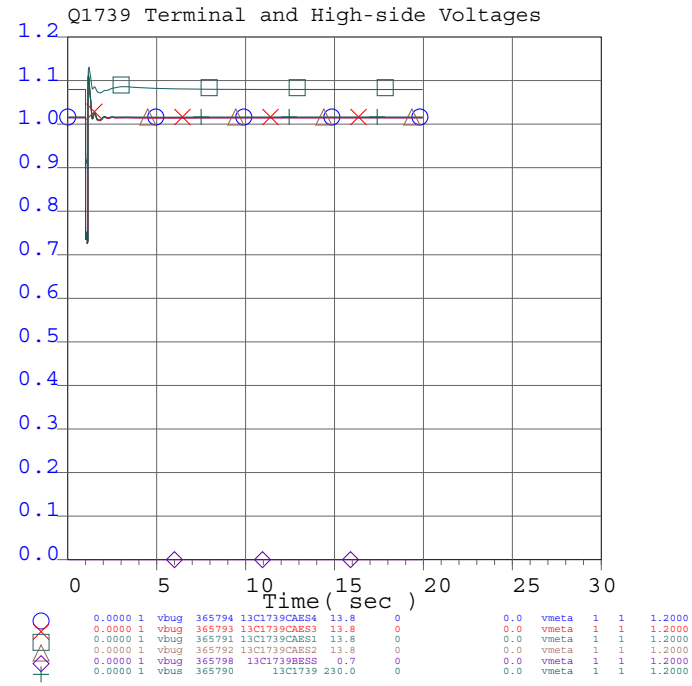
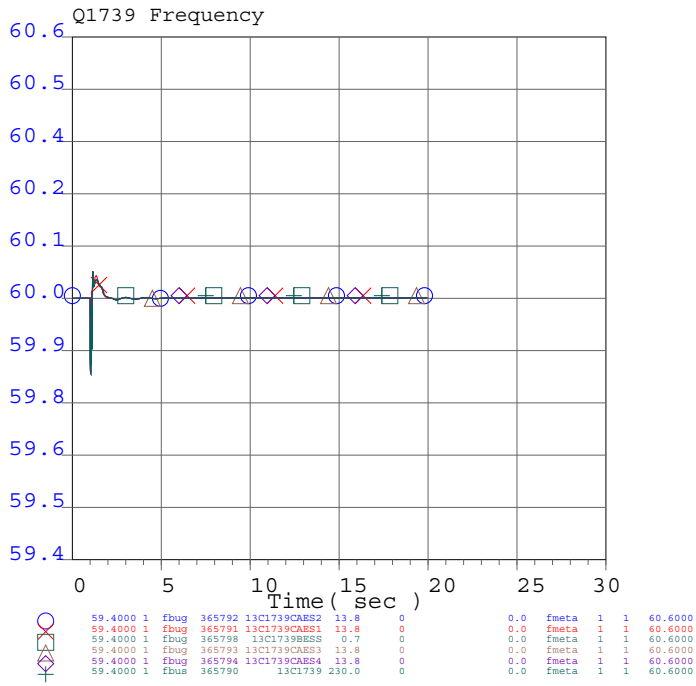
Q1739 (500 MW net): POI- Morro Bay 230 kV substation









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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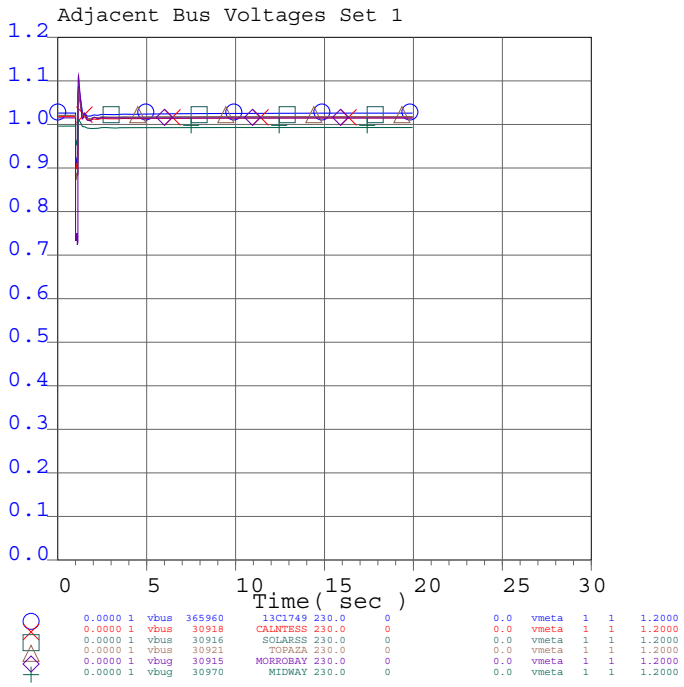

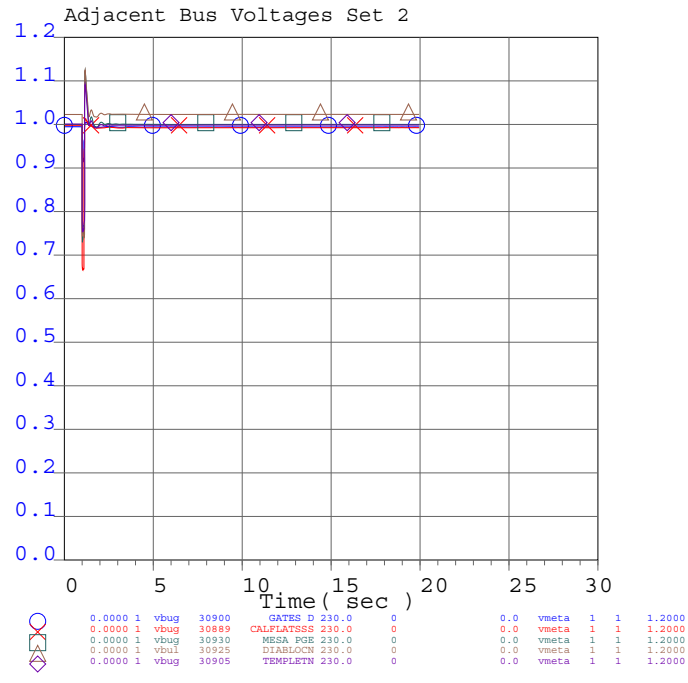

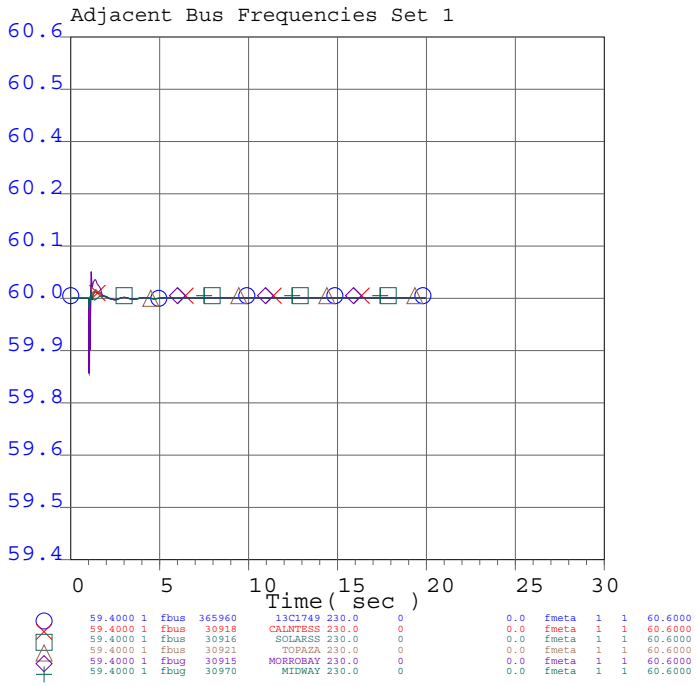

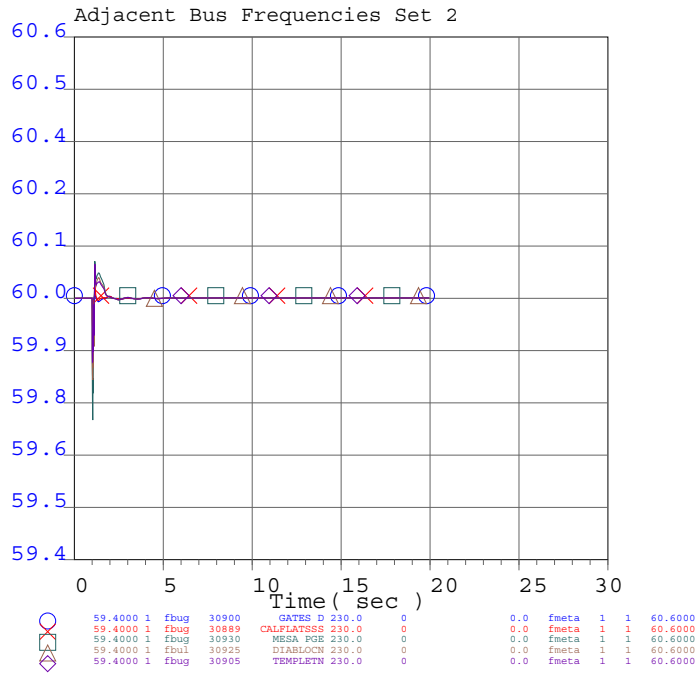

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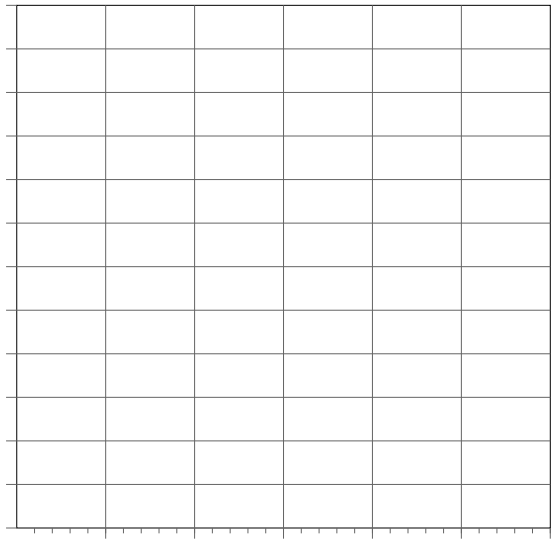
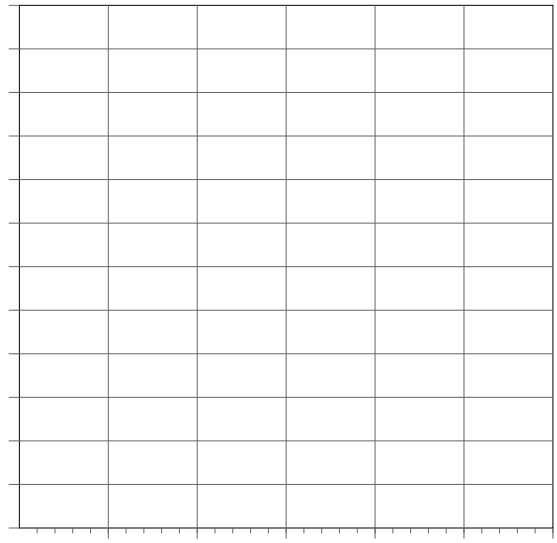
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

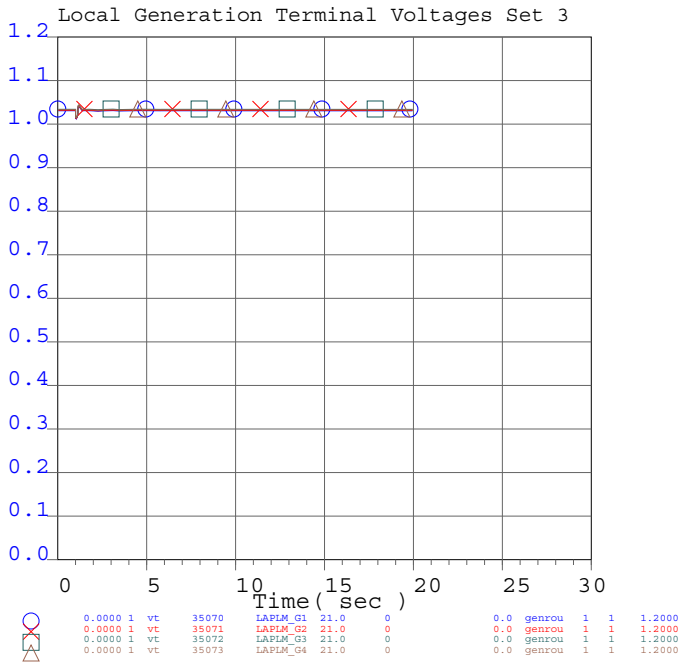
Local Generation Terminal Voltages Set 1



Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



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0.0000 1 vt 35071 LAPLM_G2 21.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35072 LAPLM_G3 21.0 0 0.0 genrou 1 1 1.2000
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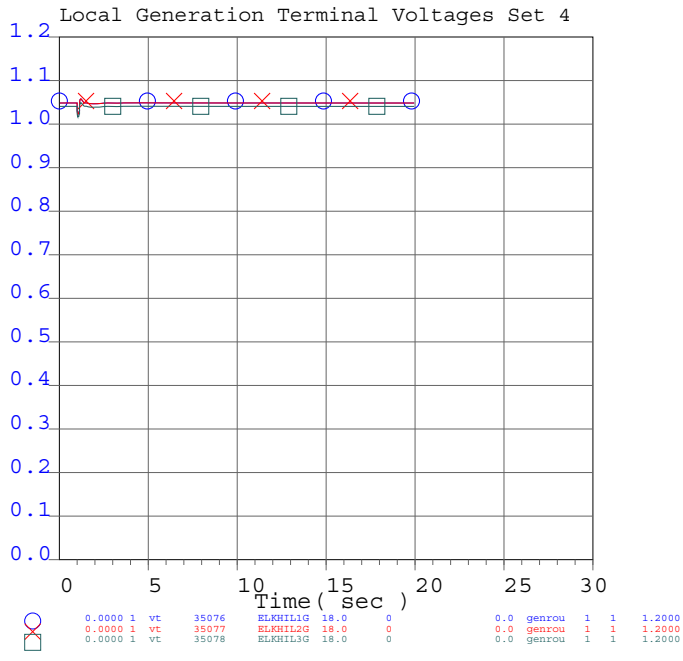
Local Generation Terminal Voltages Set 4



0.0000 1 vt 35076 ELKHIL1G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35077 ELKHIL2G 18.0 0 0.0 genrou 1 1 1.2000
0.0000 1 vt 35078 ELKHIL3G 18.0 0 0.0 genrou 1 1 1.2000

PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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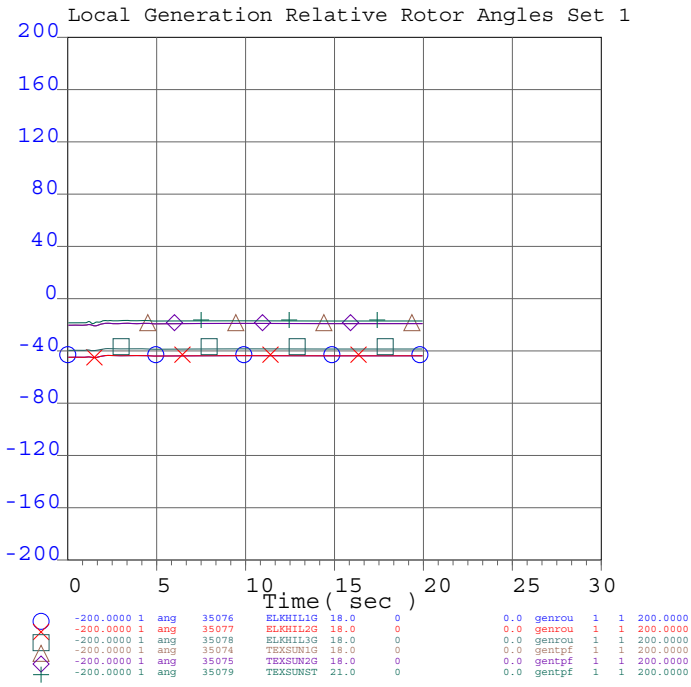
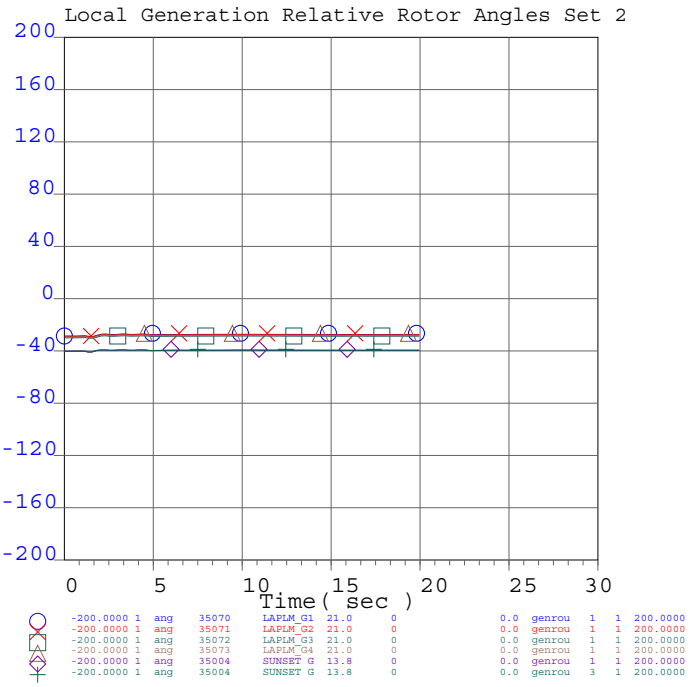
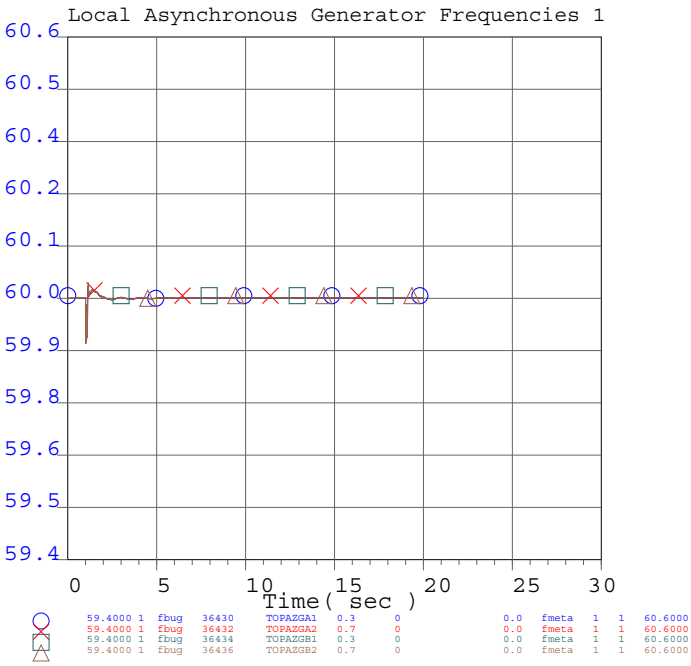
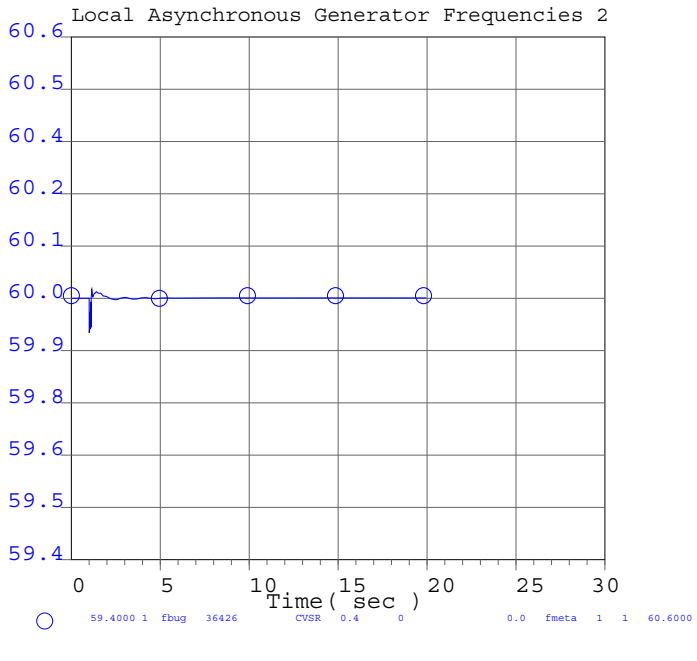
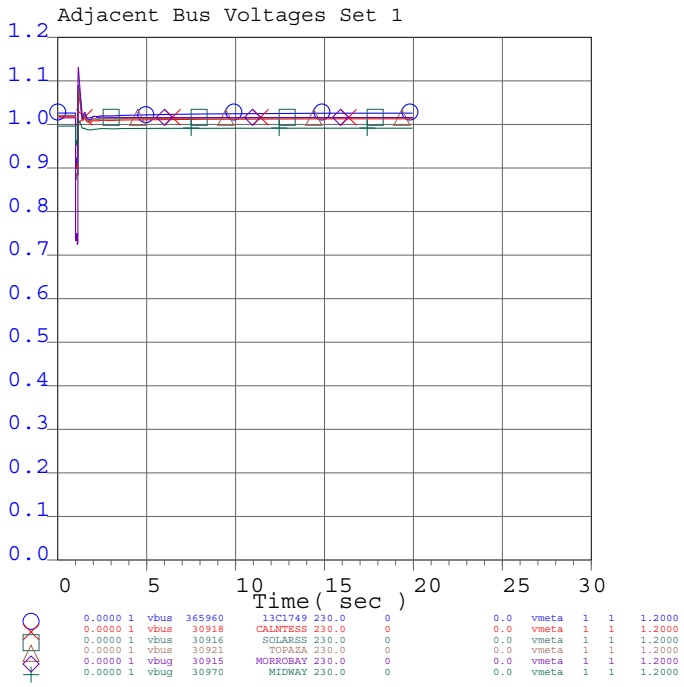


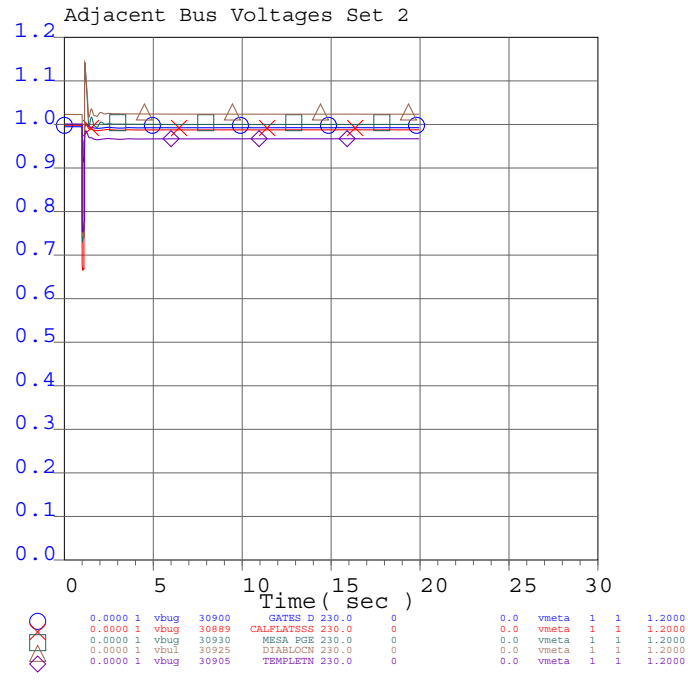


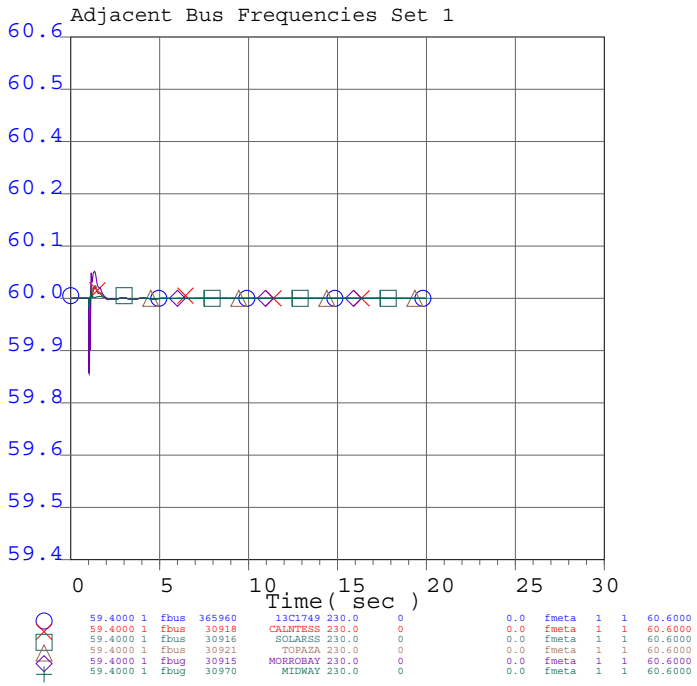


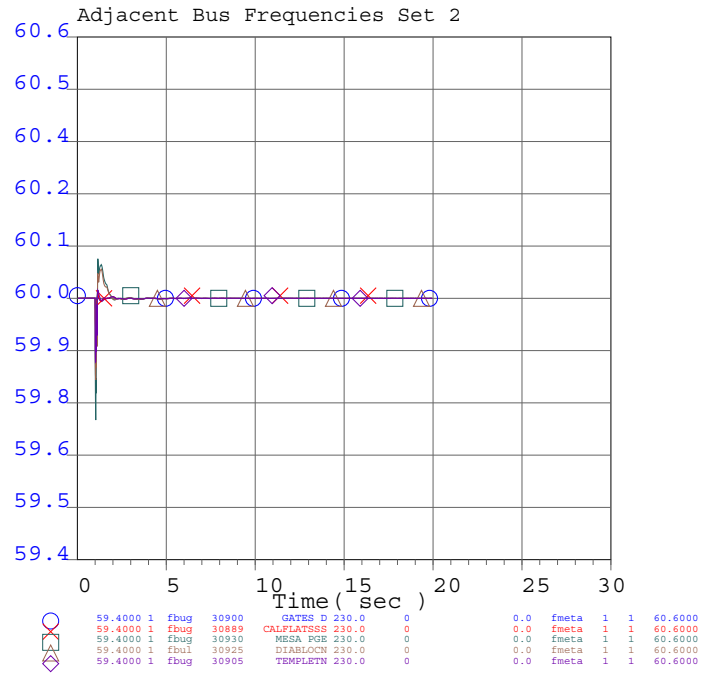


PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
PATH15= 1375 MW(S-N) PATH26= 3795 MW(N-S) PDCI= 3212 MW(N-S) COI= 4585 MW(N-S)
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









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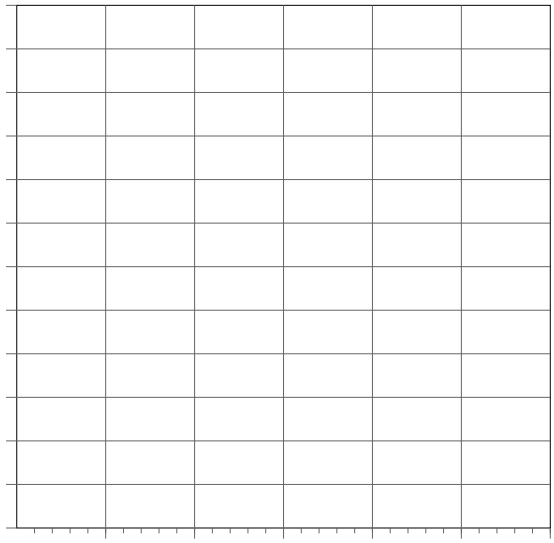
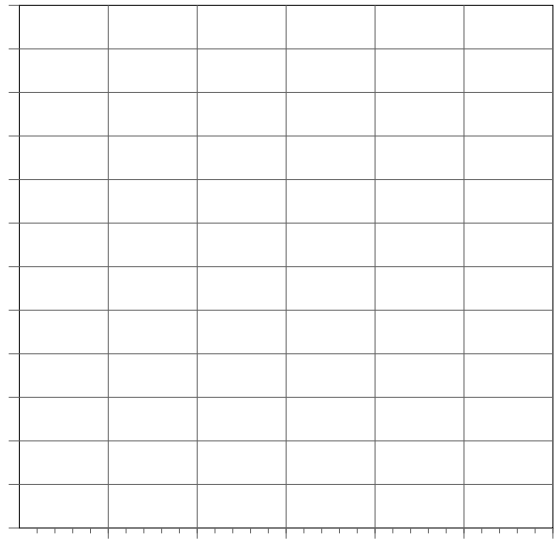
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

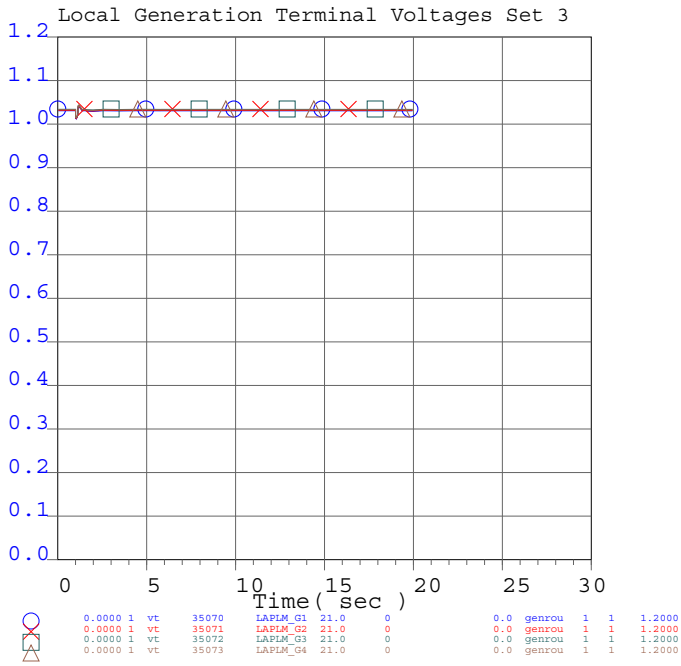
Local Generation Terminal Voltages Set 1



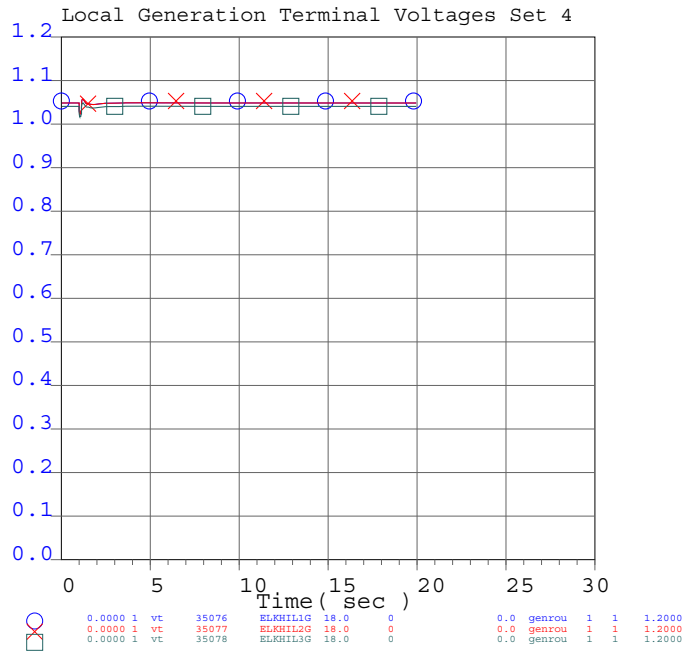
Local Generation Terminal Voltages Set 2



Local Generation Terminal Voltages Set 3



Local Generation Terminal Voltages Set 4



PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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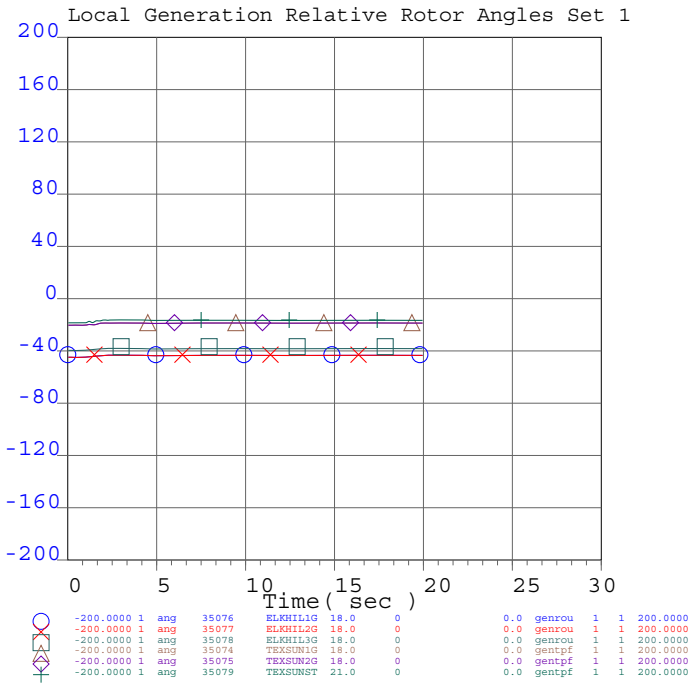
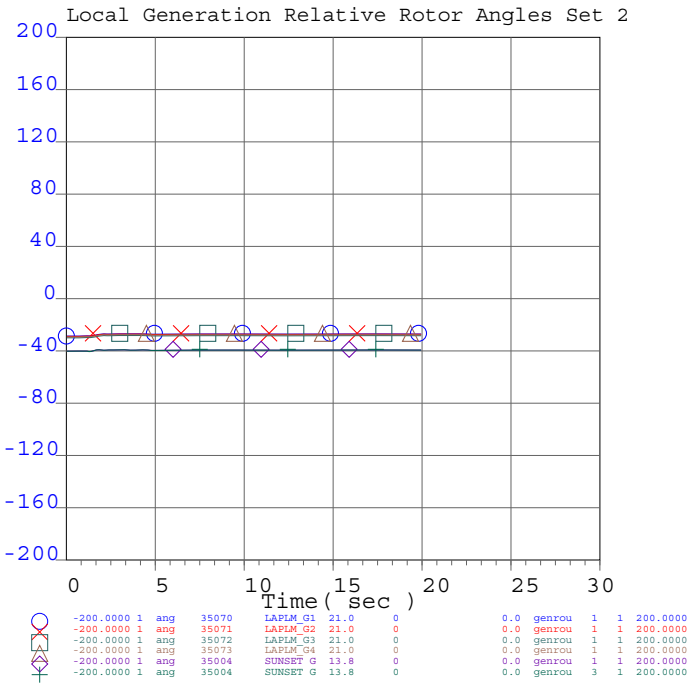
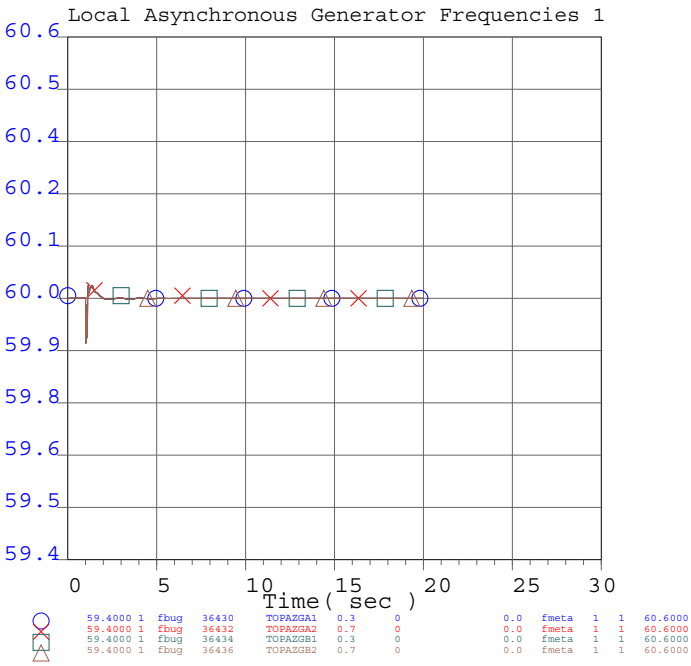
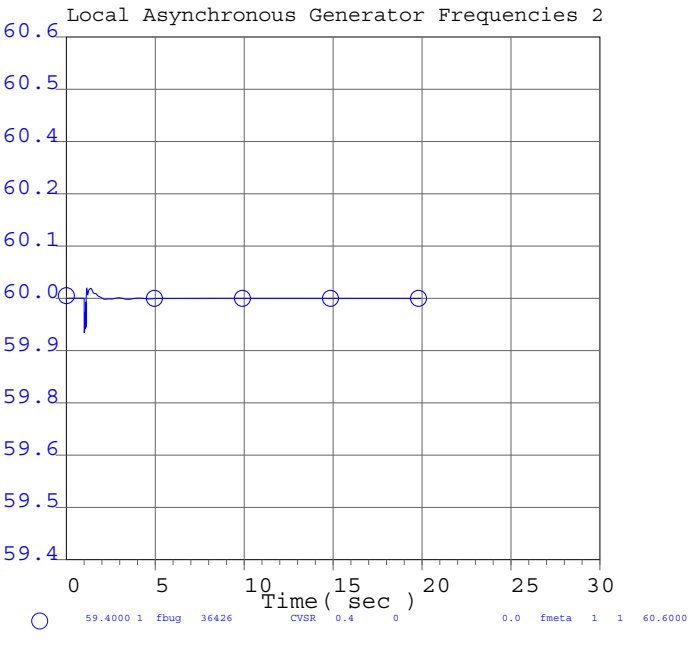
PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd









PGAE 2019 ASSESSMENT SERIES: 2025 Summer Peak SJVL-CCLP 1-in-10 loads
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PGAE qc13p1 2025 summer peak wkrn pst-proj case r6e1d m3 qc13nd

Attachment 10

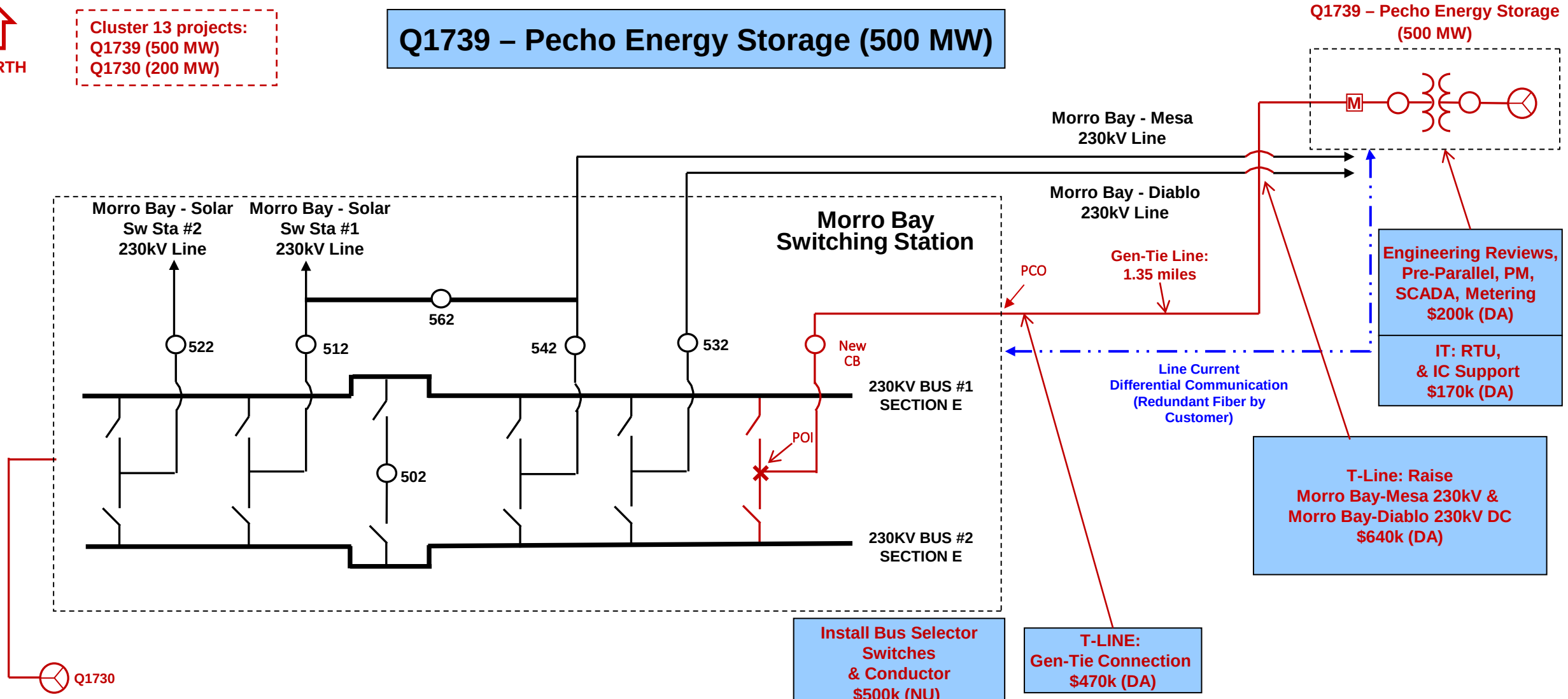
Substation and Transmission Line Work Scope

Confidential - Subject to Transmission Planning NDA

NORTH

Cluster 13 projects:
Q1739 (500 MW)
Q1730 (200 MW)

Q1739 – Pecho Energy Storage (500 MW)



Note: CB Maintenance and Bypass switches not shown

Rev. 1

Preliminary PG&E Substation Job Scope & Estimate

Cluster 13 Phase I Study
Pecho Energy Storage – Q1739
500 MW Generating Facility
Final Report: 11/04/2020

These are preliminary, order of magnitude substation cost estimates for the Pecho Energy Storage Project. The Point of Interconnection (POI) for this project will be at the Morro Bay Switching Station 230kV new DBSB bay via a Gen-Tie line. This Gen-Tie line between Morro Bay Switching Station and Q1739 is about 1.35 miles.

Interconnection Scope

NETWORK UPGRADES (NU)

Morro Bay Switching Station

1.) Install bus selector switches and conductor in existing double bus bay structure.

INTERCONNECTION FACILITIES/DIRECT ASSIGNMENT (DA)

Morro Bay Switching Station

1.) Install the following at the existing double bus bay to connect the Gen-Tie line:
    a. One (1) 230kV Circuit Breaker with maintenance switches.
    b. Install Current Differential line relay package for the dedicated Gen-Tie line with associated new bay structure, CCVT, and line disconnect switch.
        i. Set A and SET B SEL 411L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Pecho Energy Storage generator CB.
2.) IT to install, terminate, and test new fiber cable from substation fence to control building.

Transmission Line Scope of Work at Morro Bay Switching Station

1.) Install three (3) spans of transmission line conductor and two (2) new TSP's from the Morro Bay Switching Station dead-end to connect the Customer Gen-Tie Line. The Customer is responsible for building the Gen-Tie line from the Generation Facility to the PG&E Morro Bay Switching Station property line.
    a. Install two (2) single-circuit dead-end TSP's ($200,000 ea)
    b. Install three (3) spans of transmission line conductor ($20,000 ea)
    c. PG&E review of the Customer-owned TSP/Dead-end structure design data ($10,000)

2.) Raise 230KV transmission line for Morro Bay-Mesa and Morro Bay-Diablo 230kV line to accommodate the Gen-Tie line crossing underneath the PG&E line.
    a. Install two (2) double-circuit dead-end TSP ($300,000 ea)
    b. Install two (2) spans of transmission line conductor ($20,000 ea)

Notes:

- Additional PG&E–provided TSP's may be necessary depending on the Customer's final gen-tie route and permitting decisions. All Customer–owned TSP's on Morro bay Sub- Station property would require an easement. Alternatively, PG&E could be requested to engineer and install all gen-tie TSP's on Morro Bay Sub- Station property.
- Additional PG&E lines may need to be raised (DA cost) to accommodate the final gen-tie line route. The gen-tie line must cross under all PG&E lines of equal or higher voltage.

Pecho Generation Site

1.) Project Management, metering, and provide engineering and protection review and pre-parallel inspection at the generator substation.
2.) IT to install one (1) RTU and provide testing at the generator substation. The RTU scope includes the support work at the PG&E Operations Facility to connect to the RTU.

Notes:

- Customer will provide space for two (2) 19 inch racks for installation of the PG&E RTU and associated equipment.
- Customer will reserve two (2) 19 inch racks for line current differential equipment.

Interconnection Costs

Location	Network Upgrades	Cost
Morro Bay Sw Sta	Install bus selector switches and conductor	$500,000
	Subtotal	$500,000
	Interconnection Facilities	
Morro Bay Sw Sta	Gen-Tie Line terminal Equipment	$1,800,000
Morro Bay Sw Sta	Termination of Customer's Fiber	$170,000
Transmission Line	Gen-Tie T-Line Equipment on PG&E Substation Property	$470,000
Transmission Line	Raise the DC Morro Bay-Mesa & Morro Bay-Diablo 230kV lines	$640,000
Generating Site	Engineering Reviews, Metering, Pre-parallel Inspection, & PM	$200,000
Generating Site	IT install RTU, SEL-2411, and provide testing support	$170,000
	Subtotal	$3,450,000
Grand Total		**$3,950,000**
Overall Work Duration*		**36 Months**

*See Substation Assumption #10

Assumptions

Substation Estimate Assumptions:

1.) This proposed draft substation scope is based on PG&E Preliminary Protection Requirements dated November 04, 2020.
2.) Final scope will be developed only when this project moves to the implementation phase.
3.) The unit costs here do not include an applicable ITCC tax.
4.) Civil Assumptions:
    a. Cost estimates 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 locations 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 or rocky terrain requiring substantial grading effort.
    b. Costs assume that the site can be drained via customary storm water drainage infrastructure (i.e., without pump or lift stations). Costs assume including implementing Storm Water Pollution and Prevention (SWPP) and SPCC oil containment system(s).
    c. 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.
    d. Cost does not include any remedial work for impact on neighboring properties.
    e. Land Survey has not been conducted for preparation of this report. This estimate assumes a generally flat site with a minimal amount of site grading required.
    f. Geotechnical investigations have not been performed at the sites and therefore estimates do not include specific design or construction means that may be required due to local soil conditions.
5.) Land Assumptions:
    a. Land survey has not been conducted for preparation of this report. This estimate assumes a generally flat site with a minimal amount of site grading required.
    b. This estimate does not include right-of-way acquisition costs.
    c. Costs do not include any land acquisition costs.
    d. Cost does not include any remedial work for impact on neighboring properties.
6.) Unit costs do not assume extensive permitting effort.
7.) There are no ongoing PG&E projects ahead of this study (Q1739) at this POI.
8.) The following ongoing Interconnection Study are ahead or in parallel to this study (Q1739). It is assumed that these projects will proceed to implementation of Q1739. If this assumption becomes incorrect, portions of this study (Q1739) will need to be re-evaluated. The Interconnection Studies include:
    a. Q1730 – 230kV Generation Facility interconnection into Morro Bay Switching Station.
9.) Breaker overstress will be determined in a report covering all studies in Cluster 13.
10.) The Projected Work Durations are dependent upon the following:
    a. Clearances being available as required.
    b. Getting leased lines from Telco, on which PG&E has no schedule control.
    c. 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, cultural and 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.
8.) This estimate does not include costs and durations associated with the FAA (Federal Aviation Administration) review or any required structure lighting.

IT Assumptions:

1.) The Developer is responsible for all communication circuits terminating at the Developer's Gen-Site. PG&E requires these circuits to be installed and tested prior to PG&E's installation of the RTU and associated equipment.
2.) IT 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.) IT 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.

Attachment 8

Preliminary Protection Requirements

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Below are the protection requirements for the 770 MVA generator at rated power factor connection on the Morro Bay Substation 230kV Bus. 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 PG&E Transmission Interconnection Handbook should be referenced. Protection for generator equipment beyond that required in the PG&E Transmission 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 10 Synchronous Compressed Air Energy Storage rated at 52 MW at 90% power factor and 40 BESS inverter rated at 2.7 MW at 90% power factor.
2. The proposed generation will be stepped up to 230kV via five 230/13.8kV transformer (wye gnd/ delta) and one 230/34.5kV transformer (wye gnd/ delta)
3. The generator site will be connected to the Morro Bay Substation 230kV Bus.
4. Pecho Energy Storage will engineer, procure, construct, own, operate and maintain its project facility including a 230kV generator tie line required to connect the Project to the Morro Bay Substation 230 kV bus. This tie line is about 1.35 miles with 1590 ACSR or equivalent conductors. A CB will be required at the PG&E Facility which is the POI.
5. The tie 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 fully redundant line current differential protection scheme to protect the 1.35 mile gen tie line. All requirements shall be in accordance with the PG&E Transmission Interconnection Handbook.

Assumptions:

The protection requirements are based on the values provided by the customer:

- Transformer Data as provided by the customer:
  - Five 230/13.8 kV transformers with impedance of 9% at 100 MVA Base.
  - One 230/34.5 kV transformers with impedance of 7.5% at 74 MVA Base.

- The Synchronous Compressed Air Energy Storage is modeled based on the data provided by the customer:
  - X"1 (saturated) = 0.108 pu
  - X"1 (unsaturated) = 0.28 pu
  - X2 = 0.128 pu
  - X0 = 0.051 pu

- The BESS is modeled based upon PG&E standard modeling guidelines assuming 115% maximum name plate MVA at rated power factor:
  - Xd = 0.06 pu

- Xd'= 0.06 pu
- Xd"= 0.06 pu
- X2 = 0.06 pu
- X0 = 9999 pu
- Current limit of 115470 amps @ 0.69kV at unity PF

The maximum symmetrical sub transient fault current on the Pecho Energy Storage 230kV substation is **17241** amps for a three phase fault and **18939** amps for a single line to ground fault. The circuit breakers must be appropriately rated.

Morro Bay Substation Protection Requirements:

1. Install Current Differential line relay scheme on the Generation Tie Line from Pecho Energy Storage:
   - Set A SEL 411L and SET B SEL 411L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Pecho Energy Storage Generator CB.
   - SEL 451 for breaker control, as needed.

Pecho Energy Storage Generation CB at POI:

1. The Project will export power through five new 166 MVA and one new 123 MVA power transformer, which shall be connected wye grounded on the PG&E side per Generation PG&E Transmission 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 PG&E Transmission 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 Morro Bay Substation:
   - Set A SEL 411L and SET B SEL 411L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Morro Bay Substation CB.

Bus Fault Duties

Sys. Pro. Results August 2020 Proposed Project: Pecho Energy Storage			**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	Morro Bay Substation	230kV	11118	10462	17534	18640
2	Morro Bay Substation	115kV	10301	11045	11438	12497

Arc Flash has been evaluated for Morro Bay Substation; no additional study was required.

Cluster 13 Phase 1

Attachment 6

Generator Dynamic Data

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Q1739 Dynamic Data

Synchronous Generator Units 1-10

model: gentpj

Variable	Description	Value
Ld	D-axis synchronous reactance	1.65
Lpd	D-axis transient reactance	0.204
Lppd	D-axis sub-transient reactance	0.128
Lq	Q-axis synchronous reactance	0.642
Lpq	Q-axis transient reactance	0.642
Lppq	Q-axis sub-transient reactance	0.128
L1	Stator leakage reactance, pu	0.093
Ra	Stator resistance, pu	0
Tpdo	D-axis transient rotor time constant	7.246
Tppdo	D-axis sub-transient rotor time constant	0.029
Tpqo	Q-axis transient rotor time constant	0
Tppqo	Q-axis sub-transient rotor time constant	0.092
S1	Saturation factor at 1 pu flux	0.08
S12	Saturation factor at 1.2 pu flux	0.24
H	Inertia constant, sec	3.1
D	Damping factor, pu	0
Rcomp	Compounding resistance for voltage control, pu	0
Xcomp	Compounding reactance for voltage control, pu	0
Accel	Acceleration factor for network boundary iter	0.5
kis	Current multiplier for saturation calculation	0.08

model: esac8b

Variable	Description	Value
Tr	Voltage transducer time constant, sec.	0
Kpr	Voltage Regulator Proportional Gain (> 0. if Kir = 0.)	48.23
Kir	Voltage Regulator integral gain, p.u.	29.23
Kdr	Voltage Regulator derivative gain, p.u.	12.11
Tdr	Voltage Regulator Derivative Time Constant, sec.	0.12
Vrmax	Maximum regulator output, p.u.	9.07
Vrmin	Minimum regulator output, p.u.	0.05
Ka	Amplifier proportional gain. (> 0. if Kia = 0.)	1
Ta	Amplifier time constant, sec.	0.01
Te	Exciter field time constant, sec. (> 0.)	0.47
Vfemax	Exciter field current limit parameter, p.u. Efd	15.07
Vemin	Minimum exciter ouput voltage, p.u. Efd	0.05
Ke	Exciter field proportional constant	1
Kc	Rectifier regulation factor, p.u.	0.44
Kd	Exciter internal reactance, p.u.	0.18
E1	Field voltage value 1, p.u.	2.56
S(E1)	Saturation factor at E1	0.022
E2	Field voltage value 2, p.u.	4.47
S(E2)	Saturation factor at E2	0.023
vtmult	If not 0, multiply Vrmax and Vrmin by terminal voltage	0
spdmlt	If not 0, multiply output (Efd) by generator speed	0

model: pss2b

Variable	Description	Value
J1	Input signal #1 code	1
K1	Input signal #1 remote bus number	0
J2	Input signal #2 code	3
K2	Input signal #2 remote bus number	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
Tw2	Second washout on signal #1, sec.	2
Vsi2max	Stabilizer output max limit, p.u.	999
Vsi2min	Stabilizer output min limit, p.u.	-999
Tw3	First washout on signal #2, sec.	2
Tw4	Second washout on signal #2, sec.	0
T6	Time constant on signal #1, sec.	0
T7	Time constant on signal #2, sec.	2
Ks2	Gain on signal #2	0.2
Ks3	Gain on signal #2 input before ramp-tracking filter	1
T8	Lead of ramp tracking filter	0.5
T9	Lag of ramp tracking filter	0.1
n	Order of ramp tracking filter	1
m	Denominator order of ramp tracking filter	5
Ks1	Stabilizer gain	10
T1	Lead/lag time constant, sec.	0.25
T2	Lead/lag time constant, sec.	0.04
T3	Lead/lag time constant, sec.	0.2
T4	Lead/lag time constant, sec.	0.03
T10	Lead/lag time constant, sec.	0
T11	Lead/lag time constant, sec.	0
Vstmax	Stabilizer output max limit, p.u.	0.1
Vstmin	Stabilizer output min limit, p.u.	-0.1
a	Lead/lag num. gain. (not in IEEE model)	1
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)	1

model: lhvrt

Variable	Description	Value
vref	Delta voltage is computed with respect to vref	1
dvtrp1	Delta voltage trip level, p.u.	-0.1
dvtrp2	Delta voltage trip level, p.u.	-0.25
dvtrp3	Delta voltage trip level, p.u.	-0.35
dvtrp4	Delta voltage trip level, p.u.	-0.55
dvtrp5	Delta voltage trip level, p.u.	0.1
dvtrp6	Delta voltage trip level, p.u.	0.15
dvtrp7	Delta voltage trip level, p.u.	0.175
dvtrp8	Delta voltage trip level, p.u.	0.2
dvtrp9	Delta voltage trip level, p.u.	0.3
dvtrp10	Delta voltage trip level, p.u.	0
dttrp1	Voltage trip time, sec.	3
dttrp2	Voltage trip time, sec.	2
dttrp3	Voltage trip time, sec.	0.3
dttrp4	Voltage trip time, sec.	0.15
dttrp5	Voltage trip time, sec.	1
dttrp6	Voltage trip time, sec.	0.5
dttrp7	Voltage trip time, sec.	0.2
dttrp8	Voltage trip time, sec.	0.1
dttrp9	Voltage trip time, sec.	0
dttrp10	Voltage trip time, sec.	0
alarm	If greater than zero, no tripping action is enforced, a message is printed when a trip level is exceeded	1

model: lhfrt

Variable	Description	Value
fref	Delta frequency is computed with respect to fref	60
dftrp1	Delta frequency trip level, p.u.	1.7
dftrp2	Delta frequency trip level, p.u.	1.6
dftrp3	Delta frequency trip level, p.u.	0.6
dftrp4	Delta frequency trip level, p.u.	-0.6
dftrp5	Delta frequency trip level, p.u.	-1.6
dftrp6	Delta frequency trip level, p.u.	-2.2
dftrp7	Delta frequency trip level, p.u.	-2.7
dftrp8	Delta frequency trip level, p.u.	-3
dftrp9	Delta frequency trip level, p.u.	0
dftrp10	Delta frequency trip level, p.u.	0
dttrp1	Frequency trip time, sec.	0.008
dttrp2	Frequency trip time, sec.	30
dttrp3	Frequency trip time, sec.	180
dttrp4	Frequency trip time, sec.	180
dttrp5	Frequency trip time, sec.	30
dttrp6	Frequency trip time, sec.	7.5
dttrp7	Frequency trip time, sec.	0.75
dttrp8	Frequency trip time, sec.	0.008
dttrp9	Frequency trip time, sec.	0
dttrp10	Frequency trip time, sec.	0
alarm	If greater than zero, no tripping action is enforced, a message is printed when a trip level is exceeded	0

Battery Energy Storage System

model: regc_a

Variable	Description	Value
lvplsw	Connect (1) / disconnect (0) Low Volt. Power Logic switch	1
rrpwr	LVPL ramp rate limit, p.u.	10
brkpt	LVPL characteristic breakpoint, p.u.	0.8
zerox	LVPL characteristic zero crossing, p.u.	0.79
lvpl1	LVPL breakpoint, p.u.	1
vtmax	Voltage limit used in the high voltage reactive power logic, p.u.	2
lvpnt1	High voltage point for low voltage active power logic, p.u.	0.8
lvpnt0	Low voltage point for low voltage active power logic, p.u.	0
qmin	Limit in the high voltage reactive power logic, p.u.	-1
accel	Acceleration factor used in the high voltage reactive power logic, p.u.	1
tg	Time constant, sec.	0.02
tfltr	Voltage measurement time constant, sec.	0.02
iqrmax	Upward rate limit on reactive current command p.u./sec.	2
iqrmin	Downward rate limit on reactive current command p.u./sec.	-2
xe	Generator effective reactance, p.u.	0

model: reec_c

Variable	Description	Value
vdip	Vterm < vdip activates the current injection logic, p.u. (see Note b)	0.85
vup	Vterm > vup activates the current injection logic, p.u. (see Note b)	2
trv	Transducer time constant, sec.	0.02
dbd1	Deadband in voltage error, p.u.	-0.1
dbd2	Deadband in voltage error, p.u.	0.1
kqv	Reactive current injection gain during voltage dip (and overvoltage) conditions, p.u./p.u.	2
iqh1	Maximum limit of reactive current injection (**iqinj**), p.u.	1
iql1	Maximum limit of reactive current injection (**iqinj**), p.u.	-1
vref0	Reference voltage (See Note e)	0
SOCini	Initial state of charge	0.5
SOCmax	Maximum allowable state of charge	1
SOCmin	Minimum allowable state of charge,	0
T	Discharge time, sec.	14400
tp	Electrical power transducer time constant, sec.	0.02
qmax	Reactive power maximum limit, p.u.	1
qmin	Reactive power minimum limit, p.u.	-1
vmax	Voltage control maximum limit, p.u.	1.2
vmin	Voltage control minimum limit, p.u.	0
kqp	Proportional gain, p.u.	0
kqi	Integral gain, p.u.	0.5
kvp	Proportional gain, p.u.	0
kvi	Integral gain, p.u.	40
tiq	Time constant, sec.	0.02
dpmax	Up ramp rate on power reference p.u./sec.	10
dpmin	Down ramp rate on power reference p.u./sec.	-10
pmax	Maximum power reference, p.u.	1
pmin	Minimum power reference, p.u.	-1
imax	Maximum allowable total current limit, p.u.	1
tpord	Time constant, sec.	0.03
pfflag	Power factor flag:	0
vflag	Voltage control flag (see Note i):	1
qflag	Reactive power control flag	1
pqflag	Flag for P or Q priority selection on current limit:	1
vq1	User defined voltage used to define VDL1 function, p.u.	0.7
iq1	User defined current used to define VDL1 function, p.u.	1
vq2	User defined voltage used to define VDL1 function, p.u.	0.8
iq2	User defined current used to define VDL1 function, p.u.	1
vq3	User defined voltage used to define VDL1 function, p.u.	0.9
iq3	User defined current used to define VDL1 function, p.u.	1
vq4	User defined voltage used to define VDL1 function, p.u.	1

iq4	User defined current used to define VDL1 function, p.u.	1
vp1	User defined voltage used to define VDL2 function, p.u.	0.7
ip1	User defined current used to define VDL2 function, p.u.	0
vp2	User defined voltage used to define VDL2 function, p.u.	0.9
ip2	User defined current used to define VDL2 function, p.u.	1
vp3	User defined voltage used to define VDL2 function, p.u.	1
ip3	User defined current used to define VDL2 function, p.u.	1
vp4	User defined voltage used to define VDL2 function, p.u.	1
ip4	User defined current used to define VDL2 function, p.u.	1

model: repc_a

Variable	Description	Value
tfltr	Voltage or reactive power transducer time constant, sec	0.02
Kp	Proportional gain, pu	1
Ki	Integral gain, pu	0
tft	Lead time constant, sec	0
tfv	Lag time constant, sec	0.1
refflg	=1 Voltage control; =0 Reactive control	1
vfrz	If Vreg < vfrz, then state s2 is frozen	0.8
rc	Line drop compensation resistance, pu	0
xc	Line drop compensation reactance, pu	0
Kc	Droop gain, pu	0
vcmpflg	Flag for selection of droop (=0), or line drop compensation (=1)	0
emax	Maximum error limit, pu	0.1
emin	Minimum error limit, pu	-0.1
dbd	Deadband	0
qmax	Maximum Q control output, pu	1
qmin	Minimum Q control output, pu	-1
kpg	Proportional gain for power control, pu	0.25
kig	Integral gain for power control, pu	0
tp	Lag time constant on Pgen measurement, sec	0.02
fdbd1	Deadband downside, pu	-0.0003
fdbd2	Deadband upside, pu	0.0003
femax	Maximum error limit, pu	10000
femin	Minimum error limit, pu	-10000
pmax	Maximum power, pu	1
pmin	Minimum power, pu	-1
tlag	Lag time constant on pref feedback, sec	0.01
ddn	Downside droop, pu	20
dup	Upside droop, pu	20
frqflg	Pref output flag	1
outflag	Output flag 0=Qref is reactive power, 1=Qref is voltage	0

model: lhvrt

Variable	Description	Value
vref	Delta voltage is computed with respect to vref	1
dvtrp1	Delta voltage trip level, p.u.	-0.1
dvtrp2	Delta voltage trip level, p.u.	-0.3
dvtrp3	Delta voltage trip level, p.u.	-0.4
dvtrp4	Delta voltage trip level, p.u.	-1
dvtrp5	Delta voltage trip level, p.u.	-1
dvtrp6	Delta voltage trip level, p.u.	0.11
dvtrp7	Delta voltage trip level, p.u.	0.2
dvtrp8	Delta voltage trip level, p.u.	0.3
dvtrp9	Delta voltage trip level, p.u.	0.3
dvtrp10	Delta voltage trip level, p.u.	0.3
dttrp1	Voltage trip time, sec.	6550
dttrp2	Voltage trip time, sec.	3
dttrp3	Voltage trip time, sec.	1
dttrp4	Voltage trip time, sec.	0.5
dttrp5	Voltage trip time, sec.	0.5
dttrp6	Voltage trip time, sec.	6550
dttrp7	Voltage trip time, sec.	0.5
dttrp8	Voltage trip time, sec.	0.01
dttrp9	Voltage trip time, sec.	0.01
dttrp10	Voltage trip time, sec.	0.01
alarm	If greater than zero, no tripping action is enforced, a message is printed when a trip level is exceeded	0

model: lhfrt

Variable	Description	Value
fref	Delta frequency is computed with respect to fref	60
dftrp1	Delta frequency trip level, p.u.	-0.7
dftrp2	Delta frequency trip level, p.u.	-2
dftrp3	Delta frequency trip level, p.u.	-3
dftrp4	Delta frequency trip level, p.u.	-5
dftrp5	Delta frequency trip level, p.u.	-5
dftrp6	Delta frequency trip level, p.u.	0.7
dftrp7	Delta frequency trip level, p.u.	2
dftrp8	Delta frequency trip level, p.u.	3
dftrp9	Delta frequency trip level, p.u.	4
dftrp10	Delta frequency trip level, p.u.	4
dttrp1	Frequency trip time, sec.	6550
dttrp2	Frequency trip time, sec.	90
dttrp3	Frequency trip time, sec.	10
dttrp4	Frequency trip time, sec.	0.01
dttrp5	Frequency trip time, sec.	0.01
dttrp6	Frequency trip time, sec.	6550
dttrp7	Frequency trip time, sec.	90
dttrp8	Frequency trip time, sec.	5
dttrp9	Frequency trip time, sec.	0.01
dttrp10	Frequency trip time, sec.	0.01
alarm	If greater than zero, no tripping action is enforced, a message is printed when a trip level is exceeded	1

```
#
#
# PG&E Cluster 13 Q1739 Pecho Energy Storage (P53822)
# 500 MW net to grid [520 MW gross compressed air energy storage (caes), 108 MW gross battery energy storage (bess)]
# requested charging gross value for compressors is 487.2 MW
# requested charging gross value for bess is 108 MW
# POI is Morro Bay 230 kV (30915   MORROBAY     230.00)
# ISD 01/01/2023
# COD 06/01/2023
# Chad Thomson, cet7, 2020-07-20
# Carlos Bandak, ceby, 2020-07-27
#
regc_a    365798 "13C1739BESS"  0.69 "B1" : #9 mvab=120.0 /
"lvplsw"  1.00 "rrpwr"   10.0 "brkpt"   0.80 "zerox"   0.79 "lvpl1"   1.00 /
"vtmax"   2.00 "lvpnt1"  0.80 "lvpnt0"  0.00 "qmin"   -1.00 "accel"   1.00 /
"tg"      0.02 "tfltr"   0.02 "iqrmax"  2.00 "iqrmin" -2.00 "xe"      0.00
#
reec_c    365798 "13C1739BESS"  0.69 "B1" : #9 "mvab" 0. /
"vdip"    0.85 "vup"     2.00 "trv"     0.02 "dbd1"   -0.10  "dbd2"    0.10 /
"kqv"     2.00 "iqh1"    1.00 "iql1"   -1.00 "vref0"   0.00  "SOCini"  0.5 /
"SOCmax"  1.00 "SOCmin"  0.00 "T"     14400  "tp"      0.02  "qmax"    1.00 /
"qmin"   -1.00 "vmax"    1.20 "vmin"    0.00 "kqp"     0.00  "kqi"     0.50 /
"kvp"     0.00 "kvi"    40.00 "tiq"     0.02 "dpmax"   10.00 "dpmin"  -10.00 /
"pmax"    1.00 "pmin"   -1.00 "imax"    1.00 "tpord"   0.025 "pfflag"  0. /
"vflag"   1.   "qflag"   1.   "pqflag"  1.   "vq1"     0.70  "iq1"     1.00 /
"vq2"     0.80 "iq2"     1.00 "vq3"     0.90 "iq3"     1.00  "vq4"     1.00 /
"iq4"     1.00 "vp1"     0.70 "ip1"     0.00 "vp2"     0.90  "ip2"     1.00 /
"vp3"     1.00 "ip3"     1.00 "vp4"     1.00 "ip4"     1.00
#
# POWER PLANT CONTROLLER MODEL
#
repc_a    365798 "13C1739BESS"  0.69 "B1" 365790 "13C1739" 230.0  ! !  365797 "13C1739C2"  34.5 365796 "13C1739C1"  34.5 "1 " : #9 mvab=0.0
/
"tfltr"    0.0200 "kp"       1.0    "ki"       0.00    "tft"      0.0000 "tfv"      0.10   /
"refflg"   1.0000 "vfrz"     0.8000 "rc"       0.0000  "xc"       0.0000 "kc"       0.0000 /
"vcmpflg"  0.0000 "emax"     0.10   "emin"    -0.10    "dbd"      0.0000 "qmax"     1.00   /
"qmin"    -1.00   "kpg"      0.25   "kig"      0.00001 "tp"       0.0200 "fdbd1"   -0.0003 /
"fdbd2"    0.0003 "femax"    10000  "femin"   -10000   "pmax"     1.00   "pmin"    -1.00   /
"tlag"     0.010  "ddn"      20.00  "dup"      20.00   "frqflg"   1.0    "outflag"  0.0
#
# PROTECTION MODELS
#
lhvrt     365798 "13C1739BESS"  0.69 "B1" 365790 "13C1739" 230.0 : #9 /
"vref" 1.00 /
"dvtrp1" -0.10 "dvtrp2" -0.30 "dvtrp3" -0.40 "dvtrp4" -1.00 "dvtrp5" -1.00 /
"dvtrp6"  0.11 "dvtrp7"  0.20 "dvtrp8"  0.30 "dvtrp9"  0.30 "dvtrp10" 0.30 /
"dttrp1"  6550 "dttrp2"  3.00 "dttrp3"  1.00 "dttrp4"  0.50 "dttrp5"  0.50 /
"dttrp6"  6550 "dttrp7"  0.50 "dttrp8"  0.01 "dttrp9"  0.01 "dttrp10" 0.01 "alarm" 0.0
#
lhfrt     365798 "13C1739BESS"  0.69 "B1" 365790 "13C1739" 230.0 : #9 /
"fref" 60.00 /
```

```
"dftrp1" -0.70 "dftrp2" -2.00 "dftrp3" -3.00 "dftrp4" -5.00 "dftrp5" -5.00 /
"dftrp6"  0.70 "dftrp7"  2.00 "dftrp8"  3.00 "dftrp9"  4.00 "dftrp10" 4.00 /
"dttrp1"  6550 "dttrp2" 90.00 "dttrp3" 10.00 "dttrp4"  0.01 "dttrp5"  0.01 /
"dttrp6"  6550 "dttrp7" 90.00 "dttrp8"  5.00 "dttrp9"  0.01 "dttrp10" 0.01 "alarm" 1.0
#
#
#  Hydrostor Advanced CAES 500 MW project
#  10 - 50 MW Generators and 10 - 50 MW Compressors
#
# Generator G1
gentpj   365791 "13C1739CAES1"  13.8 "G1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365791 "13C1739CAES1"  13.8 "G1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365791 "13C1739CAES1"  13.8 "G1" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365791 "13C1739CAES1"  13.8 "G1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365791 "13C1739CAES1"  13.8 "G1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365791 "13C1739CAES1"  13.8 "G1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G2
gentpj   365791 "13C1739CAES1"  13.8 "G2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365791 "13C1739CAES1"  13.8 "G2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365791 "13C1739CAES1"  13.8 "G2" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365791 "13C1739CAES1"  13.8 "G2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
```

```
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365791 "13C1739CAES1"  13.8 "G2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365791 "13C1739CAES1"  13.8 "G2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C1
gentpj   365791 "13C1739CAES1"  13.8 "C1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365791 "13C1739CAES1"  13.8 "C1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365791 "13C1739CAES1"  13.8 "C1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365791 "13C1739CAES1"  13.8 "C1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365791 "13C1739CAES1"  13.8 "C1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C2
gentpj   365791 "13C1739CAES1"  13.8 "C2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365791 "13C1739CAES1"  13.8 "C2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365791 "13C1739CAES1"  13.8 "C2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365791 "13C1739CAES1"  13.8 "C2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365791 "13C1739CAES1"  13.8 "C2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
```

```
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G1
gentpj   365792 "13C1739CAES2"  13.8 "G1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365792 "13C1739CAES2"  13.8 "G1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365792 "13C1739CAES2"  13.8 "G1" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365792 "13C1739CAES2"  13.8 "G1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365792 "13C1739CAES2"  13.8 "G1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365792 "13C1739CAES2"  13.8 "G1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G2
gentpj   365792 "13C1739CAES2"  13.8 "G2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365792 "13C1739CAES2"  13.8 "G2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365792 "13C1739CAES2"  13.8 "G2" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365792 "13C1739CAES2"  13.8 "G2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365792 "13C1739CAES2"  13.8 "G2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
```

```
lhfrt    365792 "13C1739CAES2"  13.8 "G2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C1
gentpj   365792 "13C1739CAES2"  13.8 "C1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365792 "13C1739CAES2"  13.8 "C1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365792 "13C1739CAES2"  13.8 "C1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365792 "13C1739CAES2"  13.8 "C1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365792 "13C1739CAES2"  13.8 "C1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C2
gentpj   365792 "13C1739CAES2"  13.8 "C2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365792 "13C1739CAES2"  13.8 "C2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365792 "13C1739CAES2"  13.8 "C2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365792 "13C1739CAES2"  13.8 "C2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365792 "13C1739CAES2"  13.8 "C2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G1
```

```
gentpj   365793 "13C1739CAES3"  13.8 "G1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365793 "13C1739CAES3"  13.8 "G1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365793 "13C1739CAES3"  13.8 "G1" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365793 "13C1739CAES3"  13.8 "G1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365793 "13C1739CAES3"  13.8 "G1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365793 "13C1739CAES3"  13.8 "G1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G2
gentpj   365793 "13C1739CAES3"  13.8 "G2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365793 "13C1739CAES3"  13.8 "G2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365793 "13C1739CAES3"  13.8 "G2" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365793 "13C1739CAES3"  13.8 "G2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365793 "13C1739CAES3"  13.8 "G2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365793 "13C1739CAES3"  13.8 "G2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
```

```
# Compressor C1
gentpj   365793 "13C1739CAES3"  13.8 "C1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365793 "13C1739CAES3"  13.8 "C1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365793 "13C1739CAES3"  13.8 "C1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365793 "13C1739CAES3"  13.8 "C1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365793 "13C1739CAES3"  13.8 "C1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C2
gentpj   365793 "13C1739CAES3"  13.8 "C2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365793 "13C1739CAES3"  13.8 "C2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365793 "13C1739CAES3"  13.8 "C2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365793 "13C1739CAES3"  13.8 "C2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365793 "13C1739CAES3"  13.8 "C2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G1
gentpj   365794 "13C1739CAES4"  13.8 "G1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365794 "13C1739CAES4"  13.8 "G1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
```

```
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365794 "13C1739CAES4"  13.8 "G1" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365794 "13C1739CAES4"  13.8 "G1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365794 "13C1739CAES4"  13.8 "G1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365794 "13C1739CAES4"  13.8 "G1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G2
gentpj   365794 "13C1739CAES4"  13.8 "G2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365794 "13C1739CAES4"  13.8 "G2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365794 "13C1739CAES4"  13.8 "G2" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365794 "13C1739CAES4"  13.8 "G2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365794 "13C1739CAES4"  13.8 "G2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365794 "13C1739CAES4"  13.8 "G2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C1
gentpj   365794 "13C1739CAES4"  13.8 "C1" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
```

```
esac8b   365794 "13C1739CAES4"  13.8 "C1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365794 "13C1739CAES4"  13.8 "C1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
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"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365794 "13C1739CAES4"  13.8 "C1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
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1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365794 "13C1739CAES4"  13.8 "C2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
pss2b    365794 "13C1739CAES4"  13.8 "C2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365794 "13C1739CAES4"  13.8 "C2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365794 "13C1739CAES4"  13.8 "C2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
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1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365795 "13C1739CAES5"  13.8 "G1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365795 "13C1739CAES5"  13.8 "G1" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
```

```
pss2b    365795 "13C1739CAES5"  13.8 "G1" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365795 "13C1739CAES5"  13.8 "G1" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365795 "13C1739CAES5"  13.8 "G1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Generator G2
gentpj   365795 "13C1739CAES5"  13.8 "G2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365795 "13C1739CAES5"  13.8 "G2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
ieeeg1   365795 "13C1739CAES5"  13.8 "G2" : #9  mwcap=54.0  "k" 20.0  "t1" 0.0  "t2" 0.0  "t3" 0.1  "uo" 0.1  "uc" -10.0  "pmax" 1.0  "pmin"
0.0  "t4" 0.0  "k1" 1.0  "k2" 0.0  /
"t5" 0.0  "k3" 0.0  "k4" 0.0  "t6" 0.0  "k5" 0.0  "k6" 0.0  "t7" 0.0  "k7" 0.0  "k8" 0.0  "db1" 0.0  "eps" 0.0  "db2" 0.0  "gv1" 0.0  "pgv1"
0.0  "gv2" 0.0  "pgv2" 0.0  "gv3" 0.0
pss2b    365795 "13C1739CAES5"  13.8 "G2" : #9  "j1" 1  "k1" 0  "j2" 3  "k2" 0  "vsi1max" 999.0  "vsi1min" -999.0  "tw1" 2.0  "tw2" 2.0
"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365795 "13C1739CAES5"  13.8 "G2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
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0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
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1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
"accel" 0.50  "kis" 0.08
esac8b   365795 "13C1739CAES5"  13.8 "C1" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
0.023  "vtmult" 0.0  "spdmlt" 0.0
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"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
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"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
0.00 "alarm" 1.0
lhfrt    365795 "13C1739CAES5"  13.8 "C1" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
# Compressor C2
gentpj   365795 "13C1739CAES5"  13.8 "C2" : #9 mva=65.0  "tpdo" 7.246  "tppdo" 0.0293  "tpqo" 0.0  "tppqo" 0.092  "h" 3.1  "d" 0.0  "ld"
1.65  /
"lq" 0.642  "lpd" 0.204  "lpq" 0.642  "lppd" 0.128  "lppq" 0.128  "ll" 0.093  "s1" 0.08  "s12" 0.24  "ra" 0.00  "rcomp" 0.0  "xcomp" 0.0
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esac8b   365795 "13C1739CAES5"  13.8 "C2" : #9  "tr" 0.0  "kpr" 48.23  "kir" 29.23  "kdr" 12.11  "tdr" 0.12  "vrmax" 9.07  "vrmin" 0.05  /
"ka" 1.0  "ta" 0.01  "te" 0.467  "vfemax" 15.07  "vemin" 0.055  "ke" 1.0  "kc" 0.44  "kd" 0.18  "e1" 2.56  "se1" 0.022  "e2" 4.47  "se2"
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"vsi2max" 999.0  "vsi2min" -999.0  /
"tw3" 2.0  "tw4" 0.0  "t6" 0.0  "t7" 2.0  "ks2" 0.2  "ks3" 1.0  "t8" 0.50  "t9" 0.10  "n" 1.0  "m" 5.0  "ks1" 10.0  "t1" 0.25  "t2" 0.04
"t3" 0.20  "t4" 0.03  /
"t10" 0.0  "t11" 0.0  "vstmax" 0.10  "vstmin" -0.10  "a" 1.0  "ta" 0.0  "tb" 0.0  "ks4" 1.0
lhvrt    365795 "13C1739CAES5"  13.8 "C2" : #9 "vref" 1.00 "dvtrp1" -0.10 "dvtrp2" -0.25 "dvtrp3" -0.35 "dvtrp4" -0.55 "dvtrp5" 0.10
"dvtrp6"  0.15 "dvtrp7"  0.175 "dvtrp8" 0.20 "dvtrp9" 0.30 "dvtrp10" 0.00 /
"dttrp1"  3.00 "dttrp2"  2.00 "dttrp3" 0.30 "dttrp4" 0.15 "dttrp5" 1.00 "dttrp6"  0.50 "dttrp7"  0.20 "dttrp8" 0.10 "dttrp9" 0.00 "dttrp10"
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lhfrt    365795 "13C1739CAES5"  13.8 "C2" : #9 "fref" 60.0 "dftrp1" -0.6 "dftrp2" -1.6 "dftrp3" -2.2 "dftrp4" -2.7 "dftrp5" -3.0 "dftrp6"
0.60 "dftrp7" 1.60 "dftrp8" 1.70 "dftrp9" 0.00 "dftrp10" 0.00 /
"dttrp1" 180.0 "dttrp2" 30 "dttrp3" 7.50 "dttrp4" 0.75 "dttrp5" 0.15 "dttrp6" 180.0 "dttrp7" 30.0 "dttrp8" 0.15 "dttrp9" 0.00 "dttrp10" 0.00
"alarm" 1.0
#
#
```

Appendix A – Q1739

Hydrostor A-CAES USA Inc.

Pecho Energy Storage

Queue Cluster 13 Phase I Study

Final Report

California ISO

February 12, 2021

CONFIDENTIAL

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

Table of Contents

1. Introduction 4
2. Study Assumptions 7
3. Reliability Standards, Study Criteria and Methodology 8
4. Reliability Assessment Results 8
4.1 Steady State Reliability Thermal Loading Assessment Results 8
4.1.1 Steady State Thermal Overloads in the PG&E System 8
4.1.2 Bus Flow Analysis Results 8
4.1.3 Steady-State Voltage Results in PG&E System 9
4.1.4 Post-Transient Voltage Stability Results 9
4.1.5 Reactive Power Deficiency Results 9
4.1.6 Required Mitigation 9
4.2 Short Circuit Analysis 9
4.2.1 Short-Circuit Analysis Input Data 9
4.2.2 Short-Circuit Analysis Results 10
4.2.3 Required Mitigation 10
4.2.4 Preliminary Protection Requirements 10
4.3 Transient Stability Analysis 10
4.3.1 Transient Stability Study Scenarios 10
4.3.2 Transient Stability Analysis Results 14
4.3.3 Mitigation 15
4.4 Power Factor Requirements 15
4.5 Reliability Assessment for Storage Charging 15
5. Deliverability Assessment Results 15
5.1 On-Peak Deliverability Assessment 15
5.2 Off-Peak Deliverability Assessment 15
5.3 Required Mitigation 15
6. Scope of Upgrades – Interconnection Facilities and Network Upgrades 15
7. Interconnection Facilities, Network Upgrades and their Cost and Construction Duration Estimates 15
7.1 Interconnection Facilities 17
7.2 Network Upgrade 18
7.2.1 Reliability Network Upgrades - RNU 18
7.2.2 Local Delivery Network Upgrades – LDNU 20
7.2.3 Local Off-Peak Network Upgrades – LOPNU 21
7.2.4 Area Delivery Network Upgrades – ADNU 22

7.2.5 Conditionally Assigned Network Upgrades (CANU) and Potential Changes in Cost Responsibility....23
7.2.6 Precursor Network Upgrades (PNU)....24
7.2.7 Cost Responsibility Breakdown....25
8. Subsynchronous Interaction Evaluations....26
9. PG&E Technical Requirements....26
10. Environmental Evaluation / Permitting Requirements....26
11. Affected Systems Coordination....26
12. Items Not Covered in this Report....26
13. Definitions....27

Attachments:

1. **Allocation of Deliverability Driven Network Upgrades for Cost Estimates**
2. **Not Used**
3. **Not Used**
4. **Short Circuit Calculation Study Results (Refer to Appendix H of the PG&E West Kern Interconnection Area Study Report)**
5. **Deliverability Assessment Results (Refer to Appendix I of the PG&E West Kern Interconnection Area Study Report)**
6. **Generator Dynamic Data**
7. **Transient Stability Plots**
8. **Preliminary Protection Requirements**
9. **Not Used**
10. **Substation and Transmission Line Work Scope**
11. **Reliability Study of Charging Energy Storage Facilities (Refer to Appendix J of the PG&E West Kern Interconnection Area Report)**

1. Introduction

Hydrostor A-CAES USA Inc., the Interconnection Customer (IC), has submitted a completed Interconnection Request (IR) to the California Independent System Operator Corporation (CAISO) for their proposed Pecho Energy Storage, interconnecting to the CAISO Controlled Grid. The Project is a Storage (Compressed air, Battery) generation plant with a total rated output of 500 MW to Pacific Gas and Electric Company's (PG&E's) Morro Bay 230 kV Substation in San Luis Obispo County, CA. The Project was modeled with a total installed capacity of 770 MVA.

The IC has requested Full Capacity Deliverability Status, a proposed In-Service Date (ISD) of 2023-01-01 and a proposed Commercial Operation Date (COD) of 2023-06-01 for the Project. The Project occupies Queue Position Q1739 in the CAISO Queue. Such dates are specified in the Project's Interconnection Request (IR) Form. The actual ISD and COD of the Project will depend on licensing, engineering, detailed design, and construction requirements to interconnect the Project after the Generator Interconnection Agreement (GIA) has been executed and filed with the Federal Energy Regulatory Commission (FERC) for acceptance.

In accordance with Federal Energy Regulatory Commission (FERC) approved CAISO Tariff Appendix DD Generator Interconnection and Deliverability Allocation Procedures (GIDAP), the Project was grouped with Queue Cluster 13 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 West Kern Interconnection Area 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 the Generator Interconnection Agreement (GIA).

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.

Additionally, the Project encompasses energy storage equipment that required additional analysis be performed to evaluate the impacts of the Generating Facility (GF) within Participating TO's (PG&E) Transmission System. These analyses focused on the charging demand[1] aspects of the GF and consider varying levels of system demand with minimal generation dispatch within the local transmission system.

Consequently, the report also discloses the adequacy of PG&E's Transmission System to support the GF when operating in charging demand mode, identifies system limitations that may restrict the GF when operating in charging demand mode during certain demand conditions, and provides a high-level explanation of potential exposure to the GF of charging restrictions on the

[1] Charging Demand is defined as when the Project's GF draws energy from the grid and/or on-site generation to "charge" the Project-associated energy storage facilities.

electric system. The GF will follow CAISO market dispatch instructions when in charging demand mode and in discharging mode.

Since the Generating Facility has the capability of producing and deliverying more MW at the Point of Interconnection than the requested amount of 500 MW, the Interconnection Customer will need to install or demonstrate that a control system will be put in place which will manage the Generating Facility output to not exceed the maximum requested 500 MW Point of Interconnection delivery amount, which takes into account the expected losses on the generation tie line.

All the equipment and facilities comprising the Project are as disclosed by the IC in its Interconnection Request (IR) or may have been amended during the Interconnection Study process and validated by the CAISO.

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	San Luis Obispo GPS Coordinates: 35.370369, -120.828165
Participating TO's Planning Area	West Kern
Number and Type of Generators	10 x 65 MVA (Compressed Air) Synchronous Machine 40 x 3 MVA (BESS) Inverter
Interconnection Voltage	230 kV
Maximum Generator Output at Generator Terminal	511.6 MW
Generator Auxiliary Load	9.58 MW
Requested Maximum Project Output as measured at the POI	500.0 MW
Maximum Net Output at POI[2]	500 MW
Power Factor Range at Generator Terminal	Compressed Air: 0.95 lead/0.80 lag BESS: 0.90 lead/0.90 lag
Step-up Transformer(s)	5 x 230/13.8 kV rated at 166 MVA with Z = 9 % for H-X winding base on 100 MVA 1 x 230/34.5 kV rated at 123 MVA with Z = 7 % for H-X winding base on 74 MVA
Point of Interconnection (POI)	Morro Bay 230 kV Substation
Interconnection Customer Requested In-Service Date	2023-01-01
Initial Synchronization Date/Trial Operation	2023-03-01

[2] The IC is reminded that this value takes into account the auxiliary load and losses in the IC's Interconnection Facilities. The estimated ***Maximum Net Output at POI*** and losses in the Interconnection Facilities are dependent on the accuracy of the technical data provided by the IC in the Interconnection Request Form, and are subject to change should the IC change its Interconnection Facilities and/or auxiliary load parameters during the final engineering and design phase of the Project. The IC shall install an Automatic Generator Control scheme to ensure that the Generating Facility shall not exceed the net MW output as measured at the high side of the main generator step-up (GSU) transformer banks as well as not to exceed the requested MW at the Point of Interconnection.

Project Parameters	Project Specific Data
Interconnection Customer Requested Commercial Operation Date	2023-06-01

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

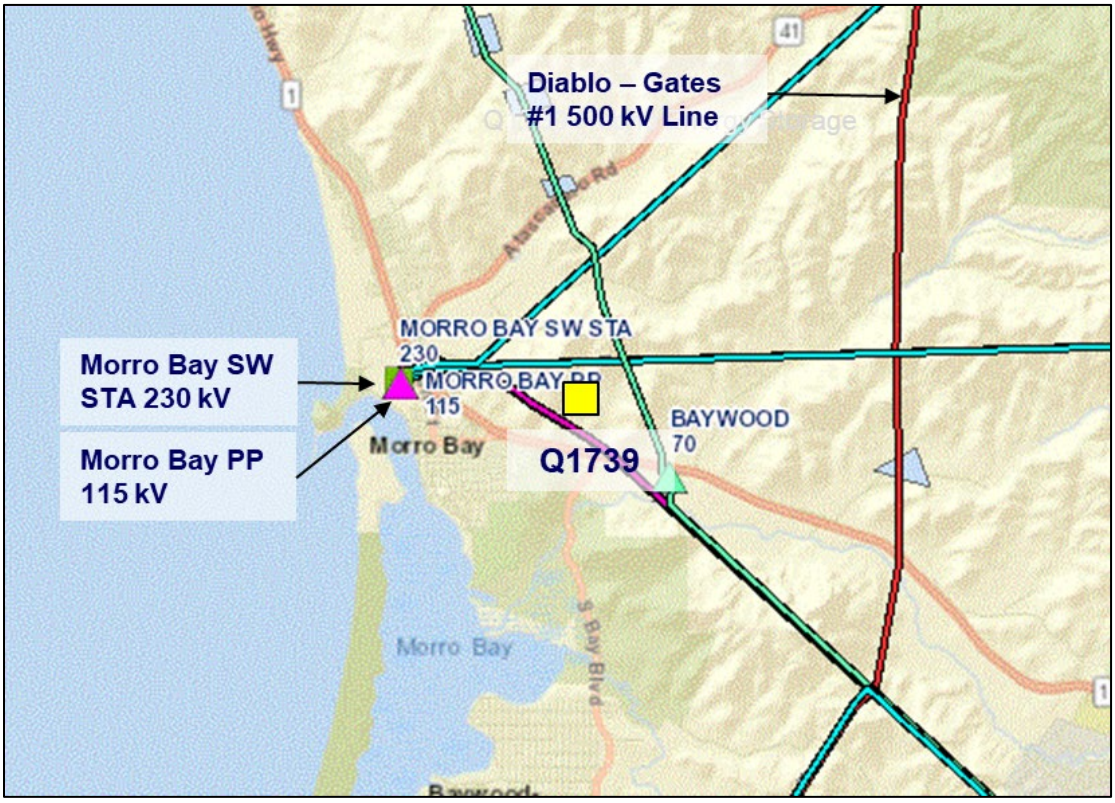
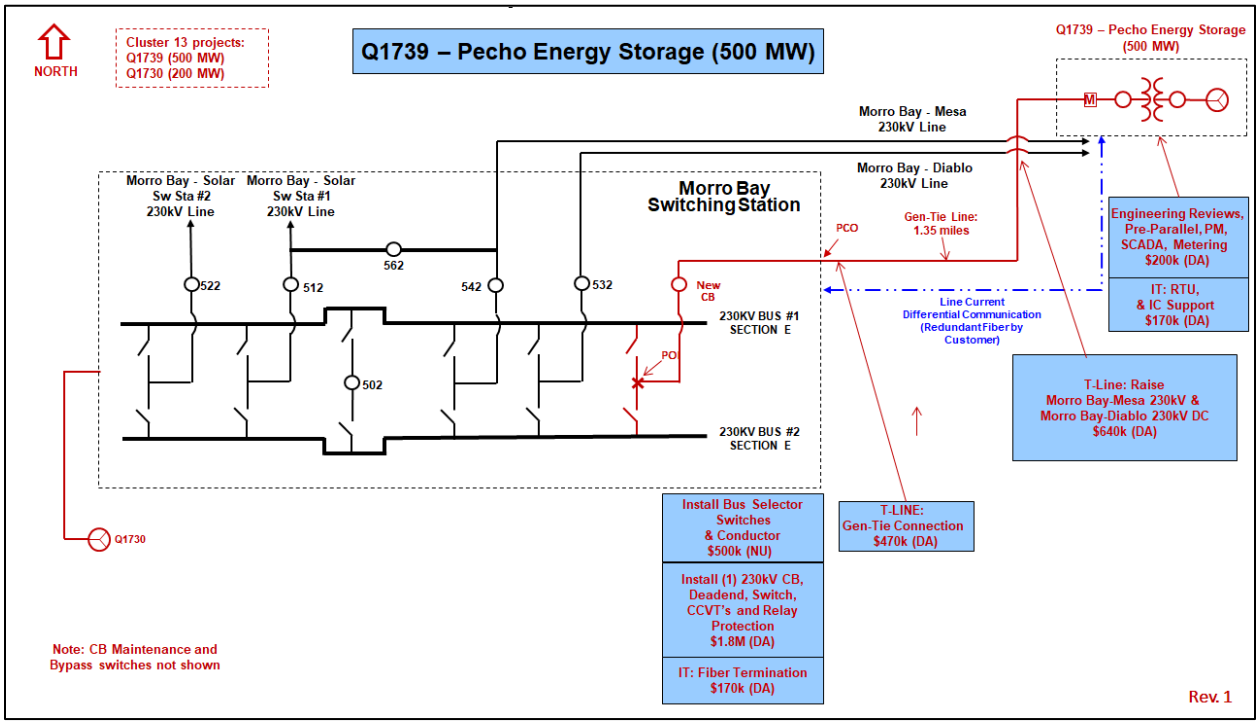


Figure 1-2: Proposed Project Plan of Service and IC Facilities Single-Line Diagram



2. Study Assumptions

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

The following assumptions are only specific to the Project:

1. The requested In-Service Date of the Project is 2023-01-01.

2. The expected Commercial Operation Date of the Project is 2023-06-01.

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

4. Energy Storage Generating Facility Considerations: The Project encompasses energy storage facilities. The details pertaining to the Reliability Study for the Generating Facility when operating in charging demand mode is included in this Appendix A report.

5. Conditionally Assigned Network Upgrade(s) (CANU):

   - The Project is dependent upon the installation of CANUs listed in Section 7.2.4. The CANUs are counted towards the IC's Maximum Cost Exposure (MCE) and may affect the Project's in-service date. The IC is not responsible for posting Interconnection Financial Security for these CANUs unless a CANU becomes an Assigned Network Upgrade (ANU) and becomes part of the Generating Facility's Current Cost Responsibility (CCR) in accordance with the CAISO Tariff.

- Any change in the IC's Current Cost Responsibility and Maximum Cost Responsibility resulting from a CANU becoming an ANU will be reflected in a revision to this study report or reassessment as applicable and amendment to the GIA
- The process by which these other CANUs can become the responsibility of the Project is set forth in Section 14.2.2 of the Appendix DD GIDAP. Reliability Standards, Study Criteria and Methodology

6. Provide updated Precursor Network Upgrades needed to achieve the Commercial Operation status and Deliverability Status for the Generating Facilities.
7. Identify LOPNUs needed for Generating Facilities selecting Off-Peak Deliverability Status, and provide final cost estimates
8. Identify AOPNUs for information only.

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 West Kern Interconnection Area Study Report for details of the applicable reliability standards, study criteria and methodology.

4. Reliability Assessment Results

The Project was studied as part of other Cluster 13 Phase I projects in the PG&E West Kern. Refer to the PG&E West Kern Interconnection Area Study Report, Section 4 – Reliability Assessment for details of the Reliability Assessment.

4.1 Steady State Reliability Thermal Loading Assessment Results

4.1.1 Steady State Thermal Overloads in the PG&E System

The reliability thermal analysis was performed on power flow cases that include all Energy-Only and Full Capacity projects dispatched to maximum values.

No steady-state thermal violations were observed in the PG&E transmission system due to the addition of the Project after curtailment.

Q1739 was curtailed in the reliability cases to 82 MW net at POI in summer peak discharging case and to 142 MW net to grid in spring off-peak discharging case. This project may be curtailed by congestion management under certain conditions including P0. Please refer to Appendix E for more details.

Appendix E to the area report further captures the reliability results where congestion management was deemed sufficient to mitigate the thermal overloads

4.1.2 Bus Flow Analysis Results

Bus flow power flow analysis was performed to evaluate impacts of the Cluster 13 Phase I interconnection projects on the loadings of buses and switching devices at PG&E substations according to Section 3.8 of the area report. Refer to Section 4.1.2 of the area report for details related to the overload found during this analysis.

4.1.3 Steady-State Voltage Results in PG&E System

There were no steady-state voltage violations identified in the reliability analysis for this project.

4.1.4 Post-Transient Voltage Stability Results

There were no post-transient voltage stability violations identified in the reliability analysis for this project.

4.1.5 Reactive Power Deficiency Results

There were no reactive power deficiencies identified in the reliability analysis for this project.

4.1.6 Required Mitigation

Refer to Section 7.2.1 of this report for the details of the mitigation for these constraints identified in the steady-state power flow analysis.

4.2 Short Circuit Analysis

Short circuit studies were performed to determine the impact of adding the Cluster 13 Phase I PG&E West Kern Area Interconnection 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 13 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 West Kern Interconnection Area Study Report.

4.2.1 Short-Circuit Analysis Input Data

The following input data provided by the Interconnection Customer and was used in this study.

- Transformer Data as provided by the customer:
  - Five 230/13.8 kV transformers with impedance of 9% at 100 MVA Base.
  - One 230/34.5 kV transformers with impedance of 7.5% at 74 MVA Base.

- The Synchronous Compressed Air Energy Storage is modeled based on the data provided by the customer:
  - X”1 (saturated) = 0.108 pu
  - X”1 (unsaturated) = 0.28 pu
  - X2 = 0.128 pu
  - X0 = 0.051 pu

- The BESS is modeled based upon PG&E standard modeling guidelines assuming 115% maximum name plate MVA at rated power factor:
  - Xd = 0.06 pu
  - Xd’= 0.06 pu
  - Xd”= 0.06 pu
  - X2 = 0.06 pu
  - X0 = 9999 pu
  - Current limit of 115470 amps @ 0.69kV at unity PF

Generation Tie Line

The generation tie line was assumed to be 1.35 miles of 1590 ACSR (Lapwing) conductor with the following impedance information:

- Z1 = 0.000092 + j0.001401
- Z0 = 0.000276 + j0.004203
- B = 0.005466

4.2.2 Short-Circuit Analysis Results

Refer to Section 4.4 of the PG&E West Kern Interconnection Area Report for the results of the Short Circuit Duty Analysis.

4.2.3 Required Mitigation

Refer to Section 7 of this report for the details of the mitigation for short-circuit duty.

4.2.4 Preliminary Protection Requirements

Per Section G2.1 of the PG&E Interconnection Handbook[3], 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.

4.3 Transient Stability Analysis

Limited transient stability analysis was conducted using the summer peak full loop base case and spring off peak full loop base case to ensure that the transmission system remains stable and meets the transmission planning performance criteria in WECC TPL-001-WECC-CRT-3. The generator dynamic data used in the study for the Project is included in Attachment 6.

4.3.1 Transient Stability Study Scenarios

Disturbance simulations were performed for a study period of 20 seconds for selected Category P1 (loss of single element) and Category P2, P4 and P7 (loss of multiple elements) outages. For this Project, the following outages were evaluated

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

Contingencies:

1. Three-phase close-in fault on the Q1730 0.48 kV bus with normal clearing of the Q1730 Unit F1 (Category P1-1)
2. Three-phase close-in fault on the Q1730 0.48 kV bus with normal clearing of the Q1730 Unit F2 (Category P1-1)
3. Three-phase close-in fault on the Q1732 0.48 kV bus with normal clearing of the Q1732 Unit F (Category P1-1)
4. Three-phase close-in fault on the Q1733 0.48 kV bus with normal clearing of the Q1733 Unit F1 (Category P1-1)
5. Three-phase close-in fault on the Q1733 0.48 kV bus with normal clearing of the Q1733 Unit F2 (Category P1-1)
6. Three-phase close-in fault on the Q1739 13.8 kV bus with normal clearing of the Q1739 Unit G1 (Category P1-1)
7. Three-phase close-in fault on the Q1739 13.8 kV bus with normal clearing of the Q1739 Unit G2 (Category P1-1)
8. Three-phase close-in fault on the Q1739 0.69 kV bus with normal clearing of the Q1739 Unit B1 (Category P1-1)
9. Three-phase close-in fault on the Q1741 0.63 kV bus with normal clearing of the Q1741 Unit F1 (Category P1-1)
10. Three-phase close-in fault on the Q1741 0.55 kV bus with normal clearing of the Q1741 Unit F2 (Category P1-1)
11. Three-phase close-in fault on the Q1789 0.48 kV bus with normal clearing of the Q1748 Unit F1 (Category P1-1)
12. Three-phase close-in fault on the Topaz 0.324 kV bus with normal clearing of the Topaz Unit 1 (Category P1-1)
13. Three-phase close-in fault on the CVSR 0.4 kV bus with normal clearing of the CVSR Unit 1 (Category P1-1)
14. Three-phase close-in fault on the Diablo 25 kV bus with normal clearing of the Diablo Unit 1 (Category P1-1)
15. Three-phase close-in fault on the Q1730-Morro Bay 230 kV Line at Q1730 with normal clearing times followed by loss of the Q1730-Morro Bay 230 kV Line (Category P1-2)
16. Three-phase close-in fault on the Q1732-Mesa 230 kV Line at Q1732 with normal clearing times followed by loss of the Q1732-Mesa 230 kV Line (Category P1-2)
17. Three-phase close-in fault on the Q1733-Mesa 230 kV Line at Q1733 with normal clearing times followed by loss of the Q1733-Mesa 230 kV Line (Category P1-2)
18. Three-phase close-in fault on the Q1739-Morro Bay 230 kV Line at Q1739 with normal clearing times followed by loss of the Q1739-Morro Bay 230 kV Line (Category P1-2)
19. Three-phase close-in fault on the Q1741 Swt. Sta.-Morro Bay 230 kV Line at Q1741 Swt. Sta. with normal clearing times followed by loss of the Q1741 Swt. Sta.-Morro Bay 230 kV Line (Category P1-2)

20. Three-phase close-in fault on the Q1741 Swt. Sta.-Solar Swt. Sta. 230 kV Line at Q1741 Swt. Sta. with normal clearing times followed by loss of the Q1741 Swt. Sta.-Solar Swt. Sta. 230 kV Line (Category P1-2)
21. Three-phase close-in fault on the Q1748 Swt. Sta.-Morro Bay 230 kV Line at Q1748 Swt. Sta. with normal clearing times followed by loss of the Q1748 Swt. Sta.-Morro Bay 230 kV Line (Category P1-2)
22. Three-phase close-in fault on the Q1748 Swt. Sta.-Mesa 230 kV Line at Q1748 Swt. Sta. with normal clearing times followed by loss of the Q1748 Swt. Sta.-Mesa 230 kV Line (Category P1-2)
23. Three-phase close-in fault on the Q1748 Swt. Sta.-Diablo Canyon #1 230 kV Line at Q1748 Swt. Sta. with normal clearing times followed by loss of the Q1748 Swt. Sta.-Diablo Canyon #1 230 kV Line (Category P1-2)
24. Three-phase close-in fault on the Q1748 Swt. Sta.-Diablo Canyon #2 230 kV Line at Q1748 Swt. Sta. with normal clearing times followed by loss of the Q1748 Swt. Sta.-Diablo Canyon #2 230 kV Line (Category P1-2)
25. Three-phase close-in fault on the Morro Bay-Estrella 230 kV Line at Morro Bay with normal clearing times followed by loss of the Morro Bay-Estrella 230 kV Line (Category P1-2)
26. Three-phase close-in fault on the Morro Bay-Mesa 230 kV Line at Morro Bay with normal clearing times followed by loss of the Morro Bay-Mesa 230 kV Line (Category P1-2)
27. Three-phase close-in fault on the Morro Bay-Solar Swt. Sta. 230 kV Line at Morro Bay with normal clearing times followed by loss of the Morro Bay-Solar Swt. Sta. 230 kV Line (Category P1-2)
28. Three-phase close-in fault on the Morro Bay-Templeton 230 kV Line at Morro Bay with normal clearing times followed by loss of the Morro Bay- Templeton 230 kV Line (Category P1-2)
29. Three-phase close-in fault on the Solar Swt. Sta.-Caliente Swt. Sta. 230 kV Line at Solar Swt. Sta. with normal clearing times followed by loss of the Solar Swt. Sta.-Caliente Swt. Sta. 230 kV Line (Category P1-2)
30. Three-phase close-in fault on the Mesa-Q1470 230 kV Line at Q1470 with normal clearing times followed by loss of the Mesa-Q1470 230 kV Line (Category P1-2)
31. Three-phase fault on the Mesa 230/115 kV #2 Transformer at the 230 kV with normal clearing times followed by loss of Mesa 230/115 kV #2 Transformer (Category P1-3)
32. Three-phase fault on the Mesa 230/115 kV #6 Transformer at the 230 kV with normal clearing times followed by loss of Mesa 230/115 kV #6 Transformer (Category P1-3)
33. Three-phase fault on the Estrella 230 kV bus with normal clearing of the Estrella SVC. (Category P1-4)
34. Three-phase fault on the Diablo Canyon 230 kV bus with normal clearing of the Diablo Canyon SVC. (Category P1-4)
35. Single-line-to-ground fault on the Morro Bay 230 kV bus 1 section E with normal clearing times followed by loss of the Morro Bay 230 kV bus 1 section E. (Category P2-2)
36. Single-line-to-ground fault on the Morro Bay 230 kV bus 1 section D with normal clearing times followed by loss of the Morro Bay 230 kV bus 1 section D. (Category P2-2)

37. Single-line-to-ground fault on the Morro Bay 230 kV bus 2 section E with normal clearing times followed by loss of the Morro Bay 230 kV bus 2 section E. (Category P2-2)
38. Single-line-to-ground fault on the Morro Bay 230 kV bus 2 section D with normal clearing times followed by loss of the Morro Bay 230 kV bus 2 section D. (Category P2-2)
39. Single-line-to-ground fault on the Diablo 230 kV bus 1 section D with normal clearing times followed by loss of the Diablo 230 kV bus 1 section D. (Category P2-2)
40. Single-line-to-ground internal breaker fault at Mesa 230 kV Middle Breaker Bay 1 with normal clearing (Category P2-3)
41. Single-line-to-ground internal breaker fault at Mesa 230 kV Middle Breaker Bay 2 with normal clearing (Category P2-3)
42. Single-line-to-ground internal breaker fault at Mesa 230 kV Middle Breaker Bay 3 with normal clearing (Category P2-3)
43. Single-line-to-ground internal breaker fault at Mesa 230 kV Middle Breaker Bay 4 with normal clearing (Category P2-3)
44. Single-line-to-ground internal breaker fault at Solar Swt. Sta. 230 kV Middle Breaker Bay 1 with normal clearing (Category P2-3)
45. Single-line-to-ground internal breaker fault at Solar Swt. Sta. 230 kV Middle Breaker Bay 2 with normal clearing (Category P2-3)
46. Single-line-to-ground internal breaker fault at Solar Swt. Sta. 230 kV Middle Breaker Bay 3 with normal clearing (Category P2-3)
47. Single-line-to-ground fault at Morro Bay 230 kV bus and bus 1 section E and bus 2 section D tie breaker fails to operate resulting in the normal clearing. (Category P2-4)
48. Single-line-to-ground fault at Morro Bay 230 kV bus and bus 1 section E and bus 2 section E tie breaker fails to operate resulting in the normal clearing. (Category P2-4)
49. Single-line-to-ground fault at Morro Bay 230 kV bus and bus 1 section D and bus 2 section D tie breaker fails to operate resulting in the normal clearing. (Category P2-4)
50. Single-line-to-ground fault at Morro Bay 230 kV bus and bus 2 section E and bus 2 section D tie breaker fails to operate resulting in the normal clearing. (Category P2-4)
51. Single-line-to-ground fault on the Morro Bay-Estrella 230 kV Line with stuck breaker at Morro Bay with delayed clearing times. (Category P4-2)
52. Single-line-to-ground fault on the Mesa-Morro Bay 230 kV Line with stuck breaker at Mesa with delayed clearing times. (Category P4-2)
53. Single-line-to-ground close-in fault at Solar Swt. Sta. on the Morro Bay-Solar Swt. Sta. and Q1741 Swt. Sta.- Solar Swt. Sta. 230 kV Lines with normal clearing times followed by loss of Morro Bay-Solar Swt. Sta. and Q1741 Swt. Sta.- Solar Swt. Sta. 230 kV Lines. (Category P7-1)
54. Single-line-to-ground close-in fault at Morro Bay on the Morro Bay-Solar Swt. Sta. and Morro Bay-Q1741 Swt. Sta 230 kV Lines with normal clearing times followed by loss of Morro Bay-Solar Swt. Sta. and Morro Bay-Q1741 Swt. Sta 230 kV Lines. (Category P7-1)
55. Single-line-to-ground close-in fault at Solar Swt. Sta. on the Solar Swt. Sta.-Caliente Swt. Sta. #1 and #2 230 kV Lines with normal clearing times followed by loss of Solar

Swt. Sta.-Caliente Swt. Sta. #1 and #2 230 kV Lines. (Category P7-1)

56. Single-line-to-ground close-in fault at Caliente Swt. Sta. on the Caliente Swt. Sta.-Midway #1 and #2 230 kV Lines with normal clearing times followed by loss of Caliente Swt. Sta.-Midway #1 and #2 230 kV Lines. (Category P7-1)
57. Single-line-to-ground close-in fault at Morro Bay on the Morro Bay-Mesa and Morro Bay-Q1748 Swt. Sta. 230 kV Lines with normal clearing times followed by loss of Morro Bay-Mesa and Morro Bay-Q1748 Swt. Sta. 230 kV Lines. (Category P7-1)
58. Single-line-to-ground close-in fault at Morro Bay on the Q1748 Swt. Sta.-Mesa and Morro Bay-Q1748 Swt. Sta. 230 kV Lines with normal clearing times followed by loss of Q1748 Swt. Sta.-Mesa and Morro Bay-Q1748 Swt. Sta. 230 kV Lines. (Category P7-1)
59. Single-line-to-ground close-in fault at Q1748 Swt. Sta. on the Q1748 Swt. Sta.-Diablo #1 and #2 230 kV Lines with normal clearing times followed by loss of Q1748 Swt. Sta.-Diablo #1 and #2 230 kV Lines. (Category P7-1)
60. Single-line-to-ground close-in fault at Mesa on the Morro Bay-Mesa and Q1748 Swt. Sta.-Mesa 230 kV Lines with normal clearing times followed by loss of Morro Bay-Mesa and Q1748 Swt. Sta.-Mesa 230 kV Lines. (Category P7-1)
61. Single-line-to-ground close-in fault at Gates on the Gates-Q1721 Swt. Sta. and Gates-California Flats Swt. Sta. 230 kV Lines with normal clearing times followed by loss of Gates-Q1721 Swt. Sta. and Gates-California Flats Swt. Sta. 230 kV Lines. (Category P7-1)
62. Single-line-to-ground close-in fault at Q1721 Swt. Sta. on the Q1721 Swt. Sta.-Templeton and California Flats Swt. Sta.-Gates 230 kV Lines with normal clearing times followed by loss of Q1721 Swt. Sta.-Templeton and California Flats Swt. Sta.-Gates 230 kV Lines. (Category P7-1)
63. Single-line-to-ground close-in fault at Q1721 Swt. Sta. on the Q1721 Swt. Sta.-Templeton and California Flats Swt. Sta.-Estrella 230 kV Lines with normal clearing times followed by loss of Q1721 Swt. Sta.-Templeton and California Flats Swt. Sta.-Estrella 230 kV Lines. (Category P7-1)
64. Single-line-to-ground close-in fault at Estrella on the Q1721 Swt. Sta.-Templeton and Estrella-Morro Bay 230 kV Lines with normal clearing times followed by loss of Q1721 Swt. Sta.-Templeton and Estrella-Morro Bay 230 kV Lines. (Category P7-1)

Single-line-to-ground close-in fault at Estrella on the Morro Bay-Templeton and Estrella-Morro Bay 230 kV Lines with normal clearing times followed by loss of Morro Bay-

4.3.2 Transient Stability Analysis Results

Summer Peak

The transient stability analysis showed that the transmission system remained stable and met WECC Criterion TPL-001-WECC-CRT-3 for all simulated outages.

Spring Off-Peak

The transient stability analysis showed that the transmission system remained stable and met WECC Criterion TPL-001-WECC-CRT-3 for all simulated outages.

The results of the study are provided in the form of plots in Attachment 7.

4.3.3 Mitigation

The transient stability analysis identified no mitigations necessary for this project.

4.4 Power Factor Requirements

Refer to Section 3 of the West Kern Interconnection Area Report for the power factor requirements.

4.5 Reliability Assessment for Storage Charging

Refer to Section 4.5 and Appendix J of the West Kern Interconnection Area Report for the Energy Storage Charging Reliability Assessment results.

5. Deliverability Assessment Results

Refer to Section 3 of the PG&E West Kern Interconnection Area Study Report for information about the Deliverability Assessment and Methodology.

5.1 On-Peak Deliverability Assessment

The On-Peak Deliverability assessment showed that the addition of this project causes deliverability thermal overloads on the system. Refer to Section 7 of this report and Appendix I of the PG&E West Kern Interconnection Area Study Report for the details of the constraints and mitigation.

5.2 Off-Peak Deliverability Assessment

Off peak deliverability assessment was performed based on the criteria discussed in section 3.9 of the PG&E West Kern Interconnection Area Report. The results of the analysis are given in Section 7 of this report and Appendix I. System mitigations have been proposed to address the constraints found in Local off-peak analysis. Area Off-peak deliverability upgrades are for information only and re provided in Appendix I in the Area report.

5.3 Required Mitigation

The thermal overloads found in the On-Peak Deliverability and Off-Peak Deliverability assessment will be mitigated by Delivery Network Upgrades as described in Section 5 of the PG&E West Kern Interconnection Area Study Report.

6. Scope of Upgrades – Interconnection Facilities and Network Upgrades

Refer to Tables 7-1 through 7-5 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 13 Phase I Study, the CAISO developed cost allocation factors based on the individual contribution of each project. Tables 7-1 through 7-7 below provide the cost in 2020 dollars and their cost escalated to the estimated operating year for Interconnection Facilities, Reliability Network Upgrades (GRNU and IRNU), and Delivery Network Upgrades (LDNU, LOPNU and ADNU) and CANUs. For the Cluster 13 Phase I study, the estimated operating date is derived by assuming GIA execution in August, 2022 and adding a two-month estimated project kickoff time to the duration of the longest estimated time to construct Interconnection Facilities or Reliability Network Upgrades from the study.

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). The estimated durations provided represent the amount of time needed to permit, engineer, procure and construct the identified facilities starting from the date of execution of the 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 84 months from the signing of the Generator Interconnection Agreement (GIA), receipt of financial posting, plus two-month estimated project kickoff time.

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)*	Morro Bay Sw Sta	• Gen-Tie Line terminal Equipment • Termination of Customer's Fiber	100.00%	$1,970	$2,384	36
	Transmission Line	• Gen-Tie T-Line Equipment on PG&E Substation Property • Raise the DC Morro Bay-Mesa & Morro Bay-Diablo 230kV lines	100.00%	$1,110	$1,344	36
	Generating Site	• Engineering Reviews, Metering, Pre-parallel Inspection, & PM • IT install RTU, SEL-2411, and provide testing support	100.00%	$370	$448	36
			Total	**$3,450**	**$4,176**	

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 2020 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

Tables 7-2, 7-3 and 7-4 are the ANUs for this project which are comprised of IRNU-A, GRNU and LDNU and LOPNU.

7.2.1 Reliability Network Upgrades - RNU

Table 7-2: Escalated Cost and Time to Construct for Reliability Network Upgrade[4]

Type of Upgrade	Upgrade Classification (GRNU, IRNU)	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	IRNU	Morro Bay Sw Sta	• Install bus selector switches and conductor	100.00%	$500	$605	36
	GRNU	Mesa Substation 115 kV CBs 132 and 142 overstress	• Replace Mesa Substation 115 kV CBs 132 and 142 with 63 kA interrupting capability	7.47%	$269	$311	36
	GRNU	Midway Substation 230 kV bus and 27 circuit breakers overstress	• Install series bus reactors between Midway Substation 230 kV bus sections D and E	1.49%	$223	$270	84
	GRNU	Morro Bay Substation 230 kV CB 472 overstress	• Replace Morro Bay Substation 230 kV CB 472 with 63 kA interrupting capability	48.54%	$971	$1,124	36
	GRNU	PGAE-QC13P1RAS-02 Midway 500/230 kV Transformer Overload RAS	• PGAE-QC13P1RAS-02 Modify existing Midway 500/230 kV transformer overload RAS to include transformer outage detection and transformer overload detection	8.84%	$239	$276	36

[4] In the first round of the Phase I reliability assessment, relieving these constraints may trigger high cost upgrades with long estimated times to construct, driven by excessively large MW amounts of new generation. Similar with ADNU analysis, the MW within queue including Cluster 13 is significantly higher than the current CPUC IRP portfolios. Within Phase 2 for Cluster 13 further analysis will be conducted based upon the generation that proceeds to Phase 2

				Total	**$2,202**	**$2,587**	

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 2020 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

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	Coalinga 1-Coalinga 2 70 kV Line (Tornado Jct-Pennzier Jct) Reconductor	• Reconductor a total of 3.3 miles of 3/0 AAC conductor of Coalinga 1-Coalinga 2 70 kV Line (Tornado Jct-Pennzier Jct) with 1113 AAC	17.42%	$2,282	$2,641	60
	Gates-Jayne Sw Sta 70 kV Line Reconductor	• Reconductor a total of 0.68 mile of Gates-Jayne Sw Sta 70 kV Line with 1113 AAC	17.91%	$1,086	$1,257	58
	Jayne Sw Sta-Coalinga #1 70 kV Line (Jayne Sw Sta-Jacalito-Coalinga #1)	• Re-conductor Jayne Sw Sta-Coalinga #1 70 kV Line (Jayne Sw Sta-Jacalito-Coalinga #1) 11.8 miles with 1113 AAC	17.91%	$4,952	$5,870	63
			Total	**$8,320**	**$9,769**	

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 2020 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 Local Off-Peak Network Upgrades – LOPNU

Table 7-4: Escalated Cost and Time to Construct for Local Off-Peak Network Upgrades

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 Off-Peak Network Upgrade	none	•				
			Total	**$0**	**$0**	

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 2020 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.

7.2.4 Area Delivery Network Upgrades – ADNU

Table 7-5: Escalated Cost for Area Delivery Network Upgrade

Upgrade	Total Cost Constant ($k)	Incremental Deliverability (MW)	Cost Rate Constant ($k/MW)	MW at POI	Sum of Allocated Constant Cost ($k)	Sum of Allocated Escalated Cost ($k)
New Gates-Arco-Midway 230 kV path looping new projects	$114,688	3870.6	$29.6	500	$14,815	$18,344
New Morro Bay-Gates/Morro Bay-Midway 230 kV lines	$1,008,033	876.5	$1,150.1	500	$575,059	$712,046
New Diablo-Midway #4 500 kV Line	$830,000	7657.4	$108.4	500	$54,196	$67,106
Reconductor Gates-Panoche #1 and #2 230 kV Lines	$214,063	1377.3	$155.4	500	$77,712	$94,061
Gates Bank #13	$35,000	5292.3	$6.6	500	$3,307	$3,738
	Grand Total				**$725,089**	**$895,296**

7.2.5 Conditionally Assigned Network Upgrades (CANU) and Potential Changes in Cost Responsibility

Table 7-6 shows CANUs that are the responsibility of Pre-Cluster projects but could impact the IC's Cost Responsibility. The IC is not required to post Interconnection Financial Security for these CANUs, however the obligation to finance and construct these CANUs shall be included in the IC's Maximum Cost Exposure.

Table 7-6: Escalated Cost and Time to Construct for Conditionally Assigned Network Upgrades

Type of Upgrade	Upgrade Classification	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Costs x 1,000	Estimated Time (Months) to Construct (Note 1)
CANUs	GRNU	Gates 230 kV bus overstress	• Install series bus reactors between Gates Substation 230 kV bus secions E and F	3.34%	$467	$541	36
	GRNU	Midway Substation 500kV CB 722 Overload mitigation	• Replace Midway 500 kV CB 722 to achieve 3600 A emergency rating	4.28%	$299	$355	72
				Total	**$766**	**$896**	

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.

7.2.6 Precursor Network Upgrades (PNU)

Table 7-7 shows PNUs and their in-service dates. The project depends on these upgrades to receive FCDS and/or Interconnect.

Table 7-7: Precursor Network Upgrades (PNU) and Estimated in Service Date

CAISO Queue	Upgrade Classification	Dependent System Upgrade	Project Type	Estimated In-Service Date
Q1739	GRNU	Midway Substation 230 kV bus and 27 circuit breakers overstress mitigation	GIDAP	2026
Q1739	GRNU	Midway Substation 500 kV control building replacement needed for completion of QC12P1RAS-02	GIDAP	2025

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.

7.2.7 Cost Responsibility Breakdown

Table 7-8 shows the Current Cost Responsibility (CCR), Maximum Cost Responsibility (MCR) and Maximum Cost Exposure (MCE) for the project.

Table 7-8: Cost Responsibility Breakdown

Pecho Energy Storage	**Q1739**
A. Current Cost Responsibility (CCR) for ANU	
A.1 GRNU ($x1000)	$1,982
A.2 IRNU ($x1000)	$605
A.3 LOPNU ($x1000)	$0
A.4 LDNU ($x1000)	$9,769
Current Cost Responsibility ($x1000) (A = A.1 + A.2 + A.3 + A.4)	**$12,356**
B. Maximum Cost Responsibility (MCR) for ANU	
B.1 GRNU ($x1000)	$1,982
B.2 IRNU ($x1000)	$605
B.3 LOPNU ($x1000)	$0
B.4 LDNU ($x1000)	$9,769
Maximum Cost Responsibility ($x1000) (B = B.1 + B.2 + B.3 + B.4)	**$12,356**
C. Maximum Cost Exposure (MCE) with CANU	
C.1 CANU - GRNU ($x1000)	$896
C.2 CANU - IRNU ($x1000)	$0
C.3 CANU - LOPNU ($x1000)	$0
C.4 CANU - LDNU ($x1000)	$0
Maximum Cost Exposure ($x1000) (C = B + C.1 + C.2 + C.3 + C.4)	**$13,252**

8. Subsynchronous Interaction Evaluations

Certain generators or inverter-based generators when interconnected within electrical proximity of series capacitor banks on the transmission system are susceptible to Subsynchronous Interaction (SI) conditions which must be evaluated. Subsynchronous Interaction evaluations include Subsynchronous Resonance (SSR) and Subsynchronous Torsional Interactions (SSTI) for conventional generation units, and Subsynchronous Control Instability (SSCI) for inverter-based generators using power electronic devices (e.g. Solar PV and Wind Turbines).

For projects interconnecting in close electrical proximity of series capacitor banks on the transmission system, a study will need to be performed to evaluate the SI between generating facilities and the transmission system. The study will require that the IC provide a detailed PSCAD model of its Large Generating Facility and associated control systems, along with the manufacturer representative's contact information. The study will identify any mitigation(s) that will be required prior to initial synchronization of the Large Generating Facility. The study and the proposed mitigation(s) shall be at the expense of the IC.

It is the IC's responsibility to select, purchase, and install turbine/inverter-based generators that are compatible with the series compensation in the area.

9. PG&E Technical Requirements

Refer to Section 9 of the Cluster 13 Phase I PG&E West Kern Interconnection Area Study Report.

10. Environmental Evaluation / Permitting Requirements

Refer to Section 11 of the Cluster 13 Phase I PG&E West Kern Interconnection Area Study Report.

11. Affected Systems Coordination

Refer to Section 9 of the Cluster 13 Phase I PG&E West Kern Interconnection Area Study Report

12. Items Not Covered in this Report

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

13. Definitions

ADNU	Area Delivery Network Upgrade
ANU	Assigned Network Upgrade
BES	Bulk Electric System
CAISO	California Independent System Operator Corporation
CANU	Conditionally Assigned Network Upgrade
CCR	Current Cost Responsibility
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
GRNU	General Reliability Network Upgrade
IC	Interconnection Customer
IID	Imperial Irrigation District
IRNU	Interconnection Reliability Network Upgrade
LDNU	Local Delivery Network Upgrade in ANU category
LFBs	Local Furnishing Bonds
LGIA	Large Generator Interconnection Agreement
LMUD	Lassen Municipal Utility District
LOPNU	Local off-peak Network Upgrade
MeID	Merced Irrigation District
MCE	Maximum Cost Exposure
MCR	Maximum Cost Responsibility
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)
PNU	Precursor Network Upgrade
POI	Point of Interconnection
POS	Plan of Service
PSREC	Plumas Sierra Rural Electric Cooperative
RNU	Reliability Network Upgrade except ISRNU in ANU category
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

PHASE I STUDY ADDENDUM

Appendix A – Q1739

Hydrostor A-CAES USA Inc.

Pecho Energy Storage

Addendum #1 to the Cluster 13 Phase I Study

Final Report

March 1, 2021

Confidential – Subject to Transmission Planning NDA

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

Interconnection Document History

Reference No.	Date	Document Title	Description of Document
2	3/1/2021	Addendum #1 to the Cluster 13 Phase I Report	Corrected Precursor Network Upgrades (PNU) allocations.
1	2/15/2020	Cluster 13 Phase I Report	Queue Cluster 13 Phase I Final Report

EXECUTIVE SUMMARY

Hydrostor A-CAES USA Inc., the Interconnection Customer (IC), has submitted a completed Interconnection Request (IR) to the California Independent System Operator Corporation (CAISO) for their proposed Pecho Energy Storage, interconnecting to the CAISO Controlled Grid. The Project is a Storage (Compressed air, Battery) generation plant with a total rated output of 500 MW to Pacific Gas and Electric Company's (PG&E's) Morro Bay 230 kV Substation in San Luis Obispo County, CA. Subsequent to the distribution of the report and based on the comments received from Interconnection Customer during the results meeting, CAISO and PG&E have identified necessary modifications to the report.

The following changes replace and supersede those in the IC's Cluster 13 Phase I study report issued on February 15, 2020.

Summary of changes:

A. Correction for Table 7-7: Precursor Network Upgrades (PNU) and Estimated in Service Date

The corrections are provided below:

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

7.2.6 Precursor Network Upgrades (PNU)

Table 7-7 shows PNUs and their in-service dates. The project depends on these upgrades to receive FCDS and/or Interconnect.

Table 7-7: Precursor Network Upgrades (PNU) and Estimated in Service Date

CAISO Queue	Upgrade Classification	Dependent System Upgrade	Project Type	Estimated In-Service Date
Q1739	GRNU	Midway Substation 230 kV bus and 27 circuit breakers overstress mitigation	GIDAP	2026
Q1739	GRNU	Midway Substation 500 kV control building replacement needed for completion of QC12P1RAS-02	GIDAP	2025
Q1739	GRNU	Morro Bay Substation 230kV Control Building Replacement	TPP Maintenance	2027

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.

This change further affects the Attachment 10 of this project; the remainder of the Cluster 13 Phase I Study Report is unaffected by this Addendum.

PECHO ENERGY STORAGE
Q1739 500 MW
CLUSTER 13 PHASE I STUDY
SUBSTATION SUMMARY

Revision 2

March 01, 2021

Report No. 13863-014-Q1739

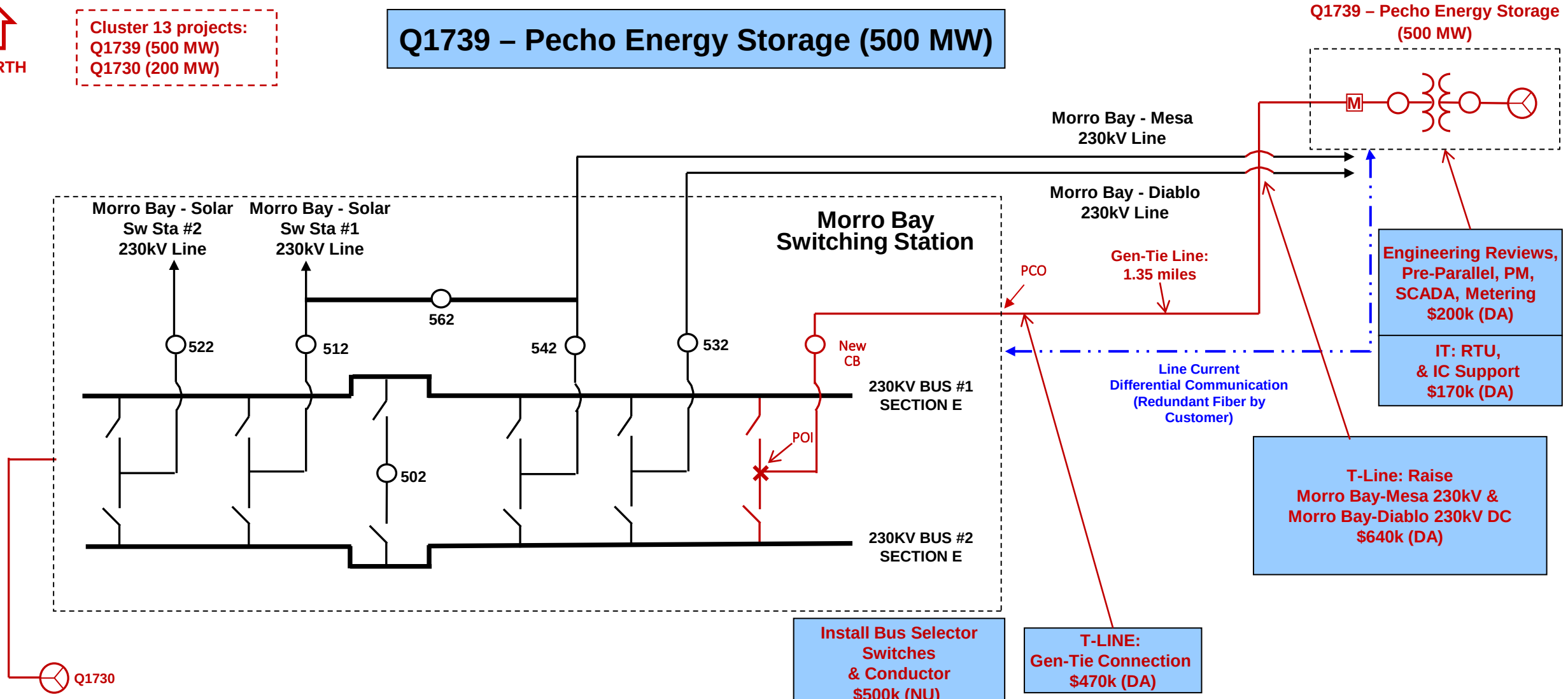
Note

Confidential – Subject to Transmission Planning NDA

NORTH

Cluster 13 projects:
Q1739 (500 MW)
Q1730 (200 MW)

Q1739 – Pecho Energy Storage (500 MW)



Note: CB Maintenance and Bypass switches not shown

Preliminary PG&E Substation Job Scope & Estimate

Cluster 13 Phase I Study
Pecho Energy Storage – Q1739
500 MW Generating Facility
Final Report: 3/01/2021

These are preliminary, order of magnitude substation cost estimates for the Pecho Energy Storage Project. The Point of Interconnection (POI) for this project will be at the Morro Bay Switching Station 230kV new DBSB bay via a Gen-Tie line. This Gen-Tie line between Morro Bay Switching Station and Q1739 is about 1.35 miles.

Interconnection Scope

NETWORK UPGRADES (NU)

Morro Bay Switching Station

1.) Install bus selector switches and conductor in existing double bus bay structure.

INTERCONNECTION FACILITIES/DIRECT ASSIGNMENT (DA)

Morro Bay Switching Station

1.) Install the following at the existing double bus bay to connect the Gen-Tie line:
    a. One (1) 230kV Circuit Breaker with maintenance switches.
    b. Install Current Differential line relay package for the dedicated Gen-Tie line with associated new bay structure, CCVT, and line disconnect switch.
        i. Set A and SET B SEL 411L line current differential, step distance and directional ground overcurrent relays with the same firmware version as that installed at Pecho Energy Storage generator CB.
2.) IT to install, terminate, and test new fiber cable from substation fence to control building.

Transmission Line Scope of Work at Morro Bay Switching Station

1.) Install three (3) spans of transmission line conductor and two (2) new TSP's from the Morro Bay Switching Station dead-end to connect the Customer Gen-Tie Line. The Customer is responsible for building the Gen-Tie line from the Generation Facility to the PG&E Morro Bay Switching Station property line.
    a. Install two (2) single-circuit dead-end TSP's ($200,000 ea)
    b. Install three (3) spans of transmission line conductor ($20,000 ea)
    c. PG&E review of the Customer-owned TSP/Dead-end structure design data ($10,000)

2.) Raise 230KV transmission line for Morro Bay-Mesa and Morro Bay-Diablo 230kV line to accommodate the Gen-Tie line crossing underneath the PG&E line.
    a. Install two (2) double-circuit dead-end TSP ($300,000 ea)
    b. Install two (2) spans of transmission line conductor ($20,000 ea)

Notes:

- Additional PG&E–provided TSP's may be necessary depending on the Customer's final gen-tie route and permitting decisions. All Customer–owned TSP's on Morro bay Sub- Station property would require an easement. Alternatively, PG&E could be requested to engineer and install all gen-tie TSP's on Morro Bay Sub- Station property.
- Additional PG&E lines may need to be raised (DA cost) to accommodate the final gen-tie line route. The gen-tie line must cross under all PG&E lines of equal or higher voltage.

Pecho Generation Site

1.) Project Management, metering, and provide engineering and protection review and pre-parallel inspection at the generator substation.
2.) IT to install one (1) RTU and provide testing at the generator substation. The RTU scope includes the support work at the PG&E Operations Facility to connect to the RTU.

Notes:

- Customer will provide space for two (2) 19 inch racks for installation of the PG&E RTU and associated equipment.
- Customer will reserve two (2) 19 inch racks for line current differential equipment.

Interconnection Costs

Location	Network Upgrades	Cost
Morro Bay Sw Sta	Install bus selector switches and conductor	$500,000
	Subtotal	$500,000
	Interconnection Facilities	
Morro Bay Sw Sta	Gen-Tie Line terminal Equipment	$1,800,000
Morro Bay Sw Sta	Termination of Customer's Fiber	$170,000
Transmission Line	Gen-Tie T-Line Equipment on PG&E Substation Property	$470,000
Transmission Line	Raise the DC Morro Bay-Mesa & Morro Bay-Diablo 230kV lines	$640,000
Generating Site	Engineering Reviews, Metering, Pre-parallel Inspection, & PM	$200,000
Generating Site	IT install RTU, SEL-2411, and provide testing support	$170,000
	Subtotal	$3,450,000
Grand Total		**$3,950,000**
Overall Work Duration*		**36 Months**

*See Substation Assumption #10

Assumptions

Substation Estimate Assumptions:

1.) This proposed draft substation scope is based on PG&E Preliminary Protection Requirements dated November 04, 2020.
2.) Final scope will be developed only when this project moves to the implementation phase.
3.) The unit costs here do not include an applicable ITCC tax.
4.) Civil Assumptions:
    a. Cost estimates 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 locations 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 or rocky terrain requiring substantial grading effort.
    b. Costs assume that the site can be drained via customary storm water drainage infrastructure (i.e., without pump or lift stations). Costs assume including implementing Storm Water Pollution and Prevention (SWPP) and SPCC oil containment system(s).
    c. 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.
    d. Cost does not include any remedial work for impact on neighboring properties.
    e. Land Survey has not been conducted for preparation of this report. This estimate assumes a generally flat site with a minimal amount of site grading required.
    f. Geotechnical investigations have not been performed at the sites and therefore estimates do not include specific design or construction means that may be required due to local soil conditions.
5.) Land Assumptions:
    a. Land survey has not been conducted for preparation of this report. This estimate assumes a generally flat site with a minimal amount of site grading required.
    b. This estimate does not include right-of-way acquisition costs.
    c. Costs do not include any land acquisition costs.
    d. Cost does not include any remedial work for impact on neighboring properties.
6.) Unit costs do not assume extensive permitting effort.
7.) The following ongoing PG&E projects at Morro Bay Substation must be completed prior to interconnection:
    a. 230kV Control Building Replacement
8.) There are no ongoing PG&E projects ahead of this study (Q1739) at this POI.
9.) The following ongoing Interconnection Study are ahead or in parallel to this study (Q1739). It is assumed that these projects will proceed to implementation of Q1739. If this assumption becomes incorrect, portions of this study (Q1739) will need to be re-evaluated. The Interconnection Studies include:
    a. Q1730 – 230kV Generation Facility interconnection into Morro Bay Switching Station.
10.) Breaker overstress will be determined in a report covering all studies in Cluster 13.
11.) The Projected Work Durations are dependent upon the following:
    a. Clearances being available as required.
    b. Getting leased lines from Telco, on which PG&E has no schedule control.
    c. 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, cultural and 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.
8.) This estimate does not include costs and durations associated with the FAA (Federal Aviation Administration) review or any required structure lighting.

IT Assumptions:

1.) The Developer is responsible for all communication circuits terminating at the Developer's Gen-Site. PG&E requires these circuits to be installed and tested prior to PG&E's installation of the RTU and associated equipment.
2.) IT 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.) IT 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.