Appendix H
System Impact Study

Appendix H
System Impact Study
Phase I (300 MW)

SDGE®

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Project Developer
Stirling Energy Systems, Inc.

Project Name
SES Solar Two

INTERCONNECTION SYSTEM IMPACT STUDY

Final Report

September 1, 2006

Study Performed for Stirling Energy Systems, Inc.
By San Diego Gas & Electric Company

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1. Executive Summary

Stirling Energy Systems, Inc. (the "Developer") requested San Diego Gas & Electric (SDG&E) to perform an Interconnection System Impact Study (the "Study") to interconnect its new concentrating solar power plant "SES Solar Two" project ("Stirling") to the Imperial Valley Substation. The proposed 300 MW Stirling location is in Imperial County. Stirling's Interconnection Request was received by the California Independent System Operator ("CAISO") on August 31, 2005 and was accepted by SDG&E and CAISO with an effective date of August 31, 2005.

Stirling's Interconnection Request states an interconnection net capacity of 300 MW to the interconnection point. Stirling will consist of 12,000-dish Stirling engine systems. Each system is made up of a Stirling engine that drives a 25 kW generator, an approximately 40-foot diameter reflecting dish, and associated controls and supporting equipment. The planned interconnection point is the 230 kV bus at SDG&E's Imperial Valley Substation. A 230 kV transmission line approximately ten miles in length will be built to connect Stirling to Imperial Valley.

Stirling's Interconnection Request states a proposed in-service date of January 1, 2008 and a commercial operation date of December 31, 2009. The project will be developed in a modular fashion over the two year period.

This Study constitutes an "Interconnection System Impact Study" in accordance with the California Independent System Operator ("CAISO") Tariff. The CAISO will be responsible for approval of the final Study report provided to Stirling and the recommended plan of service articulated in this report.

In accordance with the CAISO Large Generator Interconnection Procedures (LGIP), the study is composed of a Commercial Operating Date (COD) study, and a Future-Year (FY) study. The COD study examines the effect of Stirling on the bulk power grid at the time of its commercial operating date. The FY study looks at Stirling after all of the preceding generation in the CAISO queue has come online. The Study also identifies a preliminary transmission plan of service, preliminary cost estimate, and a preliminary analysis of the impact this project may have on the tax-exempt status of interest on Local Furnishing Bonds.

The COD study examined the 2008/2009 light winter and 2009 heavy summer[1] study periods. The FY study examined the 2010 heavy summer study period.

The analysis considered the following:

- Thermal and post-transient voltage analysis
- Reactive power deficiency analysis

[1] The Stirling project is a collection of solar generating 'dishes,' that are added in a modular fashion up to the full 300 MW project capacity. The first group of generators will go online by the January 15, 2008, interconnection date, with the full project capacity online by the Commercial Operating Date of December 31, 2009. For simplicity, the Study models the Stirling project online at the full 300 MW output level beginning in winter 2008/2009. See the Study Assumptions section for further details.

- Transient stability analysis
- Short-circuit duty analysis

The Study concluded the following:

- The short circuit analysis indicates that the addition of Stirling does not cause any existing breakers to become overdutied during fault conditions.
- The transient stability analysis indicates that the addition of Stirling does not have any adverse effect on the stability of the WECC interconnected system.
- The reactive power deficiency analysis indicates that the WECC interconnected system meets the applicable CAISO criteria for reactive power after the addition of Stirling.
- The thermal and post-transient voltage analysis indicates that the addition of Stirling will cause thermal overloads to occur on the following SDG&E bulk power facilities:
    - Imperial Valley 500/230 kV bank 80 for loss of (FLO) bank 81
    - Miguel 500/230 kV bank 81 FLO bank 82
    - Miguel 500/230 kV bank 82 FLO bank 81
- The overall analysis indicated that Stirling does not adversely impact affected systems, including but not limited to the Comision Federal de Electricidad (CFE) or the Imperial Irrigation District (IID).

Based on Stirling's proposed operating date, point of interconnection, and the results of the COD and FY analyses, the Study identified the following additional facilities and non-binding, good-faith costs and construction times directly related to the Stirling project:

Type[2]	Description	Estimated Cost[3] ($000)	Estimated Time to Design & Construct[4]
Interconnection Facilities	230 kV transmission line (Stirling to Imperial Valley)	$43,700	24 months
Reliability Network Upgrades	230 kV switchyard facilities at Imperial Valley	$5,942	18 months
Delivery Network Upgrades	Additional 1120 MVA 500/230 kV bank at Imperial Valley	$41,029	24 months
Delivery Network Upgrades	Temporary SPS to prevent overloading of Miguel 500/230 kV transformers	$1,369	12 months

[2] Refer to Appendix A for a description of these terms.
[3] See Section 15 for additional details.
[4] See Section 16 for additional details. Excludes time to obtain Certificate of Public Convenience and Necessity (CPCN), if required.

On a preliminary basis, there does not appear to be an impairment of the tax-exempt status of the interest on Local Furnishing Bonds.

Pursuant to CAISO Tariff provisions, Stirling will be responsible for the cost of "Interconnection Facilities." Should SDG&E build these facilities on behalf of Stirling, Stirling will be required to pay SDG&E in advance. Stirling is obligated to fund the construction of the facilities described as Reliability Network Upgrades. SDG&E will build the improvements and, upon the commercial operation date of the Stirling project, Stirling shall be entitled to a repayment subject to applicable CAISO Tariff provisions, equal to the total amount paid to SDG&E for the cost of the Reliability Network Upgrades. If Stirling elects not to fund Reliability Network Upgrades, SDG&E is under no obligation to construct the improvements.

Stirling may elect to fund the construction of the facilities described as Delivery Network Upgrades. If Stirling funds the construction of facilities, SDG&E will build the improvements and, upon the commercial operation date of the Stirling project, Stirling shall be entitled to a repayment subject to applicable CAISO Tariff provisions, equal to the total amount paid to SDG&E for the cost of the Delivery Network Upgrades. If Stirling elects not to fund Delivery Network Upgrades, SDG&E is under no obligation to construct the improvements.

If Delivery Network Upgrades are not built, Stirling's exposure to dispatch constraints required pursuant to CAISO congestion management and grid operation protocols may be at a level that is unacceptable to Stirling. Construction of the identified improvements will reduce the frequency and magnitude of such dispatch constraints.

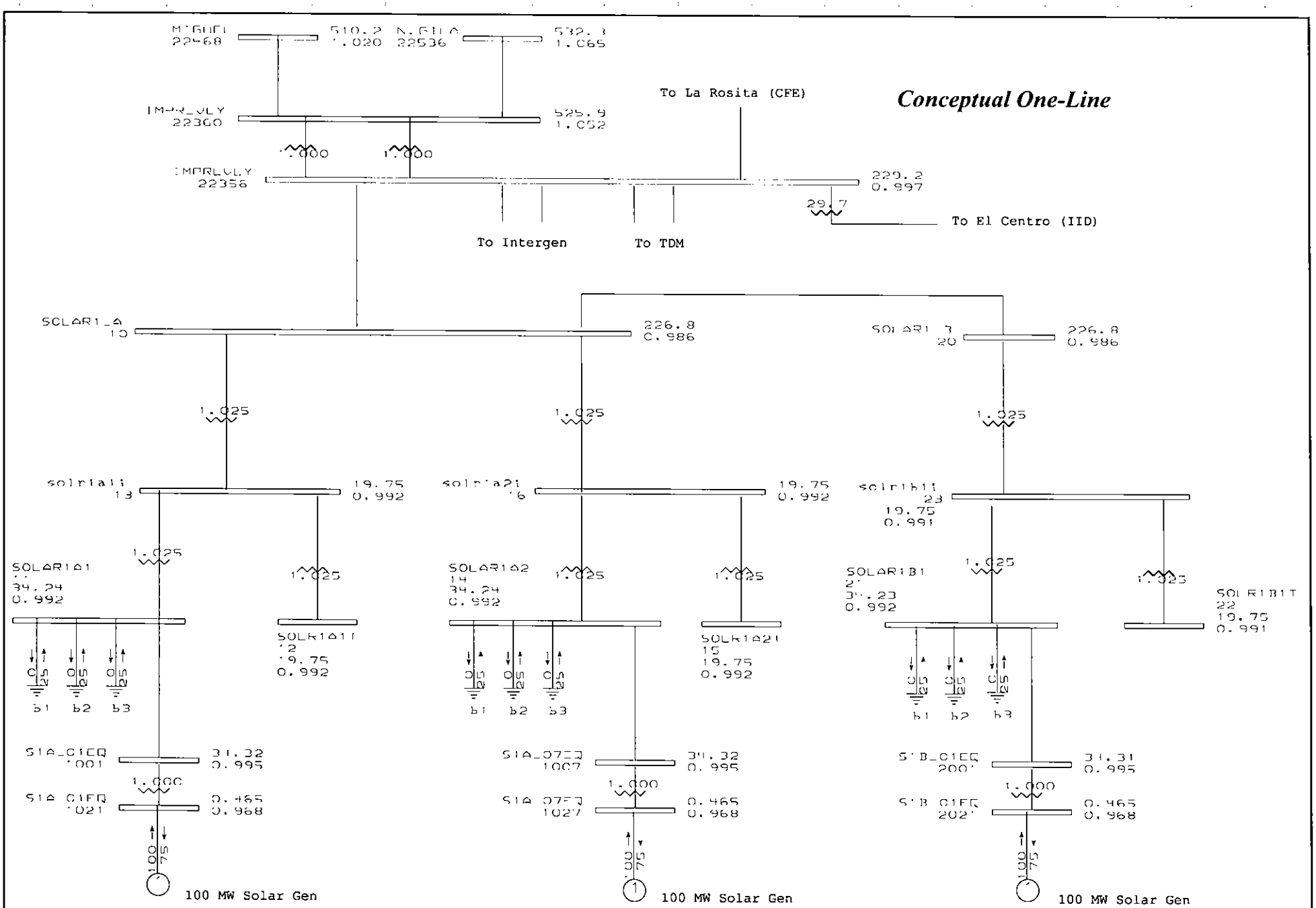
Because there are numerous possible system conditions that could be studied, the Study results should be considered valid only for the indicated study assumptions. It is Stirling's responsibility to assess whether the benefits to Stirling of constructing the identified Delivery Network Upgrades are sufficient to offset the cost of, and risks associated with, advancing construction funds to SDG&E.

The Study results and cost estimates presented in this report are preliminary, non-binding, and subject to revision as additional information is obtained, additional studies are conducted, and a more detailed analysis is performed.

Should Stirling choose to proceed with their SES Solar Two project, an Interconnection Facilities Study must be completed prior to interconnection. An Interconnection Facilities Study will determine the final transmission interconnection plan of service by integrating the results of this Interconnection System Impact Study with subsequent information. The Interconnection Facilities Study will also determine final budget class cost estimates and project lead-time requirements. Therefore, the cost estimates in the Interconnection Facilities Study may vary from the preliminary cost estimates provided in this report.

2. Project and Interconnection Information

Name: Stirling Energy System, Inc., SES Solar Two Project
Size: 300 MW net output to grid
Proposed Commercial Operating Date (COD): December 31, 2009
Proposed Interconnection Date: January 1, 2008
Proposed Testing Date: January 15, 2008
Interconnection Point: SDG&E Imperial Valley Substation
Interconnection Voltage: 230 kV
Alternate Interconnection Point: None



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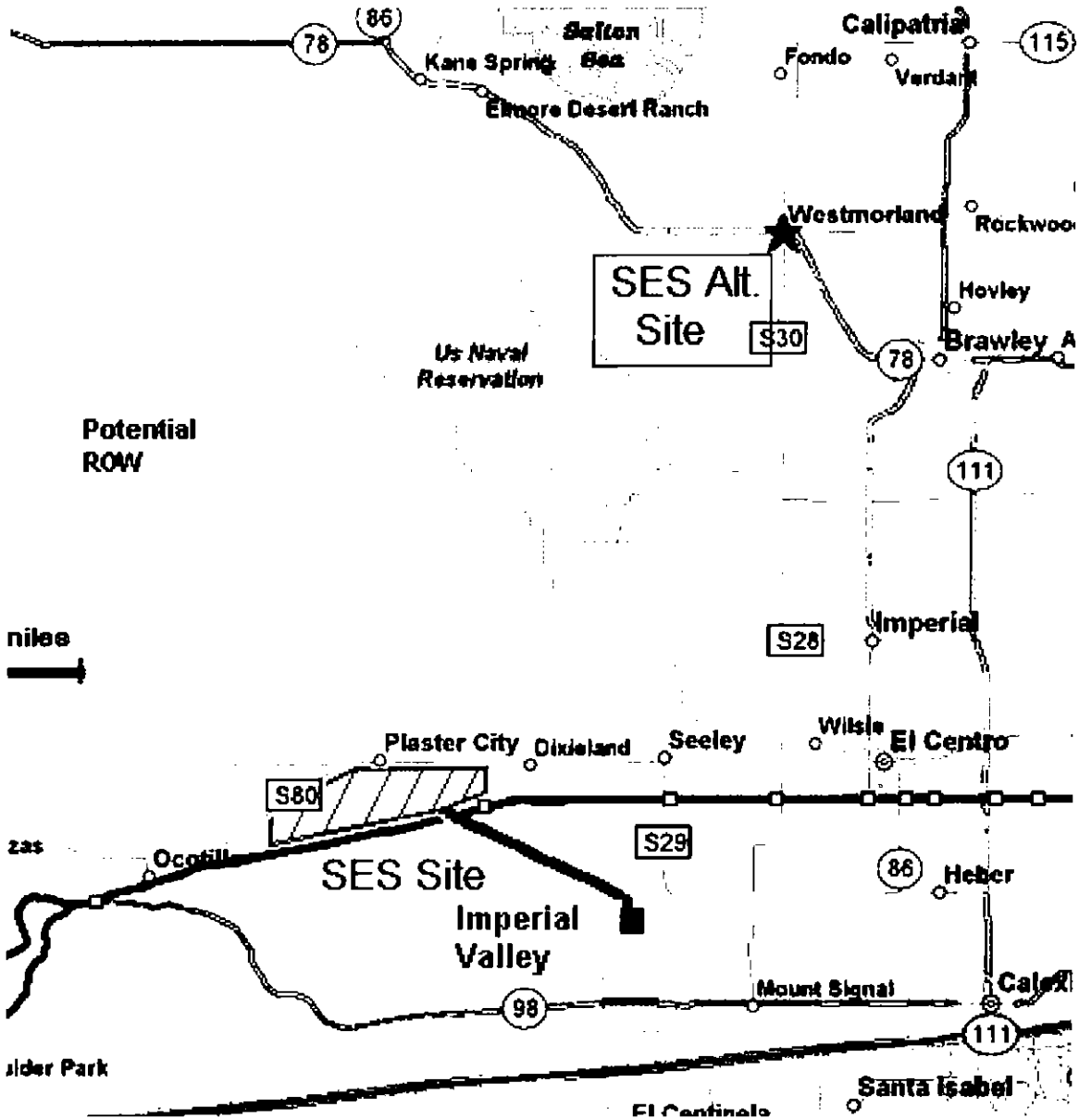
SES_hs09_post_wOL_sen1 SDGE Interconnection Base Case 09HS SES Repower Pre-Case	December 2005 ced	PSLF Program solar3.drw Rating =1

4. Project Vicinity Map



5. Study Assumptions

The overall purpose of the Study is to evaluate the impact of Stirling on the SDG&E bulk transmission system by evaluating the characteristics of the grid before and after the proposed interconnection. Where the Study indicates the proposed interconnection causes the bulk transmission system to violate thermal, voltage, or stability operating criteria as specified by WECC, CAISO, or SDG&E, the Study will propose and evaluate mitigation strategies.

The methodology used by SDG&E was to build and test power flow cases for the appropriate study years and seasons. A variety of cases, modeling appropriate generation, load, interchange, and other system conditions, was developed for a number of likely scenarios. These cases were evaluated using SDG&E's standard transmission planning software tools.

The general study assumptions are as follows:

1. This interconnection request is for an addition of 300 MW of generating capacity in the vicinity of SDG&E's Imperial Valley substation. The interconnection point is the 230 kV bus at Imperial Valley.
2. The proposed Interconnection/Testing date is January 15, 2008.
3. The proposed Commercial Operating Date is December 31, 2009.
4. Stirling was modeled at its full rated output of 300 MW, regardless of season.
5. Stirling is composed of multiple solar dish arrays with 25 kW 480 V induction generators driven by Stirling motors. As such, the generators rely on the grid to provide excitation, and are thus net consumers of reactive power. Each array consumes approximately 750 VARS for each kilowatt of electrical energy delivered to the grid. To compensate, Stirling is modeled with external 34.5 kV shunt capacitors (see the Conceptual One-Line on page 7).
6. The internal shunt capacitors modeled within Stirling do not have a common mode of failure, and Stirling will not operate without the shunt capacitors in place and operational.
7. For simplicity, the multiple solar dish arrays are modeled as three 100 MW generators. The generator step-up transformers and compensating shunts are approximated. The Stirling power flow model is as described in an EPC provided by the Project Developer.
8. Stirling occupies position number 78 in the CAISO generation queue. The FY study took into account the following higher-queued generation projects within the SDG&E network:
    - #1A - Miguel Substation/Otay Mesa Generation Project
    - #4 - Palomar 230 kV/Palomar Energy
    - #5 - Encina Power Plant Switchyard
    - #8 - Sycamore Canyon Substation

#13 – Escondido
#27 – South Bay
#72 – Proposed Lee Lake Substation

The CAISO queue may be found in Appendix B.

9. The study ignored the following higher-queued wind turbine projects, because their remote locations in the SDG&E system make them unlikely to be impacted by Stirling:
   a. #19 – Crestwood
   b. #25 – Crestwood
   c. #26 – Crestwood
   d. #32 – Boulevard-Crestwood transmission line

   These units may be represented in the cases but were not dispatched.
10. The farthest-out queue position prior to Stirling in the SDG&E network is in the 2010 time frame. Thus, the FY study considered the 2010 heavy summer study period.
11. The COD study took into account the following generation projects, based on their planned Commercial Operation Date at the time of the request for the System Impact Study:
    10/15/2005 - Palomar 230 kV/Palomar Energy
    6/1/2008 - Miguel Substation/Otay Mesa Generation Project
    6/1/2008 - Encina Power Plant Switchyard
    12/31/2008 – Proposed Lee Lake Substation
12. For the purposes of the COD study, SDG&E considered the 2008/2009 light winter and 2009 heavy summer seasons. Cases were developed for both of these operating periods.
13. All presently operating Special Protection Systems (SPS) are modeled in the power flow cases.
14. The following SDG&E transmission projects are modeled in the COD cases:
    a. Otay Mesa Generating Project and 230 kV Otay Metro Powerloop
    b. Silvergate Substation
    c. Proposed Lee Lake Substation, related transmission and 500/230 kV phase shifters
15. The following SDG&E transmission projects are modeled in the FY cases:
    a. Otay Mesa Generating Project and 230 kV Otay Metro Powerloop
    b. Silvergate Substation
    c. Proposed Lee Lake Substation, related transmission and 500/230 kV phase shifters
    d. Sunrise Powerlink 500 kV and associated plan of service

6. Power Flow Base Case and Short Circuit Case Summaries

The general power flow case assumptions made for the Stirling SIS study are as follows:

1. All power flow cases for the Study were built in PSLF version 14 or higher.
2. A WECC full-loop representation was used. This includes the western United States, western Canada, and the system of the Comisión Federal de Electricidad (CFE) of Baja California, Mexico.
3. The major transmission system elements in affected systems were monitored in all cases, for thermal, post-transient voltage, and transient stability adequacy. These affected systems included, but were not limited to, IID, CFE, and Southern California Edison (SCE).
4. The short-circuit analysis was performed using Aspen version 9.0
5. All power flow cases and the resulting thermal, voltage, and transient stability analysis for the proposed Stirling project were performed using the latest available data.
6. All generation projects in the SDG&E system with a higher queue number are modeled in the FY study, with the exception of the projects described in the Study Assumptions.
7. All generation projects with an earlier commercial operating date are modeled in the COD study, with the exception of the projects described in the Study Assumptions.
8. See Appendix C for load and resource tables for all power flow cases.

The power flow case assumptions specific to the COD study are as follows:

1. The summer peak load for the SDG&E service area in 2009 is modeled at 4839 MW, excluding losses. This represents a 1-in-10 weather scenario.
2. The light winter load for SDG&E in the 2008/2009 season is modeled at 2326 MW, excluding losses, or approximately 50% of the 2008 1-in-10 summer peak load.
3. The dispatch of the Otay Mesa, Palomar, and Imperial Valley (Intergen and Termoelectrica de Mexicali) generation projects will have the most direct affect on Stirling, based on their size and electrical proximity.
4. The settings of the Lee Lake substation phase shifters (importing, exporting, or neutral) will significantly affect power flows related to Stirling.
5. The proximity of Stirling to one of the two major import paths to SDG&E (the 500 kV Southwest Powerlink, or SWPL) indicates that the SDG&E import level will significantly affect Stirling. Specifically, Stirling's output will look like additional import to SDG&E. The cases were built with high imports to determine the effect of high imports plus maximum Stirling output.
6. The Imperial Valley generation (including Stirling) is modeled as a separate control area (Area 99). This is simply a modeling convenience, and has no effect on the power flow results.

7. The base cases model a 230 kV phase shifting transformer at Imperial Valley, at the interconnection between SDG&E and IID. The CAISO determined the phase shifter was not needed if IID's planned upgrades were to take place. Further work on the phase shifter was delayed until the fourth quarter of 2006. A sensitivity case was included in the Stirling study to model this condition.

A summary of the case conditions in the COD study is shown in Table 6.1.

Table 6.1 – Summary of the COD Study Cases

	Lee Lake Phase Shifter* (MW)	Imperial Valley Phase Shifter* (MW)	SDGE Load (MW)	SDG&E Inter-change (MW)	IV-ML Flow (MW)	Tijuana-Otay (MW)	Path 44 (South of SONGS)	Area 99 Inter-change (MW)	SES Gen (MW)
Load Flow Case Name									
08_pre_la2	0	65	2326	-1869	1115	46	703	800	0
08_pre_la2_no_ivps	276	N/A	2326	-1869	1115	39	713	800	0
08_pre_la2_leaps	470	65	2326	-1869	1181	39	923	800	0
08_pre_la3_leaps	620	65	2326	-1869	1241	44	1063	800	0
08_ses_la2	0	65	2326	-1869	1203	70	591	1100	300
08_ses_la2_no_ivps	250	65	2326	-1869	1195	65	608	1100	300
08_ses_la2_leaps	468	65	2326	-1869	1265	66	794	1100	300
08_ses_la3_leaps	594	65	2326	-1869	1316	73	954	1100	300
09hs_alt1_3_pre	-309	-97	4839	-2850	1471	335	718	950	0
09hs_alt1_3_pre_no_ivps	-309	N/A	4839	-2850	1466	317	755	950	0
09hs_alt1_4_pre	387	-97	4839	-2850	1602	368	1245	950	0
09hs_alt1_5_pre	389	-201	4839	-2850	1674	307	1235	950	0
09hs_alt1_3_post	-310	-97	4839	-2850	1629	303	619	1257	300
09hs_alt1_3_post_no_ivps	-310	N/A	4839	-2850	1596	282	676	1257	300
09hs_alt1_4_post	380	-97	4839	-2850	1749	335	1143	1257	300
09hs_alt1_5_post	389	-201	4839	-2850	1749	348	1119	1257	300

* Positive is flow out of SDG&E, negative is flow into SDG&E

The power flow case assumptions specific to the FY study are as follows:

1. The summer peak load for SDG&E in 2010 is modeled at 4904 MW, excluding losses. This represents a 1-in-10 weather scenario.
2. The dispatch of the Otay Mesa, Sycamore Canyon, South Bay, and Lee Lake generation queue projects will have the most significant effect on Stirling, based on their size and electrical proximity.
3. The Imperial Valley generation interconnects to the same bus as Stirling, and is also a significant factor.
4. The Border peaking units are dispatched in the cases, due to their electrical proximity to Stirling.
5. The proximity of Stirling to one of the two major import paths to SDG&E (the 500 kV Southwest Powerlink, or SWPL) indicates that the SDG&E import level will significantly affect Stirling. However, SDG&E has significant internal queued generation in 2010, making it difficult to maintain high internal generation

and high imports. The FY cases are a compromise between keeping the relevant generation high and maximizing imports.

6. Imperial Valley substation has 230 kV interconnections to IID and CFE. The interchange with these other utilities will have a significant impact on Stirling.

A summary of case conditions for the FY studies are shown in Tables 6.2 and 6.3.

Table 6.2 – FY Study Load and Generation Dispatch Summaries

Generation Summary	Imperial Valley Gen.	Palomar Gen.	Otay Mesa Gen.	Encina Switchyard Gen.	Sycamore Canyon Gen.	South Bay Gen.	Lee Lake Gen.	SES Gen.
Load Flow Case Name								
base_v1_pre	950	0	490	0	650	500	500	0
low_ivgen_pre	0	0	490	0	650	500	500	0
cfe_export_pre	950	0	490	0	650	500	500	0
cfe_import_pre	950	0	490	0	650	500	500	0
iid_import_pre	950	0	490	0	650	500	500	0
iv_pst_pre	950	0	490	0	650	500	500	0
ivbank82_pre	950	0	490	0	650	500	500	0
base_v1_post	950	0	490	0	650	500	500	300
low_ivgen_post	0	0	490	0	650	500	500	300
cfe_export_post	950	0	490	0	650	500	500	300
cfe_import_post	950	0	490	0	650	500	500	300
iid_import_post	950	0	490	0	650	500	500	300
iv_pst_post	950	0	490	0	650	500	500	300
ivbank82_post	950	0	490	0	650	500	500	300

Table 6.1 – FY Study Interchange Summary

Interchange Summary	SDGE Load & Losses (MW)	SDG&E Inter-change	IID Inter-change	CFE Inter-change	Lee Lake Phase Shifter*	IV Phase Shifter	Path 44 (South of SONGS)	Tijuana-Otay Mesa	IV-ML	IV-Central
Load Flow Case Name										
base_v1_pre	5053	-1450	200	0	200	N/A	1021	225	1117	710
low_ivgen_pre	5053	-1450	200	0	200	N/A	795	106	796	441
cfe_export_pre	5053	-1450	200	400	200	N/A	817	506	1076	678
cfe_import_pre	5053	-1450	200	-400	200	N/A	1227	-29	1144	731
iid_import_pre	5053	-1450	-200	0	200	N/A	1122	204	1072	675
iv_pst_pre	5053	-1450	200	0	200	-65	1002	230	1124	715
ivbank82_pre	5053	-1450	200	0	200	N/A	1020	213	1123	716
base_v1_post	5053	-1150	200	0	200	N/A	907	250	1165	747
low_ivgen_post	5053	-1150	200	0	200	N/A	681	131	845	480
cfe_export_post	5053	-1150	200	400	200	N/A	702	531	1123	715
cfe_import_post	5053	-1150	200	-400	200	N/A	1109	-3	1192	769
iid_import_post	5053	-1150	-200	0	200	N/A	977	228	1115	708
iv_pst_post	5053	-1150	200	0	200	-65	882	258	1176	756
ivbank82_post	5053	-1150	200	0	200	N/A	910	235	1174	754

* - Positive is out of SDG&E control area, negative is into SDG&E control area.

7. Study Criteria Summary

The Study criteria is summarized in Tables 7.1-7.5.

Table 7.1 - Thermal Steady-State Criteria:

Category	Disturbance	Thermal Criteria
A	None	All branches less than 100% of normal rating.
B	Generator One Circuit One Transformer	All branches less then 100% of emergency rating. No loss of load for single contingencies. All branches less then 100% of normal rating with system reconfiguration as necessary.
C	Two Generators Two Circuits Both Pacific DC Intertie (PDCI) Pole	All branches less then 100% of emergency rating. Loss of load permitted for double contingency.

Table 7.2 - Post-Transient Voltage Criteria:

Category	Disturbance	Post Transient Voltage Deviation
B	Generator One Circuit One Transformer One Pacific DC Intertie (PDCI) Pole	Not to exceed 5% at any bus. *
C	Two Generators Two Circuits Both PDCI Poles	Not to exceed 10% at any bus.
* SCE allows deviation up to 7% on certain buses for N-1		

Table 7.3 - Reactive power deficiency criteria:

Category	Disturbance	Criteria
B	Generator One Circuit One Pacific DC Intertie (PDCI) Pole	Power flow to reach convergence at 105% of SDG&E load level
C	Two Generators Two Circuits Both PDCI Poles	Power flow to reach convergence at 102.5% of SDG&E load level

Table 7.4 -Transient Stability Criteria:

Performance Level	Disturbance	Transient Voltage Dip Criteria	Minimum Transient Frequency
B	Generator One Circuit One Transformer One (PDCI) Pole	Max V Dip – 25% Max Duration of V Dip Exceeding 20% - 20 cycles Not to exceed 30% at non-load busses.	59.6 Hz for 6 cycles or more at a load bus.
C	Two Generators Two Circuits Both PDCI Poles	Max V Dip – 30% at any buss. Max Duration of V Dip Exceeding 20% - 40 cycles at load busses.	59.0 Hz for 6 cycles or more at a load bus.

Table 7.5 –Short Circuit Breaker Duty Criteria:

Equipment	Disturbance	Transient Voltage Dip Criteria
Existing Generator Breakers	L-G and 3L-G faults	No fault exceeds 100% of the applicable interrupter rating
Existing Non-Generator Breakers	L-G and 3L-G faults	No fault exceeds 115% of the applicable interrupter rating

SIS Study Results

8. Steady-State Power Flow Results

The Study found no Category A thermal or voltage violations. The Study identified the following Category B thermal constraints directly related to the Stirling project:

- Imperial Valley 500/230 kV xfmr bank 80 FLO bank 81
- Miguel 500/230 kV xfmr bank 80 FLO bank 81
- Miguel 500/230 kV xfmr bank 81 FLO bank 80

Detailed power flow output tables and power flow plots for all study periods may be found in Appendices D and E, respectively. A detailed discussion of each constraint and the recommended mitigation plan can be found in the *Mitigation Measures and Recommended Mitigation Plan* section of this report.

Note that for the power flow plots in Appendix E, line flows are denoted in amps and percent of the emergency rating (MVA2).

No thermal violations were identified in affected systems. However, it was noted that Stirling is a net consumer of reactive power at its full 300 MW output level. It is recommended that Stirling include sufficient reactive power resources to compensate for the VAR consumption of the generator step-up transformers.

9. Short-Circuit Study Results

Three line-to-ground (3LG) and single line-to-ground (SLG) faults were simulated with and without Stirling at all buses in the system, 69 kV and above. Table 9.1 summarizes the fault duties for buses in the vicinity of the Stirling project. The one-line plots for selected buses are shown in Appendix F.

Study results indicate that there are no overstressed breakers due to the Stirling interconnection.

Table 9.1 - 3LG and SLG Fault Duties for Selected Buses

Faulted Bus	Breaker Rating (Amps)	Pre-Project		Post-Project	
		Max 3LG Bus Fault (Amps)	Max SLG Bus Fault (Amps)	Max 3LG Bus Fault (Amps)	Max SLG Bus Fault (Amps)
Imperial Valley 230 kV Bus	63,000	35,152	33,698	36,949	35,383
SES 230 kV Bus		N/A	N/A	7490	7054
Miguel 230 kV Bus	40,000	25,542	23,481	27,291	24,657

10. Transient Stability Results

The 2008/2009 light winter and 2009 heavy summer cases were analyzed for transient stability adequacy using the dynamic simulation capability of PSLF version 14. The dynamic data used for each analysis was based on the WECC dynamic data library for the applicable study period. The following system disturbances were analyzed:

Category "B" – (Single Contingencies)

- Imperial Valley – Miguel 500 kV with IV Gen SPS and subsequent tripping of Imperial Valley-La Rosita 230 kV line
- Imperial Valley – North Gila 500 kV line
- Devers – Valley 500 kV line
- Hassayampa – North Gila 500 kV line
- Serrano – Valley 500 kV line
- Palo Verde – Devers 500 kV line

Category C & D – (Double Contingencies)

- Midway – Vincent 500 kV lines 1 and 2
- Lugo – Mira Loma 500 kV lines 1 and 2
- 2 San Onofre generating units
- 2 Palo Verde generating units

The results of the dynamic runs were reviewed with a Worst Condition Analysis (WCA) EPCL, to detect any criteria violations.

A discussion of the transient stability criteria, analysis, and switching files can be found in Appendix G. Transient stability plots can be found in Appendix H. The results of the analysis are summarized in Table 10.1.

Table 10.1 – Summary of Transient Stability Results

2008/2009 LW - Case 08_pre_la2.sav			
Disturbance	**Disturbance Category**	**Damped**	**Criteria Violations**
IV-Miguel 500 kV w/SPS	B	Yes	None
IV-North Gila 500 kV	B	Yes	None
Devers-Valley 500 kV	B	Yes	None
Hassayampa-North Gila 500 kV	B	Yes	None
Serrano-Valley 500 kV	B	Yes	None
Palo Verde-Devers 500 kV	B	Yes	None
Midway-Vincent 500 kV ckts. 1 and 2	C	Yes	None
Lugo-Mira Loma 500 kV ckts. 1 and 2	C	Yes	None
San Onofre units 1 and 2	C	Yes	None
Palo Verde units 2 and 3	C	Yes	None
2008/2009 LW - Case 08_post_la2.sav			
Disturbance	**Disturbance Category**	**Damped**	**Criteria Violations**
IV-Miguel 500 kV w/SPS	B	Yes	None
IV-North Gila 500 kV	B	Yes	None
Devers-Valley 500 kV	B	Yes	None
Hassayampa-North Gila 500 kV	B	Yes	None
Serrano-Valley 500 kV	B	Yes	None
Palo Verde-Devers 500 kV	B	Yes	None
Midway-Vincent 500 kV ckts. 1 and 2	C	Yes	None
Lugo-Mira Loma 500 kV ckts. 1 and 2	C	Yes	None
San Onofre units 1 and 2	C	Yes	None
Palo Verde units 2 and 3	C	Yes	None

Table 10.1 – Summary of Transient Stability Results (cont'd)

2009 HS - Case 09hs_alt1_3_pre.sav			
Disturbance	**Disturbance Category**	**Damped**	**Criteria Violations**
IV-Miguel 500 kV w/SPS	B	Yes	None
IV-North Gila 500 kV	B	Yes	None
Devers-Valley 500 kV	B	Yes	None
Hassayampa-North Gila 500 kV	B	Yes	None
Serrano-Valley 500 kV	B	Yes	None
Palo Verde-Devers 500 kV	B	Yes	None
Midway-Vincent 500 kV ckts. 1 and 2	C	N/A	Diverged at fault
Lugo-Mira Loma 500 kV ckts. 1 and 2	C	Yes	None
San Onofre units 1 and 2	C	Yes	None
Palo Verde units 2 and 3	C	Yes	None
2009 HS - Case 09hs_alt1_3_post.sav			
Disturbance	**Disturbance Category**	**Damped**	**Criteria Violations**
IV-Miguel 500 kV w/SPS	B	Yes	None
IV-North Gila 500 kV	B	Yes	None
Devers-Valley 500 kV	B	Yes	None
Hassayampa-North Gila 500 kV	B	Yes	None
Serrano-Valley 500 kV	B	Yes	None
Palo Verde-Devers 500 kV	B	Yes	None
Midway-Vincent 500 kV ckts. 1 and 2	C	N/A	Diverged at fault
Lugo-Mira Loma 500 kV ckts. 1 and 2	C	Yes	None
San Onofre units 1 and 2	C	Yes	None
Palo Verde units 2 and 3	C	Yes	None

The results of the transient stability analysis indicate that Stirling has little or no effect on the stability of the WECC interconnection. All of the scenarios modeled met the WECC criteria, with the exception of the Midway-Vincent 500 kV double line outage, which diverged for the 2009 heavy summer case. Since this scenario diverged for both the pre- and post-project cases, it is unlikely that Stirling is the cause of the instability. It is more likely either a problem within the stability data, or an insufficiency of reactive power in the Midway-Vincent (Path 26) region. This calls for additional investigation, but it is beyond the scope of this study.

11. Deliverability Assessment

The deliverability of the Stirling project will be assessed by the CAISO as part of their generation deliverability process.

12. Post-Transient Study Results

No significant post-transient voltage violations attributable to Stirling were found. A summary of post-transient voltage analysis can be found in Appendix D.

13. Reactive Power Deficiency Analysis Results

A case in each study period was analyzed for post-transient reactive power sufficiency using the VSAT[5] voltage analysis tool. VSAT performs post-transient governor power flow analysis, and recognizes the WECC base load flag. Detailed contingency lists and output from the VSAT analysis can be found in Appendix I. The cases analyzed in VSAT are summarized Table 13.1. The power flow cases reached convergence for all contingencies, thereby meeting the reactive power criteria.

Table 13.1 – Reactive Power Deficiency Analysis Case Summary

Year	Case Name	Disturbance Category	SDG&E Load (MW)
2008 LW	08_ses_la2_no_ivps_cat_b	B	2442
	08_ses_la2_no_ivps_cat_c	C	2384
2009 HS	09hs_alt1_3_post_no_ivps_cat_b	B	5081
	09hs_alt1_3_post_no_ivps_cat_c	C	4960
2010 HS	base_v1_post_cat_b	B	5149
	base_v1_post_cat_c	C	5026

However, as noted in Section 8, Stirling is a net consumer of reactive power at its full 300 MW output level. It is recommended that Stirling include sufficient reactive power resources to compensate for the VAR consumption of the generator step-up transformers and generator tie line.

14. Mitigation Measures and Recommended Mitigation Plan

The Study determined the following thermal constraints directly related to the Stirling project:

- Imperial Valley 500/230 kV xfmr bank 80 FLO bank 81

[5] Voltage Stability Analysis Tool, version 6.0. Developed by Powertech Labs, Inc.

- Miguel 500/230 kV xfmr bank 80 FLO bank 81
- Miguel 500/230 kV xfmr bank 81 FLO bank 80

No additional constraints (post-transient voltage, transient stability, short circuit, or reactive power insufficiency) were identified. A discussion of each thermal constraint and a recommended mitigation strategy follows.

Imperial Valley 500/230 kV xfmr bank 80 FLO bank 81

Imperial Valley bank 80 has a normal/emergency rating of 600/732 MVA, while the parallel bank 81 has a rating of 1120/1194 MVA. Both transformers provide the path to the SDG&E network and thus to the CAISO system.

No Category A thermal violations were observed on either bank. However, Category B violations of the bank 80 emergency rating were observed in all study years after the addition of the Stirling generation. Note that the results for COD 2009 heavy summer cases suggest that the Category B overloads appear both before and after the addition of Stirling. However, this is only true in cases with the Imperial Valley phase shifter. The results for the case without the phase shifter are the most relevant with regards to the IV banks.

This overload is also a function of the output of the other IV generation. A sensitivity case in the 2010 study year indicates that the overload does not appear in the post-Stirling case when the other IV generation is low. It is also affected by CFE export conditions.

There are several possible solutions for addressing this constraint:

- Constrain the output of Stirling when the other IV generation is high.
- Install a redundant SPS to trip Stirling generation for loss of IV bank 81, depending on the other IV generation output and CFE export conditions.
- Install additional transformer capacity at Imperial Valley.[6]

The recommended mitigation strategy is to install an additional 1120/1194 MVA 500/230 kV transformer bank at Imperial Valley. A sensitivity case in the 2010 study year indicates that adding a third 1120/1194 MVA IV bank resolves the overload without causing any additional problems. This solution also addresses the future expansion of Stirling, although this was not specifically examined as part of this study.

Miguel 500/230 kV xfmr bank 80 FLO bank 81
Miguel 500/230 kV xfmr bank 81 FLO bank 80

Miguel substation has two parallel 500/230 kV transformers, banks 80 and 81, both rated at 1120/1194 MVA. These transformers are the primary interface between the 500 kV

[6] SDG&E Transmission Planning is currently evaluating the possibility of installing additional transformer capacity at Imperial Valley as part of internal SDG&E studies. For the purposes of this study, it is assumed that no additional capacity will be added prior to Stirling's in-service date.

system and the SDG&E network in the 2008 and 2009 study years, prior to the installation of the Sunrise Powerlink in 2010. They are a part of the main import path for SDG&E, including Imperial Valley generation.

No Category A thermal violations were observed on either bank. However, Category B violations of the bank 80 and bank 81 emergency ratings were observed in the COD 2009 heavy summer study period after the addition of the Stirling generation. Note that these results suggest that the Category B overloads appear both before and after the addition of Stirling – however, this is only true in cases with the Imperial Valley phase shifter. The results for the case without the phase shifter are the most relevant with regards to the Miguel banks.

Also, note that the overload of the Miguel banks does not appear for any of the FY study cases. This is most likely because the addition of the Sunrise Powerlink provides an additional import path from Imperial Valley.

There are several possible solutions for addressing this constraint:

- Constrain the output of Stirling during high SDG&E import conditions.
- Install a redundant SPS to trip Stirling generation for loss of either Miguel bank, depending on SDG&E import conditions.
- Install additional transformer capacity at Miguel.

The Miguel banks are presently protected by an SPS that trips the existing Imperial Valley generation (Intergen and TDM) following the loss of either bank, if the flow on the remaining bank exceeds 1329 MVA. Historically, SDG&E Grid Operations has mitigated congestion at Miguel with an operating nomogram that accounted for Miguel import flows and the amount of Imperial Valley generation under SPS. Given that this constraint is temporary, installing an SPS to run back Stirling generation for specific transmission conditions is the recommended mitigation solution. The Stirling SPS should be integrated with the existing Miguel bank SPS to trip the Stirling generation first, then tripping the IV generation if the overload condition persists.

Note that the CAISO guideline for generation SPS limits the amount generation tripped to the size of the largest unit on the CAISO system. That limit is presently 1100 MW, representing the Diablo Canyon nuclear units. Adding the 300 MW of Stirling generation to the Miguel bank SPS could potentially trip up to 1370 MW. The Developer should understand that CAISO may not approve this SPS, and may require the constraint to be addressed another way.

Implementation of congestion mitigation for these constraints is contingent on the following:

1. Compliance with NERC, WECC, and CAISO planning standards.
2. Maintenance of the existing SPS for TL50001 (SWPL) and TL23050 (Imperial Valley-La Rosita).

3. Maintenance of the existing SPS for Miguel banks 80 & 81.

Stirling will also be required by the CAISO to participate in the SPS at Imperial Valley that trips all existing IV generation for loss of the Imperial Valley-Miguel 500 kV line. If the developer elects to participate in the Miguel bank SPS, adding the capability to participate in the IV-ML SPS is a trivial matter. If the developer does not elect to participate, this capability would have to be installed as a Reliability Upgrade.

As with the Miguel bank SPS, The IV-Miguel SPS is limited to a total generation trip of 1100 MW, and is subject to CAISO review and approval. Other mitigation procedures will be further reviewed as part of the Interconnection Facilities Study. Particularly after the installation of the Sunrise Powerlink, it may not be necessary to trip more than 1100 MW of IV generation to achieve the necessary mitigation.

15. Cost Estimates

According to the CAISO LGIP study process, the roles and responsibilities of SDG&E for this Interconnection System Impact Study are as follows:

1. Identify transmission constraints attributable to the proposed Stirling project
2. Develop and provide good faith but non-binding cost estimates for the Interconnection Facility, Reliability, and Delivery Network Upgrades identified in the Study
3. Determine fair and reasonable cost allocations across the various queued projects in the future year model with respect to the proposed Stirling project.

Cost estimates developed within the Study are considered conceptual and include the following assumptions:

1. All costs are based on SDG&E construction methods and techniques.
2. Project concepts are based on representations from the developer.
3. Project concepts are based on mandatory reliability criteria from applicable reliability and regulatory authorities (NERC, WECC, and CAISO).
4. Project concepts are based on sound engineering judgment.

Interconnection Facilities

A 230 kV transmission line is required to interconnect the proposed Stirling project to the SDG&E transmission network at the Imperial Valley 230 kV bus. The line will extend approximately ten miles west-northwest from the Imperial Valley substation to Stirling's preferred site[7], adjacent to the Southwest Powerlink right-of-way. This transmission line will have a minimum normal rating of 350 MVA. The tower line should have provisions for a second circuit, and have an ultimate build-out capacity of 1000 MVA. The

[7] The preferred site for Stirling in the original application was approximately 30 miles to the north of Imperial Valley. The preferred site was later changed by the Developer. This analysis reflects the latest information on the preferred site at the time of the Study.

interconnection facilities also include all protection and control additions and modifications necessary to safely operate the proposed facilities. The estimated cost for the ten-mile tower line, initial 350 MVA 230 kV circuit and associated works is $43,700,000.

Note that the 34.5 kV shunt capacitors modeled as part of the Stirling project are not included in this estimate.

The Developer is not obligated to have SDG&E perform any or all of this work, and he may chose to design, permit, and construct the Interconnection Facilities if he so chooses.

Reliability Network Upgrades

An additional 230 kV bay position is required at Imperial Valley to safely and reliably interconnect the proposed Stirling project. This work includes, but is not limited to, installation of one or more 230 kV breakers and associated switches, disconnects, bus, and other works, and may also include reconfiguration of existing facilities to ensure reliable operation. The estimated cost for the 230 kV substation work at Imperial Valley is $5,942,000

Delivery Network Upgrades

In addition to the Interconnection and Reliability Network upgrades, there are several facilities exhibiting post-contingent loading constraints. The following projects are required to relieve the constraints:

Upgrade 500/230 kV transformer capacity at Imperial Valley substation

This upgrade is required to relieve post-contingent overloads on the existing Imperial Valley 500/230 kV banks. This work includes, but is not limited to, installation of a new 1120 MVA 500/230 kV transformer, associated 500 and 230 kV breakers, switches, disconnects, buswork, and all associated control and protection schemes and equipment. The scope of work may include reconfiguration of existing facilities to ensure reliable operations. The estimated cost for this delivery network upgrade is $41,029,000.

Install temporary SPS to prevent overloading of Miguel 500/230 kV transformers

This upgrade is required to relieve post-contingent overloads on the existing Miguel 500/230 kV transformer banks. This work includes, but is not limited to, installation of protection and control equipment at Miguel, Imperial Valley, and Stirling substations, establishment of redundant communication paths between all three substations, and other works. The estimated cost for this delivery network upgrade is $1,369,000.

The cost estimates are summarized in Table 15.1. Conceptual one-lines, with the upgraded facilities associated with each cost type, may be found in Figures 15.1 and 15.2.

Table 15.1 – Non-Binding Good-Faith Cost Estimate Summary[8]

Type[9]	Description	Estimated Cost ($000)
Interconnection Facilities	230 kV transmission line (Stirling to Imperial Valley)	$43,700
Reliability Network Upgrades[10]	230 kV switchyard facilities at Imperial Valley	$5,942
Delivery Network Upgrades[11]	Additional 1120 MVA 500/230 kV bank at Imperial Valley	$41,029
Delivery Network Upgrades	Temporary SPS to prevent overloading of Miguel 500/230 kV transformers	$1,369

According to the current CAISO tariff, the Developer is not obligated to sponsor the facility improvements described as Delivery Network Upgrades, and SDG&E is not obligated to build these upgrades. However, Stirling will be subject to any dispatch constraints that may be required according to CAISO congestion management protocols. If the Developer wants to minimize the possibility of such dispatch constraints, the Developer must send a request to construct the Delivery Network Upgrades pursuant to the CAISO tariff. If the upgrades require the advancement of the transmission projects that would still be needed without the proposed generation, as part of SDG&E's plan to reliably serve customer loads, SES Solar Two's obligation for funding would be limited to the incremental construction costs, accounting for the time value of money associated with building the planned upgrades sooner than would have been required without Stirling's proposed generation.

[8] All cost estimates in this report are conceptual, non-binding/good faith. All costs shown are in "as year spent" dollars. Taxes, landscaping, undergrounding, walls, gates, driveways, CAISO metering, and environmental and licensing costs are not included. Network Upgrade Costs exclude acquisition of new transmission Right-Of-Way (ROW) and substation land. All Interconnection Facility costs for ROW are assumed to be the responsibility of the Developer.

[9] Refer to Appendix A for a description of these terms.

[10] The Developer is obligated to advance funds to SDG&E for Reliability Network Upgrades and will be reimbursed upon commercial operation of the plant.

[11] The Developer may elect to advance funds to SDG&E for Delivery Network Upgrades and will be reimbursed upon commercial operation of the plant. If the Developer does not advance funds, Stirling will be subject to CAISO congestion protocol dispatch constraints.

Figure 15.1 – Upgrades to 230 kV Facilities at Imperial Valley Substation

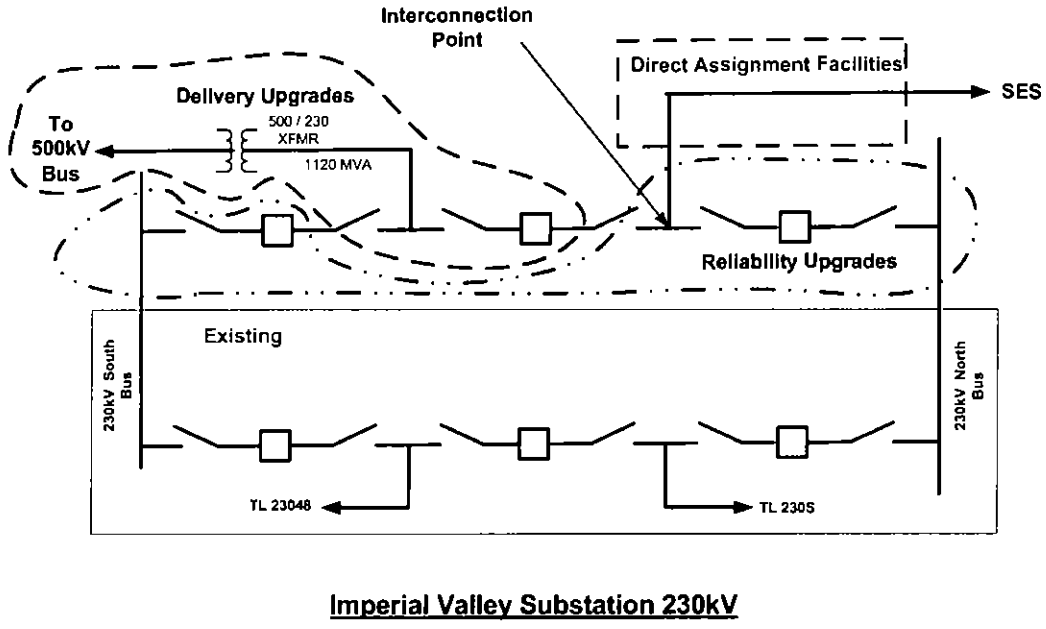
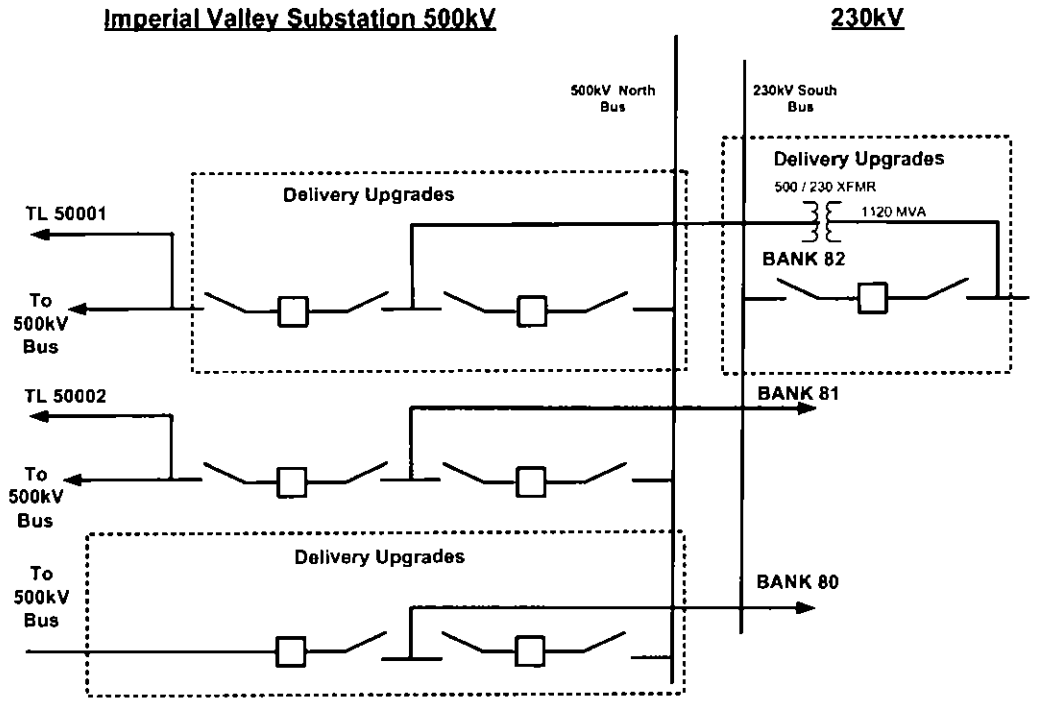


Figure 15.2 – Upgrades to 500 kV Facilities at Imperial Valley Substation



16. Time to Construct

The length of time required to construct and/or upgrade generation project Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades is uncertain at the System Impact Study level in the LGIP process. A non-binding/good-faith effort will be made to estimate approximate construction durations, but these are dependent on many factors, including but not limited to:

- Whether an exemption can be obtained from the California Public Utilities Commission's (CPUC's) G.O. 131-D Certificate of Public Convenience and Necessity (CPCN) process.
- Whether an exemption can be obtained from the CPUC's Permit to Construct (PTC) process.
- Whether the Developer chooses to permit the Stirling project through the California Energy Commission (CEC) and is issued an Application for Certification (AFC).
- Whether the Developer intends to fund the Delivery Network Upgrades.
- Whether the Developer chooses to build its own Interconnection Facilities.

The outcome of these processes and/or developer project/business decisions could increase cost and/or construction duration. Absent an exemption, the process of obtaining the CPUC's approval could take one to two years, or even longer.

The estimate construction times are summarized in Table 16.1.

Table 16.1 – Non-Binding Good-Faith Time to Construct Estimate

Type[12]	Description	Estimated time to Design & Construct[13]
Interconnection Facilities	230 kV transmission line (Stirling to Imperial Valley)	24 months
Reliability Network Upgrades[14]	230 kV switchyard facilities at Imperial Valley	18 months
Delivery Network Upgrades[15]	Additional 1120 MVA 500/230 kV bank at Imperial Valley	24 months
Delivery Network Upgrades	Temporary SPS to prevent overloading of Miguel 500/230 kV transformers	12 months

17. Local Furnishing Bonds Analysis

SDG&E has financed substantial portions of its transmission and distribution systems with proceeds from $687,000,000 of outstanding Local Furnishing Bonds (LFB) issued by the City of San Diego and the City of Chula Vista. Interest on these bonds is tax-exempt. Pursuant to applicable IRS private letter rulings, if the proposed Project would cause impairment of the tax-exempt interest on these bonds, SES Solar Two would pay any resulting costs to SDG&E in mitigating the impairment to the continued tax-exempt status of interest on the LFBs (an "Impairment").

The Stirling Project at present does not appear at this time to cause an Impairment but this conclusion will be reviewed with Bond Counsel representing the Cities of San Diego and Chula Vista on behalf of bondholders. Further, this conclusion may necessarily need to be revisited if material facts change, which are relevant to the determination if an Impairment may arise.

18. Reasons For Re-Study

[12] Refer to Appendix A for a description of these terms.
[13] Excludes time to obtain Certificate of Public Convenience and Necessity (CPCN), if required.
[14] The Developer is obligated to advance funds to SDG&E for Reliability Network Upgrades and will be reimbursed upon commercial operation of the plant.
[15] The Developer may elect to advance funds to SDG&E for Delivery Network Upgrades and will be reimbursed upon commercial operation of the plant. If the Developer does not advance funds, Stirling will be subject to CAISO congestion protocol dispatch constraints.

A re-study of the Stirling Energy Systems (SES) Solar Two project may be required for, but not limited to, the following reasons:

- A higher-queue project dropping out, or a major change to a higher queued project subject to LGIP Section 4.4
- A major change to a planned project (i.e. the Sunrise Powerlink transmission project or the Imperial Valley phase shifter)
- A major change to a WECC path rating (i.e. Path 45)
- Re-designation of the Point of Interconnection pursuant to LGIP Section 7.2.
- A change in project size.
- A change in the interconnection date, beyond the three-year limit provided in the LGIP.
- A change in the interconnection voltage level (i.e. from 230 kV to 500 kV)
- Any other material change to the project scope.

19. Disclaimer Information

Transmission Line, ROW, and Land Evaluation Requirements

Detailed transmission line, ROW, and land assessments are deferred until the Interconnection Facilites Study.

Environmental Evaluation/Permitting Information

The length of time required for environmental and permitting processes for new transmission or transmission upgrades is uncertain. It depends on many factors, including whether exemptions can be obtained from the California Public Utilities Commission's (CPUC's) G.O. 131-D Certificate of Public Convenience and Necessity (CPCN) process or the CPUC's Permit to Construct (PTC) process. The outcome of these processes could increase the cost, as well as delay the in-service date. Absent an exemption, the process of obtaining CPUC's approval could take one to two years or longer.

SDG&E believes that the ability to obtain exemptions from the CPCN and PTC processes (in which case an advice letter filing with the CPUC should be sufficient for obtaining the CPUC's approval to proceed with construction) will be enhanced if the Developer includes in its application to the appropriate permitting agency (i.e. CEC) the full scope of transmission and substation additions and upgrades that will be part of the project.

Appendix A - Definitions

Category A Contingency	All facilities in service, no contingency.
Category B Contingency	Event resulting in the loss of a single element. *(The CAISO considers the loss of a critical generator followed with redispatch of the remaining system generation and the subsequent loss of any single element as a Category B contingency.)*
Category C Contingency	Event resulting in the loss of two or more (multiple) elements.
Category D Contingency	Extreme event resulting in two or more (multiple) elements removed or cascading out of service.
Delivery Network Upgrades	Transmission facilities at or beyond the Point of Interconnection, other than Reliability Network Upgrades, identified in the Interconnection Studies to relieve constraints on the ISO Controlled Grid.
Interconnection Facilities	The Participating TO's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to the ISO Controlled Grid. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Reliability Network Upgrades The transmission facilities at or beyond the Point of Interconnection necessary to interconnect a Large Generating Facility safely and reliably to the ISO Controlled Grid, which would not have been necessary but for the interconnection of the Large Generating Facility, including Network Upgrades necessary to remedy short circuit or stability problems resulting from the interconnection of the Large Generating Facility to the ISO Controlled Grid. Reliability Network Upgrades also include, consistent with WECC practice, the facilities necessary to mitigate any adverse impact the Large Generating Facility's interconnection may have on a path's WECC rating.

Appendix B - CAISO Controlled Grid Generation Queue

The California ISO Controlled Grid Generation Queue
as of: July 26, 2006

				Generating Facility		Maximum MWs		Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	County	State	Utility	Station or Transmision Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study (SIS)	Facility Study (FAS)	Optional Study (OS)	Interconnection Agreement Status
1	9/30/1998	9/30/1998	Active	WT	W	16.5		Riverside	CA	SCE	Devers-Garnet 115 kV line (Tap)	3/1/1999	3/31/2007	NA	Complete	Complete		
1A	11/1/1999	11/1/1999	Active	CC	NG	550	550	San Diego	CA	SDGE	Miguel Substation	3/1/2002	1/1/2008	N/A	Complete	Complete		GSFA Executed
2	8/10/1999	2/3/2000	Active	CC	NG	590		Contra Costa	CA	PGE	Contra Costa Power Plant 230 kV bus	11/28/2007	11/1/2009	N/A	Complete	Complete		
3	4/21/2000	6/14/2000	Active	CC	NG	850		Riverside	CA	SCE	Devers Substation 230 kV Bus	1/1/2004	5/1/2008	NA	Complete	Restudy		
4	8/8/2000	8/8/2000	Complete	CC	NG	521	545	San Diego	CA	SDGE	Palomar 230 kV	6/1/2001	10/15/2005	NA	Complete	Complete		Executed
5	8/9/2000	8/9/2000	Active	CC	NG	900		San Diego	CA	SDGE	Encina Power Plant Switchyard	6/30/2003	6/1/2008	NA	Complete	In Progress		
6	8/23/2000	8/23/2000	Active	CC	NG	1156		San Joaquin	CA	PGE	Tesla Substation 230 kV Bus E	6/1/2008	6/1/2008	NA	Complete	In Progress		
7	8/16/2000	10/6/2000	Active	CC	NG	280		Los Angeles	CA	SCE	El Segundo 220 kV Bus	3/1/2003	9/1/2009	NA	Complete	Complete		
8	11/28/2000	11/28/2000	Active	CC	NG	750		San Diego	CA	SDGE	Sycamore Canyon Substation	6/1/2004	12/31/2010	NA	Complete	In Progress		
9	12/1/2000	12/1/2000	Active	CC	NG	1200		San Luis Obispo	CA	PGE	Morro Bay Substation	1/1/2008	1/1/2008	NA	Complete	Complete		
10	5/2/2001	5/2/2001	Active	CC	NG	620		Kings	CA	PGE	Gates Substation (Arco - Gates 230 kV line)	1/1/2009	7/1/2009	NA	Complete	Complete		GSFA Executed
11	10/14/2002	10/23/2002	Active	WT	W	63		San Bernardino	CA	SCE	Mountain Pass Substation	12/1/2004	3/1/2008	NA	Complete	Complete		
12	12/16/2002	12/16/2002	Active	WT	W	150		Solano	CA	PGE	New Birds Lndng Sw Stn near Contra Costa PP Sub	10/31/2005	3/30/2006	NA	Complete	Complete		GSFA Executed
13	1/3/2003	1/3/2003	Active	H	WTR	40		San Diego	CA	SDGE	Escondido	7/1/2007	7/1/2007	NA	Complete	Complete		
14	1/7/2003	1/7/2003	Active	CC	NG	65		San Diego	CA	SDGE	Miguel-Tijuana * (65 MWs -additional capacity, 615 total MW)	12/31/2004	1/1/2008	NA	Complete	Complete		
15	12/31/2002	1/17/2003	Active	WT	W	50		San Bernardino	CA	SCE	Mountain Pass	9/1/2004	12/31/2007	NA	Complete	Complete		
16	3/11/2003	3/11/2003	Active	WT	W	120		Santa Barbara	CA	PGE	Cabrillo	6/1/2006	10/1/2008	NA	Complete	Complete		GSFA Executed
17	3/18/2003	3/18/2003	Active	CC	NG	520		Riverside	CA	SCE	Devers-Palo Verde 500 kV line near Blythe	1/1/2006	6/1/2008	NA	In Progress			
~~18~~	~~4/15/2003~~	~~4/15/2003~~	**WITHDRAWN**	~~WT~~	~~W~~	~~200~~		~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope~~	~~12/31/2005~~	~~12/12/2007~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
19	6/4/2003	6/18/2003	Complete	WT	W	46		San Diego	CA	SDGE	Crestwood	12/31/2005	10/1/2005	NA	Complete	Complete		Executed
20	8/19/2003	9/4/2003	Active	WT	W	300		Kern	CA	SCE	Antelope	12/31/2006	12/31/2008	NA	Complete	Complete		
21	10/3/2003	10/23/2003	Active	WT	W	37.55		Byron	CA	PGE	Windmaster/Buena Vista Sub	7/1/2004	1/27/2006	NA	n/a	n/a		
22	11/18/2003	11/18/2003	Active	WT	W	38		Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	6/30/2005	3/1/2007	NA	Complete	Complete		
23	11/17/2003	11/24/2003	Complete	CC	NG	72		San Bernardino	CA	SCE	San Bernadino * 72 Additional MW	11/1/2004	10/1/2005	NA	Complete	Complete		Executed
24	1/30/2004	1/30/2004	Active	WT	W	150		Solano	CA	PGE	High Winds/Contra Costa PP	12/31/2006	12/31/2006	NA	Complete	Complete		GSFA Executed
25	2/5/2004	2/5/2004	Active	WT	W	117		San Diego	CA	SDGE	Crestwood	6/6/2005	6/1/2007	NA	In Progess			
26	2/12/2004	2/12/2004	Active	WT	W	36		San Diego	CA	SDGE	Crestwood	4/1/2006	1/1/2008	NA				
27	2/23/2004	2/23/2004	Active	CC	NG	650		San Diego	CA	SDGE	138/69 kV South Bay (650 MW CC)	1/1/2010	1/1/2010	NA	Complete	In Progress		
28	2/25/2004	2/25/2004	Active	CT	NG	145.1		San Francisco	CA	PGE	Potrero 115 kV Sub	12/1/2006	6/1/2008	NA	Complete	Complete		Executed
29	3/8/2004	3/29/2004	Active	WT	W	201		Lake & Sonoma	CA	PGE	Collector Substation at Geysers #17 & Fulton 230 kV line	12/1/2006	12/1/2006	NA	Complete	Complete		Tendered
30	4/26/2004	4/26/2004	Active	CT	NG	48.7		San Francisco	CA	PGE	SF Airport Substation	6/1/2006	6/1/2008	NA	Complete	Complete		
31	4/12/2004	5/11/2004	Active	WT	W	201		Kern	CA	SCE	Monolith Substation	12/31/2007	12/31/2009	NA	Complete	In Progress		
32	5/12/2004	5/24/2004	Active	WT	W	201		San Diego	CA	SDGE	Boulevard - Crestwood 69-kV transmission line	9/1/2007	9/1/2007	NA	In Progess			
33	7/9/2004	7/12/2004	Active	ST	G	10		Curchill	NV	SCE	Bishop Control Sub	7/14/1988	5/31/2006	NA	Complete	Complete		
34	7/19/2004	7/19/2004	Active	WT	W	300		Kern	CA	SCE	Monolith Substation	7/1/2007	12/31/2009	NA	Complete	In Progress		
35	10/25/2004	10/25/2004	Active	CT	NG	49.9		Fresno	CA	PGE	115 KV Panoche Sub	5/31/2006	5/31/2006	NA	Complete	Complete		Tendered
36	11/1/2004	11/1/2004	Active	CT	NG	99.9		Stanislaus	CA	PGE	115 kV Tesla - Stockton Cogen Trans. Line.	5/31/2006	5/31/2006	NA	Complete	Complete		Tendered
37	11/8/2004	11/8/2004	Active	CT	NG	96.9		San Joaquin	CA	PGE	Tesla Substation	1/1/2007	1/1/2007	NA	Complete	Complete		Tendered
38	10/19/2004	11/11/2004	Active	IC	NG	146.4		Humboldt	CA	PGE	Humboldt Power Plant Substation	8/1/2008	7/1/2008	NA	Complete	Tendered		
39	11/11/2004	11/11/2004	Active	WT	W	200		Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	12/31/2008	12/31/2008	NA	Complete	Complete		
40	10/19/2004	11/11/2004	Active	IC	NG	118		Alameda	CA	PGE	Eastshore Substation	5/1/2007	3/1/2007	NA	Complete	Complete		Tendered
41	11/9/2004	11/18/2004	Active	CT	NG	158.8		Kern	CA	SCE	Pastoria Substation	7/31/2006	7/31/2006	NA	Complete	In Progress		
42	11/24/2004	11/26/2004	Active	CT	NG	300		Fresno	CA	PGE	McCall Substation	5/31/2007	4/30/2007	NA	Complete	In Progress		
~~43~~	~~11/29/2004~~	~~11/29/2004~~	**WITHDRAWN**	~~IC~~	~~NG~~	~~168.7~~		~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla-Bellota 230 kV line~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~			~~Tendered~~
~~44~~	~~11/29/2004~~	~~11/29/2004~~	**WITHDRAWN**	~~IC~~	~~NG~~	~~126.5~~		~~Madera~~	~~CA~~	~~PGE~~	~~Borden Substation 230 kV Bus~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~	~~Complete~~		
45	12/1/2004	12/1/2004	Active	CT	NG	361		Alameda	CA	PGE	Eastshore substation	7/31/2007	6/1/2010	NA	Complete	Re-study in Progress		
46	12/1/2004	12/1/2004	Active	CT	NG	531		Contra Costa	CA	PGE	Tesla-Tracy #1 230 kV Line - Tracy Sub	7/31/2006	7/31/2008	NA	Complete	Complete		
47	12/1/2004	12/1/2004	Active	CT	NG	200.6		Fresno	CA	PGE	Herndon - Kearney 230 kV line	6/30/2008	6/30/2008	NA	Complete	Complete		Tendered
~~48~~	~~12/1/2004~~	~~12/1/2004~~	**WITHDRAWN**	~~5~~	~~NG~~	~~590~~		~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Power Plant 230 kV Substation~~	~~1/1/2008~~	~~10/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
49	12/14/2004	12/14/2004	Active	WT	W	100.5		Riverside	CA	SCE	Devers Substation	12/1/2006	12/1/2006	NA	Complete	In Progress		
50	12/21/2004	12/21/2004	Active	CC	NG	810		Riverside	CA	SCE	SCE Valley Substation	5/31/2008	5/31/2008	NA	Complete			
51	12/20/2004	12/21/2004	Active	IC	NG	0.55		Fresno	CA	PGE	70 kV Kerman-Helm transmission line	4/30/2005	5/31/2006	NA	n/a	n/a		
52	12/1/2004	12/21/2004	Active	CT	NG	401		Fresno	CA	PGE	Panoche Sub Station	6/30/2008	7/1/2008	NA	Complete	Complete		Tendered
53	12/1/2004	12/22/2004	Active	CT	NG	116.8		Placer	CA	PGE	Pleasant Grove Sub Station	6/1/2008	6/1/2008	NA	Complete	Complete		Tendered
54	11/11/2004	1/12/2005	Active	CT	NG	104		Fresno	CA	PGE	Panoche Substation	6/1/2008	6/1/2008	NA	Complete	In Progress		
55	12/1/2004	1/13/2005	Active	CC	NG	791		Fresno	CA	PGE	Helm substation	7/31/2008	7/31/2008	NA	Complete			

Notes:

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Legend:

- **Generator Type Key:** IC-Internal Combustion, ST=Steam Turbine, CT=Combustion Turbine, CC=Combined Cycle, H=Hydro, WT=Wind Turbine, PV=Photovoltaic
- **Fuel Type Key:** W=Wind, NU=Nuclear, NG=Natural Gas, O=Oil, C=Coal, B=Biomass, S=Solar, LFG=Land Fill Gas, WTR=Water

				Generating Facility		Maximum MWs		Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study (SIS)	Facility Study (FAS)	Optional Study (OS)	Interconnection Agreement Status
56	12/21/2004	1/25/2005	Active	CC	NG	634		Clark	NV	PGE	El Dorado 230 kV Substation	6/1/2007	6/1/2007	NA	Complete	Complete		
57	12/1/2004	2/8/2005	Active	CC	NG	715		Colusa	CA	PGE	Between Cottonwood and Vaca-Dixon	1/1/2010	1/1/2010	NA	Complete	Complete		Tendered
58	1/25/2005	2/22/2005	Active	ST	G	90		Mineral	NV	SCE	Dixie-Valley-Oxbow 220	10/7/2007	10/7/2007	NA	Complete	In Progress		
59	3/25/2005	3/28/2005	Active	CT	NG	97.2		Kings	CA	PGE	Henrietta Substantion 70 kV	1/1/2008	1/1/2008	NA	Complete	Complete		Tendered
60	3/28/2005	3/28/2005	Active	CT	NG	94		Kern County	CA	PGE	Kern Oil Substation 115 kV	3/31/2007	1/31/2009	NA	Complete	Complete		
61	3/28/2005	3/30/2005	Active	ST	NG	73.27		Fresno	CA	PGE	70kV Helm-Kerman	5/31/2006	5/31/2006	NA	Complete	Complete		Executed
~~62~~	~~3/28/2005~~	~~4/13/2005~~	WITHDRAWN	~~CC~~	~~NG~~	~~166.5~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay Humboldt #1 115 kV~~	~~5/31/2007~~	~~6/1/2007~~	~~NA~~		~~Agreement Tendered~~		
63	3/25/2005	4/18/2005	Active	CC	NG	158		Contra Costa	CA	PGE	Contra Costa (230 kV)	1/1/2008	1/1/2008	NA	Complete	Re-study in Progress		Tendered
~~64~~	~~3/30/2005~~	~~4/28/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~147~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay Power Plant Sub~~	~~5/1/2008~~	~~3/1/2008~~	~~NA~~	~~Complete~~			
65	5/6/2005	5/6/2005	Active	CT	NG	424.8		Los Angeles	CA	SCE	Long Beach Gen Station 220kv switchyard	1/1/2007	1/1/2007	NA	Complete	Complete		
66	5/6/2005	5/6/2005	Active	CT	NG	500.5		Los Angeles	CA	SCE	Walnut Substation	9/1/2007	9/1/2007	NA	Complete	Complete		
67	3/28/2005	5/9/2005	Active	CC	NG	245		Alameda	CA	PGE	Eastshore Substation	7/31/2008	7/31/2008	NA	Complete	Re-study in Progress		
68	3/30/2005	5/11/2005	Active	Other	S	850		San Bernadino	CA	SCE	Pisgah 230 kV Substation	1/31/2008	1/31/2008	Waived	Complete	Tendered		
~~69~~	~~5/6/2005~~	~~6/7/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~527~~		~~San Bernardino~~	~~CA~~	~~SCE~~	~~Etiwanda 230kV Substation~~	~~8/1/2008~~	~~8/1/2008~~	NA	~~Complete~~			
70	5/9/2005	6/14/2005	Active	IC	LFG	10.7		San Mateo	CA	PGE	Hillsdale Junction-Half Moon Bay 60 kV line	12/23/2005	4/1/2006	NA	Complete	Complete		Tendered
~~71~~	~~5/6/2005~~	~~6/15/2005~~	WITHDRAWN	~~CC~~	~~NG~~	~~591~~		~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado 500/230kV Substation~~	~~2/28/2007~~	~~1/31/2007~~	~~Complete~~	~~Tendered~~			
72	4/26/2005	6/21/2005	Active	H	WTR	500		Riverside	CA	SCE/SDGE	Proposed Lee Lake Substation	12/31/2008	12/31/2008	NA	Complete	Tendered		
73	6/6/2005	6/27/2005	Active	WT	W	250		Kern	CA	SCE	Antelope Sub	12/31/2007	12/31/2008	Waived	In Progress			
74	7/12/2005	7/12/2005	Active	WT	W	125		Shasta	CA	PGE	230kV line btn Pit#3 & Round Mtn	12/15/2007	12/15/2007	Complete	Complete			
75	4/28/2005	7/15/2005	Active	ST	B	10.5		Madera	CA	PGE	Le Grand-Chowcilla 115 kV	12/31/2005	12/31/2006	NA	Complete	Complete		Tendered
76	4/28/2005	7/15/2005	Active	ST	B	10.5		Merced	CA	PGE	PG&E Merced #1 70 kV circuit	7/1/2006	7/1/2006	NA	Complete	Complete		Tendered
~~77~~	~~8/19/2005~~	~~8/22/2005~~	WITHDRAWN	~~WT~~	~~W~~	~~300~~		~~Kern~~	~~CA~~	~~SCE/PG&E~~	~~TBD Bakersfiled~~	~~11/30/2007~~	~~11/30/2007~~	~~Complete~~	~~Tendered~~			
78	8/31/2005	8/31/2005	Active	Other	S	300		Imperial	CA	SDGE	Imperial Valley Substation	12/31/2009	12/31/2009	Waived	In Progress			
79	5/24/2005	9/7/2005	Active	WT	W	51		Kern	CA	SCE	Proposed "New" Dutchwind Substation	6/1/2006	12/15/2009	Complete	In Progress			
80	9/12/2005	9/12/2005	Active	CC	NG	610		Los Angeles	CA	SCE	Laguna Bell Substation 230 kV	7/31/2008	3/31/2009	Waived	Complete			
81	9/13/2005	9/13/2005	Active	ST	G	55		Lake	CA	PGE	Geysers #17 - Fulton 230 kV Line	9/1/2006	9/1/2006	Waived	Complete	In Progress		Tendered
82	6/10/2005	9/14/2005	Active	ST	B	6.8		Humboldt	CA	PGE	Rio Dell Substation 60 KV	1/1/2006	1/1/2006	Waived	In Progress			
83	9/16/2005	9/16/2005	Active	WT	W	60		San Bernardino	CA	SCE	Lugo-Pisgah No. 2 230 kV tran line	12/31/2008	12/31/2008	Complete	Tendered			
84	11/22/2005	12/1/2005	Active	WT	W	400		Kern	CA	SCE	Cottonwind Substation	12/31/2009	12/31/2009	Tendered				
85	12/28/2005	12/28/2005	Active	WT	W	120		Kern	CA	SCE	Segment 3 230 Collector Loop Tehachapi	12/31/2007	12/31/2007	In Progress				
~~86~~	~~12/30/2005~~	~~12/30/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~49.9~~		~~Kern~~	~~CA~~	~~PGE~~	~~Kern Oil-Vedder 115 kV Line~~	~~3/1/2008~~	~~3/1/2008~~					
86A	1/20/2006	1/20/2006	Active	WT	W	33.1		Kern	CA	SCE	Vincent Substation	1/1/2008	1/1/2008					
86B	1/20/2006	1/20/2006	Active	WT	W	34		Kern	CA	SCE	Canwind Substation	1/1/2008	1/1/2008					
~~87~~	~~2/3/2006~~	~~2/3/2006~~	WITHDRAWN	~~ST~~	~~NU~~	~~28~~		~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Diablo Canyon Substation Circuit Breakers 532 and 632~~	~~12/8/2005~~	~~12/8/2005~~					
88	2/10/2006	2/10/2006	Active	CC	NG	613.5		Los Angeles	CA	SCE	Hinson Substation 230 kV bus	7/1/2011	7/1/2011	Tendered				
89	2/13/2006	2/13/2006	Active	CC	NG	570		San Bernardino	CA	SCE	Caldwell 230 kV	7/1/2009	7/1/2009	Waived	In Progress			
90	2/16/2006	2/16/2006	Active	CT	NG	60		San Diego	CA	SDGE	Radial tie line TL6929	6/1/2007	6/1/2007	In Progress	Tendered			
91	2/22/2006	2/22/2006	Active	WT	W	51		Kern	CA	SCE	Segment 3 of Antelope Transmission Project	3/31/2010	3/31/2010	Waived	In Progress			
92	2/24/2006	2/24/2006	Active	CC	NG	570		Los Angeles	CA	SCE	Vincent 230 kV	7/1/2009	7/1/2009	Waived	In Progress			
93	3/1/2006	3/1/2006	Active	WT	W	220		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2008	12/31/2008	In Progress				
94	3/1/2006	3/1/2006	Active	WT	W	180		Kern	CA	SCE	Tehachapi Conceptual Substation #2	12/31/2008	12/31/2008	In Progress				
95	3/1/2006	3/1/2006	Active	WT	W	550		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2009	In Progress				
96	3/1/2006	3/1/2006	Active	WT	W	600		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2009	In Progress				
97	3/1/2006	3/1/2006	Active	WT	W	160		Kern	CA	SCE	Tehachapi Conceptual Substation #5	12/31/2009	12/31/2009	In Progress				
98	3/9/2006	3/9/2006	Active	ST	NU	37		San Luis Obispo	CA	PGE	Diablo Canyon Substation Circuit Breakers 532 and 632	12/8/2005	1/1/2006					
99	3/29/2006	3/29/2006	Active	ST	NU	45		San Luis Obispo	CA	PGE	Diablo Canyon Substation Circuit Breakers 542 and 642	6/8/2006	6/8/2006					
100	4/5/2006	4/5/2006	Active	ST	W	120		Kern	CA	SCE	Vincent Substation through Sagebrush 230 kV line	12/31/2007	12/31/2007					
101	4/7/2006	4/7/2006	Active	CT	NG	100		Kern	CA	PGE	PG&E Kern Oil-Vedder 115 kV line	3/1/2008	3/1/2008					
102	4/19/2006	4/19/2006	Active	WT	W	300		Monterey	CA	PGE	PG&E Coburn 230 kV Sub	11/30/2008	11/30/2008	Tendered				
~~102A~~	~~4/21/2006~~	~~4/21/2006~~	WITHDRAWN	~~WT~~	~~W~~	~~100~~		~~Santa Barbara~~	~~CA~~	~~PGE~~	~~PG&E #2 Cabrillo Divide 115 kV line~~	~~12/31/2009~~	~~12/31/2009~~	~~Tendered~~				
103	5/2/2006	5/2/2006	Active	ST	B	27		San Diego	CA	SDGE	69kV (#6910) Otay Mesa Road	12/1/2008	12/1/2008	Tendered				
104	4/14/2006	5/3/2006	Active	CT	NG	304		Los Angeles	CA	SCE	Laguna Bell 230 kV Substation	7/31/2009	7/31/2009	Waived	In Progress			
~~105~~	~~5/4/2006~~	~~5/4/2006~~	WITHDRAWN	~~WT~~	~~W~~	~~100~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Between Rio Del Junction and Bridgeville~~	~~10/30/2009~~	~~10/30/2009~~					
106	5/26/2006	5/26/2006	Active	Other	S	635		San Bernardino	CA	SCE	Mojave Generating Station	12/31/2009	12/31/2009					
106A	5/1/2006	6/6/2006	Active	WT	W	160		San Diego	CA	SDGE	Boulevard Substation	6/30/2008	6/30/2008					
107	6/9/2006	6/9/2006	Active	WT	W	128		Solano	CA	PGE	Brighton-Contra Costa 115 kV	3/1/2011	3/1/2011					
108	6/9/2006	6/9/2006	Active	WT	W	128		Solano	CA	PGE	Lambie-Contra Costa 230 kV	3/1/2011	3/1/2001					
109	6/14/2006	6/16/2006	Active	Other	S	600		San Bernardino	CA	SCE	Pisgah Substation	3/1/2011	3/1/2011					
110	6/14/2006	6/16/2006	Active	Other	S	1400		San Bernardino	CA	SCE	Pisgah Substation	3/1/2011	3/1/2011					
111	6/23/2006	6/26/2006	Active	ST	B	20		Kern	CA	PGE	Tap of Chevron 70kv tran line	8/31/2009	8/13/2009					
112	6/28/2006	6/28/2006	Active	WT	W	300		San Diego	CA	SDGE	500 kV Imperial Valley-Miguel trans line	10/31/2008	10/31/2008					
113	6/29/2006	6/30/2006	Active	WT	W	30		Solano	CA	PGE	Birds Landing	4/1/2009	4/1/2009					
114	6/29/2006	7/12/2006	Active	WT	W	50		San Bernardino	CA	SCE	Pisgah-Lugo Sub 230kV	7/1/2008	7/1/2008					
115	6/29/2006	7/12/2006	Active	WT	W	150		San Bernardino	CA	SCE	115kV Black Mountain-Victor Trans Line	7/1/2008	7/1/2008					
116	6/29/2006	7/12/2006	Active	WT	W	150		San Bernardino	CA	SCE	Pisgah-Lugo 230kV Trans Line	7/1/2008	7/1/2008					

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- **Generator Type Key:** IC-Internal Combustion, ST=Steam Turbine, CT=Combustion Turbine, CC=Combined Cycle, H=Hydro, WT=Wind Turbine, PV=Photovoltaic
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Appendix C - Load and Resource Table

Queue #	Year modeled: 2008/2009 Winter		08_pre_1a2	08_ses_1a2	08_pre_1a2_no_ivps	08_ses_1a2_no_ivps	08_pre_1a2_leaps	08_ses_1a2_leaps	08_pre_1a3_leaps	08_ses_1a3_leaps
	Base Load (incl losses)*		2371	**2380**	2371	**2380**	2375	**2383**	2382	**2391**
	Area 22 Interchange		-1869	**-1869**	-1869	**-1869**	-1869	**-1869**	-1869	**-1869**
	Area 99 Interchange		800	**1100**	800	**1100**	800	**1100**	800	**1100**
	Generation Required		1302	**1611**	1302	**1611**	1306	**1614**	1313	**1622**
	Dispatch	**Pmax**								
	Must Take									
	QF's	182	116	**116**	116	**116**	46	**46**	46	**46**
19	Kumeyaay Wind	50	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
25	CRSTWD_A	117	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
26	CRSTWD_B	36	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
32	BOULVARD	201	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
78	ling Energy Systems (SES)	300	0	**300**	0	**300**	0	**300**	0	**300**
	Sub Total	**886**								
	Combined Cycle									
5	ENCINA6	200	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
5	ENCINA7	200	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
5	ENCINA8	360	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE1	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE2	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE3	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE4	270	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
	INTBST	75	150	**150**	150	**150**	150	**150**	150	**150**
	INTBCT	150	190	**190**	190	**190**	190	**190**	190	**190**
	IV GEN1	241	121	**121**	121	**121**	121	**127**	121	**128**
	IV GEN2	179	175	**175**	175	**175**	175	**175**	175	**175**
	IV GEN3	180	175	**175**	175	**175**	175	**175**	175	**175**
1A	OTAYMGT1	170	0	**0**	0	**0**	45	**45**	45	**45**
1A	OTAYMGT2	170	0	**0**	0	**0**	45	**45**	45	**45**
1A	OTAYMST1	221	0	**0**	0	**0**	60	**59**	58	**58**
4	PEN_CT1	155	0	**0**	0	**0**	47	**47**	47	**47**
4	PEN_CT2	155	0	**0**	0	**0**	47	**47**	47	**47**
4	PEN_ST1	230	0	**0**	0	**0**	47	**50**	49	**49**
27	SOUTHBY6	165	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
27	SOUTHBY7	165	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
27	SOUTHBY8	320	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
	Sub Total	**4086**								
	Pump Storage									
13	LkHodG1	20	0	**0**	0	**0**	5	**5**	5	**5**
13	LkHodG2	20	0	**0**	0	**0**	5	**5**	5	**5**
72	Lee Lake	500	0	**0**	0	**0**	0	**0**	0	**0**
	Sub Total	**540**								
	Steam/GT/Peaker									
	ENCINA1	106	75	**75**	75	**75**	27	**27**	27	**27**
	ENCINA2	103	75	**75**	75	**75**	27	**27**	27	**27**
	ENCINA3	109	0	**0**	0	**0**	27	**27**	27	**27**
	ENCINA4	299	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINA5	329	225	**234**	225	**234**	51	**51**	58	**60**
	MEF	45	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_BD	42	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_ES	42	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_EC	42	0	**0**	0	**0**	0	**0**	0	**0**
	LRKSPBD1	46	0	**0**	0	**0**	0	**0**	0	**0**
	LRKSPBD2	46	0	**0**	0	**0**	0	**0**	0	**0**
	MEF	46	0	**0**	0	**0**	0	**0**	0	**0**
	MMC_ES	35	0	**0**	0	**0**	0	**0**	0	**0**
	OTAY1	49.5	0	**0**	0	**0**	0	**0**	0	**0**
90	OTAY2	60	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
	MIRAMRGT	17	0	**0**	0	**0**	12	**12**	12	**12**
	MIRAMRGT	16	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3AB	15	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	ELCAJNGT	13	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINAGT	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARNGT1	15	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	13	0	**0**	0	**0**	0	**0**	0	**0**
				0		**0**		**3.5**		**3.5**
	SubTotal	**1282**								
	Generation Total	**6794**								

* - Load and losses for Areas 22 and 99 combined

NIM - Not in Model

Queue #	Year modeled: 2009 Heavy Summer		09hs_alt1_3_pre	09hs_alt1_3_post	09hs_alt1_3_pre_no_ivps	09hs_alt1_3_post_no_ivps	09hs_alt1_4_pre	09hs_alt1_4_post	09hs_alt1_5_pre	09hs_alt1_5_post
	Base Load (incl losses)*		4950	**4960**	4949	**4958**	4961	**4975**	4964	**4974**
	Area 22 Interchange		-2850	**-2850**	-2850	**-2850**	-2850	**-2850**	-2850	**-2850**
	Area 99 Interchange		950	**1257**	950	**1257**	950	**1257**	957	**1257**
	Generation Required		3050	**3367**	3049	**3365**	3061	**3382**	3071	**3381**
	Generation Dispatched		3050	**3367**	3049	**3365**	3061	**3382**	3071	**3381**
	Dispatch	**Pmax**								
	Must Take									
	QF's	182	182	**182**	182	**182**	176	**161**	174	**182**
19	Kumeyaay Wind	50	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
25	CRSTWD_A	117	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
26	CRSTWD_B	36	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
32	BOULVARD	201	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
78	Ling Energy Systems (SES)	300	0	**300**	0	**300**	0	**300**	0	**300**
	Sub Total	**886**								
	Combined Cycle									
5	ENCINA6	200	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
5	ENCINA7	200	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
5	ENCINA8	360	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE1	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE2	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE3	160	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
8	SYCAMORE4	270	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
	INTBST	75	158	**158**	158	**158**	158	**150**	158	**150**
	INTBCT	150	193	**193**	193	**193**	193	**193**	193	**193**
	IV GEN1	241	56	**70**	56	**70**	56	**70**	63	**69**
	IV GEN2	179	175	**179**	175	**179**	179	**179**	179	**179**
	IV GEN3	180	175	**180**	175	**180**	180	**180**	180	**180**
	LRP-U1	194	194	**194**	194	**194**	194	**194**	194	**194**
1A	OTAYMGT1	170	170	**170**	170	**170**	170	**170**	170	**170**
1A	OTAYMGT2	170	170	**170**	170	**170**	170	**170**	170	**170**
1A	OTAYMST1	221	220	**220**	220	**220**	220	**220**	220	**220**
4	PEN_CT1	155	177	**175**	177	**175**	177	**175**	175	**175**
4	PEN_CT2	155	177	**175**	177	**175**	177	**175**	175	**175**
4	PEN_ST1	230	187	**185**	187	**185**	187	**185**	185	**185**
27	SOUTHBY6	165	165	**165**	165	**165**	165	**165**	165	**165**
27	SOUTHBY7	165	165	**165**	165	**165**	165	**165**	165	**165**
27	SOUTHBY8	320	315	**310**	315	**310**	310	**310**	310	**310**
	Sub Total	**4280**								
	Pump Storage									
13	LkHodG1	20	0	**0**	0	**0**	0	**0**	0	**0**
13	LkHodG2	20	0	**0**	0	**0**	0	**0**	0	**0**
72	Lee Lake	500	0	**0**	0	**0**	0	**0**	0	**0**
	Sub Total	**540**								
	Steam/GT/Peaker									
	ENCINA1	106	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINA2	103	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINA3	109	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINA4	299	171	**176**	170	**174**	184	**200**	195	**199**
	ENCINA5	329	0	**0**	0	**0**	0	**0**	0	**0**
	MEF	45	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_BD	42	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_ES	42	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_EC	42	0	**0**	0	**0**	0	**0**	0	**0**
	LRKSPBD1	46	0	**0**	0	**0**	0	**0**	0	**0**
	LRKSPBD2	46	0	**0**	0	**0**	0	**0**	0	**0**
	MEF	46	0	**0**	0	**0**	0	**0**	0	**0**
	MMC_ES	35	0	**0**	0	**0**	0	**0**	0	**0**
	OTAY1	49.5	0	**0**	0	**0**	0	**0**	0	**0**
90	OTAY2	60	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**	NIM	**NIM**
	MIRAMRGT	17	0	**0**	0	**0**	0	**0**	0	**0**
	MIRAMRGT	16	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3AB	15	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	ELCAJNGT	13	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINAGT	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARNGT1	15	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	14	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	13	0	**0**	0	**0**	0	**0**	0	**0**
				0		**0**		**0**		**0**
	SubTotal	**1282**								
	Generation Total	**6988**								

* - Load and losses for Areas 22 and 99 combined

NIM - Not in Model

	Case		base_v1		low_ivgen		cfe_export		cfe_import		iid_import		iv_pst		iv_bank82	
	Year modeled: 2010		pre	post	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Queue #																
	Base Load (incl losses)		5053	**5062**	5015	**5022**	5053	**5067**	5053	**5061**	5051	**5058**	5053	**5062**	5053	**5062**
	Interchange		-1450	**-1150**	-1450	**-1150**	-1450	**-1150**	-1450	**-1150**	-1450	**-1150**	-1450	**-1150**	-1450	**-1150**
	Generation Required		3603	**3912**	3565	**3872**	3603	**3917**	3603	**3911**	3601	**3908**	3603	**3912**	3603	**3912**
	Generation Dispatched		3603	**3911**	3565	**3873**	3603	**3917**	3603	**3911**	3601	**3908**	3603	**3912**	3603	**3912**
	Dispatch	**Pmax**														
	Must Take															
	QF's	182	182	**182**	182	**182**	182	**182**	182	**182**	182	**182**	182	**182**	182	**182**
19	Kumeyaay Wind	50	10	**10**	10	**10**	10	**10**	10	**10**	10	**10**	10	**10**	10	**10**
25	CRSTWD_A	117	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
26	CRSTWD_B	36	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
32	BOULVARD	201	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
78	ling Energy Systems (SES)	300	0	**300**	0	**300**	0	**300**	0	**300**	0	**300**	0	**300**	0	**300**
	Sub Total	**886**														
	Combined Cycle															
5	ENCINA6	200	0	**0**	175	**175**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
5	ENCINA7	200	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
5	ENCINA8	360	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
8	SYCAMORE1	160	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**
8	SYCAMORE2	160	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**
8	SYCAMORE3	160	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**	160	**160**
8	SYCAMORE4	350	170	**170**	350	**350**	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**
	INTBST	75	159	**159**	0	**0**	159	**159**	159	**159**	159	**159**	159	**159**	159	**159**
	INTBCT	150	193	**193**	0	**0**	193	**193**	193	**193**	193	**193**	193	**193**	193	**193**
	IV GEN1	241	241	**241**	0	**0**	241	**241**	241	**241**	241	**241**	241	**241**	241	**241**
	IV GEN2	179	179	**179**	0	**0**	179	**179**	179	**179**	179	**179**	179	**179**	179	**179**
	IV GEN3	180	180	**180**	0	**0**	180	**180**	180	**180**	180	**180**	180	**180**	180	**180**
1A	OTAYMGT1	170	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**
1A	OTAYMGT2	170	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**	170	**170**
1A	OTAYMST1	221	143	**151**	52	**60**	143	**157**	143	**151**	141	**148**	143	**152**	143	**152**
4	PEN_CT1	155	0	**0**	155	**155**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
4	PEN_CT2	155	0	**0**	155	**155**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
4	PEN_ST1	230	0	**0**	230	**230**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
27	SOUTHBY6	165	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**
27	SOUTHBY7	165	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**	150	**150**
27	SOUTHBY8	320	200	**200**	310	**310**	200	**200**	200	**200**	200	**200**	200	**200**	200	**200**
	Sub Total	**4166**														
	Pump Storage															
13	LkHodG1	20	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**
13	LkHodG2	20	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**	20	**20**
72	Lee Lake	500	500	**500**	500	**500**	500	**500**	500	**500**	500	**500**	500	**500**	500	**500**
	Sub Total	**540**														
	Steam/GT/Peaker															
	ENCINA5	329	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINA4	299	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	MEF	45	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	CALPK_BD	42	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**
	CALPK_ES	42	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**
	CALPK_EC	42	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**	42	**42**
	LRKSPBD1	46	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**
	LRKSPBD2	46	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**	46	**46**
	MEF	46	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	MMC_ES	35	35	**35**	35	**35**	35	**35**	35	**35**	35	**35**	35	**35**	35	**35**
	OTAY1	49.5	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
90	OTAY2	60	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	MIRAMRGT	17	17	**17**	17	**17**	17	**17**	17	**17**	17	**17**	17	**17**	17	**17**
	MIRAMRGT	16	16	**16**	16	**16**	16	**16**	16	**16**	16	**16**	16	**16**	16	**16**
	KEARN3AB	15	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3AB	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN3CD	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	ELCAJNGT	13	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	ENCINAGT	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARNGT1	15	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2AB	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	14	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
	KEARN2CD	13	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
				0		**0**		**0**		**0**		**0**		**0**		**0**
	SubTotal	**1282**														
	Generation Total	**6874**														

Appendix D - Power Flow Thermal and Post-Transient Voltage Analysis

2008/2009 Light Winter

Thermal Analysis: MVA1

MVA1 pu Loading				Case Name							
Monitored Element	Contingency Description	MVA1	MVA2	08_pre_la2	08_ses_la2	08_pre_la2_ no_ivps	08_ses_la2_ no_ivps	08_pre_la2_l eaps	08_ses_la2_l eaps	08_pre_la3_l eaps	08_ses_la3_l eaps
TRAN COPPERVR 345kV-COPPERVR 230kV ck1	Base system (n-0)	200	224	112%	112%	112%	112%	112%	112%	112%	112%

Thermal MVA2 Violations

		Ratings		Case Name							
Monitored Element	Contingency Description	MVA1	MVA2	08_pre_la2	08_ses_la2	08_pre_la2_ no_ivps	08_ses_la2_ no_ivps	08_pre_la2_l eaps	08_ses_la2_l eaps	08_pre_la3_l eaps	08_ses_la3_l eaps
LINE HRD-230 230kV-ROA-230 230kV ck1	IMPRLVLY - MIGUEL 1 500kV	388	430	130%	142%	128%	139%	128%	139%	131%	144%
	line 500kV IV-ML, IV Generator: SPS6.1	388	430		111%		109%		106%		111%
	line 500kV IV-ML, IV Generator: SPS6.2										
TRAN CMPPSHFT 230kV-CMPNL500 500kV ck1	CMPPSHFT - CMPNL500 2 500/230kV	333	333							108%	107%
TRAN CMPPSHFT 230kV-CMPNL500 500kV ck2	CMPPSHFT - CMPNL500 1 500/230kV	333	333							108%	107%
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck2	IMPRLVLY - IMPRLVLY 1 500/230kV	600	732		120%		112%		121%		120%

Voltage Violations - None

2009 Heavy Summer

Thermal Analysis: MVA1

None

Thermal Analysis: MVA2

MVA2 pu Loading				Case Name							
Monitored Element	Contingency Description	MVA1	MVA2	09hs_alt1_3_pre	09hs_alt1_3_post	09hs_alt1_3_pre_no_ivps	09hs_alt1_3_post_no_ivps	09hs_alt1_4_pre	09hs_alt1_4_post	09hs_alt1_5_pre	09hs_alt1_5_post
TRAN CMPPSHFT 230kV-CMPNL500 500kV ck1	line IV-ML 500kV SPS6.2	333	333		101%		101%				
TRAN CMPPSHFT 230kV-CMPNL500 500kV ck2	line IV-ML 500kV SPS6.2	333	333		101%		101%				
LINE DOUBLTTP 138kV-FRIARS 138kV ck1	PENSQTOS - OLD TOWN 1 230kV	150	150	110%	117%	107%	113%	120%	128%	121%	130%
LINE DOUBLTTP 138kV-PENSQTOS 138kV ck1	PENSQTOS - OLD TOWN 1 230kV	150	150	110%	117%	106%	113%	120%	128%	121%	130%
LINE OLD TOWN 230kV-OLDTWNTP 230kV ck1	SILVERGT - OLD TOWN 1 230kV	456	456	113%	114%	111%	111%	118%	119%	114%	121%
LINE SYCAMORE 230kV-MLSXTAP 230kV ck1	SILVERGT - SOUTHBAY 1 230kV	912	961					103%	101%		102%
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck2	IMPRLVLY - IMPRLVLY 1 500/230kV	600	732	104%	145%		124%		140%		152%
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck1	IMPRLVLY - IMPRLVLY 2 500/230kV	1120	1194								102%
TRAN MIGUEL 230kV-MIGUELMP 500kV ck1	MIGUEL - MIGUEL 2 500/230kV	1120	1329	101%	109%		107%	109%	118%	115%	119%
TRAN MIGUEL 500kV-MIGUELMP 500kV ck1	MIGUEL - MIGUEL 2 500/230kV	1120	1329	102%	110%		108%	110%	119%	116%	120%
TRAN MIGUEL 230kV-MIGUEL 500kV ck2	MIGUEL - MIGUELMP 1 500/230kV	1120	1329	101%	109%		107%	109%	118%	115%	119%
	MIGUEL - MIGUELMP 1 500/500kV	1120	1329	101%	109%		107%	109%	118%	115%	119%
TRAN DEVERS 500kV-DEVERS 230kV ck1	DEVERS - DEVERS 2 230/500kV	1120	1230	100%	102%			106%	107%	108%	109%
TRAN DEVERS 500kV-DEVERS 230kV ck2	DEVERS - DEVERS 1 230/500kV	1120	1230	100%	102%			106%	107%	108%	110%
LINE TALEGA 230kV-S.ONOFRE 230kV ck2	TALEGA - S.ONOFRE 1 230kV	456.1	577.6					114%	112%	114%	112%
LINE TALEGA 230kV-S.ONOFRE 230kV ck1	TALEGA - S.ONOFRE 2 230kV	456.1	577.6					114%	112%	114%	112%

Voltage Analysis

Delta Voltage			Case Name							
BUS Name	Contingency Description	kV	09hs_alt1_3_pre	09hs_alt1_3_post	09hs_alt1_3_pre_no_ivps	09hs_alt1_3_post_no_ivps	09hs_alt1_4_pre	09hs_alt1_4_post	09hs_alt1_5_pre	09hs_alt1_5_post
VALLEYSC	line IV-ML 500kV SPS6.2	115		-5.3%						
	LEELAKE - VALLEYSC 1 500kV	115								-5.1%
ESRP MWD	line IV-ML 500kV SPS6.2	115		-5.3%		-5.1%				
	LEELAKE - VALLEYSC 1 500kV	115								-5.1%

2010 Heavy Summer

Thermal Analysis: MVA1

MVA1 pu Loading				Case Name													
Monitored Element	Contingency Description	MVA1	MVA2	base_v1_pre	base_v1_post	cfe_export_pre	cfe_export_post	cfe_import_pre	cfe_import_post	iid_import_pre	iid_import_post	iv_pst_pre	iv_pst_post	ivbank82_pre	ivbank82_post	low_ivgen_pre	low_ivgen_post
LINE BORREGO 69kV-NARROWS 69kV ck1	Base system (n-0)	10	10	134%	134%	134%	135%	134%	134%	134%	134%	134%	134%	134%	134%	128%	128%
TRAN GILA 161kV-GILA 69kV ck1	Base system (n-0)	100	120	112%	110%	110%	107%	115%	113%	104%	102%	108%	103%	111%	109%	114%	111%
LINE WLTNMOHK 161kV-GILA 161kV ck1	Base system (n-0)	112	120							102%	101%						

Thermal Analysis: MVA2

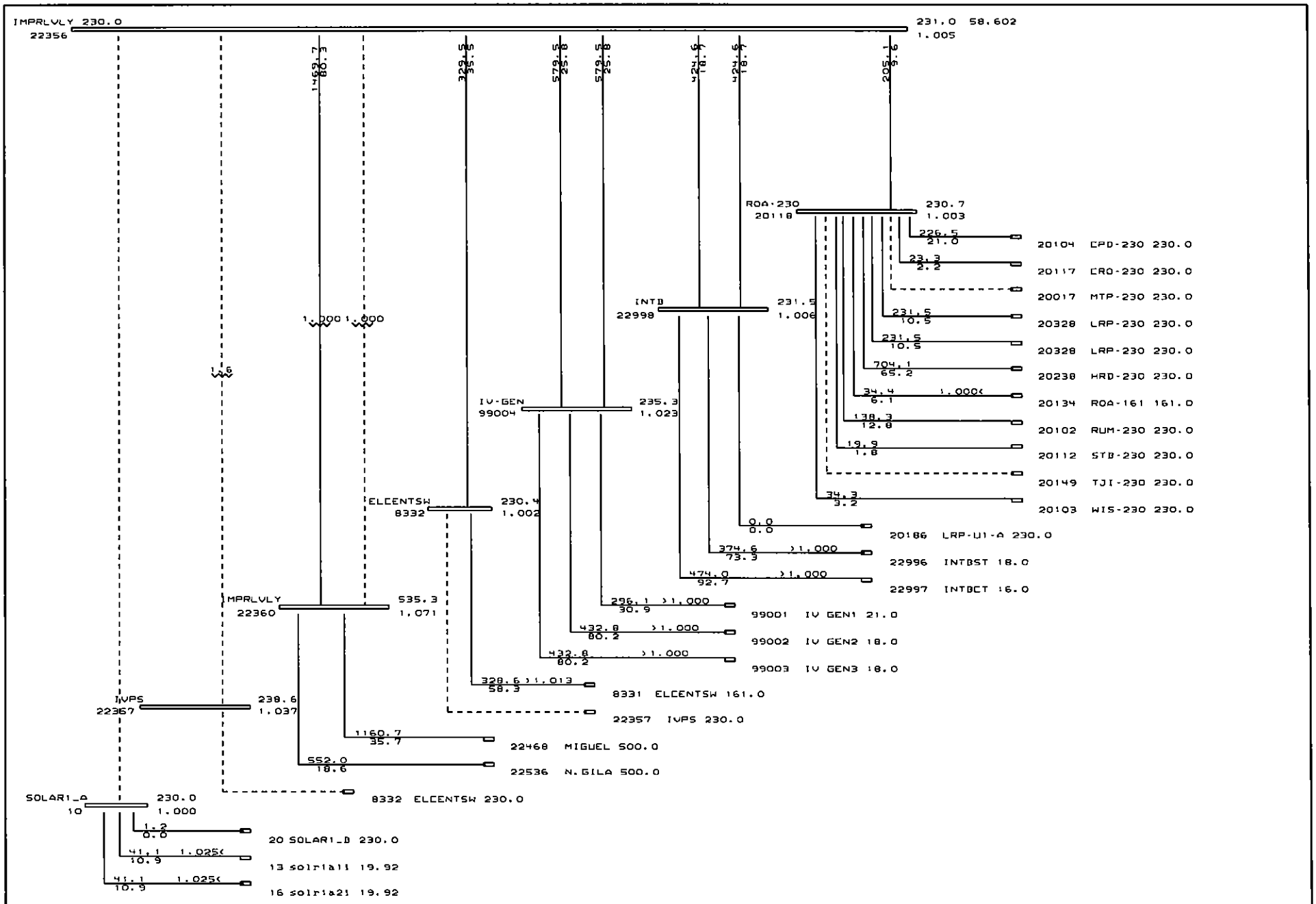
MVA2 pu Loading				Case Name													
Monitored Element	Contingency Description	MVA1	MVA2	base_v1_pre	base_v1_post	cfe_export_pre	cfe_export_post	cfe_import_pre	cfe_import_post	iid_import_pre	iid_import_post	iv_pst_pre	iv_pst_post	ivbank82_pre	ivbank82_post	low_ivgen_pre	low_ivgen_post
TRAN GILA 161kV-GILA 69kV ck1	line KNOB to PILOTKNB 161 ck 1	100	120	126%	122%	122%	118%	131%	127%	131%	126%	127%	123%	126%	122%	132%	128%
	line PILOTKNB to YUCCA 161 ck 1	100	120	103%	102%	101%		105%	104%					102%	100%	103%	102%
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	line CARLTNHS-SANTEE-SX 138	71	71													101%	101%
	line CREELMAN to LOSCOCHS 69 ck 1	71	71	103%	104%	104%	104%	103%	103%	103%	103%	103%	104%	103%	104%	102%	102%
LINE WLTNMOHK 161kV-GILA 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	112	120					103%		107%	104%					104%	101%
	line HASSYAMP to N.GILA 500 ck 1	112	120					102%		106%	103%					103%	
LINE SYCAMORE 230kV-SXCC 230kV ck2	line SYCAMORE to SXCC 230 ck 1 *assoc SPS	796	912			104%	106%										
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	line CANNON-SANLUSRY-SHADOWR 138 *assoc. SPS	63	73	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	106%	106%
LINE ESCNDIDO 69kV-ASH 69kV ck1	line ESCNDIDO to FELICITA 69 ck 1	102	102													102%	101%
	line ESCNDIDO to LILAC 69 ck 1	102	102	104%	104%	104%	104%	105%	104%	104%	104%	104%	104%	104%	104%	108%	108%
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	line MELROSE to SANLUSRY 69 ck 1	97	102	105%	104%	103%	102%	107%	106%	106%	104%	104%	103%	105%	104%		
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck2	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	600	732		124%	105%	135%		108%		102%		134%				
	line OMGP-TJI-230 230kV	600	732				110%										
	line OTAYMESA to TJI 230	600	732				110%										
	line OTAYMESA to TJI-230 230 ck 1	600	732				110%										
LINE FRIARS 138kV-MISSION 138kV ck1	tran PENSQTOS 230 to PENSQTOS 138 ck 1	150.8	150.8	105%	108%	110%	113%		103%	102%	105%	105%	109%	105%	108%		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	tran SYCAMORE 230 to SYCAMORE 69 ck 1	224	269	101%	102%	103%	104%		101%	100%	101%	102%	103%	101%	102%		
TRAN CIP-230 230kV-CIP-115 115kV ck1	tran PJZ-230 230 to PJZ-115 115 ck 1	100	100	120%	120%	121%	121%	121%	121%	120%	120%	120%	120%	120%	121%	120%	120%
LINE SILVERGT 230kV-OLD TOWN 230kV ck1	line OLD TOWN to MISSION 230 ck 2	456	588				103%										
	line SILVERGT-OLDTWNTP-MISSION 230	456	588				103%										
LINE SYCAMORE 230kV-SXCC 230kV ck1	line SYCAMORE to SXCC 230 ck 1	796.7	968				100%										
LINE MLSXTAP 230kV-SXCC 230kV ck1	line SILVERGT to SOUTHBAY 230	796.7	968				102%										
LINE SILVERGT 230kV-OLDTWNTP 230kV ck1	line SILVERGT to OLD TOWN 230	456	588				104%										
LINE OLD TOWN 230kV-OLDTWNTP 230kV ck1	line SILVERGT to OLD TOWN 230	456.1	456			106%	110%										
LINE TALEGA 230kV-S.ONOFRE 230kV ck1	line TALEGA to S.ONOFRE 230 ck 2 *assoc SPS	456	577					100%									
LINE TALEGA 230kV-S.ONOFRE 230kV ck2	line TALEGA to S.ONOFRE 230 ck 1 *assoc SPS	456	577					100%									
LINE KNOB 161kV-PILOTKNB 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	165	165					102%		115%	104%					105%	
	line HASSYAMP to N.GILA 500 ck 1	165	165							104%							
TRAN PILOTKNB 161kV-PILOTKNB 92kV ck1	line N.GILA to IMPRLVLY 500 ck 1	75	75					101%		118%	106%					105%	

2010 Heavy Summer

Voltage Analysis

Delta Voltage				Case Name													
BUS Name	Contingency Description	kV		base_v1_pre	base_v1_post	cfe_export_pre	cfe_export_post	cfe_import_pre	cfe_import_post	iid_import_pre	iid_import_post	iv_pst_pre	iv_pst_post	ivbank82_pre	ivbank82_post	low_ivgen_pre	low_ivgen_post
N.GILA 4	tran N.GILA 500 to N.GILA 69 ck 1	100		5.1%				5.3%	5.2%	5.1%							
CENTRALX	line IV-ML 500kV SPS6.2	500							-5.4%								
	line IV-ML 500kV SPS 6.8	230							-5.7%								
		500							-5.8%								
SAF-115	line CIP-115 to EMND-115 115 ck 1	115		-10.5%	-10.6%	-10.3%	-10.3%	-11.0%	-11.1%	-10.5%	-10.5%	-10.5%	-10.6%	-10.5%	-10.5%	-10.1%	-10.2%
	line KON-115 to CIP-115 115 ck 1	115		-7.8%	-7.8%	-7.7%	-7.7%	-8.1%	-8.1%	-7.8%	-7.8%	-7.8%	-7.8%	-7.8%	-7.8%	-7.6%	-7.7%
	tran PJZ-230 230 to PJZ-115 115 ck 1	115						-5.1%	-5.2%								
SIM-115	line CIP-115 to EMND-115 115 ck 1	115		-10.3%	-10.4%	-10.1%	-10.1%	-10.8%	-10.9%	-10.3%	-10.3%	-10.3%	-10.3%	-10.3%	-10.3%	-9.9%	-10.0%
	line KON-115 to CIP-115 115 ck 1	115		-7.7%	-7.7%	-7.6%	-7.6%	-7.9%	-7.9%	-7.7%	-7.7%	-7.7%	-7.7%	-7.7%	-7.7%	-7.5%	-7.5%
	tran PJZ-230 230 to PJZ-115 115 ck 1	115							-5.1%								
SQN-115	line CIP-115 to EMND-115 115 ck 1	115		-10.2%	-10.3%	-10.0%	-10.1%	-10.7%	-10.8%	-10.2%	-10.2%	-10.2%	-10.3%	-10.2%	-10.2%	-9.8%	-9.9%
	line KON-115 to CIP-115 115 ck 1	115		-7.6%	-7.6%	-7.5%	-7.5%	-7.9%	-7.9%	-7.6%	-7.6%	-7.6%	-7.6%	-7.6%	-7.6%	-7.4%	-7.5%
	line KON-115 to SQN-115 115 ck 1	115		5.8%	5.8%	5.7%	5.7%	6.4%	6.5%	5.7%	5.8%	5.8%	5.8%	5.8%	5.8%	5.1%	5.3%
	tran PJZ-230 230 to PJZ-115 115 ck 1	115							-5.1%								
VALLEYSC	line VALLEY to LEE LAKE 500 ck 1	115		-5.4%	-5.5%	-5.5%	-5.6%	-5.2%	-5.4%	-5.4%	-5.6%	-5.4%	-5.6%	-5.4%	-5.5%	-5.2%	-5.3%
		500			-5.1%	-5.1%	-5.2%				-5.2%		-5.2%		-5.1%		
	line LEELAKE to VALLEYSC 500 ck 1	115		-5.4%	-5.5%	-5.5%	-5.6%	-5.2%	-5.4%	-5.4%	-5.6%	-5.4%	-5.6%	-5.4%	-5.5%	-5.2%	-5.3%
		500			-5.1%	-5.1%	-5.2%				-5.2%		-5.2%		-5.1%		
VALLEY-S	line VALLEY to LEE LAKE 500 ck 1	115		-5.2%	-5.3%	-5.3%	-5.4%		-5.2%	-5.2%	-5.4%	-5.2%	-5.4%	-5.2%	-5.3%		-5.1%
	line LEELAKE to VALLEYSC 500 ck 1	115		-5.2%	-5.3%	-5.3%	-5.4%		-5.2%	-5.2%	-5.4%	-5.2%	-5.4%	-5.2%	-5.3%		-5.1%
ESRP MWD	line VALLEY to LEE LAKE 500 ck 1	115		-5.4%	-5.5%	-5.5%	-5.7%	-5.2%	-5.4%	-5.5%	-5.6%	-5.4%	-5.6%	-5.4%	-5.5%	-5.2%	-5.3%
	line LEELAKE to VALLEYSC 500 ck 1	115		-5.4%	-5.5%	-5.5%	-5.7%	-5.2%	-5.4%	-5.5%	-5.6%	-5.4%	-5.6%	-5.4%	-5.5%	-5.2%	-5.3%
ESCNDO50	line SHADOWR to ESCNDO50 138 ck 1	138		-8.6%	-8.5%	-8.5%	-8.4%	-8.6%	-8.5%	-8.6%	-8.5%	-8.6%	-8.5%	-8.6%	-8.5%	-7.8%	-7.7%
EMND-115	line CIP-115 to EMND-115 115 ck 1	115		-13.0%	-13.0%	-12.8%	-12.8%	-13.5%	-13.6%	-13.0%	-13.0%	-13.0%	-13.0%	-13.0%	-13.0%	-12.5%	-12.7%
ENT-115	line CIP-115 to EMND-115 115 ck 1	115		-10.2%	-10.3%	-10.0%	-10.1%	-10.8%	-10.8%	-10.2%	-10.2%	-10.2%	-10.3%	-10.2%	-10.3%	-9.8%	-9.9%
	line KON-115 to CIP-115 115 ck 1	115		-7.6%	-7.6%	-7.5%	-7.6%	-7.9%	-7.9%	-7.6%	-7.6%	-7.6%	-7.6%	-7.6%	-7.6%	-7.4%	-7.5%
	tran PJZ-230 230 to PJZ-115 115 ck 1	115							-5.1%								
EPCH-115	line CIP-115 to EMND-115 115 ck 1	115		-12.3%	-12.4%	-12.1%	-12.2%	-12.8%	-12.9%	-12.3%	-12.3%	-12.3%	-12.3%	-12.3%	-12.3%	-11.8%	-12.0%
KON-115	line CIP-115 to EMND-115 115 ck 1	115		-9.3%	-9.4%	-9.2%	-9.2%	-9.8%	-9.8%	-9.3%	-9.3%	-9.3%	-9.4%	-9.3%	-9.4%	-9.0%	-9.1%
	line KON-115 to CIP-115 115 ck 1	115		-7.0%	-7.0%	-6.9%	-6.9%	-7.2%	-7.2%	-7.0%	-7.0%	-7.0%	-7.0%	-7.0%	-7.0%	-6.8%	-6.9%
MIN-115	line CIP-115 to EMND-115 115 ck 1	115		-10.3%	-10.4%	-10.1%	-10.1%	-10.8%	-10.9%	-10.3%	-10.3%	-10.3%	-10.3%	-10.3%	-10.3%	-9.9%	-10.0%
	line KON-115 to CIP-115 115 ck 1	115		-7.7%	-7.7%	-7.6%	-7.6%	-7.9%	-7.9%	-7.7%	-7.7%	-7.7%	-7.7%	-7.7%	-7.7%	-7.5%	-7.5%
	tran PJZ-230 230 to PJZ-115 115 ck 1	115							-5.1%								
MND-115	line CIP-115 to EMND-115 115 ck 1	115		-13.0%	-13.1%	-12.8%	-12.8%	-13.6%	-13.6%	-13.0%	-13.0%	-13.0%	-13.0%	-13.0%	-13.0%	-12.5%	-12.7%
PCH-115	line CIP-115 to EMND-115 115 ck 1	115		-12.3%	-12.4%	-12.1%	-12.2%	-12.9%	-12.9%	-12.3%	-12.3%	-12.3%	-12.4%	-12.3%	-12.3%	-11.9%	-12.0%
SVE-115	line CIP-115 to EMND-115 115 ck 1	115		-10.1%	-10.2%	-10.0%	-10.0%	-10.6%	-10.7%	-10.1%	-10.1%	-10.1%	-10.2%	-10.1%	-10.1%	-9.7%	-9.9%
	line KON-115 to CIP-115 115 ck 1	115		-6.0%	-6.1%	-6.0%	-6.0%	-6.2%	-6.3%	-6.0%	-6.1%	-6.1%	-6.1%	-6.0%	-6.1%	-5.9%	-5.9%
TRI-115	line CIP-115 to EMND-115 115 ck 1	115		-9.8%	-9.9%	-9.7%	-9.7%	-10.3%	-10.4%	-9.8%	-9.8%	-9.8%	-9.9%	-9.8%	-9.9%	-9.4%	-9.6%
	line KON-115 to CIP-115 115 ck 1	115		-7.3%	-7.4%	-7.3%	-7.3%	-7.6%	-7.6%	-7.3%	-7.3%	-7.3%	-7.4%	-7.3%	-7.4%	-7.2%	-7.2%
MSN-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-9.7%	-9.8%	-9.0%	-9.0%	-10.0%	-10.0%	-9.7%	-9.7%	-9.7%	-9.8%	-9.7%	-9.8%	-9.6%	-9.6%
PNV-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-11.6%	-11.6%	-10.8%	-10.8%	-11.8%	-11.8%	-11.6%	-11.6%	-11.6%	-11.6%	-11.6%	-11.6%	-11.5%	-11.5%
JAT-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-8.0%	-8.0%	-7.3%	-7.3%	-8.2%	-8.2%	-8.0%	-8.0%	-8.0%	-8.0%	-8.0%	-8.0%	-7.8%	-7.9%
PJZ-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-13.7%	-13.7%	-12.8%	-12.8%	-13.9%	-13.9%	-13.7%	-13.7%	-13.7%	-13.7%	-13.7%	-13.7%	-13.6%	-13.6%
POP-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-12.4%	-12.4%	-11.5%	-11.5%	-12.6%	-12.6%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.3%	-12.3%
SAZ-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-7.3%	-7.3%	-6.6%	-6.6%	-7.5%	-7.6%	-7.3%	-7.3%	-7.3%	-7.3%	-7.3%	-7.3%	-7.1%	-7.2%
PNM-115	tran PJZ-230 230 to PJZ-115 115 ck 1	115		-13.8%	-13.8%	-12.9%	-12.9%	-13.9%	-14.0%	-13.8%	-13.8%	-13.8%	-13.8%	-13.8%	-13.8%	-13.7%	-13.7%

Appendix E - Power Flow Plots

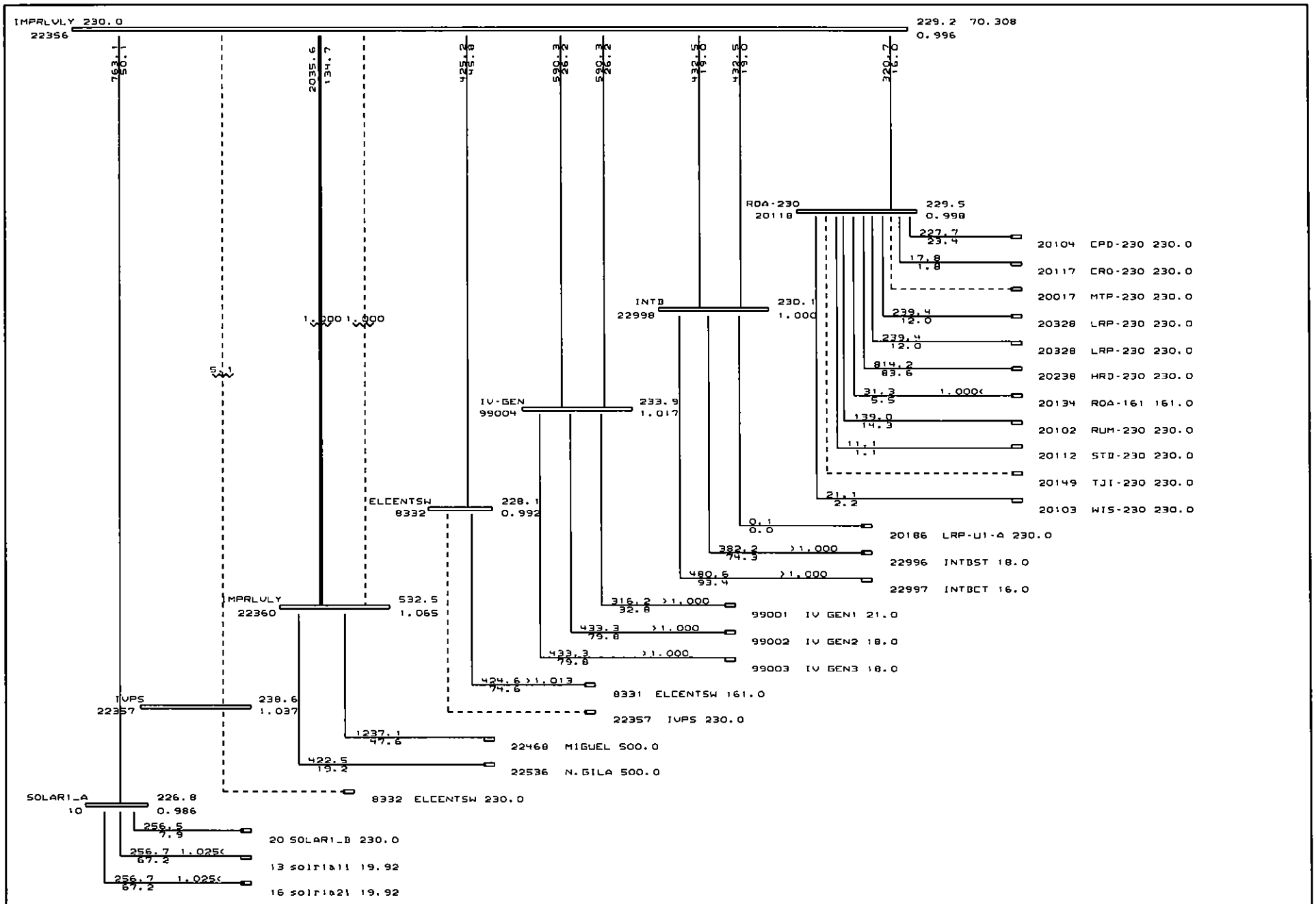


08_pre_1a2_no_ivps.sav

P mis = -0.0006 MW

Wed Aug 16 08:30:07 2006

	SES System Impact Study 2008/2009 light winter, pre-SES No IV Phase Shifter sensitivity		PSLF Program Rating =1



08_ses_1a2_no_ivps.sav

P mis = -0.0005 MW

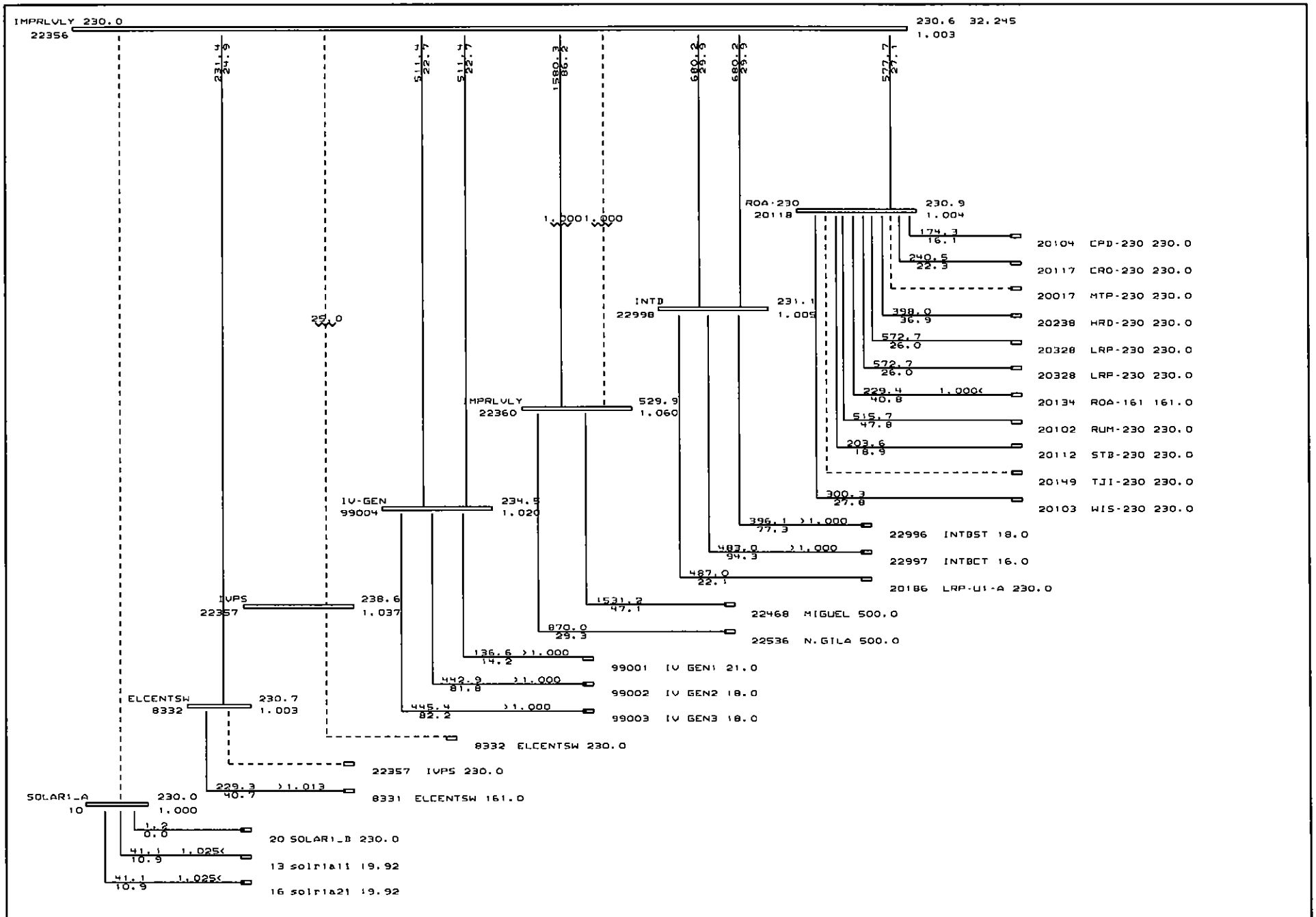
Q mis = 0.0005 MVAR

Mon Aug 21 06:56 2006

SES System Impact Study
2008/2009 light winter, post-SES
No IV Phase Shifter sensitivity

PSLF Program

Rating =1



09hs_alt1_3_pre_no_ivps.sav

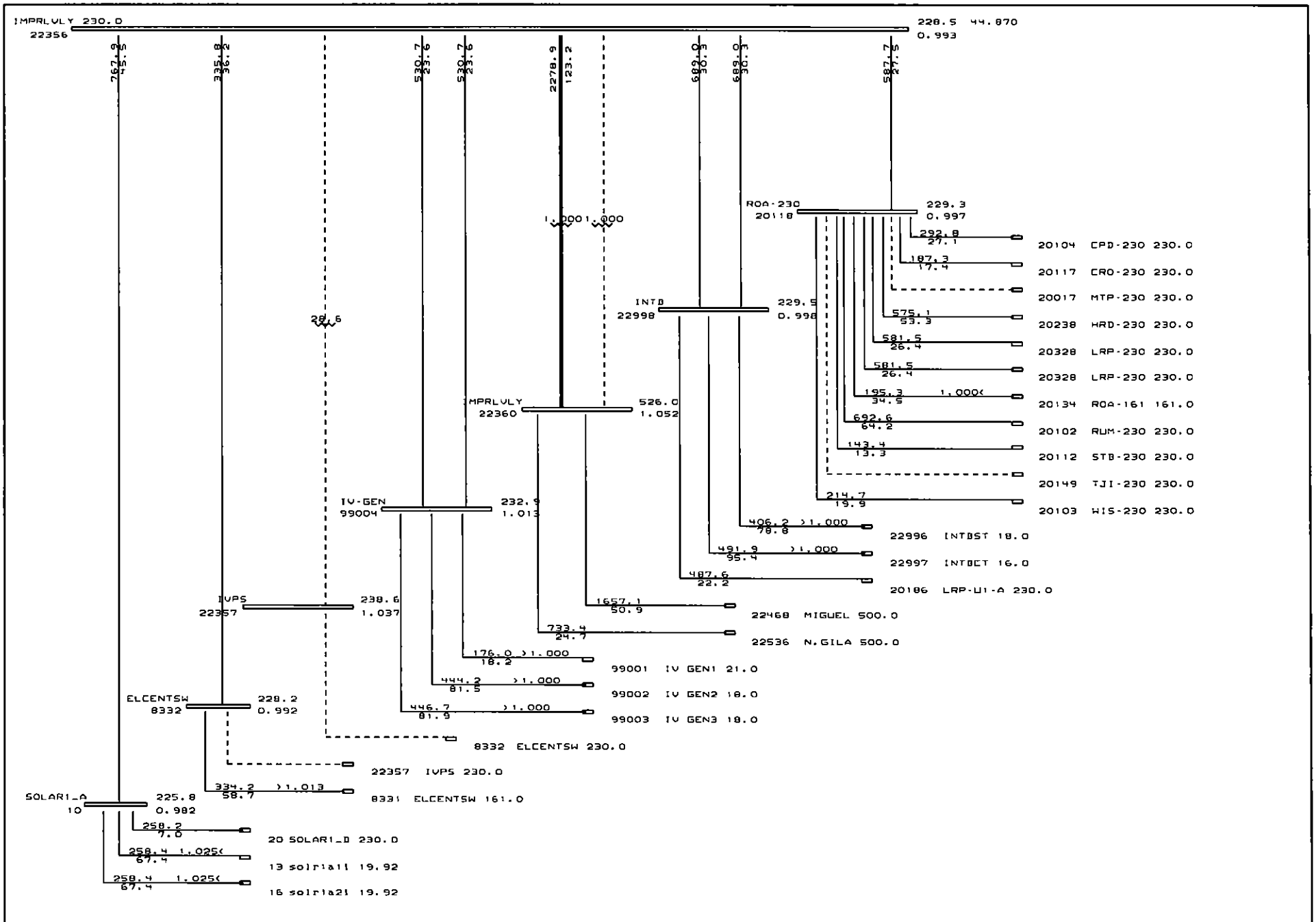
P mis = 0.0011 MW

Mon Aug 21 11:36:08 2006

SES System Impact Study
2009 heavy summer, pre-SES
No IV Phase Shifter sensitivity

PSLF Program

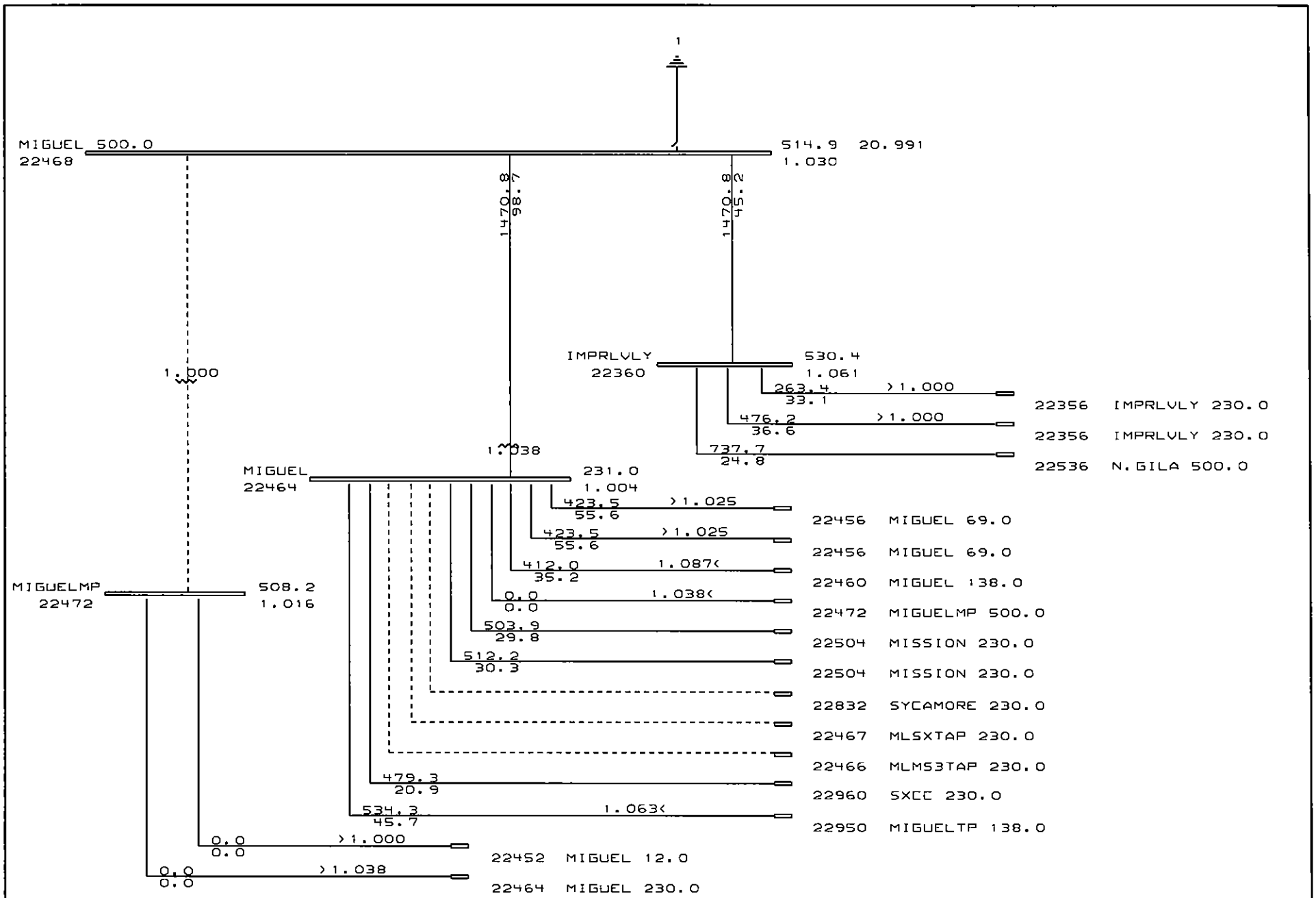
Rating =2



09hs_alt1_3_post_no_ivps.sav

P mis = 0.0002 MW Q mis = 0.0021 MVAR Mon Aug 21 08:38:59 2006

SES System Impact Study 2009 heavy summer, Post-SES No IV Phase Shifter sensitivity		PSLF Program Rating =2



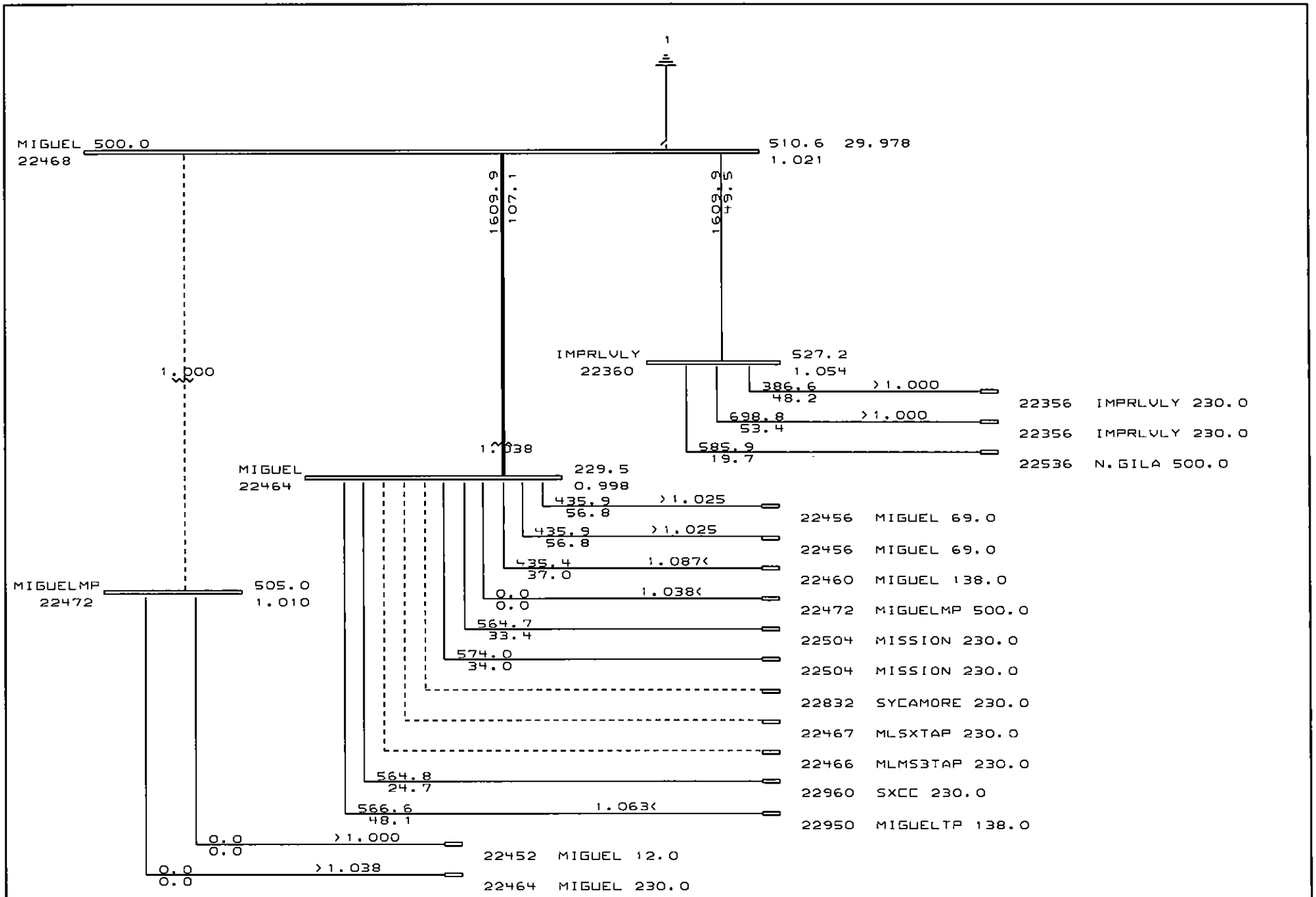
09hs_alt1_3_pre_no_ivps.sav

P mis = 0.0005 MW Q mis = 0.0007 MVAR
Mon Aug 21 11:37:02 2006

SES System Impact Study
2009 heavy summer, pre-SES
No IV Phase Shifter sensitivity

PSLF Program

Rating =2



09hs_alt1_3_post_no_ivps.sav

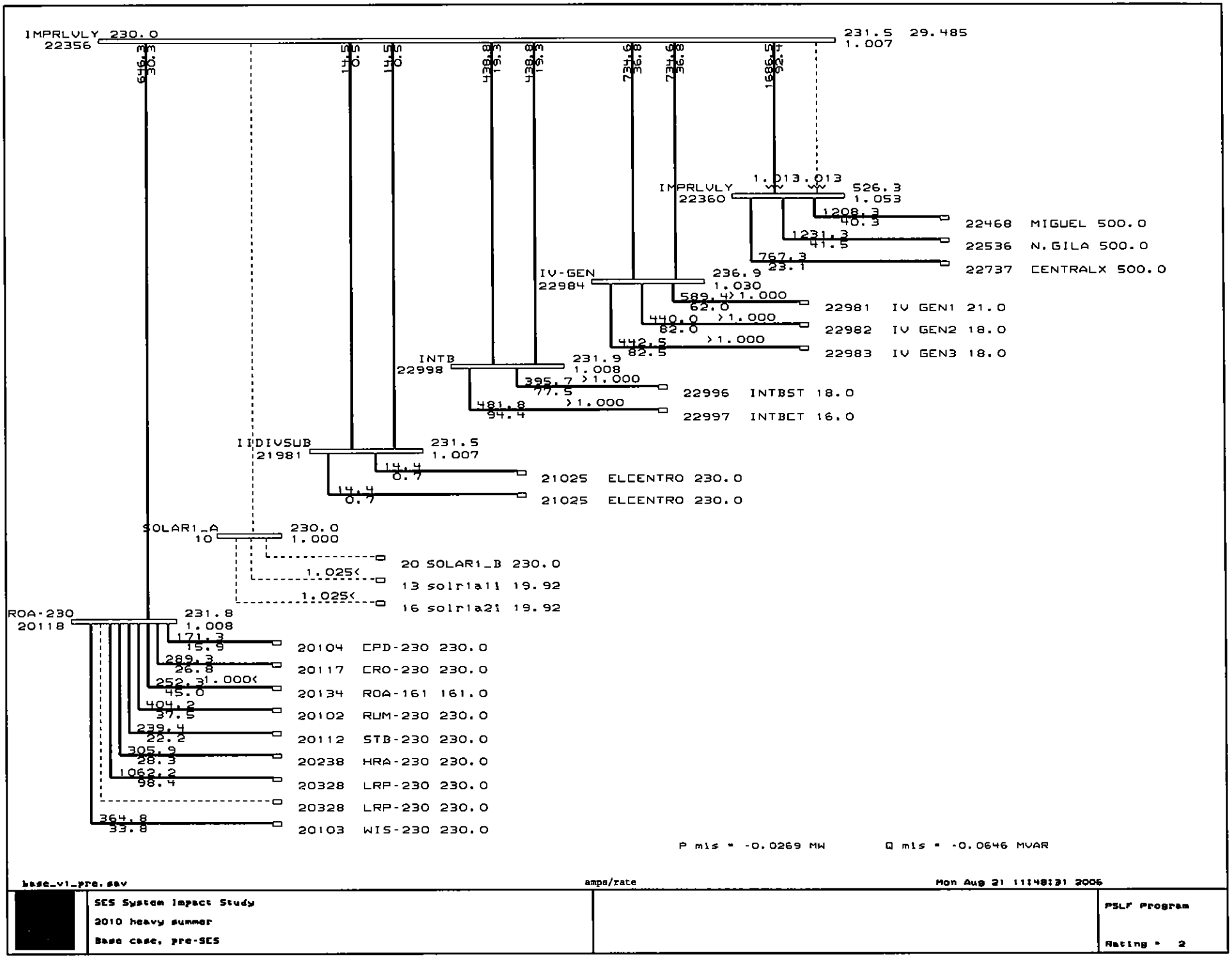
P mis = -0.0010 MW Q mis = 0.0010 MVAR

Mon Aug 21 11:38:33 2006

SES System Impact Study
2009 heavy summer, Post-SES
No IV Phase Shifter sensitivity

PSLF Program

Rating =2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646.3
30.3
14.5
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19.3
438.8
19.3
734.6
36.8
734.6
36.8
1686.5
92.4
1.013 1.013
IMPRLVLY
22360
526.3
1.053
1208.3
46.3
1231.3
41.5
767.3
23.1
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22536 N.GILA 500.0
22737 CENTRALX 500.0
IV-GEN
22984
236.9
1.030
589.4 > 1.000
62.0
440.0 > 1.000
82.0
442.5 > 1.000
82.5
22981 IV GEN1 21.0
22982 IV GEN2 18.0
22983 IV GEN3 18.0
INTB
22998
231.9
1.008
395.7 > 1.000
77.5
481.8 > 1.000
94.4
22996 INTBST 18.0
22997 INTBCT 16.0
IIDIVSUB
21981
231.5
1.007
14.4
0.7
14.4
0.7
21025 ELCENTRO 230.0
21025 ELCENTRO 230.0
SOLAR1_A
10
230.0
1.000
1.025<
1.025<
20 SOLAR1_B 230.0
13 solr1a11 19.92
16 solr1a21 19.92
ROA-230
20118
231.8
1.008
171.3
15.9
289.3
26.8
252.3 1.000<
45.6
404.2
37.5
239.4
22.2
305.9
28.3
1062.2
98.4
364.8
33.8
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SES System Impact Study
2010 heavy summer
Base case, pre-SES
PSLF Program
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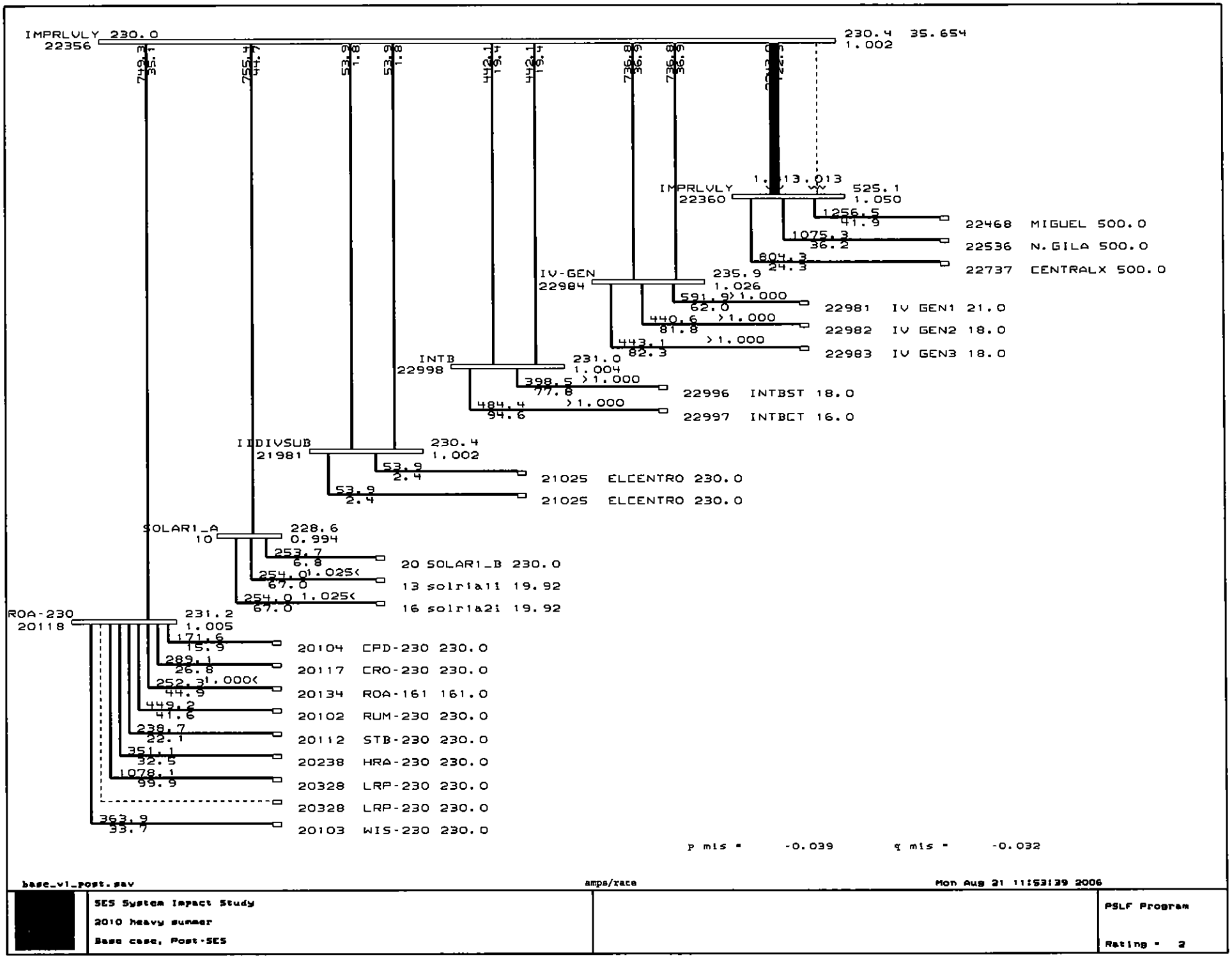
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442.1
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442.1
19.4
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36.9
736.8
36.9
1.013
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22360
525.1
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1256.5
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22468 MIGUEL 500.0
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36.2
22536 N.GILA 500.0
804.3
24.3
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IV-GEN
22984
235.9
1.026
591.9 >1.000
62.0
22981 IV GEN1 21.0
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81.8
22982 IV GEN2 18.0
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82.3
22983 IV GEN3 18.0
INTB
22998
231.0
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484.4 >1.000
94.6
22997 INTBCT 16.0
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230.4
1.002
53.9
2.4
21025 ELCENTRO 230.0
53.9
2.4
21025 ELCENTRO 230.0
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228.6
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20 SOLAR1_B 230.0
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67.0
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254.0 1.025<
67.0
16 solr1a21 19.92
ROA-230
20118
231.2
1.005
171.6
15.9
20104 CPD-230 230.0
289.1
26.8
20117 CRO-230 230.0
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44.9
20134 ROA-161 161.0
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41.6
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238.7
22.1
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32.5
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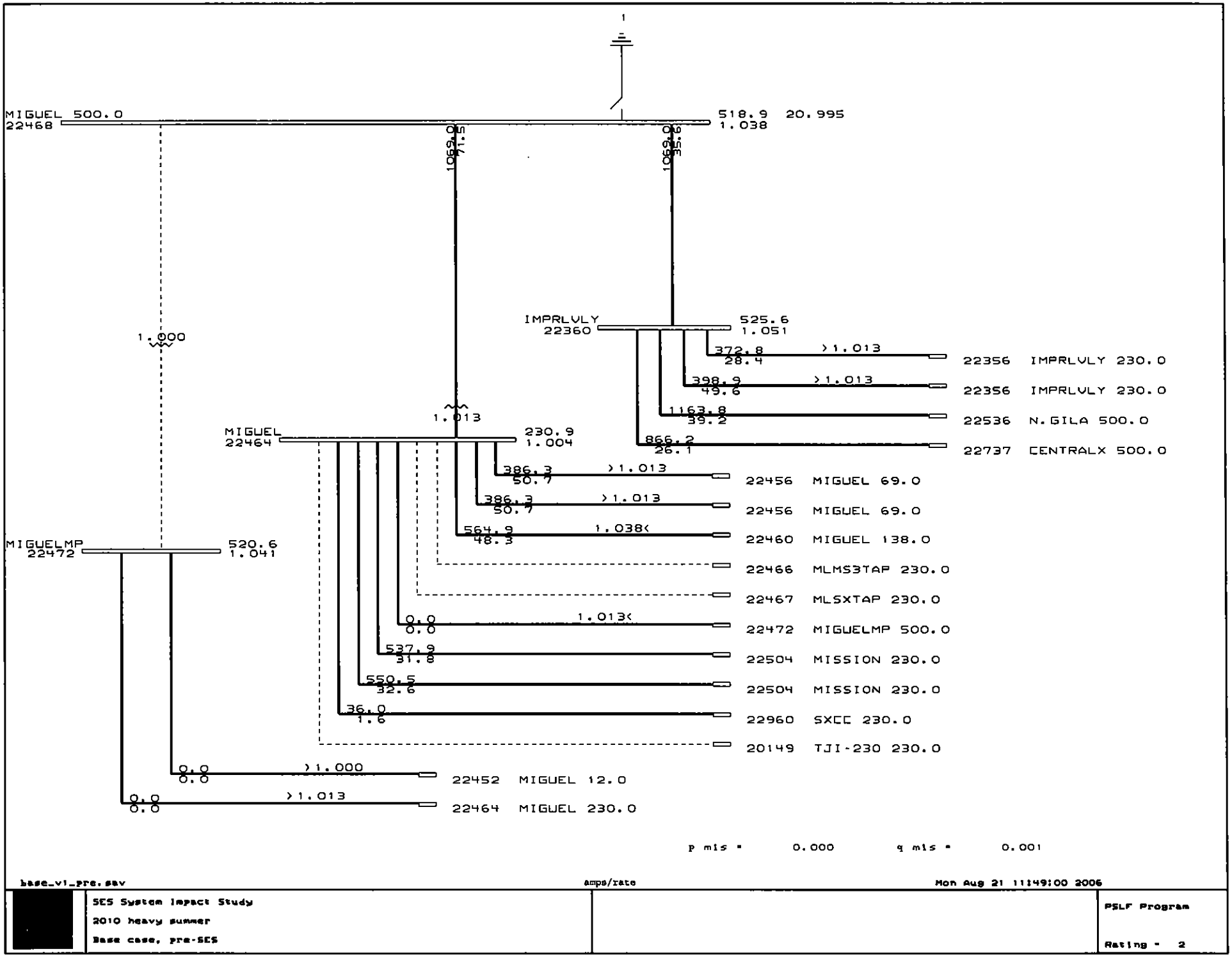
SCS System Impact Study
2010 Heavy Summer
Base case, Post-SCS
PSLF Program
Rating = 2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372.8
28.4
>1.013
22356 IMPRLVLY 230.0
398.9
49.6
>1.013
22356 IMPRLVLY 230.0
1163.8
39.2
22536 N.GILA 500.0
866.2
26.1
22737 CENTRALX 500.0
1.013
MIGUEL
22464
230.9
1.004
386.3
50.7
>1.013
22456 MIGUEL 69.0
386.3
50.7
>1.013
22456 MIGUEL 69.0
564.9
48.3
1.038<
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22466 MLMS3TAP 230.0
22467 MLSXTAP 230.0
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0.0
1.013<
22472 MIGUELMP 500.0
537.9
31.8
22504 MISSION 230.0
550.5
32.6
22504 MISSION 230.0
36.0
1.6
22960 SXCC 230.0
20149 TJI-230 230.0
MIGUELMP
22472
520.6
1.041
0.0
0.0
>1.000
22452 MIGUEL 12.0
0.0
0.0
>1.013
22464 MIGUEL 230.0
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SES System Impact Study
2010 heavy summer
Base case, pre-SES
PSLF Program
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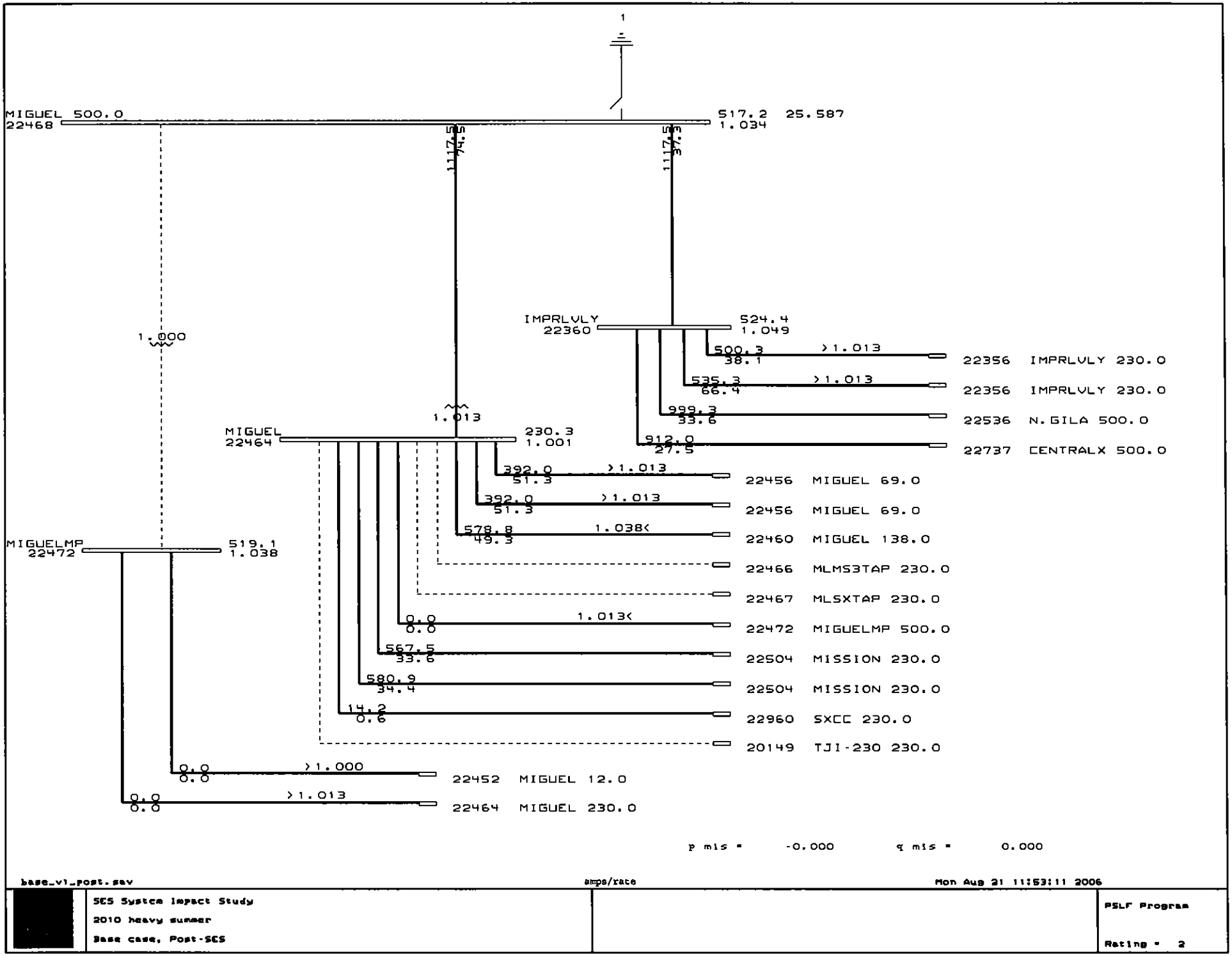
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524.4
1.049
500.3
38.1
>1.013
22356 IMPRLVLY 230.0
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66.4
>1.013
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MIGUEL
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51.3
>1.013
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51.3
>1.013
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MIGUELMP
22472
519.1
1.038
0.0
0.0
>1.000
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>1.013
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SCS System Impact Study
2010 heavy summer
Base case, Post-SCS
PSLF Program
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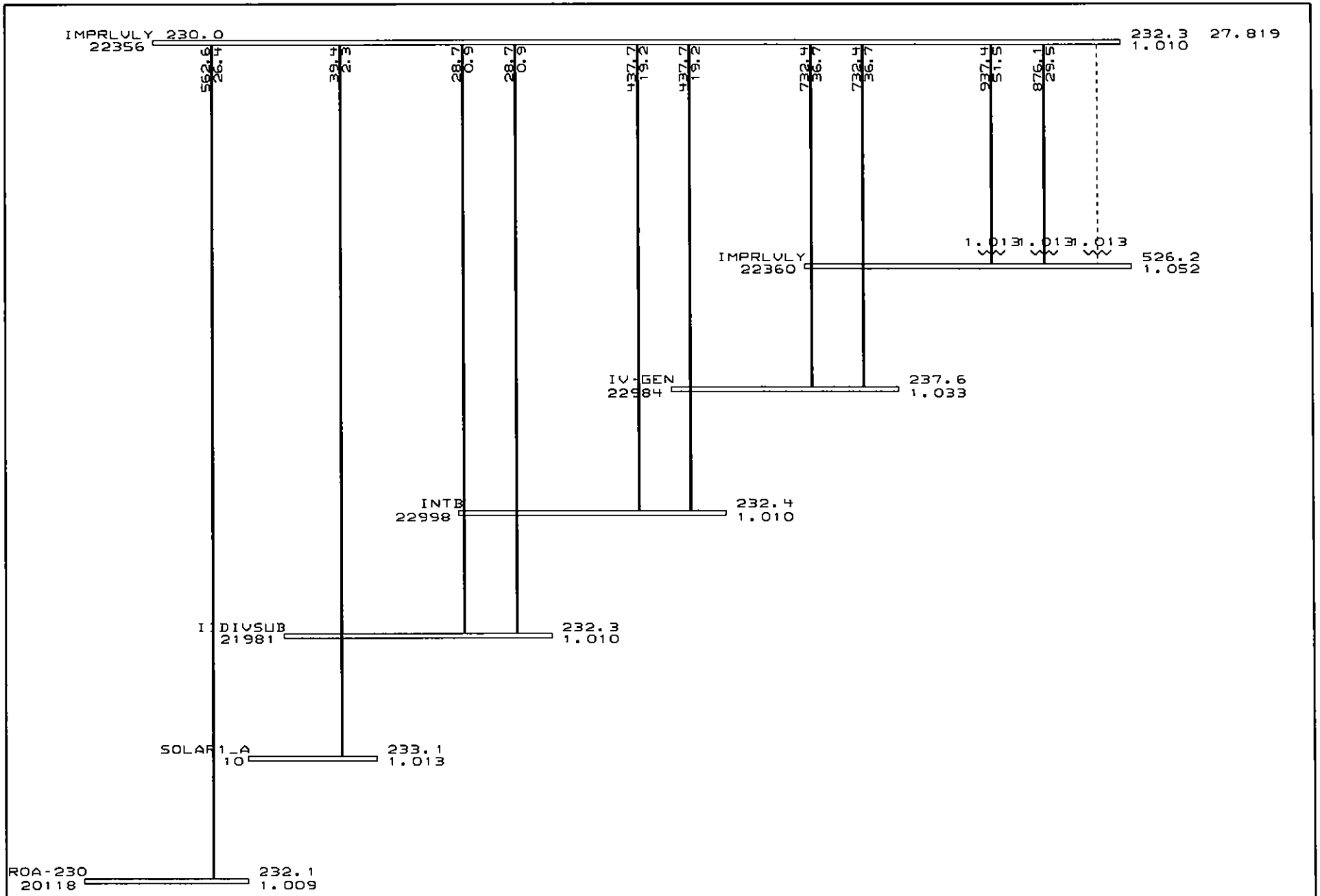
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437.7 19.2
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732.4 36.7
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876.1 29.5
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IMPRLVLY
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IV-GEN
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237.6
1.033
INTB
22998
232.4
1.010
I DIVSUB
21981
232.3
1.010
SOLAR1_A
10
233.1
1.013
ROA-230
20118
232.1
1.009
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q mis = -0.005
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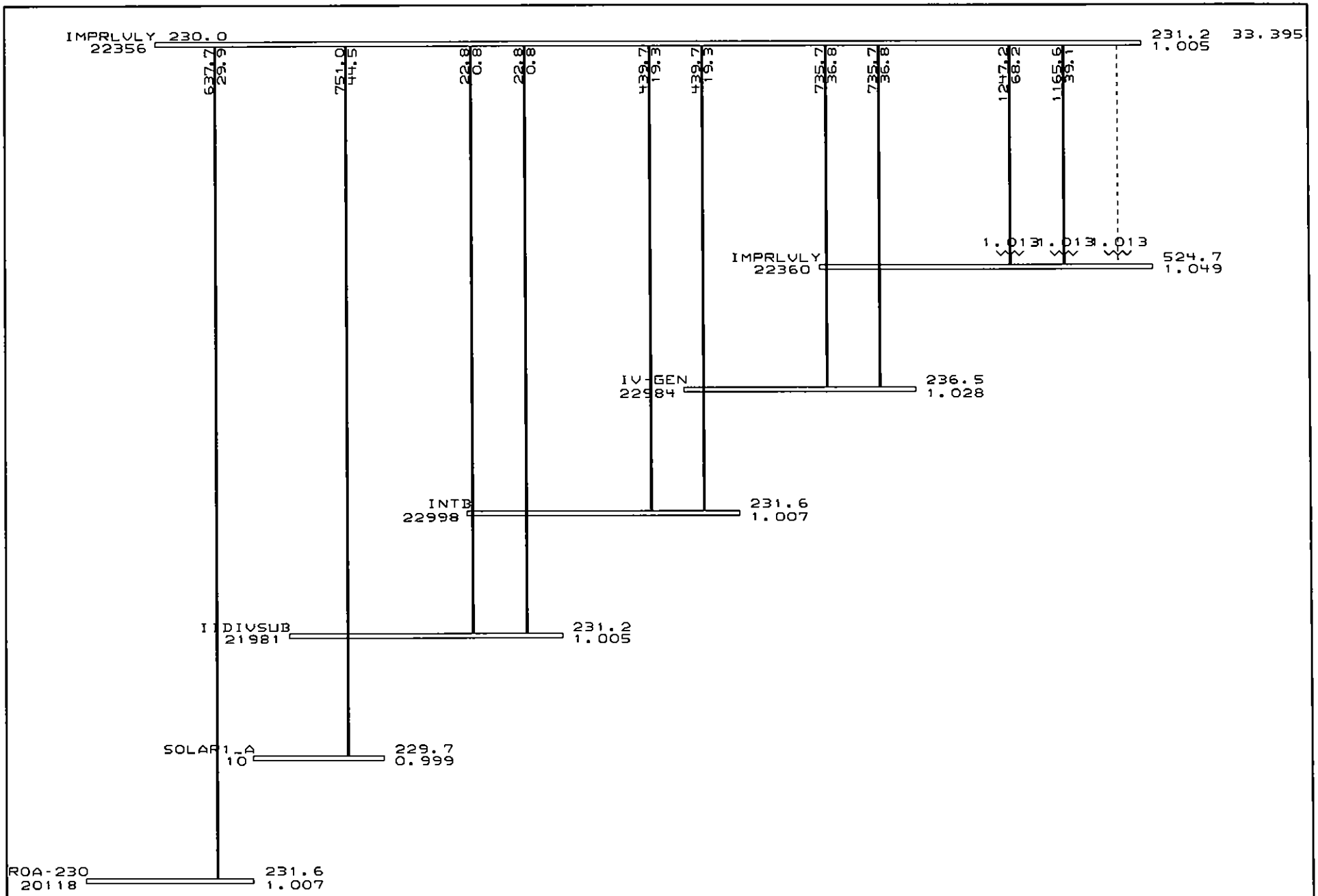
SCS System Impact Study
2010 heavy summer, Pre-SCS
IV Bank 82 Sensitivity
PSLF Program
Rating = 2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0.8
439.7
19.3
439.7
19.3
735.7
36.8
735.7
36.8
1247.2
68.2
1165.6
38.1
1.013
1.013
1.013
IMPRLVLY
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524.7
1.049
IV-GEN
22984
236.5
1.028
INTB
22998
231.6
1.007
IIDIVSUB
21981
231.2
1.005
SOLAR1_A
10
229.7
0.999
ROA-230
20118
231.6
1.007
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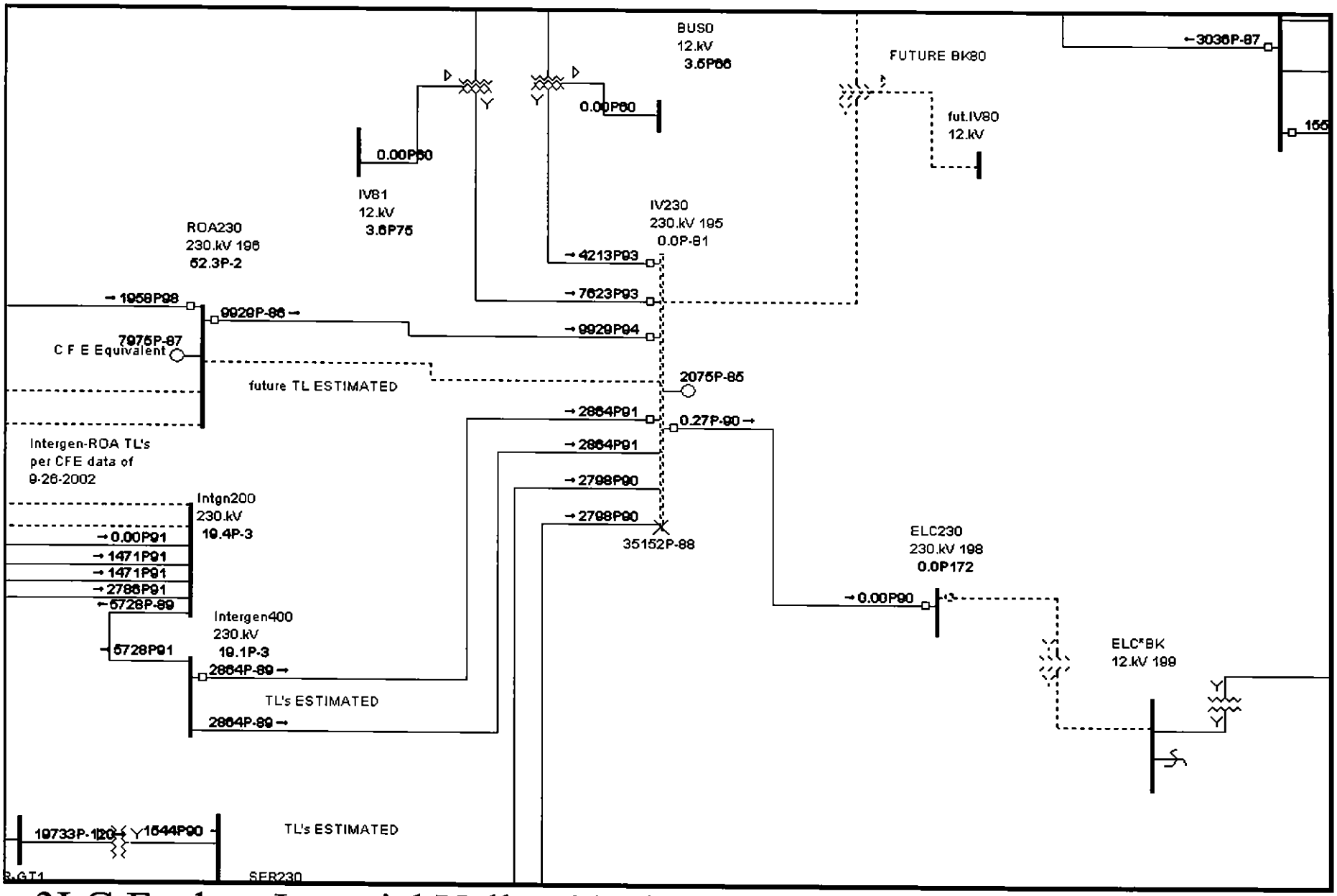
SES System Impact Study
2010 heavy summer, Post-SES
IV Bank 82 Sensitivity
PSLF Program
Rating = 2

Appendix F - Short Circuit Plots



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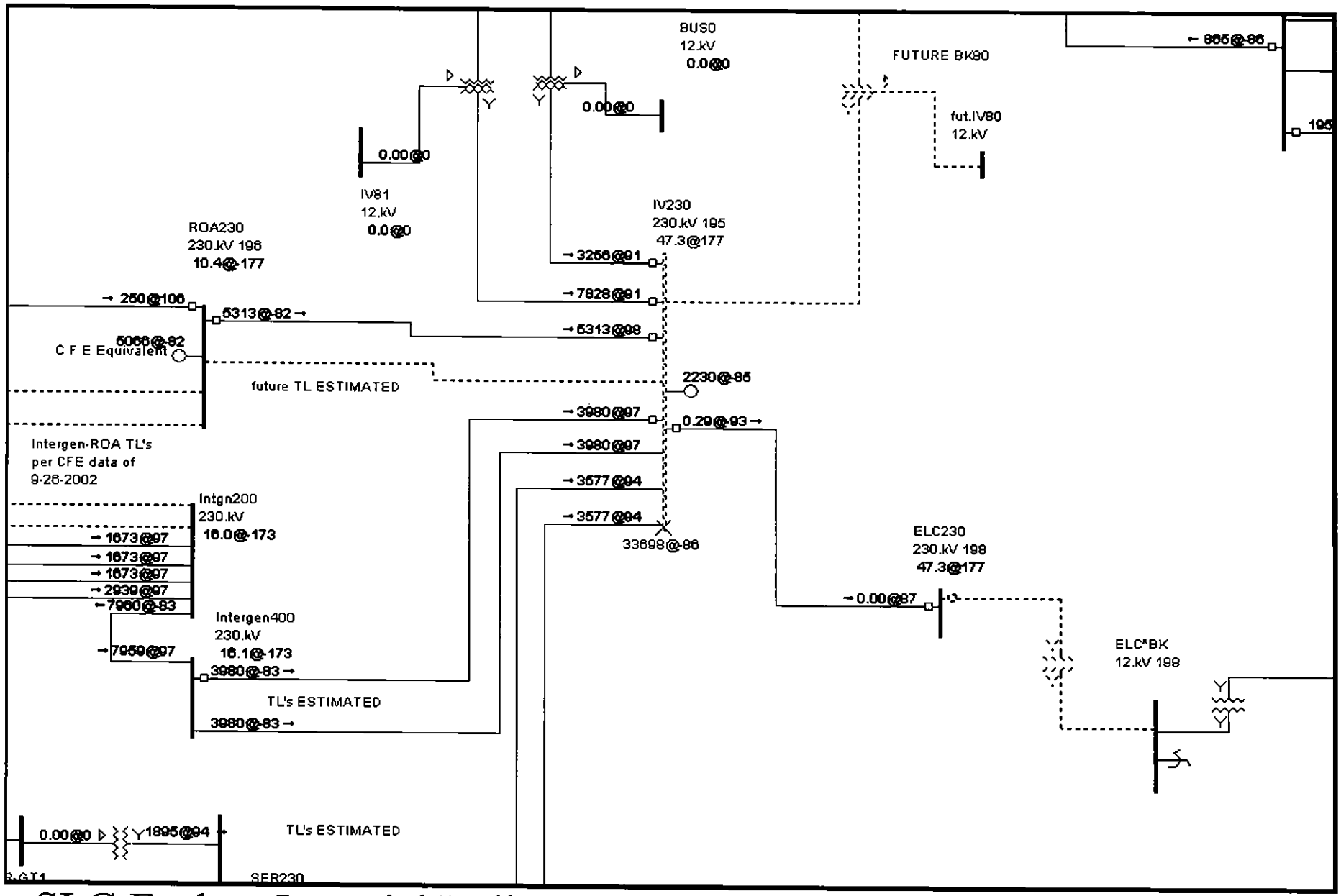
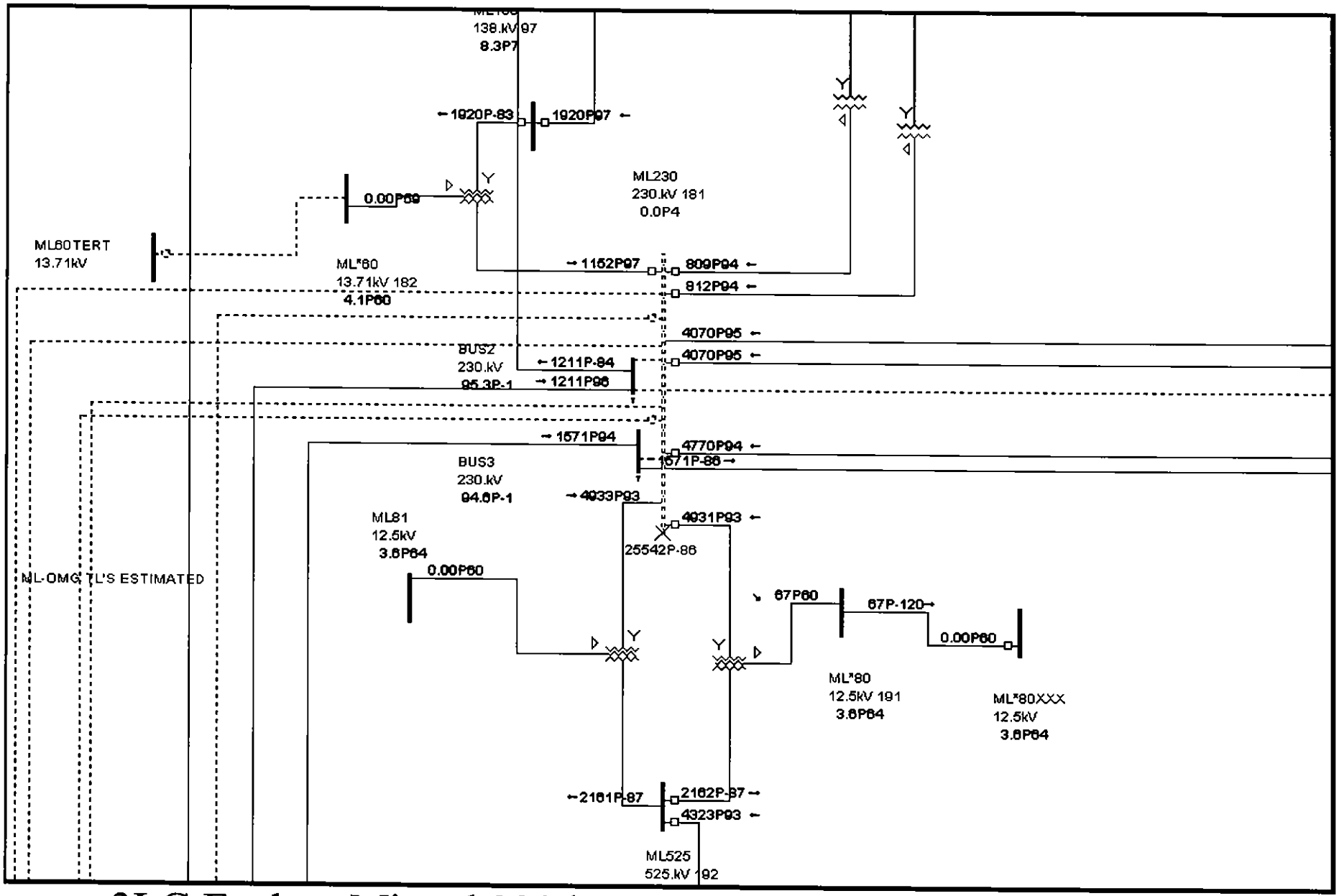


SLG Fault at Imperial Valley 230 kV Bus (Pre-Project)



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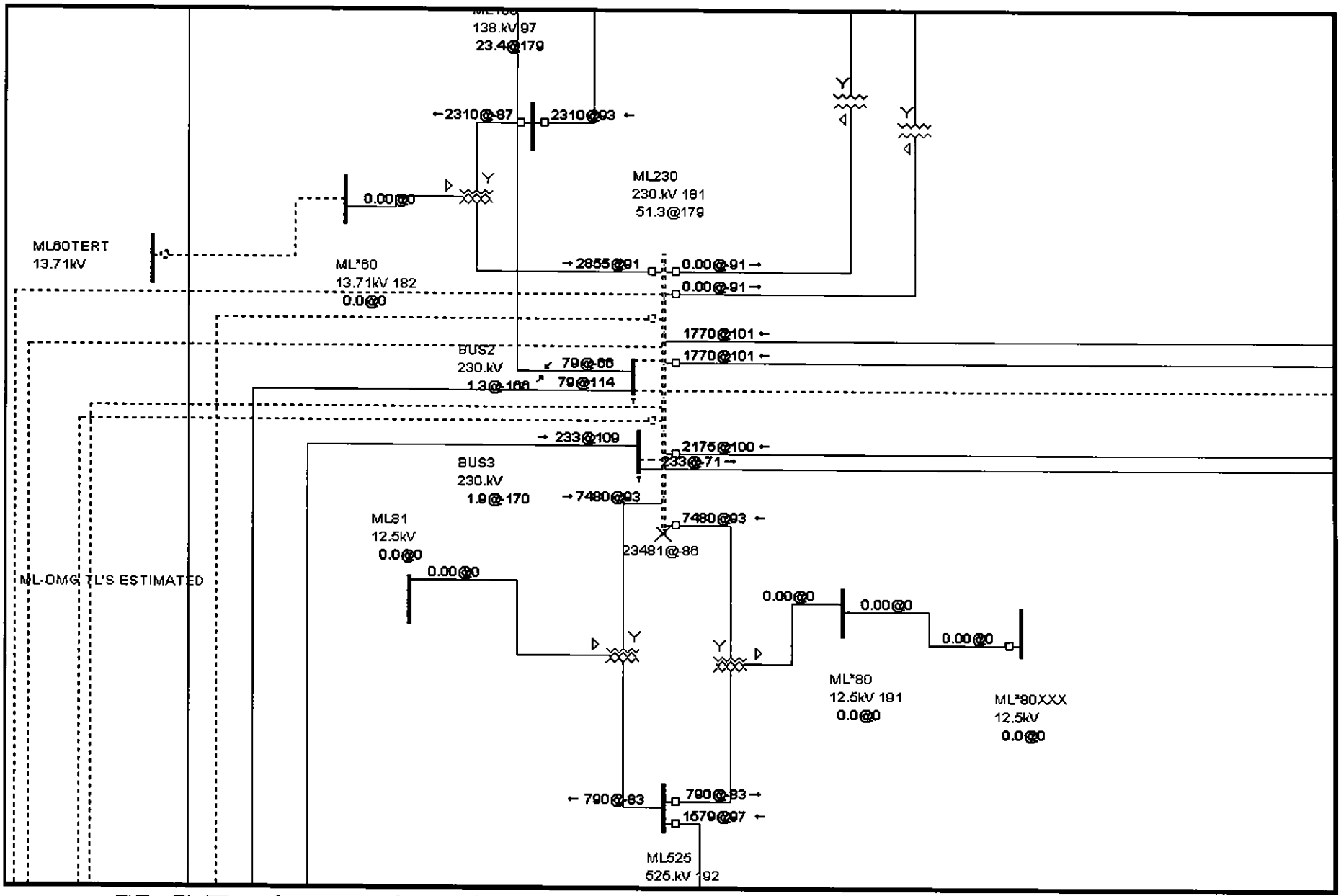
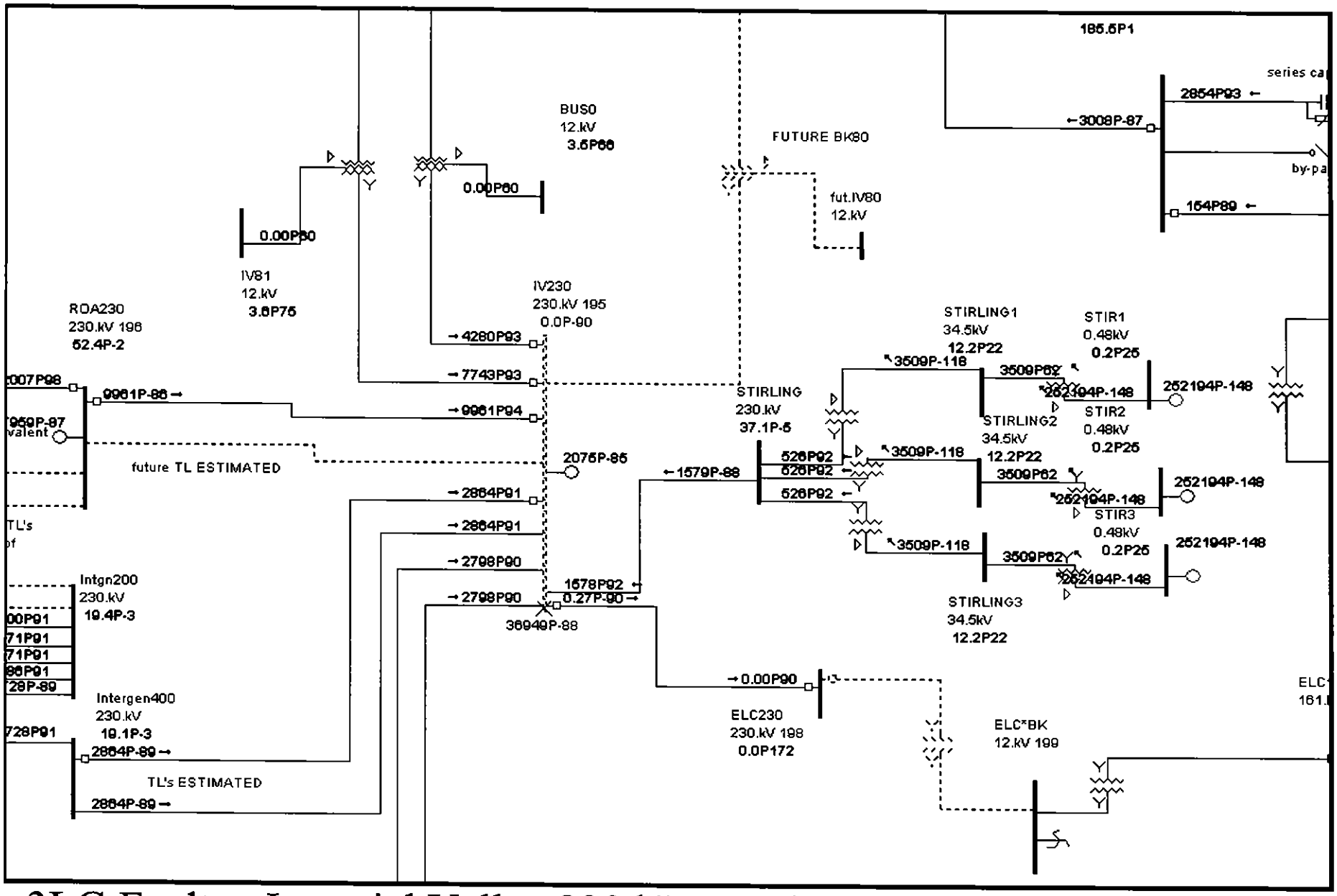
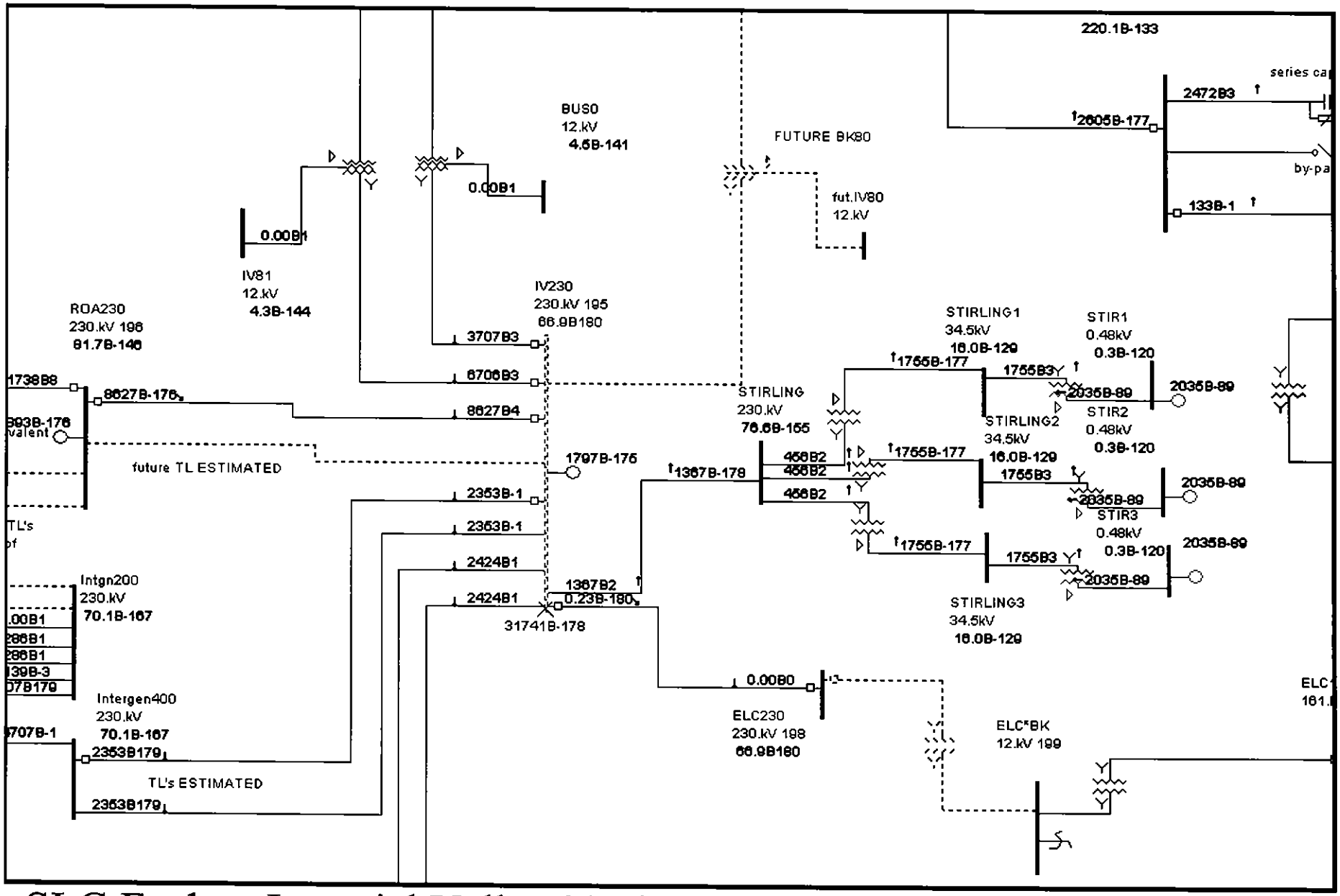


SLG Fault at Miguel 230 kV Bus (Pre-Project)



3LG Fault at Imperial Valley 230 kV Bus (Post-Project)



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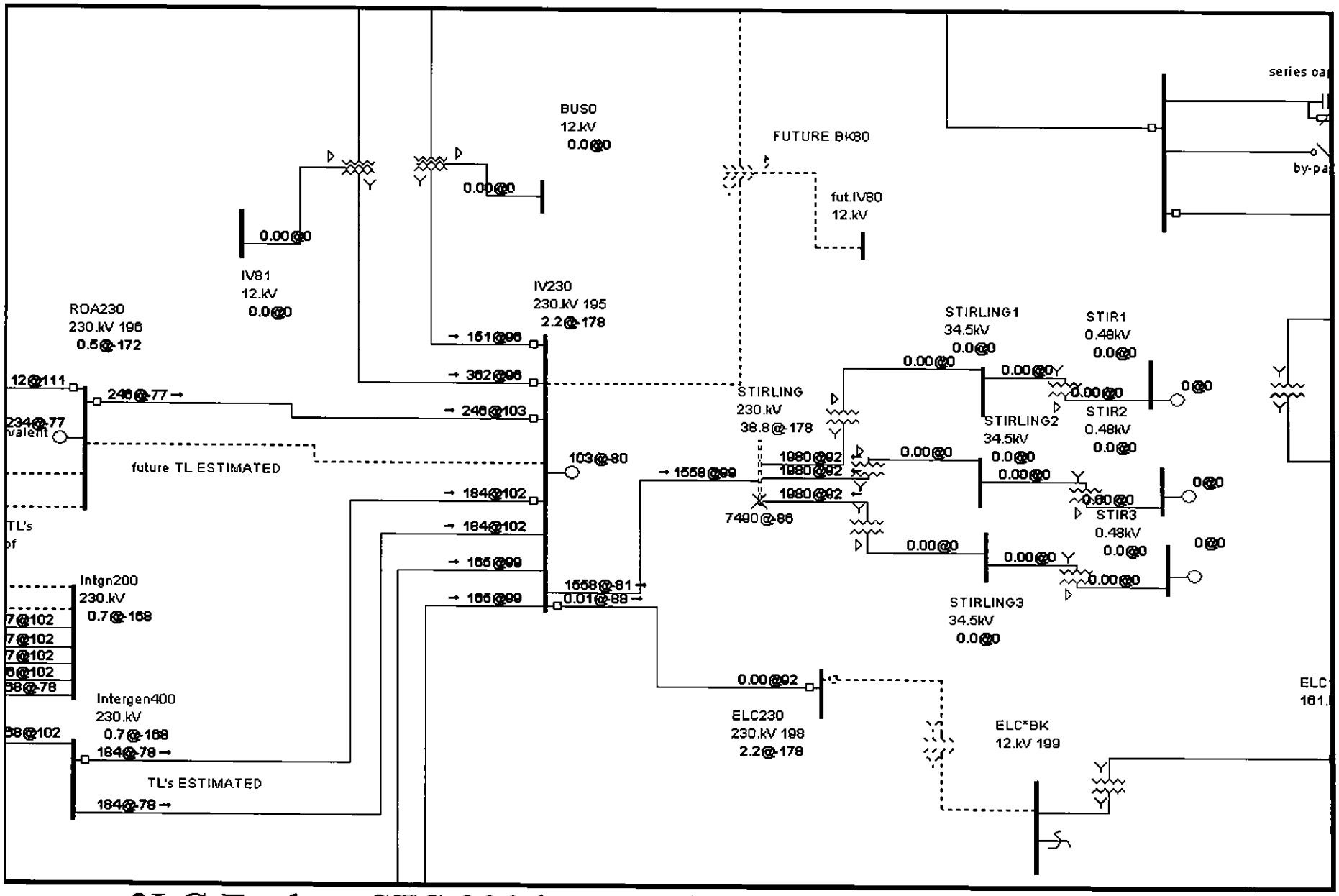
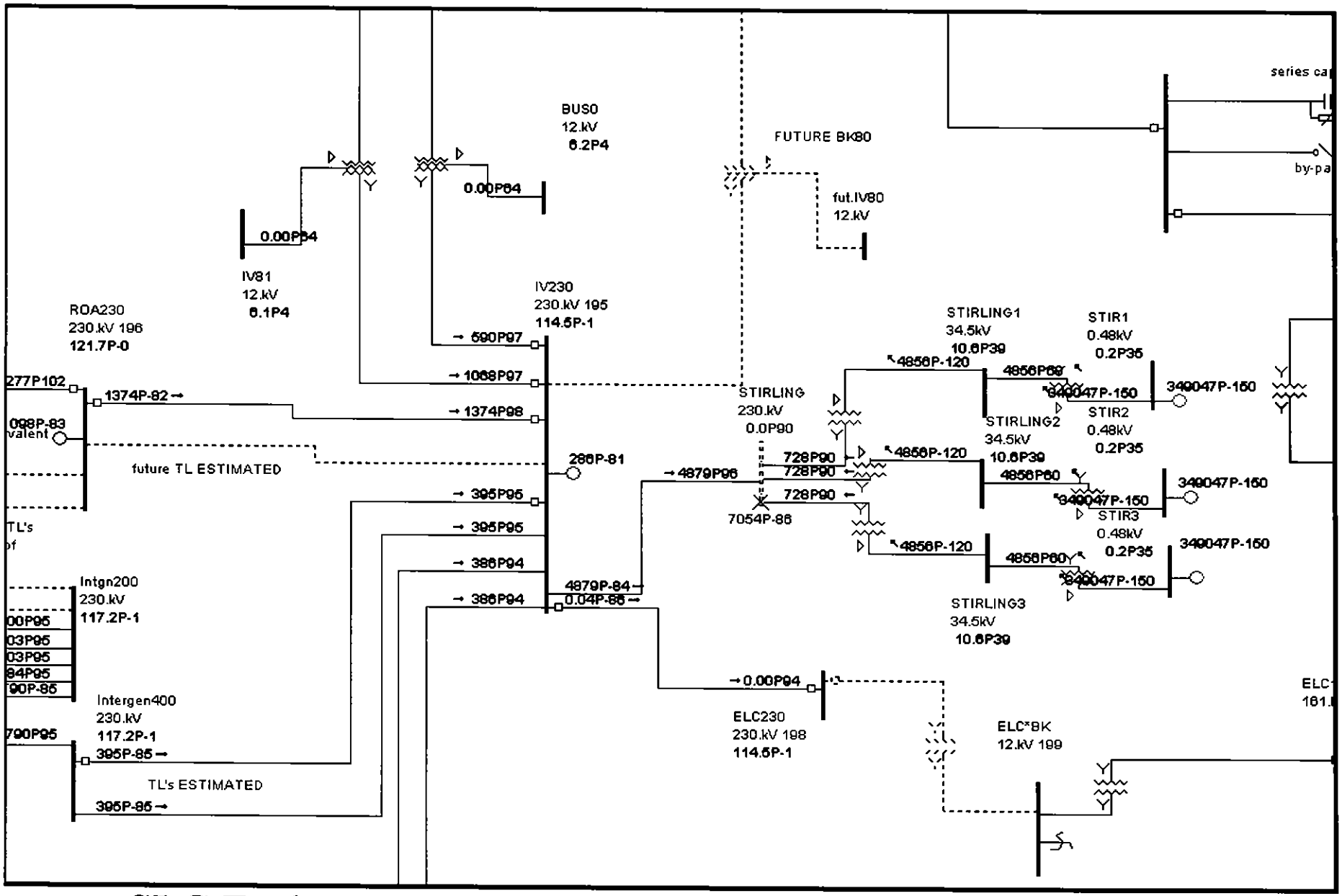
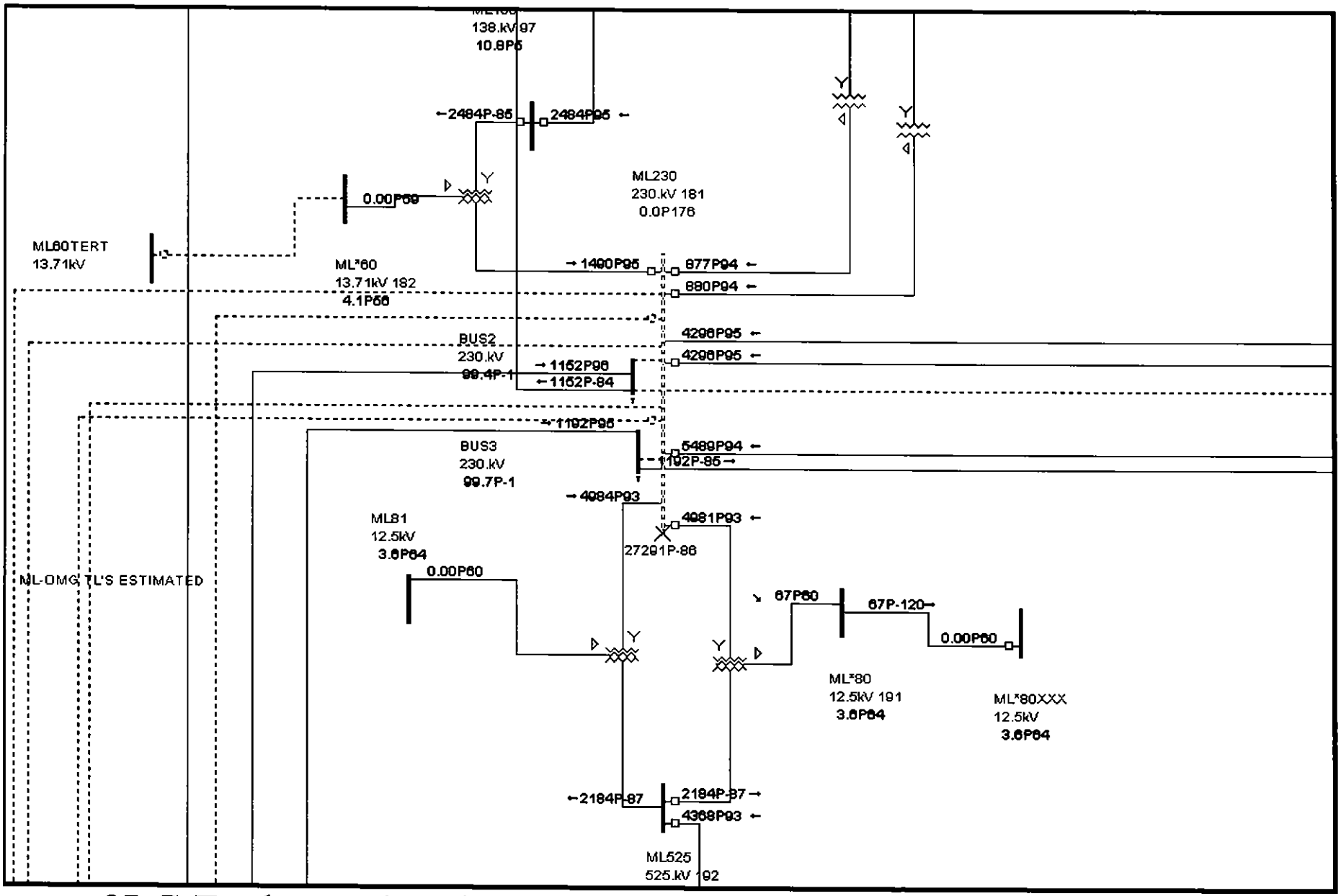


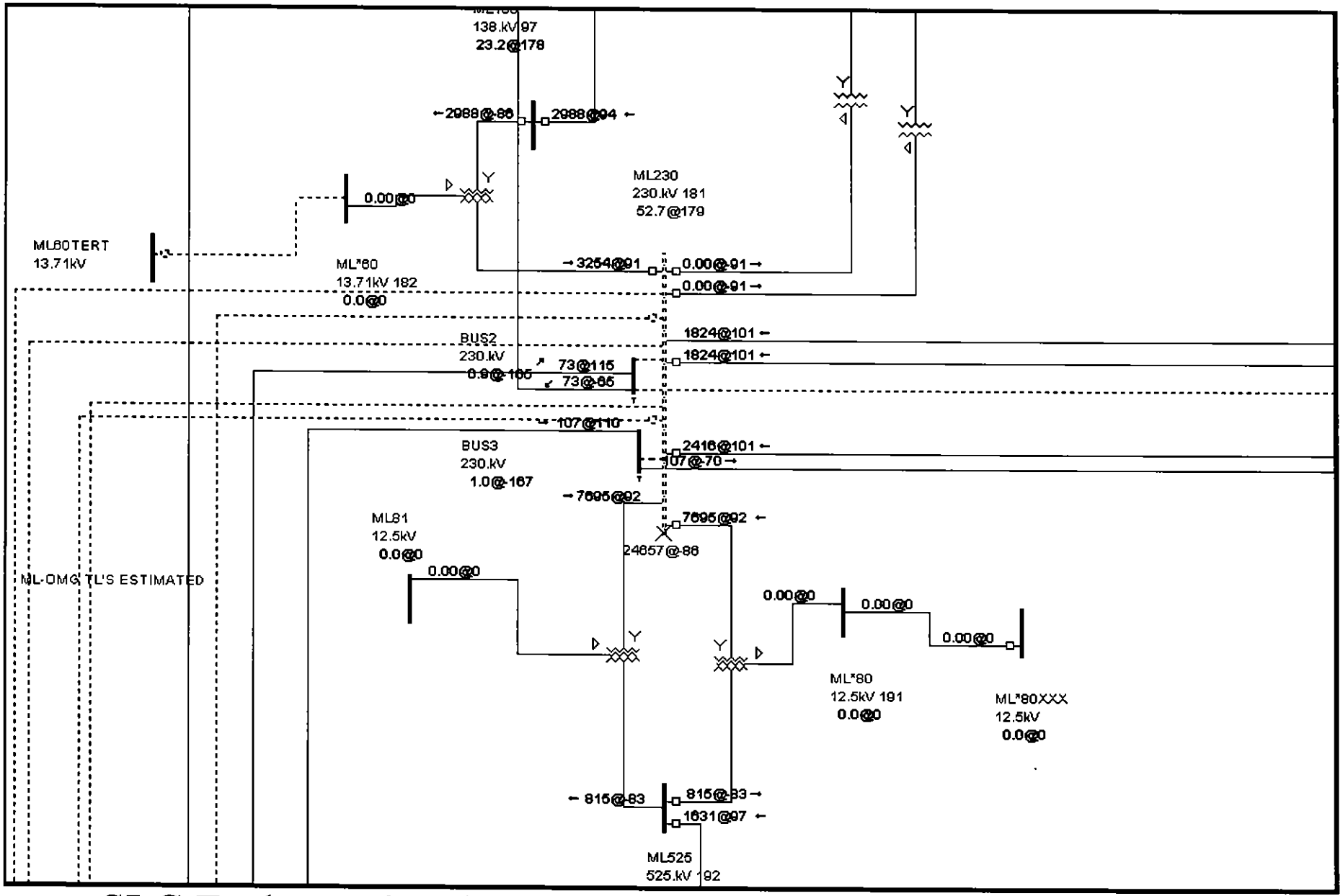
3LG Fault at SES 230 kV Bus (Post-Project)



SLG Fault at SES 230 kV Bus (Post-Project)



3LG Fault at Miguel 230 kV Bus (Post-Project)



SLG Fault at Miguel 230 kV Bus (Post-Project)

Appendix G - Transient Stability Analysis

Transient Stability Criteria

The NERC/WECC Planning Standards were used to evaluate transient stability, as published in the WECC Reliability Criteria, April 2004.

Category "B" Disturbance Criteria

- Voltage on load buses may not dip more than 25% of the pre-fault voltage or dip more than 20% of the pre-fault voltage for more than 20 cycles. Voltages may not dip more than 30% at non-load buses.
- Frequencies on load buses may not dip below 59.6 Hz for more than 6 cycles.

Category "C" Disturbance Criteria

- Voltage at any bus may not dip more than 30% of the pre-fault voltage or dip more than 20% of the pre-fault voltage for more than 40 cycles at load buses.
- Frequencies on load buses may not dip below 59.0 Hz for more than 6 cycles.

In addition to this voltage and frequency criteria, the system was considered stable if all machines in the WECC interconnected system remain in synchronism and system oscillations were positively damped.

Evidence of System Stability

The system was considered stable if the following conditions were met:

- Machine Synchronism - All machines in the WECC interconnected system must remain in synchronism as demonstrated by relative rotor angles (unless modeling problems are identified and concurrence is reached that a problem does not really exist).
- Simulation Time and System Damping
    - A stability simulation will be deemed to exhibit positive damping if a line defined by the peaks of the machine relative rotor angle swing curves tends to intersect a second line connecting the valleys of the curves with the passing of time.
    - Corresponding lines on bus voltage swing curves will likewise tend to intersect. A stability simulation, which satisfies these conditions, will be defined as stable.
    - Duration of a stability simulation run will be twenty seconds unless a longer time is required to ascertain damping.
    - The transient performance analysis will start with a one-second no disturbance period; the disturbance simulation will start after the typically "noisy" transient period of up to about two-tenths (0.2)

seconds after the fault and associated system switching and remedial actions, and conclude at the end of the simulation.

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

Fault Damping

- Three-phase fault damping was modeled for the generators where the fault was applied, as follows:
  - Palo Verde -98 MW or 7.2% /unit
  - Navajo -48 MW or 6.0% /unit

Machine Representation

- For the stability analysis, resources consistent with the time period studied were dispatched to meet the load requirements in the base cases.
- Representation of turbine generators were consistent with available turbine generator data.
- The base case power system stabilizers that are normally in-service within the WECC system were modeled for each operating period studied.
- Representation of governors were consistent with available governor data and the recommendations of the recent WECC report, New Thermal Turbine Governor Modeling for the WECC, October 2002, including incorporation of base loading and load controller features as appropriate.

System Disturbances

- System disturbances for stability studies were initiated by a three-phase fault on the EHV bus adjacent to the major interconnection point and/or power plant of interest.

Fault Clearing Time

- Faults on the transmission lines being evaluated were cleared in accordance with guidelines provided by the appropriate operating agents, as indicated by the attached switching sequences.

Series Capacitors

- Series capacitor modeling during transient conditions were as indicated by the attached switching sequences.

Unit Tripping

- Unit tripping of other utility generation and pumping loads on under-frequency were modeled in accordance with WECC guidelines or those provided by the appropriate operating agent.

Cases

- The studies were run on one 2008/2009 light winter case and one 2009 heavy summer case, before and after the Stirling interconnection.

Transient Stability Contingency List

- The following ten (10) contingencies (six single and four double contingencies) were evaluated:

Category "B" – (Single Contingencies)

- Imperial Valley – Miguel 500 kV with SPS tripping Imperial Valley generation and subsequent tripping of Imperial Valley-La Rosita 230 kV line.
- Imperial Valley – North Gila 500 kV line
- Devers – Valley 500 kV line
- Hassayampa – North Gila 500 kV line
- Serrano – Valley 500 kV line
- Palo Verde – Devers 500 kV line

Category C & D – (Double Contingencies)

- Midway – Vincent 500 kV lines 1 and 2
- Lugo – Mira Loma 500 kV lines 1 and 2
- 2 San Onofre generating units
- 2 Palo Verde generating units

The switching files used in the study can be found at the end of this appendix.

```
*
*
TIT
  SDG&E Stirling Energy Systems
  Interconnection Study
  2008 light autumn, post-case


RUN 20
*
*   Loss of Devers - Valley 500 kV Line
*
*
*   Fault bus at Devers
*
FB    0.0 "DEVERS   " 500.
*
*   Clear fault at Devers
*
CFB   4.0 "DEVERS    " 500.
*
*   Trip Devers - Valley 500 kV Line
*
DL    4.0 "DEVERS   " 500. "VALLEYSC" 500. "1 "
*
```

```
*
*
TIT
  SDG&E Stirling Energy Systems
  Interconnection Study
  2008 light autumn, post-case


RUN 20
*   Loss of Hassayampa - N. Gila 500 kV Line
*
*  CC cards for post-transient only
*
*   Fault bus at Hassayampa

*
FB   0.0 "HASSYAMP" 500.
*
*  Apply fault damping to each Palo Verde Unit
*
GFD   0.0 "PALOVRD1" 24. "1 "  0.072485
GFD   0.0 "PALOVRD2" 24. "1 "  0.072485
GFD   0.0 "PALOVRD3" 24. "1 "  0.072485
*
*   Flash series capacitors in following 500 kV Lines
*
FC   0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
FC   0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*FC   0.0 "HARQUAHA" 500. "DEVERS  " 500. "1 " 2
*FC   0.0 "HARQUAHA" 500. "DEVERS  " 500. "1 " 4
FC   0.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
FC   0.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
FC   0.0 "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
FC   0.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
FC   0.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
FC   0.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 1
FC   0.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 3
FC   0.0 "MEAD    " 500. "PERKINS " 500. "1 " 1
FC   0.0 "MEAD    " 500. "PERKINS " 500. "1 " 3
*
*   Clear fault at Hassayampa
*
CFB  4.0 "HASSYAMP" 500.
*
*   Trip Hassyampa - N. Gila 500 kV Line

*
DL   4.0 "HASSYAMP" 500. "N.GILA   " 500. "1 "
*
*  Remove fault damping to each Palo Verde Unit
*
GFD   4.0 "PALOVRD1" 24. "1 "  0.0
GFD   4.0 "PALOVRD2" 24. "1 "  0.0
GFD   4.0 "PALOVRD3" 24. "1 "  0.0
*
*   Reinsert series capacitors in following 500 kV Lines
*
RC   4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
RC   4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*RC   4.0 "HARQUAHA" 500. "DEVERS  " 500. "1 " 2
*RC   4.0 "HARQUAHA" 500. "DEVERS  " 500. "1 " 4
RC   4.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
RC   4.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
RC   4.0 "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
```

```
RC    4.0 "MEAD     " 500. "PERKINS " 500. "1 " 1
RC    4.0 "MEAD     " 500. "PERKINS " 500. "1 " 3
*
*    Reinsert series capacitors in following 500 kV Lines
*
RC    8.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
RC    8.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 1
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 3
*
```

```
*
*
TIT
  SDG&E Stirling Energy Systems
  Interconnection Study
  2008 light autumn, post-case


RUN 20
*
*   Imperial Valley - Miguel 500kV Line Out
*   followed by automatic SPS 6.1 to open IV Generation
*   followed by automatic SPS 6.2 to open IV-ROA (CFE)
*   3-phase 4 cycle fault at Imperial Valley
*
*   Fault bus at Imperial Valley
*
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Miguel line
*
DL  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*   SDG&E SPS TMC1505 6.1 SPS B
*   (assume reduntant scheme in CFE operates in 2 sec)
*   Trip IV Generation
*
TG  4.0  "INTBST   "  18. "1 "
TG  4.0  "INTBCT   "  16. "1 "
TG  4.0  "IV GEN1  "  21. "1 "
TG  4.0  "IV GEN2  "  18. "1 "
TG  4.0  "IV GEN3  "  18. "1 "
*
*   SDG&E SPS TMC1505 6.2
*   (assumes ROA-HRD or ROA-RUM over 388 MVA operates in 2 sec)
*   Trip Imperial - La Rosita line
*
DL  124.  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

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RUN 20
*  Loss of PALOVERDE unit #2 & 3
*  3 phase 4 cycles Fault bus at PALOVERDE 500 kV
*
*
*   Fault bus at Palo Verde
*
FB  0.0  "PALOVRDE" 500.
*
*   Clear fault bus at Palo Verde
*
CFB 4.0  "PALOVRDE" 500.
*
*  Trip PALOVERDE units #2 & 3
TG  4.0  "PALOVRD2 "  24. "1 "
TG  4.0  "PALOVRD3 "  24. "1 "
*
*  Set Generator MW Dropping
* CC  DRP 2704
*
*   Readjust Northwest SVC's
*
* CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
* CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*   CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri2.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
* CC  RC 12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
* CC  RC 12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
* CC  RC 12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
* CC  MBS 13.4 "MALIN   " 500. "c1" "R"
* CC  MBS 13.4 "MALIN   " 500. "c2" "R"
*
*   Remove reactor at Olinda as part of FACRI
*
* CC  MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f "
* CC  MLS 17.5 "OLINDA" 500. "CAPTJACK" 500. "1 " 1 "D" "f "
*
*   Switch on Olinda Shunt cap as part of FACRI
*
* CC  MBS  17.5 "OLINDA  " 500. "c1" "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
* CC  MBS  90. "TABLE MT" 500. "c1" "R"
* CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
```

```
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*   Switch on Kinport Shunt cap
*
* CC  MBS 200. "KINPORT" 345. "1 " "R"
*
```

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RUN 20
*  Loss of SONGS unit #2 & 3
*  3 phase 4 cycles Fault bus at SONGS 230 kV
*
*  Fault S.ONOFRE 230 kV bus
*
FB   0.0 "S.ONOFRE" 230.
*
*   Clear fault at S>ONOFRE 230 kV
*
CFB  4.0 "S.ONOFRE" 230.
*
*  Trip San Onofre units #2 and #3
*
TG   4.0 "S.ONOFR2 "  22. "**"
TG   4.0 "S.ONOFR3 "  22. "**"
*
*  Readjust Northwest SVC's
*  CC cards for post-transient only
* MSV  0.0 "KEEL-SVC"  19.6 "1 "  350. -300.
* MSV  0.0 "MV-SVC  "  19.6 "1 "  350. -300.
*
*   Dalles 3 not in SVD table
*   Dallas 3 in area 40 gens is listed as several units
*   Qgen max = 290 MVAR Qgen min = -536 MVAR
*  CC  MSV  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri2.p)
*   Disregard timing
*
*  Switch on Shunt cap at malin by adding new shunt device
*  CC cards for post-transient only
MBS  63. "MALIN   " 500. "c1" "R" 0.0  2.
MBS  63. "MALIN   " 500. "c2" "R" 0.0  2.
*  SHU 4.0  "MALIN   " 500. "b1"  1
*  SHU 4.0  "MALIN   " 500. "b2"  1
*
*  Insert Fork Rock series caps
MLX  64. "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4 -.0084
MLX  64. "GRIZZLY " 500. "MALIN   " 500. "1 " 4 -.0084
MLX  64. "PONDROSA" 500. "SUMMER L" 500. "1 " 4 -.0084
*
*  Switch on Table Mountain SVD
*  2 x 217 caps (91 Mvar reactor modeled seperately)
MSV 90.   "TABLE MT" 500. "v " 4.54   0.0000 4.5400
MSV 90.   "TRACY   " 500. "v " 6.00   0.0000 6.0000
MSV 90.   "OLINDA  " 500. "v " 2.00   0.0000 2.0000
*
*  Add SVC's at Marketplace and Adelanto
*
MSV 120.0 "ADELSVC " 500. "1 " 132.0  0.0000 132.0
MSV 120.0 "MKTPSVC " 500. "1 " 132.0  0.0000 132.0
*
*  CC cards for post-transient only
*
```

```
MSV 4.0      "GONDER  " 230. "v " -0.300 0.0000 -0.300
MSV 4.0      "GONDER1 " 230. "v " -0.150 0.0000 -0.150
MSV 4.0      "AUSTIN  " 230. "v " -0.250 0.0000 -0.250
MSV 4.0      "ANTELOPE" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "BARRE   " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "CHINO   " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "DEVERS  " 230. "ei" 2.3700 0.0000 2.3700
MSV 4.0      "EL NIDO " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "GOULD   " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "KRAMER  " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "LCIENEGA" 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "LAGUBELL" 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "MIRALOMA" 230. "ei" 2.3700 0.0000 2.3700
*MSV 4.0     "MIRAGE  " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "MOORPARK" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "OLINDA  " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "PADUA   " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "PARDEE  " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "RIOHONDO" 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "SANBRDNO" 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "S.CLARA " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "VALLEYSC" 115. "ei" 0.9000 0.0000 0.9000
MSV 4.0      "VICTOR  " 115. "ei" 0.9000 0.0000 0.9000
MSV 4.0      "VILLA PK" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "VINCENT " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "VSTA    " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "WALNUT  " 230. "ei" 0.7900 0.0000 0.7900
*
* SDGE SVD's to modify
* 2004 t     bus name  kv   id   bmax   bmin  b (bact)
MSV 4.0      "CAPSTRNO" 138. "sd" 0.4000 0.0000 0.4000
MSV 4.0      "EL CAJON"  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "LOSCOCHS"  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MAIN ST "  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MIGUEL  "  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MISSION "  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "PALOMAR " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "SHADOWR " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "TELECYN " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "PENSQTOS"  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "SANLUSRY" 138. "sd" 0.8000 0.0000 0.8000
MSV 4.0      "SYCAMORE"  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "PENSQTOS" 230. "sd" 1.2600 0.0000 1.2600
MSV 4.0      "ESCNDIDO" 230. "sd" 1.2600 0.0000 1.2600
MSV 4.0      "TALEGA  " 230. "m1" 0.6300 0.0000 0.6300
MSV 4.0      "TALEGA  " 230. "m2" 0.6300 0.0000 0.6300
MSV 4.0      "TALEGA  " 230. "m3" 0.6300 0.0000 0.6300
MSV 4.0      "MISSION " 230. "m1" 0.6300 0.0000 0.6300
MSV 4.0      "MISSION " 230. "m2" 0.6300 0.0000 0.6300
*
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RUN 20
*  Loss of SONGS unit #2 & 3
*  3 phase 4 cycles Fault bus at SONGS 230 kV
*
*  Fault S.ONOFRE 230 kV bus
*
FB   0.0 "S.ONOFRE" 230.
*
*   Clear fault at S>ONOFRE 230 kV
*
CFB  4.0 "S.ONOFRE" 230.
*
*  Trip San Onofre units #2 and #3
*
TG   4.0 "S.ONOFR2 "  22. "**"
TG   4.0 "S.ONOFR3 "  22. "**"
*
*  Readjust Northwest SVC's
*  CC cards for post-transient only
* MSV  0.0 "KEEL-SVC"  19.6 "1 "  350. -300.
* MSV  0.0 "MV-SVC  "  19.6 "1 "  350. -300.
*
*   Dalles 3 not in SVD table
*   Dallas 3 in area 40 gens is listed as several units
*   Qgen max = 290 MVAR Qgen min = -536 MVAR
*  CC  MSV  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri2.p)
*   Disregard timing
*
*  Switch on Shunt cap at malin by adding new shunt device
*  CC cards for post-transient only
MBS  63. "MALIN   " 500. "c1" "R" 0.0  2.
MBS  63. "MALIN   " 500. "c2" "R" 0.0  2.
*  SHU 4.0  "MALIN   " 500. "b1"  1
*  SHU 4.0  "MALIN   " 500. "b2"  1
*
*  Insert Fork Rock series caps
MLX  64. "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4 -.0084
MLX  64. "GRIZZLY " 500. "MALIN   " 500. "1 " 4 -.0084
MLX  64. "PONDROSA" 500. "SUMMER L" 500. "1 " 4 -.0084
*
*  Switch on Table Mountain SVD
*  2 x 217 caps (91 Mvar reactor modeled seperately)
MSV 90.   "TABLE MT" 500. "v " 4.54   0.0000 4.5400
MSV 90.   "TRACY   " 500. "v " 6.00   0.0000 6.0000
MSV 90.   "OLINDA  " 500. "v " 2.00   0.0000 2.0000
*
*  Add SVC's at Marketplace and Adelanto
*
MSV 120.0 "ADELSVC " 500. "1 " 132.0  0.0000 132.0
MSV 120.0 "MKTPSVC " 500. "1 " 132.0  0.0000 132.0
*
*  CC cards for post-transient only
*
```

```
MSV 4.0      "GONDER  " 230. "v " -0.300 0.0000 -0.300
MSV 4.0      "GONDER1 " 230. "v " -0.150 0.0000 -0.150
MSV 4.0      "AUSTIN  " 230. "v " -0.250 0.0000 -0.250
MSV 4.0      "ANTELOPE" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "BARRE   " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "CHINO   " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "DEVERS  " 230. "ei" 2.3700 0.0000 2.3700
MSV 4.0      "EL NIDO " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "GOULD   " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "KRAMER  " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "LCIENEGA" 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "LAGUBELL" 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "MIRALOMA" 230. "ei" 2.3700 0.0000 2.3700
*MSV 4.0     "MIRAGE  " 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "MOORPARK" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "OLINDA  " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "PADUA   " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "PARDEE  " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "RIOHONDO" 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "SANBRDNO" 230. "ei" 0.7900 0.0000 0.7900
*MSV 4.0     "S.CLARA " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "VALLEYSC" 115. "ei" 0.9000 0.0000 0.9000
MSV 4.0      "VICTOR  " 115. "ei" 0.9000 0.0000 0.9000
MSV 4.0      "VILLA PK" 230. "ei" 1.5800 0.0000 1.5800
MSV 4.0      "VINCENT " 230. "ei" 1.5800 0.0000 1.5800
*MSV 4.0     "VSTA    " 230. "ei" 0.7900 0.0000 0.7900
MSV 4.0      "WALNUT  " 230. "ei" 0.7900 0.0000 0.7900
*
* SDGE SVD's to modify
* 2004 t     bus name  kv   id   bmax   bmin  b (bact)
MSV 4.0      "CAPSTRNO" 138. "sd" 0.4000 0.0000 0.4000
MSV 4.0      "EL CAJON"  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "LOSCOCHS"  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MAIN ST "  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MIGUEL  "  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "MISSION "  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "PALOMAR " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "SHADOWR " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "TELECYN " 138. "sd" 0.4300 0.0000 0.4300
MSV 4.0      "PENSQTOS"  69. "sd" 1.0000 0.0000 1.0000
MSV 4.0      "SANLUSRY" 138. "sd" 0.8000 0.0000 0.8000
MSV 4.0      "SYCAMORE"  69. "sd" 0.5000 0.0000 0.5000
MSV 4.0      "PENSQTOS" 230. "sd" 1.2600 0.0000 1.2600
MSV 4.0      "ESCNDIDO" 230. "sd" 1.2600 0.0000 1.2600
MSV 4.0      "TALEGA  " 230. "m1" 0.6300 0.0000 0.6300
MSV 4.0      "TALEGA  " 230. "m2" 0.6300 0.0000 0.6300
MSV 4.0      "TALEGA  " 230. "m3" 0.6300 0.0000 0.6300
MSV 4.0      "MISSION " 230. "m1" 0.6300 0.0000 0.6300
MSV 4.0      "MISSION " 230. "m2" 0.6300 0.0000 0.6300
*
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RUN 20
*
*   Loss of Lugo - Mira Loma 2 & 3 Lines
*
*
*   Fault bus at Mira Loma
*
FB    0.0 "MIRALOMA" 500.
*
*   Clear fault at Mira Loma
*
CFB   4.0 "MIRALOMA" 500.
*
*   Trip Lugo - Mira Loma 2 & 3 Lines
*
DL    4.0 "LUGO     " 500. "MIRALOMA" 500. "2 "
DL    4.0 "LUGO     " 500. "MIRALOMA" 500. "3 "
*
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RUN 20
*   Loss of Palo Verde - Devers
*
*  CC cards for post-transient only
*
*   Fault bus at Palo Verde
*
FB    0.0 "PALOVRDE" 500.
*
*  Apply fault damping to each Palo Verde Unit
*
GFD    0.0 "PALOVRD1" 24. "1 "  0.072485
GFD    0.0 "PALOVRD2" 24. "1 "  0.072485
GFD    0.0 "PALOVRD3" 24. "1 "  0.072485
*
*   Flash series capacitors in following 500 kV Lines
*
FC    0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
FC    0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
FC    0.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
FC    0.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
FC    0.0 "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
FC    0.0 "MEAD    " 500. "PERKINS " 500. "1 " 1
FC    0.0 "MEAD    " 500. "PERKINS " 500. "1 " 3
FC    0.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
FC    0.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
FC    0.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 1
FC    0.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 3
*
*   Clear fault at Palo Verde
*
CFB   4.0 "PALOVRDE" 500.
*
*   Trip Palo Verde - Devers 500 kV Line
*   Trip Haquahala  - Devers 500 kV Line
*
DL    4.0 "PALOVRDE" 500. "DEVERS   " 500. "1 "
*
*  Remove fault damping to each Palo Verde Unit
*
GFD    4.0 "PALOVRD1" 24. "1 "  0.0
GFD    4.0 "PALOVRD2" 24. "1 "  0.0
GFD    4.0 "PALOVRD3" 24. "1 "  0.0
*
*   Reinsert series capacitors in following 500 kV Lines
*
* RC    4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
* RC    4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
RC    4.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
RC    4.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
RC    4.0 "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
RC    4.0 "MEAD    " 500. "PERKINS " 500. "1 " 1
RC    4.0 "MEAD    " 500. "PERKINS " 500. "1 " 3
*
*   Reinsert series capacitors in following 500 kV Lines
*
```

```
RC    8.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
RC    8.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 1
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 3
*
```

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RUN 20
*
*   Loss of Midway - Vincent 1 & 2 Lines
*
*
*   Fault bus at Midway
*
FB    0.0 "MIDWAY  " 500.
*
*   Clear fault at Mira Loma
*
CFB   4.0 "MIDWAY  " 500.
*
*   Trip Lugo - Mira Loma 2 & 3 Lines
*
DL    4.0 "MIDWAY  " 500. "VINCENT " 500. "1 "
DL    4.0 "MIDWAY  " 500. "VINCENT " 500. "2 "
*
*   If the FACRI RAS is applicable:
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri2.p)
*   Disregard timing
*
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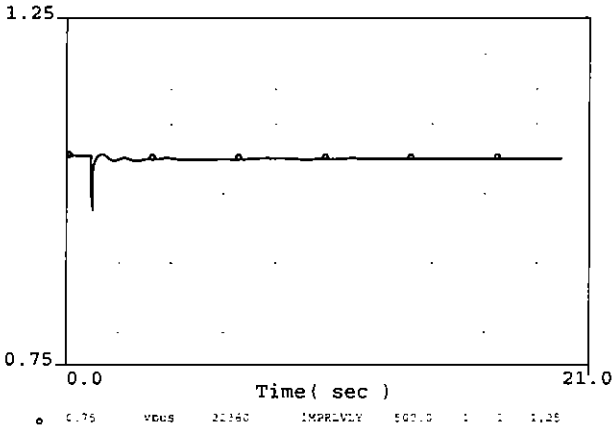
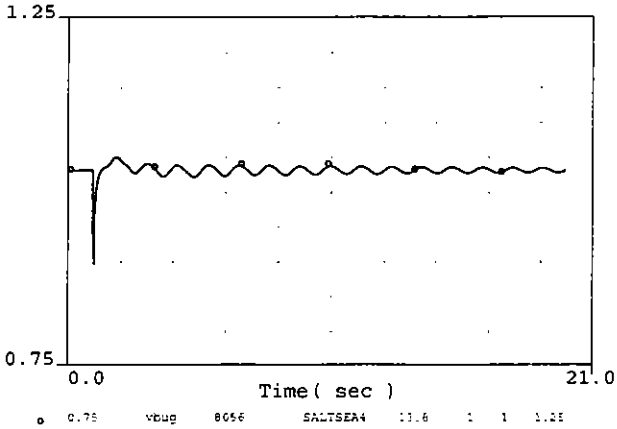
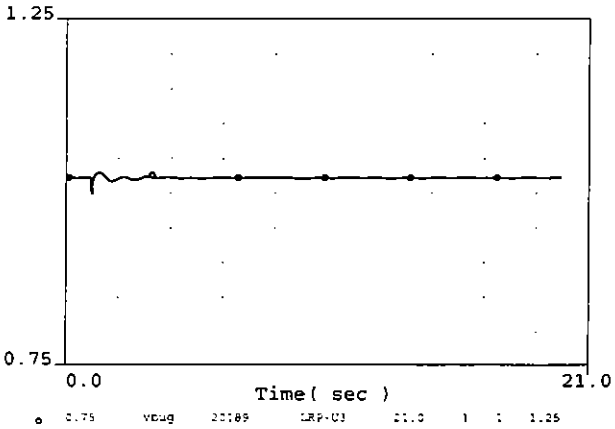
RUN 20
*
*   Serrano - Valley 500 kV Line Out
*   3 phase 4 cycles fault at Serrano 500 kV
*
*
*   Fault bus at Serrano 500 kV
*
FB    0.0 "SERRANO " 500.
*
*   Clear fault at Serrano
*
CFB   4.0 "SERRANO " 500.
*
*   Trip Serrano - Valley 500 kV Line
*
DL    4.0 "SERRANO " 500. "VALLEYSC" 500. "1 "
*
```

Appendix H - Transient Stability Plots


1.25
0.75
0.0
21.0
Time(sec)


1.25
0.75
0.0
21.0
Time(sec)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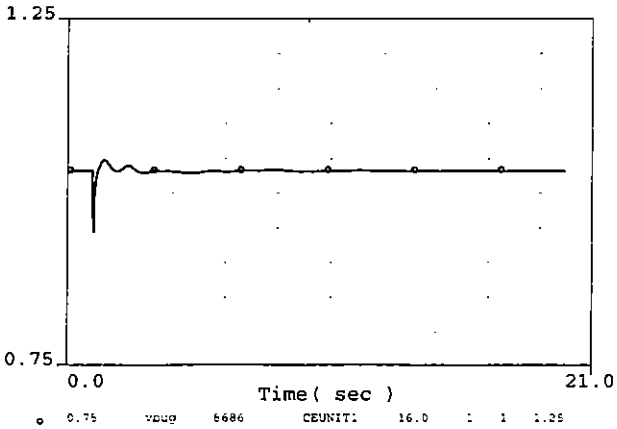
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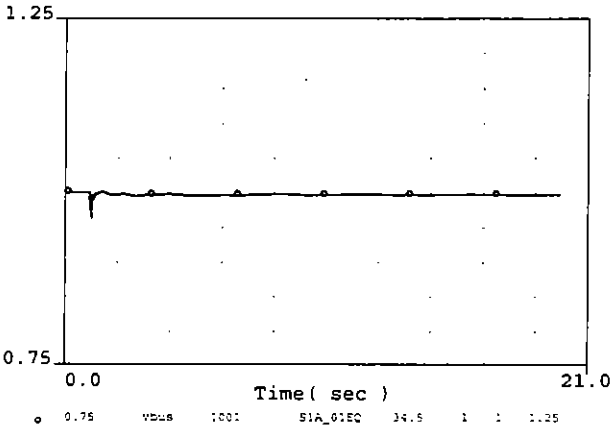
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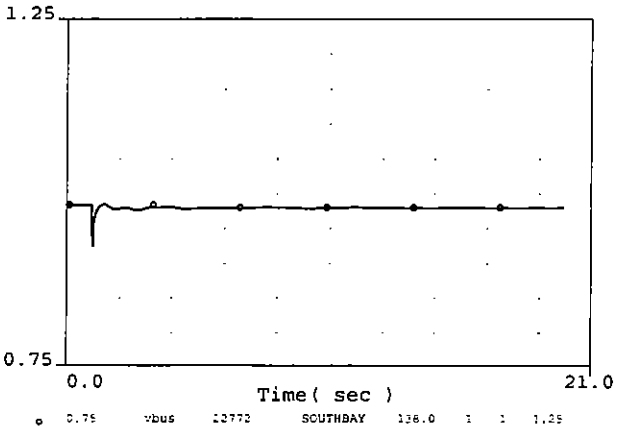
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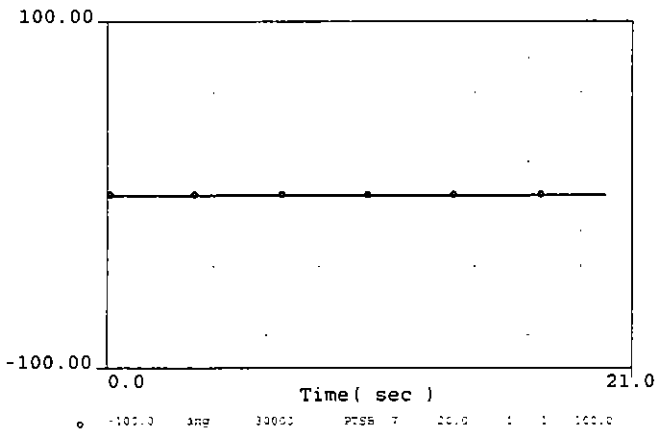

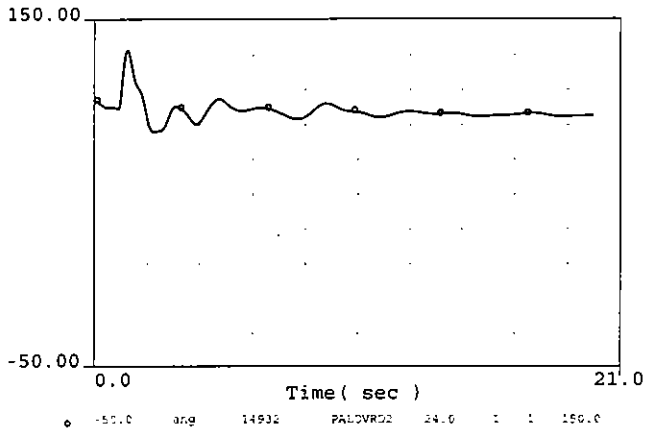

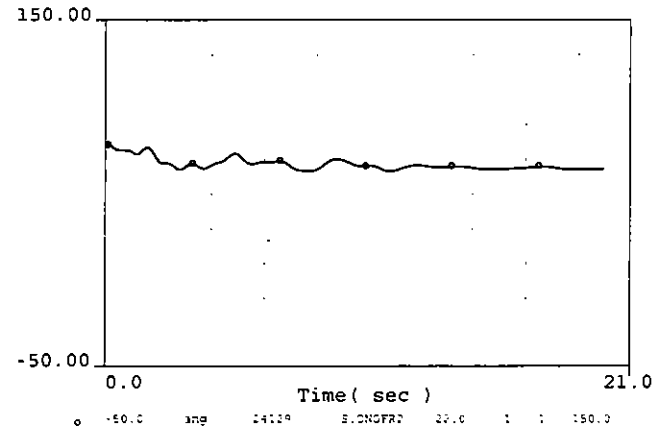

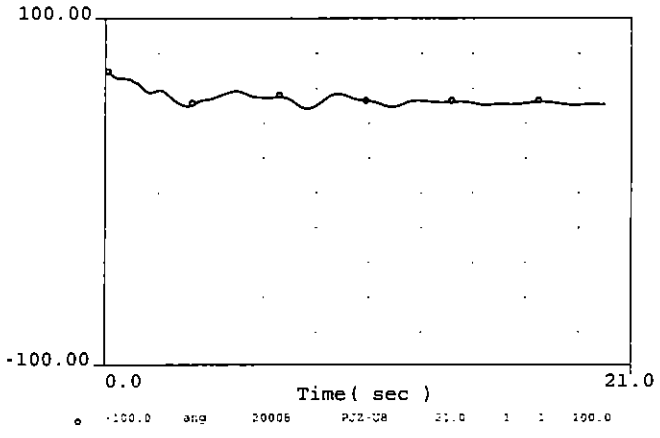

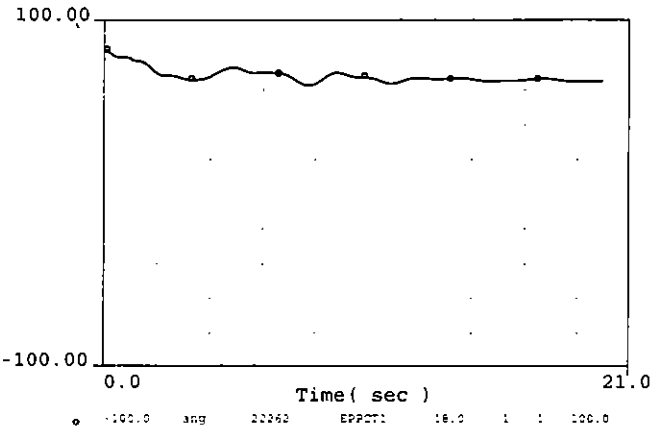

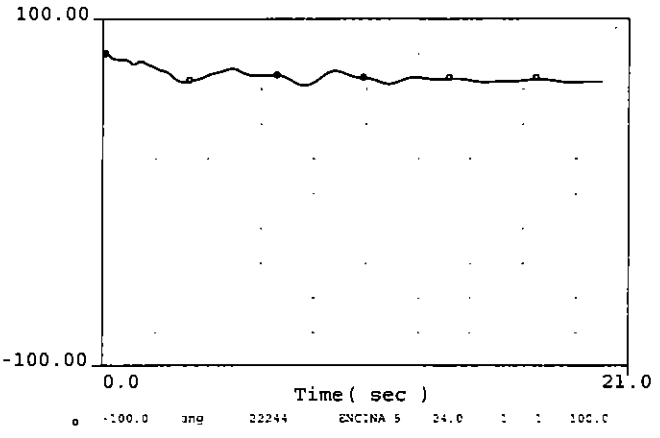

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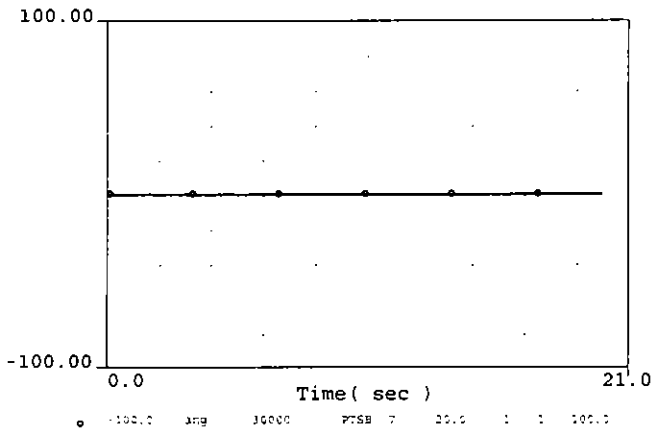
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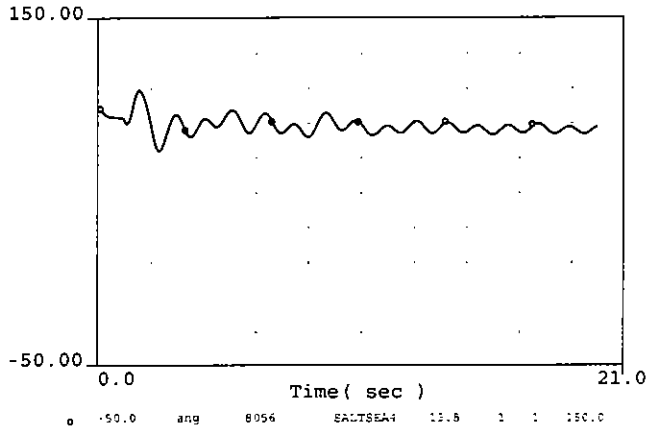
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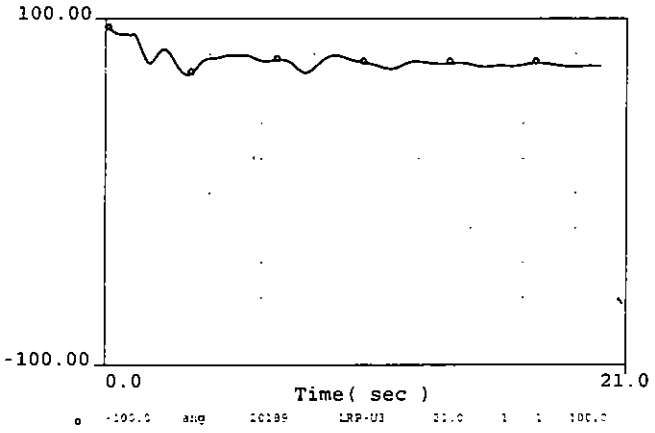
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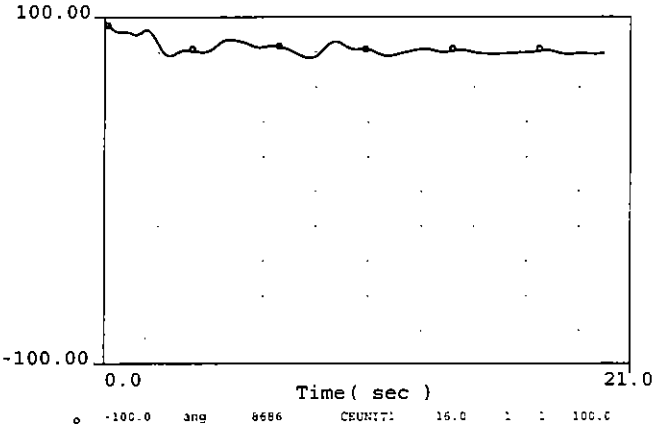
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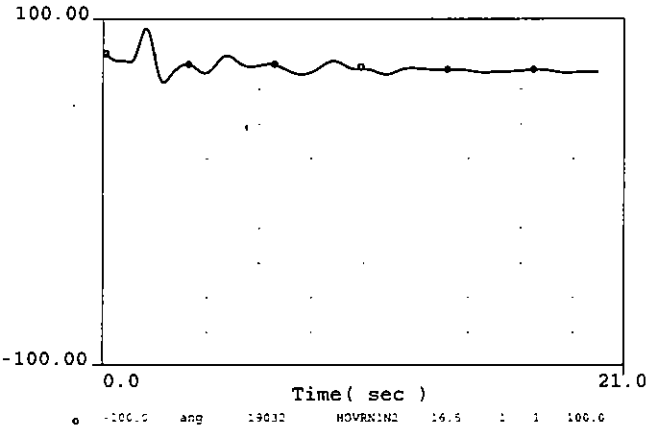
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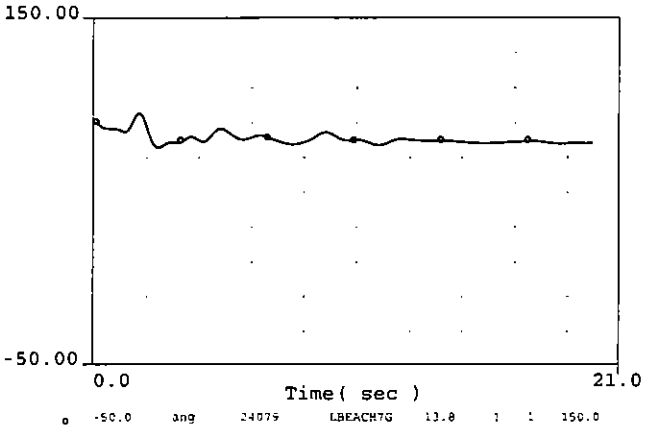
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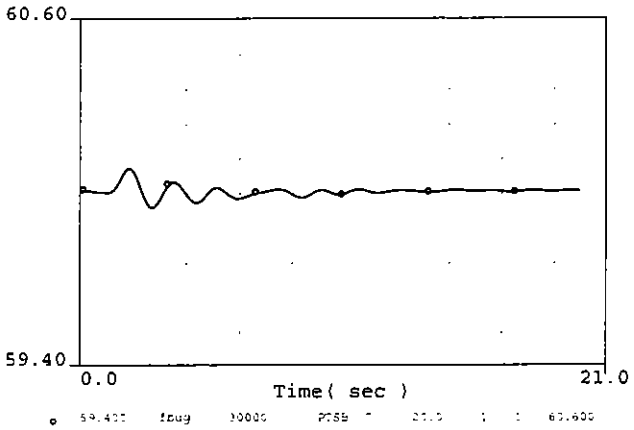
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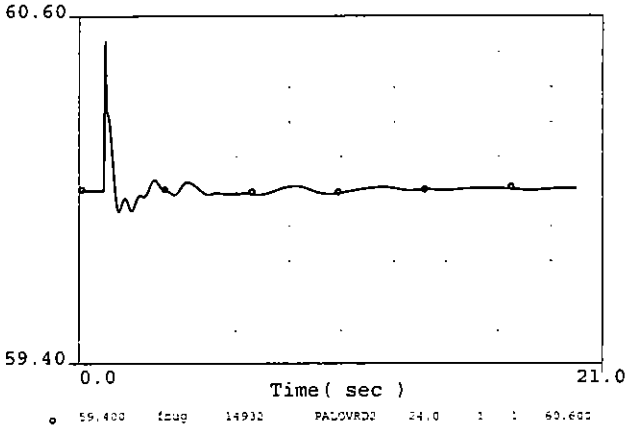
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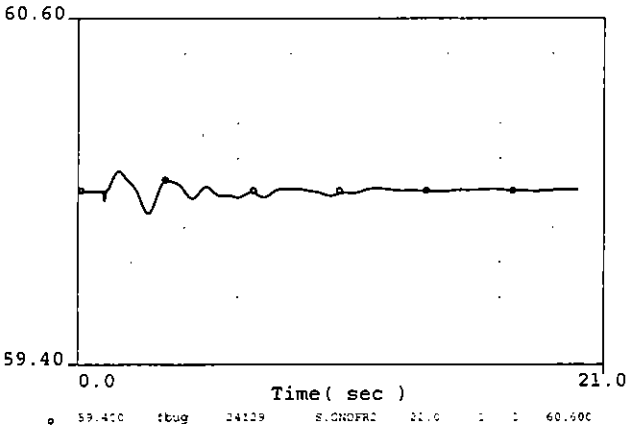
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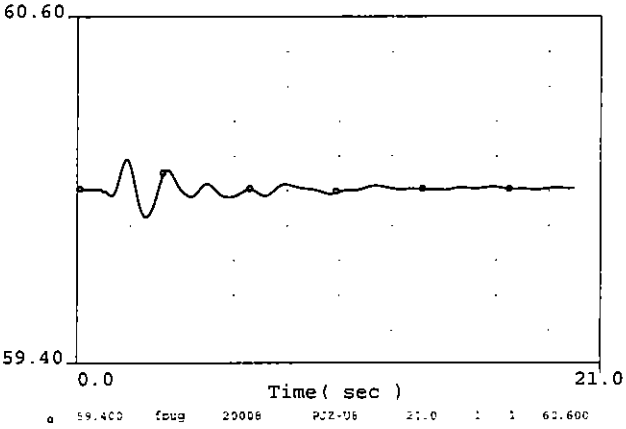
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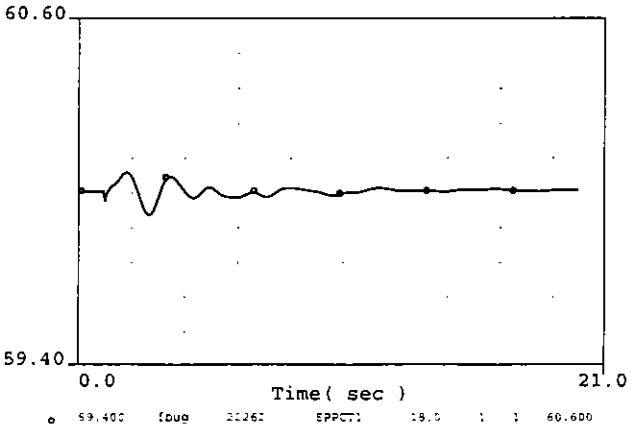
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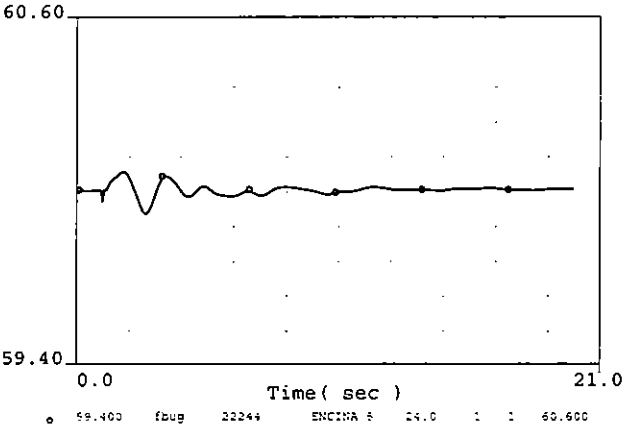
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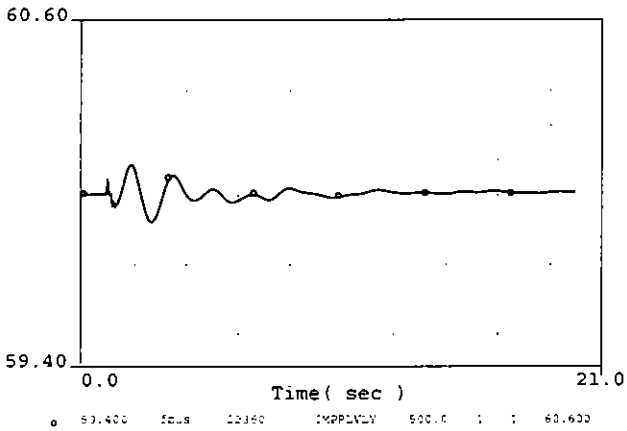
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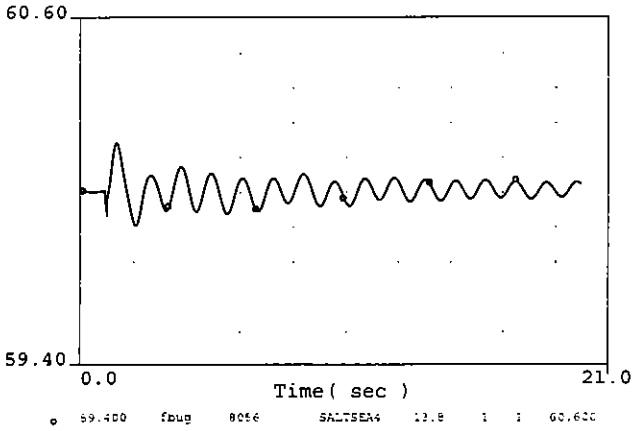
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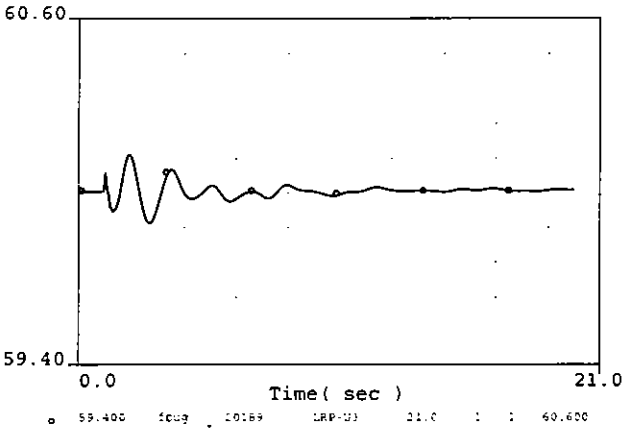
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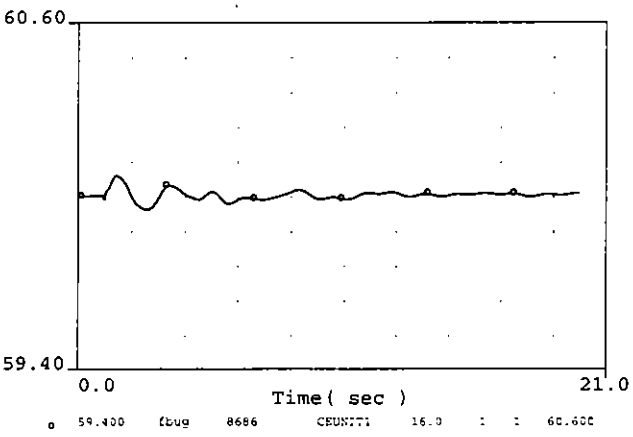
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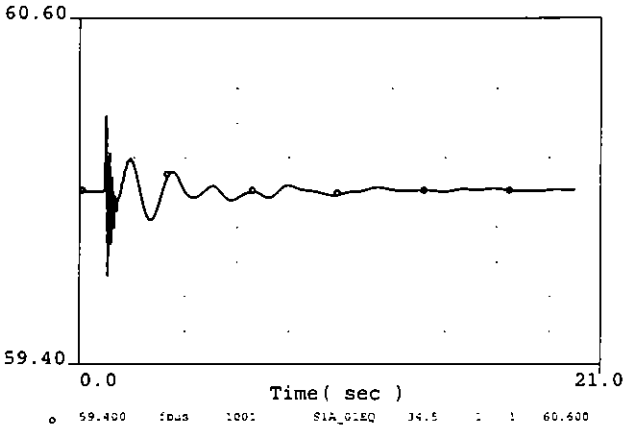
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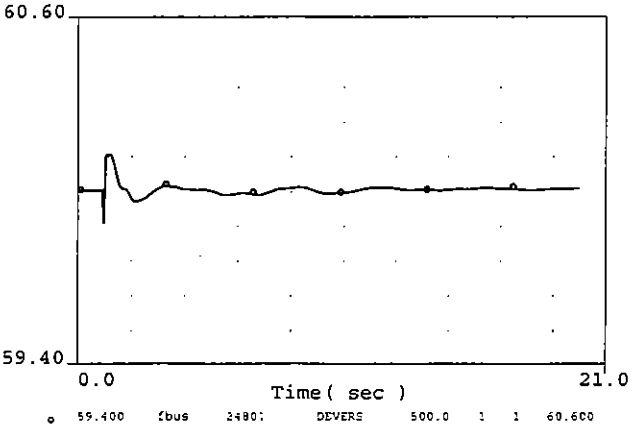
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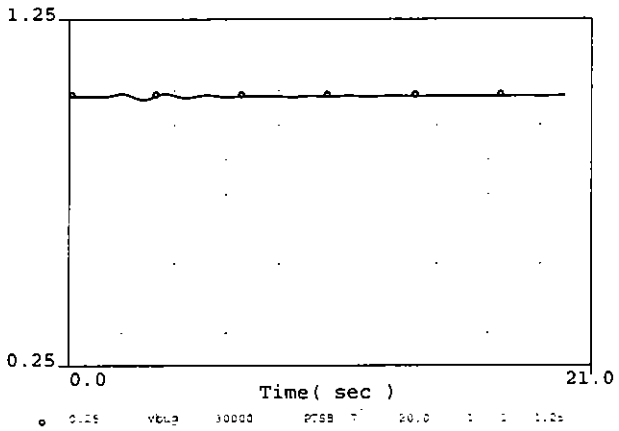
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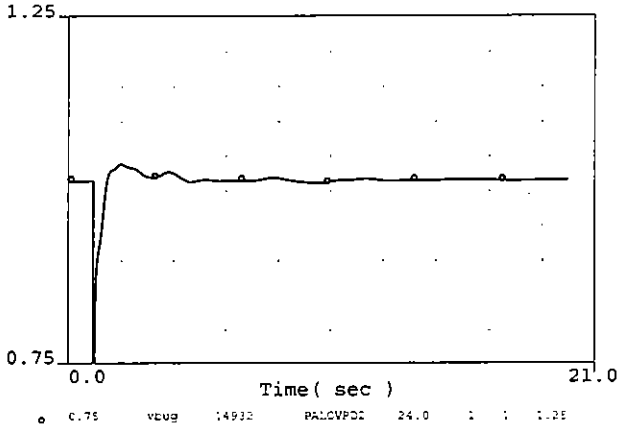
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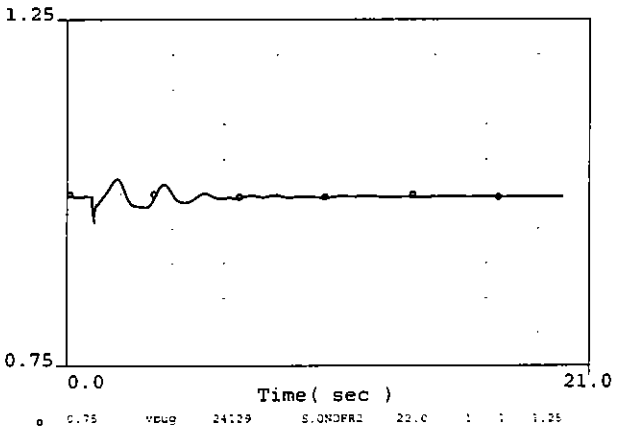
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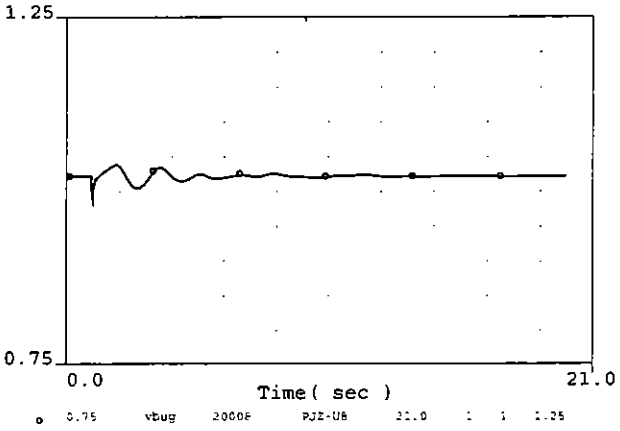
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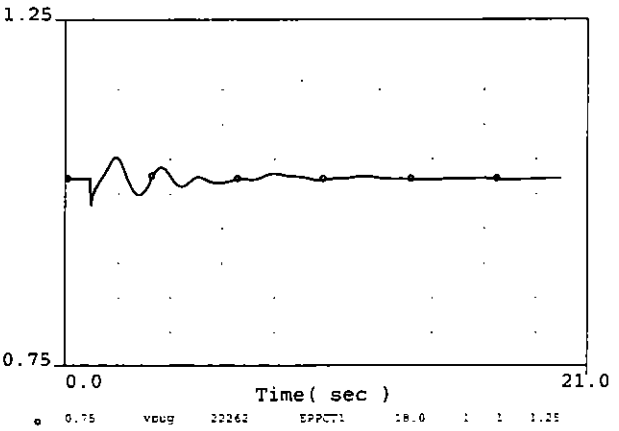
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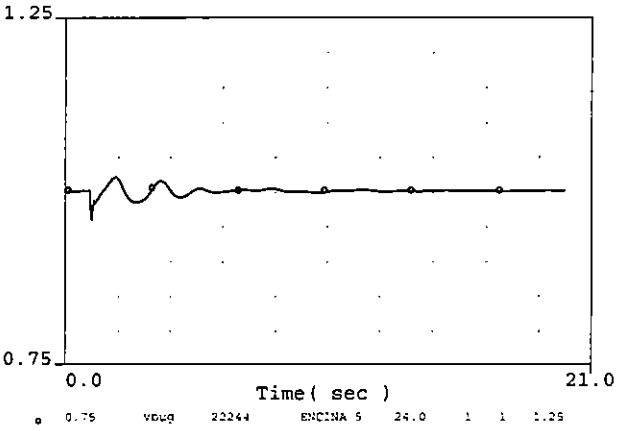
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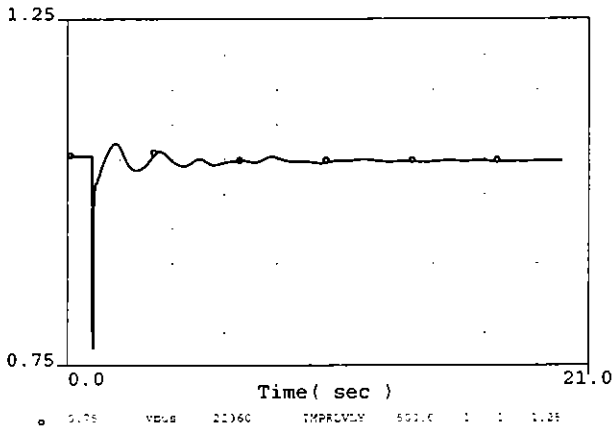
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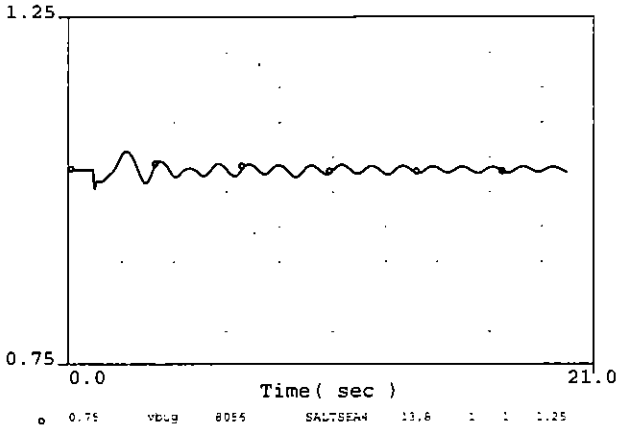
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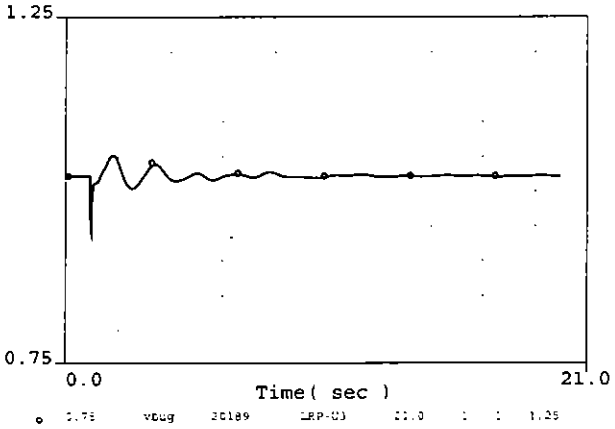
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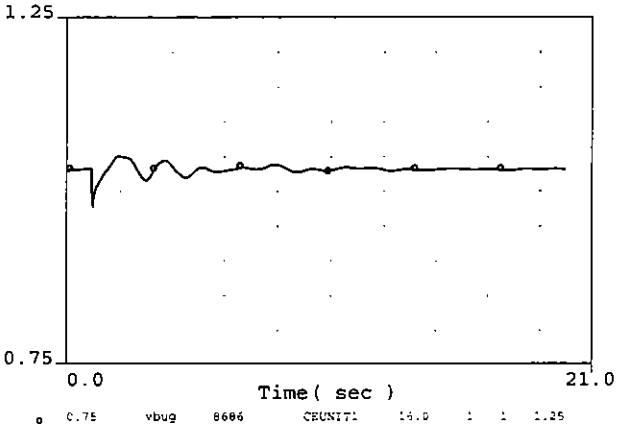
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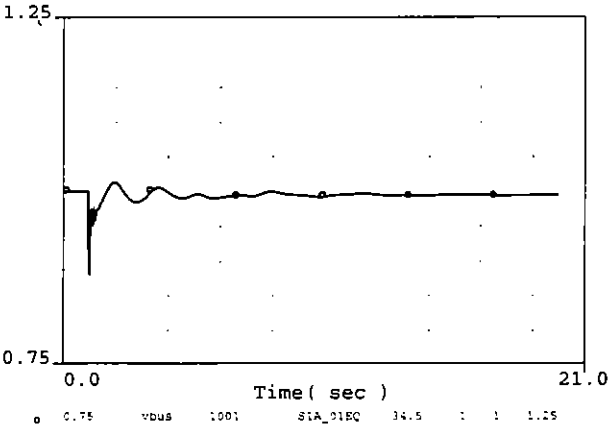
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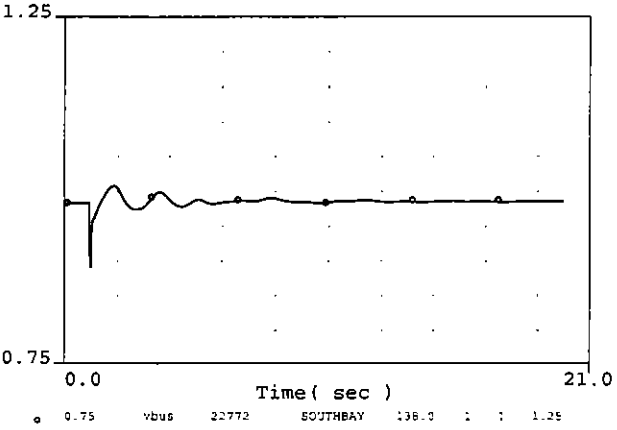
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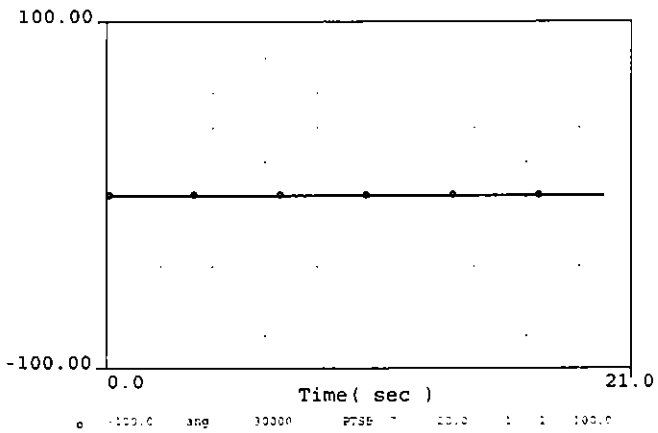

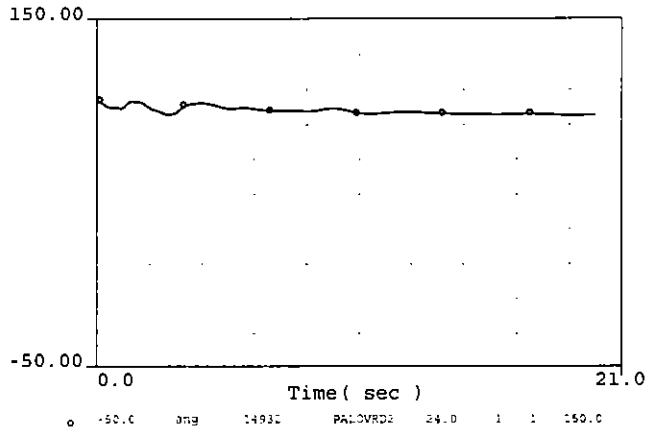

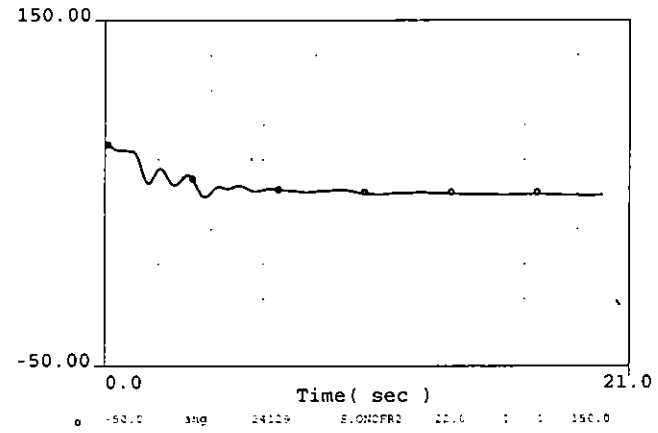

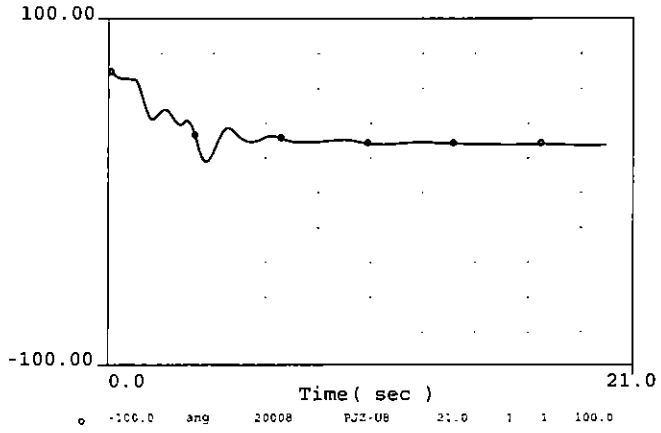

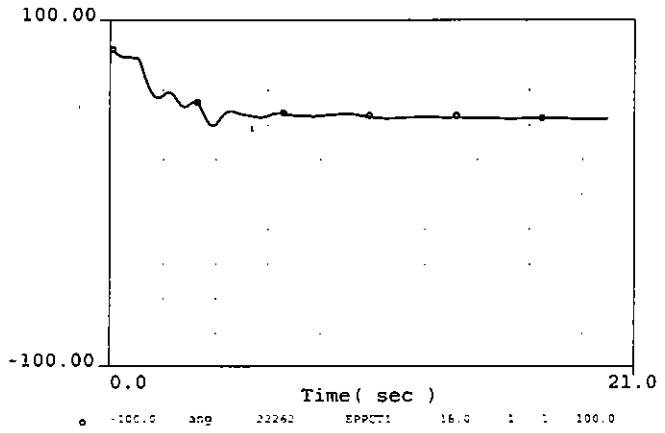

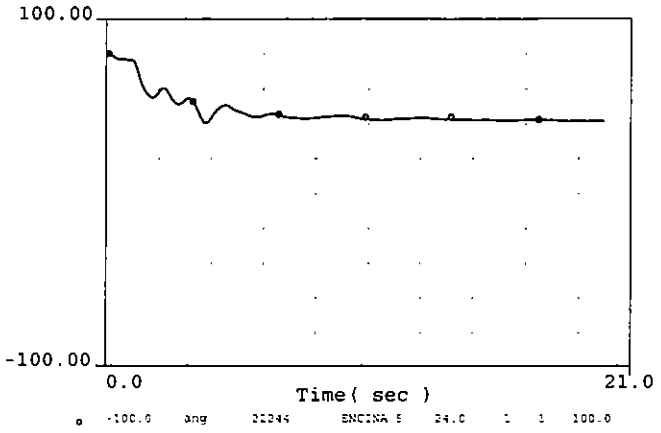

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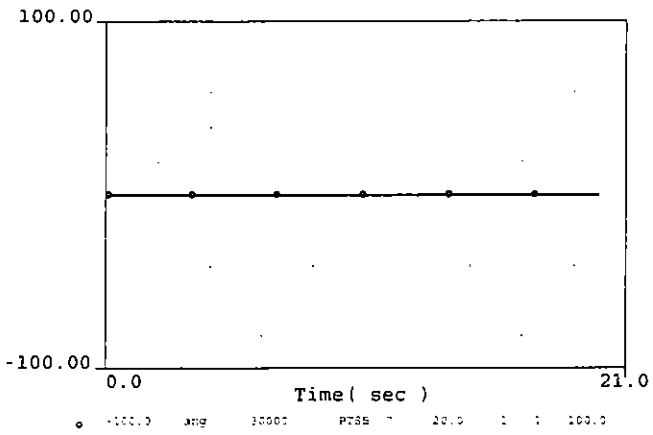
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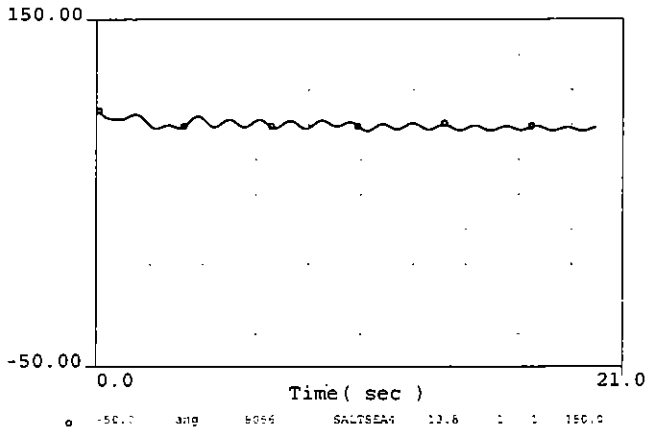
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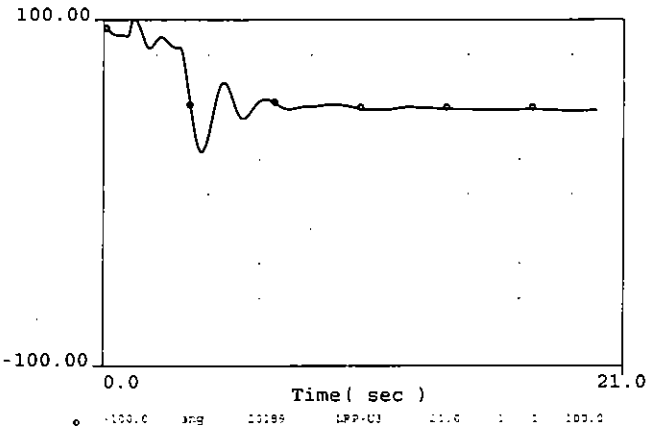
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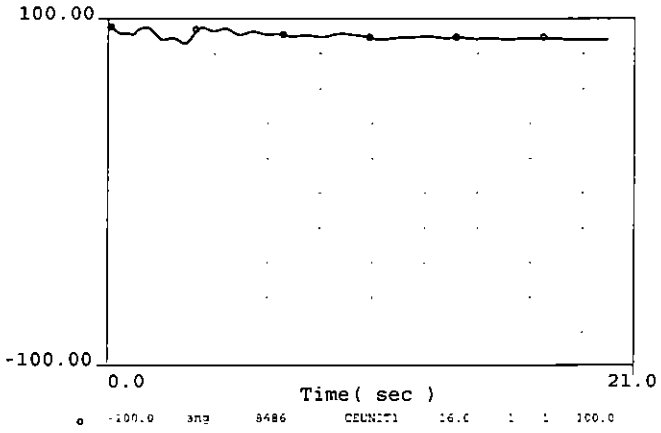
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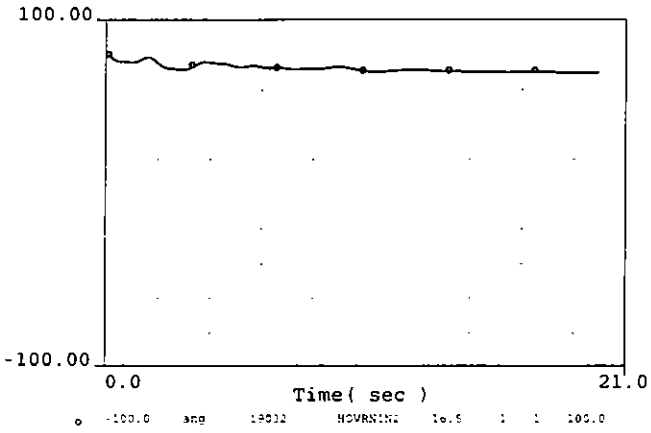
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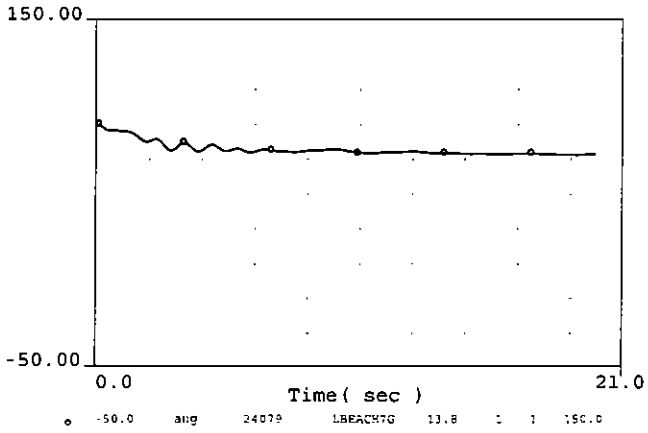
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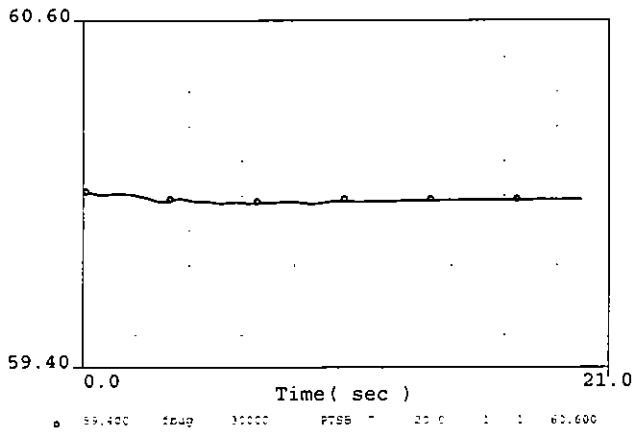
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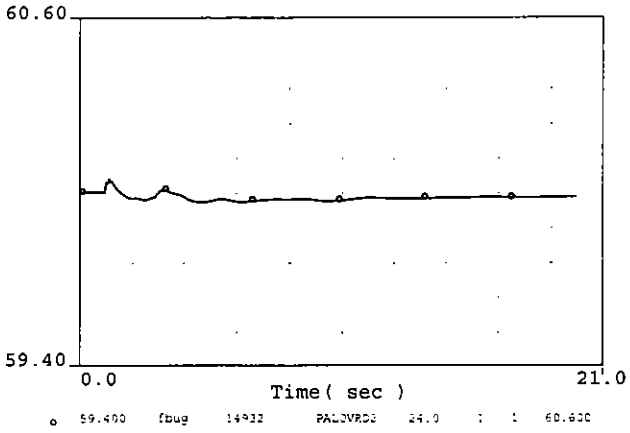
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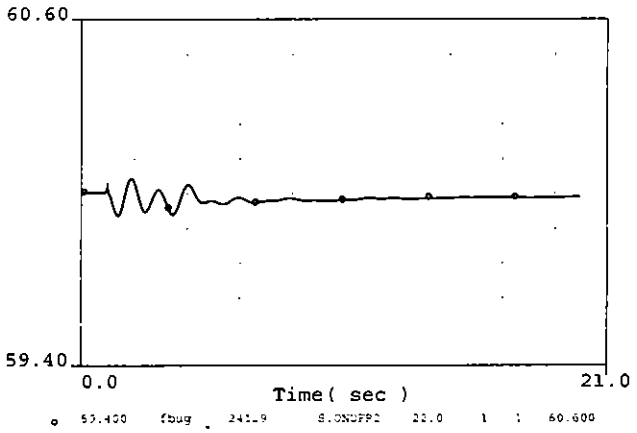
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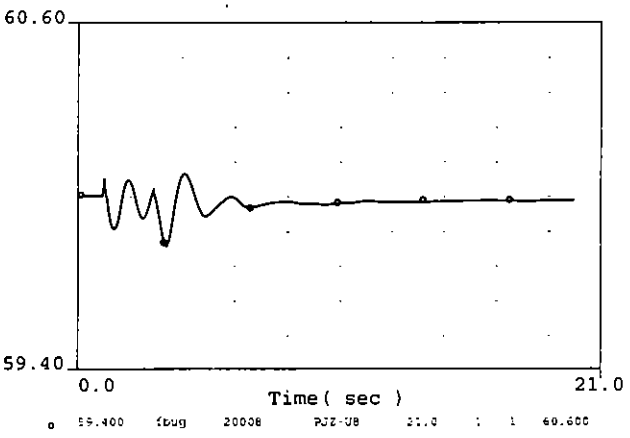
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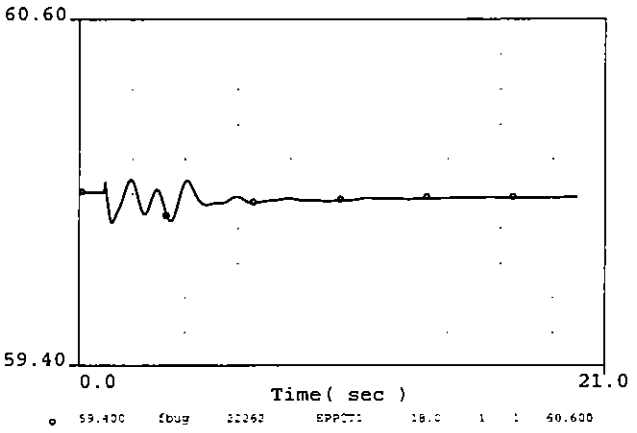
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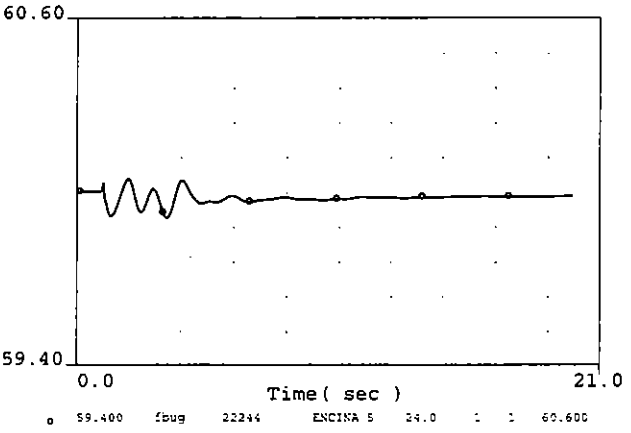
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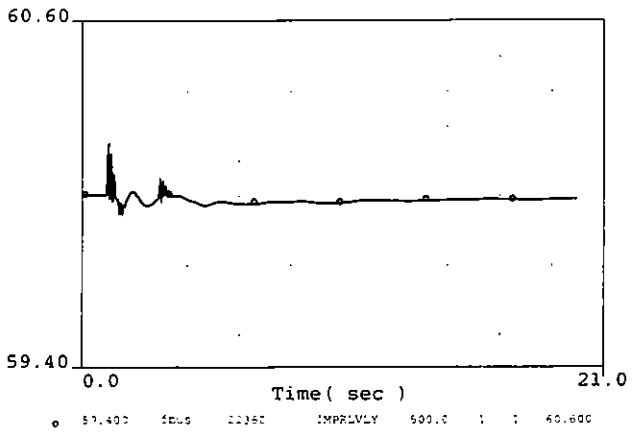
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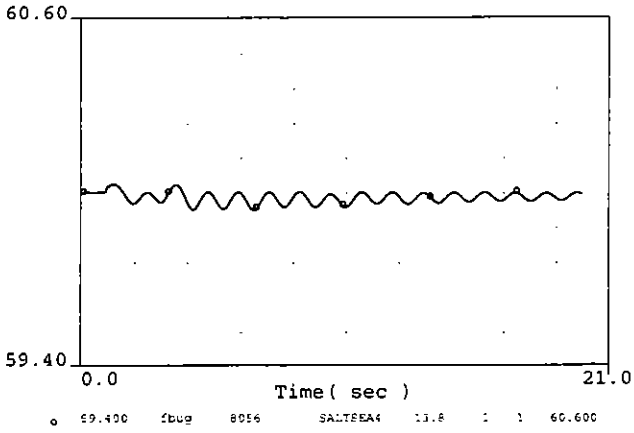
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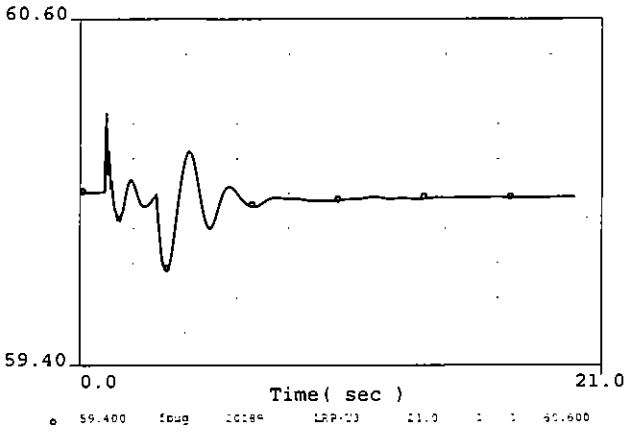
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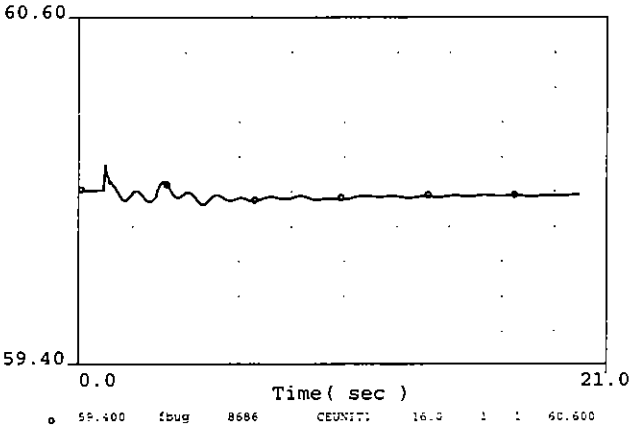
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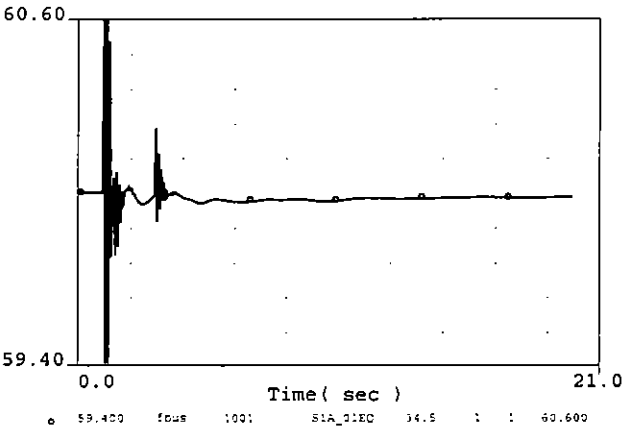
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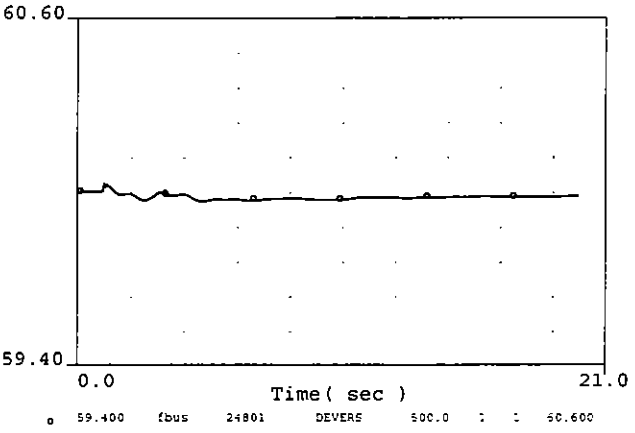
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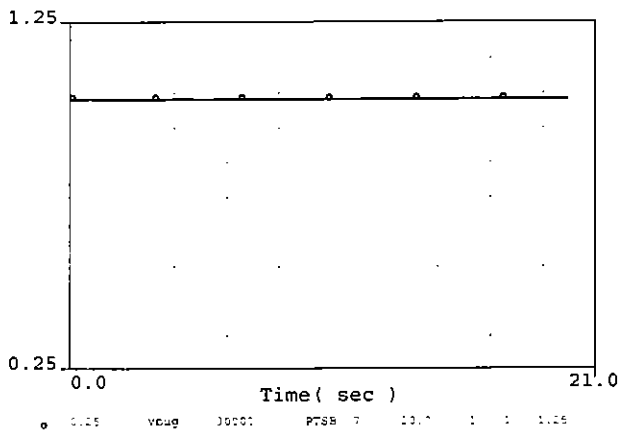
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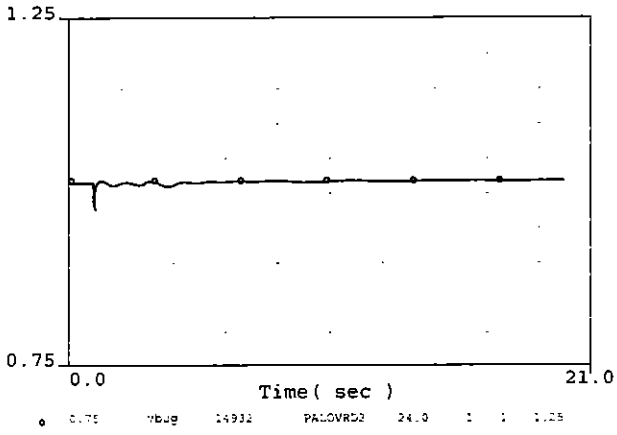
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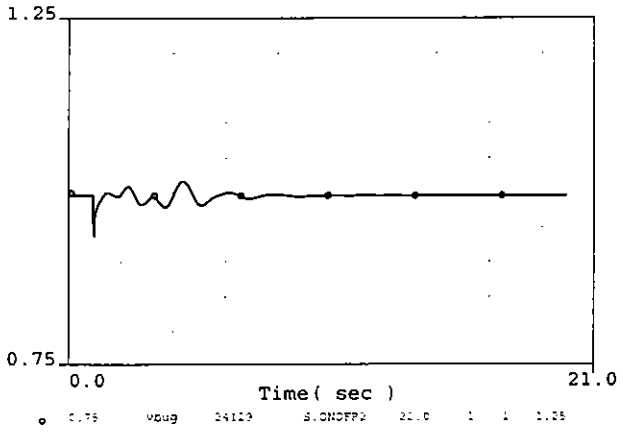
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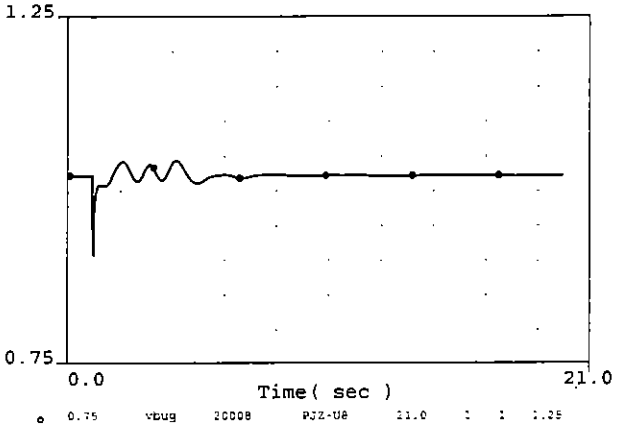
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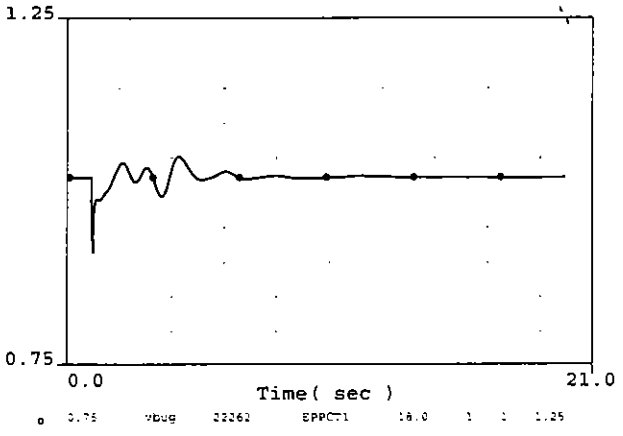
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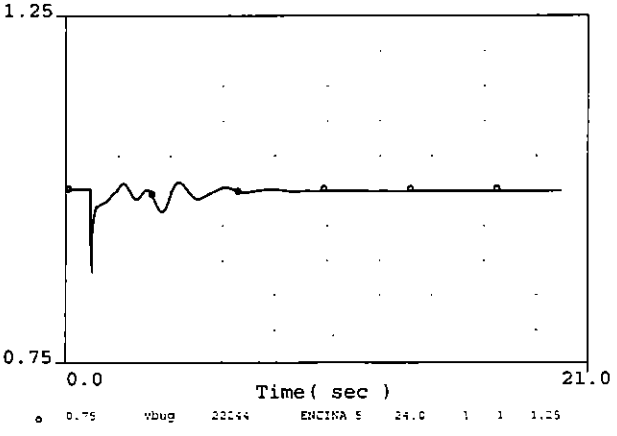
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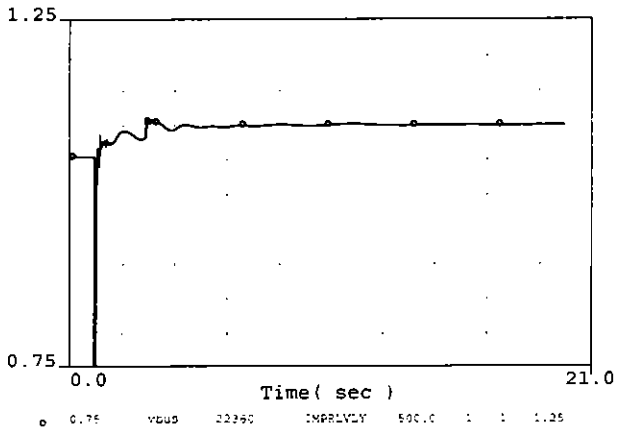
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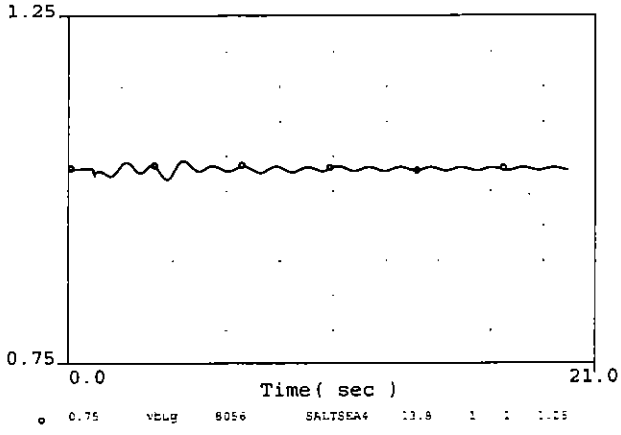
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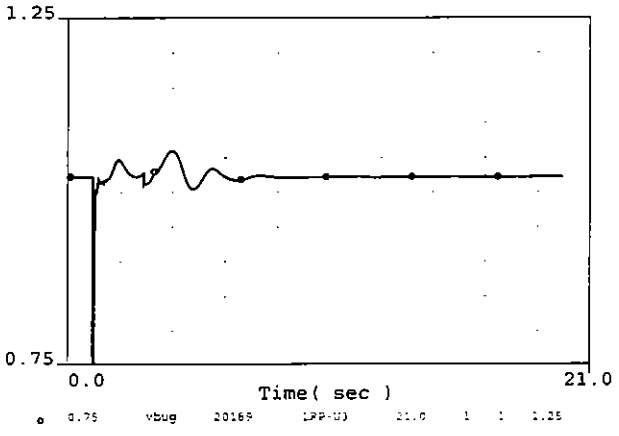
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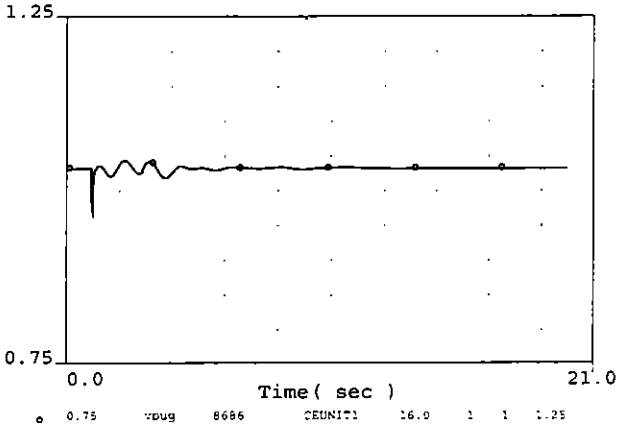
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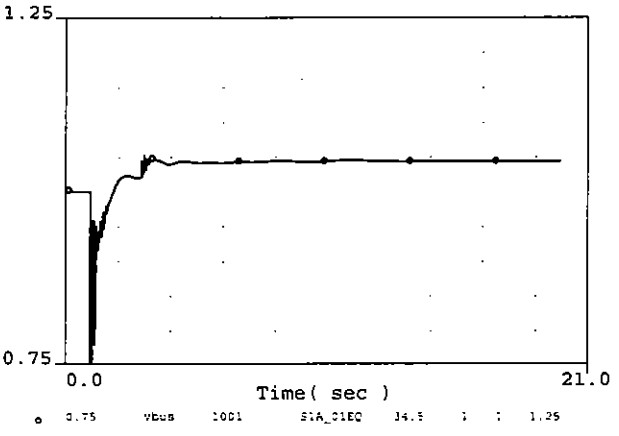
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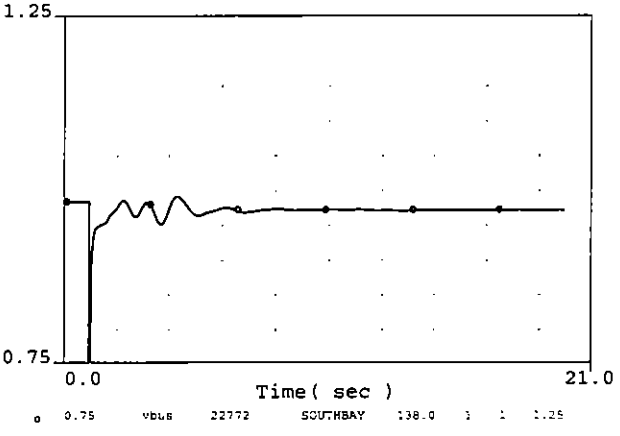
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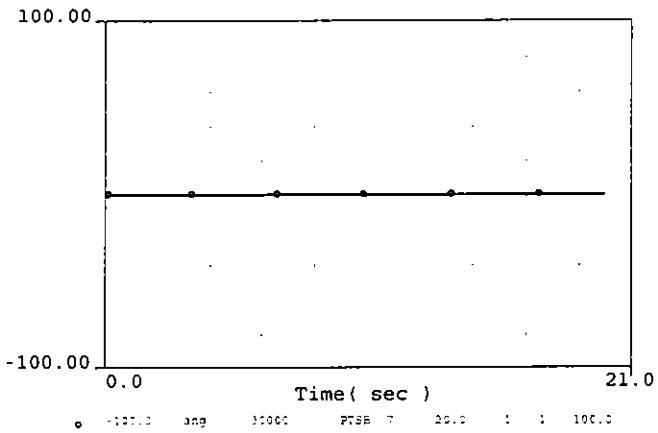
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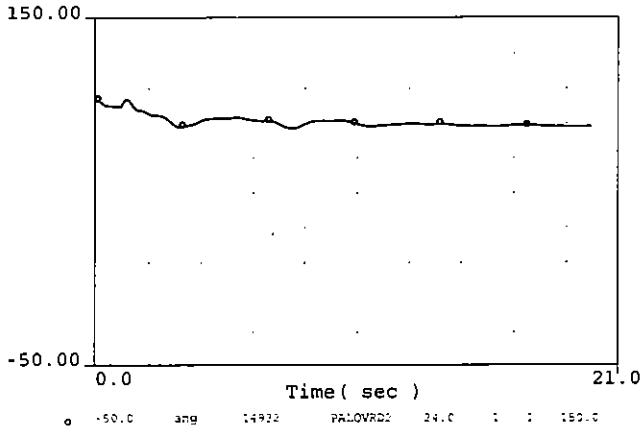
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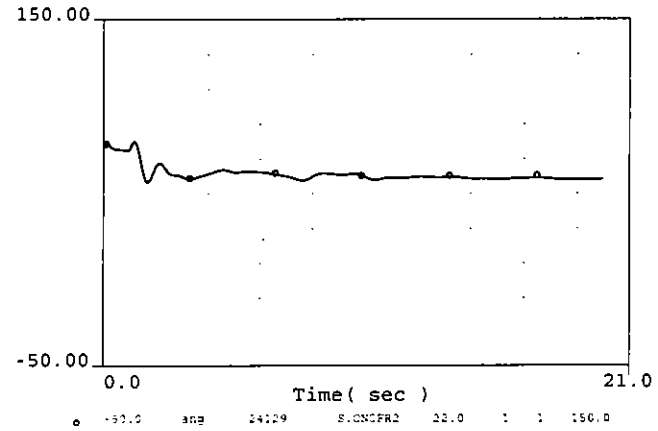
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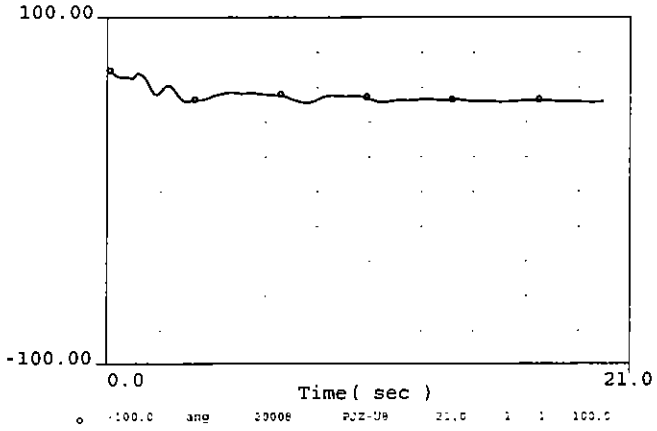
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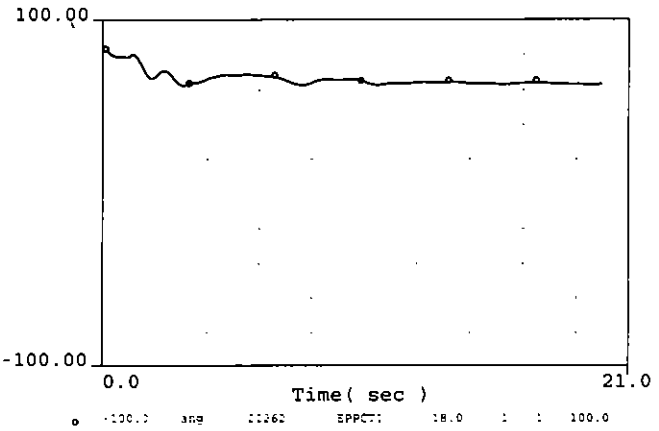
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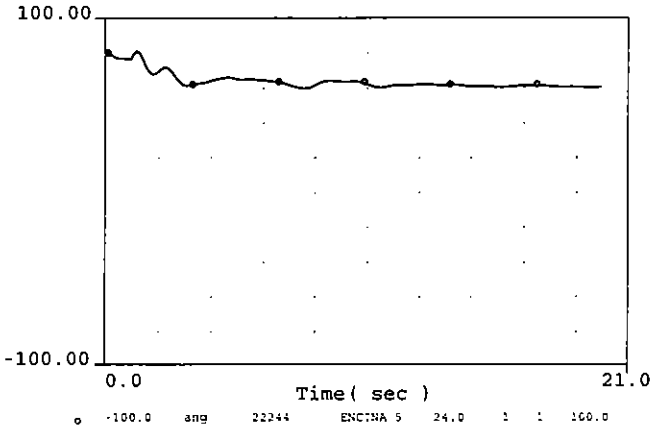
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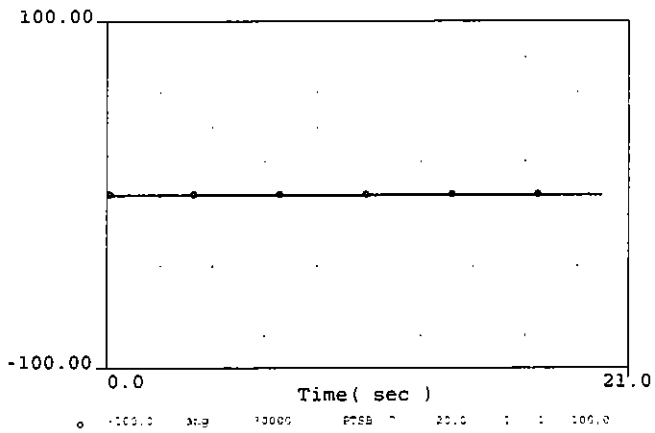
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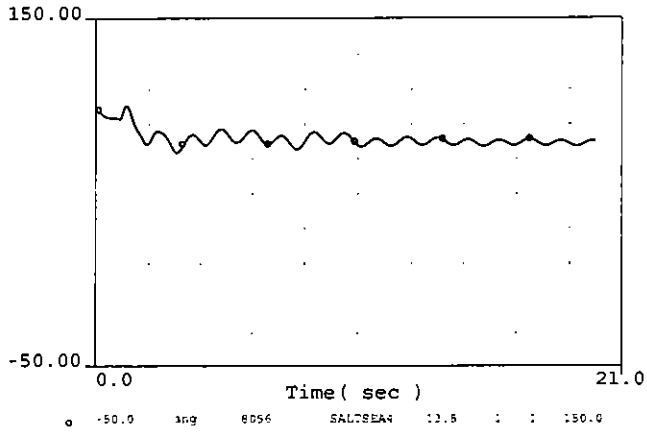
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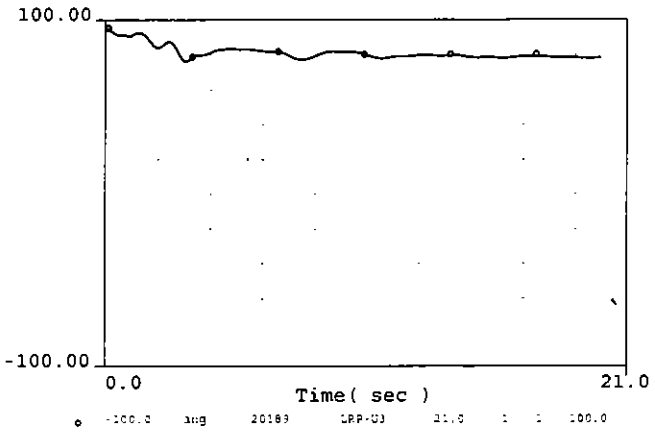
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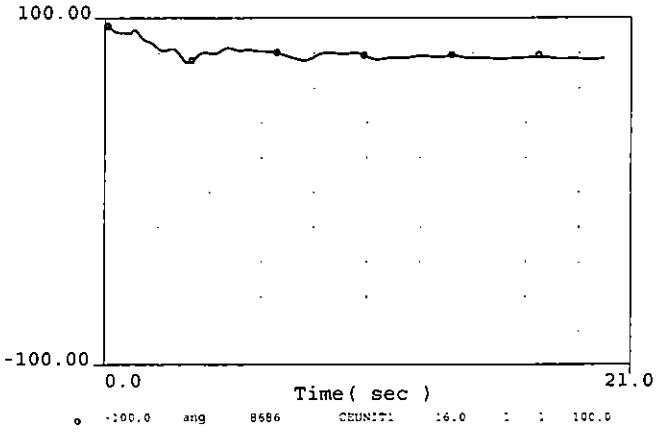
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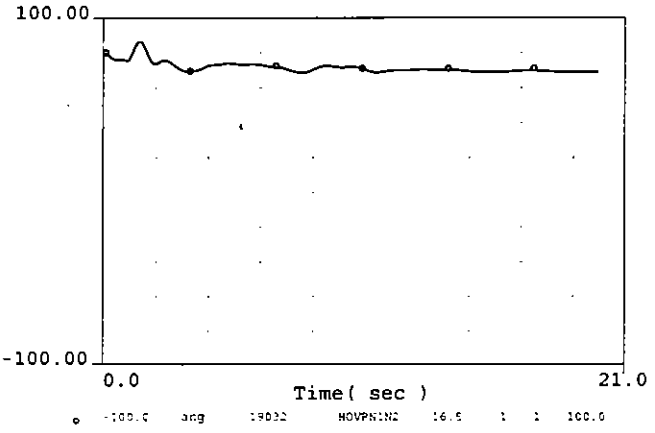
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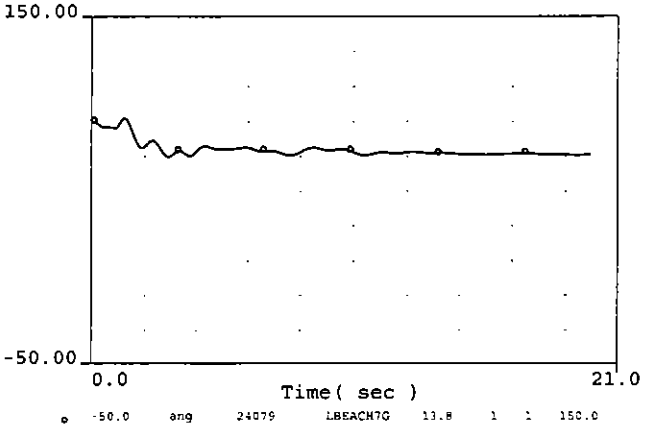
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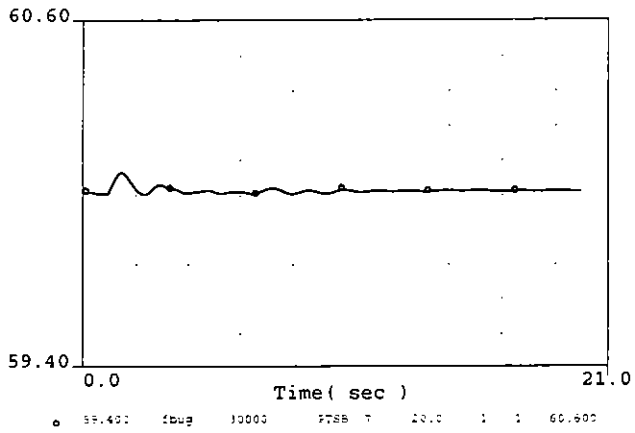
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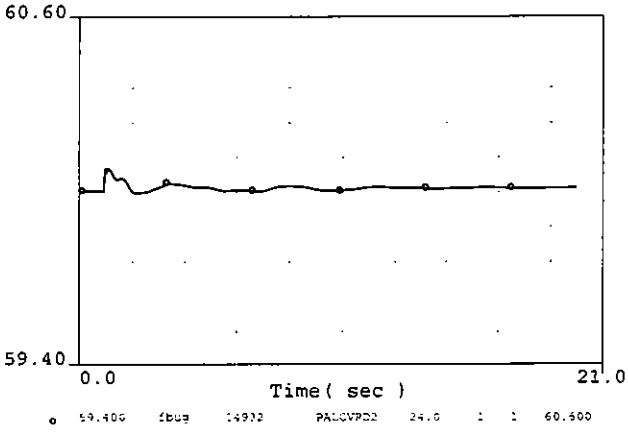
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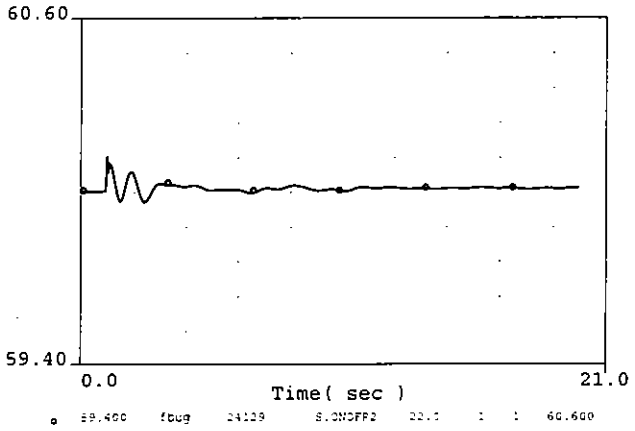
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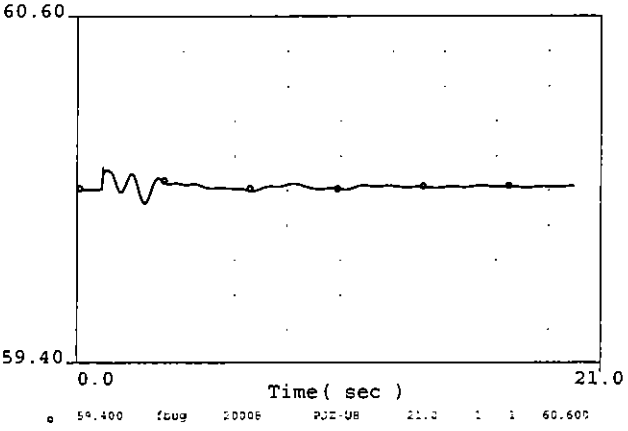
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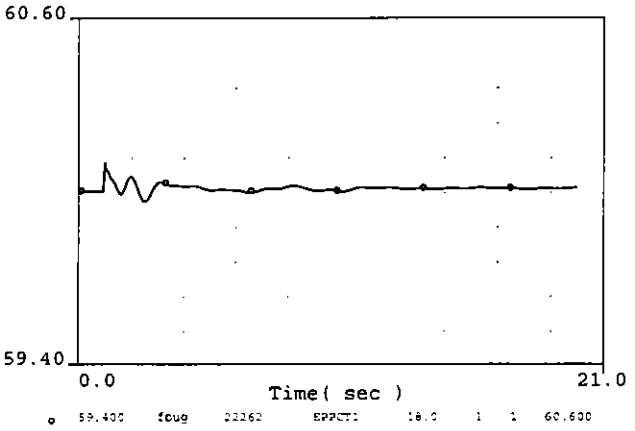
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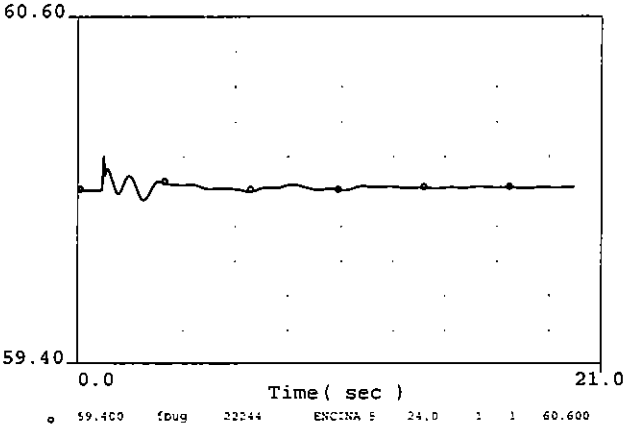
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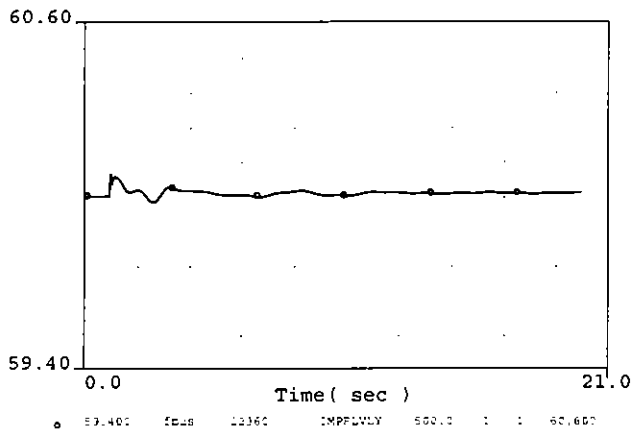
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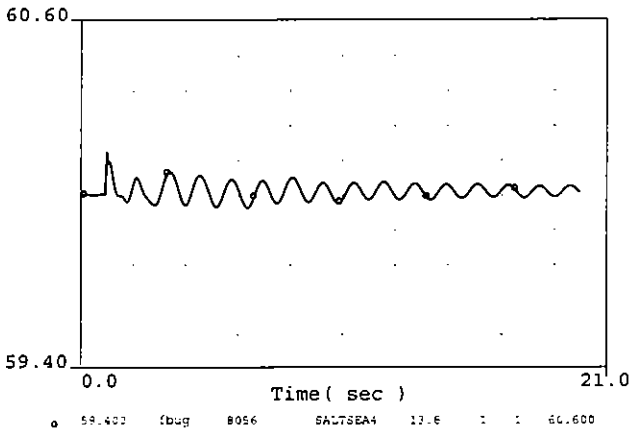
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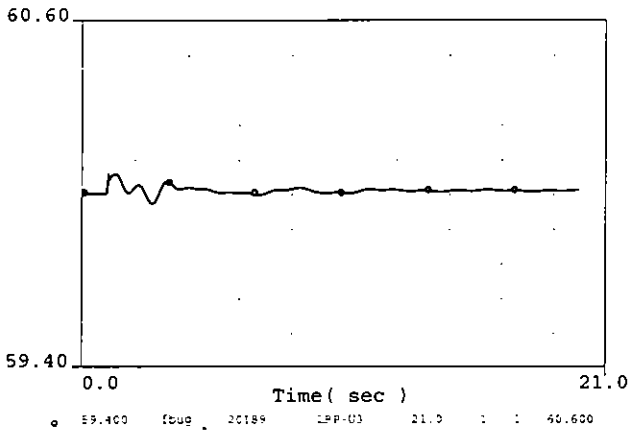
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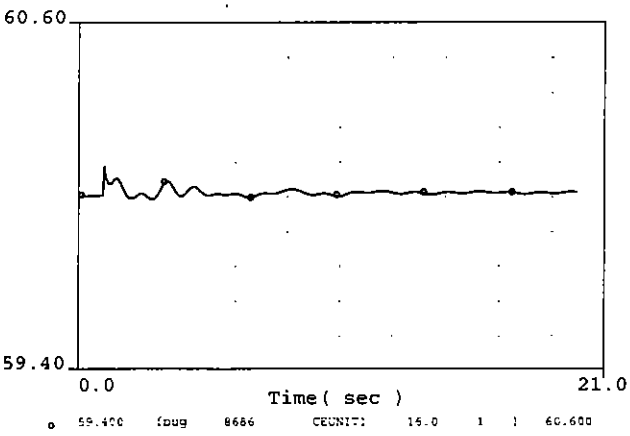
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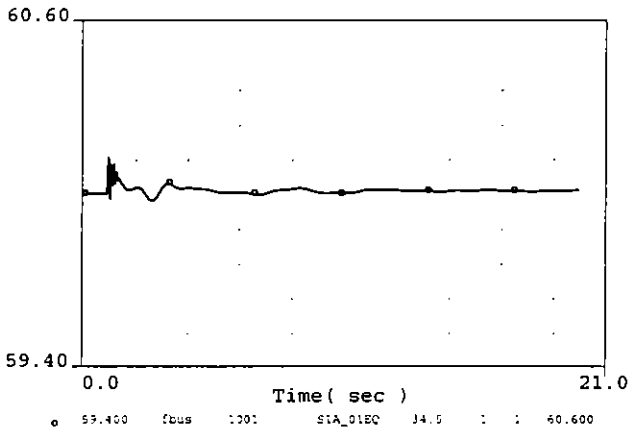
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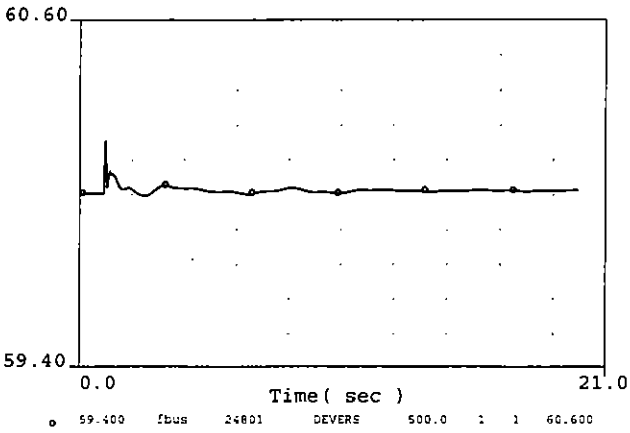
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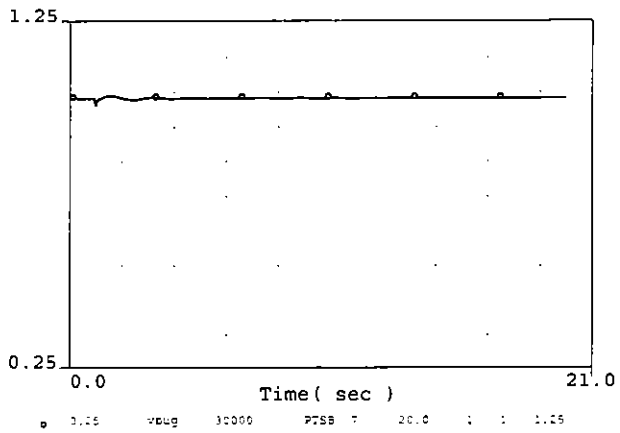
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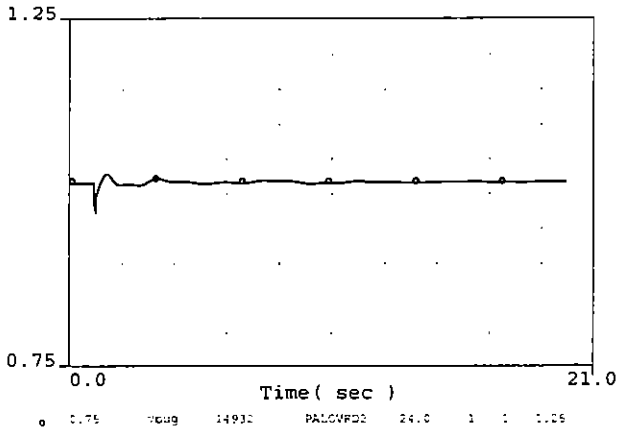
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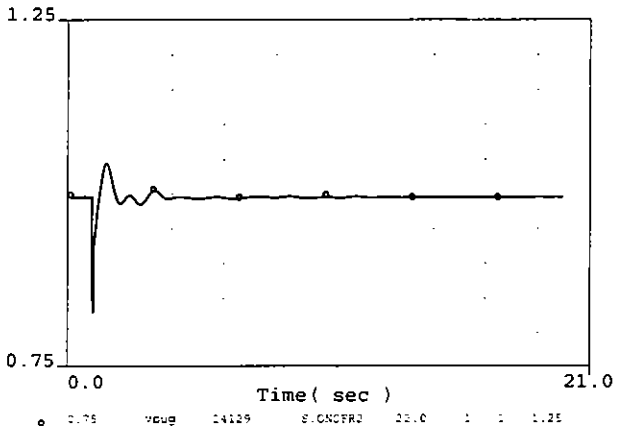
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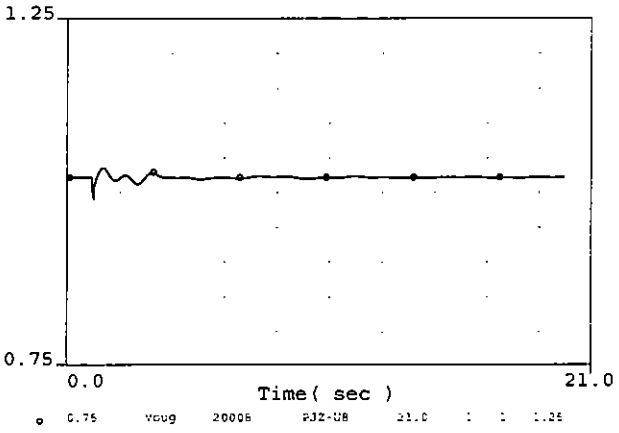
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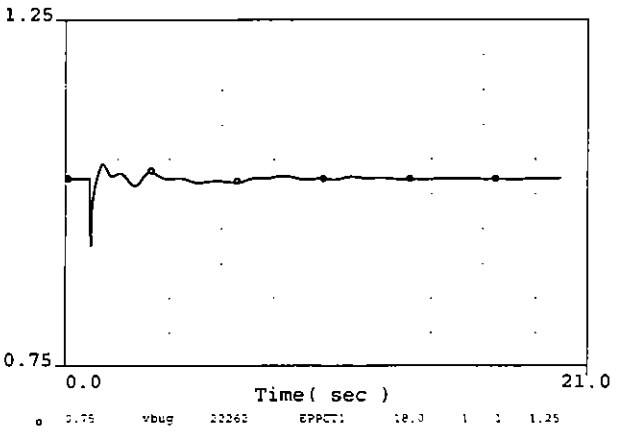
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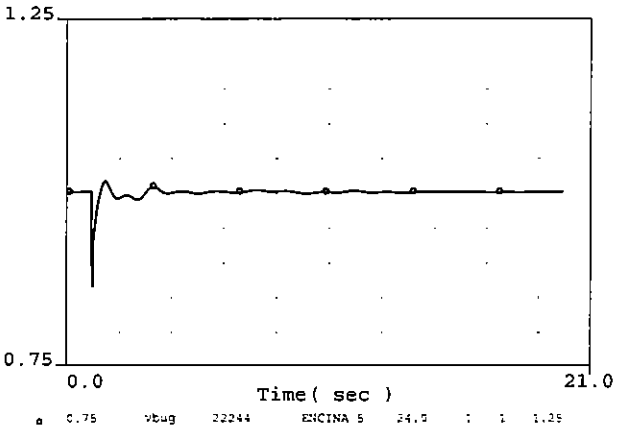
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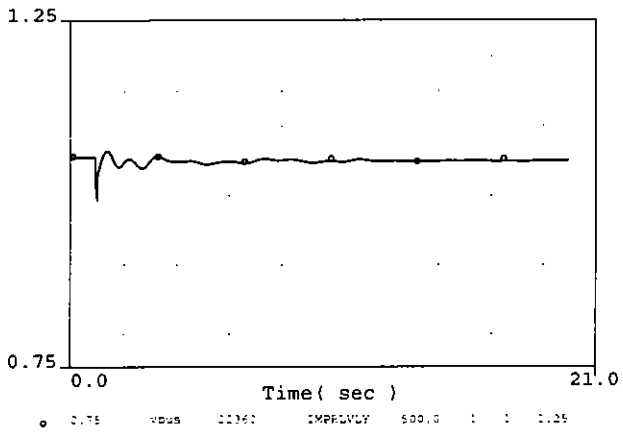
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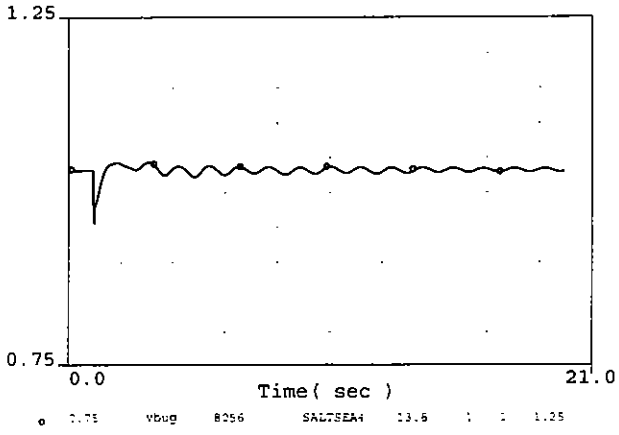
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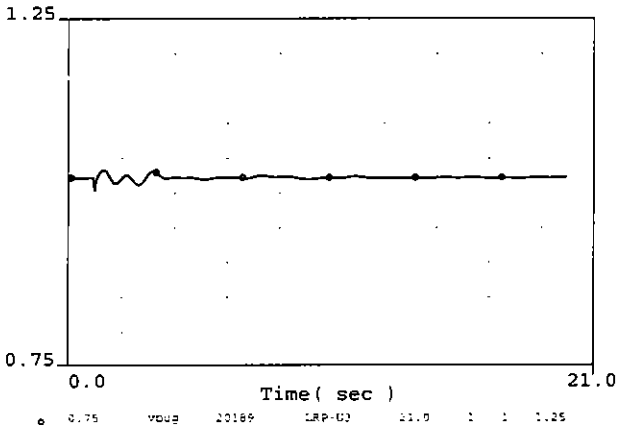
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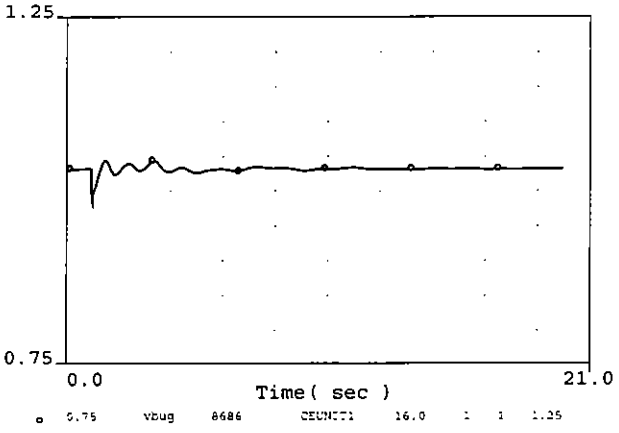
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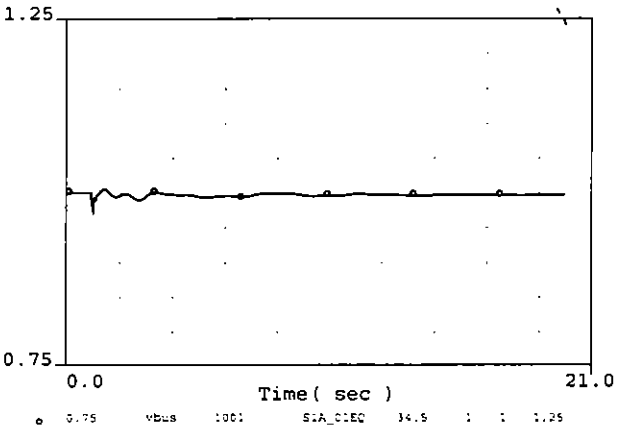
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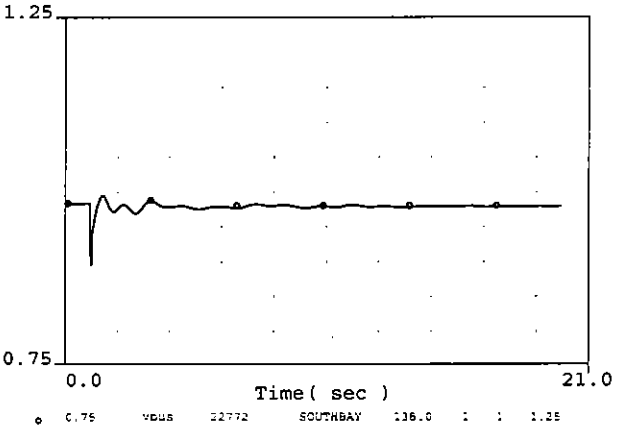
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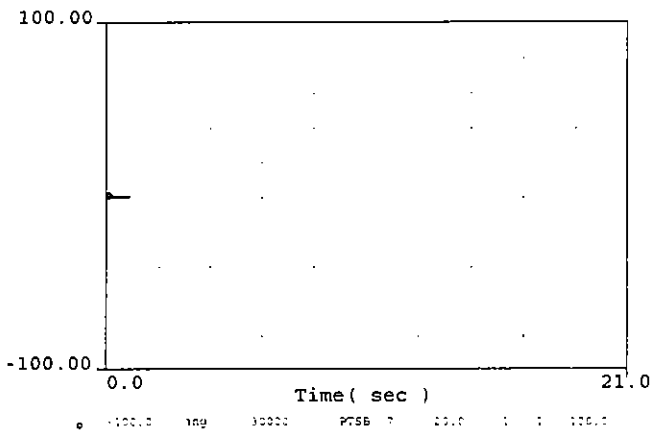

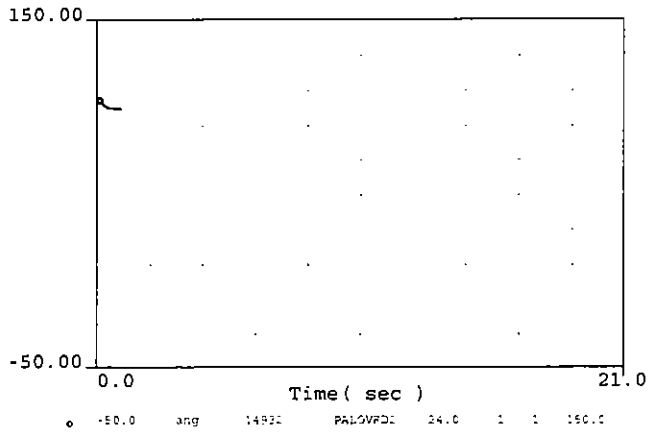

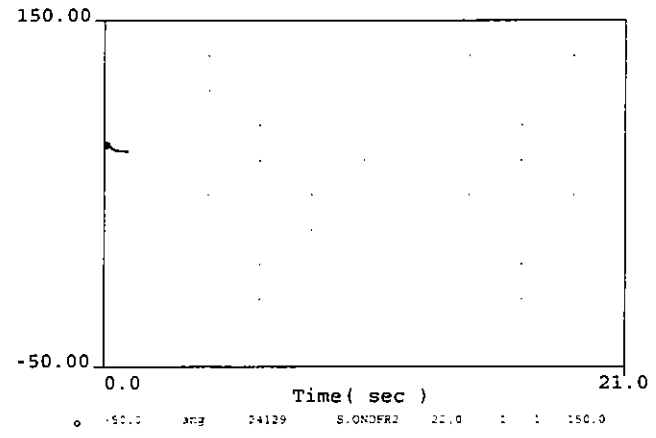

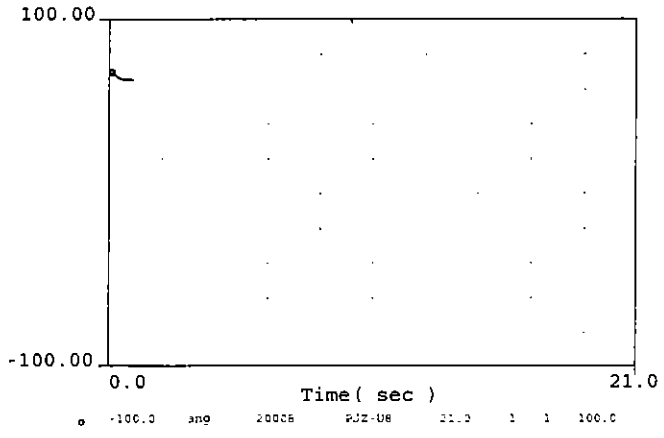

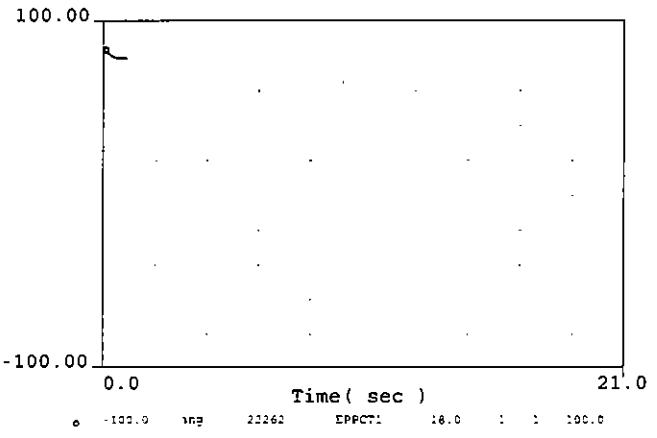

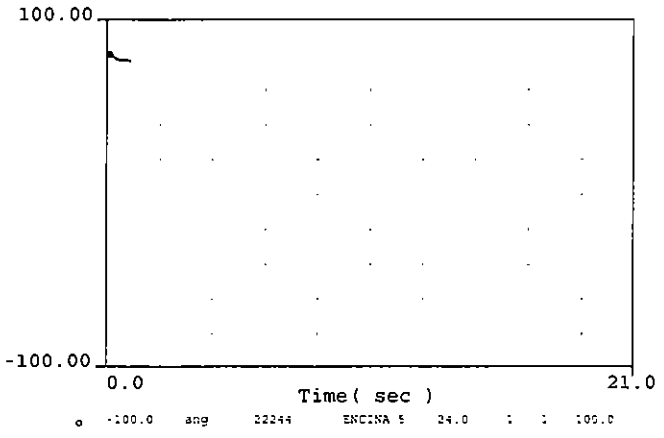

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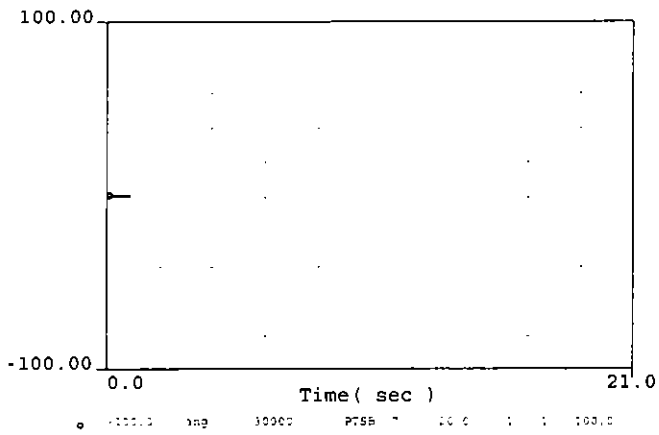

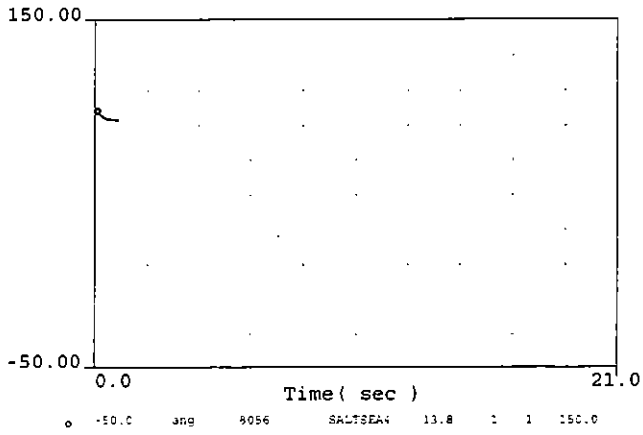

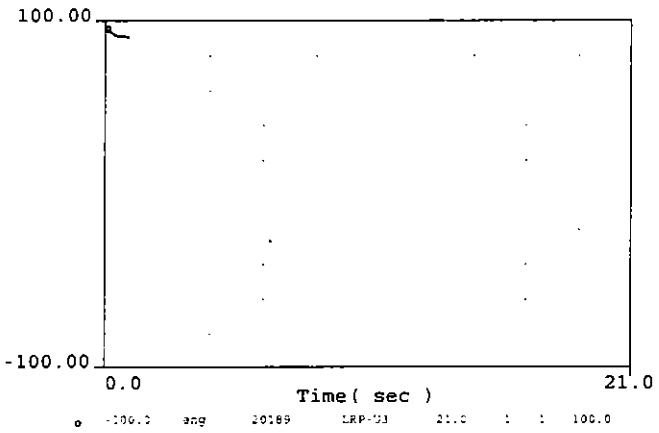

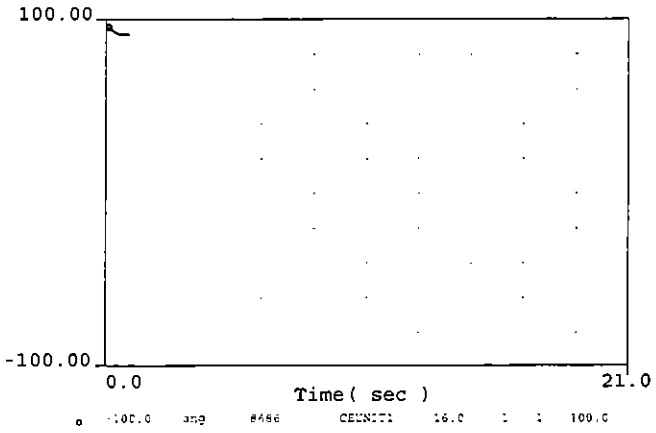

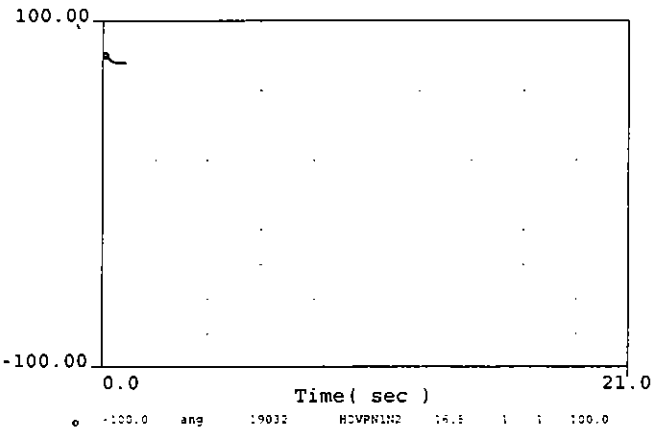

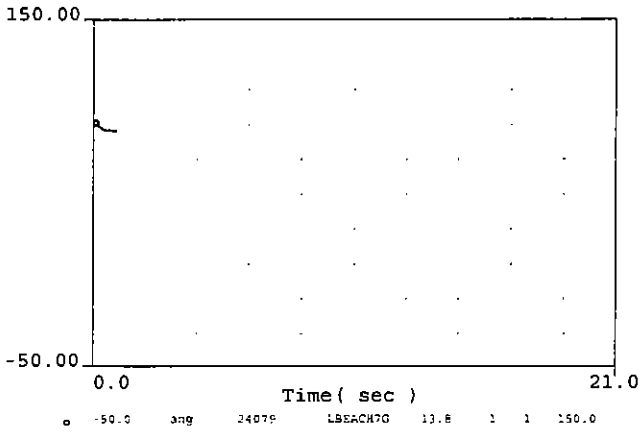

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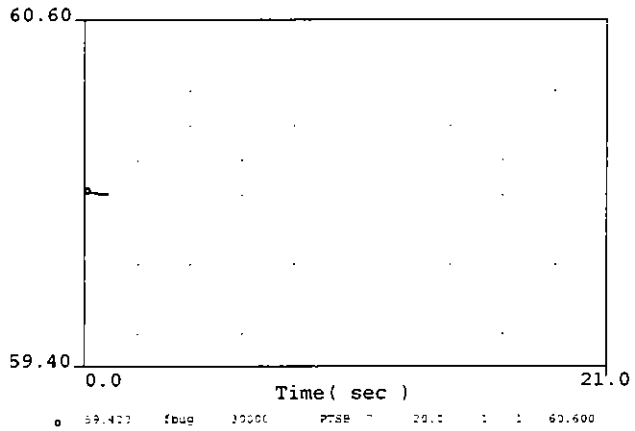
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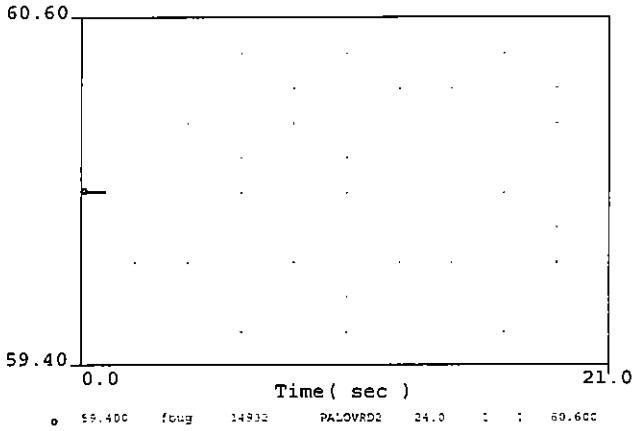
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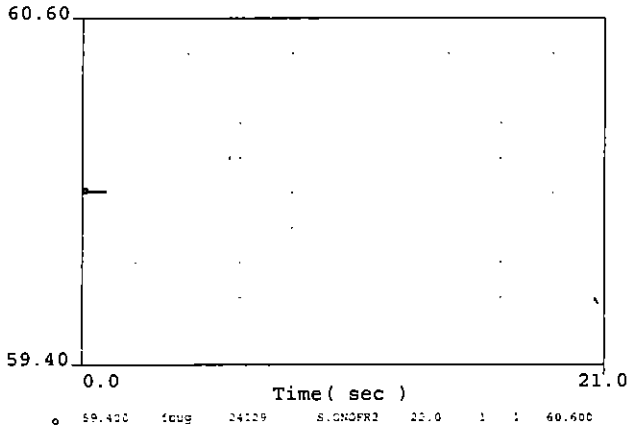
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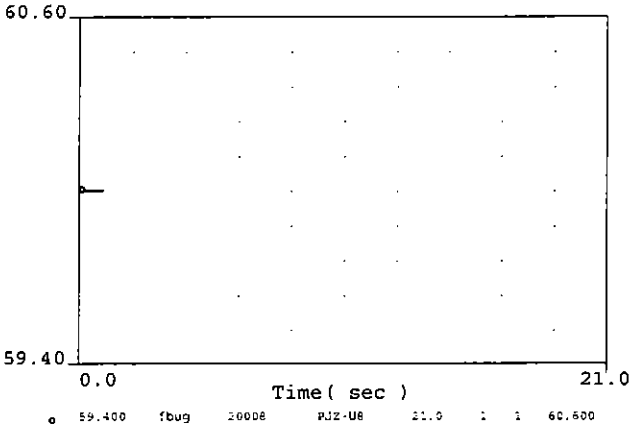
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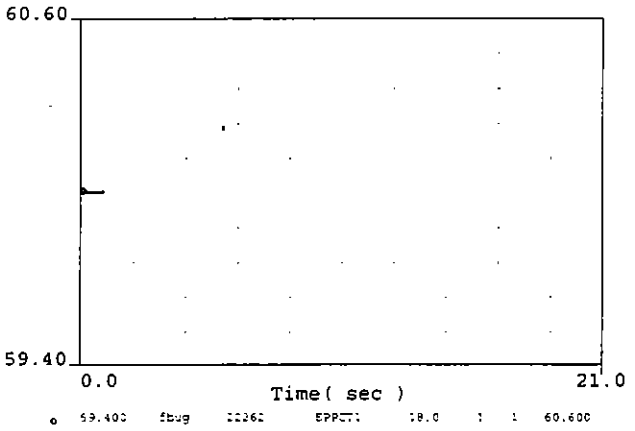
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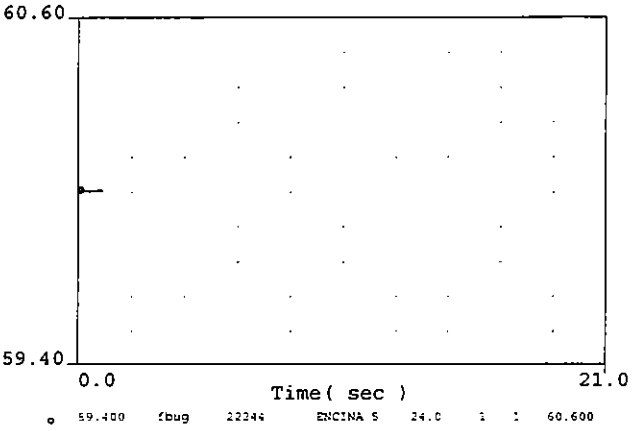
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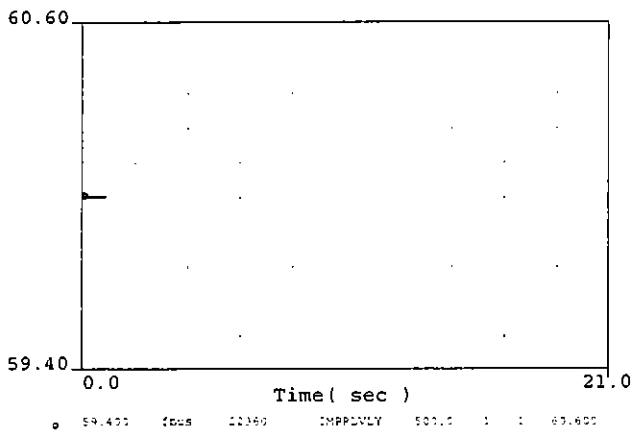
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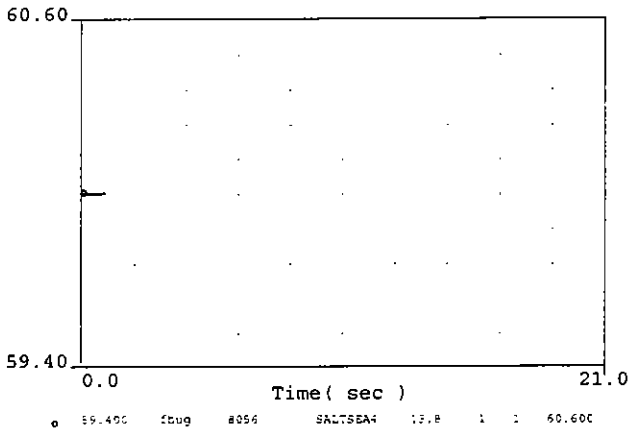
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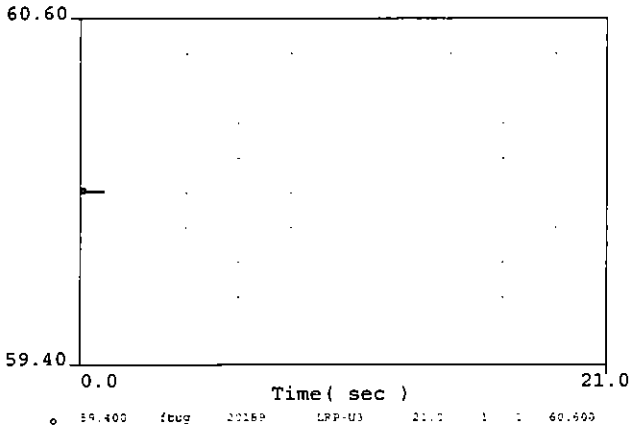
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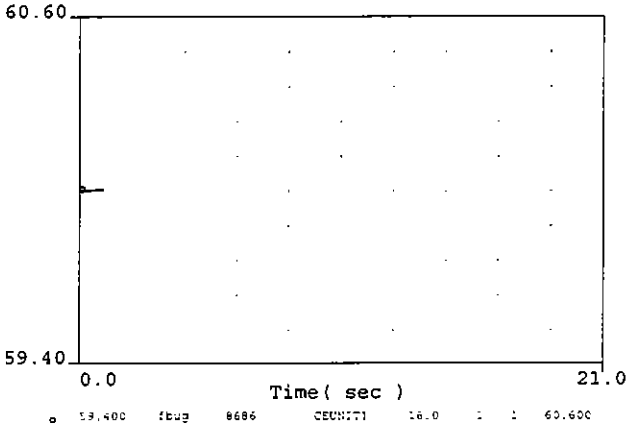
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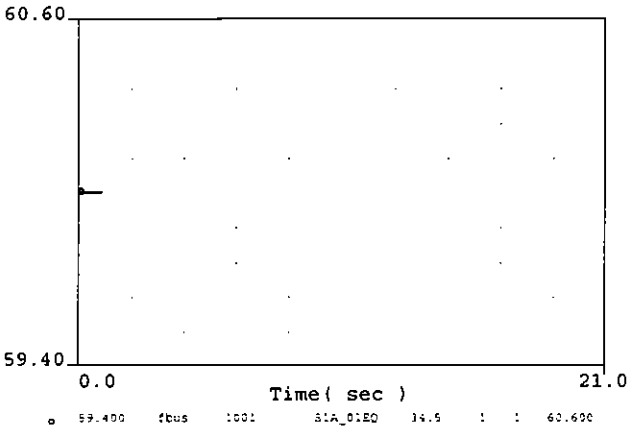
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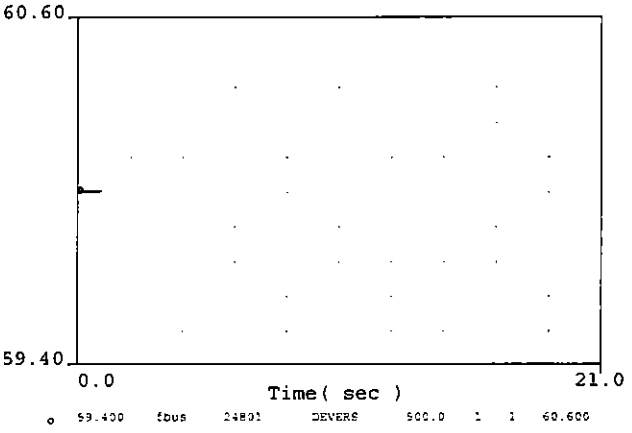
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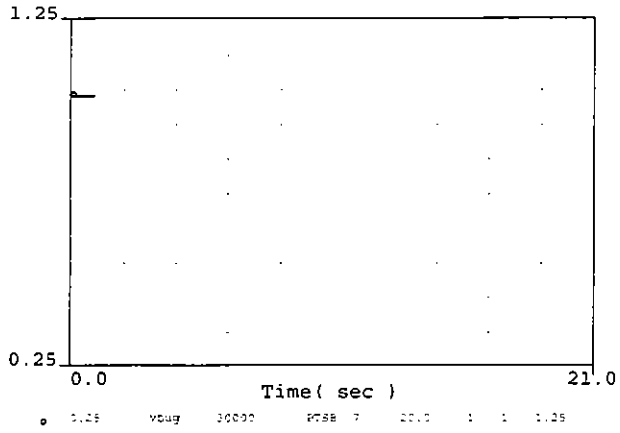
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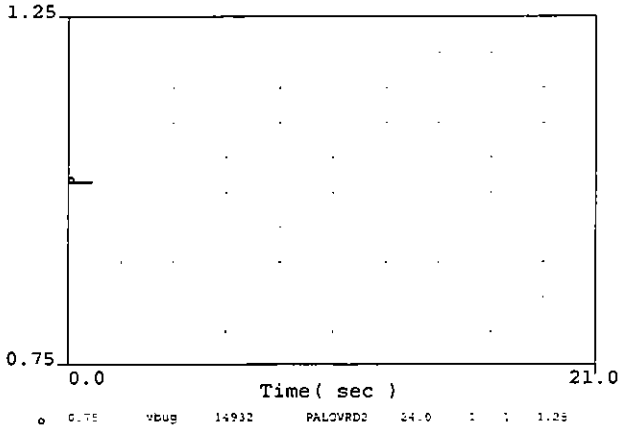
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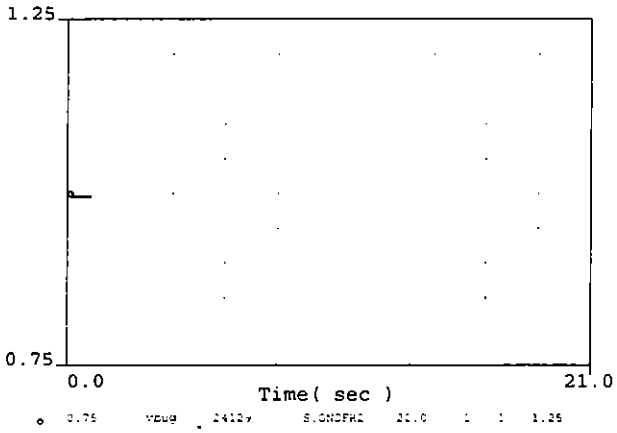
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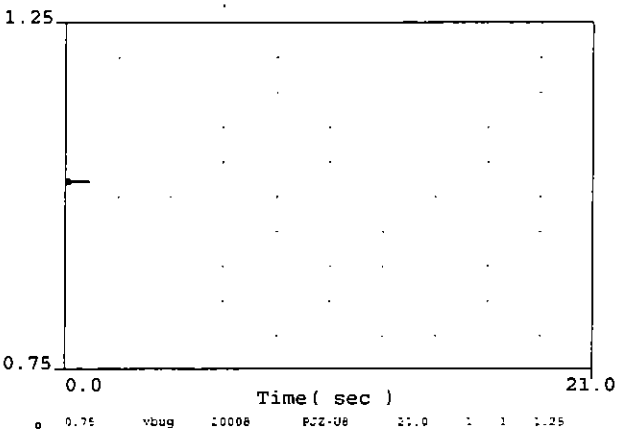
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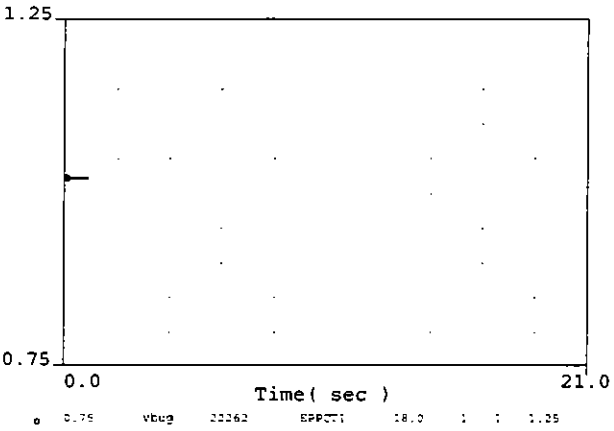
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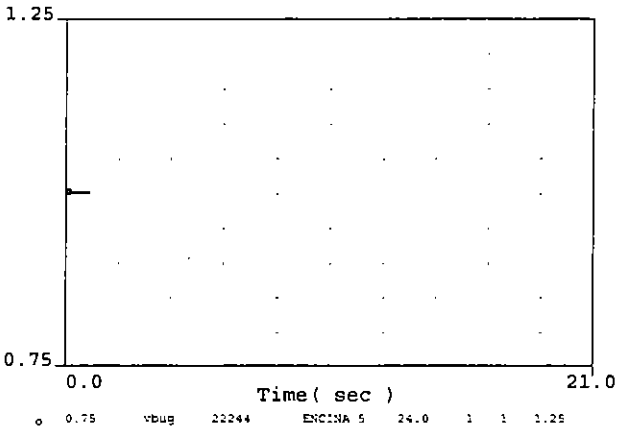
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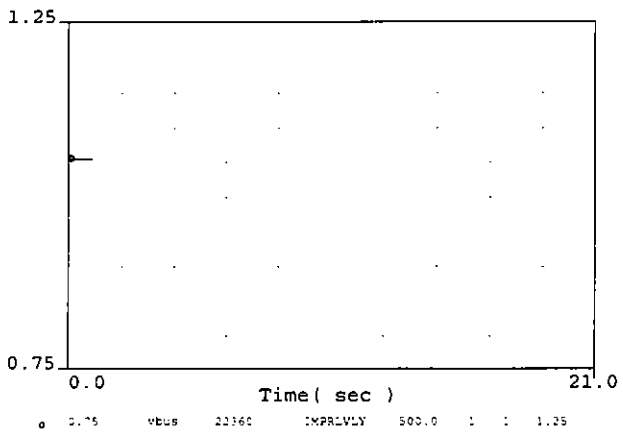
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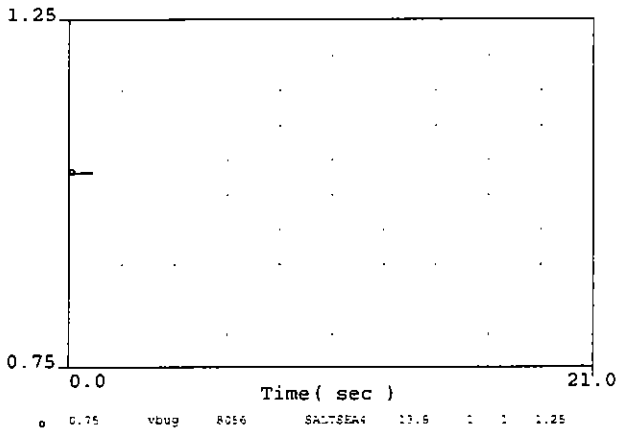
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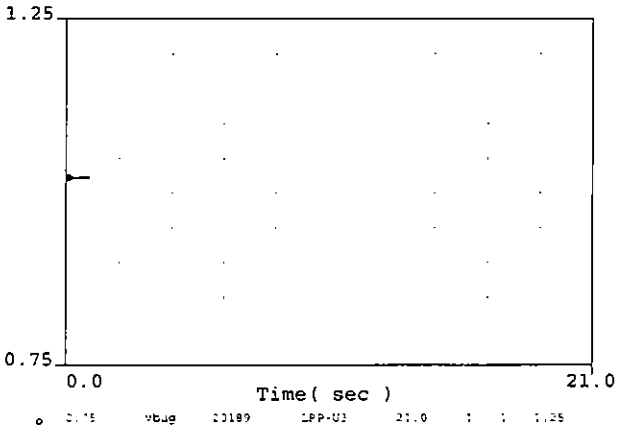
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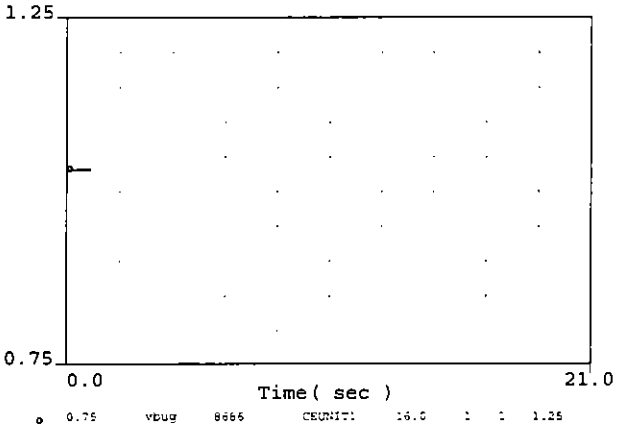
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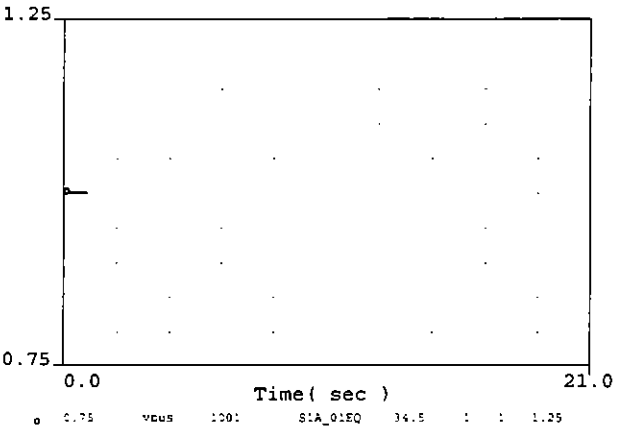
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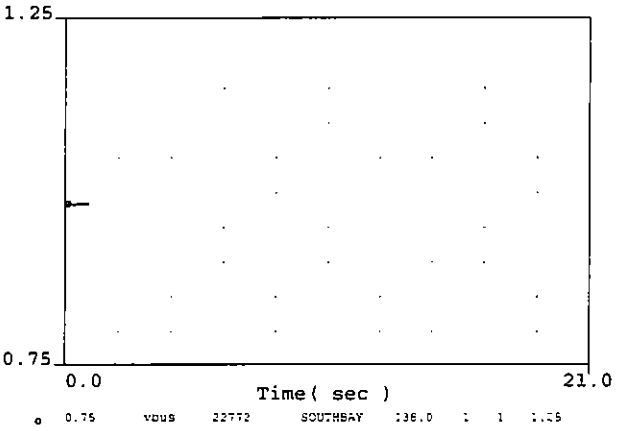
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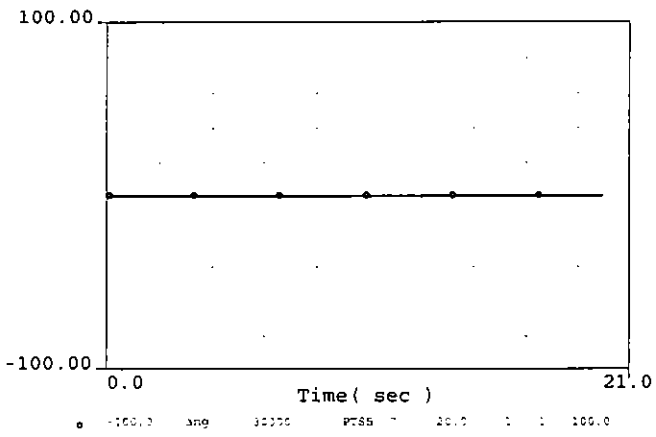

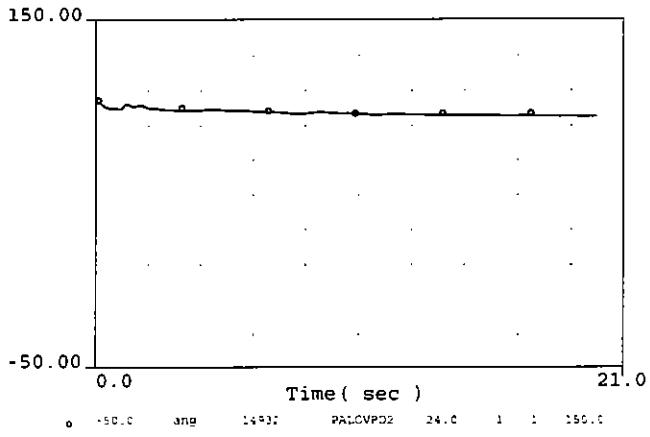

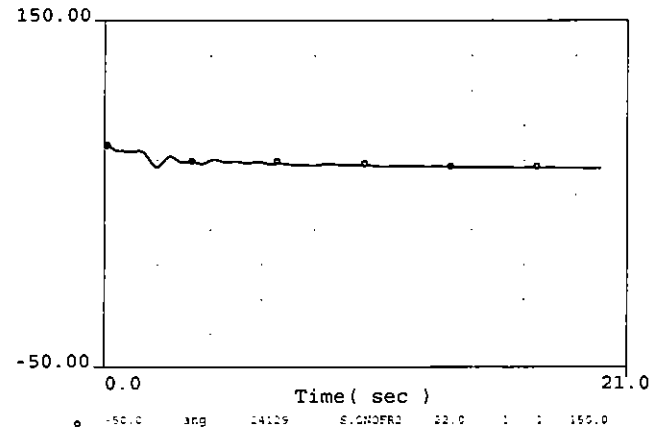

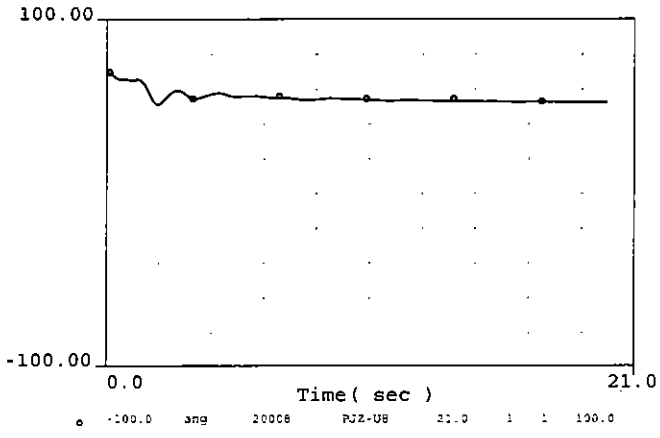

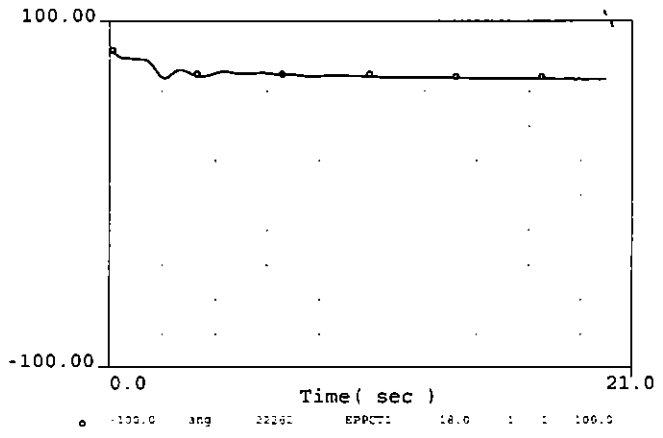

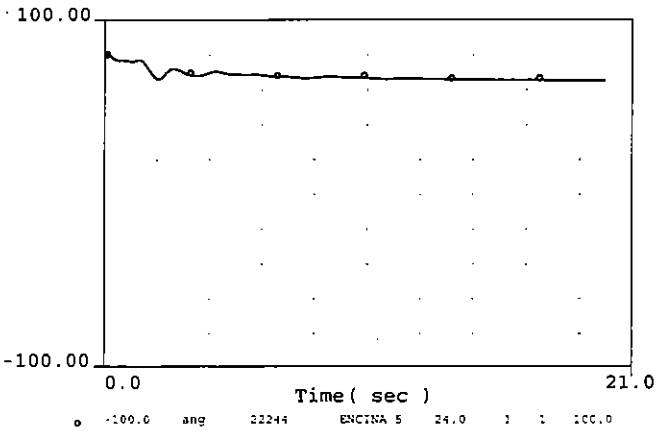

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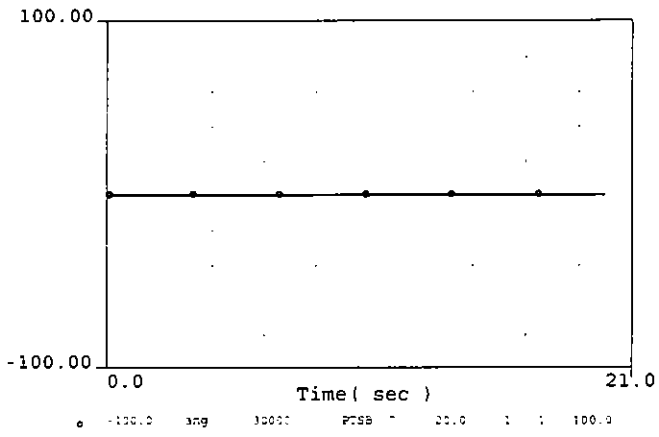
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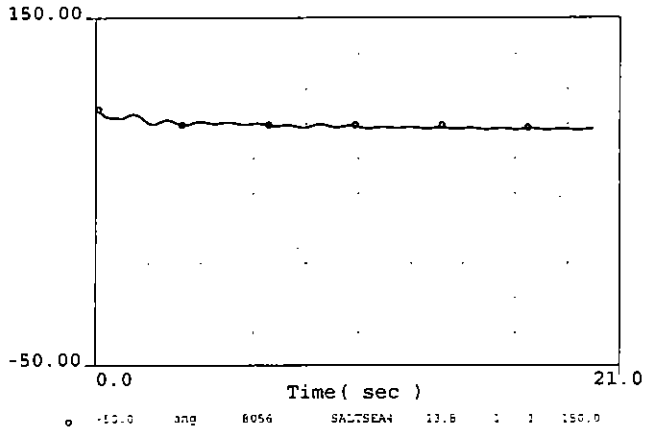
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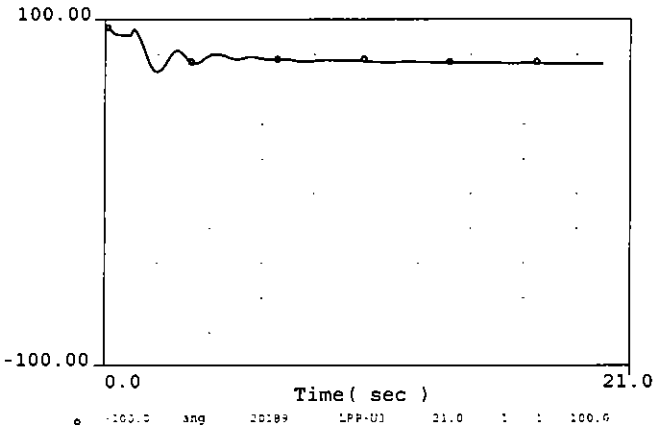
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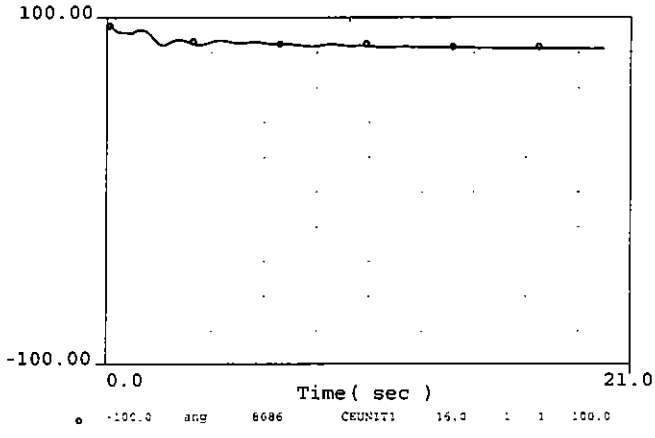
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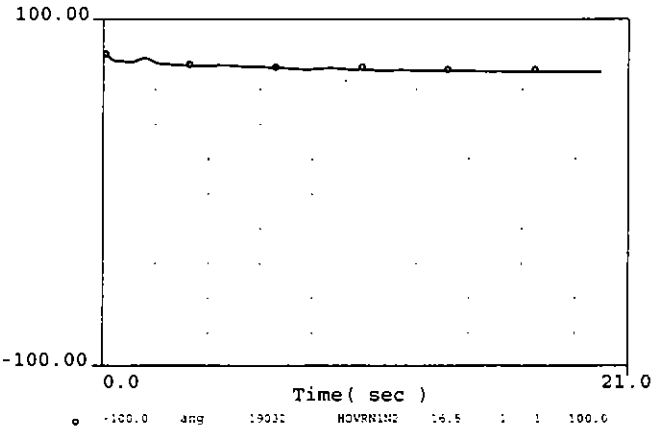
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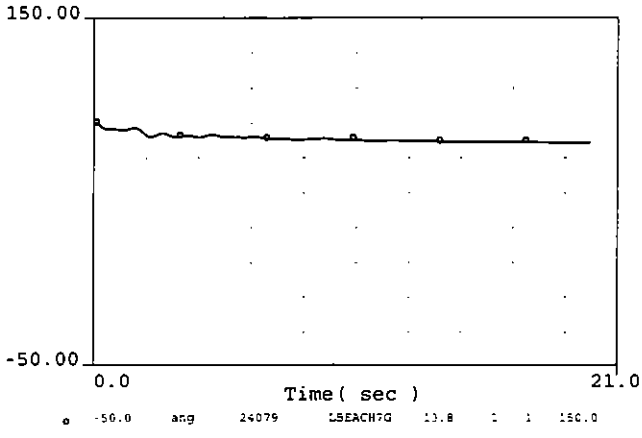
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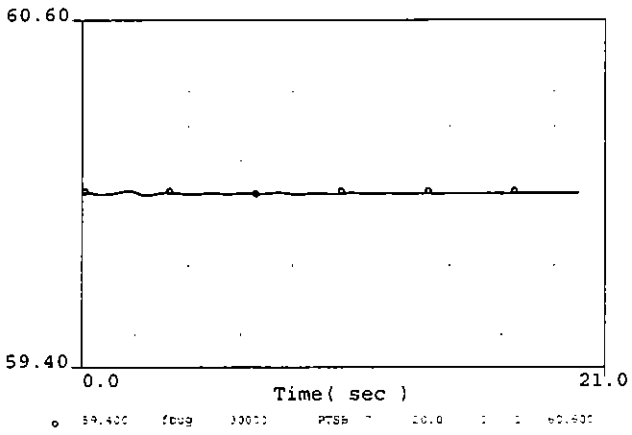
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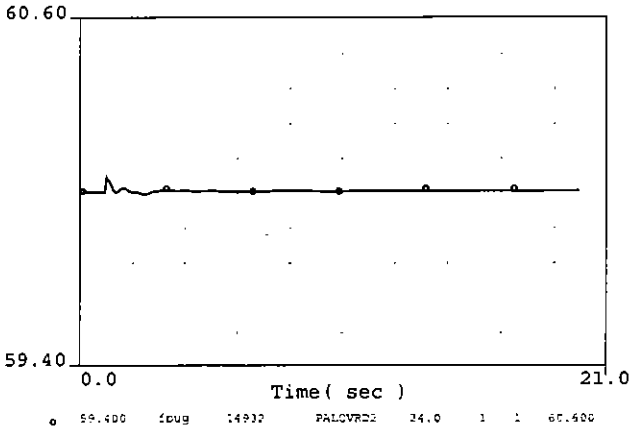
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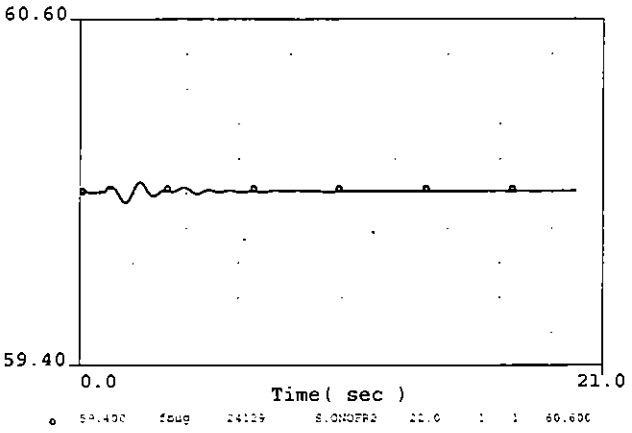
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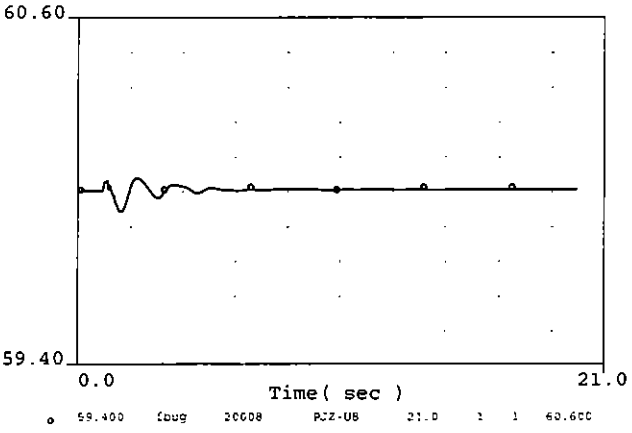
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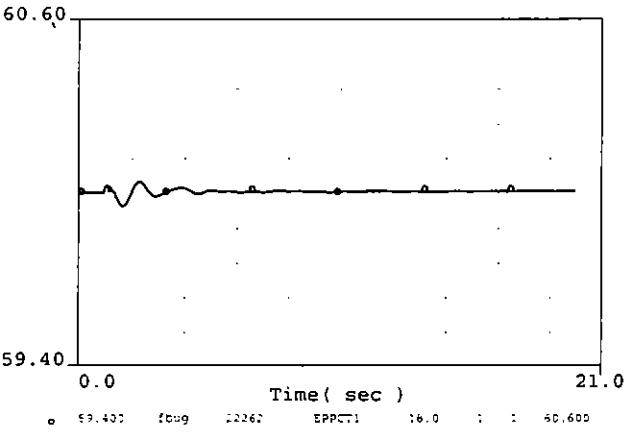
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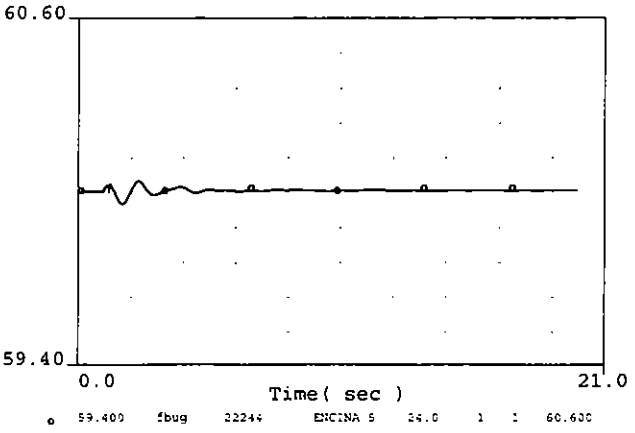
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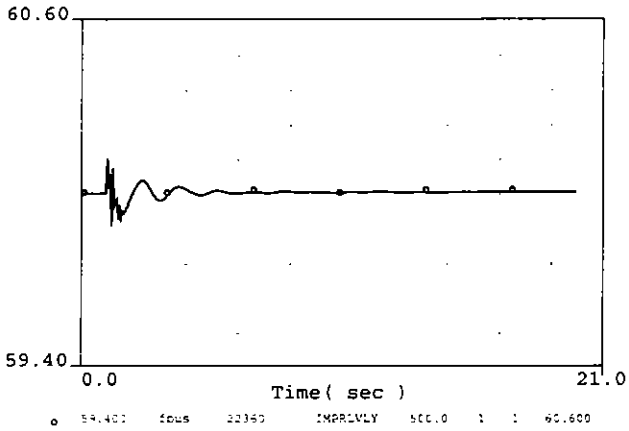
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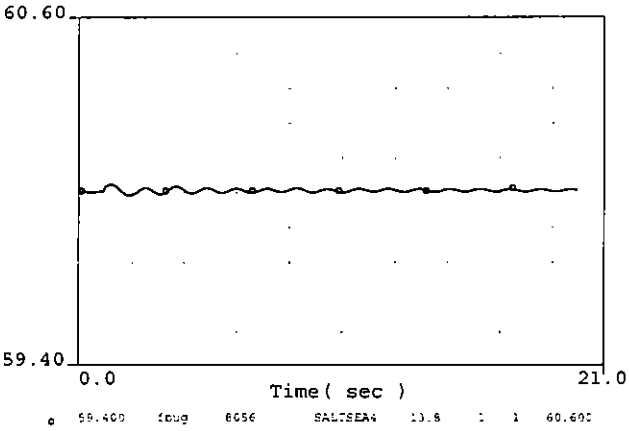
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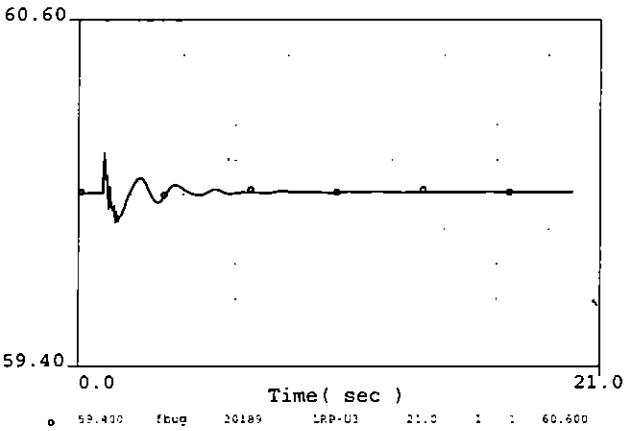
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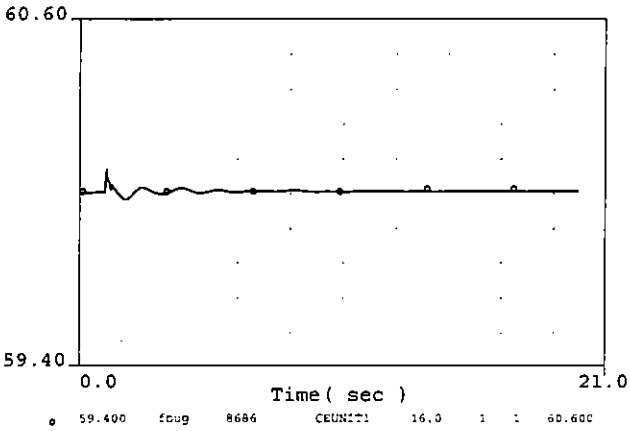
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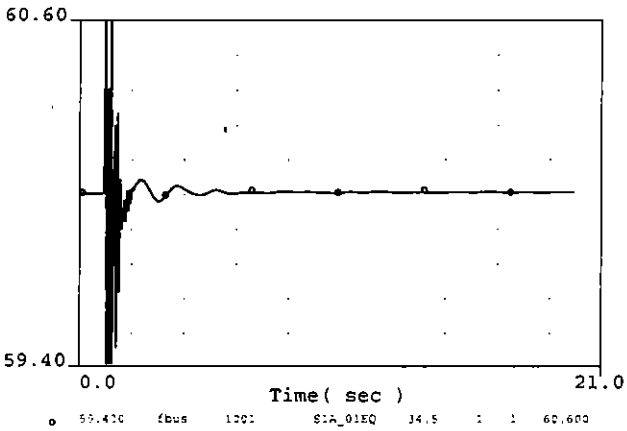
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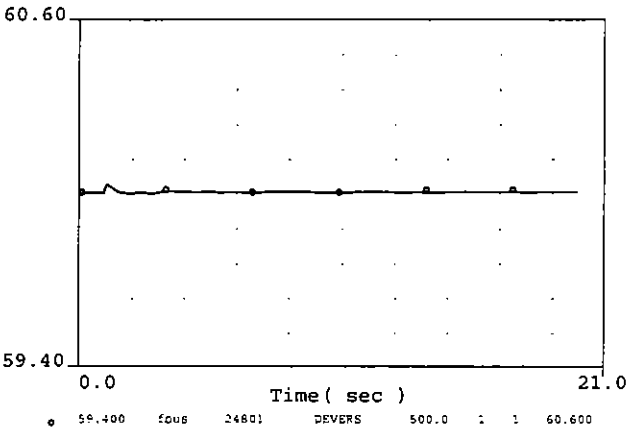
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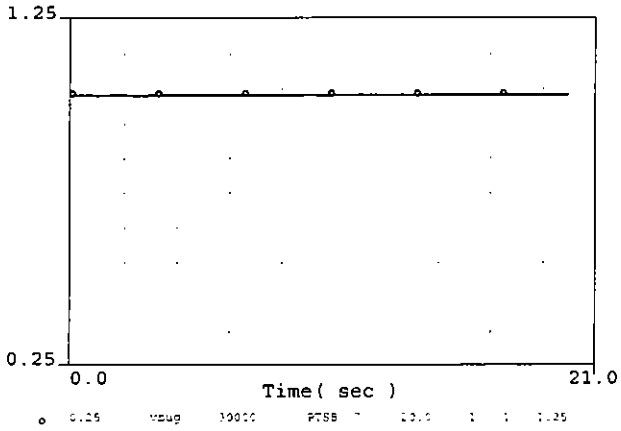
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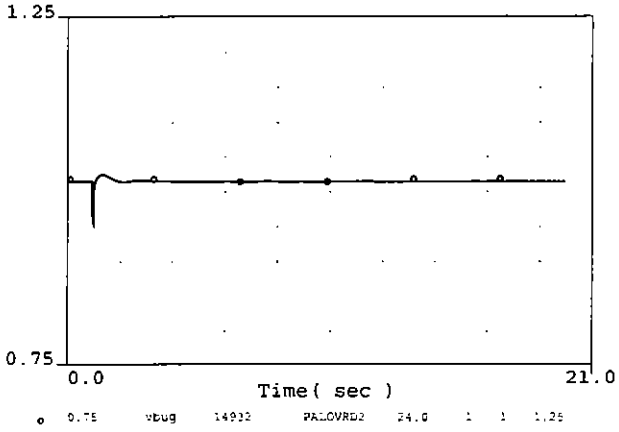
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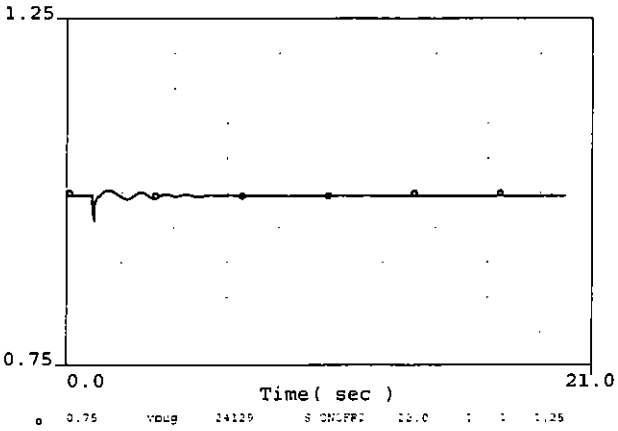
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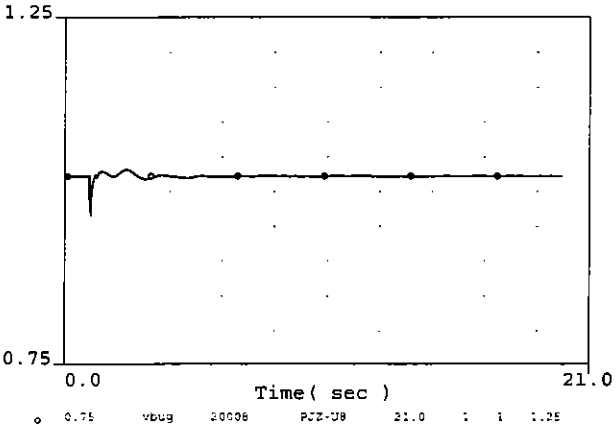
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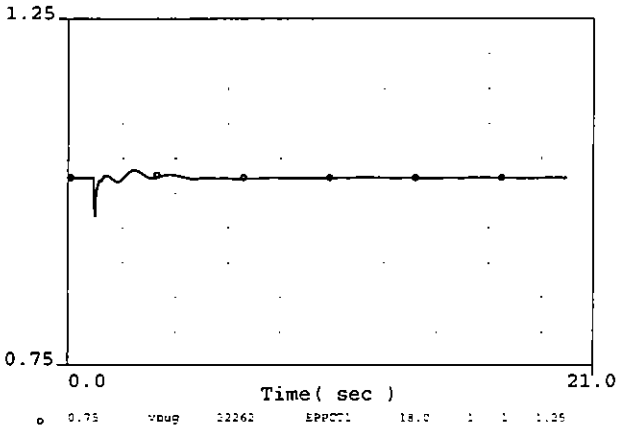
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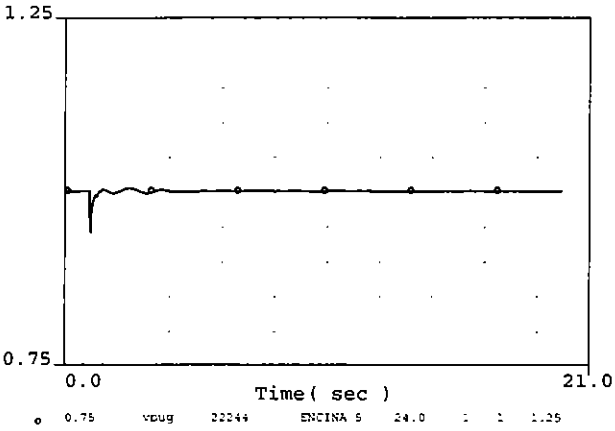
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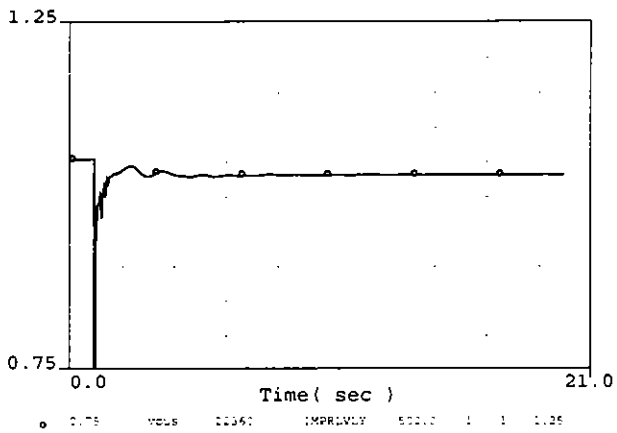
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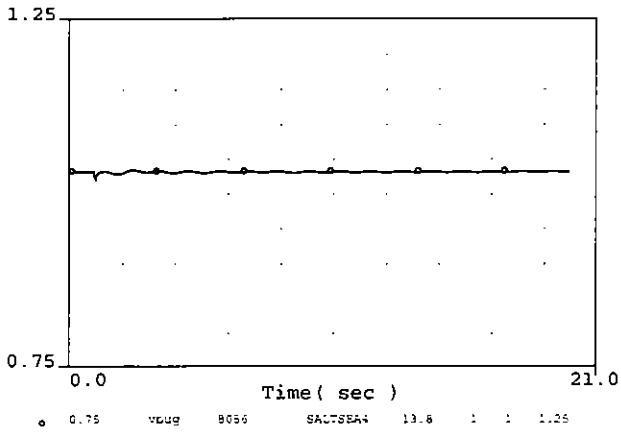
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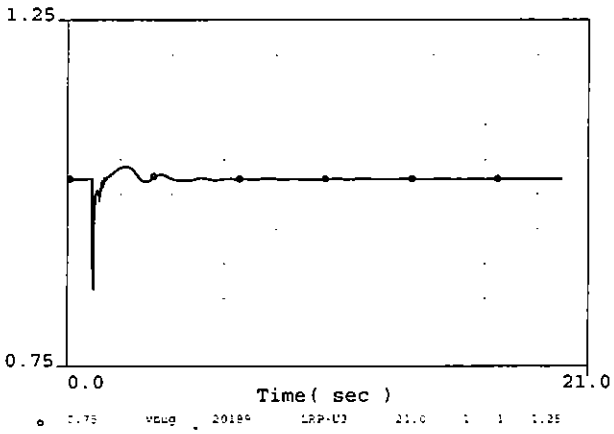
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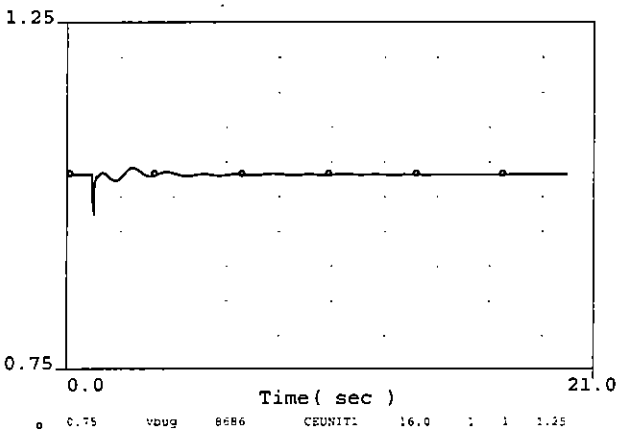
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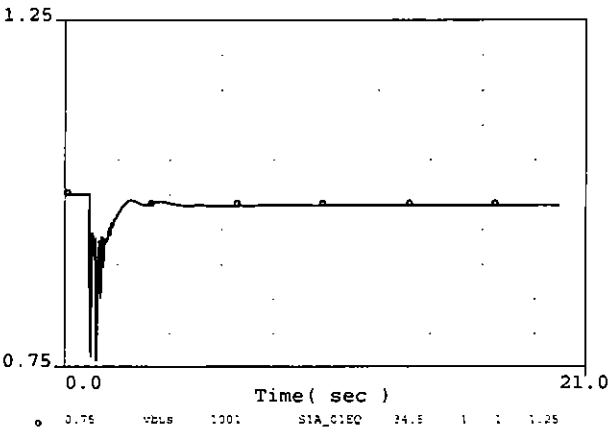
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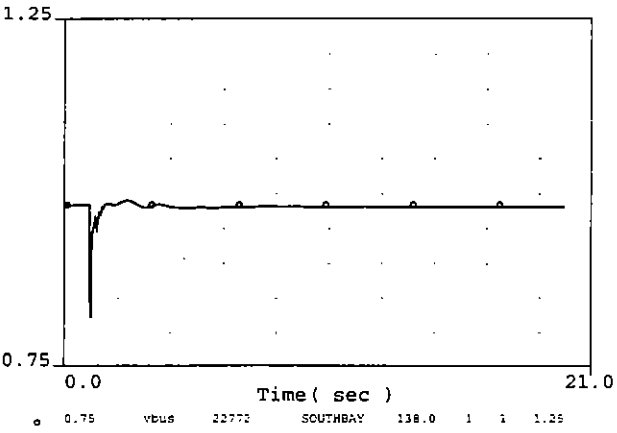
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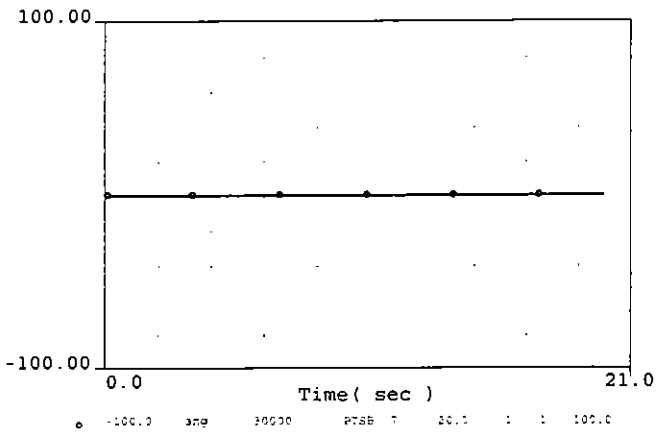

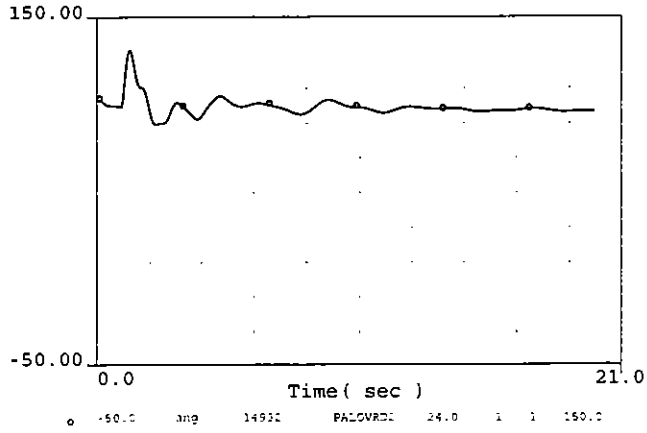

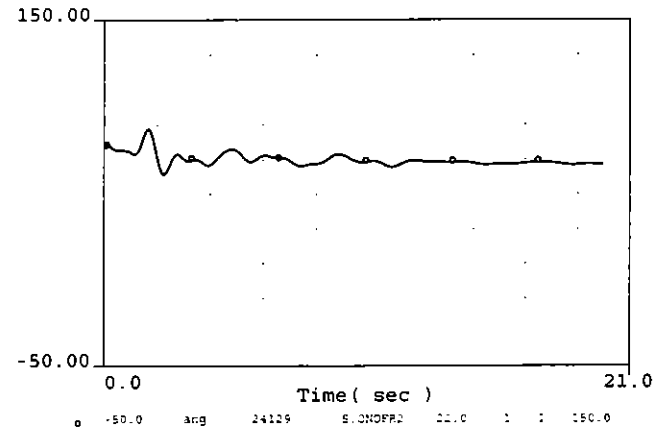

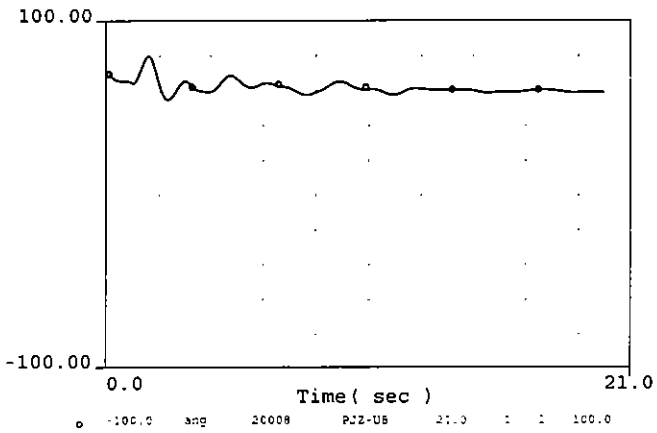

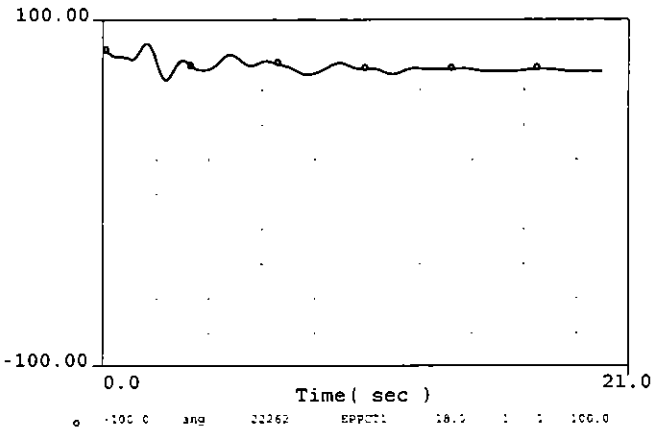

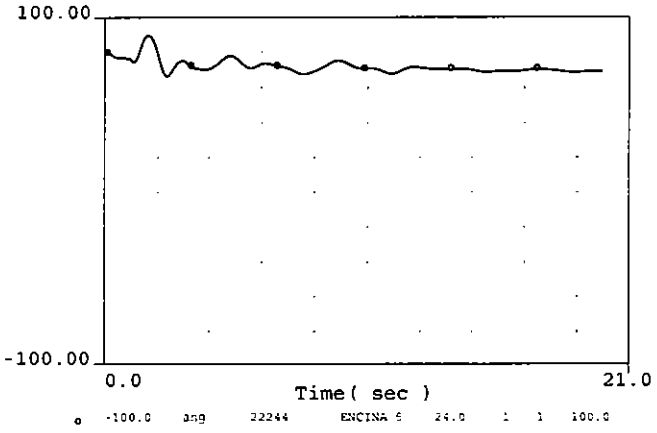

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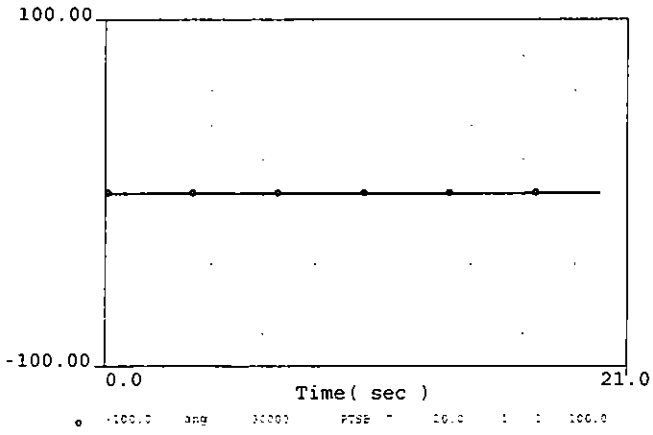
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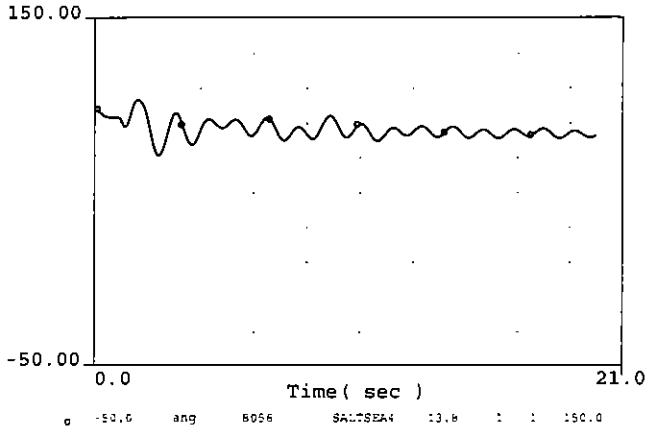
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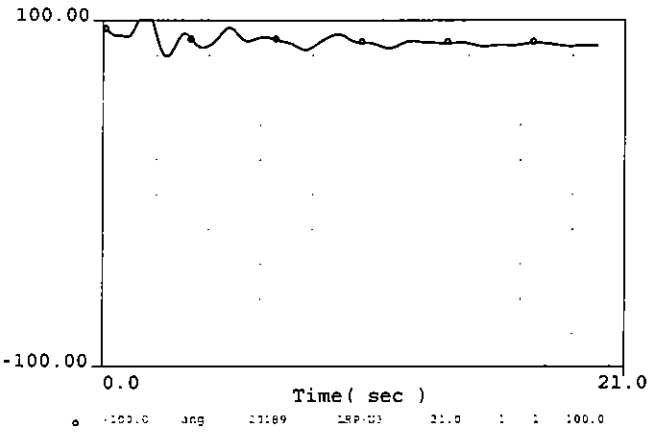
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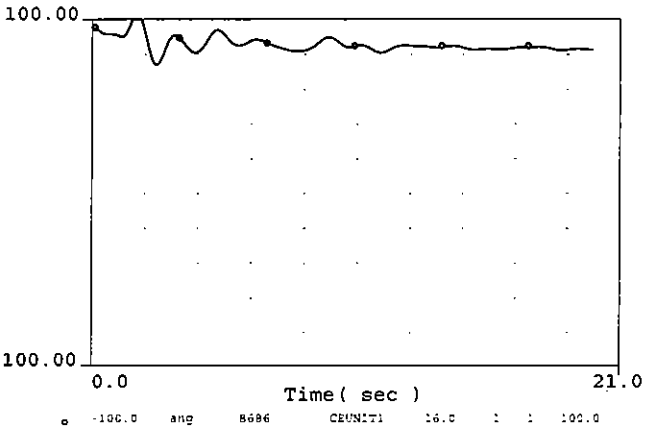
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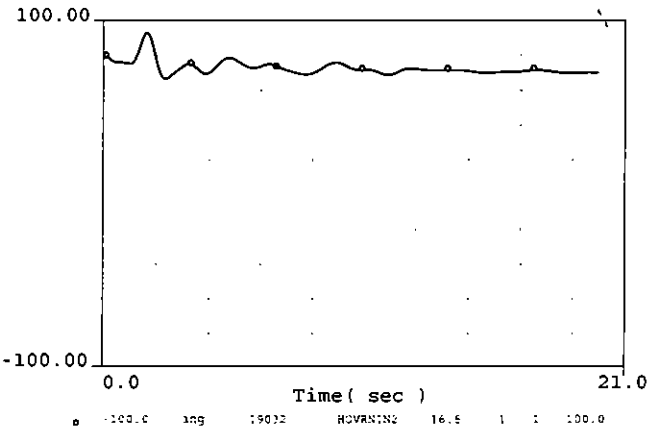
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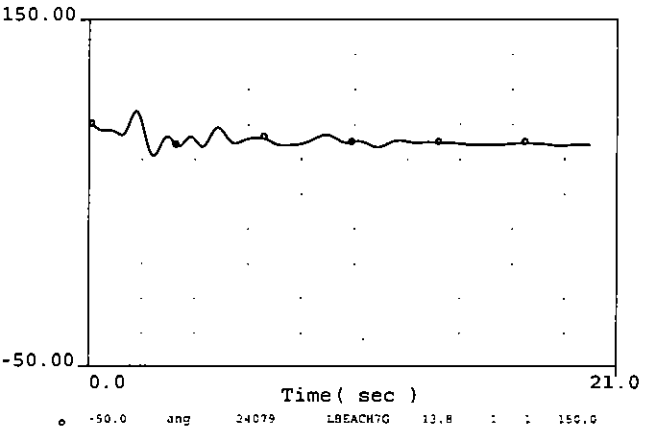
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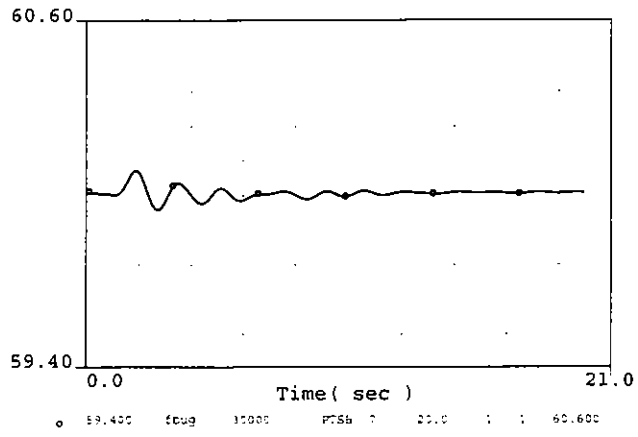
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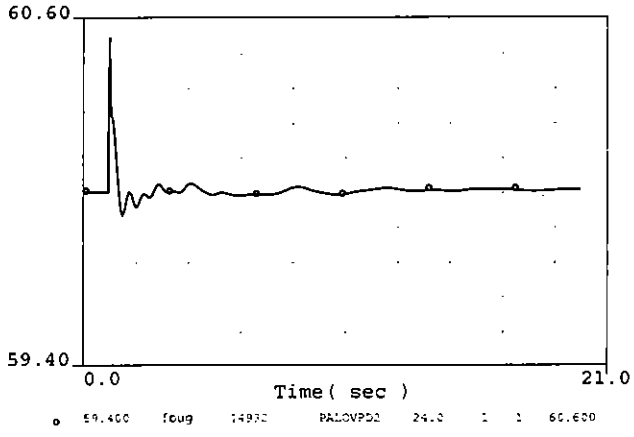
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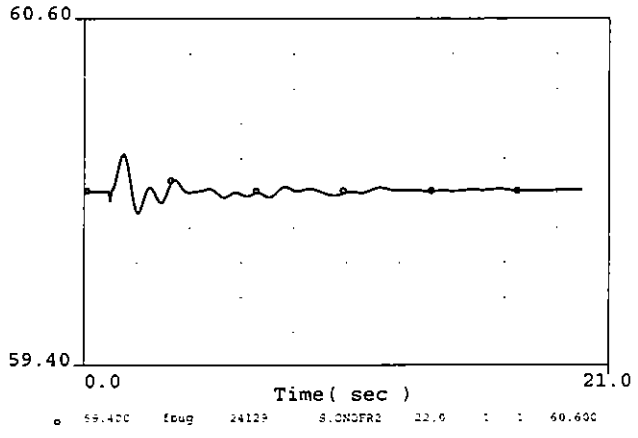
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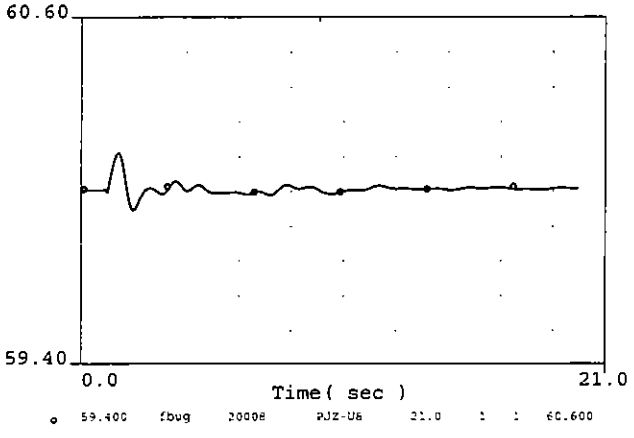
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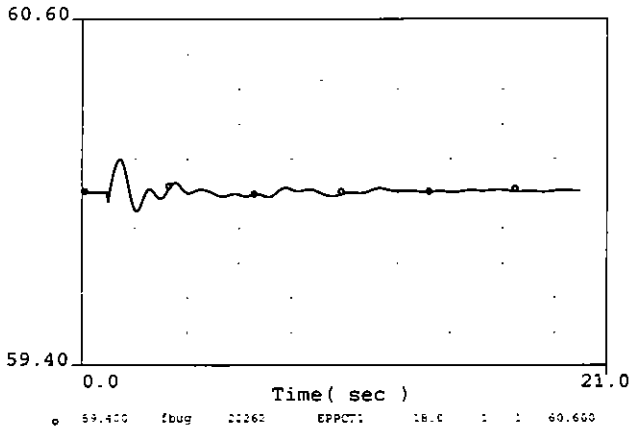
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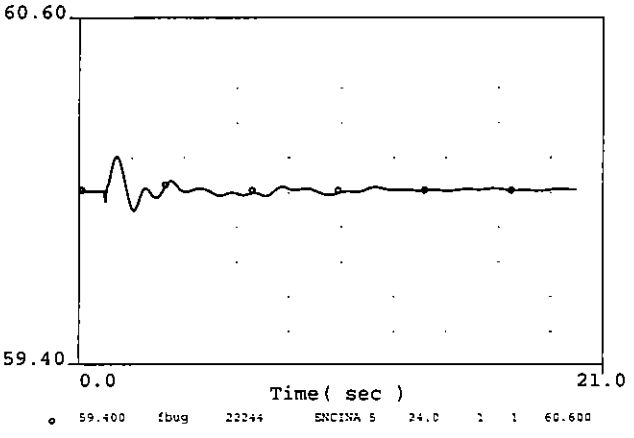
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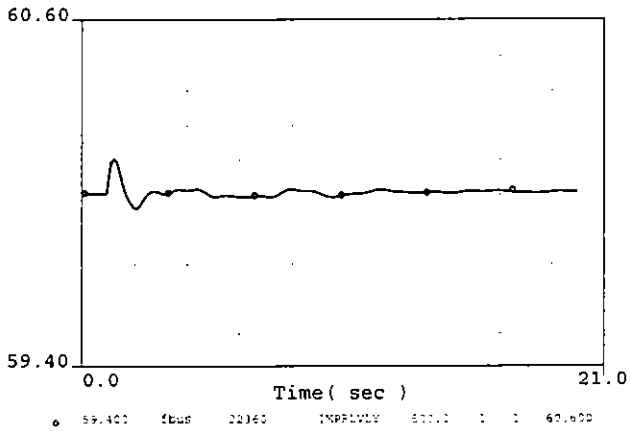
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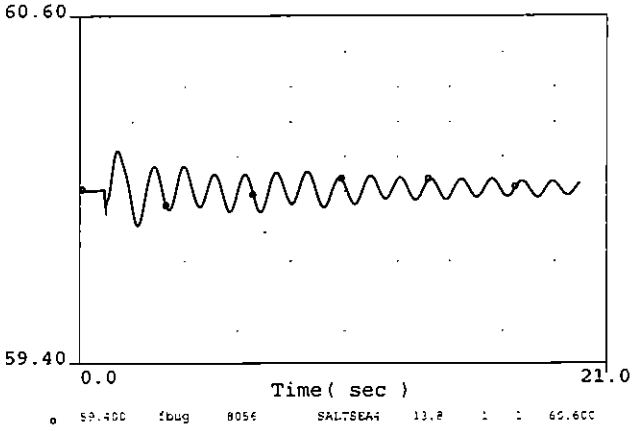
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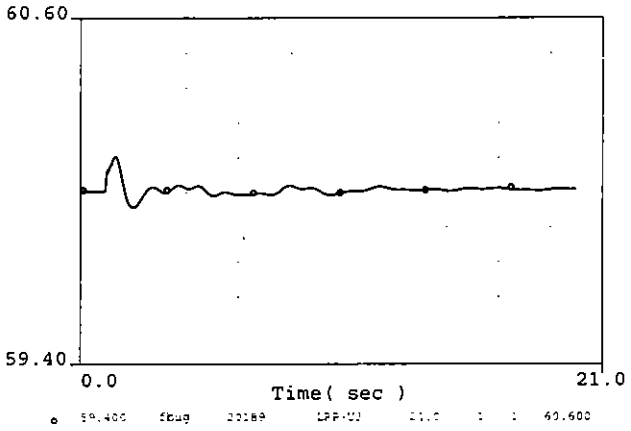
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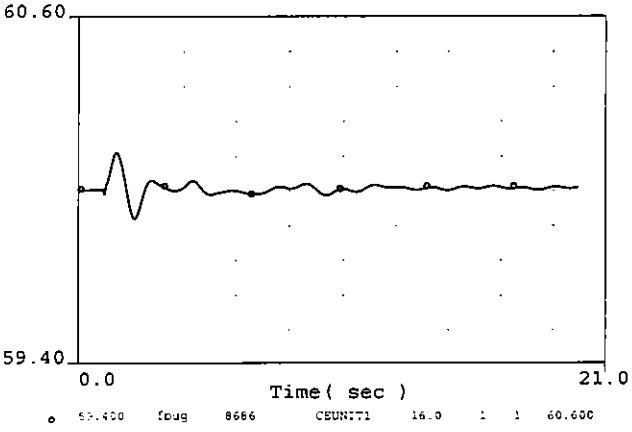
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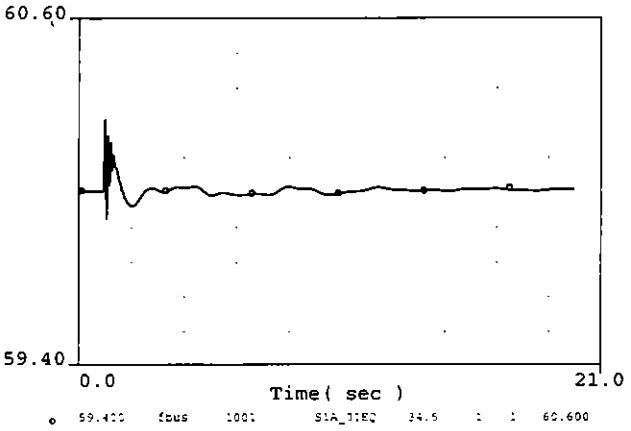
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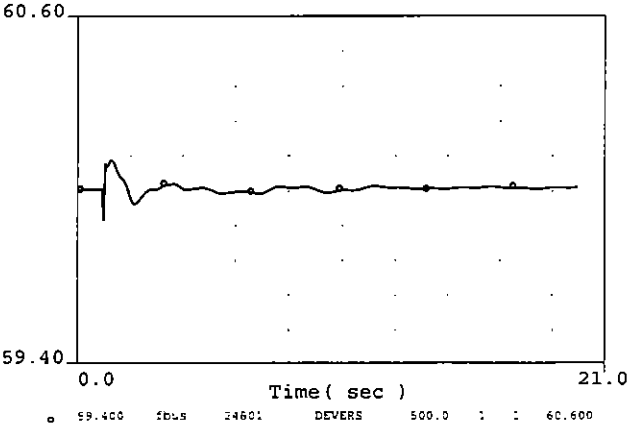
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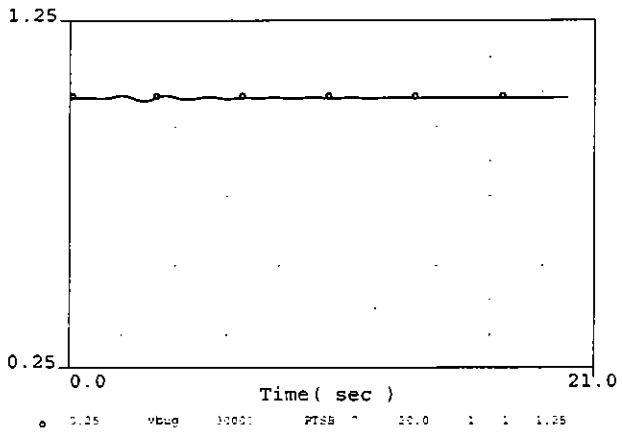
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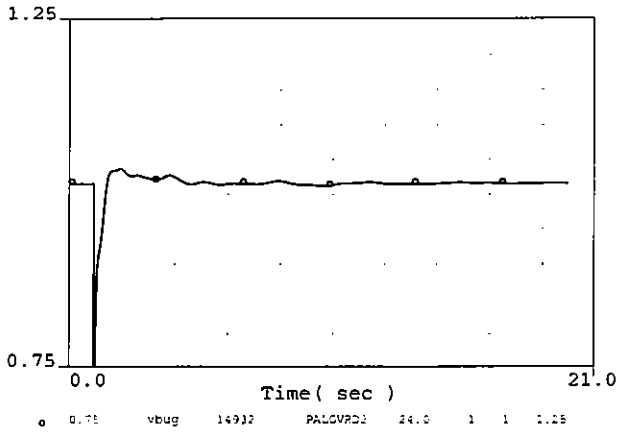
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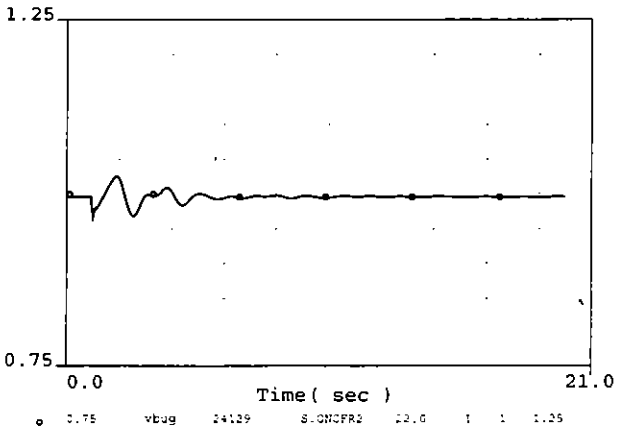
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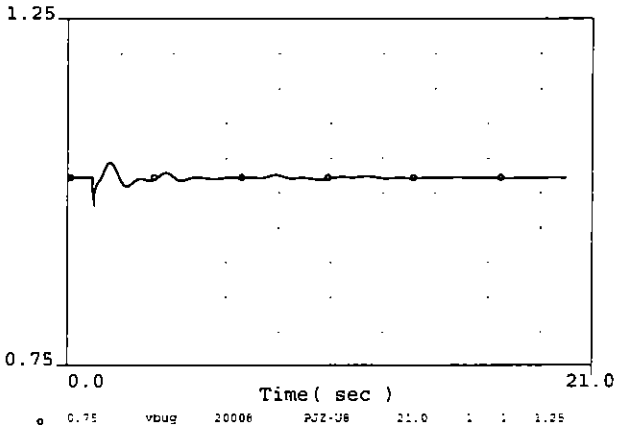
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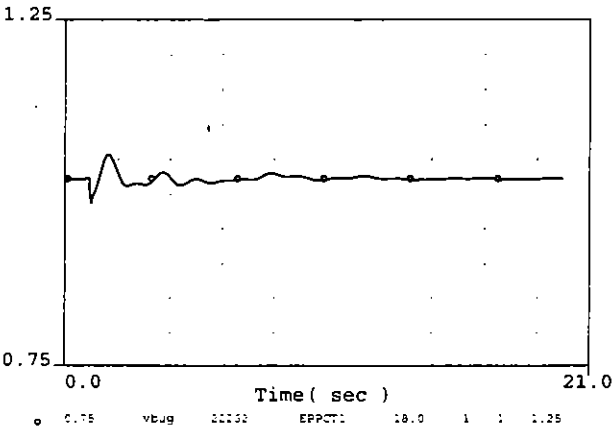
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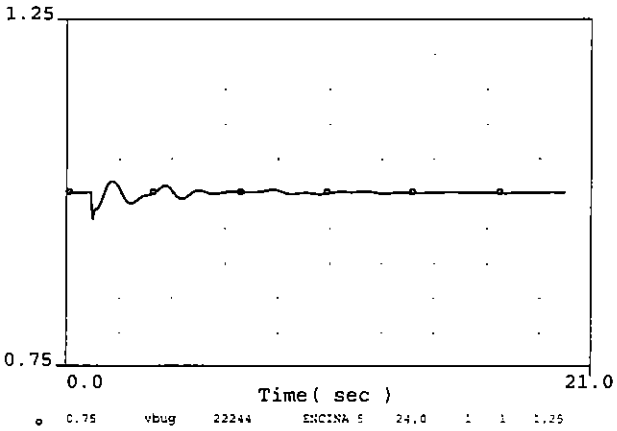
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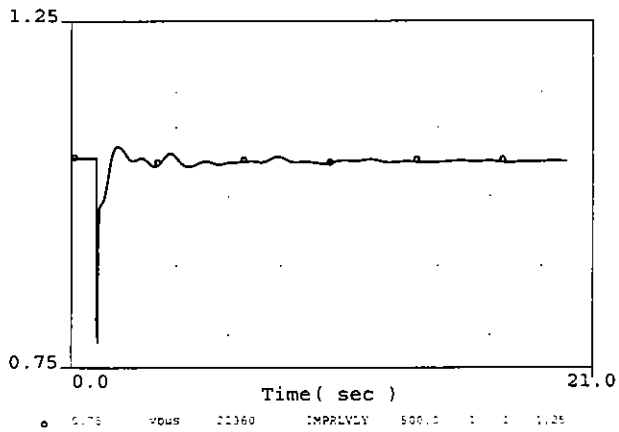
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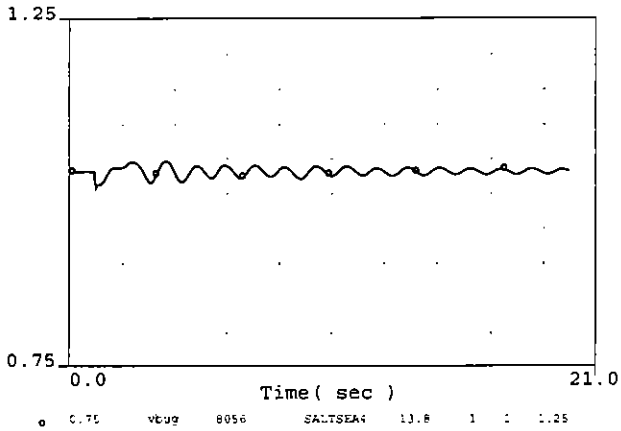
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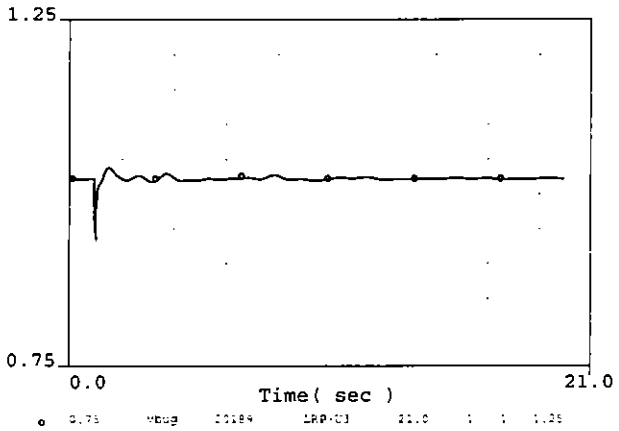
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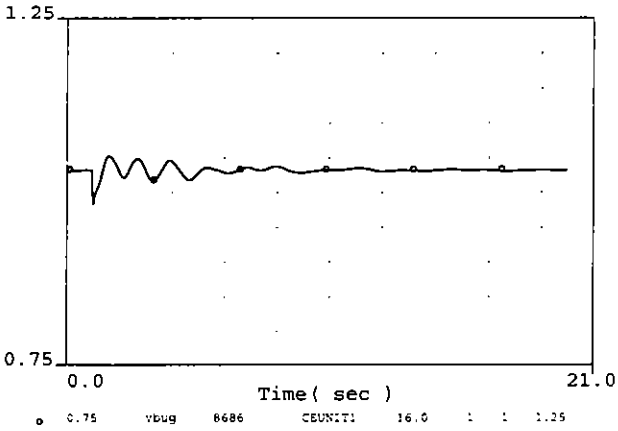
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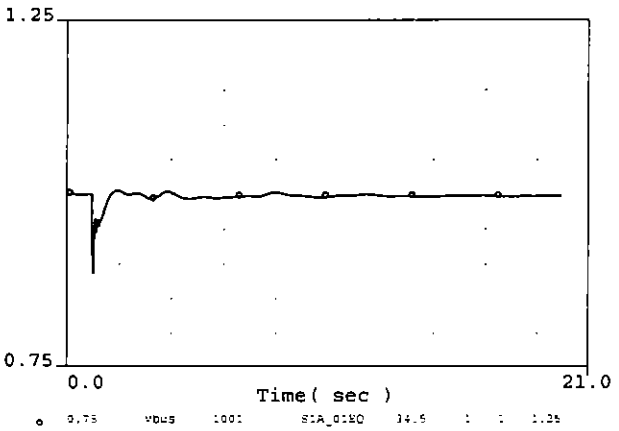
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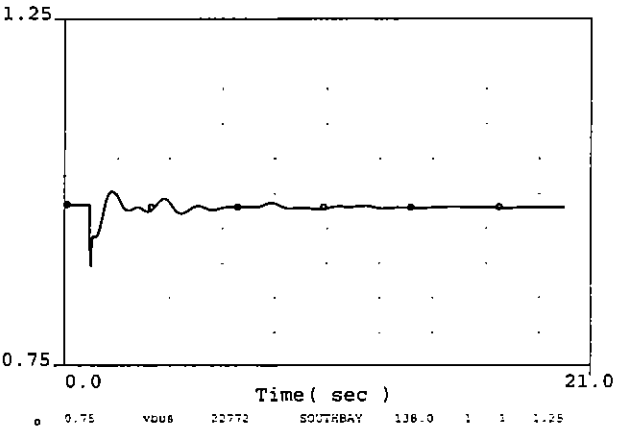
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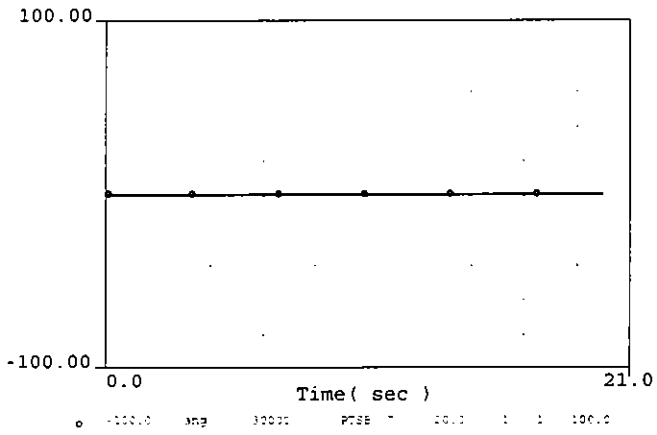

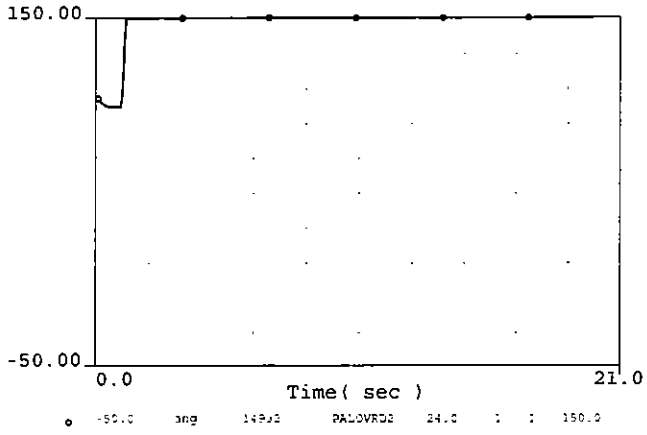

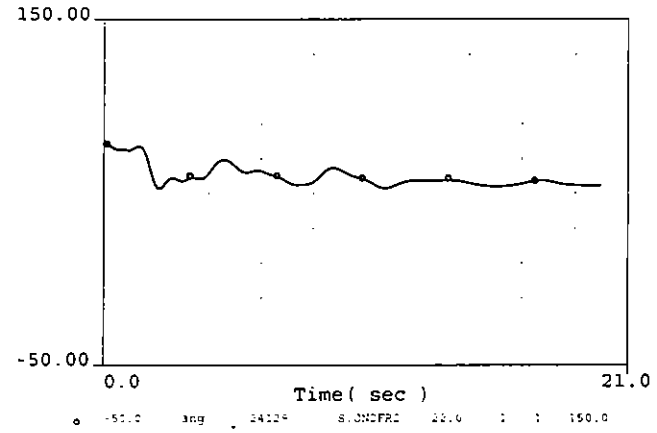

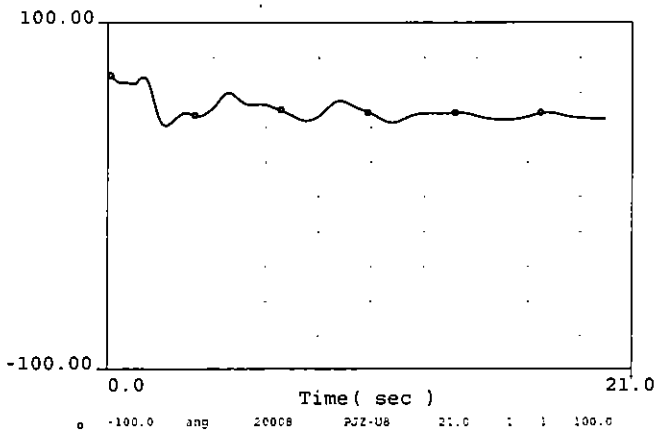

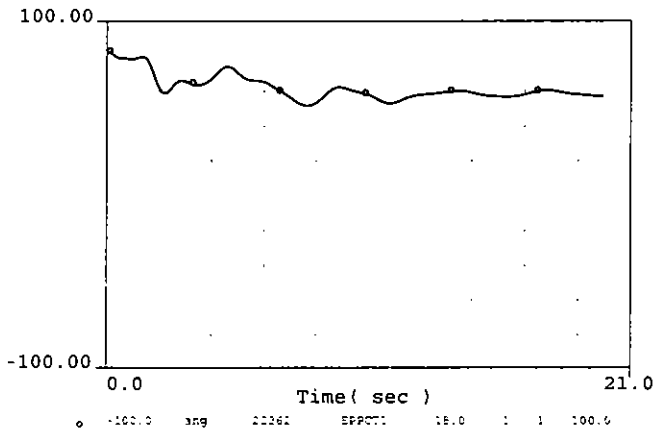

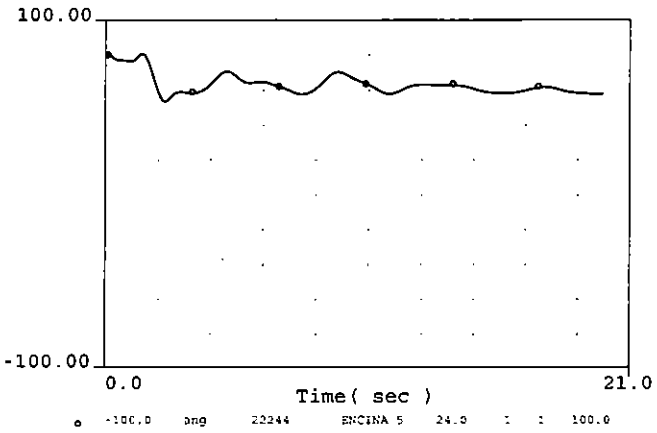

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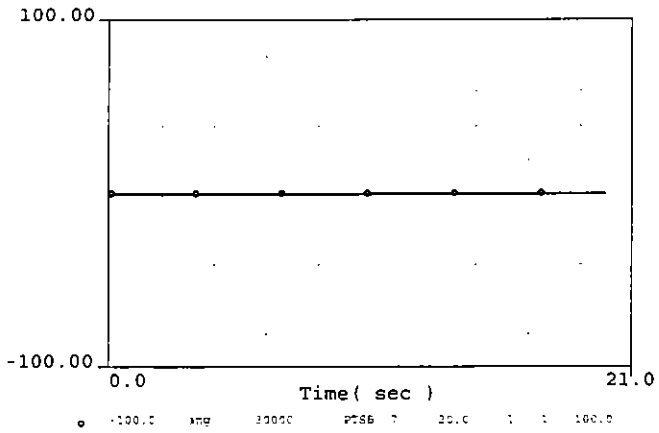
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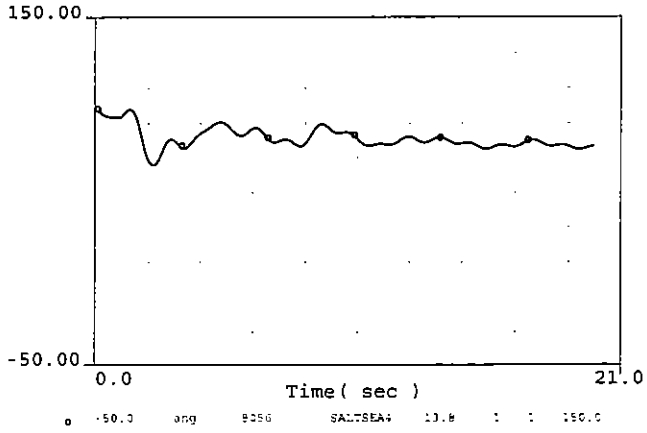
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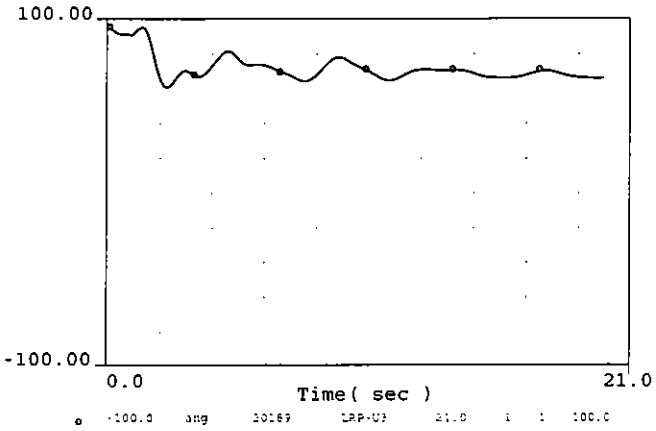
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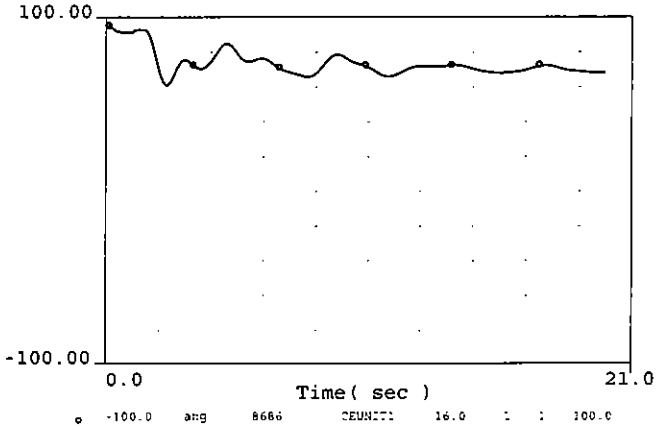
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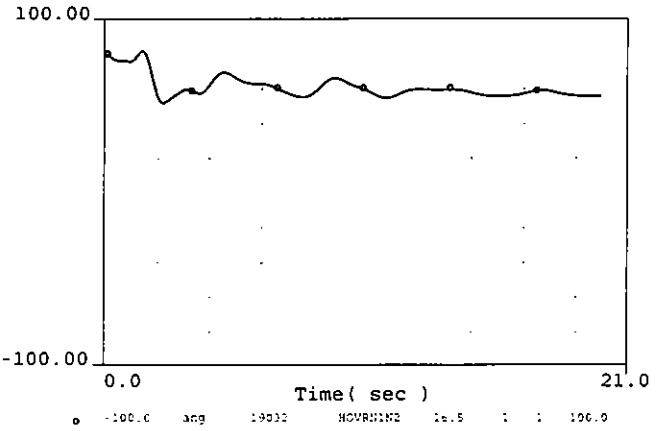
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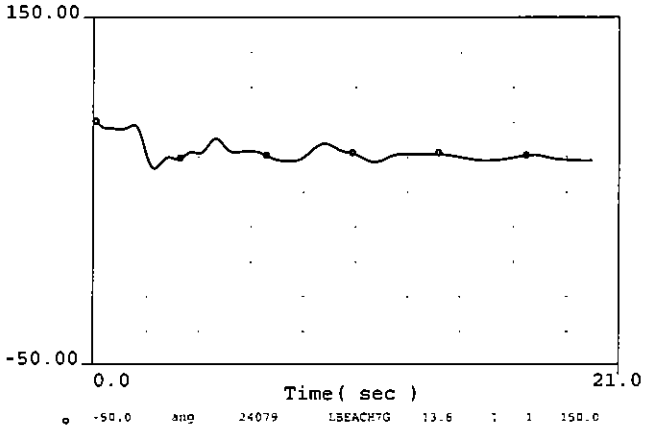
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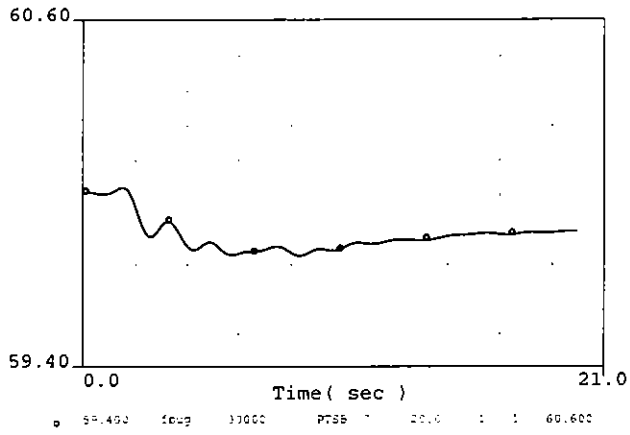
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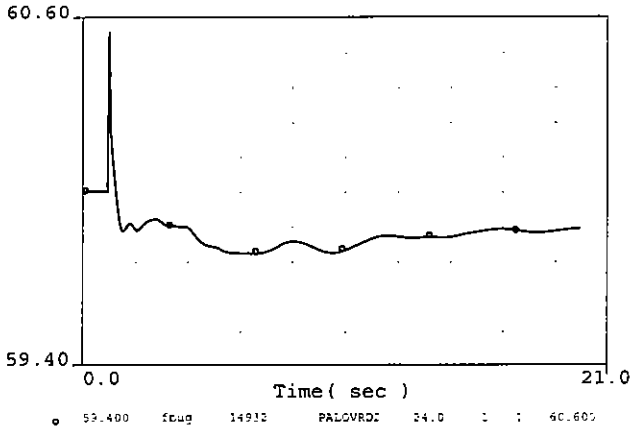
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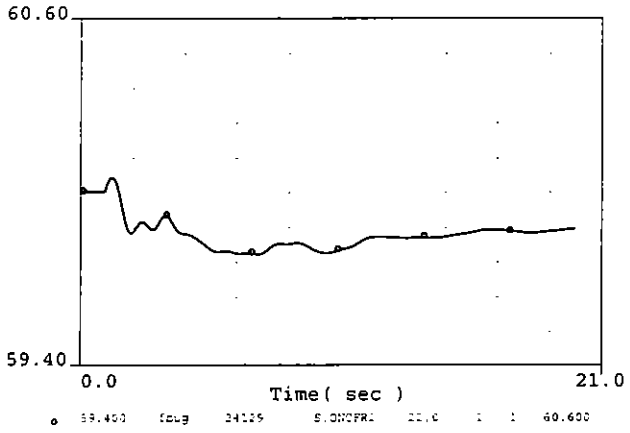
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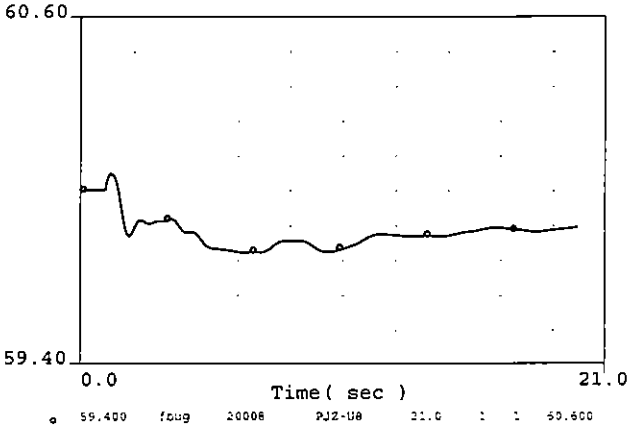
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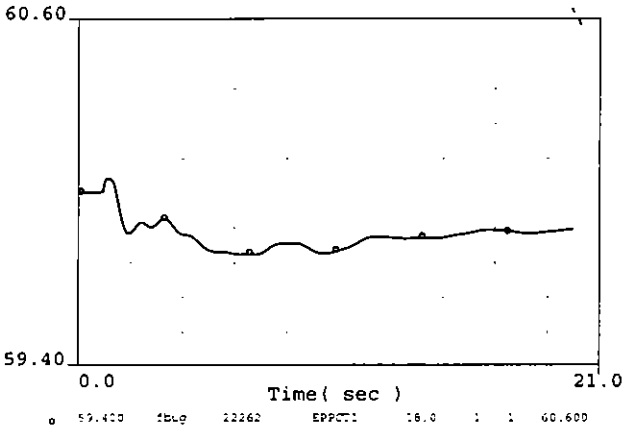
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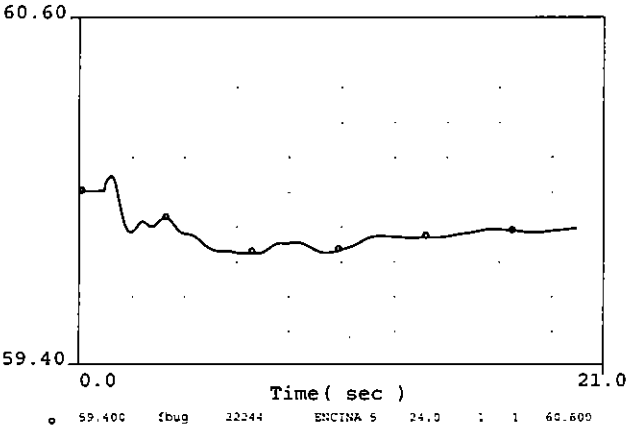
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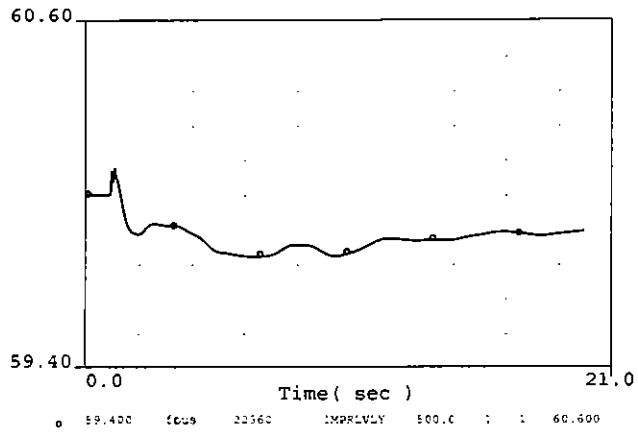
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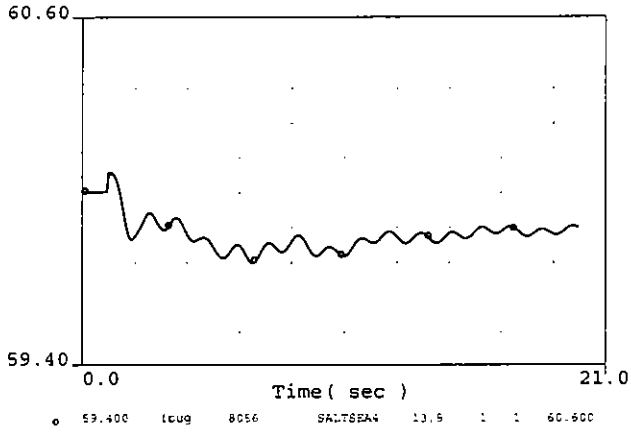
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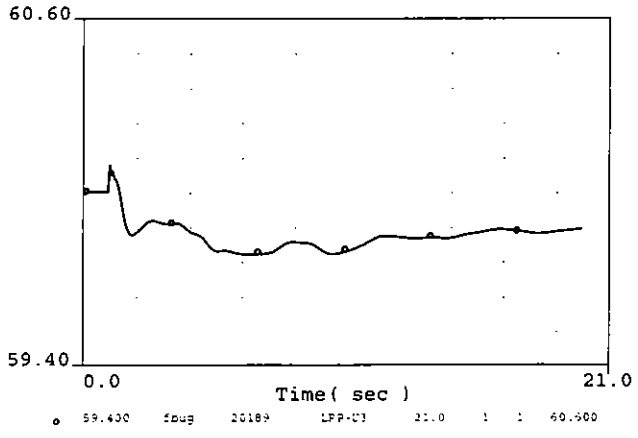
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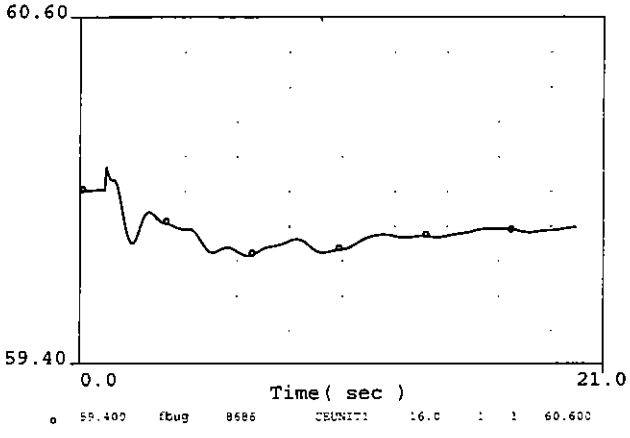
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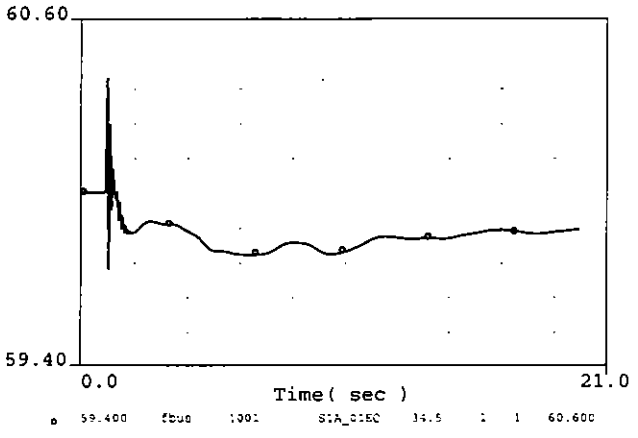
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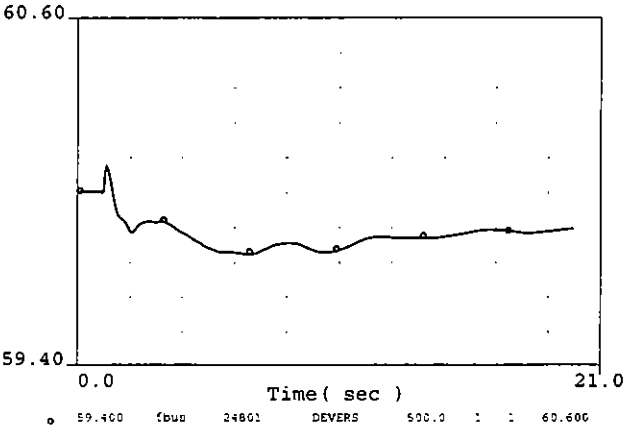
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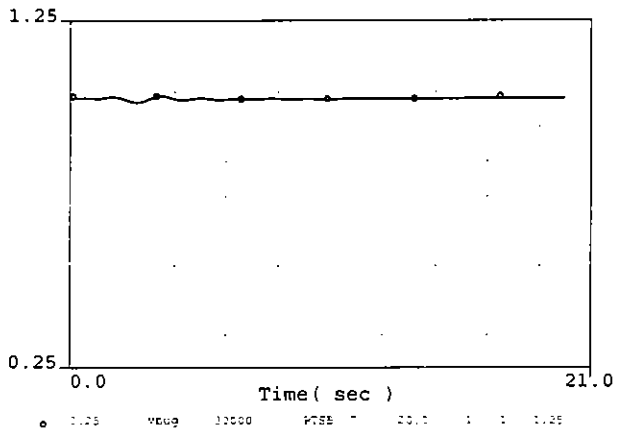
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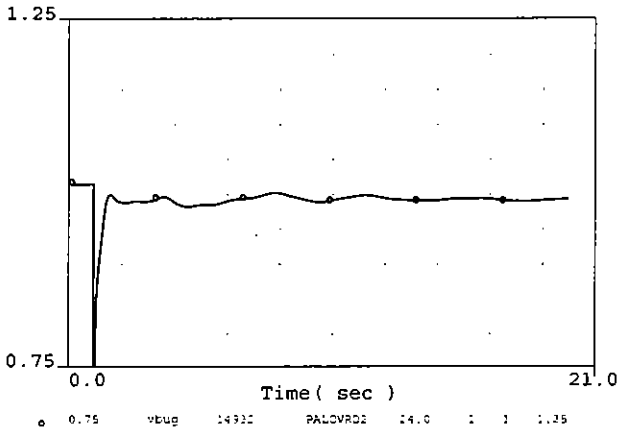
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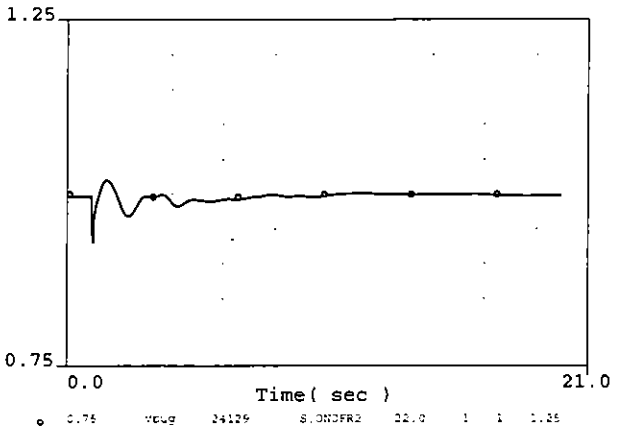
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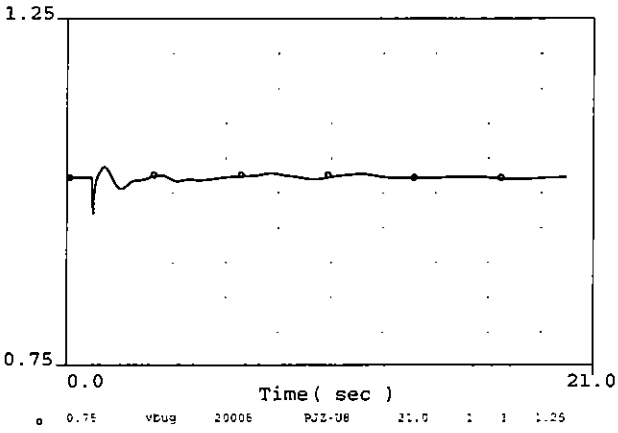
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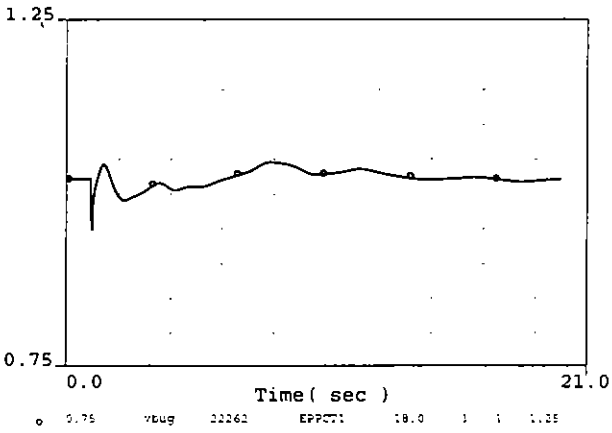
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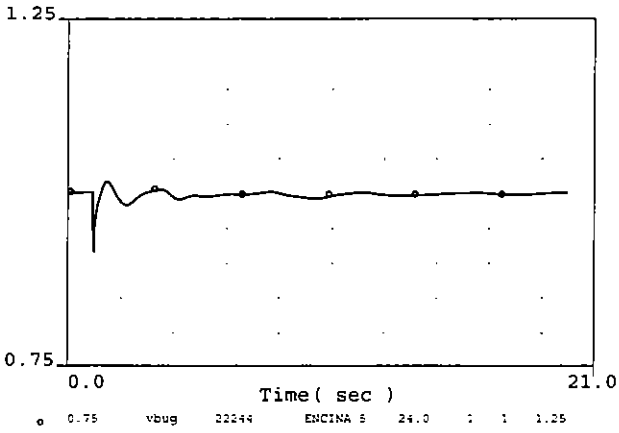
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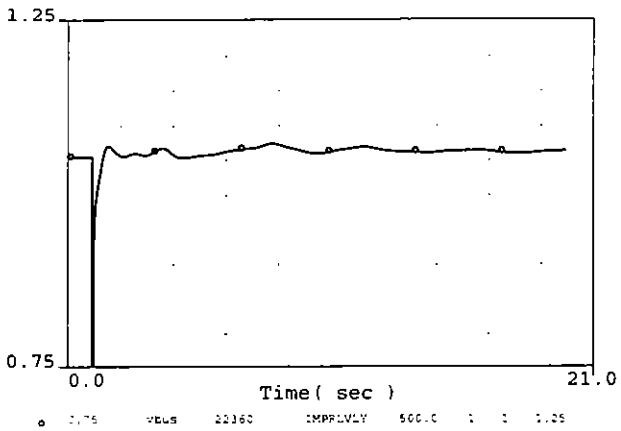
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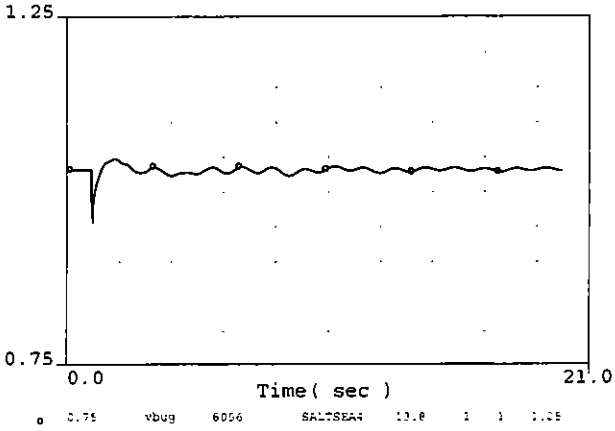
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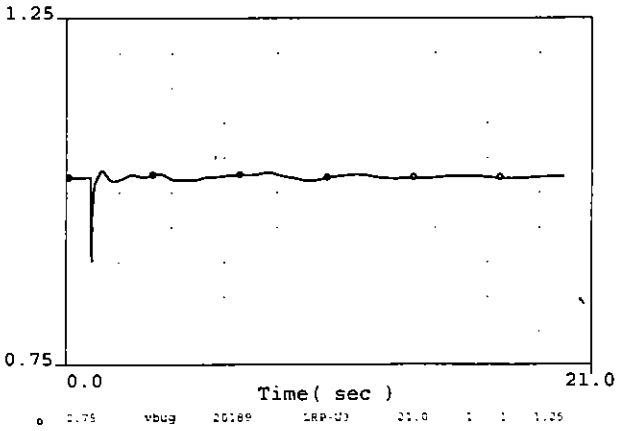
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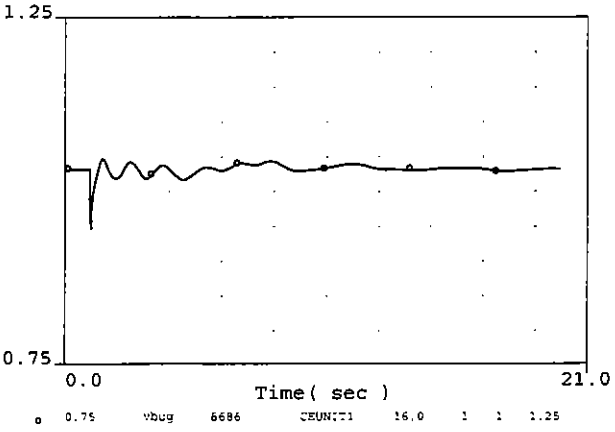
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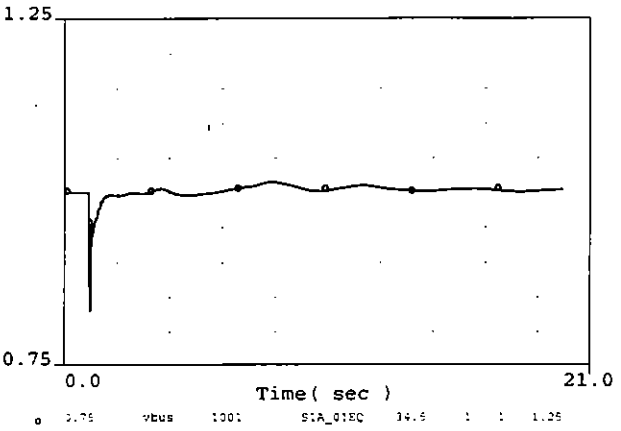
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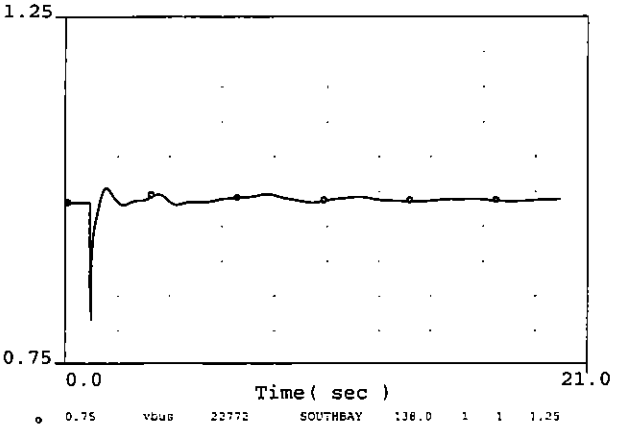
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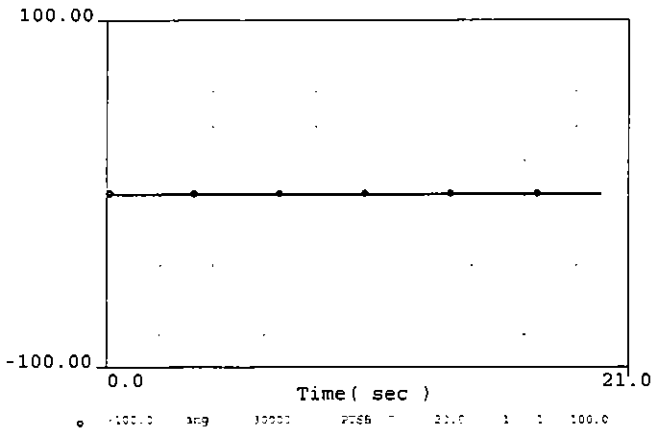
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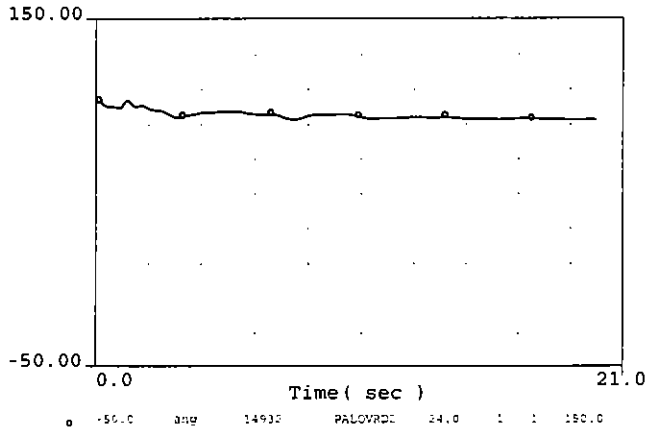
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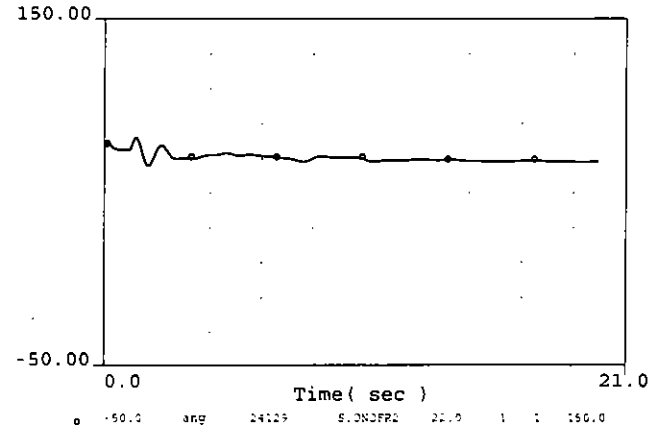
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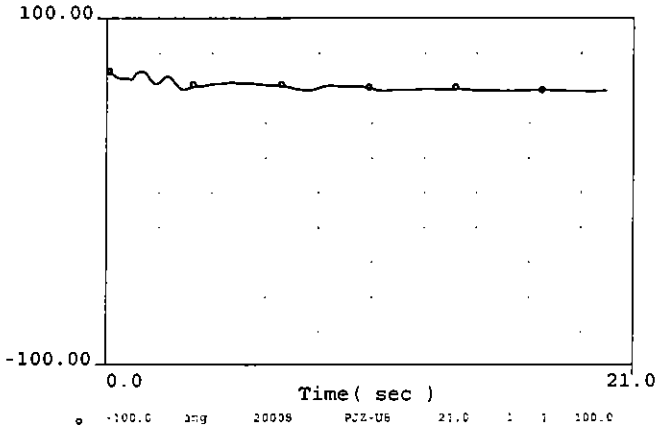
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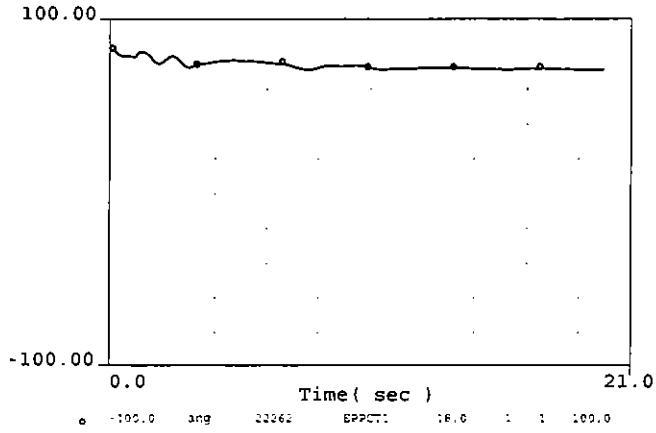
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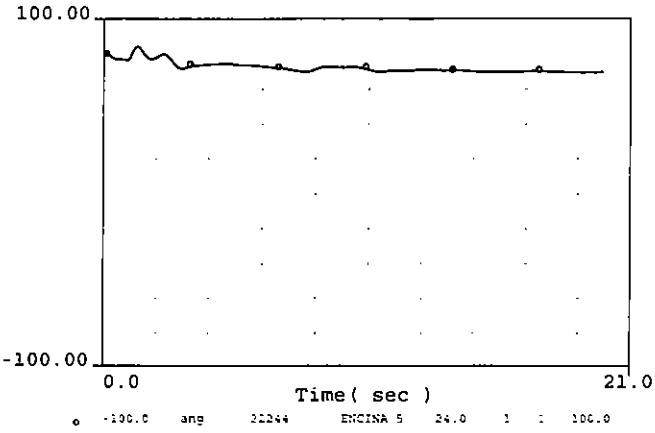
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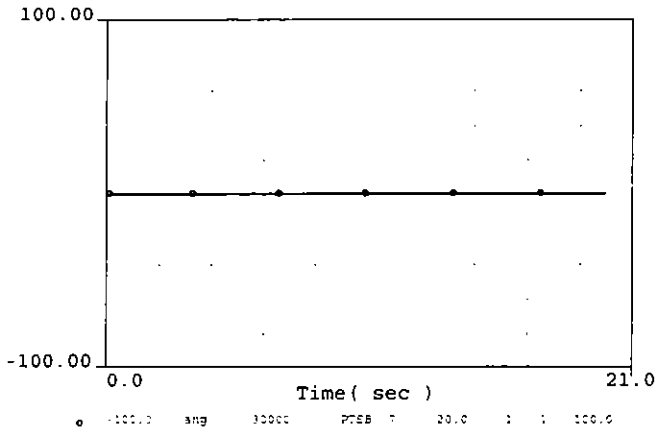

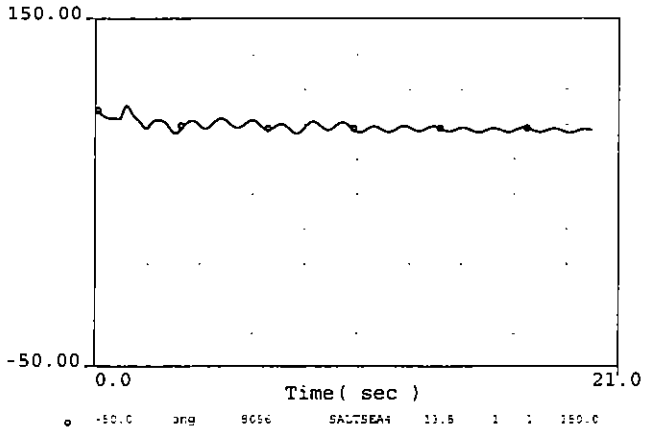

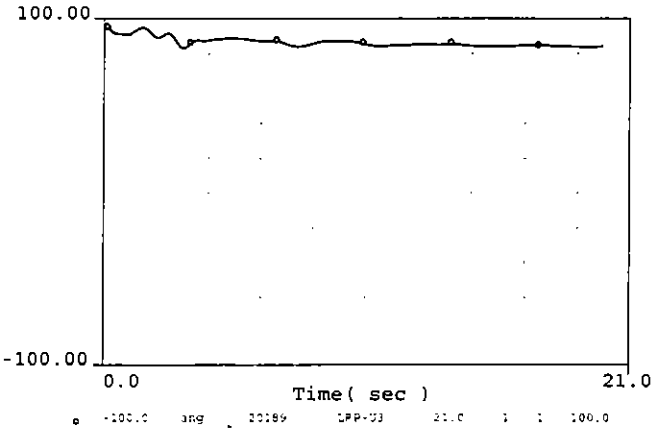

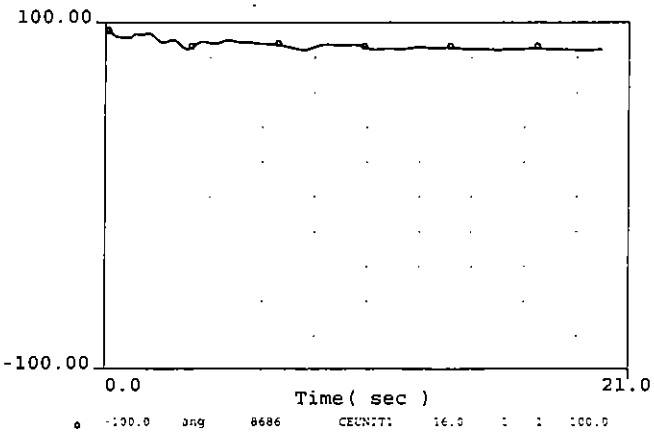

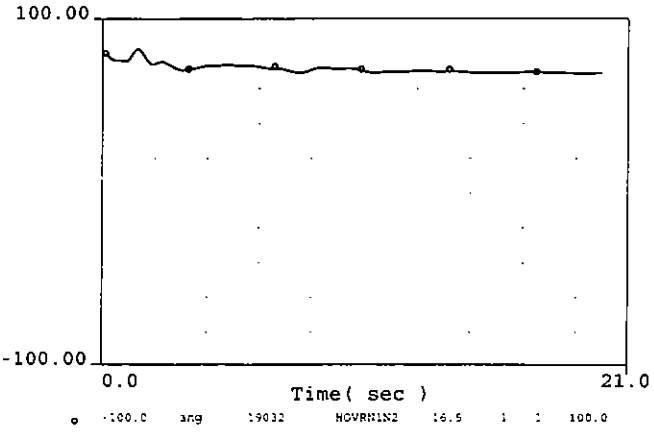

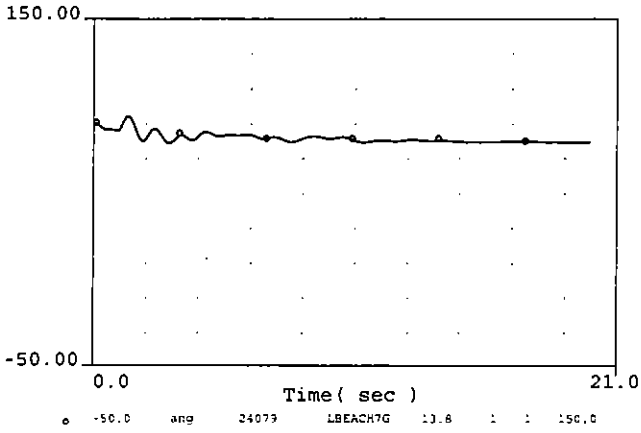

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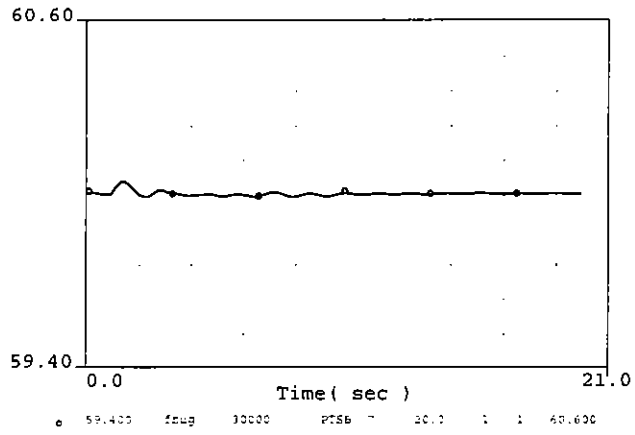
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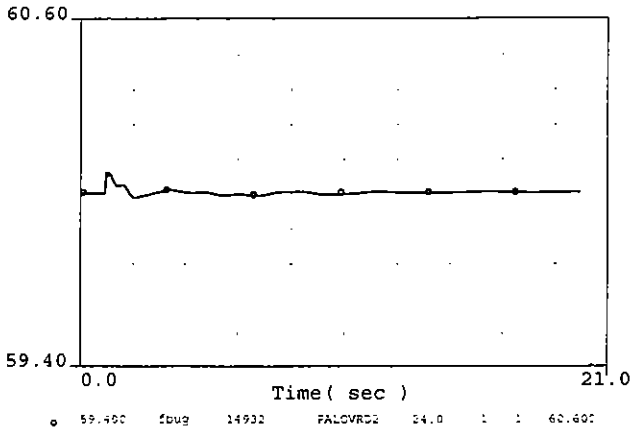
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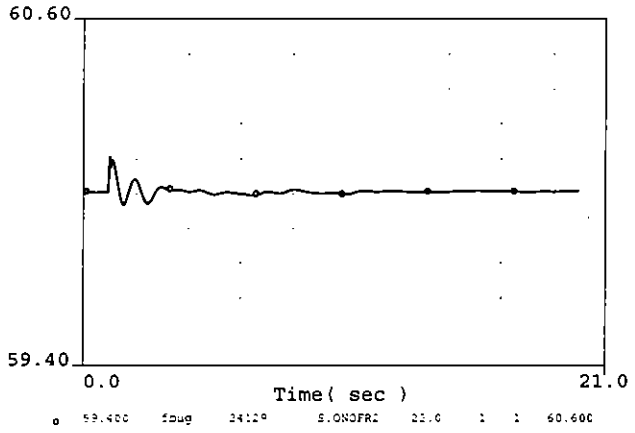
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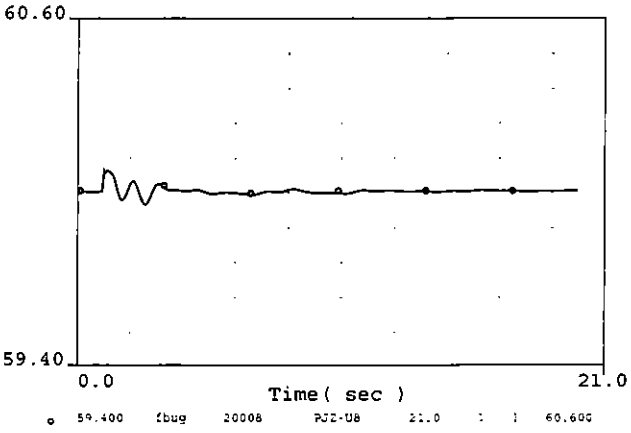
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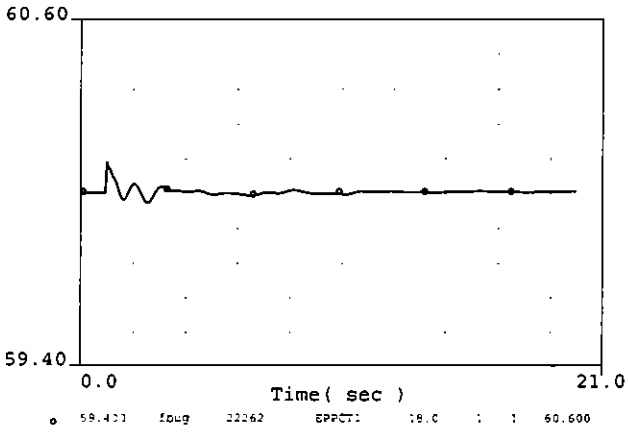
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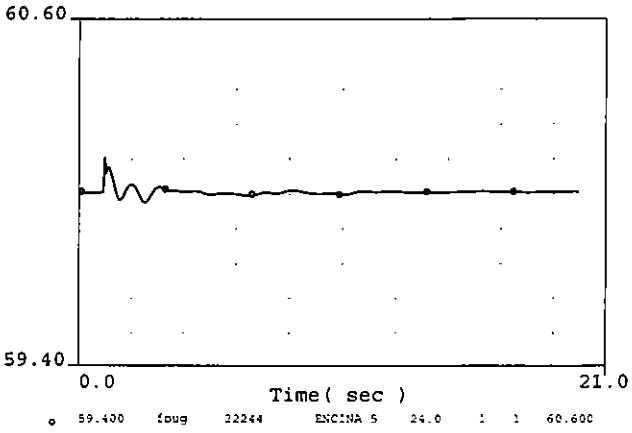
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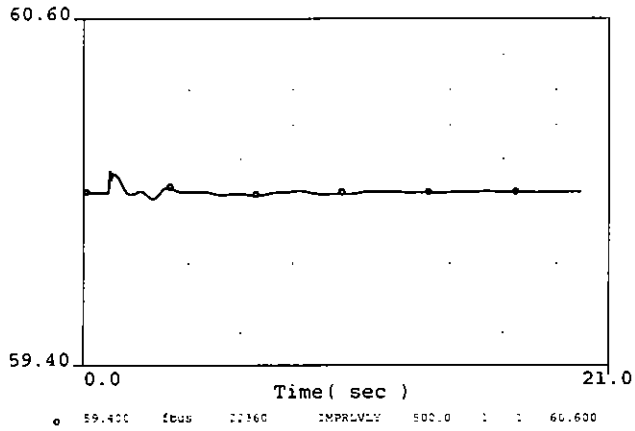
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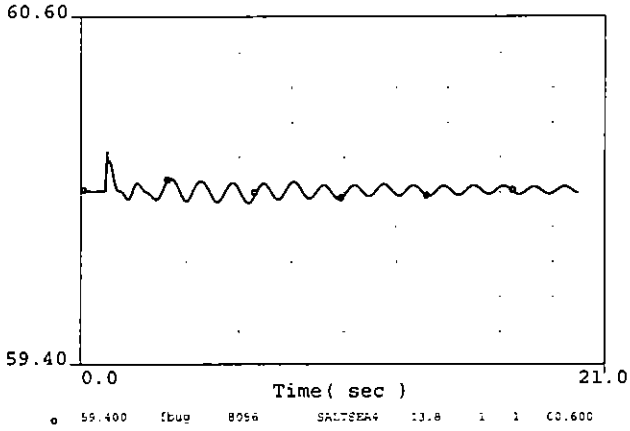
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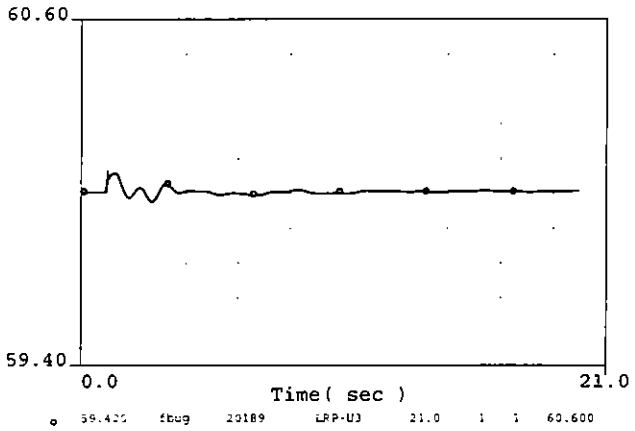
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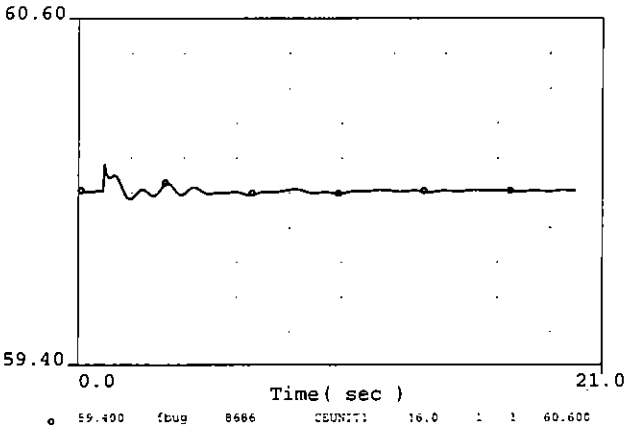
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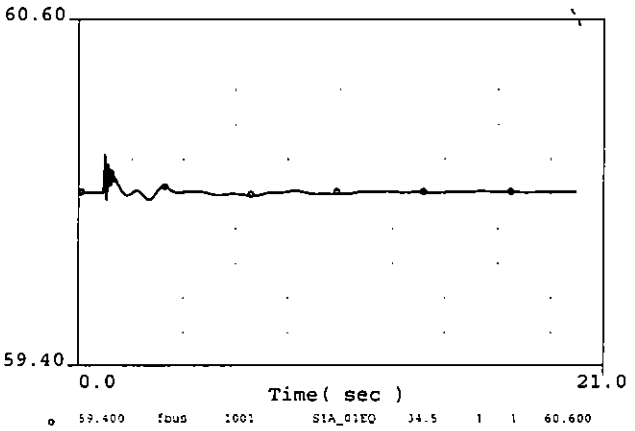
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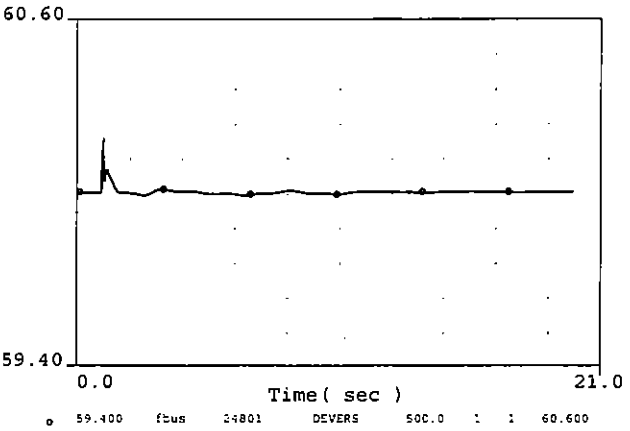
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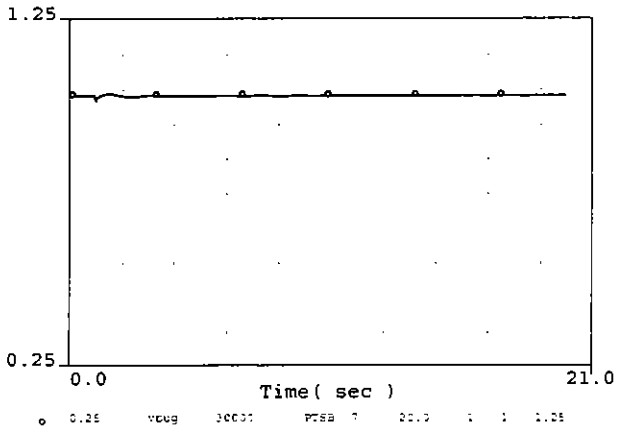
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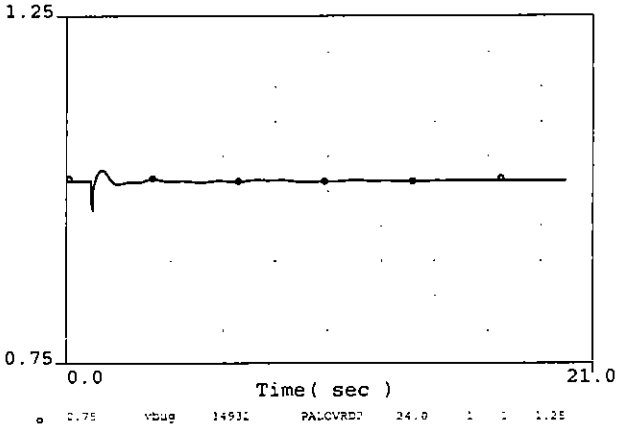
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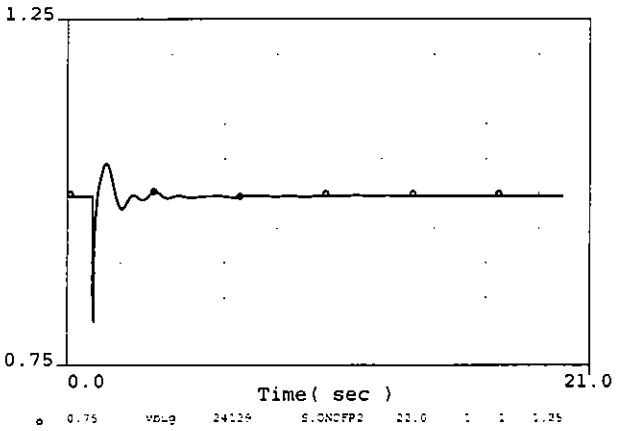
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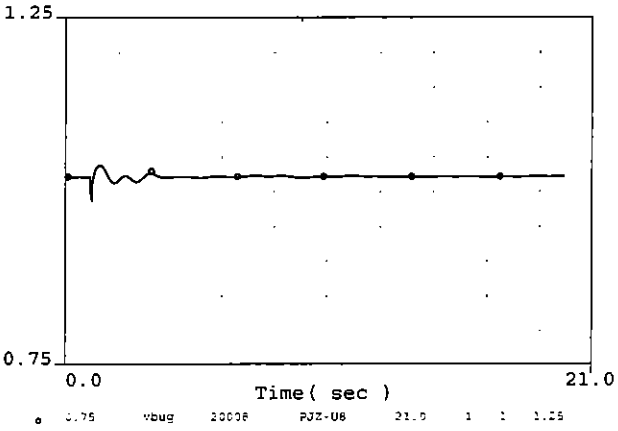
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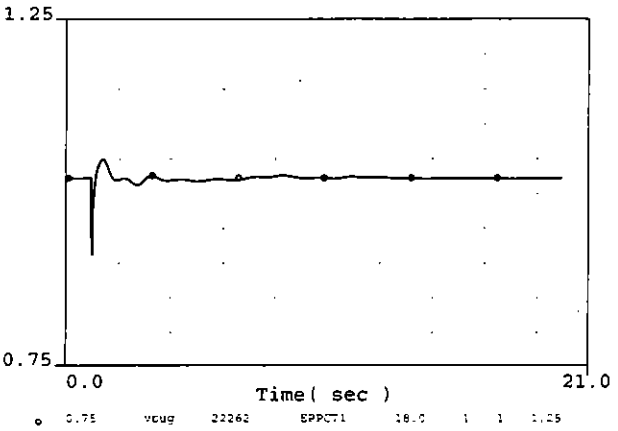
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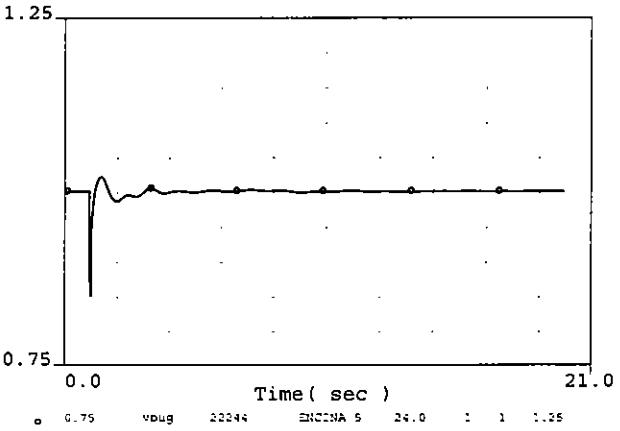
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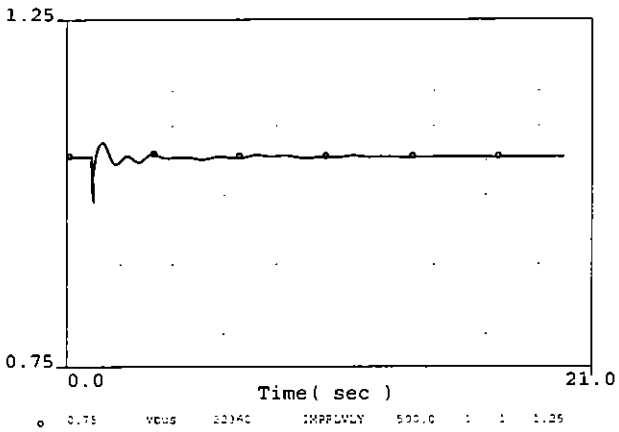
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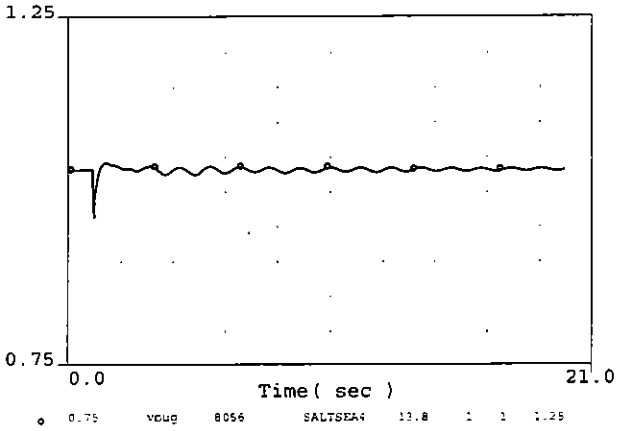
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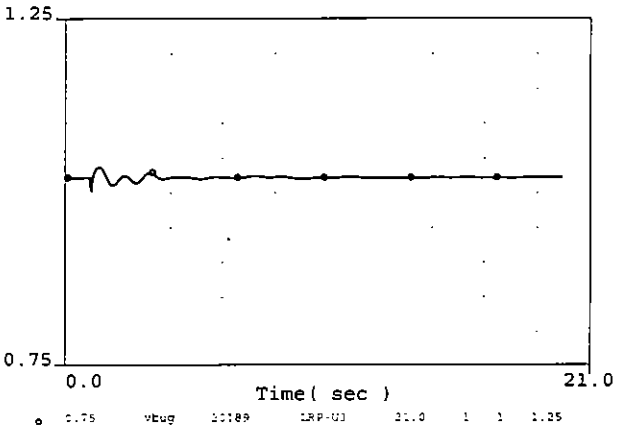
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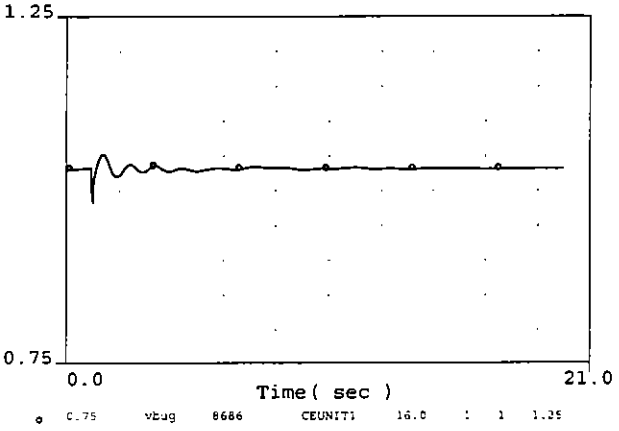
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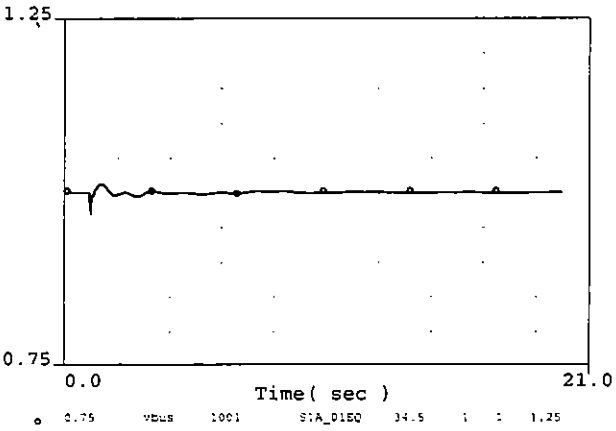
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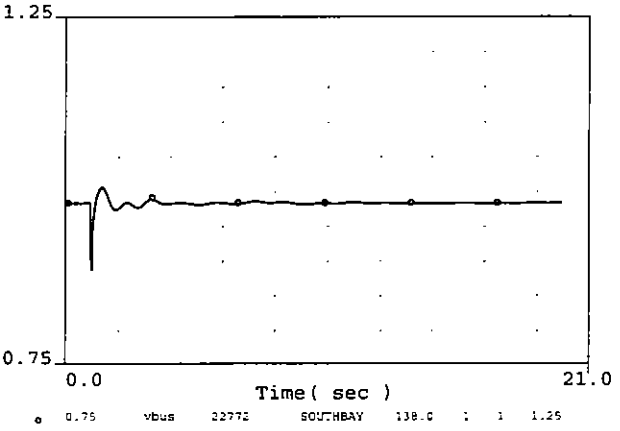
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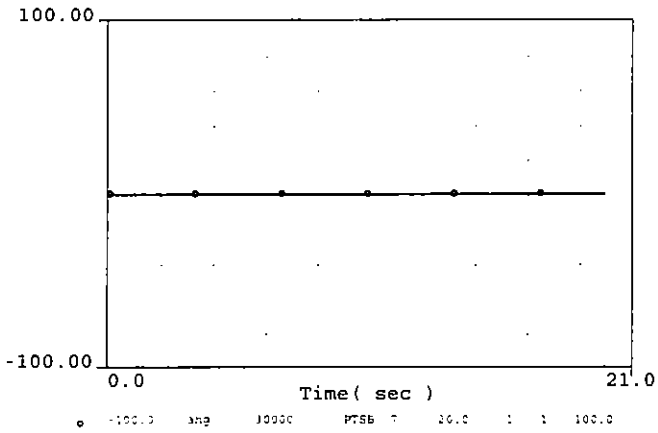

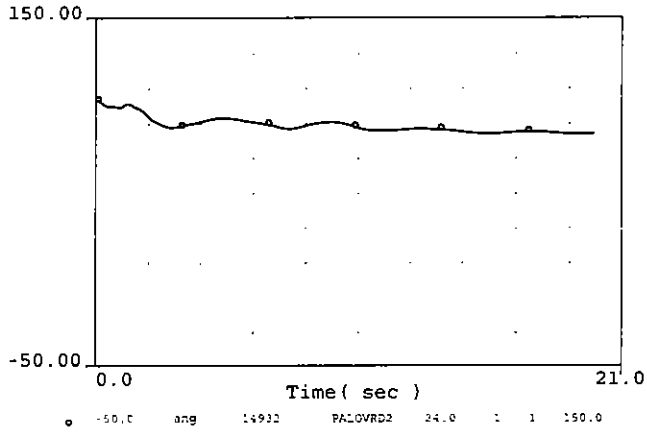

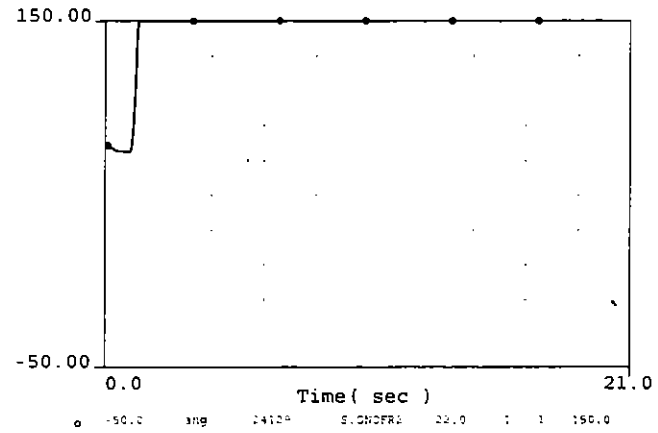

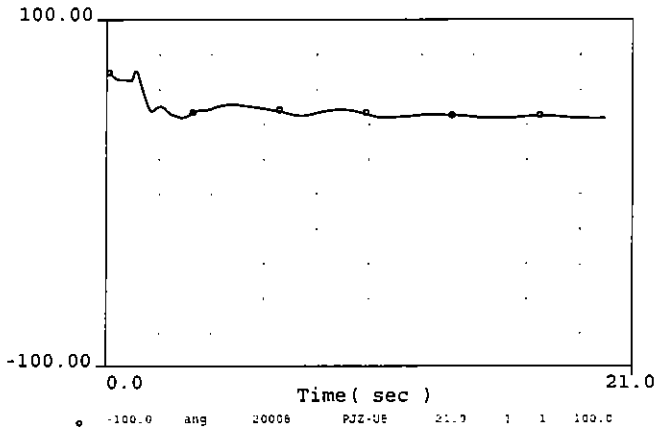

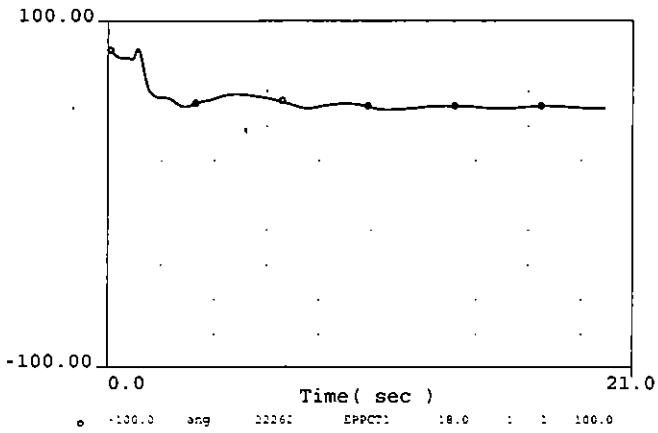

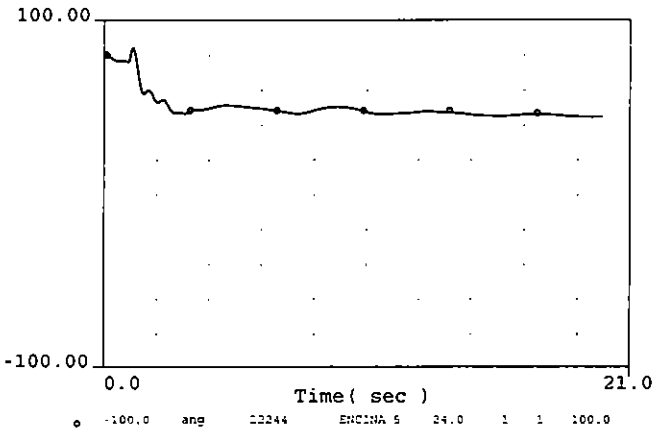

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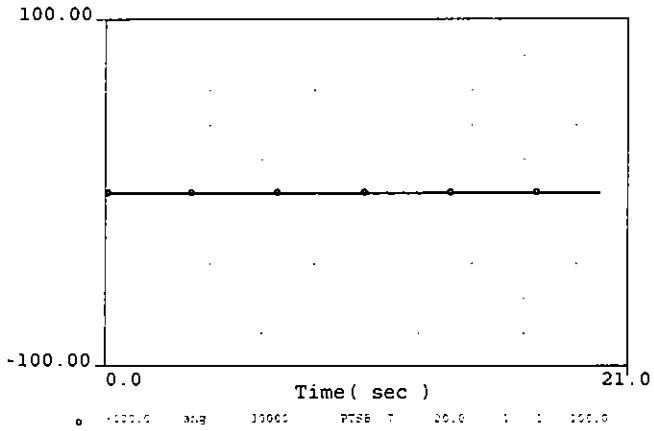
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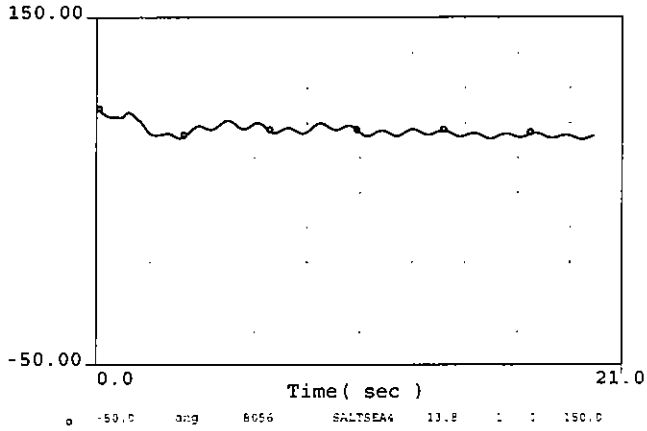
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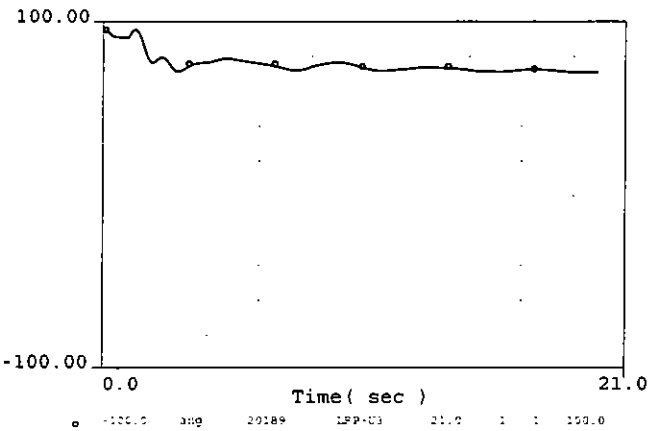
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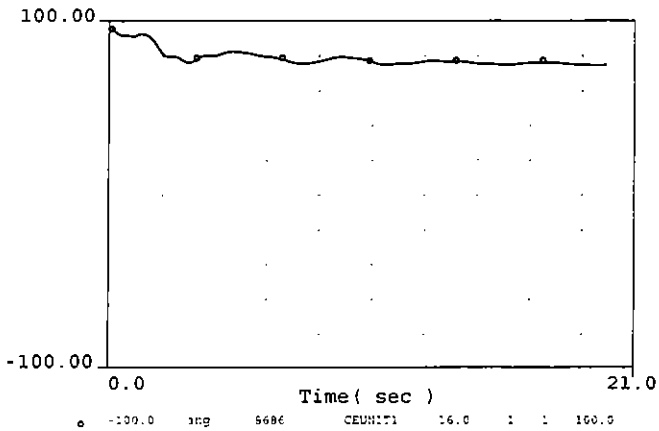
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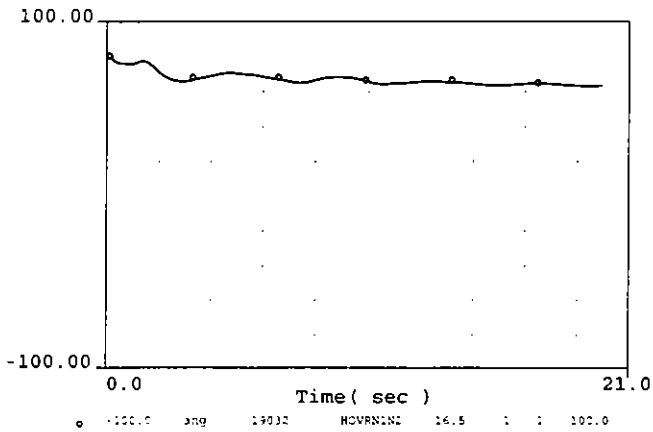
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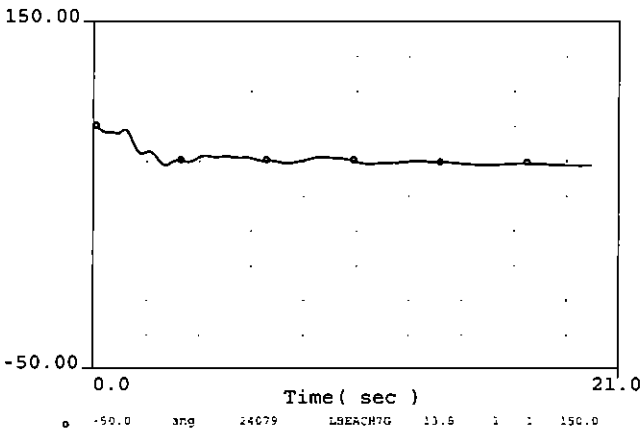
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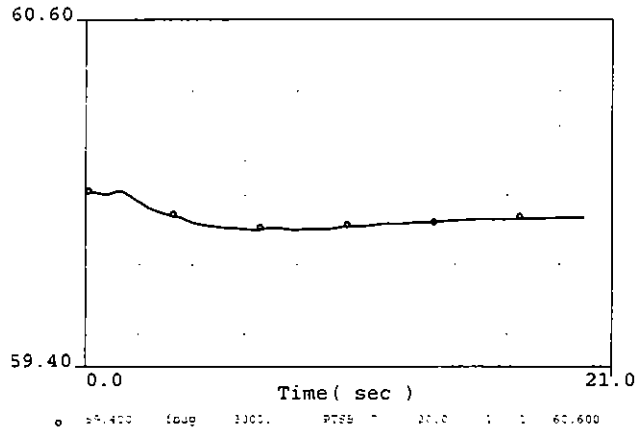
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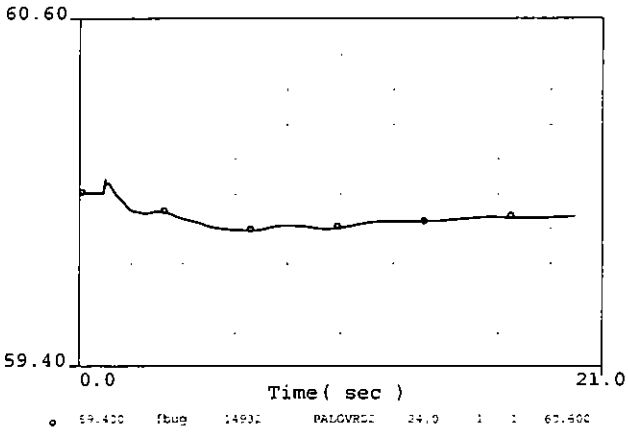
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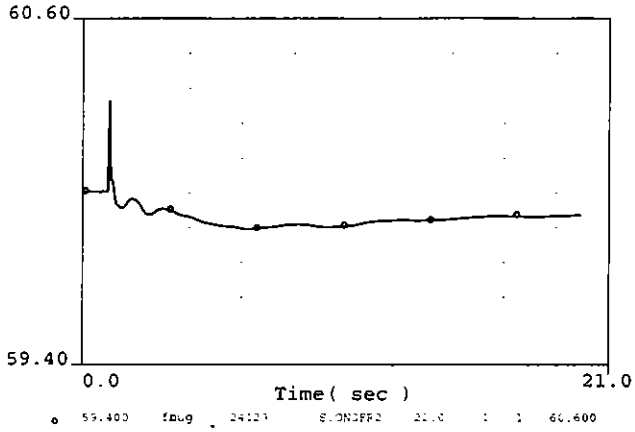
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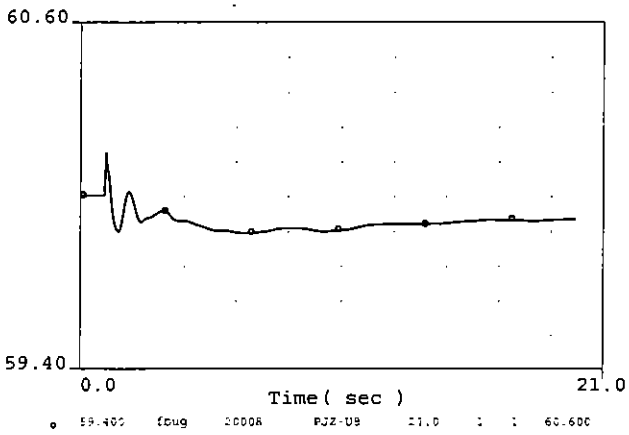
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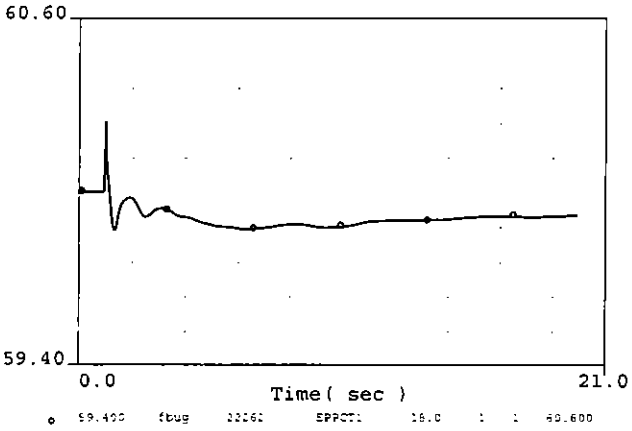
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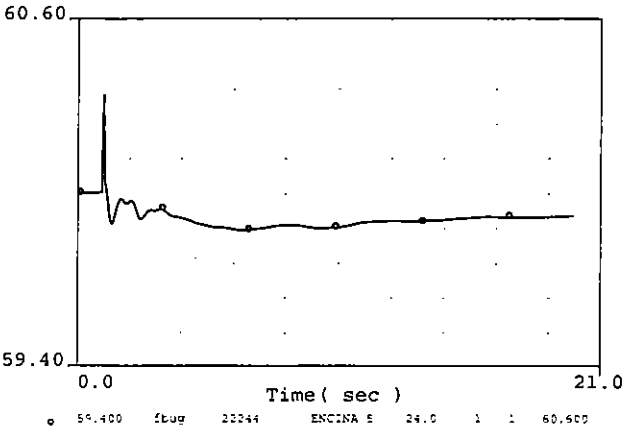
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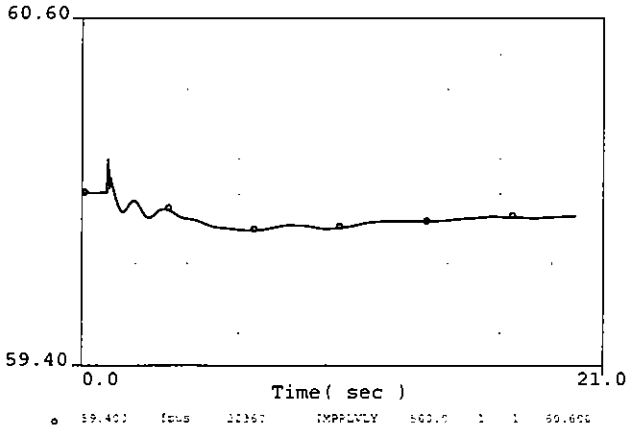
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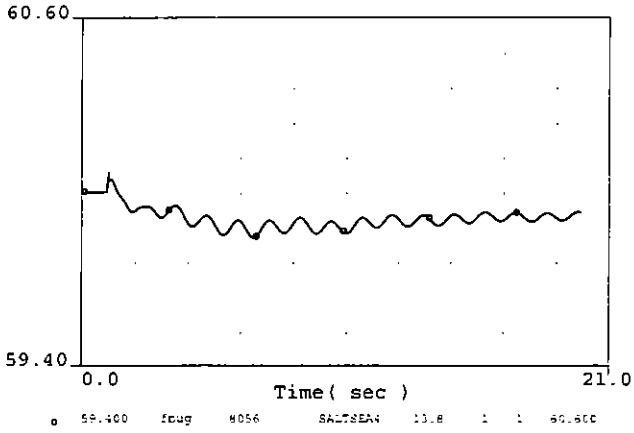
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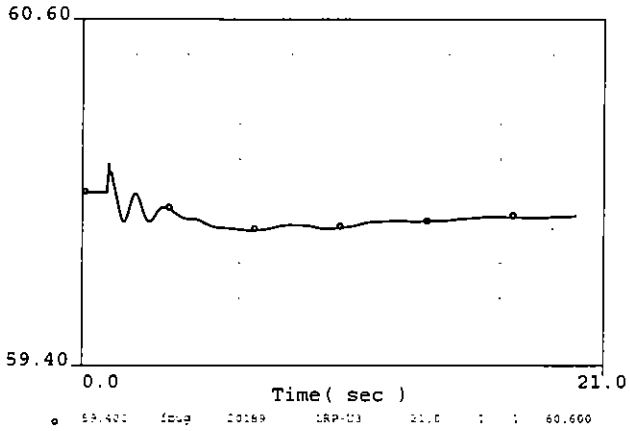
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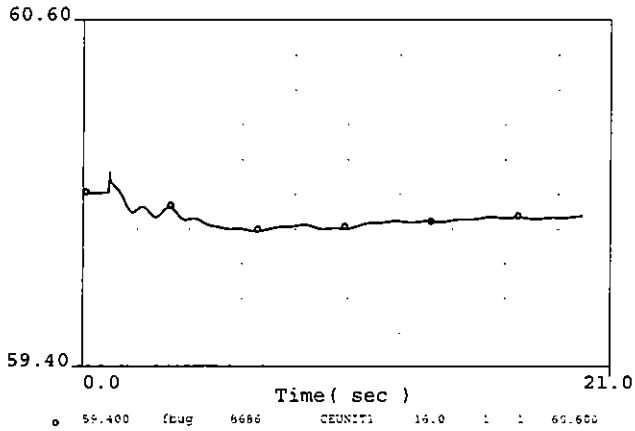
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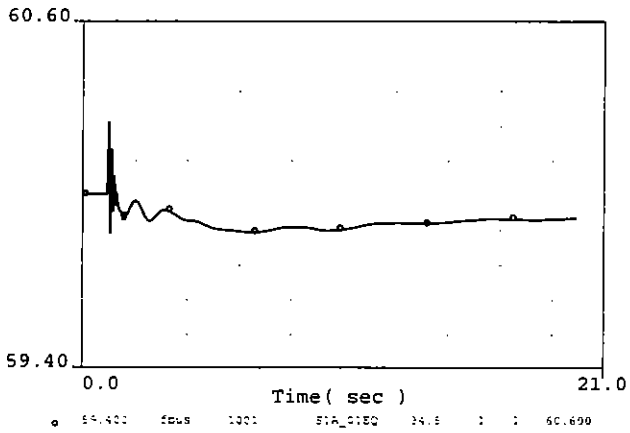
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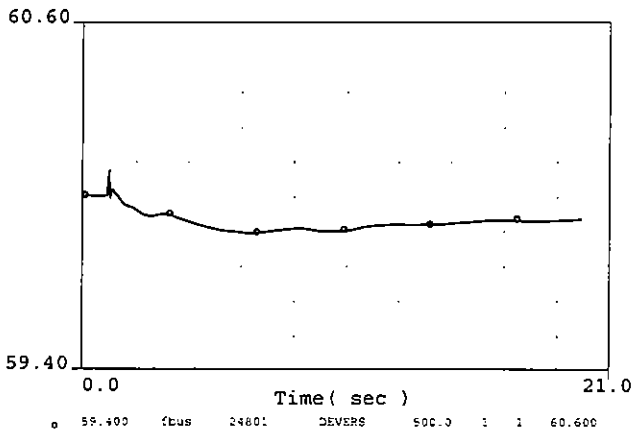
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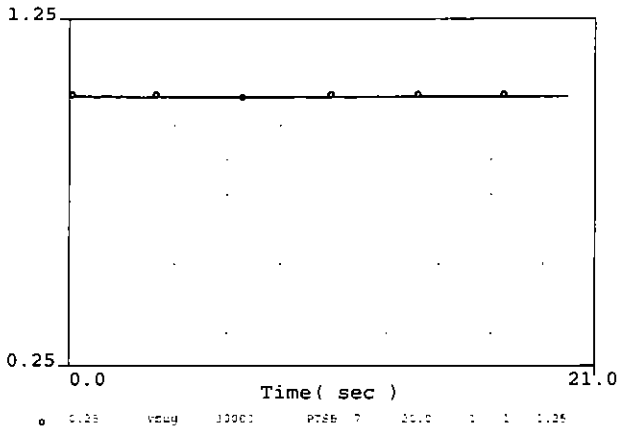
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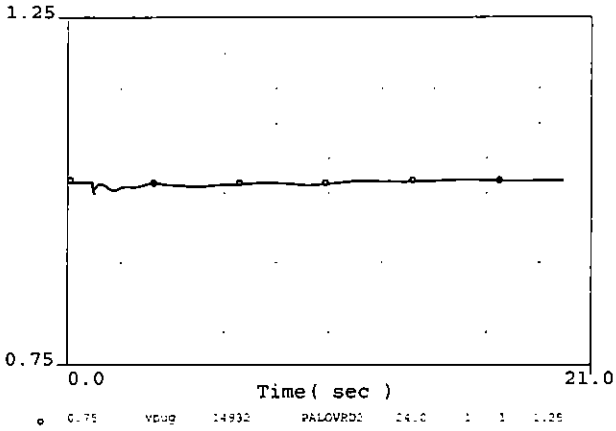
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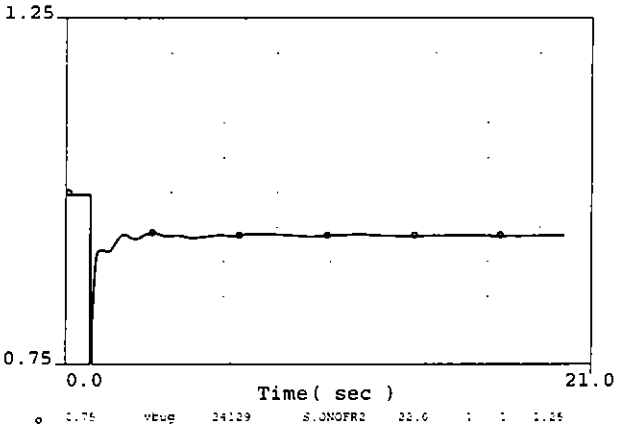
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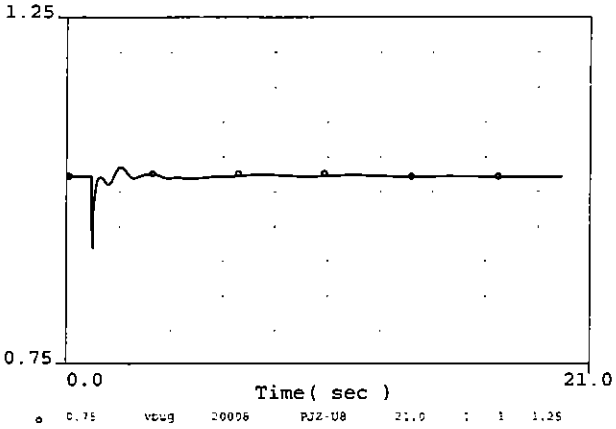
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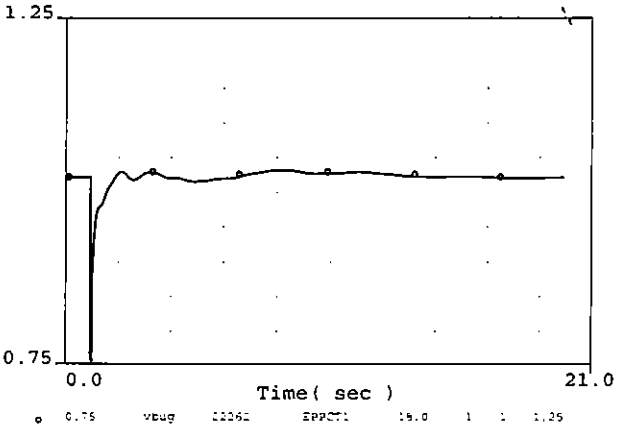
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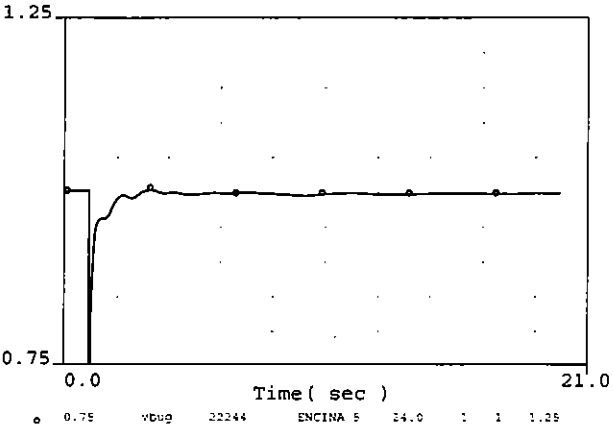
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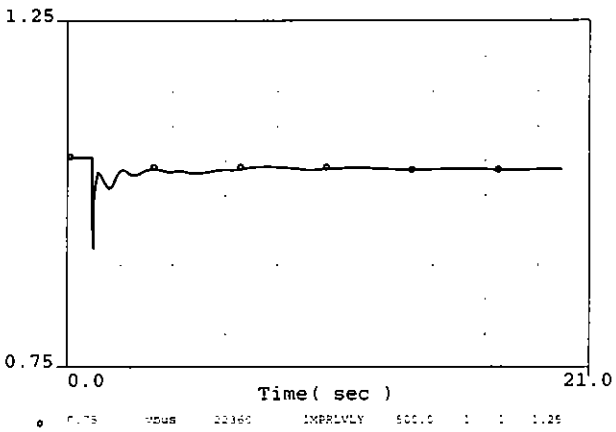
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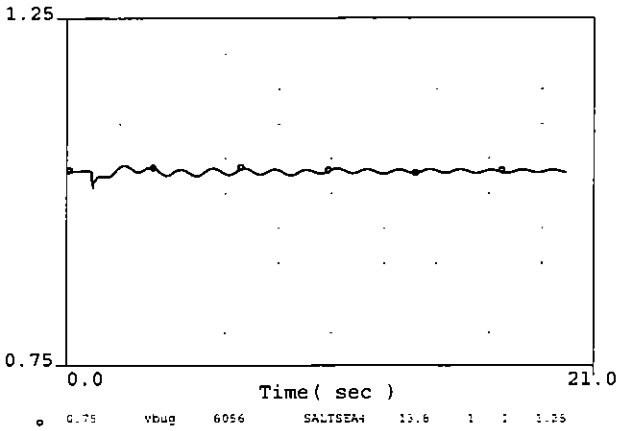
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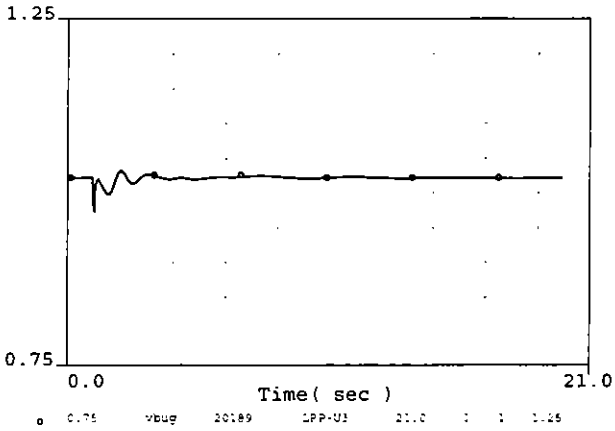
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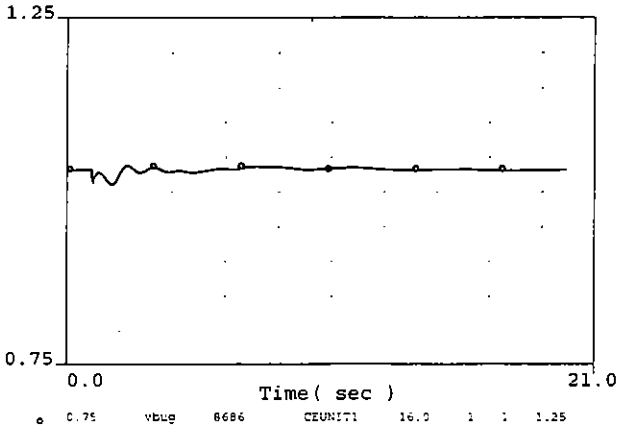
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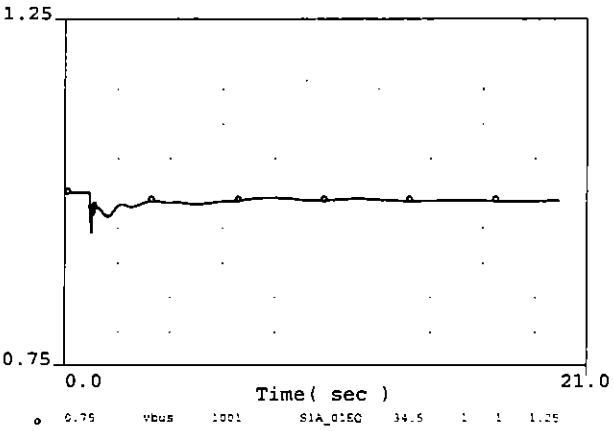
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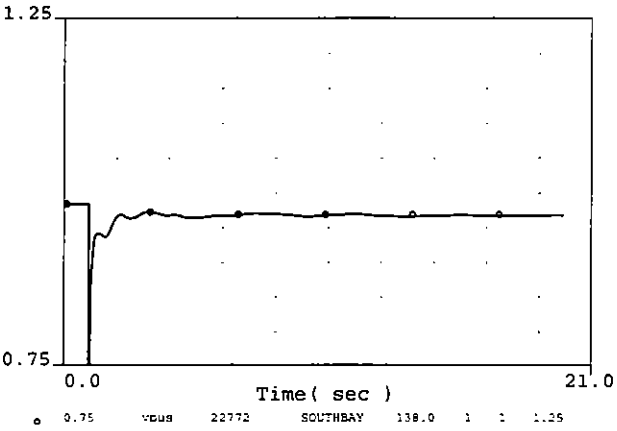
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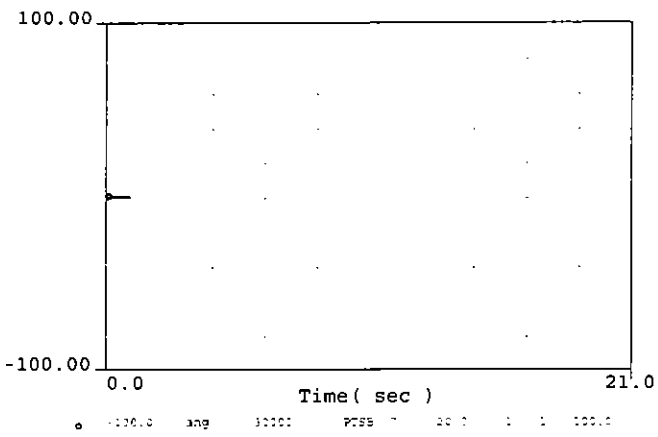
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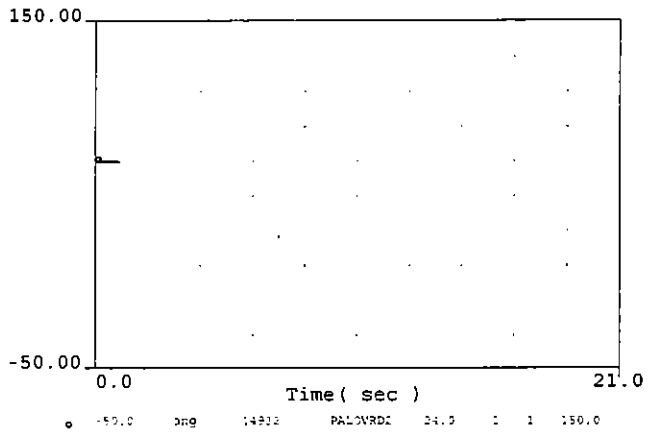
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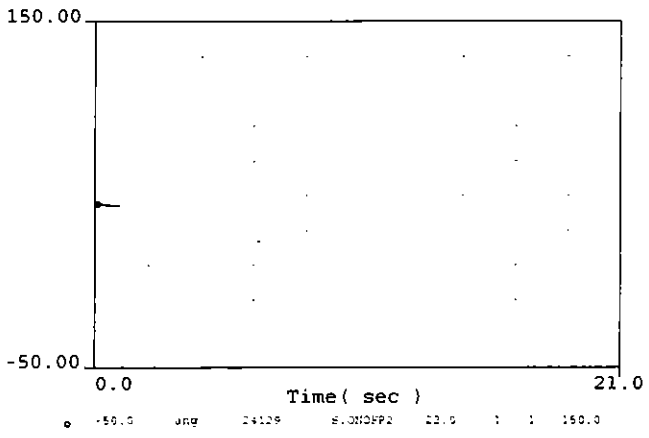
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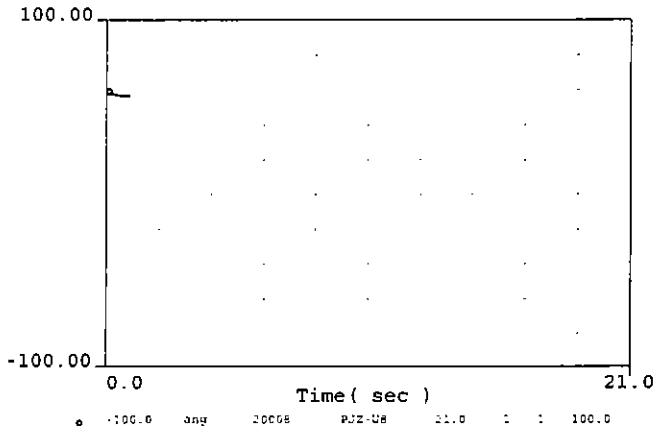
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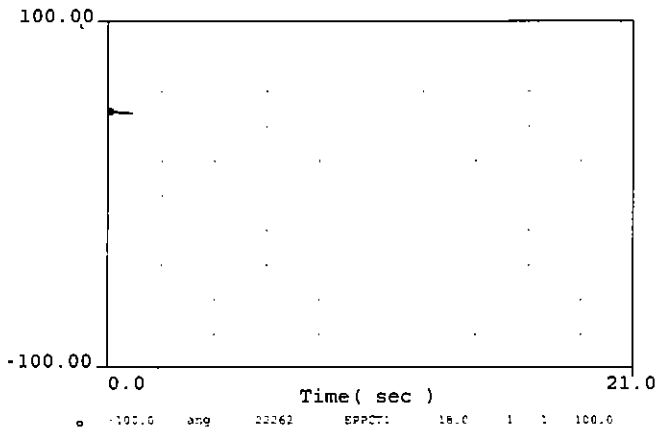
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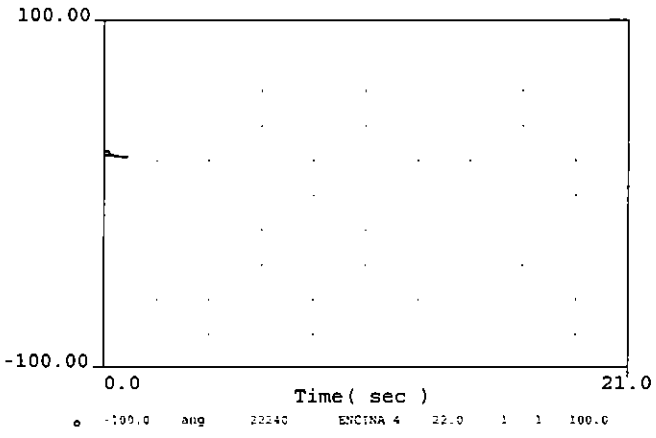
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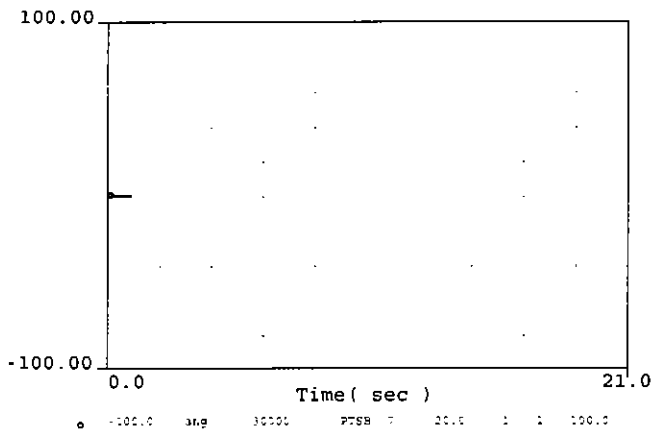
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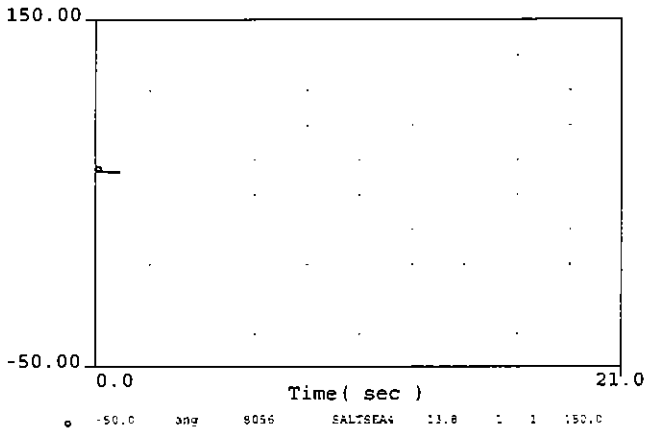
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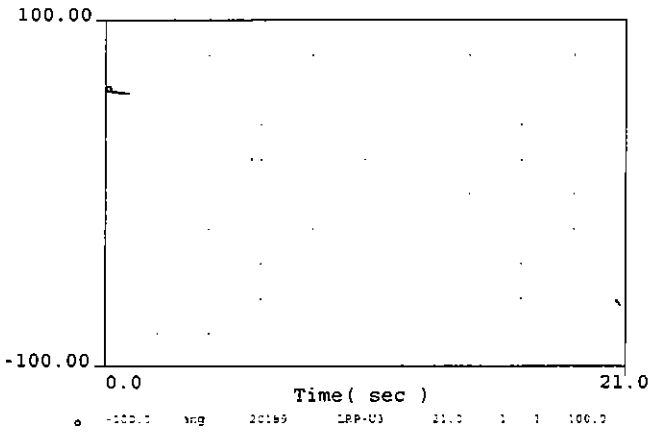
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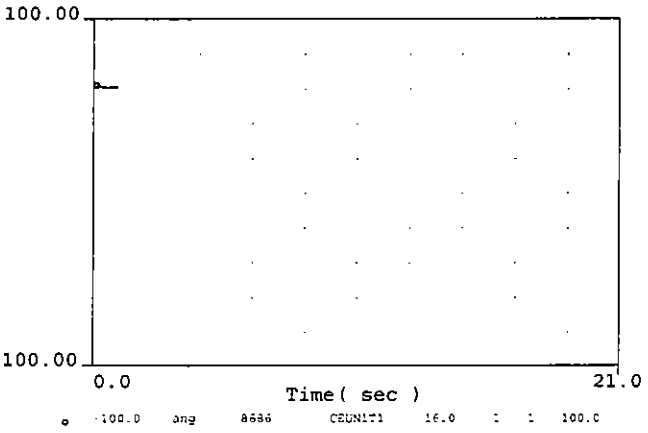
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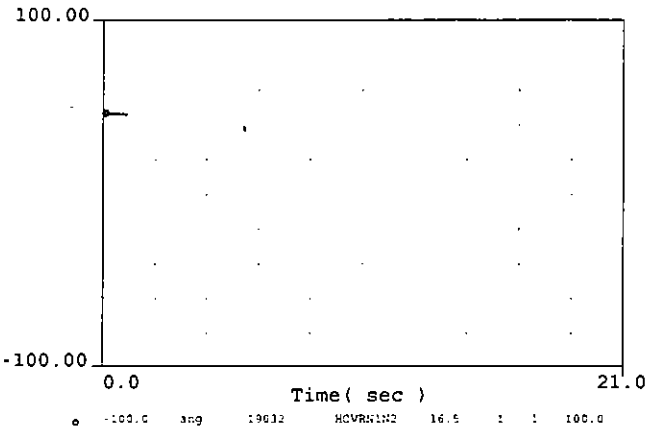
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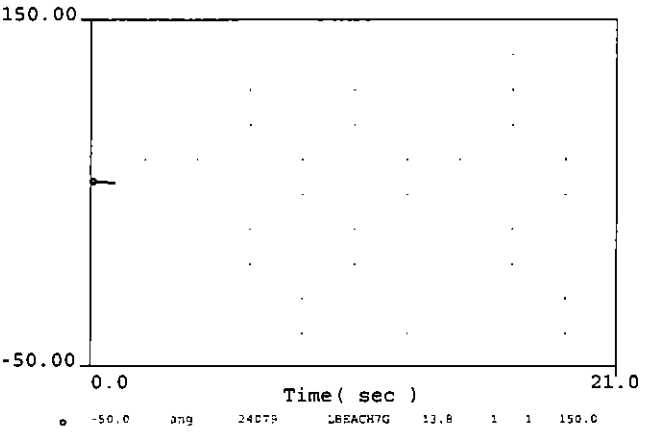
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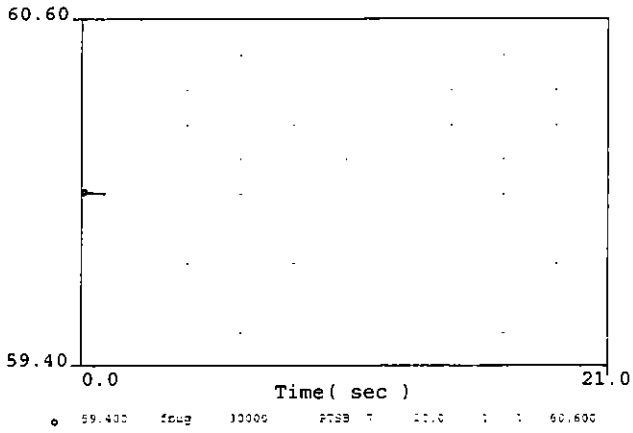
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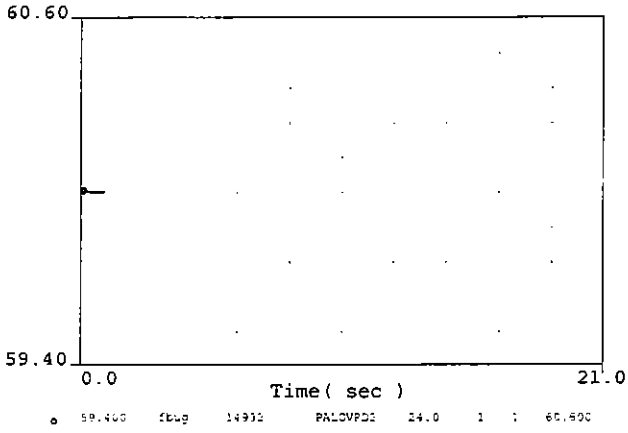
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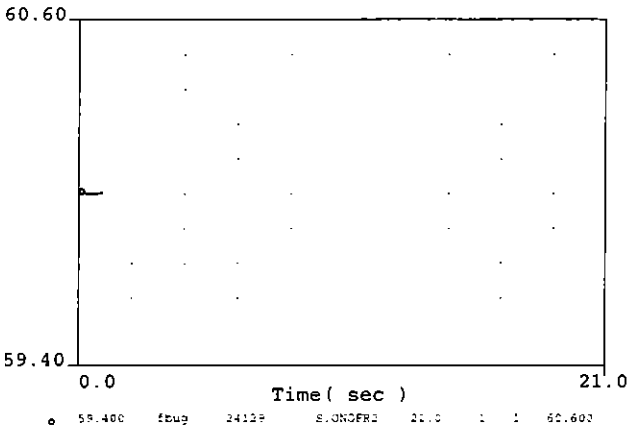
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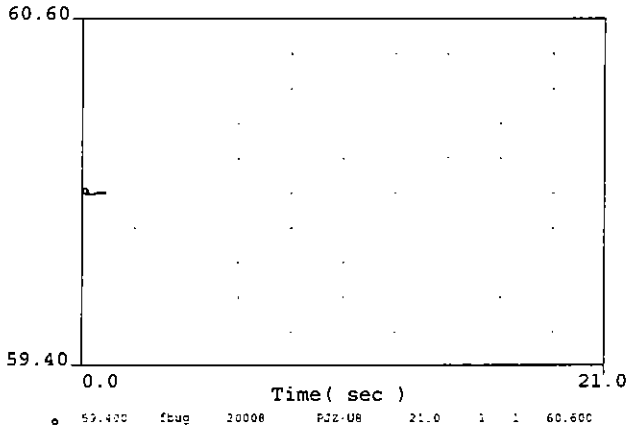
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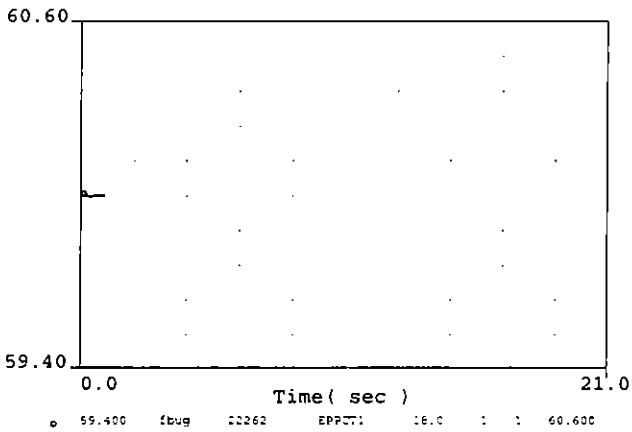
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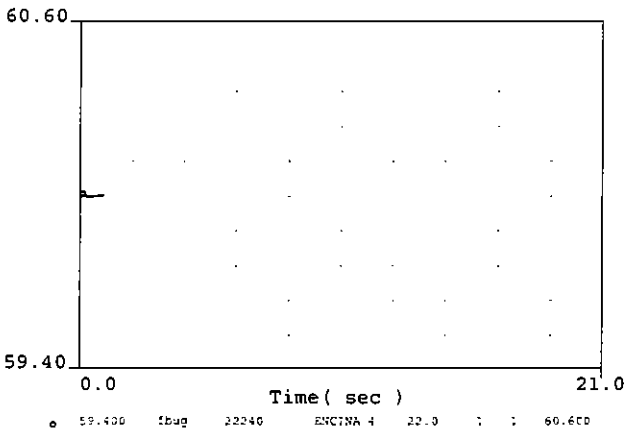
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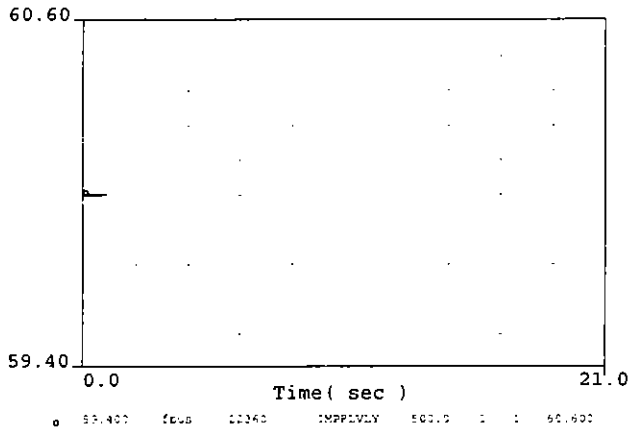
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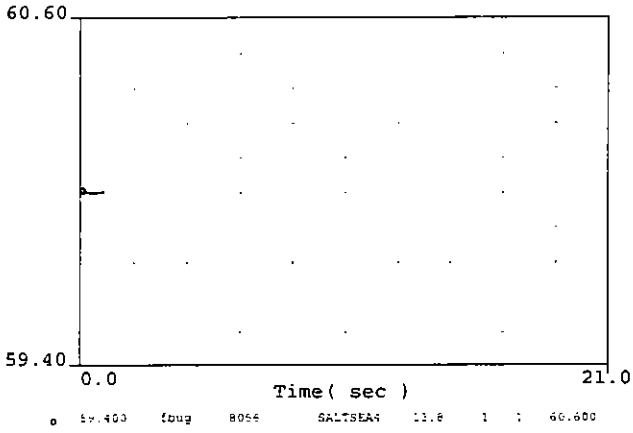
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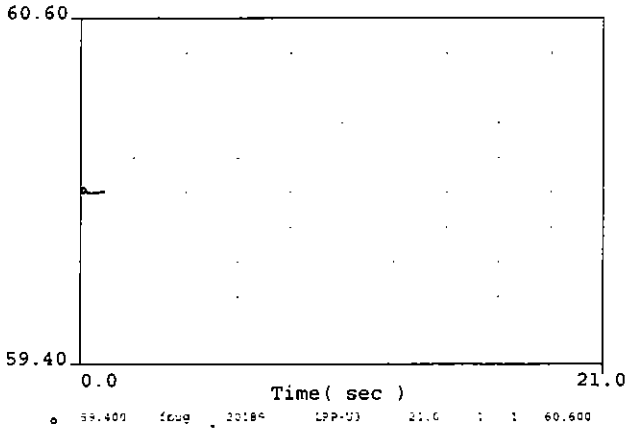
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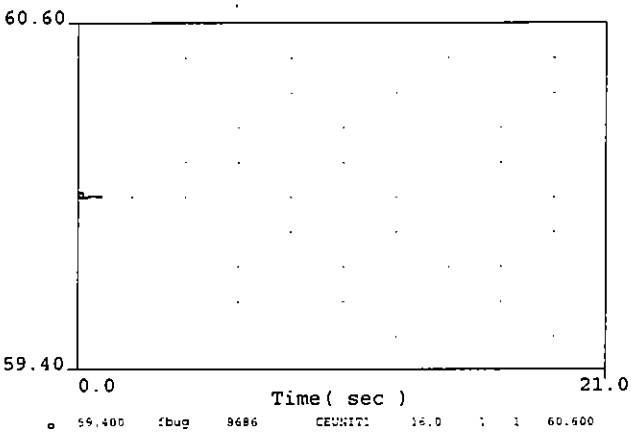
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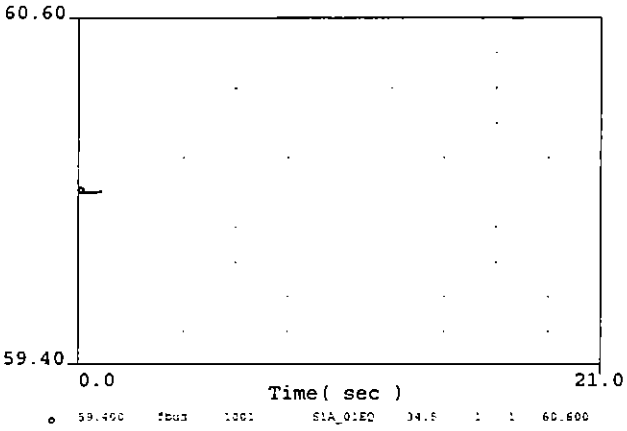
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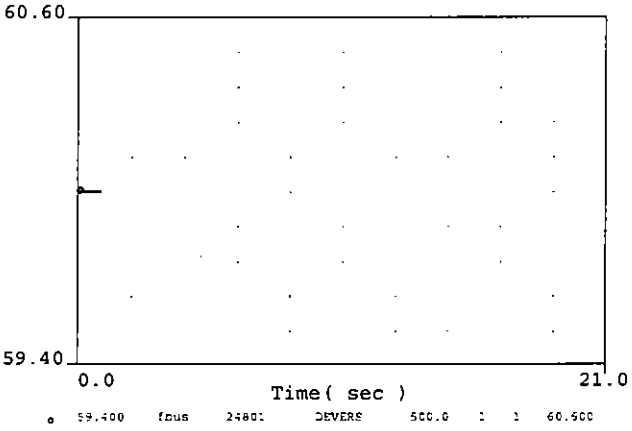
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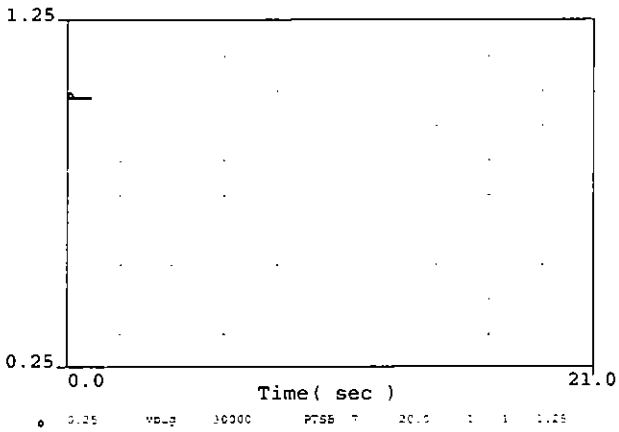
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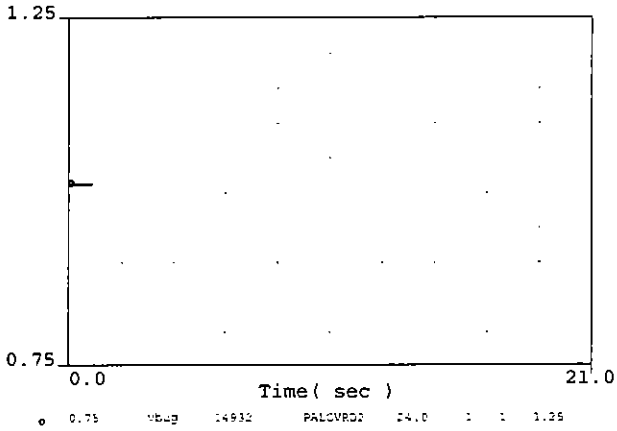
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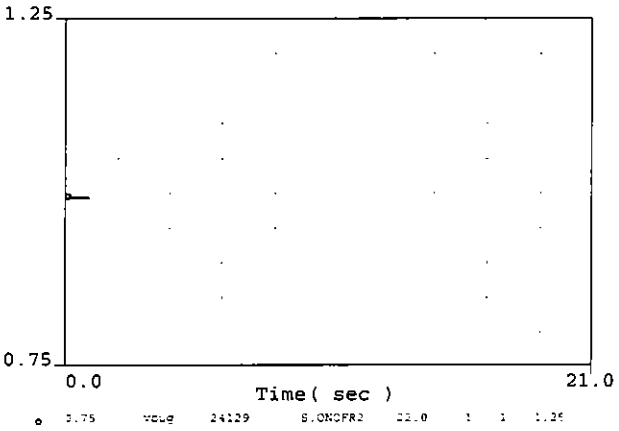
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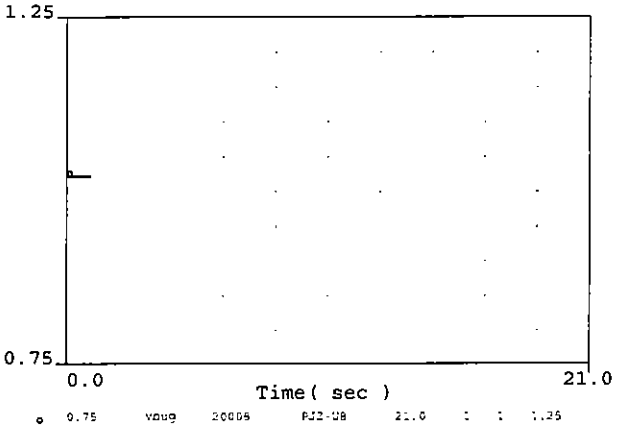
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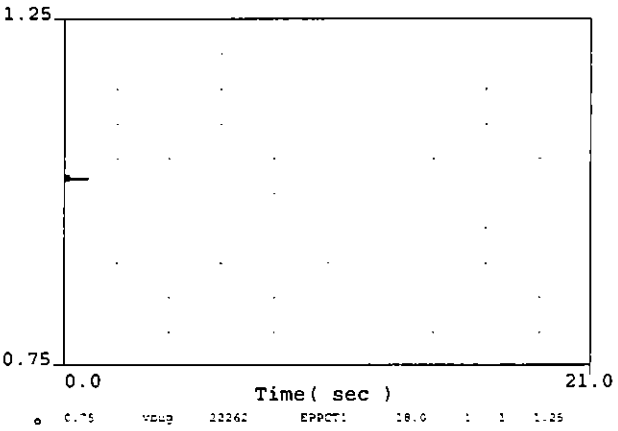
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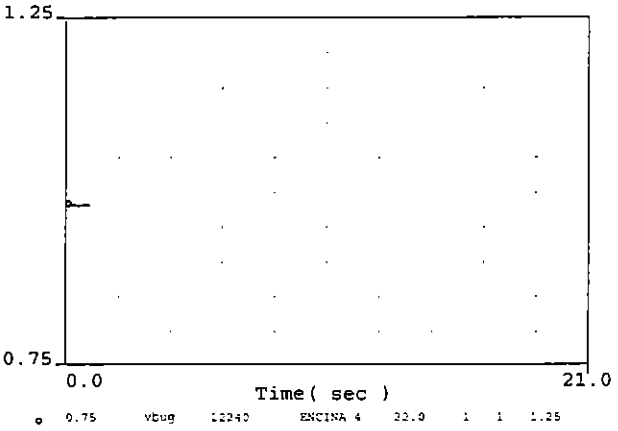
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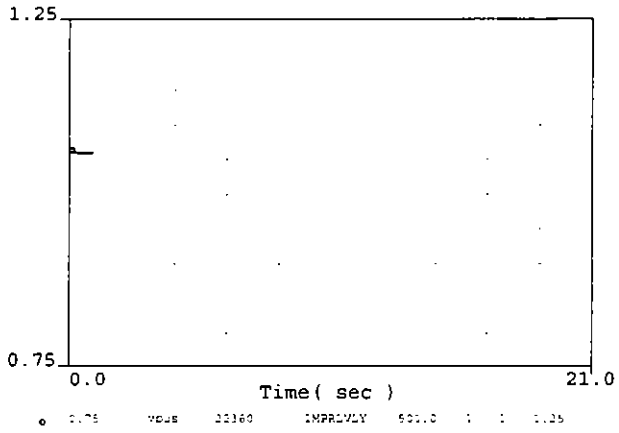
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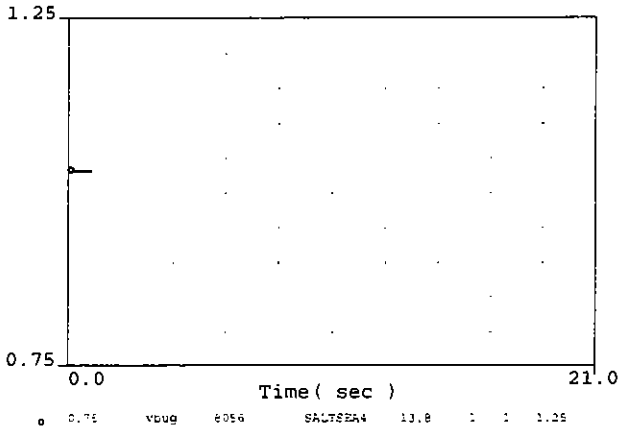
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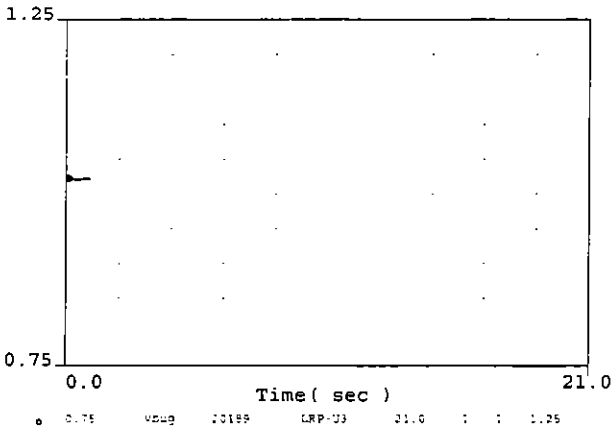
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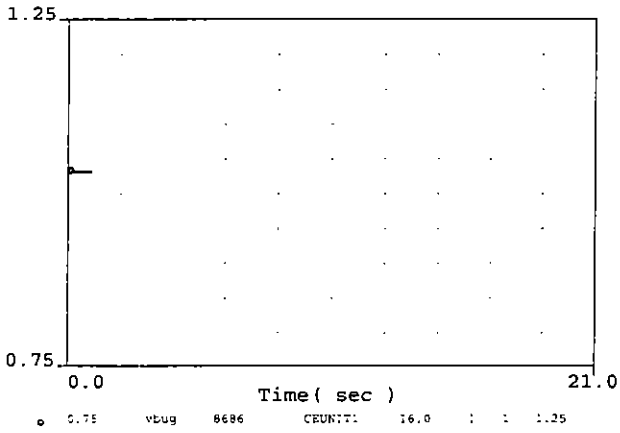
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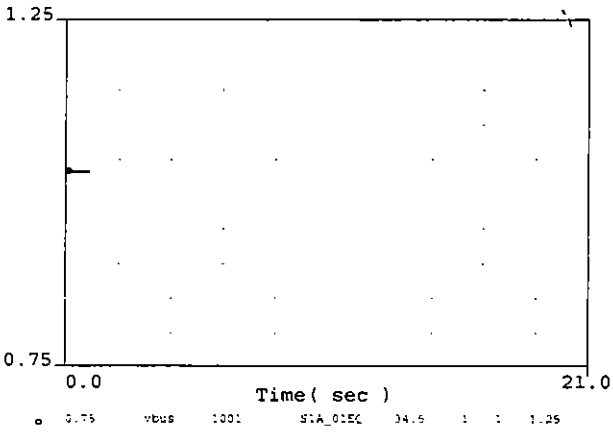
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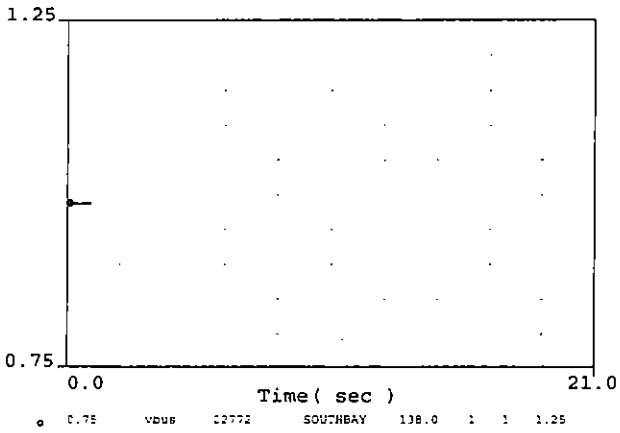
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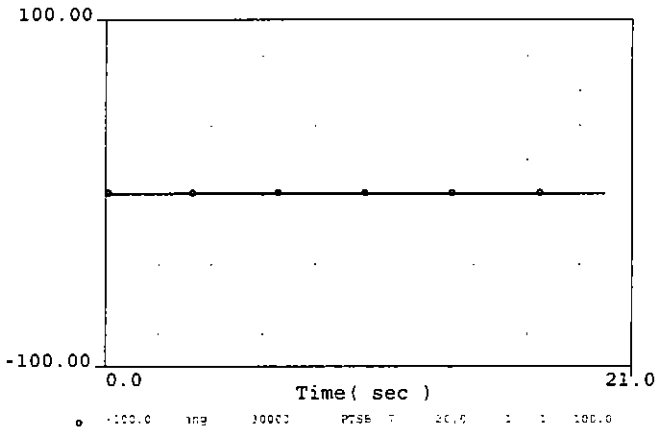

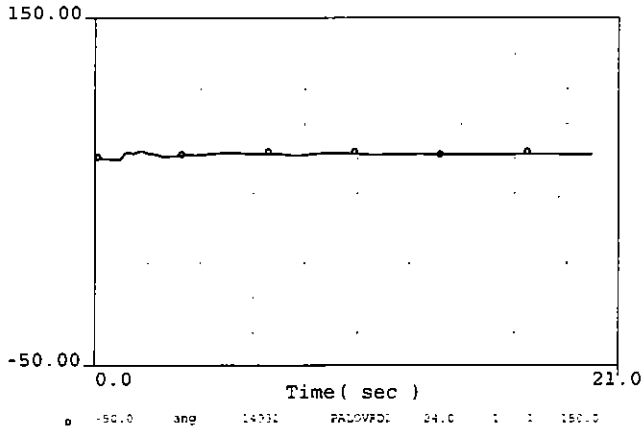

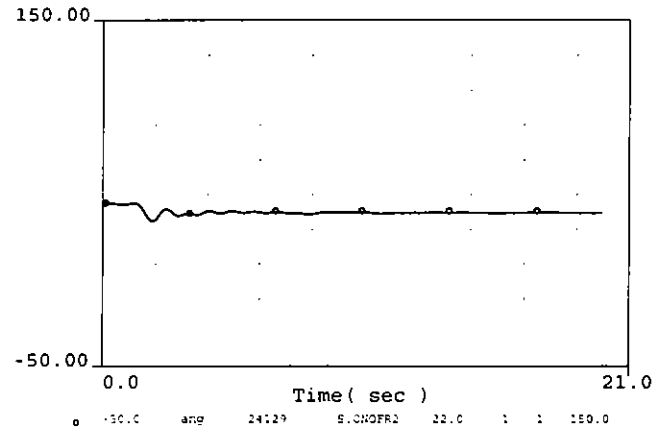

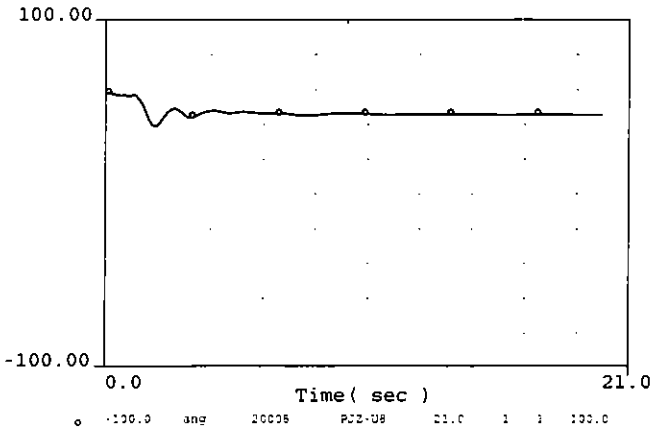

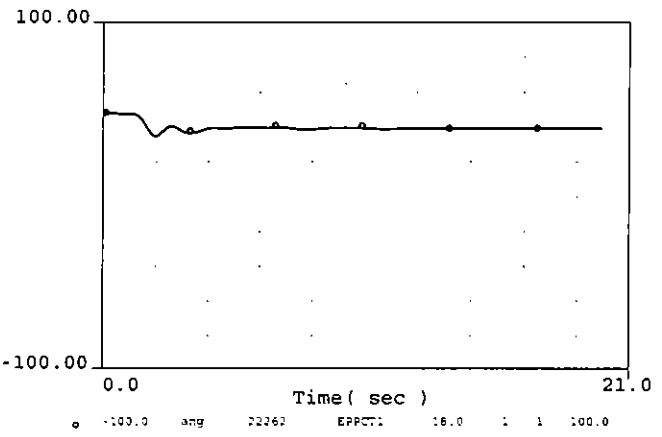

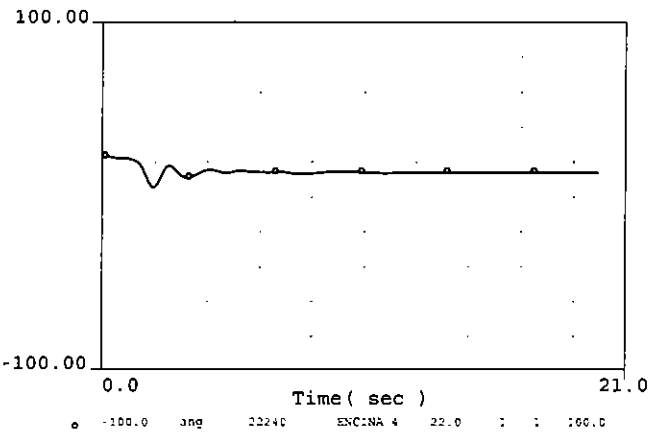

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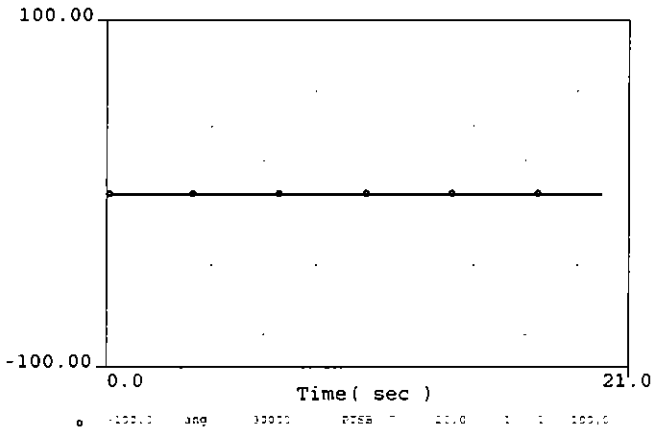
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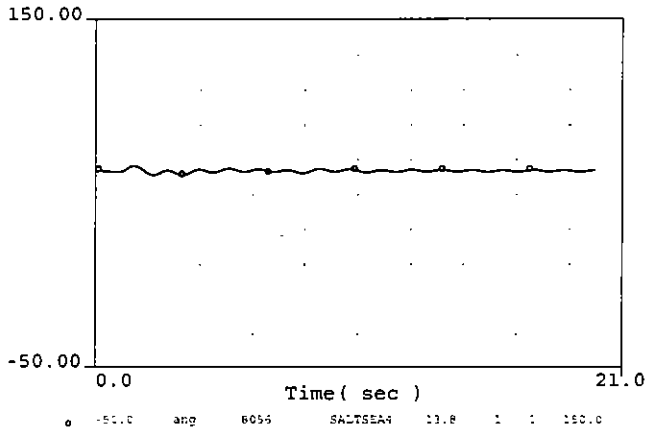
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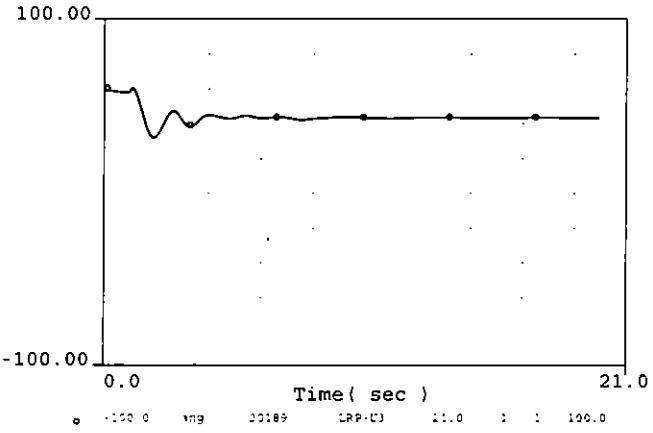
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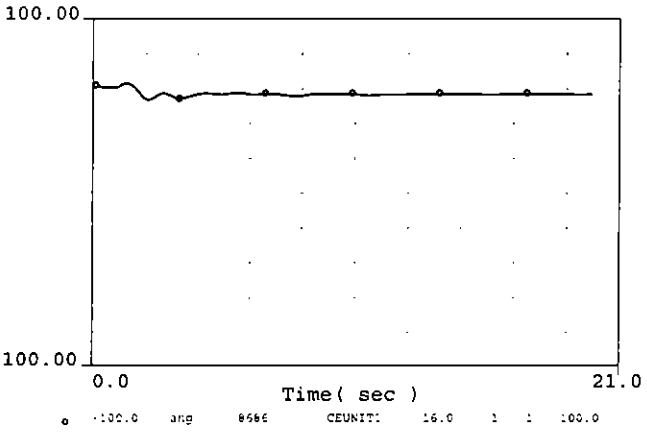
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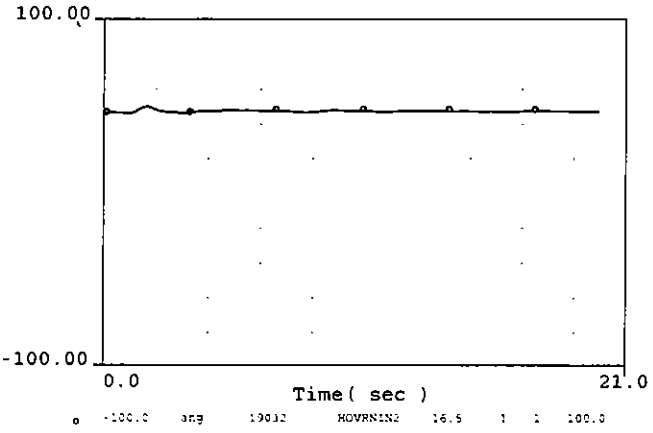
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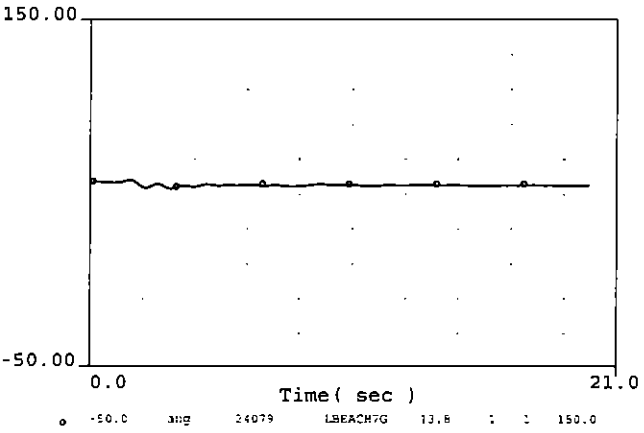
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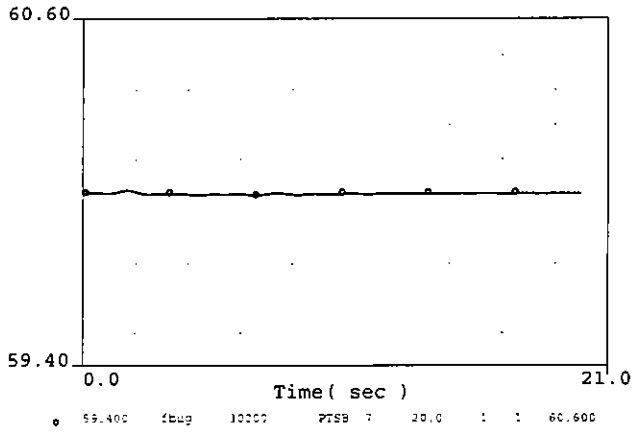
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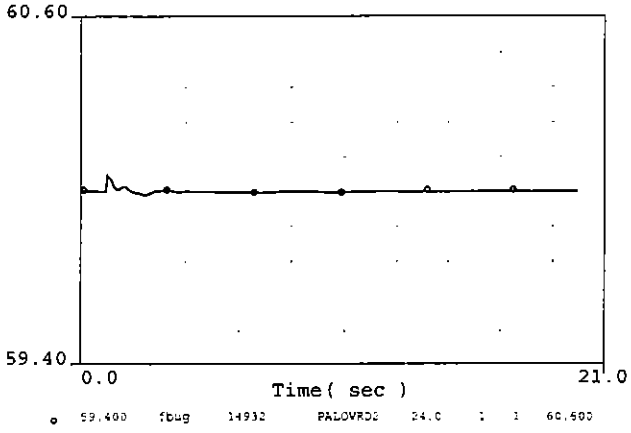
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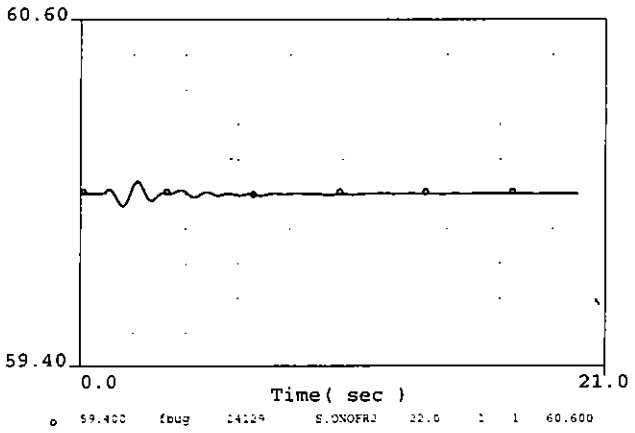
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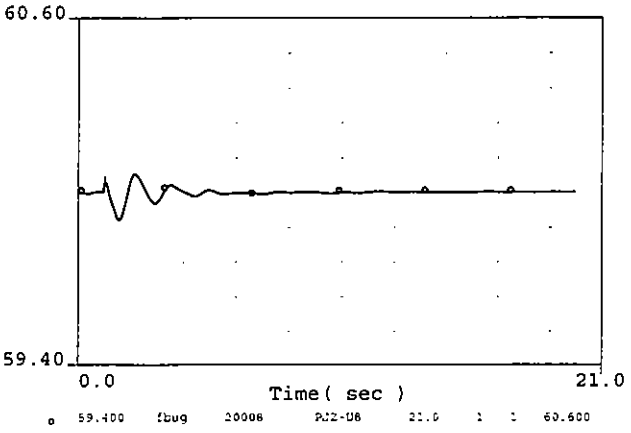
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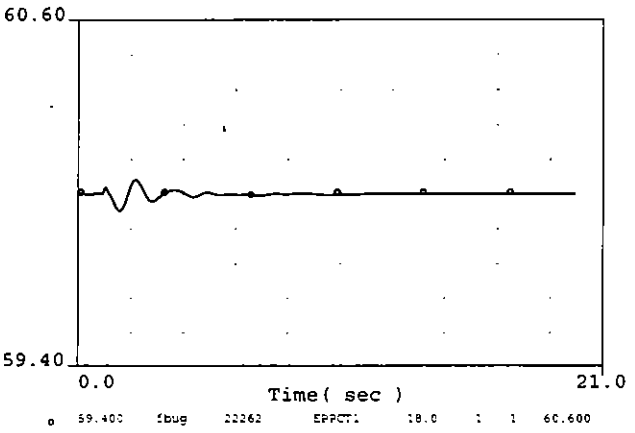
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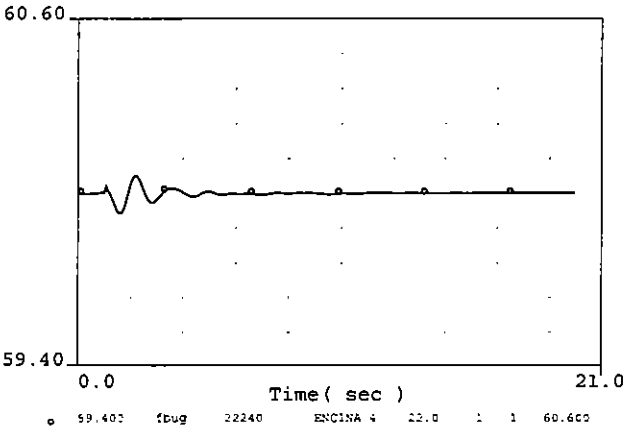
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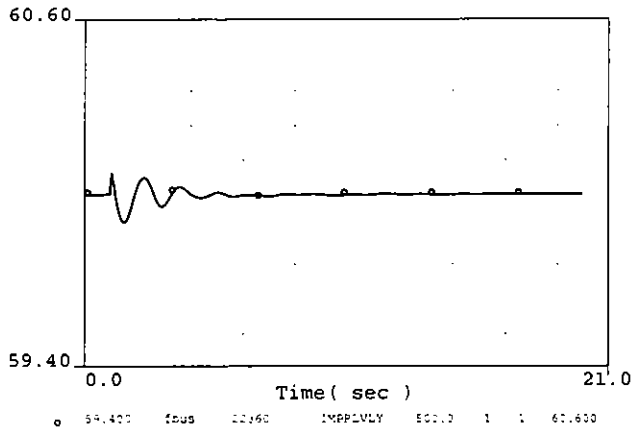
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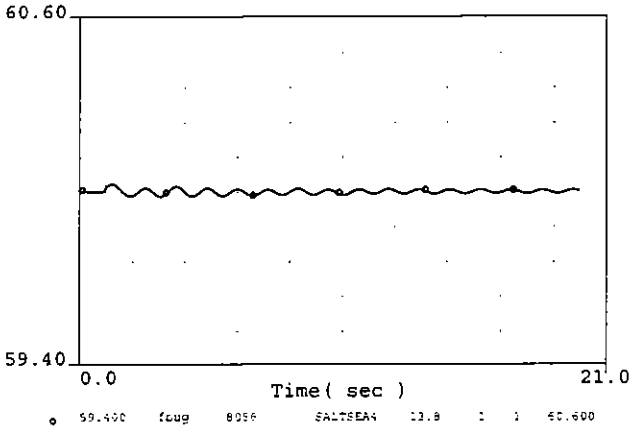
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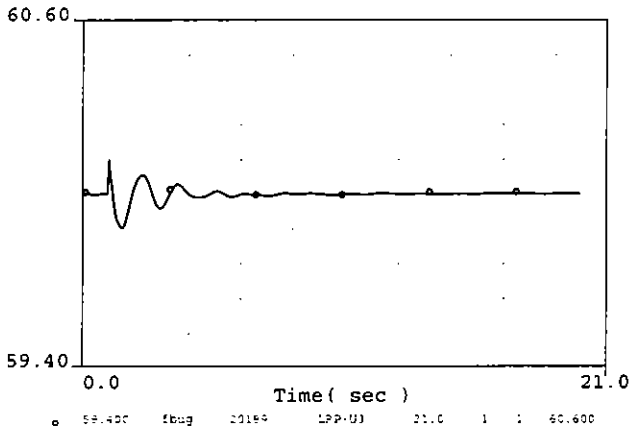
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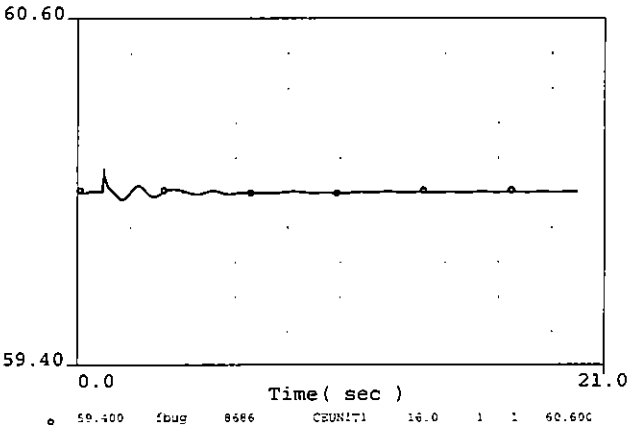
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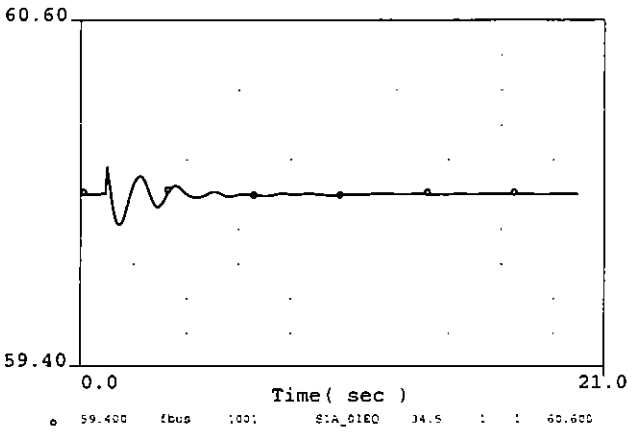
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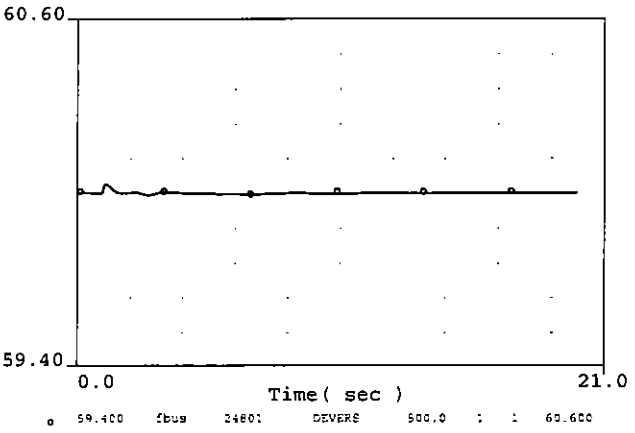
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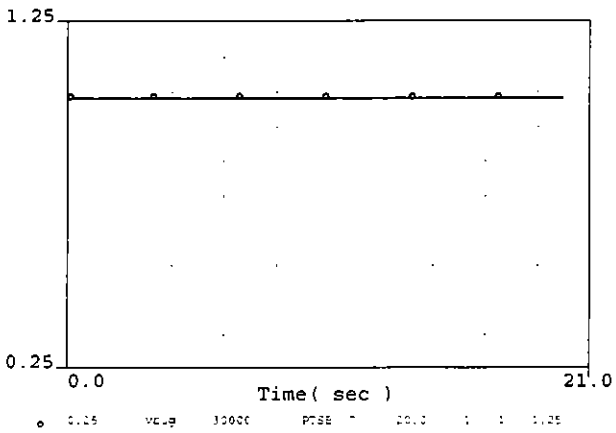
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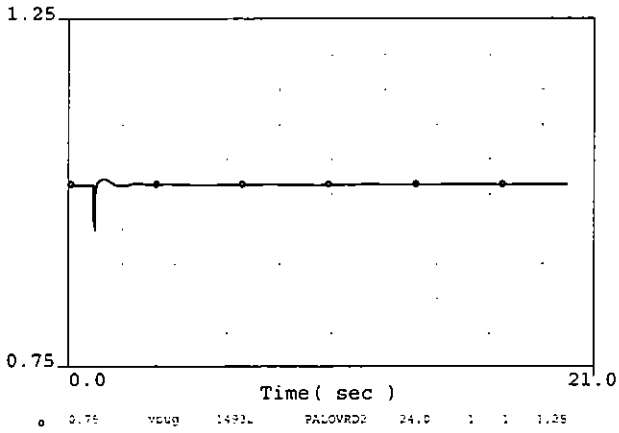
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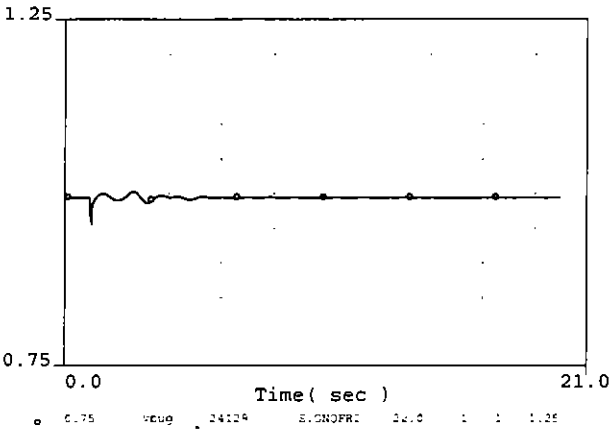
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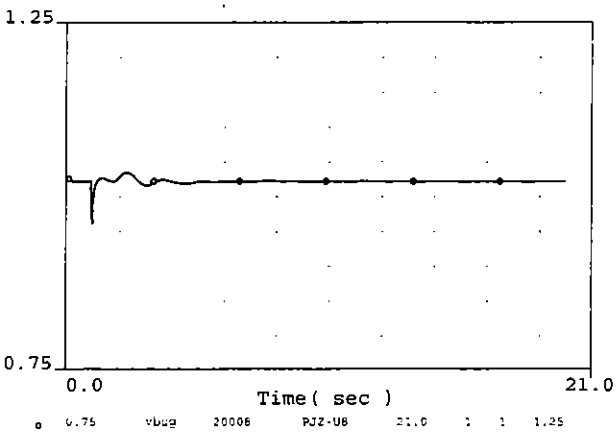
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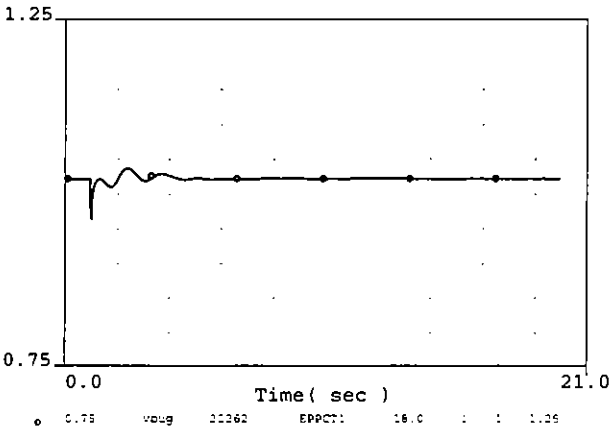
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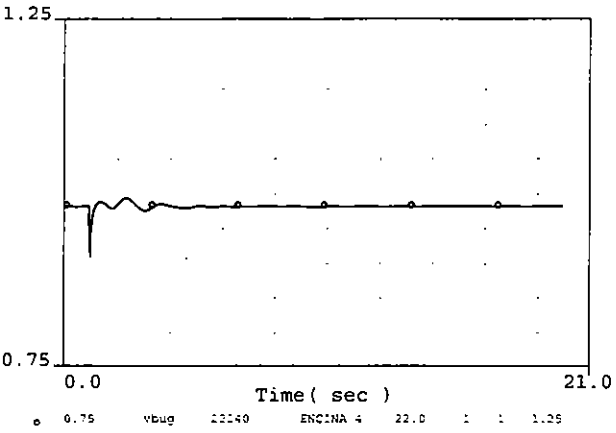
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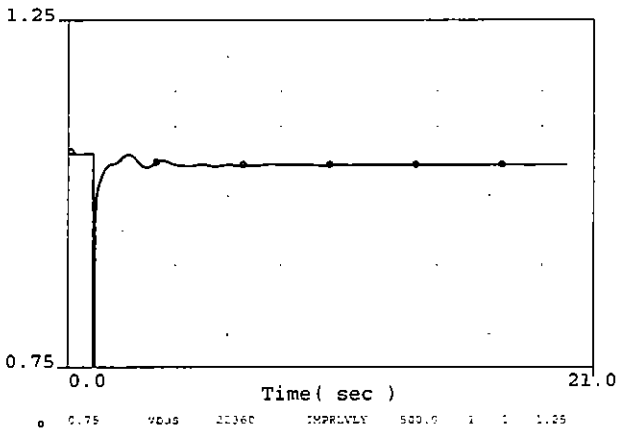
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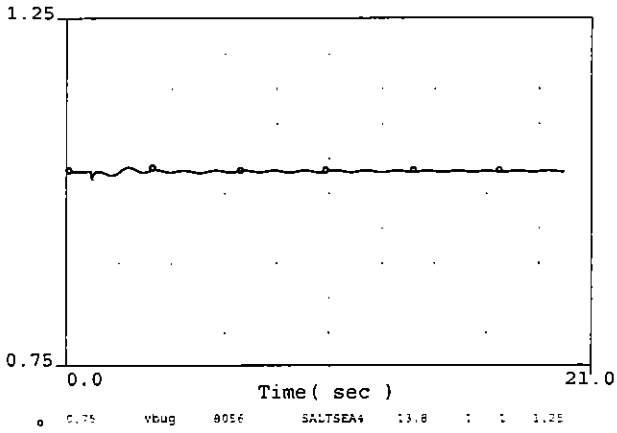
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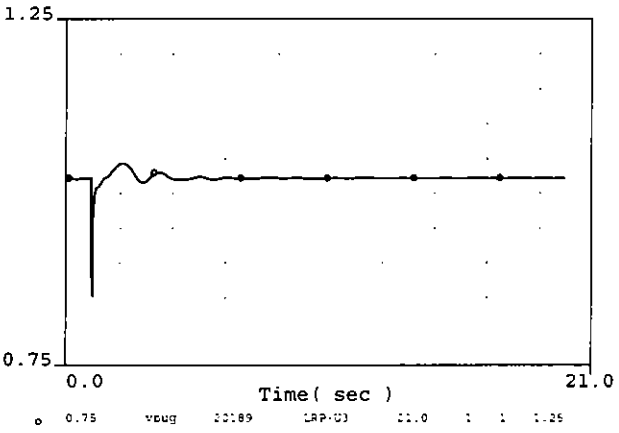
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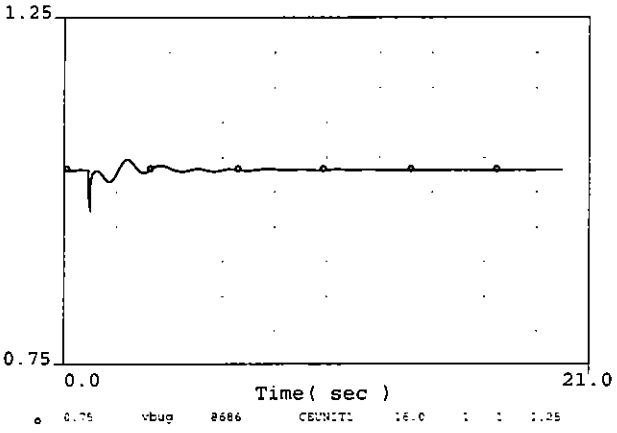
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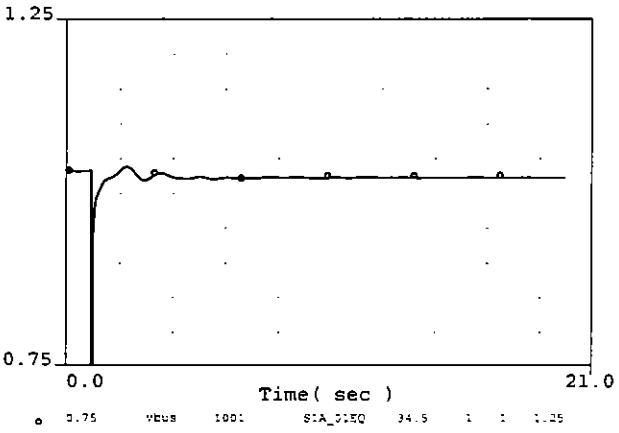
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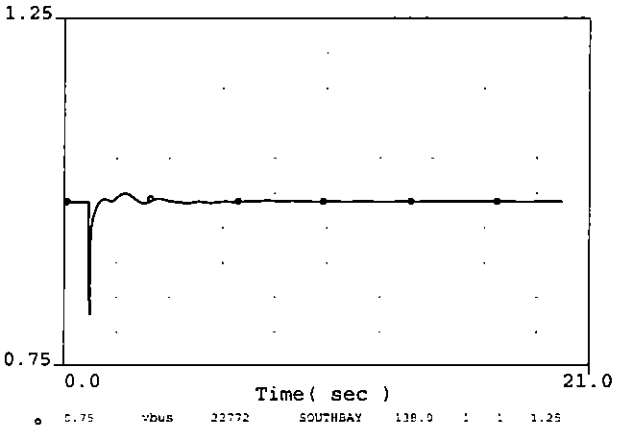
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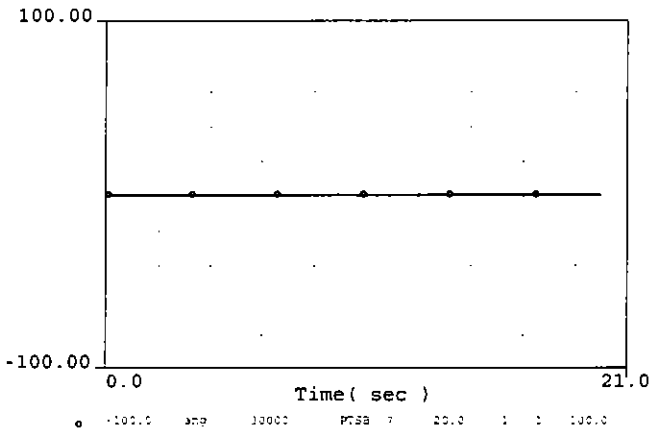

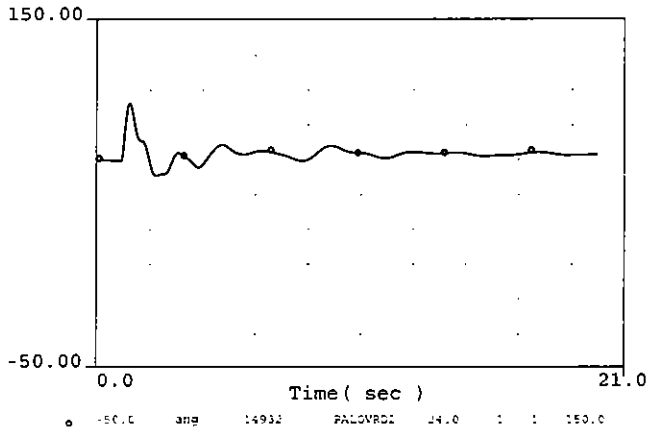

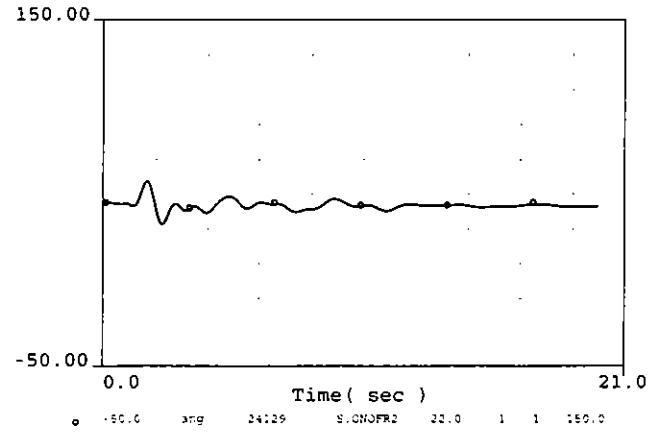

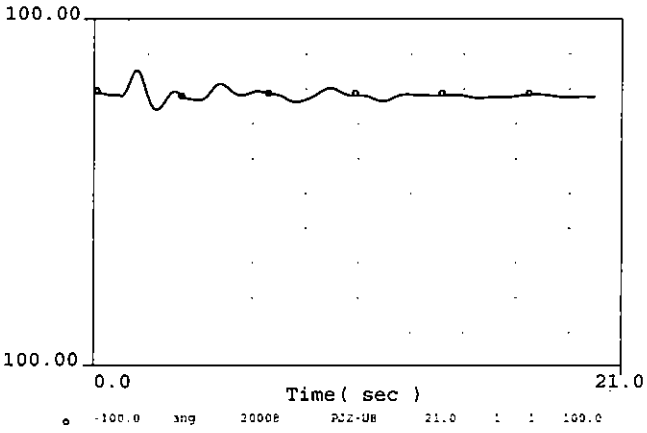

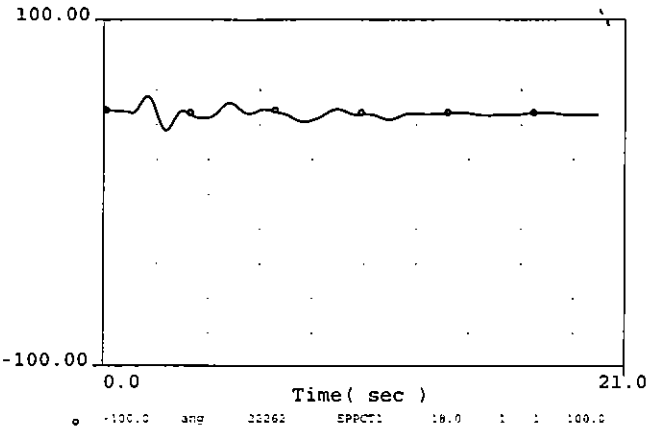

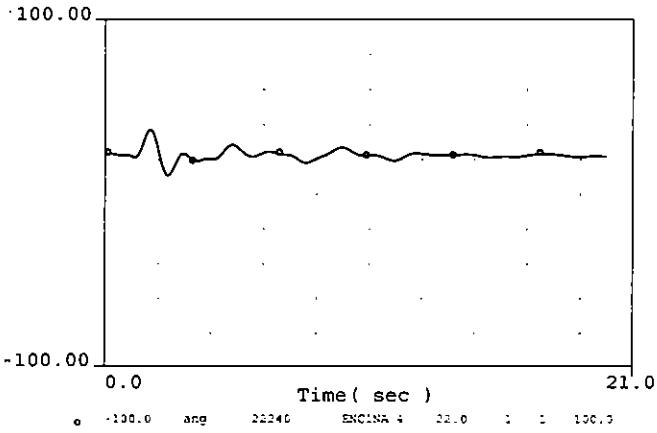

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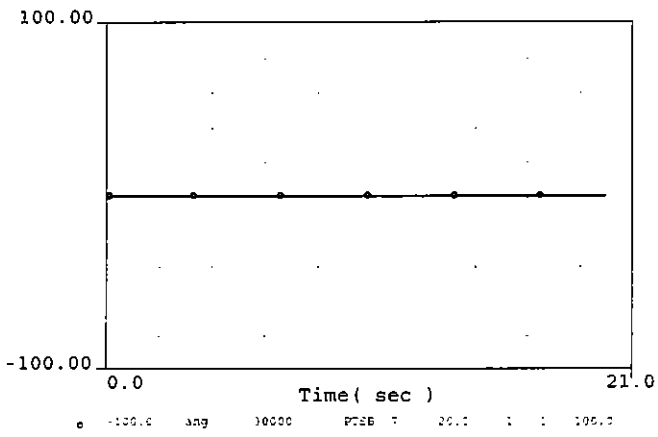
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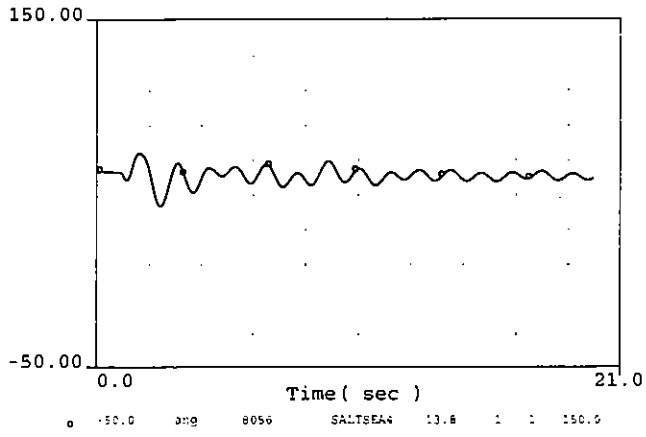
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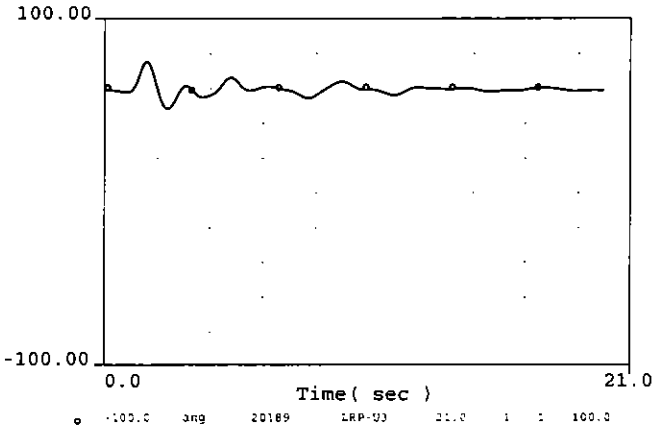
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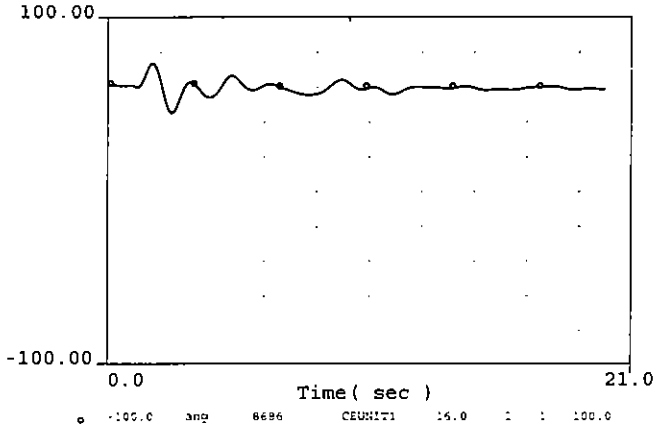
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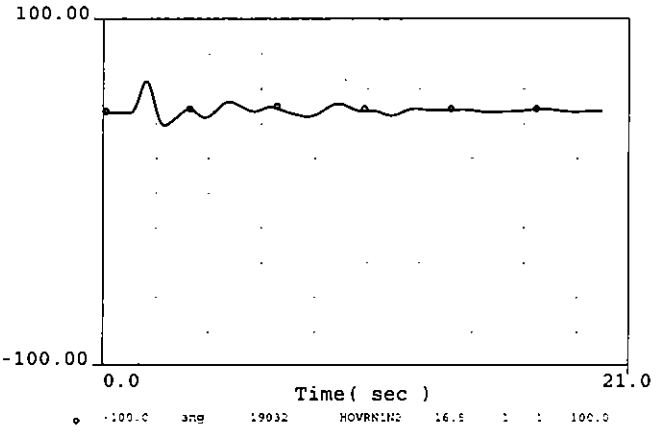
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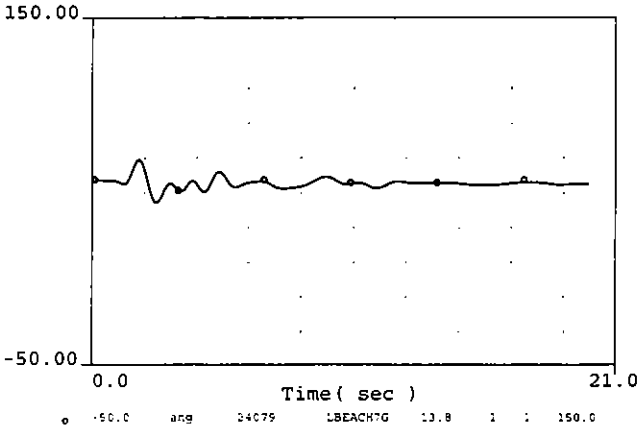
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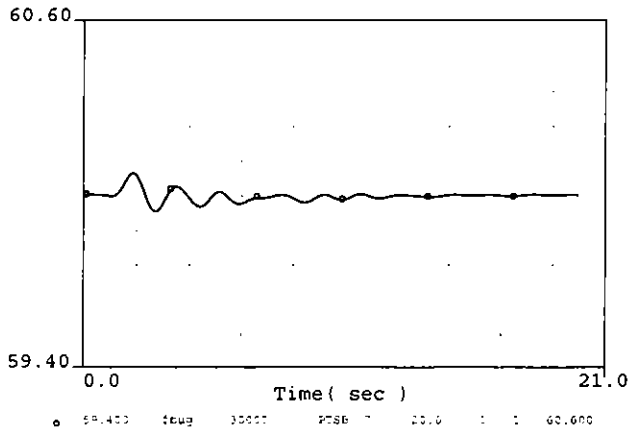
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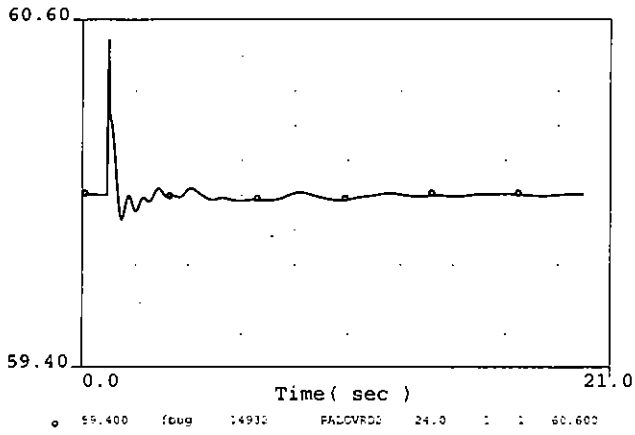
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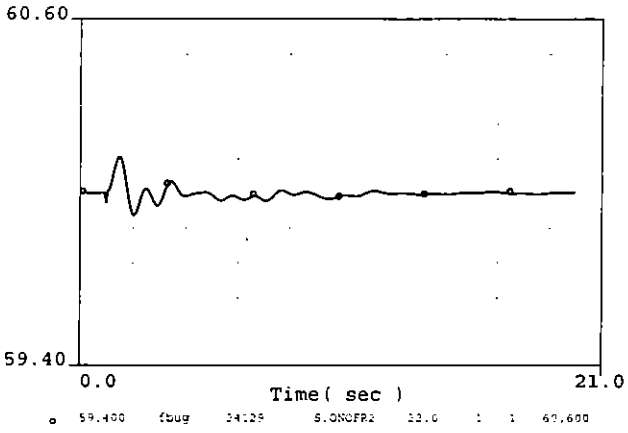
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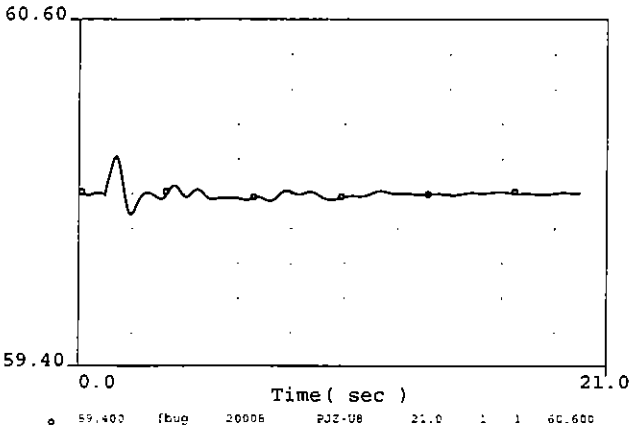
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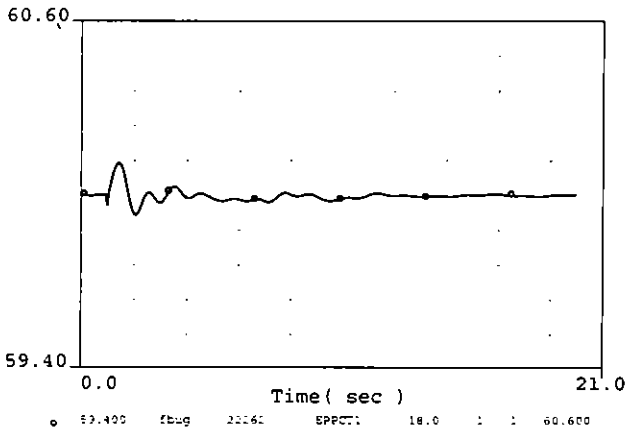
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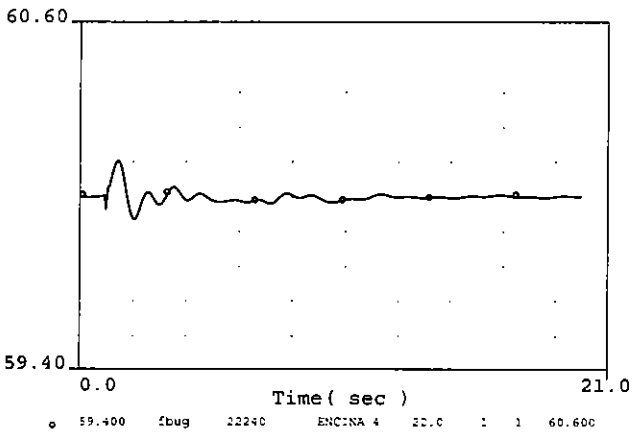
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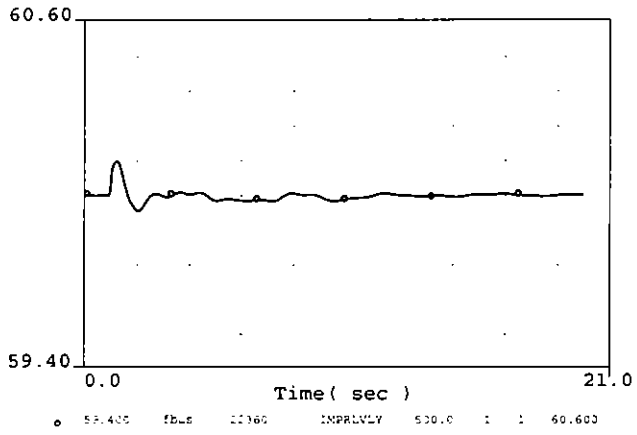
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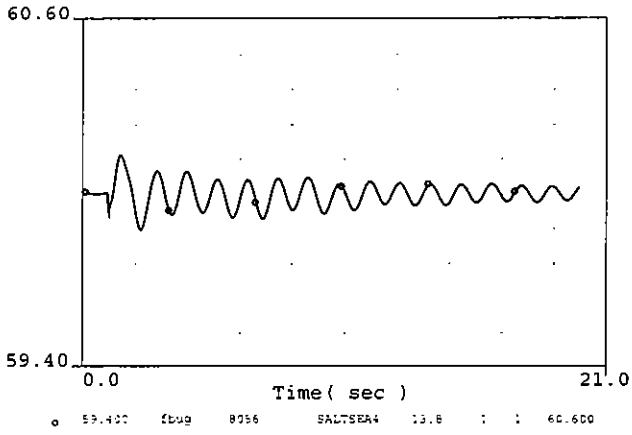
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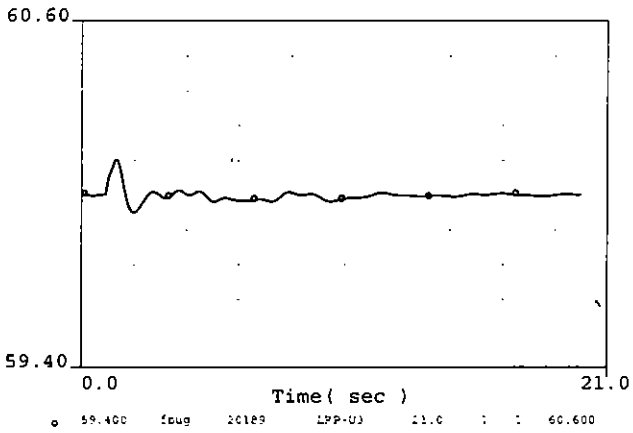
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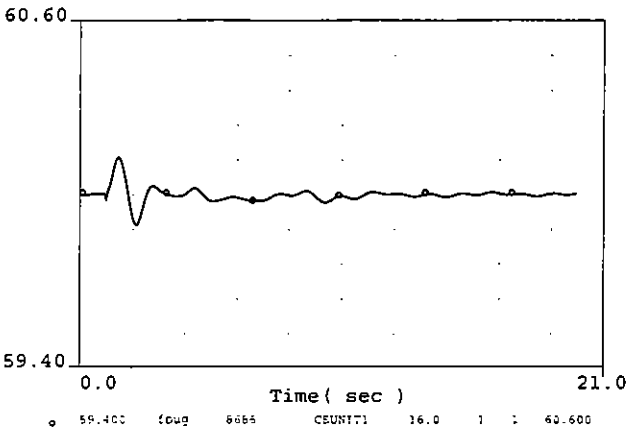
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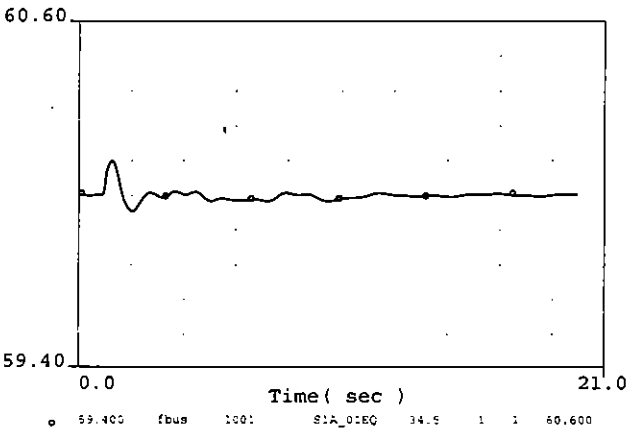
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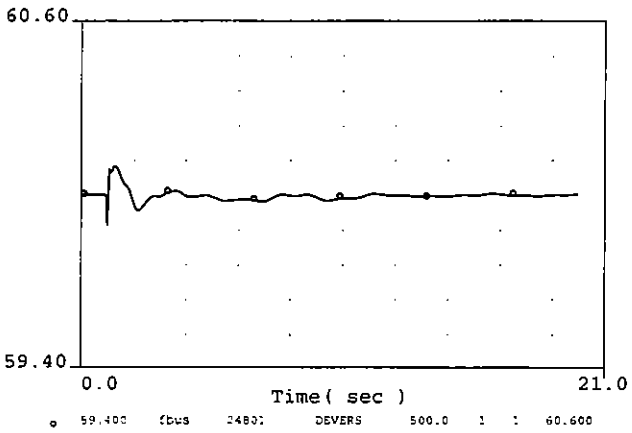
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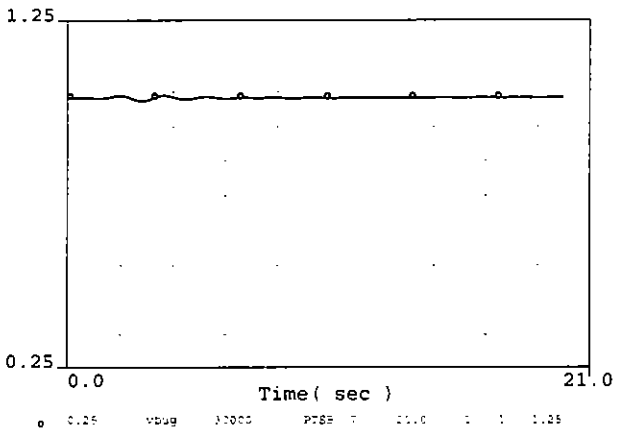
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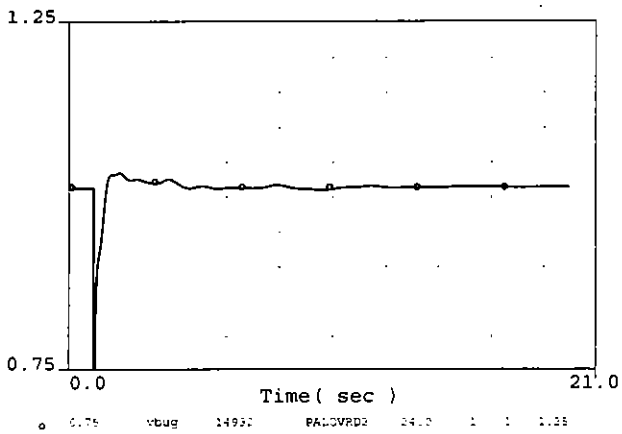
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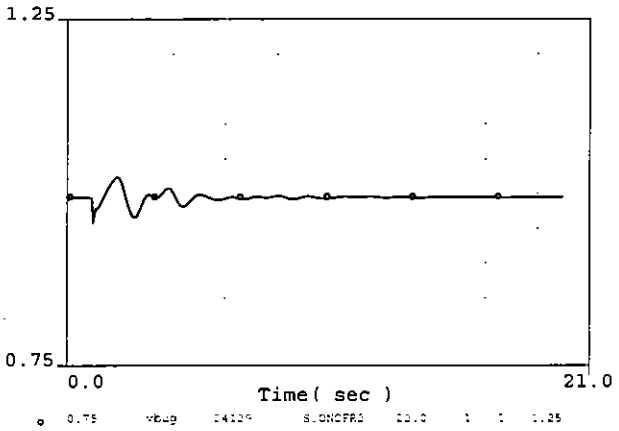
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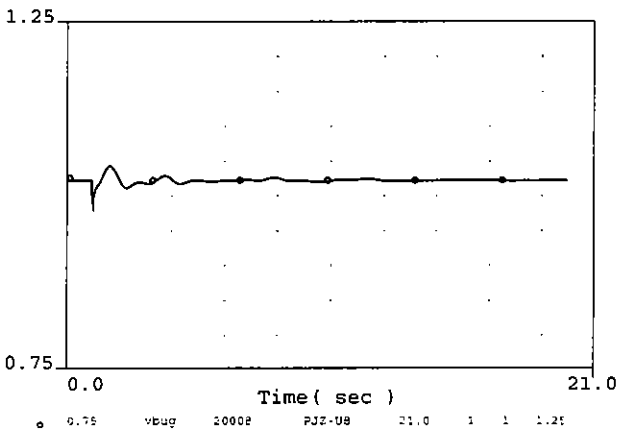
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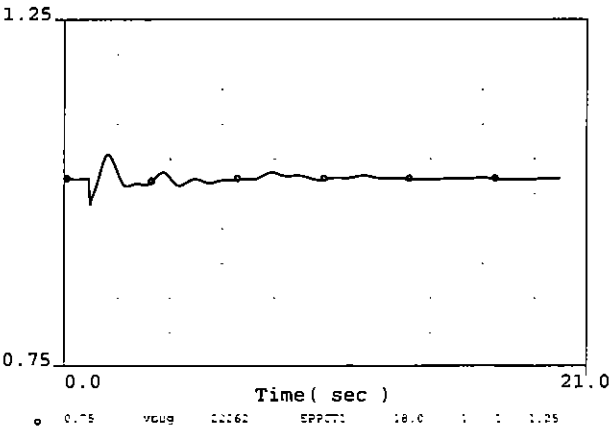
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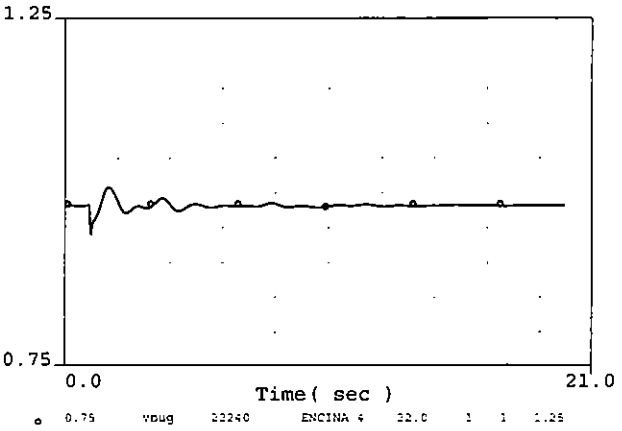
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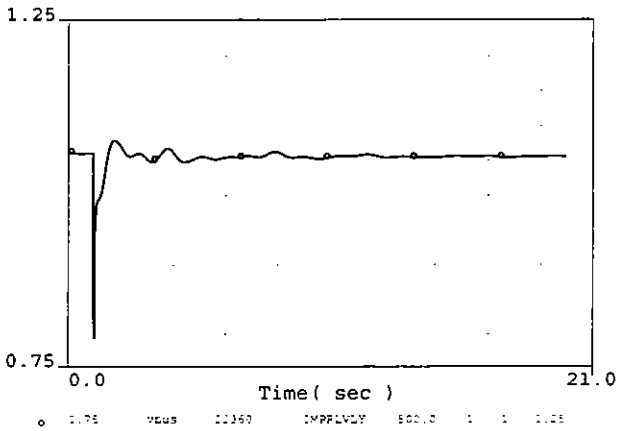
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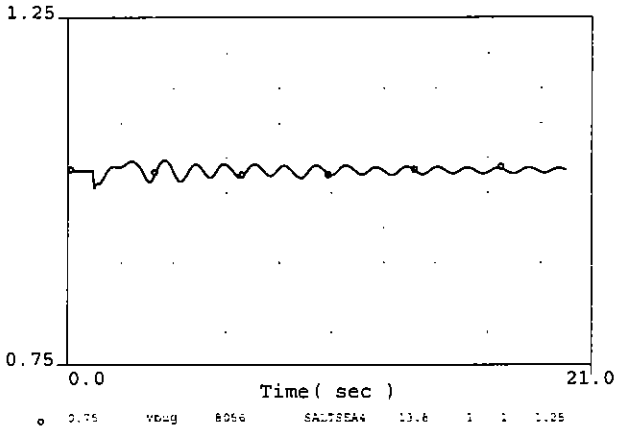
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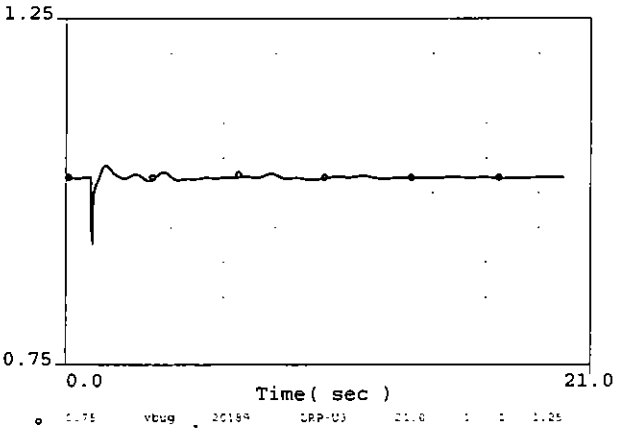
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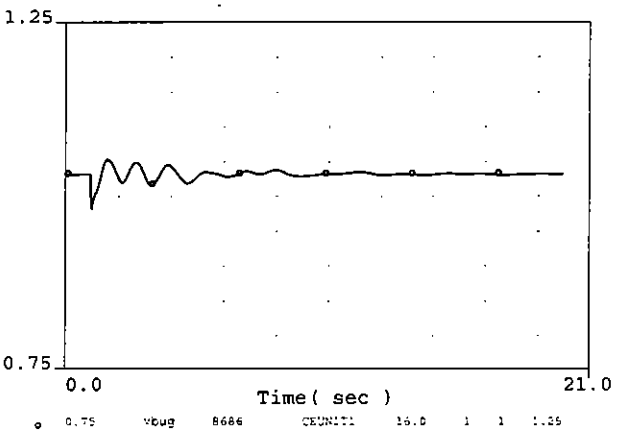
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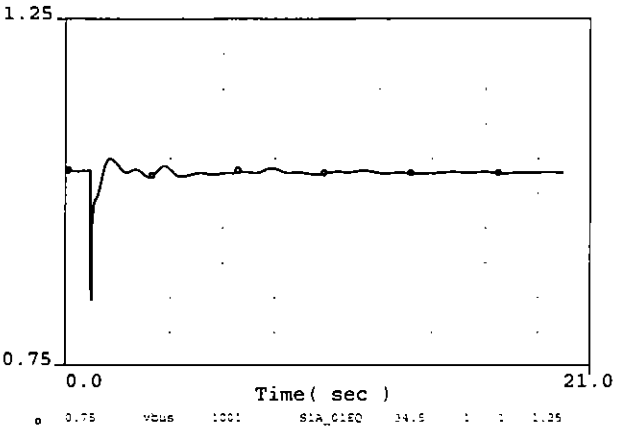
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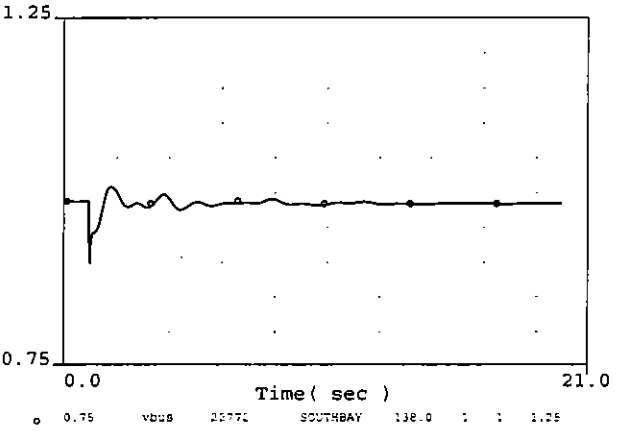
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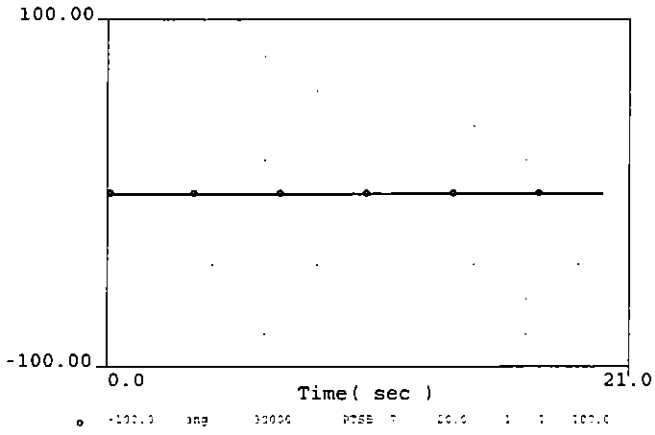
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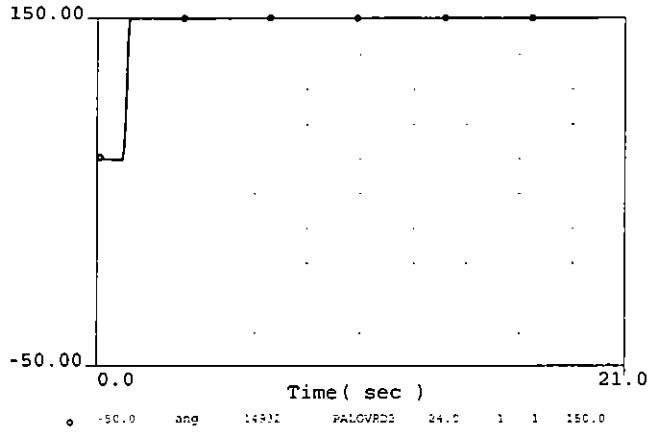
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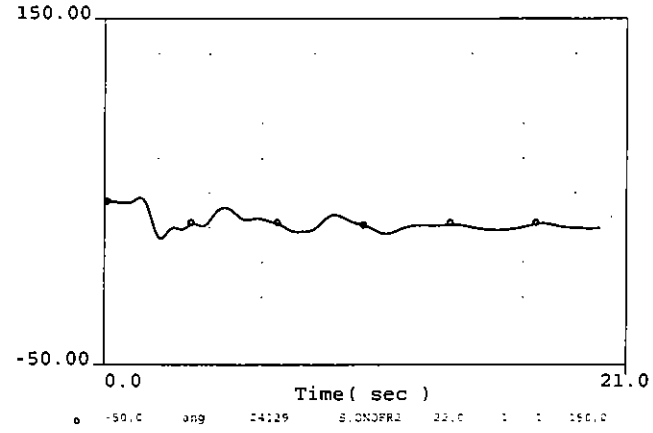
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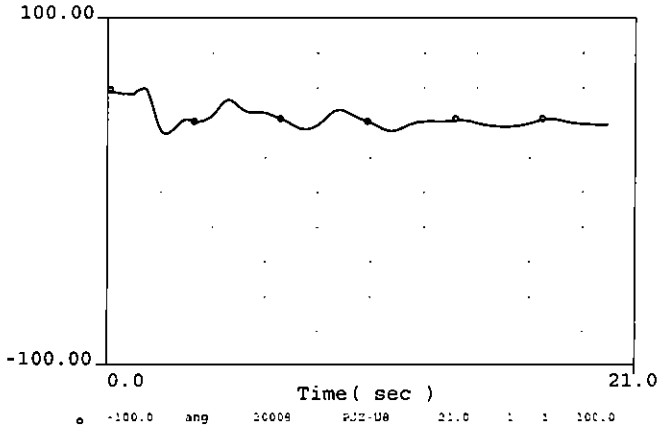
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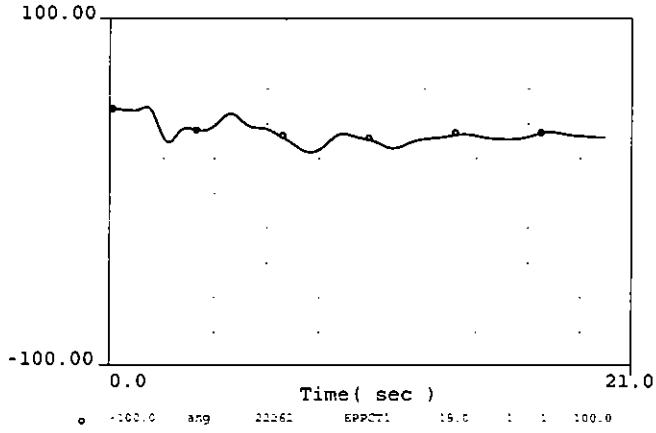
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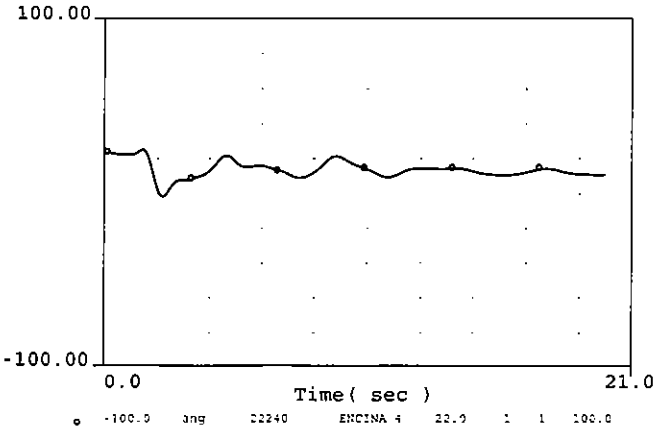
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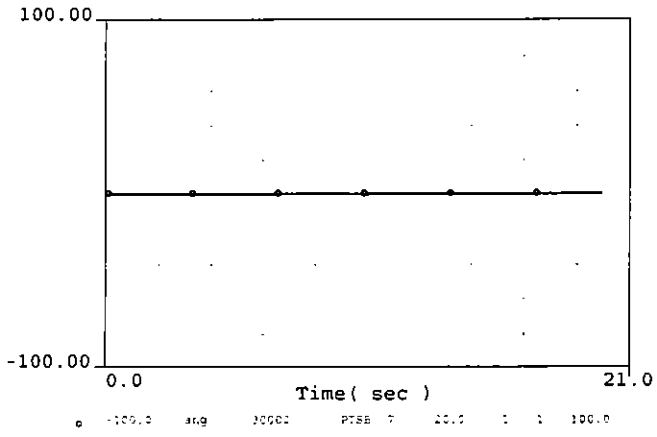
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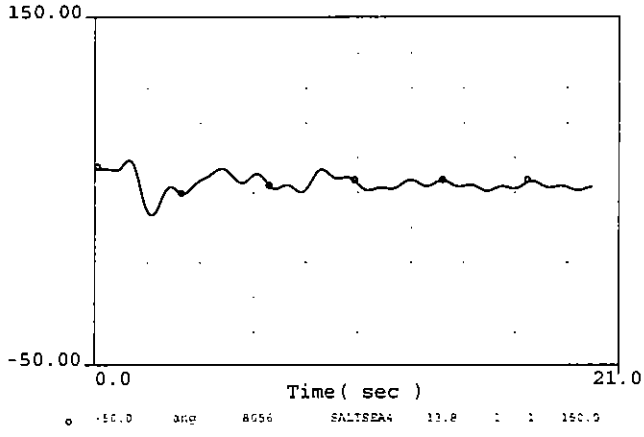
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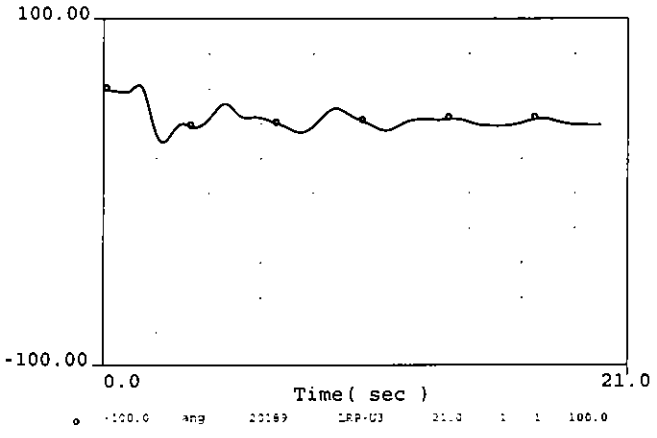
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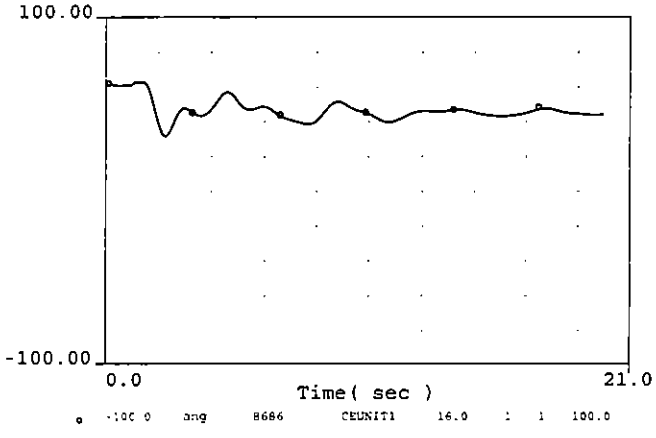
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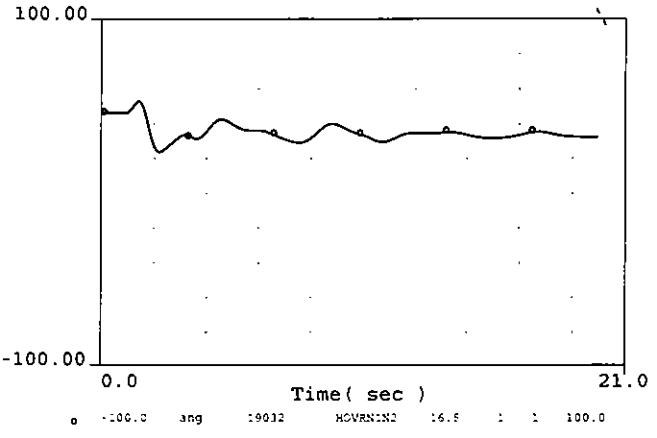
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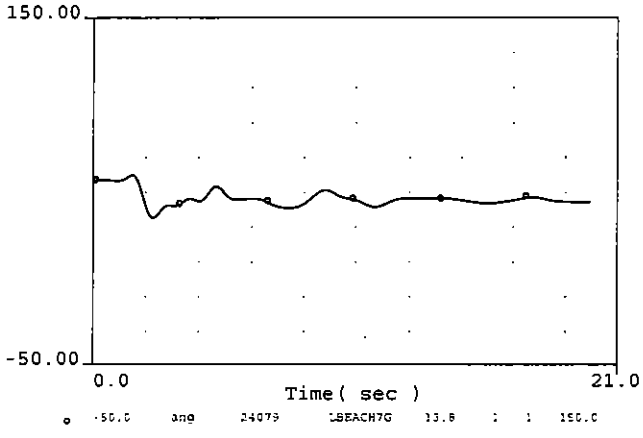
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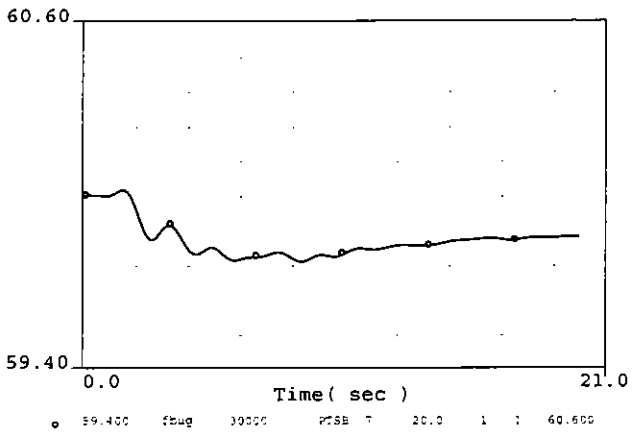
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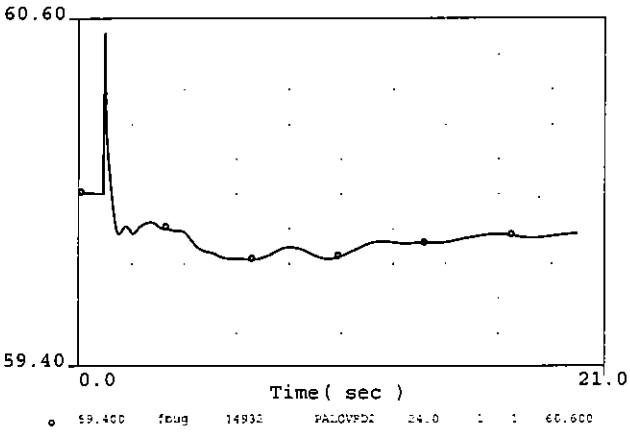
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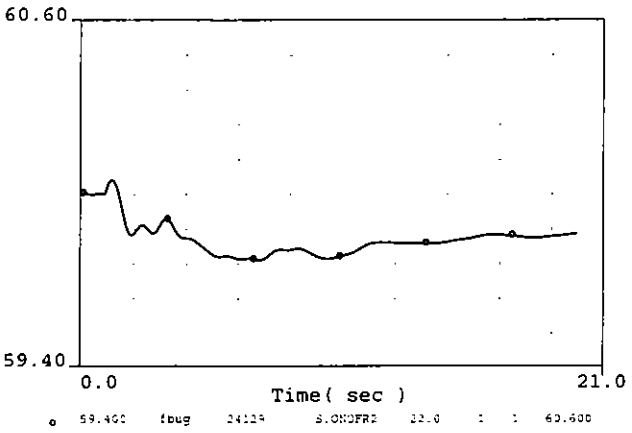
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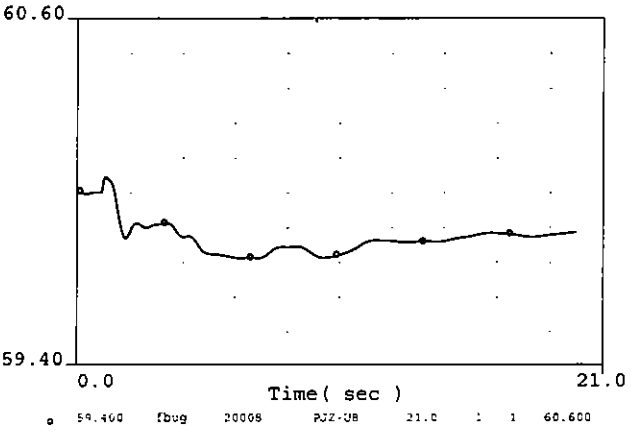
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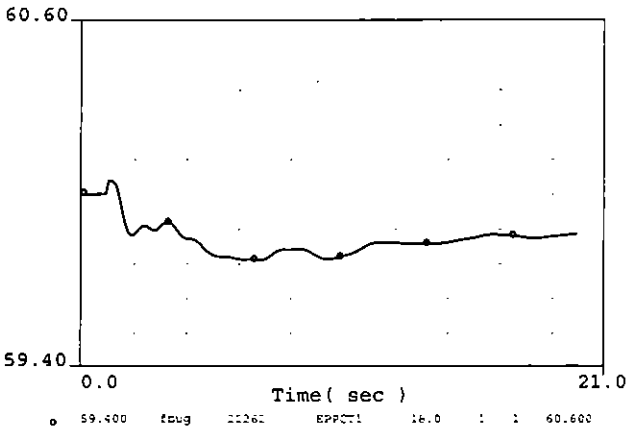
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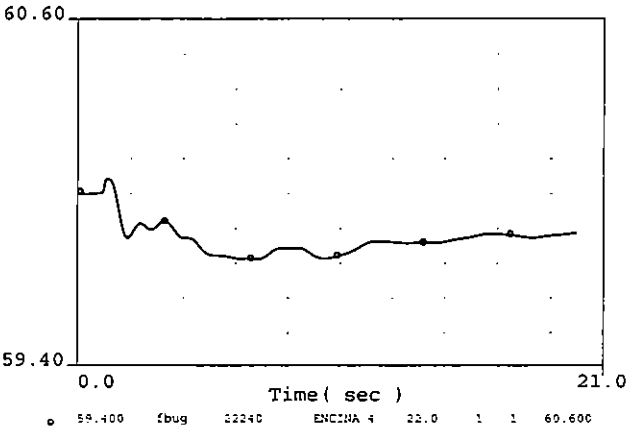
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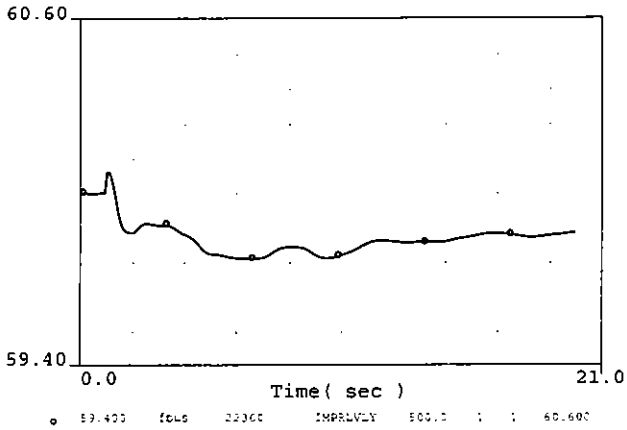
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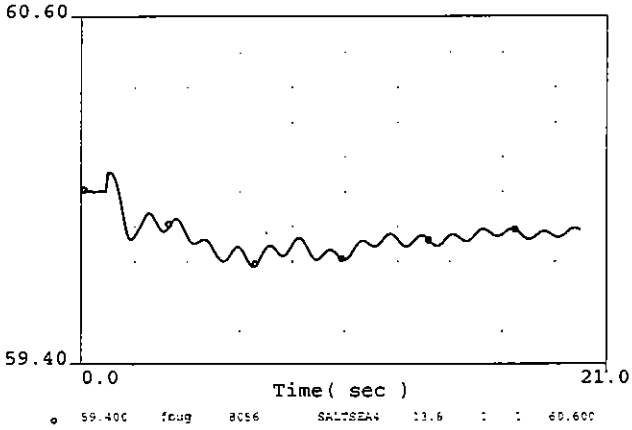
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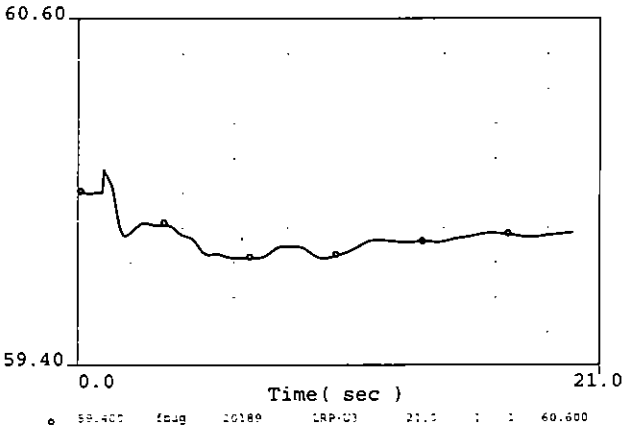
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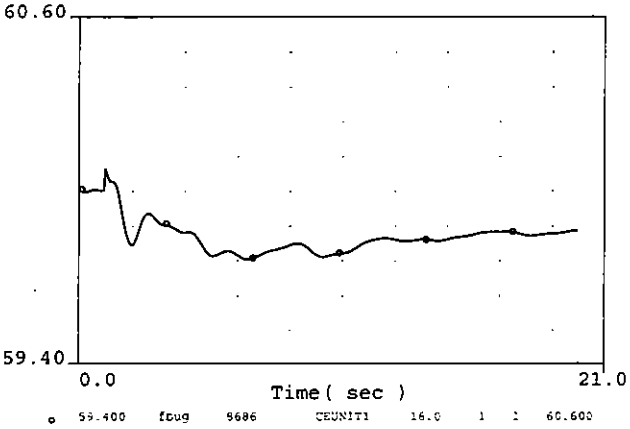
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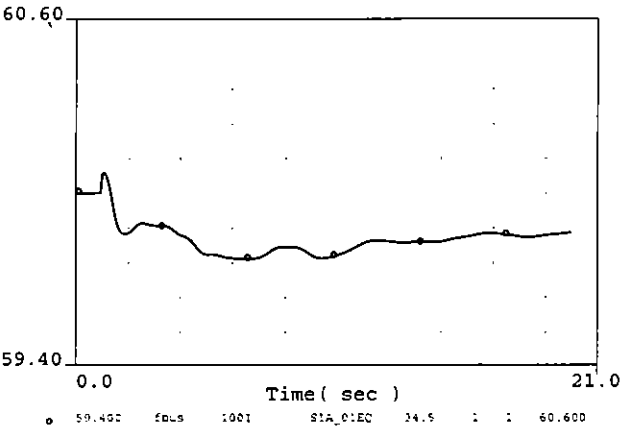
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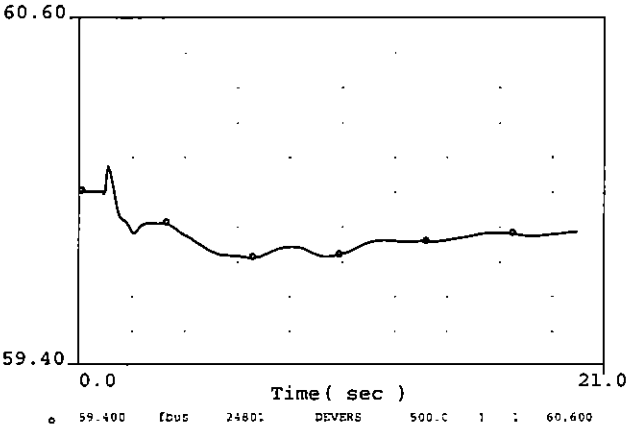
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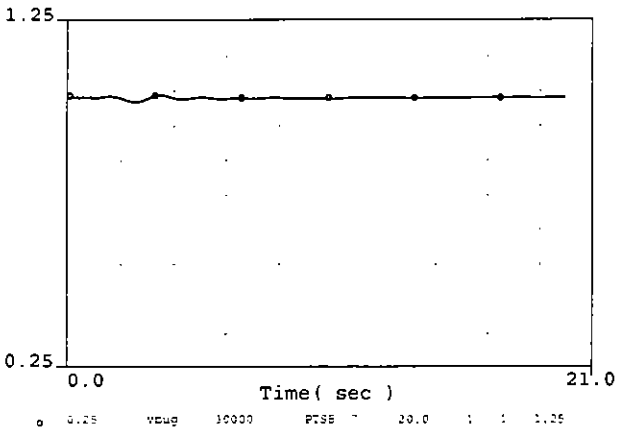
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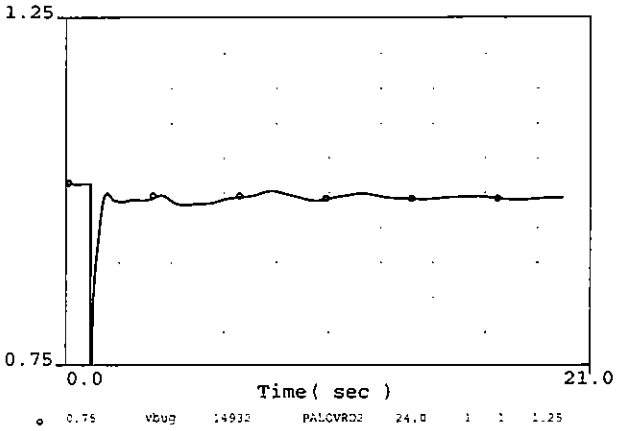
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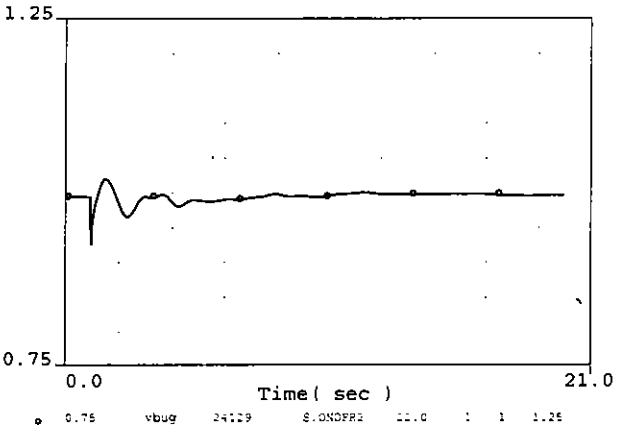
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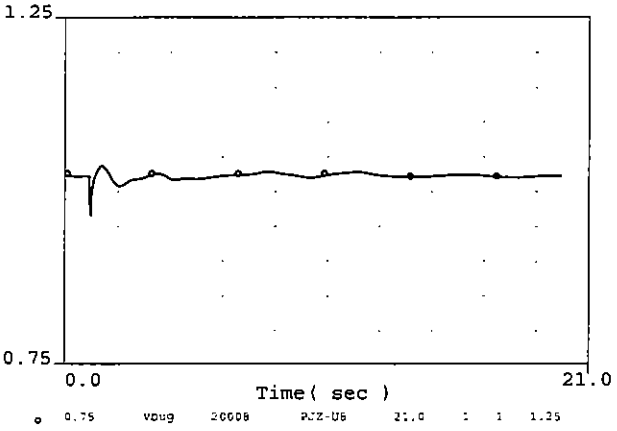
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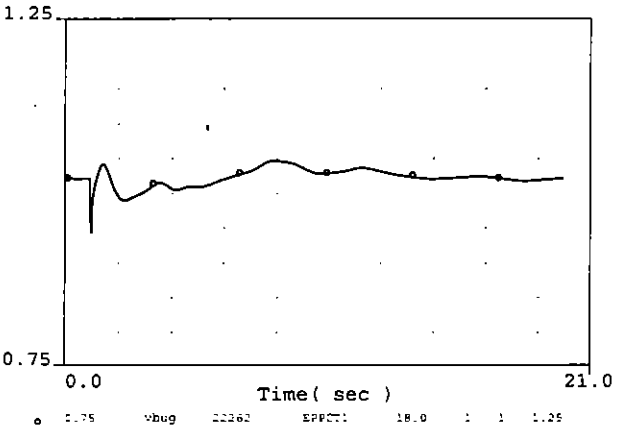
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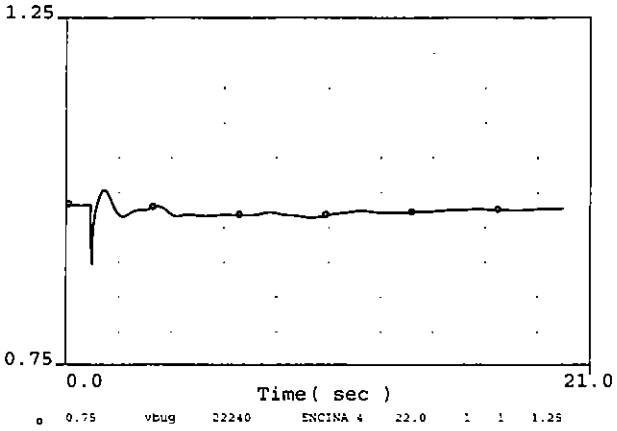
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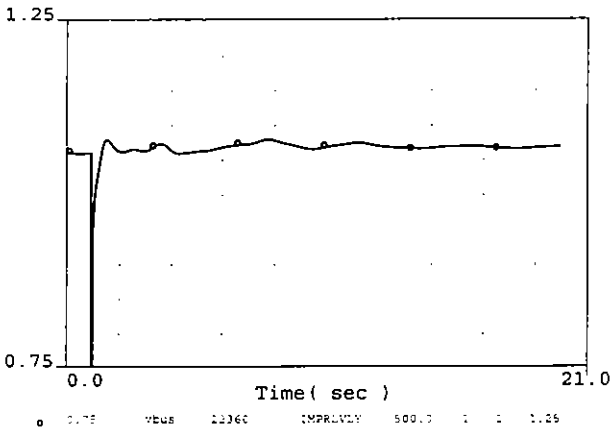
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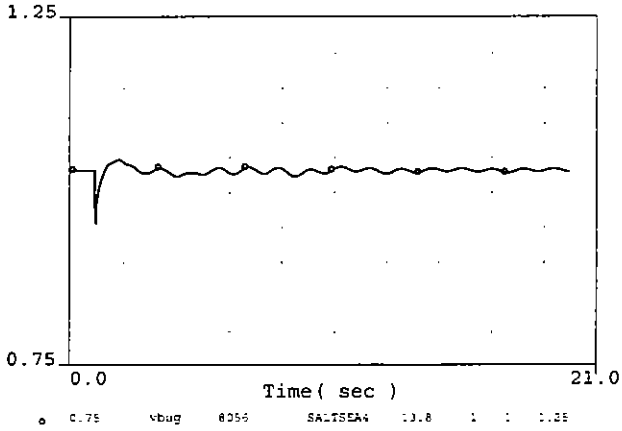
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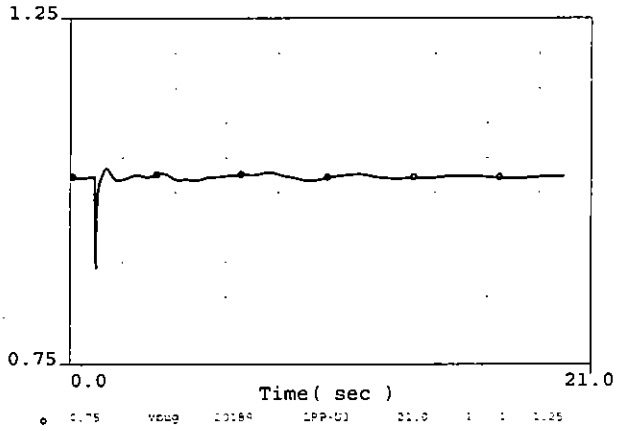
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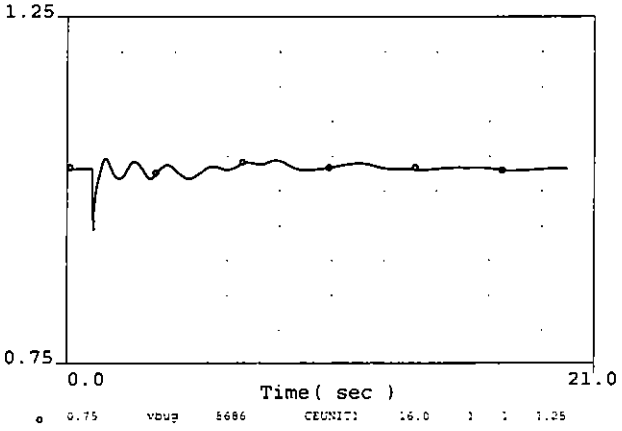
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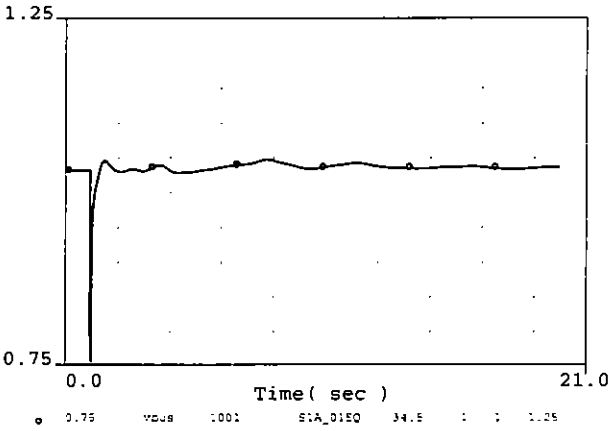
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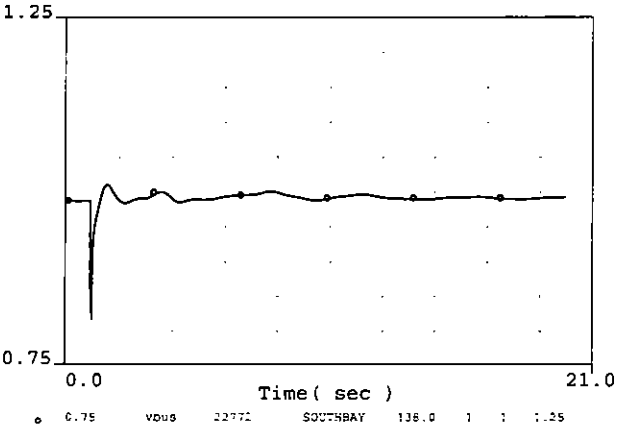
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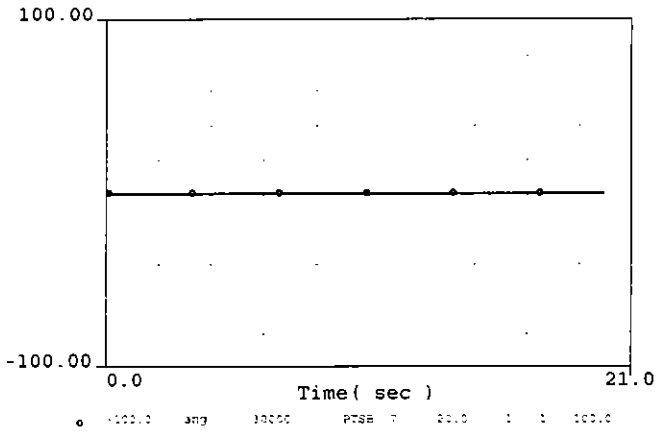

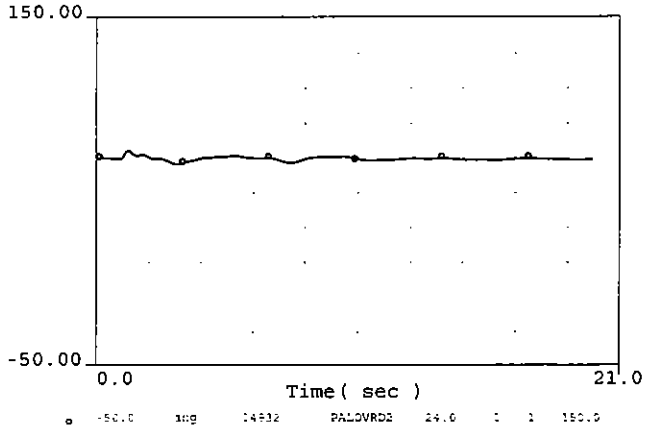

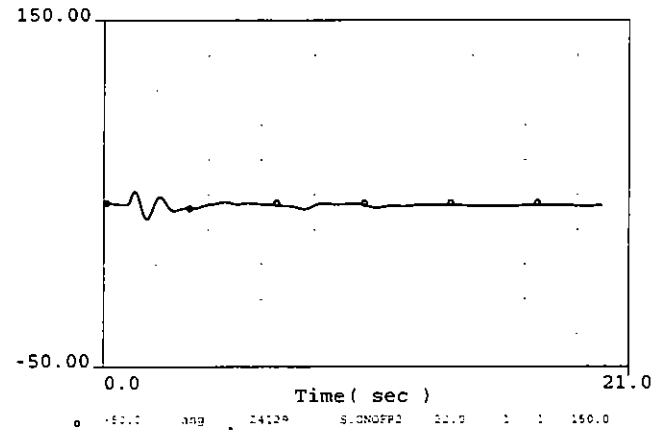

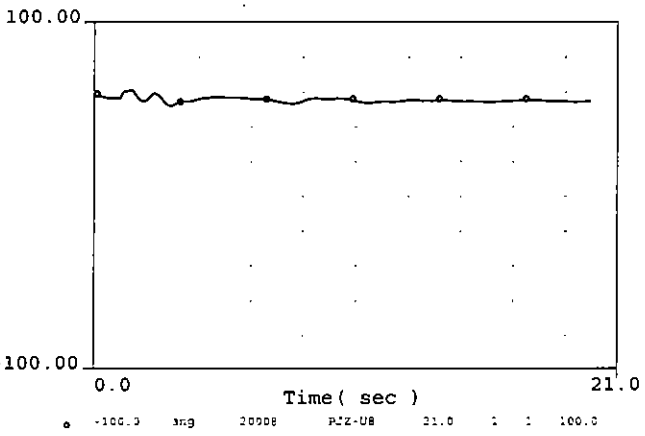

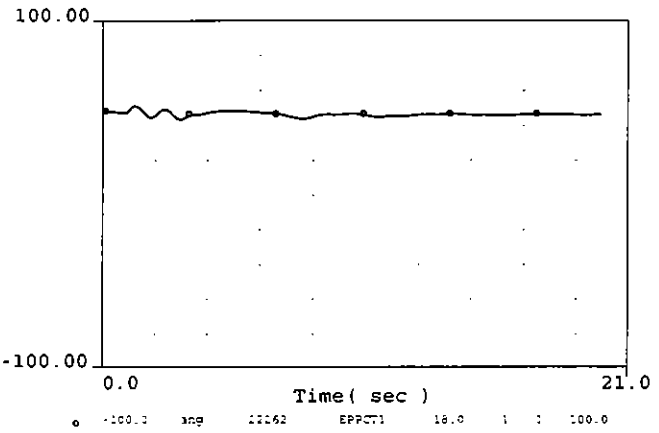

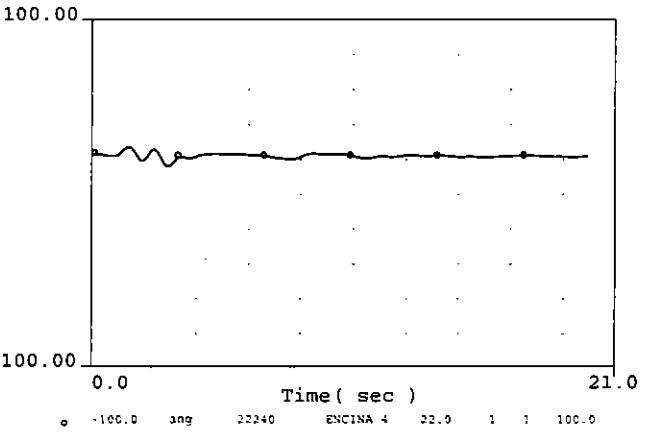

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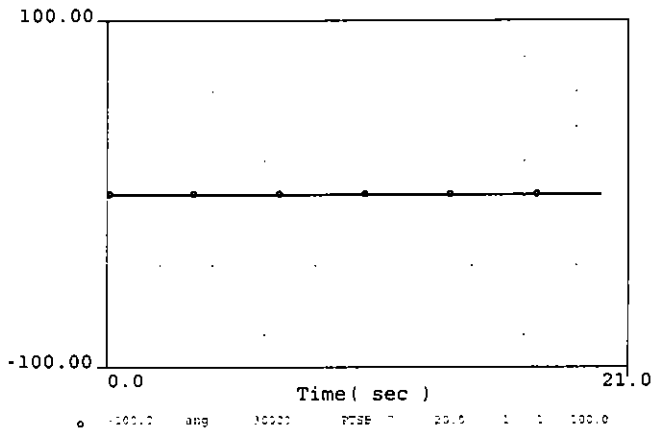
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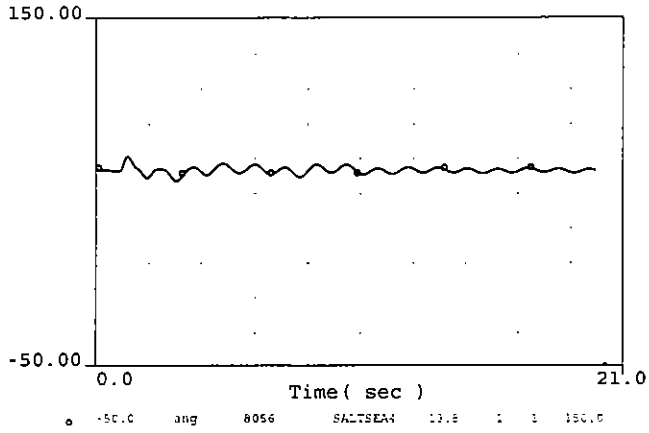
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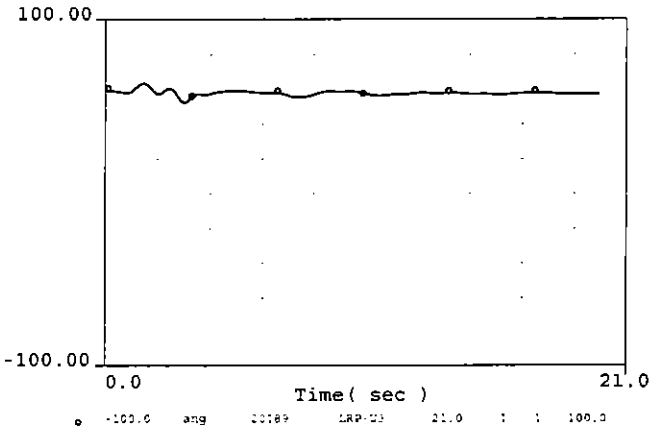
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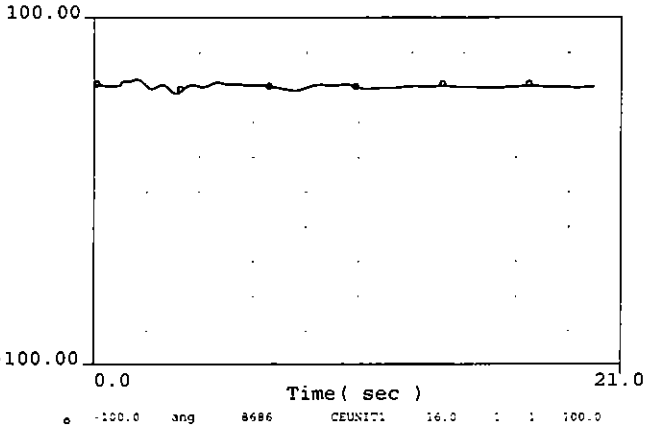
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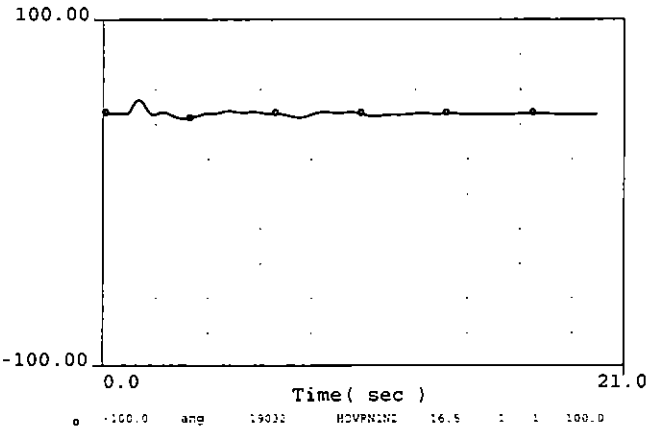
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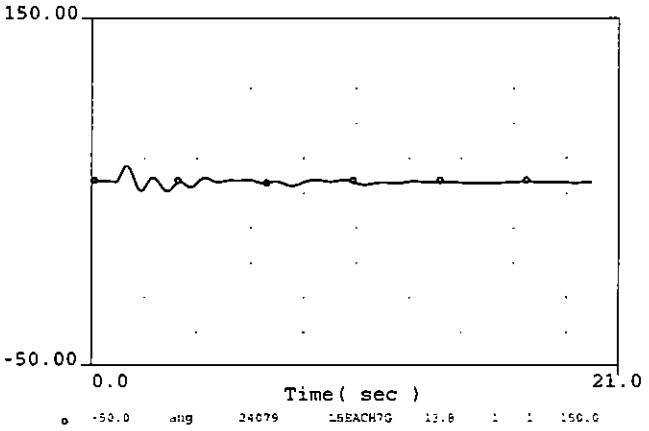
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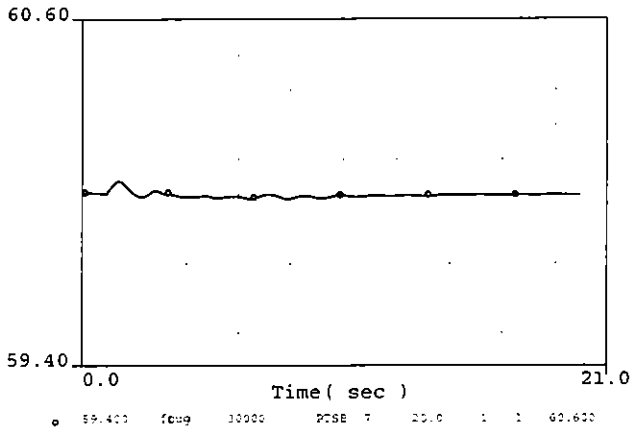
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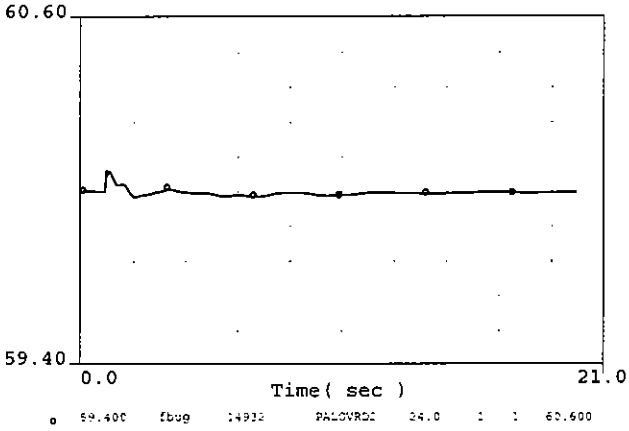
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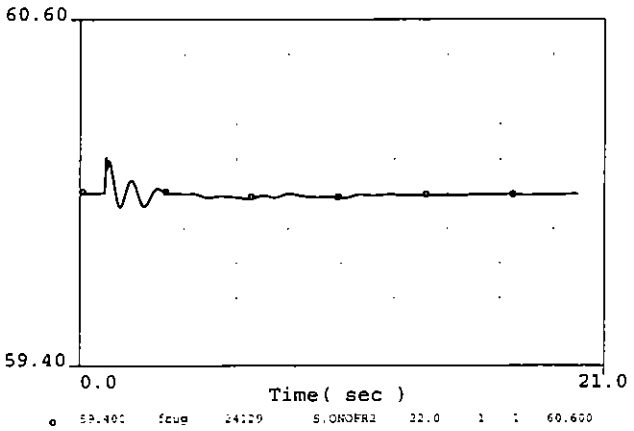
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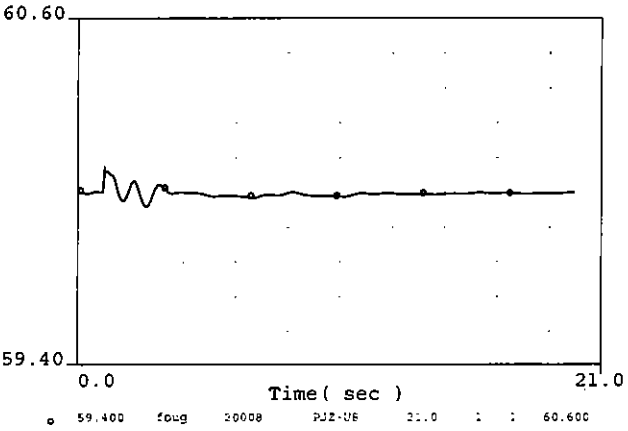
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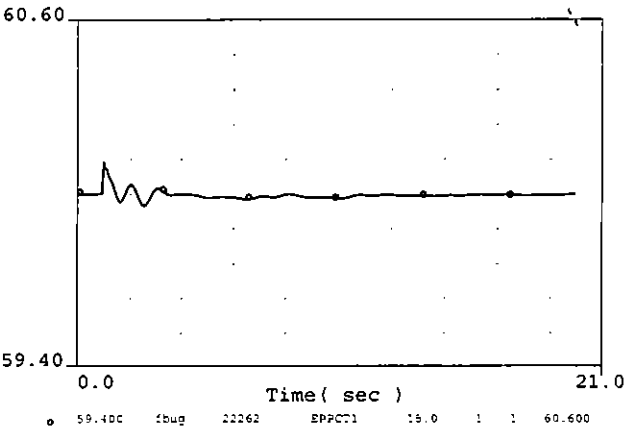
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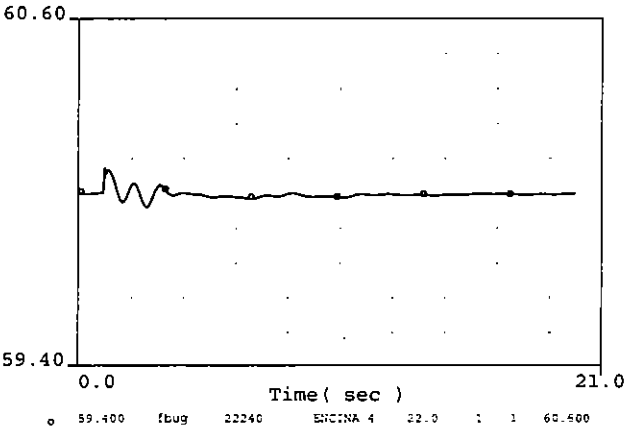
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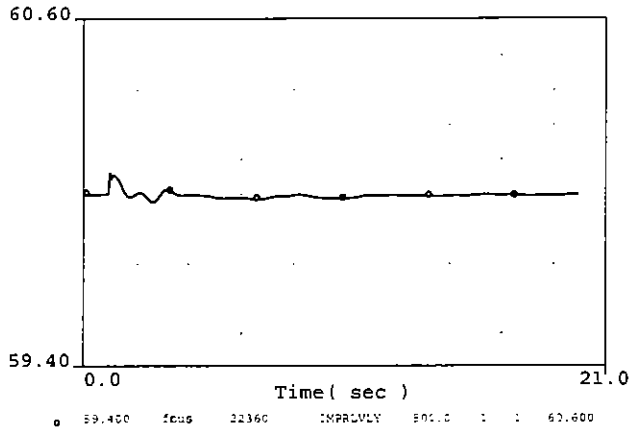
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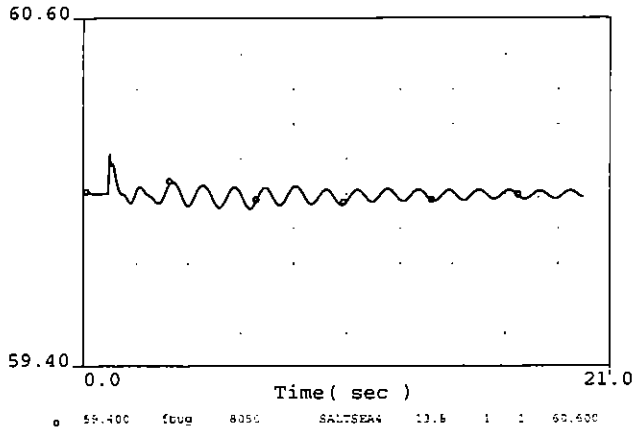
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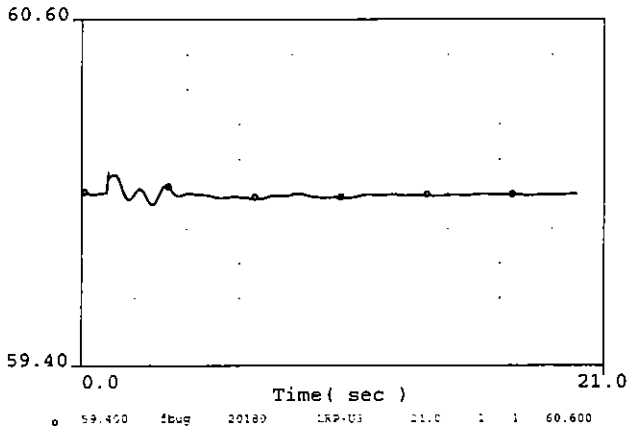
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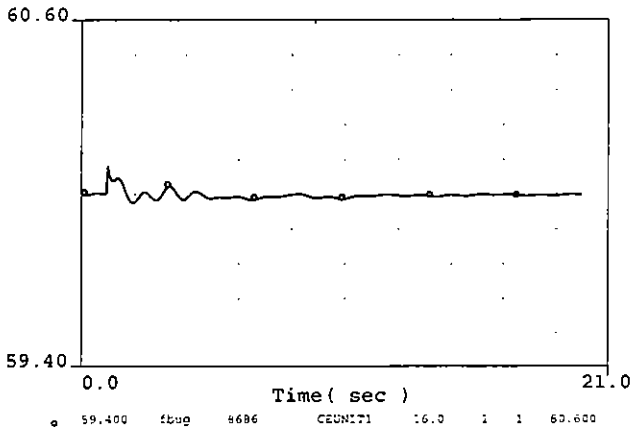
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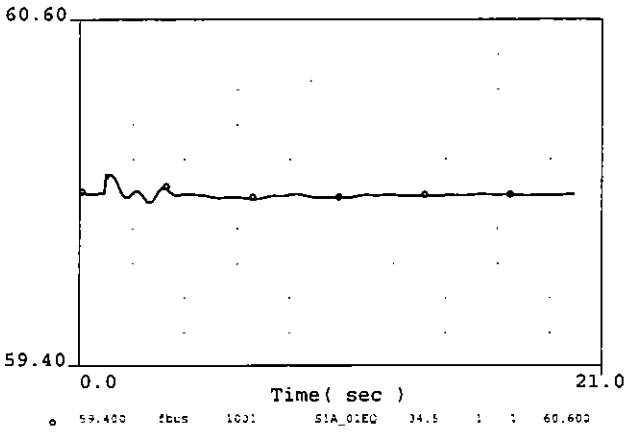
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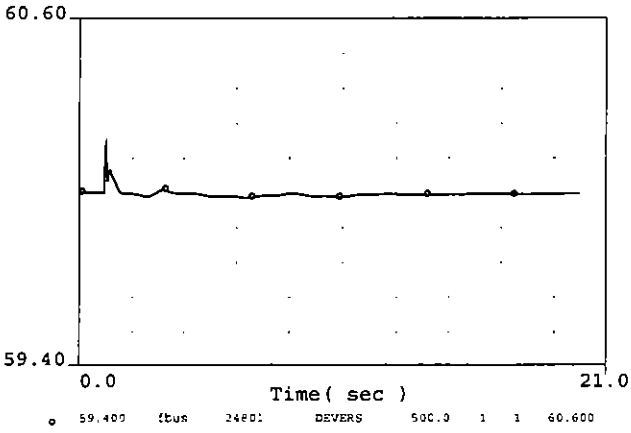
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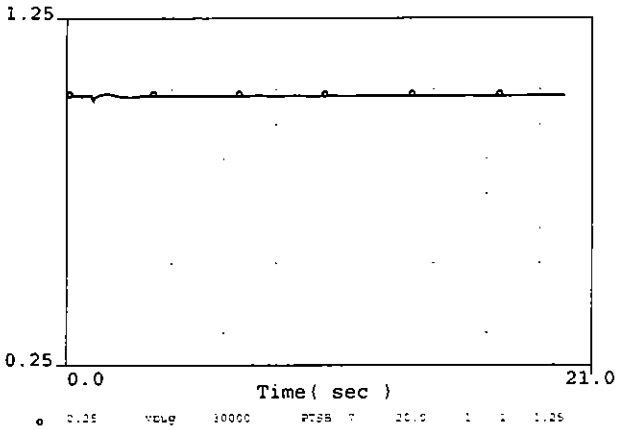
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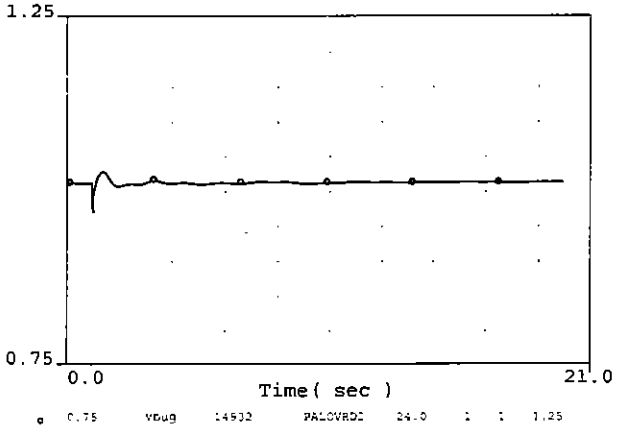
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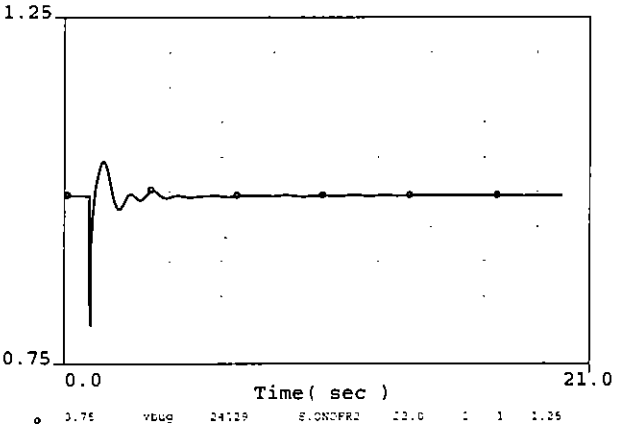
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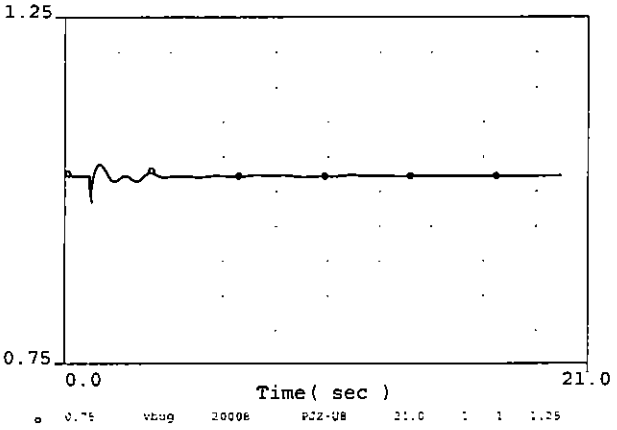
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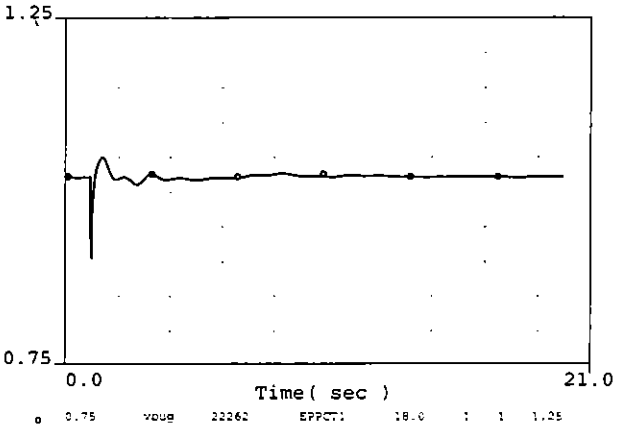
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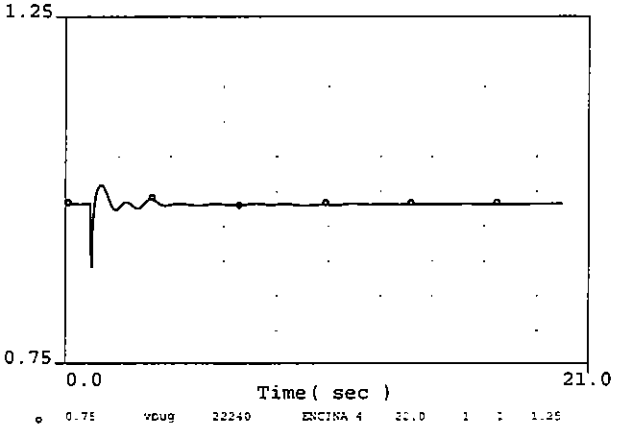
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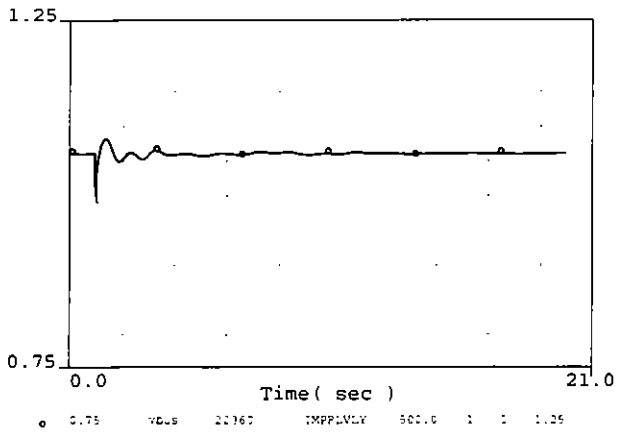
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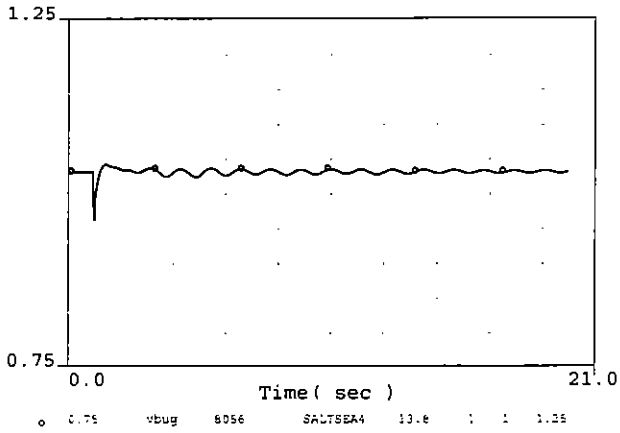
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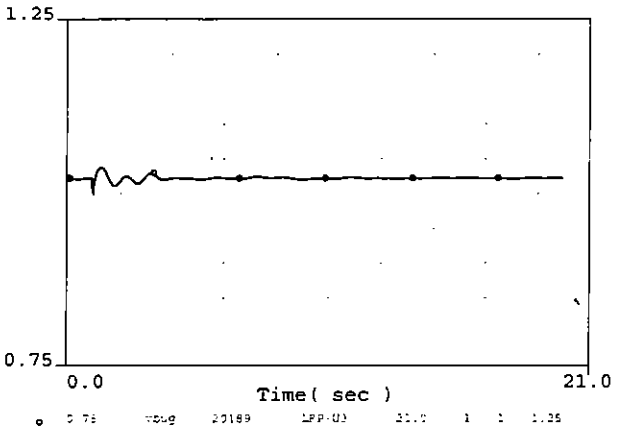
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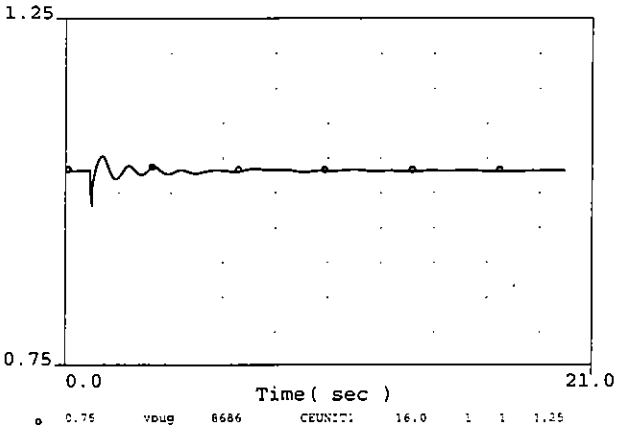
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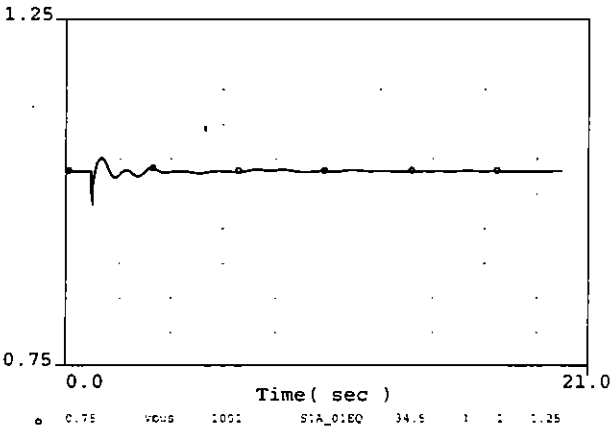
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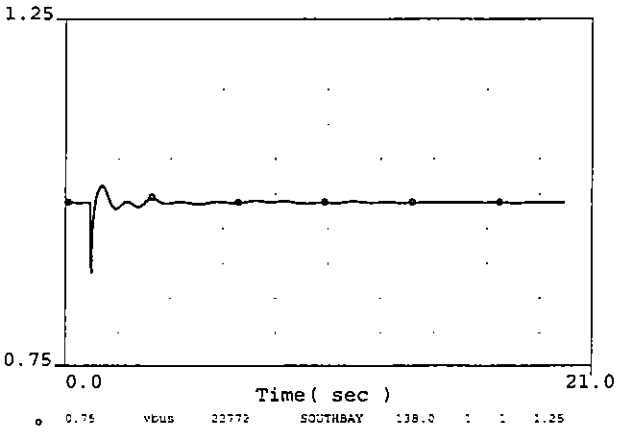
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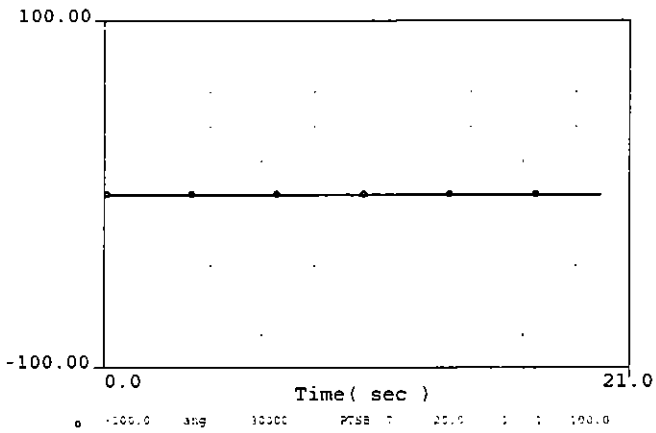
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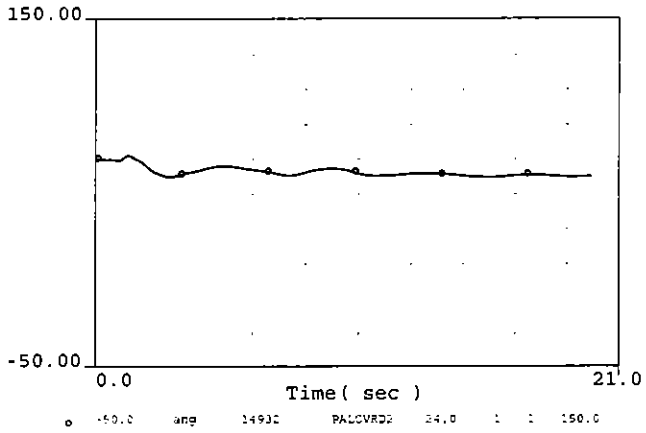
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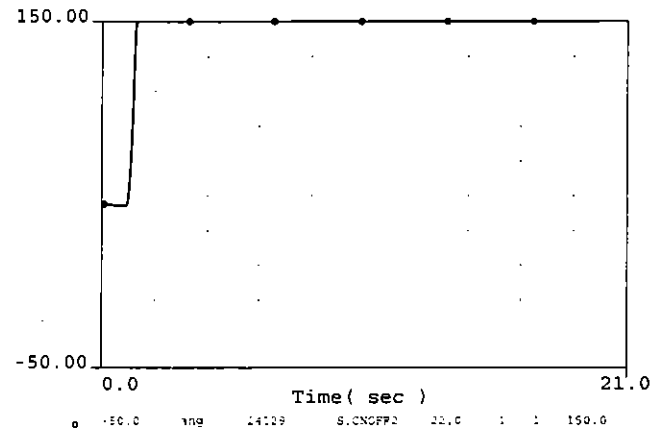
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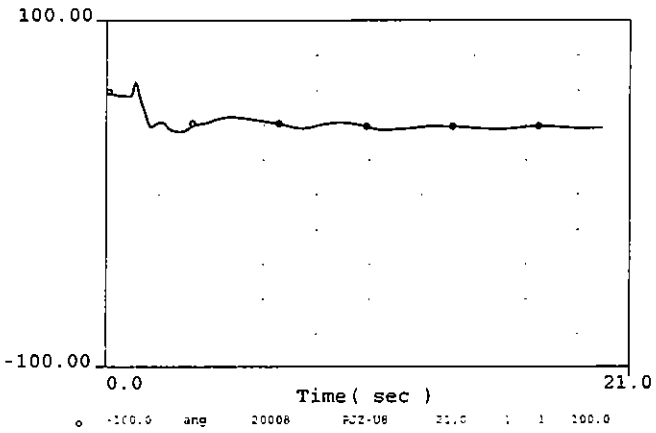
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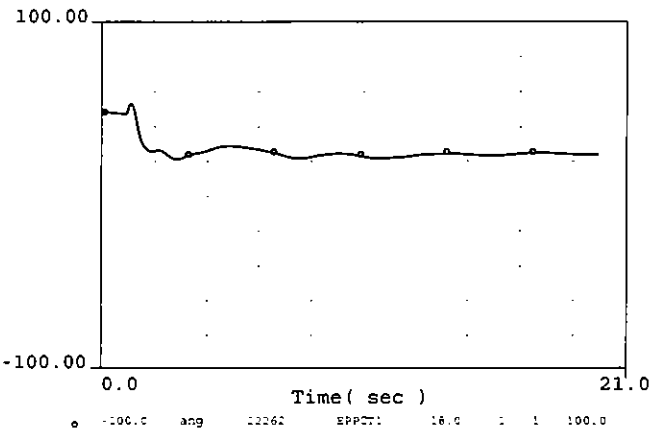
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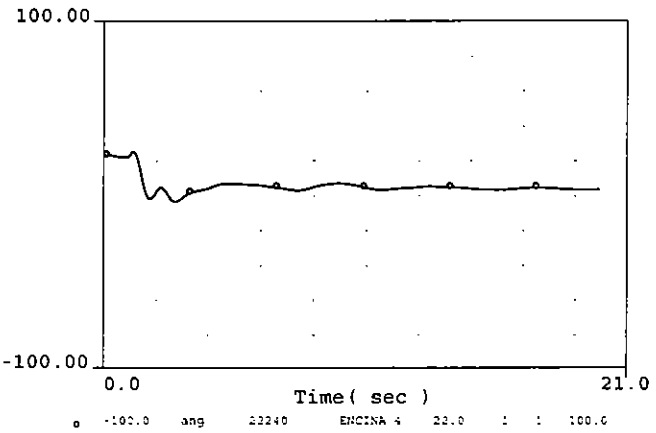
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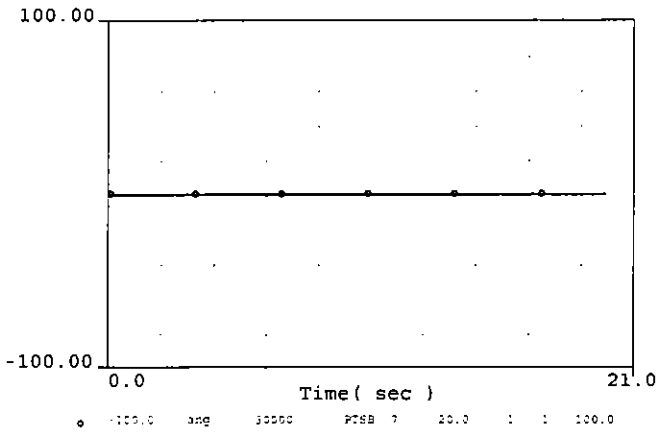

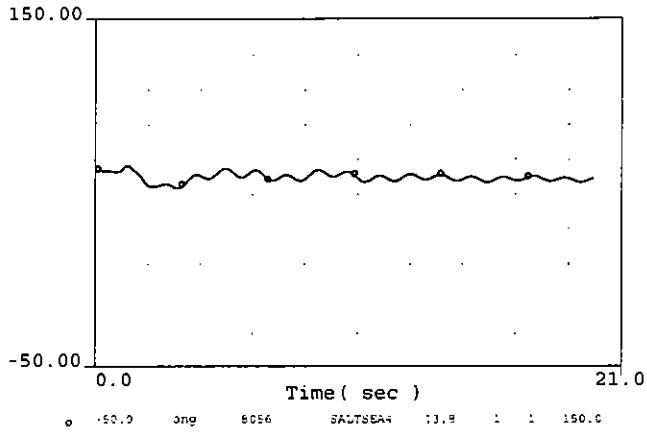

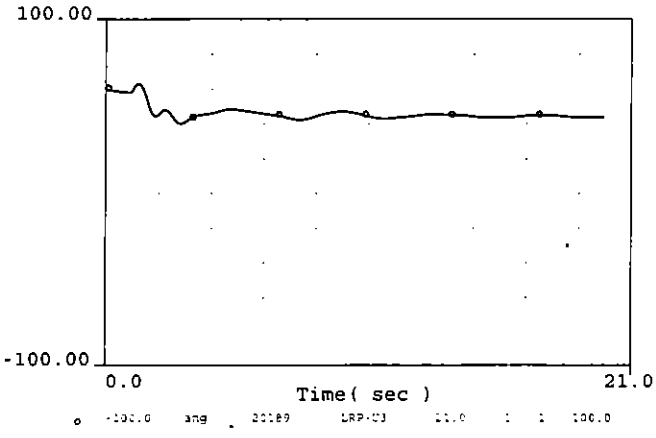

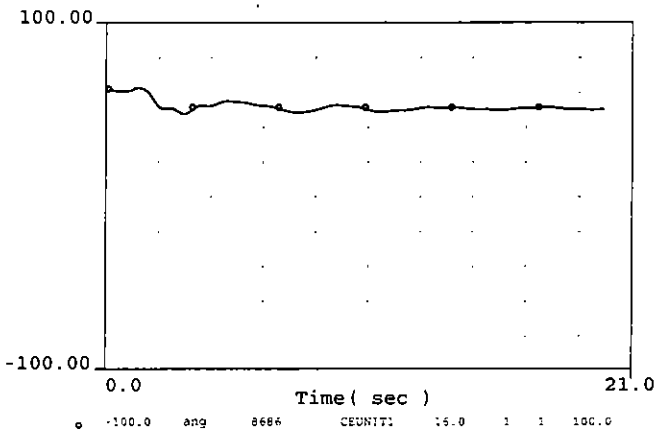

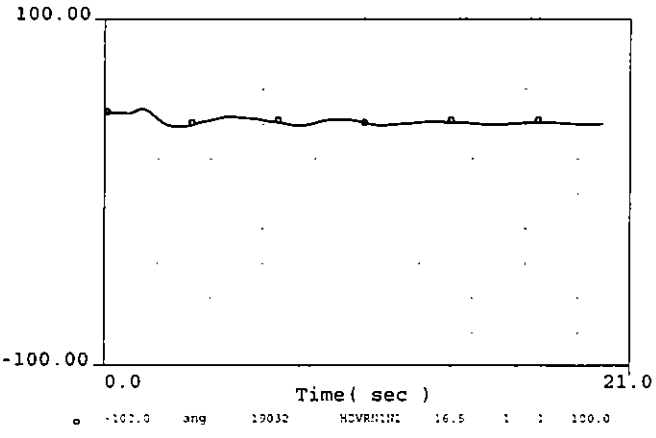

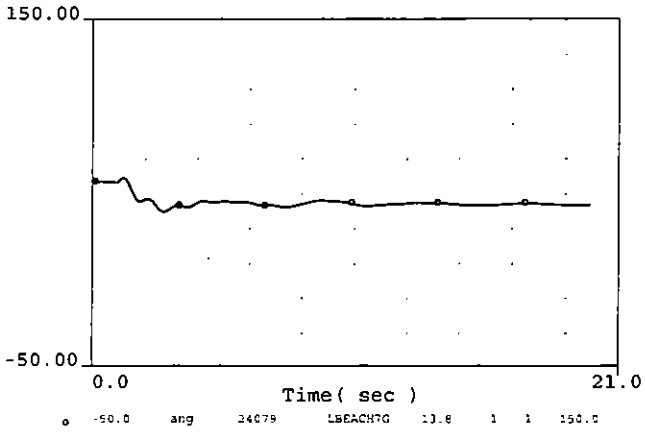

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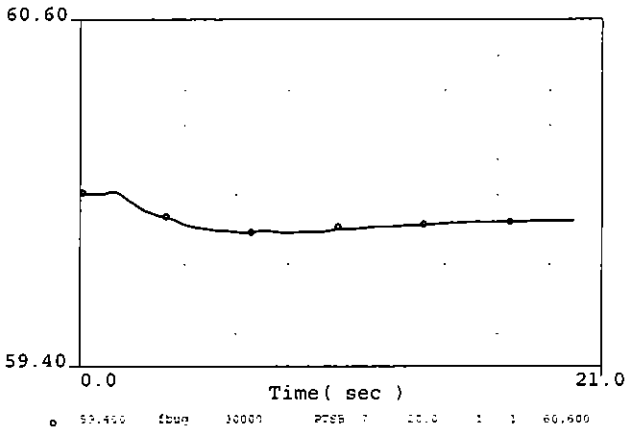
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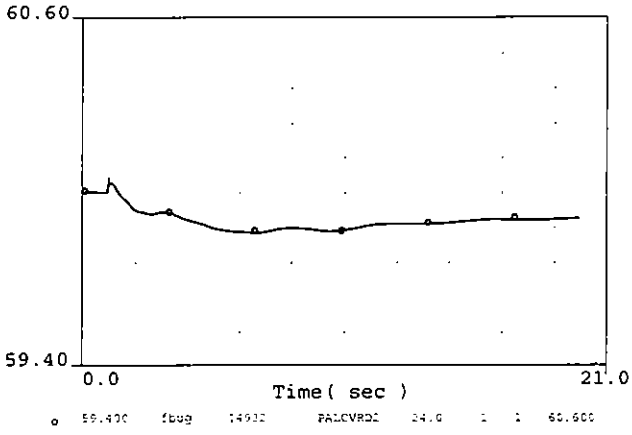
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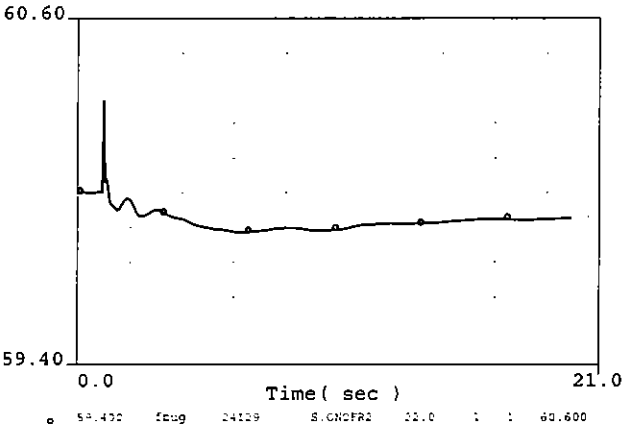
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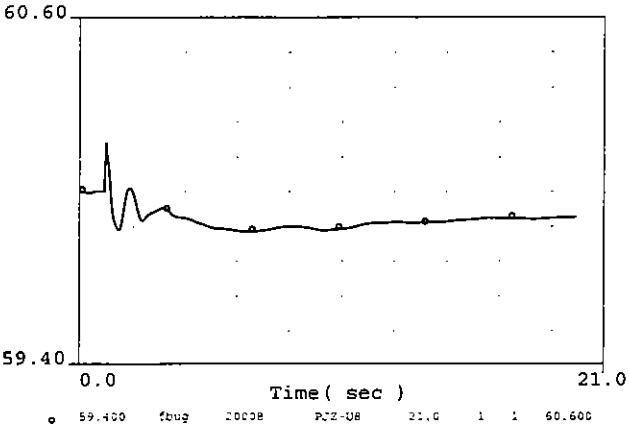
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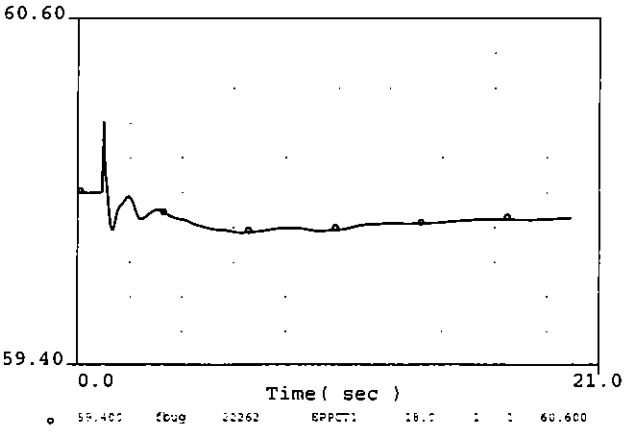
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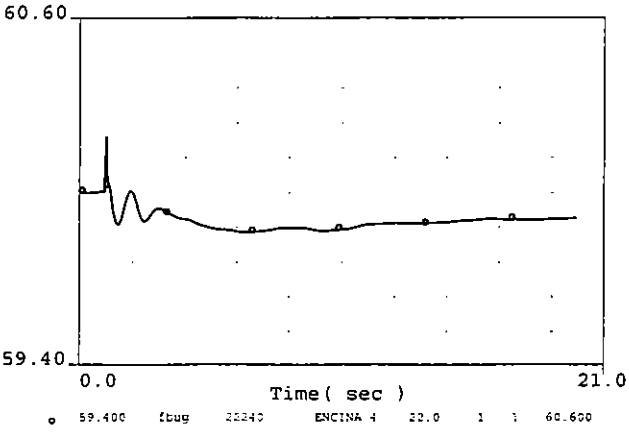
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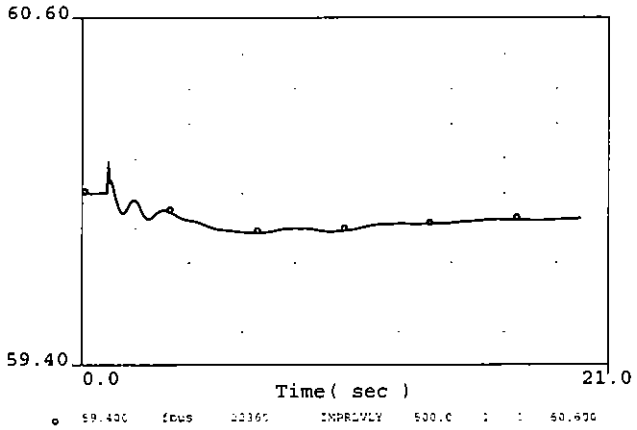
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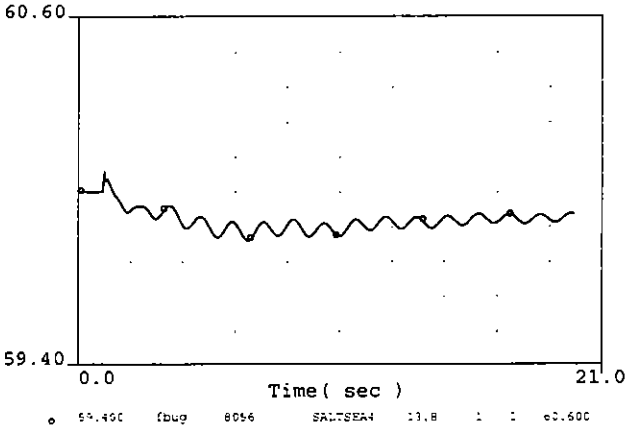
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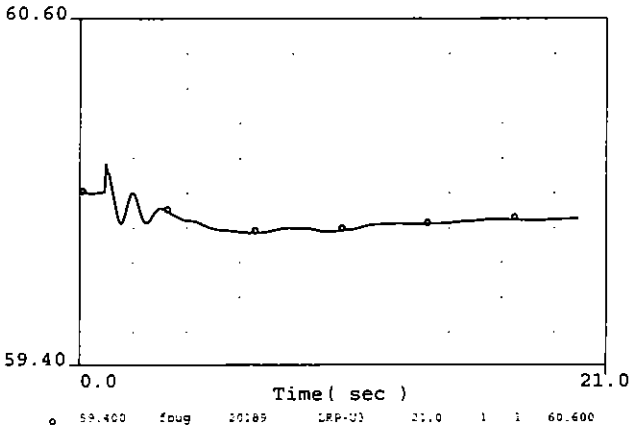
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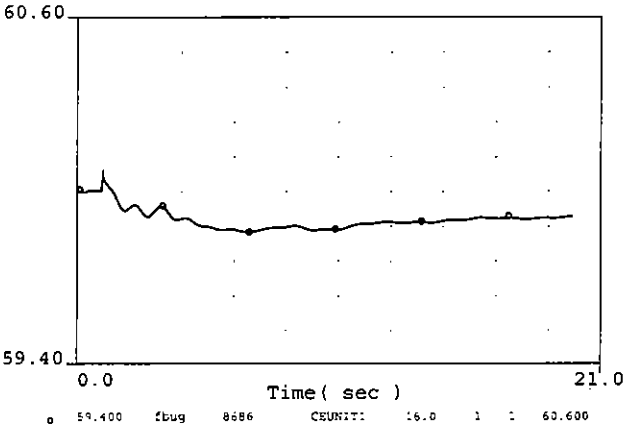
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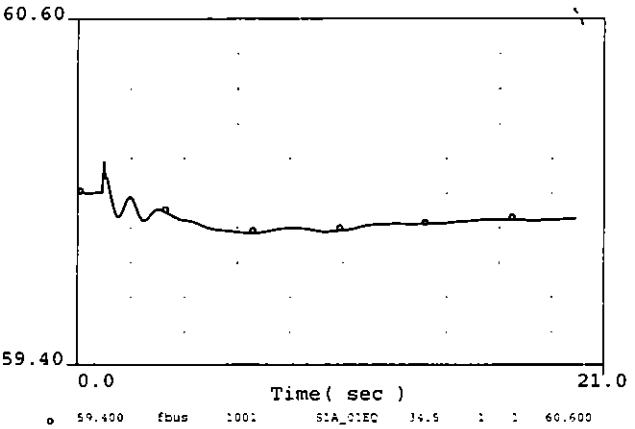
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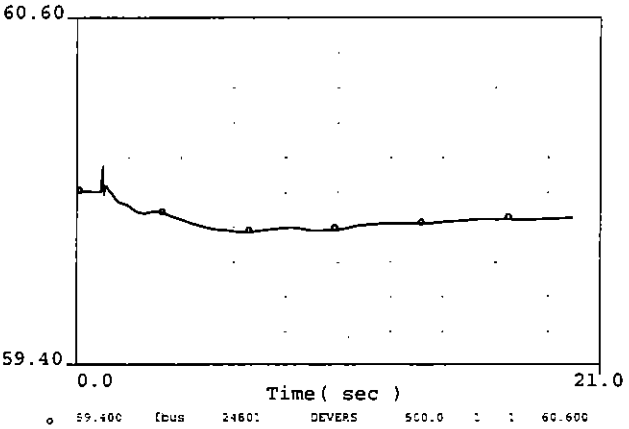
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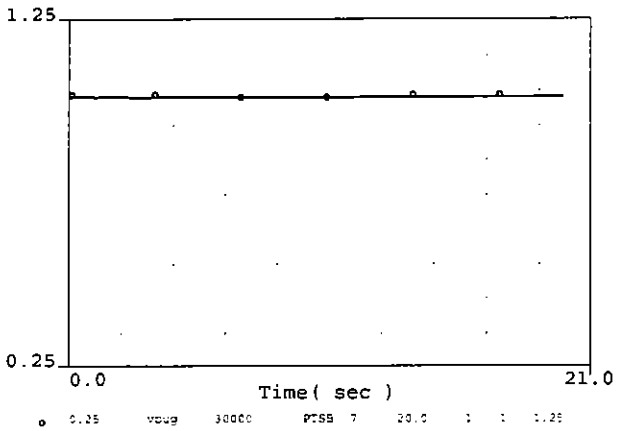
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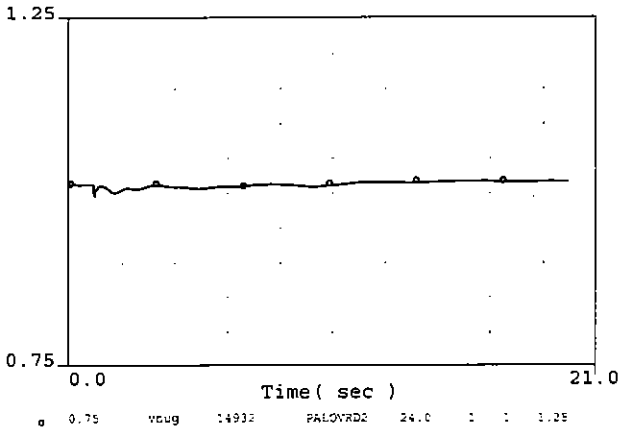
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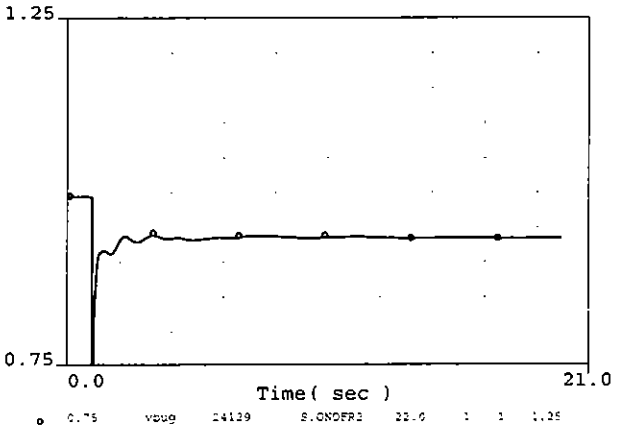
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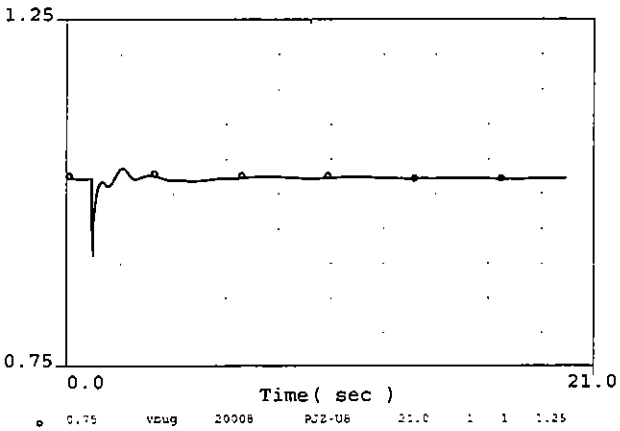
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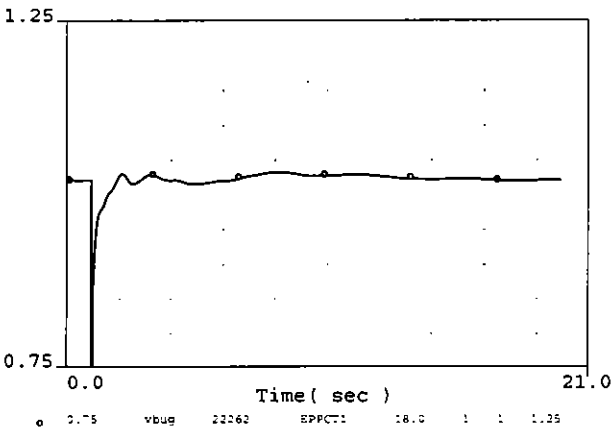
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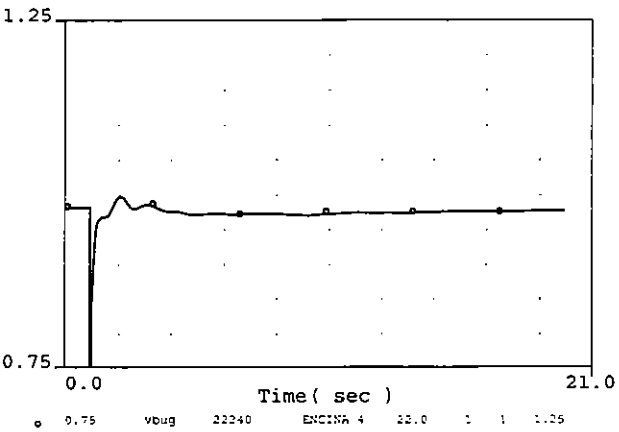
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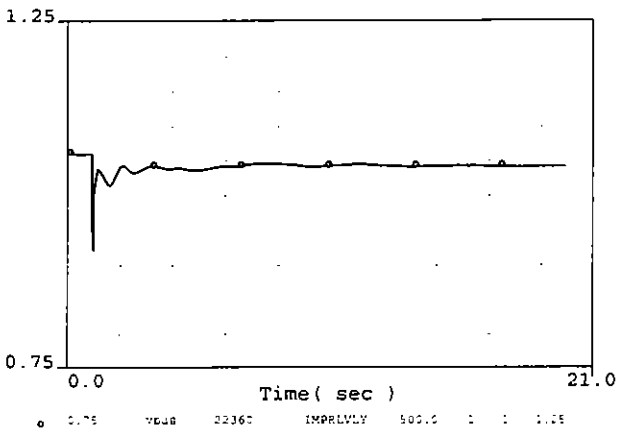
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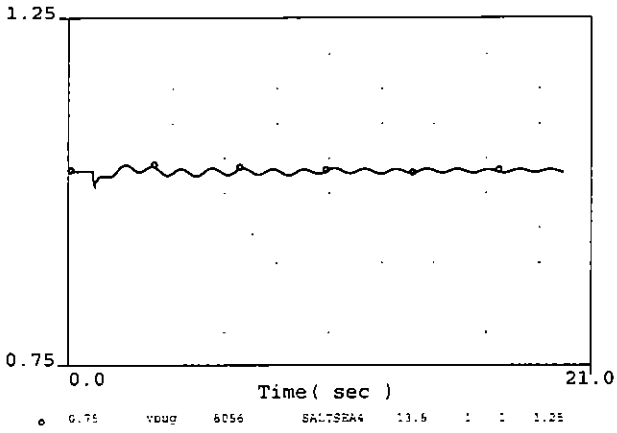
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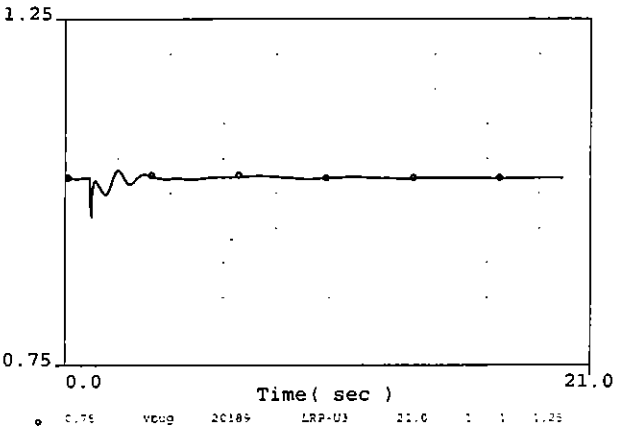
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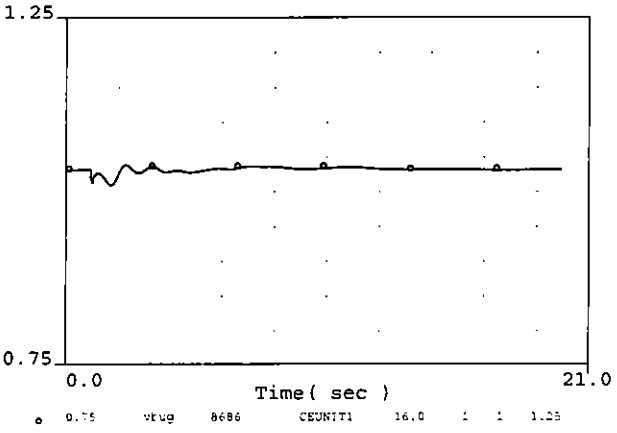
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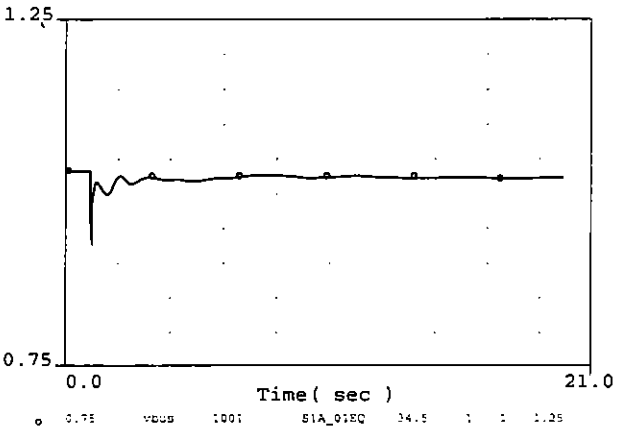
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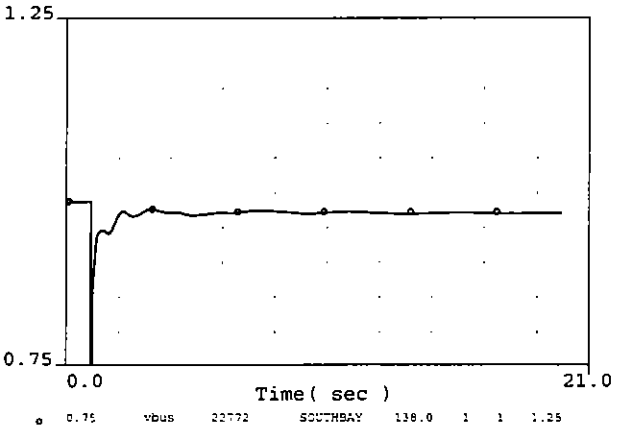
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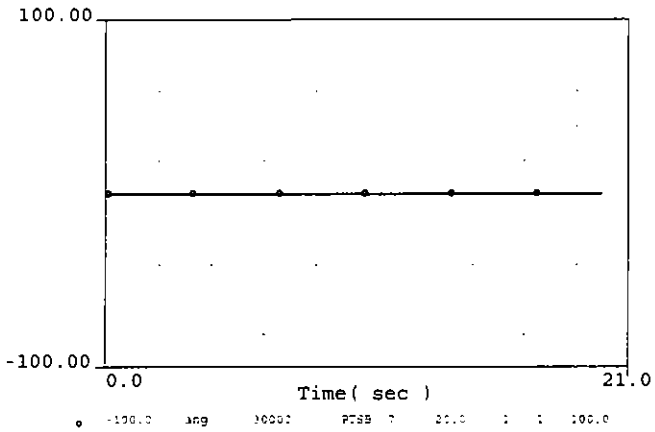

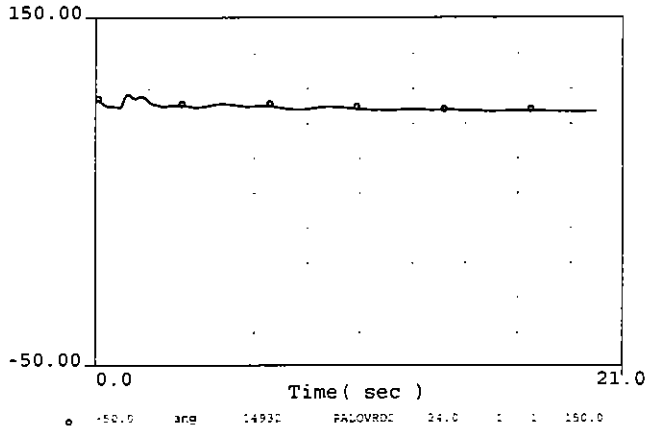

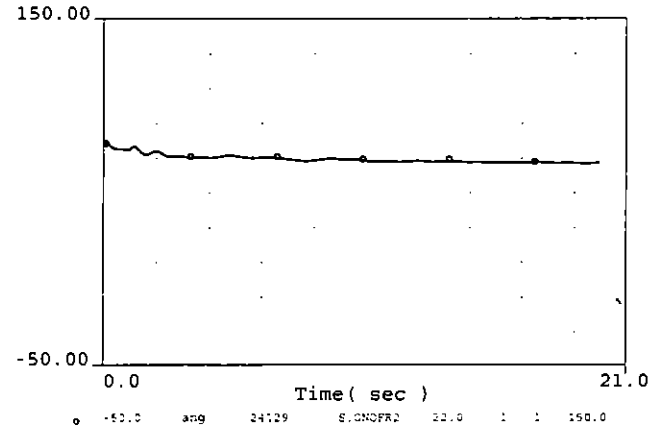

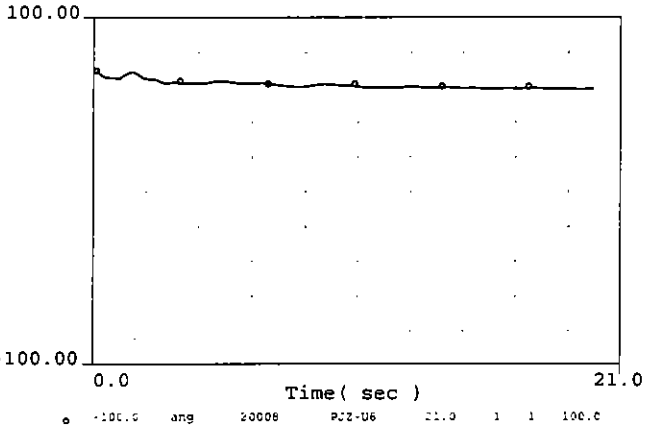

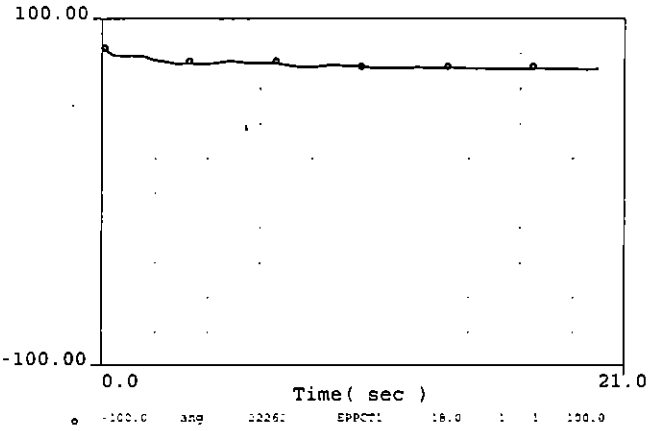

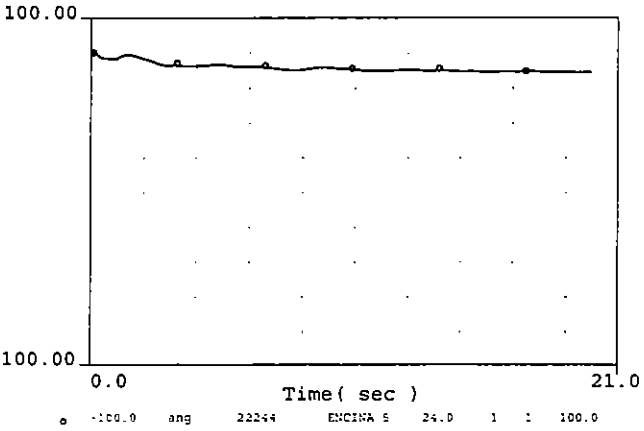

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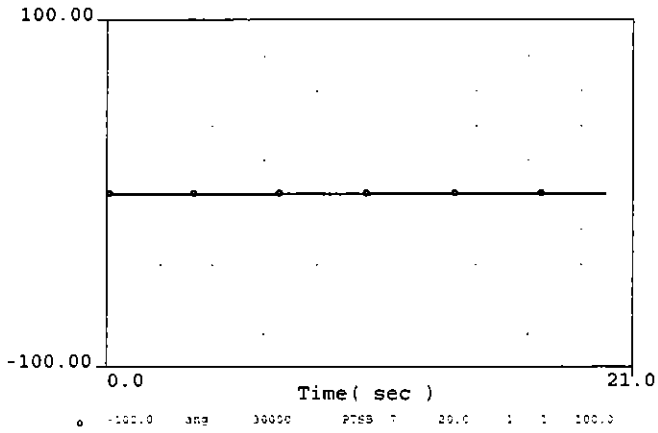
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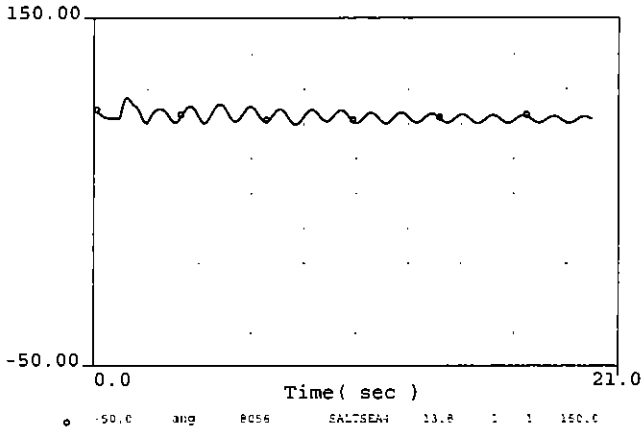
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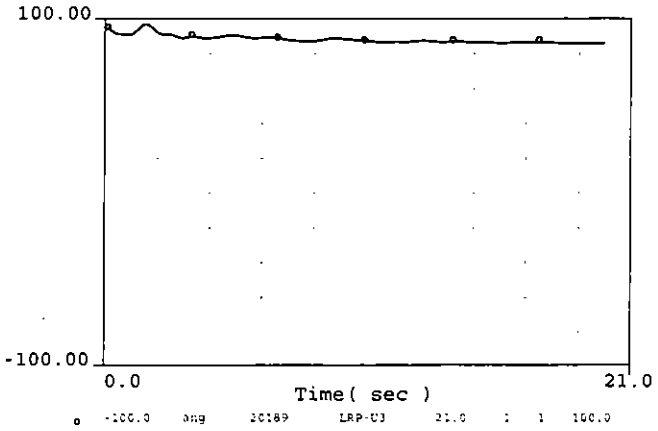
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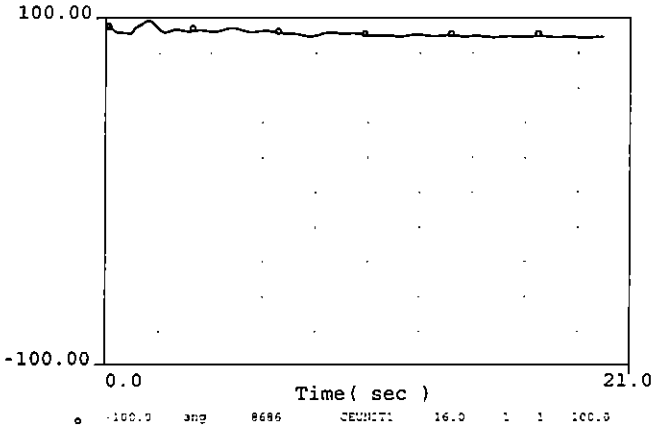
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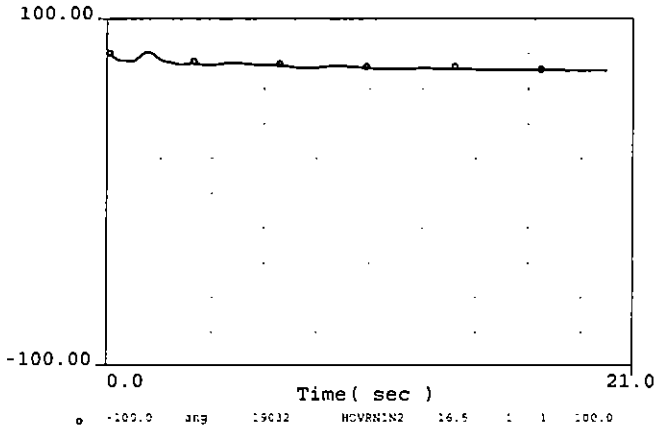
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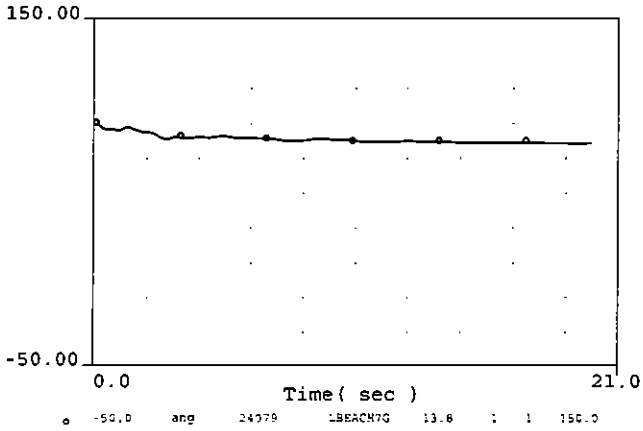
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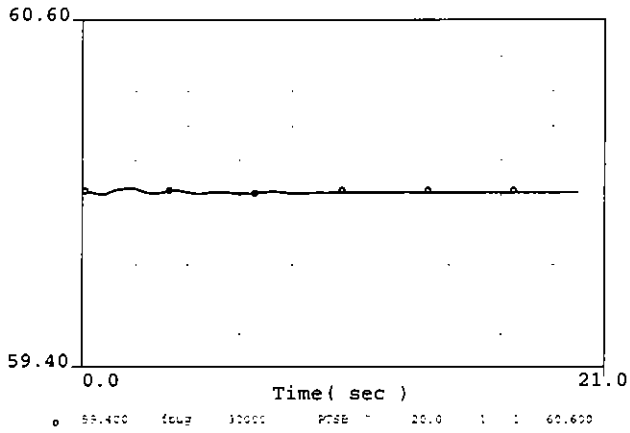
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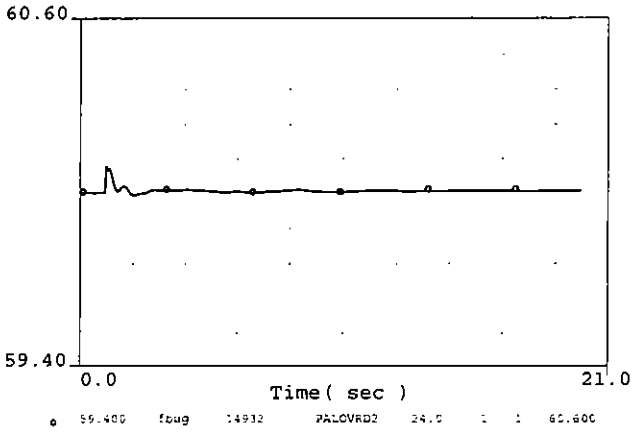
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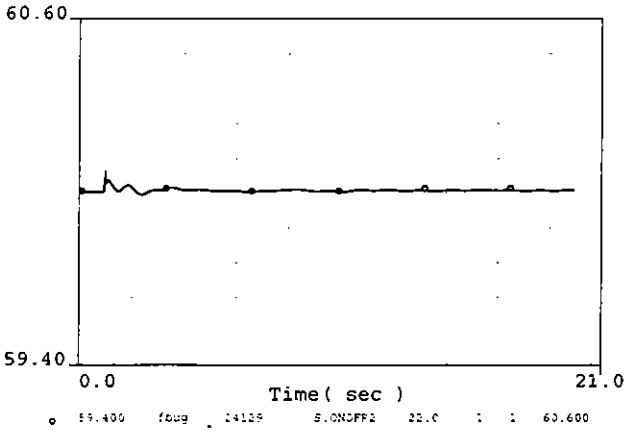
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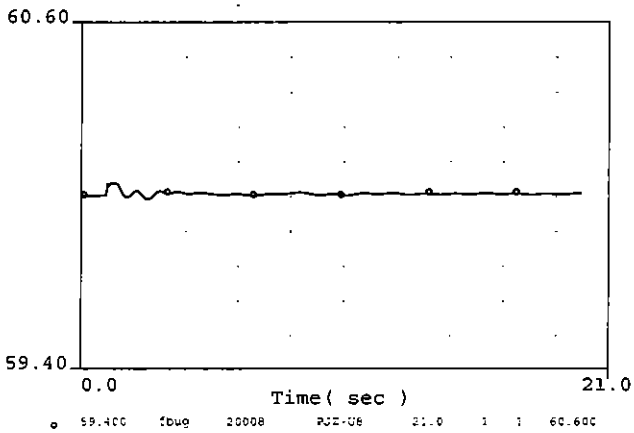
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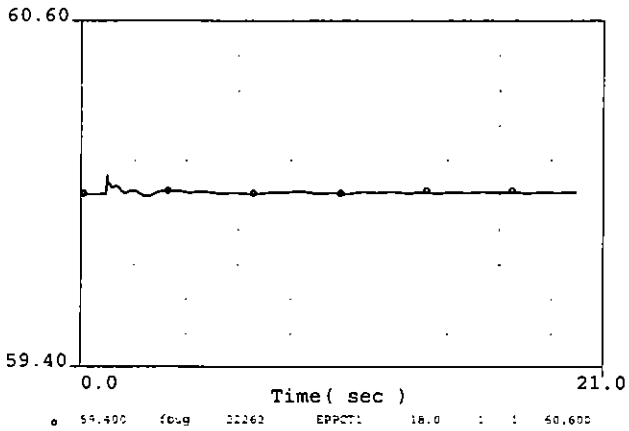
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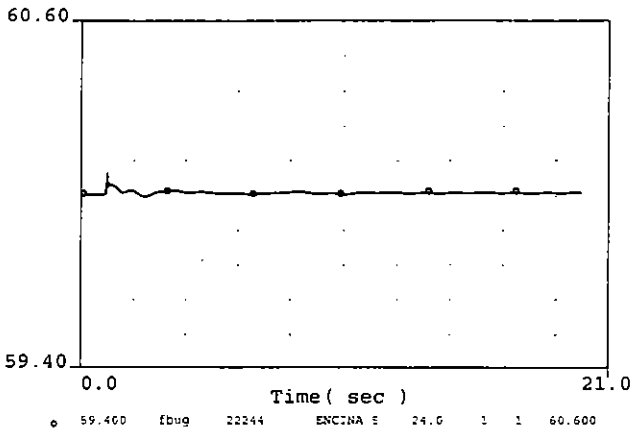
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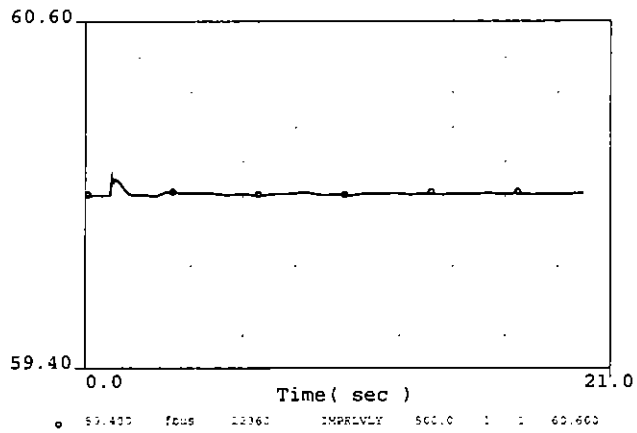
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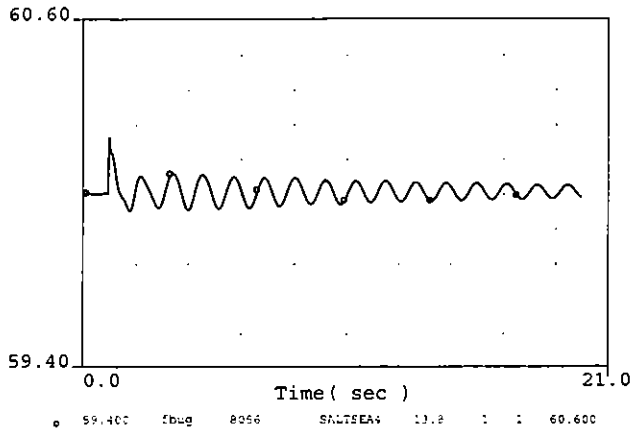
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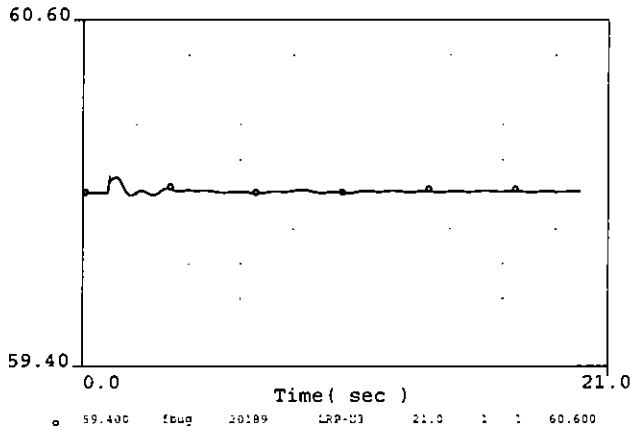
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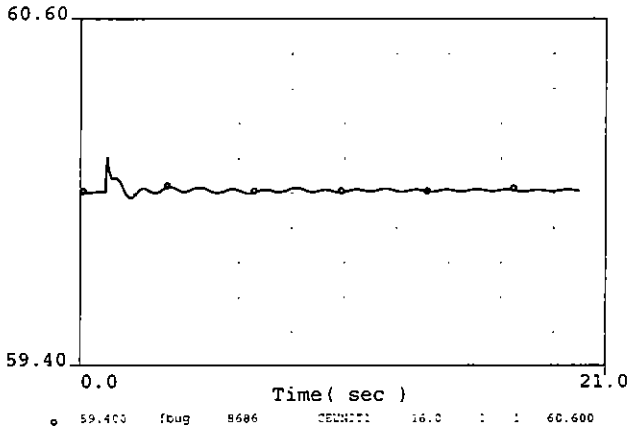
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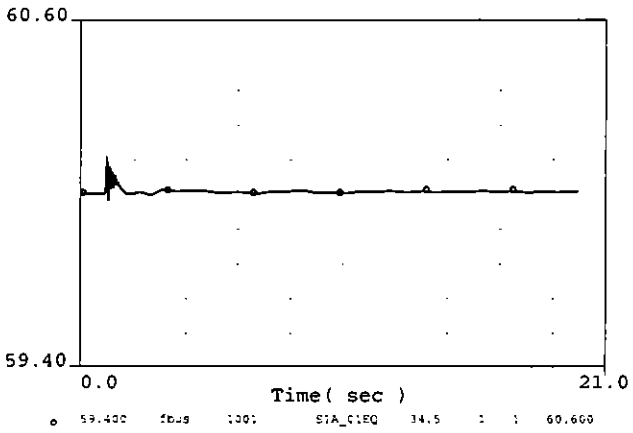
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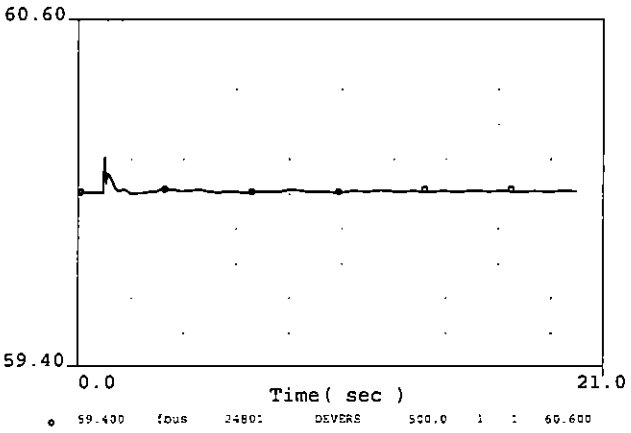
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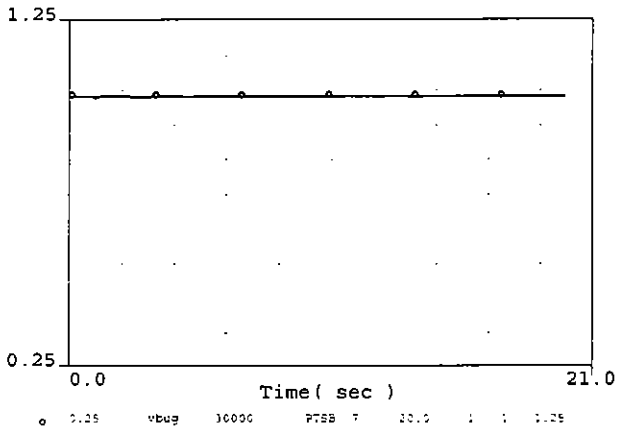
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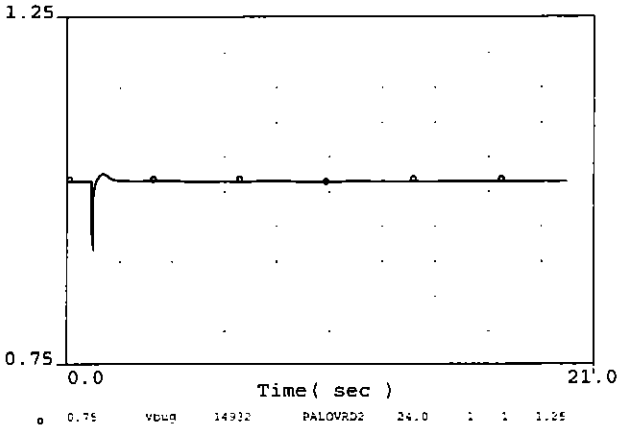
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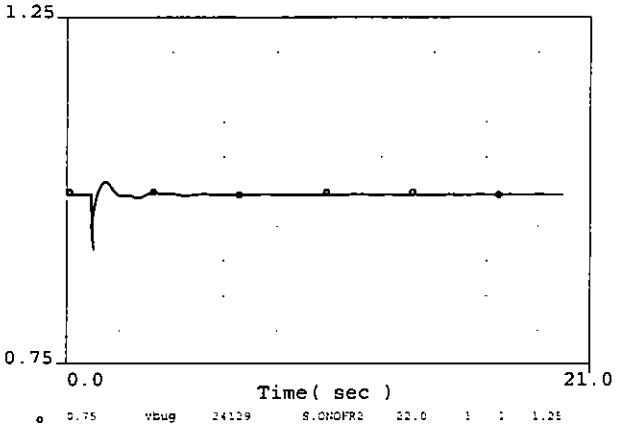
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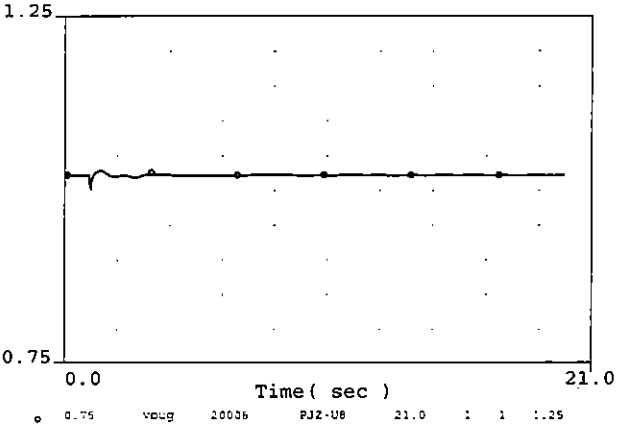
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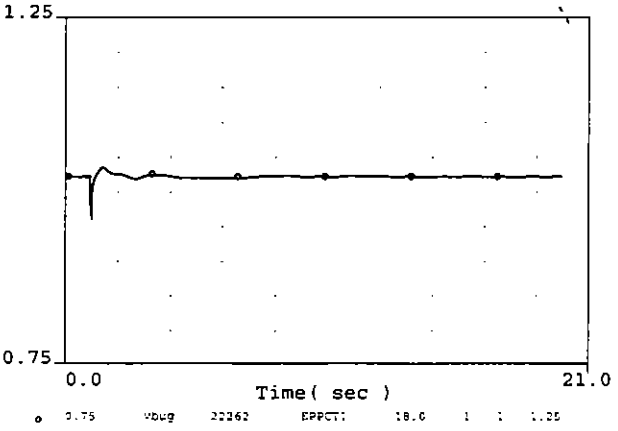
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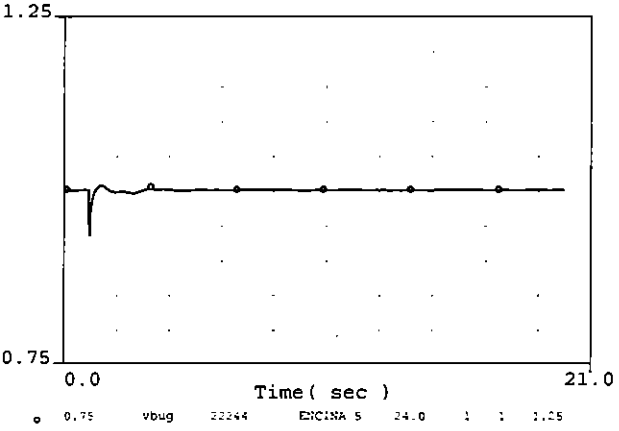
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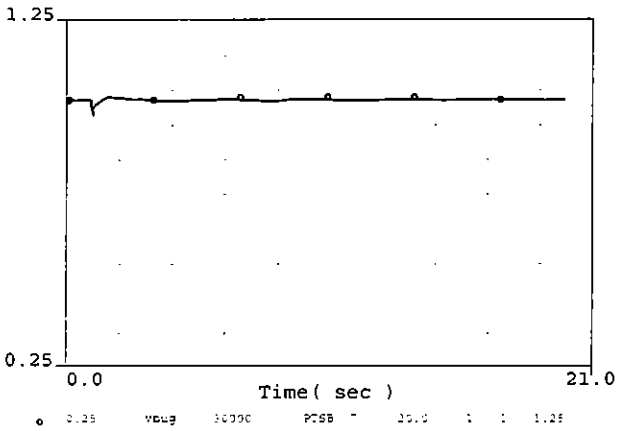

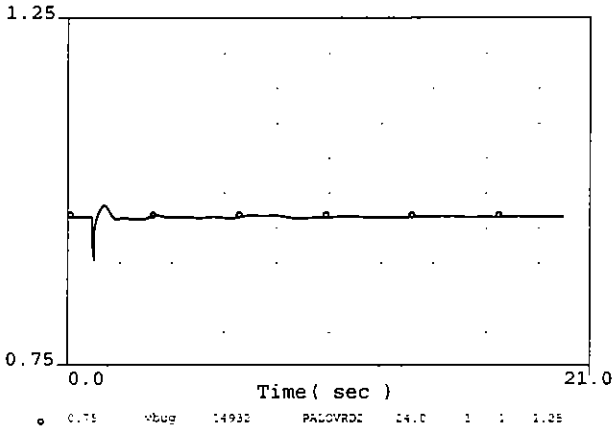

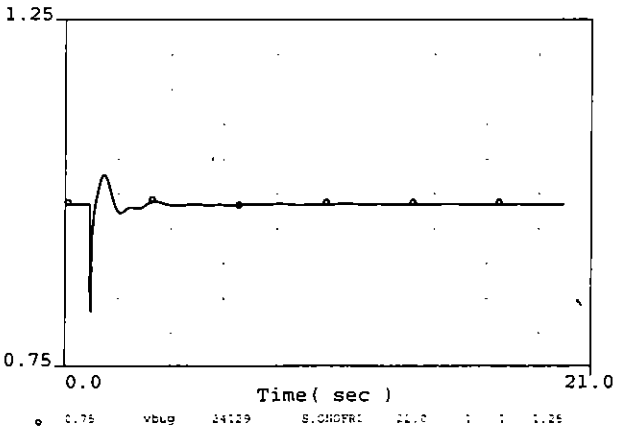

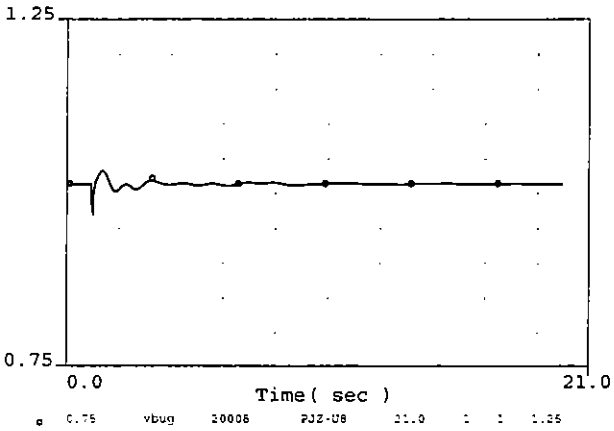

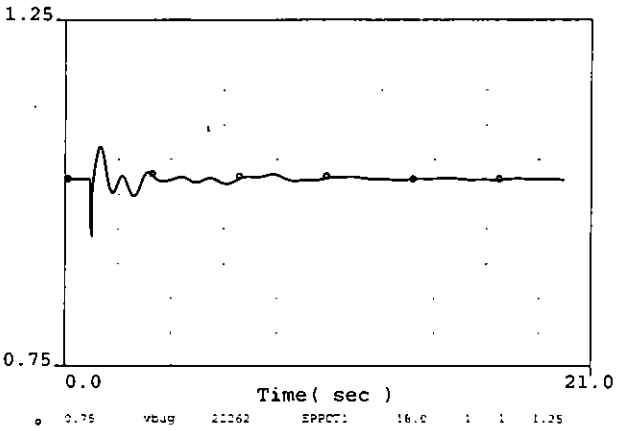

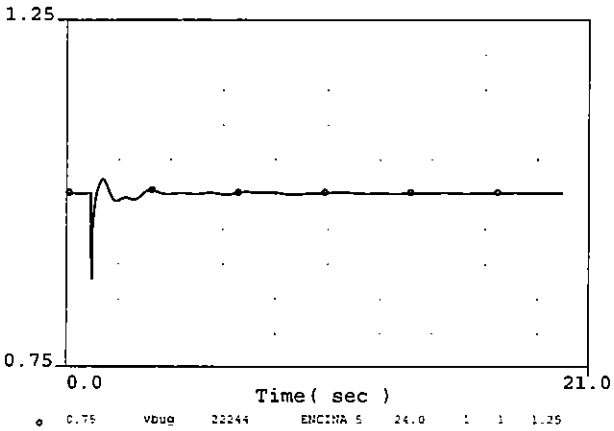

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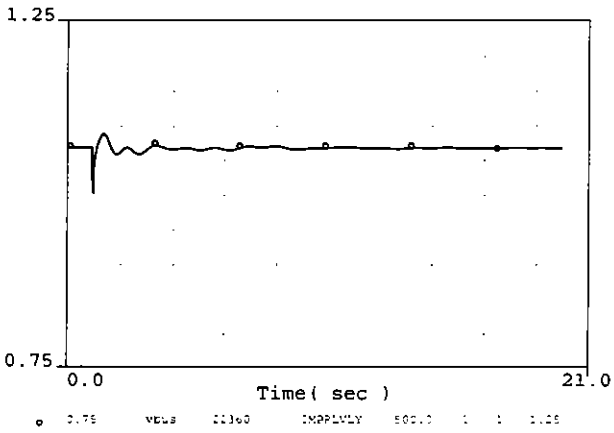

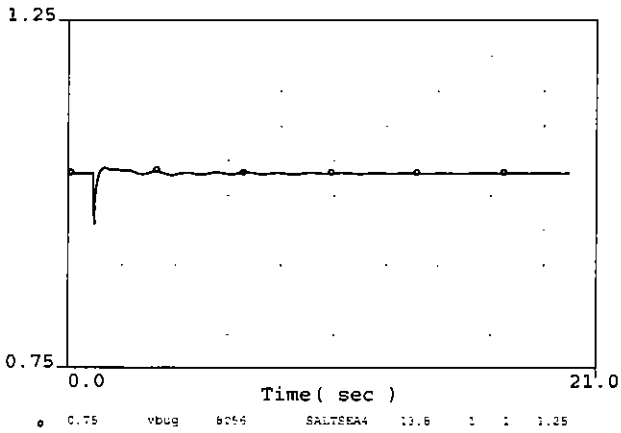

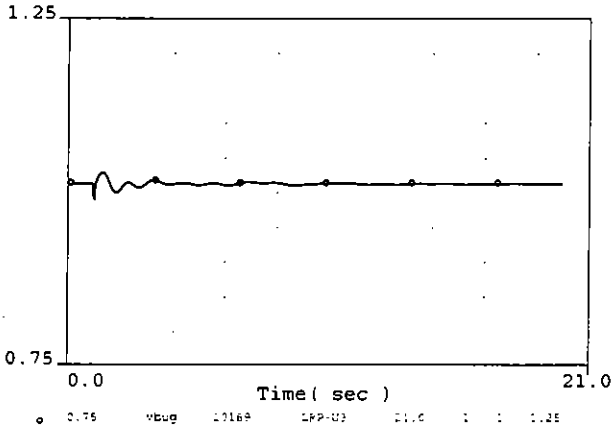

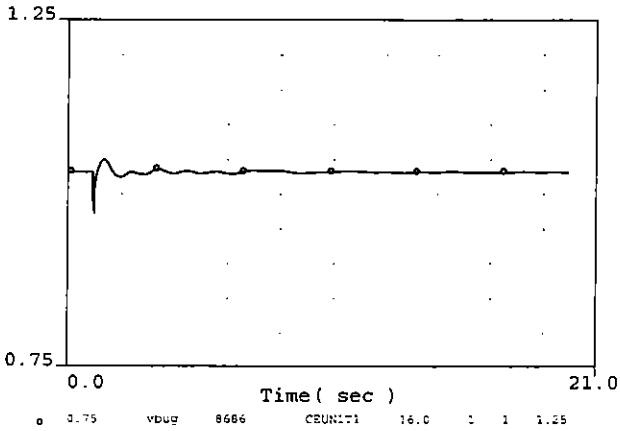

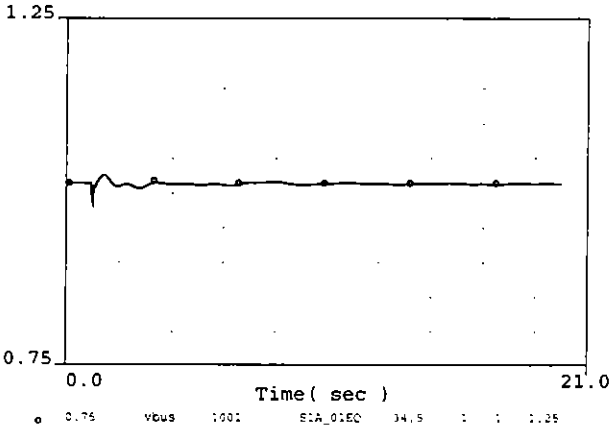

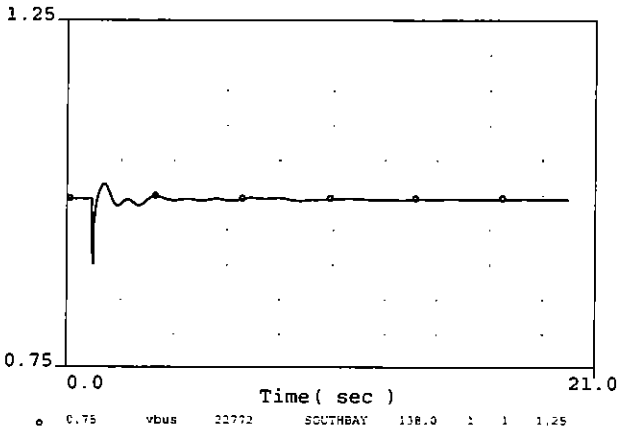

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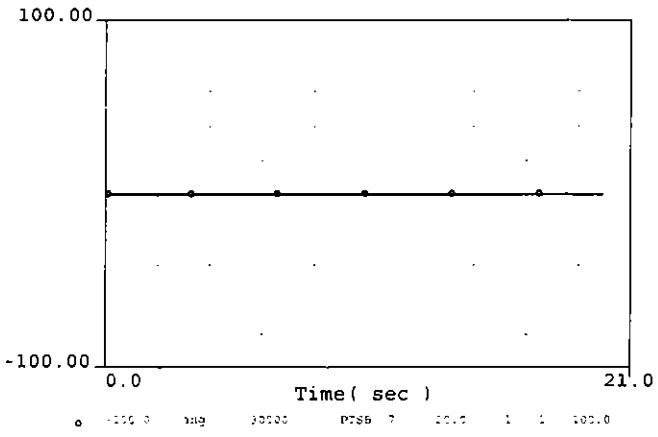

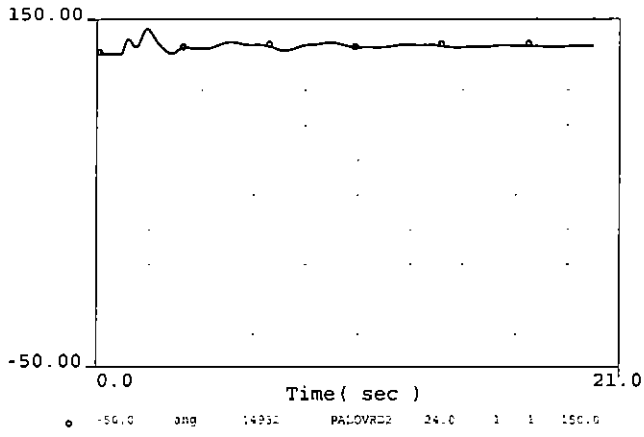

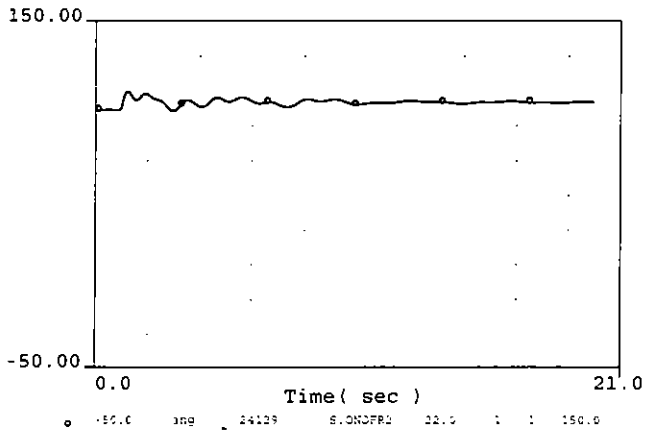

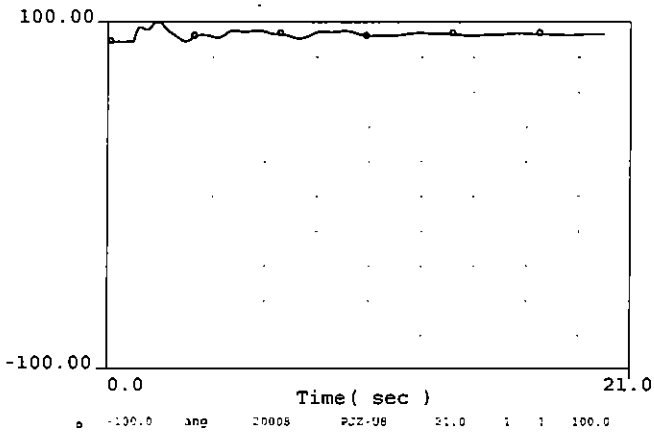

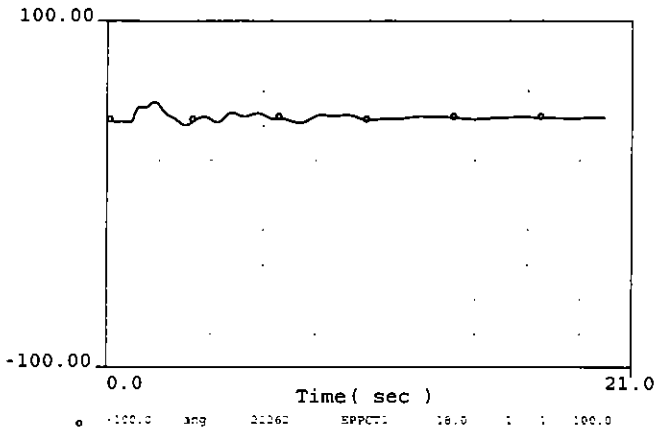

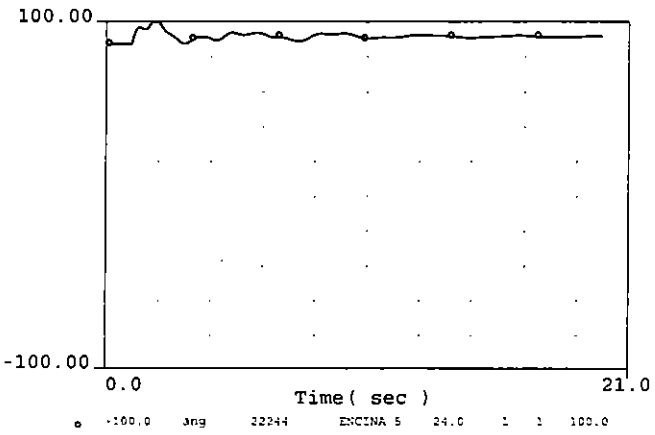

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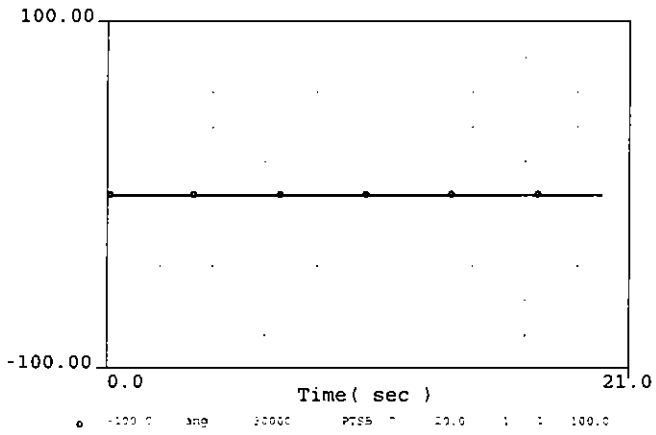

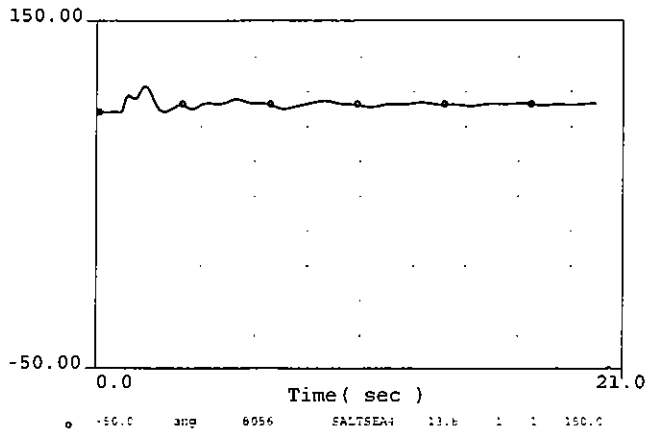

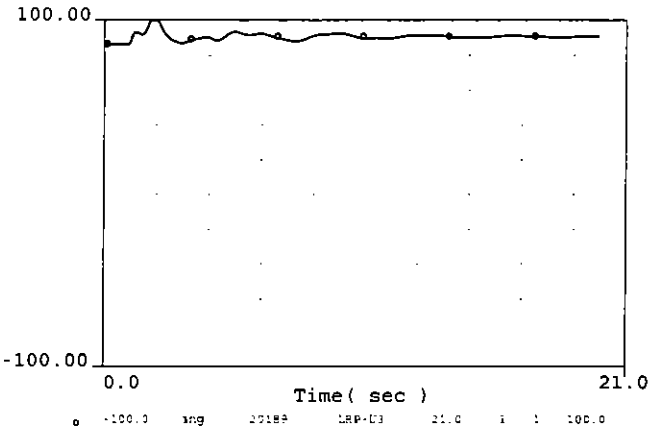

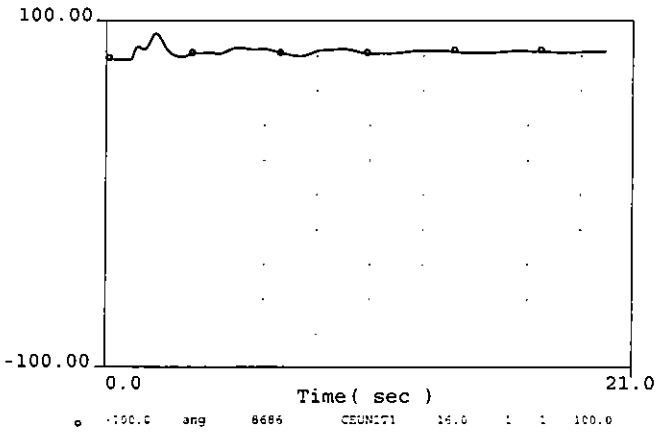

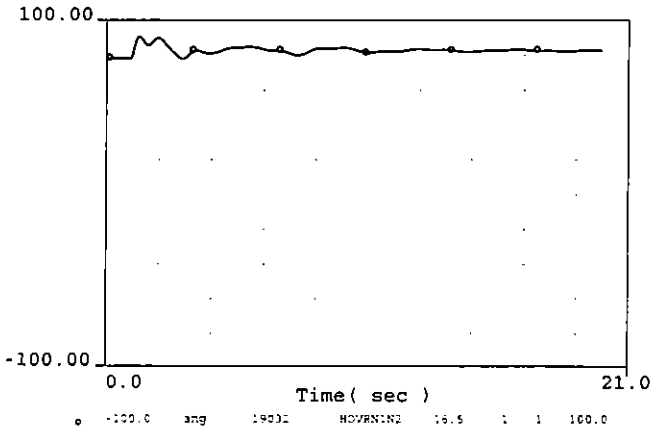

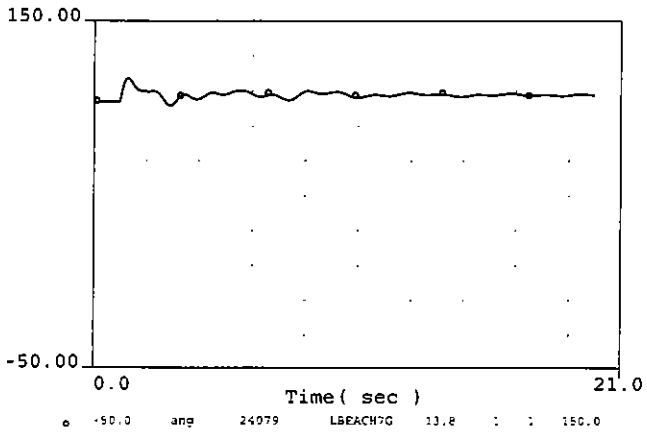

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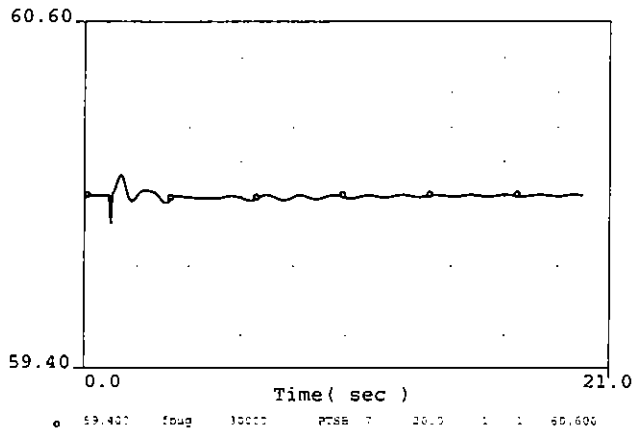
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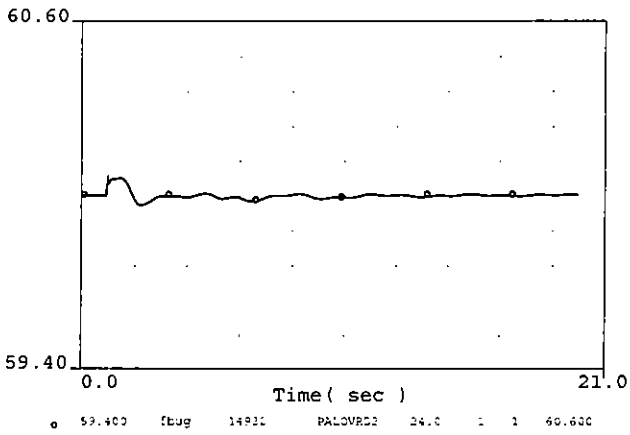
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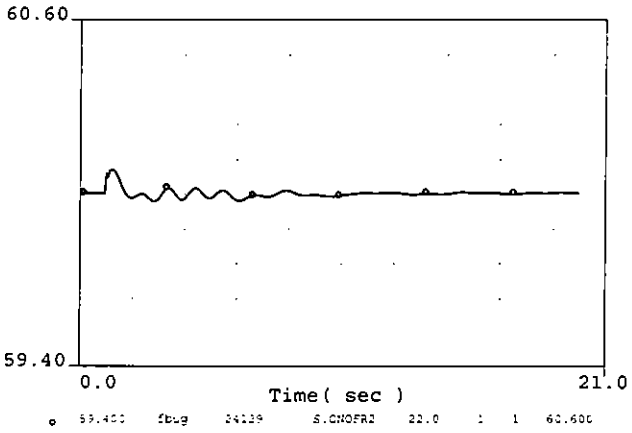
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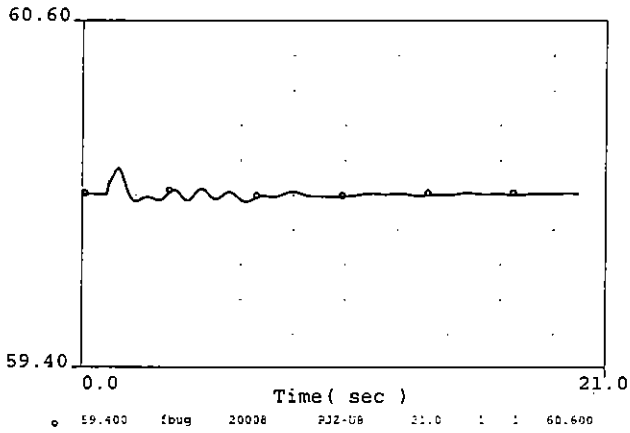
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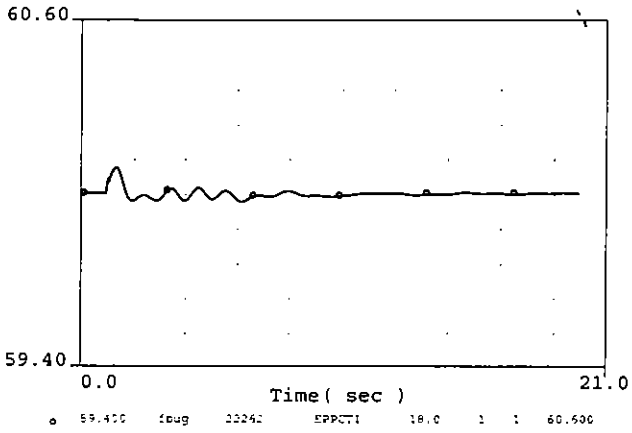
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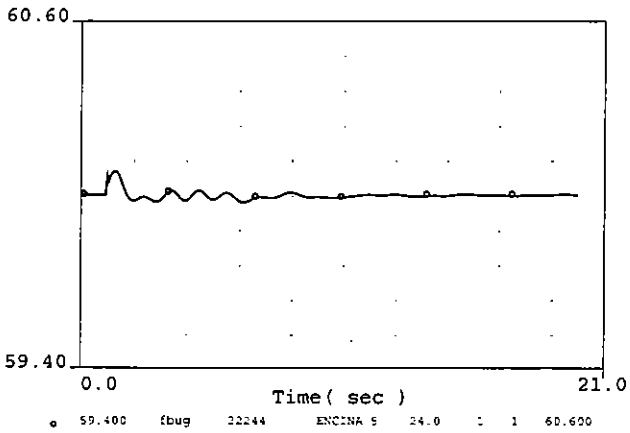
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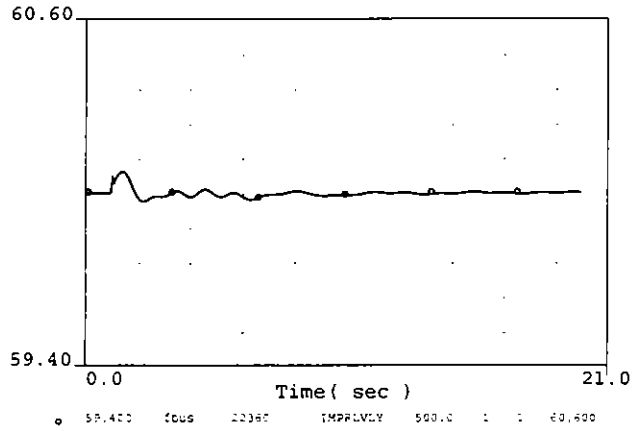

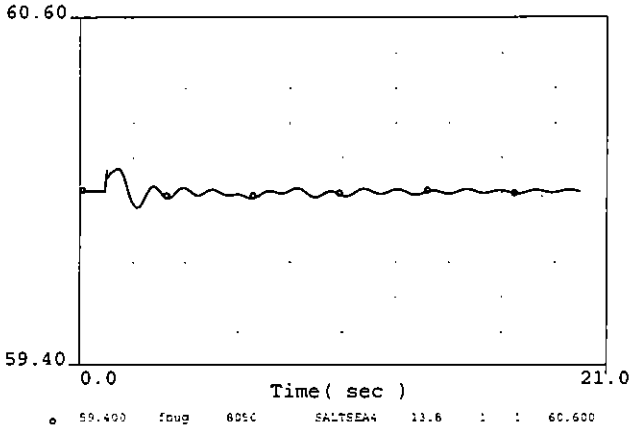

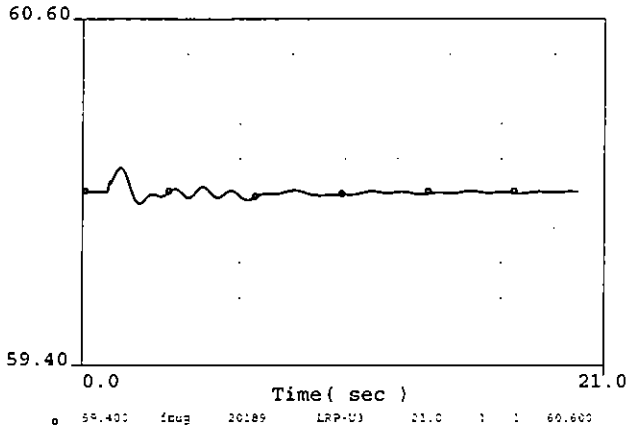

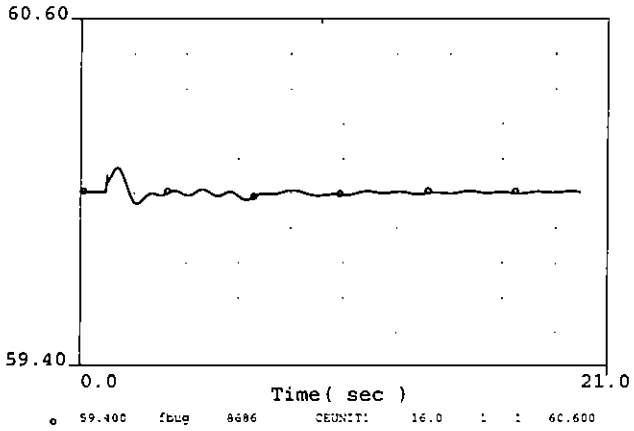

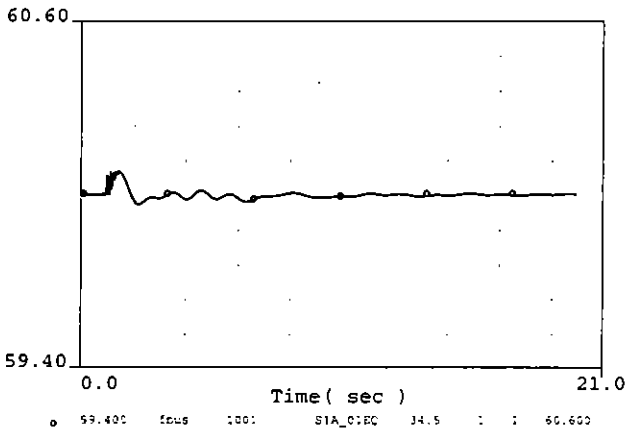

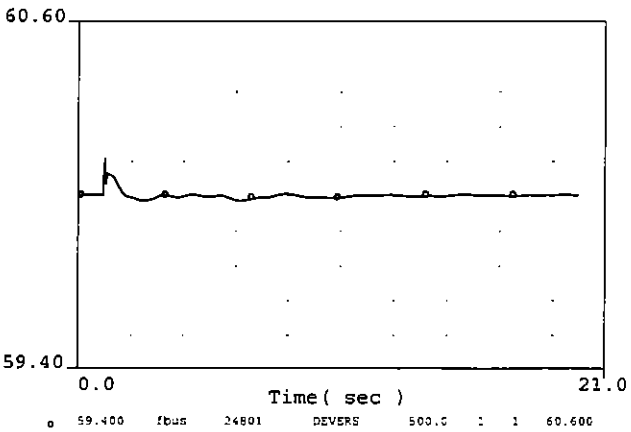

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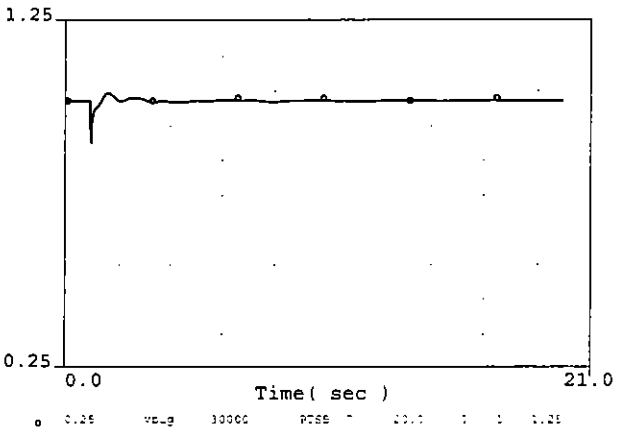
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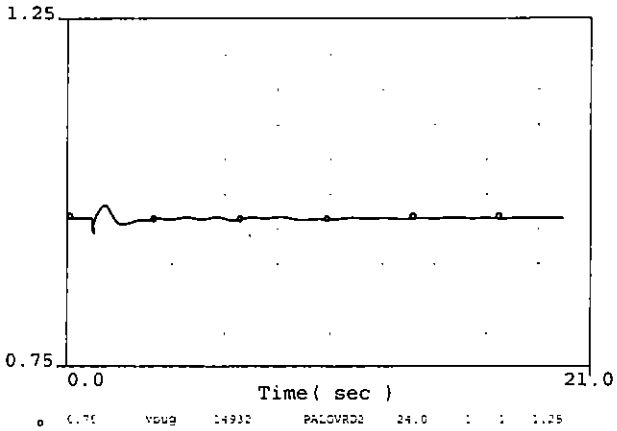
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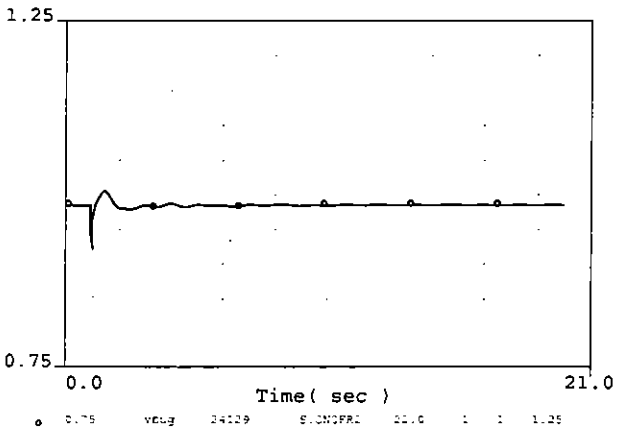
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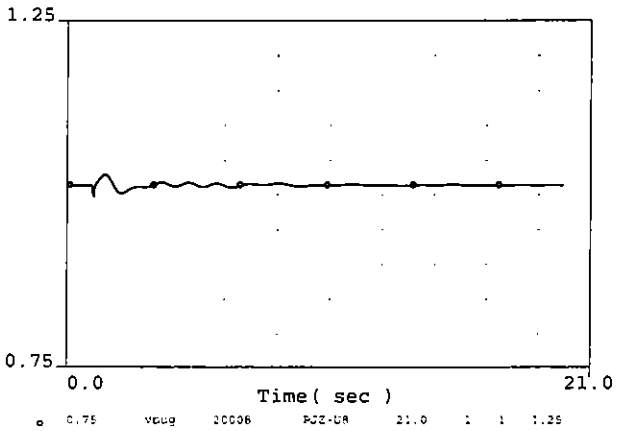
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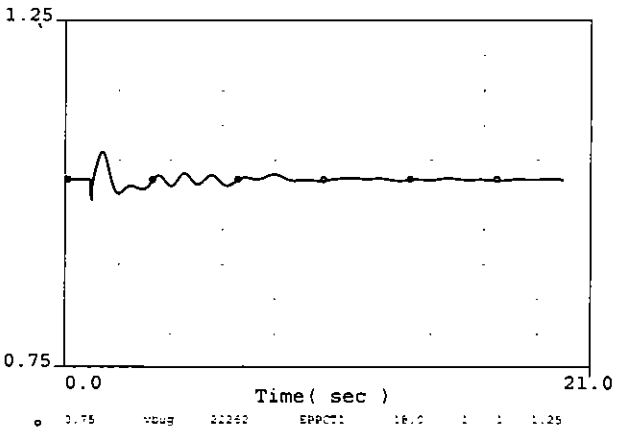
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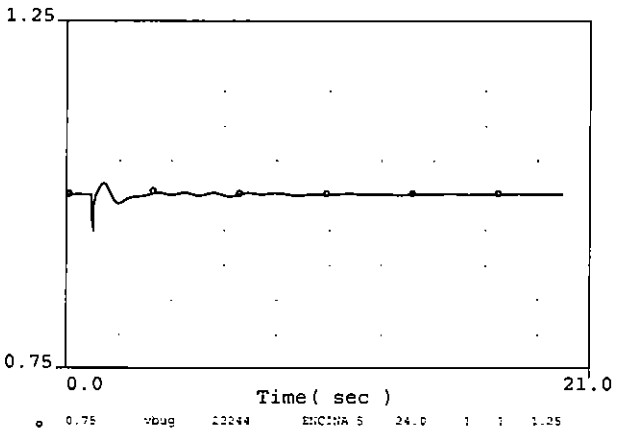
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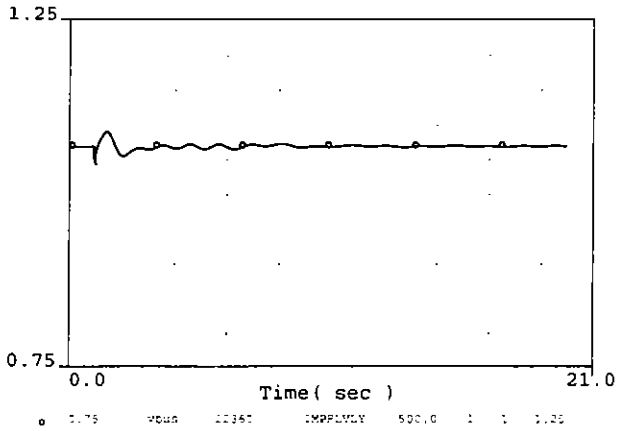

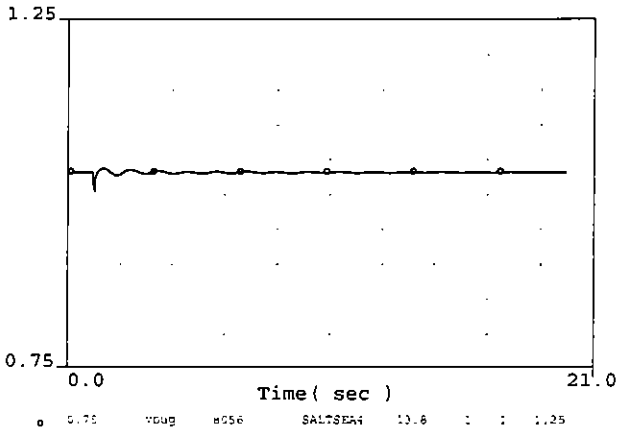

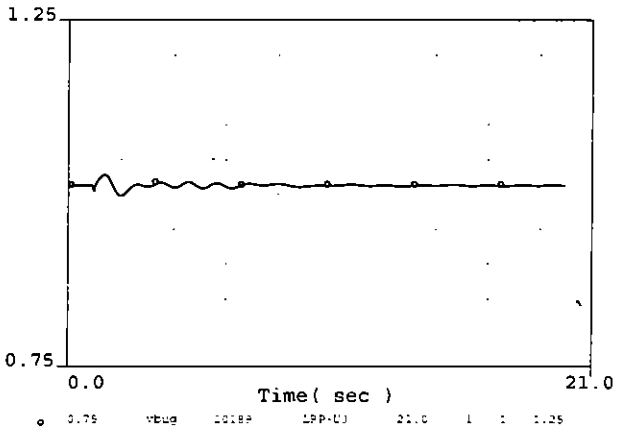

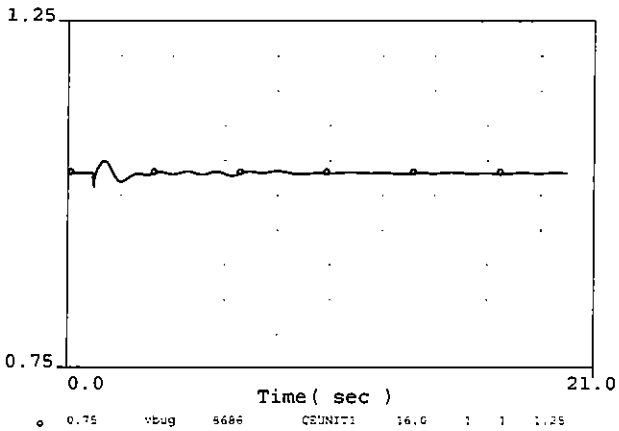

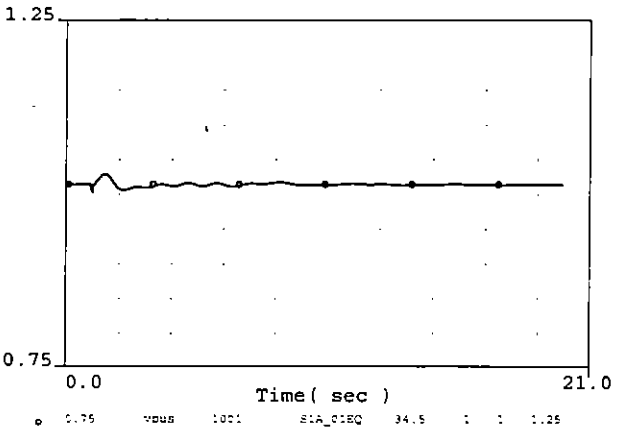

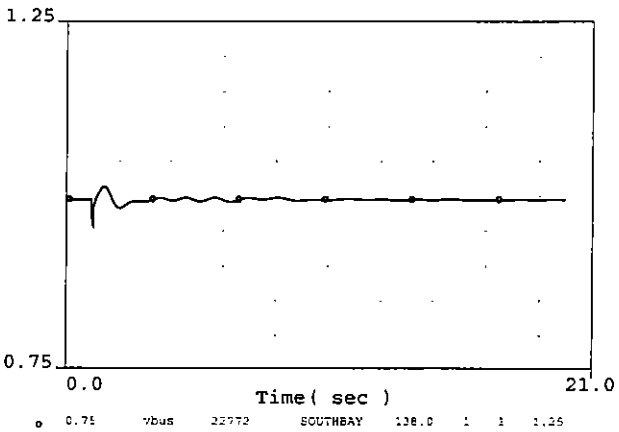

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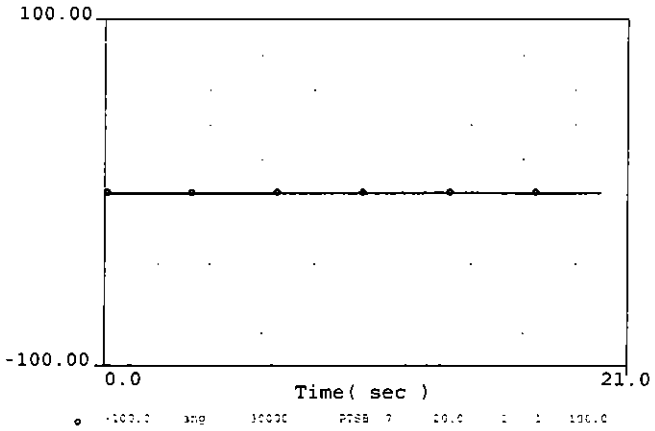

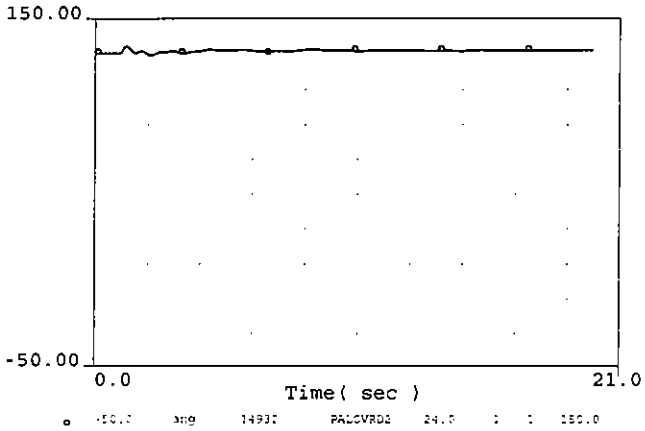

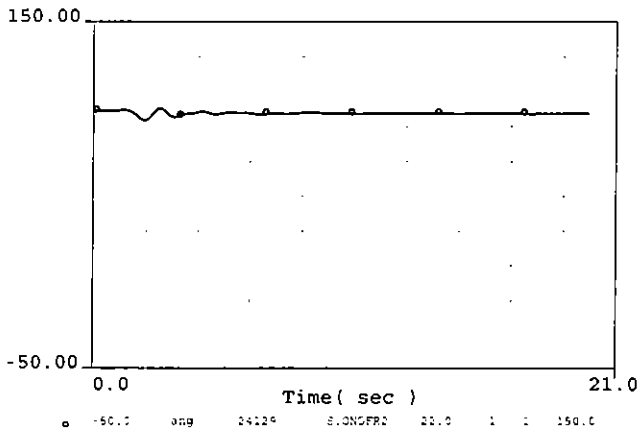

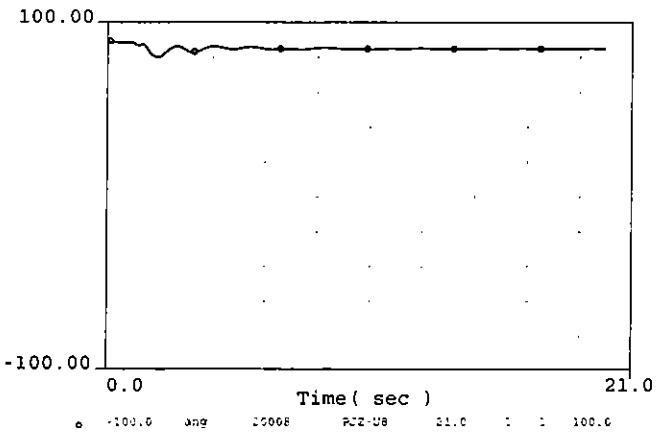

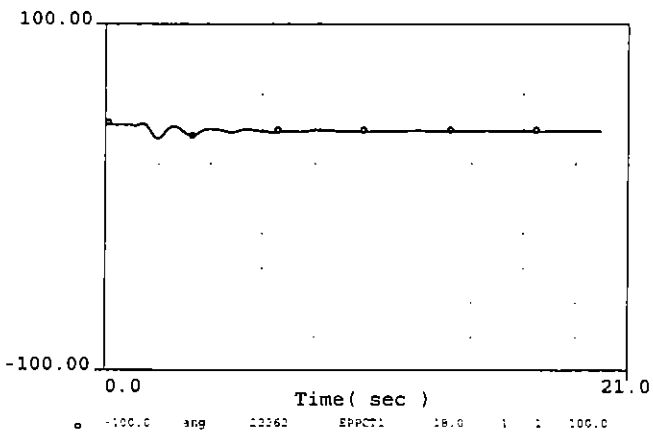

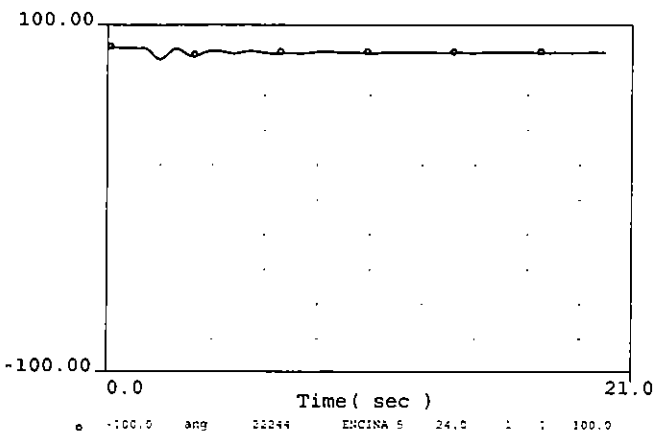

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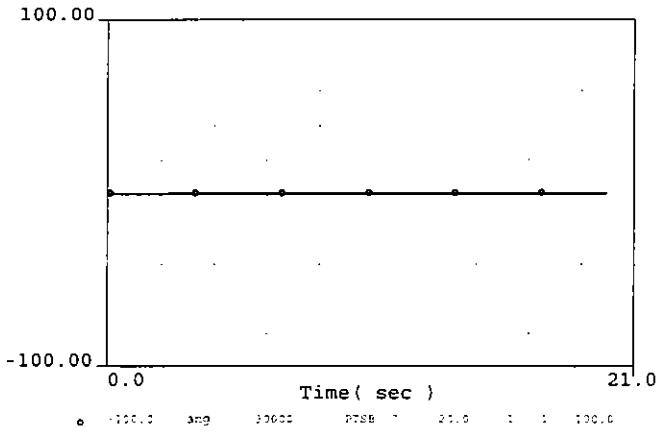

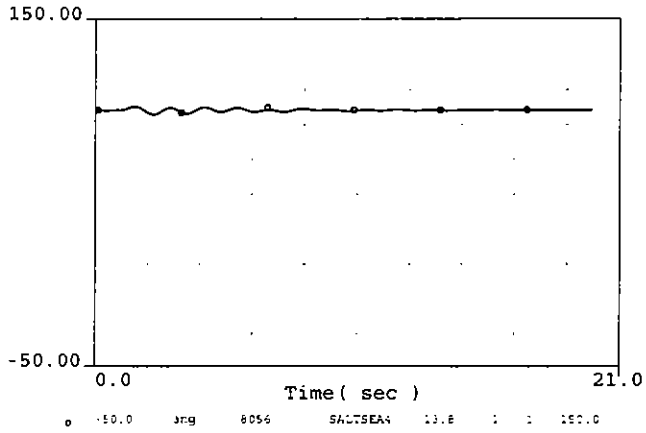

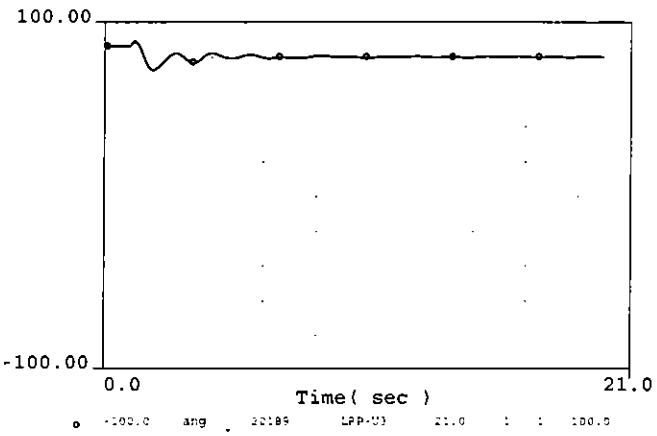

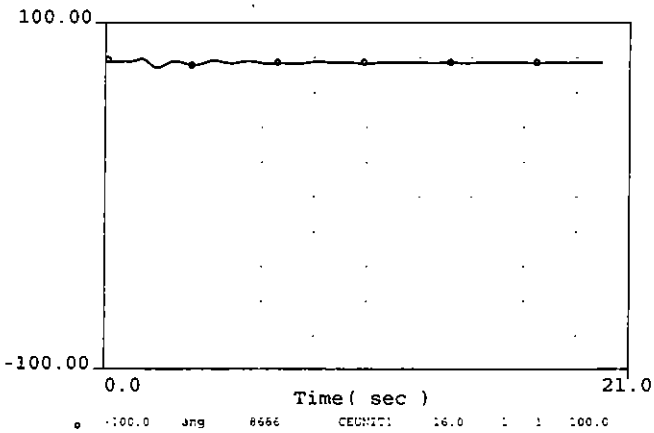

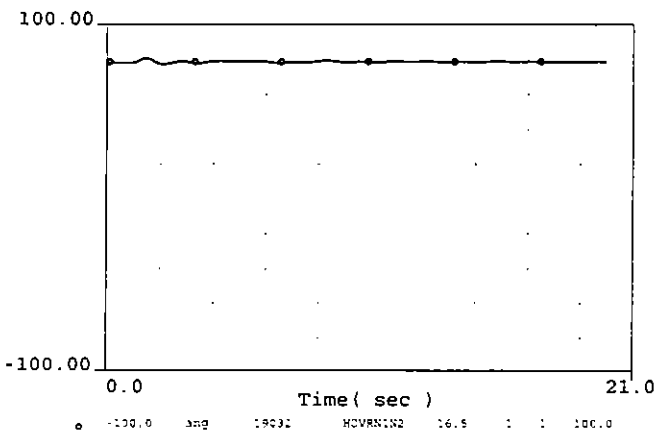

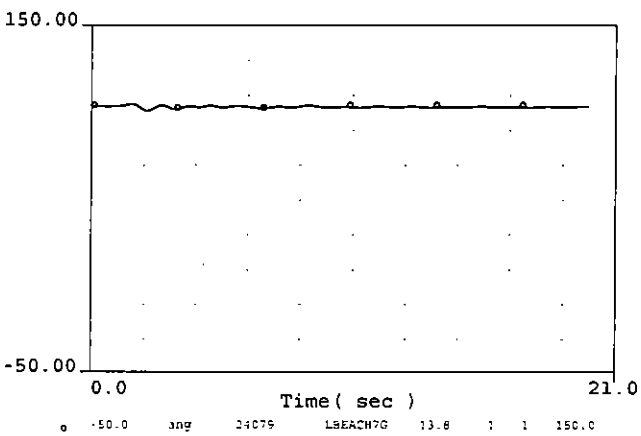

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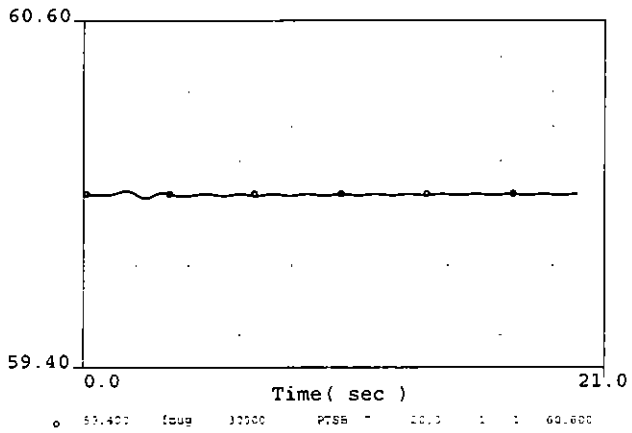

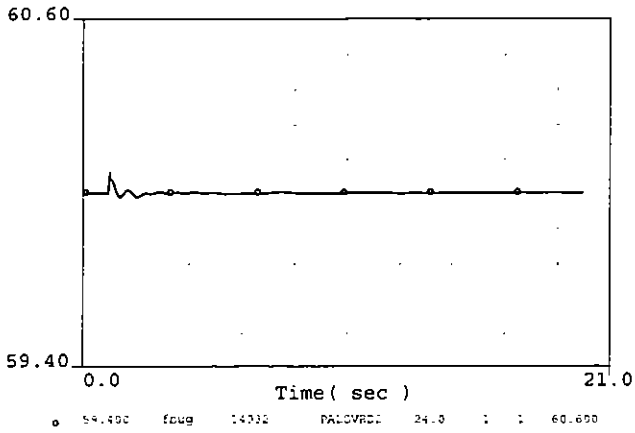

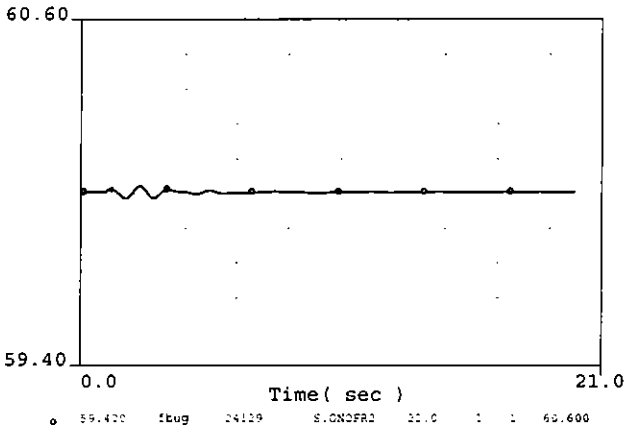

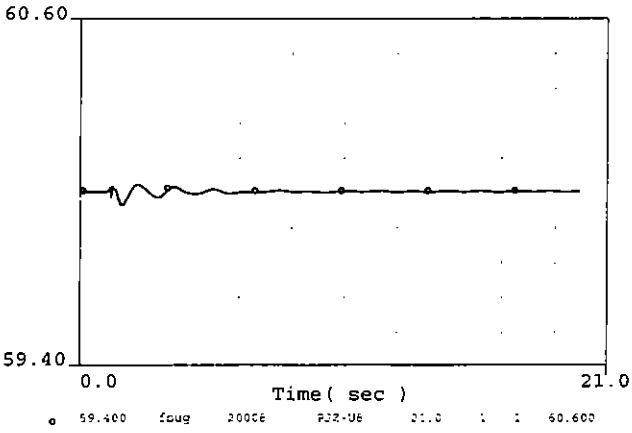

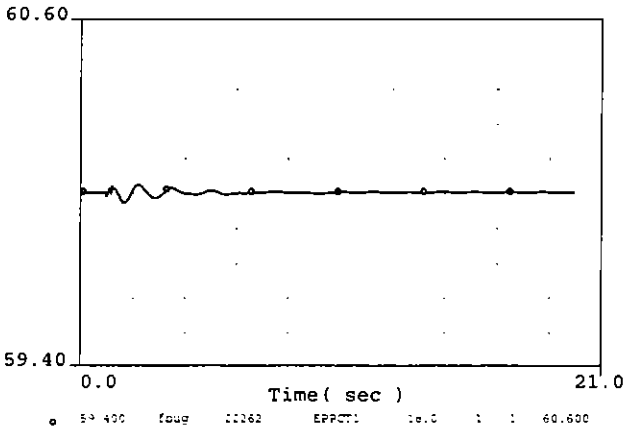

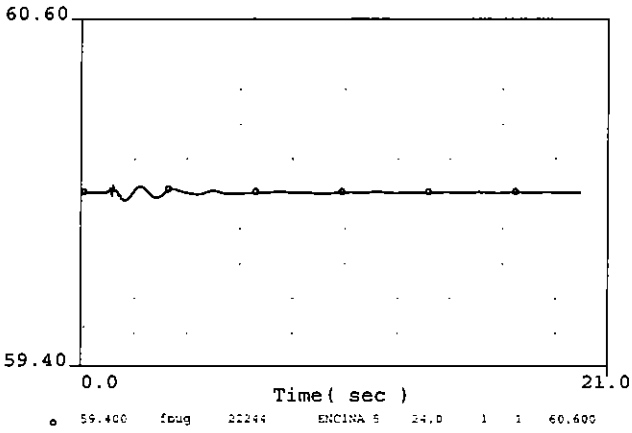

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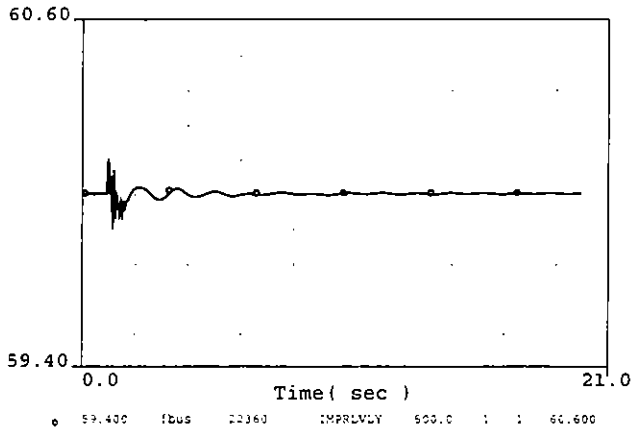
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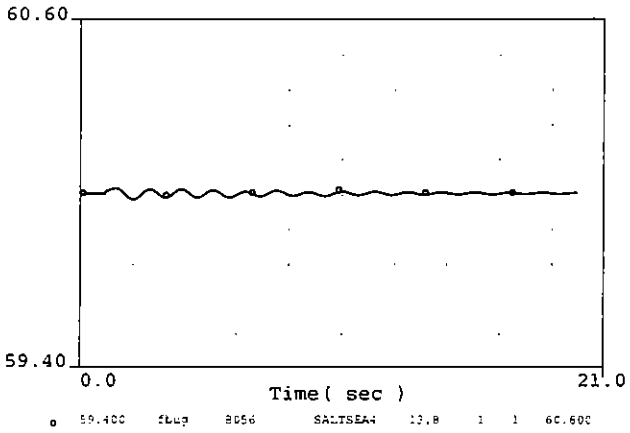
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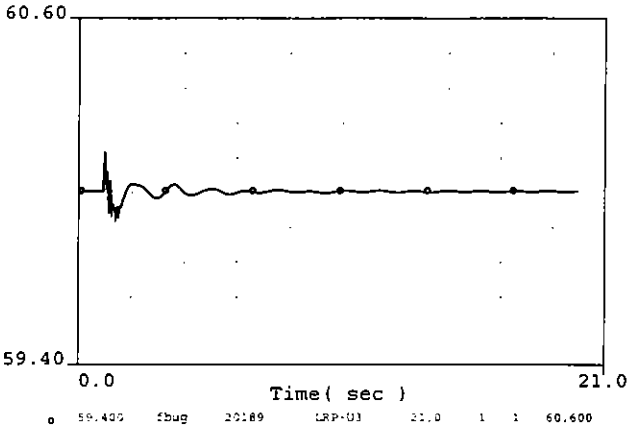
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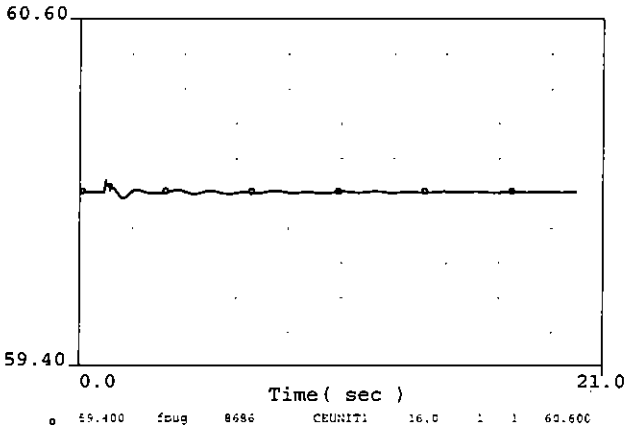
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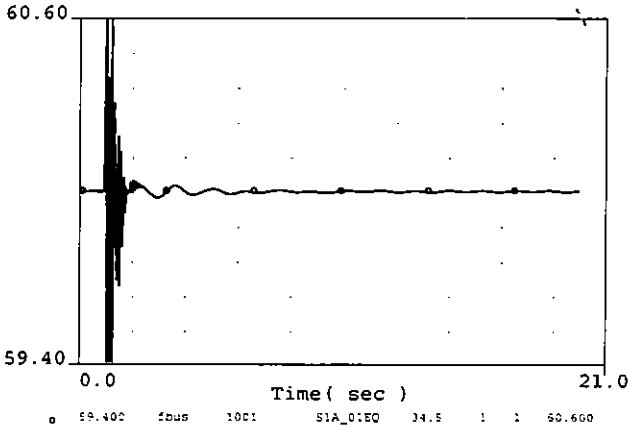
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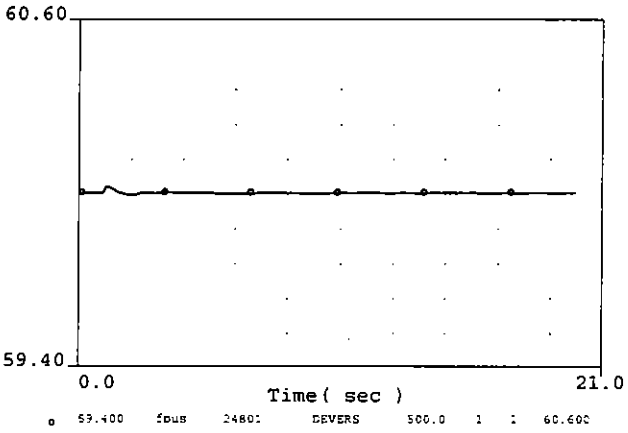
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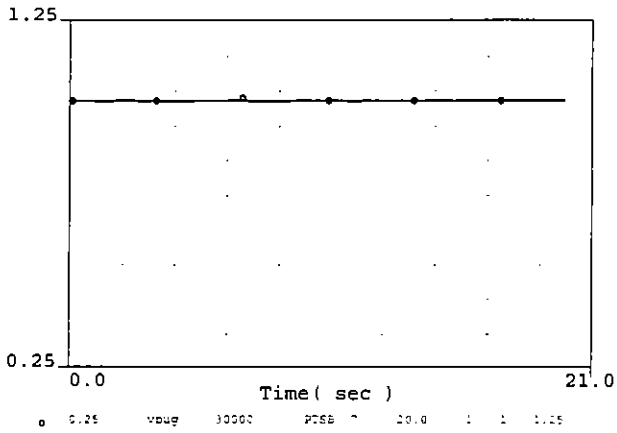

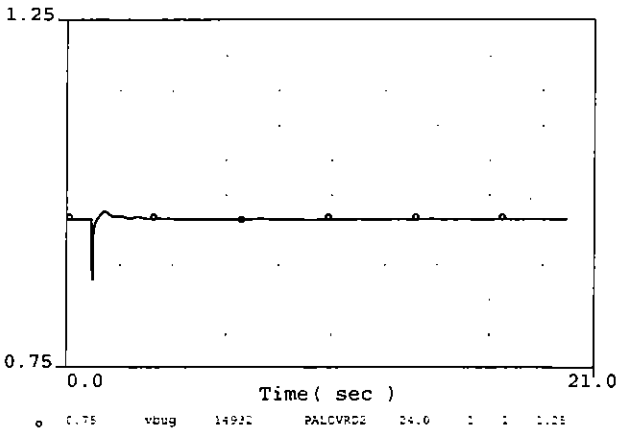

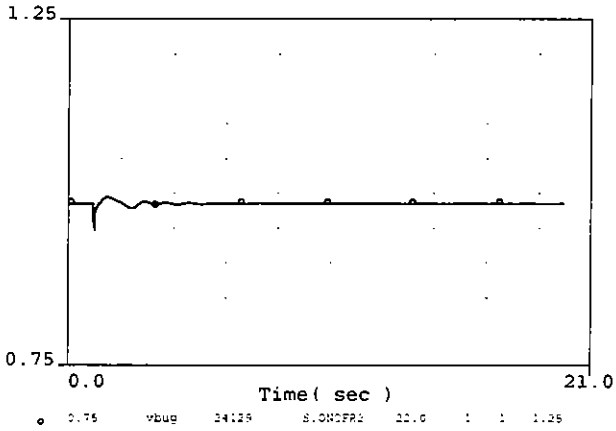

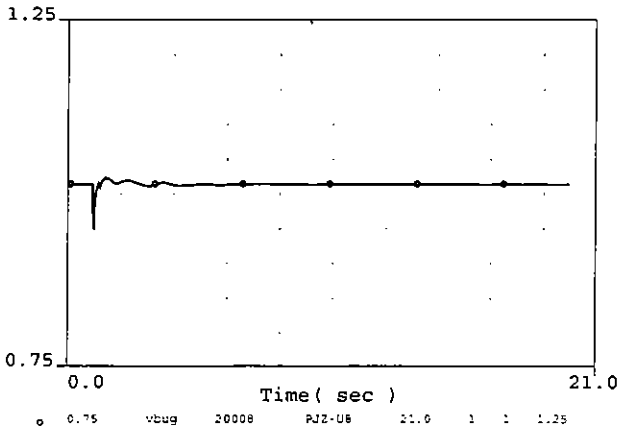

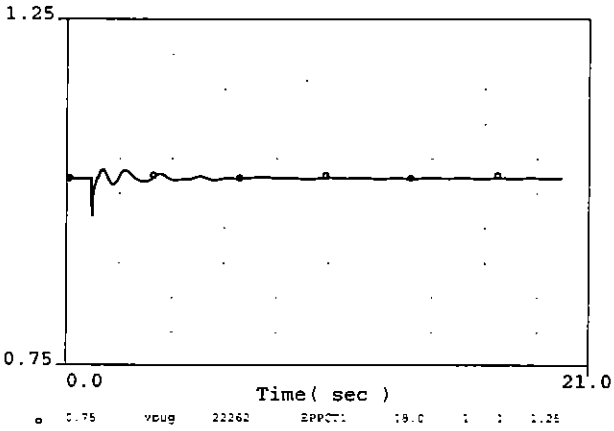

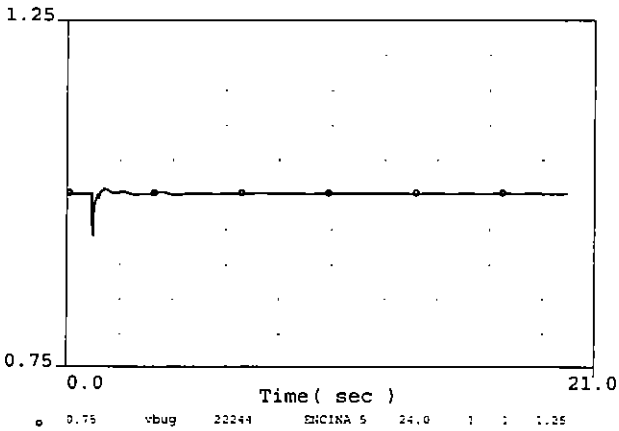

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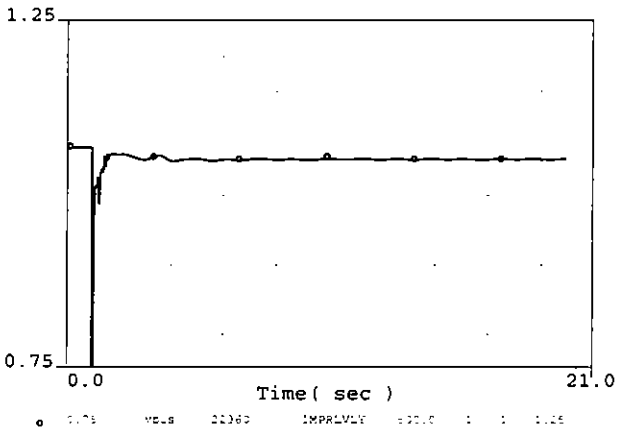

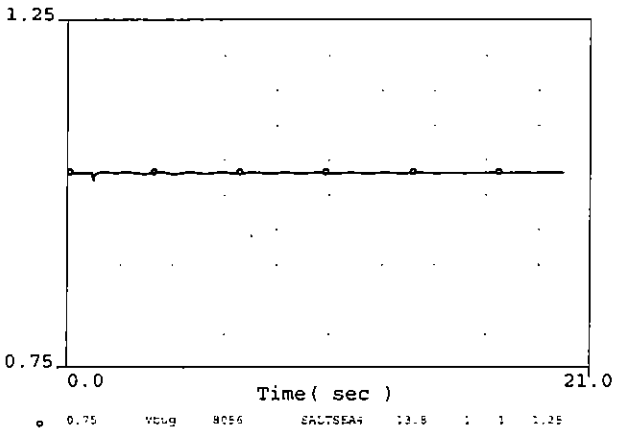

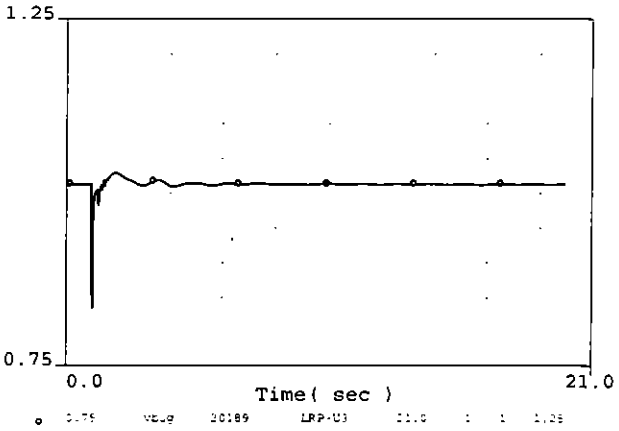

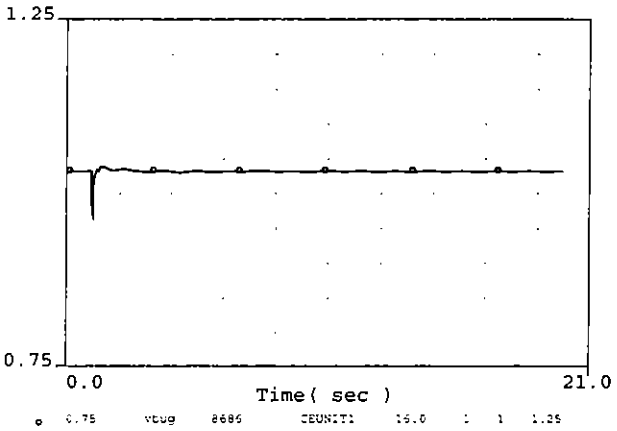

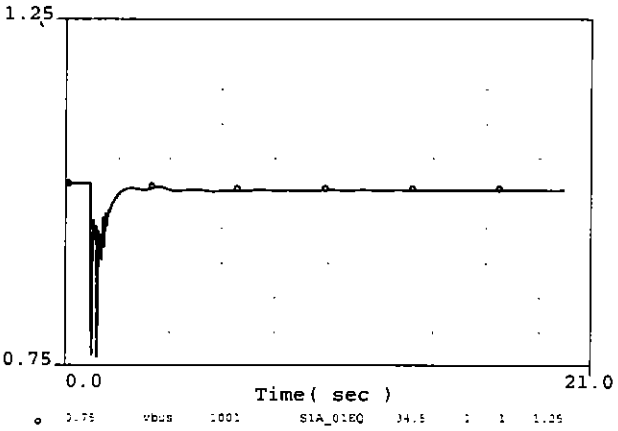

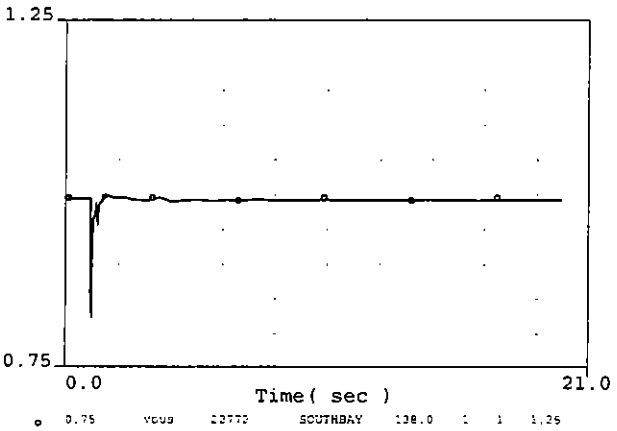

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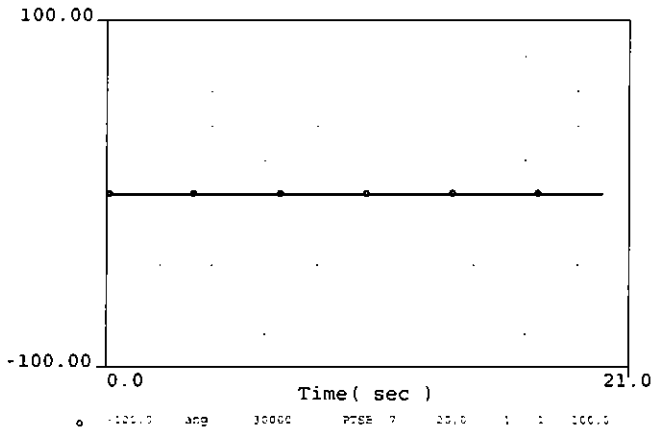

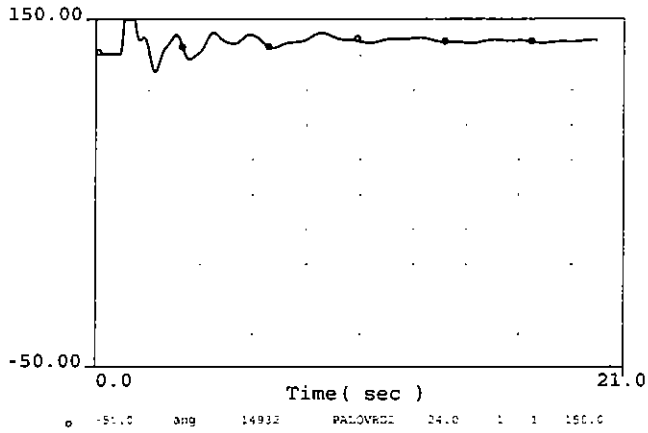

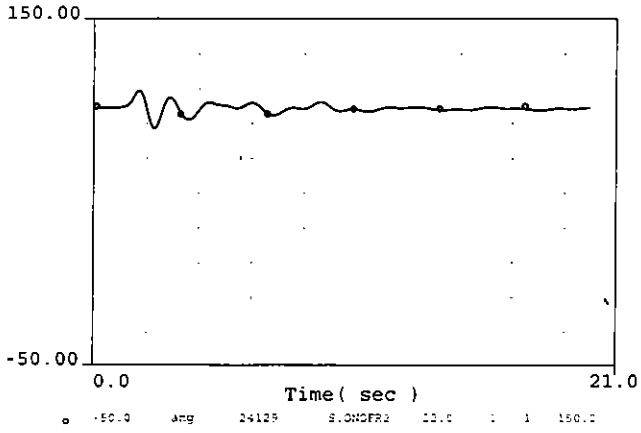

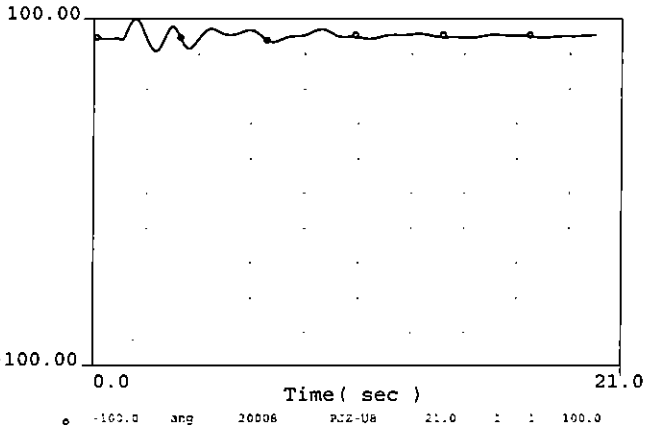

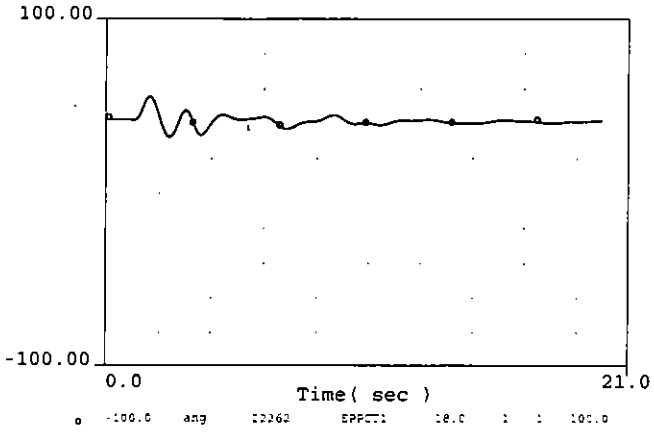

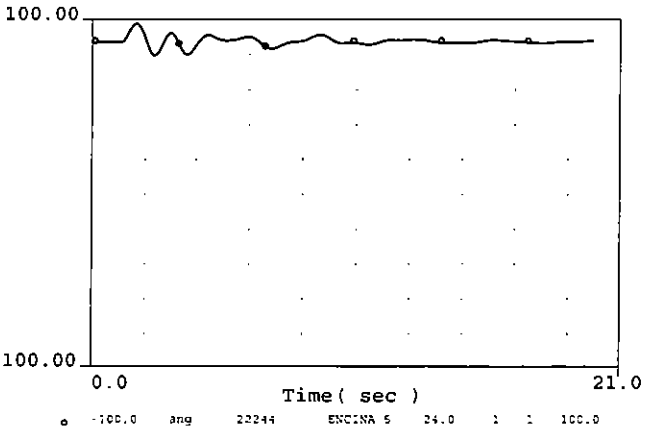

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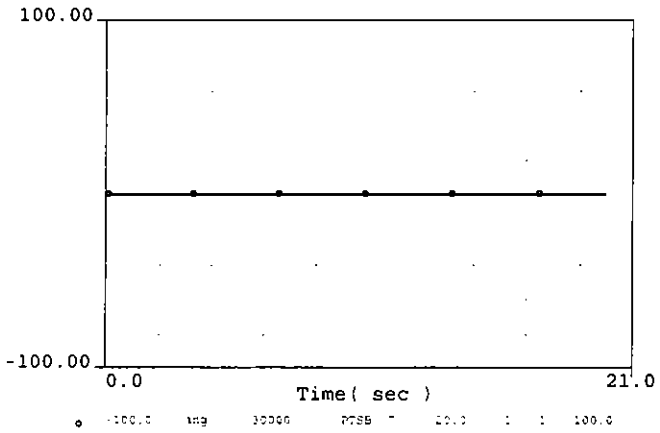

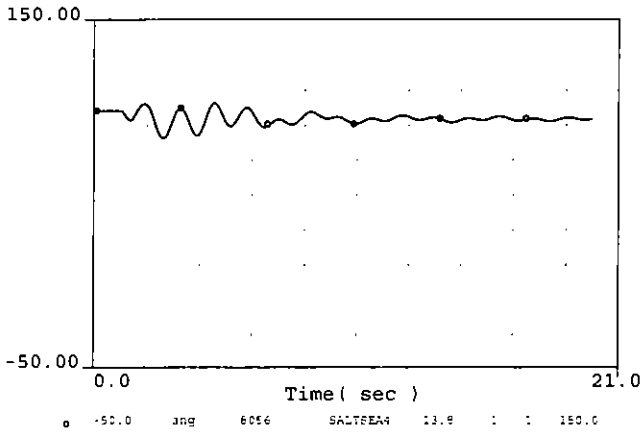

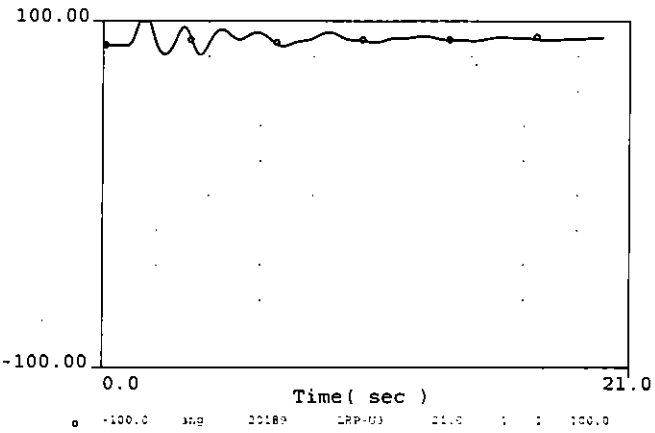

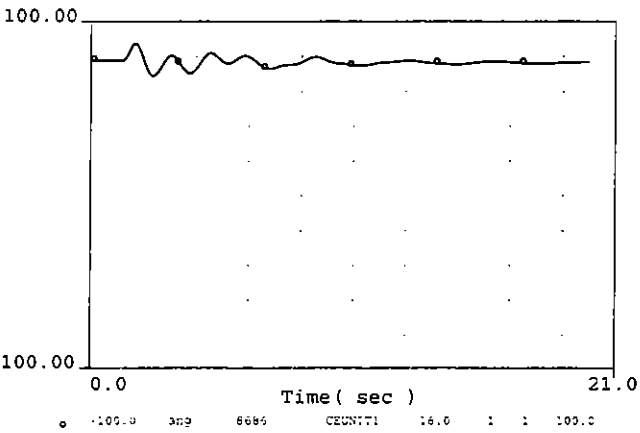

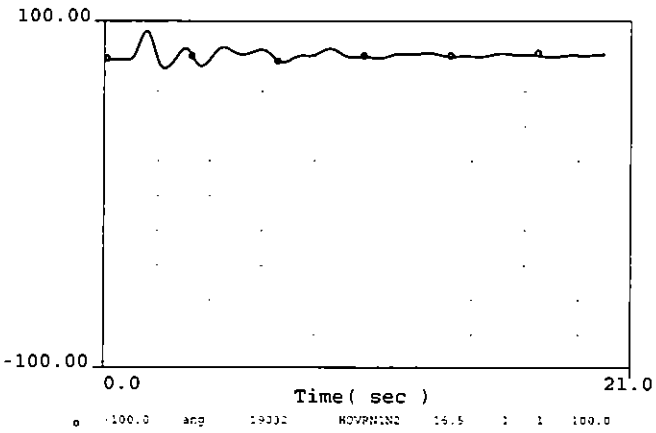

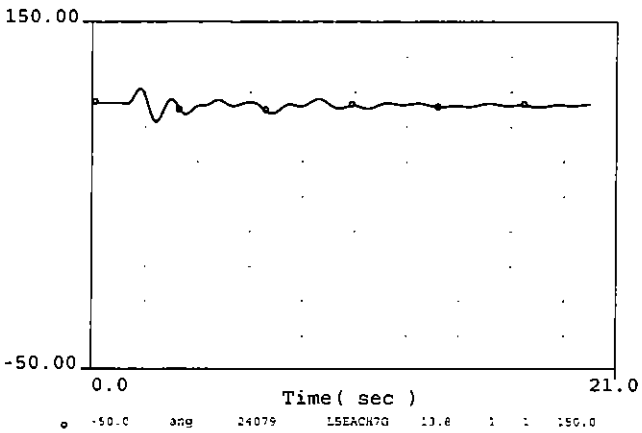

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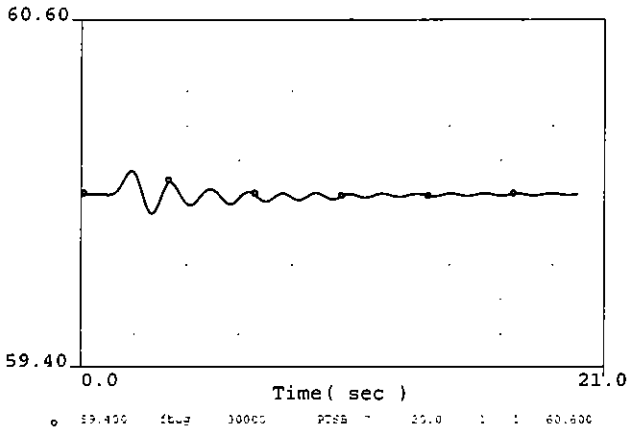

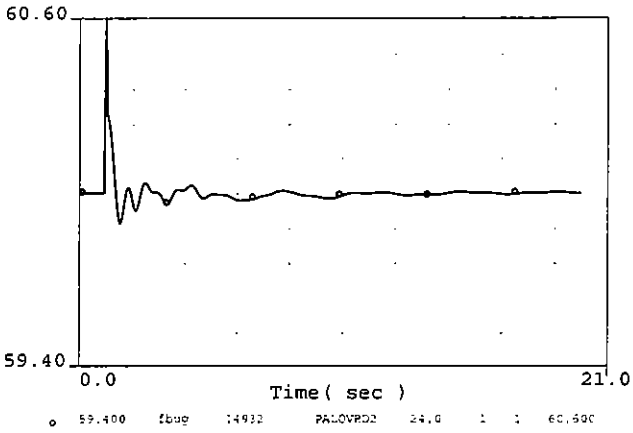

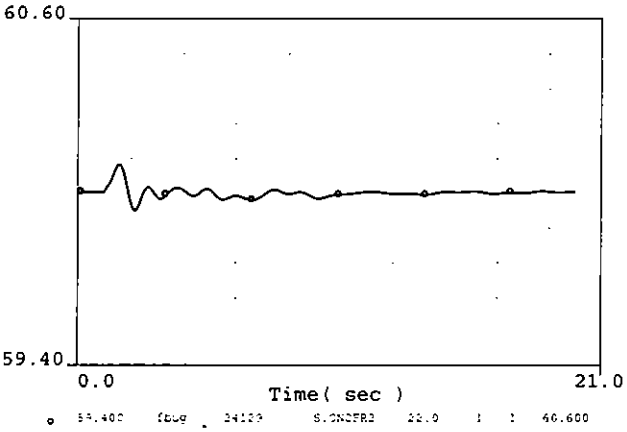

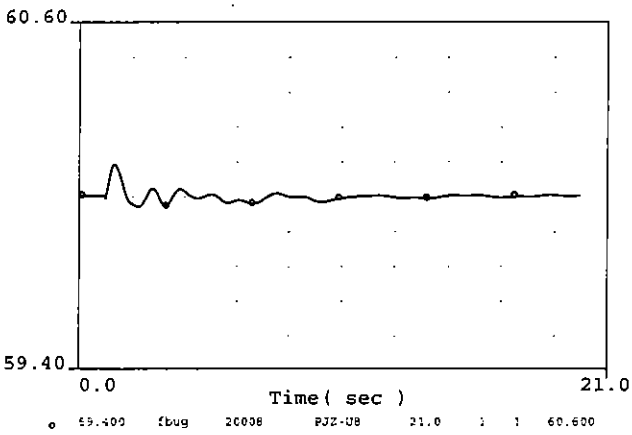

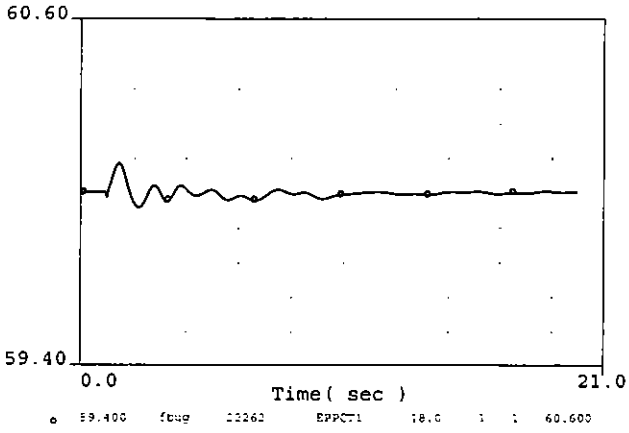

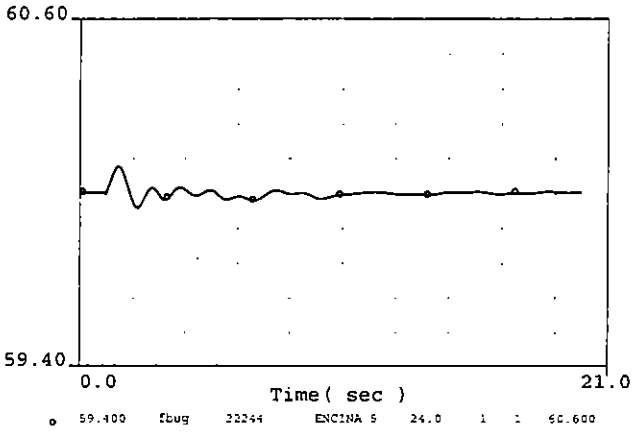

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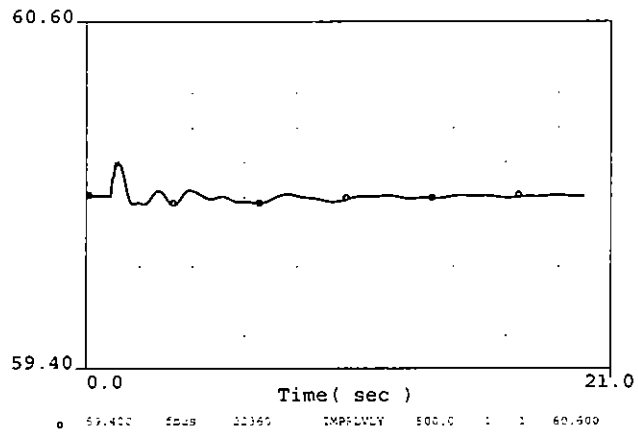

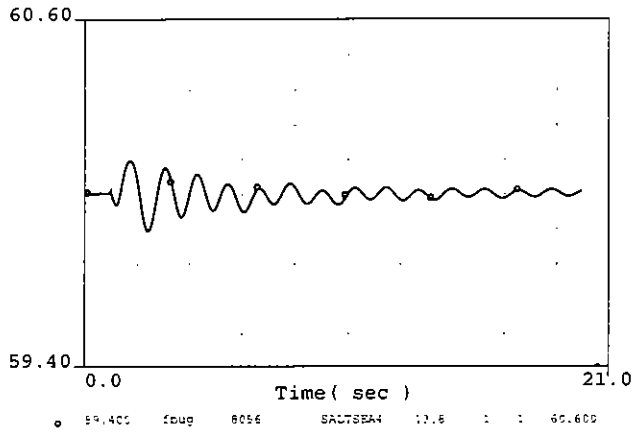

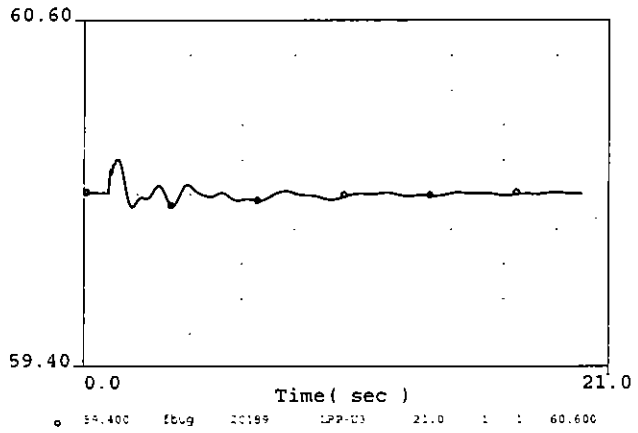

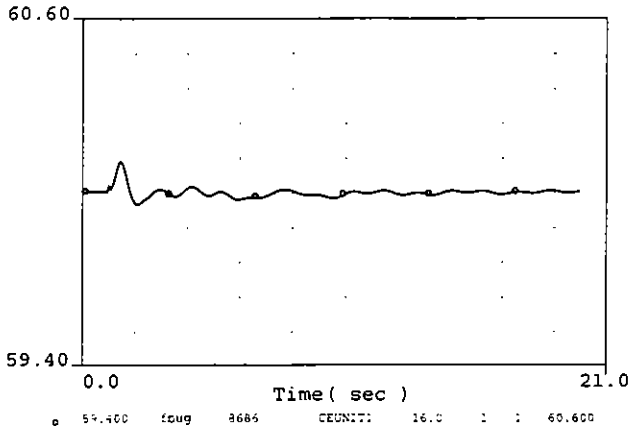

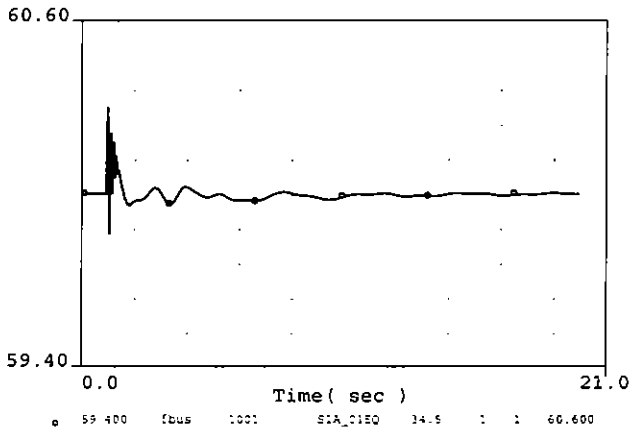

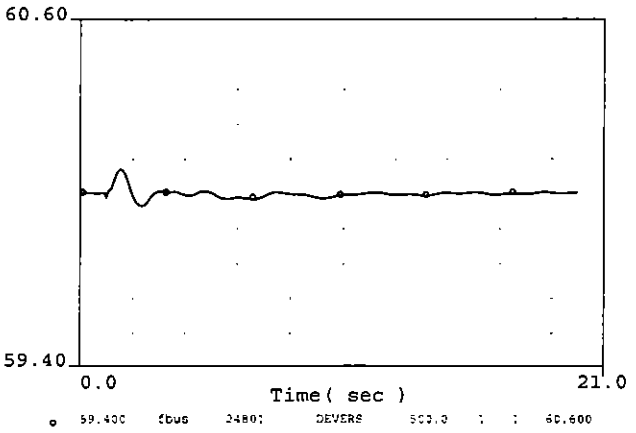

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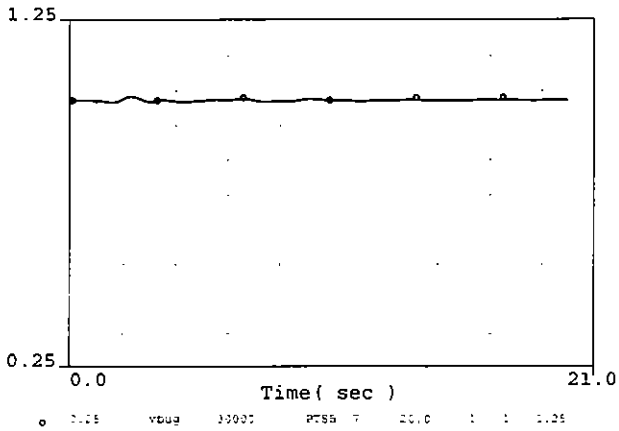

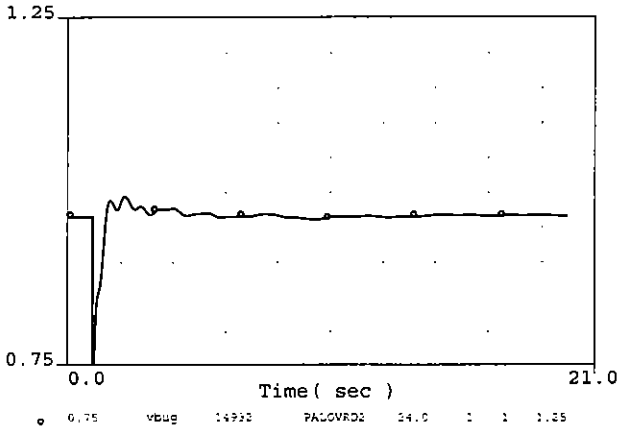

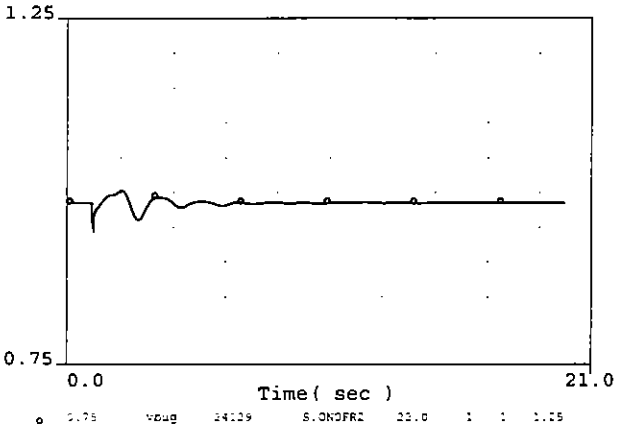

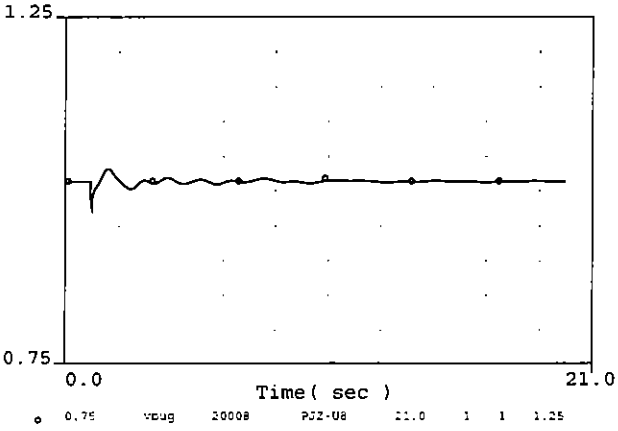

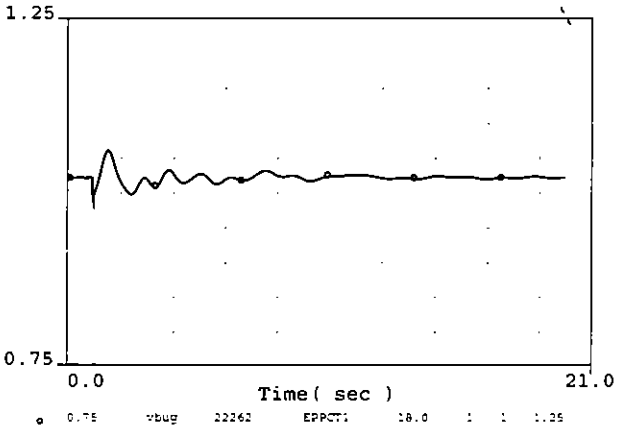

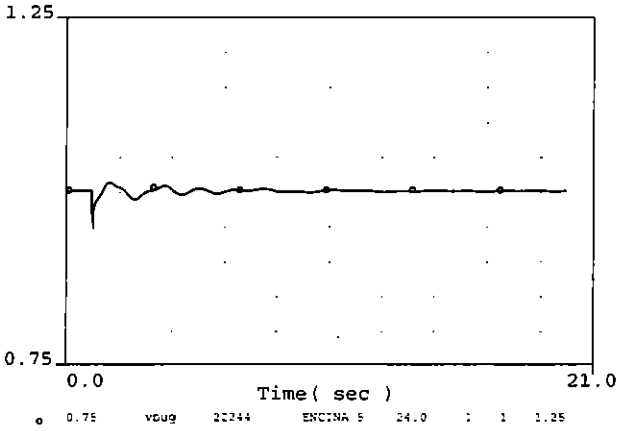

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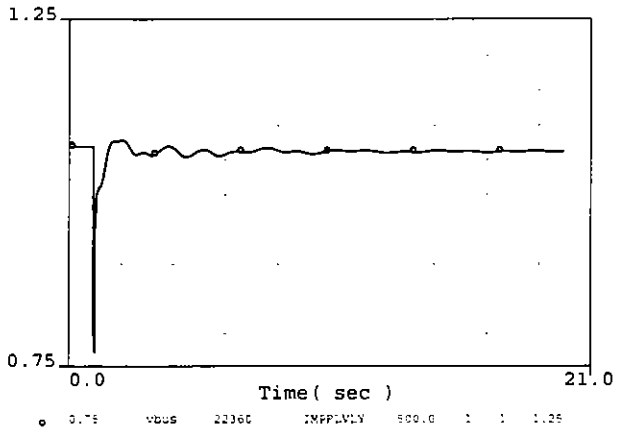

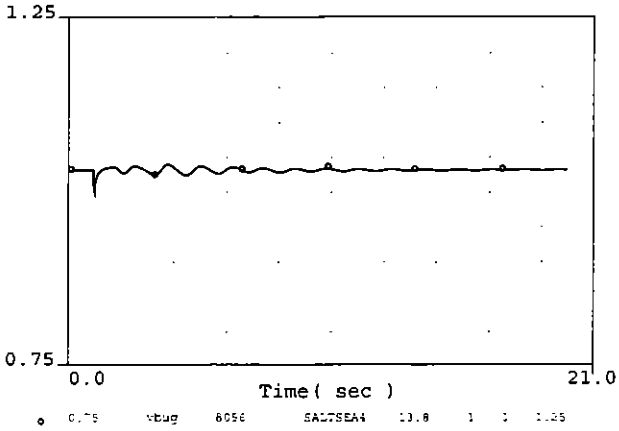

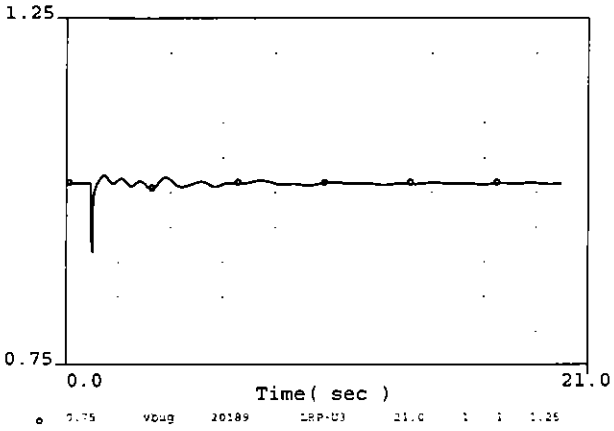

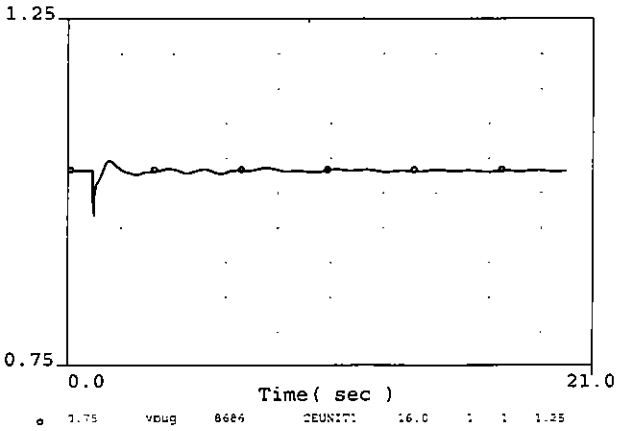

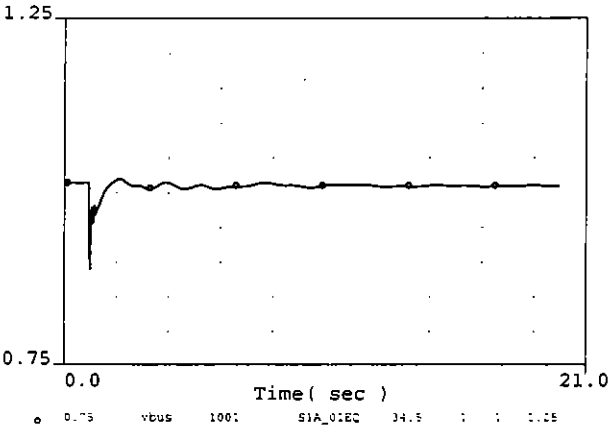

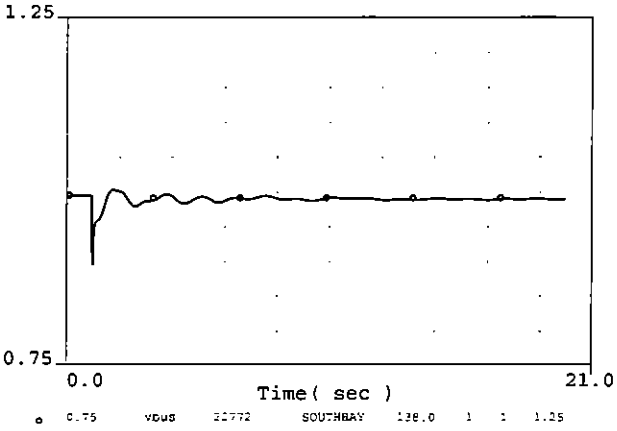

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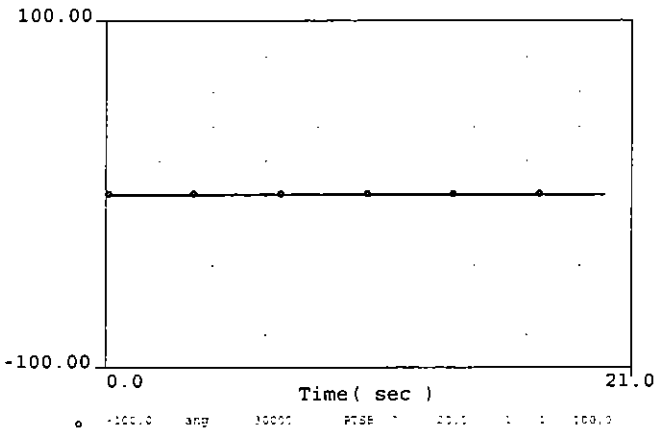

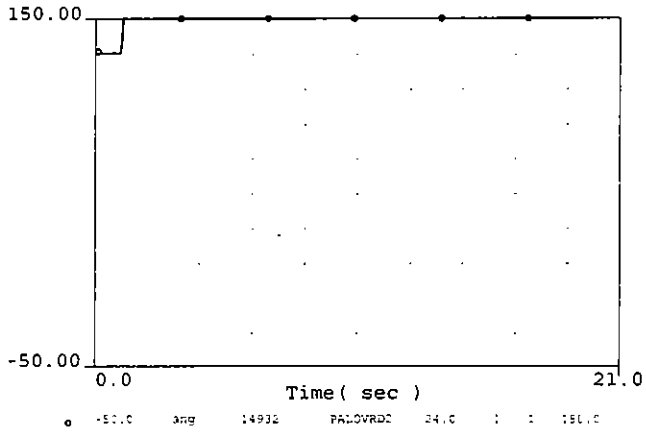

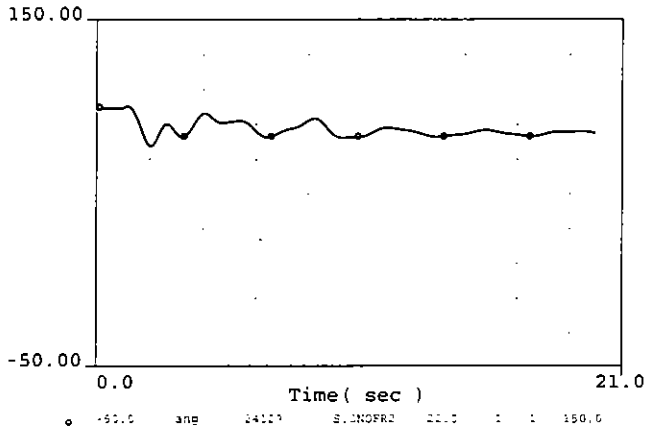

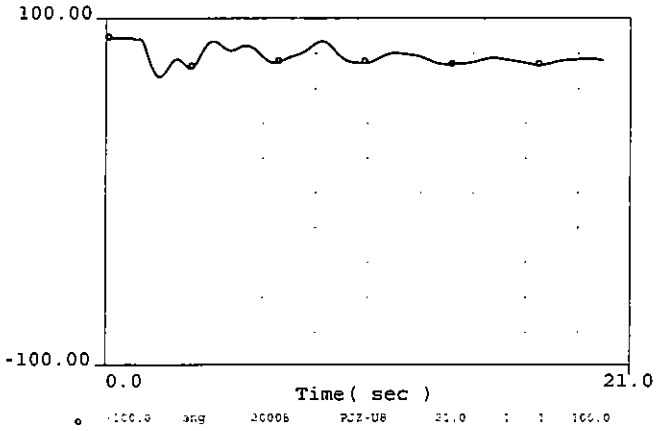

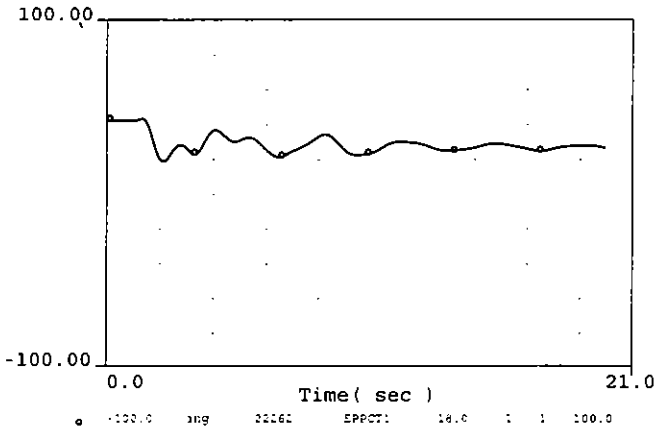

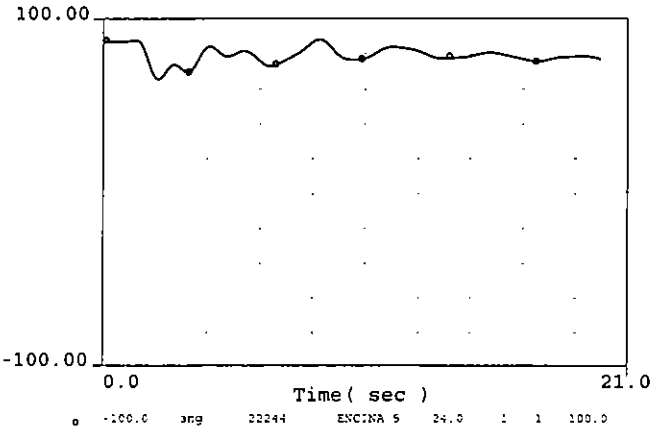

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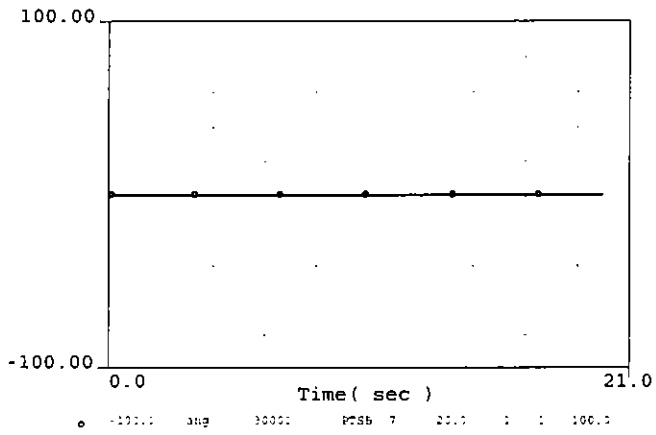

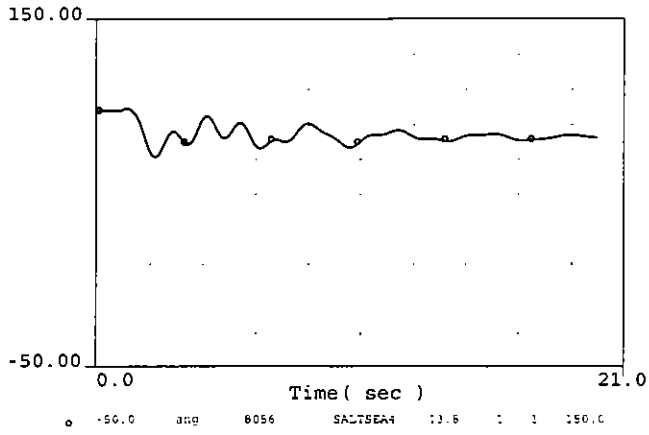

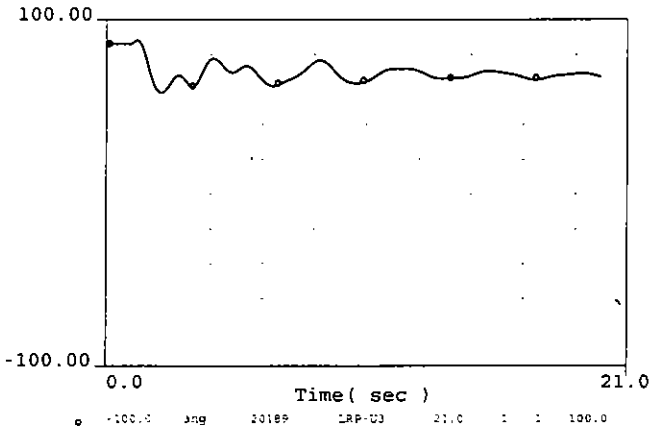

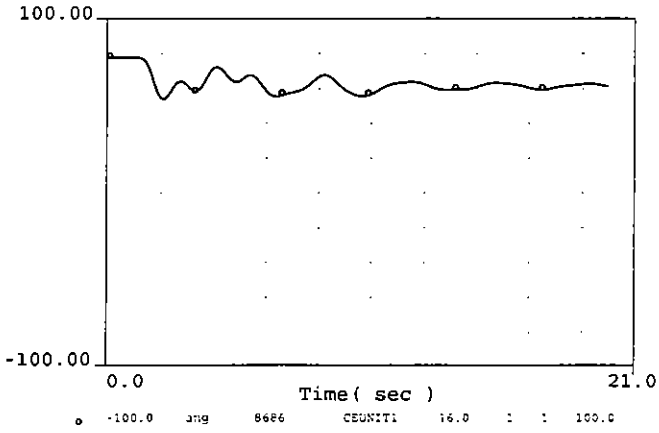

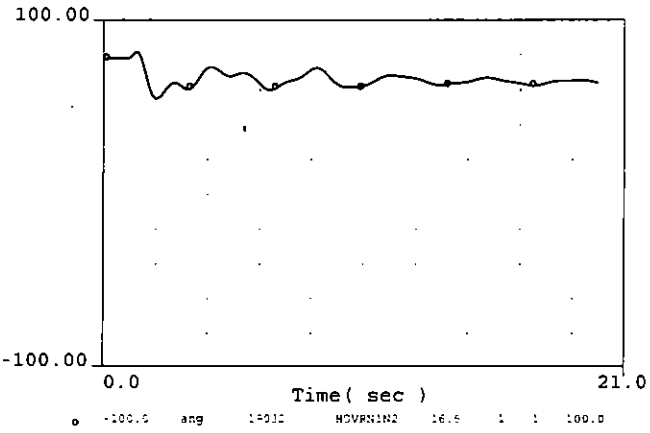

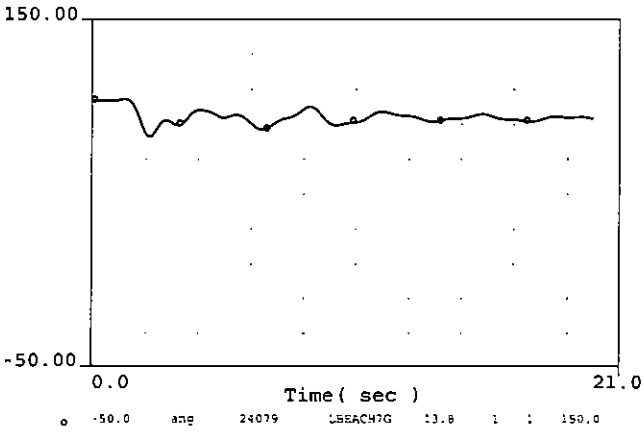

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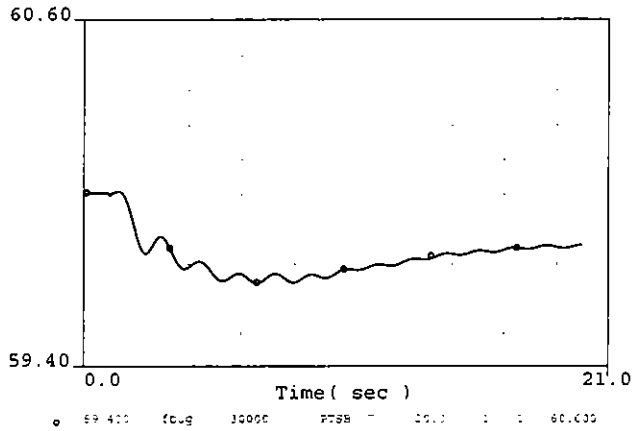

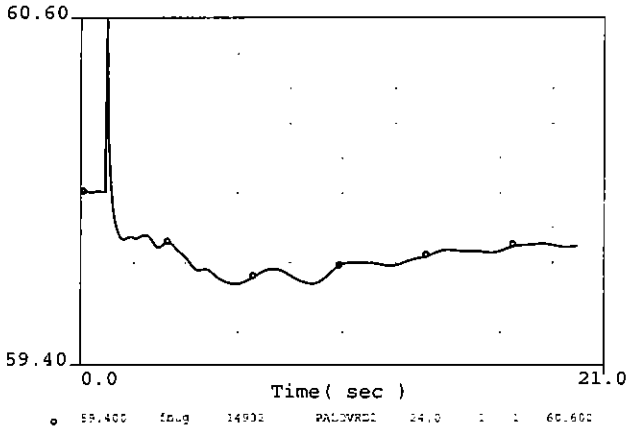

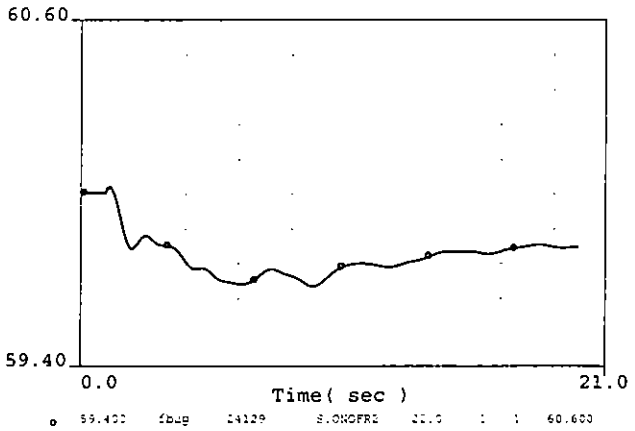

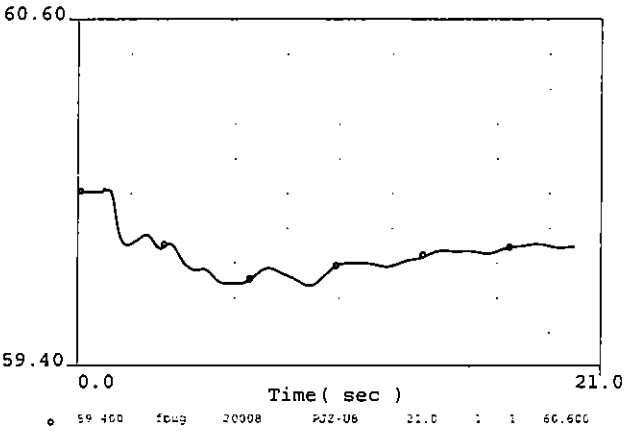

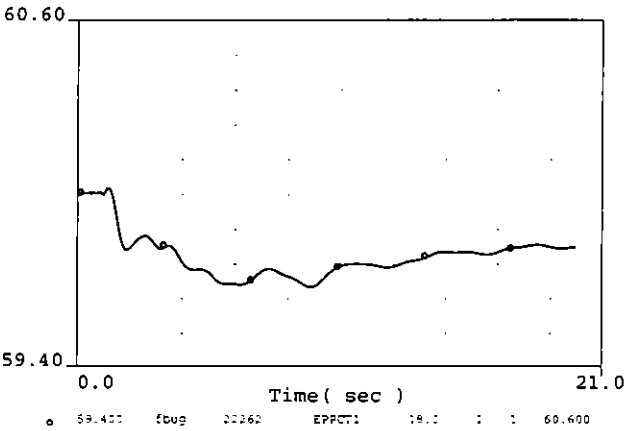

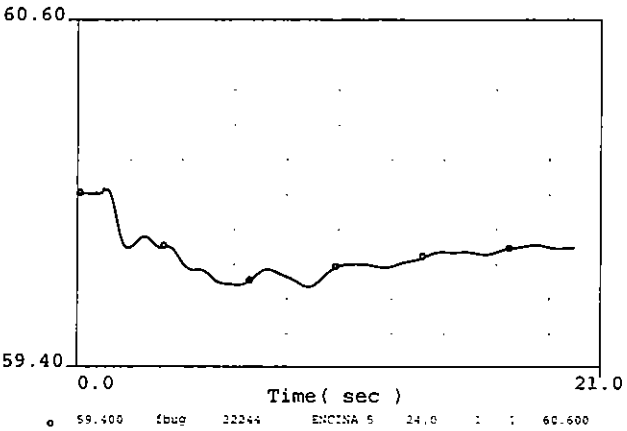

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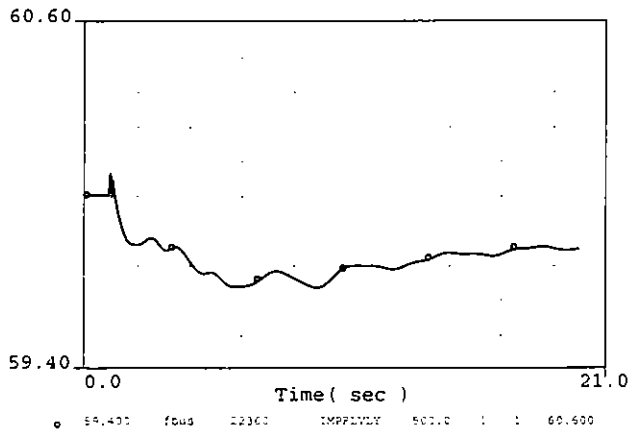

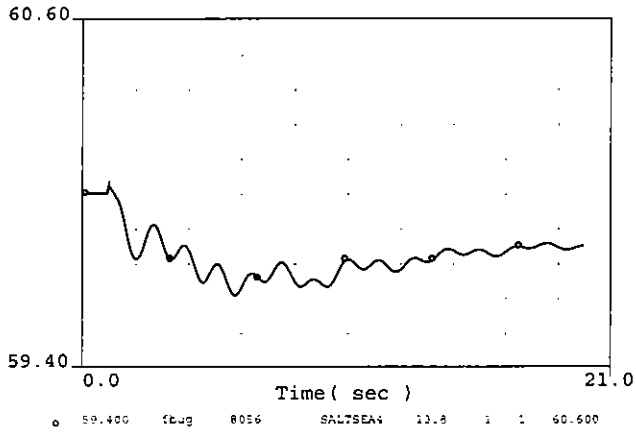

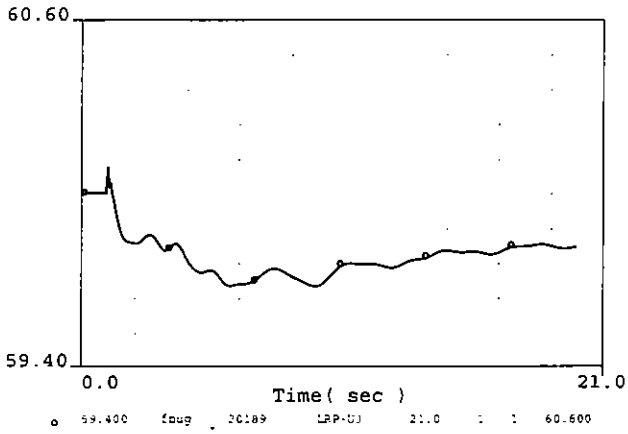

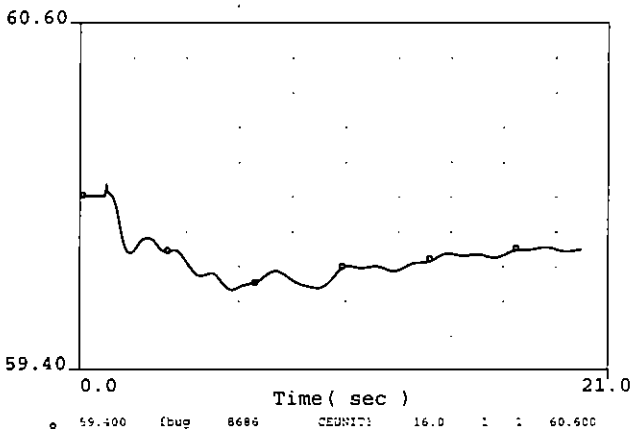

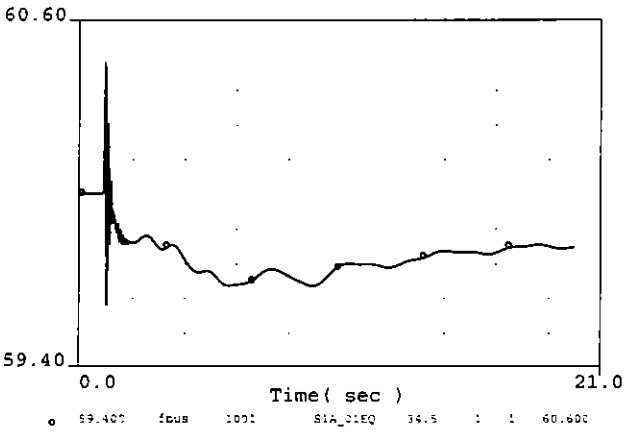

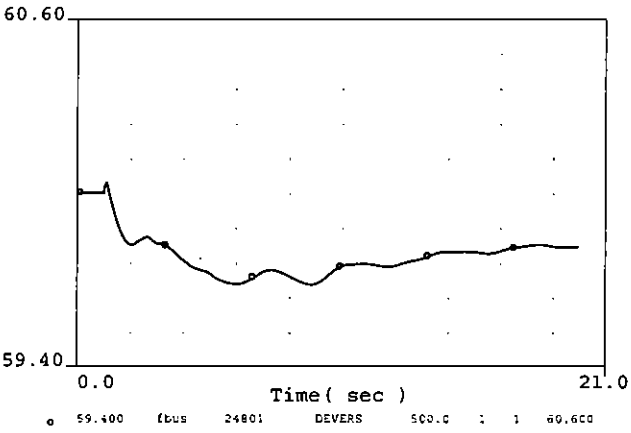

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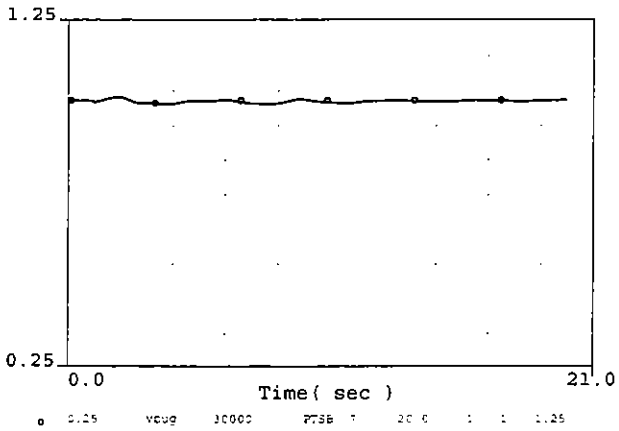

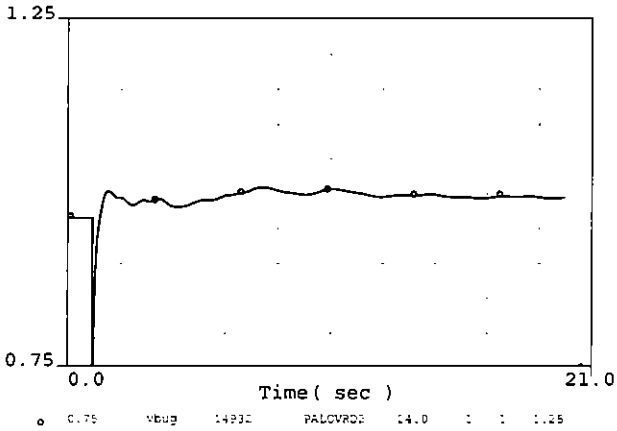

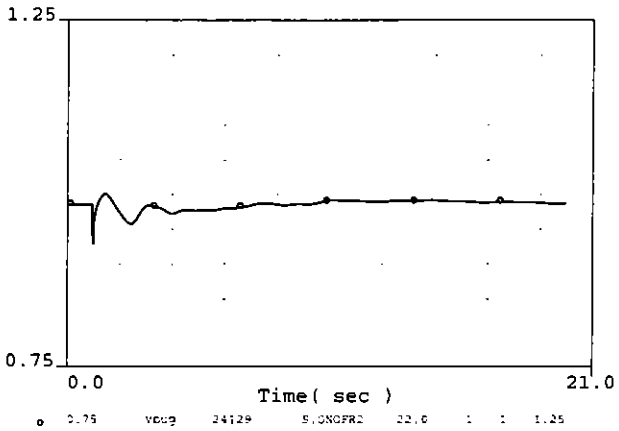

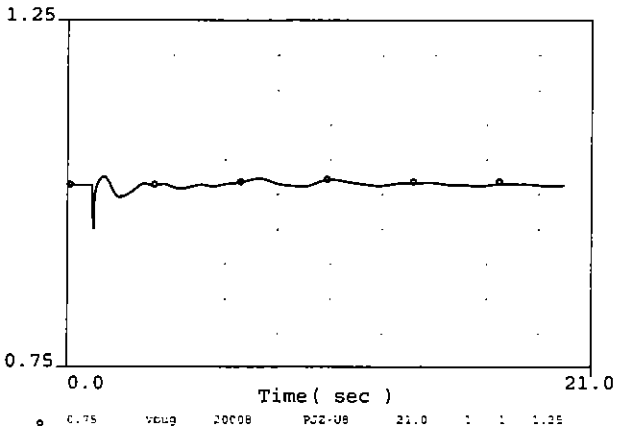

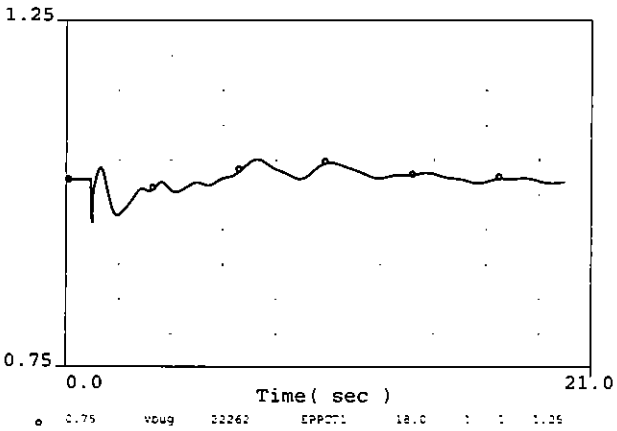

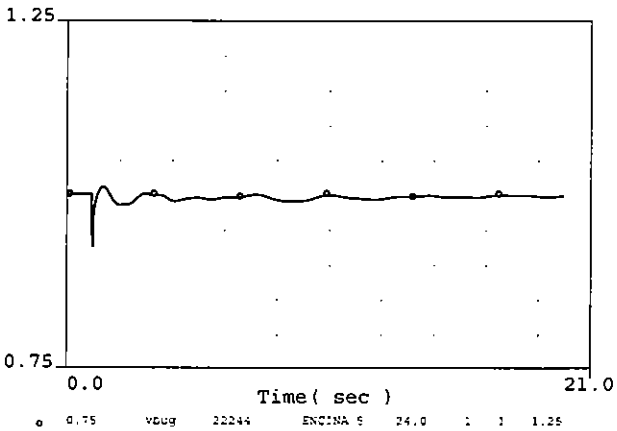

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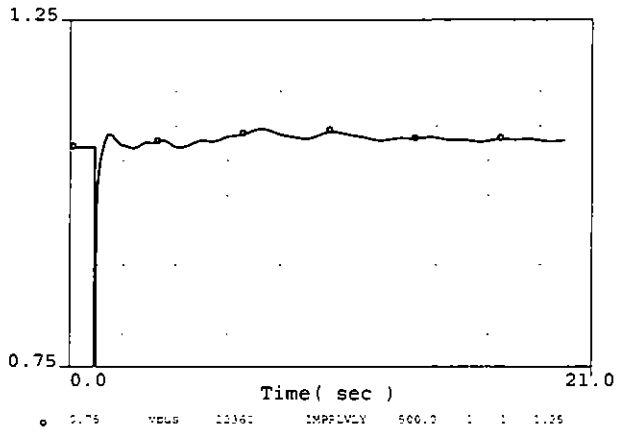

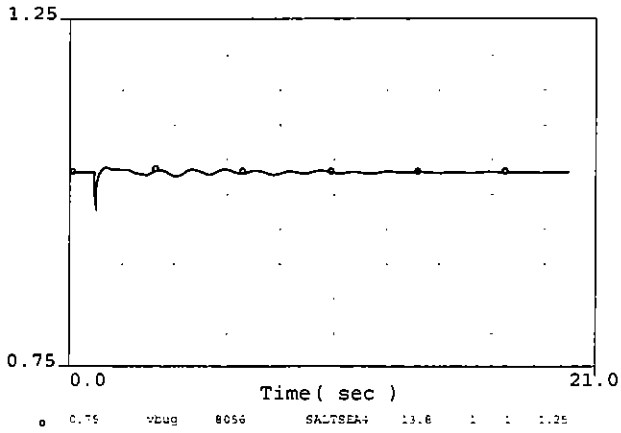

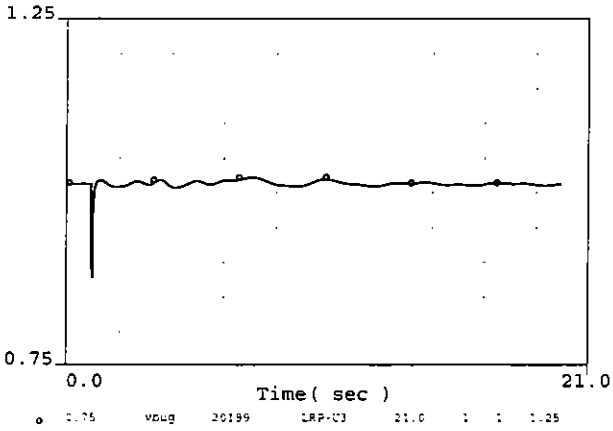

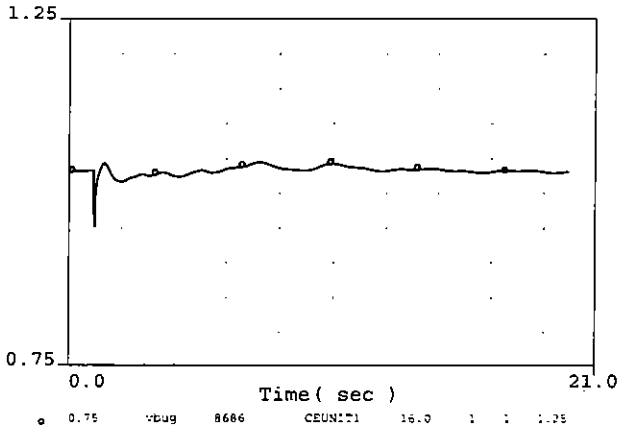

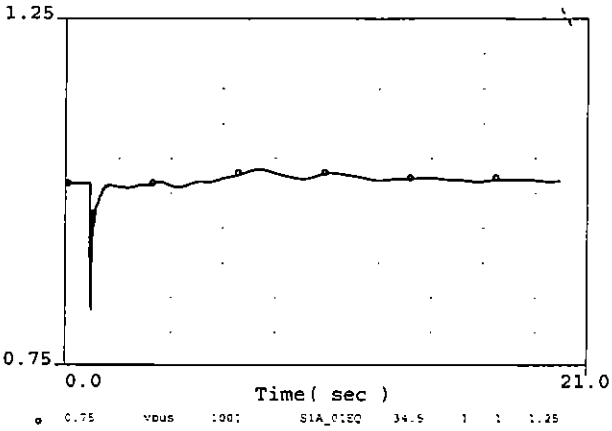

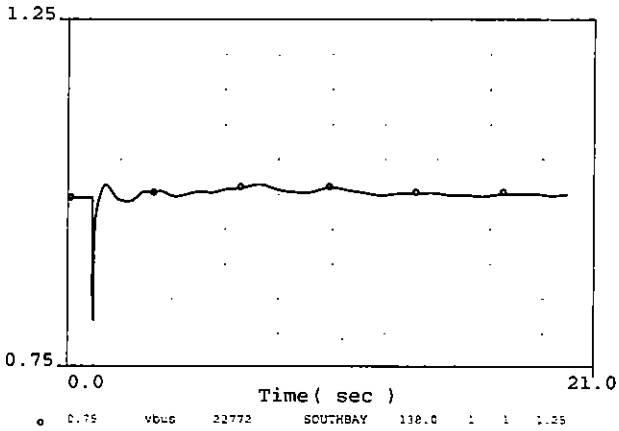

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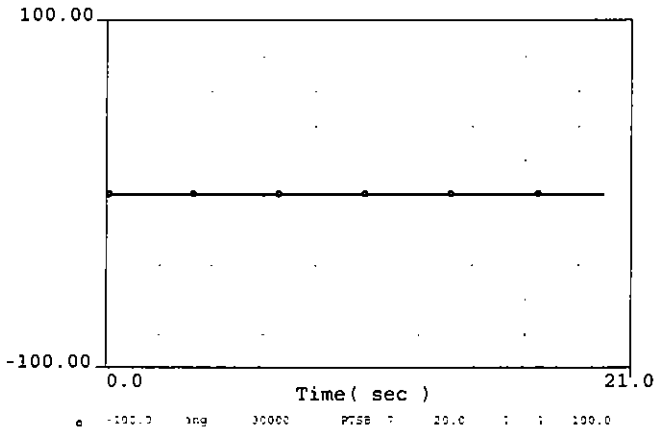

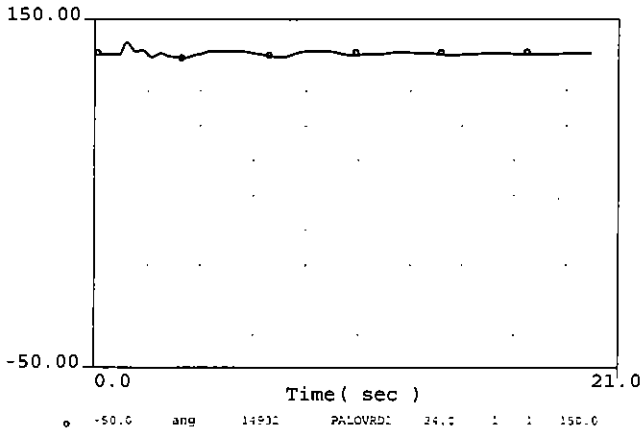

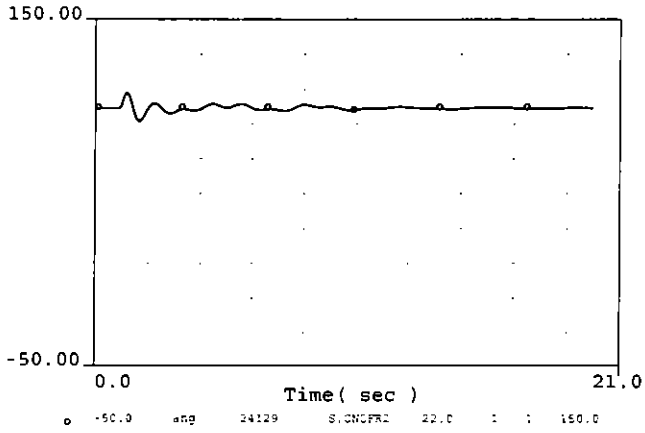

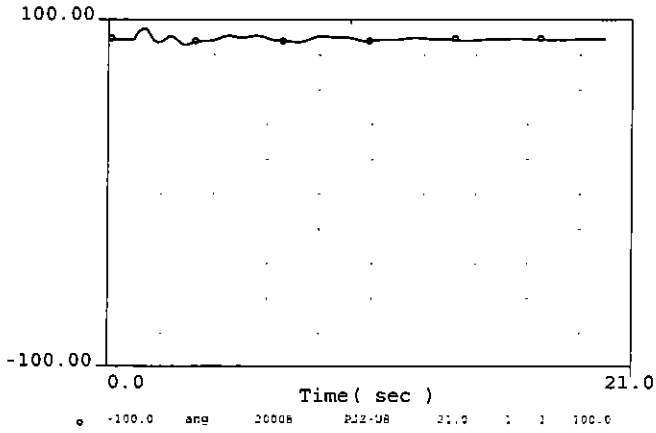

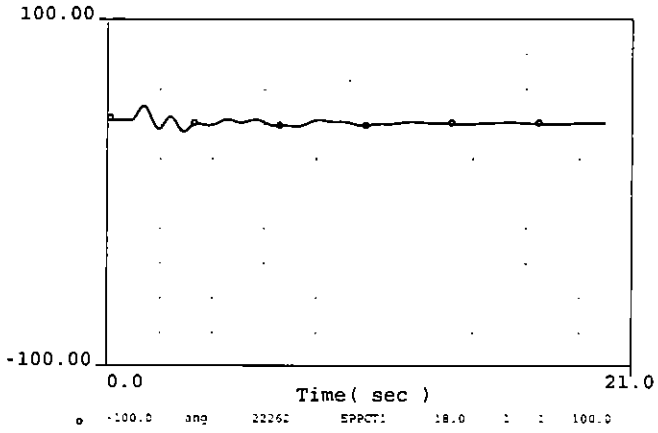

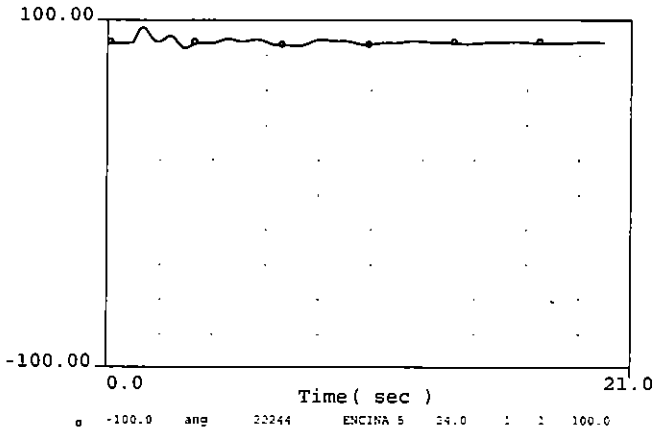

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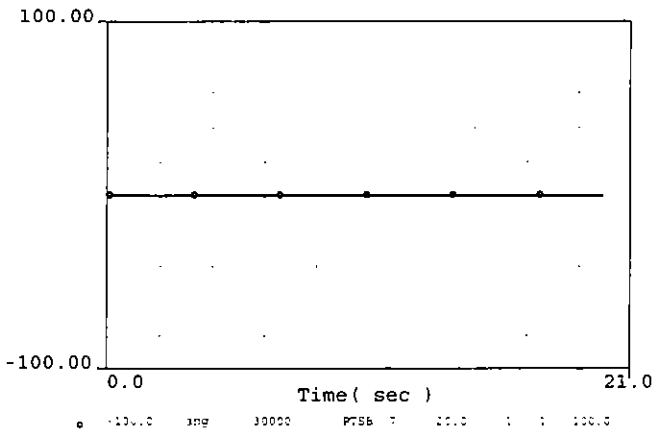

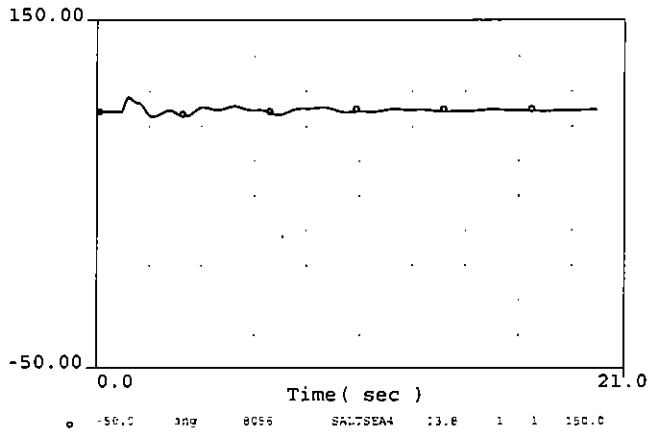

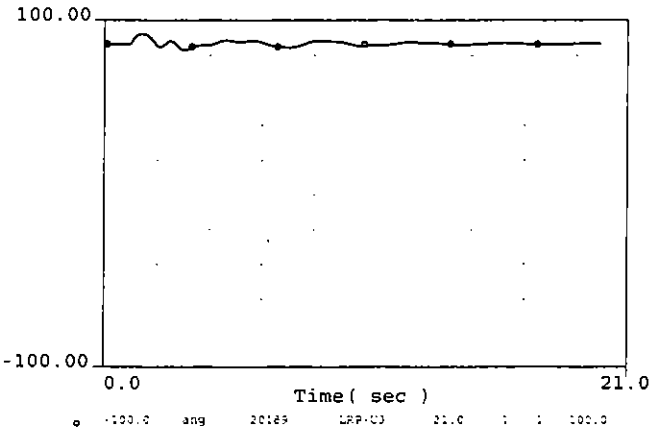

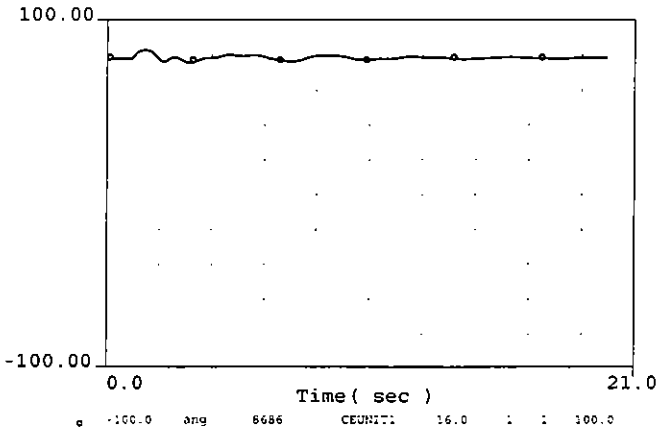

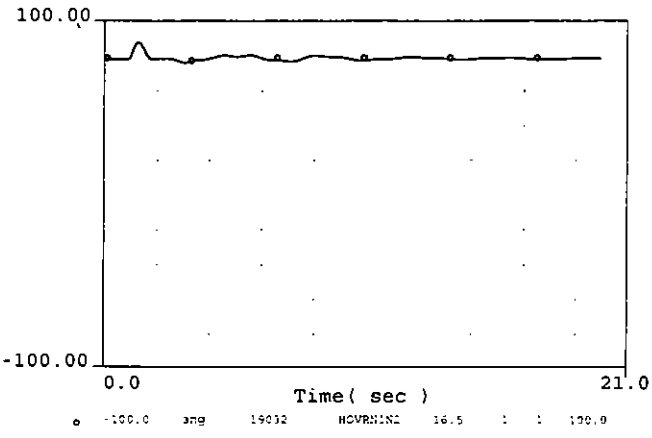

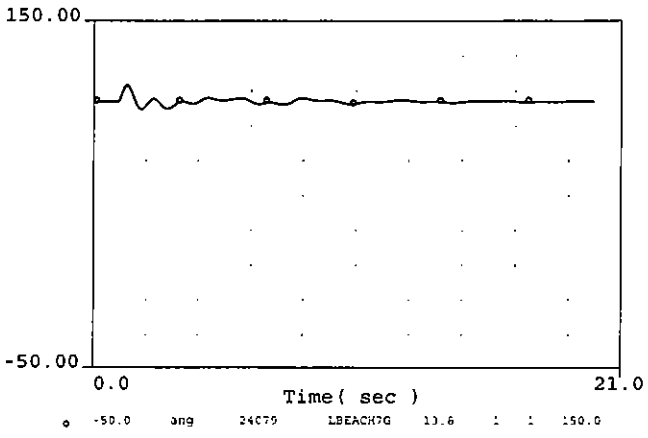

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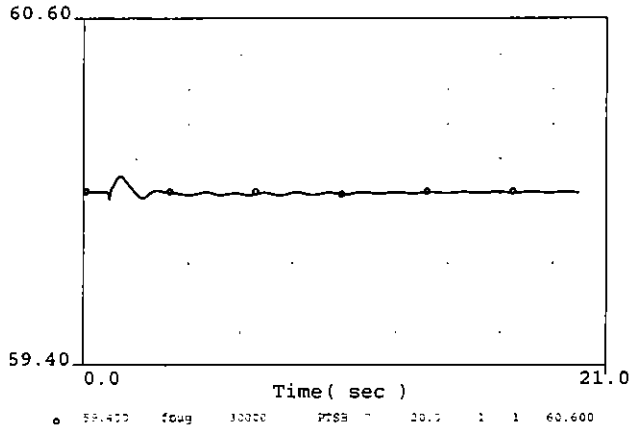

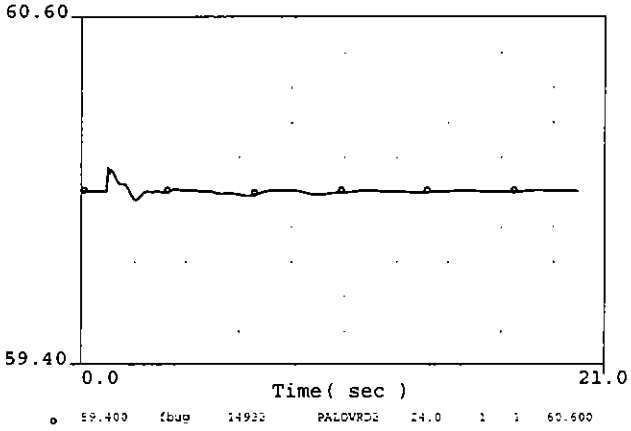

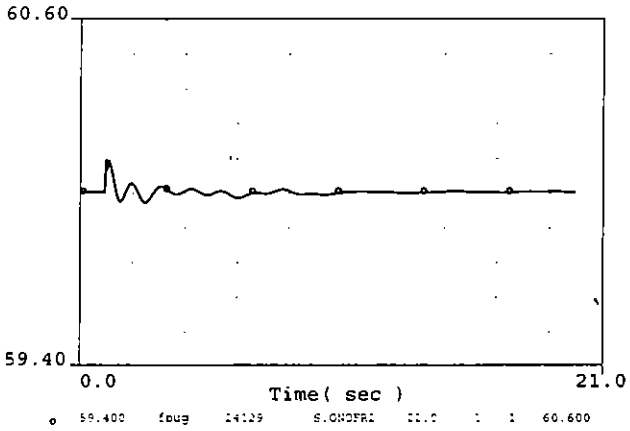

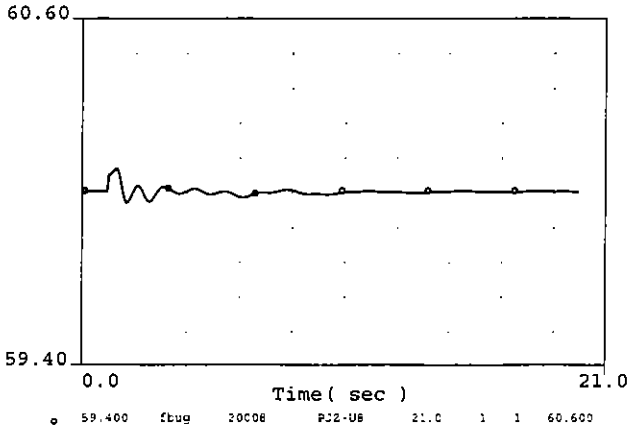

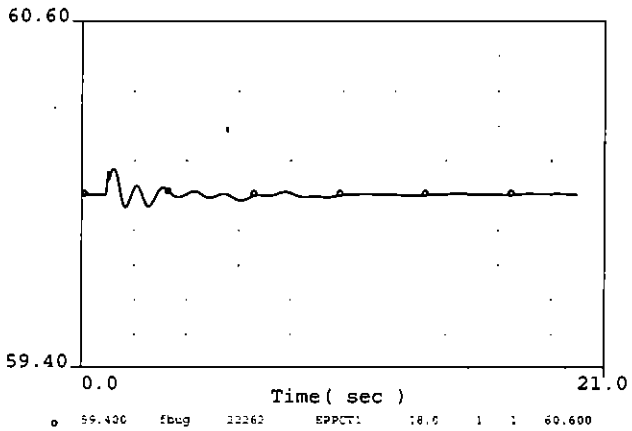

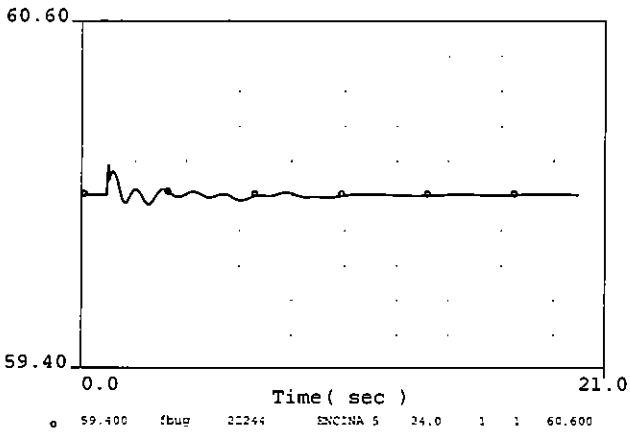

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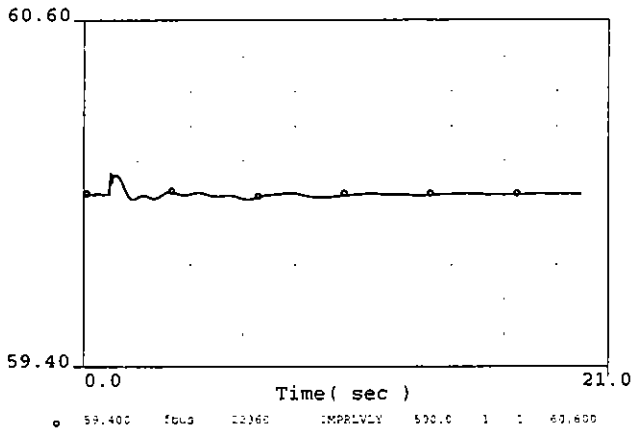

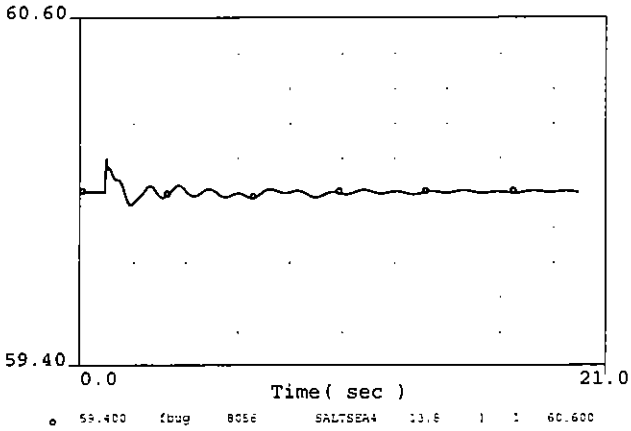

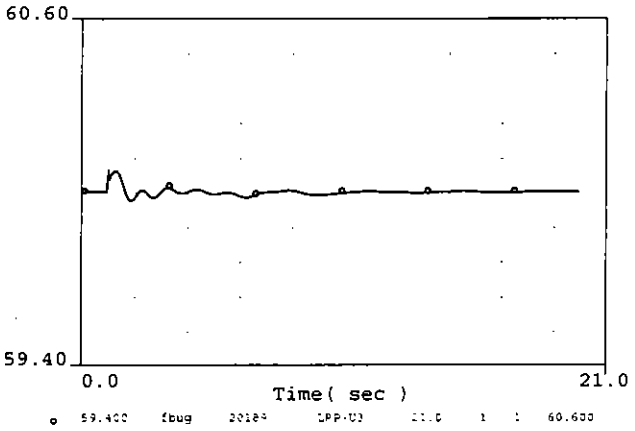

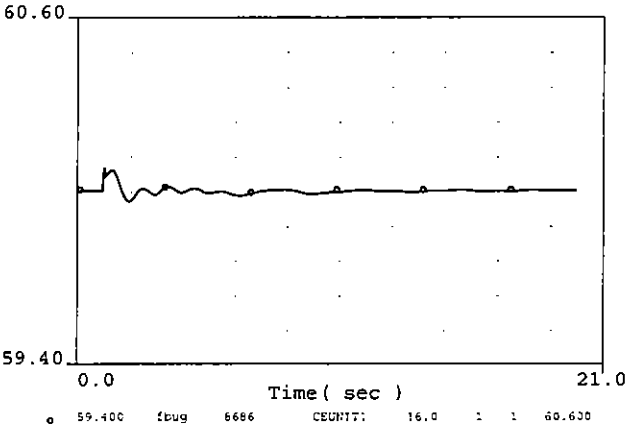

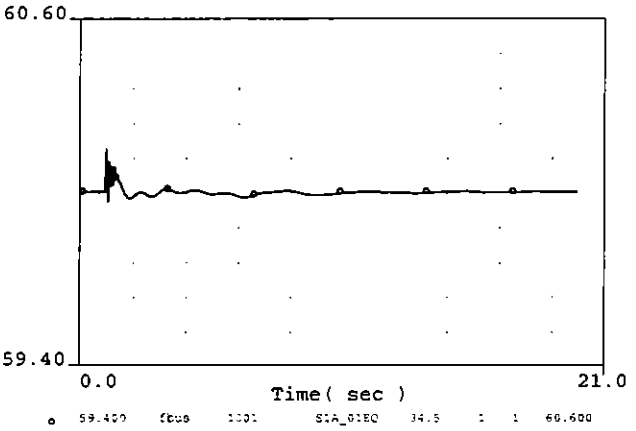

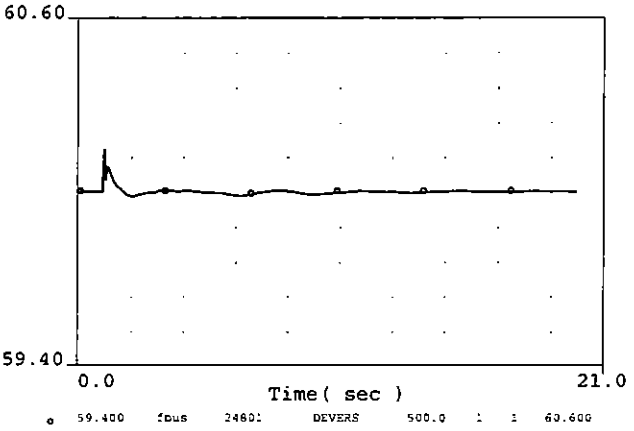

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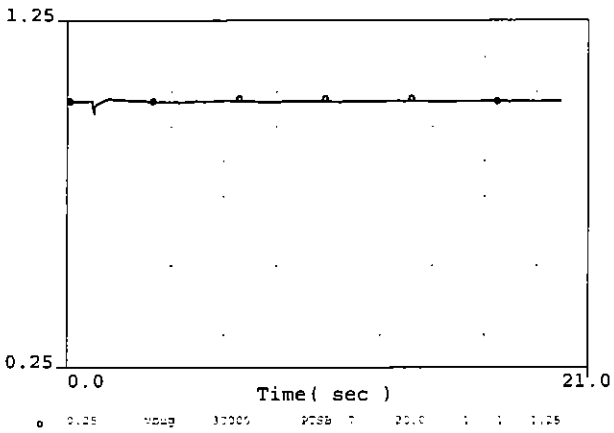

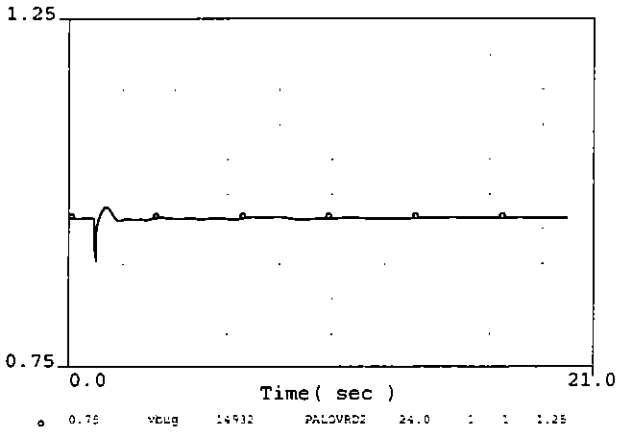

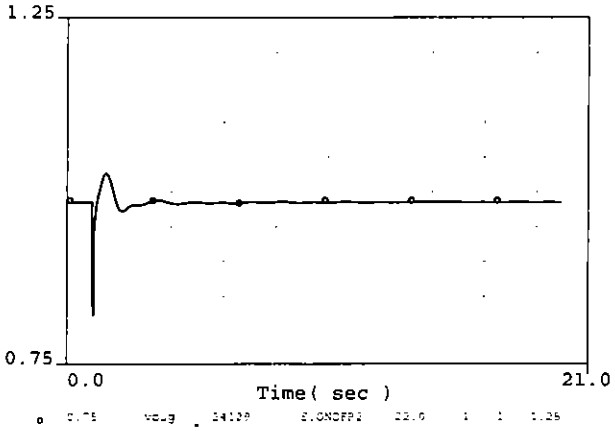

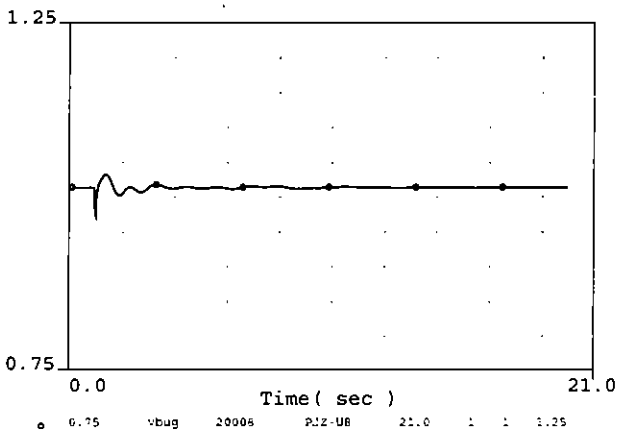

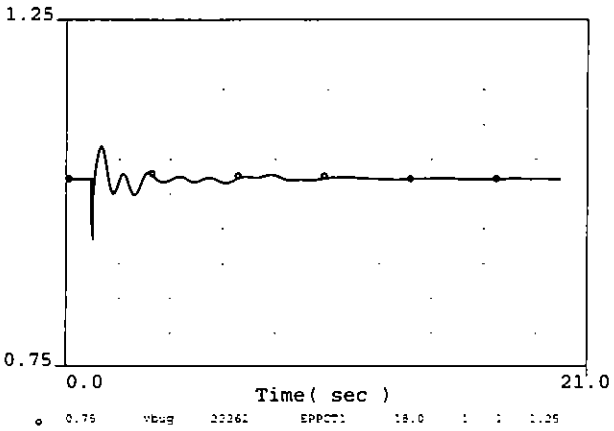

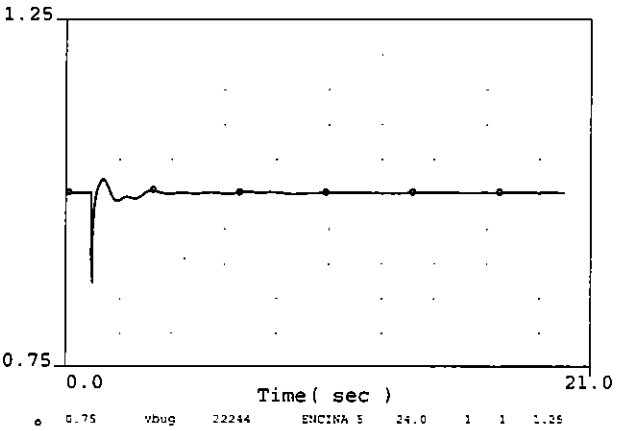

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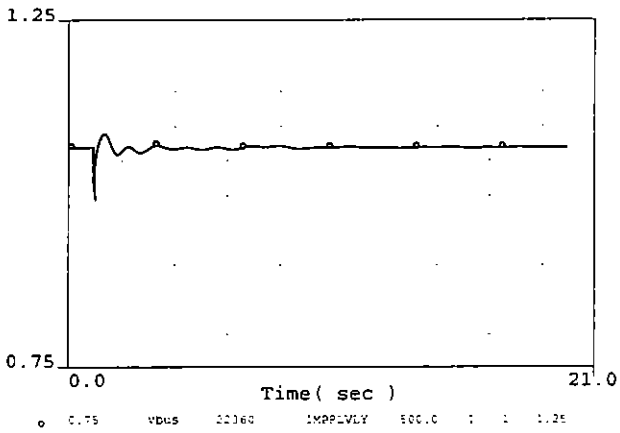

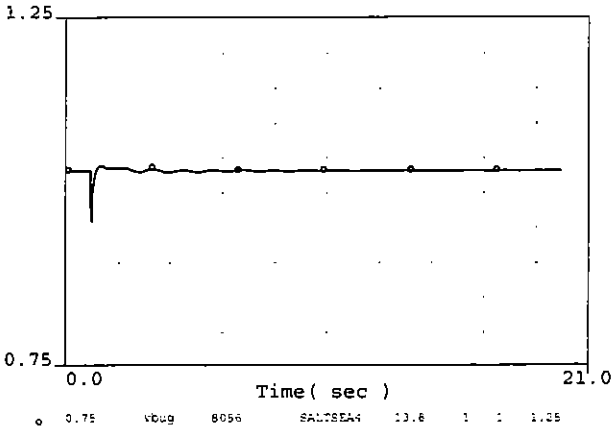

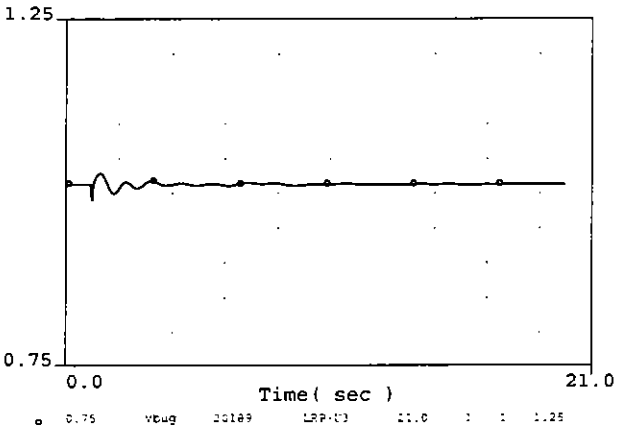

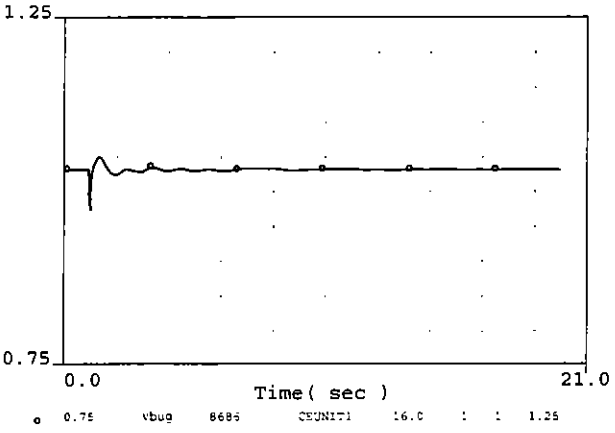

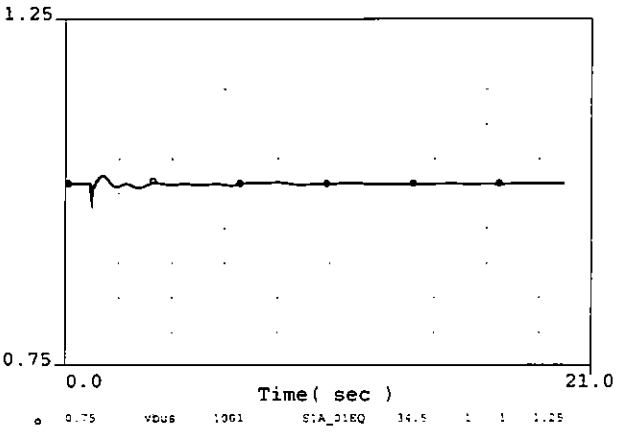

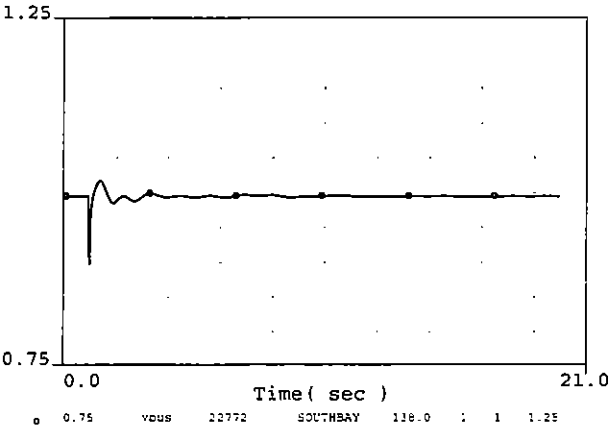

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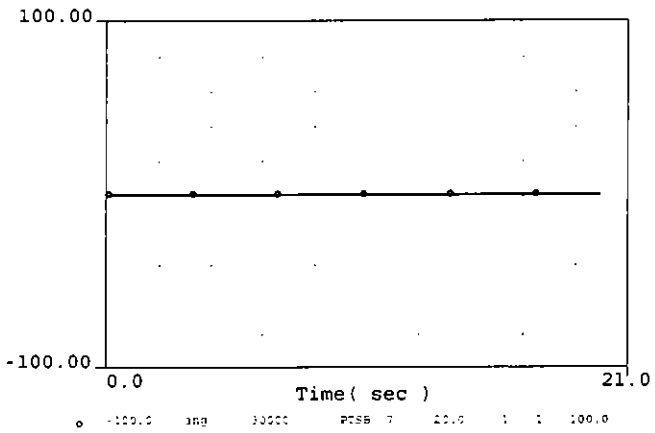

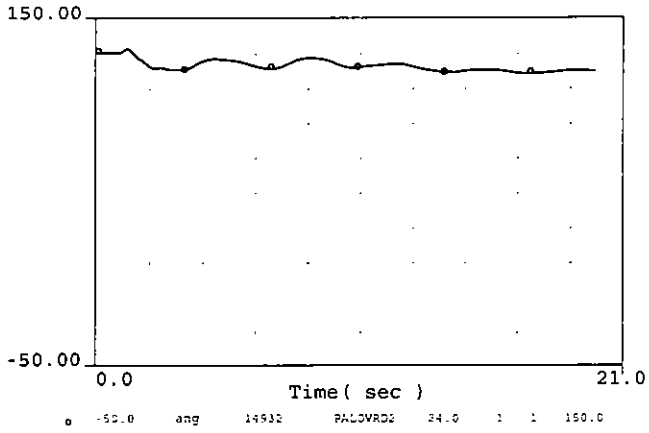

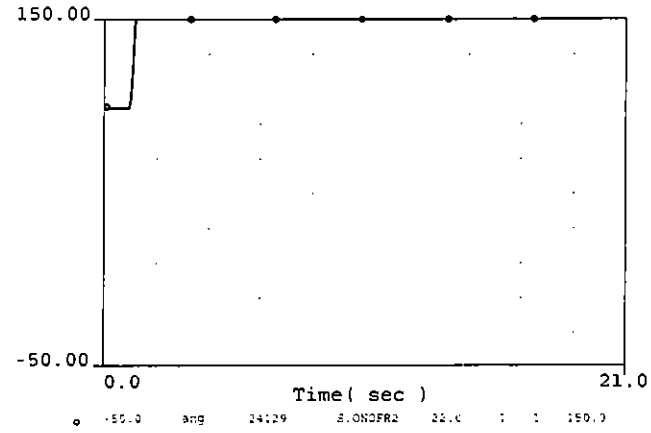

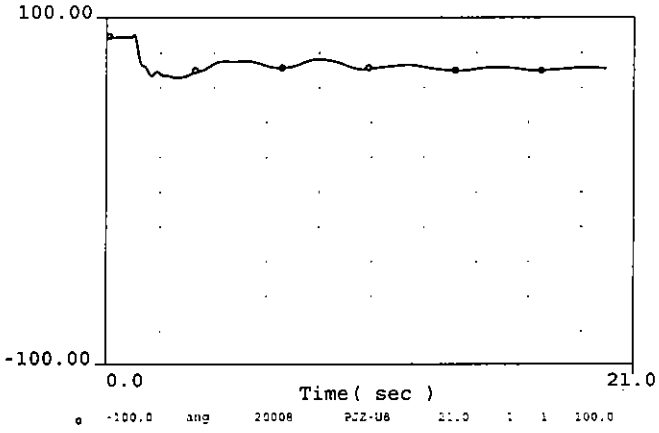

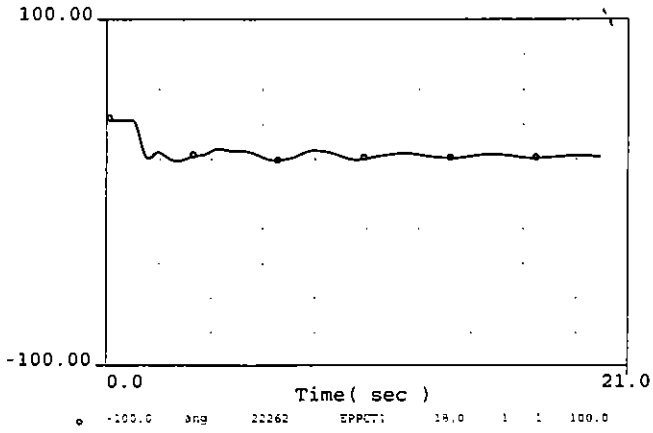

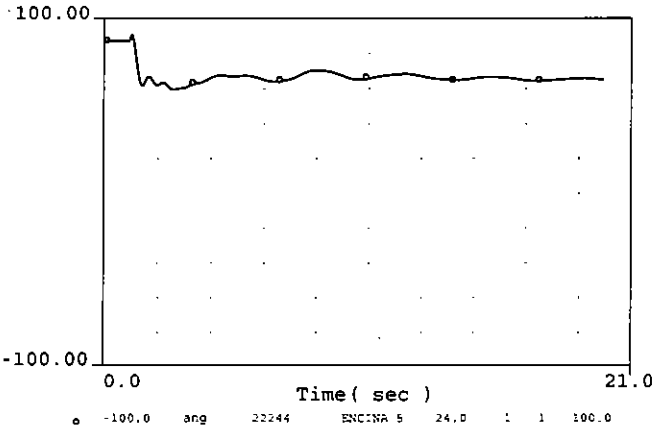

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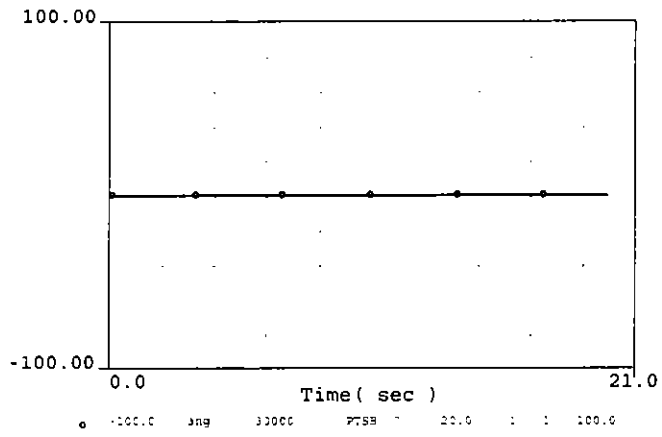

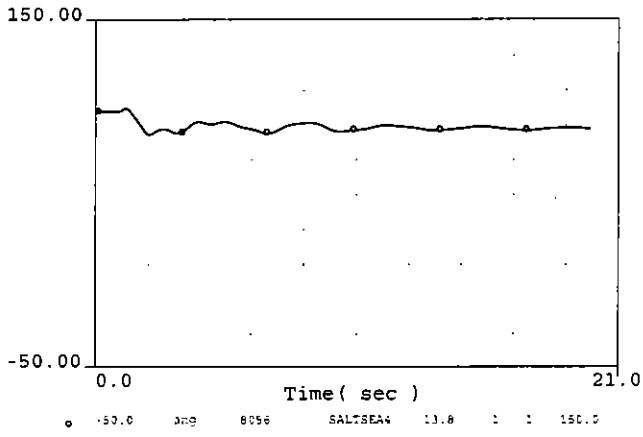

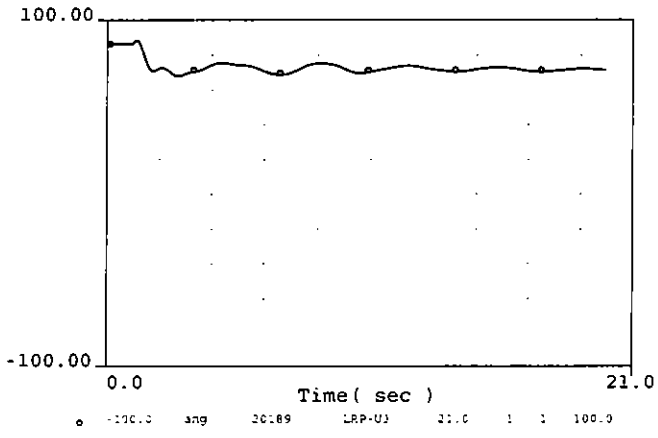

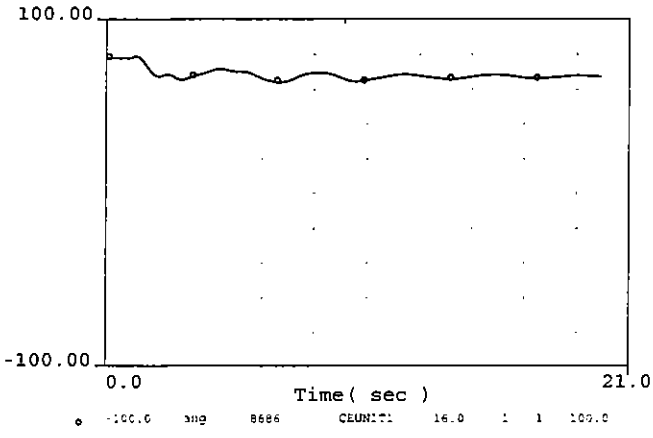

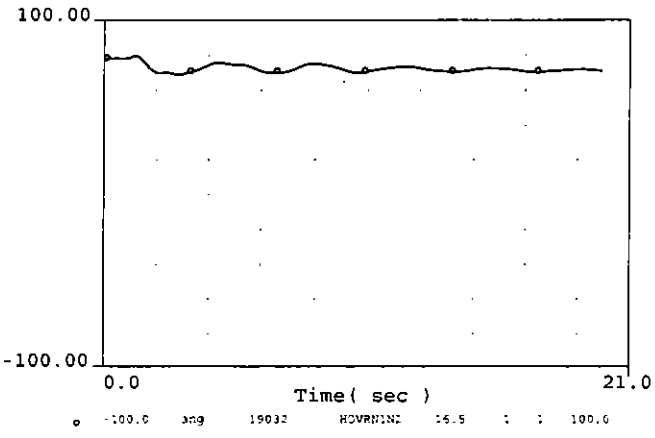

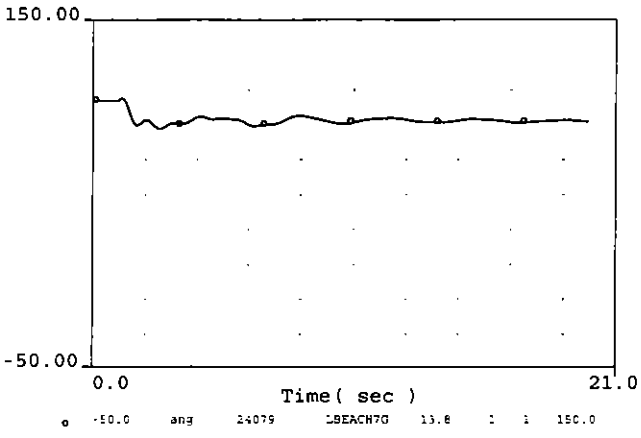

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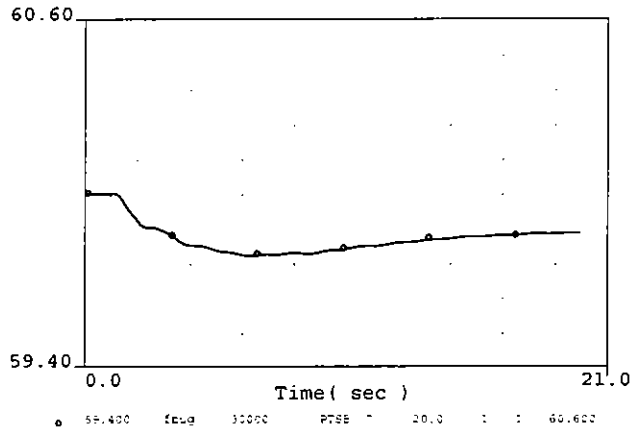

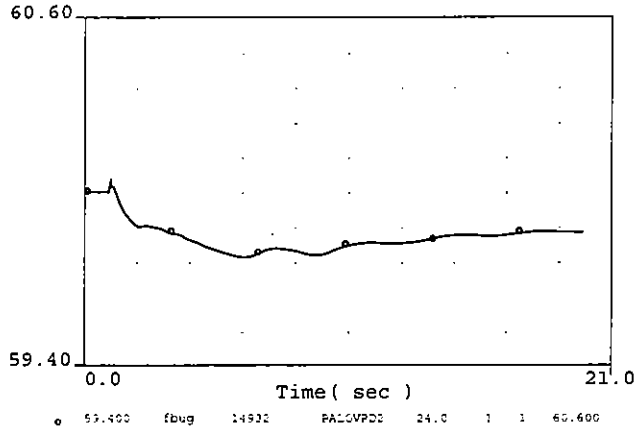

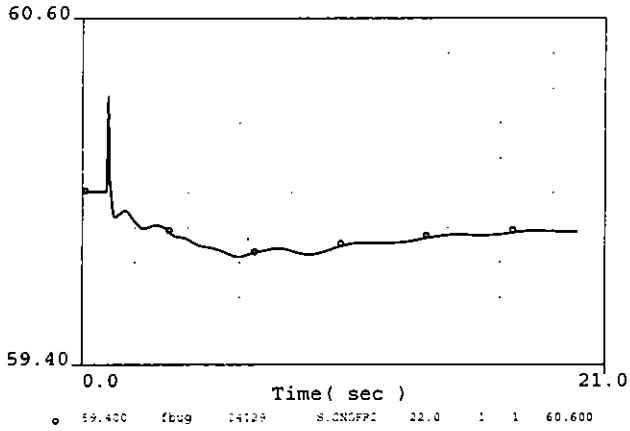

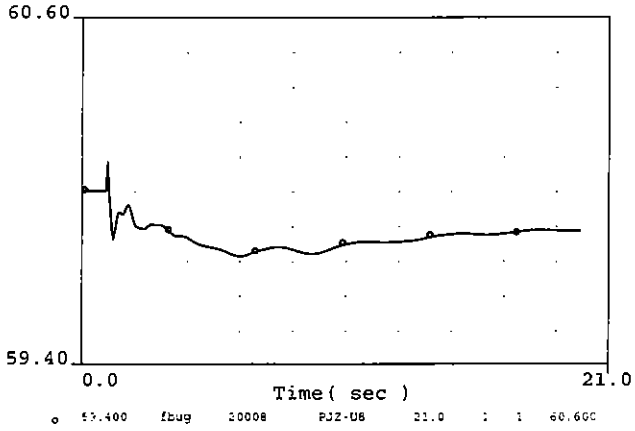

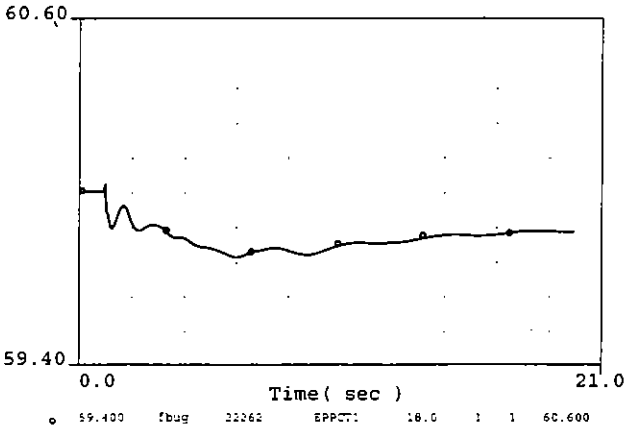

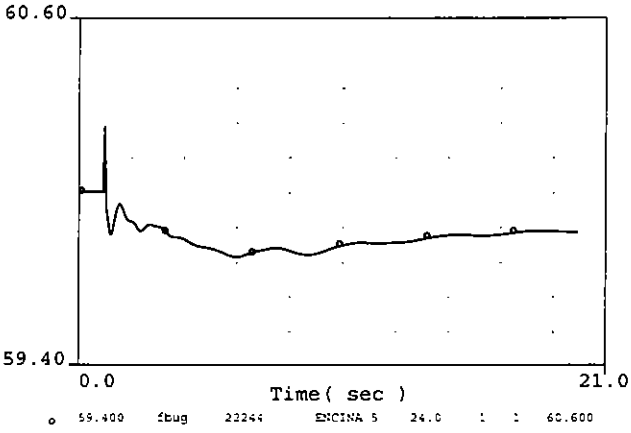

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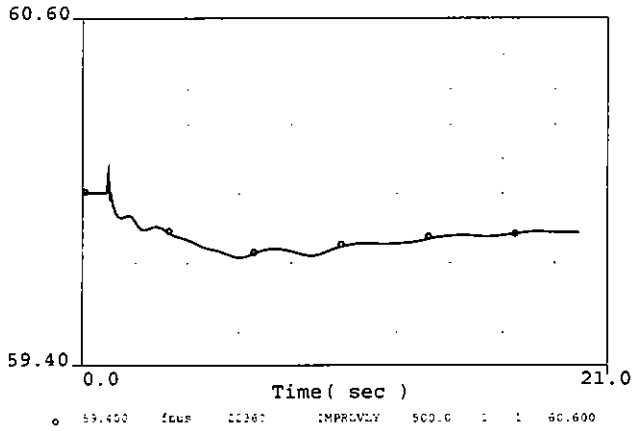

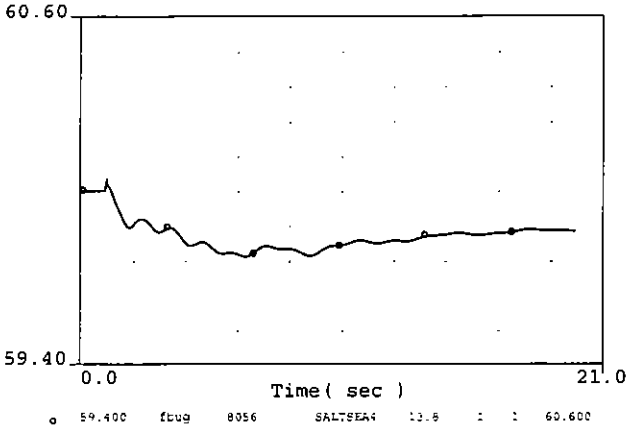

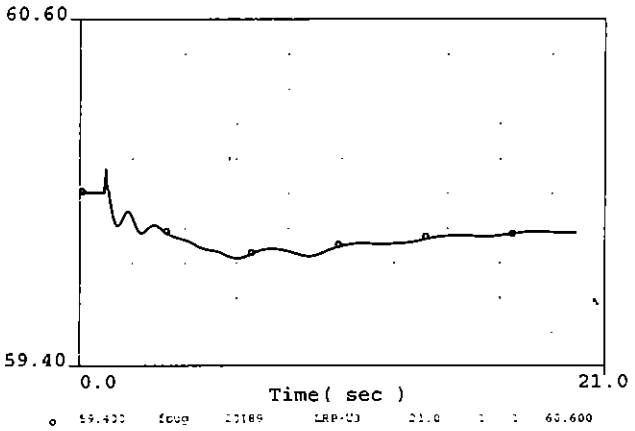

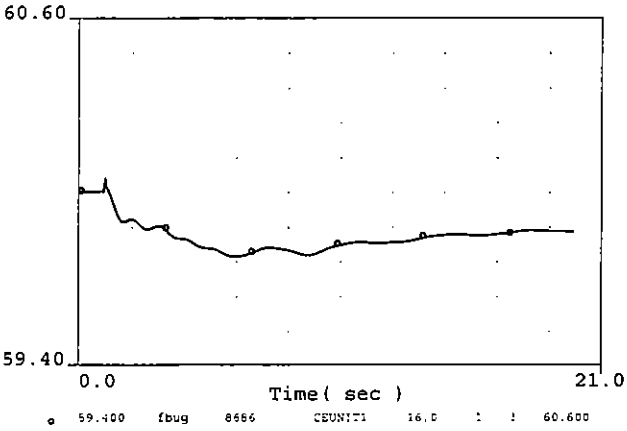

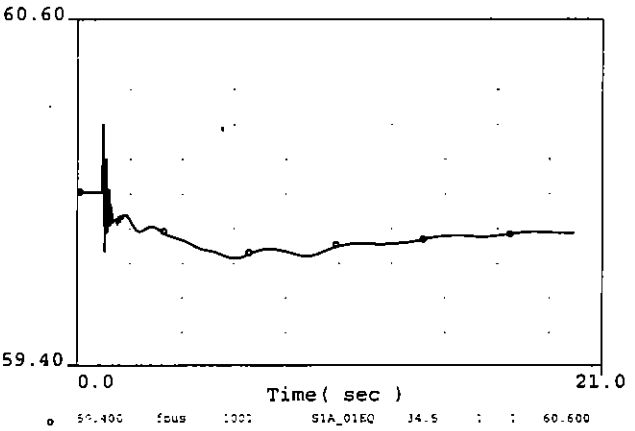

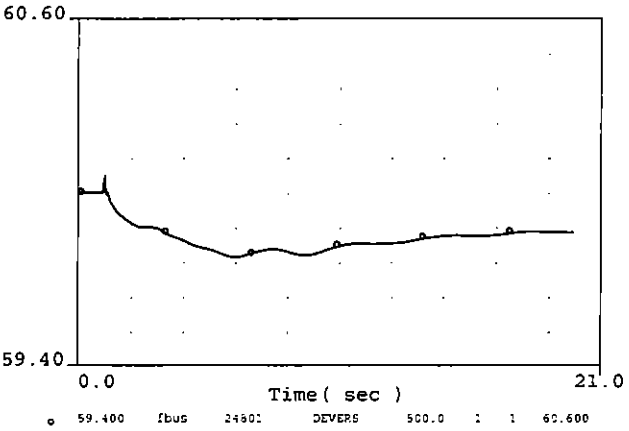

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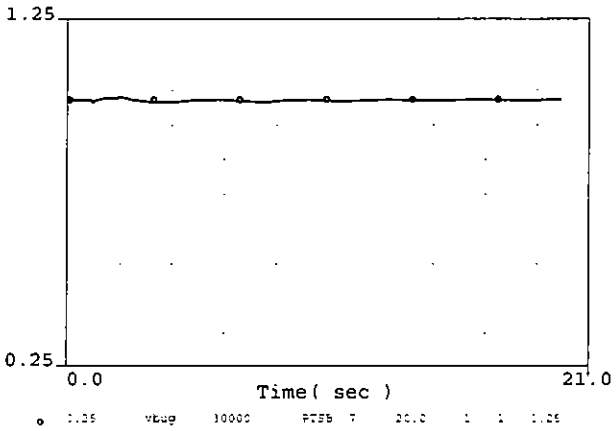

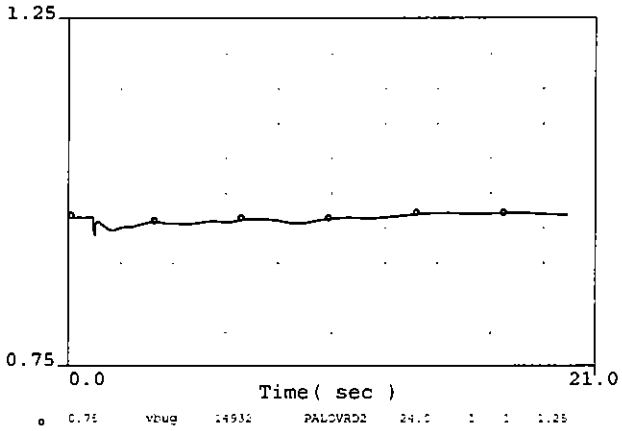

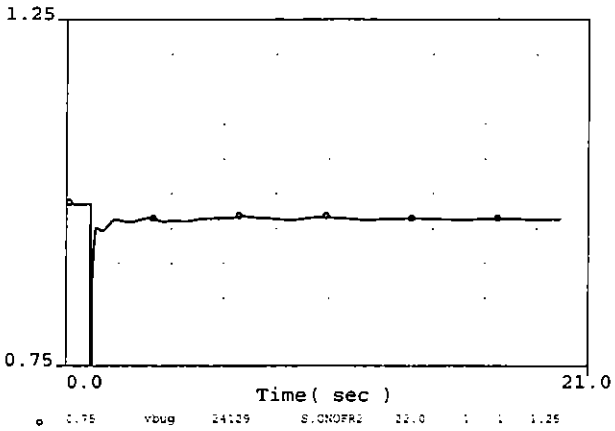

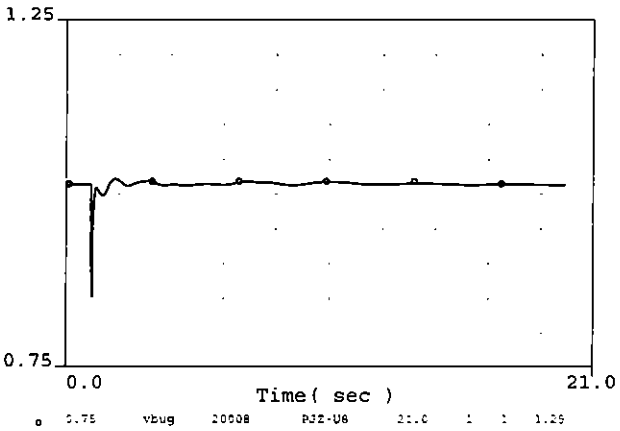

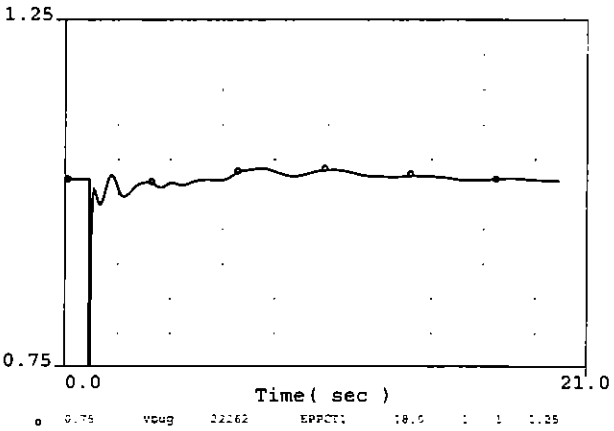

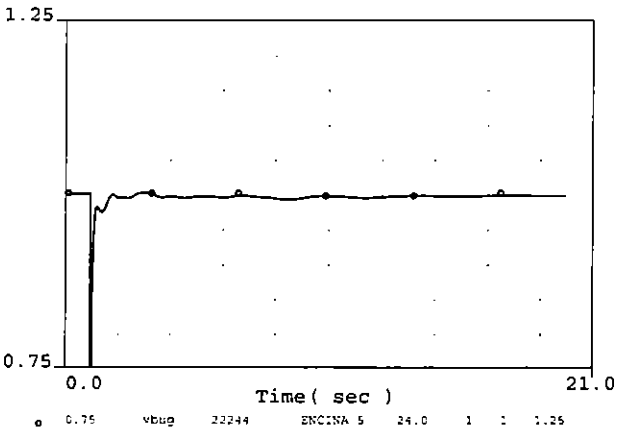

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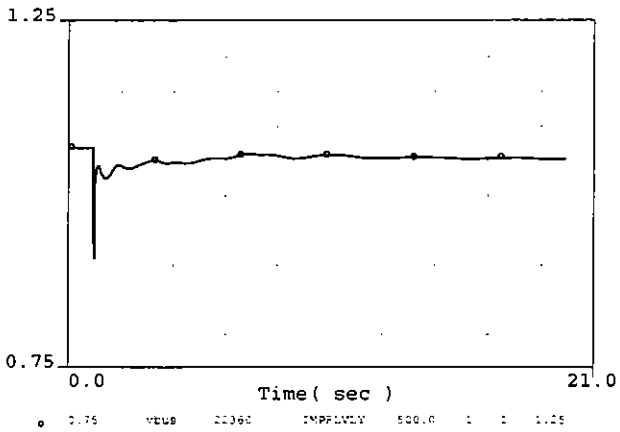

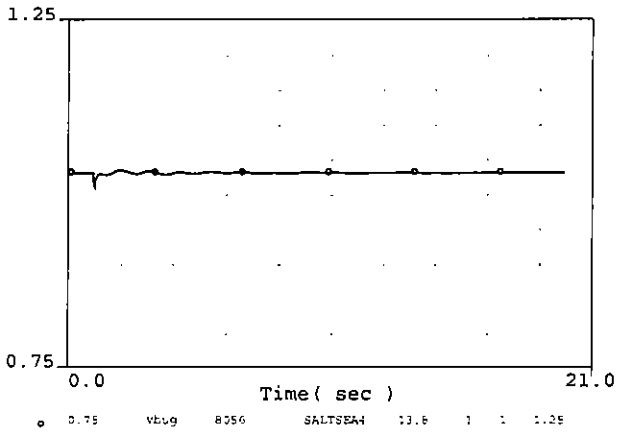

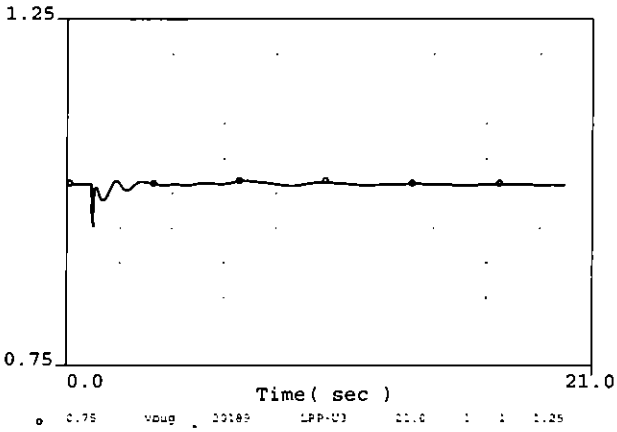

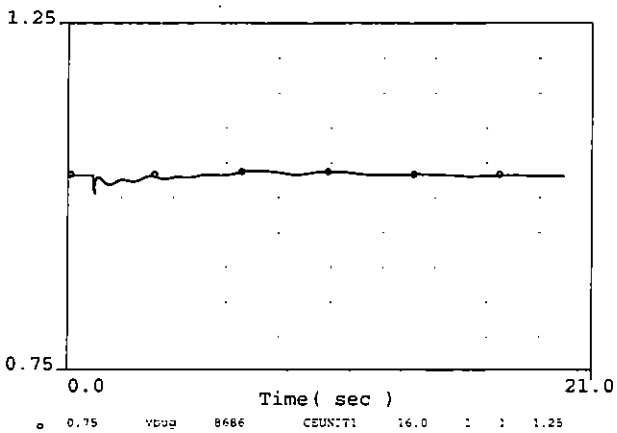

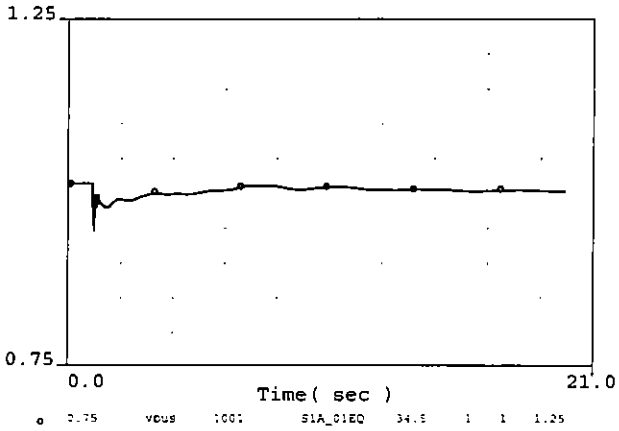

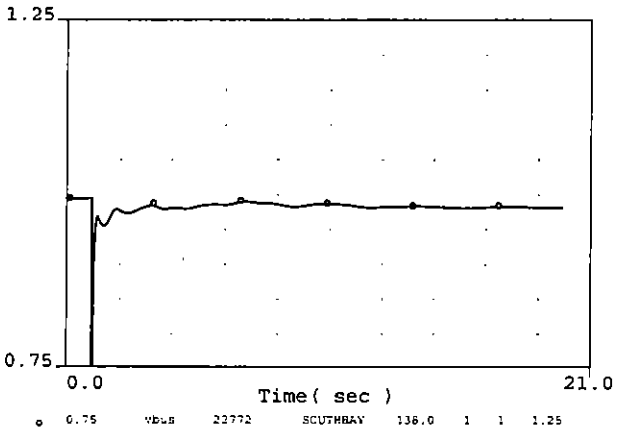

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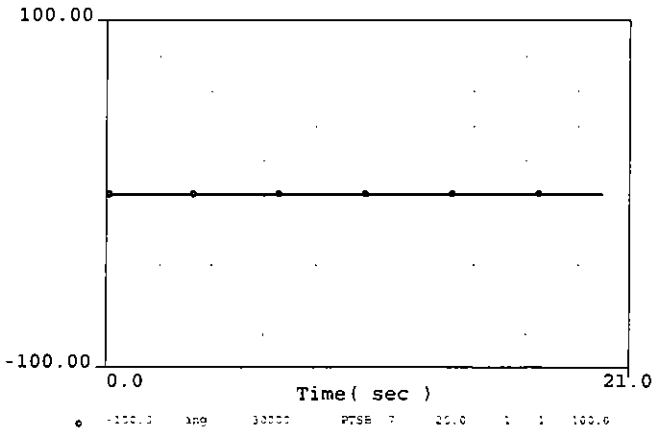
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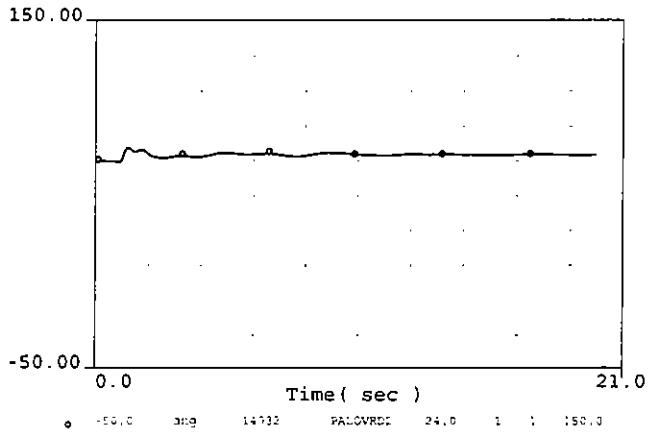
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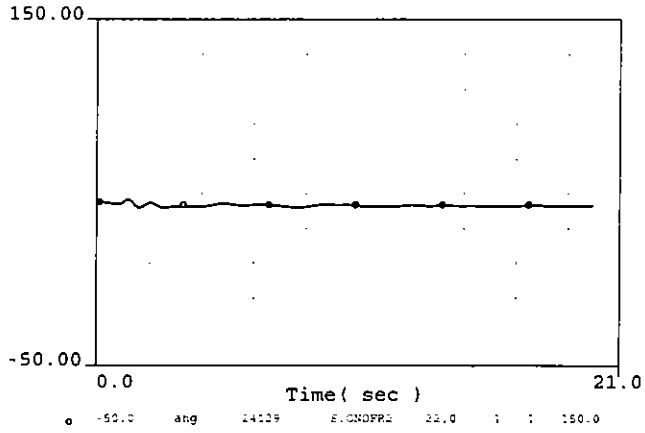
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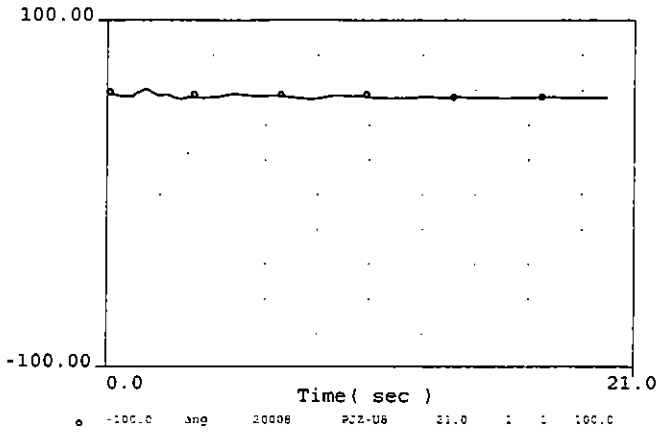
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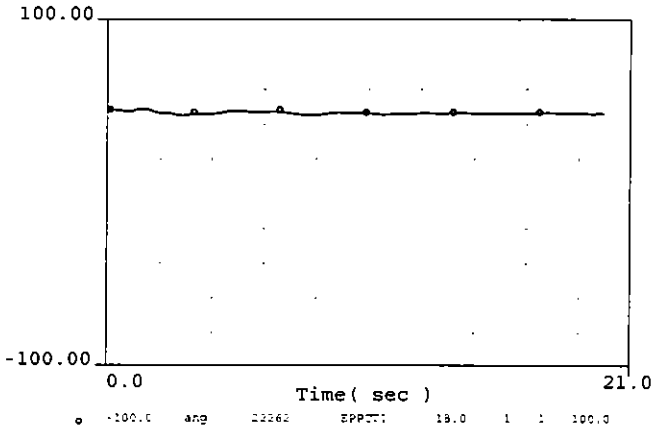
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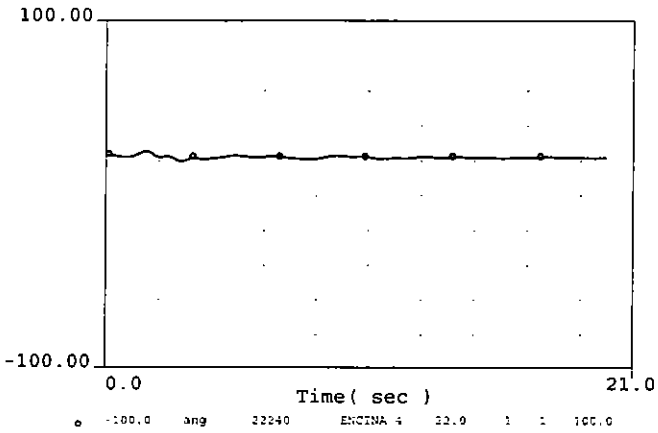
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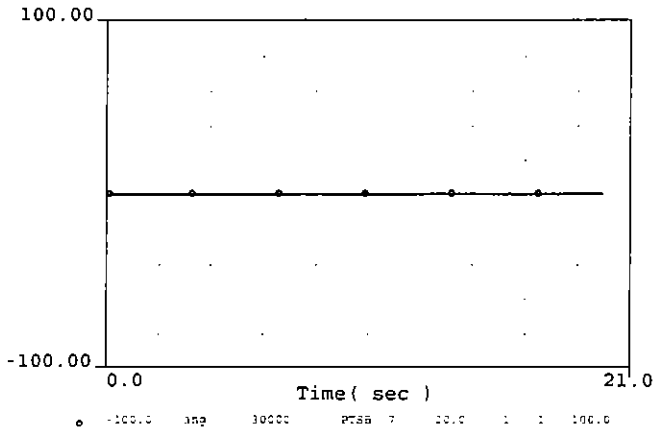
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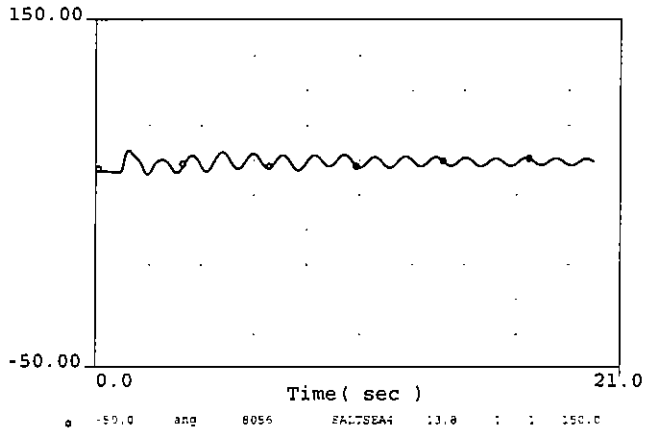
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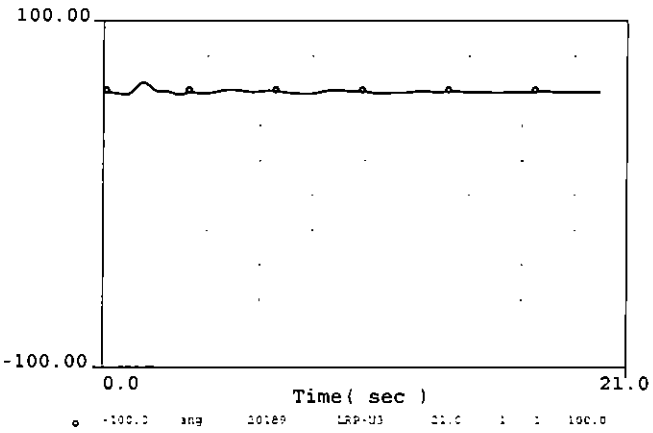
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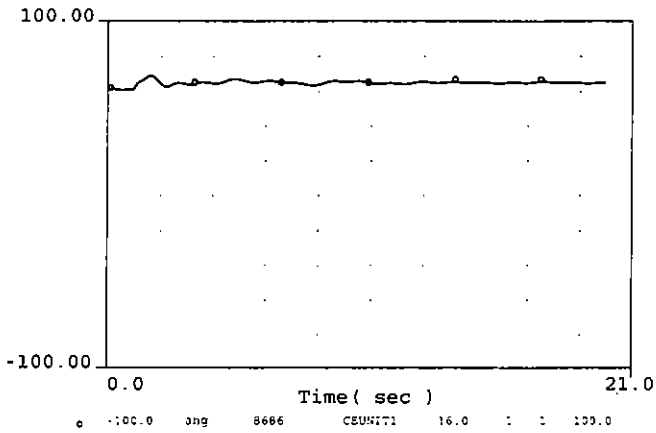
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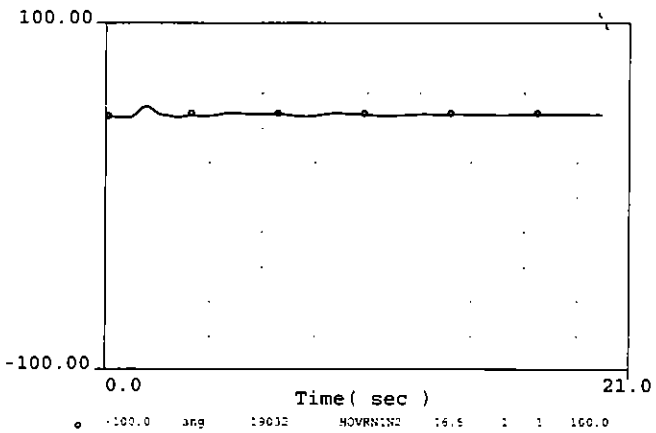
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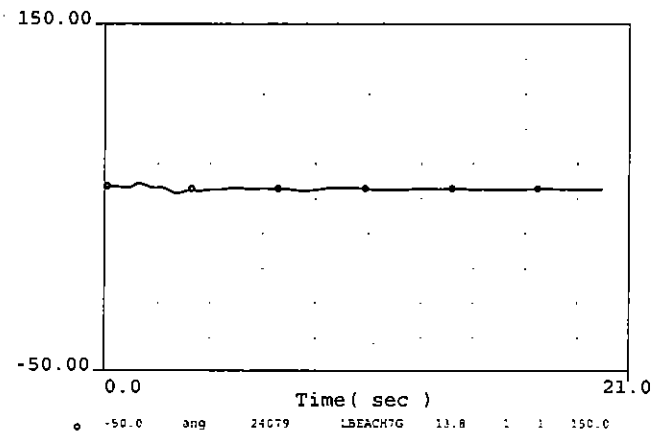
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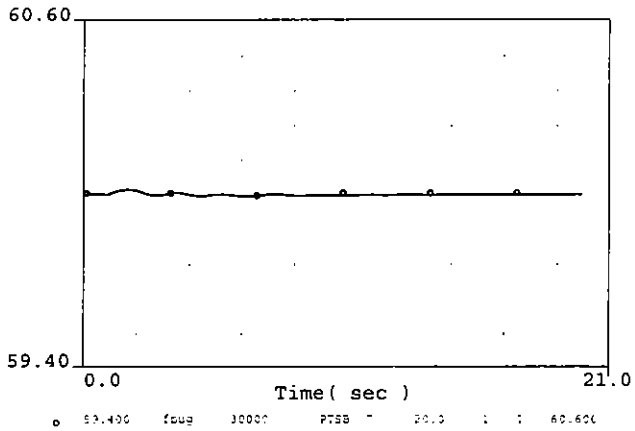
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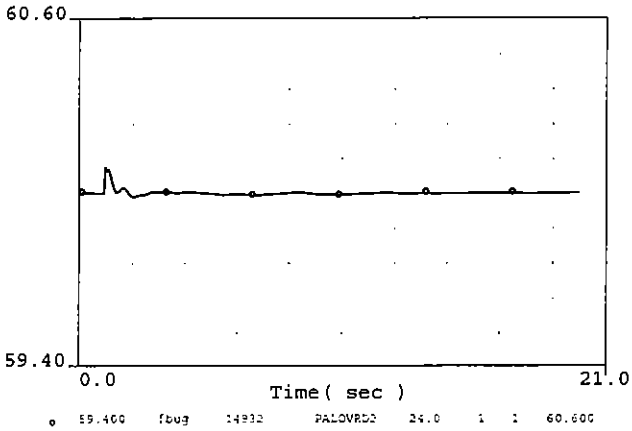
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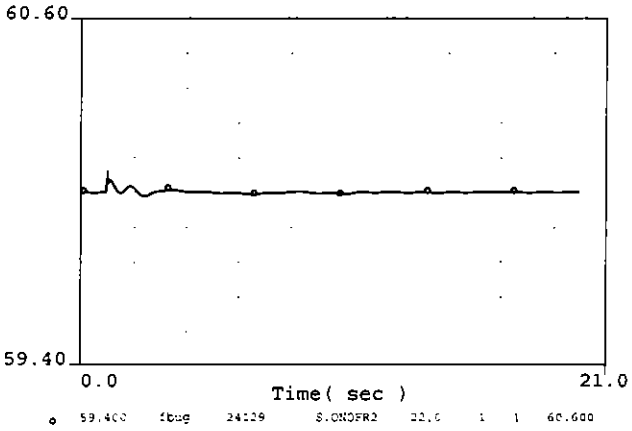
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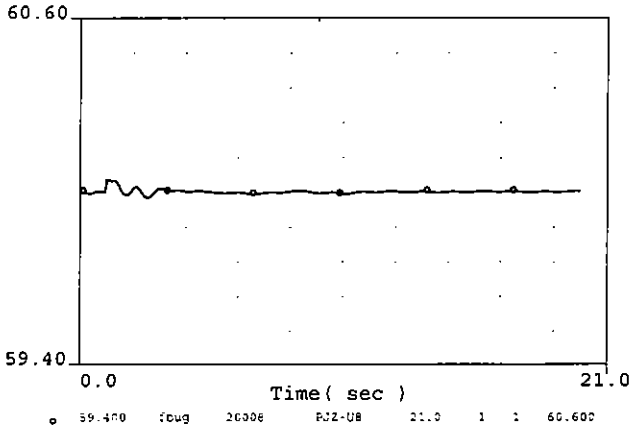
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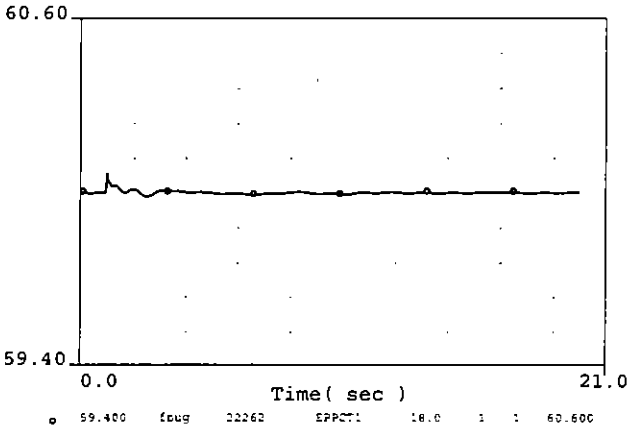
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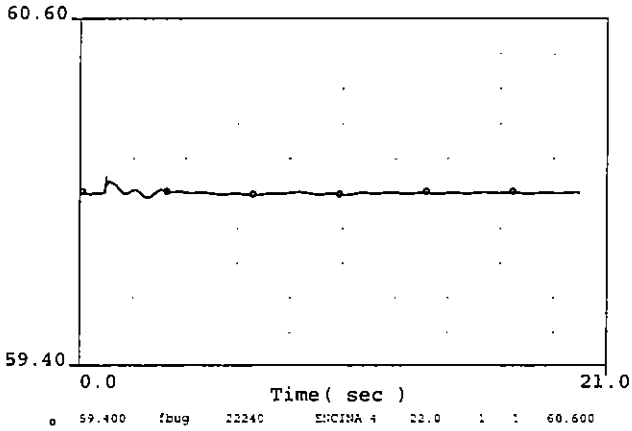
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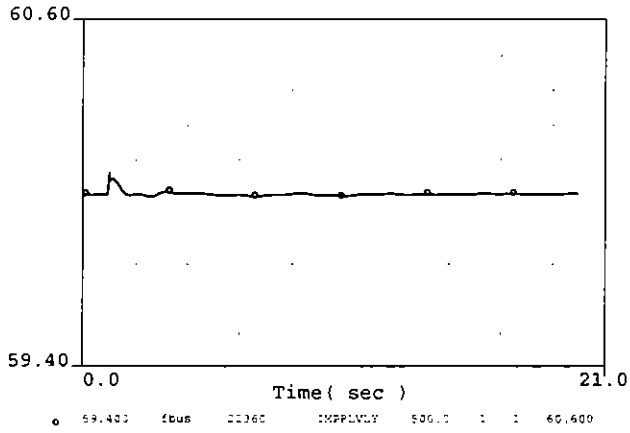
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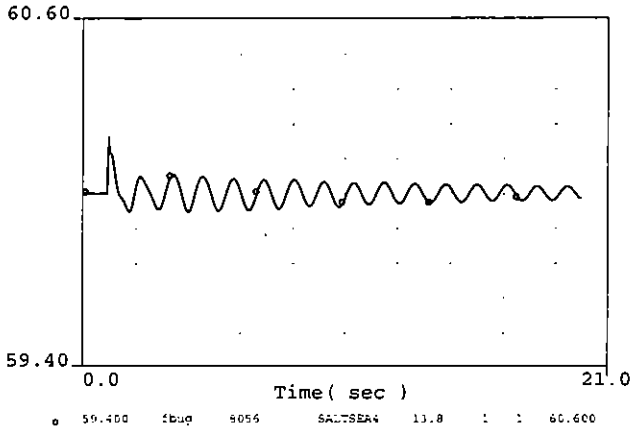
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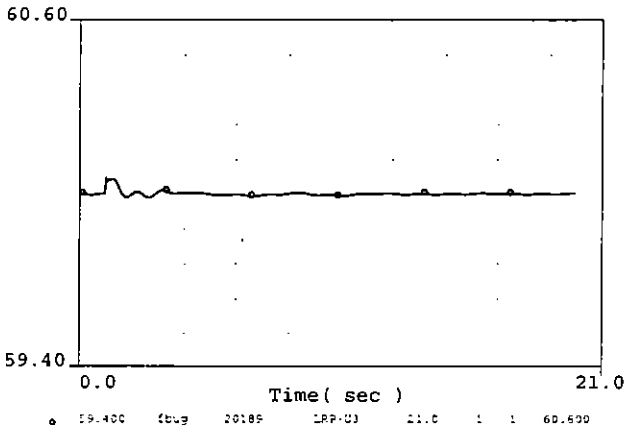
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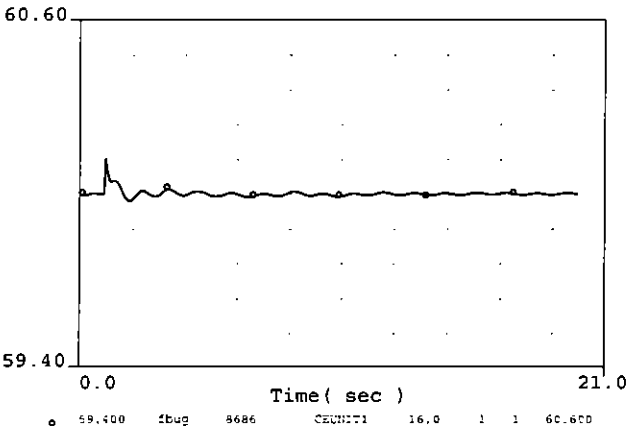
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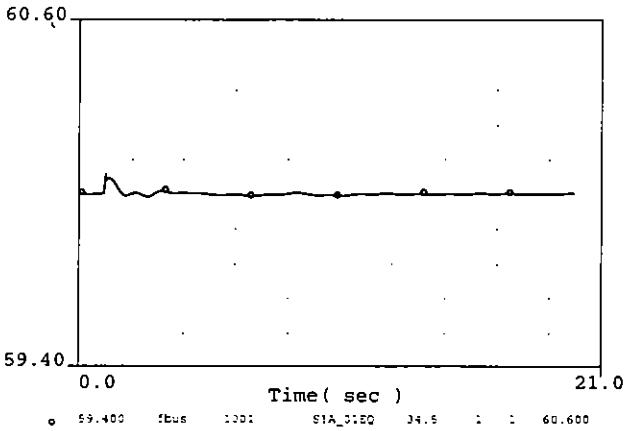
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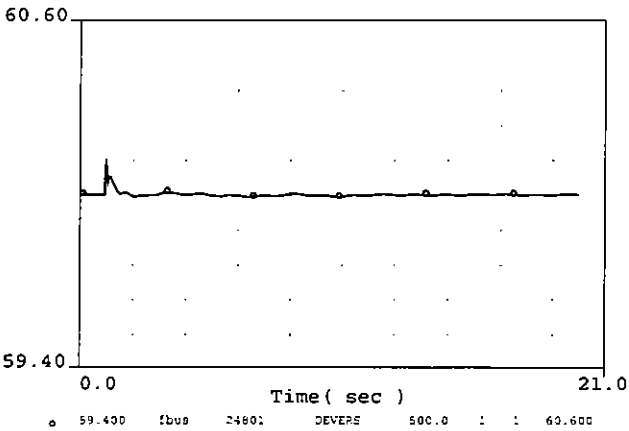
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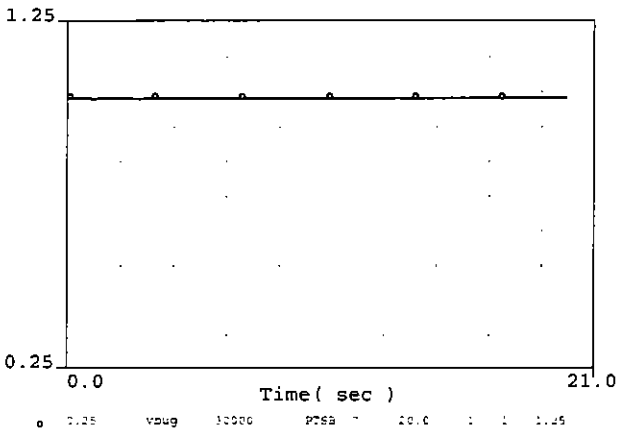
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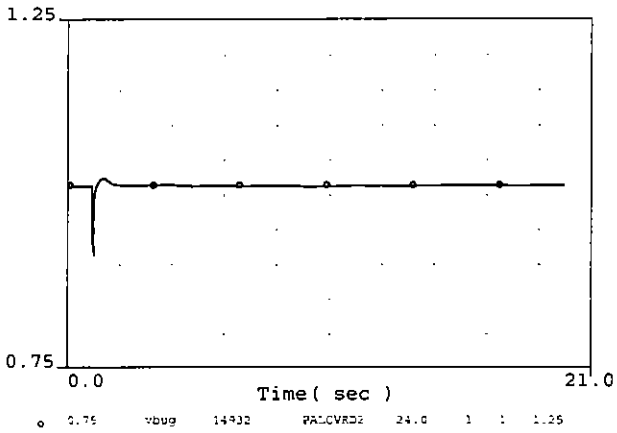
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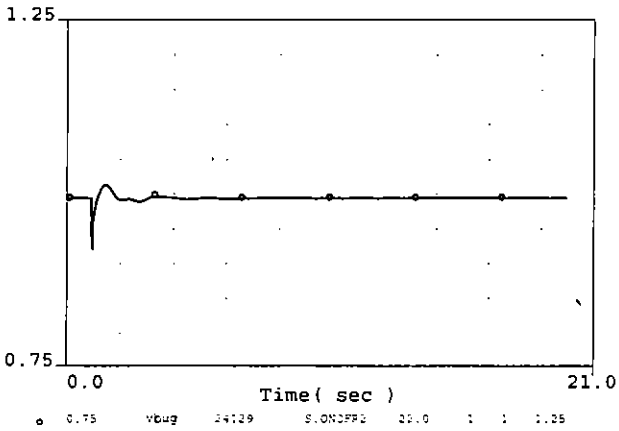
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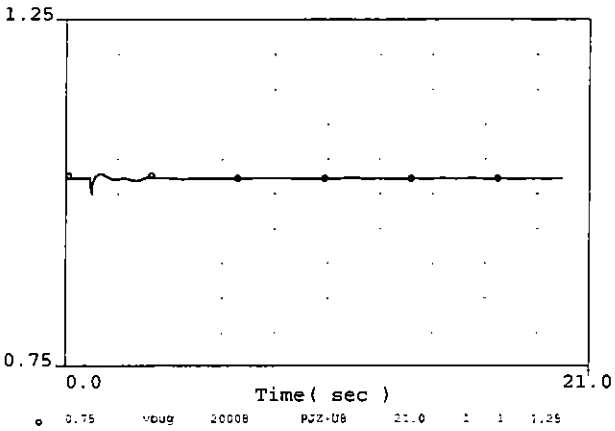
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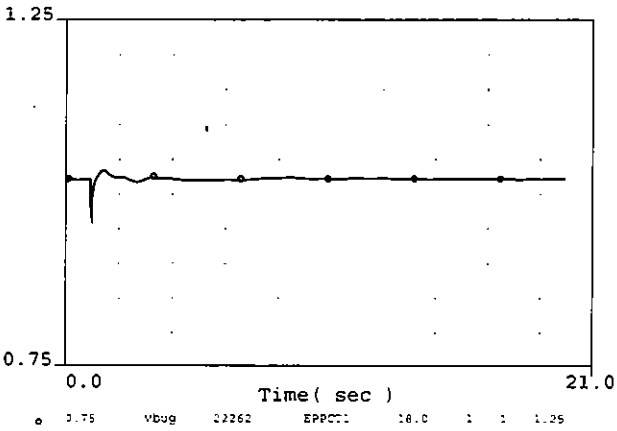
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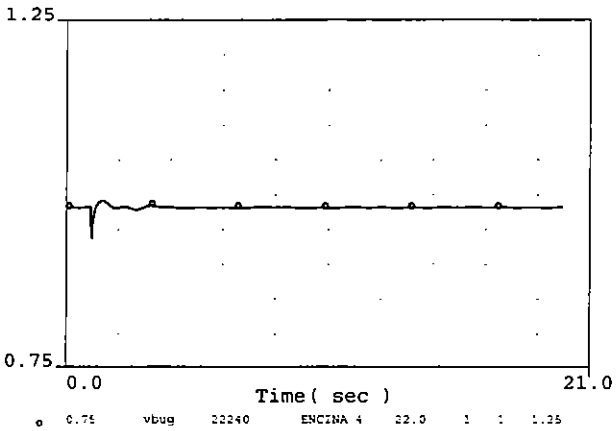
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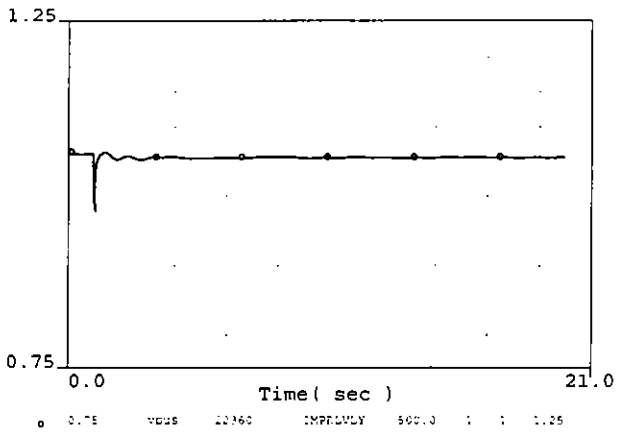
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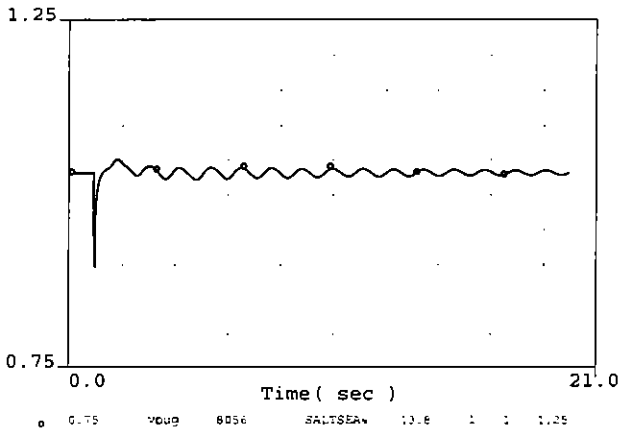
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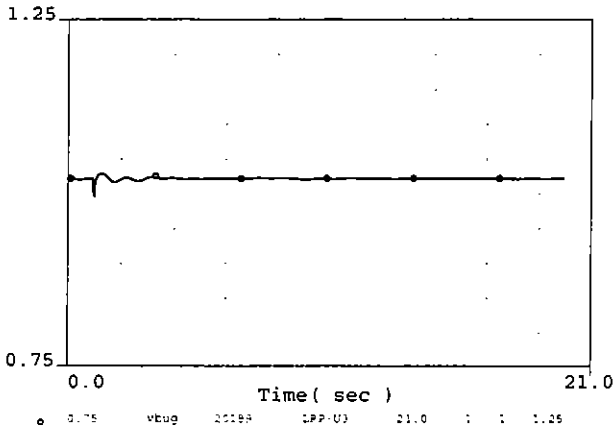
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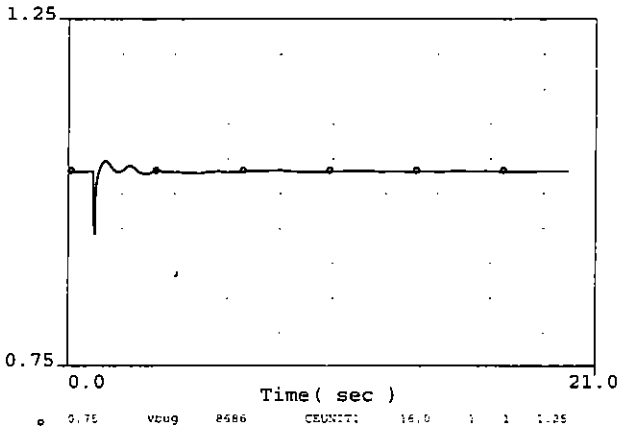
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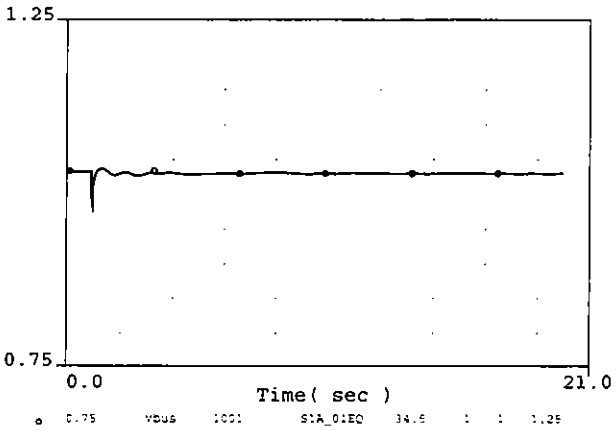
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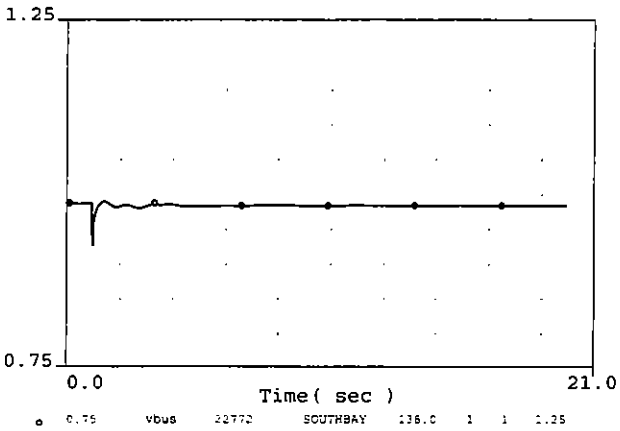
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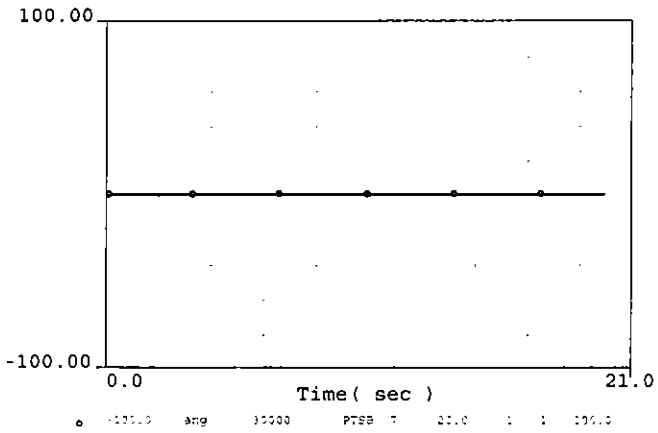
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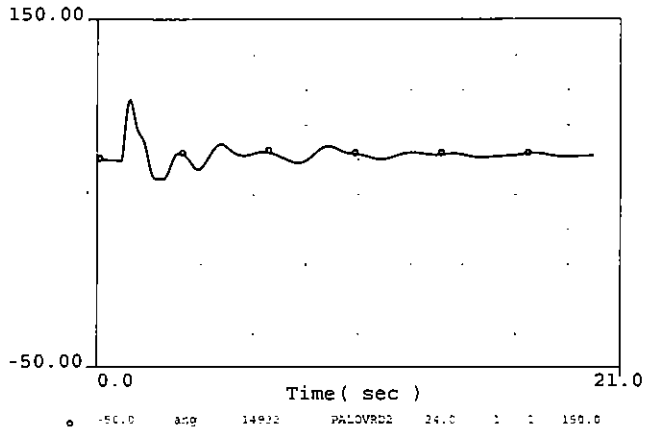
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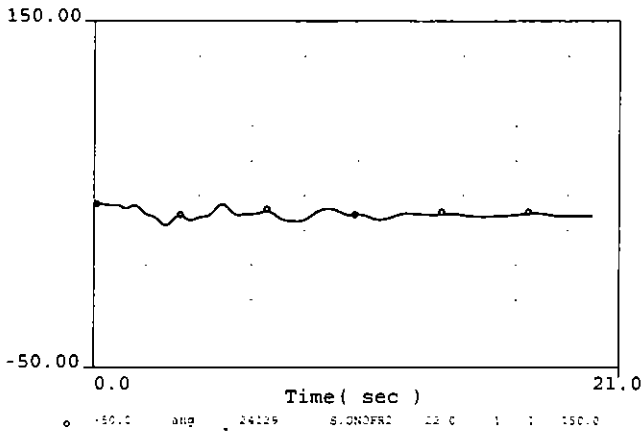
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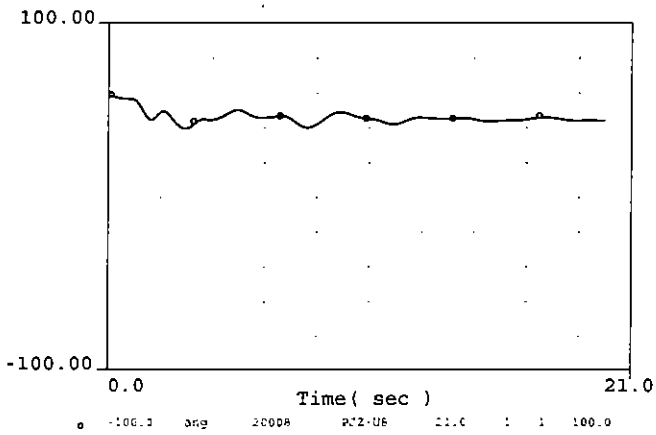
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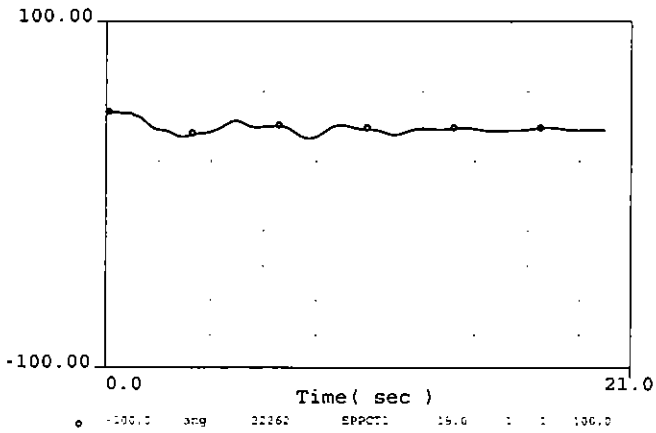
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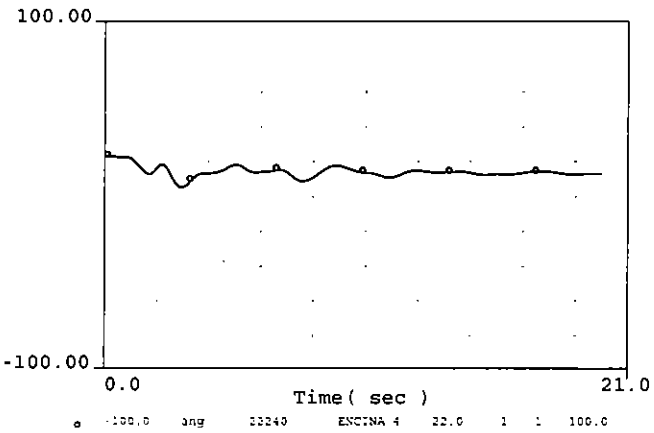
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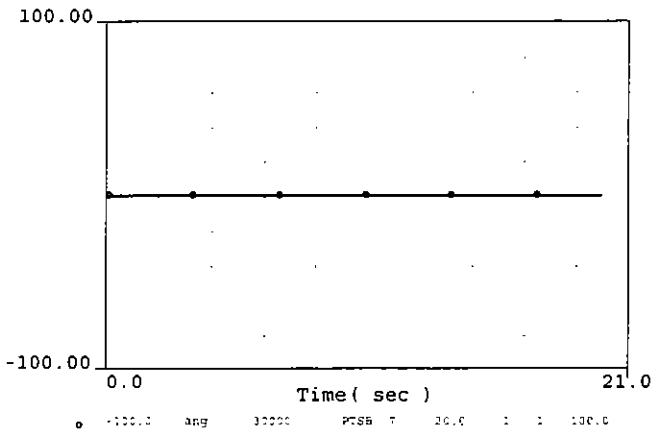
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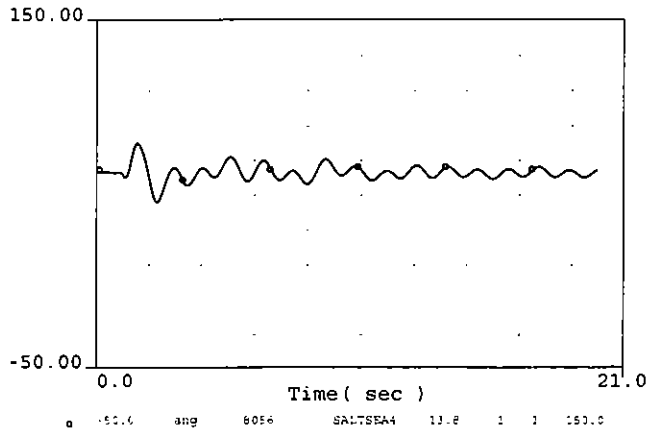
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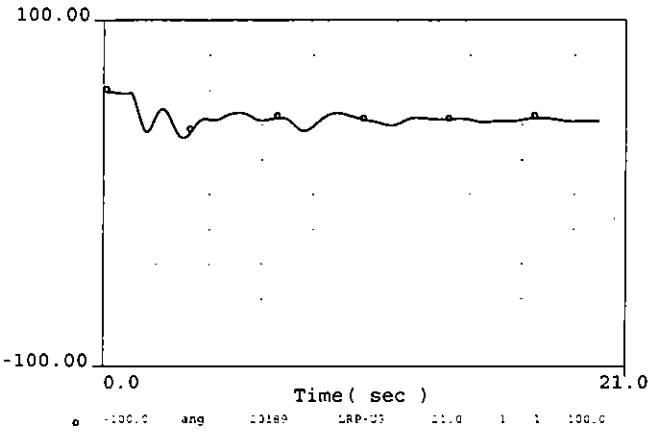
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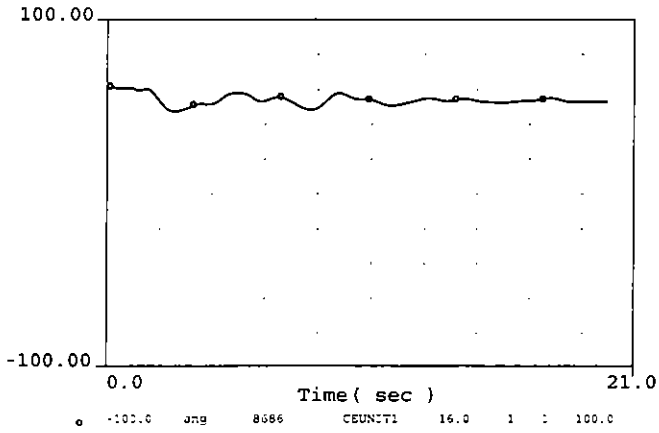
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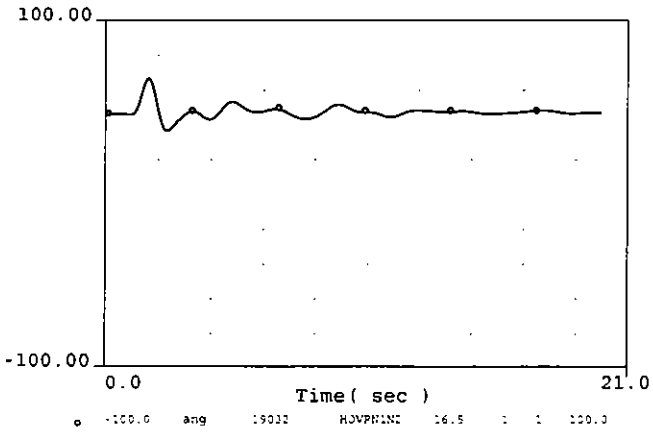
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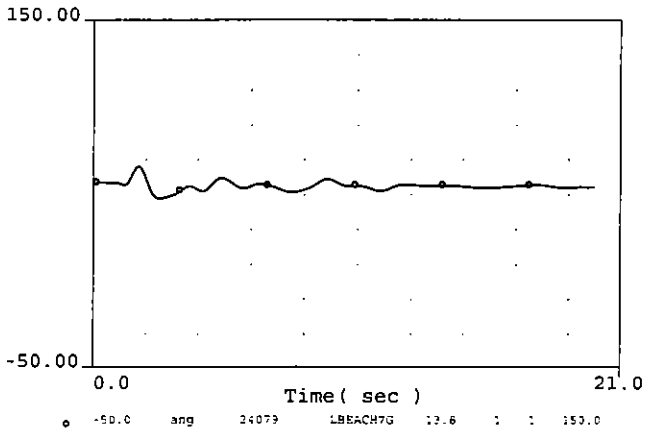
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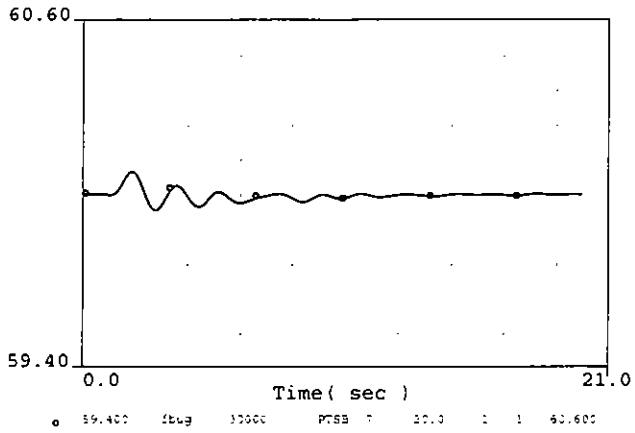
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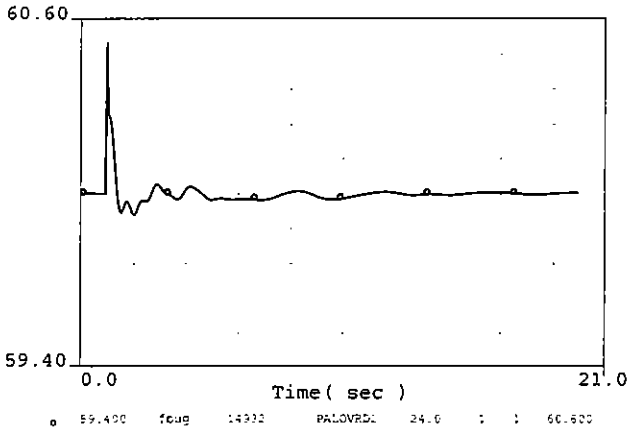
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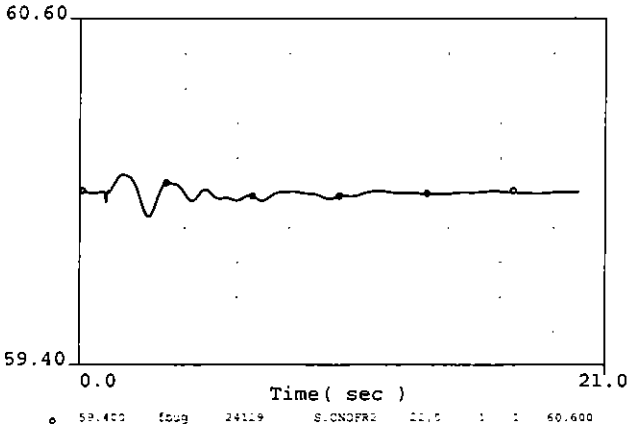
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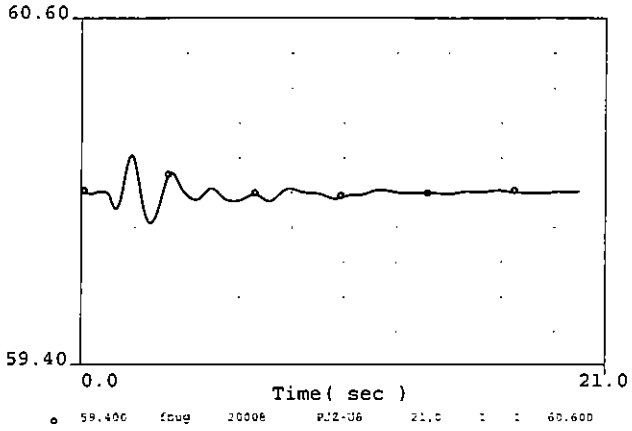
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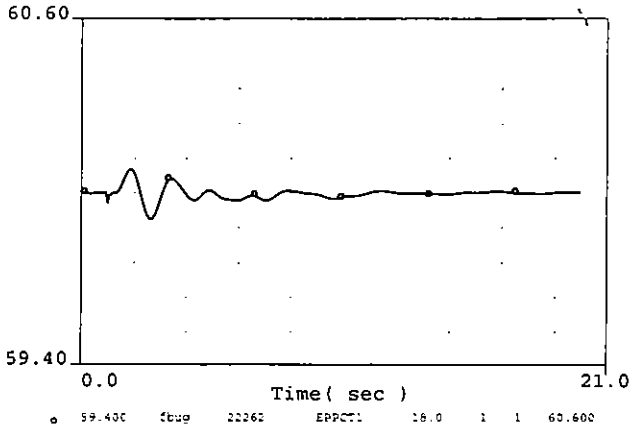
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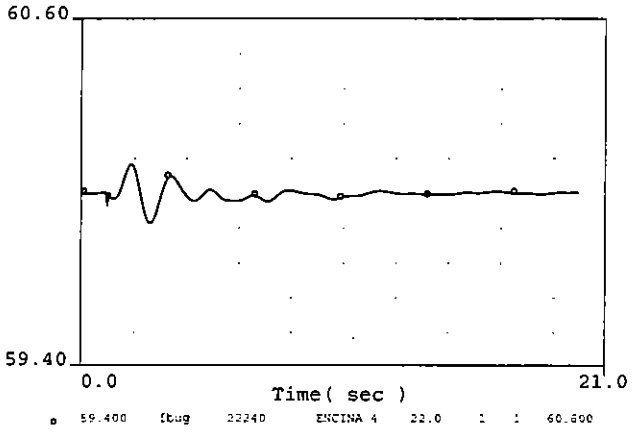
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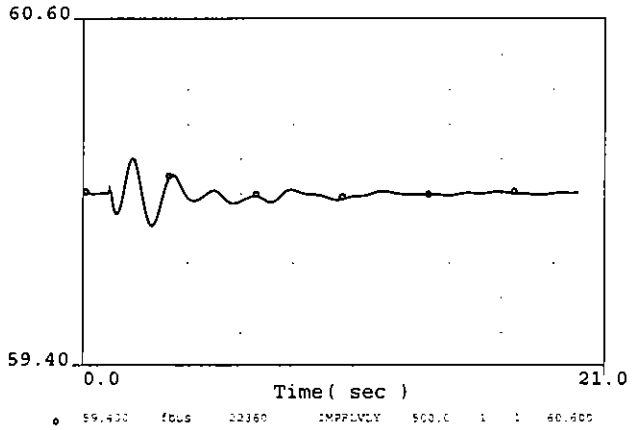
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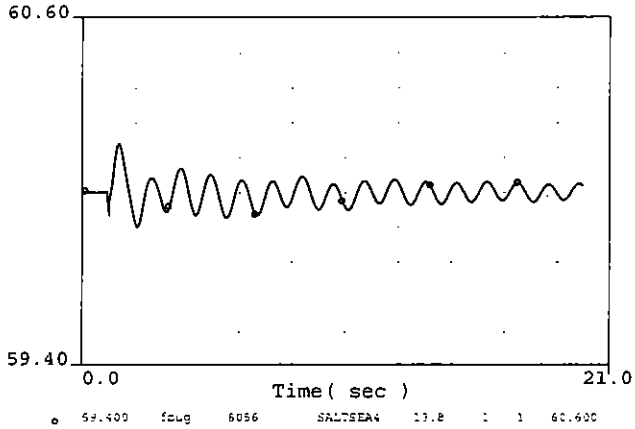
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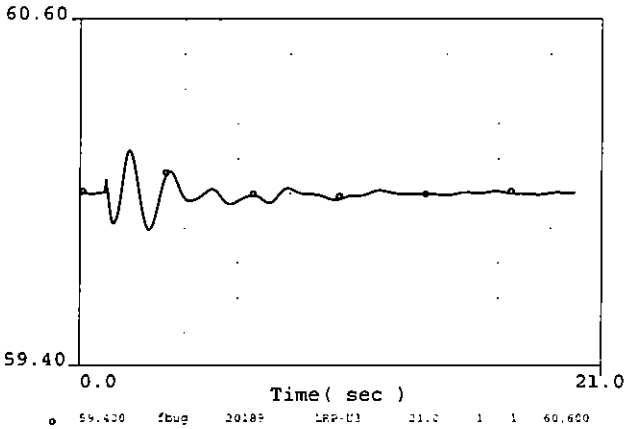
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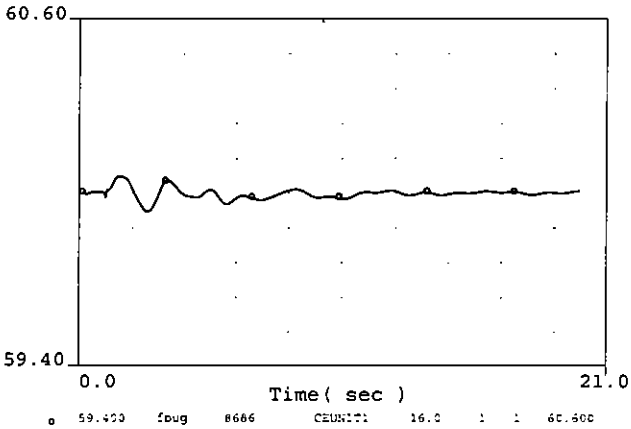
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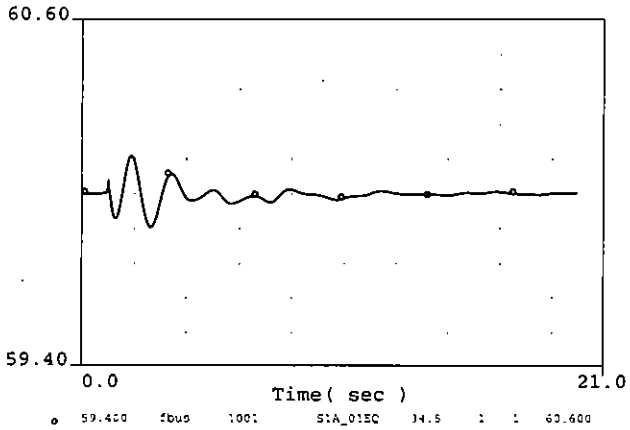
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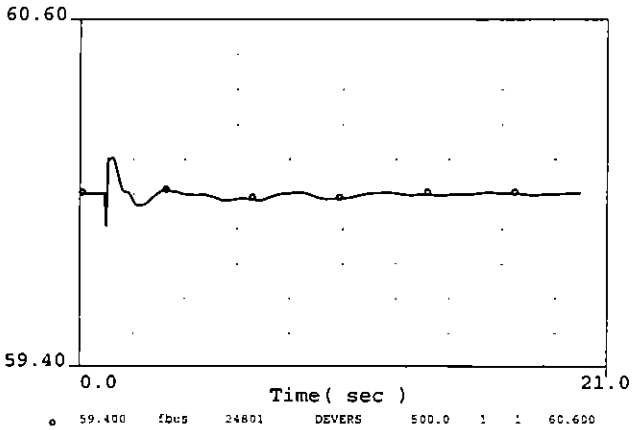
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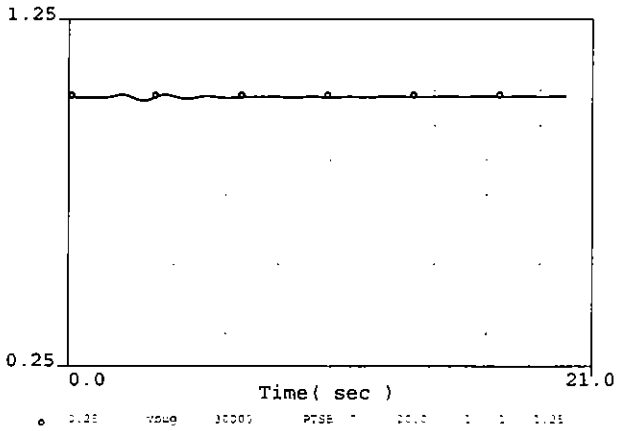
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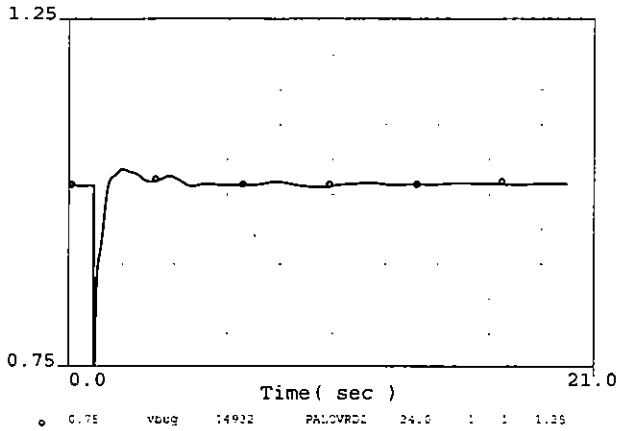
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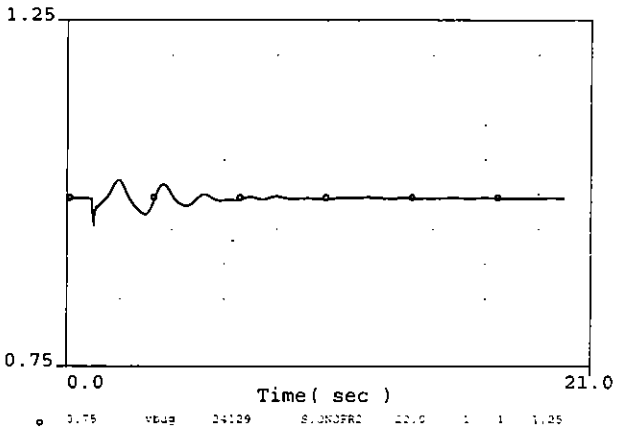
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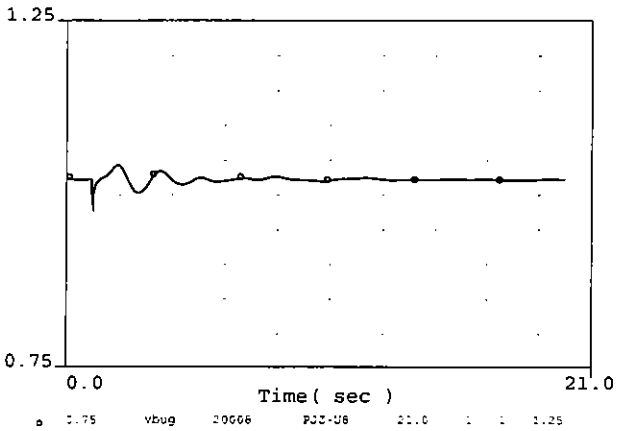
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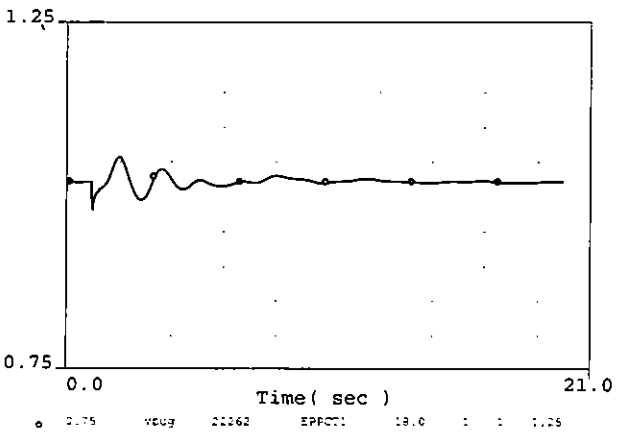
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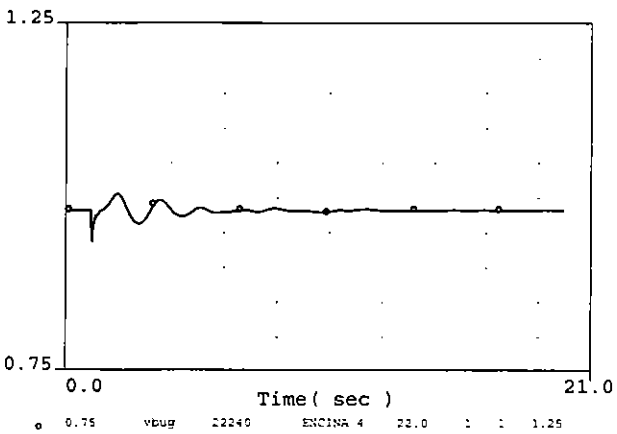
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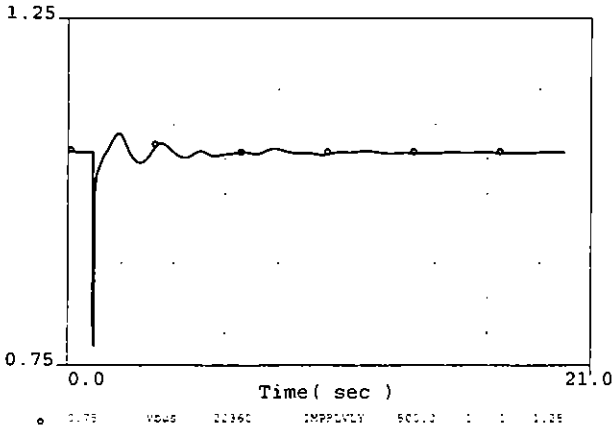
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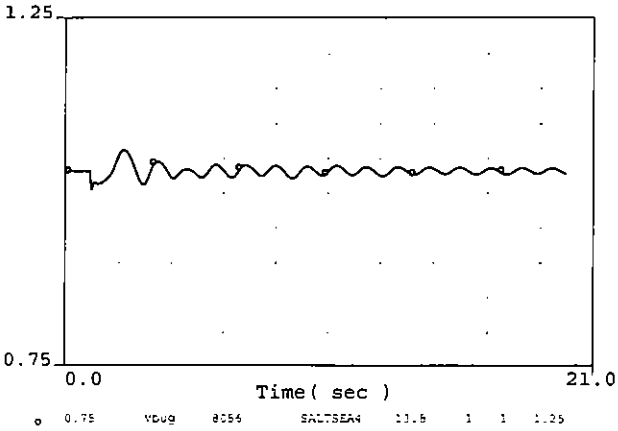
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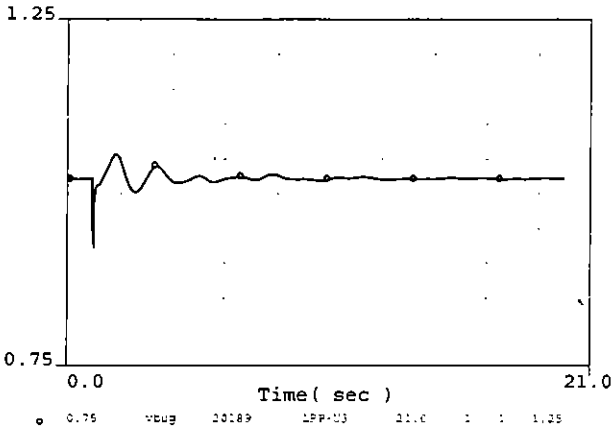
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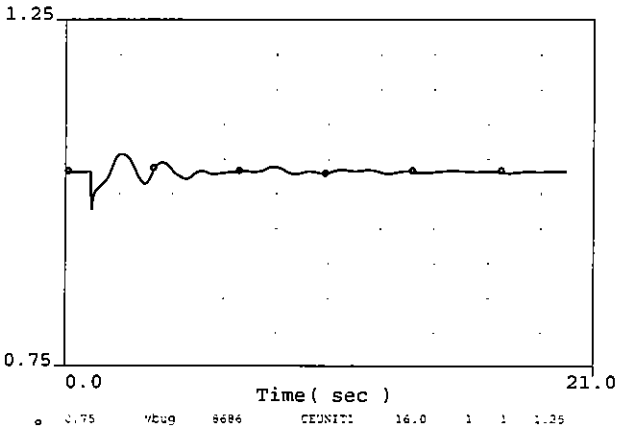
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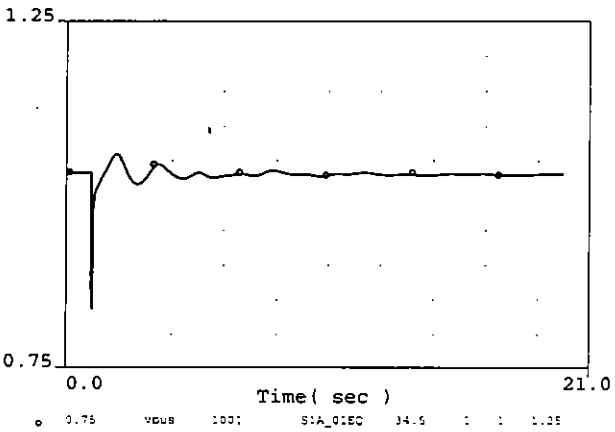
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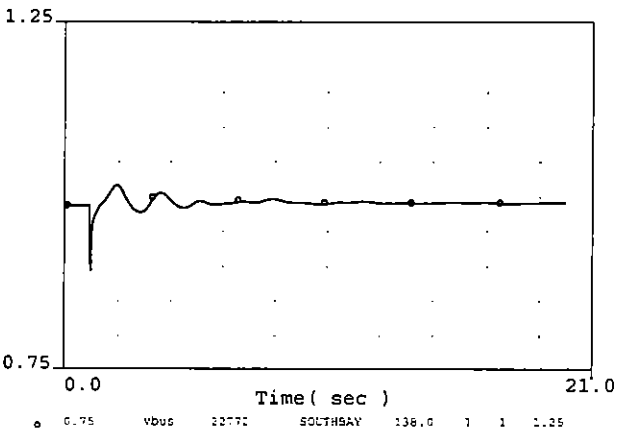
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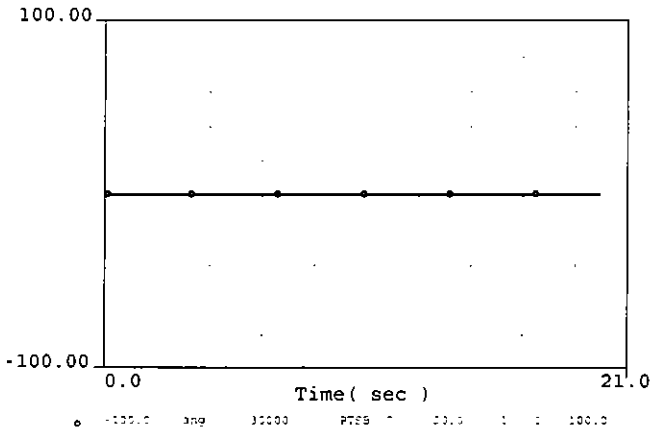
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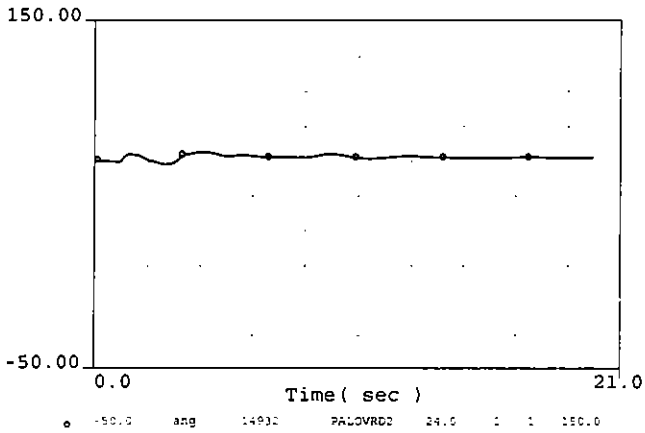
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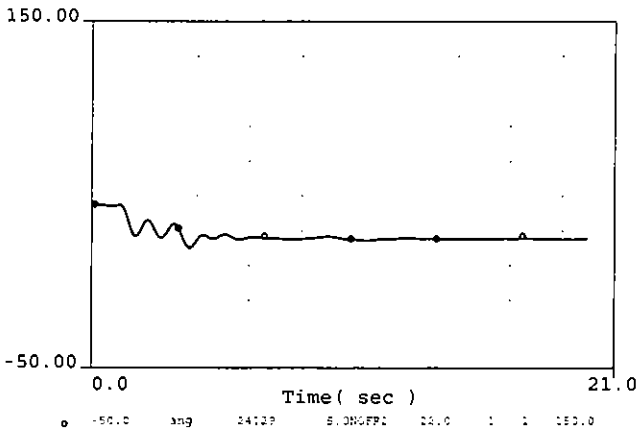
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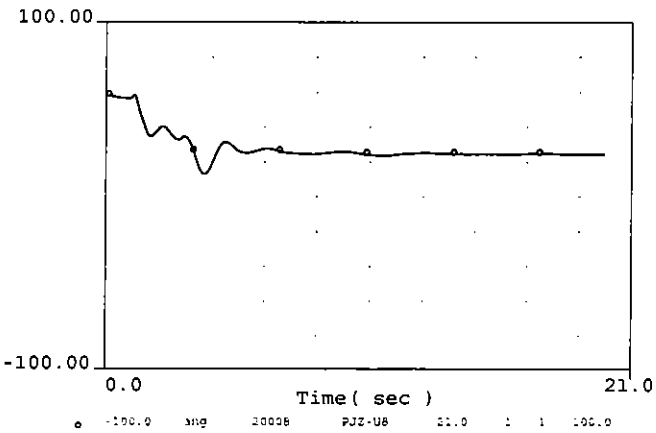
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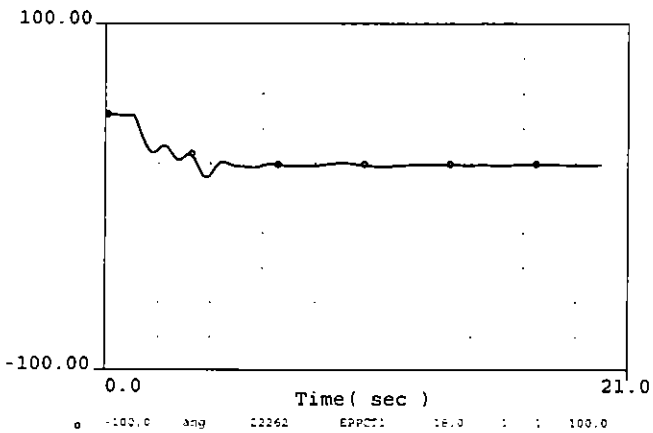
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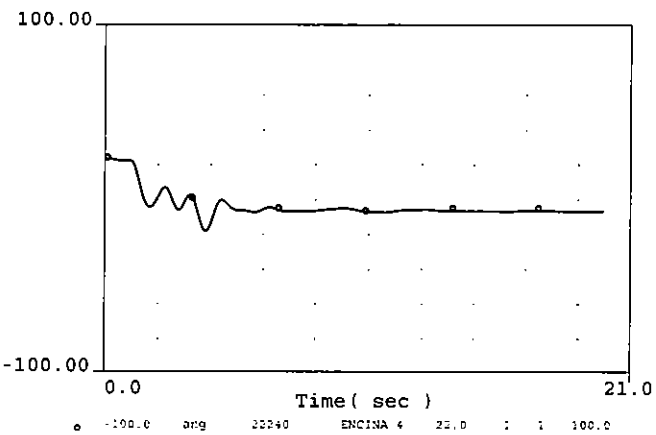
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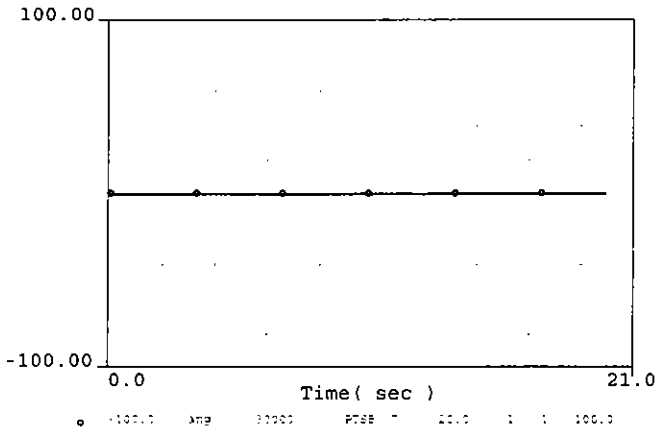
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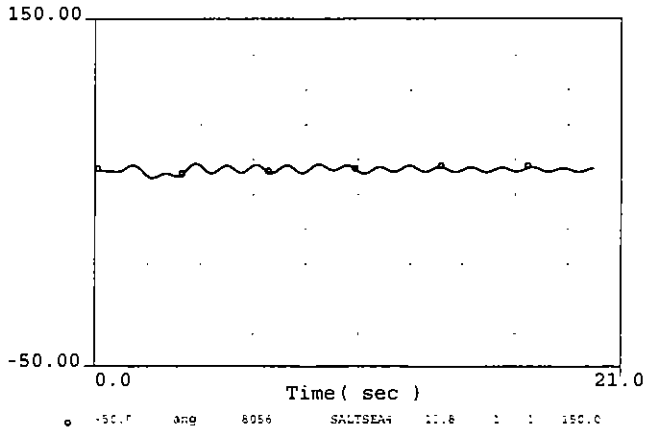
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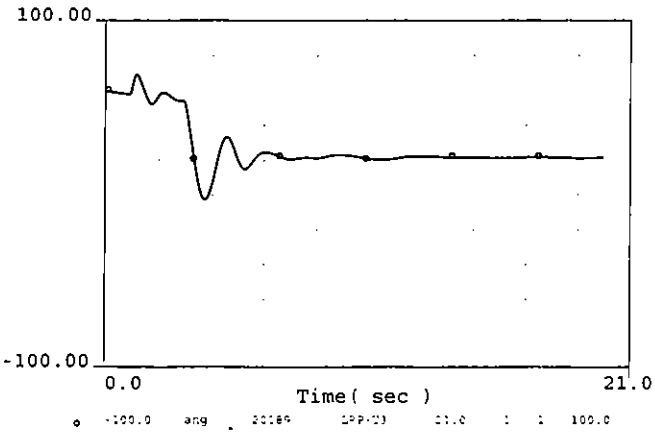
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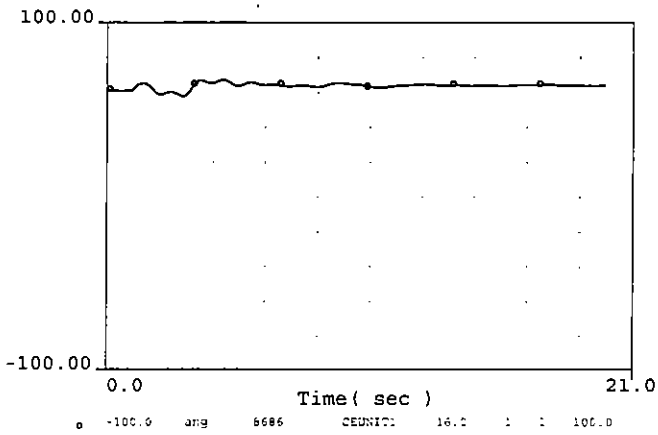
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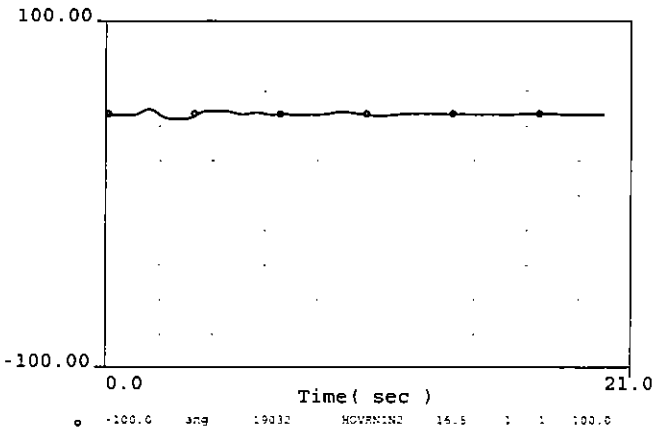
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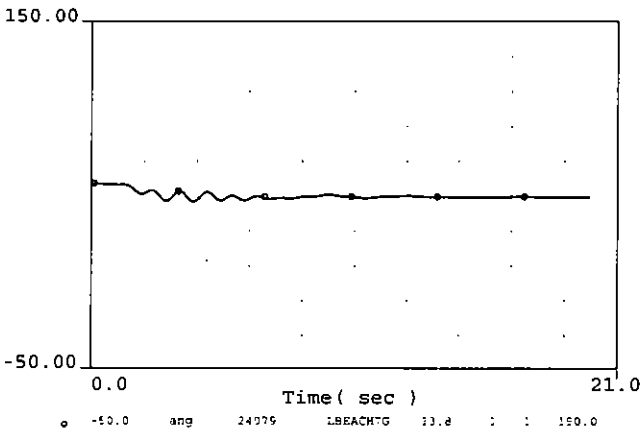
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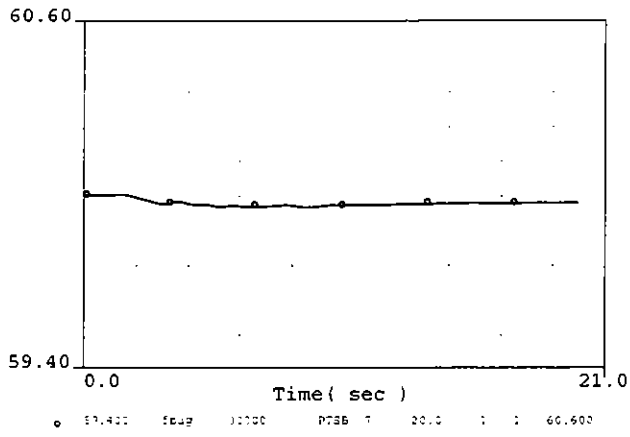
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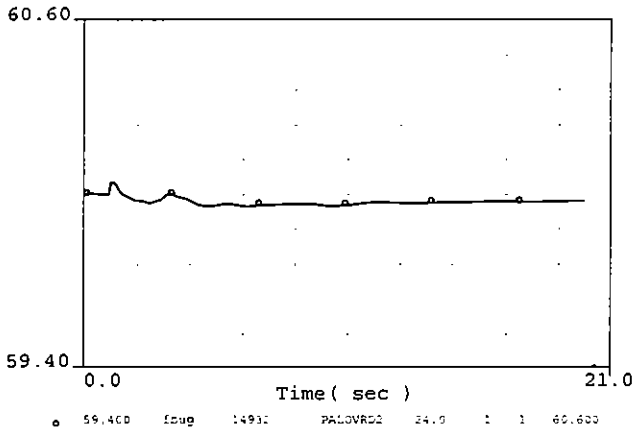
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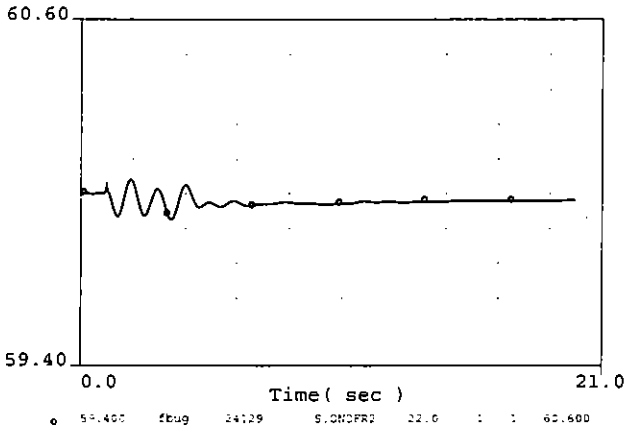
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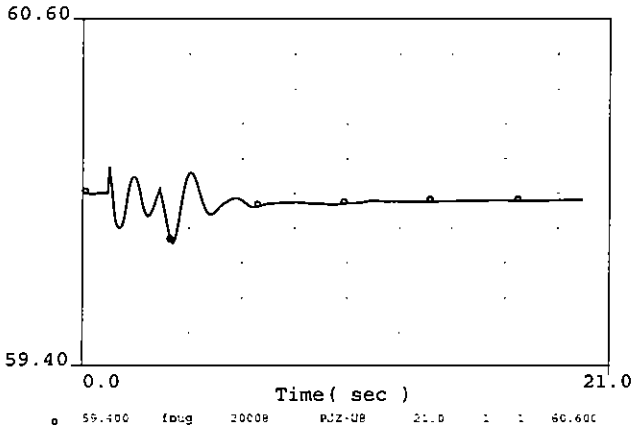
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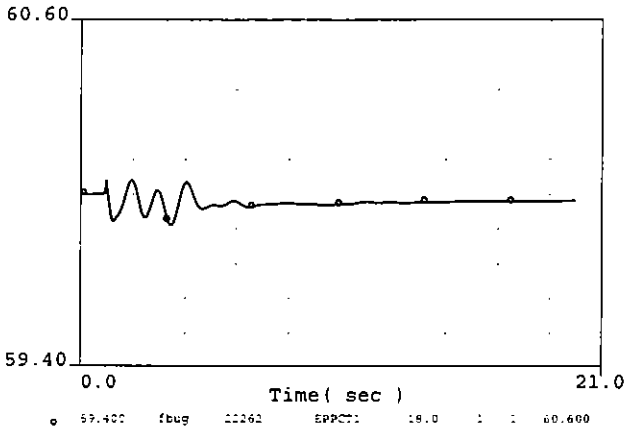
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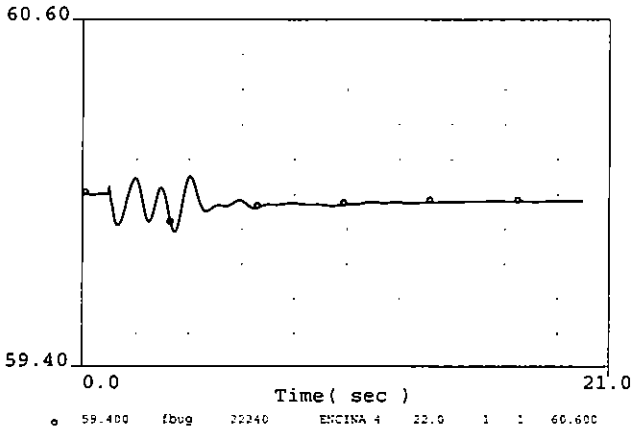
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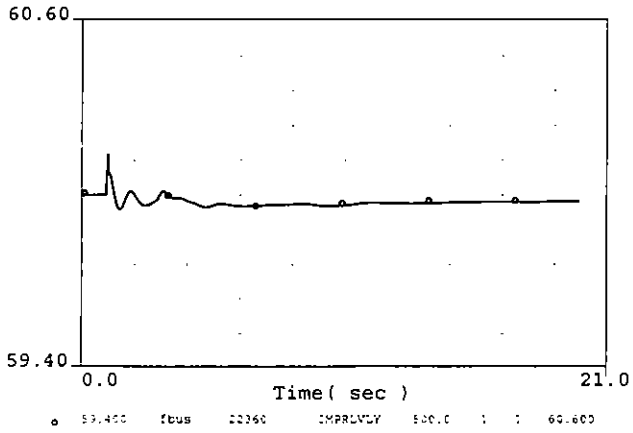
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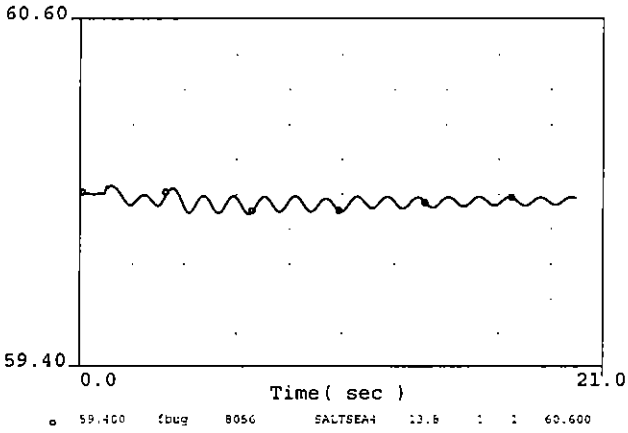
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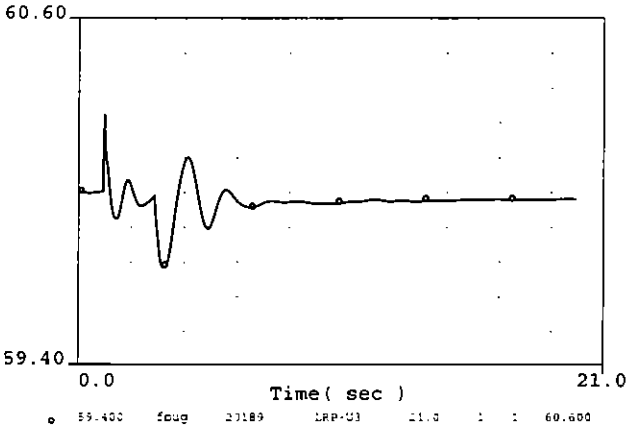
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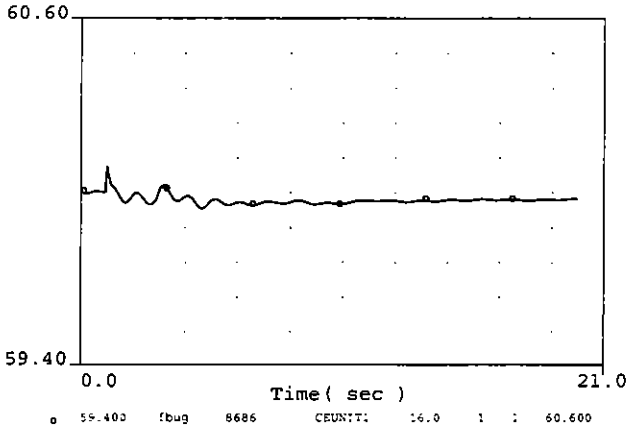
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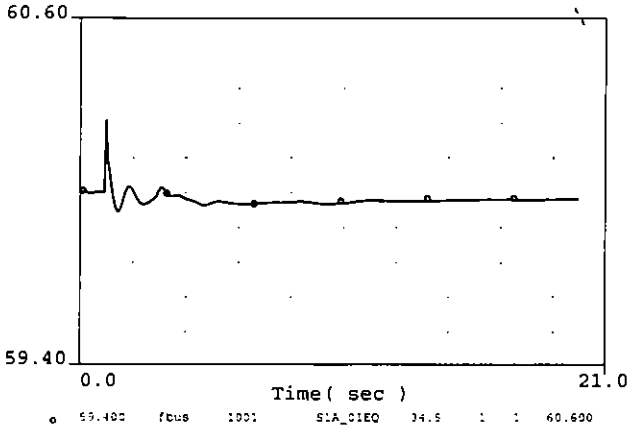
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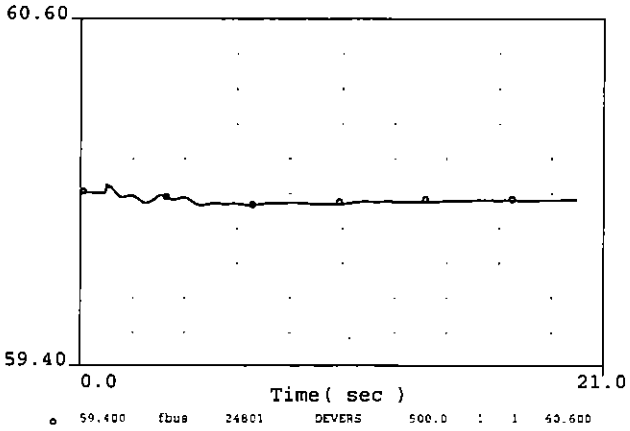
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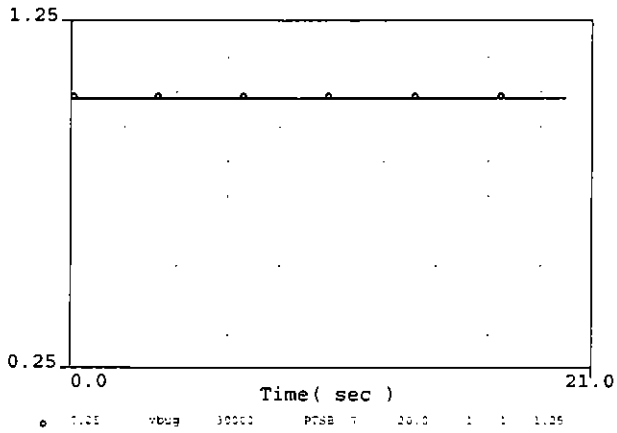
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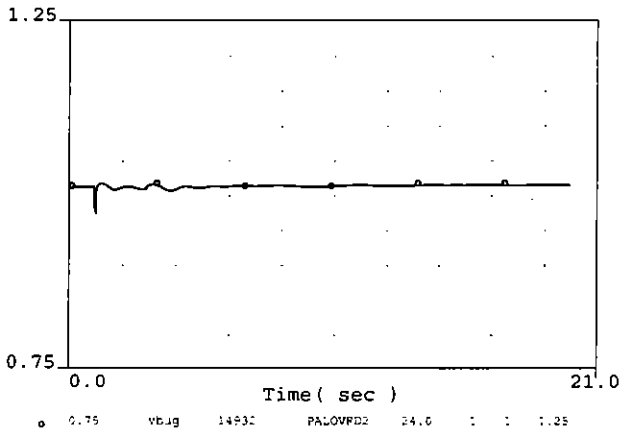
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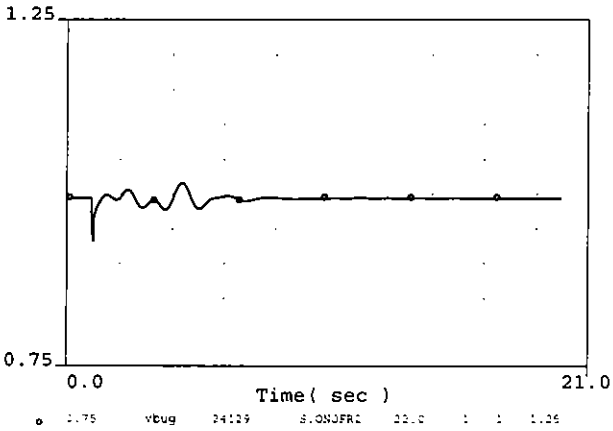
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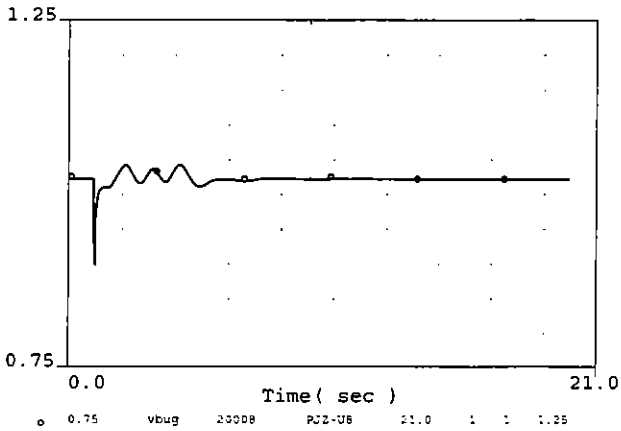
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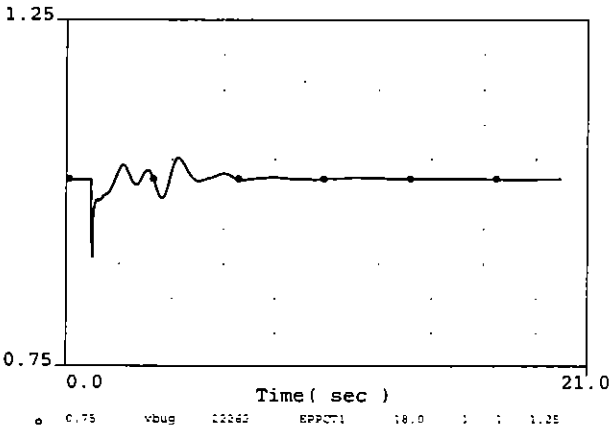
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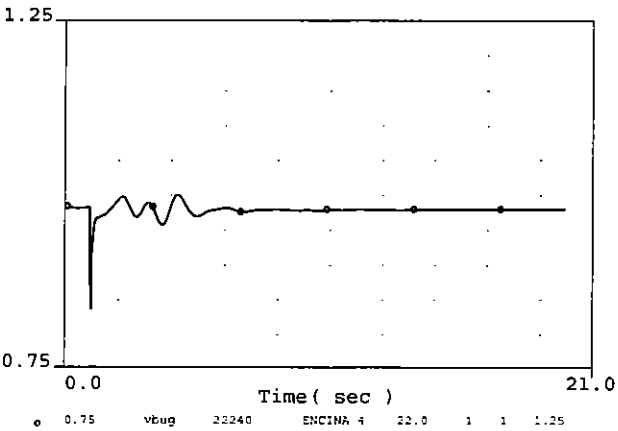
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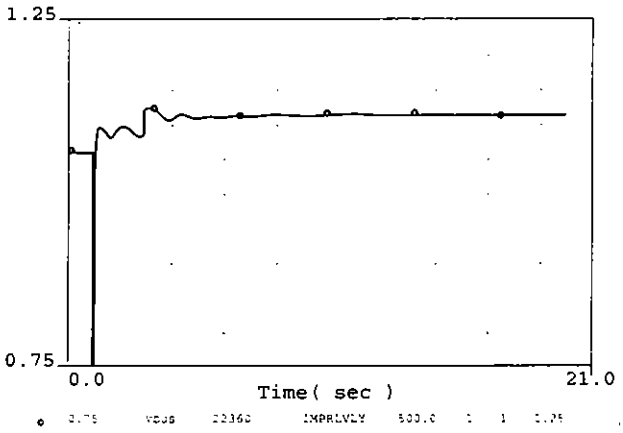
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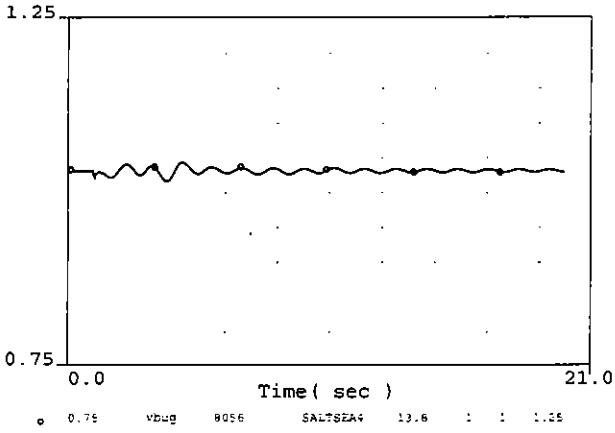
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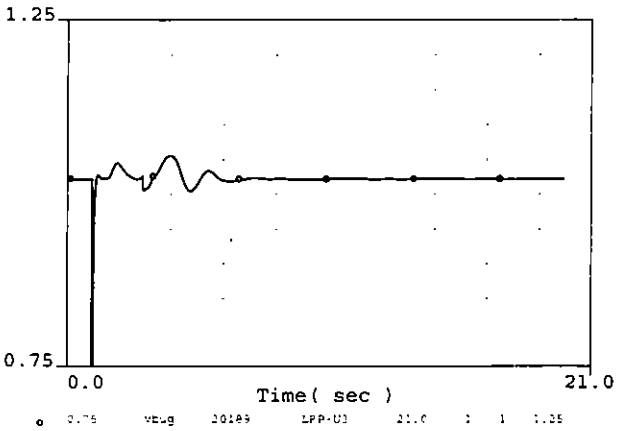
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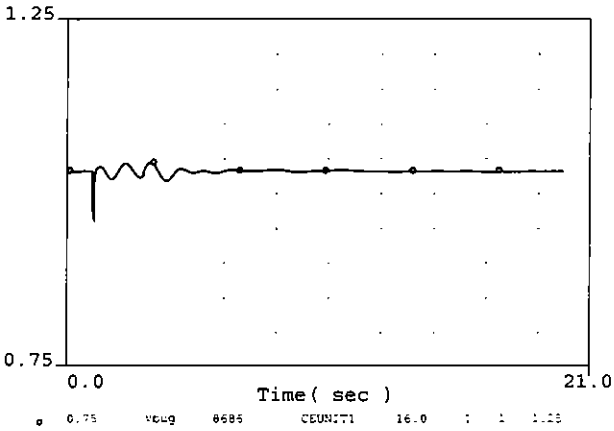
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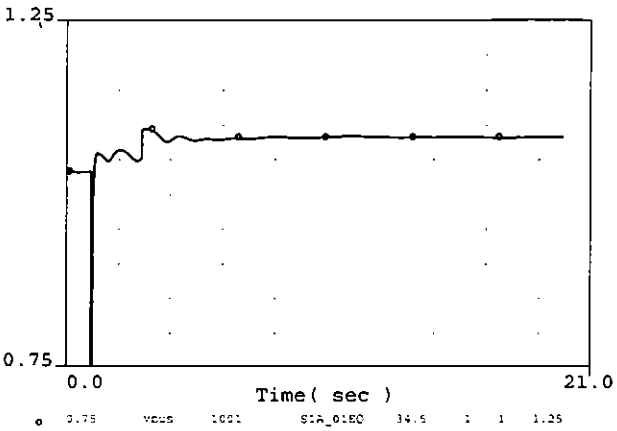
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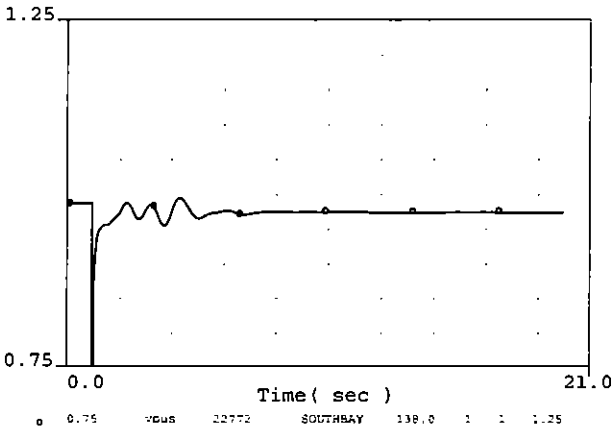
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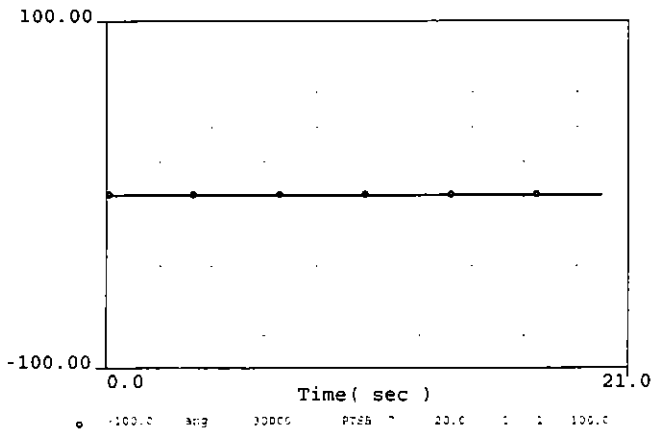
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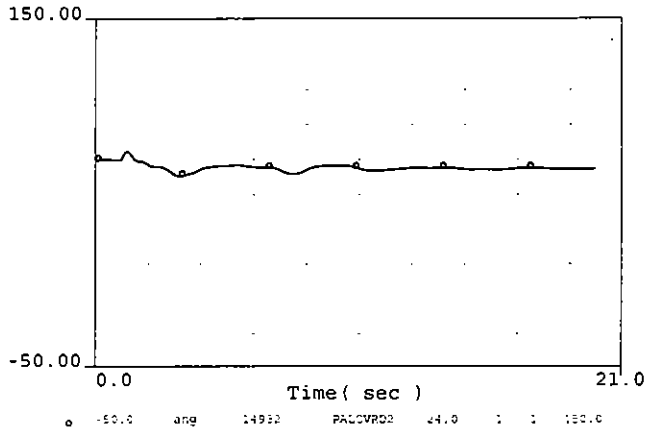
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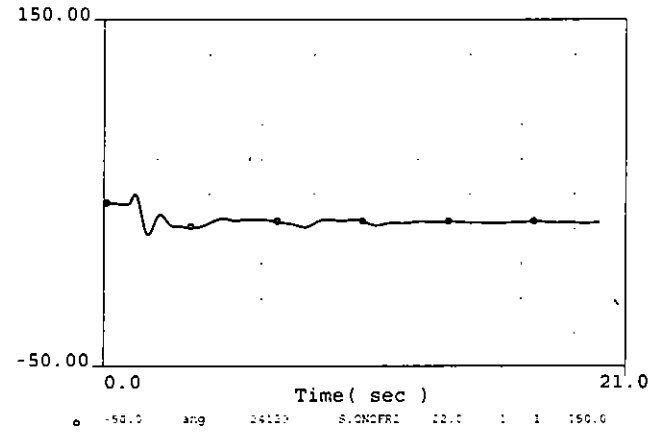
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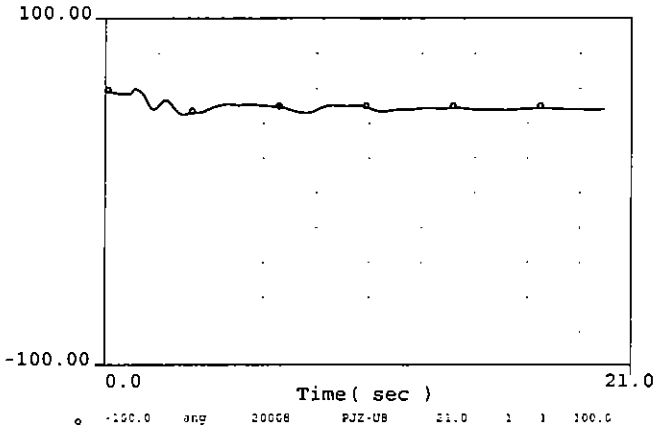
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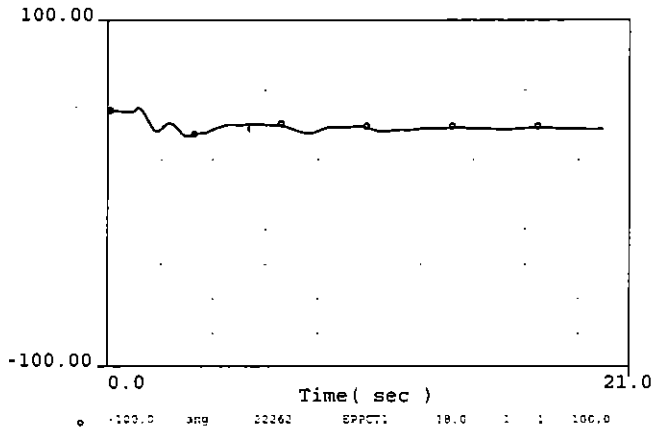
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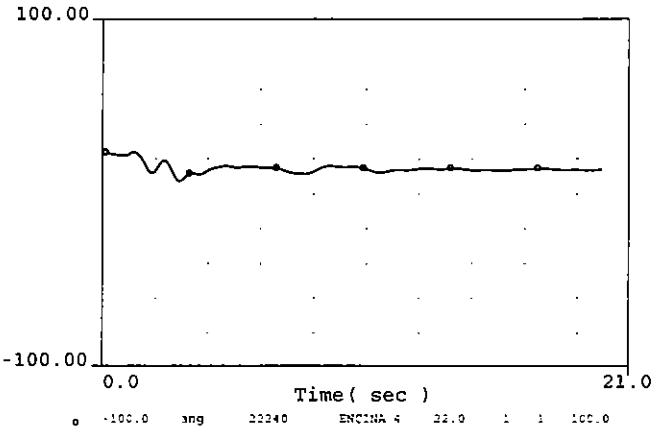
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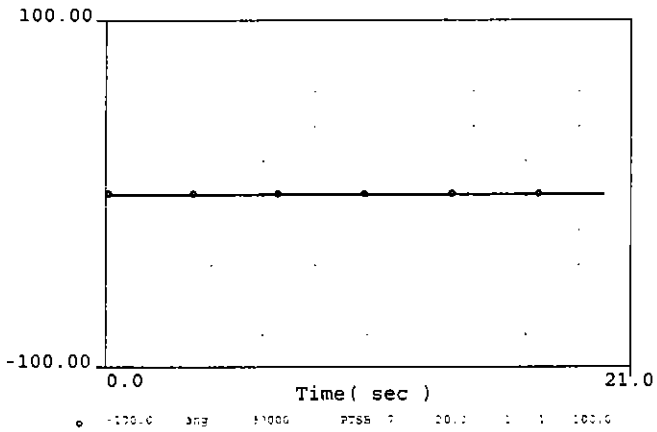
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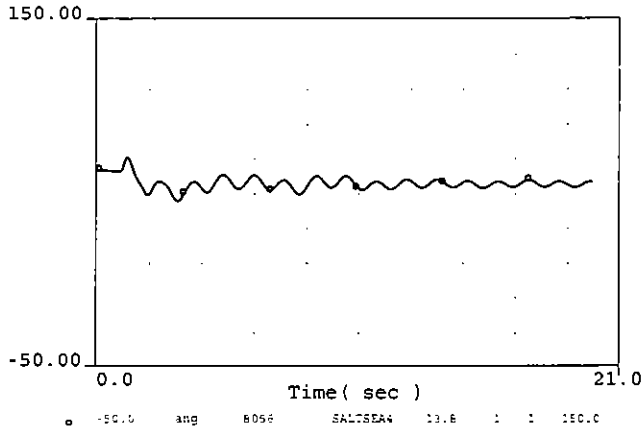
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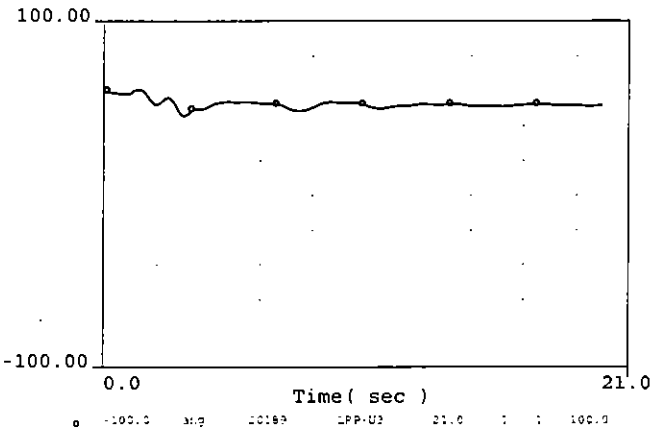
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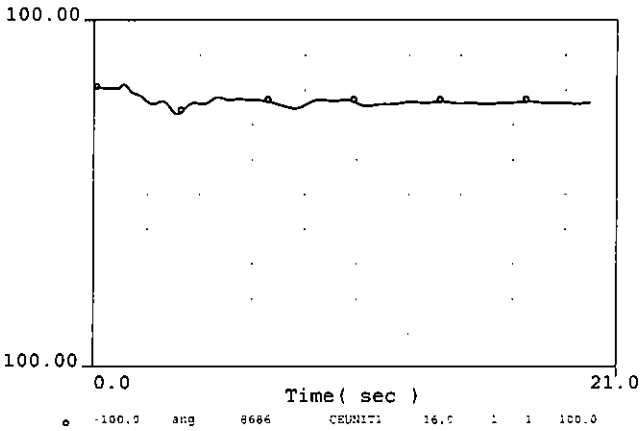
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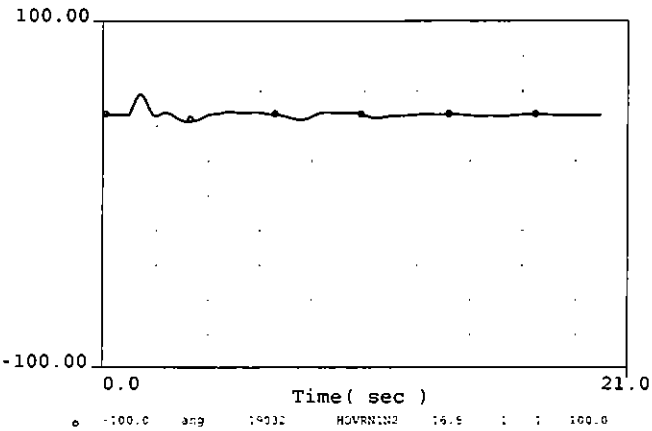
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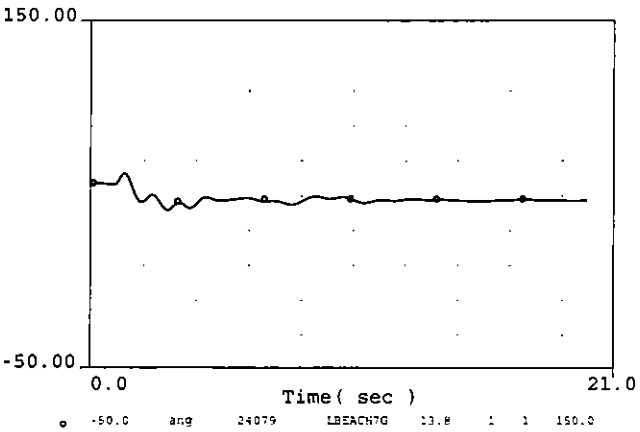
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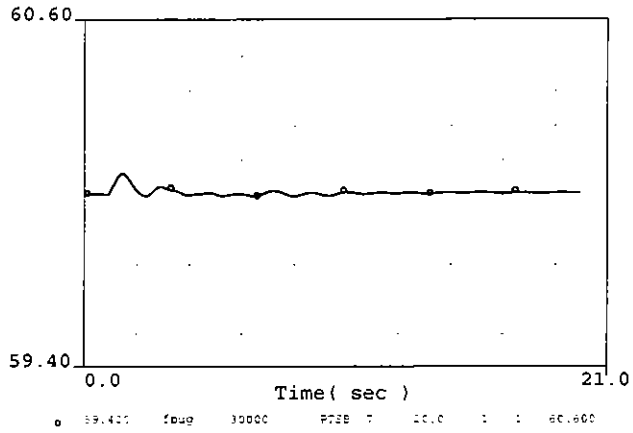
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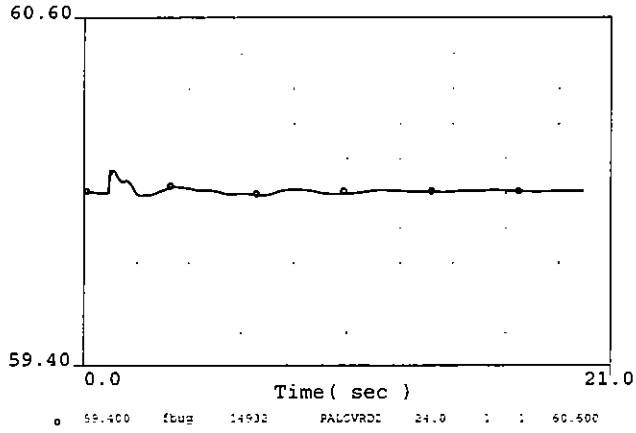
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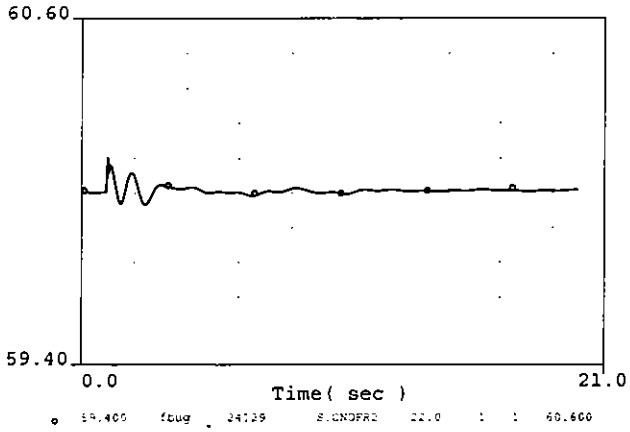
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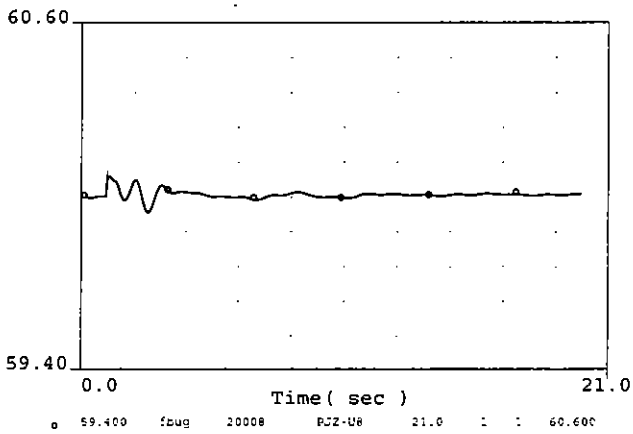
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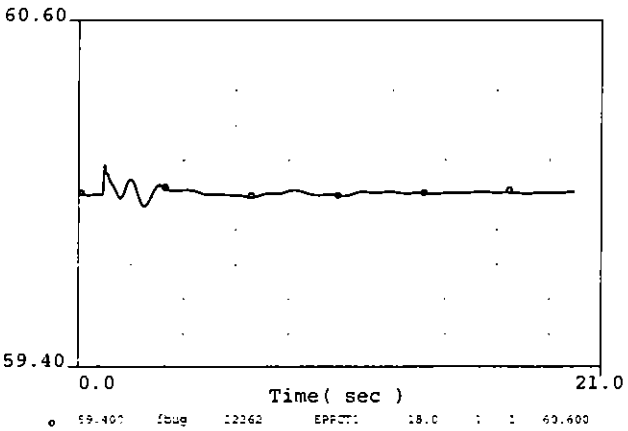
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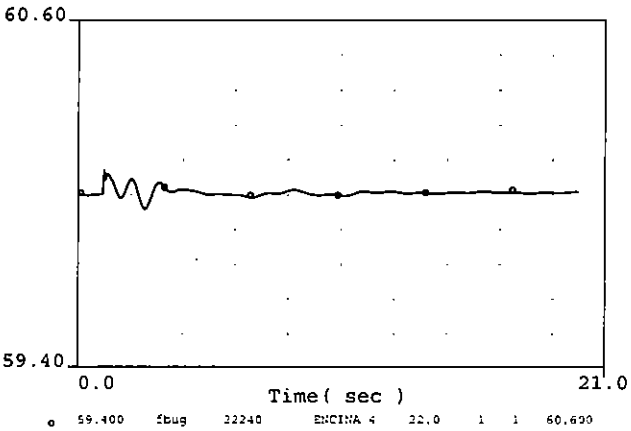
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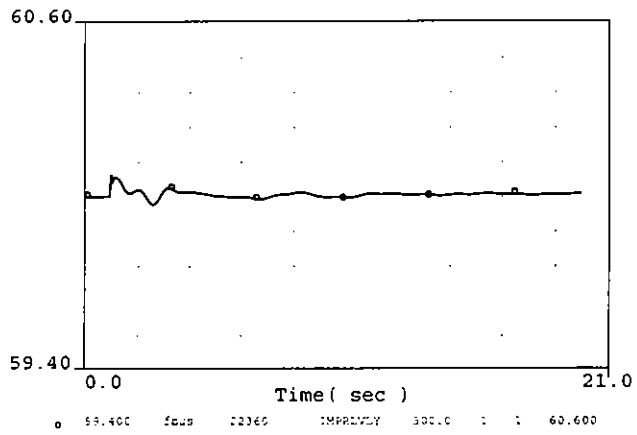
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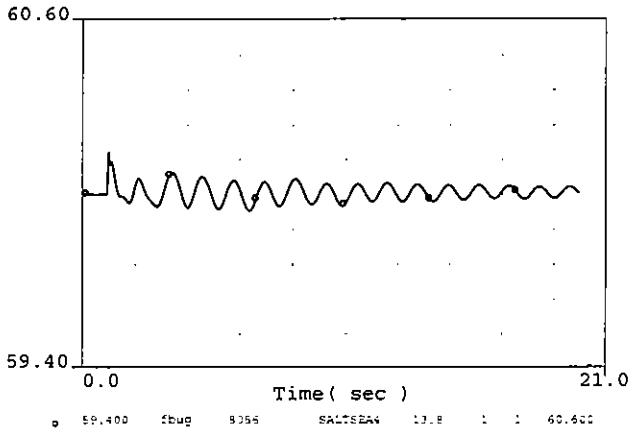
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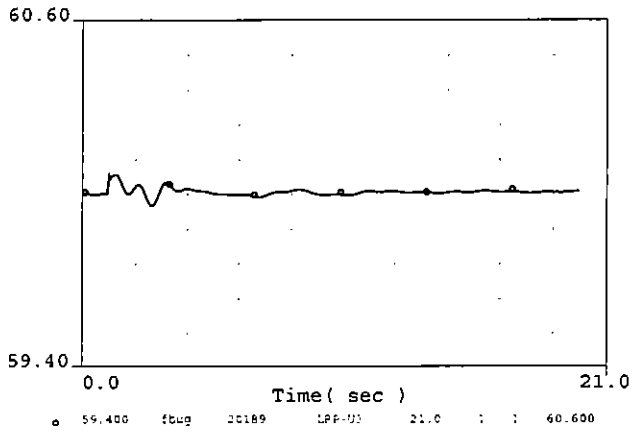
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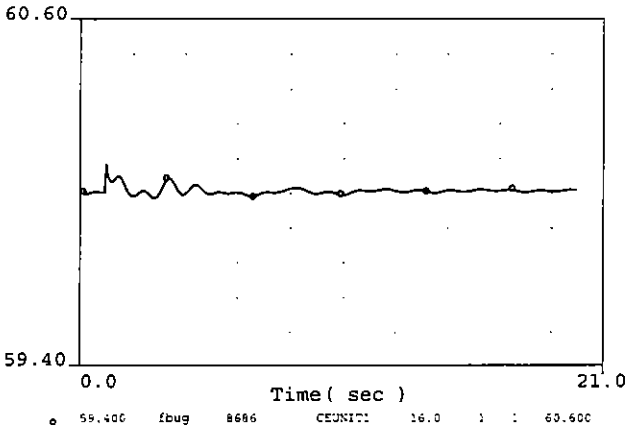
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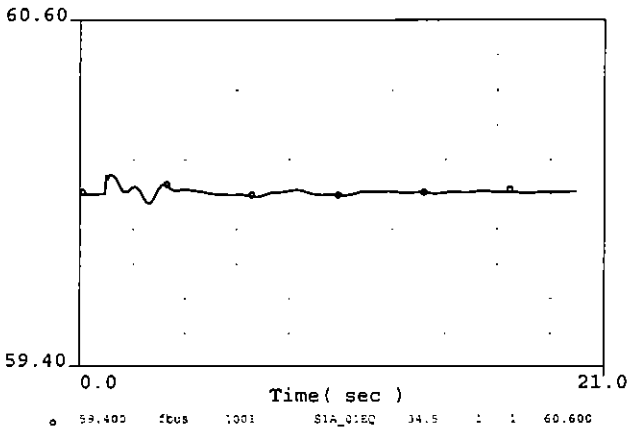
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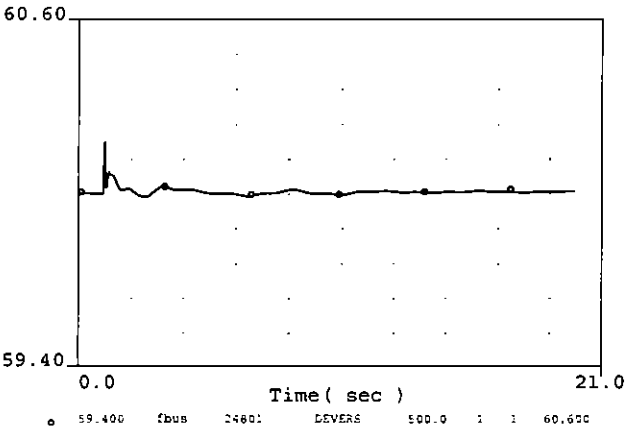
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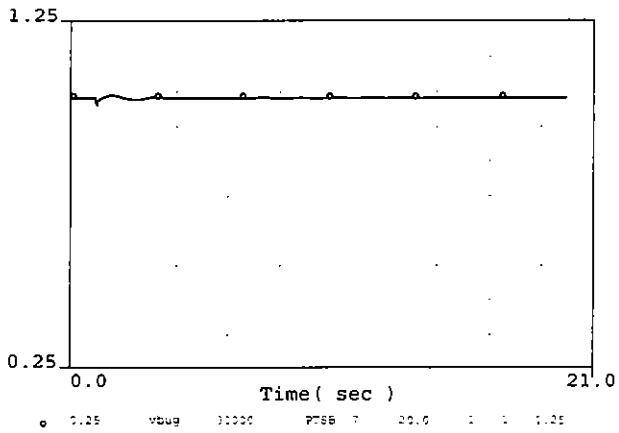
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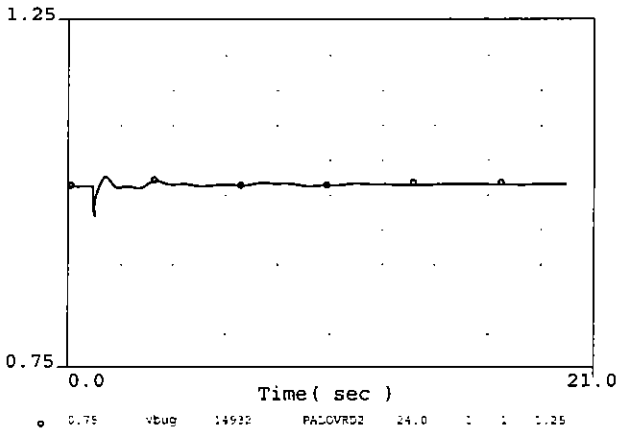
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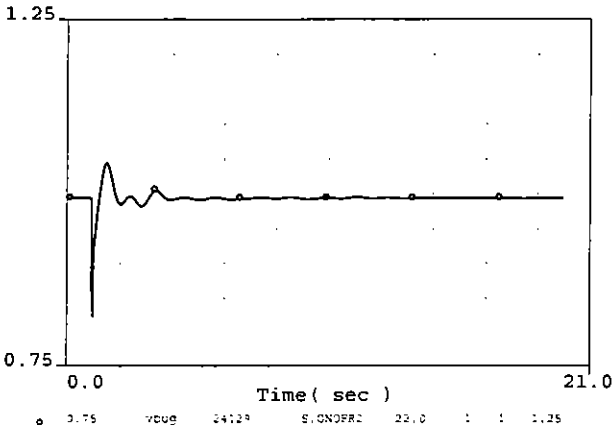
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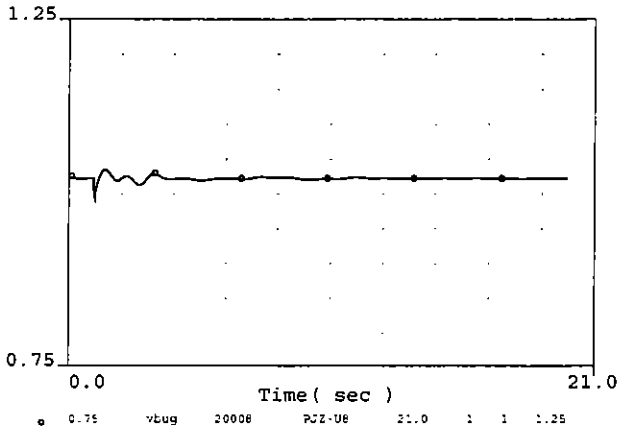
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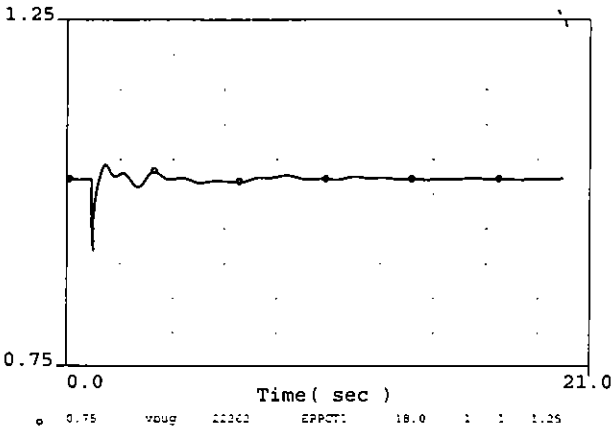
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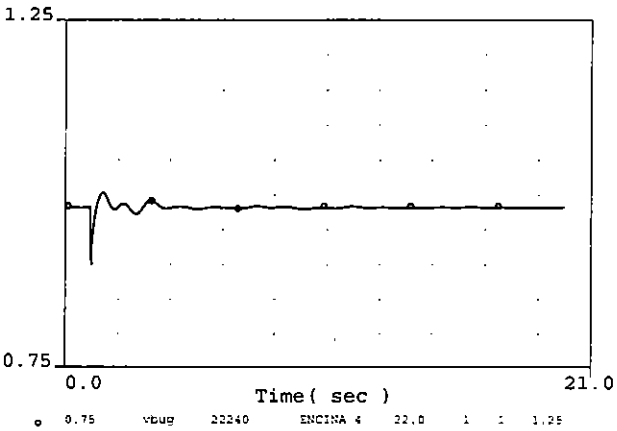
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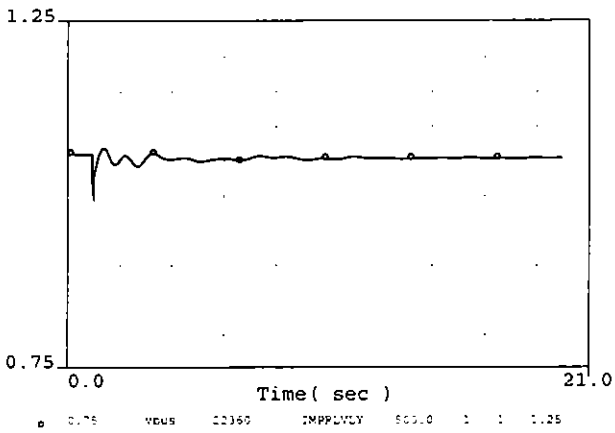
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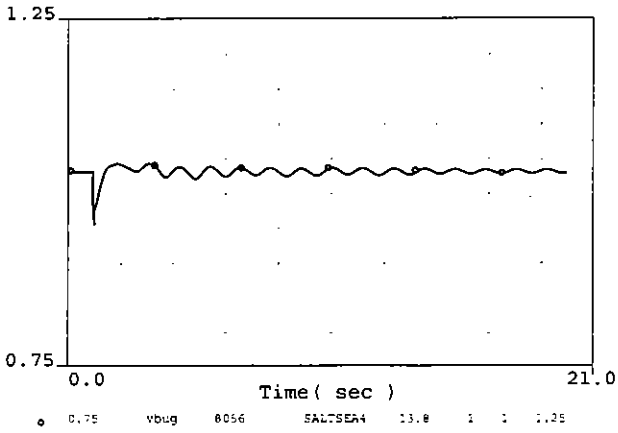
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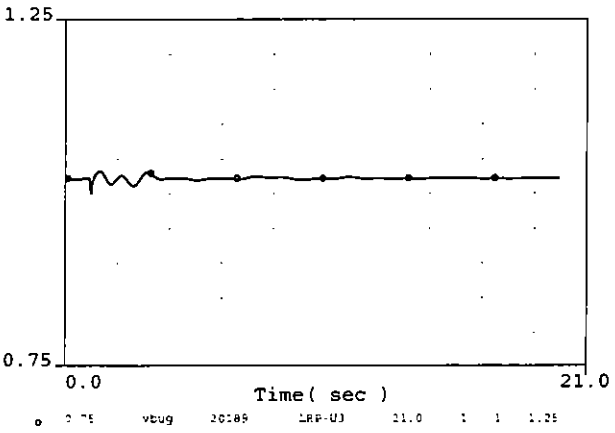
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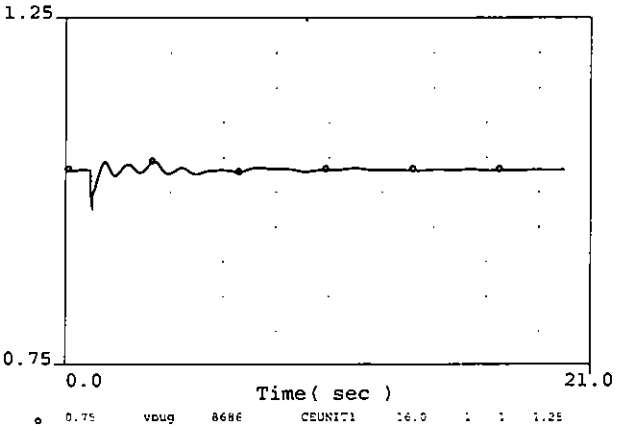
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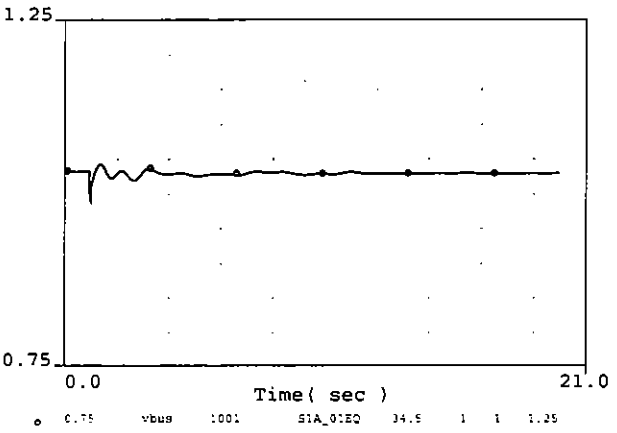
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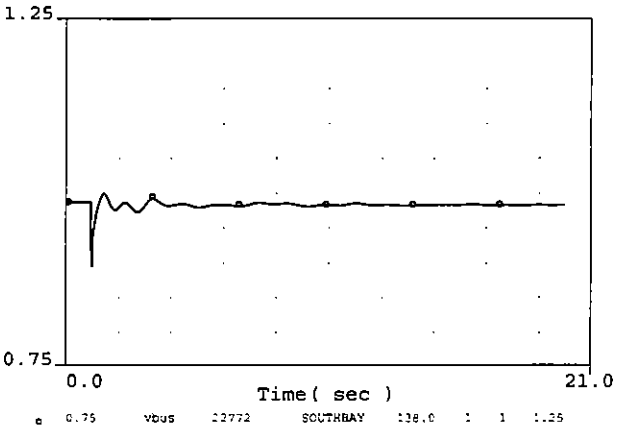
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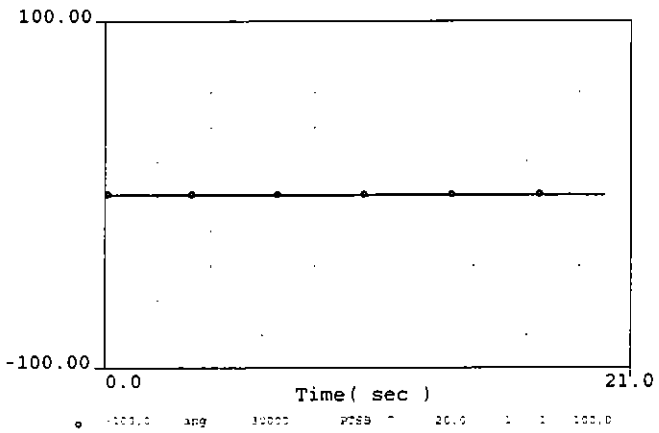

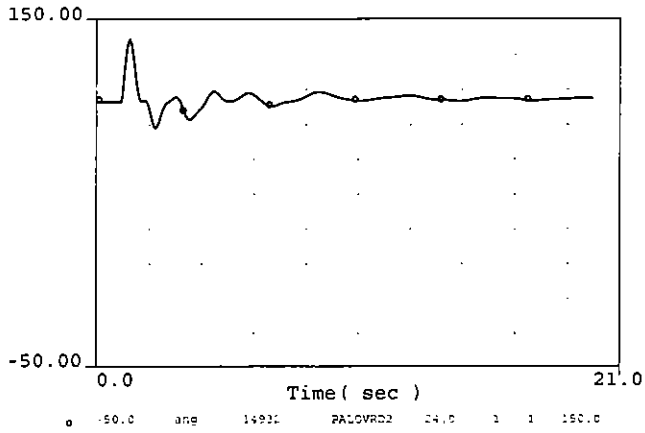

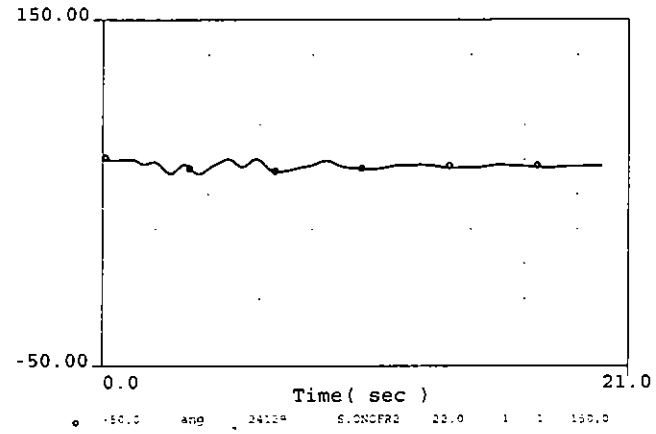

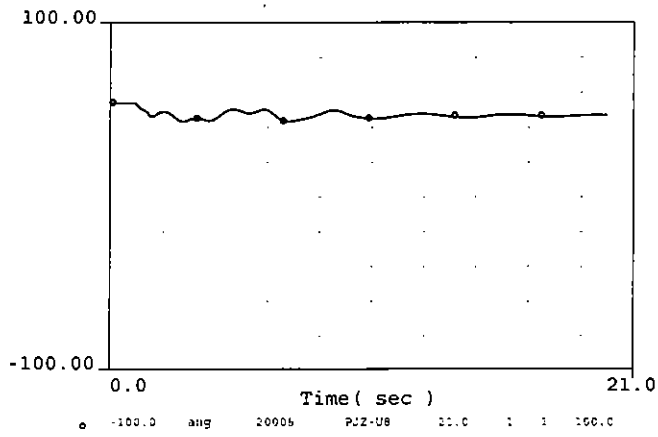

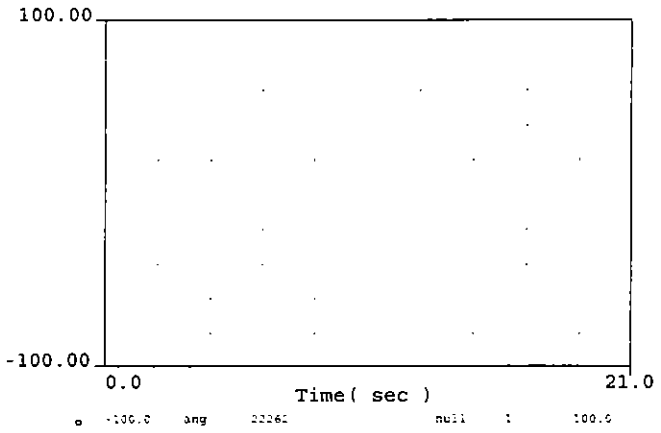

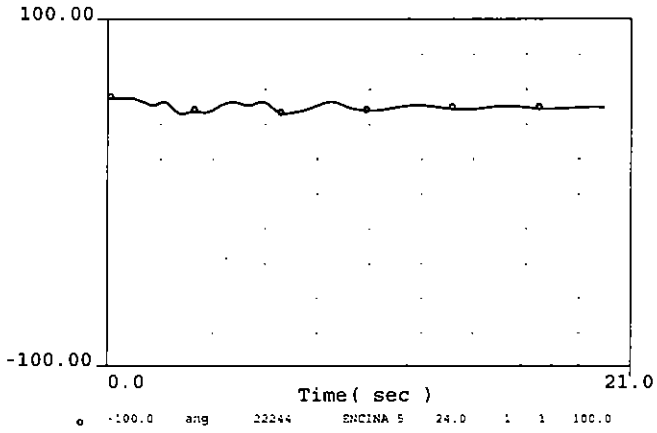

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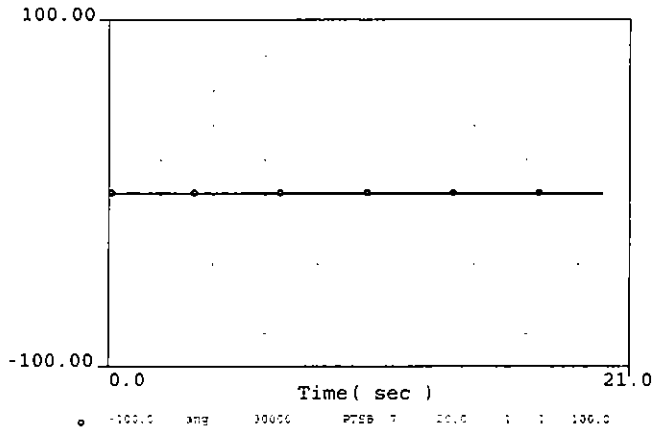
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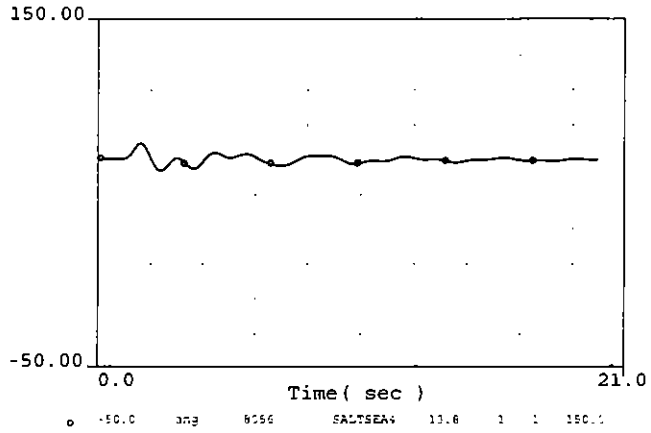
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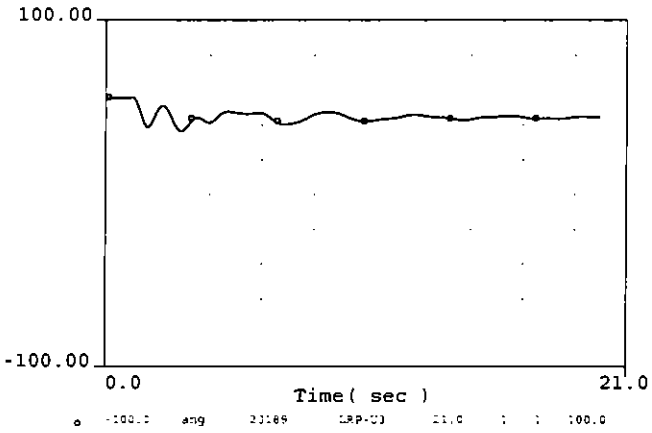
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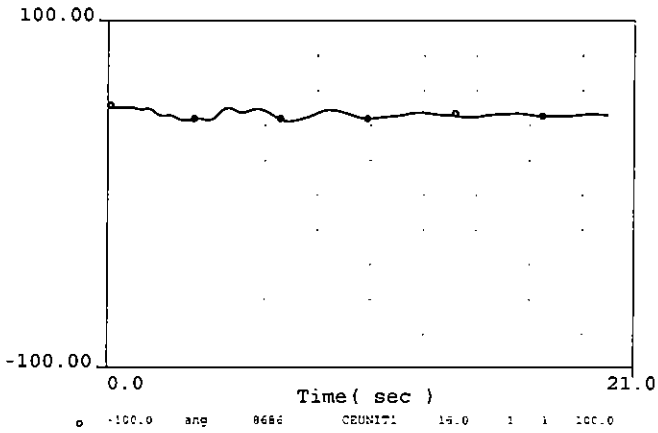
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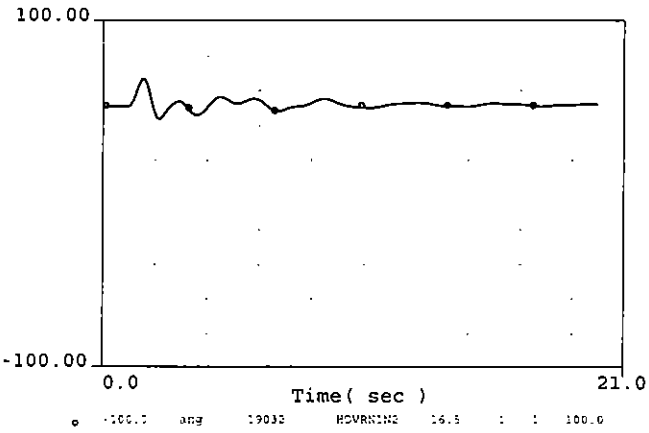
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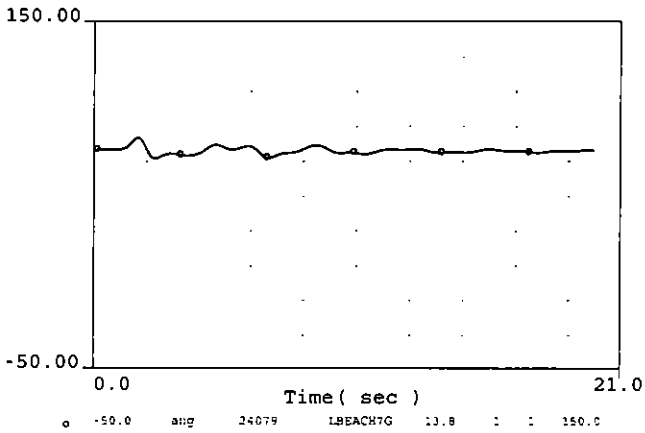
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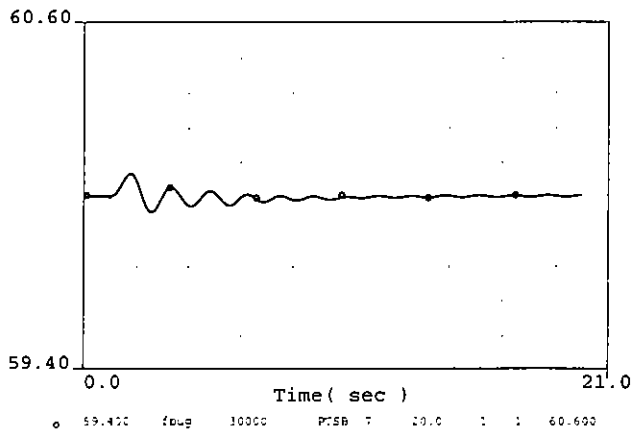

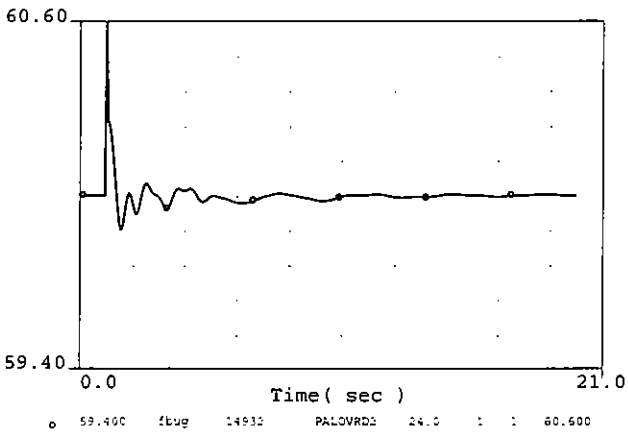

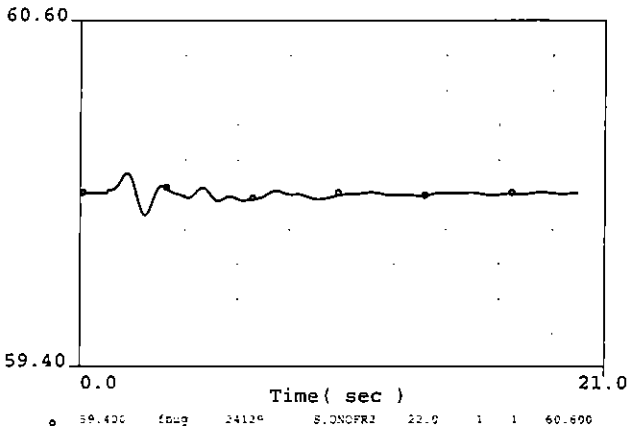

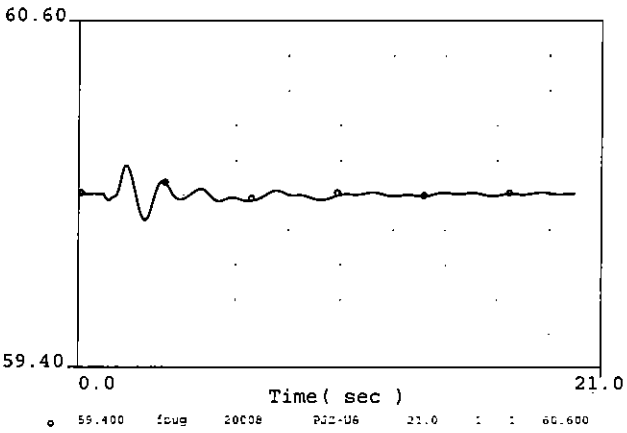

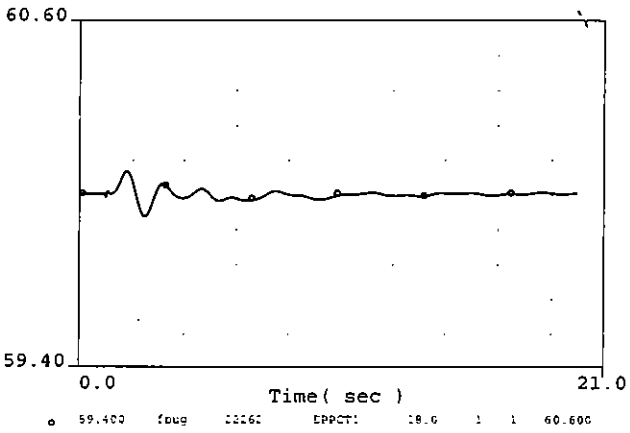

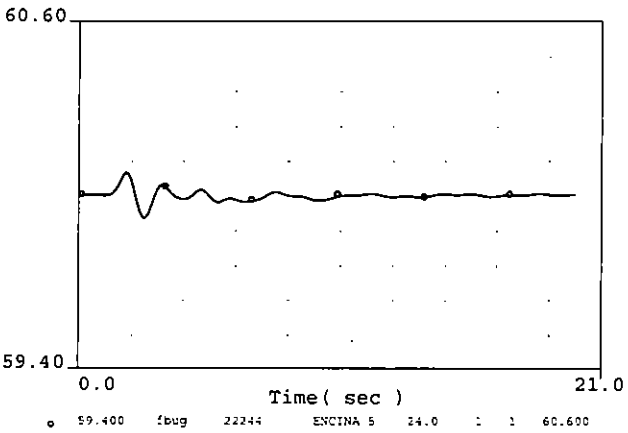

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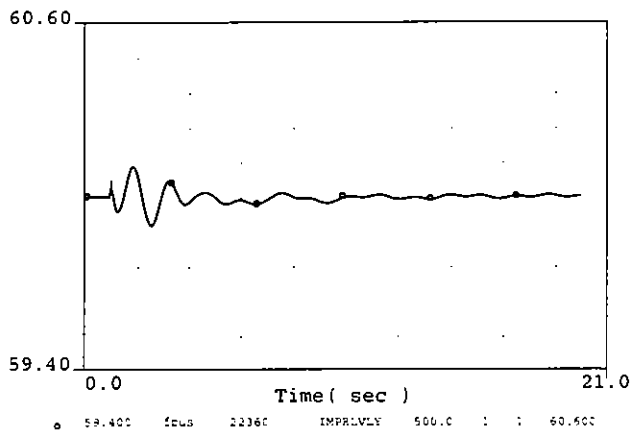

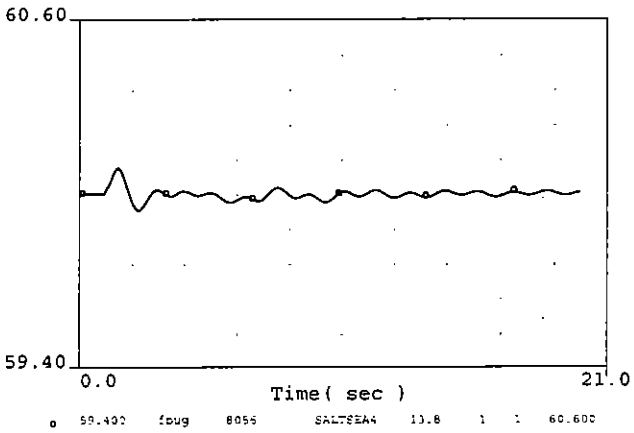

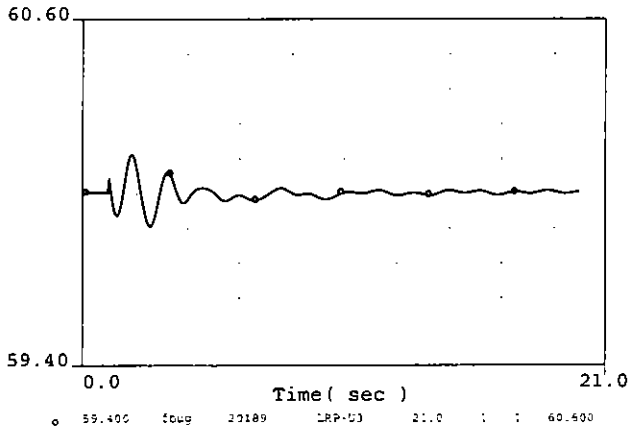

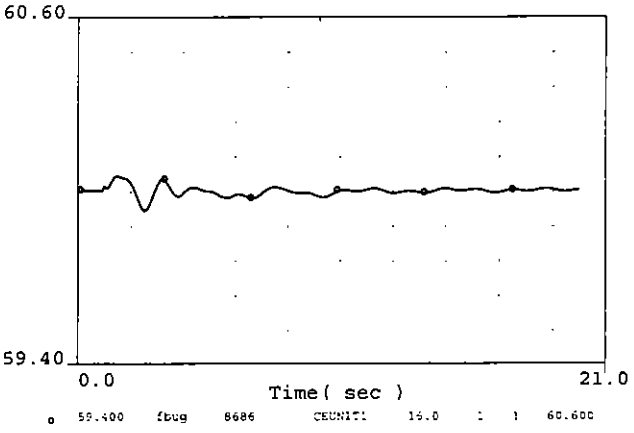

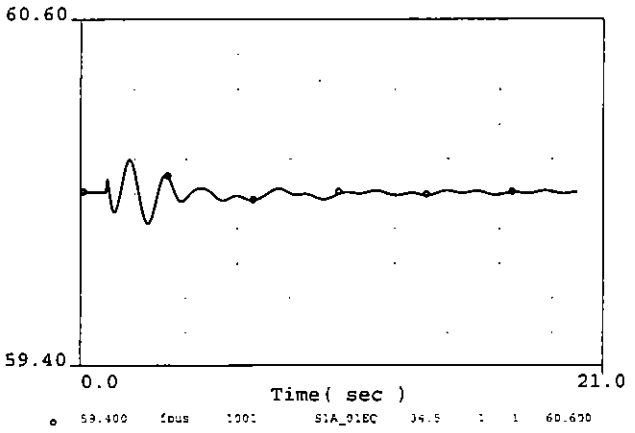

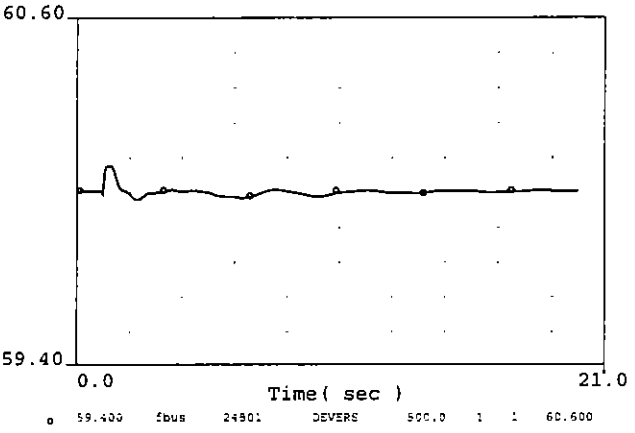

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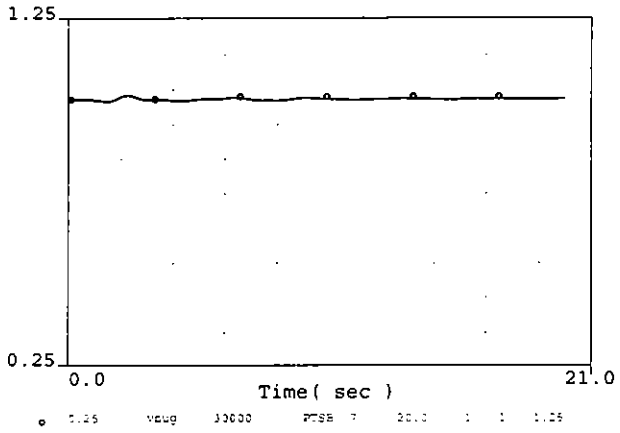

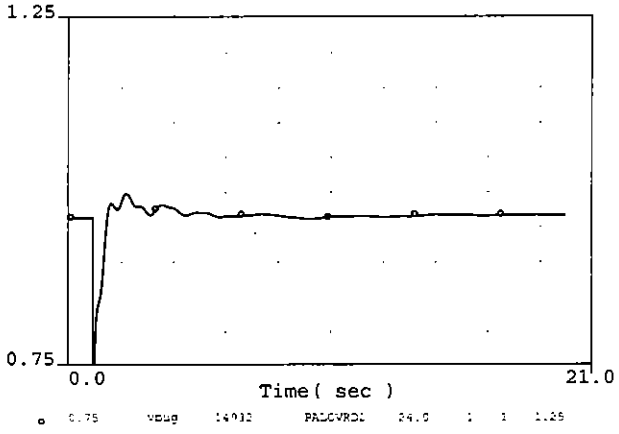

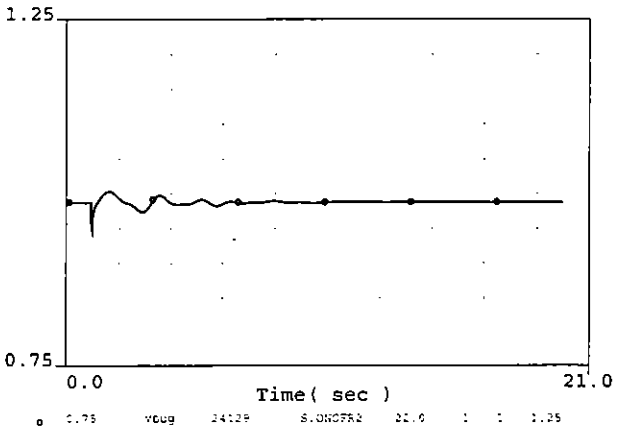

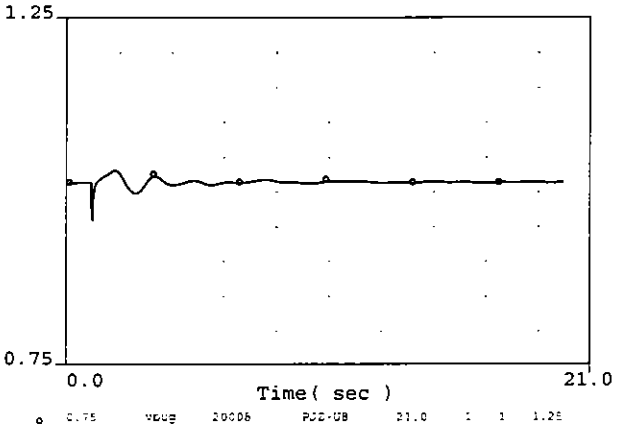

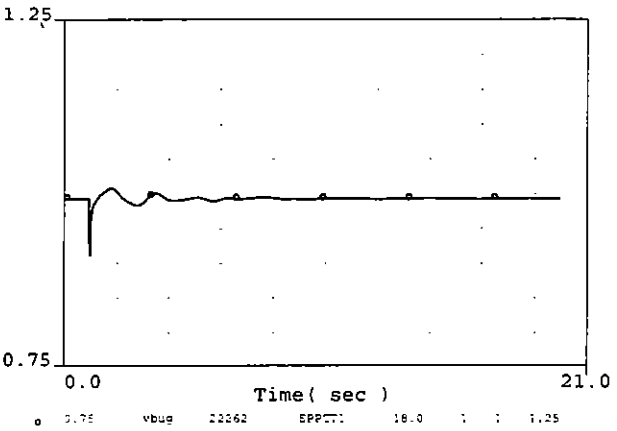

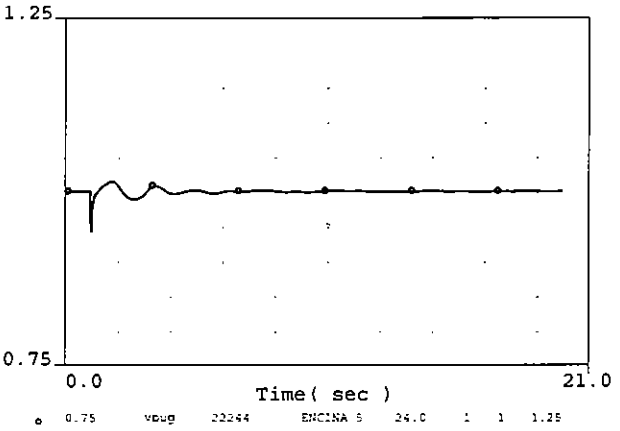

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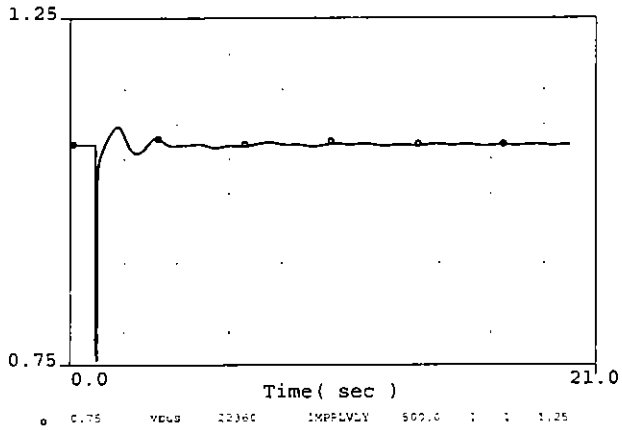

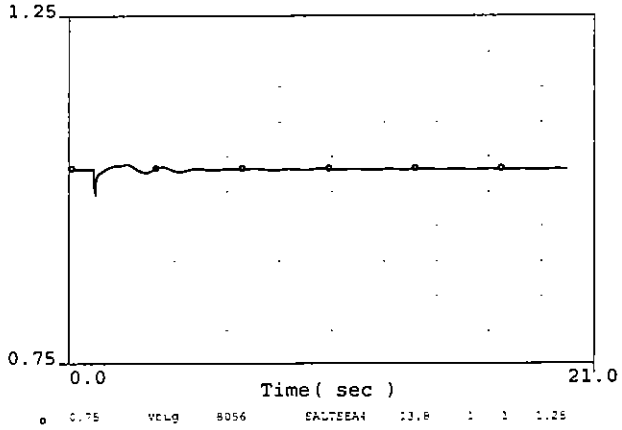

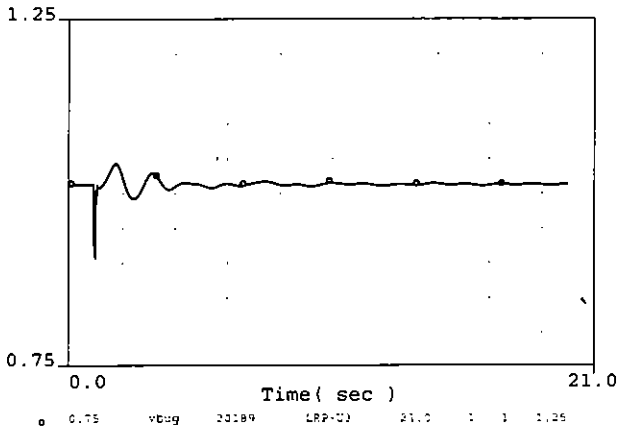

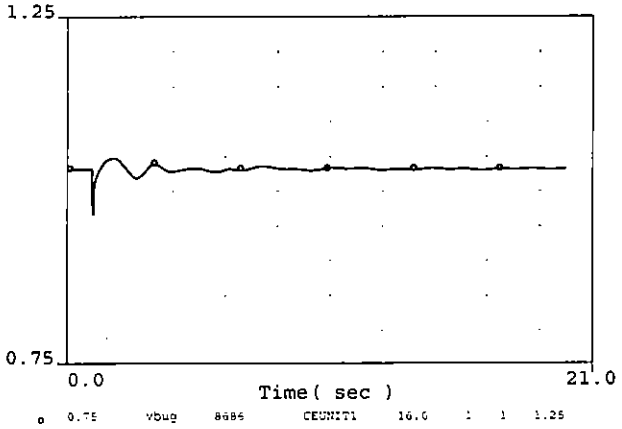

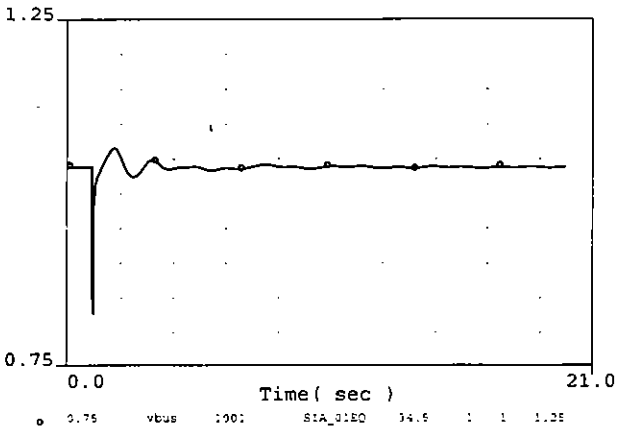

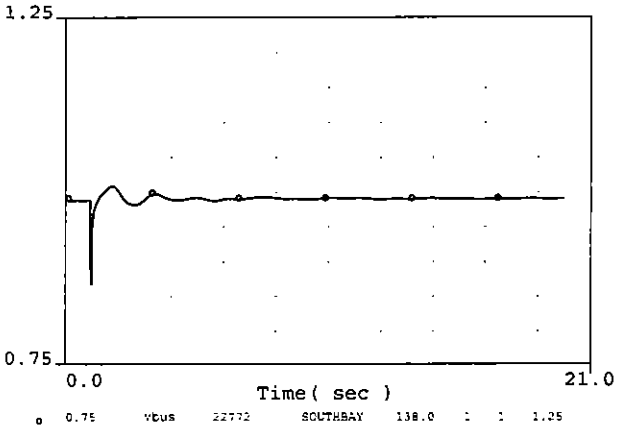

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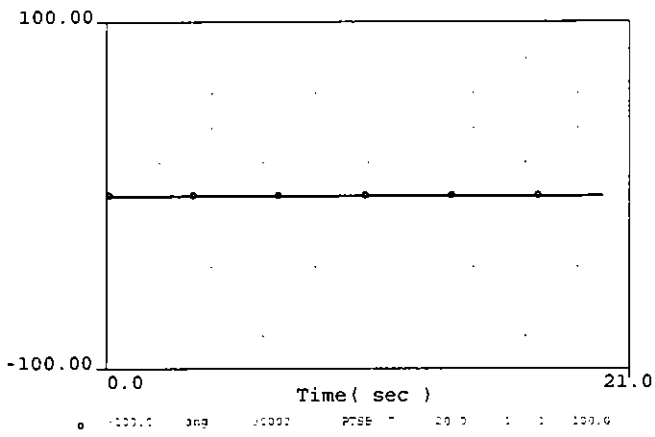

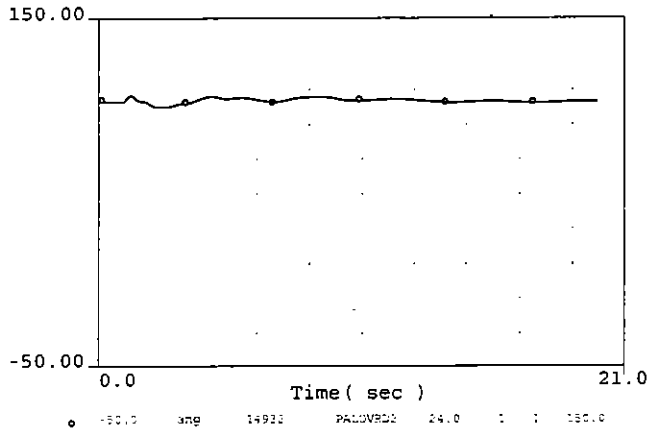

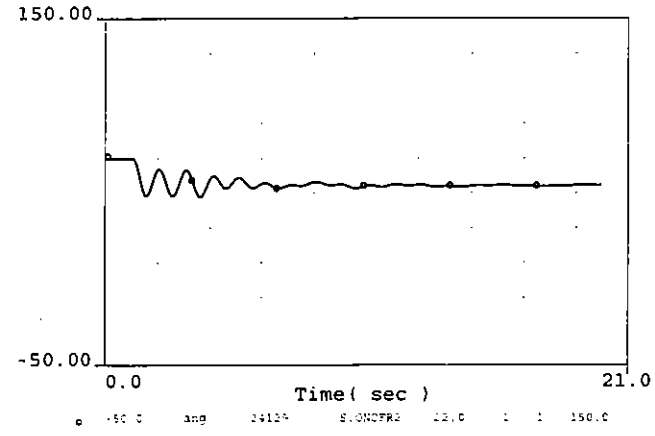

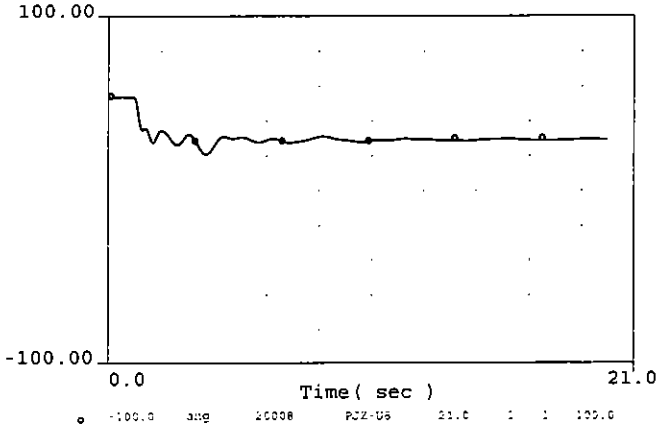

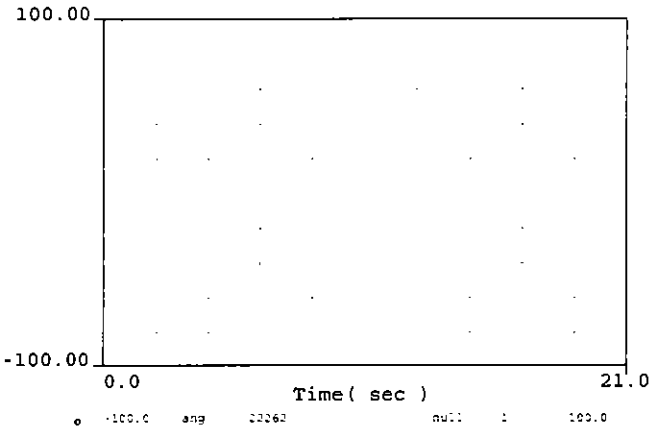

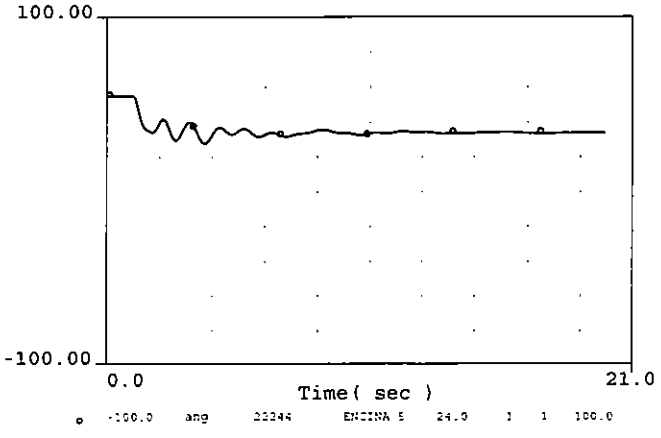

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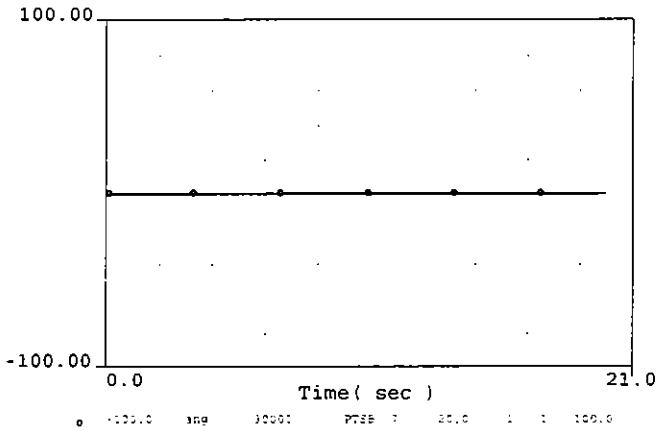

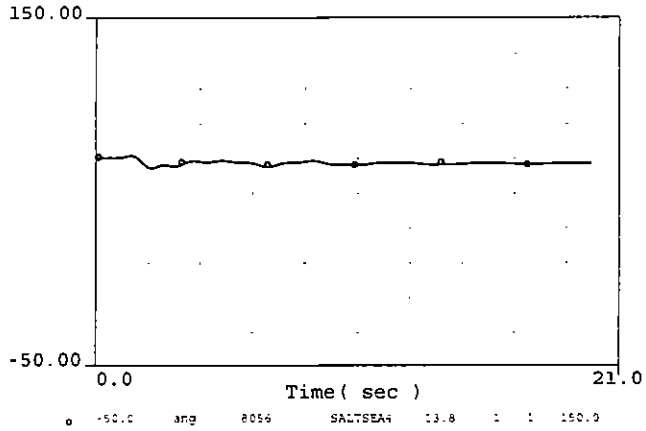

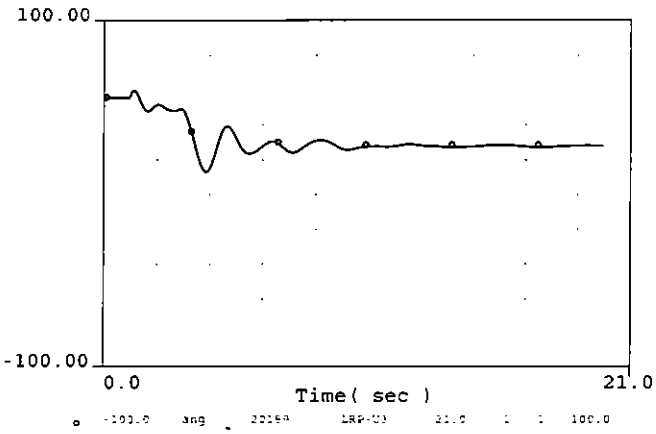

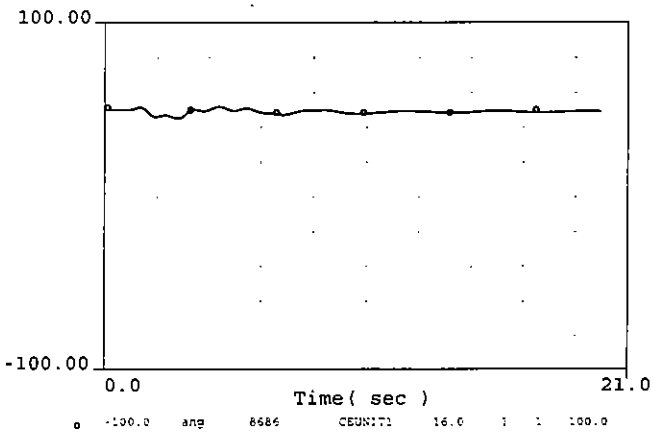

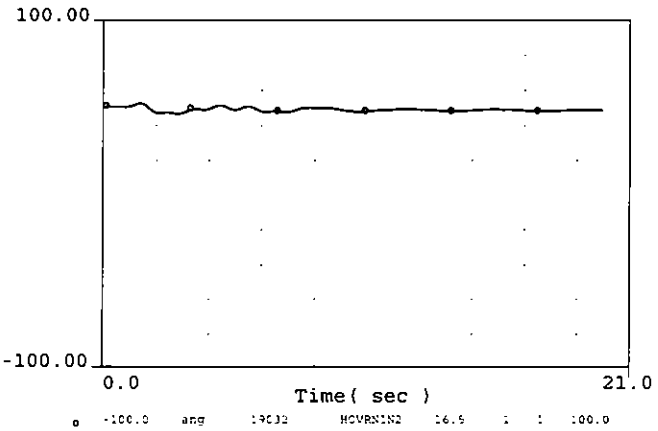

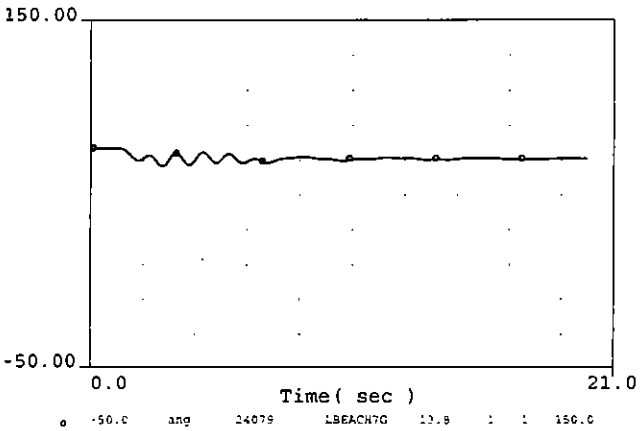

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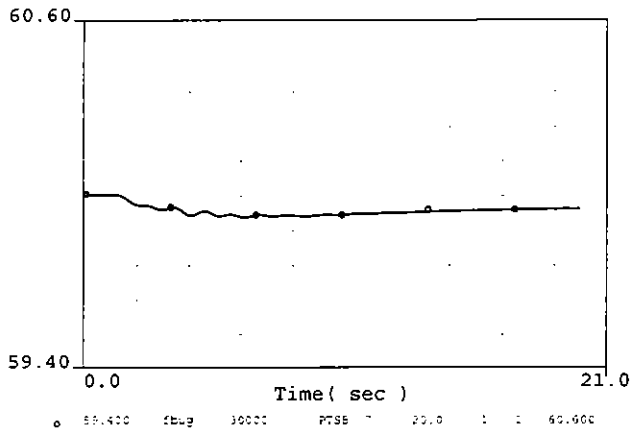

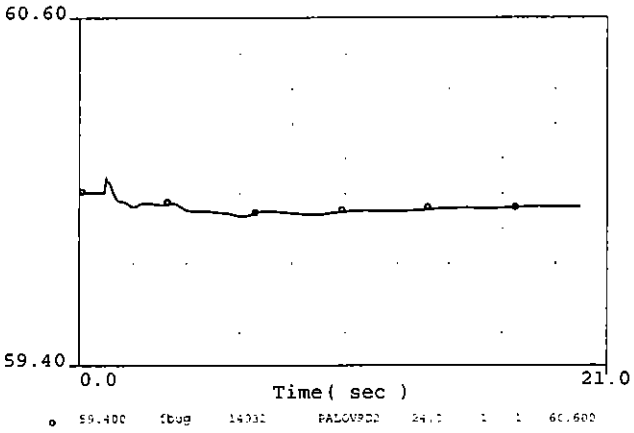

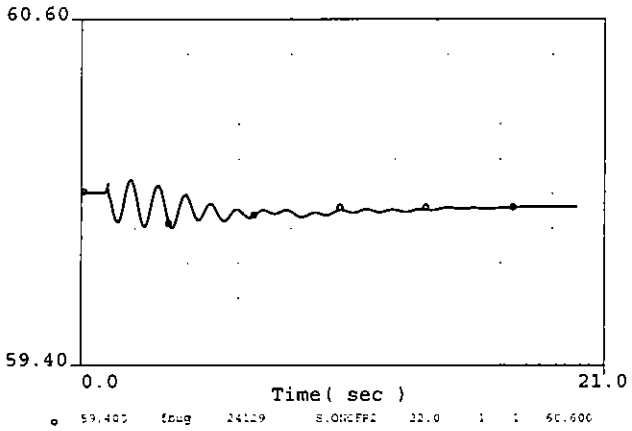

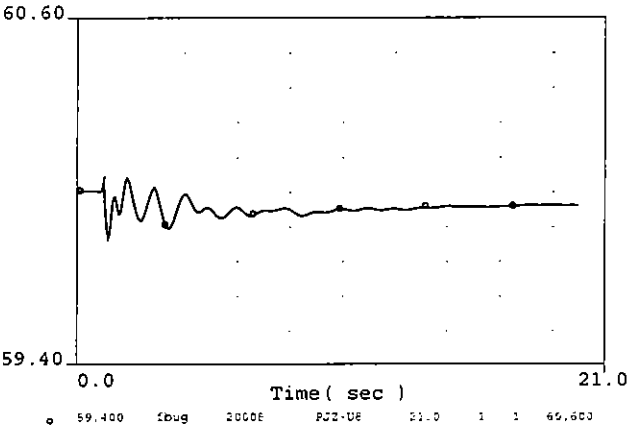

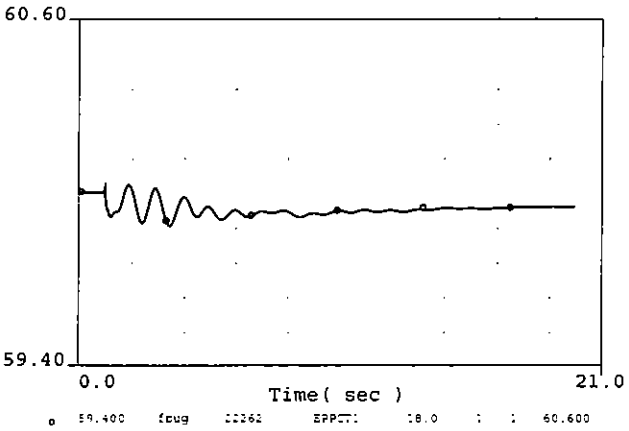

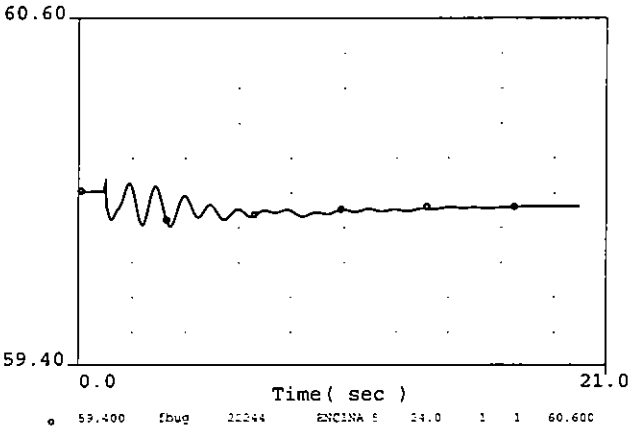

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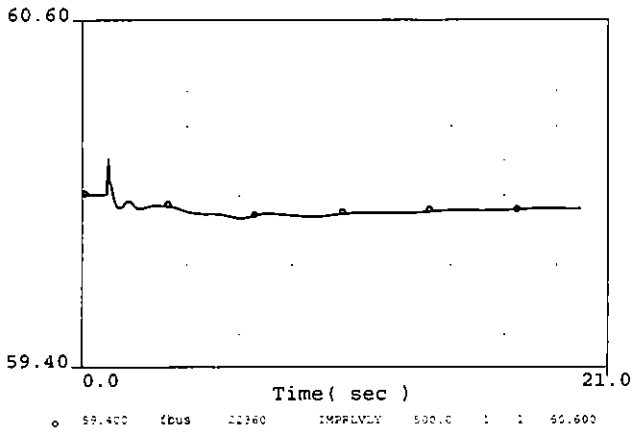

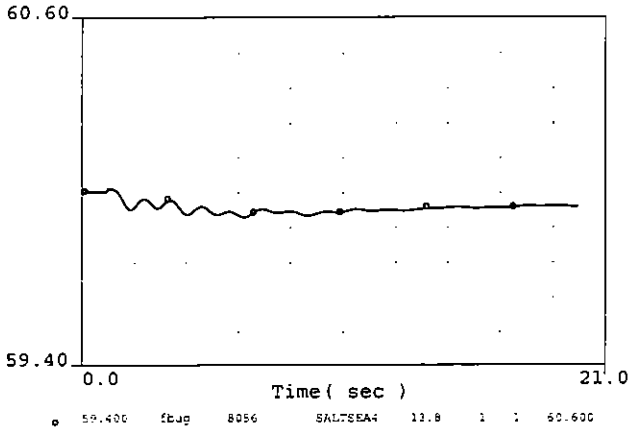

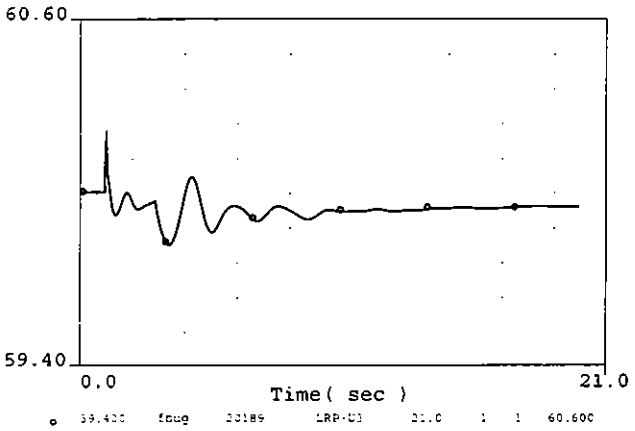

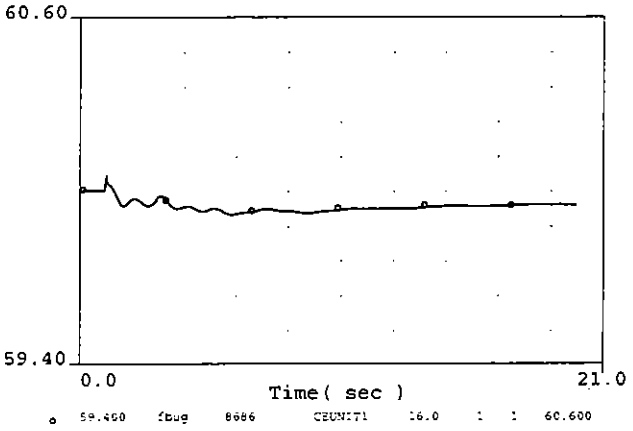

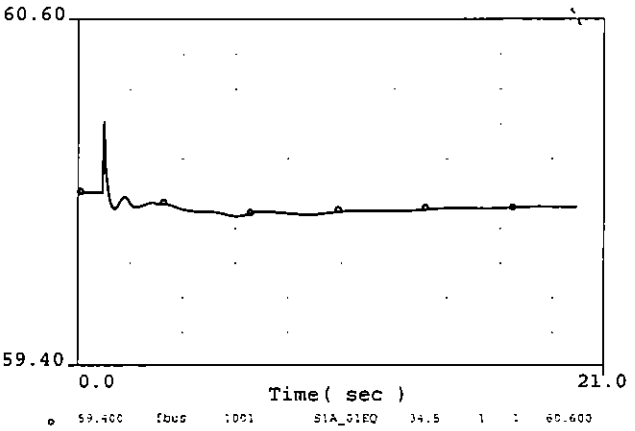

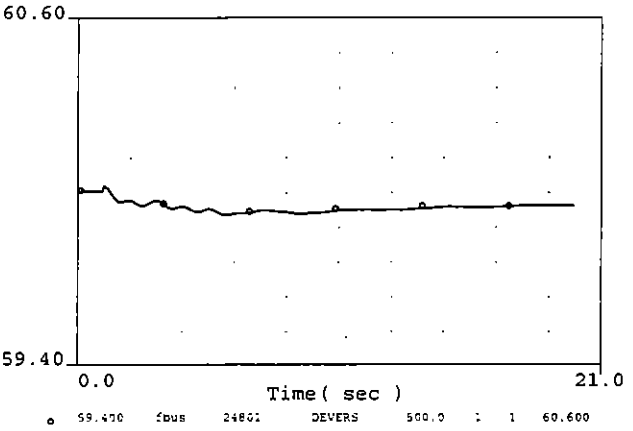

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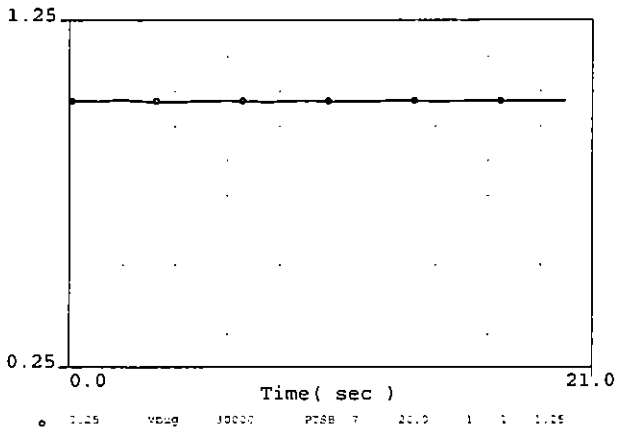

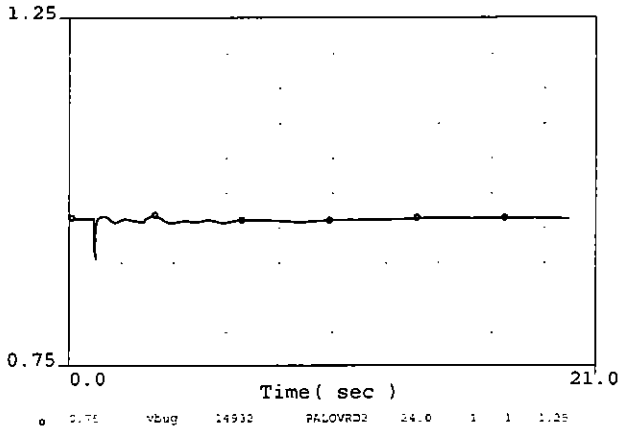

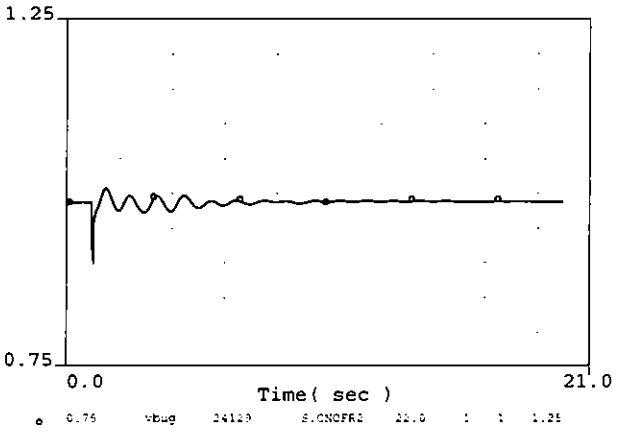

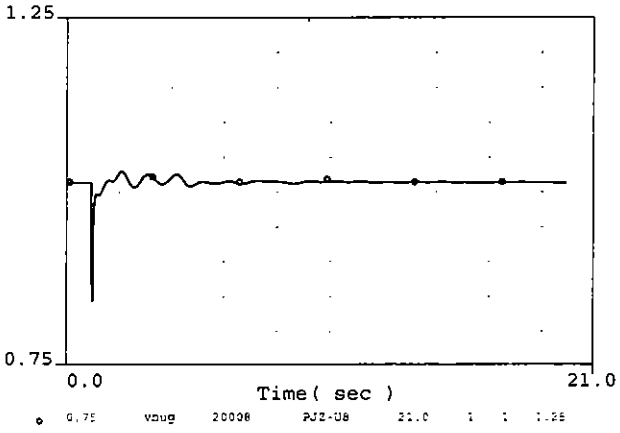

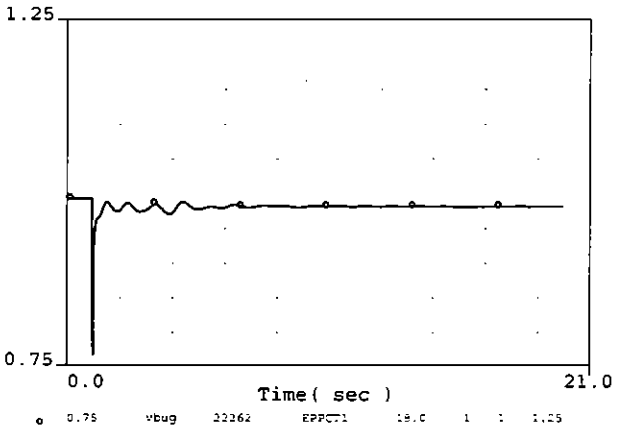

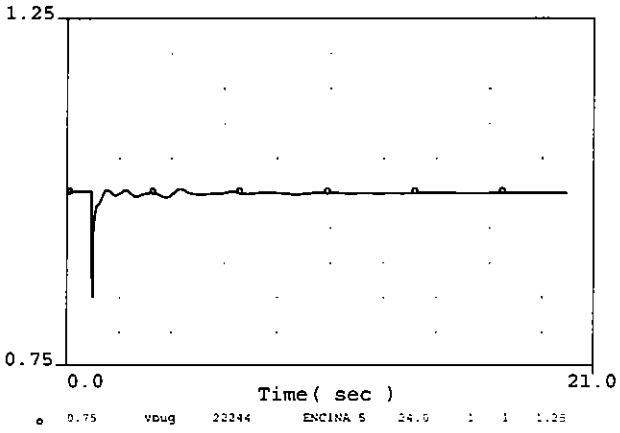

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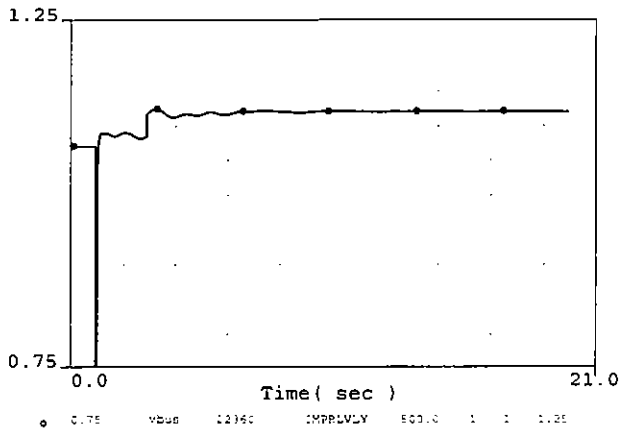

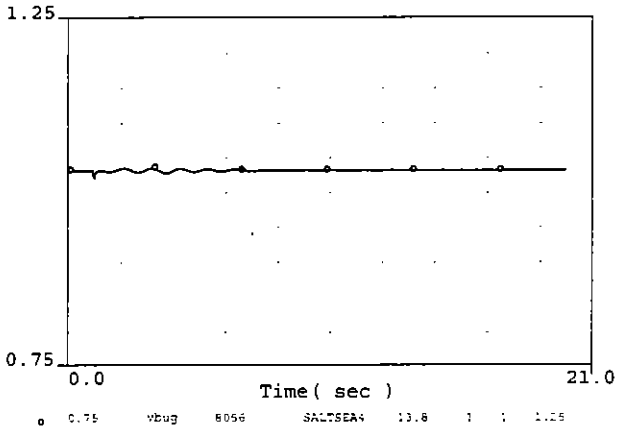

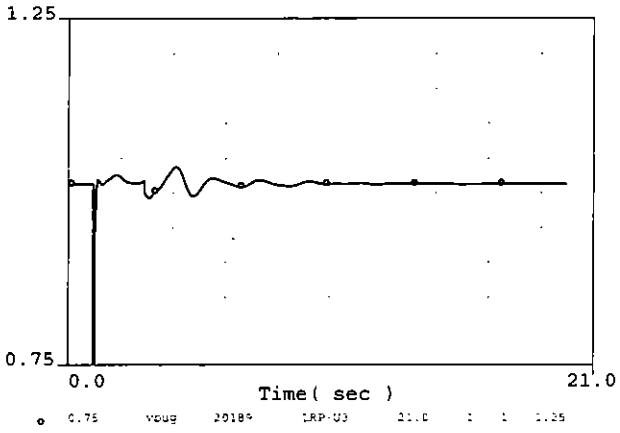

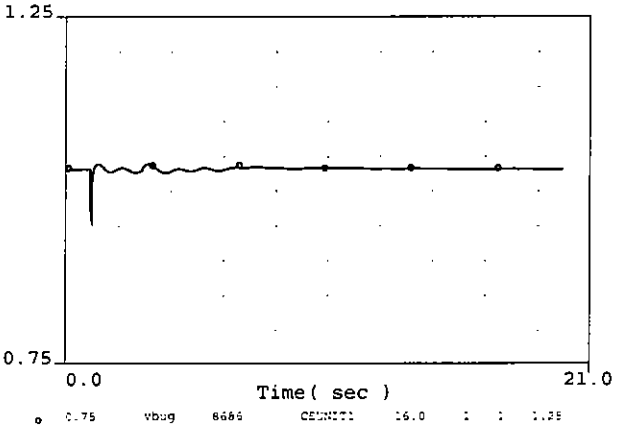

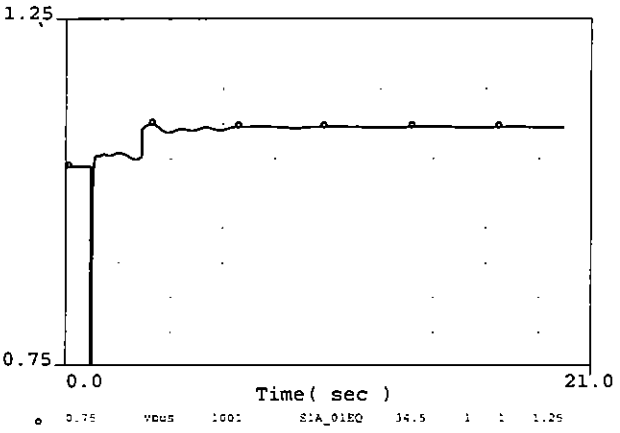

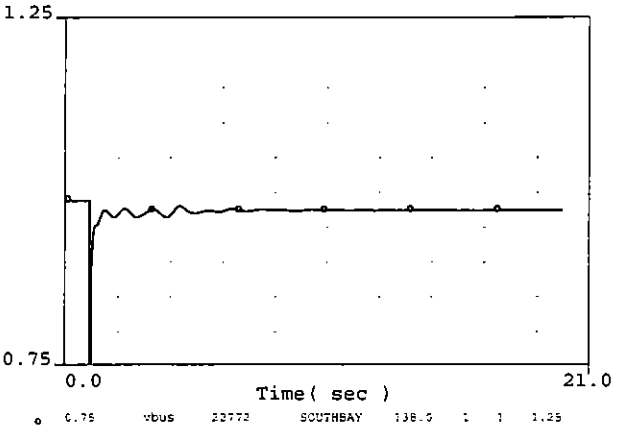

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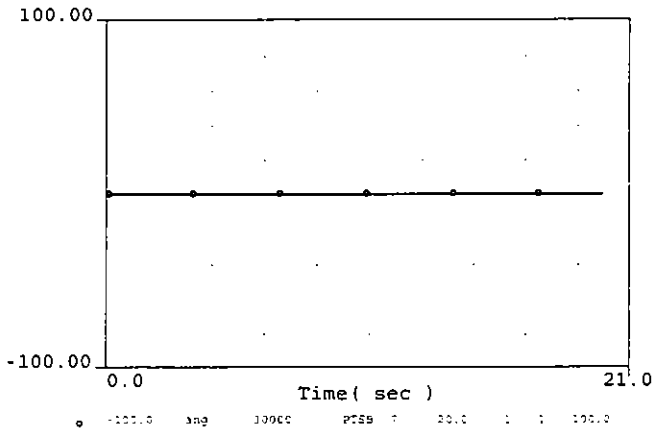

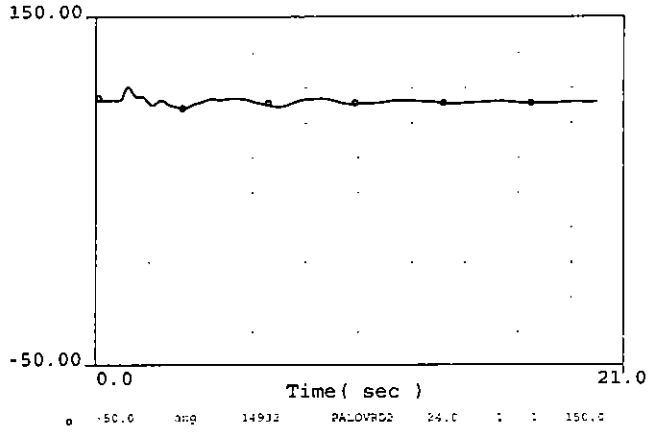

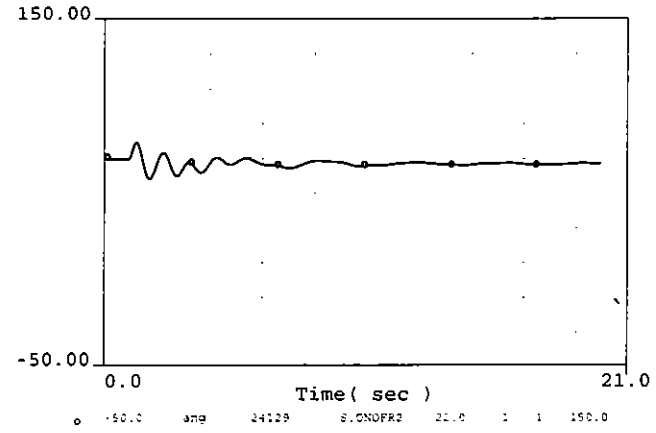

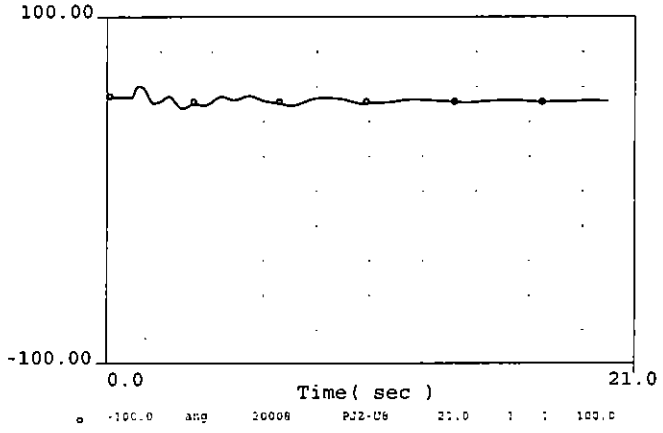

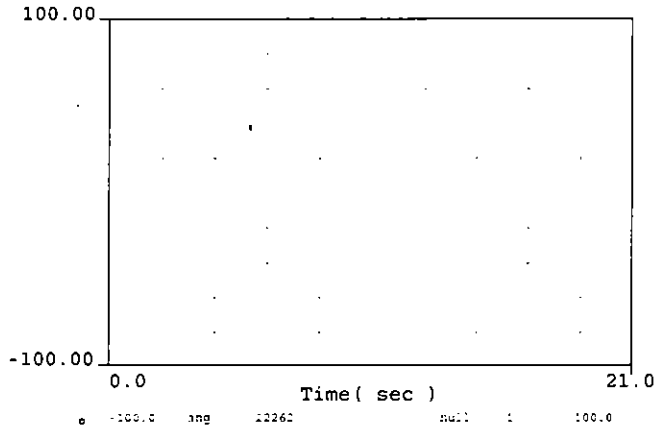

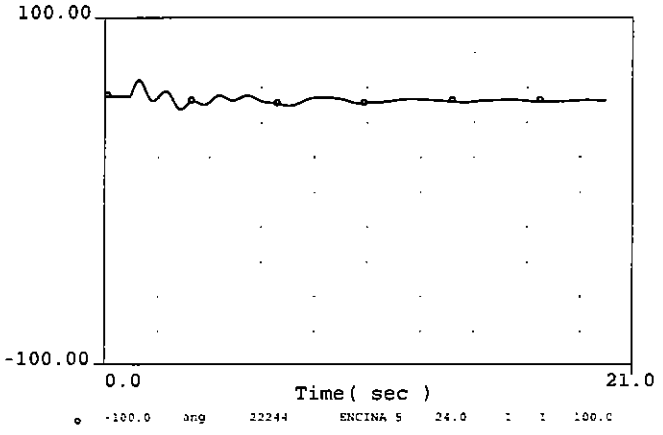

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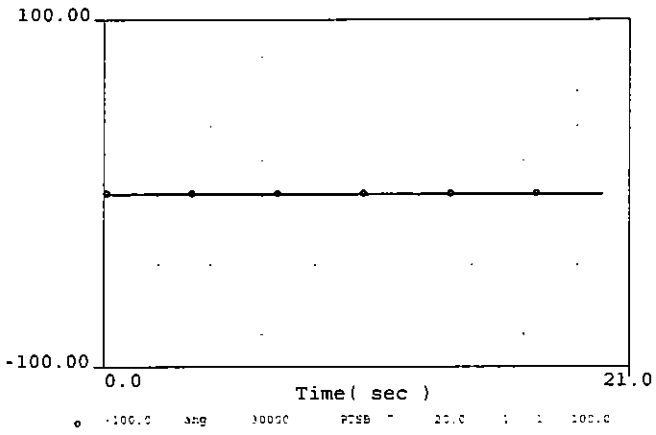

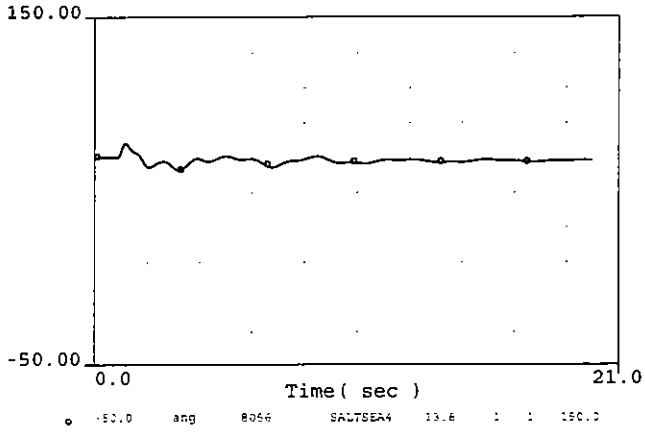

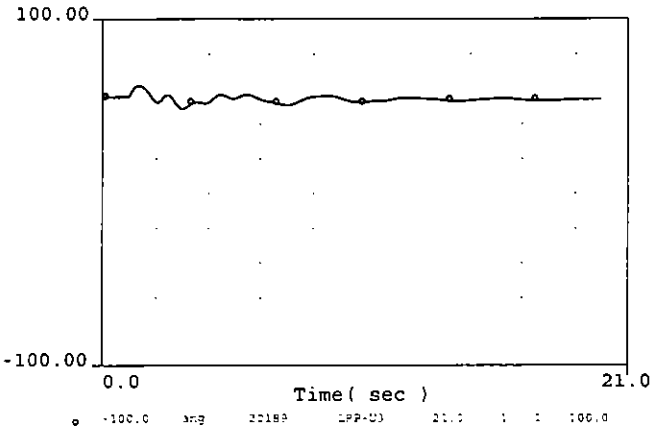

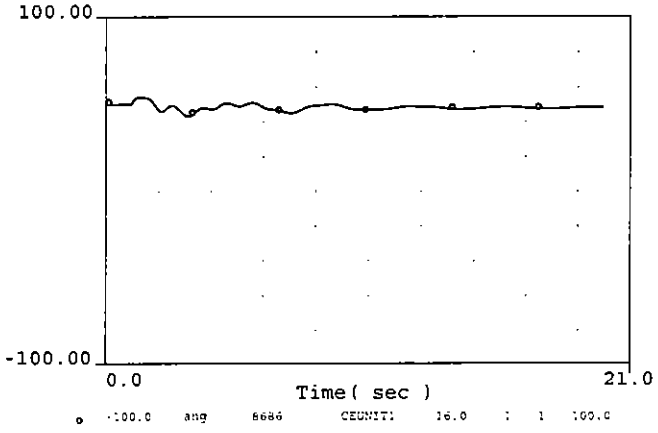

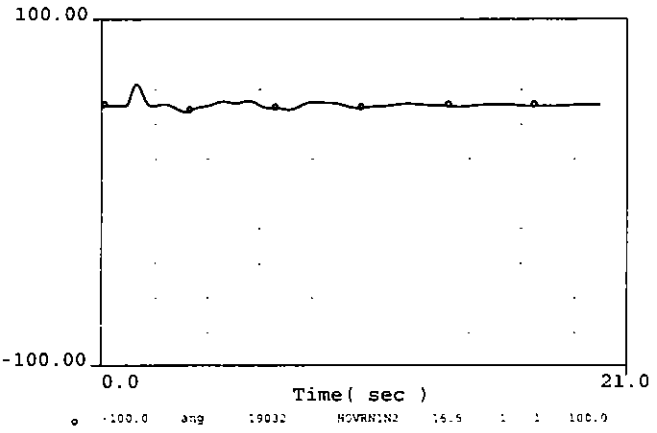

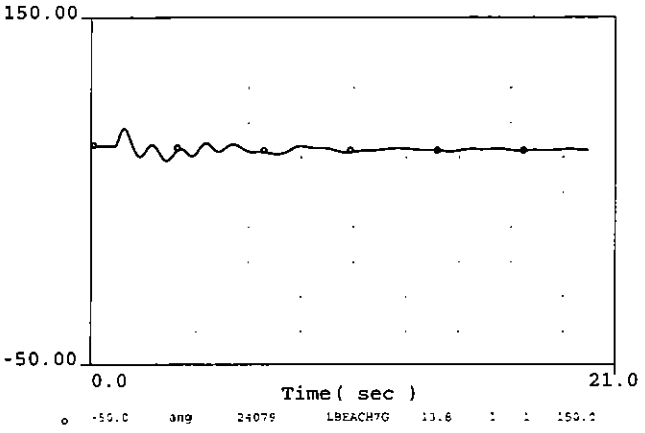

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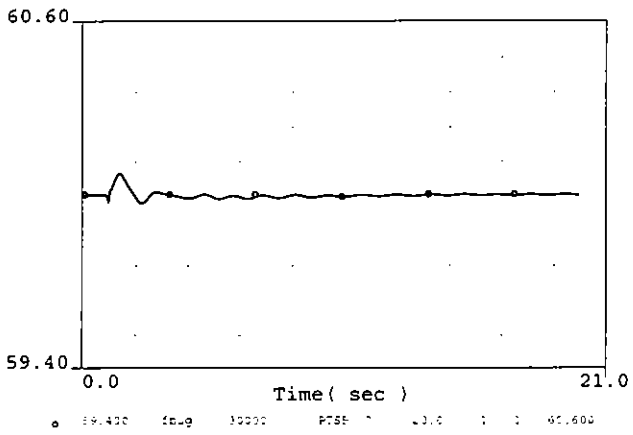

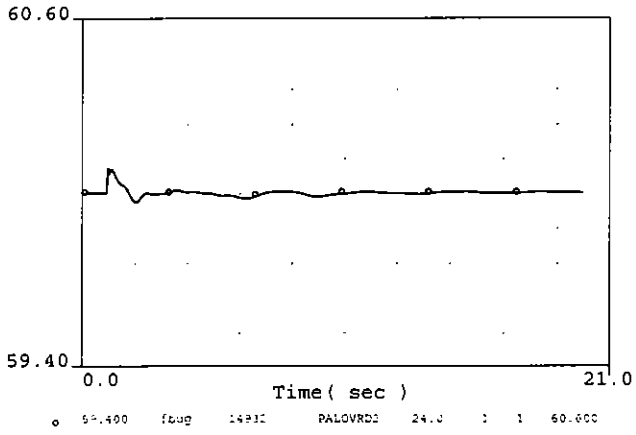

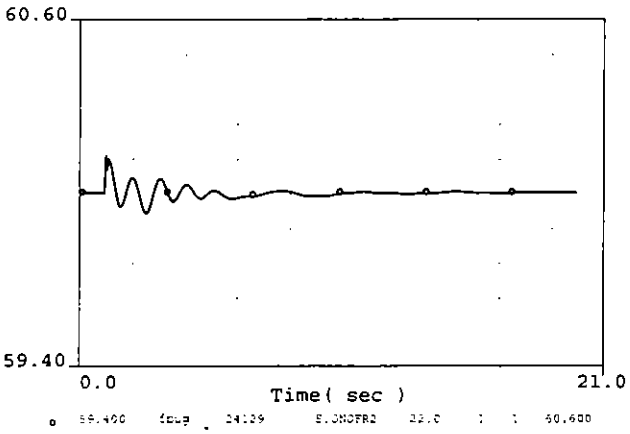

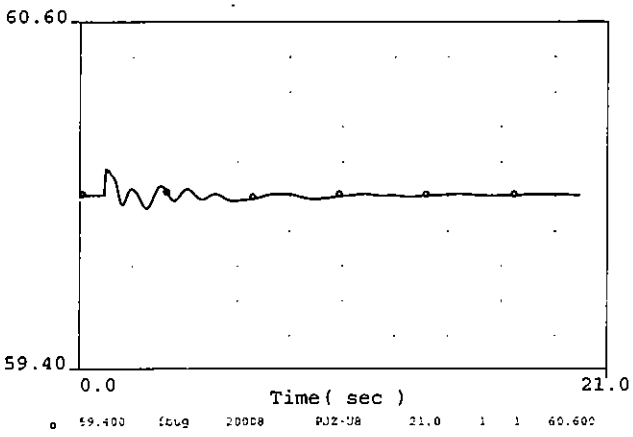

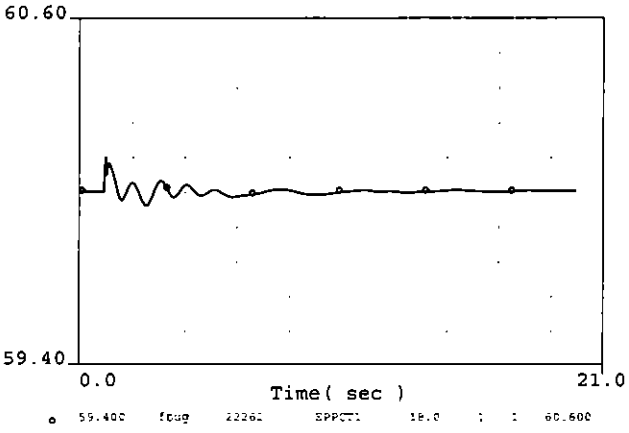

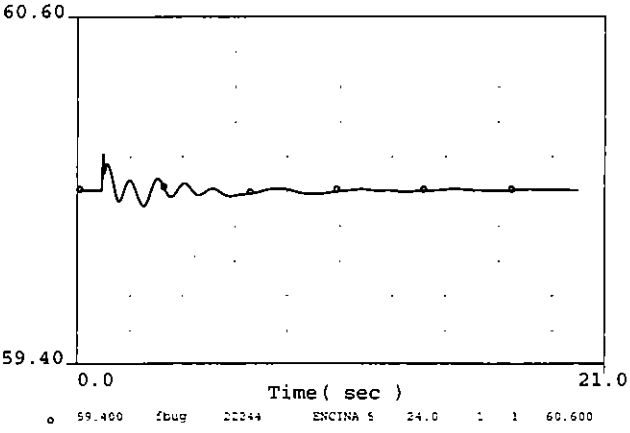

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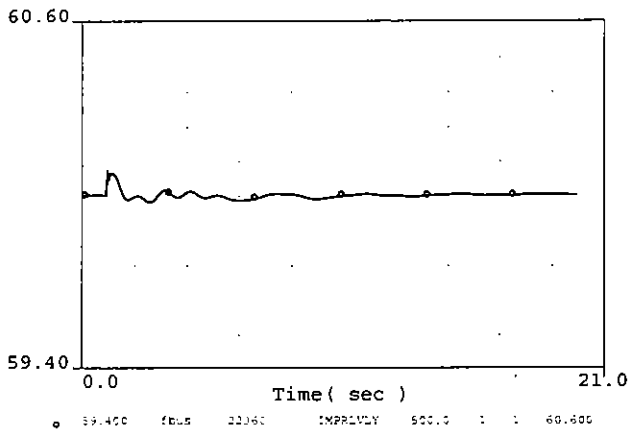

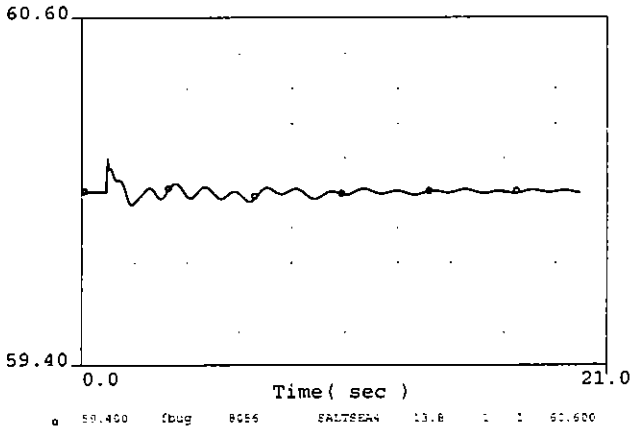

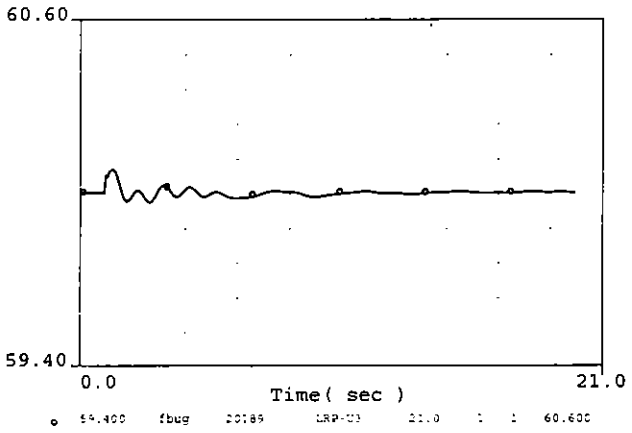

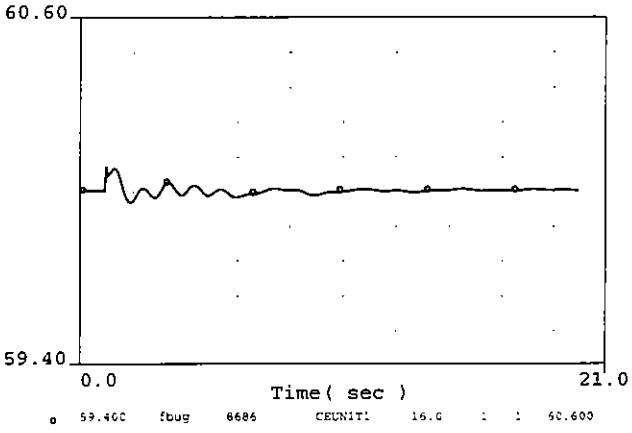

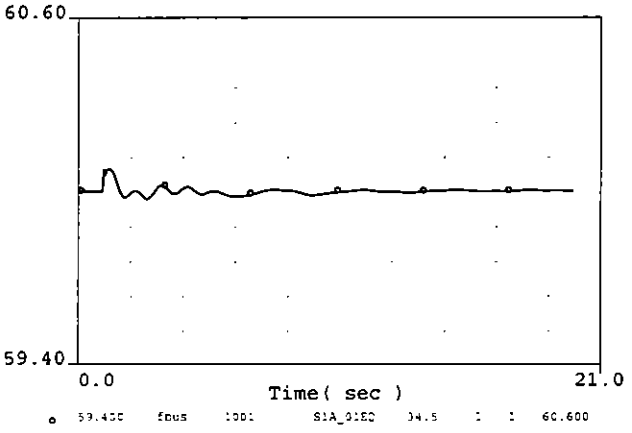

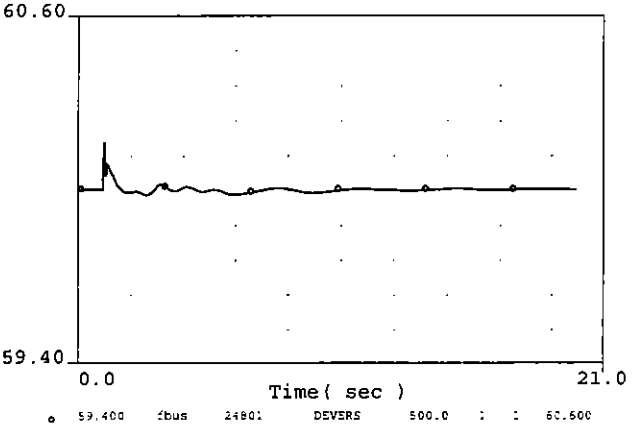

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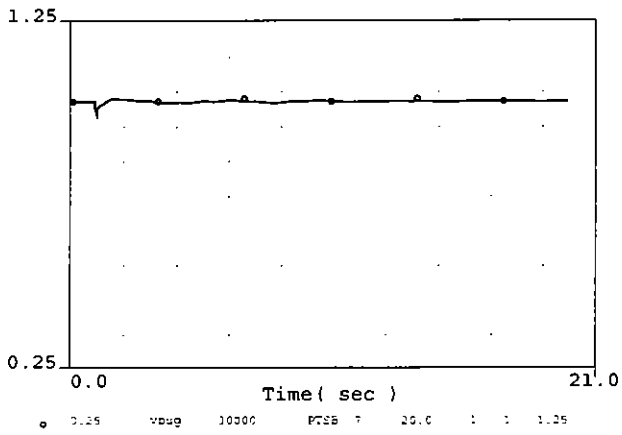

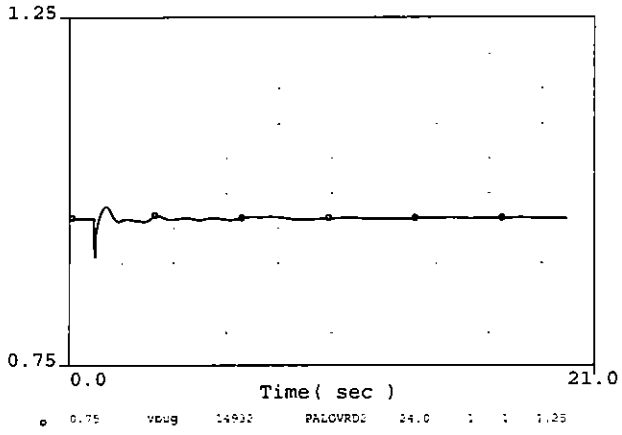

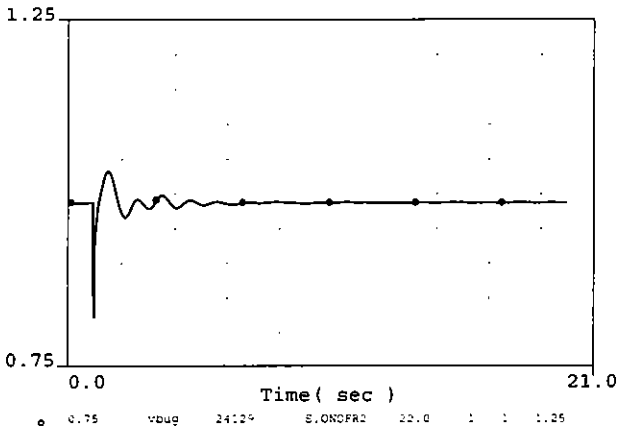

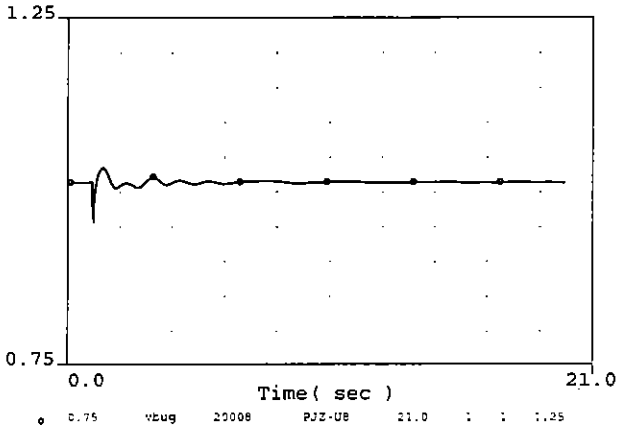

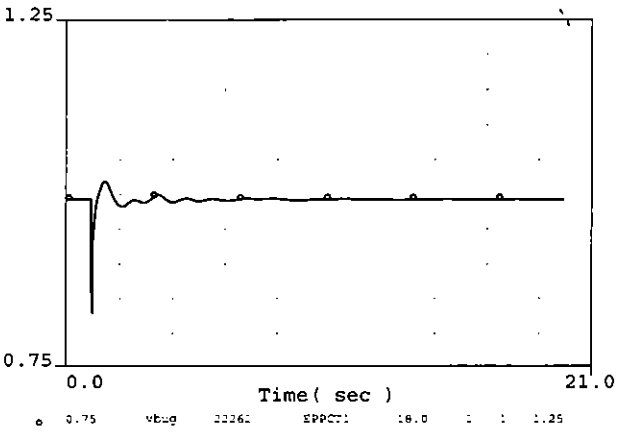

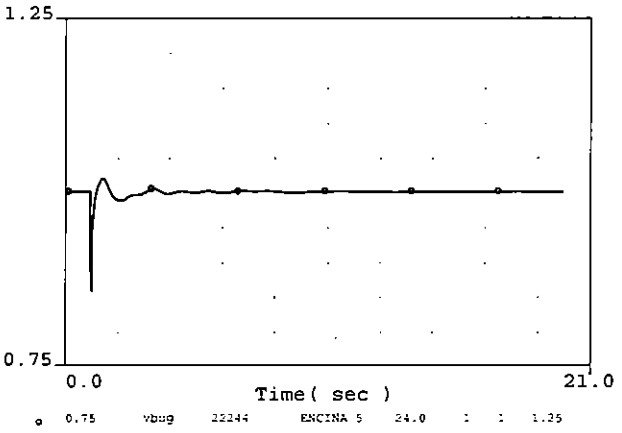

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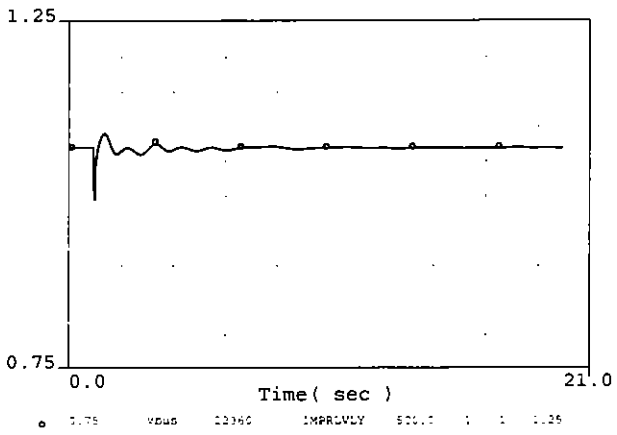

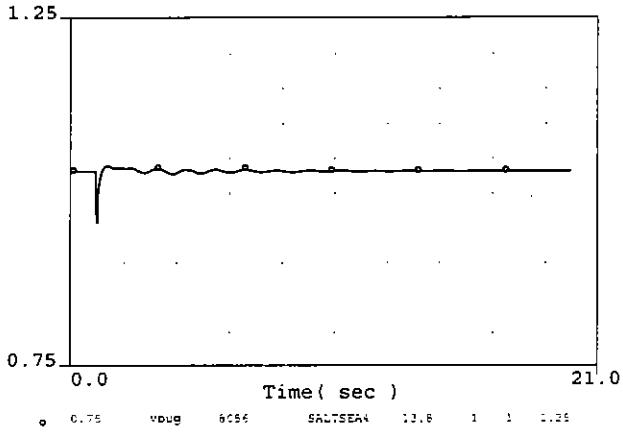

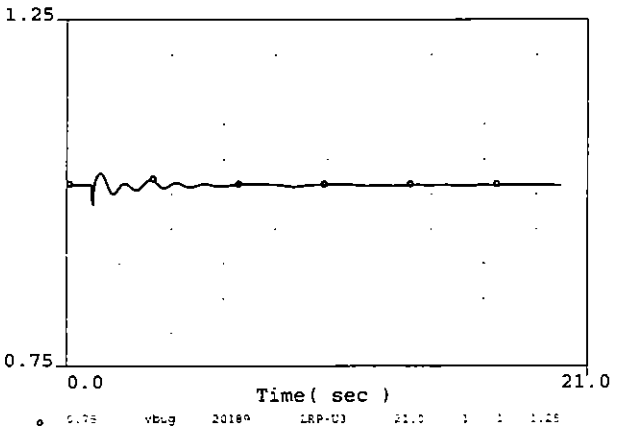

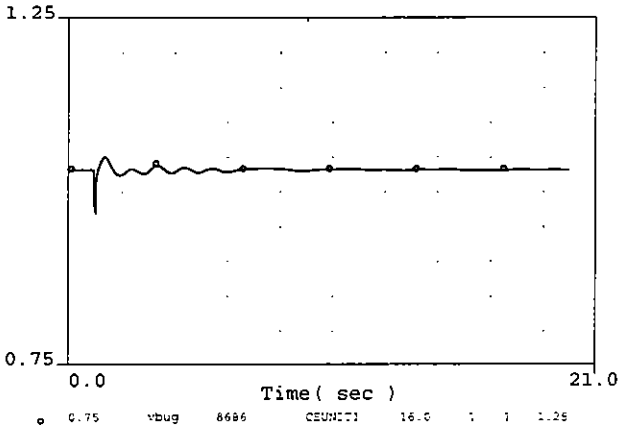

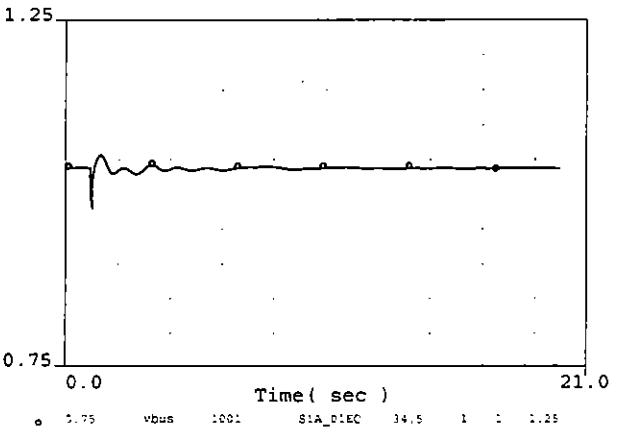

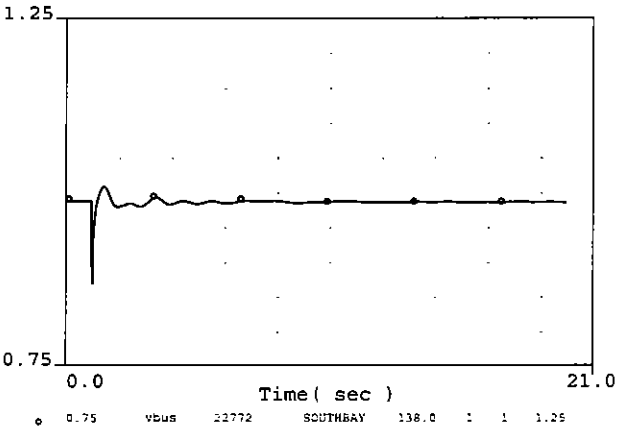

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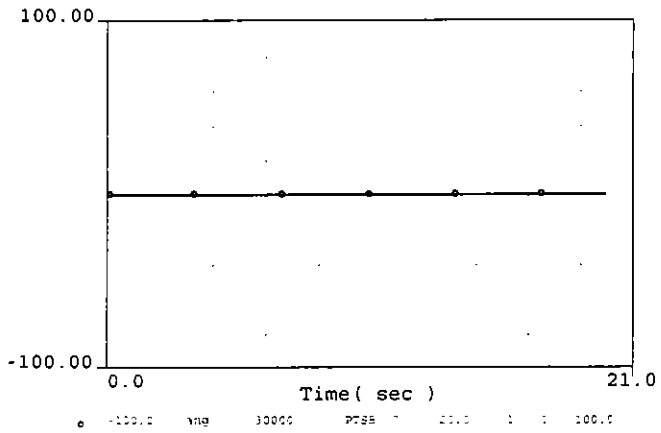

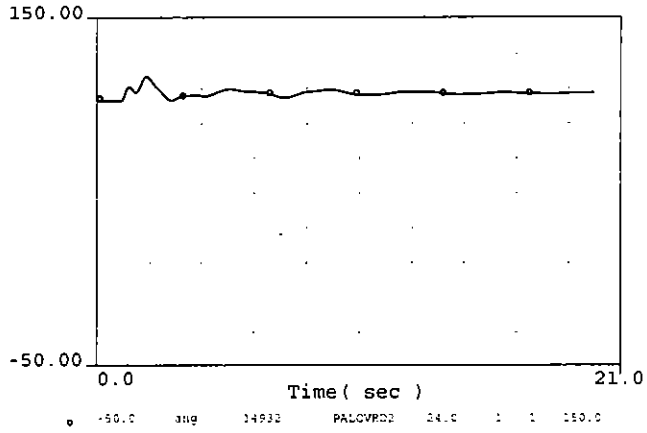

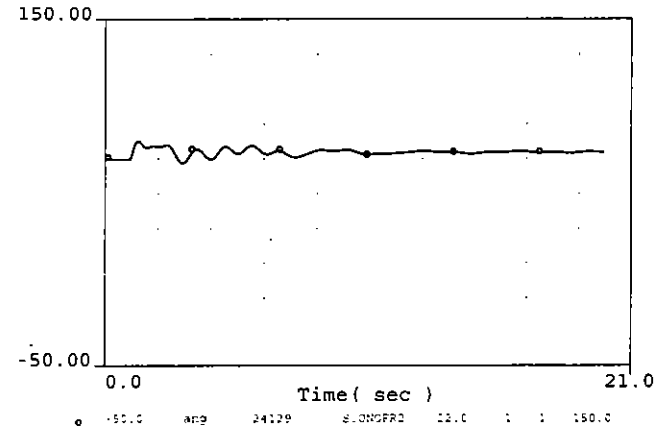

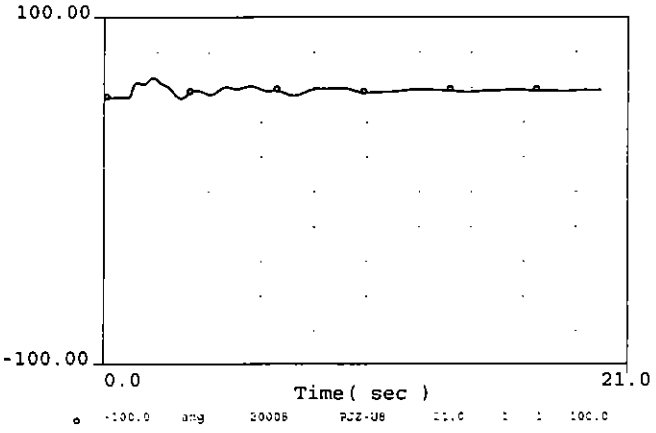

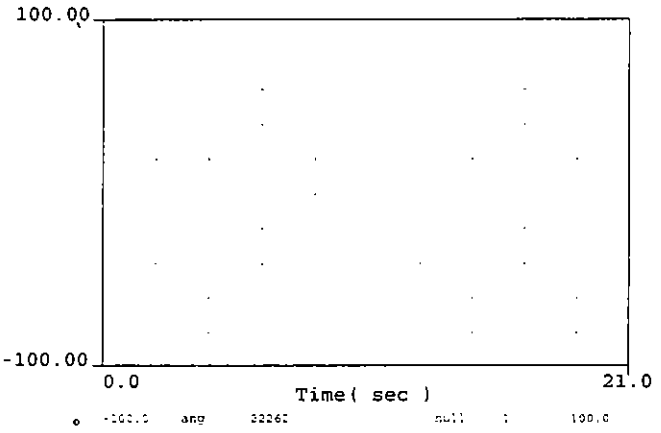

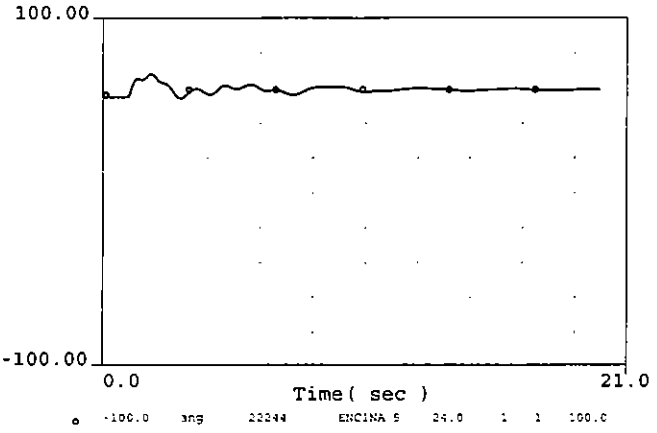

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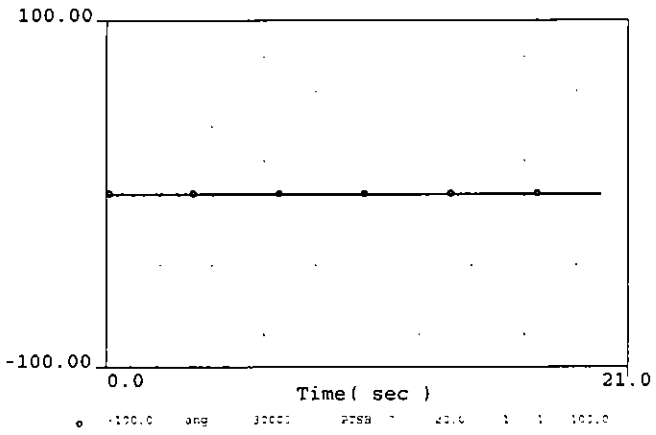

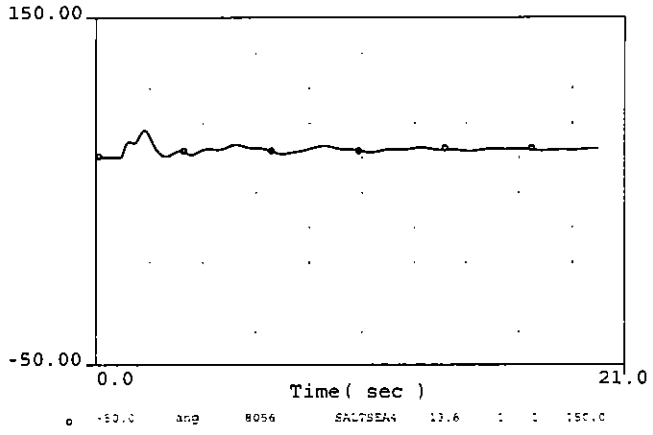

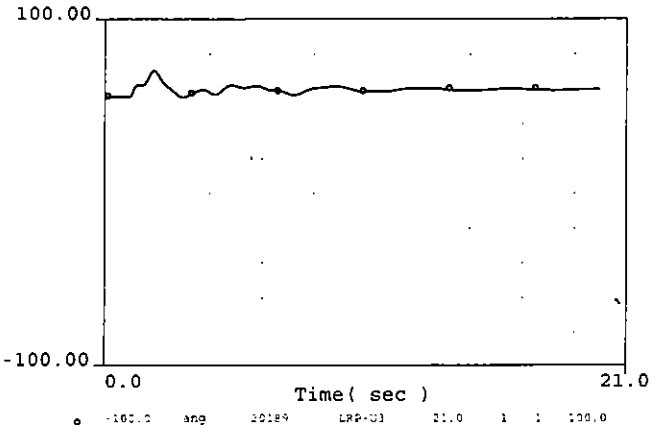

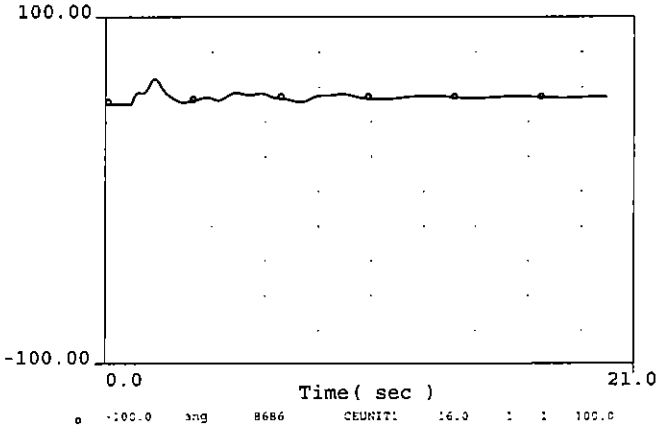

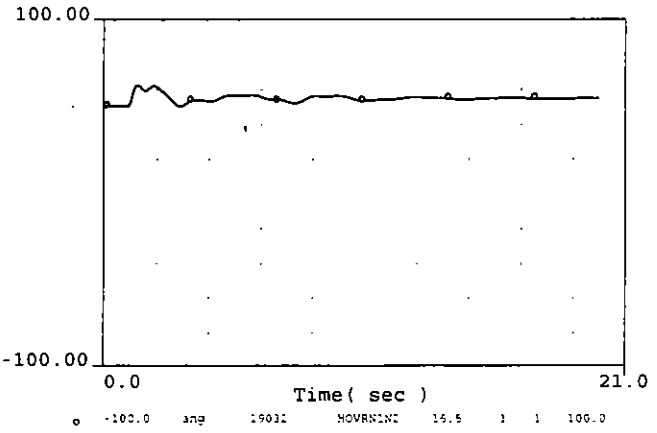

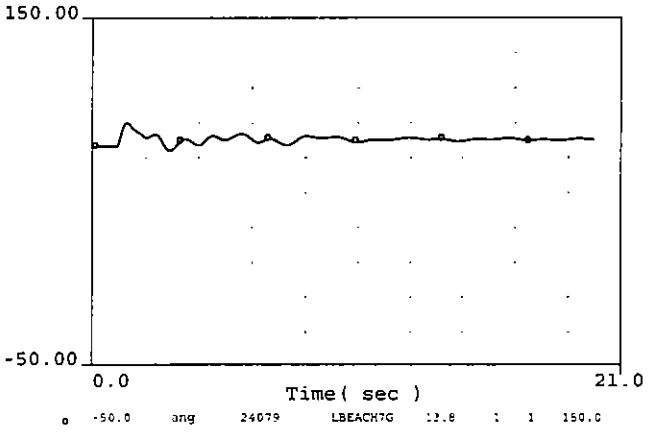

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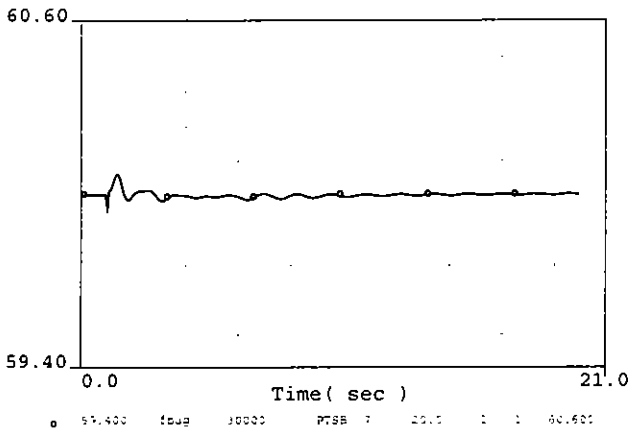

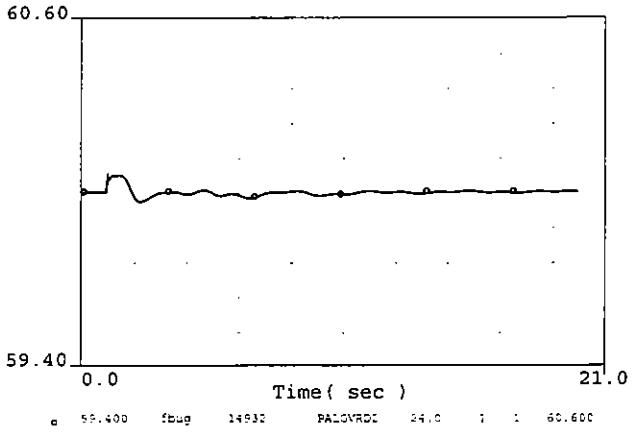

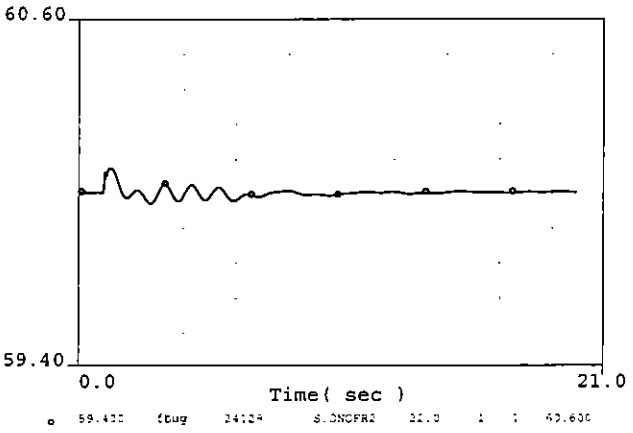

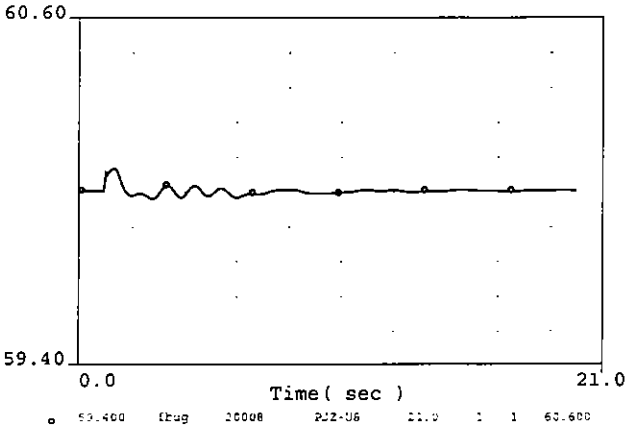

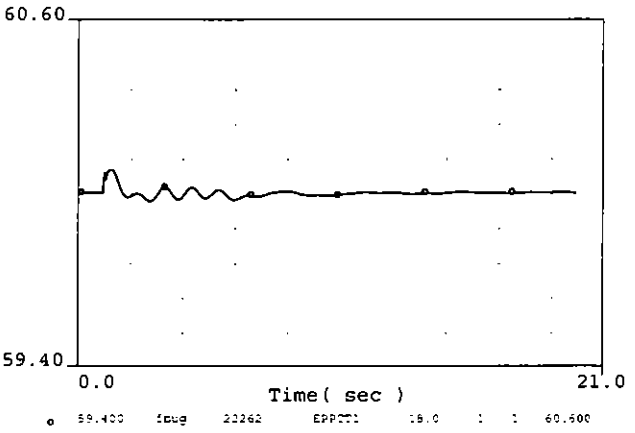

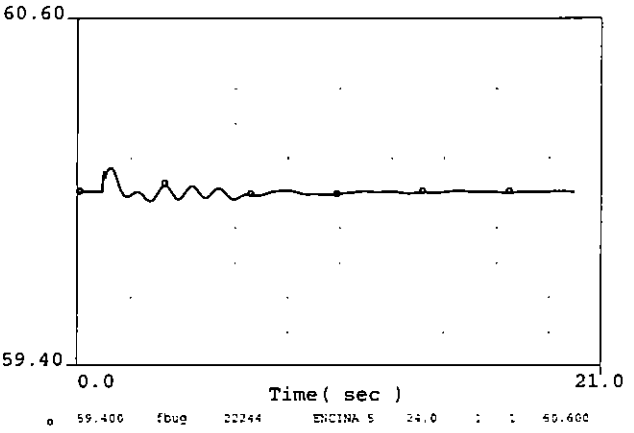

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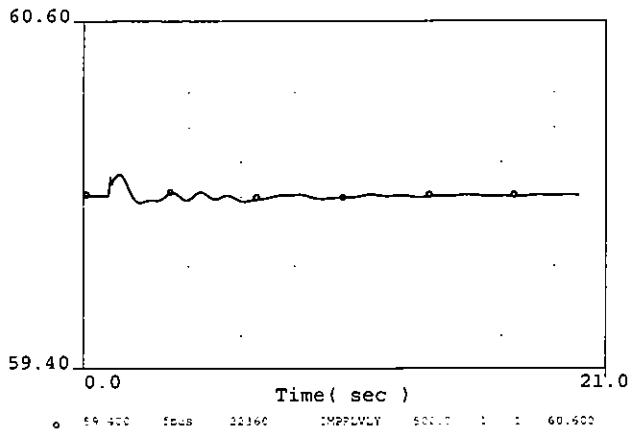

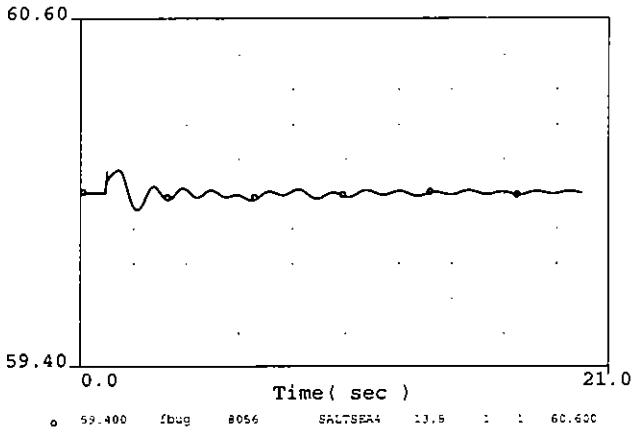

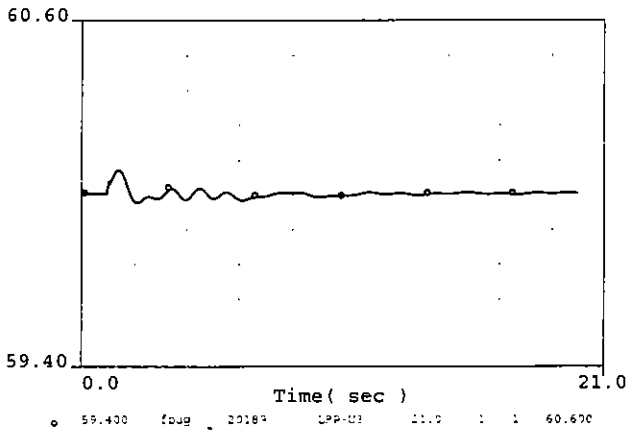

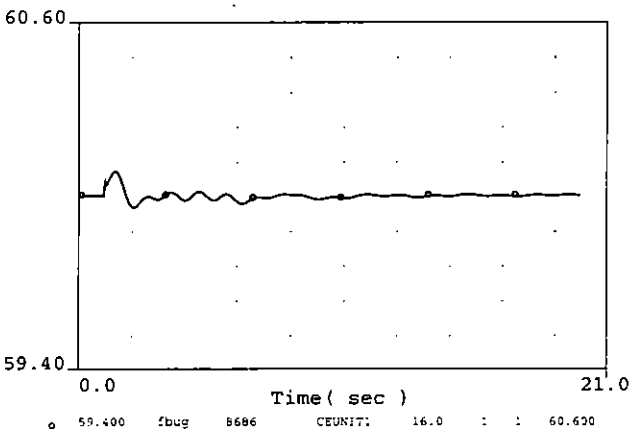

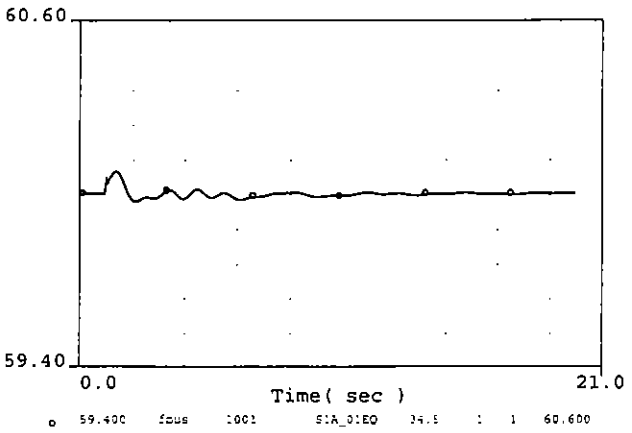

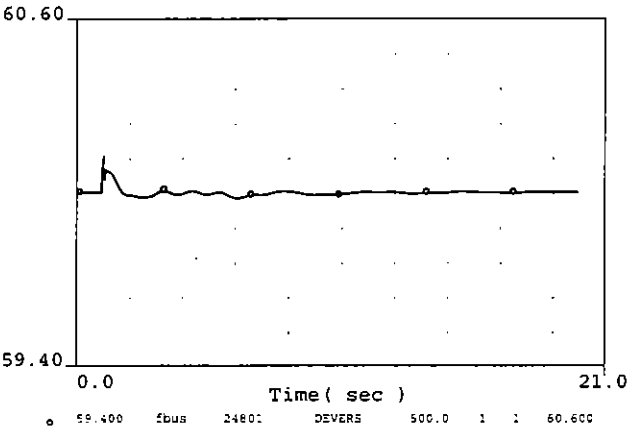

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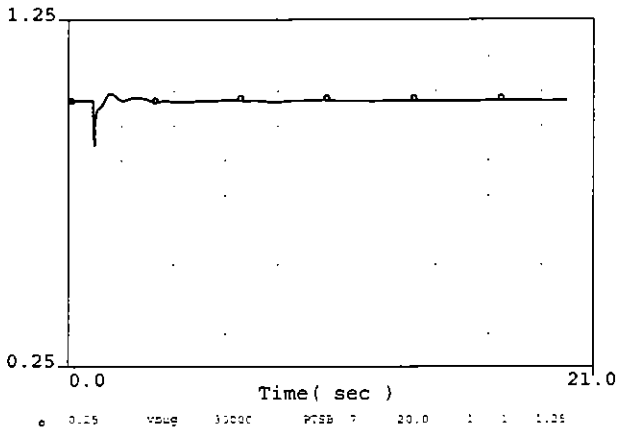

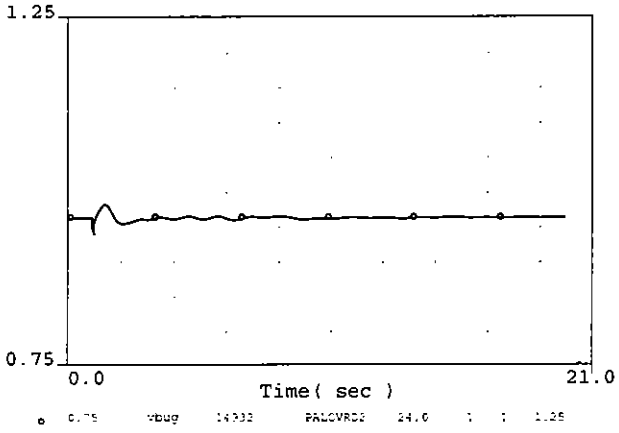

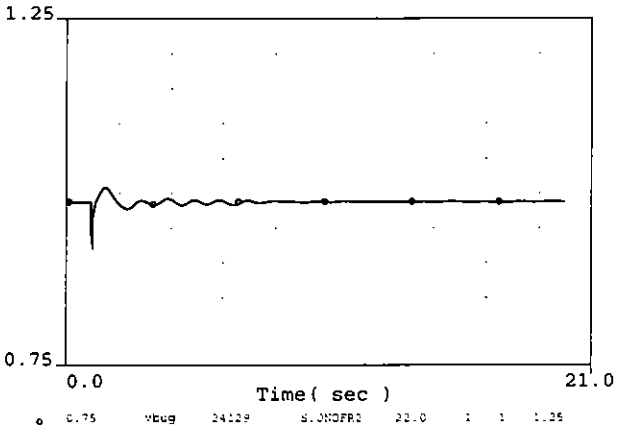

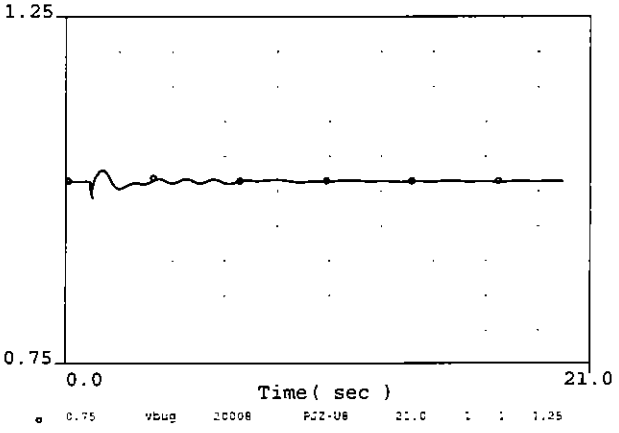

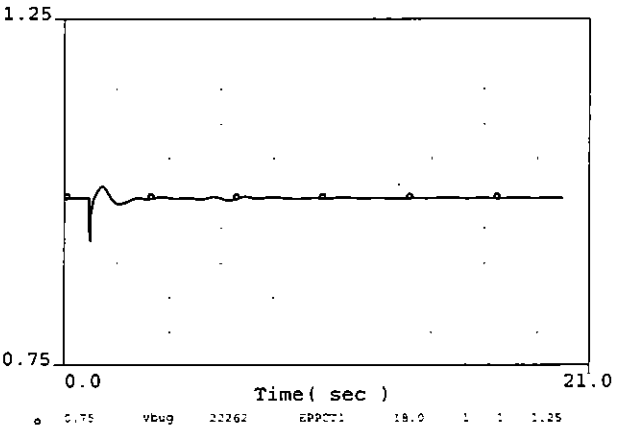

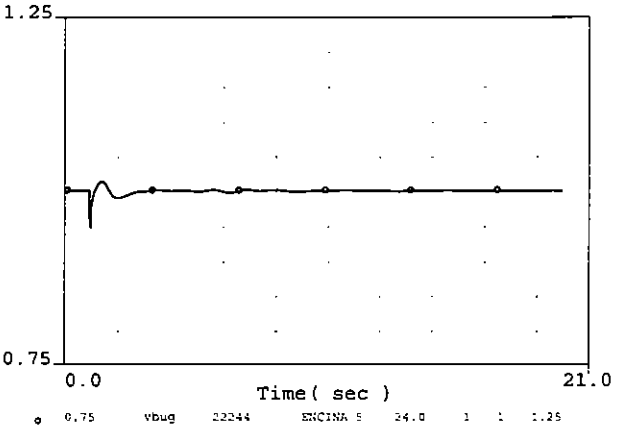

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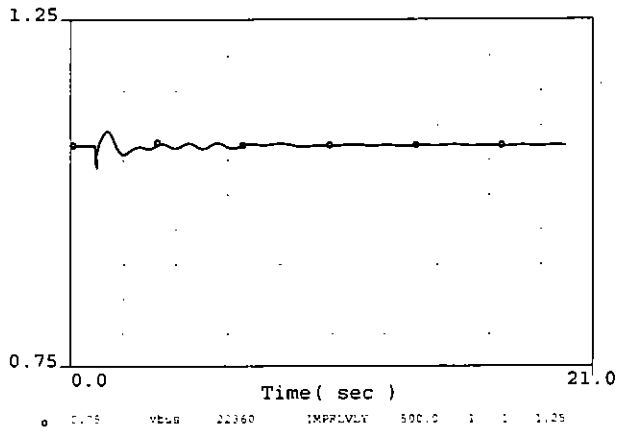

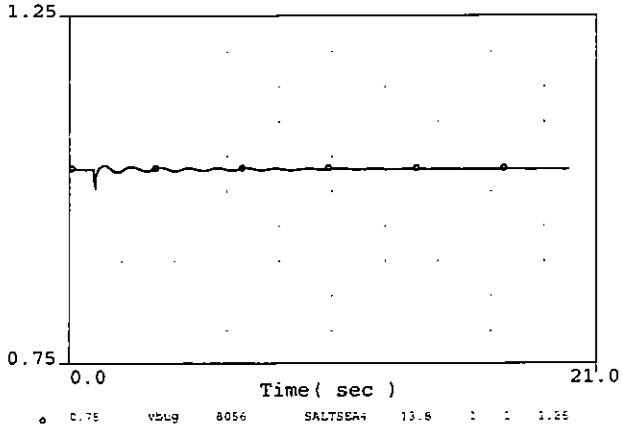

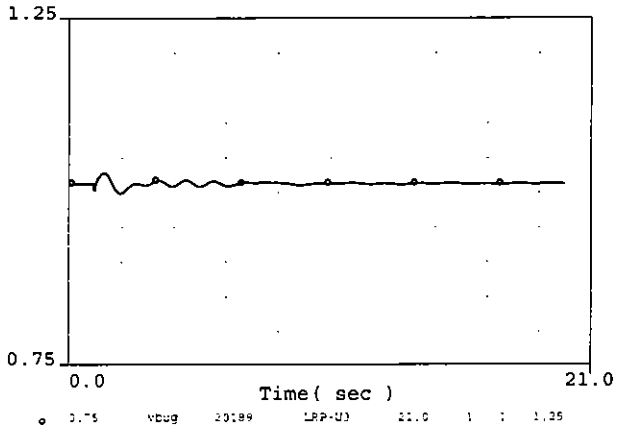

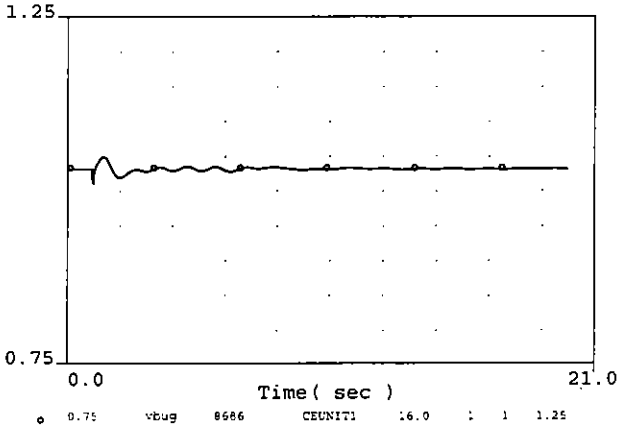

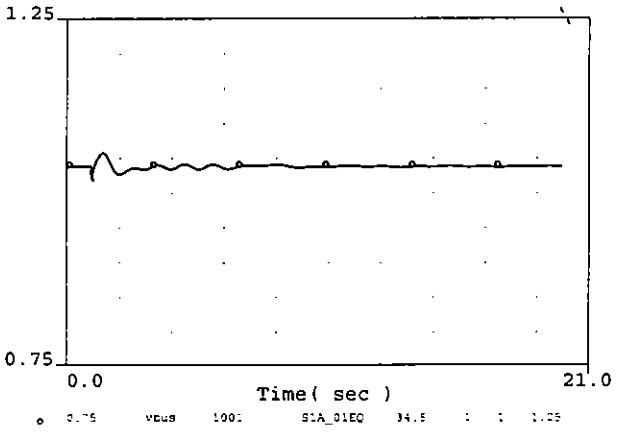

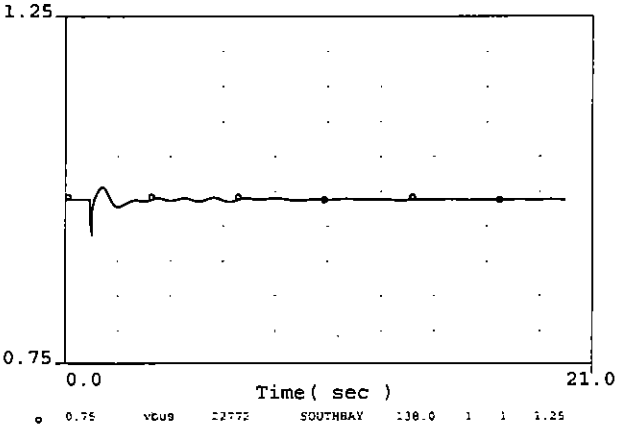

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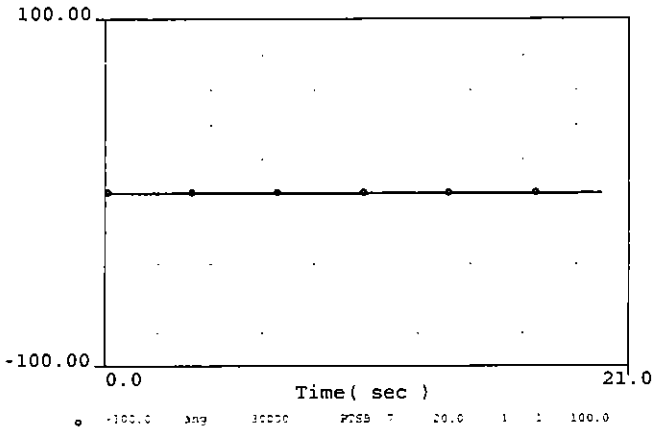

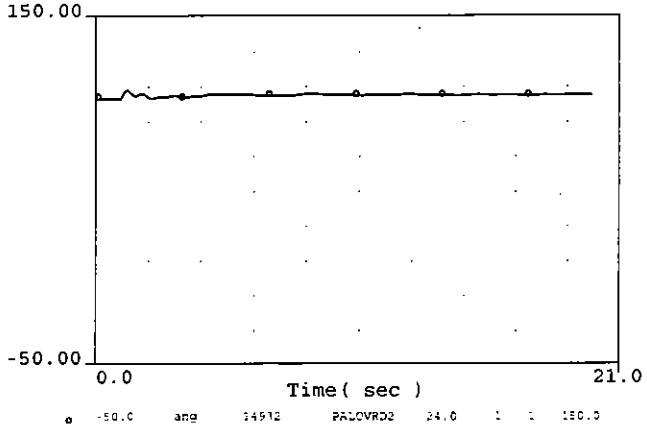

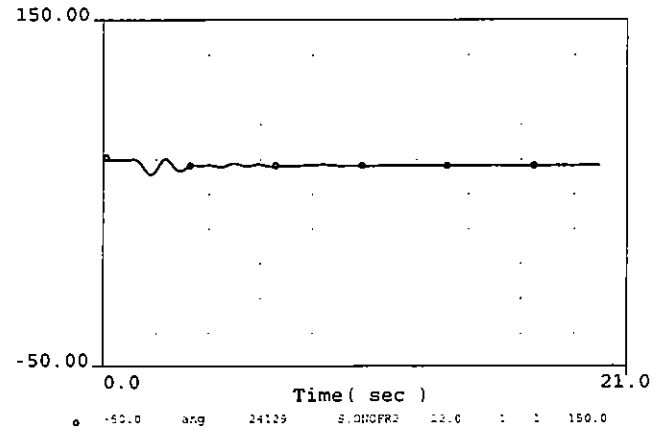

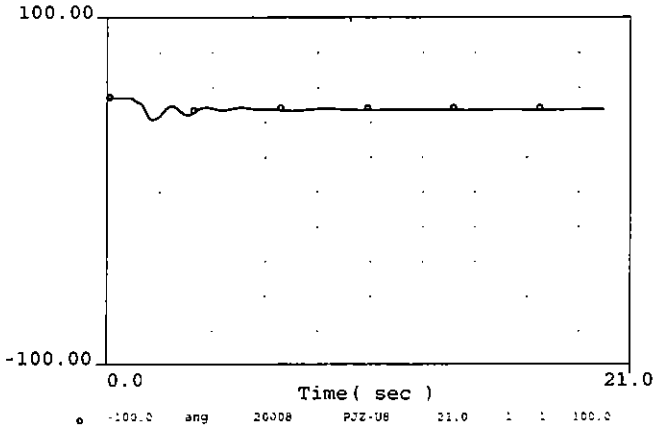

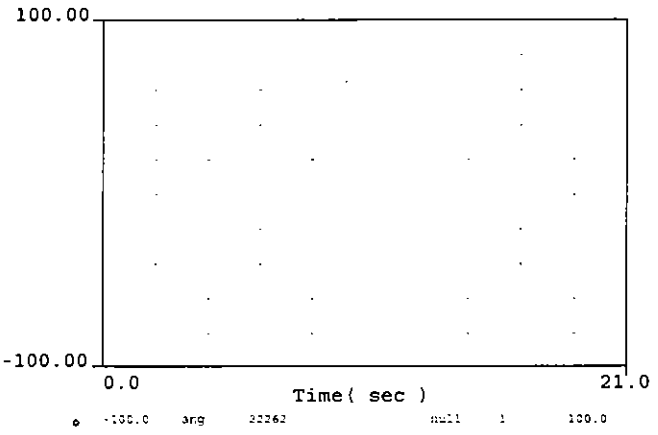

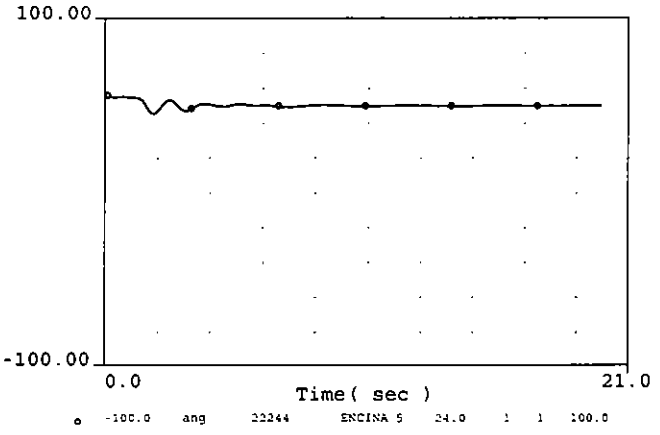

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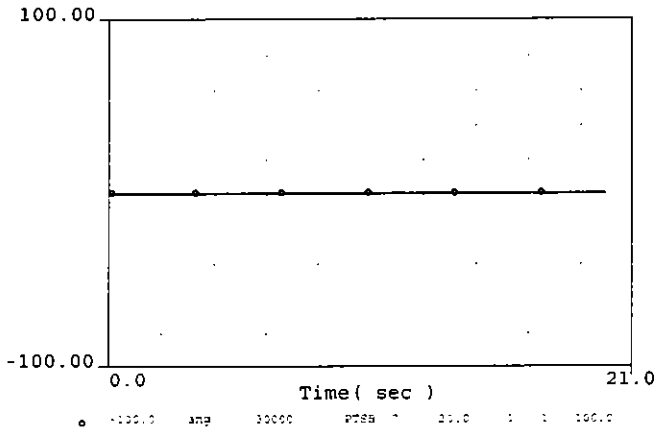

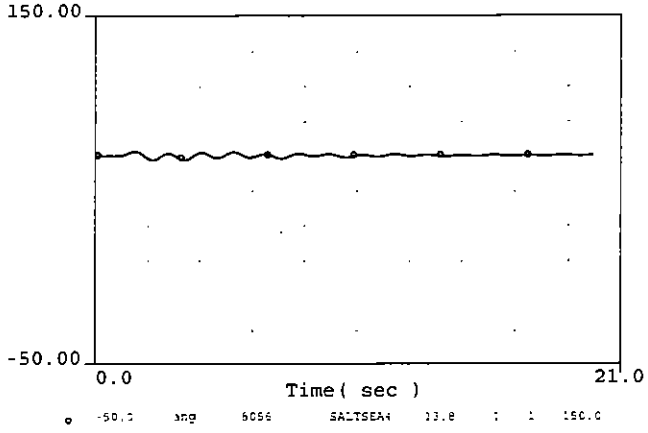

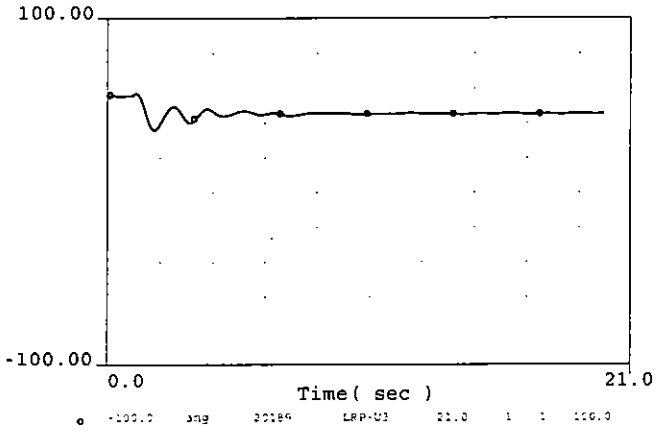

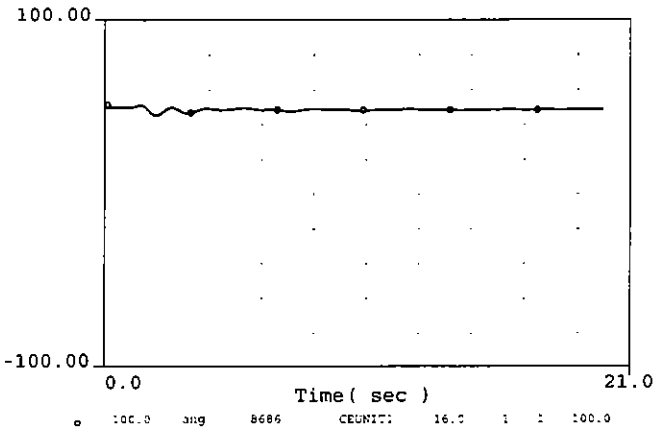

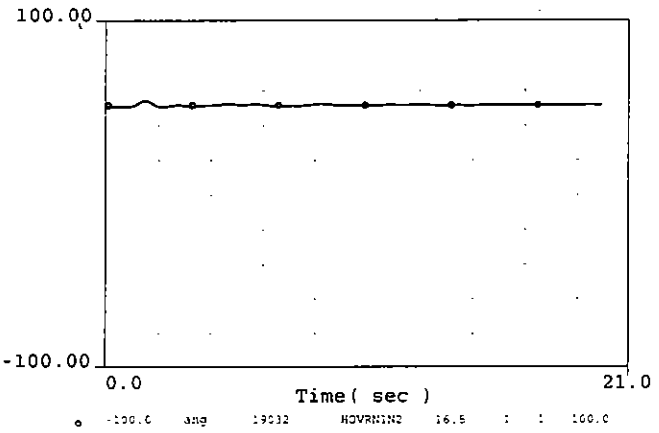

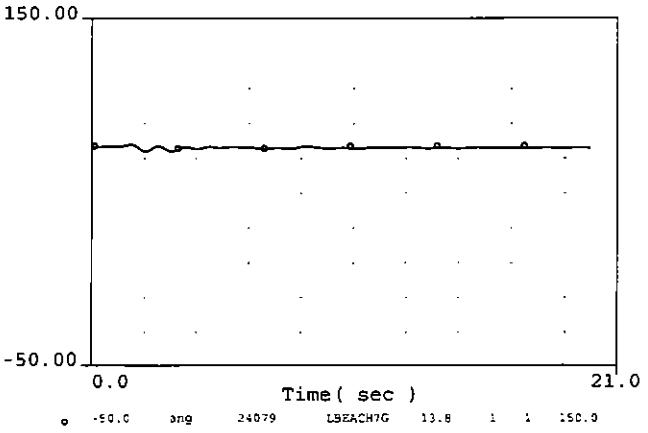

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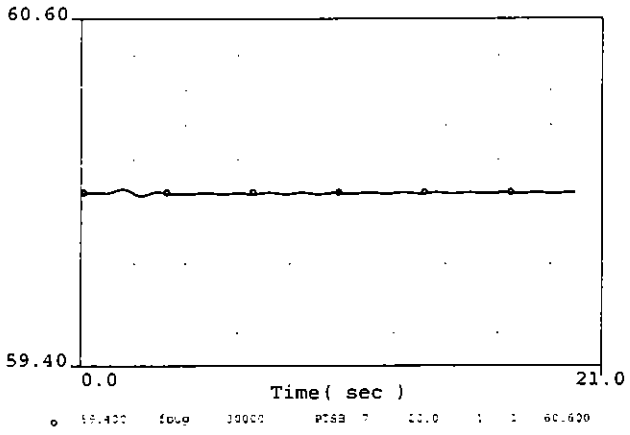

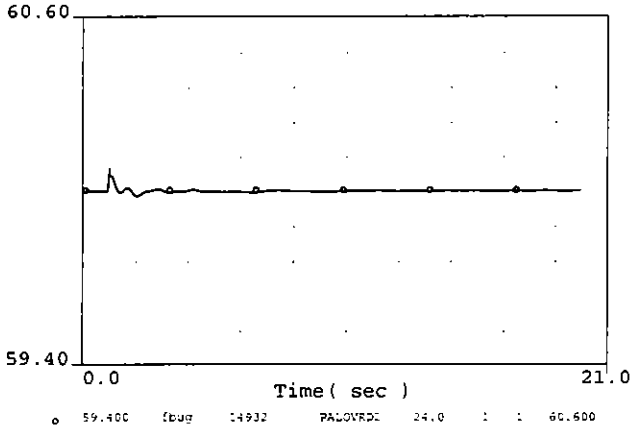

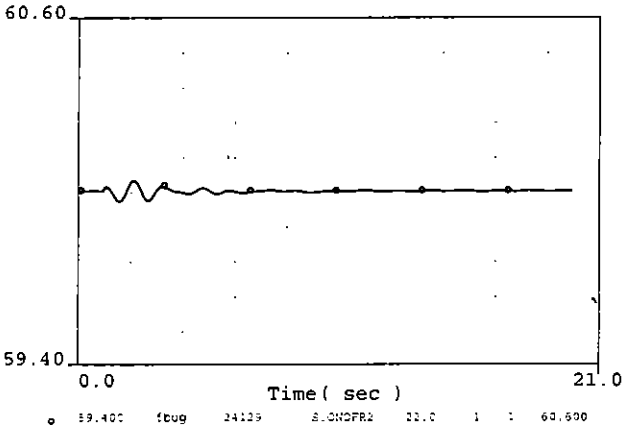

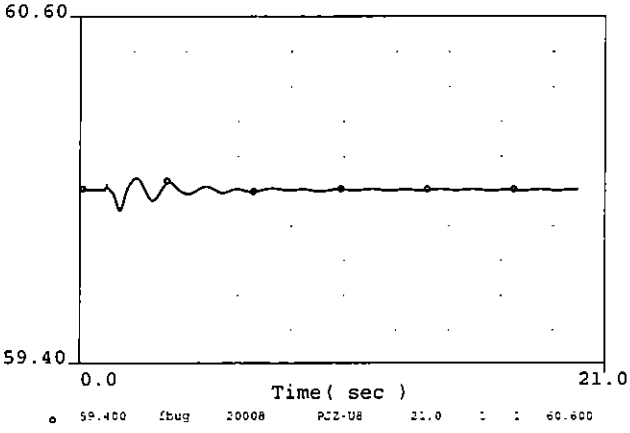

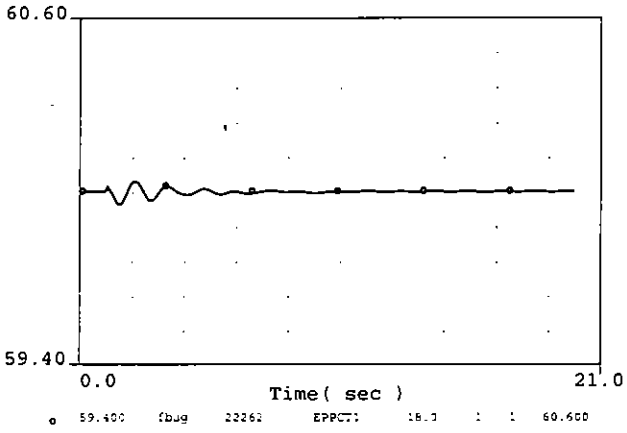

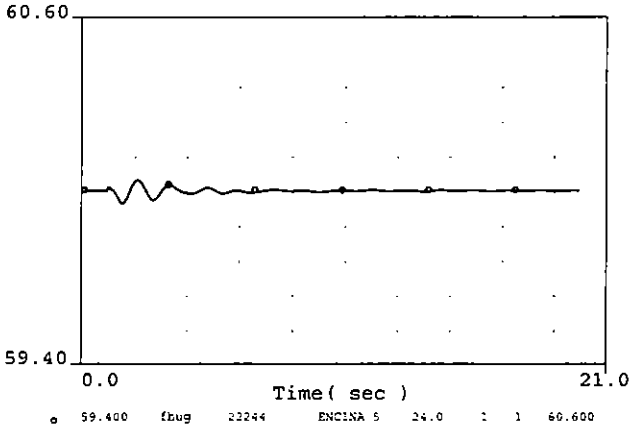

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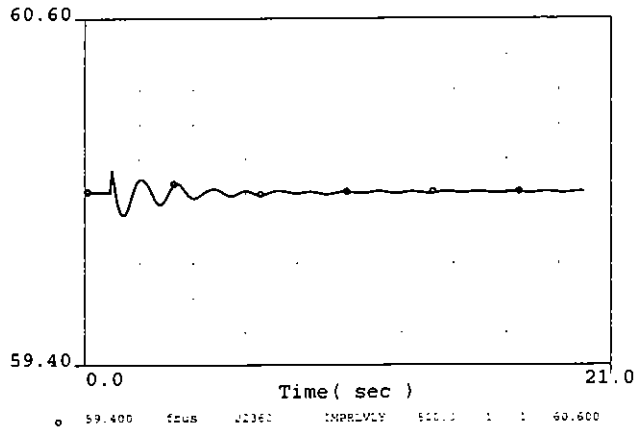

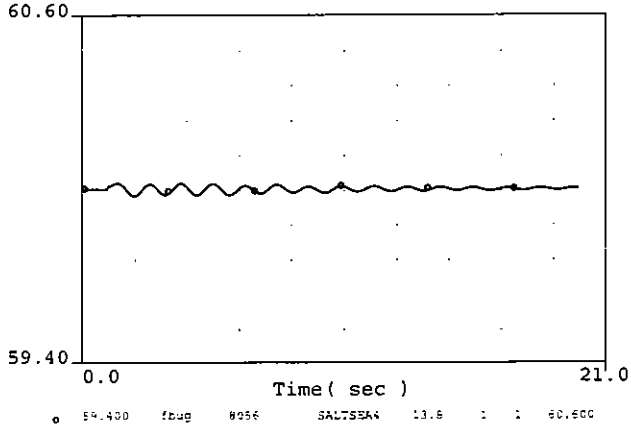

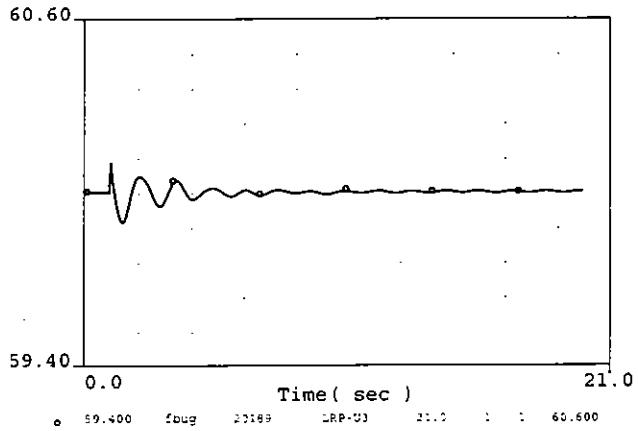

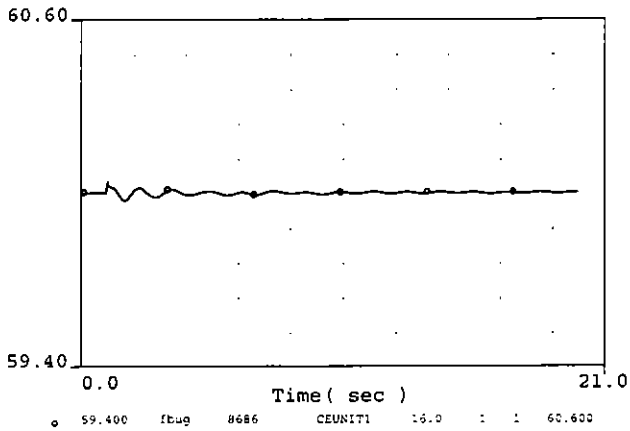

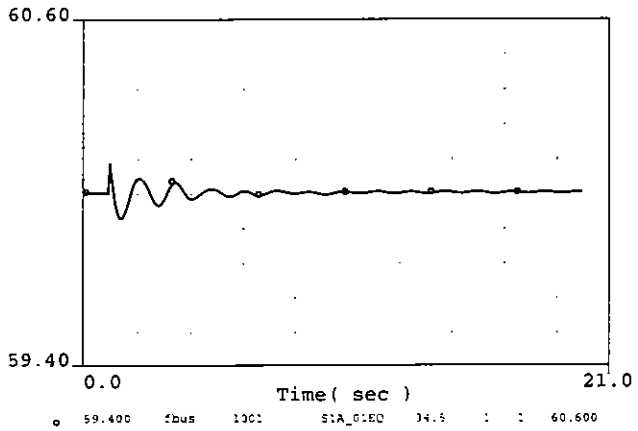

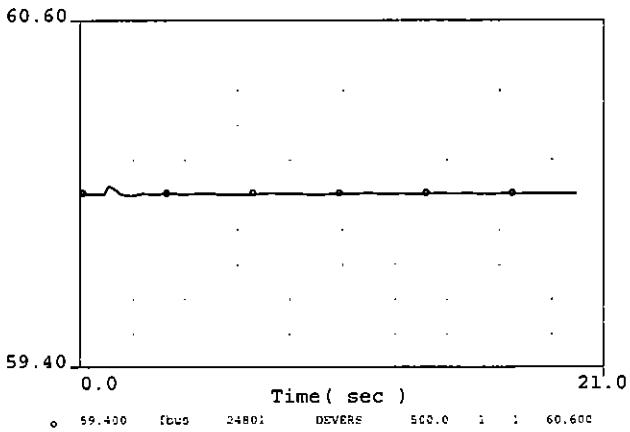

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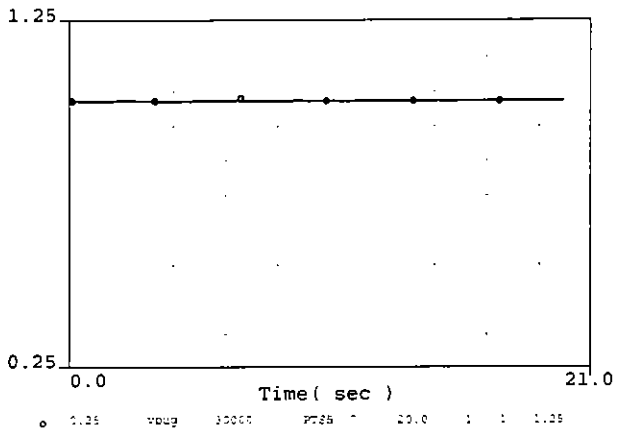

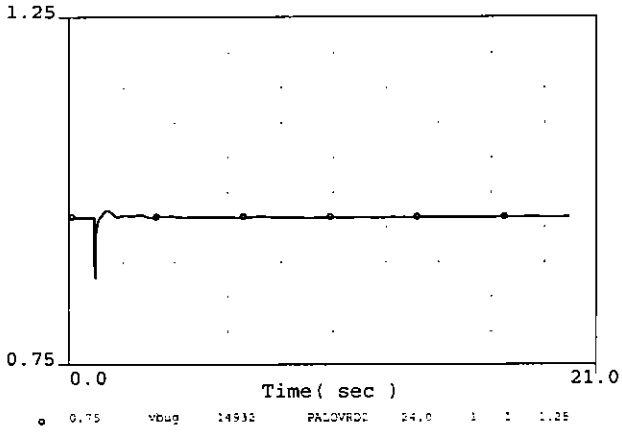

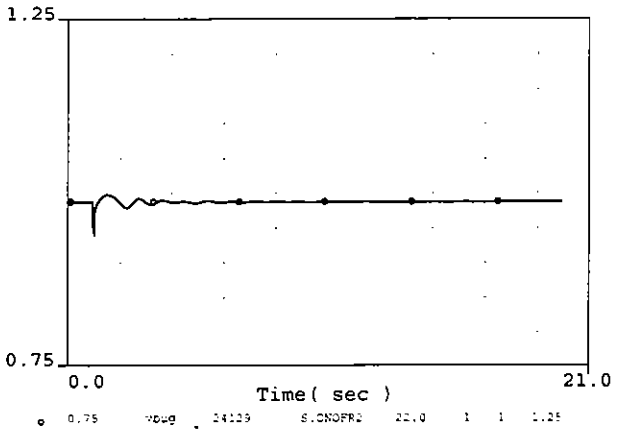

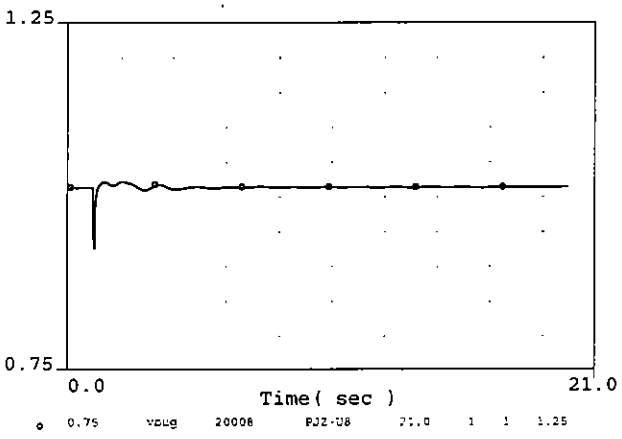

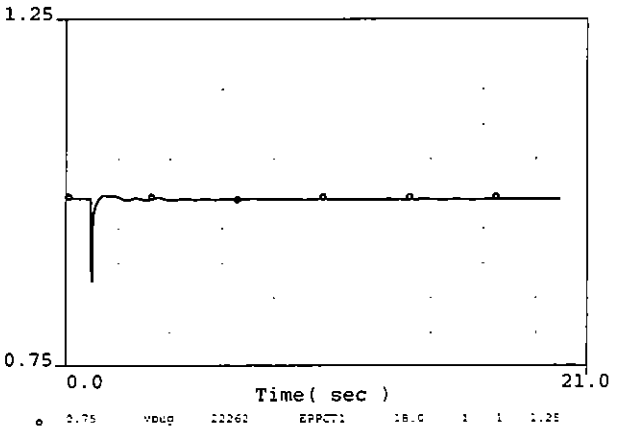

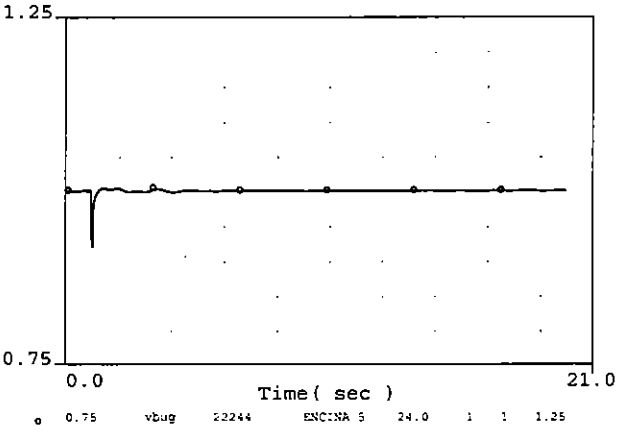

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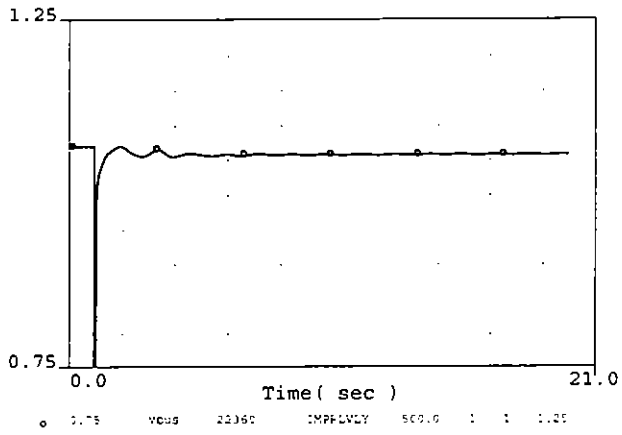

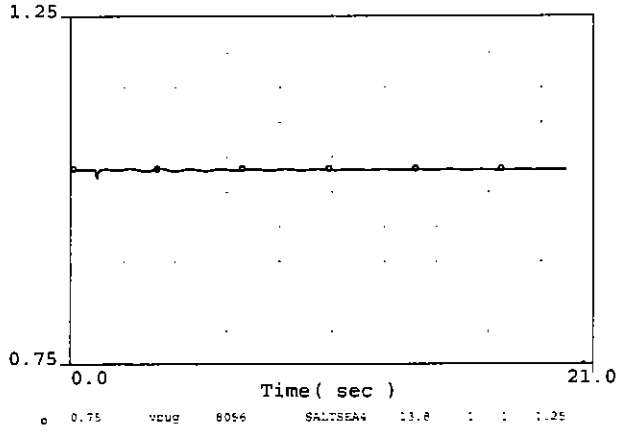

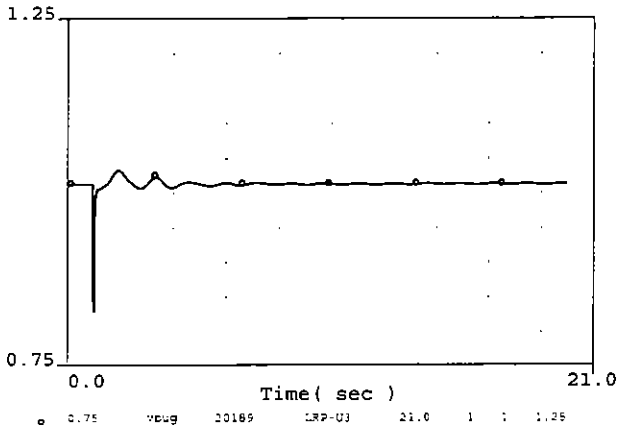

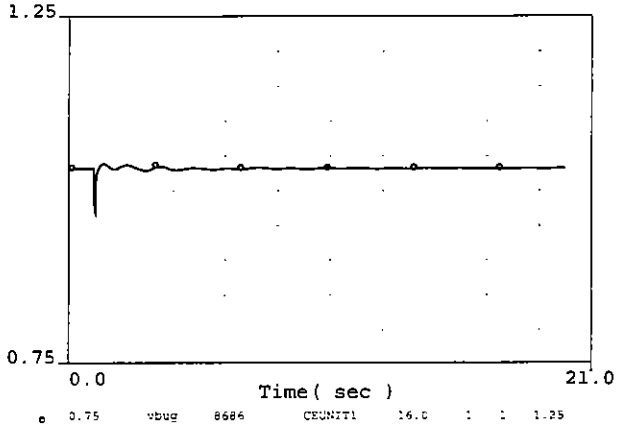

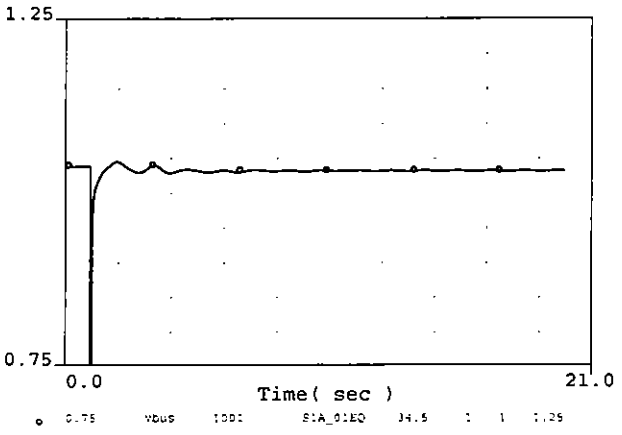

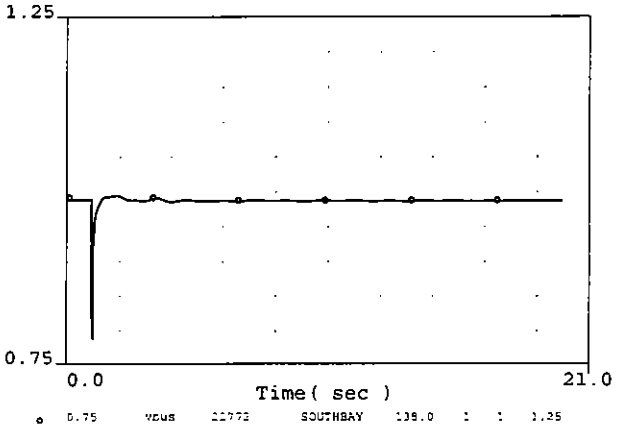

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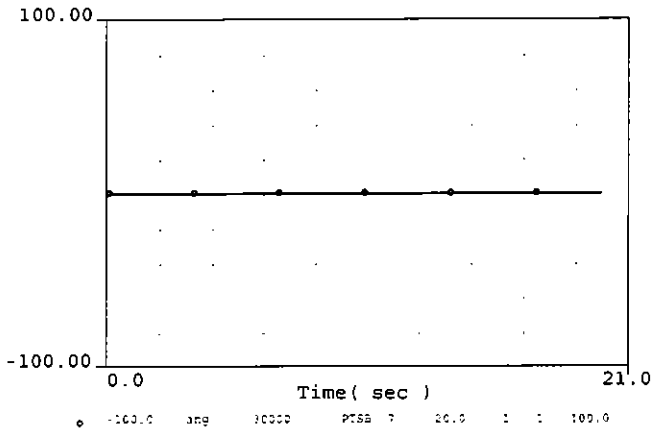

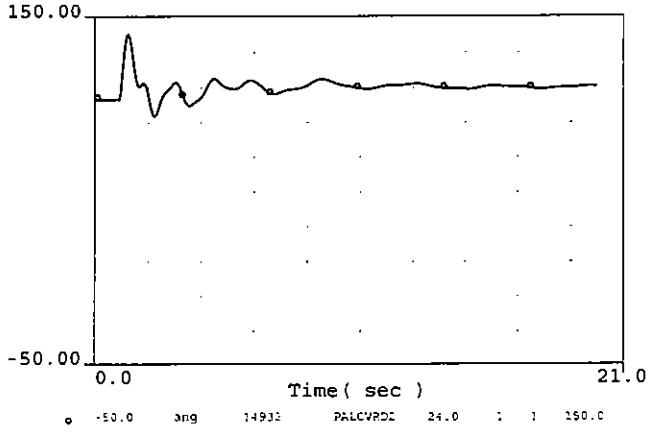

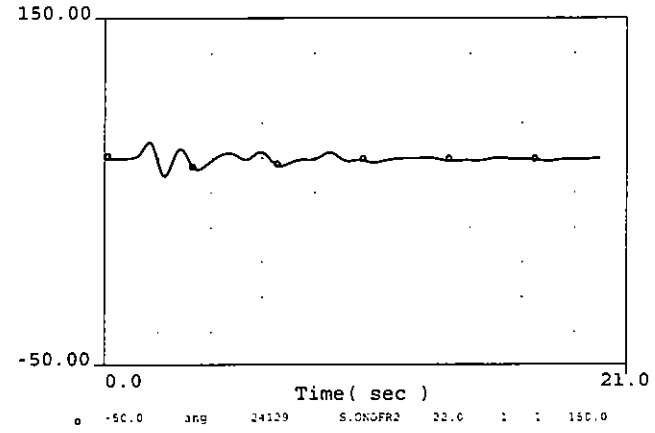

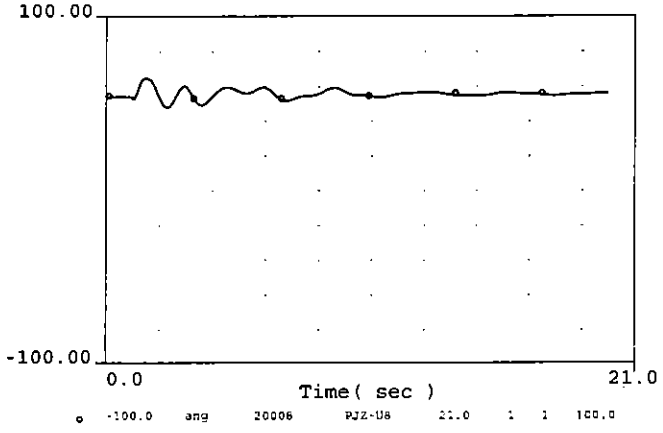

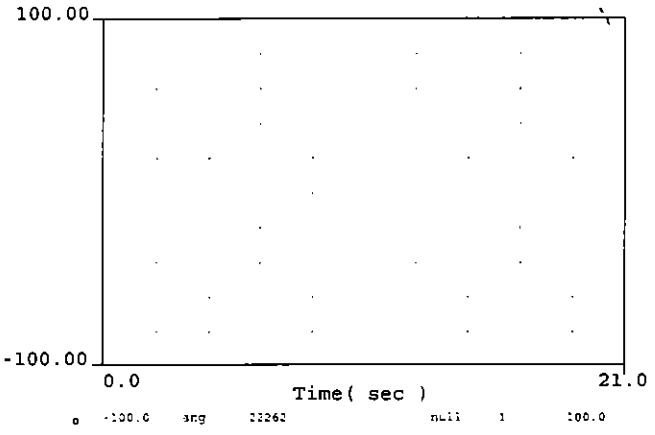

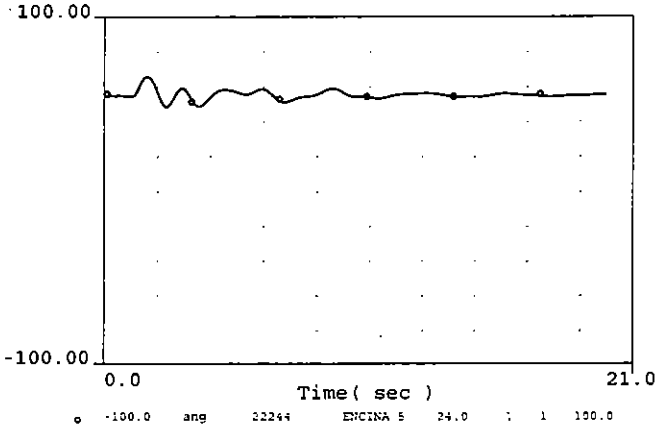

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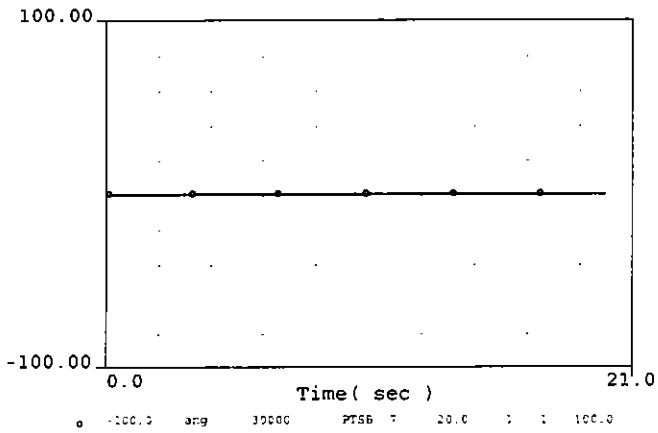

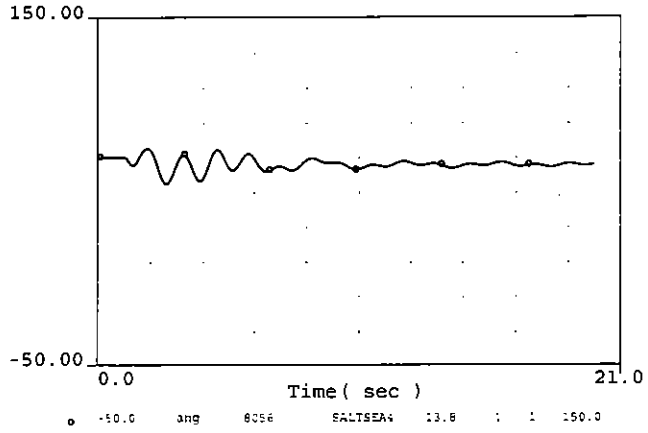

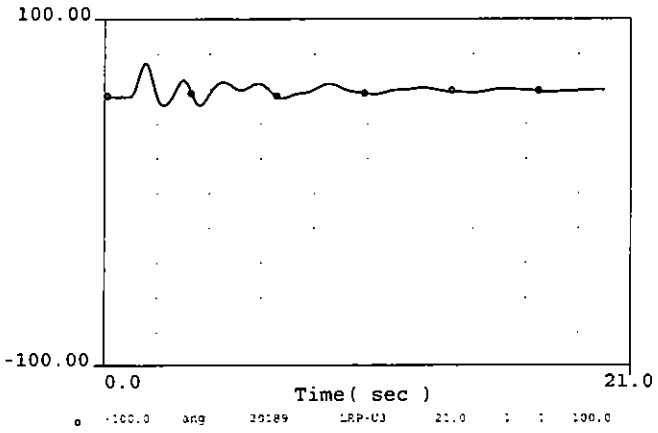

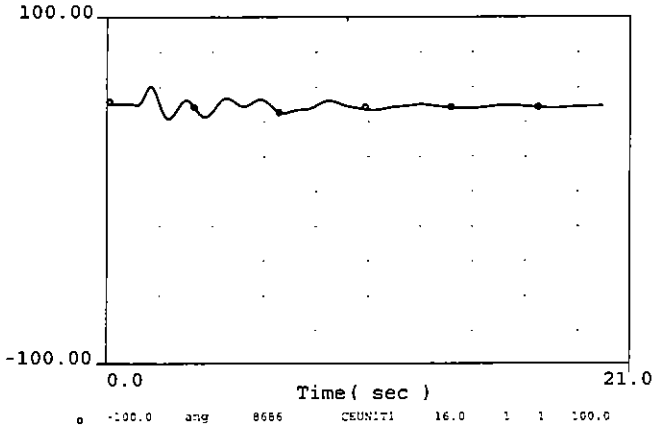

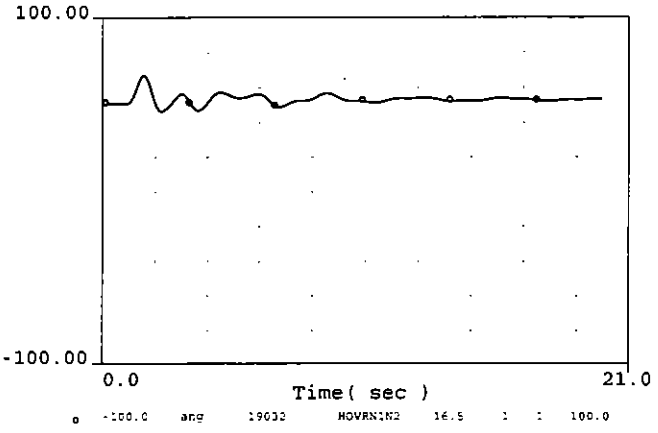

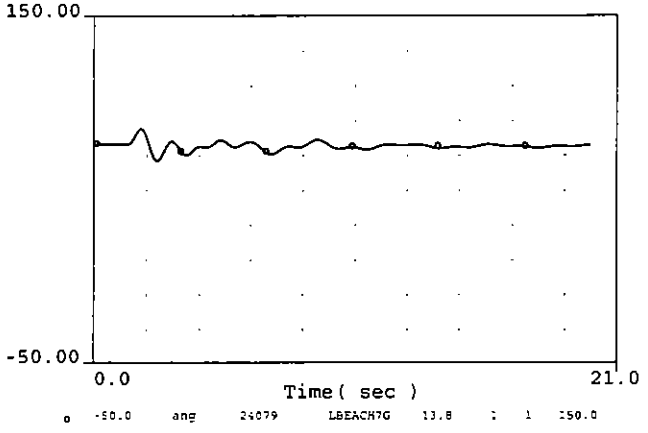

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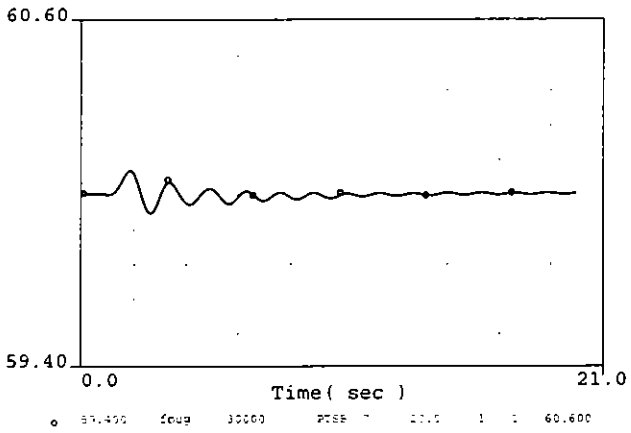

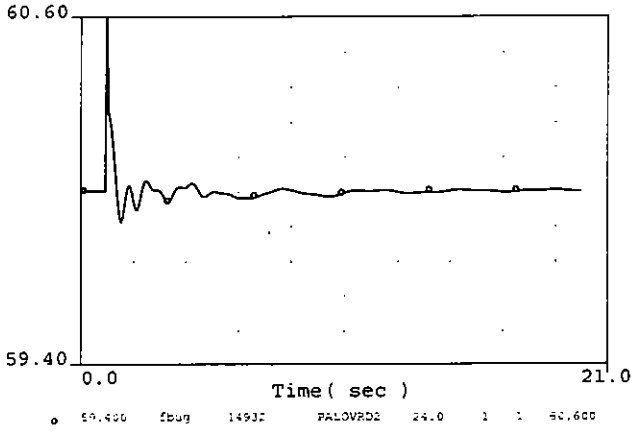

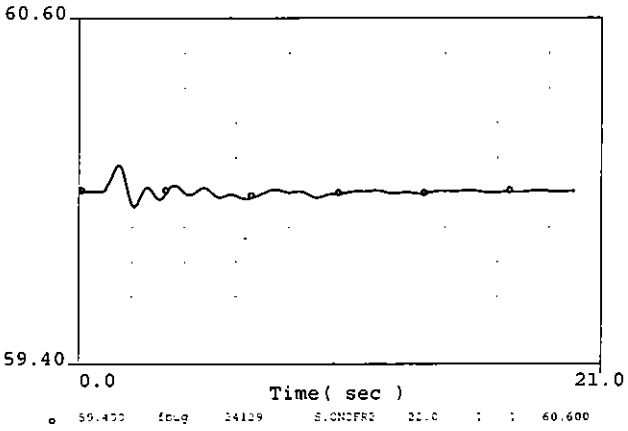

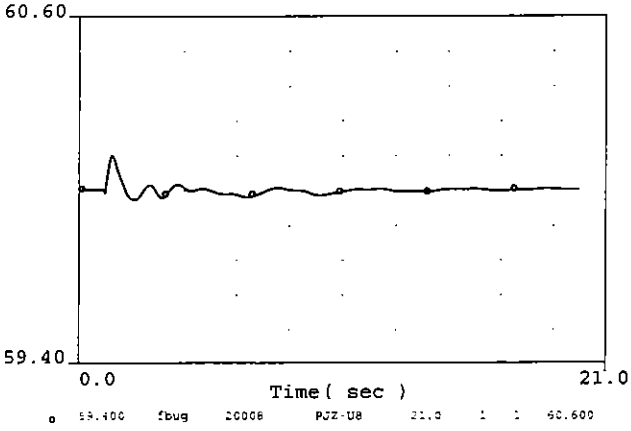

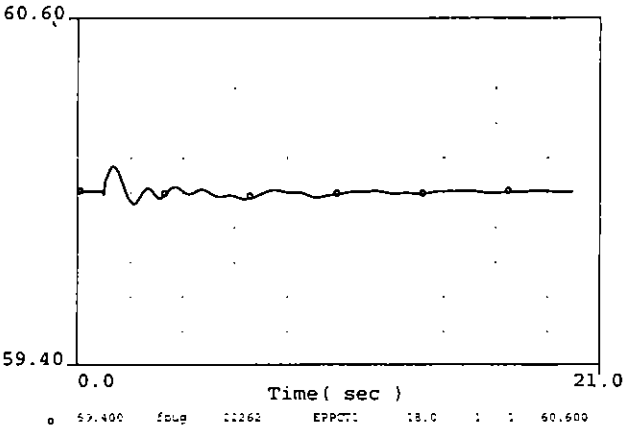

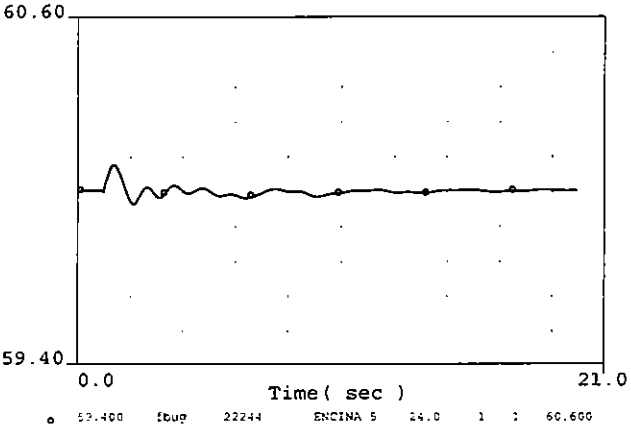

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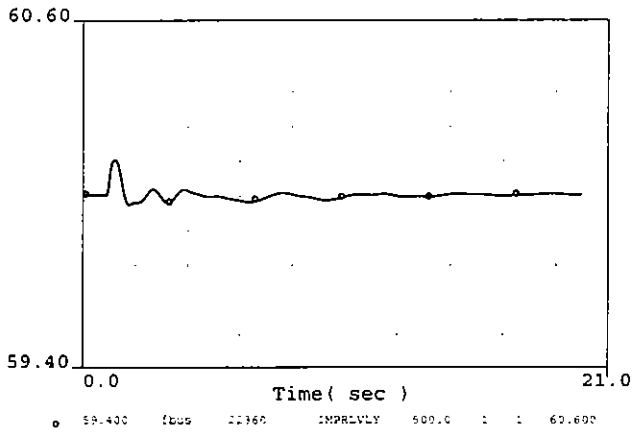

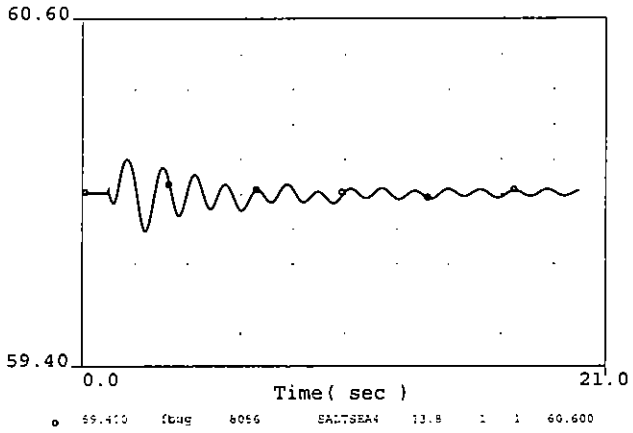

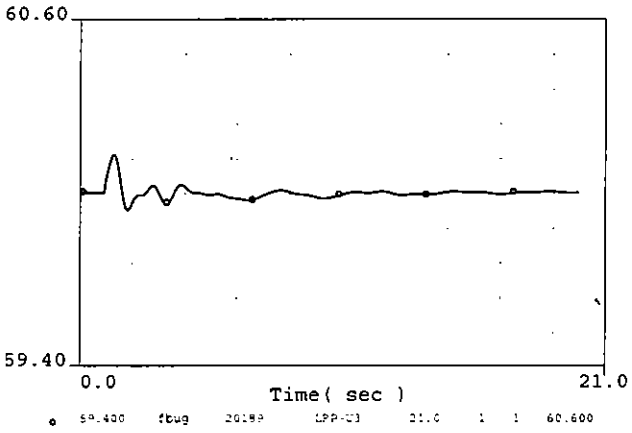

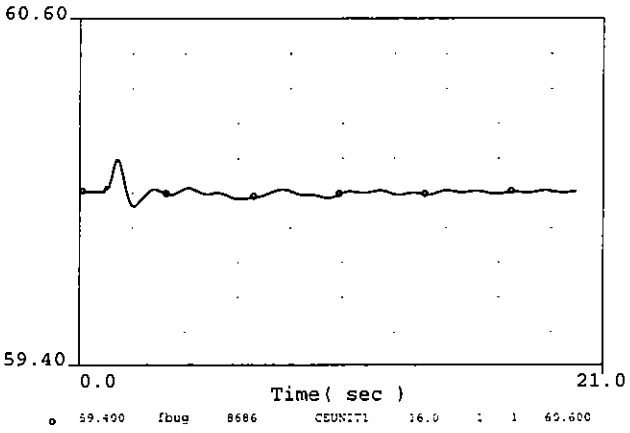

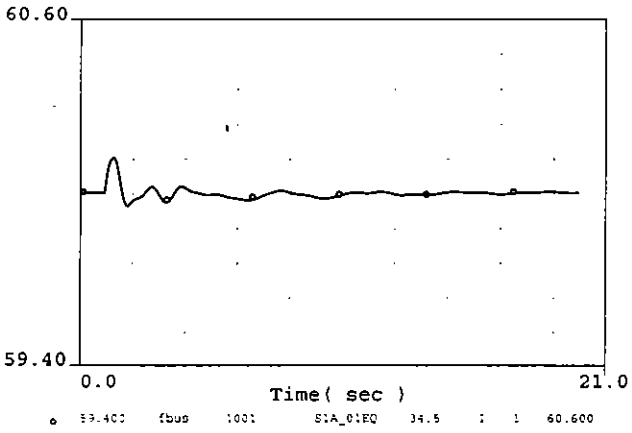

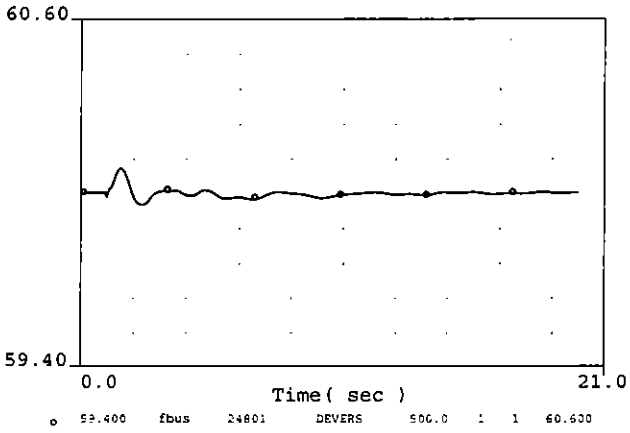

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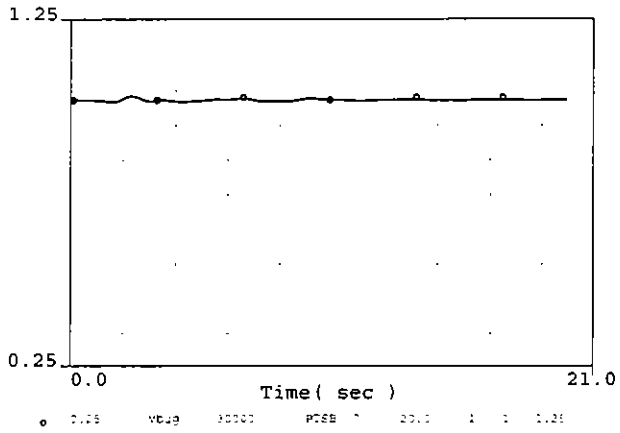

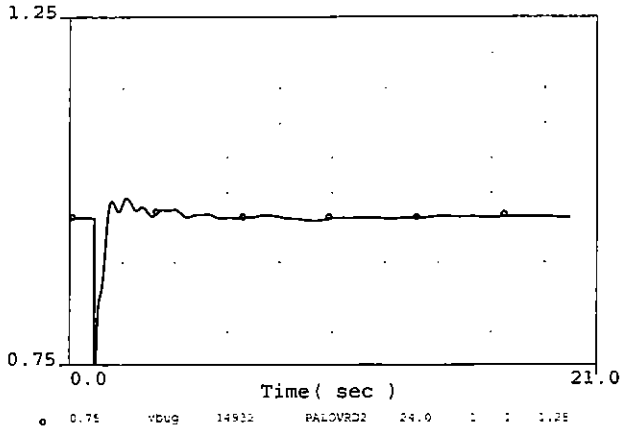

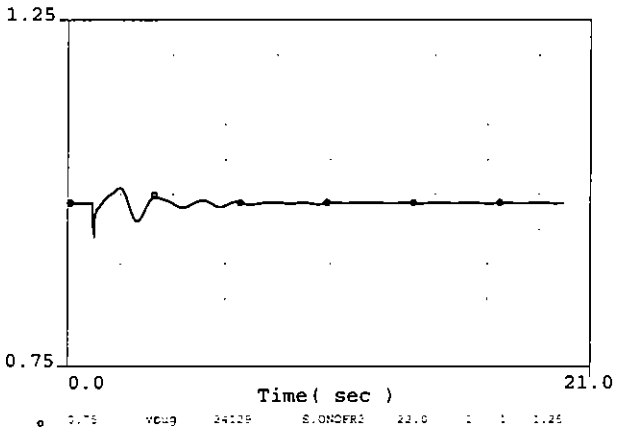

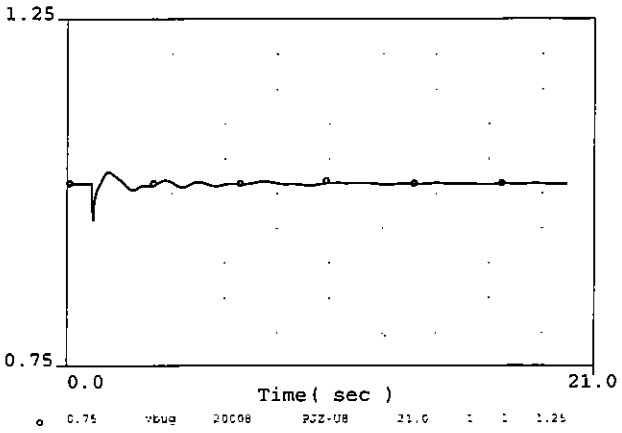

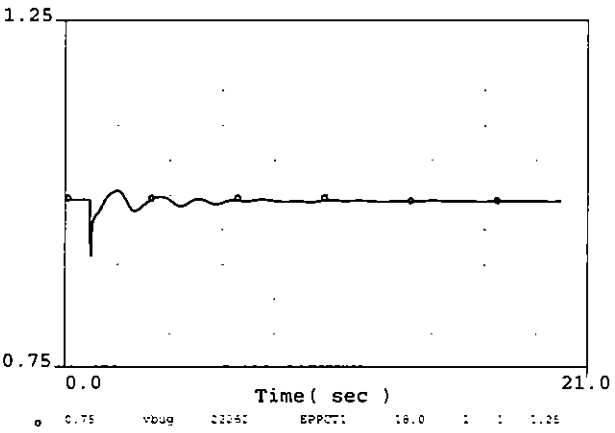

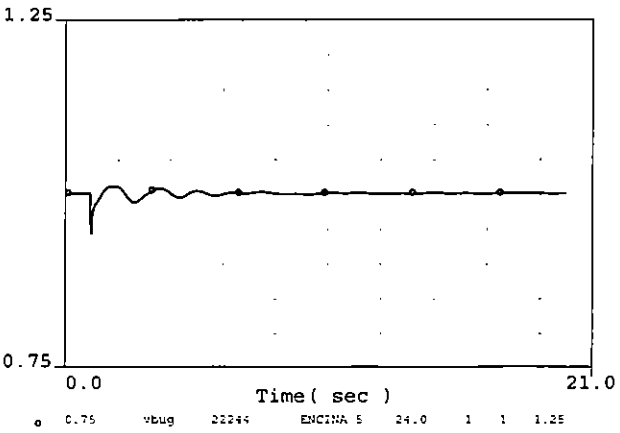

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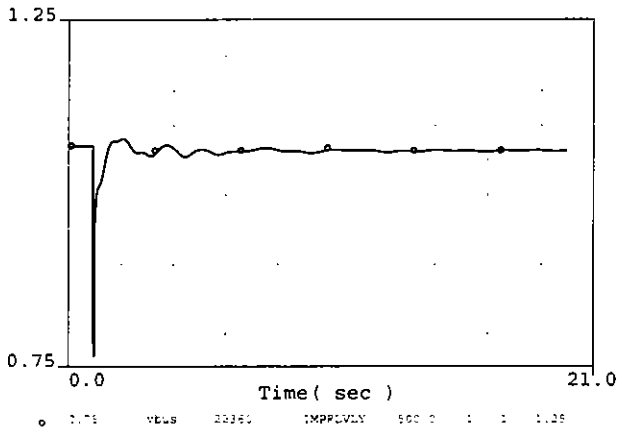
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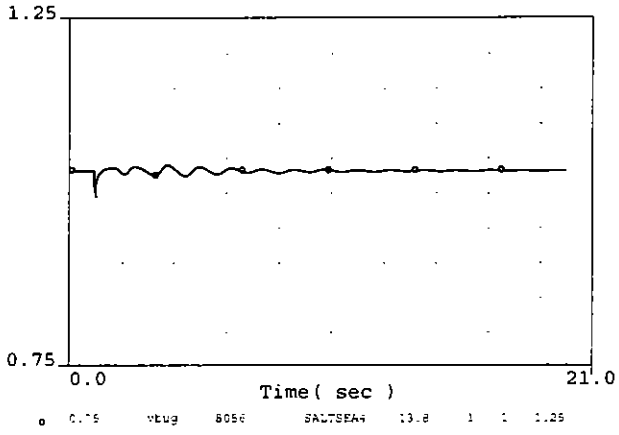
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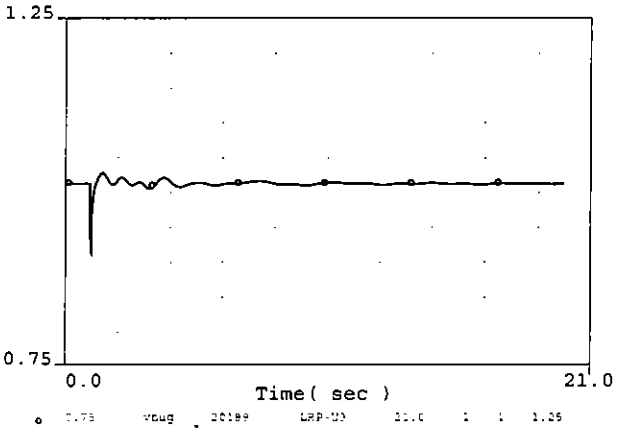
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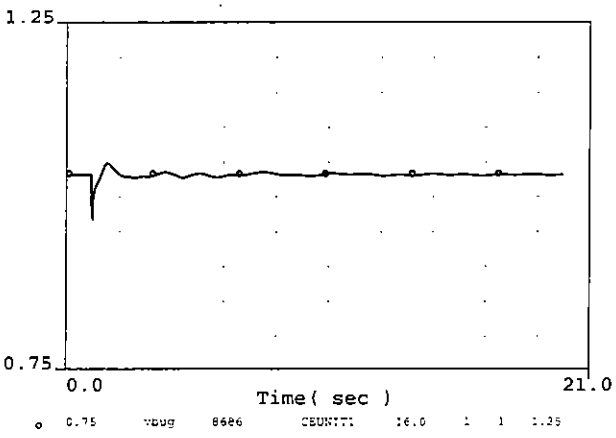
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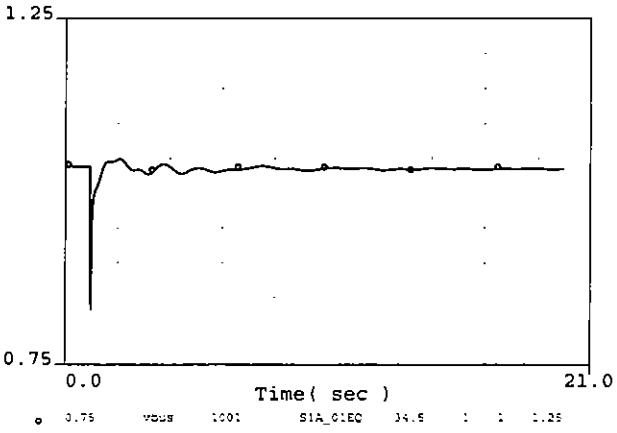
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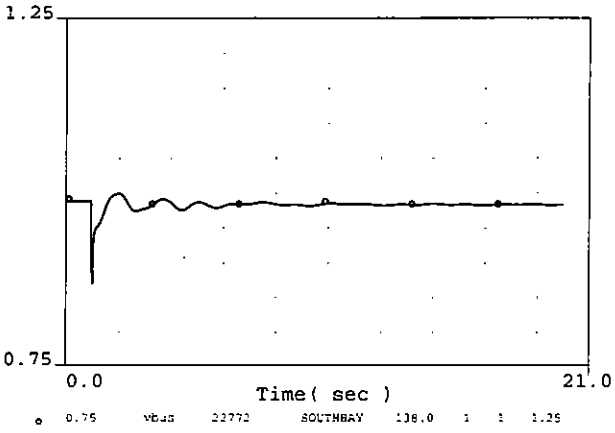
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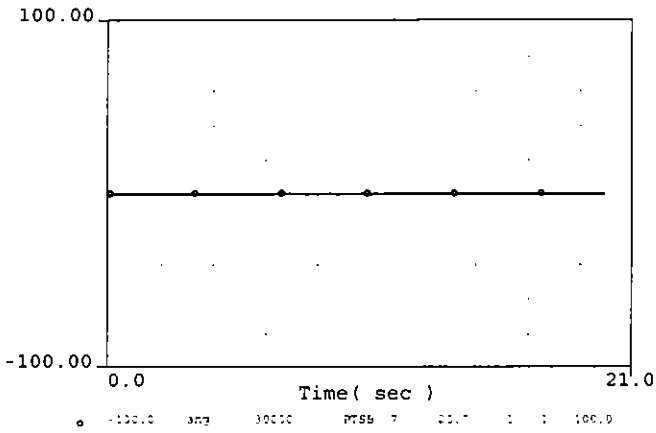

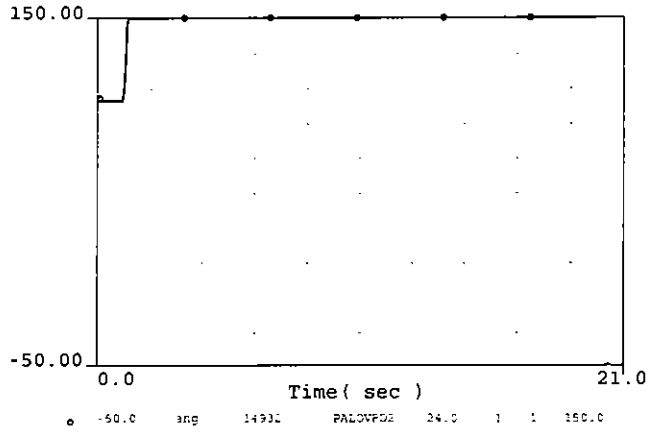

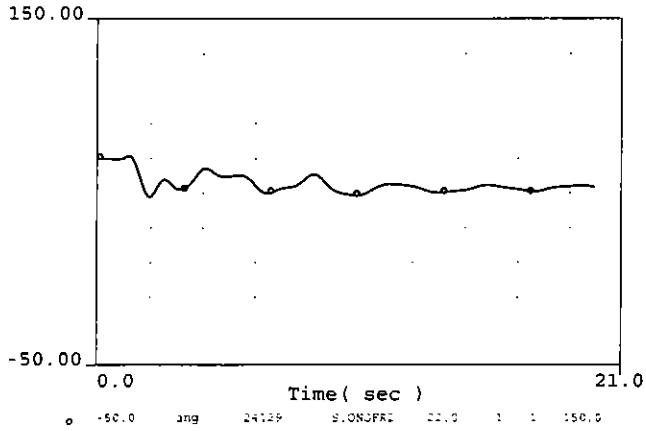

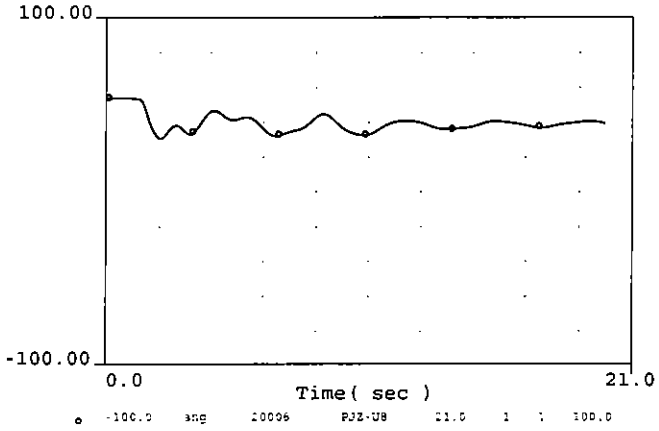

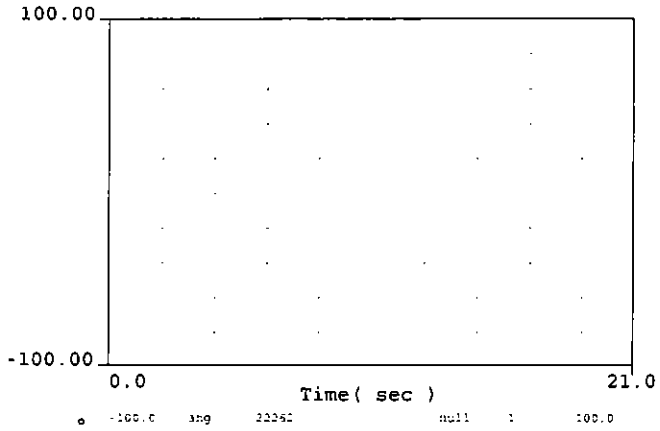

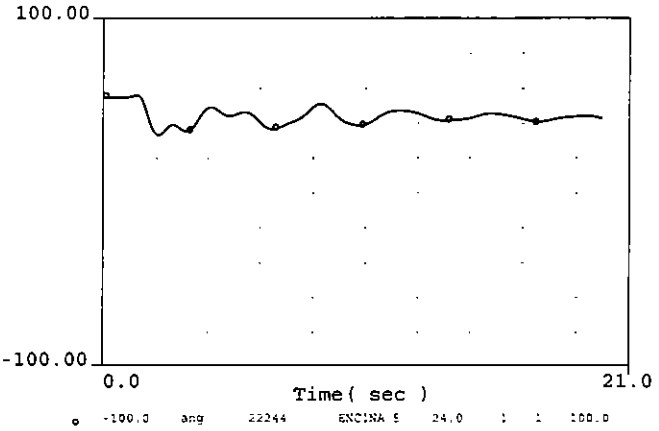

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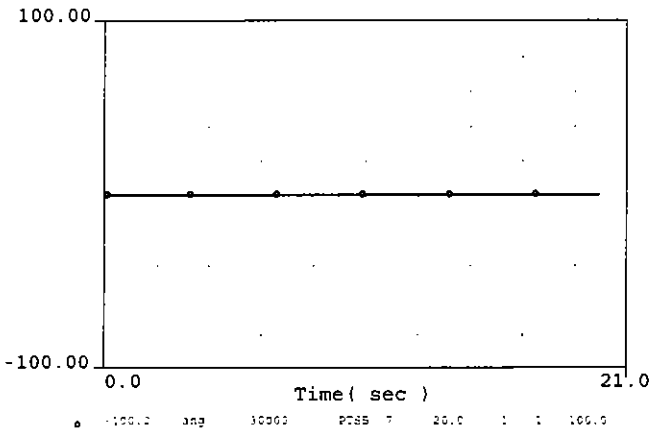

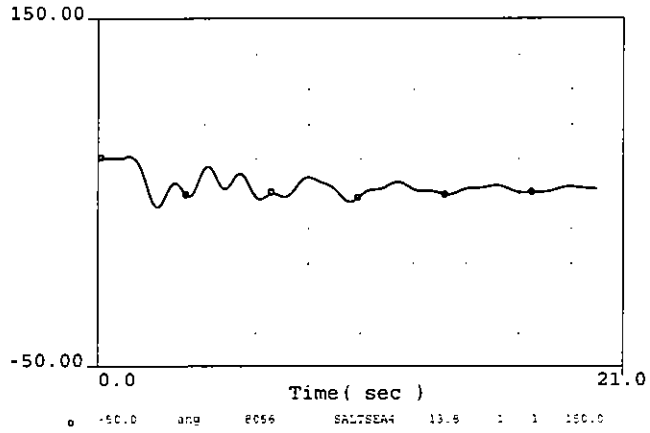

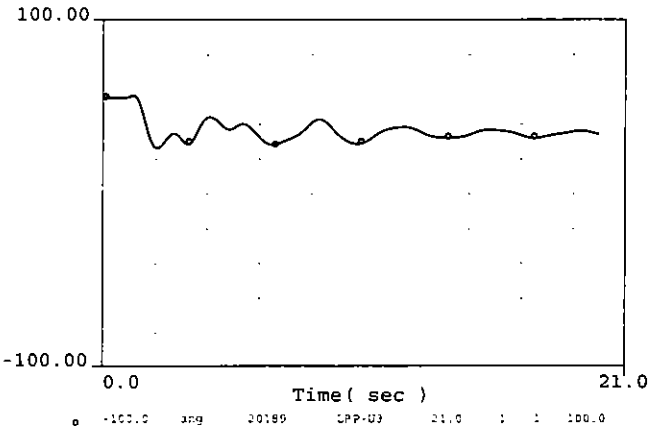

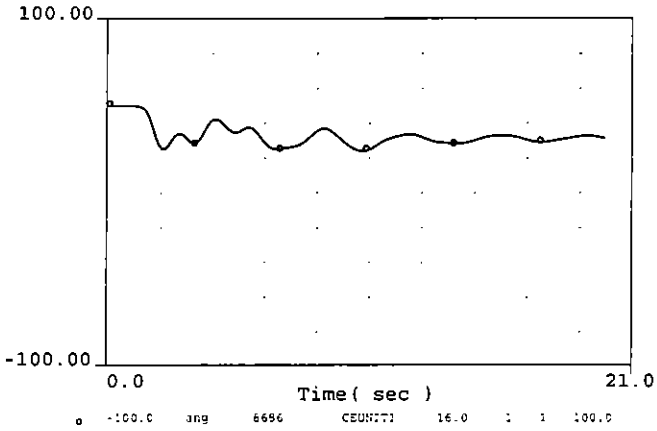

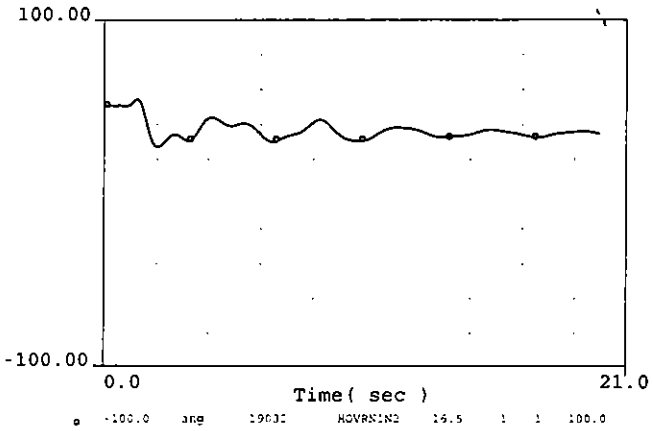

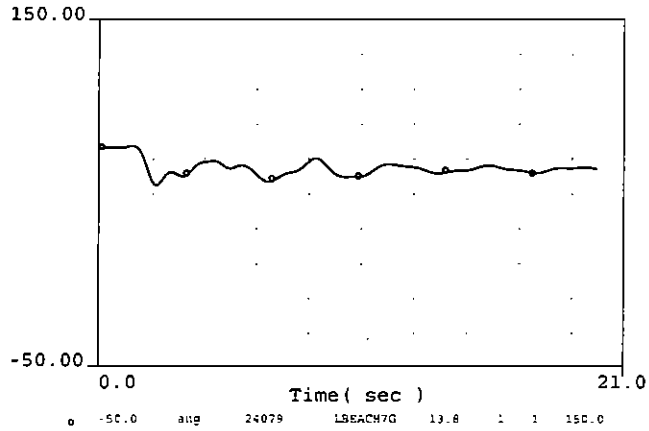

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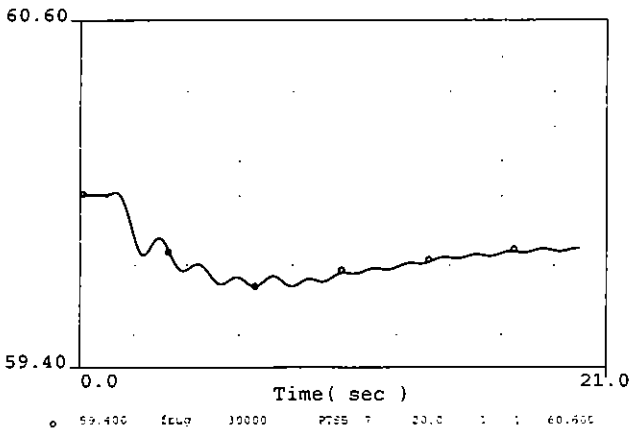

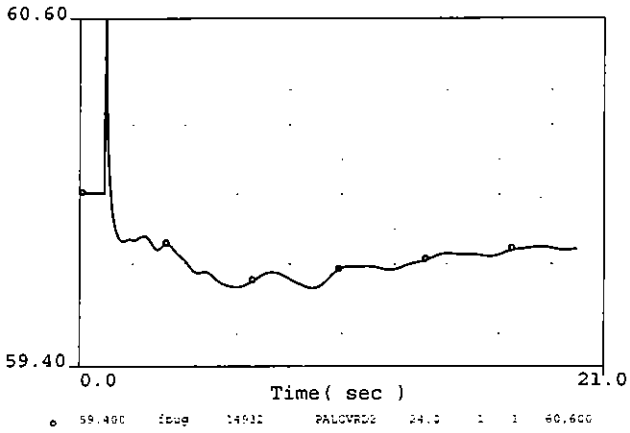

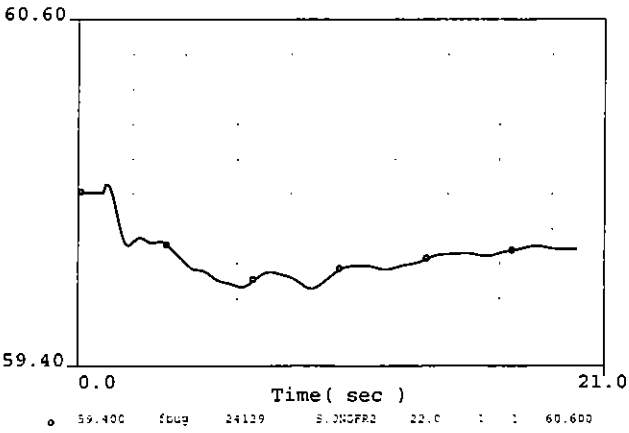

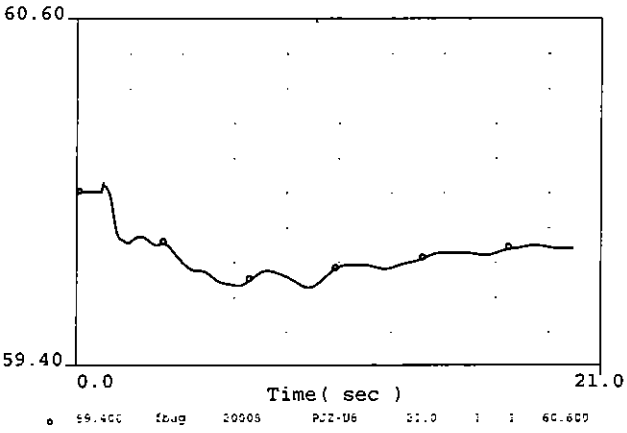

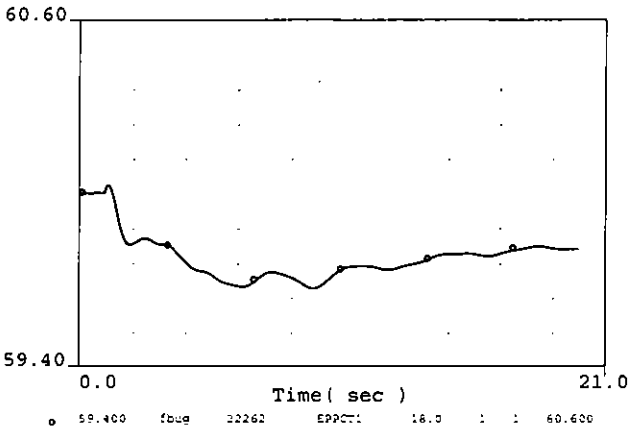

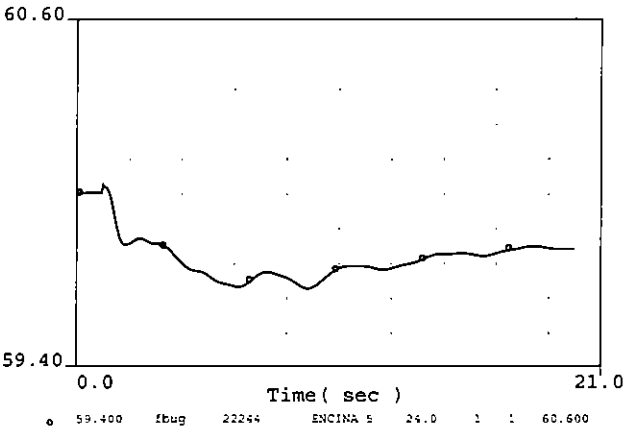

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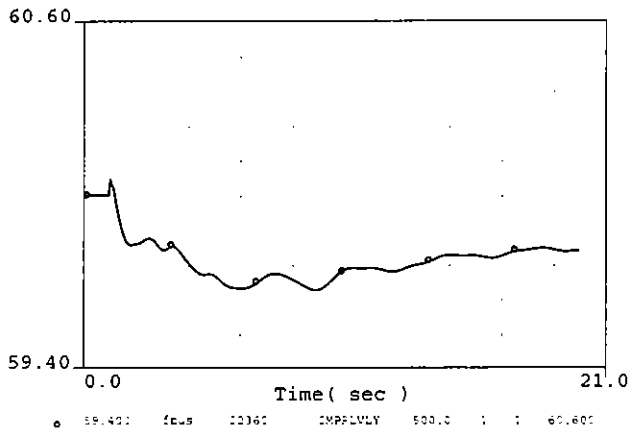
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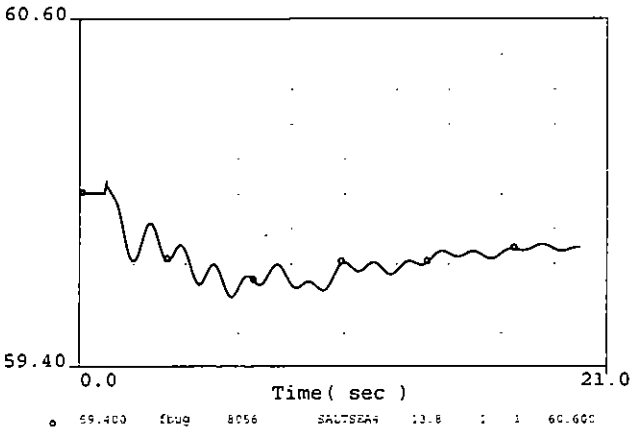
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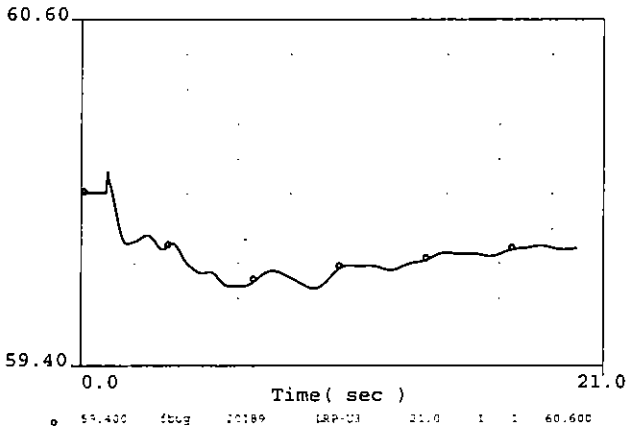
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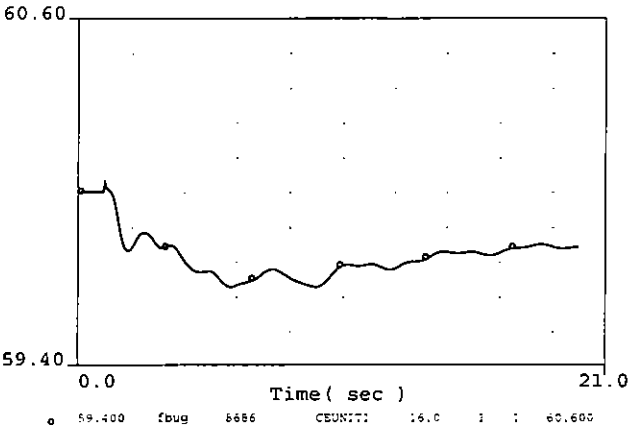
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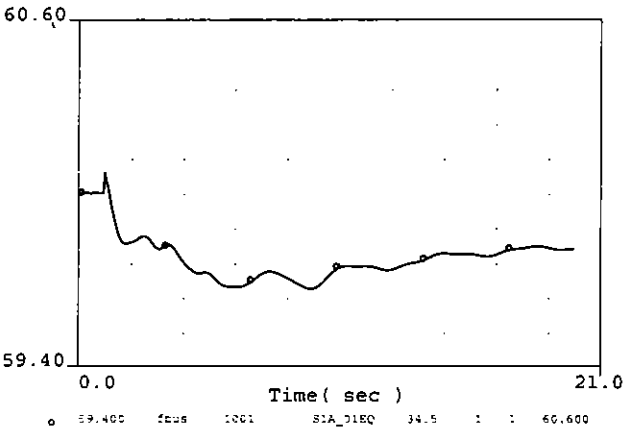
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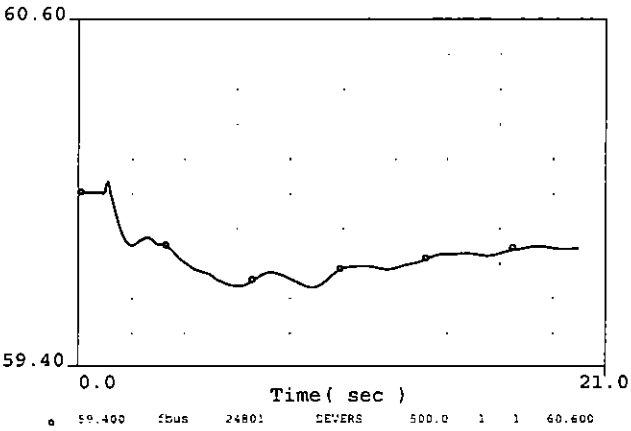
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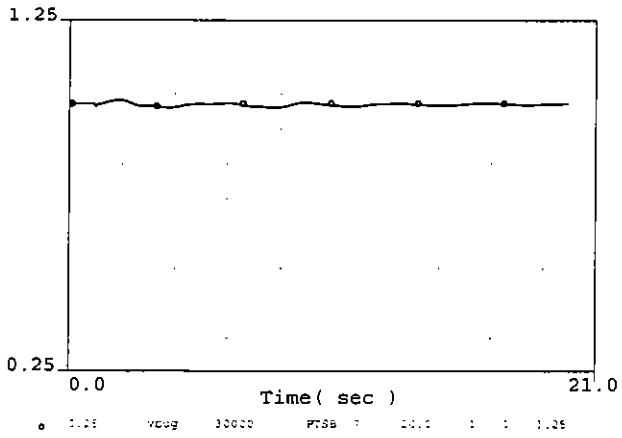

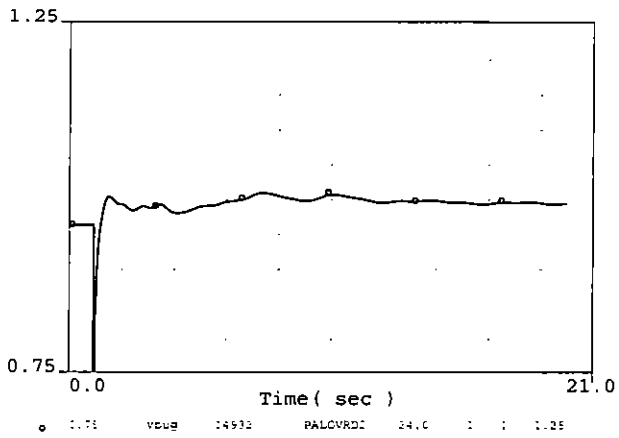

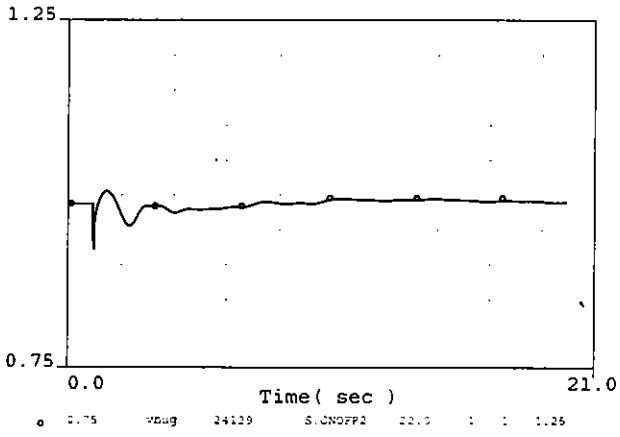

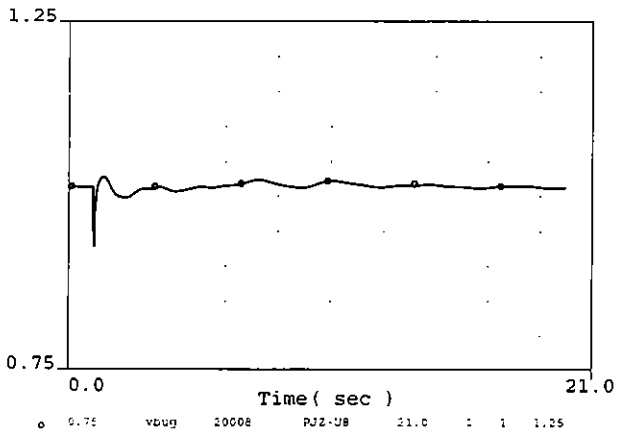

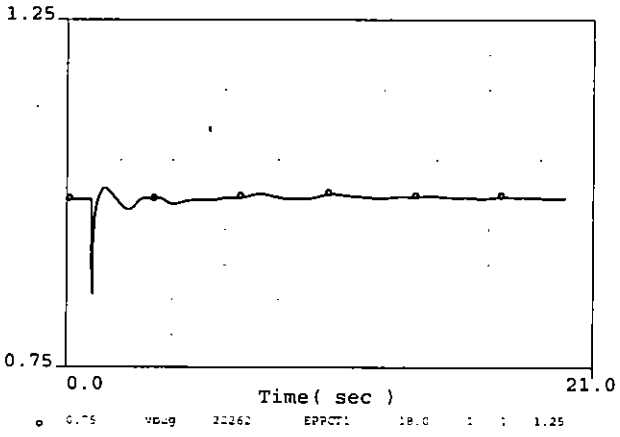

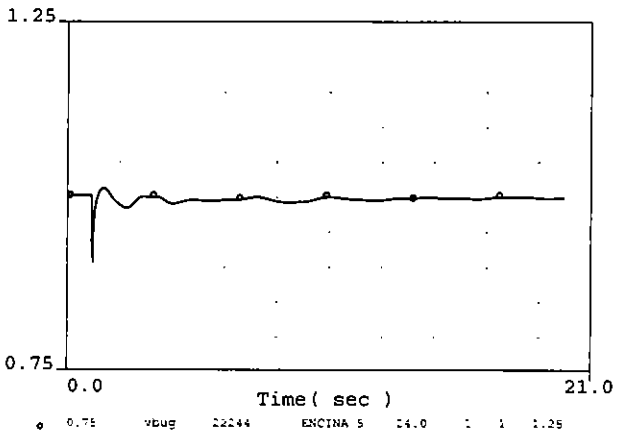

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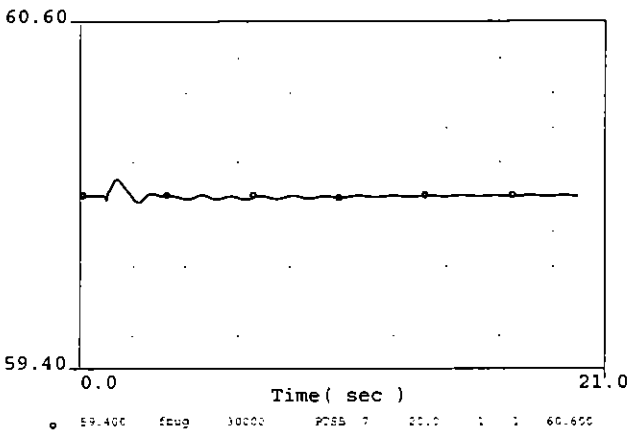

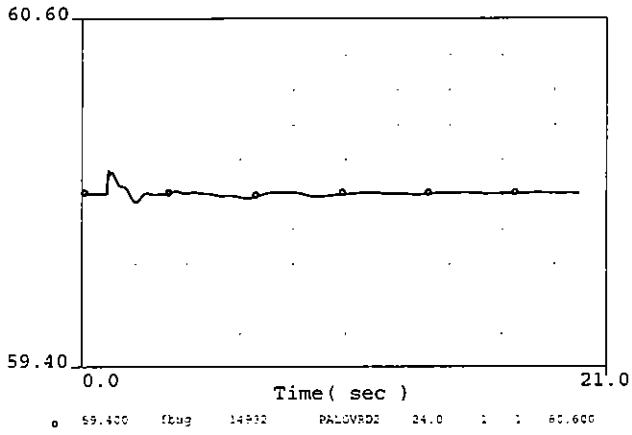

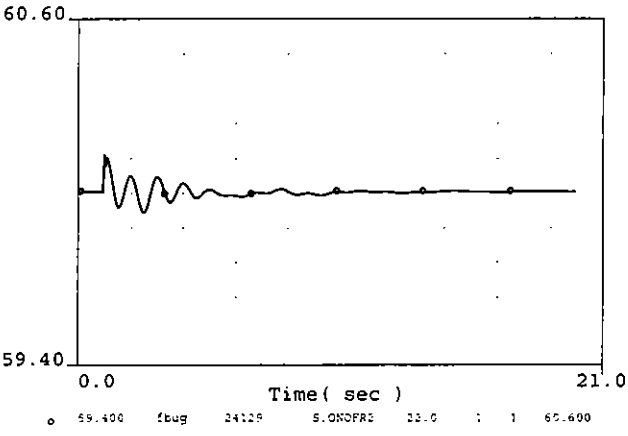

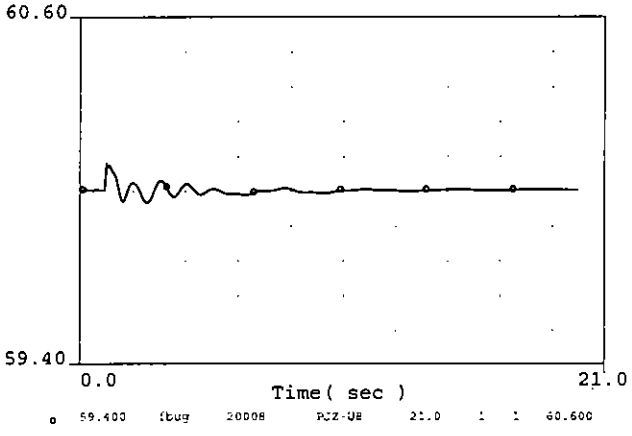

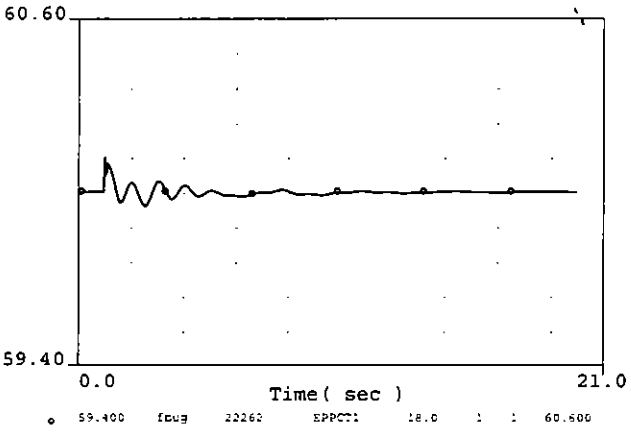

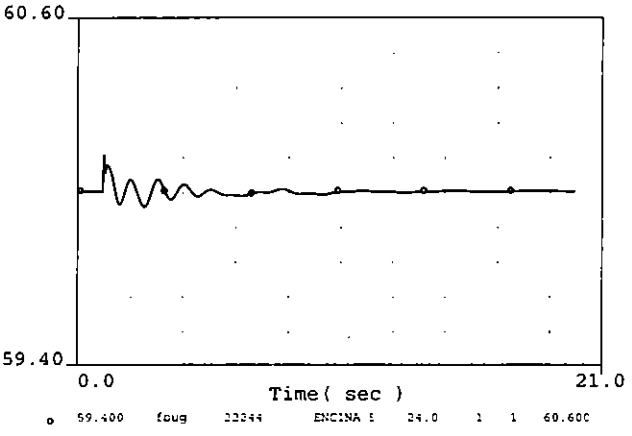

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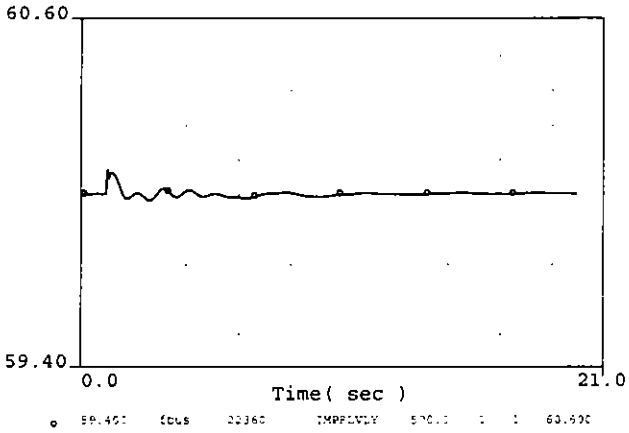

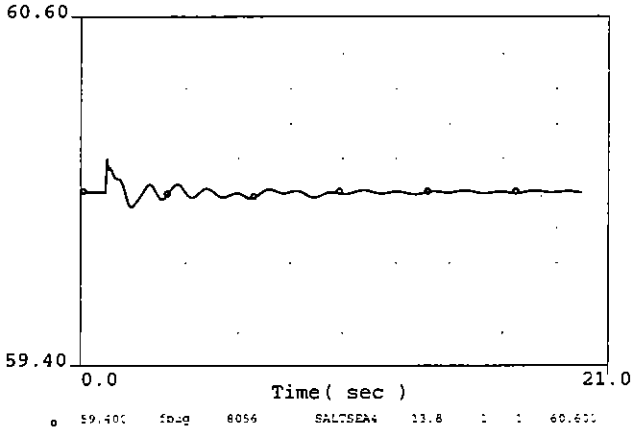

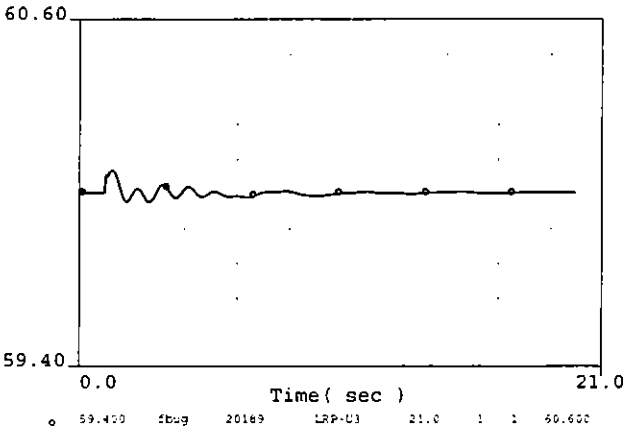

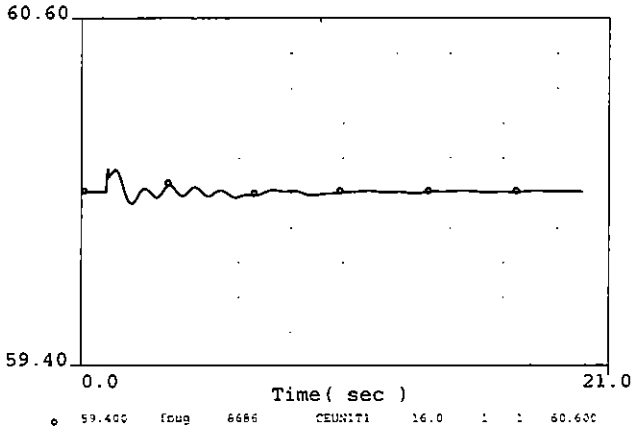

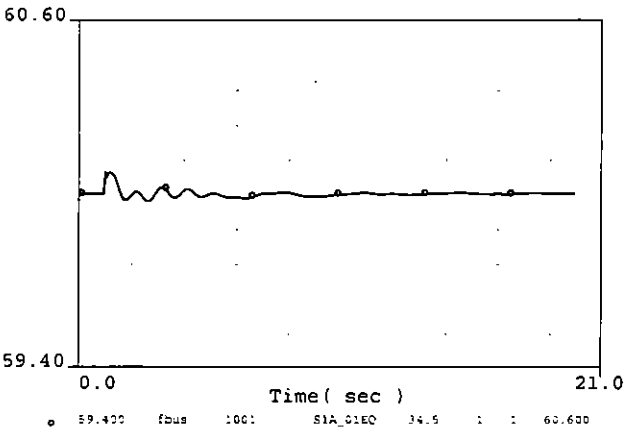

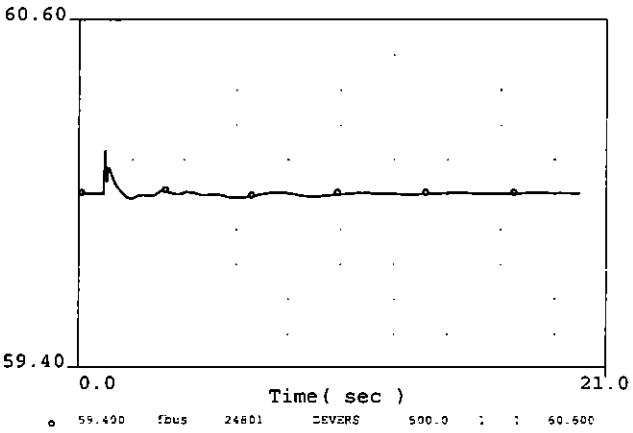

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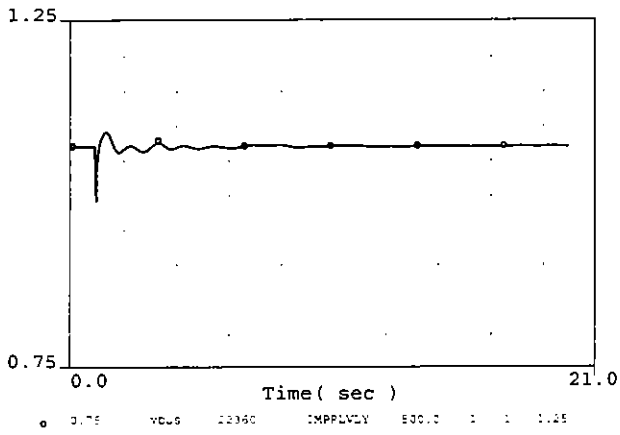

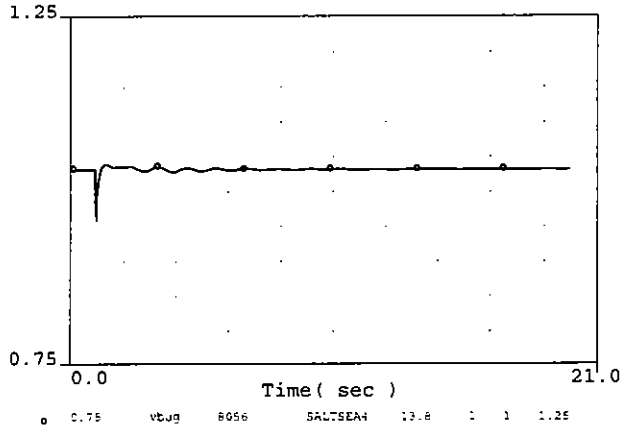

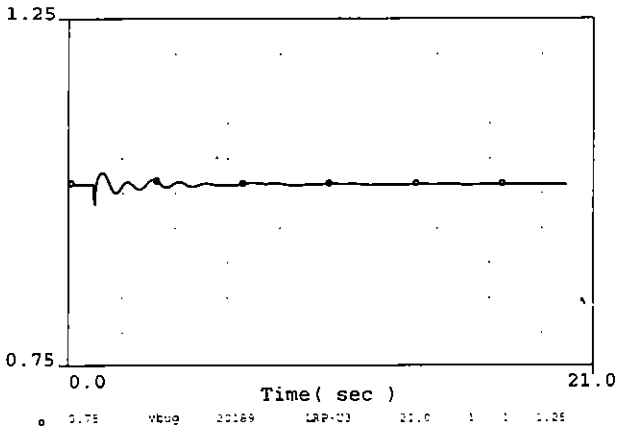

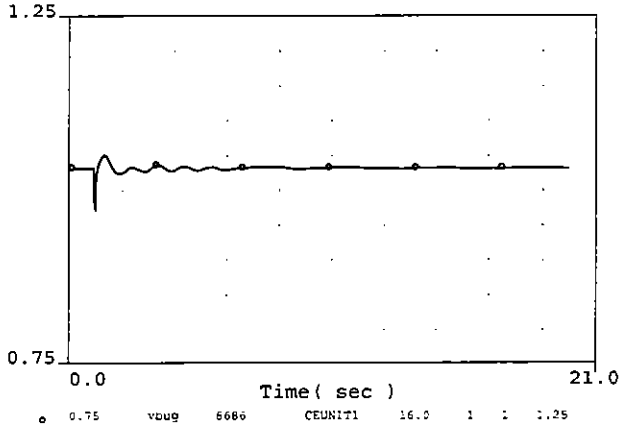

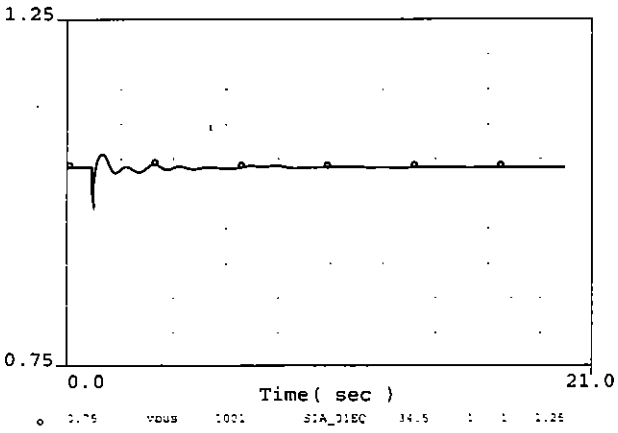

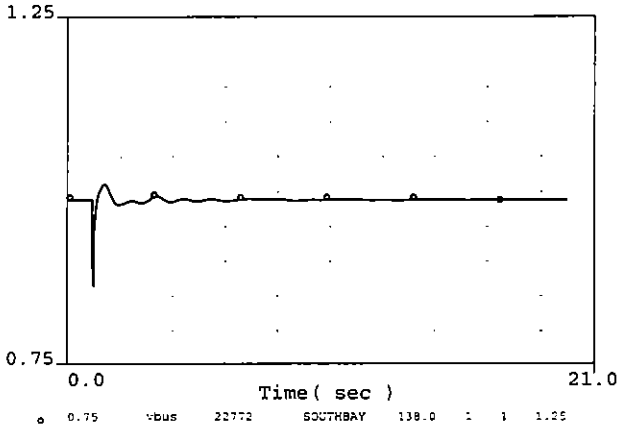

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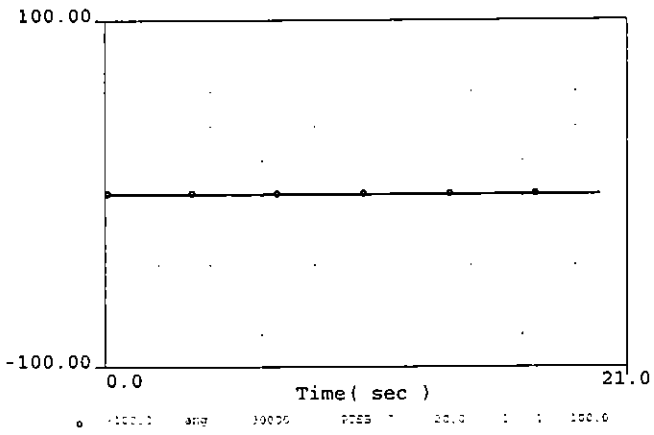

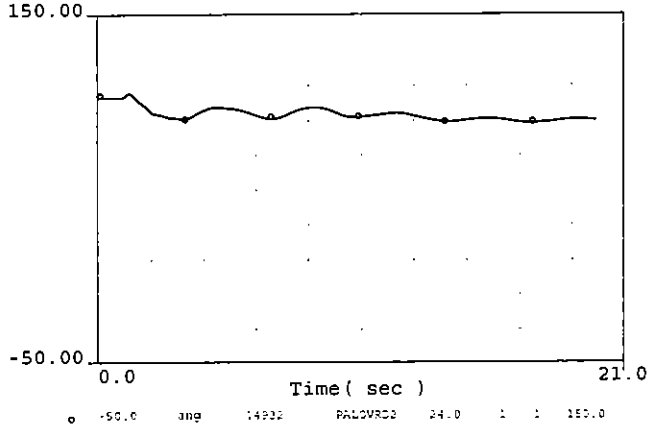

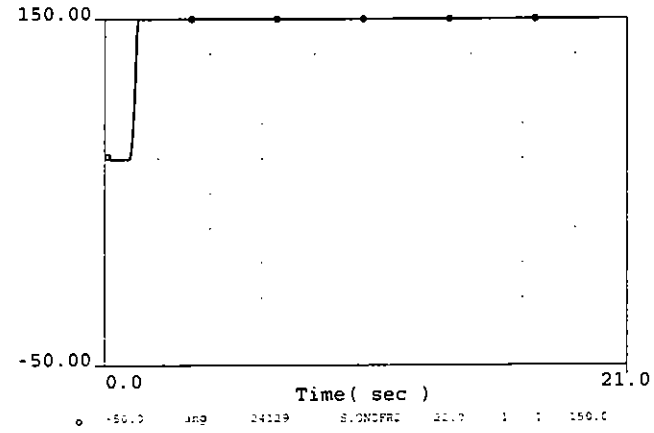

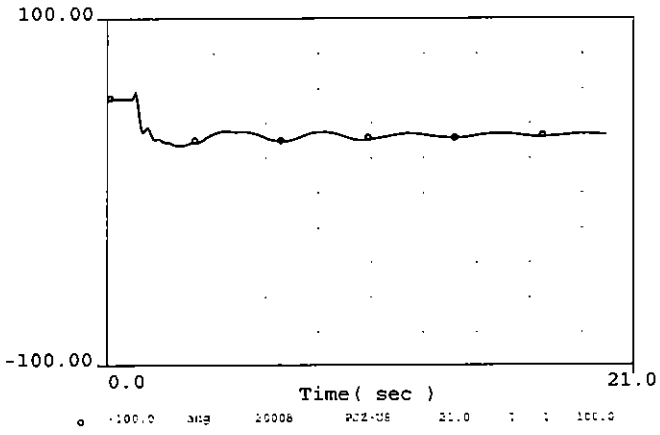

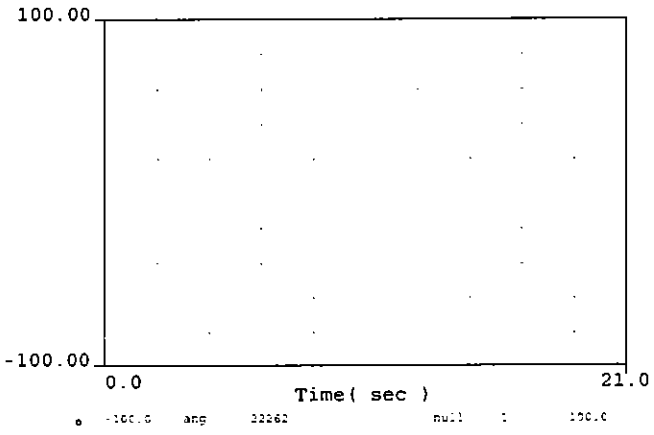

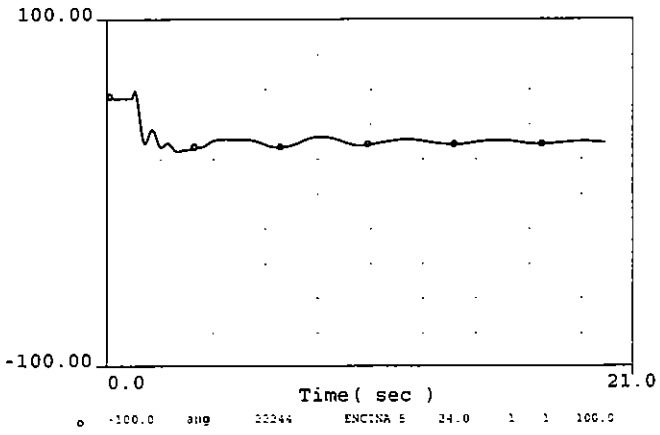

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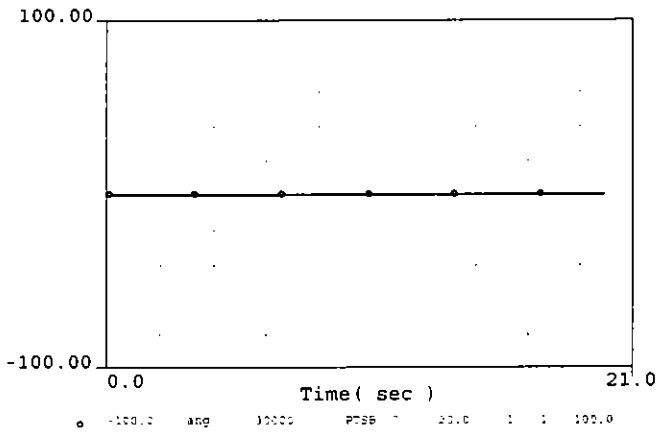

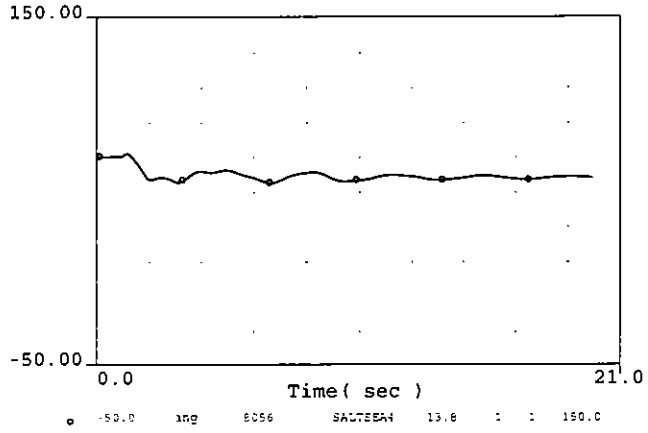

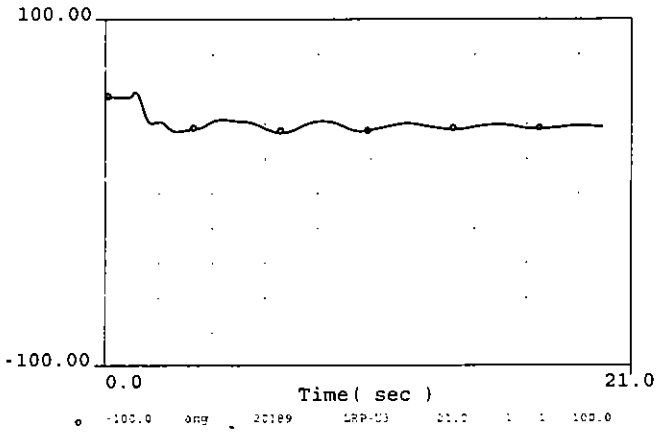

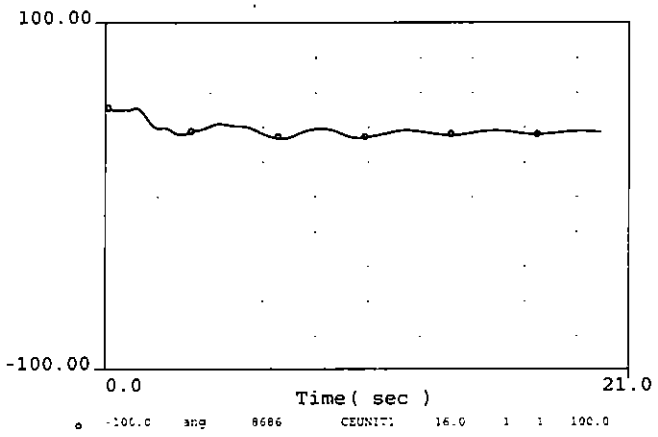

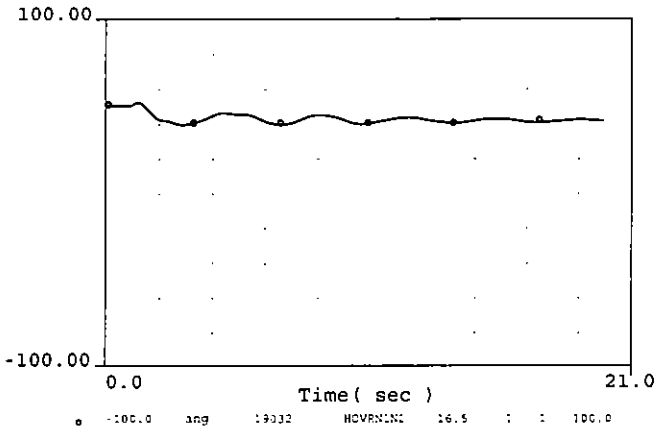

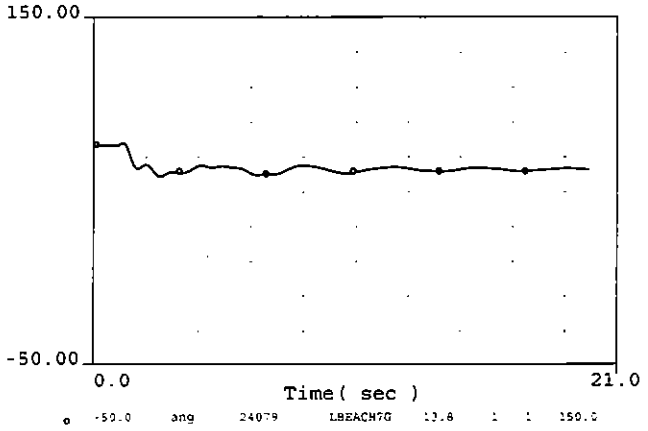

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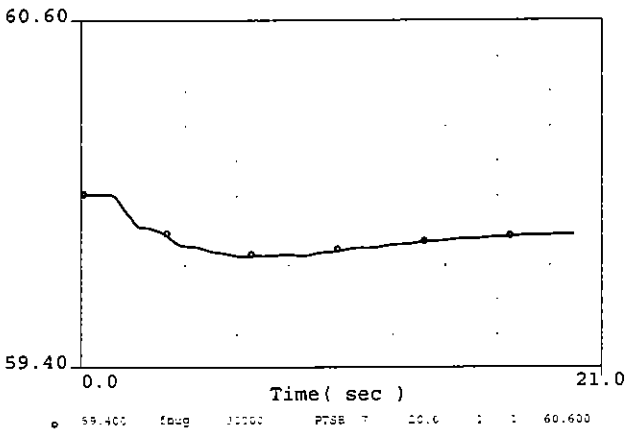

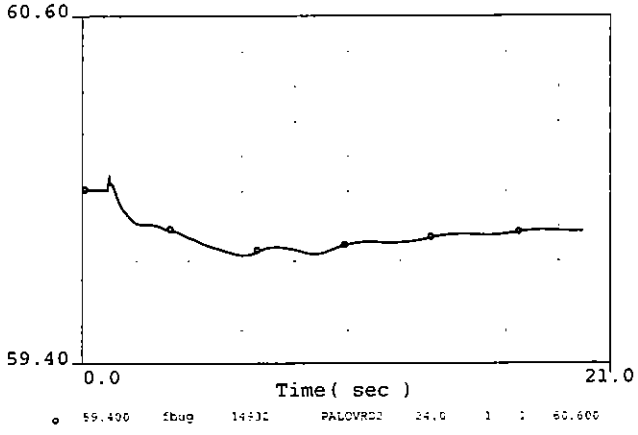

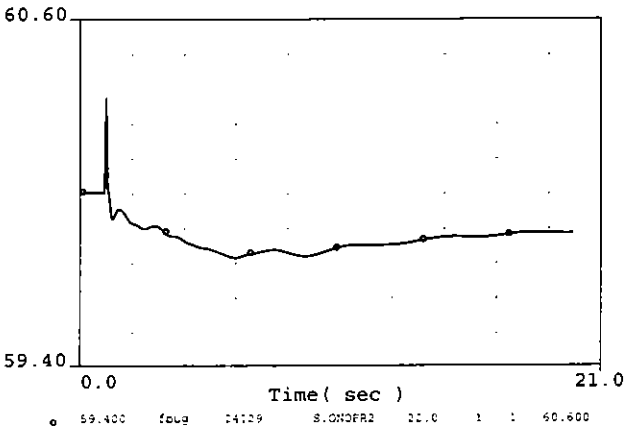

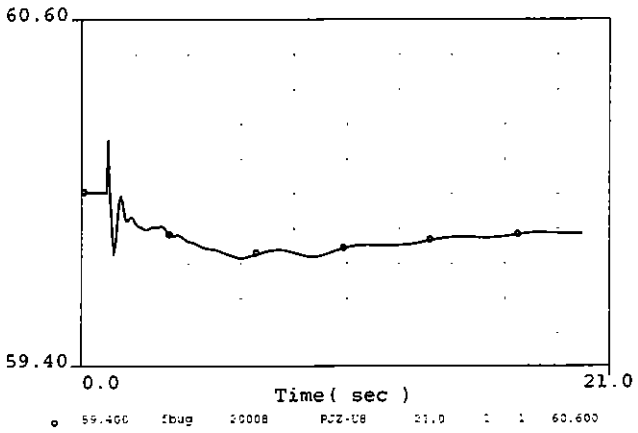

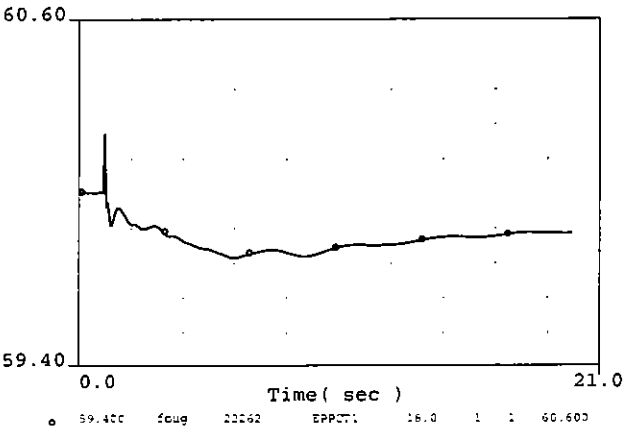

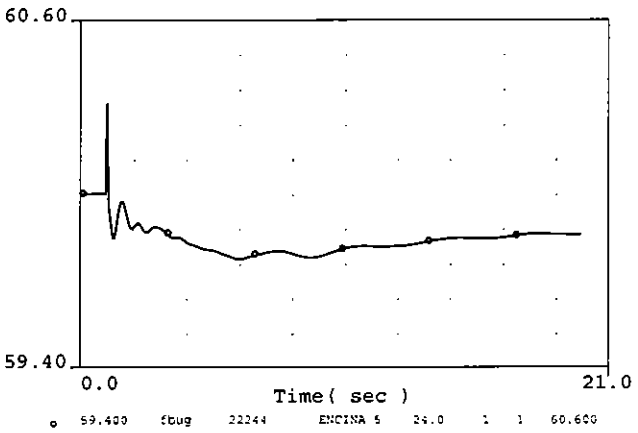

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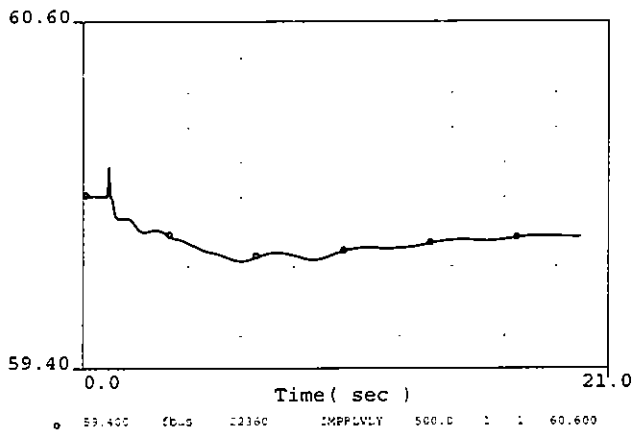

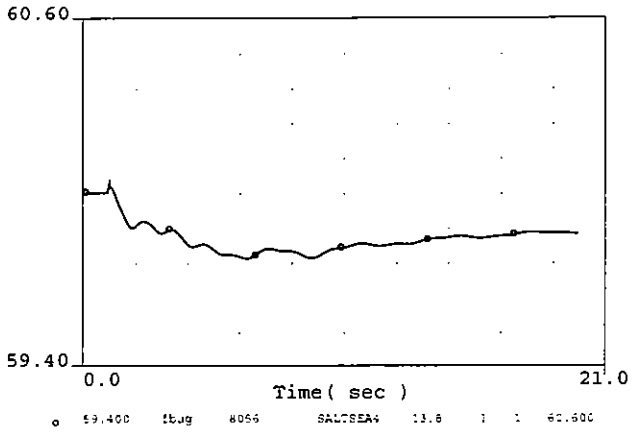

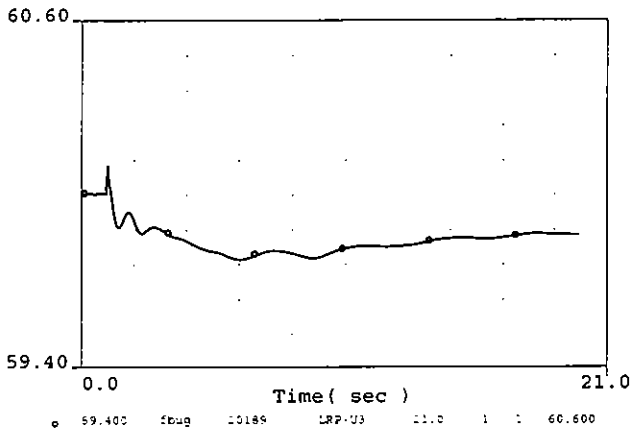

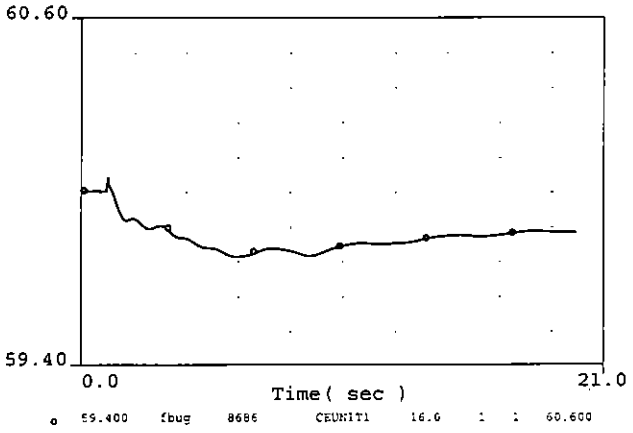

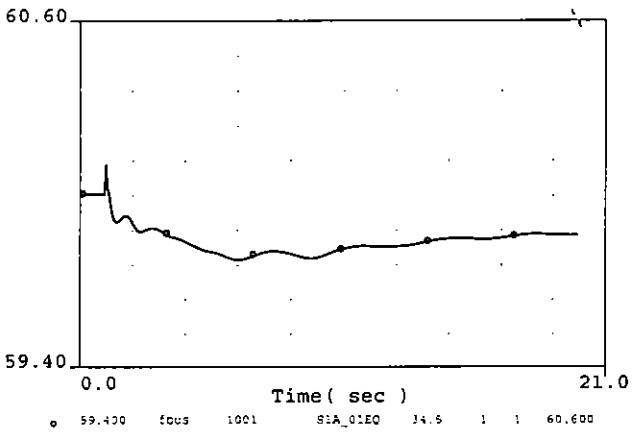

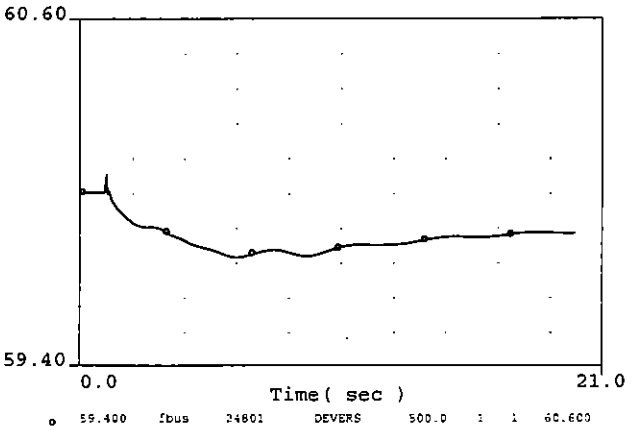

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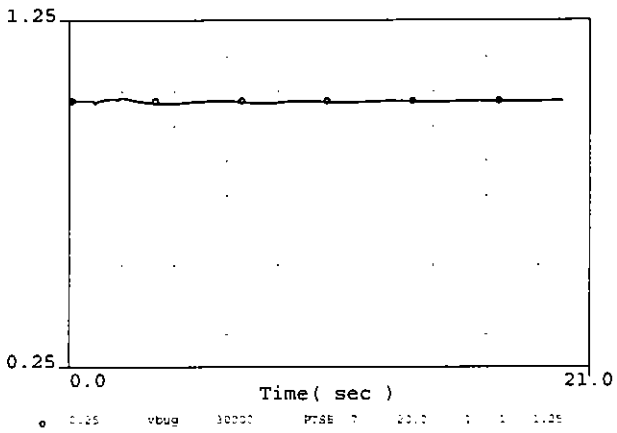

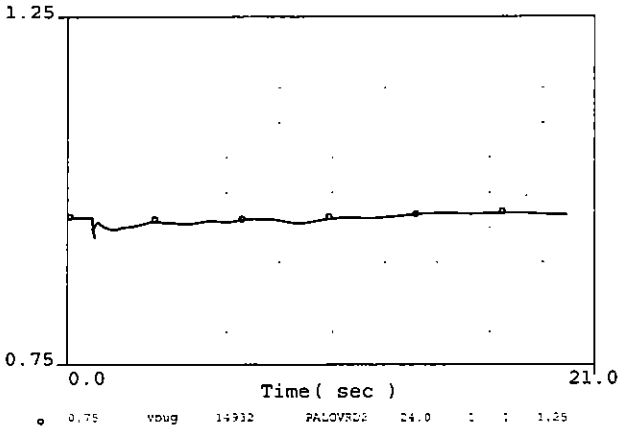

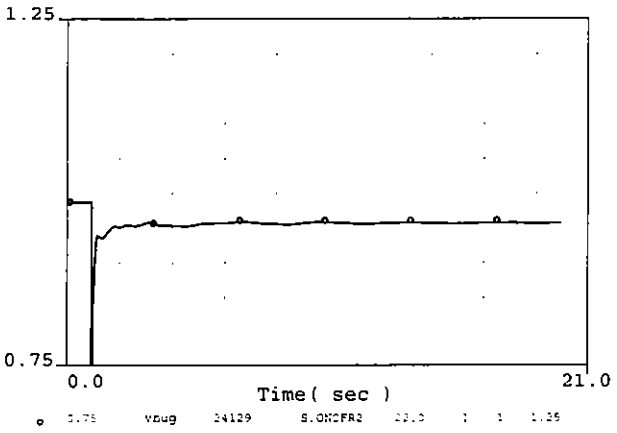

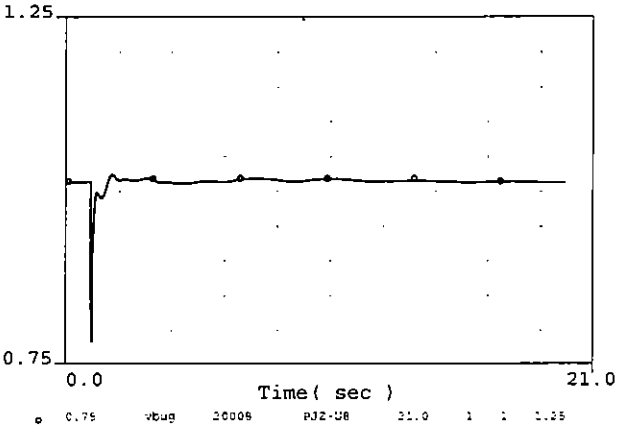

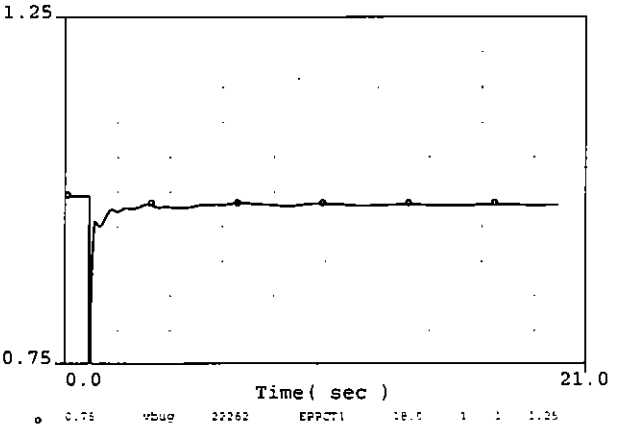

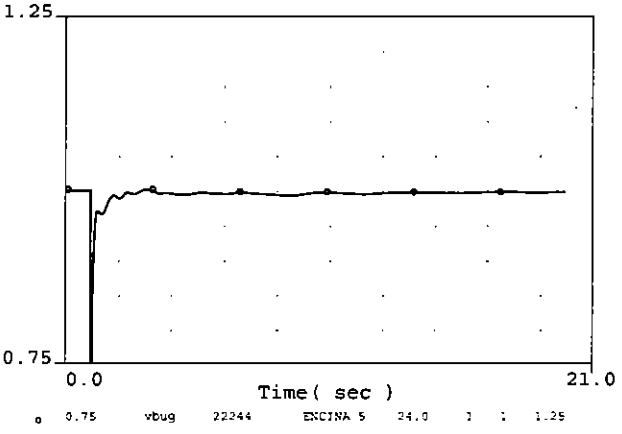

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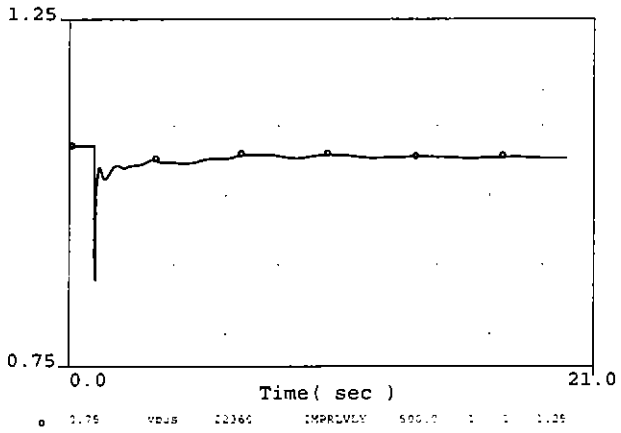

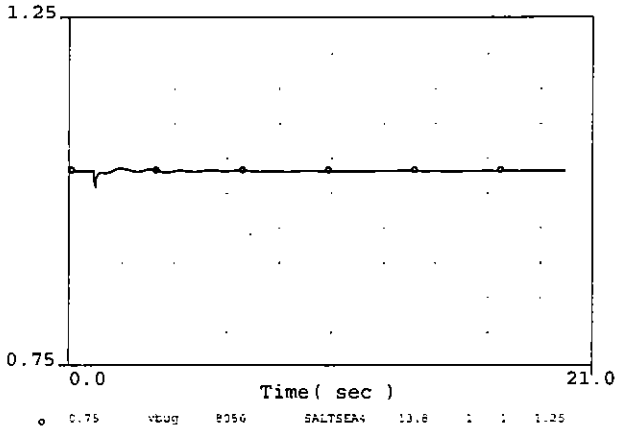

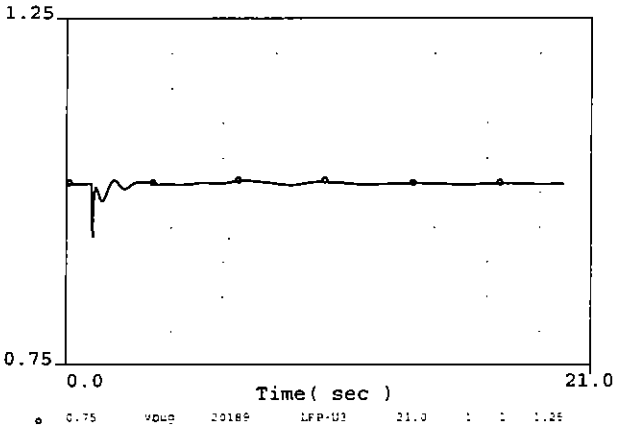

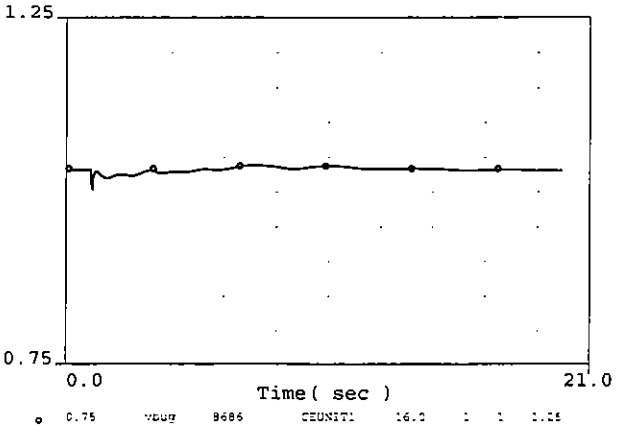

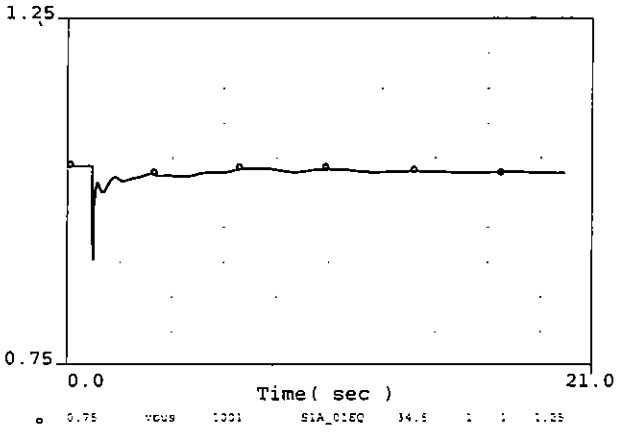

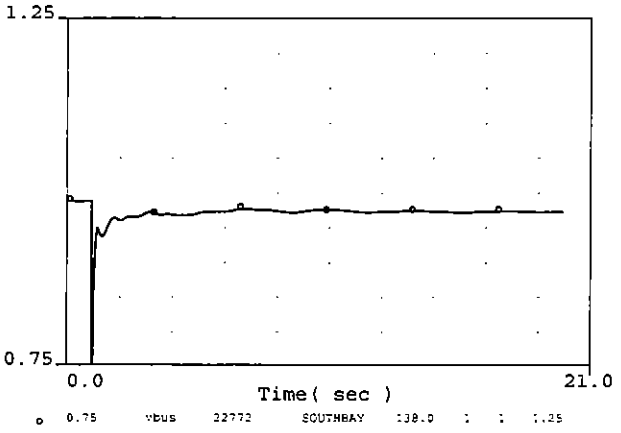

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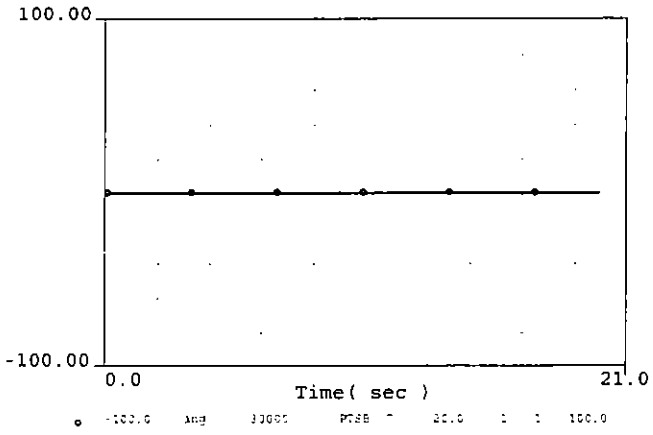

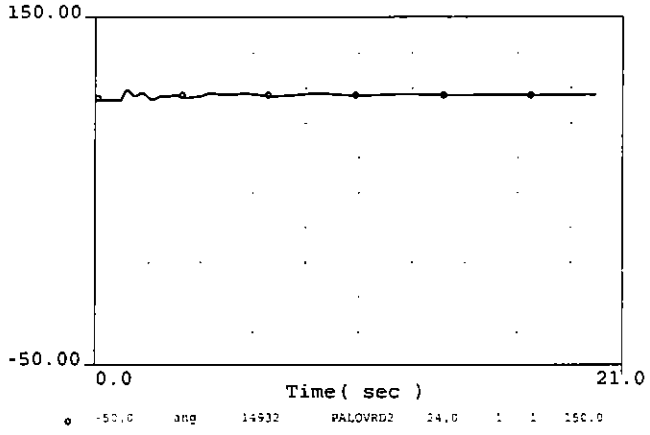

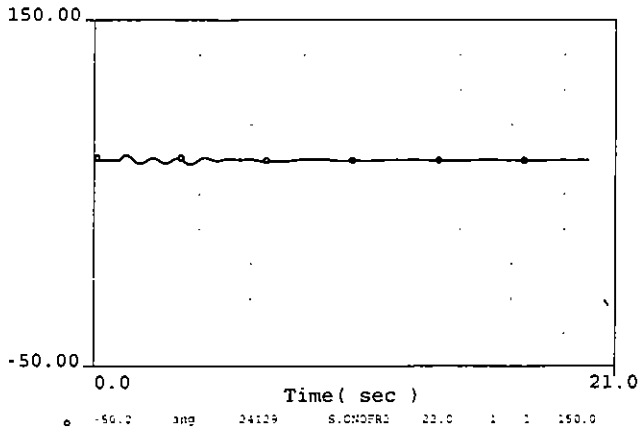

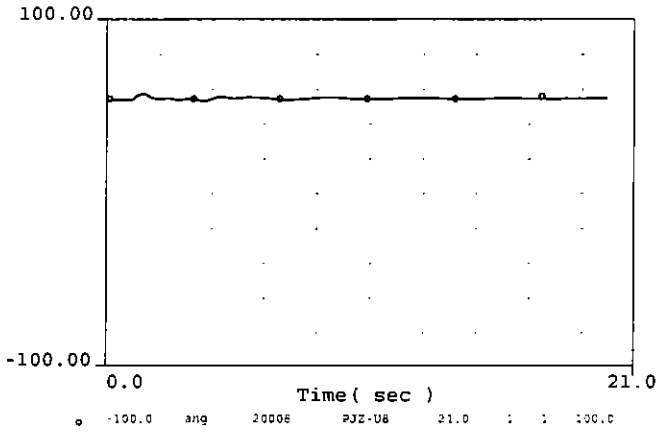

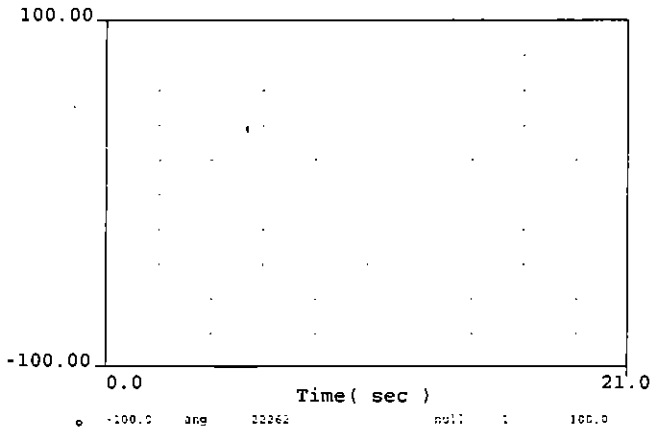

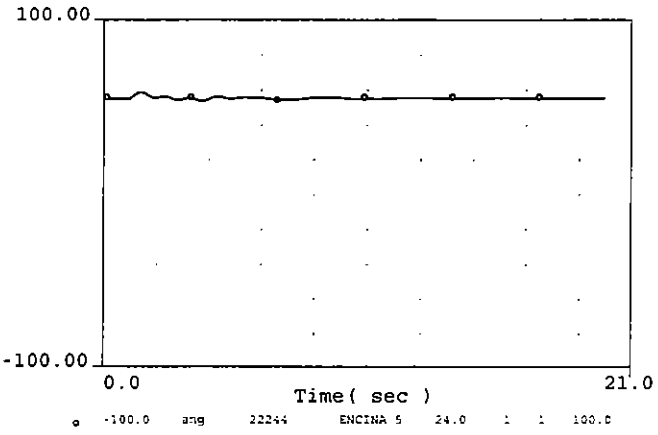

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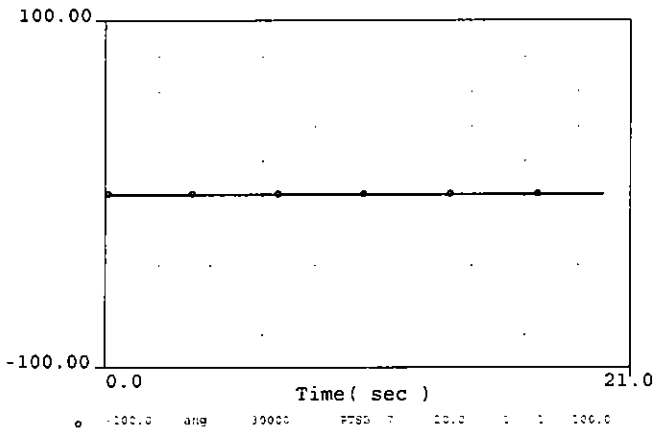

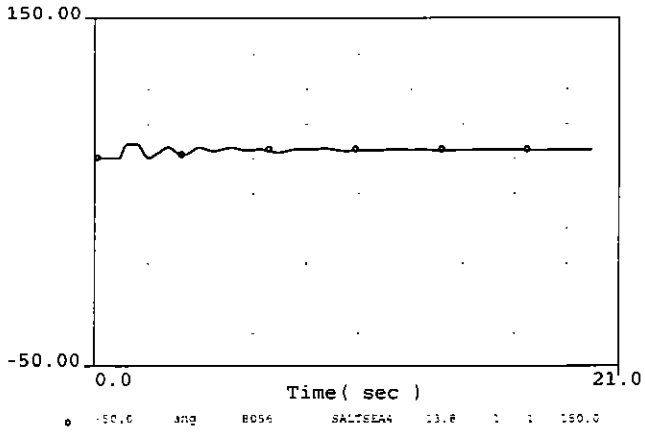

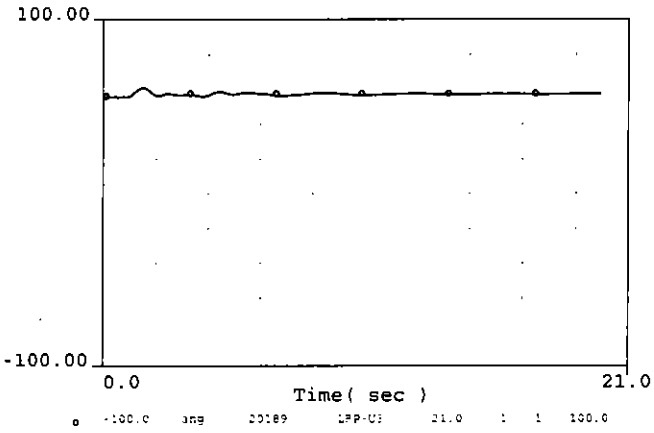

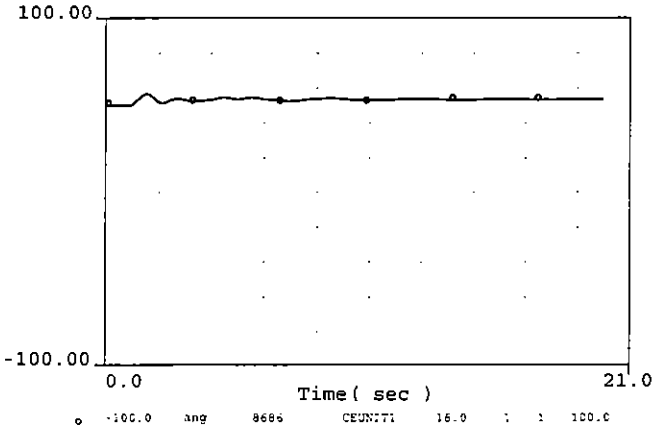

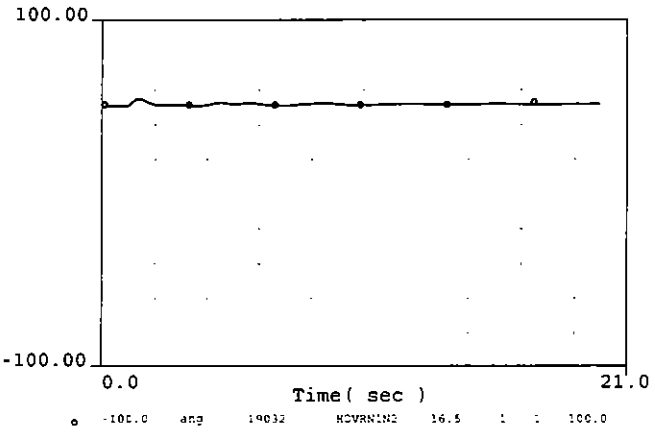

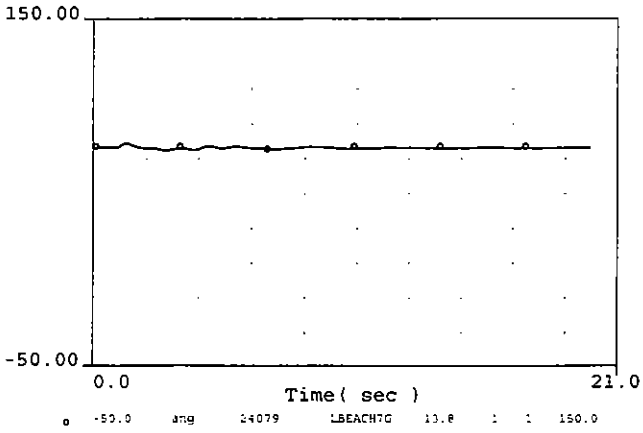

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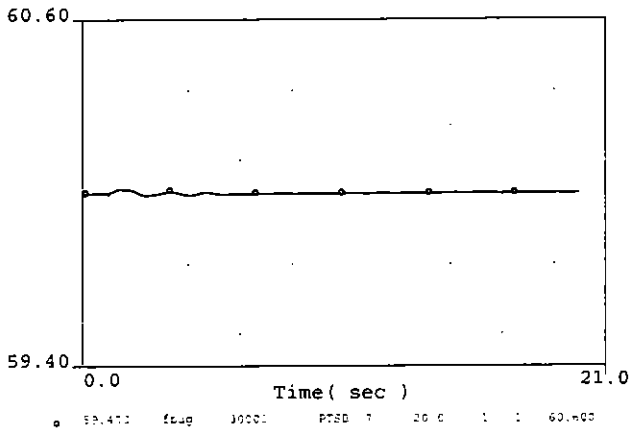

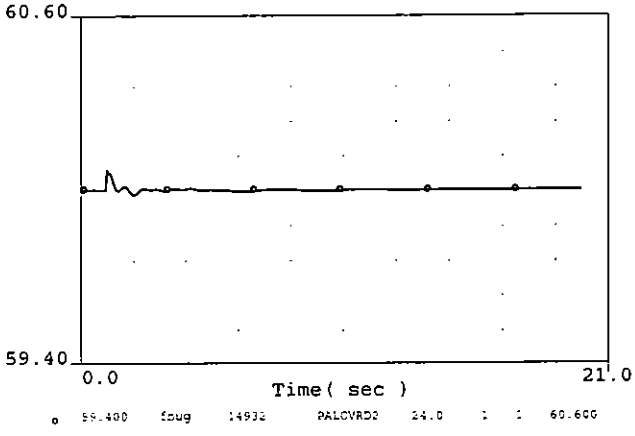

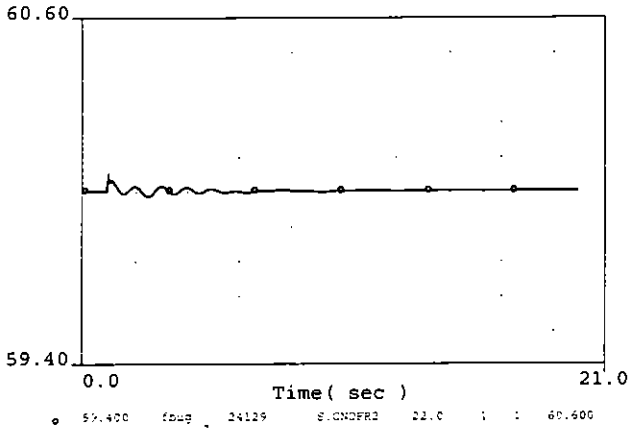

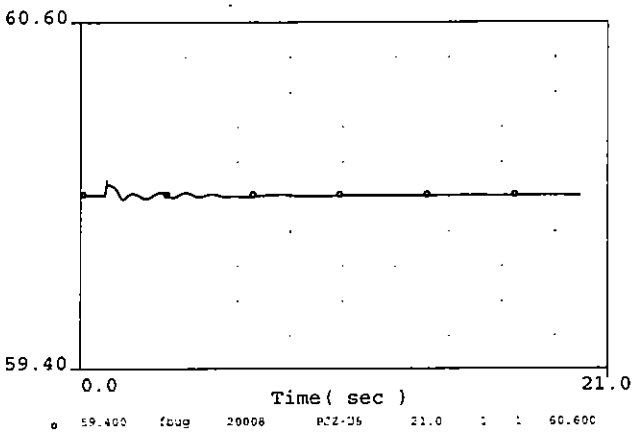

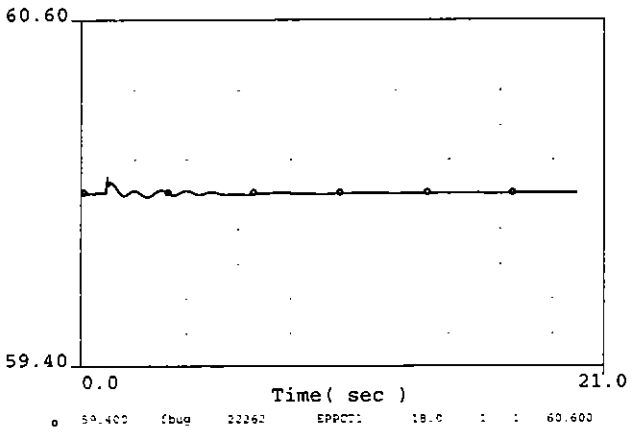

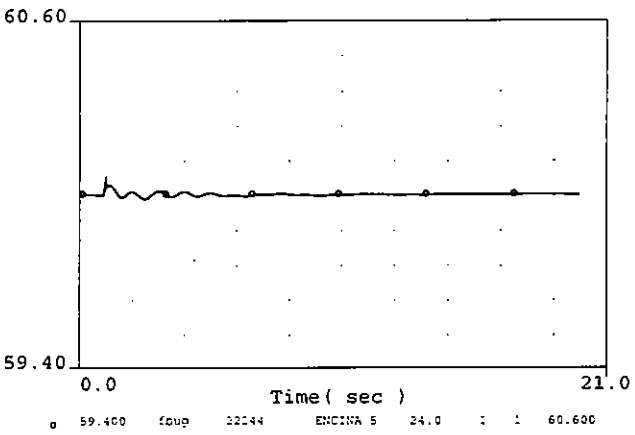

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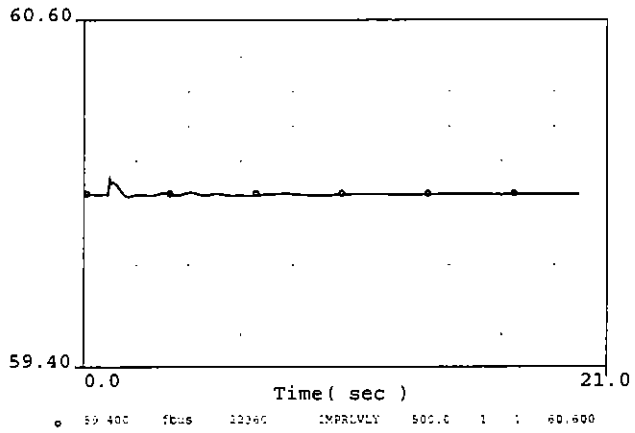

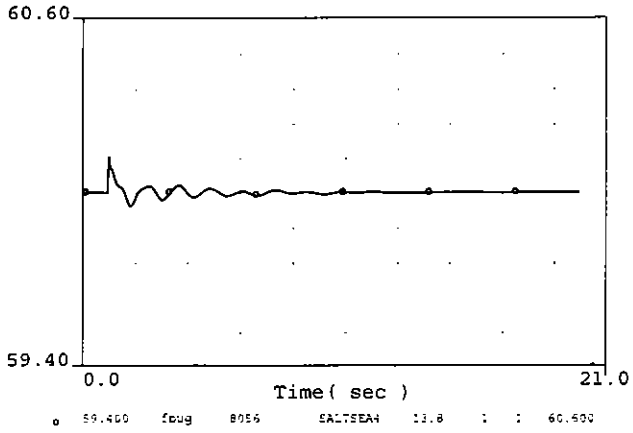

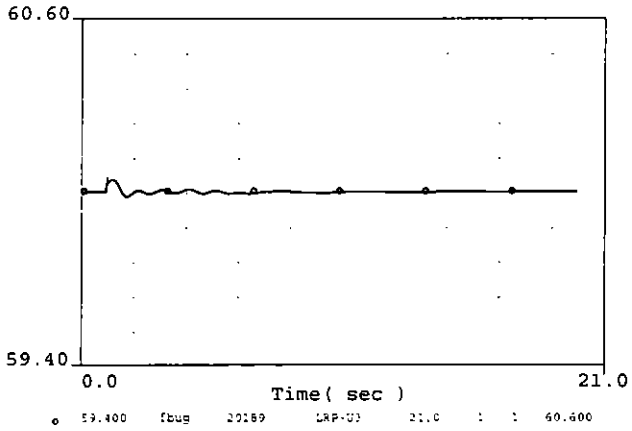

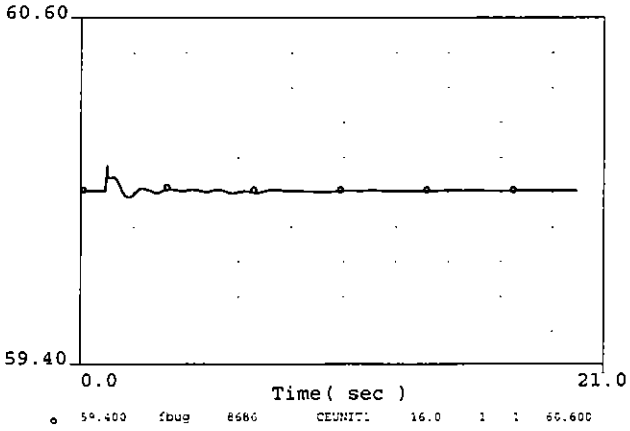

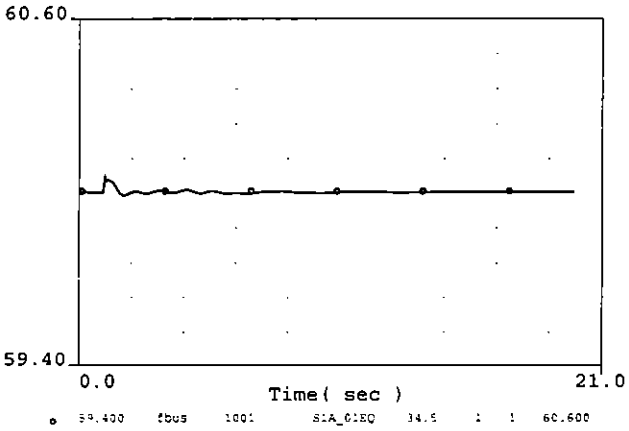

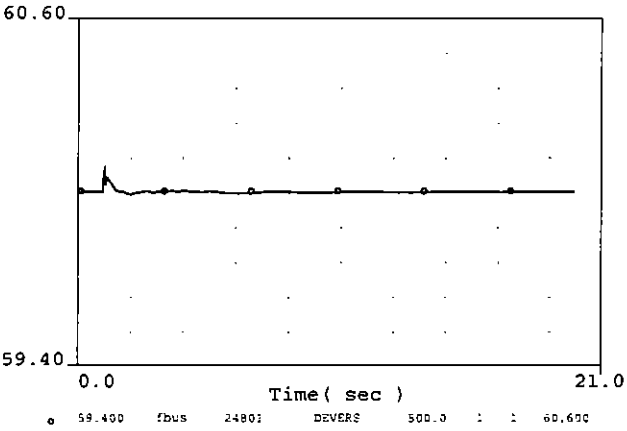

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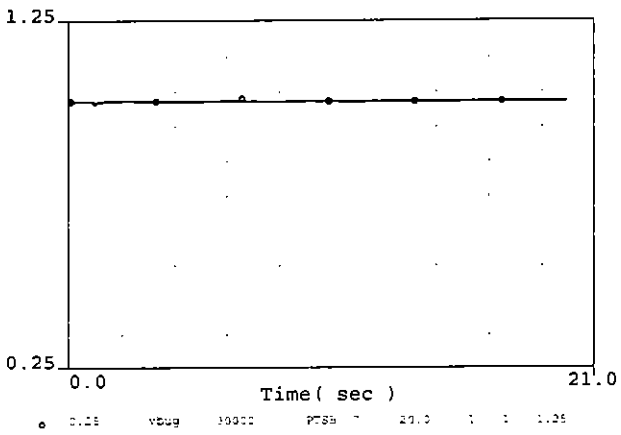

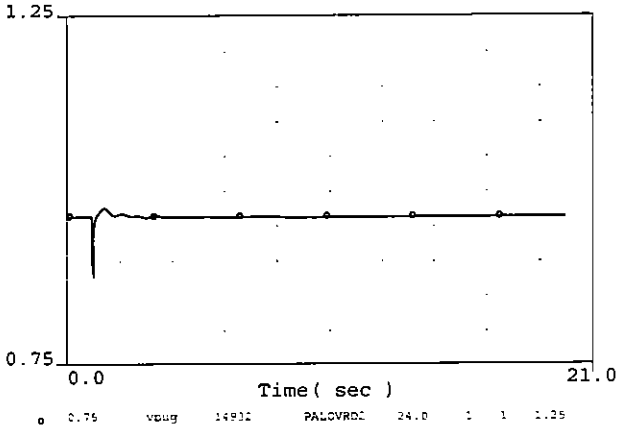

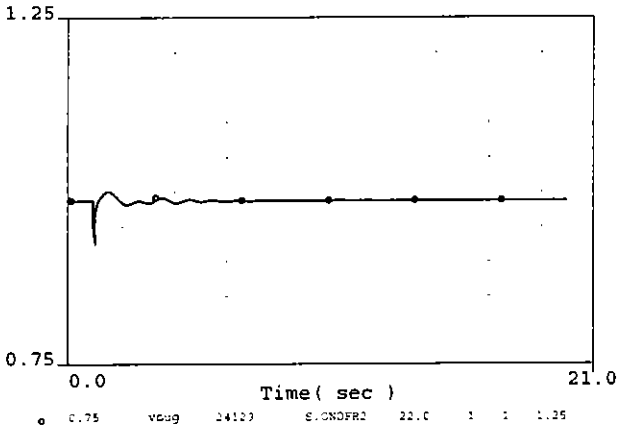

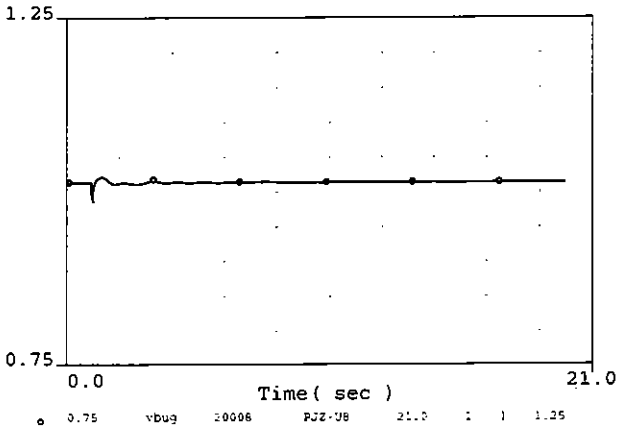

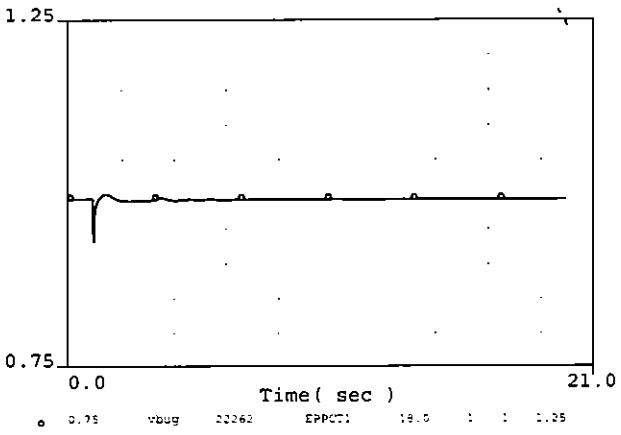

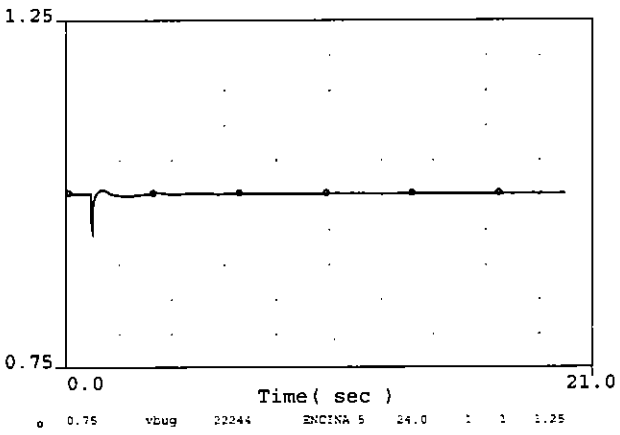

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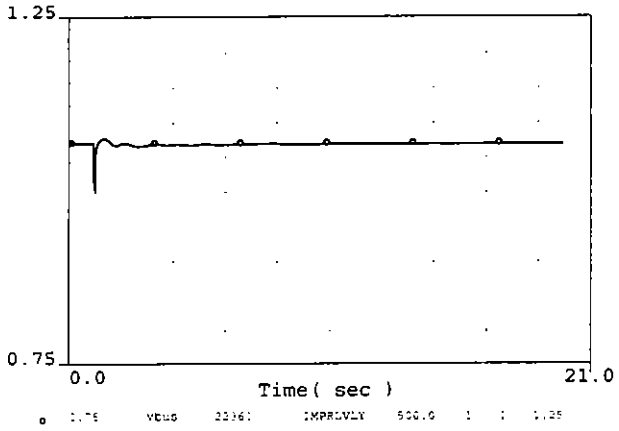

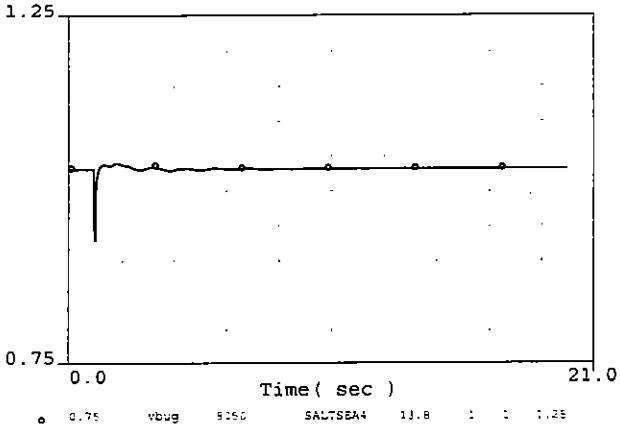

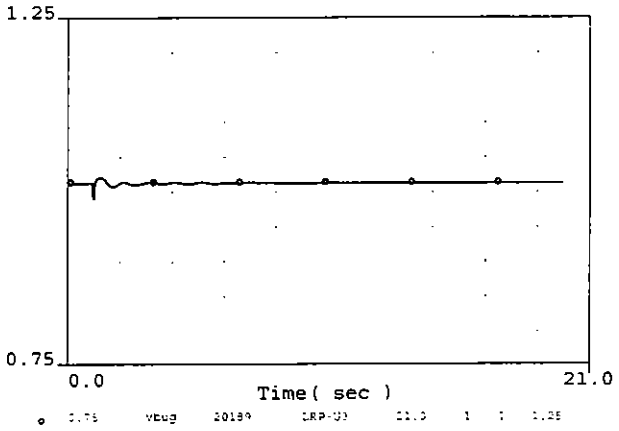

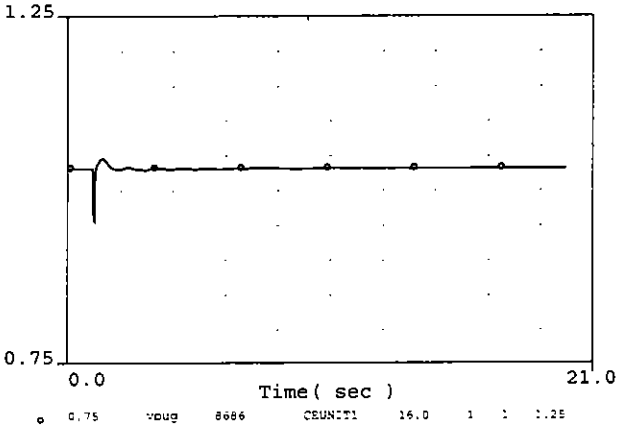

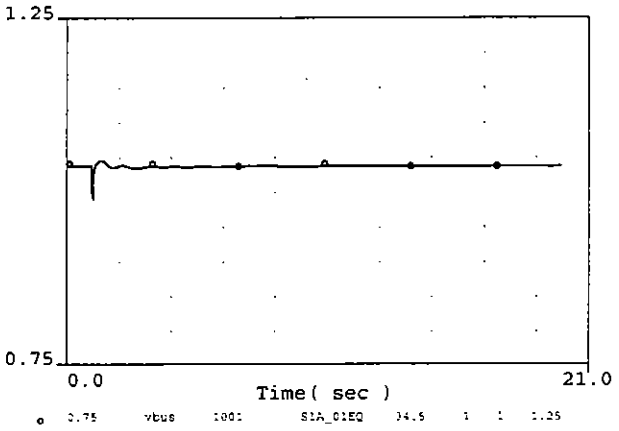

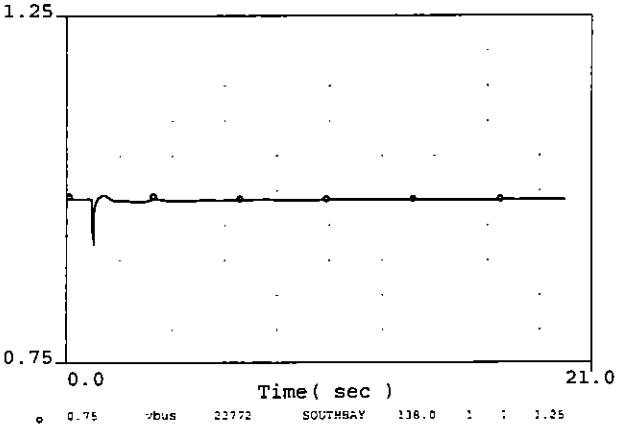

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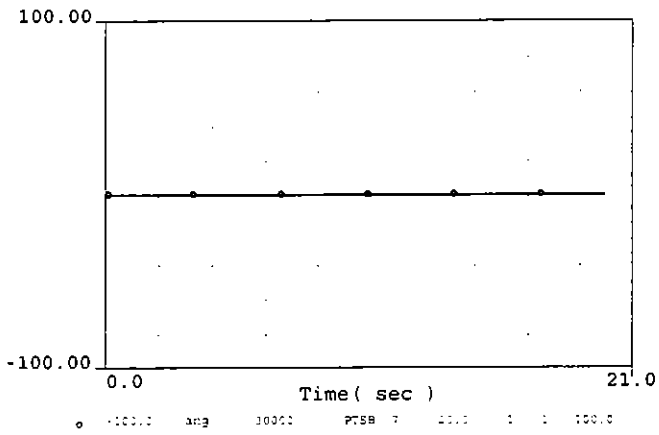

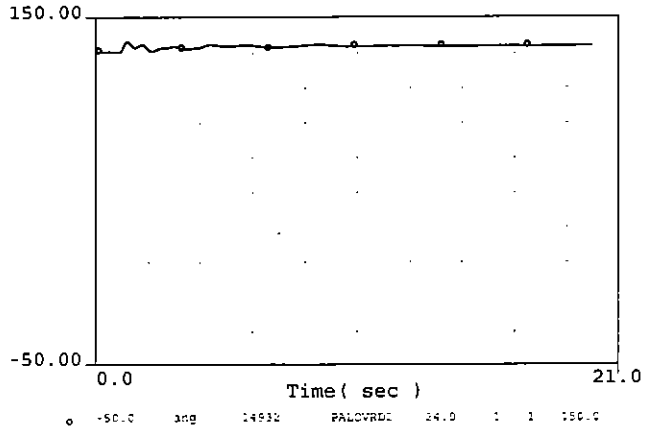

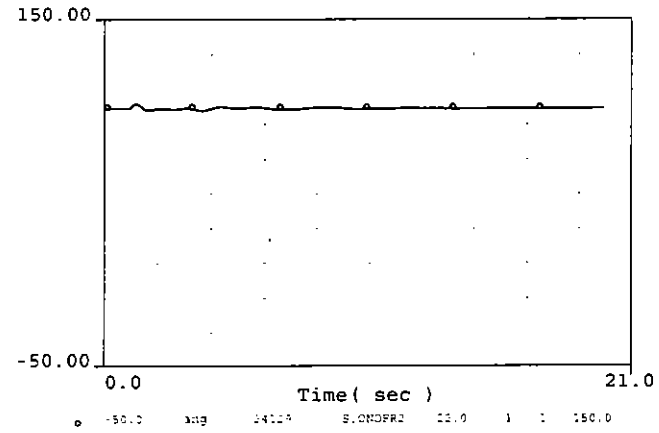

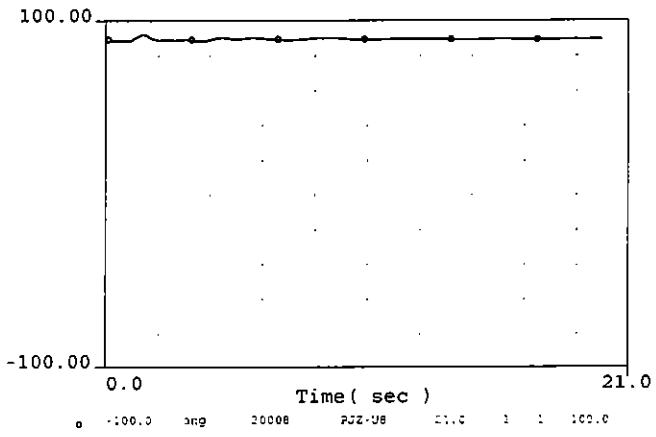

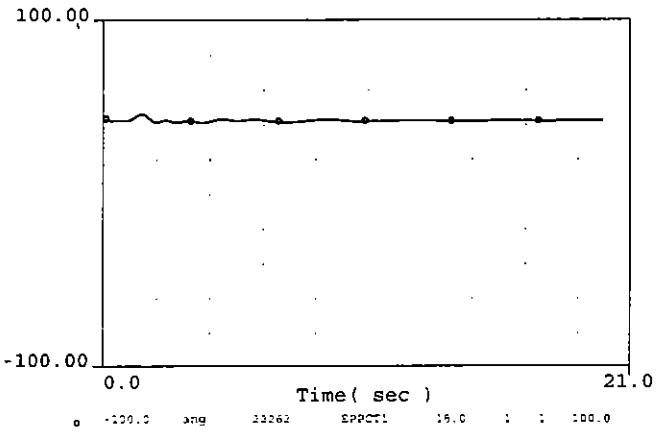

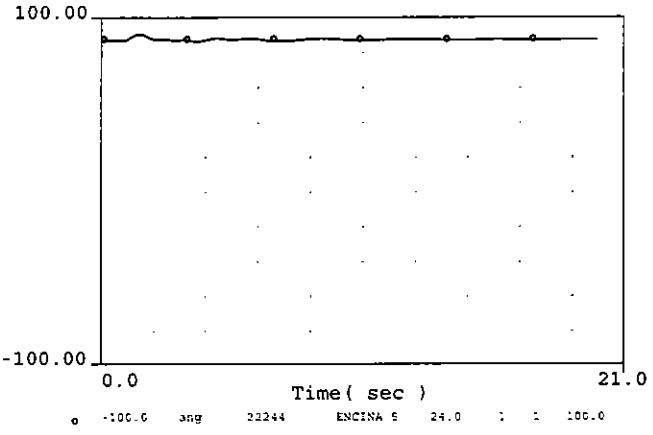

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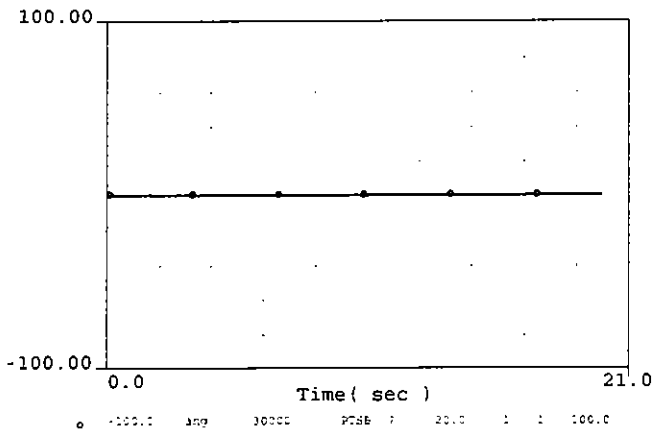

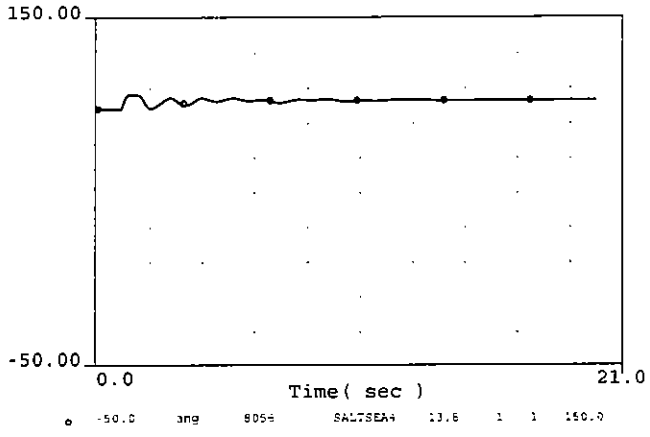

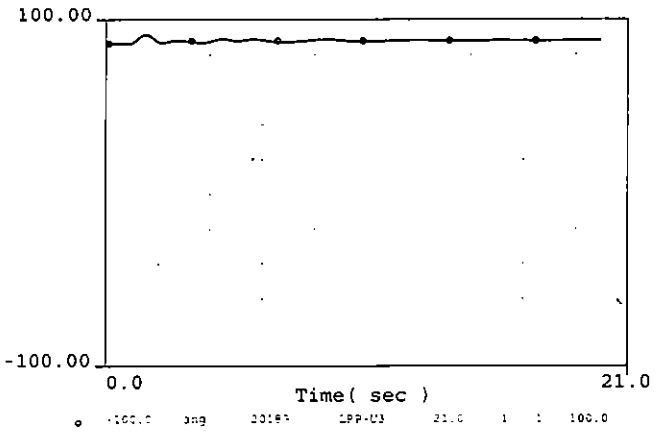

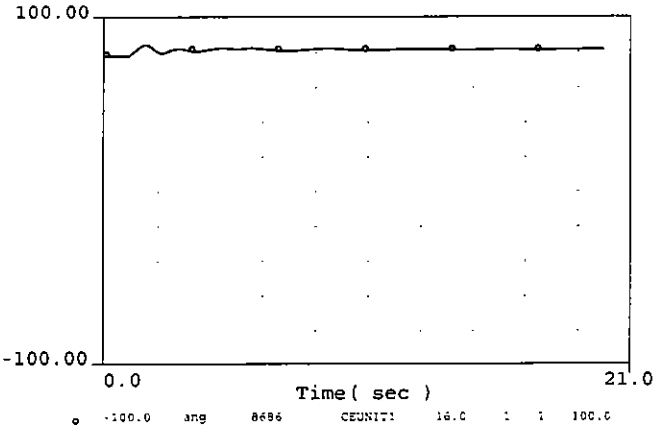

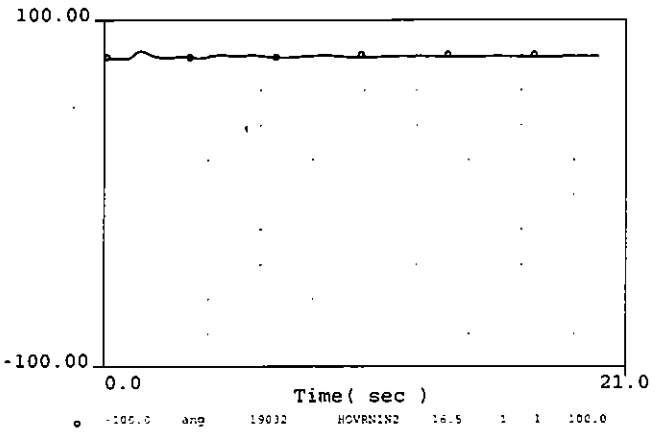

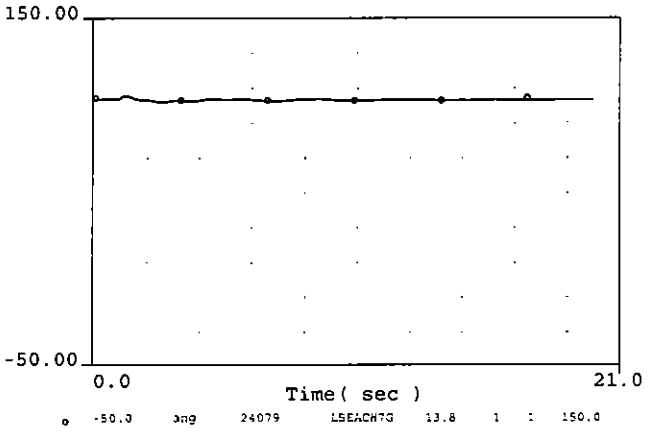

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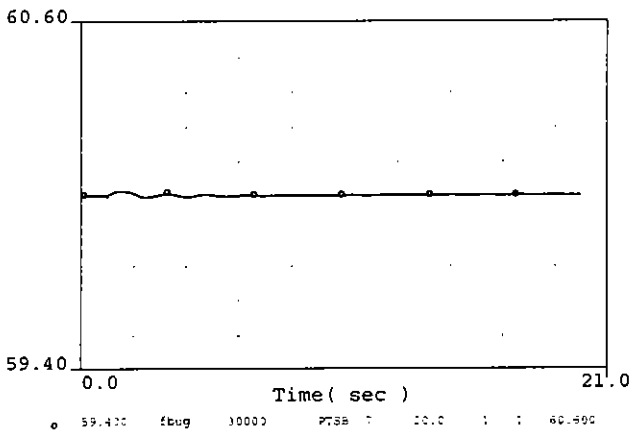

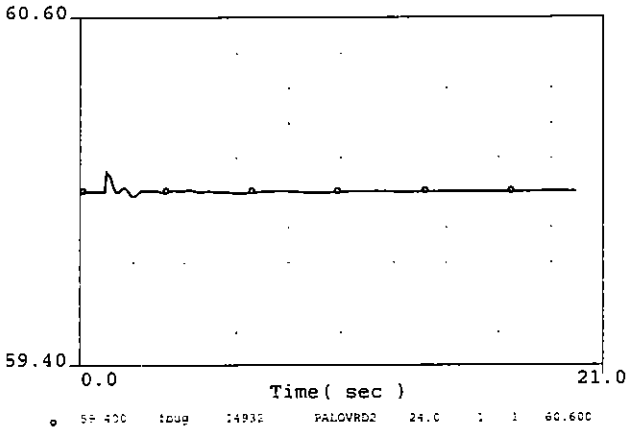

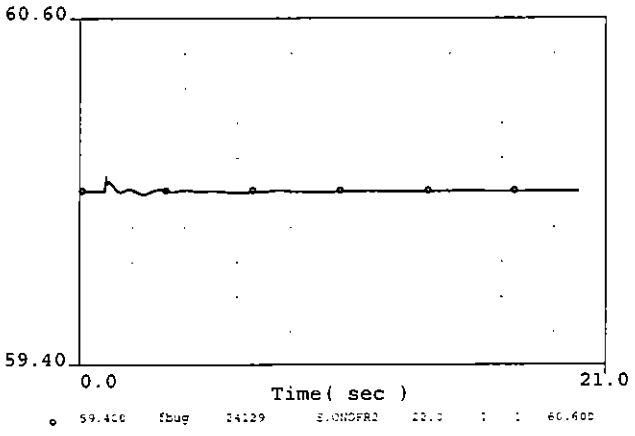

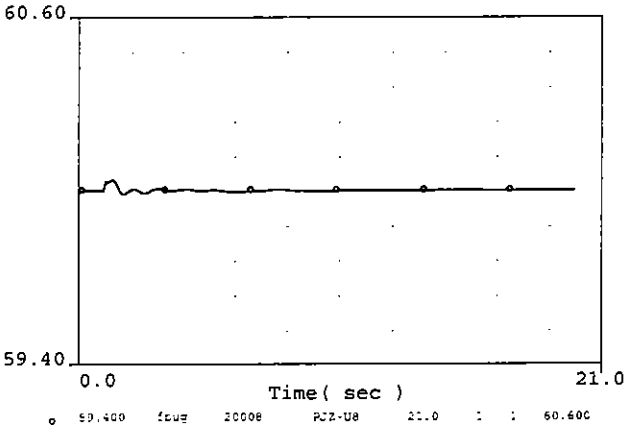

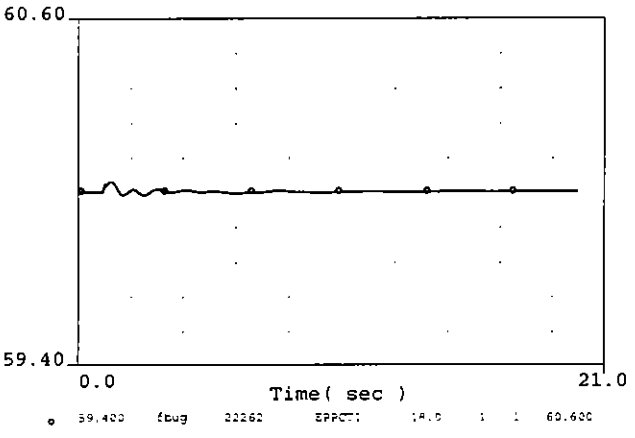

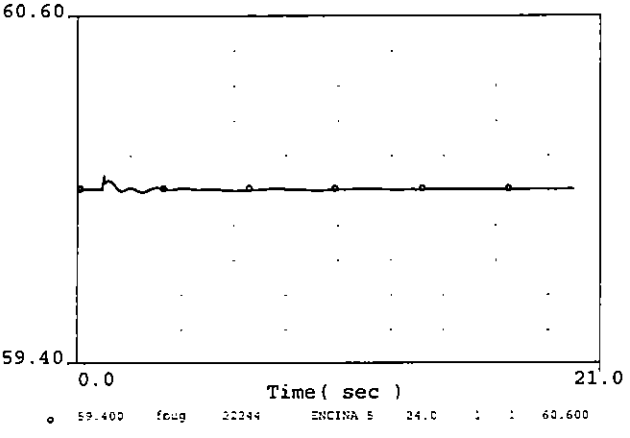

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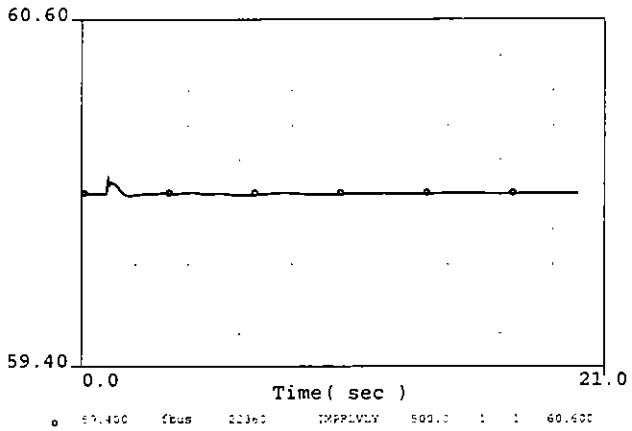

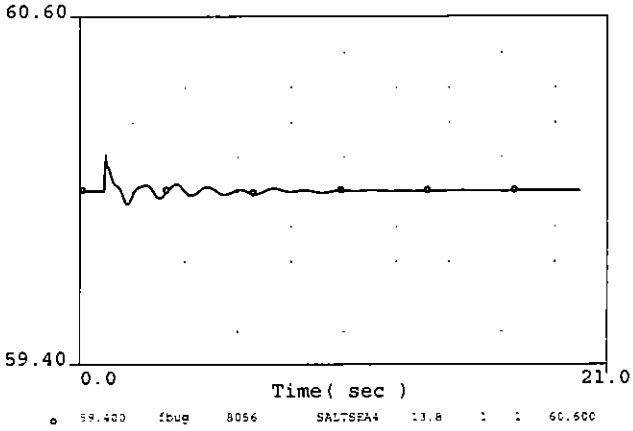

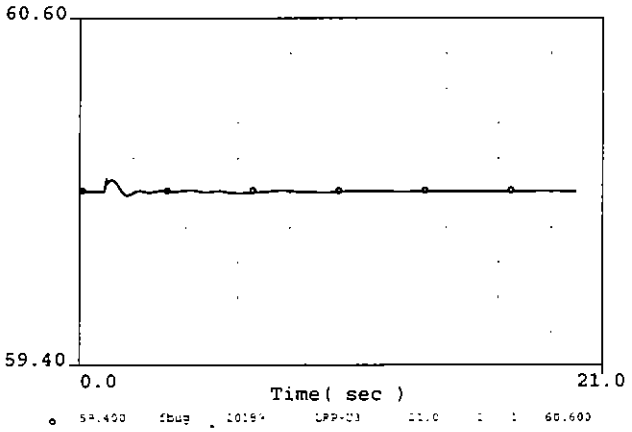

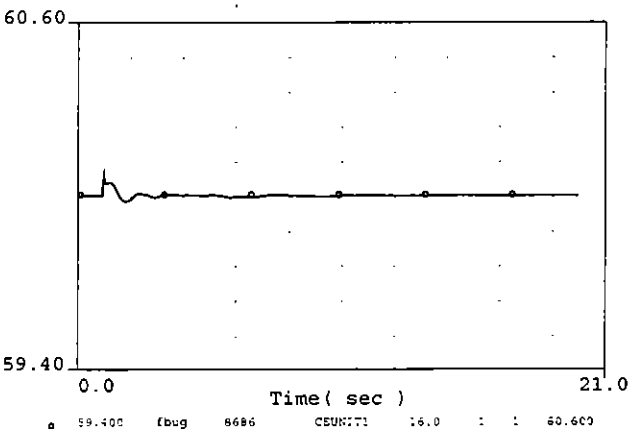

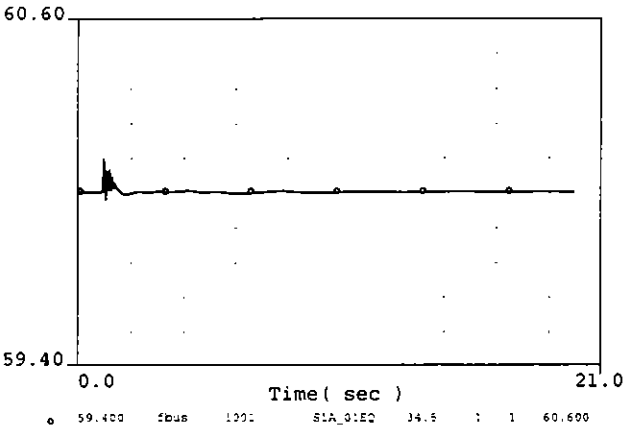

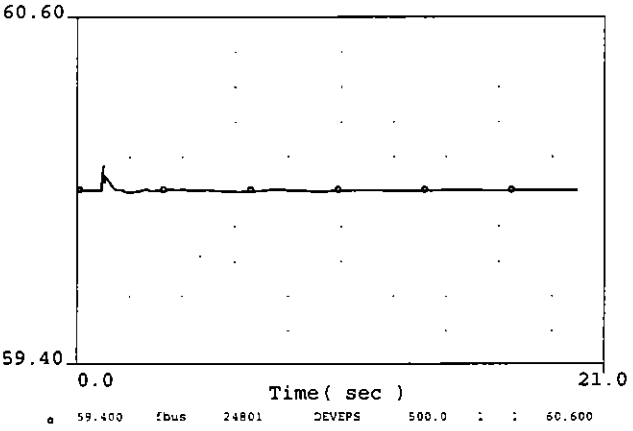

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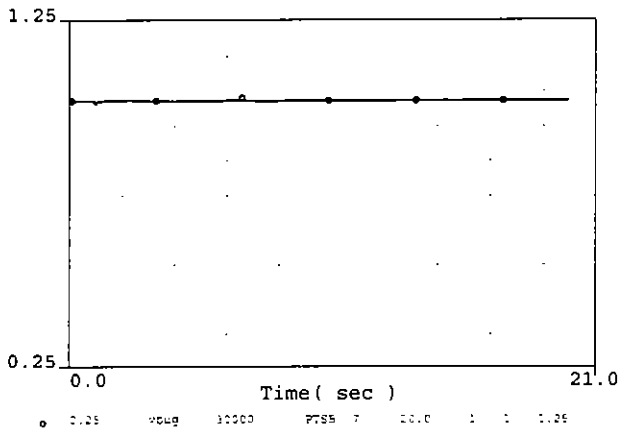

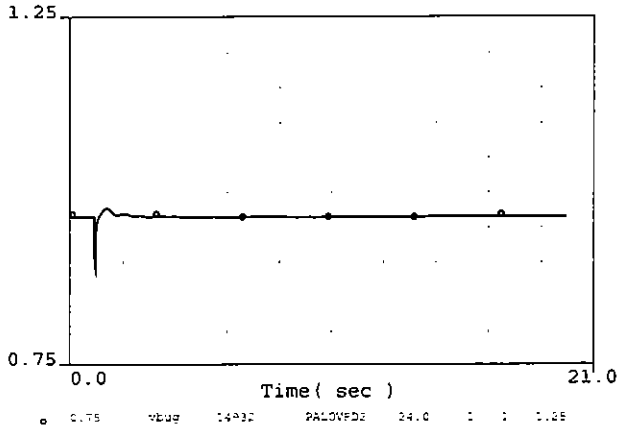

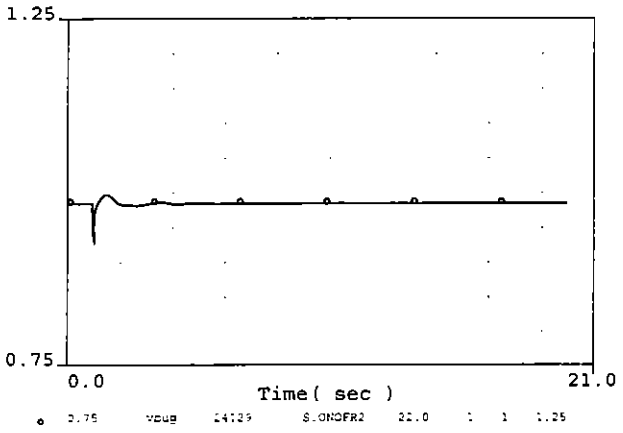

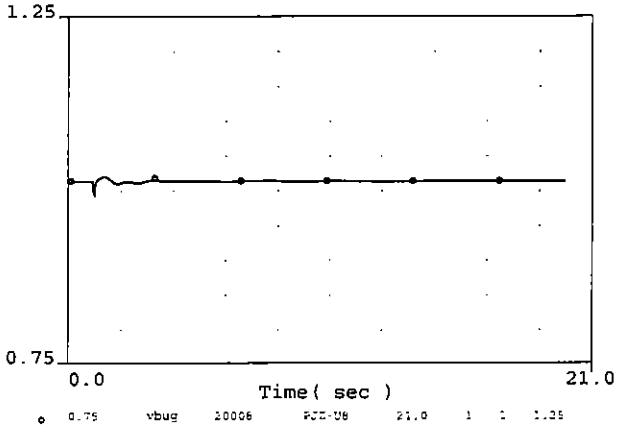

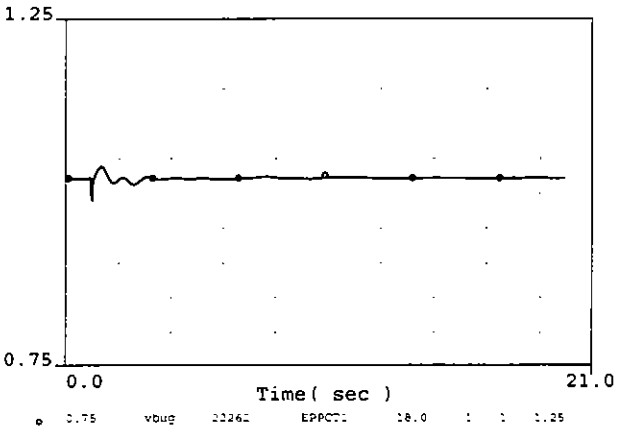

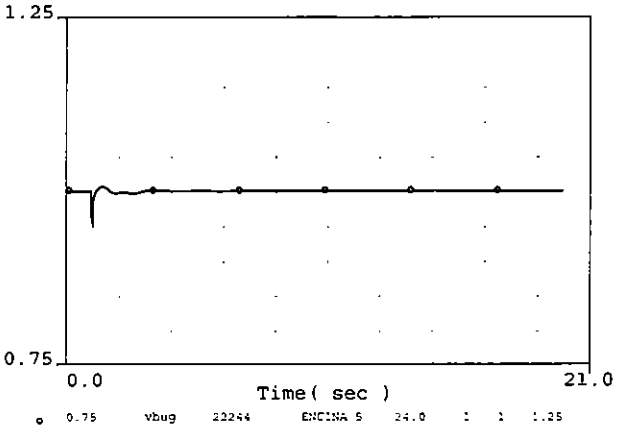

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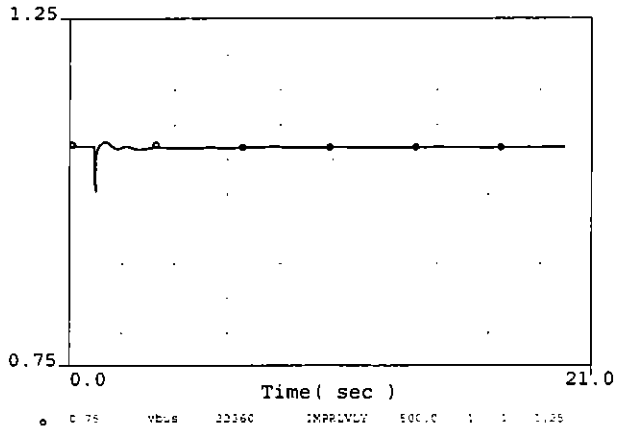

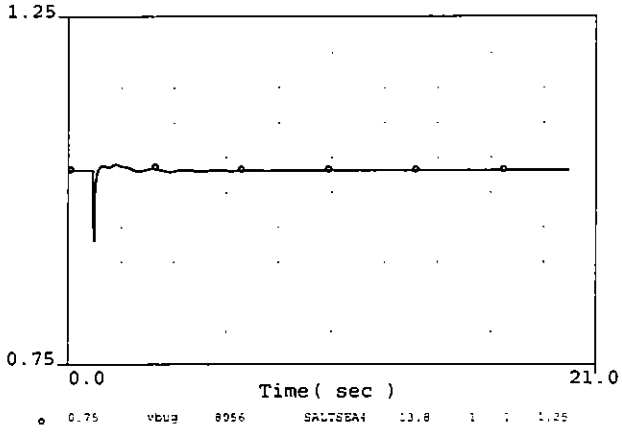

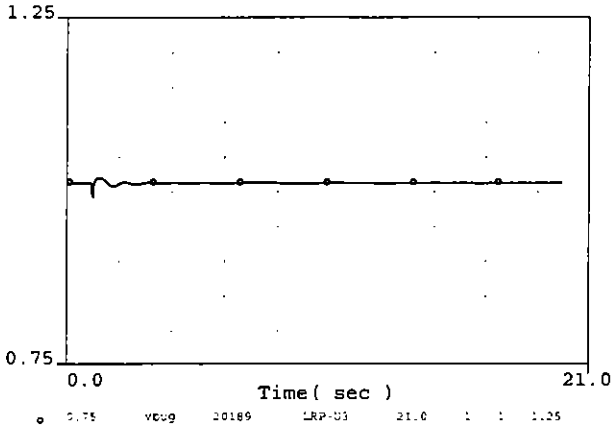

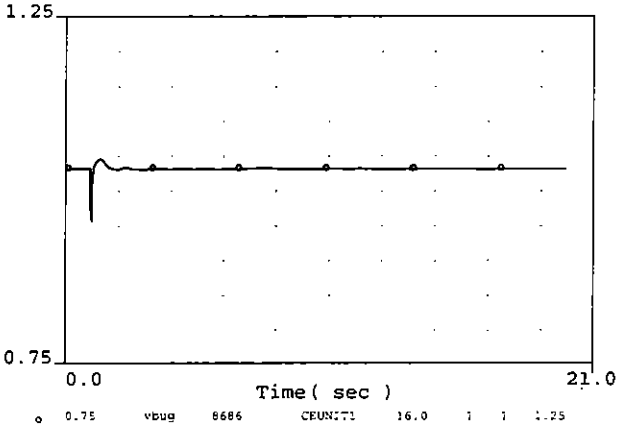

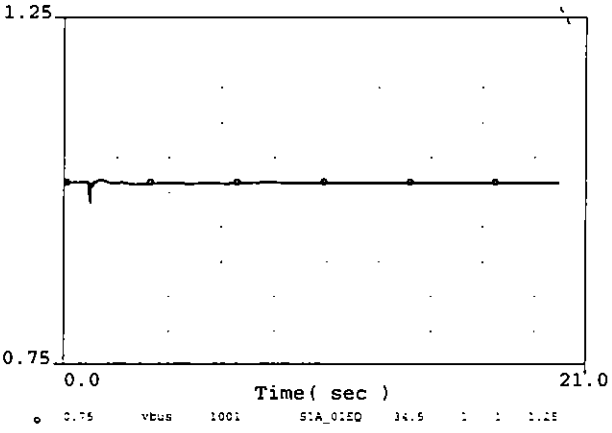

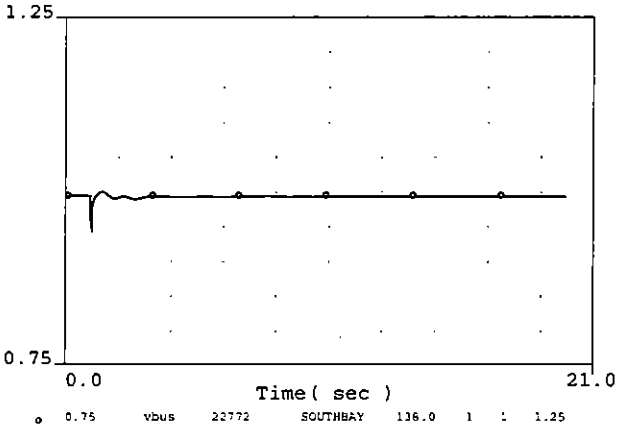

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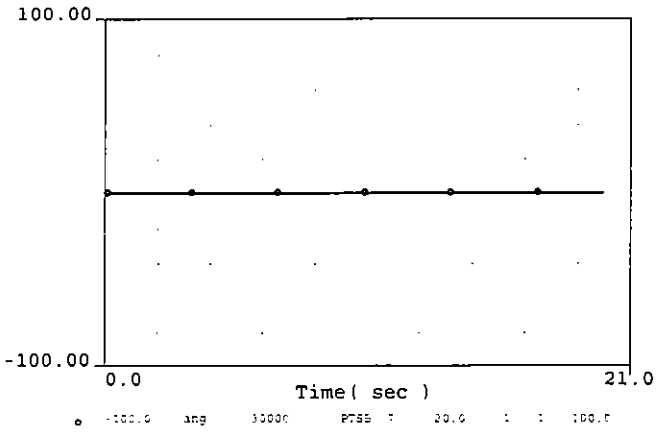

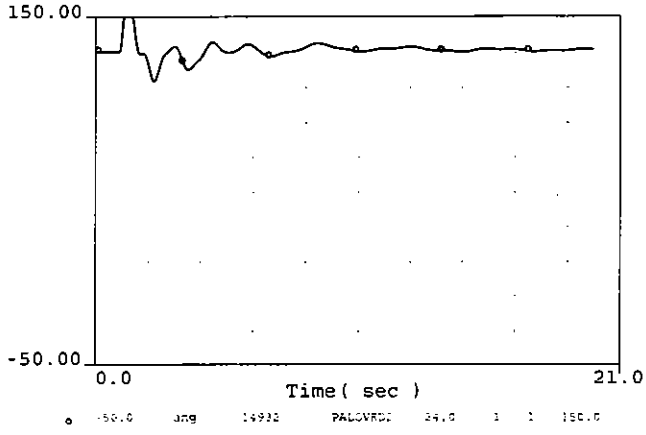

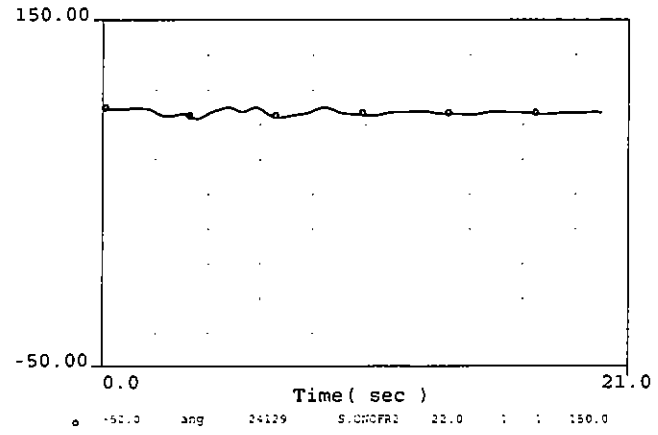

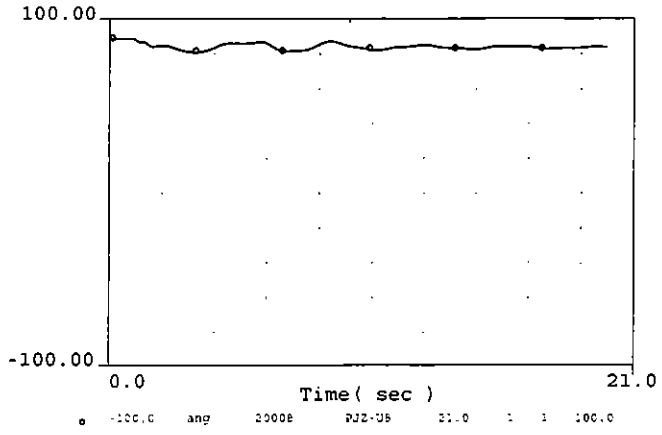

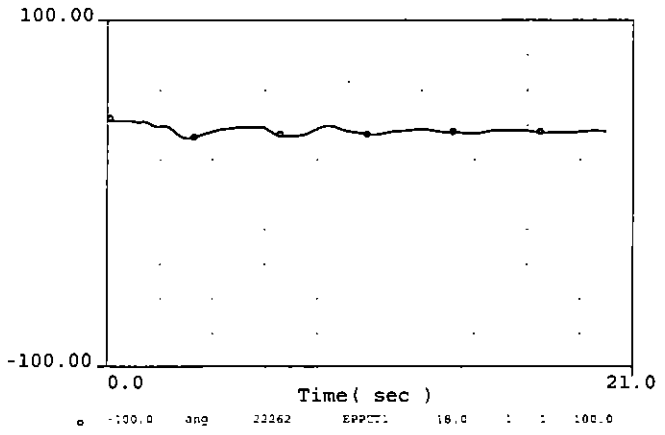

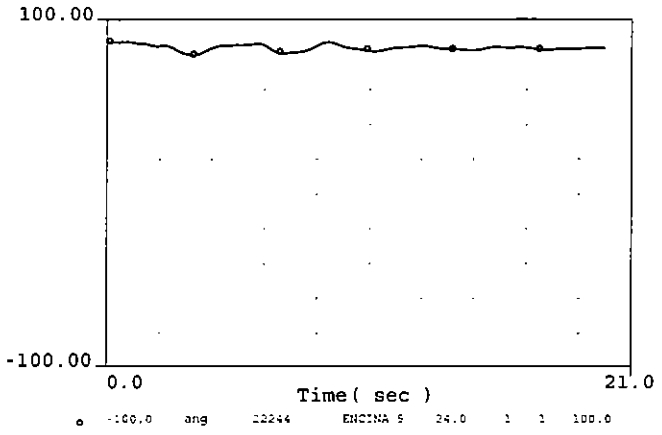

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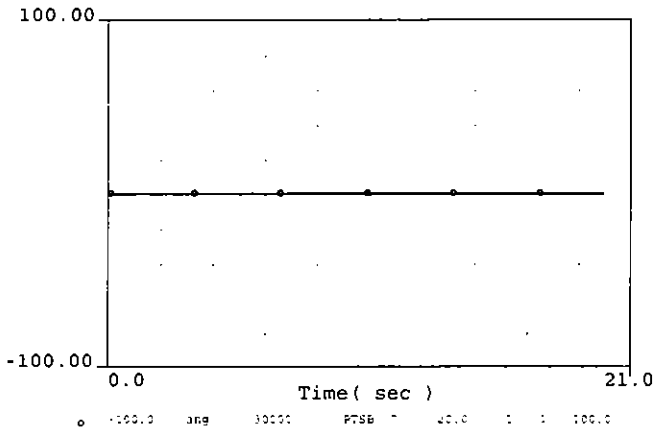

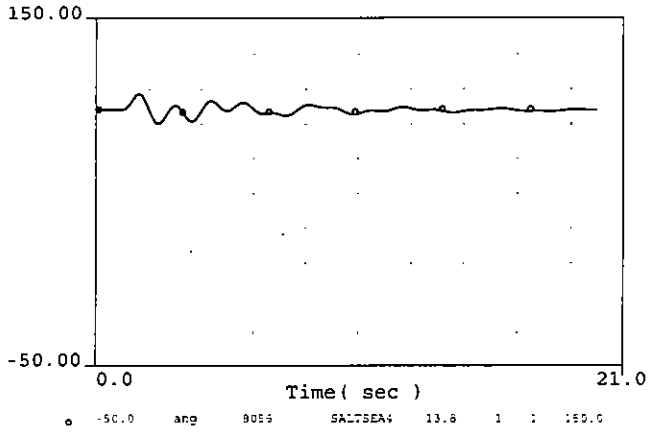

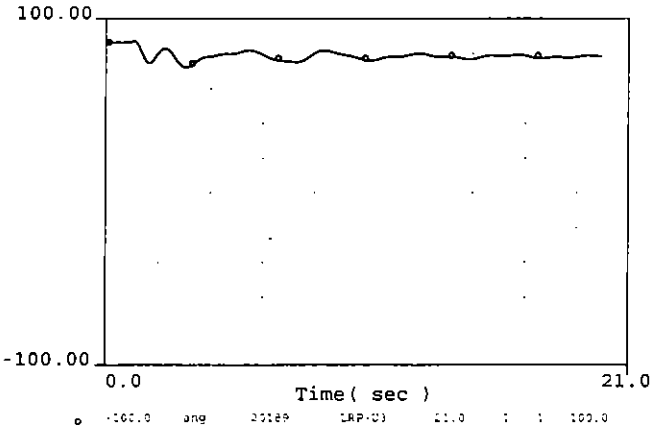

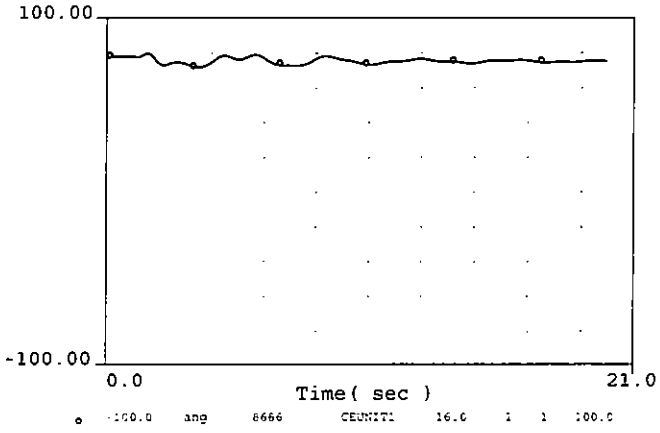

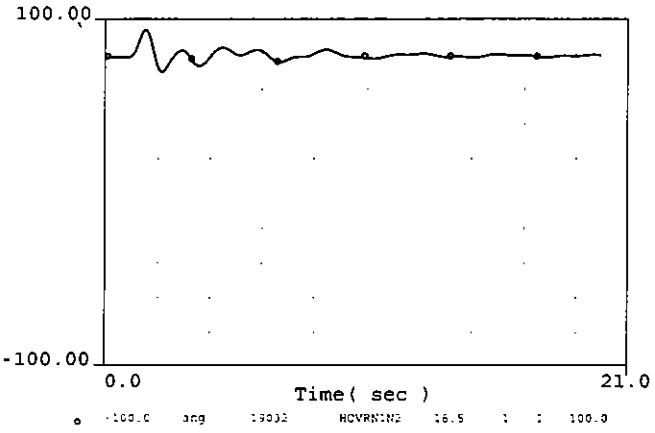

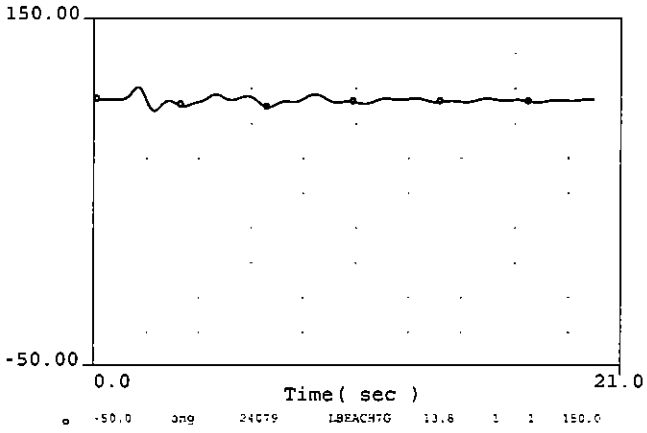

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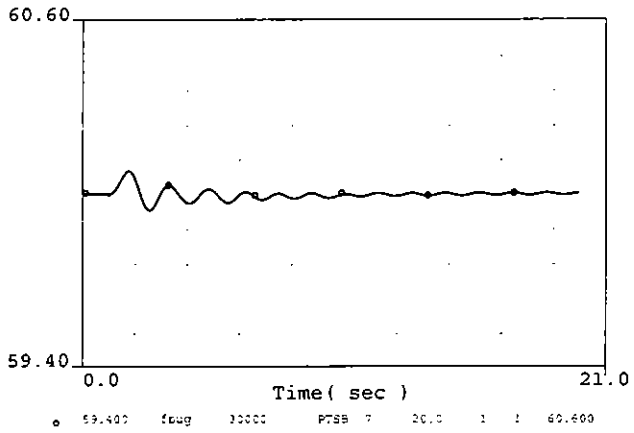

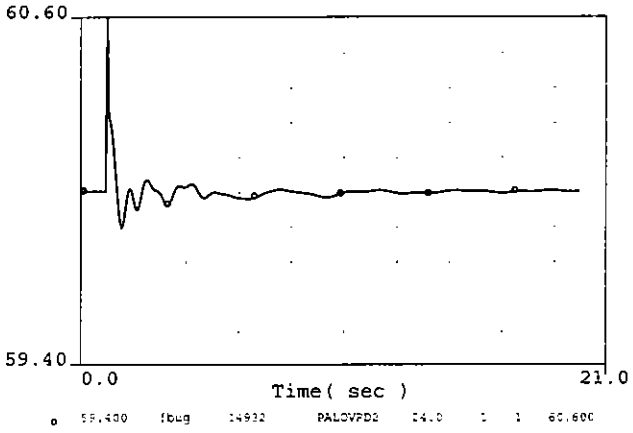

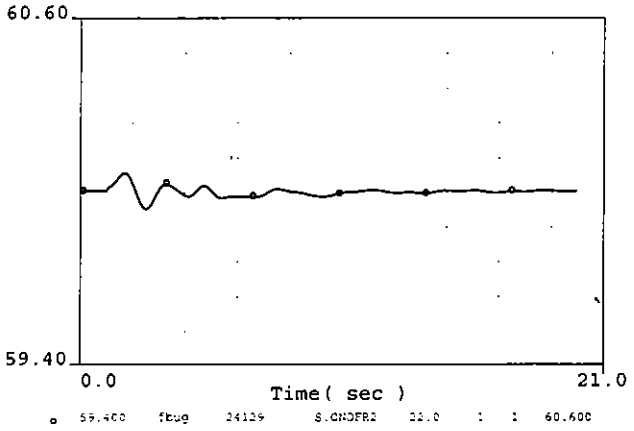

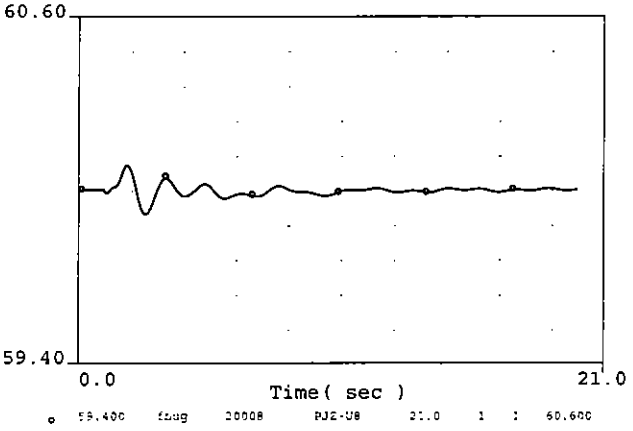

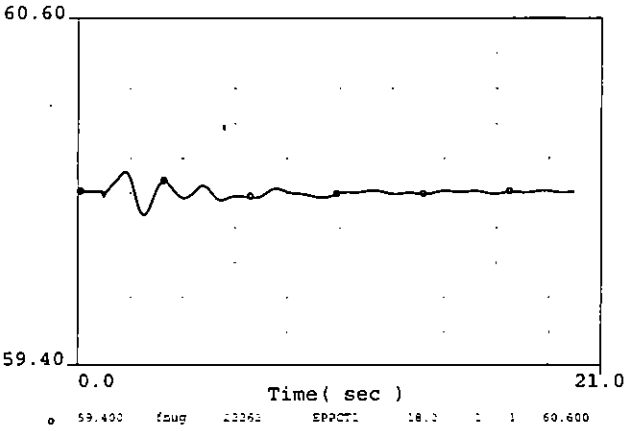

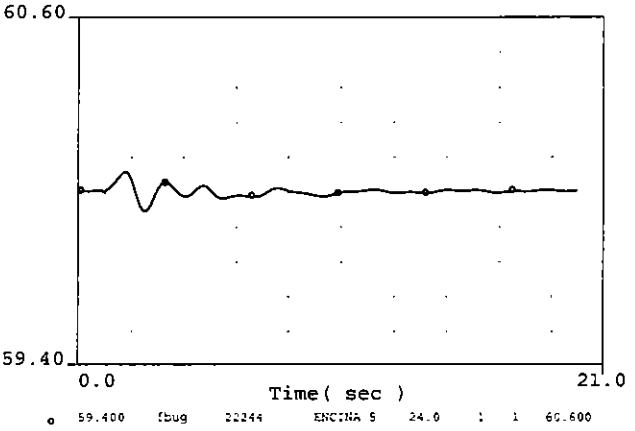

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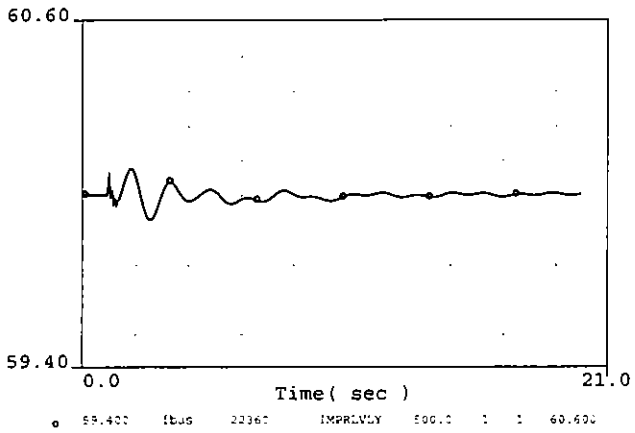

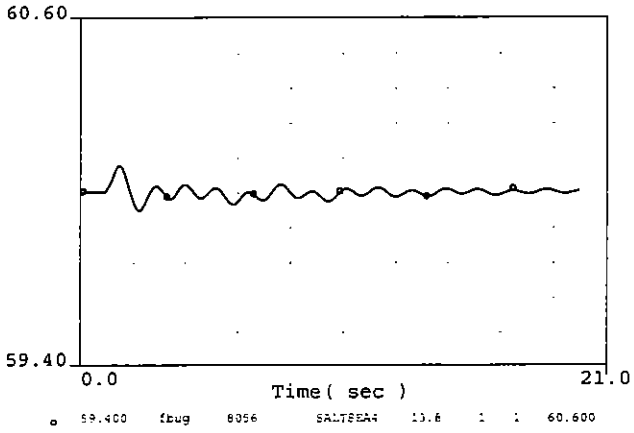

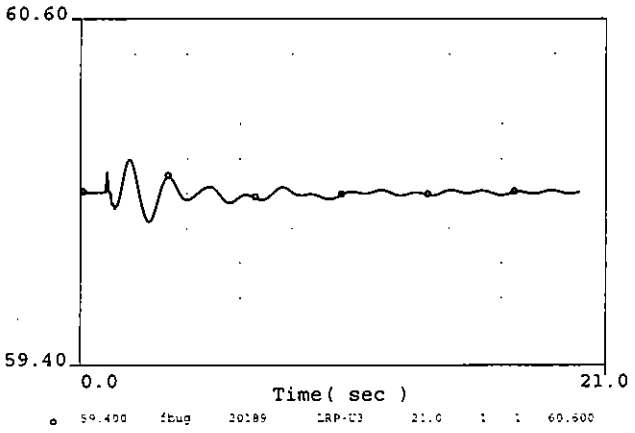

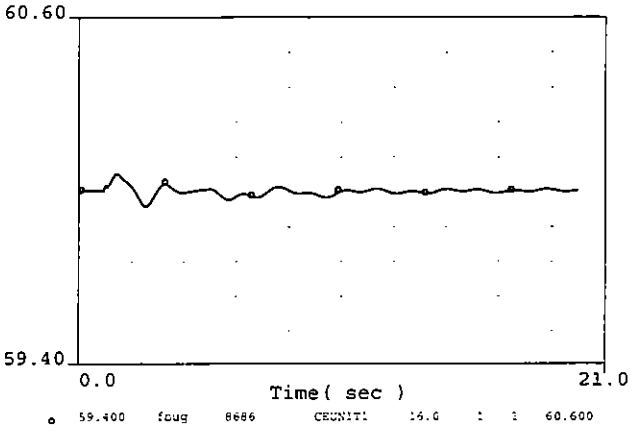

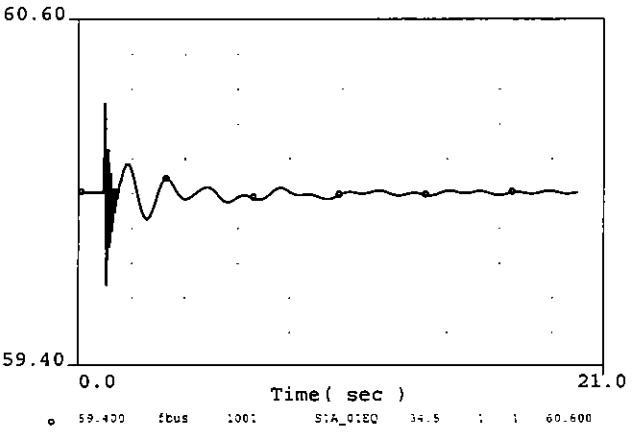

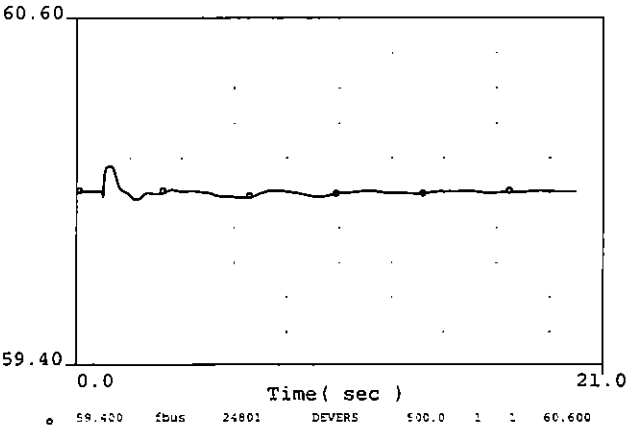

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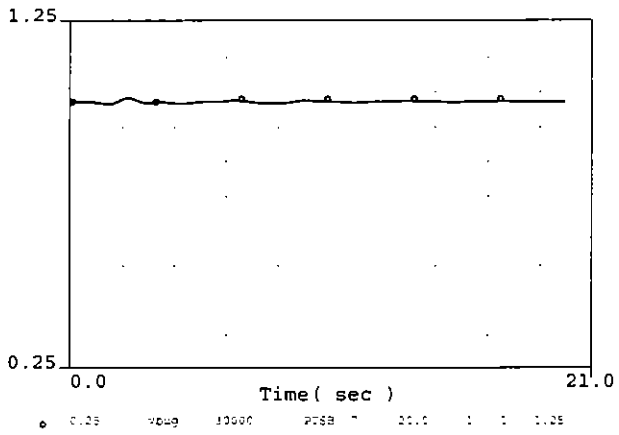

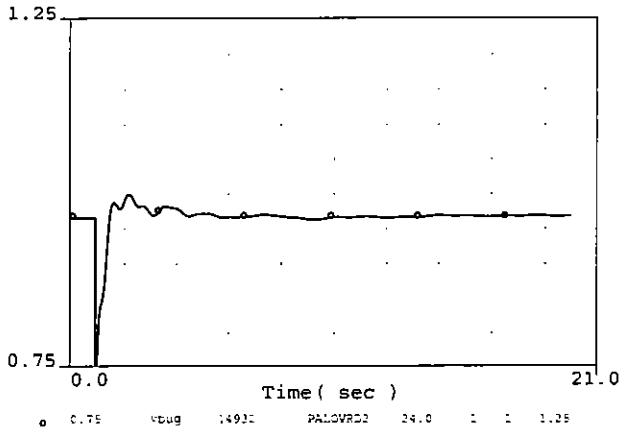

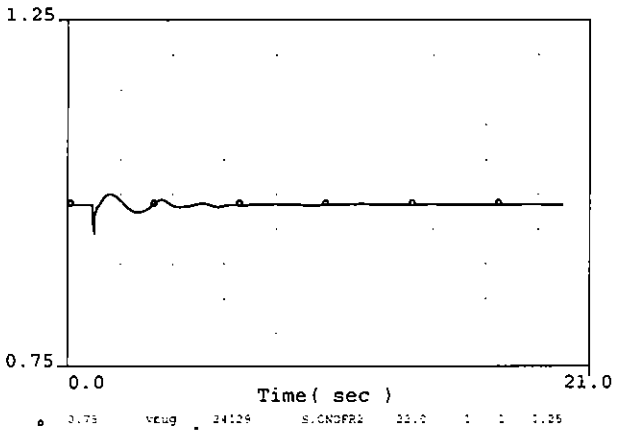

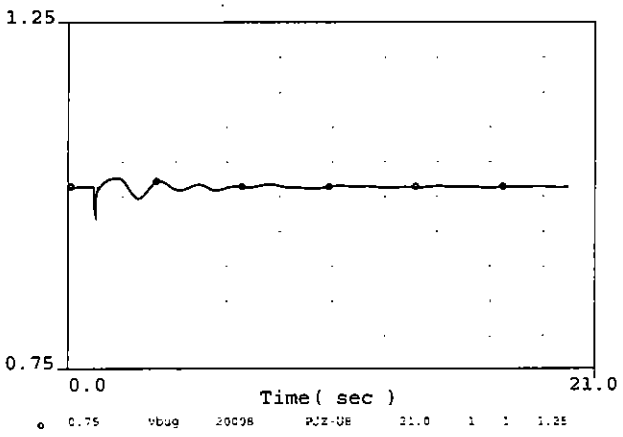

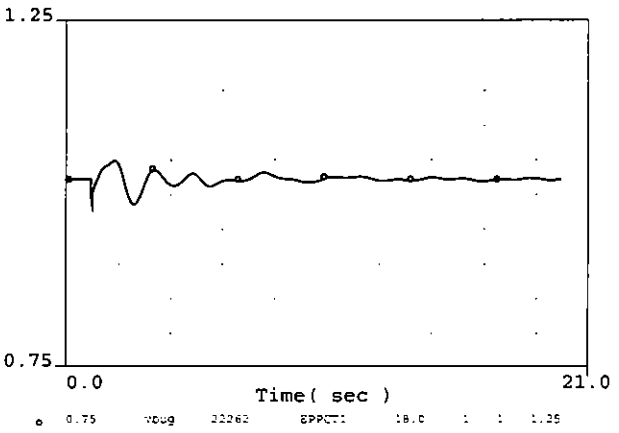

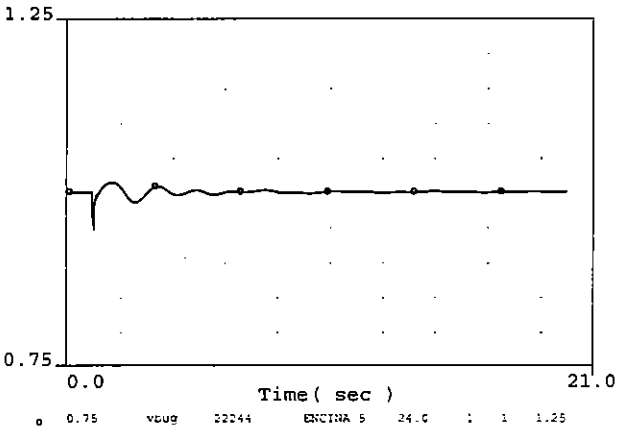

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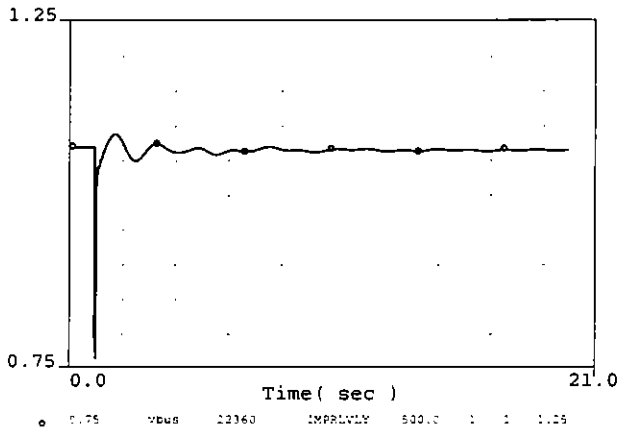

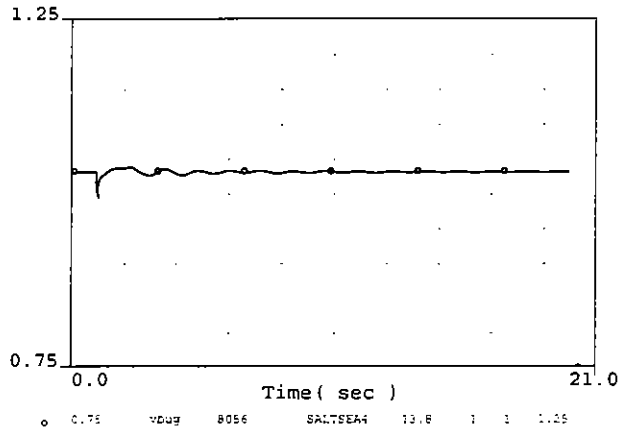

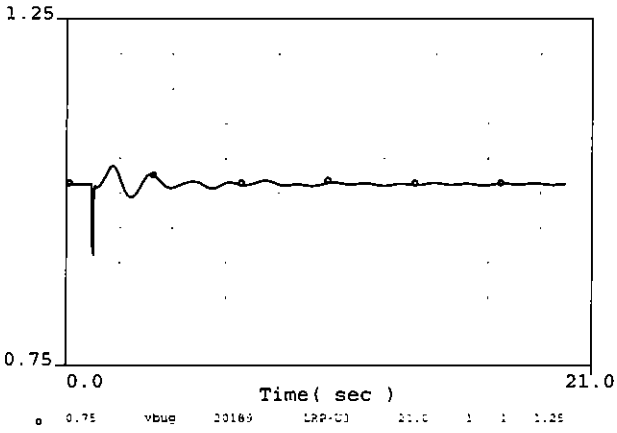

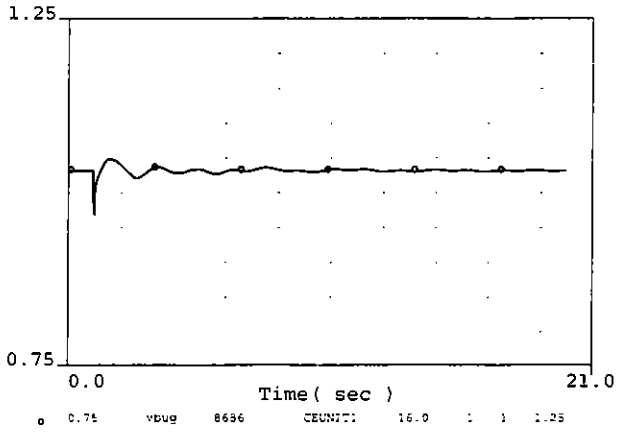

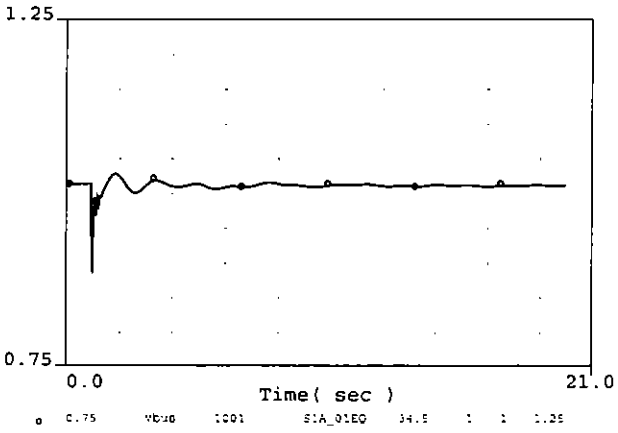

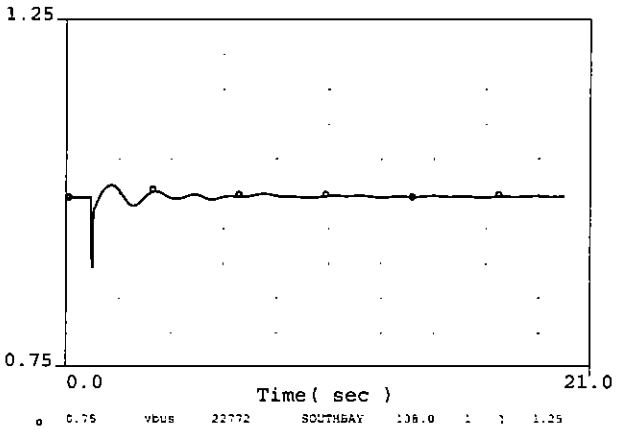

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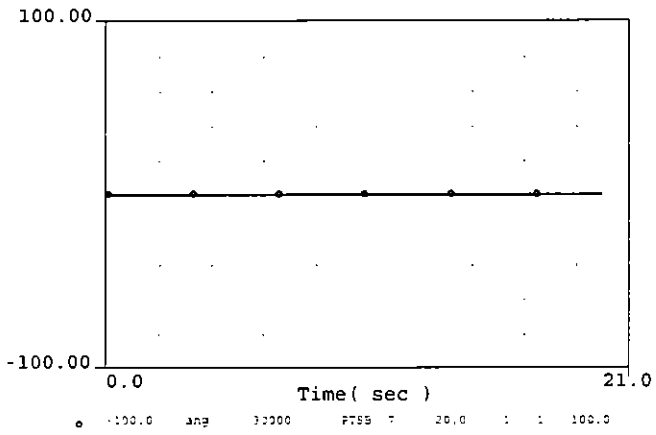

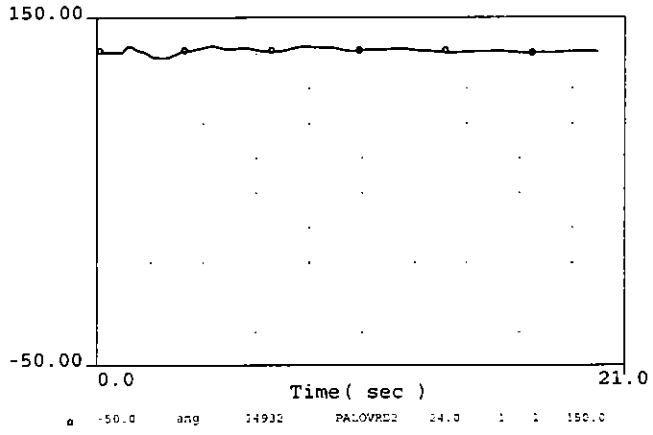

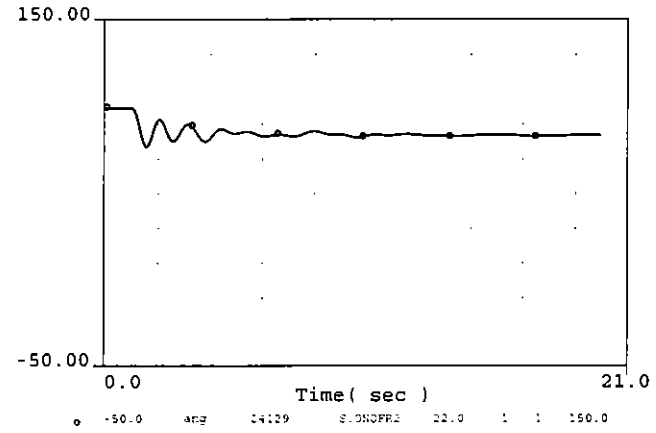

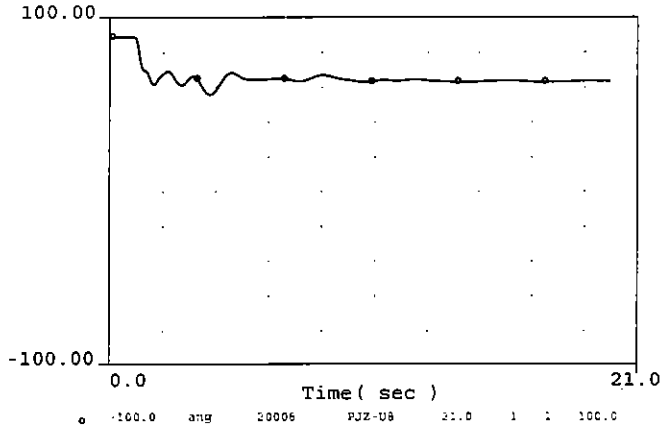

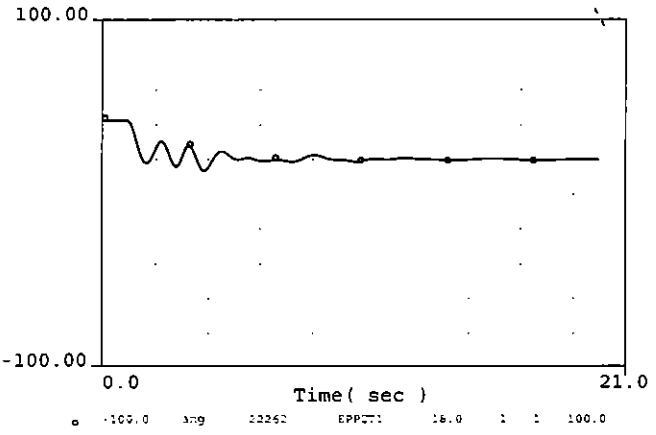

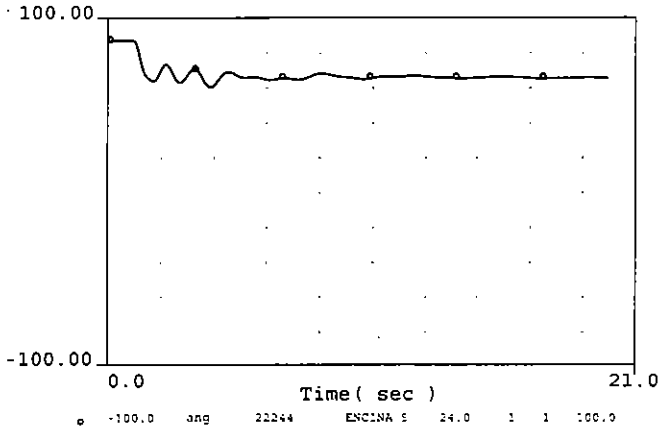

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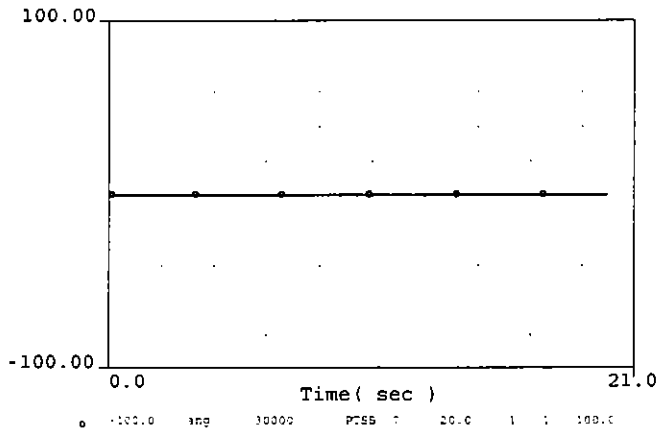

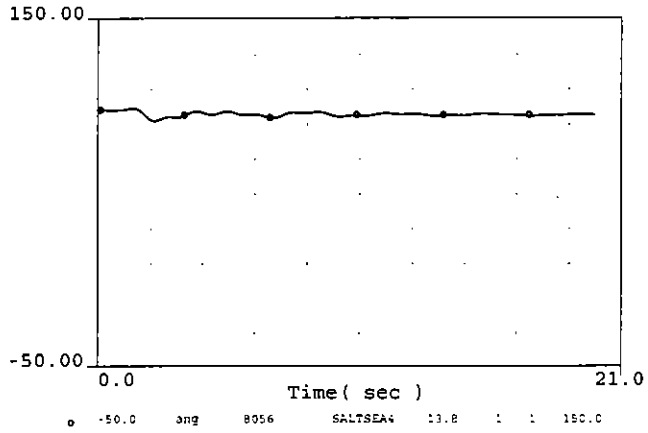

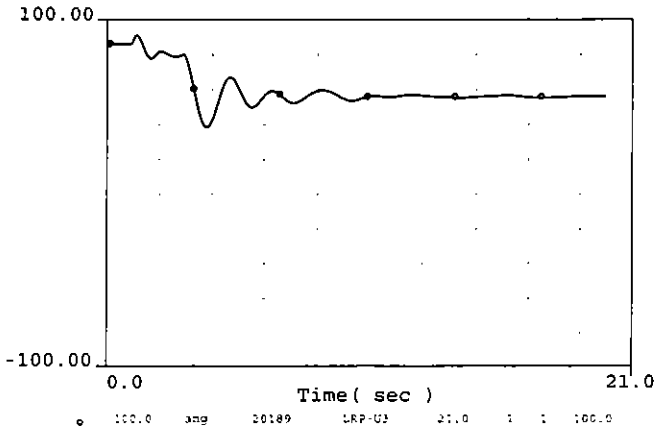

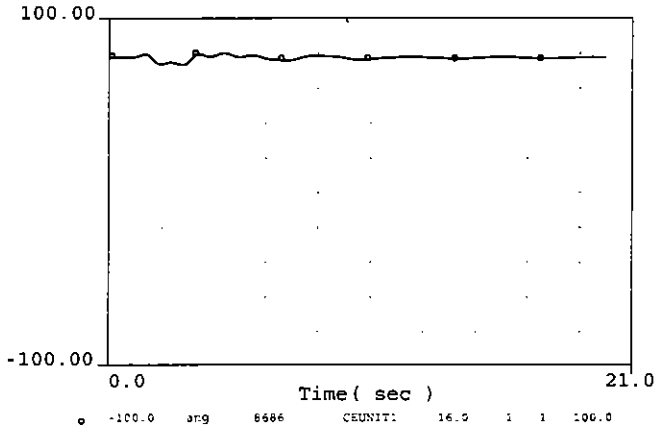

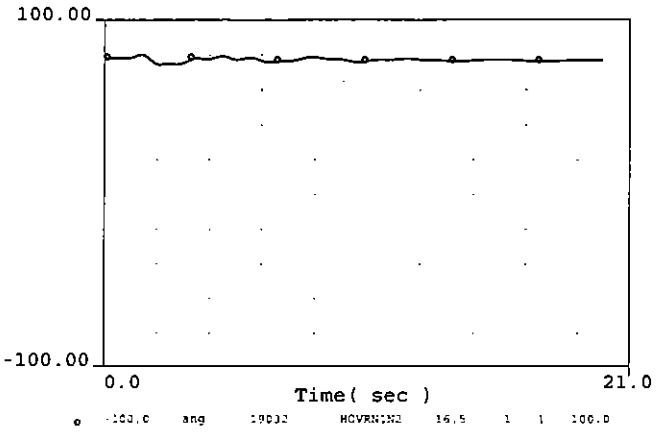

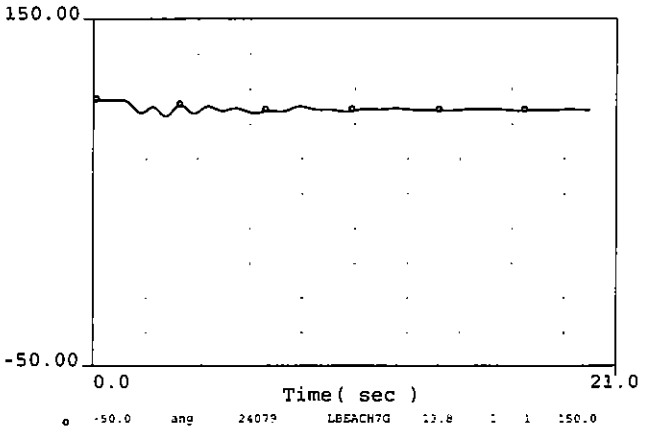

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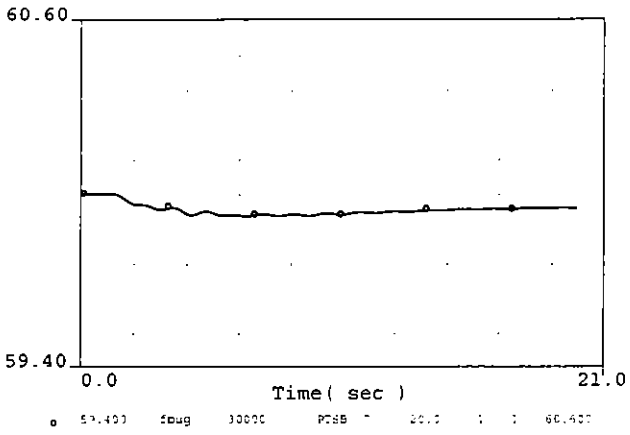

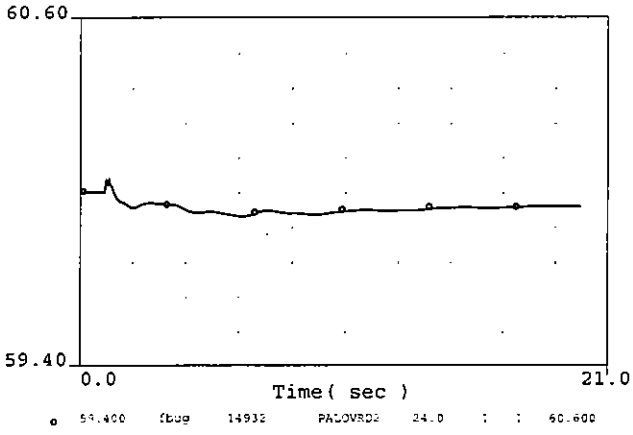

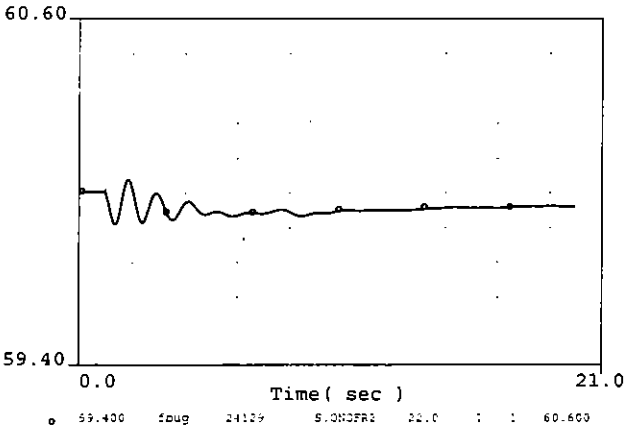

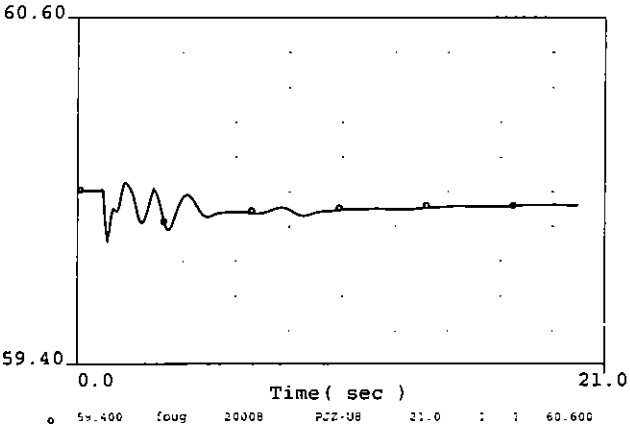

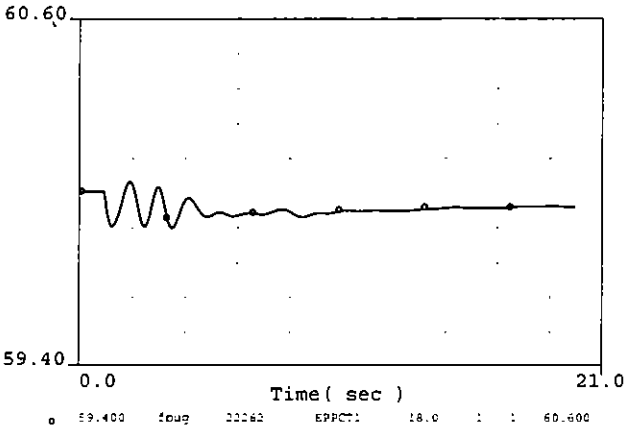

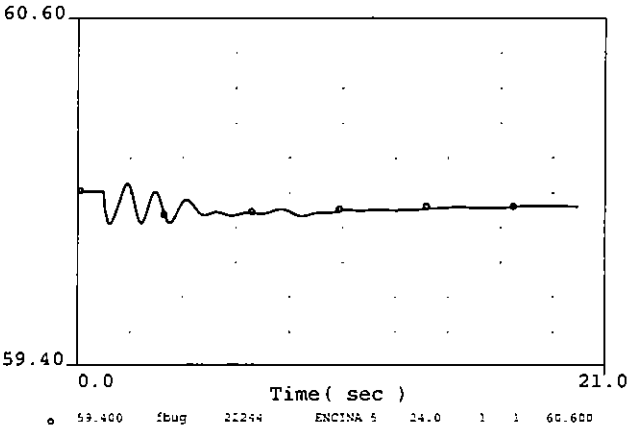

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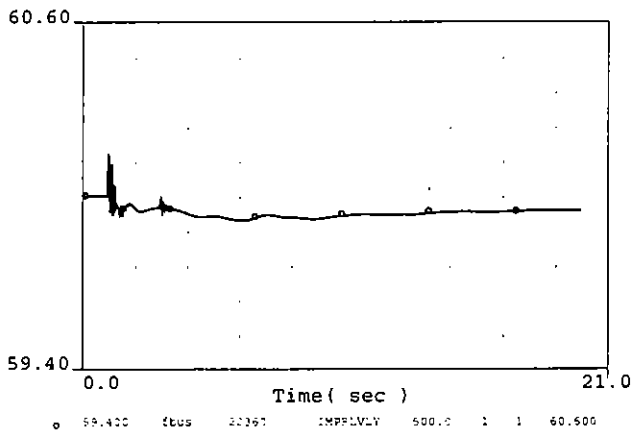
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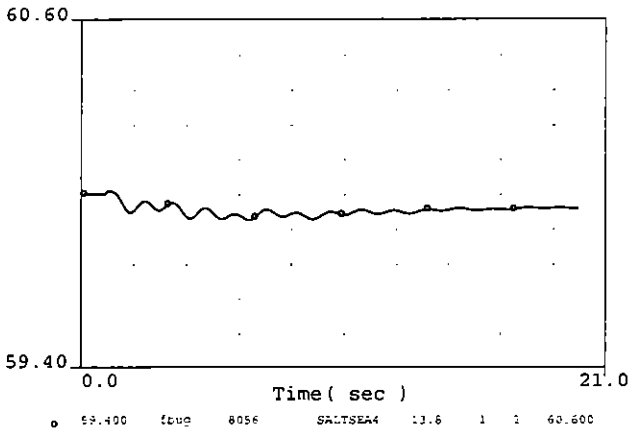
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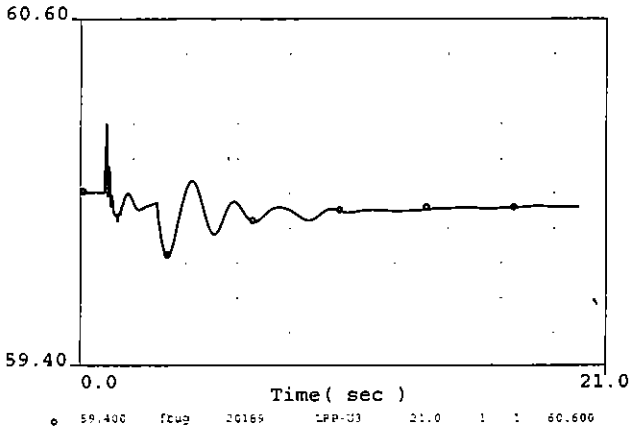
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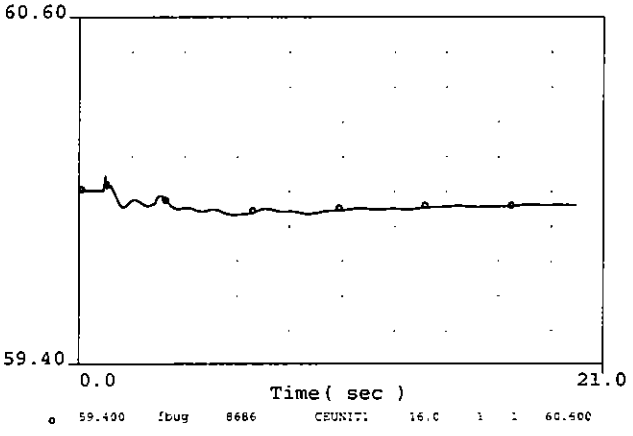
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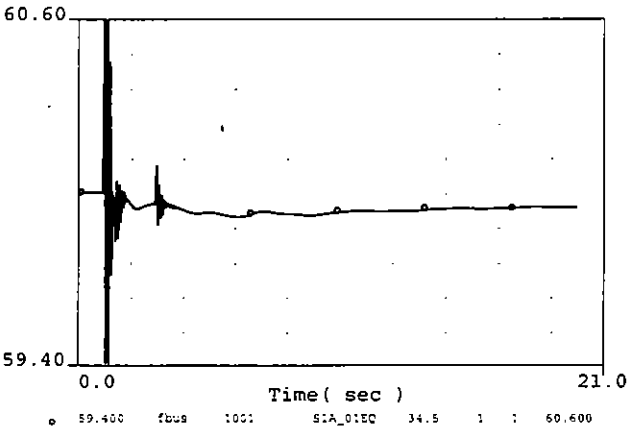
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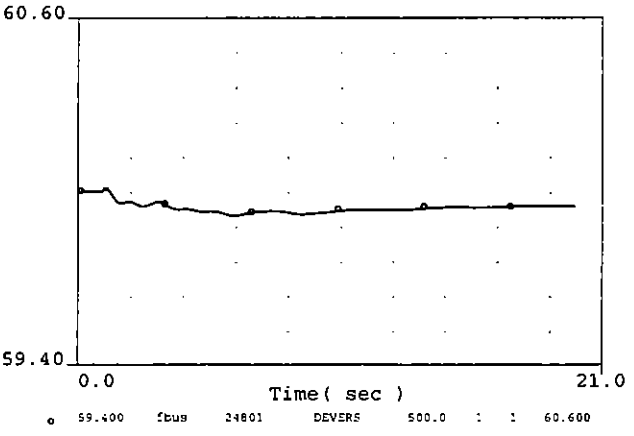
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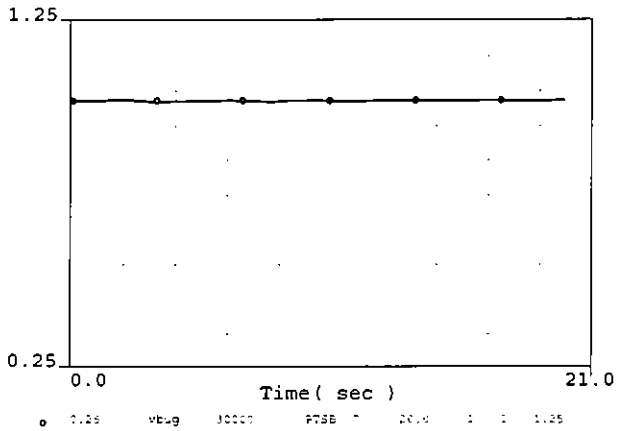

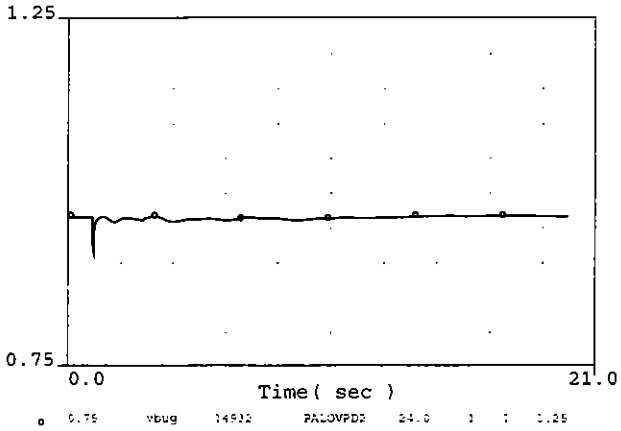

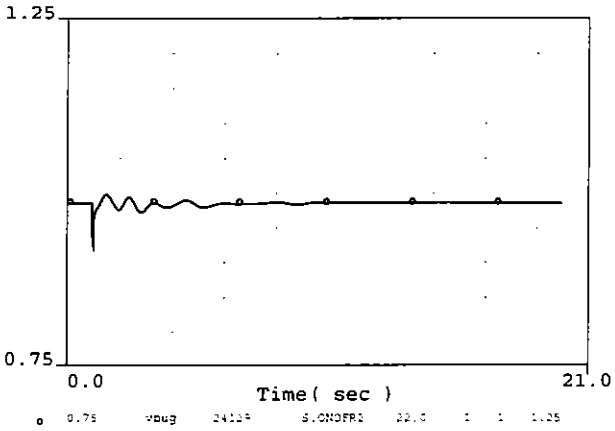

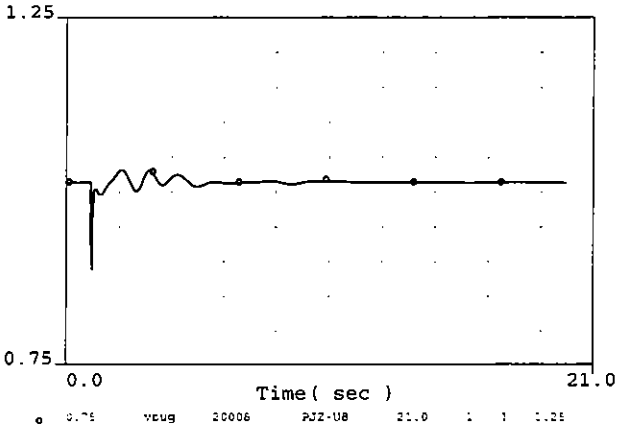

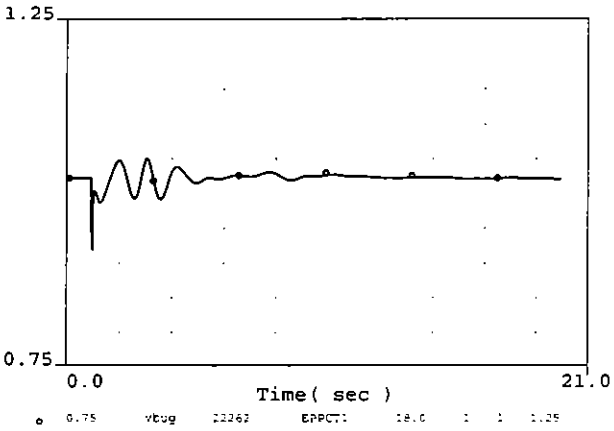

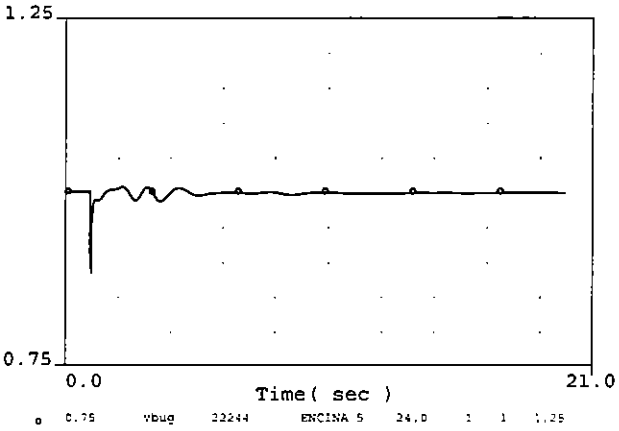

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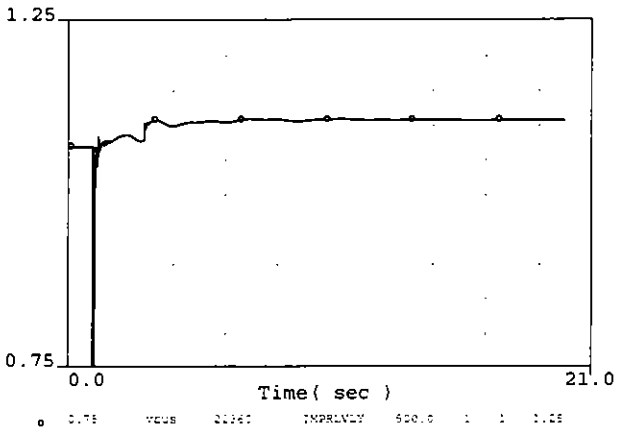

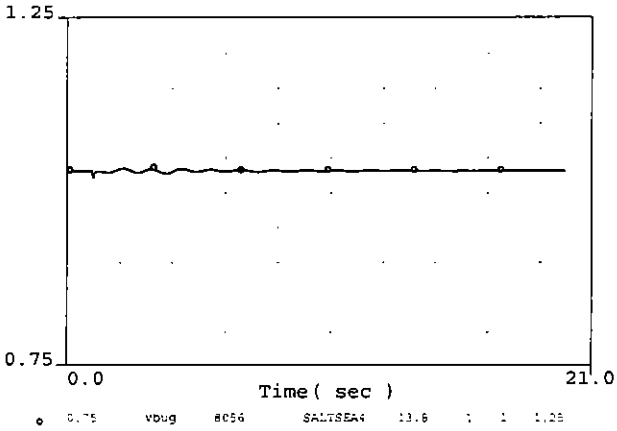

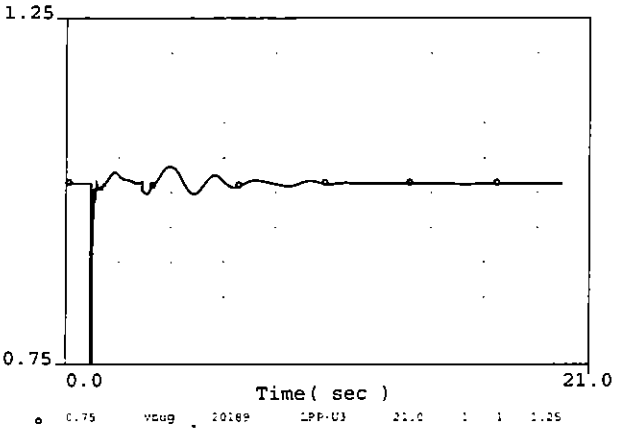

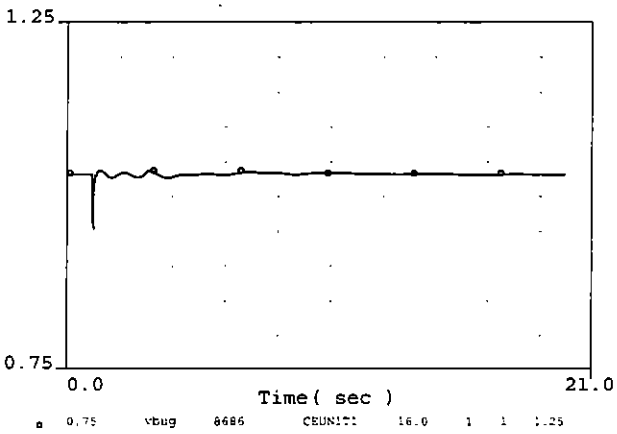

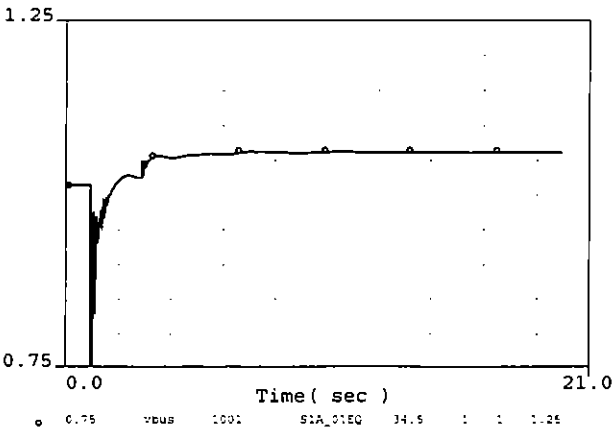

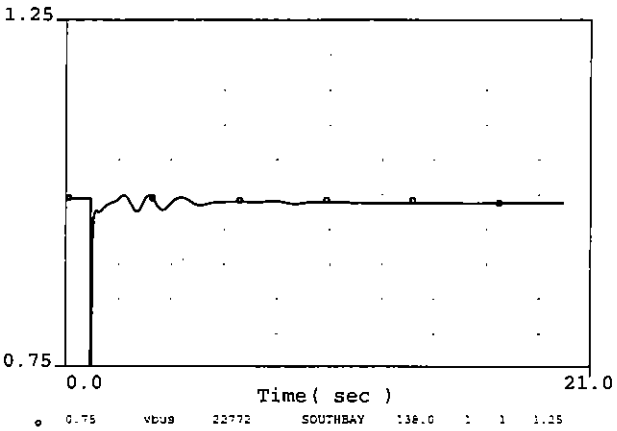

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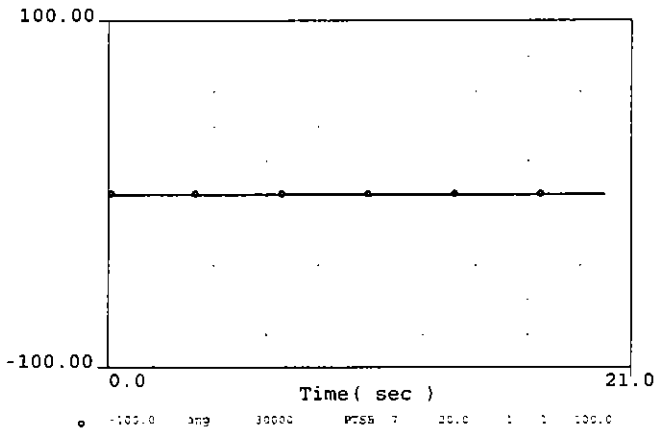
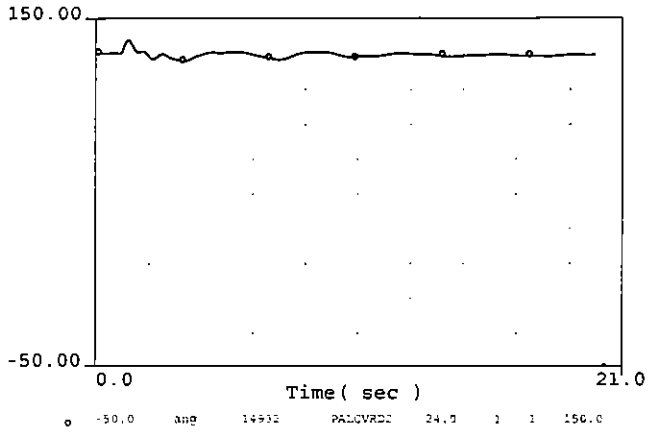
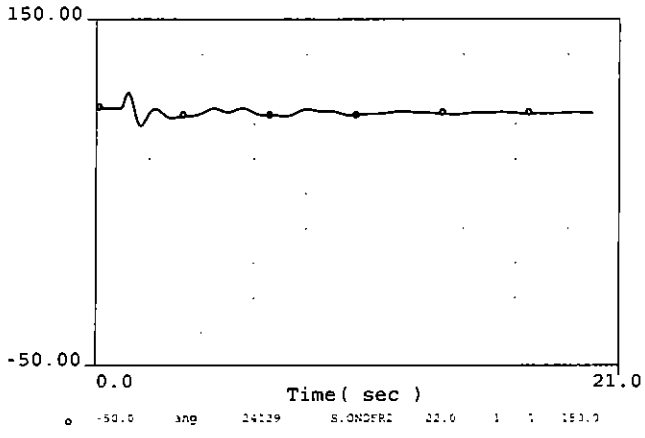
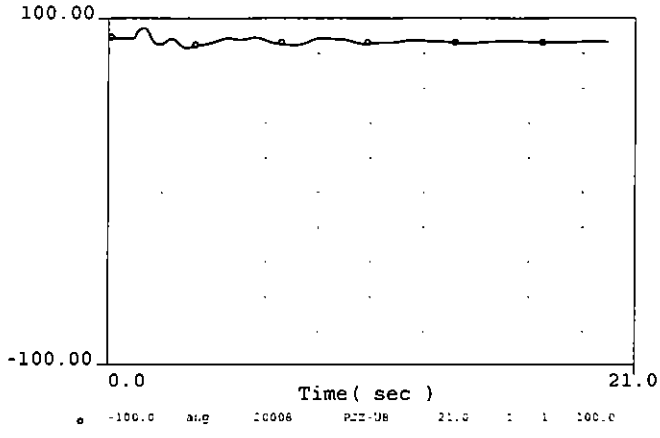
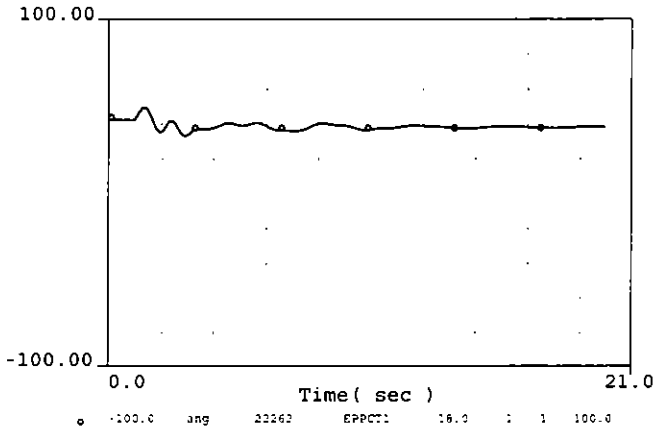
_008 light autumn, post-case
N-0: BASE CASE

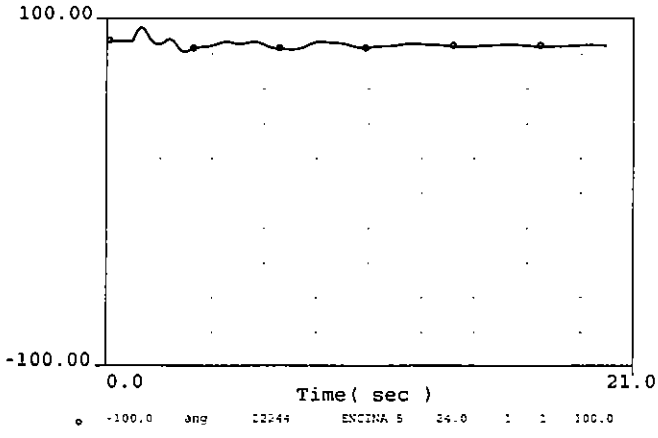












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008 light autumn, post-case
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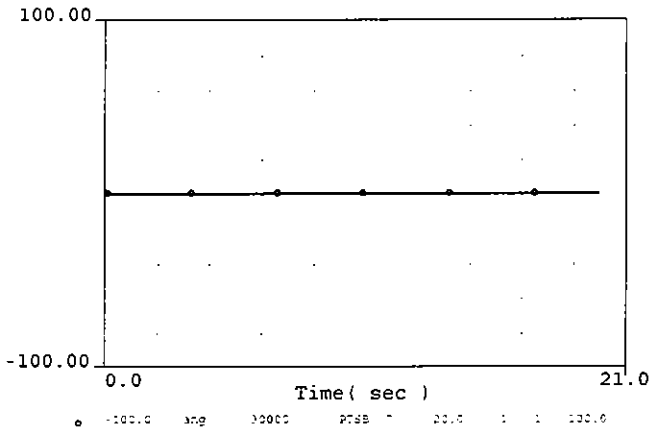

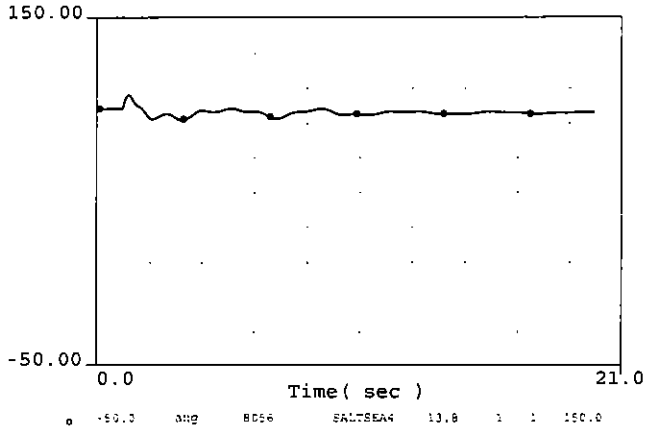

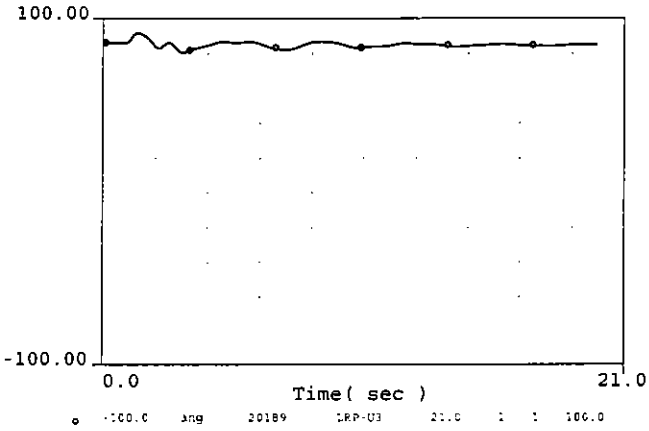

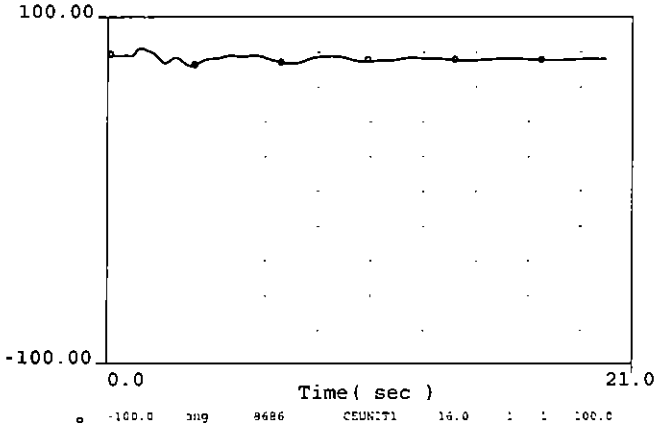

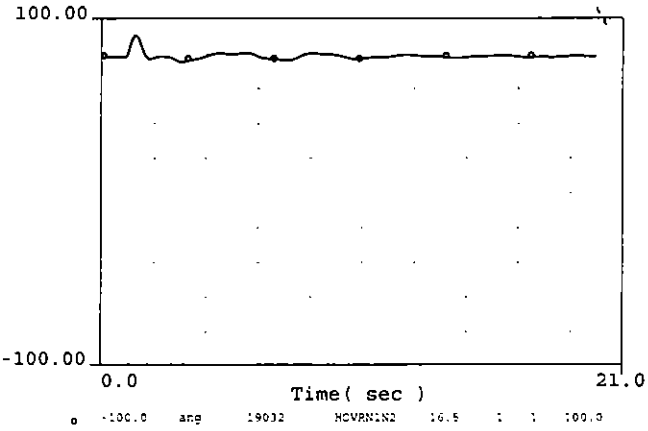

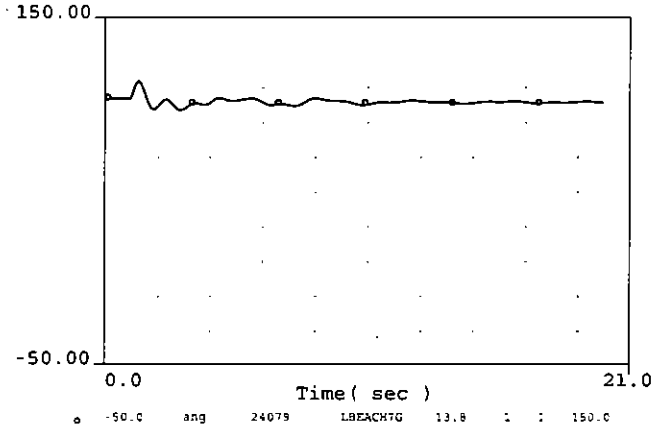

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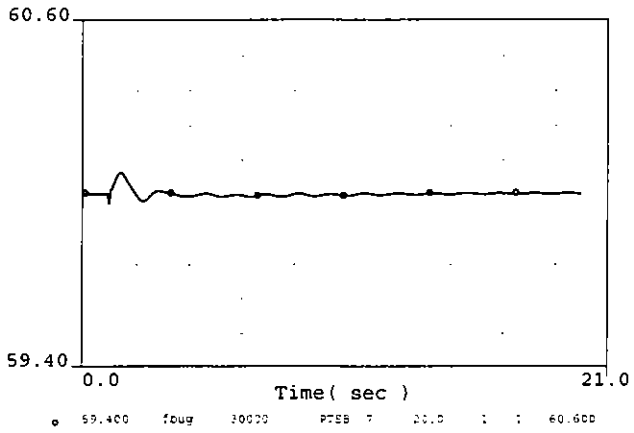

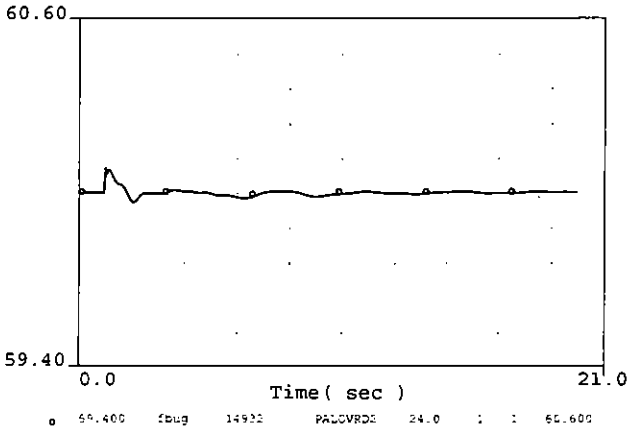

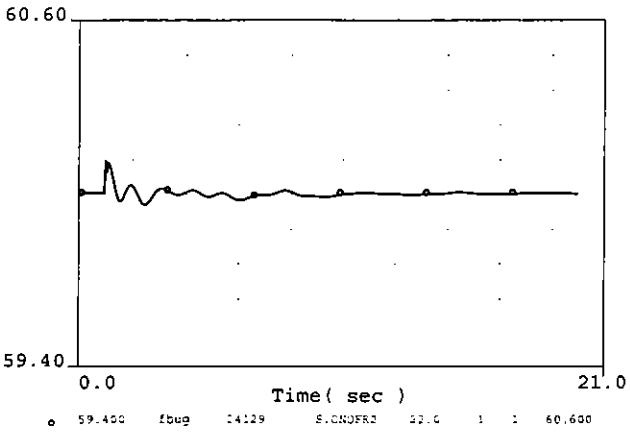

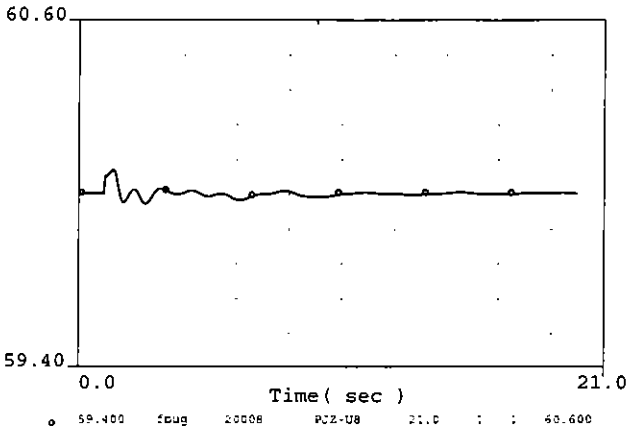

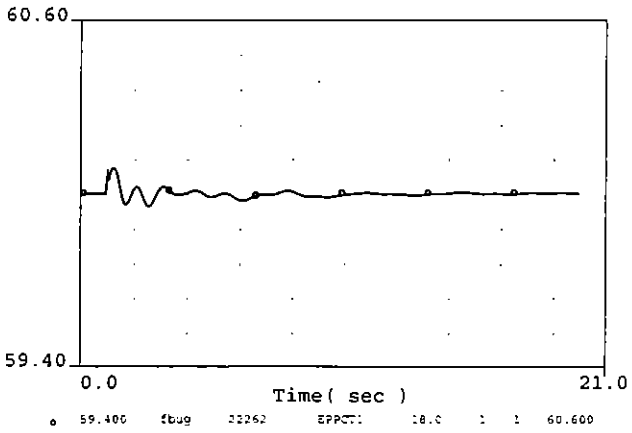

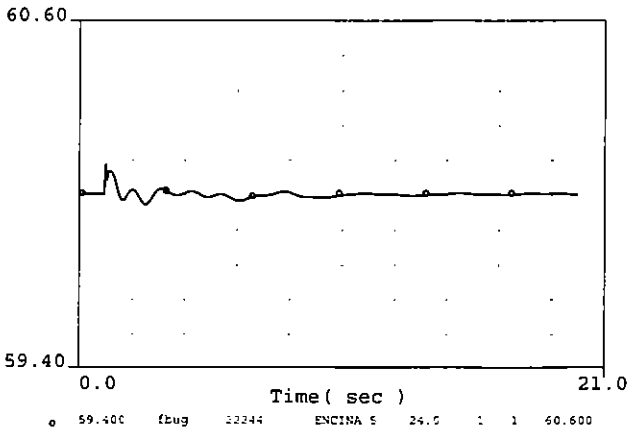

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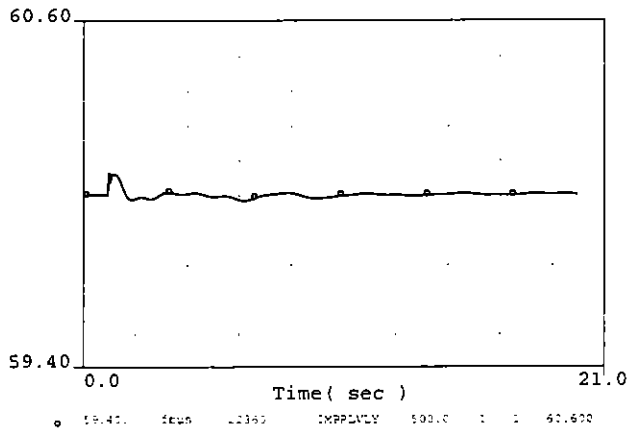
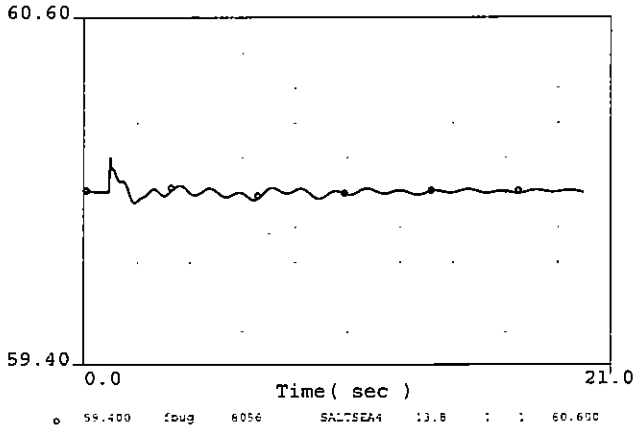
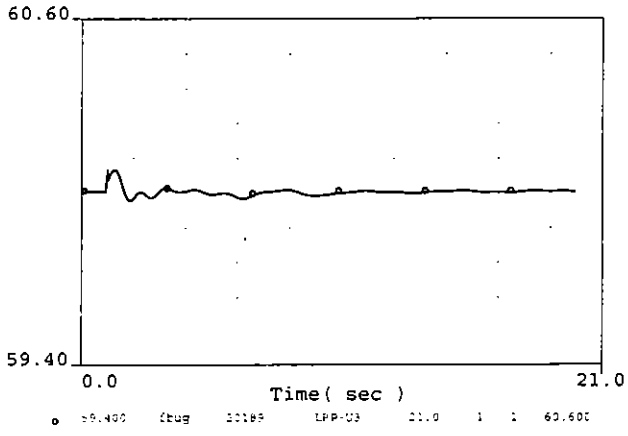
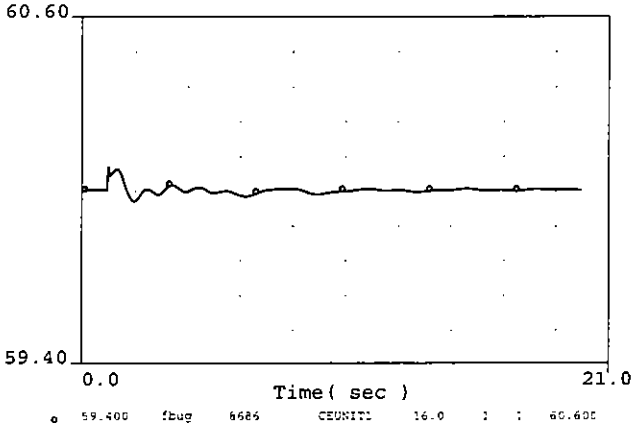
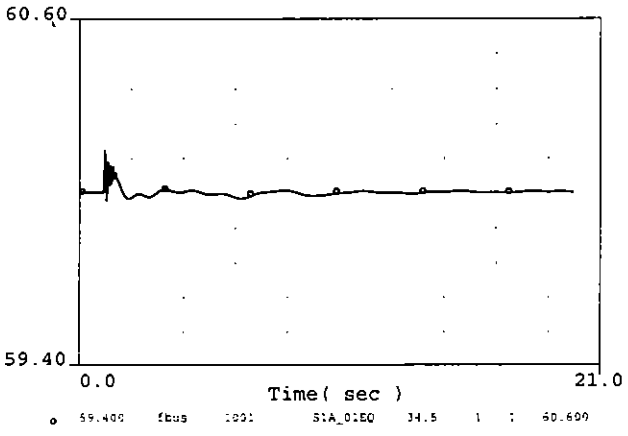
_008 light autumn, post-case
N-0: BASE CASE

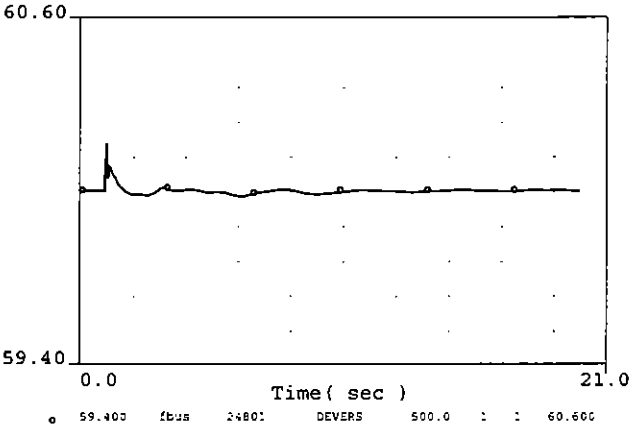












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Appendix I - Reactive Power Deficiency Analysis

```
{End contingency}
{Contingency}
  Contingency name = 'LUGO-ELD'              /Lugo-Eldorado
  Outage Branch = 24086 24042 '1'
{End contingency}
{Contingency}
  Contingency name = 'MOH-LUGO'              /Mohave-Lugo
  Outage Branch = 24086 24097 '1'
{End contingency}
{Contingency}
  Contingency name = 'VIC-LUGO'              /Victorville-Lugo
  Outage Branch = 24086 26105 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VST1'              /Devers-Vista #1
  Outage Branch = 24804 24901 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VST2'              /Devers-Vista #2
  Outage Branch = 24804 24901 '2'
{End contingency}
{Contingency}
  Contingency name = 'DEV-SBD1'              /Devers-San Bernadino #1
  Outage Branch = 24804 24132 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-SBD2'              /Devers-San Bernadino #2
  Outage Branch = 24804 24132 '1A'
{End contingency}
{Contingency}
  Contingency name = 'VSTA-SBD'              /Vista-San Bernadino
  Outage Branch = 24901 24132 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-ELCE1'              /IV-El Centro #1
  Outage Branch = 8356 8332 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ELCE2'              /IV-El Centro #2
  Outage Branch = 8356 8332 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-ML'           /IV-Miguel & ML xfmrs
  Outage Branch = 22360 22468 '1'
{End contingency}
{Contingency}
  Contingency name = 'SWPLgen'             /IV-Miguel w/gen SPS
  Outage Branch = 22360 22468 '1'
  Change Generation = 22996 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'SWPLgx  '            /IV-Miguel w/gen & xtrip SPS
```

```
  Outage Branch = 22360 22468 '1'
  Outage Branch = 22360 22468 '1'
  Outage Branch = 22356 20118 '1'
  Change Generation = 22996 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'HAA-NG'          /Hassayampa-N. Gila
  Outage Branch = 15090 22536 '1'
{End contingency}
{Contingency}
  Contingency name = 'NG-IV'             /N.Gila-IV
  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ROA'            /IV-La Rosita
  Outage Branch = 20118 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'OTAY-TJI'               /Otay Mesa-TijuanaIV-Miguel w/gen &
xtrip SPS
  Outage Branch = 22609 20149 '1'
{End contingency}

{End]
```

```
{VSAT 4.X Contingency}

/----------
/---------- Class C Double Contingencies
/----------
{Contingency Must Run}
  Contingency name = 'PV-WSTWG'      /Palo Verde-Westwing
  Outage Branch = 14005 15021 '1'
  Outage Branch = 14005 15021 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'LUGO-MLM'      /Lugo-Mira Loma
  Outage Branch = 24086 24092 '2'
  Outage Branch = 24086 24092 '3'
{End contingency}
{Contingency Must Run}
  Contingency name = 'MID-VIN'       /Midway-Vincent 1&2
  Outage Branch = 24156 30060 '1'
  Outage Branch = 24156 30060 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'MCCL-VIC'      /McCullough-Victorville
  Outage Branch = 26105 26048 '1'
  Outage Branch = 26105 26048 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'PV-DEV'        /Palo Verdo-Devers 1&2
  Outage Branch = 24801 15021 '1'
  Outage Branch = 24801 15093 '1'
{End contingency}
{Contingency Must Run}
  Contingency name = 'VIST-DEV'      /Vista-Devers
  Outage Branch = 24804 24901 '1'
  Outage Branch = 24804 24901 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SBER-DEV'      /Devers-San Bernardino
  Outage Branch = 24804 24132 '1'
  Outage Branch = 24804 24132 '1A'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SBERNDNO'      /San Bernadino-Vista & San Bernardino-
Etiwanda
  Outage Branch = 24132 24901 '2'
  Outage Branch = 24132 24056 '1'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SONOF-TA'      /SONGS-Talega 1&2
  Outage Branch = 24131 22844 '1'
  Outage Branch = 24131 22844 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SONOF-SA'      /SONGS-San Luis Rey 1&3
  Outage Branch = 24131 22716 '1'
  Outage Branch = 24131 22716 '3'
{End contingency}
{Contingency Must Run}
```

```
  Contingency name = 'ML-MS1&2'      /Miguel-Mission 1&2
  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SX-ML'         /Sycamore-Otay & Sycamore-Mission
  Outage Branch = 22464 22832 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'PV#2-3'        /Palo Verde units 2 and 2
  Change Generation = 14932 '1' 0
  Change Generation = 14933 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'SO#2-3'        /San Onofre units 2 and 3
  Change Generation = 24129 '2' 0
  Change Generation = 24130 '3' 0
{End contingency}

[END]
```

```
[VSAT 4.X Contingency]

/----------
/---------- Class B Single Contingencies
/----------

{Contingency}
  Contingency name = 'PV-DV'            /Palo Verde-Devers
  Outage Branch = 24801 15021 '1'
{End contingency}
{Contingency}
  Contingency name = 'HAA-DV'          /Harquahala-Devers
  Outage Branch = 24801 15093 '1'
{End contingency}
{Contingency}
  Contingency name = 'ELD-MOEN'              /Eldorado-Moenkopi
  Outage Branch = 24042 14002 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VAL'               /Devers-Valley
  Outage Branch = 24801 24151 '1'
{End contingency}
{Contingency}
  Contingency name = 'VAL-SER'               /Valley-Serrano
  Outage Branch = 24151 24138 '1'
{End contingency}
{Contingency}
  Contingency name = 'CRYS-NAV'               /Crystal-Navajo
  Outage Branch = 26123 14003 '1'
{End contingency}
{Contingency}
  Contingency name = 'CRYS-MCC'               /Crystal-McCullough
  Outage Branch = 26048 26123 '1'
{End contingency}
{Contingency}
  Contingency name = 'MEAD-PRK'               /Mead-Perkins
  Outage Branch = 15034 19038 '1'
{End contingency}
{Contingency}
  Contingency name = 'MRK-ADEL'               /Marketplace-Adelanto
  Outage Branch = 26044 26003 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-MKTP'               /McCullough-Marketplace
  Outage Branch = 26048 26044 '1'
{End contingency}
{Contingency}
  Contingency name = 'ELD-MCCU'               /Eldorado-McCullough
  Outage Branch = 24042 26048 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-VCT1'               /McCullough-Victorville #1
  Outage Branch = 26048 26105 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-VCT2'               /McCullough-Victorville #2
  Outage Branch = 26048 26105 '2'
```

```
[VSAT 4.X Contingency]

/----------
/---------- Class B Single Contingencies, post-Sunrise
/----------

{Contingency}
  Contingency name = 'PV-DV'          /Palo Verde-Devers
  Outage Branch = 24801 15021 '1'
{End contingency}
{Contingency}
  Contingency name = 'HAA-DV'         /Harquahala-Devers
  Outage Branch = 24801 15093 '1'
{End contingency}
{Contingency}
  Contingency name = 'ELD-MOEN'       /Eldorado-Moenkopi
  Outage Branch = 24042 14002 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VAL'        /Devers-Valley
  Outage Branch = 24801 24151 '1'
{End contingency}
{Contingency}
  Contingency name = 'VAL-SER'        /Valley-Serrano
  Outage Branch = 24151 24138 '1'
{End contingency}
{Contingency}
  Contingency name = 'CRYS-NAV'        /Crystal-Navajo
  Outage Branch = 26123 14003 '1'
{End contingency}
{Contingency}
  Contingency name = 'CRYS-MCC'        /Crystal-McCullough
  Outage Branch = 26048 26123 '1'
{End contingency}
{Contingency}
  Contingency name = 'MEAD-PRK'        /Mead-Perkins
  Outage Branch = 15034 19038 '1'
{End contingency}
{Contingency}
  Contingency name = 'MRK-ADEL'        /Marketplace-Adelanto
  Outage Branch = 26044 26003 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-MKTP'        /McCullough-Marketplace
  Outage Branch = 26048 26044 '1'
{End contingency}
{Contingency}
  Contingency name = 'ELD-MCCU'        /Eldorado-McCullough
  Outage Branch = 24042 26048 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-VCT1'        /McCullough-Victorville #1
  Outage Branch = 26048 26105 '1'
{End contingency}
{Contingency}
  Contingency name = 'MCC-VCT2'        /McCullough-Victorville #2
  Outage Branch = 26048 26105 '2'
```

```
{End contingency}
{Contingency}
  Contingency name = 'LUGO-ELD'          /Lugo-Eldorado
  Outage Branch = 24086 24042 '1'
{End contingency}
{Contingency}
  Contingency name = 'MOH-LUGO'          /Mohave-Lugo
  Outage Branch = 24086 24097 '1'
{End contingency}
{Contingency}
  Contingency name = 'VIC-LUGO'          /Victorville-Lugo
  Outage Branch = 24086 26105 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VST1'          /Devers-Vista #1
  Outage Branch = 24804 24901 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-VST2'          /Devers-Vista #2
  Outage Branch = 24804 24901 '2'
{End contingency}
{Contingency}
  Contingency name = 'DEV-SBD1'          /Devers-San Bernadino #1
  Outage Branch = 24804 24132 '1'
{End contingency}
{Contingency}
  Contingency name = 'DEV-SBD2'          /Devers-San Bernadino #2
  Outage Branch = 24804 24132 '2'
{End contingency}
{Contingency}
  Contingency name = 'VSTA-SBD'          /Vista-San Bernadino
  Outage Branch = 24901 24132 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-ELCE1'          /IV-El Centro #1
  Outage Branch = 21025 21981 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ELCE2'          /IV-El Centro #2
  Outage Branch = 21025 21981 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-ML'             /IV-Miguel & ML xfmrs
  Outage Branch = 22360 22468 '1'
  Outage Branch = 22472 22468 '1'
  Outage Branch = 22464 22468 '2'
  Outage Branch = 22472 22452 '1'
  Outage Branch = 22472 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'SWPLgen'           /IV-Miguel w/gen SPS
  Outage Branch = 22360 22468 '1'
  Change Generation = 22996 '2' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '2' 0
  Change Generation = 22983 '3' 0
```

```
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'SWPLgx  '          /IV-Miguel w/gen & xtrip SPS
  Outage Branch = 22360 22468 '1'
  Outage Branch = 22360 22468 '1'
  Outage Branch = 22356 20118 '1'
  Change Generation = 22996 '2' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '2' 0
  Change Generation = 22983 '3' 0
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'IV-CE'             /IV-Central
  Outage Branch = 22360 22737 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'IV-CEgen'          /IV-Central w/gen SPS
  Outage Branch = 22360 22737 '1'
  Change Generation = 22996 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'IV-CEgx'           /IV-Central w/gen & xtrip SPS
  Outage Branch = 22360 22737 '1'
  Outage Branch = 22356 20118 '1'
  Change Generation = 22996 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'HAA-NG'            /Hassayampa-N. Gila
  Outage Branch = 15090 22536 '1'
{End contingency}
{Contingency}
  Contingency name = 'NG-IV'             /N.Gila-IV
  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ROA'            /IV-La Rosita
  Outage Branch = 20118 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'OTAY-TJI'          /Otay Mesa-Tijuana
  Outage Branch = 22609 20149 '1'
{End contingency}

{End}
```

```
[VSAT 4.X Contingency]

/----------
/---------- Class C Double Contingencies, post-Sunrise
/----------

{Contingency Must Run}
  Contingency name = 'PV-WSTWG'     /Palo Verde-Westwing
  Outage Branch = 14005 15021 '1'
  Outage Branch = 14005 15021 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'LUGO-MLM'          /Lugo-Mira Loma
  Outage Branch = 24086 24092 '2'
  Outage Branch = 24086 24092 '3'
{End contingency}
{Contingency Must Run}
  Contingency name = 'MID-VIN'           /Midway-Vincent 1&2
  Outage Branch = 24156 30060 '1'
  Outage Branch = 24156 30060 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'MCCL-VIC'          /McCullough-Victorville
  Outage Branch = 26105 26048 '1'
  Outage Branch = 26105 26048 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'PV-DEV12'          /Palo Verdo-Devers 1&2
  Outage Branch = 24801 15021 '1'
  Outage Branch = 24801 15093 '1'
{End contingency}
{Contingency Must Run}
  Contingency name = 'VIST-DEV'          /Vista-Devers
  Outage Branch = 24804 24901 '1'
  Outage Branch = 24804 24901 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SBER-DEV'          /Devers-San Bernardino
  Outage Branch = 24804 24132 '1'
  Outage Branch = 24804 24132 '2'

{End contingency}
{Contingency Must Run}
  Contingency name = 'SBERNDNO'          /San Bernadino-Vista & San Bernardino-
Etiwanda
  Outage Branch = 24132 24901 '2'
  Outage Branch = 24132 24056 '1'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SONOF-TA'          /SONGS-Talega 1&2
  Outage Branch = 24131 22844 '1'
  Outage Branch = 24131 22844 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SONOF-SA'          /SONGS-San Luis Rey 1&3
  Outage Branch = 24131 22716 '1'
  Outage Branch = 24131 22716 '3'
```

```
{End contingency}
{Contingency Must Run}
  Contingency name = 'ML-MS1&2'          /Miguel-Mission 1&2
  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency Must Run}
  Contingency name = 'SX-ML'       /Sycamore-Otay & Sycamore-Mission
  Outage Branch = 22960 22464 '1'
  Outage Branch = 22960 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'PV#2-3'        /Palo Verde units 2 and 2
  Change Generation = 14932 '1' 0
  Change Generation = 14933 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'SO#2-3'        /San Onofre units 2 and 3
  Change Generation = 24129 '2' 0
  Change Generation = 24130 '3' 0
{End contingency}
{End}
```

Appendix H
System Impact Study
Phase II (Up to 600 MW)

California ISO
Your Link to Power

California Independent System Operator Corporation

Ali Asraf Chowdhury, Ph.D.
Director of Regional Transmission - South
(916) 608-1113

July 19, 2007

Mr. Robert Liden
Stirling Energy Systems, Inc.
2920 E Camelback Road, Suite #150
Phoenix, AZ 85016

Subject: SES Solar II Expansion ISIS

Dear Mr. Liden:

Attached is the Interconnection System Impact Study (ISIS) Report for the SES Solar II Expansion project (the Project). The SES Solar II Expansion Project has been proposed by Stirling Energy Systems, Inc. (SES) to interconnect 600 MW (net output to the grid) to the CAISO Controlled Grid. The Point of Interconnection is at SDG&E's Imperial Valley 500/230 kV Substation, to which the Project will be connected by a ten-mile generation-tie line. The proposed in-service date is January 1, 2011, and the commercial operation date is March 1, 2011. The study covered the second and third phases for the Solar Two project, each phase adding 300 MW of solar generation capacity. The first phase of the Solar Two Project (300 MW) was studied separately. The ISIS was performed by SDG&E under the direction of CAISO.

The ISIS has determined that the addition of the SES Solar II Expansion Project would cause two SDG&E facilities to overload in the SDG&E's system for Category A contingencies, two facilities to overload for Category B contingencies and no facilities to overload for Category C contingencies. The study did not find any overstressed circuit breakers caused by the addition of the Project. The transient stability analysis concluded that the WECC transmission system remained stable for all contingency simulations and no criteria violations were found due to the Project. The Project does not appear to cause an Impairment of the tax-exempt status of the interest on Local Furnishing Bonds (LFB).

The post transient/governor power flow analysis indicated one contingency that failed to converge for the various pre-project scenarios. The study found numerous voltage deviations greater than the prescribed limit. Further investigations will be necessary within the Facility Study. Some additional design and/or modeling refinements are needed from the developer as well.

The reactive power deficiency analysis determined that the Project does not yet demonstrate automatic voltage control capability, exhibits poor VAR margin characteristics by failing numerous governor power flow tests, complies with post contingency high/low voltage limits, and exhibits several Category B delta voltage drop excursions greater than 5%.

Based on the proposed operating date, Point of Interconnection, and the results of the analyses, this study identified Interconnection Facilities, Reliability Network Upgrades and Delivery Network Upgrades necessary to interconnect the SES Solar Two Expansion Project at full output to the SDG&E transmission system. The non-binding cost estimate of the **Interconnection Facilities and Reliability Network Upgrades** needed to integrate this Project into the CAISO Controlled Grid would be approximately

$7.6 million[1]. The non-binding time to construct the **Interconnection Facilities and Reliability Network Upgrades** is approximately **18 months** from the signing of the LGIA (Interconnection Agreement) and does not include the time needed for environmental review and permitting. The non-binding cost estimate of the **Delivery Network Upgrades** identified for this Project is approximately **$133 million**[2]. The study did not provide an estimated time to construct the **Delivery Network Upgrades** because the time for such construction time **varies**.

The ISIS did not address the Deliverability Assessment of this Project because it will be assessed by the CAISO as part of its generation deliverability process. Please note that this letter approving the interconnection of the SES Solar II Expansion Project allows the Project to be eligible to deliver the Project's output to the CAISO Controlled Grid using available transmission. However, it does not establish the Project's level of deliverability for purposes of determining its Net Qualifying Capacity under the CAISO Tariff and in accordance with CPUC-adopted Resource Adequacy Rules. Therefore, this letter makes no representation, and SES cannot rely on any statements herein, regarding the ability, or amount, of the output of the Project to be eligible to sell Resource Adequacy Capacity. We encourage SES to continue to follow the baseline deliverability studies ongoing at the CAISO. For more information on generation deliverability, please reference the web link: http://www.caiso.com/181c/181c902120c80.html.

Should you have any questions regarding the Study, please contact Irina Green at (916) 608-1296 (IGreen@caiso.com) or myself at (916) 608-1113 (AChowdhury@caiso.com).

Sincerely,

Ali Asraf Chowdhury, Ph.D
Director of Regional Transmission – South

AAC/IG:pjp
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[1] All costs estimates are preliminary, non-binding, good faith estimates in "as year spent" dollars.
[2] All costs estimates are preliminary, non-binding, good faith estimates in "as year spent" dollars.

Interconnection System Impact Study

Generation Interconnection

Stirling Energy Systems, Inc.

SES Solar Two Expansion

California ISO

Your Link to Power

July 19, 2007

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1. Executive Summary

Stirling Energy Systems, Inc. (SES) proposes to interconnect their 600 MW (net output to the grid) SES Solar Two Expansion Project (SESS2E) to the San Diego Gas & Electric (SDG&E) transmission system. The proposed in-service date is January 1, 2011 and the commercial operation date is March 1, 2011. The proposed location of the project is near Plaster City in Imperial County. The Point of Interconnection is the 230 kV bus of SDG&E's Imperial Valley 500/230 kV Substation, to which the Project will be connected by a 10-mile generation tie-line. This study covers the second and third phases for the Solar Two project, each phase adding 300 MW of solar generation capacity. The first phase of the Solar Two Project (300 MW) was studied separately.

In accordance with Federal Energy Regulatory Commission (FERC) Large Generation Interconnection Procedures (LGIP), the California Independent System Operator (CAISO) and SDG&E performed an Interconnection System Impact Study (ISIS). The ISIS determined:

1. Transmission system impacts caused solely by the SESS2E Project,
2. System reinforcements necessary to mitigate the adverse impacts of the SES Solar Two Expansion Project under various system conditions,
3. Non-binding, good faith estimate of cost and cost responsibility, and
4. Non-binding, good faith estimate of time to construct.

This study is composed of a Commercial Operation Date (COD) and Future Year (FY) analysis. The COD analysis examines the effect of the SESS2E Project on the bulk power grid at the time of its commercial operation date. The "furthest out" commercial operation date of higher-queued projects establishes the year of the FY analysis. The COD and FY analysis are the same for the SESS2E Project because there are no higher-queued projects with the operational dates past the date of this project. To determine the system impacts caused by the addition of the SES Solar Two Expansion Project, studies were performed using the following power flow cases:

1. 2011 Heavy Summer COD/FY, and
2. 2011/2012 Light Winter COD/FY

The studies performed in this ISIS included:

1. Steady State Power Flow Analysis,
2. Short Circuit Analysis,
3. Transient Stability Analysis,
4. Post-Transient/Governor Power Flow/Delta Voltage Analysis,
5. Reactive Power Deficiency Analysis, and
6. Local Furnishing Bonds (LFB) analysis.

The power flow analysis concluded that the addition of the SESS2E Project:

1. Caused two SDG&E facilities to overload above continuous ratings for Category A steady state (normal) / 2011 heavy summer conditions:

   Sycamore Canyon 230/69 kV transformer banks 70 and 71.

However, if a higher-queue generation project doesn't materialize, these transformers might not overload.

2. Caused two SDG&E facilities to overload for Category B contingencies:

   TL13820 (Sycamore – Chicarita) 138 kV transmission line has post-project overloads for Category B contingencies for 2011 heavy summer conditions, and

   Imperial Valley 500/230 kV transformer bank 81 has post-project overloads due to Category B contingencies for 2011/2012 light winter conditions.

Operating procedures which may include curtailing the output of the project during planned or extended forced outages may be required in order to operate reliably. However, identification of the operating procedures is outside the scope of this study.

The short circuit analysis found no overstressed circuit breakers caused by the addition of the SES Solar Two Expansion Project.

The transient stability analysis concluded that the WECC transmission system remained stable for all contingency simulations and no criteria violations were found due to the SES Solar Two Expansion Project.

The post transient/governor power flow analysis indicates only one contingency that failed to converge for the various pre-project scenarios. However, the post-project SESS2E modeling indicates there are nine governor power flow tests with failures to converge the solution of certain simulated outage/scenario combinations. Further investigations will be necessary within the Facility study. However, some additional design and/or modeling refinements are no doubt needed from the developer as well. There are numerous voltage deviations greater than the prescribed 5% limit.

The reactive power deficiency analysis assessed the project's reactive power adequacy based on how the model performs with respect to automatic voltage control design and performance, governor power flow test, post contingency high or low voltage excursions, and delta voltage deviations. From results of the various simulations, performance indicators are that:

SESS2E does not yet demonstrate automatic voltage control capability,
Exhibits poor VAR margin characteristics by failing nine outage/scenario governor power flow tests,
Complies with post contingency high/low voltage limits, and
Exhibits several Category B delta voltage drop excursions greater than 5%.

The SESS2E project does not appear to cause impairment of the tax-exempt status of the interest on Local Furnishing Bonds.

Based on the proposed operating date, Point of Interconnection, and the results of the analyses, this study identified Interconnection Facilities, Reliability Network Upgrades and Delivery Network Upgrades necessary to interconnect the SES Solar Two Expansion Project at full output to the SDG&E transmission system. The following Interconnection Facilities are needed to interconnect the SES Solar Two Expansion Project to the Imperial Valley 230 kV bus:

> Conductor to interconnect from Point of Change of Ownership to Point of Interconnection.

The preliminary, non-binding, good faith estimate of cost and estimate of time to construct for the Interconnection Facilities, Reliability Network Upgrades and Delivery Network Upgrades are shown in Table 1.1. The Delivery Network upgrades listed in the table represent ultimate upgrades for which the SESS2E generation developer might be responsible. Some of these upgrades might be completed by other generation projects that are ahead of the SES Solar II Expansion in the generation interconnection queue, others might be constructed as a part of SDG&E transmission development.

For example, cost of the upgrade of the Sycamore-Chicarita 138 kV transmission line was estimated in the Sunrise Power Link Transmission Project. The cost that was estimated was for re-locating the line due to the Sunrise Power Link Project. Upgrade of this line may be combined with the relocation without significant change in the cost (see also note 1 on the next page).

Table 1.1: Estimated Cost and Estimated Time to Construct.

Good Faith/Non-Binding Estimate of Cost & Time-to-Construct

Type	Description	Estimated Cost (X $1000)	Estimated Time to Construct /3
PTO's Interconnection Facilities	Conductor to connect from Point of Change of Ownership (Imperial Valley substation fence) to the Point of Interconnection.	$175	6 mos.
Reliability Network Upgrades	Imperial Valley 230 kV: Install two 230 kV circuit breakers, associated disconnects, bus work, protection, and control apparatus.	$7,397	18 mos.
Subtotal	***Interconnection Facilities & Reliability Network Upgrades***	***$7,572***	***18 mos.***
Delivery Network Upgrades	Add transformer bank 72, 230/69 kV, 224 MVA, TCUL capable transformer bank and associated circuit breakers, disconnects, bus work, protection, and control Apparatus at Sycamore 230/138/69 kV substation.	$17,995	24 mos.
Delivery Network Upgrades	Upgrade the 138 kV transmission line TL13820 (Sycamore-Chicarita) to a continuous rating of 250 MVA (nominal) from bus-to-bus. **/1**	$54,860	18 mos.
Delivery Network Upgrades	Install 500/230 kV, 1120 MVA transformer bank 82 at Imperial Valley Substation; including two 500 kV breakers and associated disconnect switches, bus work, two 230 kV circuit breakers, and associated disconnects, bus work, protection devices and controls. Convert the existing 500 kV ring bus to breaker-and-a-half by installing two 500 kV circuit breakers and disconnects in bay 1, install associated controls and protection equipment. **/2**	$59,894	36 mos.
Subtotal	***Delivery Network Upgrades***	***$132,749***	***Varies***
Total	***PTO's Interconnection Facilities, Reliability & Delivery Network Upgrades***	***$140,321***	***Varies***

Notes

/1 The costs listed for upgrade TL13820 were estimated as part of the Sunrise 500 kV project. These dollars only represent the cost of facilities for replacement in kind (i.e. same rating of 204 MVA results) of the existing 138 kV line. However, the costs to upgrade TL13820 to 250 MVA capability are minor by comparison. If the Sunrise project is not constructed, the responsibility to fund the upgrade of TL13820 falls to the Q124 project.

/2 The costs to install a third Imperial Valley transformer as a Delivery Network Upgrade were also identified for the SES Solar II 300 MW project, Q78. Should that project go forward, the Q78 project may/may not choose to fund the IV Bank 82 upgrade. If not, the option would fall to the next interconnection project for which the same constraint/upgrade is required.

/3 Total time-to-construct can vary depending on which Delivery Network Upgrades are funded. Time-to-construct does not include the time for obtaining required federal, state and local licenses or permits.

The preliminary, non-binding, good faith construction schedule estimate to design, procure, and construct the facilities typically begins after the signing of the Large Generator Interconnection Agreement (LGIA) and does not include the time required for environmental review and the permitting processes, if applicable. Required lead times depend on many factors, including whether an exemption(s) from the California Public Utilities Commission's (CPUC's) G.O. 131-D Certificate of Public Convenience and Necessity (CPCN) process, or the CPUC's Permit to Construct (PTC) process, can be obtained. For example, absent an exemption, the process of obtaining a PTC could take one to two years, possibly even longer. SDG&E believes that the ability to obtain exemptions from the CPCN and PTC processes (in which case an advice letter filing with the CPUC should be sufficient for obtaining the CPUC's approval to proceed with construction) will be enhanced if the IC includes in its application to the CEC the full scope of the transmission and substation additions and upgrades that will be part of the project.

2. Project and Interconnection Information

The SES Solar Two Expansion Project is a 600 MW (net output to grid) concentrating solar power plant. The proposed location of the plant is near Plaster City in Imperial County, California. This interconnection request specifically covers the second and third phases for Solar Two, each phase adding 300 MW of solar generation capacity.

SES proposes the following milestone dates:

1. Proposed In-Service Date: January 1, 2011
2. Proposed Trial Operation Date: January 15, 2011
3. Proposed Commercial Operation Date: March 1, 2011

The requested point of interconnection is the 230 kV bus at SDG&E's Imperial Valley Substation. No alternative point of interconnection was identified.

A conceptual one-line diagram of the proposed interconnection is shown in Figure 2.1. Figure 2.2 provides project location details.

Figure 2.1: Conceptual One-line Diagram.

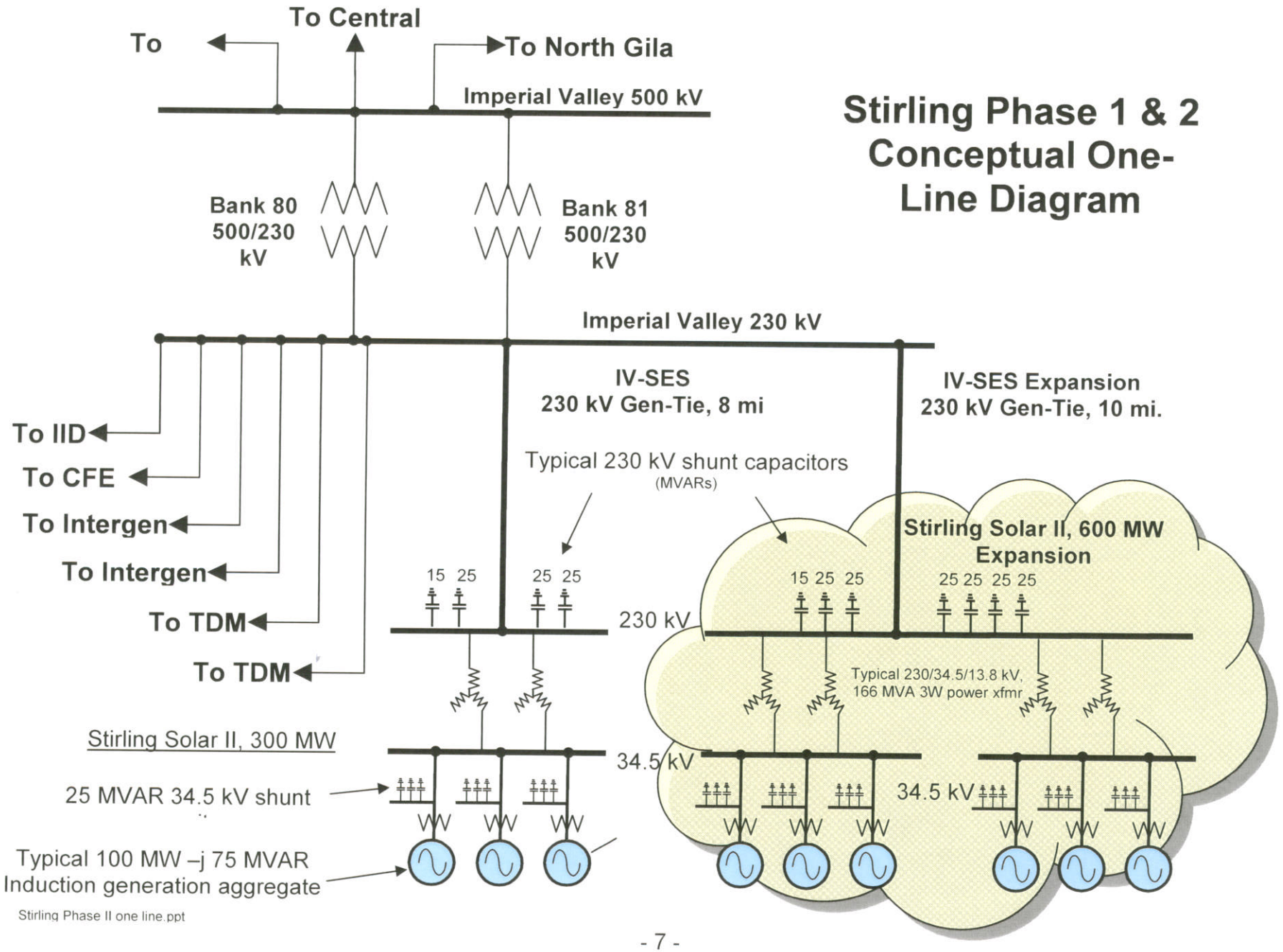


Figure 2.2: Project Vicinity Map.

3. Study Assumptions

The CAISO and SDG&E conducted the ISIS using the following assumptions:

1. This interconnection request is for an addition of 600 MW of generating capacity in the vicinity of SDG&E's Imperial Valley Substation. The preferred interconnection point is SDG&E's 230 kV bus at Imperial Valley Substation
2. The preferred site is the proposed location of SES Solar Two Phase I (Stirling Phase I), a 300 MW solar generation project. This study assumes that Phase I is in service and operational in all study periods.
3. The proposed Commercial Operation Date (COD) is March 1, 2011.
4. SESS2E is composed of 24,000 concentrating solar dish arrays with 25 kW 480 V induction generators driven by Stirling motors. As such, the generators rely on the grid to provide excitation, and are thus net consumers of reactive power. Each array consumes approximately 750 VARs for each 1000 Watts of power delivered to the grid. To compensate for these inductive reactance loads, SESS2E is modeled with external 34.5 kV and 230 kV shunt capacitors in order to obtain unity power factor during steady state conditions at the Imperial Valley 230 kV bus.
5. For simplicity, the multiple solar dish arrays are modeled as six 100 MW generators. The generator step-up transformers and 34.5 kV, compensating shunts are approximated. The power flow model is as described in an EPC file provided by the Interconnection Customer.
6. The generator tie line for SES Solar Two Phase 1 was designed for a future upgrade to double circuit 230 kV with a maximum capacity of 637 MVA continuous, 756 MVA emergency.
7. The internal shunt capacitor modeling for SESS2E does not have a common mode of failure, and SESS2E will not operate without the shunt capacitors in place and operational.
8. Additional shunt capacitors were added at the project's 230 kV bus in order to obtain unity power factor at the Point of Interconnection. Up to 165 MVAR (6 X 25 MVAR plus 1 X 15 MVAR) of shunt capacitors were necessary to meet steady state power factor requirements.
9. SESS2E occupies Queue Position #124 in the CAISO Controlled Grid Generation Queue. The Commercial Operation Date (COD) study examines operating conditions modeling higher-queued generation projects within the SDG&E network which will be in-service when Stirling SES Solar Two Expansion is in-service. The Future Year (FY) study, or 'queue' study, includes all higher-queued generation projects within the SDG&E network. For the SES Solar Two Phase 2, the COD/FY study cases are the same because there are no generation projects higher in the queue with earlier interconnection dates. The COD/FY study evaluated the 2011 heavy summer and 2011-2012 light winter study period. Table 3.1 below identifies CAISO queue generation projects modeled in the power flow and short circuit cases.
10. All project related Special Protection Systems (SPS) presently in-service are incorporated in the contingency lists.
11. Table 3.2 below identifies SDG&E transmission projects modeled in each of the power flow and short circuit cases.

Table 3.1: Modeled CAISO Queue Generation Projects.

Queue Position	Point of Interconnection	COD/FY	
		2011 Heavy Summer	2011-12 Light Winter
1A	Miguel Substation/Otay Mesa Generation Project	Yes	Yes
8	Sycamore Canyon Substation	Yes	Yes
13	Escondido	Yes	Yes
25	Crestwood	Yes	Yes
26	Crestwood	Yes	Yes
27	South Bay	Yes	Yes
32	Boulevard-Crestwood 69 kV transmission line	Yes	Yes
72	Proposed Lee Lake Substation	Yes	Yes
78	Imperial Valley Substation	Yes	Yes
90	Existing radial 69 kV gen-tie to TL6929	Yes	Yes
103	Border Substation 69 kV	Yes	Yes
106A	500 kV Imperial Valley-Miguel trans line	Yes	Yes
112	500 kV Imperial Valley-Miguel trans line	Yes	Yes
121	Miramar GT 69 kV substation	Yes	Yes

These generation projects will be modeled in the study cases, but may not necessarily be dispatched under all study conditions. Generation was dispatched to represent a "worst case analysis" by stressing the transmission system in a reasonable manner. The latest CAISO Controlled Grid Generation Queue is included in Appendix B. Two heavy summer generation dispatch scenarios were considered for this study.

As of June 15, 2007, the project in ISO Queue position 25 (117MW, connecting to Crestwood substation) has withdrawn. It is not expected to have any impact on the results of this ISIS because the Q25 project is electrically far away from Imperial Valley substation and was connecting to 69 kV. This project was modeled as not dispatched in the power flow cases following the "worst case" scenario.

Table 3.2: Modeled SDG&E Transmission Projects.

Project	COD/FY	
	2011 Heavy Summer	2011-12 Light Winter
230 kV Otay Metro Power Loop	Yes	Yes
Silvergate Substation	Yes	Yes
Proposed Lee Lake Substation, related transmission and 500/230 kV phase shifters	Yes	Yes
Sunrise Power Link 500 kV and associated plan of service	Yes	Yes

12. Thermal loading and transient stability studies were performed with and without the proposed Imperial Valley 500/230 kV transformer bank 82.
13. The power flow models include forecasted peak and off-peak load conditions.

3.1 Power Flow Cases

Two (2) power flow base cases were used to evaluate the addition of the SES Solar Two Expansion Project. All power flow cases were derived from the latest available CAISO/Western Electric Coordinating Council (WECC) full-loop power flow cases and developed with GE PSLF version 16 or higher.

3.1.1 2011 Heavy Summer COD/FY

The 2011 heavy summer case has a 1-in-10 year heat wave load forecast of 4,991 MW. The case is derived from the WECC "10hs1a" case. This case represents high load conditions. Two (2) generation dispatch scenarios were used for the heavy summer analysis.

1. High SDG&E imports and low in-basin generation
2. Low SDG&E imports and high in-basin generation

3.1.2 2011 Light Winter COD/FY

The 2011 light winter case has an off-peak load forecast of 2,526 MW (50% of summer peak). The case is derived from the WECC "12lw1-sa" case. This case represents low load conditions. Generation within the immediate proximity of the project is fully dispatched.

The 2011 heavy summer high import, 2011 heavy summer low import and 2011 light winter power flow cases were modeled both with and without the proposed Imperial Valley 500/230 kV bank 82. Load and resource summary tables for all power flow cases are included in Appendix C.

4. Study Criteria

The Western Electricity Coordinating Council (WECC) and North American Electric Reliability Council (NERC) planning criteria were used to evaluate the system impact.

4.1. Thermal Loading Criteria

All power flow analyses are conducted using the General Electric PSLF Version 16 software.

4.1.1. Category A – All Facilities in Service

Category A (N-0) normal overloads are those that exceed 100% of continuous line and/or transformer ratings that result from all facilities in-service.

4.1.2. Category B – Loss of Single Element

A Category B contingency is commonly referred to as an "N-1" event, where there is a loss of a single element. Category B emergency overloads are those that exceed 100% of emergency ratings post Category B contingency. No loss of customer load is allowed for Category B contingencies. Included in the Category B classification is a single transmission circuit outage with one generator already out of service and the system adjusted (G-1/N-1). This contingency shall also meet the performance requirements of the NERC Planning Standards for Category B contingencies.

4.1.3. Category C – Loss of Multiple Elements

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

4.2. Short Circuit Breaker Duty Criteria

Short circuit studies were performed to determine the maximum fault currents on various buses in the vicinity of the project. This study assessed the impact of increased fault duty resulting from the interconnection of the project. The Aspen Version 9.0 program was used to conduct detailed short circuit studies with three line-to-ground (3LG) and single line-to-ground (SLG) faults to examine impacts of the project on the system. Equipment that may become overstressed as a result of added generation will be identified using the criteria in Table 4.2.

Table 4.2: SDG&E Short Circuit Breaker Duty Criteria Summary.

Equipment	Disturbance	Criteria
Existing Generator Breakers	LG and 3LG faults	No fault exceeds 100% of the nameplate interrupting rating.
Existing Non-Generator Breakers ≤ 230 kV	LG and 3LG faults	No fault exceeds 115% of the nameplate interrupting rating.
Existing Non-Generator Breakers > 230 kV	LG and 3LG faults	No fault exceeds 100% of the nameplate interrupting rating.

4.3. Transient Stability Criteria

Transient stability analysis is a time domain based simulation that assesses the performance of the power system during (and shortly following) a contingency; typically zero (0) to twenty (20) seconds in duration. Transient stability studies were performed to assess system stability performance following critical system faults. The system is considered stable if the following conditions are met:

1. Machine Synchronism – All machines in the WECC interconnected system must remain in synchronism as demonstrated by relative rotor angles (unless modeling problems are identified and concurrence is reached that a problem does not really exist).
2. Simulation Time and System Damping
    a. A stability simulation will be deemed to exhibit positive damping if a line defined by the peaks of the machine relative rotor angle swing curves tends to intersect a second line connecting the valleys of the curves with the passing of time.
    b. Corresponding lines on bus voltage swing curves will likewise tend to intersect. A stability simulation, which satisfies these conditions, will be defined as stable.
    c. Duration of a stability simulation run will be ten seconds unless a longer time is required to ascertain damping.
    d. The transient performance analysis will start 2-3 cycles after the fault clearing and conclude at the end of the simulation.
    e. A case will be defined as marginally stable if it appears to have zero percent damping and the voltage dips are within (or at) the WECC Reliability Criteria limits.

Performance of the transmission system is measured against the WECC Reliability Criteria and the NERC Planning Standards. Table 4.3 is an excerpt from the NERC/WECC Reliability Criteria. The reliability and performance criteria were applied to the entire WECC transmission system.

Table 4.3: WECC Disturbance-Performance Table of Allowable Effects on Other Systems.

NERC/WECC Categories	Transient Voltage Dip Standard	Minimum Transient Frequency Standard
A: System normal	Nothing in addition to NERC	
B: One element out-of-service	Not to exceed 25% at load buses or 30% at non-load buses. Not to exceed 20% for more than 20 cycles at load buses.	Not below 59.6Hz for 6 cycles or more at a load bus.
C: Two or more elements out-of-service	Not to exceed 30% at any bus. Not to exceed 20% for more than 40 cycles at load buses.	Not below 59.0Hz for 6 cycles or more at a load bus.
D: Extreme multiple-element outages	Nothing in addition to NERC	

4.4. Post-Transient/Governor Power Flow/Delta Voltage Criteria

The governor power flow test serves two purposes:

1. Indications as to reactive power margin are provided by this test or simulation. The simulations, for the steady state and for contingency conditions are compared for scenarios initially modeling base load and/or interface (cut-plane) flows with the same scenarios stressed by a load or interface burden of an additional 5% for Category B or 2-1/2% for Category C contingencies.
2. Indications as to violations of delta voltage criteria.

Tables 4.4 and 4.5 are excerpts from the NERC/WECC Planning Standards. The governor power flow test is utilized to assess the post-transient VAR margin and voltage deviation performance.

Table 4.4: Summary of NERC/WECC Planning Standards for voltage support and reactive power criteria.

Performance Level/Category	Disturbance	Reactive Power Deficiency Criteria
B	Generator One Circuit One Transformer PDCI	Governor power flow to reach convergence at 105% of SDG&E load level/import level
C	Two Generators Two Circuits IPPDC	Governor power flow to reach convergence at 102.5% of SDG&E load level/import level

Table 4.5: WECC Disturbance-Performance Table of Allowable Effects on Other Systems.

Performance Level/Category	Disturbance	Post Transient Voltage Deviation Criteria
B	Generator One Circuit One Transformer PDCI	Not to exceed 5% at any bus. *
C	Two Generators Two Circuits IPPDC	Not to exceed 10% at any bus.
* SCE allows deviation up to 7% on certain buses for N-1		

4.5. *Reactive Power Deficiency Criteria*

The purpose of this portion of the Interconnection System Impact Study is to assess whether the Project's reactive power representation and simulated performance complies with prescribed operating capability parameters. The assessment considers a project's reactive power adequacy based on how the model performs with respect to automatic voltage control design and performance, governor power flow test, post contingency high or low voltage excursions, and delta voltage deviations.

5. Interconnection System Impact Study Results

5.1. Steady State Power Flow Results

Steady state power flow analysis, including Category A, B, and C contingencies, was performed for the 2011 heavy summer high import, 2011 heavy summer low import and 2011 light winter power flow cases both with and without the proposed Imperial Valley 500/230 kV bank 82. A complete listing of all contingencies is included in Appendix D.

5.1.1. Category A (N-0) Normal Violations

There were two (2) Category A normal overloads resulting from the interconnection of the project. The Sycamore Canyon 230/69 kV transformer banks 70 and 71 exhibit overloads above continuous ratings for 2011 heavy summer low import conditions, both with and without the proposed Imperial Valley 500/230 kV transformer bank 82.

5.1.2. Category B (N-1) Contingency Violations

There were two SDG&E facilities that have Category B overloads resulting from the interconnection of the project.

1. The Sycamore - Chicarita 138 kV TL13820 has post-project overloads due to two Category B contingencies for 2011 heavy summer high import and low import conditions, both with and without the proposed Imperial Valley 500/230 kV bank 82. This line might not overload if a generation project ahead of the SES Solar II Expansion does not materialize.

2. The Imperial Valley 500/230 kV bank 81 has post-project overloads due to Category B contingencies for 2011 light winter conditions without the proposed Imperial Valley 500/230 kV bank 82.

5.1.3. Category C Contingency Violations

There were no Category C overloads resulting from the interconnection of the project for any of the scenarios studied. Complete listings of all power flow analysis results are included in Appendix E. Selected power flow plots for normal and emergency conditions are included in Appendix F.

5.2. Short Circuit Study Results

Three-line-to-ground (3LG) and single line-to-ground (SLG) faults were simulated with and without the SES Solar Two Expansion Project to determine if there are any overstressed circuit breakers caused by addition of the SES Solar Two Expansion Project. Study results indicate there are no circuit breaker fault duty limit violations attributable to the SES Solar

Two Expansion Project. The IC is not responsible for mitigating any pre-existing overstressed circuit breakers. The short circuit analysis results are included in Appendix G.

5.3. Substation and Transmission Evaluation

The substation work scope and related costs required for the SESS2E project entail interconnection facility and network upgrades to existing SDG&E transmission facilities:

5.3.1. Substation

Interconnection Facilities Requirements: Presently no large generator interconnection exists between SES Solar Two Expansion and the SDG&E/CAISO controlled grid. The proposed SESS2E large generator project is planned to be constructed within approximately ten (10) miles of SDG&E's Imperial Valley 500/230 kV substation. This project is the proposed 600 MW expansion of the initially proposed 300 MW concentrating solar power plant project. The interconnection will be facilitated by two developer constructed 230 kV transmission lines; one line (8 mi.) to serve as the gen-tie for the initial 300 MW project (Q78), and one line (10 mi.) to serve as the gen-tie for the 600 MW expansion (Q124).. The interconnection facility requirements are limited solely to short length (approximately 200 feet per conductor) transmission line conductors to be installed between the proposed project's transmission gen-tie lines ownership change point (Imperial Valley 230 kV fence line) and the interconnection point within the new 230 kV bay position in the existing Imperial Valley Substation bus network.

The non-binding/good faith estimated cost for the short length transmission line conductors is $175,000.

Substation related Reliability Network Upgrades are required for the SESS2E project at or beyond the Point of Interconnection. These facilities are necessary to interconnect the proposed generating facility safely and reliably to the SDG&E/CAISO controlled grid, and which would not have been required but for the proposed interconnection. In general, they are required to:

1. Transfer power from the proposed generator plant to the SDG&E/CAISO controlled grid,
2. Remedy short circuit or stability problems resulting from said interconnection, and/or
3. Install or upgrade of facilities which, consistent with WECC practice, are necessary to that the proposed interconnection may have on a WECC path rating.

Reliability Network Upgrades identified from performing this ISIS include:

1. Addition of a 230 kV bay position at Imperial Valley Substation for the termination of the second generation transmission tie line from the SESS2E project. This addition entails but is not limited to the installation of two (2) 230 kV breakers, disconnect switches, associated bus work, SCADA, protection, and control apparatus.

The cost for this portion of the project is $7,397,000. The time-to-construct is 18 months.

Delivery Network Upgrades identified from performing this ISIS include:

1. Addition of a third 230/69 kV 224 MVA, TCUL transformer (bank 72) at Sycamore Substation. This entails, but is not limited to:
   A. 230 kV: installation of the new transformer, addition of one 230 kV circuit breaker and related disconnect switches, conductors, associated bus work, SCADA, protection, and control apparatus.
   B. 69 kV: installation of one new 69 kV circuit breaker and related disconnect switches, conductors, associated bus work, SCADA, protection, and control apparatus.

The cost for this portion of the project is $17,995,000. The time-to-construct is 24 months.

2. Add a third 500/230 kV, 1120 MVA TCUL transformer at Imperial Valley Substation. The work scope entails installing transformer bank 82 in a new bay position in the Imperial Valley 500/230 kV switchyard. In general the work scope includes adding the new transformer, related 500 kV and 230 kV circuit breakers, disconnects, conductors, and associated control and relay panels, and RTU points for control, monitoring, and alarming.

   The cost for this portion of the project is $59,894,000. The time-to-construct is 36 months. This upgrade was identified for SES Solar Two Project, Queue 78. If the Q78 project does not choose to fund the IV Bank 82 upgrade, then the next interconnection project for which the same constraint/upgrade is required would be responsible for the bank upgrade.

5.3.2. Transmission

The transmission work scope and related costs required for the SESS2E) project entail network upgrades to existing SDG&E transmission facilities.

Delivery Network Upgrades identified from performing this ISIS include:

1. Upgrade the 138 kV transmission line TL13820 (Sycamore-Chicarita) to a continuous rating of 250 MVA (nominal) from bus-to-bus.

The cost for this portion of the project is $54,860,000. The time-to-construct is 18 months.

5.4. System Protection Study

Preliminary review of the proposed SES Solar Two Expansion project, with respect to protection issues, provides the following guidance:

Special protection schemes (SPS) exist that relate to the need to protect transmission facilities under the control of the CAISO, the Comision Federal de Electricidad (CFE), and the Imperial Irrigation District (IID). Those SPS that address Imperial Valley Substation, connected facilities, and/or other affected parties include the following:

- 500 kV TL 50001 (IV-Miguel) IV Generator SPS,
- CFE SPS to protect lines from La Rosita to Tijuana,
- Miguel to South Bay 138 kV path and TL 23023 N-2 SPS,
- Miguel to South Bay 138 kV path and TL 23021 N-2 SPS,
- TL 230S Protection (IID El Centro transformer),
- Miguel 500/230 kV transformer bank 80/ bank 81,
- Miguel Stuck Breaker N-2 SPS, and
- 230 kV TL 23040, Miguel - Tijuana SPS.

All of the above identified SPS relate to needs to: a) effect run-back or tripping of existing on-line generation connected to the Imperial Valley 230 kV bus, or b) to trip certain transmission lines to protect other affected parties (CFE or IID). All are protection schemes developed within the system protection guidelines of the CAISO and WECC. Those guidelines specify complexity and numbers of potential events and maximum amounts of generation tripping that may occur to mitigate identified transmission constraints.

In the SES Solar Two (Q78, 300 MW) studies, a Delivery Network Upgrade was listed as a modification of the Imperial Valley/Miguel SPS. Without having completed that analysis in this ISIS study, conceptually that need would not diminish from operation of this Expansion project (Q124, 600 MW added). In concept, with that and the existing CAISO system protection guidelines/limits, the feasibility to integrate more generation into an existing SPS would diminish. According to the CAISO guidelines, the amount of generation that can be tripped following a single-facility outage is limited to 1150 MW. Due to a large amount of generation already connected to the Imperial Valley Substation, adding more generation from SES Solar Two to the SPS may not be possible. Further analysis is required in the Facility Study phase of the SES Solar Two project to conclusively answer that question.

5.5. Transient Stability Study Results

The purpose of the transient stability study is to determine if the transmission system would be stable with the addition of the project. Project specific dynamic models and supporting EPCL files were provided by SES. Details of the machine dynamic models are included in Appendix H.

Transient stability analysis was performed for the following system contingencies for both the 2011 heavy summer high import and 2011 light winter cases with the proposed Imperial Valley 500/230 kV bank 82, for a study period of 10 seconds:

1. Three-phase fault on Windfarms 500 kV bus cleared after 4 cycles by opening Windfarms - Miguel 500 kV transmission line,
2. Three-phase fault on Imperial Valley 500 kV bus cleared after 4 cycles by opening Imperial Valley - North Gila 500 kV transmission line,
3. Three-phase fault on Imperial Valley 500 kV bus cleared after 4 cycles by opening Imperial Valley - Central 500 kV transmission line,
4. Three-phase fault on Imperial Valley 230 kV bus cleared after 4 cycles by opening Imperial Valley - El Centro 230 kV transmission line,

5. Three-phase fault on Imperial Valley 230 kV bus cleared after 4 cycles by opening Imperial Valley - La Rosita 230 kV transmission line,
6. Three-phase fault on Imperial Valley 230 kV bus cleared after 4 cycles by opening Imperial Valley 500/230 kV bank 81,
7. Three-phase fault on San Onofre 230 kV bus cleared after 6 cycles by tripping San Onofre units 2 and 3, and
8. Three-phase fault on Hassyampa 500 kV bus cleared after 4 cycles by opening Hassyampa - North Gila 500 kV transmission line.

Switching sequences for the transient stability simulations are included in Appendix I.

The transmission system was adequately damped and all generators remained synchronized for all transient stability simulations studied.

There were WECC transient voltage dip violations for all studied cases, both pre and post-project, for Imperial Valley 230 kV faults followed by the loss of the Imperial Valley - El Centro or Imperial Valley - La Rosita 230 kV lines. The voltage dips on SES Solar Two facilities were as large as 50% for approximately 7 cycles, which exceeds the WECC 30% maximum transient voltage dip standard. Results show that there are no adverse impacts to the adjacent buses for these simulations. Therefore, the observed transient voltage dip deviations at the SES Solar Two buses are not considered significant to SDG&E's transmission system.

The transient stability analysis concluded that the WECC transmission system remained stable for all contingency simulations and no criteria violations were found due to the SES Solar Two Expansion Project. Complete listings of all transient stability analysis results are included in Appendix J. Selected transient stability plots for all pre-project and post-project simulations are included in Appendix K.

5.6. Deliverability Assessment Results

In accordance with LGIP sections 3.3.2 and 3.3.3 of the LGIP, a Deliverability Assessment will be performed to determine the qualified capacity of the project from Resource Adequacy perspective. This study will focus on the ability of the system to accommodate output of the project to the aggregate of load under the conditions when resources are needed the most such as during summer peak conditions when resource shortage is likely to happen. For more details of Deliverability Assessment including methodology and modeling requirements for deliverability base case, please refer to http://www.caiso.com/181c/181c902120c80.html. As required by LGIP tariff language, deliverability results need to provide the following information of this project regarding deliverability:

1. The amount of capacity that can be deliverable without additional upgrade, and
2. The upgrade needed for this project to be fully deliverable (delivery upgrades) if the study results identify transmission limitations that prevent the project from being fully deliverable.

Please note that delivery network upgrades are optional upgrades for those customers willing to provide a higher level of services. A project, for which the required reliability upgrades have been implemented, may proceed to interconnect to the CAISO control grid without delivery upgrades. However, the decision to omit delivery upgrades could result in the project losing its eligibility to receive capacity payments from the CPUC led Resource Adequacy program.

5.7. Post-Transient/ Governor Power Flow/Delta Voltage Drop Analysis Results

5.7.1. Background

The post transient/governor power flow modeling and simulations were performed to assess the performance, with regard to voltage stability, of the proposed Stirling Energy Systems 600 MW expansion project. This project represents a proposed expansion by an additional 600 MW (Q124) to the initial project of 300 MW (Q78) capacity. Both projects propose to interconnect to the SDG&E 230 kV bus at Imperial Valley. Initial investigations were problematical in that, after review of results, it appeared there may be some error or inconsistency in impedance modeling for the 230 kV gen-tie transmission lines proposed between the project and the Imperial Valley 230 kV switchyard.

SDG&E and the CAISO, with the input provided from the developer's consultant, implemented changes to some data (impedance and topology). The SESS2E project was initially modeled as being connected to Imperial Valley by two 230 kV gen-ties, each of about 30 miles length (assumed from the impedance). The revised data and topology input resulted in revisions to the model such that the initial 300 MW project is modeled as served by one 8 mile 230 kV gen-tie; the 600 MW expansion project is served by a second 10 mile long 230 kV gen-tie. There is no electrical connection between the two projects. This resulted in a large reduction in real losses.

Using these revised models, reactive support was modeled such that 75 MVAR of 34.5 kV shunt capacitors were provided for each 100 MW of aggregated solar parabolic induction generators (3 times 75 MVAR for the 300 MW project, and 6 times 75 MVAR for the 600 MW expansion). The MVAR burden is provided by the revised EPC file provided by the IC (Attachment A, item 8.a. 0.84 power factor plus pointer to GE model). In addition, 230 kV shunt capacitors were assumed at the 230 kV project bus for the 300 MW and 600 MW project. The amount of shunt capacitors in-service was only sufficient to facilitate a low reactive power flow, near unity power factor across the 230 kV interconnection at Imperial Valley (6 X 25 MVAR plus 1 X 15 MVAR for SESS2E). No details were available as to any specific switching or control methodology/technology for the reactive components. The details regarding the amount and technology for reactive support will need to be identified in the Facilities Study.

5.7.2. Post Transient/Governor Power Flow Summary

Results from steady state and contingency simulations indicate that:

1. The pre-project model, for contingencies simulated, with one exception, all solved the governor power flow test for heavy summer and light winter load modeling. The one diverged solution was for the light winter case modeling a 5% load burden. The contingency was for the loss of the Imperial Valley-Central 500 kV line with the modeling of tripping the approximate 950 MW of generation modeled on-line at the TDM and Intergen plants in northern Mexico (IV-CN +SPS 6.1). The Central 500 kV bus is a new bus in the plan of service for the proposed Sunrise project scheduled for operation in 2010. It is thought that this performance corresponds to performance as determined in the earlier SES Solar II (Q78) study results. Tripping of the generation at Imperial Valley may be required to avoid overloading on the CFE 230 kV system. However, in this case, no overload was identified on the CFE system, therefore, generation tripping was not needed. The outage with the SPS tripping Imperial Valley generation was simulated only as a test. In reality, the system will have sufficient reactive margin for this outage.

2. Post-project modeling:
   a) The light winter scenario; for the same contingencies simulated as above, continues to indicate diverged solutions. However, there was marked improvement to the light winter load scenarios overall. Only one case diverged where there were 9 simulations that diverged in the initial attempts. The outage of the IV-CN +SPS 6.1 500 kV line, in the base load/cut-plane scenario diverged. The same contingency solved for the slightly more stressed assumption of 5% load and 5% cut plane burden for Category B outages. This might be indicative of a slightly improved condition resulting in an increase to in-basin SDG&E generation to serve the 5% additional load burden. In reality, Imperial Valley generation tripping may not be needed under light winter conditions for the Imperial Valley-Central 500 kV line outage.

   b) The heavy summer load scenario; for the same contingencies simulated as above, continues to indicate several diverged solutions as detailed in the accompanying table. The outage of the Imperial Valley-Central 500 kV + SPS 6.2 and Windfarm-Miguel + SPS 6.2 are the base load/cut-plane, load +5%, and cut-plane +5% scenarios that diverge. The attempted mitigation of tripping 100 MW of SES Exp generation provided enough relief for those contingencies to solve the governor power flow test with one exception. The IV-CN +SPS 6.2 + SES 100 MW additional gen trip failed to solve. The Category C outage of two SONGS generators did not solve the governor power flow test for the base load/cut-plane scenario but did solve for the load +2-1/2% and cut-plane +2-1/2%. Again, indicating that readjustments to SDG&E in-basin generation with respect to higher load may have been a factor.

   Refer to Tables 5.7.2.a & b below and to Appendix L (L1-L12) for specific details. Further investigations will be necessary within the Facility study. However, some additional design and/or modeling refinements are no doubt needed from the

developer as well. Governor power flow studies will need to be repeated in the Facilities Study with the refined model of the reactive support for the SES Solar Two Expansion generation. These studies will need to identify the required reactive support and/or SPS or other measures to mitigate criteria violations.

5.7.3. Delta Voltage Drop Summary (SDG&E buses)

As for the post transient analysis, the pre- versus post-project comparisons regarding the delta voltage drop issue are dramatic as well. However, certainly for the heavy summer cases, the post project scenarios model the SESS2E project as displacing 600 MW of in-basin SDG&E generation (Encina 4 and 5). This is not an improbable assumption since the proposed project is of the renewable category and SDG&E has been seeking opportunities to fill out its CPUC mandated 20% compliance for renewables subscriptions. No doubt different dispatch modeling, holding in-basin generation higher, would reduce the heavy summer voltage deviations for category B outages to fewer in number. Heavy summer cases are identified as cases ending "a" to "e" pre-project (or q124_"a" to "e") and cases "f" to "j" (or q124_"f"-"j") for post-project. Category C heavy summer cases performance for one G-2 outage simulation of SONGS double unit outage (case ending in "c" or "e" pre-project, or "h" or "j") indicate better performance with the SESS2E project. There are no deviations exceeding 10% for pre-project simulations. There are a few for post-project however, indicated by yellow shading. Refer to the load/resource/dispatch spread sheet in Appendix C for details of power flow case generation dispatch for the SDG&E area generation. Refer to Appendix L (DVD 1-18, DVD 8-IV, and L-14) for specific details.

5.7.4. Post Transient Methodology

Twenty power flow cases were built modeling the 2011 peak summer load forecast and 2011/12 light winter load levels. For each season, pre- and post-project models were constructed. The various scenarios include base load and cut-plane assumptions for category B and C contingencies. For category B contingencies, load plus 5% and cut-plane plus 5% cases were built. Additionally, load and cut-plane flow was stressed 2-1/2% for category C contingencies. The following contingencies were simulated:

Cat A (N-0) No Contingency

Cat B (Loss of Single element)

SES Capacitor 25 MVAR 230 kV
IV-Central 500 kV
IV-Central SPS 6.1 (trip IVGens*)
IV-Central SPS 6.2 (trip IVGens+IV-ROA)
IV-Central SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen
Windfarm-Miguel 500 kV
Windfarm-Miguel SPS 6.1 (trip IVGens)
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA)
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen

(the SPS indicated above were not necessarily needed for all the cases, in real time, the SPS will be activated only if the CFE transmission lines are overloaded)

IV-Stirling #2 230 kV (600 MW)
IV 500/230 kV bank 81, 1120 MVA
Intergen Generation
TDM Generation

Cat C (Loss of two or more elements)
SONGS Double Unit Outage

Generators dispatched at or near Pmax levels or designated as base load units were blocked from governor action to account for system real power performance. Additionally, switching actions not expected to be performed automatically were not allowed to be simulated. Thus, TCUL taps, SVDs, and phase shifting transformers were not adjusted or switched as the case applies. The governor power flow action was applied for swing machine mismatches greater than 10 MW.

**: IVGens refers collectively to the existing TDM (Termoelectrica de Mexicali) and Intergen (La Rosita) plants sited south of the Imperial Valley Substation across the international border with Mexico.*

Table 5.7.2a: Heavy Summer Load, Governor Power Flow Test: Converge Y/N (Diverged)?

Contingency Heavy Summer Load	Pre-Project (SES=300 MW)			Post-Project (SES=900 MW)		
	Base Load/ Cut Plane	Load +5%	Cut Plane +5%	Base Load/ Cut Plane	Load +5%	CP +5%
Cat A (N-0) No Contingency	Y	Y	Y	Y	Y	Y
Cat B (Loss of Single element)						
SES Capacitor 25 MVAR 230 kV	Y	Y	Y	Y	Y	Y
IV-Central 500 kV	Y	Y	Y	Y	Y	Y
IV-Central SPS 6.1 (trip IVGens)	Y	Y	Y	Y	Y	Y
IV-Central SPS 6.2 (trip IVGens+IV-ROA)	Y	Y	Y	Diverged	Diverged	Diverged
IV-Central SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen.	N/A	N/A	N/A	Y	Y	Diverged
Windfarm-Miguel 500 kV	Y	Y	Y	Y	Y	Y
Windfarm-Miguel SPS 6.1 (trip IVGens)	Y	Y	Y	Y	Y	Y
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA)	Y	Y	Y	Diverged	Diverged	Diverged
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen.	N/A	N/A	N/A	Y	Y	Y
IV-Stirling #1 230 kV (300 MW)	Y	Y	Y	Y	Y	Y
IV 500/230 kV bank 81, 1120 MVA	Y	Y	Y	Y	Y	Y
Intergen Generation	Y	Y	Y	Y	Y	Y
TDM Generation	Y	Y	Y	Y	Y	Y
Cat C (Loss of two or more elements)		**+2.5%**	**+2.5%**		**+2.5%**	**+2.5%**
SONGS Double Unit Outage	Y	Y	Y	Diverged	Y	Y

CP = Cut plane (P-44 + Sunrise + LEAPS + Windfarm-Miguel + CFE-Otaymesa)
Load = SDG&E system load

Table 5.7.2b: Light Winter Load, Governor Power Flow Test: Converge Y/N (Diverged)?

Light Winter Load	Pre-Project (SES=300 MW)			Post-Project (SES=900 MW)		
	Base Load/ Cut Plane	Load +5%	Cut Plane +5%	Base Load/ Cut Plane	Load +5%	CP +5%
Cat A (N-0) No Contingency	Y	Y	Y	Y	Y	Y
Cat B (Loss of Single element)						
SES Capacitor 25 MVAR 230 kV	Y	Y	Y	Y	Y	Y
IV-Central 500 kV	Y	Y	Y	Y	Y	Y
IV-Central SPS 6.1 (trip IVGens)	Y	Y	Diverged	Diverged	Y	Y
IV-Central SPS 6.2 (trip IVGens+IV-ROA)	Y	Y	Y	Y	Y	Y
IV-Central SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen.	N/A	N/A	N/A	N/A	N/A	N/A
Windfarm-Miguel 500 kV	Y	Y	Y	Y	Y	Y
Windfarm-Miguel SPS 6.1 (trip IVGens)	Y	Y	Y	Y	Y	Y
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA)	Y	Y	Y	Y	Y	Y
Windfarm-Miguel SPS 6.2 (trip IVGens+IV-ROA) + Mitigation of trip 100 MW of SES Exp gen.	N/A	N/A	N/A	N/A	N/A	N/A
IV-Stirling #2 230 kV (600 MW)	Y	Y	Y	Y	Y	**Y**
IV 500/230 kV bank 81, 1120 MVA	Y	Y	Y	Y	Y	Y
Intergen Generation	Y	Y	Y	Y	Y	Y
TDM Generation	Y	Y	Y	Y	Y	Y
Cat C (Loss of two or more elements)		**+2.5%**	**+2.5%**		**+2.5%**	**+2.5%**
SONGS Double Unit Outage	Y	Y	Y	Y	Y	Y

CP = Cut plane (P-44 + Sunrise + LEAPS + Windfarm-Miguel + CFE-Otaymesa)
Load = SDG&E system load

5.8. Reactive Power Deficiency Analysis Results

5.8.1. Summary:

The purpose of this portion of the Interconnection System Impact Study is to assess whether the proposed project's reactive power representation and simulated performance complies with prescribed operating capability parameters and that, from simulations of the model, performance indications fall within acceptable reliability indices. The issue as to deficiency is of some greater importance as regards energy resources which are of the induction generator type. This is because some induction-type generators in use currently can only provide reactive power through the addition of external reactive power devices. These external devices can include shunt capacitors or inductors, static VAR compensators, or other solid state high speed response reactive power resources. SDG&E chooses to assess a project's reactive power adequacy based on how the model performs with respect to automatic voltage control design and performance, governor power flow test, post contingency high or low voltage excursions, and delta voltage deviations.

From review of the Interconnection Request, data provided thus far, and performance assessment results detailed below for the proposed Project, insufficient reactive resources, control apparatus and/or logic are included in the modeling to be able to conclude that the design and equipment are capable of meeting the voltage control and reactive power requirements prescribed by SDG&E for the Imperial Valley 230 kV bus. Those prescriptions are documented in SDG&E standard operating procedures TMC1005 ("Transmission System Voltage and VAR Control") and GEN2500 ("Optimal Generation Voltage Levels"). Further, NERC prescribes to Transmission Operators and Purchasing and Selling Entities, within the new standard VAR-001-1, that they "ensure that voltage levels, reactive flows, and reactive resources are monitored, controlled, and maintained within limits in real time to protect equipment and the reliable operation of the Interconnection".

5.8.2. Background:

Modeling: The proposed SESS2E project (add-on 600 MW of capacity produced by solar energy sourced induction generation machines), as modeled for this ISIS, is an out growth of the modeling simulated in the LGIP studies for the initial proposed SES Solar II 300 MW project. The Project is modeled as six equivalent generators of an induction type. Each generator is modeled as a 100 MW capacity machine which consumes 75 MVARs of reactive power (inductive reactance). This 100 MW of capacity represents the aggregated output for 4000 Stirling machines, each capable of delivering 25 kW of energy. Additional step-up transformers, a simple transmission representation of the project's collector network, and ultimate interconnection via a 10 mile long 230 kV transmission gen-tie to the Imperial Valley 230 kV bus complete the project modeling.

Reactive support, as detailed by the design for the 300 MW SES project, consisted of three 25 MVAR 34.5 kV shunt capacitors connected at the 34.5 kV collector bus nearest

to each 100 MW generator. Though more reactive power support was not detailed in the model provided by the Developer, even only in the form of shunt capacitors, additional 230 kV shunt capacitors were modeled at the 230 kV collector bus to provide additional reactive power support to effect conformity with the IR representation of intent that power factor adjustment would be provided to yield a power factor of unity at the CAISO interconnection bus (i.e. SDG&E's Imperial Valley 230 kV). Six 25 MVAR 230 kV and one 15 MVAR 230 kV shunt capacitors were modeled at the project's 230 kV collector bus (23052-SOLR2A). At full 600 MW dispatch output for steady state modeling there is only about 3 MVARs, on top of 594 MWs, flowing into Imperial Valley 230 kV bus from the Project. No assumption was made as to how, other than by manual operation, any of the shunt capacitors might be operated. However, there are elements inherent in the modeling which, if controlled via manual or some automatic voltage control mechanism(s), could effect, by use of increasing or decreasing capacitive or inductive reactance elements within the project, changes to Imperial Valley 230 kV voltage levels. It is these automatic control mechanisms which are missing in the modeling thus far.

Review of the post transient and governor power flow analyses indicate that the pre-project heavy summer and light winter scenario's performance was acceptable in that all outage simulations solved the governor power flow test with one exception (Light winter, IV-Central + SPS 6.1). Results of the post-project heavy summer and light winter scenarios indicated failure of nine scenario/outage combinations. The scenario/outage combination which indicated the poorest voltage performance was for the heavy summer scenario and IV-Central + SPS 6.2 outage combination. To test the proposed project for reactive power deficiency that heavy summer/outage combination was examined solely.

SDG&E Voltage Reliability Requirements: SDG&E operates and follows two standard operating procedures related to: a) optimal transmission voltage and VAR control for the SDG&E portion of the CAISO controlled grid, and b) optimal generation voltage levels. The optimum 230 kV bus voltage range specified for Imperial Valley 230 kV bus is 230-233 kV. The proposed project must be operated such that no impairment is induced to the CAISO/SDG&E controlled grid as relates to maintaining prescribed transmission voltage set points and/or reactive power schedules as issued by the PTO and/or CAISO. Key functionality for assessment includes a) type and magnitude of reactive power support equipment proposed, and b) mode of effecting voltage and/or reactive power control from the proposed project. Critical generating plant functionality includes the ability to automatically respond and make adjustments to the generating plant equipment to effect anticipated and acceptable responses to initial and follow-on set points as issued during real-time operational periods.

SDG&E requires that generator plants must operate their unit(s) on **automatic voltage control** mode with adequate reactive power loading to maintain optimum voltage levels and to not burden the transmission system to support the generator plants reactive power loads or losses. SDG&E or CAISO will notify those generation plants failing to comply to increase/decrease the reactive loading of their units in the event of low/high voltages at the Imperial Valley 230kV bus. (Refer to Tables 5.8.1 and 5.8.2 below.)

Table 5.8.1: Voltage Control Limits.

Bus	Nominal kV	Optimum Operating Range	Pre-Contingency		Post-Contingency		Fog	Voltage Control - Reactive Resources (MVAR)
			Low Limit[1]	Hi Limit	Low Limit	Hi Limit		
LTC Transformer-Controlled Buses								
Escondido	69	69.5 - 70.5[2]	65.6	72.5	62.1	72.5		
Main	69	70 – 71	65.6	72.5	62.1	72.5	< 68	2 x 50 capacitor
Miguel	69	71 – 72	65.6	72.5	62.1	72.5	< 68	2 x 50 capacitor
Mission	69	70 – 71	65.6	72.5	62.1	72.5	< 68	2 x 25 capacitor
San Luis Rey	69	70 – 71	65.6	72.5	62.1	72.5	< 68	
Sycamore Canyon	69	70 – 71	65.6	72.5	62.1	72.5	< 68	2 x 25 capacitor
Talega	69	70 – 71	65.6	72.5	62.1	72.5	< 68	
Los Coches	138	137.6 - 138.6	131.1	138.6	124.2	138.6	≤ 138.6	
Mission	138	137.6 - 138.6	131.1	138.6	124.2	138.6	≤ 138.6	
Penasquitos	138	137.6 - 138.6	131.1	138.6	124.2	138.6	≤ 138.6	
Talega	138	141 - 142	131.1	144.9	124.2	144.9	< 141	100/-100 STATCOM, 2x5 capacitor
Imp Valley	230	230 - 233	218.5	241.5	207.0	241.5		
Miguel	230	230 - 231	218.5	241.5	207.0	241.5		4 x 45 reactor [4] 2 x 63 capacitor
Imp Valley	500	510 - 535	498.8	550/575	472.5	550/575		126 reactor
Non-LTC Transformer-Controlled Buses								
Creelman	69		65.6	72.5	62.1	72.5	<68	16 capacitor
El Cajon	69		65.6	72.5	62.1	72.5	<68	2 x 25 capacitor
Los Coches	69		65.6	72.5	62.1	72.5	<68	2 x 50 capacitor
Narrows	69		65.6	72.5	62.1	72.5	<68	1 x 2.4 capacitor
Penasquitos	69		65.6	72.5	62.1	72.5	<68	2 x 50 capacitor
Capistrano	138		131.1	144.9	124.2	144.9	<141	40 capacitor
Palomar	138		131.1	144.9	124.2	144.9	<141	43 capacitor
San Luis Rey	138		131.1	144.9	124.2	144.9	<141	2 x 40 capacitor

Bus	Nominal kV	Optimum Operating Range	Pre-Contingency		Post-Contingency		Fog	Voltage Control - Reactive Resources (MVAR)
			Low Limit[1]	Hi Limit	Low Limit	Hi Limit		
Shadow Ridge	138		131.1	144.9	124.2	144.9	<141	43 capacitor
Telegraph Canyon	138		131.1	144.9	124.2	144.9	<141	43 capacitor
Escondido	230		218.5	241.5	207	241.5		2 x 63 capacitor
Penasquitos	230		218.5	241.5	207	241.5		2 x 63 capacitor
Talega	230		218.5	241.5	207	241.5		3 x 63 capacitor
Miguel	500		498.8	550/575	472.5	550/575		126 reactor
North Gila	500		500	550/575	500	550/575		126 reactor
Generating Plant Bus Voltages								
Encina [8]	138	139 - 141	131.1	144.9	124.2	144.9	< 141	
Encina [8]	230	230 - 231	218.5	241.5	207	241.5		
Encina 1	14.4							-20 / 46
Encina 2	14.4							-20 / 46
Encina 3	14.4							-20 / 45
Encina 4	22							-40 / 122
Encina 5	24							-40 / 168
Palomar Energy	230	230-232	218.5	241.5	207	241.5		
Palomar GTG1	230							-50 / 100
Palomar GTG2	230							-50 / 100
Palomar STG	230							-75 / 150
South Bay	69	71 - 72	65.6	72.5	62.1	72.5	< 68	
South Bay	138	139 - 141	131.1	144.9	124.2	144.9	< 141	
South Bay 1	15							-30 / 37
South Bay 2	15							-30 / 37
South Bay 3	20							-28 / 76
South Bay 4	20							-30 / 89
SONGS	230	227-131	227	231				

Table 5.8.2: Optimum bus voltage at various generator-connected transmission buses.

Transmission Voltage Requirements		
Substation	**Generators**	**Optimum Voltage Range**
Encina	Units 1-4, GT*	139 – 141 kV
	Unit 5	230 – 231 kV
South Bay	Unit 1, GT*	71 – 72 kV
	Units 2-4	139 – 141 kV
Palomar Energy	PP units 1-3	230 – 232 kV
Imperial Valley	TDM units 1-2	230 – 233 kV
Imperial Valley	CLR II units 1-3	230 – 233 kV
Kearny	Kearny GTs PB 1-3*	65.6 – 72.5 kV
Division	NSQF	65.6 – 72.5 kV
Esco	Goal Line QF	65.6 – 72.5 kV
Miramar	MMCT1	
	MR GT1A*&1B	65.6 – 72.5 kV
El Cajon	Cal Peak	
	ECGT	65.6 – 72.5 kV
North Island Metering	NIQF	65.6 – 72.5 kV
Point Loma	NTCQF	65.6 – 72.5 kV
Border	Cal Peak	65.6 – 72.5 kV
	Larkspur 1, 2	65.6 – 72.5 kV
Escondido	Cal Peak	65.6 – 72.5 kV
	MMC	65.6 – 72.5 kV
Otay	MMC	65.6 – 72.5 kV

* Black start units.

5.8.3. Results

Automatic Voltage Control: The requirement for generators to implement automatic voltage control mode of operation is reliability based. During real time operations the operating point may change from one hour to the next as a function of changes in load, resource availability, forced CAISO/SDG&E transmission facility or generator interruptions, and weather. Extreme events, though of perhaps low probability for occurrence, can result in low voltages. Generators operating under automatic voltage control mode can respond very quickly to provide voltage support; either by injecting VARs or absorbing same in less than minutes of response time. The Project, of elementary design as to how the developer intends to implement automatic voltage

control mechanisms, presents itself solely with shunt connected static capacitors. The methodology of controlling the status of these various capacitors was assumed to be manual switching operations. For steady state conditions manual operations are frequently utilized. With manual operation some time elapses before the actual switching action is performed. This can be minutes to tens of minutes. For steady state operation this method is usually satisfactory. Following forced outage interruptions, having to wait for manual switching of shunt capacitors may be too long with respect to increased risk for transmission reliability and security. The capacitive reactive power output from capacitors is a function of the square of the voltage level. Lower voltages mean lower capacitor output. As time elapses post contingency, it becomes increasingly burdensome on the transmission system facilities and operators to raise voltages to new acceptable, though usually not optimal, operating levels.

In addition to effecting voltage control via capacitor switching, this project could also curtail real power output during contingency periods to provide assistance in voltage support. The reduction in the real power output would reduce the inductive MVAR loading of the induction generators thus freeing up capacitive reactive power for voltage support. This option may not be compatible with the business plan of the project as the income stream is largely a function of the real power delivery. Examples of voltage and VAR responses and how mitigation measures might be applied conceptually are illustrated in the plots of simulated contingencies that resulted in low voltage conditions at Imperial Valley 230 kV bus. Refer to Appendix M.

Governor Power Flow Test: Presently within the domain of voltage and reactive power planning, operation, and assessments, one methodology employed to assess suitability of reactive power planning is use of the post transient study methodology, often referred to as the governor power flow test. This methodology assumes that all generators operating with unblocked governors will share the generation deficiency or surplus in proportion to their maximum generating output capabilities until they reach maximum or minimum outputs. Those resources flagged in the model as being base-load resources are not allowed to share in the redistribution of dispatch, be it either in creased or decreased dispatch determinations. Additionally, the automatic actions of system elements which can operate within the 0-3 minute time frame after the disturbance are modeled to hold system voltage or frequency. Manual switching actions by operators are not modeled because they take more time to perform.

In the performance of this test, three levels of system stress are modeled in the analysis. A base load and import (cut- plane or interface flow) level is established and modeled; load +5% and cut-plane +5% scenarios are modeled, and load +2-1/2% and cut-plane +2-1/2% scenarios are modeled. Category A, B, and C contingencies are simulated against these base scenarios; Only Category B outage simulations are performed against the +5% added stress scenarios, and only Category C outage simulations are performed against the +2-1/2% added stress scenarios. Both Cat B and Cat C contingencies are simulated against the base load/import models.

As reported in the Post Transient analysis section of this system impact study report, the post-project performance indicates nine scenario/outage simulations which failed the governor power flow test. These simulation tests and failures result from simulations of the following outages:

Heavy Summer

IV-Central 500 kV line + SPS 6.2 base, load +5%, cut plane +5%.

IV-Central 500 kV line + SPS 6.2 & trip 100 MW of SESS2E generation cut plane +5%.

Windfarm-Miguel + SPS 6.2 base, load +5%, cut plane +5%.

SONGS double unit outage, base case.

Light Winter

IV-Central 500 kV line + SPS 6.1 base.

Post Contingency high or Low Voltage Excursions: Recently SDG&E revised the post contingency voltage limits for Imperial Valley 230 kV bus. The low voltage limit is now 207 kV or 0.9 pu. Based on this change, there are no post-contingency low voltage or high voltage excursions beyond limits identified for simulations performed. Refer to table below:

Busname	Bus kV	Contingency	Criteria	q124_f_rp	q124_f2_noivgens
IMPRLVLY	230	IV-CN 500 kV SPS 6.2 SES 0/0/0 MW/MVARind/MVARcap	1.03		0.928
IMPRLVLY	230	IV-CN 500 kV SPS 6.2 SES 100/75/75 MW/MVARind/MVARcap	1.03	0.934	
IMPRLVLY	500	IV-CN 500 kV SPS 6.2 SES 0/0/0 MW/MVARind/MVARcap	1.03		0.998
IMPRLVLY	500	IV-CN 500 kV SPS 6.2 SES 100/75/75 MW/MVARind/MVARcap	1.03	0.993	

Note: The criteria, indicated as 1.03, was held high to effect reporting of actual voltages even though they may be lower that the real threshold.

Post contingency VAR margin results for above outages:

V. Sch	IMPRLVLY 230 kV bus	
1.020	196.1	208.3
1.010	166.5	175.5
1.000	138.6	144.3
0.990	112.3	115.4
0.980	87.5	90.6
0.970	64.5	67.9
0.960	43.4	47.6
0.950	24.5	29.5
0.940	8.0	14.1
0.930	-5.8	1.9
0.920	-16.9	-7.1
0.910	-24.6	-12.3
0.900	-29.0	-13.3
0.890		-9.0
0.880		2.1
0.870		22.8
0.860		60.2
0.850		133.5

The "blue" contingency simulates the forced outage of the proposed IV-Central 500 kV line followed by action of the SPS 6.2 which trips IVGens interconnected at Imperial Valley 230 plus tripping 100 MW of SES Exp generation and corresponding tripping of the 75 MVARs of 34.5 kV capacitors that support the 75 MVAR inductive load of the generation. The "grey" contingency simulates the same line outage and SPS tripping of IVGens but not the SESS2E generation. Though neither outage simulation results in voltages below post-contingency limits, the VAR margin is quite low with respect to standards SDG&E developed some years back, 150 MVAR of margin post contingency for Cat B outages. To maintain 1.0 pu voltage at Imperial Valley 230 kV bus post contingency, indications are that an additional 140 MVARs of reactive support is required.

Delta Voltage Deviations: In the table below are voltage deviation results indicating that, for Cat B outage simulations, there are deviations attributable to the project which are greater than the reliability limit of 5%:

Busname	Bus kV	Contingency	Criteria	q124_f_rp	q124_f2_noivgens
IMPRLVLY	230	IV-CN 500 kV SPS 6.2 SES 0/0/0 MW/MVARind/MVARcap	0.05		0.084
IMPRLVLY	230	IV-CN 500 kV SPS 6.2 SES 100/75/75 MW/MVARind/MVARcap	0.05	0.07	
IMPRLVLY	500	IV-CN 500 kV SPS 6.2 SES 0/0/0 MW/MVARind/MVARcap	0.05		0.078
IMPRLVLY	500	IV-CN 500 kV SPS 6.2 SES 100/75/75 MW/MVARind/MVARcap	0.05	0.077	

6. Mitigation

Delivery Network Upgrades are required to mitigate the thermal overloads caused by addition of the SES Solar Two Expansion.

6.1. Preferred Mitigation

The preferred mitigation to eliminate the overloads caused by addition of SES Solar Two Expansion includes:

Delivery Network Upgrades

1. adding a third 230/69 kV transformer bank at Sycamore Canyon
2. upgrading the Sycamore Canyon - Chicarita 138 kV TL13820
3. adding a third 500/230 kV transformer bank at Imperial Valley (upgrade identified for Q78)

6.2. Maximum Output without Delivery Network Upgrades

The maximum generation output allowed without the need for Delivery Network Upgrades is 250 MW. Limiting output of this project's generator to 250 MW may not be an acceptable mitigation for this Interconnection Request. Per the LGIP 4.4.2, prior to the return of the executed Interconnection Facility Study Agreement to the CAISO, a 15 percent decrease in the generation output is permitted. A reduction in generation output to 250 MW is greater than permitted under this section, LGIP 4.4.2. If this lower generation level of 250 MW is pursued, the IC must request that the CAISO evaluate whether such a modification is a Material Modification. If it is determined that this reduction is not a Material Modification, the reduction in output will be acceptable. If it is deemed a Material Modification, this Interconnection Request must be withdrawn from the queue and a new Interconnection Request for 250 MW must be submitted.

6.2.1. Methodology

The maximum allowed output without Delivery Network Upgrades is determined using power flow cases that model all Interconnection Facilities and Reliability Network Upgrades for all higher queued projects and SESS2E. The SESS2E output is reduced while existing SDG&E generating resources are increased according to generation dispatch priority to balance resources, until thermal loading on monitored facilities decreases to 99% for all pertinent contingencies.

The thermal loading on the monitored facilities are very dependent upon the specific generating resources that are increased to balance resources in the SDG&E system. Therefore a range of maximum allowed outputs are determined based on generation re-dispatch scenarios that depend on the resources that are available.

The maximum allowed output to reduce the emergency loading on the Imperial Valley 500/230 kV transformer bank 81 is 360 MW for light winter conditions using Encina 230

kV area generation to balance load and resources in SDG&E's transmission system. The maximum allowed output to reduce the emergency loading on the Sycamore Canyon - Chicarita 138 kV TL13820 is 250 MW using Encina 230 kV area generation to balance load and resources in SDG&E's transmission system. The maximum allowed output to reduce the emergency loading on the Sycamore Canyon - Chicarita 138 kV TL13820 is 625 MW using Encina 138 kV area generation to balance load and resources in SDG&E's transmission system.

For the loading of the Sycamore 230/69 kV transformers, the maximum allowed output of the SESS2E is 400 MW using Encina 5/230 kV system; or a limit of 300 MW of SESS2E dispatch if using the Encina 138 kV generation (EA 3 & 4).

In summary, the range of maximum allowed output without Delivery Network Upgrades is 250 MW - 360 MW.

7. Local Furnishing Bonds/Industrial Development Bonds

SDG&E has financed or refinanced substantial portions of its wholly-owned transmission and distribution systems with proceeds from $687,000,000 of outstanding Local Furnishing Bonds ("LFBs") issued by the City of San Diego and the City of Chula Vista. This includes (without limitation) a portion of the costs of SDG&E's wholly-owned Miguel - Imperial Valley 500 kV transmission line and a portion of SDG&E's wholly-owned portion of the Miguel – Tijuana 230 kV transmission line. Interest on these LFBs is tax-exempt. If the proposed Project would impair the tax-exempt status of interest on these LFBs under the Internal Revenue Code, Treasury Regulations and applicable IRS private letter rulings (an "Impairment"), the IC will be required to pay any costs SDG&E incurs in mitigating the Impairment.

SDG&E undertook an analysis of the SES Solar Two Expansion Project (Project) to determine if an Impairment might arise. This analysis consisted of comparing the flows on LFB-funded facilities pre- and post-project, where the Project is dispatched taking into account the following scenarios:

1. Internal generation directly connected to SDG&E's T/D System ,
2. External generation in the IID/WAPA control areas, and
3. External generation owned in whole or in part by SDG&E that is remote from the T/D System.

The results of the pre- and post-project analysis are summarized in Table 7.1.

Table 7.1: Flows on LFB-funded facilities, pre- and post-project.

		Line Flows (MW)				
	Rating (MVA)	Pre-project	Dispatched against SDG&E Internal Generation @ So. Bay	Dispatched against SDG&E Internal Generation @ Encina	Dispatched against IID/WAPA generation	Dispatched against remote generation
Imperial Valley-Windfarm 500 kV	**2252**	571	762	726	595	632
Windfarm-Miguel 500 kV	**2598**	1024	1214	1178	1048	1084
Otay Mesa-South Bay 230 kV	**912**	478	626	554	499	519
South Bay-Silvergate 230 kV	**912**	774	620	848	795	814
Otay Mesa-Sycamore Canyon 230 kV	**797**	282	272	322	296	305
Otay Mesa-Tijuana 230 kV	**797**	-263	-360	-340	-277	-303

A GridView production modeling analysis was performed to determine the post-project cumulative annual net inbound flow. For the purposes of this analysis, any generation not owned in whole or in part by SDG&E that is connected at the Imperial Valley 230 kV bus is not treated as internal generation for purposes of determining cumulative annual net inbound flows because it is anticipated it will not be directly connected to SDG&E's wholly owned T/D System.

The results of the net inbound flow analysis are summarized in Table 7.2.

Table 7.2: Summary of Net Inbound Flow analysis.

	Net Inbound (Outbound) Flows (GW-hr)
Net Imperial Valley-Miguel Import	6199
Net Path 44 Import (South of SONGS)	(422)
Net Tijuana-Otay Mesa Import	(1569)
Net Sunrise Power Link Import	3590
Net Lake Elsinore Import	(1523)
20% SDG&E San Onofre Generation	(3767)
Q106A Net Generation	(411)
Q112 Net Generation	(771)
Net Inbound (Outbound) Flow	**1326**

Based on this analysis, SDG&E's present reasonable expectation in connection with the SES Solar Two Expansion Project is that (1) it will not need to construct any facilities sooner, larger, more costly or of a different design than are needed for the purpose of providing electric service to SDG&E's retail electric customers; and (2) the actual and deemed flows of electricity into and out of SDG&E's wholly-owned electric T/D System in San Diego, Orange and Imperial Counties will not become outbound on a net annual basis with the addition of the SES Solar Two Expansion Project. These present expectations will continue to be monitored to determine if they remain reasonable based on any change in material facts which are relevant to determining whether an Impairment may arise. Further, the Project is advised that under the CAISO Tariff and Transmission Control Agreement (TCA), the CAISO is obligated to effect such remedial measures as might be available to avoid an Impairment that would otherwise trigger a redemption or defeasance of the LFBs.

8. Estimated Costs

According to the CAISO LGIP study process, the role and responsibilities of SDG&E for this Interconnection System Impact Study are as follows:

1. Identify transmission constraints attributable to the proposed SES Solar Two Expansion Project,
2. Develop and provide non-binding, good faith estimate of cost and cost responsibility for the Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades identified in this study,
3. Determine fair and reasonable cost allocations across the various queued projects in the Future Year model with respect to the proposed project.

Cost estimates developed within this study are considered to be preliminary, non-binding, good faith and include the following assumptions:

1. Project concepts are based on representations from the Interconnection Customer.
2. Project concepts are based on mandatory reliability criteria from applicable reliability and regulatory authorities (NERC, WECC, and CAISO).
3. Project concepts are based on sound engineering judgment.
4. All costs are based on SDG&E construction methods and techniques.
5. All costs are in "as year spent" dollars.
6. All costs included in this report are valid for 90 days only.

Table 8.1 summarizes the scope of transmission reinforcements identified in this study and the associated preliminary, non-binding, good faith costs of construction of the facilities. The costs reflect a 2011 in-service date.

Table 8.1: Non-Binding, Good Faith Cost Estimate Summary.

Good Faith/Non-Binding Estimate of Cost

Type	Description	Estimated Cost (X $1000)
PTO's Interconnection Facilities	Conductor to connect from Point of Change of Ownership (Imperial Valley substation fence) to the Point of Interconnection.	$175
Reliability Network Upgrades	Imperial Valley 230 kV: Install two 230 kV circuit breakers, associated disconnects, bus work, protection, and control apparatus.	$7,397
Subtotal	***Interconnection Facilities & Reliability Network Upgrades***	***$7,572***
Delivery Network Upgrades	Add transformer bank 72, 230/69 kV, 224 MVA, TCUL capable transformer bank and associated circuit breakers, disconnects, bus work, protection, and control Apparatus at Sycamore 230/138/69 kV substation.	$17,995
Delivery Network Upgrades	Upgrade the 138 kV transmission line TL13820 (Sycamore-Chicarita) to a continuous rating of 250 MVA (nominal) from bus-to-bus. **/1**	$54,860
Delivery Network Upgrades	Install 500/230 kV, 1120 MVA transformer bank 82 at Imperial Valley Substation; including two 500 kV breakers and associated disconnect switches, bus work, two 230 kV circuit breakers, and associated disconnects, bus work, protection devices and controls. Convert the existing 500 kV ring bus to breaker-and-a-half by installing two 500 kV circuit breakers and disconnects in bay 1, install associated controls and protection equipment. **/2**	$59,894
Subtotal	***Delivery Network Upgrades***	***$132,749***
Total	***PTO's Interconnection Facilities, Reliability & Delivery Network Upgrades***	***$140,321***

Notes

/1 The costs listed for upgrade TL13820 were estimated as part of the Sunrise 500 kV project. These dollars only represent the cost of facilities for replacement in kind (i.e. same rating of 204 MVA results) of the existing 138 kV line. However, the costs to upgrade TL13820 to 250 MVA capability are minor by comparison. If the Sunrise project is not constructed, the responsibility to fund the upgrade of TL13820 falls to the Q124 project.

/2 The costs to install a third Imperial Valley transformer as a Delivery Network Upgrade were also identified for the SES Solar II 300 MW project, Q78. Should that project go forward, the Q78 project may/may not choose to fund the IV Bank 82 upgrade. If not, the option would fall to the next interconnection project for which the same constraint/upgrade is required.

8.1. Participating PTO's Interconnection Facilities

The PTO's Interconnection Facilities are all the facilities and equipment owned, controlled, or operated by SDG&E from the Point of Change of Ownership to the Point of Interconnection (see Figure 8.1). The Point of Interconnection is the 230 kV bus at the SDG&E Imperial Valley Substation. The Point of Ownership Change is the Imperial Valley 230 kV fence line.

Figure 8.1: SES Solar II Expansion, Interconnection and Reliability Network Upgrades.

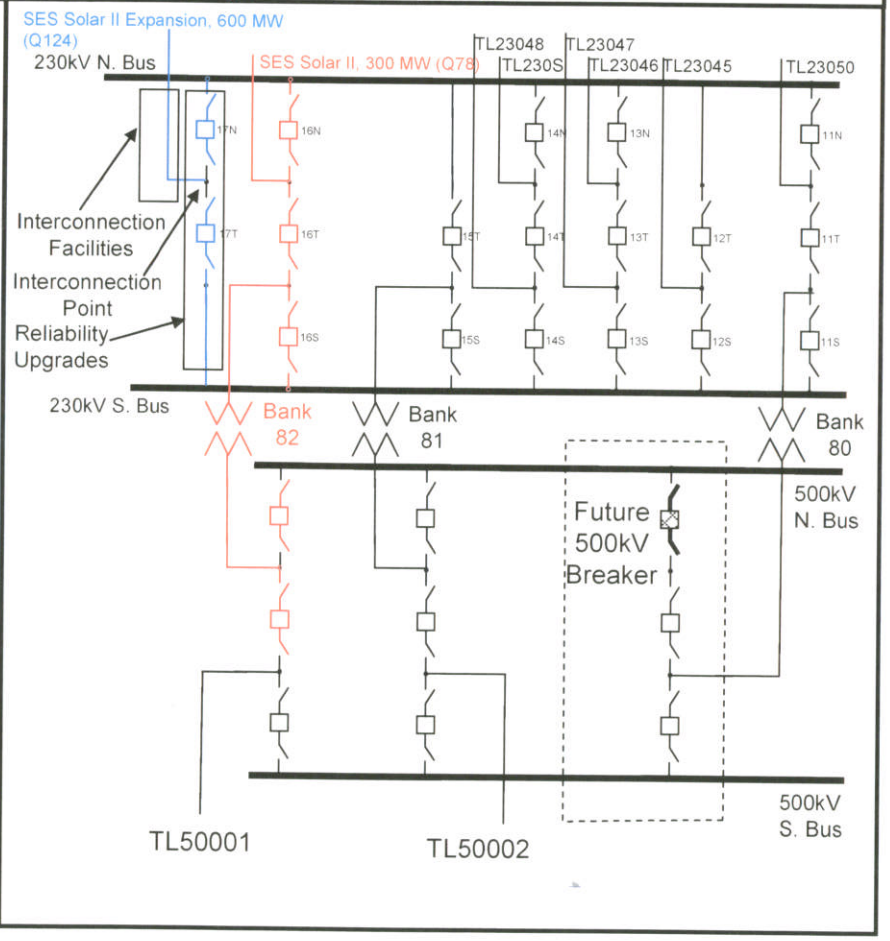
Project: Interconnection Request Q124, Imperial Valley Substation, 600 MW Solar

SCOPE:
Install two 230kV breakers, associated disconnects, buswork, protection and control apparatus, and conductor from point of interconnection to substation fence.

PRIOR WORK: SES Solar II 300 MW project is colored red on diagram.

NEW WORK: SES Solar II 600 MW Expansion is colored blue on diagram.

IN-SERVICE DATE:
June 2011



The following PTO's Interconnection Facilities are required for the SES Solar Two Expansion Project:

Conductor to connect from Point of Change of Ownership (Imperial Valley substation fence) to the Point of Interconnection.

According to the current CAISO Tariff, the IC is obligated to pay $175,000 for the PTO's Interconnection Facilities.

8.2. Reliability Network Upgrades

Reliability Network Upgrades include substation work at the Imperial Valley Substation:

Installation of two 230 kV circuit breakers and associated disconnects, also bus work, protection and control.

According to the current CAISO Tariff, the IC is obligated to pay $7,397,000 for the upgrade of transmission constraints identified as Reliability Network Upgrades.

8.3. Delivery Network Upgrades

The thermal analysis identified two facilities that overload during simulated steady state operating conditions:

Existing 230/69 kV transformer banks 70 and 71 at Sycamore Canyon

The overloading condition of these facilities is attributed to the interconnection of the SES Solar Two Expansion Project. The preferred mitigation includes:

1. adding a third 230/69 kV TCUL capable transformer bank at Sycamore Canyon

Adding a third 230/69 kV transformer bank at Sycamore Canyon eliminates the normal overloads on the two existing transformer banks. This upgrade eliminates the normal overload caused by the addition of the SES Solar Two Expansion Project.

The thermal analysis identified two overloaded facilities attributed to the interconnection of the SES Solar Two Expansion Project for Category B Contingencies. The preferred mitigation includes:

1. upgrading the Sycamore Canyon - Chicarita 138 kV TL13820
2. adding a third 500/230 kV transformer bank at Imperial Valley (upgrade identified for Q78)

If the upgrades require the advancement of the transmission projects that would still be needed without the proposed generation, as part of SDG&E's plan to reliably serve customer loads, the IC's obligation for funding would be limited to the incremental construction costs, accounting for the time value of money associated with building the planned upgrades sooner than would have been required without MEF II's proposed generation.

According to the current CAISO Tariff, the IC is has the option to fund $132,749,000 for the upgrade of transmission constraints identified as Delivery Network Upgrades. Upon approval by the CAISO, if the IC does not choose to upgrade SDG&E's transmission facilities to mitigate the identified Delivery Network related transmission constraints, the IC will be obligated to install a Special Protection System (SPS) to trip project

generation for selected contingencies to eliminate overloading Sycamore Canyon - Chicarita 138 kV TL13820 and Imperial Valley 500/230 kV transformer bank 81 and operate with the reduced output for overload of the Sycamore Canyon 230/69 kV transformers.

Operating procedures which may include curtailing the output of the project during planned or extended forced outages may be required in order to operate reliably. However, identification of the operating procedures is outside the scope of this study.

In addition, the System Impact Study identified insufficient reactive margin for some outages that may require installation of additional reactive support. The need for reactive support, its type, amount and locations will need to be re-evaluated in the Facilities Study. Cost of the additional reactive support, if needed, will be estimated in the Facilities Study.

8.4. Repayment of Amounts Advanced for Network Upgrades

Upon the Commercial Operation Date, the Interconnection Customer shall be entitled to a repayment for the cost of Network Upgrades. Such amount shall be paid to the Interconnection Customer by SDG&E on a dollar-for-dollar basis either through (1) direct payments made on a levelized basis of the five-year period commencing on the Commercial Operation Date; or (2) any alternative payment schedule that is mutually agreeable to the Interconnection Customer and SDG&E; provided that such amount is paid within five (5) years of the Commercial Operation Date. Any repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 C.F.R§35.19a(a)(2)(iii) from the date of any payment for Network Upgrades through the date on which the Interconnection Customer receives a repayment of such payment. The Interconnection Customer may reassign such repayment to any person.

9. Estimated Time to Construct

The length of time that SDG&E needs to design, procure, and construct and/or upgrade a generation project's Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades is a preliminary, non-binding, good-faith effort to estimate the total construction time. These estimates are dependent on many factors (when applicable), including but not limited to:

1. Whether an exemption can be obtained from the California Public Utilities Commission's (CPUC's) G.O. 131-D Certificate of Public Convenience and Necessity (CPCN) process,
2. Whether an exemption can be obtained from the CPUC's Permit to Construct (PTC) process,
3. Whether the IC chooses to permit the project through the California Energy Commission (CEC) and is issued an Application for Certification (AFC),
4. Whether the IC intends to fund the Delivery Network Upgrades, and/or
5. Whether the IC chooses to build its own Interconnection Facilities.

The outcome of these processes and/or IC project/business decisions could increase cost and/or construction duration. Absent an exemption, the process of obtaining the CPUC's approval could take one to two years, or even longer.

The estimated time to construct/upgrade the identified facilities summarized in Table 9.1 below does not include the time needed for environmental review and permitting. The estimated time SDG&E needs to design, procure and construct the facilities is listed in the table. The design phase does not typically start until successful completion of the Large Generator Interconnection Agreement (LGIA).

The proposed in-service date of January 1, 2011 and commercial operation date of March 1, 2011 appear to be feasible considering the time needed to complete the Interconnection Facilities Study, the LGIA, and construction of the Interconnection Facilities, Reliability and Delivery Network Upgrades (including potential environmental review, permitting, design, procurement, and construction).

Per Section 9 of the LGIP, an Engineering & Procurement (E&P) Agreement may be utilized prior to executing an LGIA. The E&P Agreement authorizes the PTO to commence engineering and procurement of long lead-time items necessary for the interconnection. The IC may want to consider this optional procedure to meet the in-service date.

Table 9.1: Non-Binding, Good Faith Estimated Time to Construct.

Good Faith/Non-Binding Estimate of Time-to-Construct

Type	Description	Estimated Time to Construct /3
PTO's Interconnection Facilities	Conductor to connect from Point of Change of Ownership (Imperial Valley substation fence) to the Point of Interconnection.	6 mos.
Reliability Network Upgrades	Imperial Valley 230 kV: Install two 230 kV circuit breakers, associated disconnects, bus work, protection, and control apparatus.	18 mos.
Subtotal	***Interconnection Facilities & Reliability Network Upgrades***	***18 mos.***
Delivery Network Upgrades	Add transformer bank 72, 230/69 kV, 224 MVA, TCUL capable transformer bank and associated circuit breakers, disconnects, bus work, protection, and control Apparatus at Sycamore 230/138/69 kV substation.	24 mos.
Delivery Network Upgrades	Upgrade the 138 kV transmission line TL13820 (Sycamore-Chicarita) to a continuous rating of 250 MVA (nominal) from bus-to-bus. **/1**	18 mos.
Delivery Network Upgrades	Install 500/230 kV, 1120 MVA transformer bank 82 at Imperial Valley Substation; including two 500 kV breakers and associated disconnect switches, bus work, two 230 kV circuit breakers, and associated disconnects, bus work, protection devices and controls. Convert the existing 500 kV ring bus to breaker-and-a-half by installing two 500 kV circuit breakers and disconnects in bay 1, install associated controls and protection equipment. **/2**	36 mos.

Notes

/1 The costs listed for upgrade TL13820 were estimated as part of the Sunrise 500 kV project. These dollars only represent the cost of facilities for replacement in kind (i.e. same rating of 204 MVA results) of the existing 138 kV line. However, the costs to upgrade TL13820 to 250 MVA capability are minor by comparison. If the Sunrise project is not constructed, the responsibility to fund the upgrade of TL13820 falls to the Q124 project.

/2 The costs to install a third Imperial Valley transformer as a Delivery Network Upgrade were also identified for the SES Solar II 300 MW project, Q78. Should that project go forward, the Q78 project may/may not choose to fund the IV Bank 82 upgrade. If not, the option would fall to the next interconnection project for which the same constraint/upgrade is required.

/3 Total time-to-construct can vary depending on which Delivery Network Upgrades are funded. Time-to-construct does not include the time for obtaining required federal, state and local licenses or permits.

10. Re-Study

Potential for re-study of the ISIS exists and may be required due to a higher-queued project dropping out of the queue or a modification of a higher-queued project, or any other effective change in information which necessitates a re-study. If this possibility materializes SDG&E shall so notify the IC and the CAISO in writing. Upon receipt of such notice, the IC shall provide SDG&E, within ten (10) business days, a written request that the Participating TO either (i) terminate the study and withdraw the Interconnection Request; or (ii) continue the study. If the IC requests SDG&E to continue the study, the IC shall pay an additional $10,000 deposit for the re-study along with providing written notice for the study to continue. Such re-study shall take no longer than sixty (60) calendar days from the date written notice is received to continue the study and payment of the additional $10,000 deposit. Study results will be shared for review. Comments will be incorporated and a final study report will be issued within eighty (80) calendar days following receipt of the IC's written notice to continue the study and payment of the additional $10,000 deposit. If SDG&E and/or the CAISO is unable to complete the ISIS within that additional eighty (80) calendar days time period, SDG&E shall notify the IC and provide an estimated completion date with an explanation of the reasons why additional time is required. Any and all costs of a re-study shall be borne by the IC.

Appendix A

Definitions

CPUC CPCN	California Public Utilities Commission Certificate Of Public Convenience and Necessity.
Category A Contingency	All facilities in service, no contingency.
Category B Contingency	Event resulting in the loss of a single element. *(The CAISO considers the loss of a critical generator followed with re-dispatch of the remaining system generation and the subsequent loss of any single element as a Category B contingency.)*
Category C Contingency	Event resulting in the loss of two or more (multiple) elements.
Category D Contingency	Extreme event resulting in two or more (multiple) elements removed or cascading out of service.
Delivery Network Upgrades	Transmission facilities at or beyond the Point of Interconnection, other than Reliability Network Upgrades, identified in the Interconnection Studies to relieve constraints on the ISO Controlled Grid.
Interconnection Facilities	The Participating TO's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to the ISO Controlled Grid. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.
Interconnection Customer	Any entity, including a Participating TO or any of its Affiliates or subsidiaries, that proposes to interconnect its Generating Facility with the ISO Controlled Grid.

Interconnection Customer's Interconnection Facilities	All facilities and equipment, as identified in Part A of the Standard Large Generator Interconnection Agreement, that are located between the Generating Facility and the Point of Change of Ownership, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the ISO Controlled Grid. Interconnection Customer's Interconnection Facilities are sole use facilities.
Participating TO's Interconnection Facilities	All facilities and equipment owned, controlled, or operated by the Participating TO from the Point of Change of Ownership to the Point of Interconnection as identified in Part A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Participating TO's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.
Reliability Network Upgrades	The transmission facilities at or beyond the Point of Interconnection necessary to interconnect a Large Generating Facility safely and reliably to the ISO Controlled Grid, which would not have been necessary but for the interconnection of the Large Generating Facility, including Network Upgrades necessary to remedy short circuit or stability problems resulting from the interconnection of the Large Generating Facility to the ISO Controlled Grid. Reliability Network Upgrades also include, consistent with WECC practice, the facilities necessary to mitigate any adverse impact the Large Generating Facility's interconnection may have on a path's WECC rating.

Appendix B

CAISO Controlled Grid Generation Queue

The California ISO Controlled Grid Generation Queue
as of: July 26, 2006

				Generating Facility		Maximum MWs		Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	County	State	Utility	Station or Transmision Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study (SIS)	Facility Study (FAS)	Optional Study (OS)	Interconnection Agreement Status
1	9/30/1998	9/30/1998	Active	WT	W	16.5		Riverside	CA	SCE	Devers-Garnet 115 kV line (Tap)	3/1/1999	3/31/2007	NA	Complete	Complete		
1A	11/1/1999	11/1/1999	Active	CC	NG	550	550	San Diego	CA	SDGE	Miguel Substation	3/1/2002	1/1/2008	N/A	Complete	Complete		GSFA Executed
2	8/10/1999	2/3/2000	Active	CC	NG	590		Contra Costa	CA	PGE	Contra Costa Power Plant 230 kV bus	11/28/2007	11/1/2009	N/A	Complete	Complete		
3	4/21/2000	6/14/2000	Active	CC	NG	850		Riverside	CA	SCE	Devers Substation 230 kV Bus	1/1/2004	5/1/2008	NA	Complete	Restudy		
4	8/8/2000	8/8/2000	Complete	CC	NG	521	545	San Diego	CA	SDGE	Palomar 230 kV	6/1/2001	10/15/2005	NA	Complete	Complete		Executed
5	8/9/2000	8/9/2000	Active	CC	NG	900		San Diego	CA	SDGE	Encina Power Plant Switchyard	6/30/2003	6/1/2008	NA	Complete	In Progress		
6	8/23/2000	8/23/2000	Active	CC	NG	1156		San Joaquin	CA	PGE	Tesla Substation 230 kV Bus E	6/1/2008	6/1/2008	NA	Complete	In Progress		
7	8/16/2000	10/6/2000	Active	CC	NG	280		Los Angeles	CA	SCE	El Segundo 220 kV Bus	3/1/2003	9/1/2009	NA	Complete	Complete		
8	11/28/2000	11/28/2000	Active	CC	NG	750		San Diego	CA	SDGE	Sycamore Canyon Substation	6/1/2004	12/31/2010	NA	Complete	In Progress		
9	12/1/2000	12/1/2000	Active	CC	NG	1200		San Luis Obispo	CA	PGE	Morro Bay Substation	1/1/2008	1/1/2008	NA	Complete	Complete		
10	5/2/2001	5/2/2001	Active	CC	NG	620		Kings	CA	PGE	Gates Substation (Arco - Gates 230 kV line)	1/1/2009	7/1/2009	NA	Complete	Complete		GSFA Executed
11	10/14/2002	10/23/2002	Active	WT	W	63		San Bernardino	CA	SCE	Mountain Pass Substation	12/1/2004	3/1/2008	NA	Complete	Complete		
12	12/16/2002	12/16/2002	Active	WT	W	150		Solano	CA	PGE	New Birds Lndng Sw Stn near Contra Costa PP Sub	10/31/2005	3/30/2006	NA	Complete	Complete		GSFA Executed
13	1/3/2003	1/3/2003	Active	H	WTR	40		San Diego	CA	SDGE	Escondido	7/1/2007	7/1/2007	NA	Complete	Complete		
14	1/7/2003	1/7/2003	Active	CC	NG	65		San Diego	CA	SDGE	Miguel-Tijuana * (65 MWs -additional capacity, 615 total MW)	12/31/2004	1/1/2008	NA	Complete	Complete		
15	12/31/2002	1/17/2003	Active	WT	W	50		San Bernardino	CA	SCE	Mountain Pass	9/1/2004	12/31/2007	NA	Complete	Complete		
16	3/11/2003	3/11/2003	Active	WT	W	120		Santa Barbara	CA	PGE	Cabrillo	6/1/2006	10/1/2008	NA	Complete	Complete		GSFA Executed
17	3/18/2003	3/18/2003	Active	CC	NG	520		Riverside	CA	SCE	Devers-Palo Verde 500 kV line near Blythe	1/1/2006	6/1/2008	NA	In Progress			
~~18~~	~~4/15/2003~~	~~4/15/2003~~	**WITHDRAWN**	~~WT~~	~~W~~	~~200~~		~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope~~	~~12/31/2005~~	~~12/12/2007~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
19	6/4/2003	6/18/2003	Complete	WT	W	46		San Diego	CA	SDGE	Crestwood	12/31/2005	10/1/2005	NA	Complete	Complete		Executed
20	8/19/2003	9/4/2003	Active	WT	W	300		Kern	CA	SCE	Antelope	12/31/2006	12/31/2008	NA	Complete	Complete		
21	10/3/2003	10/23/2003	Active	WT	W	37.55		Byron	CA	PGE	Windmaster/Buena Vista Sub	7/1/2004	1/27/2006	NA	n/a	n/a		
22	11/18/2003	11/18/2003	Active	WT	W	38		Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	6/30/2005	3/1/2007	NA	Complete	Complete		
23	11/17/2003	11/24/2003	Complete	CC	NG	72		San Bernardino	CA	SCE	San Bernadino * 72 Additional MW	11/1/2004	10/1/2005	NA	Complete	Complete		Executed
24	1/30/2004	1/30/2004	Active	WT	W	150		Solano	CA	PGE	High Winds/Contra Costa PP	12/31/2006	12/31/2006	NA	Complete	Complete		GSFA Executed
25	2/5/2004	2/5/2004	Active	WT	W	117		San Diego	CA	SDGE	Crestwood	6/6/2005	6/1/2007	NA	In Progess			
26	2/12/2004	2/12/2004	Active	WT	W	36		San Diego	CA	SDGE	Crestwood	4/1/2006	1/1/2008	NA				
27	2/23/2004	2/23/2004	Active	CC	NG	650		San Diego	CA	SDGE	138/69 kV South Bay (650 MW CC)	1/1/2010	1/1/2010	NA	Complete	In Progress		
28	2/25/2004	2/25/2004	Active	CT	NG	145.1		San Francisco	CA	PGE	Potrero 115 kV Sub	12/1/2006	6/1/2008	NA	Complete	Complete		Executed
29	3/8/2004	3/29/2004	Active	WT	W	201		Lake & Sonoma	CA	PGE	Collector Substation at Geysers #17 & Fulton 230 kV line	12/1/2006	12/1/2006	NA	Complete	Complete		Tendered
30	4/26/2004	4/26/2004	Active	CT	NG	48.7		San Francisco	CA	PGE	SF Airport Substation	6/1/2006	6/1/2008	NA	Complete	Complete		
31	4/12/2004	5/11/2004	Active	WT	W	201		Kern	CA	SCE	Monolith Substation	12/31/2007	12/31/2009	NA	Complete	In Progress		
32	5/12/2004	5/24/2004	Active	WT	W	201		San Diego	CA	SDGE	Boulevard - Crestwood 69-kV transmission line	9/1/2007	9/1/2007	NA	In Progess			
33	7/9/2004	7/12/2004	Active	ST	G	10		Curchill	NV	SCE	Bishop Control Sub	7/14/1988	5/31/2006	NA	Complete	Complete		
34	7/19/2004	7/19/2004	Active	WT	W	300		Kern	CA	SCE	Monolith Substation	7/1/2007	12/31/2009	NA	Complete	In Progress		
35	10/25/2004	10/25/2004	Active	CT	NG	49.9		Fresno	CA	PGE	115 KV Panoche Sub	5/31/2006	5/31/2006	NA	Complete	Complete		Tendered
36	11/1/2004	11/1/2004	Active	CT	NG	99.9		Stanislaus	CA	PGE	115 kV Tesla - Stockton Cogen Trans. Line.	5/31/2006	5/31/2006	NA	Complete	Complete		Tendered
37	11/8/2004	11/8/2004	Active	CT	NG	96.9		San Joaquin	CA	PGE	Tesla Substation	1/1/2007	1/1/2007	NA	Complete	Complete		Tendered
38	10/19/2004	11/11/2004	Active	IC	NG	146.4		Humboldt	CA	PGE	Humboldt Power Plant Substation	8/1/2008	7/1/2008	NA	Complete	Tendered		
39	11/11/2004	11/11/2004	Active	WT	W	200		Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	12/31/2008	12/31/2008	NA	Complete	Complete		
40	10/19/2004	11/11/2004	Active	IC	NG	118		Alameda	CA	PGE	Eastshore Substation	5/1/2007	3/1/2007	NA	Complete	Complete		Tendered
41	11/9/2004	11/18/2004	Active	CT	NG	158.8		Kern	CA	SCE	Pastoria Substation	7/31/2006	7/31/2006	NA	Complete	In Progress		
42	11/24/2004	11/26/2004	Active	CT	NG	300		Fresno	CA	PGE	McCall Substation	5/31/2007	4/30/2007	NA	Complete	In Progress		
~~43~~	~~11/29/2004~~	~~11/29/2004~~	**WITHDRAWN**	~~IC~~	~~NG~~	~~168.7~~		~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla-Bellota 230 kV line~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~			~~Tendered~~
~~44~~	~~11/29/2004~~	~~11/29/2004~~	**WITHDRAWN**	~~IC~~	~~NG~~	~~126.5~~		~~Madera~~	~~CA~~	~~PGE~~	~~Borden Substation 230 kV Bus~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~	~~Complete~~		
45	12/1/2004	12/1/2004	Active	CT	NG	361		Alameda	CA	PGE	Eastshore substation	7/31/2007	6/1/2010	NA	Complete	Re-study in Progress		
46	12/1/2004	12/1/2004	Active	CT	NG	531		Contra Costa	CA	PGE	Tesla-Tracy #1 230 kV Line - Tracy Sub	7/31/2006	7/31/2008	NA	Complete	Complete		
47	12/1/2004	12/1/2004	Active	CT	NG	200.6		Fresno	CA	PGE	Herndon - Kearney 230 kV line	6/30/2008	6/30/2008	NA	Complete	Complete		Tendered
~~48~~	~~12/1/2004~~	~~12/1/2004~~	**WITHDRAWN**	~~5~~	~~NG~~	~~590~~		~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Power Plant 230 kV Substation~~	~~1/1/2008~~	~~10/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
49	12/14/2004	12/14/2004	Active	WT	W	100.5		Riverside	CA	SCE	Devers Substation	12/1/2006	12/1/2006	NA	Complete	In Progress		
50	12/21/2004	12/21/2004	Active	CC	NG	810		Riverside	CA	SCE	SCE Valley Substation	5/31/2008	5/31/2008	NA	Complete			
51	12/20/2004	12/21/2004	Active	IC	NG	0.55		Fresno	CA	PGE	70 kV Kerman-Helm transmission line	4/30/2005	5/31/2006	NA	n/a	n/a		
52	12/1/2004	12/21/2004	Active	CT	NG	401		Fresno	CA	PGE	Panoche Sub Station	6/30/2008	7/1/2008	NA	Complete	Complete		Tendered
53	12/1/2004	12/22/2004	Active	CT	NG	116.8		Placer	CA	PGE	Pleasant Grove Sub Station	6/1/2008	6/1/2008	NA	Complete	Complete		Tendered
54	11/11/2004	1/12/2005	Active	CT	NG	104		Fresno	CA	PGE	Panoche Substation	6/1/2008	6/1/2008	NA	Complete	In Progress		
55	12/1/2004	1/13/2005	Active	CC	NG	791		Fresno	CA	PGE	Helm substation	7/31/2008	7/31/2008	NA	Complete			

Notes:

This Queue posting reflects the requirements of the FERC Order 2003 for Large Generator Interconnection Procedures (LGIP).
Generator Interconnection Requests or applications Completed or Withdrawn prior to this posting are not shown.
Future withdrawals will be indicated in the Application Status as Withdrawn and their Queue position will be retired.
Weekly posting is anticipated.

Legend:

- **Generator Type Key:** IC-Internal Combustion, ST=Steam Turbine, CT=Combustion Turbine, CC=Combined Cycle, H=Hydro, WT=Wind Turbine, PV=Photovoltaic
- **Fuel Type Key:** W=Wind, NU=Nuclear, NG=Natural Gas, O=Oil, C=Coal, B=Biomass, S=Solar, LFG=Land Fill Gas, WTR=Water

				Generating Facility		Maximum MWs		Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study (SIS)	Facility Study (FAS)	Optional Study (OS)	Interconnection Agreement Status
56	12/21/2004	1/25/2005	Active	CC	NG	634		Clark	NV	PGE	El Dorado 230 kV Substation	6/1/2007	6/1/2007	NA	Complete	Complete		
57	12/1/2004	2/8/2005	Active	CC	NG	715		Colusa	CA	PGE	Between Cottonwood and Vaca-Dixon	1/1/2010	1/1/2010	NA	Complete	Complete		Tendered
58	1/25/2005	2/22/2005	Active	ST	G	90		Mineral	NV	SCE	Dixie-Valley-Oxbow 220	10/7/2007	10/7/2007	NA	Complete	In Progress		
59	3/25/2005	3/28/2005	Active	CT	NG	97.2		Kings	CA	PGE	Henrietta Substantion 70 kV	1/1/2008	1/1/2008	NA	Complete	Complete		Tendered
60	3/28/2005	3/28/2005	Active	CT	NG	94		Kern County	CA	PGE	Kern Oil Substation 115 kV	3/31/2007	1/31/2009	NA	Complete	Complete		
61	3/28/2005	3/30/2005	Active	ST	NG	73.27		Fresno	CA	PGE	70kV Helm-Kerman	5/31/2006	5/31/2006	NA	Complete	Complete		Executed
~~62~~	~~3/28/2005~~	~~4/13/2005~~	WITHDRAWN	~~CC~~	~~NG~~	~~166.5~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay Humboldt #1 115 kV~~	~~5/31/2007~~	~~6/1/2007~~	~~NA~~		~~Agreement Tendered~~		
63	3/25/2005	4/18/2005	Active	CC	NG	158		Contra Costa	CA	PGE	Contra Costa (230 kV)	1/1/2008	1/1/2008	NA	Complete	Re-study in Progress		Tendered
~~64~~	~~3/30/2005~~	~~4/28/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~147~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay Power Plant Sub~~	~~5/1/2008~~	~~3/1/2008~~	~~NA~~	~~Complete~~			
65	5/6/2005	5/6/2005	Active	CT	NG	424.8		Los Angeles	CA	SCE	Long Beach Gen Station 220kv switchyard	1/1/2007	1/1/2007	NA	Complete	Complete		
66	5/6/2005	5/6/2005	Active	CT	NG	500.5		Los Angeles	CA	SCE	Walnut Substation	9/1/2007	9/1/2007	NA	Complete	Complete		
67	3/28/2005	5/9/2005	Active	CC	NG	245		Alameda	CA	PGE	Eastshore Substation	7/31/2008	7/31/2008	NA	Complete	Re-study in Progress		
68	3/30/2005	5/11/2005	Active	Other	S	850		San Bernadino	CA	SCE	Pisgah 230 kV Substation	1/31/2008	1/31/2008	Waived	Complete	Tendered		
~~69~~	~~5/6/2005~~	~~6/7/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~527~~		~~San Bernardino~~	~~CA~~	~~SCE~~	~~Etiwanda 230kV Substation~~	~~8/1/2008~~	~~8/1/2008~~	NA	~~Complete~~			
70	5/9/2005	6/14/2005	Active	IC	LFG	10.7		San Mateo	CA	PGE	Hillsdale Junction-Half Moon Bay 60 kV line	12/23/2005	4/1/2006	NA	Complete	Complete		Tendered
~~71~~	~~5/6/2005~~	~~6/15/2005~~	WITHDRAWN	~~CC~~	~~NG~~	~~591~~		~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado 500/230kV Substation~~	~~2/28/2007~~	~~1/31/2007~~	~~Complete~~	~~Tendered~~			
72	4/26/2005	6/21/2005	Active	H	WTR	500		Riverside	CA	SCE/SDGE	Proposed Lee Lake Substation	12/31/2008	12/31/2008	NA	Complete	Tendered		
73	6/6/2005	6/27/2005	Active	WT	W	250		Kern	CA	SCE	Antelope Sub	12/31/2007	12/31/2008	Waived	In Progress			
74	7/12/2005	7/12/2005	Active	WT	W	125		Shasta	CA	PGE	230kV line btn Pit#3 & Round Mtn	12/15/2007	12/15/2007	Complete	Complete			
75	4/28/2005	7/15/2005	Active	ST	B	10.5		Madera	CA	PGE	Le Grand-Chowcilla 115 kV	12/31/2005	12/31/2006	NA	Complete	Complete		Tendered
76	4/28/2005	7/15/2005	Active	ST	B	10.5		Merced	CA	PGE	PG&E Merced #1 70 kV circuit	7/1/2006	7/1/2006	NA	Complete	Complete		Tendered
~~77~~	~~8/19/2005~~	~~8/22/2005~~	WITHDRAWN	~~WT~~	~~W~~	~~300~~		~~Kern~~	~~CA~~	~~SCE/PG&E~~	~~TBD Bakersfiled~~	~~11/30/2007~~	~~11/30/2007~~	~~Complete~~	~~Tendered~~			
78	8/31/2005	8/31/2005	Active	Other	S	300		Imperial	CA	SDGE	Imperial Valley Substation	12/31/2009	12/31/2009	Waived	In Progress			
79	5/24/2005	9/7/2005	Active	WT	W	51		Kern	CA	SCE	Proposed "New" Dutchwind Substation	6/1/2006	12/15/2009	Complete	In Progress			
80	9/12/2005	9/12/2005	Active	CC	NG	610		Los Angeles	CA	SCE	Laguna Bell Substation 230 kV	7/31/2008	3/31/2009	Waived	Complete			
81	9/13/2005	9/13/2005	Active	ST	G	55		Lake	CA	PGE	Geysers #17 - Fulton 230 kV Line	9/1/2006	9/1/2006	Waived	Complete	In Progress		Tendered
82	6/10/2005	9/14/2005	Active	ST	B	6.8		Humboldt	CA	PGE	Rio Dell Substation 60 KV	1/1/2006	1/1/2006	Waived	In Progress			
83	9/16/2005	9/16/2005	Active	WT	W	60		San Bernardino	CA	SCE	Lugo-Pisgah No. 2 230 kV tran line	12/31/2008	12/31/2008	Complete	Tendered			
84	11/22/2005	12/1/2005	Active	WT	W	400		Kern	CA	SCE	Cottonwind Substation	12/31/2009	12/31/2009	Tendered				
85	12/28/2005	12/28/2005	Active	WT	W	120		Kern	CA	SCE	Segment 3 230 Collector Loop Tehachapi	12/31/2007	12/31/2007	In Progress				
~~86~~	~~12/30/2005~~	~~12/30/2005~~	WITHDRAWN	~~CT~~	~~NG~~	~~49.9~~		~~Kern~~	~~CA~~	~~PGE~~	~~Kern Oil-Vedder 115 kV Line~~	~~3/1/2008~~	~~3/1/2008~~					
86A	1/20/2006	1/20/2006	Active	WT	W	33.1		Kern	CA	SCE	Vincent Substation	1/1/2008	1/1/2008					
86B	1/20/2006	1/20/2006	Active	WT	W	34		Kern	CA	SCE	Canwind Substation	1/1/2008	1/1/2008					
~~87~~	~~2/3/2006~~	~~2/3/2006~~	WITHDRAWN	~~ST~~	~~NU~~	~~28~~		~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Diablo Canyon Substation Circuit Breakers 532 and 632~~	~~12/8/2005~~	~~12/8/2005~~					
88	2/10/2006	2/10/2006	Active	CC	NG	613.5		Los Angeles	CA	SCE	Hinson Substation 230 kV bus	7/1/2011	7/1/2011	Tendered				
89	2/13/2006	2/13/2006	Active	CC	NG	570		San Bernardino	CA	SCE	Caldwell 230 kV	7/1/2009	7/1/2009	Waived	In Progress			
90	2/16/2006	2/16/2006	Active	CT	NG	60		San Diego	CA	SDGE	Radial tie line TL6929	6/1/2007	6/1/2007	In Progress	Tendered			
91	2/22/2006	2/22/2006	Active	WT	W	51		Kern	CA	SCE	Segment 3 of Antelope Transmission Project	3/31/2010	3/31/2010	Waived	In Progress			
92	2/24/2006	2/24/2006	Active	CC	NG	570		Los Angeles	CA	SCE	Vincent 230 kV	7/1/2009	7/1/2009	Waived	In Progress			
93	3/1/2006	3/1/2006	Active	WT	W	220		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2008	12/31/2008	In Progress				
94	3/1/2006	3/1/2006	Active	WT	W	180		Kern	CA	SCE	Tehachapi Conceptual Substation #2	12/31/2008	12/31/2008	In Progress				
95	3/1/2006	3/1/2006	Active	WT	W	550		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2009	In Progress				
96	3/1/2006	3/1/2006	Active	WT	W	600		Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2009	In Progress				
97	3/1/2006	3/1/2006	Active	WT	W	160		Kern	CA	SCE	Tehachapi Conceptual Substation #5	12/31/2009	12/31/2009	In Progress				
98	3/9/2006	3/9/2006	Active	ST	NU	37		San Luis Obispo	CA	PGE	Diablo Canyon Substation Circuit Breakers 532 and 632	12/8/2005	1/1/2006					
99	3/29/2006	3/29/2006	Active	ST	NU	45		San Luis Obispo	CA	PGE	Diablo Canyon Substation Circuit Breakers 542 and 642	6/8/2006	6/8/2006					
100	4/5/2006	4/5/2006	Active	ST	W	120		Kern	CA	SCE	Vincent Substation through Sagebrush 230 kV line	12/31/2007	12/31/2007					
101	4/7/2006	4/7/2006	Active	CT	NG	100		Kern	CA	PGE	PG&E Kern Oil-Vedder 115 kV line	3/1/2008	3/1/2008					
102	4/19/2006	4/19/2006	Active	WT	W	300		Monterey	CA	PGE	PG&E Coburn 230 kV Sub	11/30/2008	11/30/2008	Tendered				
~~102A~~	~~4/21/2006~~	~~4/21/2006~~	WITHDRAWN	~~WT~~	~~W~~	~~100~~		~~Santa Barbara~~	~~CA~~	~~PGE~~	~~PG&E #2 Cabrillo Divide 115 kV line~~	~~12/31/2009~~	~~12/31/2009~~	~~Tendered~~				
103	5/2/2006	5/2/2006	Active	ST	B	27		San Diego	CA	SDGE	69kV (#6910) Otay Mesa Road	12/1/2008	12/1/2008	Tendered				
104	4/14/2006	5/3/2006	Active	CT	NG	304		Los Angeles	CA	SCE	Laguna Bell 230 kV Substation	7/31/2009	7/31/2009	Waived	In Progress			
~~105~~	~~5/4/2006~~	~~5/4/2006~~	WITHDRAWN	~~WT~~	~~W~~	~~100~~		~~Humboldt~~	~~CA~~	~~PGE~~	~~Between Rio Del Junction and Bridgeville~~	~~10/30/2009~~	~~10/30/2009~~					
106	5/26/2006	5/26/2006	Active	Other	S	635		San Bernardino	CA	SCE	Mojave Generating Station	12/31/2009	12/31/2009					
106A	5/1/2006	6/6/2006	Active	WT	W	160		San Diego	CA	SDGE	Boulevard Substation	6/30/2008	6/30/2008					
107	6/9/2006	6/9/2006	Active	WT	W	128		Solano	CA	PGE	Brighton-Contra Costa 115 kV	3/1/2011	3/1/2011					
108	6/9/2006	6/9/2006	Active	WT	W	128		Solano	CA	PGE	Lambie-Contra Costa 230 kV	3/1/2011	3/1/2001					
109	6/14/2006	6/16/2006	Active	Other	S	600		San Bernardino	CA	SCE	Pisgah Substation	3/1/2011	3/1/2011					
110	6/14/2006	6/16/2006	Active	Other	S	1400		San Bernardino	CA	SCE	Pisgah Substation	3/1/2011	3/1/2011					
111	6/23/2006	6/26/2006	Active	ST	B	20		Kern	CA	PGE	Tap of Chevron 70kv tran line	8/31/2009	8/13/2009					
112	6/28/2006	6/28/2006	Active	WT	W	300		San Diego	CA	SDGE	500 kV Imperial Valley-Miguel trans line	10/31/2008	10/31/2008					
113	6/29/2006	6/30/2006	Active	WT	W	30		Solano	CA	PGE	Birds Landing	4/1/2009	4/1/2009					
114	6/29/2006	7/12/2006	Active	WT	W	50		San Bernardino	CA	SCE	Pisgah-Lugo Sub 230kV	7/1/2008	7/1/2008					
115	6/29/2006	7/12/2006	Active	WT	W	150		San Bernardino	CA	SCE	115kV Black Mountain-Victor Trans Line	7/1/2008	7/1/2008					
116	6/29/2006	7/12/2006	Active	WT	W	150		San Bernardino	CA	SCE	Pisgah-Lugo 230kV Trans Line	7/1/2008	7/1/2008					

Notes:

This Queue posting reflects the requirements of the FERC Order 2003 for Large Generator Interconnection Procedures (LGIP).
Generator Interconnection Requests or applications Completed or Withdrawn prior to this posting are not shown.
Future withdrawals will be indicated in the Application Status as Withdrawn and their Queue position will be retired.
Weekly posting is anticipated.

Legend:

- **Generator Type Key:** IC-Internal Combustion, ST=Steam Turbine, CT=Combustion Turbine, CC=Combined Cycle, H=Hydro, WT=Wind Turbine, PV=Photovoltaic
- **Fuel Type Key:** W=Wind, NU=Nuclear, NG=Natural Gas, O=Oil, C=Coal, B=Biomass, S=Solar, LFG=Land Fill Gas, WTR=Water

Appendix C

Load and Resources Tables

Table C.1: Power Flow Case Names and Descriptions

Case Name	Case Description
11hs-pre	2011 Heavy Summer High Import Pre-Project Case
11hs-pst	2011 Heavy Summer High Import Post-Project Case
11hs-pre-li	2011 Heavy Summer Low Import Pre-Project Case
11hs-pst-li	2011 Heavy Summer Low Import Post-Project Case
11hs-pre-g1	2011 Heavy Summer High Import Pre-Project Case with Otay Mesa G-1 and System Readjusted
11hs-pst-g1	2011 Heavy Summer High Import Post-Project Case with Otay Mesa G-1 and System Readjusted
11lw-pre	2011 Light Winter Pre-Project Case
11lw-pst	2011 Light Winter Post-Project Case

Revision 4 power flow cases include Imperial Valley 500/230 kV Bank 82. Revision 4a cases do not include Imperial Valley 500/230 kV Bank 82.

L&R Summary
Q124 SIS
600 MW at IV 230 kV
4/12/2007
revision 4 cases
with IV 500/23 kV bank 82

(MW)	11hs-pre	11hs-pst	11hs-pre-II	11hs-pst-II	11hs-pre-q1	11hs-pst-q1	11lw-pre	11lw-pst
Path 44 South of SONGS	810	985	119	294	777	984	181	-35
Miguel 500/230 kV Flow @ 230 kV	1151	1313	947	1110	1121	1280	885	957
Central 500/230 kV Flow @ 230 kV	899	1061	635	800	890	1063	719	793
LEAPS 500/230 kV Flow @ 230 kV	1	1	495	492	0	-2	-1	0
Tijuana-OtayMesa 230 kV @ OM	319	395	238	314	393	480	136	183
SDG&E Import Cut Plane	3180	3756	2433	3010	3181	3805	1920	1899
SDG&E Interchange	-1520	-1520	-270	-270	-1520	-1570	-250	350
Load	4991	4991	4991	4991	4991	4991	2526	2526
Losses	148	185	145	180	135	173	79	107
Load + Losses	5139	5176	5136	5171	5126	5164	2605	2633
SDG&E Generation	3619	3656	4865	4900	3606	3595	2355	2983
Existing IV 230 kV Generation	952	952	952	952	952	952	951	951
Existing + Queue IV 230 kV Generation	1252	1852	1252	1852	1252	1852	1251	1851

QF Generation
(Always On)

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
22008	ASH	69	QF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0
22092	CABRILLO	69	QF	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0
22112	CAPSTRNO	138	QF	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	0
22120	CARLTNHS	138	QF	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	0
22172	DIVISION	69	QF	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0
22204	EASTGATE	69	QF	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
22332	GOALLINE	69	QF	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	0
22448	MESAHGTS	69	QF	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	0
22532	MURRAY	69	QF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
22576	NOISLMTR	69	QF	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	0
22604	OTAY	69	QF	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	0
22660	POINTLMA	69	QF	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	0
22680	R SNTAFE	69	QF	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0
22704	SAMPSON	12.5	QF	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	0
22724	SANMRCOS	69	QF	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0
22760	SHADOWR	138	QF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
	Sub-total			**182**	**182**	**182**	**182**	**182**	**182**	**182**	**182**	**183**	

(Always On)
Priority One
(Order Top to Bottom)

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
Q13 22625	LkHodG1	13.8	D	20	20	20	20	20	20	0	0	20	0
Q13 22626	LkHod G2	13.8	Q	20	20	20	20	20	20	0	0	20	0
Q1A 22605	OTAYMGT1	18	1	170	170	170	170	0	0	170	170	170	0
Q1A 22606	OTAYMGT2	18	1	170	170	170	170	0	0	170	170	170	0
Q1A 22607	OTAYMST1	16	1	178	216	175	210	0	0	111	139	221	0
Q4 22262	PEN_CT1	18	1	155	155	155	155	155	155	0	0	155	0
Q4 22263	PEN_CT2	18	2	155	155	155	155	155	155	0	0	155	0
Q4 22265	PEN_ST1	18	3	215	215	215	215	224	223	0	0	215	0
	Sub-total			**1083**	**1131**	**1090**	**1115**	**674**	**673**	**451**	**479**	**1125**	

Priority Two
(Order Top to Bottom)

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
22244	ENCINA 5	24	5	320	0	320	0	320	0	0	0	329	0
22240	ENCINA 4	22	4	280	0	280	0	290	0	0	0	299	0
22236	ENCINA 3	14.4	3	0	0	0	0	0	0	0	0	109	0
22234	ENCINA 2	14.4	2	0	0	0	0	0	0	0	0	103	0
22233	ENCINA 1	14.4	1	0	0	0	0	0	0	0	0	106	0
22486	MEF	13.8	1	0	0	0	0	46	46	0	0	46	0
22149	CALPK_BD	13.8	1	0	0	0	0	42	42	0	0	42	0
22153	CALPK_ES	13.8	1	0	0	0	0	42	42	0	0	42	0
22150	CALPK_EC	13.8	1	0	0	0	0	42	42	0	0	42	0
22074	LRKSPBD1	13.8	1	0	0	0	0	46	46	0	0	46	0
22075	LRKSPBD2	13.8	2	0	0	0	0	46	46	0	0	46	0
22488	MIRAMRGT	12.5	1	0	0	0	0	17	17	0	0	17	0
22488	MIRAMRGT	12.5	2	0	0	0	0	16	16	0	0	16	0
22375	KEARN3AB	12.5	1	0	0	0	0	15	15	0	0	15	0
22375	KEARN3AB	12.5	2	0	0	0	0	14	14	0	0	14	0
22376	KEARN3CD	12.5	1	0	0	0	0	14	14	0	0	14	0
22376	KEARN3CD	12.5	2	0	0	0	0	14	14	0	0	14	0
22212	ELCAJNGT	12.5	1	0	0	0	0	13	13	0	0	13	0
22377	KEARNGT1	12.5	1	0	0	0	0	15	15	0	0	15	0
22373	KEARN2AB	12.5	1	0	0	0	0	14	14	0	0	14	0
22373	KEARN2AB	12.5	2	0	0	0	0	14	14	0	0	14	0
22374	KEARN2CD	12.5	1	0	0	0	0	14	14	0	0	14	0
22374	KEARN2CD	12.5	2	0	0	0	0	13	13	0	0	13	0
Q19 22915	CAMPOGEN	0.69	1	30	30	30	30	30	30	0	0	50	0
22257	RAMCO_ES	13.8	1	0	0	0	0	49	49	0	0	49	0
	Sub-total			**630**	**30**	**630**	**30**	**1126**	**616**	**0**	**0**	**1482**	

Existing IV Generation

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
22981	IV GEN1	21	1	241	241	241	241	241	241	241	241	241	0
22982	IV GEN2	18	2	179	179	179	179	179	179	179	179	179	0
22983	IV GEN3	18	3	180	180	180	180	180	180	180	180	180	0
22997	INTBCT	15	1	194	194	194	194	194	194	193	193	194	150
22996	INTBST	18	2	159	159	159	159	159	159	158	158	159	75
	Sub-total			**952**	**952**	**952**	**952**	**952**	**952**	**951**	**951**	**952**	

CAISO Queue Position

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
6 22961	SXCC-U1	16	Q	0	0	160	160	0	0	0	0	160	50
6 22962	SXCC-U2	16	Q	0	0	160	160	0	0	0	0	160	50
6 22963	SXCC-U3	21	Q	0	0	270	270	0	0	0	0	270	60
6 22964	SXCC-U4	16	Q	0	0	160	160	0	0	0	0	160	50
25 22907	CW117MWG	34.5	Q	0	0	0	0	0	0	0	0	117	0
26 22905	CW36MWG	34.5	Q	0	0	0	0	0	0	0	0	36	0
27 22780	SOUTHBY6	18	Q	0	0	0	0	0	0	0	0	165	0
27 22784	SOUTHBY7	18	Q	0	0	0	0	0	0	0	0	165	0
27 22788	SOUTHBY8	18	Q	0	0	0	0	0	0	0	0	320	0
32 22087	BLCW201G	34.5	Q1	0	0	0	0	0	0	0	0	201	0
72 99110	ELSNORE1	16	L	0	0	250	250	0	0	0	0	251	-300
72 99112	ELSNORE2	16	L	0	0	250	250	0	0	0	0	251	-300
78 23004	SOLR1A1Q	0.48	Q1	100	100	100	100	100	100	100	100	100	0
78 23009	SOLR1A2Q	0.48	Q2	100	100	100	100	100	100	100	100	100	0
78 23014	SOLR1B1Q	0.48	Q3	100	100	100	100	100	100	100	100	100	0
90 22617	OTAY_46A	13.8	Q1	0	0	0	0	0	0	0	0	46	0
90 23110	OTAY_46B	13.8	Q2	0	0	0	0	0	0	0	0	46	0
103 23120	BD27MW	13.8	Q	0	0	0	0	0	0	0	0	27	0
106A 22890	WD160MW	230	Q	162	162	162	162	162	162	162	162	162	0
112 22891	WD300MW	230	Q	309	309	309	309	309	309	309	309	309	0
121 22487	MRGT49MW	13.8	Q	0	0	0	0	0	0	0	0	49	0
124 23019	SOLR2A1Q	0.48	Q1	0	100	0	100	0	100	0	100	100	0
124 23024	SOLR2A2Q	0.48	Q2	0	100	0	100	0	100	0	100	100	0
124 23029	SOLR2B1Q	0.48	Q3	0	100	0	100	0	100	0	100	100	0
124 23034	SOLR3A1Q	0.48	Q4	0	100	0	100	0	100	0	100	100	0
124 23039	SOLR3A2Q	0.48	Q5	0	100	0	100	0	100	0	100	100	0
124 23044	SOLR3B1Q	0.48	Q6	0	100	0	100	0	100	0	100	100	0
	Sub-total			**771**	**1371**	**2021**	**2021**	**771**	**1371**	**771**	**1371**	**3795**	
	Total			**3619**	**3656**	**4865**	**4900**	**3606**	**3595**	**2355**	**2983**	**7630**	

Notes: If it means the generator is not modeled and therefore the Pgen values are all zeroed out

L&R Summary
Q124 SIS
600 MW at IV 230 kV
4/12/2007
revision 4a cases
w/out IV 500/23 kV bank 82

(MW)	11hs-pre	11hs-pst	11hs-pre-ll	11hs-pst-li	11hs-pre-q1	11hs-pst-q1	11hw-pre	11hw-pst
Path 44 South of SONGS	811	991	120	295	776	987	181	-30
Miguel 500/230 kV Flow @ 230 kV	1142	1298	939	1095	1110	1266	873	939
Central 500/230 kV Flow @ 230 kV	889	1044	625	785	882	1047	706	774
LEAPS 500/230 kV Flow @ 230 kV	2	0	495	493	1	-1	-1	1
Tijuana-OtayMesa 230 kV @ OM	335	420	254	342	407	506	160	218
SDG&E Import Cut Plane	3180	3756	2433	3010	3181	3805	1920	1899
SDG&E Interchange	-1520	-1520	-270	-270	-1520	-1570	-250	350
Load	4991	4991	4991	4991	4991	4991	2526	2526
Losses	148	166	145	160	135	173	79	107
Load + Losses	5139	5177	5136	5171	5126	5164	2605	2633
SDG&E Generation	3619	3656	4865	4900	3606	3595	2355	2983
Existing IV 230 kV Generation	952	952	952	952	952	952	951	951
Existing + Queue IV 230 kV Generation	1252	1852	1252	1852	1252	1852	1251	1851

QF Generation
(Always On)

	Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
	22006	ASH	69	QF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0
	22092	CABRILLO	69	QF	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0
	22112	CAPSTRNO	138	QF	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	0
	22120	CARLTNHS	138	QF	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	0
	22172	DIVISION	69	QF	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0
	22204	EASTGATE	69	QF	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
	22332	GOALLINE	69	QF	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	0
	22446	MESAHGTS	69	QF	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	0
	22532	MURRAY	69	QF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
	22576	NOISLMTR	69	QF	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	0
	22604	OTAY	69	QF	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	0
	22660	POINTLMA	69	QF	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	0
	22680	R SNTAFE	69	QF	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0
	22704	SAMPSON	12.5	QF	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	0
	22724	SANMRCOS	69	QF	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0
	22760	SHADOWR	138	QF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
(Always On)		**Sub-total**			**182**	**182**	**182**	**182**	**182**	**182**	**182**	**182**	**183**	

Priority One
(Order Top to Bottom)

	Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
Q13	22625	LkHodG1	13.8	Q	20	20	20	20	20	20	0	0	20	0
Q13	22626	LkHod G2	13.8	Q	20	20	20	20	20	20	0	0	20	0
Q1A	22605	OTAYMGT1	18	1	170	170	170	170	0	0	170	170	170	0
Q1A	22606	OTAYMGT2	18	1	170	170	170	170	0	0	170	170	170	0
Q1A (swing bus)	22607	OTAYMST1	16	1	178	216	175	210	0	0	111	139	221	0
Q4	22262	PEN_CT1	18	1	155	155	155	155	155	155	0	0	155	0
Q4	22263	PEN_CT2	18	2	155	155	155	155	155	155	0	0	155	0
Q4	22265	PEN_ST1	16	3	215	215	215	215	224	223	0	0	215	0
		Sub-total			**1083**	**1121**	**1090**	**1115**	**574**	**573**	**461**	**479**	**1125**	

Priority Two
(Order Top to Bottom)

	Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
	22244	ENCINA 5	24	5	320	0	320	0	320	0	0	0	329	0
	22240	ENCINA 4	22	4	280	0	280	0	290	0	0	0	299	0
	22236	ENCINA 3	14.4	3	0	0	0	0	0	0	0	0	109	0
	22234	ENCINA 2	14.4	2	0	0	0	0	0	0	0	0	103	0
	22233	ENCINA 1	14.4	1	0	0	0	0	0	0	0	0	106	0
	22486	MEF	13.8	1	0	0	0	0	46	46	0	0	46	0
	22149	CALPK_BD	13.8	1	0	0	0	0	42	42	0	0	42	0
	22153	CALPK_ES	13.8	1	0	0	0	0	42	42	0	0	42	0
	22150	CALPK_EC	13.8	1	0	0	0	0	42	42	0	0	42	0
	22074	LRKSPBD1	13.8	1	0	0	0	0	46	46	0	0	46	0
	22075	LRKSPBD2	13.8	2	0	0	0	0	46	46	0	0	46	0
	22488	MIRAMRGT	12.5	1	0	0	0	0	17	17	0	0	17	0
	22488	MIRAMRGT	12.5	2	0	0	0	0	16	16	0	0	16	0
	22375	KEARN3AB	12.5	1	0	0	0	0	15	15	0	0	15	0
	22375	KEARN3AB	12.5	2	0	0	0	0	14	14	0	0	14	0
	22376	KEARN3CD	12.5	1	0	0	0	0	14	14	0	0	14	0
	22376	KEARN3CD	12.5	2	0	0	0	0	14	14	0	0	14	0
	22212	ELCAJNGT	12.5	1	0	0	0	0	13	13	0	0	13	0
	22377	KEARNGT1	12.5	1	0	0	0	0	15	15	0	0	15	0
	22373	KEARN2AB	12.5	1	0	0	0	0	14	14	0	0	14	0
	22373	KEARN2AB	12.5	2	0	0	0	0	14	14	0	0	14	0
	22374	KEARN2CD	12.5	1	0	0	0	0	14	14	0	0	14	0
	22374	KEARN2CD	12.5	2	0	0	0	0	13	13	0	0	13	0
Q19	22915	CAMPOGEN	0.69	1	30	30	30	30	30	30	0	0	50	0
	22257	RAMCO_ES	13.8	1	0	0	0	0	49	49	0	0	49	0
		Sub-total			**630**	**30**	**630**	**30**	**1126**	**516**	**0**	**0**	**1402**	

Existing IV Generation

Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
22981	IV GEN1	21	1	241	241	241	241	241	241	241	241	241	0
22982	IV GEN2	18	2	179	179	179	179	179	179	179	179	179	0
22983	IV GEN3	18	3	180	180	180	180	180	180	180	180	180	0
22997	INTBCT	18	1	194	194	194	194	194	194	193	193	194	150
22996	INTBST	18	2	159	159	159	159	159	158	156	159	159	75
	Sub-total			**952**	**952**	**952**	**952**	**952**	**952**	**951**	**951**	**952**	

CAISO Queue Position

	Bus #	Bus Name	Voltage	ID	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pgen	Pmax	Pmin
8	22961	SXCC-U1	16	Q	0	0	160	160	0	0	0	0	160	50
8	22962	SXCC-U2	16	Q	0	0	160	160	0	0	0	0	160	50
8	22963	SXCC-U3	21	Q	0	0	270	270	0	0	0	0	270	60
8	22964	SXCC-U4	16	Q	0	0	160	160	0	0	0	0	160	50
25	22907	CW117MWG	34.5	Q	0	0	0	0	0	0	0	0	117	0
26	22905	CW36MWG	34.5	Q	0	0	0	0	0	0	0	0	36	0
27	22780	SOUTHBY8	18	Q	0	0	0	0	0	0	0	0	165	0
27	22784	SOUTHBY7	18	Q	0	0	0	0	0	0	0	0	165	0
27	22788	SOUTHBY8	18	Q	0	0	0	0	0	0	0	0	320	0
32	22087	BLCW201G	34.5	Q1	0	0	0	0	0	0	0	0	201	0
72	99110	ELSNORE1	16	L	0	0	250	250	0	0	0	0	251	-300
72	99112	ELSNORE2	16	L	0	0	250	250	0	0	0	0	251	-300
78	23004	SOLR1A1Q	0.48	Q1	100	100	100	100	100	100	100	100	100	0
78	23009	SOLR1A2Q	0.48	Q2	100	100	100	100	100	100	100	100	100	0
78	23014	SOLR1B1Q	0.48	Q3	100	100	100	100	100	100	100	100	100	0
90	22617	OTAY_46A	13.8	Q1	0	0	0	0	0	0	0	0	46	0
90	23110	OTAY_46B	13.8	Q2	0	0	0	0	0	0	0	0	46	0
103	23120	BD27MW	13.8	Q	0	0	0	0	0	0	0	0	27	0
106A	22890	WD160MW	230	Q	162	162	162	162	162	162	162	162	162	0
112	22891	WD300MW	230	Q	309	309	309	309	309	309	309	309	309	0
121	22487	MRGT49MW	13.8	Q	0	0	0	0	0	0	0	0	49	0
124	23019	SOLR2A1Q	0.48	Q1	0	100	0	100	0	100	0	100	100	0
124	23024	SOLR2A2Q	0.48	Q2	0	100	0	100	0	100	0	100	100	0
124	23029	SOLR2B1Q	0.48	Q3	0	100	0	100	0	100	0	100	100	0
124	23034	SOLR3A1Q	0.48	Q4	0	100	0	100	0	100	0	100	100	0
124	23039	SOLR3A2Q	0.48	Q5	0	100	0	100	0	100	0	100	100	0
124	23044	SOLR3B1Q	0.48	Q6	0	100	0	100	0	100	0	100	100	0
		Sub-total			**771**	**1371**	**2021**	**2521**	**771**	**1371**	**771**	**1371**	**3795**	
		Total			**3619**	**3656**	**4865**	**4900**	**3606**	**3595**	**2355**	**2983**	**7539**	

Notes: #N/A means the generator is not modeled and therefore the Pgen values are all zeroed out.

Appendix D

Contingency Lists

```
# SDG&E 2011 category b contingency list Q124 r3
#
##############################################################
# SDG&E 500 kV Transmission Line Outages (Category B: L-1)
##############################################################
50001a   "line IV-WIND 500kV"  "L-1" "B"
       1  "IMPRLVLY 500.00"  "WNDFARMS 500.00"  "1 "  1 0
       0
##############################################################
#SPS 6.1 500kV IV-ML and IV Generator SPS (protects CFE TJI-ROA 230kV)
50001a_1  "line IV-WIND 500kV SPS6.1"  "L-1" "B"
       1  "IMPRLVLY 500.00"  "WNDFARMS 500.00"  "1 "  1 0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
       0
##################################################################
#SPS 6.2 CFE SPS to protect lines from La Rosita to Tijuana
50001a_2  "line IV-WIND 500kV SPS6.2"  "L-1" "B"
       1  "IMPRLVLY 500.00"  "WNDFARMS 500.00"  "1 "  1 0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
       1  "IMPRLVLY 230.00"  "ROA-230  230.00"  "1 "  1 0
       0
50001b   "line WIND-ML 500kV"  "L-1" "B"
       1  "WNDFARMS 500.00"  "MIGUEL   500.00"  "1 "  1 0
       0
##############################################################
#SPS 6.1 500kV IV-ML and IV Generator SPS (protects CFE TJI-ROA 230kV)
50001b_1 "line WIND-ML 500kV SPS6.1"  "L-1" "B"
       1  "WNDFARMS 500.00"  "MIGUEL   500.00"  "1 "  1 0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
       0
##################################################################
#SPS 6.2 CFE SPS to protect lines from La Rosita to Tijuana
50001b_2 "line WIND-ML 500kV SPS6.2"  "L-1" "B"
       1  "WNDFARMS 500.00"  "MIGUEL   500.00"  "1 "  1 0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
       1  "IMPRLVLY 230.00"  "ROA-230  230.00"  "1 "  1 0
       0
50002  "line N.GILA   to IMPRLVLY 500 ck 1 "  "L-1" "B"
       1 "N.GILA   500"  "IMPRLVLY 500"  "1 "   1  0
       0
50003  "line HASSYAMP to N.GILA 500 ck 1 "  "L-1" "B"
       1 "HASSYAMP 500"  "N.GILA   500"  "1 "  2 0
       0
50005  "line LEELAKE to LEAPS-MP 500 ck 1 "  "L-1" "B"
         1 "LEELAKE  500"  "LEAPS-MP 500"  "1 "  1 0
       0
50006  "line LEAPS-MP to CMPNL500 500 ck 1 "  "L-1" "B"
         1 "LEAPS-MP 500"  "CMPNL500 500"  "1 "  1 0
       0
SCELPS1 "line VALLEY to LEE LAKE 500 ck 1 "  "N-1" "B"
       1 "VALLEYSC 500"  "LEELAKE  500"  "1 "  1 0
       0
SCELPS2 "line SERRANO to LEE LAKE 500 ck 1 "  "N-1" "B"
       1 "SERRANO  500"  "LEELAKE 500"  "1 "  1 0
       0
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TLSUNRI "line IMPRLVLY to CENTRALX 500 ck 1"  "L-1" "B"
       1 "IMPRLVLY 500"  "CENTRALX 500"  "1 "   1  0
       0
##############################################################
# SDG&E 230 kV Transmission Line Outages (Category B: L-1)
##############################################################
TL23001  "line SANLUSRY to MISSION  230 ck 1"  "L-1" "B"
       1 "SANLUSRY 230"  "MISSION  230"  "1 "   1  0
       0
TL23010X "line ENCINA toS.ONOFRE   230 ck 1"  "L-1" "B"
         1 "ENCINA   230"  "S.ONOFRE 230"  "1 "   1  0
       0
TL23004  "line SANLUSRY to MISSION  230 ck 2"  "L-1" "B"
       1 "SANLUSRY 230"  "MISSION  230"  "2 "   1  0
       0
TL23006  "line SANLUSRY to S.ONOFRE 230 ck 2"  "L-1" "B"
       1 "SANLUSRY 230"  "S.ONOFRE 230"  "2 "   1  0
       0
TL23007  "line TALEGA   to S.ONOFRE 230 ck 2"  "L-1" "B"
       1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
       0
TL23010  "line SANLUSRY to S.ONOFRE 230 ck 3"  "L-1" "B"
       1 "SANLUSRY 230"  "S.ONOFRE 230"  "3 "   1  0
       0
TL23011C "line PEN to ESCNDIDO 230"  "L-1" "B"
       1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
       1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
       1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
       0
TL23012  "line PENSQTOS to ENCINA   230 ck 1"  "L-1" "B"
       1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
       0
TL23013  "line PENSQTOS to OLD TOWN 230 ck 1"  "L-1" "B"
       1 "PENSQTOS 230"  "OLD TOWN 230"  "1 "   1  0
       0
TL23014  "line PEN      to ESCNDIDO 230 ck 1"  "L-1" "B"
       1 "PEN      230"  "ESCNDIDO 230"  "1 "   1  0
       0
TL23021a  "line MIGUEL   to SXCC     230 ck 1"  "L-1" "B"
       1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
       0
TL23021b  "line SYCAMORE to SXCC     230 ck 1"  "L-1" "B"
       1 "SYCAMORE 230"  "SXCC     230"  "1 "   1  0
       0
TL23022  "line MIGUEL   to MISSION  230 ck 1"  "L-1" "B"
       1 "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       0
TL23023  "line MIGUEL   to MISSION  230 ck 2"  "L-1" "B"
       1 "MIGUEL   230"  "MISSION  230"  "2"    1  0
       0
TL23027  "line OLD TOWN to MISSION  230 ck 1"  "L-1" "B"
       1 "OLD TOWN 230"  "MISSION  230"  "1 "   1  0
       0
TL23028  "line OLD TOWN-SILVERGATE-MISSION  230 ck 2"  "L-1" "B"
         1  "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
         1  "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
         1  "OLDTWNTP 230"  "MISSION  230"  "2 "   1  0
       0
TL23030a  "line CMPNL230 to TALEGA   230 ck 1"  "L-1" "B"
       1 "CMPNL230 230"  "TALEGA   230"  "1 "   1  0
       0
TL23030b  "line ESCNDIDO to CMPNL230   230 ck 1"  "L-1" "B"
         1  "ESCNDIDO 230"  "CMPNL230 230"  "1 "   1  0
       0
TL230L1  "line CMPPSHFT to CMPNL230   230 ck L1"  "L-1" "B"
         1  "CMPPSHFT 230"  "CMPNL230 230"  "L1"   1  0
       0
TL230L2  "line CMPPSHFT to CMPNL230   230 ck L2"  "L-1" "B"
         1  "CMPPSHFT 230"  "CMPNL230 230"  "L2"   1  0
       0
TL23040 "line OTAYMESA to TJI 230 ck 1"  "L-1" "B"
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```
      1 "OTAYMESA 230"  "TJI-230  230"  "1 "   1  0
      0
TL23045  "line INTB     to IMPRLVLY 230 ck 1"  "L-1" "B"
      1 "INTB     230"  "IMPRLVLY 230"  "1 "   1  0
      0
TL23046  "line INTB     to IMPRLVLY 230 ck 2"  "L-1" "B"
      1 "INTB     230"  "IMPRLVLY 230"  "2 "   1  0
      0
TL23047  "line IV-GEN   to IMPRLVLY 230 ck 1"  "L-1" "B"
      1 "IV-GEN   230"  "IMPRLVLY 230"  "1 "   1  0
      0
TL23048  "line IV-GEN   to IMPRLVLY 230 ck 2"  "L-1" "B"
      1 "IV-GEN   230"  "IMPRLVLY 230"  "2 "   1  0
      0
TL23050  "line IMPRLVLY to ROA-230  230 ck 1"  "L-1" "B"
      1 "IMPRLVLY 230"  "ROA-230  230"  "1 "   1  0
      0
TL23051  "line SYCAMORE to PEN      230 ck 1"  "L-1" "B"
      1 "PEN      230"  "SYCAMORE 230"  "1 "   1  0
      0
TL23052  "line TALEGA   to S.ONOFRE 230 ck 1"  "L-1" "B"
      1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
      0
TL230XA "line SILVERGT to OLD TOWN 230 ck 1"  "L-1" "B"
      1 "SILVERGT 230"  "OLD TOWN 230"  "1 "   1  0
      0
TL230XC "line OTAYMESA to SOUTHBAY 230 ck 1"  "L-1" "B"
      1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "   1  0
      1 "MLMS3TAP 230"  "SOUTHBAY 230"  "1 "   1  0
      0
TL230XD "line SILVERGT to SOUTHBAY 230 ck 1"  "L-1" "B"
      1 "SILVERGT 230"  "SOUTHBAY 230"  "1 "   1  0
      0
TL230XYa "line OTAYMESA to SXCC     230 ck 1"  "L-1" "B"
      1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "   1  0
      1 "MLSXTAP  230"  "SXCC     230"  "1 "   1  0
      0
TL230XYb  "line SYCAMORE to SXCC     230 ck 2"  "L-1" "B"
      1 "SYCAMORE 230"  "SXCC     230"  "2 "   1  0
      0
TL230SR1 "line CENTRALX to SYCAMORE 230 ck 1"  "L-1" "B"
      1 "CENTRALX 230"  "SYCAMORE 230"  "1 "   1  0
      0
TL230SR2 "line CENTRALX to SYCAMORE 230 ck 2"  "L-1" "B"
      1 "CENTRALX 230"  "SYCAMORE 230"  "2 "   1  0
      0
TL230SR3 "line PENSQTOS to SYCAMORE 230 ck 1"  "L-1" "B"
      1 "PENSQTOS 230"  "SYCAMORE 230"  "1 "   1  0
      0
TL_230S  "line IMPRLVLY to ELCENTSW 230 ck 1"  "L-1" "B"
      1 "IMPRLVLY 230"  "ELCENTSW 230"  "1 "   1  0
      0
TL_230R  "line IMPRLVLY to DIXIE230 230 ck 1"  "L-1" "B"
      1 "IMPRLVLY 230"  "DIXIE230 230"  "1 "   1  0
      0
TL_Q078-1  "line IMPRLVLY to SOLR1A 230 ck 1"  "L-1" "B"
      1 "IMPRLVLY 230"  "SOLR1A   230"  "1 "   1  0
      0
TL_Q078-2  "line SOLR1A to SOLR1B 230 ck 1"  "L-1" "B"
      1 "SOLR1A   230"  "SOLR1B   230"  "1 "   1  0
      0
TL_Q124-1  "line IMPRLVLY to SOLR1A 230 ck 2"  "L-1" "B"
      1 "IMPRLVLY 230"  "SOLR1A   230"  "2 "   1  0
      0
TL_Q124-2  "line SOLR2A to SOLR1A 230 ck 1"  "L-1" "B"
      1 "SOLR2A   230"  "SOLR1A   230"  "1 "   1  0
      0
TL_Q124-3  "line SOLR2A to SOLR2B 230 ck 1"  "L-1" "B"
      1 "SOLR2A   230"  "SOLR2B   230"  "1 "   1  0
      0
TL_Q124-4  "line SOLR3A to SOLR1A 230 ck 1"  "L-1" "B"
```

```
        1 "SOLR3A   230"  "SOLR1A   230"  "1 "   1  0
        0
TL_Q124-5  "line SOLR3A to SOLR2B 230 ck 1"  "L-1" "B"
        1 "SOLR3A   230"  "SOLR3B   230"  "1 "   1  0
        0
##############################################################
# SDG&E 138 kV Transmission Line Outages (Category B: L-1)
TL13801  "line ENCINA    to CANNON    138 ck 1"  "L-1" "B"
       1 "ENCINA   138"  "CANNON   138"  "1 "   1  0
       0
TL13802  "line CANNON-SANLUSRY-SHADOWR 138"  "L-1" "B"
       1 "CALAVRTP 138"  "CANNON   138"  "1 "   1  0
       1 "CALAVRTP 138"  "SANLUSRY 138"  "1 "   1  0
       1 "CALAVRTP 138"  "SHADOWR  138"  "1 "   1  0
       0
TL13804  "line BATIQTOS-PENSQTOS-ENCINA 138"  "L-1" "B"
       1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
       1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
       1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
       0
TL13805 "line PALOMAR  to BATIQTOS 138 ck 1"  "L-1" "B"
       1 "PALOMAR  138"  "BATIQTOS 138"  "1 "   1  0
       0
TL13806  "line ENCINA    to PALOMAR  138 ck 1"  "L-1" "B"
       1 "ENCINA   138"  "PALOMAR  138"  "1 "   1  0
       0
TL13807  "line ENCINA    to NORTHCTY 138 ck 1"  "L-1" "B"
       1 "ENCINA   138"  "NORTHCTY 138"  "1 "   1  0
       0
TL13808  "line NORTHCTY to PENSQTOS 138 ck 1"  "L-1" "B"
       1 "NORTHCTY 138"  "PENSQTOS 138"  "1 "   1  0
       0
TL13809  "line PRCTRVLY to TELECYN  138 ck 1 "  "L-1" "B"
       1 "PRCTRVLY 138"  "TELECYN  138"  "1 "   1  0
       0
TL13810  "line DOUBLET-FRIARS-PENSQTOS 138"  "L-1" "B"
       1 "DOUBLET  138"  "DOUBLTTP 138"  "1 "   1  0
       1 "DOUBLTTP 138"  "FRIARS   138"  "1 "   1  0
       1 "DOUBLTTP 138"  "PENSQTOS 138"  "1 "   1  0
       0
TL13811  "line SHADOWR  to ESCNDO50 138 ck 1"  "L-1" "B"
       1 "SHADOWR  138"  "ESCNDO50 138"  "1 "   1  0
       0
TL13812  "line TALEGA    to SANMATEO 138 ck 1"  "L-1" "B"
       1 "TALEGA   138"  "SANMATEO 138"  "1 "   1  0
       0
TL13815A "line MISSION  to GRNT HLL 138 ck 1 "  "L-1" "B"
       1 "MISSION  138"  "GRNT HLL 138"  "1 "   1  0
       0
TL13815B "line GRNT HLL to SOUTHBAY 138 ck 1 "  "L-1" "B"
       1 "GRNT HLL 138"  "SOUTHBAY 138"  "1 "   1  0
       0
TL13816  "line CAPSTRNO to PICO     138 ck 1"  "L-1" "B"
       1 "CAPSTRNO 138"  "PICO     138"  "1 "   1  0
       0
TL13819 "line SANTEE   to LOSCOCHS 138 ck 1 "  "L-1" "B"
       1 "LOSCOCHS 138"  "SANTEE   138"  "1 "   1  0
       0
TL13821  "line CARLTNHS-SANTEE 138"  "L-1" "B"
       1 "CARLTNHS 138"  "CARLTHTP 138"  "1 "   1  0
       1 "CARLTHTP 138"  "SANTEE   138"  "1 "   1  0
       0
TL13821D "line SYCAMORE-CHCARITA 138"  "L-1" "B"
       1 "SYCAMORE 138"  "CHCARITA 138"  "1 "   1  0
       0
TL13822  "line MISSION-CARLTNHS-SYCAMORE 138 ck 1"  "L-1" "B"
         1 "SYCAMORE 138"  "CARLTHT2 138"  "1 "   1  0
         1 "MISSION  138"  "CARLTHT2 138"  "1 "   1  0
         1 "CARLTNHS 138"  "CARLTHT2 138"  "1 "   1  0
       0
TL13823  "line TELECYN  to SOUTHBAY 138 ck 1"  "L-1" "B"
```

```
      1 "TELECYN  138"  "SOUTHBAY 138"  "1 "   1  0
      0
TL13824  "line LOSCOCHS to SOUTHBAY 138 ck 1"  "L-1" "B"
      1 "LOSCOCHS 138"  "SOUTHBAY 138"  "1 "   1  0
      0
TL13825  "line BATIQTOS-CHCARITA 138"  "L-1" "B"
      1 "BATIQTOS 138"  "MDWLRKTP 138"  "1 "   1  0
      1 "CHCARITA 138"  "MDWLRKTP 138"  "1 "   1  0
      0
TL13826  "line PRCTRVLY to MIGUEL   138 ck 1"  "L-1" "B"
      1 "PRCTRVLY 138"  "MIGUEL   138"  "1 "   1  0
      0
TL13827  "line FRIARS   to MISSION  138 ck 1"  "L-1" "B"
      1 "FRIARS   138"  "MISSION  138"  "1 "   1  0
      0
TL13830  "line MARGARTA to TRABUCO  138 ck 1"  "L-1" "B"
      1 "MARGARTA 138"  "TRABUCO  138"  "1 "   1  0
      0
TL13831  "line TALEGA   to MARGARTA 138 ck 1"  "L-1" "B"
      1 "TALEGA   138"  "MARGARTA 138"  "1 "   1  0
      0
TL13833  "line TALEGA   to TRABUCO  138 ck 1"  "L-1" "B"
      1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
      0
TL13834  "line CAPSTRNO to TRABUCO  138 ck 1"  "L-1" "B"
      1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "   1  0
      0
TL13835  "line SANMATEO to LAGNA NL 138 ck 1"  "L-1" "B"
      1 "SANMATEO 138"  "LAGNA NL 138"  "1 "   1  0
      0
TL13836  "line TALEGA   to PICO     138 ck 1 "  "L-1" "B"
      1 "TALEGA   138"  "PICO     138"  "1 "   1  0
      0
TL13837  "line CAPSTRNO to LAGNA NL 138 ck 1"  "L-1" "B"
      1 "CAPSTRNO 138"  "LAGNA NL 138"  "1 "   1  0
      0
############################################################
# SDG&E 69 kV Transmission Line Outages (Category B: L-1)
############################################################
TL00600  "line CLAIRMNT to CLARMTTP  69 ck 1"  "L-1" "B"
      1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
      1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
      1 "ROSE CYN  69"  "CLARMTTP  69"  "1 "   1  0
      0
TL00601  "line B        to URBAN     69 ck 1"  "L-1" "B"
      1 "B          69"  "URBAN     69"  "1 "   1  0
      0
TL00602  "line B        to MAIN ST   69 ck 1"  "L-1" "B"
      1 "B          69"  "MAIN ST   69"  "1 "   1  0
      0
TL00603  "line NC-NSM-SW             69 ck 1"  "L-1" "B"
      1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
      1 "NAVSTMTR  69"  "SWTWTRTP  69"  "1 "   1  0
      1 "SWEETWTR  69"  "SWTWTRTP  69"  "1 "   1  0
      0
TL00604  "line OLD TOWN to KETTNER   69 ck 1"  "L-1" "B"
      1 "OLD TOWN  69"  "KETTNER   69"  "1 "   1  0
      0
TL00605  "line MAIN ST  to URBAN     69 ck 1"  "L-1" "B"
      1 "MAIN ST   69"  "URBAN     69"  "1 "   1  0
      0
TL00606  "line DIVISION to NAVSTMTR  69 ck 1"  "L-1" "B"
      1 "DIVISION  69"  "NAVSTMTR  69"  "1 "   1  0
      0
TL00607  "line WABASH   to STREAMVW  69 ck 1"  "L-1" "B"
      1 "WABASH    69"  "STREAMVW  69"  "1 "   1  0
      0
TL00608  "line STREAMVW to CHOLLAS   69 ck 1"  "L-1" "B"
      1 "STREAMVW  69"  "CHOLLAS   69"  "1 "   1  0
      0
TL00609  "line KETTNER  to B         69 ck 1"  "L-1" "B"
```

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      1 "KETTNER   69"  "B          69"  "1 "   1  0
      0
TL00610  "line RSNTAFE-RSNTATP-DM-PQ 69 ck 1"  "L-1" "B"
      1 "R.SNTAFE  69"  "R.SNTATP  69"  "1 "   1  0
      1 "R.SNTATP  69"  "DEL MAR   69"  "1 "   1  0
      1 "R.SNTATP  69"  "PENSQTOS  69"  "1 "   1  0
      0
TL00611  "line OLD TOWN to POINTLMA  69 ck 2"  "L-1" "B"
      1 "OLD TOWN  69"  "POINTLMA  69"  "2 "   1  0
      0
TL00612  "line OLD TOWN to POINTLMA  69 ck 1"  "L-1" "B"
      1 "OLD TOWN  69"  "POINTLMA  69"  "1 "   1  0
      0
TL00613  "line PACFCBCH to OLD TOWN  69 ck 1"  "L-1" "B"
      1 "PACFCBCH  69"  "OLD TOWN  69"  "1 "   1  0
      0
TL00614  "line CHOLLAS  to SWEETWTR  69 ck 1"  "L-1" "B"
      1 "CHOLLAS   69"  "SWEETWTR  69"  "1 "   1  0
      0
TL00615  "line CABRILLO to POINTLMA  69 ck 1"  "L-1" "B"
      1 "CABRILLO  69"  "POINTLMA  69"  "1 "  1 0
      0
TL00616a  "line BRND-BRNDTP-RSF-LKHDG  69 ck 1"  "L-1" "B"
        1  "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
        1  "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
        1  "BERNDOTP  69"  "R.SNTAFE  69"  "1 "   1  0
      0
TL00616b  "line OMWD-LKHDG  69 ck 1"  "L-1" "B"
        1  "OMWD      69"  "Lkhodges  69"  "1 "   1  0
      0
TL00617  "line ROSCYNTP to PACFCBCH  69 ck 1"  "L-1" "B"
      1 "ROSCYNTP  69"  "PACFCBCH  69"  "1 "   1  0
      1 "ROSCYNTP  69"  "ROSE CYN  69"  "1 "   1  0
      1 "ROSCYNTP  69"  "LA JOLLA  69"  "1 "   1  0
        0
TL00618  "line MISSION  to MURRAY    69 ck 1"  "L-1" "B"
      1 "MISSION   69"  "MURRAY    69"  "1 "   1  0
      0
TL00619  "line MISSION  to MURRAY    69 ck 2"  "L-1" "B"
      1 "MISSION   69"  "MURRAY    69"  "2 "   1  0
      0
TL00620  "line MURRAY   to GARFIELD  69 ck 1"  "L-1" "B"
      1 "MURRAY    69"  "GARFIELD  69"  "1 "   1  0
      0
TL00621  "line PARADISE to MIGUEL    69 ck 1"  "L-1" "B"
      1 "PARADISE  69"  "MIGUEL    69"  "1 "   1  0
      0
TL00622  "line CHOLLAS  to SPRNGVLY  69 ck 1"  "L-1" "B"
      1 "CHOLLAS   69"  "SPRNGVLY  69"  "1 "   1  0
      0
TL00623  "line IMPRLBCH-OTAYTP-SYO 69 ck 1  "  "L-1" "B"
      1 "IMPRLBCH  69"  "OTAY  TP  69"  "1 "   1  0
      1 "SANYSDRO  69"  "OTAY  TP  69"  "1 "   1  0
      1 "OTAY      69"  "OTAY  TP  69"  "1 "   1  0
      0
TL00624  "line EL CAJON to JAMACHA   69 ck 1"  "L-1" "B"
      1 "EL CAJON  69"  "JAMACHA   69"  "1 "   1  0
      0
TL00625  "line BARRETT-BARTTP-DS-LV  69 ck 1"  "L-1" "B"
      1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
      1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
      1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
      0
TL00626  "line BLDCRKTP to DESCANSO  69 ck 1"  "L-1" "B"
      1 "BLDCRKTP  69"  "DESCANSO  69"  "1 "   1  0
      1 "BLDCRKTP  69"  "SANTYSBL  69"  "1 "   1  0
        1 "BOLDRCRK  69"  "BLDCRKTP  69"  "1 "   1  0
        8 "BOLDRCRK  69"
      0
TL00627  "line MIGUEL   to JAMACHA   69 ck 1"  "L-1" "B"
      1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
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      0
TL00628  "line MIGUELTP to MIGUEL    69 ck 1"  "L-1" "B"
      4 "SUNYSIDE  69"  "10"   0
      1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
      1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
      1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
      1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
      1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
      0
TL00629  "line BLTP-CMRN MULTIPTAP   69 ck 1"  "L-1" "B"
      8 "GLNCLFTP  69"
      8 "BOLVRDTP  69"
      8 "CRESTWD   69"
      8 "BOULEVRD  69"
      8 "GLENCLIF  69"
      8 "BLCW201   69"
      8 "BLCW201G 34.50"
      1 "BOLVRDTP  69"  "CAMERON   69"  "1 "   1  0
      1 "BOLVRDTP  69"  "GLNCLFTP  69"  "1 "   1  0
      1 "BOLVRDTP  69"  "CRESTWD   69"  "1 "   1  0
      1 "BOLVRDTP  69"  "CW36MWT   69"  "1 "   1  0
      1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
      1 "GLENCLIF  69"  "GLNCLFTP  69"  "1 "   1  0
      0
TL00630  "line EL CAJON to GRANITE   69 ck 1"  "L-1" "B"
      1 "EL CAJON  69"  "GRANITE   69"  "1 "   1  0
      0
TL00631  "line EL CAJON to LOSCOCHS  69 ck 1"  "L-1" "B"
      1 "EL CAJON  69"  "LOSCOCHS  69"  "1 "   1  0
      0
TL00632  "line GRANITE to GRANITTP   69 ck 1"  "L-1" "B"
      1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
      1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
      1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
      0
TL00633  "line BERNARDO to R.CARMEL  69 ck 1"  "L-1" "B"
      1 "BERNARDO  69"  "R.CARMEL  69"  "1 "   1  0
      0
TL00634  "line ESCO-WARCYNTP-POW-WC  69 ck 1"  "L-1" "B"
      4 "WARENCYN  69"  "10"   0
      1 "ESCO      69"  "WARCYNTP  69"  "1 "   1  0
      1 "WARENCYN  69"  "WARCYNTP  69"  "1 "   1  0
      1 "POWAY     69"  "WARCYNTP  69"  "1 "   1  0
      0
TL00635  "line CREELMAN to LOSCOCHS  69 ck 1"  "L-1" "B"
      1 "CREELMAN  69"  "LOSCOCHS  69"  "1 "   1  0
      0
TL00636  "line LOSCOCHS to ELLIOTT  69 ck 1 "  "L-1" "B"
      1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
      0
TL00637  "line SANTYSBL to CREELMAN  69 ck 1"  "L-1" "B"
      1 "SANTYSBL  69"  "CREELMAN  69"  "1 "   1  0
      0
TL00639  "line SYCAMORE to ELLIOTT   69 ck 1"  "L-1" "B"
      1 "SYCAMORE  69"  "ELLIOTT   69"  "1 "   1  0
      0
TL00640  "line PARADISE to CHOLLAS  69 ck 1 "  "L-1" "B"
      1 "PARADISE  69"  "CHOLLAS   69"  "1 "   1  0
      0
TL00641  "line SOUTHBAY to MONTGMRY  69 ck 1"  "L-1" "B"
      1 "SOUTHBAY  69"  "MONTGMRY  69"  "1 "   1  0
      0
TL00642  "line MG-MONTGYTP-SW-SY  69 ck 1   "  "L-1" "B"
      1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
      1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
      1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
      0
TL00643  "line MIGUEL   to JAMACHA   69 ck 2"  "L-1" "B"
      1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
      0
TL00644  "line SY-SWEETWTR69 ck 1"  "L-1" "B"
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      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      0
##############################################################
# SPS 7.0-SPECIAL PROTECTION SYSTEMS FOR BORDER  GENERATOR UNITS
# Outage of TL644 O/L TL642B Sweetwater-Montgomery Tap
TL00644a  "line SY-SWEETWTR69 ck 1 SPSa"  "L-1" "B"
      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      3 "CALPK_BD  13.80"  "1 "   0
#     3 "LRKSPBD1  13.80"  "1 "   0
#     3 "LRKSPBD2  13.80"  "2 "   0
      0
TL00644b  "line SY-SWEETWTR69 ck 1 SPSb"  "L-1" "B"
      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      3 "CALPK_BD  13.80"  "1 "   0
      3 "LRKSPBD1  13.80"  "1 "   0
#     3 "LRKSPBD2  13.80"  "2 "   0
      0
TL00644c  "line SY-SWEETWTR69 ck 1 SPSc"  "L-1" "B"
      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      3 "CALPK_BD  13.80"  "1 "   0
      3 "LRKSPBD1  13.80"  "1 "   0
      3 "LRKSPBD2  13.80"  "2 "   0
      0
TL00645  "line SOUTHBAY to OTAY      69 ck 1"  "L-1" "B"
      1 "SOUTHBAY  69"  "OTAY      69"  "1 "   1  0
      0
TL00646  "line SOUTHBAY to OTAY      69 ck 2"  "L-1" "B"
      1 "SOUTHBAY  69"  "OTAY      69"  "2 "   1  0
      0
TL00647  "line SOUTHBAY to IMPRLBCH  69 ck 1"  "L-1" "B"
      1 "SOUTHBAY  69"  "IMPRLBCH  69"  "1 "   1  0
      0
TL00648  "line POWAY    to R.CARMEL  69 ck 1"  "L-1" "B"
      1 "POWAY     69"  "R.CARMEL  69"  "1 "   1  0
      0
TL00649  "line BRDR-BRDRTP-OYTP-OY-SYO 69 ck 1"  "L-1" "B"
      4 "OTAYLAKE  69"  "10"   0
      1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
      1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
      1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
      1 "OTAY      69"  "OTAYLKTP  69"  "1 "   1  0
      1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
      0
TL00650  "line B-BTP-NOIS-CORON     TP  69 ck 1"  "L-1" "B"
      1 "B         69"  "B     TP  69"  "1 "   1  0
      1 "NOISLMTR  69"  "B     TP  69"  "1 "   1  0
      1 "CORONADO  69"  "B     TP  69"  "1 "   1  0
        7
      0
TL00651  "line NATNLCTY  to WABASH    69 ck 1"  "L-1" "B"
      1 "NATNLCTY   69"  "WABASH    69"  "1 "   1  0
      0
TL00652  "line WABASH   to MAIN ST   69 ck 1"  "L-1" "B"
      1 "WABASH    69"  "MAIN ST   69"  "1 "   1  0
      0
TL00653  "line MISSION  to F         69 ck 1"  "L-1" "B"
      1 "MISSION   69"  "F         69"  "1 "   1  0
      0
TL00654  "line MISSION  to F         69 ck 2"  "L-1" "B"
      1 "MISSION   69"  "F         69"  "2 "   1  0
      0
TL00655  "line SAMPSON  to CORONADO  69 ck 1"  "L-1" "B"
      1 "SAMPSON   69"  "CORONADO  69"  "1 "   1  0
      0
TL00656  "line SAMPSON  to MAIN ST   69 ck 1"  "L-1" "B"
      1 "SAMPSON   69"  "MAIN ST   69"  "1 "   1  0
      0
TL00657  "line SAMPSON  to MAIN ST   69 ck 2"  "L-1" "B"
      1 "SAMPSON   69"  "MAIN ST   69"  "2 "   1  0
      0
TL00658  "line SAMPSON  to DIVISION  69 ck 1"  "L-1" "B"
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      1 "SAMPSON   69"  "DIVISION  69"  "1 "   1  0
      0
TL00659  "line CABRILLO to POINTLMA  69 ck 2"  "L-1" "B"
      1 "CABRILLO  69"  "POINTLMA  69"  "2 "   1  0
      0
TL00660  "line ENCNITAS to DEL MAR   69 ck 1"  "L-1" "B"
      1 "ENCNITAS  69"  "DEL MAR   69"  "1 "   1  0
      0
TL00661  "line ROSE CYN to PENSQTOS  69 ck 1"  "L-1" "B"
      1 "ROSE CYN  69"  "PENSQTOS  69"  "1 "   1  0
      0
TL00662  "line PENSQTOS to TOREYPNS  69 ck 1"  "L-1" "B"
      1 "PENSQTOS  69"  "TOREYPNS  69"  "1 "   1  0
      0
TL00663  "line KEARNY   to MISSION   69 ck 1"  "L-1" "B"
      1 "KEARNY    69"  "MISSION   69"  "1 "   1  0
      0
TL00664  "line EASTGATE to MIRAMRTP  69 ck 1"  "L-1" "B"
      1 "EASTGATE  69"  "MIRAMRTP  69"  "1 "   1  0
      1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
      1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
      0
TL00665  "line PENSQTOS to GENESEE   69 ck 1"  "L-1" "B"
      1 "PENSQTOS  69"  "GENESEE   69"  "1 "   1  0
      0
TL00666  "line DEL MR-DMTAP MULTITP  69 ck 1"  "L-1" "B"
      4 "DUNHILL   69"  "10"   0
      1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
      1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
      1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
      1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
      1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
      1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
      1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
      0
TL00667  "line DEL MAR  to PENSQTOS  69 ck 1"  "L-1" "B"
      1 "DEL MAR   69"  "PENSQTOS  69"  "1 "   1  0
      0
TL00668  "line FNTNTP-FNTON-MR-MR    69 ck 1"  "L-1" "B"
      4 "FENTON    69"  "10"   0
      1 "FENTONTP  69"  "FENTON    69"  "1 "   1  0
      1 "MIRAMAR1  69"  "FENTONTP  69"  "1 "   1  0
      1 "MIRAMAR   69"  "FENTONTP  69"  "1 "   1  0
      0
TL00669  "line MIRAMAR  to SCRIPPS   69 ck 1"  "L-1" "B"
      1 "MIRAMAR   69"  "SCRIPPS   69"  "1 "   1  0
      0
TL00670  "line CLAIRMNT-MISSION  69 ck 1"  "L-1" "B"
      1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
      0
TL00671  "line MISSION  to ELLIOTT   69 ck 1"  "L-1" "B"
      1 "MISSION   69"  "ELLIOTT   69"  "1 "   1  0
      0
TL00672  "line KYOCRATP-KA MULTITAP   69 ck1"  "L-1" "B"
      8 "KYOCRATP  69"
      8 "KYOCERA   69"
      4 "KYOCERA   69"  "10"   0
      4 "GEN DYNM  69"  "10"   0
      1 "KYOCRATP  69"  "GENDYNTP  69"  "1 "   1  0
      1 "KYOCRATP  69"  "KYOCERA   69"  "1 "   1  0
      1 "MESAHGTS  69"  "KYOCRATP  69"  "1 "   1  0
      1 "KEARNY    69"  "GENDYNTP  69"  "1 "   1  0
      1 "GEN DYNM  69"  "GENDYNTP  69"  "1 "   1  0
        0
TL00673  "line LA JOLLA to ROSE CYN  69 ck 1"  "L-1" "B"
      1 "LA JOLLA  69"  "ROSE CYN  69"  "1 "   1  0
      0
TL00674  "line ENCNITAS to PENSQTOS  69 ck 1"  "L-1" "B"
      1 "ENCNITAS  69"  "PENSQTOS  69"  "1 "   1  0
      0
TL00675  "line PENSQTOS to MESA RIM  69 ck 1"  "L-1" "B"
```

```
       1 "PENSQTOS  69"  "MESA RIM  69"  "1 "   1  0
       0
TL00676  "line MESAHGTS to MISSION   69 ck 1"  "L-1" "B"
       1 "MESAHGTS  69"  "MISSION   69"  "1 "   1  0
       0
TL00677  "line MESA RIM to MIRAMAR   69 ck 1"  "L-1" "B"
       1 "MESA RIM  69"  "MIRAMAR   69"  "1 "   1  0
       0
TL00678  "line LOSCOCHS to ALPINE    69 ck 1"  "L-1" "B"
       1 "LOSCOCHS  69"  "ALPINE    69"  "1 "   1  0
       0
TL00679  "line ESCNDIDO to FELICITA  69 ck 1"  "L-1" "B"
       1 "ESCNDIDO  69"  "FELICITA  69"  "1 "   1  0
       0
TL00680  "line MELROSE  to MELRSETP  69 ck 1"  "L-1" "B"
       1 "MELROSE   69"  "MELRSETP  69"  "1 "   1  0
       1 "MELRSETP  69"  "SANLUSRY  69"  "1 "   1  0
       1 "MELRSETP  69"  "SANMRCOS  69"  "1 "   1  0
       0
TL00681  "line ASH-ASHTP-FELICITA-VC 69 ck 1"  "L-1" "B"
       1 "ASH       69"  "ASH    TP  69"  "1 "   1  0
       1 "FELICITA  69"  "ASH    TP  69"  "1 "   1  0
       1 "VALCNTR   69"  "ASH    TP  69"  "1 "   1  0
       0
TL00682  "line WARNERS  to RINCON    69 ck 1"  "L-1" "B"
       1 "WARNERS   69"  "RINCON    69"  "1 "   1  0
       0
TL00683  "line RINCON   to LILAC     69 ck 1 "  "L-1" "B"
       1 "RINCON    69"  "LILAC     69"  "1 "   1  0
       0
TL00684  "line ESCNDIDO to SANMRCOS  69 ck 1"  "L-1" "B"
       1 "ESCNDIDO  69"  "SANMRCOS  69"  "1 "   1  0
       0
TL00685  "line WARNERS  to SANTYSBL  69 ck 1"  "L-1" "B"
       1 "WARNERS   69"  "SANTYSBL  69"  "1 "   1  0
       0
TL00686  "line WARNERS  to NARROWS  69 ck 1"  "L-1" "B"
       8 "BORREGO   69"
       8 "NARROWS   69"
       1 "WARNERS   69"  "NARROWS   69"  "1 "   1  0
       0
TL00687  "line BORREGO  to NARROWS   69 ck 1"  "L-1" "B"
       8 "BORREGO   69"
       1 "BORREGO   69"  "NARROWS   69"  "1 "   1  0
       0
TL00688  "line ESCNDIDO to LILAC     69 ck 1"  "L-1" "B"
       1 "ESCNDIDO  69"  "LILAC     69"  "1 "   1  0
       0
TL00689  "line BRNDO-FLCTATP-ES-FLC  69 ck 1"  "L-1" "B"
       1 "BERNARDO  69"  "FELCTATP  69"  "1 "   1  0
       1 "ESCNDIDO  69"  "FELCTATP  69"  "1 "   1  0
       1 "FELCTATP  69"  "FELICITA  69"  "1 "   1  0
       0
TL00690  "line OCNTP-OCN-SLR-LSPL-STTP 69 ck 1"  "L-1" "B"
       4 "STUART    69"  "10"   0
       1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
       1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
       1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
       1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
       0
TL00691  "line AVCDTP-AVCAD-PND-MNSRT   69 ck 1"  "L-1" "B"
       1 "AVCADOTP  69"  "AVOCADO   69"  "1 "   1  0
       1 "PENDLETN  69"  "AVCADOTP  69"  "1 "   1  0
       1 "MONSRATE  69"  "AVCADOTP  69"  "1 "   1  0
       0
TL00692  "line HORNO-HORNO TP-JPM-LSPL  69 ck 1"  "L-1" "B"
       4 "HORNO     69"  "10"   0
       1 "HORNO     69"  "HORNO TP  69"  "1 "   1  0
       1 "HORNO TP  69"  "JAP MESA  69"  "1 "   1  0
       1 "LASPULGS  69"  "HORNO TP  69"  "1 "   1  0
       0
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TL00693  "line MELROSE  to SANLUSRY  69 ck 1"  "L-1" "B"
       1 "MELROSE   69"  "SANLUSRY  69"  "1 "   1  0
       0
TL00694  "line MONSRT-MRHLTP-MH-SLR  69 ck 1"  "L-1" "B"
       4 "MOROHILL  69"  "10"   0
       1 "MONSRATE  69"  "MORHILTP  69"  "1 "   1  0
       1 "MORHILTP  69"  "MOROHILL  69"  "1 "   1  0
       1 "MORHILTP  69"  "SANLUSRY  69"  "1 "   1  0
       0
TL00695  "line CRSTNTS-TALEGATP-JPM-TL  69 ck 1"  "L-1" "B"
       4 "CRSTNTS   69"  "10"   0
       1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
       1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
       1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
       0
TL00696  "line ESCNDIDO to ASH       69 ck 1"  "L-1" "B"
       1 "ESCNDIDO  69"  "ASH       69"  "1 "   1  0
       0
TL00697  "line SANLUSRY to OCEANSDE  69 ck 1"  "L-1" "B"
       1 "SANLUSRY  69"  "OCEANSDE  69"  "1 "   1  0
       0
TL00698  "line AVCDO-MNSRTP-MNSR-PALA  69 ck 1"  "L-1" "B"
       1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
       1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
       1 "PALA      69"  "MNSRATTP  69"  "1 "   1  0
       0
TL00699  "line B        to MAIN ST   69 ck 2"  "L-1" "B"
       1 "B         69"  "MAIN ST   69"  "2 "   1  0
       0
TL06902 "line NOISLMTR to CORONADO  69 ck 1"  "L-1" "B"
       1 "NOISLMTR  69"  "CORONADO  69"  "1 "   1  0
       0
TL06904  "line LOVELAND to ALPINE    69 ck 1"  "L-1" "B"
       1 "LOVELAND  69"  "ALPINE    69"  "1 "   1  0
       0
TL06905  "line GENESEE  to PENSQTOS  69 ck 2 "  "L-1" "B"
       1 "GENESEE   69"  "PENSQTOS  69"  "2 "   1  0
       0
TL06906  "line MIRAMAR  to PENSQTOS  69 ck 1"  "L-1" "B"
       1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
       0
TL06907  "line GENESEE  to UCM       69 ck 1"  "L-1" "B"
       1 "GENESEE   69"  "UCM       69"  "1 "   1  0
       0
TL06908  "line ESCNDIDO to ESCO      69 ck 1"  "L-1" "B"
       1 "ESCNDIDO  69"  "ESCO      69"  "1 "   1  0
       0
TL06910  "line MIGUEL   to BORDER    69 ck 1"  "L-1" "B"
         1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
       0
##############################################################
# SPS 7.0-SPECIAL PROTECTION SYSTEMS FOR BORDER GENERATOR UNITS
# Outage of TL6910 O/L TL649
TL06910a  "line MIGUEL   to BORDER    69 ck 1 SPSa"  "L-1" "B"
         1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
#      3 "LRKSPBD1  13.80"  "1 "   0
#      3 "LRKSPBD2  13.80"  "2 "   0
       0
TL06910b  "line MIGUEL   to BORDER    69 ck 1 SPSb"  "L-1" "B"
         1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
       3 "LRKSPBD1  13.80"  "1 "   0
#      3 "LRKSPBD2  13.80"  "2 "   0
       0
TL06910c  "line MIGUEL   to BORDER    69 ck 1 SPSc"  "L-1" "B"
         1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
       3 "LRKSPBD1  13.80"  "1 "   0
       3 "LRKSPBD2  13.80"  "2 "   0
       0
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TL06911  "line JAMACHA  to SPRNGVLY  69 ck 1"  "L-1" "B"
       1 "JAMACHA   69"  "SPRNGVLY  69"  "1 "   1  0
       0
TL06912  "line PENDLETN to SANLUSRY  69 ck 1"  "L-1" "B"
       1 "PENDLETN  69"  "SANLUSRY  69"  "1 "   1  0
       0
TL06913  "line POWAY    to POMERADO  69 ck 1"  "L-1" "B"
       1 "POWAY     69"  "POMERADO  69"  "1 "   1  0
       0
TL06914  "line LOVELAND to LOSCOCHS  69 ck 1"  "L-1" "B"
       1 "LOVELAND  69"  "LOSCOCHS  69"  "1 "   1  0
       0
TL06915  "line POMERADO to SYCAMORE  69 ck 1"  "L-1" "B"
       1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
       0
TL06916  "line SYCAMORE to SCRIPPS   69 ck 1"  "L-1" "B"
       1 "SYCAMORE  69"  "SCRIPPS   69"  "1 "   1  0
       0
TL06917  "line CREELMAN to SYCAMORE  69 ck 1"  "L-1" "B"
       1 "CREELMAN  69"  "SYCAMORE  69"  "1 "   1  0
       0
TL06920  "line ARTESN   to SYCAMORE  69 ck 1 "  "L-1" "B"
       1 "ARTESN    69"  "SYCAMORE  69"  "1 "   1  0
       0
TL06923  "line BARRETT  to CAMERON   69 ck 1"  "L-1" "B"
       1 "BARRETT   69"  "CAMERON   69"  "1 "   1  0
       0
TL06924  "line POMERADO to SYCAMORE  69 ck 2"  "L-1" "B"
       1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
       0
TL06925 "line GARFIELD to EL CAJON  69 ck 1"  "L-1" "B"
       1 "GARFIELD  69"  "EL CAJON  69"  "1 "   1  0
       0
TL06926  "line RINCON   to VALCNTR   69 ck 1"  "L-1" "B"
       1 "RINCON    69"  "VALCNTR   69"  "1 "   1  0
       0
TL06927  "line EASTGATE to ROSE CYN  69 ck 1"  "L-1" "B"
       1 "EASTGATE  69"  "ROSE CYN  69"  "1 "   1  0
       0
TL06929  "line OTAY to OTAY_93  69 ck 1"  "L-1" "B"
       1 "OTAY      69"  "OTAY_93   69"  "1 "   1  0
       2 "OTAY_93   69"  "OTAY_46A 13.8"  "1 "  0
       0
TL06930  "line OMWD     to ESCNDIDO  69 ck 1"  "L-1" "B"
       1 "OMWD      69"  "ESCNDIDO  69"  "1 "   1  0
       0
TL06931a "line BLCW201 to CRESTWD   69 ck 1"  "L-1" "B"
         8 "BOULEVRD 69"
       8 "BLCW201   69"
       8 "BLCW201G 34.50"
       4 "BOULEVRD  69"  "10"   0
       0
TL06931b "line BOULEVRD to BLCW201 69 ck 1"  "N-1" "B"
       8 "BOULEVRD 69"
       4 "BOULEVRD  69"  "10"   0
       1 "BOULEVRD  69"  "BLCW201  69"  "1 "   1  0
       0
TL06932 "line LILAC    to PALA      69 ck 1"  "L-1" "B"
       1 "LILAC     69"  "PALA      69"  "1 "   1  0
       0
TL06939 "line BERNARDO to ARTESN    69 ck 1 "  "L-1" "B"
       1 "BERNARDO  69"  "ARTESN    69"  "1 "   1  0
       0
TL06943  "line TOREYPNS  to UCM      69 ck 1"  "L-1" "B"
       1 "TOREYPNS   69"  "UCM      69"  "1 "   1  0
       0
############################################################
# SDG&E Bulk Power Transformer Single Outage
CMPNLT1  "tran CMPPSHFT 230 to CMPNL500 500 ck 1"  "T-1" "B"
         2  "CMPPSHFT 230" "CMPNL500 500"  "1 "   0
       0
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CMPNLT2  "tran CMPPSHFT 230 to CMPNL500 500 ck 2"  "T-1" "B"
         2  "CMPPSHFT 230" "CMPNL500 500"  "2 "   0
       0
CMPNLP1  "tran CMPPSHFT 230 to CMPNL230 230 ck P1"  "T-1" "B"
         2  "CMPPSHFT 230" "CMPNL230 230"  "P1"   0
       0
CMPNLP2  "tran CMPPSHFT 230 to CMPNL230 230 ck P2"  "T-1" "B"
         2  "CMPPSHFT 230" "CMPNL230 230"  "P2"   0
       0
CE80    "tran CENTRAL BK80 "  "T-1" "B"
      2 "CENTRALX 230"  "CENTRLMP 500"  "1 "  0
      2 "CENTRALX  12"  "CENTRLMP 500"  "1 "  0
      2 "CENTRALX 500"  "CENTRLMP 500"  "1 "  0
      0
CE81    "tran CENTRAL BK81 "  "T-1" "B"
      2 "CENTRALX 230"  "CENTRLMP 500"  "2 "  0
      2 "CENTRALX  12"  "CENTRLMP 500"  "2 "  0
      2 "CENTRALX 500"  "CENTRLMP 500"  "2 "  0
      0
ES50  "tran ESCNDO50 138 to ESCNDIDO   69 ck 2"  "T-1" "B"
       2 "ESCNDO50 138"  "ESCNDIDO  69"  "2 "  0
       0
ES70  "tran ESCNDIDO  69 to ESCNDIDO  230 ck 1"  "T-1" "B"
       2 "ESCNDIDO  69"  "ESCNDIDO 230"  "1 "  0
       0
ES71  "tran ESCNDIDO  69 to ESCNDIDO  230 ck 2"  "T-1" "B"
       2 "ESCNDIDO  69"  "ESCNDIDO 230"  "2 "  0
       0
ES72  "tran ESCNDIDO  69 to ESCNDIDO  230 ck 3"  "T-1" "B"
       2 "ESCNDIDO  69"  "ESCNDIDO 230"  "3 "  0
       0
IV80  "tran IMPRLVLY 230 to IMPRLVLY  500 ck 1"  "T-1" "B"
       2 "IMPRLVLY 230"  "IMPRLVLY 500"  "1 "  0
       0
IV81  "tran IMPRLVLY 230 to IMPRLVLY  500 ck 2"  "T-1" "B"
       2 "IMPRLVLY 230"  "IMPRLVLY 500"  "2 "  0
       0
IV82  "tran IMPRLVLY 230 to IMPRLVLY  500 ck 3"  "T-1" "B"
       2 "IMPRLVLY 230"  "IMPRLVLY 500"  "3 "  0
       0
LC50  "tran LOSCOCHS 138 to LOSCOCHS   69 ck 1"  "T-1" "B"
       2 "LOSCOCHS 138"  "LOSCOCHS  69"  "1 "  0
       0
LC51  "tran LOSCOCHS  69 to LOSCOCHS  138 ck 2"  "T-1" "B"
       2 "LOSCOCHS  69"  "LOSCOCHS 138"  "2 "  0
       0
ML60  "tran MIGUEL   230 to MIGUEL    138 ck 1"  "T-1" "B"
       2 "MIGUEL   230"  "MIGUEL   138"  "1 "  0
       0
ML70  "tran MIGUEL    69 to MIGUEL    230 ck 1"  "T-1" "B"
       2 "MIGUEL    69"  "MIGUEL   230"  "1 "  0
       0
ML71  "tran MIGUEL    69 to MIGUEL    230 ck 2"  "T-1" "B"
       2 "MIGUEL    69"  "MIGUEL   230"  "2 "  0
       0
ML_BK80  "ML BK80"  "T-1" "B"
       2 "MIGUEL   230"  "MIGUELMP 500"  "1 "  0
       2 "MIGUEL    12"  "MIGUELMP 500"  "1 "  0
       2 "MIGUEL   500"  "MIGUELMP 500"  "1 "  0
       0
#############################################################
#SPS 6.6      Miguel BK 80/81 protection
ML_BK80F "ML BK80 SPS6.6 f"  "T-1" "B"
       2 "MIGUEL   230"  "MIGUELMP 500"  "1 "  0
       2 "MIGUEL    12"  "MIGUELMP 500"  "1 "  0
       2 "MIGUEL   500"  "MIGUELMP 500"  "1 "  0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
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      0
ML_BK81  "ML BK81"  "T-1" "B"
      2  "MIGUEL   230"  "MIGUEL   500"  "2 "  0
      0
##############################################################
#SPS 6.6     Miguel BK 80/81 protection
ML_BK81F "ML BK81 SPS6.6 f"  "T-1" "B"
      2  "MIGUEL   230"  "MIGUEL   500"  "2 "  0
      3  "INTBST    18.00"    "2 "  0
      3  "INTBCT    16.00"    "1 "  0
      3  "IV GEN1   21.00"    "1 "  0
      3  "IV GEN2   18.00"    "2 "  0
      3  "IV GEN3   18.00"    "3 "  0
      0
MS50  "tran MISSION  138 to MISSION    69 ck 1"  "T-1" "B"
      2 "MISSION  138"  "MISSION   69"  "1 "  0
      0
MS51  "tran MISSION  138 to MISSION    69 ck 2"  "T-1" "B"
      2 "MISSION  138"  "MISSION   69"  "2 "  0
      0
MS52  "tran MISSION  138 to MISSION    69 ck 3"  "T-1" "B"
      2 "MISSION  138"  "MISSION   69"  "3 "  0
      0
MS60  "tran MISSION  230 to MISSION   138 ck 1"  "T-1" "B"
      2 "MISSION  230"  "MISSION  138"  "1 "  0
      0
MS61  "tran MISSION  230 to MISSION   138 ck 2"  "T-1" "B"
      2 "MISSION  230"  "MISSION  138"  "2 "  0
      0
MS70  "tran MISSION  230 to MISSION   69 ck 1"  "T-1" "B"
      2 "MISSION  230"  "MISSION   69"  "1 "  0
      0
NG500/69-1  "tran N.GILA  500 to N.GILA  69 ck 1"  "T-1" "B"
      2 "N.GILA   500"  "N.GILA    69"  "1 "  0
      0
NG500/69-2  "tran N.GILA  500 to N.GILA  69 ck 2"  "T-1" "B"
      2 "N.GILA   500"  "N.GILA    69"  "2 "  0
      0
OT70  "tran OLD TOWN  69 to OLD TOWN  230 ck 1"  "T-1" "B"
      2 "OLD TOWN  69"  "OLD TOWN 230"  "1 "  0
      0
OT71  "tran OLD TOWN  69 to OLD TOWN  230 ck 2"  "T-1" "B"
      2 "OLD TOWN  69"  "OLD TOWN 230"  "2 "  0
      0
PQ50  "tran PENSQTOS 138 to PENSQTOS   69 ck 1"  "T-1" "B"
      2 "PENSQTOS 138"  "PENSQTOS  69"  "1 "  0
      0
PQ51  "tran PENSQTOS  69 to PENSQTOS  138 ck 2"  "T-1" "B"
      2 "PENSQTOS  69"  "PENSQTOS 138"  "2 "  0
      0
PQ52  "tran PENSQTOS  69 to PENSQTOS  138 ck 3"  "T-1" "B"
      2 "PENSQTOS  69"  "PENSQTOS 138"  "3 "  0
      0
PQ60  "tran PENSQTOS 230 to PENSQTOS   138 ck 1"  "T-1" "B"
      2 "PENSQTOS 230"  "PENSQTOS 138"  "1 "  0
      0
PQ70  "tran PENSQTOS 230 to PENSQTOS   69 ck 1"  "T-1" "B"
      2 "PENSQTOS 230"  "PENSQTOS  69"  "1 "  0
      0
PQ71  "tran PENSQTOS 230 to PENSQTOS   69 ck 2"  "T-1" "B"
      2 "PENSQTOS 230"  "PENSQTOS  69"  "2 "  0
      0
SA51     "tran SANLUSRY 138 to SANLUSRY   69 ck 1"  "T-1" "B"
      2 "SANLUSRY 138"  "SANLUSRY  69"  "1 "  0
      0
SA70  "tran SANLUSRY  69 to SANLUSRY  230 ck 1"  "T-1" "B"
      2 "SANLUSRY  69"  "SANLUSRY 230"  "1 "  0
      0
##############################################################
# SPS 9.1a   230/69 kV Banks SA 70 and SA 71
# drop SA load for xfmr loading > 336 MVA
```

```
SA70RAS  "tran SANLUSRY  69 to SANLUSRY  230 ck 1 SPS"  "T-1" "B"
       2 "SANLUSRY  69"  "SANLUSRY 230"  "1 "  0
       4 "SANLUSRY  69"  "10"   0
       0
SA71  "tran SANLUSRY  69 to SANLUSRY  230 ck 2"  "T-1" "B"
       2 "SANLUSRY  69"  "SANLUSRY 230"  "2 "  0
       0
############################################################
# SPS 9.1b   230/69 kV Banks SA 70 and SA 71
# drop SA load for xfmr loading > 336 MVA
SA71RAS  "tran SANLUSRY  69 to SANLUSRY  230 ck 2 SPS"  "T-1" "B"
       2 "SANLUSRY  69"  "SANLUSRY 230"  "2 "  0
       4 "SANLUSRY  69"  "10"   0
       0
SA72  "tran SANLUSRY  69 to SANLUSRY  230 ck 3"  "T-1" "B"
       2 "SANLUSRY  69"  "SANLUSRY 230"  "3 "  0
       0
SI70     "tran SILVERGT 230/69"  "T-1" "B"
       2 "SILVERGT 230"  "MAIN ST   69"  "1 "  0
       0
SI71     "tran SILVERGT 230/69"  "T-1" "B"
       2 "SILVERGT 230"  "MAIN ST   69"  "2 "  0
       0
SX60     "tran SYCAMORE 230 to SYCAMORE  138 ck 1"  "T-1" "B"
       2 "SYCAMORE 230"  "SYCAMORE 138"  "1 "  0
       0
SX70     "tran SYCAMORE 230 to SYCAMORE   69 ck 1"  "T-1" "B"
       2 "SYCAMORE 230"  "SYCAMORE  69"  "1 "  0
       0
SX71     "tran SYCAMORE 230 to SYCAMORE   69 ck 2"  "T-1" "B"
       2 "SYCAMORE 230"  "SYCAMORE  69"  "2 "  0
       0
SY50     "tran SOUTHBAY  69 to SOUTHBAY  138 ck 1"  "T-1" "B"
       2 "SOUTHBAY  69"  "SOUTHBAY 138"  "1 "  0
       0
TA50     "tran TALEGA    69 to TALEGA    138 ck 1"  "T-1" "B"
       2 "TALEGA    69"  "TALEGA   138"  "1 "  0
       0
TA60  "tran TALEGA   230 to TALEGA    138 ck 1"  "T-1" "B"
       2 "TALEGA   230"  "TALEGA   138"  "1 "  0
       0
TA62  "tran TALEGA   230 to TALEGA    138 ck 2"  "T-1" "B"
       2 "TALEGA   230"  "TALEGA   138"  "2 "  0
       0
TA61  "tran TALEGA   230 to TALEGA    138 ck 3"  "T-1" "B"
       2 "TALEGA   230"  "TALEGA   138"  "3 "  0
       0
TA63  "tran TALEGA   230 to TALEGA    138 ck 4"  "T-1" "B"
       2 "TALEGA   230"  "TALEGA   138"  "4 "  0
       0
############################################################
# SDG&E Selected Generator Outage (Category B: G-1)
CALPK-BD "gen CALPK_BD  13.80"  "G-1" "B"
       3 "CALPK_BD  13.80"  "1 "   0
       0
CALPK-EC "gen CALPK_EC  13.80"  "G-1" "B"
       3 "CALPK_EC  13.80"  "1 "   0
       0
CALPK-ES "gen CALPK_ES  13.80"  "G-1" "B"
       3 "CALPK_ES  13.80"  "1 "   0
       0
CAMPO    "gen CAMPOGEN  0.69"  "G-1" "B"
         3  "CAMPOGEN 0.69"    "1 "   0
         0
DIVISION "gen DIV QF  13.80"  "G-1" "B"
       3 "DIVISION  69.00"  "QF"   0
       0
EA1      "gen ENCINA 1  14.40"  "G-1" "B"
       3 "ENCINA 1  14.40"  "1 "   0
       0
EA2      "gen ENCINA 2  14.40"  "G-1" "B"
```

```
       3 "ENCINA 2  14.40"  "2 "   0
       0
EA3      "gen ENCINA 3  14.40"  "G-1" "B"
       3 "ENCINA 3  14.40"  "3 "   0
       0
EA4      "gen ENCINA 4  22.00"  "G-1" "B"
       3 "ENCINA 4  22"  "4 "   0
       0
EA5      "gen ENCINA 5  24.00"  "G-1" "B"
       3 "ENCINA 5  24"  "5 "   0
       0
EC      "gen ELCAJNGT  12.50"  "G-1" "B"
       3 "ELCAJNGT  12.5"  "1 "   0
       0
GOALLINE "gen GOALLINE    69.00" "G-1" "B"
       3 "GOALLINE  69.00"  "QF"  0
       0
INTGEN1  "gen INTBCT   16.00" "G-1" "B"
         3  "INTBCT   16.00"   "1 "   0
         0
INTGEN2  "gen INTBST   18.00" "G-1" "B"
         3  "INTBST   18.00"   "2 "   0
         0
IVGEN1   "gen IV GEN1  21.00" "G-1" "B"
         3  "IV GEN1  21.00"   "1 "   0
         0
IVGEN2   "gen IV GEN2  21.00" "G-1" "B"
         3  "IV GEN2  18.00"   "2 "   0
         0
IVGEN3   "gen IV GEN3  21.00" "G-1" "B"
         3  "IV GEN3  18.00"   "3 "   0
         0
KEARNYGT "gen KEARNGT1    12.50" "G-1" "B"
         3  "KEARNGT1 12.50"  "1 "  0
       0
KEARNY2A "gen KEARN2AB    12.50" "G-1" "B"
         3  "KEARN2AB 12.50"  "1 "  0
       0
KEARNY2B "gen KEARN2AB    12.50" "G-1" "B"
         3  "KEARN2AB 12.50"  "2 "  0
       0
KEARNY2C "gen KEARN2CD    12.50" "G-1" "B"
         3  "KEARN2CD 12.50"  "1 "  0
       0
KEARNY2D "gen KEARN2CD    12.50" "G-1" "B"
         3  "KEARN2CD 12.50"  "2 "  0
       0
KEARNY3A "gen KEARN3AB    12.50" "G-1" "B"
         3  "KEARN3AB 12.50"  "1 "  0
       0
KEARNY3B "gen KEARN3AB    12.50" "G-1" "B"
         3  "KEARN3AB 12.50"  "2 "  0
       0
KEARNY3C "gen KEARN3CD    12.50" "G-1" "B"
         3  "KEARN3CD 12.50"  "1 "  0
       0
KEARNY3D "gen KEARN3CD    12.50" "G-1" "B"
         3  "KEARN3CD 12.50"  "2 "  0
       0
LKHDG1   "gen LkHodG1  13.80" "G-1" "B"
         3  "LkHodG1  13.80"  "Q "  0
       0
LKHDG2   "gen LkHodG1  13.80" "G-1" "B"
         3  "LkHodG2  13.80"  "Q "  0
       0
LRKSPBD1 "gen LRKSP_BD  13.80"  "G-1" "B"
       3 "LRKSPBD1  13.80"  "1 "   0
       0
LRKSPBD2 "gen LRKSP_BD  13.80"  "G-1" "B"
       3 "LRKSPBD2  13.80"  "2 "   0
       0
```

```
NIM-GT   "gen NOISLMTR  69.00"  "G-1" "B"
       3 "NOISLMTR  69"    "QF"  0
       0
POINTLMA "gen PNTLMA QF  69.00"  "G-1" "B"
       3 "POINTLMA  69"    "QF"  0
       0
RAMCO-ES "gen RAMCO_ES  13.80"  "G-1" "B"
       3 "RAMCO_ES  13.80"  "1 "   0
       0
MEF      "gen MEF  13.80"     "G-1" "B"
         3 "MEF      13.80"  "1 "  0
       0
MRGT1    "gen MIRAMRGT1 12.50"  "G-1" "B"
         3  "MIRAMRGT 12.50"  "1 "   0
       0
MRGT2    "gen MIRAMRGT2 12.50"  "G-1" "B"
         3  "MIRAMRGT 12.50"  "2 "   0
       0
PEN-P    "gen PEN PLANT 18.00" "G-1" "B"
       3 "PEN_CT1   18.00"  "1 "  0
       3 "PEN_CT2   18.00"  "2 "  0
       3 "PEN_ST    18.00"  "3 "  0
       0
PEN-3    "gen PEN_ST    18.00" "G-1" "B"
       3 "PEN_ST    18.00"  "3 "  0
       0
OTAYM-P    "gen OTAY MESA PLANT"  "G-1" "B"
       3 "OTAYMGT1 18.0"  "1 "   0
       3 "OTAYMGT2 18.0"  "1 "   0
       3 "OTAYMST1 16.0"  "1 "   0
       0
OTAYM-3    "gen OTAYMST1 16.0"  "G-1" "B"
       3 "OTAYMST1 16.0"  "1 "   0
       0
SQF      "gen SAMPSON   12.50"  "G-1" "B"
         3 "SAMPSON   12.50"    "QF"  0
       0
Q008-P     "gen SXCC PLANT"  "G-1" "B"
         3 "SXCC-U1  16.00"  "Q "   0
         3 "SXCC-U2  16.00"  "Q "   0
         3 "SXCC-U3  21.00"  "Q "   0
         3 "SXCC-U4  16.00"  "Q "   0
       0
Q008-3     "gen SXCC-U3  21.00"  "G-1" "B"
         3 "SXCC-U3  21.00"  "Q "   0
       0
Q025     "gen CW117MWG  34.50"  "G-1" "B"
         3  "CW117MWG 34.50"    "Q "   0
         0
Q026     "gen CW36MWG  34.50"  "G-1" "B"
         3  "CW36MWG  34.50"    "Q "   0
         0
Q027-P   "gen SOUTHBY PLANT" "G-1" "B"
       3 "SOUTHBY6 18.00"    "Q "  0
       3 "SOUTHBY7 18.00"    "Q "  0
       3 "SOUTHBY8 18.00"    "Q "  0
       0
Q027-6   "gen SOUTHBY6 18.00" "G-1" "B"
       3 "SOUTHBY6 18.00"    "Q "  0
       0
Q027-7   "gen SOUTHBY7 18.00" "G-1" "B"
       3 "SOUTHBY7 18.00"    "Q "  0
       0
Q027-8   "gen SOUTHBY8 18.00" "G-1" "B"
       3 "SOUTHBY8 18.00"    "Q "  0
       0
Q032     "gen BLCW201G 34.50"  "G-1" "B"
         3 "BLCW201G 34.50"   "Q1"   0
       0
Q072-1   "gen ELSNORE1 16.00"  "G-1" "B"
         3 "ELSNORE1 16.00"   "L "   0
```

```
      0
Q072-2   "gen ELSNORE2 16.00"  "G-1" "B"
         3 "ELSNORE2 16.00"   "L "   0
      0
Q078-1   "gen SOLR1A1Q 0.48kV" "G-1" "B"
         3  "SOLR1A1Q 0.48"     "Q1"  0
      0
Q078-2   "gen SOLR1A2Q 0.48" "G-1" "B"
         3  "SOLR1A2Q 0.48"     "Q2"  0
      0
Q078-3   "gen SOLR1B1Q 0.48" "G-1" "B"
         3  "SOLR1B1Q 0.48"     "Q3"  0
      0
Q090-1   "gen OTAY_46A 13.80"  "G-1" "B"
      3 "OTAY_46A  13.80"   "Q1"   0
      0
Q090-2   "gen OTAY_46B 13.80"  "G-1" "B"
      3 "OTAY_46B  13.80"   "Q2"   0
      0
Q103     "gen BD27MW   13.80"  "G-1" "B"
         3  "BD27MW   13.80"   "Q "   0
         0
Q106A    "gen WD160MW 0.69"  "G-1" "B"
         3  "WD160MW   0.69"    "Q "  0
         0
Q112     "gen WD300MWQ 0.58"  "G-1" "B"
         3  "WD300MWQ  0.58"    "Q "  0
         0
Q121     "gen MRGT49MW 13.80"  "G-1" "B"
         3 "MRGT49MW  13.80"    "Q "  0
      0
Q124-1   "gen SOLR2A1Q 0.48kV" "G-1" "B"
         3  "SOLR2A1Q 0.48"     "Q1"  0
      0
Q124-2   "gen SOLR2A2Q 0.48" "G-1" "B"
         3  "SOLR2A2Q 0.48"     "Q2"  0
      0
Q124-3   "gen SOLR2B1Q 0.48" "G-1" "B"
         3  "SOLR2B1Q 0.48"     "Q3"  0
      0
Q124-4   "gen SOLR3A1Q 0.48kV" "G-1" "B"
         3  "SOLR3A1Q 0.48"     "Q4"  0
      0
Q124-5   "gen SOLR3A2Q 0.48" "G-1" "B"
         3  "SOLR3A2Q 0.48"     "Q5"  0
      0
Q124-6   "gen SOLR3B1Q 0.48" "G-1" "B"
         3  "SOLR3B1Q 0.48"     "Q6"  0
      0
##############################################################
##############################################################
# SET THE FOLLOWING LINE TO -1 TO STOP RUNNING CONTINGENCIES IN NEIGHBORING AREAS
# OR INSERT # BEFORE -1 TO RUN SELECTED CONTINGENCIES IN NEIGHBORING AREAS
-1

first element type:

    0 = end of contingency
   -1 = end of all contingencies
    1 = Change line (secdd) status
    2 = Change tran status (tran)
    3 = Change gen status (if status        1, change generation = P)
    4 = Change load status(if status        1, change load = P, const pf)
    5 = Change shunt status
    6 = Change SVD status
    7 = reorder
    8 = isolate a bus
   11 = change dc converter status
   20 = run an epcl for a complex outage
```

```
# SDG&E 2011 category c contingency list Q124 r3
#
#################################################################
# SDG&E Bus Section Outages (Category C: Bus Section)
# Note: Alphabetical Order
#################################################################
Bus_AV69 "Avocado 69kV Bus"  "BUS" "C"
       1 "AVCADOTP  69"  "AVOCADO   69"  "1 "   1  0
       1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
       4 "AVOCADO   69"  "10"   0
       0
Bus_B69N "Station B 69kV N Bus"  "BUS" "C"
       1 "B         69"  "B     TP  69"  "1 "   1  0
       1 "B         69"  "MAIN ST   69"  "2 "   1  0
       1 "KETTNER   69"  "B         69"  "1 "   1  0
       0
Bus_B69S "Station B 69kV S Bus"  "BUS" "C"
       1 "B         69"  "MAIN ST   69"  "1 "   1  0
       1 "B         69"  "URBAN     69"  "1 "   1  0
       0
Bus_BAR69 "Barrett 69kV Bus"  "BUS" "C"
       1 "BARRETT   69"  "CAMERON   69"  "1 "   1  0
       1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
       4 "BARRETT   69"  "10"   0
       0
Bus_BE69E "Bernardo 69kV E Bus"  "BUS" "C"
       1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
       1 "BERNARDO  69"  "R.CARMEL  69"  "1 "   1  0
       0
Bus_BQ138E "Batiquitos 138kV E Bus"  "BUS" "C"
       1 "BATIQTOS 138"  "MDWLRKTP 138"  "1 "   1  0
       1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
       0
Bus_CM69 "Clairemont 69kV Bus"  "BUS" "C"
       1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
       1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
       4 "CLAIRMNT  69"  "10"   0
       0
Bus_CN69 "Cameron 69kV Bus"  "BUS" "C"
       1 "BARRETT   69"  "CAMERON   69"  "1 "   1  0
       1 "BOLVRDTP  69"  "CAMERON   69"  "1 "   1  0
       4 "CAMERON   69"  "10"   0
       0
Bus_CP138S "Capistrano 138kV S Bus"  "BUS" "C"
       1 "CAPSTRNO 138"  "LAGNA NL 138"  "1 "   1  0
       1 "CAPSTRNO 138"  "PICO     138"  "1 "   1  0
       0
Bus_CR69W "Coronado 69kV W Bus"  "BUS" "C"
       1 "NOISLMTR  69"  "CORONADO  69"  "1 "   1  0
       1 "CORONADO  69"  "B     TP  69"  "1 "   1  0
       0
Bus_CRE69E "Creelman 69kV E Bus"  "BUS" "C"
       1 "CREELMAN  69"  "LOSCOCHS  69"  "1 "   1  0
       1 "SANTYSBL  69"  "CREELMAN  69"  "1 "   1  0
       0
Bus_CS69 "Chollas 69kV Bus"   "BUS" "C"
       1 "CHOLLAS   69"  "SWEETWTR  69"  "1 "   1  0
       1 "CHOLLAS   69"  "SPRNGVLY  69"  "1 "   1  0
       1 "PARADISE  69"  "CHOLLAS   69"  "1 "   1  0
       1 "STREAMVW  69"  "CHOLLAS   69"  "1 "   1  0
       4 "CHOLLAS   69"  "10"   0
       0
Bus_DE69 "Descanso 69kV Bus"  "BUS" "C"
       1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
       1 "BLDCRKTP  69"  "DESCANSO  69"  "1 "   1  0
       1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
       4 "DESCANSO  69"  "10"   0
       0
Bus_DM69E "Del Mar 69kV E Bus"  "BUS" "C"
       1 "DEL MAR   69"  "PENSQTOS  69"  "1 "   1  0
       1 "R.SNTATP  69"  "DEL MAR   69"  "1 "   1  0
```

```
      0
Bus_DM69W "Del Mar W 69kV Bus"  "BUS" "C"
      1 "ENCNITAS  69"  "DEL MAR   69"  "1 "   1  0
      1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
      0
Bus_EC69N "El Cajon 69kV N Bus"  "BUS" "C"
      1 "EL CAJON  69"  "LOSCOCHS  69"  "1 "   1  0
      1 "GARFIELD  69"  "EL CAJON  69"  "1 "   1  0
      1 "CALPK_EC  69"  "EL CAJON  69"  "1 "   1  0
      8 "CALPK_EC 13.8"
      0
Bus_EC69S "El Cajon 69kV S Bus"  "BUS" "C"
      1 "EL CAJON  69"  "GRANITE   69"  "1 "   1  0
      1 "EL CAJON  69"  "JAMACHA   69"  "1 "   1  0
      0
Bus_EL69S "Elliot 69kV S Bus"  "BUS" "C"
      1 "MISSION   69"  "ELLIOTT   69"  "1 "   1  0
      1 "SYCAMORE  69"  "ELLIOTT   69"  "1 "   1  0
      0
Bus_ES69NW "Escondido 69kV NW Bus"  "BUS" "C"
      1 "ESCNDIDO  69"  "SANMRCOS  69"  "1 "   1  0
      1 "RAMCO_ES  69"  "ESCNDIDO  69"  "1 "   1  0
      8 "RAMCO_ES 13.8"
      0
Bus_ES69SE "Escondido 69kV SE Bus"  "BUS" "C"
      1 "CALPK_ES  69"  "ESCNDIDO  69"  "1 "   1  0
      1 "ESCNDIDO  69"  "ASH       69"  "1 "   1  0
      1 "ESCNDIDO  69"  "ESCO      69"  "1 "   1  0
      8 "CALPK_ES 13.8"
      0
Bus_ES69SW "Escondido 69kV SW Bus"  "BUS" "C"
      1 "ESCNDIDO  69"  "FELICITA  69"  "1 "   1  0
      1 "ESCNDIDO  69"  "LILAC     69"  "1 "   1  0
      0
Bus_F69 "Station F 69kV Bus"  "BUS" "C"
      1 "MISSION   69"  "F         69"  "1 "   1  0
      1 "MISSION   69"  "F         69"  "2 "   1  0
      4 "F         69"  "10"   0
      0
Bus_FE69S "Felicita 69kV S Bus"  "BUS" "C"
      1 "ESCNDIDO  69"  "FELICITA  69"  "1 "   1  0
      1 "FELICITA  69"  "ASH   TP  69"  "1 "   1  0
      0
Bus_FR138 "Friars 138kV Bus"  "BUS" "C"
      1 "DOUBLTTP 138"  "FRIARS   138"  "1 "   1  0
      1 "FRIARS   138"  "MISSION  138"  "1 "   1  0
      4 "FRIARS   138"  "10"   0
      0
Bus_GE69S "Genesee 69kV S Bus"  "BUS" "C"
      1 "GENESEE   69"  "UCM       69"  "1 "   1  0
      1 "PENSQTOS  69"  "GENESEE   69"  "1 "   1  0
      0
Bus_JM69N "Jamacha 69kV N Bus"  "BUS" "C"
      1 "JAMACHA   69"  "SPRNGVLY  69"  "1 "   1  0
      1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
      0
Bus_JM69S "Jamacha 69kV S Bus"  "BUS" "C"
      1 "EL CAJON  69"  "JAMACHA   69"  "1 "   1  0
      1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
      0
Bus_KY69E "Kearny 69kV E Bus"  "BUS" "C"
      1 "KEARNY    69"  "MISSION   69"  "1 "   1  0
      2 "KEARNY    69"  "KEAMDGT2  69"  "1 "   0
      2 "KEAMDGT2  69"  "KEARN2AB  12.50"  "1 "   0
      2 "KEAMDGT2  69"  "KEARN2CD  12.50"  "1 "   0
      0
Bus_KY69W "Kearny 69kV W Bus"  "BUS" "C"
      1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
      1 "KEARNY    69"  "GENDYNTP  69"  "1 "   1  0
      2 "KEARNY    69"  "KEAMDGT3  69"  "1 "   0
      2 "KEAMDGT3  69"  "KEARN3AB  12.50"  "1 "   0
```

```
      2 "KEAMDGT3  69"  "KEARN3CD  12.50"  "1 "   0
      0
Bus_LC69E "Los Coches 69kV E Bus"  "BUS" "C"
      1 "LOSCOCHS  69"  "GRANITTP  69"  "1 "   1  0
      1 "LOSCOCHS  69"  "ALPINE    69"  "1 "   1  0
      2 "LOSCOCHS 138"  "LOSCOCHS  69"  "2 "   0
      0
Bus_LC69W "Los Coches 69kV W Bus"  "BUS" "C"
      1 "CREELMAN  69"  "LOSCOCHS  69"  "1 "   1  0
      1 "EL CAJON  69"  "LOSCOCHS  69"  "1 "   1  0
      1 "LOSCOCHS  69"  "GRANITTP  69"  "1 "   1  0
      1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
      2 "LOSCOCHS  69"  "LOSCOCHS 138"  "1 "   0
      0
Bus_LI69S "Lilac 69kV S Bus"  "BUS" "C"
      1 "ESCNDIDO  69"  "LILAC     69"  "1 "   1  0
      1 "RINCON    69"  "LILAC     69"  "1 "   1  0
      0
Bus_LL69 "Loveland 69kV Bus"  "BUS" "C"
      1 "LOVELAND  69"  "ALPINE    69"  "1 "   1  0
      1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
      4 "LOVELAND  69"  "10"   0
      0
Bus_LP69 "Las Pulgas 69kV Bus"  "BUS" "C"
      1 "LASPULGS  69"  "HORNO TP  69"  "1 "   1  0
      1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
      4 "LASPULGS  69"  "10"   0
      0
Bus_MG69 "Montgomery 69kV Bus"  "BUS" "C"
      1 "SOUTHBAY  69"  "MONTGMRY  69"  "1 "   1  0
      1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
      4 "MONTGMRY  69"  "10"   0
      0
Bus_MI69E "Main St 69kV E Bus"  "BUS" "C"
      1 "B         69"  "MAIN ST   69"  "2 "   1  0
      1 "SAMPSON   69"  "MAIN ST   69"  "1 "   1  0
      1 "WABASH    69"  "MAIN ST   69"  "1 "   1  0
      2 "MAIN ST   69"  "SILVERGT 230"  "1 "   0
      0
Bus_MI69W "Main St 69kV W Bus"  "BUS" "C"
      1 "MAIN ST   69"  "URBAN     69"  "1 "   1  0
      1 "B         69"  "MAIN ST   69"  "1 "   1  0
      1 "SAMPSON   69"  "MAIN ST   69"  "2 "   1  0
      2 "MAIN ST   69"  "SILVERGT 230"  "2 "   0
      0
Bus_ML69N "Miguel 69kV N Bus"  "BUS" "C"
      1 "MIGUEL    69"  "GRANITTP  69"  "1 "   1  0
      1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
      0
Bus_ML69S "Miguel 69kV S Bus"  "BUS" "C"
      1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
      1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
      1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
      1 "PARADISE  69"  "MIGUEL    69"  "1 "   1  0
      0
Bus_MN69 "Monserate 69kV S Bus"  "BUS" "C"
      1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
      1 "MONSRATE  69"  "MORHILTP  69"  "1 "   1  0
      0
Bus_MR69E "Miramar 69kV E Bus"  "BUS" "C"
      1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
      1 "MIRAMAR   69"  "SCRIPPS   69"  "1 "   1  0
      0
Bus_MR69W "Miramar 69kV W Bus"  "BUS" "C"
      1 "MIRAMAR   69"  "FENTONTP  69"  "1 "   1  0
      1 "MESA RIM  69"  "MIRAMAR   69"  "1 "   1  0
      0
Bus_MRGT69 "Miramar1 (GT) 69kV Bus"  "BUS" "C"
      1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
      1 "MIRAMAR1  69"  "FENTONTP  69"  "1 "   1  0
      8 "MIRAMRGT  12.50"
```

```
       8 "MEF       13.80"
       8 "MRGT49MW  13.80"
       0
Bus_MS69N "Mission 69kV N Bus"  "BUS" "C"
       1 "KEARNY    69"  "MISSION   69"  "1 "   1  0
       1 "MISSION   69"  "CLAIRMNT  69"  "1 "   1  0
       1 "MISSION   69"  "F         69"  "1 "   1  0
       1 "MISSION   69"  "MURRAY    69"  "1 "   1  0
       0
Bus_MS69S "Mission 69kV S Bus"  "BUS" "C"
       1 "MESAHGTS  69"  "MISSION   69"  "1 "   1  0
       1 "MISSION   69"  "ELLIOTT   69"  "1 "   1  0
       1 "MISSION   69"  "F         69"  "2 "   1  0
       1 "MISSION   69"  "MURRAY    69"  "2 "   1  0
       2 "MISSION  138"  "MISSION   69"  "2 "   0
       0
Bus_MY69N "Murray 69kV N Bus"  "BUS" "C"
       1 "MISSION   69"  "MURRAY    69"  "1 "   1  0
       1 "MISSION   69"  "MURRAY    69"  "2 "   1  0
       0
Bus_NC69 "National City 69kV Bus"  "BUS" "C"
       1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
       1 "NATNLCTY  69"  "WABASH    69"  "1 "   1  0
       4 "NATNLCTY  69"  "10"   0
       0
Bus_NW69 "Narrows 69kV Bus"  "BUS" "C"
       8 "NARROWS   69"
       8 "BORREGO   69"
       0
Bus_OS69 "Oceanside 69kV Bus"  "BUS" "C"
       1 "OCEANSDE  69"  "SANLUSRY  69"  "1 "   1  0
       1 "OCEANSDE  69"  "OCNSDETP  69"  "1 "   1  0
       4 "OCEANSDE  69"  "10"   0
       0
Bus_OY69 "Otay 69kV Bus"   "BUS" "C"
       8 "OTAY      69"
       8 "OTAY_93   69"
       8 "OTAY_46A 13.80"
       8 "OTAY_46B 13.80"
         0
Bus_PD69 "Paradise 69kV Bus"  "BUS" "C"
       1 "PARADISE  69"  "CHOLLAS   69"  "1 "   1  0
       1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
       0
Bus_PL69E "Point Loma 69kV E Bus"  "BUS" "C"
       1 "OLD TOWN  69"  "POINTLMA  69"  "2 "   1  0
       1 "CABRILLO  69"  "POINTLMA  69"  "1 "   1  0
       0
Bus_PL69W "Point Loma 69kV W Bus"  "BUS" "C"
       1 "OLD TOWN  69"  "POINTLMA  69"  "1 "   1  0
       1 "CABRILLO  69"  "POINTLMA  69"  "2 "   1  0
       0
Bus_PO69 "Poway 69kV Bus"  "BUS" "C"
       1 "POWAY     69"  "WARCYNTP  69"  "1 "   1  0
       1 "POWAY     69"  "POMERADO  69"  "1 "   1  0
       0
Bus_PO69a "Poway 69kV Bus SPS"  "BUS" "C"
       1 "POWAY     69"  "WARCYNTP  69"  "1 "   1  0
       1 "POWAY     69"  "POMERADO  69"  "1 "   1  0
       4 "R.CARMEL  69"  "10"   0
       0
Bus_POM69E "Pomerado 69kV E Bus"  "BUS" "C"
       1 "POWAY     69"  "POMERADO  69"  "1 "   1  0
       1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
       0
Bus_PQ69NE "Penasquitos 69kV NE Bus"  "BUS" "C"
       1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
       1 "PENSQTOS  69"  "GENESEE   69"  "2 "   1  0
       0
Bus_PQ69NW "Penasquitos 69kV NW Bus"  "BUS" "C"
       1 "R.SNTATP  69"  "PENSQTOS  69"  "1 "   1  0
```

```
      1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
      0
Bus_PQ69SE "Penasquitos 69kV SE Bus"  "BUS" "C"
      1 "PENSQTOS  69"  "ROSE CYN  69"  "1 "   1  0
      1 "PENSQTOS  69"  "MESA RIM  69"  "1 "   1  0
      1 "PENSQTOS  69"  "TOREYPNS  69"  "1 "   1  0
      0
Bus_PQ69SW "Penasquitos 69kV SW Bus"  "BUS" "C"
      1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
      1 "DEL MAR   69"  "PENSQTOS  69"  "1 "   1  0
      0
Bus_PV138 "Proctor Valley 138kV Bus"  "BUS" "C"
      1 "PRCTRVLY 138"  "MIGUEL   138"  "1 "   1  0
      1 "PRCTRVLY 138"  "TELECYN  138"  "1 "   1  0
      4 "PRCTRVLY 138"  "10"   0
      0
Bus_RIN69N "Rincon 69kV N Bus"  "BUS" "C"
      1 "RINCON    69"  "LILAC     69"  "1 "   1  0
      1 "WARNERS   69"  "RINCON    69"  "1 "   1  0
      0
Bus_RN69W "Rose Canyon 69kV W Bus"  "BUS" "C"
      1 "EASTGATE  69"  "ROSE CYN  69"  "1 "   1  0
      1 "LA JOLLA  69"  "ROSE CYN  69"  "1 "   1  0
      0
Bus_SA69N "San Luis Rey 69kV N Bus"  "BUS" "C"
      1 "MELROSE   69"  "SANLUSRY  69"  "1 "   1  0
      1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
      1 "PENDLETN  69"  "SANLUSRY  69"  "1 "   1  0
      0
Bus_SA69S "San Luis Rey 69kV S Bus"  "BUS" "C"
      1 "SANLUSRY  69"  "OCEANSDE  69"  "1 "   1  0
      1 "MELRSETP  69"  "SANLUSRY  69"  "1 "   1  0
      1 "MORHILTP  69"  "SANLUSRY  69"  "1 "   1  0
      0
Bus_SHBT "Shadow Ridge 138kV BusTIE"  "BUS" "C"
      1 "SHADOWR  138"  "ESCNDO50 138"  "1 "   1  0
      1 "CALAVRTP 138"  "SHADOWR  138"  "1 "   1  0
      4 "SHADOWR  138"  "10"   0
      8 "SHADOWR  138"
      0
Bus_SW69 "Sweetwater 69kV Bus       "  "BUS" "C"
      1 "SWEETWTR  69"  "CHOLLAS   69"  "1 "   1  0
      1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
      1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      1 "SWTWTRTP  69"  "SWEETWTR  69"  "1 "   1  0
      8 "SWEETWTR  69"
      4 "SWEETWTR  69"  "10"   0
      0
Bus_SY69N "Southbay 69kV N Bus"  "BUS" "C"
      1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
      1 "SOUTHBAY  69"  "OTAY      69"  "1 "   1  0
      1 "SOUTHBAY  69"  "IMPRLBCH  69"  "1 "   1  0
      0
Bus_SY69S "Southbay 69kV S Bus"  "BUS" "C"
      1 "SOUTHBAY  69"  "MONTGMRY  69"  "1 "   1  0
      1 "SOUTHBAY  69"  "OTAY      69"  "2 "   1  0
      1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
      0
Bus_SX69S "Sycamore 69kV S Bus"  "BUS" "C"
      1 "ARTESN    69"  "SYCAMORE  69"  "1 "   1  0
      1 "SYCAMORE  69"  "ELLIOTT   69"  "1 "   1  0
      1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
      0
Bus_ST69 "Santa Ysabel 69kV Bus"  "BUS" "C"
      1 "WARNERS   69"  "SANTYSBL  69"  "1 "   1  0
      1 "BLDCRKTP  69"  "SANTYSBL  69"  "1 "   1  0
      1 "SANTYSBL  69"  "CREELMAN  69"  "1 "   1  0
      4 "SANTYSBL  69"  "10"   0
      0
Bus_TB138S "Trabuco 138kV S Bus"  "BUS" "C"
```

```
       1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "   1  0
       1 "MARGARTA 138"  "TRABUCO  138"  "1 "   1  0
       0
Bus_VC69 "Valycntr 69kV Bus"  "BUS" "C"
       1 "VALCNTR   69"  "ASH   TP  69"  "1 "   1  0
       1 "RINCON    69"  "VALCNTR   69"  "1 "   1  0
       4 "VALCNTR   69"  "10"   0
       0
Bus_WA69 "Wabash 69kV Bus"  "BUS" "C"
       1 "WABASH    69"  "MAIN ST   69"  "1 "   1  0
       1 "WABASH    69"  "NATNLCTY  69"  "1 "   1  0
       1 "WABASH    69"  "STREAMVW  69"  "1 "   1  0
       4 "WABASH    69"  "10"   0
       0
Bus_WR69 "Warners 69kV Bus"  "BUS" "C"
       8 "NARROWS   69"
       8 "BORREGO   69"
       1 "NARROWS   69"  "WARNERS   69"  "1 "   1  0
       1 "WARNERS   69"  "RINCON    69"  "1 "   1  0
       1 "WARNERS   69"  "SANTYSBL  69"  "1 "   1  0
       4 "WARNERS   69"  "10"   0
       0
############################################################
# SDG&E Stuck Breaker Outages (Category C: Stuck Breaker)
# Note: Alphabetical Order
Bkr_EA2T "ENCINA 2T Breaker"  "BRKR" "C"
       1 "PENSQTOS 230"   "ENCINA   230"  "1 "  1  0
       3 "ENCINA 5  24"   "5 "   0
       0
Bkr_EA2W "ENCINA 2W Breaker"  "BRKR" "C"
         1 "ENCINA   230"  "S.ONOFRE 230"  "1 "   1  0
       3 "ENCINA 5  24"  "5 "    0
       0
Bkr_ML "ML BK71 & Miguel - SXCC     #1 230 kV aa"  "BRKR" "C"
       1 "MIGUEL   230"  "MISSION  230"  "2 "  1  0
       2 "MIGUEL    69"  "MIGUEL   230"  "2 "  0
       1 "MIGUEL   230"  "SXCC     230"  "1 "  1  0
       0
############################################################
# SDG&E Common Structure Outages (Category C: N-2)
23052/23007 "TA-SO 1 + 2 230KV *assoc SPS"  "N-2" "C"
       1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
       1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
       0
23051A/23011 "SX-PEN + PEN-EA-SA 230KV"  "N-2" "C"
       1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
       1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
       1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
       1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
       0
23051B/230XX "PEN-ES #1+ PEN-ES #2 230KV"  "N-2" "C"
       1 "PEN      230"  "ESCNDIDO 230"  "1 "   1  0
       1 "ESCNDIDO 230"  "PEN      230"  "2 "   1  0
       0
23051A/6920A "SX-PEN 230KV + BE-AR 69KV"  "N-2" "C"
       1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
       1 "BERNARDO  69"  "ARTESN    69"  "1 "   1  0
       0
23051A/6920B "SX-PEN 230KV + AR-SX 69KV"  "N-2" "C"
       1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
       1 "ARTESN    69"  "SYCAMORE  69"  "1 "   1  0
       0
23028/23027 "OT-MS 1&2 230KV"  "N-2" "C"
       1  "OLD TOWN 230"  "MISSION  230"  "1 "   1  0
         1  "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
         1  "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
         1  "OLDTWNTP 230"  "MISSION  230"  "2 "   1  0
       0
23021/22 "line ML-MS&ML-SX 230kV"  "N-2" "C"
       1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
```

```
      0
##############################################################
# SPS 6.3 for TL23021/22 in TMC 1505 for
# the Miguel-Mission congestion,
# 6.3 Miguel to South Bay 138 kV path N-2 SPS
23021/22a "line ML-MS&ML-SX 230kV SPS6.3 a"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
#     3  "INTBCT    16.00"    "1 "  0
#     3  "IV GEN1   21.00"    "1 "  0
#     3  "IV GEN2   18.00"    "2 "  0
#     3  "IV GEN3   18.00"    "3 "  0
      0
23021/22b "line ML-MS&ML-SX 230kV SPS6.3 b"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
      3  "INTBCT    16.00"    "1 "  0
#     3  "IV GEN1   21.00"    "1 "  0
#     3  "IV GEN2   18.00"    "2 "  0
#     3  "IV GEN3   18.00"    "3 "  0
      0
23021/22c "line ML-MS&ML-SX 230kV SPS6.3 c"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
      3  "INTBCT    16.00"    "1 "  0
      3  "IV GEN1   21.00"    "1 "  0
#     3  "IV GEN2   18.00"    "2 "  0
#     3  "IV GEN3   18.00"    "3 "  0
      0
23021/22d "line ML-MS&ML-SX 230kV SPS6.3 d"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
      3  "INTBCT    16.00"    "1 "  0
      3  "IV GEN1   21.00"    "1 "  0
      3  "IV GEN2   18.00"    "2 "  0
#     3  "IV GEN3   18.00"    "3 "  0
      0
23021/22e "line ML-MS&ML-SX 230kV SPS6.3 e"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
      3  "INTBCT    16.00"    "1 "  0
      3  "IV GEN1   21.00"    "1 "  0
      3  "IV GEN2   18.00"    "2 "  0
      3  "IV GEN3   18.00"    "3 "  0
      0
23022/23  "line ML-MS 1&2 230kV"  "N-2" "C"
      1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      0
##############################################################
#
# SPS 6.4 for TL23022/23 in TMC 1505 for
# the Miguel-Mission congestion,
# 6.4 Miguel to South Bay 138 kV path N-2 SPS
23022/23a "line ML-MS 1&2 230kV SPS6.4 a"  "N-2" "C"
      1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      3  "INTBST    18.00"    "2 "  0
#     3  "INTBCT    16.00"    "1 "  0
#     3  "IV GEN1   21.00"    "1 "  0
#     3  "IV GEN2   18.00"    "2 "  0
#     3  "IV GEN3   18.00"    "3 "  0
      0
23022/23b "line ML-MS 1&2 230kV SPS6.4 b"  "N-2" "C"
      1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
```

```
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
#      3  "IV GEN1   21.00"    "1 "  0
#      3  "IV GEN2   18.00"    "2 "  0
#      3  "IV GEN3   18.00"    "3 "  0
       0
23022/23c "line ML-MS 1&2 230kV SPS6.4 c"  "N-2" "C"
       1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
#      3  "IV GEN2   18.00"    "2 "  0
#      3  "IV GEN3   18.00"    "3 "  0
       0
23022/23d "line ML-MS 1&2 230kV SPS6.4 d"  "N-2" "C"
       1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
#      3  "IV GEN3   18.00"    "3 "  0
       0
23022/23e "line ML-MS 1&2 230kV SPS6.4 e"  "N-2" "C"
       1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3  "INTBST    18.00"    "2 "  0
       3  "INTBCT    16.00"    "1 "  0
       3  "IV GEN1   21.00"    "1 "  0
       3  "IV GEN2   18.00"    "2 "  0
       3  "IV GEN3   18.00"    "3 "  0
       0
23012/13808 "PQ-EA 230KV + NCW-PQ 138KV"  "N-2" "C"
       1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
       1 "NORTHCTY 138"  "PENSQTOS 138"  "1 "   1  0
       0
23012/13807 "PQ-EA 230KV + EA-NCW 138KV"  "N-2" "C"
       1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
       1 "ENCINA   138"  "NORTHCTY 138"  "1 "   1  0
       0
23010X/23003 "EA-SO 230KV + SA-ES-EA 230KV"  "N-2" "C"
         1 "ENCINA   230"  "S.ONOFRE 230"  "1 "   1  0
       1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
       1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
       1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
       0
23011/13825 "ES-EA-SA 230KV + BQ-CC-ES-NCM 138KV"  "N-2" "C"
       1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
       1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
       1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
       1 "BATIQTOS 138"  "MDWLRKTP 138"  "1 "   1  0
       1 "CHCARITA 138"  "MDWLRKTP 138"  "1 "   1  0
       0
23010X/23002 "EA-SO + SO-SA 3 230KV"  "N-2" "C"
         1 "ENCINA   230"  "S.ONOFRE 230"  "1 "   1  0
       1 "SANLUSRY 230"  "S.ONOFRE 230"  "3 "   1  0
       0
23004/23001 "SA-MS 1 + SA-MS 2 230KV"  "N-2" "C"
       1 "SANLUSRY 230"  "MISSION  230"  "1 "   1  0
       1 "SANLUSRY 230"  "MISSION  230"  "2 "   1  0
       0
23030a12  "line CMPNL230 to TALEGA   230 ck 1 & 2"  "N-2" "C"
       1 "CMPNL230 230"  "TALEGA   230"  "1 "   1  0
       1 "CMPNL230 230"  "TALEGA   230"  "2 "   1  0
       0
23030b12  "line ESCNDIDO to CMPNL230   230 ck 1 & 2"  "N-2" "C"
         1  "ESCNDIDO 230"  "CMPNL230 230"  "1 "   1  0
         1  "ESCNDIDO 230"  "CMPNL230 230"  "2 "   1  0
       0
13837/13835 "CP-LNL + SMO-LNL 138KV"  "N-2" "C"
```

```
      1 "CAPSTRNO 138"  "LAGNA NL 138"  "1 "   1  0
      1 "SANMATEO 138"  "LAGNA NL 138"  "1 "   1  0
      4 "LAGNA NL 138"  "10"   0
      0
13837/13834 "CP-LNL + CP-TB 138KV"  "N-2" "C"
      1 "CAPSTRNO 138"  "LAGNA NL 138"  "1 "   1  0
      1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "   1  0
      0
13836/13833 "TA-TB + TA-PI 138KV"  "N-2" "C"
      1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
      1 "TALEGA   138"  "PICO     138"  "1 "   1  0
      0
13835/13833 "TA-TB + LNL-SMO 138KV"  "N-2" "C"
      1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
      1 "LAGNA NL 138"  "SANMATEO 138"  "1 "   1  0
      0
13835/695 "LNL-SMO 138KV + CI-JA-TA 69KV"  "N-2" "C"
      1 "LAGNA NL 138"  "SANMATEO 138"  "1 "   1  0
      1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
      1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
      1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
      4 "CRSTNTS   69"  "10"   0
      0
13834/13833 "TB-CP + TA-TB 138KV"  "N-2" "C"
      1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "   1  0
      1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
      0
13833/13816 "PI-CP + TA-TB 138KV"  "N-2" "C"
      1 "PICO     138"  "CAPSTRNO 138"  "1 "   1  0
      1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
      0
13827/670 "FR-MS 138KV + CM-MS 69KV"   "N-2" "C"
      1 "FRIARS   138"  "MISSION  138"  "1 "   1  0
      1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
      0
13824/13823 "LC-SY + SY-TC 138KV"  "N-2" "C"
      1 "LOSCOCHS 138"  "SOUTHBAY 138"  "1 "   1  0
      1 "TELECYN  138"  "SOUTHBAY 138"  "1 "   1  0
      0
13824/632  "LC-SY+ML-LC 138/69KV"  "N-2" "C"
      1 "LOSCOCHS 138"  "SOUTHBAY 138"  "1 "   1  0
      1 "MIGUEL    69"  "GRANITTP  69"  "1 "   1  0
      0
13824/13809 "PV-TC + LC-SY 138KV"  "N-2" "C"
      1 "PRCTRVLY 138"  "TELECYN  138"  "1 "   1  0
      1 "LOSCOCHS 138"  "SOUTHBAY 138"  "1 "   1  0
      0
13810B/670 "DB-FR-MIR 138KV + CM-MS 69KV"   "N-2" "C"
      1 "DOUBLET  138"  "DOUBLTTP 138"  "1 "   1  0
      1 "DOUBLTTP 138"  "PENSQTOS 138"  "1 "   1  0
      1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
      0
13804/13801 "EA-BQ-PQ + EA-CAN 138KV"   "N-2" "C"
      1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
      1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
      1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
      1 "ENCINA   138"  "CANNON   138"  "1 "   1  0
      0
13804/6906 "EA-BQ-PQ 138KV + MR-PQ 69KV"   "N-2" "C"
      1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
      1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
      1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
      1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
      0
13802/13801 "CAN-SA-SH + EA-CAN 138KV"   "N-2" "C"
      1 "CALAVRTP 138"  "CANNON   138"  "1 "   1  0
      1 "CALAVRTP 138"  "SANLUSRY 138"  "1 "   1  0
      1 "CALAVRTP 138"  "SHADOWR  138"  "1 "   1  0
      1 "ENCINA   138"  "CANNON   138"  "1 "   1  0
      4 "CANNON   138"  "10"   0
      0
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13819/636   "LC-SN + LC-EL 138/69 KV "   "N-2" "C"
      1 "LOSCOCHS 138"  "SANTEE   138"  "1 "   1  0
      1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
      0
13821/636   "CH-SX-SN+LC-EL 138/69 KV"   "N-2" "C"
      1 "CARLTNHS 138"  "CARLTHTP 138"  "1 "   1  0
      1 "CARLTHTP 138"  "SANTEE   138"  "1 "   1  0
      1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
      0
6924/6915 "POM-SX 1 + 2 69KV"   "N-2" "C"
      1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
      1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
      0
6906/675 "MR-PQ 69KV + PQ-MRM 69KV"   "N-2" "C"
      1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
      1 "PENSQTOS  69"  "MESA RIM  69"  "1 "   1  0
      0
643/627 "ML-JM 1 + 2 69KV"   "N-2" "C"
      1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
      1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
      0
6915/24  "line POMERADO-SYCAMORE  69 ck 1/2"  "N-2" "C"
      1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
      1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
      0
#################################################################
#SPS 9.4     69kV TL633 at RCL
#protect 69kV TL633 from overloads following either a Poway
# 69 kV South Bus outage or a common structure outage of
# 69 kV TL 6915 and TL 6924 at high system loads.
6915/24a "line POMERADO-SYCAMORE  69 ck 1/2 SPS9.4a"  "N-2" "C"
      1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
      1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
      4 "R.CARMEL  69"  "10"   0
      0
#################################################################
# SPS 9.7    69kV TL695A at TA
# Prevent overloads on sections of TL 690/TL 692/TL695 following
# the common structure outage of TL23007 and TL 23052 (SONGS-TALEGA 1/2).
# Also designed to prevent o/l on Talega 138/69 kV Bk 50 and 69 kV TL 695
# following fault on San Luis Rey Bank 71. A stuck breaker condition
# (5W) will cause simultaneous loss of bank 70/71 at San Luis Rey.
# Such loading is likely to occur at high system loads and heavy SOS flow.
# A directional o/c relay is installed at Talega on TL 695 that will:
# trip TL 695 at Talega if loading on TL 695 into TA exceeds 7 MVA for
# 5 seconds, OR if loading on 69 kV TL 695 out of TA exceeds
# 30 MVA for 5 seconds.
23052/23007a "TA-SO 1 + 2 230KV SPS a 9.7"  "N-2" "C"
      1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
      1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
      4 "CRSTNTS   69"  "10"   0
      1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
      1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
      1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
      0
#OR
SA5WSPSb "SA5W TRIP TL695 SPS b 9.7"  "BRKR" "C"
      2 "SANLUSRY  69"  "SANLUSRY 230"  "1 "  0
      2 "SANLUSRY  69"  "SANLUSRY 230"  "2 "  0
      1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
      0
23022/23021 "ML-SX + ML-MS 230KV"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
      1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
      0
#################################################################
# SPS 7.0-SPECIAL PROTECTION SYSTEMS FOR BORDER  GENERATOR UNITS
# Outage of TL23021/22 can O/L TL640
# Trip Border Genration sequentially
23022/23021a "ML-SX + ML-MS 230KV SPS 7.0a"  "N-2" "C"
      1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
```

```
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
#      3 "LRKSPBD1  13.80"  "1 "   0
#      3 "LRKSPBD2  13.80"  "2 "   0
       0
23022/23021b "ML-SX + ML-MS 230KV SPS 7.0b"  "N-2" "C"
       1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
       3 "LRKSPBD1  13.80"  "1 "   0
#      3 "LRKSPBD2  13.80"  "2 "   0
       0
23022/23021c "ML-SX + ML-MS 230KV SPS 730c"  "N-2" "C"
       1  "MIGUEL   230"  "SXCC     230"  "1 "   1  0
       1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
       3 "CALPK_BD  13.80"  "1 "   0
       3 "LRKSPBD1  13.80"  "1 "   0
       3 "LRKSPBD2  13.80"  "2 "   0
       0
############################################################
############################################################
# SET THE FOLLOWING LINE TO -1 TO STOP RUNNING CONTINGENCIES IN NEIGHBORING AREAS
# OR INSERT # BEFORE -1 TO RUN SELECTED CONTINGENCIES IN NEIGHBORING AREAS
-1

first element type:

    0 = end of contingency
   -1 = end of all contingencies
    1 = Change line (secdd) status
    2 = Change tran status (tran)
    3 = Change gen status (if status        1, change generation = P)
    4 = Change load status(if status        1, change load = P, const pf)
    5 = Change shunt status
    6 = Change SVD status
    7 = reorder
    8 = isolate a bus
   11 = change dc converter status
   20 = run an epcl for a complex outage
```

Appendix E

Power Flow Analysis Results

MVA1 pu Loading					CaseName					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	Base system (n-0)	224	285	1.27			0.98	1.02		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	Base system (n-0)	224	269	1.20			0.95	1.00		

MVA1 pu Loading					CaseName					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-II	11hs-pst-II	11lw-pre	11lw-pst
LINE CMPNL230 230kV-TALEGA 230kV ck1	line IV-WIND 500kV SPS6.2	456	456	1.00			1.00	1.01		
	line WIND-ML 500kV	456	456	1.00			1.01	1.01		
	line WIND-ML 500kV SPS6.1	456	456	1.00			1.03	1.02		
	line WIND-ML 500kV SPS6.2	456	456	1.00			1.06	1.07		
	line PEN to ESCNDIDO 230	456	456	1.00			1.00	1.00		
	line ESCNDIDO to CMPNL230 230 ck 1	456	456	1.00			1.04	1.03		
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	line IV-WIND 500kV	71	71	1.00	1.04	1.06	1.06	1.07		
	line IV-WIND 500kV SPS6.1	71	71	1.00	1.02	1.04	1.04	1.05		
	line IV-WIND 500kV SPS6.2	71	71	1.00	1.04		1.05	1.06		
	line WIND-ML 500kV	71	71	1.00	1.13	1.17	1.13	1.15		
	line WIND-ML 500kV SPS6.1	71	71	1.00	1.11	1.14	1.12	1.13		
	line WIND-ML 500kV SPS6.2	71	71	1.00	1.14	1.14	1.13	1.15		
	line PENSQTOS to OLD TOWN 230 ck 1	71	71	1.00			1.02			
	line OTAYMESA to SOUTHBAY 230 ck 1	71	71	1.00	1.02	1.04	1.05	1.07		
	line SILVERGT to SOUTHBAY 230 ck 1	71	71	1.00	1.02	1.05	1.06	1.07		
	line PENSQTOS to SYCAMORE 230 ck 1	71	71	1.00	1.01	1.02	1.07	1.08		
	line PRCTRVLY to TELECYN 138 ck 1	71	71	1.00	1.03	1.04	1.07	1.08		
	line SANTEE to LOSCOCHS 138 ck 1	71	71	1.00	1.00		1.05	1.04		
	line CARLTNHS-SANTEE 138	71	71	1.00	1.08	1.07	1.12	1.11		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	71	71	1.00	1.15	1.14	1.19	1.18		
	line TELECYN to SOUTHBAY 138 ck 1	71	71	1.00	1.01	1.01	1.05	1.05		
	line LOSCOCHS to SOUTHBAY 138 ck 1	71	71	1.00	1.04	1.05	1.08	1.09		
	line PRCTRVLY to MIGUEL 138 ck 1	71	71	1.00	1.05	1.06	1.09	1.10		
	line OLD TOWN to KETTNER 69 ck 1	71	71	1.00			1.01	1.01		
	line MISSION to MURRAY 69 ck 1	71	71	1.00			1.03	1.02		
	line MISSION to MURRAY 69 ck 2	71	71	1.00			1.02	1.02		
	line MURRAY to GARFIELD 69 ck 1	71	71	1.00	1.01	1.00	1.05	1.04		
	line EL CAJON to JAMACHA 69 ck 1	71	71	1.00			1.02	1.02		
	line BLTP-CMRN MULTIPTAP 69 ck 1	71	71	1.00			1.04	1.04		
	line CREELMAN to LOSCOCHS 69 ck 1	71	71	1.00	1.03	1.04	1.05	1.06		
	line LOSCOCHS to ELLIOTT 69 ck 1	71	71	1.00			1.03	1.02		
	line SYCAMORE to ELLIOTT 69 ck 1	71	71	1.00	1.01	1.01	1.06	1.06		
	line ASH-ASHTP-FELICITA-VC 69 ck 1	71	71	1.00			1.04	1.03		
	line WARNERS to RINCON 69 ck 1	71	71	1.00	1.03	1.02	1.07	1.06		
	line ESCNDIDO to LILAC 69 ck 1	71	71	1.00			1.03	1.03		
	line ESCNDIDO to ASH 69 ck 1	71	71	1.00				1.01		
	line POWAY to POMERADO 69 ck 1	71	71	1.00			1.03	1.03		
	line SYCAMORE to SCRIPPS 69 ck 1	71	71	1.00			1.03	1.03		
	line ARTESN to SYCAMORE 69 ck 1	71	71	1.00				1.01		
	line GARFIELD to EL CAJON 69 ck 1	71	71	1.00			1.02	1.02		
	line RINCON to VALCNTR 69 ck 1	71	71	1.00			1.01	1.01		
	tran LOSCOCHS 138 to LOSCOCHS 69 ck 1	71	71	1.00	1.02	1.03	1.07	1.06		
	tran LOSCOCHS 69 to LOSCOCHS 138 ck 2	71	71	1.00	1.02	1.02	1.06	1.06		
	tran MIGUEL 230 to MIGUEL 138 ck 1	71	71	1.00	1.05	1.06	1.09	1.10		
	tran MIGUEL 69 to MIGUEL 230 ck 1	71	71	1.00	1.01	1.02	1.05	1.06		
	tran MIGUEL 69 to MIGUEL 230 ck 2	71	71	1.00	1.01	1.02	1.05	1.06		
	tran MISSION 230 to MISSION 138 ck 1	71	71	1.00				1.01		
	tran MISSION 230 to MISSION 138 ck 2	71	71	1.00				1.01		
	tran MISSION 230 to MISSION 69 ck 1	71	71	1.00			1.01	1.01		
	tran SILVERGT 230/69	71	71	1.00			1.01	1.01		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	71	71	1.00		1.00	1.04	1.05		
	gen CAMPOGEN 0.69	71	71	1.00	1.02	1.02	1.06	1.06		
	line MIGUEL to SXCC 230 ck 1	71	71	1.00			1.02	1.01		
LINE EASTGATE 69kV-ROSE CYN 69kV ck1	line PACFCBCH to OLD TOWN 69 ck 1	50	50	1.00			1.01			
	line ROSE CYN to PENSQTOS 69 ck 1	50	50	1.00	1.12		1.16	1.04		
LINE EL CAJON 69kV-GRANITE 69kV ck1	line GRANITE to GRANITTP 69 ck 1	97	114	1.18	1.02	1.01	1.01	1.02		
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	line WIND-ML 500kV SPS6.2	102	113	1.11	1.00	1.00				
	line ESCNDIDO to FELICITA 69 ck 1	102	113	1.11	1.19	1.17	1.18	1.16		
	line ESCNDIDO to ASH 69 ck 1	102	113	1.11	1.27	1.26	1.27	1.25		
LINE FELCTATP 69kV-FELICITA 69kV ck1	line ESCNDIDO to ASH 69 ck 1	72	97	1.35	1.09	1.11	1.11	1.13		
LINE FELICITA 69kV-ASH TP 69kV ck1	line ESCNDIDO to ASH 69 ck 1	90	90	1.00	1.02	1.02	1.03	1.03		
LINE KEARNY 69kV-MISSION 69kV ck1	line MESAHGTS to MISSION 69 ck 1	97	129	1.33	1.08	1.13	1.07	1.11		
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	line ESCNDIDO to SANMRCOS 69 ck 1	97.5	102.1	1.05	1.01	1.02	1.01	1.02		
	line MELROSE to SANLUSRY 69 ck 1	97.5	102.1	1.05	1.11	1.10	1.03	1.01		
LINE MESAHGTS 69kV-MISSION 69kV ck1	line KEARNY to MISSION 69 ck 1	97	136	1.40	1.16	1.20	1.15	1.19		
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	line PARADISE to MIGUEL 69 ck 1	97	136	1.40	1.12	1.18	1.10	1.15		
LINE MLSXTAP 230kV-SXCC 230kV ck1	line OTAYMESA to SOUTHBAY 230 ck 1	796.7	968	1.22	0.87	1.02				
	line SILVERGT to SOUTHBAY 230 ck 1	796.7	968	1.22	0.87	1.02				
LINE MURRAY 69kV-GARFIELD 69kV ck1	line WIND-ML 500kV	97	103	1.06	0.99	1.01				
	line WIND-ML 500kV SPS6.2	97	103	1.06	1.01	1.01				
	tran MIGUEL 69 to MIGUEL 230 ck 1	97	103	1.06			1.01			
	tran MIGUEL 69 to MIGUEL 230 ck 2	97	103	1.06			1.01			
LINE OLD TOWN 69kV-KETTNER 69kV ck1	tran SILVERGT 230/69	215	239	1.11	1.03	1.00	1.03	1.01		
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	line PENSQTOS to TOREYPNS 69 ck 1	97	129	1.33	1.13	1.13	1.12	1.13		
LINE PENSQTOS 69kV-MIRAMRTP 69kV ck1	line ROSE CYN to PENSQTOS 69 ck 1	97	112	1.15	1.05		1.05			
	line PENSQTOS to MESA RIM 69 ck 1	97	112	1.15	1.01					
LINE POMERADO 69kV-SYCAMORE 69kV ck1	line POMERADO to SYCAMORE 69 ck 2	97	136	1.40	1.11	1.18	1.15	1.21		
LINE POMERADO 69kV-SYCAMORE 69kV ck2	line POMERADO to SYCAMORE 69 ck 1	97	136	1.40	1.11	1.18	1.15	1.21		
LINE SAMPSON 69kV-MAIN ST 69kV ck1	line SAMPSON to MAIN ST 69 ck 2	129	129	1.00	1.23	1.19	1.24	1.21		
LINE SAMPSON 69kV-MAIN ST 69kV ck2	line SAMPSON to MAIN ST 69 ck 1	129	129	1.00	1.23	1.20	1.25	1.21		
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22	1.22	1.22		
LINE SYCAMORE 138kV-CHCARITA 138kV ck1	line PENSQTOS to SYCAMORE 230 ck 1	204	204	1.00	0.67	1.01	0.76	1.11		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	204	204	1.00				1.02		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	204	204	1.00	0.65	1.02	0.71	1.07		
LINE SYCAMORE 230kV-PENSQTOS 230kV ck1	line OTAYMESA to SOUTHBAY 230 ck 1	796.7	1153	1.45			1.05	1.22		
	line SILVERGT to SOUTHBAY 230 ck 1	796.7	1153	1.45			1.05	1.22		
LINE SYCAMORE 230kV-SXCC 230kV ck1	line SYCAMORE to SXCC 230 ck 2	796.7	968	1.22			0.92	1.01		
LINE SYCAMORE 230kV-SXCC 230kV ck2	line SYCAMORE to SXCC 230 ck 1	796	912	1.15			0.92	1.01		
TRAN CENTRALX 12kV-CENTRLMP 500kV ck1	tran CENTRAL BK81	180	180	1.00					1.20	1.19
TRAN CENTRALX 12kV-CENTRLMP 500kV ck2	tran CENTRAL BK80	180	180	1.00					1.20	1.19
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck1	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	239	1.07	0.98	1.00	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	239	1.07	0.98	1.00	1.00	1.03		
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck2	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	239	1.07	0.98	1.01	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	239	1.07	0.98	1.01	1.01	1.03		
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck3	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	239	1.07	0.98	1.01	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	239	1.07	0.98	1.01	1.01	1.03		

MVA1 pu Loading					CaseName					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-ll	11hs-pst-ll	11lw-pre	11lw-pst
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22	1.22	1.21		
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck1	tran IMPRLVLY 230 to IMPRLVLY 500 ck 2	1120	1194	1.07					0.77	1.13
TRAN IMPRLVLY 230kV-IMPRLVLY 500kV ck2	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	600	732	1.22	0.96	1.53	0.96	1.55	1.24	1.82
TRAN INTBCT 16kV-INTB 230kV ck1	line IMPRLVLY to CENTRALX 500 ck 1	205	205	1.00		1.00				
TRAN MIGUEL 230kV-MIGUEL 500kV ck2	ML BK80	1120	1344	1.20	0.92	1.04				
TRAN MIGUEL 230kV-MIGUELMP 500kV ck1	ML BK81	1120	1329	1.19	0.92	1.05				
TRAN MIGUEL 500kV-MIGUELMP 500kV ck1	ML BK81	1120	1329	1.19	0.93	1.05				
TRAN MIGUEL 69kV-MIGUEL 230kV ck1	tran MIGUEL 69 to MIGUEL 230 ck 2	224	305	1.36	1.27	1.32	1.25	1.31		
TRAN MIGUEL 69kV-MIGUEL 230kV ck2	tran MIGUEL 69 to MIGUEL 230 ck 1	224	305	1.36	1.27	1.32	1.25	1.31		
TRAN OLD TOWN 69kV-OLD TOWN 230kV ck1	tran OLD TOWN 69 to OLD TOWN 230 ck 2	224	263	1.17	1.11	1.11	1.11	1.11		
TRAN OLD TOWN 69kV-OLD TOWN 230kV ck2	tran OLD TOWN 69 to OLD TOWN 230 ck 1	224	239	1.07	1.11	1.11	1.11	1.11		
TRAN PENSQTOS 230kV-PENSQTOS 69kV ck1	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	285	1.27	0.98	1.02	0.98	1.02		
TRAN PENSQTOS 230kV-PENSQTOS 69kV ck2	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	269	1.20	0.99	1.04	0.99	1.04		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	269	1.20	0.94	1.02	0.93	1.03		
TRAN SOUTHBAY 69kV-SOUTHBAY 138kV ck1	line NC-NSM-SW 69 ck 1	140	143	1.02	1.04	1.02	1.04	1.03		
	line OLD TOWN to KETTNER 69 ck 1	140	143	1.02	1.03	1.02	1.03	1.02		
	line SAMPSON to DIVISION 69 ck 1	140	143	1.02	1.03	1.01	1.03	1.02		
	tran MIGUEL 69 to MIGUEL 230 ck 1	140	143	1.02	1.05	1.05	1.05	1.05		
	tran MIGUEL 69 to MIGUEL 230 ck 2	140	143	1.02	1.05	1.05	1.05	1.05		
	tran SILVERGT 230/69	140	143	1.02	1.01	1.00	1.01	1.01		
TRAN SYCAMORE 230kV-SYCAMORE 138kV ck1	line PENSQTOS to SYCAMORE 230 ck 1	392	477	1.22			0.96	1.14		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	line IV-WIND 500kV	224	285	1.27				1.05		
	line WIND-ML 500kV	224	285	1.27			1.02	1.07		
	line WIND-ML 500kV SPS6.1	224	285	1.27				1.04		
	line WIND-ML 500kV SPS6.2	224	285	1.27				1.05		
	line OTAYMESA to SOUTHBAY 230 ck 1	224	285	1.27		1.04	1.05	1.11		
	line SILVERGT to SOUTHBAY 230 ck 1	224	285	1.27		1.04	1.05	1.11		
	line PENSQTOS to SYCAMORE 230 ck 1	224	285	1.27	1.06	1.13	1.15	1.23		
	line PRCTRVLY to TELECYN 138 ck 1	224	285	1.27				1.05		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	224	285	1.27			1.02	1.06		
	line TELECYN to SOUTHBAY 138 ck 1	224	285	1.27				1.04		
	line PRCTRVLY to MIGUEL 138 ck 1	224	285	1.27				1.06		
	line ESCO-WARCYNTP-POW-WC 69 ck 1	224	285	1.27				1.04		
	line PENSQTOS to MESA RIM 69 ck 1	224	285	1.27				1.05		
	line BRNDO-FLCTATP-ES-FLC 69 ck 1	224	285	1.27				1.05		
	line ESCNDIDO to ESCO 69 ck 1	224	285	1.27				1.05		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	285	1.27				1.05		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	285	1.27				1.05		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	285	1.27				1.05		
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	285	1.27				1.06		
	tran MIGUEL 69 to MIGUEL 230 ck 1	224	285	1.27				1.04		
	tran MIGUEL 69 to MIGUEL 230 ck 2	224	285	1.27				1.04		
	tran MISSION 230 to MISSION 69 ck 1	224	285	1.27				1.06		
	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	285	1.27			1.02	1.07		
	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	285	1.27			1.02	1.07		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	224	285	1.27		1.03	1.04	1.10		
	tran SYCAMORE 230 to SYCAMORE 69 ck 2	224	285	1.27	1.27	1.33	1.35	1.41		
	line SYCAMORE to PEN 230 ck 1	224	285	1.27				1.06		
	line SYCAMORE-CHCARITA 138	224	285	1.27				1.05		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	285	1.27				1.07		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	line IV-WIND 500kV	224	269	1.20				1.02		
	line WIND-ML 500kV	224	269	1.20				1.05		
	line WIND-ML 500kV SPS6.1	224	269	1.20				1.02		
	line WIND-ML 500kV SPS6.2	224	269	1.20				1.02		
	line OTAYMESA to SOUTHBAY 230 ck 1	224	269	1.20		1.02	1.03	1.08		
	line SILVERGT to SOUTHBAY 230 ck 1	224	269	1.20		1.02	1.03	1.08		
	line PENSQTOS to SYCAMORE 230 ck 1	224	269	1.20	1.04	1.10	1.13	1.20		
	line PRCTRVLY to TELECYN 138 ck 1	224	269	1.20				1.03		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	224	269	1.20				1.04		
	line TELECYN to SOUTHBAY 138 ck 1	224	269	1.20				1.02		
	line PRCTRVLY to MIGUEL 138 ck 1	224	269	1.20				1.04		
	line ESCO-WARCYNTP-POW-WC 69 ck 1	224	269	1.20				1.02		
	line PENSQTOS to MESA RIM 69 ck 1	224	269	1.20				1.03		
	line BRNDO-FLCTATP-ES-FLC 69 ck 1	224	269	1.20				1.03		
	line ESCNDIDO to ESCO 69 ck 1	224	269	1.20				1.02		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	269	1.20				1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	269	1.20				1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	269	1.20				1.03		
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	269	1.20				1.04		
	tran MISSION 230 to MISSION 69 ck 1	224	269	1.20				1.03		
	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	269	1.20				1.04		
	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	269	1.20				1.04		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	224	269	1.20		1.01	1.02	1.07		
	tran SYCAMORE 230 to SYCAMORE 69 ck 1	224	269	1.20	1.26	1.31	1.33	1.39		
	line SYCAMORE to PEN 230 ck 1	224	269	1.20				1.03		
	line SYCAMORE-CHCARITA 138	224	269	1.20				1.02		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	269	1.20				1.04		

MVA1 pu Loading					CaseName					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-ll	11hs-pst-ll	11lw-pre	11lw-pst
LINE BERNARDO 69kV-R.CARMEL 69kV ck1	Poway 69kV Bus	68	76	1.12	1.57	1.58	1.57	1.58		
	POM-SX 1 + 2 69KV	68	76	1.12	1.29	1.31	1.30	1.32		
	line POMERADO-SYCAMORE 69 ck 1/2	68	76	1.12	1.29	1.31	1.30	1.32		
LINE CAPSTRNO 138kV-PICO 138kV ck1	TA-TB + LNL-SMO 138KV	157	157	1.00	1.19	1.18	1.19	1.19		
LINE CHOLLAS 69kV-SPRNGVLY 69kV ck1	ML-JM 1 + 2 69KV	97	136	1.40	1.15	1.16	1.13	1.17		
LINE CMPNL230 230kV-TALEGA 230kV ck1	TA-SO 1 + 2 230KV *assoc SPS	456	456	1.00			1.01	1.02		
	TA-SO 1 + 2 230KV SPS a 9.7	456	456	1.00	1.00					
	EA-SO 230KV + SA-ES-EA 230KV	456	456	1.00			1.05			
	SX-PEN + PEN-EA-SA 230KV	456	456	1.00			1.01			
	ES-EA-SA 230KV + BQ-CC-ES-NCM 138KV	456	456	1.00			1.01	1.01		
	line ESCNDIDO to CMPNL230 230 ck 1 & 2	456	456	1.00			1.04	1.03		
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	El Cajon 69kV S Bus	71	71	1.00			1.02	1.02		
	Elliot 69kV S Bus	71	71	1.00	1.13	1.12	1.18	1.18		
	Escondido 69kV SW Bus	71	71	1.00			1.03	1.03		
	Jamacha 69kV S Bus	71	71	1.00			1.02	1.02		
	Los Coches 69kV E Bus	71	71	1.00	1.02	1.03	1.06	1.06		
	Los Coches 69kV W Bus	71	71	1.00	1.05	1.04	1.07	1.08		
	Main St 69kV E Bus	71	71	1.00				1.02		
	Miguel 69kV N Bus	71	71	1.00	1.03	1.03	1.07	1.07		
	Mission 69kV N Bus	71	71	1.00			1.02	1.02		
	Murray 69kV N Bus	71	71	1.00	1.13	1.11	1.16	1.16		
	Poway 69kV Bus	71	71	1.00			1.02	1.02		
	Poway 69kV Bus SPS	71	71	1.00			1.03	1.03		
	Pomerado 69kV E Bus	71	71	1.00			1.03	1.03		
	Proctor Valley 138kV Bus	71	71	1.00	1.03	1.04	1.07	1.08		
	Rincon 69kV N Bus	71	71	1.00	1.03	1.02	1.07	1.06		
	Sycamore 69kV S Bus	71	71	1.00	1.04	1.04	1.10	1.10		
	ML BK71 & Miguel - SXCC #1 230 kV aa	71	71	1.00			1.07	1.06		
	SX-PEN 230KV + AR-SX 69KV	71	71	1.00				1.02		
	LC-SY + SY-TC 138KV	71	71	1.00	1.06	1.07	1.10	1.11		
	LC-SY+ML-LC 138/69KV	71	71	1.00	1.12	1.13	1.16	1.17		
	PV-TC + LC-SY 138KV	71	71	1.00	1.08	1.08	1 11	1.12		
	LC-SN + LC-EL 138/69 KV	71	71	1.00	1.06	1.05	1.10	1.09		
	CH-SX-SN-LC-EL 138/69 KV	71	71	1.00	1.14	1.13	1.19	1.18		
	POM-SX 1 + 2 69KV	71	71	1.00	1.02	1.03	1.07	1.07		
	ML-JM 1 + 2 69KV	71	71	1.00			1.04	1.04		
	line POMERADO-SYCAMORE 69 ck 1/2	71	71	1.00	1.02	1.03	1.07	1.07		
	line POMERADO-SYCAMORE 69 ck 1/2 SPS9.4a	71	71	1.00	1.03	1.03	1.07	1.07		
LINE DEL MAR 69kV-DELMARTP 69kV ck1	Del Mar 69kV E Bus	50	54	1.08	1.13	1.14	1.13	1.14		
LINE EASTGATE 69kV-ROSE CYN 69kV ck1	Penasquitos 69kV SE Bus	50	50	1.00	1.10		1.15	1.02		
LINE EL CAJON 69kV-LOSCOCHS 69kV ck1	Murray 69kV N Bus	55	55	1.00	1.35	1.31	1.36	1.33		
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	Escondido 69kV SE Bus	102	113	1.11	1.34	1.33	1.34	1.32		
	Escondido 69kV SW Bus	102	113	1.11	1.30	1.28	1.29	1.28		
	Felicita 69kV S Bus	102	113	1.11	1.13	1.11	1.12	1.09		
	Poway 69kV Bus	102	113	1.11	1.08	1.07	1.07	1.07		
LINE FELCTATP 69kV-FELICITA 69kV ck1	Escondido 69kV SW Bus	72	97	1.35	1.10	1.11	1.11	1.13		
LINE FELICITA 69kV-ASH TP 69kV ck1	Escondido 69kV SE Bus	90	90	1.00	1.02	1.02	1.03	1.03		
LINE GARFIELD 69kV-EL CAJON 69kV ck1	Murray 69kV N Bus	97	102	1.05	1.35	1.34	1.34	1.36		
LINE GRANITE 69kV-GRANITTP 69kV ck1	Murray 69kV N Bus	97.5	136.8	1.40	1.30	1.28	1.30	1.30		
LINE KEARNY 69kV-MISSION 69kV ck1	Mission 69kV S Bus	97	129	1.33	1.10	1.14	1.08	1.12		
LINE MELROSE 69kV-SANLUSRY 69kV ck1	San Luis Rey 69kV S Bus	97.5	102.1	1.05	1.05	1.04				
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	Escondido 69kV NW Bus	97.5	102.1	1.05	1.01	1.02	1.01	1.02		
	San Luis Rey 69kV N Bus	97.5	102.1	1.05	1.15	1.13	1.06	1.05		
LINE MESAHGTS 69kV-MISSION 69kV ck1	Kearny 69kV E Bus	97	136	1.40	1.16	1.20	1.15	1.19		
	Mission 69kV N Bus	97	136	1.40	1.35	1.40	1.33	1.38		
LINE MIGUEL 69kV-JAMACHA 69kV ck1	Miguel 69kV N Bus	97	143	1.47	1.29	1.34	1.27	1.33		
LINE MIGUEL 69kV-JAMACHA 69kV ck2	Miguel 69kV S Bus	136	143	1.05	1.22	1.27	1.19	1.25		
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	ML-JM 1 + 2 69KV	97	136	1.40	1.14	1.19	1.11	1.17		
LINE MONSRATE 69kV-AVCADOTP 69kV ck1	San Luis Rey 69kV S Bus	51	51	1.00	1.04	1.03				
LINE MONSRATE 69kV-MNSRATTP 69kV ck1	Lilac 69kV S Bus	77	77	1.00	1.04	1.05	1.04	1.05		
LINE MURRAY 69kV-GARFIELD 69kV ck1	Murray 69kV N Bus	97	103	1.06	1.07	1.06	1.07	1.08		
	CH-SX-SN+LC-EL 138/69 KV	97	103	1.06			1.01			
	ML-JM 1 + 2 69KV	97	103	1.06	1.06	1.03	1.07	1.03		
LINE OLD TOWN 69kV-KETTNER 69kV ck1	Main St 69kV W Bus	215	239	1.11	1.03	1.01	1.04	1.02		
LINE PALA 69kV-MNSRATTP 69kV ck1	Lilac 69kV S Bus	68	68	1.00	1.03	1.04	1.03	1.04		
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	Del Mar 69kV E Bus	97	129	1.33	1.15	1.17	1.15	1.17		
	Penasquitos 69kV SE Bus	97	129	1.33	1.14	1.14	1.13	1.14		
LINE PENSQTOS 69kV-MIRAMRTP 69kV ck1	Penasquitos 69kV SE Bus	97	112	1.15	1.25	1.15	1.24	1.15		
	MR-PQ 69KV + PQ-MRM 69KV	97	112	1.15	1.23	1.14	1.21	1.12		
LINE POMERADO 69kV-SYCAMORE 69kV ck2	Sycamore 69kV S Bus	97	136	1.40	1.33	1.40	1.37	1.45		
LINE POWAY 69kV-POMERADO 69kV ck1	PEN-ES #1+ PEN-ES #2 230KV	97	143	1.47	1.16	1.23				
LINE PRCTRVLY 138kV-MIGUEL 138kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	392	468	1.19	0.98	1.08				
	line ML-MS 1&2 230kV	392	468	1.19	0.97	1.07	0.93	1.03		
	line ML-MS 1&2 230kV SPS6.4 a	392	468	1.19	0.96	1.06	0.92	1.02		
	line ML-MS 1&2 230kV SPS6.4 b	392	468	1.19	0.94	1.04	0.90	1.00		
	line ML-MS 1&2 230kV SPS6.4 c	392	468	1.19	0.93	1.02				
	line ML-MS 1&2 230kV SPS6.4 d	392	468	1.19	0.91	1.01				
LINE SAMPSON 69kV-MAIN ST 69kV ck2	Main St 69kV E Bus	129	129	1.00	1.21	1.16	1.22	1.18		
LINE SANMATEO 138kV-LAGNA NL 138kV ck1	TA-TB + TA-PI 138KV	136	136	1.00	1.03	1.03	1.04	1.04		
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	CAN-SA-SH + EA-CAN 138KV	63	73	1.16	1.22	1.22	1.22	1.22		
LINE SOUTHBAY 69kV-IMPRLBCH 69kV ck1	Otay 69kV Bus	55	55	1.00	1.17	1.16	1.18	1.17		
LINE SOUTHBAY 69kV-OTAY 69kV ck2	Southbay 69kV N Bus	100	100	1.00	1.02	1.01	1.02	1.01		
LINE SYCAMORE 69kV-SCRIPPS 69kV ck1	MR-PQ 69KV + PQ-MRM 69KV	102	136	1.33			1.04	1.08		
LINE TALEGA 138kV-PICO 138kV ck1	TA-TB + LNL-SMO 138KV	204	204	1.00	1.13	1.13	1.13	1.13		
LINE TALEGA 138kV-SANMATEO 138kV ck1	TA-TB + TA-PI 138KV	136	136	1.00	1.30	1.29	1.30	1.30		
	PI-CP + TA-TB 138KV	136	136	1.00	1.15	1.15	1.15	1.16		
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	CAN-SA-SH + EA-CAN 138KV	63	73	1.16	1.22	1.22	1.22	1.22		
TRAN LOSCOCHS 69kV-LOSCOCHS 138kV ck2	Los Coches 69kV W Bus	140	155	1.11	0.84	1.07				
TRAN MIGUEL 230kV-MIGUEL 138kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	392	468	1.19	0.98	1.08				
	line ML-MS 1&2 230kV	392	468	1.19	0.97	1.07	0.94	1.04		
	line ML-MS 1&2 230kV SPS6.4 a	392	468	1.19	0.97	1.07	0.93	1.03		
	line ML-MS 1&2 230kV SPS6.4 b	392	468	1.19	0.95	1.05	0.92	1.02		
	line ML-MS 1&2 230kV SPS6.4 c	392	468	1.19	0.94	1.04	0.91	1.01		
	line ML-MS 1&2 230kV SPS6.4 d	392	468	1.19	0.93	1.03				
	line ML-MS 1&2 230kV SPS6.4 e	392	468	1.19	0.91	1.02				
TRAN MIGUEL 69kV-MIGUEL 230kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	224	305	1.36	1.37	1.46	1.29	1.38		

MVA1 pu Loading					CaseName					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
	line ML-MS 1&2 230kV	224	305	1.36	1.04	1.11	1.02			
	line ML-MS 1&2 230kV SPS6.4 a	224	305	1.36	1.03	1.10	1.01			
	line ML-MS 1&2 230kV SPS6.4 b	224	305	1.36	1.02	1.09	1.00			
TRAN MIGUEL 69kV-MIGUEL 230kV ck2	line ML-MS 1&2 230kV	224	305	1.36	1.04	1.11	1.02			
	line ML-MS 1&2 230kV SPS6.4 a	224	305	1.36	1.03	1.10	1.01			
	line ML-MS 1&2 230kV SPS6.4 b	224	305	1.36	1.02	1.09	1.00			
TRAN SANLUSRY 69kV-SANLUSRY 230kV ck3	SA5W TRIP TL695 SPS b 9.7	224	301	1.34	1.19	1.31	1.10	1.22		
TRAN SOUTHBAY 69kV-SOUTHBAY 138kV ck1	Main St 69kV E Bus	140	143	1.02	1.03	1.02	1.03	1.02		
	Main St 69kV W Bus	140	143	1.02	1.01	1.00	1.01	1.01		
	Miguel 69kV S Bus	140	143	1.02	1.26	1.27	1.25	1.27		
	Sweetwater 69kV Bus	140	143	1.02	1.05	1.04	1.05	1.04		
	ML BK71 & Miguel - SXCC #1 230 kV aa	140	143	1.02	1.07	1.09	1.06	1.07		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	Escondido 69kV SE Bus	224	285	1.27				1.06		
	Proctor Valley 138kV Bus	224	285	1.27				1.05		
	ML BK71 & Miguel - SXCC #1 230 kV aa	224	285	1.27				1.06		
	PEN-ES #1+ PEN-ES #2 230KV	224	285	1.27	1.07	1.11	1.10	1.15		
	line ML-MS 1&2 230kV	224	285	1.27				1.06		
	line ML-MS 1&2 230kV SPS6.4 a	224	285	1.27				1.05		
	LC-SY + SY-TC 138KV	224	285	1.27				1.05		
	PV-TC + LC-SY 138KV	224	285	1.27				1.06		
	MR-PQ 69KV + PQ-MRM 69KV	224	285	1.27		1.03	1.04	1.08		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	Escondido 69kV SE Bus	224	269	1.20				1.03		
	Proctor Valley 138kV Bus	224	269	1.20				1.03		
	ML BK71 & Miguel - SXCC #1 230 kV aa	224	269	1.20				1.03		
	PEN-ES #1+ PEN-ES #2 230KV	224	269	1.20	1.05	1.09	1.08	1.12		
	line ML-MS 1&2 230kV	224	269	1.20				1.03		
	line ML-MS 1&2 230kV SPS6.4 a	224	269	1.20				1.03		
	LC-SY + SY-TC 138KV	224	269	1.20				1.03		
	PV-TC + LC-SY 138KV	224	269	1.20				1.03		
	MR-PQ 69KV + PQ-MRM 69KV	224	269	1.20		1.00	1.02	1.06		

MVA1 pu Loading					CaseName	
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre-g1	11hs-pst-g1
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	line WIND-ML 500kV	71	71	1.00	1.04	1.09
	line WIND-ML 500kV SPS6.1	71	71	1.00	1.02	1.06
	line WIND-ML 500kV SPS6.2	71	71	1.00	1.05	diverged
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	71	71	1.00	1.05	1.06
	line CREELMAN to LOSCOCHS 69 ck 1	71	71	1.00	1.00	1.02
LINE EL CAJON 69kV-GRANITE 69kV ck1	line GRANITE to GRANITTP 69 ck 1	97	114	1.18	0.99	1.01
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	line WIND-ML 500kV SPS6.2	102	113	1.11	1.00	diverged
	line ESCNDIDO to FELICITA 69 ck 1	102	113	1.11	1.20	1.20
	line ESCNDIDO to ASH 69 ck 1	102	113	1.11	1.28	1.28
LINE FELCTATP 69kV-FELICITA 69kV ck1	line ESCNDIDO to ASH 69 ck 1	72	97	1.35	1.07	1.10
LINE FELICITA 69kV-ASH TP 69kV ck1	line ESCNDIDO to ASH 69 ck 1	90	90	1.00	1.01	1.02
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	line ESCNDIDO to SANMRCOS 69 ck 1	97.5	102.1	1.05	1.00	1.02
	line MELROSE to SANLUSRY 69 ck 1	97.5	102.1	1.05	1.04	1.03
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	line PARADISE to MIGUEL 69 ck 1	97	136	1.40	1.18	1.25
LINE OTAY 69kV-OTAYLKTP 69kV ck1	line MIGUEL to BORDER 69 ck 1	50	50	1.00	1.05	1.03
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	line PENSQTOS to TOREYPNS 69 ck 1	97	129	1.33	1.11	1.13
LINE POMERADO 69kV-SYCAMORE 69kV ck1	line POMERADO to SYCAMORE 69 ck 2	97	136	1.40	1.08	1.14
LINE POMERADO 69kV-SYCAMORE 69kV ck2	line POMERADO to SYCAMORE 69 ck 1	97	136	1.40	1.08	1.14
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22

MVA1 pu Loading						CaseName					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
LINE ARABY S 69kV-AR FH TP 69kV ck1	Base system (n-0)	14	78.6	78.6	1.00	1.01	1.02	1.00	1.01		
LINE BLYTHE 161kV-BUCKBLVD 161kV ck1	Base system (n-0)	14	400	440	1.10	1.15	1.15	1.15	1.15		
LINE MEADOWBK 230kV-SUNYSLOP 230kV ck1	Base system (n-0)	14	325	490	1.51			1.04	1.05		
LINE RTAP2 92kV-RTP1 92kV ck1	Base system (n-0)	8	57	57	1.00	1.07	1.17	1.19	1.29		
LINE SHANDIN 115kV-TAP902 115kV ck1	Base system (n-0)	24	109.1	165.3	1.52					1.11	1.11
LINE YAVAPAI 230kV-VERDE N 230kV ck1	Base system (n-0)	14	319	398	1.25	1.02	1.02	1.05	1.05		
TRAN BLKMSA34 69kV-BLK MESA 230kV ck1	Base system (n-0)	14	40	44.8	1.12	1.10	1.10	1.10	1.10		
TRAN BLKMSA34 69kV-BLK MESA 230kV ck2	Base system (n-0)	14	40	44.8	1.12	1.05	1.05	1.05	1.05		
TRAN GILA 161kV-GILA 69kV ck1	Base system (n-0)	14	100	120	1.20	1.26	1.26	1.21	1.22		
TRAN HAVASU12 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN HAVASU34 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN HAVASU56 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN INYO 115kV-INYO PS 115kV ck1	Base system (n-0)	24	56	62	1.11					1.00	1.03
TRAN SUN ARIZ 230kV-SUN G9 13.8kV ck1	Base system (n-0)	14	115	138	1.20	1.05	1.05	1.05	1.05		
TRAN VALNCIA1 13.2kV-VALNCIA 115kV ck1	Base system (n-0)	14	20	22.4	1.12	1.06	1.06	1.06	1.06		
TRAN VALNCIA2 13.2kV-VALNCIA 115kV ck1	Base system (n-0)	14	20	22.4	1.12	1.06	1.06	1.06	1.06		

MVA1 pu Loading						CaseName					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-ll	11hs-pst-ll	11lw-pre	11lw-pst
LINE ARABY S 69kV-AR FH TP 69kV ck1	line HASSYAMP to N.GILA 500 ck 1	14	78.6	78.6	1.00	1.09	1.08	1.04	1.04		
LINE COACHELA 230kV-DEVERS 230kV ck1	line WIND-ML 500kV	24	392.8	392.8	1.00					0.84	1.04
	line IMPRLVLY to CENTRALX 500 ck 1	24	392.8	392.8	1.00					0.82	1.03
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	24	392.8	392.8	1.00					0.87	1.13
LINE NILAND 161kV-BLYTHE 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	8	165	165	1.00	1.02					
LINE RTAP2 92kV-RTP1 92kV ck1	line IV-WIND 500kV	8	57	57	1.00	1.14	1.25	1.24	1.35		
	line IV-WIND 500kV SPS6.1	8	57	57	1.00				1.10		
	line IV-WIND 500kV SPS6.2	8	57	57	1.00			1.03	1.17		
	line WIND-ML 500kV	8	57	57	1.00	1.18	1.31	1.28	1.39		
	line WIND-ML 500kV SPS6.1	8	57	57	1.00		1.05	1.03	1.14		
	line WIND-ML 500kV SPS6.2	8	57	57	1.00	1.03		1.09	1.23		
	line N.GILA to IMPRLVLY 500 ck 1	8	57	57	1.00			1.04	1.18		
	line HASSYAMP to N.GILA 500 ck 1	8	57	57	1.00			1.02	1.16		
	line IMPRLVLY to CENTRALX 500 ck 1	8	57	57	1.00	1.17	1.29	1.26	1.38		
	line OTAYMESA to TJI 230 ck 1	8	57	57	1.00	1.14		1.24	1.36		
	line IMPRLVLY to ROA-230 230 ck 1	8	57	57	1.00	1.13	1.26	1.24	1.36		
	line OTAYMESA to SOUTHBAY 230 ck 1	8	57	57	1.00	1.11	1.22	1.23	1.34		
	line SILVERGT to SOUTHBAY 230 ck 1	8	57	57	1.00	1.11	1.23	1.23	1.34		
	line CENTRALX to SYCAMORE 230 ck 1	8	57	57	1.00	1.10	1.21		1.32		
	line CENTRALX to SYCAMORE 230 ck 2	8	57	57	1.00	1.10	1.21		1.32		
	line IMPRLVLY to ELCENTSW 230 ck 1	8	57	57	1.00	1.10	1.21	1.24	1.35		
	line IMPRLVLY to DIXIE230 230 ck 1	8	57	57	1.00				1.05		
	line IMPRLVLY to SOLR1A 230 ck 1	8	57	57	1.00			1.12			
	line SOLR1A to SOLR1B 230 ck 1	8	57	57	1.00	1.05	1.15	1.17	1.27		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	8	57	57	1.00	1.17	1.32	1.29	1.44		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 2	8	57	57	1.00	1.10	1.22	1.22	1.34		
	ML BK80 SPS6.6 f	8	57	57	1.00				1.06		
	ML BK81 SPS6.6 f	8	57	57	1.00				1.06		
	gen ENCINA 4 22.00	8	57	57	1.00	1.05		1.17			
	gen ENCINA 5 24.00	8	57	57	1.00	1.05		1.17			
	gen INTBCT 16.00	8	57	57	1.00	1.02	1.12	1.14	1.24		
	gen INTBST 18.00	8	57	57	1.00	1.03	1.13	1.15	1.25		
	gen IV GEN1 21.00	8	57	57	1.00	1.01	1.11	1.13	1.23		
	gen IV GEN2 21.00	8	57	57	1.00	1.03	1.13	1.15	1.25		
	gen IV GEN3 21.00	8	57	57	1.00	1.03	1.13	1.15	1.25		
	gen PEN PLANT 18.00	8	57	57	1.00	1.03	1.13	1.15	1.25		
	gen OTAY MESA PLANT	8	57	57	1.00	1.00	1.10	1.12	1.22		
	gen OTAYMST1 16.0	8	57	57	1.00	1.05	1.14	1.17	1.26		
	gen SOLR1A1Q 0.48kV	8	57	57	1.00	1.05	1.15	1.17	1.27		
	gen SOLR1A2Q 0.48	8	57	57	1.00	1.05	1.15	1.17	1.27		
	gen SOLR1B1Q 0.48	8	57	57	1.00	1.05	1.14	1.17	1.27		
	gen WD160MW 0.69	8	57	57	1.00	1.05	1.14	1.17	1.26		
	gen WD300MWQ 0.58	8	57	57	1.00	1.02	1.12	1.14	1.24		
	line SOLR2A to SOLR1A 230 ck 1	8	57	57	1.00		1.10		1.22		
	line SOLR2A to SOLR2B 230 ck 1	8	57	57	1.00		1.15		1.27		
	line SOLR3A to SOLR1A 230 ck 1	8	57	57	1.00		1.10		1.22		
	line SOLR3A to SOLR2B 230 ck 1	8	57	57	1.00		1.15		1.27		
	gen SOLR2A1Q 0.48kV	8	57	57	1.00		1.14		1.27		
	gen SOLR2A2Q 0.48	8	57	57	1.00		1.14		1.27		
	gen SOLR2B1Q 0.48	8	57	57	1.00		1.14		1.27		
	gen SOLR3A1Q 0.48kV	8	57	57	1.00		1.14		1.27		
	gen SOLR3A2Q 0.48	8	57	57	1.00		1.14		1.27		
	gen SOLR3B1Q 0.48	8	57	57	1.00		1.14		1.27		
	line LEAPS-MP to CMPNL500 500 ck 1	8	57	57	1.00			1.15	1.25		
	gen SXCC PLANT	8	57	57	1.00			1.10	1.20		
	gen SXCC-U3 21.00	8	57	57	1.00			1.16	1.26		
LINE WLTNMOHK 161kV-GILA 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	14	112	120	1.07	1.03					
TRAN GILA 161kV-GILA 69kV ck1	line IV-WIND 500kV	14	100	120	1.20	1.21	1.20	1.18	1.17		
	line WIND-ML 500kV	14	100	120	1.20	1.17	1.16	1.14	1.14		
	line WIND-ML 500kV SPS6.1	14	100	120	1.20	1.22	1.21		1.19		
	line WIND-ML 500kV SPS6.2	14	100	120	1.20	1.22			1.19		
	line N.GILA to IMPRLVLY 500 ck 1	14	100	120	1.20				1.03		
	line HASSYAMP to N.GILA 500 ck 1	14	100	120	1.20	1.89	1.83	1.53	1.46		
	line IMPRLVLY to CENTRALX 500 ck 1	14	100	120	1.20	1.18	1.17	1.16	1.16		
	line CENTRALX to SYCAMORE 230 ck 1	14	100	120	1.20	1.23	1.24				
	line CENTRALX to SYCAMORE 230 ck 2	14	100	120	1.20	1.23	1.24				
	line IMPRLVLY to ELCENTSW 230 ck 1	14	100	120	1.20	1.19	1.16	1.10	1.08		
	line IMPRLVLY to DIXIE230 230 ck 1	14	100	120	1.20	1.22	1.22	1.17	1.17		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	14	100	120	1.20	1.33	1.39	1.29	1.34		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 2	14	100	120	1.20	1.28	1.30	1.23	1.25		
	ML BK80 SPS6.6 f	14	100	120	1.20	1.29	1.29	1.24	1.25		
	ML BK81 SPS6.6 f	14	100	120	1.20	1.29	1.29	1.24	1.25		
	tran N.GILA 500 to N.GILA 69 ck 1	14	100	120	1.20	1.33	1.34	1.29	1.30		
	tran N.GILA 500 to N.GILA 69 ck 2	14	100	120	1.20	1.33	1.34	1.29	1.30		
	gen PEN PLANT 18.00	14	100	120	1.20	1.28	1.28	1.23	1.24		
	gen OTAY MESA PLANT	14	100	120	1.20	1.28	1.29	1.24	1.25		
	gen WD300MWQ 0.58	14	100	120	1.20	1.29	1.29	1.24	1.25		
	gen SXCC PLANT	14	100	120	1.20			1.26	1.27		

MVA1 pu Loading						CaseName					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
LINE RTAP2 92kV-RTP1 92kV ck1	ENCINA 2T Breaker	8	57	57	1.00	1.04					
	line ML-MS&ML-SX 230kV SPS6.3 a	8	57	57	1.00	1.04	1.14	1.16	1.26		
	line ML-MS&ML-SX 230kV SPS6.3 b	8	57	57	1.00		1.09	1.11	1.21		
	line ML-MS&ML-SX 230kV SPS6.3 c	8	57	57	1.00		1.03	1.05	1.14		
	line ML-MS&ML-SX 230kV SPS6.3 d	8	57	57	1.00				1.10		
	line ML-MS&ML-SX 230kV SPS6.3 e	8	57	57	1.00				1.05		
	line ML-MS 1&2 230kV SPS6.4 b	8	57	57	1.00		1.10	1.12	1.22		
	line ML-MS 1&2 230kV SPS6.4 c	8	57	57	1.00		1.04	1.06	1.16		
	line ML-MS 1&2 230kV SPS6.4 d	8	57	57	1.00			1.01	1.11		
	line ML-MS 1&2 230kV SPS6.4 e	8	57	57	1.00				1.06		
TRAN GILA 161kV-GILA 69kV ck1	line ML-MS&ML-SX 230kV SPS6.3 d	14	100	120	1.20			1.24	1.25		
	line ML-MS&ML-SX 230kV SPS6.3 e	14	100	120	1.20	1.29	1.30	1.25	1.26		
	line ML-MS 1&2 230kV SPS6.4 e	14	100	120	1.20	1.29		1.24	1.25		

MVA1 pu Loading						CaseName	
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre-g1	11hs-pst-g1
LINE ARABY S 69kV-AR FH TP 69kV ck1	line HASSYAMP to N.GILA 500 ck 1	14	78.6	78.6	1.00	1.09	1.09
LINE NILAND 161kV-BLYTHE 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	8	165	165	1.00	1.03	0.99
LINE RTAP2 92kV-RTP1 92kV ck1	line IV-WIND 500kV	8	57	57	1.00	1.12	1.23
	line WIND-ML 500kV	8	57	57	1.00	1.16	1.29
	line WIND-ML 500kV SPS6.1	8	57	57	1.00	0.96	1.02
	line WIND-ML 500kV SPS6.2	8	57	57	1.00	1.02	diverged
	line IMPRLVLY to CENTRALX 500 ck 1	8	57	57	1.00	1.15	1.27
	line OTAYMESA to TJI 230 ck 1	8	57	57	1.00	1.13	1.26
	line IMPRLVLY to ROA-230 230 ck 1	8	57	57	1.00	1.13	1.25
	line OTAYMESA to SOUTHBAY 230 ck 1	8	57	57	1.00	1.08	1.18
	line SILVERGT to SOUTHBAY 230 ck 1	8	57	57	1.00	1.08	1.18
	line CENTRALX to SYCAMORE 230 ck 1	8	57	57	1.00	1.08	1.19
	line CENTRALX to SYCAMORE 230 ck 2	8	57	57	1.00	1.08	1.19
	line IMPRLVLY to ELCENTSW 230 ck 1	8	57	57	1.00	1.08	1.19
	line SOLR1A to SOLR1B 230 ck 1	8	57	57	1.00	1.03	1.13
	line SOLR2A to SOLR1A 230 ck 1	8	57	57	1.00		1.08
	line SOLR2A to SOLR2B 230 ck 1	8	57	57	1.00		1.13
	line SOLR3A to SOLR1A 230 ck 1	8	57	57	1.00		1.08
	line SOLR3A to SOLR2B 230 ck 1	8	57	57	1.00		1.13
LINE WLTNMOHK 161kV-GILA 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	14	112	120	1.07	1.04	1.01
TRAN GILA 161kV-GILA 69kV ck1	line IV-WIND 500kV	14	100	120	1.20	1.21	1.20
	line WIND-ML 500kV	14	100	120	1.20	1.18	1.16
	line WIND-ML 500kV SPS6.1	14	100	120	1.20	1.22	1.21
	line WIND-ML 500kV SPS6.2	14	100	120	1.20	1.22	diverged
	line HASSYAMP to N.GILA 500 ck 1	14	100	120	1.20	1.90	1.85
	line IMPRLVLY to CENTRALX 500 ck 1	14	100	120	1.20	1.19	1.17
	line CENTRALX to SYCAMORE 230 ck 1	14	100	120	1.20		1.24
	line CENTRALX to SYCAMORE 230 ck 2	14	100	120	1.20		1.24
	line IMPRLVLY to ELCENTSW 230 ck 1	14	100	120	1.20	1.19	1.17
	line IMPRLVLY to DIXIE230 230 ck 1	14	100	120	1.20	1.23	1.23

MVA1 pu Loading					Case Name					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	Base system (n-0)	224	285	1.27			0.98	1.02		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	Base system (n-0)	224	269	1.20			0.95	1.00		

MVA1 pu Loading					Case Name					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
LINE CMPNL230 230kV-TALEGA 230kV ck1	line IV-WIND 500kV SPS6.2	456	456	1.00			1.00	1.01		
	line WIND-ML 500kV	456	456	1.00			1.01	1.01		
	line WIND-ML 500kV SPS6.1	456	456	1.00			1.03	1.02		
	line WIND-ML 500kV SPS6.2	456	456	1.00			1.06	1.07		
	line PEN to ESCNDIDO 230	456	456	1.00			1.00	1.00		
	line ESCNDIDO to CMPNL230 230 ck 1	456	456	1.00			1.04	1.03		
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	line IV-WIND 500kV	71	71	1.00	1.04	1.06	1.06	1.07		
	line IV-WIND 500kV SPS6.1	71	71	1.00	1.02	1.04	1.04	1.05		
	line IV-WIND 500kV SPS6.2	71	71	1.00	1.04		1.05	1.06		
	line WIND-ML 500kV	71	71	1.00	1.13	1.17	1.13	1.15		
	line WIND-ML 500kV SPS6.1	71	71	1.00	1.11	1.14	1.12	1.13		
	line WIND-ML 500kV SPS6.2	71	71	1.00	1.14		1.13	1.15		
	line OTAYMESA to SOUTHBAY 230 ck 1	71	71	1.00	1.01	1.03	1.05	1.06		
	line SILVERGT to SOUTHBAY 230 ck 1	71	71	1.00	1.02	1.04	1.06	1.07		
	line PENSQTOS to SYCAMORE 230 ck 1	71	71	1.00	1.01	1.02	1.07	1.08		
	line PRCTRVLY to TELECYN 138 ck 1	71	71	1.00	1.03	1.04	1.07	1.08		
	line SANTEE to LOSCOCHS 138 ck 1	71	71	1.00	1.00		1.05	1.04		
	line CARLTNHS-SANTEE 138	71	71	1.00	1.08	1.07	1.12	1.11		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	71	71	1.00	1.15	1.14	1.19	1.18		
	line TELECYN to SOUTHBAY 138 ck 1	71	71	1.00	1.01	1.01	1.05	1.05		
	line LOSCOCHS to SOUTHBAY 138 ck 1	71	71	1.00	1.04	1.05	1.08	1.09		
	line PRCTRVLY to MIGUEL 138 ck 1	71	71	1.00	1.05	1.06	1.09	1.10		
	line MISSION to MURRAY 69 ck 1	71	71	1.00			1.03	1.02		
	line MISSION to MURRAY 69 ck 2	71	71	1.00			1.03	1.02		
	line MURRAY to GARFIELD 69 ck 1	71	71	1.00	1.01		1.05	1.04		
	line EL CAJON to JAMACHA 69 ck 1	71	71	1.00			1.02	1.02		
	line BLTP-CMRN MULTIPTAP 69 ck 1	71	71	1.00			1.04	1.04		
	line CREELMAN to LOSCOCHS 69 ck 1	71	71	1.00	1.03	1.04	1.05	1.06		
	line LOSCOCHS to ELLIOTT 69 ck 1	71	71	1.00			1.03	1.02		
	line SYCAMORE to ELLIOTT 69 ck 1	71	71	1.00	1.01	1.01	1.06	1.06		
	line ASH-ASHTP-FELICITA-VC 69 ck 1	71	71	1.00			1.04	1.03		
	line WARNERS to RINCON 69 ck 1	71	71	1.00	1.03	1.02	1.07	1.06		
	line ESCNDIDO to LILAC 69 ck 1	71	71	1.00			1.03	1.03		
	line POWAY to POMERADO 69 ck 1	71	71	1.00			1.03	1.03		
	line SYCAMORE to SCRIPPS 69 ck 1	71	71	1.00			1.03	1.03		
	line GARFIELD to EL CAJON 69 ck 1	71	71	1.00			1.02	1.02		
	tran LOSCOCHS 138 to LOSCOCHS 69 ck 1	71	71	1.00	1.03	1.02	1.07	1.06		
	tran LOSCOCHS 69 to LOSCOCHS 138 ck 2	71	71	1.00	1.02	1.02	1.06	1.06		
	tran MIGUEL 230 to MIGUEL 138 ck 1	71	71	1.00	1.05	1.06	1.09	1.10		
	tran MIGUEL 69 to MIGUEL 230 ck 1	71	71	1.00	1.02	1.02	1.06	1.06		
	tran MIGUEL 69 to MIGUEL 230 ck 2	71	71	1.00	1.02	1.02	1.06	1.06		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	71	71	1.00		1.00	1.04	1.05		
	gen CAMPOGEN 0.69	71	71	1.00	1.02	1.02	1.06	1.06		
	line PENSQTOS to OLD TOWN 230 ck 1	71	71	1.00			1.02			
LINE EASTGATE 69kV-ROSE CYN 69kV ck1	line PACFCBCH to OLD TOWN 69 ck 1	50	50	1.00			1.02			
	line ROSE CYN to PENSQTOS 69 ck 1	50	50	1.00	1.12		1.17	1.04		
LINE EL CAJON 69kV-GRANITE 69kV ck1	line GRANITE to GRANITTP 69 ck 1	97	114	1.18	1.02	1.01	1.01	1.02		
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	line WIND-ML 500kV SPS6.2	102	113	1.11	1.00					
	line ESCNDIDO to FELICITA 69 ck 1	102	113	1.11	1.19	1.17	1.18	1.16		
	line ESCNDIDO to ASH 69 ck 1	102	113	1.11	1.27	1.25	1.27	1.25		
LINE FELCTATP 69kV-FELICITA 69kV ck1	line ESCNDIDO to ASH 69 ck 1	72	97	1.35	1.09	1.11	1.11	1.13		
LINE FELICITA 69kV-ASH TP 69kV ck1	line ESCNDIDO to ASH 69 ck 1	90	90	1.00	1.02	1.02	1.03	1.03		
LINE KEARNY 69kV-MISSION 69kV ck1	line MESAHGTS to MISSION 69 ck 1	97	129	1.33	1.08	1.13	1.07	1.11		
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	line ESCNDIDO to SANMRCOS 69 ck 1	97.5	102.1	1.05	1.01	1.02	1.01	1.02		
	line MELROSE to SANLUSRY 69 ck 1	97.5	102.1	1.05	1.11	1.10	1.03	1.01		
LINE MESAHGTS 69kV-MISSION 69kV ck1	line KEARNY to MISSION 69 ck 1	97	136	1.40	1.16	1.20	1.15	1.19		
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	line PARADISE to MIGUEL 69 ck 1	97	136	1.40	1.13	1.18	1.10	1.16		
LINE MURRAY 69kV-GARFIELD 69kV ck1	line WIND-ML 500kV	97	103	1.06		1.01				
	line WIND-ML 500kV SPS6.2	97	103	1.06	1.01					
	tran MIGUEL 69 to MIGUEL 230 ck 1	97	103	1.06			1.00			
	tran MIGUEL 69 to MIGUEL 230 ck 2	97	103	1.06			1.00			
LINE OLD TOWN 69kV-KETTNER 69kV ck1	tran SILVERGT 230/69	215	239	1.11	1.02		1.03	1.01		
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	line PENSQTOS to TORREYPNS 69 ck 1	97	129	1.33	1.13	1.13	1.12	1.13		
LINE PENSQTOS 69kV-MIRAMRTP 69kV ck1	line ROSE CYN to PENSQTOS 69 ck 1	97	112	1.15	1.05		1.05			
	line PENSQTOS to MESA RIM 69 ck 1	97	112	1.15	1.01		1.00			
LINE POMERADO 69kV-SYCAMORE 69kV ck1	line POMERADO to SYCAMORE 69 ck 2	97	136	1.40	1.11	1.18	1.15	1.21		
LINE POMERADO 69kV-SYCAMORE 69kV ck2	line POMERADO to SYCAMORE 69 ck 1	97	136	1.40	1.11	1.18	1.15	1.21		
LINE SAMPSON 69kV-MAIN ST 69kV ck1	line SAMPSON to MAIN ST 69 ck 2	129	129	1.00	1.23	1.19	1.24	1.21		
LINE SAMPSON 69kV-MAIN ST 69kV ck2	line SAMPSON to MAIN ST 69 ck 1	129	129	1.00	1.23	1.19	1.24	1.21		
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22	1.22	1.22		
LINE SYCAMORE 138kV-CHCARITA 138kV ck1	line PENSQTOS to SYCAMORE 230 ck 1	204	204	1.00	0.67	1.01	0.77	1.11		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	204	204	1.00			0.72	1.02		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	204	204	1.00	0.66	1.02	0.71	1.07		
LINE SYCAMORE 230kV-PENSQTOS 230kV ck1	line OTAYMESA to SOUTHBAY 230 ck 1	796.7	1153	1.45			1.05	1.22		
	line SILVERGT to SOUTHBAY 230 ck 1	796.7	1153	1.45			1.05	1.22		
LINE SYCAMORE 69kV-SCRIPPS 69kV ck1	line PENSQTOS to SYCAMORE 230 ck 1	102	136	1.33				1.07		
TRAN CENTRALX 12kV-CENTRLMP 500kV ck1	tran CENTRAL BK81	180	180	1.00					1.20	1.19
TRAN CENTRALX 12kV-CENTRLMP 500kV ck2	tran CENTRAL BK80	180	180	1.00					1.20	1.19
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck1	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	239	1.07		1.00	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	239	1.07		1.00	1.00	1.03		
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck2	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	239	1.07		1.01	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	239	1.07		1.01	1.01	1.03		
TRAN ESCNDIDO 69kV-ESCNDIDO 230kV ck3	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	239	1.07		1.01	1.00	1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	239	1.07		1.01	1.01	1.03		
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22	1.22	1.21		
TRAN INTBCT 16kV-INTB 230kV ck1	line IMPRLVLY to CENTRALX 500 ck 1	205	205	1.00		1.00				
TRAN MIGUEL 230kV-MIGUEL 500kV ck2	ML BK80	1120	1344	1.20		1.05				
TRAN MIGUEL 230kV-MIGUELMP 500kV ck1	ML BK81	1120	1329	1.19		1.06				
TRAN MIGUEL 500kV-MIGUELMP 500kV ck1	ML BK81	1120	1329	1.19		1.06				
TRAN MIGUEL 69kV-MIGUEL 230kV ck1	line PRCTRVLY to MIGUEL 138 ck 1	224	305	1.36		1.09				
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	305	1.36		1.09				
	tran MIGUEL 69 to MIGUEL 230 ck 2	224	305	1.36	1.27	1.33	1.25	1.31		
TRAN MIGUEL 69kV-MIGUEL 230kV ck2	line PRCTRVLY to MIGUEL 138 ck 1	224	305	1.36		1.09				
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	305	1.36		1.09				
	tran MIGUEL 69 to MIGUEL 230 ck 1	224	305	1.36	1.27	1.33	1.25	1.31		
TRAN OLD TOWN 69kV-OLD TOWN 230kV ck1	tran OLD TOWN 69 to OLD TOWN 230 ck 2	224	263	1.17	1.11	1.10	1.11	1.11		

MVA1 pu Loading					Case Name					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
TRAN OLD TOWN 69kV-OLD TOWN 230kV ck2	tran OLD TOWN 69 to OLD TOWN 230 ck 1	224	239	1.07	1.11	1.10	1.11	1.11		
TRAN PENSQTOS 230kV-PENSQTOS 69kV ck1	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	285	1.27		1.02		1.02		
TRAN PENSQTOS 230kV-PENSQTOS 69kV ck2	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	269	1.20		1.04		1.04		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	269	1.20		1.02		1.03		
TRAN SOUTHBAY 69kV-SOUTHBAY 138kV ck1	line NC-NSM-SW 69 ck 1	140	143	1.02	1.04	1.02	1.04	1.03		
	line OLD TOWN to KETTNER 69 ck 1	140	143	1.02	1.03	1.02	1.03	1.03		
	line SAMPSON to DIVISION 69 ck 1	140	143	1.02	1.03	1.01	1.03	1.02		
	tran MIGUEL 69 to MIGUEL 230 ck 1	140	143	1.02	1.05	1.05	1.05	1.05		
	tran MIGUEL 69 to MIGUEL 230 ck 2	140	143	1.02	1.05	1.05	1.05	1.05		
	tran SILVERGT 230/69	140	143	1.02	1.01	1.01	1.01	1.01		
TRAN SYCAMORE 230kV-SYCAMORE 138kV ck1	line PENSQTOS to SYCAMORE 230 ck 1	392	477	1.22				1.15		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	line WIND-ML 500kV	224	285	1.27			1.02	1.07		
	line OTAYMESA to SOUTHBAY 230 ck 1	224	285	1.27		1.04	1.05	1.10		
	line SILVERGT to SOUTHBAY 230 ck 1	224	285	1.27		1.04	1.05	1.11		
	line PENSQTOS to SYCAMORE 230 ck 1	224	285	1.27	1.06	1.13	1.15	1.23		
	line PRCTRVLY to TELECYN 138 ck 1	224	285	1.27				1.05		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	224	285	1.27			1.02	1.07		
	line PRCTRVLY to MIGUEL 138 ck 1	224	285	1.27				1.06		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	285	1.27				1.05		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	285	1.27				1.05		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	285	1.27				1.05		
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	285	1.27				1.06		
	tran MISSION 230 to MISSION 69 ck 1	224	285	1.27				1.06		
	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	285	1.27			1.02	1.07		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	224	285	1.27		1.03	1.04	1.10		
	tran SYCAMORE 230 to SYCAMORE 69 ck 2	224	285	1.27	1.27	1.33	1.35	1.41		
	line BRNDO-FLCTATP-ES-FLC 69 ck 1	224	285	1.27				1.05		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	285	1.27				1.07		
	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	285	1.27			1.02	1.07		
	line SYCAMORE to PEN 230 ck 1	224	285	1.27				1.06		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	line WIND-ML 500kV	224	269	1.20				1.05		
	line OTAYMESA to SOUTHBAY 230 ck 1	224	269	1.20		1.02	1.03	1.08		
	line SILVERGT to SOUTHBAY 230 ck 1	224	269	1.20		1.02	1.03	1.08		
	line PENSQTOS to SYCAMORE 230 ck 1	224	269	1.20	1.04	1.10	1.13	1.20		
	line PRCTRVLY to TELECYN 138 ck 1	224	269	1.20				1.03		
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	224	269	1.20				1.04		
	line PRCTRVLY to MIGUEL 138 ck 1	224	269	1.20				1.04		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 1	224	269	1.20				1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 2	224	269	1.20				1.03		
	tran ESCNDIDO 69 to ESCNDIDO 230 ck 3	224	269	1.20				1.03		
	tran MIGUEL 230 to MIGUEL 138 ck 1	224	269	1.20				1.04		
	tran MISSION 230 to MISSION 69 ck 1	224	269	1.20				1.03		
	tran PENSQTOS 230 to PENSQTOS 69 ck 1	224	269	1.20				1.04		
	tran SYCAMORE 230 to SYCAMORE 138 ck 1	224	269	1.20		1.01	1.02	1.07		
	tran SYCAMORE 230 to SYCAMORE 69 ck 1	224	269	1.20	1.26	1.31	1.33	1.39		
	line BRNDO-FLCTATP-ES-FLC 69 ck 1	224	269	1.20				1.03		
	tran PENSQTOS 230 to PENSQTOS 138 ck 1	224	269	1.20				1.04		
	tran PENSQTOS 230 to PENSQTOS 69 ck 2	224	269	1.20				1.04		
	line SYCAMORE to PEN 230 ck 1	224	269	1.20				1.03		

MVA1 pu Loading					Case Name					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-II	11hs-pst-II	11lw-pre	11lw-pst
LINE BERNARDO 69kV-R.CARMEL 69kV ck1	Poway 69kV Bus	68	76	1.12	1.57	1.58	1.57	1.58		
	POM-SX 1 + 2 69KV	68	76	1.12	1.29	1.31	1.30	1.32		
	line POMERADO-SYCAMORE 69 ck 1/2	68	76	1.12	1.29	1.31	1.30	1.32		
LINE CAPSTRNO 138kV-PICO 138kV ck1	TA-TB + LNL-SMO 138KV	157	157	1.00	1.19	1.18	1.19	1.19		
LINE CHOLLAS 69kV-SPRNGVLY 69kV ck1	ML-JM 1 + 2 69KV	97	136	1.40	1.15	1.16	1.13	1.17		
LINE CMPNL230 230kV-TALEGA 230kV ck1	TA-SO 1 + 2 230KV *assoc SPS	456	456	1.00			1.01	1.02		
	TA-SO 1 + 2 230KV SPS a 9.7	456	456	1.00	1.00					
	EA-SO 230KV + SA-ES-EA 230KV	456	456	1.00			1.05			
	SX-PEN + PEN-EA-SA 230KV	456	456	1.00			1.01			
	ES-EA-SA 230KV + BQ-CC-ES-NCM 138KV	456	456	1.00			1.01	1.01		
	line ESCNDIDO to CMPNL230 230 ck 1 & 2	456	456	1.00			1.04	1.03		
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	El Cajon 69kV S Bus	71	71	1.00			1.02	1.02		
	Elliot 69kV S Bus	71	71	1.00	1.13	1.12	1.18	1.18		
	Escondido 69kV SW Bus	71	71	1.00			1.03	1.03		
	Jamacha 69kV S Bus	71	71	1.00			1.02	1.02		
	Los Coches 69kV E Bus	71	71	1.00	1.02	1.03	1.06	1.06		
	Los Coches 69kV W Bus	71	71	1.00	1.05	1.04	1.07	1.08		
	Miguel 69kV N Bus	71	71	1.00	1.03	1.03	1.07	1.07		
	Mission 69kV N Bus	71	71	1.00			1.02	1.02		
	Murray 69kV N Bus	71	71	1.00	1.13	1.11	1.17	1.16		
	Poway 69kV Bus	71	71	1.00			1.02	1.02		
	Poway 69kV Bus SPS	71	71	1.00			1.03	1.03		
	Pomerado 69kV E Bus	71	71	1.00			1.03	1.03		
	Proctor Valley 138kV Bus	71	71	1.00	1.03	1.04	1.07	1.08		
	Rincon 69kV N Bus	71	71	1.00	1.03	1.02	1.07	1.06		
	Sycamore 69kV S Bus	71	71	1.00	1.04	1.04	1.10	1.10		
	ML BK71 & Miguel - SXCC #1 230 kV aa	71	71	1.00			1.07	1.06		
	SX-PEN 230KV + AR-SX 69KV	71	71	1.00				1.02		
	LC-SY + SY-TC 138KV	71	71	1.00	1.06	1.07	1.10	1.11		
	LC-SY+ML-LC 138/69KV	71	71	1.00	1.12	1.13	1.16	1.17		
	PV-TC + LC-SY 138KV	71	71	1.00	1.08	1.08	1.11	1.12		
	LC-SN + LC-EL 138/69 KV	71	71	1.00	1.06	1.05	1.10	1.09		
	CH-SX-SN+LC-EL 138/69 KV	71	71	1.00	1.14	1.13	1.19	1.18		
	POM-SX 1 + 2 69KV	71	71	1.00	1.02	1.02	1.07	1.07		
	ML-JM 1 + 2 69KV	71	71	1.00			1.04	1.04		
	line POMERADO-SYCAMORE 69 ck 1/2	71	71	1.00	1.02	1.02	1.07	1.07		
	line POMERADO-SYCAMORE 69 ck 1/2 SPS9.4a	71	71	1.00	1.03	1.03	1.07	1.07		
LINE DEL MAR 69kV-DELMARTP 69kV ck1	Del Mar 69kV E Bus	50	54	1.08	1.13	1.14	1.13	1.14		
LINE EASTGATE 69kV-ROSE CYN 69kV ck1	Penasquitos 69kV SE Bus	50	50	1.00	1.10		1.15	1.02		
LINE EL CAJON 69kV-LOSCOCHS 69kV ck1	Murray 69kV N Bus	55	55	1.00	1.35	1.31	1.36	1.33		
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	Escondido 69kV SE Bus	102	113	1.11	1.34	1.32	1.34	1.32		
	Escondido 69kV SW Bus	102	113	1.11	1.30	1.28	1.30	1.28		
	Felicita 69kV S Bus	102	113	1.11	1.13	1.11	1.12	1.09		
	Poway 69kV Bus	102	113	1.11	1.08	1.07	1.08	1.07		
LINE ESCNDIDO 69kV-SANMRCOS 69kV ck1	SA5W TRIP TL695 SPS b 9.7	97	129	1.33				1.13		
LINE FELCTATP 69kV-FELICITA 69kV ck1	Escondido 69kV SE Bus	72	97	1.35				1.08		
	Escondido 69kV SW Bus	72	97	1.35	1.10	1.11	1.12	1.13		
LINE FELICITA 69kV-ASH TP 69kV ck1	Escondido 69kV SE Bus	90	90	1.00	1.02	1.02	1.03	1.03		
LINE GARFIELD 69kV-EL CAJON 69kV ck1	Murray 69kV N Bus	97	102	1.05	1.35	1.34	1.35	1.36		
LINE GRANITE 69kV-GRANITTP 69kV ck1	Murray 69kV N Bus	97.5	136.8	1.40	1.30	1.28	1.30	1.30		
LINE KEARNY 69kV-MISSION 69kV ck1	Mission 69kV S Bus	97	129	1.33	1.10	1.14	1.08	1.12		
LINE MELROSE 69kV-SANLUSRY 69kV ck1	San Luis Rey 69kV S Bus	97.5	102.1	1.05	1.05	1.04				
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	Escondido 69kV NW Bus	97.5	102.1	1.05	1.01	1.02	1.01	1.02		
	San Luis Rey 69kV N Bus	97.5	102.1	1.05	1.15	1.13	1.06	1.05		
LINE MESAHGTS 69kV-MISSION 69kV ck1	Kearny 69kV E Bus	97	136	1.40	1.16	1.20	1.15	1.19		
	Mission 69kV N Bus	97	136	1.40	1.35	1.40	1.33	1.38		
LINE MIGUEL 69kV-JAMACHA 69kV ck1	Miguel 69kV N Bus	97	143	1.47	1.29	1.34	1.27	1.33		
LINE MIGUEL 69kV-JAMACHA 69kV ck2	Miguel 69kV S Bus	136	143	1.05	1.22	1.27	1.20	1.25		
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	ML-JM 1 + 2 69KV	97	136	1.40	1.14	1.20		1.18		
LINE MONSRATE 69kV-AVCADOTP 69kV ck1	San Luis Rey 69kV S Bus	51	51	1.00	1.04	1.03				
LINE MONSRATE 69kV-MNSRATTP 69kV ck1	Lilac 69kV S Bus	77	77	1.00	1.04	1.05	1.04	1.05		
LINE MURRAY 69kV-GARFIELD 69kV ck1	Murray 69kV N Bus	97	103	1.06	1.07	1.06	1.07	1.08		
	CH-SX-SN+LC-EL 138/69 KV	97	103	1.06			1.01			
	ML-JM 1 + 2 69KV	97	103	1.06	1.06	1.03	1.07	1.03		
LINE OLD TOWN 69kV-KETTNER 69kV ck1	Main St 69kV W Bus	215	239	1.11	1.03	1.01	1.04	1.01		
LINE PALA 69kV-MNSRATTP 69kV ck1	Lilac 69kV S Bus	68	68	1.00	1.03	1.04	1.03	1.04		
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	Del Mar 69kV E Bus	97	129	1.33	1.15	1.17	1.15	1.17		
	Penasquitos 69kV SE Bus	97	129	1.33	1.14	1.14	1.13	1.14		
LINE PENSQTOS 69kV-MIRAMRTP 69kV ck1	Penasquitos 69kV SE Bus	97	112	1.15	1.25	1.15	1.24	1.15		
	MR-PQ 69KV + PQ-MRM 69KV	97	112	1.15	1.23	1.14	1.21	1.12		
LINE POMERADO 69kV-SYCAMORE 69kV ck2	Sycamore 69kV S Bus	97	136	1.40	1.33	1.40	1.37	1.45		
LINE POWAY 69kV-POMERADO 69kV ck1	PEN-ES #1+ PEN-ES #2 230KV	97	143	1.47	1.10	1.23	1.13	1.18		
LINE PRCTRVLY 138kV-MIGUEL 138kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	392	468	1.19		1.09				
	line ML-MS 1&2 230kV	392	468	1.19		1.08		1.03		
	line ML-MS 1&2 230kV SPS6.4 a	392	468	1.19		1.06		1.02		
	line ML-MS 1&2 230kV SPS6.4 b	392	468	1.19		1.05		1.01		
	line ML-MS 1&2 230kV SPS6.4 c	392	468	1.19		1.03				
	line ML-MS 1&2 230kV SPS6.4 d	392	468	1.19		1.01				
LINE SAMPSON 69kV-MAIN ST 69kV ck2	Main St 69kV E Bus	129	129	1.00	1.20	1.15	1.22	1.17		
LINE SANMATEO 138kV-LAGNA NL 138kV ck1	TA-TB + TA-PI 138KV	136	136	1.00	1.03	1.03	1.04	1.04		
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	CAN-SA-SH + EA-CAN 138KV	63	73	1.16	1.22	1.22	1.22	1.22		
LINE SOUTHBAY 69kV-IMPRLBCH 69kV ck1	Otay 69kV Bus	55	55	1.00	1.17	1.16	1.18	1.17		
LINE SOUTHBAY 69kV-OTAY 69kV ck2	Southbay 69kV N Bus	100	100	1.00	1.02	1.01	1.02	1.01		
LINE SYCAMORE 69kV-SCRIPPS 69kV ck1	MR-PQ 69KV + PQ-MRM 69KV	102	136	1.33			1.04	1.08		
LINE TALEGA 138kV-PICO 138kV ck1	TA-TB + LNL-SMO 138KV	204	204	1.00	1.13	1.13	1.13	1.13		
LINE TALEGA 138kV-SANMATEO 138kV ck1	TA-TB + TA-PI 138KV	136	136	1.00	1.30	1.29	1.30	1.30		
	PI-CP + TA-TB 138KV	136	136	1.00	1.15	1.15	1.15	1.16		
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	CAN-SA-SH + EA-CAN 138KV	63	73	1.16	1.22	1.22	1.22	1.22		
TRAN LOSCOCHS 69kV-LOSCOCHS 138kV ck2	Los Coches 69kV W Bus	140	155	1.11		1.07				
TRAN MIGUEL 230kV-MIGUEL 138kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	392	468	1.19		1.09				
	line ML-MS 1&2 230kV	392	468	1.19		1.08		1.05		
	line ML-MS 1&2 230kV SPS6.4 a	392	468	1.19		1.07		1.04		
	line ML-MS 1&2 230kV SPS6.4 b	392	468	1.19		1.06		1.03		
	line ML-MS 1&2 230kV SPS6.4 c	392	468	1.19		1.05		1.01		
	line ML-MS 1&2 230kV SPS6.4 d	392	468	1.19		1.03		1.00		
	line ML-MS 1&2 230kV SPS6.4 e	392	468	1.19		1.02				

MVA1 pu Loading					Case Name					
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
TRAN MIGUEL 69kV-MIGUEL 230kV ck1	ML BK71 & Miguel - SXCC #1 230 kV aa	224	305	1.36	1.37	1.47	1.29	1.39		
	line ML-MS 1&2 230kV	224	305	1.36		1.11		1.09		
	line ML-MS 1&2 230kV SPS6.4 a	224	305	1.36		1.10				
	line ML-MS 1&2 230kV SPS6.4 b	224	305	1.36		1.10				
TRAN MIGUEL 69kV-MIGUEL 230kV ck2	line ML-MS 1&2 230kV	224	305	1.36		1.11		1.09		
	line ML-MS 1&2 230kV SPS6.4 a	224	305	1.36		1.10				
	line ML-MS 1&2 230kV SPS6.4 b	224	305	1.36		1.10				
TRAN SANLUSRY 69kV-SANLUSRY 230kV ck3	SA5W TRIP TL695 SPS b 9.7	224	301	1.34	1.19	1.31	1.10	1.22		
TRAN SOUTHBAY 69kV-SOUTHBAY 138kV ck1	Main St 69kV E Bus	140	143	1.02	1.03	1.02	1.03	1.03		
	Main St 69kV W Bus	140	143	1.02	1.01	1.00	1.01	1.01		
	Miguel 69kV S Bus	140	143	1.02	1.26	1.27	1.25	1.27		
	Sweetwater 69kV Bus	140	143	1.02	1.05	1.03	1.05	1.04		
	ML BK71 & Miguel - SXCC #1 230 kV aa	140	143	1.02	1.08	1.09	1.06	1.07		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck1	Escondido 69kV SE Bus	224	285	1.27				1.06		
	Proctor Valley 138kV Bus	224	285	1.27				1.06		
	ML BK71 & Miguel - SXCC #1 230 kV aa	224	285	1.27				1.06		
	PEN-ES #1+ PEN-ES #2 230KV	224	285	1.27	1.07	1.11	1.10	1.15		
	line ML-MS 1&2 230kV	224	285	1.27				1.06		
	line ML-MS 1&2 230kV SPS6.4 a	224	285	1.27				1.05		
	LC-SY + SY-TC 138KV	224	285	1.27				1.05		
	PV-TC + LC-SY 138KV	224	285	1.27				1.06		
	MR-PQ 69KV + PQ-MRM 69KV	224	285	1.27		1.03	1.04	1.08		
TRAN SYCAMORE 230kV-SYCAMORE 69kV ck2	Escondido 69kV SE Bus	224	269	1.20				1.03		
	Proctor Valley 138kV Bus	224	269	1.20				1.03		
	ML BK71 & Miguel - SXCC #1 230 kV aa	224	269	1.20				1.03		
	PEN-ES #1+ PEN-ES #2 230KV	224	269	1.20	1.05	1.09	1.08	1.12		
	line ML-MS 1&2 230kV	224	269	1.20				1.04		
	line ML-MS 1&2 230kV SPS6.4 a	224	269	1.20				1.03		
	LC-SY + SY-TC 138KV	224	269	1.20				1.03		
	PV-TC + LC-SY 138KV	224	269	1.20				1.04		
	MR-PQ 69KV + PQ-MRM 69KV	224	269	1.20		1.00	1.02	1.06		

MVA1 pu Loading					Case Name	
Monitored Element	Contingency Description	MVA1	MVA2	MVA2/MVA1	11hs-pre-g1	11hs-pst-g1
LINE CREELMAN 69kV-SYCAMORE 69kV ck1	line WIND-ML 500kV	71	71	1.00	1.04	1.09
	line WIND-ML 500kV SPS6.1	71	71	1.00	1.02	1.06
	line WIND-ML 500kV SPS6.2	71	71	1.00	1.05	diverged
	line MISSION-CARLTNHS-SYCAMORE 138 ck 1	71	71	1.00	1.05	1.06
	line CREELMAN to LOSCOCHS 69 ck 1	71	71	1.00	1.00	1.02
LINE EL CAJON 69kV-GRANITE 69kV ck1	line GRANITE to GRANITTP 69 ck 1	97	114	1.18	0.99	1.01
LINE ESCNDIDO 69kV-FELCTATP 69kV ck1	line WIND-ML 500kV SPS6.2	102	113	1.11	1.00	diverged
	line ESCNDIDO to FELICITA 69 ck 1	102	113	1.11	1.20	1.20
	line ESCNDIDO to ASH 69 ck 1	102	113	1.11	1.28	1.28
LINE FELCTATP 69kV-FELICITA 69kV ck1	line ESCNDIDO to ASH 69 ck 1	72	97	1.35	1.07	1.10
LINE FELICITA 69kV-ASH TP 69kV ck1	line ESCNDIDO to ASH 69 ck 1	90	90	1.00	1.01	1.02
LINE MELRSETP 69kV-SANLUSRY 69kV ck1	line ESCNDIDO to SANMRCOS 69 ck 1	97.5	102.1	1.05	1.00	1.02
	line MELROSE to SANLUSRY 69 ck 1	97.5	102.1	1.05	1.04	1.03
LINE MIGUELTP 69kV-MIGUEL 69kV ck1	line PARADISE to MIGUEL 69 ck 1	97	136	1.40	1.18	1.25
LINE OTAY 69kV-OTAYLKTP 69kV ck1	line MIGUEL to BORDER 69 ck 1	50	50	1.00	1.05	1.03
LINE PENSQTOS 69kV-DELMARTP 69kV ck1	line PENSQTOS to TOREYPNS 69 ck 1	97	129	1.33	1.11	1.13
LINE POMERADO 69kV-SYCAMORE 69kV ck1	line POMERADO to SYCAMORE 69 ck 2	97	136	1.40	1.08	1.14
LINE POMERADO 69kV-SYCAMORE 69kV ck2	line POMERADO to SYCAMORE 69 ck 1	97	136	1.40	1.08	1.14
LINE SHADOWR 138kV-ESCNDO50 138kV ck1	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22
TRAN ESCNDO50 138kV-ESCNDIDO 69kV ck2	line CANNON-SANLUSRY-SHADOWR 138	63	73	1.16	1.22	1.22
TRAN INTBCT 16kV-INTB 230kV ck1	line IMPRLVLY to CENTRALX 500 ck 1	205	205	1.00	0.96	1.00
TRAN PEN_ST 18kV-PEN 230kV ck1	line WIND-ML 500kV	235	235	1.00	0.97	1.01

MVA1 pu Loading						Case Name					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-II	11hs-pst-II	11lw-pre	11lw-pst
LINE ARABY S 69kV-AR FH TP 69kV ck1	Base system (n-0)	14	78.6	78.6	1.00	1.01	1.01	1.00	1.00		
LINE BLYTHE 161kV-BUCKBLVD 161kV ck1	Base system (n-0)	14	400	440	1.10	1.15	1.15	1.15	1.15		
LINE MEADOWBK 230kV-SUNYSLOP 230kV ck1	Base system (n-0)	14	325	490	1.51			1.04	1.05		
LINE RTAP2 92kV-RTP1 92kV ck1	Base system (n-0)	8	57	57	1.00	1.05	1.13	1.17	1.25		
LINE SHANDIN 115kV-TAP902 115kV ck1	Base system (n-0)	24	109.1	165.3	1.52					1.10	1.11
LINE YAVAPAI 230kV-VERDE N 230kV ck1	Base system (n-0)	14	319	398	1.25	1.02	1.02	1.05	1.05		
TRAN BLKMSA34 69kV-BLK MESA 230kV ck1	Base system (n-0)	14	40	44.8	1.12	1.10	1.10	1.10	1.10		
TRAN BLKMSA34 69kV-BLK MESA 230kV ck2	Base system (n-0)	14	40	44.8	1.12	1.05	1.05	1.05	1.05		
TRAN GILA 161kV-GILA 69kV ck1	Base system (n-0)	14	100	120	1.20	1.23	1.23	1.19	1.18		
TRAN HAVASU12 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN HAVASU34 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN HAVASU56 13.2kV-HAVASU 230kV ck1	Base system (n-0)	14	100	0	0.00					1.00	1.00
TRAN INYO 115kV-INYO PS 115kV ck1	Base system (n-0)	24	56	62	1.11					1.00	1.03
TRAN SUN ARIZ 230kV-SUN G9 13.8kV ck1	Base system (n-0)	14	115	138	1.20	1.05	1.05	1.05	1.05		
TRAN VALNCIA1 13.2kV-VALNCIA 115kV ck1	Base system (n-0)	14	20	22.4	1.12	1.06	1.06	1.06	1.06		
TRAN VALNCIA2 13.2kV-VALNCIA 115kV ck1	Base system (n-0)	14	20	22.4	1.12	1.06	1.06	1.06	1.06		

MVA1 pu Loading						Case Name					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
LINE ARABY S 69kV-AR FH TP 69kV ck1	line HASSYAMP to N.GILA 500 ck 1	14	78.6	78.6	1.00	1.08	1.07	1.04			
LINE NILAND 161kV-BLYTHE 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	8	165	165	1.00	1.03					
LINE RTAP2 92kV-RTP1 92kV ck1	line IV-WIND 500kV	8	57	57	1.00	1.12	1.22	1.22	1.32		
	line IV-WIND 500kV SPS6.1	8	57	57	1.00				1.09		
	line IV-WIND 500kV SPS6.2	8	57	57	1.00			1.03	1.14		
	line WIND-ML 500kV	8	57	57	1.00	1.17	1.28	1.26	1.36		
	line WIND-ML 500kV SPS6.1	8	57	57	1.00		1.04	1.03	1.13		
	line WIND-ML 500kV SPS6.2	8	57	57	1.00			1.09	1.21		
	line N.GILA to IMPRLVLY 500 ck 1	8	57	57	1.00			1.02	1.15		
	line HASSYAMP to N.GILA 500 ck 1	8	57	57	1.00				1.12		
	line IMPRLVLY to CENTRALX 500 ck 1	8	57	57	1.00	1.15	1.26	1.24	1.34		
	line OTAYMESA to TJI 230 ck 1	8	57	57	1.00	1.10	1.20	1.20	1.30		
	line IMPRLVLY to ROA-230 230 ck 1	8	57	57	1.00	1.09	1.20	1.20	1.30		
	line OTAYMESA to SOUTHBAY 230 ck 1	8	57	57	1.00	1.08	1.18	1.20	1.29		
	line SILVERGT to SOUTHBAY 230 ck 1	8	57	57	1.00	1.08	1.18	1.20	1.29		
	line IMPRLVLY to ELCENTSW 230 ck 1	8	57	57	1.00		1.16	1.21	1.30		
	line IMPRLVLY to DIXIE230 230 ck 1	8	57	57	1.00				1.02		
	line IMPRLVLY to SOLR1A 230 ck 1	8	57	57	1.00			1.10			
	ML BK80 SPS6.6 f	8	57	57	1.00				1.04		
	ML BK81 SPS6.6 f	8	57	57	1.00				1.04		
	gen INTBCT 16.00	8	57	57	1.00	1.00	1.09	1.12	1.21		
	gen INTBST 16.00	8	57	57	1.00	1.01	1.10	1.13	1.22		
	gen IV GEN1 21.00	8	57	57	1.00		1.08	1.12	1.20		
	gen IV GEN2 21.00	8	57	57	1.00	1.01	1.09	1.13	1.21		
	gen IV GEN3 21.00	8	57	57	1.00	1.01	1.09	1.13	1.21		
	gen PEN PLANT 18.00	8	57	57	1.00	1.01	1.09	1.12	1.21		
	gen OTAY MESA PLANT	8	57	57	1.00		1.06	1.10	1.18		
	gen WD300MWQ 0.58	8	57	57	1.00		1.08	1.12	1.20		
	line CENTRALX to SYCAMORE 230 ck 1	8	57	57	1.00		1.17				
	line CENTRALX to SYCAMORE 230 ck 2	8	57	57	1.00		1.17				
	line SOLR2A to SOLR1A 230 ck 1	8	57	57	1.00		1.06		1.18		
	line SOLR3A to SOLR1A 230 ck 1	8	57	57	1.00		1.06		1.18		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	8	57	57	1.00		1.17		1.29		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 3	8	57	57	1.00		1.17		1.29		
	gen WD160MW 0.69	8	57	57	1.00		1.10				
	line LEAPS-MP to CMPNL500 500 ck 1	8	57	57	1.00			1.12	1.21		
	gen SXCC PLANT	8	57	57	1.00			1.08	1.16		
	gen SXCC-U3 21.00	8	57	57	1.00			1.14	1.22		
LINE WLTNMOHK 161kV-GILA 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	14	112	120	1.07	1.04	1.00				
TRAN GILA 161kV-GILA 69kV ck1	line IV-WIND 500kV	14	100	120	1.20	1.19	1.17	1.16	1.14		
	line IV-WIND 500kV SPS6.1	14	100	120	1.20			1.22			
	line IV-WIND 500kV SPS6.2	14	100	120	1.20			1.23			
	line WIND-ML 500kV	14	100	120	1.20	1.16	1.14	1.13	1.11		
	line N.GILA to IMPRLVLY 500 ck 1	14	100	120	1.20				1.01		
	line HASSYAMP to N.GILA 500 ck 1	14	100	120	1.20	1.65	1.77	1.49	1.41		
	line IMPRLVLY to CENTRALX 500 ck 1	14	100	120	1.20	1.17	1.15	1.14	1.13		
	line IMPRLVLY to ELCENTSW 230 ck 1	14	100	120	1.20	1.17	1.14	1.09	1.06		
	line IMPRLVLY to DIXIE230 230 ck 1	14	100	120	1.20		1.19	1.15	1.14		
	ML BK80 SPS6.6 f	14	100	120	1.20	1.29	1.28	1.24	1.24		
	ML BK81 SPS6.6 f	14	100	120	1.20	1.29	1.28	1.24	1.24		
	tran N.GILA 500 to N.GILA 69 ck 1	14	100	120	1.20	1.31	1.31	1.28	1.28		
	tran N.GILA 500 to N.GILA 69 ck 2	14	100	120	1.20	1.31	1.31	1.28	1.28		
	gen OTAY MESA PLANT	14	100	120	1.20	1.27	1.26	1.22	1.22		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 1	14	100	120	1.20		1.26		1.22		
	tran IMPRLVLY 230 to IMPRLVLY 500 ck 3	14	100	120	1.20		1.26		1.22		
	gen SXCC PLANT	14	100	120	1.20			1.24	1.23		
TRAN HEBERSCE 92kV-HEBERSCE 13.8kV ck1	line IV-WIND 500kV SPS6.2	8	50	55	1.10						1.01

MVA1 pu Loading						Case Name					
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA	11hs-pre	11hs-pst	11hs-pre-li	11hs-pst-li	11lw-pre	11lw-pst
LINE RTAP2 92kV-RTP1 92kV ck1	ENCINA 2T Breaker	8	57	57	1.00	1.02					
	line ML-MS&ML-SX 230kV SPS6.3 b	8	57	57	1.00		1.06	1.09	1.17		
	line ML-MS&ML-SX 230kV SPS6.3 c	8	57	57	1.00		1.00	1.04	1.12		
	line ML-MS&ML-SX 230kV SPS6.3 d	8	57	57	1.00				1.08		
	line ML-MS&ML-SX 230kV SPS6.3 e	8	57	57	1.00				1.04		
	line ML-MS 1&2 230kV SPS6.4 b	8	57	57	1.00		1.07	1.10	1.19		
	line ML-MS 1&2 230kV SPS6.4 c	8	57	57	1.00		1.01	1.05	1.13		
	line ML-MS 1&2 230kV SPS6.4 d	8	57	57	1.00			1.01	1.09		
	line ML-MS 1&2 230kV SPS6.4 e	8	57	57	1.00				1.05		
	line ML-MS&ML-SX 230kV SPS6.3 a	8	57	57	1.00			1.14	1.22		
TRAN GILA 161kV-GILA 69kV ck1	line ML-MS&ML-SX 230kV SPS6.3 c	14	100	120	1.20	1.27	1.26	1.22	1.22		
	line ML-MS&ML-SX 230kV SPS6.3 d	14	100	120	1.20	1.28	1.27	1.24	1.23		
	line ML-MS&ML-SX 230kV SPS6.3 e	14	100	120	1.20	1.29	1.28	1.25	1.24		
	line ML-MS 1&2 230kV SPS6.4 d	14	100	120	1.20	1.27	1.27	1.23	1.22		
	line ML-MS 1&2 230kV SPS6.4 e	14	100	120	1.20	1.28	1.28	1.24	1.24		

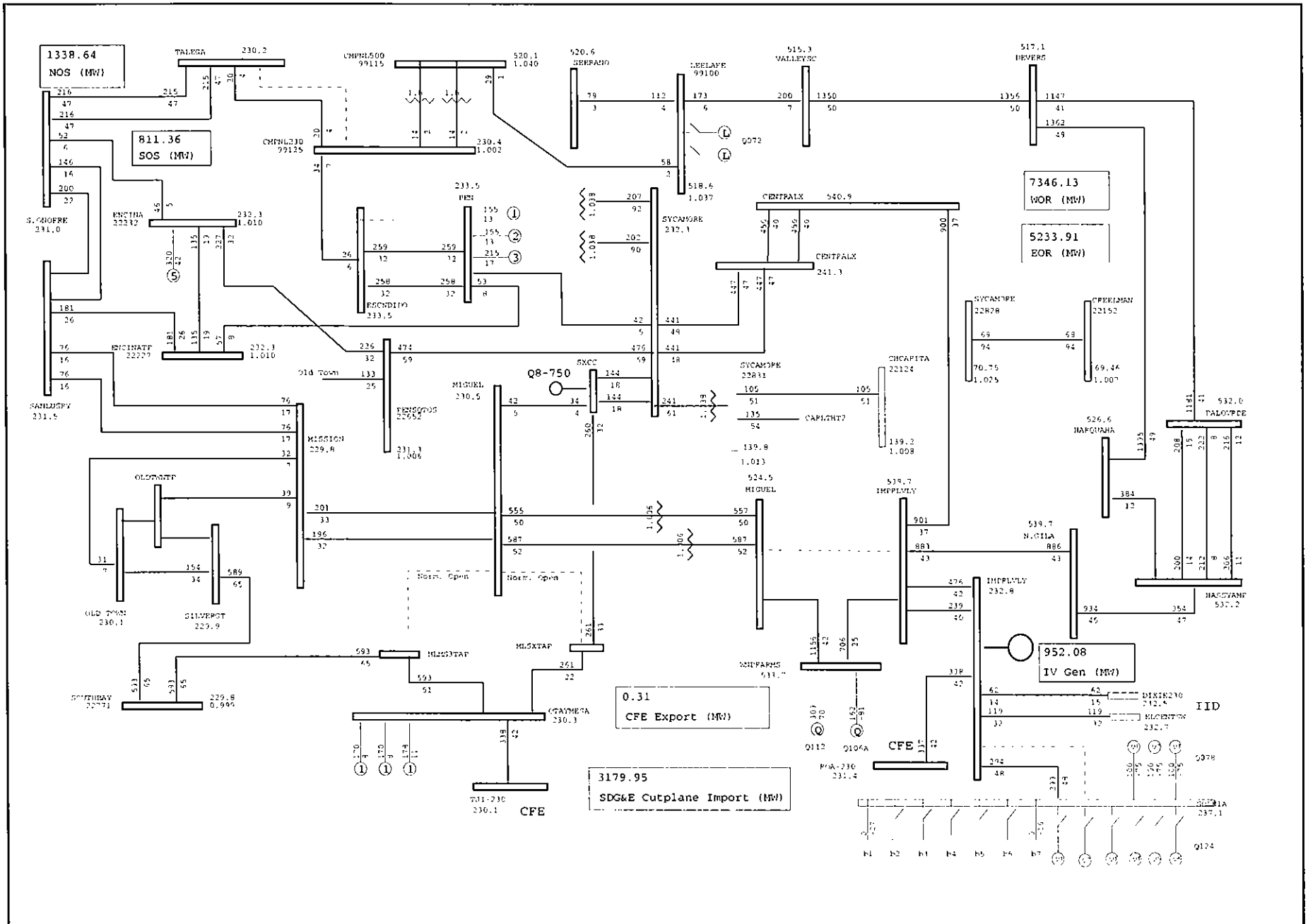
MVA1 pu Loading						CaseName	
Monitored Element	Contingency Description	Area	MVA1	MVA2	MVA2/MVA1	11hs-pre-g1	11hs-pst-g1
LINE ARABY S 69kV-AR FH TP 69kV ck1	line HASSYAMP to N.GILA 500 ck 1	14	78.6	78.6	1.00	1.08	1.08
LINE NILAND 161kV-BLYTHE 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	8	165	165	1.00	1.03	1.00
LINE RTAP2 92kV-RTP1 92kV ck1	line IV-WIND 500kV	8	57	57	1.00	1.10	1.20
	line WIND-ML 500kV	8	57	57	1.00	1.15	1.26
	line WIND-ML 500kV SPS6.1	8	57	57	1.00		1.02
	line WIND-ML 500kV SPS6.2	8	57	57	1.00	1.01	diverged
	line IMPRLVLY to CENTRALX 500 ck 1	8	57	57	1.00	1.13	1.24
	line OTAYMESA to TJI 230 ck 1	8	57	57	1.00	1.09	1.20
	line IMPRLVLY to ROA-230 230 ck 1	8	57	57	1.00	1.09	1.19
	line OTAYMESA to SOUTHBAY 230 ck 1	8	57	57	1.00		1.14
	line SILVERGT to SOUTHBAY 230 ck 1	8	57	57	1.00		1.14
	line CENTRALX to SYCAMORE 230 ck 1	8	57	57	1.00	1.06	1.15
	line CENTRALX to SYCAMORE 230 ck 2	8	57	57	1.00	1.06	1.15
	line IMPRLVLY to ELCENTSW 230 ck 1	8	57	57	1.00	1.06	1.14
	line SOLR1A to SOLR1B 230 ck 1	8	57	57	1.00	1.01	1.09
	line SOLR2A to SOLR1A 230 ck 1	8	57	57	1.00		1.05
	line SOLR2A to SOLR2B 230 ck 1	8	57	57	1.00		1.09
	line SOLR3A to SOLR1A 230 ck 1	8	57	57	1.00		1.05
	line SOLR3A to SOLR2B 230 ck 1	8	57	57	1.00		1.09
LINE WLTNMOHK 161kV-GILA 161kV ck1	line N.GILA to IMPRLVLY 500 ck 1	14	112	120	1.07	1.04	1.01
TRAN GILA 161kV-GILA 69kV ck1	line IV-WIND 500kV	14	100	120	1.20	1.19	1.18
	line IV-WIND 500kV SPS6.1	14	100	120	1.20	1.26	
	line WIND-ML 500kV	14	100	120	1.20	1.16	1.14
	line WIND-ML 500kV SPS6.2	14	100	120	1.20	1.21	diverged
	line HASSYAMP to N.GILA 500 ck 1	14	100	120	1.20	1.86	1.80
	line IMPRLVLY to CENTRALX 500 ck 1	14	100	120	1.20	1.17	1.15
	line CENTRALX to SYCAMORE 230 ck 1	14	100	120	1.20		1.21
	line CENTRALX to SYCAMORE 230 ck 2	14	100	120	1.20		1.21
	line IMPRLVLY to ELCENTSW 230 ck 1	14	100	120	1.20	1.18	1.15
	line IMPRLVLY to DIXIE230 230 ck 1	14	100	120	1.20	1.21	1.20

Appendix F

Power Flow Plots

Power Flow Plot #	Description
01	2011 Heavy Summer High Import without IV Bank 82 Pre-Project Normal Conditions (MVA/%)
02	2011 Heavy Summer High Import without IV Bank 82 Post-Project Normal Conditions (MVA/%)
03	2011 Heavy Summer Low Import without IV Bank 82 Pre-Project Normal Conditions (MVA/%)
04	2011 Heavy Summer Low Import without IV Bank 82 Post-Project Normal Conditions (MVA/%)
05	2011 Light Winter without IV Bank 82 Pre-Project Normal Conditions (MVA/%)
06	2011 Light Winter without IV Bank 82 Post-Project Normal Conditions (MVA/%)
07	2011 Heavy Summer High Import with IV Bank 82 Pre-Project Normal Conditions (MVA/%)
08	2011 Heavy Summer High Import with IV Bank 82 Post-Project Normal Conditions (MVA/%)
09	2011 Heavy Summer Low Import with IV Bank 82 Pre-Project Normal Conditions (MVA/%)
10	2011 Heavy Summer Low Import with IV Bank 82 Post-Project Normal Conditions (MVA/%)
11	2011 Light Winter with IV Bank 82 Pre-Project Normal Conditions (MVA/%)
12	2011 Light Winter with IV Bank 82 Post-Project Normal Conditions (MVA/%)
13	2011 Heavy Summer High Import without IV Bank 82 Pre-Project: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
14	2011 Heavy Summer High Import without IV Bank 82 Post-Project: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
15	2011 Heavy Summer Low Import without IV Bank 82 Pre-Project: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
16	2011 Heavy Summer Low Import without IV Bank 82 Post-Project: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
17	2011 Light Winter without IV Bank 82 Pre-Project: Imperial Valley 500/230 kV Bank 80 Outage (MVA/%)
18	2011 Light Winter without IV Bank 82 Post-Project: Imperial Valley 500/230 kV Bank 80 Outage (MVA/%)

Power Flow Plot #	Description
19	2011 Heavy Summer High Import Post-Project with Mitigation 1 Normal Conditions (MVA/%)
20	2011 Heavy Summer Low Import Post-Project with Mitigation 1 Normal Conditions (MVA/%)
21	2011 Light Winter Post-Project with Mitigation 1 Normal Conditions (MVA/%)
22	2011 Heavy Summer High Import Post-Project with Mitigation 1: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
23	2011 Heavy Summer Low Import Post-Project with Mitigation 1: Sycamore - Penasquitos 230 kV Line Outage (MVA/%)
24	2011 Light Winter Post-Project with Mitigation 1: Imperial Valley 500/230 kV Bank 80 Outage (MVA/%)



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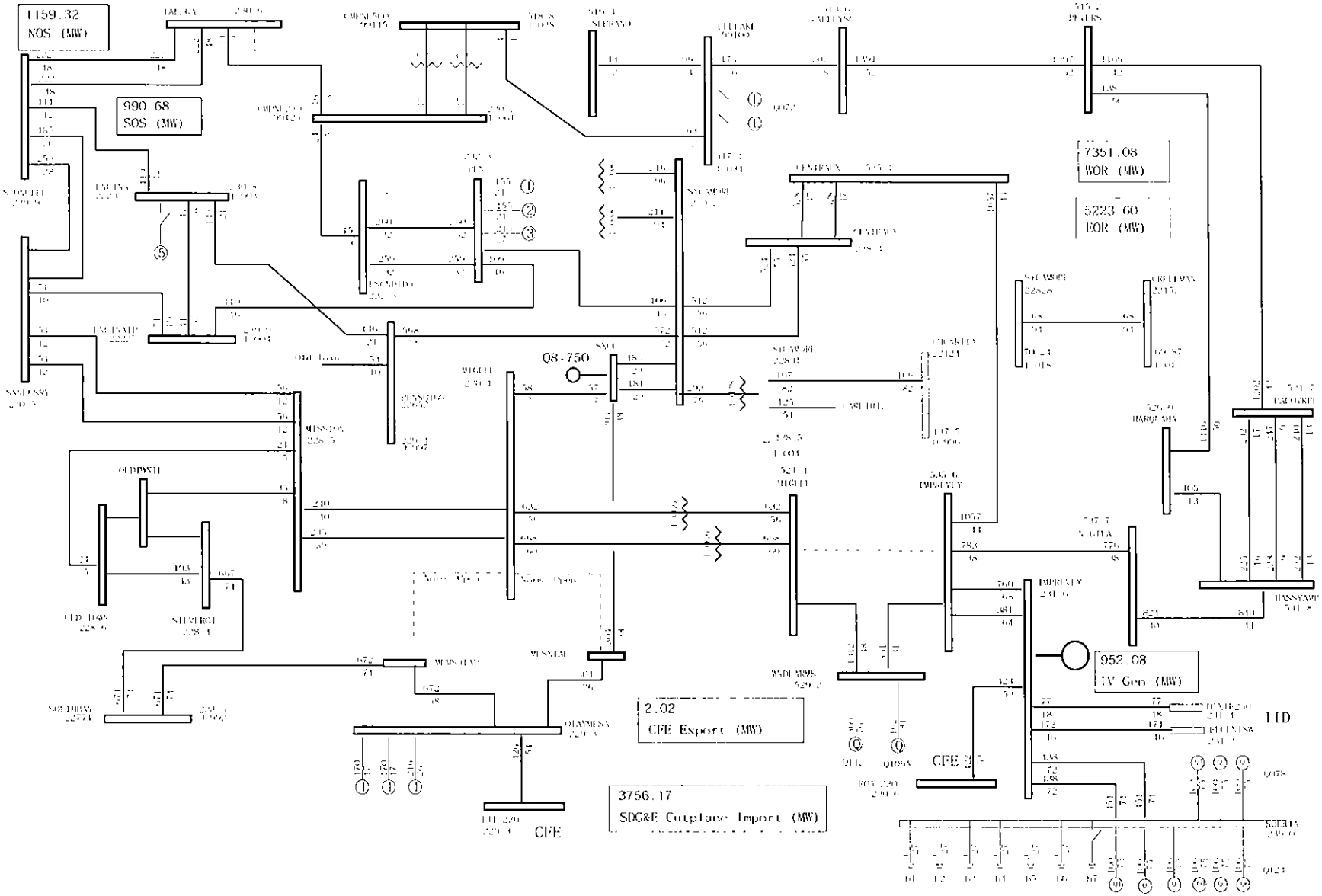
	SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre Project Case Plot 01: Normal Conditions		MVA/*rate draw\q124.drw Rating 1



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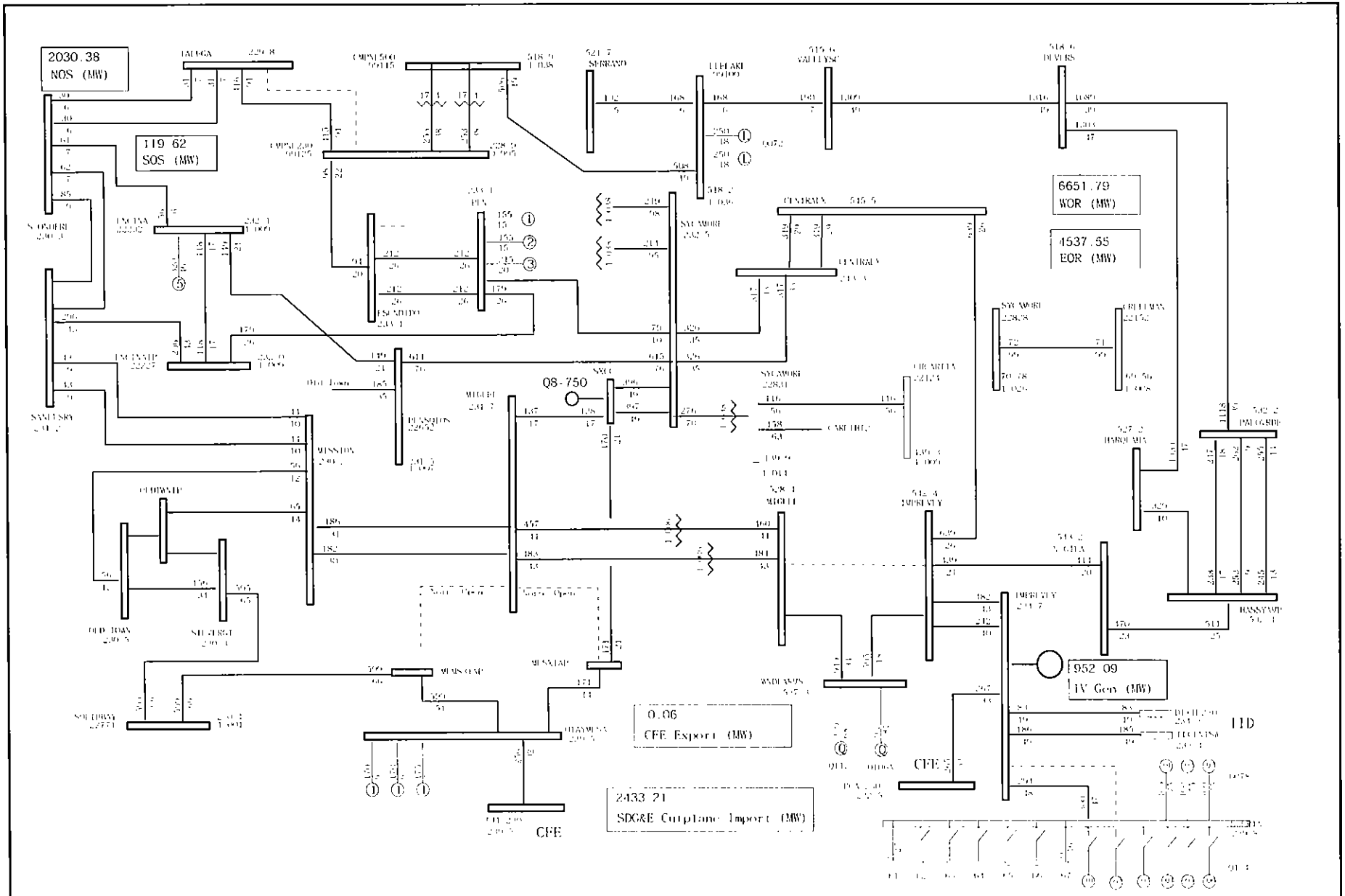
	SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case		MVA Base
	Plot 02 Normal Conditions		draw\q124.drw
			Revision 1



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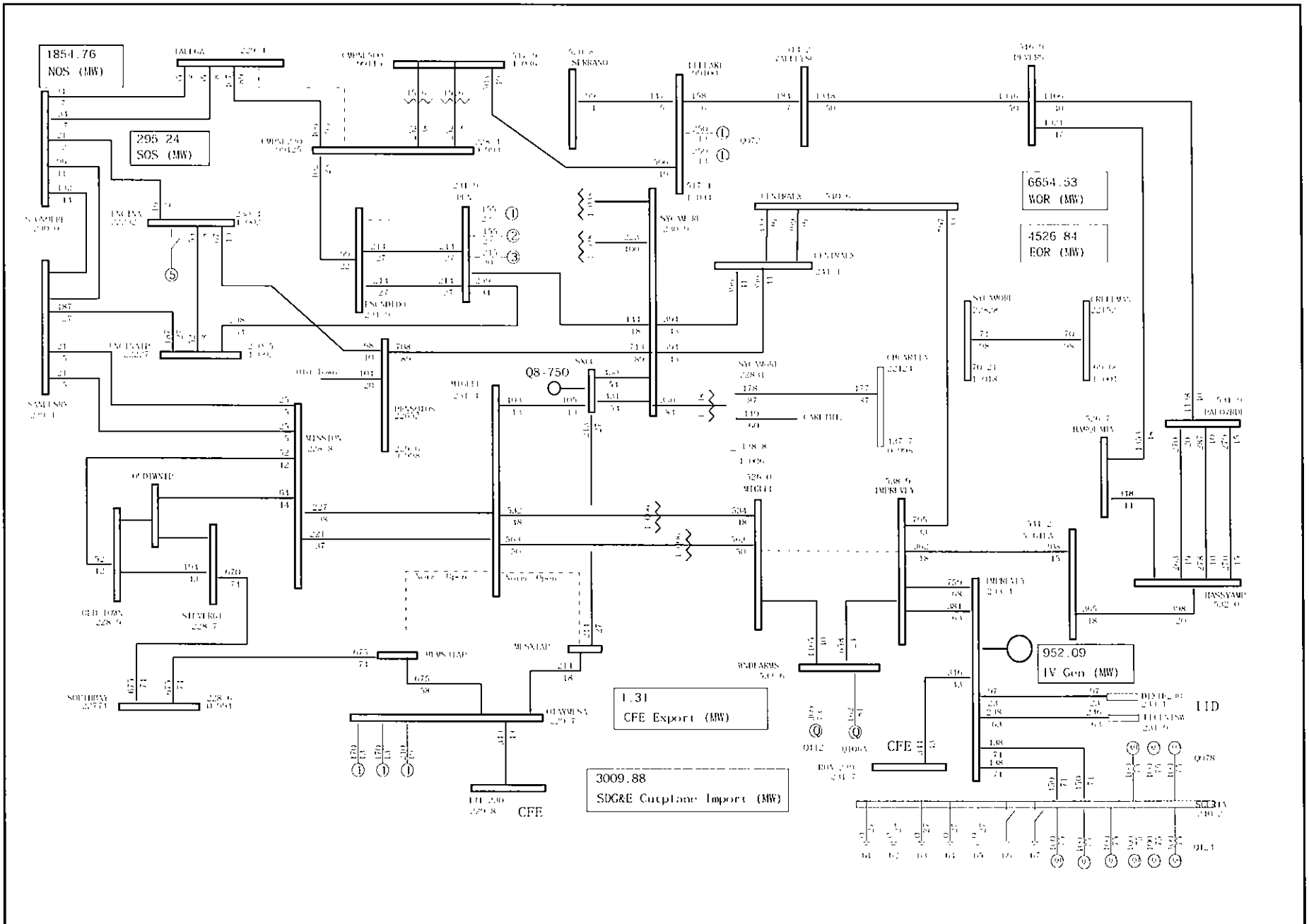
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Low Import Pre Project Case Plot 03 Normal Conditions			MVA Scale draw\q124.drw Rating = 1



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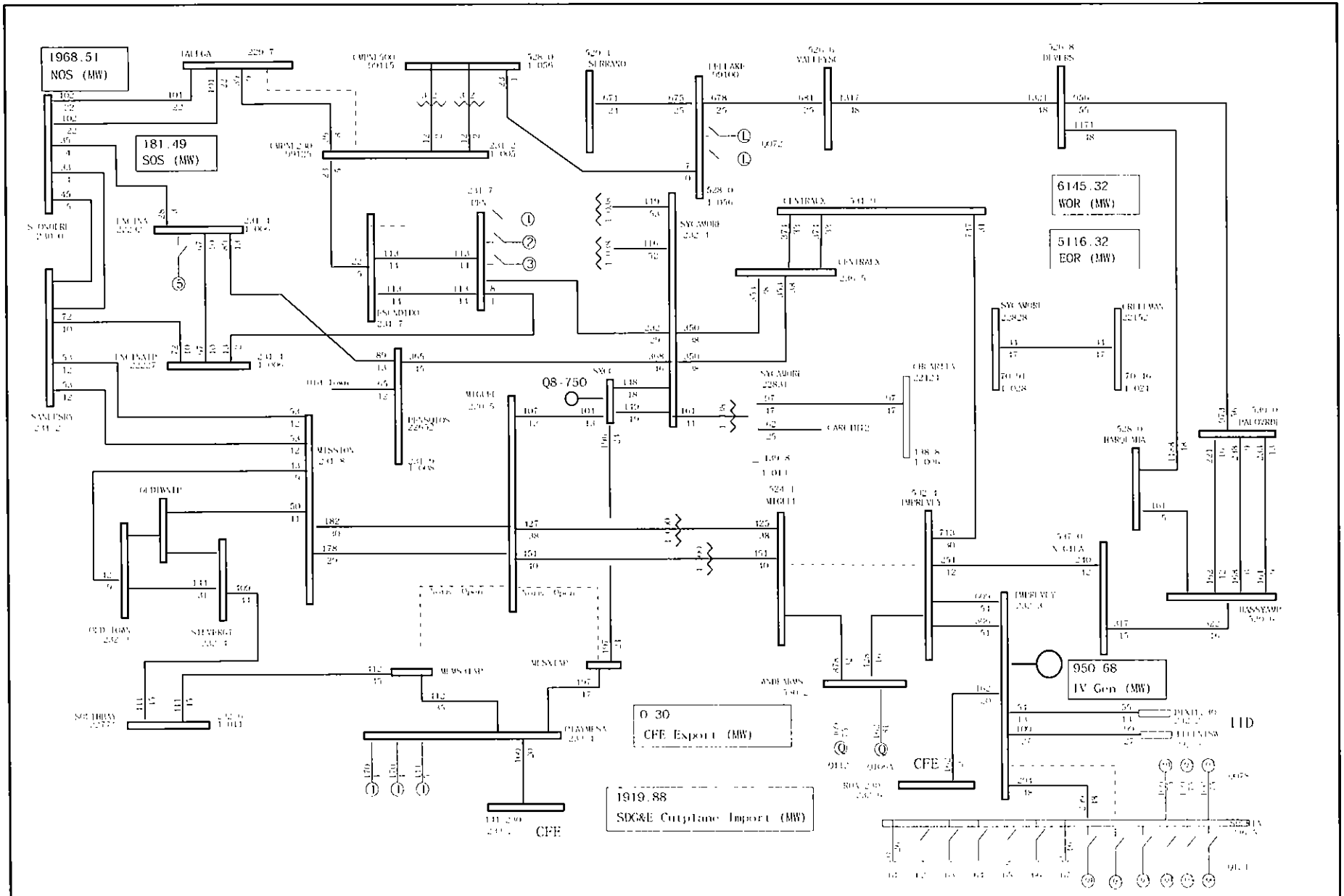

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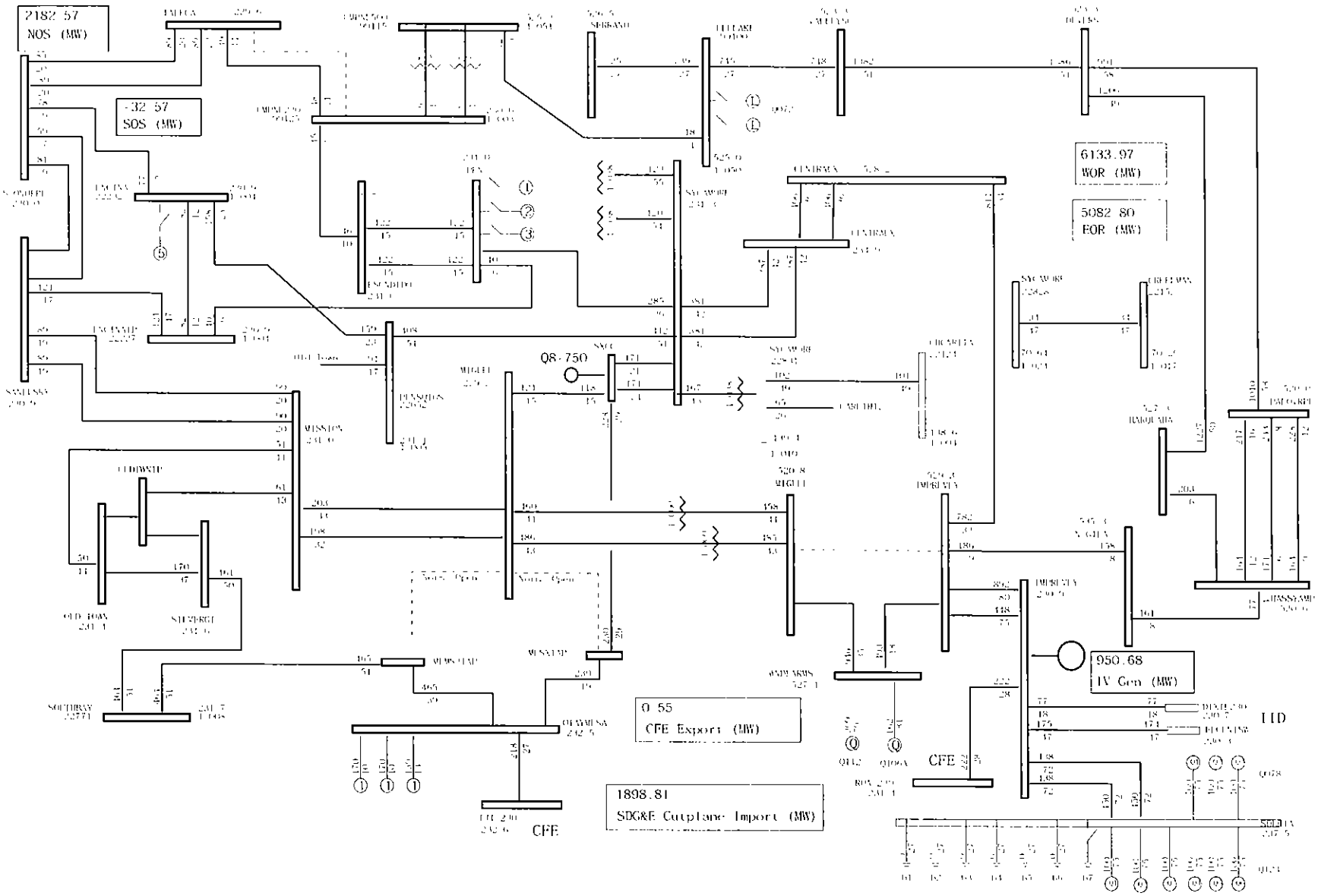

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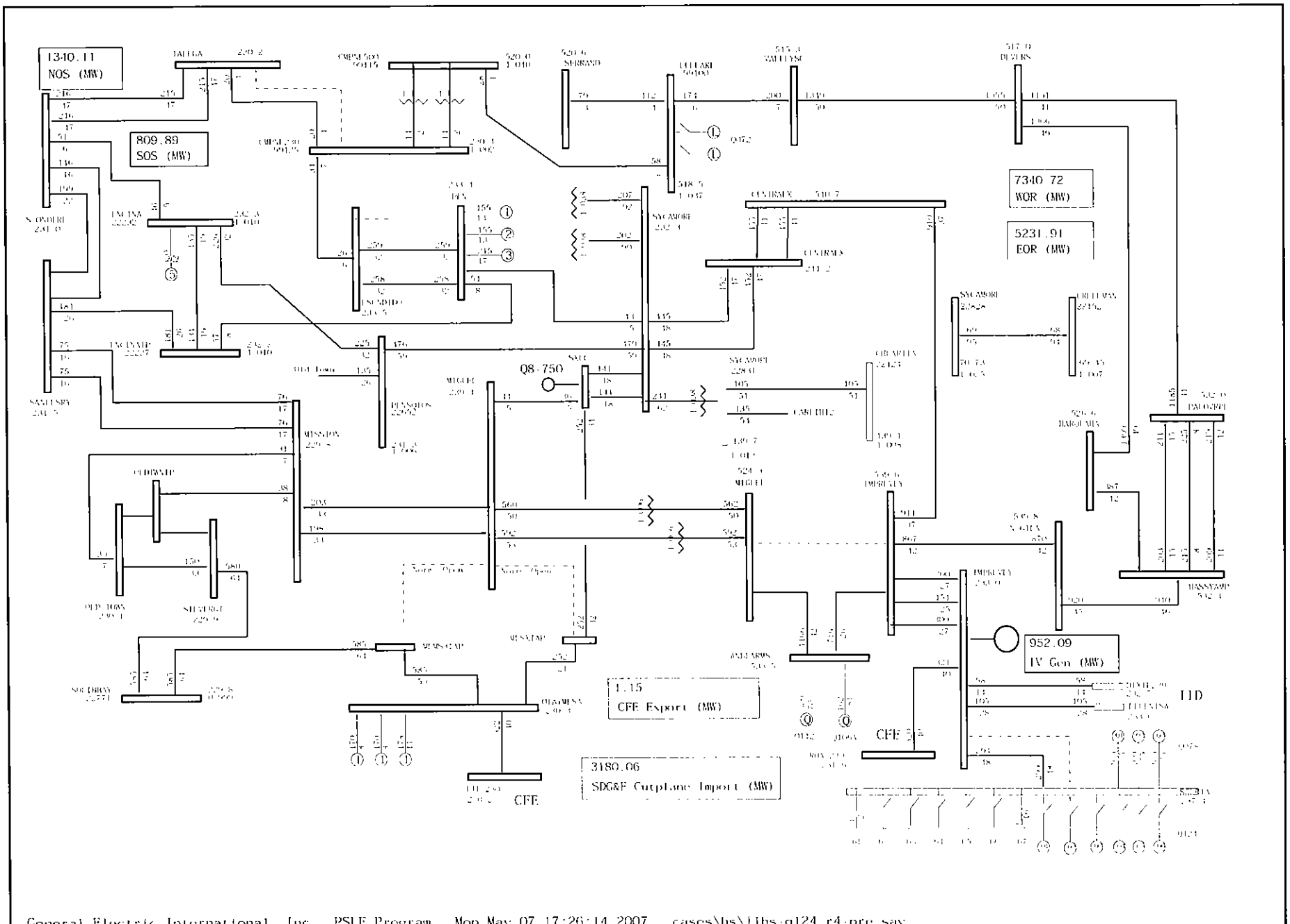
	Plot 06: Normal Conditions		Rating: - 1



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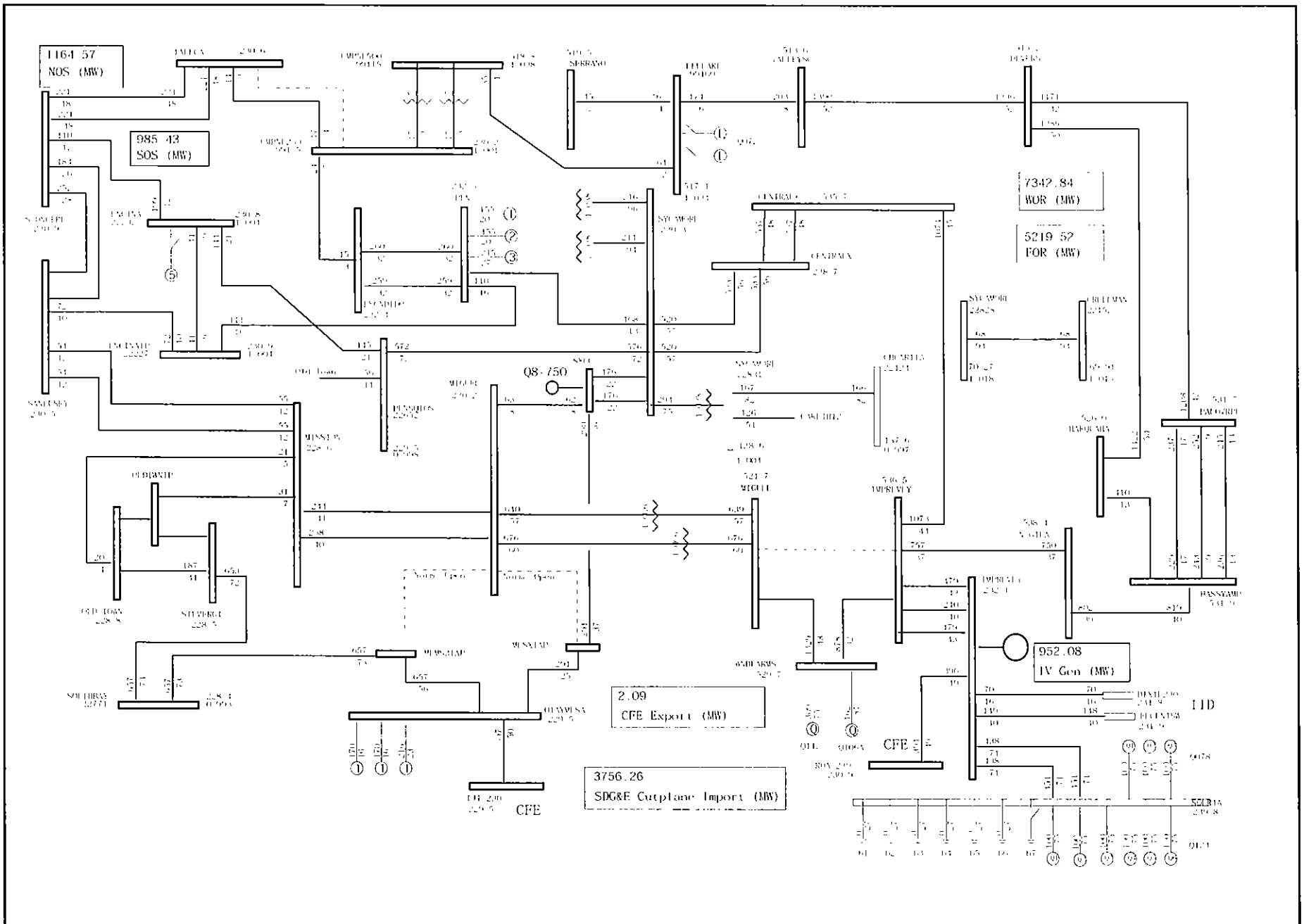

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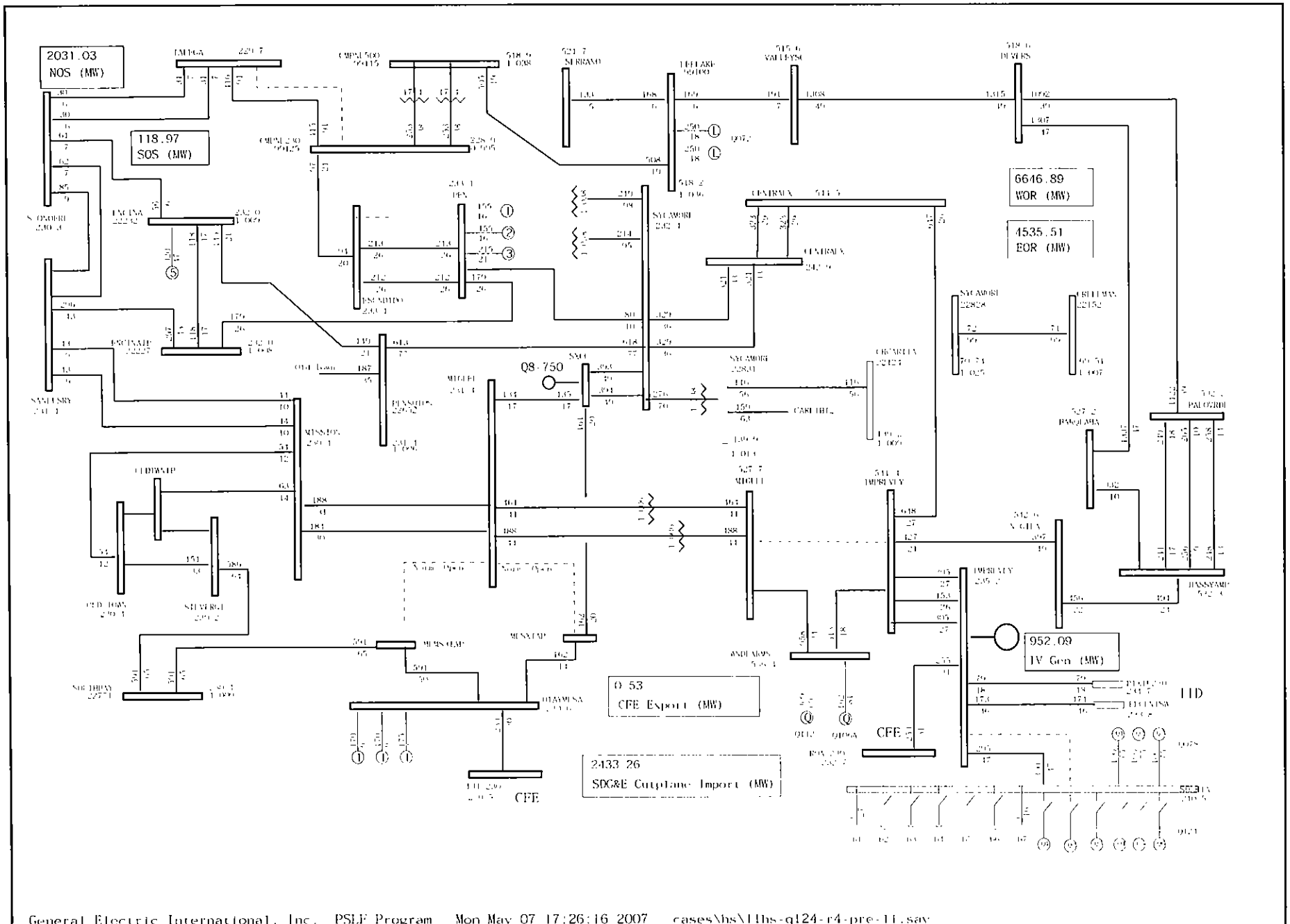
SDG&E	SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case Plot 08 Normal Conditions		MVA/Scale draw\q124.drw Rating = 1



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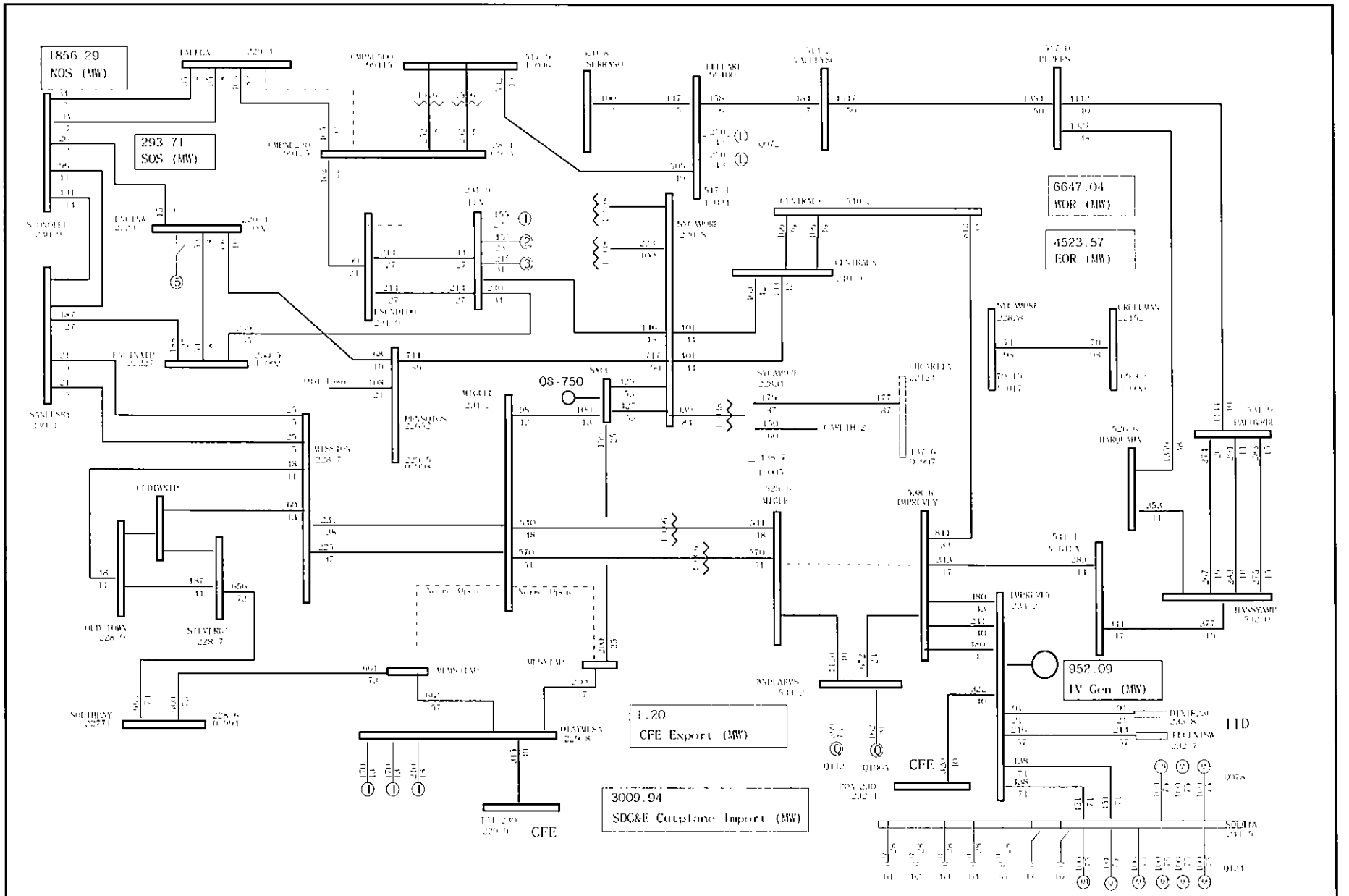

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	Plot 10 Normal Conditions		draw\q124.dtw
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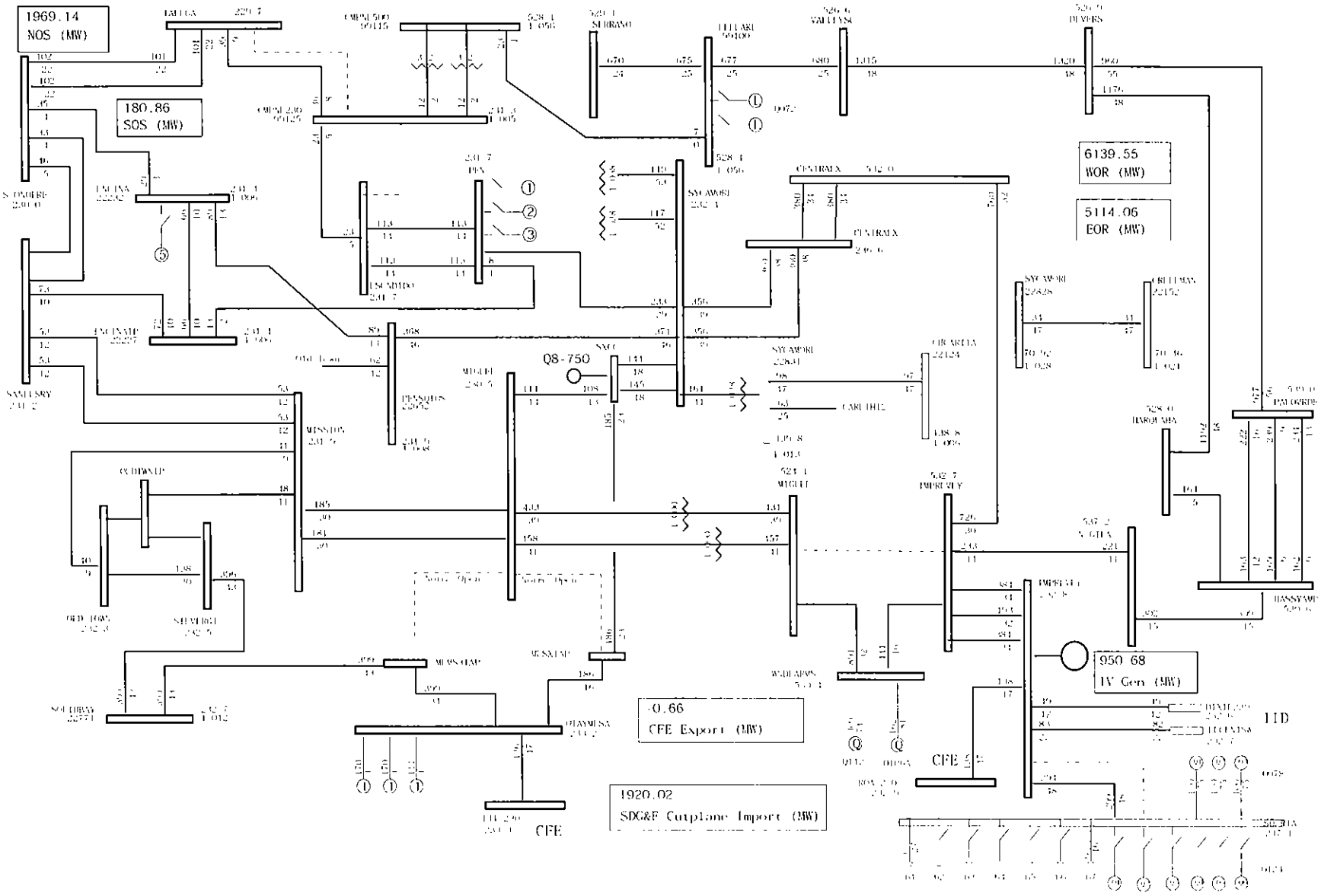

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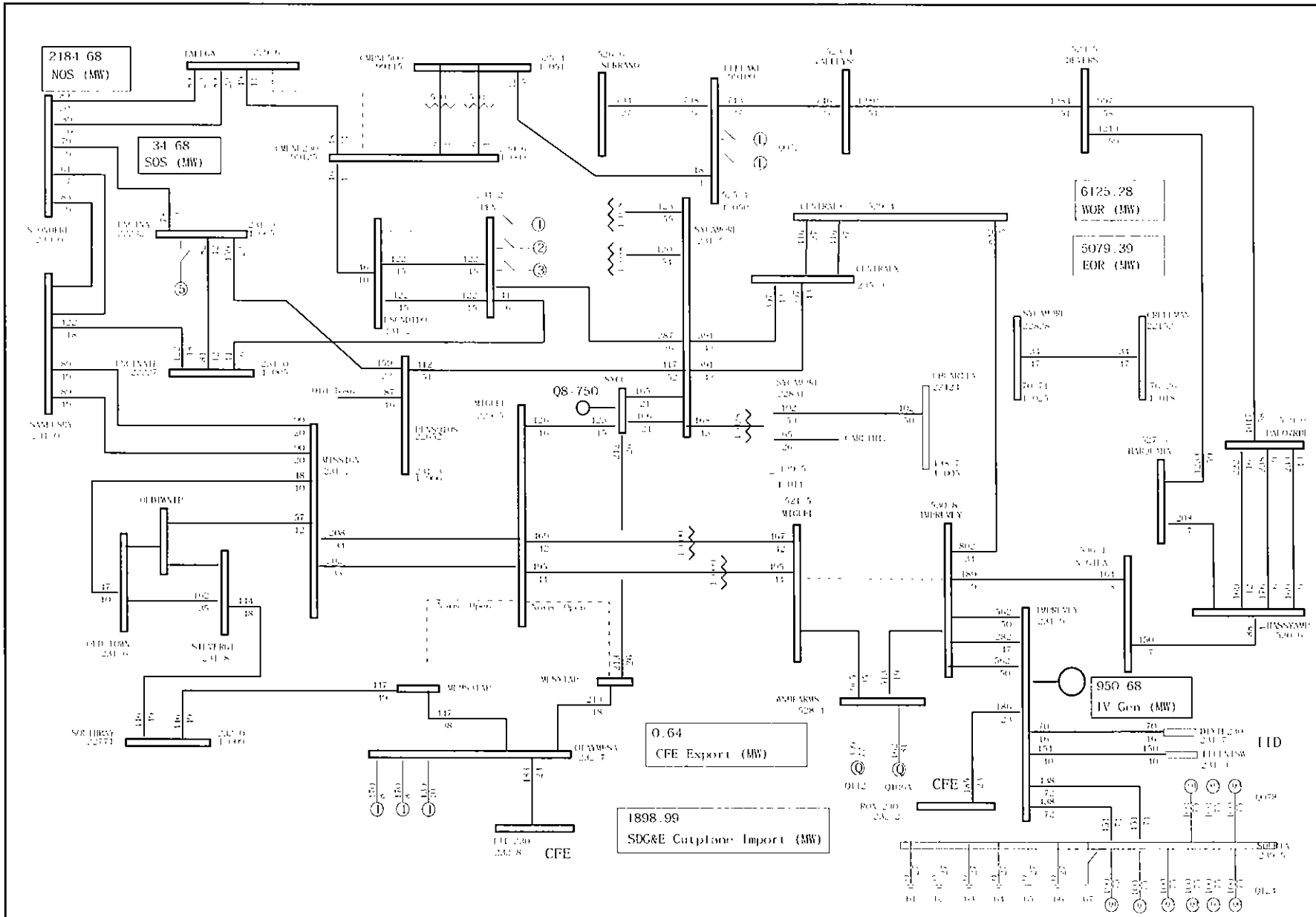
	SDG&E 2011 Light Winter Q124 620 MW of IV 230 kV Pre Prospect Case		MVA Scale
	Plot 11 Normal Conditions		draw-q124.drw
			Rating - 1



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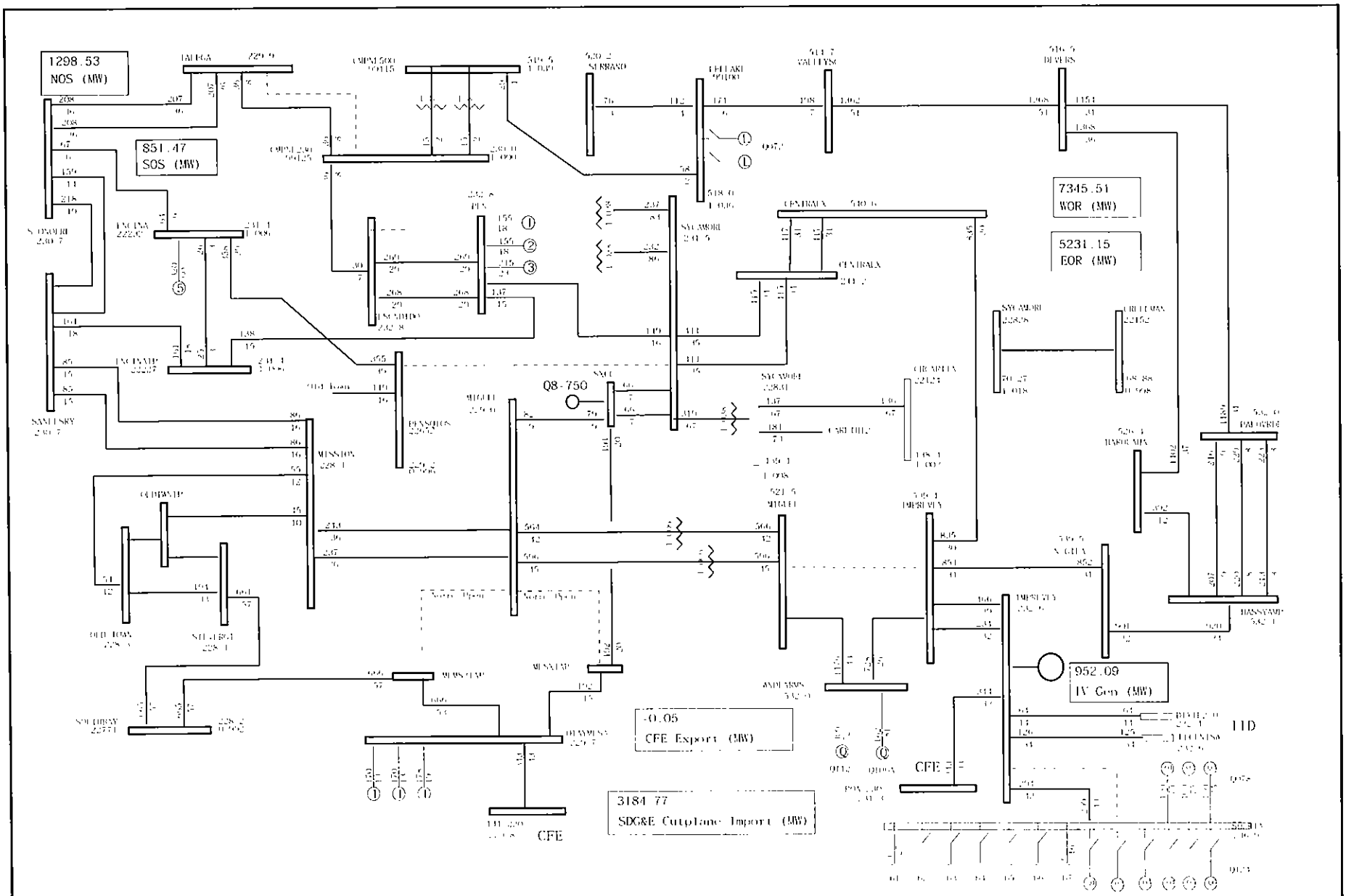
	Plot 12. Normal Conditions		Rating = 1



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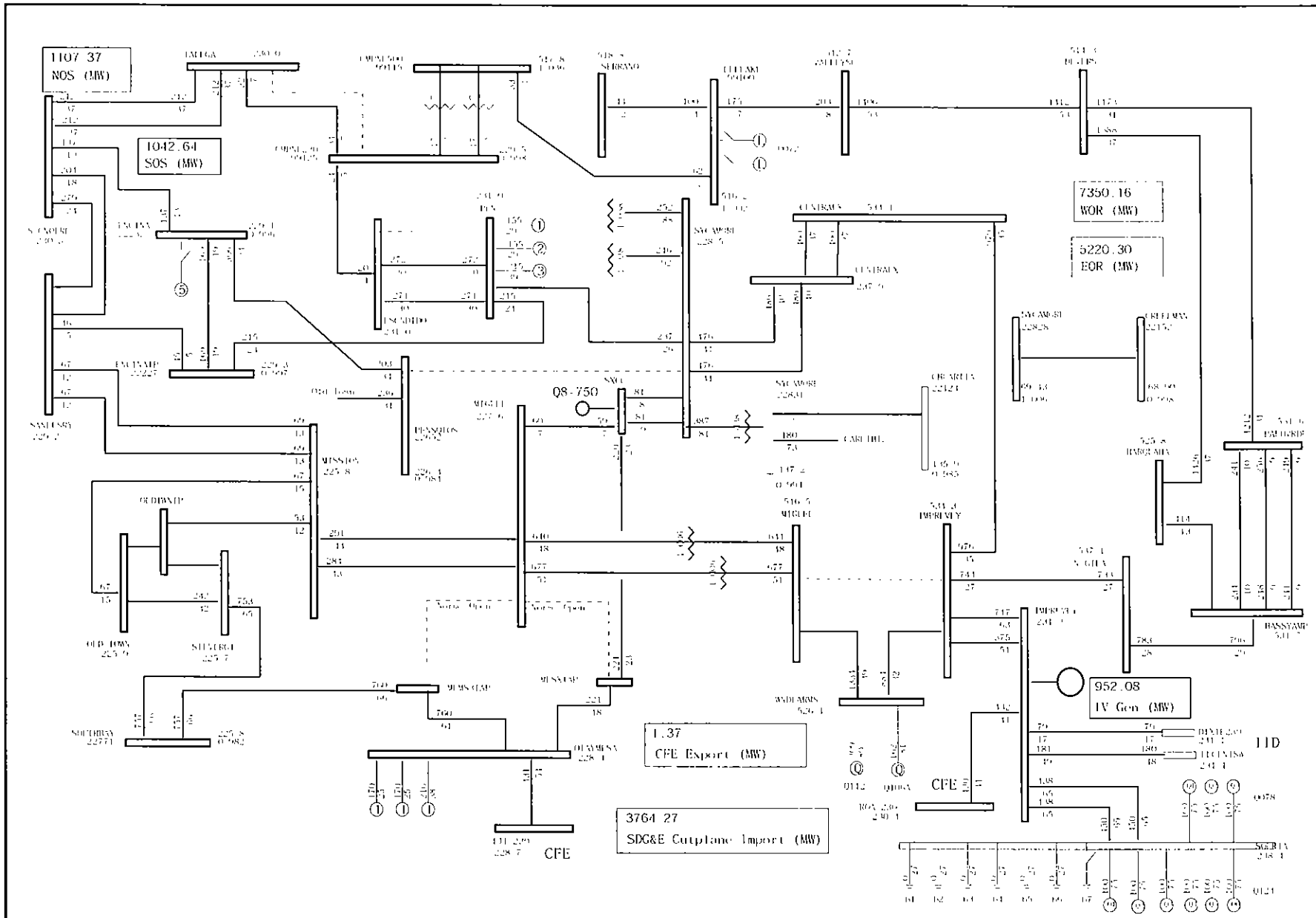
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre Project Case Plot 13 Penasquitos Sycamore Canyon 230 kV Line Outage			MVA Scale draw q124.drw Rating 2



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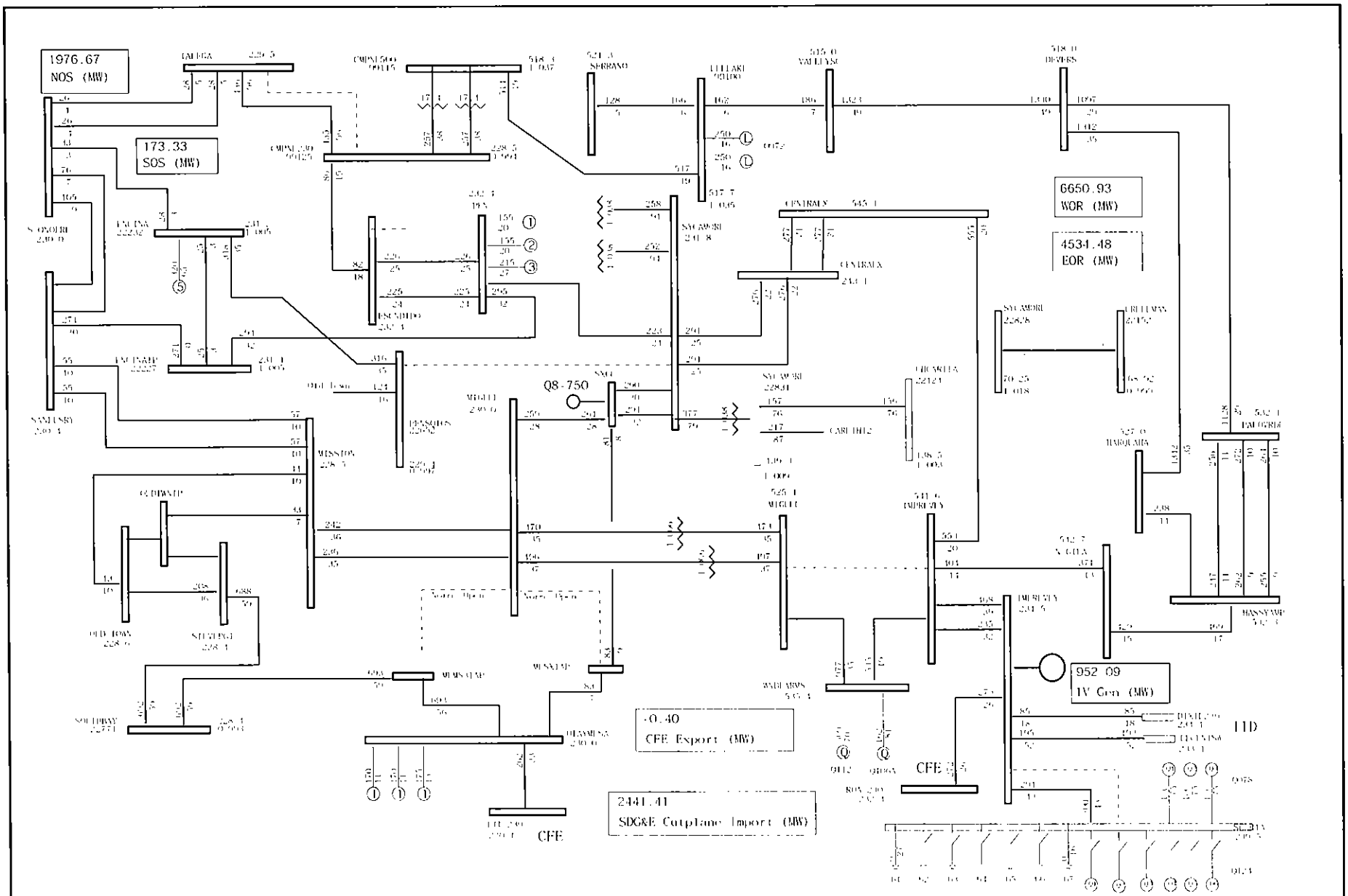
	Plot 14 Penasquitos - Sycamore Canyon 230 kV Line Outage		draw\q124.draw
			Rating - 2



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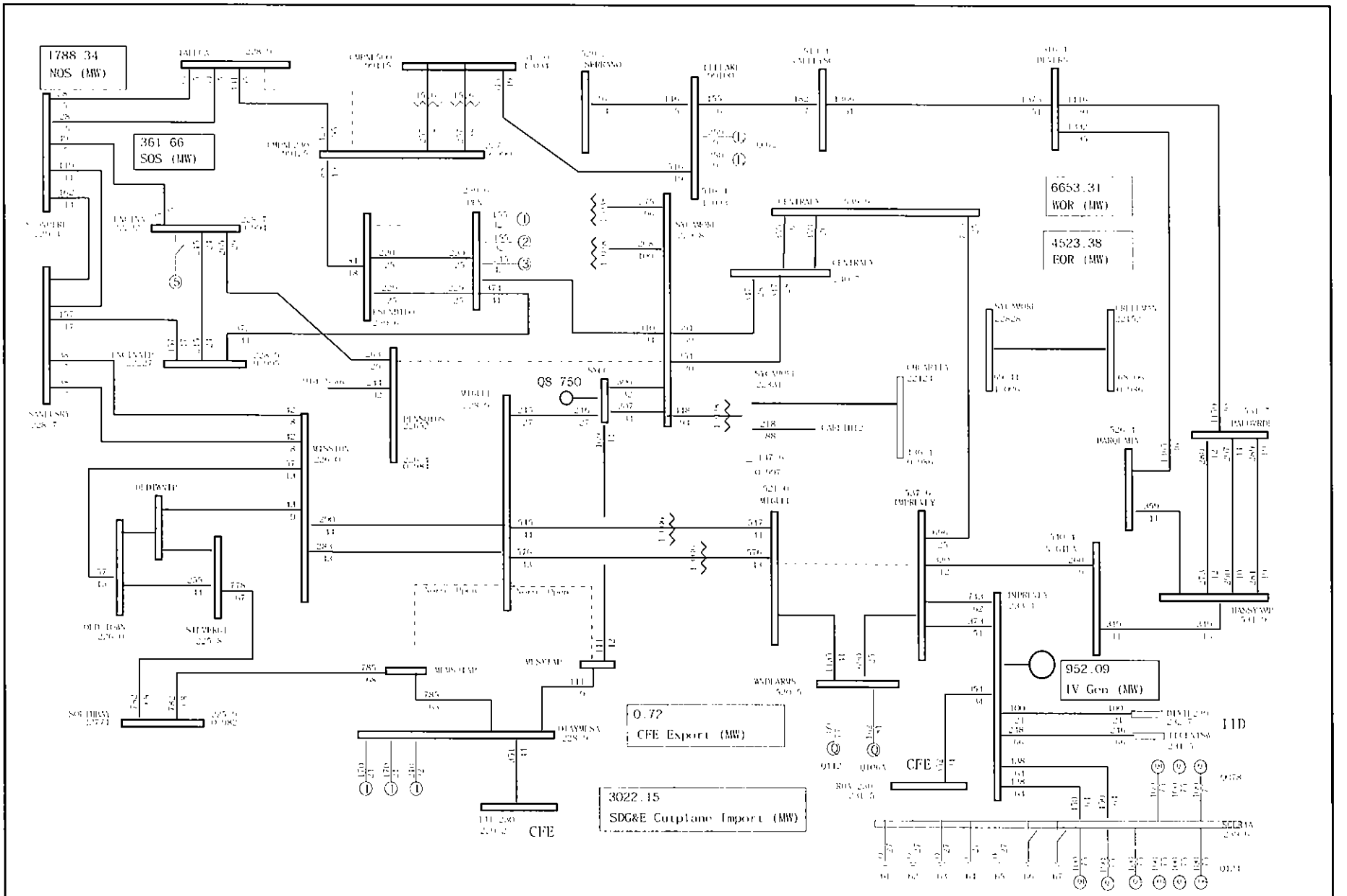

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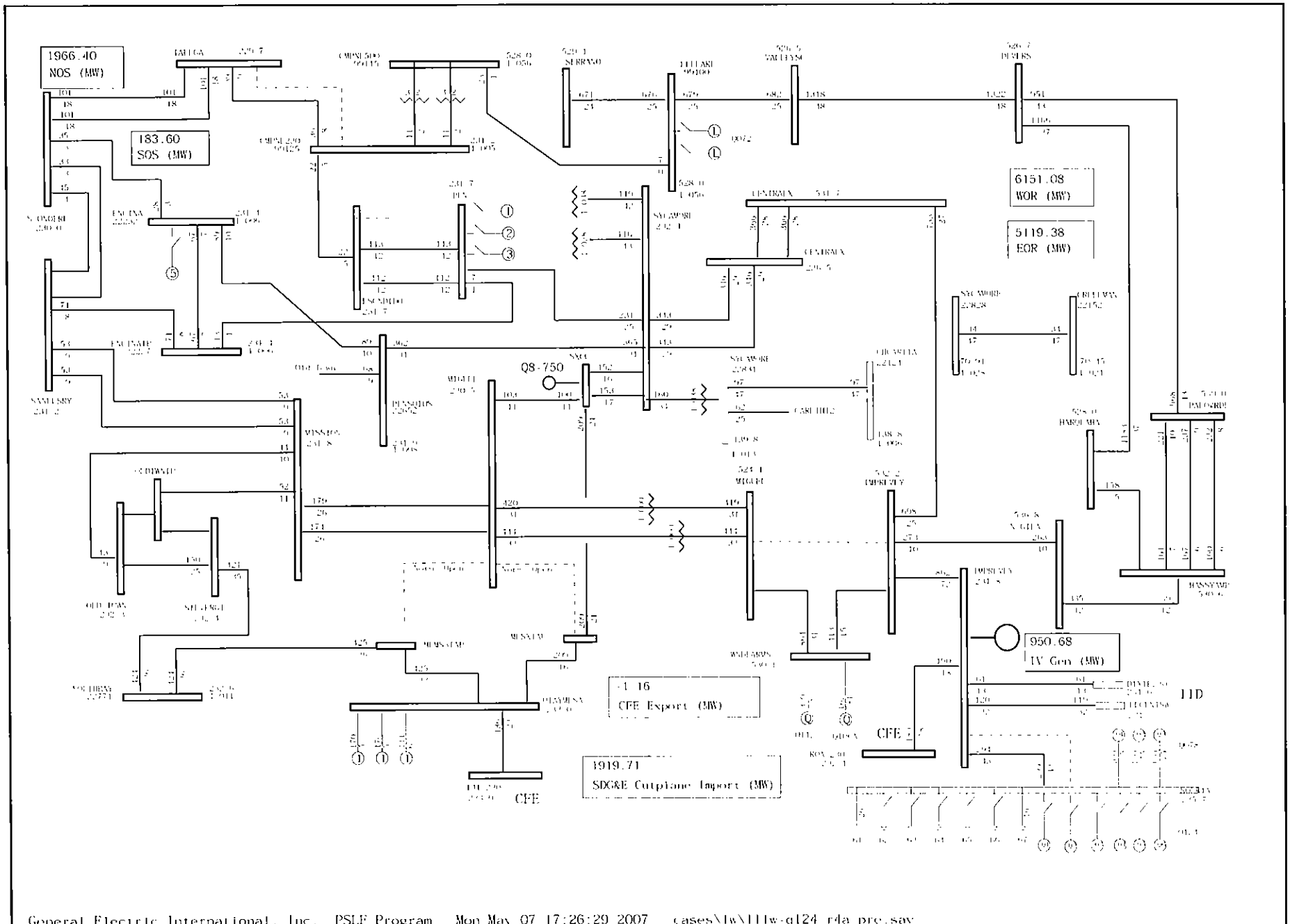
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Low Import Post-Project Case Plot 16 Penasquitos Sycamore Canyon 230 kV Line Outage		MVA/Mvate draw\q124.drw Rating - 2



General Electric International, Inc. PSLF Program Mon May 07 17:26:29 2007 cases\lw\111w-q124 r4a pre.sav

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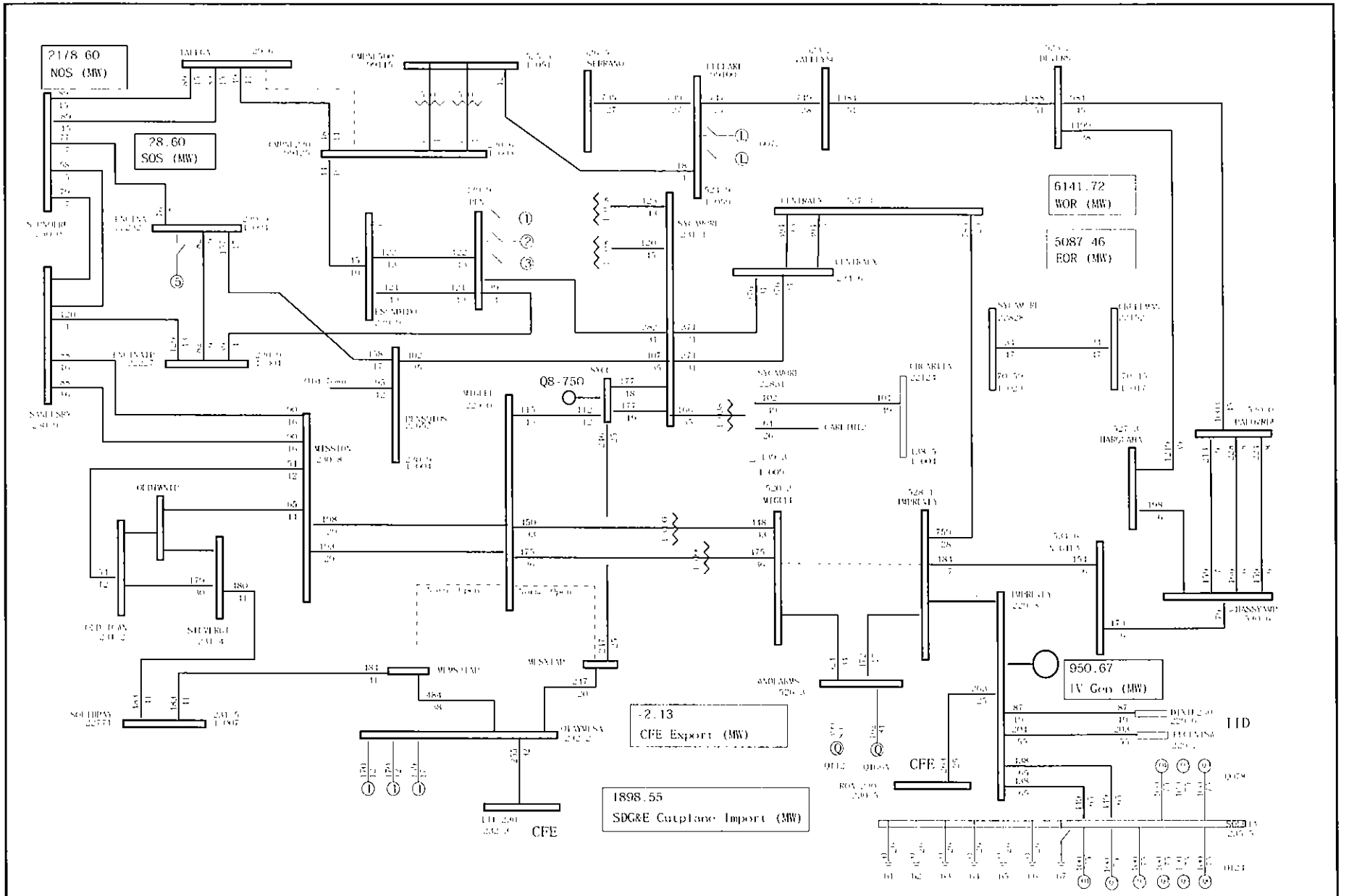

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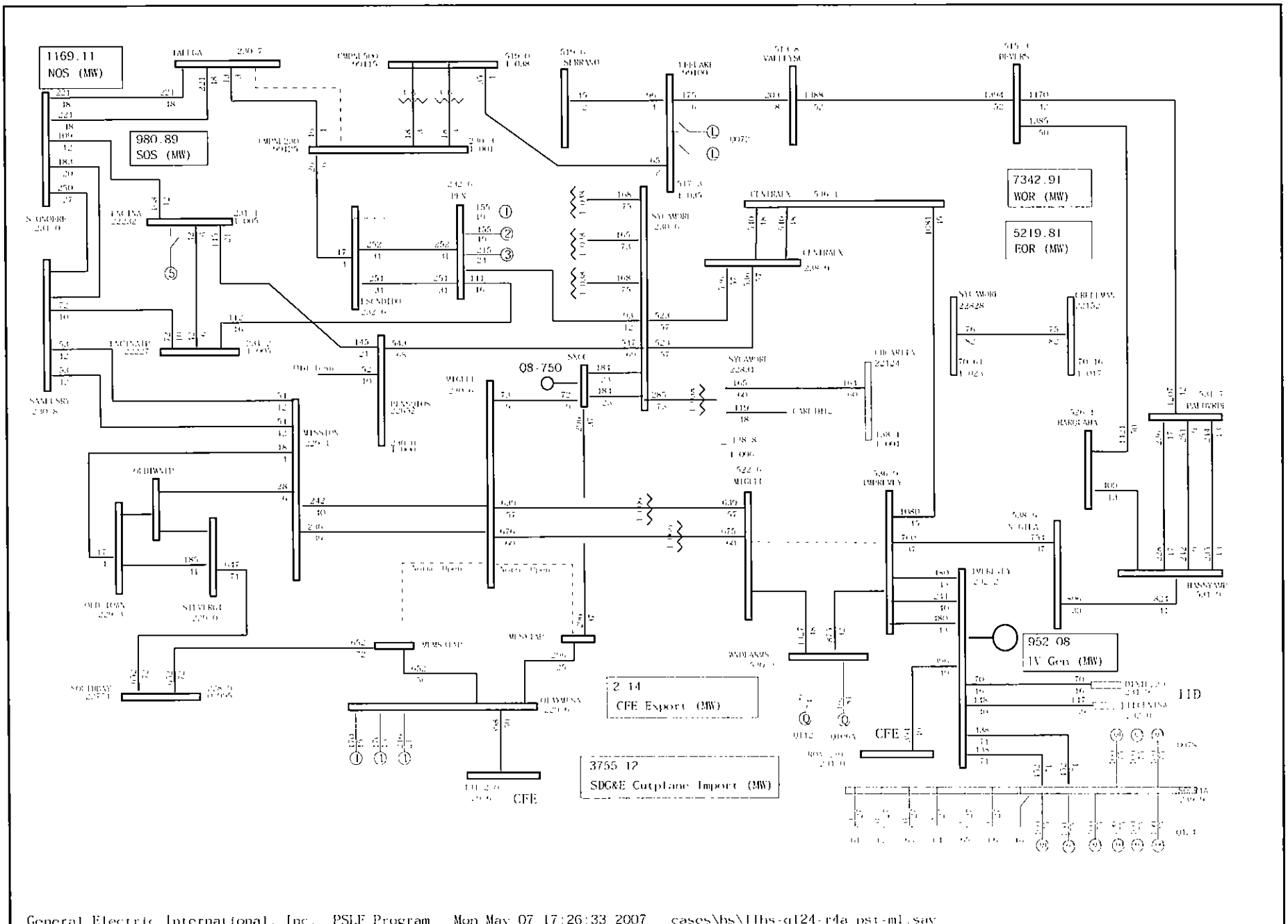
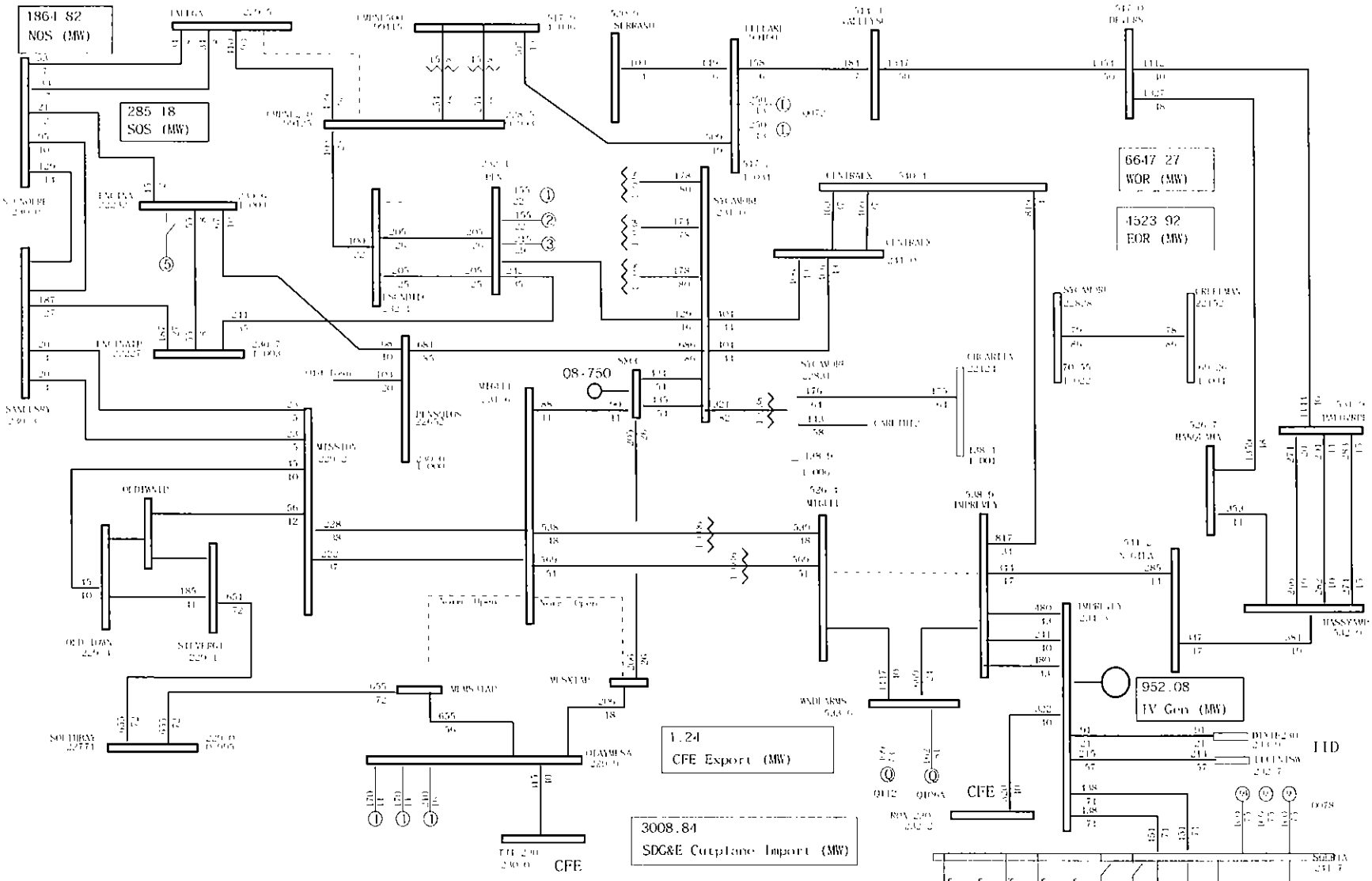
	SDGE 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case		MVA/Watts
	Plot 18 Imperial Valley 500/230 kV Bank 80 Outage		draw\q124.drw
			Rating = 2



General Electric International, Inc. PSLF Program Mon May 07 17:26:33 2007 cases\hs\11hs-q124-r4a pst-ml.sav

SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post Project Case
added mitigation 1 reliability and network upgrades ml
Plot 19 Normal Conditions

MVA Scale
draw q124.dsw
Rating = 1


1864 82
NOS (MW)
285 18
SOS (MW)
6647 27
WOR (MW)
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EOR (MW)
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IV Gen (MW)
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CFE Export (MW)
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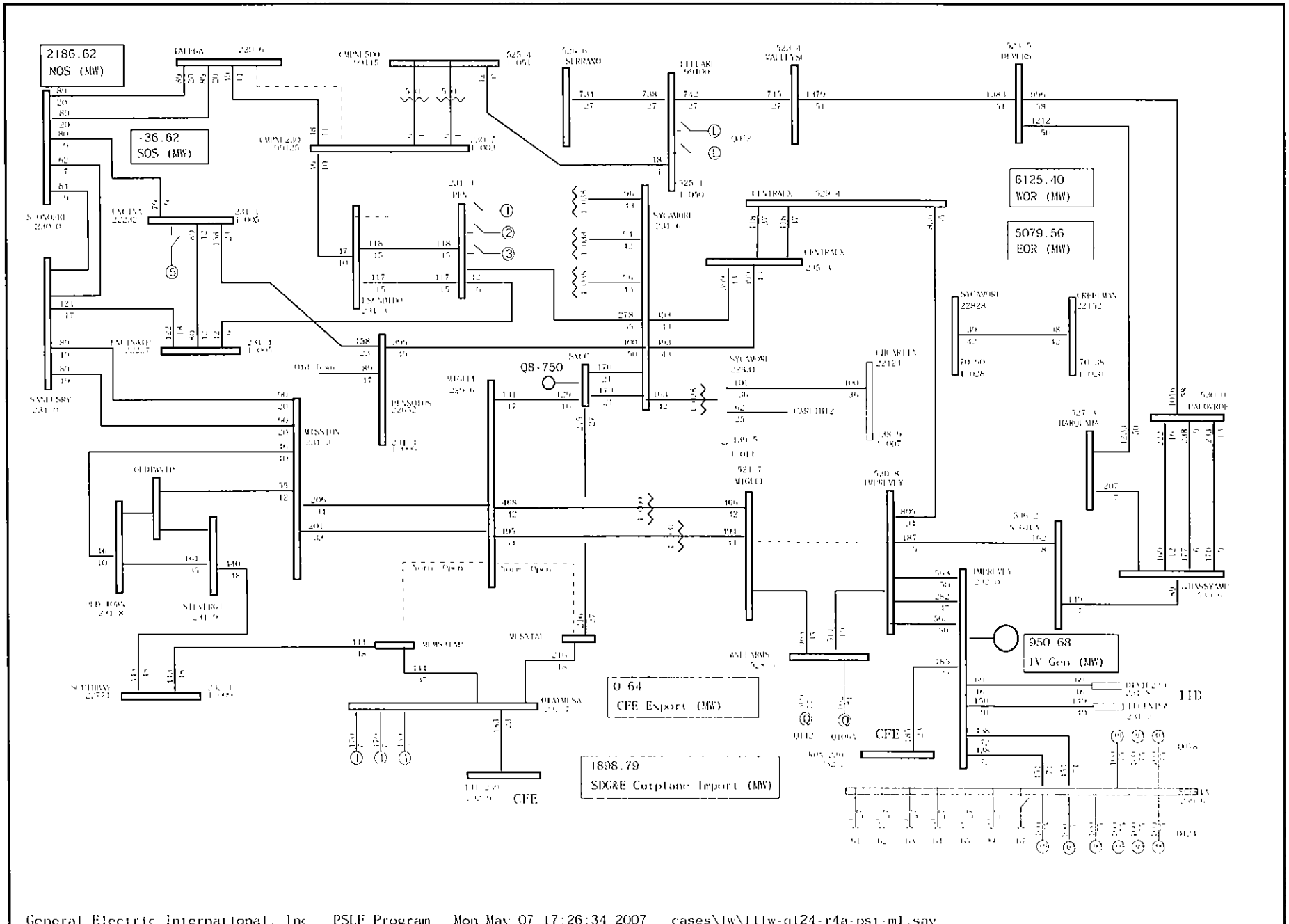
SDG&E Cuyamaca Import (MW)
Q8-750
CFE
IID



General Electric International, Inc PSLF Program Mon May 07 17:26:34 2007 cases\lw\11lw-q124-r4a-psi-ml.sav

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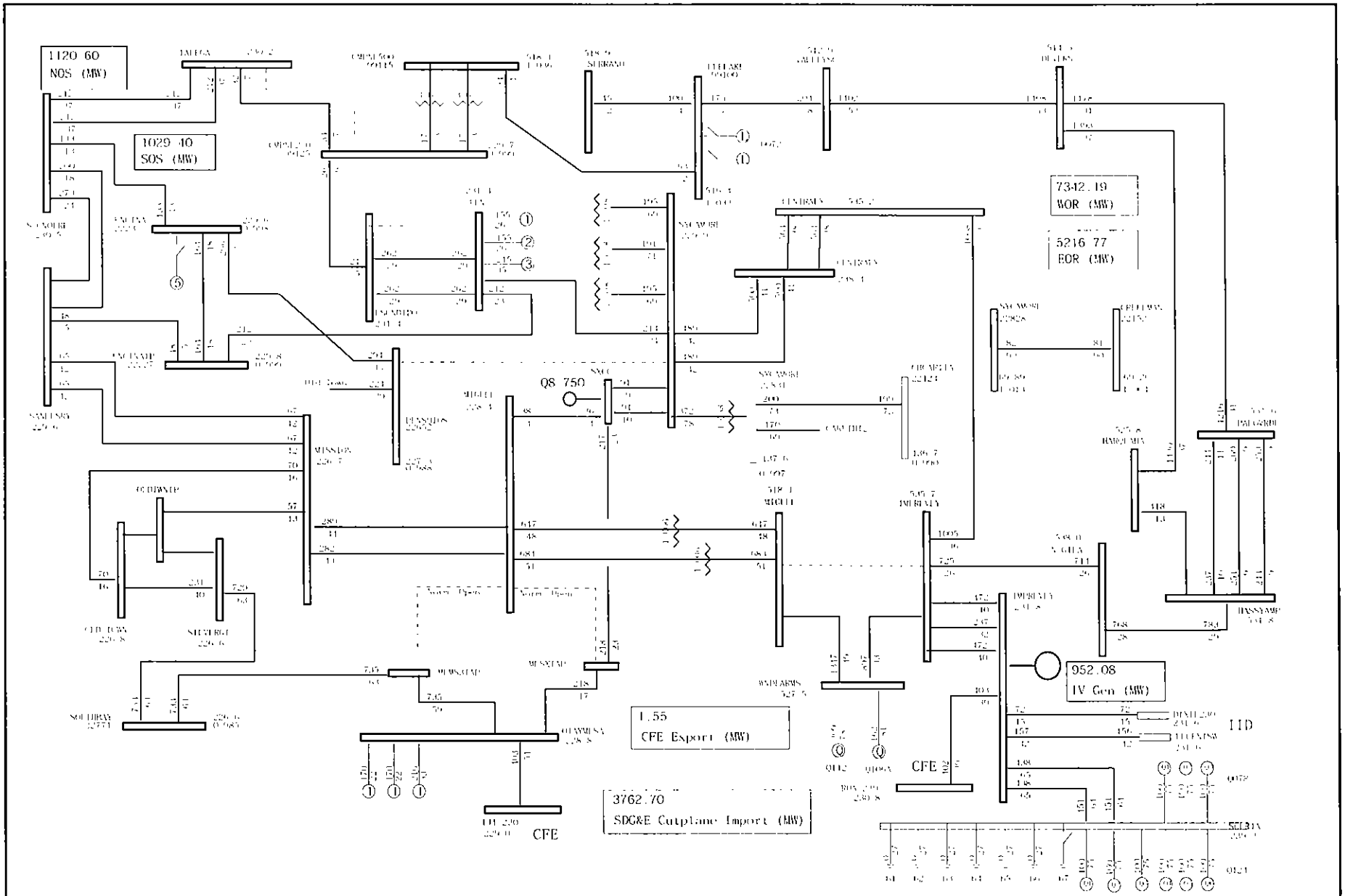
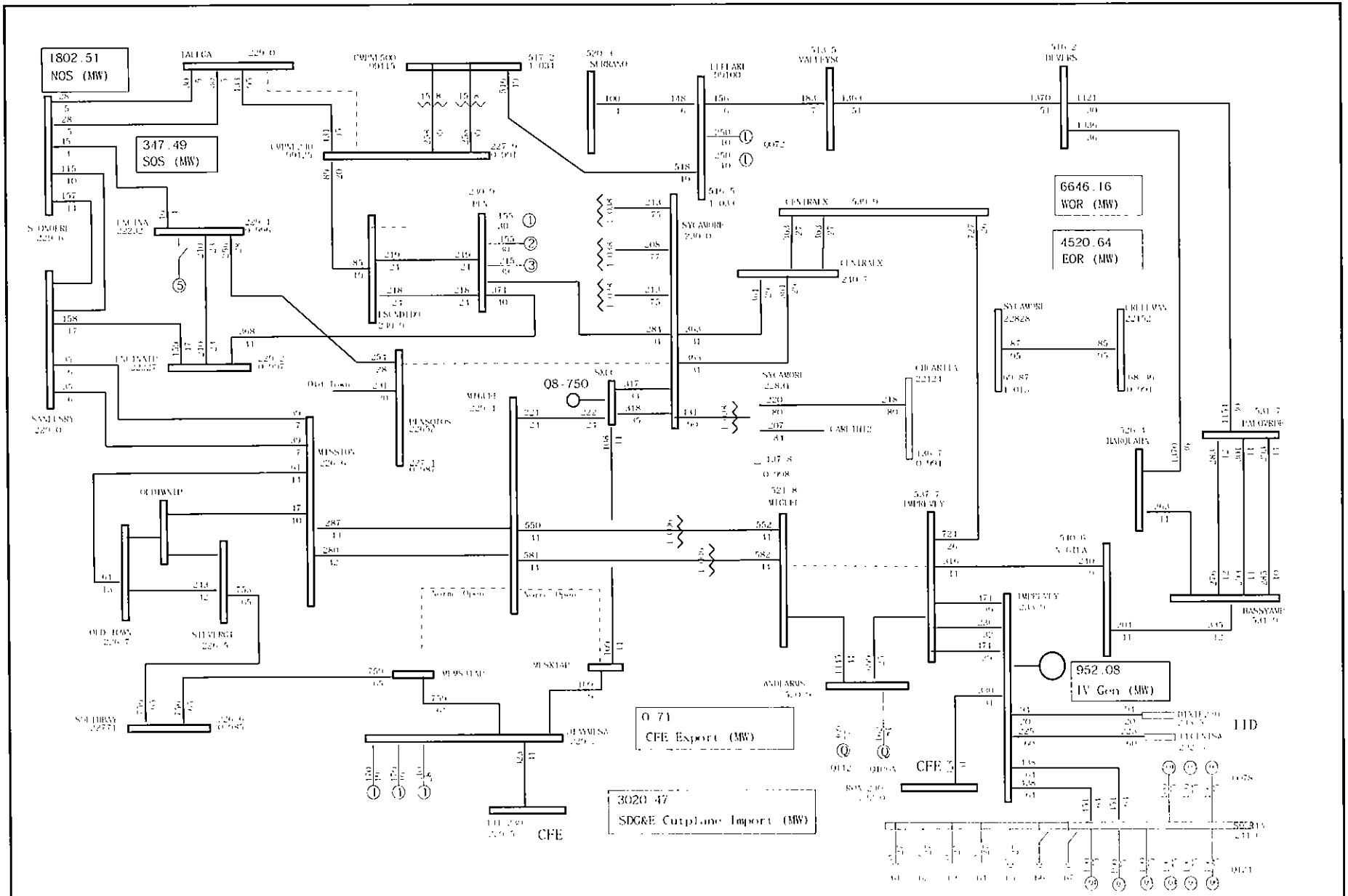


General Electric International, Inc. PSLF Program Mon May 07 17:26:37 2007 cases\hs\11hs-q124-r4a-pst-ml.sav

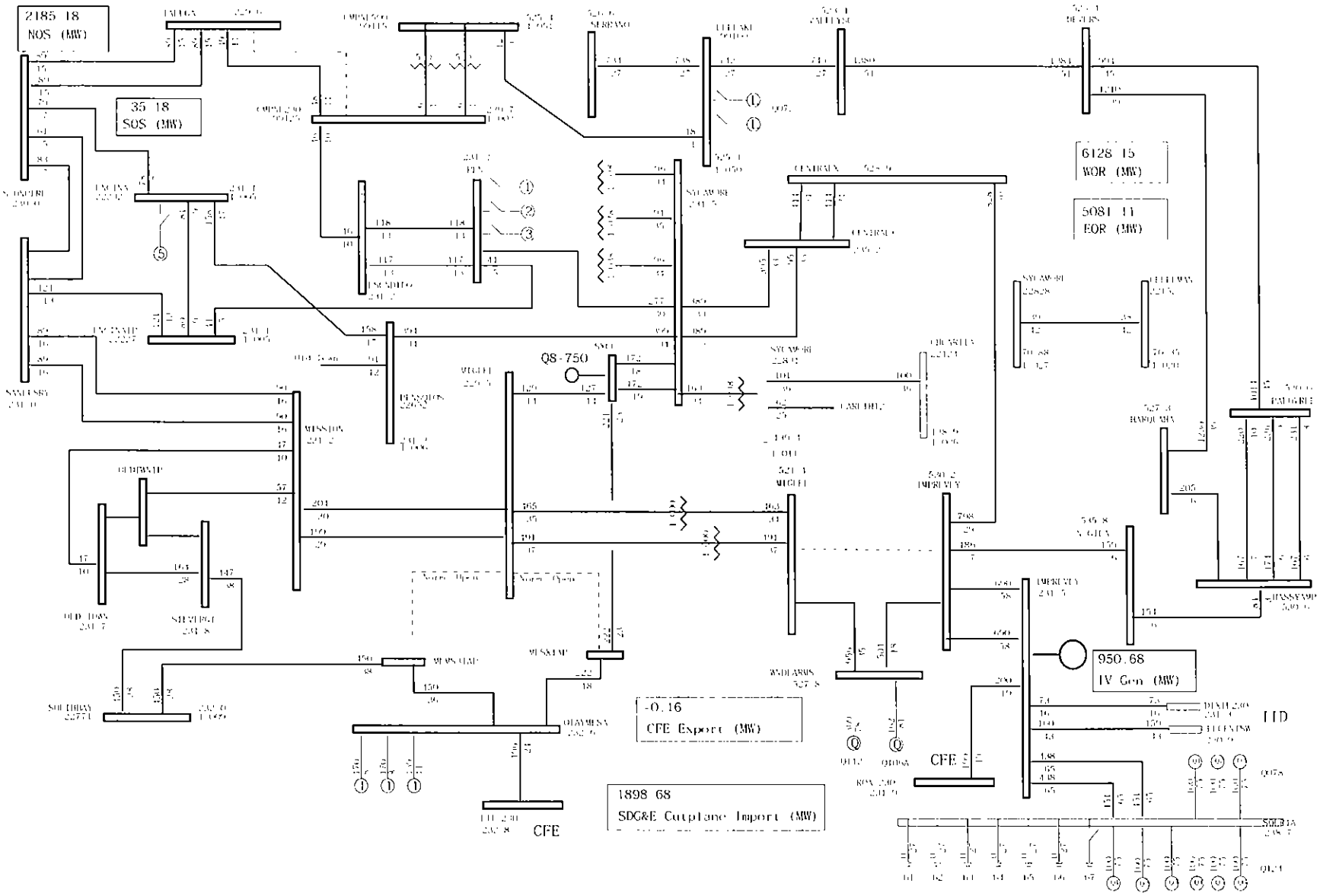
	SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case added mitigation 1 reliability and network upgrades ml Plot 22 Penasquitos Sycamore Canyon 230 kV Line Outage		MVA/%rate draw\q124.drw Rating = 2



General Electric International, Inc. PSLF Program Mon May 07 17:26:39 2007 cases\hs\11hs-q124-r4a-pst-11-ml.sav

SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Low Import Post-Project Case
added mitigation 1 reliability and network upgrades ml
Plot 23 Penasquitos Sycamore Canyon 230 kV Line Outage

MVA % rate
draw q124.drw
Rating = 2



General Electric International, Inc. PSLF Program Mon May 07 17:26:42 2007 cases\lw\111w-q124-r4a-pst-m1.sav

	SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case added mitigation 1 reliability and network upgrades m1 Plot 24 Imperial Valley 500/230 kV Bank 80 Outage		MVA/%scale draw\q124.drw Rating = 2

Appendix G

Short Circuit Analysis Results

BREAKER	Data	Pre-Case	Post-Case	Project Puts Breaker out of Tolerance
EC624	Duty Percent	100.7	100.8	FALSE
	Breaker Rating	21000	21000	
EL636	Duty Percent	106.1	106.2	FALSE
	Breaker Rating	21000	21000	
EL671	Duty Percent	106.1	106.2	FALSE
	Breaker Rating	21000	21000	
ES30	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES31	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES32	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES50	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
ES616	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES679	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES684	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
ES688	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
ES689	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES6908	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
ES696	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
ES70	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES71	Duty Percent	117	117	FALSE
	Breaker Rating	40000	40000	
ES72	Duty Percent	114.4	114.5	FALSE
	Breaker Rating	40000	40000	
KY31	Duty Percent	103.3	103.4	FALSE
	Breaker Rating	27000	27000	
KY32	Duty Percent	103.3	103.4	FALSE
	Breaker Rating	27000	27000	
LCEAST31	Duty Percent	99.9	100	FALSE
	Breaker Rating	21000	21000	
LCWEST32	Duty Percent	100	100.1	FALSE
	Breaker Rating	21000	21000	
ME32	Duty Percent	105	105	FALSE
	Breaker Rating	12500	12500	

BREAKER	Data	Pre-Case	Post-Case	Project Puts Breaker out of Tolerance
ME33	Duty Percent	105	105	FALSE
	Breaker Rating	12500	12500	
MS30	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS31	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS32	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS33	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS50	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	41000	41000	
MS51	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	41000	41000	
MS52	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	41000	41000	
MS618	Duty Percent	106.1	106.2	FALSE
	Breaker Rating	42000	42000	
MS619	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS653	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS654	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS663	Duty Percent	106.1	106.2	FALSE
	Breaker Rating	42000	42000	
MS670	Duty Percent	106.1	106.2	FALSE
	Breaker Rating	42000	42000	
MS671	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS676	Duty Percent	111.4	111.5	FALSE
	Breaker Rating	40000	40000	
MS70	Duty Percent	111.8	111.9	FALSE
	Breaker Rating	40000	40000	
OY30	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	21000	21000	
OY623	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	21000	21000	
OY649	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	21000	21000	
OY6929	Duty Percent	108.7	108.8	FALSE
	Breaker Rating	21000	21000	
PQ13810	Duty Percent	135.2	135.3	FALSE
	Breaker Rating	21000	21000	
PQ50	Duty Percent	135.2	135.3	FALSE

BREAKER	Data	Pre-Case	Post-Case	Project Puts Breaker out of Tolerance
	Breaker Rating	42000	42000	
PQ51	Duty Percent	118.6	118.7	FALSE
	Breaker Rating	38000	38000	
PQ52	Duty Percent	118.6	118.7	FALSE
	Breaker Rating	38000	38000	
PQ610	Duty Percent	109.4	109.5	FALSE
	Breaker Rating	42000	42000	
PQ661	Duty Percent	107.3	107.4	FALSE
	Breaker Rating	42000	42000	
PQ662	Duty Percent	107.3	107.4	FALSE
	Breaker Rating	42000	42000	
PQ664	Duty Percent	120.9	121.1	FALSE
	Breaker Rating	38000	38000	
PQ665	Duty Percent	114.9	115	FALSE
	Breaker Rating	40000	40000	
PQ666	Duty Percent	114.9	115	FALSE
	Breaker Rating	40000	40000	
PQ667	Duty Percent	114.9	115	FALSE
	Breaker Rating	40000	40000	
PQ674	Duty Percent	107.3	107.4	FALSE
	Breaker Rating	42000	42000	
PQ675	Duty Percent	107.3	107.4	FALSE
	Breaker Rating	42000	42000	
PQ6905	Duty Percent	107.3	107.4	FALSE
	Breaker Rating	42000	42000	
PQ6906	Duty Percent	120.9	121.1	FALSE
	Breaker Rating	38000	38000	
PQ70	Duty Percent	114.8	115	FALSE
	Breaker Rating	40000	40000	
PQ71	Duty Percent	118.6	118.7	FALSE
	Breaker Rating	38000	38000	
RN617	Duty Percent	109.6	109.7	FALSE
	Breaker Rating	21000	21000	
RN661	Duty Percent	109.6	109.7	FALSE
	Breaker Rating	21000	21000	
RN6927	Duty Percent	109.6	109.7	FALSE
	Breaker Rating	21000	21000	
SA34	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	
SA35	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	
SA51	Duty Percent	110.9	111	FALSE
	Breaker Rating	38000	38000	
SA680	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	

BREAKER	Data	Pre-Case	Post-Case	Project Puts Breaker out of Tolerance
SA690	Duty Percent	105.4	105.4	FALSE
	Breaker Rating	40000	40000	
SA6912	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	
SA693	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	
SA694	Duty Percent	133.8	133.9	FALSE
	Breaker Rating	31500	31500	
SA697	Duty Percent	156.1	156.2	FALSE
	Breaker Rating	27000	27000	
SF616	Duty Percent	107.6	107.7	FALSE
	Breaker Rating	13000	13000	
SO23007	Duty Percent	117	117.1	FALSE
	Breaker Rating	50000	50000	

Appendix H

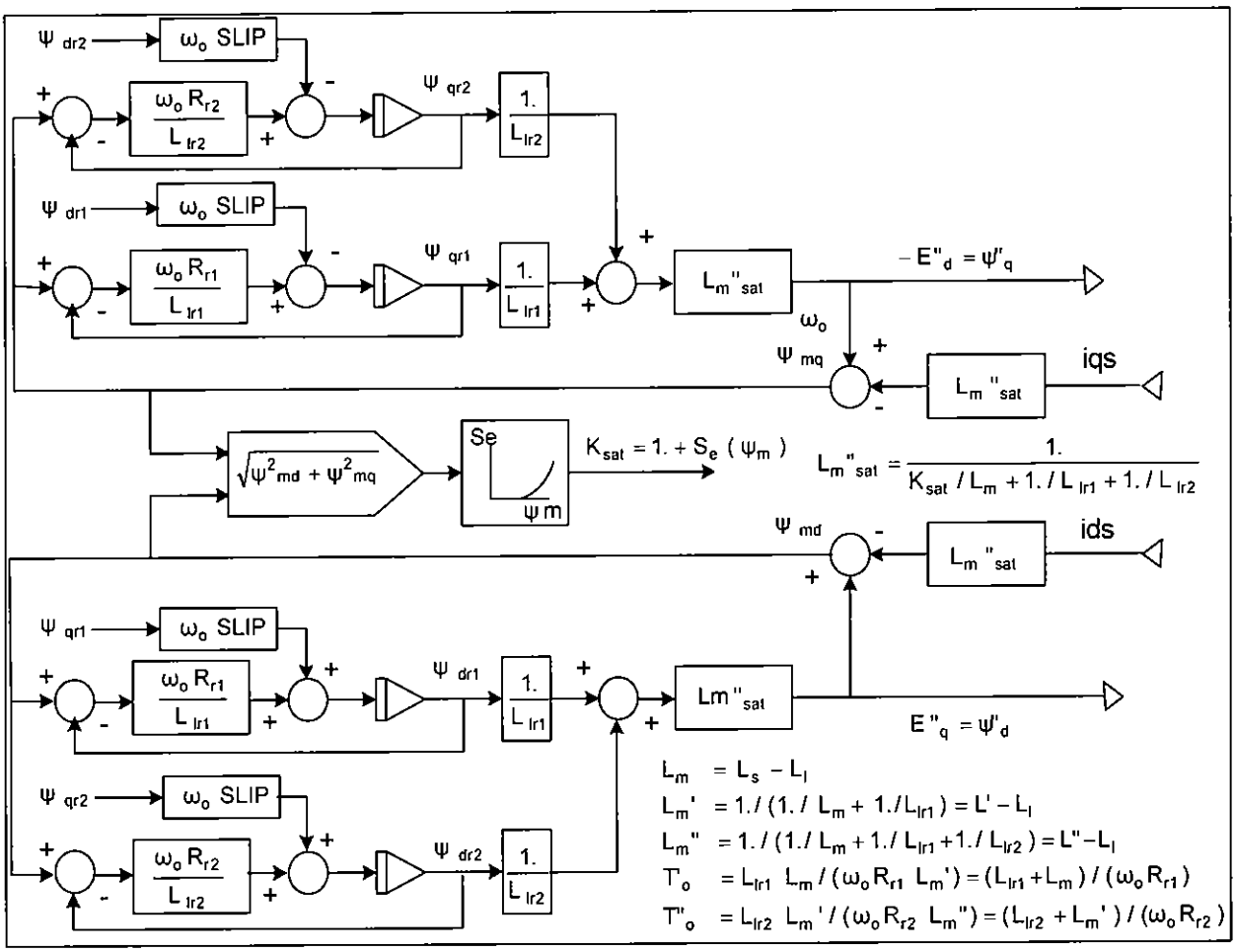
Transient Stability Modeling

Generator Model

Model Name:	motor1	
Description		"Two-cage" or "one-cage" induction machine
Prerequisites:		Induction machine represented in load flow working case as a generator
Inputs:		
Invocation:	motor1 [<n>] {<name> <kv>} <id> : [r] [mva=<value>]	
Parameters:		

EPCL		
Variable	Description	Data
MVA	MVA rating	121.0
Ls	Synchronous reactance	2.24
Lp	Transient reactance	0.2
Ra	Stator resistance, p.u.	0.015
Tpo	Transient rotor time constant	1.43
H	Inertia constant, sec.	0.12
D	Damping factor, p.u.	0.0
Se1	Saturation factor at 1 p.u. flux	0.164
Se2	Saturation factor at 1.2 p.u. flux	0.894
VT	Voltage threshold for tripping (default = 0), p.u.	0.15
TV	Voltage trip pickup time (default = 999), sec.	0.0
FT	Frequency threshold for tripping (default = 0), Hz	0.0
TF	Frequency trip pickup time (default = 999), sec.	999.0
Vr	Voltage at which reconnection is permitted (default = 1.2), p.u.	1.2
Tvr	Time delay for reconnection (default = 999), sec.	999.0
Acc	Acceleration factor for initialization	1.0
Lpp	Sub-transient reactance, p.u.	0.13
Ll	Stator leakage reactance, p.u.	0.12
Tppo	Sub-transient rotor time constant, sec.	0.008

All data provided by Interconnection Customer combined with user written epcl provided by Interconnection Customer.


Ψ dr2
ωo SLIP
ωo Rr2 / Llr2
Ψ qr2
1. / Llr2
Ψ dr1
ωo SLIP
ωo Rr1 / Llr1
Ψ qr1
1. / Llr1
Lm "sat
− E"d = Ψ'q
ωo
Ψ mq
iqs
Lm "sat
√(Ψ²md + Ψ²mq)
Se
Ψm
Ksat = 1. + Se (Ψm)
Lm"sat = 1. / (Ksat / Lm + 1. / Llr1 + 1. / Llr2)
Ψ md
ids
Lm "sat
Ψ qr1
ωo SLIP
ωo Rr1 / Llr1
Ψ dr1
1. / Llr1
Lm "sat
E "q = Ψ'd
Ψ qr2
ωo SLIP
ωo Rr2 / Llr2
Ψ dr2
1. / Llr2
Lm = Ls − Ll
Lm' = 1. / (1. / Lm + 1. / Llr1) = L' − Ll
Lm" = 1. / (1. / Lm + 1. / Llr1 + 1. / Llr2) = L" − Ll
T'o = Llr1 Lm / (ωo Rr1 Lm') = (Llr1 + Lm) / (ωo Rr1)
T"o = Llr2 Lm' / (ωo Rr2 Lm") = (Llr2 + Lm') / (ωo Rr2)

Appendix I

Transient Stability Switching Sequences

```
*
*  3-phase 4 cycle fault at Imperial Valley 500 kV/Windfarm 500 kV
*  followed by loss of Imperial Valley/Windfarm - Miguel 500 kV TL50001;
*
*  CC cards for post-transient only
*
CC  DRP 0
*
*  Apply bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
FB   60.0  "WNDFARMS" 500.
*
*  Flash SWPL capacitors
*
FC   60.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC   60.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC   60.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
CFB  64.0  "WNDFARMS" 500.
*
*  Trip Imperial Valley/Windfarm - Miguel TL50001
*
DL   64.0  "WNDFARMS" 500. "MIGUEL  " 500. "1 "
*
*  Reinsert remaining SWPL capacitors
*
RC   64.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*RC   64.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*RC   64.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 500 kV/Windfarm 500 kV
*  followed by loss of Imperial Valley/Windfarm - Miguel 500 kV TL50001;
*  followed by automatic SPS 6.1 to open IV Generation
*
*  CC cards for post-transient only
*
CC  DRP 952

*
*  Apply bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
FB   60.0  "WNDFARMS" 500.
*
*  Flash SWPL capacitors
*
FC   60.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC   60.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC   60.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
CFB  64.0  "WNDFARMS" 500.
*
*  Trip Imperial Valley/Windfarm - Miguel TL50001
*
DL   64.0  "WNDFARMS" 500. "MIGUEL  " 500. "1 "
*
*  Reinsert remaining SWPL capacitors
*
RC   64.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*RC   64.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*RC   64.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  SDG&E SPS TMC1505 6.1 SPS B
*  (assume redundant scheme in CFE operates in 2 sec)
*  Trip IV Generation
*
TG   64.0  "INTBCT  "  16.  "**"
TG   64.0  "INTBST  "  18.  "**"
TG   64.0  "IV GEN1 "  21.  "**"
TG   64.0  "IV GEN2 "  18.  "**"
TG   64.0  "IV GEN3 "  18.  "**"
*
*  Add in LRP1 unit if connected for export to U.S.
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 500 kV/Windfarm 500 kV
*  followed by loss of Imperial Valley/Windfarm - Miguel 500 kV TL50001;
*  followed by automatic SPS 6.1 to open IV Generation
*  followed by automatic SPS 6.2 to open IV-ROA (CFE)
*
*  CC cards for post-transient only
*
CC  DRP 952
*
*  Apply bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
FB   60.0  "WNDFARMS" 500.
*
*  Flash SWPL capacitors
*
FC   60.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC   60.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC   60.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at Imperial Valley 500 kV/Windfarm 500 kV
*
CFB  64.0  "WNDFARMS" 500.
*
*  Trip Imperial Valley/Windfarm - Miguel TL50001
*
DL   64.0  "WNDFARMS" 500. "MIGUEL  " 500. "1 "
*
*  Reinsert remaining SWPL capacitors
*
RC   64.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*RC   64.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*RC   64.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  SDG&E SPS TMC1505 6.1 SPS B
*  (assume redundant scheme in CFE operates in 2 sec)
*  Trip IV Generation
*
TG   64.0  "INTBCT  "  16.  "**"
TG   64.0  "INTBST  "  18.  "**"
TG   64.0  "IV GEN1 "  21.  "**"
TG   64.0  "IV GEN2 "  18.  "**"
TG   64.0  "IV GEN3 "  18.  "**"
*
*  Add in LRP1 unit if connected for export to U.S.
*
*  SDG&E SPS TMC1505 6.2
*  (assumes ROA-HRD or ROA-RUM over 388 MVA operates in 2 sec)
*  Trip Imperial - La Rosita line
*
DL   184.  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

```
*
* 3-phase 4 cycle fault at N. Gila 500 kV
* followed by loss of N. Gila - Imperial Valley 500 kV
*
* CC cards for post-transient only
* DRP MW   (positive number indicates generation dropping)
CC DRP 0
*
*  Apply bus fault at N. Gila 500 kV
*FB   time  bus_name   kV     r         x
FB    60.0 "N.GILA  " 500.
*
* Flash series capacitors in following 500 kV Lines at time of fault
*FC   time  bus1_name  kV  bus2_name   kV  ckt sec
FC    60.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC    60.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC    60.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at N. Gila 500 kV
*CFB  time  bus_name    kV
CFB   64.0 "N.GILA  " 500.
*
* Trip N. Gila - Imperial Valley 500 kV line after 4 cyles
*DL   time  bus1_name  kV   bus2_name   kV  ckt
DL    64.0 "N.GILA  " 500.  "IMPRLVLY" 500. "1 "
*
* Reinsert series capacitors in following 500 kV Lines
*RC   time  bus1_name   kV  bus2_name   kV  ckt sec
RC    64.0 "HASSYAMP" 500. "N.GILA  " 500. "1 "  2
*RC    64.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 "  1
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 500 kV
*  followed by loss of Imperial Valley - Central 500 kV line
*
*  CC cards for post-transient only
*
CC  DRP 0
*
*  Apply bus fault at Imperial Valley 500 kV
*
FB   60.0  "IMPRLVLY" 500.
*
* Flash series capacitors in following 500 kV Lines at time of fault
*FC   time  bus1_name  kV  bus2_name   kV  ckt sec
FC    60.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC    60.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC    60.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at Imperial Valley 500 kV
*
CFB  64.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Central 500 kV line
*
DL   64.0  "CENTRALX" 500. "IMPRLVLY" 500. "1 "
*
* Reinsert series capacitors in following 500 kV Lines
*RC   time  bus1_name   kV  bus2_name   kV  ckt sec
RC   64.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*RC   64.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*RC   64.0  "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*
*   Readjust SCE's Devers SVCs
*
*   MSV 66.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*   MSV 66.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*  Turn on 132 MVAr of SVC's at Marketplace and Adelanto 500 kV
*  if voltage drops by 5% or more
*    MBS  time  bus_name    kV  shunt_id  code   G(pu)  B(pu)
*CC  MBS  180.0 "ADELSVC " 500. "PT"      "R"     0.0   1.320
*CC  MBS  180.0 "MKTPSVC " 500. "PT"      "R"     0.0   1.320
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 230 kV
*  followed by loss of Imperial Valley - El Centro 230 kV TL230S
*
*  CC cards for post-transient only
*
CC  DRP 0
*
*  Apply bus fault at Imperial Valley 230 kV
*
FB   60.0  "IMPRLVLY" 230.
*
*  Clear bus fault at Imperial Valley 230 kV
*
CFB  64.0  "IMPRLVLY" 230.
*
*  Trip Imperial Valley - El Centro 230 kV TL230S
*
DL   64.0  "IMPRLVLY" 230. "ELCENTSW" 230. "1 "
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 230 kV
*  followed by loss of Imperial Valley - La Rosita 230 kV TL23050
*
*  CC cards for post-transient only
*
CC  DRP 0
*
*  Apply bus fault at Imperial Valley 230 kV
*
FB   60.0  "IMPRLVLY" 230.
*
*  Clear bus fault at Imperial Valley 230 kV
*
CFB  64.0  "IMPRLVLY" 230.
*
*  Trip Imperial Valley - La Rosita 230 kV TL23050
*
DL   64.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
```

```
*
*  3-phase 4 cycle fault at Imperial Valley 500 kV
*  followed by loss of Imperial Valley 500/230 kV Bank 81 "1"
*
*  CC cards for post-transient only
*
CC  DRP 0
*
*  Apply bus fault at Imperial Valley 500 kV
*
FB    60.0  "IMPRLVLY" 500.
*
* Flash series capacitors in following 500 kV Lines at time of fault
*FC   time  bus1_name  kV  bus2_name   kV  ckt sec
FC    60.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC    60.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC    60.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
*
*  Clear bus fault at N. Gila 500 kV
*CFB  time  bus_name    kV
CFB   64.0 "N.GILA  " 500.
*
*   Trip Imperial Valley 500/230 kV Bank 81 "1"
*DL   time  bus1_name  kV   bus2_name   kV  ckt
DL    64.0  "IMPRLVLY" 500. "IMPRLVLY" 230. "1 "
*
* Reinsert series capacitors in following 500 kV Lines
*RC   time  bus1_name   kV  bus2_name   kV  ckt sec
RC    64.0 "HASSYAMP" 500. "N.GILA  " 500. "1 "  2
*RC    64.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 "  2
*RC    64.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 "  1
*
```

```
*
*  3 phase 6 cycle fault at San Onofre 230 kV
*  followed by loss of SONGS units #2 and #3
*
*  CC cards for post-transient only
*
CC DRP 2150
*
*  Apply bus fault at S.ONOFRE 230 kV
*
FB   60.0  "S.ONOFRE" 230.
*
*  Clear bus fault at S.ONOFRE 230 kV
*
CFB  66.0  "S.ONOFRE" 230.
*
*  Trip SONGS units #2 and #3
*
TG   66.0 "S.ONOFR2 "  22. "**"
TG   66.0 "S.ONOFR3 "  22. "**"
*
```

```
*
* 3-phase 4 cycle fault at Hassyampa
* followed by loss of Hassyampa - North Gila 500 kV
*
* CC cards for post-transient only
* DRP MW   (positive number indicates generation dropping)
CC DRP 0
*
* Fault bus at Hassyampa
*FB   time  bus_name   kV     r         x
FB    60.0 "HASSYAMP" 500.
*
* Apply fault damping to each Palo Verde Unit
*GFD  time  bus_name   kV  id   reduction
*GFD   60.0 "PALOVRD1" 24. "1 "  0.072485
*GFD   60.0 "PALOVRD2" 24. "1 "  0.072485
*GFD   60.0 "PALOVRD3" 24. "1 "  0.072485
*
* Flash series capacitors in following 500 kV Lines at time of fault
*FC   time  bus1_name  kV  bus2_name   kV  ckt sec
FC    60.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
FC    60.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
FC    60.0 "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*FC    60.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*FC    60.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 " 1
FC    60.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
FC    60.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
FC    60.0 "NAVAJO  " 500. "RACEWAY " 500. "1 " 1
FC    60.0 "NAVAJO  " 500. "RACEWAY " 500. "1 " 3
FC    60.0 "MEAD    " 500. "PERKINS " 500. "1 " 1
FC    60.0 "MEAD    " 500. "PERKINS " 500. "1 " 3
*
* Clear fault at Hassyampa 500 kV bus after 4 cycles
*CFB  time  bus_name    kV
CFB   64.0 "HASSYAMP" 500.
*
* Trip Hassyampa - North Gila 500 kV line after 4 cyles
*DL   time  bus1_name  kV   bus2_name   kV  ckt
DL    64.0 "HASSYAMP" 500.  "N.GILA  " 500. "1 "
*
* Remove fault damping to each Palo Verde Unit
*GFD  time  bus_name   kV  id   reduction
*GFD   64.0 "PALOVRD1" 24. "1 "  0.0
*GFD   64.0 "PALOVRD2" 24. "1 "  0.0
*GFD   64.0 "PALOVRD3" 24. "1 "  0.0
*
* Reinsert series capacitors in following 500 kV Lines
*RC   time  bus1_name   kV  bus2_name   kV  ckt sec
RC    64.0 "PALOVRDE" 500. "DEVERS  " 500. "1 "  2
RC    64.0 "PALOVRDE" 500. "DEVERS  " 500. "1 "  4
*RC    64.0 "N.GILA  " 500. "IMPRLVLY" 500. "1 "  2
*RC    64.0 "IMPRLVLY" 500. "WNDFARMS" 500. "1 "  1
RC    64.0 "MEAD    " 500. "PERKINS " 500. "1 "  1
RC    64.0 "MEAD    " 500. "PERKINS " 500. "1 "  3
*
RC    68.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 "  1
RC    68.0 "YAVAPAI " 500. "WESTWING" 500. "1 "  2
```

```
RC     68.0 "NAVAJO   " 500. "RACEWAY " 500. "1 "  1
RC     68.0 "NAVAJO   " 500. "RACEWAY " 500. "1 "  3
*
```

Appendix J

Transient Stability Analysis Results

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
23000 SOLR1A1 34.5	vbus	1	22	227	1.050754	0.474457	0.576297	54.846058	1.183335	0.112502	6.75009	
23001 SOLR1A1T 19.92	vbus	1	22	227	1.051226	0.465676	0.58555	55.701656	1.183335	0.112502	6.75009	
23002 SOLR1A1i 19.92	vbus	1	22	227	1.051225	0.465675	0.58555	55.701656	1.183335	0.112502	6.75009	
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.053	0.484918	0.568081	53.948868	1.183335	0.112502	6.75009	
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.027958	0.460561	0.567398	55.196571	1.183335	0.112502	6.75009	
23005 SOLR1A2 34.5	vbus	1	22	227	1.050754	0.474457	0.576297	54.846058	1.183335	0.112502	6.75009	
23006 SOLR1A2T 19.92	vbus	1	22	227	1.051226	0.465676	0.58555	55.701656	1.183335	0.112502	6.75009	
23007 SOLR1A2i 19.92	vbus	1	22	227	1.051225	0.465675	0.58555	55.701656	1.183335	0.112502	6.75009	
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.053	0.484918	0.568081	53.948868	1.183335	0.112502	6.75009	
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.027958	0.460561	0.567398	55.196571	1.183335	0.112502	6.75009	
23010 SOLR1B1 34.5	vbus	1	22	227	1.050748	0.465183	0.585564	55.728348	1.183335	0.112502	6.75009	
23011 SOLR1B1T 19.92	vbus	1	22	227	1.05122	0.456294	0.594926	56.593838	1.183335	0.112502	6.75009	
23012 SOLR1B1i 19.92	vbus	1	22	227	1.051219	0.456294	0.594925	56.593838	1.183335	0.112502	6.75009	
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.052994	0.475779	0.577215	54.816551	1.183335	0.112502	6.75009	
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.027952	0.451802	0.576151	56.048378	1.183335	0.112502	6.75009	
23050 SOLR1A 230	vbus	1	22	227	1.032115	0.643204	0.388911	37.68095	1.183335	0.075001	4.50006	
23051 SOLR1B 230	vbus	1	22	227	1.03211	0.638631	0.393479	38.123741	1.183335	0.075001	4.50006	

XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS												
XXX
XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
23000 SOLR1A1 34.5	vbus	1	22	227	1.050754	0.454615	0.596139	56.734417	1.183335	0.112502	6.75009	
23001 SOLR1A1T 19.92	vbus	1	22	227	1.051226	0.447023	0.604202	57.475986	1.183335	0.112502	6.75009	
23002 SOLR1A1i 19.92	vbus	1	22	227	1.051225	0.447023	0.604202	57.475986	1.183335	0.112502	6.75009	
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.053	0.465432	0.587568	55.799435	1.183335	0.112502	6.75009	
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.027958	0.445	0.582958	56.710266	1.183335	0.112502	6.75009	
23005 SOLR1A2 34.5	vbus	1	22	227	1.050754	0.454615	0.596139	56.734417	1.183335	0.112502	6.75009	
23006 SOLR1A2T 19.92	vbus	1	22	227	1.051226	0.447023	0.604202	57.475986	1.183335	0.112502	6.75009	
23007 SOLR1A2i 19.92	vbus	1	22	227	1.051225	0.447023	0.604202	57.475986	1.183335	0.112502	6.75009	
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.053	0.465432	0.587568	55.799435	1.183335	0.112502	6.75009	
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.027958	0.445	0.582958	56.710266	1.183335	0.112502	6.75009	
23010 SOLR1B1 34.5	vbus	1	22	227	1.050748	0.445356	0.605392	57.615307	1.183335	0.112502	6.75009	
23011 SOLR1B1T 19.92	vbus	1	22	227	1.05122	0.437684	0.613536	58.364162	1.183335	0.112502	6.75009	
23012 SOLR1B1i 19.92	vbus	1	22	227	1.051219	0.437684	0.613535	58.364166	1.183335	0.112502	6.75009	
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.052994	0.456306	0.596688	56.665848	1.183335	0.112502	6.75009	
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.027952	0.436335	0.591617	57.552967	1.183335	0.112502	6.75009	
23050 SOLR1A 230	vbus	1	22	227	1.032115	0.62086	0.411255	39.845825	1.183335	0.075001	4.50006	
23051 SOLR1B 230	vbus	1	22	227	1.03211	0.61627	0.41584	40.290295	1.183335	0.075001	4.50006	
XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS												
XXX
XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS												
XXX
XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS												
XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
24129 S.ONOFR2 22	ang	2	24	240	23.586906	0	0	44213.28125	0	0	0		
24130 S.ONOFR3 22	ang	3	24	240	23.848221	0	0	44749.38672	0	0	0	MAXIMUM	XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 40.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.0HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS													XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
23000 SOLR1A1 34.5	vbus	1	22	227	1.063699	0.557368	0.50633	47.600906	1.183335	0.112502	6.75009		
23001 SOLR1A1T 19.92	vbus	1	22	227	1.064439	0.561271	0.503168	47.270706	1.183335	0.112502	6.75009		
23002 SOLR1A1i 19.92	vbus	1	22	227	1.064439	0.561271	0.503168	47.27071	1.183335	0.112502	6.75009		
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.065921	0.567552	0.498369	46.754799	1.183335	0.112502	6.75009		
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.04121	0.567905	0.473305	45.457207	1.183335	0.112502	6.75009		
23005 SOLR1A2 34.5	vbus	1	22	227	1.063699	0.557368	0.50633	47.600906	1.183335	0.112502	6.75009		
23006 SOLR1A2T 19.92	vbus	1	22	227	1.064439	0.561271	0.503168	47.270706	1.183335	0.112502	6.75009		
23007 SOLR1A2i 19.92	vbus	1	22	227	1.064439	0.561271	0.503168	47.27071	1.183335	0.112502	6.75009		
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.065921	0.567552	0.498369	46.754799	1.183335	0.112502	6.75009		
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.04121	0.567905	0.473305	45.457207	1.183335	0.112502	6.75009		
23010 SOLR1B1 34.5	vbus	1	22	227	1.063752	0.554183	0.50957	47.903038	1.183335	0.112502	6.75009		
23011 SOLR1B1T 19.92	vbus	1	22	227	1.064494	0.558119	0.506376	47.569595	1.183335	0.112502	6.75009		
23012 SOLR1B1i 19.92	vbus	1	22	227	1.064493	0.558118	0.506375	47.569595	1.183335	0.112502	6.75009		
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.065974	0.564469	0.501505	47.046623	1.183335	0.112502	6.75009		
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.041265	0.565091	0.476173	45.730297	1.183335	0.112502	6.75009		
23015 SOLR2A1 34.5	vbus	1	22	227	1.063845	0.547511	0.516334	48.534729	1.183335	0.112502	6.75009		
23016 SOLR2A1T 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191422	1.183335	0.112502	6.75009		
23017 SOLR2A1i 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191425	1.183335	0.112502	6.75009		
23018 SOLR2A1Q 34.5	vbus	1	22	227	1.066067	0.558005	0.508061	47.657555	1.183335	0.112502	6.75009		
23019 SOLR2A1Q 0.48	vbug	1	22	227	1.04136	0.559262	0.482098	46.295074	1.183335	0.112502	6.75009		
23020 SOLR2A2 34.5	vbus	1	22	227	1.063845	0.547511	0.516334	48.534729	1.183335	0.112502	6.75009		
23021 SOLR2A2T 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191422	1.183335	0.112502	6.75009		
23022 SOLR2A2i 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191425	1.183335	0.112502	6.75009		
23023 SOLR2A2Q 34.5	vbus	1	22	227	1.066067	0.558005	0.508061	47.657555	1.183335	0.112502	6.75009		
23024 SOLR2A2Q 0.48	vbug	1	22	227	1.04136	0.559262	0.482098	46.295074	1.183335	0.112502	6.75009		
23025 SOLR2B1 34.5	vbus	1	22	227	1.063901	0.54422	0.519681	48.846779	1.183335	0.112502	6.75009	MINIMUM	XXX
23026 SOLR2B1T 19.92	vbus	1	22	227	1.064646	0.548303	0.516343	48.499065	1.183335	0.112502	6.75009		
23027 SOLR2B1i 19.92	vbus	1	22	227	1.064645	0.548302	0.516343	48.499065	1.183335	0.112502	6.75009		
23028 SOLR2B1Q 34.5	vbus	1	22	227	1.066123	0.554817	0.511306	47.95937	1.183335	0.112502	6.75009		
23029 SOLR2B1Q 0.48	vbug	1	22	227	1.041417	0.556378	0.485039	46.574924	1.183335	0.112502	6.75009		
23030 SOLR3A1 34.5	vbus	1	22	227	1.063845	0.547511	0.516334	48.534729	1.183335	0.112502	6.75009		
23031 SOLR3A1T 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191422	1.183335	0.112502	6.75009		
23032 SOLR3A1i 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191425	1.183335	0.112502	6.75009		
23033 SOLR3A1Q 34.5	vbus	1	22	227	1.066067	0.558005	0.508061	47.657555	1.183335	0.112502	6.75009		
23034 SOLR3A1Q 0.48	vbug	1	22	227	1.04136	0.559262	0.482098	46.295074	1.183335	0.112502	6.75009		
23035 SOLR3A2 34.5	vbus	1	22	227	1.063845	0.547511	0.516334	48.534729	1.183335	0.112502	6.75009		
23036 SOLR3A2T 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191422	1.183335	0.112502	6.75009		
23037 SOLR3A2i 19.92	vbus	1	22	227	1.064588	0.551548	0.51304	48.191425	1.183335	0.112502	6.75009		
23038 SOLR3A2Q 34.5	vbus	1	22	227	1.066067	0.558005	0.508061	47.657555	1.183335	0.112502	6.75009		
23039 SOLR3A2Q 0.48	vbug	1	22	227	1.04136	0.559262	0.482098	46.295074	1.183335	0.112502	6.75009		
23040 SOLR3B1 34.5	vbus	1	22	227	1.063901	0.54422	0.519681	48.846779	1.183335	0.112502	6.75009		
23041 SOLR3B1T 19.92	vbus	1	22	227	1.064646	0.548303	0.516343	48.499065	1.183335	0.112502	6.75009		
23042 SOLR3B1i 19.92	vbus	1	22	227	1.064645	0.548302	0.516343	48.499065	1.183335	0.112502	6.75009		
23043 SOLR3B1Q 34.5	vbus	1	22	227	1.066123	0.554817	0.511306	47.95937	1.183335	0.112502	6.75009		
23044 SOLR3B1Q 0.48	vbug	1	22	227	1.041417	0.556378	0.485039	46.574924	1.183335	0.112502	6.75009		
23050 SOLR1A 230	vbus	1	22	227	1.042416	0.587723	0.454693	43.619171	1.183335	0.075001	4.50006		
23051 SOLR1B 230	vbus	1	22	227	1.04246	0.585987	0.456472	43.787994	1.183335	0.075001	4.50006		
23052 SOLR2A 230	vbus	1	22	227	1.042533	0.58201	0.460523	44.17347	1.183335	0.075001	4.50006		
23053 SOLR2B 230	vbus	1	22	227	1.042577	0.580132	0.462445	44.355968	1.183335	0.075001	4.50006		
23054 SOLR3A 230	vbus	1	22	227	1.042533	0.58201	0.460523	44.17347	1.183335	0.075001	4.50006		
23055 SOLR3B 230	vbus	1	22	227	1.042577	0.580132	0.462445	44.355968	1.183335	0.075001	4.50006		

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS													XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS													XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS													XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
23000 SOLR1A1 34.5	vbus	1	22	227	1.063699	0.533	0.530698	49.8918	1.183335	0.112502	6.75009		
23001 SOLR1A1T 19.92	vbus	1	22	227	1.064439	0.539462	0.524977	49.319607	1.183335	0.112502	6.75009		
23002 SOLR1A1i 19.92	vbus	1	22	227	1.064439	0.539462	0.524977	49.319607	1.183335	0.112502	6.75009		
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.065921	0.543577	0.522344	49.004025	1.183335	0.112502	6.75009		
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.04121	0.550901	0.49031	47.090374	1.183335	0.112502	6.75009		
23005 SOLR1A2 34.5	vbus	1	22	227	1.063699	0.533	0.530698	49.8918	1.183335	0.112502	6.75009		
23006 SOLR1A2T 19.92	vbus	1	22	227	1.064439	0.539462	0.524977	49.319607	1.183335	0.112502	6.75009		
23007 SOLR1A2i 19.92	vbus	1	22	227	1.064439	0.539462	0.524977	49.319607	1.183335	0.112502	6.75009		
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.065921	0.543577	0.522344	49.004025	1.183335	0.112502	6.75009		
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.04121	0.550901	0.49031	47.090374	1.183335	0.112502	6.75009		
23010 SOLR1B1 34.5	vbus	1	22	227	1.063752	0.530356	0.533396	50.142864	1.183335	0.112502	6.75009		
23011 SOLR1B1T 19.92	vbus	1	22	227	1.064494	0.53687	0.527625	49.565762	1.183335	0.112502	6.75009		
23012 SOLR1B1i 19.92	vbus	1	22	227	1.064493	0.536869	0.527624	49.565754	1.183335	0.112502	6.75009		
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.065974	0.541022	0.524952	49.246197	1.183335	0.112502	6.75009		
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.041265	0.548627	0.492638	47.311474	1.183335	0.112502	6.75009		
23015 SOLR2A1 34.5	vbus	1	22	227	1.063845	0.5248	0.539045	50.669525	1.183335	0.112502	6.75009		
23016 SOLR2A1T 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079357	1.183335	0.112502	6.75009		
23017 SOLR2A1i 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079365	1.183335	0.112502	6.75009		
23018 SOLR2A1Q 34.5	vbus	1	22	227	1.066067	0.535646	0.530421	49.754913	1.183335	0.112502	6.75009		
23019 SOLR2A1Q 0.48	vbug	1	22	227	1.04136	0.543903	0.497457	47.769901	1.183335	0.112502	6.75009		
23020 SOLR2A2 34.5	vbus	1	22	227	1.063845	0.5248	0.539045	50.669525	1.183335	0.112502	6.75009		
23021 SOLR2A2T 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079357	1.183335	0.112502	6.75009		
23022 SOLR2A2i 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079365	1.183335	0.112502	6.75009		
23023 SOLR2A2Q 34.5	vbus	1	22	227	1.066067	0.535646	0.530421	49.754913	1.183335	0.112502	6.75009		
23024 SOLR2A2Q 0.48	vbug	1	22	227	1.04136	0.543903	0.497457	47.769901	1.183335	0.112502	6.75009		
23025 SOLR2B1 34.5	vbus	1	22	227	1.063901	0.522083	0.541818	50.927471	1.183335	0.112502	6.75009	MINIMUM	XXX
23026 SOLR2B1T 19.92	vbus	1	22	227	1.064646	0.528796	0.53585	50.331306	1.183335	0.112502	6.75009		
23027 SOLR2B1i 19.92	vbus	1	22	227	1.064645	0.528795	0.53585	50.331306	1.183335	0.112502	6.75009		
23028 SOLR2B1Q 34.5	vbus	1	22	227	1.066123	0.533018	0.533104	50.004032	1.183335	0.112502	6.75009		
23029 SOLR2B1Q 0.48	vbug	1	22	227	1.041417	0.541588	0.499829	47.995106	1.183335	0.112502	6.75009		
23030 SOLR3A1 34.5	vbus	1	22	227	1.063845	0.5248	0.539045	50.669525	1.183335	0.112502	6.75009		
23031 SOLR3A1T 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079357	1.183335	0.112502	6.75009		
23032 SOLR3A1i 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079365	1.183335	0.112502	6.75009		
23033 SOLR3A1Q 34.5	vbus	1	22	227	1.066067	0.535646	0.530421	49.754913	1.183335	0.112502	6.75009		
23034 SOLR3A1Q 0.48	vbug	1	22	227	1.04136	0.543903	0.497457	47.769901	1.183335	0.112502	6.75009		
23035 SOLR3A2 34.5	vbus	1	22	227	1.063845	0.5248	0.539045	50.669525	1.183335	0.112502	6.75009		
23036 SOLR3A2T 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079357	1.183335	0.112502	6.75009		
23037 SOLR3A2i 19.92	vbus	1	22	227	1.064588	0.531449	0.533139	50.079365	1.183335	0.112502	6.75009		
23038 SOLR3A2Q 34.5	vbus	1	22	227	1.066067	0.535646	0.530421	49.754913	1.183335	0.112502	6.75009		
23039 SOLR3A2Q 0.48	vbug	1	22	227	1.04136	0.543903	0.497457	47.769901	1.183335	0.112502	6.75009		
23040 SOLR3B1 34.5	vbus	1	22	227	1.063901	0.522083	0.541818	50.927471	1.183335	0.112502	6.75009		
23041 SOLR3B1T 19.92	vbus	1	22	227	1.064646	0.528796	0.53585	50.331306	1.183335	0.112502	6.75009		
23042 SOLR3B1i 19.92	vbus	1	22	227	1.064645	0.528795	0.53585	50.331306	1.183335	0.112502	6.75009		
23043 SOLR3B1Q 34.5	vbus	1	22	227	1.066123	0.533018	0.533104	50.004032	1.183335	0.112502	6.75009		
23044 SOLR3B1Q 0.48	vbug	1	22	227	1.041417	0.541588	0.499829	47.995106	1.183335	0.112502	6.75009		
23050 SOLR1A 230	vbus	1	22	227	1.042416	0.54718	0.495236	47.508503	1.183335	0.112502	6.75009		
23051 SOLR1B 230	vbus	1	22	227	1.04246	0.545669	0.49679	47.655598	1.183335	0.112502	6.75009		
23052 SOLR2A 230	vbus	1	22	227	1.042533	0.542173	0.50036	47.994648	1.183335	0.112502	6.75009		
23053 SOLR2B 230	vbus	1	22	227	1.042577	0.540541	0.502036	48.1534	1.183335	0.112502	6.75009		
23054 SOLR3A 230	vbus	1	22	227	1.042533	0.542173	0.50036	47.994648	1.183335	0.112502	6.75009		
23055 SOLR3B 230	vbus	1	22	227	1.042577	0.540541	0.502036	48.1534	1.183335	0.112502	6.75009		

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
24129 S.ONOFR2 22	ang	2	24	240	21.993572	0	0	44200.20703	0	0	0		
24130 S.ONOFR3 22	ang	3	24	240	22.256302	0	0	44736.38672	0	0	0	MAXIMUM	XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 40.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.0HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT XXX

*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT XXX
23000 SOLR1A1 34.5	vbus	1	22	227	1.049345	0.437121	0.612224	58.343407	1.183335	0.112502	6.75009	
23001 SOLR1A1T 19.92	vbus	1	22	227	1.049787	0.429715	0.620072	59.066448	1.183335	0.112502	6.75009	
23002 SOLR1A1i 19.92	vbus	1	22	227	1.049787	0.429715	0.620072	59.066448	1.183335	0.112502	6.75009	
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.051594	0.448093	0.603501	57.389179	1.183335	0.112502	6.75009	
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.026515	0.4291	0.597416	58.198421	1.183335	0.112502	6.75009	
23005 SOLR1A2 34.5	vbus	1	22	227	1.049345	0.437121	0.612224	58.343407	1.183335	0.112502	6.75009	
23006 SOLR1A2T 19.92	vbus	1	22	227	1.049787	0.429715	0.620072	59.066448	1.183335	0.112502	6.75009	
23007 SOLR1A2i 19.92	vbus	1	22	227	1.049787	0.429715	0.620072	59.066448	1.183335	0.112502	6.75009	
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.051594	0.448093	0.603501	57.389179	1.183335	0.112502	6.75009	
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.026515	0.4291	0.597416	58.198421	1.183335	0.112502	6.75009	
23010 SOLR1B1 34.5	vbus	1	22	227	1.049332	0.428542	0.62079	59.160526	1.183335	0.112502	6.75009	
23011 SOLR1B1T 19.92	vbus	1	22	227	1.049774	0.421127	0.628647	59.88401	1.183335	0.112502	6.75009	
23012 SOLR1B1i 19.92	vbus	1	22	227	1.049773	0.421127	0.628646	59.88401	1.183335	0.112502	6.75009	
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.05158	0.439638	0.611942	58.192631	1.183335	0.112502	6.75009	
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.026502	0.421241	0.60526	58.963417	1.183335	0.112502	6.75009	
23050 SOLR1A 230	vbus	1	22	227	1.030997	0.607389	0.423609	41.087273	1.183335	0.075001	4.50006	
23051 SOLR1B 230	vbus	1	22	227	1.030987	0.602704	0.428283	41.541035	1.183335	0.075001	4.50006	

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

XXX

*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT
23000 SOLR1A1 34.5	vbus	1	22	227	1.049345	0.41524	0.634104	60.4286	1.183335	0.112502	6.75009	
23001 SOLR1A1T 19.92	vbus	1	22	227	1.049787	0.408801	0.640986	61.058678	1.183335	0.112502	6.75009	
23002 SOLR1A1i 19.92	vbus	1	22	227	1.049787	0.408801	0.640986	61.058681	1.183335	0.112502	6.75009	
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.051594	0.426537	0.625057	59.43898	1.183335	0.112502	6.75009	
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.026515	0.411135	0.61538	59.948475	1.183335	0.150002	9.00012	
23005 SOLR1A2 34.5	vbus	1	22	227	1.049345	0.41524	0.634104	60.4286	1.183335	0.112502	6.75009	
23006 SOLR1A2T 19.92	vbus	1	22	227	1.049787	0.408801	0.640986	61.058678	1.183335	0.112502	6.75009	
23007 SOLR1A2i 19.92	vbus	1	22	227	1.049787	0.408801	0.640986	61.058681	1.183335	0.112502	6.75009	
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.051594	0.426537	0.625057	59.43898	1.183335	0.112502	6.75009	
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.026515	0.411135	0.61538	59.948475	1.183335	0.150002	9.00012	
23010 SOLR1B1 34.5	vbus	1	22	227	1.049332	0.406744	0.642587	61.237759	1.183335	0.112502	6.75009	
23011 SOLR1B1T 19.92	vbus	1	22	227	1.049774	0.400337	0.649436	61.864407	1.183335	0.150002	9.00012	
23012 SOLR1B1i 19.92	vbus	1	22	227	1.049773	0.400337	0.649436	61.86441	1.183335	0.150002	9.00012	
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.05158	0.418164	0.633416	60.234676	1.183335	0.112502	6.75009	
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.026502	0.403467	0.623035	60.694973	1.183335	0.150002	9.00012	
23050 SOLR1A 230	vbus	1	22	227	1.030997	0.586165	0.444832	43.145805	1.183335	0.112502	6.75009	
23051 SOLR1B 230	vbus	1	22	227	1.030987	0.581406	0.449581	43.606892	1.183335	0.112502	6.75009	

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
24129 S.ONOFR2 22	ang	2	24	240	61.951283	0	0	44451.78906	0	0	0		
24130 S.ONOFR3 22	ang	3	24	240	62.216869	0	0	44988.56641	0	0	0	MAXIMUM	XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 40.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.0HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX

*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
23000 SOLR1A1 34.5	vbus	1	22	227	1.062505	0.541014	0.521492	49.081326	1.183335	0.112502	6.75009		
23001 SOLR1A1T 19.92	vbus	1	22	227	1.063222	0.546763	0.516459	48.574883	1.183335	0.112502	6.75009		
23002 SOLR1A1i 19.92	vbus	1	22	227	1.063221	0.546763	0.516458	48.574886	1.183335	0.112502	6.75009		
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.06473	0.551415	0.513315	48.210846	1.183335	0.112502	6.75009		
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.039989	0.556701	0.483289	46.470528	1.183335	0.112502	6.75009		
23005 SOLR1A2 34.5	vbus	1	22	227	1.062505	0.541014	0.521492	49.081326	1.183335	0.112502	6.75009		
23006 SOLR1A2T 19.92	vbus	1	22	227	1.063222	0.546763	0.516459	48.574883	1.183335	0.112502	6.75009		
23007 SOLR1A2i 19.92	vbus	1	22	227	1.063221	0.546763	0.516458	48.574886	1.183335	0.112502	6.75009		
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.06473	0.551415	0.513315	48.210846	1.183335	0.112502	6.75009		
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.039989	0.556701	0.483289	46.470528	1.183335	0.112502	6.75009		
23010 SOLR1B1 34.5	vbus	1	22	227	1.062554	0.538387	0.524166	49.330822	1.183335	0.112502	6.75009		
23011 SOLR1B1T 19.92	vbus	1	22	227	1.06327	0.544187	0.519083	48.819485	1.183335	0.112502	6.75009		
23012 SOLR1B1i 19.92	vbus	1	22	227	1.06327	0.544187	0.519083	48.819489	1.183335	0.112502	6.75009		
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.064778	0.548878	0.5159	48.451416	1.183335	0.112502	6.75009		
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.040038	0.554443	0.485595	46.690125	1.183335	0.112502	6.75009		
23015 SOLR2A1 34.5	vbus	1	22	227	1.062635	0.532887	0.529748	49.852287	1.183335	0.112502	6.75009		
23016 SOLR2A1T 19.92	vbus	1	22	227	1.063354	0.538822	0.524532	49.328037	1.183335	0.112502	6.75009		
23017 SOLR2A1i 19.92	vbus	1	22	227	1.063354	0.538822	0.524531	49.328037	1.183335	0.112502	6.75009		
23018 SOLR2A1Q 34.5	vbus	1	22	227	1.06486	0.543559	0.521301	48.954884	1.183335	0.112502	6.75009		
23019 SOLR2A1Q 0.48	vbug	1	22	227	1.040122	0.549769	0.490353	47.143772	1.183335	0.112502	6.75009		
23020 SOLR2A2 34.5	vbus	1	22	227	1.062635	0.532887	0.529748	49.852287	1.183335	0.112502	6.75009		
23021 SOLR2A2T 19.92	vbus	1	22	227	1.063354	0.538822	0.524532	49.328037	1.183335	0.112502	6.75009		
23022 SOLR2A2i 19.92	vbus	1	22	227	1.063354	0.538822	0.524531	49.328037	1.183335	0.112502	6.75009		
23023 SOLR2A2Q 34.5	vbus	1	22	227	1.06486	0.543559	0.521301	48.954884	1.183335	0.112502	6.75009		
23024 SOLR2A2Q 0.48	vbug	1	22	227	1.040122	0.549769	0.490353	47.143772	1.183335	0.112502	6.75009		
23025 SOLR2B1 34.5	vbus	1	22	227	1.062685	0.530188	0.532497	50.108627	1.183335	0.112502	6.75009	MINIMUM	XXX
23026 SOLR2B1T 19.92	vbus	1	22	227	1.063405	0.536185	0.52722	49.578461	1.183335	0.112502	6.75009		
23027 SOLR2B1i 19.92	vbus	1	22	227	1.063404	0.536185	0.527219	49.578453	1.183335	0.112502	6.75009		
23028 SOLR2B1Q 34.5	vbus	1	22	227	1.064909	0.540949	0.52396	49.202343	1.183335	0.112502	6.75009		
23029 SOLR2B1Q 0.48	vbug	1	22	227	1.040173	0.547468	0.492705	47.367592	1.183335	0.112502	6.75009		
23030 SOLR3A1 34.5	vbus	1	22	227	1.062635	0.532887	0.529748	49.852287	1.183335	0.112502	6.75009		
23031 SOLR3A1T 19.92	vbus	1	22	227	1.063354	0.538822	0.524532	49.328037	1.183335	0.112502	6.75009		
23032 SOLR3A1i 19.92	vbus	1	22	227	1.063354	0.538822	0.524531	49.328037	1.183335	0.112502	6.75009		
23033 SOLR3A1Q 34.5	vbus	1	22	227	1.06486	0.543559	0.521301	48.954884	1.183335	0.112502	6.75009		
23034 SOLR3A1Q 0.48	vbug	1	22	227	1.040122	0.549769	0.490353	47.143772	1.183335	0.112502	6.75009		
23035 SOLR3A2 34.5	vbus	1	22	227	1.062635	0.532887	0.529748	49.852287	1.183335	0.112502	6.75009		
23036 SOLR3A2T 19.92	vbus	1	22	227	1.063354	0.538822	0.524532	49.328037	1.183335	0.112502	6.75009		
23037 SOLR3A2i 19.92	vbus	1	22	227	1.063354	0.538822	0.524531	49.328037	1.183335	0.112502	6.75009		
23038 SOLR3A2Q 34.5	vbus	1	22	227	1.06486	0.543559	0.521301	48.954884	1.183335	0.112502	6.75009		
23039 SOLR3A2Q 0.48	vbug	1	22	227	1.040122	0.549769	0.490353	47.143772	1.183335	0.112502	6.75009		
23040 SOLR3B1 34.5	vbus	1	22	227	1.062685	0.530188	0.532497	50.108627	1.183335	0.112502	6.75009		
23041 SOLR3B1T 19.92	vbus	1	22	227	1.063405	0.536185	0.52722	49.578461	1.183335	0.112502	6.75009		
23042 SOLR3B1i 19.92	vbus	1	22	227	1.063404	0.536185	0.527219	49.578453	1.183335	0.112502	6.75009		
23043 SOLR3B1Q 34.5	vbus	1	22	227	1.064909	0.540949	0.52396	49.202343	1.183335	0.112502	6.75009		
23044 SOLR3B1Q 0.48	vbug	1	22	227	1.040173	0.547468	0.492705	47.367592	1.183335	0.112502	6.75009		
23050 SOLR1A 230	vbus	1	22	227	1.041465	0.558562	0.482903	46.36771	1.183335	0.112502	6.75009		
23051 SOLR1B 230	vbus	1	22	227	1.041504	0.557029	0.484475	46.516895	1.183335	0.112502	6.75009		
23052 SOLR2A 230	vbus	1	22	227	1.041569	0.553506	0.488063	46.858444	1.183335	0.112502	6.75009		
23053 SOLR2B 230	vbus	1	22	227	1.041608	0.551856	0.489752	47.018871	1.183335	0.112502	6.75009		
23054 SOLR3A 230	vbus	1	22	227	1.041569	0.553506	0.488063	46.858444	1.183335	0.112502	6.75009		
23055 SOLR3B 230	vbus	1	22	227	1.041608	0.551856	0.489752	47.018871	1.183335	0.112502	6.75009		

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
23000 SOLR1A1 34.5	vbus	1	22	227	1.062505	0.527111	0.535395	50.38982	1.183335	0.112502	6.75009		
23001 SOLR1A1T 19.92	vbus	1	22	227	1.063222	0.534504	0.528718	49.727917	1.183335	0.112502	6.75009		
23002 SOLR1A1i 19.92	vbus	1	22	227	1.063221	0.534503	0.528718	49.727917	1.183335	0.112502	6.75009		
23003 SOLR1A1Q 34.5	vbus	1	22	227	1.06473	0.537715	0.527015	49.497532	1.183335	0.112502	6.75009		
23004 SOLR1A1Q 0.48	vbug	1	22	227	1.039989	0.547378	0.492611	47.366974	1.183335	0.150002	9.00012		
23005 SOLR1A2 34.5	vbus	1	22	227	1.062505	0.527111	0.535395	50.38982	1.183335	0.112502	6.75009		
23006 SOLR1A2T 19.92	vbus	1	22	227	1.063222	0.534504	0.528718	49.727917	1.183335	0.112502	6.75009		
23007 SOLR1A2i 19.92	vbus	1	22	227	1.063221	0.534503	0.528718	49.727917	1.183335	0.112502	6.75009		
23008 SOLR1A2Q 34.5	vbus	1	22	227	1.06473	0.537715	0.527015	49.497532	1.183335	0.112502	6.75009		
23009 SOLR1A2Q 0.48	vbug	1	22	227	1.039989	0.547378	0.492611	47.366974	1.183335	0.150002	9.00012		
23010 SOLR1B1 34.5	vbus	1	22	227	1.062554	0.524859	0.537695	50.604004	1.183335	0.112502	6.75009		
23011 SOLR1B1T 19.92	vbus	1	22	227	1.06327	0.532311	0.530959	49.936401	1.183335	0.112502	6.75009		
23012 SOLR1B1i 19.92	vbus	1	22	227	1.06327	0.532311	0.530959	49.936401	1.183335	0.112502	6.75009		
23013 SOLR1B1Q 34.5	vbus	1	22	227	1.064778	0.535543	0.529234	49.703747	1.183335	0.112502	6.75009		
23014 SOLR1B1Q 0.48	vbug	1	22	227	1.040038	0.545485	0.494553	47.551468	1.183335	0.150002	9.00012		
23015 SOLR2A1 34.5	vbus	1	22	227	1.062635	0.520128	0.542508	51.053024	1.183335	0.112502	6.75009		
23016 SOLR2A1T 19.92	vbus	1	22	227	1.063354	0.527731	0.535623	50.371056	1.183335	0.112502	6.75009		
23017 SOLR2A1i 19.92	vbus	1	22	227	1.063354	0.527731	0.535622	50.371056	1.183335	0.112502	6.75009		
23018 SOLR2A1Q 34.5	vbus	1	22	227	1.06486	0.530974	0.533885	50.1367	1.183335	0.112502	6.75009		
23019 SOLR2A1Q 0.48	vbug	1	22	227	1.040122	0.541554	0.498568	47.93359	1.183335	0.150002	9.00012		
23020 SOLR2A2 34.5	vbus	1	22	227	1.062635	0.520128	0.542508	51.053024	1.183335	0.112502	6.75009		
23021 SOLR2A2T 19.92	vbus	1	22	227	1.063354	0.527731	0.535623	50.371056	1.183335	0.112502	6.75009		
23022 SOLR2A2i 19.92	vbus	1	22	227	1.063354	0.527731	0.535622	50.371056	1.183335	0.112502	6.75009		
23023 SOLR2A2Q 34.5	vbus	1	22	227	1.06486	0.530974	0.533885	50.1367	1.183335	0.112502	6.75009		
23024 SOLR2A2Q 0.48	vbug	1	22	227	1.040122	0.541554	0.498568	47.93359	1.183335	0.150002	9.00012		
23025 SOLR2B1 34.5	vbus	1	22	227	1.062685	0.517821	0.544864	51.272373	1.183335	0.112502	6.75009	MINIMUM	XXX
23026 SOLR2B1T 19.92	vbus	1	22	227	1.063405	0.525494	0.53791	50.583786	1.183335	0.112502	6.75009		
23027 SOLR2B1i 19.92	vbus	1	22	227	1.063404	0.525494	0.53791	50.583778	1.183335	0.112502	6.75009		
23028 SOLR2B1Q 34.5	vbus	1	22	227	1.064909	0.528747	0.536162	50.348133	1.183335	0.112502	6.75009		
23029 SOLR2B1Q 0.48	vbug	1	22	227	1.040173	0.539631	0.500541	48.120964	1.183335	0.150002	9.00012		
23030 SOLR3A1 34.5	vbus	1	22	227	1.062635	0.520128	0.542508	51.053024	1.183335	0.112502	6.75009		
23031 SOLR3A1T 19.92	vbus	1	22	227	1.063354	0.527731	0.535623	50.371056	1.183335	0.112502	6.75009		
23032 SOLR3A1i 19.92	vbus	1	22	227	1.063354	0.527731	0.535622	50.371056	1.183335	0.112502	6.75009		
23033 SOLR3A1Q 34.5	vbus	1	22	227	1.06486	0.530974	0.533885	50.1367	1.183335	0.112502	6.75009		
23034 SOLR3A1Q 0.48	vbug	1	22	227	1.040122	0.541554	0.498568	47.93359	1.183335	0.150002	9.00012		
23035 SOLR3A2 34.5	vbus	1	22	227	1.062635	0.520128	0.542508	51.053024	1.183335	0.112502	6.75009		
23036 SOLR3A2T 19.92	vbus	1	22	227	1.063354	0.527731	0.535623	50.371056	1.183335	0.112502	6.75009		
23037 SOLR3A2i 19.92	vbus	1	22	227	1.063354	0.527731	0.535622	50.371056	1.183335	0.112502	6.75009		
23038 SOLR3A2Q 34.5	vbus	1	22	227	1.06486	0.530974	0.533885	50.1367	1.183335	0.112502	6.75009		
23039 SOLR3A2Q 0.48	vbug	1	22	227	1.040122	0.541554	0.498568	47.93359	1.183335	0.150002	9.00012		
23040 SOLR3B1 34.5	vbus	1	22	227	1.062685	0.517821	0.544864	51.272373	1.183335	0.112502	6.75009		
23041 SOLR3B1T 19.92	vbus	1	22	227	1.063405	0.525494	0.53791	50.583786	1.183335	0.112502	6.75009		
23042 SOLR3B1i 19.92	vbus	1	22	227	1.063404	0.525494	0.53791	50.583778	1.183335	0.112502	6.75009		
23043 SOLR3B1Q 34.5	vbus	1	22	227	1.064909	0.528747	0.536162	50.348133	1.183335	0.112502	6.75009		
23044 SOLR3B1Q 0.48	vbug	1	22	227	1.040173	0.539631	0.500541	48.120964	1.183335	0.150002	9.00012		
23050 SOLR1A 230	vbus	1	22	227	1.041465	0.533504	0.507961	48.773655	1.183335	0.112502	6.75009		
23051 SOLR1B 230	vbus	1	22	227	1.041504	0.532137	0.509367	48.906872	1.183335	0.112502	6.75009		
23052 SOLR2A 230	vbus	1	22	227	1.041569	0.528969	0.5126	49.214233	1.183335	0.112502	6.75009		
23053 SOLR2B 230	vbus	1	22	227	1.041608	0.527499	0.514109	49.357265	1.183335	0.112502	6.75009		
23054 SOLR3A 230	vbus	1	22	227	1.041569	0.528969	0.5126	49.214233	1.183335	0.112502	6.75009		
23055 SOLR3B 230	vbus	1	22	227	1.041608	0.527499	0.514109	49.357265	1.183335	0.112502	6.75009		

XXX

III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	SPREAD	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX
24129 S.ONOFR2 22	ang	2	24	240	61.907082	0	0	44449.3125	0	0	0		
24130 S.ONOFR3 22	ang	3	24	240	62.171944	0	0	44986.13281	0	0	0	MAXIMUM	XXX

XXX

II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 40.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

XXX

V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.0HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX

EXTNUM/NAME/BASEKV	TYPE	ID	AREA	ZONE	INITIAL	MIN/MAX	DELTA	PERCDIFF	ATTIME	DURATION (Seconds)	DURATION (Cycles)	COMMENT	XXX

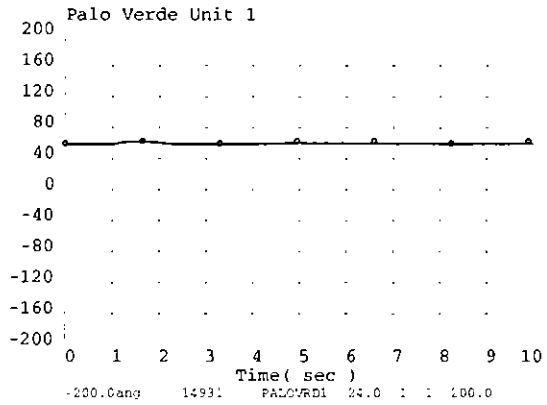
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

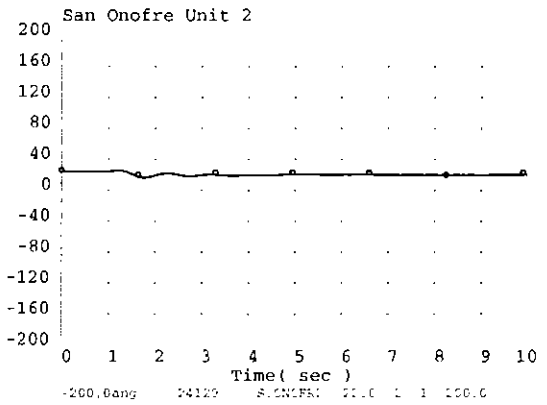
I. WORST-CONDITION ANALYSIS REPORT FOR ANGLE SPREADS EXCEEDING 180.0 DEGREES [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA SPREAD ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO ANGLE CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
II. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 30.0% [ALL BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
III. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 25.0% [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
IV. WORST-CONDITION ANALYSIS REPORT FOR VOLTAGE DIPS EXCEEDING 20.0% FOR 20.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX
XXX
V. WORST-CONDITION ANALYSIS REPORT FOR FREQUENCY DIPS EXCEEDING 59.6HZ FOR 6.0-CYCLES OR MORE [LOAD BUSES] XXX
EXTNUM/NAME/BASEKV TYPE ID AREA ZONE INITIAL MIN/MAX DELTA PERCDIFF ATTIME DURATION (Seconds) DURATION (Cycles) COMMENT XXX
*** NO CRITERIA VIOLATIONS FOUND - TERMINATING ANALYSIS XXX

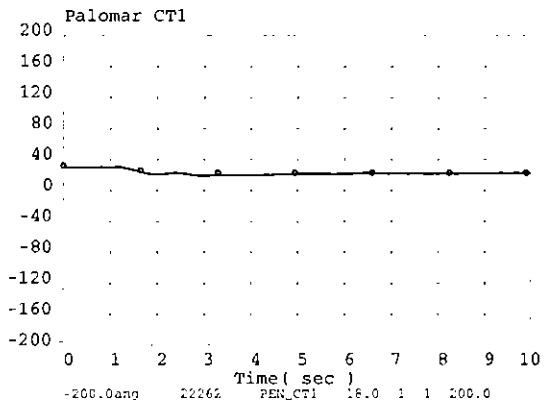
Appendix K

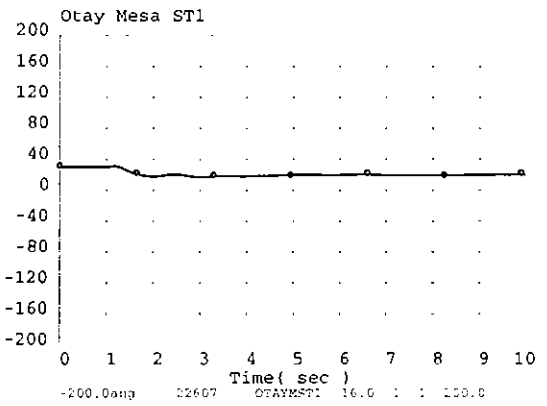
Transient Stability Plots

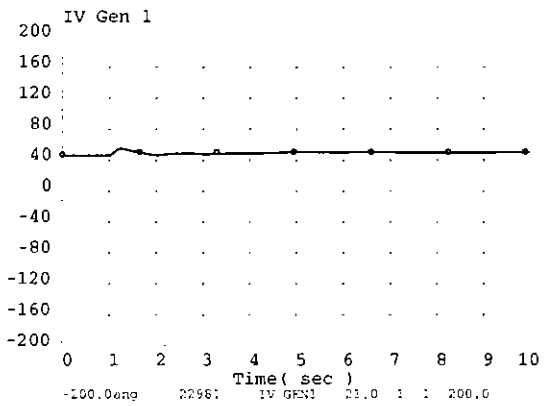
Relative Rotor Angle

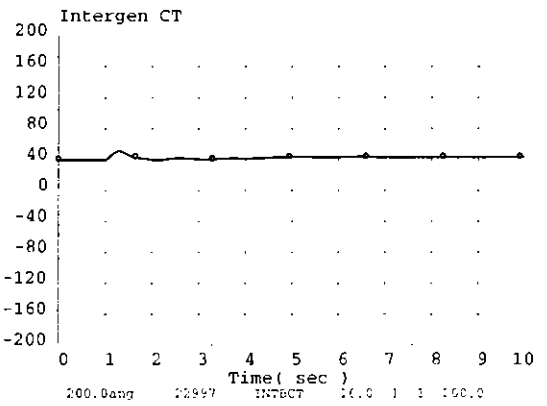






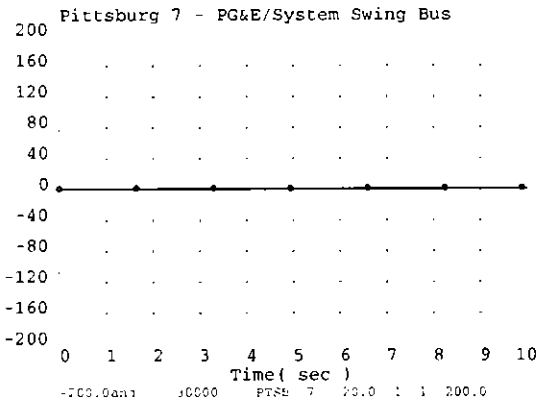


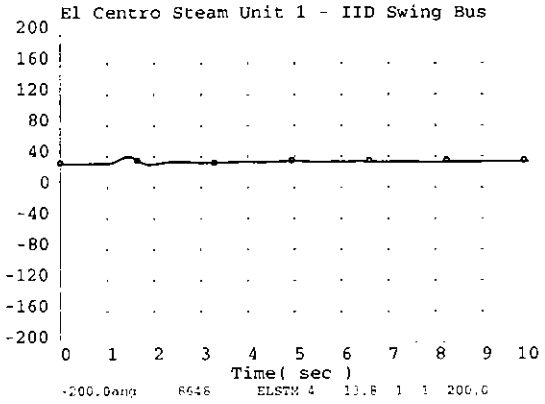


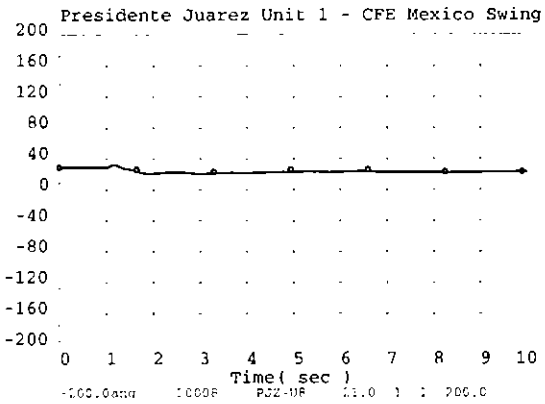


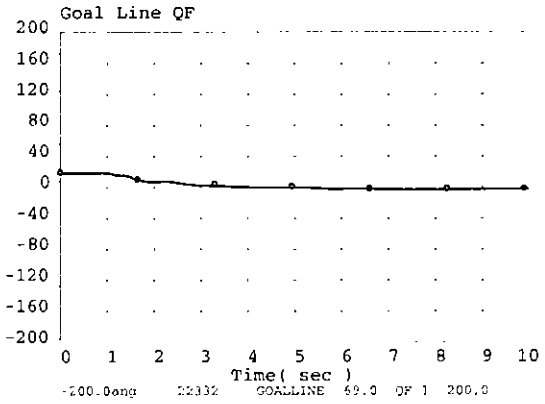
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

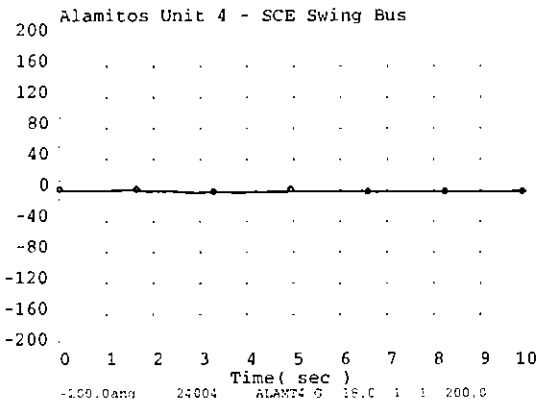
Relative Rotor Angle

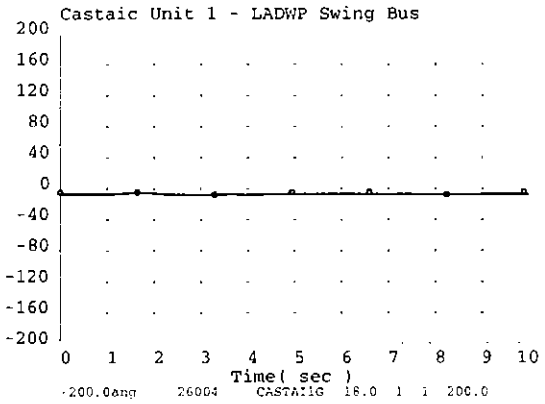






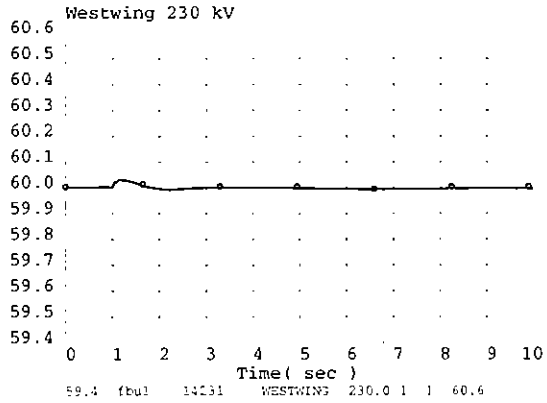


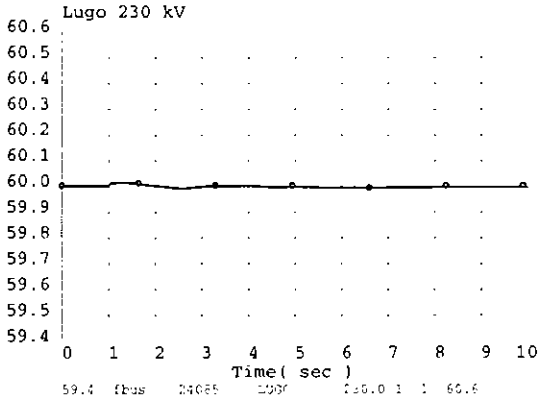


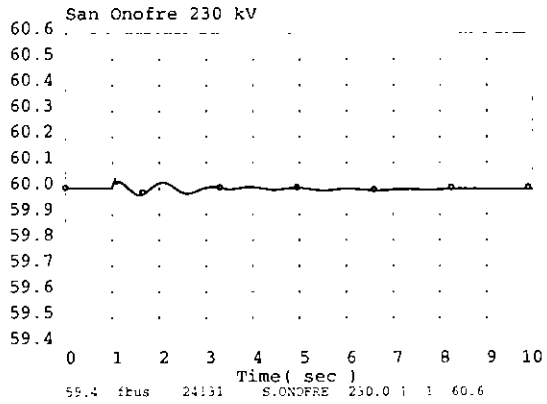


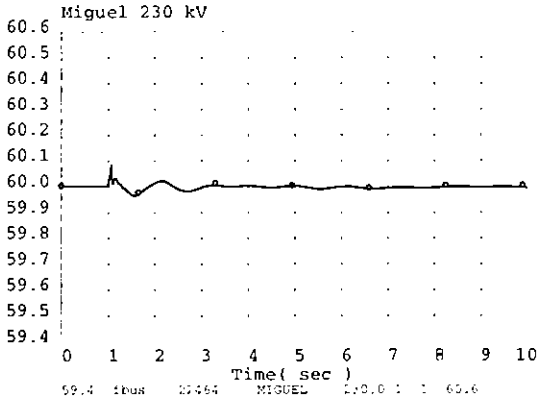
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

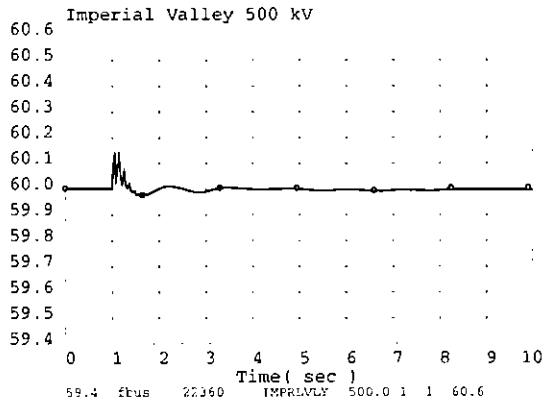
Bus Frequency

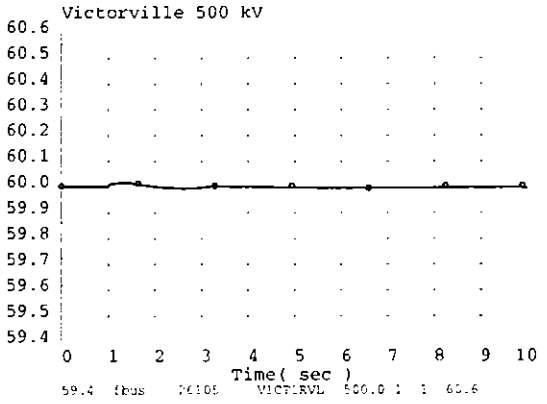






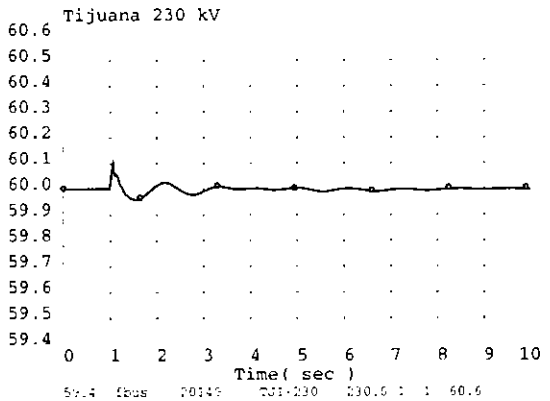


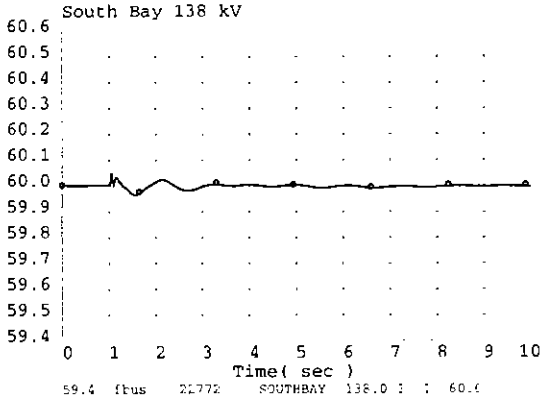


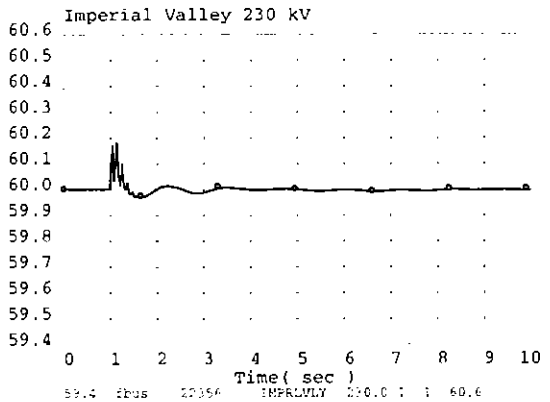


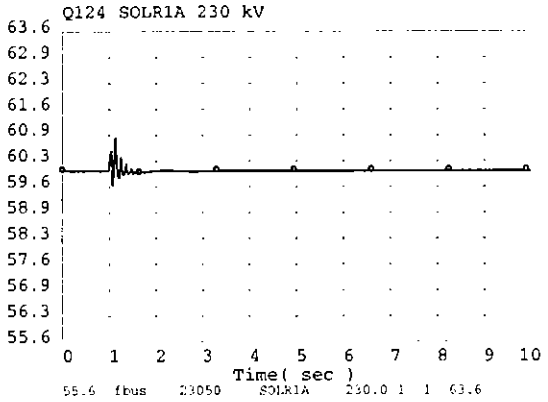
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

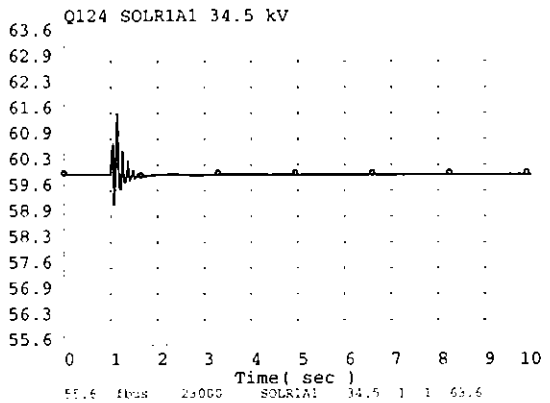
Bus Frequency

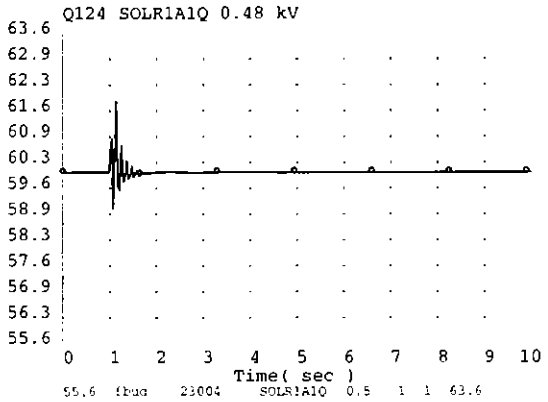






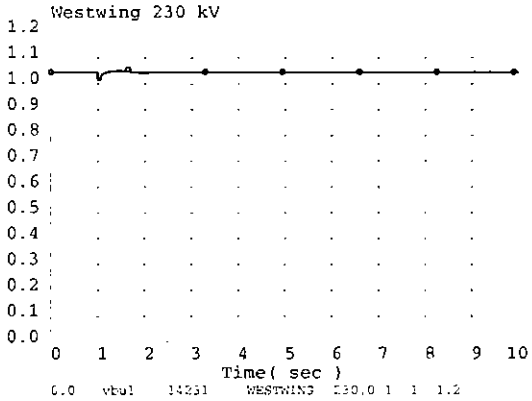


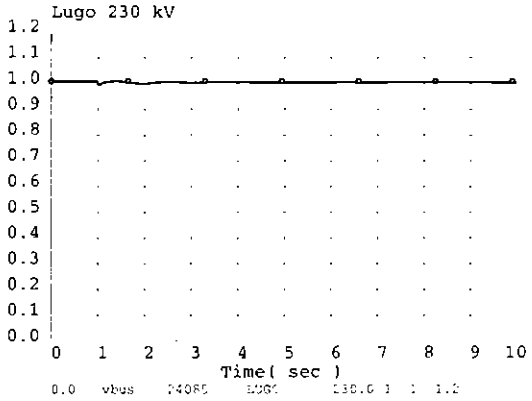


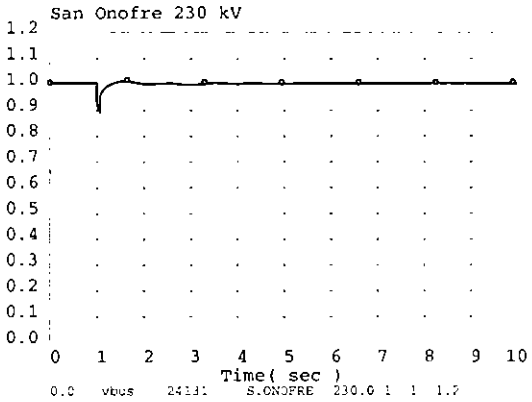


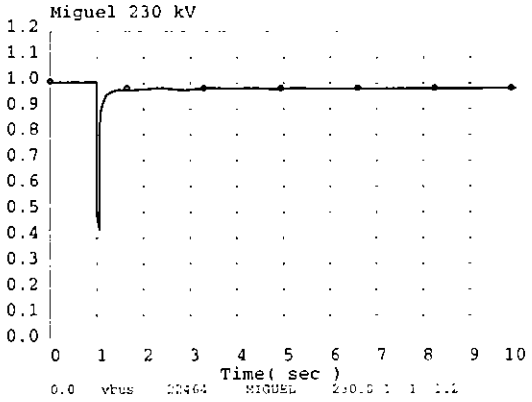
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

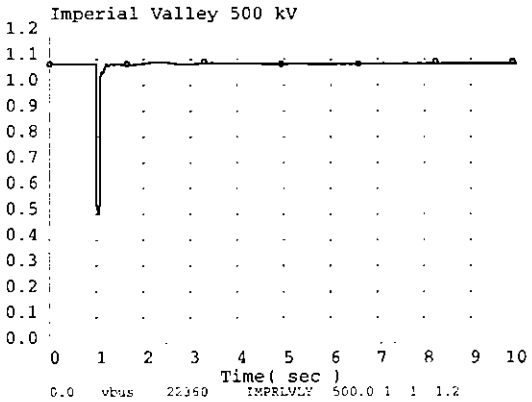
Bus Voltage

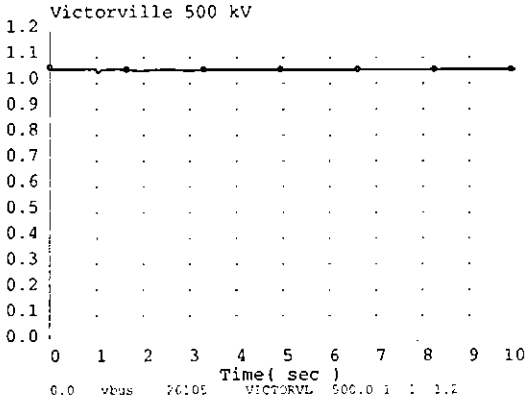




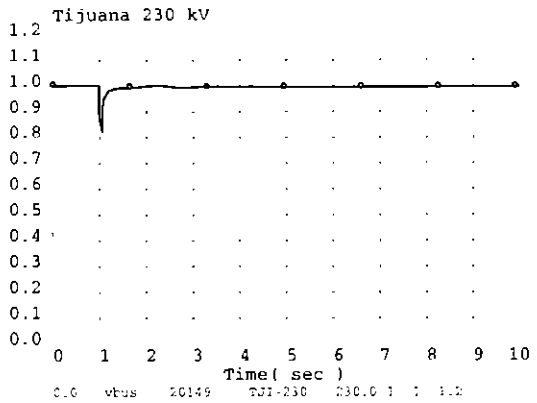


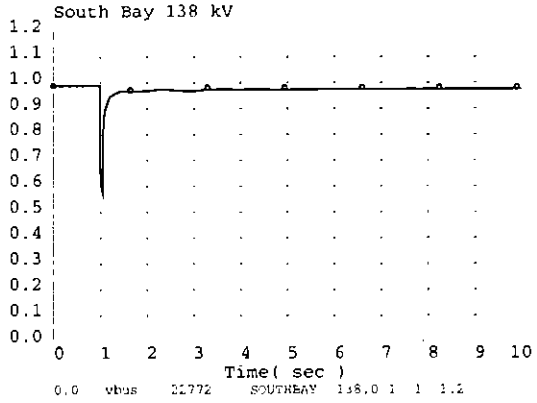


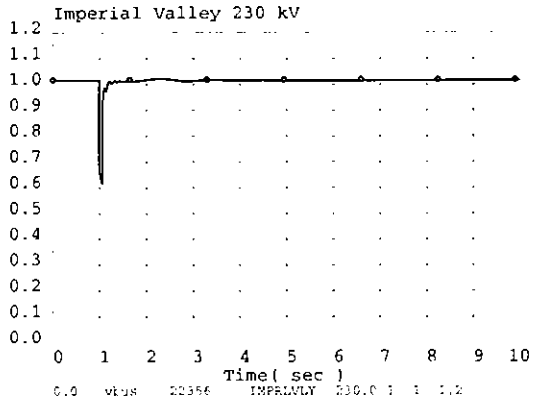


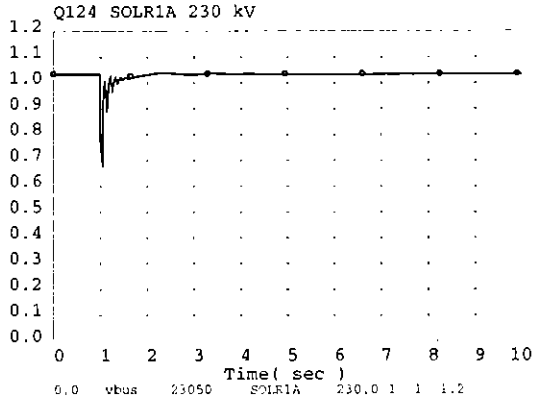


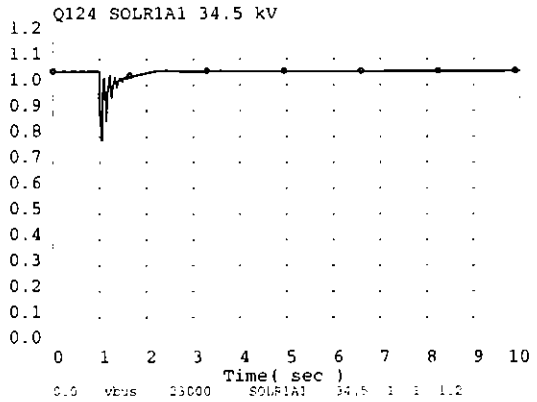
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

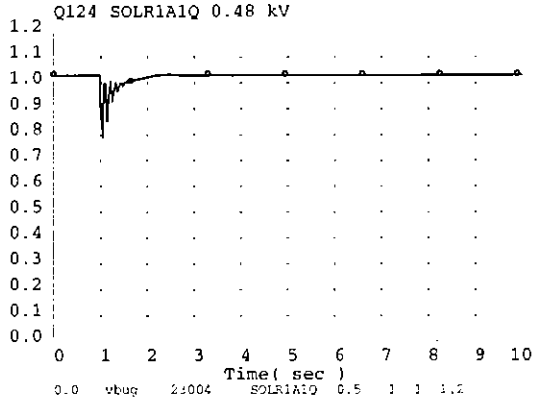






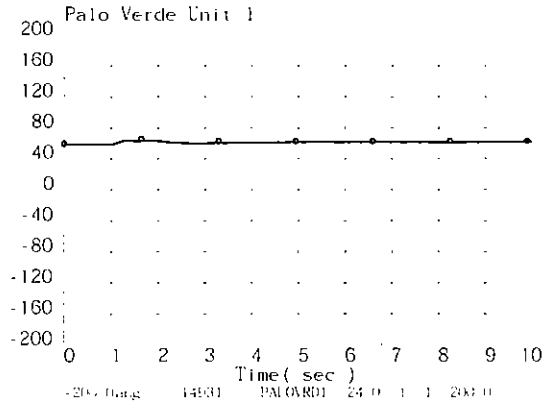


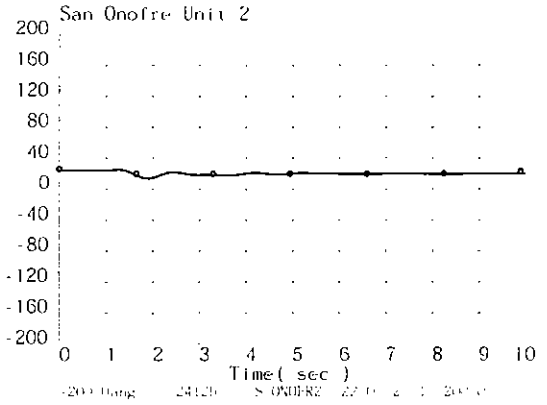


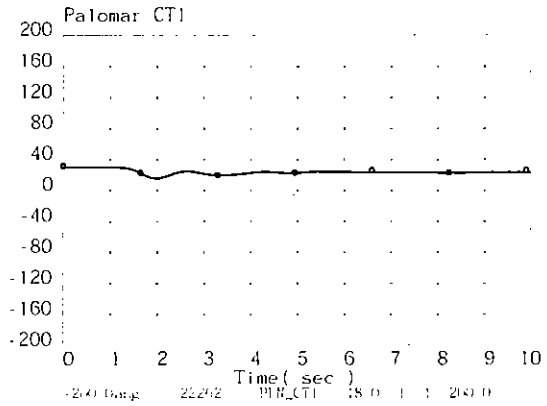


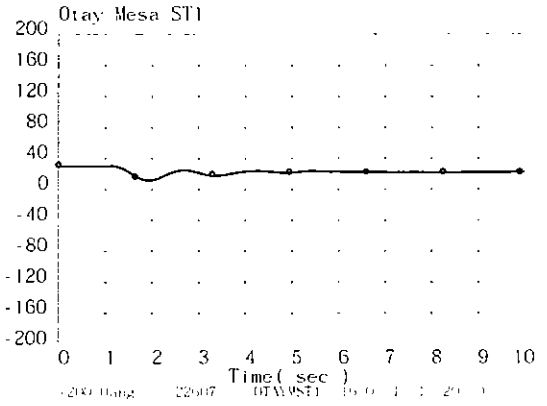
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

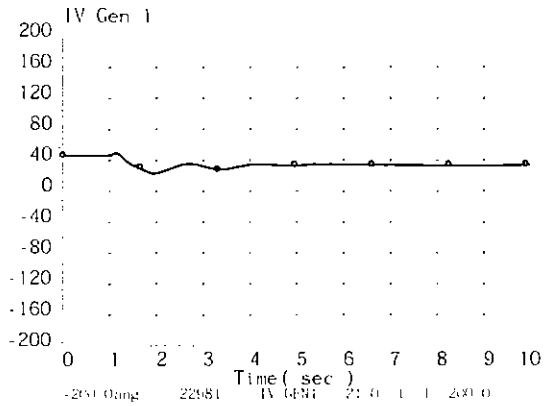
Relative Rotor Angle

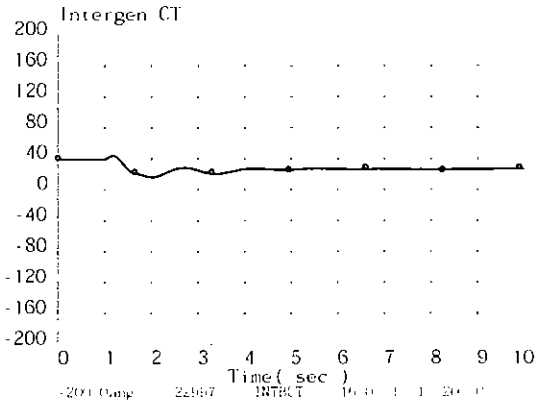




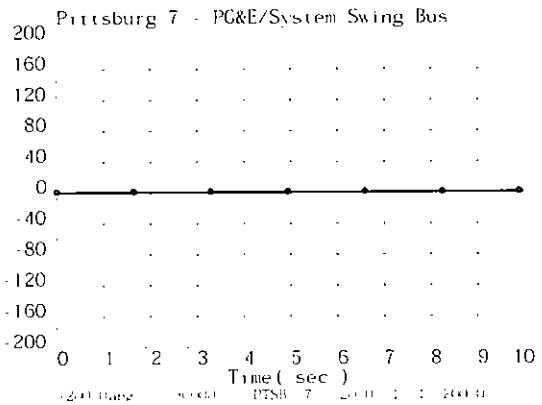


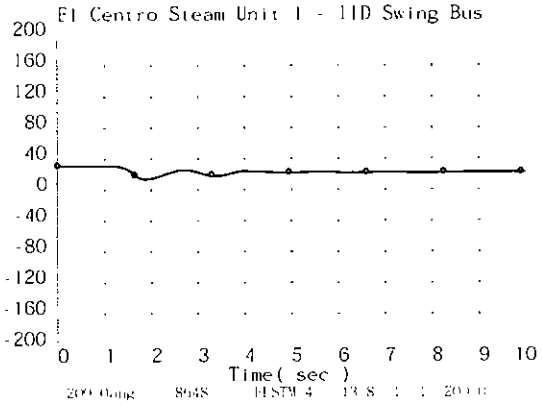


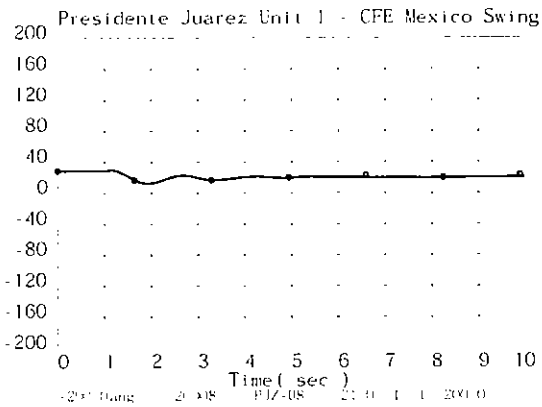


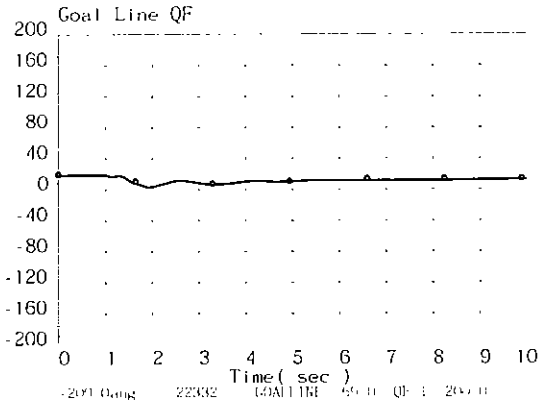


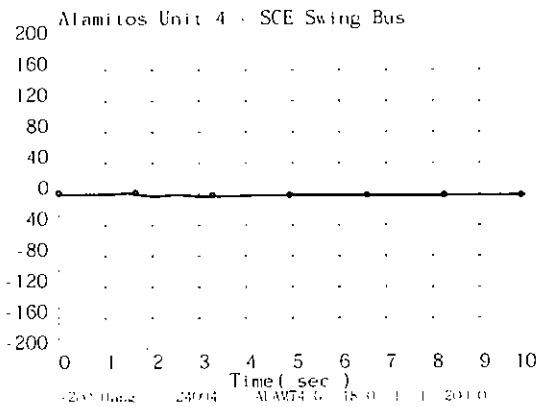
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

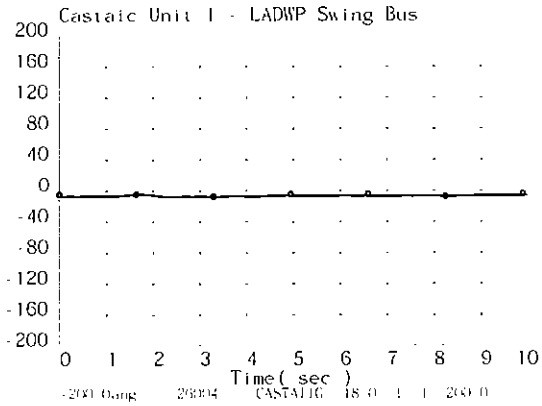






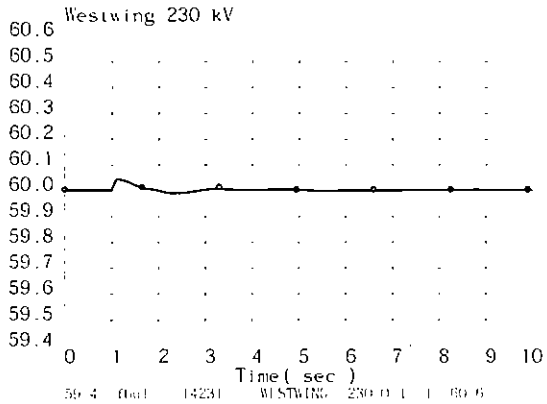


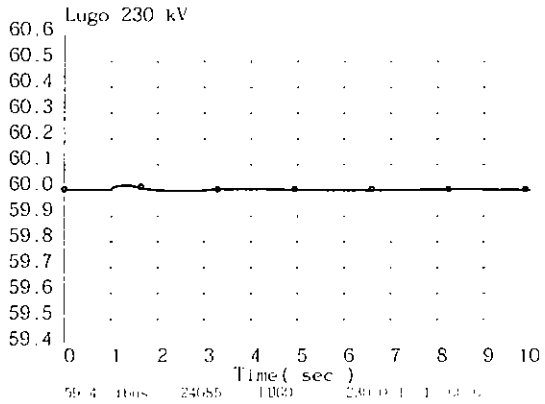


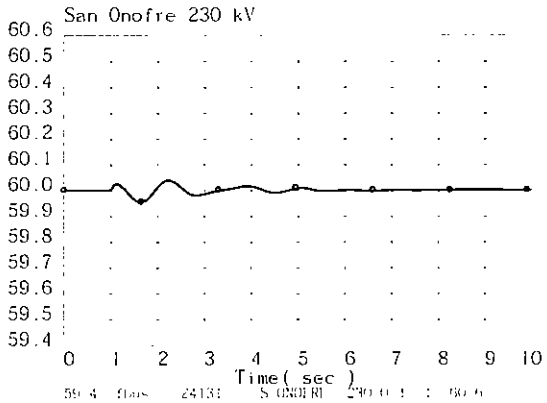


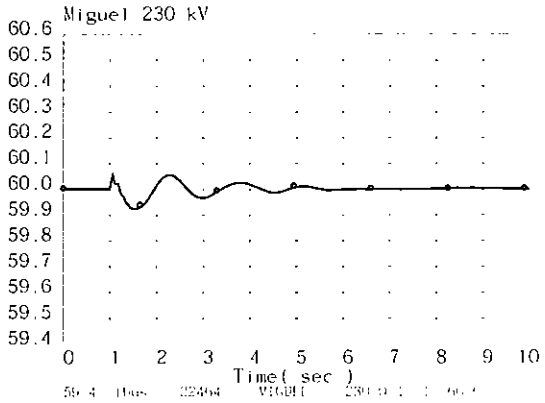
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

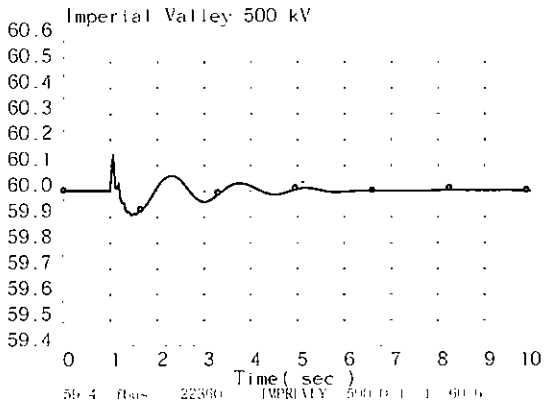
Bus Frequency

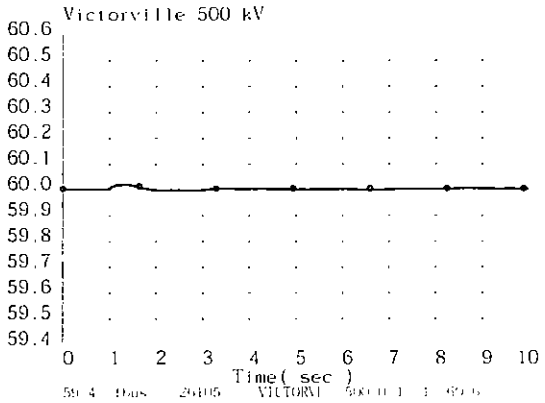






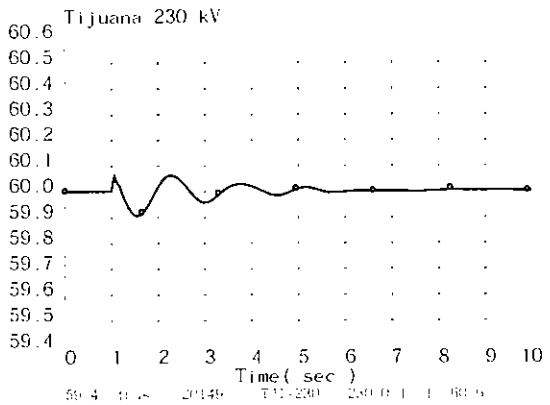


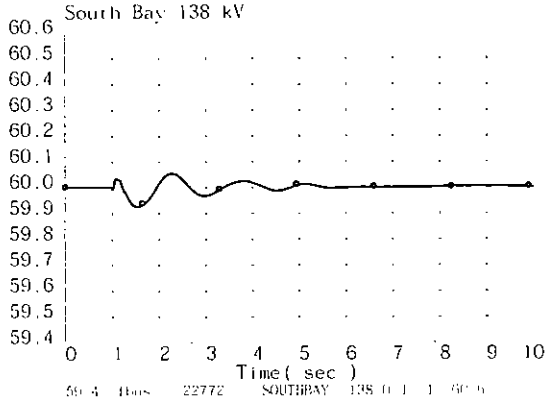


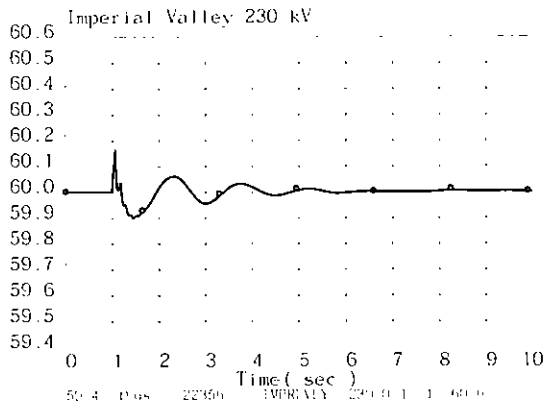


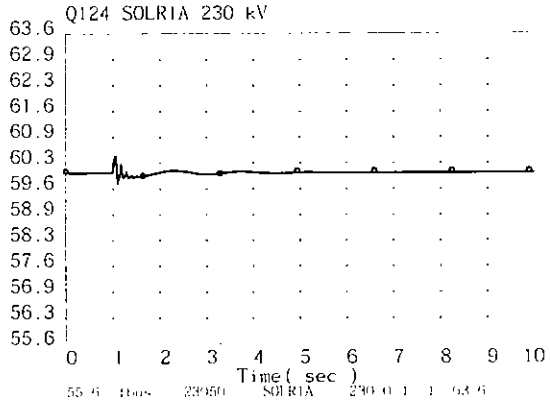
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

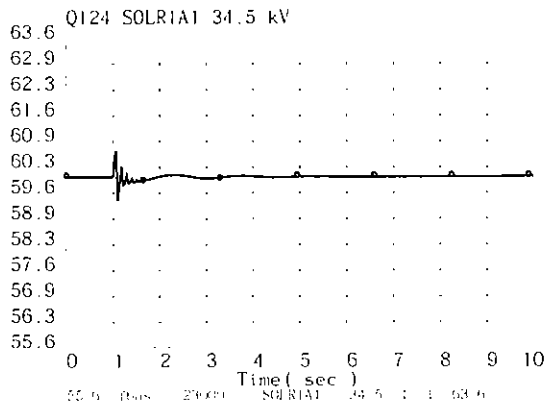
Bus Frequency

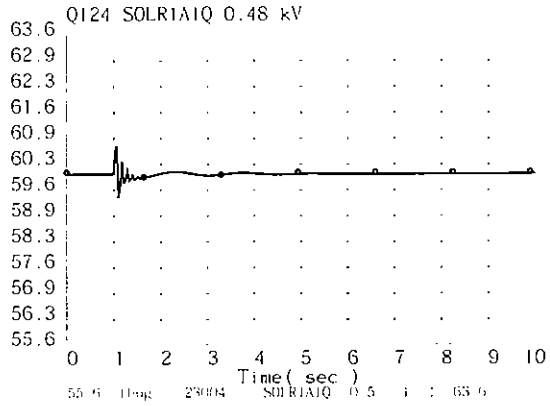






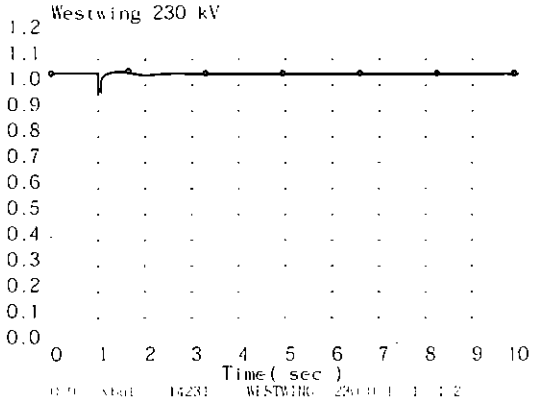


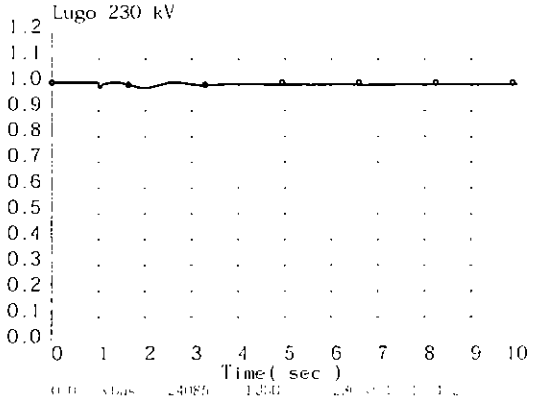


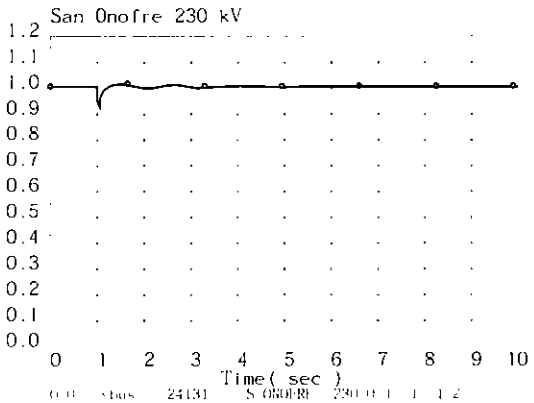


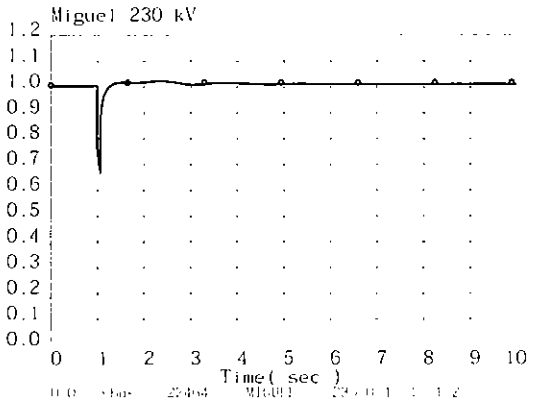
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

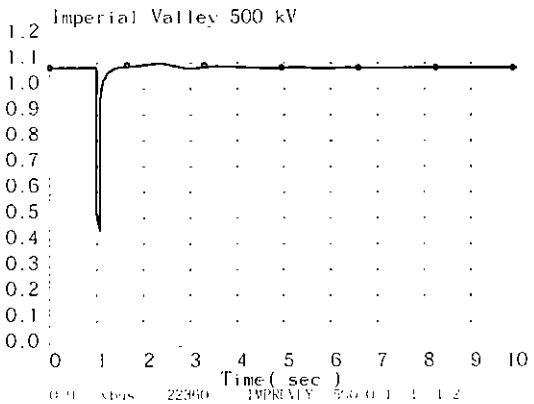
Bus Voltage

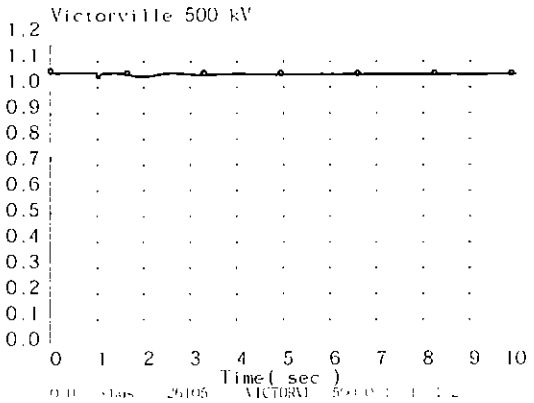




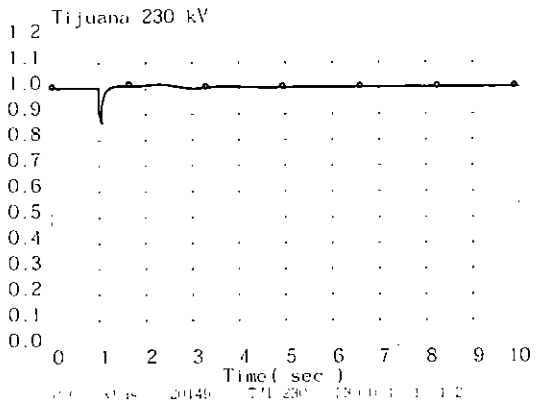


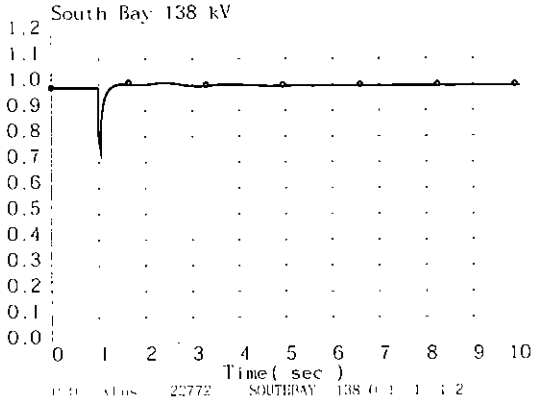


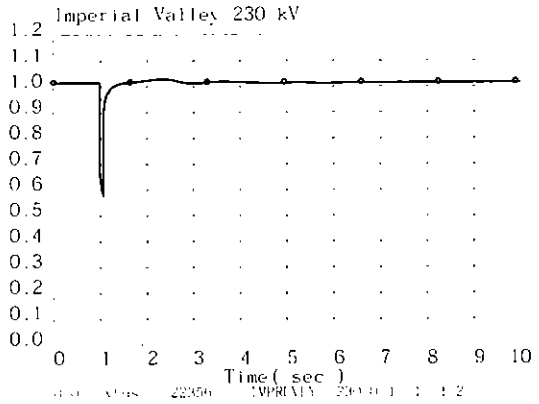


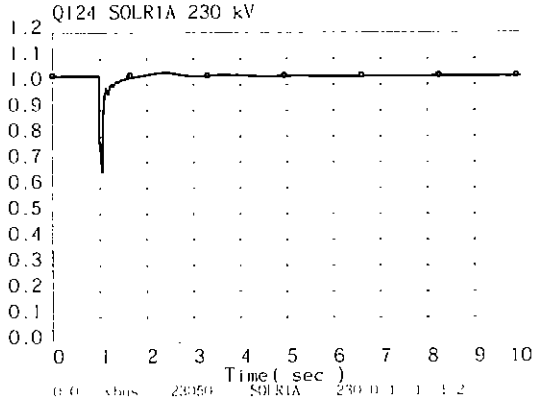


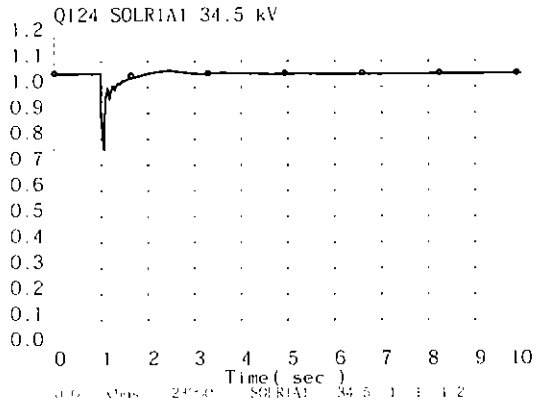
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

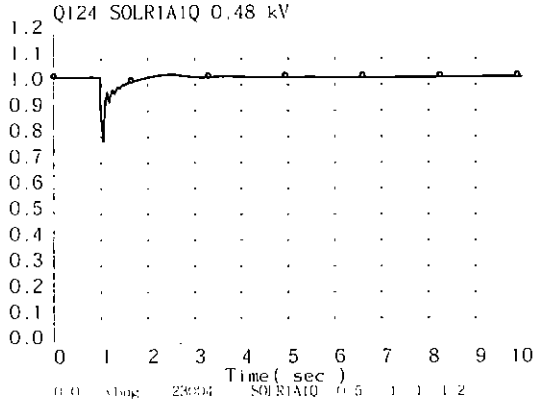






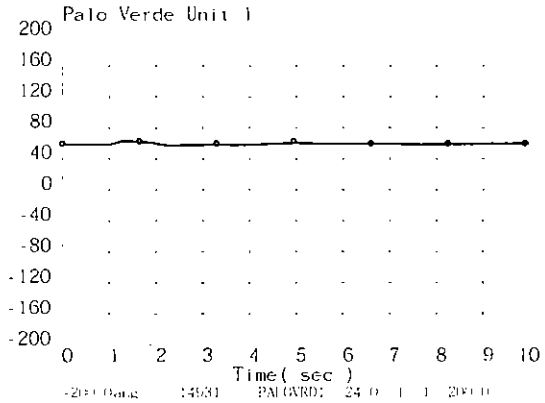


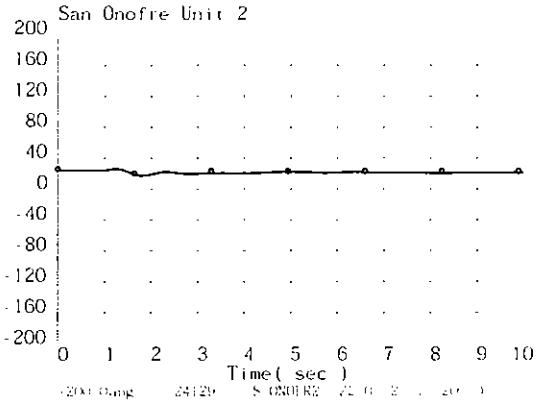


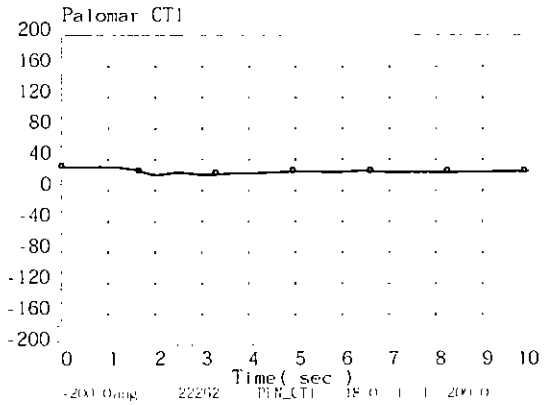


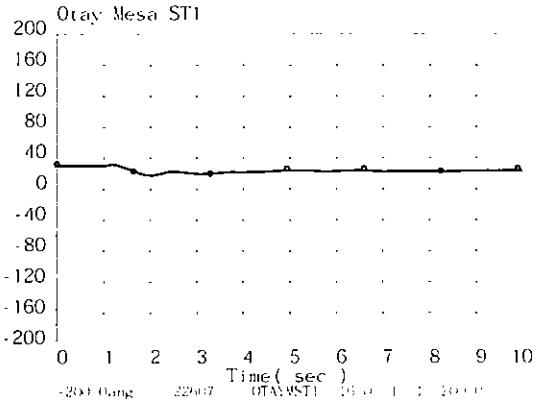
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

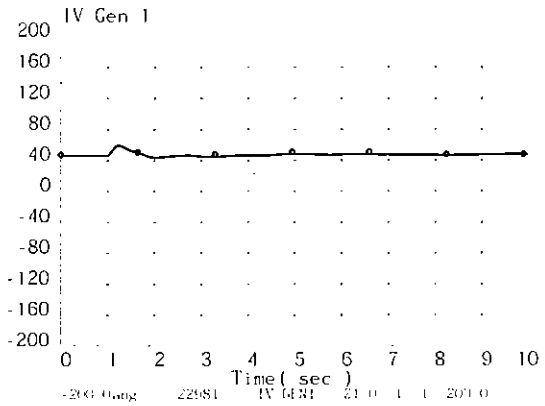
Relative Rotor Angle

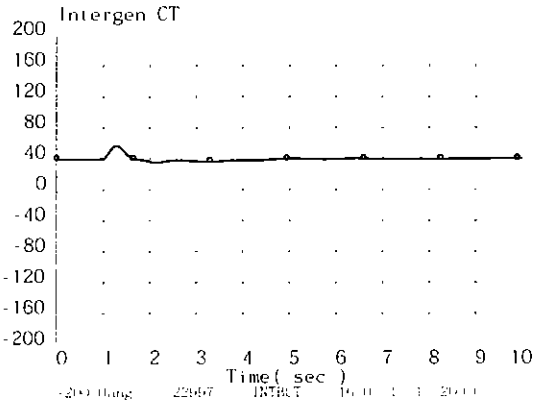




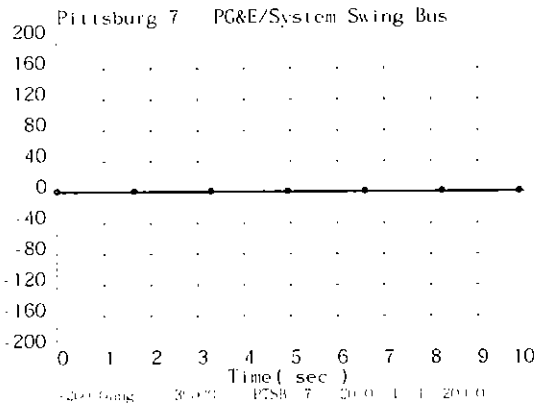


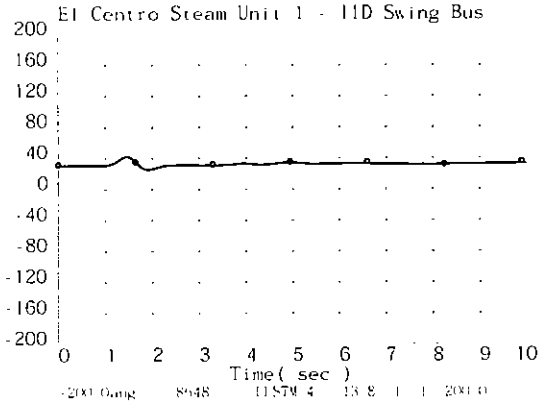


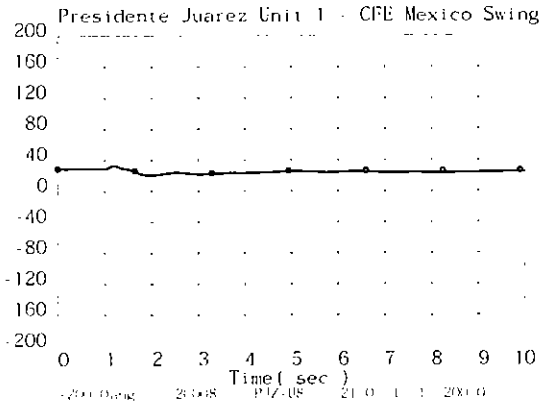


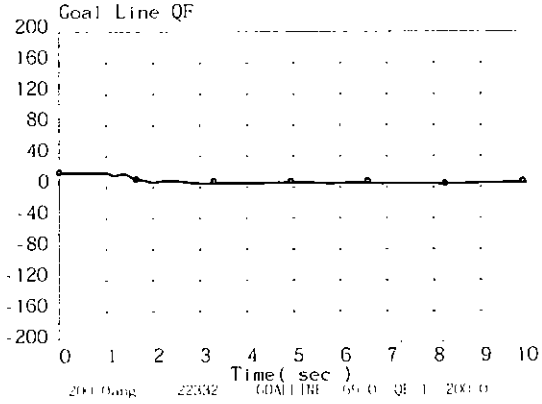


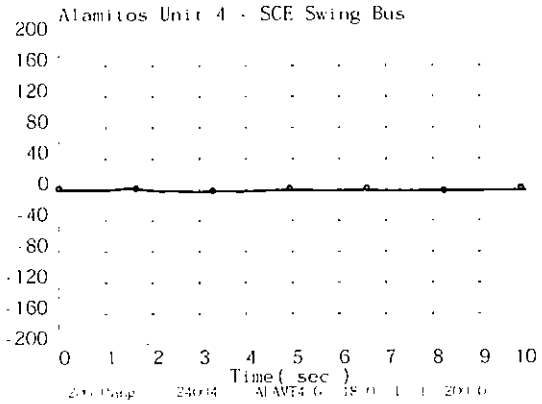
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

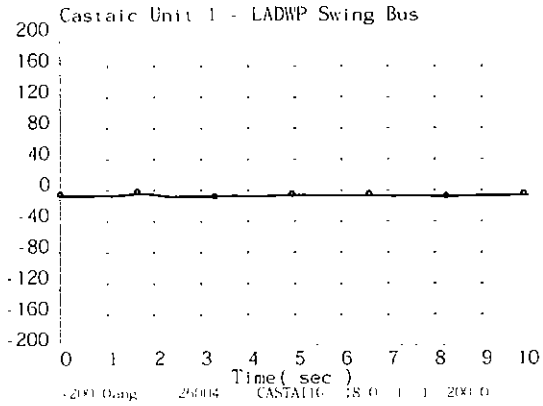






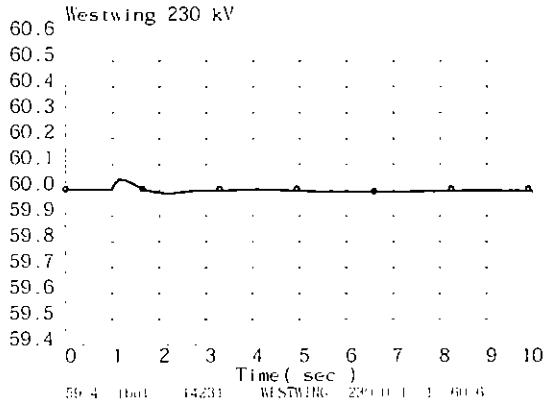


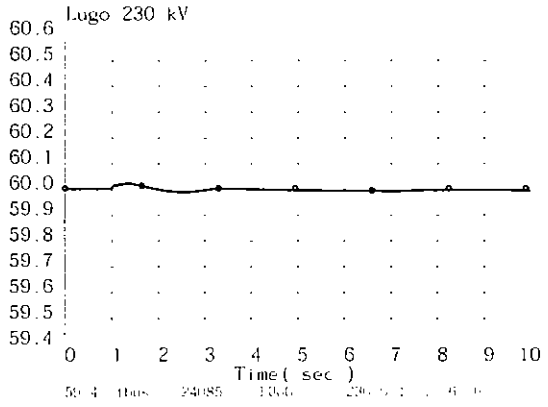


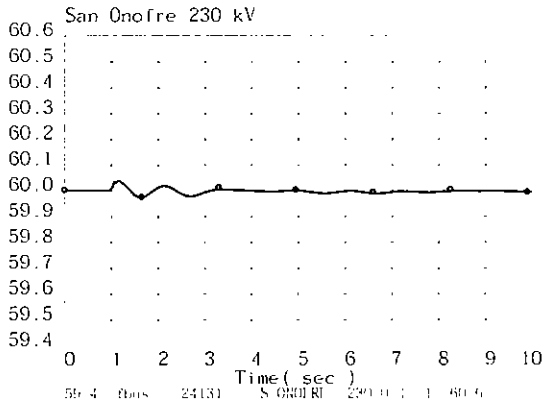


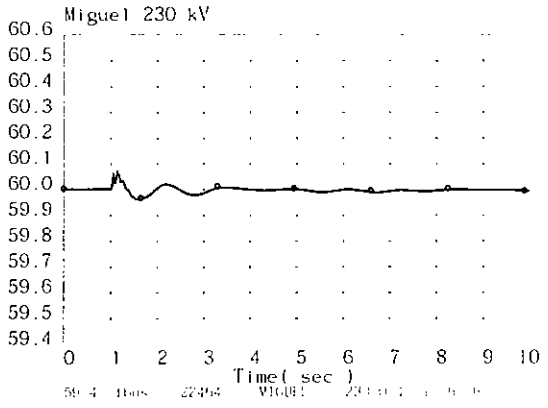
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

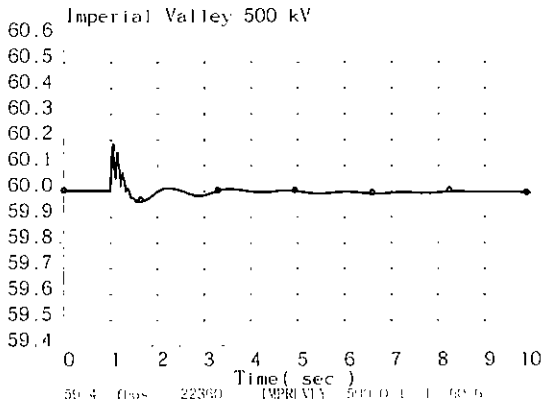
Bus Frequency

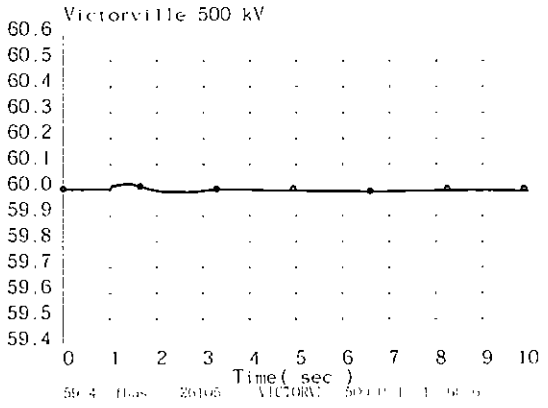






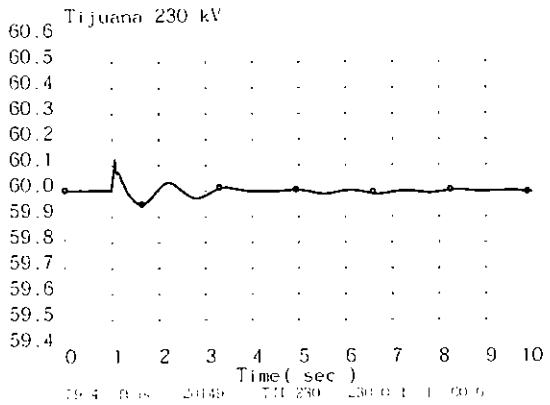


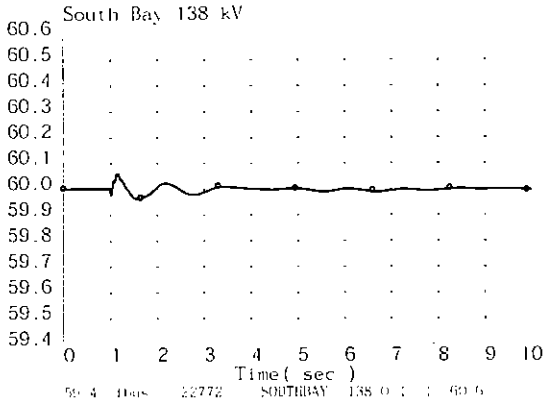


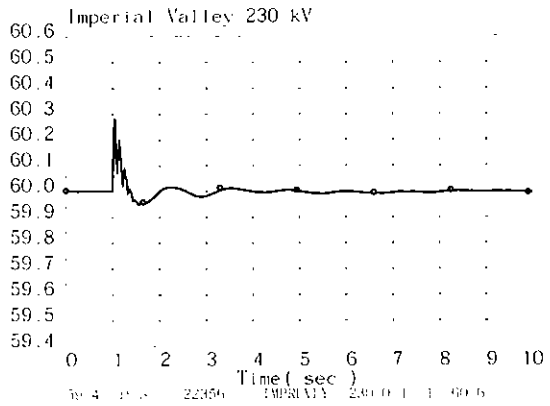


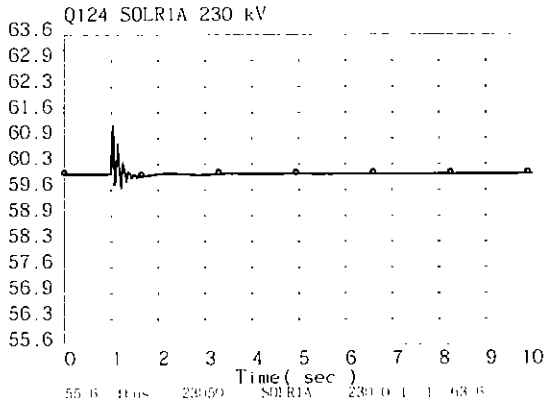
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

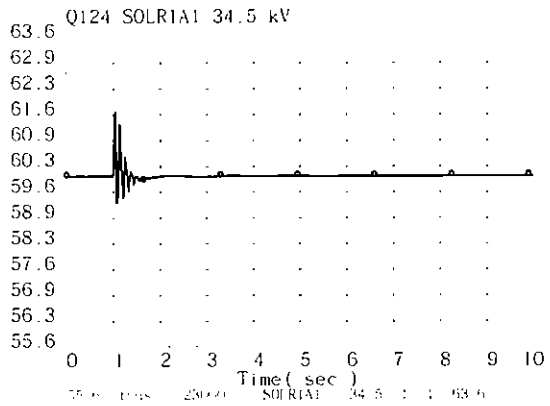
Bus Frequency

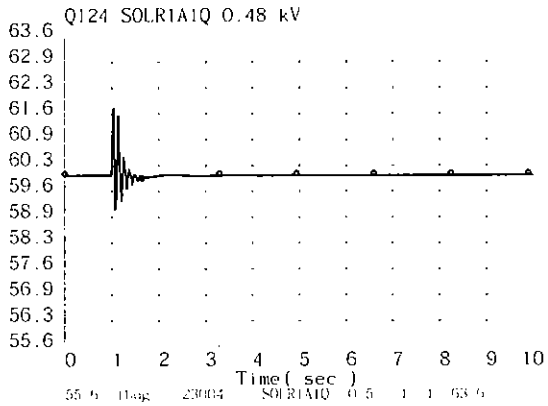




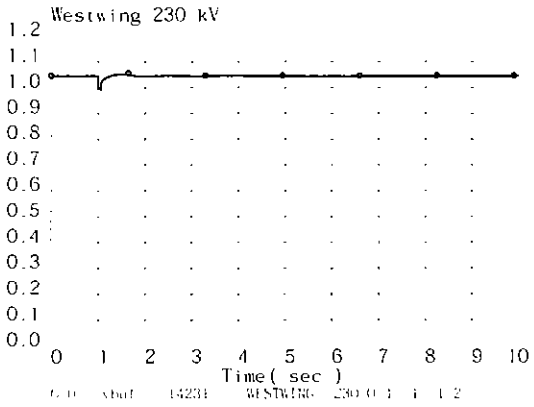


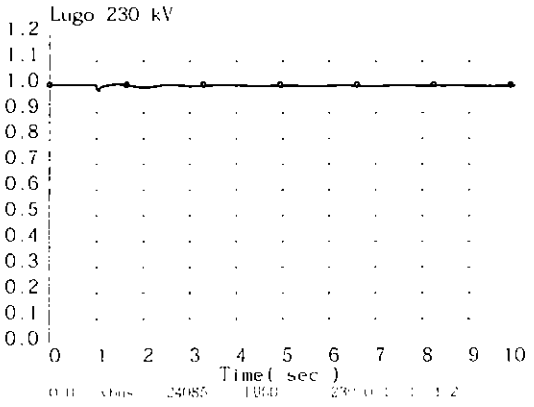


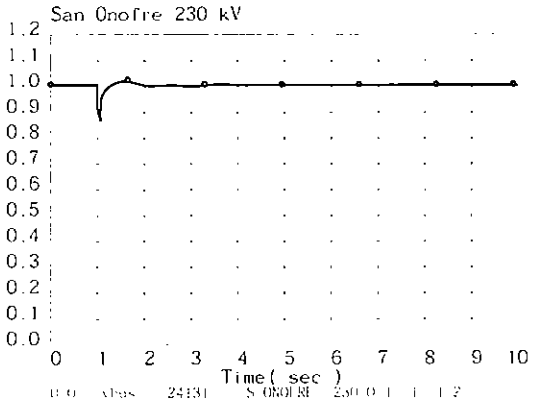


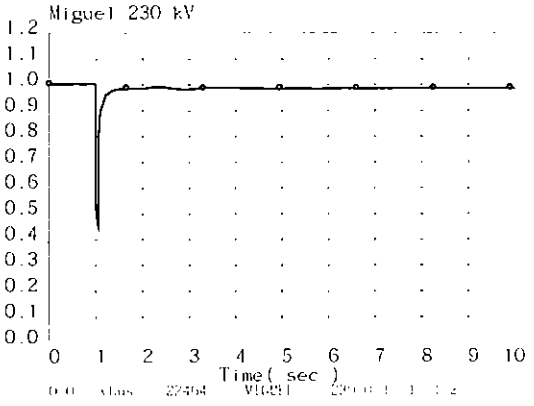


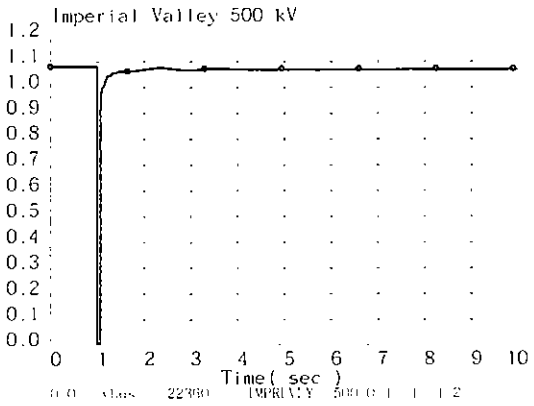
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

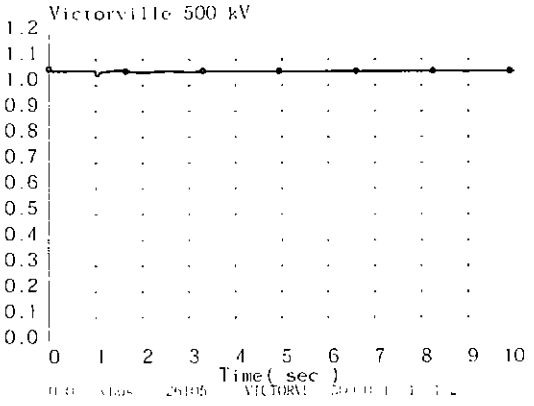






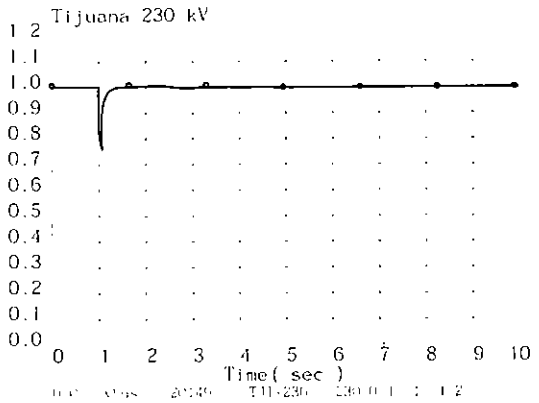


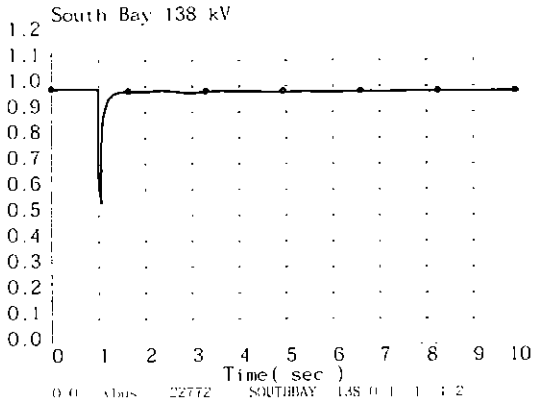


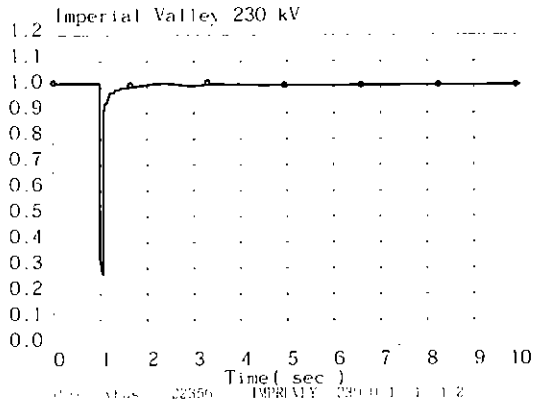


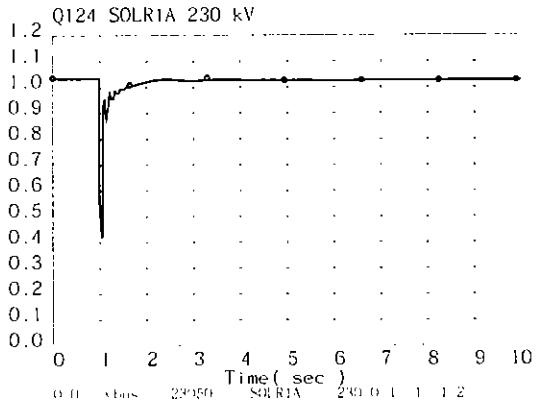
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

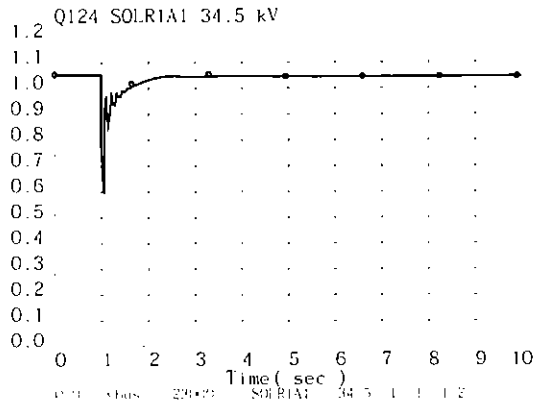
Bus Voltage

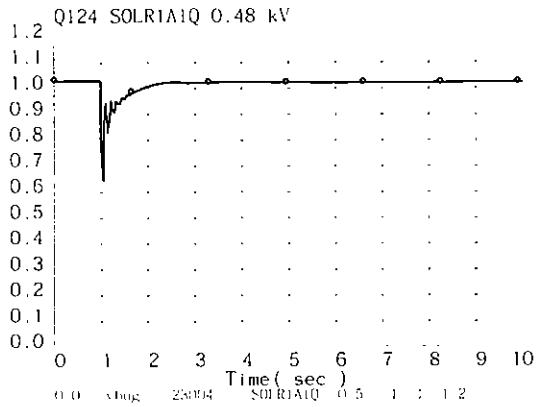






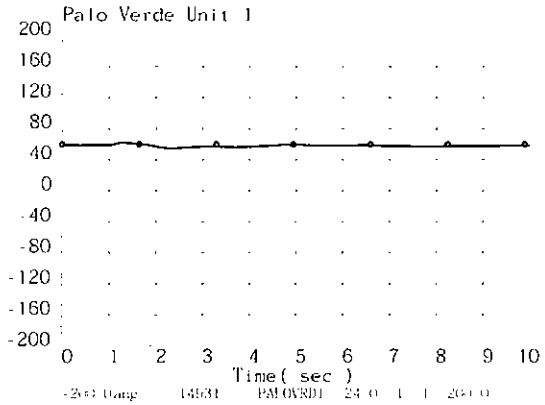


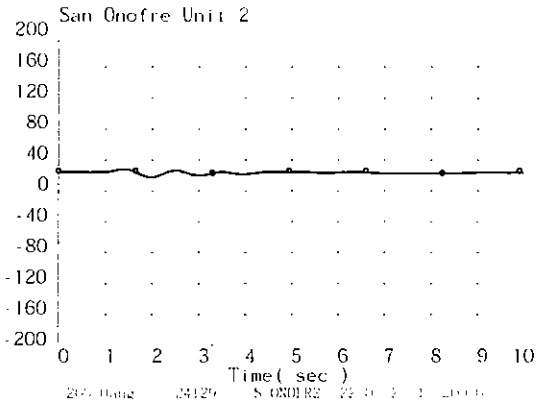


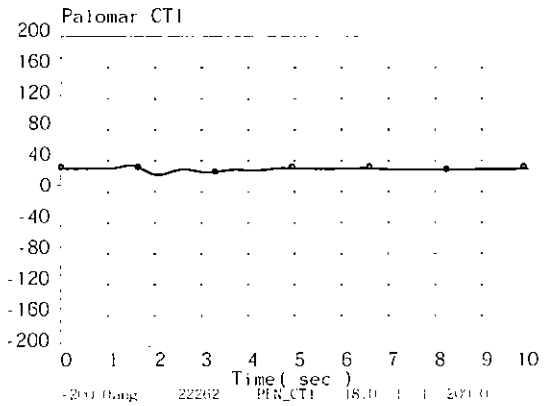


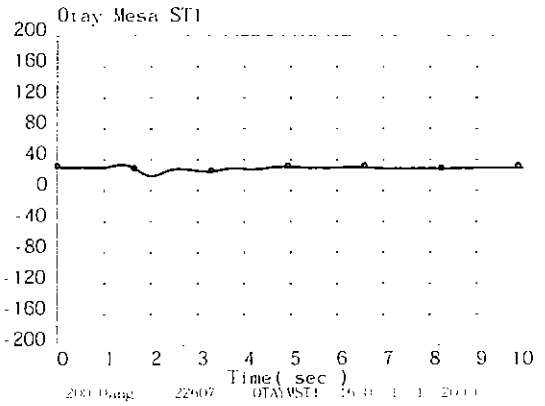
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

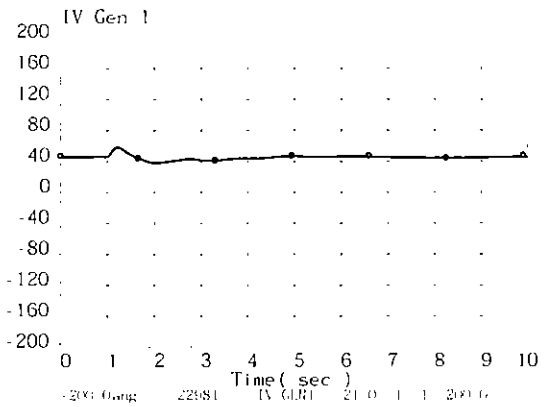
Relative Rotor Angle

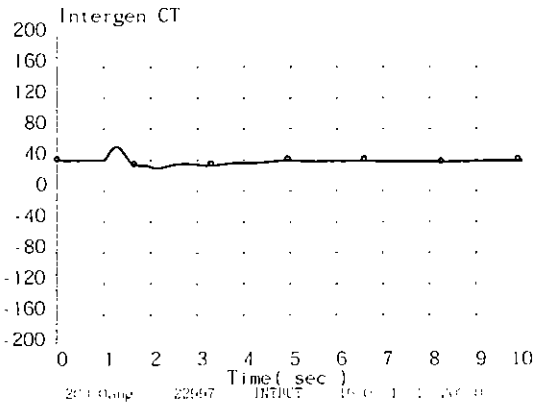






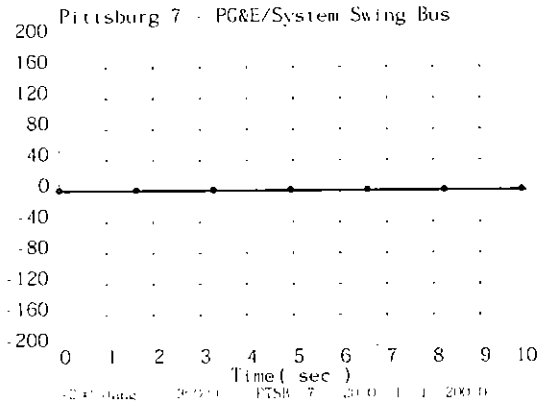


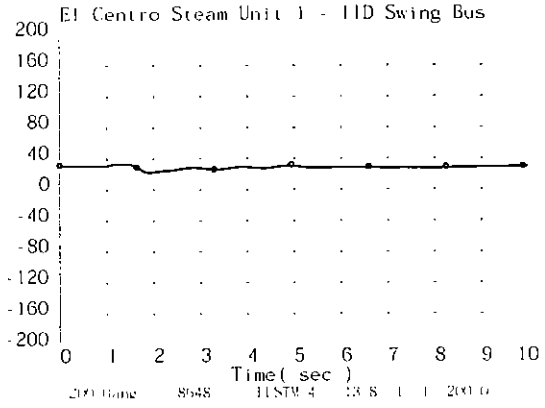


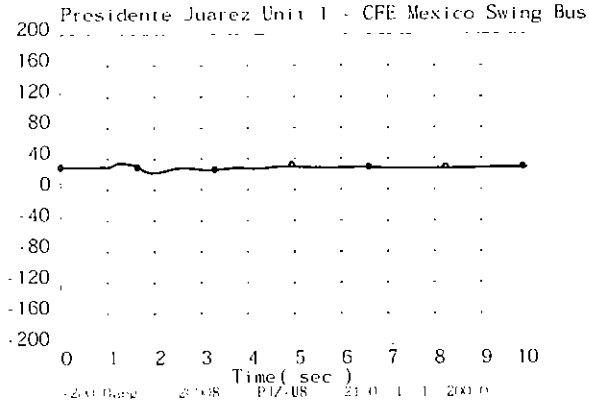


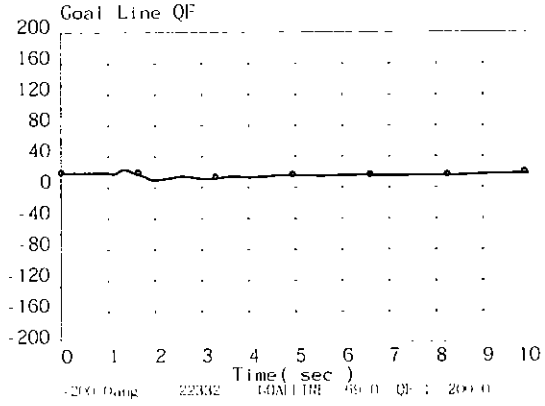
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

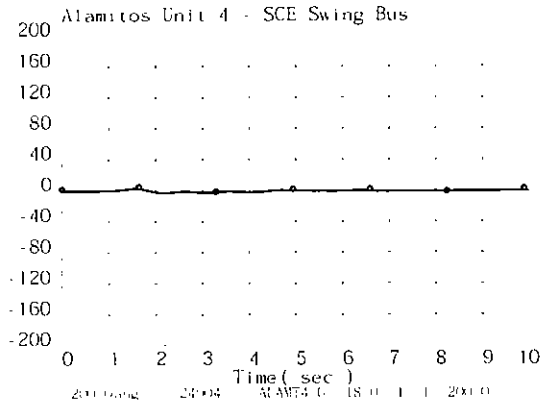
Relative Rotor Angle

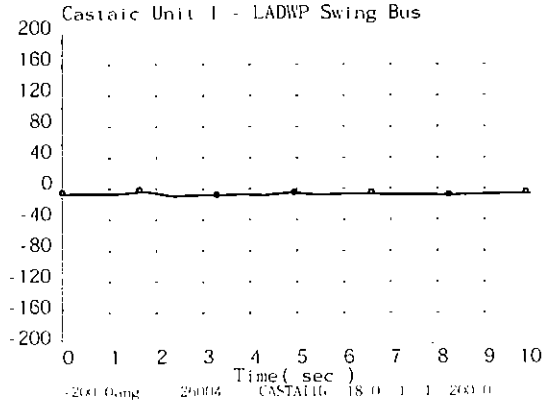




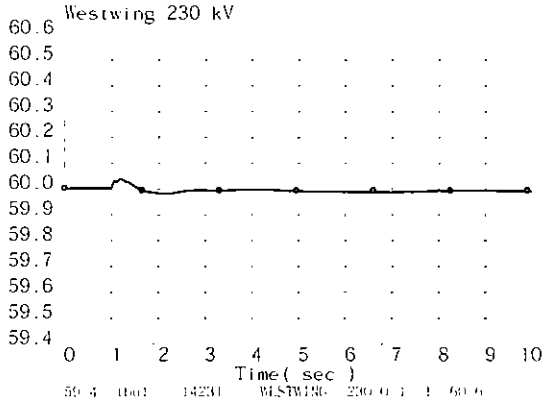


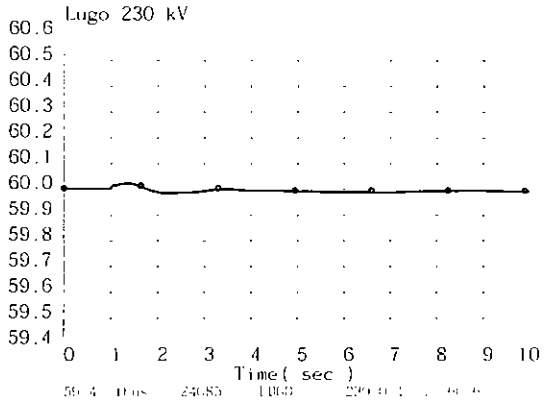


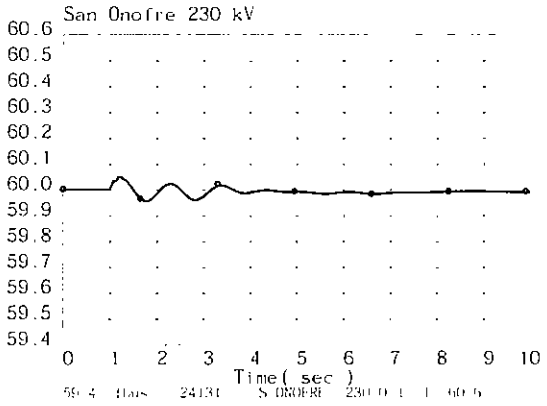


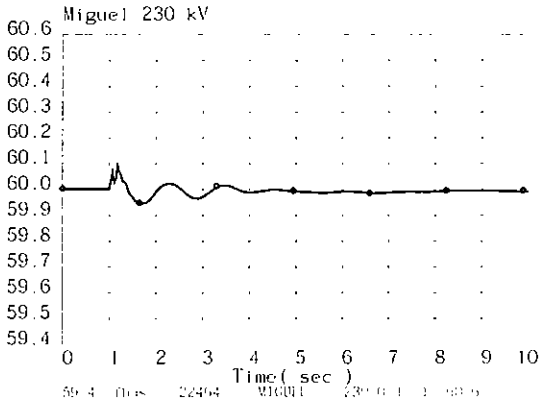


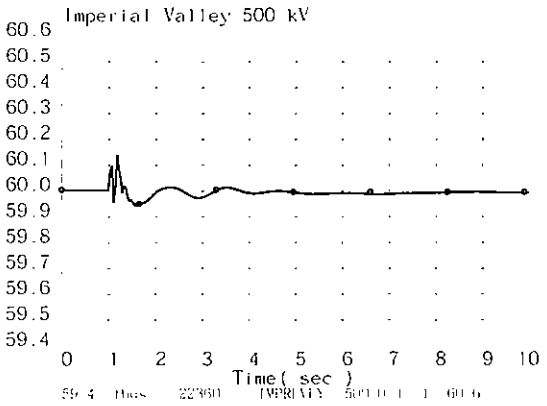
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

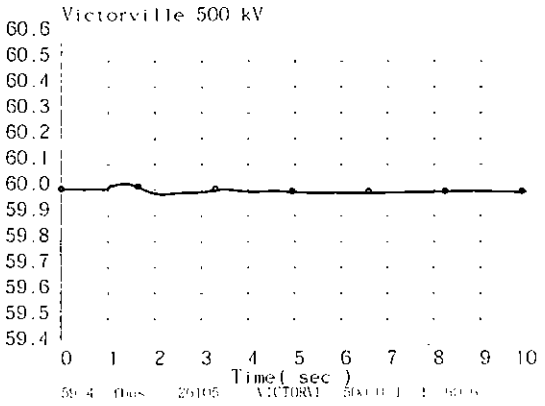






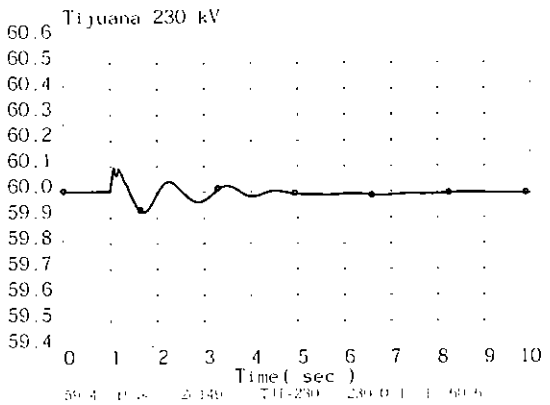


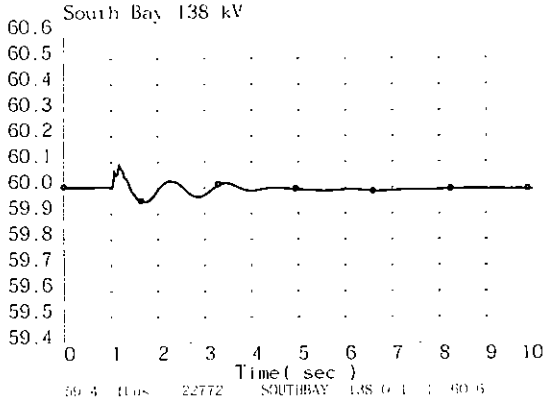


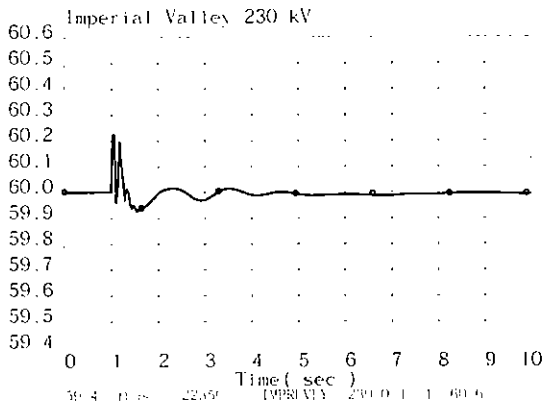


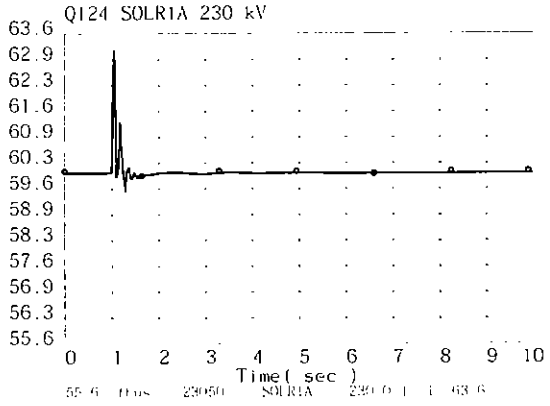
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

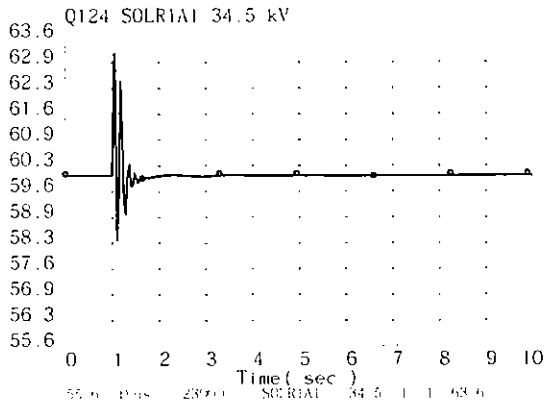
Bus Frequency

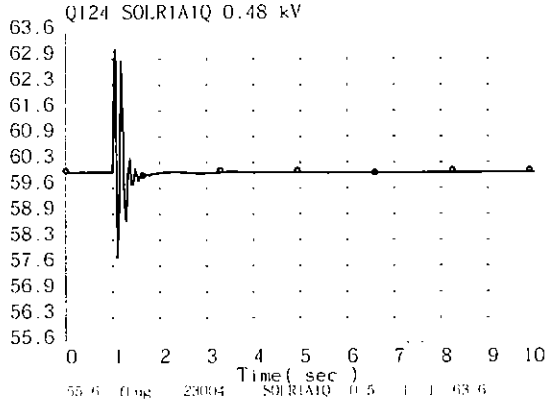






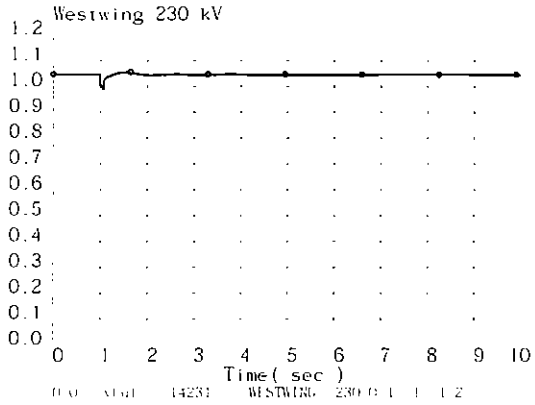


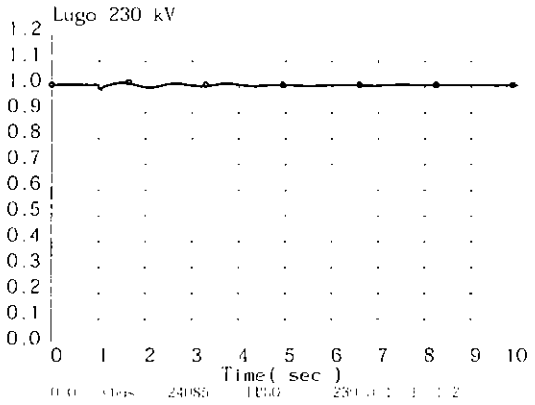


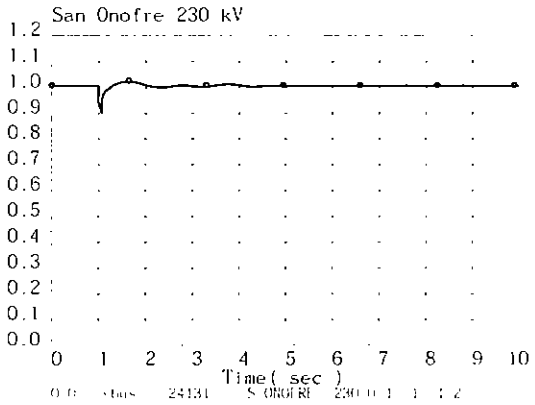


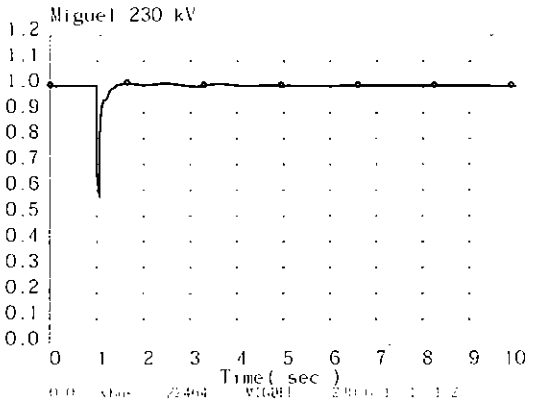
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

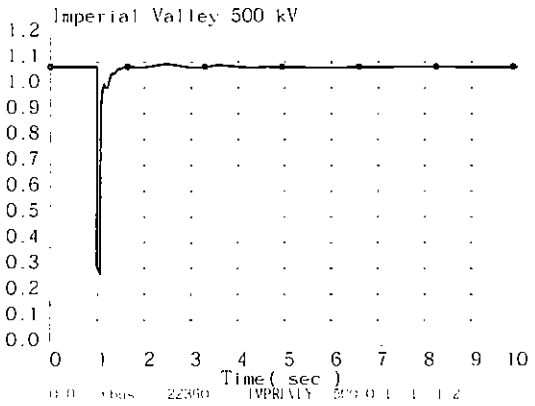
Bus Voltage

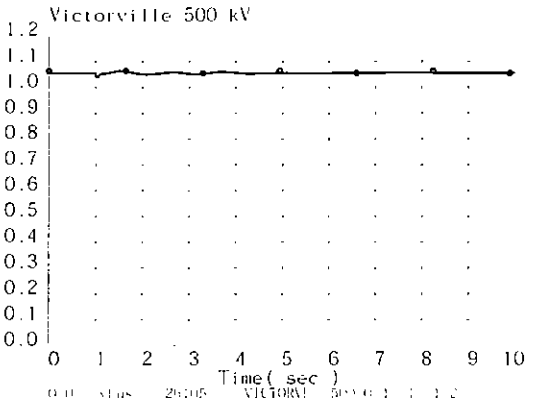




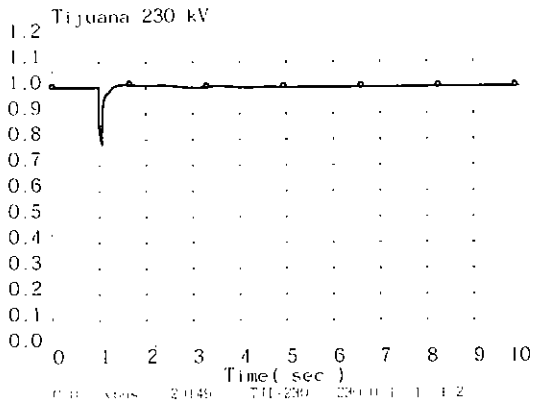


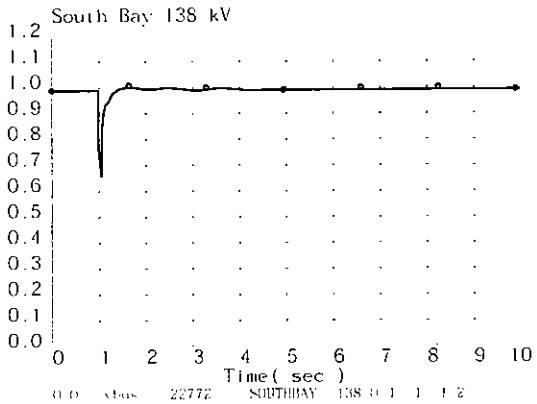


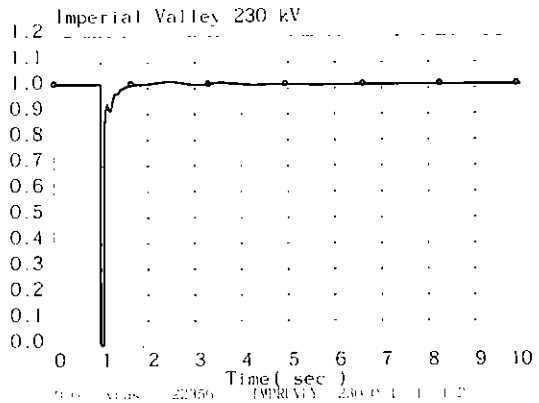


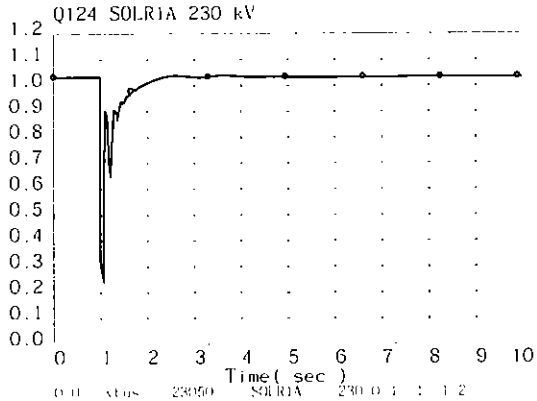


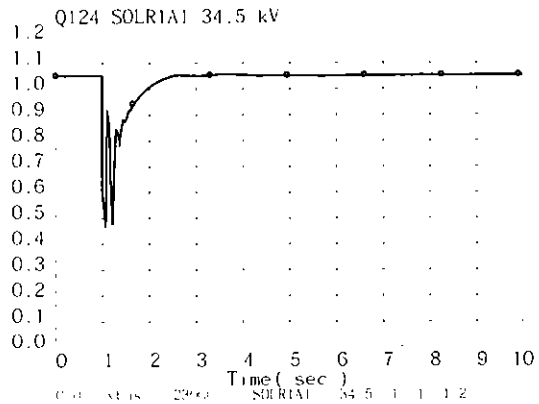
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

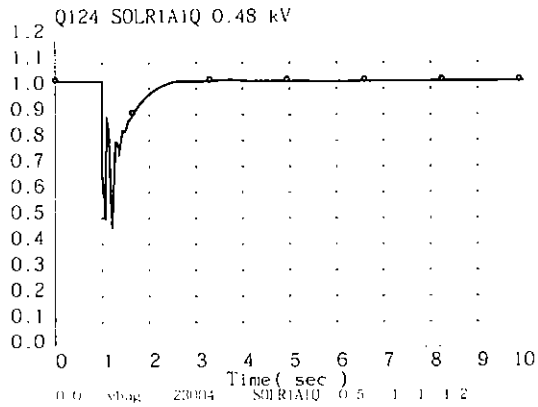






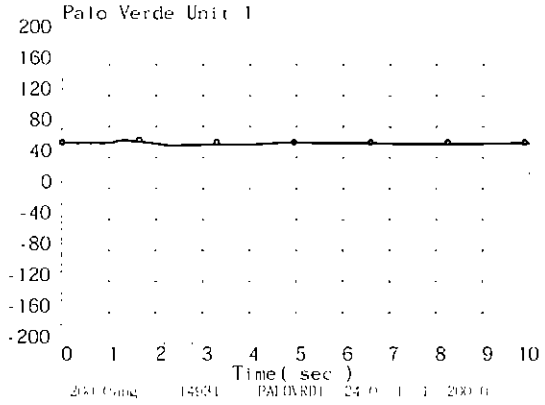


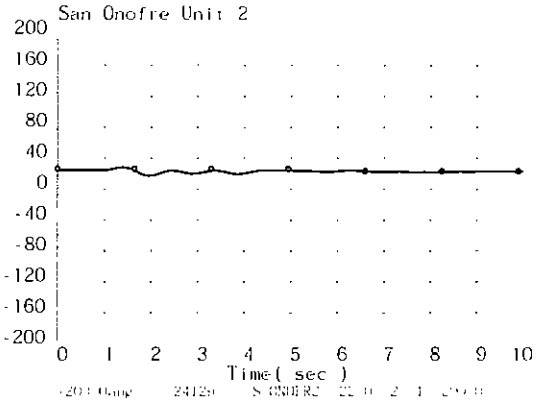


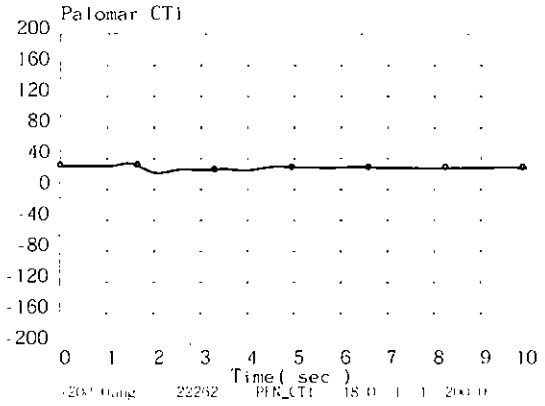


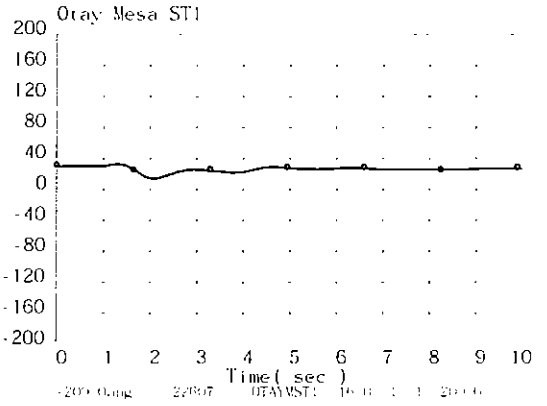
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

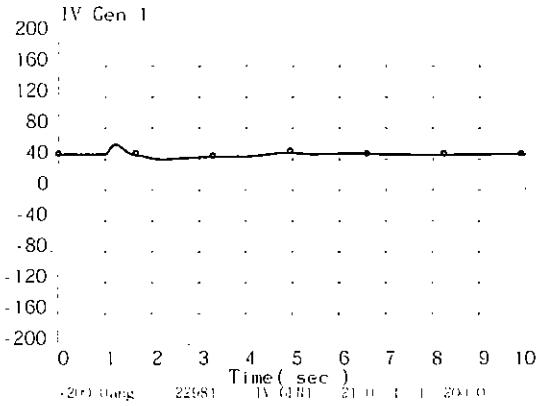
Relative Rotor Angle

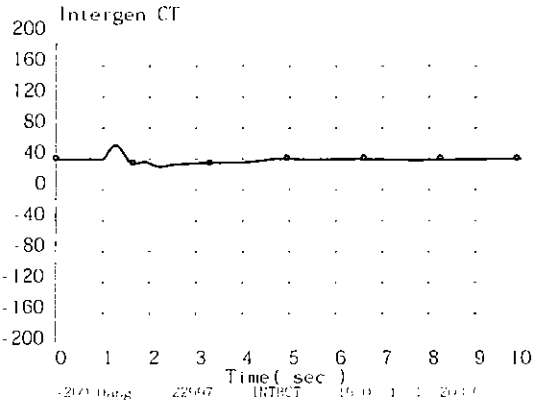






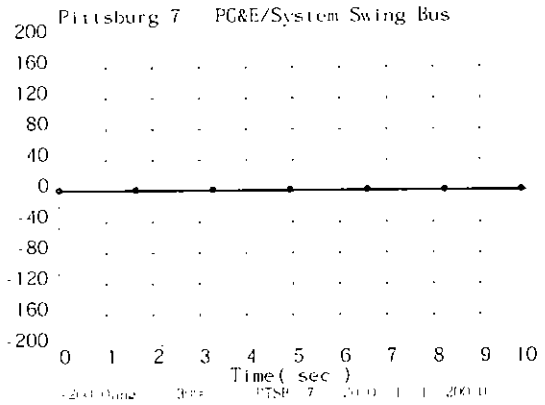


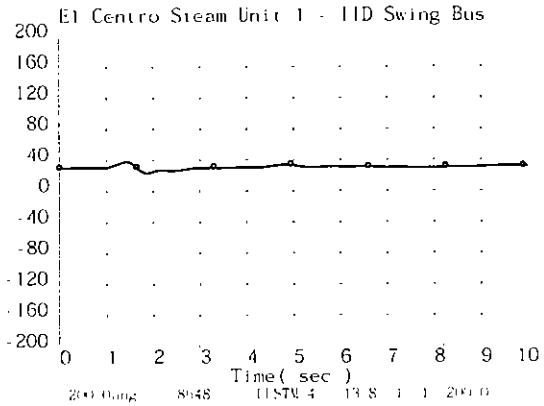


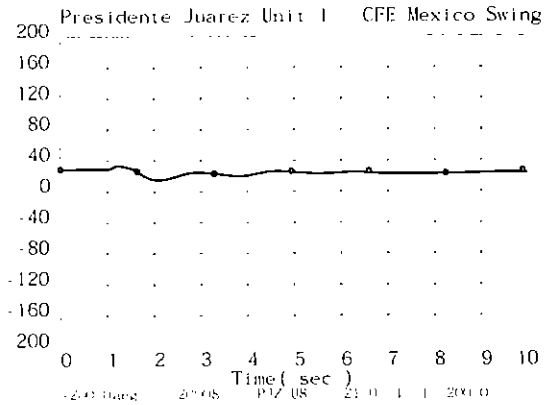


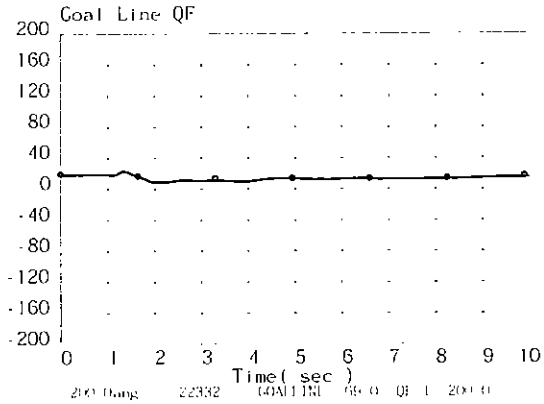
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

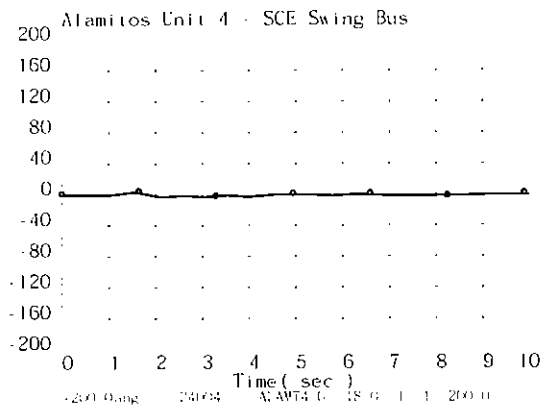
Relative Rotor Angle

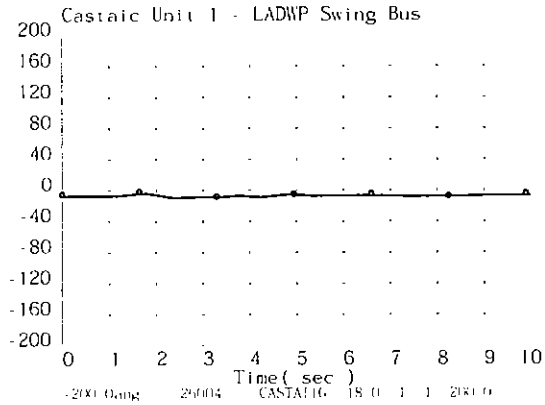






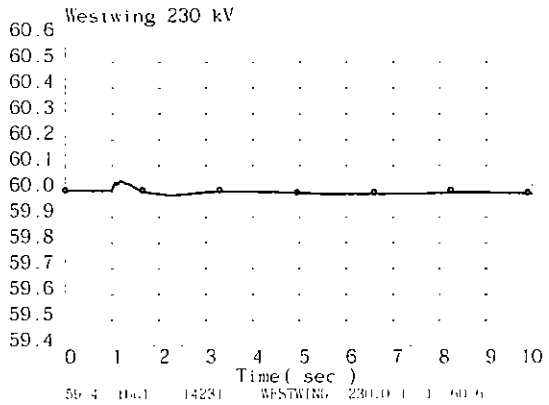


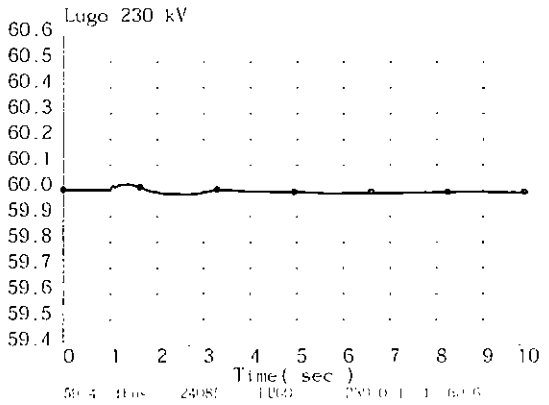


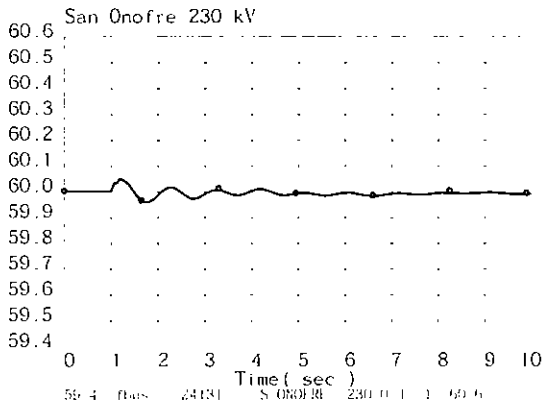


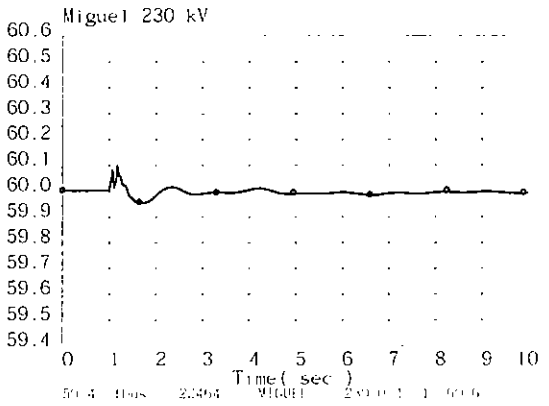
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

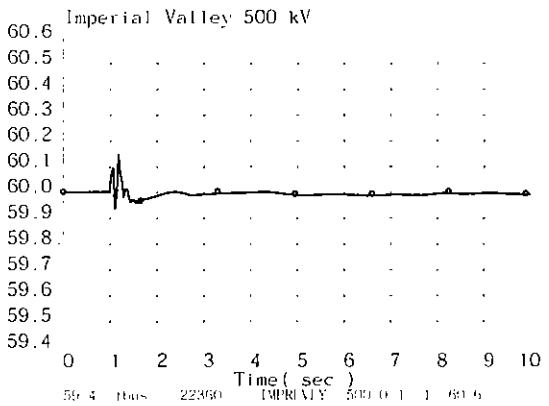
Bus Frequency

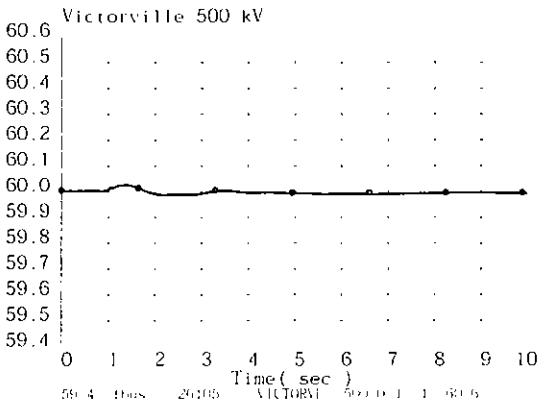






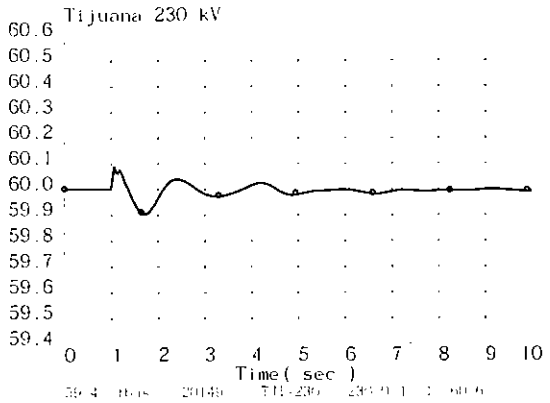


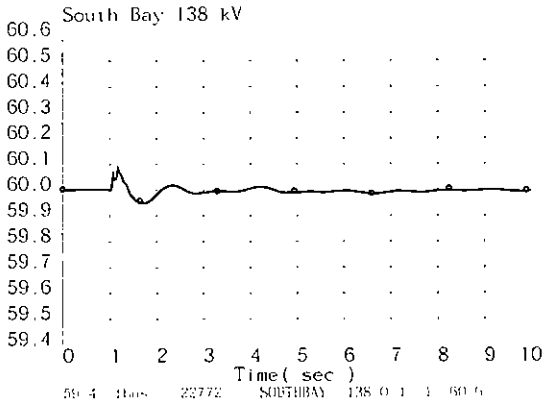


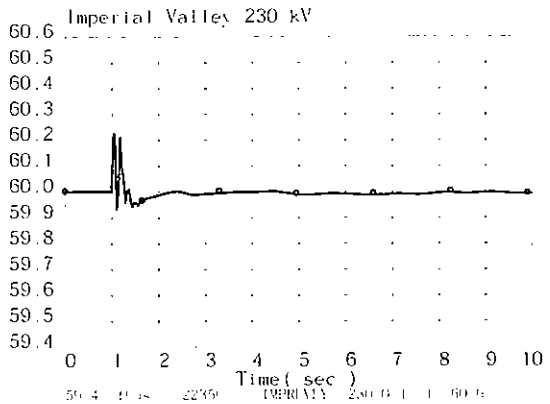


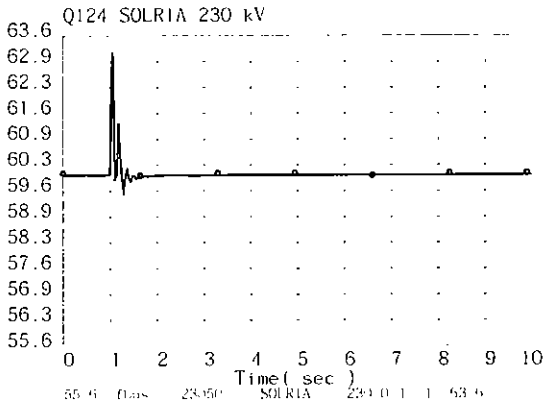
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

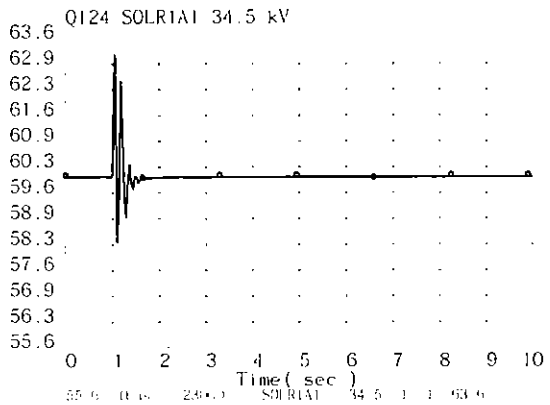
Bus Frequency

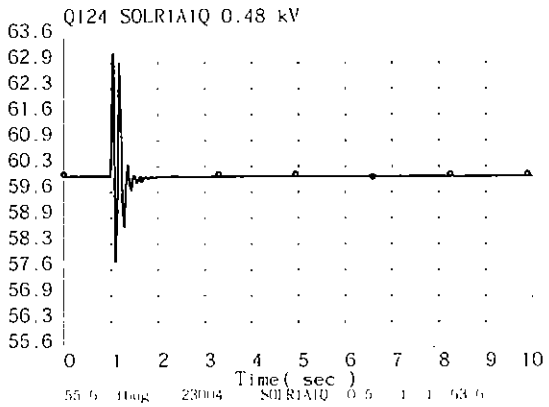






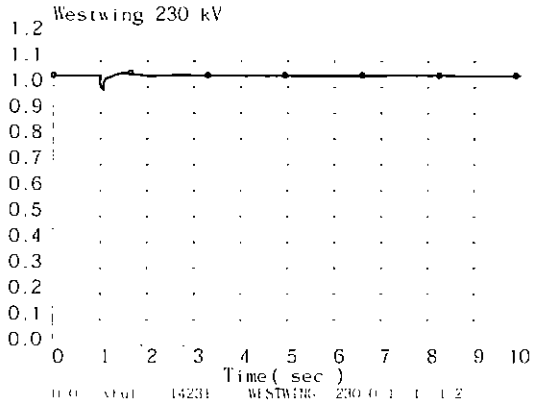


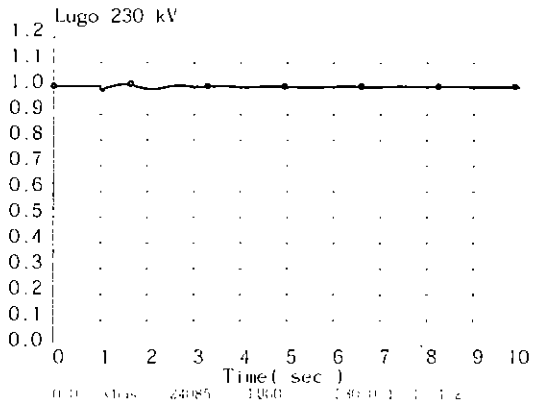


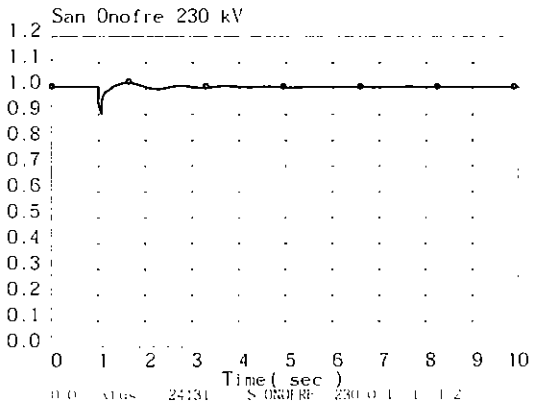


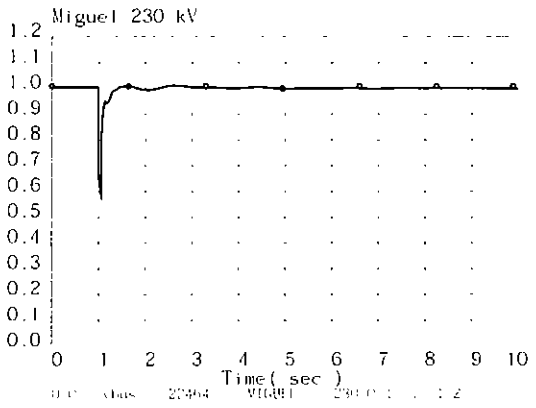
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

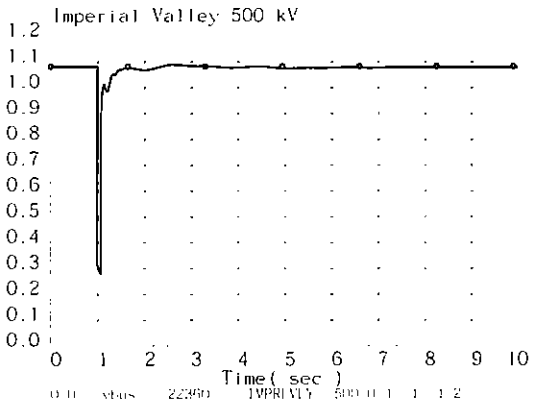
Bus Voltage

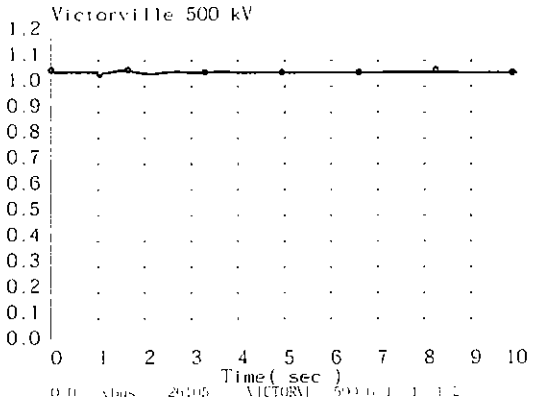




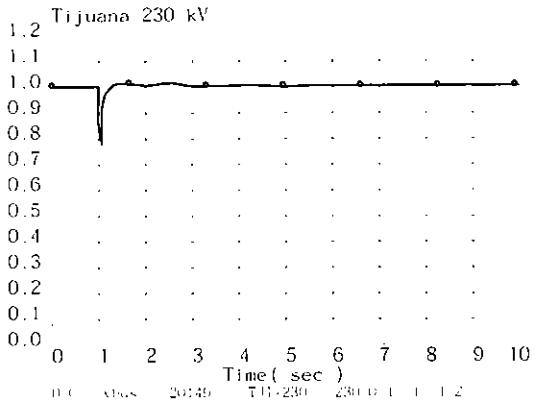


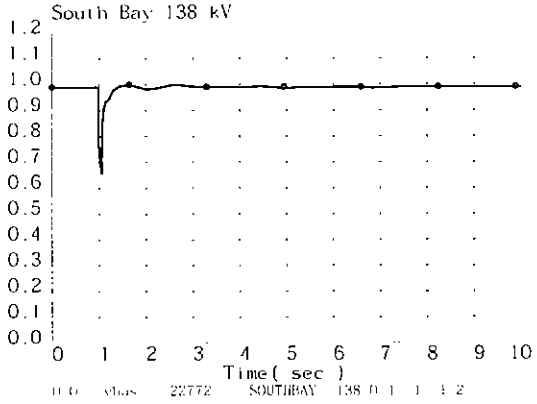


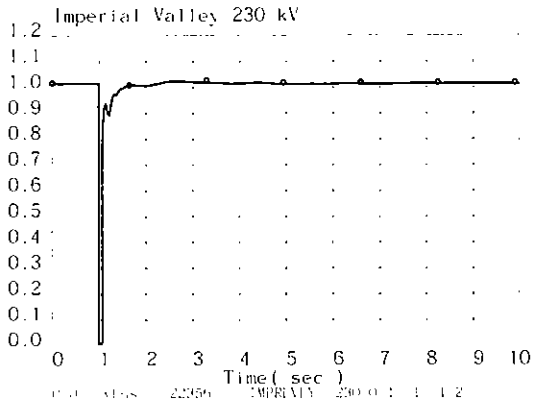


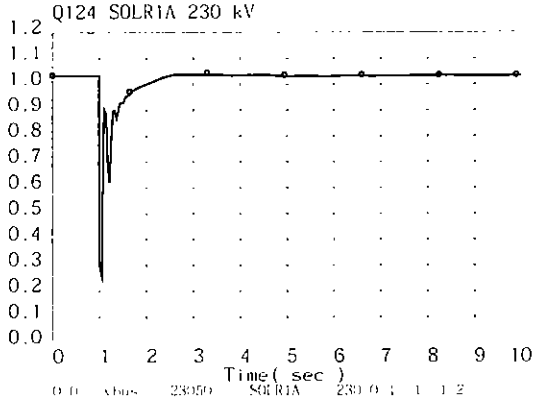


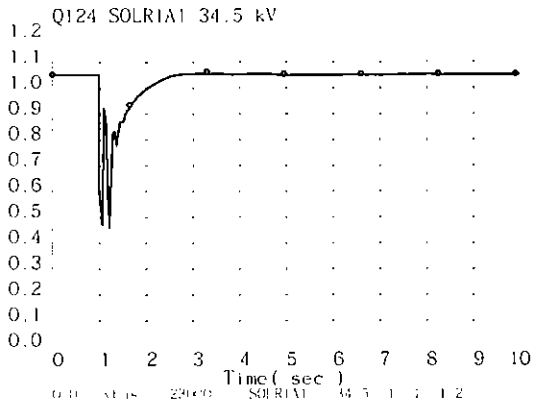
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

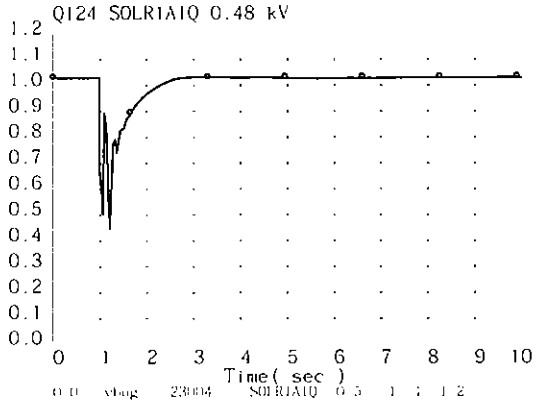






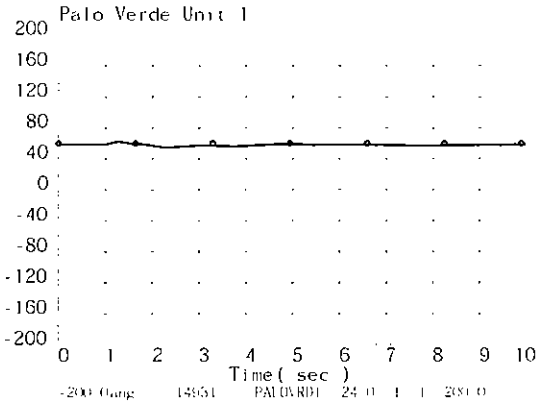


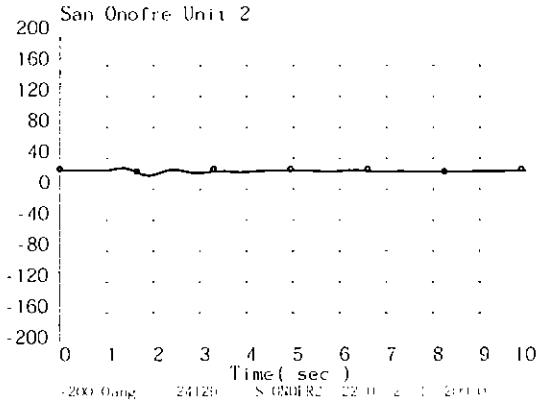


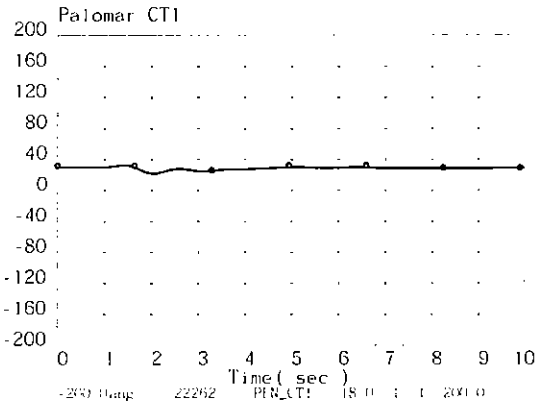


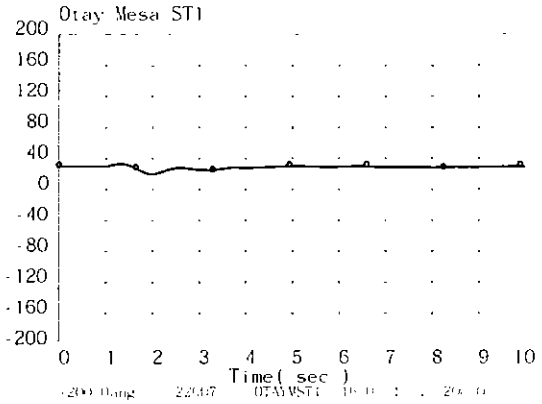
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

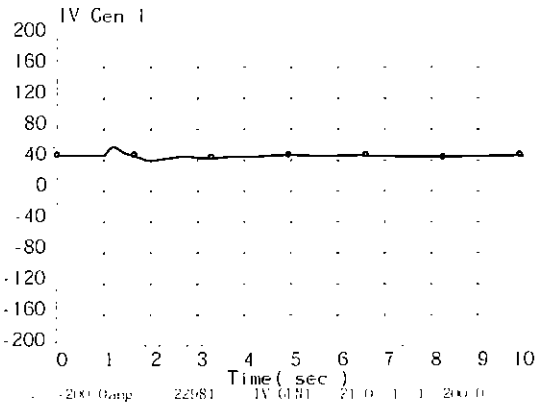
Relative Rotor Angle

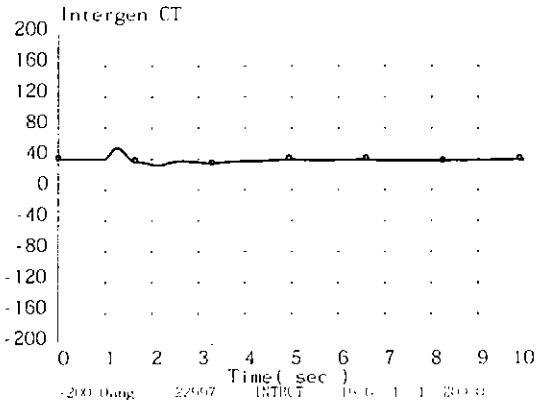






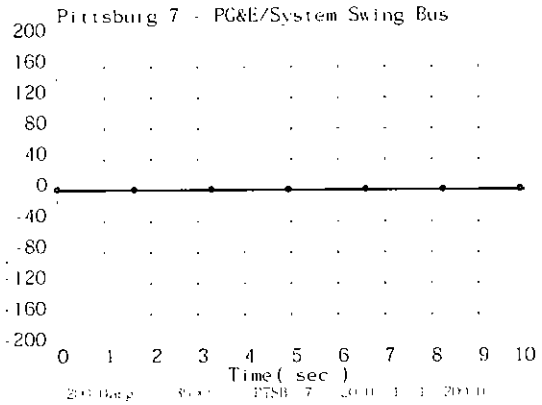


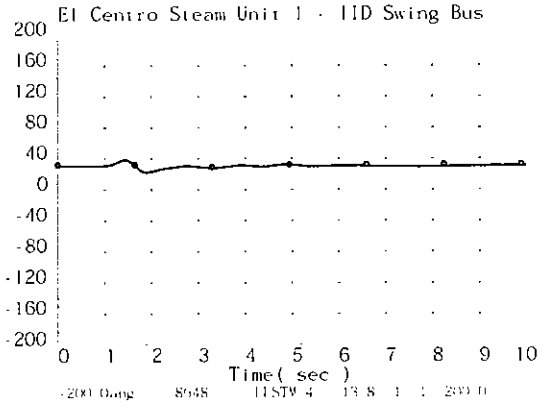


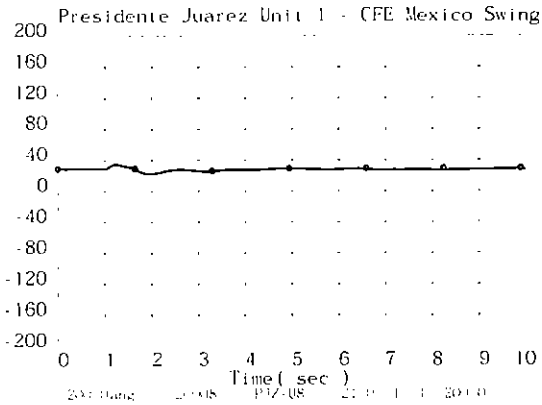


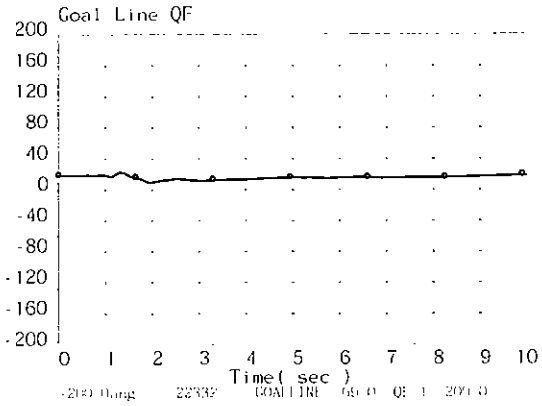
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

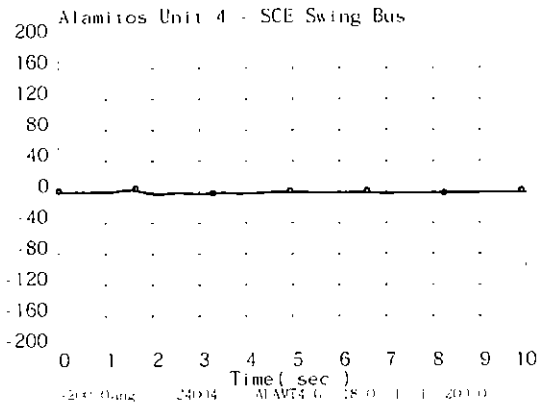
Relative Rotor Angle

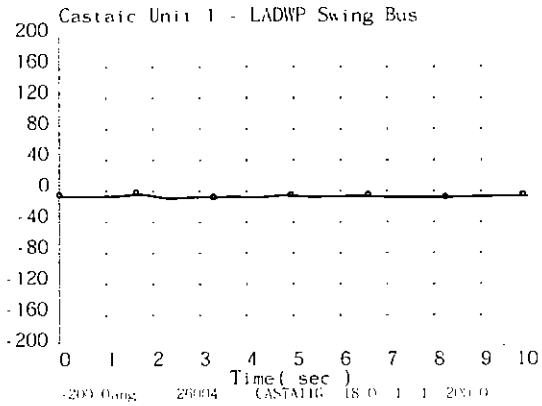






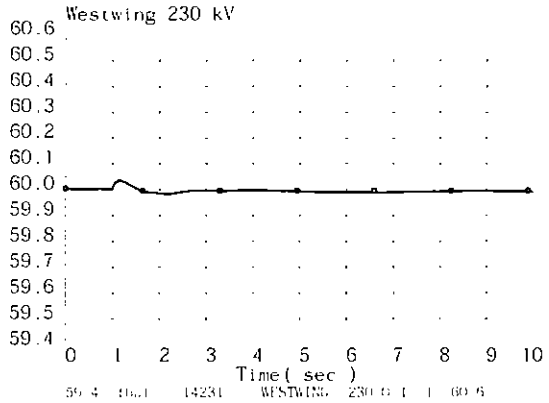


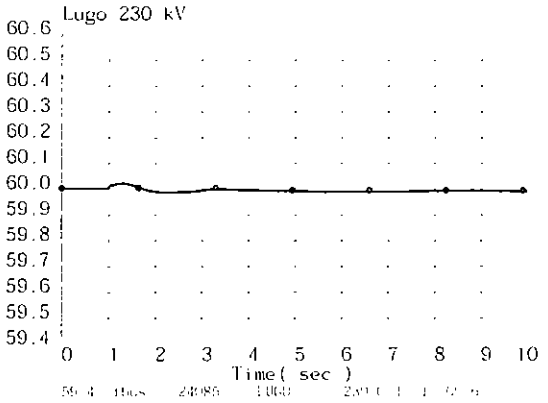


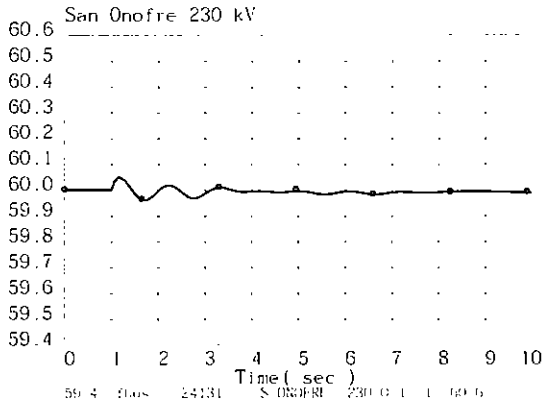


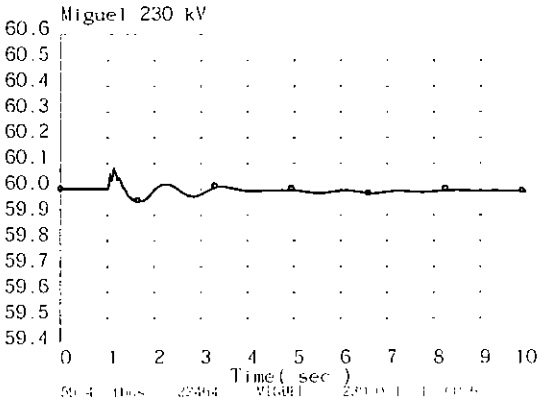
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

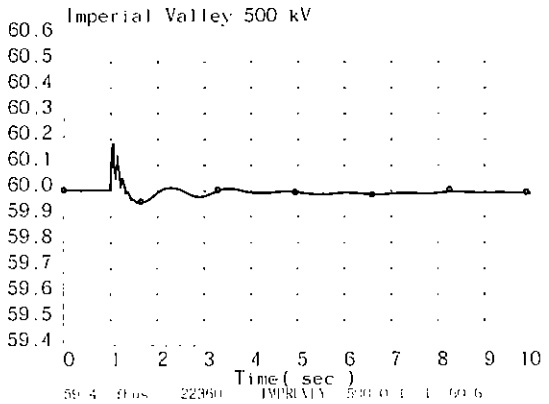
Bus Frequency

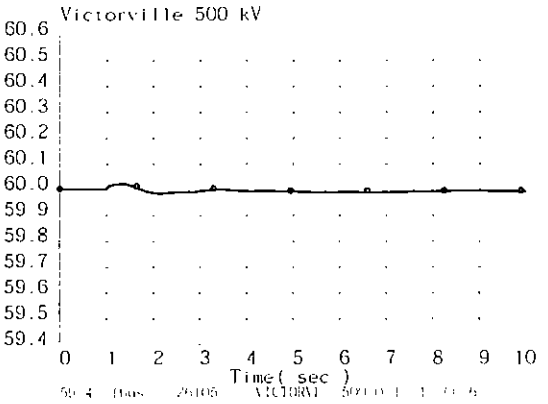




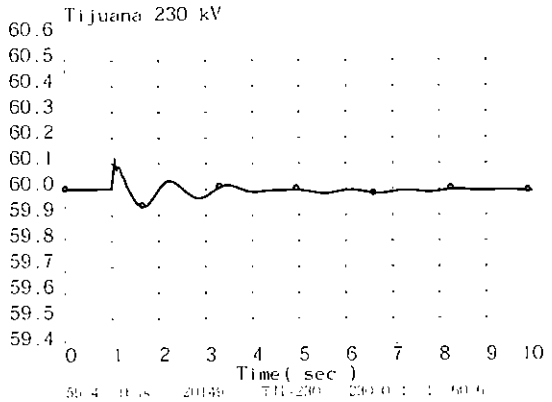


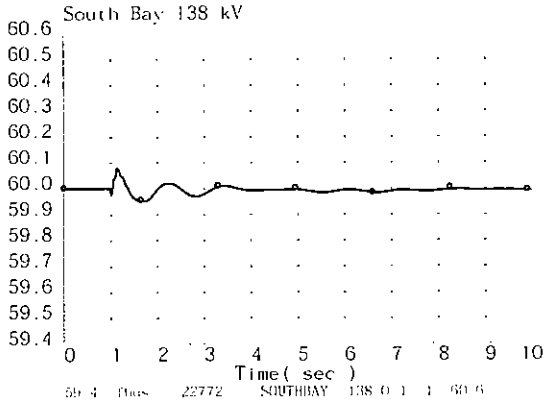


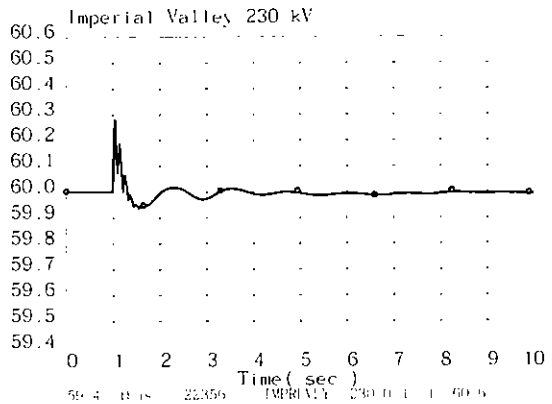


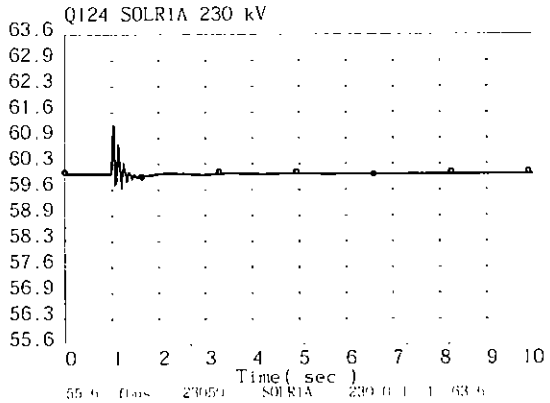


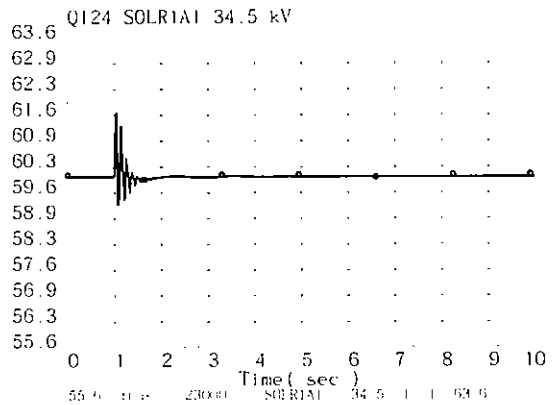
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

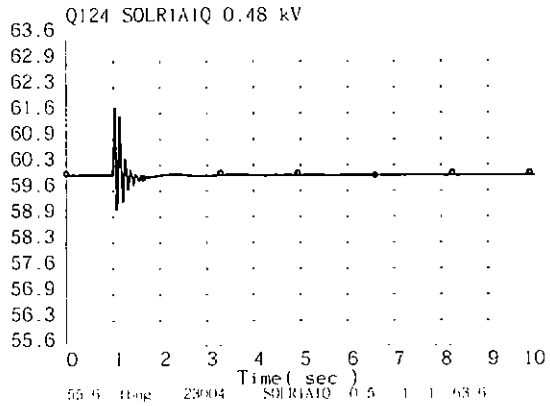






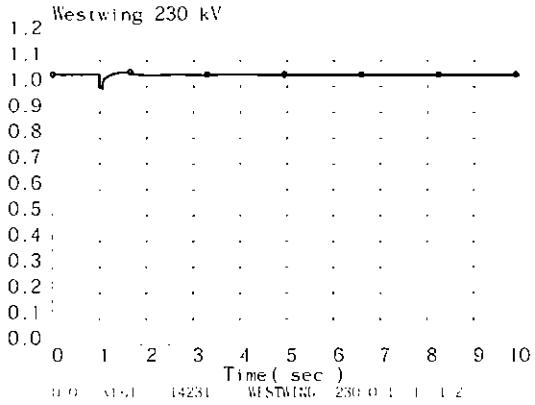


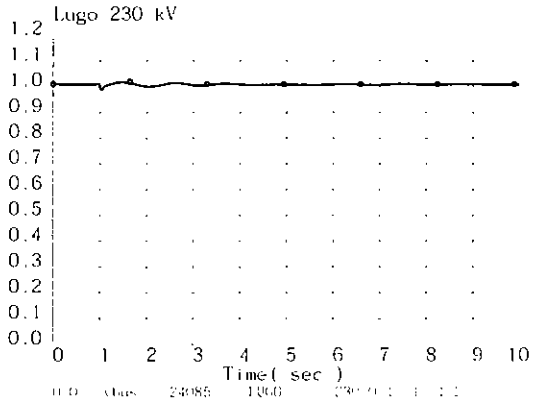


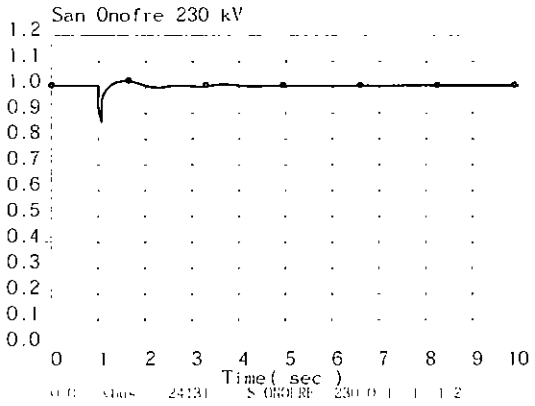


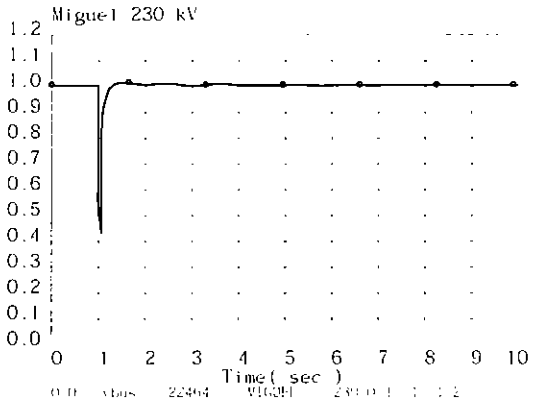
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

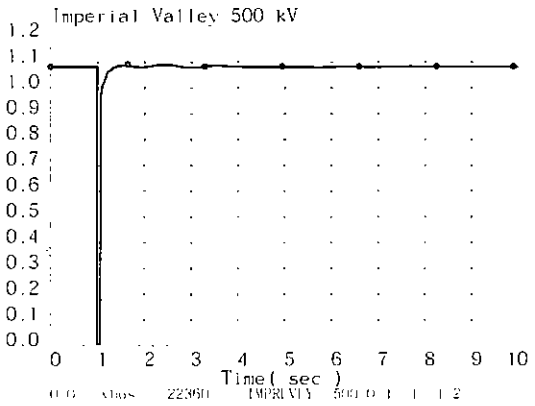
Bus Voltage

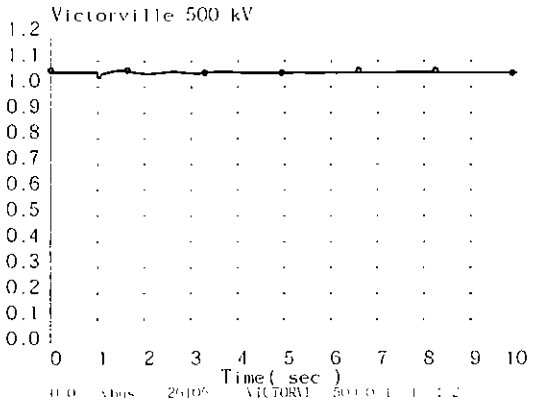




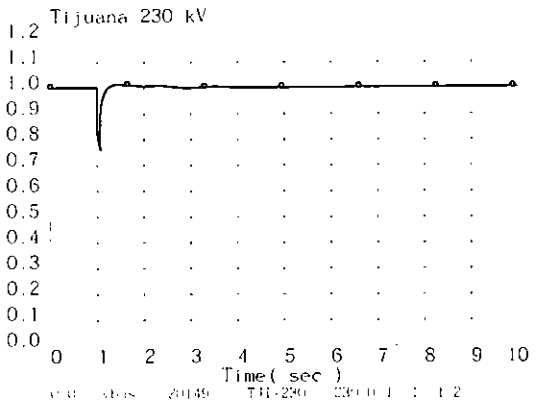


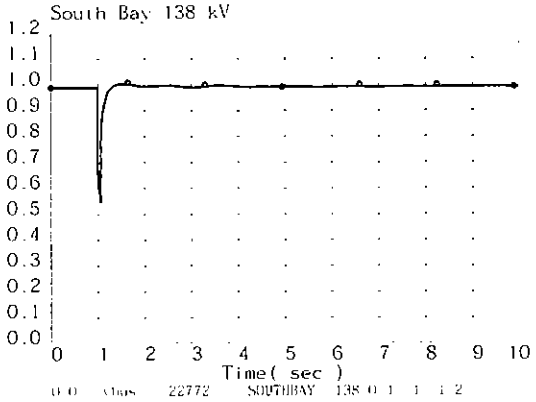


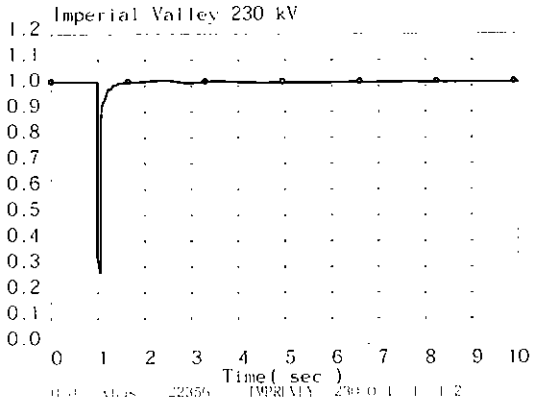


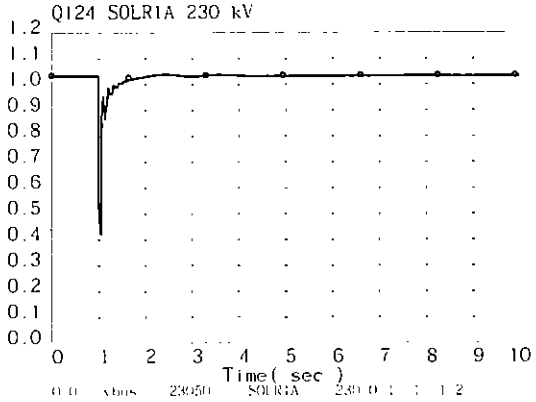


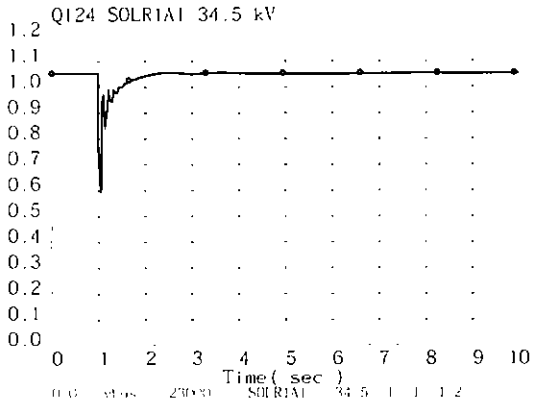
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

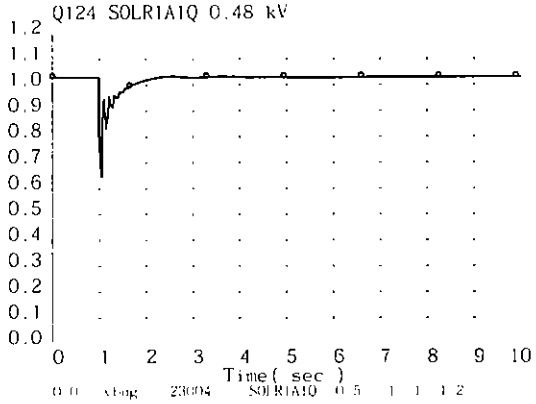






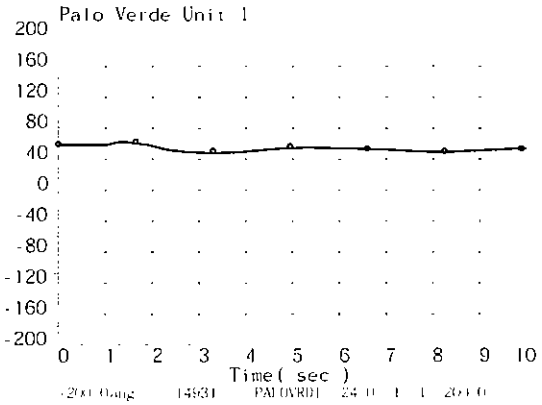


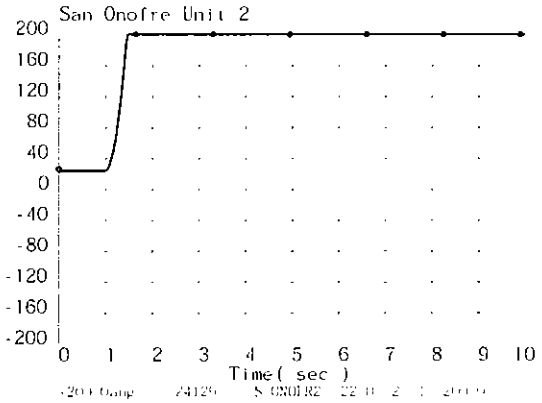


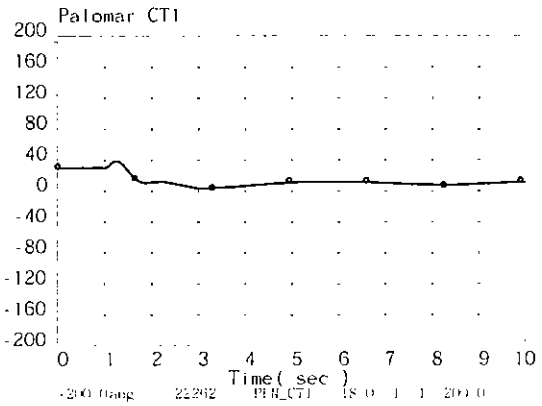


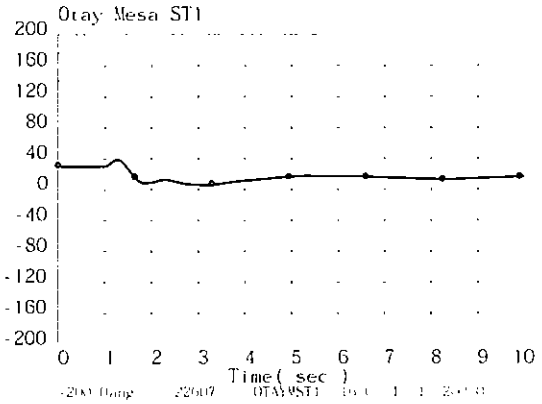
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

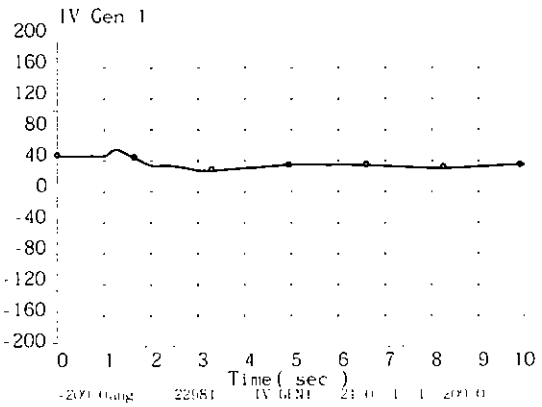
Relative Rotor Angle

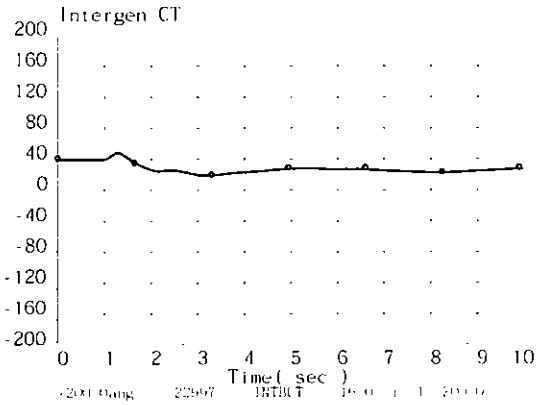






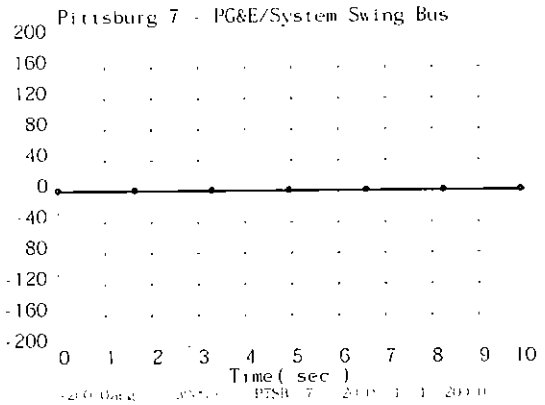


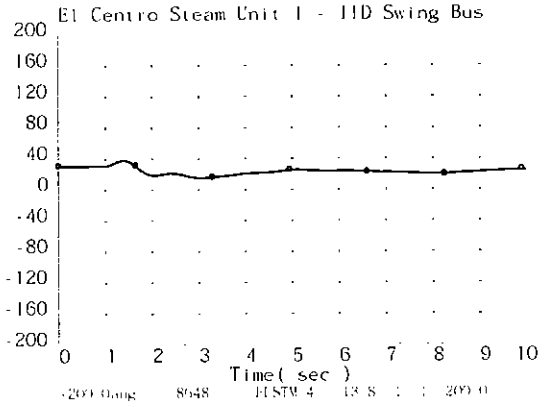


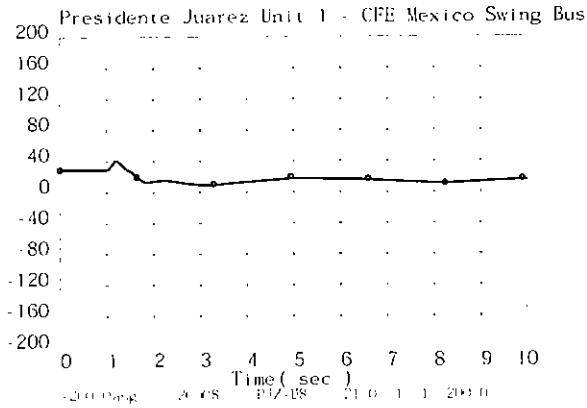


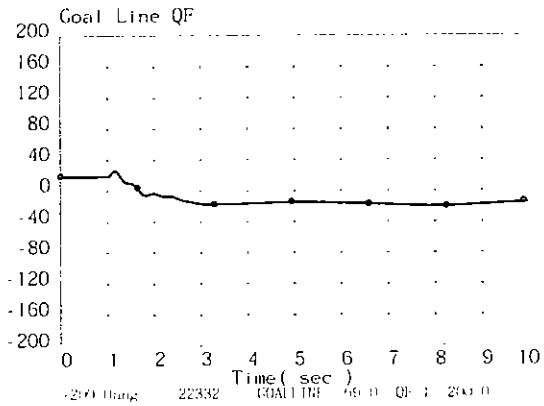
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

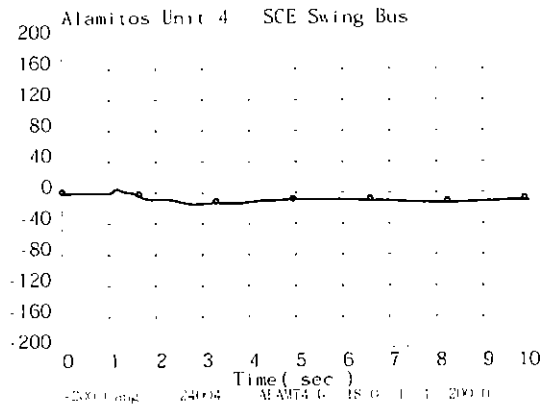
Relative Rotor Angle

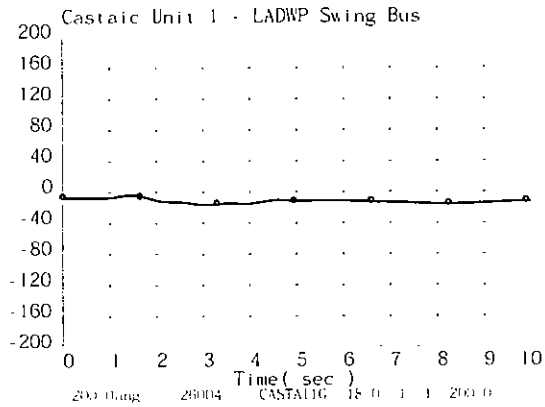






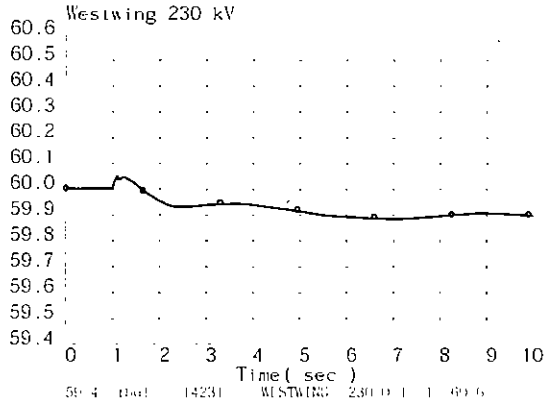


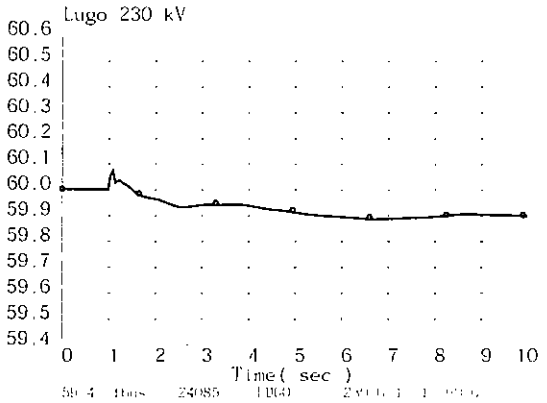


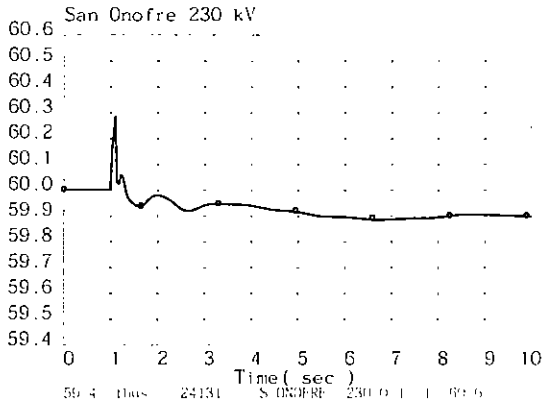


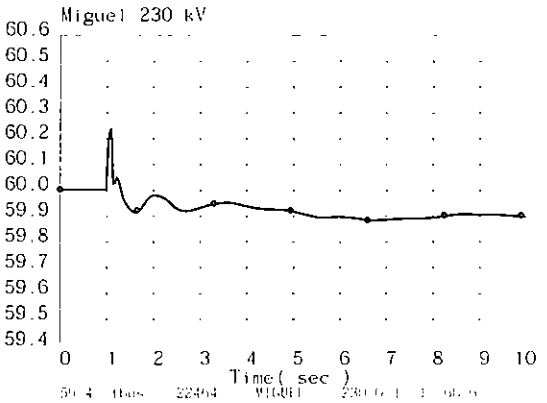
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

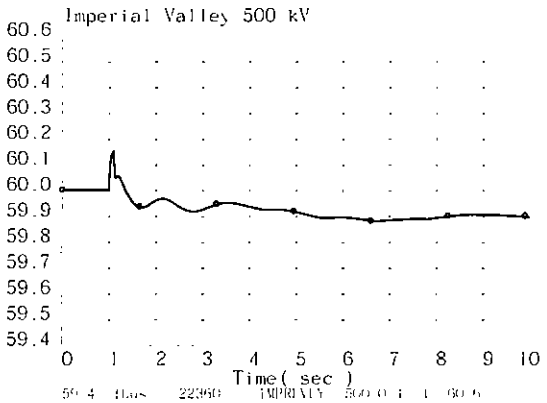
Bus Frequency

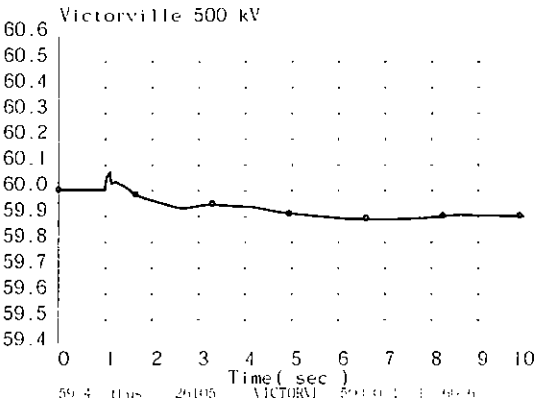






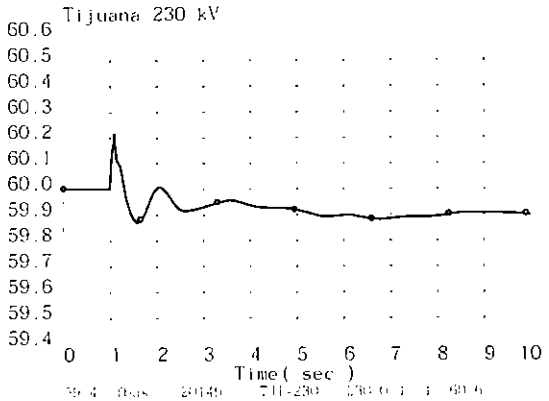


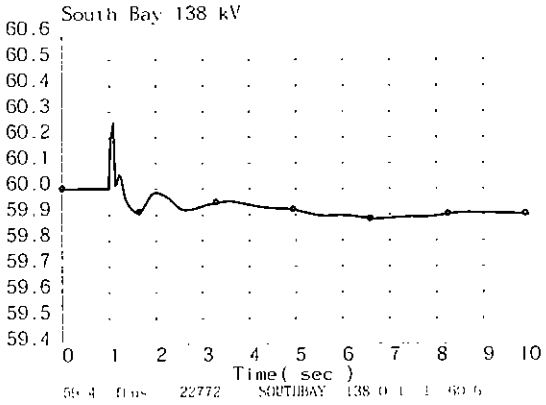


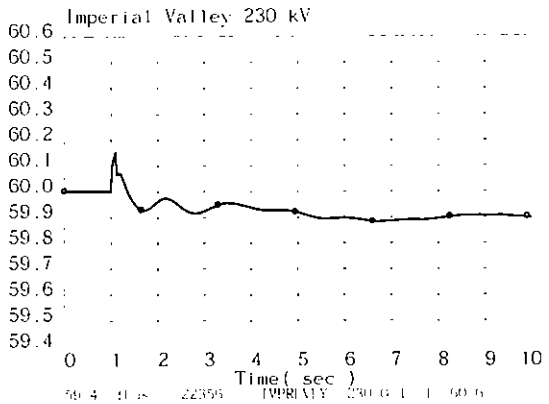


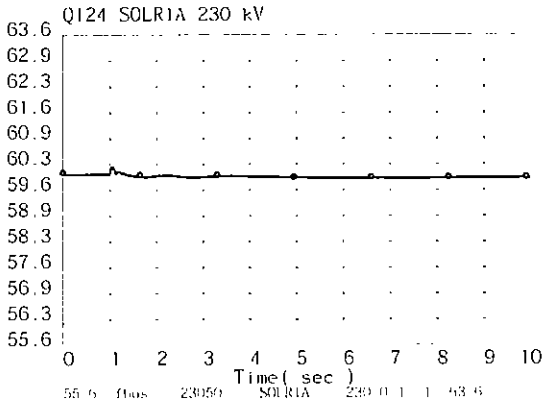
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

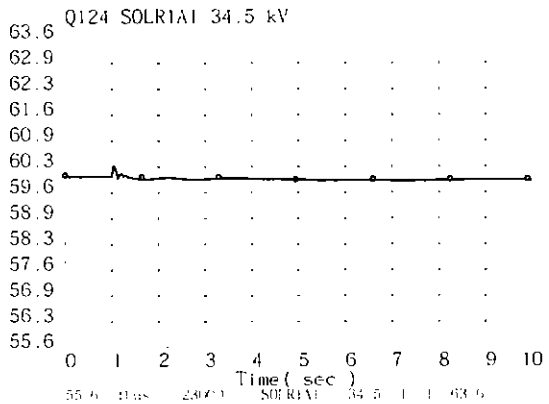
Bus Frequency

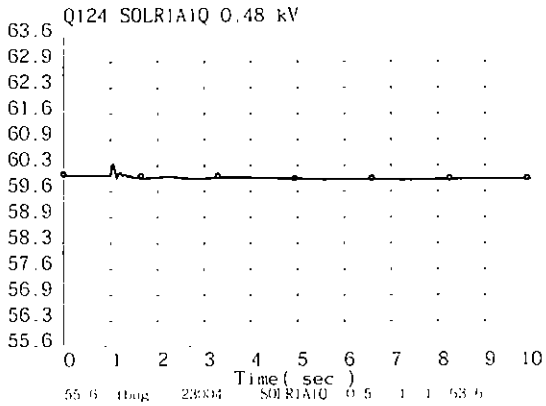






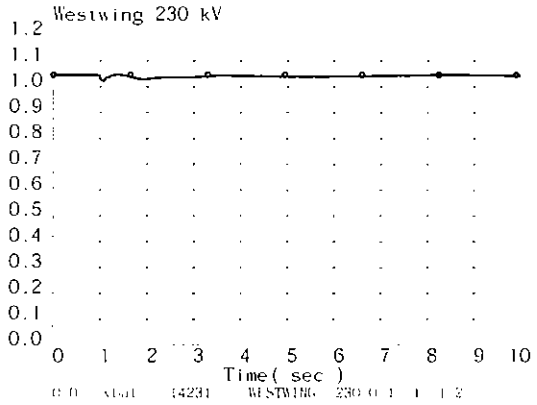


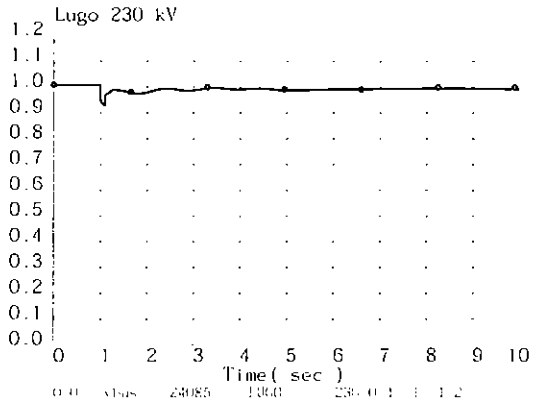


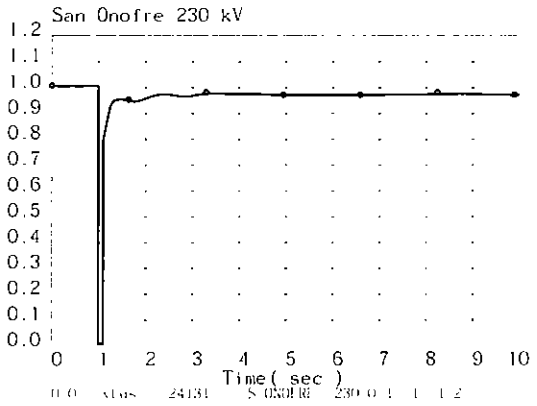


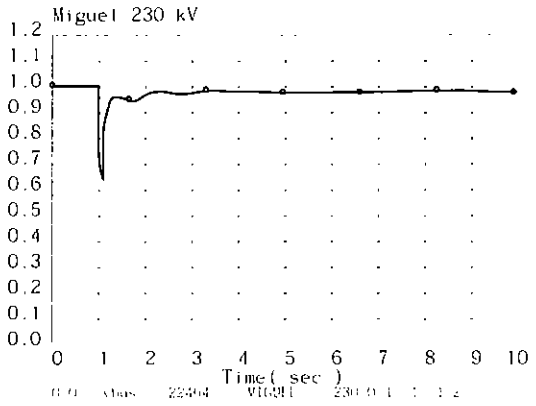
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

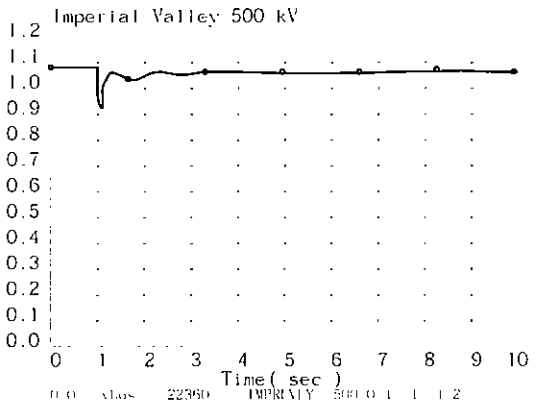
Bus Voltage

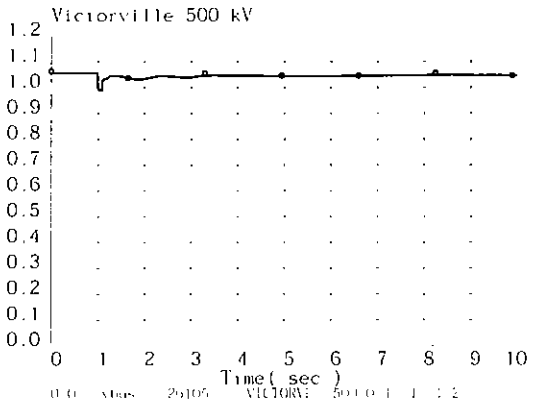






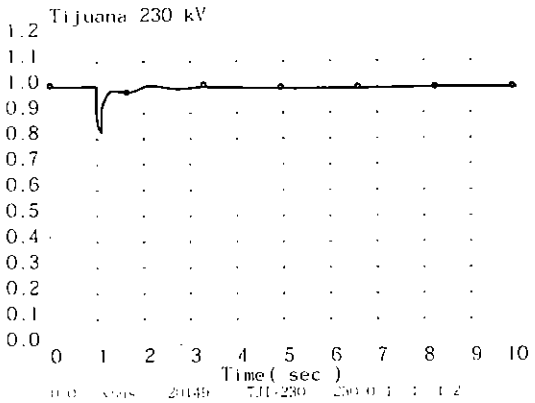


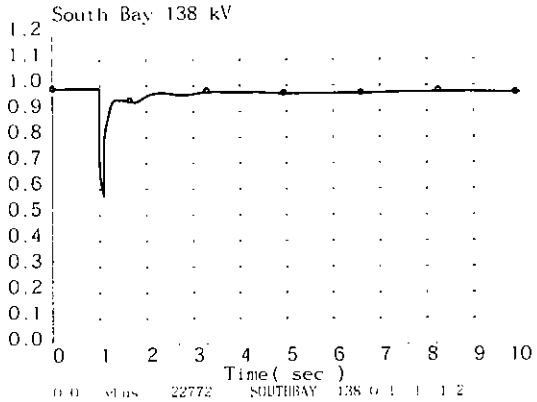


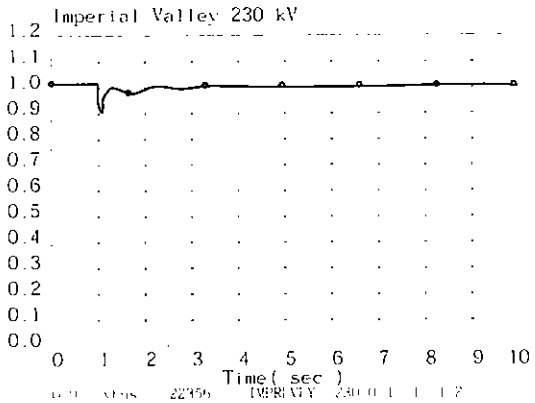


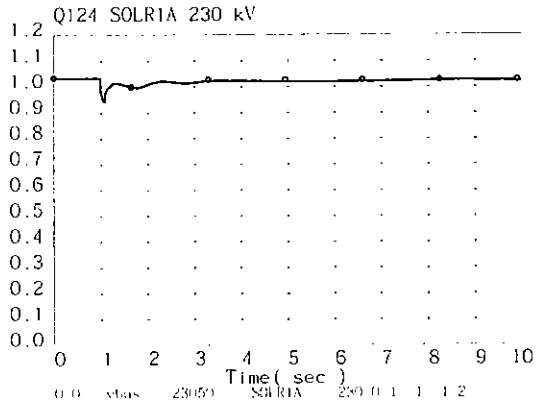
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

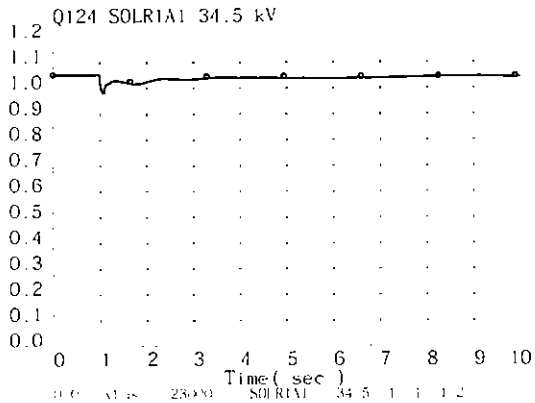
Bus Voltage

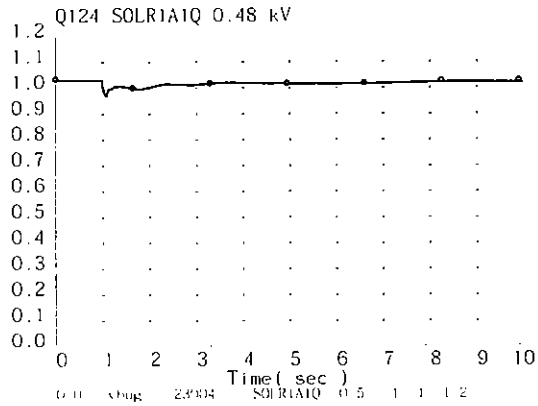






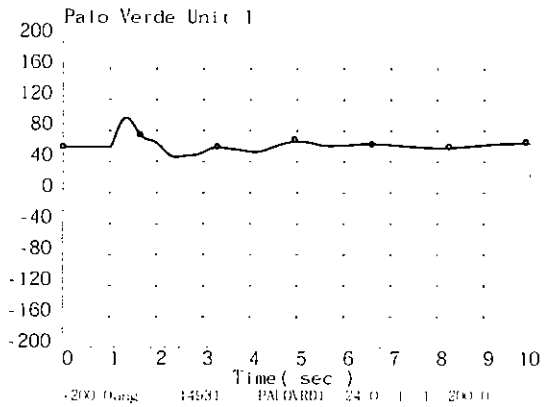


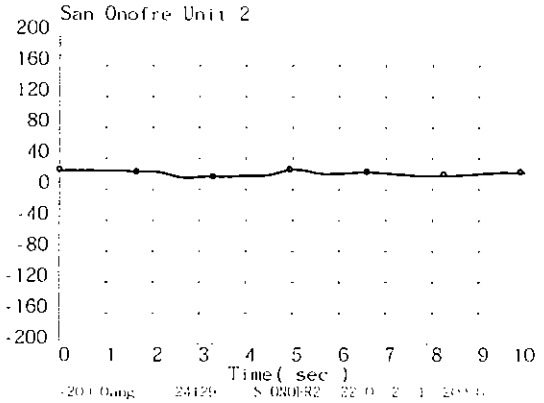


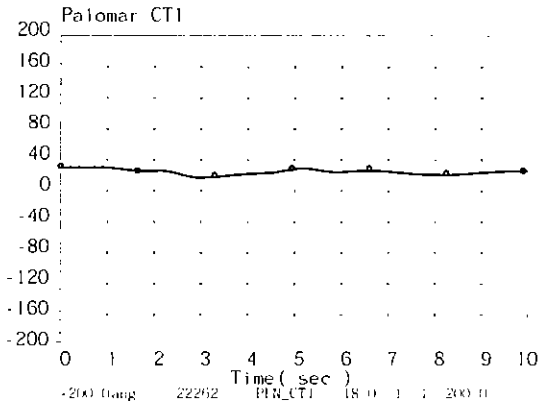


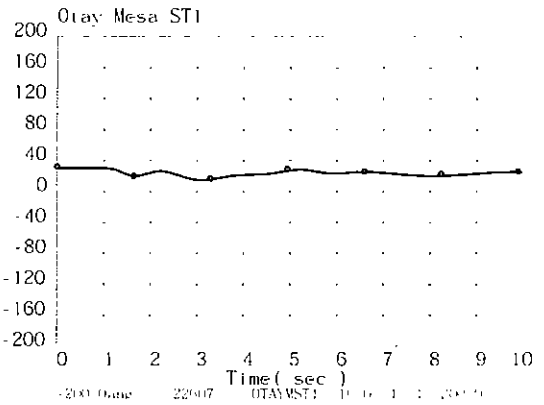
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

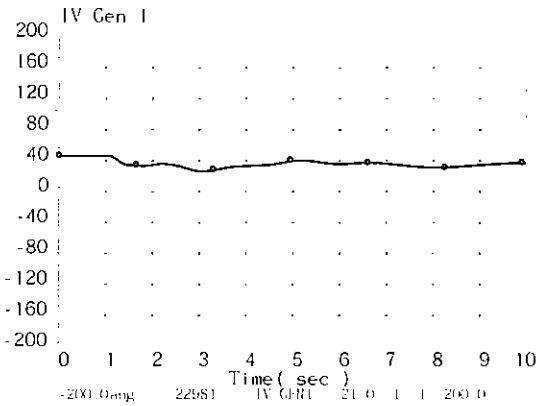
Relative Rotor Angle

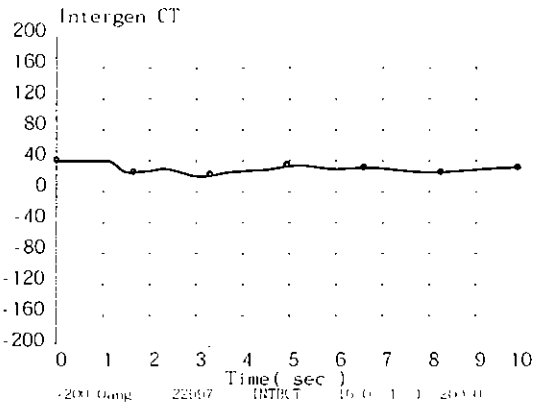






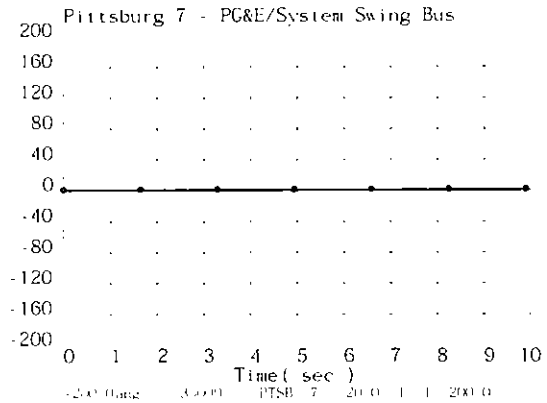


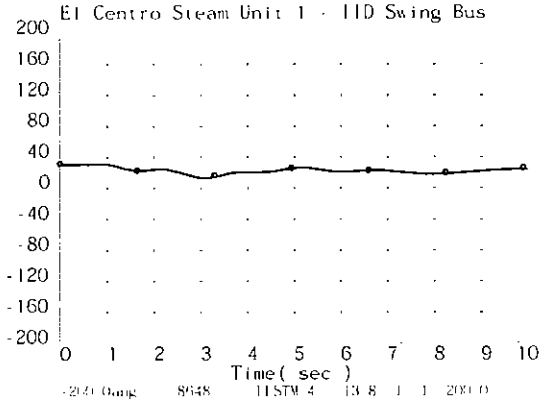


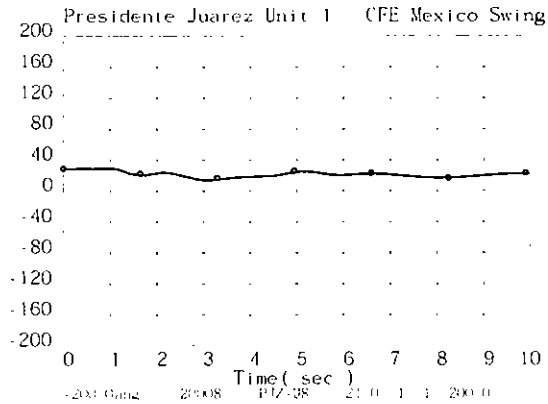


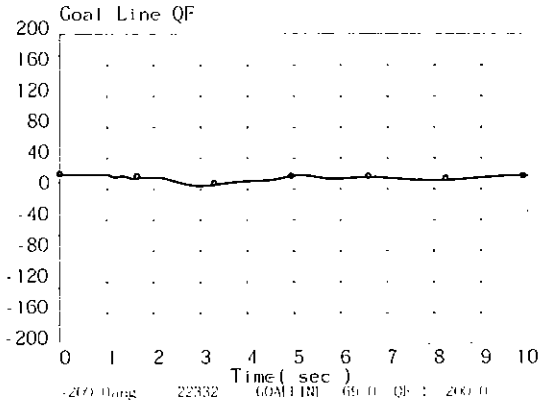
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

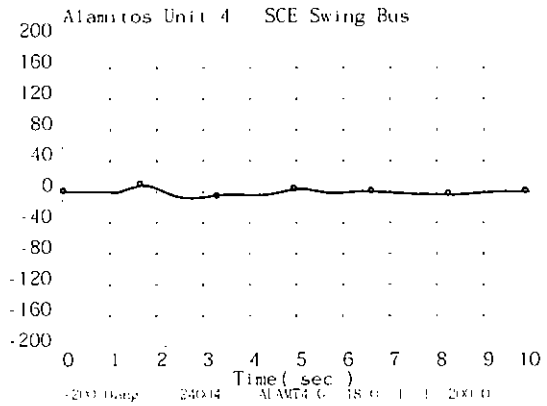
Relative Rotor Angle

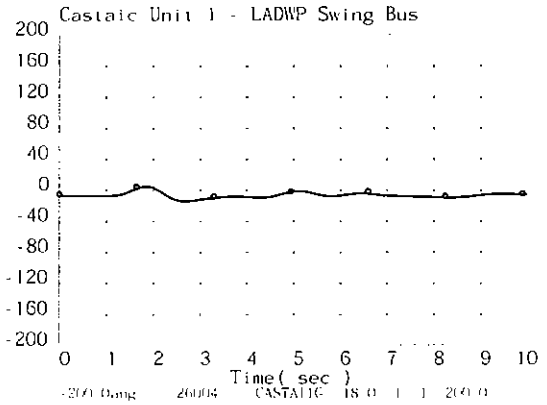






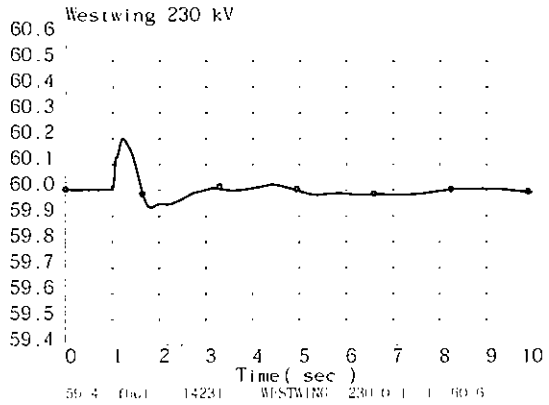


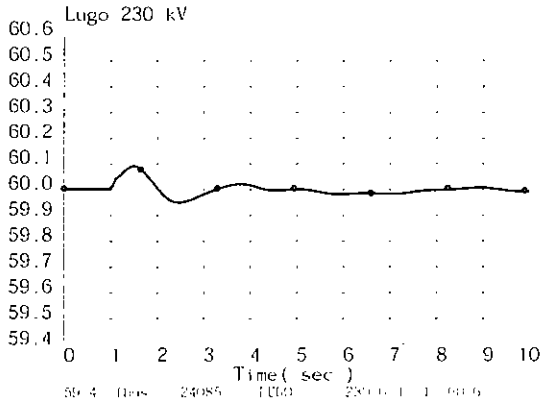


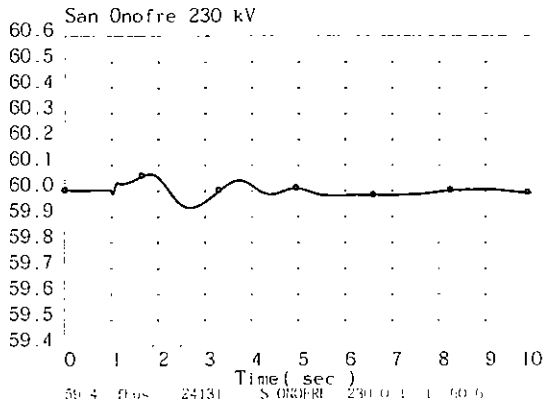


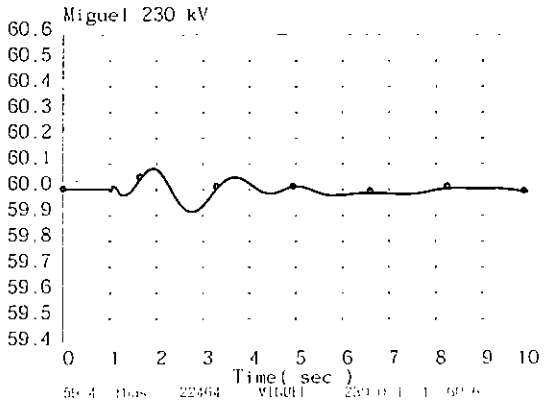
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

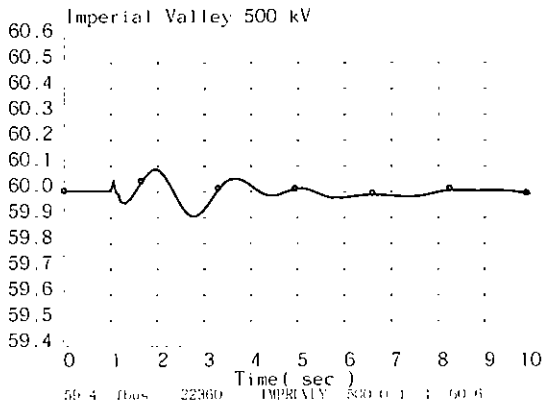
Bus Frequency

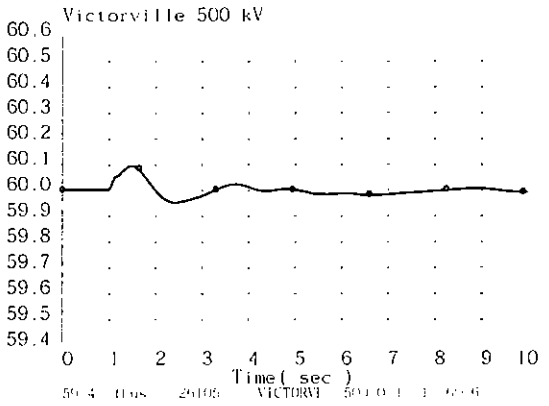






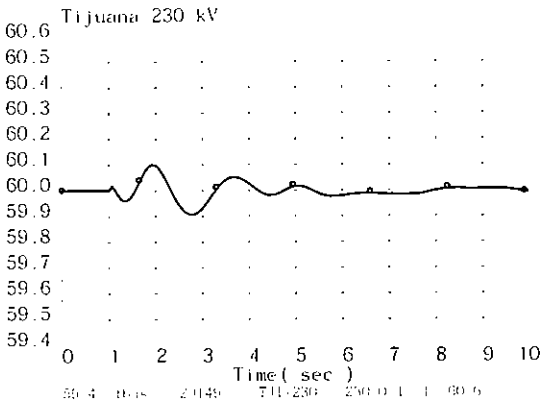


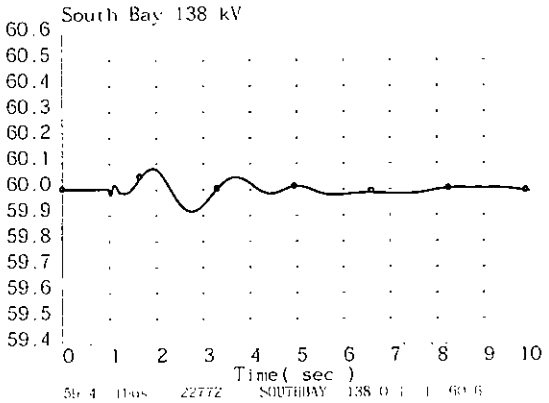


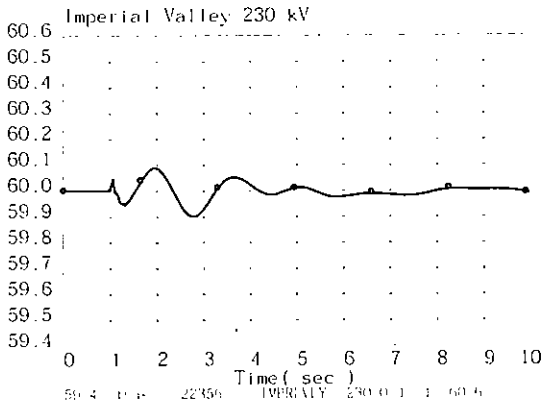


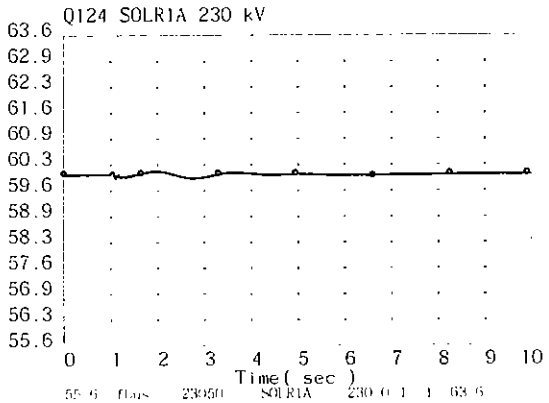
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

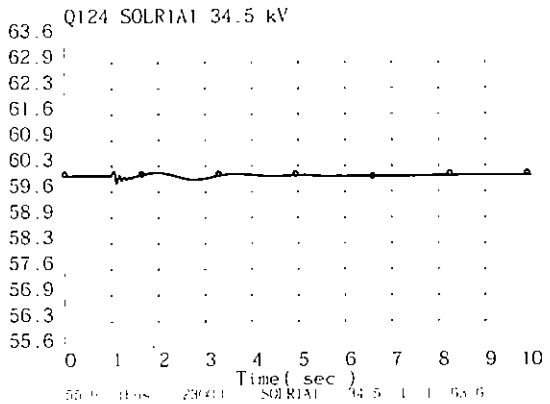
Bus Frequency

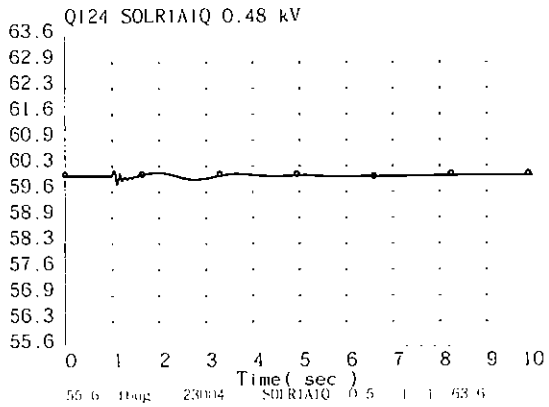






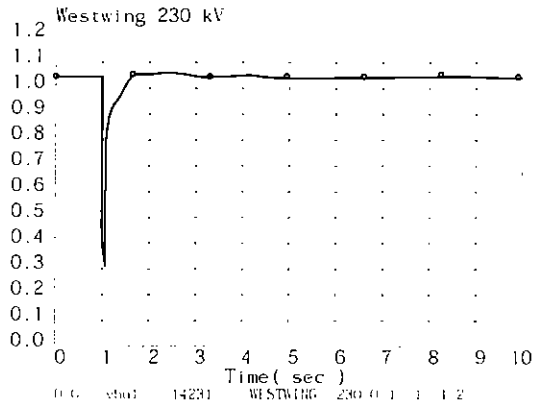


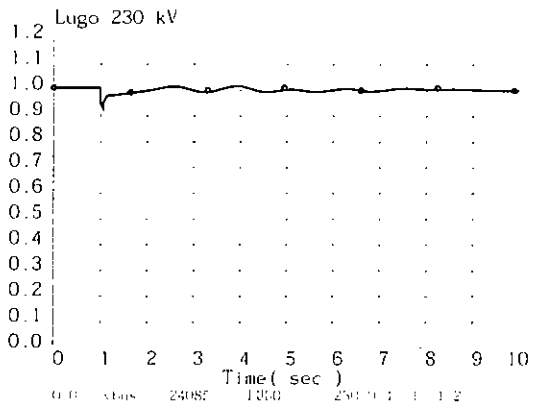


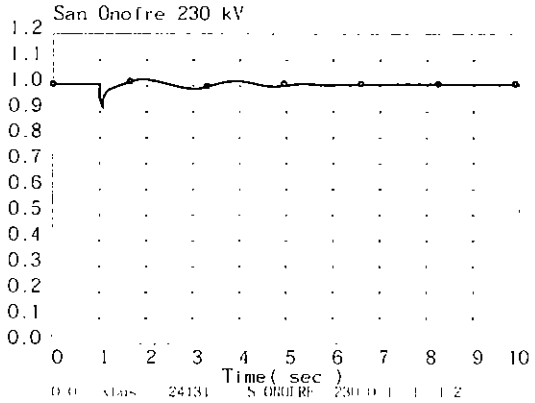


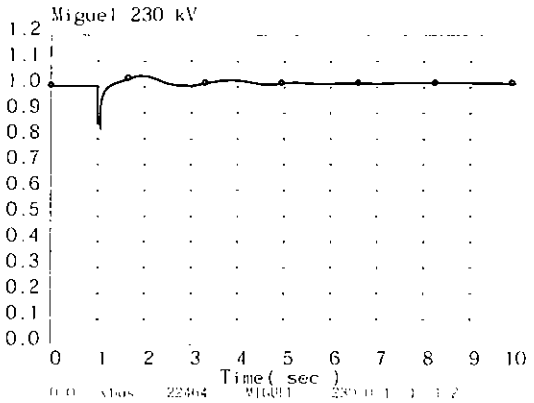
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

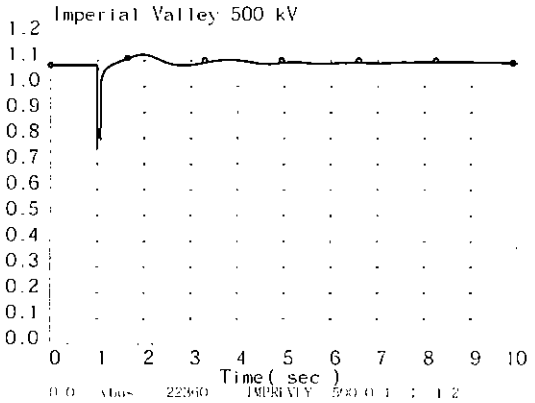
Bus Voltage

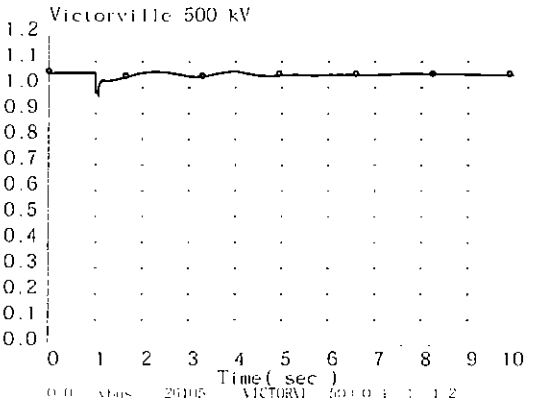






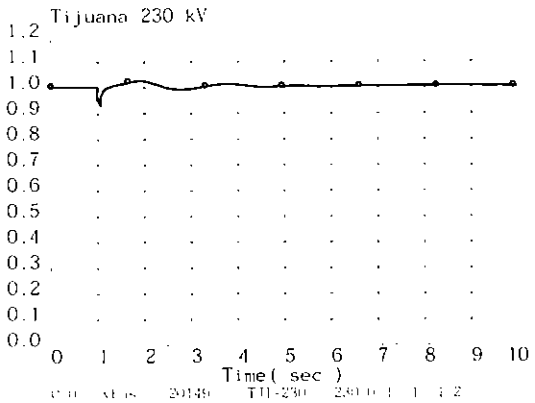


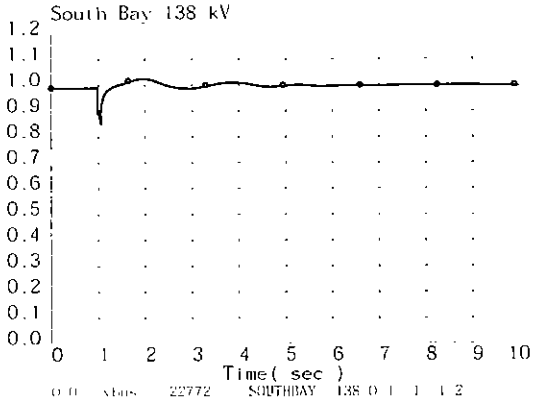


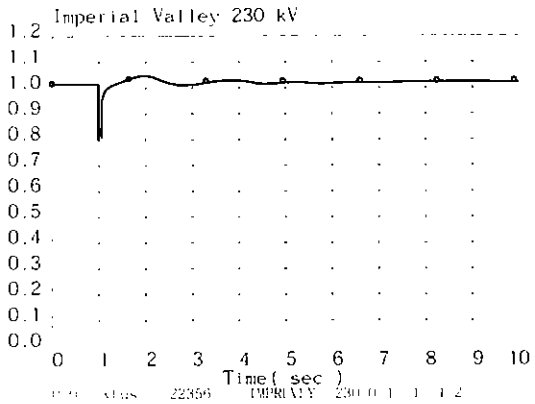


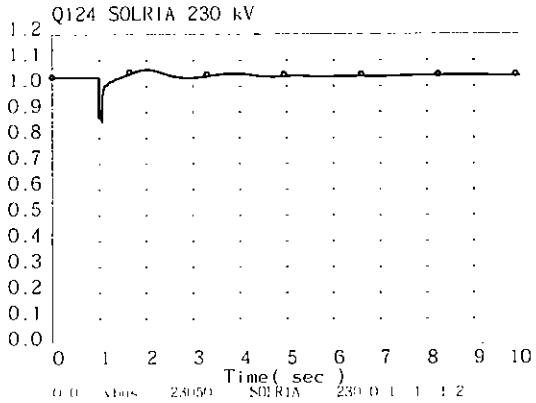
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

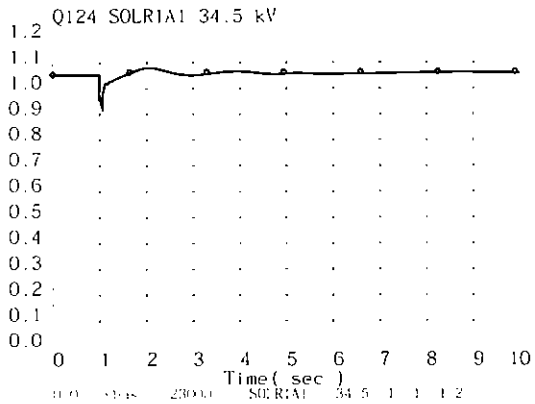
Bus Voltage

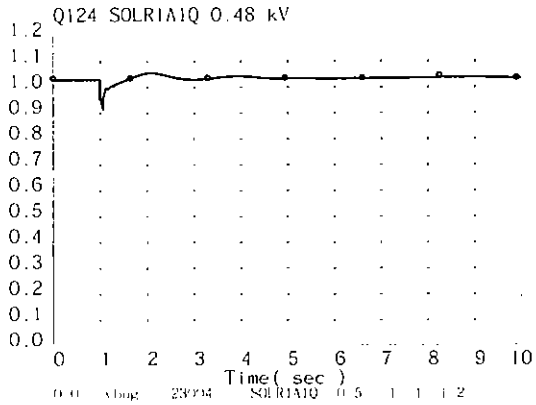






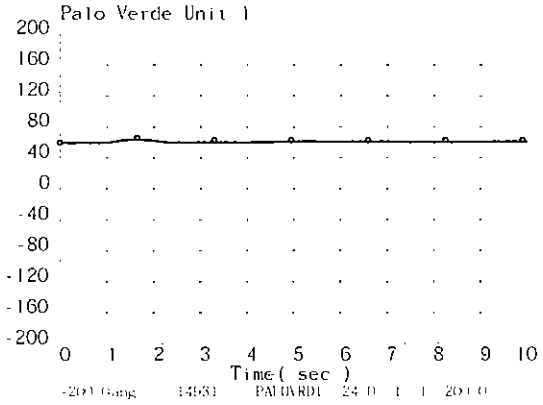


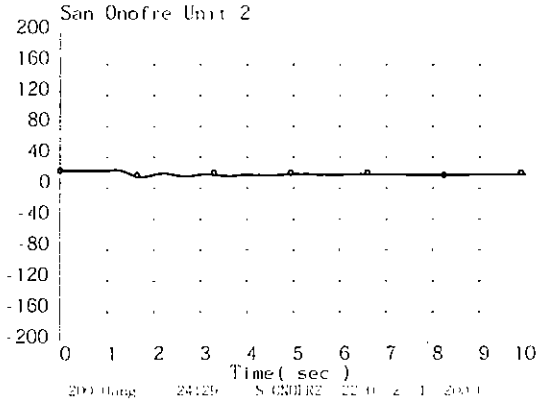


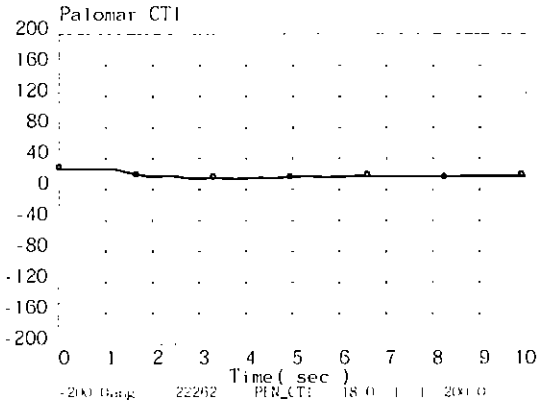


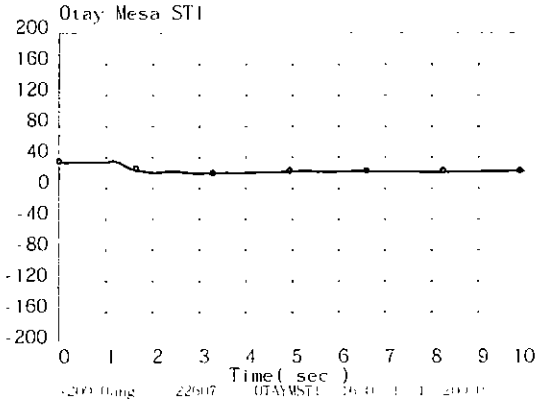
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

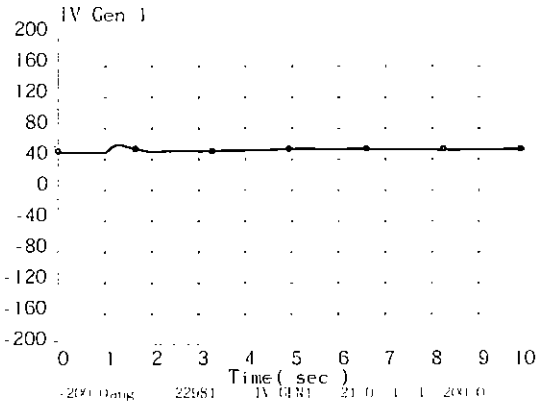
Relative Rotor Angle

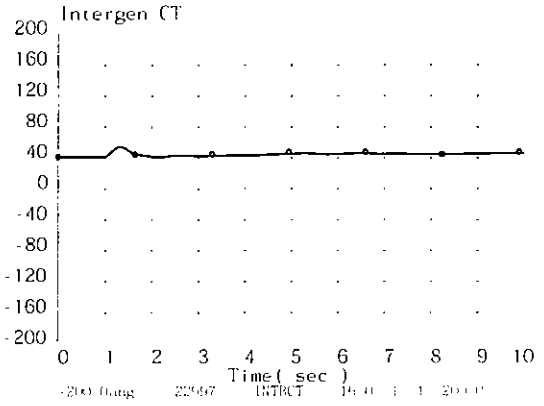






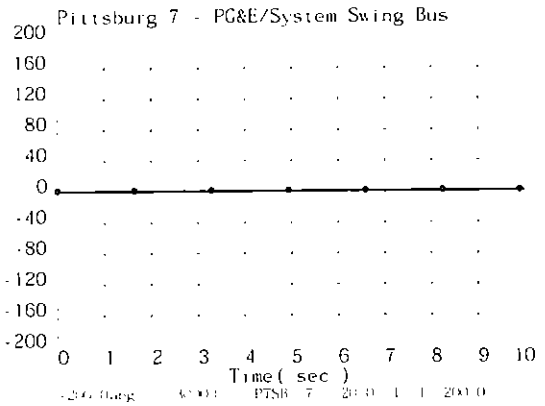


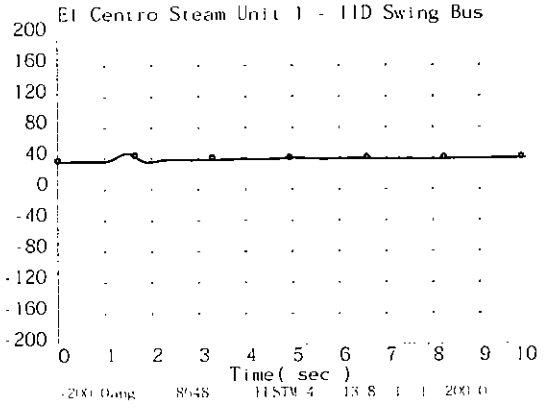


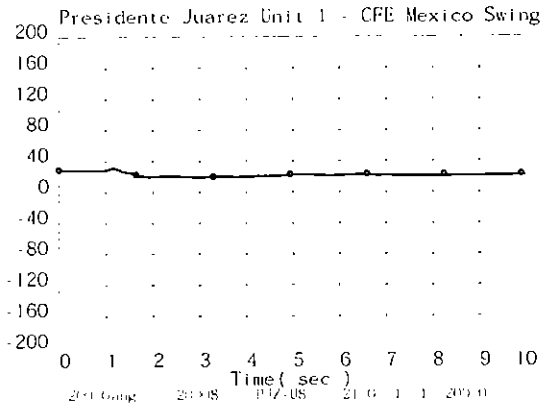


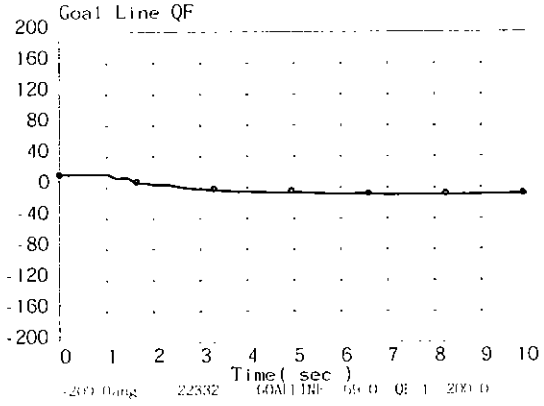
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

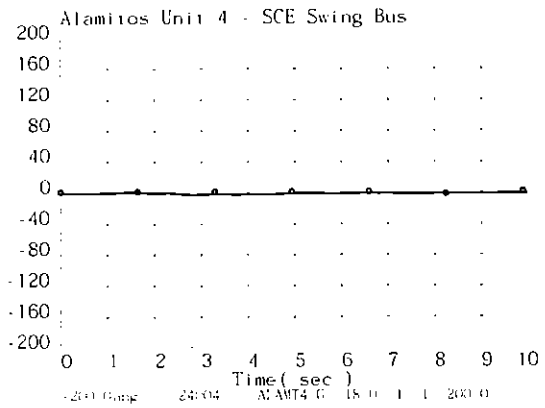
Relative Rotor Angle

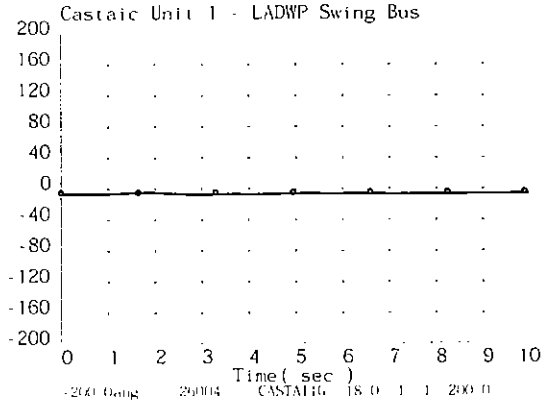






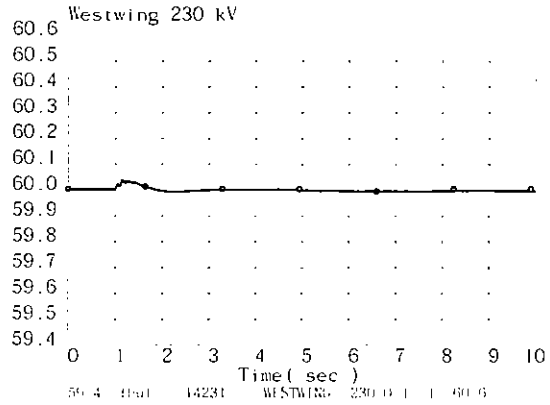


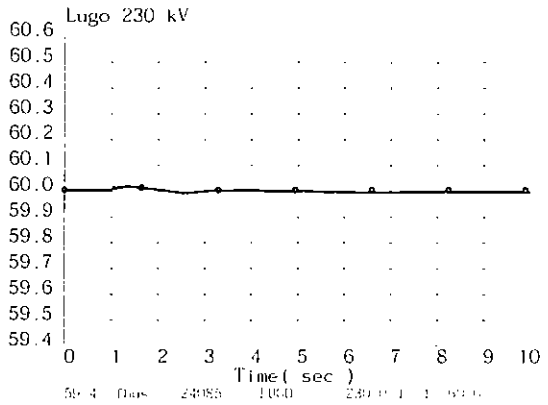


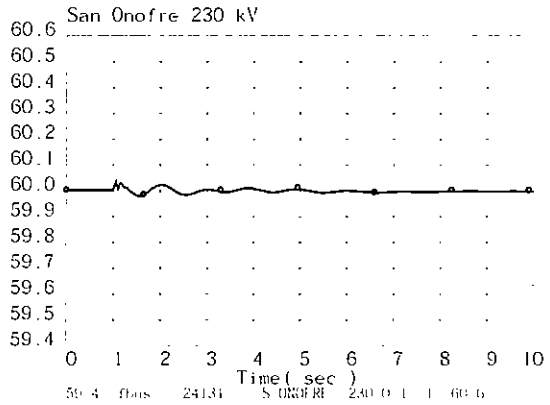


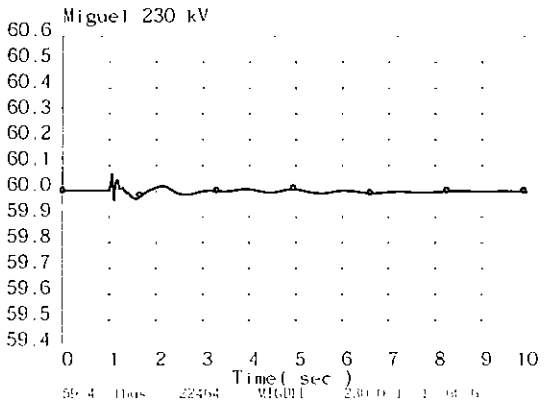
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

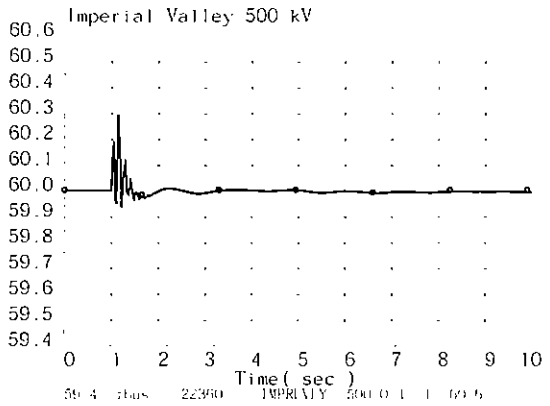
Bus Frequency

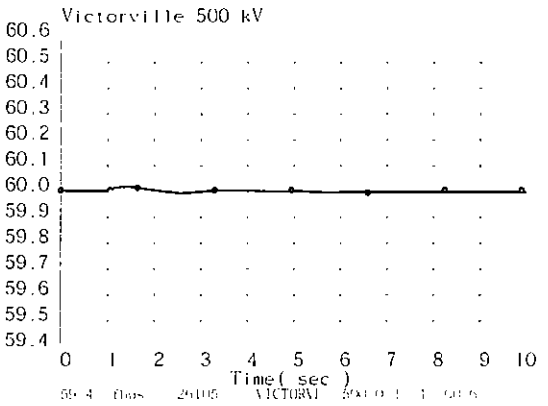






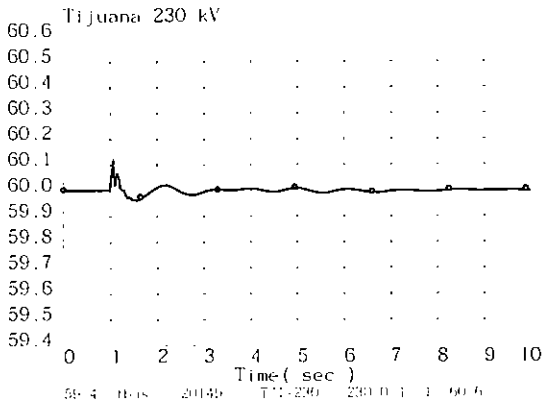


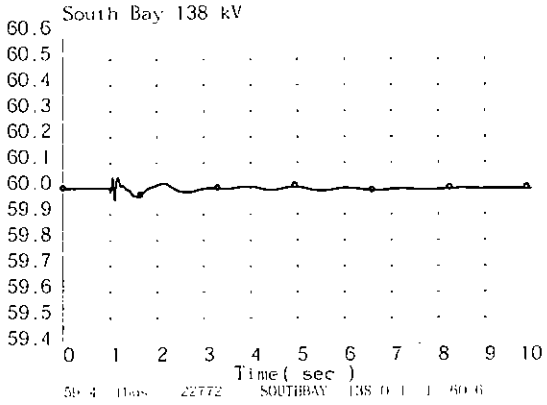


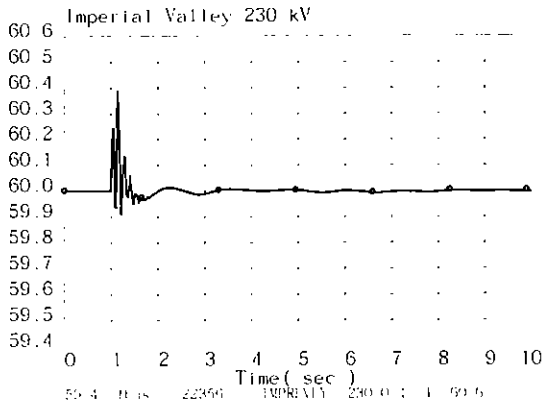


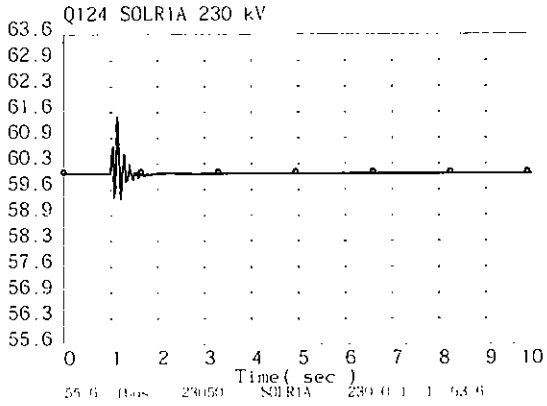
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

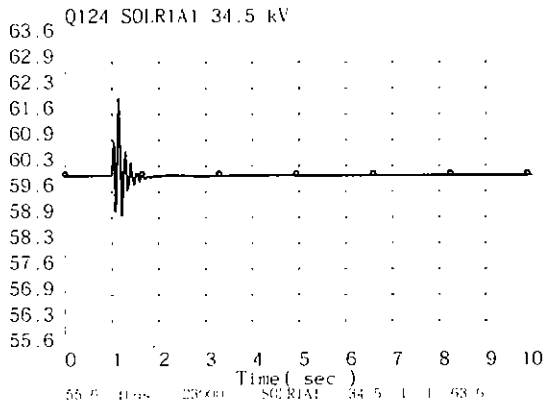
Bus Frequency

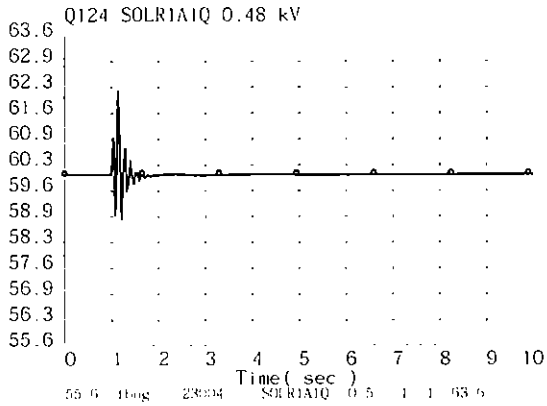






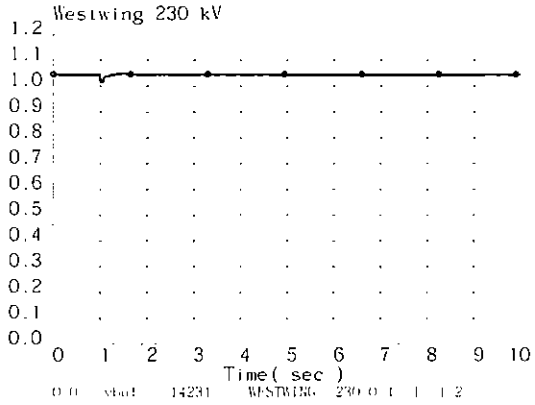


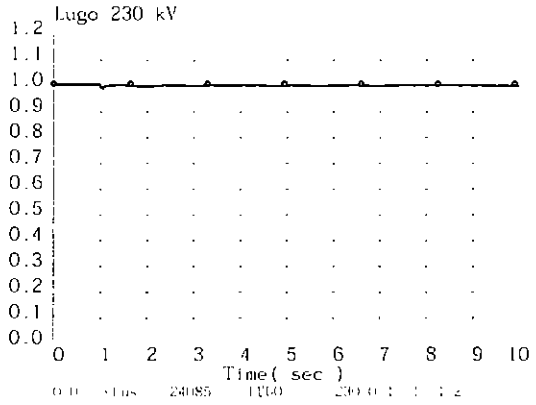


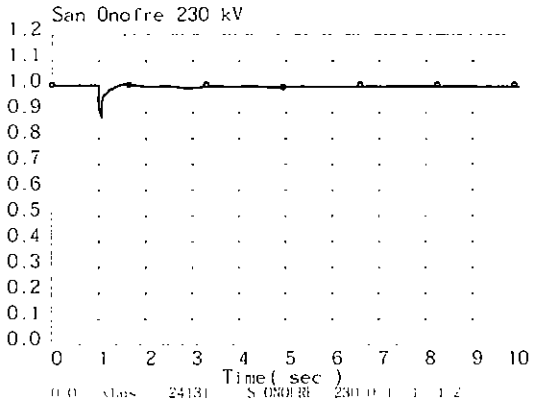


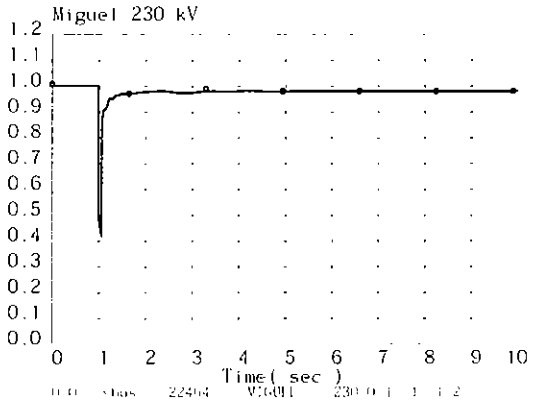
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

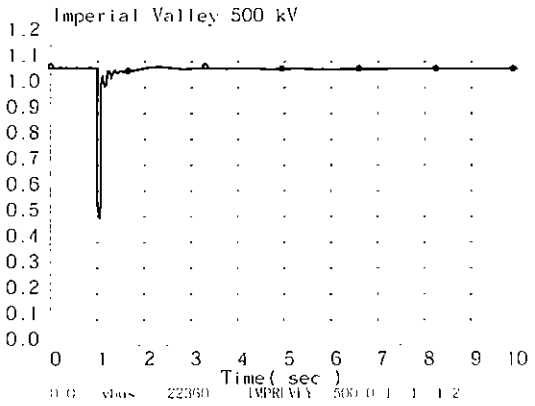
Bus Voltage

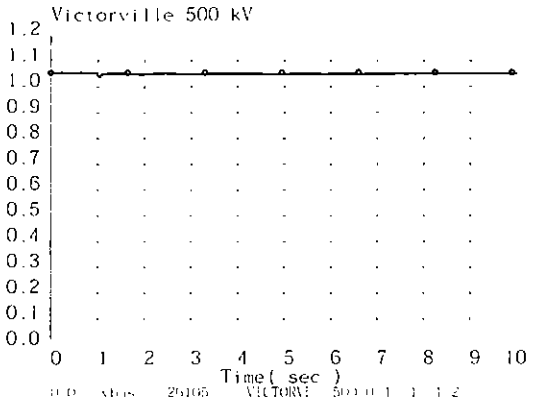






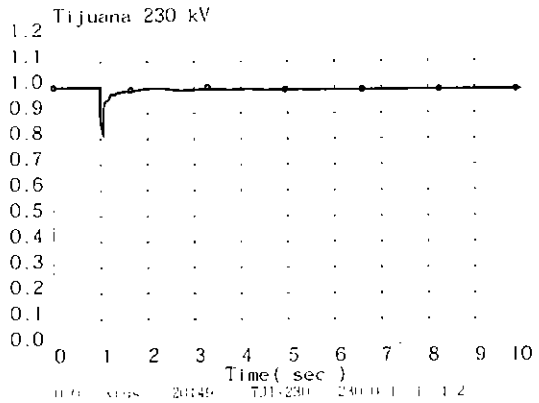


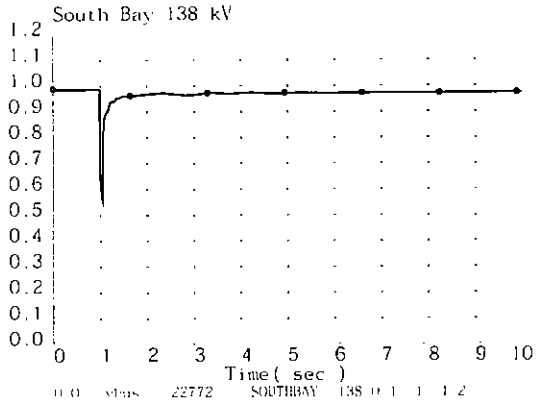


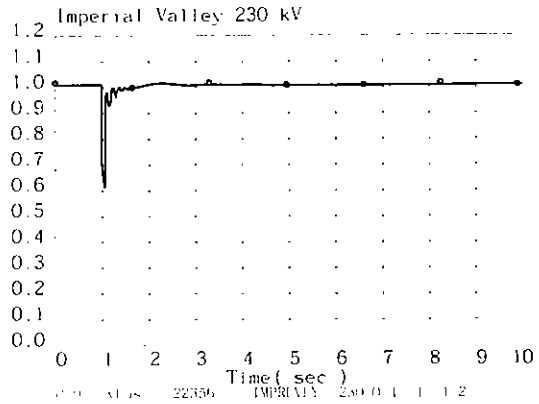


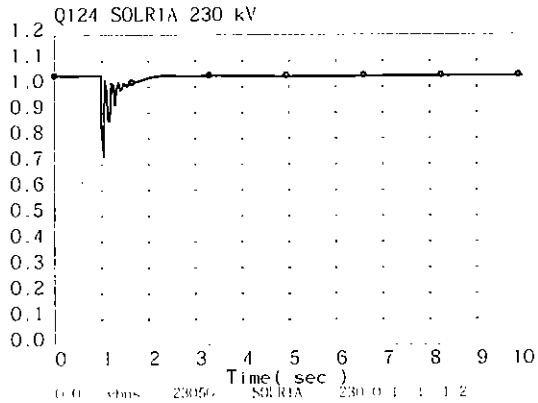
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

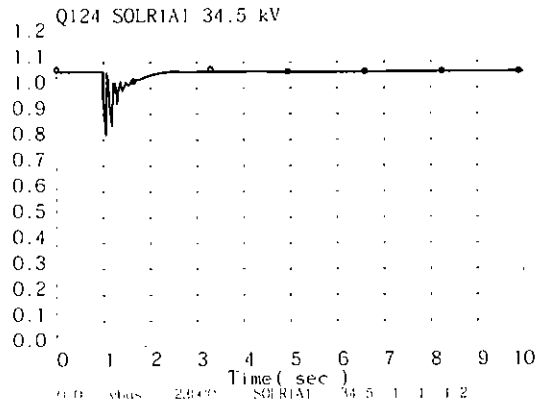
Bus Voltage

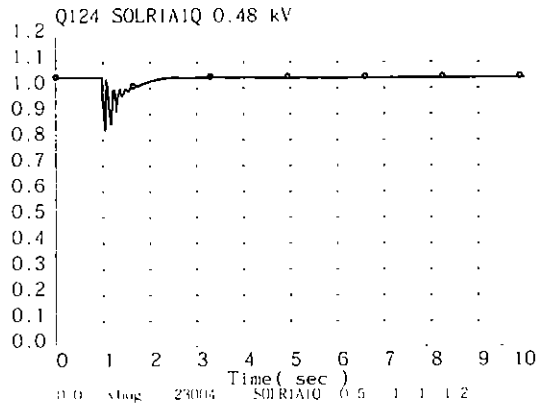






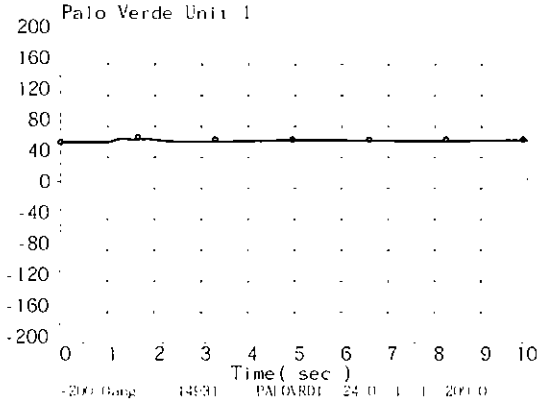


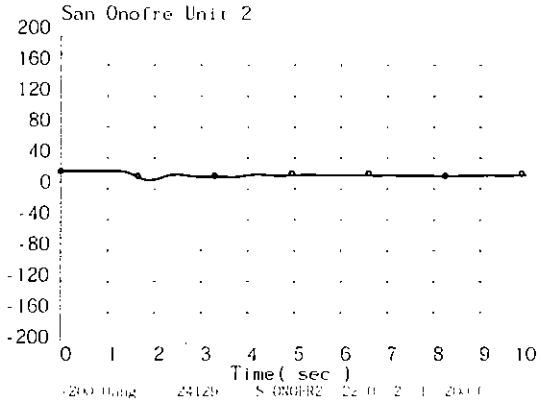


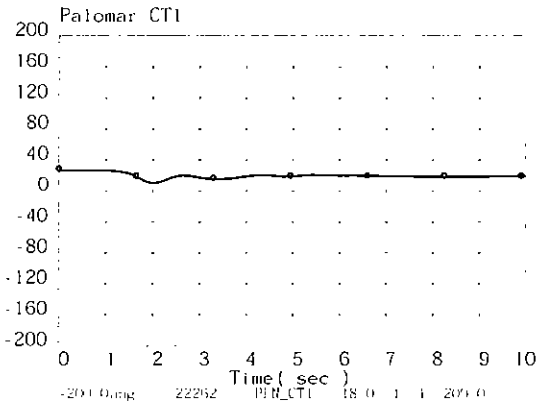


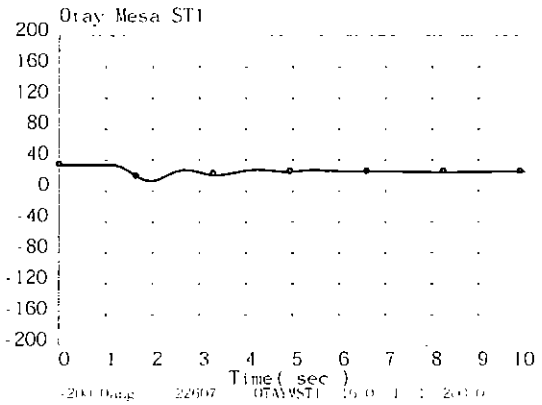
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

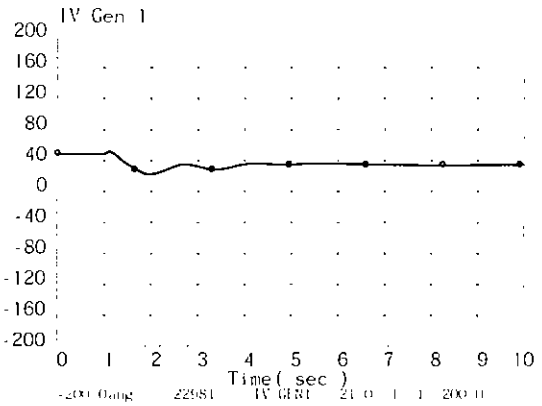
Relative Rotor Angle

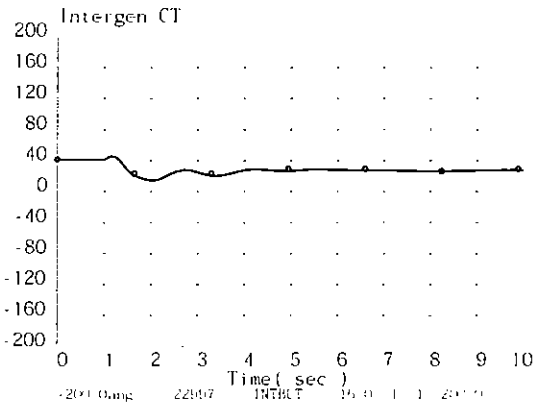






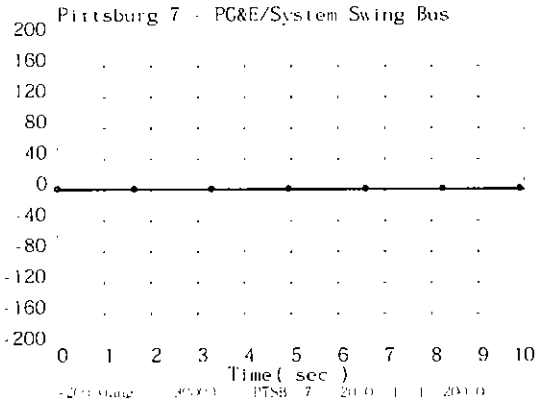


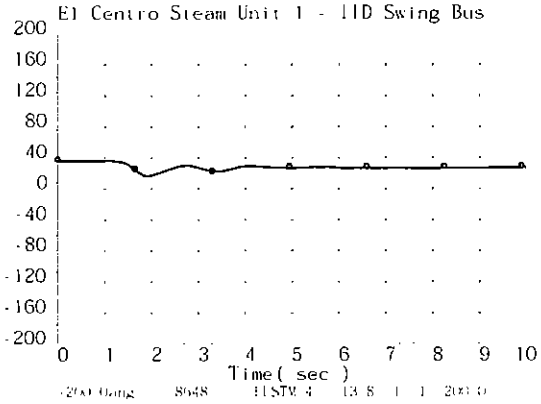


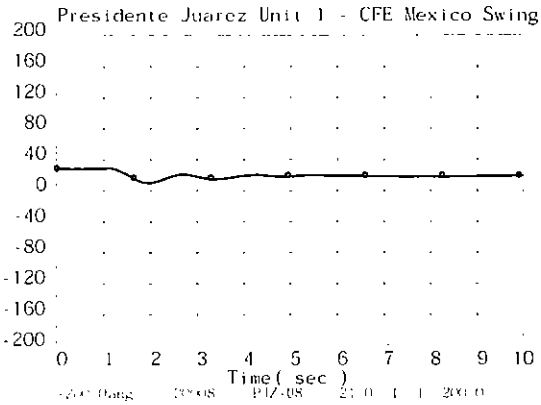


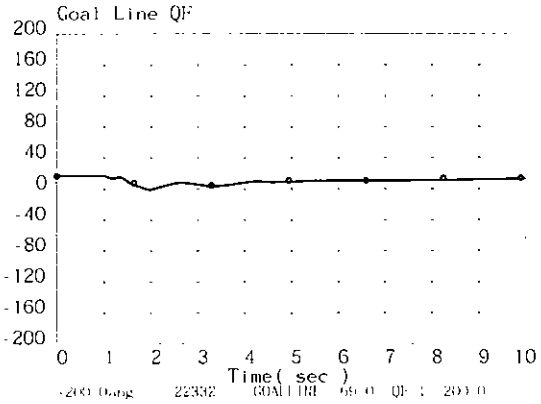
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

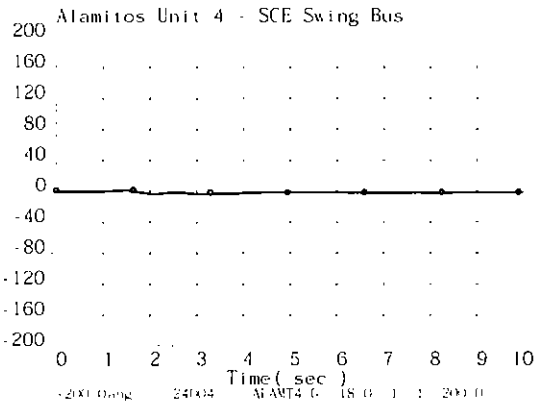
Relative Rotor Angle

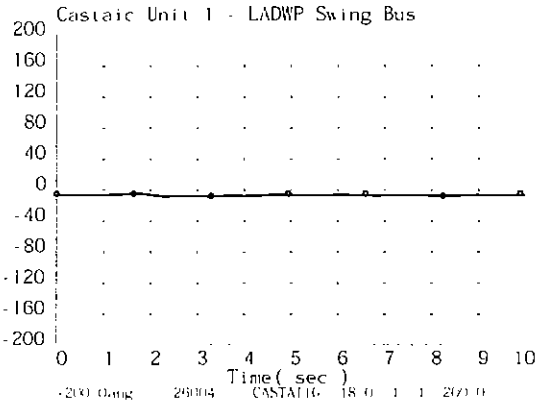






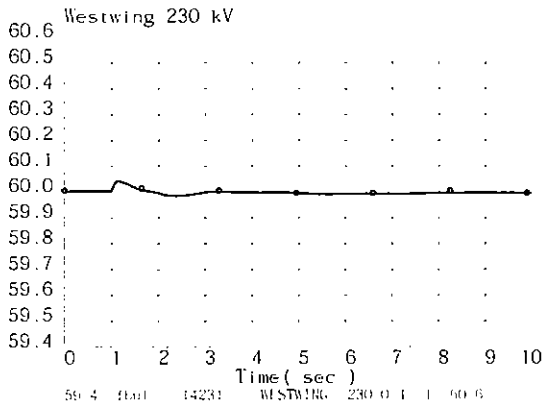


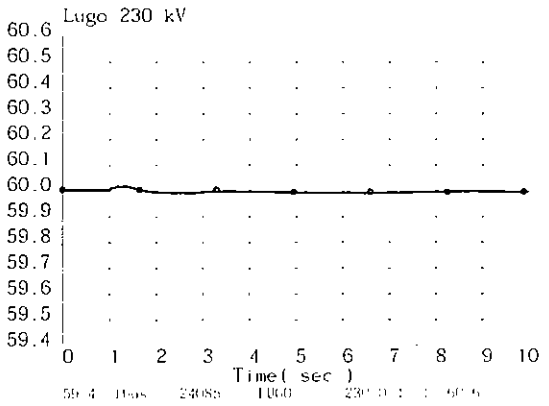


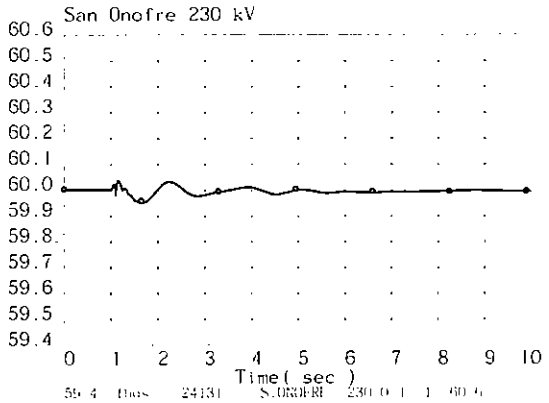


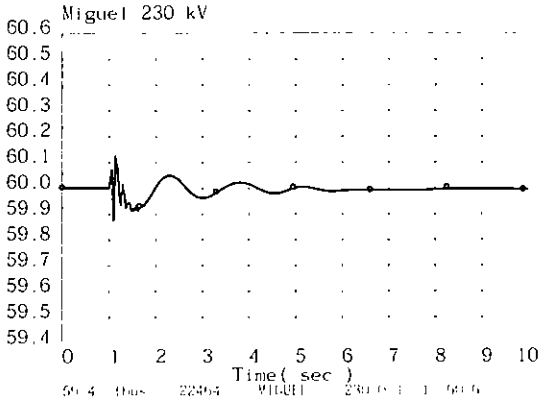
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

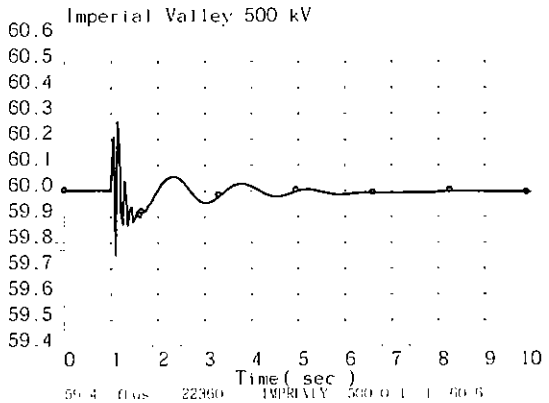
Bus Frequency

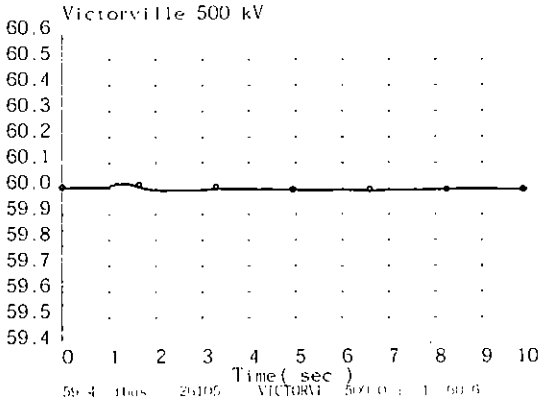




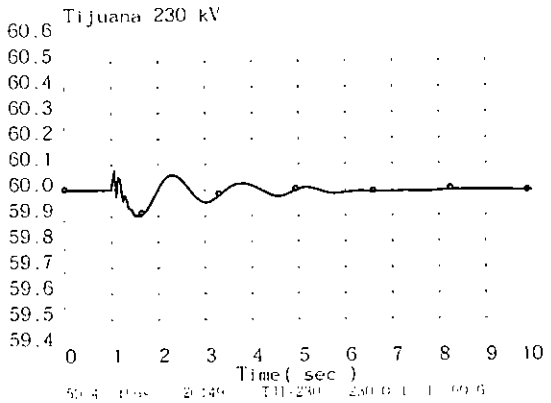


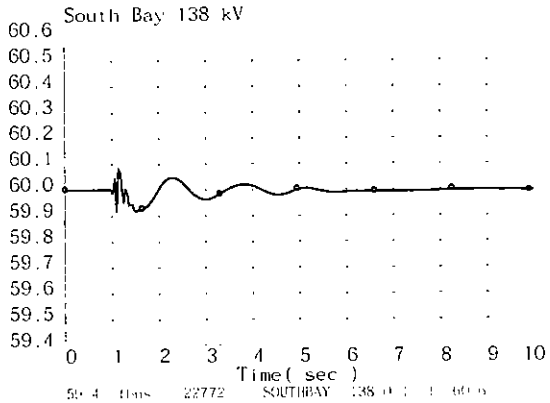


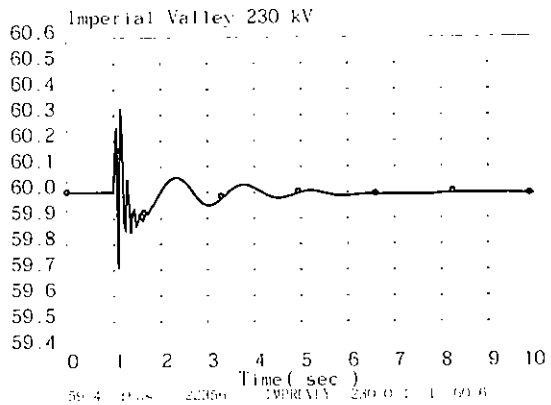


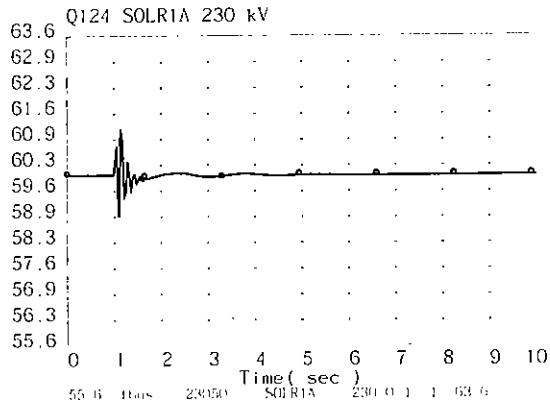


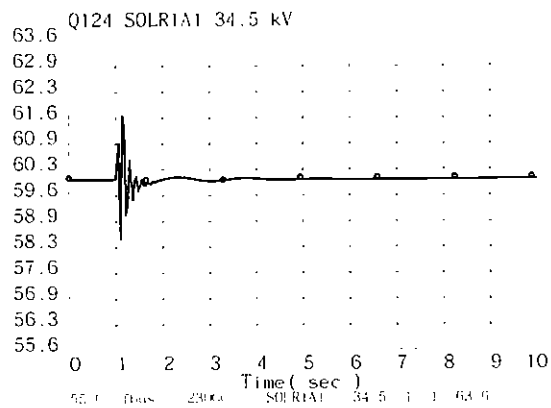
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

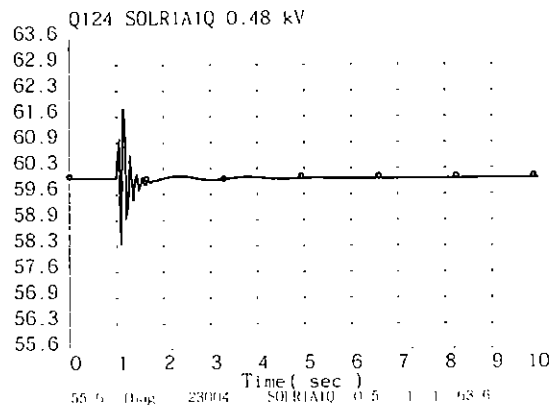




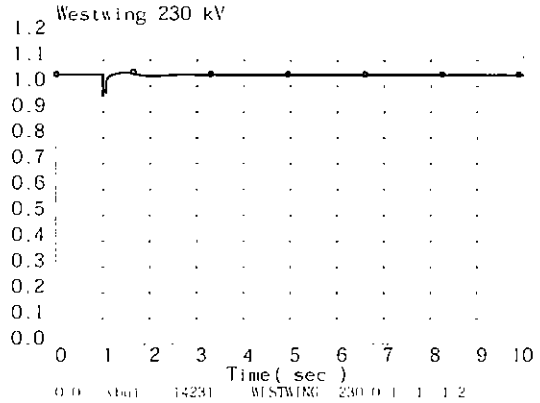


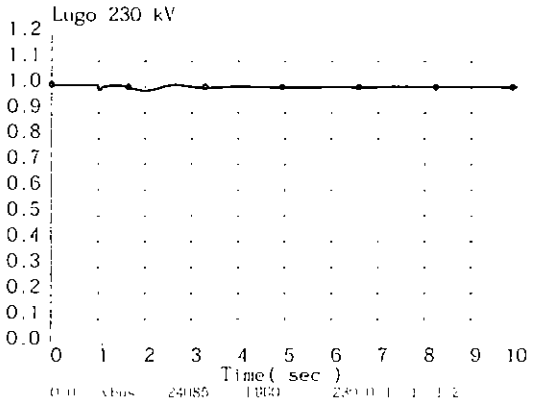


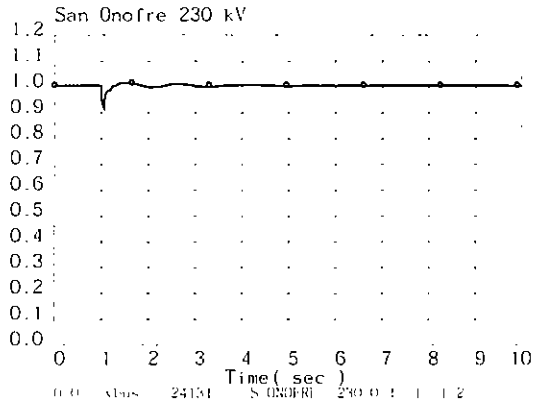


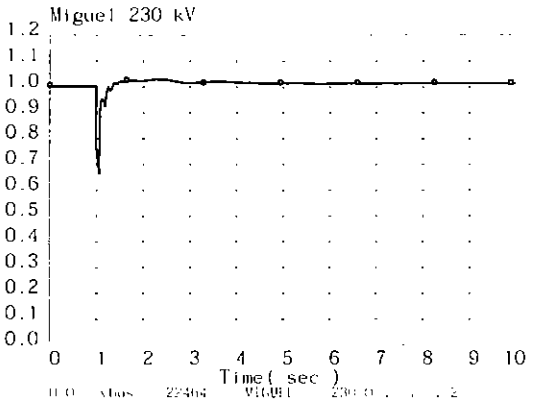


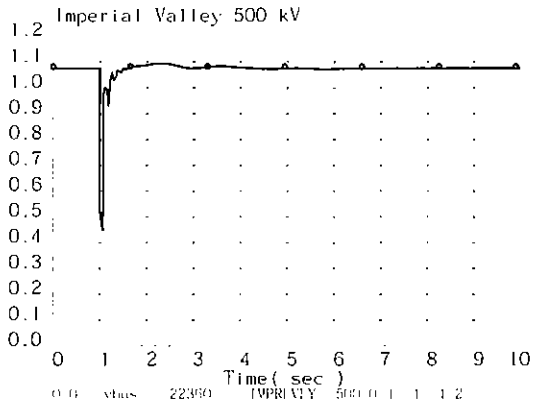
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

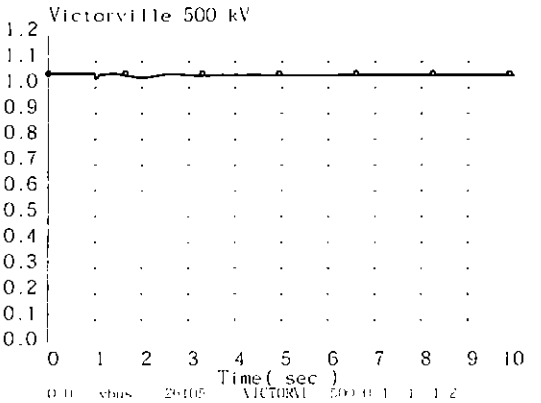






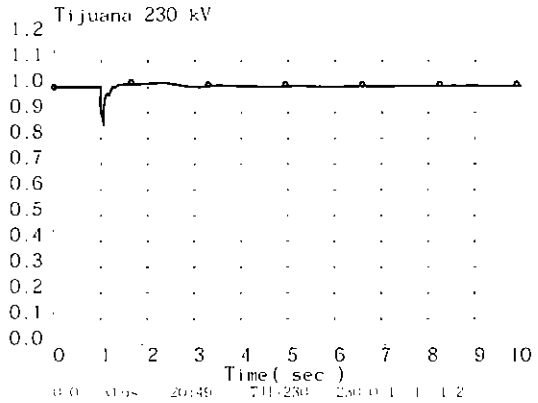


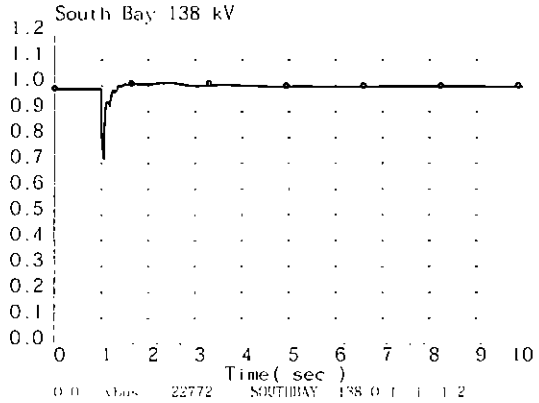


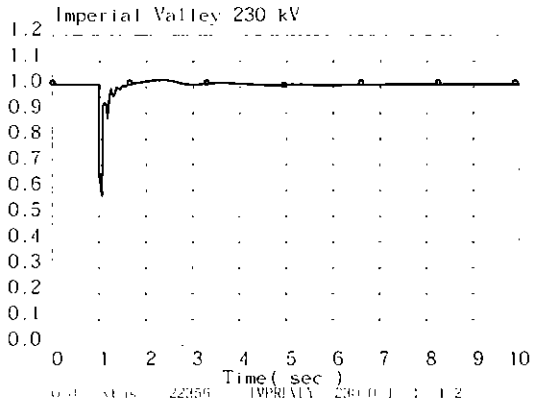


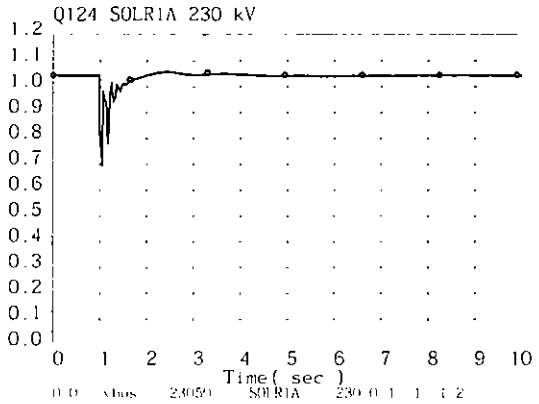
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

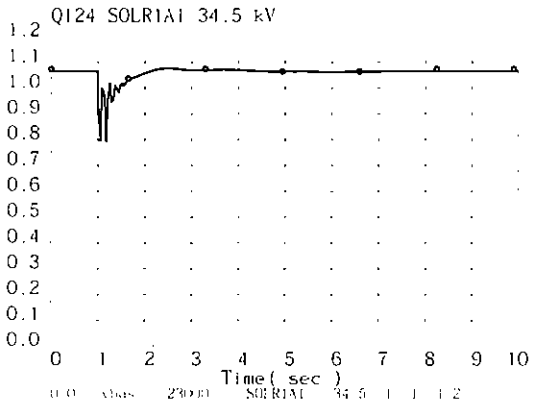
Bus Voltage

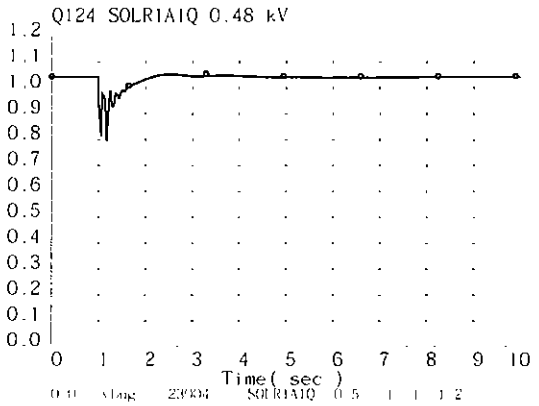






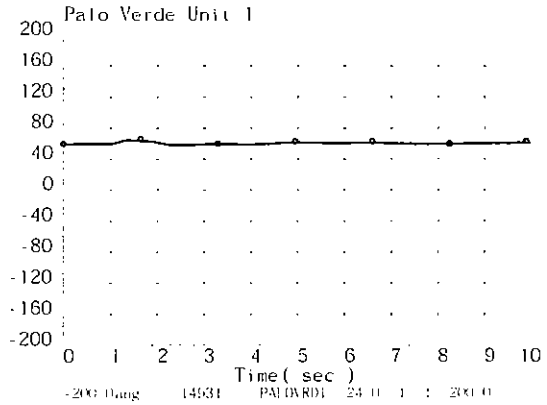


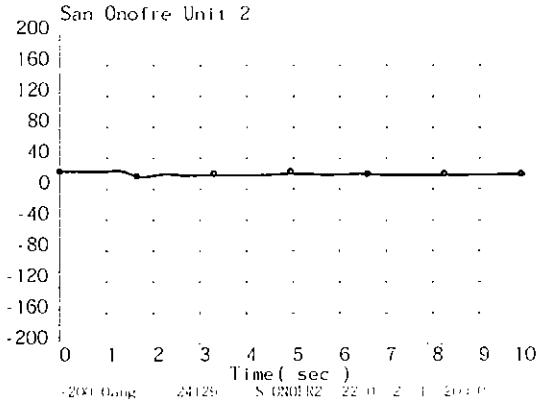


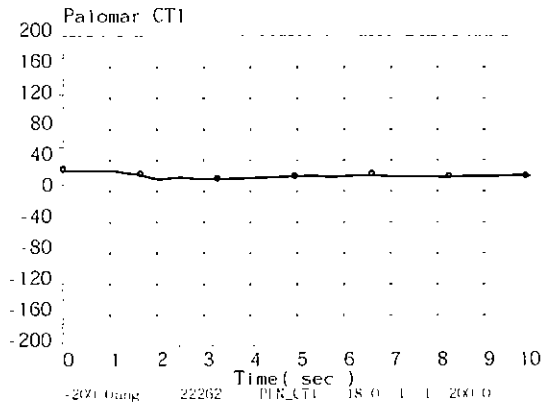


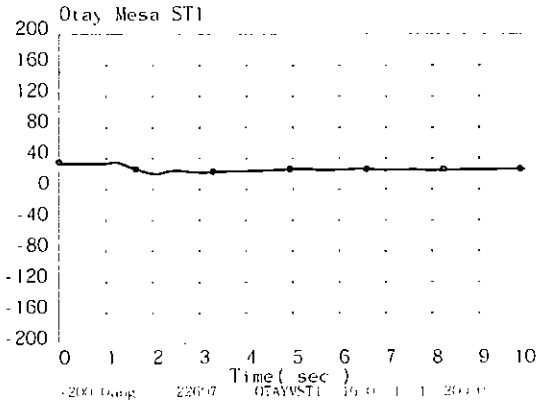
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

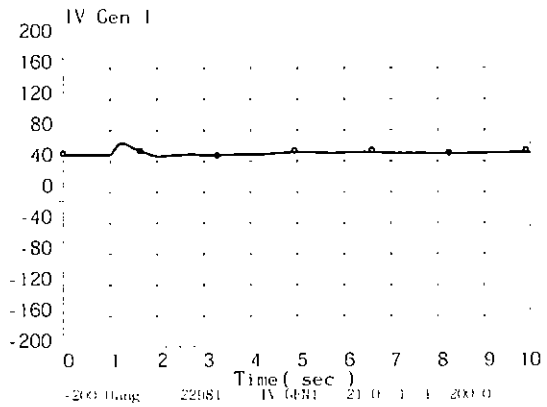
Relative Rotor Angle

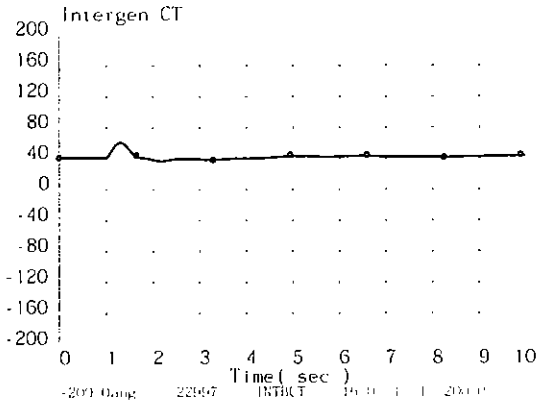






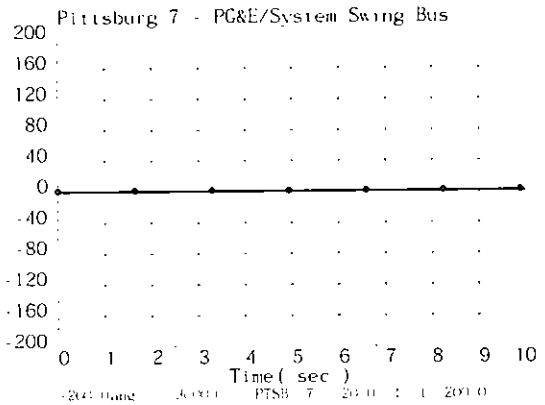


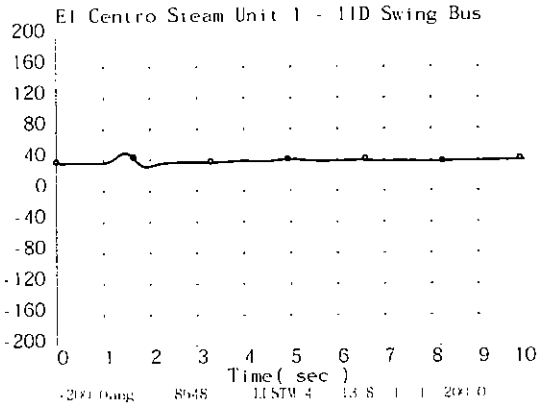


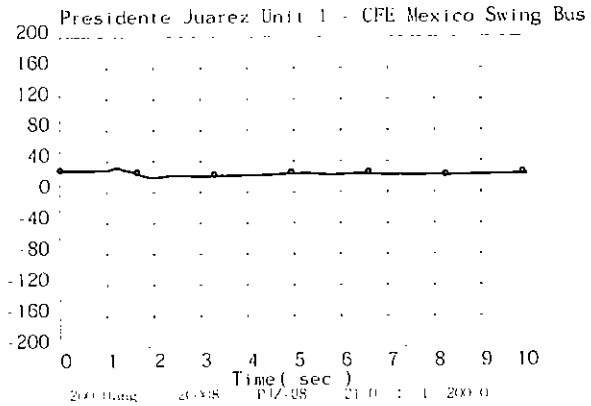


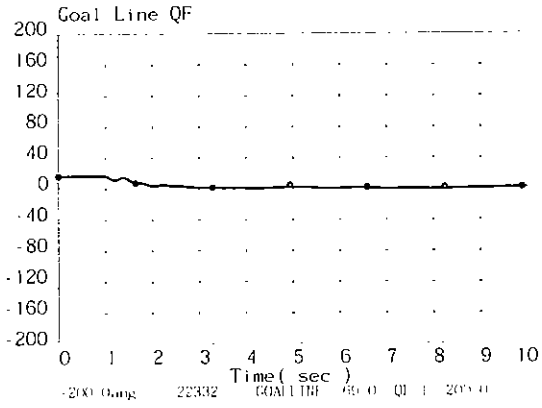
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

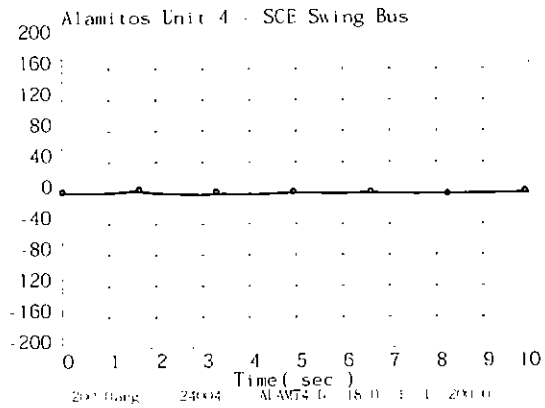
Relative Rotor Angle

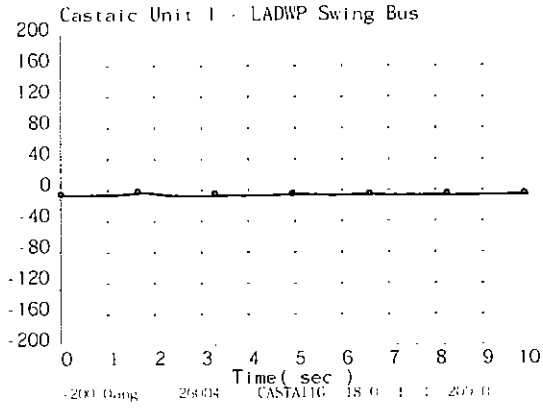






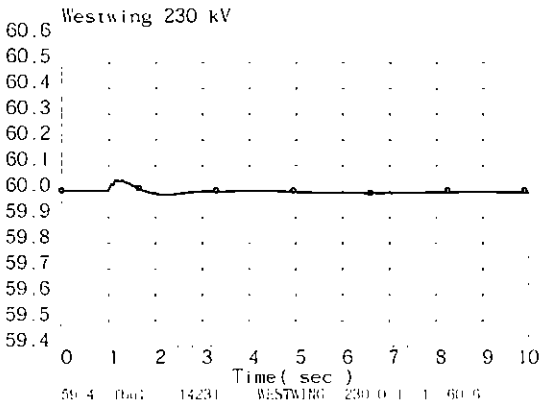


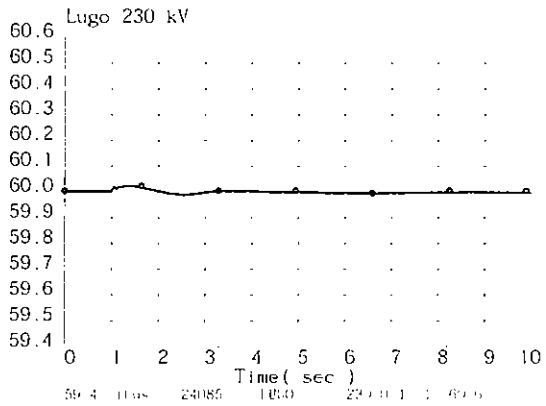


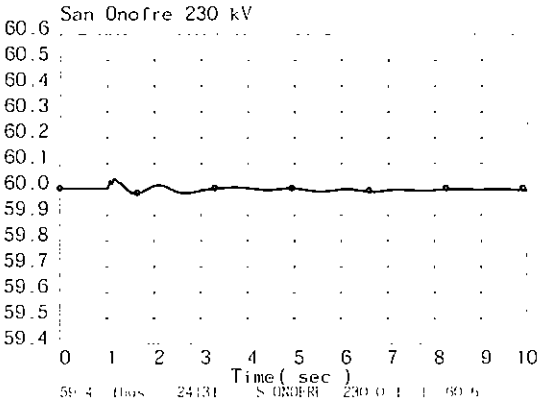


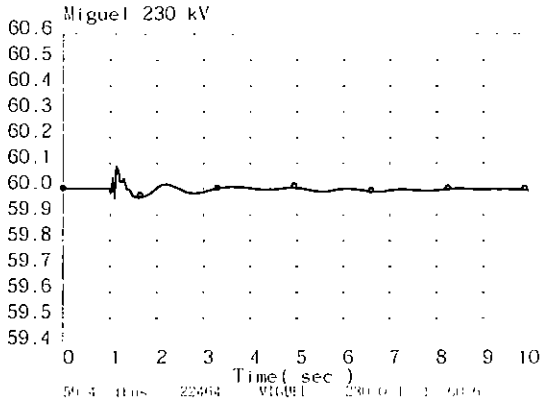
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

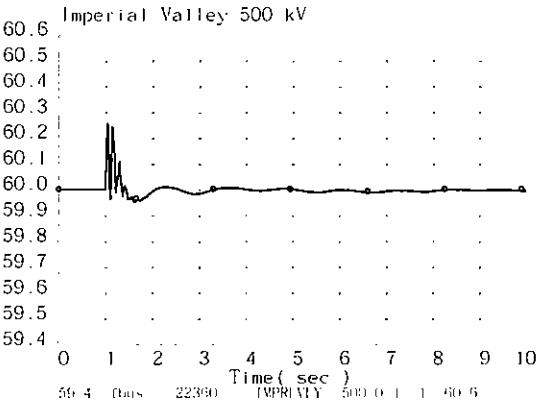
Bus Frequency

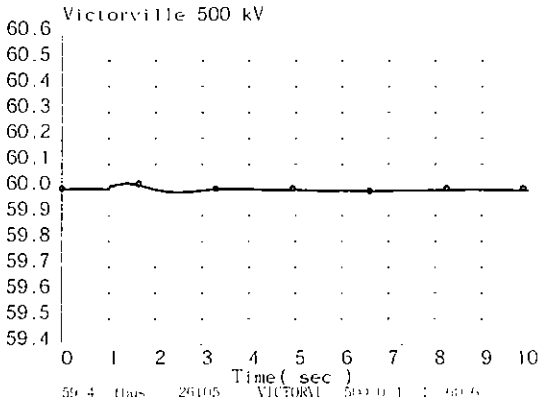






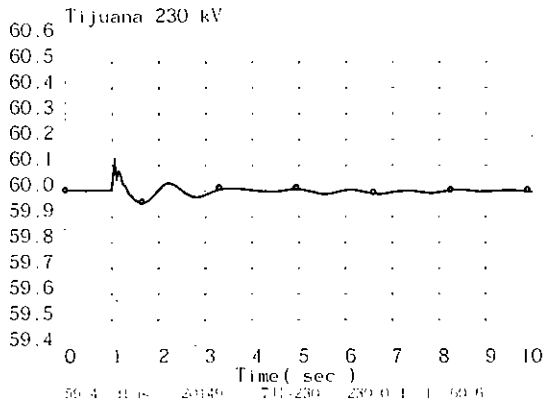


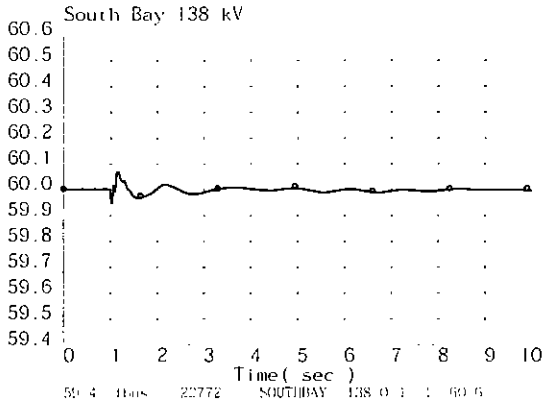


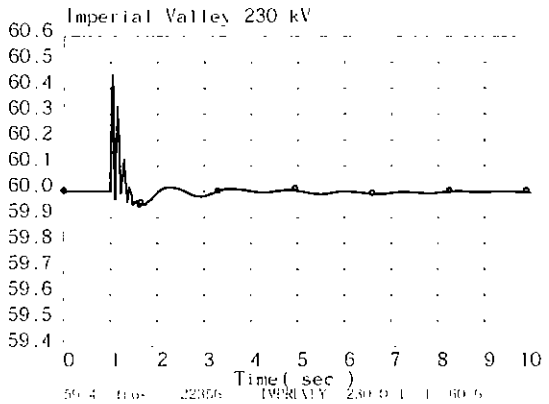


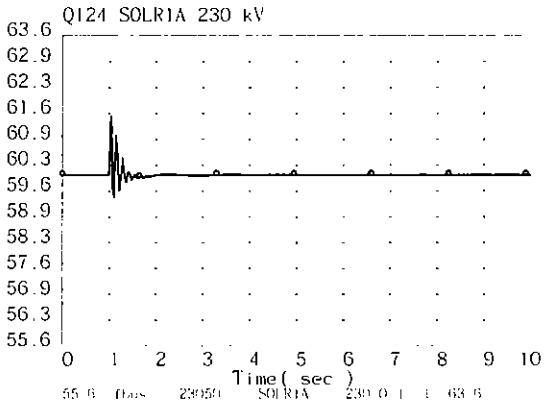
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

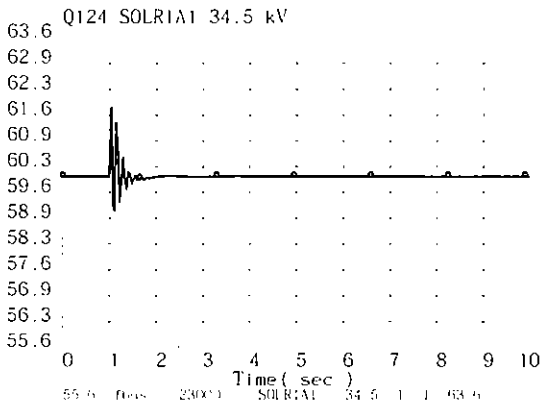
Bus Frequency

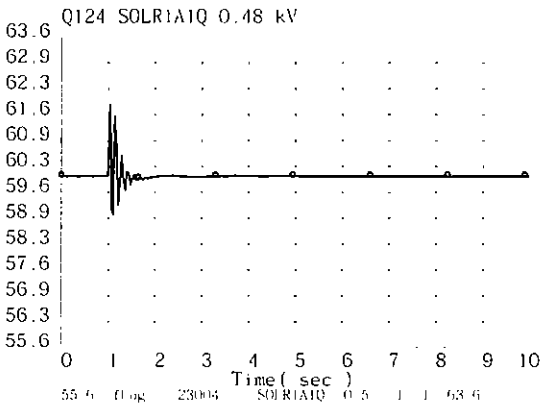






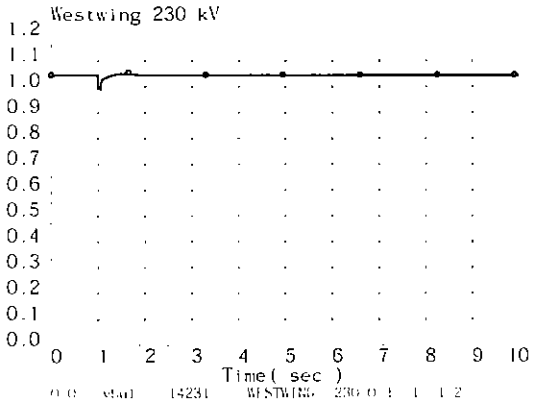


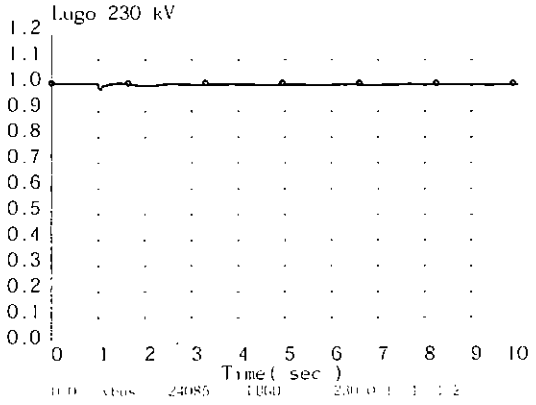


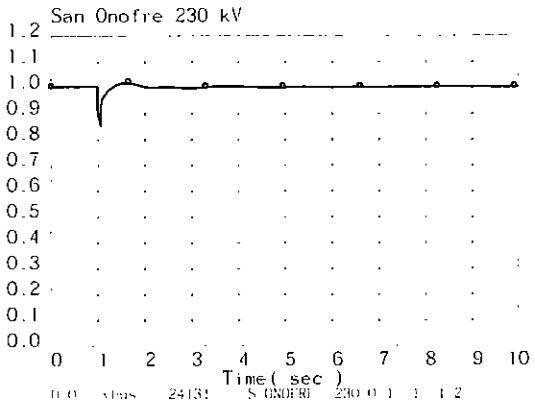


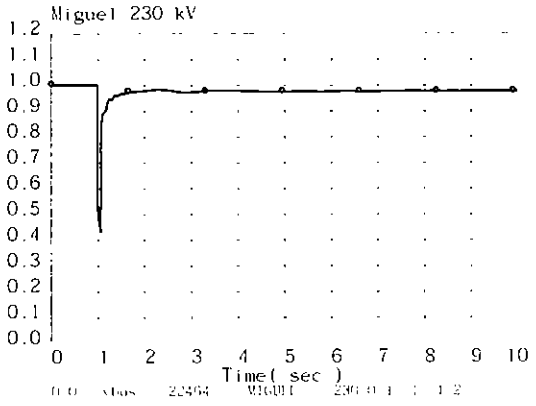
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

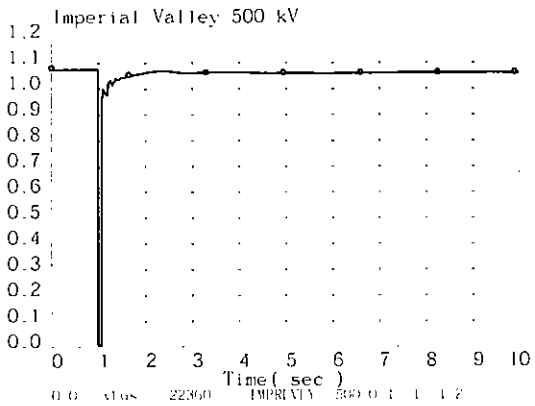
Bus Voltage

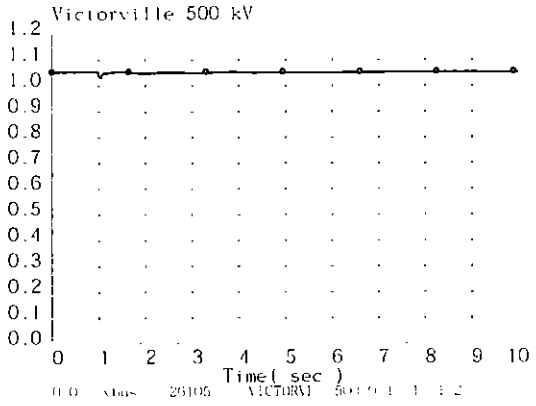




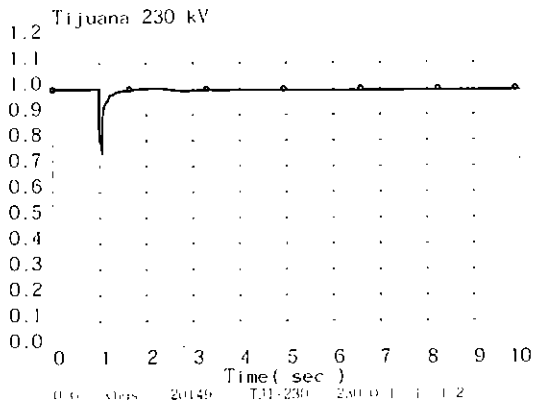


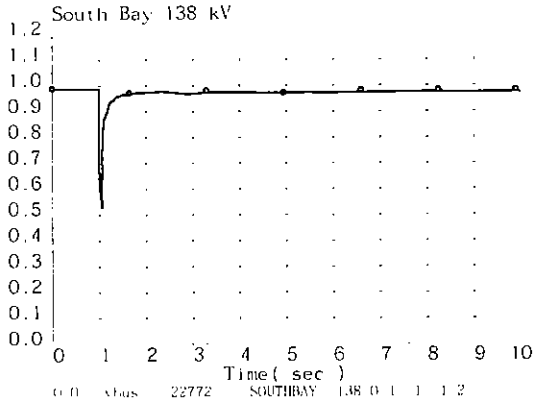


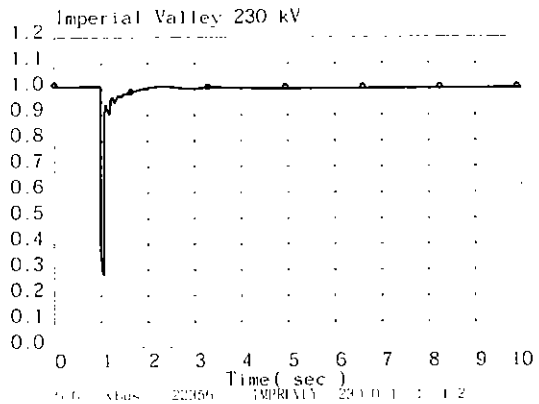


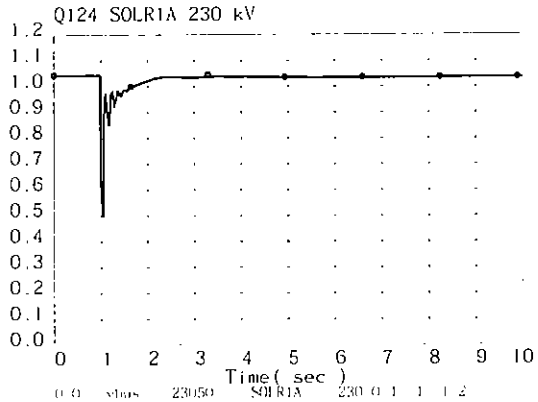


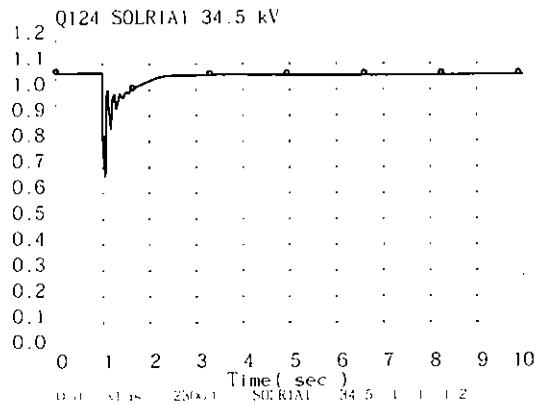
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

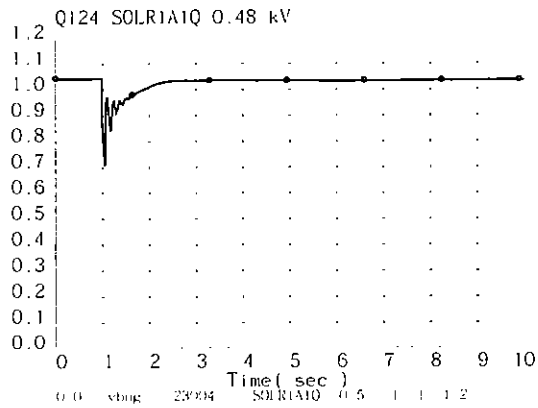






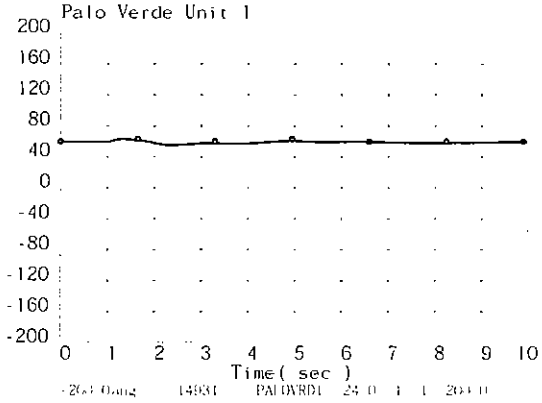


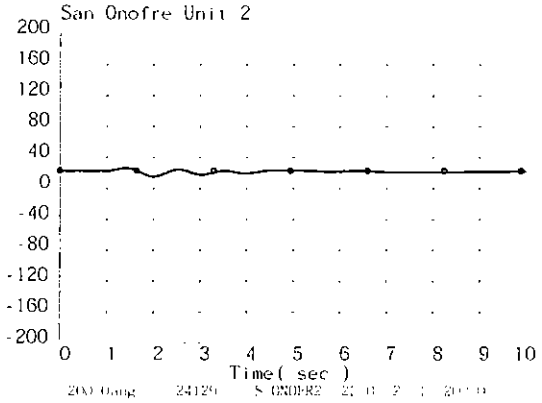


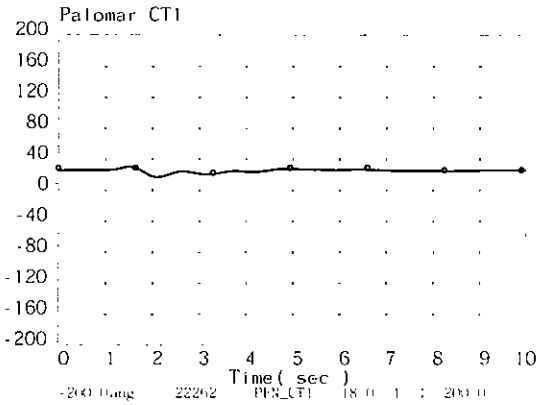


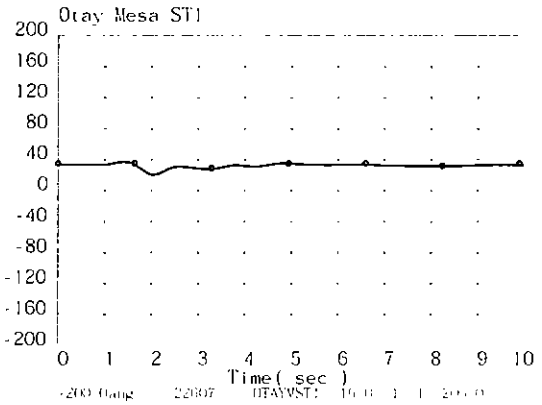
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

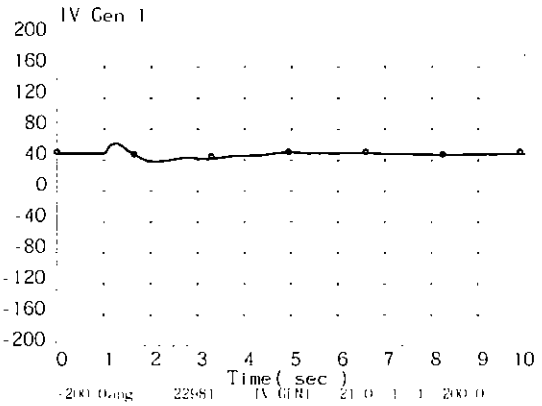
Relative Rotor Angle

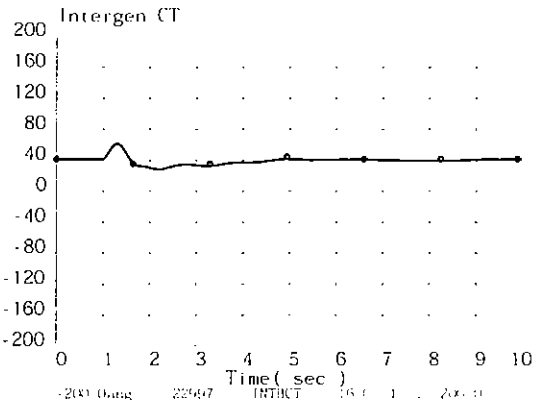






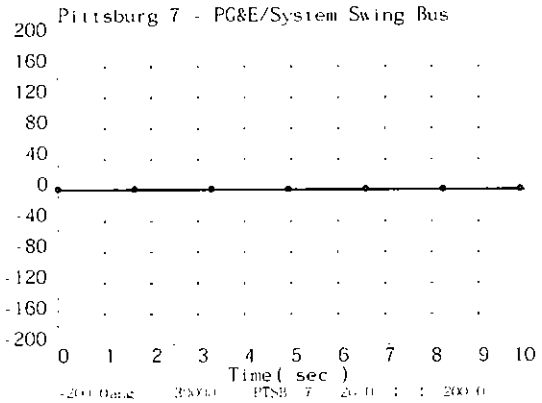


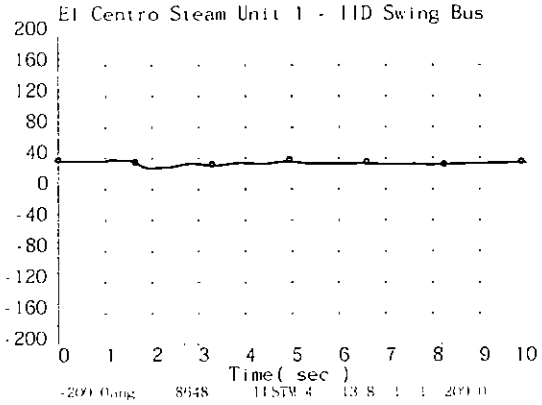


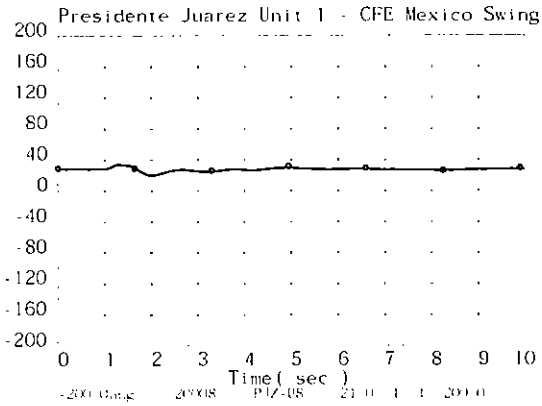


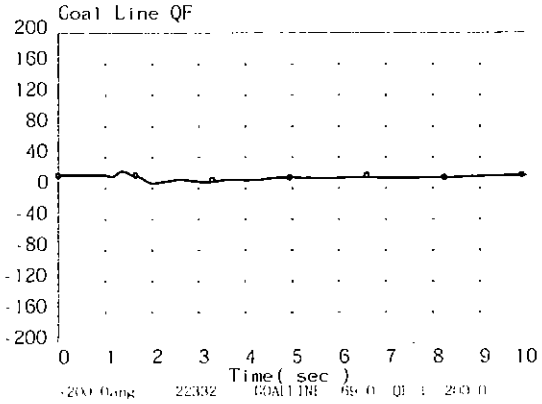
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

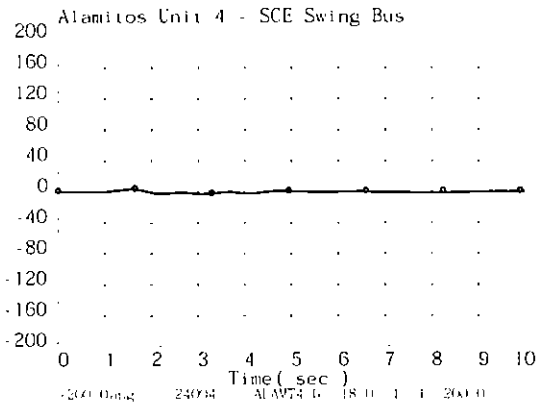
Relative Rotor Angle

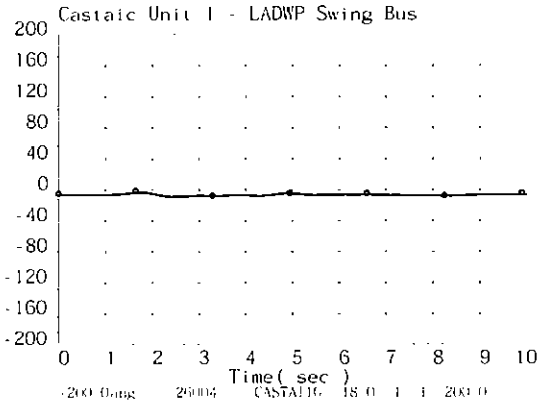






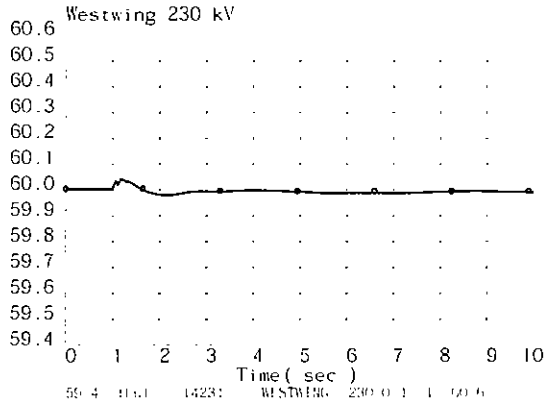


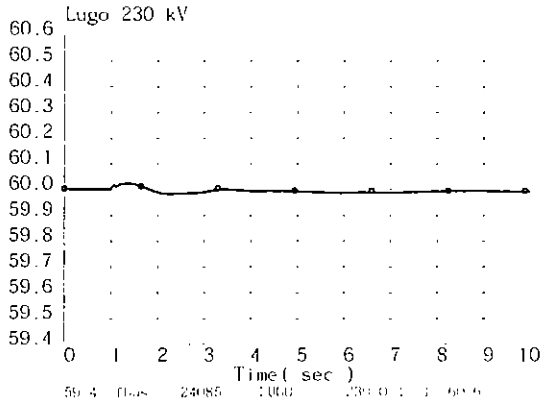


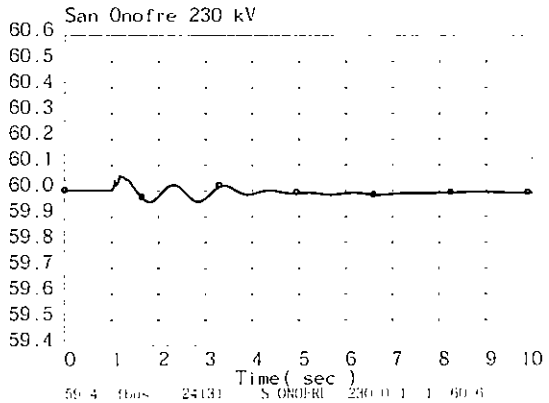


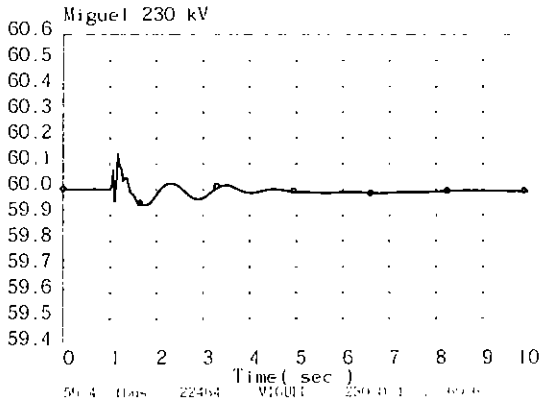
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV El Centro 230 kV line

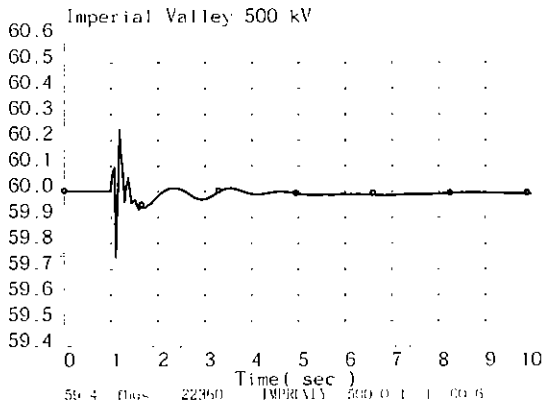
Bus Frequency

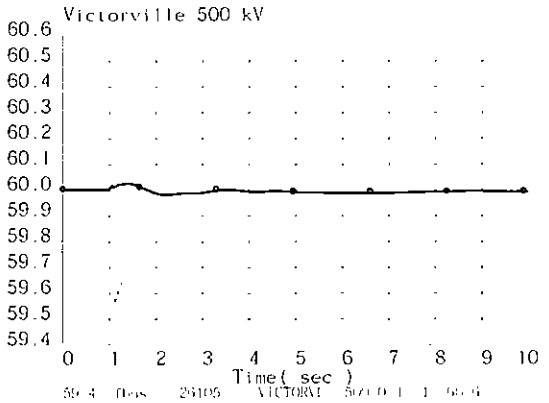






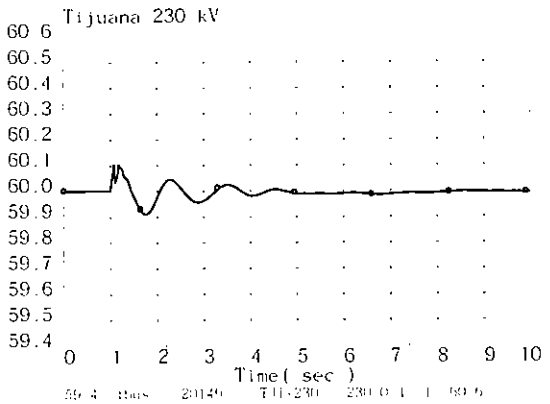


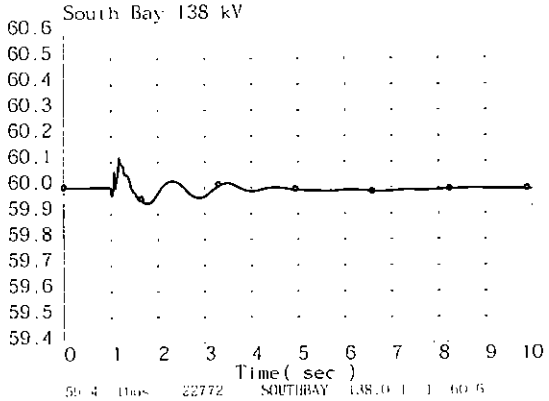


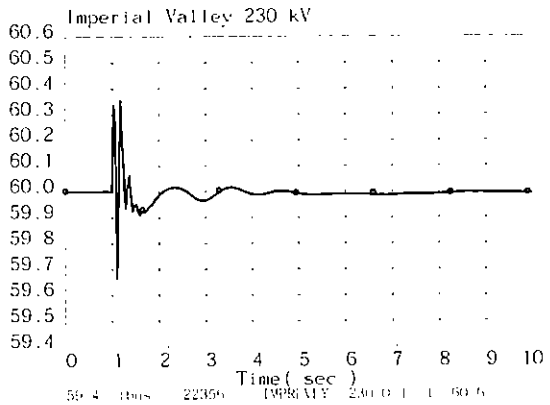


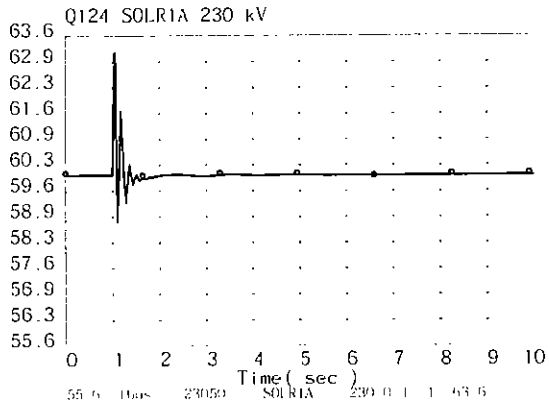
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

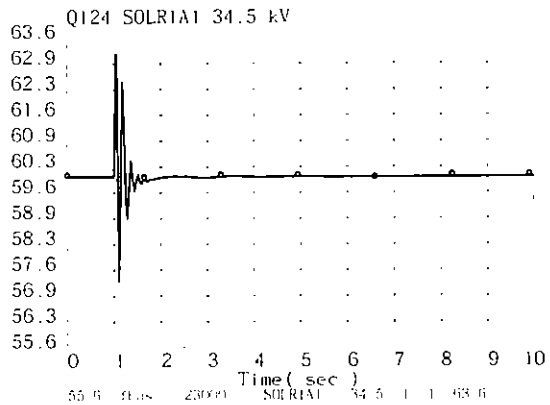
Bus Frequency

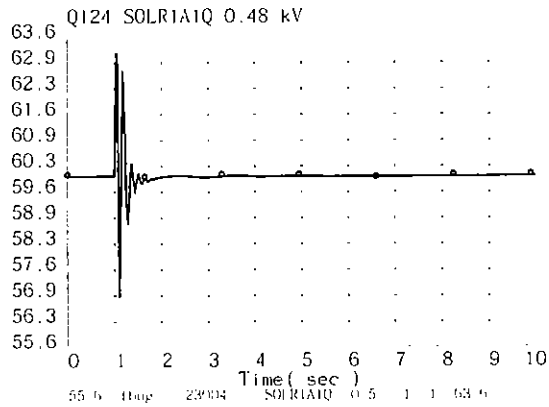






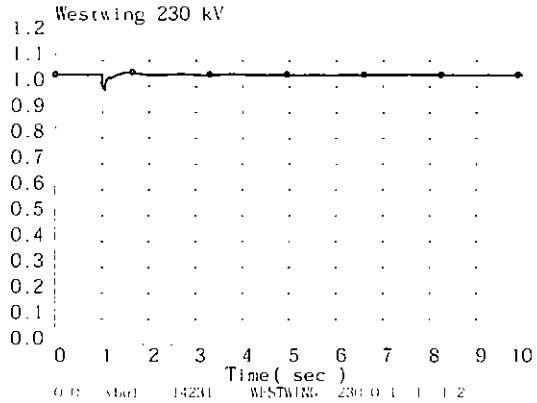


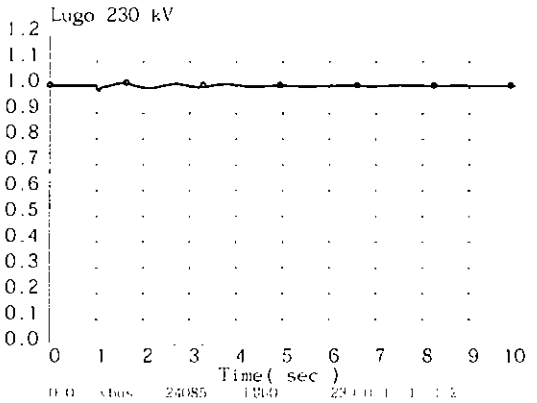


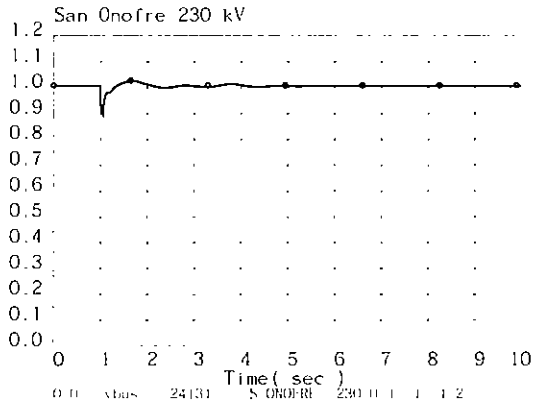


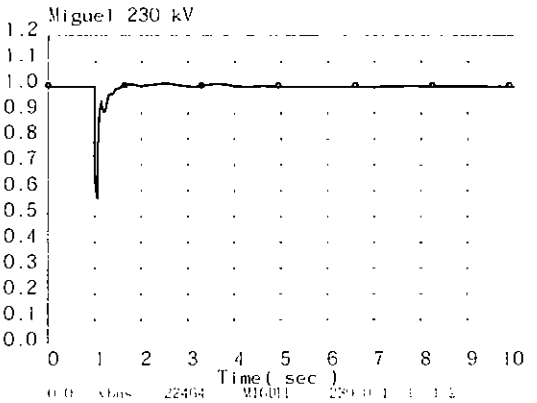
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

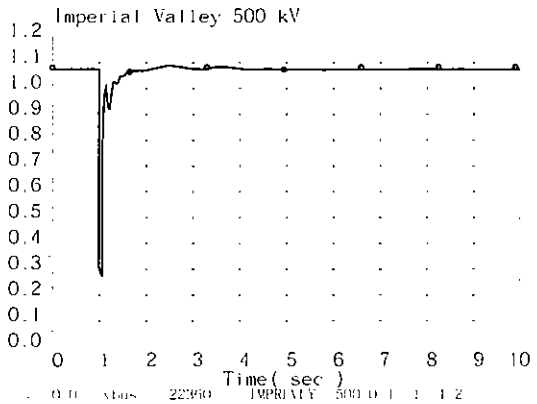
Bus Voltage

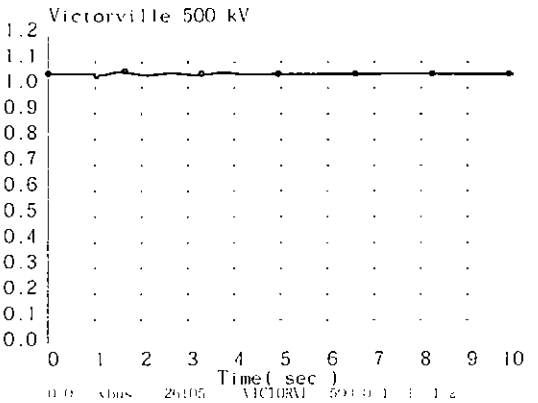






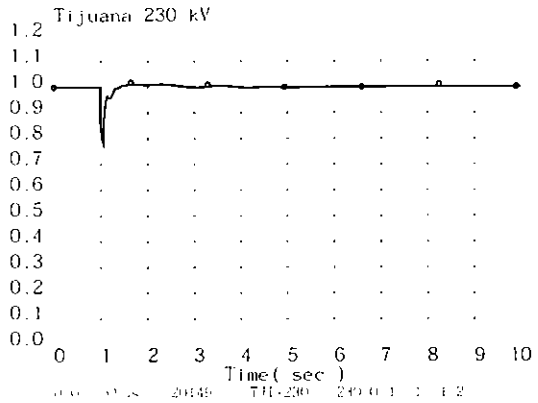


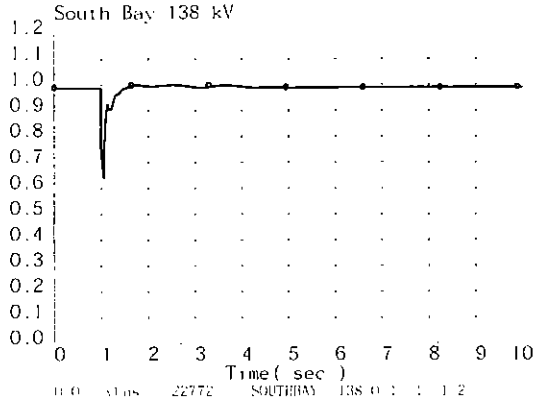


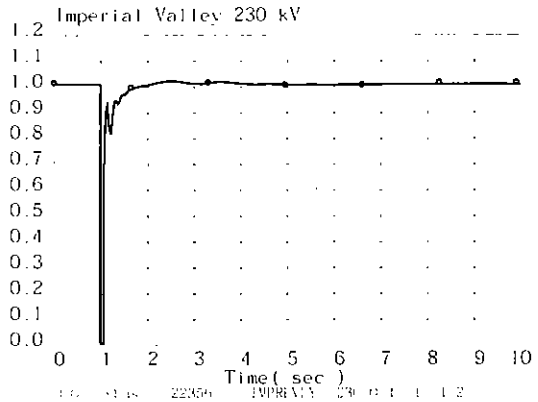


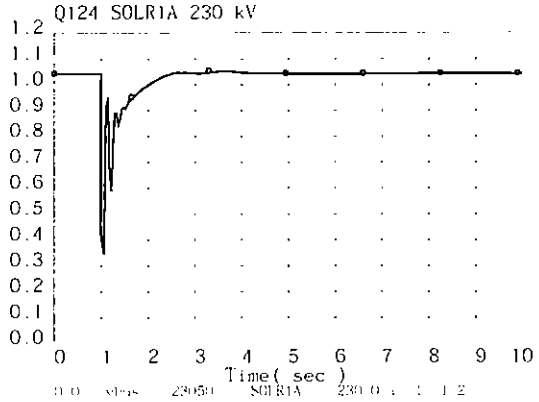
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

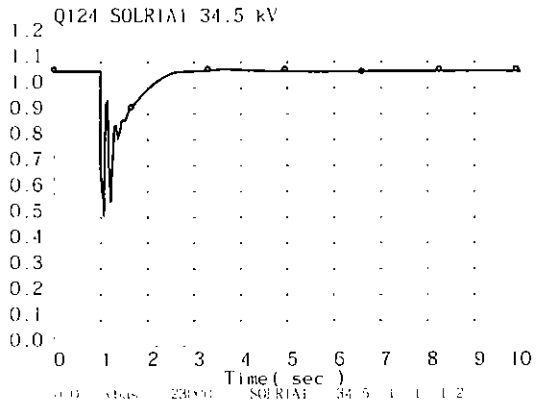
Bus Voltage

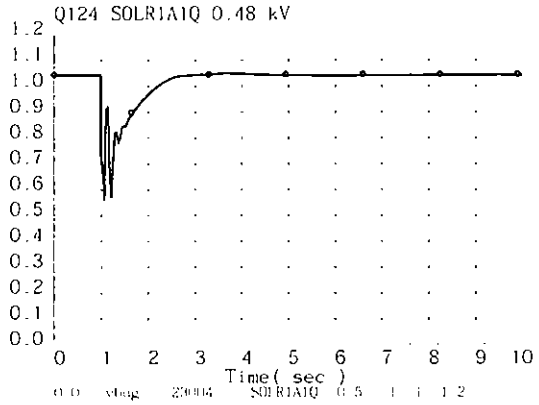






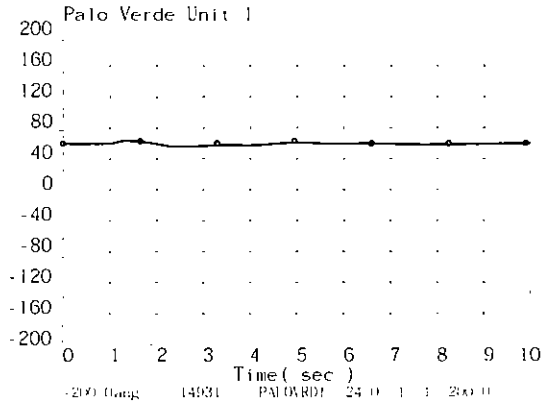


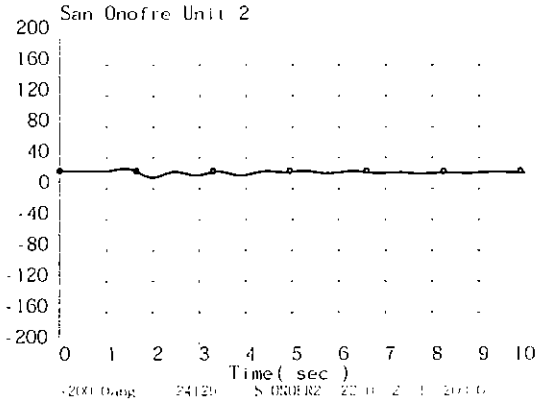


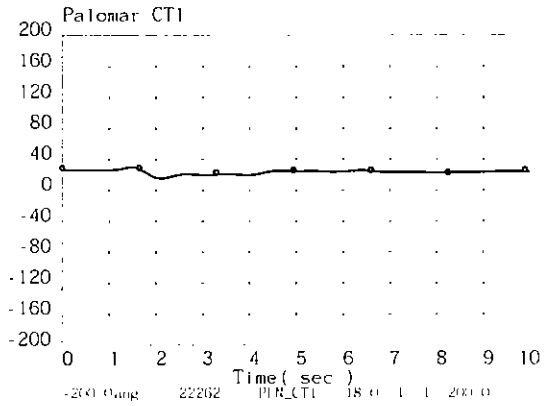


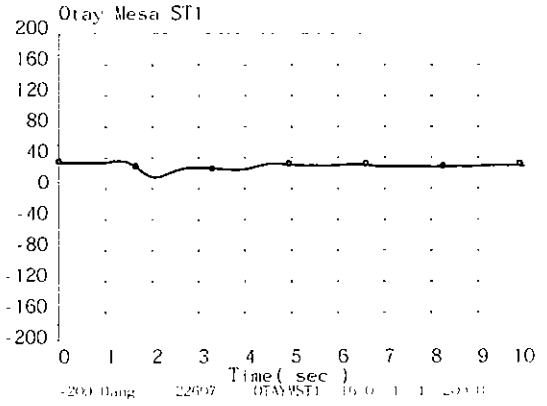
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

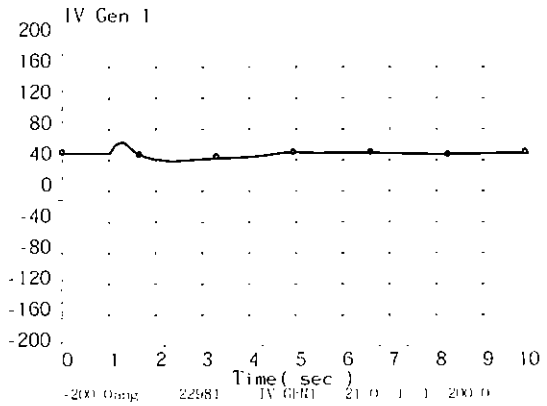
Relative Rotor Angle

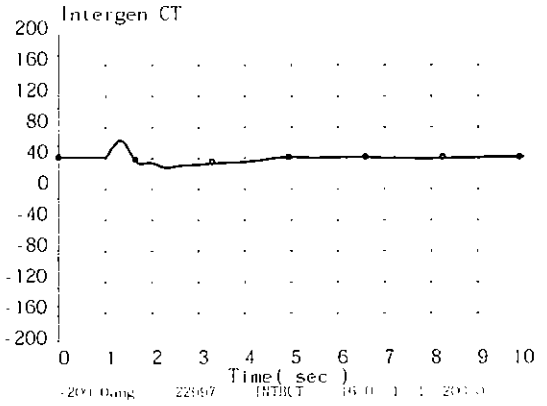






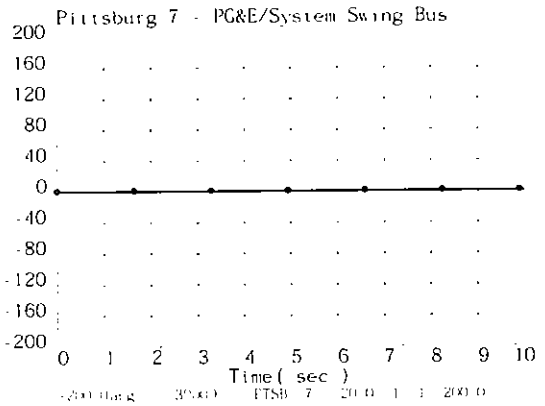


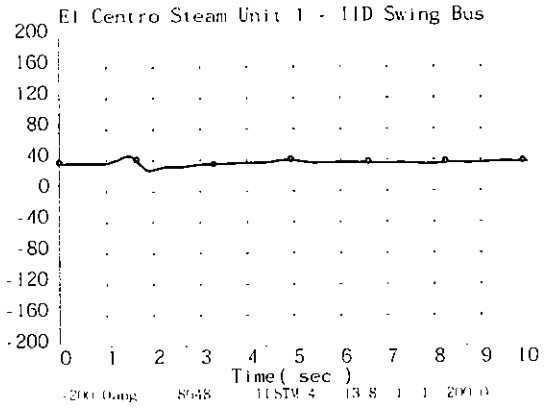


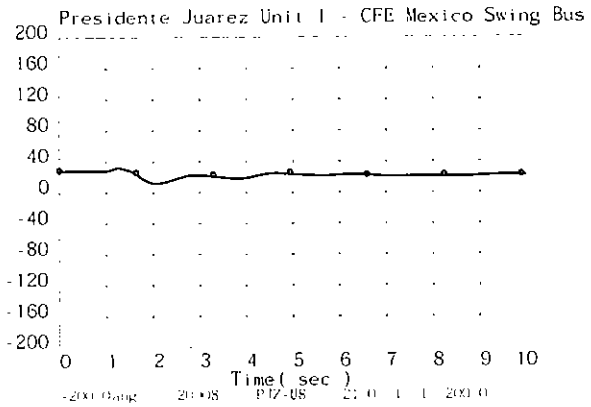


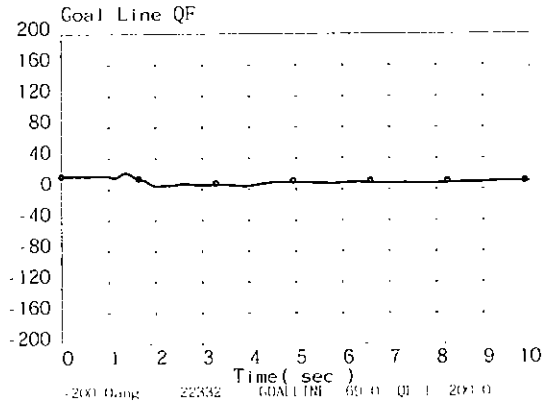
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

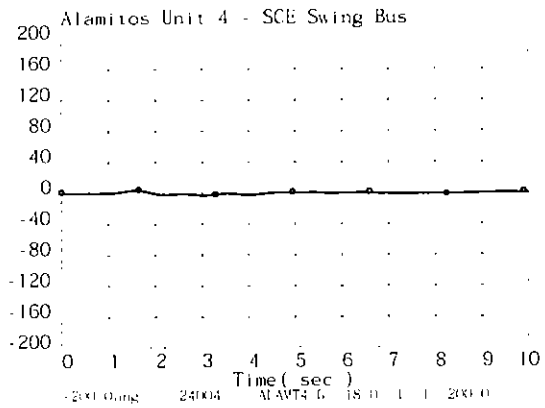
Relative Rotor Angle

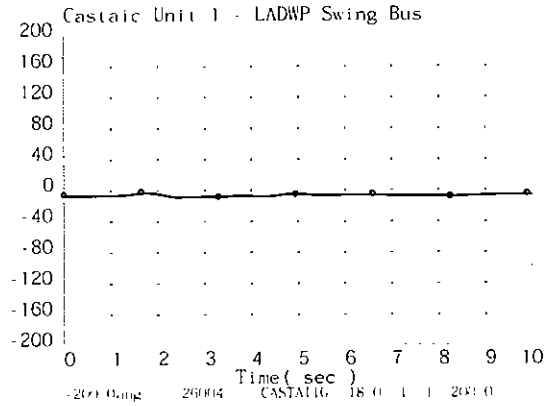




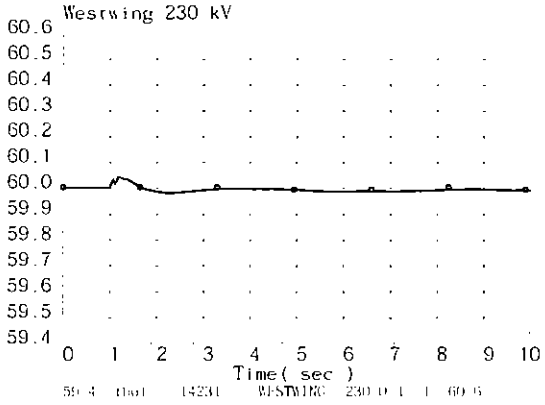


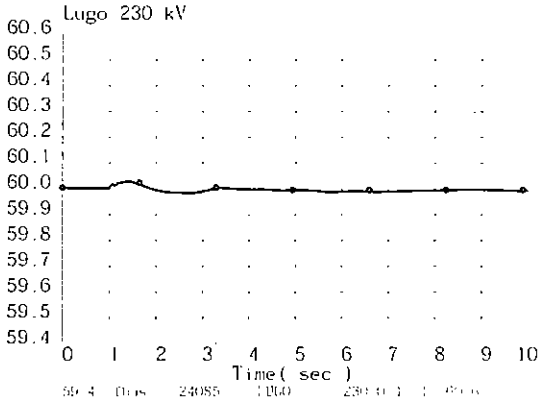


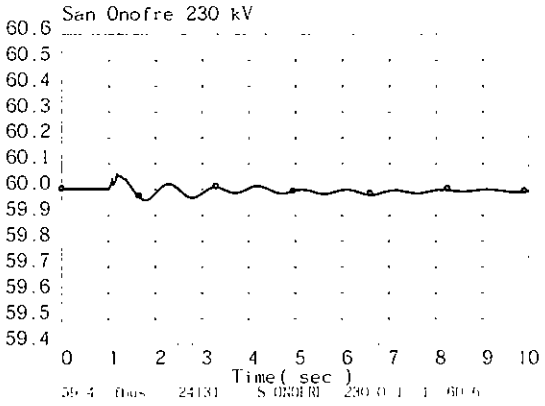


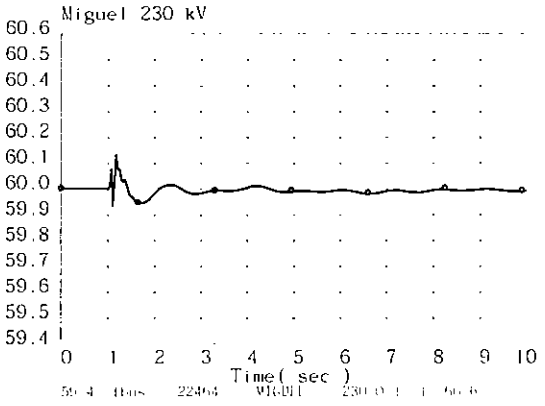


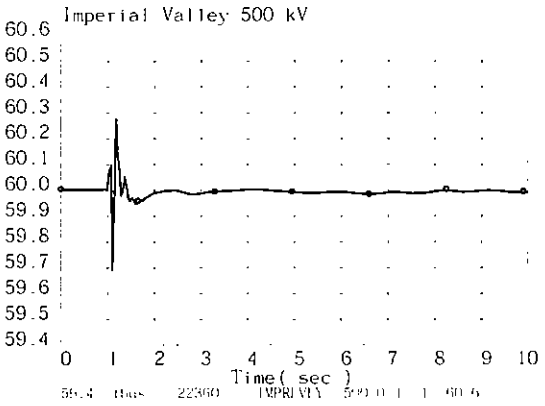
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

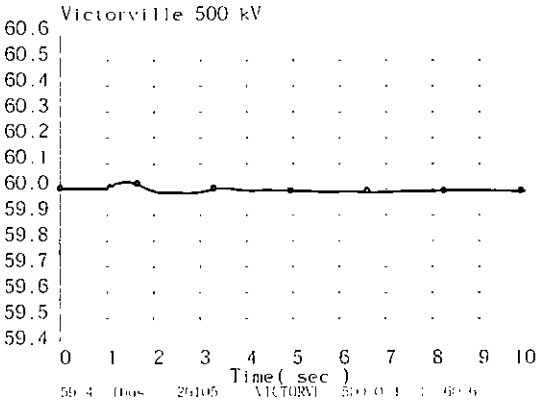






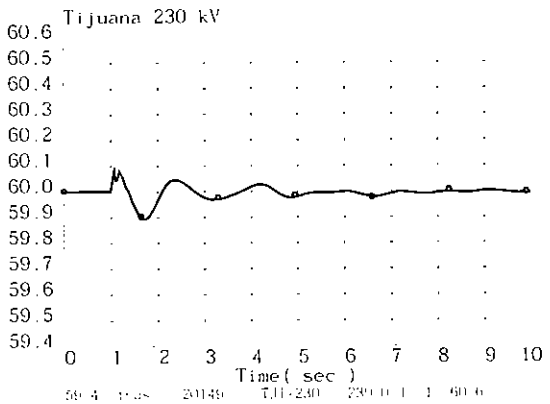


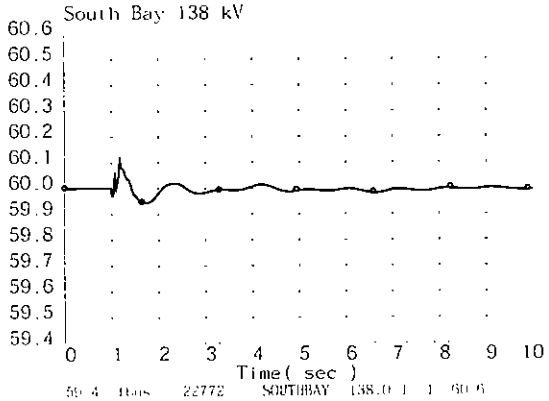


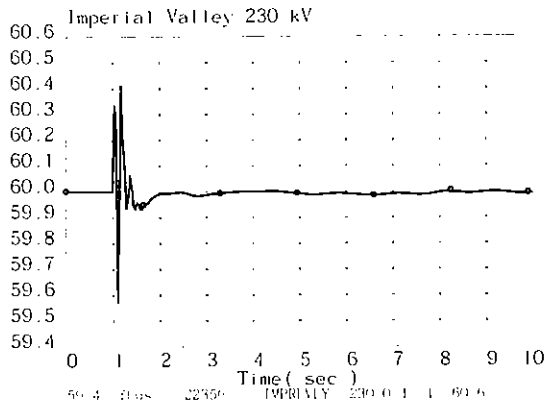


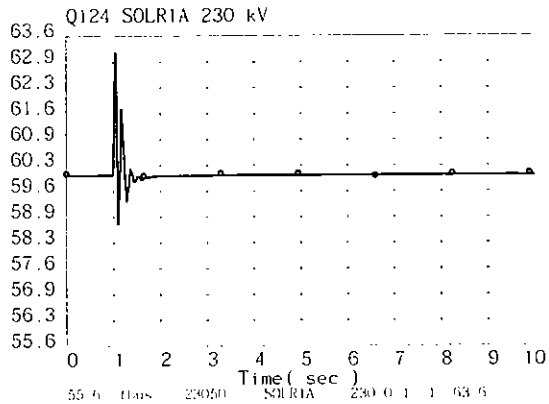
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

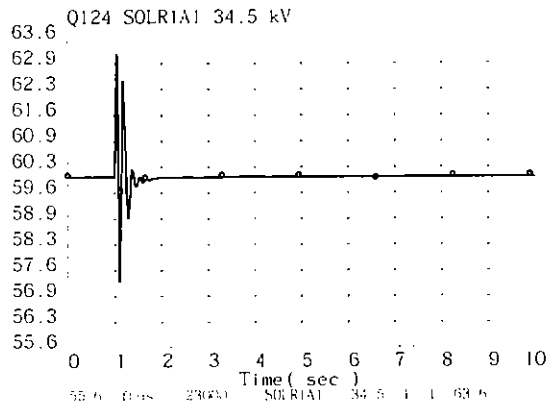
Bus Frequency

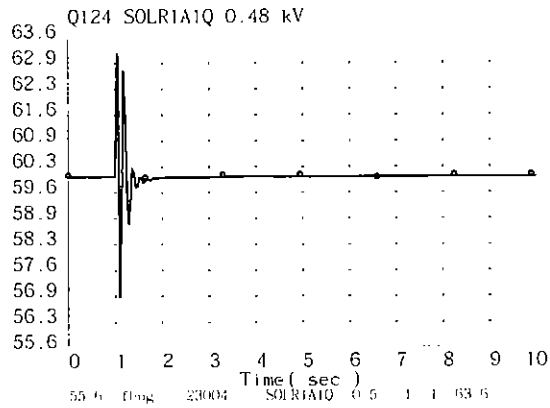






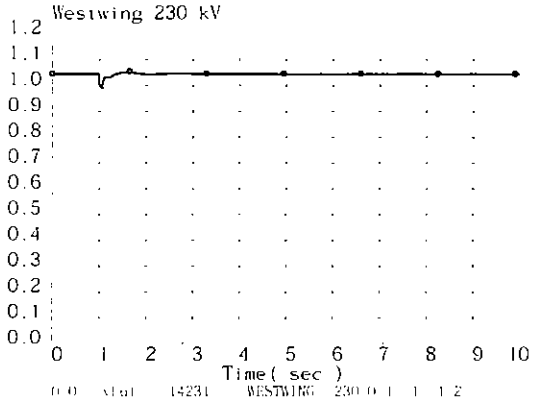


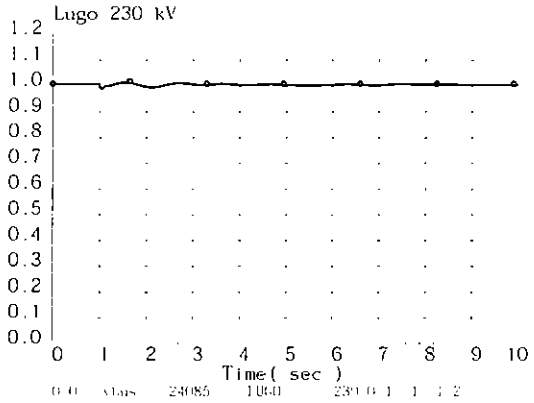


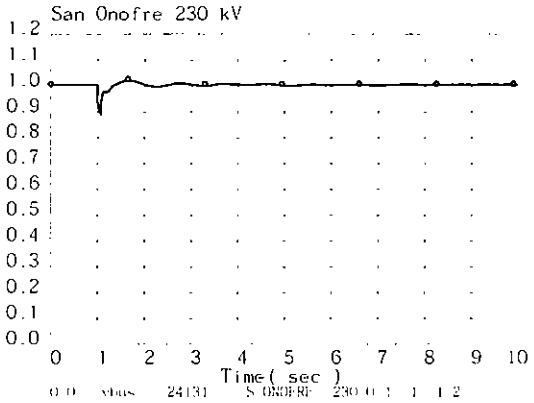


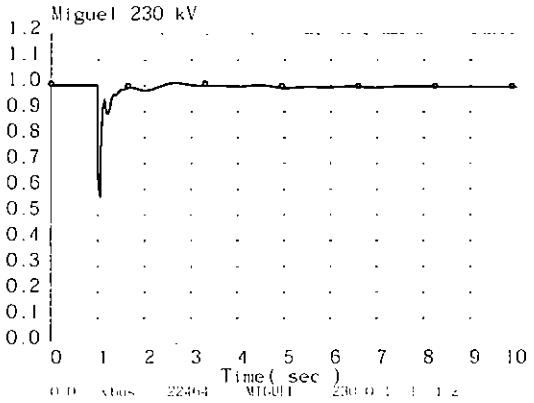
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

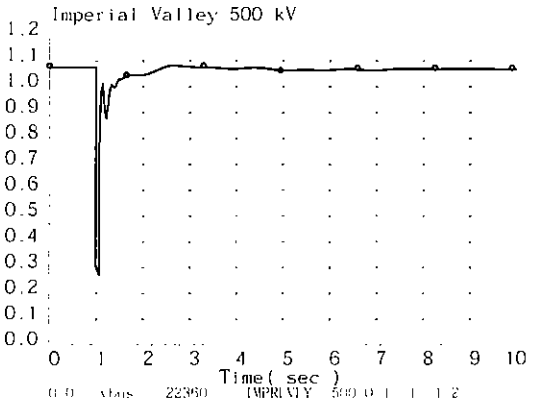
Bus Voltage

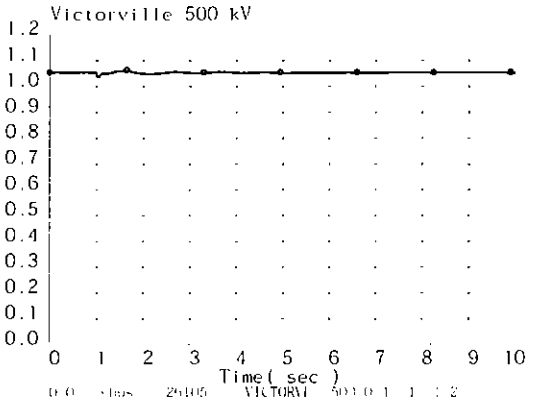






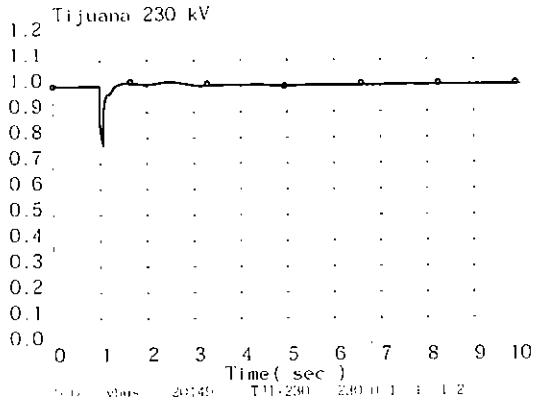


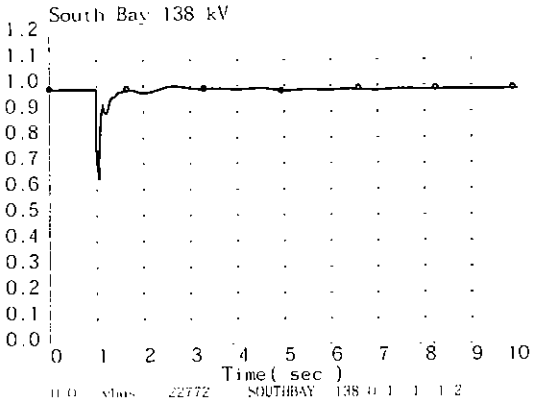


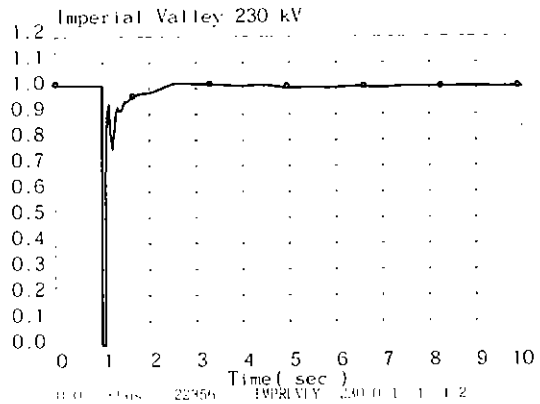


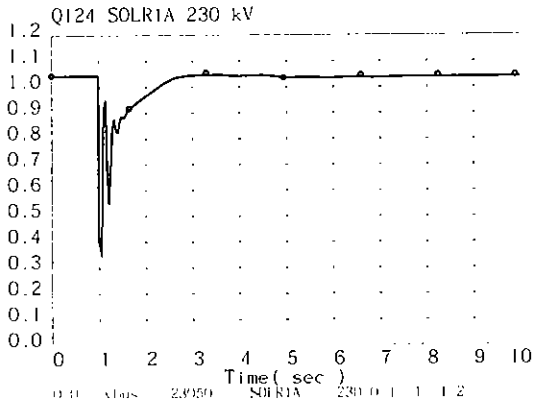
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

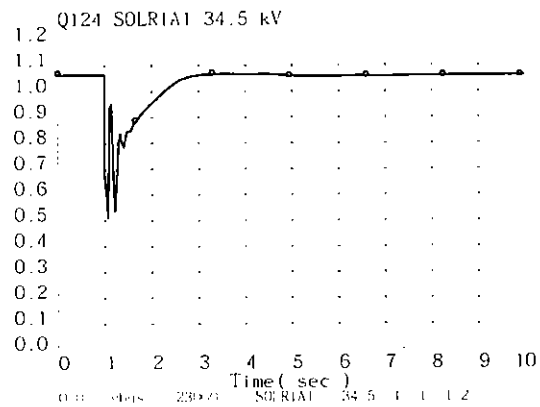
Bus Voltage

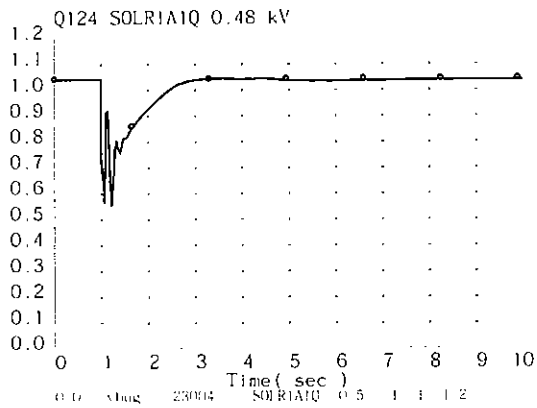






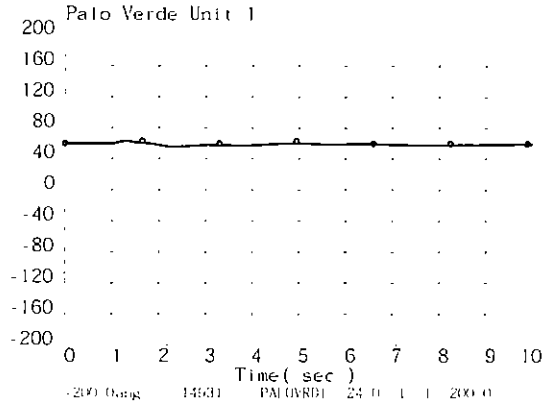


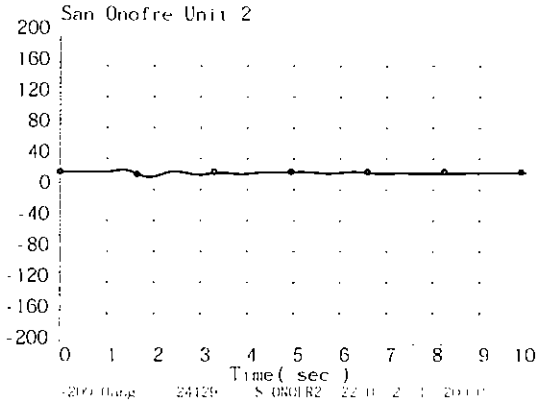


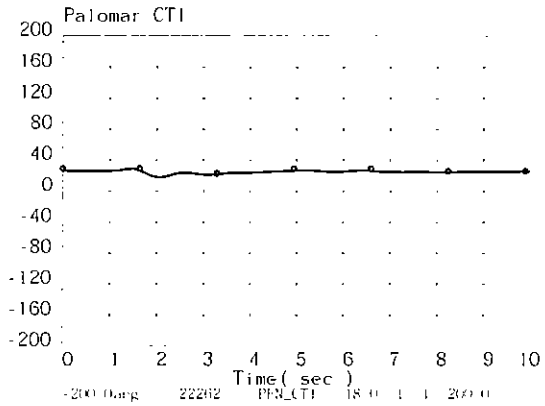


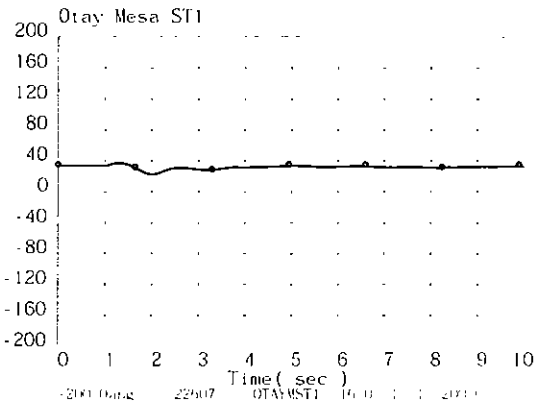
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

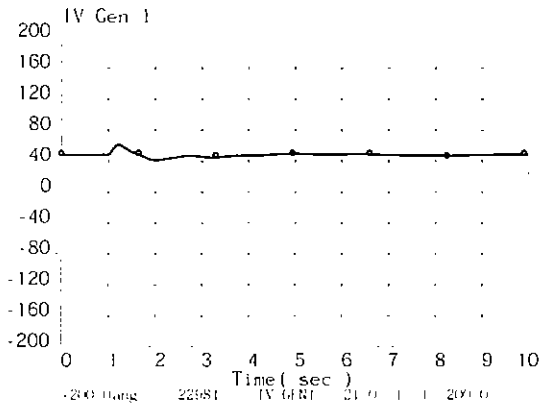
Relative Rotor Angle

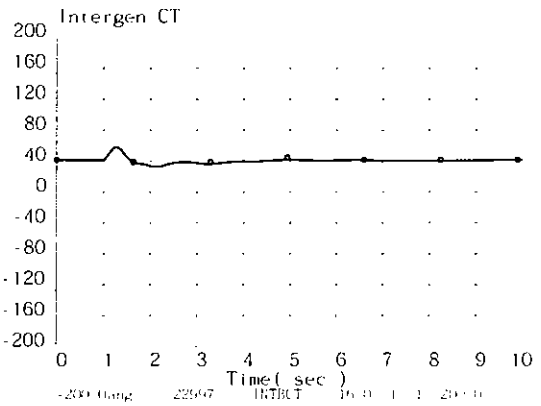






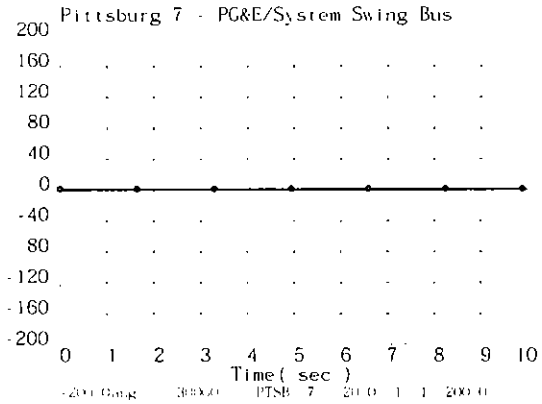


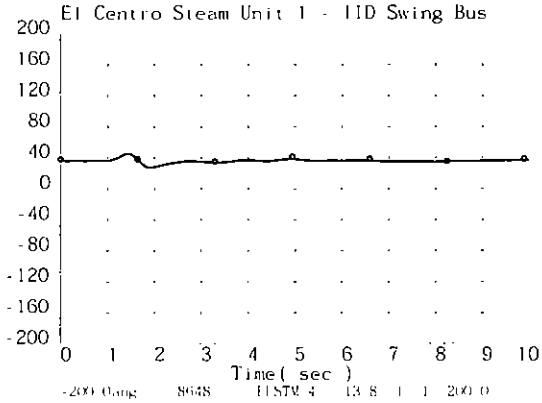


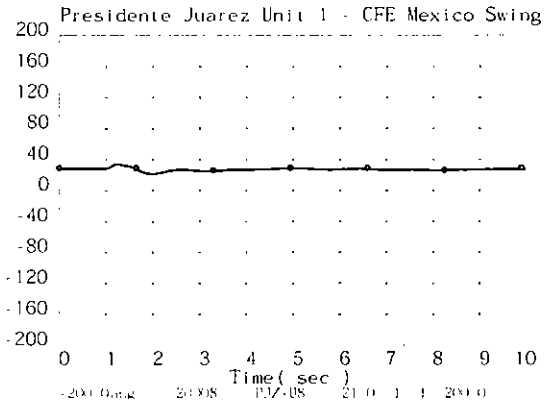


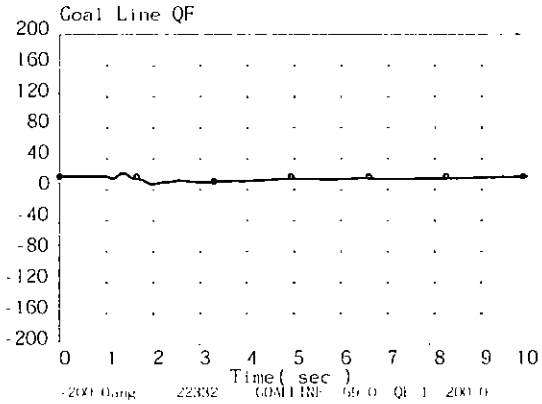
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

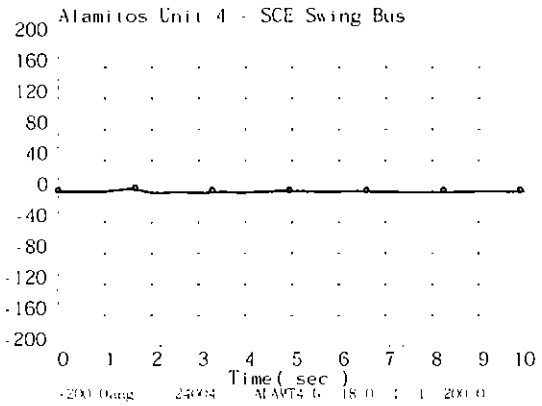
Relative Rotor Angle

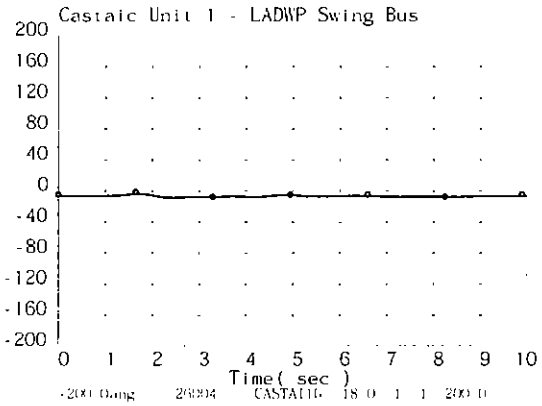






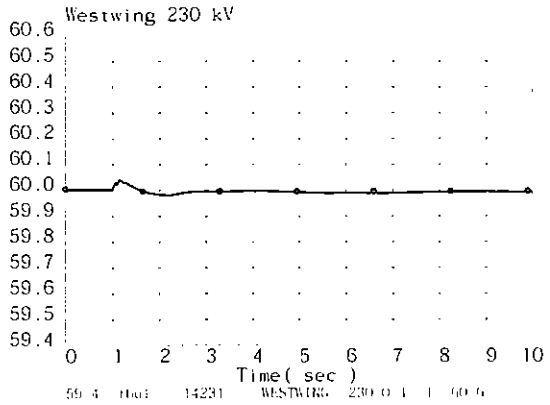


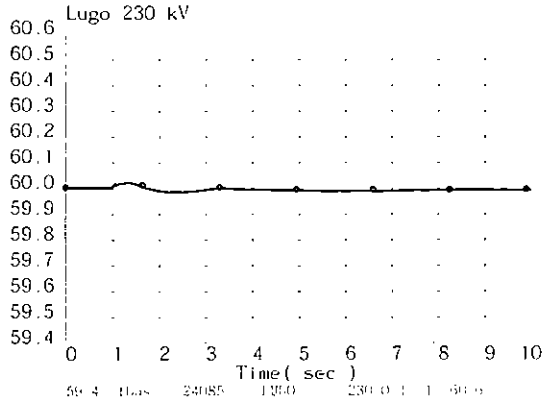


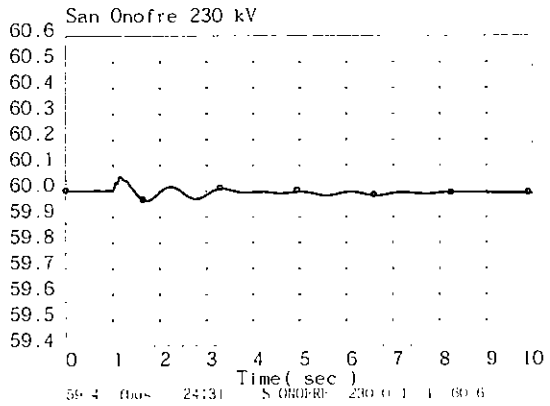


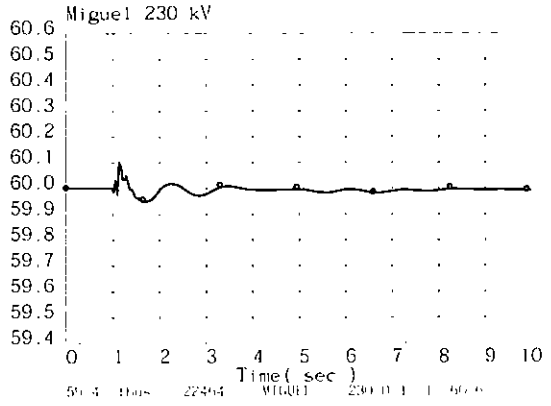
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

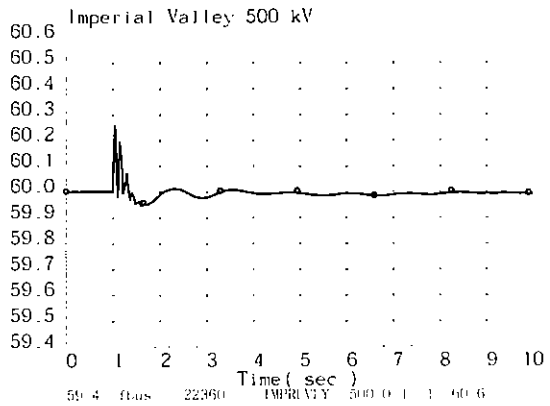
Bus Frequency

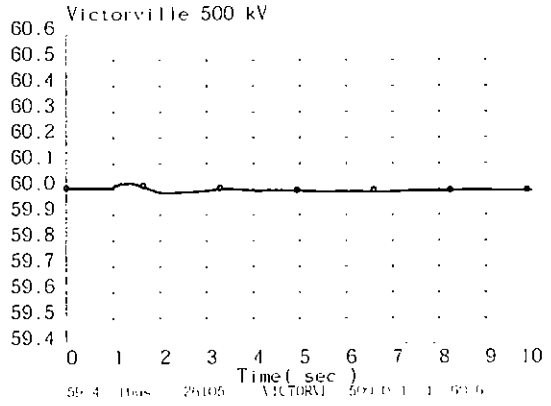




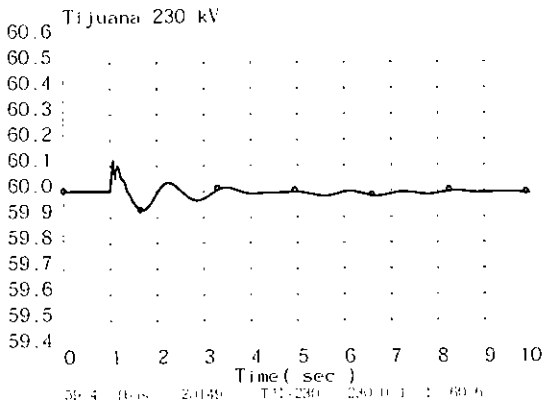


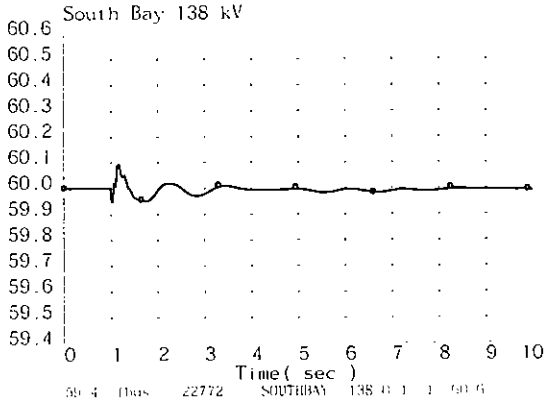


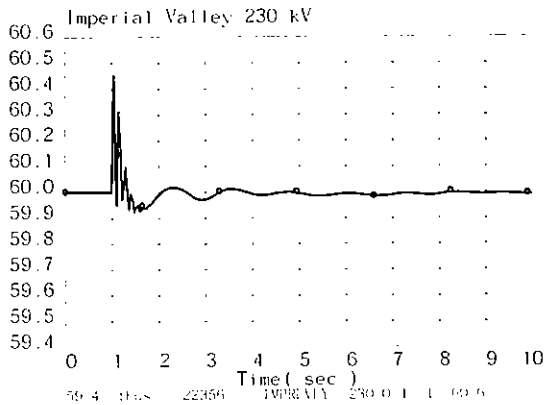


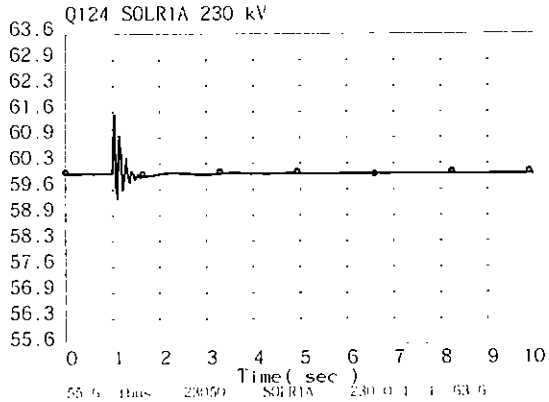


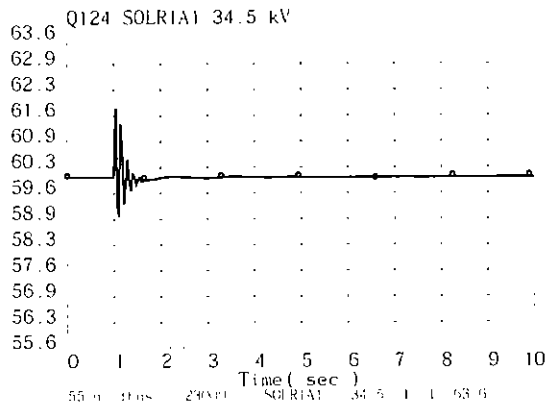
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

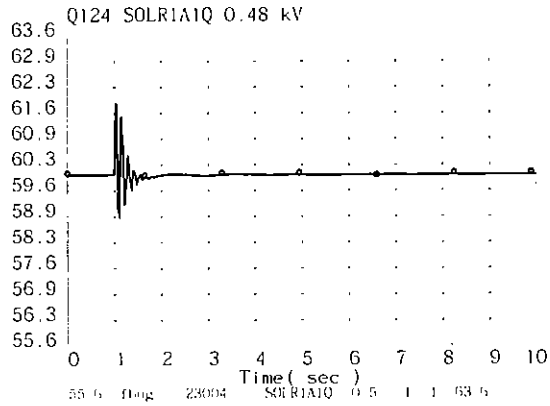






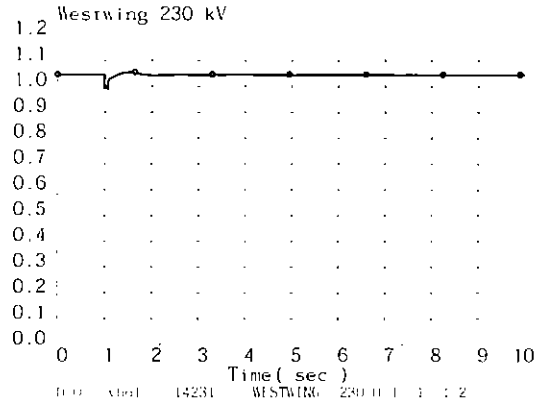


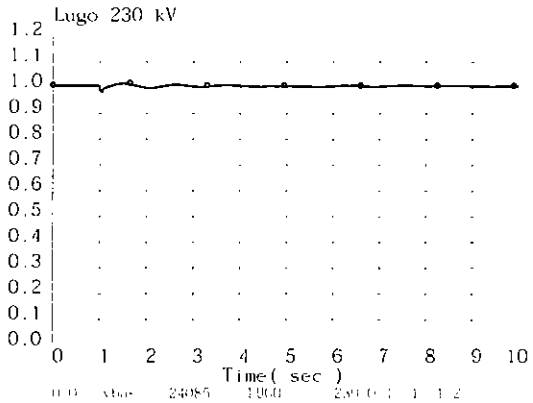


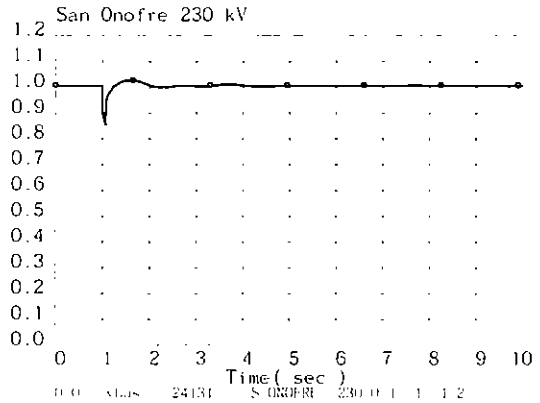


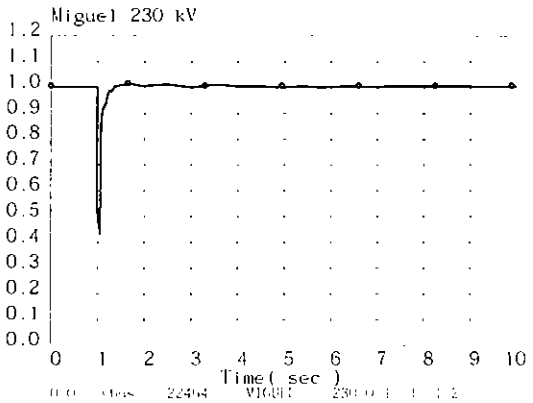
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

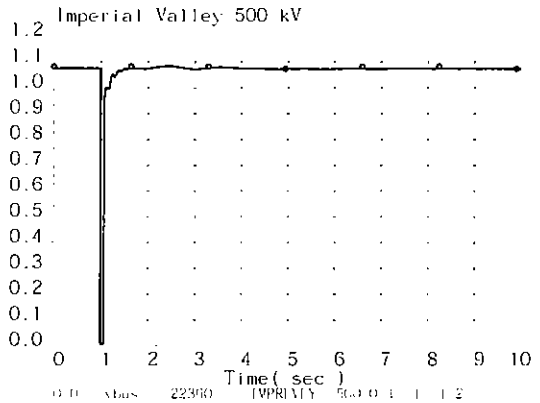
Bus Voltage

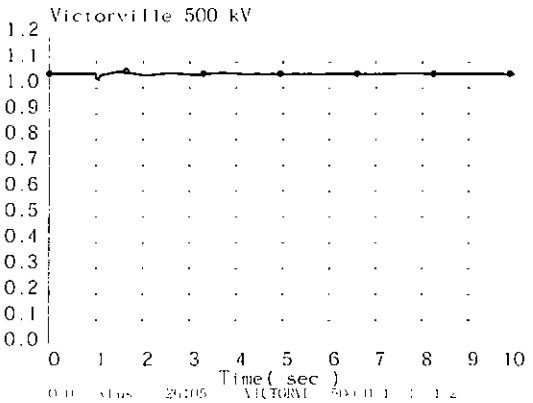




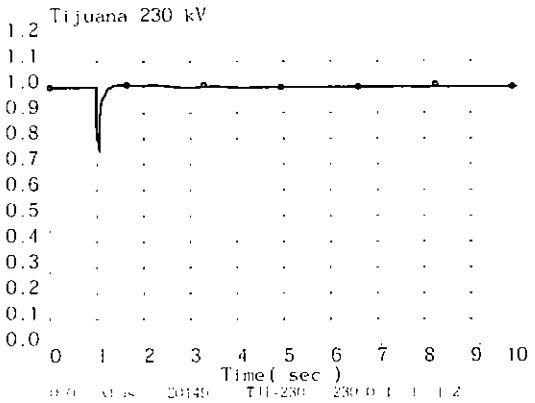


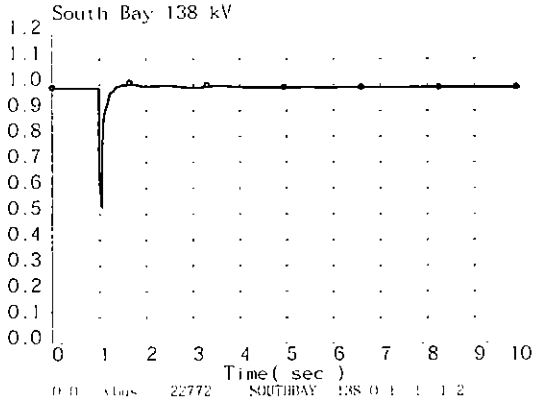


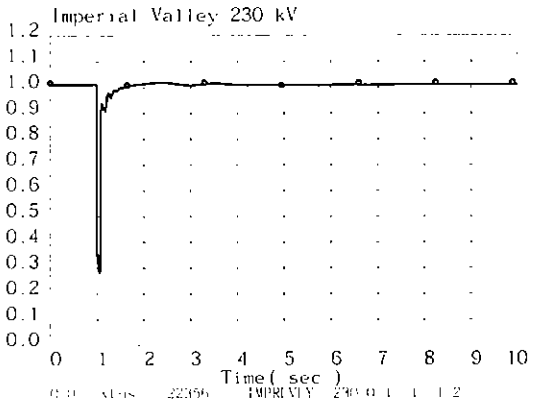


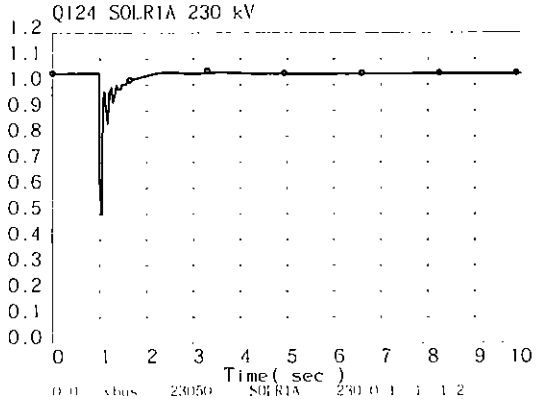


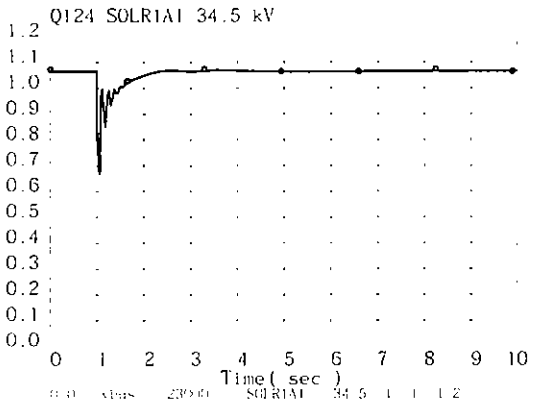
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

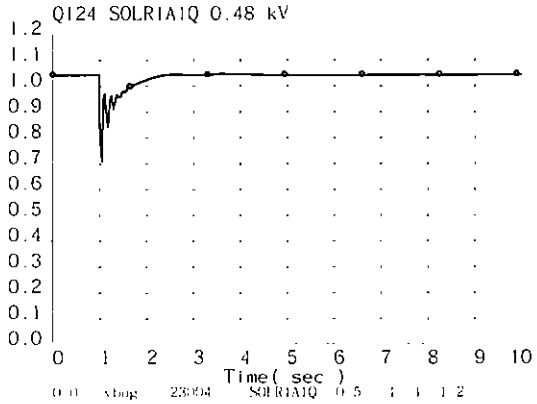






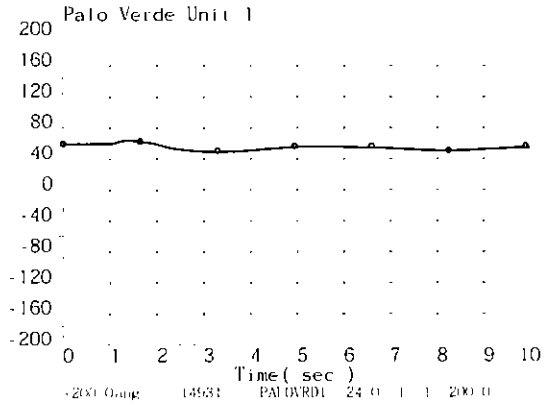


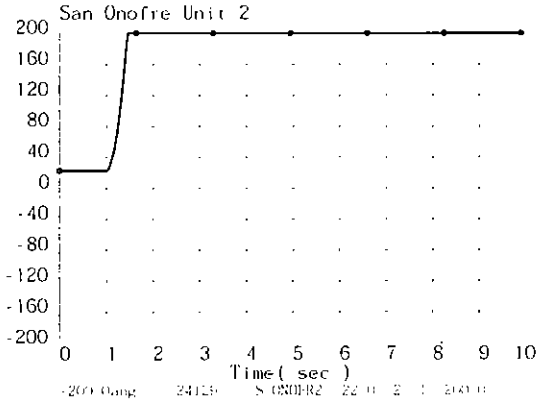


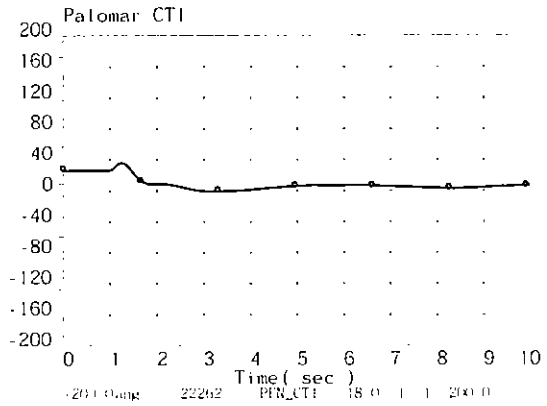


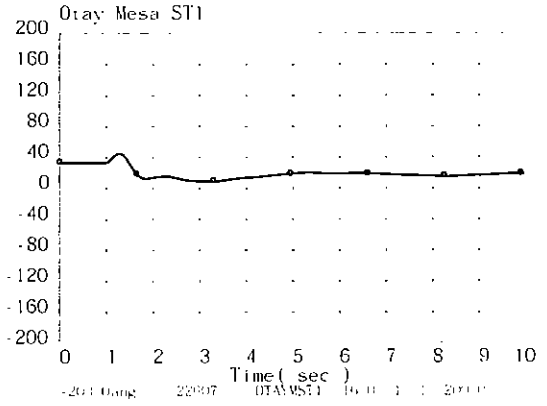
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

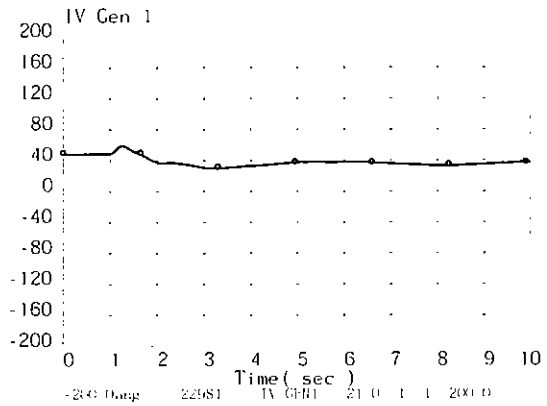
Relative Rotor Angle

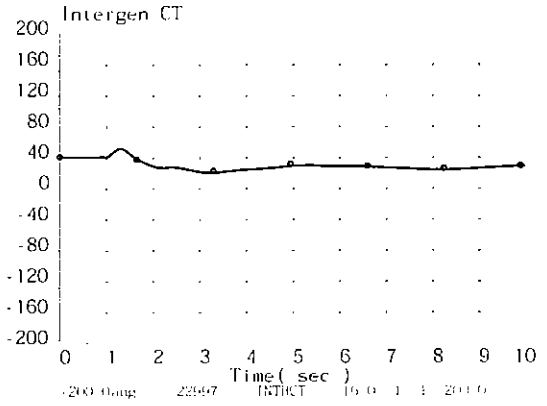






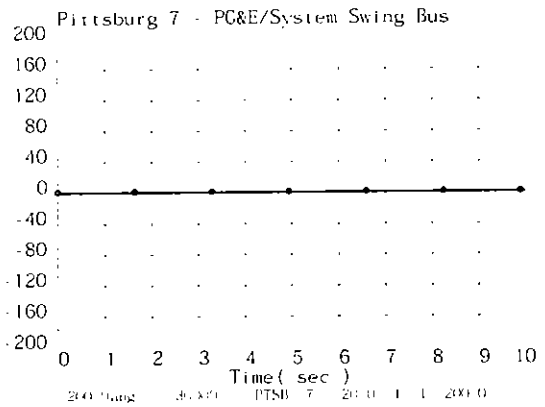


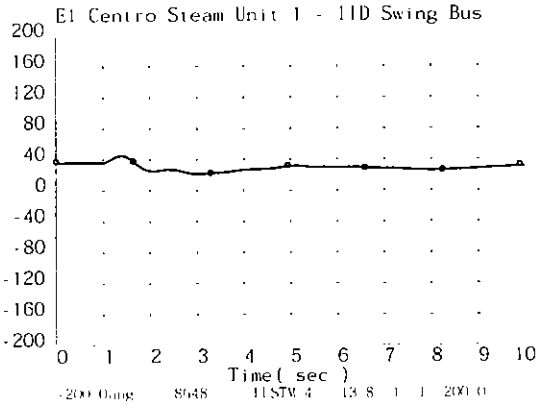


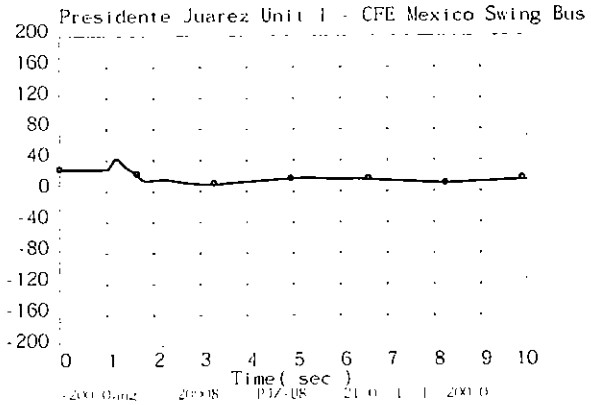


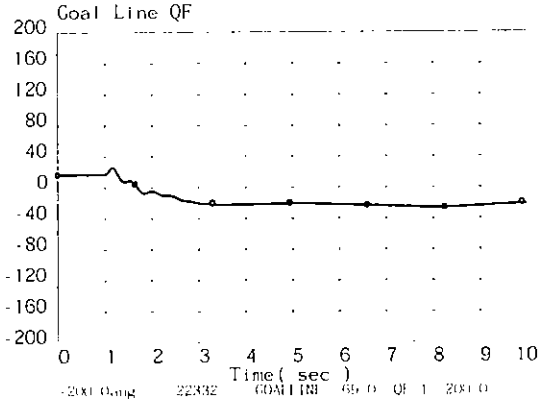
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

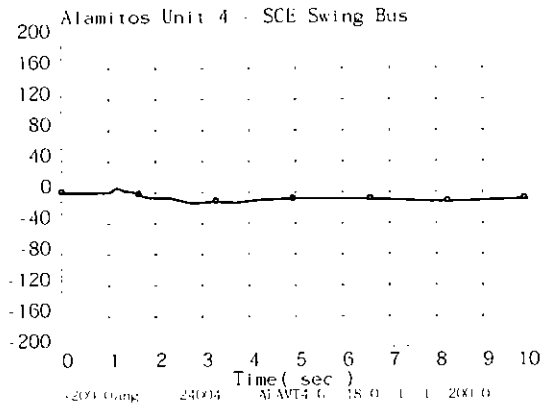
Relative Rotor Angle

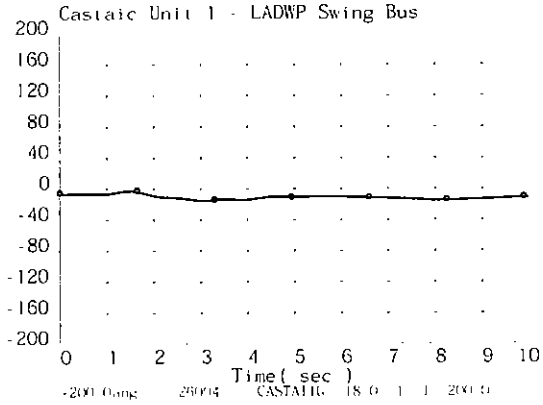






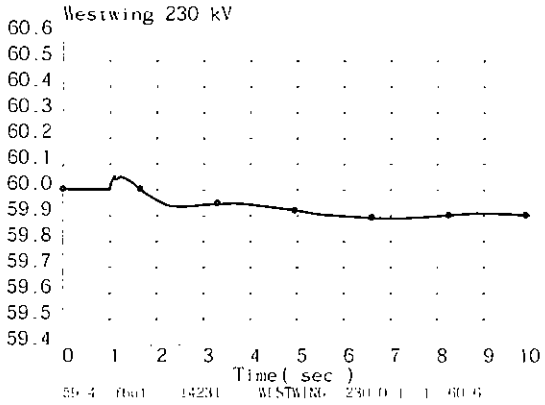


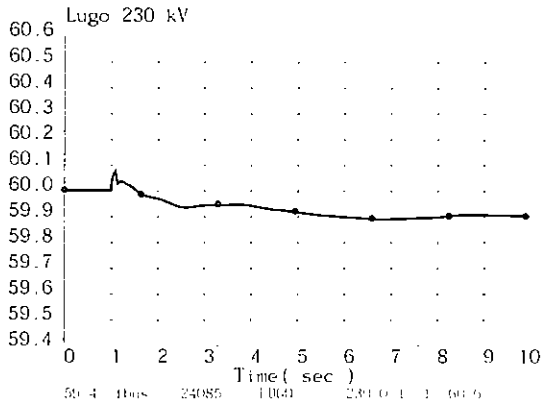


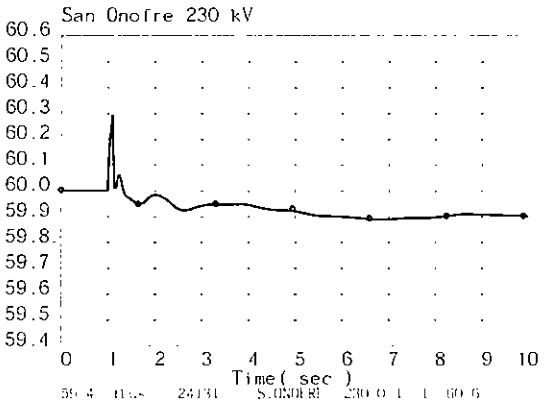


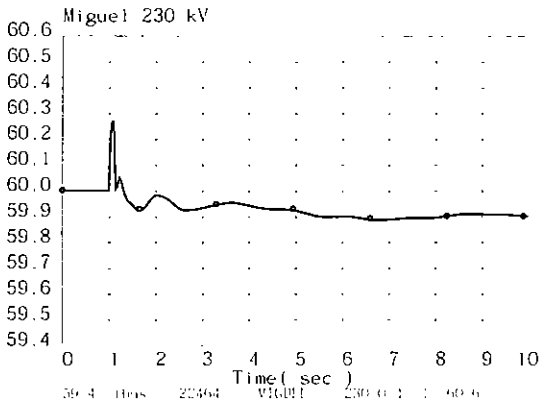
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

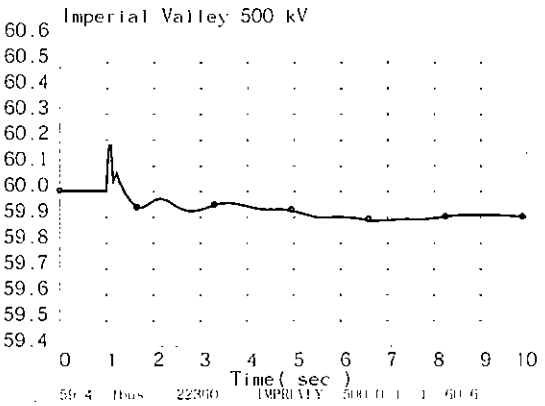
Bus Frequency

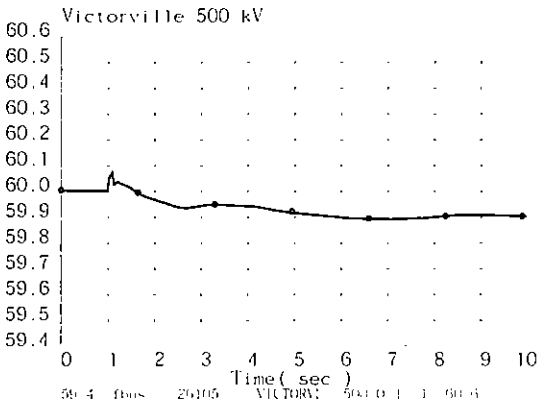






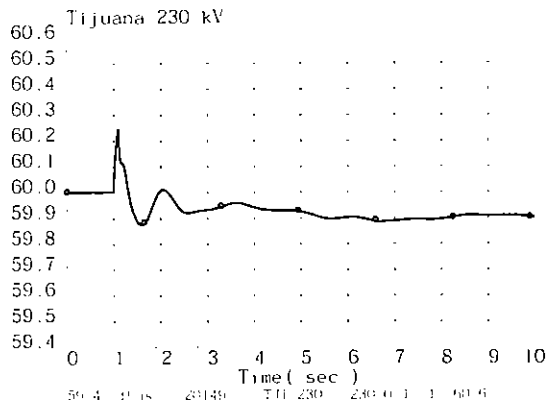


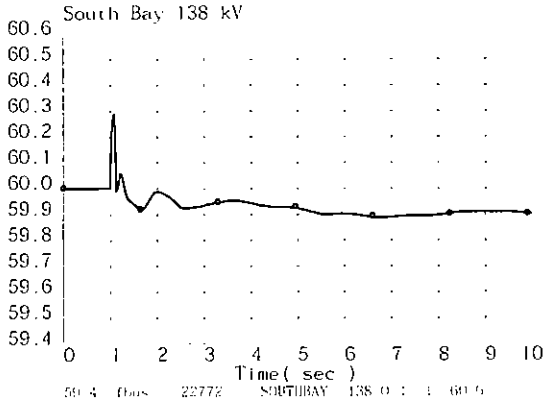


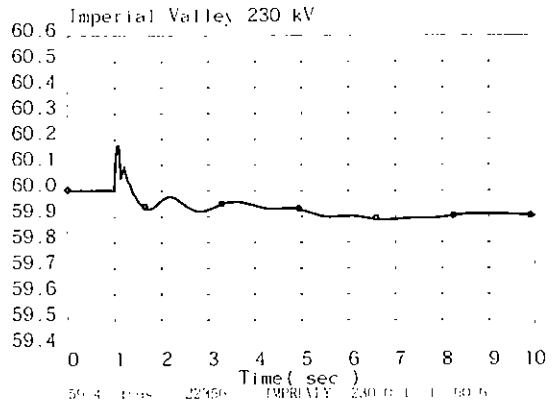


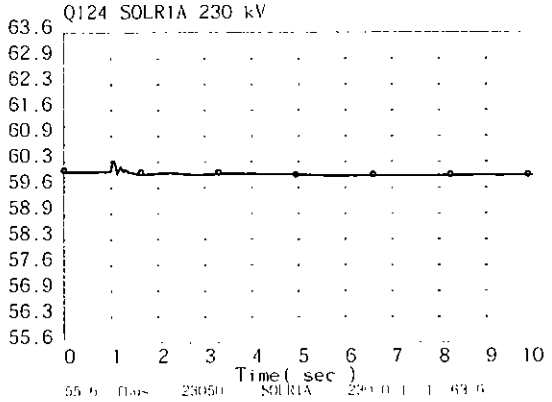
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

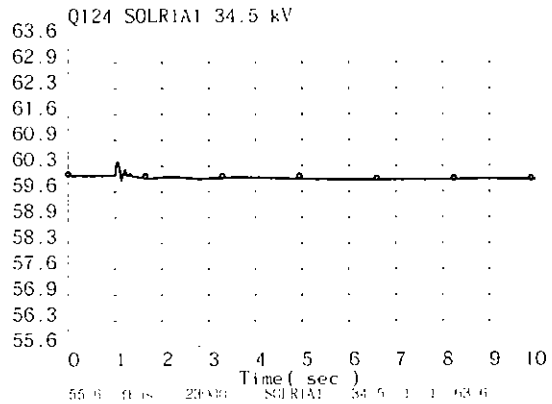
Bus Frequency

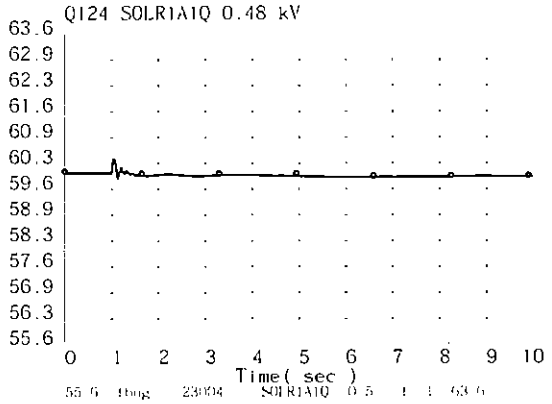






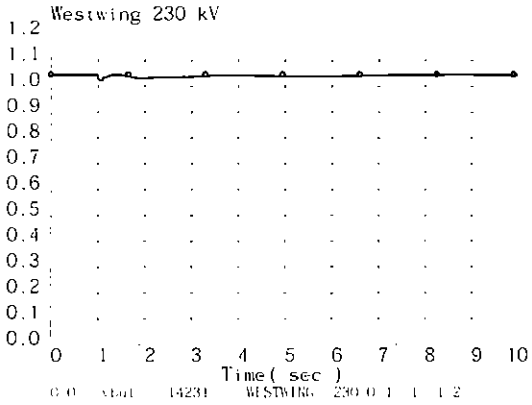


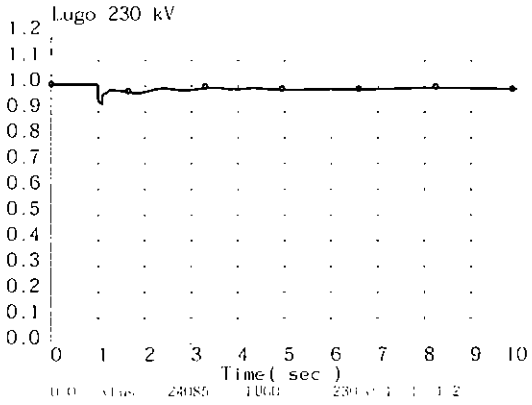


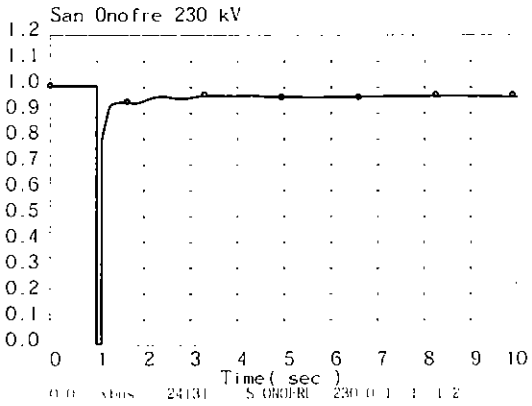


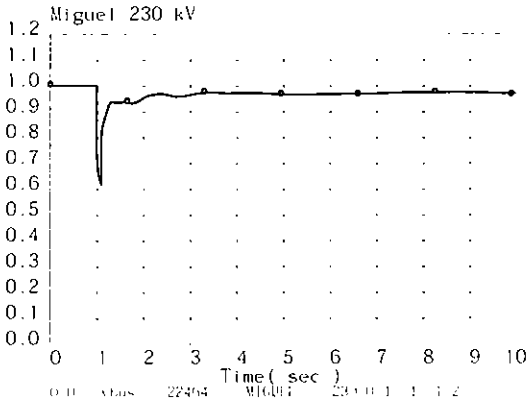
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

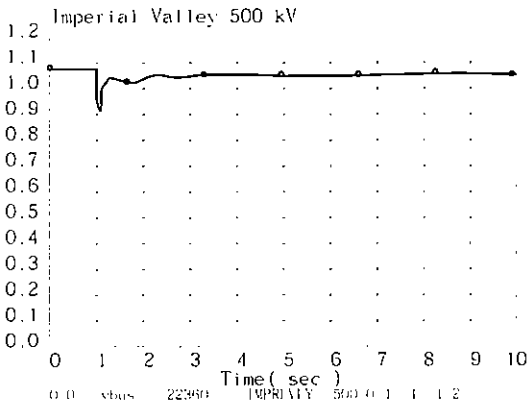
Bus Voltage

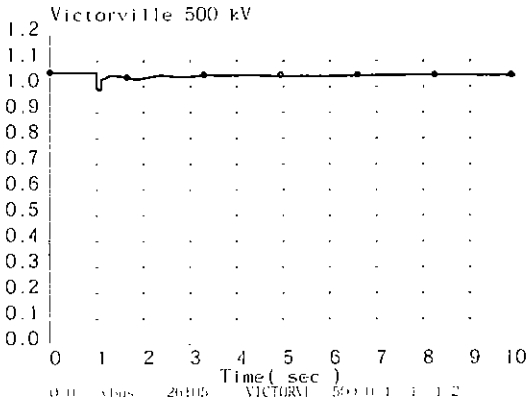






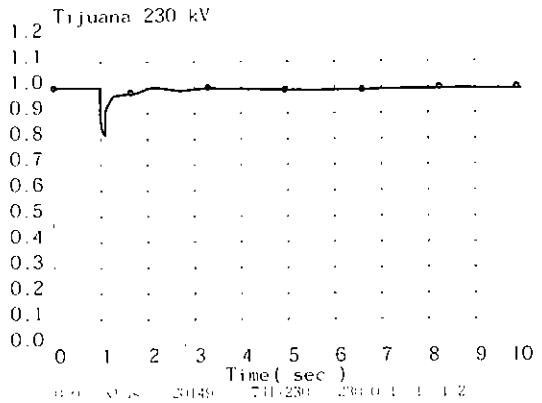


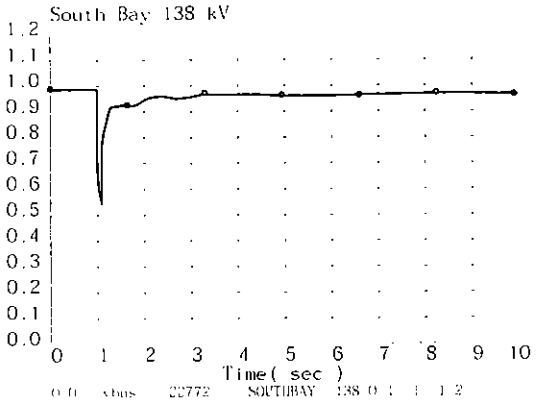


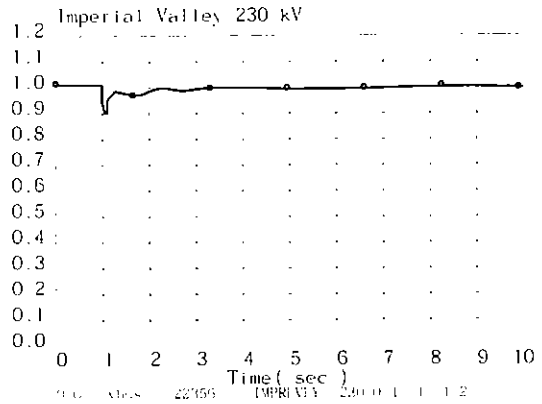


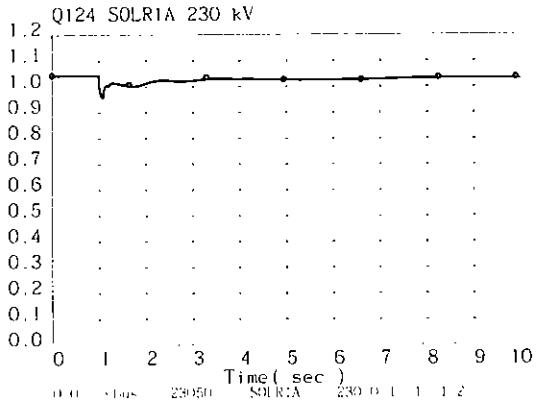
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

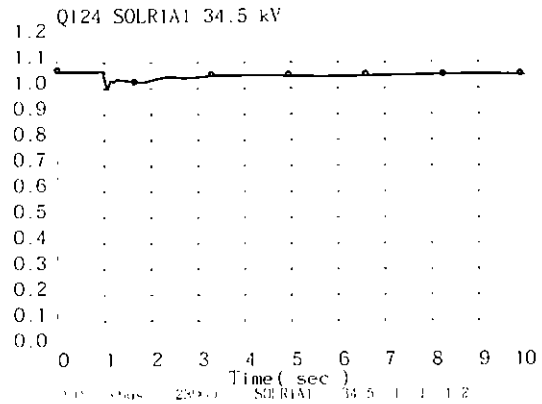
Bus Voltage

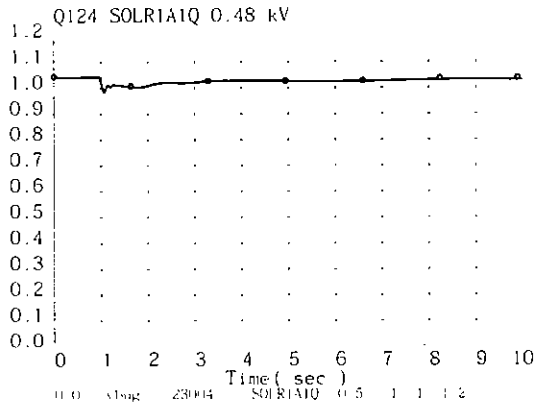






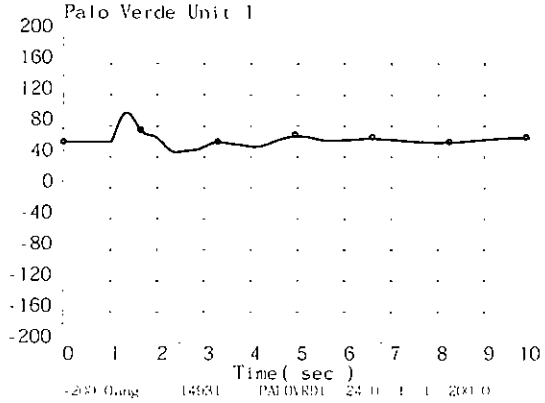


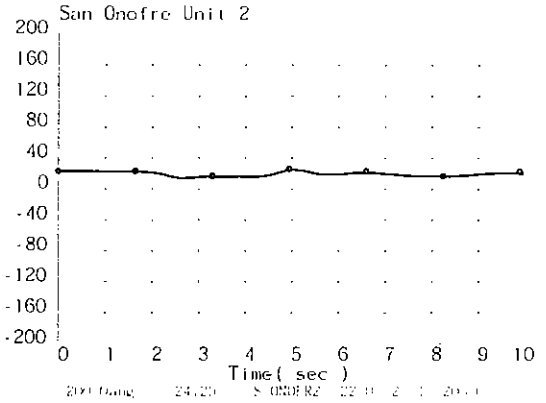


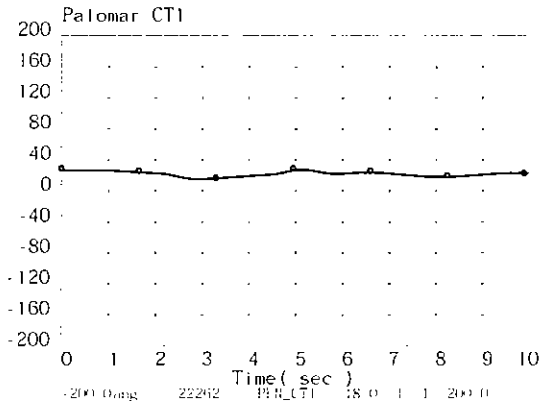


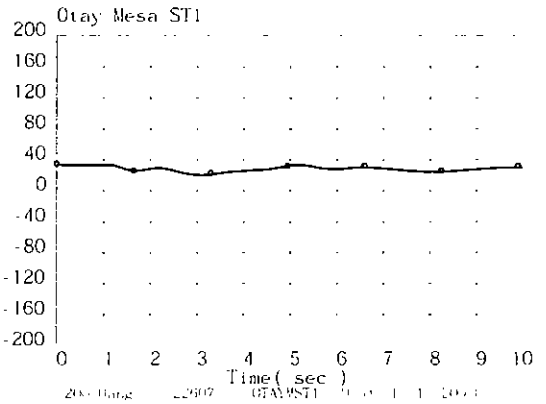
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

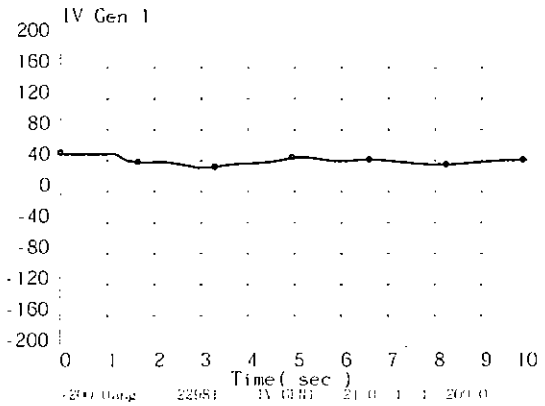
Relative Rotor Angle

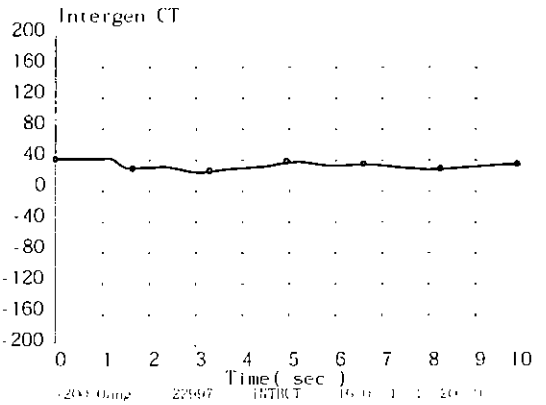






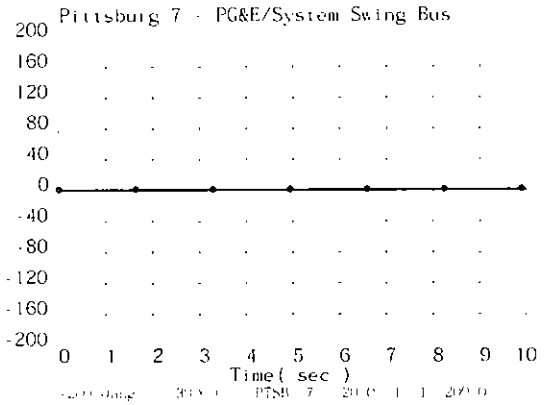


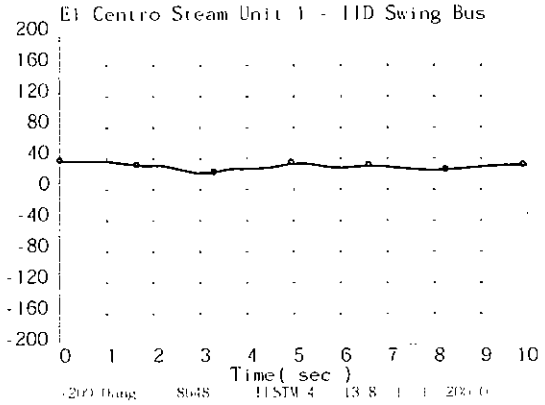


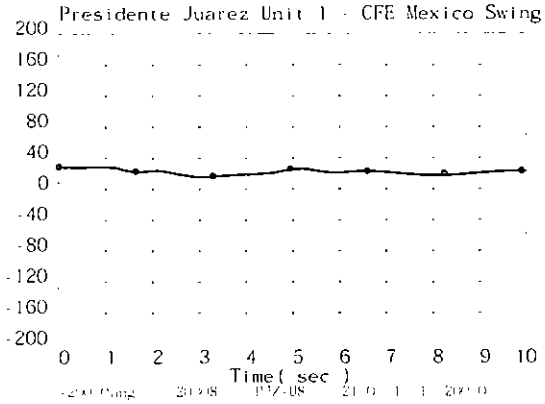


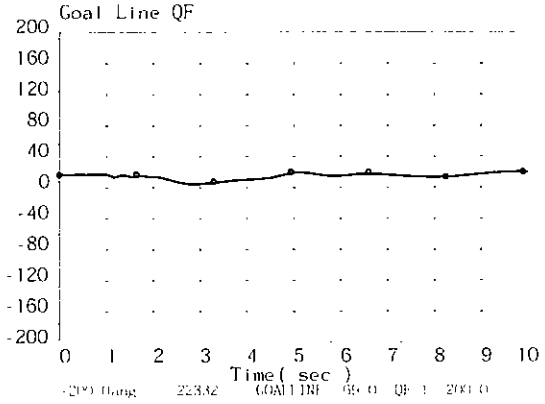
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

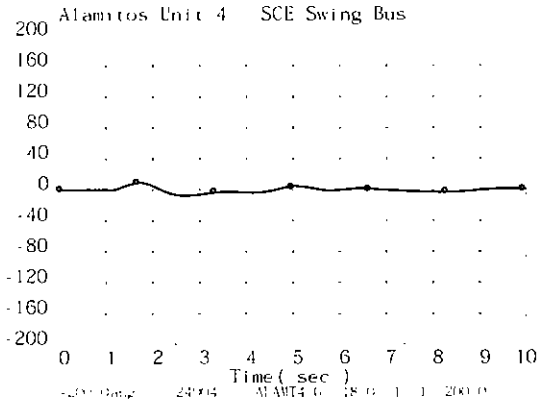
Relative Rotor Angle

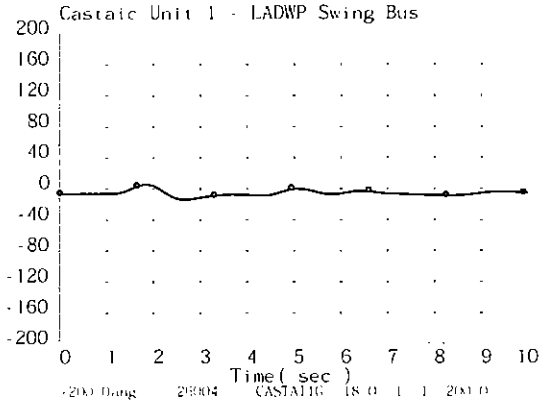






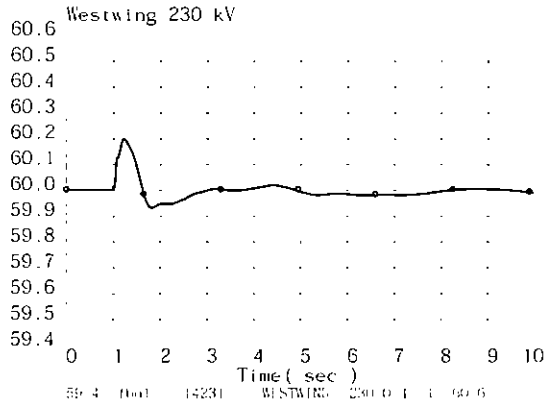


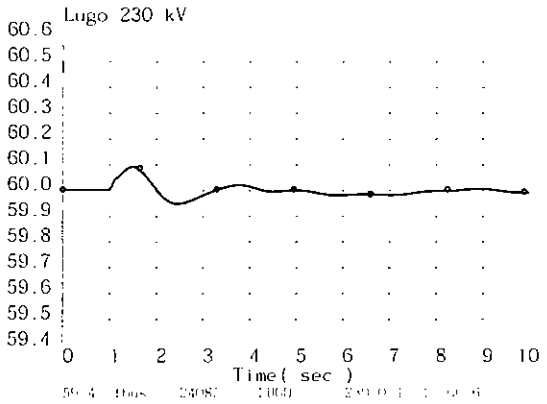


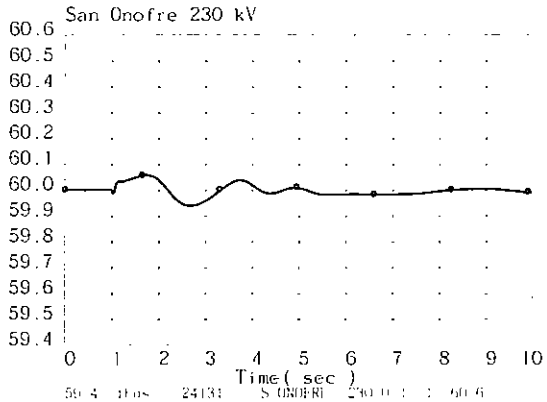


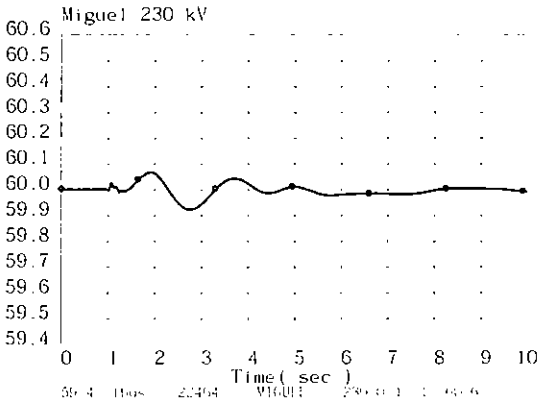
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

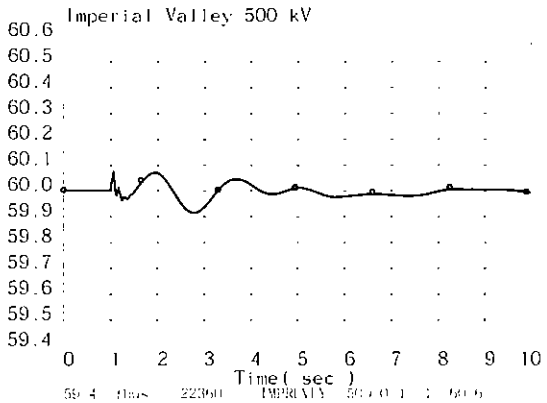
Bus Frequency

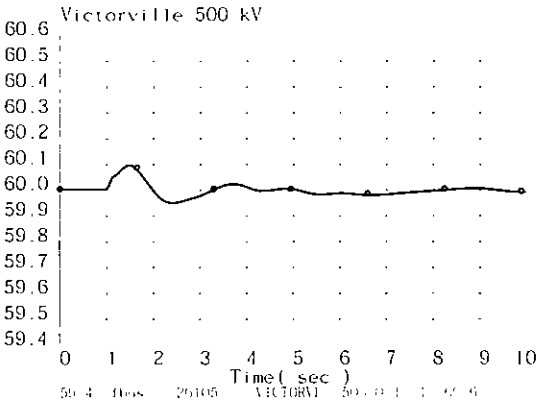






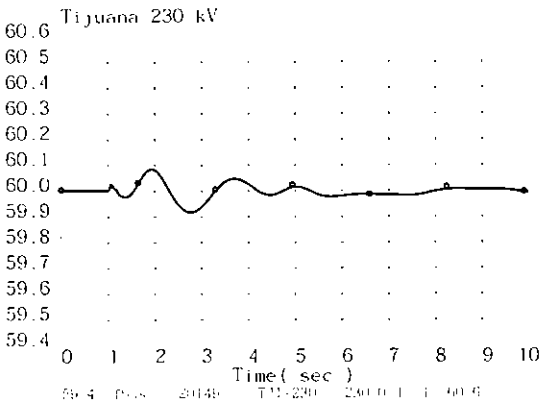


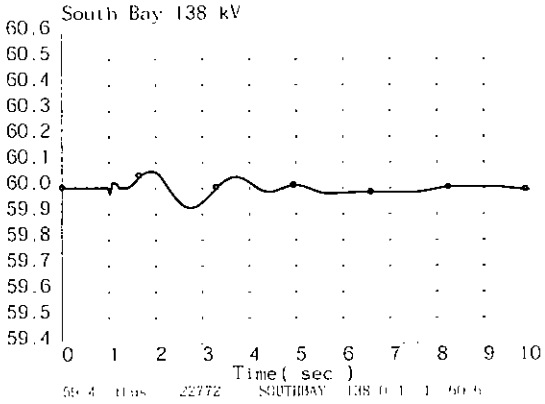


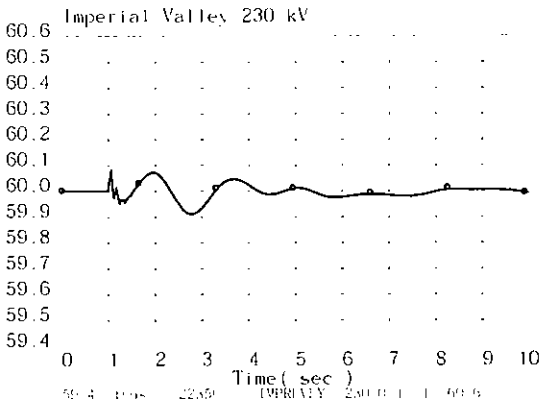


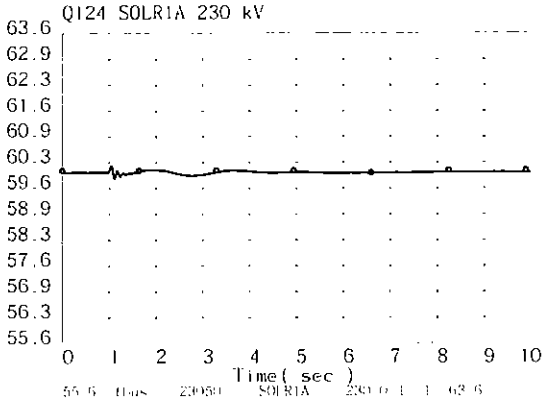
SDC&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

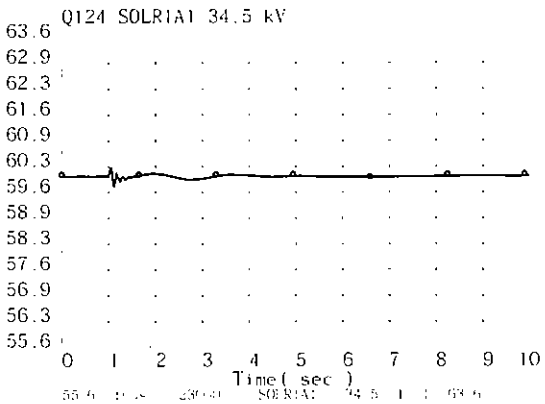
Bus Frequency

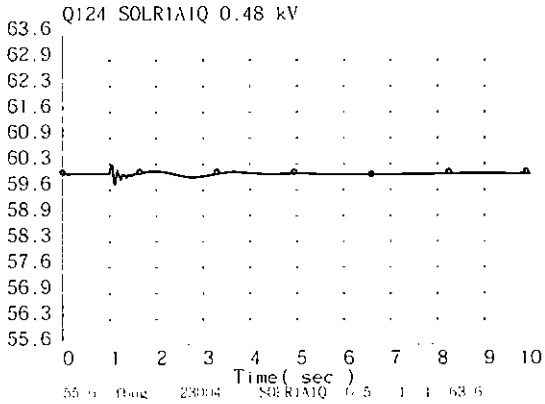




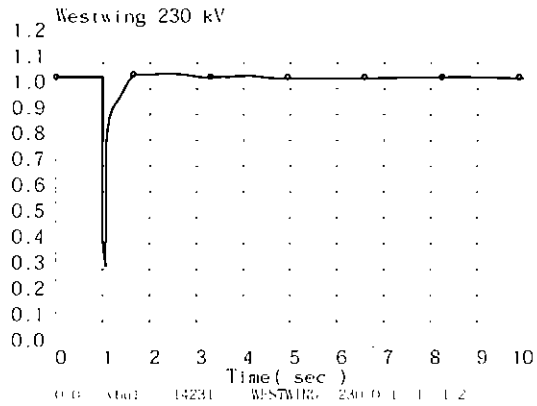


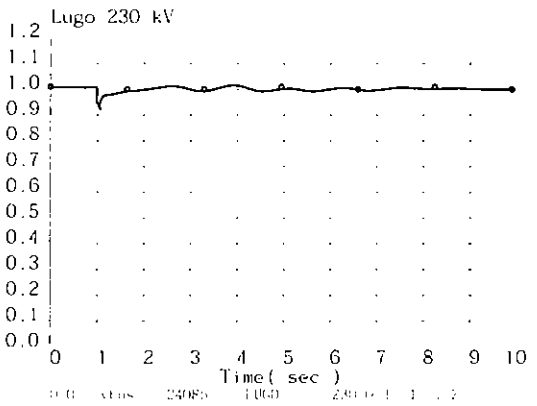


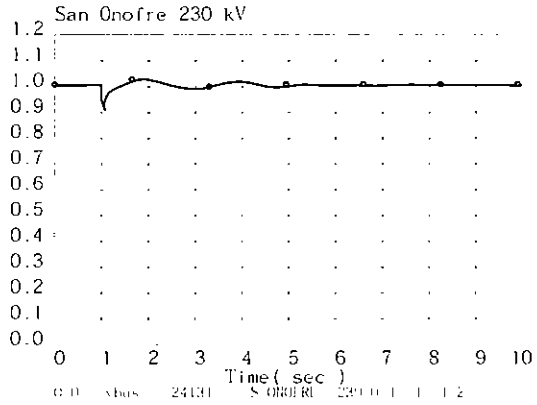


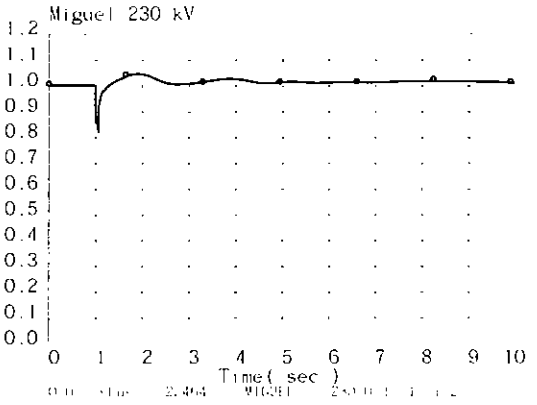


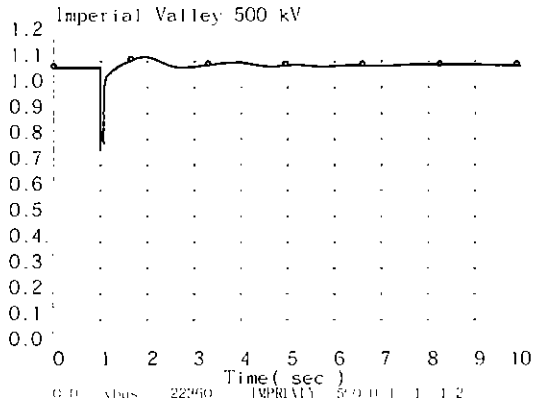
SDC&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

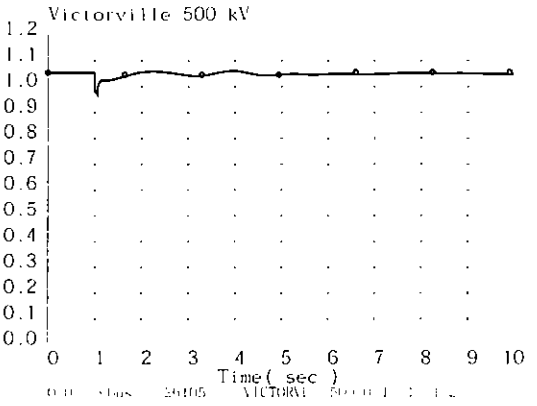






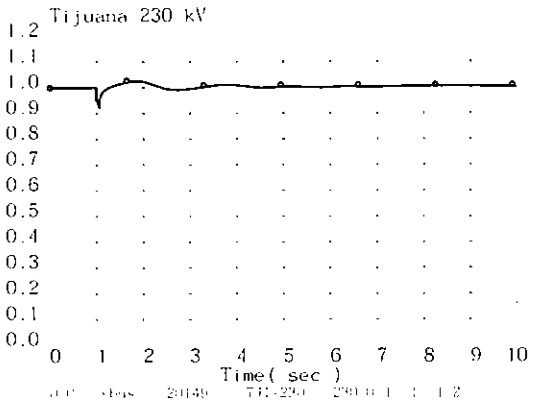


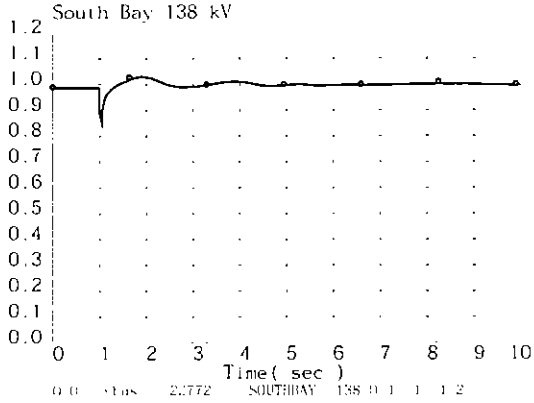


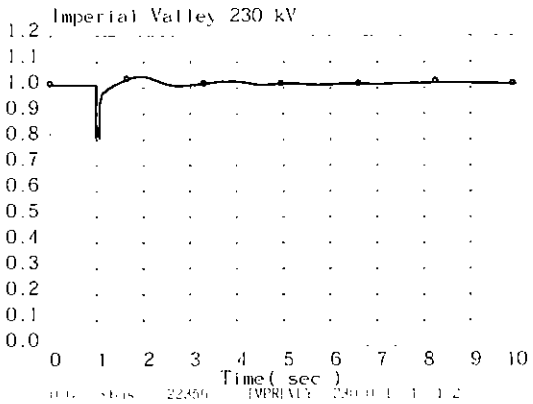


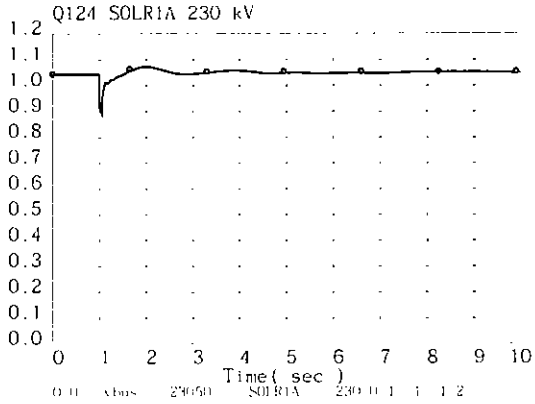
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

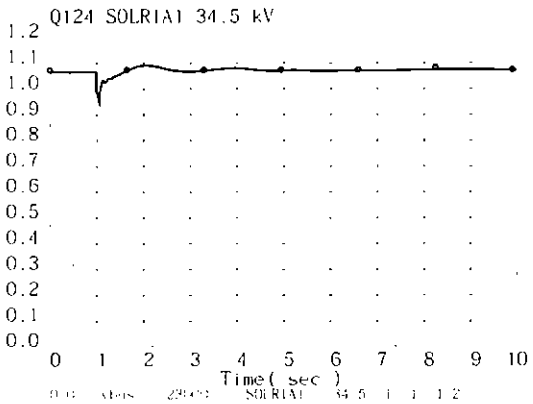
Bus Voltage

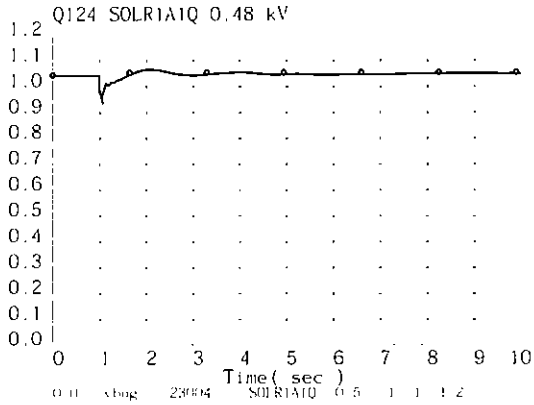






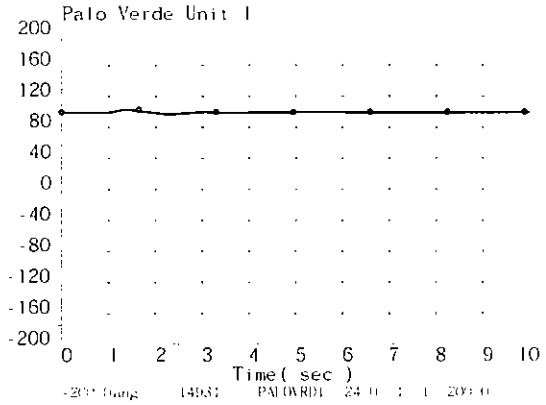


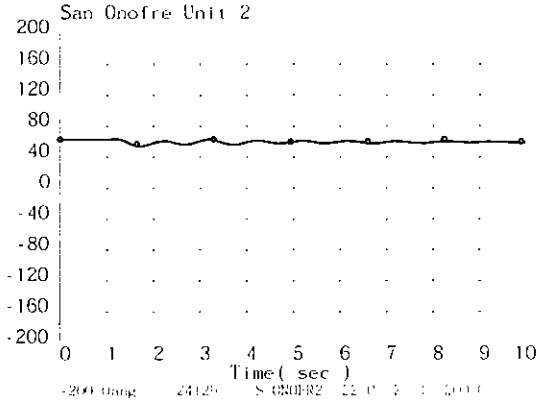


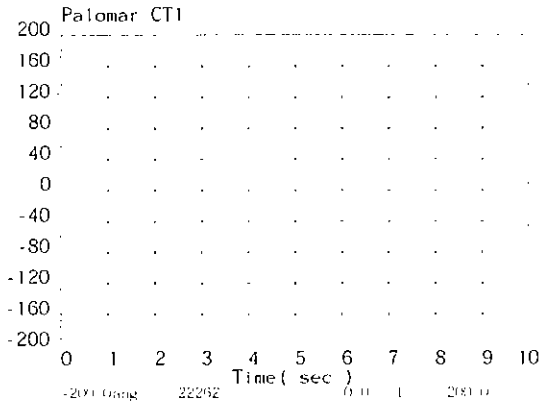


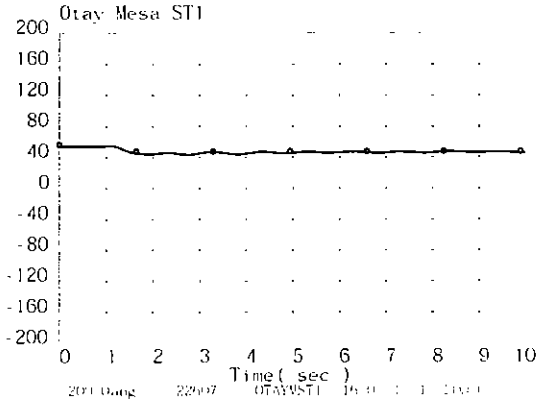
SDG&E 2011 Heavy Summer Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

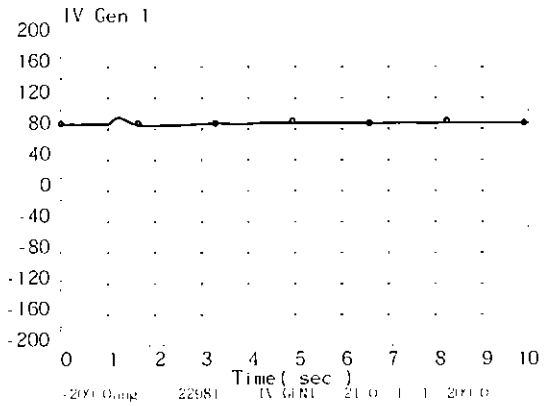
Relative Rotor Angle

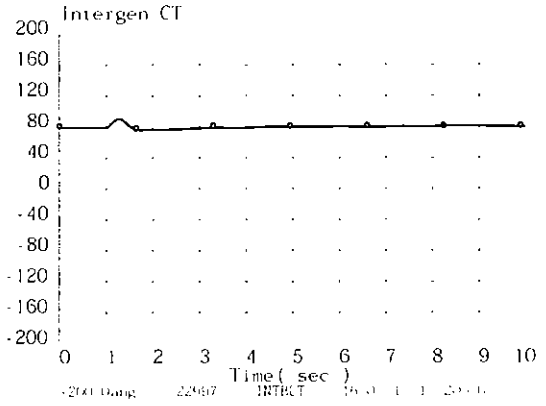






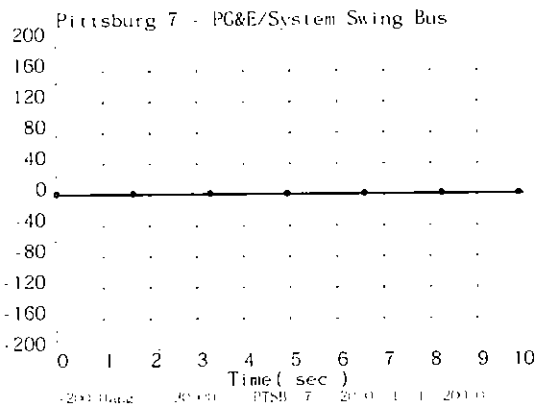


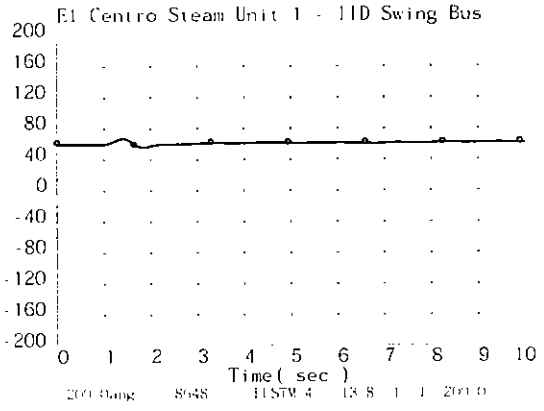


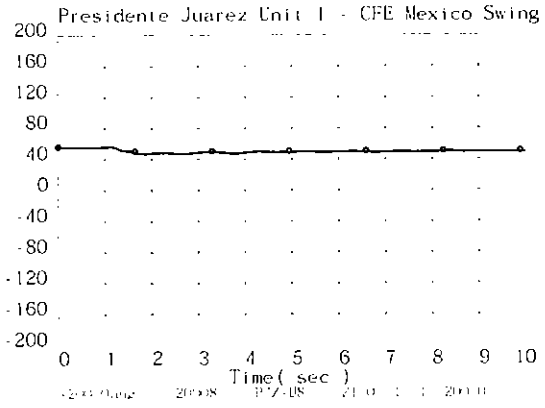


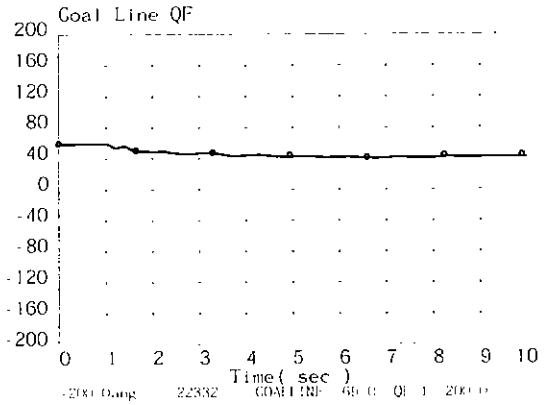
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

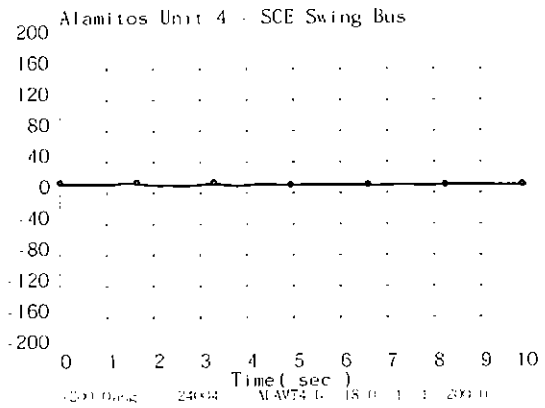
Relative Rotor Angle

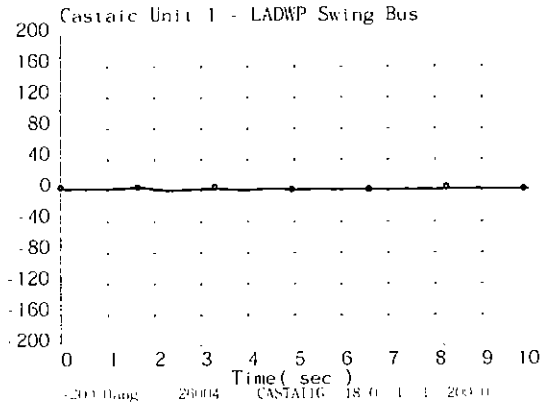












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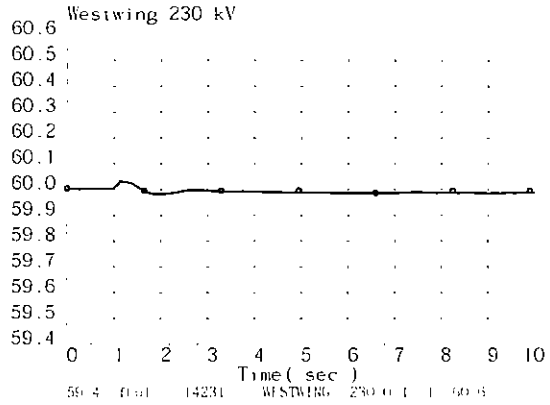
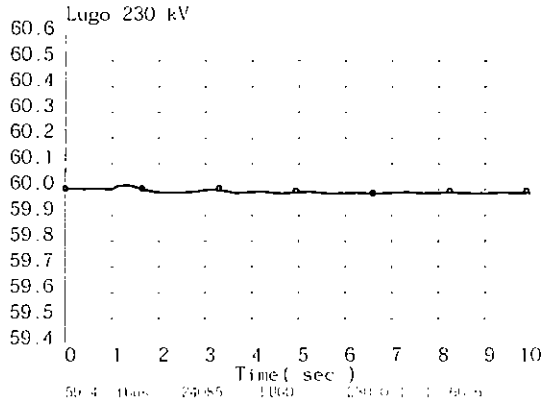
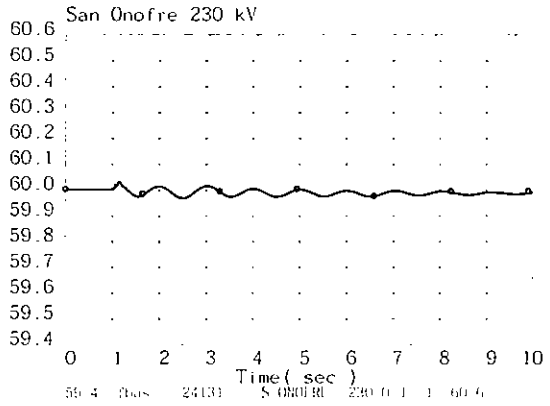
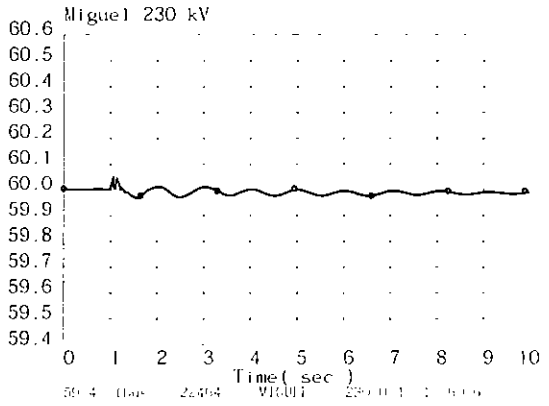
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

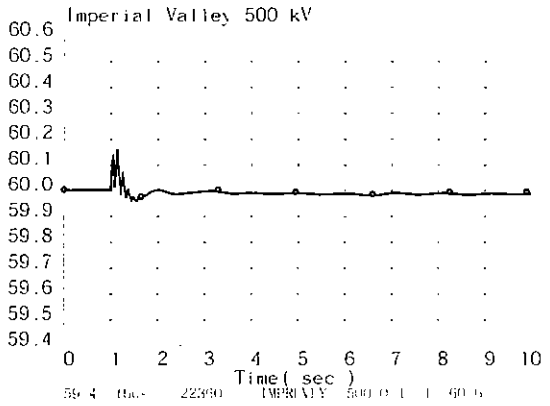
Bus Frequency

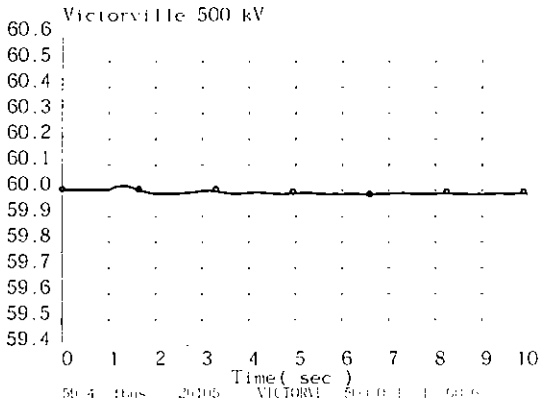












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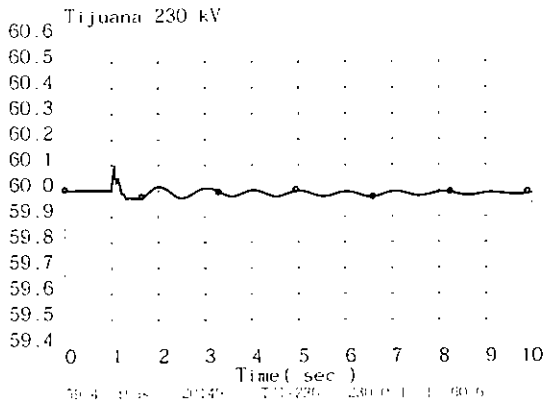
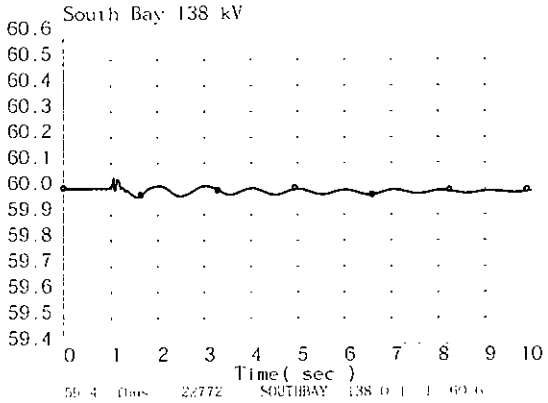
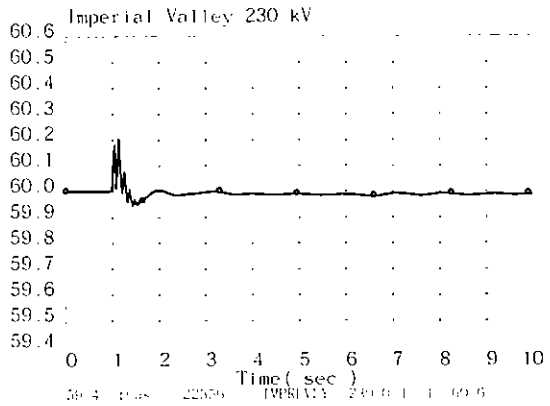
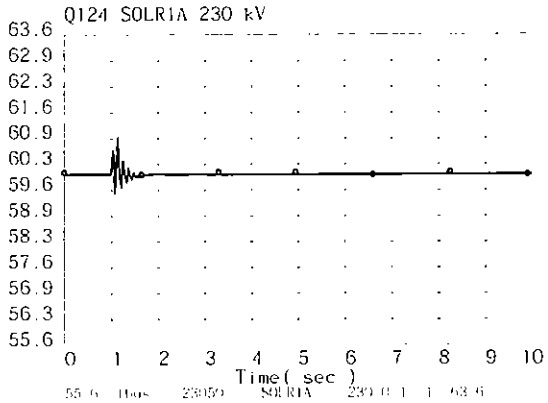
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

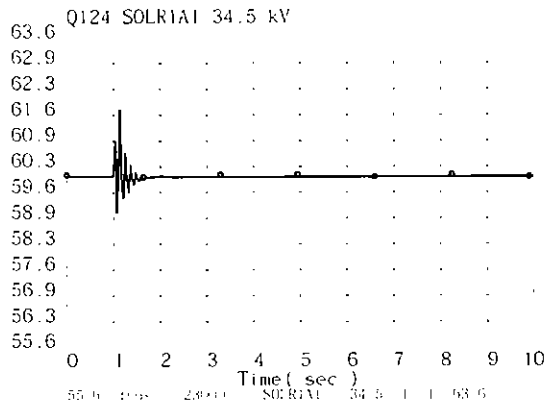
Bus Frequency

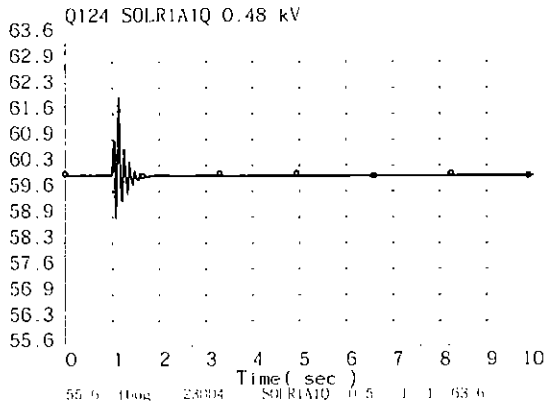












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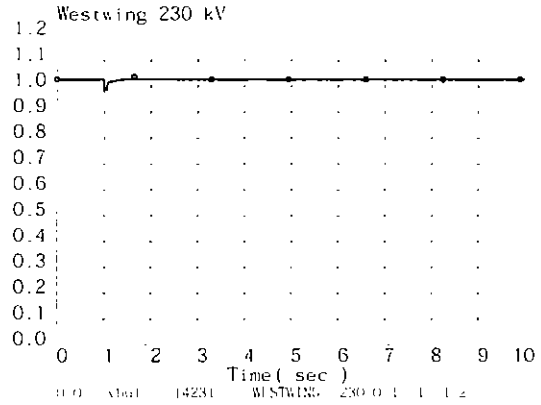
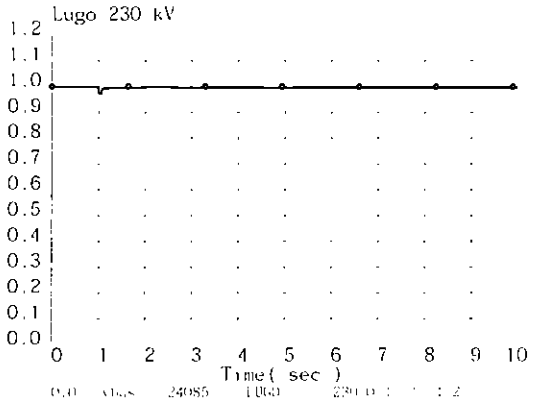
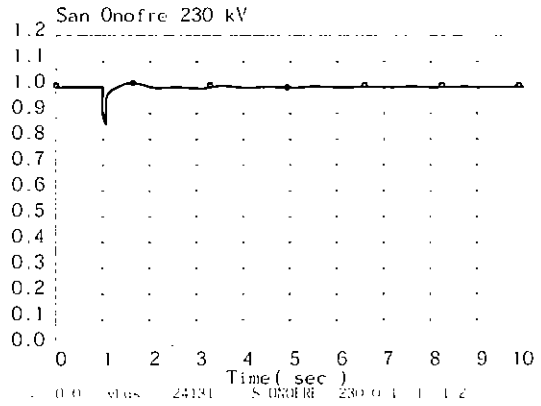
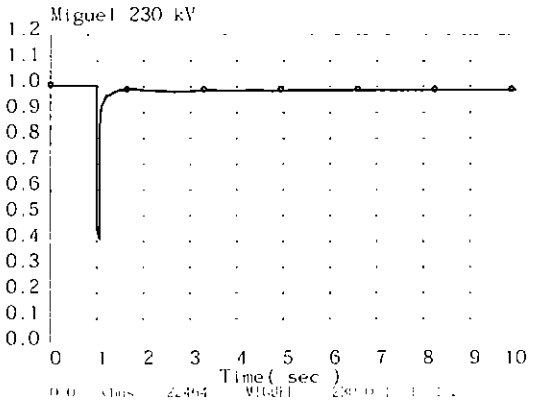
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

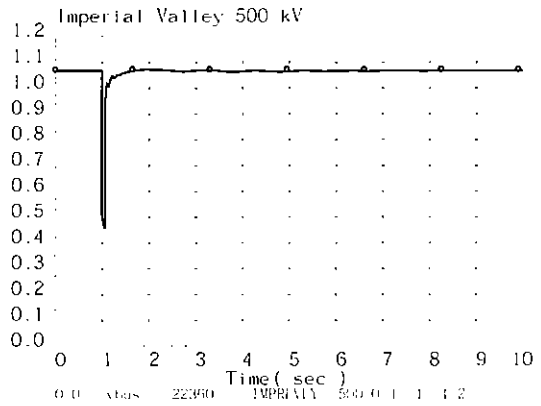
Bus Voltage

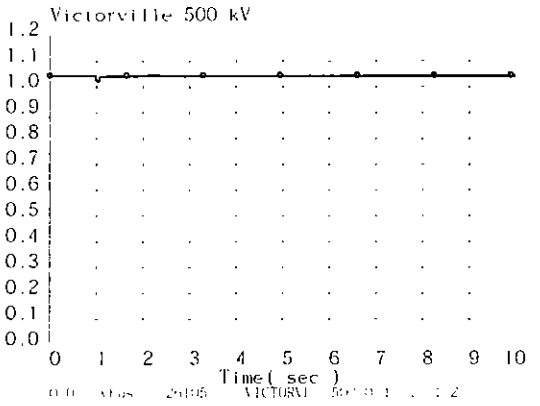












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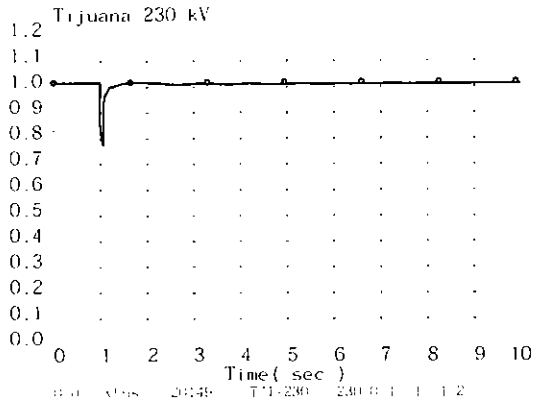
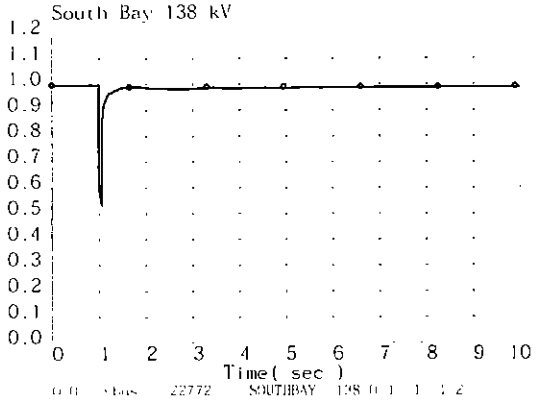
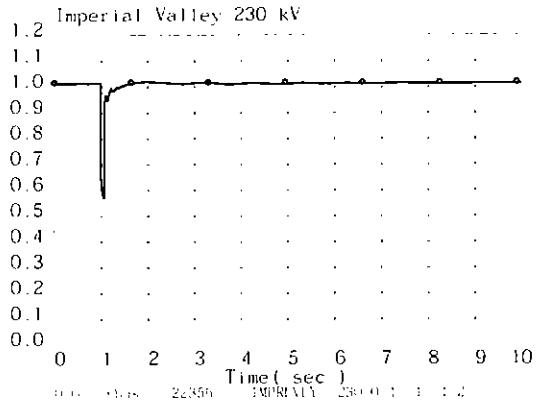
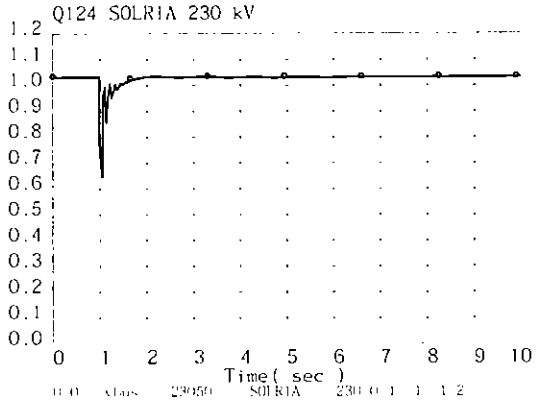
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

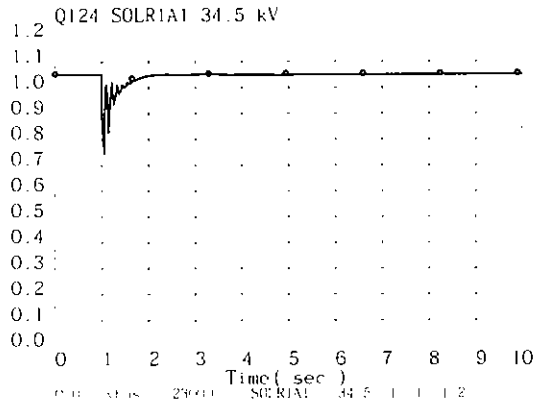
Bus Voltage

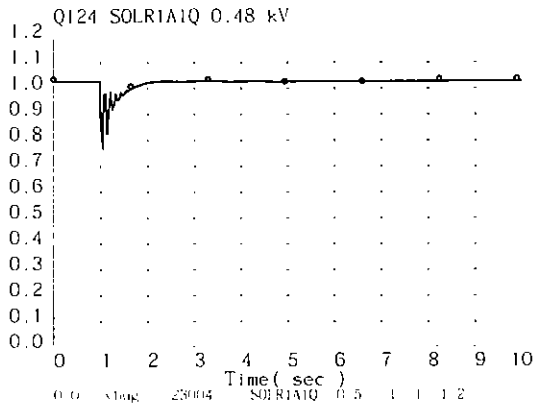






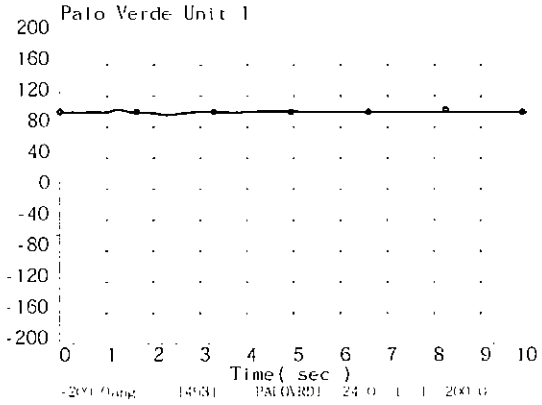


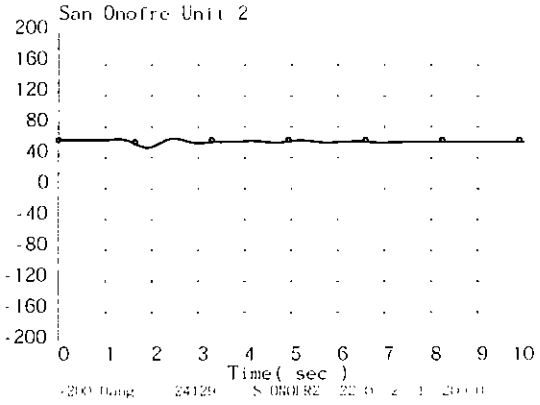


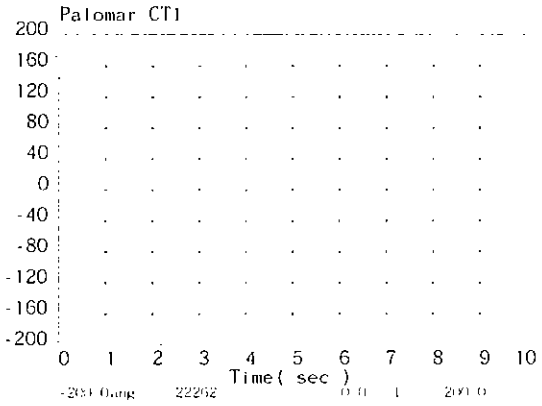


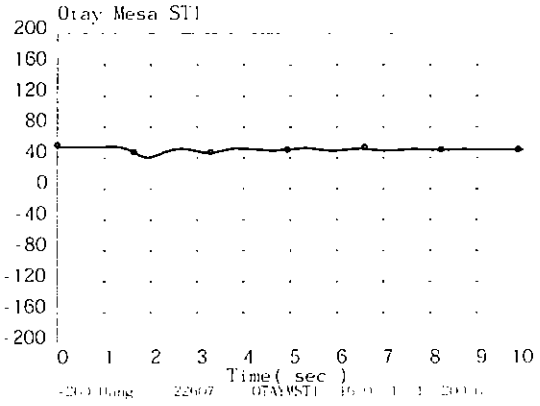
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

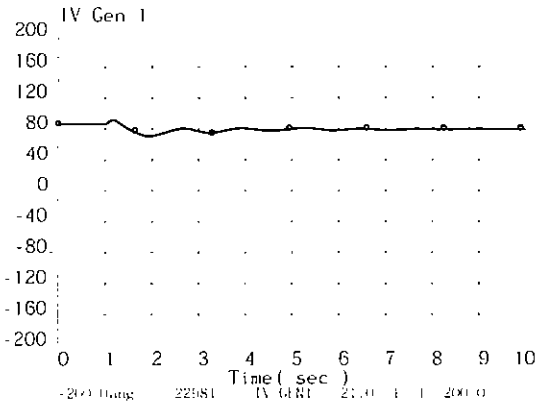
Relative Rotor Angle

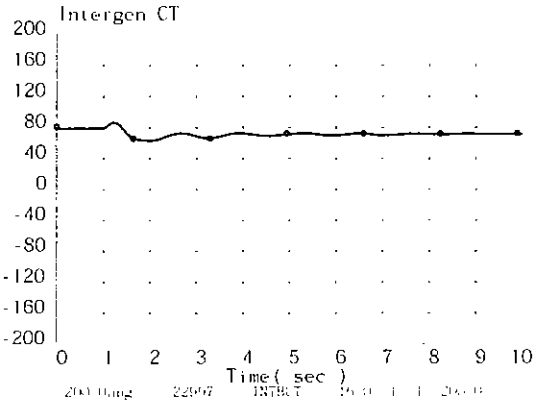




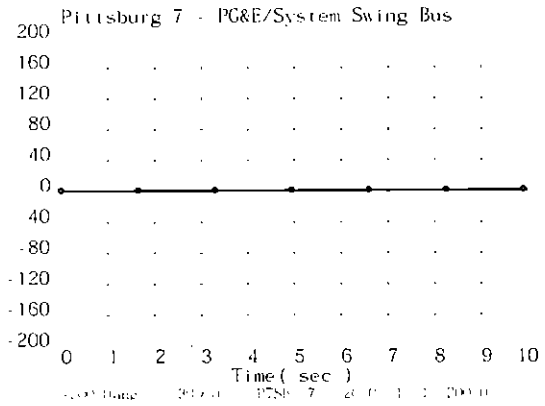


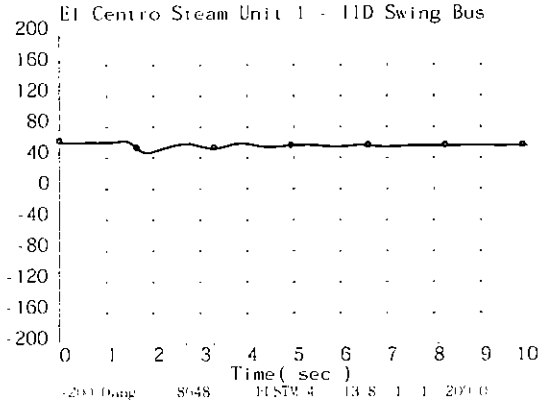


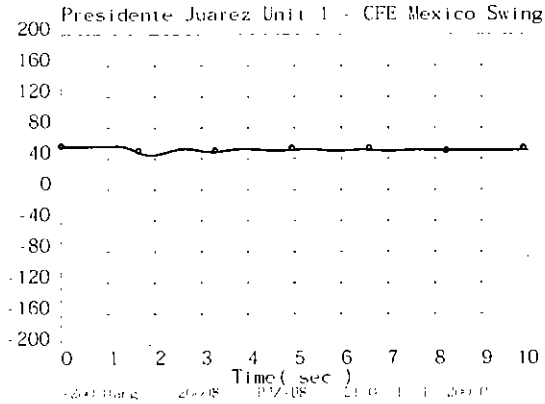


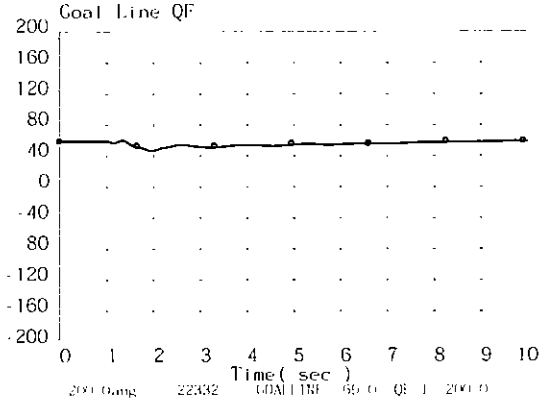


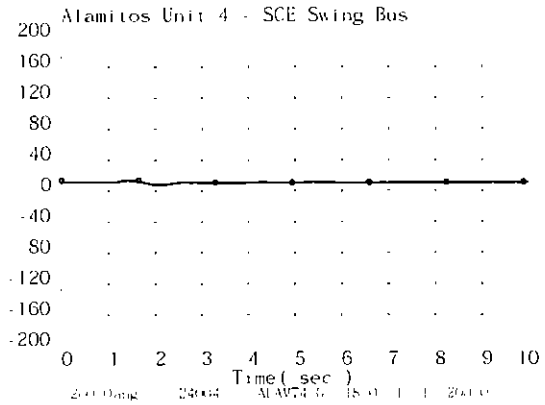
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

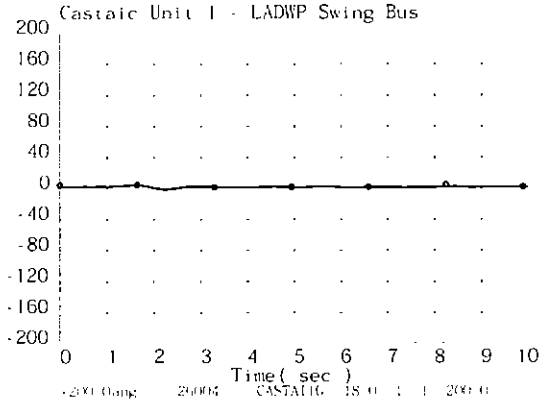






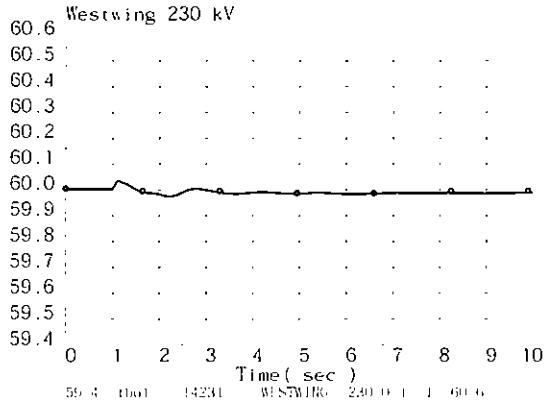


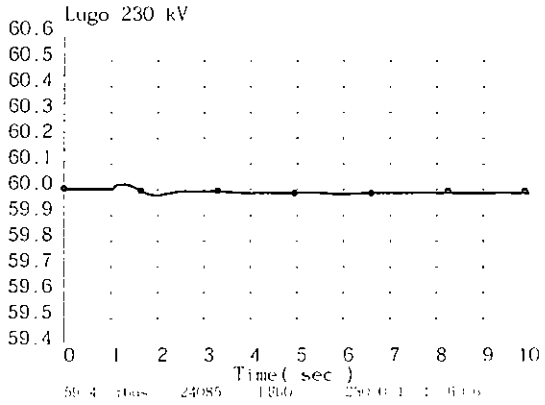


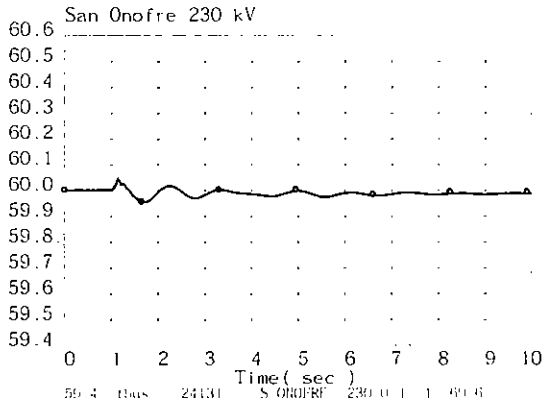


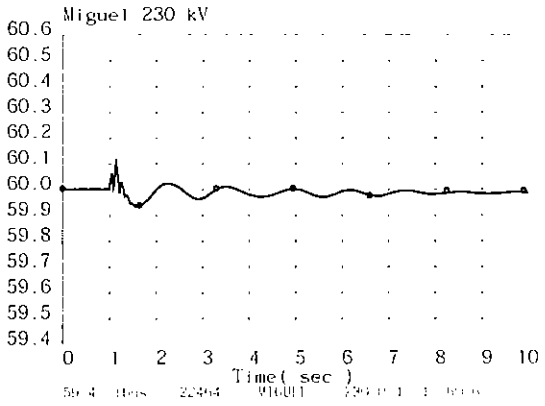
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

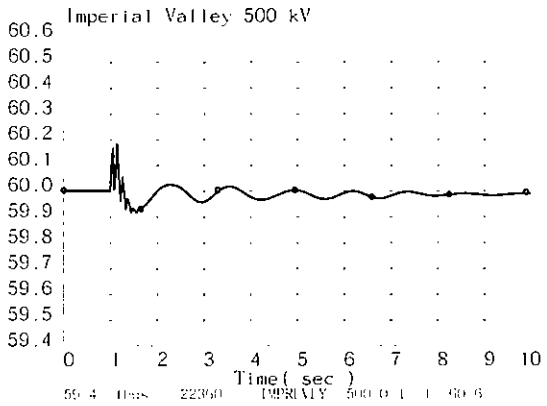
Bus Frequency

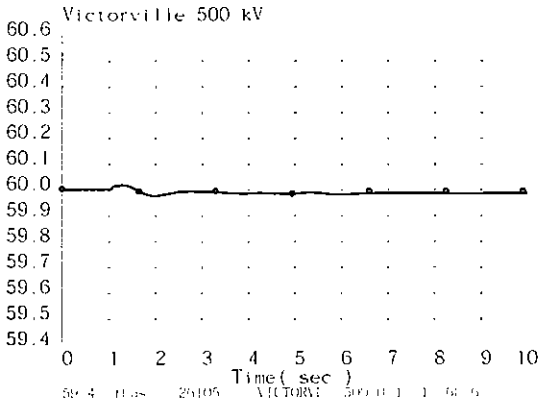






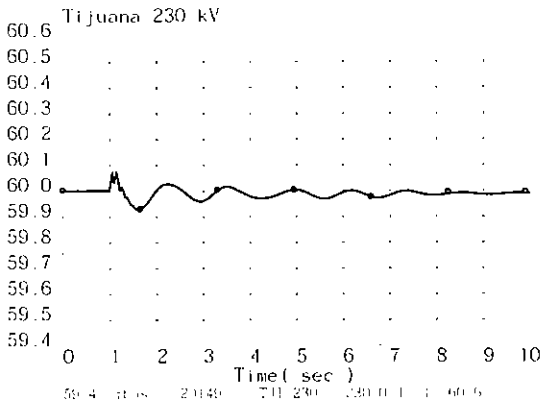


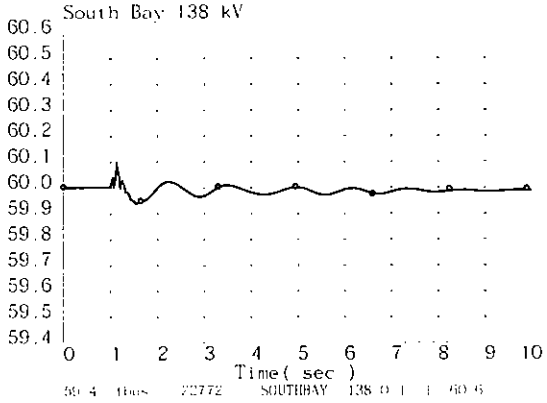


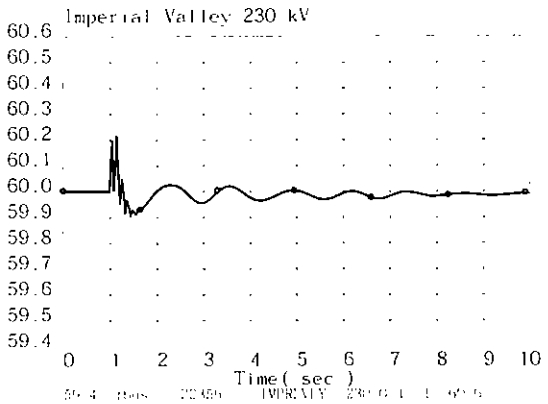


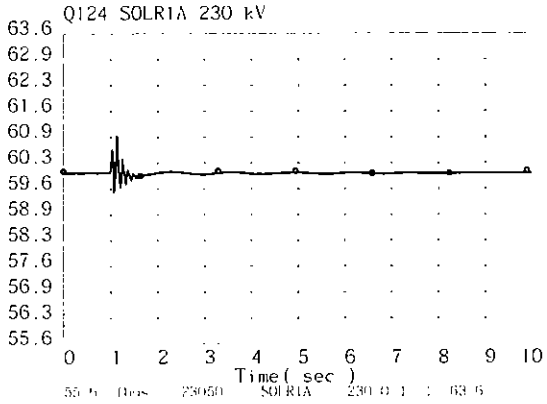
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

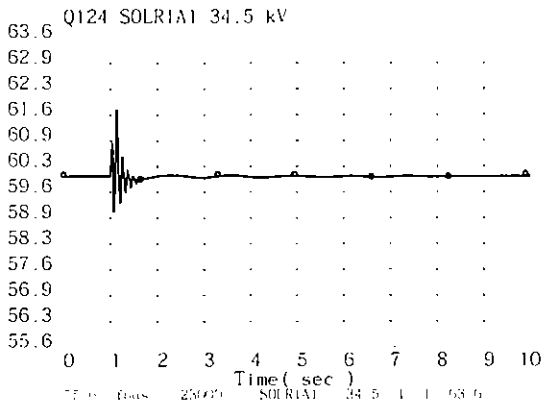
Bus Frequency

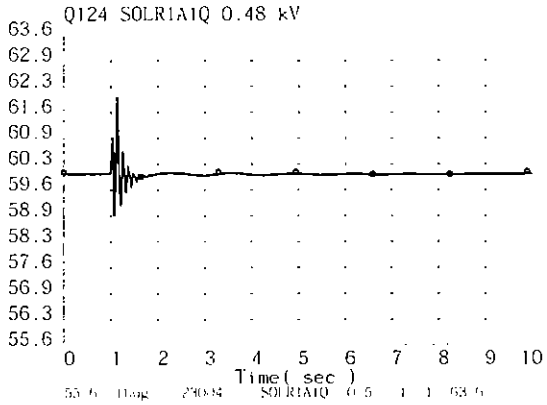




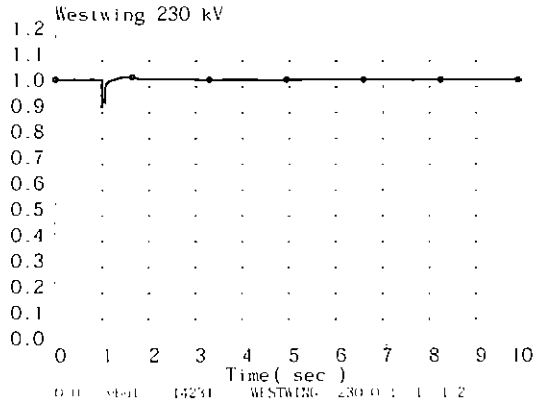


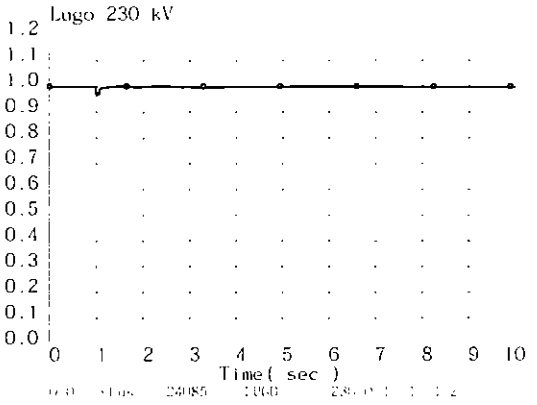


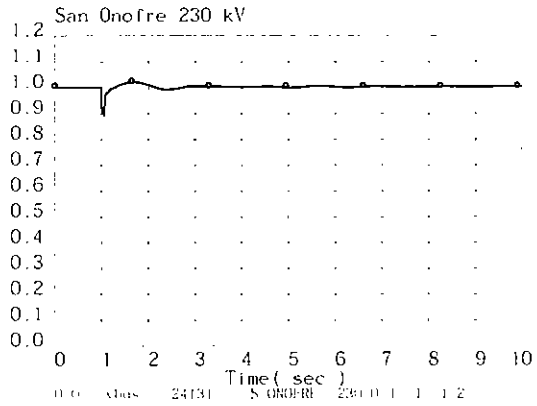


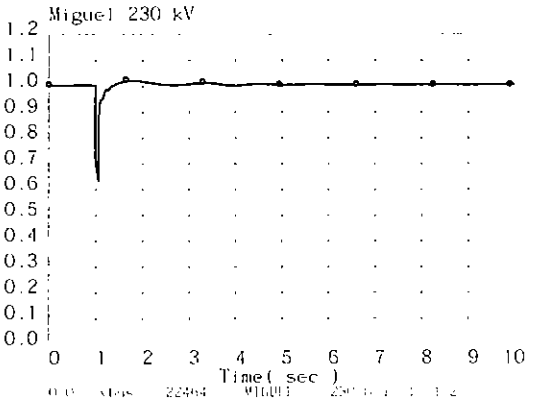


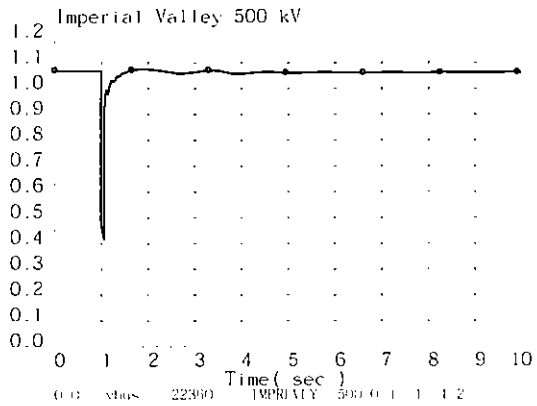
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

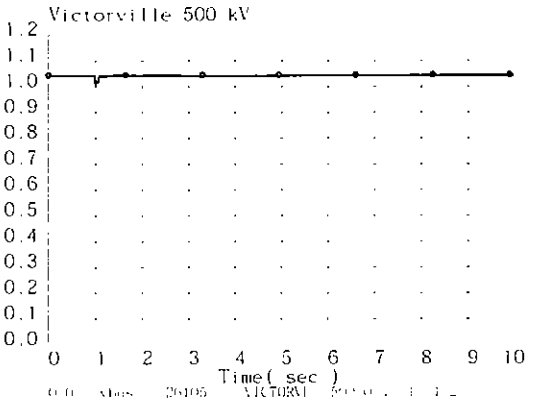






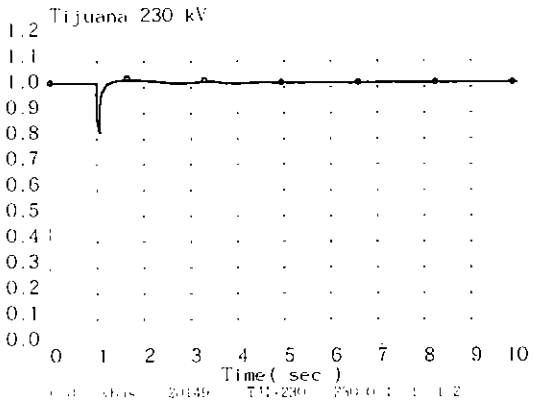


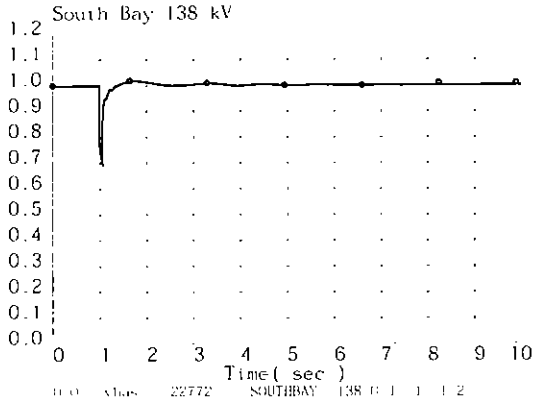


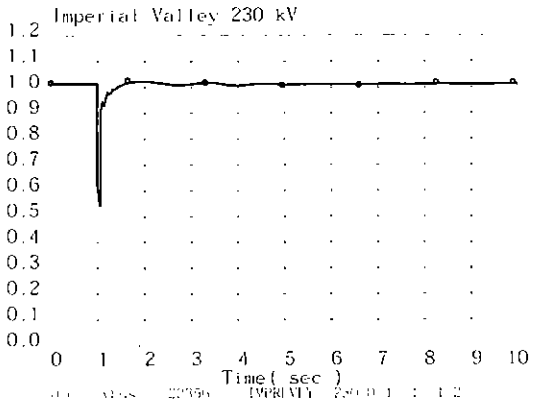


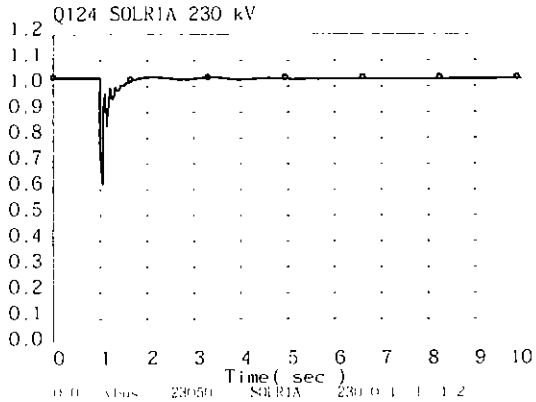
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

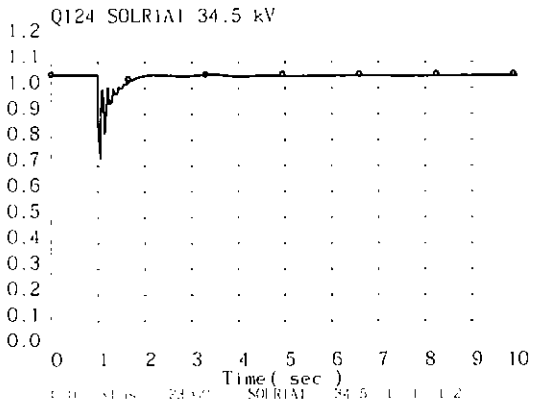
Bus Voltage

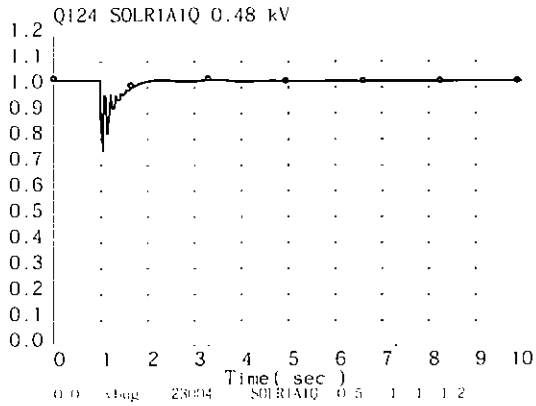






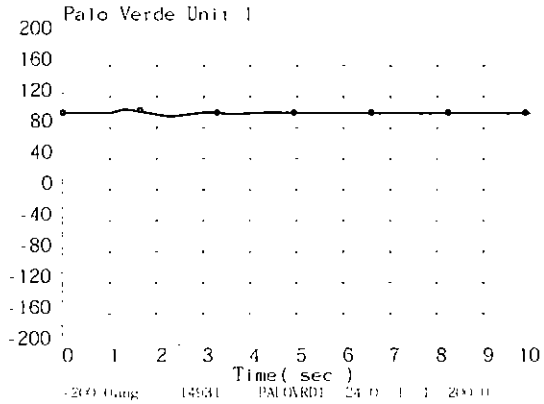


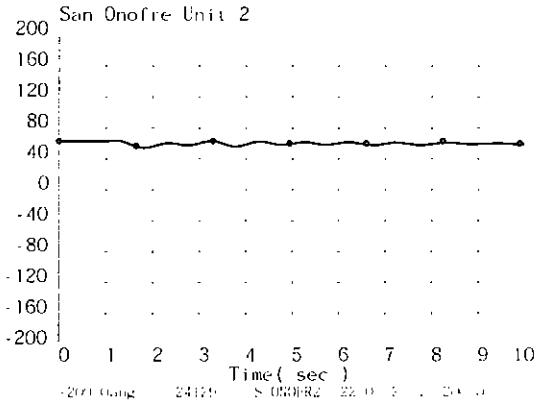


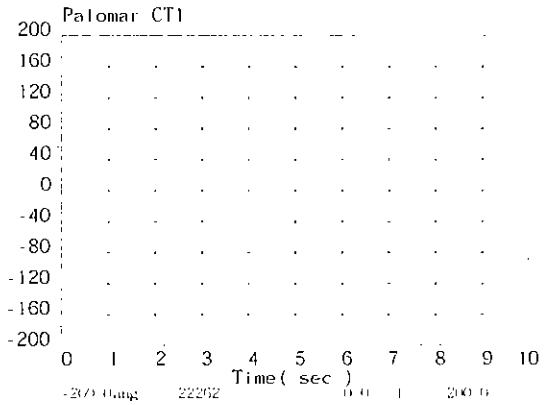


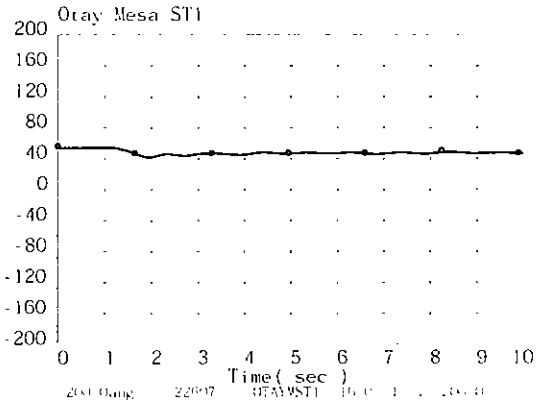
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

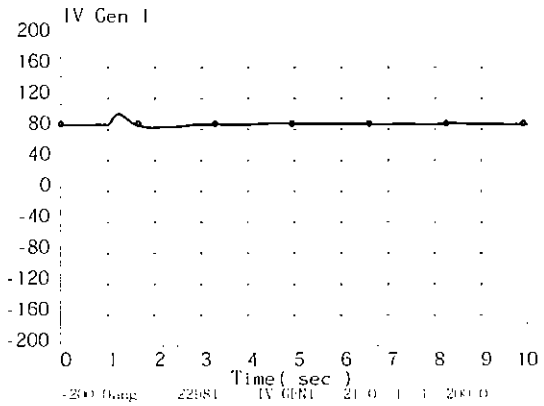
Relative Rotor Angle

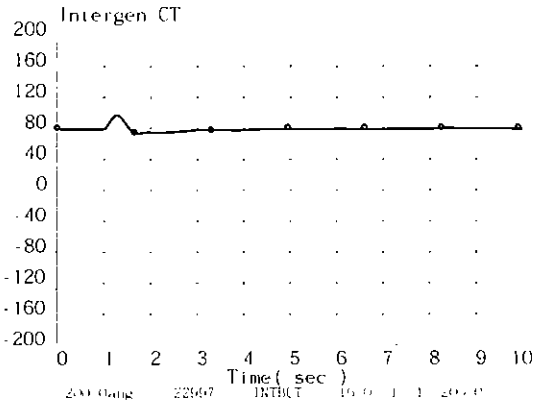






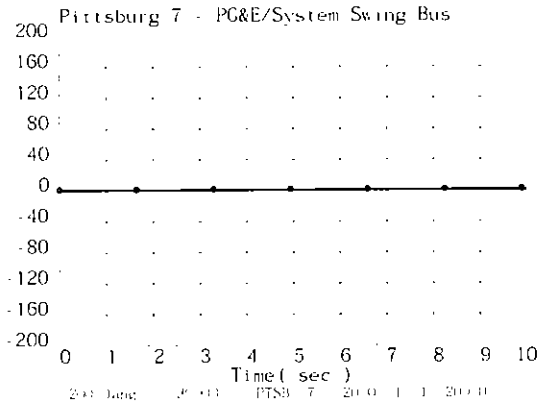


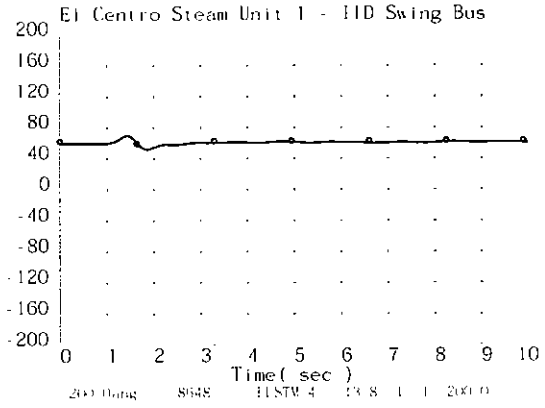


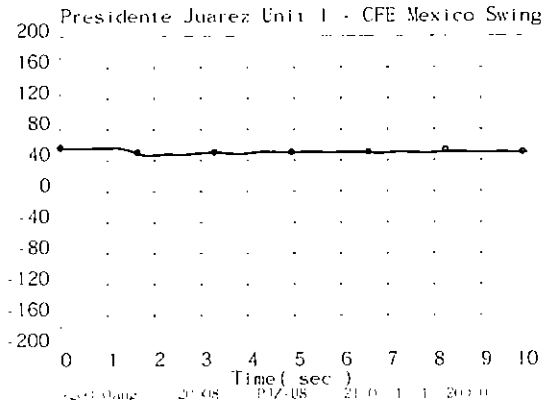


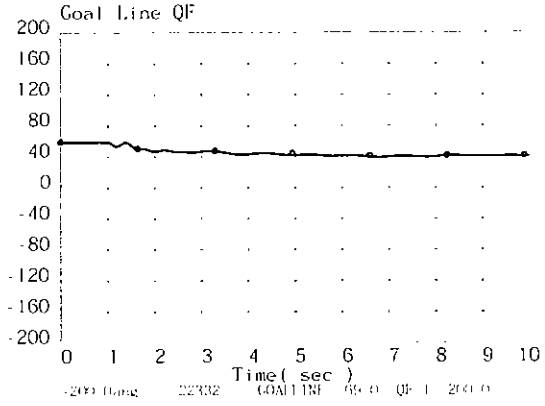
SDC&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

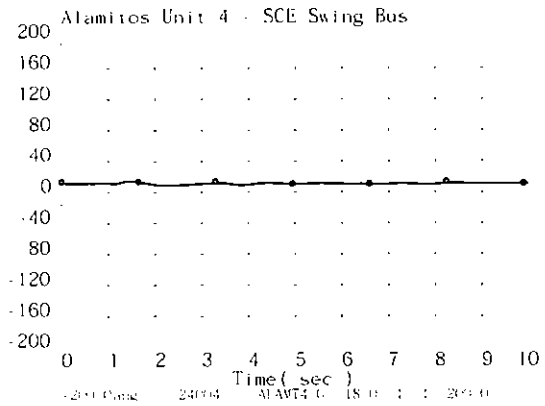
Relative Rotor Angle

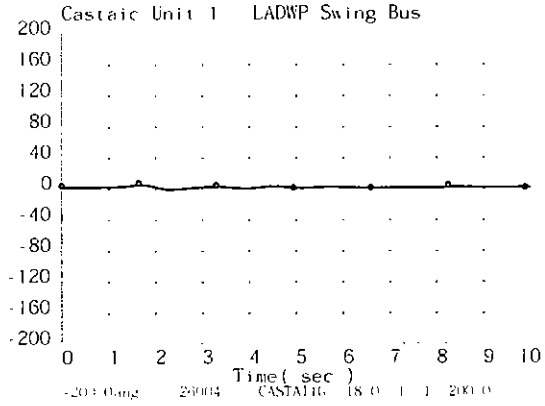






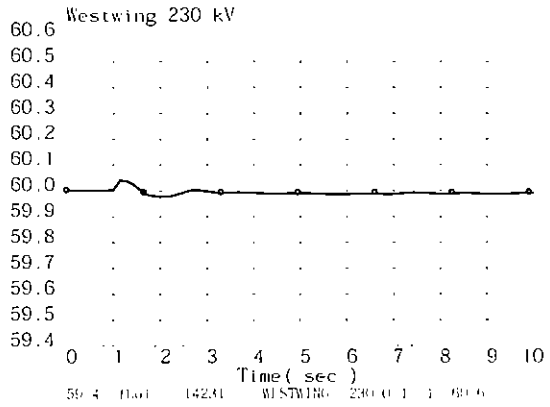


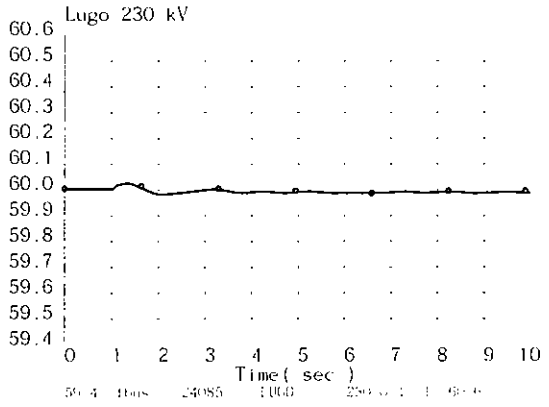


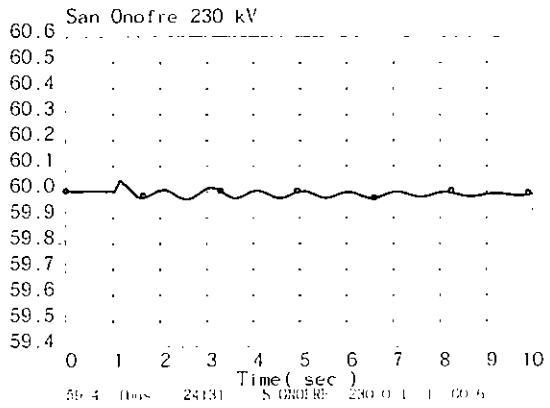


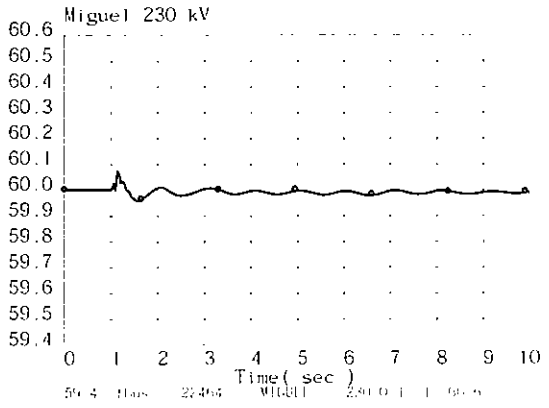
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

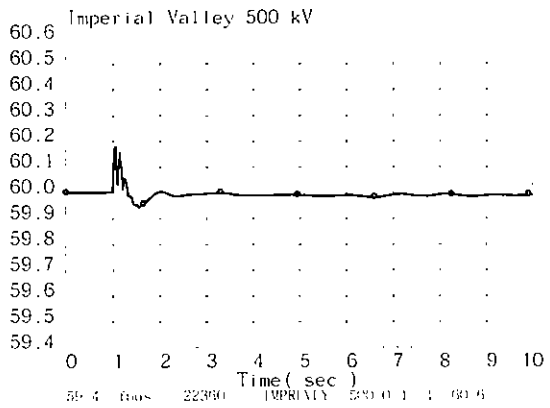
Bus Frequency

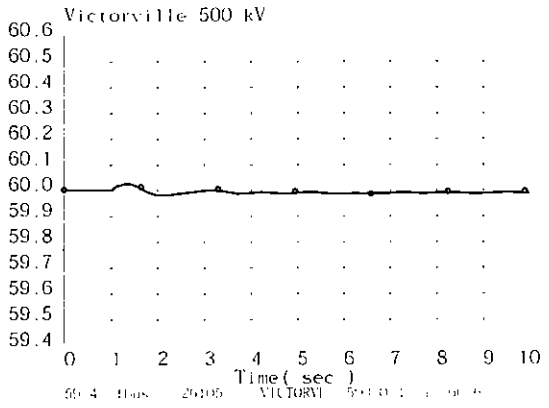






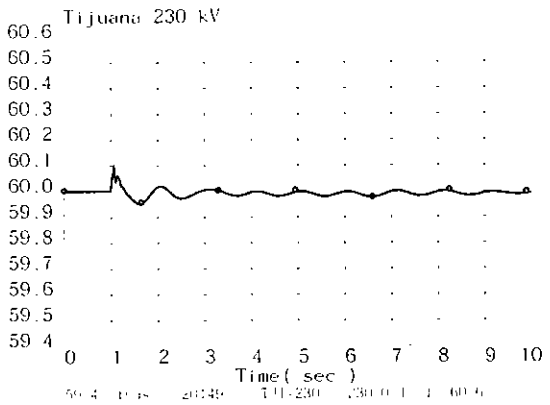


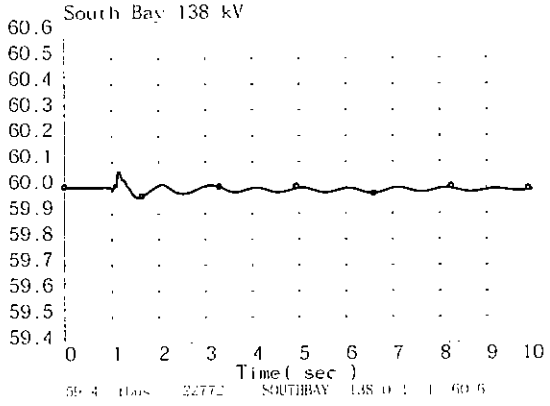


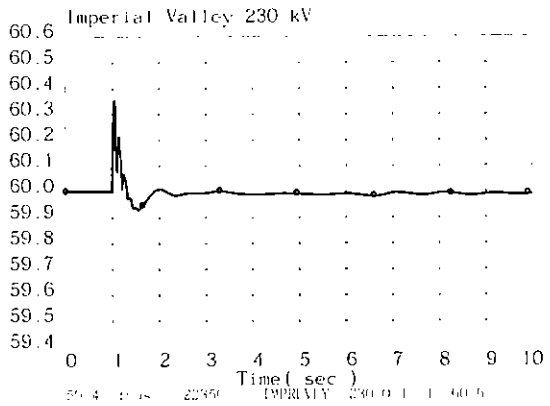


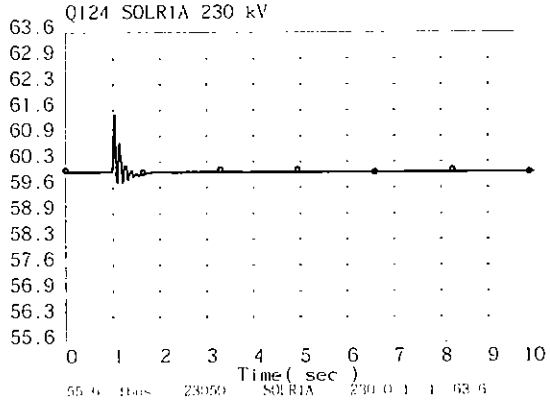
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

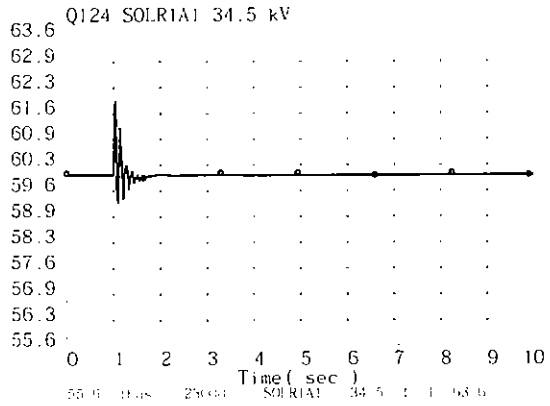
Bus Frequency

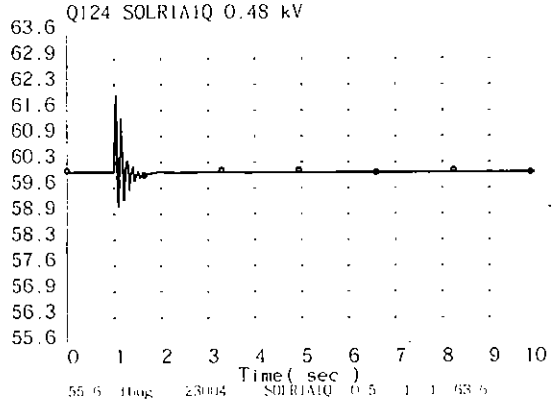






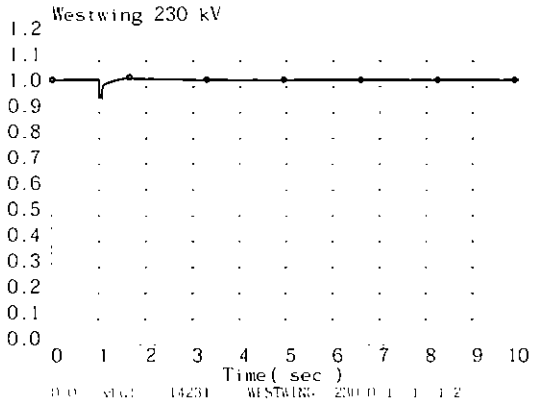


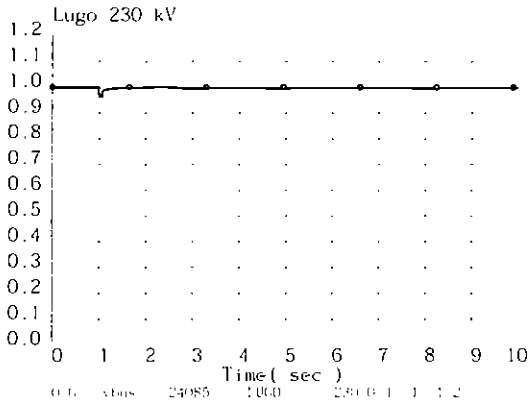


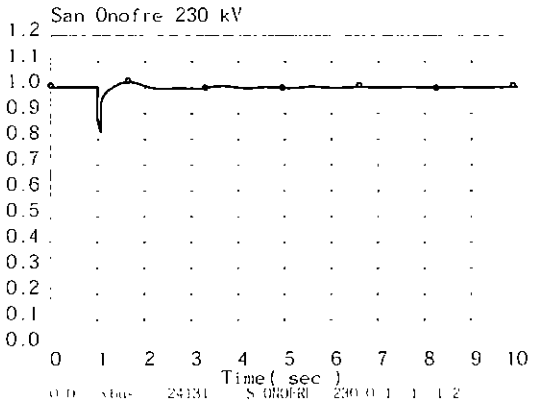


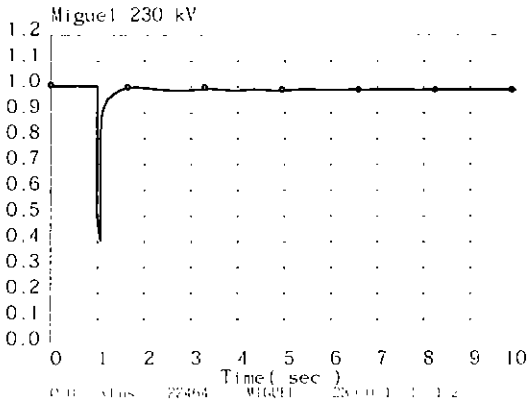
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

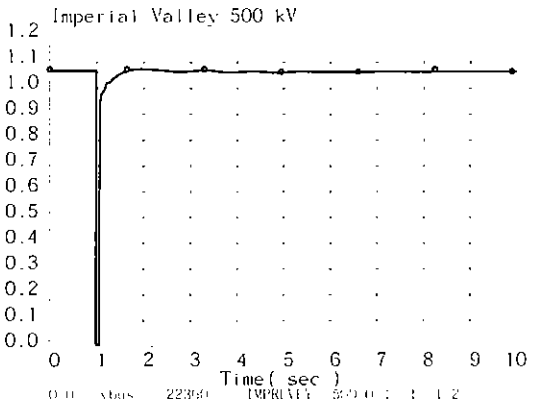
Bus Voltage

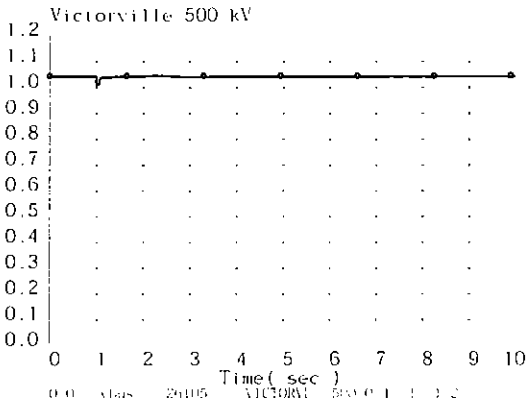






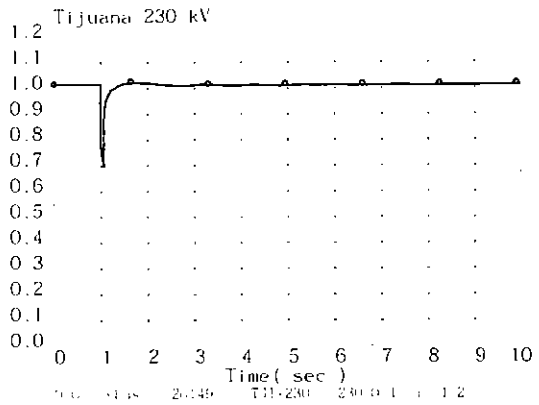


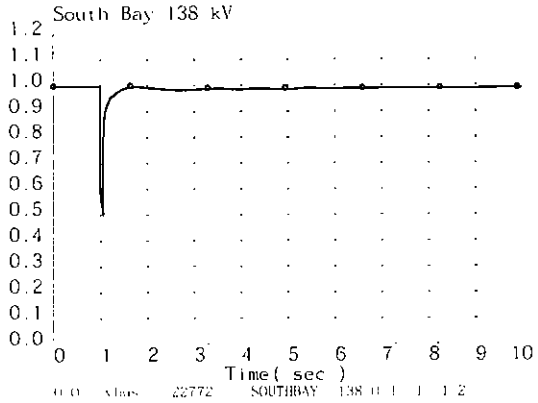


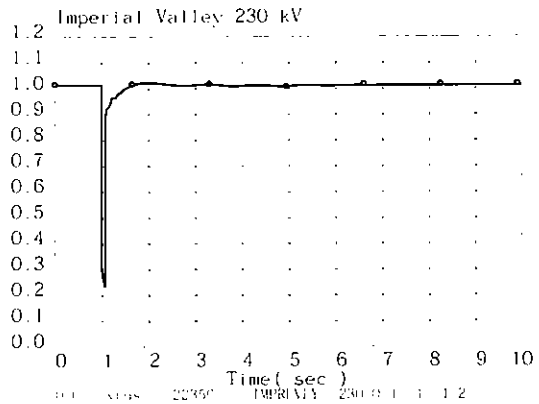


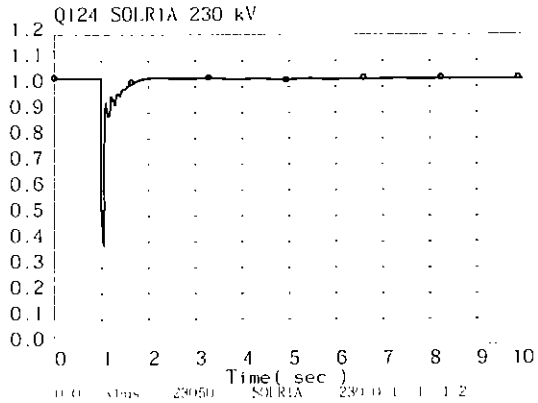
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

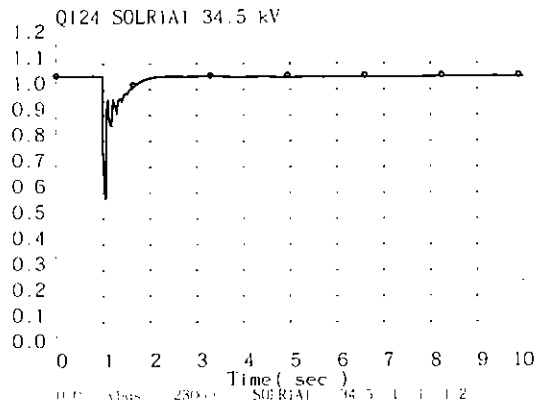
Bus Voltage

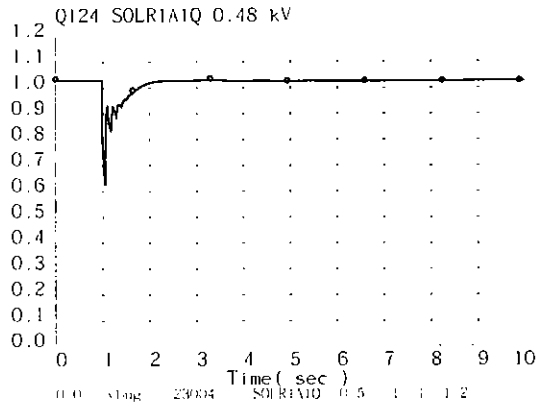






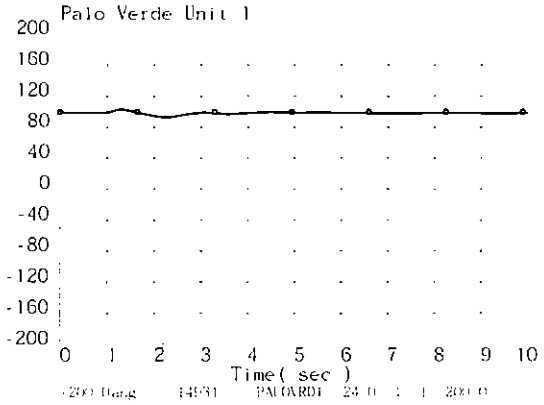


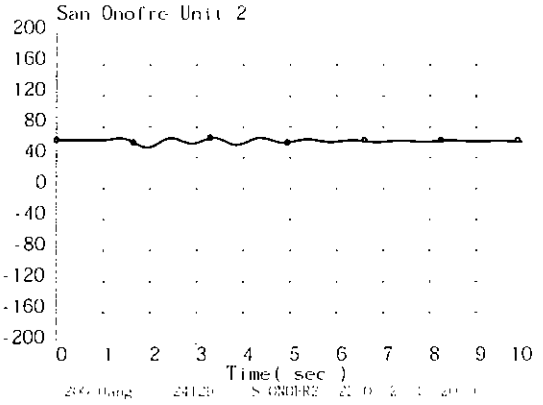


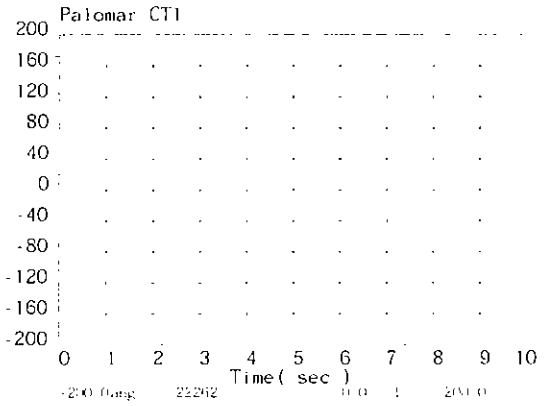


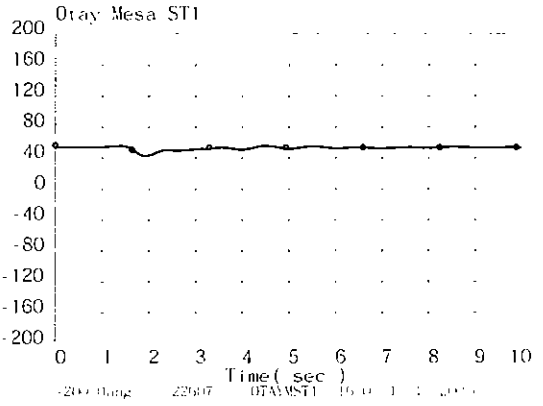
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

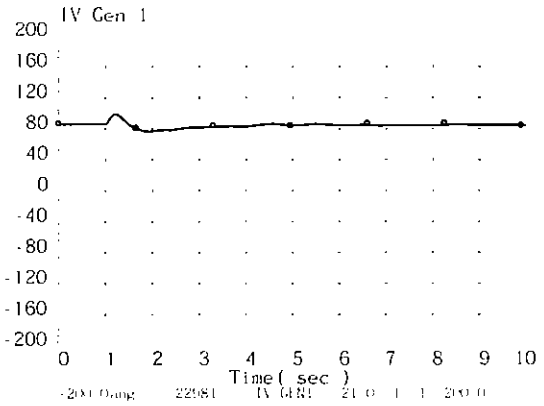
Relative Rotor Angle

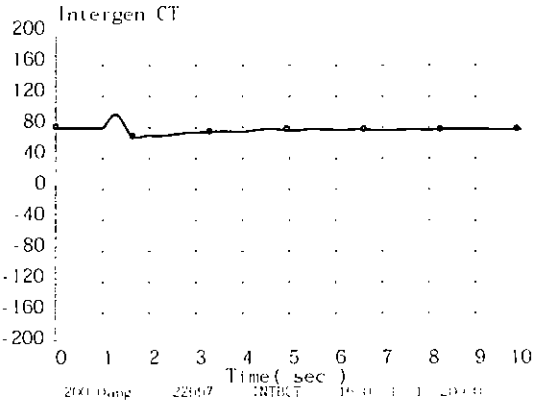






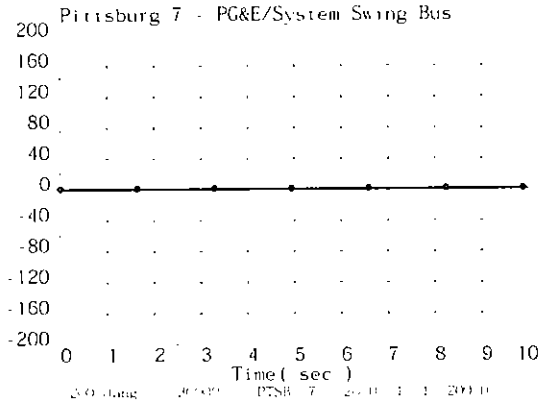


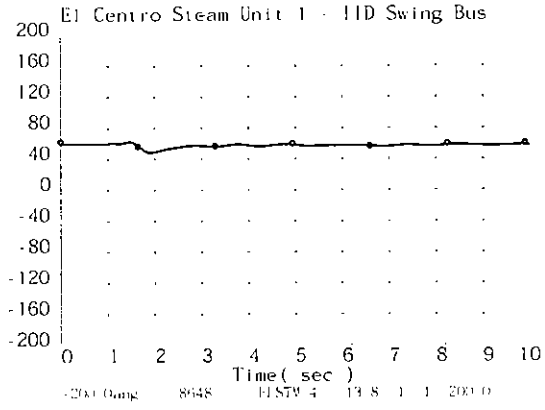


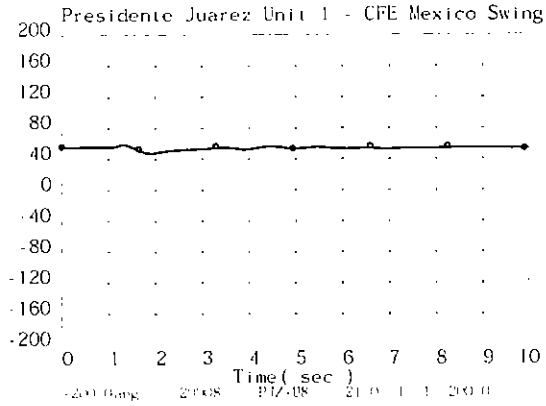


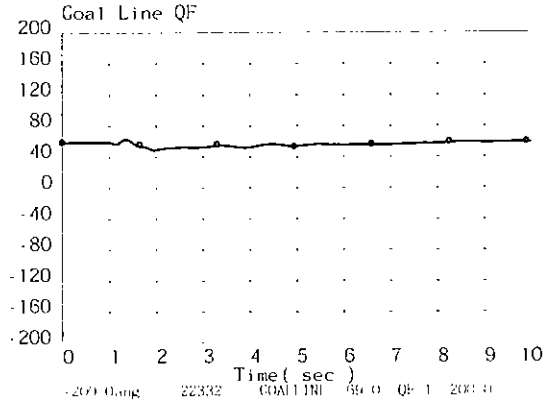
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

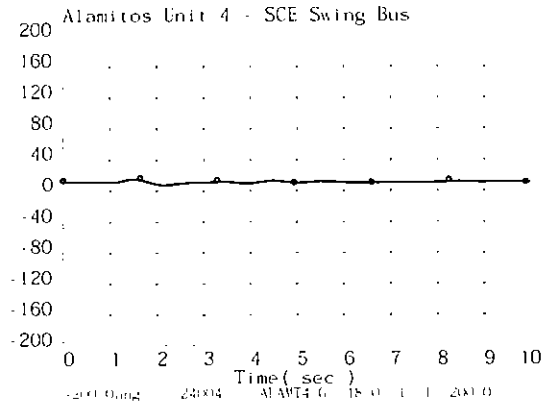
Relative Rotor Angle

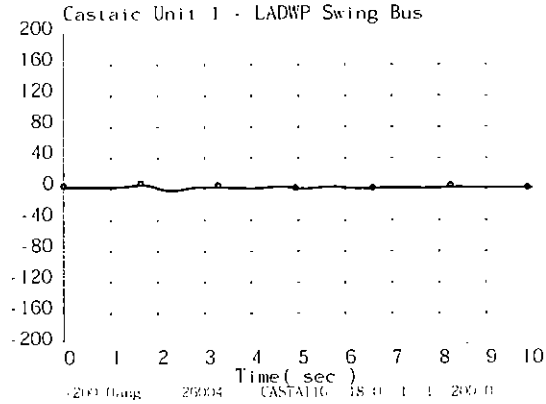






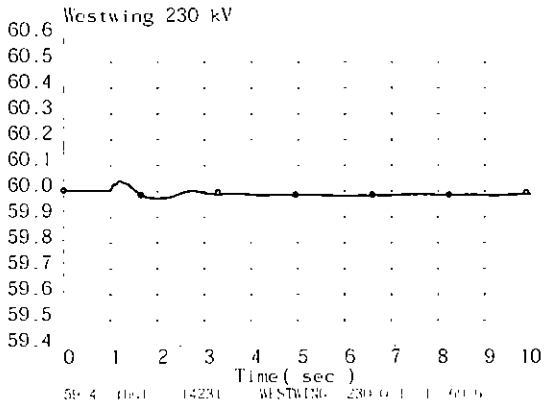


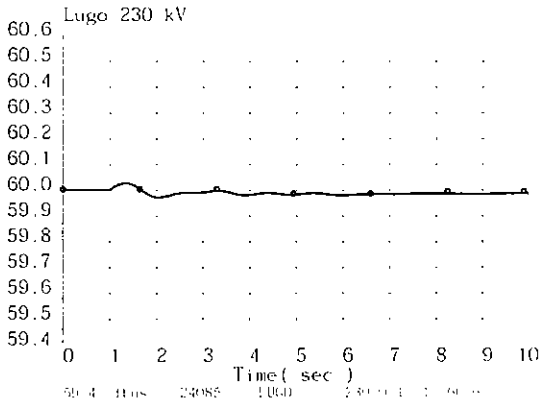


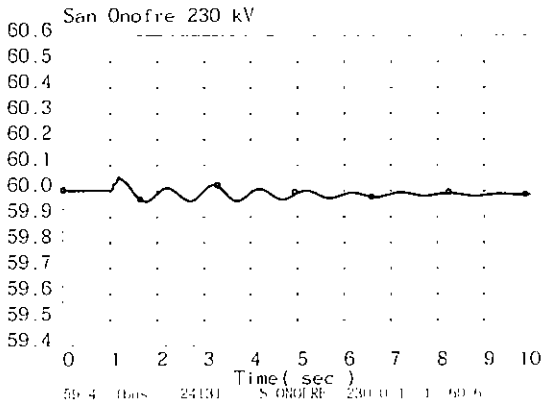


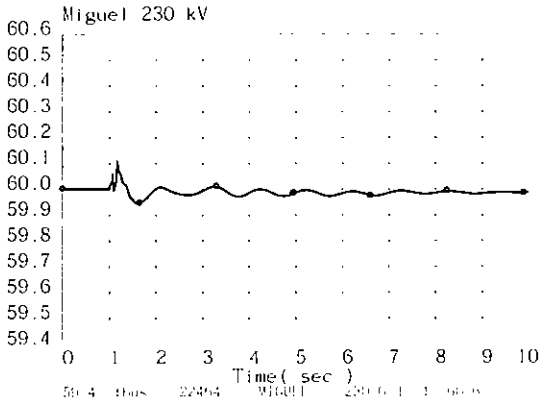
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

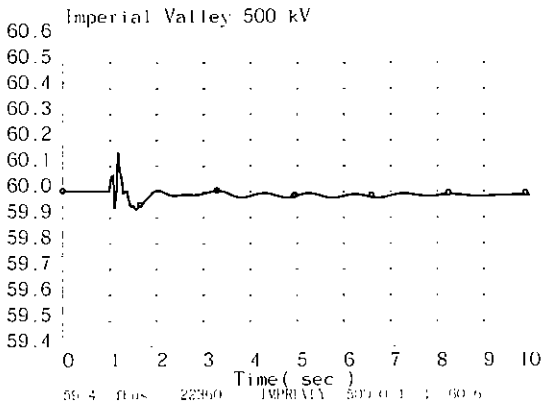
Bus Frequency

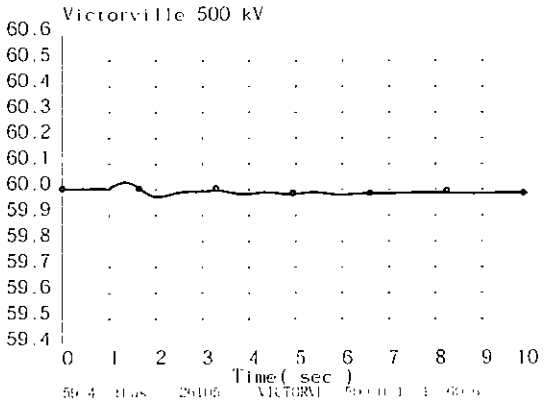




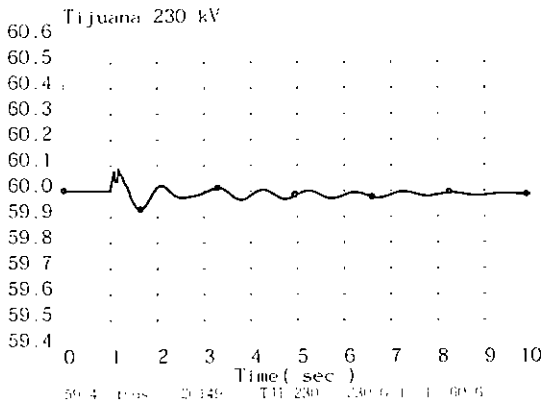


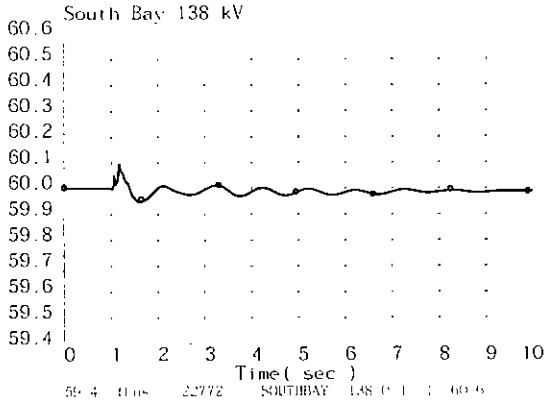


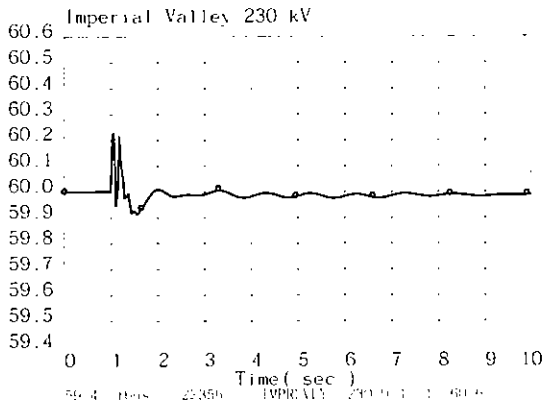


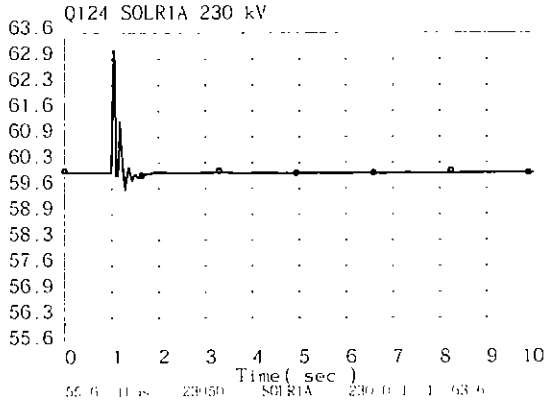


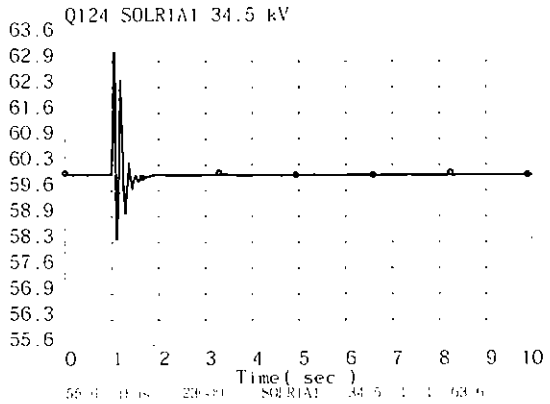
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

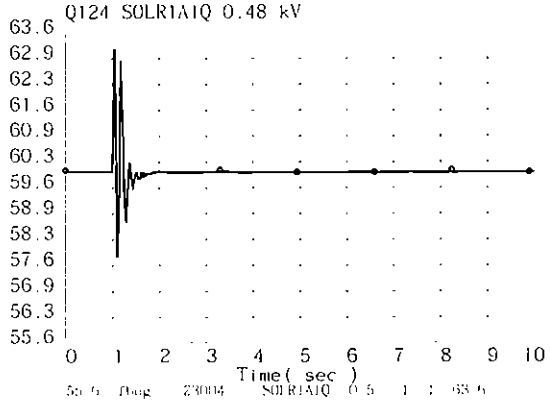






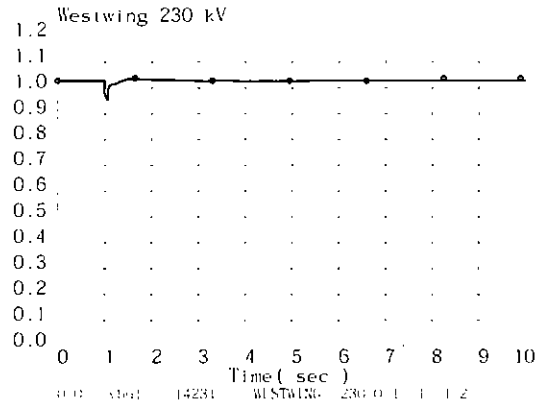


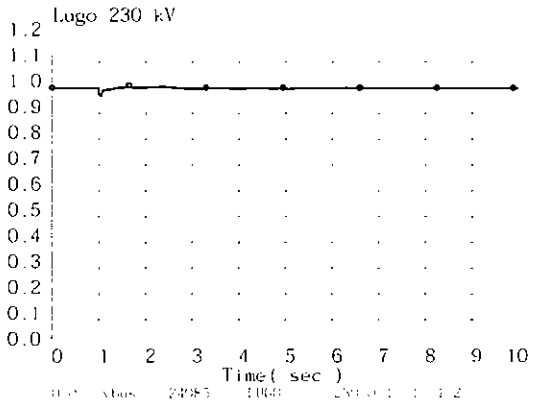


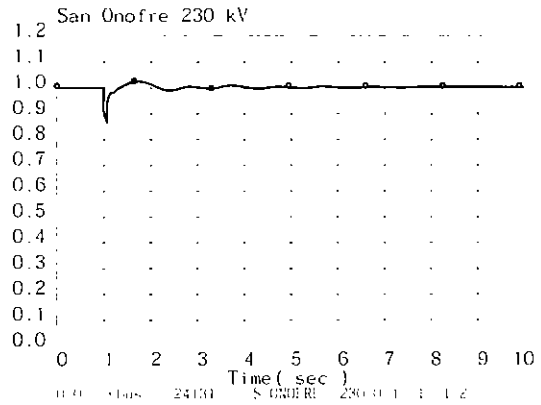


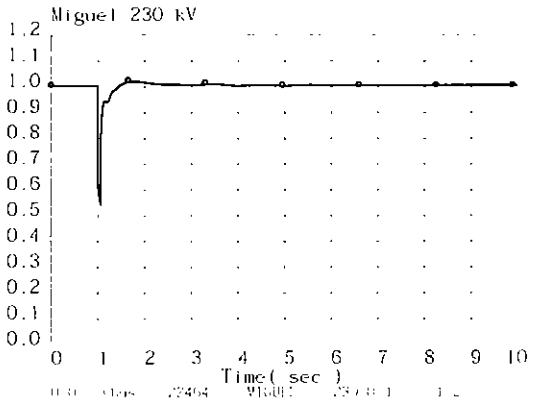
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

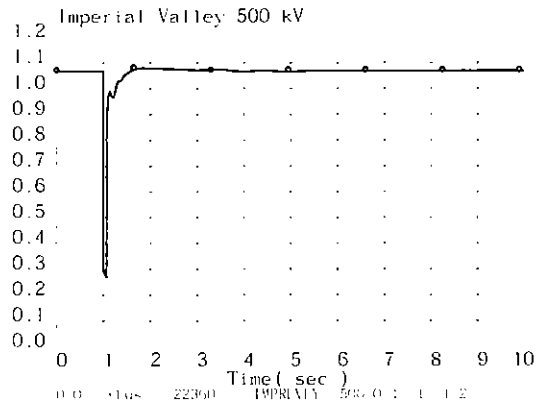
Bus Voltage

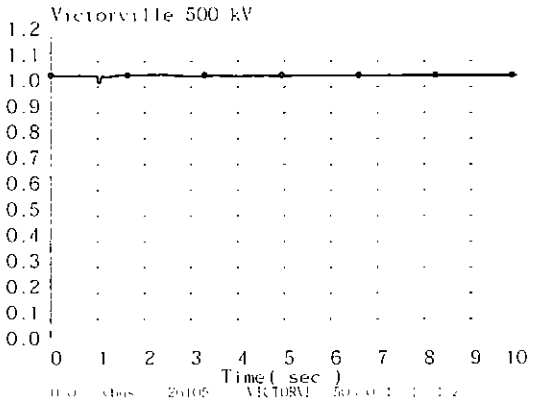






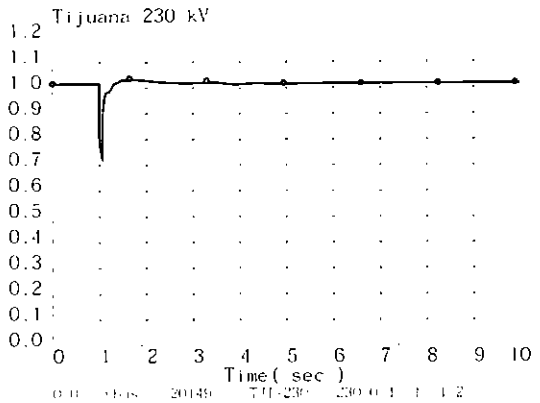


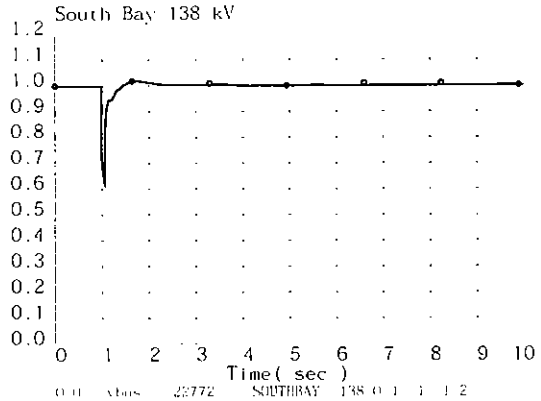


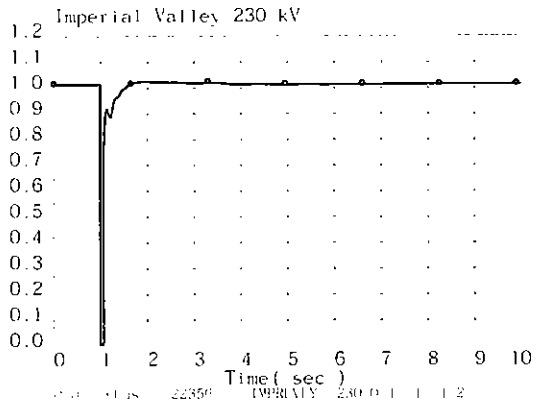


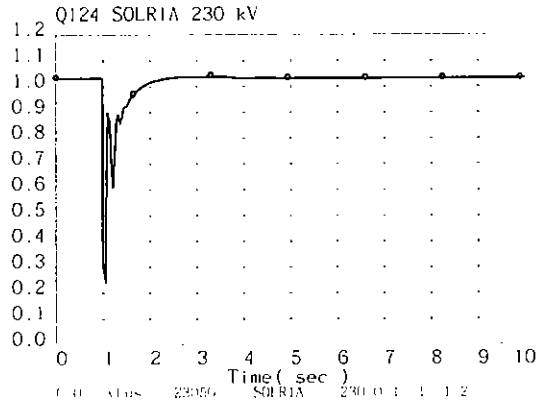
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

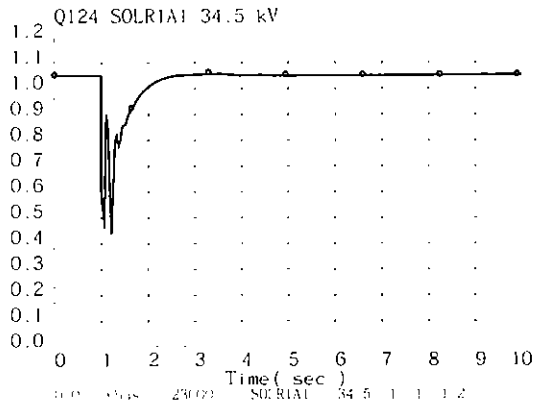
Bus Voltage

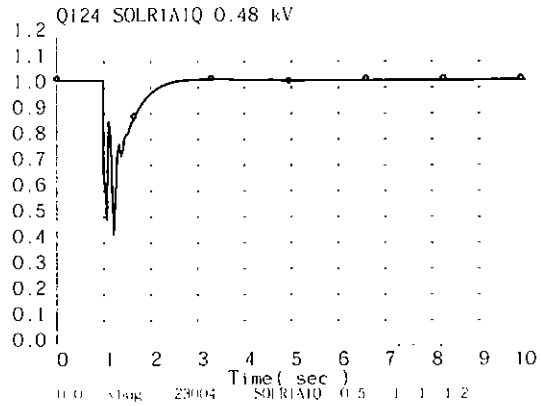






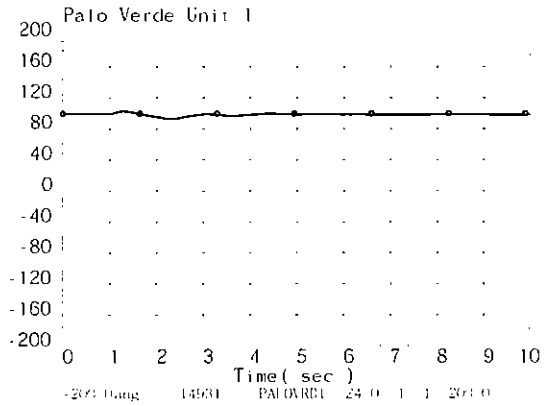


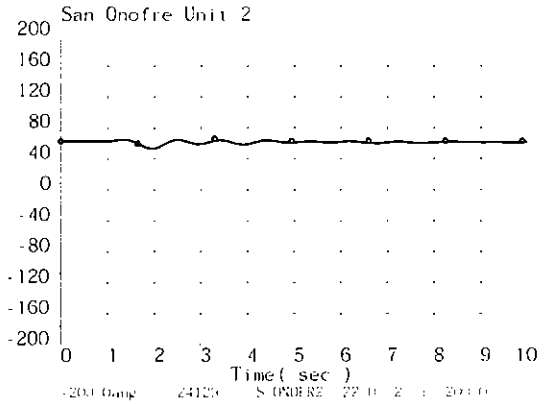


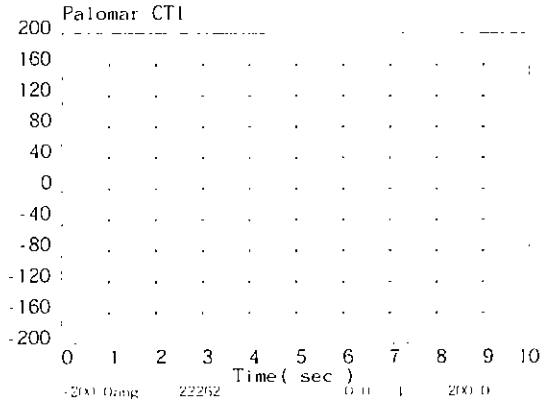


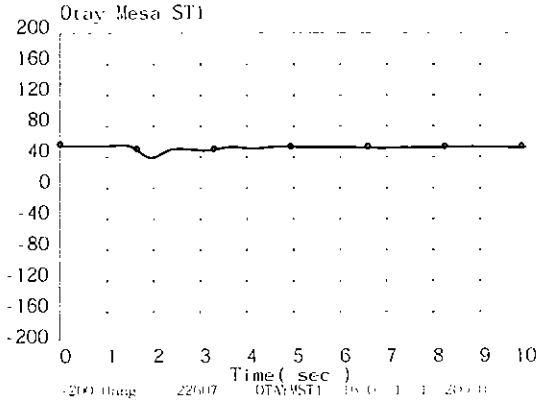
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV El Centro 230 kV line

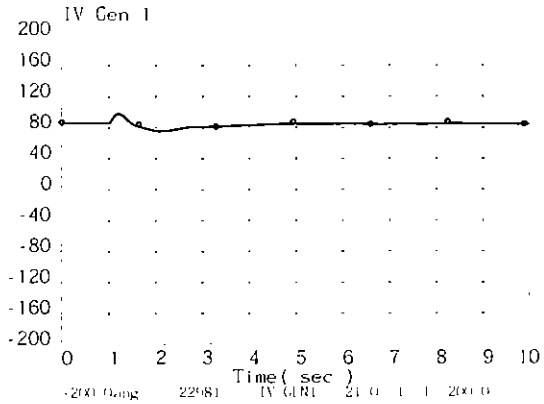
Relative Rotor Angle

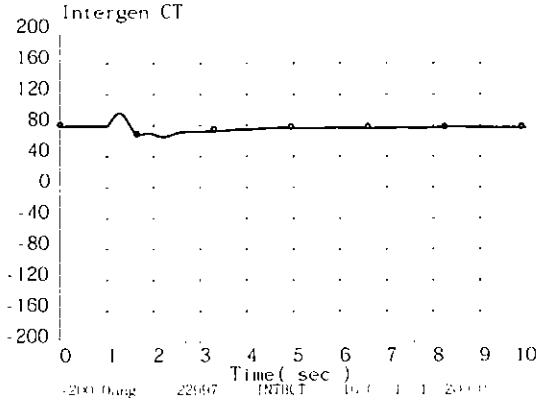






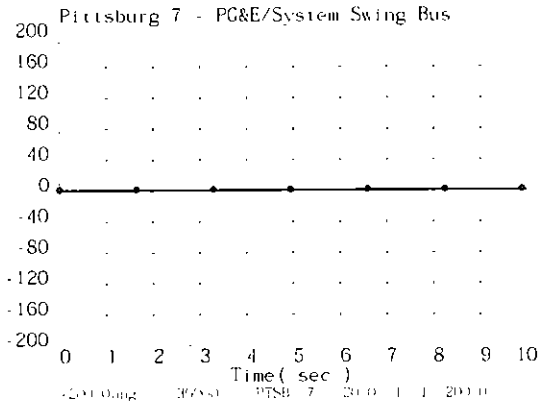


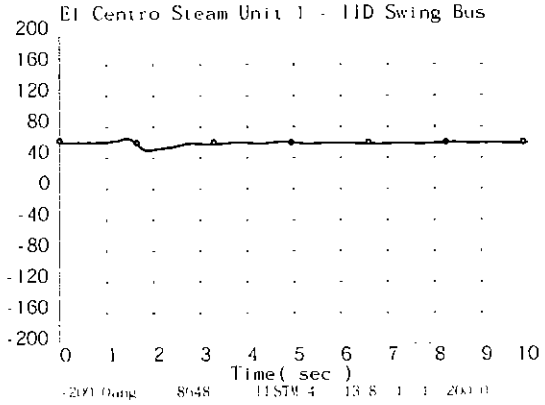


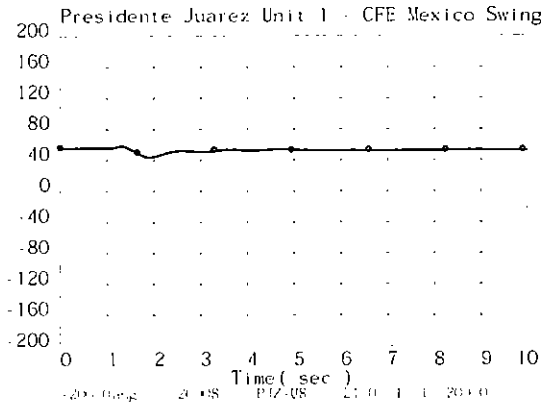


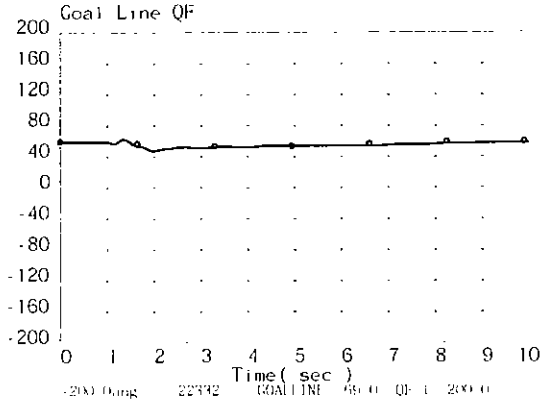
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

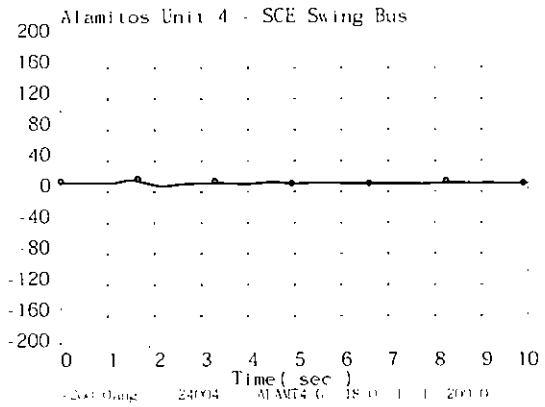
Relative Rotor Angle

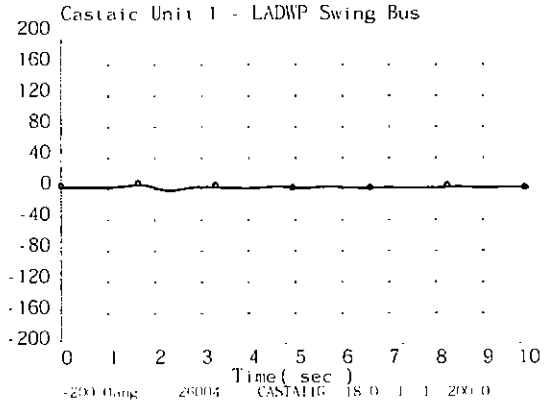






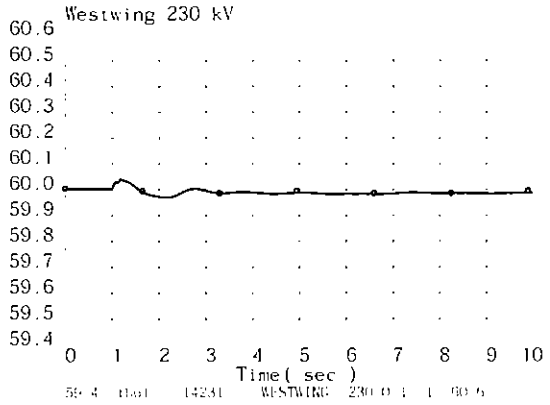


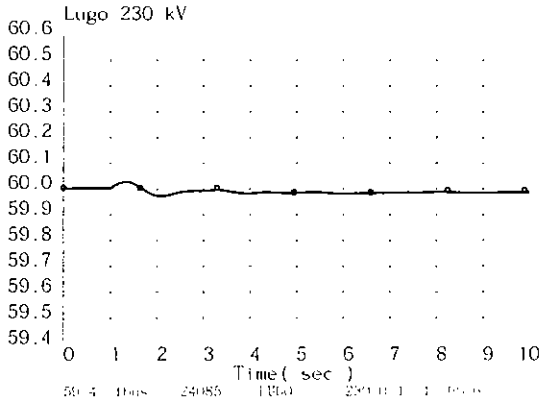


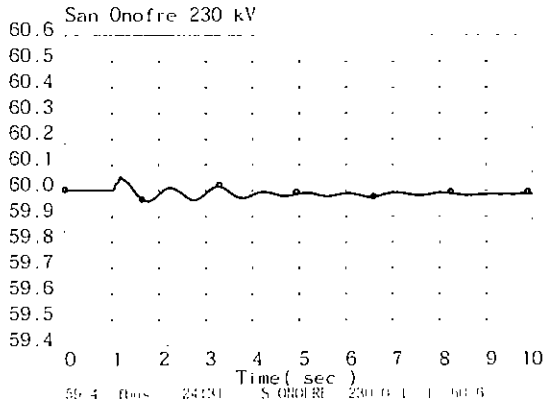


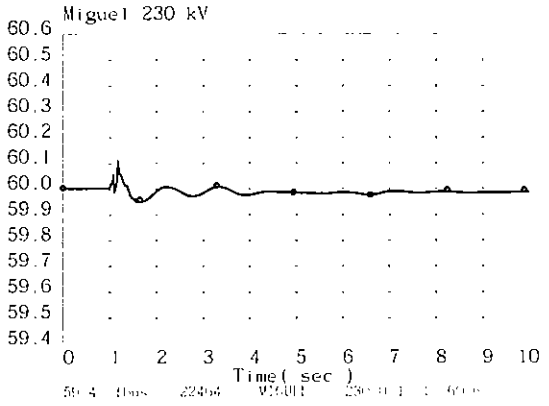
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

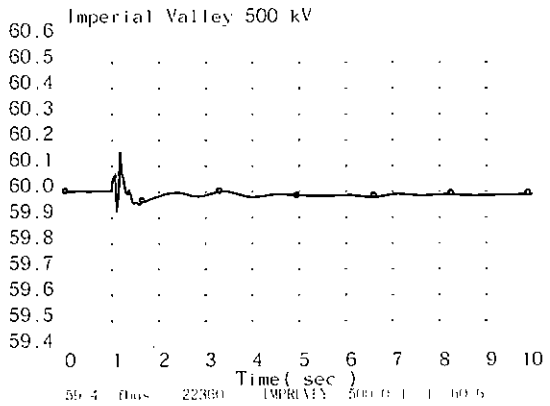
Bus Frequency

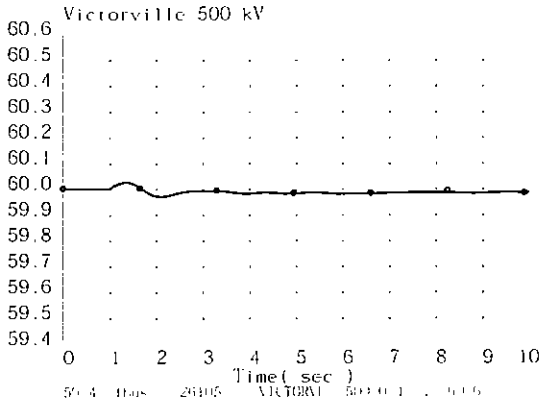






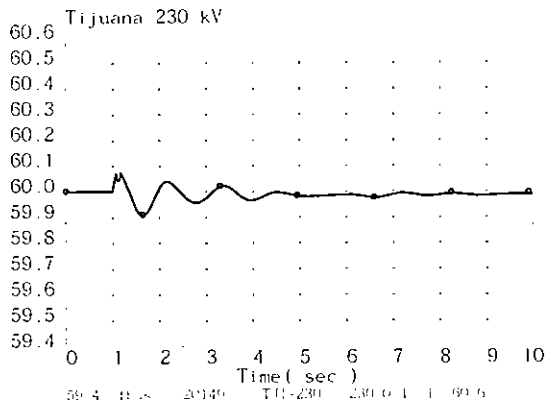


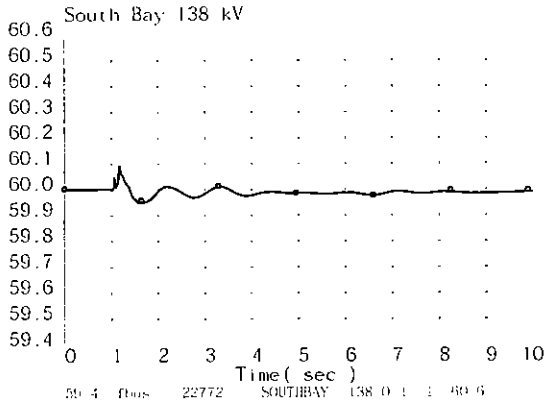


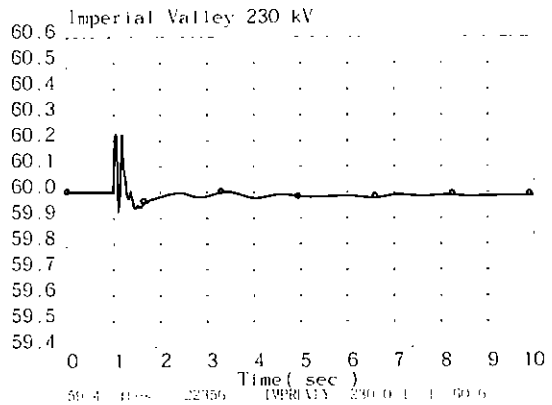


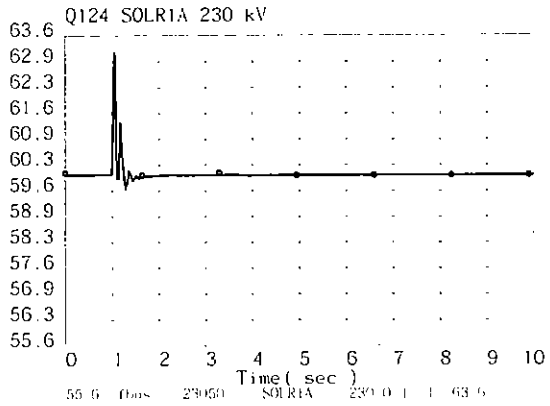
SDC&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

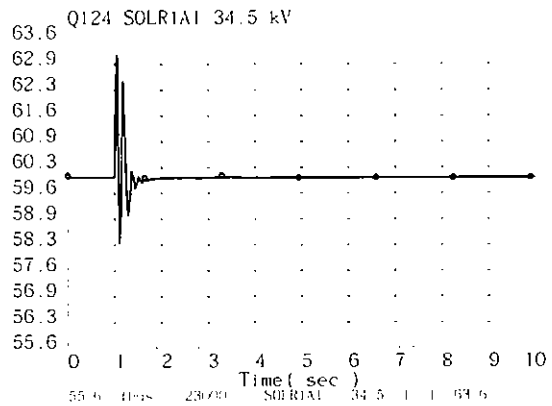
Bus Frequency

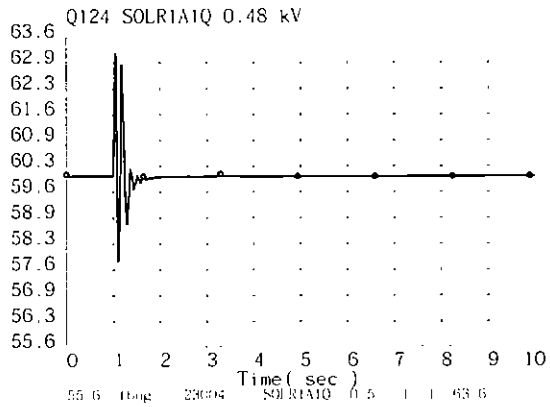






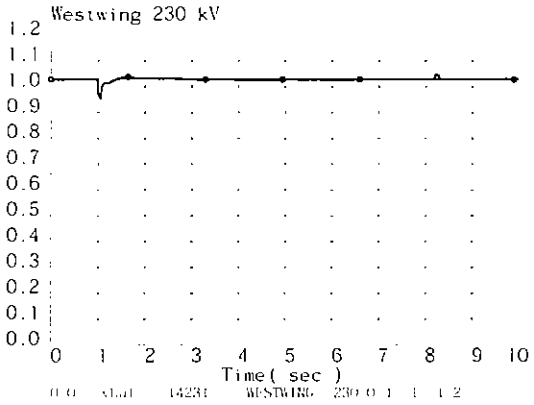


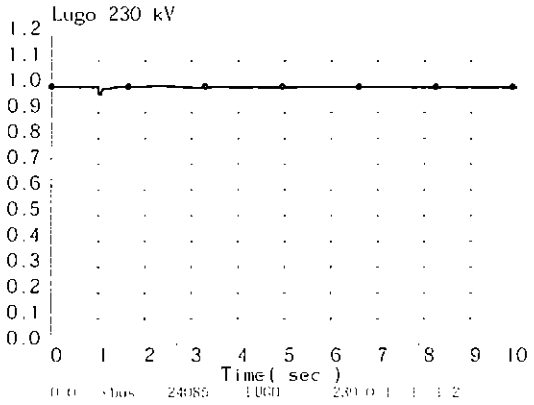


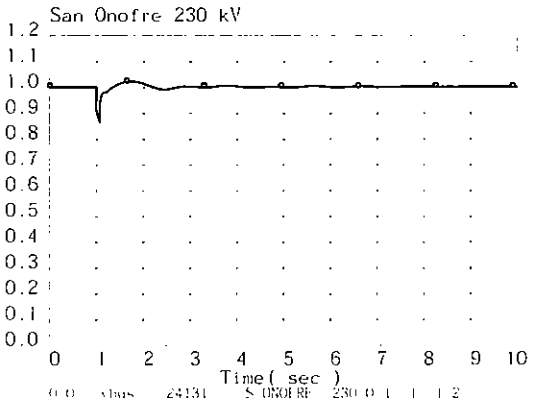


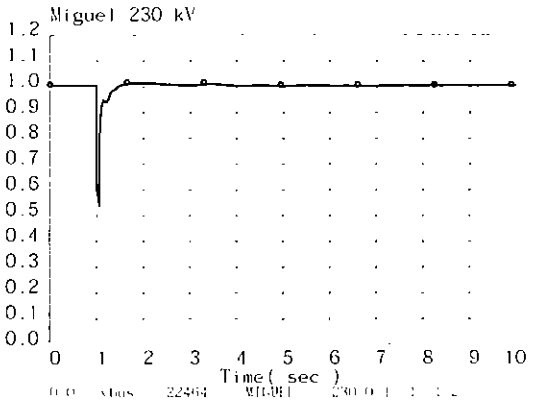
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

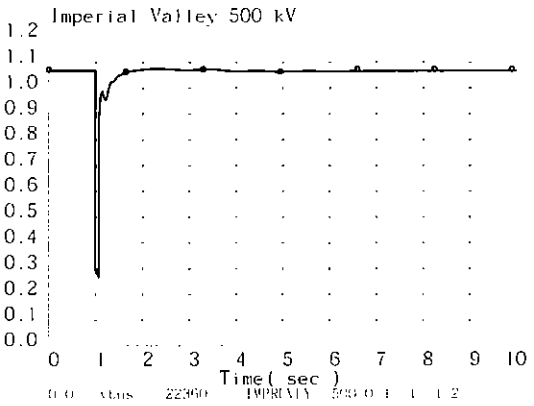
Bus Voltage

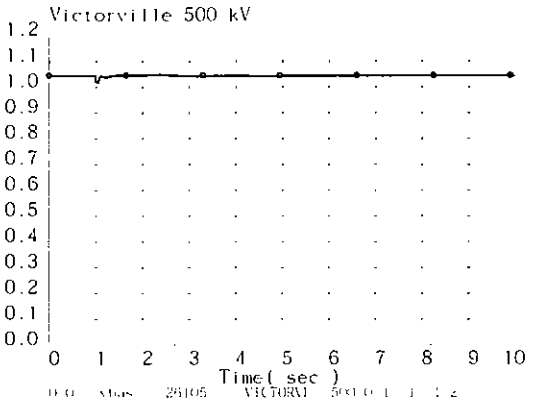






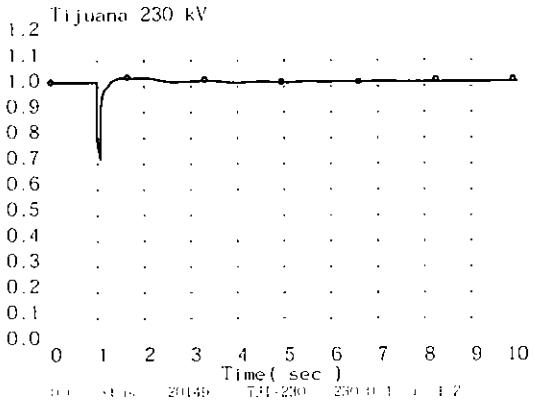


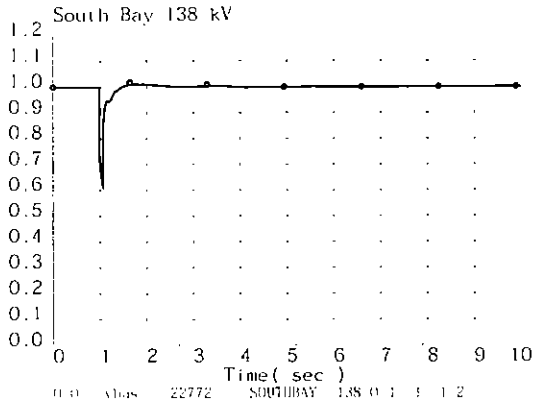


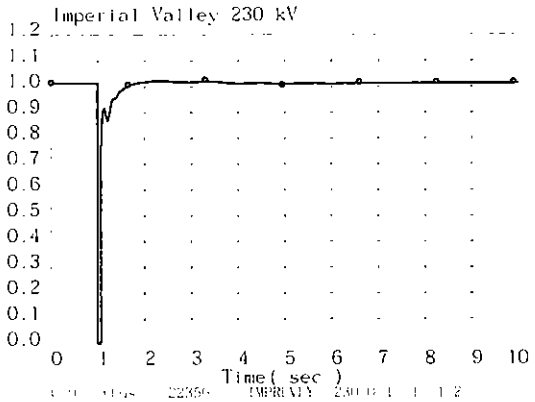


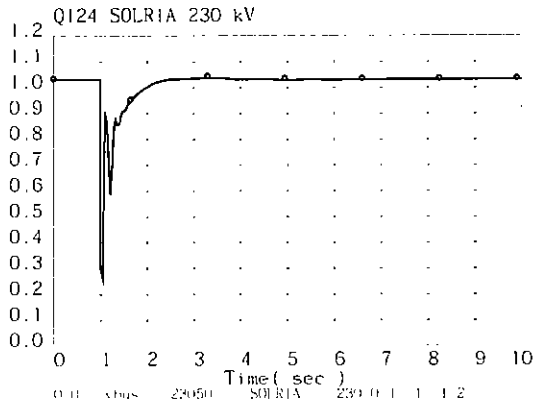
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

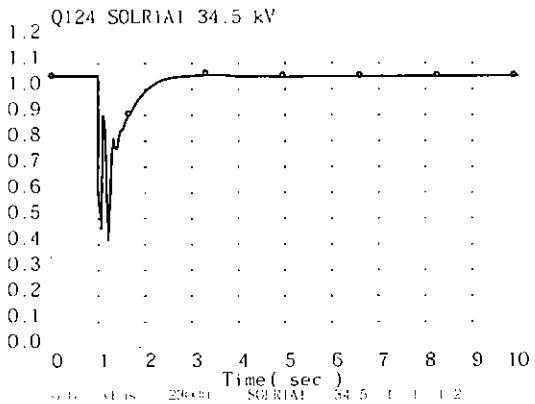
Bus Voltage

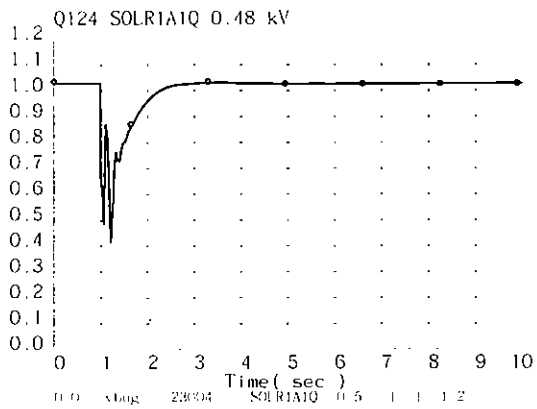






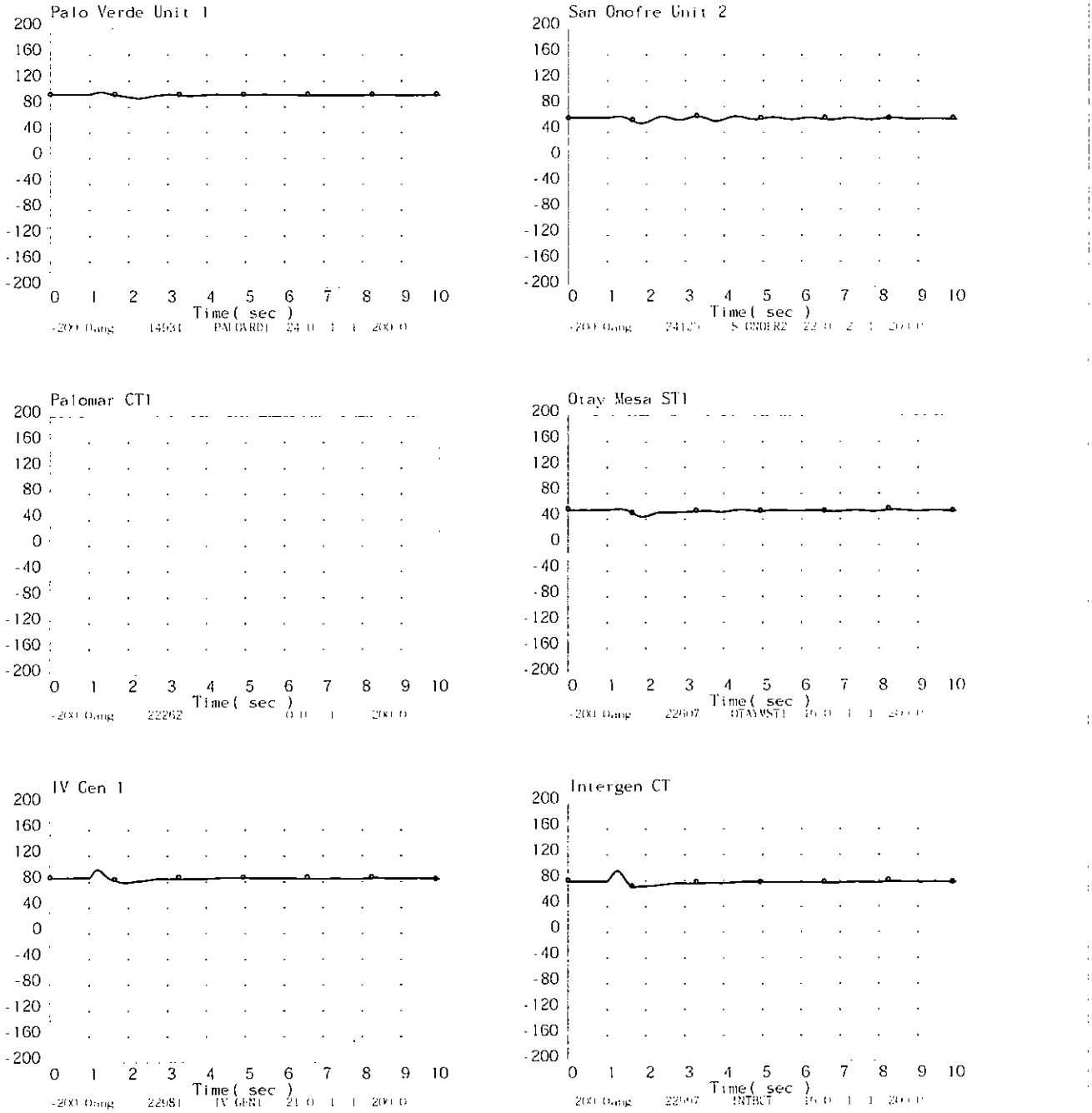






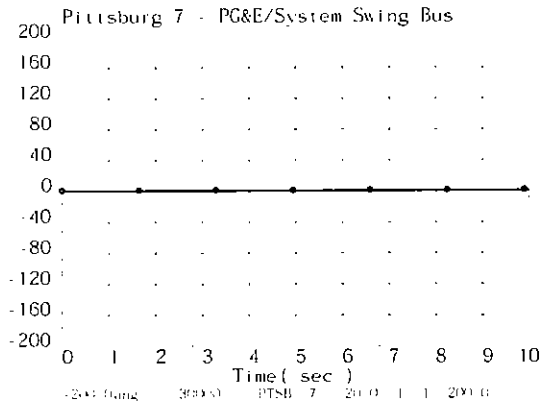
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV La Rosita 230 kV line

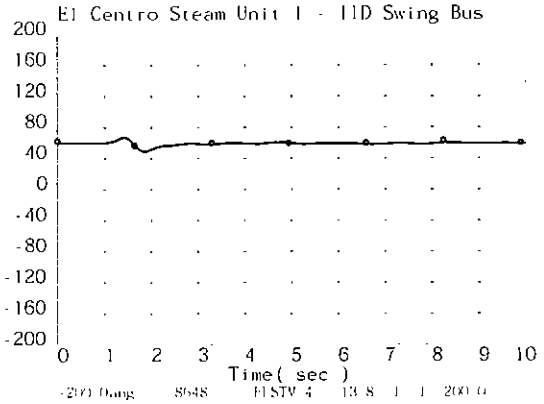
Relative Rotor Angle

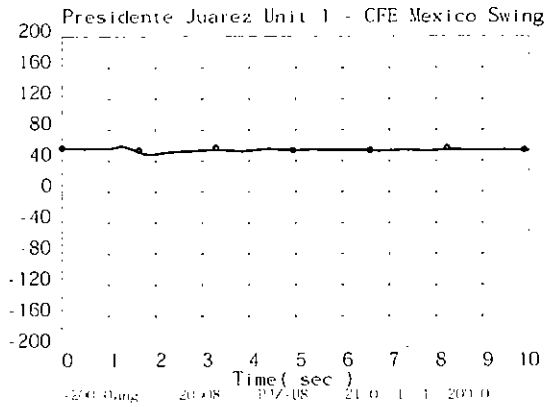


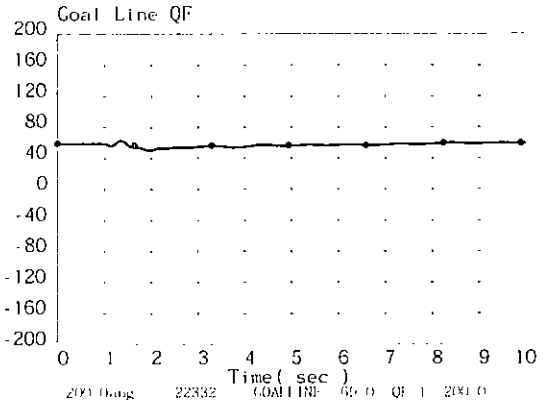
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

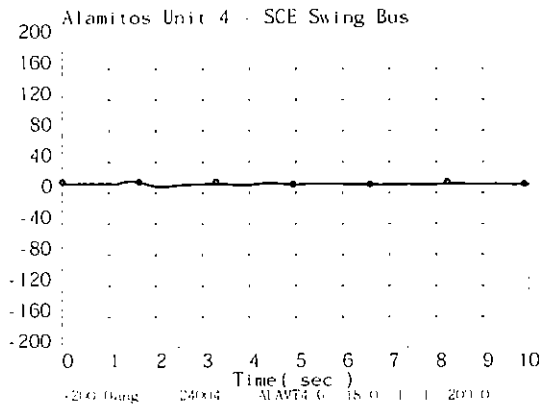
Relative Rotor Angle

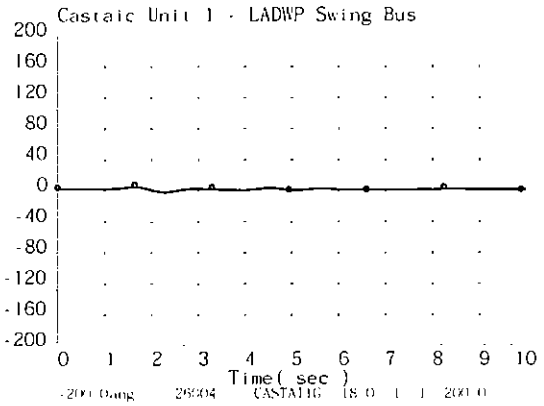






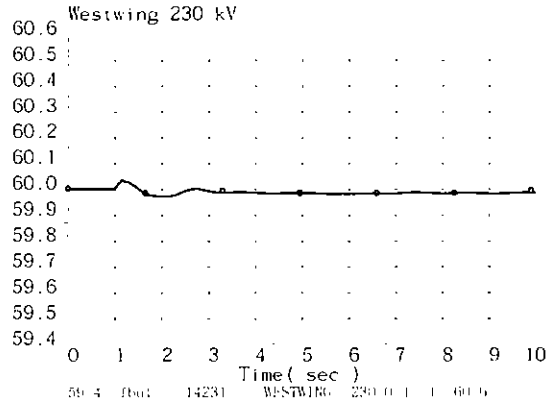


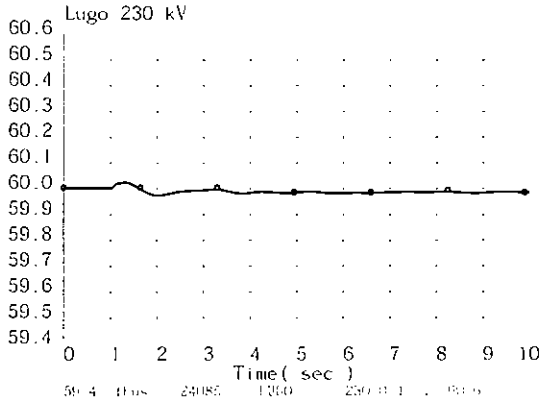


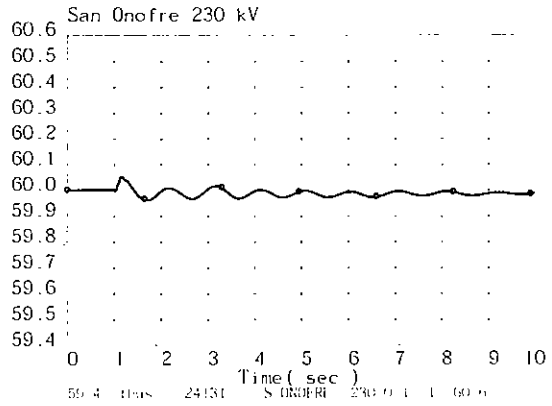


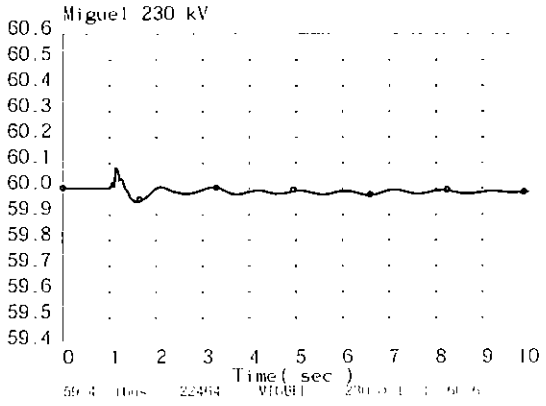
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

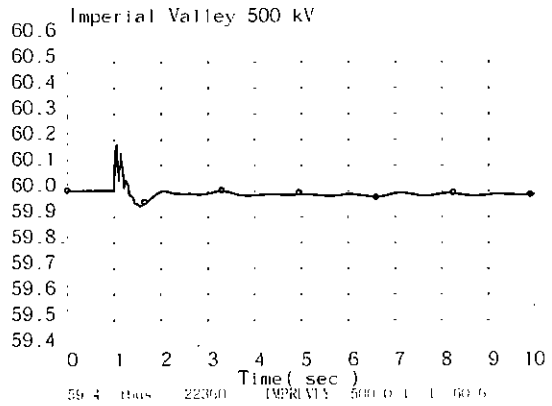
Bus Frequency

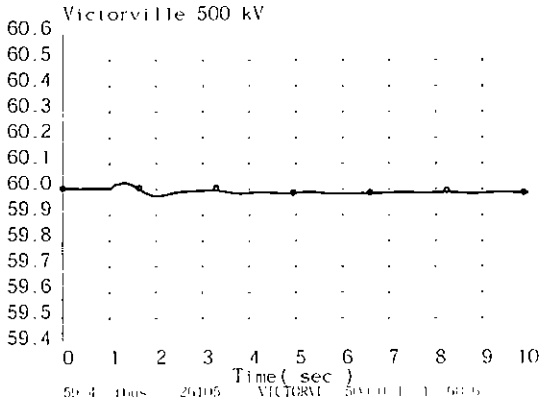






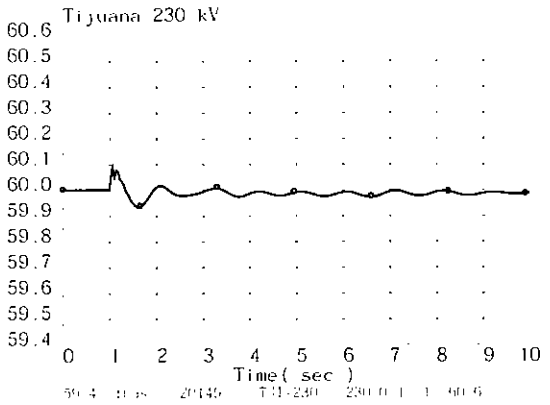


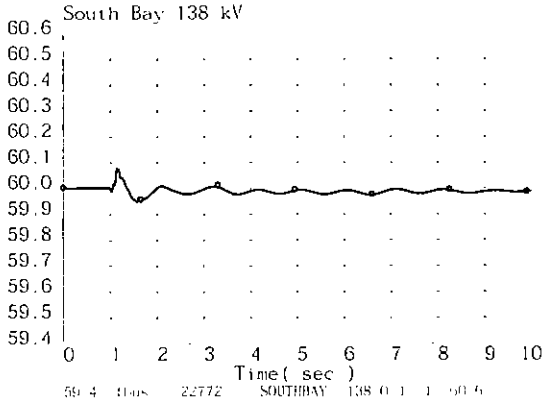


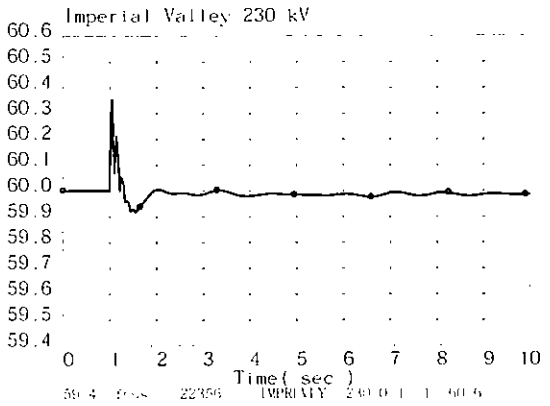


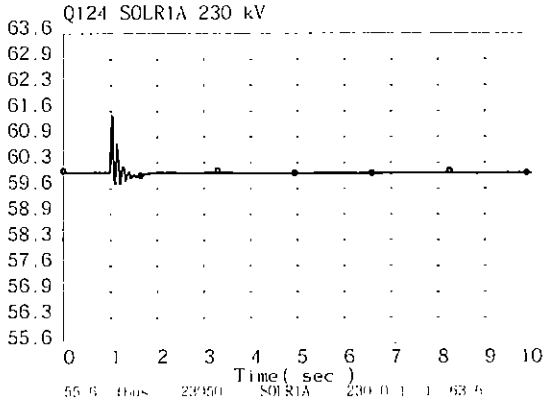
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

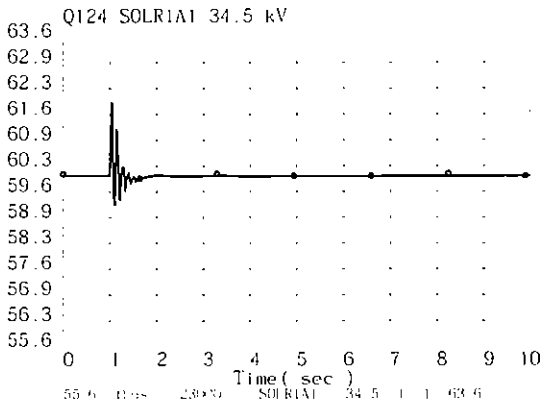
Bus Frequency

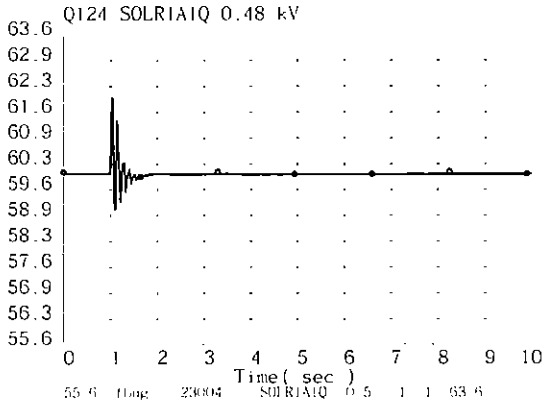






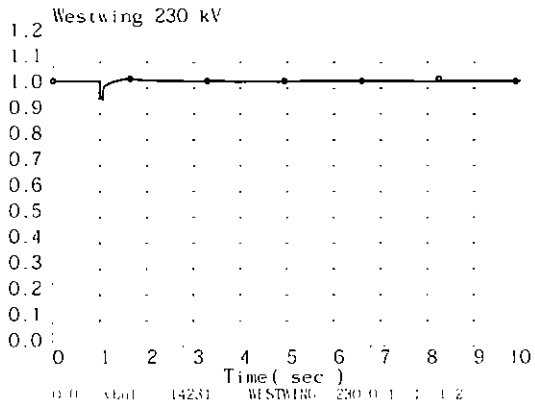


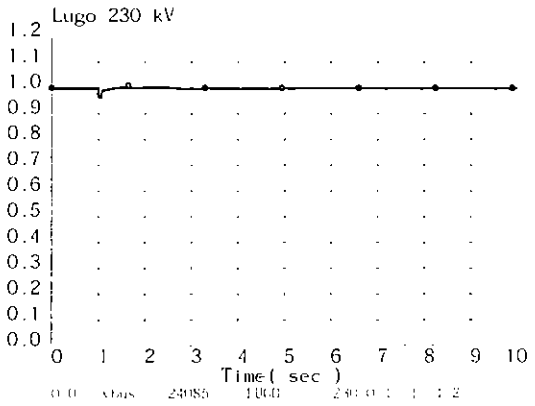


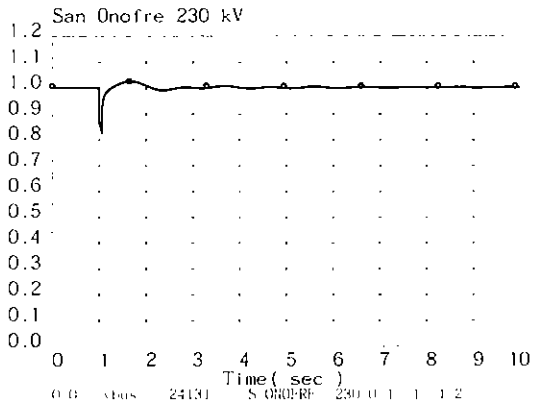


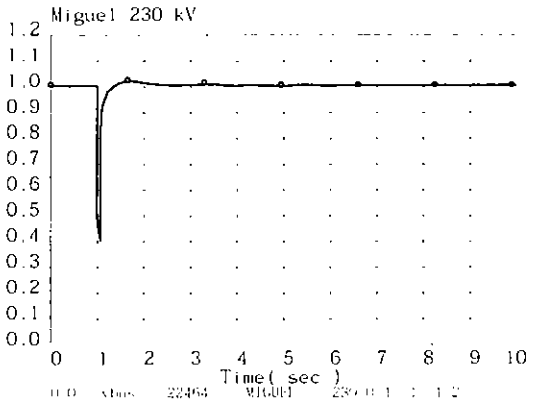
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

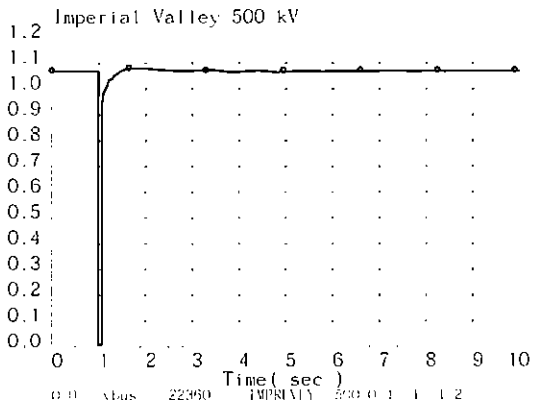
Bus Voltage

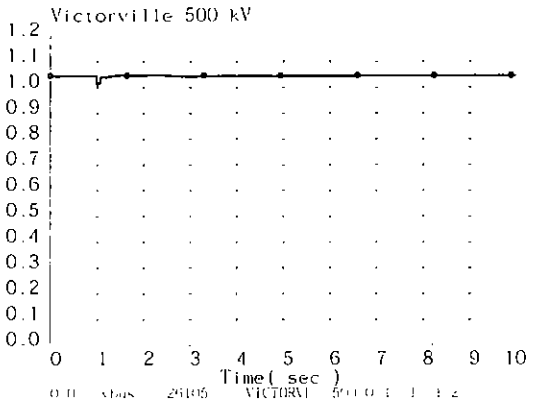






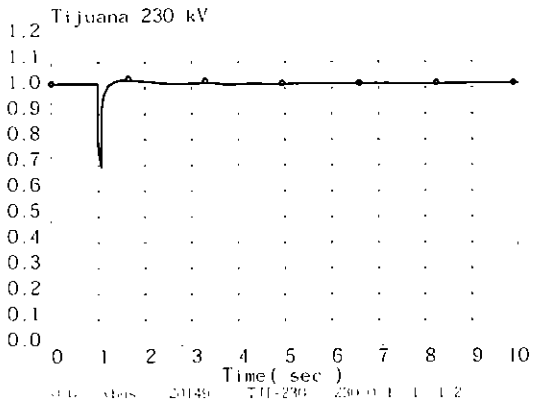


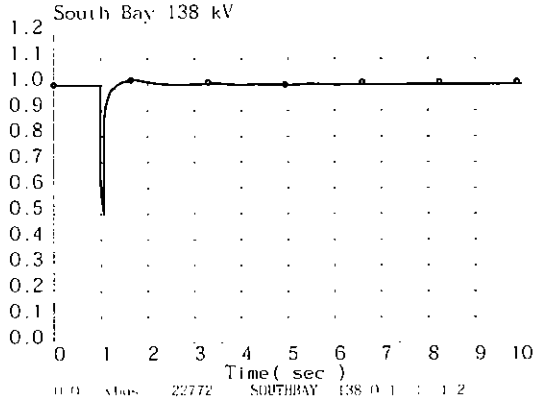


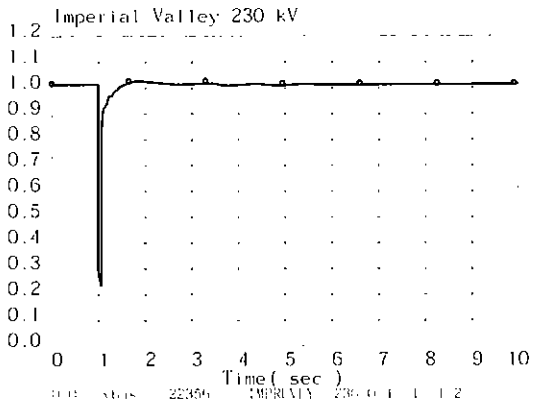


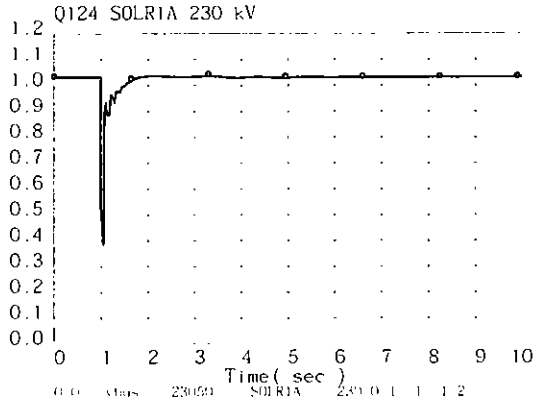
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

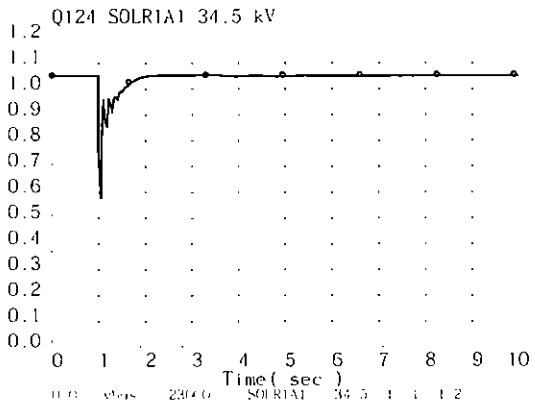
Bus Voltage

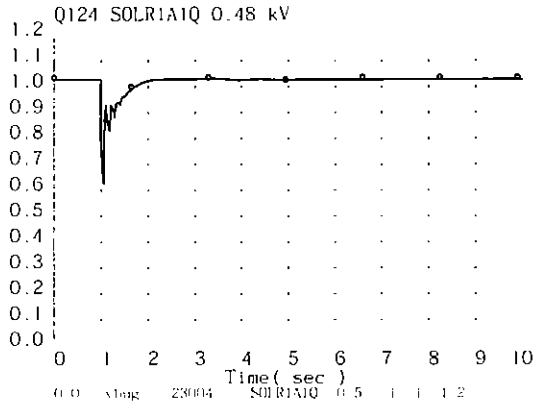






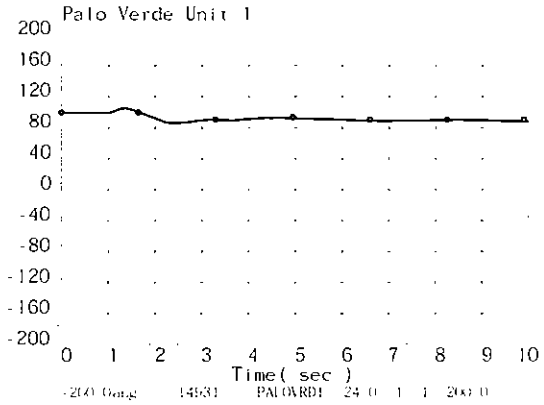


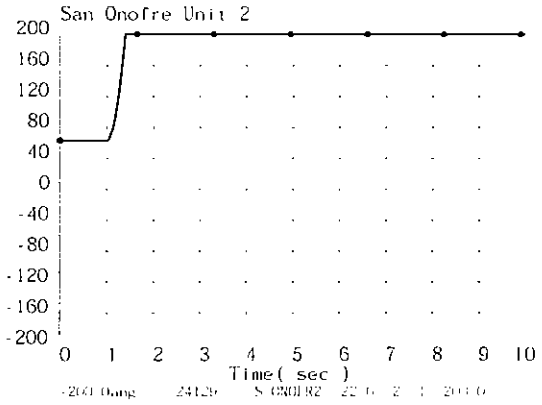


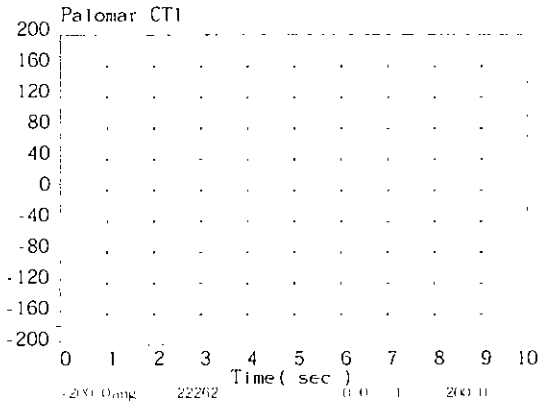


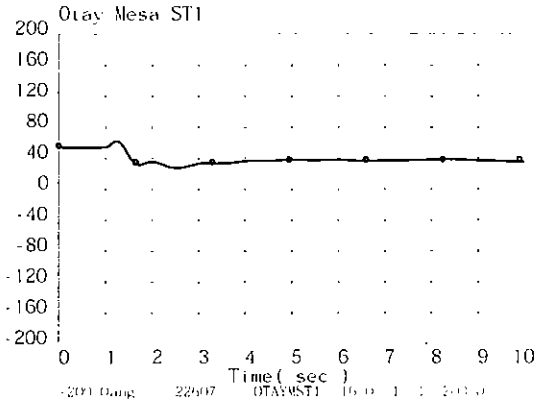
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

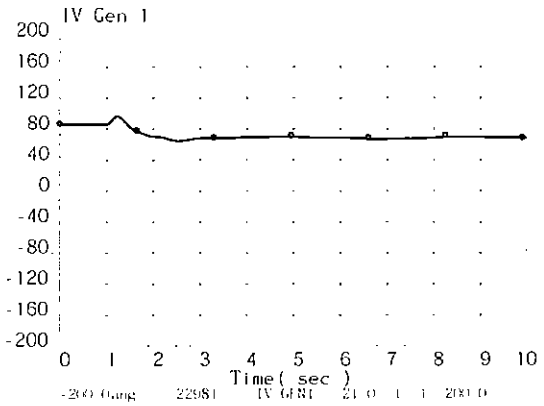
Relative Rotor Angle

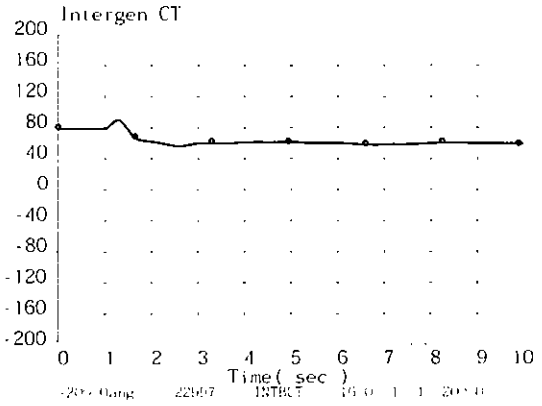






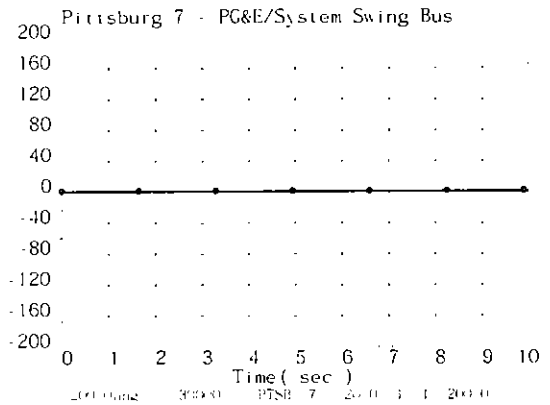


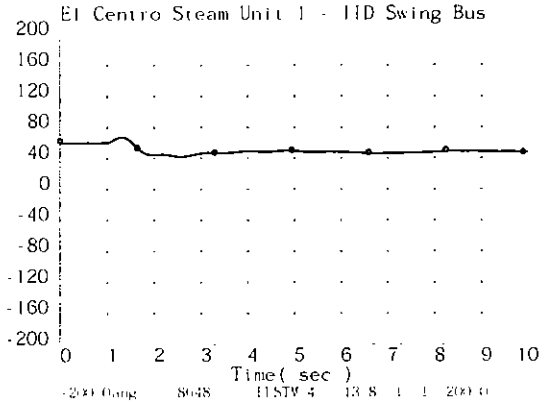


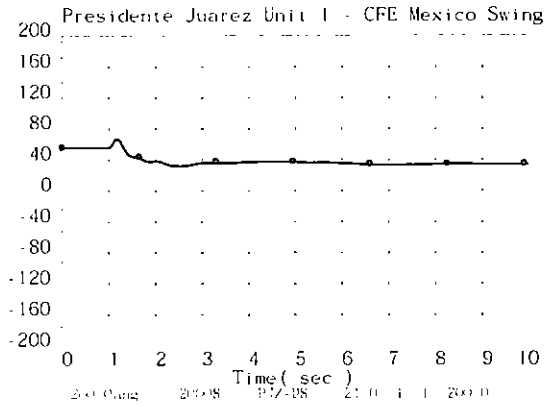


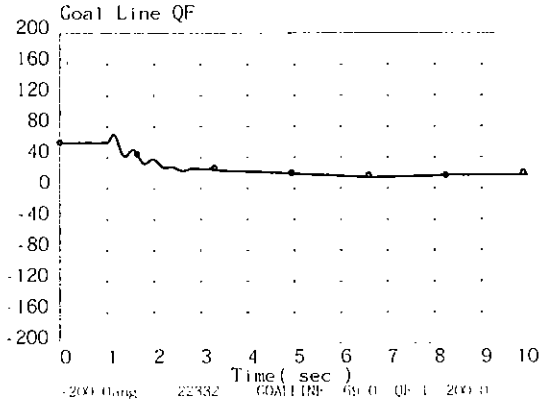
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

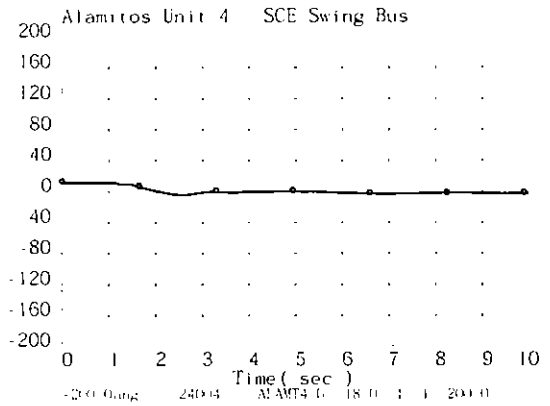
Relative Rotor Angle

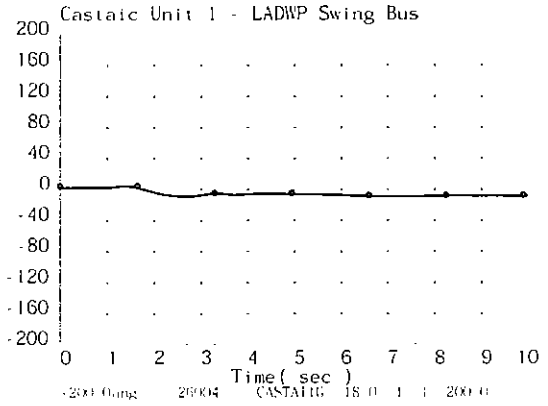






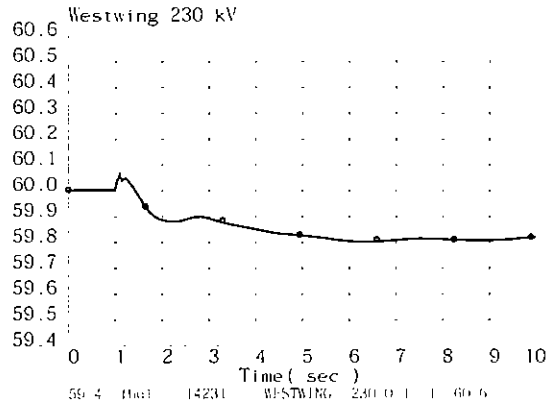


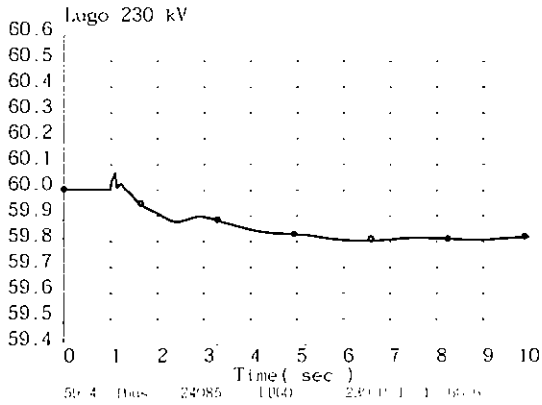


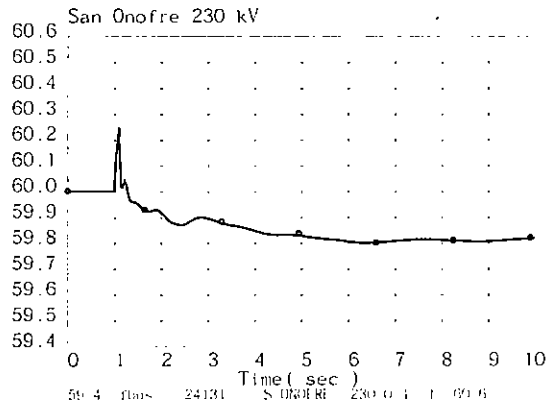


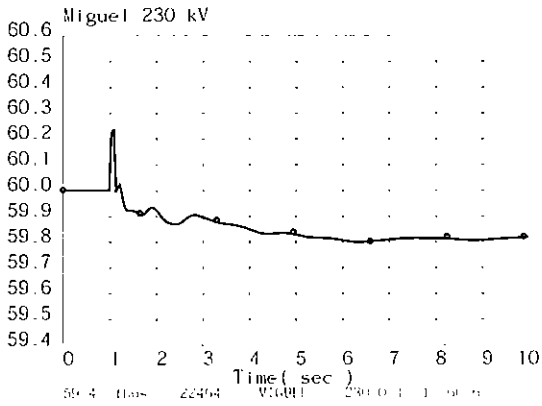
SDG&E 2011 Light Winter Q124 600 MW at 1V 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

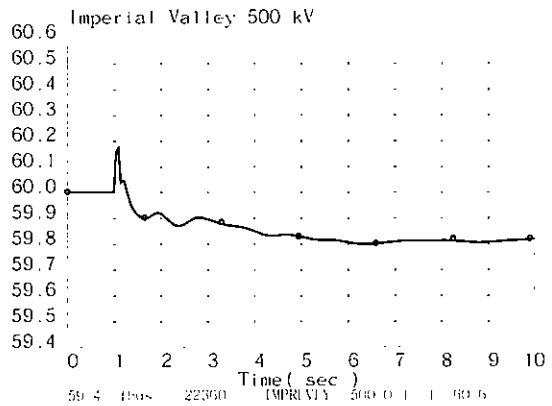
Bus Frequency

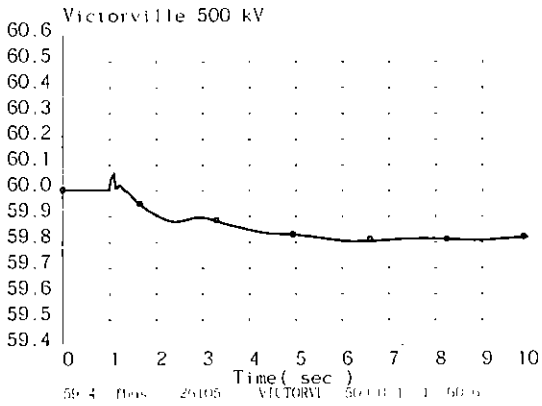






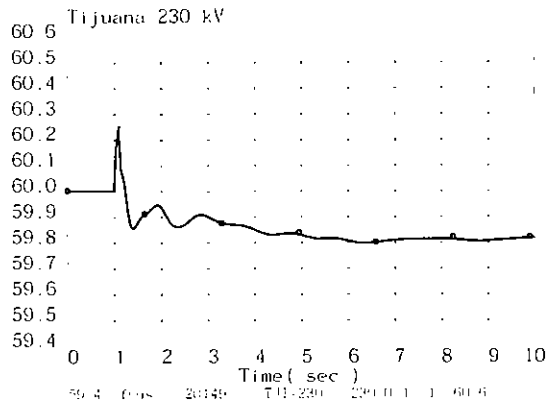


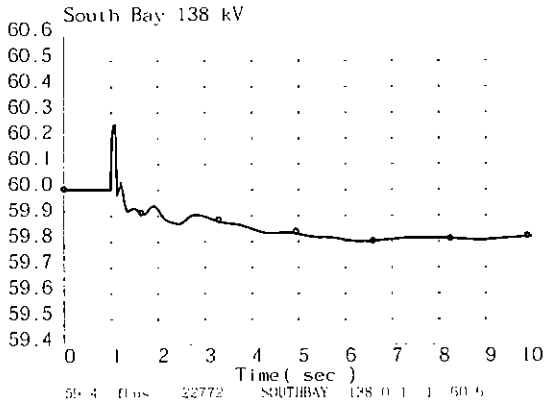


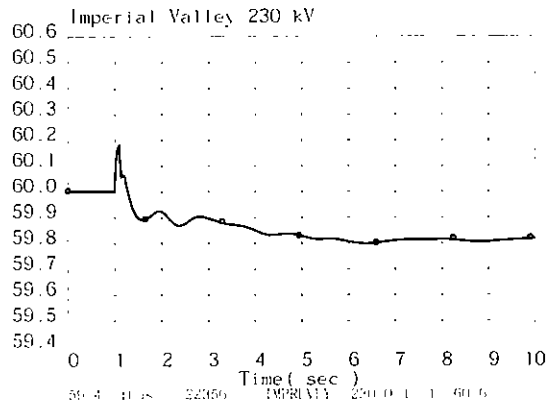


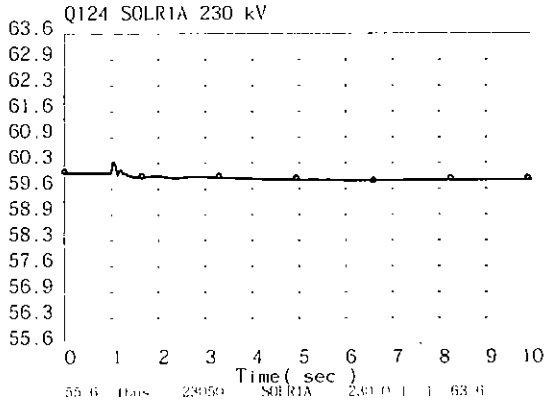
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

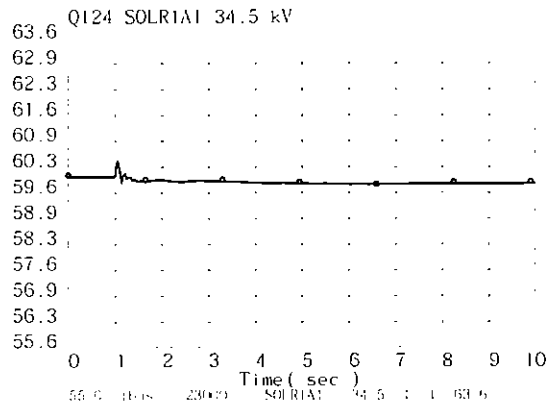
Bus Frequency

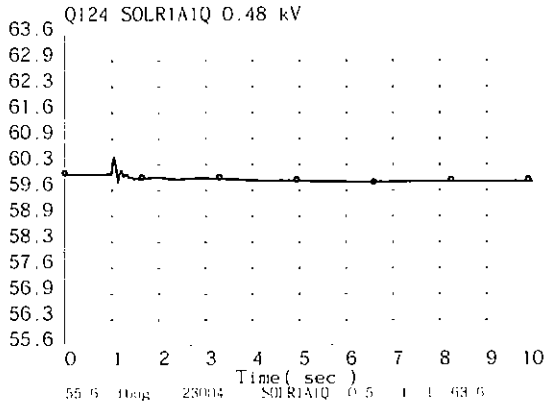






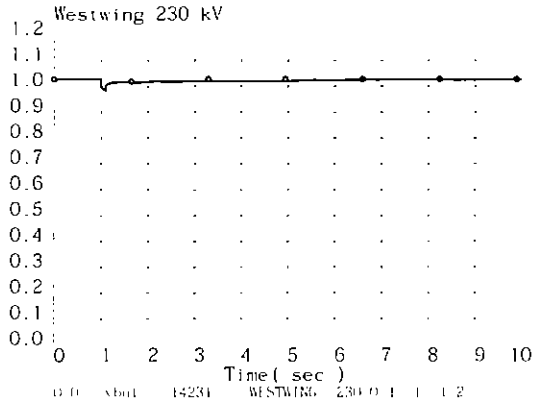


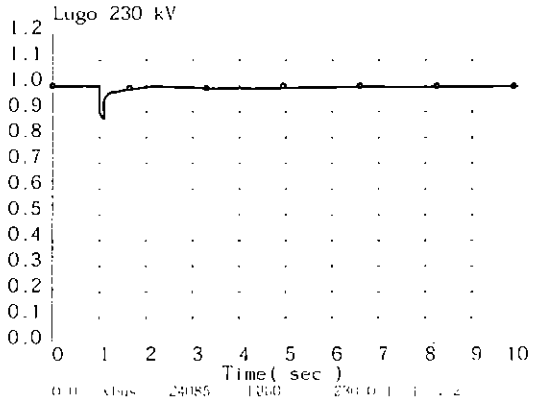


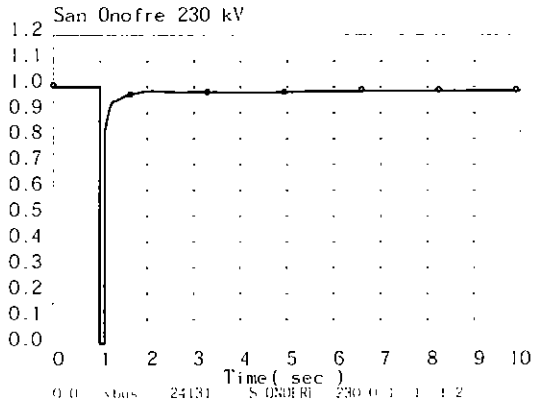


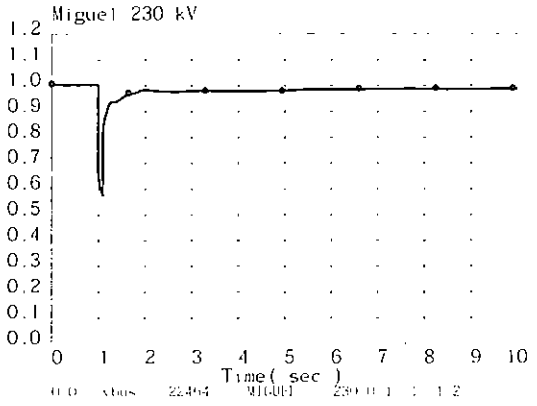
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

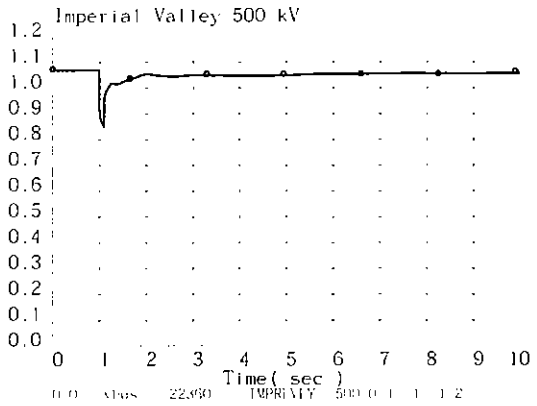
Bus Voltage

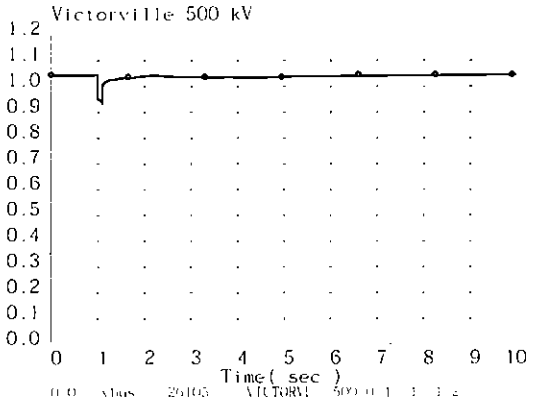






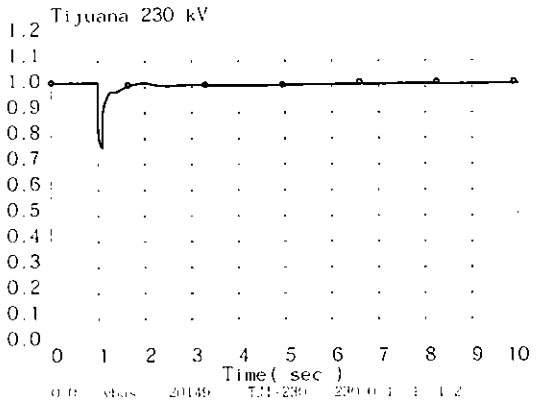


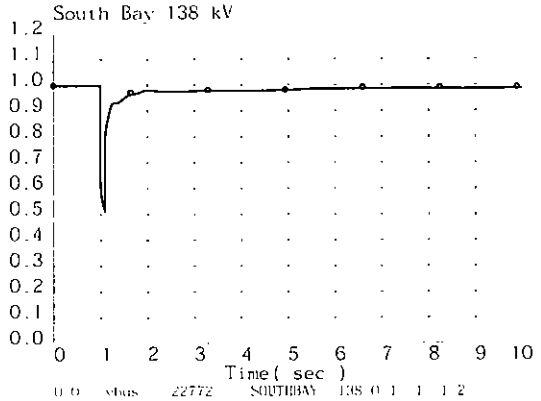


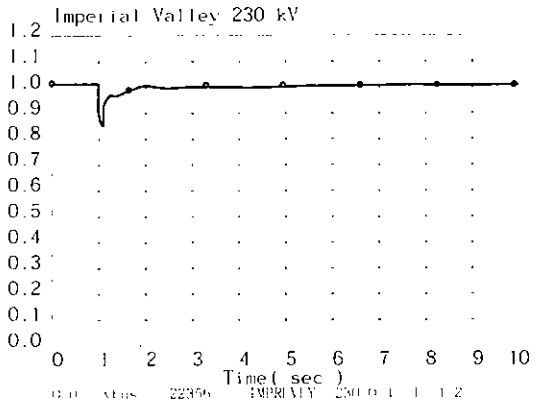


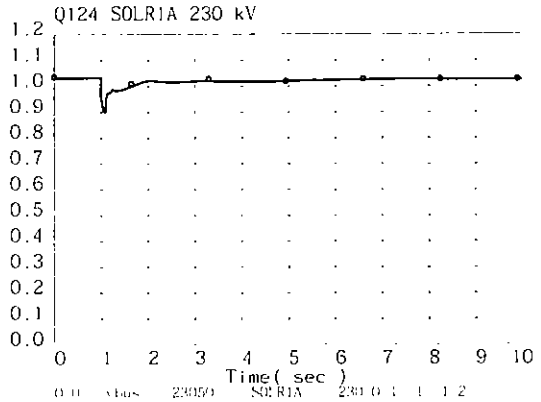
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

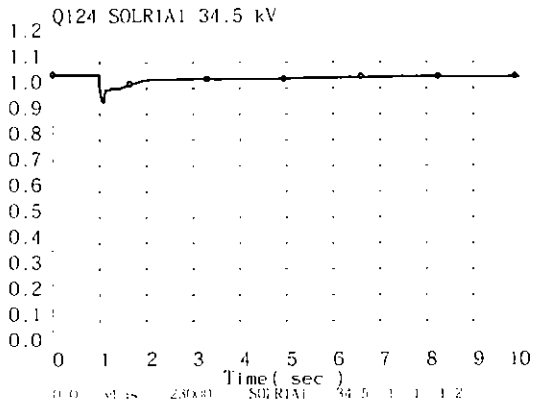
Bus Voltage

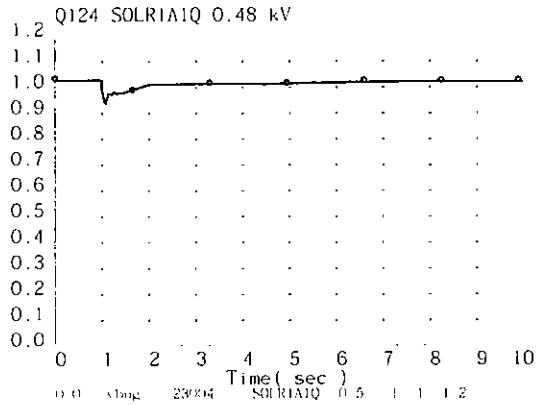






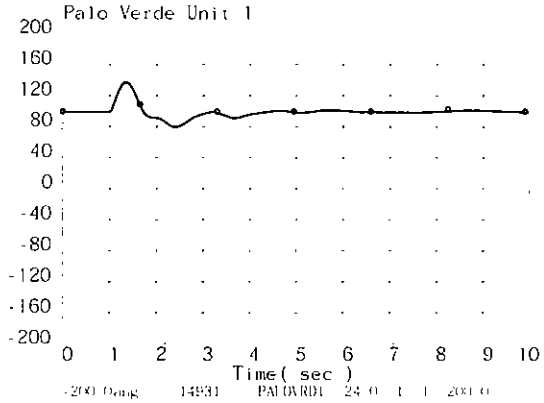


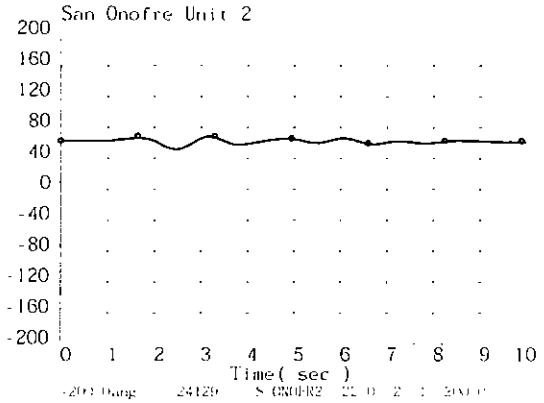


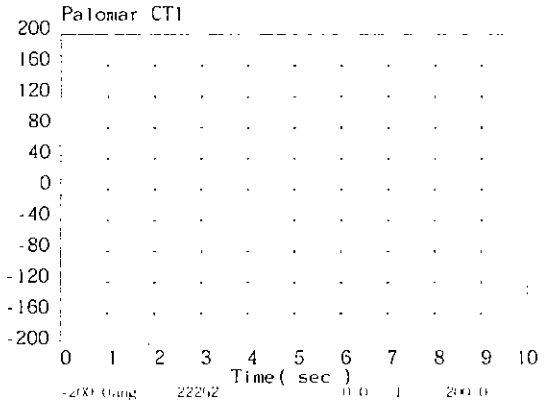


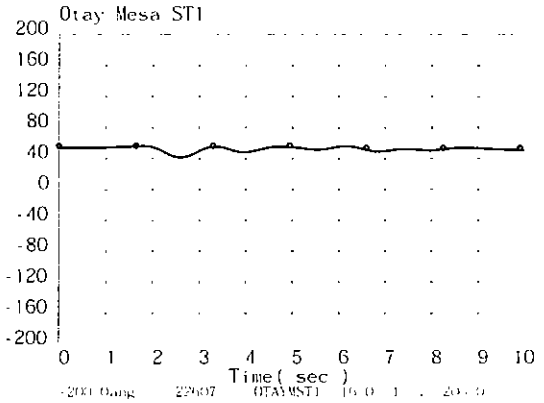
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

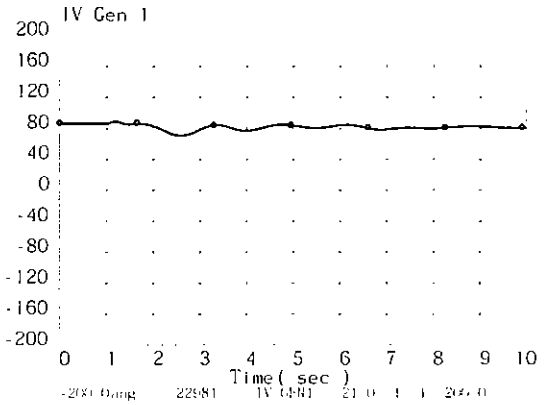
Relative Rotor Angle

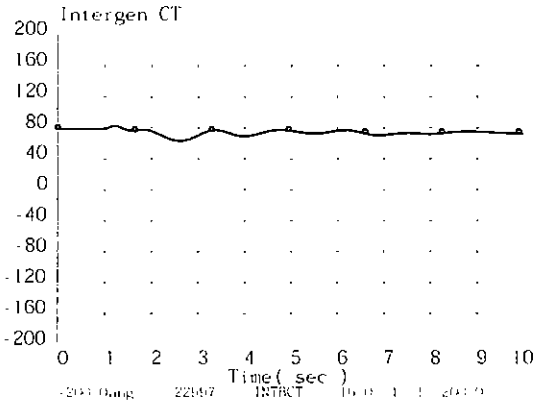






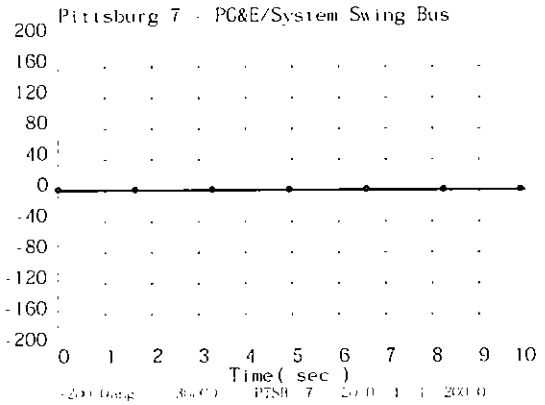


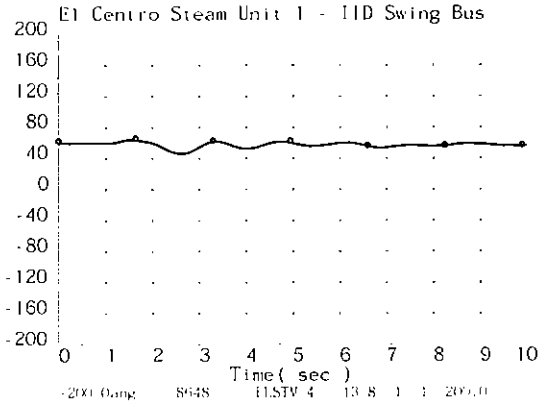


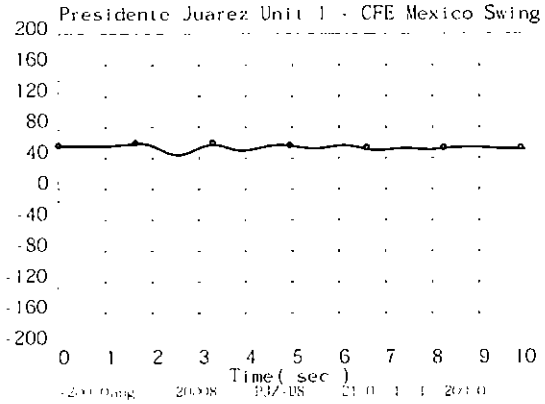


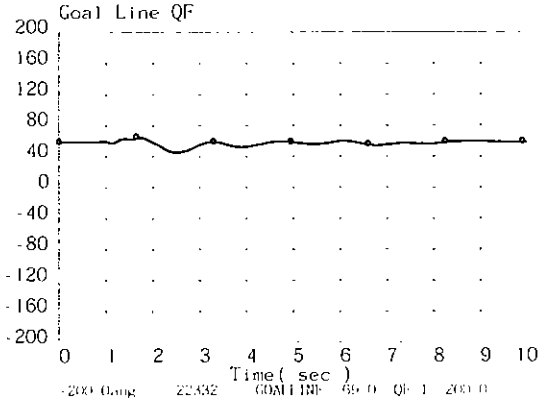
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

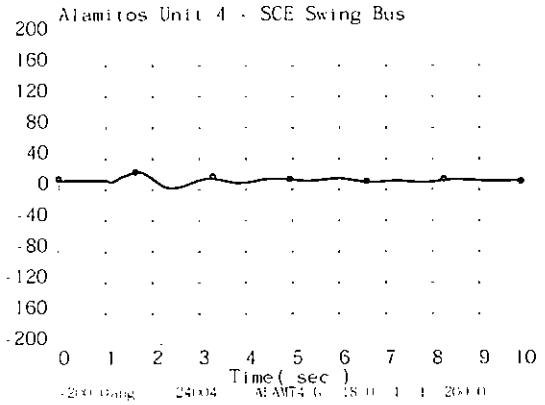
Relative Rotor Angle

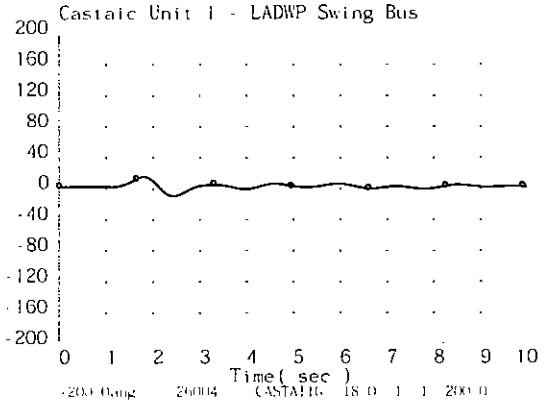






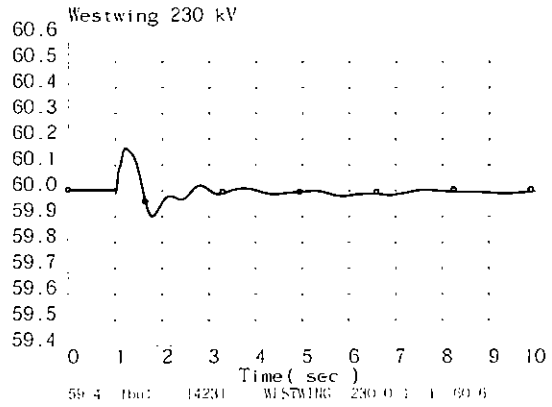


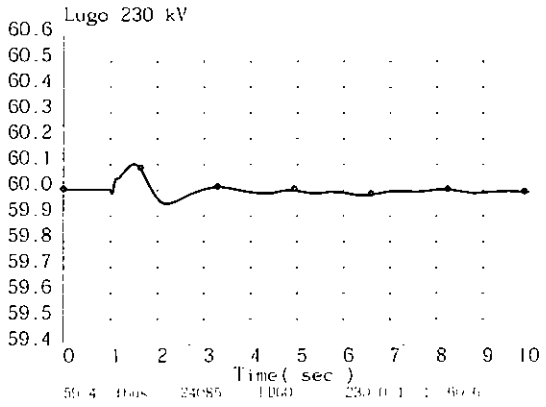


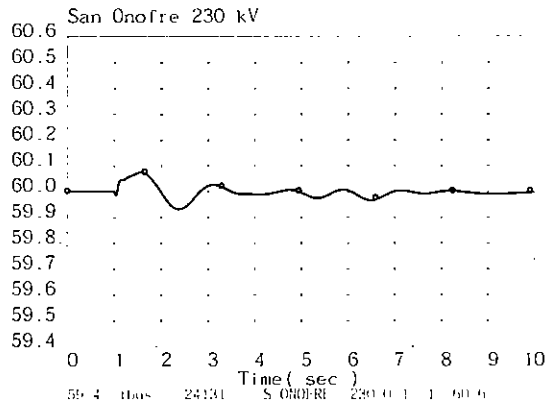


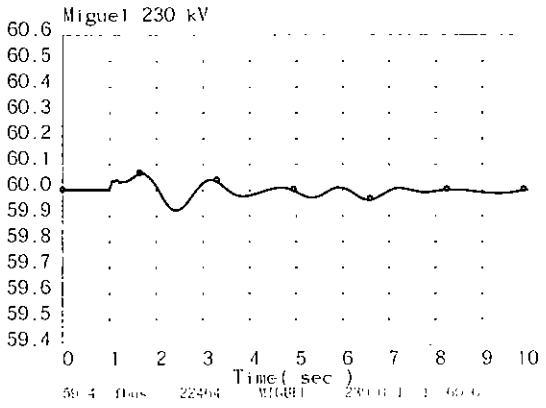
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

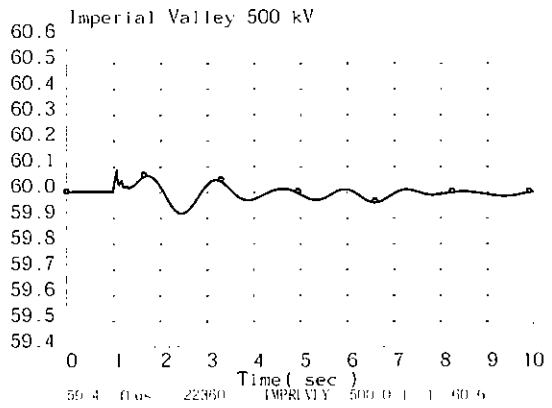
Bus Frequency

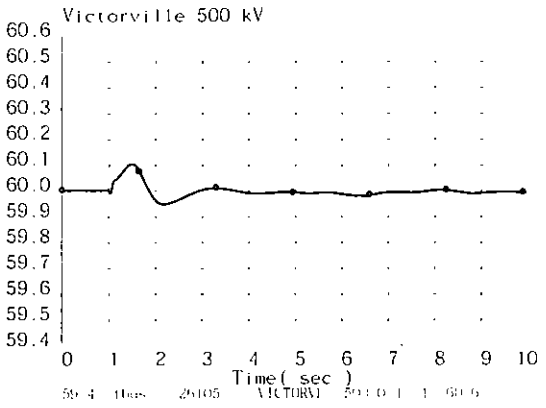






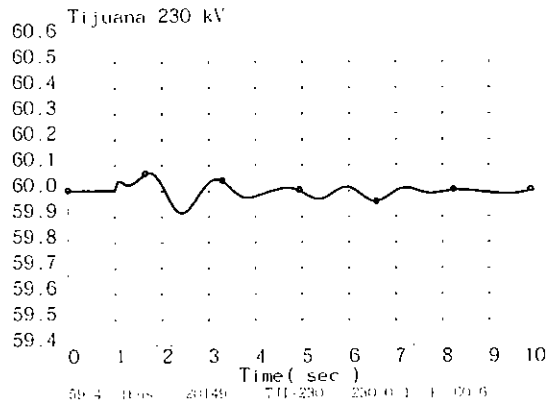


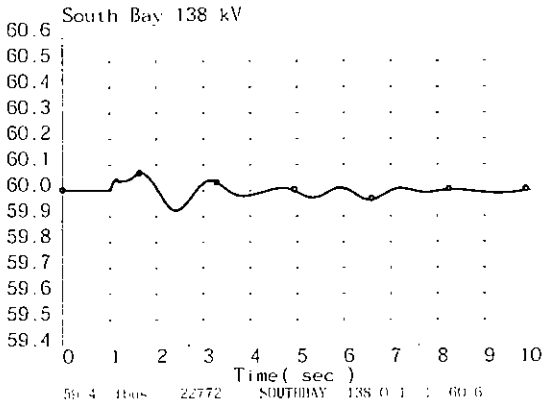


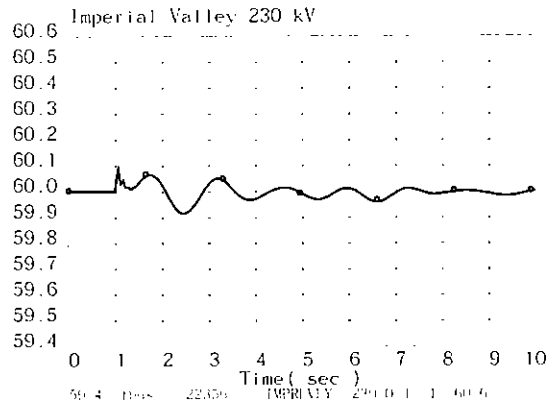


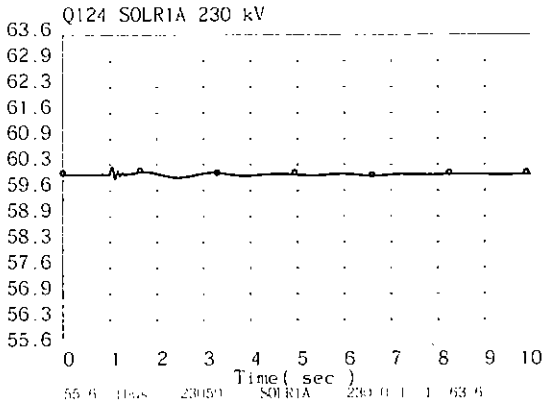
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

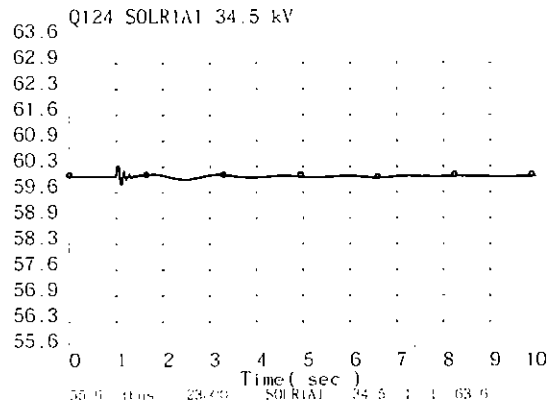
Bus Frequency

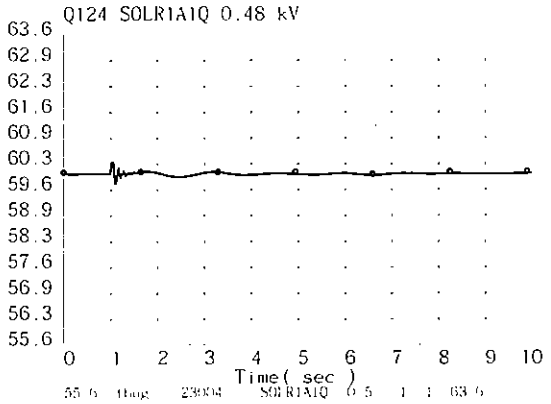






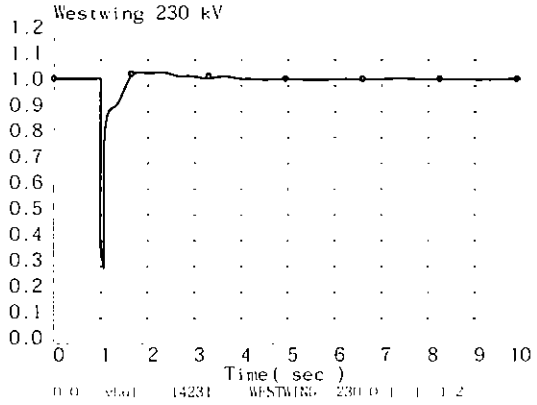


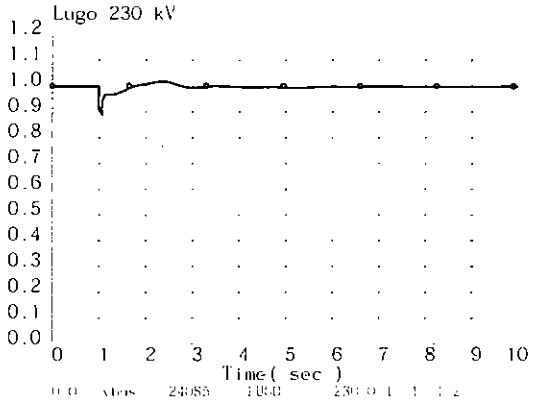


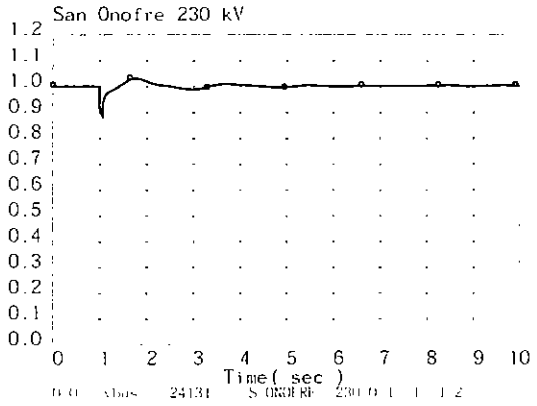


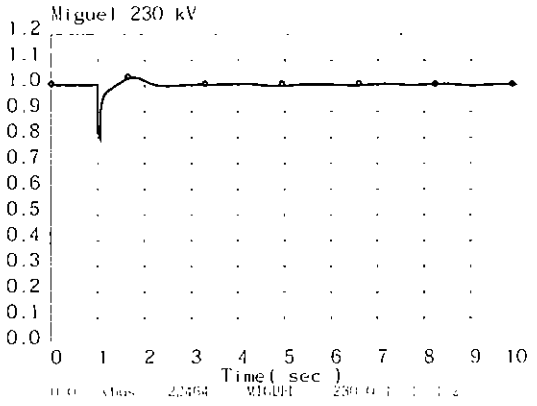
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

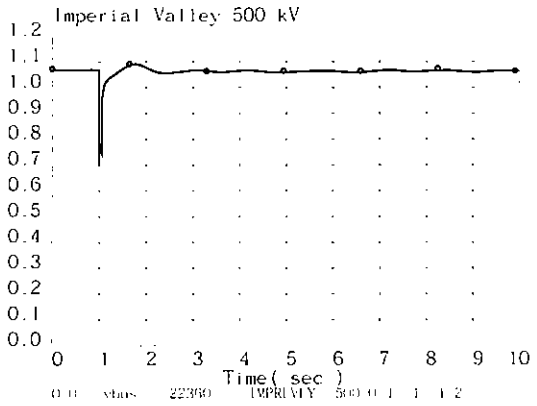
Bus Voltage

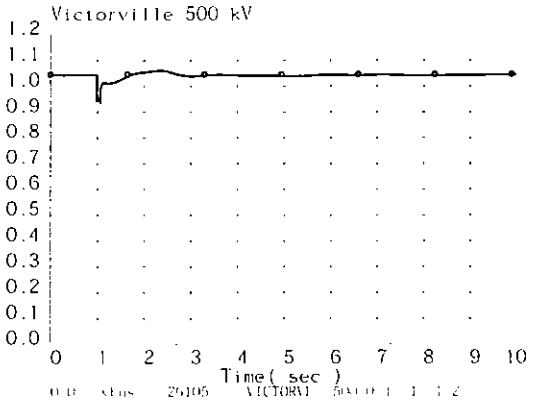






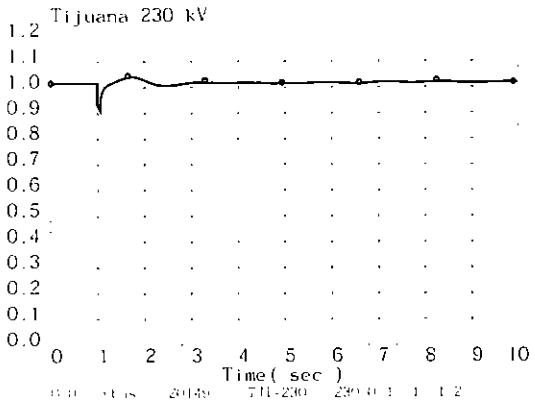


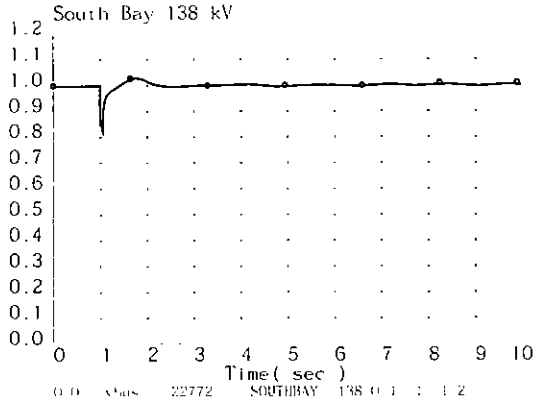


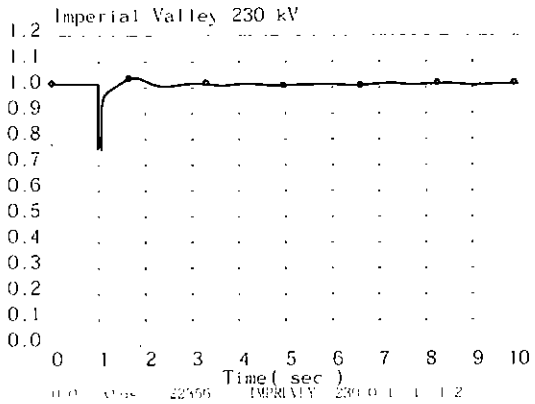


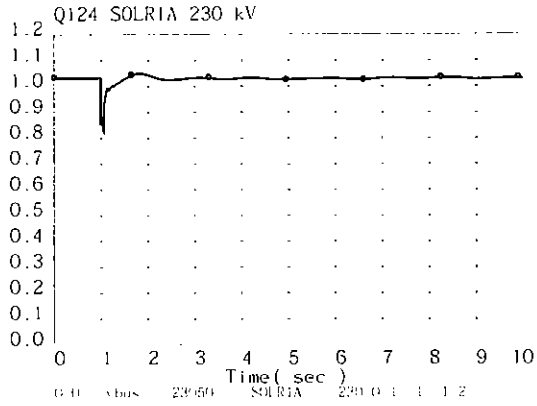
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

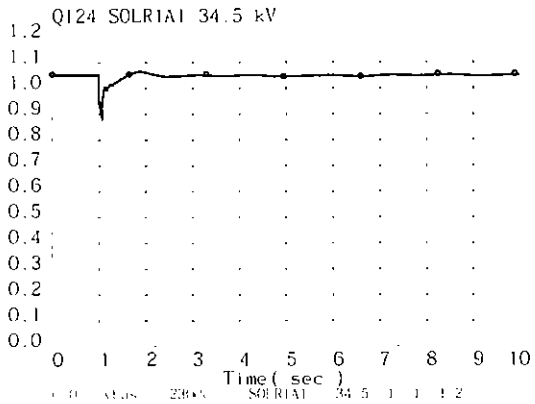
Bus Voltage

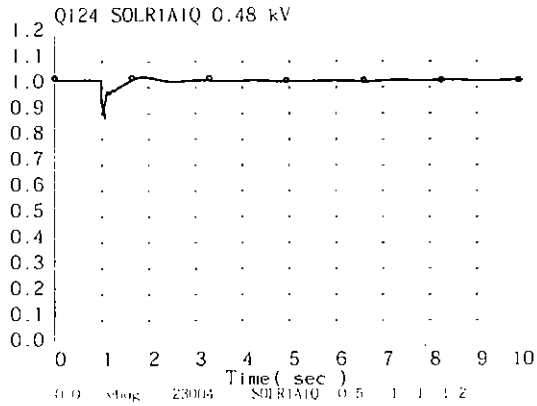






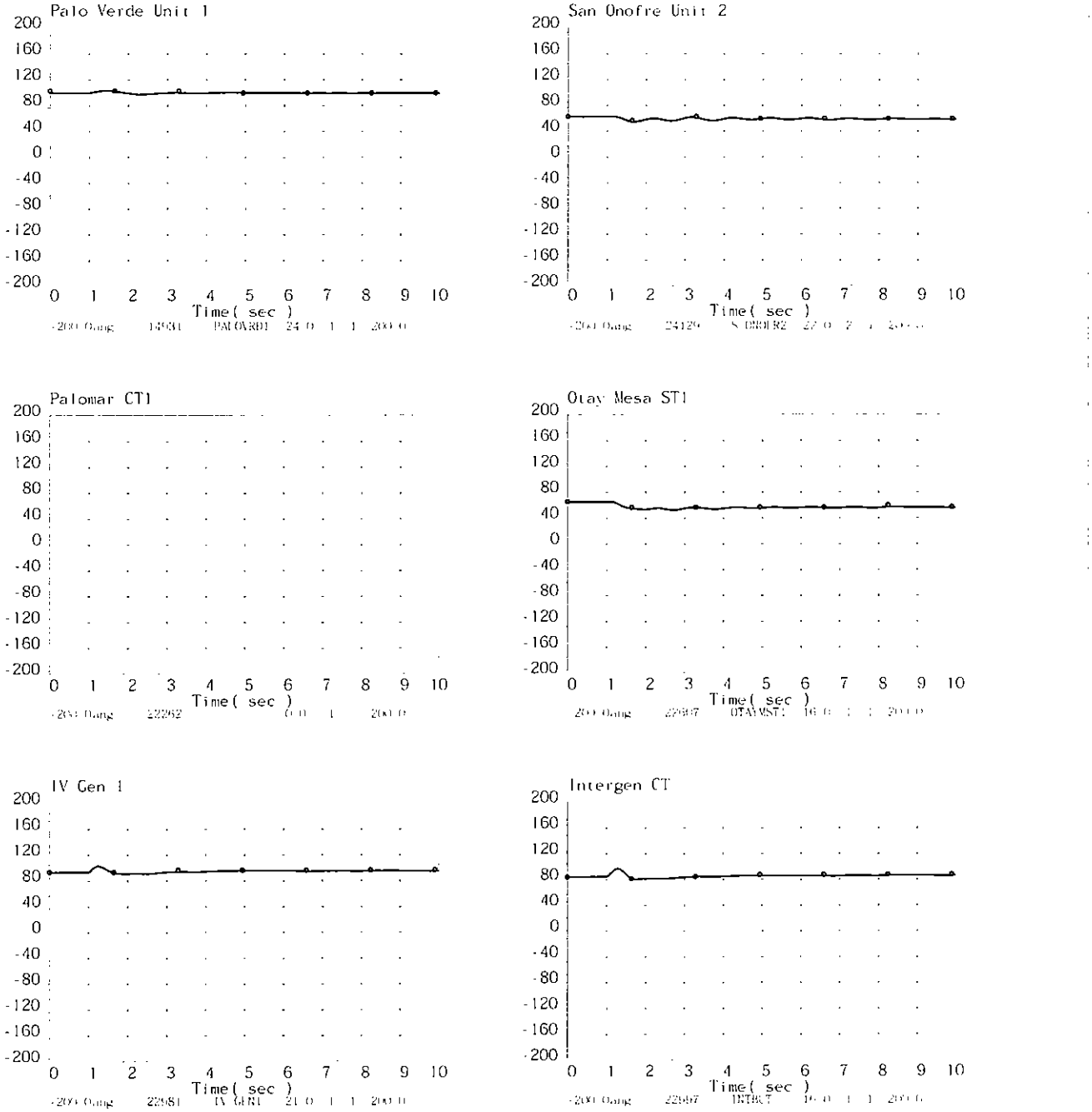






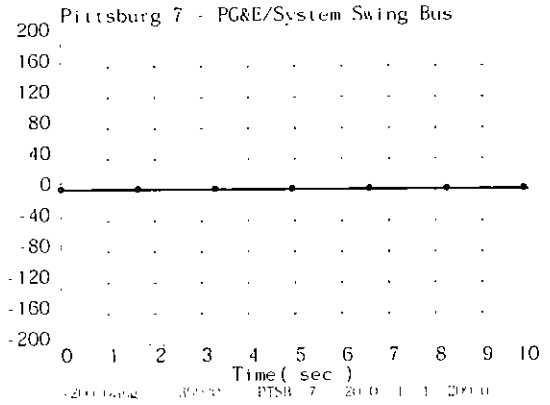
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Pre-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

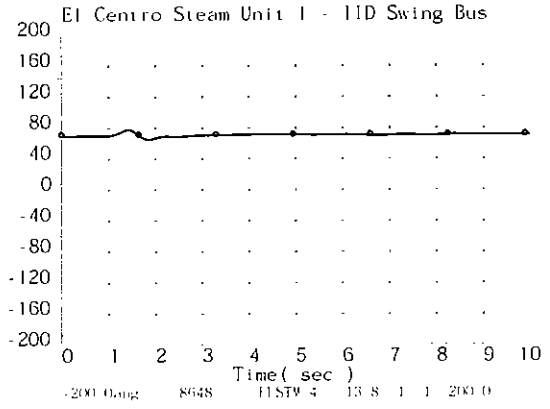
Relative Rotor Angle

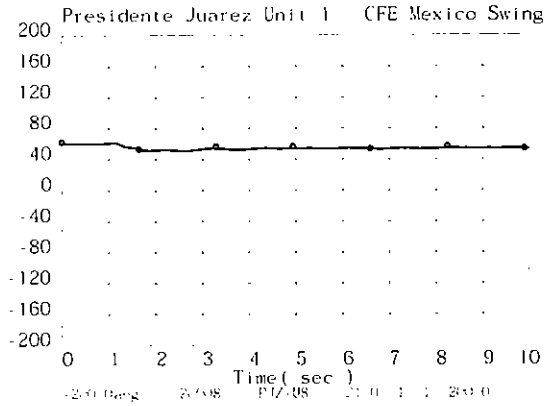


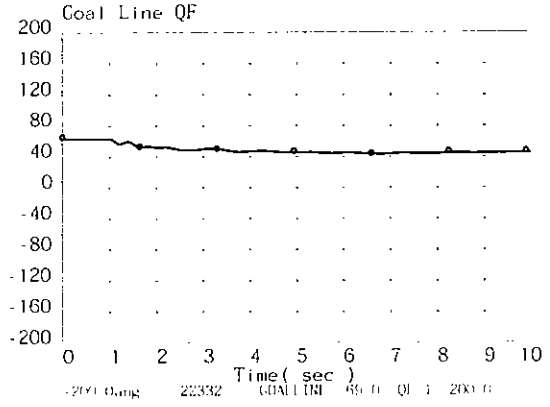
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

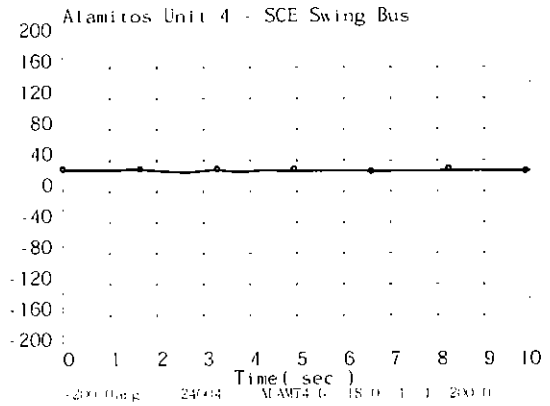
Relative Rotor Angle

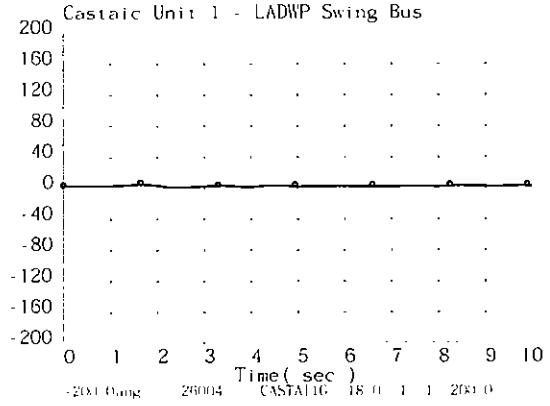






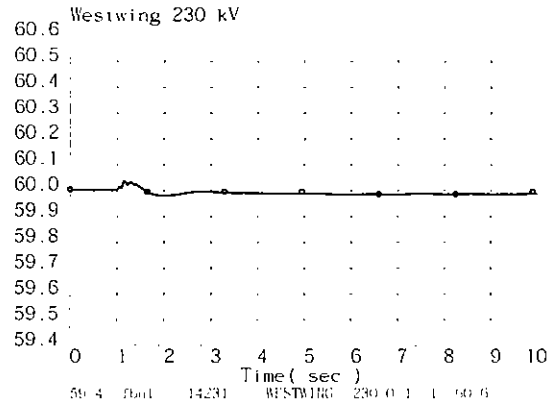


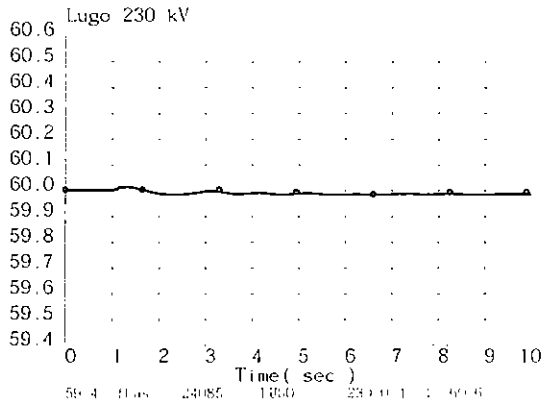


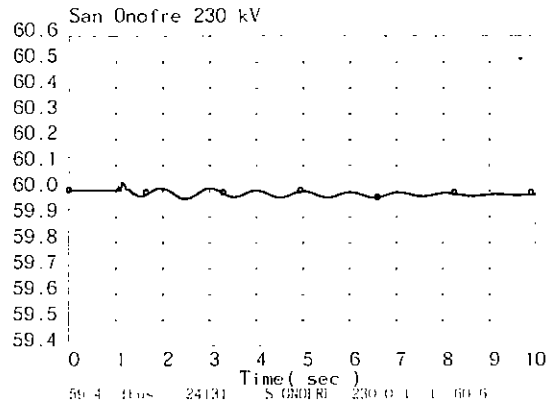


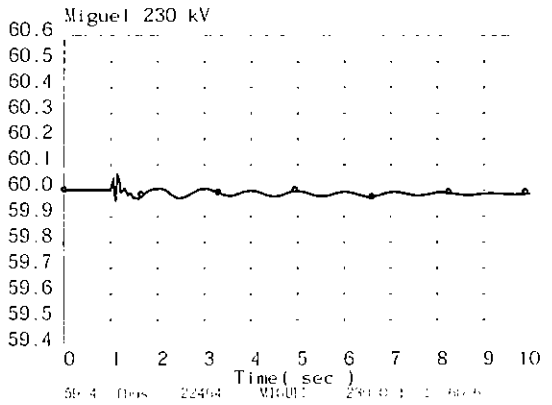
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

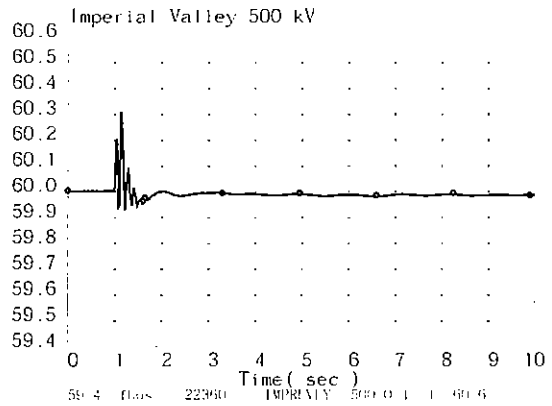
Bus Frequency

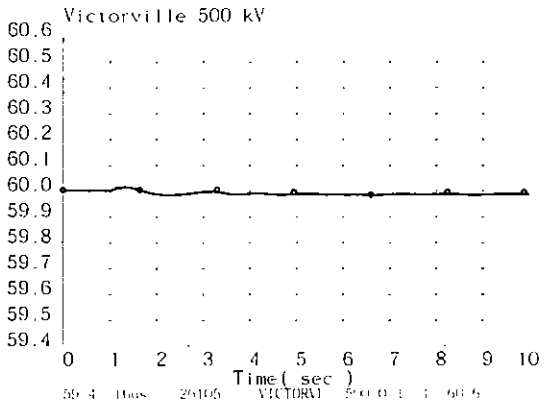






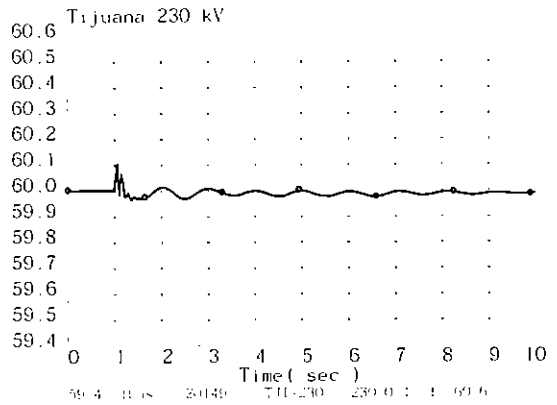


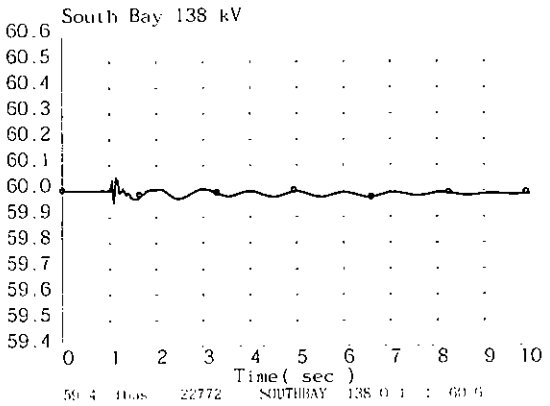


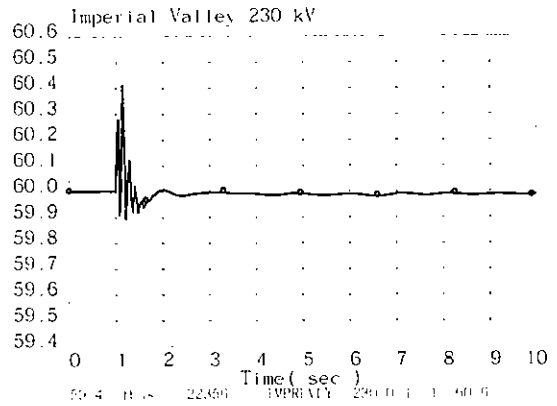


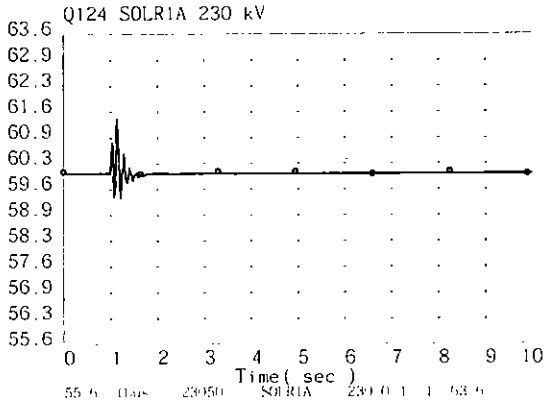
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

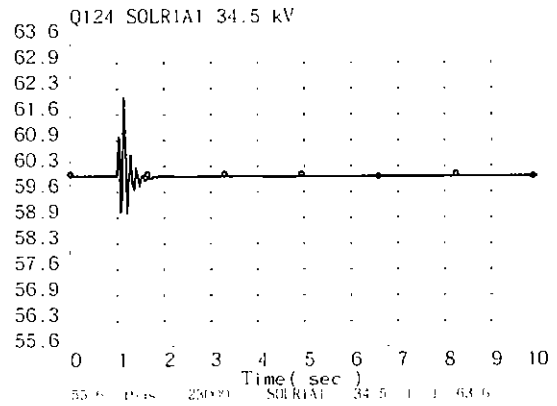
Bus Frequency

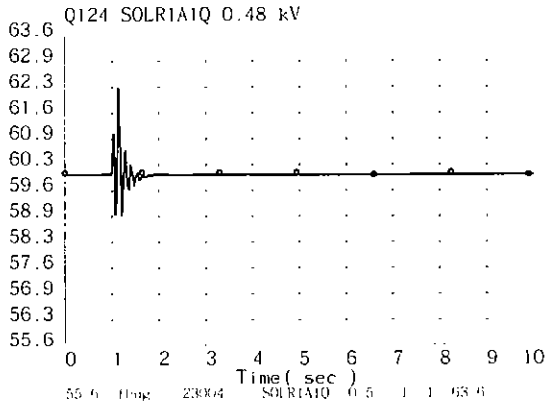






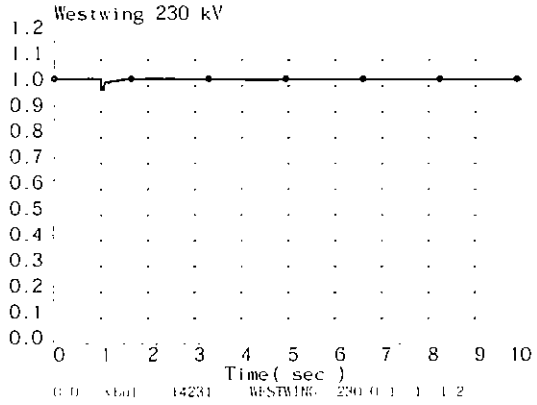


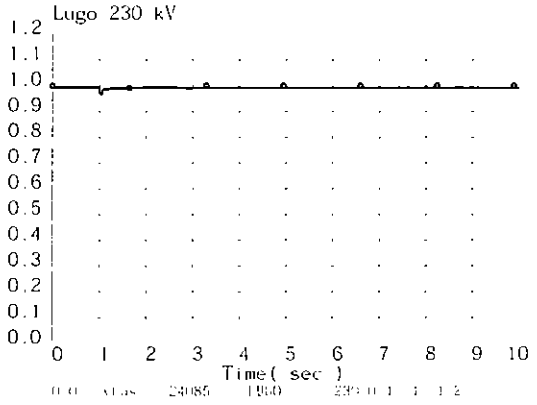


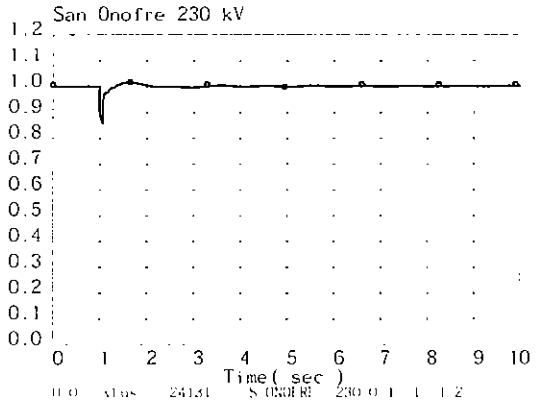


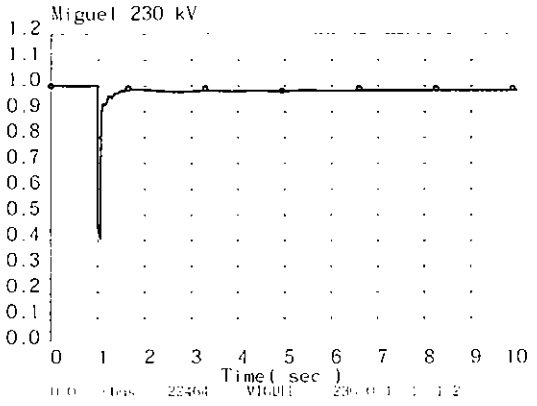
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

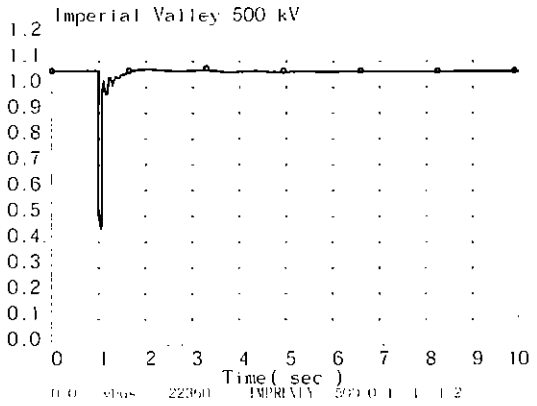
Bus Voltage

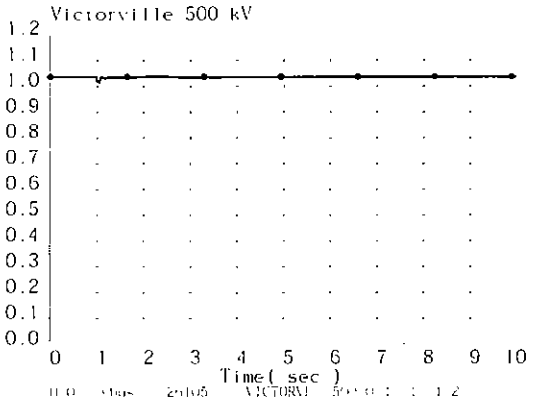






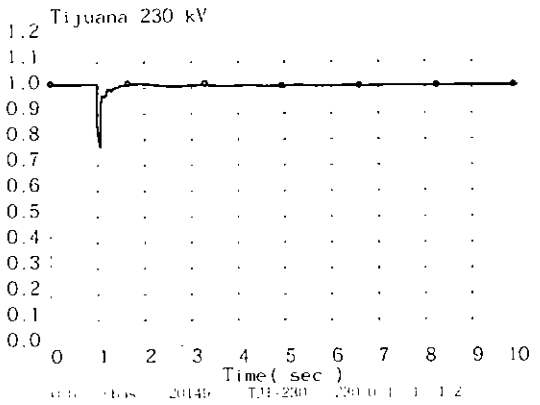


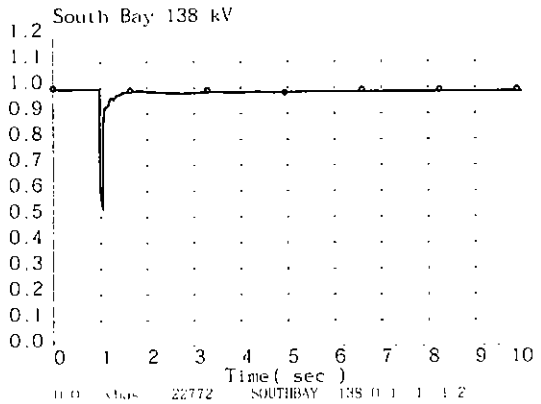


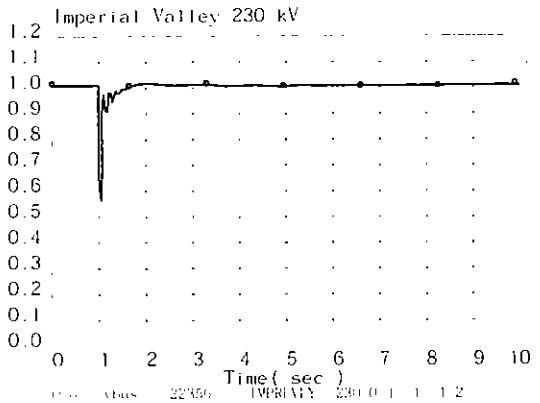


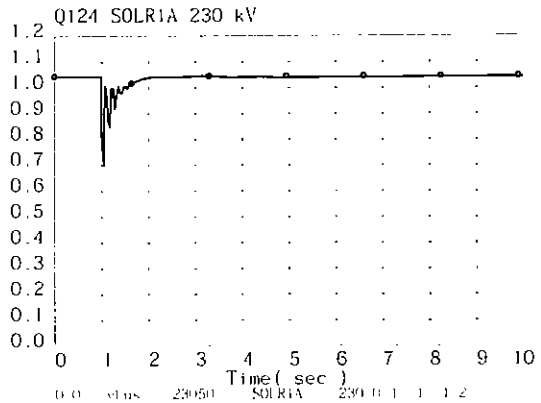
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

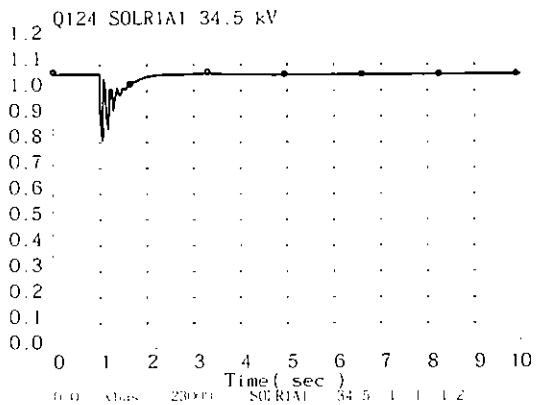
Bus Voltage

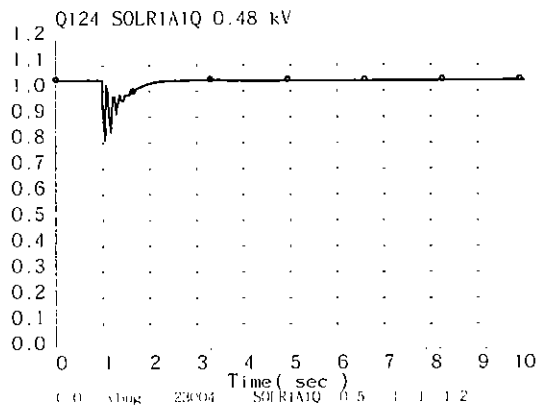






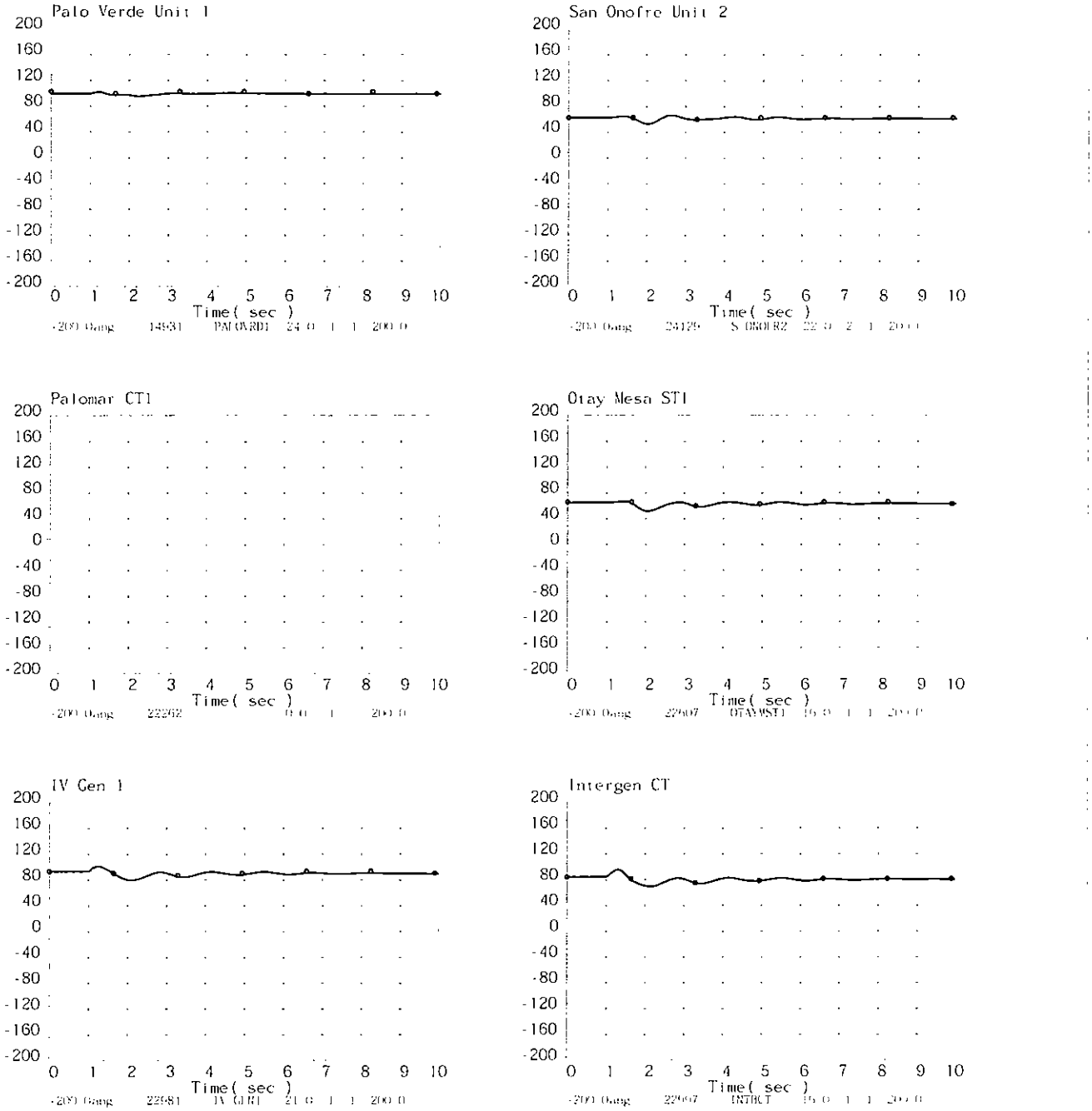






SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Windfarms 500 kV, trip Windfarms - Miguel 500 kV line

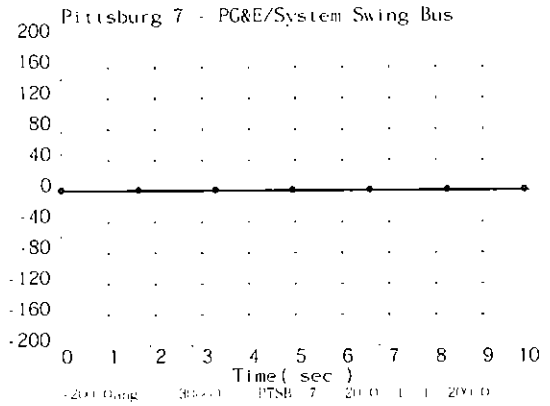
Relative Rotor Angle

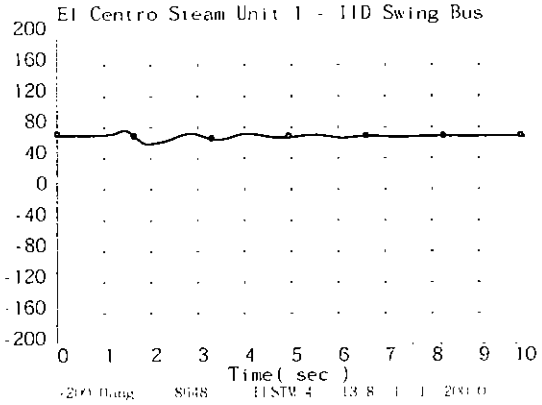


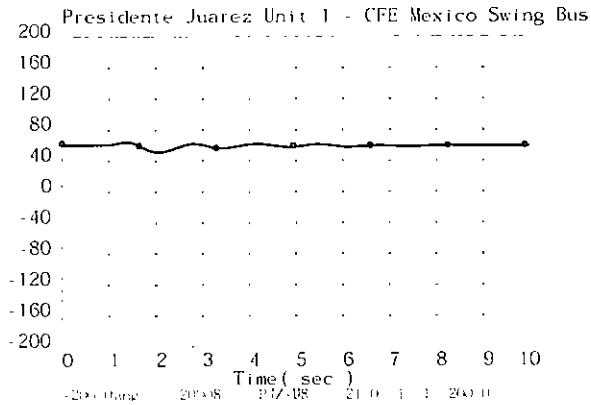
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

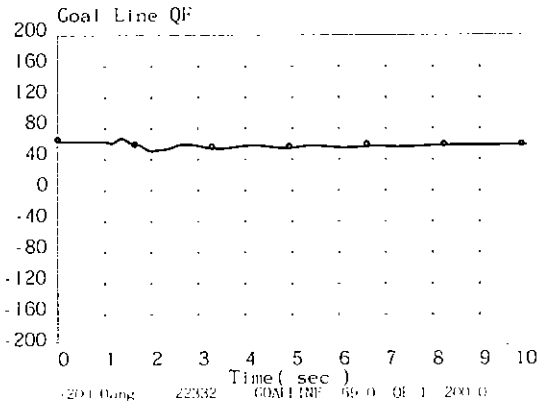
	111w-q124-r4-pst-dyn_swt2_ngila-iv500.chf	c:\pslf\sdge\q124\sis\dyn Fri Apr 20 13:12:16 2007

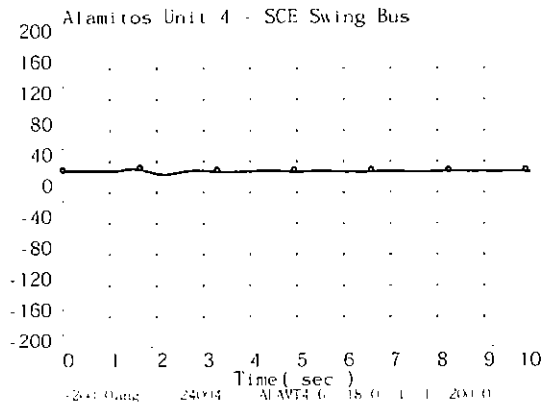
Relative Rotor Angle

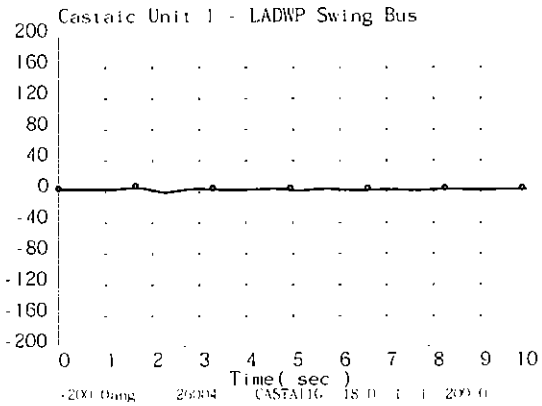






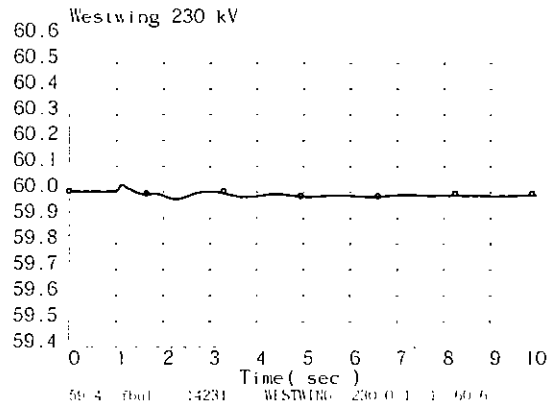


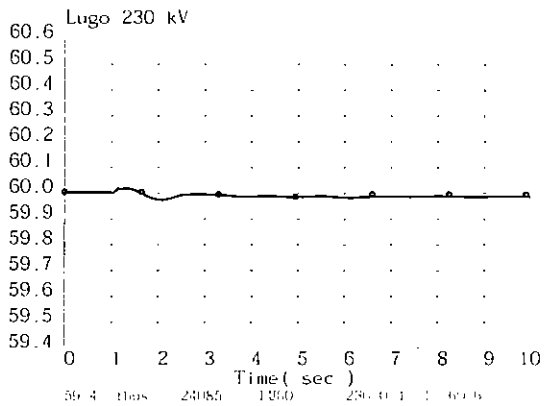


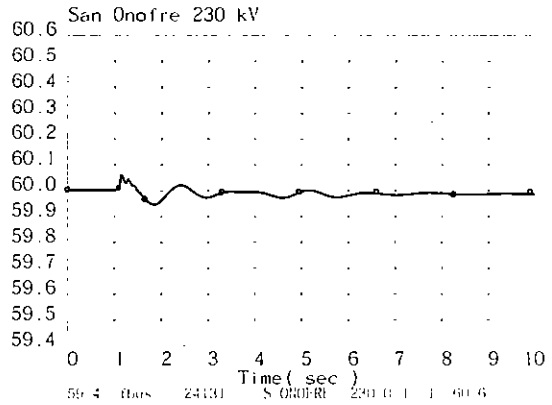


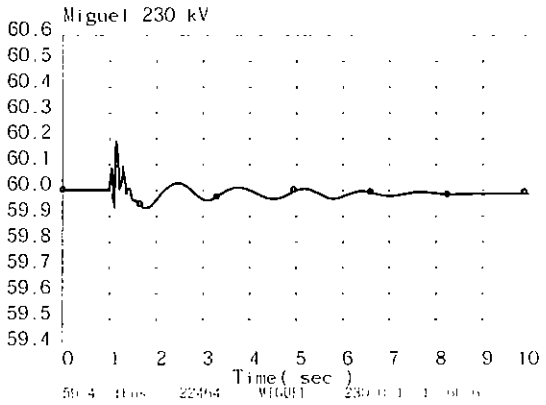
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

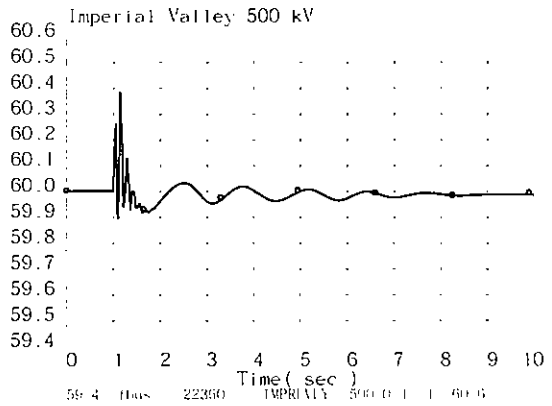
Bus Frequency

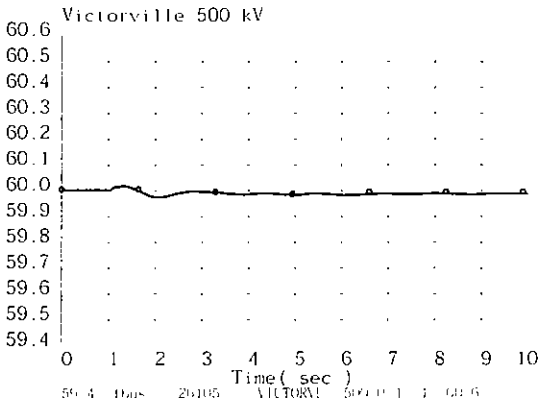






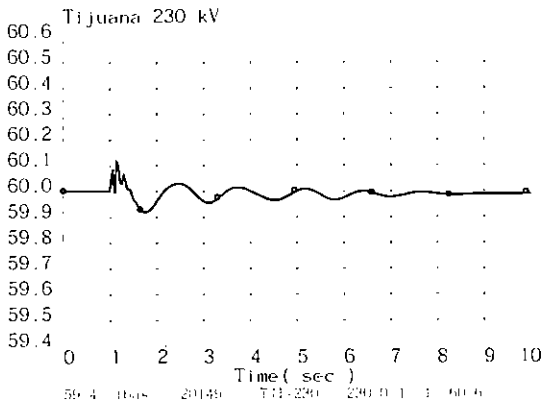


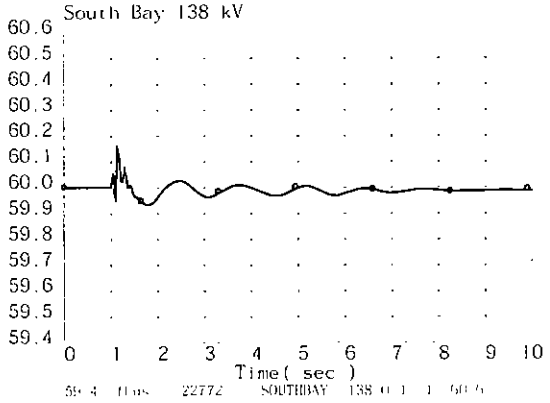


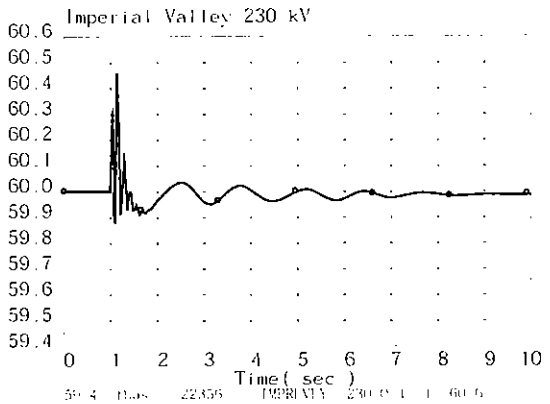


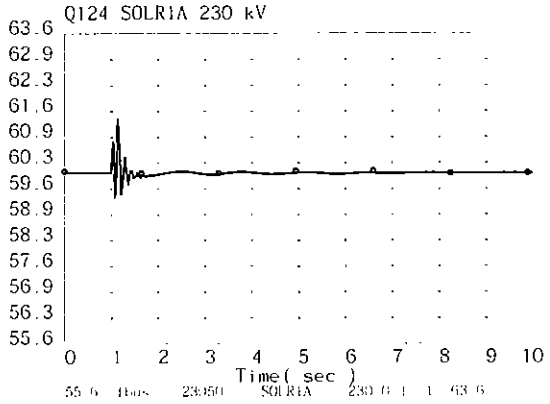
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

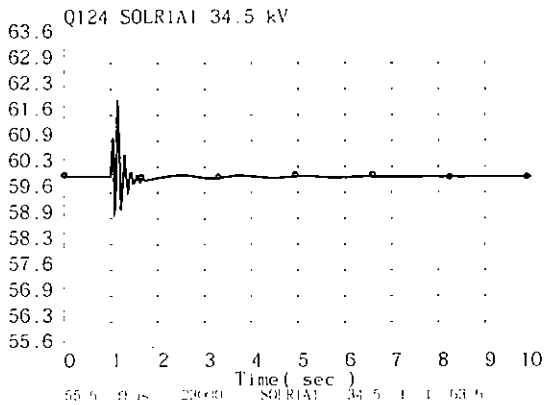
Bus Frequency

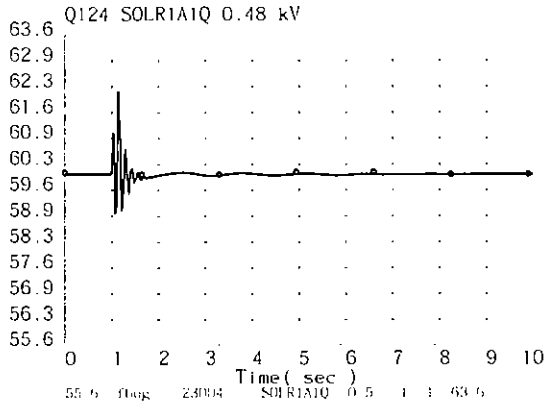






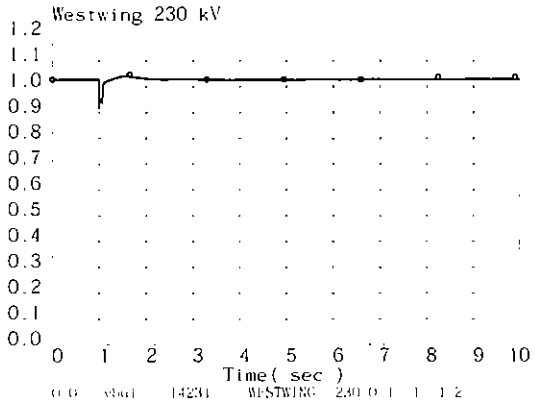


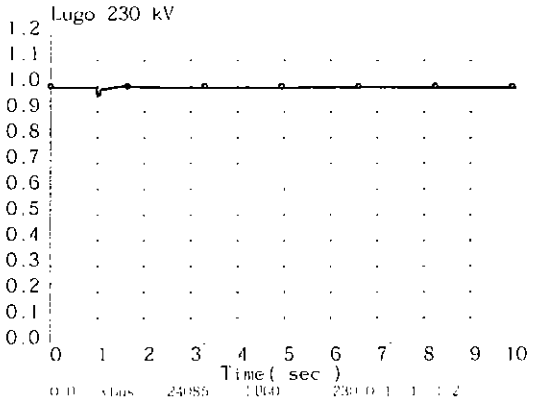


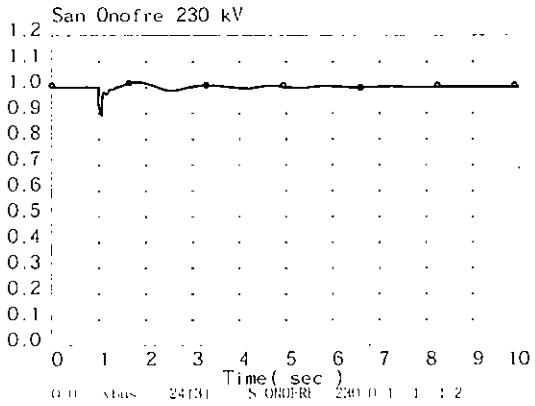


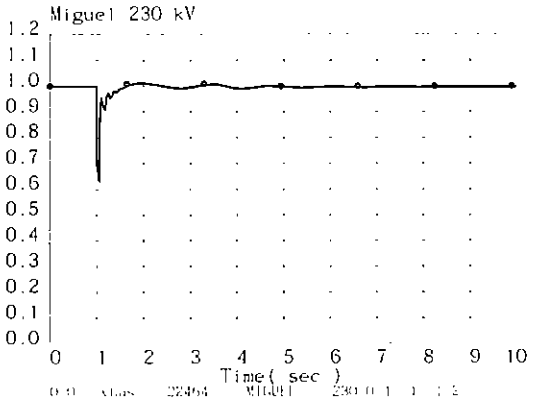
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

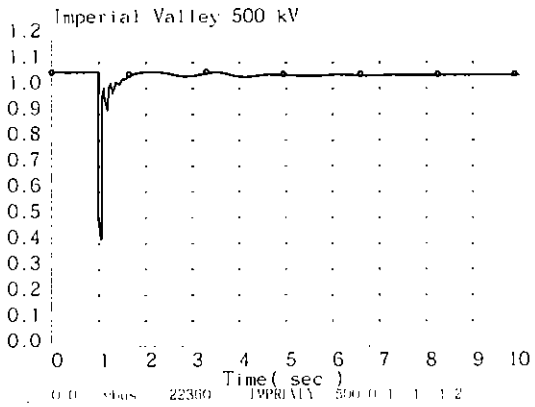
Bus Voltage

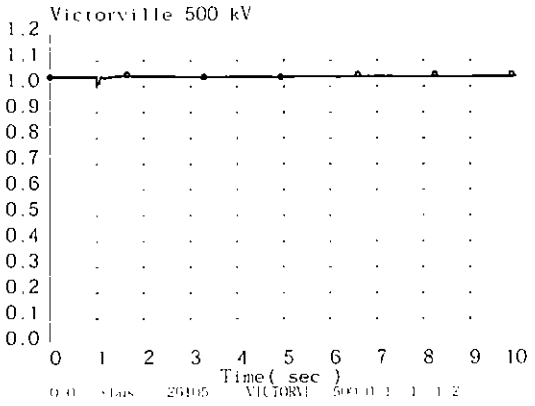




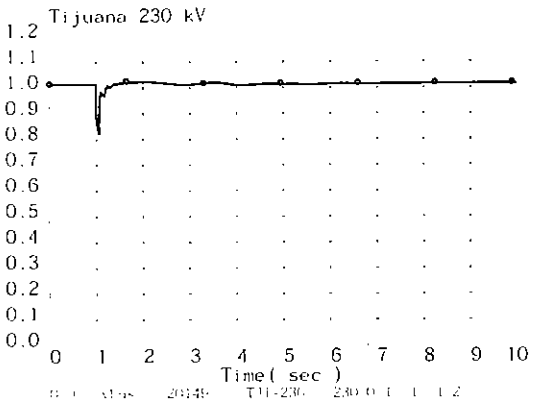


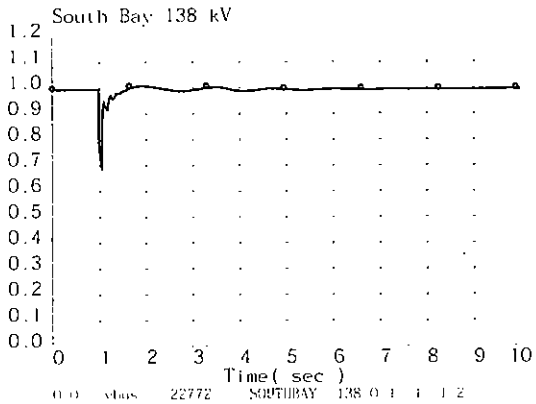


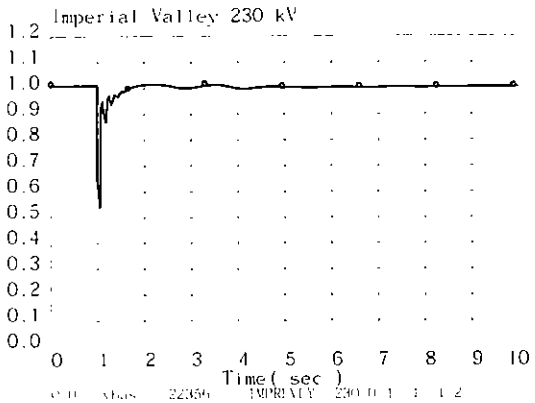


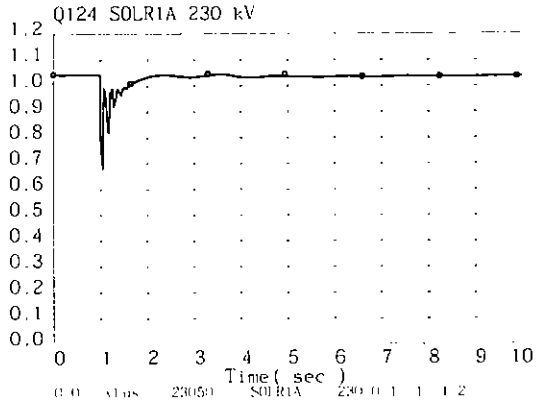


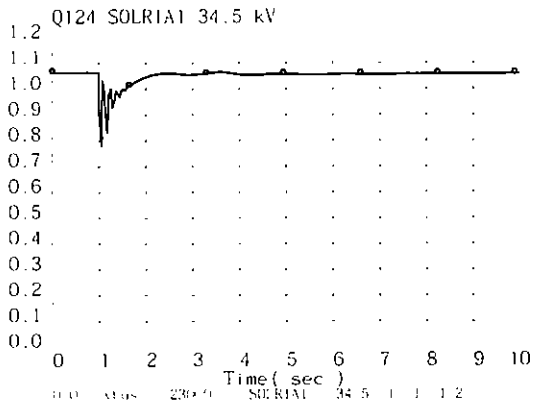
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

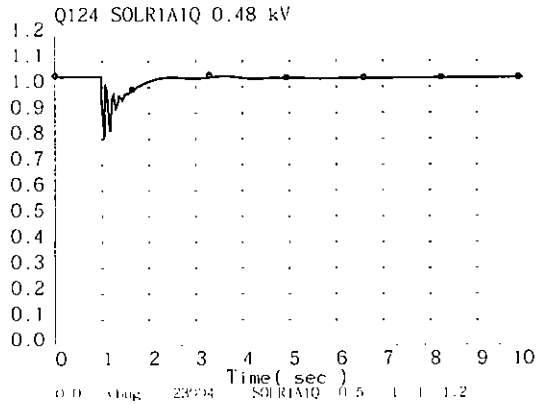






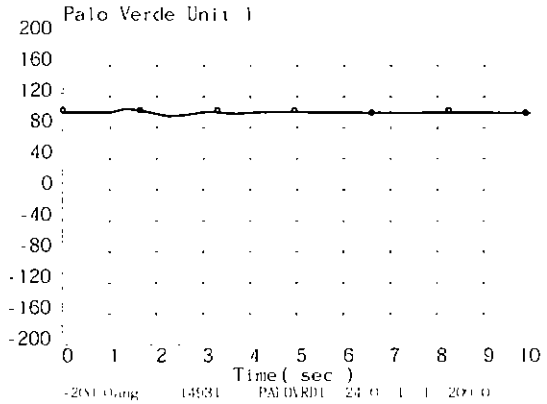


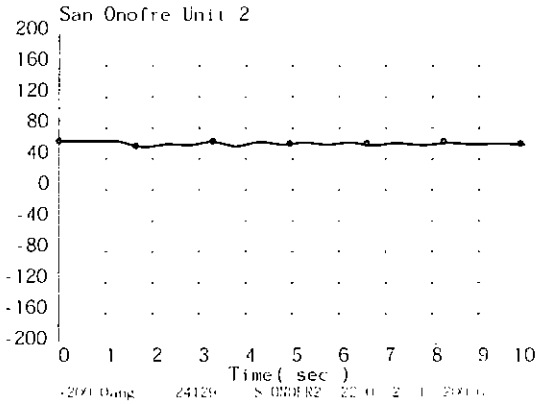


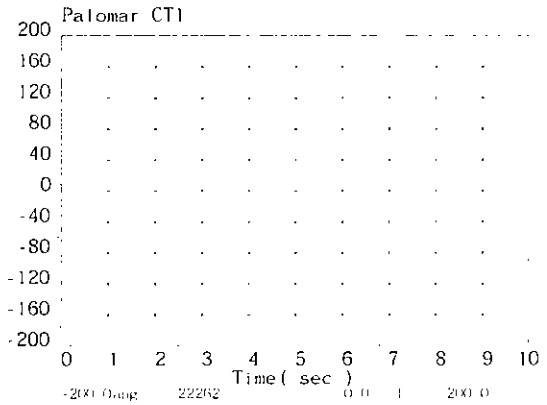


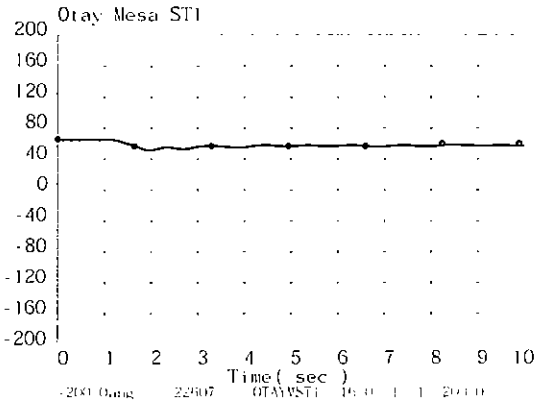
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - N. Gila 500 kV line

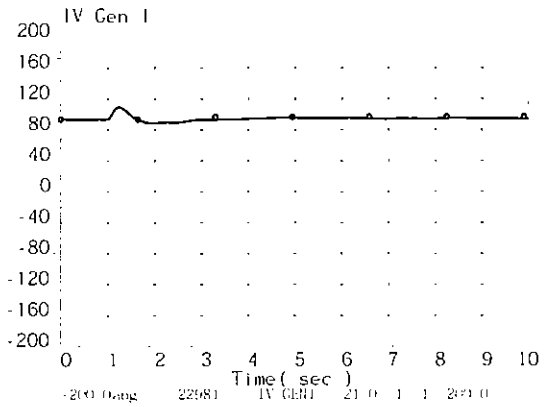
Relative Rotor Angle

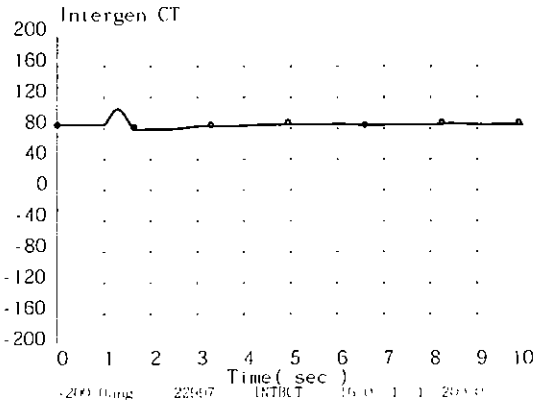






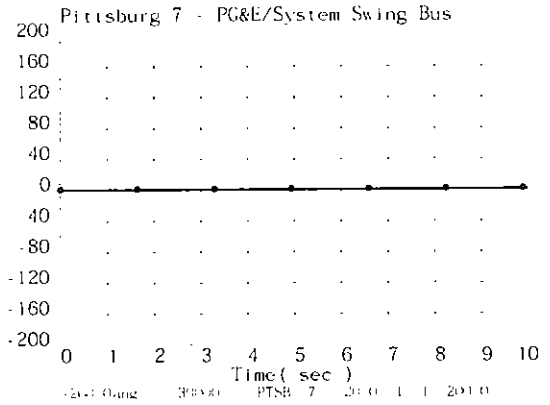


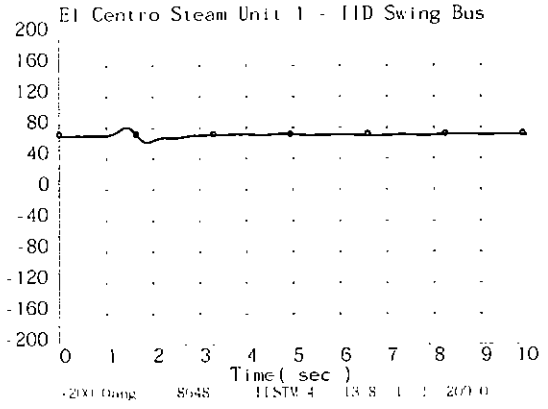


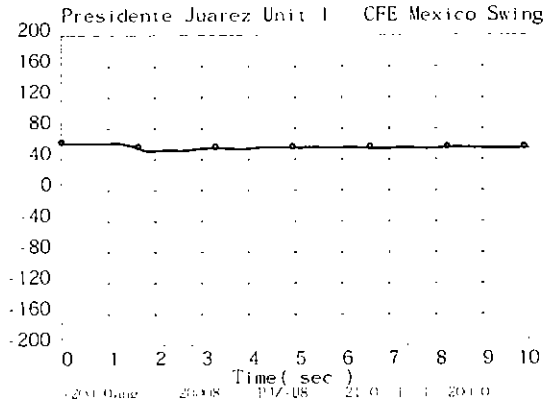


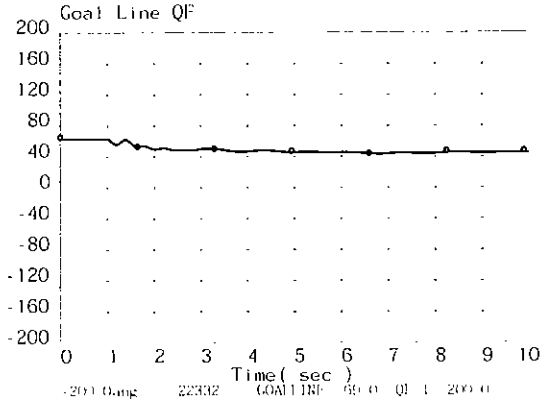
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

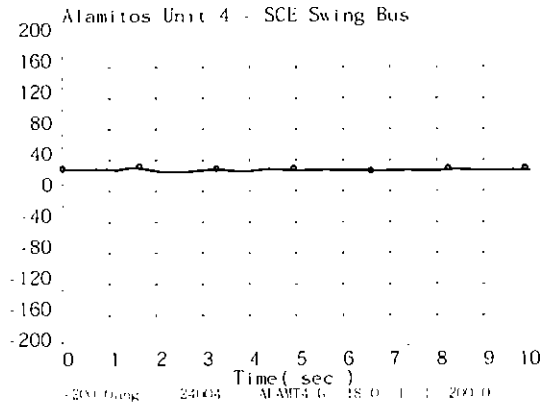
Relative Rotor Angle

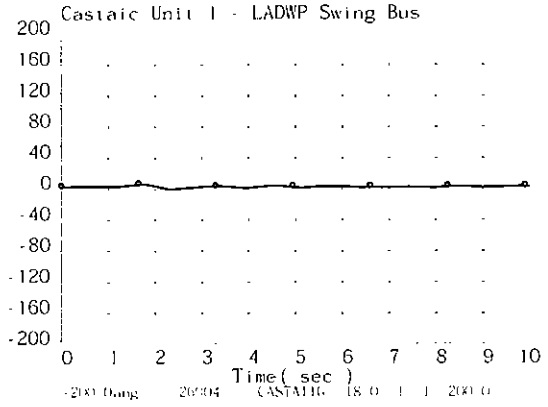






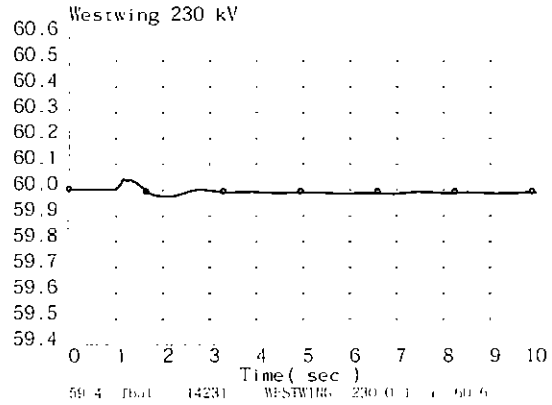


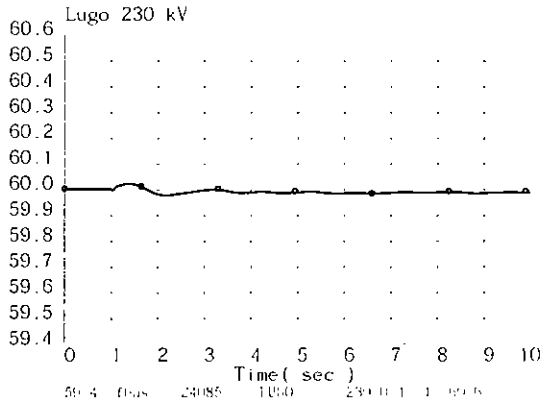


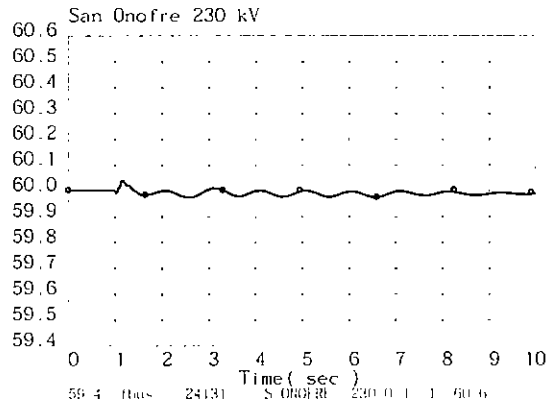


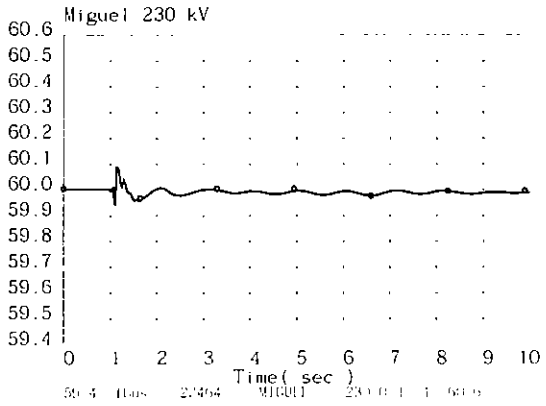
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

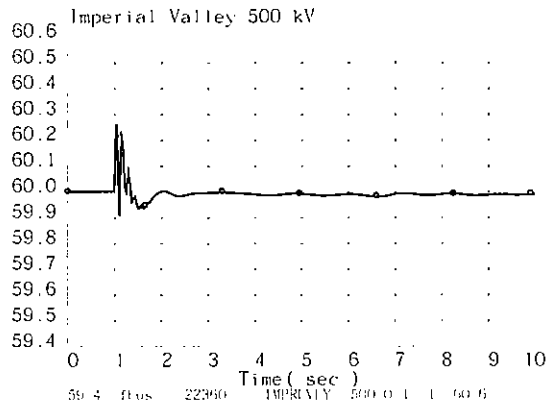
Bus Frequency

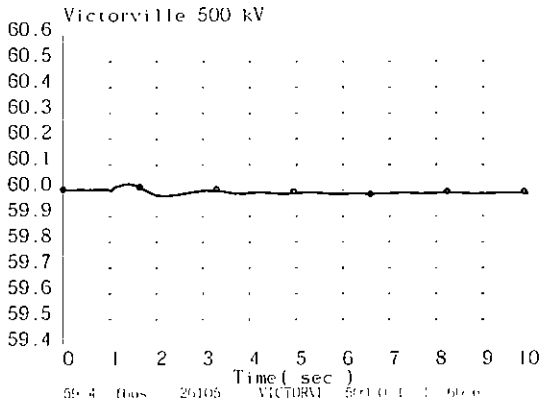






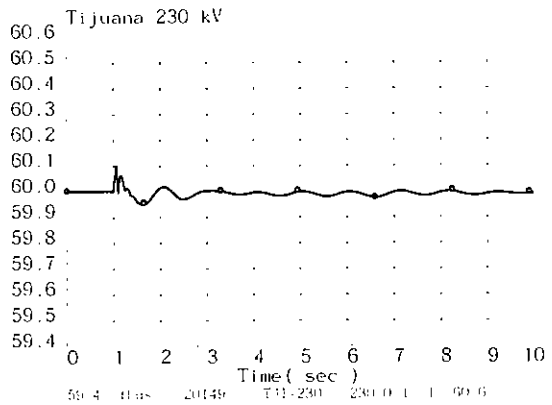


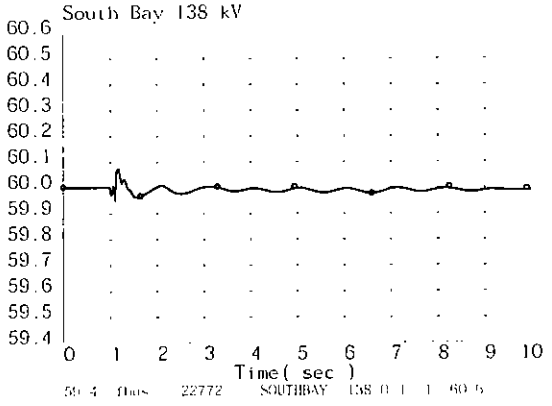


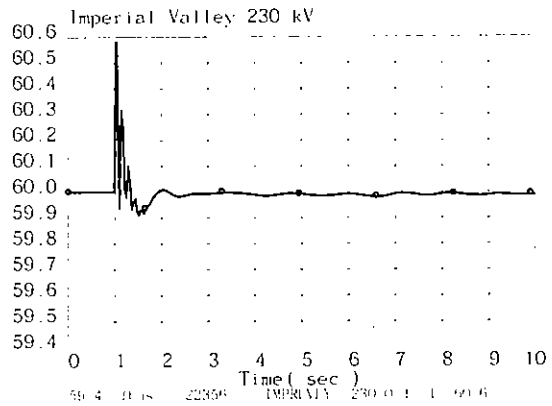


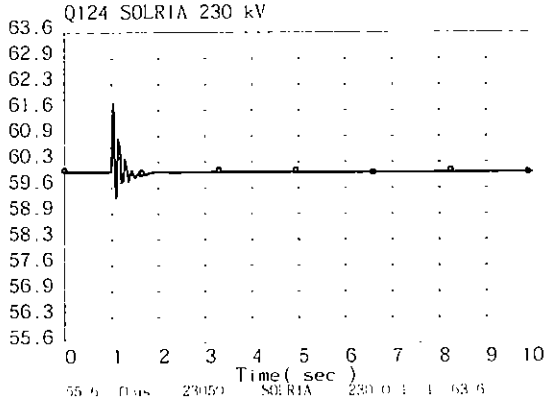
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

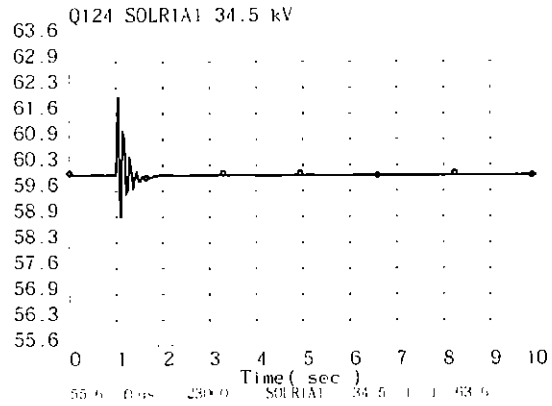
Bus Frequency

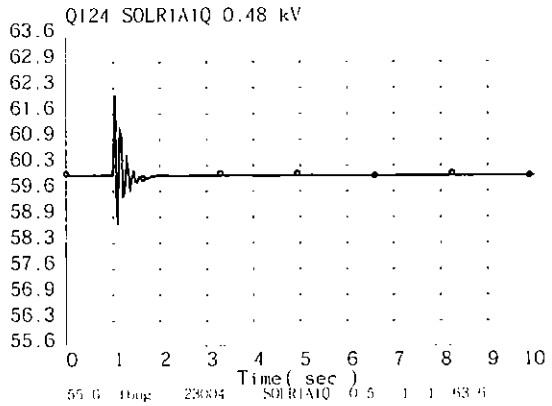






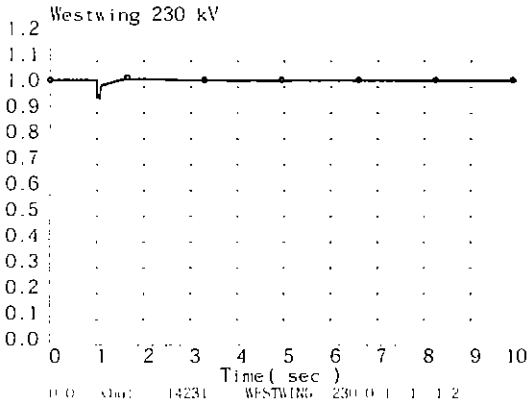


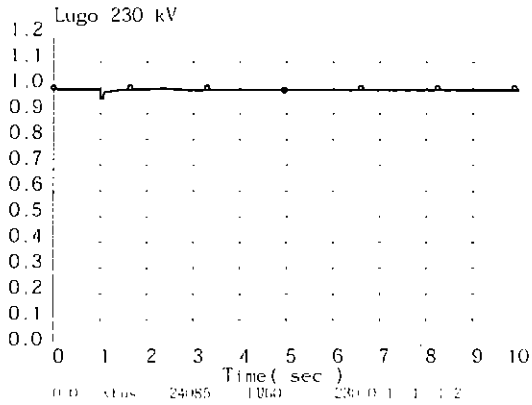


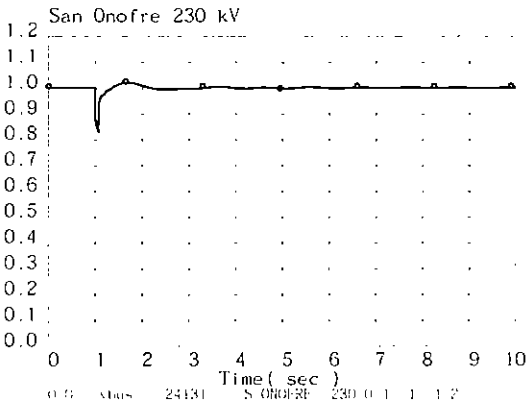


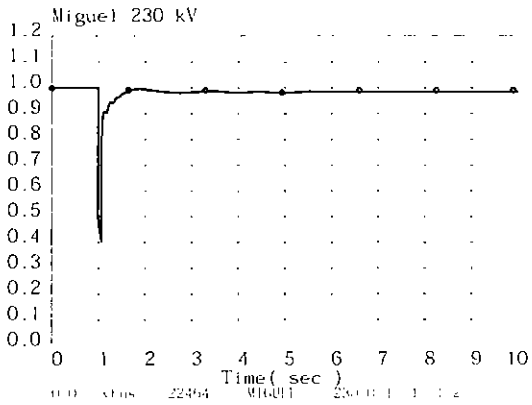
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

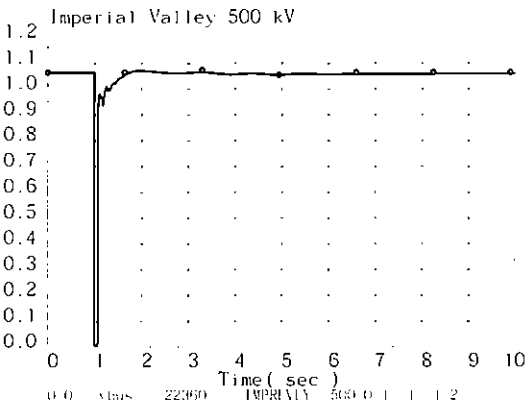
Bus Voltage

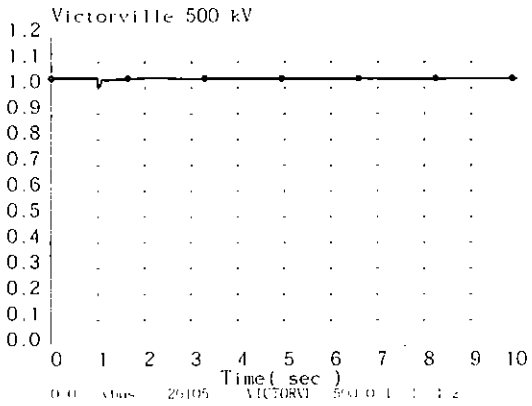






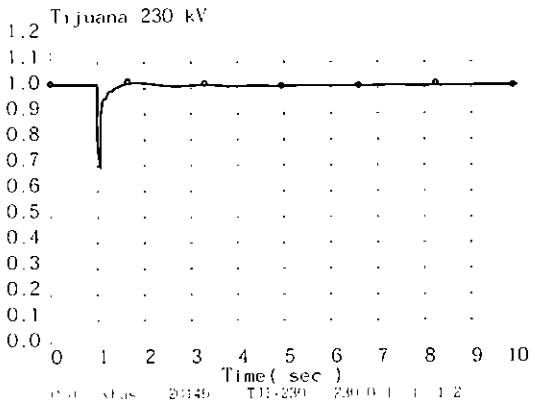


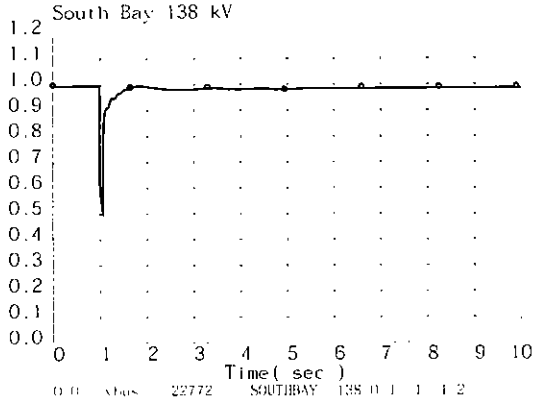


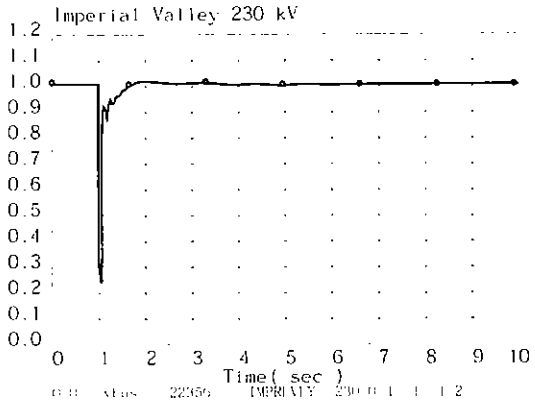


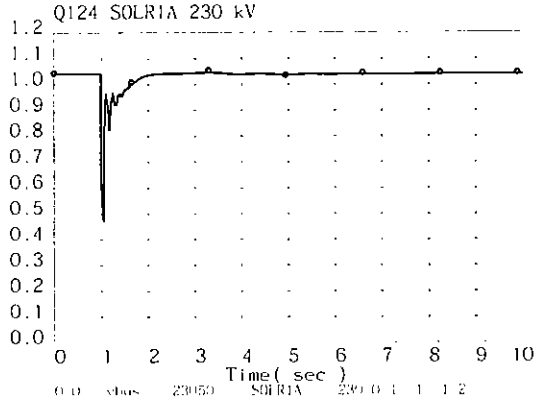
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

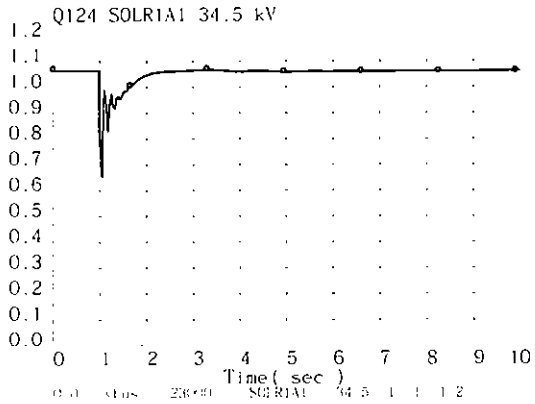
Bus Voltage

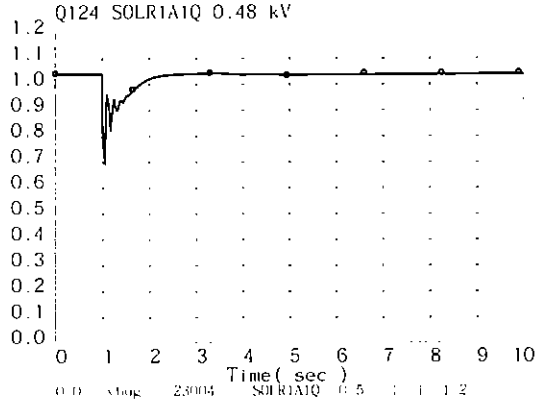






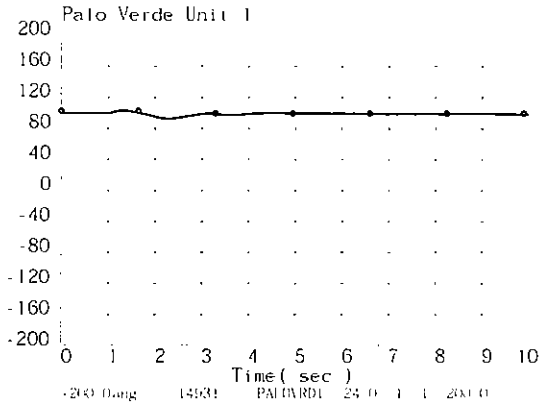


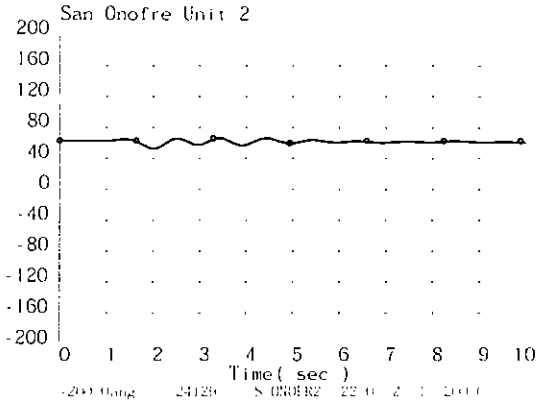


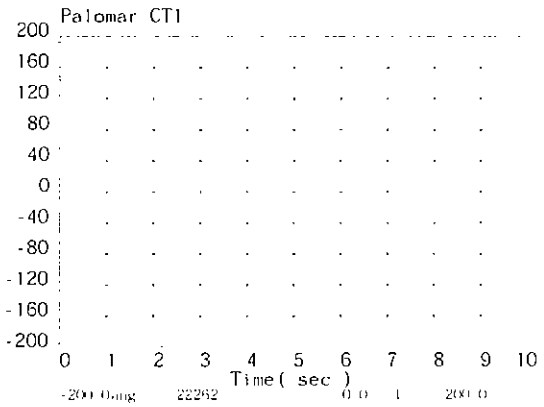


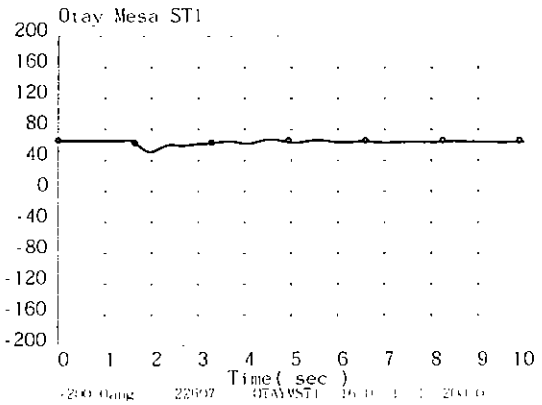
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 500 kV, trip IV - Central 500 kV line

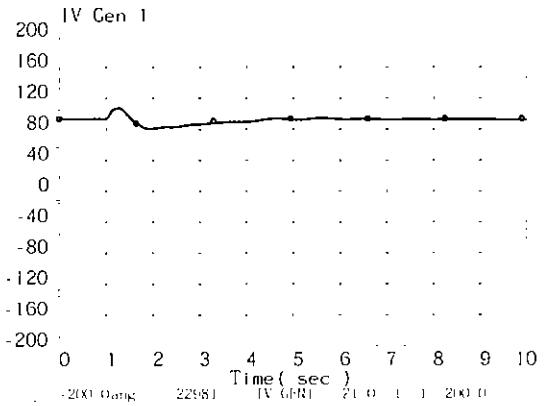
Relative Rotor Angle

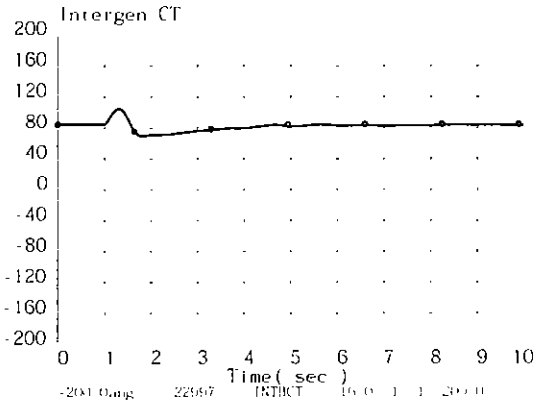






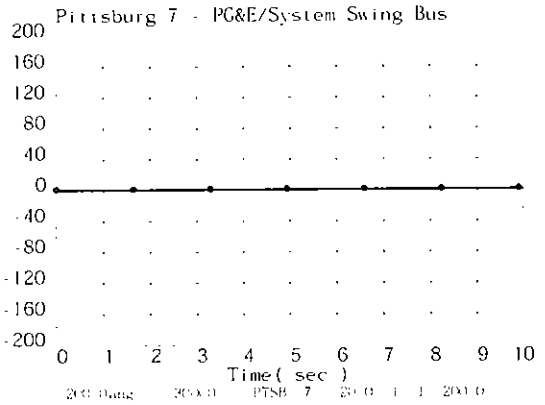


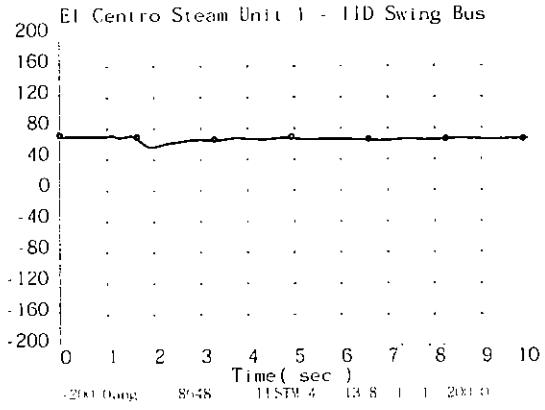


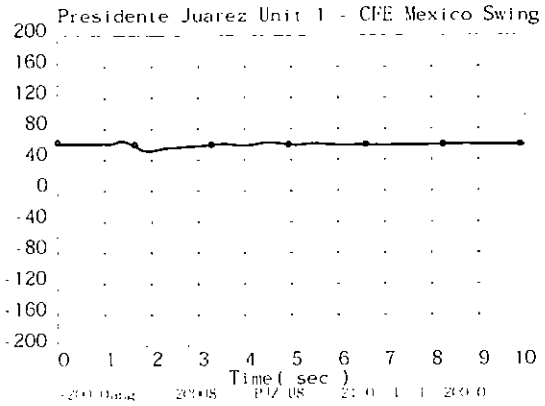


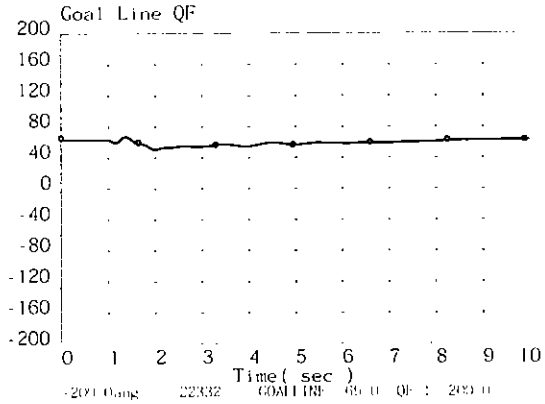
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

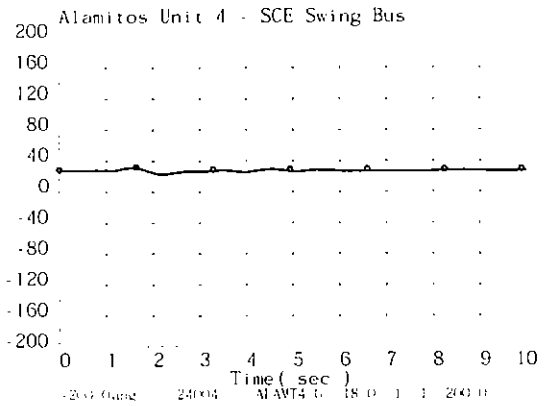
Relative Rotor Angle

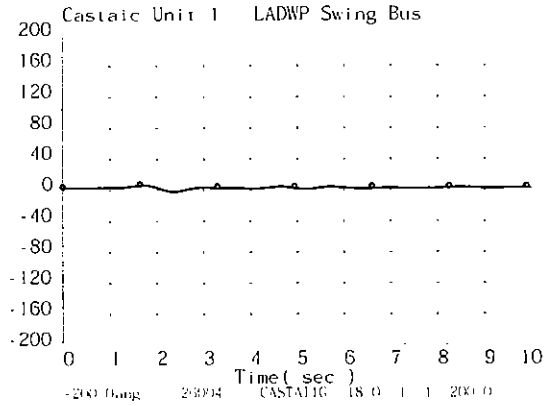






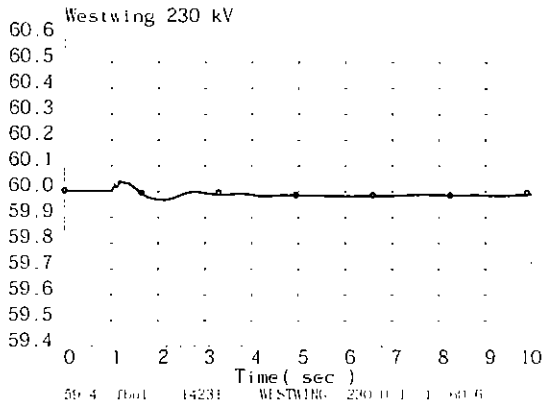


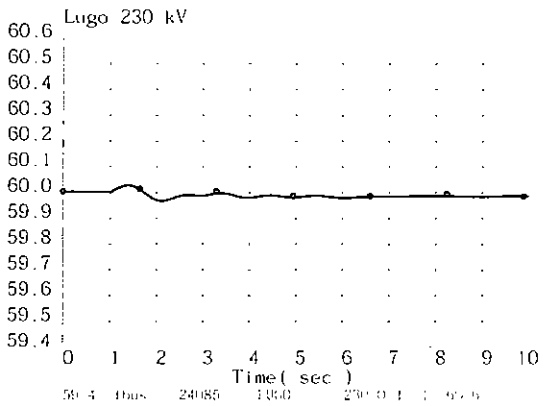


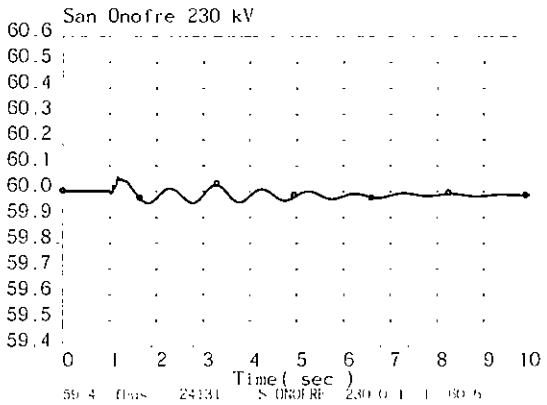


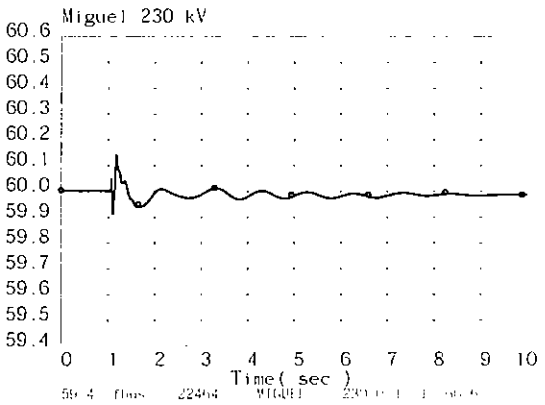
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

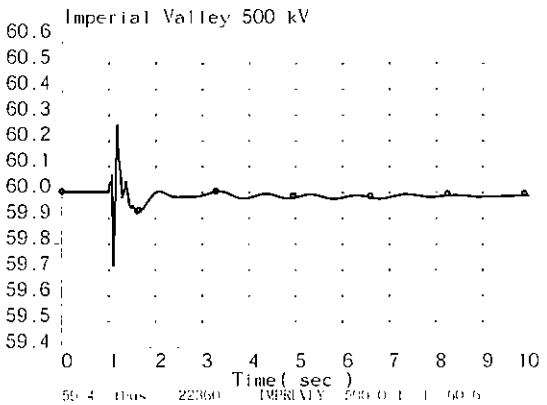
Bus Frequency

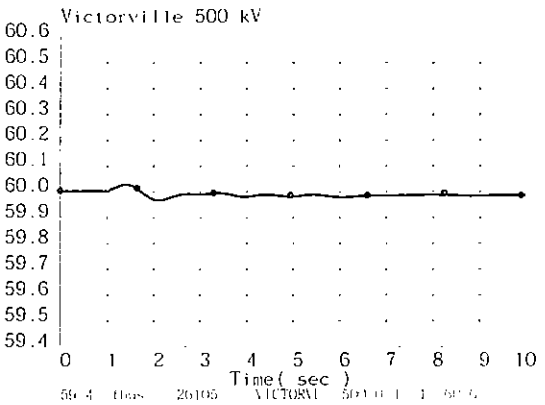






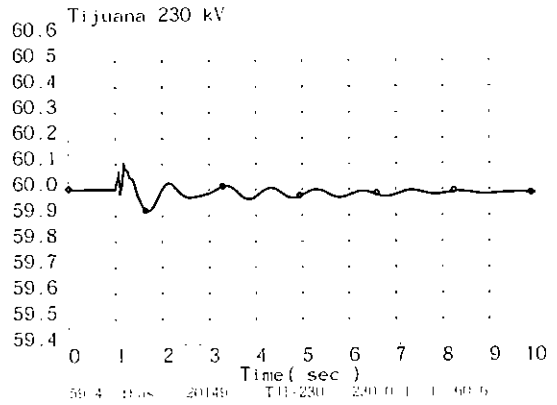


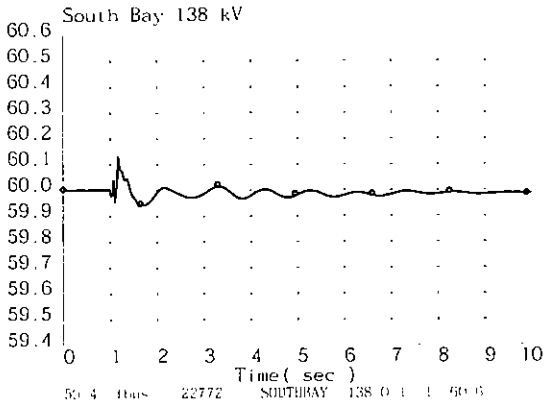


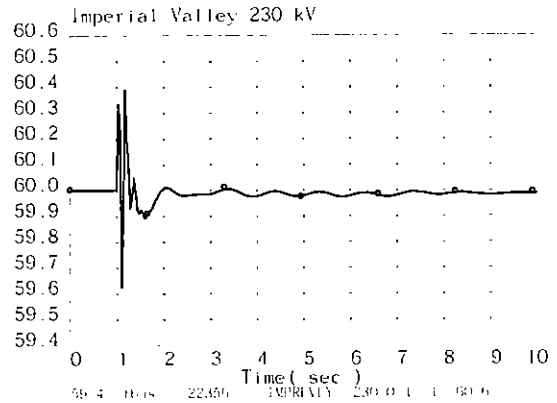


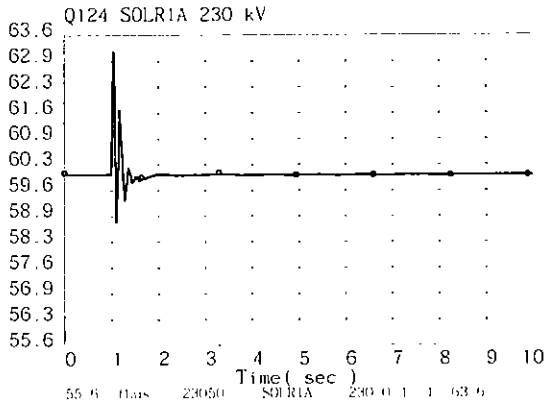
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

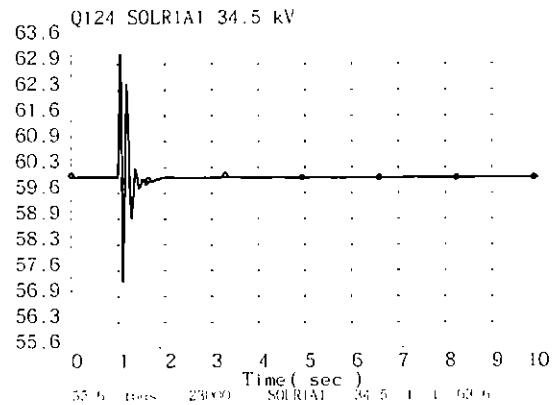
Bus Frequency

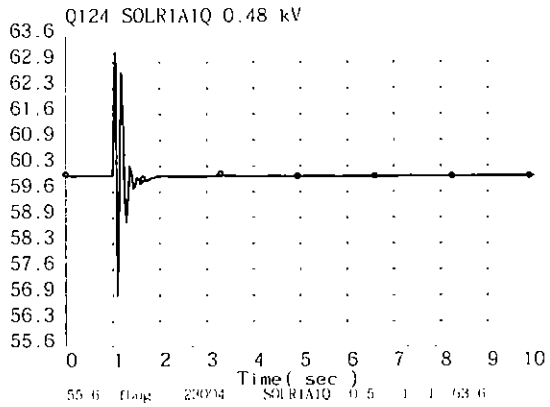






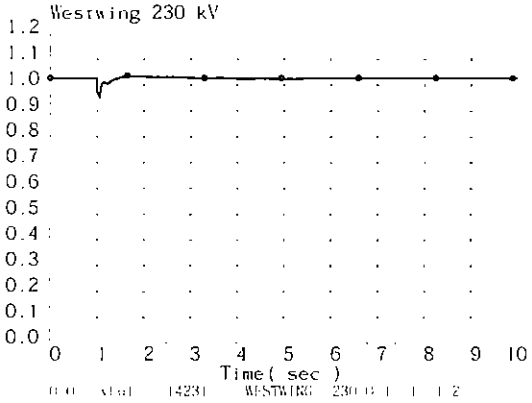


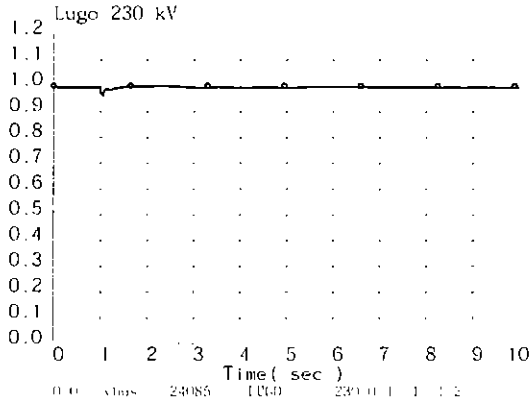


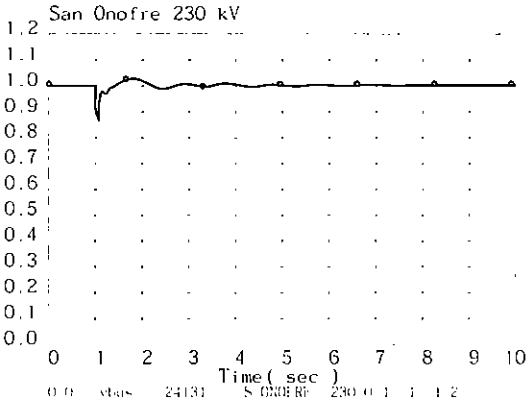


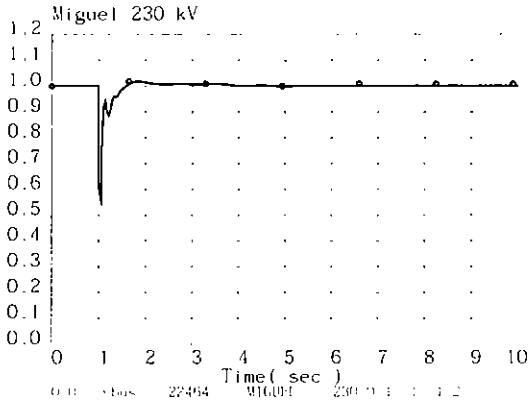
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

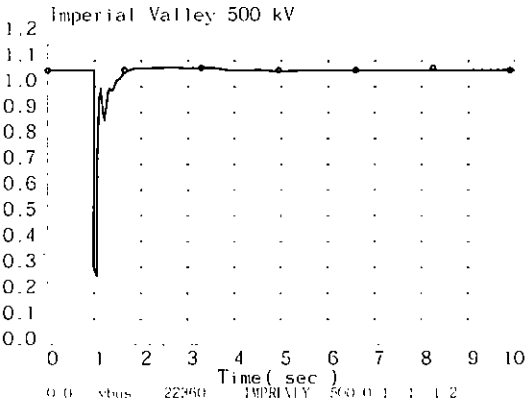
Bus Voltage

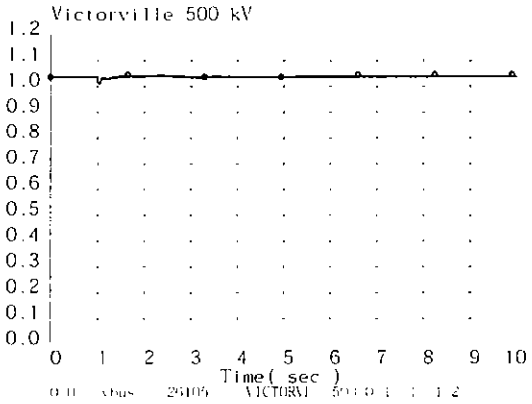




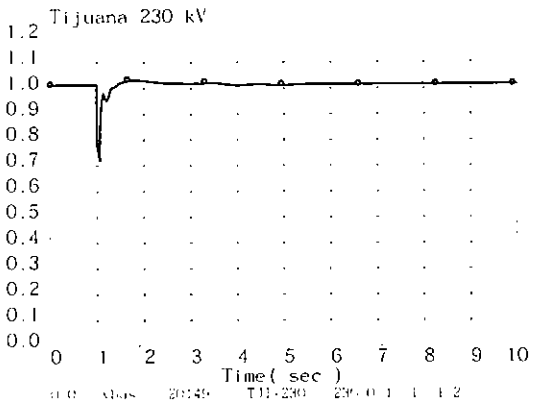


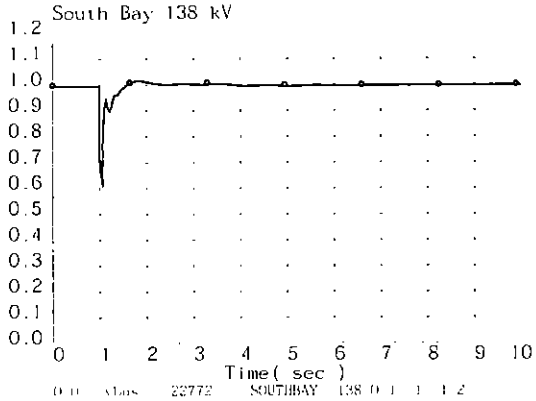


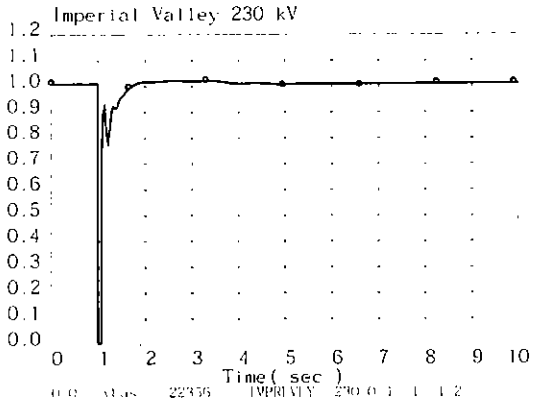


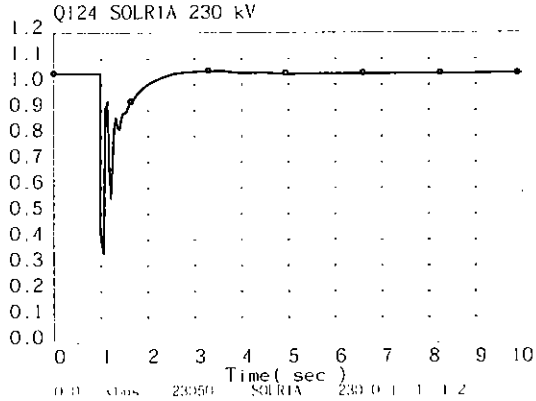


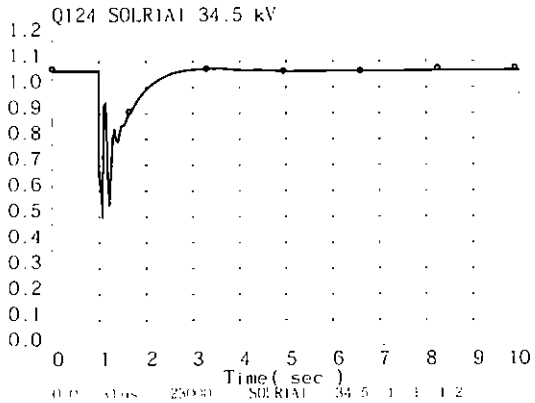
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

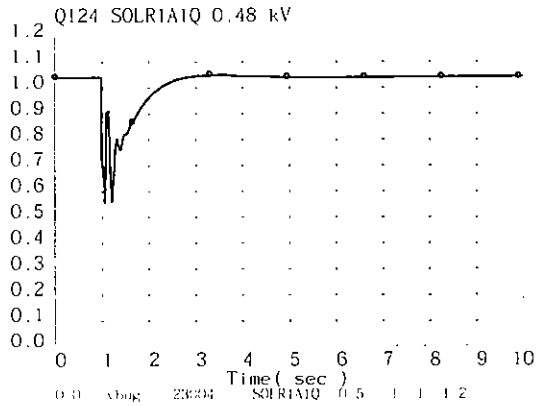






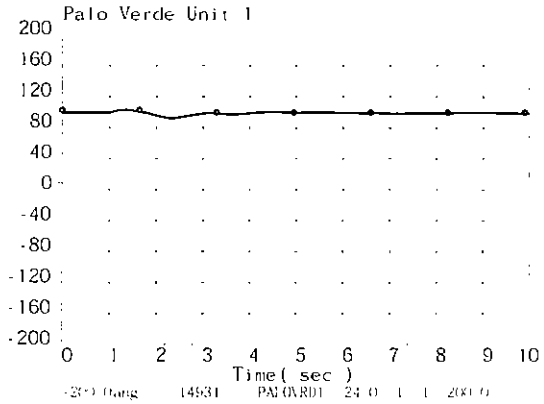


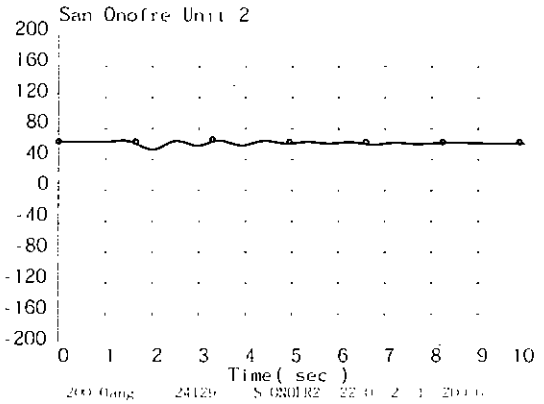


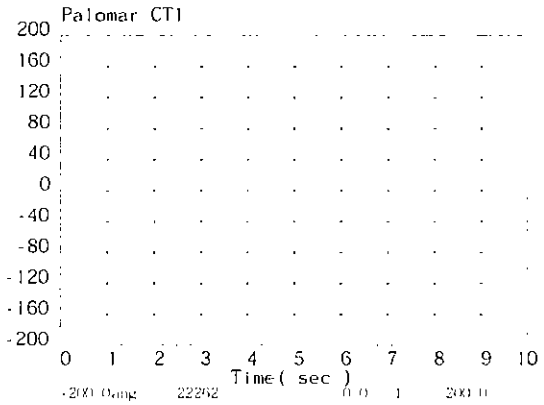


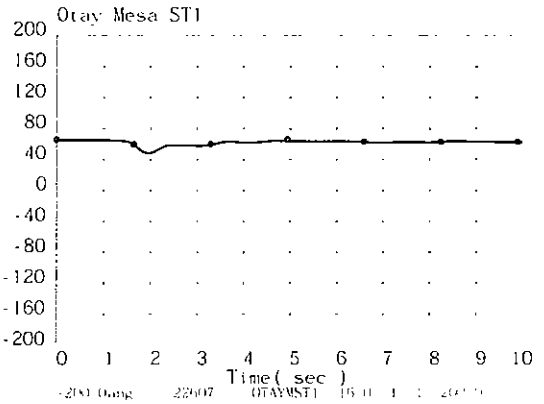
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - El Centro 230 kV line

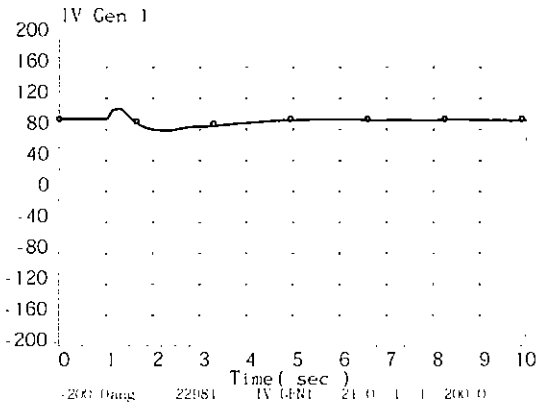
Relative Rotor Angle

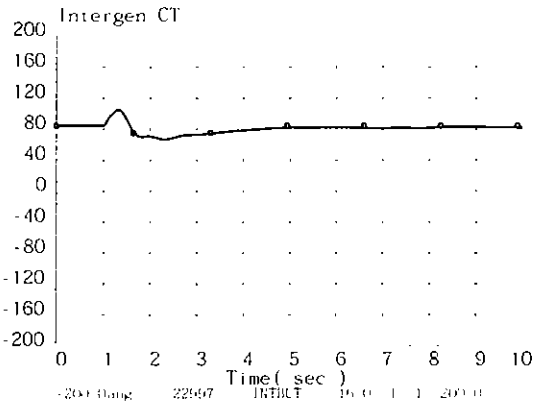






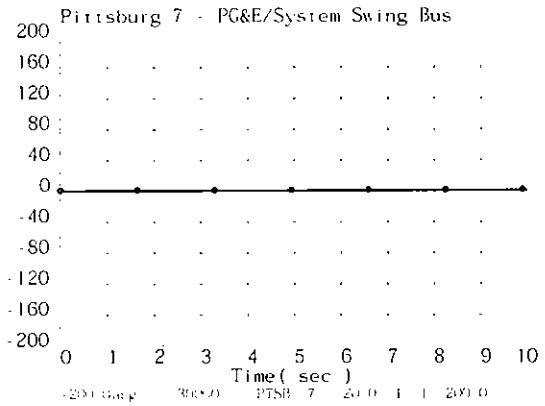


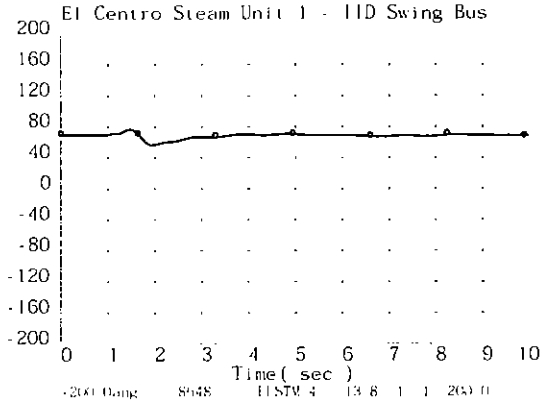


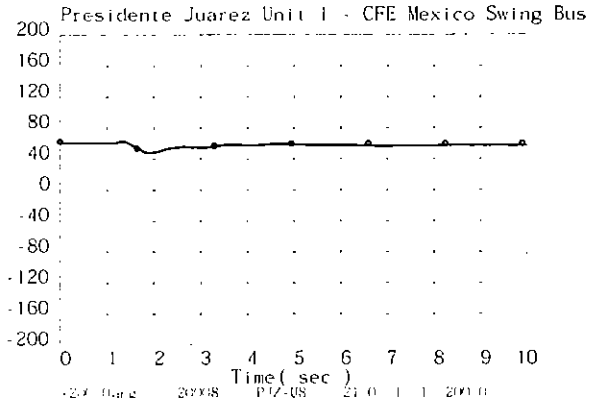


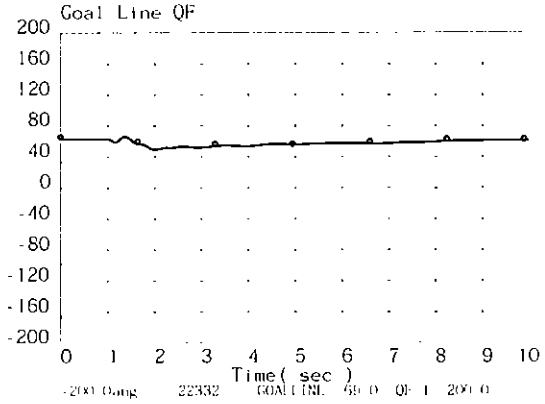
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

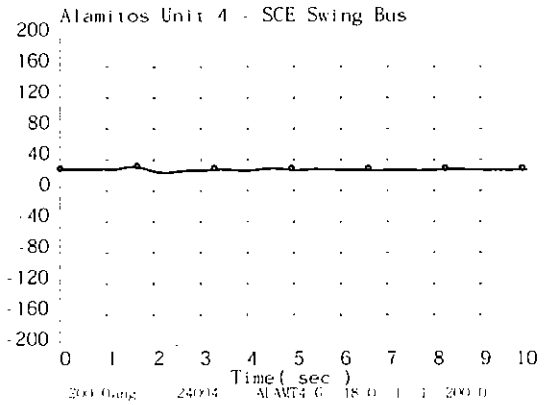
Relative Rotor Angle

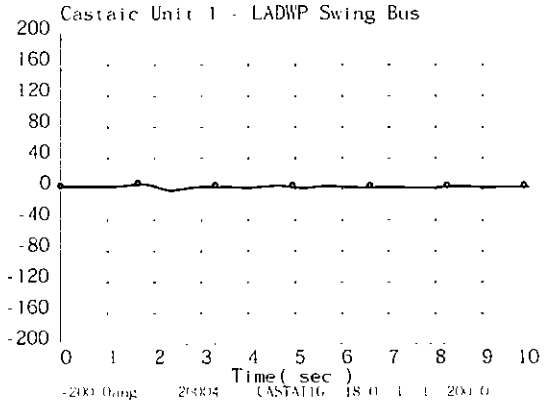






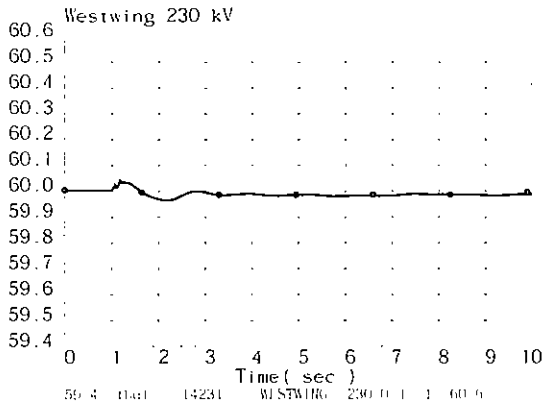


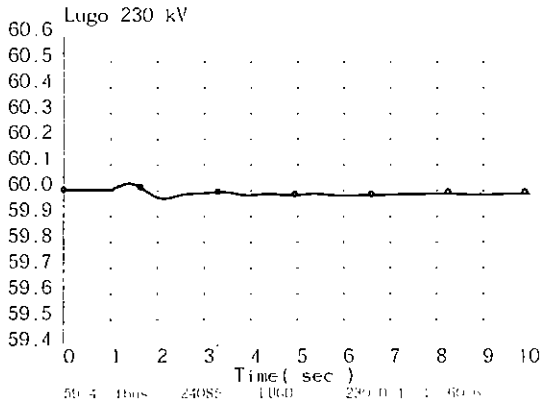


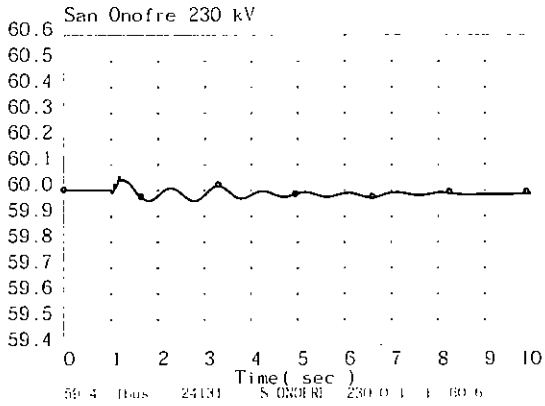


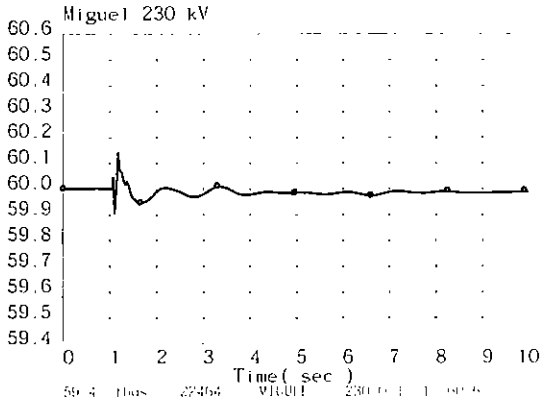
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

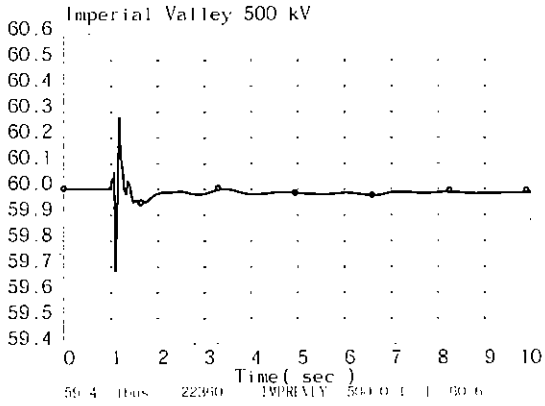
Bus Frequency

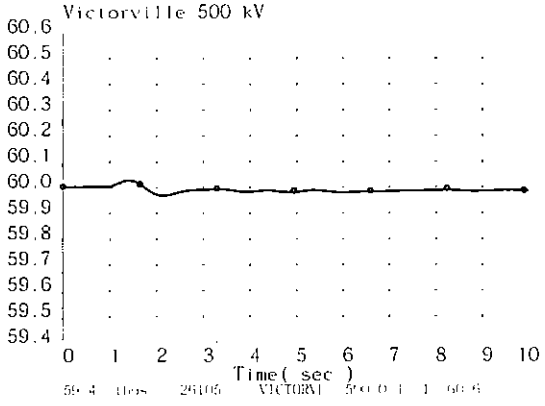






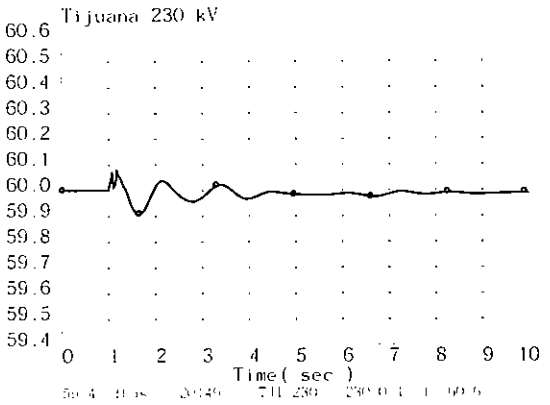


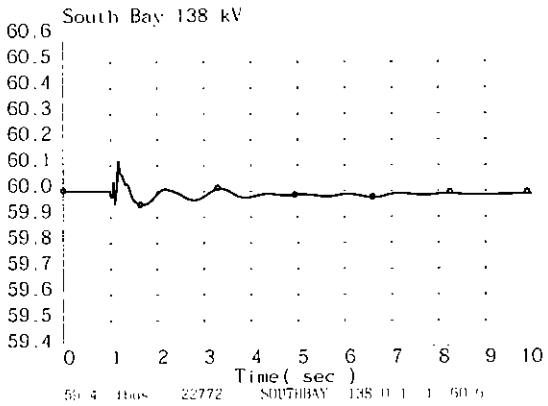


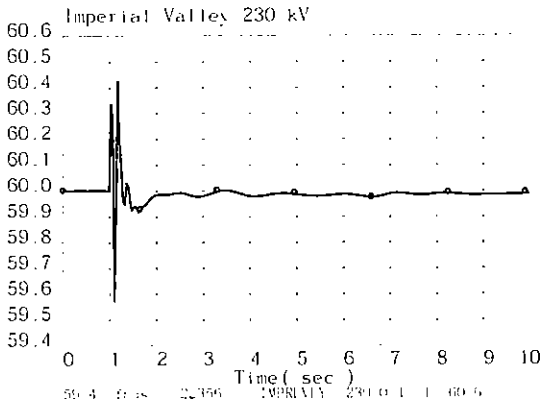


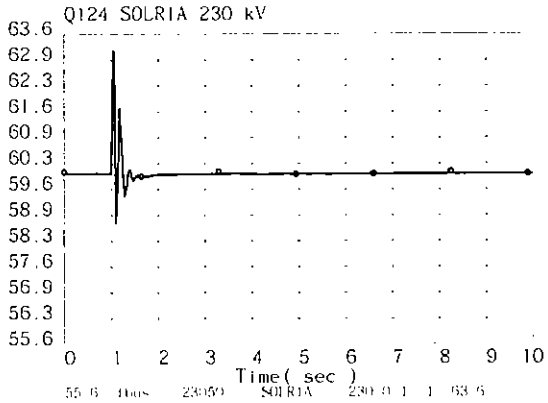
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

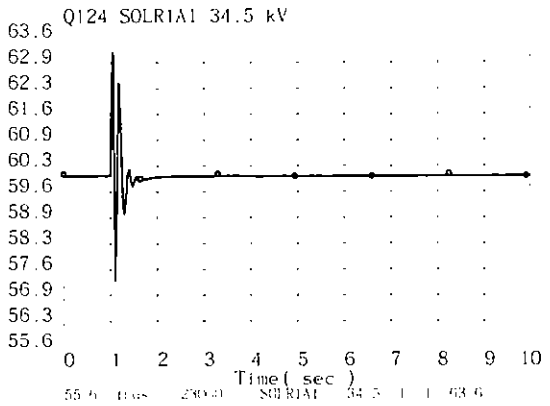
Bus Frequency

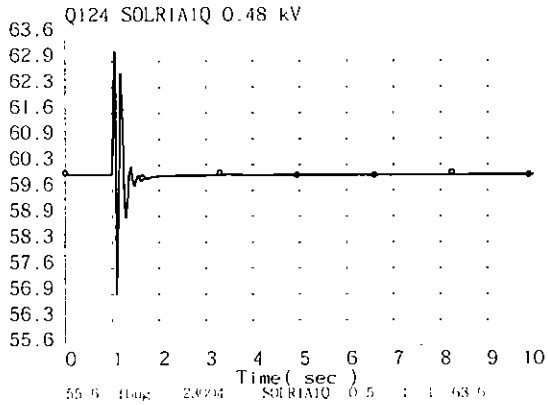






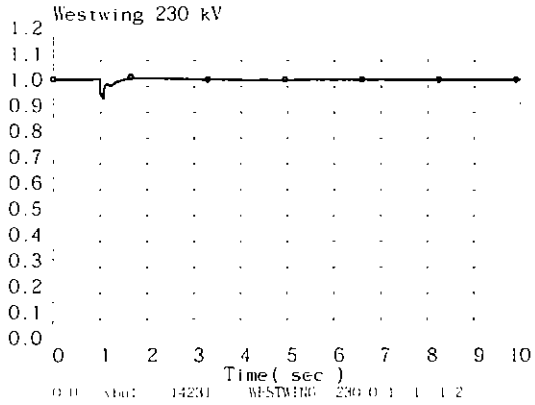


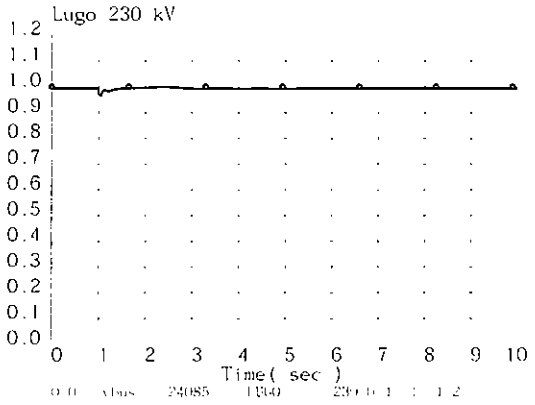


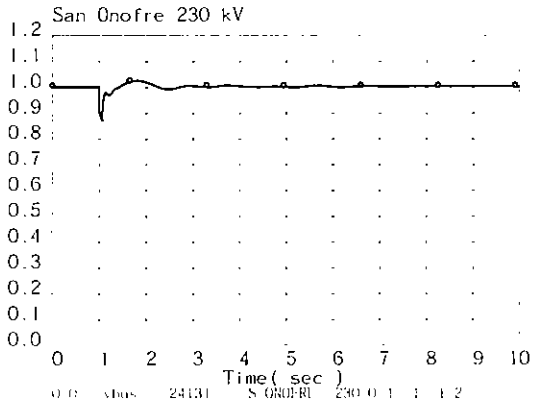


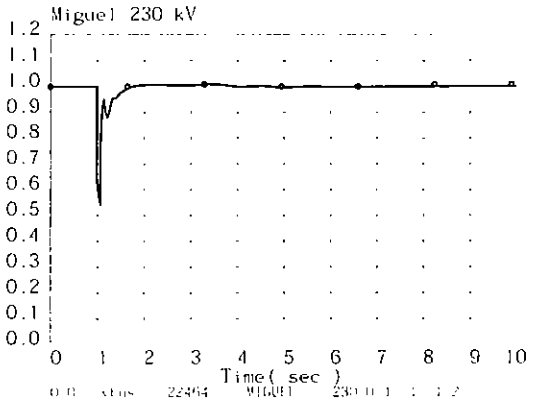
SDC&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

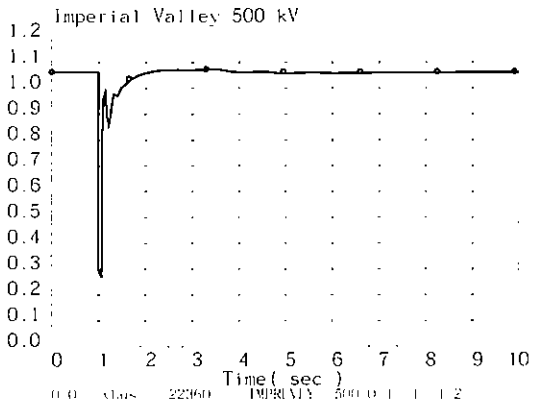
Bus Voltage

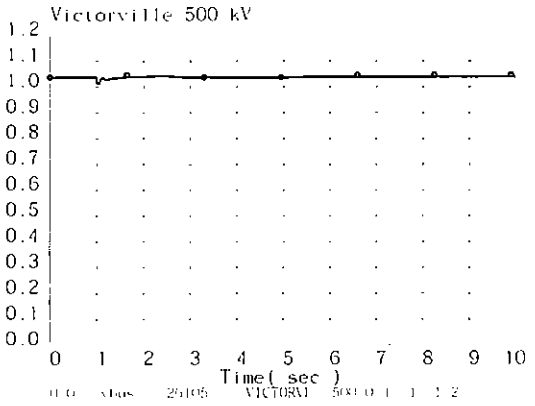




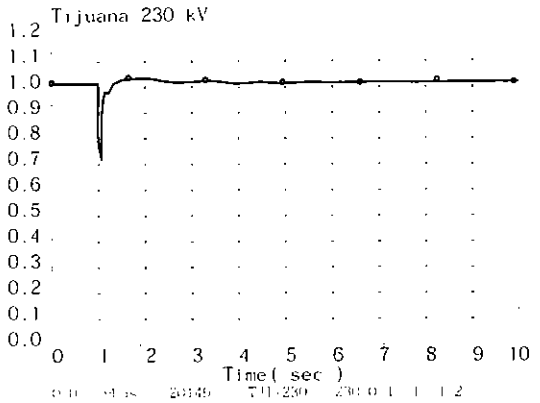


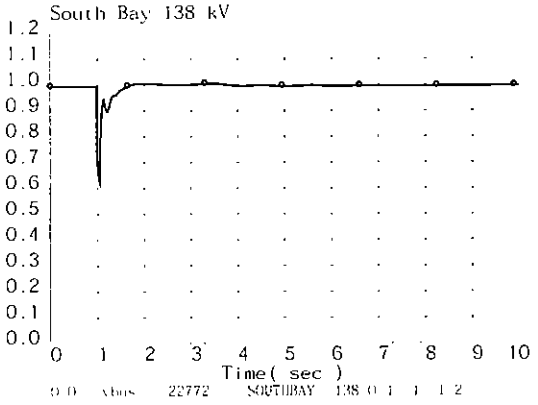


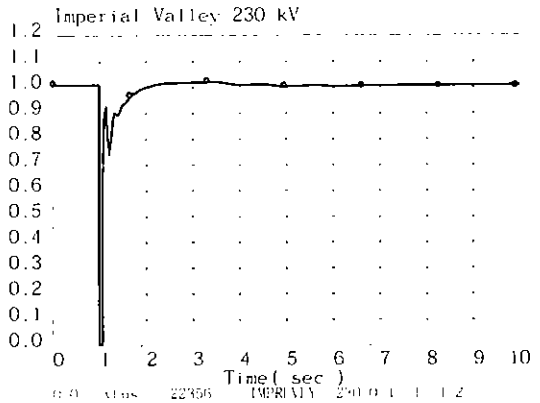


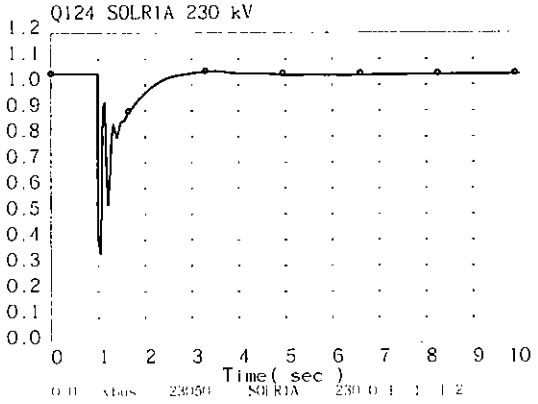


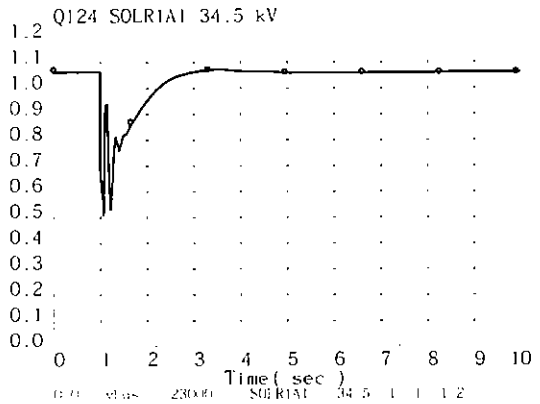
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

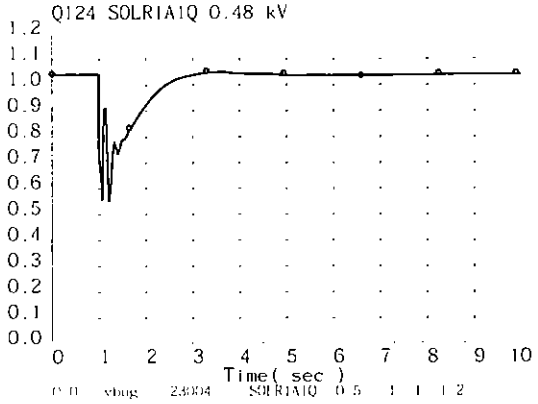






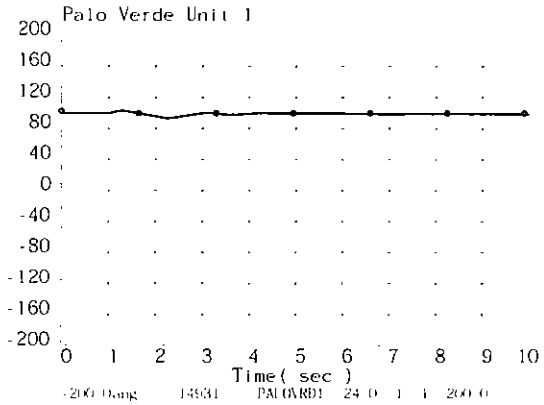


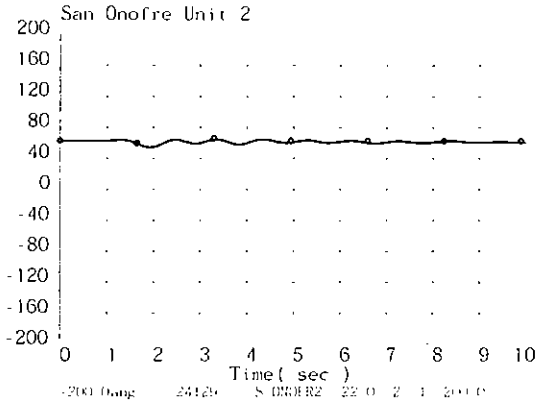


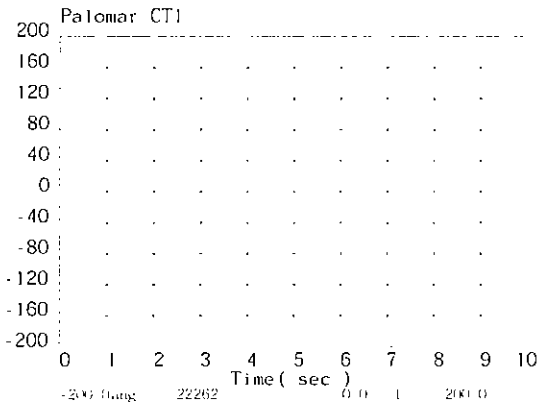


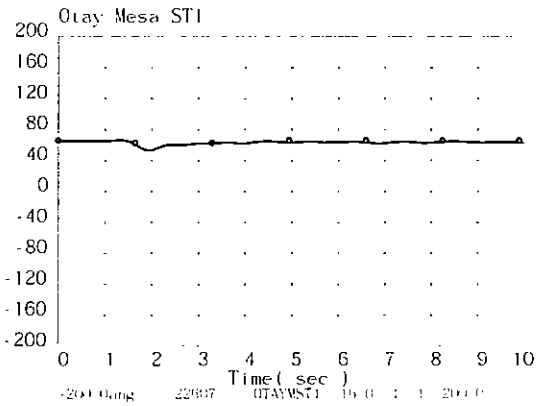
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV - La Rosita 230 kV line

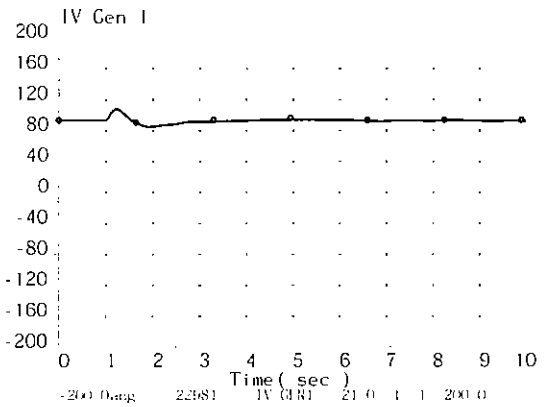
Relative Rotor Angle

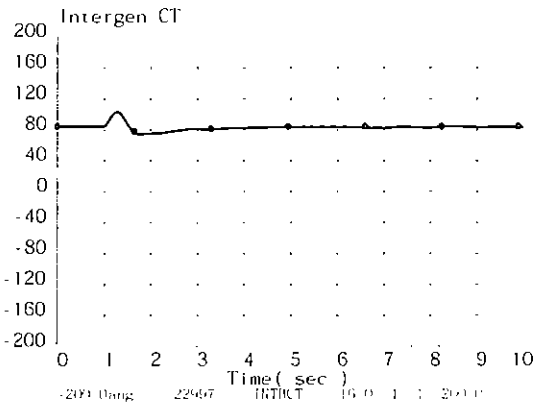






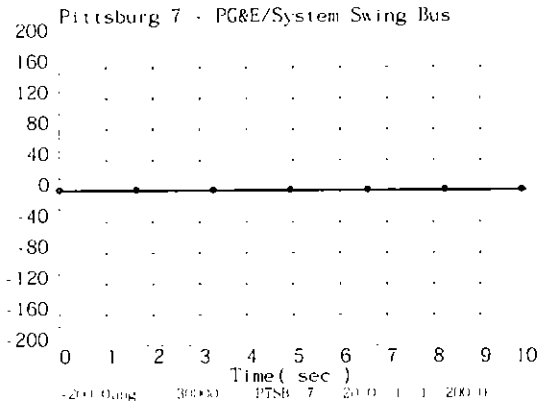


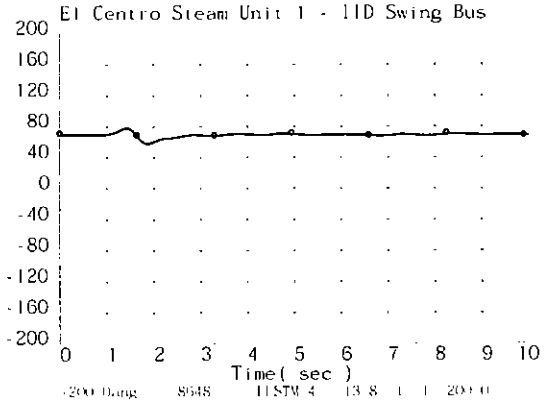


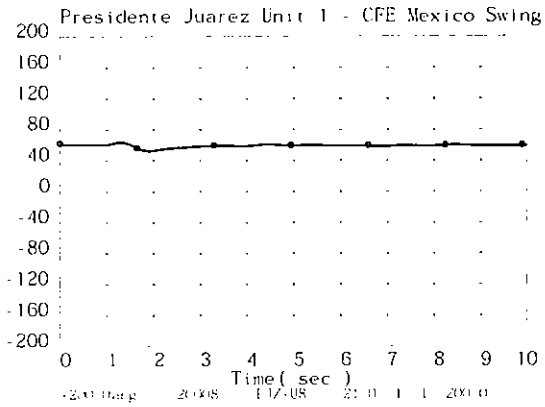


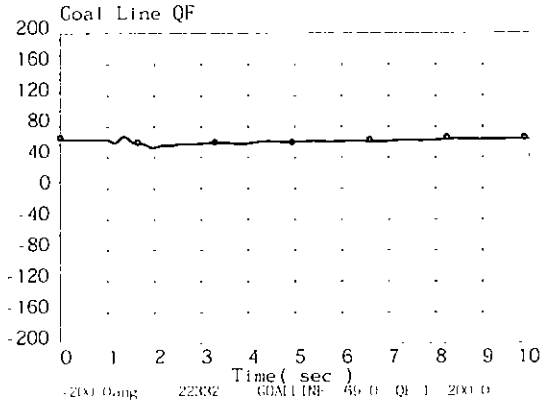
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

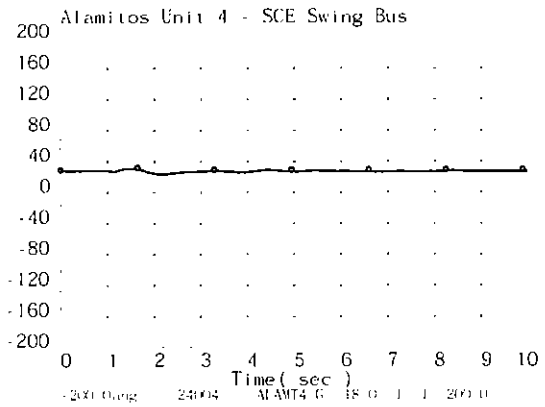
Relative Rotor Angle

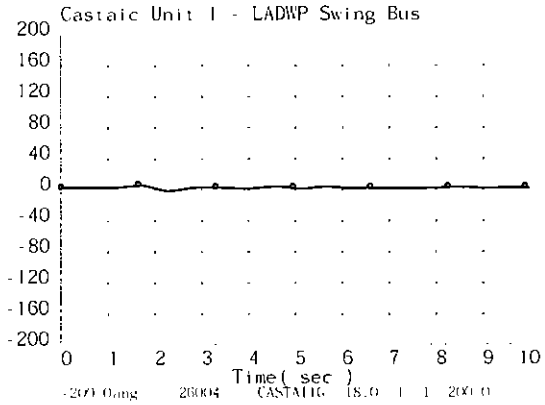






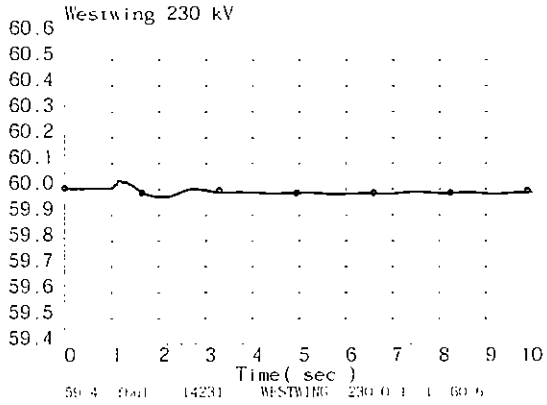


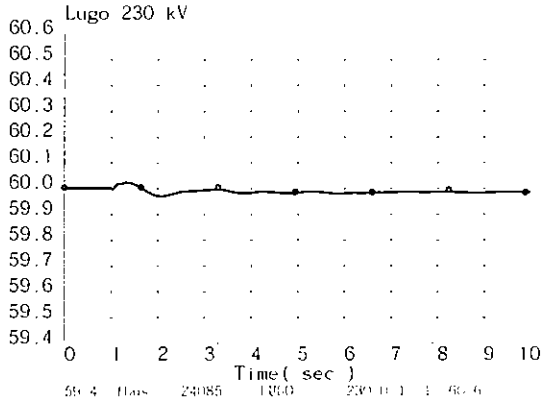


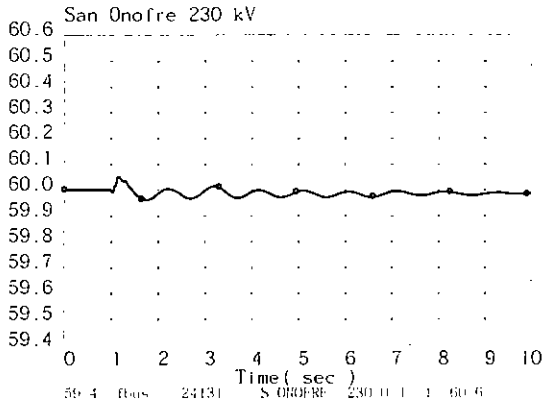


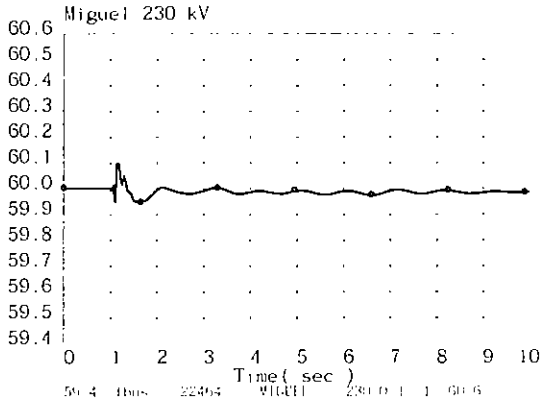
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

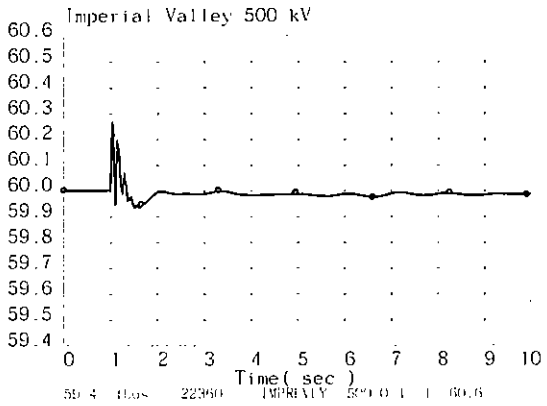
Bus Frequency

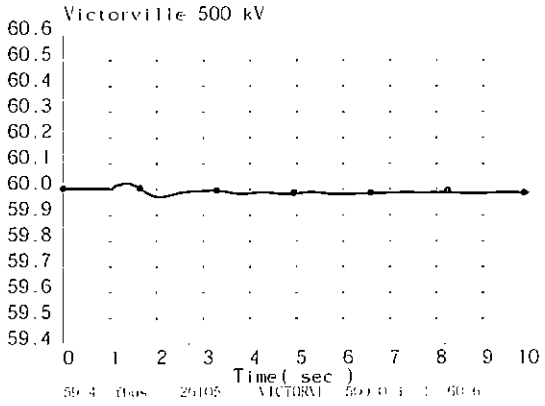






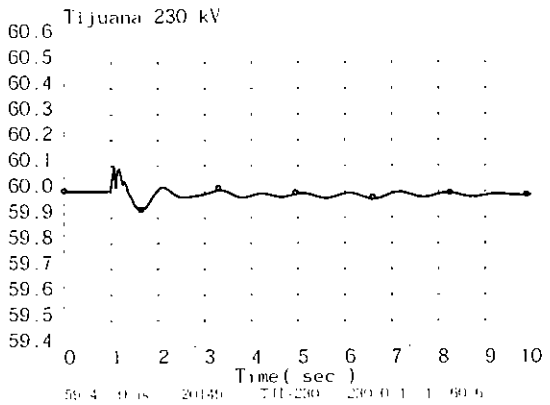


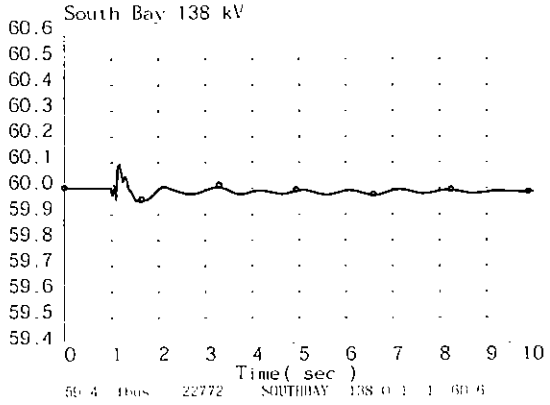


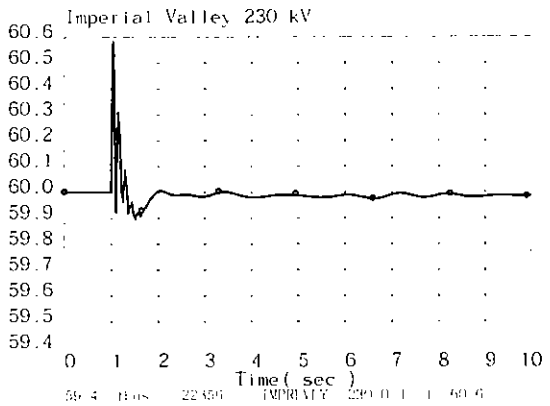


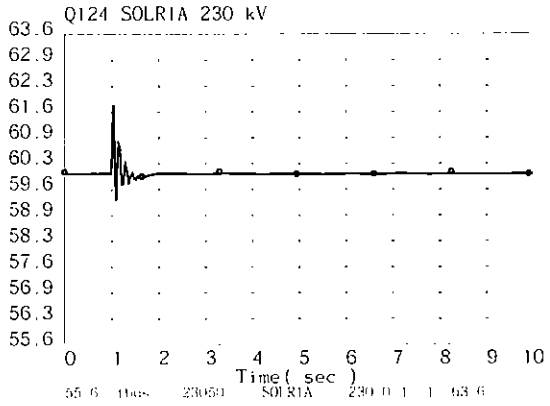
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

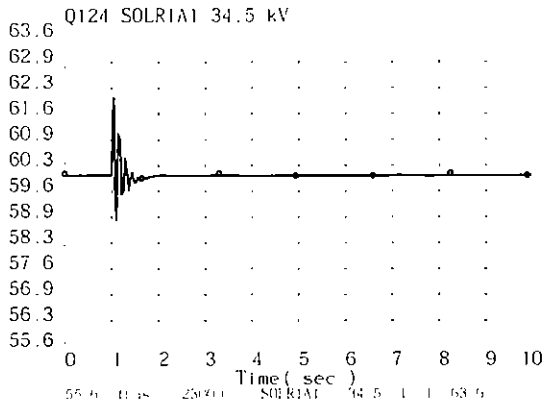
Bus Frequency

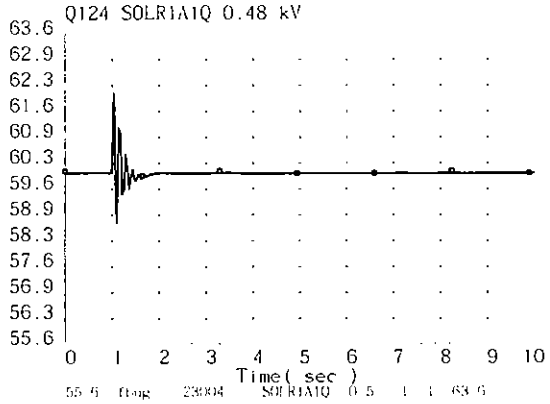






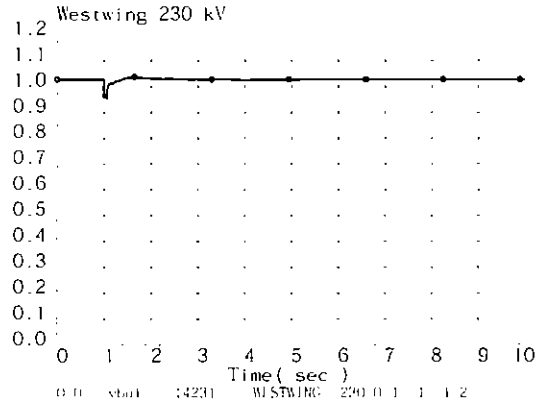


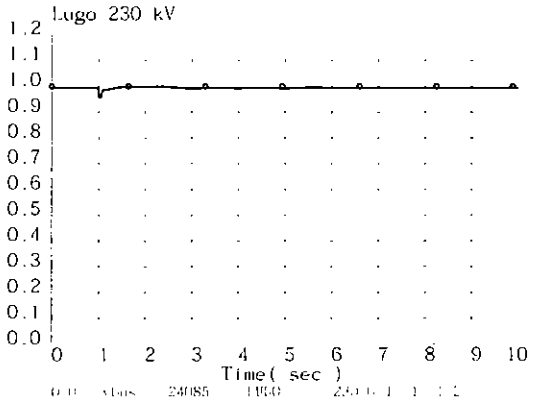


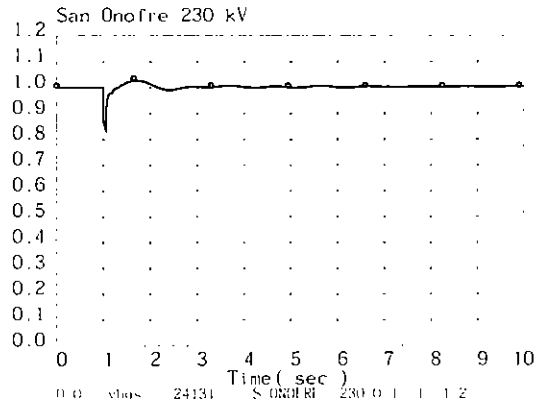


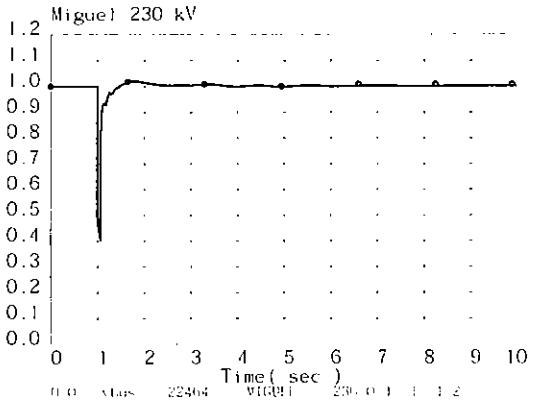
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

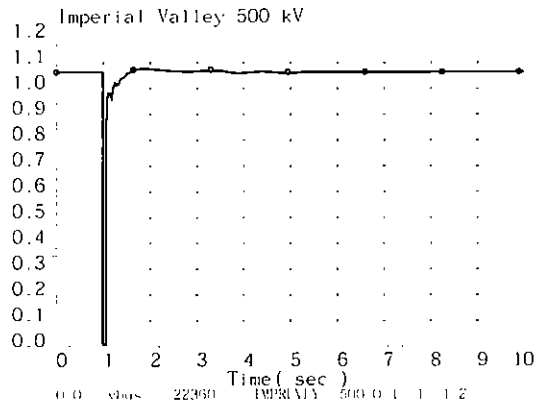
Bus Voltage

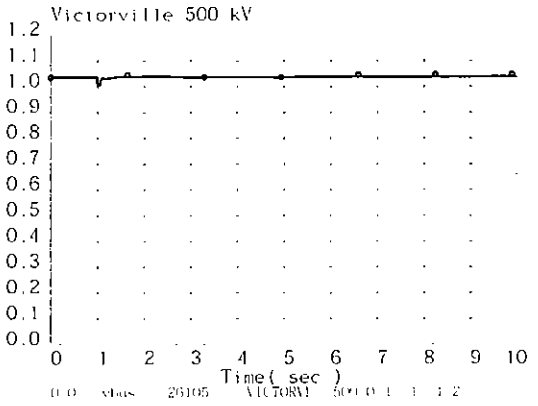






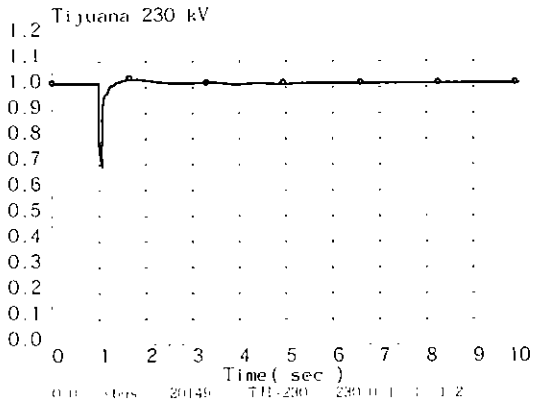


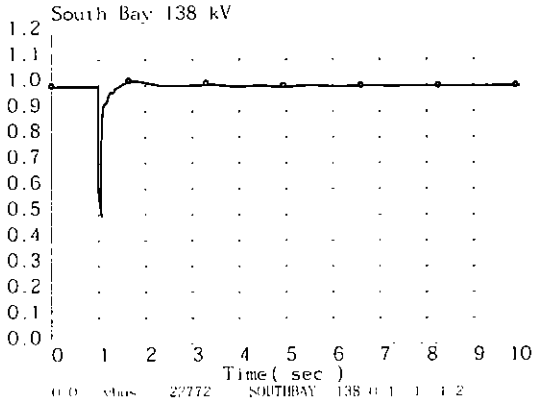


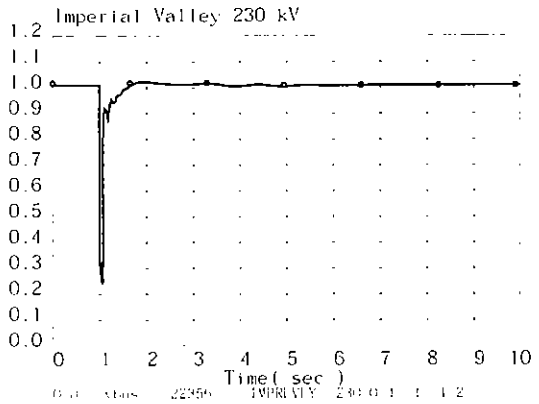


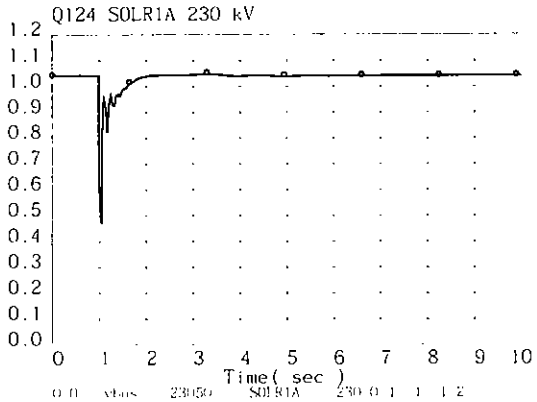
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

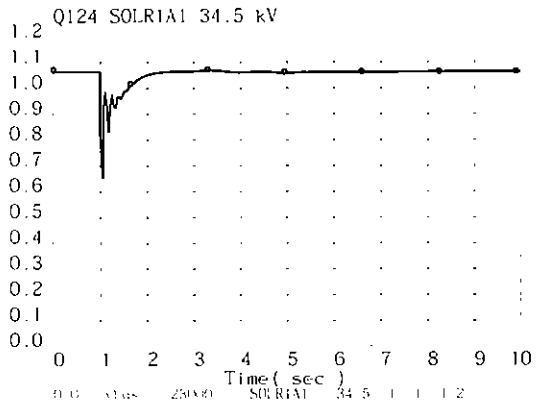
Bus Voltage

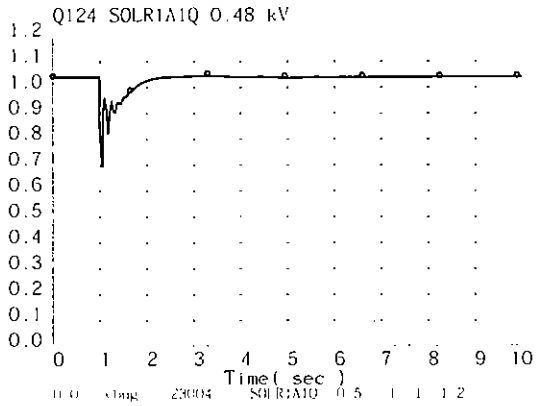






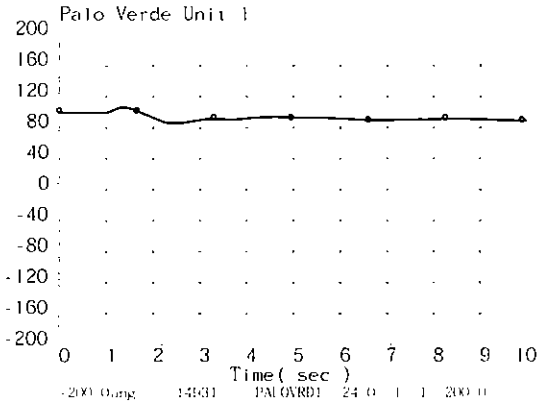


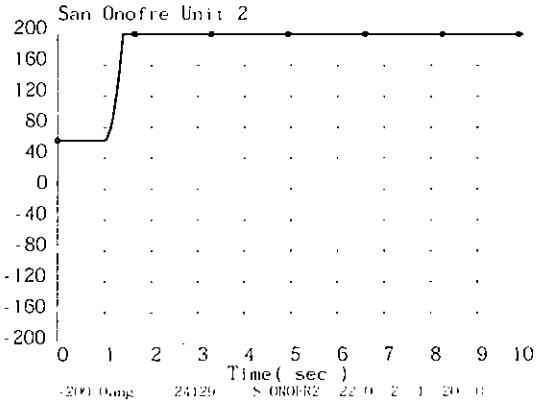


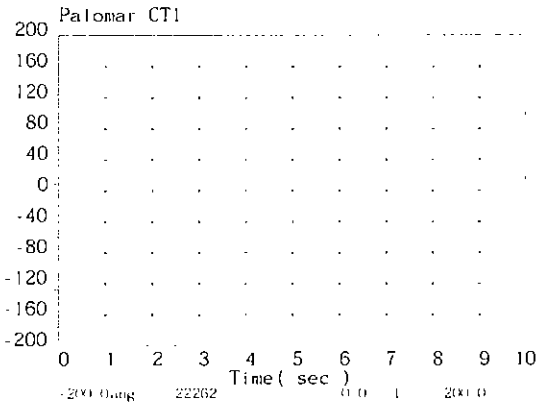


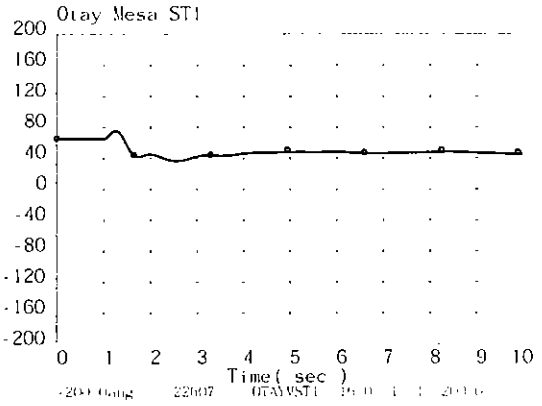
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at IV 230 kV, trip IV 500/230 kV Bank 81

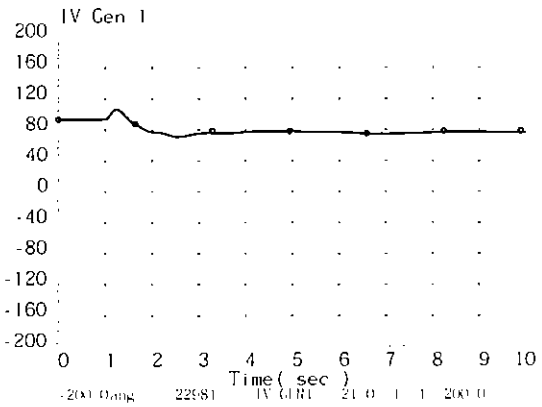
Relative Rotor Angle

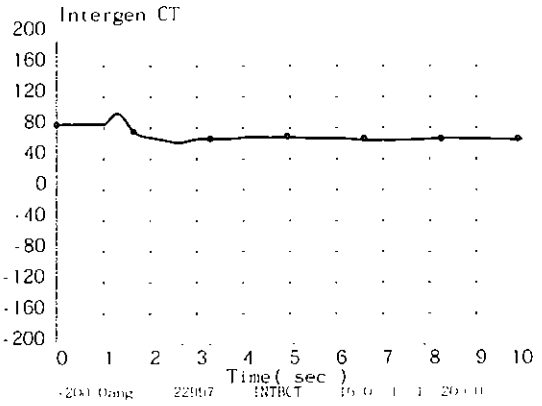






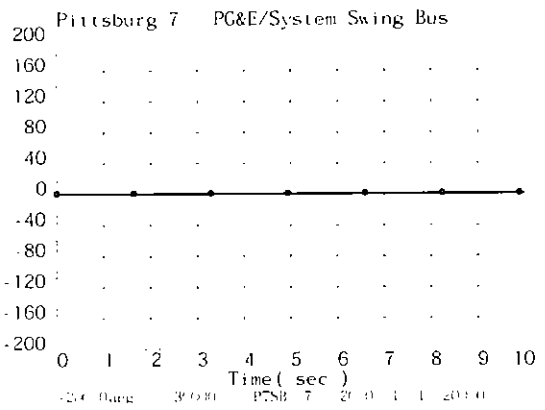


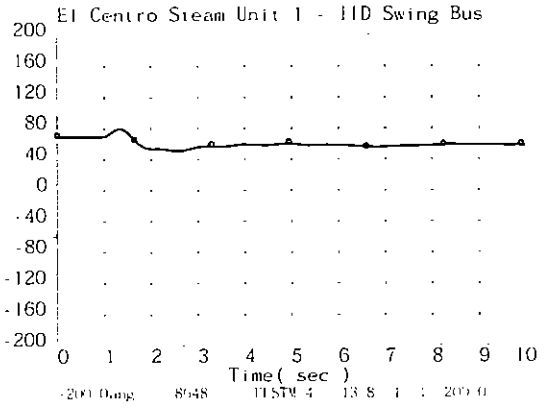


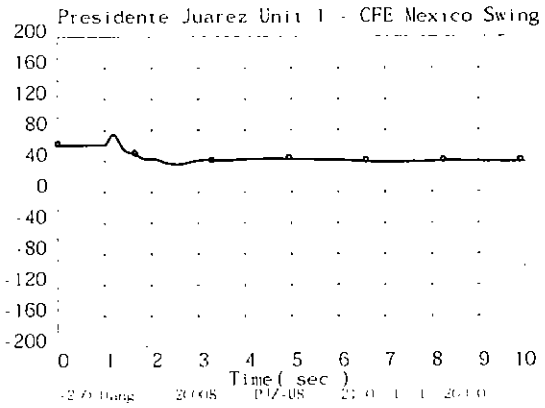


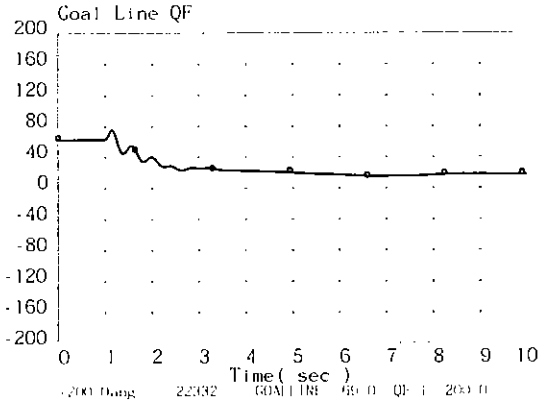
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

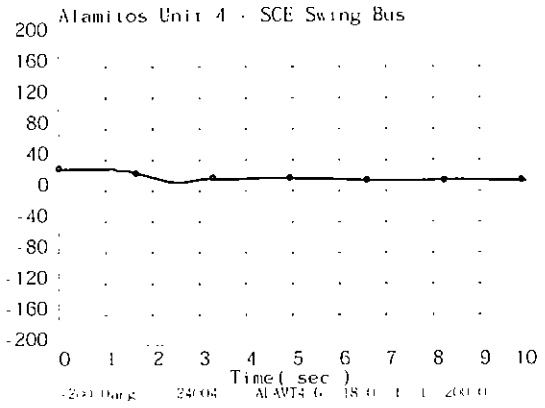
Relative Rotor Angle

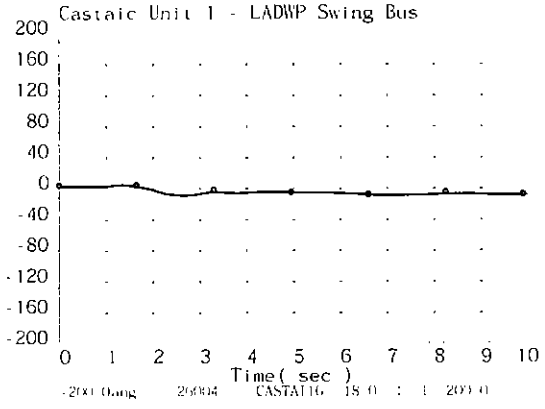






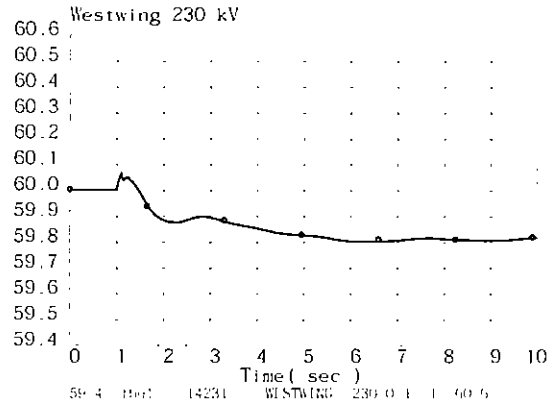


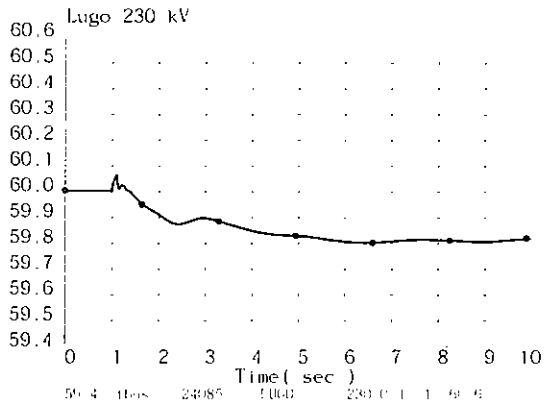


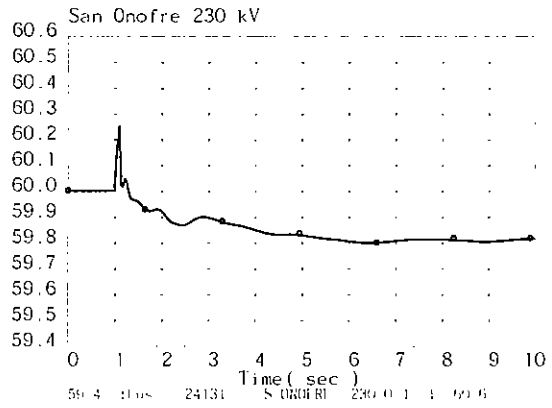


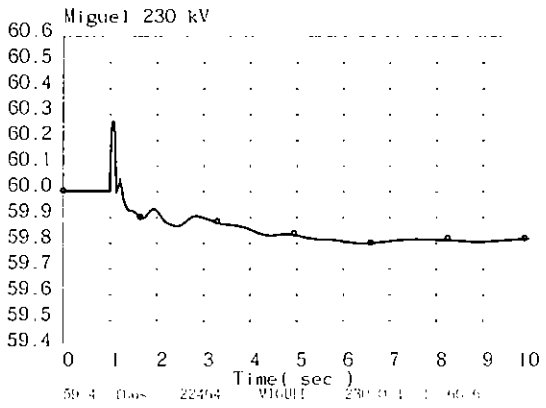
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

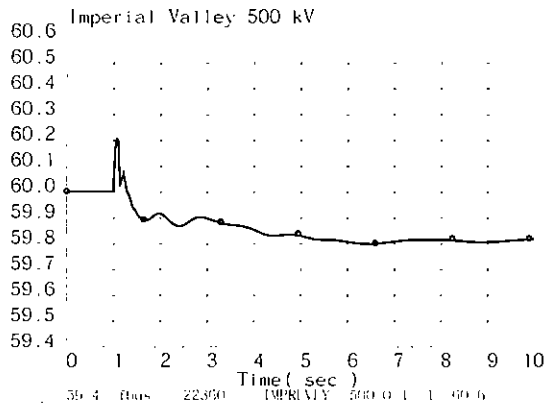
Bus Frequency

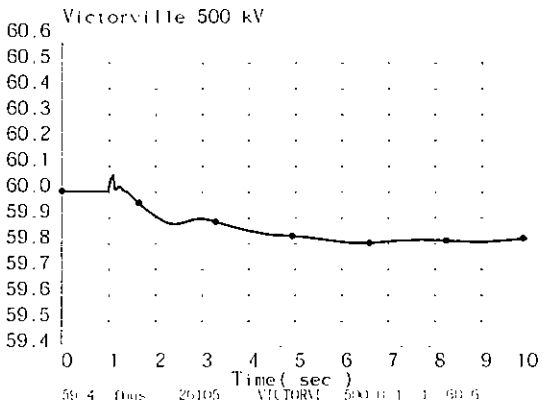






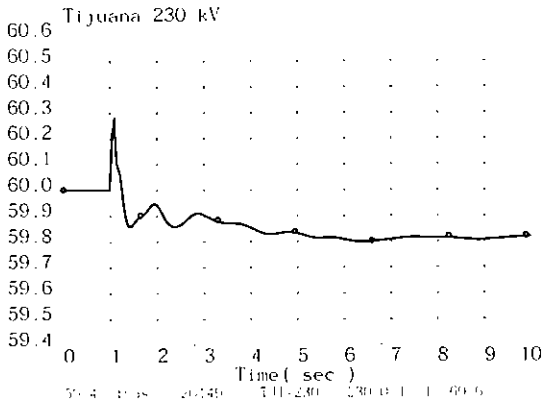


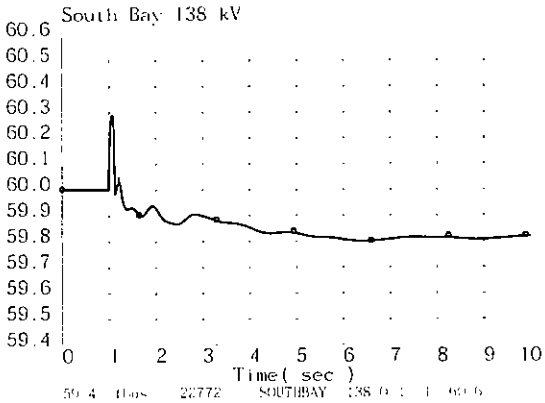


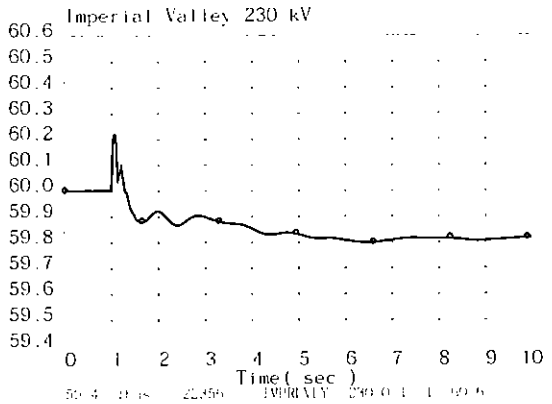


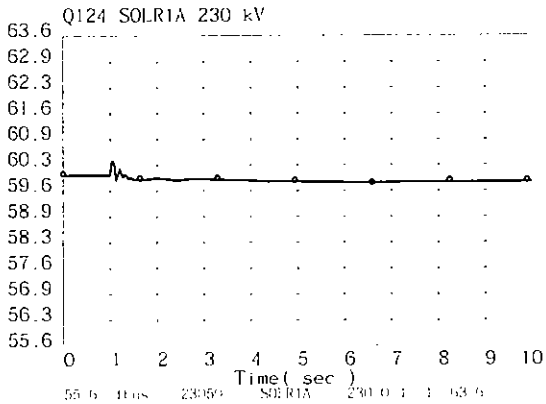
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

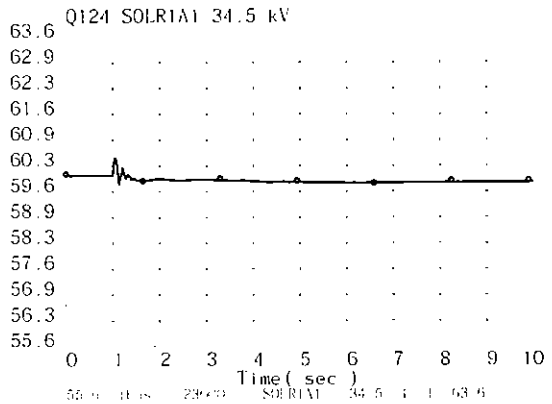
Bus Frequency

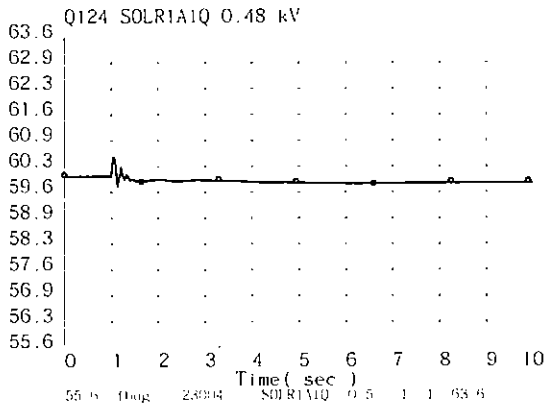




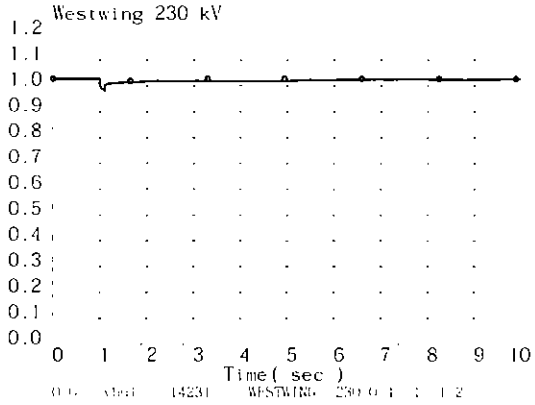


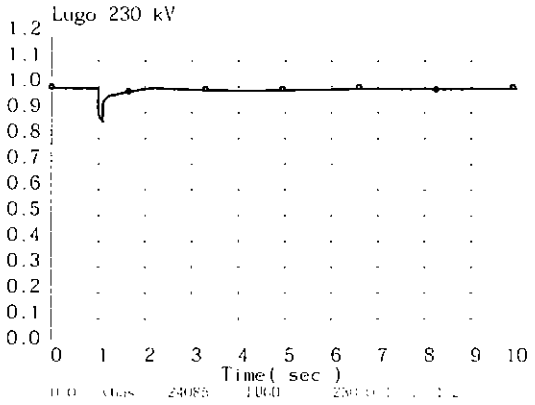


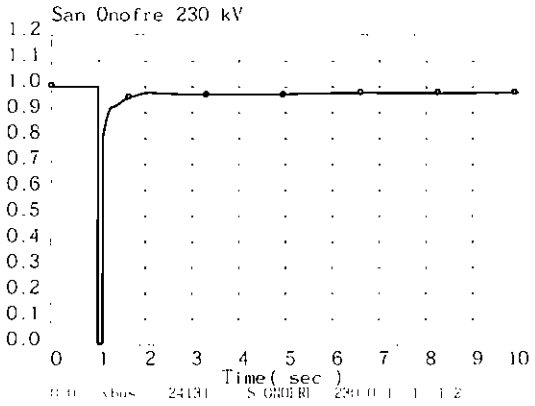


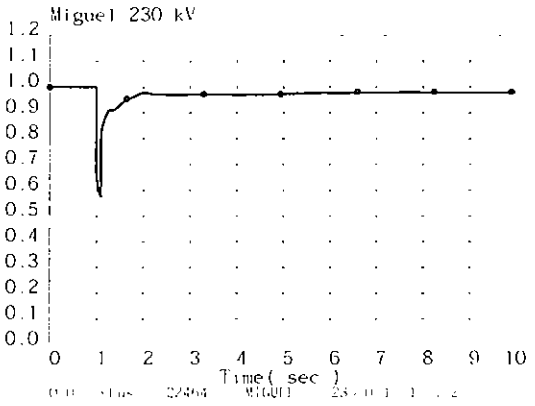


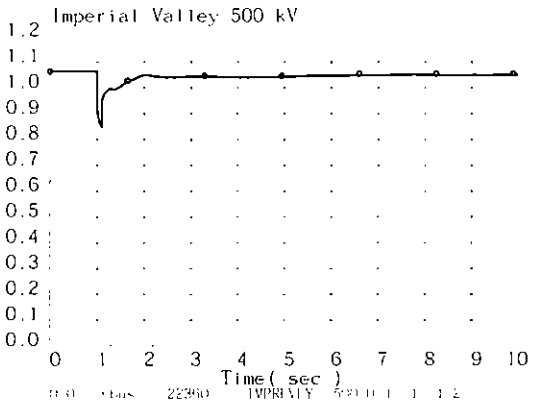
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

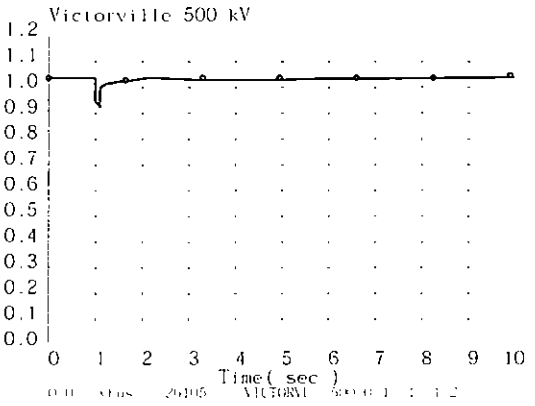






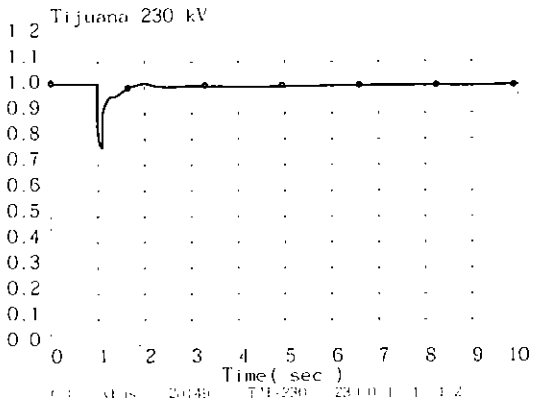


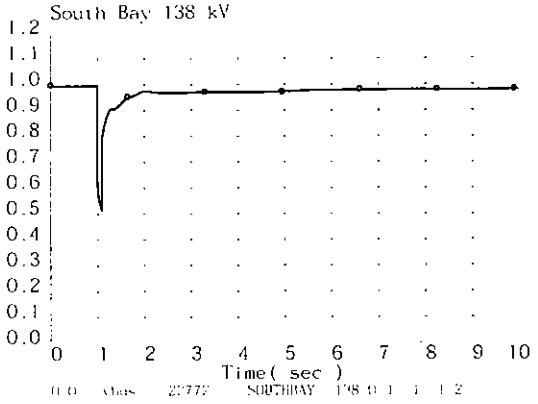


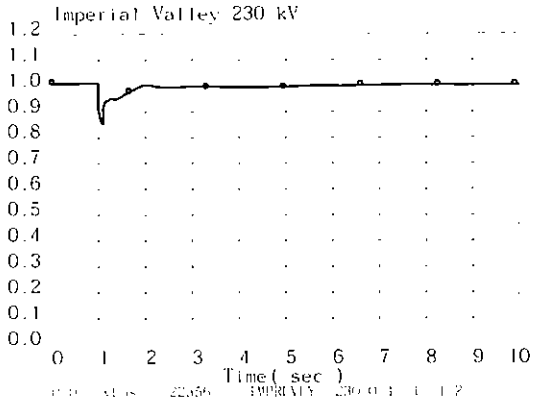


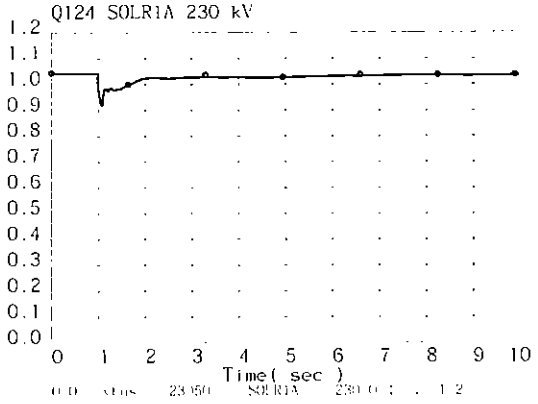
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

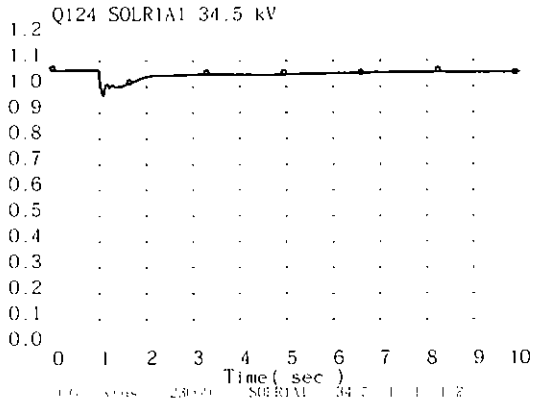
Bus Voltage

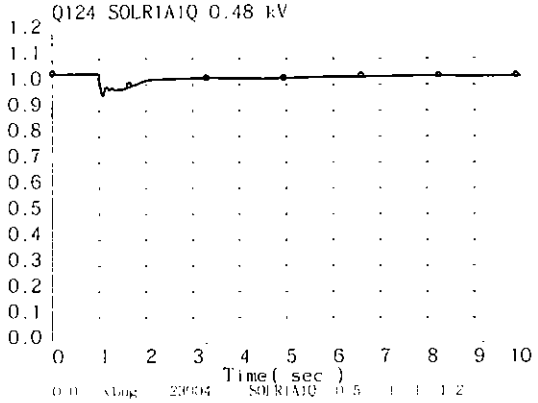






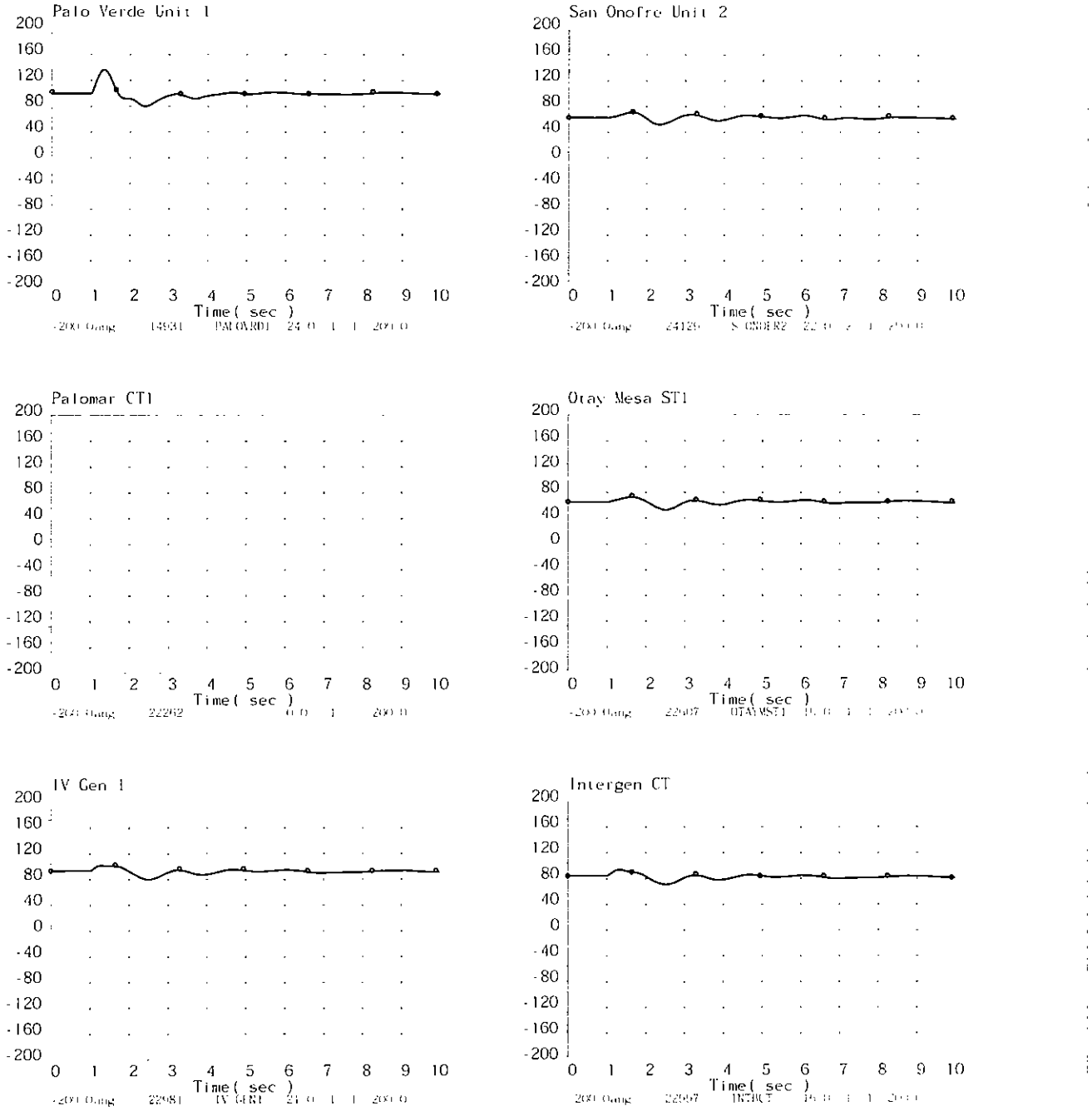






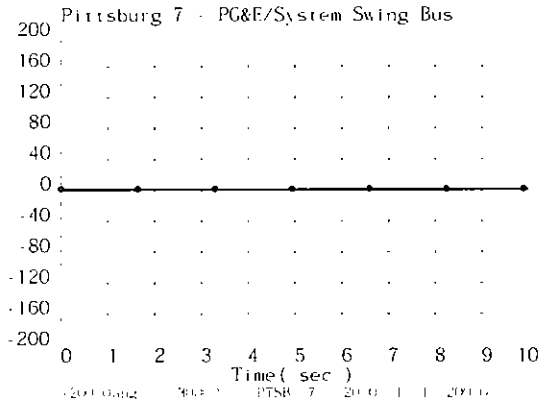
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 6 cycle fault at San Onofre 230 kV, trip SONGS units #2 and #3

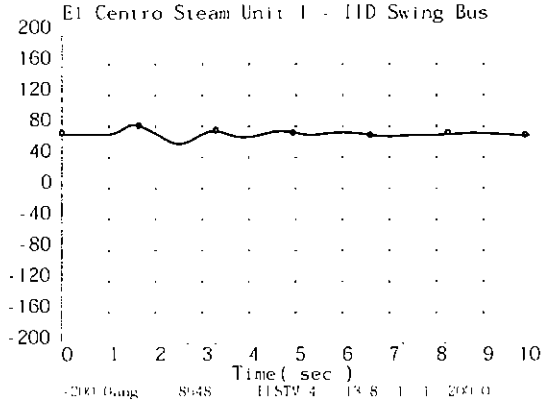
Relative Rotor Angle

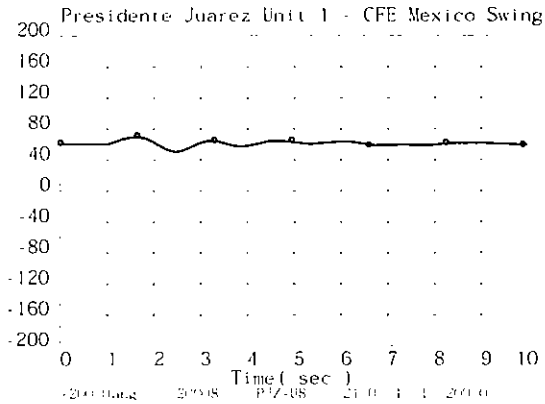


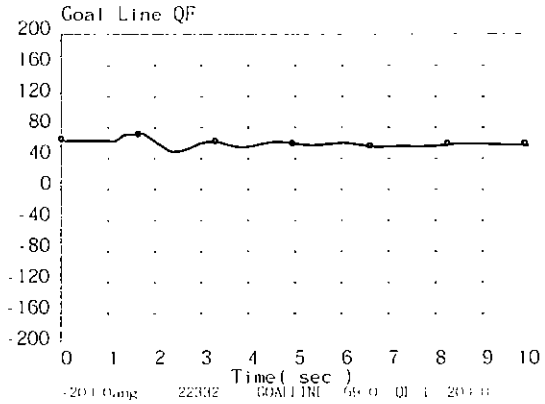
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

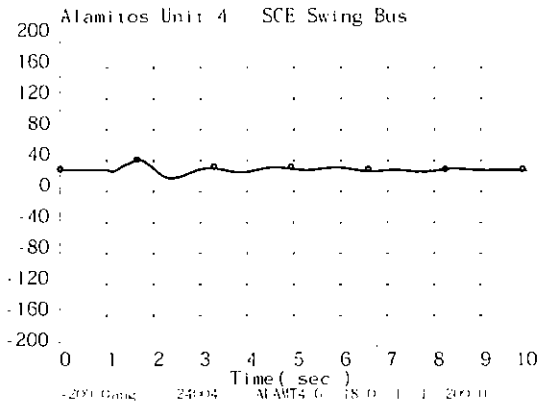
Relative Rotor Angle

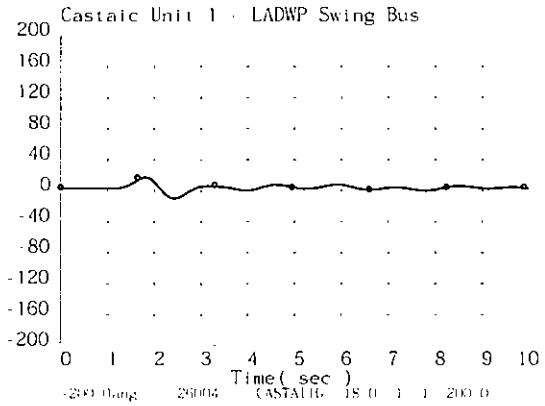






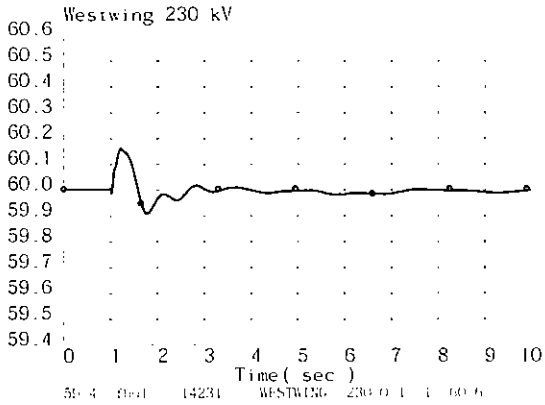


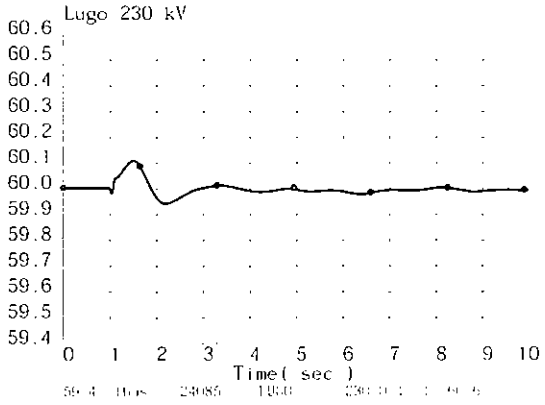


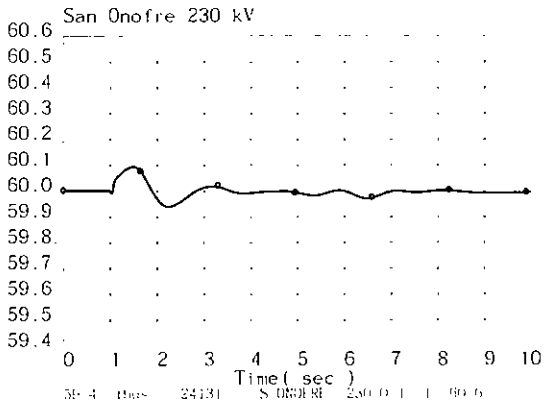


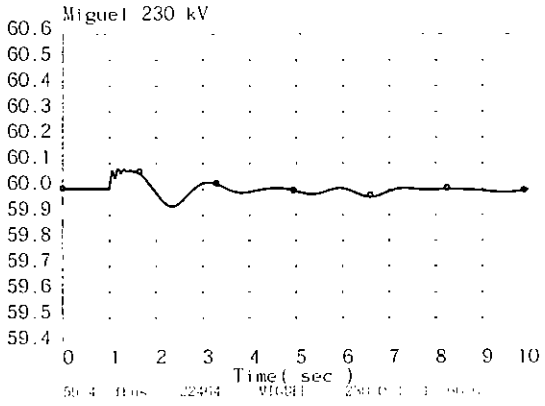
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

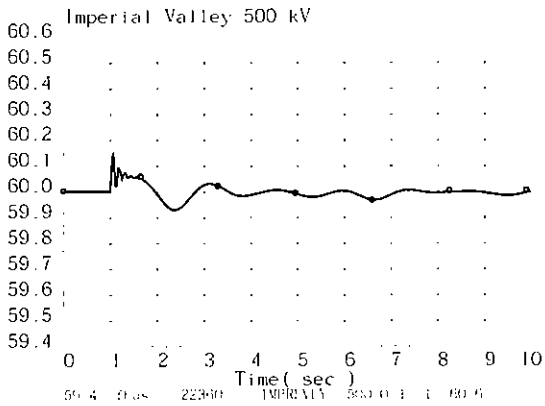
Bus Frequency

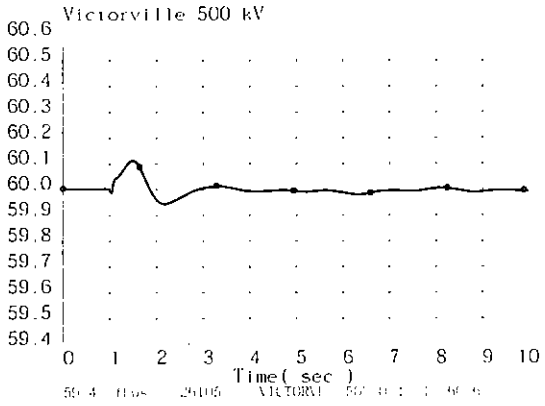






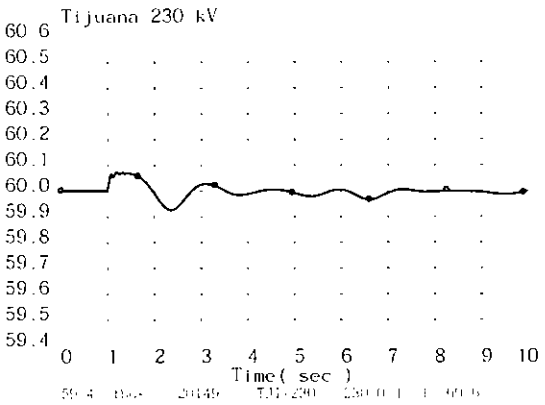


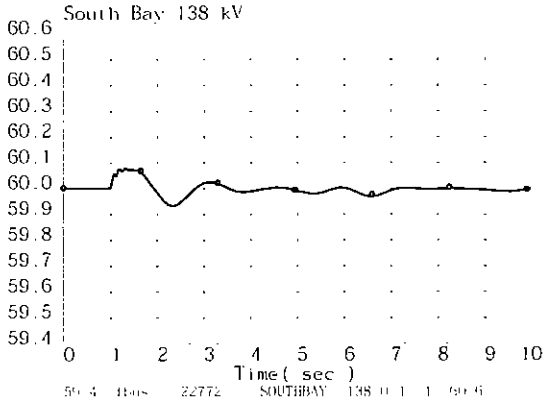


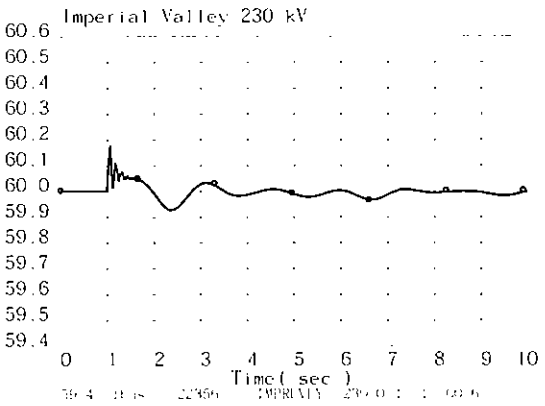


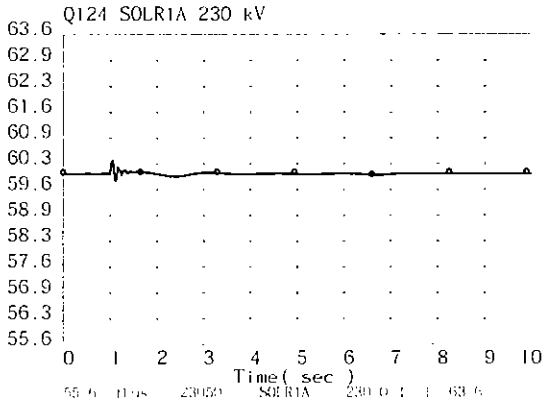
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

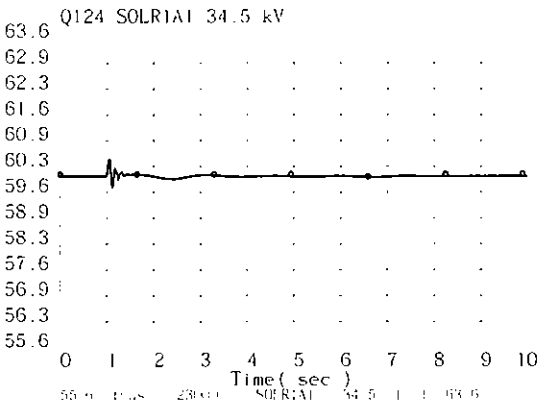
Bus Frequency

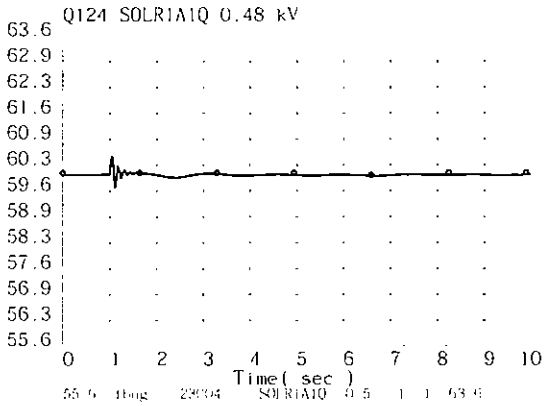






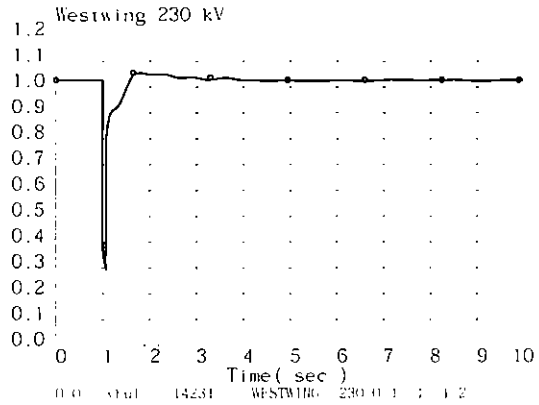


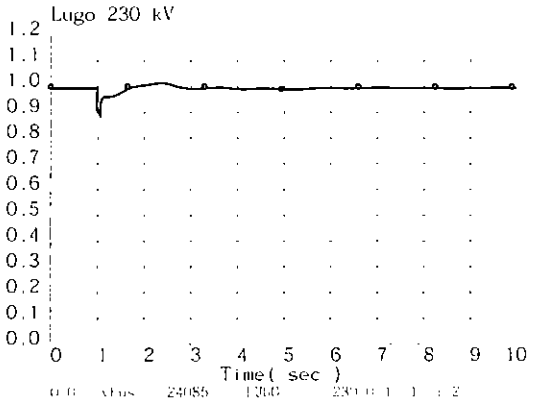


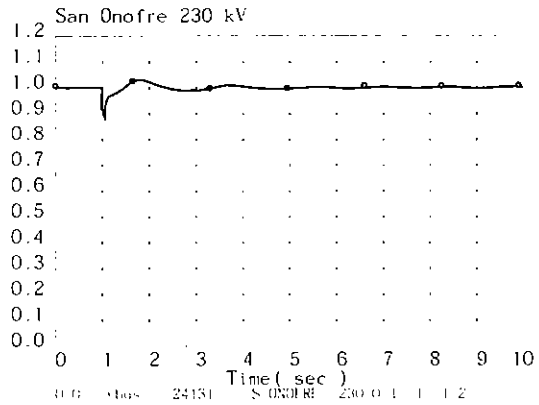


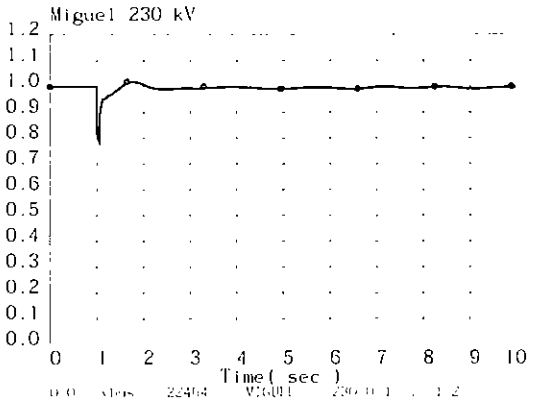
SDG&E 2011 Light Winter Q124 600 MW at IV 230 kV Post-Project Case
case prepared for post-transient/transient stability analysis
3-phase 4 cycle fault at Hassyampa 500 kV, trip Hassyampa - N. Gila 500 kV

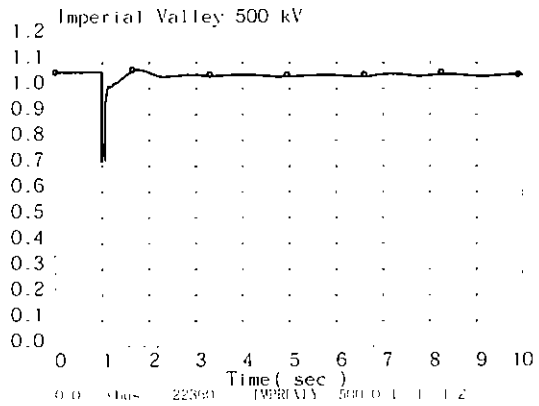
Bus Voltage

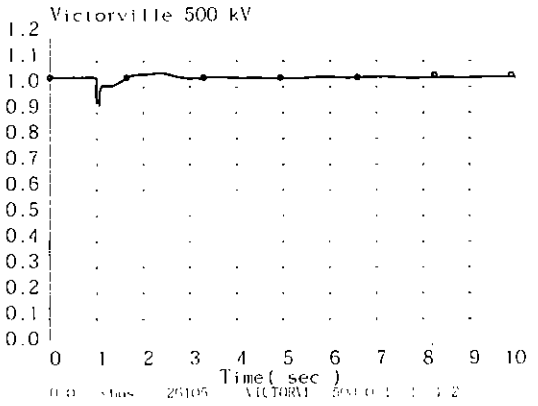












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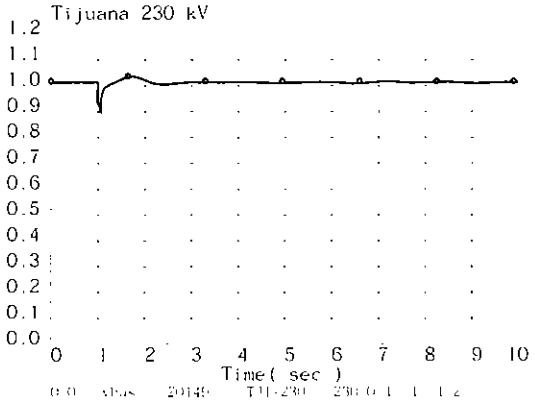

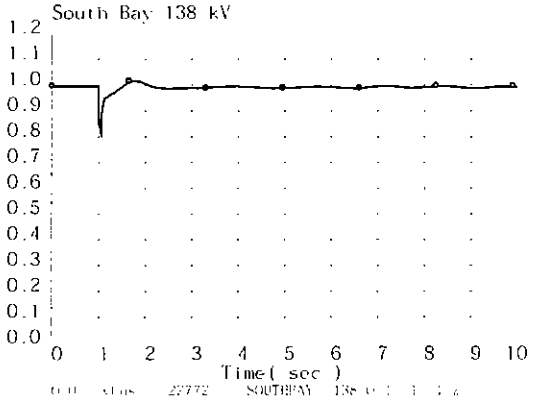

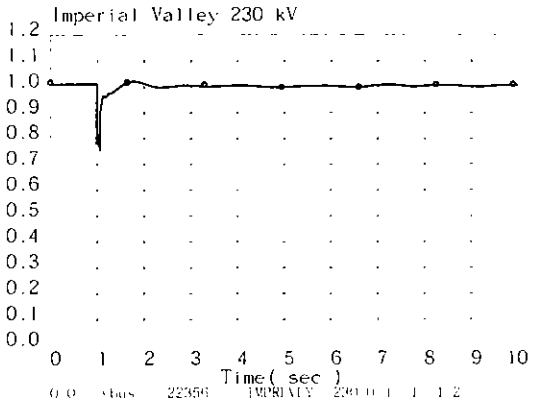

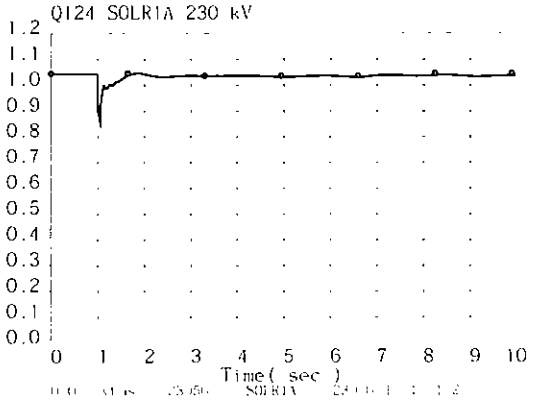

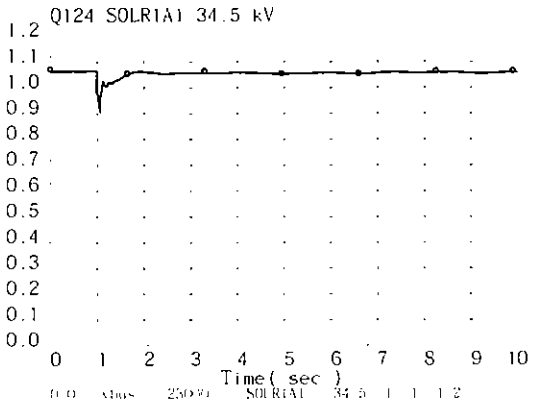

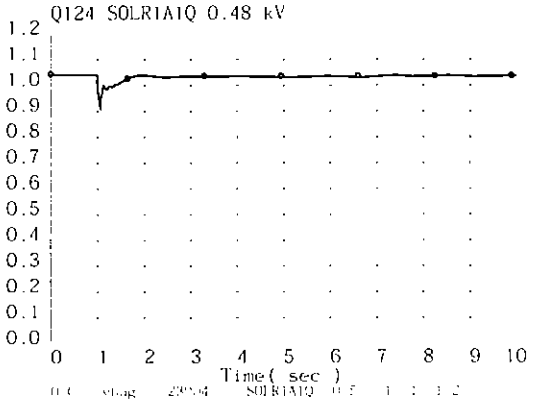

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