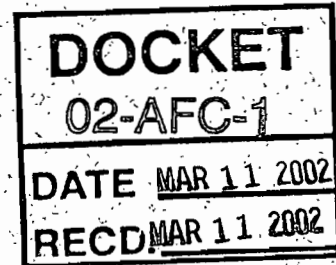


GREYSTONE®

Environmental Consultants, Inc.

March 11, 2002

Mr. William Pfanner
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, California 95814



**Subject: 02-AFC-2 Blythe Energy Project Phase II
Transmission Study Report**

Dear Mr. Pfanner:

Greystone is pleased to submit 20 copies of Volume 3 of the Blythe Energy Project Phase II containing the transmission study report. We are also transmitting 5 compact disks containing the report in pdf format.

If you have any questions or if you need additional information, please don't hesitate to call me at (916) 843-1900.

A handwritten signature in black ink, appearing to read "Peter Boucher".

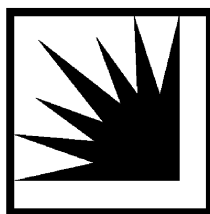
Peter Boucher
Project Manager

Attachment

BLYTHE ENERGY
BLYTHE ENERGY PROJECT II

TECHNICAL ASSESSMENT

March 6, 2002



SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL*SM Company

Prepared by
David Franklin

Southern California Edison Company

James M. Cabell
for Patricia L Mayfield

EXECUTIVE SUMMARY

Blythe Energy LLC. ("Blythe"), submitted an application to Southern California Edison ("SCE"), to interconnect the Blythe II generation project (535MW), in addition to the Blythe I generation project (535MW) for which SCE performed an interconnection study, dated September 25, 2001.

The Blythe I generation project consists of two gas turbines with a maximum operating rating of 175MW each, one steam turbine with a maximum operating rating of 185MW, and an auxiliary load of 15MW. The Blythe II generation project is a duplication of the Blythe I generation project. With a total net generation of 1040MW, the Blythe I and Blythe II projects have a total operating rating of 1070MW with a total auxiliary load of 30MW.

Blythe I Project will initially be connected to Western's Buck Boulevard 161 KV bus. With the addition of Blythe II Project, both projects will then be connected to Western's Buck Boulevard Substation 230 kV bus. Two new 230/161 kV transformer banks will be installed at the Buck Boulevard Substation, along with a new transmission line connecting the Buck Boulevard 161 kV bus and Western's Blythe 161 kV bus. An existing bus-tie connects Western's Blythe 161kV bus to SCE's Blythe 161kV bus. In addition, there are two new transmission lines between the Buck Boulevard 230 kV bus and the Midway X 230 kV bus. Along with these additions are a new 230 kV line between Highline and El Centro substations, and an upgrade of the existing Eagle Mtn, 230/161 kV transformer bank, from 70 MVA to 280 MVA. This study assumes all of the aforementioned upgrades.

SCE performed a System Impact Study for the Blythe II project as requested by Blythe Energy, LLC. The purpose of this study is to assess the projects impact on the SCE's transmission system, and to conduct other analysis to determine if the proposed project requires transmission system modifications and/or possible congestion management by the Cal-ISO. This is needed in order to maintain system reliability in accordance with Cal-ISO Planning Criteria. The study includes assessments of power flow and voltages (steady-state and post-transient), short circuit duties, and transient stability.

The study was conducted for the Blythe II net generation of 1040 MW and a reevaluation of the 520MW for 2004 Heavy Summer loads and for 2004 Light Spring loads (65% of 2004 Heavy Summer load). The 2004 1-in-10 heat wave load forecast was used for the summer case. The power imports to Southern California were maintained within the SCIT limits of 13,200 MW for summer conditions and 12,500 MW for spring conditions. The Spring and Summer cases were both evaluated under high East of River (EOR) and West of River (WOR) flows, and a high Palo Verde – Devers 500 KV flow, with and without the project, for a total of six scenarios (Refer to Table 1 for a complete listing of the path flows).

This study models all generation within the area in the queue (with formal TO Tariff/WDAT Tariff requests) as of December 11, 2001. The Blythe I project study only considered those

generation projects in queue ahead of the Blythe September 2000 application with requested in-service dates prior to September 2001. The Blythe II study identifies the impacts associated with interconnection of the Blythe II project 2004 assuming all projects in queue ahead of the Blythe II are on-line regardless of their requested in-service date. SCE has placed this project in its queue for purposes of allocating costs for system reinforcements. This study provides the basis for requiring mitigation of impacts on SCE's grid caused by this project. **The study accuracy and the results for the assessment of the system adequacy are contingent on the accuracy of the technical data provided by the customer as shown in the Phase II study Appendix B.** SCE should be notified in the event that Blythe Energy decides not to pursue the interconnection with Western Area Power Authority (Western).

Imperial Irrigation District (IID) provided base case representations for both 2003 Heavy Summer and 2003 Light Spring scenarios. IID's system representations for both scenarios were incorporated into the base cases for this study. Western also provided a base case representation that was also incorporated into SCE's 2004 Heavy Summer base. Western's 2003 heavy summer base case loads were reduced to 65% reflect spring conditions.

SCE STUDY RESULTS

Power Flow

The addition of Blythe Energy's generation project mainly affects the loading on 230 kV transmission lines in the Devers, Mirage, Blythe, and Eagle Mountain area. Overloads were identified in SCE's, IID's and Western's area under certain contingencies. IID and Western should re-evaluate their system using the new Blythe Energy project configuration to verify the findings SCE has made regarding the loading of IID's and Western's facilities, respectively. SCE will not recommend or construct projects to mitigate impacts on IID's and Western's system. Blythe Energy will need to work with IID and Western to determine appropriate mitigations.

As discussed below, the results of this System Impact Study identified that with the Blythe I&II projects and previous generation projects ahead of Blythe in the transmission queue:

- a) The flow on Path 42 exceeded its currently acceptable WSCC path rating of 600MW
- b) The SCE transmission system is not adequate to accommodate the proposed generation addition without facility upgrades, Remedial Action Schemes (RAS), or implementing Cal-ISO congestion management.

Base Case:

Path 42 Discussion:

System congestion is present under 2004 Light Spring and 2004 Heavy Summer conditions due to Path 42 flow exceeding its 600 MW rating. Exceeding Path 42 rating was previously identified in studies evaluating impacts of new market generation ahead of Blythe in the transmission queue. The addition of the Blythe project further increased the flow on Path 42. As the study findings indicate, Path 42 cannot deliver any generation from the Blythe project unless

Path 42 is upgraded. When scheduling flows on Path 42, Cal-ISO will keep the path flow below its path rating under all conditions.

IID has proposed upgrading the Coachella-Devers and Coachella-Ramon, Ramon-Mirage 230kV lines of Path 42, which would mitigate the overloads on these transmission lines caused by the Blythe project and previous projects ahead of Blythe in the queue. Base case, N-1, and N-2 overloads were noted in this study, but the results are not discussed in this report. However, Cal-ISO congestion management would need to be implemented to trip all Blythe generation until Path 42 is re-rated to a higher rating.

Edison owns portions of Coachella – Devers 230kV Transmission Line (From Devers Substation to Mirage Substation). Reconductoring the SCE segment of the Coachella – Devers 230kV transmission line will mitigate the overloads on SCE’s segment of this line.

This technical assessment study identified that Edison’s existing facilities are inadequate to provide service to the proposed Blythe II project under normal conditions with all facilities in service. The following tables summarize N-0, N-1, and N-2 conditions with the Blythe II generation project. Table 2 lists the results of the most critical line outages.

BASE CASE OVERLOADS

Transmission Line/Transformer	Pre-Blythe Project	Post-Bythe I	Post-Bythe II	% Increase*	Congestion
Devers - Mirage 230-kV Transmission Line	64%	85%	107%*	43%	180 MW

As summarized in the above table, a new base case overload was identified during the light load conditions.

Devers-Mirage 230-Kv Transmission Line

With the addition of Blythe II, the Devers-Mirage 230-kV transmission line loadings is increased to 107%, which exceeds the base case limits. Since this is within the long term rating, congestion management, to mitigate the base case overload, is deemed possible. The Blythe project generation would need to be reduced by 180MW to mitigate the Devers-Mirage 230-kV transmission line overload. A second alternative is to upgrade the Devers – Mirage 230kV transmission line.

SINGLE CONTINGENCY OVERLOADS

Transmission Line/Transformer Overloaded	Pre-Blythe Project	Blythe I Project	Blythe II Project	% Increase*	Congestion Management
Blythe (SCE) – Eagle Mountain 161 #1	58	91	121.4	63.4	180MW

Etiwanda 230 - San Bernardino 230 #1	114	120.9	125.9	11.9	1040MW + Additional Generation
San Bernardino - Devers 230 #1	141	146.6	159.7	18.7	1040MW + Additional Generation
Devers - Mirage 230 #1	107	142	175.8	68.8	1040MW + Additional Generation
Devers – Vista 230 #2	101	122.8	132.1	31.1	1040MW + Additional Generation
Mirage 230 - Mirage 115 #1	84	100	111**	27	1040MW + Additional Generation
Mirage 115 - Tamarisk 115 #1	104.8	123	139.8	35	1040MW + Additional Generation
Vista - San Bernardino 230 #2	124	130	132	8	1040MW + Additional Generation
Vista – Devers 230 #1	119	131	140.9	21.9	1040MW + Additional Generation
San Bernardino – Devers 230 kV #2	101	123	132		
Eagle Mountain 230 - Eagle Mountain 161 #1	60	91	121.1	61.1	180MW

* % Increase is a comparison between Blythe II project and pre-project loadings

** This loading percentage is based on the 280MVA Mirage230/115 transformer rating. The loading on the circuit breaker is 143% breaker rating of 218MVA.

Under light spring conditions and heavy summer conditions, a total of 116/scenario single contingencies resulting in overloaded facilities were evaluated to determine the effects on the SCE's facilities. The above table summarizes the worst-case conditions, highest pre and post project loadings on those lines for either light load or heavy summer conditions. The table lists 8 existing and 3 new overloads during light load conditions. The following provides a discussion for each overload identified in the above table:

BlytheSCE- Eagle Mountain 161-kV

An overload on BlytheSCE- Eagle Mountain 161-kV transmission line was previously identified in the Blythe I project. There are plans to upgrade the transmission line to mitigate the overload for the Blythe I project. With the new upgrade, the overload reoccurs with the Blythe II project. With the loss of the Ramon-Mirage 230-kV transmission line, the loading on the BlytheSCE – Eagle Mountain 161-kV exceeds the long term rating for N-1 conditions and short term ratings for N-2 conditions.

The recommendations to mitigate the overload are either: (1) A RAS to trip the Blythe II generation project by 180MW, (2) upgrade the transmission line, or (3) add a new transmission line.

Transmission Lines West of Devers

For the loss of the Devers-Valley 500 kV line during light spring conditions, loading on the following four 230 kV lines west of Devers Substation exceeded their thermal ratings with the Blythe generation project. Three of the four overloads were previously identified in studies for generation projects ahead of Blythe in the transmission queue.

- San Bernardino-Devers 230 kV #1 (existing)

- San Bernardino-Devers 230 kV #2 (new)
- Devers-Vista 230 kV #1 (existing)
- Devers-Vista 230 kV #2 (existing)

These 230 kV lines west of Devers do not have long-term or short-term ratings. A RAS is necessary to either trip Blythe's generation and other generation or, if the RAS is not acceptable, the lines must be upgraded. The recommendations are:

- Upgrade San Bernardino-Devers 230 kV #1 line to at least 1300 Amps for N-1 conditions
- Upgrade San Bernardino-Devers 230 kV #2 line to at least 1350 Amps for N-1 conditions
- Upgrade Devers-Vista 230 kV #1 line to at least 1650 Amps for N-1 conditions
- Upgrade Devers-Vista 230 kV #2 line to at least 1250 Amps for N-1 conditions

San Bernardino – Vista 220kV Transmission Line

The Transmission Assessment also identified an overload on the 2400A wave trap on the San Bernardino - Vista 220kV Transmission Line, at the San Bernardino Generating Station, 220kV Switchyard under N-1 contingencies caused by either a loss of Etiwanda – San Bernardino 220kV Transmission Line or Devers - Valley 500kV transmission line outages.

This wave trap is included in SCE's Carrier Replacement Program and is scheduled to be removed, at SCE's expense, by December 1, 2002.

Mirage 230/115-k Transformer

For the loss of the Devers-Mirage 230 kV line during heavy summer conditions, a pre-project thermal overload was identified on the Mirage 230/115 kV transformer bank. The loading on the transformer bank increases to 111%. A previous generation study ahead of Blythe in the queue identified an overload on the Mirage 230/115kV transformer bank. The Blythe project compounds the loading on this transformer bank. The previous study identified the need for a new transformer bank.

Installing a new transformer bank will mitigate the overload. If the bank is installed, the overload will be mitigated. If the project is not built, then a RAS is required to trip the Blythe Project by 180MW.

Mirage - Tamarisk 115 #1

With the loss of the Devers – Mirage 230kV transmission line, the loading on the Mirage – Tamarisk 115kV transmission line increases to 139%, which exceeds its long term thermal rating. A previous generation study ahead of Blythe in the queue identified an overload on the Mirage – Tamarisk 115kV #1 transmission line. A RAS to mitigate the overload requires tripping Blythe II project and additional generation that exceeds the 1150 MW criteria. A RAS is not acceptable. A second alternative, as recommended in the previous study, is to loop the existing Devers – Capwind – Concho – Ramon(IID) 115kV line into the Mirage Substation (SCE). This line rearrangement mitigates the overload on this transmission line.

DOUBLE CONTINGENCY OVERLOADS

Transmission Line/Transformer Overloaded	Pre-Blythe Project	Blythe I Project	Blythe II Project	% Increase	Congestion Management
2004 Spring					
Buck 230 - Buck 161kV	0	93	200	200	520MW
Eisenhower - Thornhill 115 #1	82.8	163	207.8	125	865MW
Thornhill - Tamarisk 115 kV	104	191.4	235.7	235.7	1040 + Additional Generation
Mirage - Tamarisk 115 kV	171	207	245	74	1040 + Additional Generation
Santa Rosa - Tamarisk 115 kV	85	144	169	84	1040
Blythe (SCE) - Eagle Mountain 161 #1	32	96.4	166	134	520MW
Etiwanda 230 - San Bernardino 230 #1	46	133	139.7	93.7	1040MW + Additional Generation
San Bernardino – Devers 230 #1	120.7	136.3	149.4	28.7	1040MW + Additional Generation
Devers - Mirage 230 #1	108.4	141.9	174.1	65.7	1040MW + Additional Generation
Mirage 230 - Mirage 115 #1	173.6	207.3	232.9	59.3	1040MW + Additional Generation
Vista - San Bernardino 230 #2	131.9	139.2	144.9	13	1040MW + Additional Generation
Vista - Devers 230 #1	110	119	128	18	1040MW + Additional Generation

* %Increase is a comparison between Blythe II project and pre-project loadings

Under light spring conditions and heavy summer conditions, a total of 18/scenario double contingencies were evaluated to determine the effects on the SCE's facilities. The above table summarizes the worst-case conditions, highest pre and post project loadings on those lines. The table lists 7 existing and 5 new overloads (Pre-Blythe I) during light load conditions. The following provides a discussion for each overload identified in the above table:

BlytheSCE-Eagle Mountain 161 kV Transmission Line

With the loss of the Midway X – Buck Boulevard 1&2 transmission lines, the loading on the BlytheSCE – Eagle Mountain 161-kV exceeds the short term ratings for N-2 conditions. An overload on this transmission was identified in the Blythe I project. Subsequently, there are plans to upgrade the transmission line that will mitigate the overload for the Blythe I project. With the new upgrades, the overload reoccurs with the Blythe II project.

A RAS is required to trip the Blythe II project to mitigate the overloads on the BlytheSCE – Eagle Mountain 161-kV transmission line. If the Special Protection System (SPS) is not an acceptable recommendation to trip the Blythe Project, facility upgrades are required to mitigate the overload.

Transmission Lines West of Devers

A simultaneous outage of the Etiwanda-San Bernardino#1 and San Bernardino-Vista 230kV#2 lines results in additional overloading on the Devers-Vista 230kV No. 1, Devers-Vista 230kV No. 2, and San Bernardino – Devers 230kV transmission lines. The loadings exceed the conductor thermal rating of these transmission lines. Clearance issues on Devers-Vista 230kV 1&2, and San Bernardino – Devers 230kV transmission lines limit the maximum allowable loading to no more than their normal rating of 1150, 1240 amps, and 796 Amps respectively. Generation reduction was recommended for previous project(s) to reduce loading to within acceptable limits. These overloads were previously identified in studies for generation projects ahead of Blythe in the transmission queue.

Remedial action to trip generation under contingency conditions is an option to mitigate the bulk power system overloads identified above. If the RAS option is acceptable to the CAISO as the mitigation measure for the overloads, participation by the proposed Blythe I&II projects will be required in 2004 if all queue projects materialize and if the need, during actual operation of the system, arises. A RAS is needed to trip all of Blythe I&II generation projects and additional generation in SCE's eastern area to mitigate the overloads on these transmission lines.

If a RAS is not acceptable, facility upgrades are required to mitigate the overloads.

Mirage 230/115 kV transformer bank

For the loss of the Devers-Mirage & Coachella-Devers 230 kV transmission lines during heavy summer conditions, a pre-project thermal overload was identified on the Mirage 230/115 kV transformer bank. The Blythe I & II generation projects increase the loading on this transformer bank. As previously discussed for N-1 contingencies, installing a new Mirage 230/115kV transformer will mitigate this overload.

Mirage – Tamarisk 115kV Transmission

For the loss of the Coachella-Devers & Devers-Mirage 230 kV lines, the Blythe Project II generation project compounded overloads on the Thornhill – Tamarisk 115kV, Santa Rosa – Tamarisk 115kV, Mirage – Tamarisk 115kV, and Eisenhower – Thornhill 115kV #1 transmission lines. The Blythe Project II project creates a new overload on the Santa Rosa – Tamarisk 115kV transmission line. Congestion management may not be feasible due to the amount of generation to be tripped will exceed SONGS 1150MW. A second alternative, as identified in a previous generation project study, is to construct new a Concho-Mirage 115 kV line by looping the Concho to Mirage 115kV to correct the Mirage-Tamarisk 115 kV line overload.

Etiwanda – San Bernardino 230kV #1 Transmission Line

With the loss of the Vista – San Bernardino #2 115 kV and Devers – Vista #2 115kV transmission line, the loading on the Etiwanda – San Bernardino 230kV #1 transmission exceeds the wave trap rating. A RAS is required to trip 1040MW plus additional generation. An alternative is to upgrade the wave trap to increase the rating.

Post-Transient

The Blythe Energy project does not result in large changes to the voltage stability characteristics of SCE's system. All single contingencies were within the 7% post-transient limit for percent voltage change. All double contingencies were well within the 10% post-transient limit for percent voltage change.

Short-Circuit

Short circuit duty study results indicate the potential for equipment capability to be exceeded on SCE's, MWD's, and Western's system. These evaluations should be done concurrently by each utility in order for the project to be able to achieve a timely mitigation, if necessary, and to meet its target operating date. SCE typically refers to this evaluation of equipment as a facility study. The Blythe II project increases three-phase short-circuit duties 0.1 kA at four buses, as follows: five 230kV, and two 161kV buses. A Facility Study should be done to determine whether this project could be accommodated within existing breaker ratings of SCE equipment

The single phase-to-ground fault duties could not be completed due to insufficient data for the IID 230kV. This will be part of the Facility Study. MWD breaker ratings at Eagle Mountain and Gene substations should be checked during the Facility Study since the short-circuit duty at those locations were above 0.1 kA. Refer to Table 4 for a complete listing of the substations.

Transient Stability

With the N-2 of Coachella – Devers & Ramon – Mirage 230 kV lines outages, the system is unstable with the Blythe II project. . However for the same outage without the Blythe II project, the system is stable. A RAS is required to trip generation of 180MW. Refer to table 5 for a listing of the line outages that were evaluated for stability studies.

CONCLUSION:

A Facilities Study will be required to determine the facilities and upgrades required to interconnect the proposed Blythe II project beyond 2004. The study scope is similar to that proposed in Blythe I interconnection study. The study should:

1. Review feasibility and develop costs associated with upgrades to mitigate the two base case overloads. Verify if the addition of a second Mirage 230/115 kV transformer bank mitigates the overloads. Develop cost for adding the second bank.

➤ **Devers – Mirage 230kV Transmission Line**

- **Reconductor the SCE segment of the Coachella-Devers 230kV transmission line (From Devers Substation to Mirage Substation) with 2-1590KCMIL ACSR**
2. Review feasibility and develop costs associated with upgrades to mitigate N-1 contingency overloads. Verify the proposed projects mitigate the overloads, and determine if it causes additional problems (e.g. breaker replacement).
 - **Mirage 230/115kV Transformer**
 - **BlytheSCE – Eagle Mountain 161kV**
 - **Etiwanda 230 – San Bernardino 230kV #1**
 - **Devers – Mirage 230kV**
 - **Devers – Vista #1 230kV**
 - **Devers – Vista #2 230kV**
 - **San Bernardino – Devers #1 230kV**
 - **San Bernardino – Vista #2 230kV**
 - **Mirage 230/115kV Transformer**
 - **Mirage Tamarisk 115 #1**
 - **Coachella – Devers 230kV Transmission Line**
 - **Form the Devers – Capwind – Concho – Mirage 115kV Line into Mirage Substation**
 3. Review feasibility and develop costs associated with upgrades to mitigate N-2 contingency overloads. Verify if the N-1 mitigation also mitigates N-2 overloads.
 - **BlytheSCE – Eagle Mountain 161kV**
 - **Buck 230/161kV**
 - **Eisenhower – Thornhill 115 #1**
 - **Mirage – Tamarisk 115kV**
 - **Thornhill – Tamarisk 115kV**
 - **Santa Rosa – Tamarisk 115kV**
 - **Etiwanda – San Bernardino 230kV #1**
 - **San Bernardino – Devers 230 #1**
 - **Devers – Mirage 230kV #1**
 - **Mirage 230/115kV #1**
 - **Vista-San Bernardino 230kV #2**
 - **Vista - Devers 230 #1**
 - **Etiwanda – San Bernardino 230kV #2**
 4. Evaluate the conductor at the Blythe Substation that connects Blythe (Western) and Blythe (SCE) to determine if it should be upgraded with a conductor with greater capacity.
 5. Design a Remedial Action Scheme (RAS) that will automatically trip the proposed Blythe project generation if the need arises. Determine if addition SPS is required with the upgrades. All the N-2 contingencies involve at least one of these N-1 Contingency

and hence tripping the project for the single contingencies requiring RAS also affectively remove its contribution for the overloads for related N-2 s.

6. Review circuit breakers at the four 230-kV substation locations (Refer Table 3) to determine need for breaker replacement and develop cost for breaker upgrades/replacement cost allocation.
7. With the Blythe II generation project, the case is unstable for an outage Coachella-Devers & Ramon-Mirage 230kV transmission lines. Without the Blythe II generation project, the case is stable. Design a RAS to trip the generation by 180MW.
8. Conduct single phase to ground SCD study. Determine if additional circuit breakers need to be evaluated and if upgrades are required. Develop cost if applicable.

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BLYTHE II PROJECT COMPANY
BLYTHE II PROJECT
TECHNICAL ASSESSMENT STUDY

INTRODUCTION

Blythe Energy LLC. ("Blythe"), submitted an application to Southern California Edison ("SCE"), to interconnect the Blythe II generation project (535MW), in addition to the Blythe I generation project (535MW) for which SCE performed an interconnection study, dated September 25, 2001.

The purpose of this Technical Assessment is to assess the Blythe II project impact on the SCE transmission system, and to conduct other analysis to determine if the proposed project requires transmission system modifications and/or possible congestion management by the Cal-ISO. This is needed in order to maintain system reliability in accordance with Cal-ISO Planning Criteria. The study includes assessments of power flow and voltages (steady-state and post-transient), short circuit duties, and transient stability.

The Blythe I generation project consists of two gas turbines with a maximum operating rating of 175MW each, one steam turbine with a maximum operating rating of 185MW, and a station auxiliary load of 15MW. The Blythe II generation project is a duplication of the Blythe I generation project. With a total net generation of 1040MW, the Blythe I and Blythe II projects have a total operating rating of 1070MW with a total auxiliary station load of 30MW.

Blythe Project I will initially be connected to the Buck Boulevard 161 KV bus. With the addition of Blythe Project II, both projects will then be connected to the Buck Boulevard Substation 230 kV bus. Two new 230/161 kV transformer banks will be installed at the Buck Boulevard Substation, along with a new transmission line connecting between the Buck Boulevard 161 kV bus and the Blythe 161 kV bus. In addition, there are two new transmission lines between the Buck Boulevard 230 kV bus and the Midway X 230 kV bus. Along with these additions are a new 230 kV line between Highline and El Centro substations, and an upgrade of the existing Eagle Mtn, 230/161 kV transformer bank, from 70 MVA to 280 MVA. This study assumes all of the aforementioned upgrades.

The study was conducted for the Blythe II net generation of 1040 MW and a reevaluation of the Blythe I of 520MW for 2004 Heavy Summer loads and for 2004 Light Spring loads (65% of 2004 Heavy Summer load). The 2004 1-in-10 heat wave load forecast was used for the summer case. The power imports to Southern California were maintained within the SCIT limits of 13,200 MW for summer conditions and 12,500 MW for spring conditions. The Spring and Summer cases were both evaluated under high East of River (EOR) and West of River (WOR)

flows, and a high Palo Verde – Devers 500 KV flow, with and without the project, for a total of six scenarios.

This study models all generation within the area in the queue (with formal TO Tariff/WDAT Tariff requests) as of December 11, 2001. The Blythe I project study only considered those generation projects in queue ahead of the Blythe September 2000 application with requested in-service dates prior to September 2002. The Blythe II study identifies the impacts associated with interconnection of the Blythe II project for the year 2004 assuming all projects in queue ahead of the Blythe II are on-line regardless of their requested in-service date. SCE has placed this project in its queue for purposes of allocating costs for system reinforcements. This study provides the basis for requiring mitigation of impacts on SCE's grid caused by this project. **The study accuracy and the results for the assessment of the system adequacy are contingent on the accuracy of the technical data provided by the customer as shown in the Phase II study Figure 2 and Appendix B.** SCE should be notified in the event that Blythe Energy decides not to pursue the interconnection with Western Area Power Authority ("Western").

IID provided base case representations for both 2003 Heavy Summer and 2003 Light Spring scenarios. IID's system representations for both scenarios were incorporated into the base cases for this study. Western also provided a base case representation that was also incorporated into SCE's 2004 Heavy Summer base. Western's 2003 heavy summer base case loads were reduced to 65% to reflect spring conditions.

STUDY CONDITIONS AND ASSUMPTIONS

A. Planning Criteria

The study was conducted by applying the California Independent System Operator (CAISO) Reliability Criteria. More specifically, the main criteria applicable to this study are as follows:

Load Flow Assessment

The following contingencies are considered for transmission or sub transmission lines and 500/230 kV transformer banks ("AA-Banks"):

Assuming the largest unit (San Onofre Unit 2 or 3) initially off and then:

- Single Contingencies (N-1 Line or N-1 AA-Bank)

Assuming both San Onofre Units 2 and 3 in service and then:

- Single Contingencies (N-1 Line or N-1 AA-Bank)
- Double Contingencies (N-2 Two Lines, N-1 Line and N-1 AA-Bank)
(Outages of two AA-Banks are beyond the Planning Criteria)

The following loading criteria are used:

Transmission Lines	Base Case	Limiting Component Normal Rating
	N-1	Limiting Component A-Rating
	N-2	Limiting Component B-Rating
500-230kV Transformer Banks	Base Case	Normal Loading Limit
	Long-Term & Short-Term	As defined by SCE Operating Bulletin

The following principles were used in determining whether congestion management, remedial action schemes, or facility upgrades are required to mitigate base case, single contingency, or double contingency overloads.

- Congestion management, as means to mitigate base case overloads, can be used if it is determined to be manageable and the CAISO concurs with the use of congestion management.
- Facility upgrades will be required if it is determined that the use of congestion management is impractical.
- Remedial action schemes (RAS), in lieu of facility upgrades, will be recommended if the scheme is effective and is not a hazard to reliability. Hazard determination will be made if the amount of generation tripping exceeds a single SONGS unit.
- Facility upgrades will be recommended if RAS is determined to be unworkable or determined to be a hazard to reliability.
- Congestion management in preparation for the next contingency will be required if no facility upgrades or remedial action schemes are implemented.

Congestion Assessment

The following study method was implemented to assess the extent of possible congestion:

- a). Under Base Case (all transmission facilities in service), without the proposed Project, the system was evaluated with all existing interconnected generation and all generation requests in the area that have a queue position ahead of this request.
- b). Under Base Case, the total output of the proposed project was added and the system was reevaluated.

If the normal loading limits of facilities are exceeded, the overload is identified as either an existing overload caused by a project or number of projects in queue ahead of the proposed project or identified as having been caused by the addition of the proposed project. The Blythe II project and other projects in queue ahead of this request may be subjected to congestion management, potential upgrade cost sharing and/or participation of any proposed remedial action schemes if the project aggravates or triggers the overload. Additionally, the Blythe II project may have to participate in mitigation of

overloads triggered by subsequent projects in queue, subject to FERC protocols and policies.

The results of these studies should be able to identify:

- a). If there is capacity available to accommodate the proposed project and all projects in queue without the need for congestion management, remedial action schemes or facility upgrades.
- b). If overloads exist in the area with all projects in queue and all facilities in service. The amount of congestion will be determined by reducing generation projects in reverse queue order until the overload is mitigated. Although this may not be the most efficient market method to manage congestion, it does consider the incremental impacts of all new projects on the system, it identifies the extent of the possible congestion impact on the project, and it doesn't mask the impacts by using other existing market generators.
- c). If congestion exists in the area with all projects in queue under single element and double element outage conditions assuming no new remedial action schemes in place. The amount of congestion will be determined by reducing generation projects in reverse queue order until the overload is mitigated. This value will be used in determining if use of remedial action schemes fit under the less than one SONGS unit criteria.
- d). If remedial action schemes appear to be workable solutions to increasing the amount of generation that can be accommodated prior to a potential single and/or double element outage condition. Since remedial action schemes require hard wiring of specific units, RAS will be recommended in reverse queue order recommending tripping only those generators which triggered and aggravated the overloads.
- e). If sufficient capacity is maintained to accommodate all Must Run and Regulatory Must-Take generation resources with all facilities in service
- f). If sufficient capacity is maintained to accommodate the total output of any one generation resource which is not classified as Must-Run

B. Blythe Generation Project

Figure 1 shows the one-line diagram for the Blythe I project 535MW, 2 gas turbines and 1 steam turbine, and an auxiliary load of 15MW. Figure 2 shows the one-line diagram for the Blythe I & II projects, 4 gas turbines and 2 steam turbines, and an auxiliary of load of 30MW. This technical assessment would maintain the upgrades as deemed necessary to maintain system reliability for the Blythe I project study. A summary of the net total power output for station is as follows:

The dynamic data for Blythe I&II project, as provided by Blythe Company, was modeled in the GE PSLF program for this Blythe I & II study (See Appendix B).

Blythe I & II Generation Projects

Generator	MW	No.	Total MW	Auxiliary Load MW	Net Output
Gas Turbines	175	4	700	15	685
Steam Turbines	185	2	370	15	355
Total Output			1070	30	1040

The Blythe II project is connected to the Western's Buck 230kV substation. The Buck Boulevard 230kV bus is stepped down to 161kV. A new transmission line connects Buck Boulevard 161kV to Western's Blythe 161 kV substation. An existing bus-tie connects Western's Blythe 161kV bus to SCE's Blythe 161kV bus. A 161kV transmission line connects Blythe 161kV substation to Eagle Mountain 161kV substation (Path 59). The Blythe 161kV – Eagle Mountain 161kV transmission line connects the Blythe substation to the CAISO controlled system. The ratings of this line is limited by the line conductor as follows:

Transmission Line	N-Rating AMPS	A-Rating AMPS	B-Rating AMPS
Blythe – Eagle Mountain 161kV	605	695	725

C. System Conditions

Several bulk transmission system conditions were studied based on varying demand levels in Southern California. Each scenario assumed relatively high levels of Southern California import on the EOR and WOR. The generation in SCE's eastern area were online.

To simulate the SCE transmission system for analysis, the study used the WSCC's 2003 heavy summer and 2002 light spring base cases. Loads were modified in the 2002 Light Spring base case to reflect 2003 Light Spring forecast (65% of Heavy Summer). The loads are based on SCE's latest Transmission Substation Transformer Capacity Assessment as shown in Table 1-1 and 1-2. The forecast corresponds to a one-in-ten-year heat wave assumption for the local system. It should be noted that loads lower than 65% during actual operation of the system might subject the proposed project to congestion management not identified by this study.

D. Load Flow Study

Bulk power system load flow studies were conducted under 2004 heavy summer and light spring conditions. Further description of the case assumptions follows:

- a). 2004 Heavy Summer without the project, Case 1

2004 heavy summer load. Generation included: Year 2000 reliability must-run, regulatory must-take, all existing generation in SCE's eastern area and all other proposed generation projects in queue up to the proposed project request.

- b). 2004 Heavy Summer with the Blythe I project, Case 2

Case 1 modified to include the addition of the Blythe I project (520MW).

- c). 2004 Heavy Summer with the Blythe I project, Case 3

Case 2 modified to include the addition of the Blythe II project (520MW).

- d). 2004 Light Spring without the project, Case 4

2004 light spring load with high EOR, WOR, Palo-Verde Generation included: Year 2000 reliability must-run, regulatory must-take, all existing generation in SCE's eastern area and all other proposed generation projects in queue up to the proposed project request.

- e). 2004 Light Spring with the Blythe I project, Case 5

Case 4 modified to include the addition of the Blythe I project (520). The addition of the Blythe I project displaced the Mohave generation

- f). 2004 Light Spring with the Blythe I project, Case 6

Case 4 modified to include the addition of the Blythe II project (520). The addition of the Blythe II displaced the Midway-Vincent flow to maintain the SCIT level at 12500MW.

Case Summary

SCE AREA TOTAL GENERATION, IMPORT,						
LOAD AND LOSSES (MW)						
	Summer 2004			Spring 2004		
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Generation	16827	16035	15238	8,157	7,590	7,609
Import	5,529	6,309	7,101	7,355	7,930	7,940
Load	21,889	21,889	21,889	15,115	15,115	15,115
Losses	467	455	450	397	405	433

Simulations

For each of the four cases, load flow simulations of the bulk power system were conducted for the base case, single contingencies and double contingencies for lines and 500-230 kV transformer banks to determine impacts to the SCE system. Both spring and summer system conditions were modeled as described above. A total of 116/scenario single line (N-1) and 18/scenario double line (N-2) contingencies in SCE's CAISO controlled grid were studied for each scenario with system performance monitored for thermal loading planning criteria violations on the system. Both contingency lists are available upon request.

E. Transient Stability and Post Transient Voltage Studies

Stability studies were conducted for the contingencies listed in Table 4. These contingencies were identified in the following two studies:

1. in this system impact study, with 5-cycle 3-phase faults on 230-kV buses in the vicinity of the Devers 230-kV bus and 4-cycle 3-phase faults on the most critical 500-kV buses

The same Blythe II project cases used for power flow studies were also used for the stability study. Stability studies were performed on the 2004 Heavy Summer and Light Spring cases with Blythe 1040MW online. If a case was unstable or diverged, then the stability studies were performed without the project. For each of the two cases, a total of 14 critical contingencies were evaluated for stability.

F. Short Circuit Duty Study

To determine the impact of the proposed project on short circuit duties at buses in the SCE bulk transmission system a complete short-circuit duty study was performed. The study calculated the maximum symmetrical three-phase-to-ground short circuit duties and X/R ratios at all the critical 500-kV and 230-kV buses before and after the project. The criteria used to identify substation locations for further circuit-breaker engineering review is an increase of the three-phase-to-ground duties of at least 0.1KA.

The study used a 2004 heavy summer scenario with all generators in service. The study also considered the following major transmission upgrades based on the current plans for the projects identified in the CAISO Controlled Transmission 2000-2005 Assessment:

In addition, market generation projects in queue ahead of the proposed project were added to the short-circuit duty study regardless of their proposed on-line date.

STUDY RESULTS

Power Flow:

The addition of Blythe Energy's generation project mainly affects the loading on 230 kV transmission lines in the Devers, Mirage, Blythe, and Eagle Mountain area. Some overloads were identified in SCE's, Imperial Irrigation District's (IID's) and Western's area under certain contingencies. IID and Western should re-evaluate their system using the new Blythe Energy project configuration to verify the findings SCE has made regarding the loading on IID's and Western's facilities, respectively. SCE will not recommend or construct projects to mitigate impacts on IID's and Western's grids. Blythe Energy will need to work with IID and Western to determine appropriate mitigations.

As discussed below, the results of this System Impact Study identified that with the Blythe I&II projects and previous generation projects ahead of Blythe in the transmission queue:

- a) The flow on Path 42 exceeded its currently acceptable WSCC path rating of 600MW
- b) The SCE transmission system is not adequate to accommodate the proposed generation addition without facility upgrades, Remedial Action Schemes (RAS), or implementing Cal-ISO congestion management.

Base Case:

System congestion is present under 2004 Light Spring and 2004 Heavy Summer conditions due to Path 42 flow exceeding its 600 MW rating. Exceeding Path 42 rating was previously identified in studies evaluating impacts of new market generation ahead of Blythe in the transmission queue. The addition of the Blythe project further increased the flow on Path 42. As the study findings indicate, Path 42 cannot deliver any generation from the Blythe project unless Path 42 is upgraded. When scheduling flows on Path 42, Cal-ISO will keep the path flow below its path rating under all conditions.

IID has proposed upgrading the Coachella-Devers and Coachella-Ramon, Ramon-Mirage 230kV lines of Path 42, which would mitigate the overloads caused by the Blythe project and previous projects ahead of Blythe in the queue. However, Cal-ISO congestion management would need to be implemented to trip all Blythe generation until Path 42 is re-rated to a higher rating.

This technical assessment study identified that the existing facilities are still inadequate to provide service beyond 2004 to the proposed Blythe II project under normal conditions with all facilities in service. The following tables summarize N-0, N-1, and N-2 conditions with the Blythe II generation project.

The BlytheSCE 161 – Blythe(Western) bus-tie has potential loading exceeding the conductor thermal rating under N-1 and N-2 contingencies. SCE is currently verifying the conductor type and rating. The potential overload on this bus-tie requires further evaluation during the facility study.

BASE CASE OVERLOADS

Transmission Line/Transformer	Pre- Blythe Project	Post- Bythe I	Post- Bythe II	% Increase*	Congestion
Devers - Mirage 230-kV Transmission Line	64%	85%	107%*	43%	180 MW

As summarized in the above table, a new base case overload was identified during the light load conditions.

Devers-Mirage 230-Kv Transmission Line

With the addition of Blythe II, the Devers-Mirage 230-kV transmission line loadings is increased to 107%, which exceeds the base case limits. Since this is within the long term rating, congestion management, to mitigate the base case overload, is deemed possible. The Blythe project generation would need to be reduced by 180MW to mitigate the Devers-Mirage 230-kV transmission line overload. A second alternative is to upgrade the Devers – Mirage 230kV transmission.

SINGLE CONTINGENCY OVERLOADS

Transmission Line/Transformer Outage	Pre-Blythe Project	Blythe I Project (520MW)	Blythe II Project (1040MW)	% Increase*	Congestion Management
2004 Spring					
Blythe (SCE) - Eagle Mountain 161 #1 Ramon - Mirage 230 1	58	91	121.4	63.4	180MW
Etiwanda 230 - San Bernardino 230 #1 Vista - San Bernardino 230 #2	114	120.9	125.9	11.9	1040MW + Additional Generation
San Bernardino - Devers 230 #1 Devers - ValleySC 500 #1	141	146.6	159.7	18.7	1040MW + Additional Generation
Devers - Mirage 230 #1 CoachellaLV - Devers 230 #1	107	142	175.8	68.8	1040MW + Additional Generation
Devers - Vista 230 #2 Devers - ValleySC 500 #1	101	122.8	132.1	31.1	1040MW + Additional Generation

Mirage 230 - Mirage 115 #1 Devers - Mirage 230 #1	84	100	111	35.1	1040MW + Additional Generation
Mirage 115 - Tamarisk 115 #1 Devers - Mirage 230 #1	104.8	123	139.8	35	1040MW + Additional Generation
Vista - San Bernardino 230 #2 Devers 500 - ValleySC 500 #1	124	130	132	8	1040MW + Additional Generation
Vista - Devers 230 #1 Devers 500 – ValleySC 500 #1	119	131	140.9	21.9	1040MW + Additional Generation
Eagle Mountain 230 - Eagle Mountain 161 #1 Ramon - Mirage 230 #1	60	91	121.1	61.1	180MW
San Bernardino – Devers 230 kV #2 Devers 500 – ValleySC 500 #1	101	123	132		

* % Increase is a comparison between Blythe II project and pre-project loadings

** This loading percentage is based on the 280MVA Mirage230/115 transformer rating. The loading on the circuit breaker is 143% breaker rating of 218MVA.

Under light spring conditions and heavy summer conditions, a total of 116/scenario single contingencies resulting in overloaded facilities were evaluated to determine the effects on the SCE's facilities. The above table summarizes the worst-case conditions, highest pre and post project loadings on those lines for either light load or heavy summer conditions. The table lists 8 existing and 3 new overloads during light load conditions. The following provides a discussion for each overload identified in the above table:

BlytheSCE- Eagle Mountain 161-kV

An overload on BlytheSCE- Eagle Mountain 161-kV transmission line was previously identified in the Blythe I project. There are plans to upgrade the transmission line to mitigate the overload for the Blythe I project. With the new upgrade, the overload reoccurs with the Blythe II project. With the lost of the Ramon-Mirage 230-kV transmission line, the loading on the BlytheSCE – Eagle Mountain 161-kV exceeds the long term rating for N-1 conditions and short term ratings for N-2 conditions.

The recommendations to mitigate the overload are either: (1) A RAS to trip the Blythe II generation project by 180MW, (2) upgrade the transmission line, or (3) add a new transmission line.

Transmission Lines West of Devers

For the loss of the Devers-Valley 500 kV line during light spring conditions, loading on the following four 230 kV lines west of Devers Substation exceeded their thermal ratings with the Blythe generation project. Three of the four overloads were previously identified in studies for generation projects ahead of Blythe in the transmission queue.

- San Bernardino-Devers 230 kV #1 (existing)
- San Bernardino-Devers 230 kV #2 (existing)
- Devers-Vista 230 kV #1 (existing)
- Devers-Vista 230 kV #2 (existing)

These 230 kV lines west of Devers do not have long-term or short-term ratings. A RAS is necessary to either trip Blythe's generation and other generation or, if the RAS is not acceptable, the lines must be upgraded. The recommendations are:

- Upgrade San Bernardino-Devers 230 kV #1 line to at least 1300 Amps for N-1 conditions
- Upgrade San Bernardino-Devers 230 kV #2 line to at least 1350 Amps for N-1 conditions
- Upgrade Devers-Vista 230 kV #1 line to at least 1650 Amps for N-1 conditions
- Upgrade Devers-Vista 230 kV #2 line to at least 1250 Amps for N-1 conditions

San Bernardino – Vista 220kV Transmission Line

The Transmission Assessment also identified an overload on the 2400A wave trap on the San Bernardino - Vista 220kV Transmission Line, at the San Bernardino Generating Station, 220kV Switchyard under N-1 contingencies caused by either a loss of Etiwanda – San Bernardino 220kV Transmission Line or Devers - Valley 500kV transmission line outages.

This wave trap is included in SCE's Carrier Replacement Program and is scheduled to be removed, at SCE's expense, by December 1, 2002.

Mirage 230/115-k Transformer

For the loss of the Devers-Mirage 230 kV line during heavy summer conditions, a pre-project thermal overload was identified on the Mirage 230/115 kV transformer bank. The loading on the transformer bank increases to 111%. A previous generation study ahead of Blythe in the queue identified an overload on the Mirage 230/115kV transformer bank. The Blythe project compounds the loading on this transformer bank. The previous study identified the need for a new transformer bank.

Installing a new transformer bank will mitigate the overload. If the bank is installed, the overload will be mitigated. If the project is not built, then a RAS is required to trip the Blythe Project by 180MW.

Mirage - Tamarisk 115 #1

With the loss of the Devers – Mirage 230kV transmission line, the loading on the Mirage – Tamarisk 115kV transmission line increases to 139%, which exceeds its long term thermal rating. A previous generation study ahead of Blythe in the queue identified an overload on the Mirage – Tamarisk 115kV #1 transmission line. A RAS to mitigate the overload requires tripping Blythe II project and additional generation that exceeds the 1150 MW criteria. A RAS is not acceptable. A second alternative, as recommended in the previous study, is to loop the existing Devers – Capwind – Concho – Ramon(IID) 115kV line into the Mirage Substation (SCE). This line rearrangement mitigates the overload on this transmission line.

DOUBLE CONTINGENCY OVERLOADS

Transmission Line/Transformer Overload Outage	Pre-Blythe Project	Blythe I Project (520MW)	Blythe II Project (1040MW)	% Increase	Congestion Management
2004 Spring					
Buck 230 - Buck 161kV Midway X - Buck 230 #2 & Midway X - Buck 230 1	0	93	200	200	520MW
Eisenhower - Thornhill 115 #1 CoachellaLV - Devers 230 #1 & Devers - Mirage 230 kV #1	82.8	163	207.8	125	865MW
Thornhill - Tamarisk 115 kV CoachellaLV - Devers 230 kV #1 & Devers - Mirage 230 kV #1		191.4	235.7	235.7	1040 + Additional Generation
Blythe (SCE) - Eagle Mountain 161 #1 Midway X - Buck 230 kV #1 & Midway X - Buck 230 kV #2	32	96.4	166	134	520MW
Etiwanda 230 - San Bernardino 230 #1 Vista - San Bernardino 230 #2 & Devers - Vista 230 #2	46	133	139.7	93.7	1040MW + Additional Generation
San Bernardino - Devers 230 #1 Devers - Vista 230#2 & Devers - San Bernardino 230 #2	120.7	136.3	149.4	28.7	1040MW + Additional Generation
Devers - Mirage 230 #1 CoachellaLV - Devers 230 #1 & CoachellaLV - Devers 230 #1	108.4	141.9	174.1	65.7	1040MW + Additional Generation
Mirage 230 - Mirage 115 #1 Devers - Mirage 230 #1 & CoachellaLV - Devers 230 #1	173.6	207.3	232.9	59.3	1040MW + Additional Generation

Vista - San Bernardino 230 #2 Vista - Devers 230 #1 & Etiwanda - San Bernardino #1	131.9	139.2	144.9	13	1040MW + Additional Generation
Vista - Devers 230 #1 Devers - Vista 230kV #2 & Vista - San Bernardino 230 kV #2	110	119	128	28	1040MW + Additional Generation

* %Increase is a comparison between Blythe II project and pre-project loadings

Under light spring conditions and heavy summer conditions, a total of 18/scenario double contingencies were evaluated to determine the effects on the SCE's facilities. The above table summarizes the worst-case conditions, highest pre and post project loadings on those lines. The table lists 7 existing and 5 new overloads (Pre-Blythe I) during light load conditions. The following provides a discussion for each overload identified in the above table:

Eagle – Mountain 161 kV Transmission Line

With the loss of the Midway X – Buck Boulevard 1&2 transmission lines, the loading on the BlytheSCE – Eagle Mountain 161-kV exceeds the short term ratings for N-2 conditions. An overload on this transmission was identified in the Blythe I project. Subsequently, there are plans to upgrade the transmission line that will mitigate the overload for the Blythe I project. With the new upgrades, the overload reoccurs with the Blythe II project.

A RAS is required to trip the Blythe II project to mitigate the overloads on the BlytheSCE – Eagle Mountain 161-kV transmission line. If the Special Protection System (SPS) is not an acceptable recommendation to trip the Blythe Project, facilities upgrades are required to mitigate the overload.

Transmission Lines West of Devers

A simultaneous outage of the Etiwanda-San Bernardino#1 and San Bernardino-Vista 230kV#2 lines results in additional overloading on the Devers-Vista 230kV No. 1, Devers-Vista 230kV No. 2, and San Bernardino – Devers 230kV transmission lines. The loadings exceed the conductor thermal rating of these transmission lines. Clearance issues on Devers-Vista 230kV 1&2, and San Bernardino – Devers 230kV transmission lines limit the maximum allowable loading to no more than their normal rating of 1150, 1240 amps, and 796 Amps respectively. Generation reduction was recommended for previous project(s) to reduce loading to within acceptable limits. These overloads were previously identified in studies for generation projects ahead of Blythe in the transmission queue.

Remedial action to trip generation under contingency conditions is an option to mitigate the bulk power system overloads identified above. If the RAS option is acceptable to the CAISO as the mitigation measure for the overloads, participation by the proposed Blythe

I&II projects will be required in 2004 if all queue projects materialize and if the need, during actual operation of the system, arises. A RAS is needed to trip all of Blythe I&II generation projects and additional generation in SCE's eastern area to mitigate the overloads on these transmission lines.

If a RAS is not acceptable, facility upgrades are required to mitigate the overloads.

Mirage 230/115 kV transformer bank

For the loss of the Devers-Mirage & Coachella-Devers 230 kV transmission lines during heavy summer conditions, a pre-project thermal overload was identified on the Mirage 230/115 kV transformer bank. The Blythe I & II generation projects increase the loading on this transformer bank. As previously discussed for an N-1 contingency, installing a new Mirage 230/115kV transformer will mitigate this overload.

Mirage – Tamarisk 115kV Transmission

For the loss of the Coachella-Devers & Devers-Mirage 230 kV lines, the Blythe Project II generation project compounded overloads on the Thornhill – Tamarisk 115kV, Santa Rosa – Tamarisk 115kV, Mirage – Tamarisk 115kV, and Eisenhower – Thornhill 115kV #1 transmission lines. The Blythe Project II project creates a new overload on the Santa Rosa – Tamarisk 115kV transmission line. Congestion management may not be feasible due to the amount of generation to be tripped will exceed SONGS 1150MW. A second alternative, as identified in a previous generation project study, is to construct a new Concho-Mirage 115 kV line by looping the Concho to Mirage 115kV to correct the Mirage-Tamarisk 115 kV line overload.

Etiwanda – San Bernardino 230kV #1 Transmission Line

With the loss of the Vista – San Bernardino #2 115 kV and Devers – Vista #2 115kV transmission line, the loading on the Etiwanda – San Bernardino 230kV #1 transmission exceeds the wave trap rating. A RAS is required to trip 1040MW plus additional generation. An alternative is to upgrade the transmission line. An alternative is to upgrade the wave trap to increase the rating.

Post-Transient

The Blythe Energy project does not result in large changes to the voltage stability characteristics of SCE's system. All single contingencies were within the 7% post-transient limit for percent voltage change. All double contingencies were well within the 10% post-transient limit for percent voltage change.

Short-Circuit

Short circuit duty study results indicate the potential for equipment capability to be exceeded on SCE's, MWD's, and Western's system. These evaluations should be done concurrently by each

utility in order for the project to be able to achieve a timely mitigation, if necessary, and to meet its target operating date. SCE typically refers to this evaluation of equipment as a facility study. The Blythe II project increases three-phase short-circuit duties 0.1 kA at four buses, as follows: five 230kV, and two 161kV buses.

A Facility Study should be done to determine whether this project could be accommodated within existing breaker ratings of SCE equipment

Miraloma E	230kV
Miraloma W	230kV
Mirage	230kV
Devers	230Kv

The single phase-to-ground fault duties could not be completed due to insufficient data for the IID 230kV system. This will be part of the Facility Study. MWD breaker ratings at Eagle Mountain and Gene substations should be checked during the Facility Study since the short-circuit duty at those locations were above 0.1 kA.

Transient Stability

With the N-2 of Coachella – Devers & Ramon – Mirage 230 kV lines outages, the system is unstable with the Blythe II project. . However for the same outage without the Blythe II project, the system is stable. A RAS is required to trip generation of 180MW.

CONCLUSIONS AND RECOMMENDATIONS

Studies identified that the existing facilities are inadequate to accommodate the Blythe II generation project. The study identified the need for congestion management for:

Base Case

- Devers-Mirage 230kV Transmission Line
- Coachella – Devers 230kV Transmission Line

N-1 Contingencies

- BlytheSCE-Eagle Mountain 161kV (Transmission Line)
- Etiwanda-San Bernardino 230kV #1 (Transmission Line)
- Devers-Mirage 230kV (Transmission Line)
- Devers-Vista #1 230kV (Transmission Line)
- Devers-Vista #2 230kV (Transmission Line)
- San Bernardino-Devers#1 230kV (Transmission Line)
- San Bernardino – Vista#2 230kV (Wave Trap)
- Mirage 230-Mirage 1150kV (Transformer)
- Mirage-Tamarisk 115kV#1 (Transmission Line)

N-2 Contingencies

- BlytheSCE- Eagle Mountain 161-kV (Transmission Line)

Etiwanda-San Bernardino 230kV#1
 Devers – Mirage 230-kV (Transmission Line)
 Devers – Vista #1 230-kV (Transmission Line)
 Devers – Vista #2 230-kV (Transmission Line)
 Mirage 230-kV – Mirage 115-kV (Transformer)
 Vista – San Bernardino 230kV #2 (Transmission Line)
 Eagle Mountain – Eagle Mountain 161kV #1 (Transmission Line)

Studies identified that the existing facilities are inadequate to provide service to the proposed Blythe II project under normal conditions with all facilities in service and under N-1 and N-2 contingencies:

- Transmission capacity on the SCE's Devers/Mirage 115 kV system is not adequate to accommodate the proposed generation addition without upgrades under base case.
- CAISO approval of RAS is required as mitigation option for the three 230 kV lines, Devers-San Bernardino and Devers-Vista Nos. 1 and 2, under N-1 and N-2 contingencies in both summer and spring load conditions.
- If congestion management is needed, the developer must agree to participate in the congestion management schemes in accordance with CAISO's protocols without compensation from Edison.
- For the outage of Etiwanda – San Bernardino 220kV Transmission Line or Devers - Valley 500kV Transmission Line outages, the . This Wave Trap is included in SCE's Carrier Replacement Program and is scheduled to be removed, at SCE's expense, by December 1, 2002
- The loading on the wave trap on the San Bernardino - Vista 220kV Transmission Line exceeded the amp ratings of the wave trap, at the San Bernardino Generating Station. This Wave Trap is scheduled to be replaced, included SCE's Carrier Replacement Program, by December 1, 2002.
- Evaluate the conductor at the Blythe Substation that connects Blythe (Western) and Blythe (SCE) to determine if it should be upgraded with a conductor with greater capacity.

Transient Stability:

With the N-2 of Coachella – Devers & Ramon – Mirage 230 kV line outages, the stability diverges for the Blythe II. However for the same outage without the Blythe II project, the system is stable.

A Facilities Study will be required to determine the facilities and upgrades required to interconnect the proposed Blythe II project beyond 2004. The study scope is similar to that proposed in Phase II interconnection study. The study should:

Review feasibility and develop costs associated with upgrades to mitigate the two base case overloads. Review feasibility and develop costs associated with upgrades to mitigate the two base case overloads. Develop cost for adding the second bank.

- **Devers – Mirage 230kV**
Upgrade the existing 1033 KCM conductor to 2B-1590, 15.2mi
- **Reconductor the SCE segment of the Coachella-Devers 230kV transmission line (From Devers Substation to Mirage Substation) with 2-1590KCMIL ACSR**

Review feasibility and develop costs associated with upgrades to mitigate N-1 contingency overloads. Review feasibility and develop costs associated with upgrades to mitigate N-1 contingency overloads. Verify the proposed projects mitigate the overloads, and determine if it causes additional problems (e.g. breaker replacement).

- **BlytheSCE – Eagle Mountain 161kV**
Upgrade the transmission line to accommodate 734amps
- **Devers – Mirage 230kV**
Upgrade the existing 1033 KCM conductor to 2B-1590, 15.2mi
- **Devers – Vista #1 230Kv**
Upgrade the existing 1033 KCM conductor to 1590 ACSR, 45mi
- **Devers – Vista #2 230kV**
Upgrade the existing 1033 KCM conductor to 1590 ACSR, 45mi
- **San Bernardino – Devers #1 230kV**
Upgrade the existing 605 KCM conductor leg with 1033 ACSR, 39mi
- **San Bernardino – Vista #2 230kV Upgrade the existing wavetrap rated at 2400Amps to a higher rating over 3500amps**
- **Mirage 230/115kV Transformer**
- **Install a second Mirage 230/115kV transformer bank to accommodate 600Amps for a normal rating.**

9. Review feasibility and develop costs associated with upgrades to mitigate N-2 contingency overloads. Review feasibility and develop costs associated with upgrades to mitigate N-2 contingency overloads. Verify if the N-1 mitigation also mitigates N-2 overloads.

10. Review feasibility and develop costs associated with upgrades to mitigate N-2 contingency overloads. Verify if the N-1 mitigation also mitigates N-2 overloads.

- **BlytheSCE – Eagle Mountain 161kV**
Upgrade the transmission line to accommodate 1004amps
- **Devers – Mirage 230kV**
Upgrade the existing 1033 KCM conductor to 2B-1590, 15.2mi
- **Devers – Vista #1 230Kv**
Upgrade the existing 1033 KCM conductor to 1590 ACSR, 45mi
- **Devers – Vista #2 230kV**

- Upgrade the existing 1033 KCM conductor to 1590 ACSR, 45mi
- San Bernardino – Devers #1 230kV
- Upgrade the existing 605 KCM conductor leg with 1033 ACSR, 39mi
- San Bernardino – Devers #2 230kV
- San Bernardino – Vista #2 230kV Upgrade the existing wavetrap rated at 2400Amps to a higher rating over 3500amps
- Increase the rating/clearance on the existing 1033 KCM conductor, 43 mi San Bernardino – Vista #2 230kV
- Form the Devers – Capwind – Concho – Mirage 115kV Line into Mirage Substation to mitigate the overloads on the following transmission lines.
 - a. Mirage – Tamarisk 115kV
 - b. Thornhill – Tamarisk 115kV
 - c. Santa Rosa – Tamarisk 115kV
 - d. Eisenhower – Thornhill 115 #1
- Etiwanda – San Bernardino 230kV #1
- Upgrade the existing wavetrap rated at 2400Amps to a higher rating over 3000amps
- Devers – Mirage 230kV #1
- Mirage 230/115kV #1

Evaluate the conductor at the Blythe Substation that connects Blythe (Western) and Blythe (SCE) to determine if it should be upgraded with a conductor with greater capacity.

Design a Remedial Action Scheme (RAS) that will automatically trip the proposed Blythe project generation if the need arises. All the N-2 contingencies involve at least one of these N-1 Contingency and hence tripping the project for the single contingencies requiring RAS also affectively remove its contribution for the overloads for related N-2 s.

Review circuit breakers at the four 230-kV substation locations (Refer Table 3) to determine need for breaker replacement and cost allocation.

With the Blythe II generation project, the case is unstable for an outage Coachella-Devers & Ramon-Mirage 230kV transmission lines. Without the Blythe II generation project, the case is stable. Design a RAS to reduce the generation by 180MW.

Conduct single phase to ground SCD study. Determine if additional circuit breakers need to be evaluated and if upgrades are required. Develop cost if applicable.

TABLE 1
Load Flow Study Case Characteristics –
Summary Statistics

TABLE 1

**Blythe Energy I&II Project Analysis
2004 Light Spring and 2003 Heavy Summer
Load Flow Study Case Characteristics – Summary Statistics**

LOAD FLOW CASE SCENARIO	PROJECT	SCE	SCE	SCE	SCE
	STATUS (MW)	AREA LOAD (MW)	AREA LOSSES (MW)	AREA GEN (MW)	AREA IMPORT (MW)
Light Spring 2004	0	15,115	397	8,157	7,355
Light Spring 2004	520	15,115	405	7,590	7,930
Light Spring 2004	1040	15,115	433	7,609	7,940
Heavy Summer 2004	0	21,889	467	16,827	5,529
Heavy Summer 2004	520	21,889	455	16,035	6,309
Heavy Summer 2004	1040	21,889	450	15,238	7,101

TABLE 2
Load Flow Study Results - Most Critical
Line Loading

TABLE 2A
Blythe Energy Project Analysis
2004 Heavy Spring

Load Flow Study Results Critical Overloads

Overload	Outage	Pre-Blythe Project	Blythe I Project (520MW)			Blythe II Project (1040MW)			No. of Units	
N-1										
		Amps/MV % Loading Amps/MV % Loading % Increase mps/MV % Loading % Increase								
Buck230 - Buck 161 1 Xformer Rating: 280MVA LC: Transformer	Midway X - Buck 230 1	17 MVA	6	287 MVA	68	62	281 MVA	100.4	94.4	6
CoachellaLV - Miriid 230 1 Line Conductor Rating: LC	CoachellaLV - Devers 230 1	1594.5A	161.7	1982A	201	39.3	2348A	238.1	76.4	6
CoachellaLV - Devers 230 1 Line Conductor Rating: Limiting Component:	Miriid - Mirage 230 1	1681A	170.5	2118A	214.8	44.3	2543A	257.9	87.4	6
Miriid - Mirage 230 1 Line Conductor Rating: Limiting Component: Line	CoachellaLV - Devers 230 1	1846A	187.3	2304A	233.7	46.4	2744A	278.3	91	6
Blythe (SCE) - Eagle Mountain 161 1 Line Conductor Rating: 280MVA Limiting Component: XFORMER	Miriid - Mirage 230 1 CoachellaLV - Miriid 230 1	351A	58	549A	91	33	734A	121.4	63.4	6
		304A	50	491A	81	31	662A	109.5	59.5	6
Etswana 230 - San Bernardino 230 1 Line Conductor Rating: 2400	Vista - San Bernardino 230 2	2288A	114	2418A	120.9	6.9	2519A	125.9	11.9	6

Limiting Component:Wave Trap										
San Bernardino - Devers 230 1 Line Conductor Rating:1150 Limiting Component: Line	Devers - ValleySC 500 1	1119A	141	1163A	146.6	5.6	1267A	159.7	18.7	6
Devers - San Bernardino 230 2 Line Conductor Rating:1150 Limiting Component: Line	Devers - ValleySC 500 1	1156A	101	1205A	104.8	3.8	1313A	114.2	13.2	6
Devers - Mirage 230 1 Line Conductor Rating:1240 Limiting Component: Line	CoachellaLV - Devers 230 1	1326A	107	1762A	142	35	2176A	175.8	68.8	6
Devers - Vista 230 2 Line Conductor Rating:1240 Limiting Component: Line	Devers - ValleySC 500 1	1156A	101	1523A	122.8	21.8	1639A	132.1	31.1	6
Mirage 230 - Mirage 115 1 Xformer Rating:280MVA Breaker 218MVA Limiting Component: Line	Devers - Mirage 230 1	234.8A	107.7	278A	127.7	20	311A	142.8	35.1	6
Mirage 115 - Tamarisk 115 1 Line Conductor Rating: 1090 Limiting Component: Line	Devers - Mirage 230 1	1142A	104.8	1340A	123	18.2	1523A	139.8	35	6
Thornhill - Tamarisk 115 1 Line Conductor Rating: 547A	Devers - Mirage 230 1	396A	50	515A	94	44	614A	112.6	62.6	6

[illegible]

Line Conductor Rating: 600a	Midway X - Buck 230						
Limiting Component: Disconnect	1						
Etiwanda - San Bernardino 230 #1 Line Conductor Rating: 2400A Limiting Component: Wave Trap	Devers - Vista 230 #2 Vista - San Bernardino 230 #2	970	46	2661	133	87	2794.3 139.7 93.7
San Bernardino - Devers 230 #1 Line Conductor Rating: 795A	Devers - Vista 230 #2 2 Devers - San Bernardino 230 #2	955.3	120.7	1079.7	136.3	15.6	1183.2 149.4 28.7
Limiting Component: Line							6
Devers - Mirage 230 #1 Line Conductor Rating: 1240A Limiting Component: Line	CoachellaLV - Devers 230 1 Julian Hinds - Mirage 230 1	1342.3	108.4	1757.1	141.9	33.5	2155.2 174.1 65.7
Mirage 230 - Mirage 115	CoachellaLV - Devers 230 #1	378.5	173.6	452	207.3	33.7	507.7 232.9 59.3
Line Conductor Rating: 280MVA Breaker 218MVA Limiting Component: Breaker	Devers - Mirage 230 #1						
Eisenhower - Thornhill 115 #1 Line Conductor Rating: 547a	CoachellaLV - Devers 230 1 Devers - Mirage 230 #1	657.2	82.8	885.1	163	80.2	1127.6 207.8 125
Limiting Component: Line							6
Thornhill - Tamarisk 115 #1 Line Conductor Rating: 798a	CoachellaLV - Devers 230 1 Devers - Mirage 230 #1	830	104	1041.1	191.4	87.4	1280.3 235.7 131.7
Limiting Component: Line							
Vista - San Bernardino 2 230kV Line Conductor Rating: 2489a	Vista - Devers 230 #1 Etiwanda - San Bernardino #1	3165.6	131.9	3341.4	139.2	7.3	3477.7 144.9 13
							6

[illegible]

TABLE 2B
Blythe Energy Project Analysis
2004 Heavy Summer

Load Flow Study Results Critical Overloads

Overload	Outage	Pre-Blythe Project		Blythe I Project (520MW)			Blythe II Project (1040MW)			No. of Units On- line
N-1										
		Amps/MV	% Loading	Amps/MVA	% Loading	% Increase	Amps/MVA	% Loading	% Increase	
Buck230 - Buck 161 1 Xformer Rating: 280MVA LC: Transformer	Midway X - Buck 230 1	17MVA	6	287MVA	68	62	281MVA	100.4	94.4	6
CoachellaLV - Mirriid 230 1 Line Rating: LC	CoachellaLV - Devers 230 1	1098A	111	1529A	155	44	1855A	188.1	77.1	6
CoachellaLV - Devers 230kV 1 Line Rating: LC: Transformer	MIRIID - MIRAGE 230kV 1	971A	98.5	1393A	141.3	42.8	1809A	183.5	85	6
	CoachelV - MIRIID 230kV 1	957A	97.1	1330A	134.9	37.8	1697	172.1	75	
	Devers - Palo Verde 500kV 1	893A	90.5	1153A	116.9	26.4	1401A	142.1	51.6	
	Devers - Mirage 230kV 1	684A	69.4	1042A	105.6	36.2	1401A	142.1	72.7	
	Blythe - Buck 161kV 1	575A	58.3	896A	91	32.7	1214A	123.1	64.8	
	Mirage 115 - Tamarisk 115kV 1	641A	65	898A	91	26	1147A	116.3	51.3	
	Paloverde 500 - Devers 500 kV 1	630A	63.9	880A	89	25.1	1114A	113	49.1	
	Blythe - BlytheSC 161kV 1	582A	59	846A	86	27	1101A	111.6	52.6	
MIRIID - Mirage 230kV 1	BASE CASE	681A	69	954A	97	28	1228MVA	124.6	55.6	6

Line Rating:	CoachellaLV - Devers 230KV 1	1057A	107.2	1504A	152.6	45.4	1944MVA	197.1	89.9	
Limiting Component	Devers - Palo Verde 500KV 1	1002A	101.6	1287A	130.6	29	1564MVA	158.6	57	
	Blythe (SCE) - BUCK 161KV 1	699A	70.9	1077A	109.3	38.4	1468MVA	148.9	78	
	Blythe (Western) - Blythe (SCE) 161KV 1	758A	76.9	1077A	109.2	32.3	1398MVA	141.8	64.9	
	Julian Hinds - Eagle Mountain 230KV 1	777A	78.8	1063A	107.8	29	1349MVA	136.8	58	
	BlytheSC - Eaglemountain 161KV 1	708A	71.8	1027A	104.2	32.4	1348MVA	136.7	64.9	
	Devers - Palo Verde 500KV 1	741A	75.1	1014A	102.9	27.8	1284MVA	130.2	55.1	
	Iron Mountain - Camino 230KV 1	762A	77.3	1021A	103.6	26.3	1278MVA	129.7	52.4	
	Julian Hinds - Mirage 230KV 1	698A	70.8	985A	99.9	29.1	1272MVA	129	58.2	
Devers - Mirage 230KV 1	CoachellaLV - Devers 230KV 1	640A	52.1	1043A	84	31.9	1415MVA	114.4	62.3	6
Line Rating: 1240A LC: Transmission Line										
Mirage 230 - Mirage 115 kXformer Rating: 280MVA Breaker Rating: 218MVA	Devers - Mirage 230 kV 1 CoachellaLV - Devers 230KV 1	218MVA 219MVA	100 100.5	260MVA 236MVA	119 108.2	19 7.7	291.3 255.9	133.6 117.4	33.6 16.9	6
Limiting Component: Breaker										
N-2										
Blythe - Buck 161KV Line Rating: 1240A LC: Transmission Line	Midway X - Buck 230 230 2 & Midway X - Buck 230 1	0	0	1860.1	92.1	92.1	4009.8	198.6	198.6	6

Blythe(Western)- Blythe(SCE) 161kV Line Rating: 1240A LC: Transmission Line	Midway X - Buck 230 230 2 &	243	36	641.8	95.8	59.8	1101.2	125.9	89.9	6
Buck 230 - Buck 161 Line Rating: 1240A LC: Transmission Line	Midway X - Buck 230 230 2 & Midway X - Buck 230 1	0	0	260	93	93	555	198.2	198.2	6
Mirriid - Mirage 230kV Line Rating: 1240A LC: Transmission Line	CoachellaL V - Devers 230 1 Julian Hinds - Mirage 230 1	1073	109	1530.7	155.2	46.2	1974.9	200.3	91.3	6
Blythe (SCE) - Eagle Mountain 161kV Line Rating: 605A Limiting Component: Transmission Line	Midway X - Buck 230 230 2 & Midway X - Buck 230 1	169	76	467.9	77.3	1.3	911.7	150.7	74.7	6
Mirage 230 - Mirage 115 Xformer Rating: 280MVA Circuit Breker: 218MVA Limiting Component: Breaker	CoachellaL V - Devers 230 1 Devers - Mirage 230 1	296	136	369.8	169.6	33.6	435.7	199.9	63.9	6
Vista - San Bernardino 2 230kV Line Rating: 2480A Limiting Component: Wave Trap	Vista - Devers 230 1 Etiwanda - San Bernardino 230 1	2184	91	2326.5	96.9	5.9	2429.1	101.2	10.2	6
Eagle Mountain 230 - Eagle Mountain 161 Line Rating: 280MVA Limiting Component: Xformer	Midway X - Buck 230 230 2 & Midway X - Buck 230 1	20	12	1624.5	67.7	55.7	240.7	143.3	131.3	6

TABLE 3
Power Flow Interchanges

TABLE 3
Blythe Energy Project Analysis
2004 Heavy Summer & Light Spring
Power Flow Interchanges

CASE SCENARIO	Blythe Generation	SCIT (MW)	WOR (MW)	EOR (MW)	Palo Verde-Devers (MW)	PATH 42 (MW)	MIDWAY-VINCENT (MW)
Light Spring 2004	0/WP	12,445	9,714	6,015	1,581	858	408
Light Spring 2004	520/BEP I	12,452	10,051	59,989	1,551	1,230	78
Light Spring 2004	1040/BEP II	12452	10,050	5,998	1,551	1,235	78
Heavy Summer 2004	0/WP	13,202	8,489	5,259	1,533	490	430
Heavy Summer 2004	520/BEP I	13,178	8,443	5425.4	1,532	728	452
Heavy Summer 2004	1040/BEP II	13,201	8,097	5,458	1,508	890	820

TABLE 4
Short Circuit Duty Summary

TABLE 4**Blythe Energy Project II Analysis
Short Circuit Duty Summary**

Substation Name	kV	Pre Project		Post Project		Delta KA
		KA	X/R	KA	X/R	
Mira Loma E	230	65	23.8	65.1	23.8	0.1
Mira Loma W	230	65	23.8	65.1	23.8	0.1
Mirage	230	15.3	9.5	15.4	9.5	0.1
Devers	230	37	18.3	37.3	18.2	0.3
Gene	230	13.9	11.2	14	11.2	0.1
Blythe (SCE)	161	13.4	11.3	19.2	14.6	5.8
Eagle Mtn.	161	5	7.3	5.1	7	0.1

TABLE 5
Transient Stability Summary

TABLE 5
Blythe Energy Project Analysis
2004 Heavy Summer & Light Spring
Transient Stability Summary

Case	3-Phase Bus Fault	Component Outage	Clearing Time (cycles)	Spring w/1040MW (Stable/Unstable)	Summer w/1040MW (Stable/Unstable)
1	Devers 500kV	Coachella - Devers 230kV T/L	5	Stable	Stable
2	Devers 500kV	Devers - Mirage 230kV T/L	5	Stable	Stable
3	Devers 500kV	San Bernardino - Devers 230kV T/L	5	Stable	Stable
4	Devers 500kV	Vista - Devers 230kV T/L	5	Stable	Stable
5	Mirage 230kV	Mirid - Mirage 230kV T/L	5	Stable	Stable
6	Palo Verde 500kV	Palo Verde - Devers 500kV T/L	5	Stable	Stable
7	Palo Verde 500kV	Palo Verde - N.Gila T/L	5	Stable	Stable
8	Valley 500kV	Devers - Valley 500kV T/L	5	Stable	Stable
9	Mirage 230kV	Mirage - Mirid - Devers - Mirage 230kV T/L	5	Stable	Stable
10	Devers 230kV	Coachella - Devers 230kV - Mirid - Mirage 230kV T/L	5	Stable	Trip Stable 180MW
11	Devers 500kV	Coachella - Devers - Devers - Mirage 230kV T/L	5	Stable	Stable
12	Devers 230kV	Devers - San Bernardino 1&2 kV T/L	5	Stable	Stable
13	Devers 230kV	Devers - Vista 1& 2 230kV Lines T/L	5	Stable	Stable
14	Coachella 230kV	Coachella - Devers 230kV - Mirid - Mirage 230kV T/L	5	Stable	Stable

TABLE 6
Forecasted Coincident Peak Load
Demand (MW)

4

N

AVERAGE GROWTH	410
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TABLE 7
N-1 CONTINGENCY LIST

2004 BLYTHE ENERGY
1040MW N-1

1	24017	24035	"1 "	0	line from BLYTHESC	161.00	to	EAGLEMTN	161.00
0									
1	24056	24112	"1 "	0	line from ETIWANDA	230.00	to	PADUA	230.00
0									
1	24056	24132	"1 "	0	line from ETIWANDA	230.00	to	SANBRDNO	230.00
0									
1	24056	24901	"1 "	0	line from ETIWANDA	230.00	to	VSTA	230.00
0									
1	24056	25656	"1 "	0	line from ETIWANDA	230.00	to	MIRALOME	230.00
0									
1	24132	24804	"1 "	0	line from SANBRDNO	230.00	to	DEVERS	230.00
0									
1	24801	24151	"1 "	0	line from DEVERS	500.00	to	VALLEYSC	500.00
0									
1	24801	28070	"1 "	0	line from DEVERS	500.00	to	p5157	500.00
0									
1	24804	24132	"2 "	0	line from DEVERS	230.00	to	SANBRDNO	230.00
0									
1	24804	24806	"1 "	0	line from DEVERS	230.00	to	MIRAGE	230.00
0									
1	24804	24901	"2 "	0	line from DEVERS	230.00	to	VSTA	230.00
0									
1	24804	28100	"1 "	0	line from DEVERS	230.00	to	p5160b	230.00
0									
1	24805	24645	"1 "	0	line from DEVERS	115.00	to	TAP817	115.00
0									
1	24805	24808	"1 "	0	line from DEVERS	115.00	to	TAP801	115.00
0									
1	24805	24813	"1 "	0	line from DEVERS	115.00	to	TAP804	115.00
0									
1	24805	24817	"1 "	0	line from DEVERS	115.00	to	EISENHOW	115.00
0									
1	24805	25622	"1 "	0	line from DEVERS	115.00	to	TAP806	115.00
0									
1	24805	25623	"1 "	0	line from DEVERS	115.00	to	TAP807	115.00
0									
1	24805	25625	"1 "	0	line from DEVERS	115.00	to	TAP809	115.00
0									
1	24807	24821	"1 "	0	line from MIRAGE	115.00	to	TAMARISK	115.00
0									
1	24808	24809	"1 "	0	line from TAP801	115.00	to	YUCCA	115.00
0									
1	24808	24811	"1 "	0	line from TAP801	115.00	to	TAP802	115.00
0									
1	24811	24824	"1 "	0	line from TAP802	115.00	to	CARODEAN	115.00
0									
1	24812	24810	"1 "	0	line from TAP803	115.00	to	HI DESER	115.00
0									
1	24812	25624	"1 "	0	line from TAP803	115.00	to	TAP808	115.00
0									
1	24813	25644	"1 "	0	line from TAP804	115.00	to	TAP818	115.00
0									
1	24814	25641	"1 "	0	line from BANNING	115.00	to	TAP816	115.00
0									
1	24815	24645	"1 "	0	line from GARNET	115.00	to	TAP817	115.00
0									
1	24815	24813	"1 "	0	line from GARNET	115.00	to	TAP804	115.00
0									
1	24815	25626	"1 "	0	line from GARNET	115.00	to	TAP810	115.00
0									
1	24815	25631	"1 "	0	line from GARNET	115.00	to	TAP815	115.00
0									
1	24816	24823	"1 "	0	line from SANTA RO	115.00	to	TAP805	115.00
0									
1	24816	25626	"1 "	0	line from SANTA RO	115.00	to	TAP810	115.00

0									
1	24817	24820	"1 "	0	line from EISENHOW	115.00	to	THORNHIL	115.00
0									
1	24818	24817	"1 "	0	line from FARREL	115.00	to	EISENHOW	115.00
0									
1	24818	25642	"1 "	0	line from FARREL	115.00	to	TAP819	115.00
0									
1	24819	24822	"1 "	0	line from CONCHO	115.00	to	INDIAN W	115.00
0									
1	24819	24823	"1 "	0	line from CONCHO	115.00	to	TAP805	115.00
0									
1	24819	25622	"1 "	0	line from CONCHO	115.00	to	TAP806	115.00
0									
1	24820	24821	"1 "	0	line from THORNHIL	115.00	to	TAMARISK	115.00
0									
1	24821	24816	"1 "	0	line from TAMARISK	115.00	to	SANTA RO	115.00
0									
1	24822	24823	"1 "	0	line from INDIAN W	115.00	to	TAP805	115.00
0									
1	24825	24812	"1 "	0	line from JOSHUA	115.00	to	TAP803	115.00
0									
1	24826	24645	"1 "	0	line from WINTEC4	115.00	to	TAP817	115.00
0									
1	24901	24132	"2 "	0	line from VSTA	230.00	to	SANBRDNO	230.00
0									
1	24901	24804	"1 "	0	line from VSTA	230.00	to	DEVERS	230.00
0									
1	24913	24911	"1 "	0	line from SANBRDNO	115.00	to	HOMART	115.00
0									
1	25401	25405	"1 "	0	line from EAGLEMTN	230.00	to	IRON MTN	230.00
0									
1	25405	24019	"1 "	0	line from IRON MTN	230.00	to	CAMINO	230.00
0									
1	25406	24806	"1 "	0	line from J.HINDS	230.00	to	MIRAGE	230.00
0									
1	25406	25401	"1 "	0	line from J.HINDS	230.00	to	EAGLEMTN	230.00
0									
1	25623	25624	"1 "	0	line from TAP807	115.00	to	TAP808	115.00
0									
1	25627	25628	"1 "	0	line from TAP811	115.00	to	TAP812	115.00
0									
1	25627	25629	"1 "	0	line from TAP811	115.00	to	TAP813	115.00
0									
1	25629	25630	"1 "	0	line from TAP813	115.00	to	TAP814	115.00
0									
1	25630	25631	"1 "	0	line from TAP814	115.00	to	TAP815	115.00
0									
1	25632	25623	"1 "	0	line from TERAWND	115.00	to	TAP807	115.00
0									
1	25633	25622	"1 "	0	line from CAPWIND	115.00	to	TAP806	115.00
0									
1	25634	25625	"1 "	0	line from BUCKWND	115.00	to	TAP809	115.00
0									
1	25635	25642	"1 "	0	line from ALTWIND	115.00	to	TAP819	115.00
0									
1	25636	25630	"1 "	0	line from RENWIND	115.00	to	TAP814	115.00
0									
1	25637	25629	"1 "	0	line from TRANWND	115.00	to	TAP813	115.00
0									
1	25638	25628	"1 "	0	line from FOIL	115.00	to	TAP812	115.00
0									
1	25640	25639	"1 "	0	line from PANAERO	115.00	to	SEAWIND	115.00
0									
1	25640	25641	"1 "	0	line from PANAERO	115.00	to	TAP816	115.00
0									
1	25641	25644	"1 "	0	line from TAP816	115.00	to	TAP818	115.00
0									
1	25642	25625	"1 "	0	line from TAP819	115.00	to	TAP809	115.00

3/7/02

3

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0
1 19020 21047 "1 " 0 line from BLYTHE 161.00 to NILAND 161.00
0
1 19051 21059 "1 " 0 line from KNOB 161.00 to PILOTKNB 161.00
0
1 21006 21047 "1 " 0 line from COACHELV 161.00 to NILAND 161.00
0
1 21007 21045 "1 " 0 line from COACHELV 230.00 to MIDWAY X 230.00
0
1 21007 21045 "2 " 0 line from COACHELV 230.00 to MIDWAY X 230.00
0
1 21038 21045 "1 " 0 line from HIGHLINE 230.00 to MIDWAY X 230.00
0
1 21038 21045 "2 " 0 line from HIGHLINE 230.00 to MIDWAY X 230.00
0
1 21059 21072 "1 " 0 line from PILOTKNB 161.00 to YUCCA 161.00
0
1 21007 24804 "1 " 0 line from COACHELV 230.00 to DEVERS 230.00
0
1 21045 19400 "1 " 0 line from MIDWAY X 230.00 to BUCK230 230.00
0
1 21045 19400 "2 " 0 line from MIDWAY X 230.00 to BUCK230 230.00
0
1 21038 21025 "1 " 0 line from HIGHLINE 230.00 to ELCENTRO 230.00
0
1 21038 21025 "2 " 0 line from HIGHLINE 230.00 to ELCENTRO 230.00
0
1 21076 24806 "1 " 0 line from MIRIID 230.00 to MIRAGE 230.00
0
1 21007 21076 "1 " 0 line from COACHELV 230.00 to MIRIID 230.00
-1

```

TABLE 8
N-2 CONTINGENCY LIST

SCE N-2 contingency list

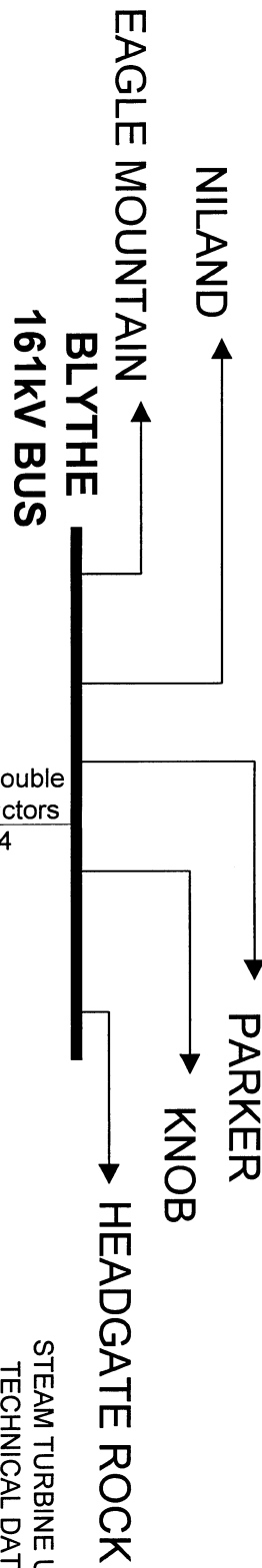
Buses away criteria: 1

Case: c:\upslf112\blythespr1040d.sav

1	24804	24806	"1 "	0	line from DEVERS	230.00	to	MIRAGE	230.00
1	24056	24901	"1 "	0	line from ETIWANDA	230.00	to	VSTA	230.00
0									
1	24804	24901	"2 "	0	line from DEVERS	230.00	to	VSTA	230.00
1	24901	24132	"2 "	0	line from VSTA	230.00	to	SANBRDNO	230.00
0									
1	24804	24901	"2 "	0	line from DEVERS	230.00	to	VSTA	230.00
1	24132	24804	"1 "	0	line from SANBRDNO	230.00	to	DEVERS	230.00
0									
1	24804	24901	"2 "	0	line from DEVERS	230.00	to	VSTA	230.00
1	24804	24132	"2 "	0	line from DEVERS	230.00	to	SANBRDNO	230.00
0									
1	24804	24901	"2 "	0	line from DEVERS	230.00	to	VSTA	230.00
1	24804	24806	"1 "	0	line from DEVERS	230.00	to	MIRAGE	230.00
0									
1	24901	24804	"1 "	0	line from VSTA	230.00	to	DEVERS	230.00
1	24056	24132	"1 "	0	line from ETIWANDA	230.00	to	SANBRDNO	230.00
0									
1	21007	24804	"1 "	0	line from COACHELV	230.00	to	DEVERS	230.00
1	25406	24806	"1 "	0	line from J.HINDS	230.00	to	MIRAGE	230.00
0									
1	21007	24804	"1 "	0	line from COACHELV	230.00	to	DEVERS	230.00
1	24804	24806	"1 "	0	line from DEVERS	230.00	to	MIRAGE	230.00
0									
1	21045	19400	"2 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00
1	21045	19400	"1 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00
0									
1	22356	21025	"2 "	0	line from IMPRLVLY	230.00	to	ELCENTRO	230.00
1	22356	21025	"1 "	0	line from IMPRLVLY	230.00	to	ELCENTRO	230.00
0									
1	21038	21025	"2 "	0	line from HIGHLINE	230.00	to	ELCENTRO	230.00
1	21038	21025	"1 "	0	line from HIGHLINE	230.00	to	ELCENTRO	230.00
0									
1	19020	19399	"1 "	0	line from BLYTHE	161.00	to	BUCK161	161.00
1	21045	19400	"1 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00
0									
1	19020	19399	"1 "	0	line from BLYTHE	161.00	to	BUCK161	161.00
1	21045	19400	"2 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00
0									
1	21007	21045	"2 "	0	line from COACHELV	230.00	to	MIDWAY X	230.00
1	21007	21045	"1 "	0	line from COACHELV	230.00	to	MIDWAY X	230.00
0									
1	21038	21045	"2 "	0	line from HIGHLINE	230.00	to	MIDWAY X	230.00
1	21038	21045	"1 "	0	line from HIGHLINE	230.00	to	MIDWAY X	230.00
0									
1	21045	19400	"2 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00
1	21045	19400	"1 "	0	line from MIDWAY X	230.00	to	BUCK230	230.00

APPENDIX A ONE LINE DIAGRAM MODEL

BLYTHE ENERGY GENERATING FACILITY CONFIGURATION (Phase II) **TWO STS AND FOUR CTs FOR TOTAL OUTPUT OF 1040 MW**



STEAM TURBINE UNITS
TECHNICAL DATA

CAPACITY SIZE:	185 MW
MVA RATING:	227 MVA
VOLTAGE RATING:	16 kV
POWER FACTOR:	0.85
X''d:	0.15

TRANSFORMER DATA

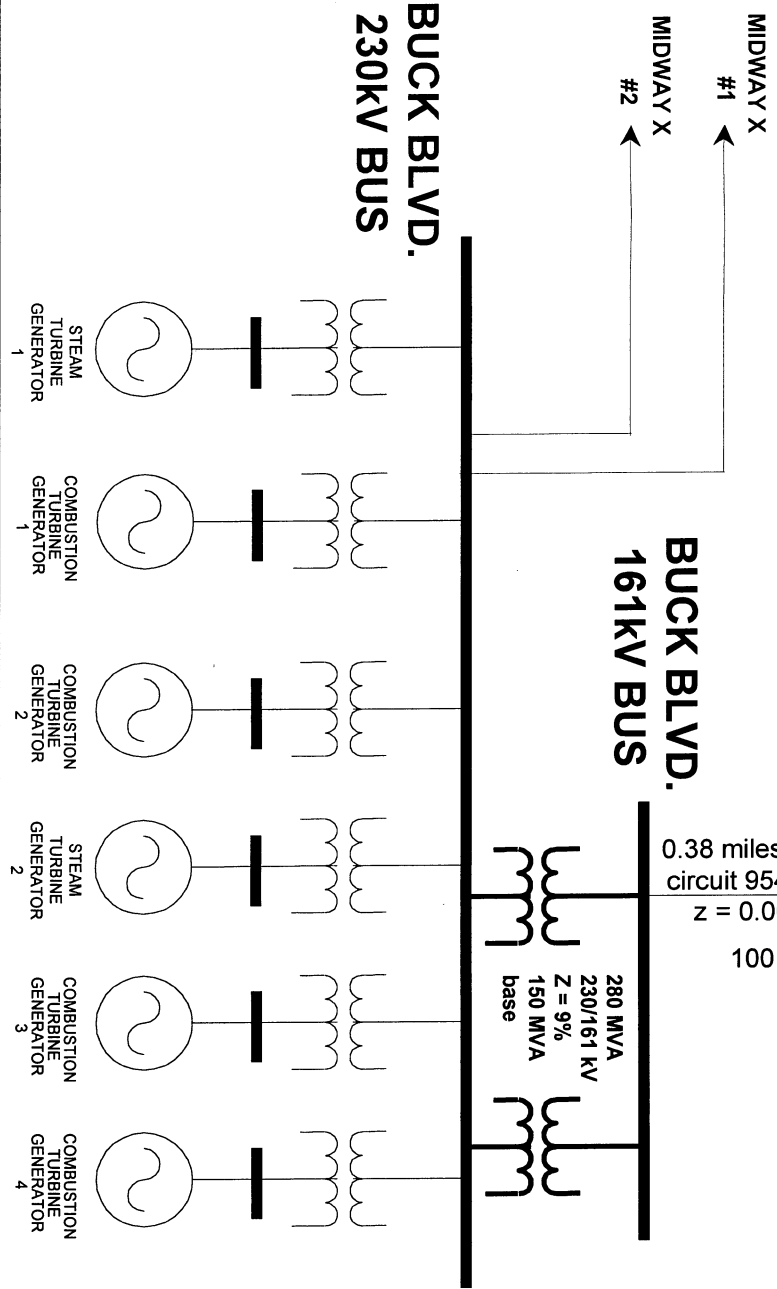
RATED MVA	260
RATED VOLTAGE	230/16kV
Z	0.0027 + j 0.09
156 MVA BASE	

COMBUSTION TURBINE UNITS TECHNICAL DATA

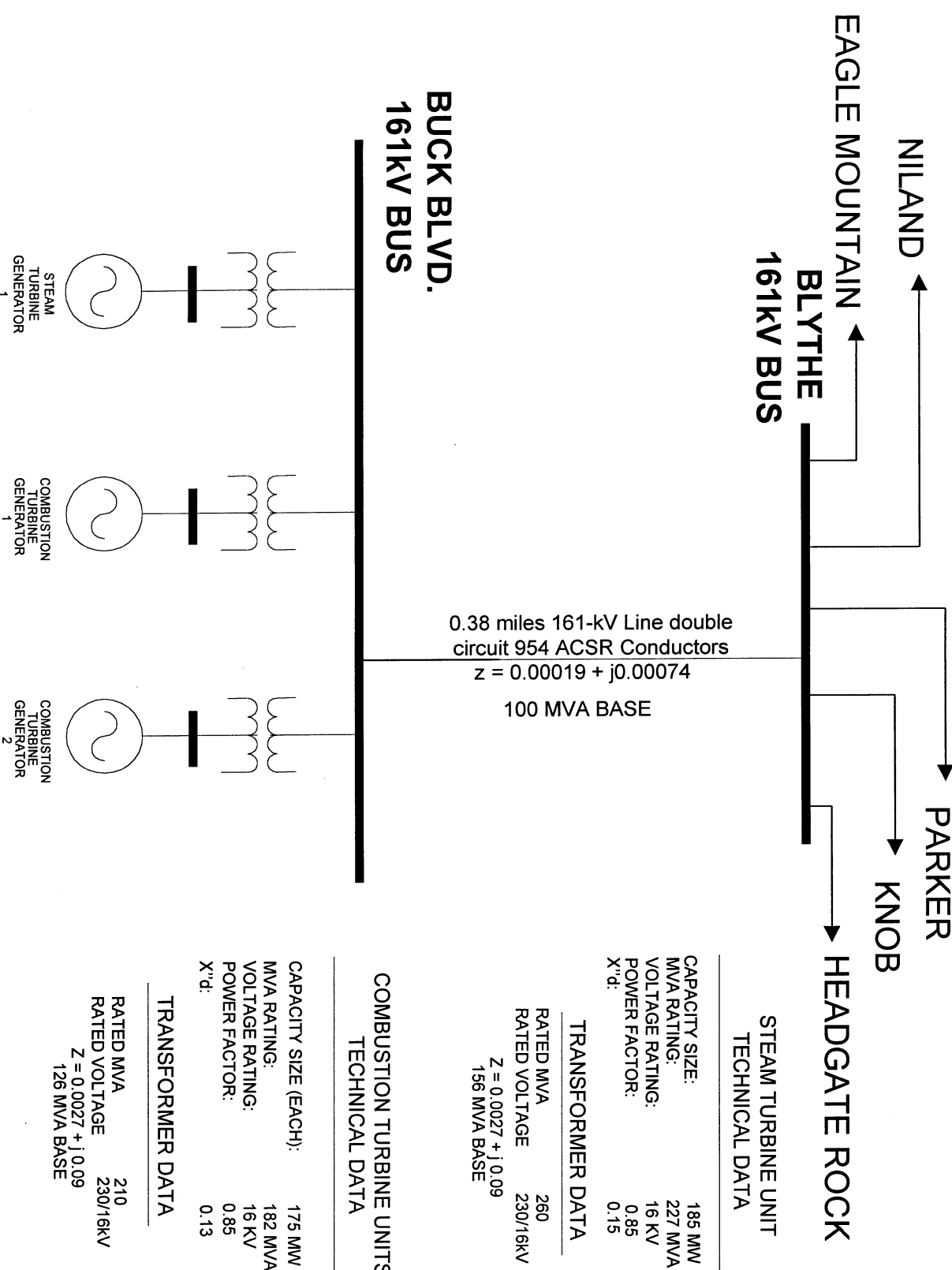
CAPACITY SIZE (EACH):	175 MW
MVA RATING:	182 MVA
VOLTAGE RATING:	16 kV
POWER FACTOR:	0.85
X''d:	0.13

TRANSFORMER DATA

RATED MVA	210
RATED VOLTAGE	230/16kV
Z	0.0027 + j 0.09
126 MVA BASE	



BLYTHE ENERGY GENERATING FACILITY CONFIGURATION (Phase I) ONE ST AND TWO CTS FOR TOTAL OUTPUT OF 520 MW



APPENDIX B
STABILITY MACHINE
MODELS

GENERATING STATION - UNIT SIZING AND OPERATING DATES

GENERATING UNIT TYPE 1:						GENERATING UNIT TYPE 2:						AUXILIARY LOAD	NET OUTPUT	OPERATING DATE
Units or Group of Units	Number of Units	Nominal Rating			Operating MW	Units or Group of Units	Number of Units	Nominal Rating			Operating MW	MW	MW	
		kV	MVA	MW				kV	MVA	MW				
GT	2	16	182	154.7	175	STEAM	1	16	227	193.0	185	15	520	12/02
GT	2	16	182	154.7	175	STEAM	1	16	227	193.0	185	15	520	12/03
TOTAL					700							370	30	1040

1 if Generator field current, pu

Invocation: exst1 [<n>] {<name> <kv>} <id> :

Parameters:

	\cName	\cEPCL\p Variable	Description\p
0.00	tr		Filter time constant, sec
0.10	Vimax	vimax	Maximum error, pu
-0.10	Vimin	vimin	Minimum error, pu
1.00	Tc	tc	Lead time constant, sec
10.00	Tb	tb	Lag time constant, sec
200.00	Ka	ka	Gain
0.07	Ta	ta	Time constant, sec
5.00	Vrmax	vrmax	Maximum controller output
-5.00	Vrmin	vrmin	Minimum controller output
0.05	Kc	kc	Excitation system regulation factor, pu
0.00	Kf	kf	Rate feedback gain
1.00	Tf	tf	Rate feedback time constant, sec
1.00	Tcl	tcl	Lead time constant, sec
1.00	Tbl	tbl	Lag time constant, sec
5.00	Vamax	vamax	Maximum control element output, p.u.
-5.00	Vamin	vamin	Minimum control element output, p.u.
0.04	Xe	xe	Excitation transformer effective reactance, p.u.
2.80	Ilr	ilr	Maximum field current, p.u.
5.00	Klr	klr	Gain on field current limit

EXST1
DEFAULT DATA
IS USED FOR
THIS PROJECTR. GAVAHAN
MWH 24OCT01

Notes:

- a) This model can be used to represent a controlled-rectifier excitation system whose a.c. power source is a simple power transformer fed from the generator terminals. The voltage regulation of the excitation transformer and rectifier are approximated by the parameter Kc.

\n
EPCFIG exst1.blk .94 1.0

Model Name: gast

Description: Single shaft gas turbine

Prerequisites: Generator model ahead of this model
in the dynamic models table

Inputs: Shaft speed

Output Channels:

Record Level	Name	Description
1	pm	Turbine power, MW

Invocation: gast [<n>] {<name> <kv>} <id> : [mwcap=<value>]

Parameters:

	\cName	\cEPCL\p Variable	Description\p
_____	R	r	Permanent droop, pu
_____	T1	t1	Governor mechanism time constant, sec
_____	T2	t2	Turbine power time constant, sec
_____	T3	t3	Turbine exhaust temperature time constant, sec
_____	Lmax	lmax	Ambient temperature load limit
_____	Kt	kt	Temperature limiter gain
_____	Vmax	vmax	Maximum turbine power, pu of mwcap

and rcomp, xcomp are set to zero.

\n
EPCFIG genrou.blk 1.0 1.0

Model Name: pss2a

Descriptions: Dual input Power system stabilizer
(IEEE type PSS2A)

Prerequisites: Generator model ahead of this model in
dynamic models table

Inputs: Generator shaft speed

Frequency of generator terminal or system bus
voltage

Generator electric power or accelerating power

voltage amplitude of generator terminal bus or
system bus

Current amplitude in specified branch

Output Channels:

Record Level	Name	Description
1	vs	Stabilizer output signal, p.u.

Invocation: pss2a [<n>] {<name> <kv>} <id> ;

Parameters:

\cname	\CEPCL\p Variable	Description\p
1	j1	Input signal #1 code
0	k1	Input signal #1 remote bus number
3	j2	Input signal #2 code
0	k2	Input signal #2 remote bus number
2	tw1	First washout on signal #1, sec
2	tw2	Second washout on signal #1, sec
2	tw3	First washout on signal #2, sec
0	tw4	Second washout on signal #2, sec
0	t6	Time constant on signal #1, sec
2	t7	Time constant on signal #2, sec
0.1	ks2	Gain on signal #2
1	ks3	Gain on signal #2
1	ks4	Gain on signal #2
0.5	t8	Lead of ramp tracking filter
0.1	t9	Lag of ramp tracking filter
1	n	Order of ramp tracking filter
5	m	Order of ramp tracking filter
10	ks1	Stabilizer gain
0.25/0.04/0.2/0.03	t1-t4	Lead/lag time constants, sec
0.1	vstmax	Stabilizer output max limit, p.u.
-0.1	vstmin	Stabilizer output min limit, p.u.

Notes:

- 0.25/0.04/0.2/0.03
T1 T2 T3 T4
- a) TW1 and TW3 must be greater than zero.
 - b) Setting TW2 or TW4 to zero will bypass the washout function.
 - c) T1, T2, T3, T4, T6, T7, T8, and T9 may be zero.
 - d) Set T9 = 0 or n = 0 to get a null effect from the ramp tracking filter.

- e) The product of $n \cdot m$ can not be greater than 10.
- f) The input signal code, j , and the remote bus number, k , specify the input signal used by the stabilizer. If k is zero the signal is taken from the shaft or terminals of the generator on which the stabilizer is located. If k is non-zero the signal is taken from bus number k (for $j = 1, 2, 3, 4$, or 5).
- g) To use branch current as an input, the branch is specified using the ([$\langle mon_i \rangle$] { $\langle name \rangle$ $\langle kv \rangle$ } [$\langle mon_j \rangle$] { $\langle name \rangle$ $\langle kv \rangle$ } $\langle ck \rangle$ $\langle sec \rangle$) data in the PYD file or in the "edds" table. Note that only one branch current may be used as input to this model.

\n

The input signal code, j , is

1	for shaft speed
2	for frequency of bus voltage
3	for generator electrical power
4	for generator accelerating power
5	for amplitude of bus voltage
7	for amplitude of branch current

EPCFIG pss2a.blk .9 .85

Model Name: gentpf

Description: Generator represented by uniform inductance ratios rotor modeling to match WSCC type F model; shaft speed effects are neglected

Prerequisites: Generator present in load flow working case

Inputs: Network boundary variables
Field voltage
Turbine power

Output Channels:

Record Level	Name	Description
1	ang	Rotor angle, degrees
1	vt	Terminal voltage, pu
2	efd	Field voltage, pu
3	it	Terminal current, pu
4	pg	Electrical power, MW
5	spd	Shaft speed, pu
6	qg	Reactive power, MVAR

Invocation: gentpf [$\langle n \rangle$] { $\langle name \rangle$ $\langle kv \rangle$ } $\langle id \rangle$:

Parameters:

Name	EPCL Variable	Description
T'do	tpdo	D-axis transient rotor time constant
T''do	tppdo	D-axis subtransient rotor time constant
T'qo	tpqo	Q-axis transient rotor time constant
T''qo	tppqo	Q-axis subtransient rotor time constant
H	h	Inertia constant, sec
D	d	Damping factor, pu
Ld	ld	D-axis synchronous reactance
Lq	lq	Q-axis synchronous reactance
L'd	lpd	D-axis transient reactance
L'q	lpq	Q-axis transient reactance
L''d	lppd	D-axis subtransient reactance
L''q	lppq	Q-axis subtransient reactance
Ll	ll	Stator leakage reactance, pu

- e) The product of $n \cdot m$ can not be greater than 10.
- f) The input signal code, j , and the remote bus number, k , specify the input signal used by the stabilizer. If k is zero the signal is taken from the shaft or terminals of the generator on which the stabilizer is located. If k is non-zero the signal is taken from bus number k (for $j = 1, 2, 3, 4$, or 5).
- g) To use branch current as an input, the branch is specified using the ([mon_i] {<name> <kv>} [mon_j] {<name> <kv>} <ck> <sec>) data in the DYD file or in the "edds" table. Note that only one branch current may be used as input to this model.

\n

The input signal code, j , is

1	for shaft speed
2	for frequency of bus voltage
3	for generator electrical power
4	for generator accelerating power
5	for amplitude of bus voltage
7	for amplitude of branch current

EPCFIG pss2a.blk .9 .85

Model Name: gentpf

Description: Generator represented by uniform inductance ratios rotor modeling to match WSCC type F model; shaft speed effects are neglected

Prerequisites: Generator present in load flow working case

Inputs: Network boundary variables
Field voltage
Turbine power

Output Channels:

Record Level	Name	Description
1	ang	Rotor angle, degrees
1	vt	Terminal voltage, pu
2	efd	Field voltage, pu
3	it	Terminal current, pu
4	pg	Electrical power, MW
5	spd	Shaft speed, pu
6	qg	Reactive power, MVAR

Invocation: gentpf [<n>] {<name> <kv>} <id> :

Parameters:

CTG	Name	STG	EPCL Variable	Description
9.09	T'do	9.09	tpdo	D-axis transient rotor time constant
0.042	T''do	0.042	tppdo	D-axis subtransient rotor time constant
2.50	T'qo	2.50	tpqo	Q-axis transient rotor time constant
0.150	T''qo	0.150	tppqo	Q-axis subtransient rotor time constant
6.9	H	6.8	h	Inertia constant, sec W sec / VA
0.0	D	0.0	d	Damping factor, pu
1.55	Ld	1.26	ld	D-axis synchronous reactance
1.47	Lq	1.68	lq	Q-axis synchronous reactance
0.18	L'd	0.20	lpd	D-axis transient reactance
0.34	L'q	0.39	lpq	Q-axis transient reactance
0.13	L''d	0.15	lppd	D-axis subtransient reactance
0.14	L''q	0.16	lppq	Q-axis subtransient reactance
0.112	Ll	0.137	ll	Stator leakage reactance, pu

17%
45%
0.00069
0
0
**

Se(1.0) 12% s1
Se(1.2) 45% s12
Ra 0.00069 ra
Rcomp 0 rcomp
Xcomp 0 xcomp
accel ** accel

Saturation factor at 1 pu flux
Saturation factor at 1.2 pu flux
Stator resistance, pu OHMS PER PHASE
Compounding resistance for voltage control, pu
Compounding reactance for voltage control, pu
Acceleration factor for network boundary iteration

Notes: ** DON'T SPECIFY PER JOHN UNDRILL OR GE POWER SYS.
* 0 UNTIL PLANT IS BUILT PER JOHN UNDRILL.

- a) To represent a solid rotor machine:
 - * all rotor time constants must be non-zero
 - * $L'd$, $L''d$, $L'q$, $L''q$, $L1$ must be non-zero
 - * $(Ra + j L''d)$ overwrites machine characteristic reactance
- b) To represent a salient pole machine with a single amortisseur circuit on each axis (keeping compatibility with the WSCC program's method of handling such machines)
 - * Set $T'do$, $T''do$ and $T''qo$ to non-zero values
 - * Set $T'qo$ to zero
 - * Set $L'q = Lq$
 - * Set $L''q$ to the q-axis subtransient reactance
 - * $(Ra + j L''d)$ overwrites the machine characteristic reactance
- c) To represent a salient pole machine without amortisseur circuits (keeping compatibility with the WSCC program's method of handling of such machines)
 - * Set $T'do$ to a non-zero value
 - * Set $T''do = T'qo = T''qo = 0$
 - * Set $L'd$ to the transient reactance
 - * Set $L''d = L'd$ and $L'q = L''q = Lq$
 - * $(Ra + j L'd)$ overwrites the machine characteristic reactance
- d) All reactances entered in the parameter list must be unsaturated values. Saturated reactances are calculated internally.
- e) It is not necessary for $L''q$ to be equal to $L''d$.
- f) D has the dimensions $_P/_{speed}$.
- g) Se1.0 and Se1.2 are defined in Figure 3.10.2, and must be non-zero.
- h) The acceleration factor, accel, must be less than unity and should normally be in the range 0.3 to 0.5.
- i) If absent, Ra is set to the resistance part of the characteristic impedance from the load flow data table, Rcomp, Xcomp are set to zero, and accel is set to 0.3.

\n
EPCFIG gentpf.gif 1.0 1.0

Model Name: ieee1

Description: IEEE steam turbine/governor model
(with deadband and nonlinear valve gain added)

Prerequisites: One or two generator models ahead of this model
in the dynamic models table

Inputs: Generator shaft speed

Output Channels:
Record

**Blythe Energy Project
Generator Step-Up Power Transformers**

**APPENDIX A
COMBUSTION-TURBINE GSU POWER TRANSFORMER**

Manufacturer: <u>Hitachi, Ltd.</u>	Location: <u>Tokyo, Japan</u>
High-Voltage Winding: <u>126/168/210 MVA</u>	<u>161- or 230-kV</u> <u>Grd. Wye Connected</u>
High-Voltage Winding Line BIL: <u>750-kV</u>	High Voltage Winding Neutral BIL: <u>150-kV</u>
Low-Voltage Winding: <u>126/168/210 MVA</u>	<u>16-kV</u> <u>Delta Connected</u>
Low-Voltage Winding Line BIL: <u>150-kV</u>	
No. of Phases: <u>3</u>	Frequency: <u>60 Hertz</u>
Construction: <u>Core-form</u>	Oil Preservation System: <u>Conservator</u>
Cooling: <u>OA/FA/FA</u>	Angular Displacement: <u>ANSI Standard</u>
Temperature Rise, Winding/Oil: <u>65°C/65°C</u>	Windings: <u>2</u>

	161-kV operation	230-kV operation
1.0 Guaranteed positive-sequence through impedance, % on OA base:	9.0	8.7
Resistance/Reactance:	0.3/9.0	0.17/8.7
2.0 Zero sequence impedance, % on OA base:	Approx. 7.2	Approx. 7.0
Resistance/Reactance:	Approx. 0.3/7.2	Approx. 0.17/7.0
3.0 R/X ratio (effective ac ohms resistance to ohms reactance):	50	85
4.0 Guaranteed exciting current on OA base, %, 100% V; 105% V; 110 % V:	0.17; 0.20; 0.25	0.33; 0.40; 0.50
5.0 Voltage regulation at top MVA rating, %; Unity pf:	1.7	1.4
Voltage regulation at top MVA rating, %; 0.8 pf (lag):	10.1	9.6
6.0 Efficiency at top rating, %; 100% load:	99.47	99.64
7.0 Guaranteed no-load loss at 100% rated voltage, kW:	70	150
8.0 Guaranteed total losses (no-load + load), kW, OA:	448 378	366 216
Guaranteed total losses (no-load + load), kW, OA/FA:	742 672	438 288
Guaranteed total losses (no-load + load), kW, OA/FA/FA:	1110 1040	750 500
9.0 Guaranteed cooling losses, kW; first stage:	8	8
Guaranteed cooling losses, kW; total:	16	16
10.0 Taps:	± 2 - 2.5-%	± 2 - 2.5-%

**Blythe Energy Project
Generator Step-Up Power Transformers**

**APPENDIX B
STEAM-TURBINE GSU POWER TRANSFORMER**

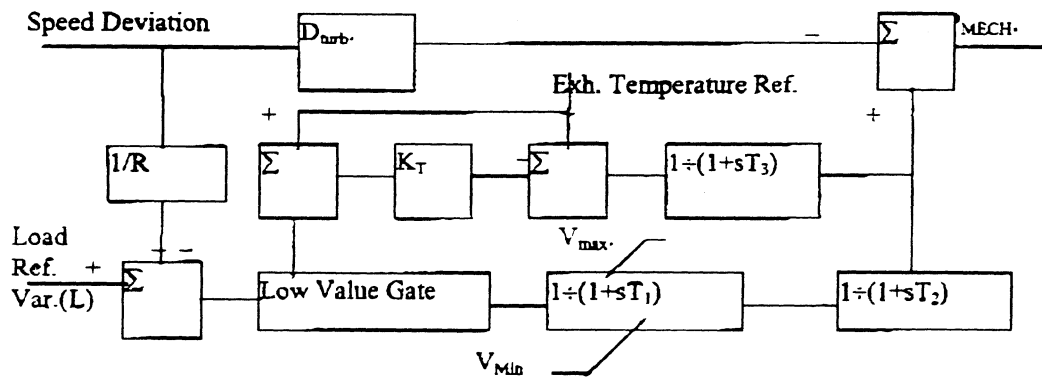
Manufacturer:	<u>Hitachi, Ltd.</u>	Location:	<u>Tokyo, Japan</u>
High-Voltage Winding:	<u>156/208/260 MVA</u>	<u>161- or 230-kV</u>	<u>Grd. Wye Connected</u>
High-Voltage Winding Line BIL:	<u>750-kV</u>	High Voltage Winding Neutral BIL:	<u>150-kV</u>
Low-Voltage Winding:	<u>156/208/260 MVA</u>	<u>16-kV</u>	<u>Delta Connected</u>
Low-Voltage Winding Line BIL:	<u>150-kV</u>		
No. of Phases:	<u>3</u>	Frequency:	<u>60 Hertz</u>
Construction:	<u>Core-form</u>	Oil Preservation System:	<u>Conservator</u>
Cooling:	<u>OA/FA/FA</u>	Angular Displacement:	<u>ANSI Standard</u>
Temperature Rise, Winding/Oil:	<u>65°C/65°C</u>	Windings:	<u>2</u>

	161-kV operation	230-kV operation
1.0 Guaranteed positive-sequence through impedance, % on OA base:	9.0	8.7
Resistance/Reactance:	0.27/9.0	0.15/8.7
2.0 Zero sequence impedance, % on OA base:	Approx. 7.2	Approx. 7.0
Resistance/Reactance:	Approx. 0.27/7.2	Approx. 0.65/7.0
3.0 R/X ratio (ratio of effective ac ohms resistance to ohms reactance:	57	97
4.0 Guaranteed exciting current on OA base, %, 100% V; 105% V; 110 % V:	0.15; 0.18; 0.22	0.3; 0.37; 0.45
5.0 Voltage regulation at top MVA rating, %; Unity pf:	1.6	1.3
Voltage regulation at top MVA rating, %; 0.8 pf (lag):	10.1	9.7
6.0 Efficiency at top rating, %; 100% load:	99.53	99.69
7.0 Guaranteed no-load loss at 100% rated voltage, kW:	80	160
8.0 Guaranteed total losses (no-load + load), kW , OA:	494	394
Guaranteed total losses (no-load + load), kW , OA/FA:	816	576
Guaranteed total losses (no-load + load), kW , OA/FA/FA:	1230	810
9.0 Guaranteed cooling losses, kW; first stage:	10	10
Guaranteed cooling losses, kW; total:	20	20
10.0 Taps:	± 2 - 2.5-%	± 2 - 2.5-%

Siemens

Gas Turbine Control

1. Speed Drop Rate $R = 0.05$
2. Governor Mechanism Time Constant $T_1 = 0.7$ sec.
3. Turbine Power Time Constant $T_2 = 1$ sec.
4. Turbine Exhaust Temperature Time Constant $T_3 = 4.5$ sec.
5. Ambient Temperature Load Limit $A_T = 1$ pu
6. Temperature Limiter Gain $K_t = 4$
7. Maximum Valve Position $V_{\max} = 1$ p.u. on KVA Base
8. Minimum Valve Position $V_{\min} = 0.2$ P.u. on KVA Base
9. Turbine Damping Coefficient $D_{\text{urb}} = 0$

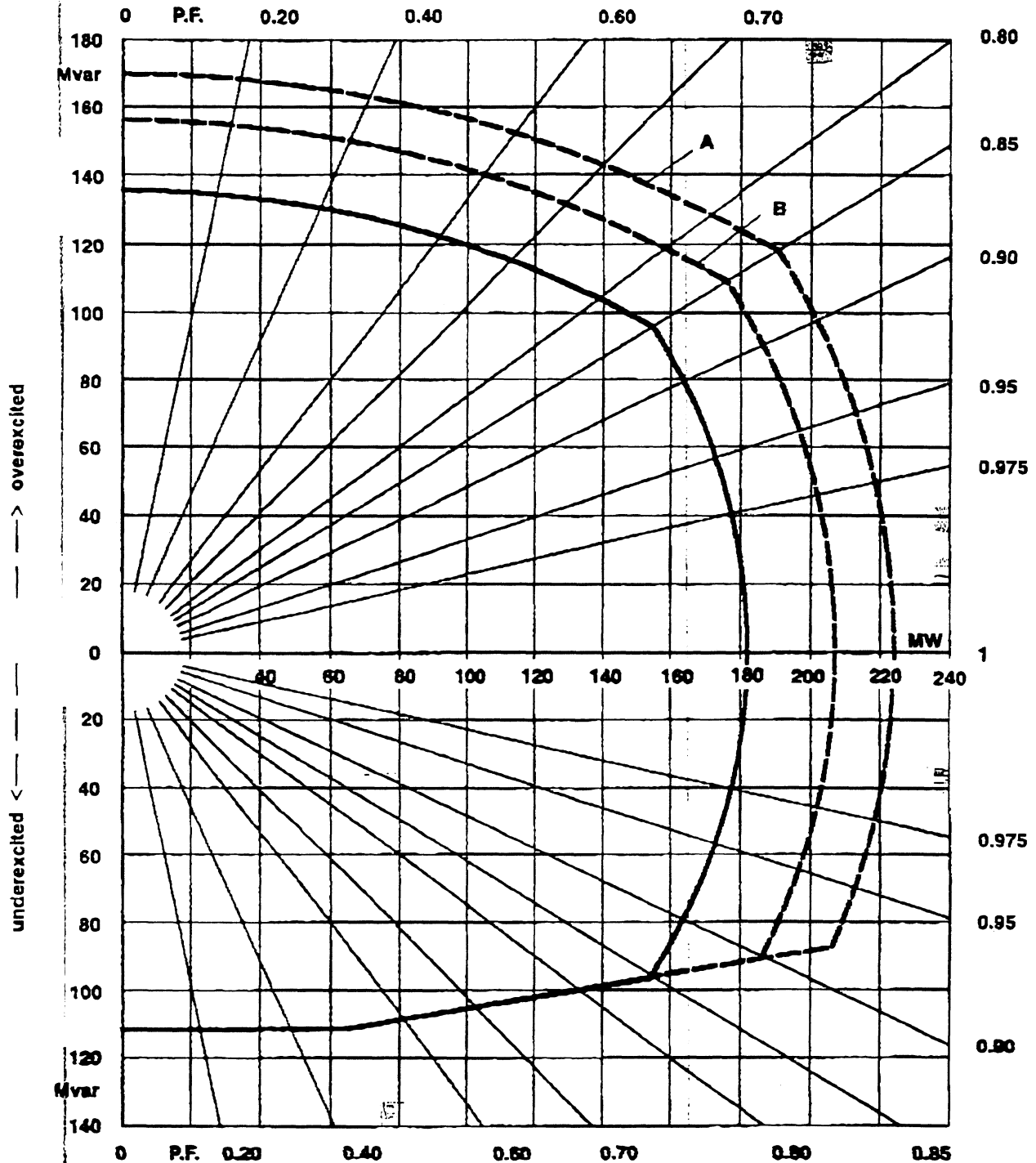


GT Model

**KWU G134, Di
Jun 1999
USAModel.doc**

Generator Type: TLRI 108/46-36

		Rated	A	B
Apparent Output	S	182.000 MVA	224.000 MVA	207.000 MVA
Armature Voltage	U	18.000 kV		
Armature Current	I	6.567 kA		
Frequency	f	60.0 Hz		
Power Factor	P.F	0.85	0.85	0.85
Cold Gas Temperature	T _K	38.0 °C (100.4 °F)	23.0 °C (73.4 °F)	30.0 °C (86.0 °F)



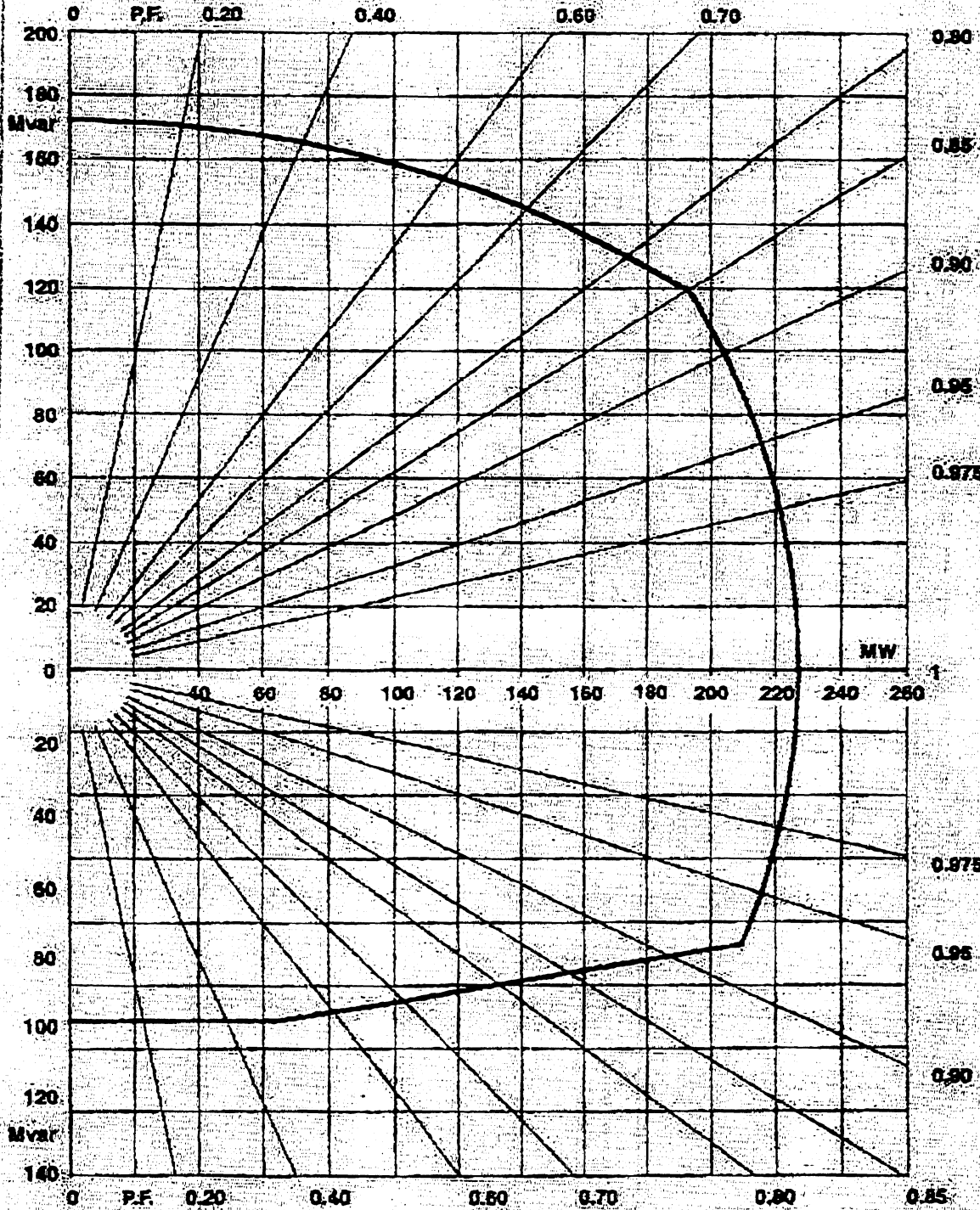
CTG

Reactive Capability Curve

TYPE: TLR 100/46-35

Rated

Apparent Output	$\frac{1}{\sqrt{3}} S$	227.000 MVA
Armature Voltage	U	16.000 kV
Armature Current	I	8.191 kA
Frequency	f	60.0 Hz
Power Factor	P.F.	0.85
Gold Gas Temperature	T_k	38.0 °C (100.4 °F)



STG

APPENDIX C

LOAD FLOW PLOTS

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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PSLF Program
Diythe II Project
1040PM
2004 SPRING CASE

MM/Pct	Tue Mar 05 13:39:56 2002
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APPENDIX E

STABILITY PLOTS

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blythespr1040f.dyd
TITLE
2004 Spring
5-CYCLE 3-Phase Fault on Coachella 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "COACHELV" 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL      5.0 "MIRIID " 230. "MIRAGE " 230. "1 "
DL      5.0 "COACHELV" 230. "DEVERS " 230. "1 "
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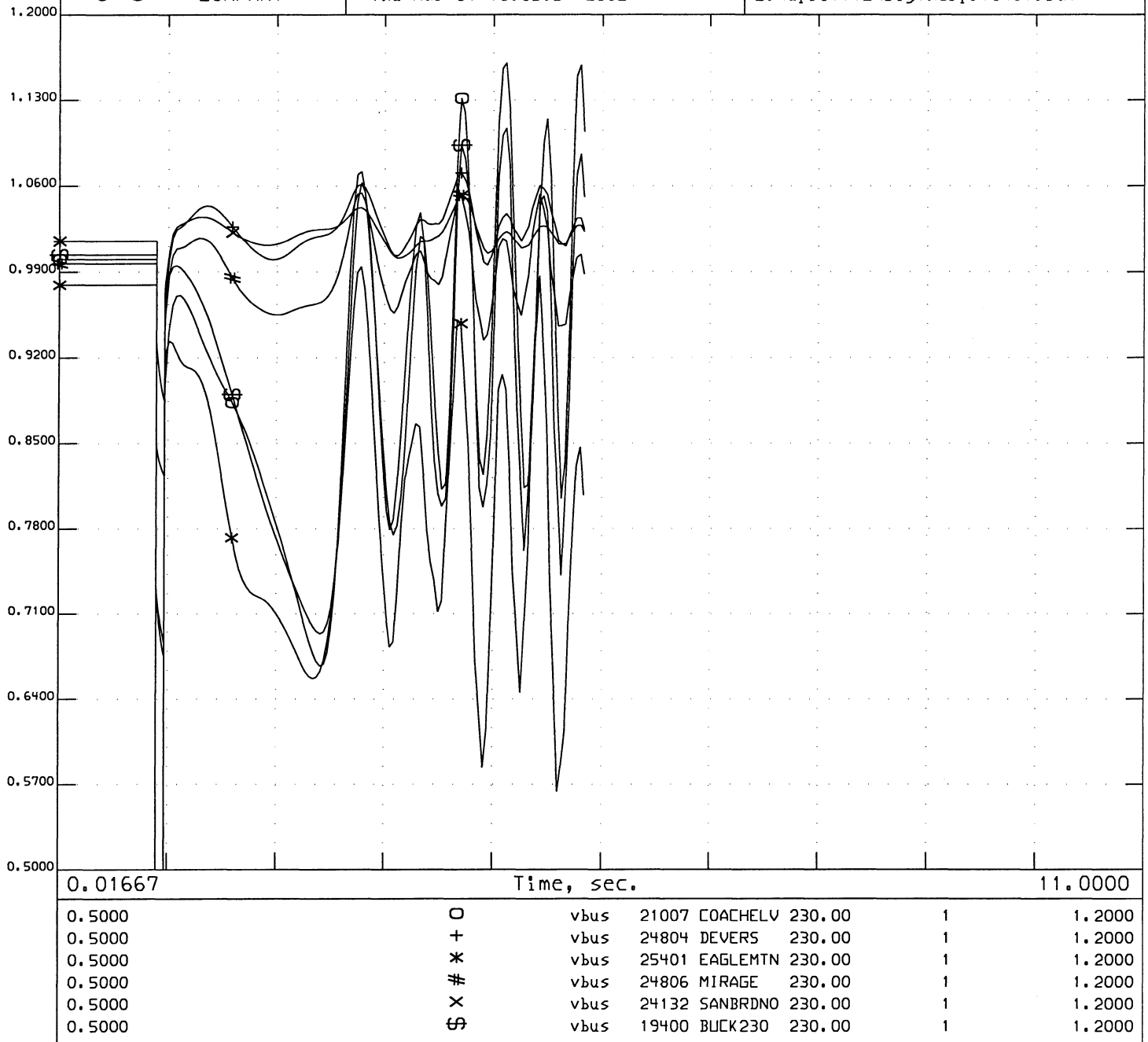
GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG

Thu Mar 07 16:05:57 2002

coachelln2spra.chf

C:\upslf112\blythespr1040f.sav



2004 Spring

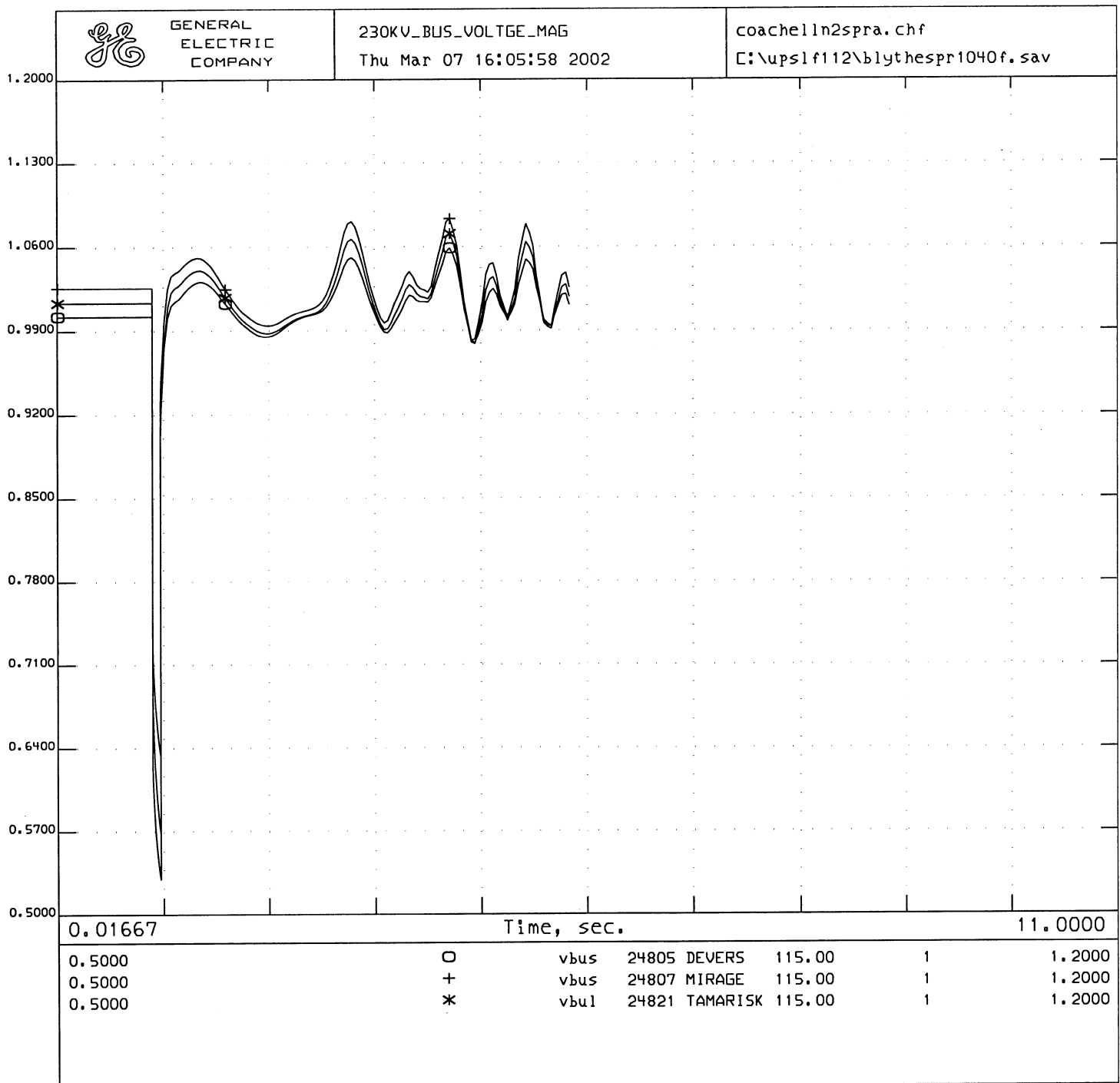
5-CYCLE 3-Phase Fault on Coachella 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Coachella 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt

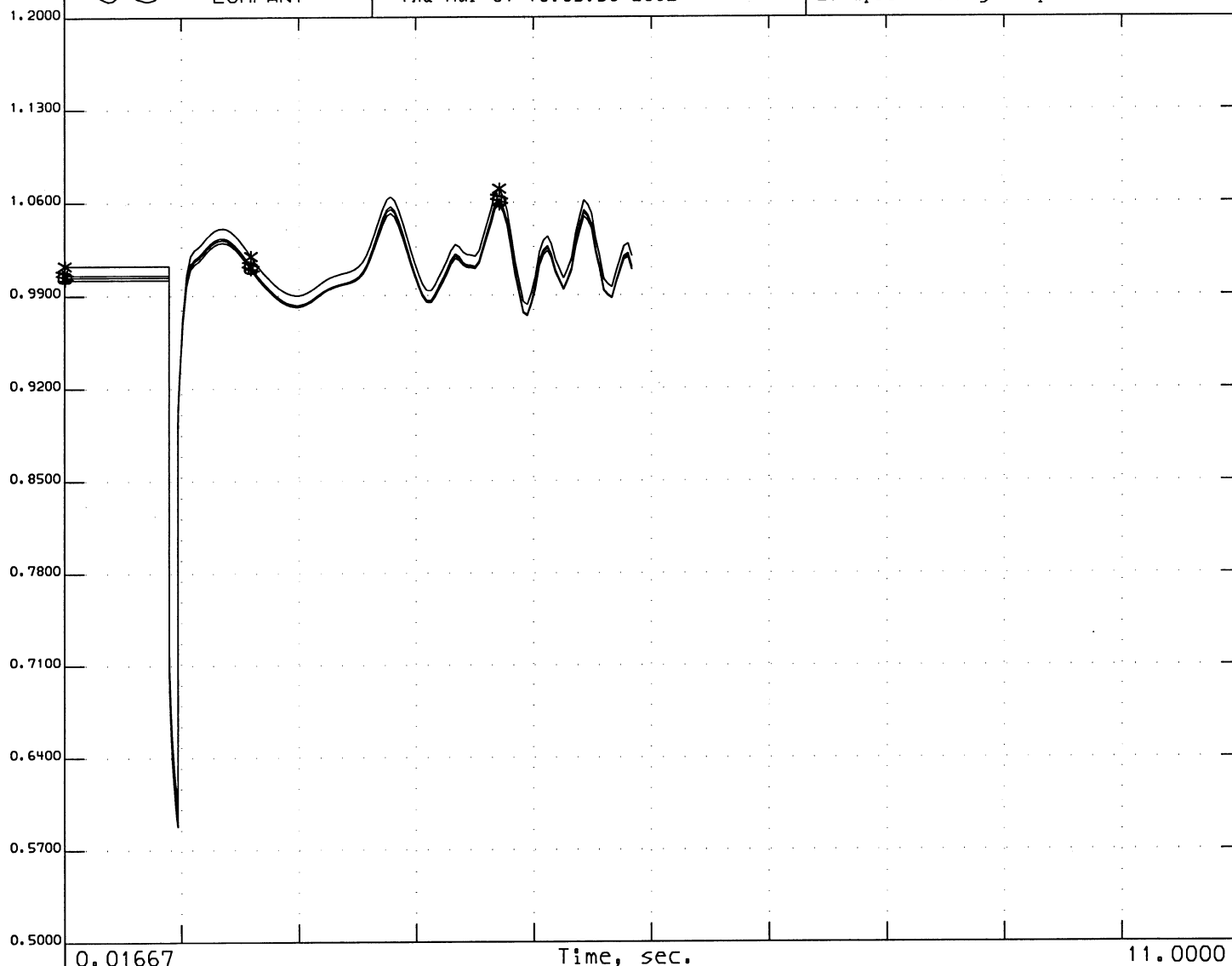
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 16:05:58 2002

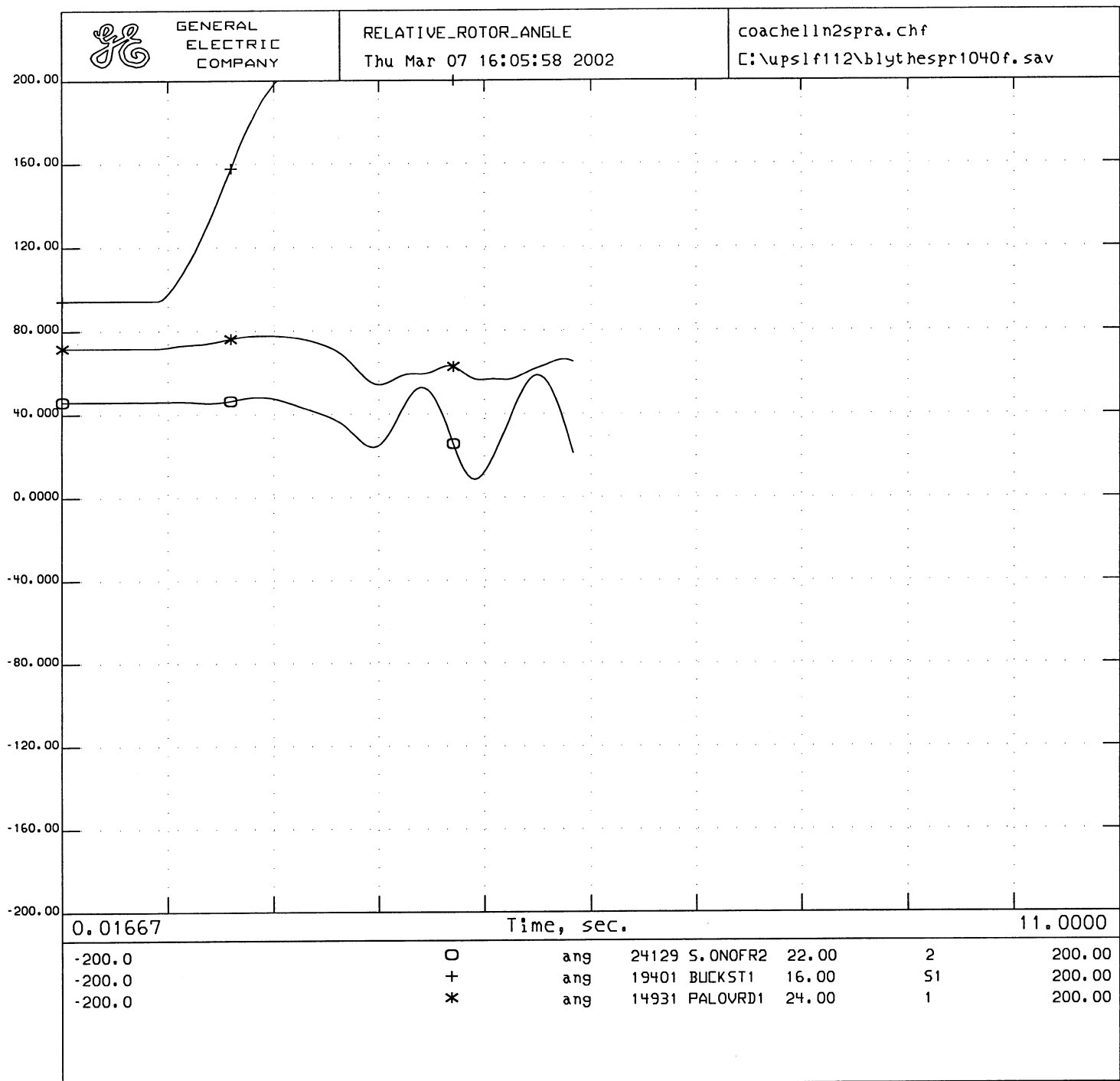
coachelln2spra.chf
C:\ups1f112\blythespr1040f.sav



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0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Coachella 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Coachella 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt

IID CHANGES

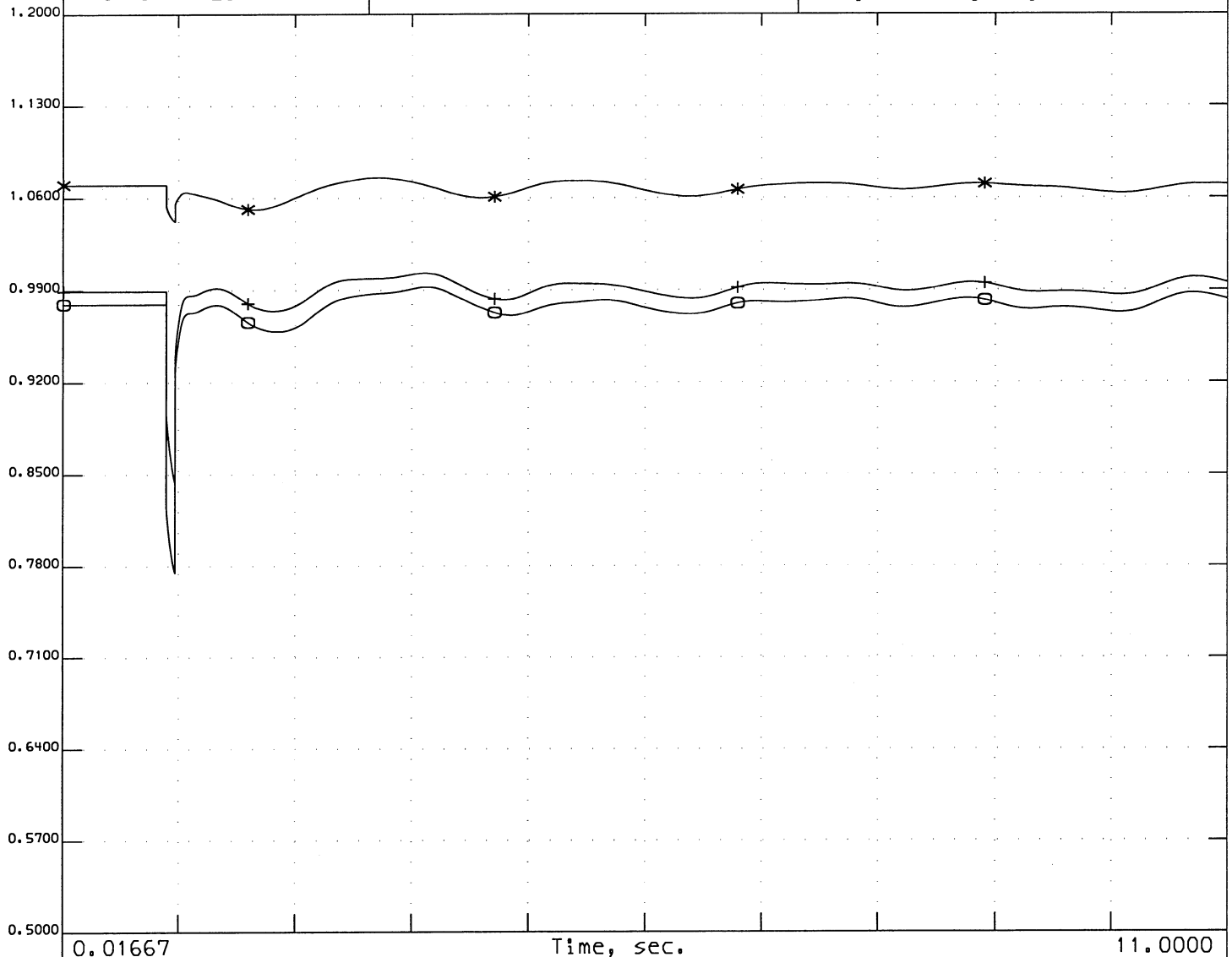

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blythespr1040f.sav
blythespr1040f.dyd
TITLE
2004 Spring
5-CYCLE 3-Phase Fault on Coachella 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "COACHELV" 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL      5.0 "MIRIID " 230. "MIRAGE " 230. "1 "
DL      5.0 "COACHELV" 230. "DEVERS " 230. "1 "
TG      12.0 "BUCKST2 " 16.00 "S2"
```



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 16:42:13 2002

coachelln2spr1a.chf
C:\ups1f112\blythespr1040f.sav



0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Coachella 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt

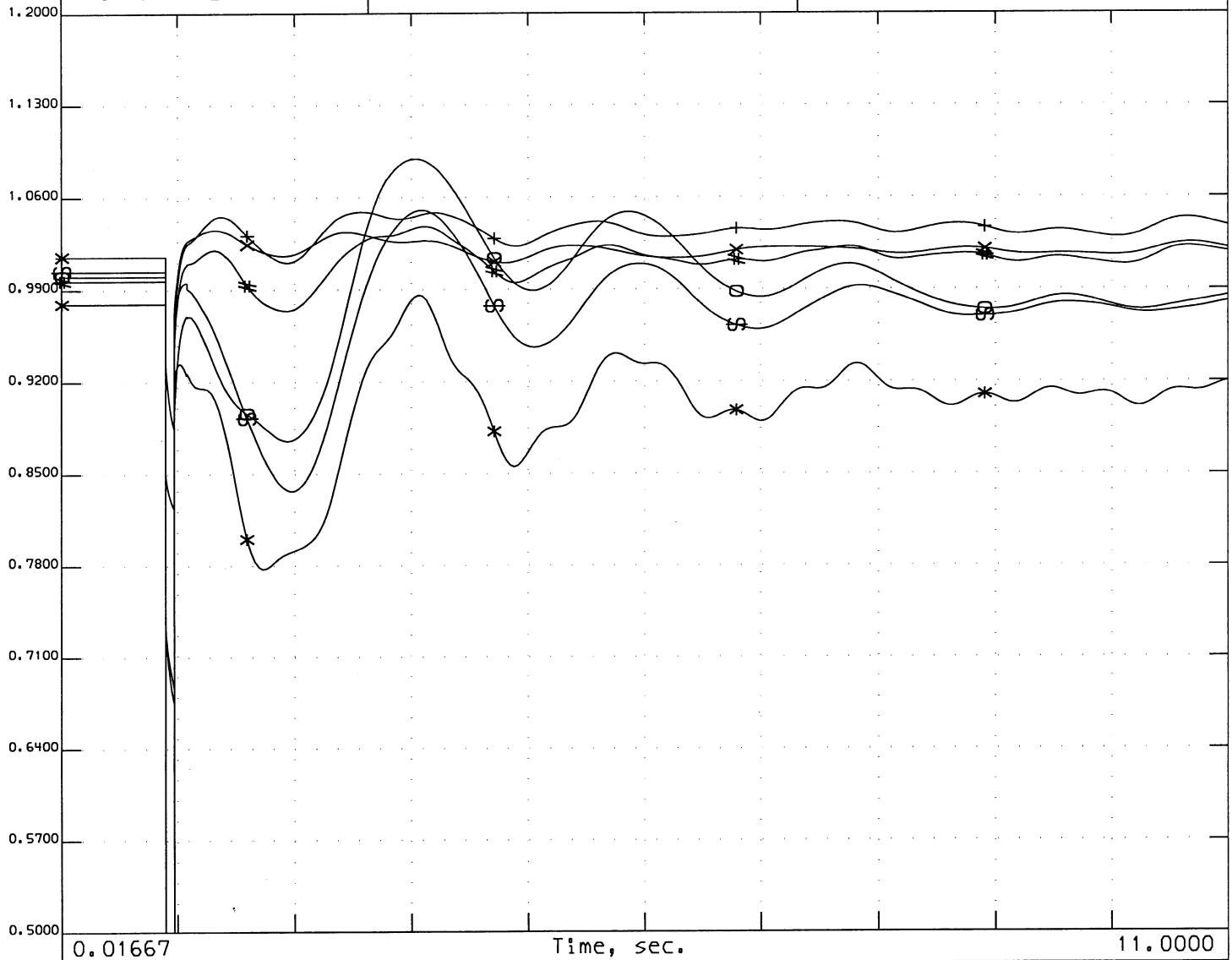
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:42:13 2002

coachelln2spr1a.chf
C:\ups1f112\blythespr1040f.sav



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0.5000	+	vbus	24804	DEVERS	230.00	1 1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1 1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1 1.2000
0.5000	X	vbus	24132	SANBRDNO	230.00	1 1.2000
0.5000	⊗	vbus	19400	BUCK230	230.00	1 1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Coachella 230KV Bus

Contingency-Remove Coachella - Devers & Miriad - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt

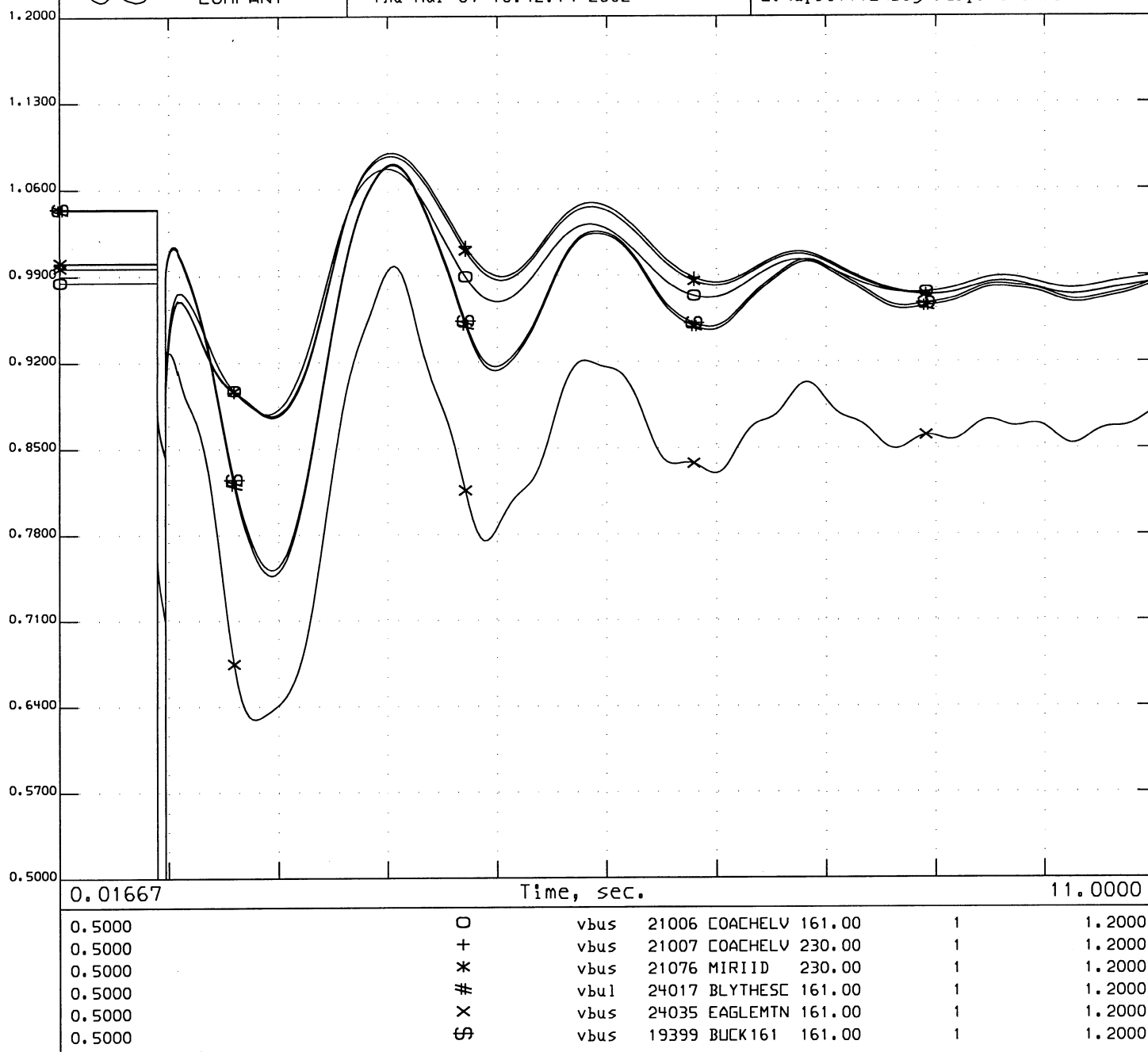
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:42:14 2002

coachelln2spr1a.chf
C:\ups1f112\blythespr1040f.sav



2004 Spring

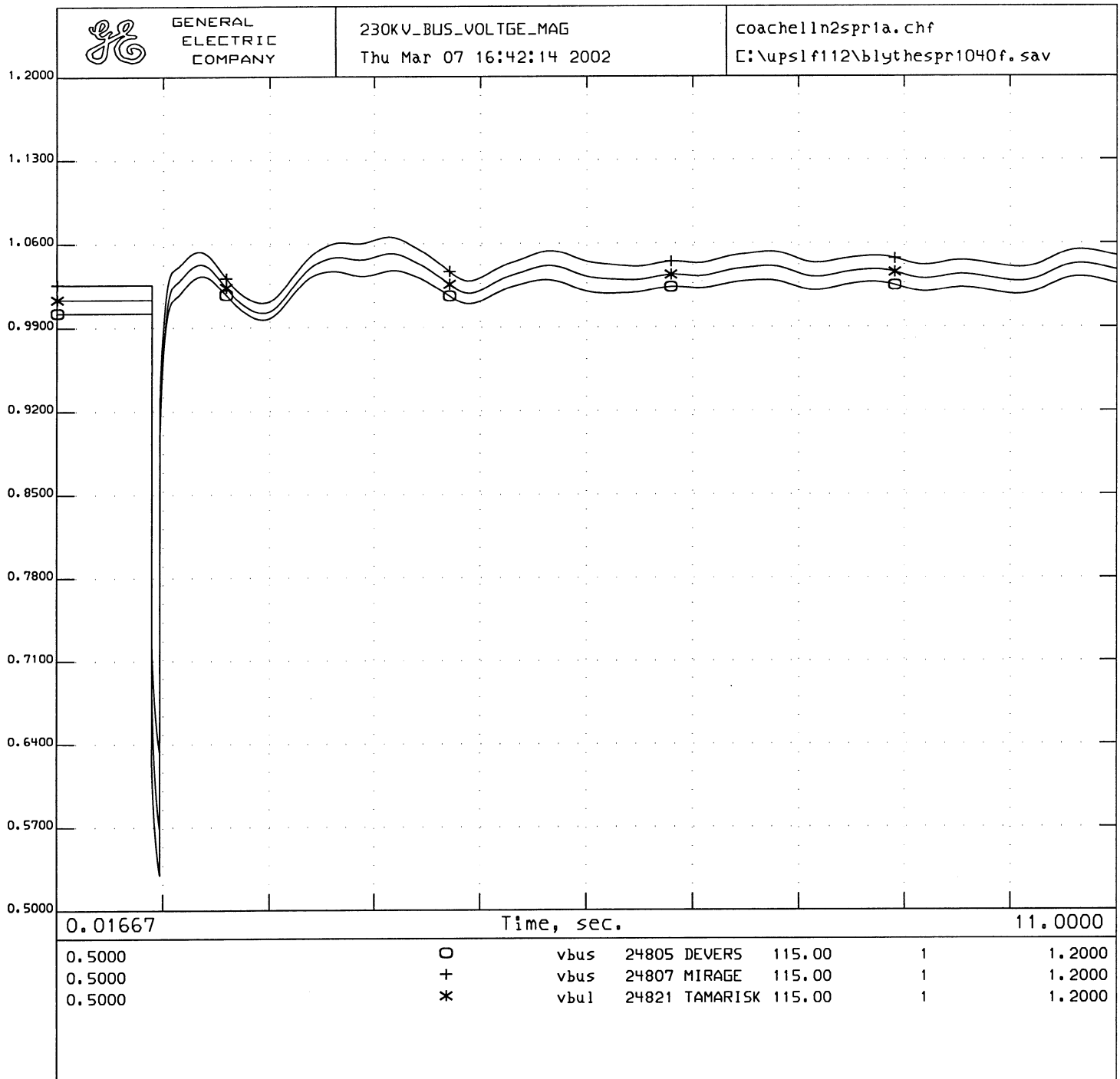
5-CYCLE 3-Phase Fault on Coachella 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

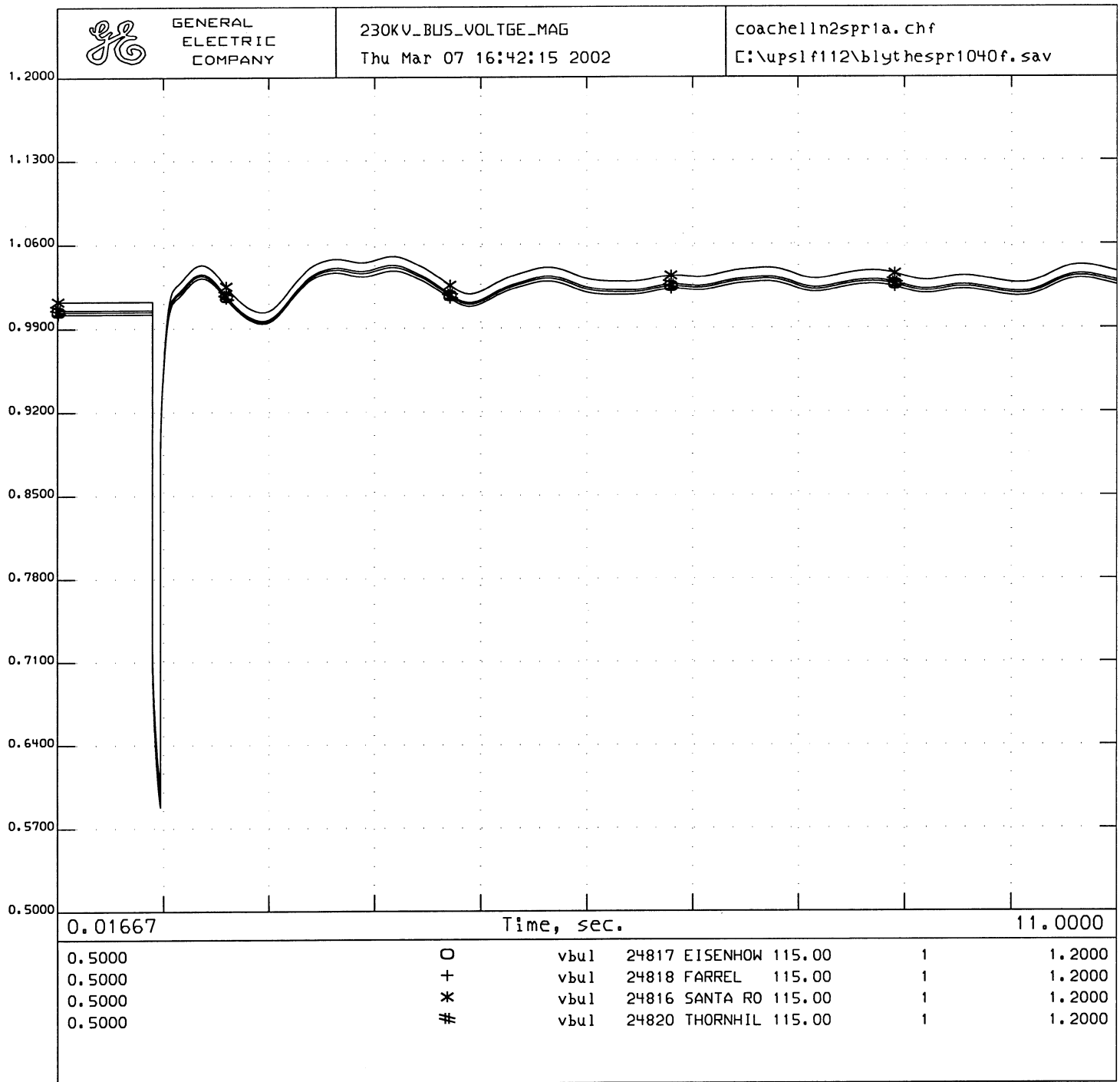
Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Coachella 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Coachella 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spr1a.swt

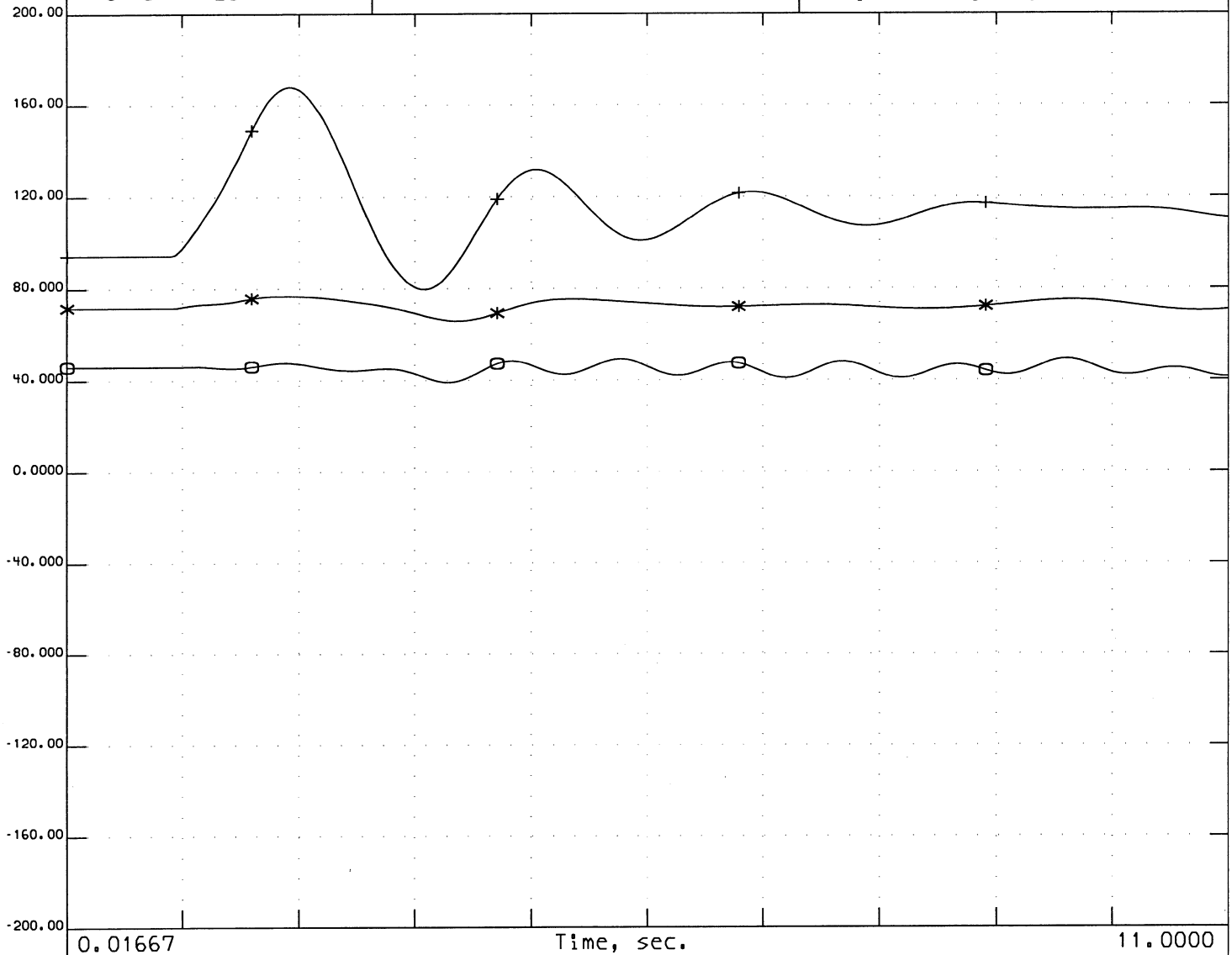
IID CHANGES



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 16:42:15 2002

coachelln2spr1a.chf
C:\ups1f112\blythespr1040f.sav



-200.0	o	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	+	ang	19401 BUCKST1	16.00	51	200.00
-200.0	*	ang	14931 PALOVRD1	24.00	1	200.00

2004 Spring
5-CYCLE 3-Phase Fault on Coachella 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
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IID CHANGES

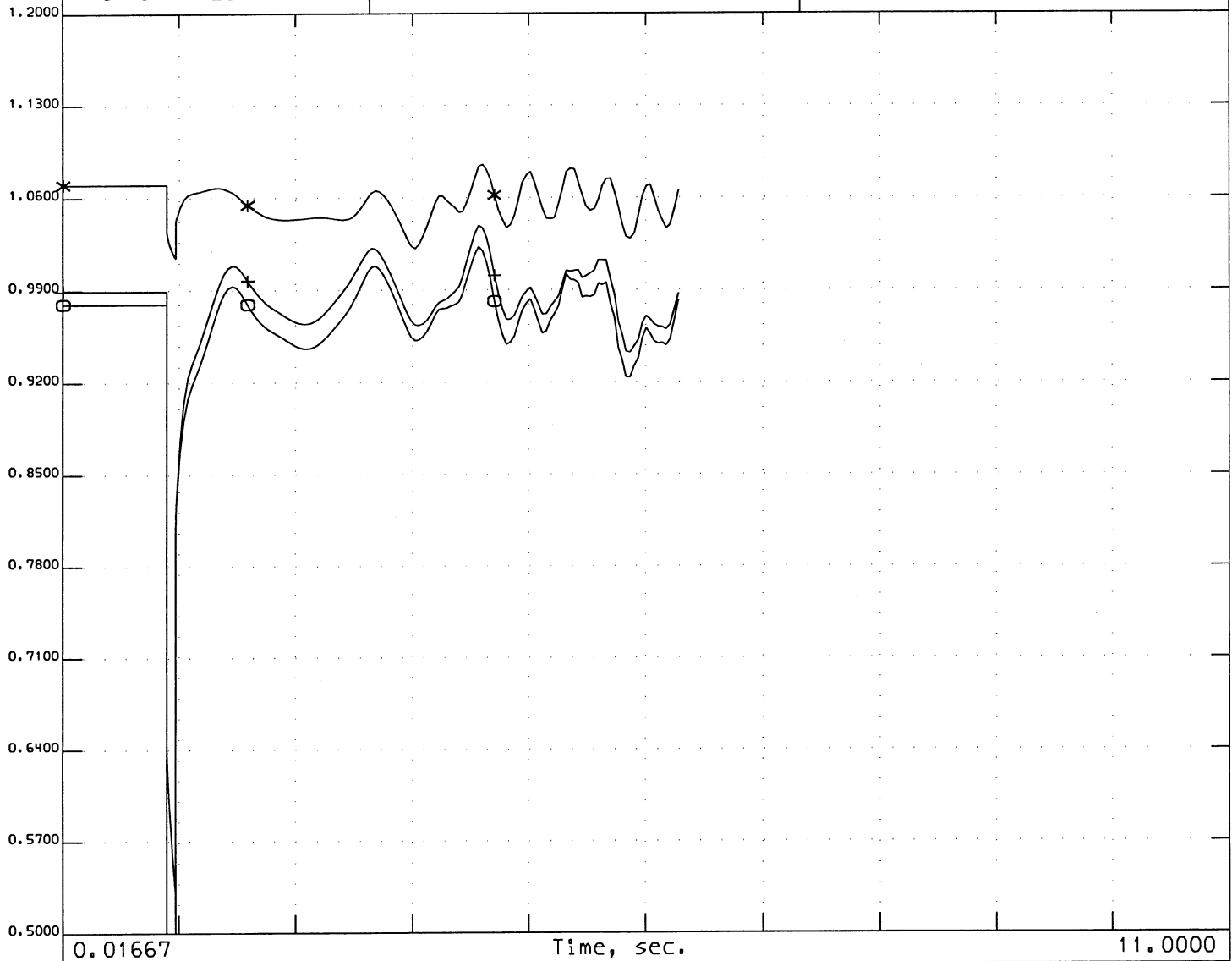
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blythespr1040f.sav
blythespr1040f.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + coachella-n2spr.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "DEVERS " 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "
DL 5.0 "COACHELV" 230. "DEVERS " 230. "1 "
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GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 16:06:35 2002

coachella-n2spr.chf
C:\ups\l112\blythespr1040f.sav



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0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

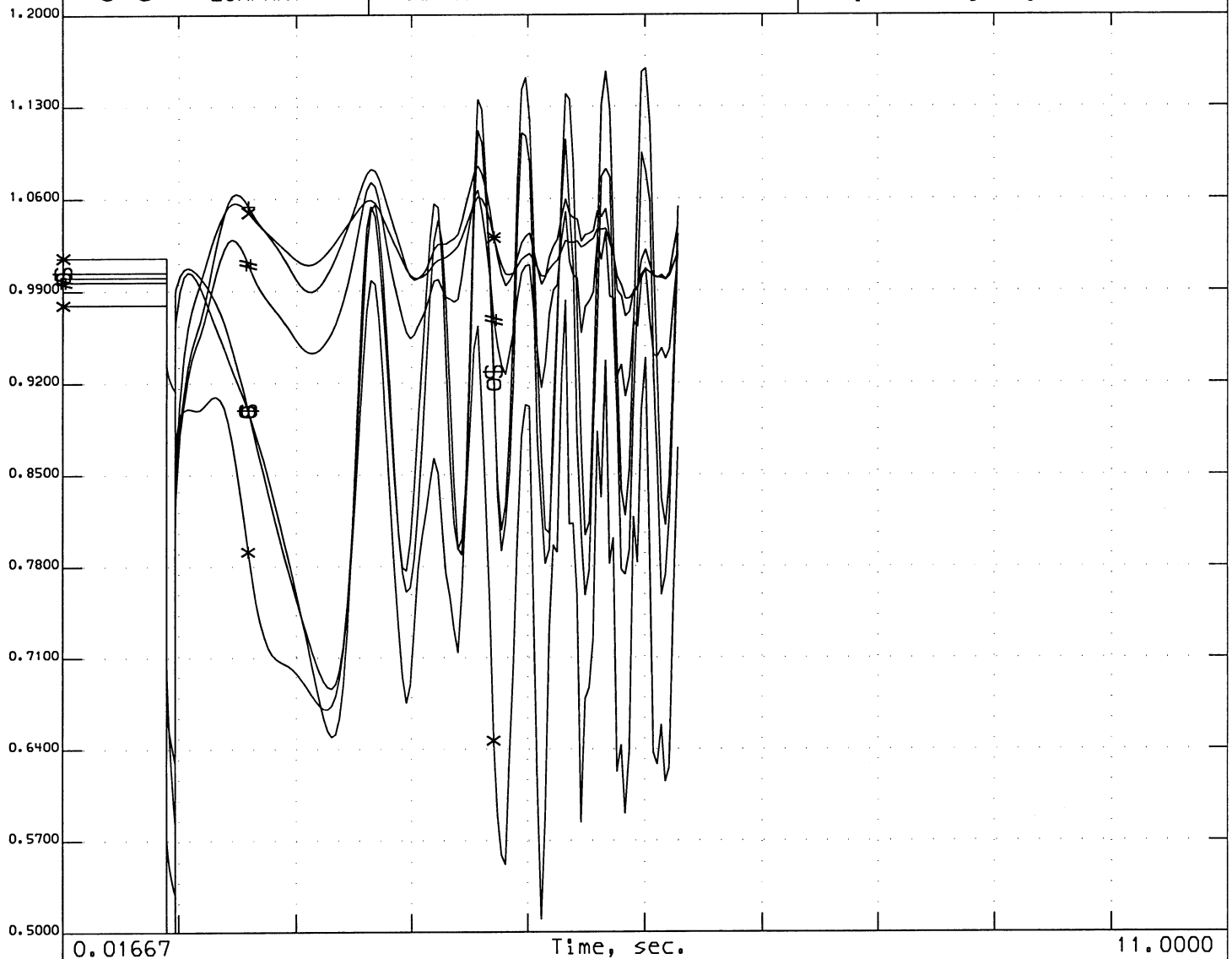
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:06:36 2002

coachella-n2spr.chf
C:\ups1f112\blythespr1040f.sav



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0.5000	+	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	X	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	@	vbus	19400	BUCK230	230.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
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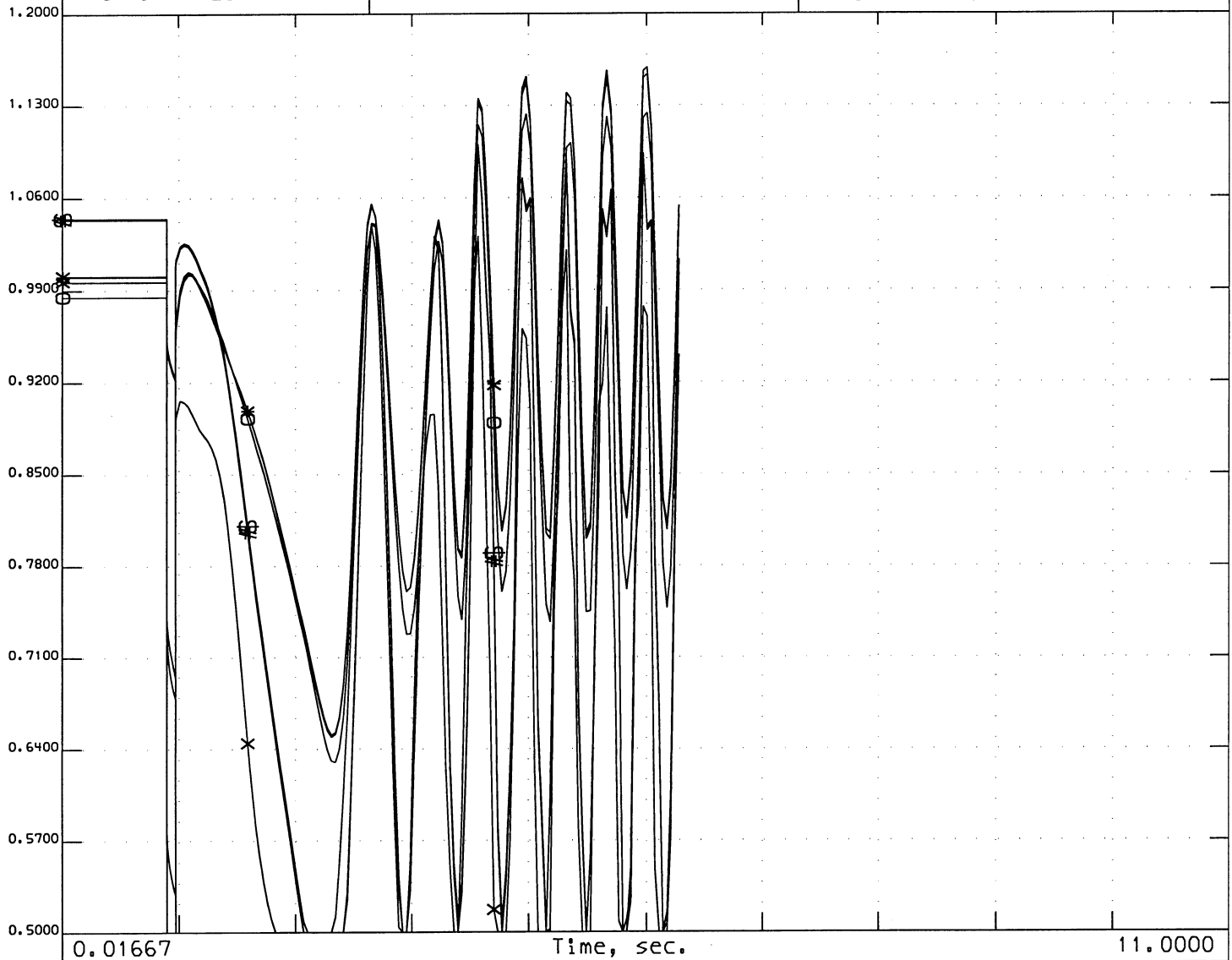
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:06:37 2002

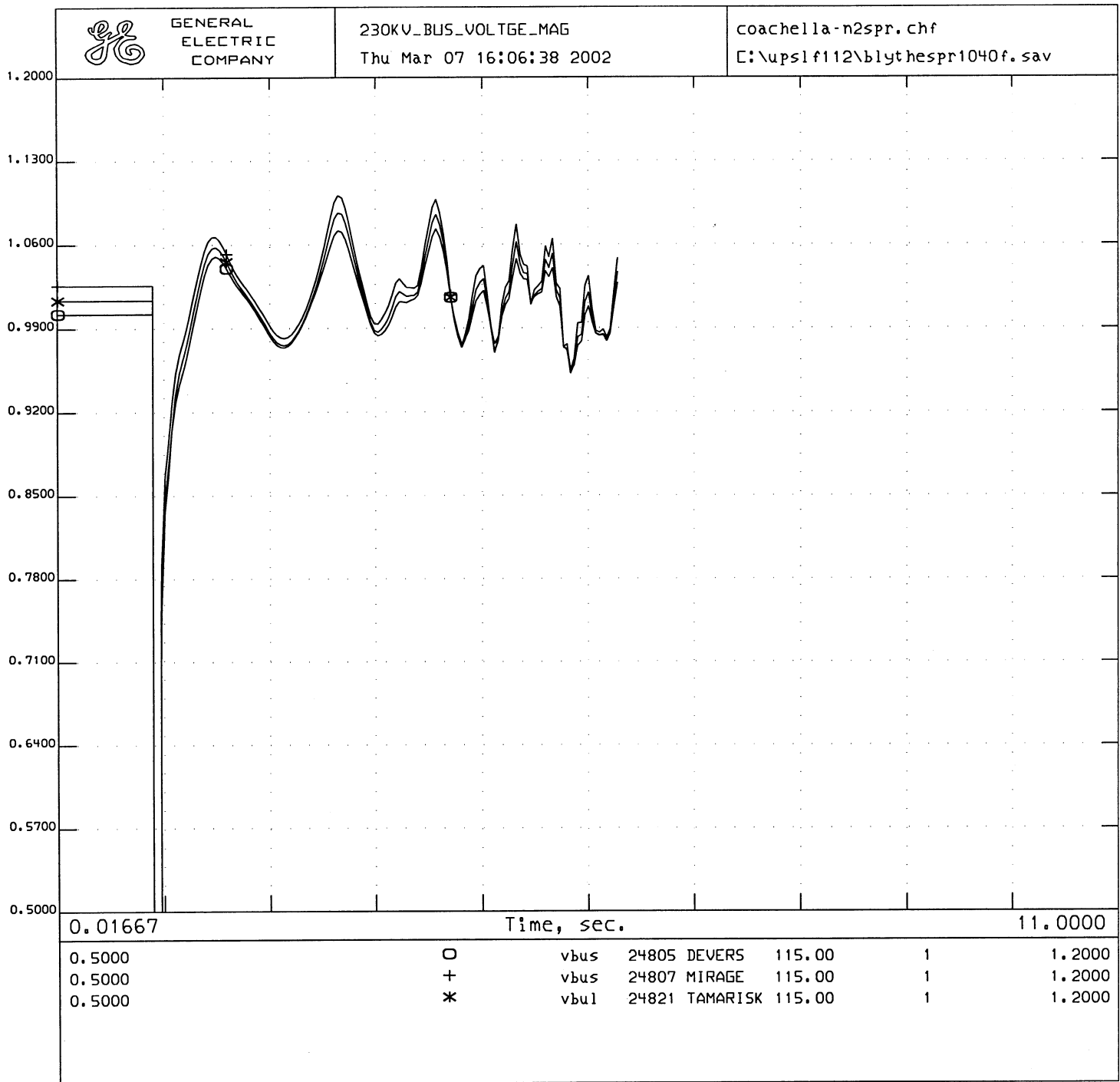
coachella-n2spr.chf
C:\ups1f112\blythespr1040f.sav



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0.5000	+	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	*	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	#	vbul	24017	BLYTHESC	161.00	1	1.2000
0.5000	X	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	69	vbus	19399	BUCK161	161.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 500KV Bus
 Contingency-Remove Coachelv - Devers 230 KV Line
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

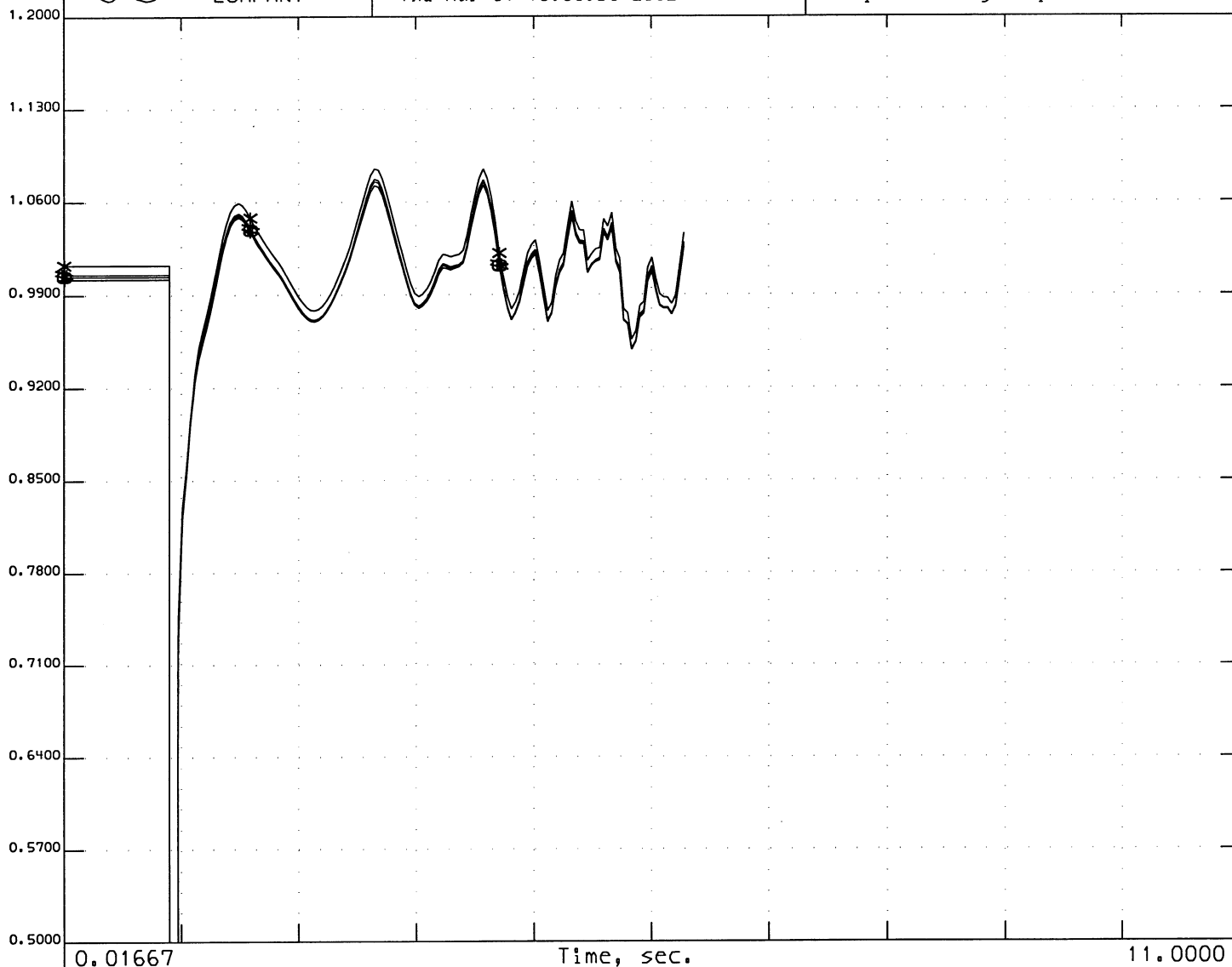
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
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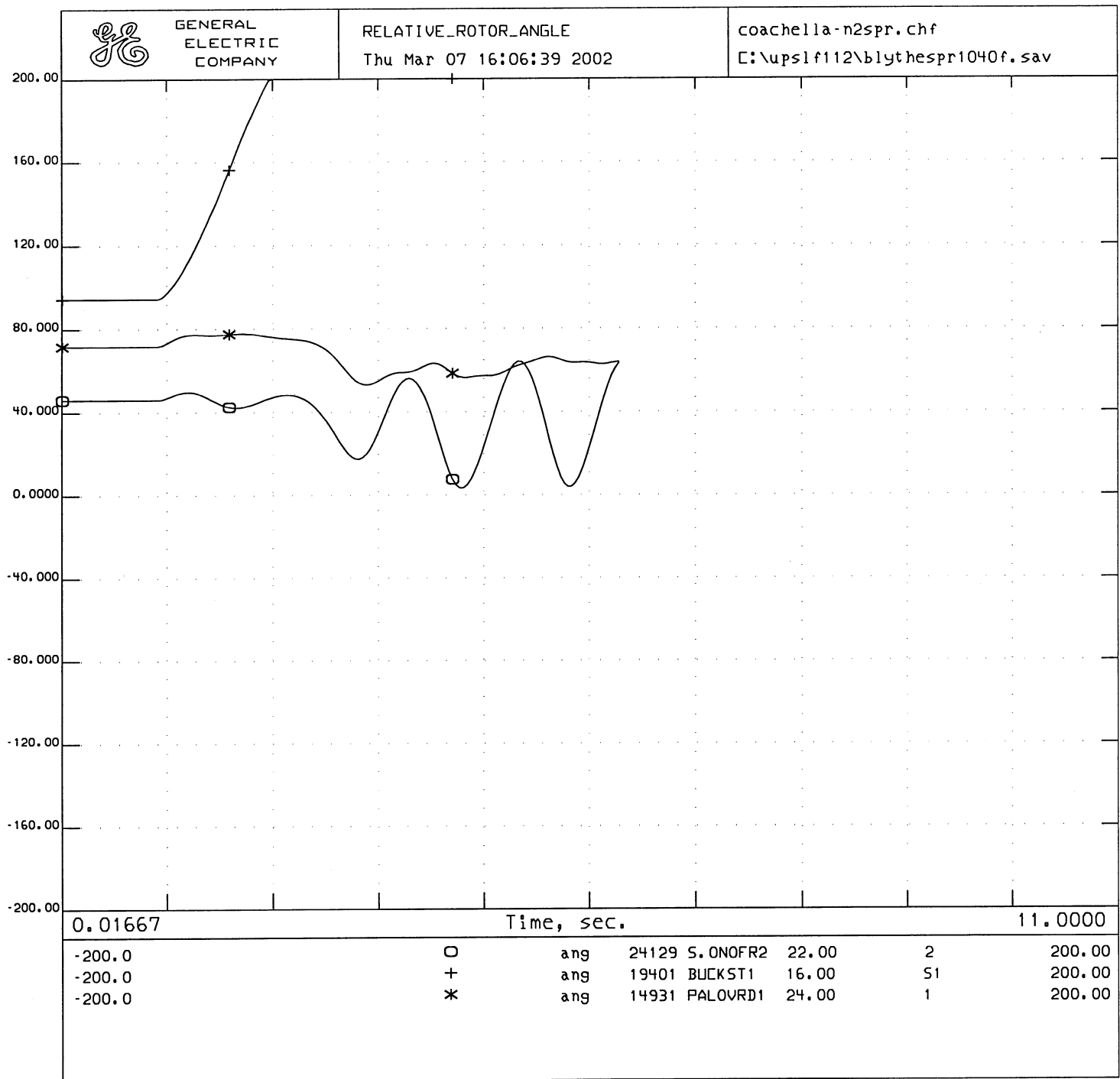
coachella-n2spr.chf
C:\ups\lf112\blythespr1040f.sav



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0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
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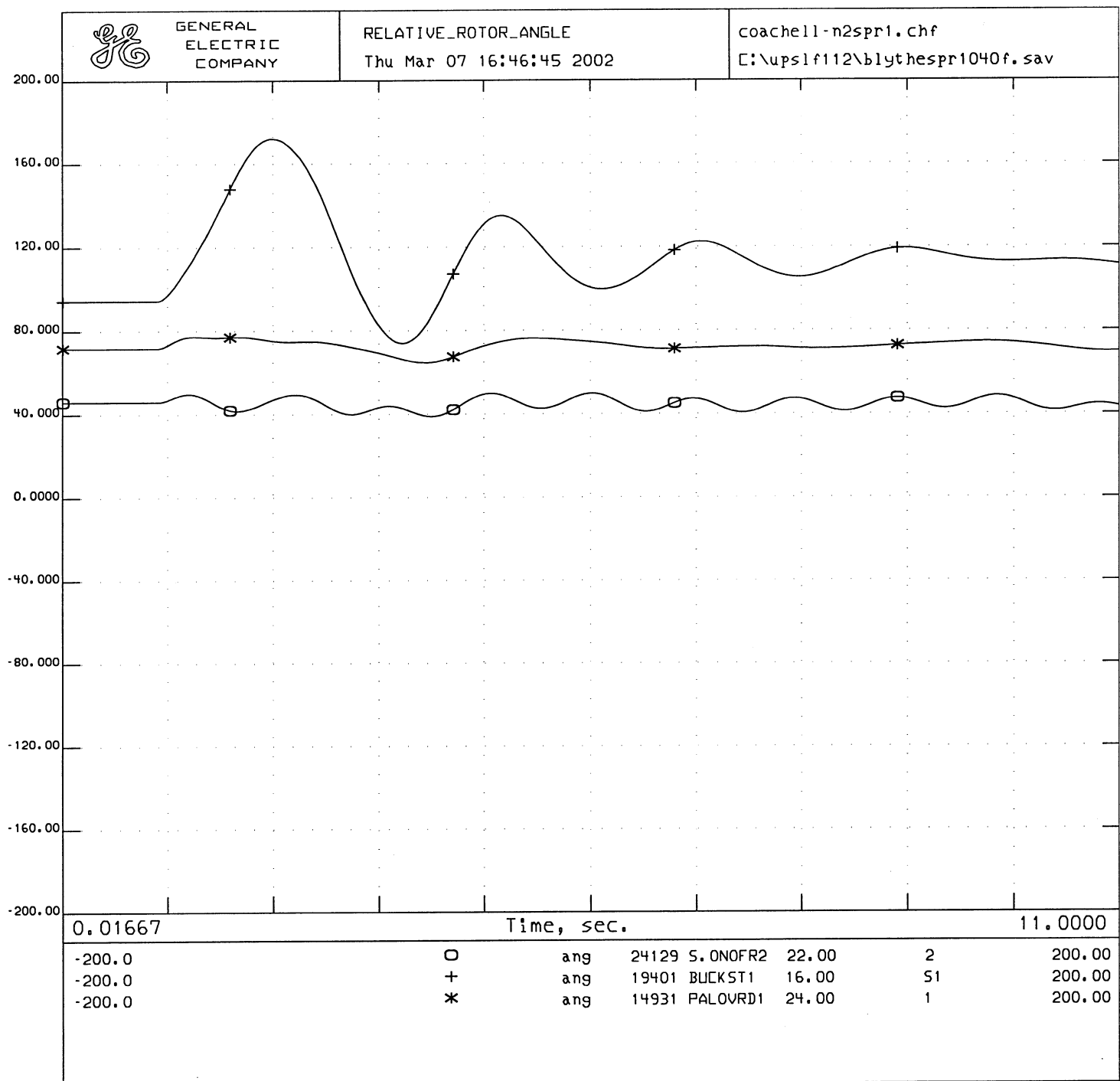
IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 500KV Bus
 Contingency-Remove Coachelv - Devers 230 KV Line
 SYSTEM STABILITY STUDY CASES
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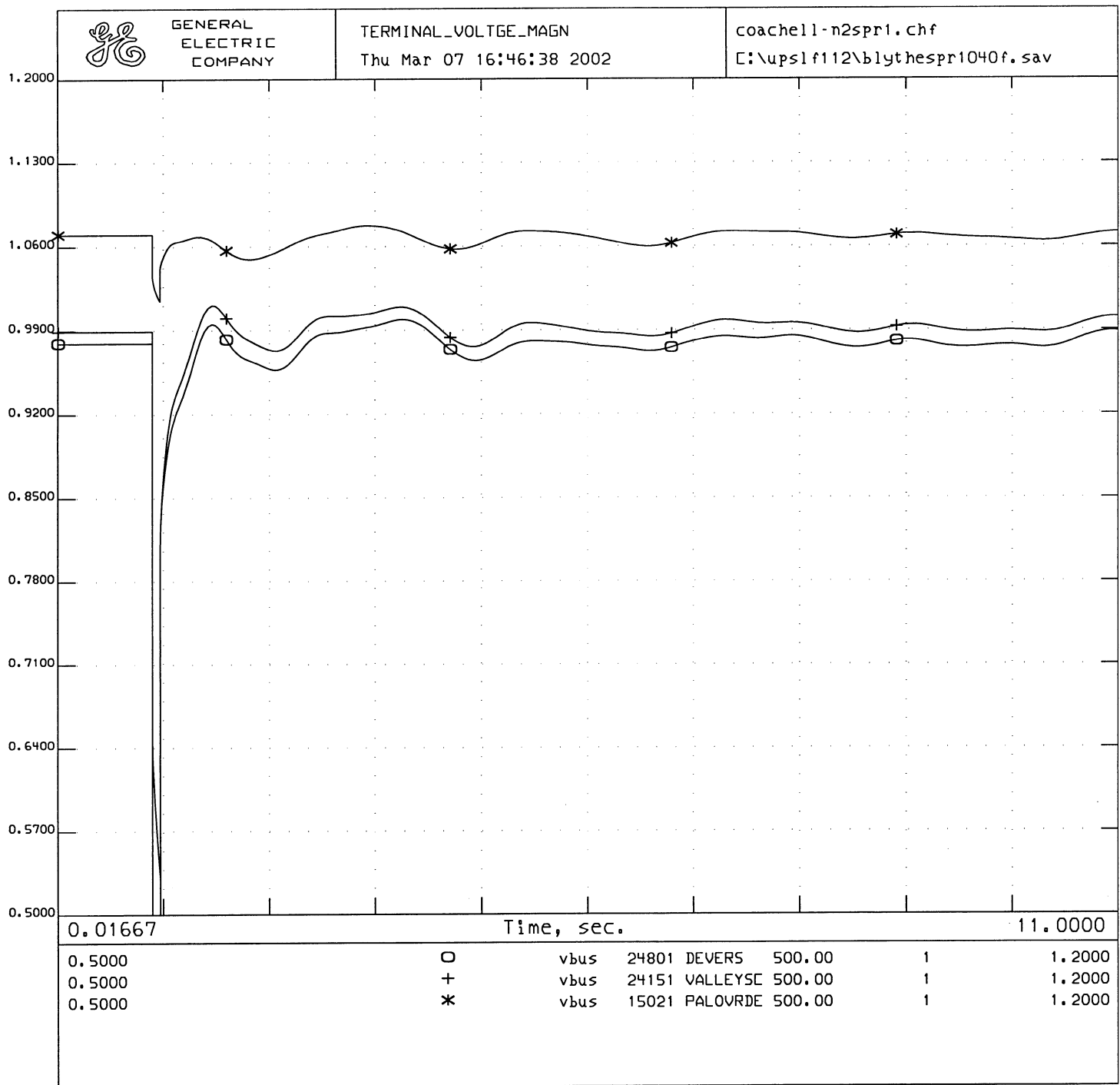
IID CHANGES

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blythespr1040f.sav
blythespr1040f.dyd
TITLE
2004 Spring
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "DEVERS " 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "
DL 5.0 "COACHELV" 230. "DEVERS " 230. "1 "
TG 12.0 "BUCKST2 " 16.00 "S2"
```



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

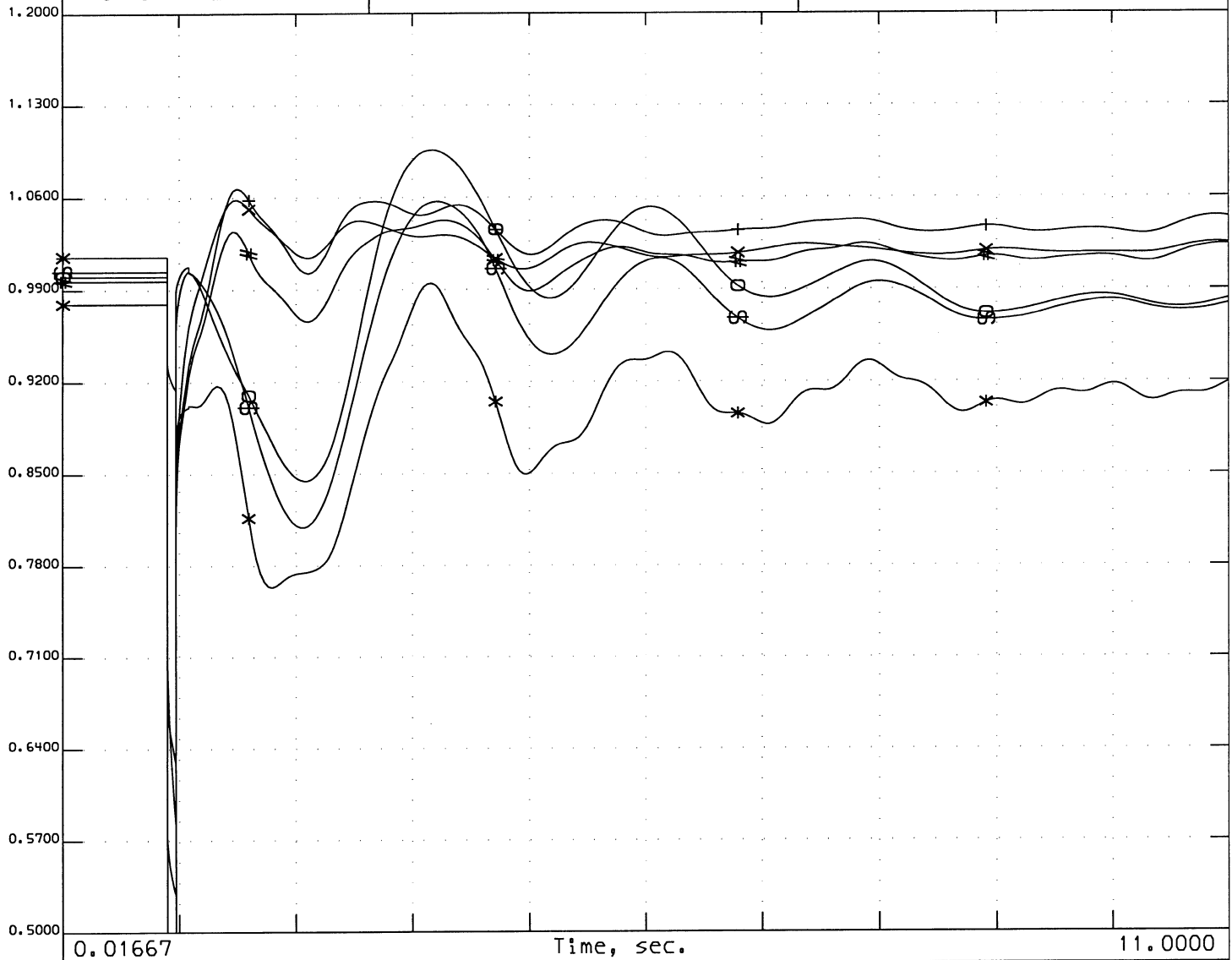
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:46:42 2002

coachell-n2spr1.chf
C:\ups1f112\blythespr1040f.sav



0.5000	O	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	+	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	X	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	⊗	vbus	19400	BUCK230	230.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

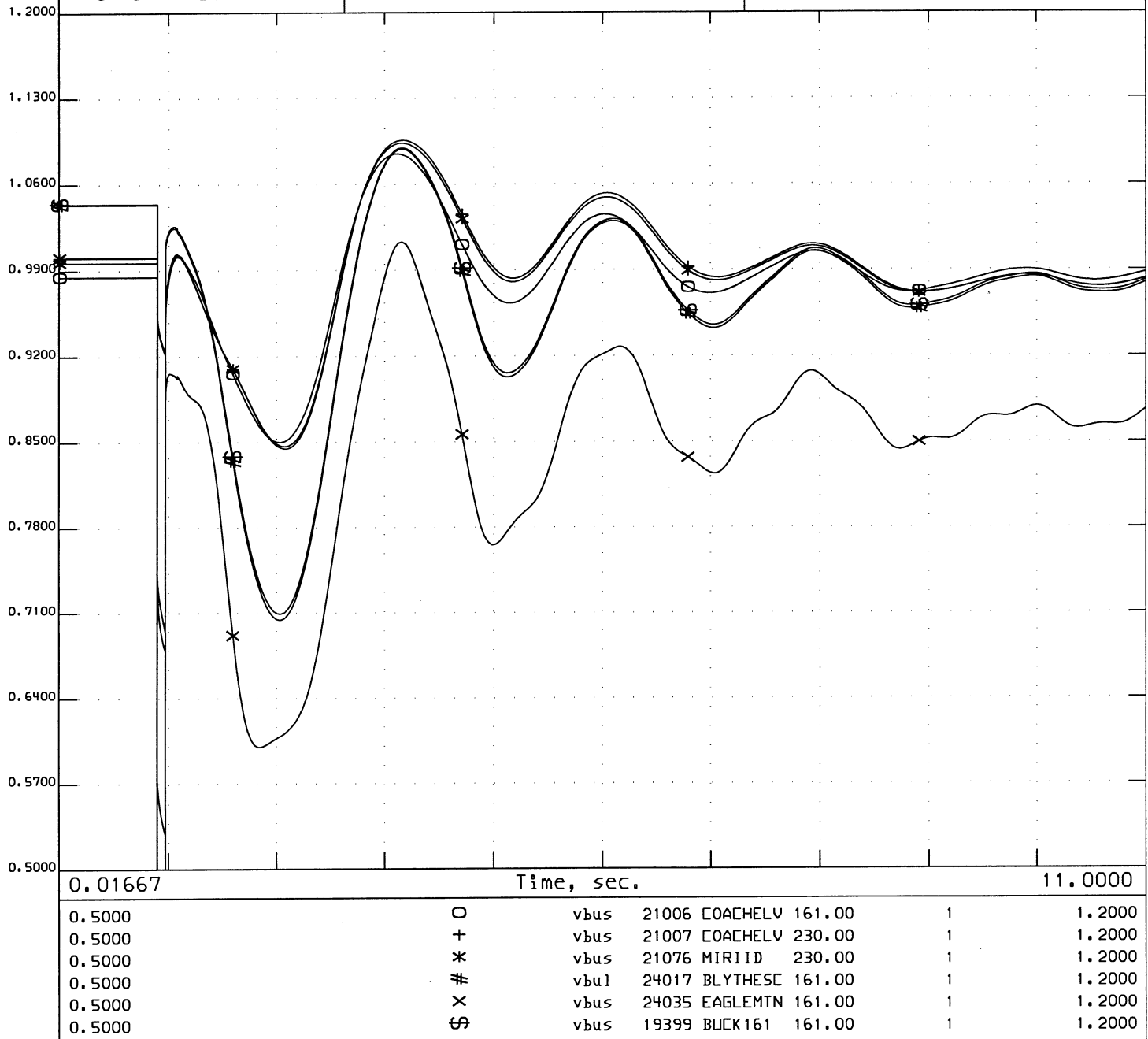
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:46:44 2002

coachell-n2spr1.chf
C:\ups1f112\blythespr1040f.sav



2004 Spring

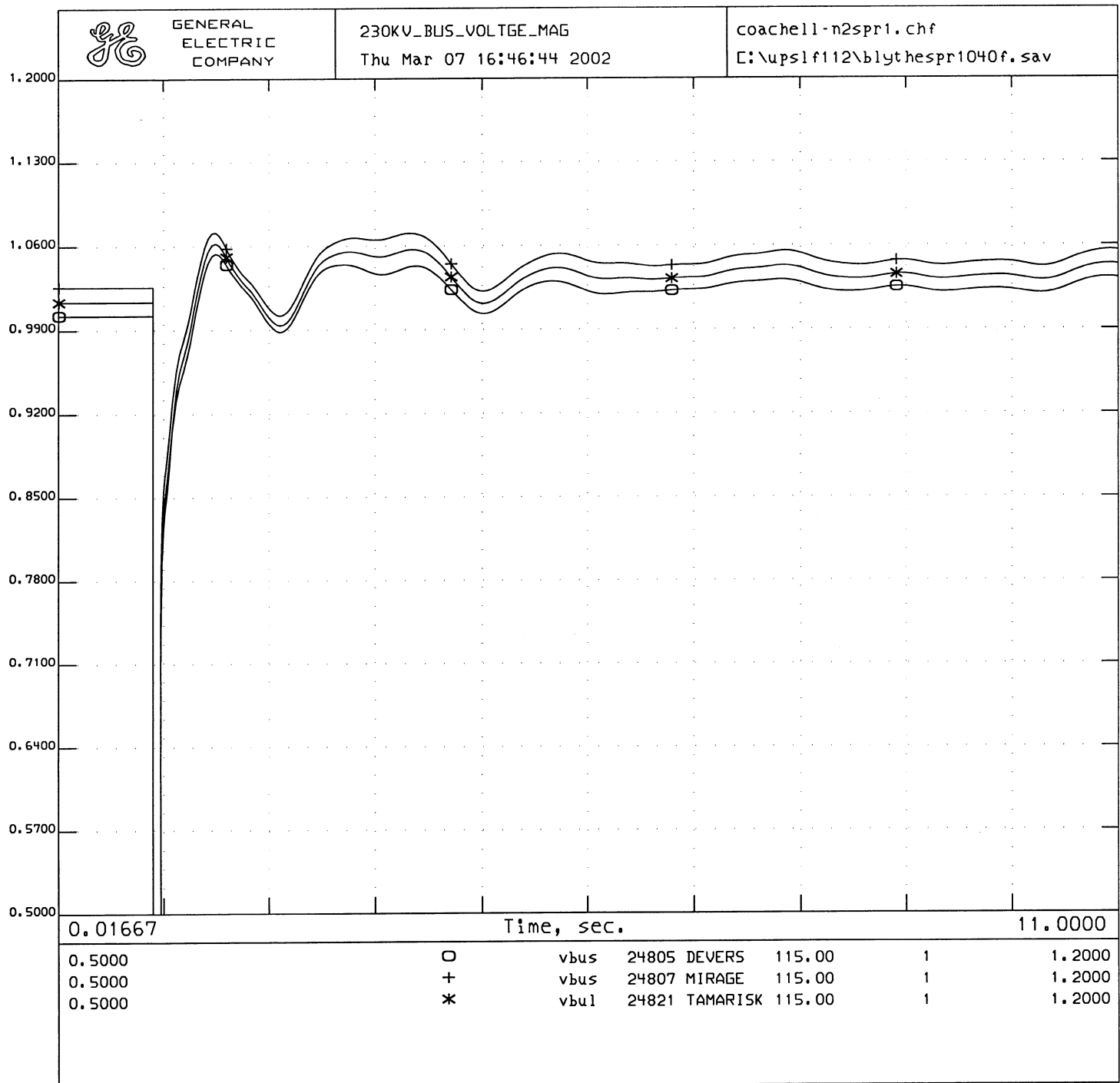
5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

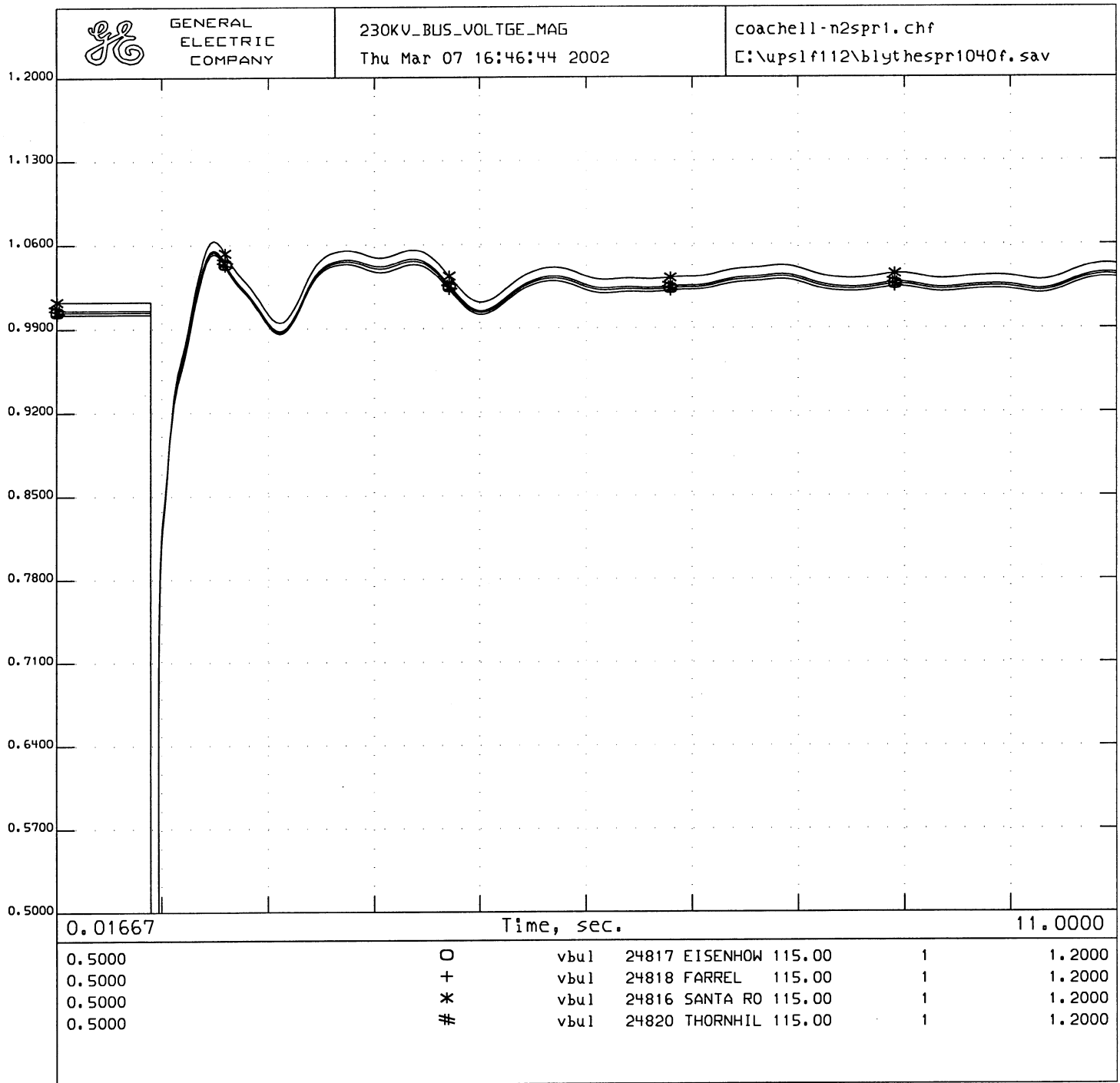
Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Devers 230KV Bus
 Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythespr1040f.sav + Blythespr1040f.dyd + coachell-n2spr1.swt

IID CHANGES

blythesum1040d.sav
blythesum1040d.dyd

TITLE

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS

* CC

FB 0.0 "DEVERS " 230

* CLEAR FAULT

CFB 5.0 "DEVERS " 230

DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "

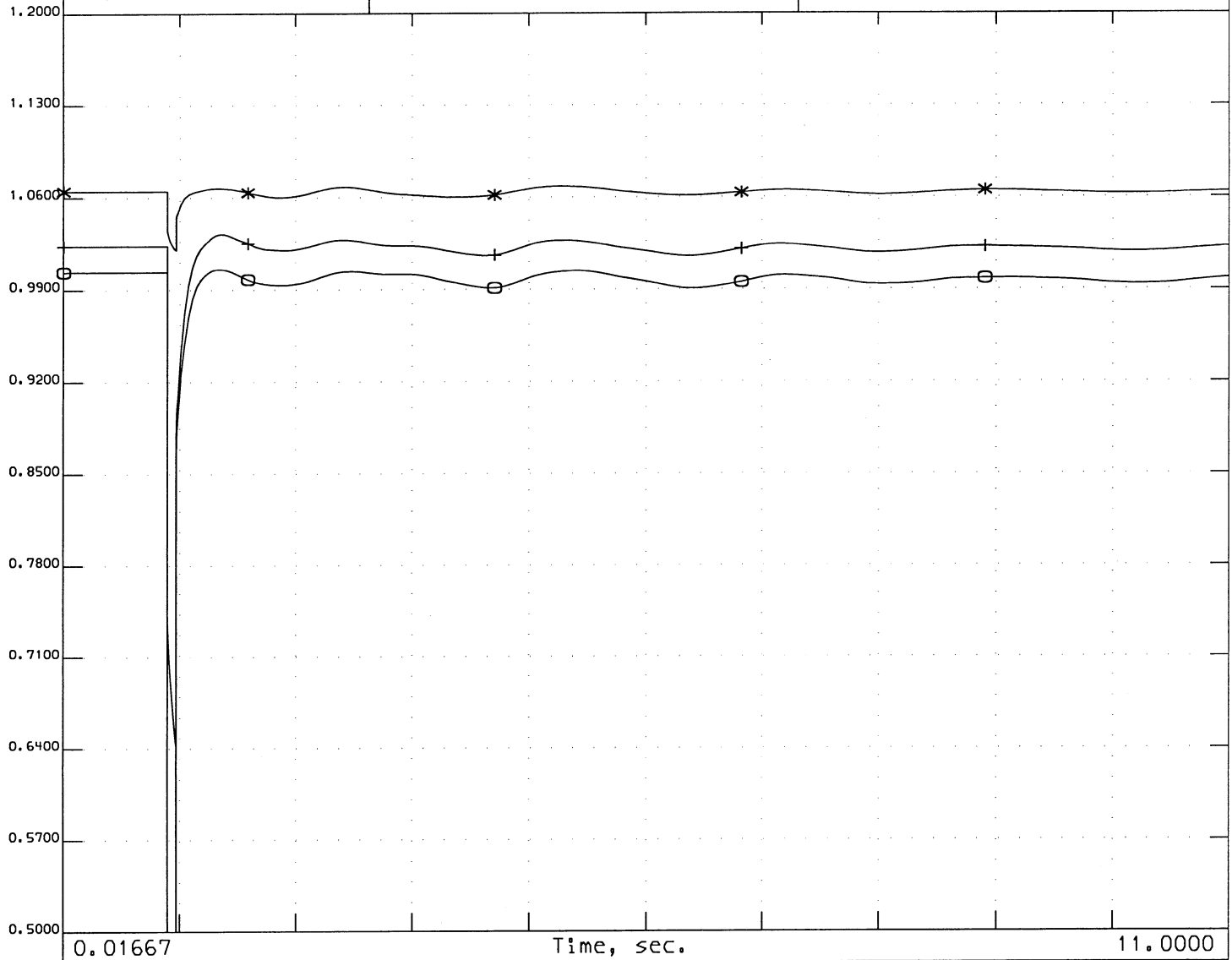
DL 5.0 "COACHELV" 230. "DEVERS " 230. "1 "



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:42:13 2002

coachella-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVPRDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriud - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

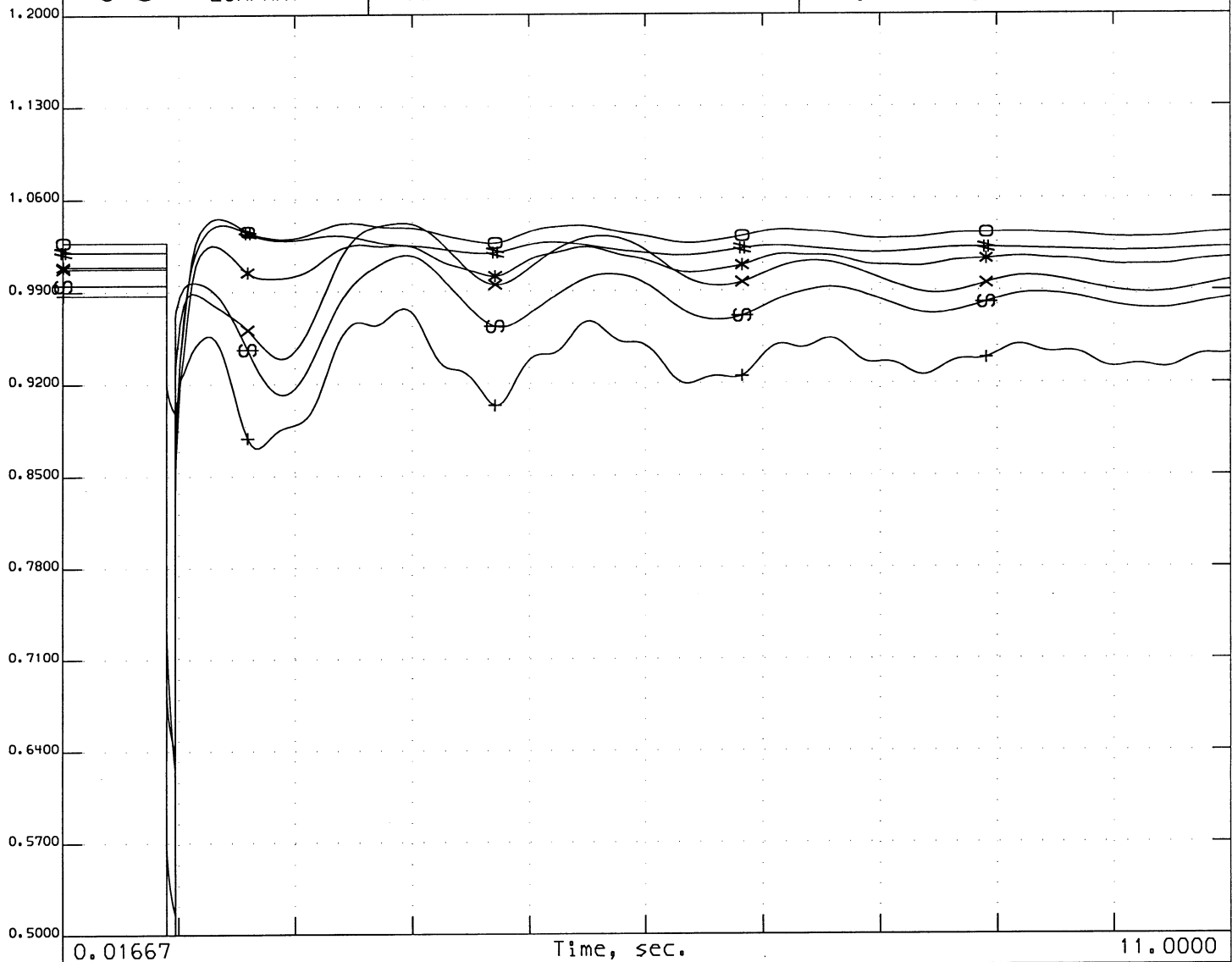
Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:42:15 2002

coachella-n2sum.chf
C:\ups\1f112\blythesum1040d.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

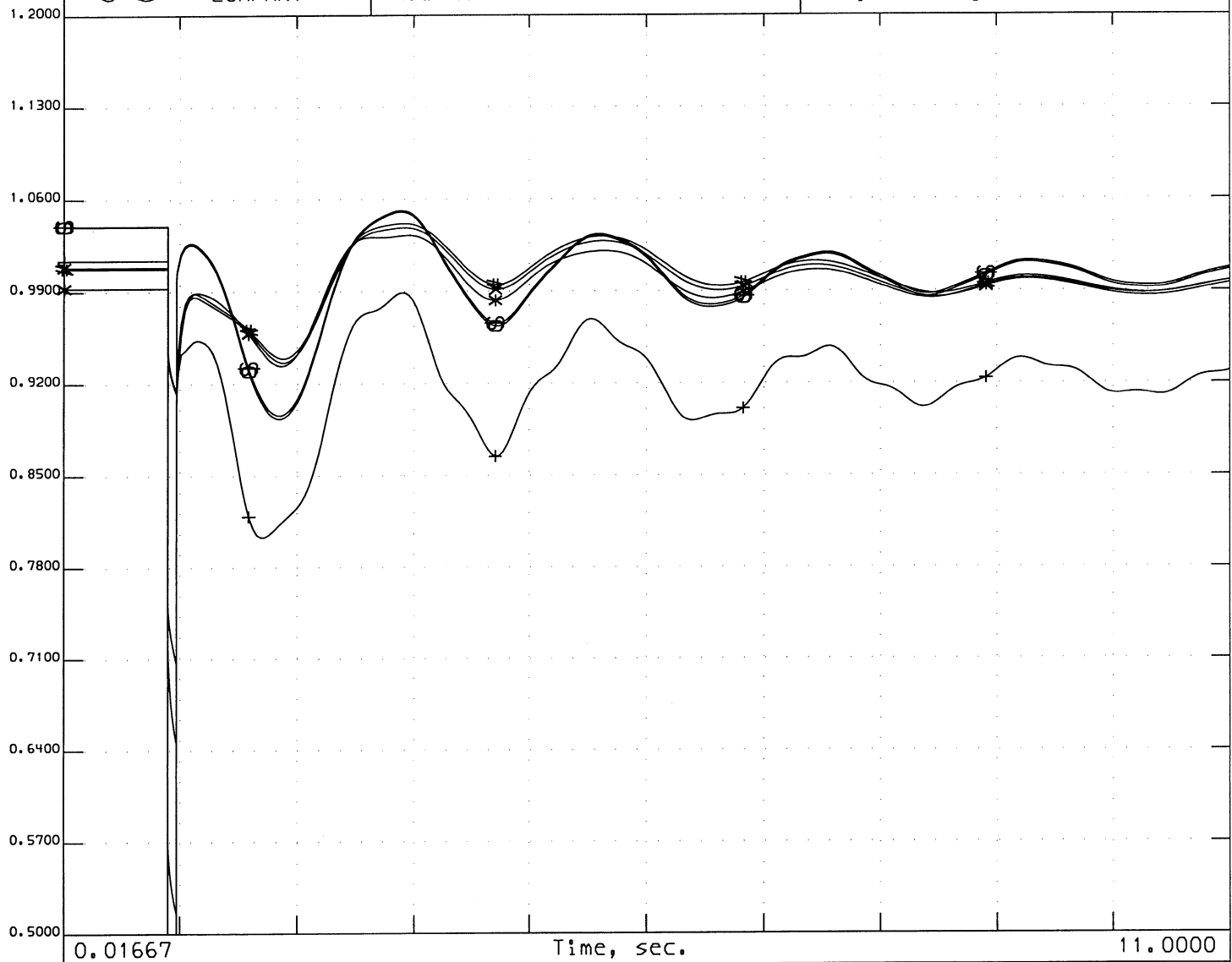
Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:42:16 2002

coachella-n2sum.chf
C:\ups\1f112\blythesum1040d.sav



0.5000	+	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	x	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	@	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

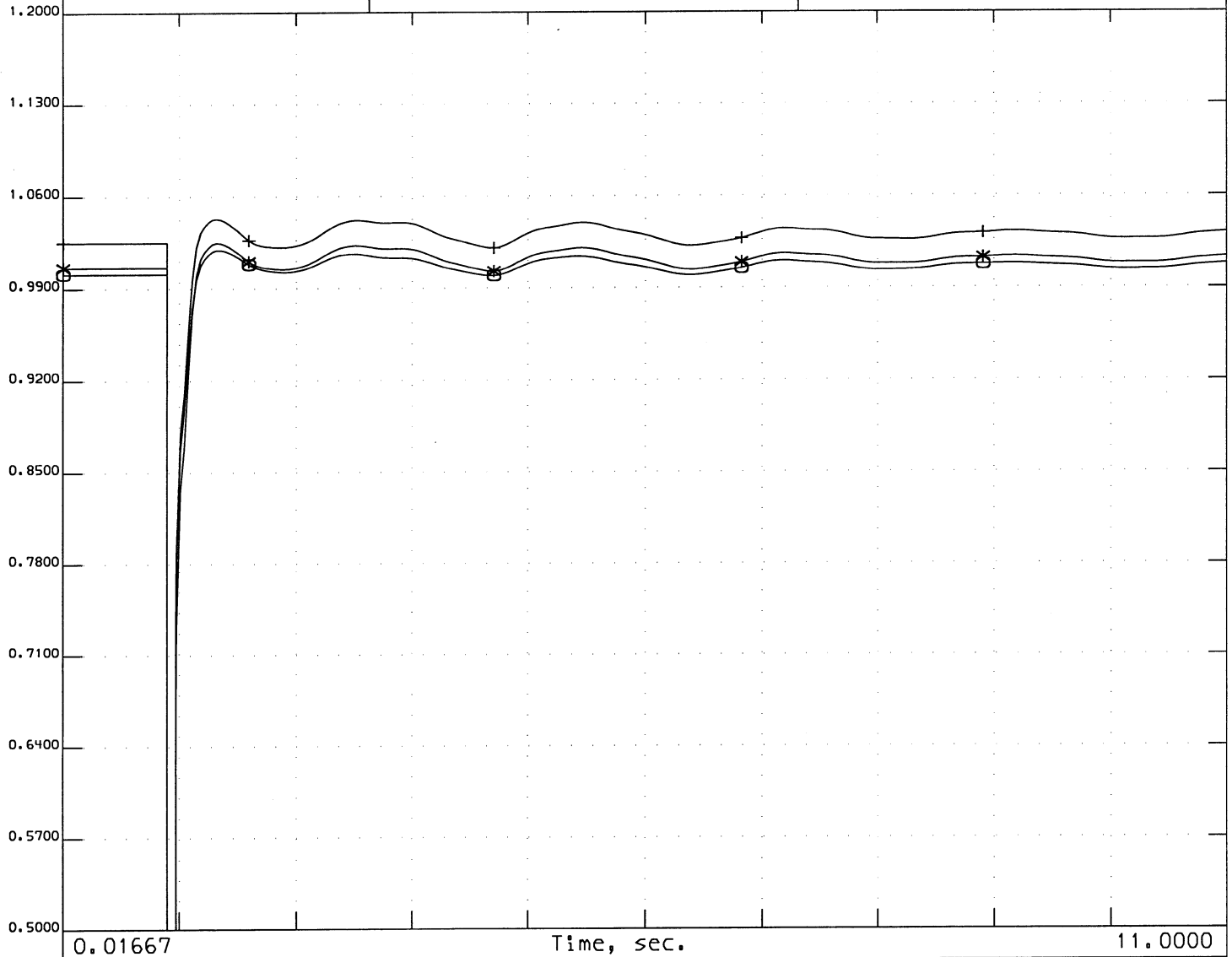
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GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:42:17 2002

coachella-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriad - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

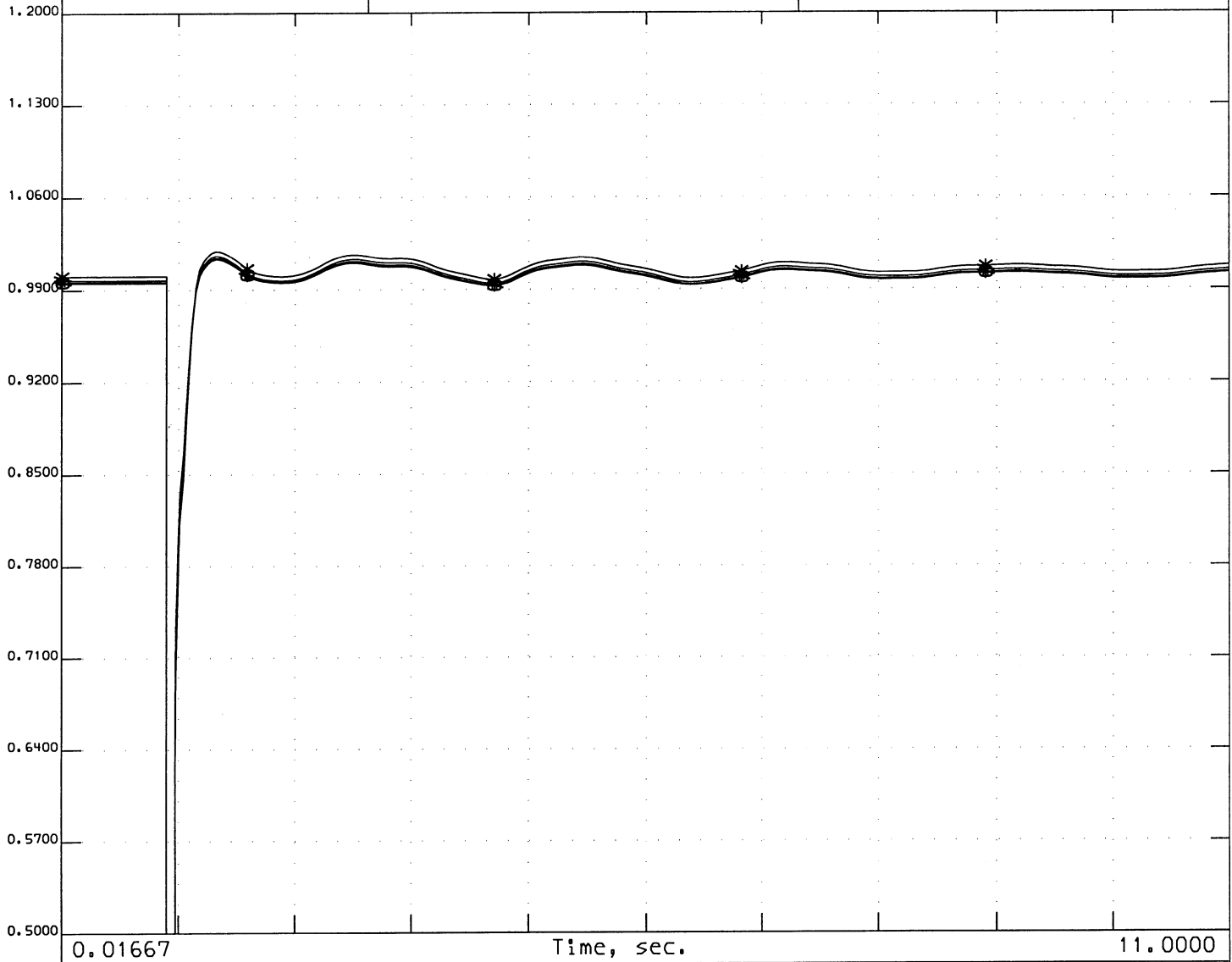
Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:42:17 2002

coachella-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vb1	24817	EISENHOW	115.00	1	1.2000
0.5000	+	vb1	24818	FARREL	115.00	1	1.2000
0.5000	*	vb1	24816	SANTA RO	115.00	1	1.2000
0.5000	#	vb1	24820	THORNHIL	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

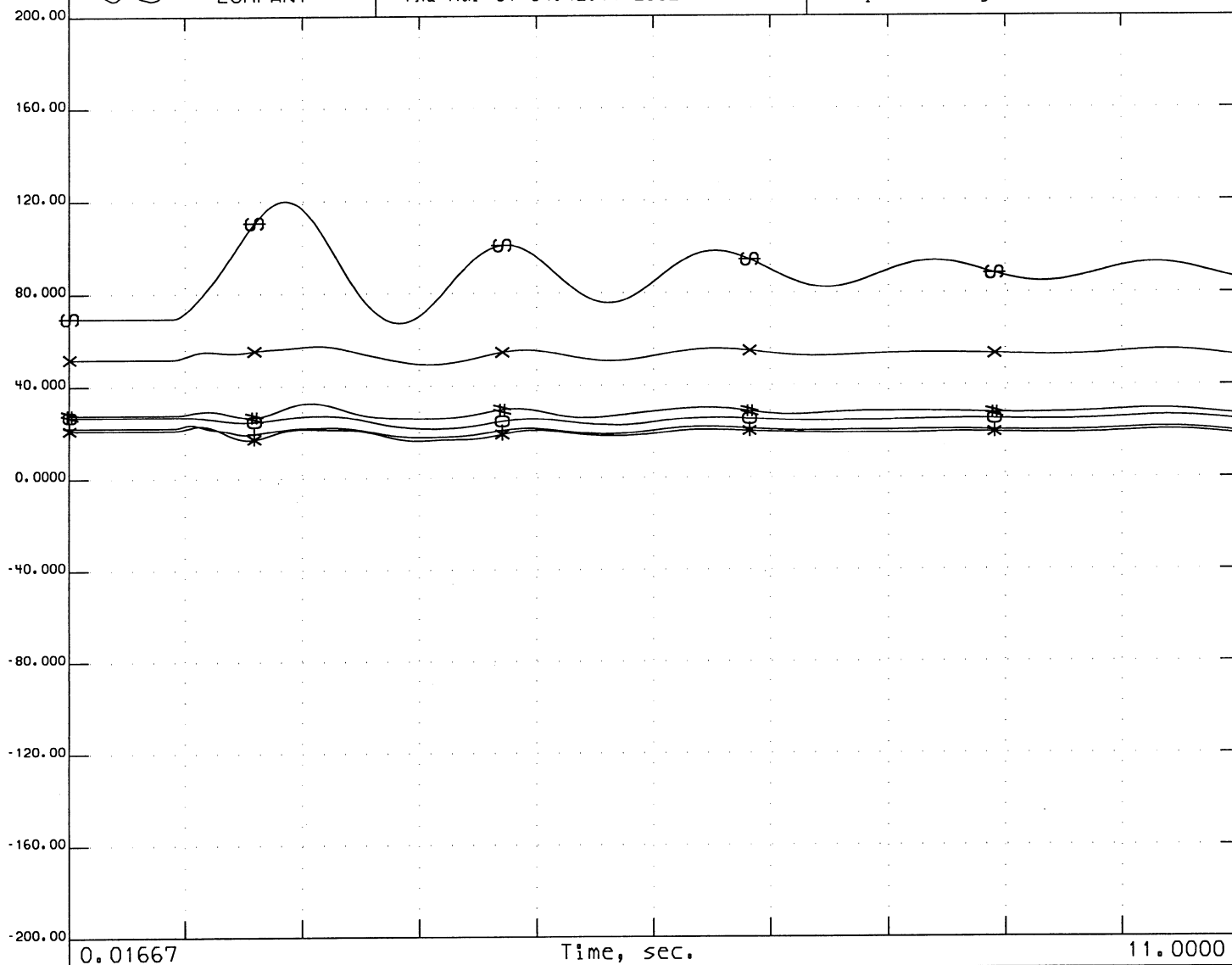
Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:42:17 2002

coachella-n2sum.chf
C:\ups\lf112\blythesum1040d.sav



-200.0		O	ang	24050 MTNVIST1	15.50	1	200.00
-200.0		+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0		*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0		#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0		X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0		O	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Coachella - Devers & Miriud - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + coachella-n2sum.swt

CchDvr-n1.swt

3/5/02

blythespr1040f.sav

blythespr1040f.dyd

TITLE

2004 Spring

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS

* CC

FB 0.0 "DEVERS " 230

* CLEAR FAULT

CFB 5.0 "DEVERS " 230

DL 5.0 "COACHELV" 230. "DEVERS " 230. "1 "

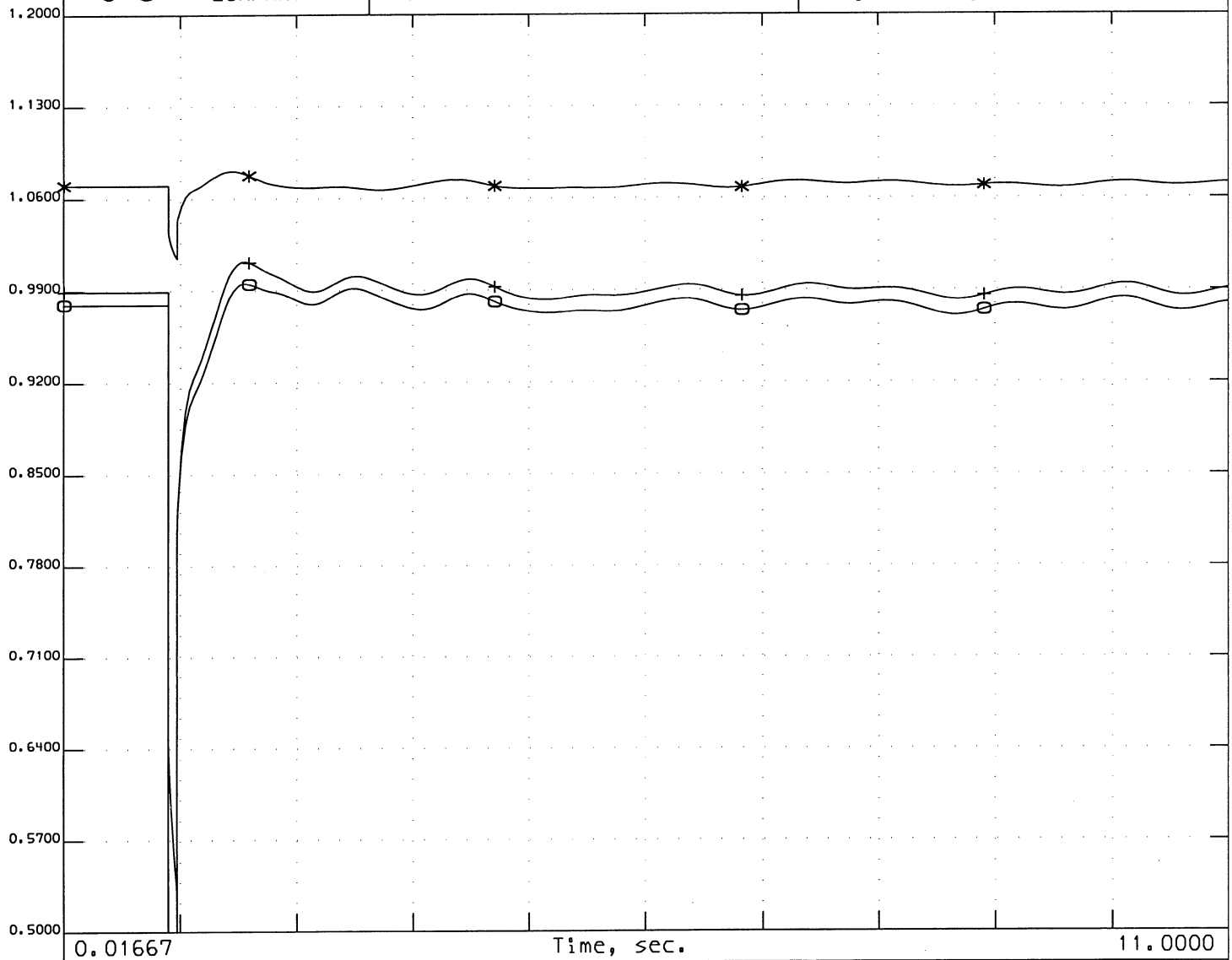
3



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 16:05:01 2002

cchdvr-n1.chf
C:\ups1f112\blythespr1040f.sav



0.5000	O	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVUDE	500.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

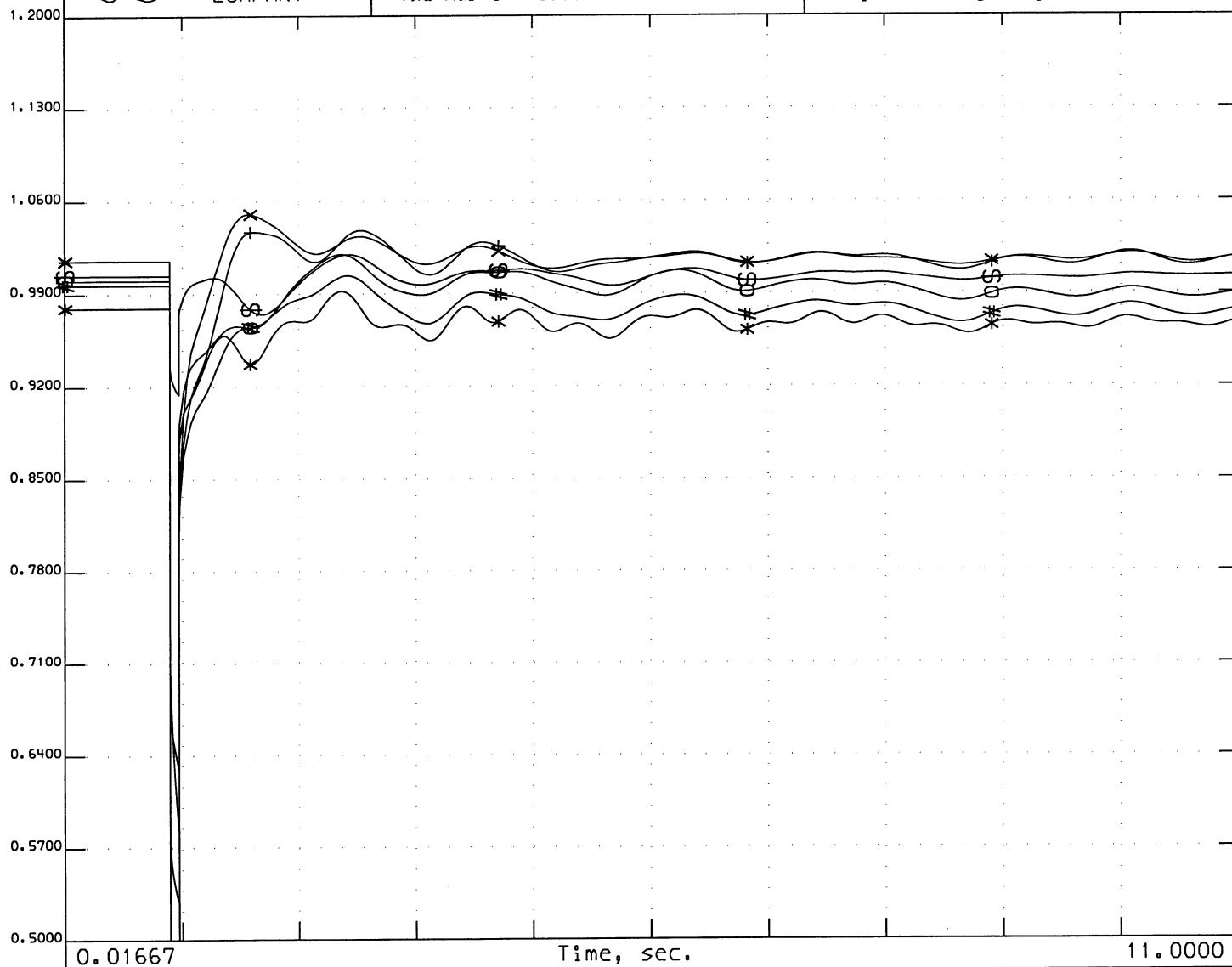
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:05:05 2002

cchdvr-n1.chf
C:\ups1f112\blythespr1040f.sav



0.01667		Time, sec.					11.0000
0.5000	O	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	+	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	X	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	@	vbus	19400	BUCK230	230.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

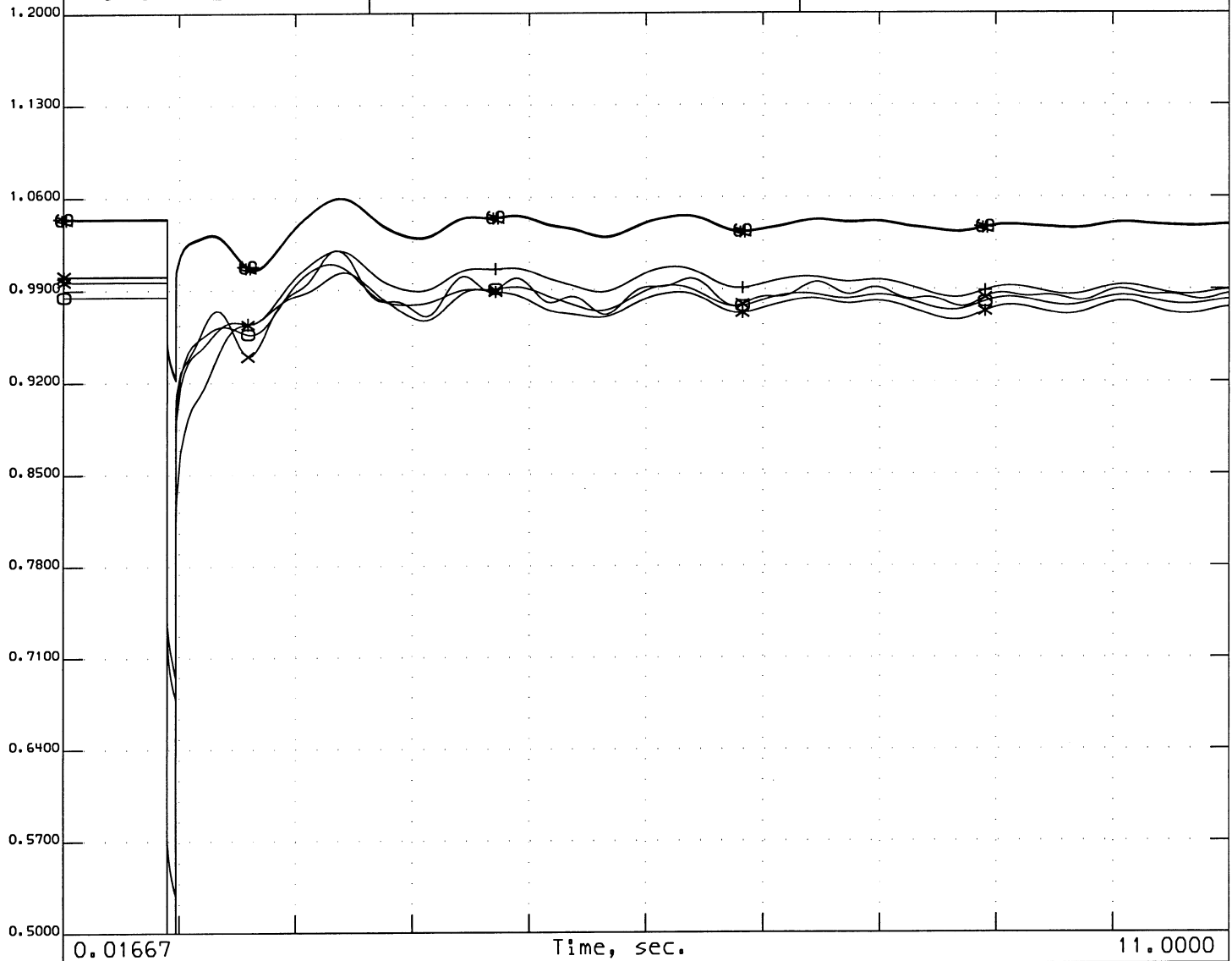
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 16:05:07 2002

cchdvr-n1.chf
C:\upslf112\blythespr1040f.sav



0.5000	O	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	+	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	*	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	#	vbul	24017	BLYTHESE	161.00	1	1.2000
0.5000	X	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	@	vbus	19399	BUCK161	161.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

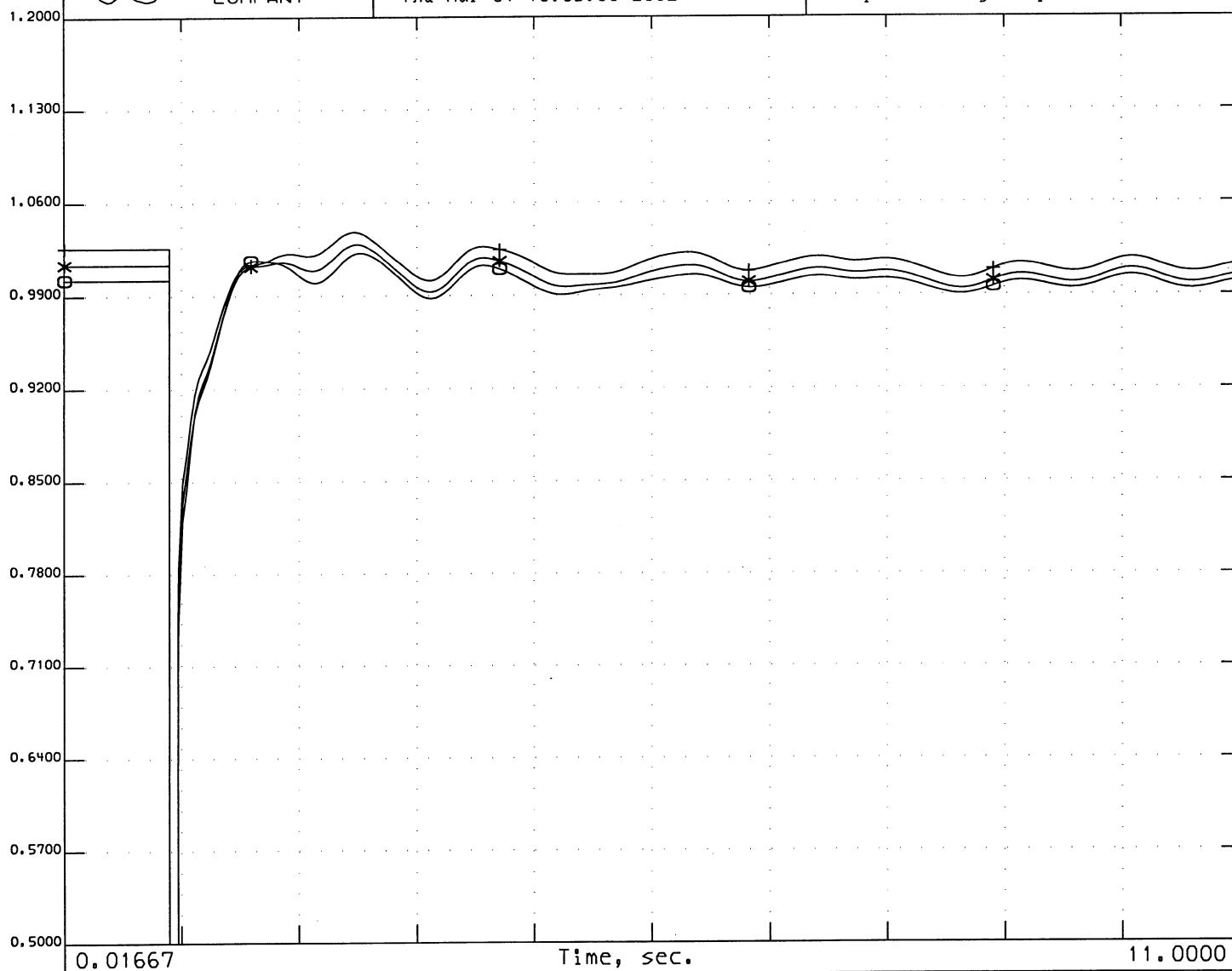
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 16:05:08 2002

cchdvr-n1.chf
C:\ups1f112\blythespr1040f.sav



0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbu1	24821	TAMARISK	115.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

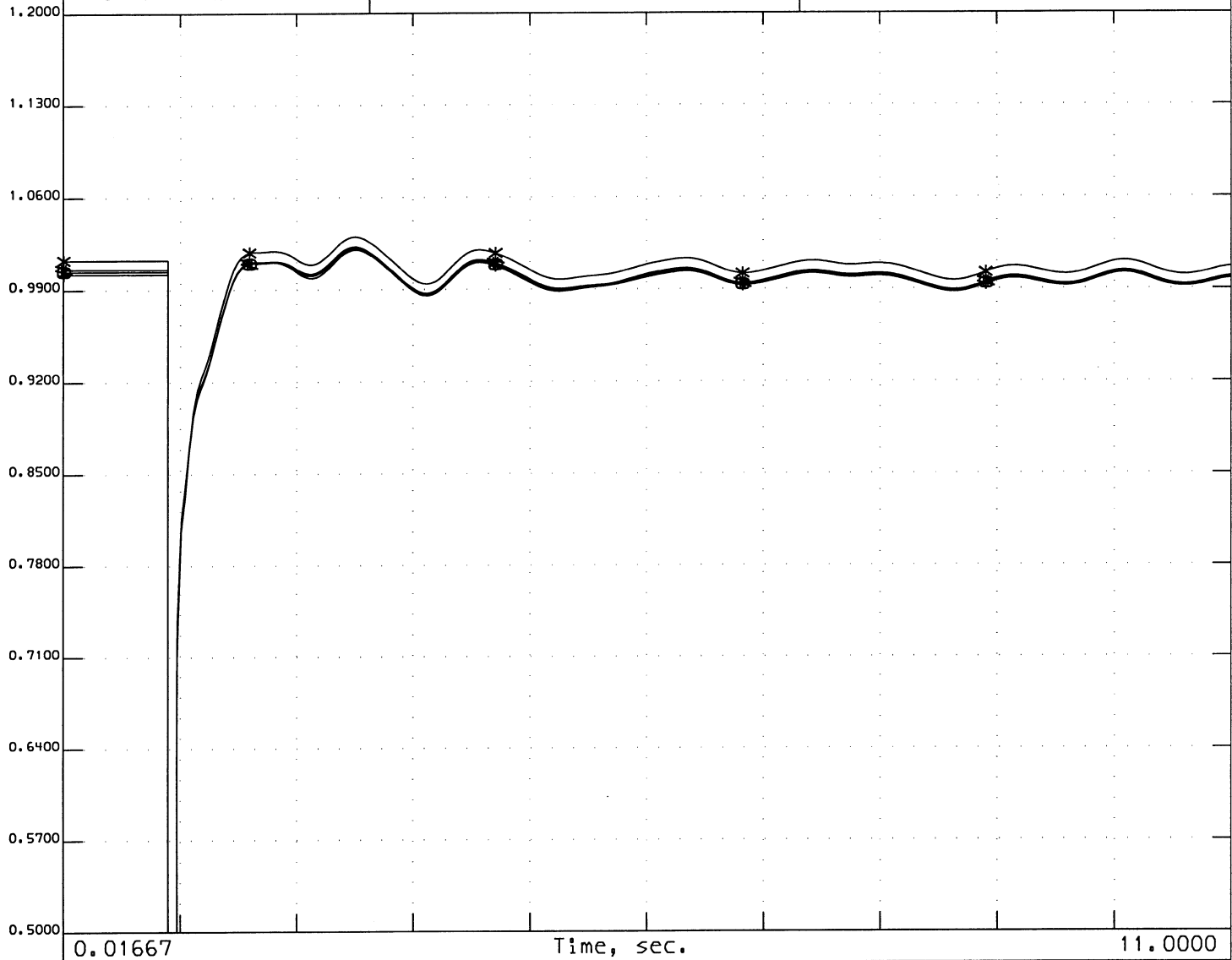
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 16:05:08 2002

cchdvr-n1.chf
E:\upslf112\blythespr1040f.sav



0.5000	O	ybul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

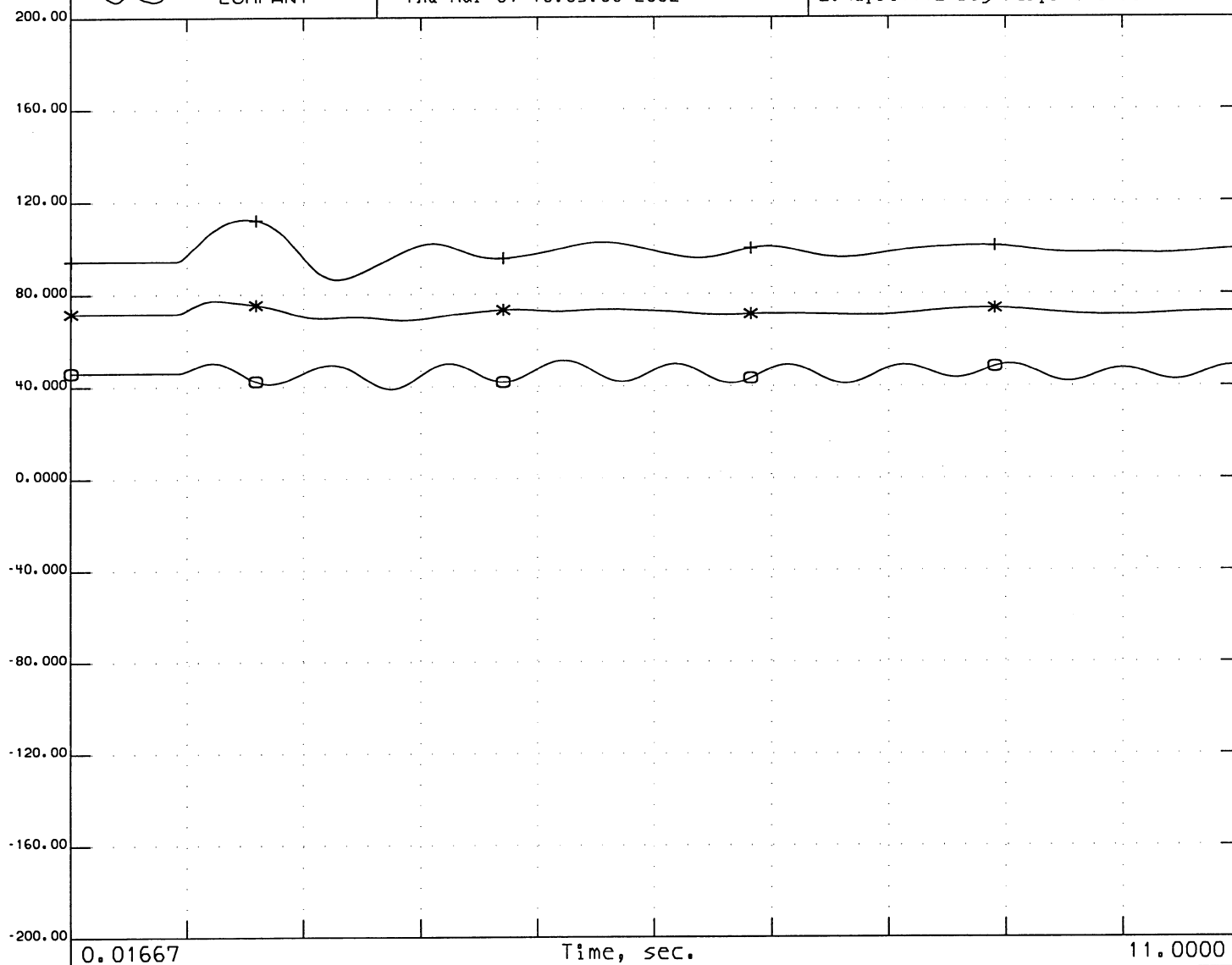
IID CHANGES



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 16:05:08 2002

cchdvr-n1.chf
C:\ups1f112\blythespr1040f.sav



-200.0	O	ang	24129	S.ONOFR2	22.00	2	200.00
-200.0	+	ang	19401	BUCKST1	16.00	51	200.00
-200.0	*	ang	14931	PALOVDR1	24.00	1	200.00

2004 Spring
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythespr1040f.sav + Blythespr1040f.dyd + cchdvr-n1.swt

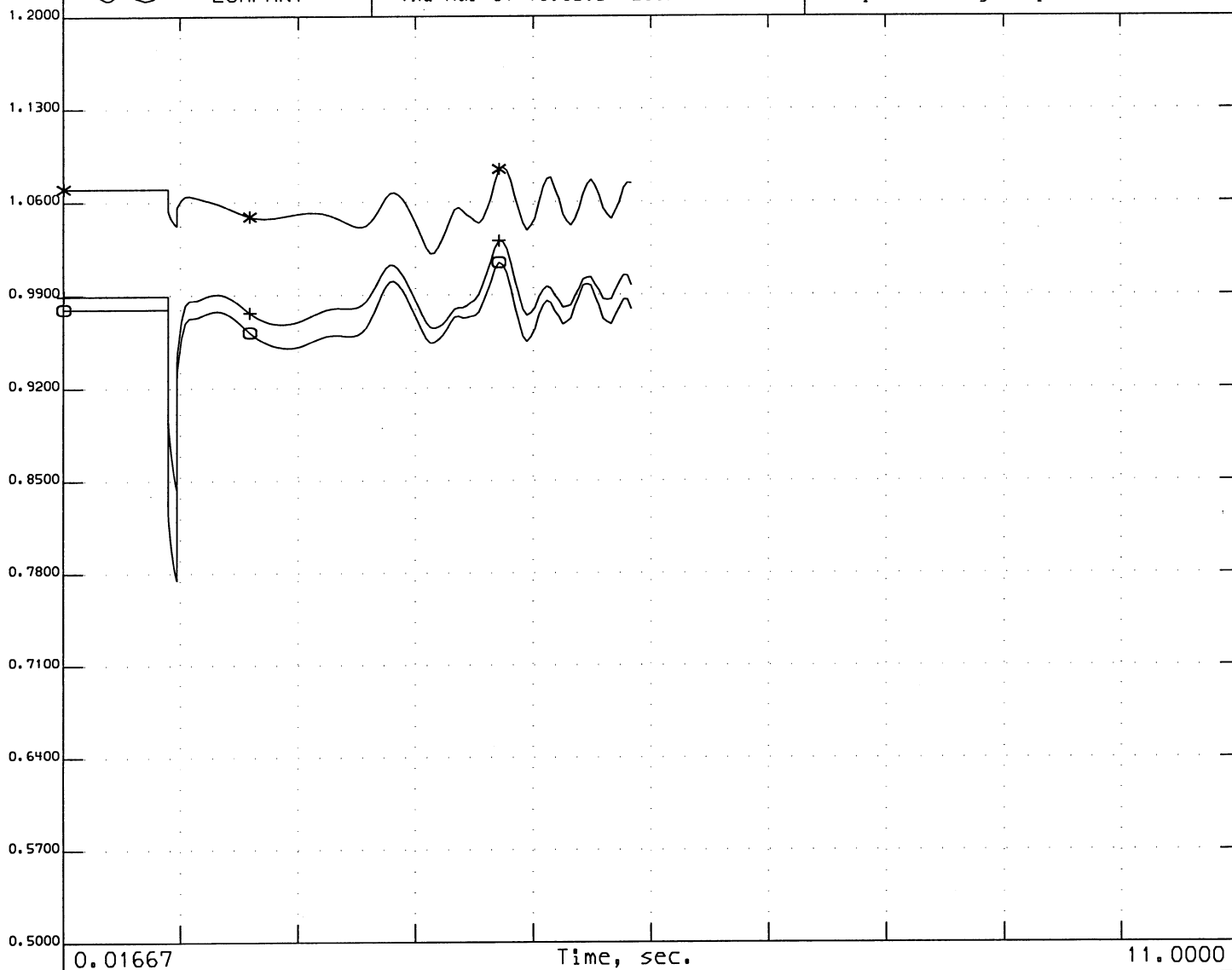
IID CHANGES



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 16:05:57 2002

coachelln2spra.chf
C:\ups1f112\blythespr1040f.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Coachella 230KV Bus

Contingency-Remove Coachella - Devers & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythespr1040f.sav + Blythespr1040f.dyd + coachelln2spra.swt

IID CHANGES

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blythesum1040d.sav
blythesum1040d.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Valley 500KV Bus
Contingency-Remove Devers - Valley 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
*   3 phase 4 cycle fault at Valley 500
*   Loss of Serrano-Valley 500 kV Line
*
* CC cards for post-transient only
*
*   Fault bus at Ellis
FB   0.0 "VALLEYSC" 500.
*
*   Clear fault at Ellis
CFB  4.0 "VALLEYSC" 500.
*
*   Trip Devers-Valley 500 kV Line
*
DL   4.0 "DEVERS  " 500. "VALLEYSC" 500. "1 "
*
* Readjust Northwest SVC's
CC MSV  0.0 "KEEL-SVC" 230.0 "1 " 350. -300.
CC MSV  0.0 "MV-SVC  " 230.0 "1 " 350. -300.
* CC MSV  0.0 "DALLES 3" 13.8 "1 " 180. -270.
*
* 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
*

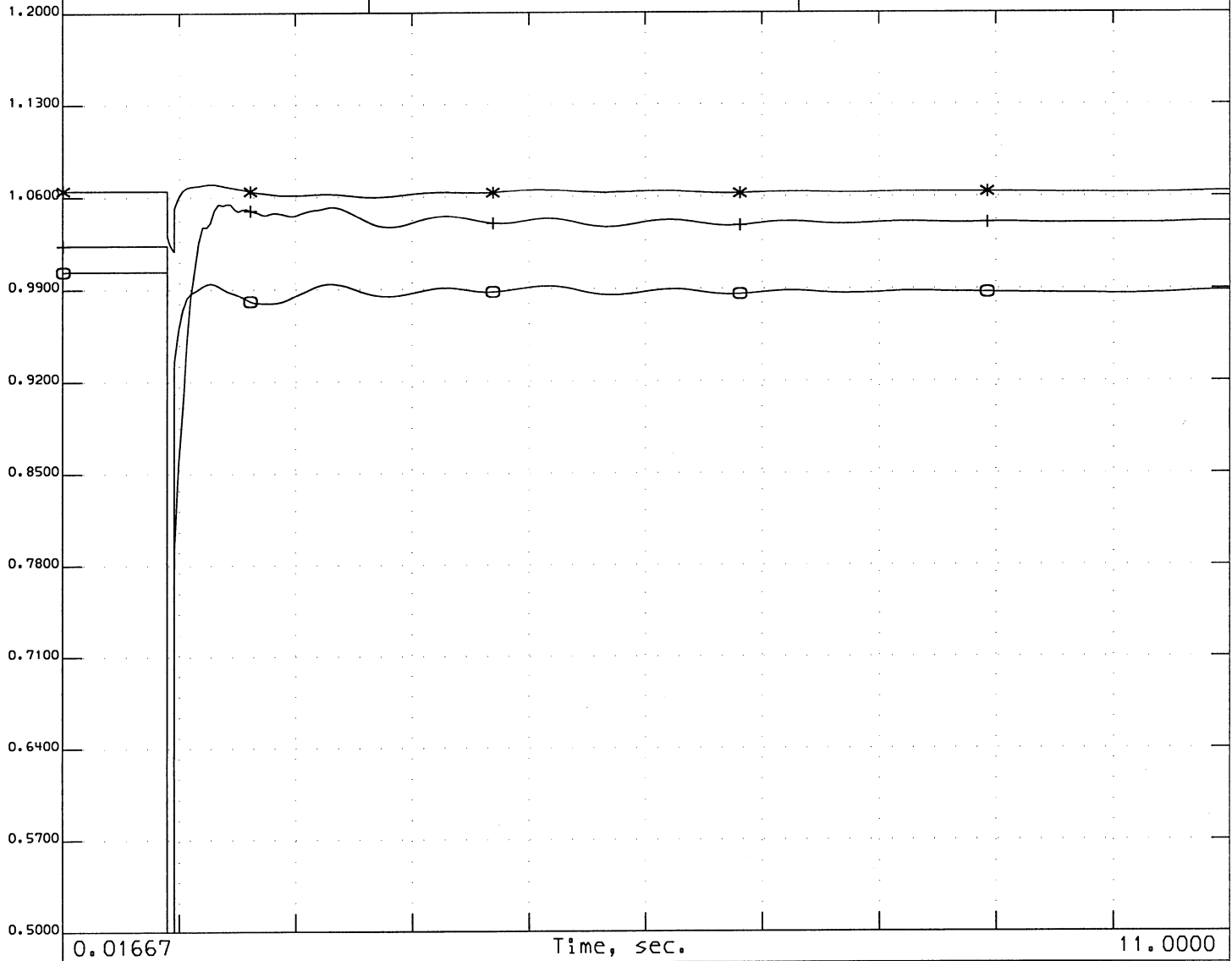
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GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:47:56 2002

dvrvalley-slosum.chf
C:\ups\1f112\blythesum1040d.sav



0.5000	□	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Valley 500KV Bus

Contingency-Remove Devers - Valley 500 KV Line

SYSTEM STABILITY STUDY CASES

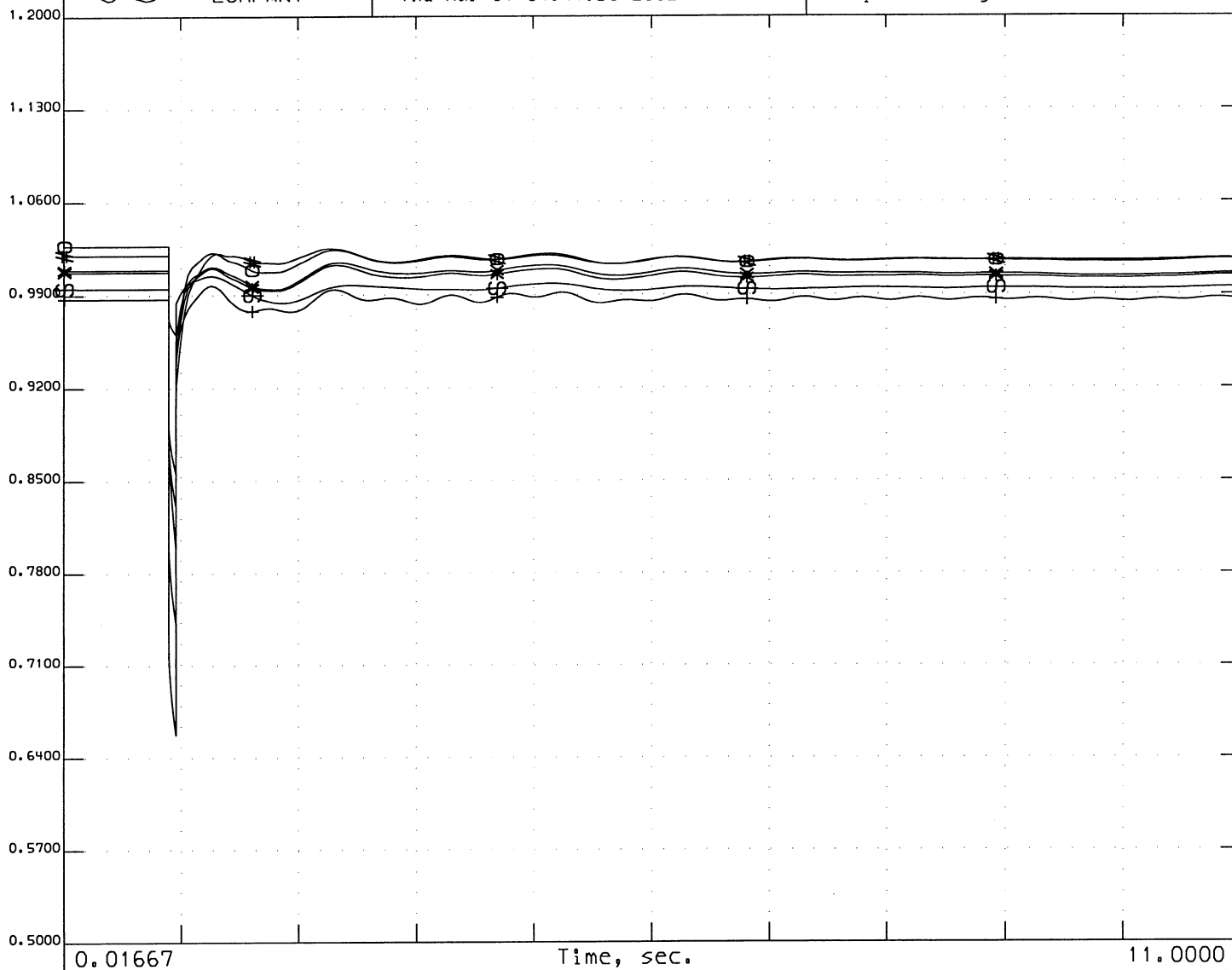
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:47:58 2002

dvrvalley-slosum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	@	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Valley 500KV Bus

Contingency-Remove Devers - Valley 500 KV Line

SYSTEM STABILITY STUDY CASES

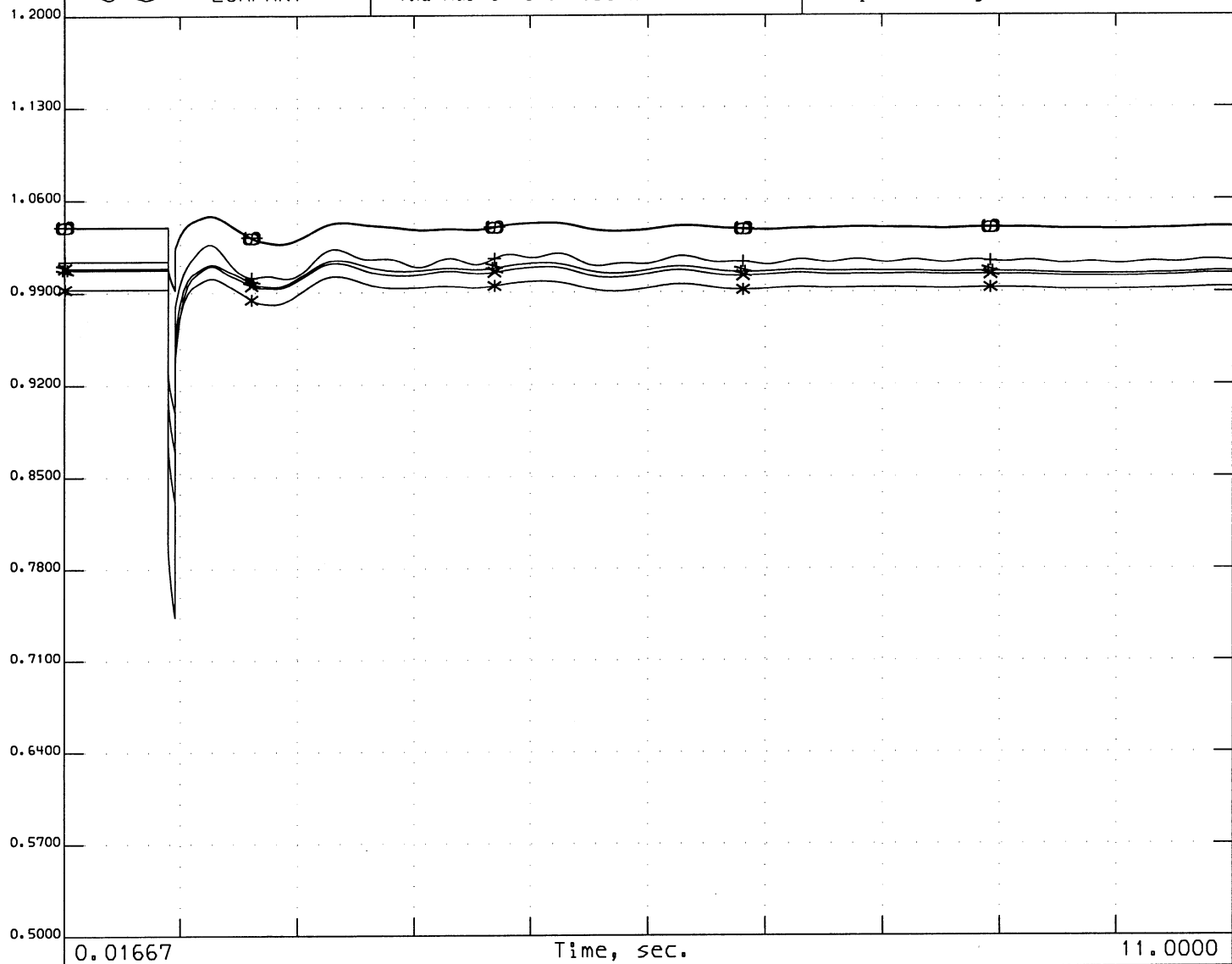
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:47:59 2002

dvrvalley-slosun.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	X	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	@	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Valley 500KV Bus

Contingency-Remove Devers - Valley 500 KV Line

SYSTEM STABILITY STUDY CASES

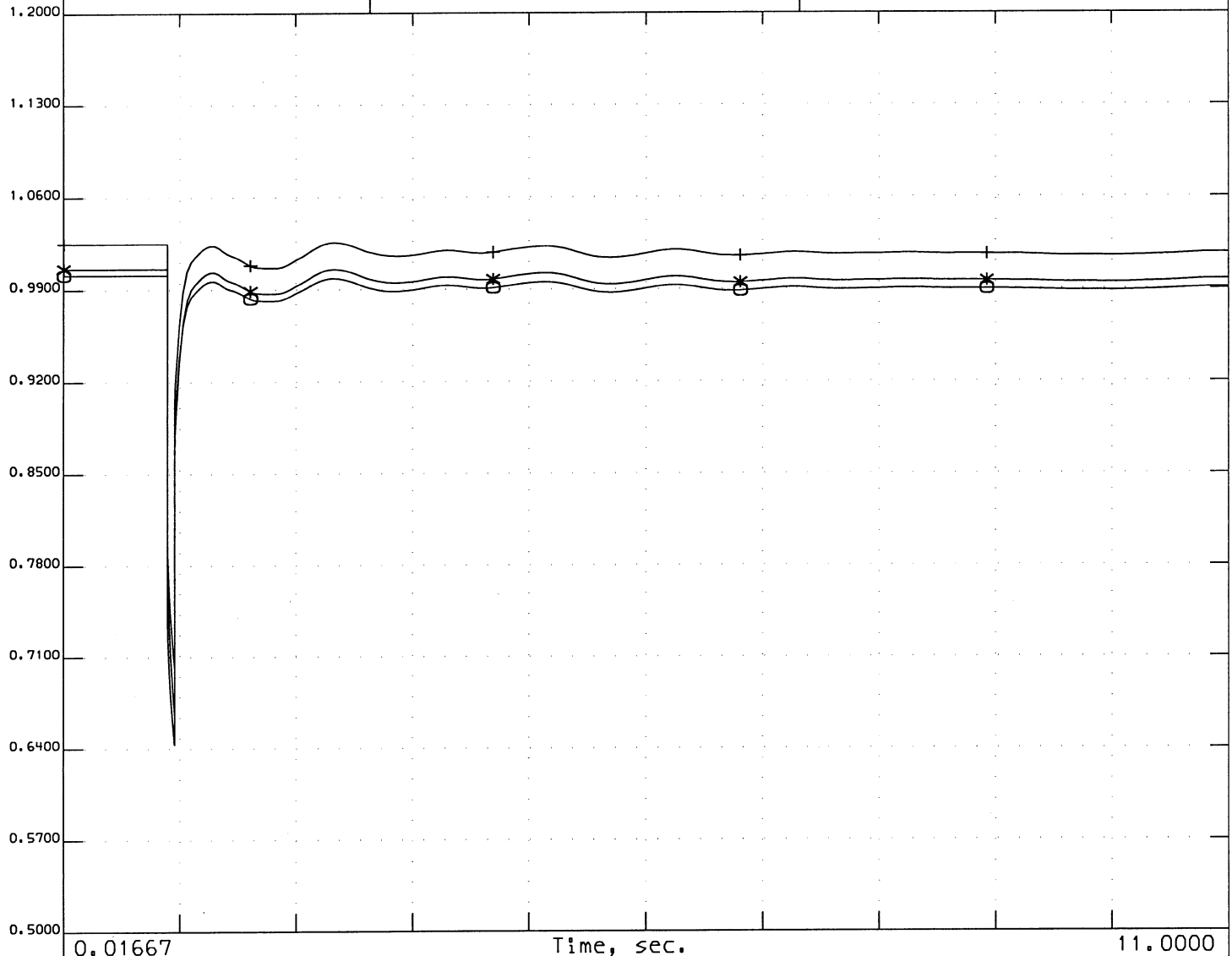
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosun.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:48:00 2002

dvrvalley-slosum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Valley 500KV Bus

Contingency-Remove Devers - Valley 500 KV Line

SYSTEM STABILITY STUDY CASES

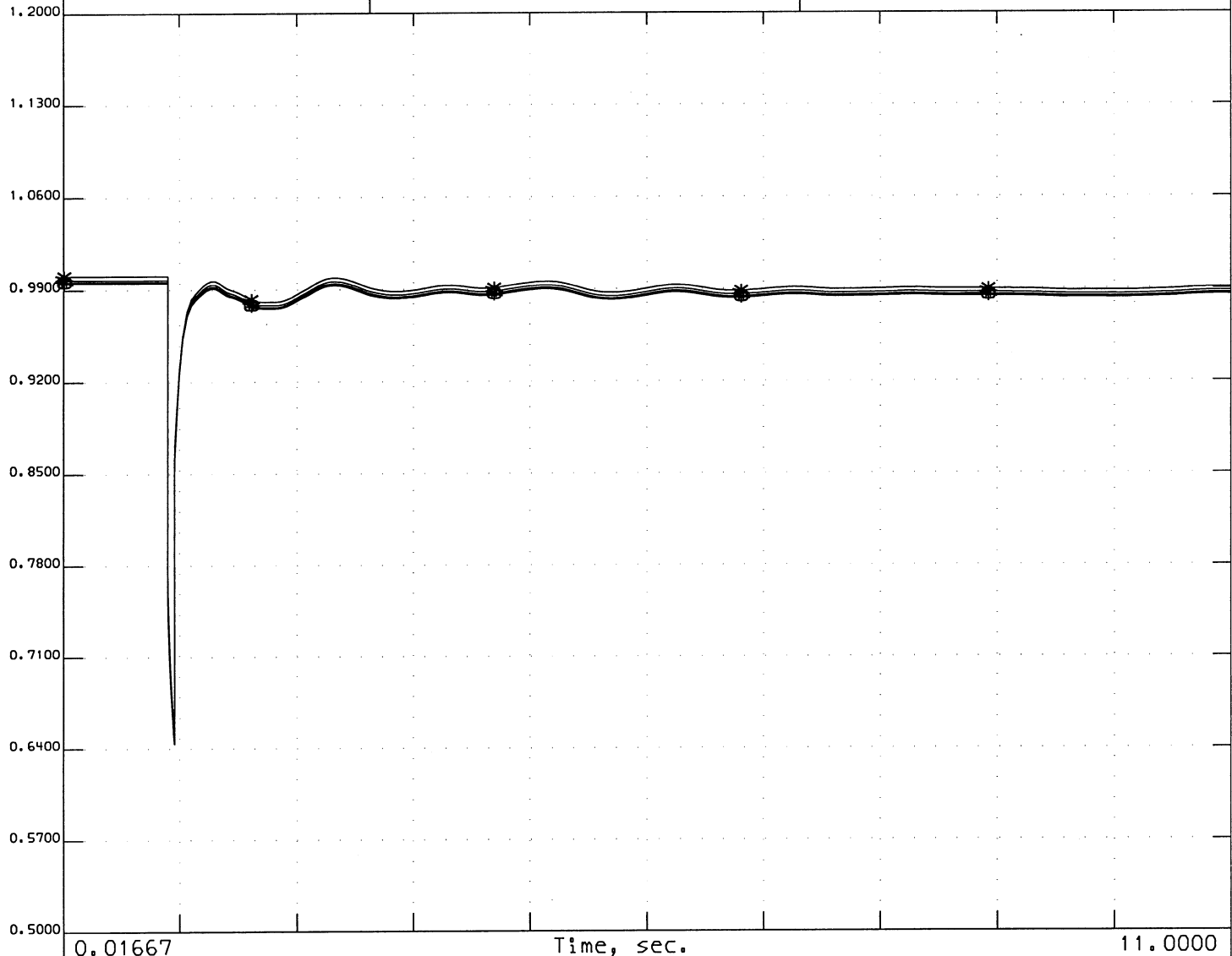
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:48:01 2002

dvrvalley-slosun.chf
C:\ups\lf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000
0.5000	O	vbui	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbui	24818 FARREL	115.00	1	1.2000
0.5000	*	vbui	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbui	24820 THORNHIL	115.00	1	1.2000

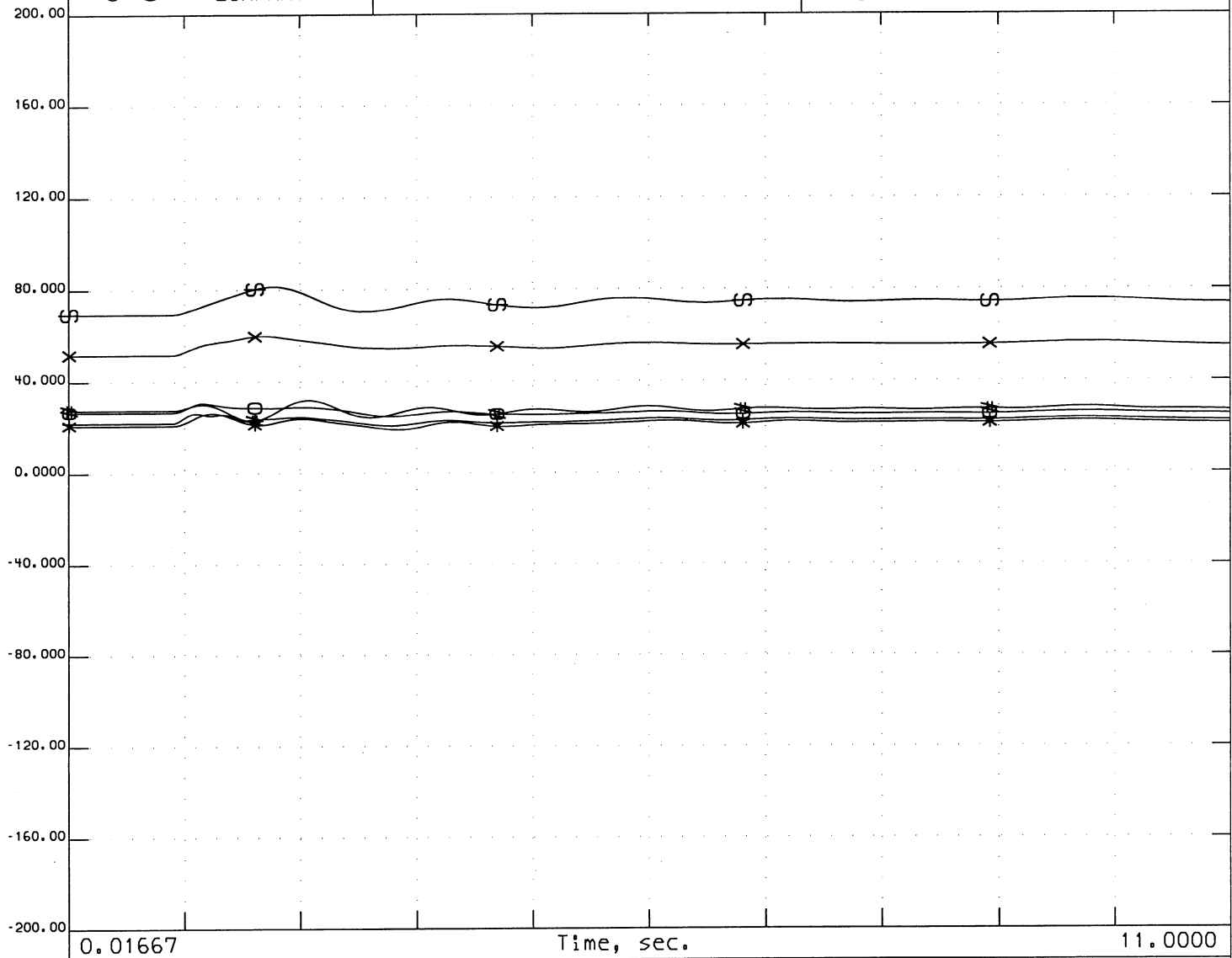
2004 Summer
5-CYCLE 3-Phase Fault on Valley 500KV Bus
Contingency-Remove Devers - Valley 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosun.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE ROTOR ANGLE
Thu Mar 07 04:48:01 2002

dvrvalley-slosum.chf
C:\ups\1f112\blythesum1040d.sav



-200.0	0	ang	24050 MTNVIST1	15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0	\$	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Valley 500KV Bus

Contingency-Remove Devers - Valley 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + dvrvalley-slosum.swt

blythesum1040c.sav

blythesum1040c.dyd

TITLE

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

*

* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE MIRAGE 230 BUS

* CC

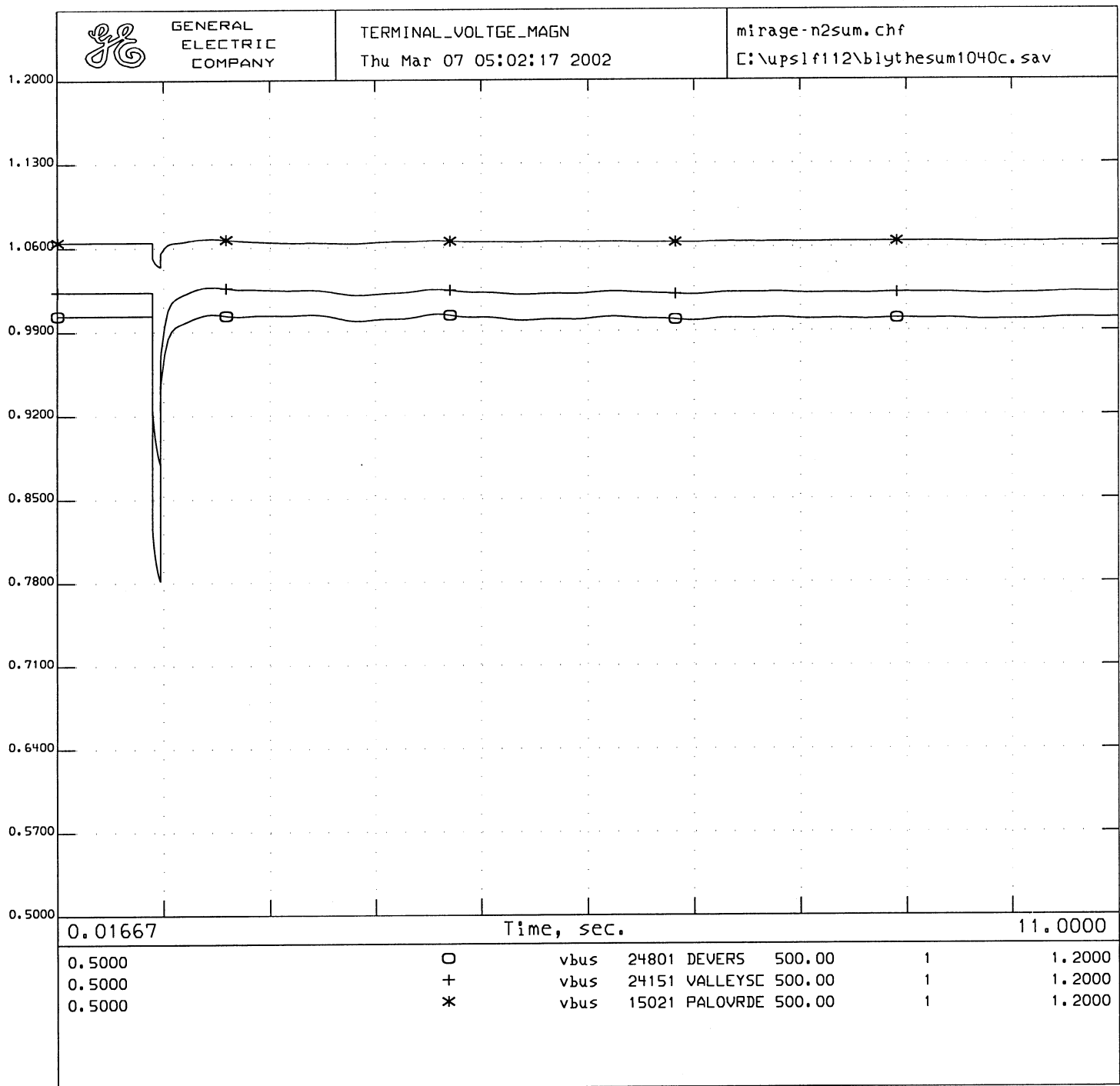
FB 0.0 "MIRAGE " 230

* CLEAR FAULT

CFB 5.0 "DEVERS " 230

DL 5.0 "DEVERS " 230. "MIRAGE " 230. "1 "

DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "



2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

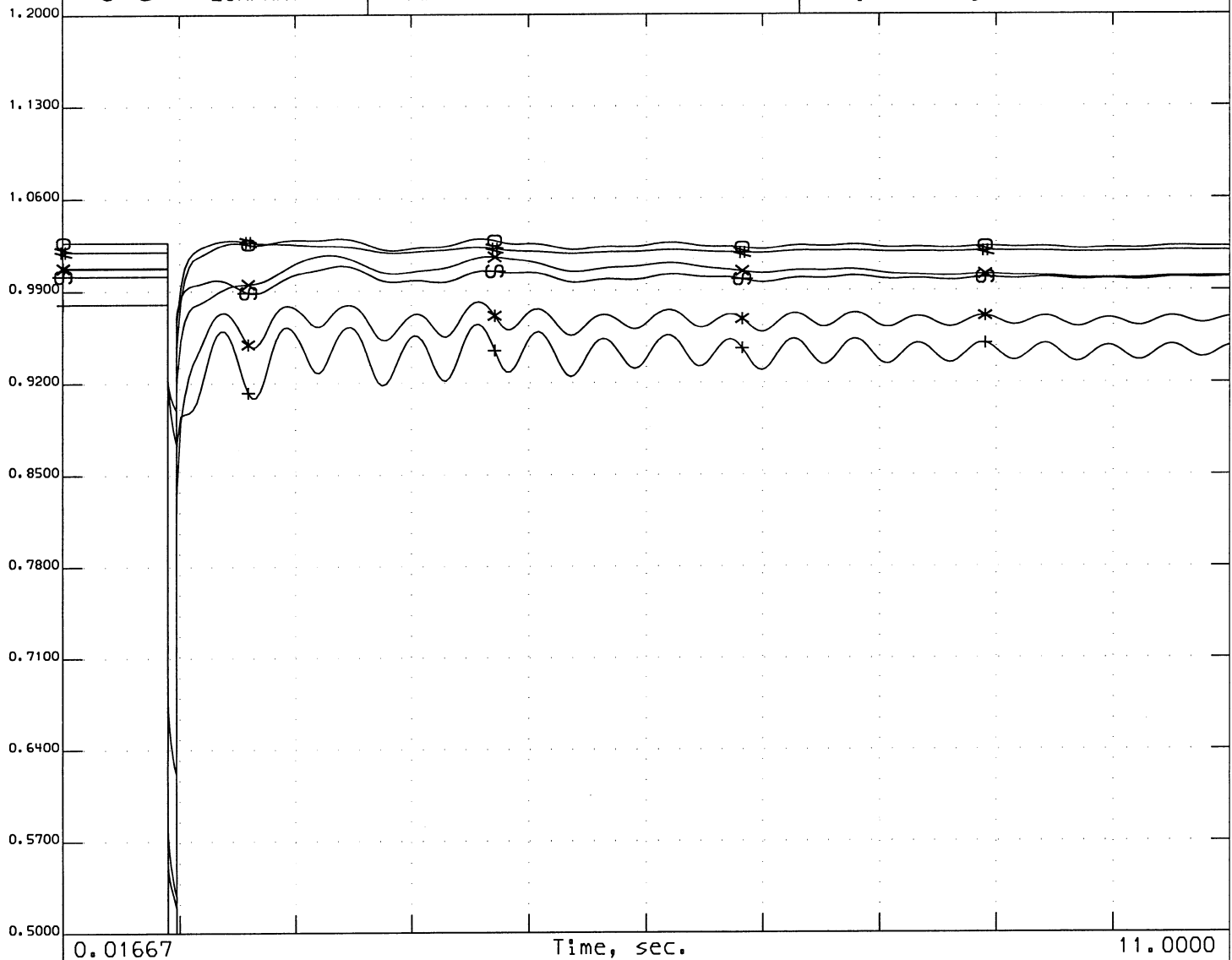
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:02:18 2002

mirage-n2sum.chf
C:\upslf112\blythesum1040c.sav



0.01667		Time, sec.				11.0000
0.5000	O	vbus	24804	DEVERS	230.00	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1.2000
0.5000	x	vbus	21007	COACHELV	230.00	1.2000
0.5000	⊕	vbus	19400	BUCK230	230.00	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

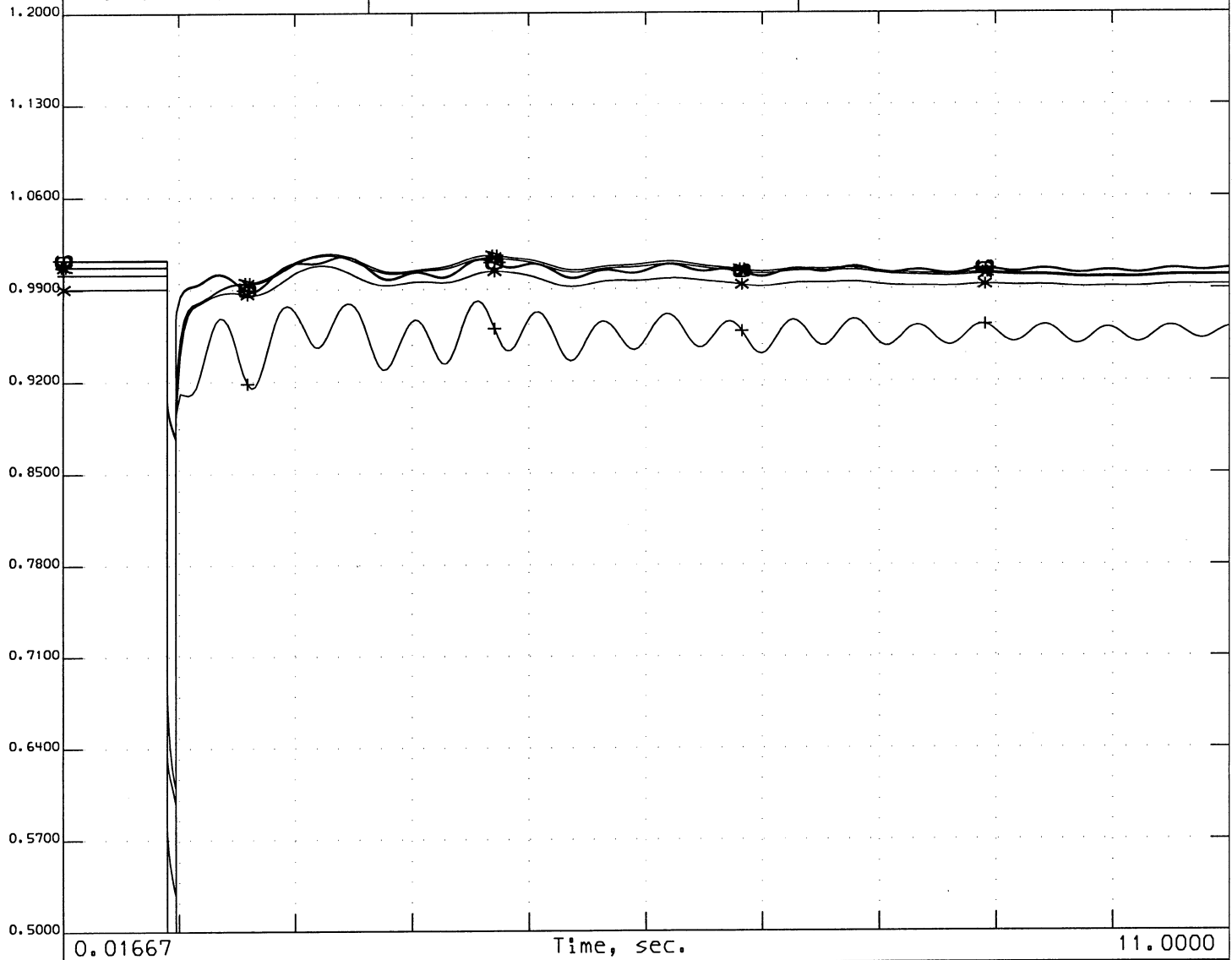
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:02:18 2002

mirage-n2sum.chf
C:\ups1f112\blythesum1040c.sav



0.5000	O	vb1	24017 BLYTHESC	161.00	1	1.2000
0.5000	+	vb35	24035 EAGLEMTN	161.00	1	1.2000
0.5000	*	vb21006	COACHELV	161.00	1	1.2000
0.5000	#	vb21007	COACHELV	230.00	1	1.2000
0.5000	x	vb21076	MIRIID	230.00	1	1.2000
0.5000	⊕	vb219399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASE5

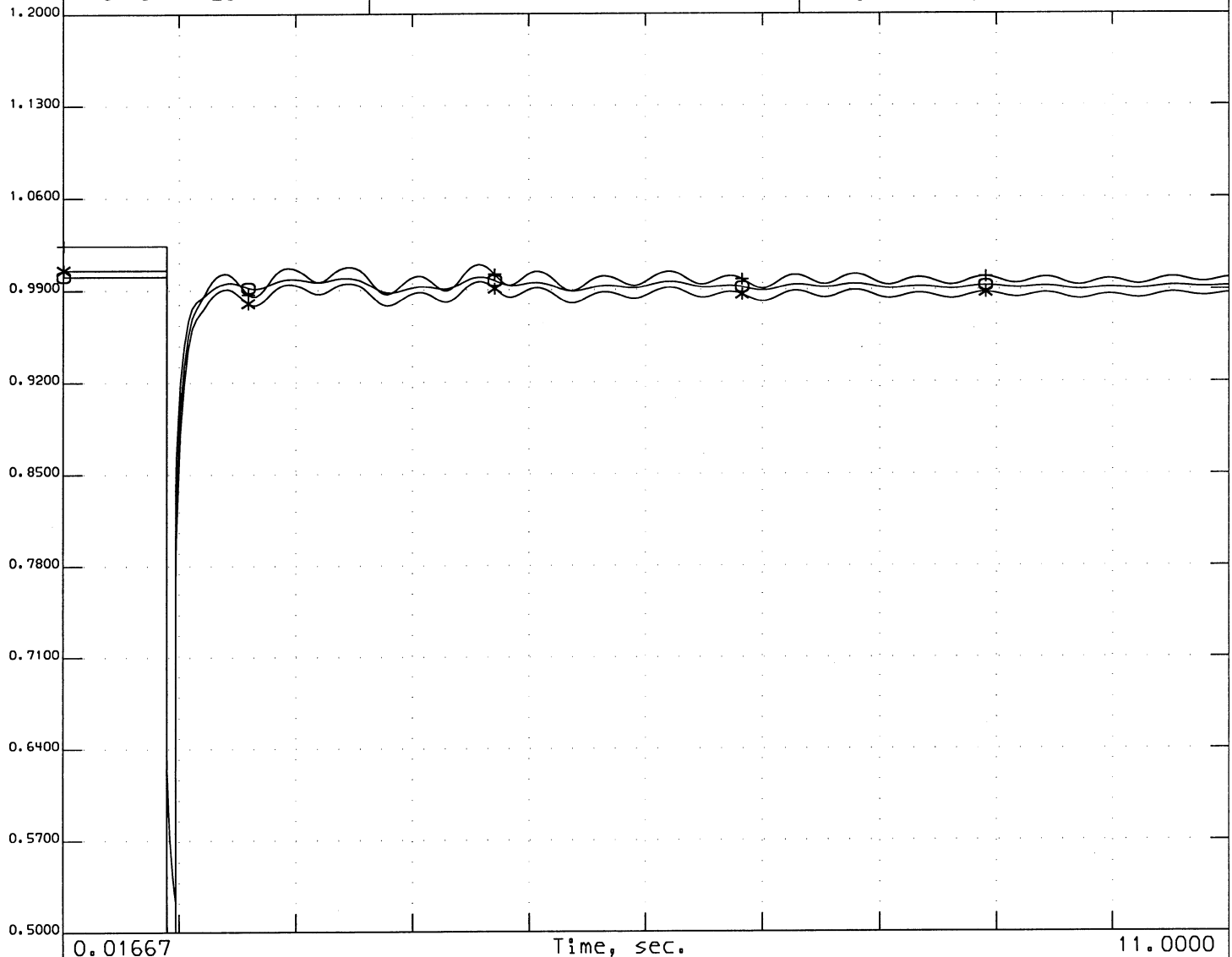
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:02:19 2002

mirage-n2sum.chf
C:\upslf112\blythesum1040c.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

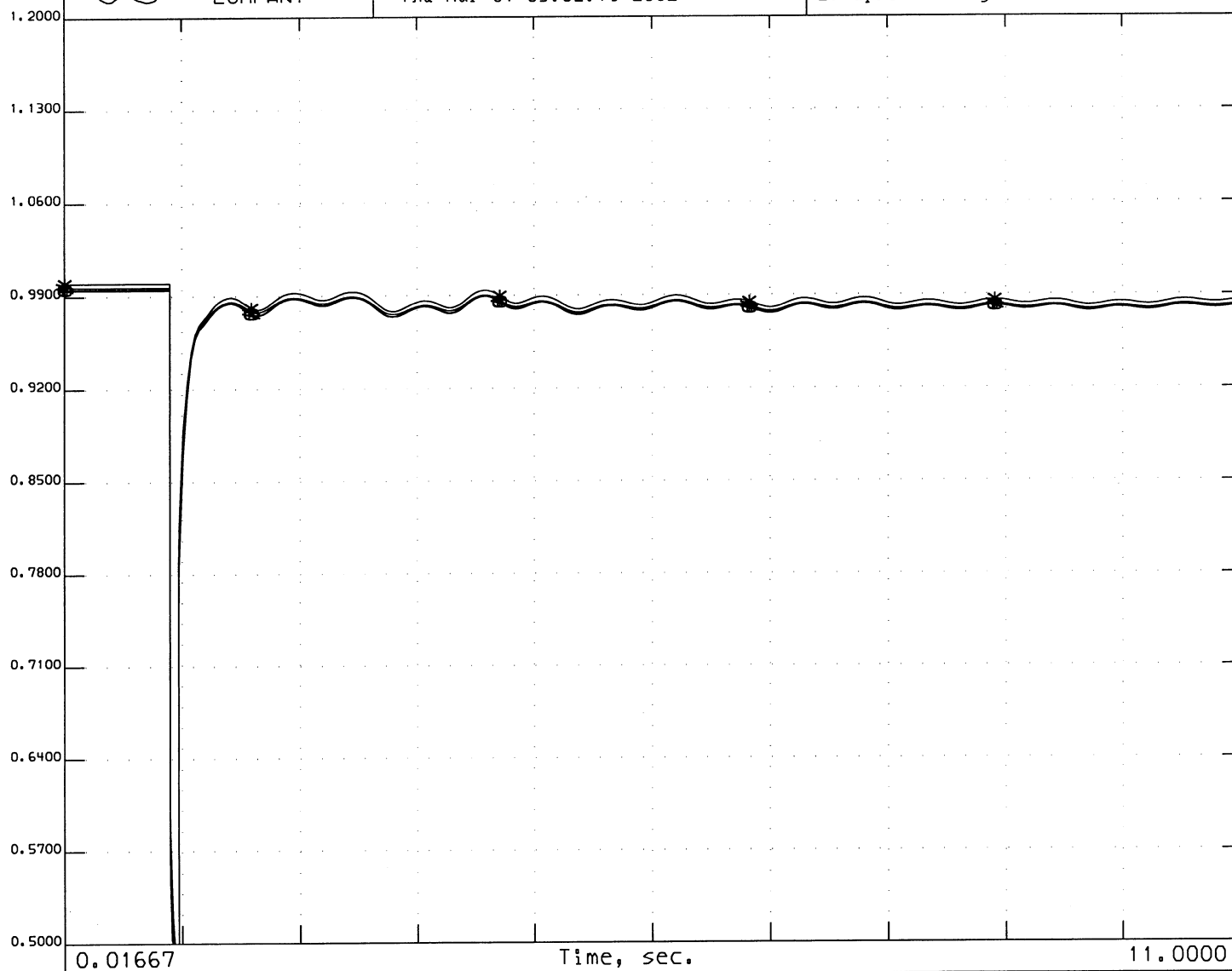
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:02:19 2002

mirage-n2sum.chf
C:\ups1f112\blythesum1040c.sav



0.5000	O	vb1	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vb1	24818 FARREL	115.00	1	1.2000
0.5000	*	vb1	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vb1	24820 THORNHIL	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

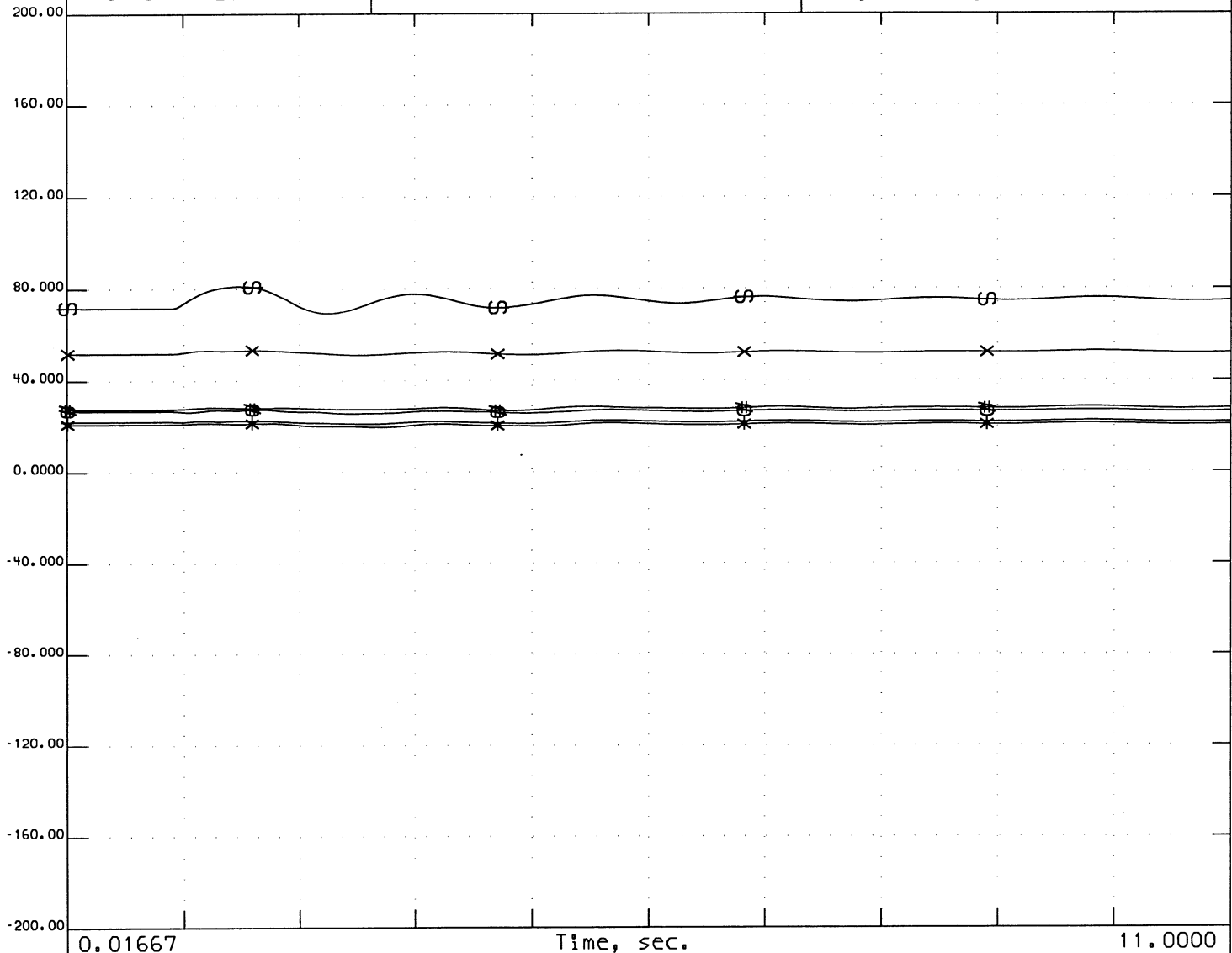
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 05:02:20 2002

mirage-n2sum.chf
E:\upslf112\blythesum1040c.sav



0.01667		Time, sec.				11.0000	
-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00	
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00	
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00	
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00	
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00	
-200.0	S	ang	19401 BUCKST1	16.00	S1	200.00	

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2sum.swt

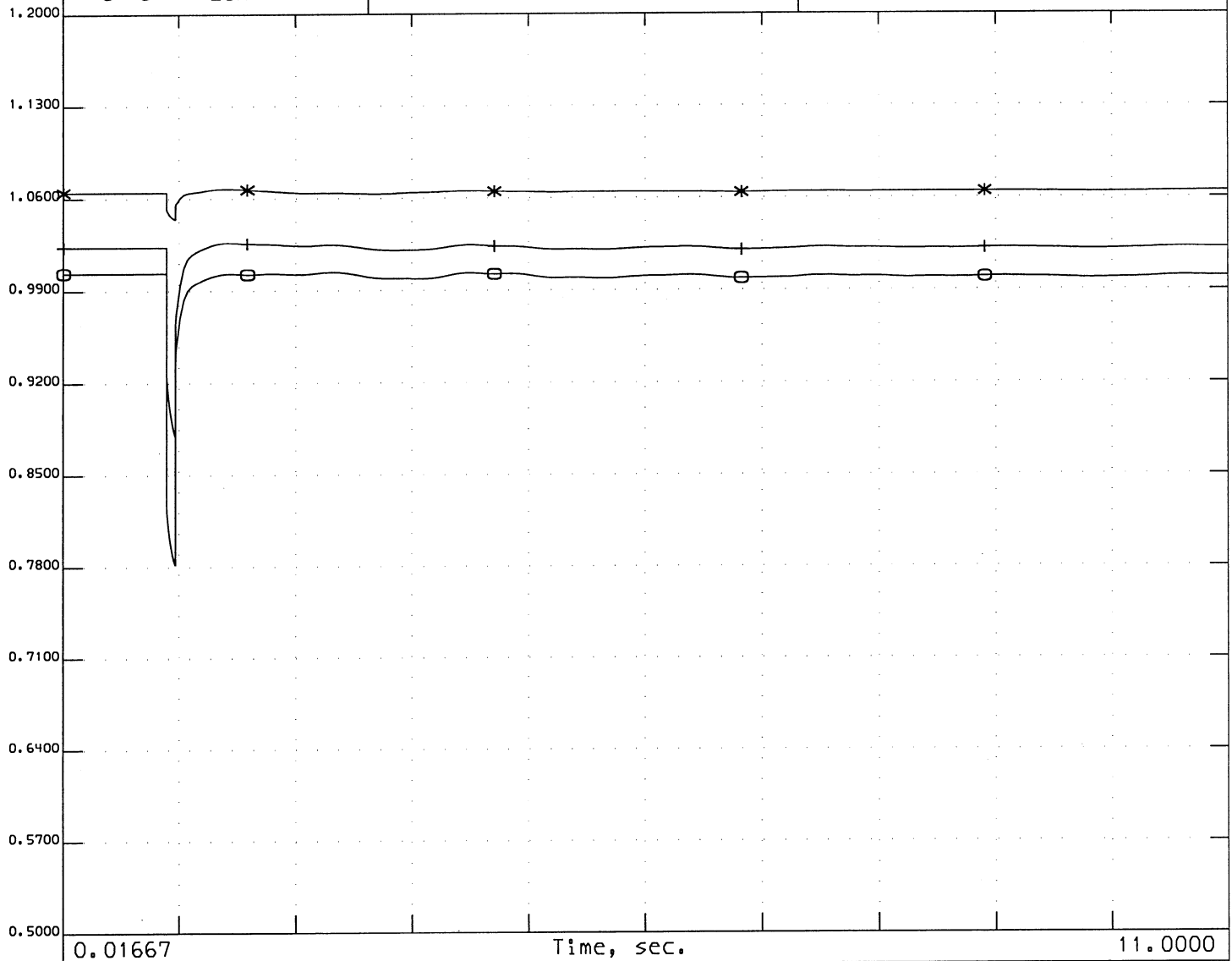
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blythesum1040c.sav
blythesum1040c.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Mirage 500KV Bus
Contingency-Remove Miriid - Mirage 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-nlsum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE MIRAGE 230 BUS
* CC
FB 0.0 "MIRAGE " 230
* CLEAR FAULT
CFB 5.0 "MIRAGE " 230
DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "
```



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:58:52 2002

miimrg-n1sum.chf
C:\ups1f112\blythesum1040c.sav



0.5000	O	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVNDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 500KV Bus

Contingency-Remove Miriid - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

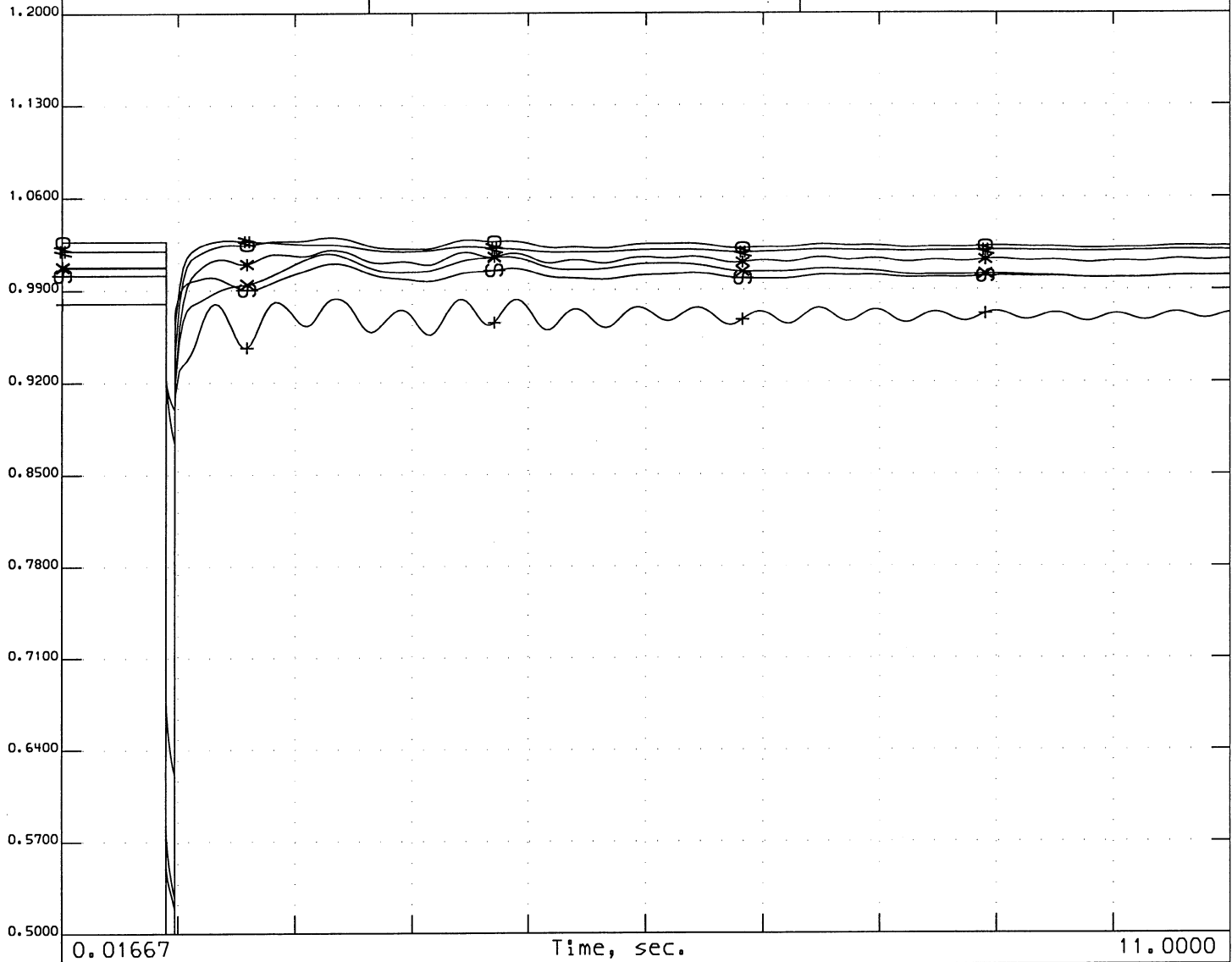
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:58:54 2002

miimrg-n1sum.chf
C:\upslf112\blythesum1040c.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	@	vbus	19400	BUCK230	230.00	1	1.2000

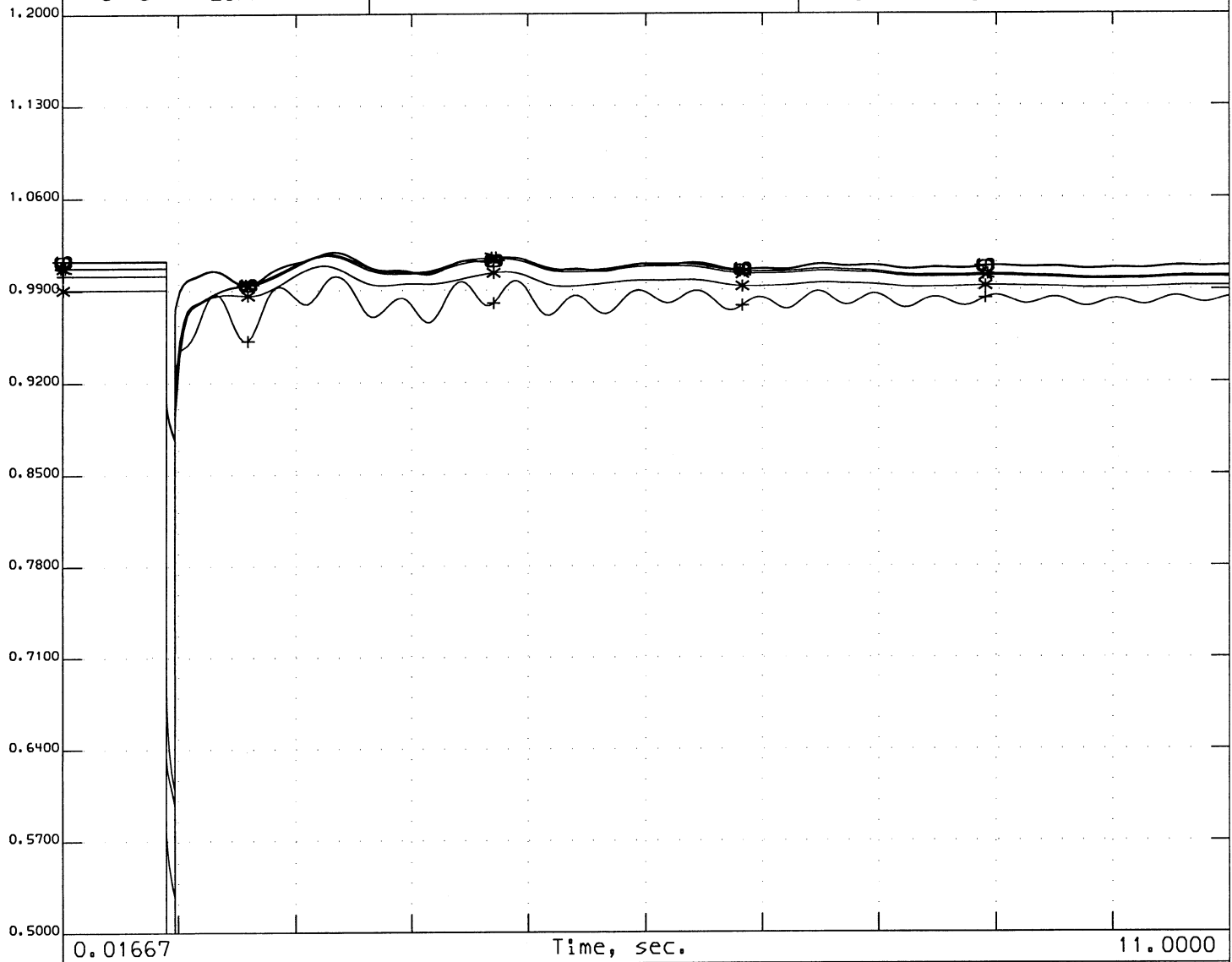
2004 Summer
5-CYCLE 3-Phase Fault on Mirage 500KV Bus
Contingency-Remove Miriid - Mirage 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:58:55 2002

miimrg-n1sum.chf
C:\ups\1f112\blythesum1040c.sav



0.5000	□	vbus	24017	BLYTHESE	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	x	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 500KV Bus

Contingency-Remove Miriid - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

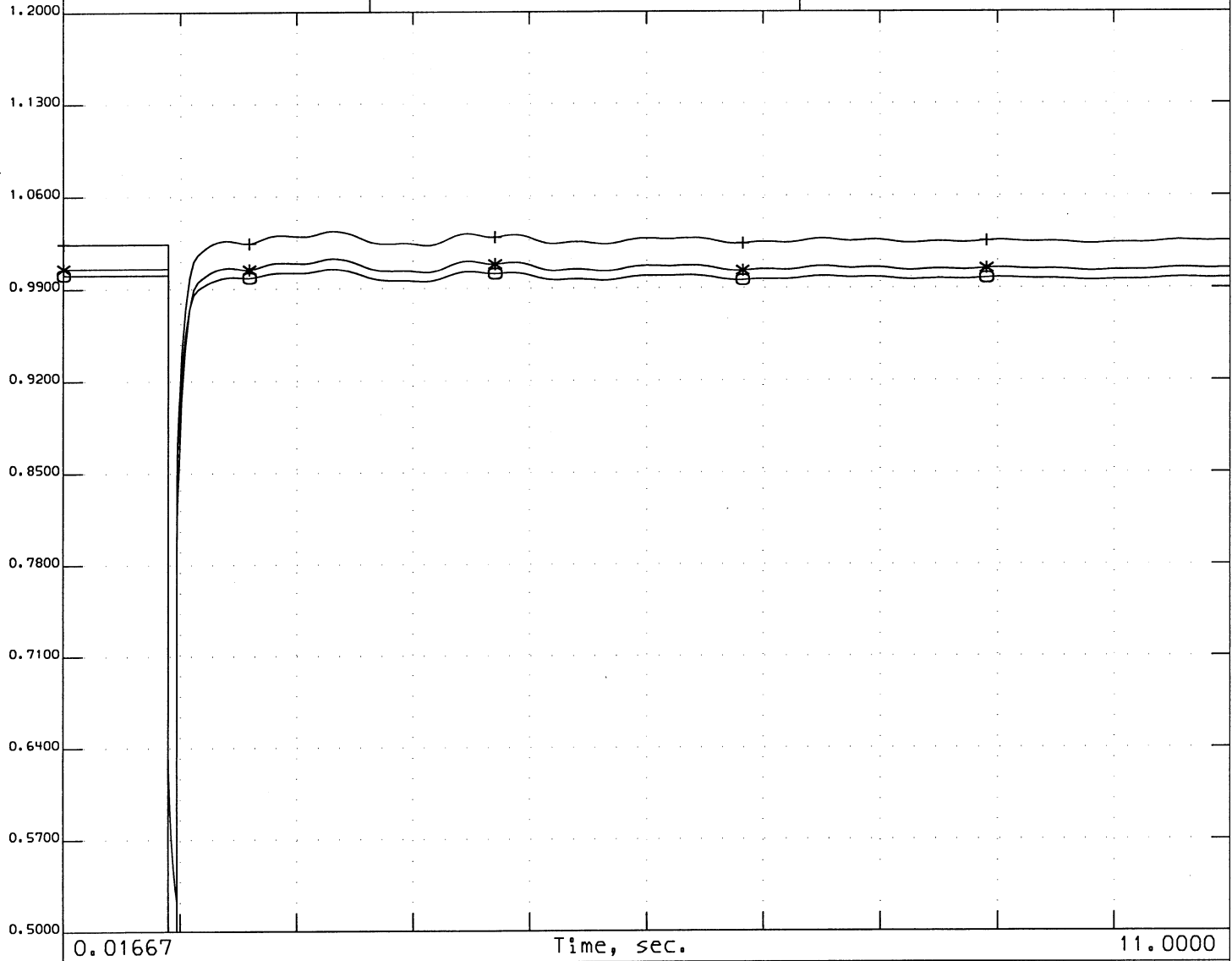
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:58:56 2002

miimrg-n1sum.chf
C:\upslf112\blythesum1040c.sav



Time, sec.						
0.5000	○	vbus	24805	DEVERS	115.00	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1.2000

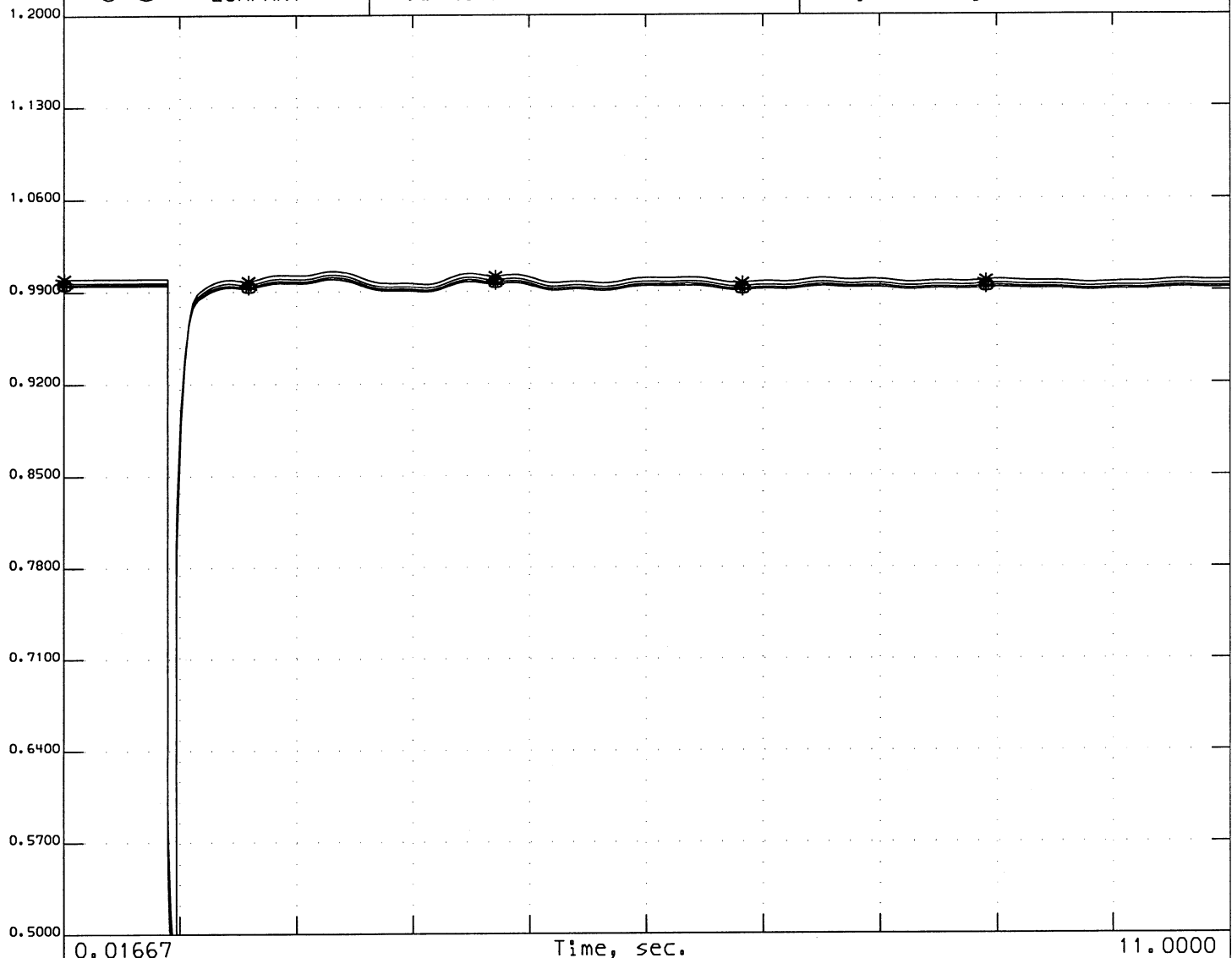
2004 Summer
5-CYCLE 3-Phase Fault on Mirage 500KV Bus
Contingency-Remove Miriid - Mirage 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:58:56 2002

miimrg-n1sum.chf
C:\ups\1f112\blythesum1040c.sav



0.01667		Time, sec.				11.0000
0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

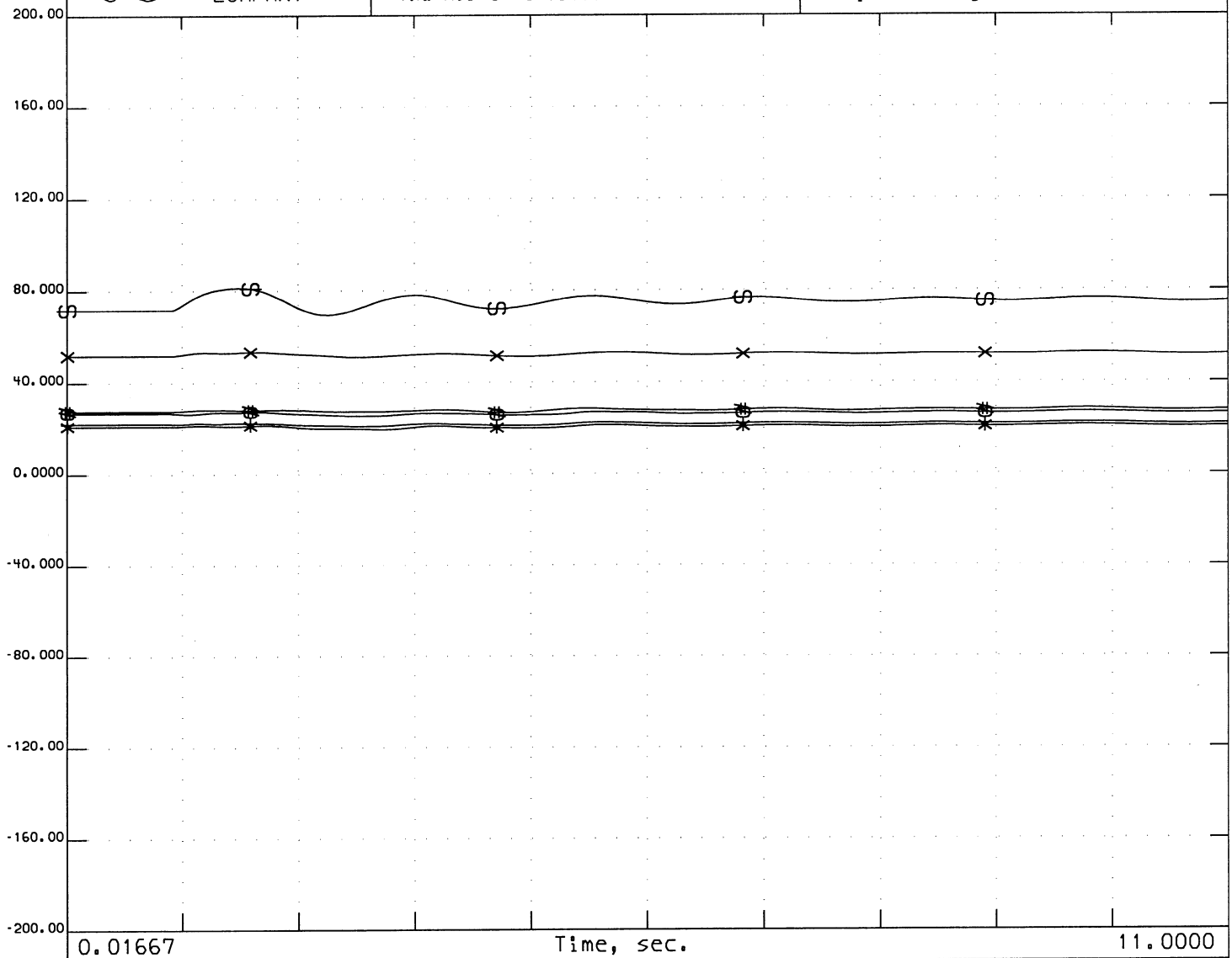
2004 Summer
5-CYCLE 3-Phase Fault on Mirage 500KV Bus
Contingency-Remove Miriid - Mirage 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:58:57 2002

miimrg-n1sum.chf
C:\ups1f112\blythesum1040c.sav



-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0	S	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Mirage 500KV Bus

Contingency-Remove Miriid - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + miimrg-n1sum.swt

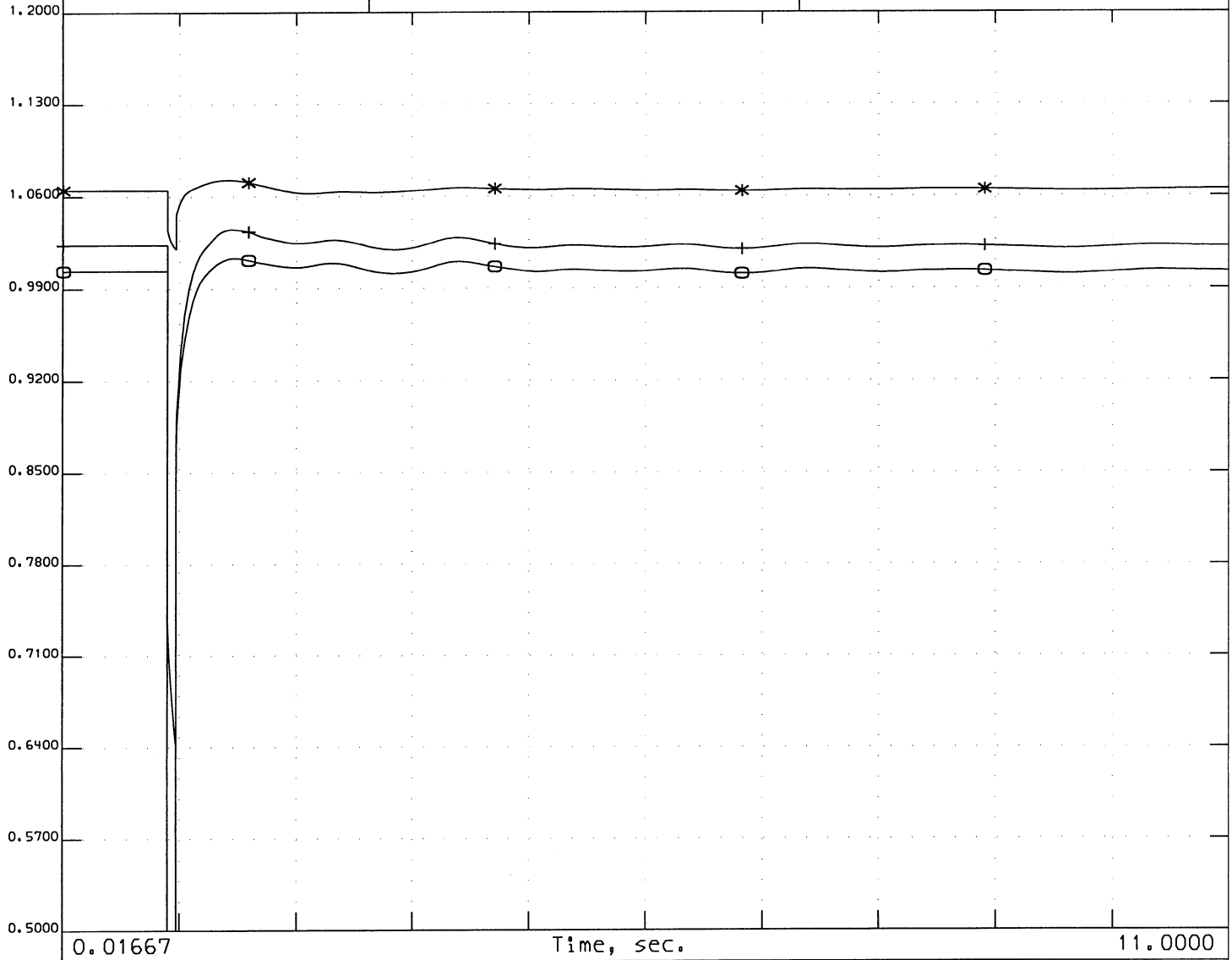
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blythesum1040d.sav
blythesum1040d.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrsbr-n2sum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "DEVERS " 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL 5.0 "DEVERS " 230. "SANBRDNO" 230. "2 "
DL 5.0 "SANBRDNO" 230. "DEVERS " 230. "1 "
```



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:51:26 2002

dvrbr-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.5000	□	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines

SYSTEM STABILITY STUDY CASES

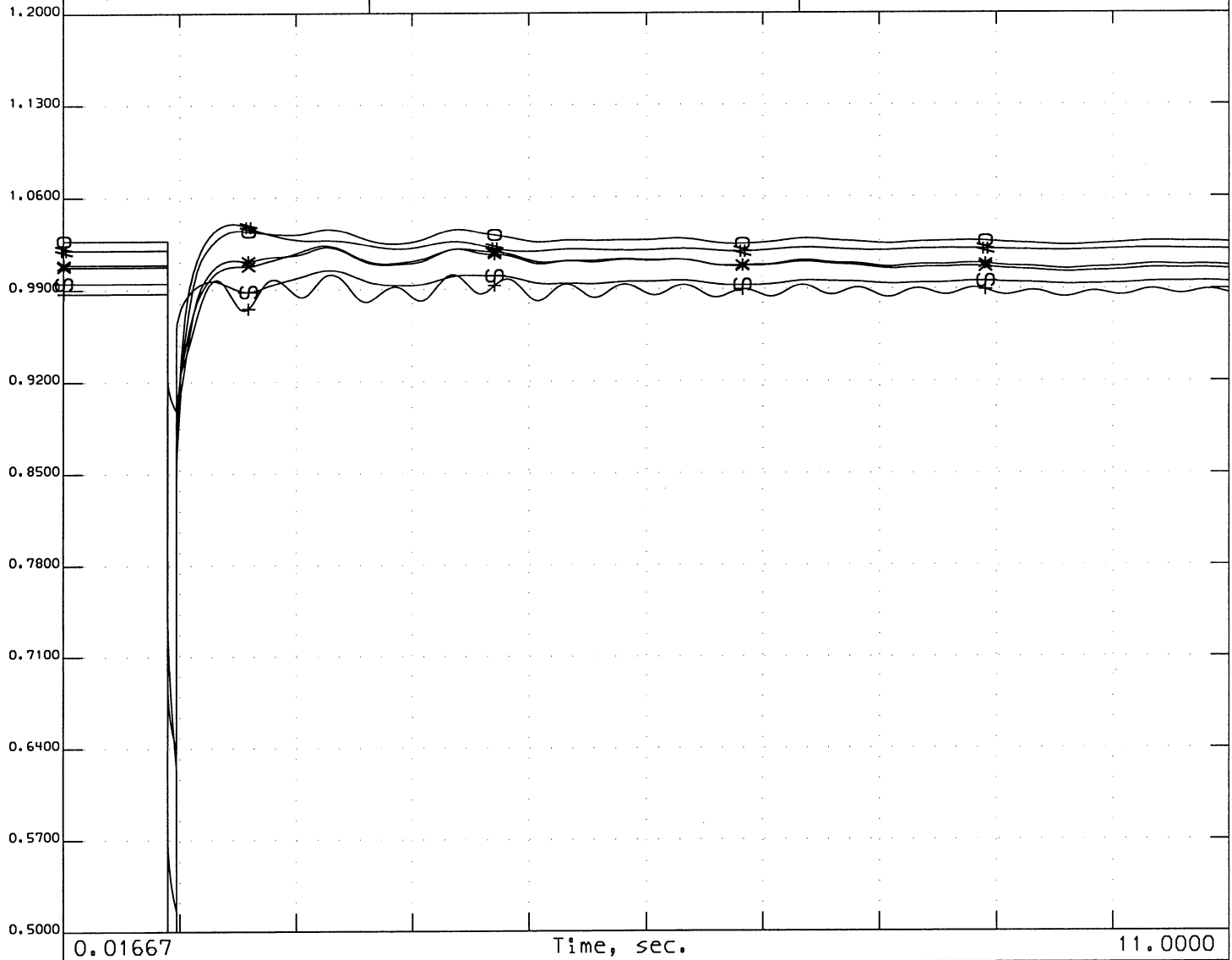
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:51:27 2002

dvrbr-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	⊕	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines

SYSTEM STABILITY STUDY CASES

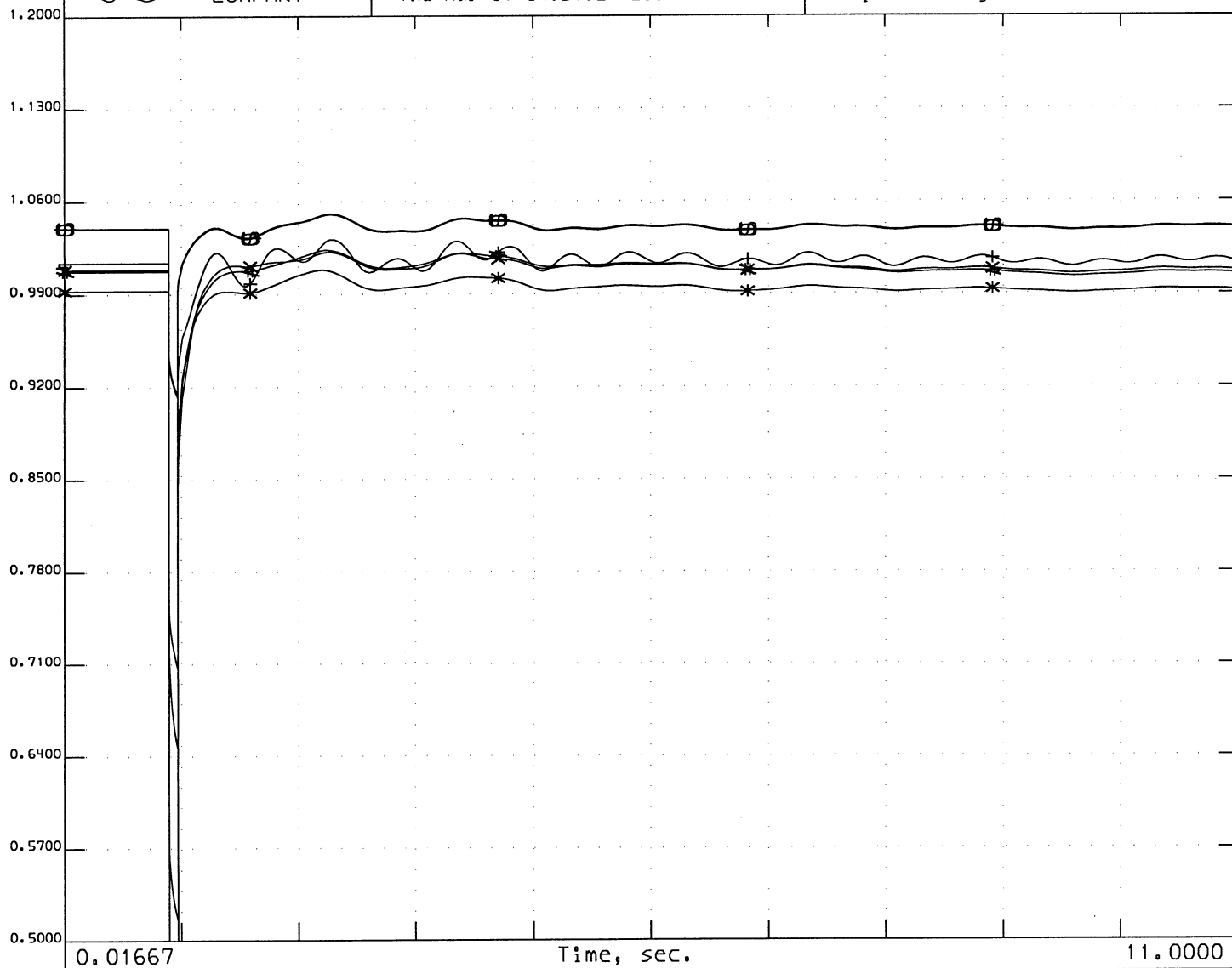
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:51:27 2002

dvrbr-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.					11.0000
0.5000	O	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	X	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines

SYSTEM STABILITY STUDY CASES

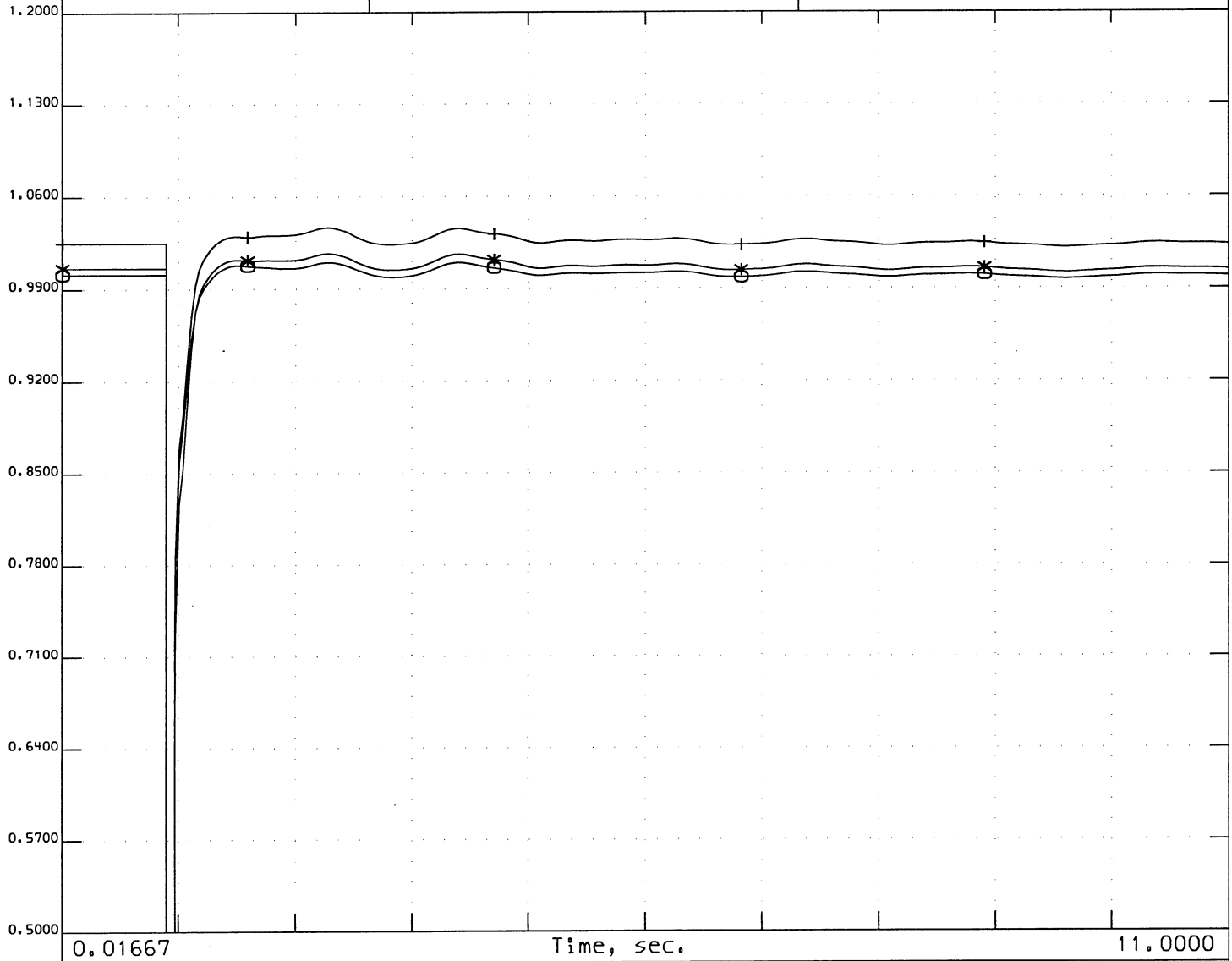
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:51:27 2002

dvrbr-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines

SYSTEM STABILITY STUDY CASES

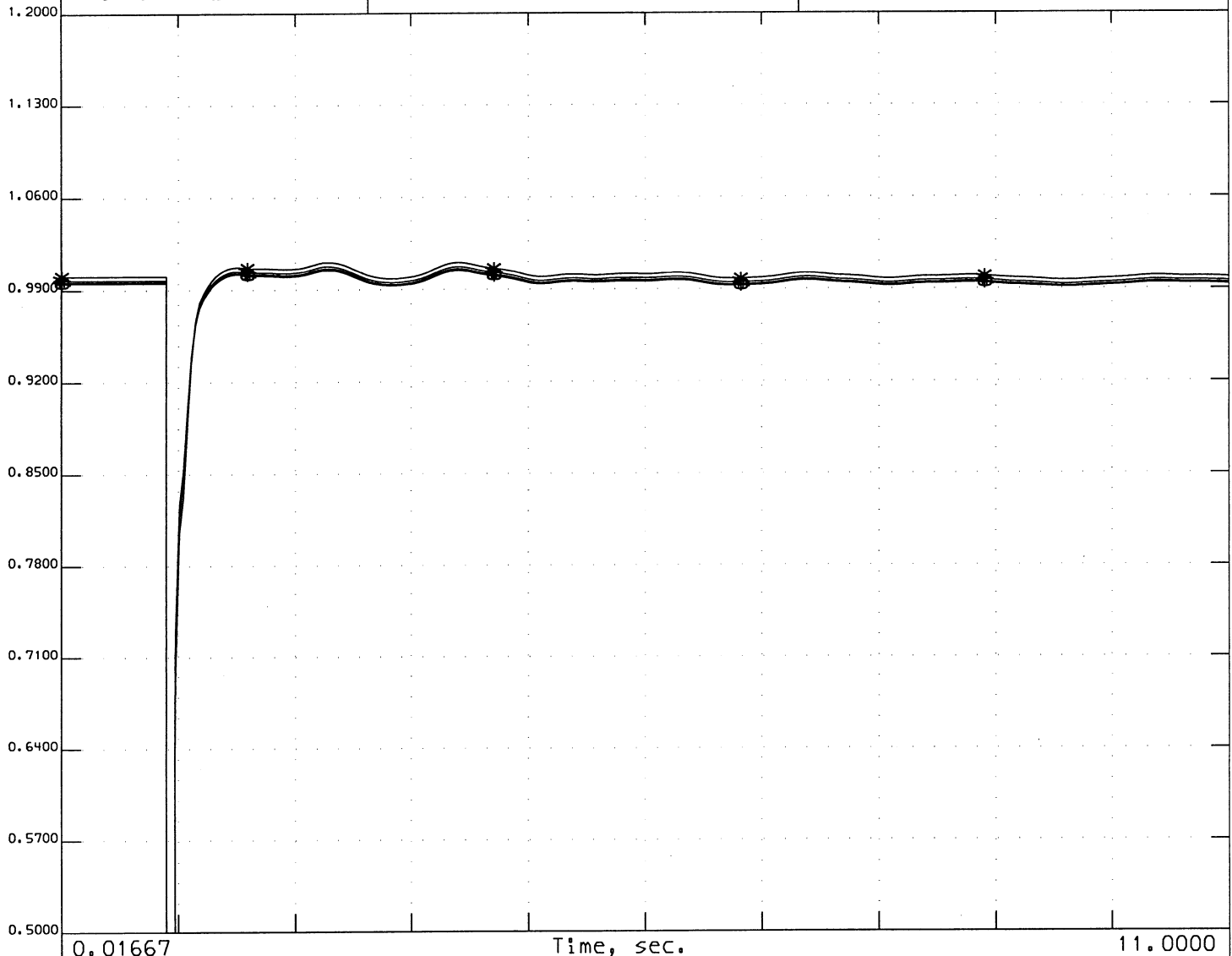
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:51:28 2002

dvrbr-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000
0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

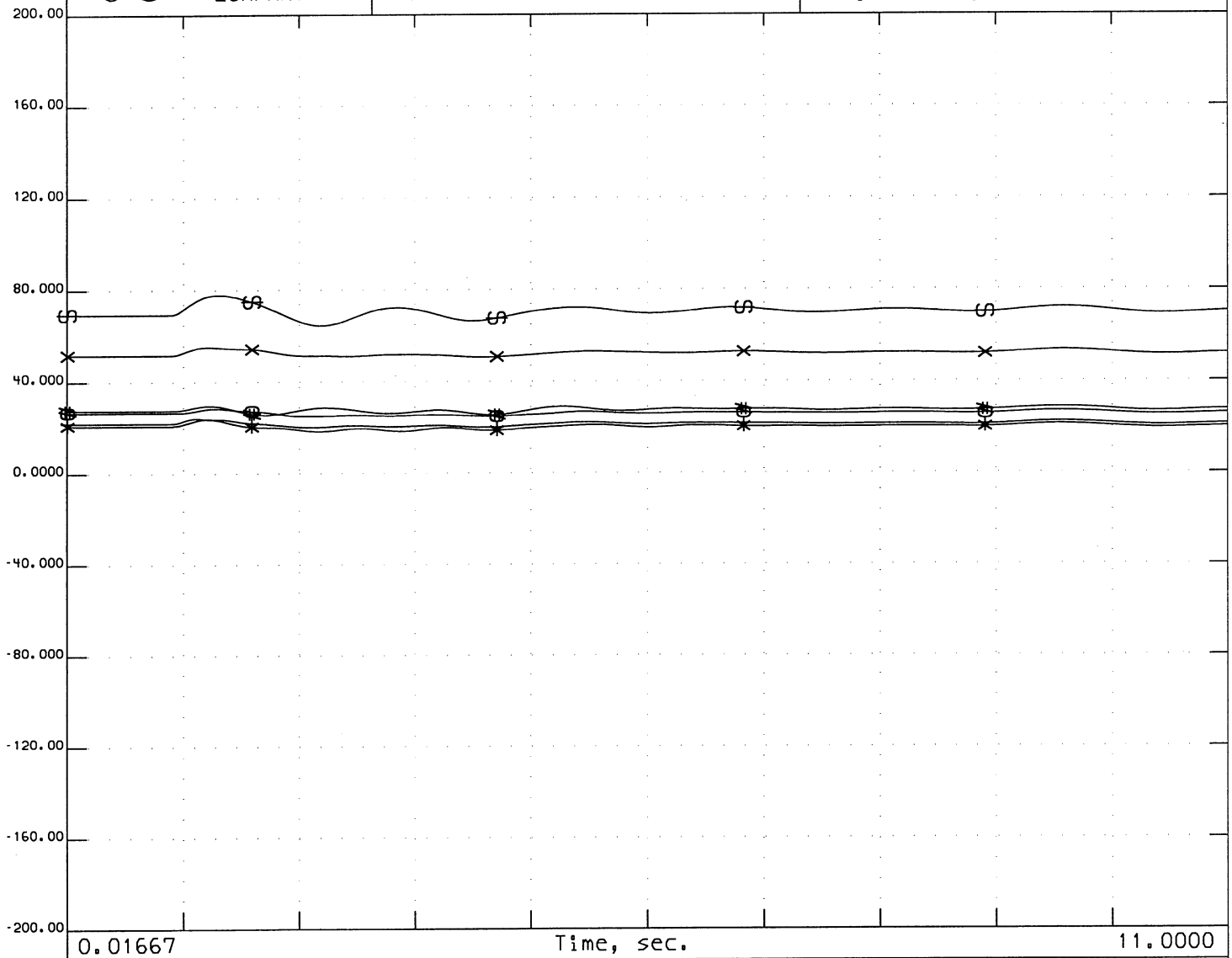
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:51:28 2002

dvrbr-n2sum.chf
C:\ups1f112\blythesum1040d.sav



-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0	S	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove Devers - San Bernardino 1&2 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n2sum.swt

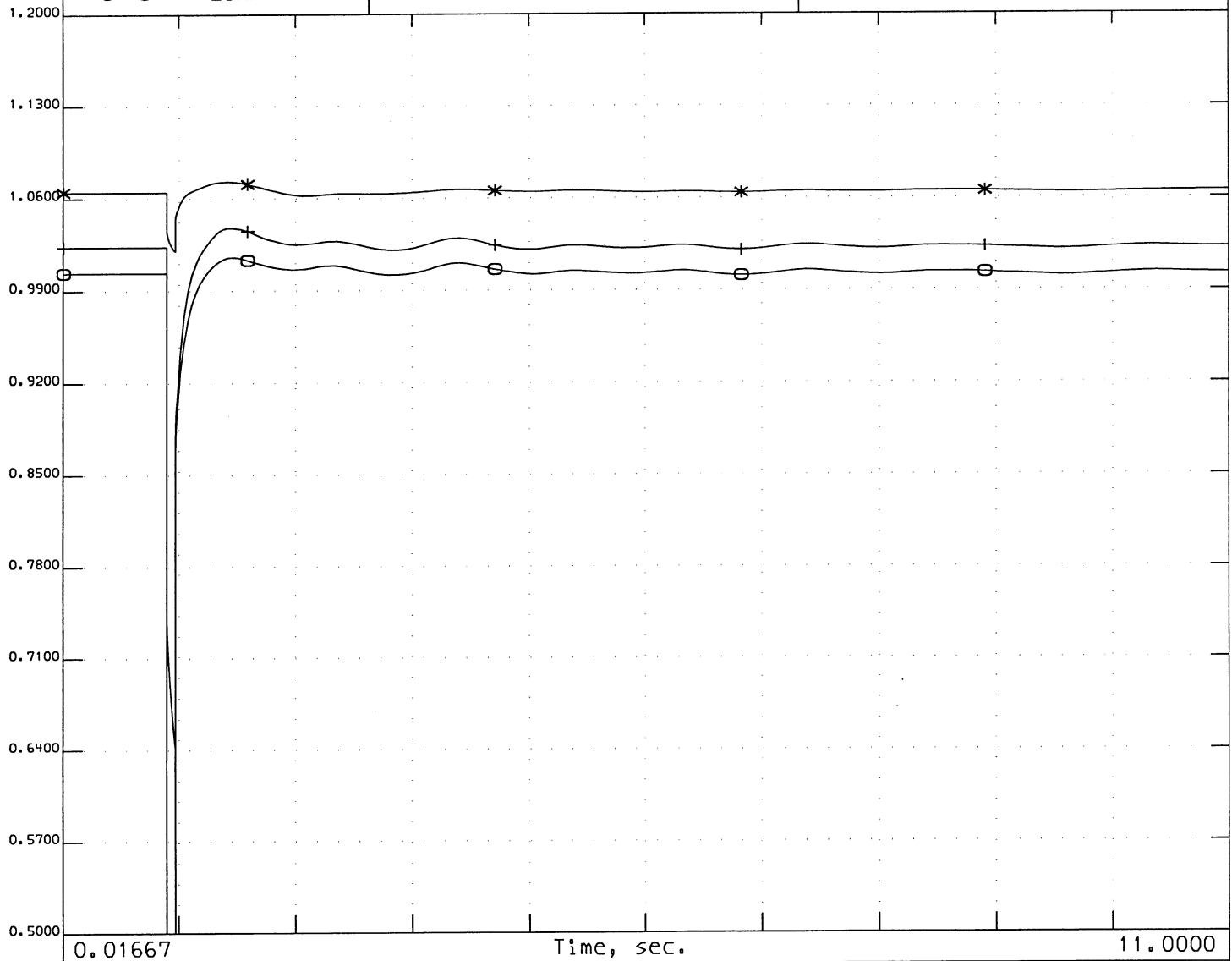

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blythesum1040d.sav
blythesum1040d.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove San Bernardino - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrSbr-nlsum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "DEVERS " 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL 5.0 "SANBRDNO" 230. "DEVERS " 230. "1 "
```



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:45:36 2002

dvrbr-n1sum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVNDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove San Bernardino - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

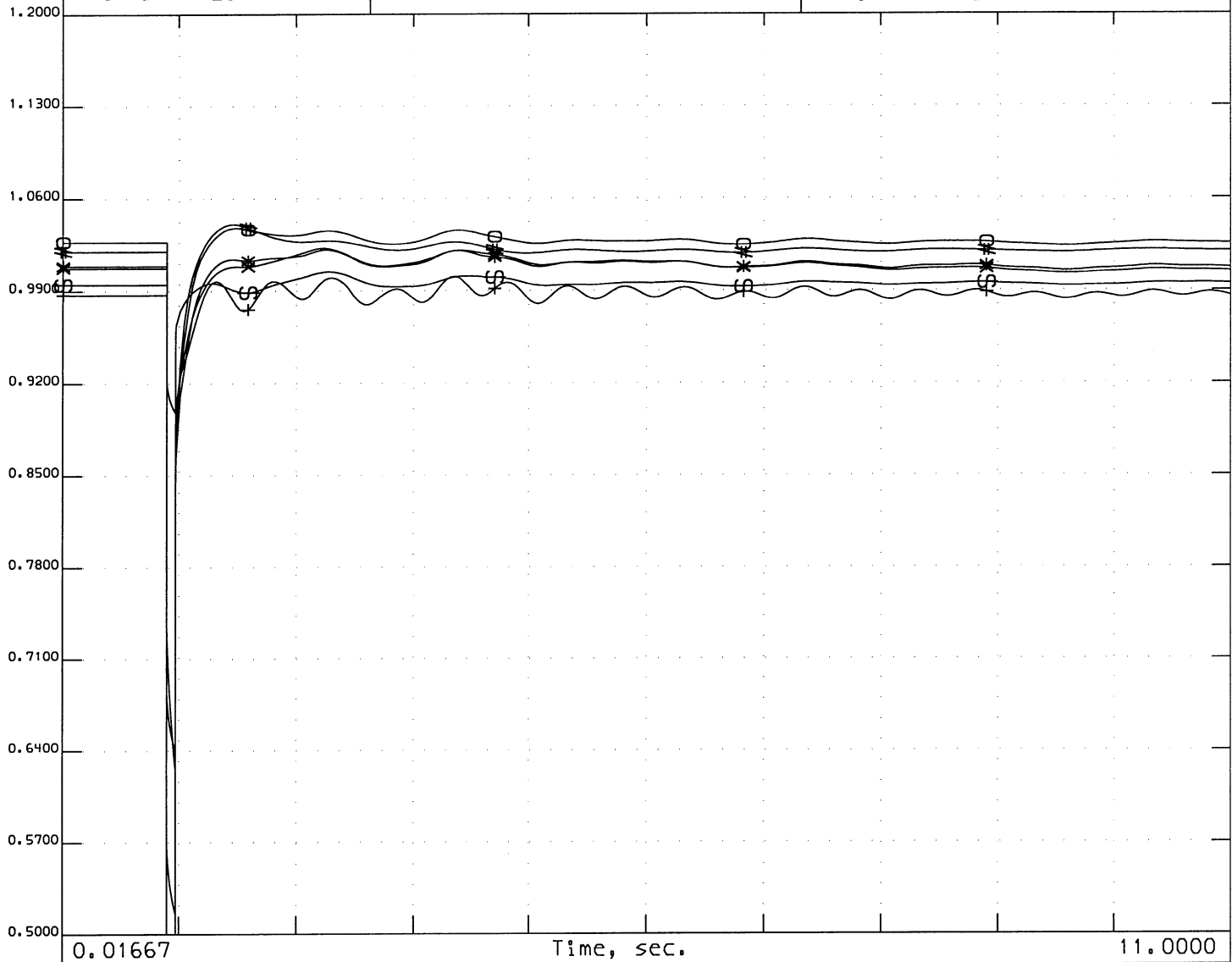
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:45:38 2002

dvrbr-n1sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

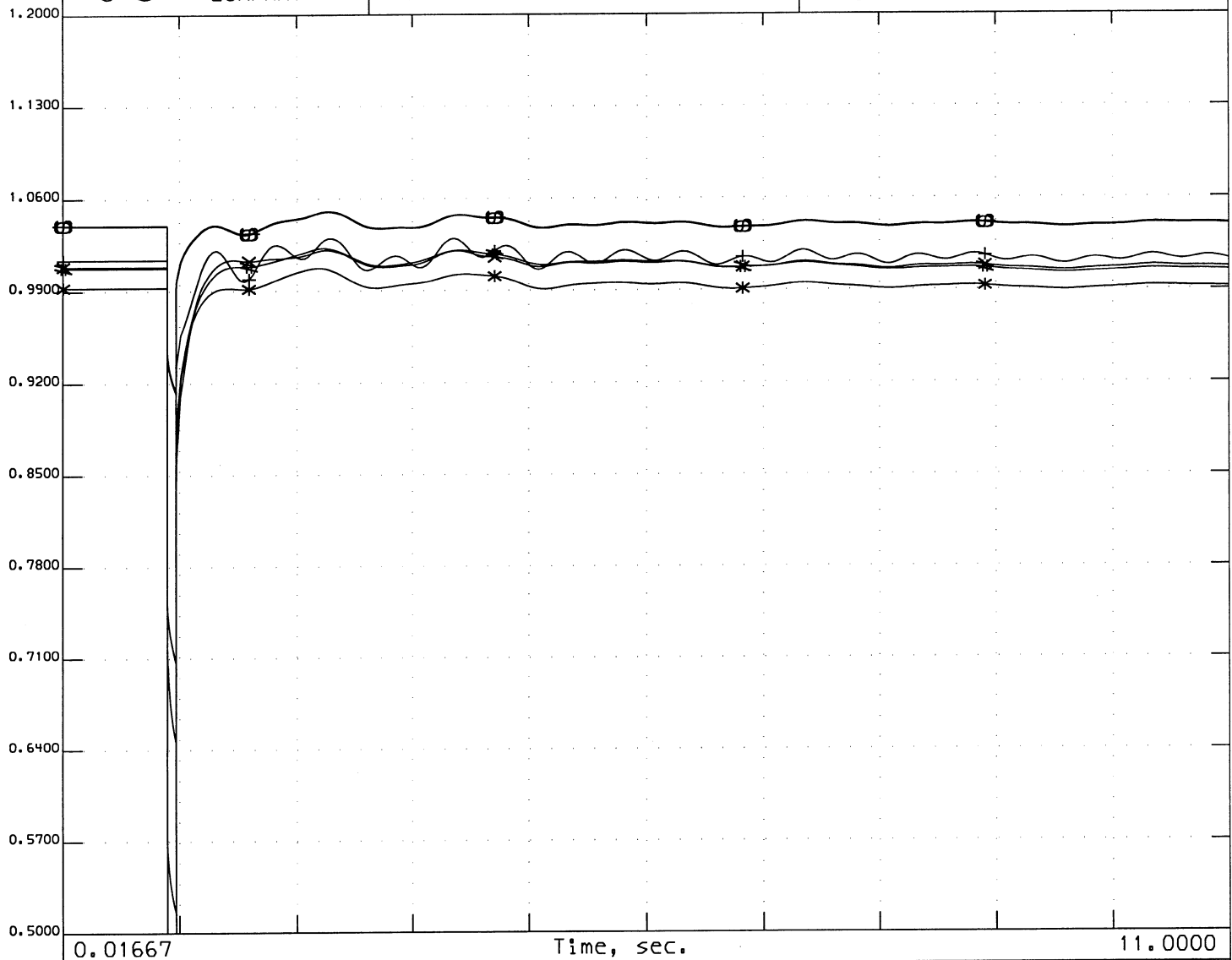
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove San Bernardino - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:45:40 2002

dvrbr-n1sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	X	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove San Bernardino - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

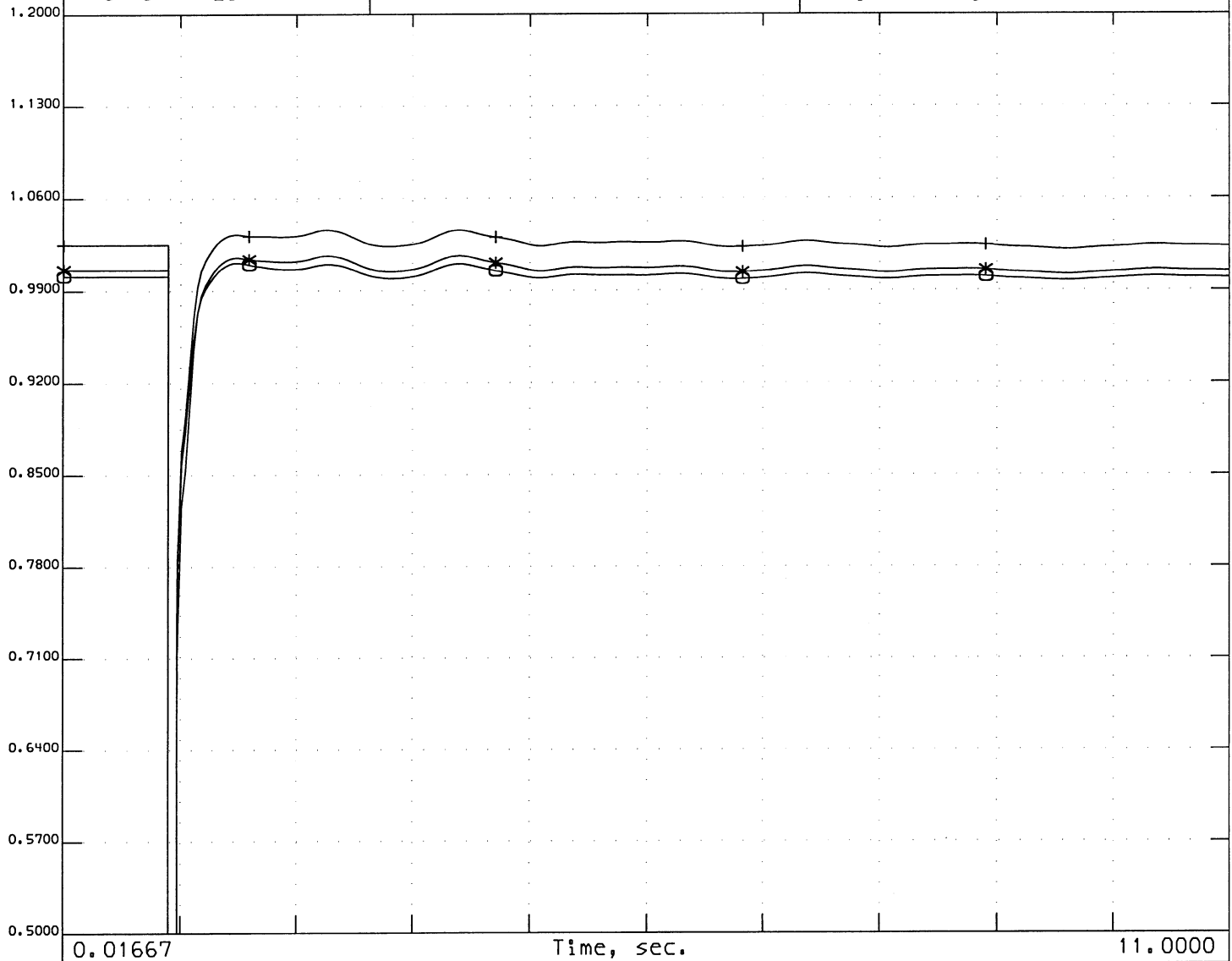
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:45:40 2002

dvrbr-n1sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

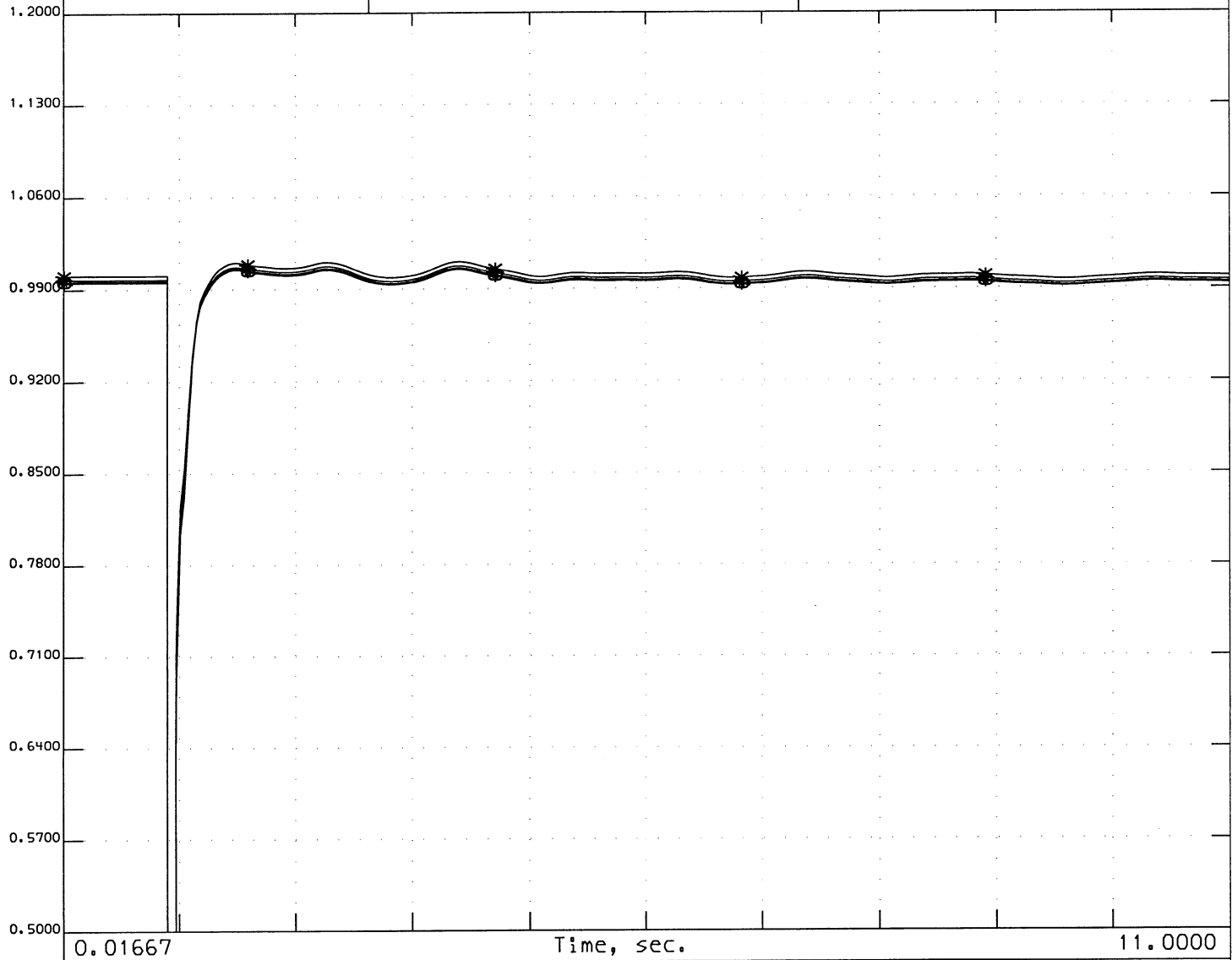
2004 Summer
5-CYCLE 3-Phase Fault on Devers 230KV Bus
Contingency-Remove San Bernardino - Devers 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:45:41 2002

dvrbr-n1sum.chf
C:\ups1f112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vb1	24817 EISENHOW	115.00	1	1.2000	
0.5000	+	vb1	24818 FARREL	115.00	1	1.2000	
0.5000	*	vb1	24816 SANTA RO	115.00	1	1.2000	
0.5000	#	vb1	24820 THORNHIL	115.00	1	1.2000	

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove San Bernardino - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

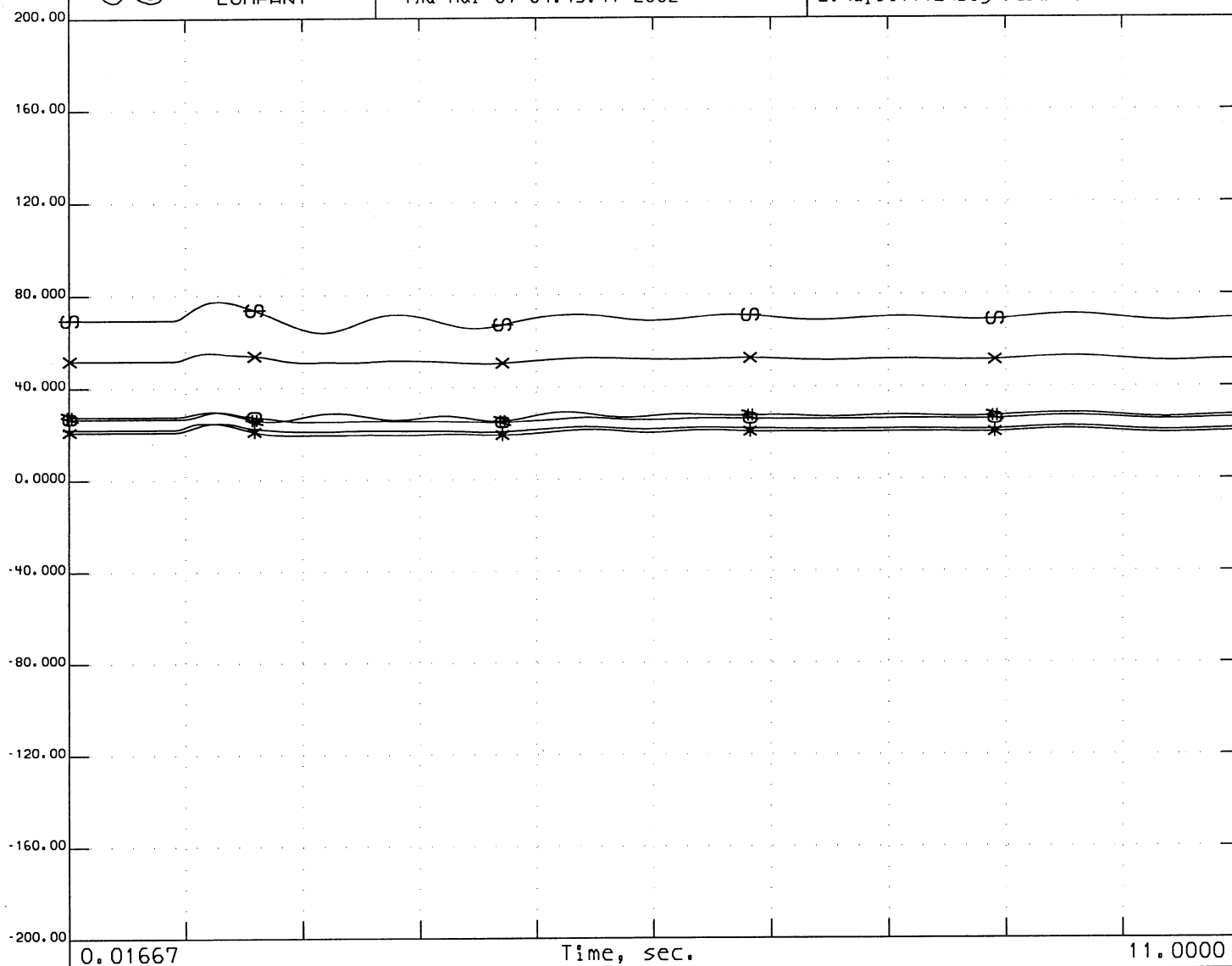
Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:45:41 2002

dvrbr-n1sum.chf
C:\ups1f112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00	
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00	
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00	
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00	
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00	
-200.0	O	ang	19401 BUCKST1	16.00	S1	200.00	

2004 Summer

5-CYCLE 3-Phase Fault on Devers 230KV Bus

Contingency-Remove San Bernardino - Devers 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + dvrbr-n1sum.swt

blythespr1040f.sav
blythespr1040f.dyd

TITLE

2004 Spring

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

*

* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE MIRAGE 230 BUS

* CC

FB 0.0 "MIRAGE " 230

* CLEAR FAULT

CFB 5.0 "DEVERS " 230

DL 5.0 "DEVERS " 230. "MIRAGE " 230. "1 "

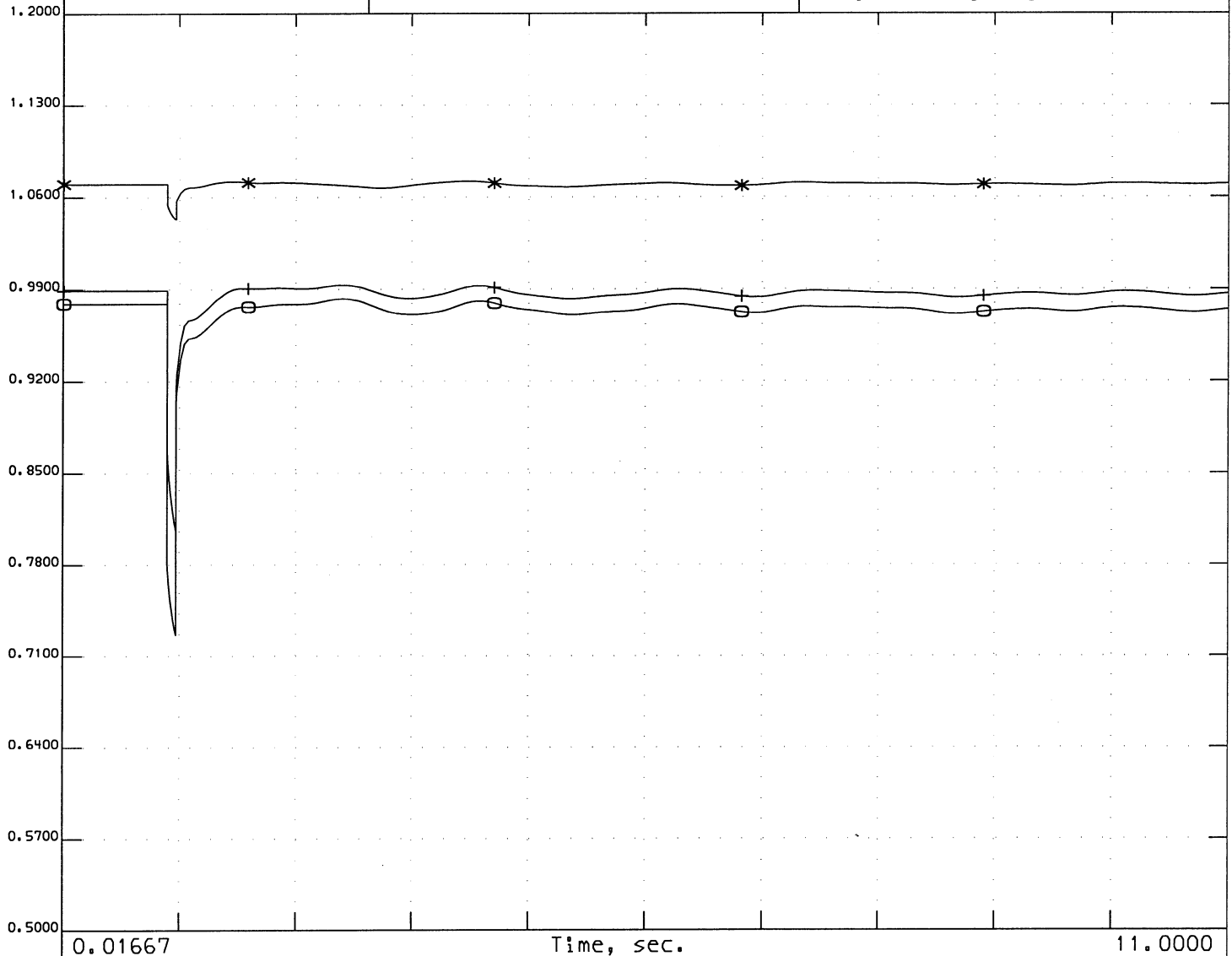
DL 5.0 "MIRIID " 230. "MIRAGE " 230. "1 "



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:59:55 2002

mirage-n2spr.chf
C:\ups1f112\blythespr1040f.sav



0.01667		Time, sec.				11.0000	
0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

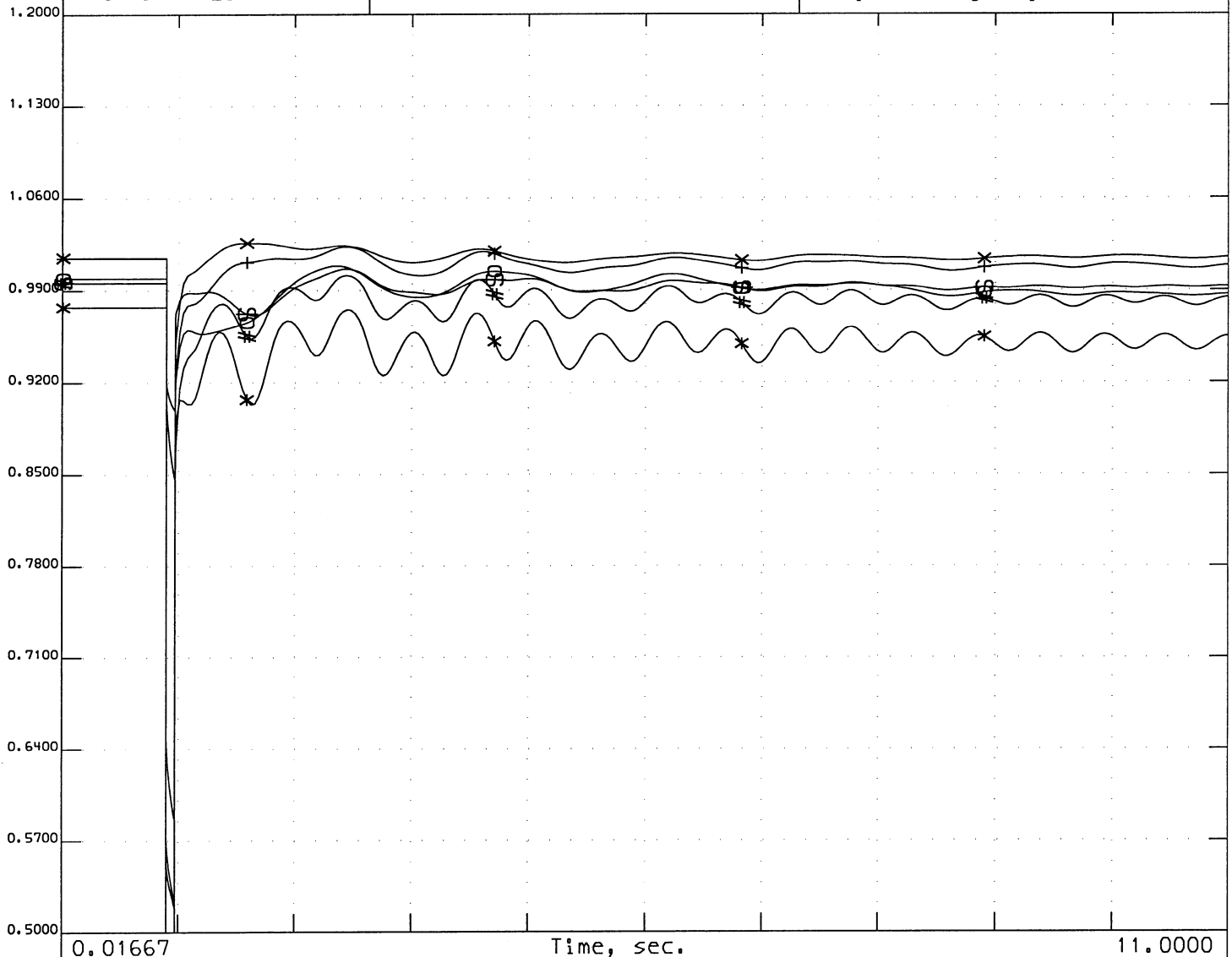
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:59:58 2002

mirage-n2spr.chf
C:\ups1f112\blythespr1040f.sav



0.01667		Time, sec.				11.0000
0.5000	O	vbus	21007 COACHELV	230.00	1	1.2000
0.5000	+	vbus	24804 DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401 EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806 MIRAGE	230.00	1	1.2000
0.5000	X	vbus	24132 SANBRDNO	230.00	1	1.2000
0.5000	⊗	vbus	19400 BUCK230	230.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

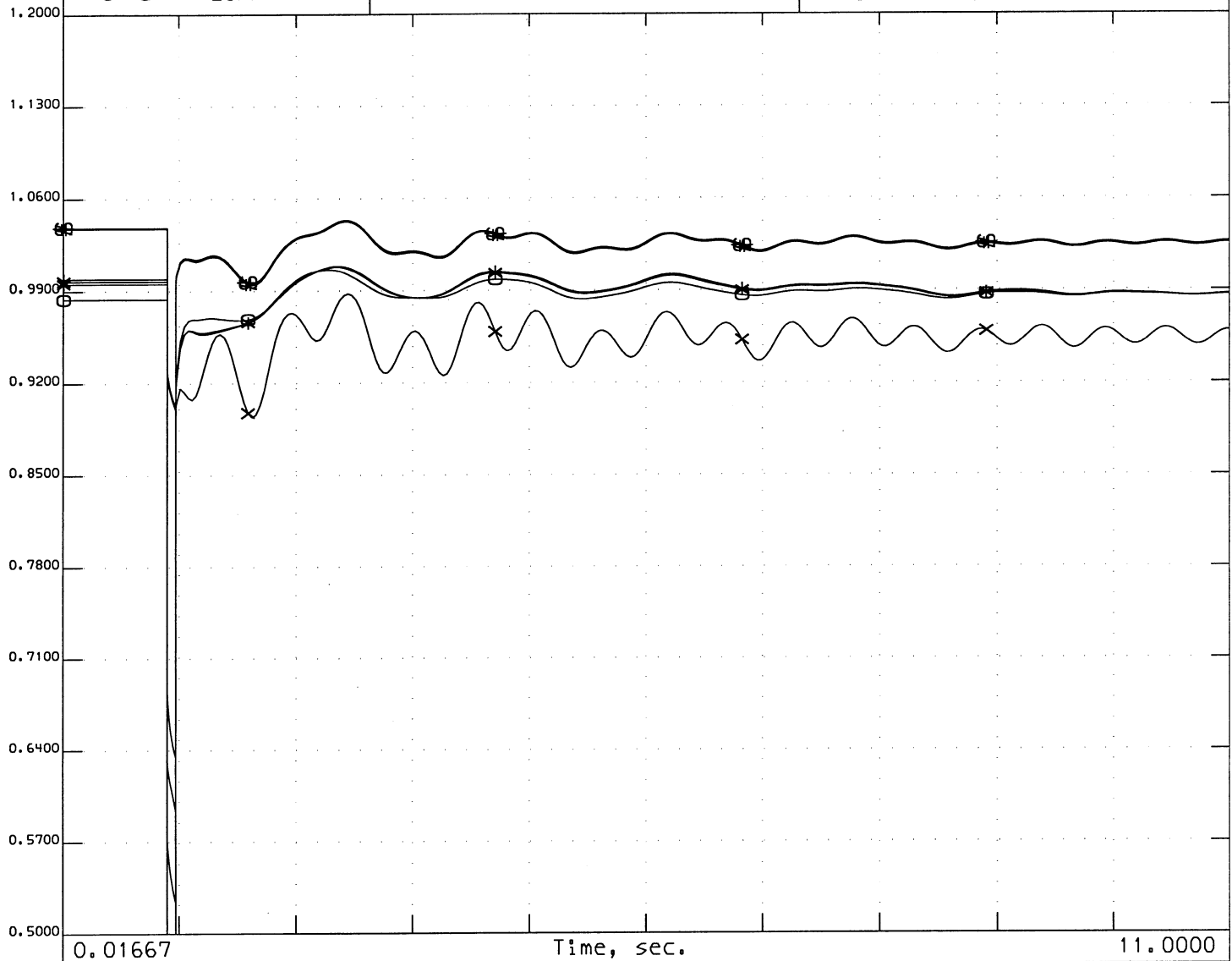
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:59:59 2002

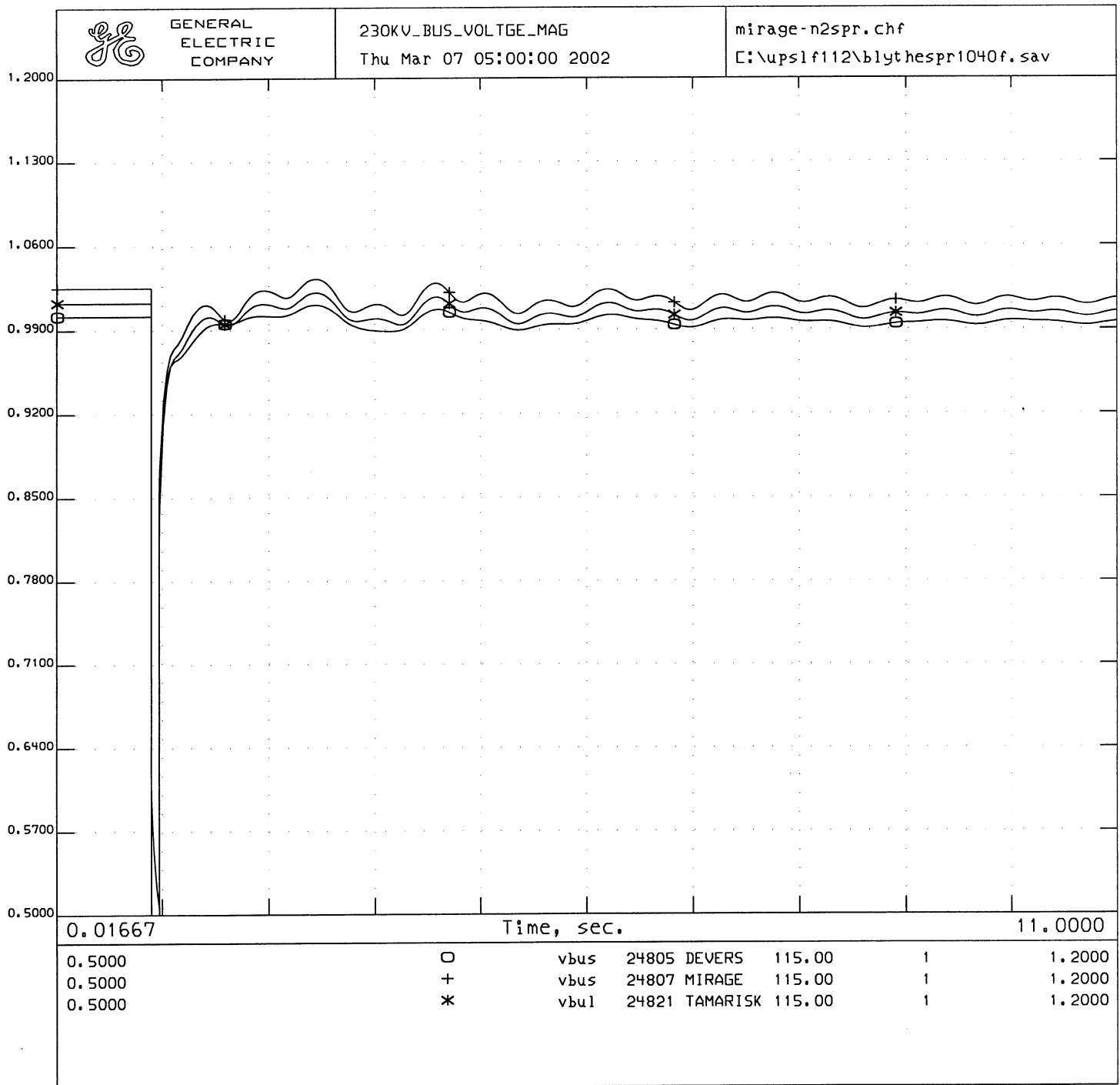
mirage-n2spr.chf
C:\upslf112\blythespr1040f.sav



0.01667		Time, sec.				11.0000	
0.5000	O	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	+	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	*	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	#	vbul	24017	BLYTHESC	161.00	1	1.2000
0.5000	X	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Mirage 230KV Bus
Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Mirage 230KV Bus
 Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines
 SYSTEM STABILITY STUDY CASES
 Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

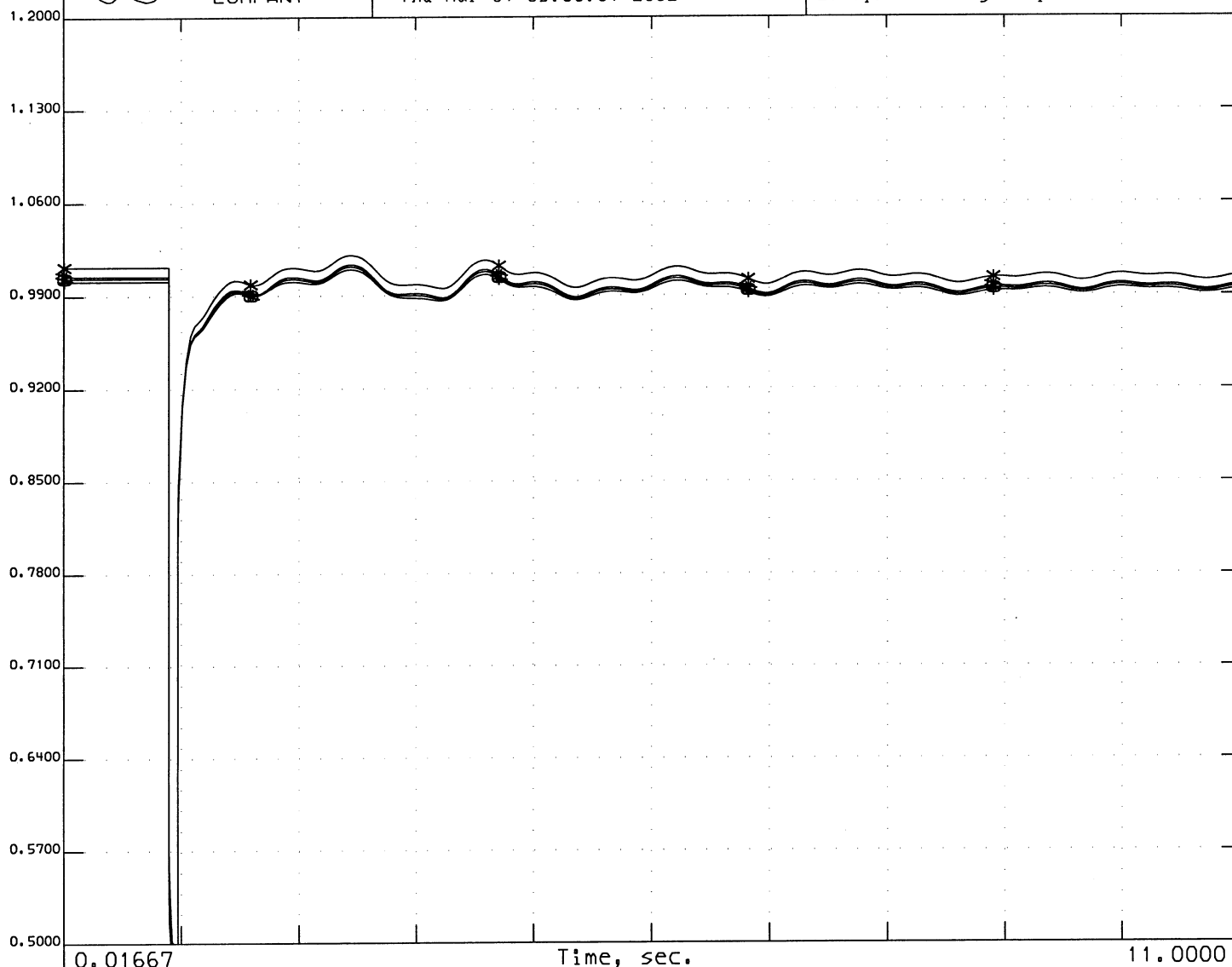
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:00:01 2002

mirage-n2spr.chf
C:\ups\lf112\blythespr1040f.sav



0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Spring

5-CYCLE 3-Phase Fault on Mirage 230KV Bus

Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

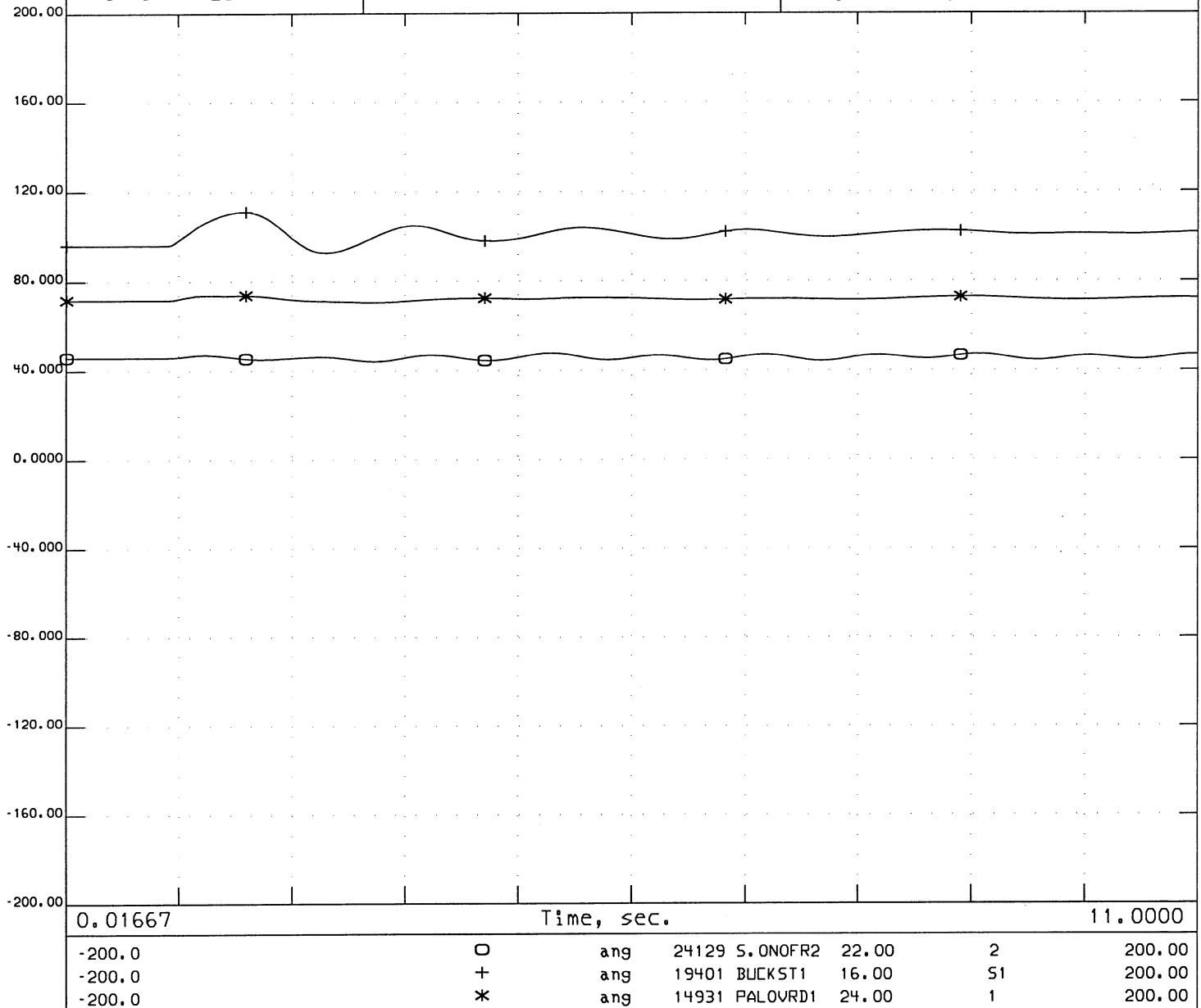
IID CHANGES



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 05:00:01 2002

mirage-n2spr.chf
C:\ups1f112\blythespr1040f.sav



2004 Spring
5-CYCLE 3-Phase Fault on Mirage 230KV Bus
Contingency-Remove Devers - Mirage & Miriid - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + mirage-n2spr.swt

IID CHANGES

```

blythespr1040f.sav
blythespr1040f.dyd
TITLE
2004 Spring
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
*   Loss of Palo Verde - Devers Line
*
* CC cards for post-transient only
*
*   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.
*
*   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 "DEVERS " 500. "p5157 " 500. "1 " 1
FC 0.0 "DEVERS " 500. "p5157 " 500. "1 " 3
FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 3
FC 0.0 "N.GILA " 500. "IMPRLVLY" 500. "1 " 2
FC 0.0 "IMPRLVLY" 500. "MIGUEL " 500. "1 " 1
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 Palo Verde
CFB 4.0 "PALOVRDE" 500.
*
*   Trip Palo Verde - Devers 500 kV Line
*
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 1
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 2
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 3
*
*   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 "PALOVRSO" 500. "N.GILA " 500. "1 " 3
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

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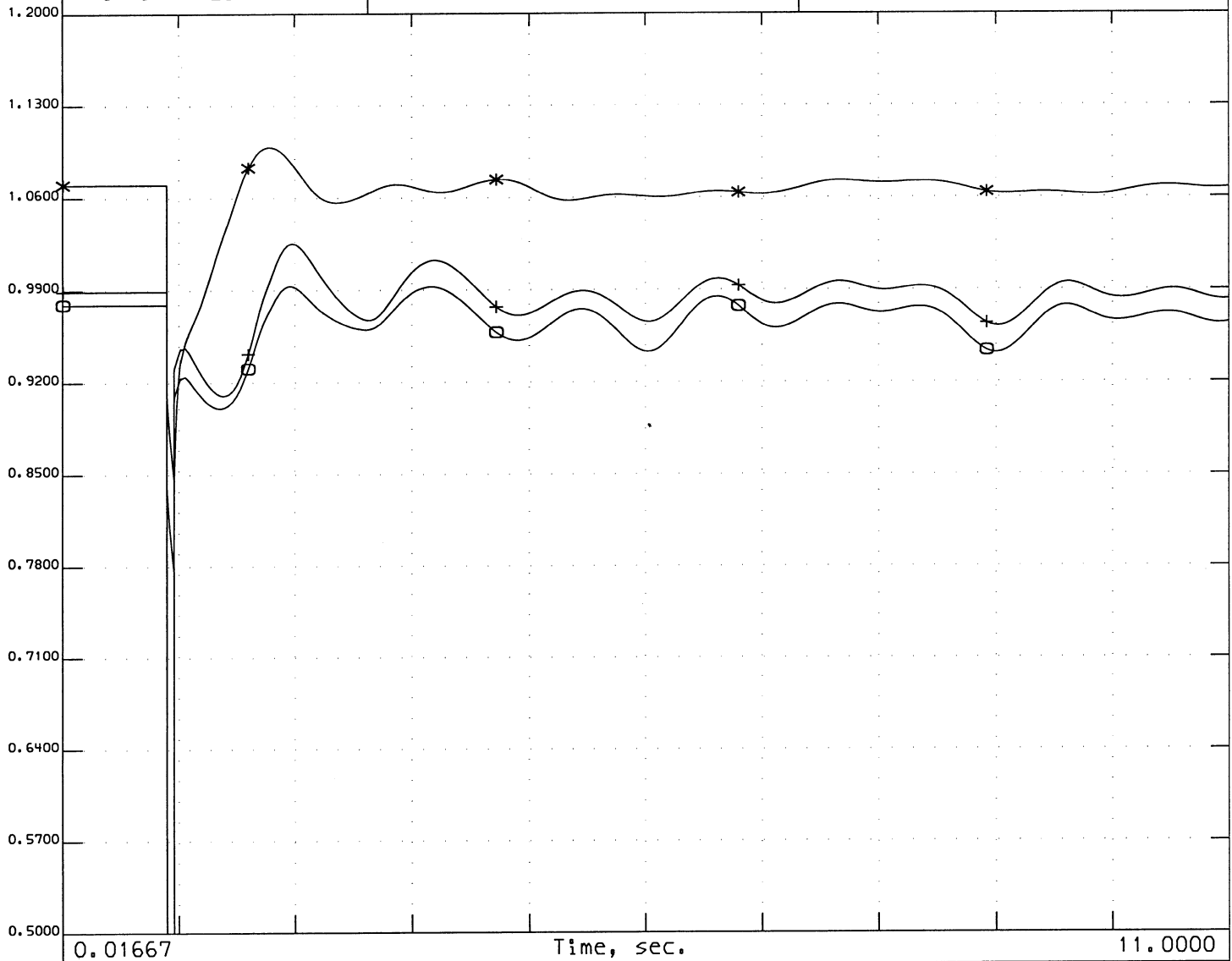
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RC 8.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
RC 8.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
RC 8.0 "NAVAJO " 500. "WESTWING" 500. "1 " 1
RC 8.0 "NAVAJO " 500. "WESTWING" 500. "1 " 3
*
*
* Add SVC's at Marketplace and Adelanto
*
CC MBS 120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC MBS 120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```




GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 05:03:12 2002

pvdevers-slospr.chf
C:\upslf112\blythespr1040f.sav



0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

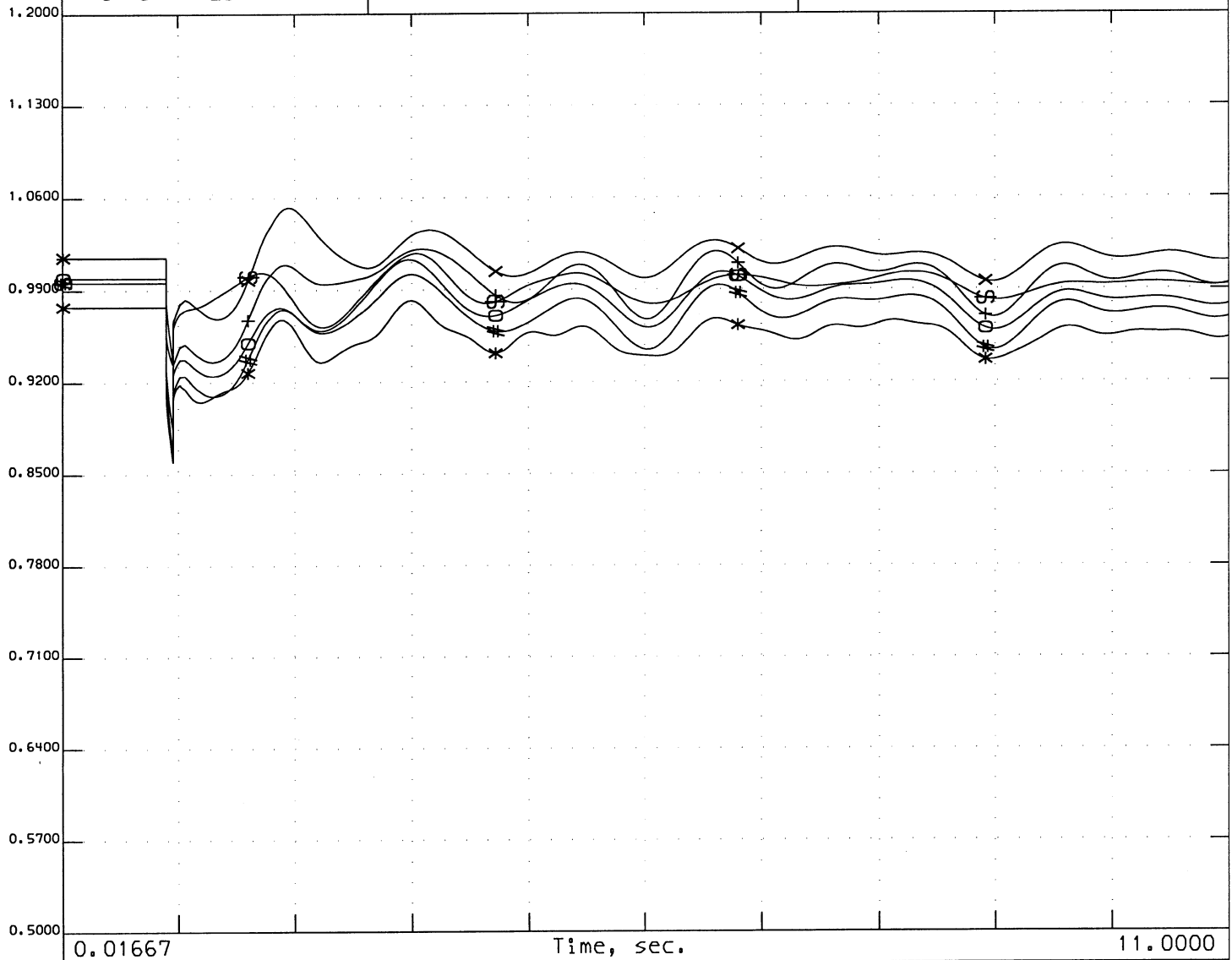
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:03:15 2002

pvdevers-slospr.chf
C:\upslf112\blythespr1040f.sav



0.01667		Time, sec.					11.0000
0.5000	O	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	+	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	X	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

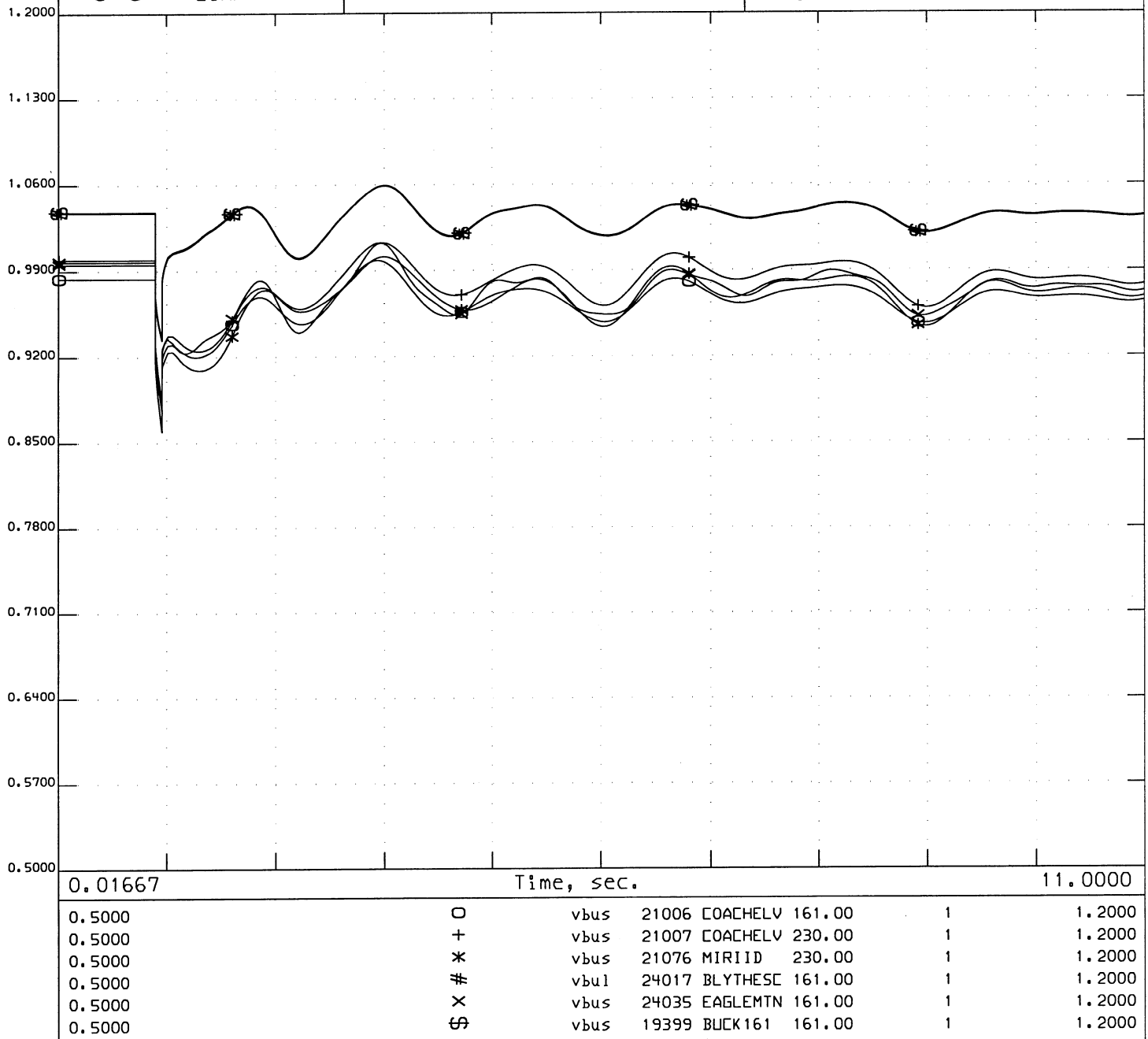
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:03:17 2002

pvdevers-slospr.chf
C:\ups1f112\blythespr1040f.sav



2004 Spring

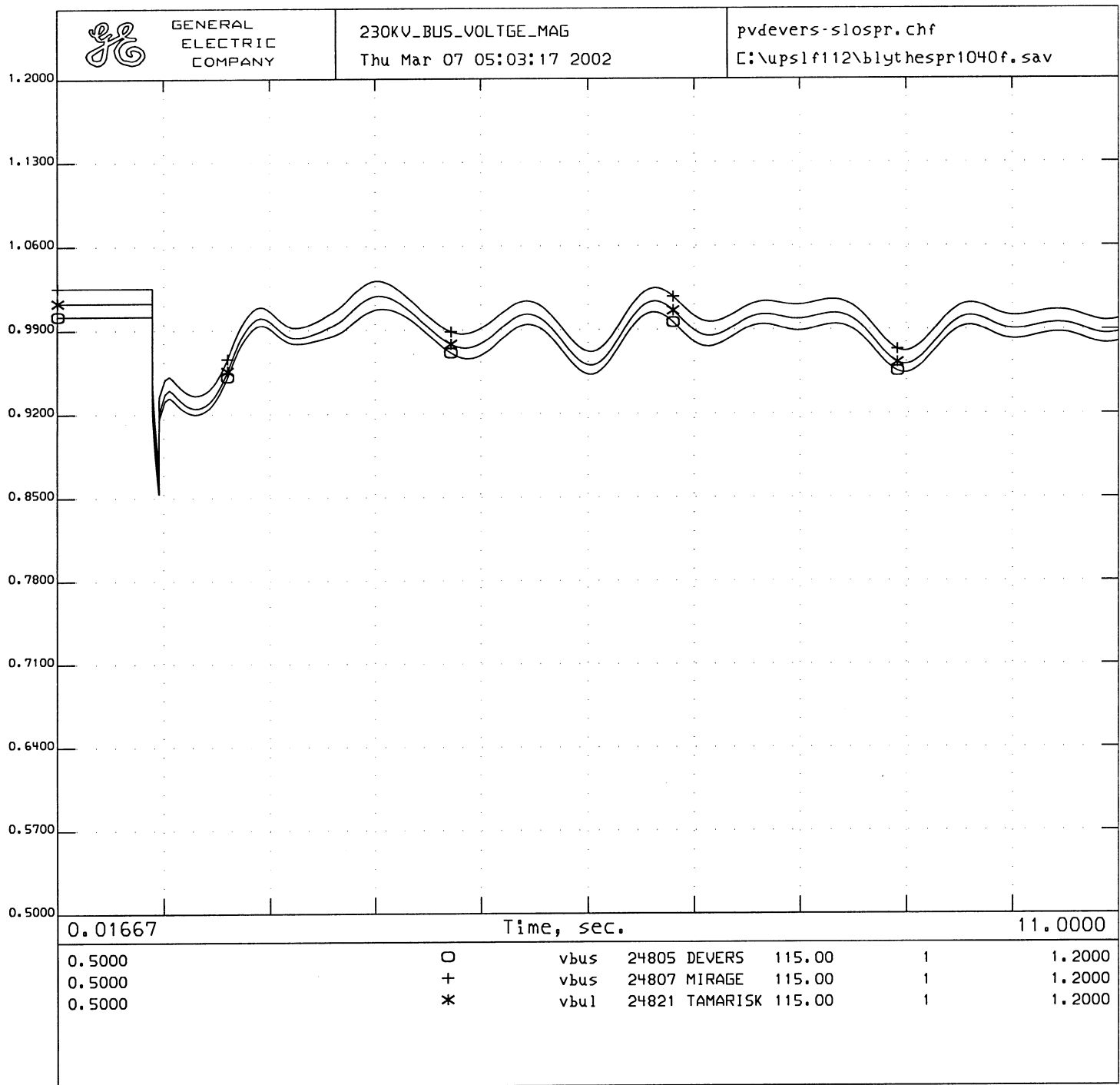
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

IID CHANGES



2004 Spring
 5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
 Contingency-Remove Palo Verde - Devers 500 KV Line
 SYSTEM STABILITY STUDY CASES
 Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

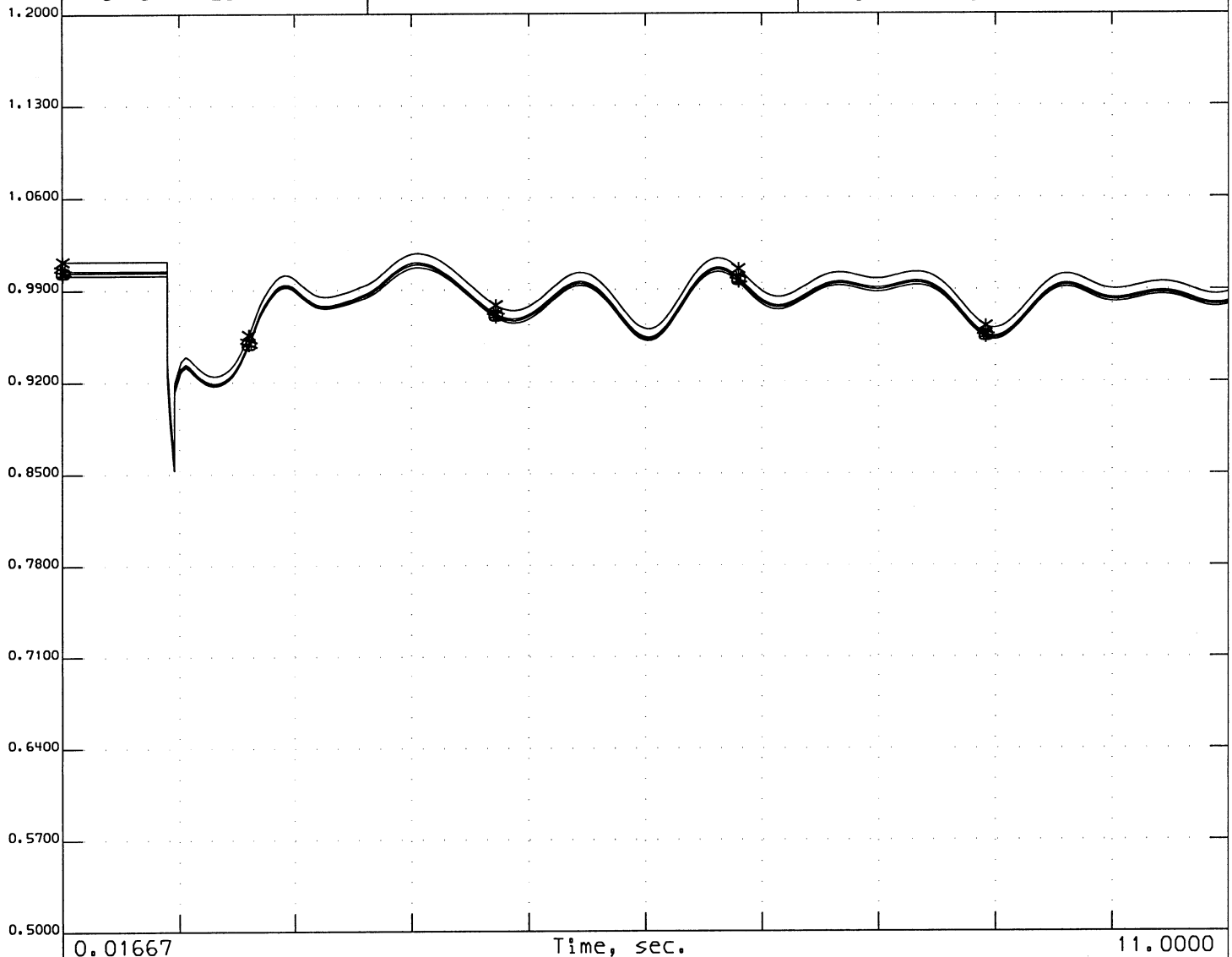
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:03:17 2002

pvdevers-slospr.chf
C:\ups1f112\blythespr1040f.sav



0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Spring
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

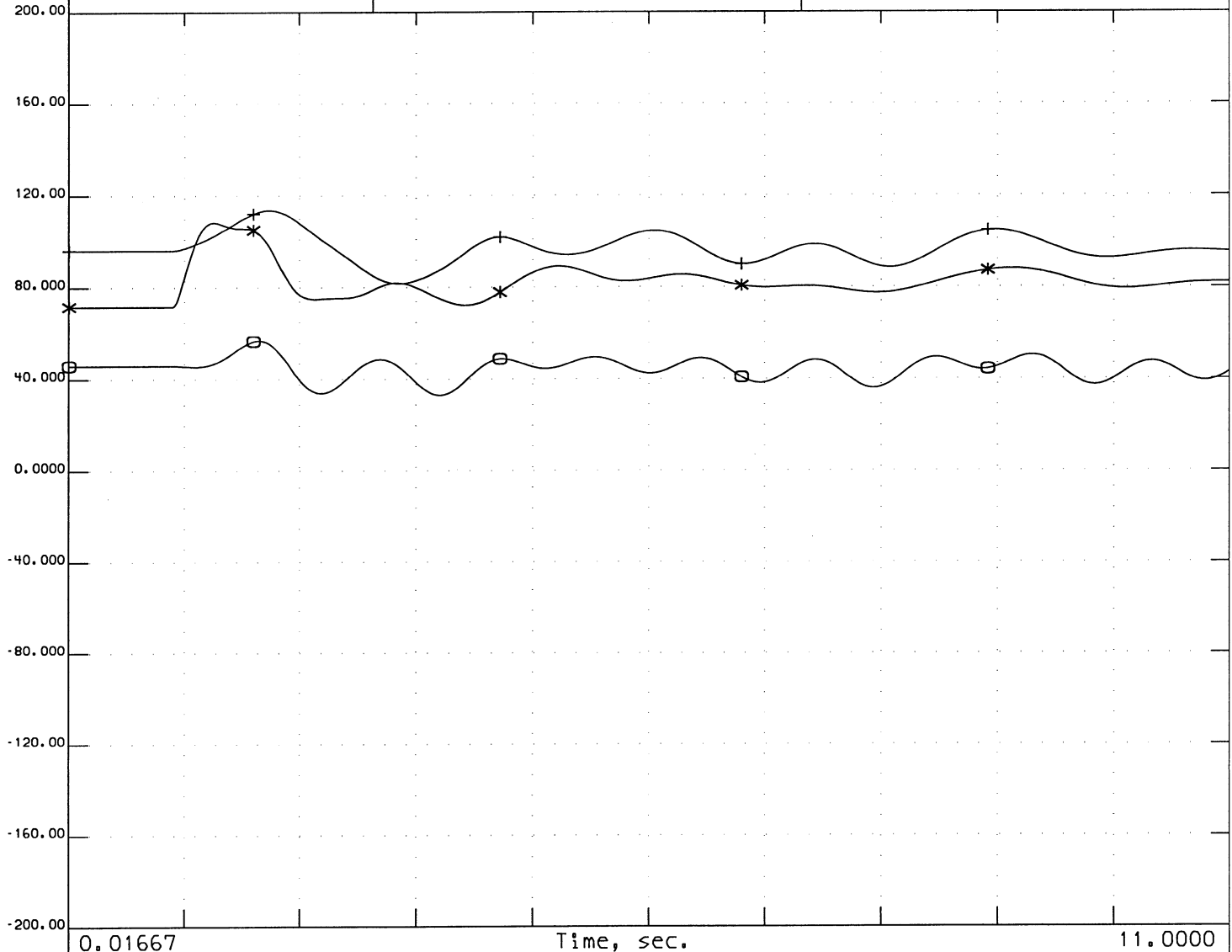
IID CHANGES



GENERAL
ELECTRIC
COMPANY

RELATIVE ROTOR ANGLE
Thu Mar 07 05:03:18 2002

pvdevers-slospr.chf
C:\upslf112\blythespr1040f.sav



Time, sec.						
0.01667						11.0000
-200.0	O	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	+	ang	19401 BUCKST1	16.00	51	200.00
-200.0	*	ang	14931 PALOVRD1	24.00	1	200.00

2004 Spring

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slospr.swt

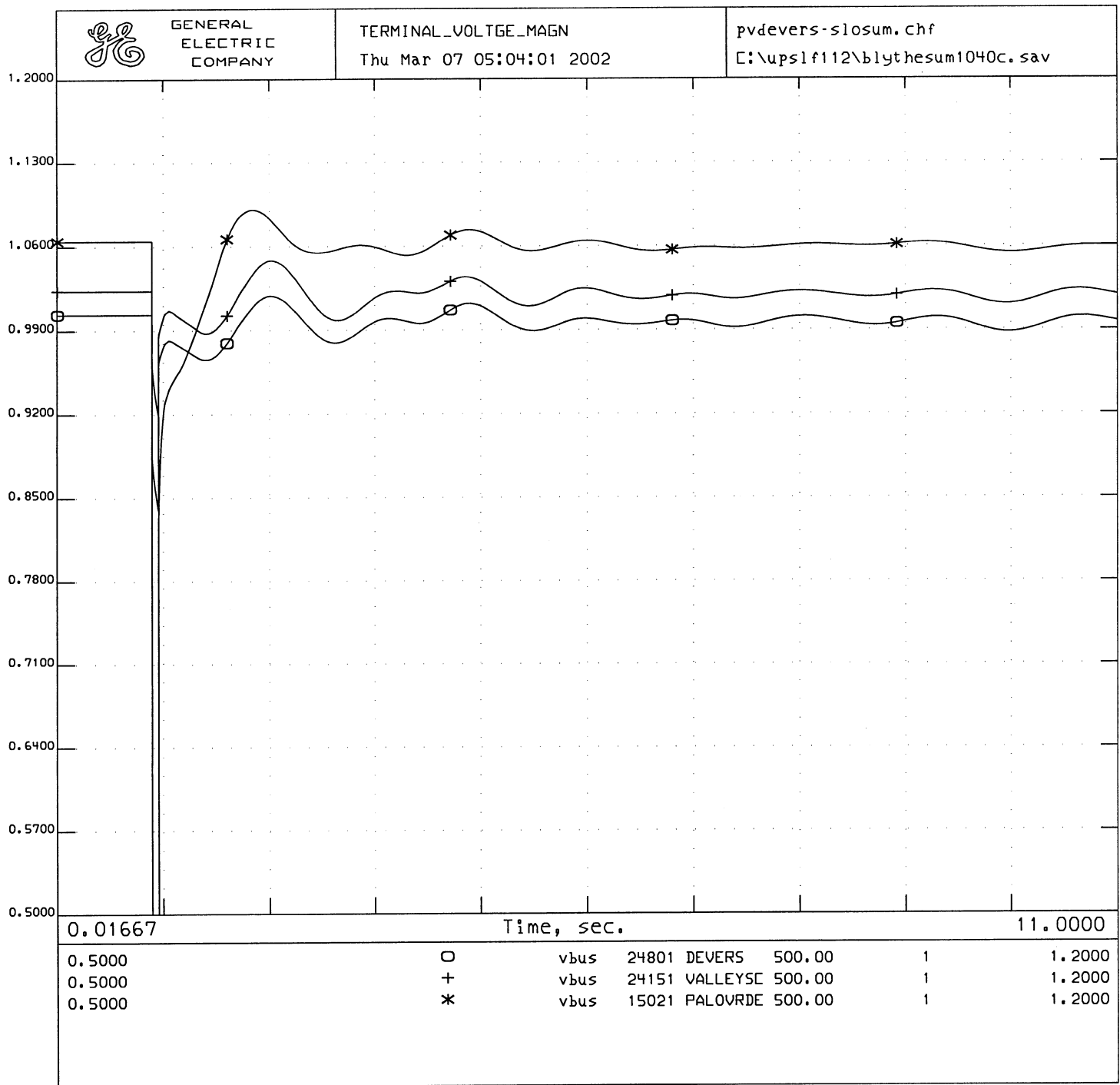
IID CHANGES

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blythesum1040c.sav
blythesum1040c.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
*   Loss of Palo Verde - Devers Line
*
* CC cards for post-transient only
*
*   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.
*
*   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 "DEVERS " 500. "p5157 " 500. "1 " 1
FC 0.0 "DEVERS " 500. "p5157 " 500. "1 " 3
FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 3
FC 0.0 "N.GILA " 500. "IMPRLVLY" 500. "1 " 2
FC 0.0 "IMPRLVLY" 500. "MIGUEL " 500. "1 " 1
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 Palo Verde
CFB 4.0 "PALOVRDE" 500.
*
*   Trip Palo Verde - Devers 500 kV Line
*
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 1
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 2
DL 4.0 "DEVERS " 500. "p5157 " 500. "1 " 3
*
*   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 "PALOVRSO" 500. "N.GILA " 500. "1 " 3
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

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```
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
*
*
* 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
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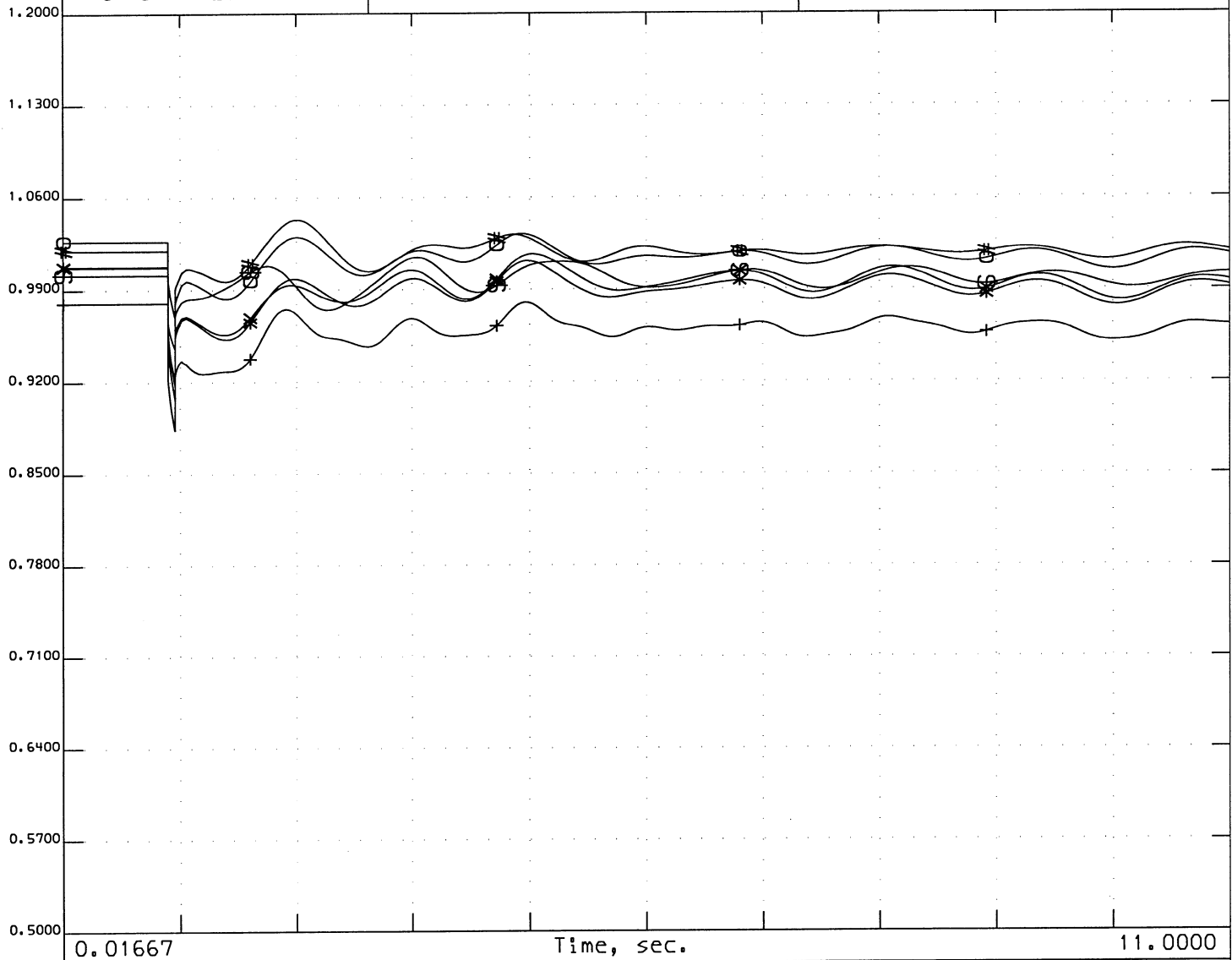
2004 Summer
 5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
 Contingency-Remove Palo Verde - Devers 500 KV Line
 SYSTEM STABILITY STUDY CASES
 Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:01 2002

pvdevers-slosum.chf
C:\ups1f112\blythesum1040c.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

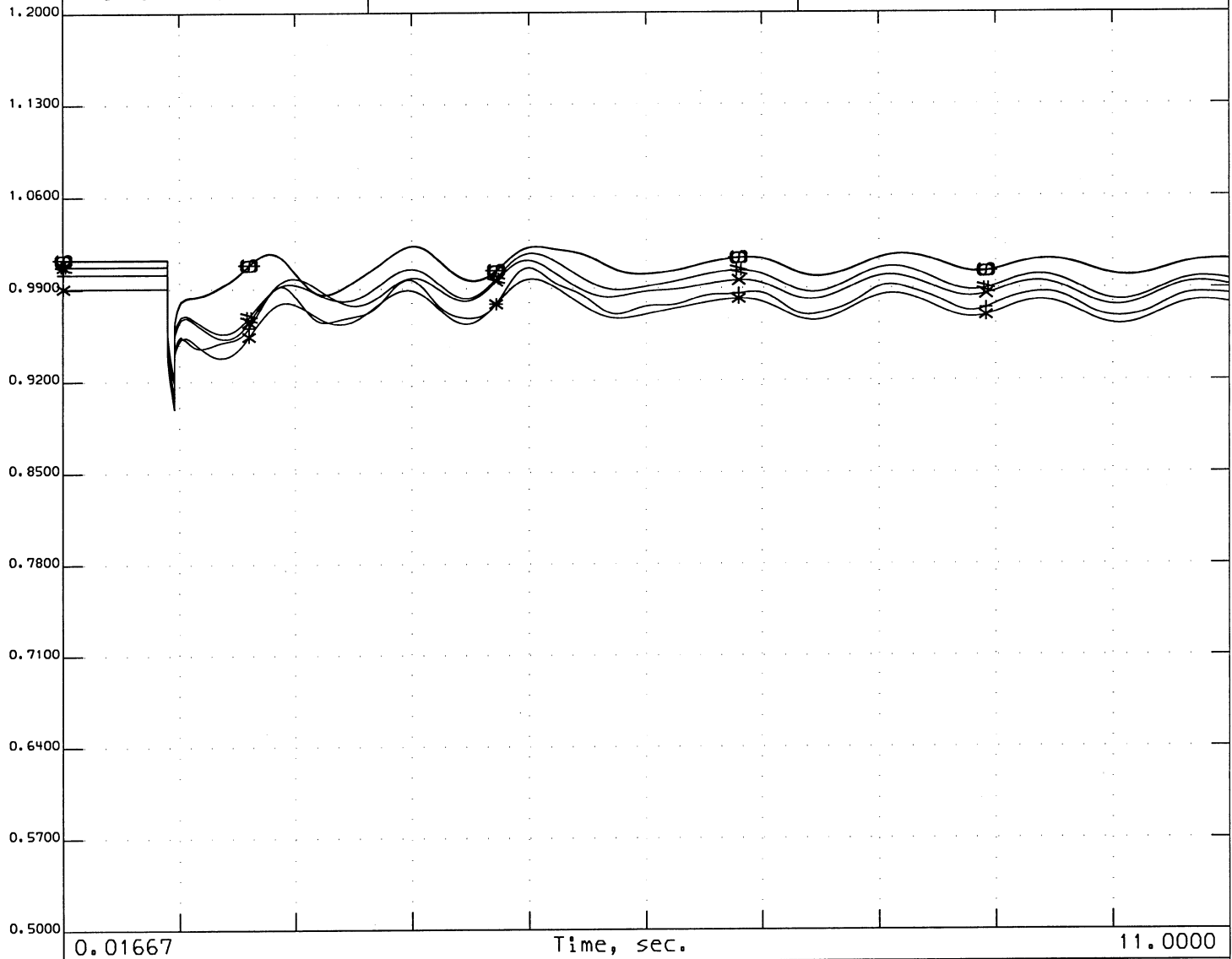
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:03 2002

pvdevers-slosum.chf
C:\ups1f112\blythesum1040c.sav



0.5000	○	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	x	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

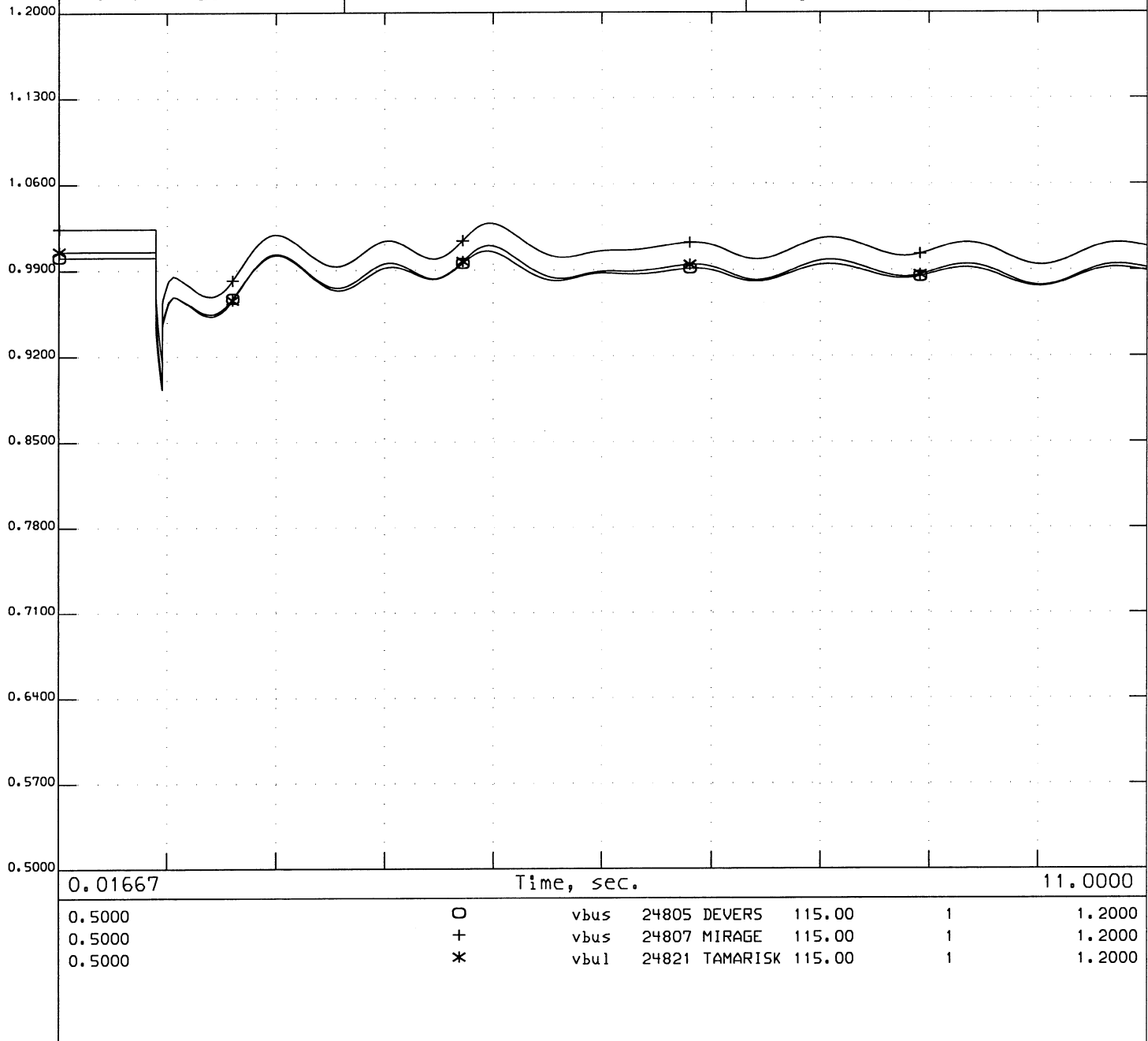
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:03 2002

pvdevers-slosum.chf
C:\upslf112\blythesum1040c.sav



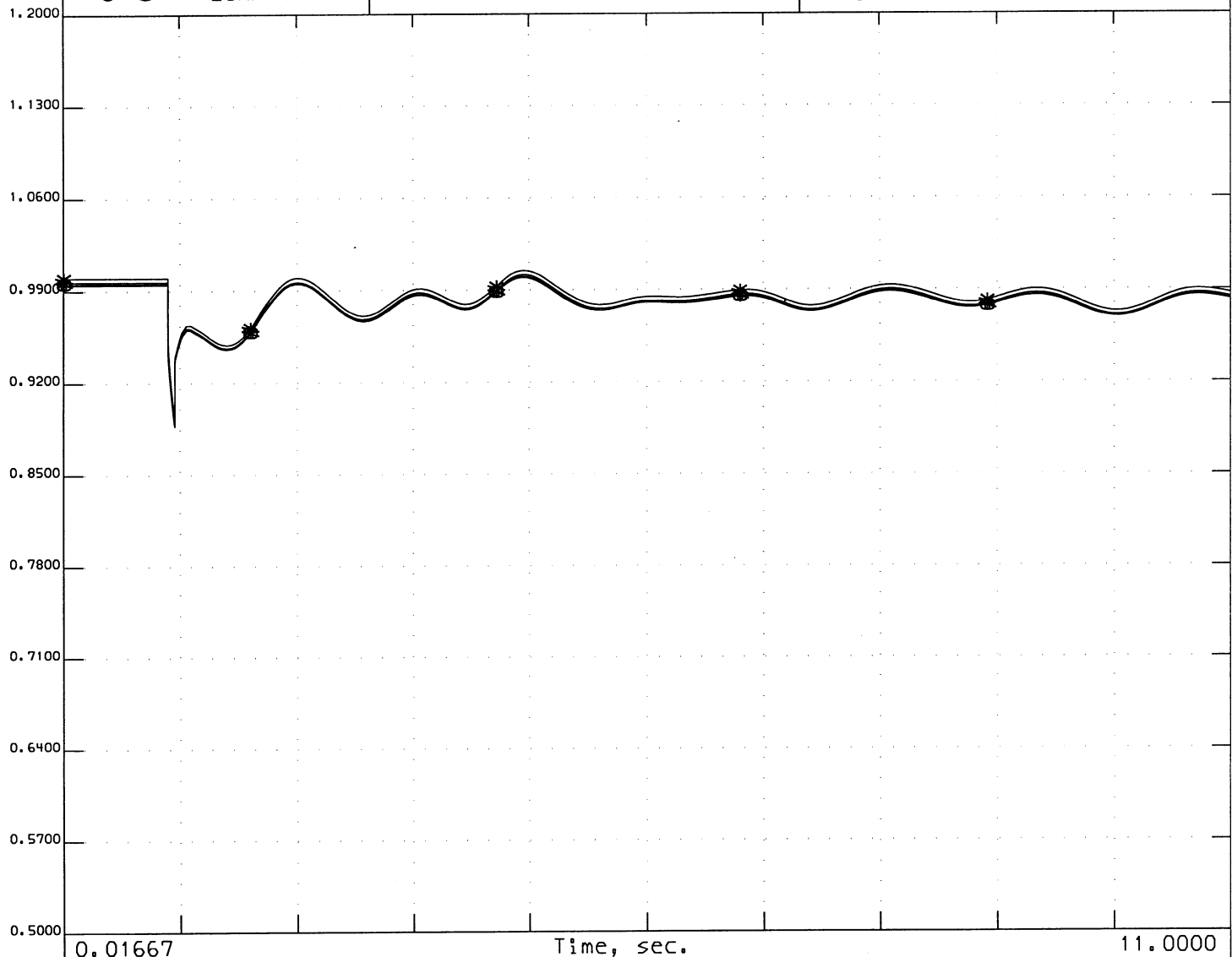
2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - Devers 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:04 2002

pvdevers-slosum.chf
C:\ups1f112\blythesum1040c.sav



0.01667		Time, sec.				11.0000
0.5000	O	vb1	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vb1	24818 FARREL	115.00	1	1.2000
0.5000	*	vb1	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vb1	24820 THORNHIL	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

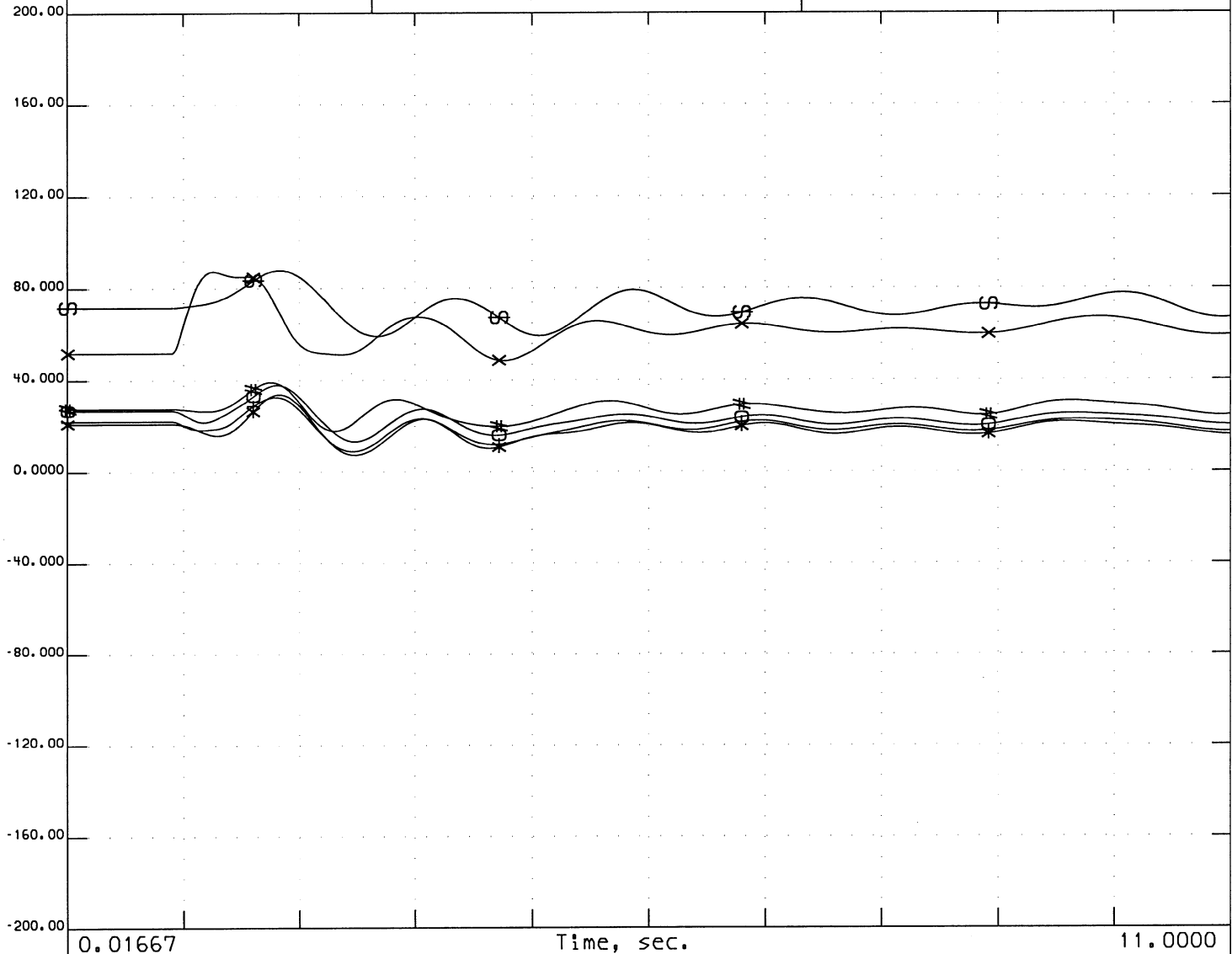
Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 05:04:04 2002

pvdevers-slosum.chf
C:\ups1f112\blythesum1040c.sav



-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0	@	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - Devers 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvdevers-slosum.swt

blythespr1040f.sav

blythespr1040f.dyd

TITLE

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvngila-slospr.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

* Loss of Palo Verde - N. Gila Line

*

* CC cards for post-transient only

*

* 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.

*

* 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 "DEVERS " 500. "p5157 " 500. "1 " 1

FC 0.0 "DEVERS " 500. "p5157 " 500. "1 " 3

FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 1

FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 3

FC 0.0 "N.GILA " 500. "IMPRLVLY" 500. "1 " 2

FC 0.0 "IMPRLVLY" 500. "MIGUEL " 500. "1 " 2

FC 0.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 2

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 Palo Verde

CFB 4.0 "PALOVRDE" 500.

*

* Trip Palo Verde - N. Gila 500 kV Line

*

DL 4.0 "PALOVRSO" 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 "DEVERS " 500. "p5157 " 500. "1 " 1

RC 4.0 "DEVERS " 500. "p5157 " 500. "1 " 3

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

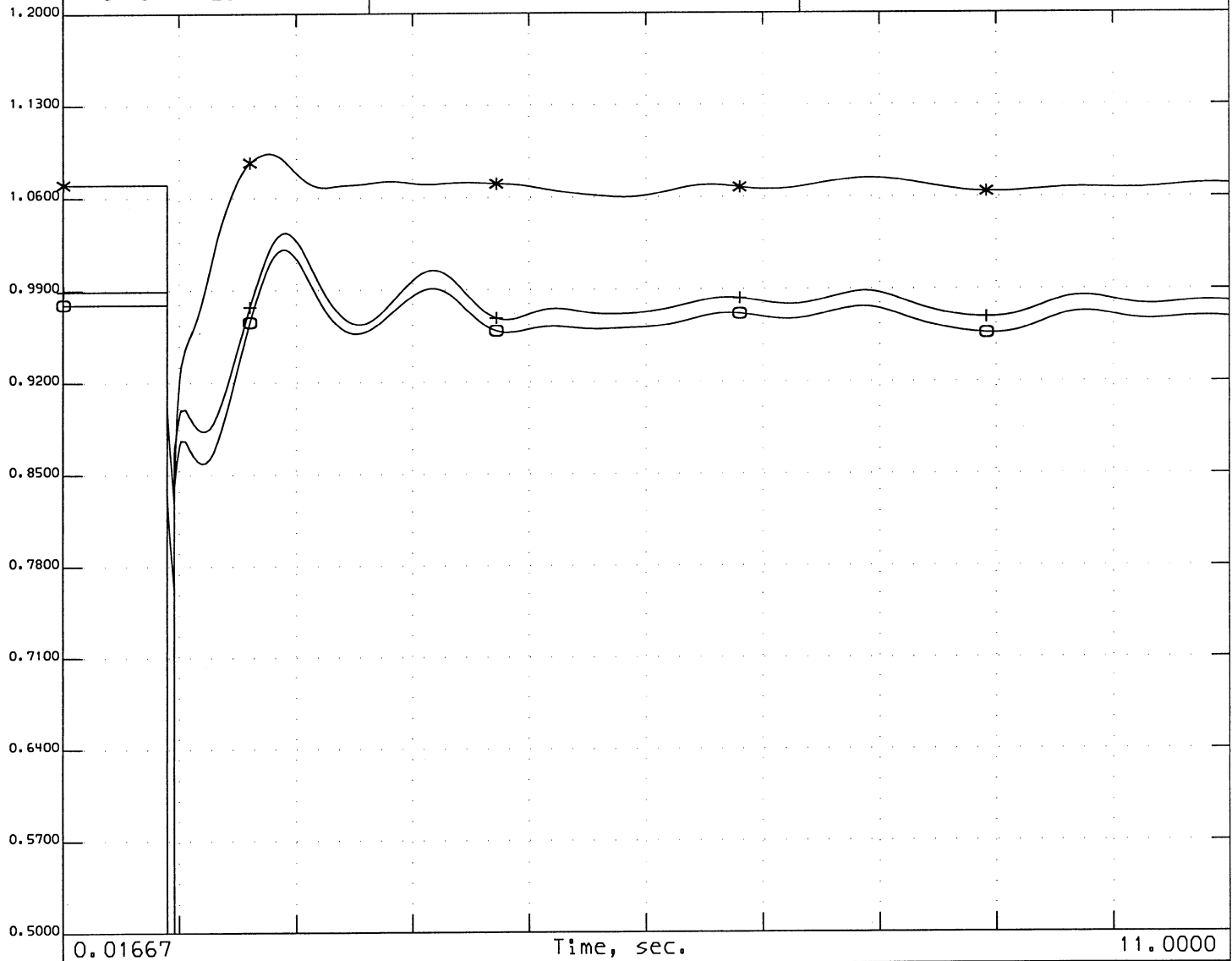
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RC 8.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
RC 8.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
RC 8.0 "NAVAJO " 500. "WESTWING" 500. "1 " 1
RC 8.0 "NAVAJO " 500. "WESTWING" 500. "1 " 3
*
*
* Add SVC's at Marketplace and Adelanto
*
CC MBS 120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC MBS 120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```




GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 05:04:41 2002

pvnigila-slospr.chf
C:\ups\l112\blythespr1040f.sav



0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVPRDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slospr.swt

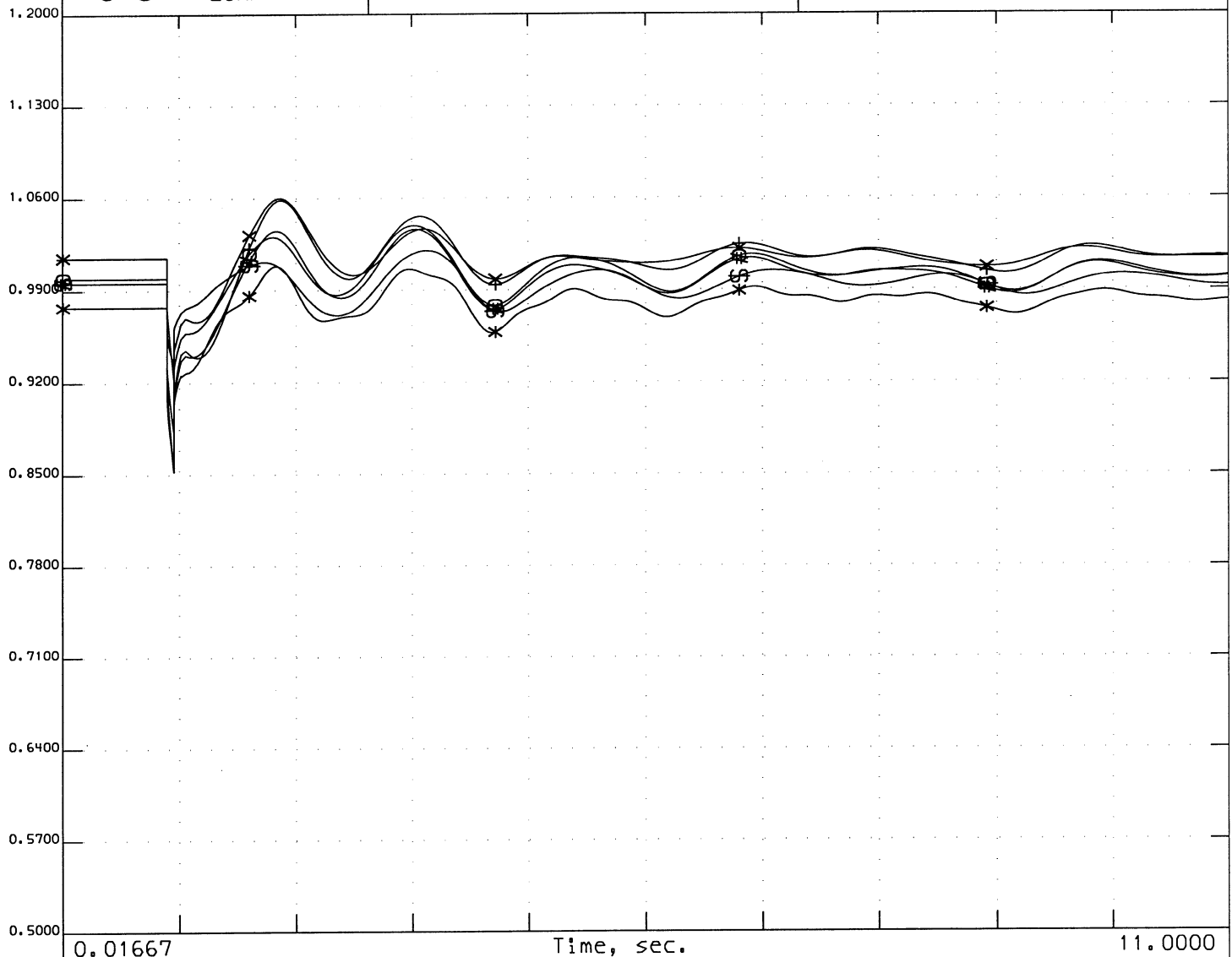
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:44 2002

pvnigila-slospr.chf
C:\ups\lf112\blythespr1040f.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	+	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	*	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	#	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	x	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	⊗	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slospr.swt

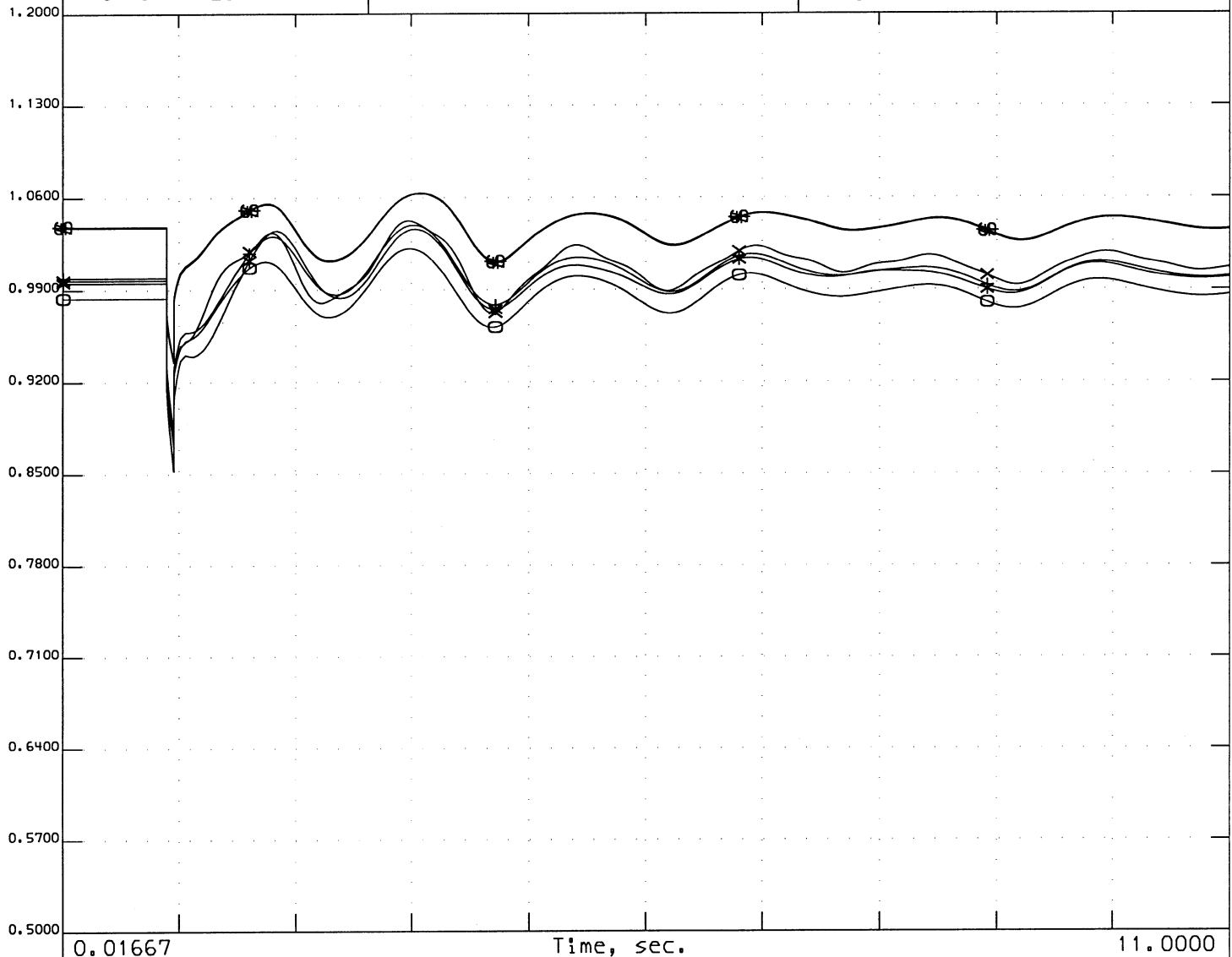
IID CHANGES



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:46 2002

pvnigila-slospr.chf
C:\upslf112\blythespr1040f.sav



0.5000	○	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	+	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	*	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	#	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	x	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	⊕	vbus	19399	BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slospr.swt

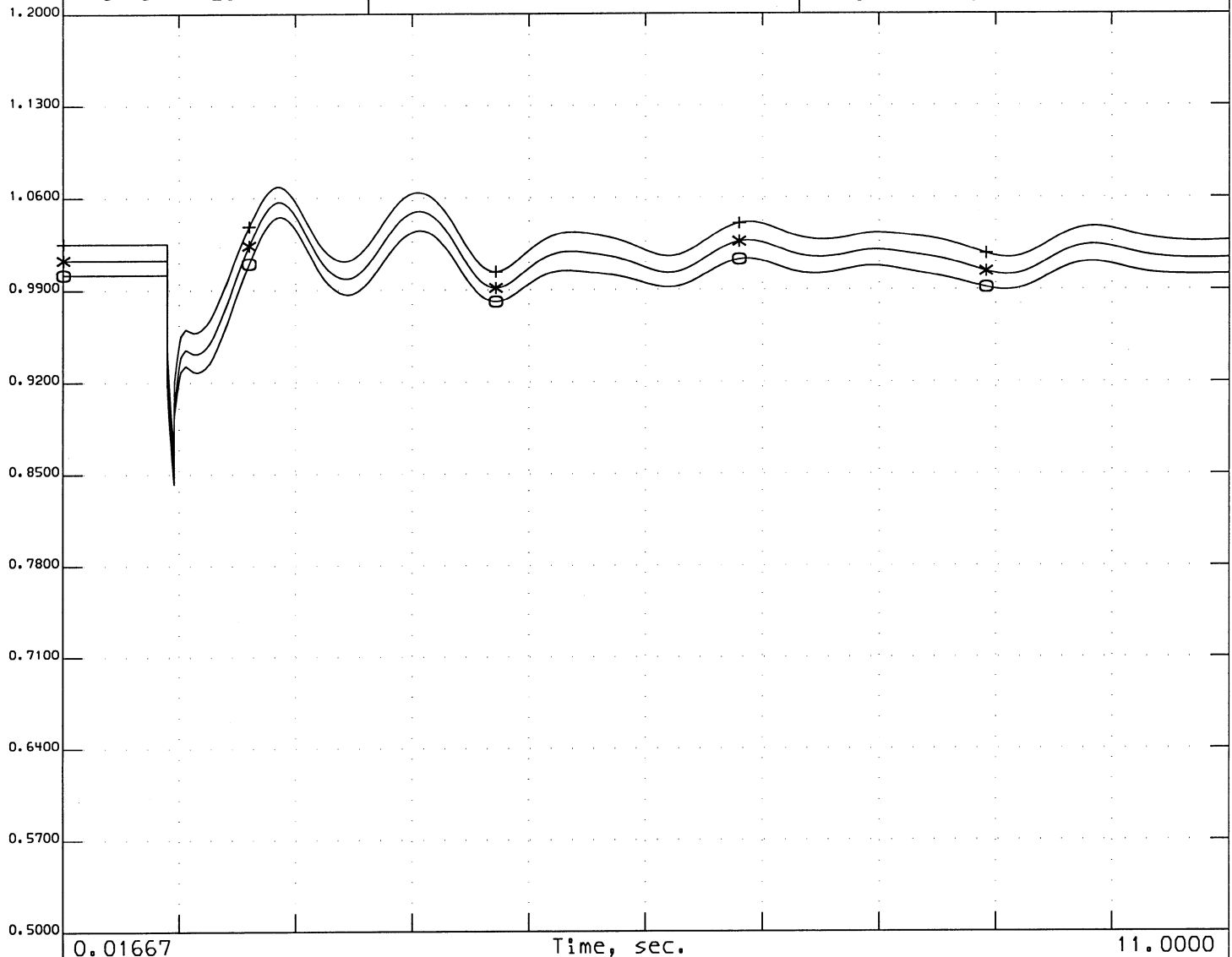
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:46 2002

pvngila-slospr.chf
C:\ups1f112\blythespr1040f.sav



0.01667		Time, sec.					11.0000
0.5000	○	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvngila-slospr.swt

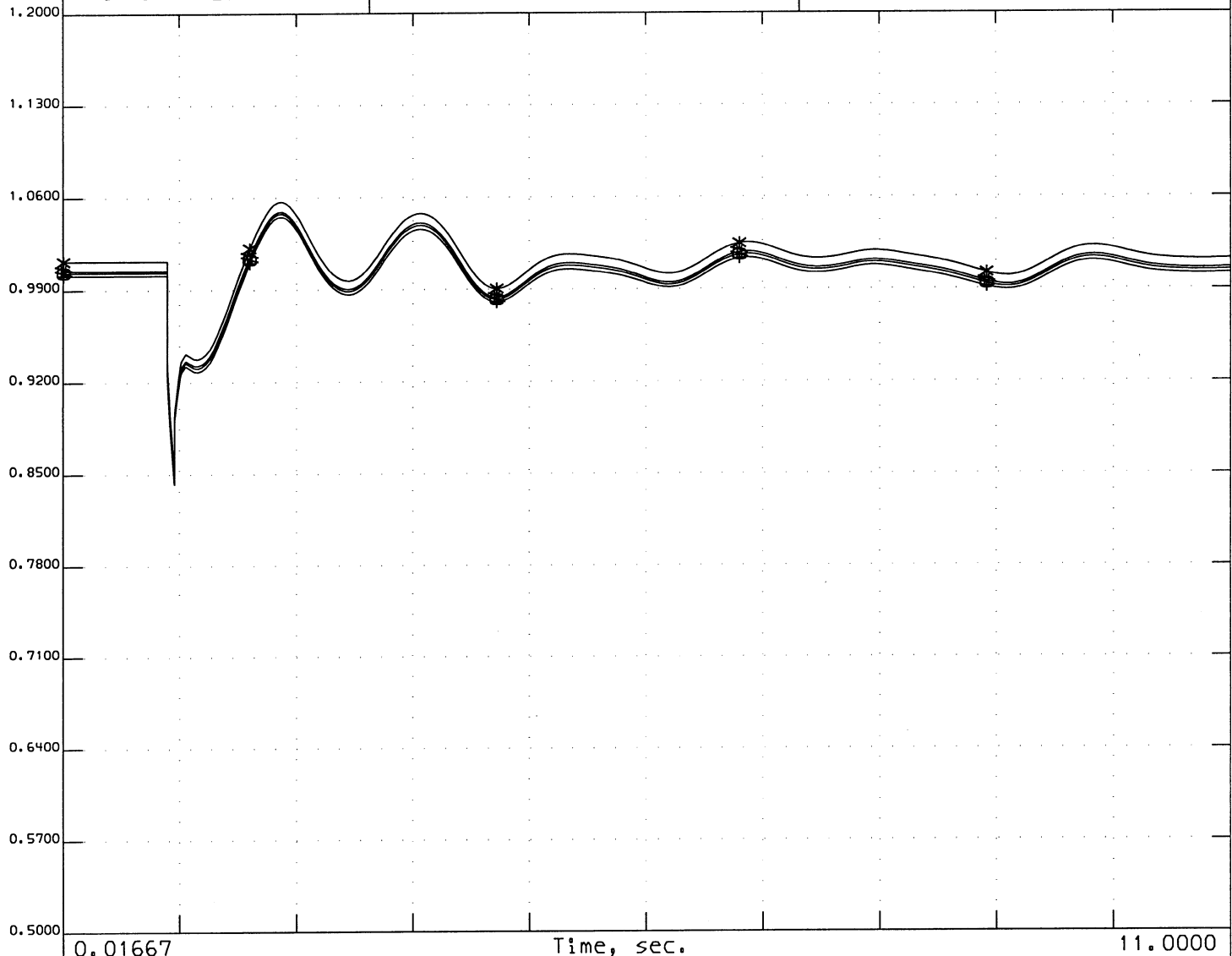
IID CHANGES



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:04:47 2002

pvngila-slospr.chf
C:\ups\lf112\blythespr1040f.sav



0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvngila-slospr.swt

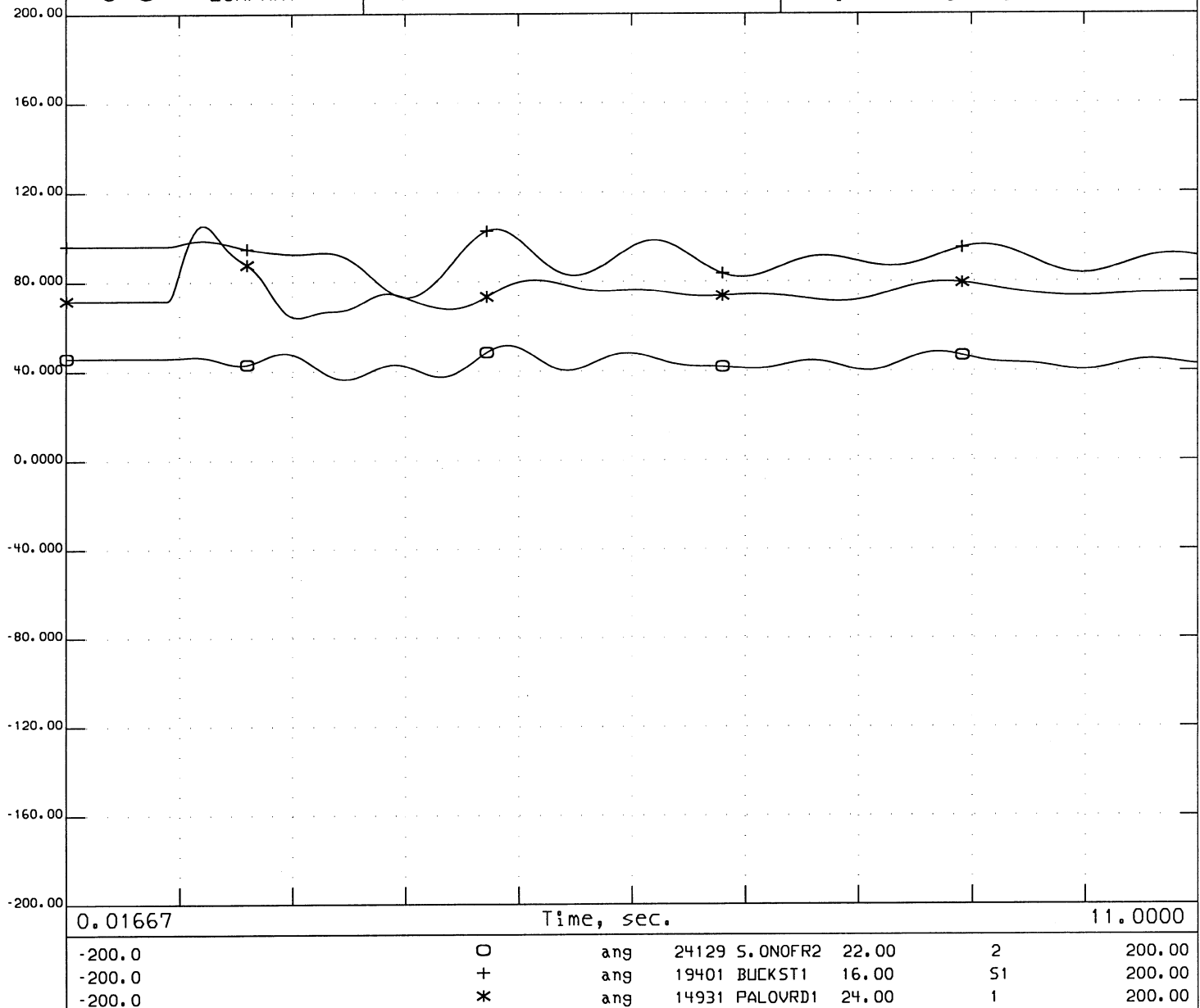
IID CHANGES



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 05:04:47 2002

pvnigila-slospr.chf
C:\upslf112\blythespr1040f.sav



2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slospr.swt

IID CHANGES

blythesum1040c.sav

blythesum1040c.dyd

TITLE

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvngila-slosum.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

* Loss of Palo Verde - N. Gila Line

*

* CC cards for post-transient only

*

* 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.

*

* 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 "DEVERS " 500. "p5157 " 500. "1 " 1

FC 0.0 "DEVERS " 500. "p5157 " 500. "1 " 3

FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 1

FC 0.0 "PALOVRSO" 500. "N.GILA " 500. "1 " 3

FC 0.0 "N.GILA " 500. "IMPRLVLY" 500. "1 " 2

FC 0.0 "IMPRLVLY" 500. "MIGUEL " 500. "1 " 2

FC 0.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 2

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 Palo Verde

CFB 4.0 "PALOVRDE" 500.

*

* Trip Palo Verde - N. Gila 500 kV Line

*

DL 4.0 "PALOVRSO" 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 "DEVERS " 500. "p5157 " 500. "1 " 1

RC 4.0 "DEVERS " 500. "p5157 " 500. "1 " 3

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

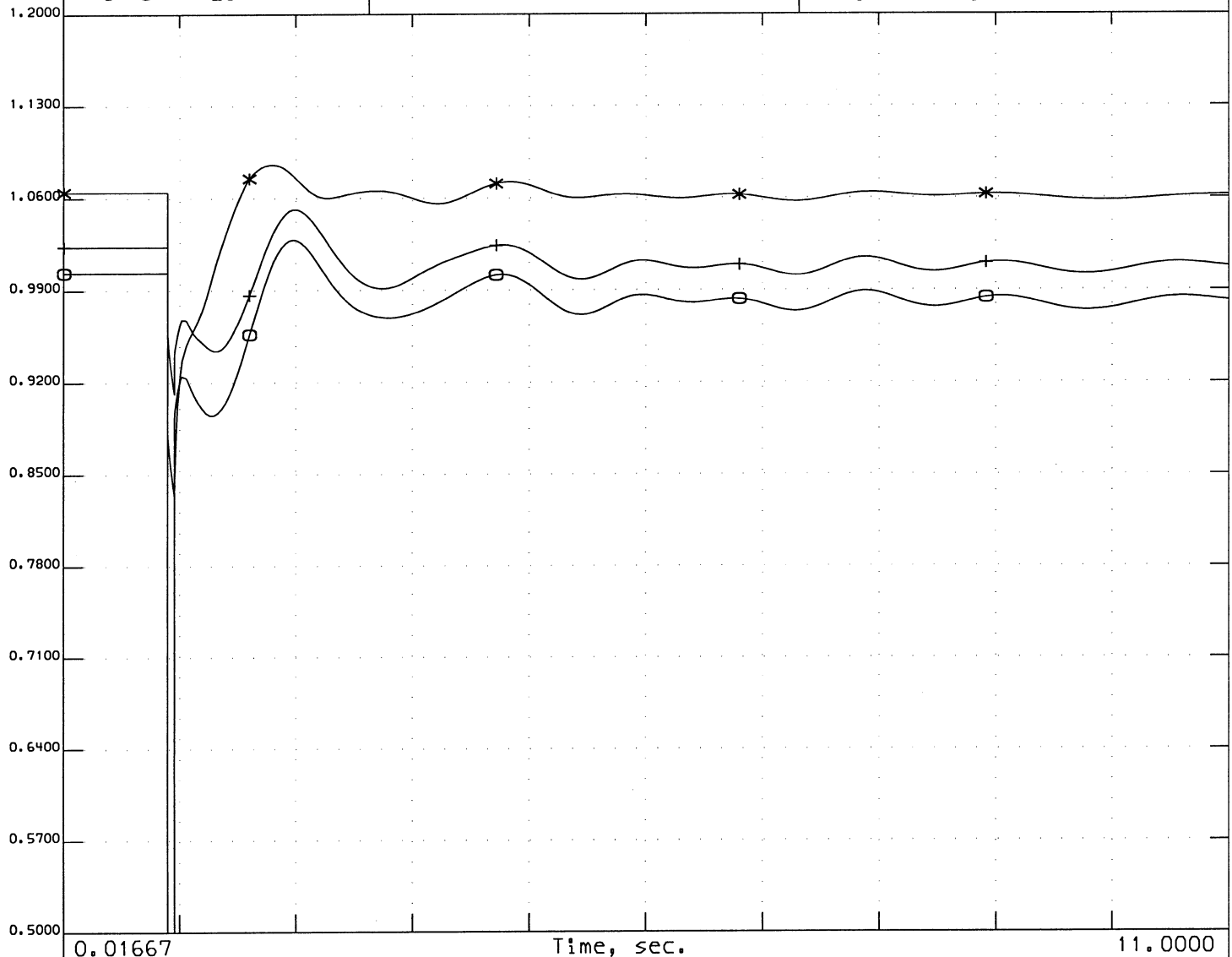
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RC    8.0 "MOENKOPI" 500. "YAVAPAI " 500. "1 " 1
RC    8.0 "YAVAPAI " 500. "WESTWING" 500. "1 " 2
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 1
RC    8.0 "NAVAJO  " 500. "WESTWING" 500. "1 " 3
*
*
*   Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```




GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 05:05:19 2002

pvngila-slosum.chf
C:\upslf112\blythesum1040c.sav



Time, sec.						
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0.5000	O	vbus	24801	DEVERS	500.00	1 1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1 1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1 1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

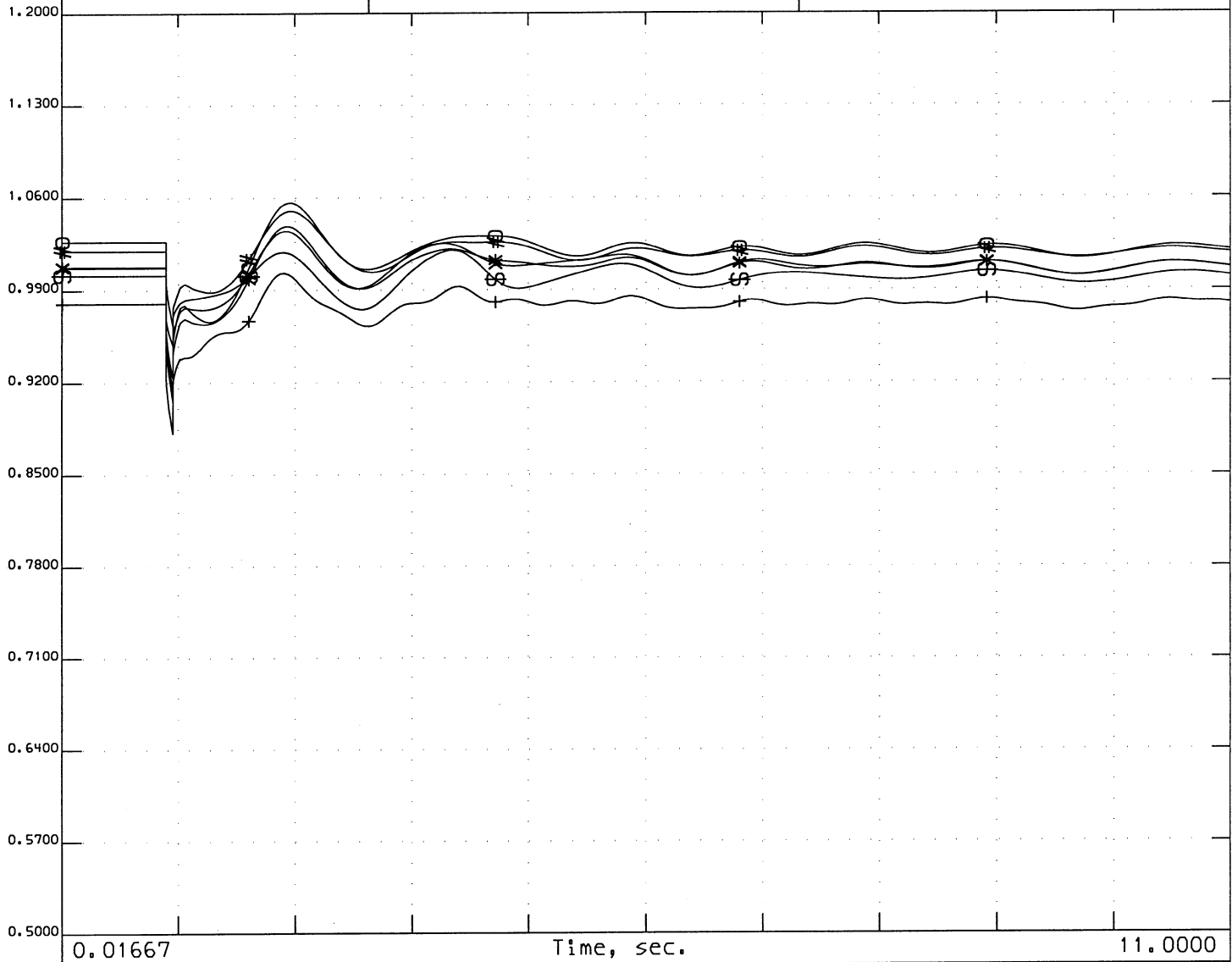
Blythesum1040c.sav + Blythesum1040c.dyd + pvngila-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:05:21 2002

pvnigila-slosum.chf
C:\ups\lf112\blythesum1040c.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

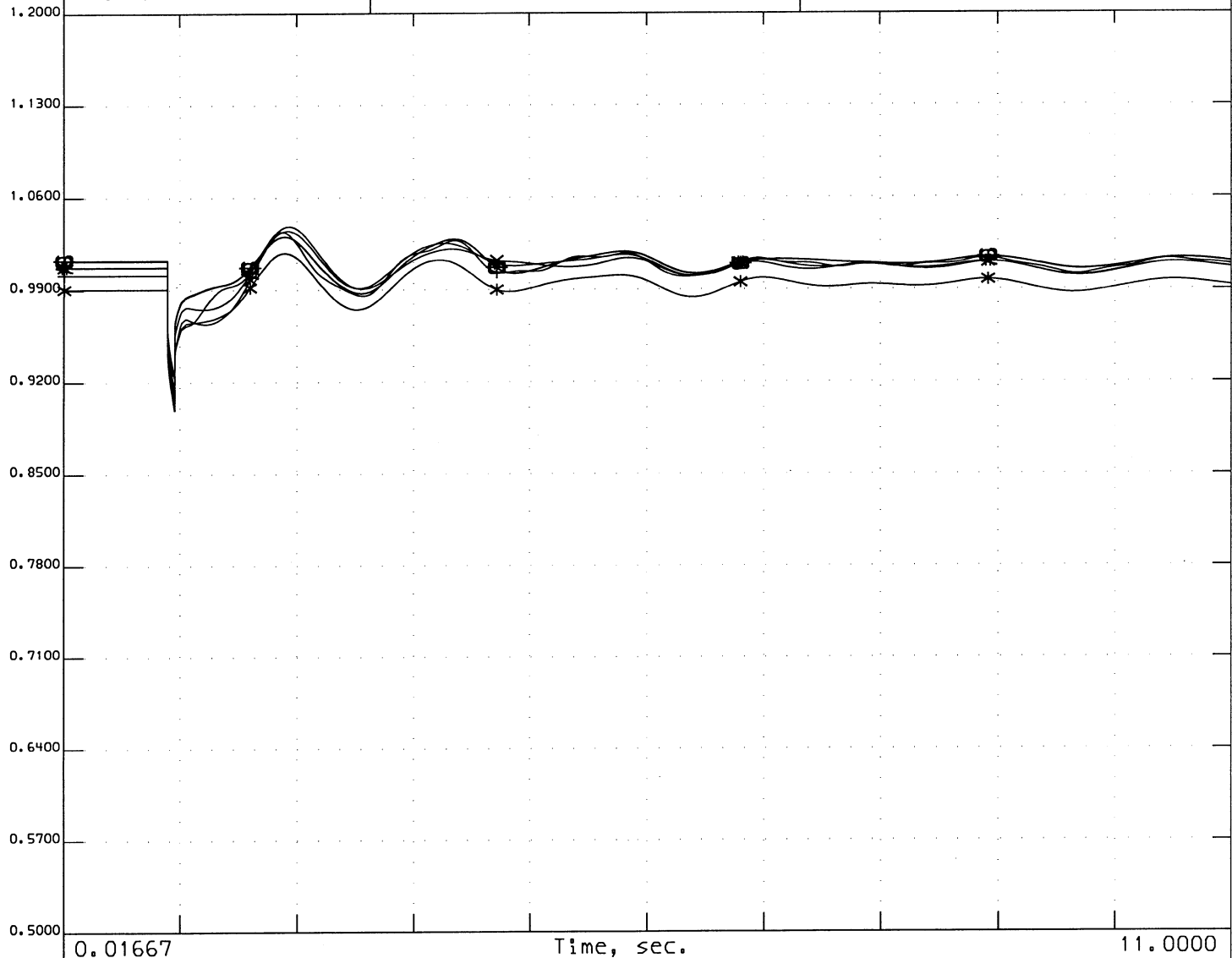
2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slosum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 05:05:22 2002

pvnigila-slosum.chf
C:\ups\1f112\blythesum1040c.sav



0.5000	O	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	X	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊕	vbus	19399	BUCK161	161.00	1	1.2000

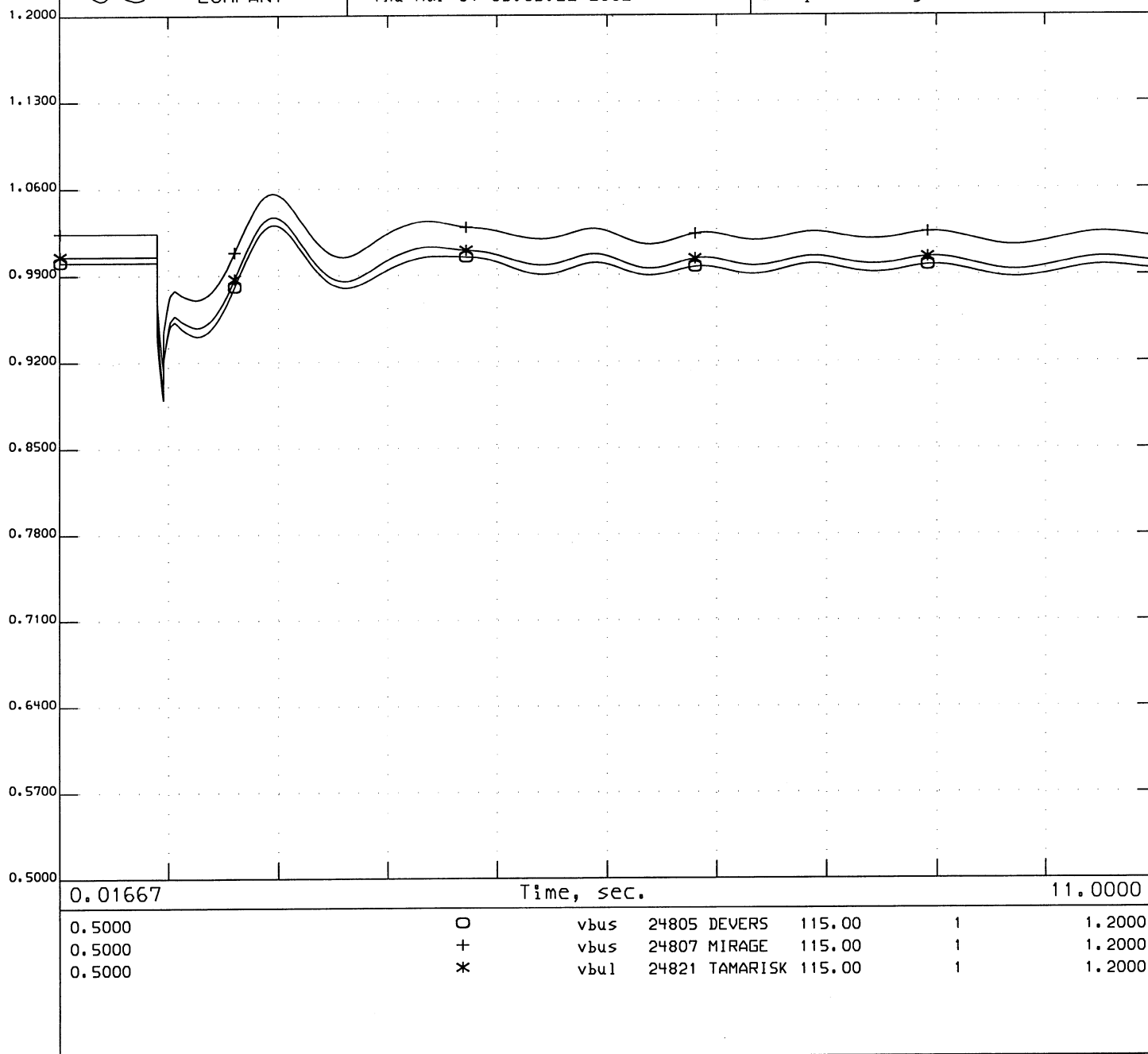
2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slosum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:05:22 2002

pvnigila-slosum.chf
C:\ups\lf112\blythesum1040c.sav



2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

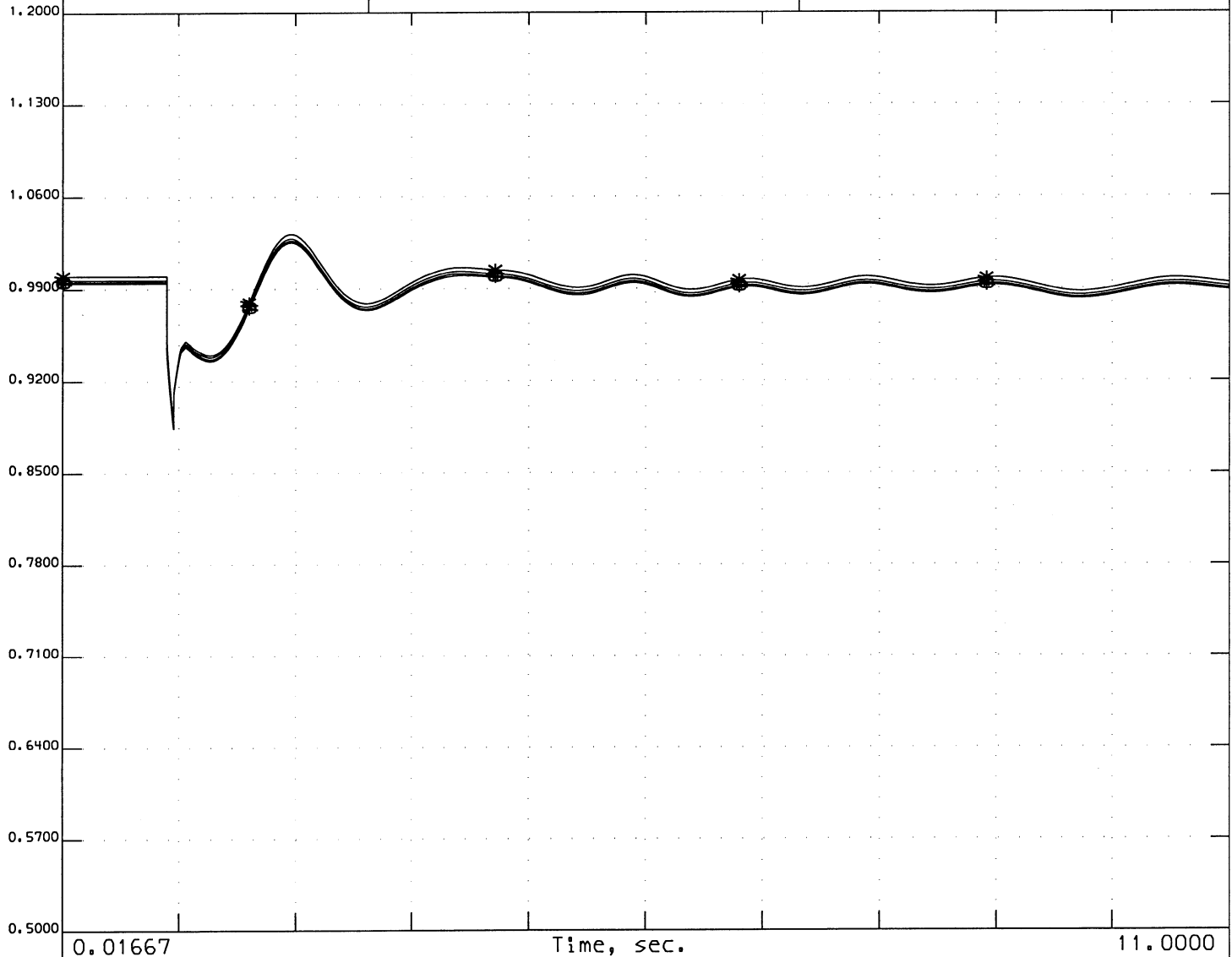
Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slosum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 05:05:23 2002

pvnvila-slosum.chf
C:\ups\lf112\blythesum1040c.sav



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0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

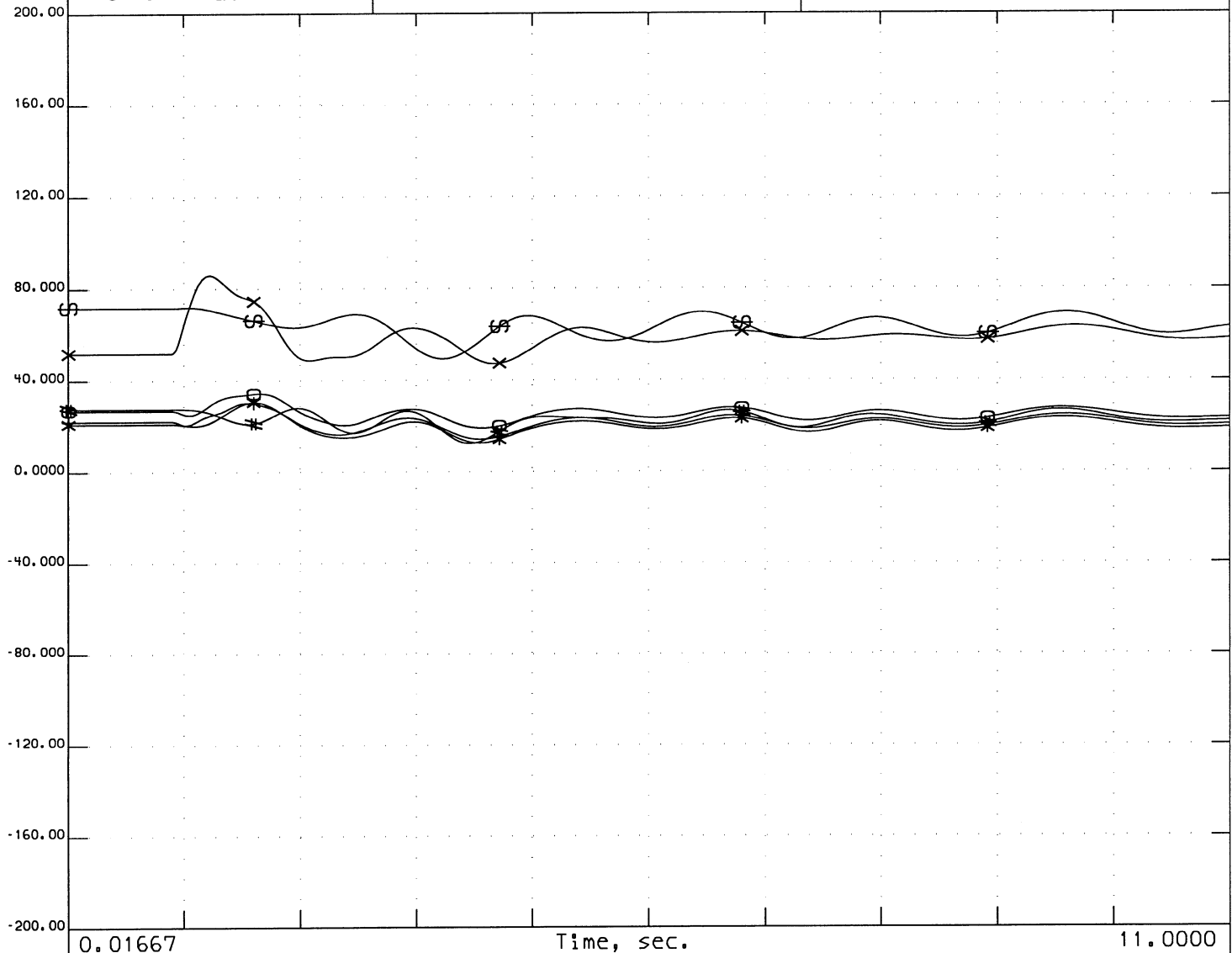
2004 Summer
5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus
Contingency-Remove Palo Verde - N. Gila 500 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040c.sav + Blythesum1040c.dyd + pvnvila-slosum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 05:05:23 2002

pvnigila-slosum.chf
C:\ups1f112\blythesum1040c.sav



-200.0		Time, sec.		11.0000	
-200.0	O	ang	24050 MTNVIST1	15.50	1 200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H 200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L 200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2 200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1 200.00
-200.0	t	ang	19401 BUCKST1	16.00	S1 200.00

2004 Summer

5-CYCLE 3-Phase Fault on Palo Verde 500KV Bus

Contingency-Remove Palo Verde - N. Gila 500 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040c.sav + Blythesum1040c.dyd + pvnigila-slosum.swt

blythesum1040d.sav

blythesum1040d.dyd

TITLE

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + dvrMrg-nlsum.swt

RUN 10.0

CC

*

* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****

* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS

* CC

FB 0.0 "DEVERS " 230

* CLEAR FAULT

CFB 5.0 "DEVERS " 230

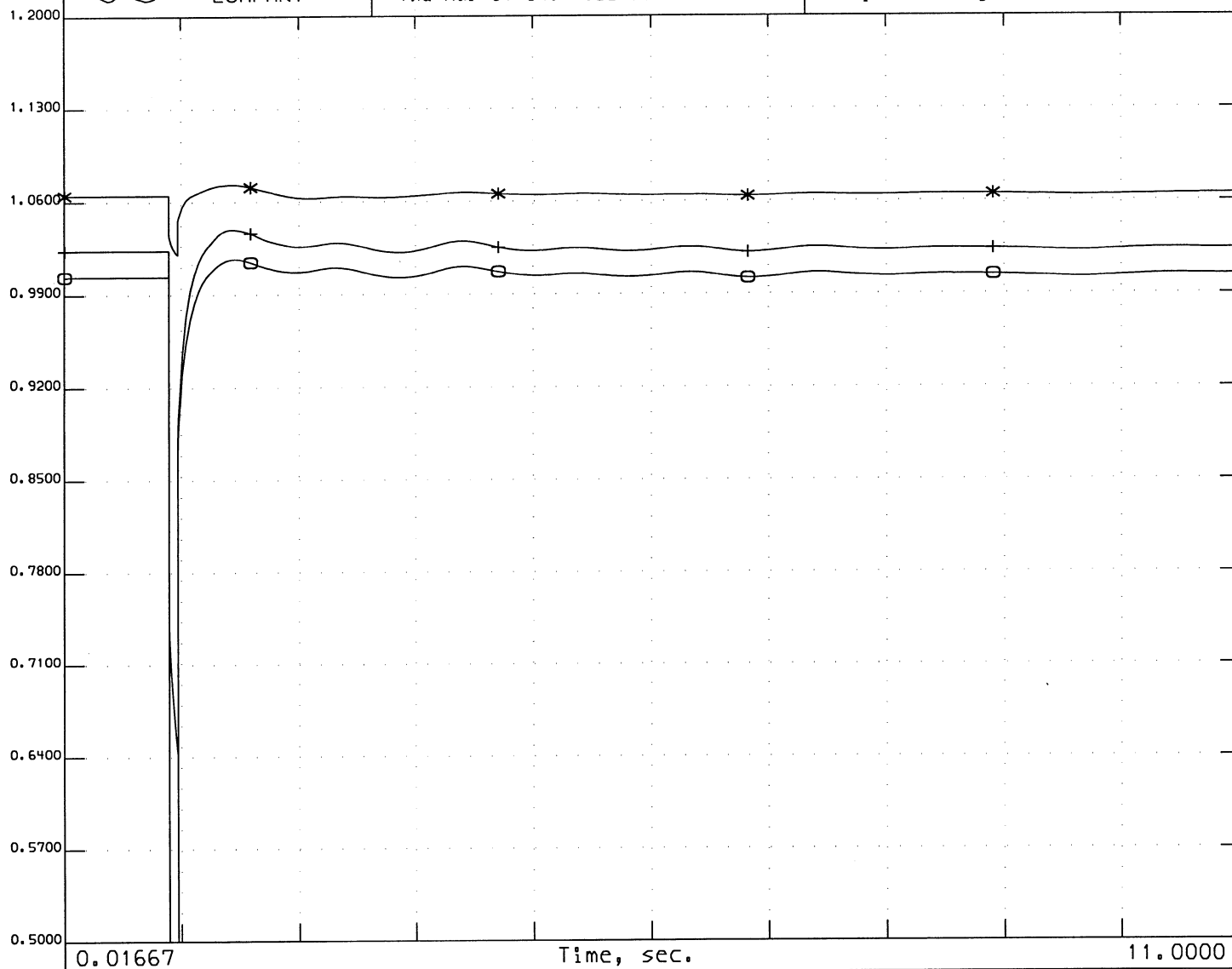
DL 5.0 "DEVERS " 230. "MIRAGE " 230. "1 "



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:44:53 2002

dvrnrg-n1sum.chf
C:\ups\l112\blythesum1040d.sav



Time, sec.							11.0000
0.5000	○	vbus	24801	DEVERS	500.00	1	1.2000
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000
0.5000	*	vbus	15021	PALOVRDE	500.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

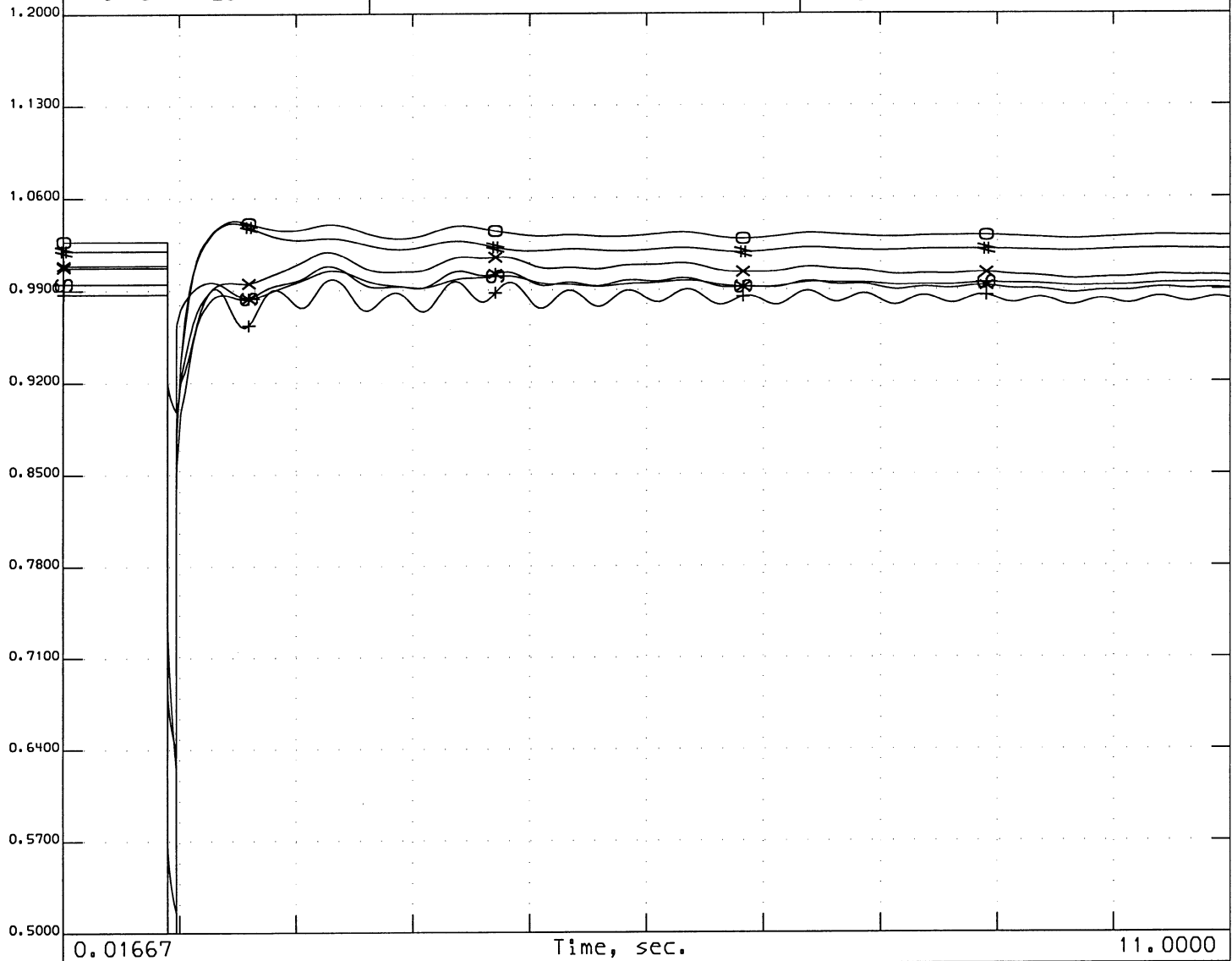
Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:56 2002

dvrnrg-nlsum.chf
C:\upslf112\blythesum1040d.sav



0.5000	O	vbus	24804	DEVERS	230.00	1		1.2000	
0.5000	+	vbus	25401	EAGLEMTN	230.00	1		1.2000	
0.5000	*	vbus	24806	MIRAGE	230.00	1		1.2000	
0.5000	#	vbus	24132	SANBRDNO	230.00	1		1.2000	
0.5000	X	vbus	21007	COACHELV	230.00	1		1.2000	
0.5000	⊕	vbus	19400	BUCK230	230.00	1		1.2000	

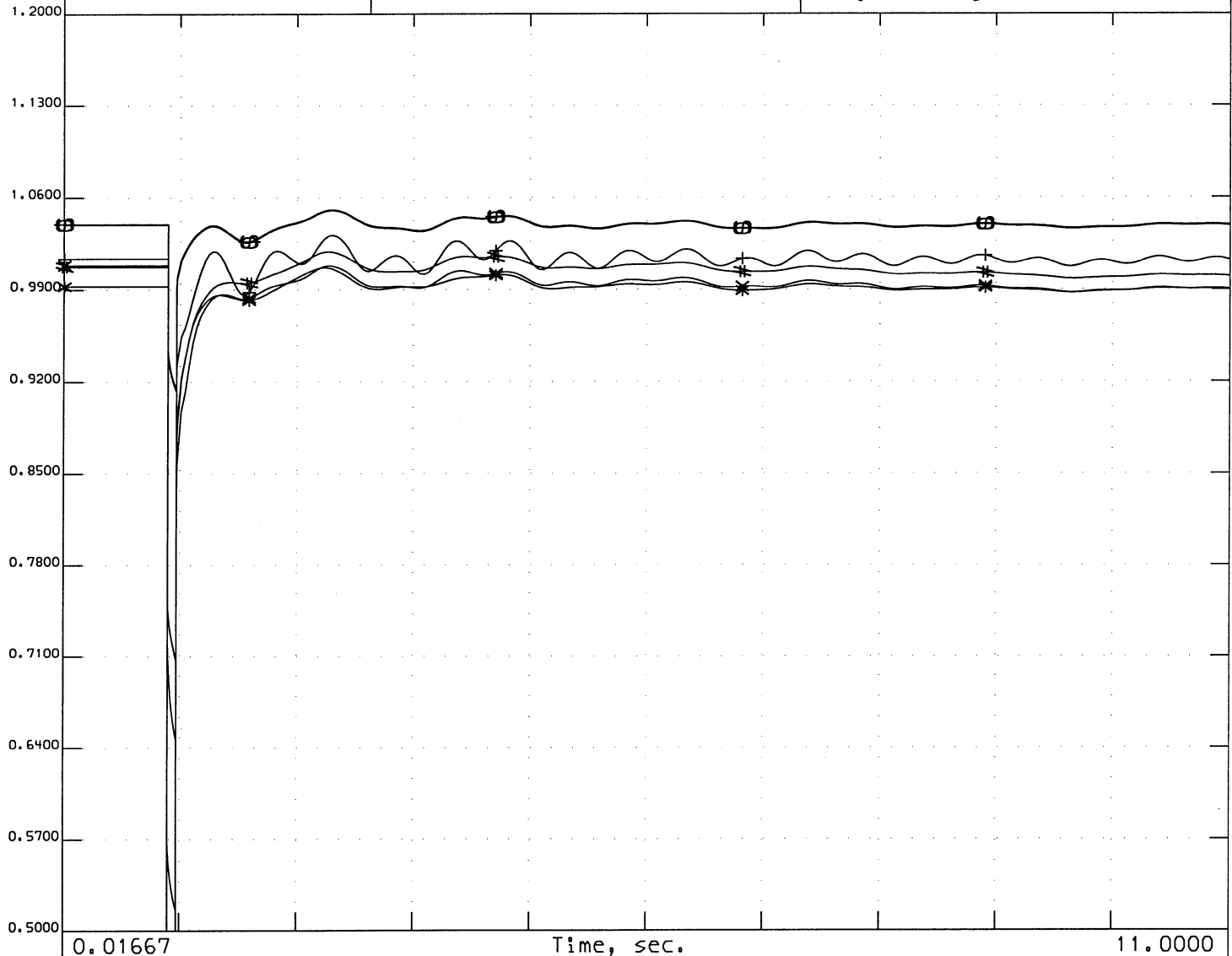
2004 Summer
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Devers - Mirage 230 KV Line
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-nlsum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:57 2002

dvrnrg-n1sum.chf
C:\upslf112\blythesum1040d.sav



0.5000	o	vbus	24017 BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035 EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006 COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007 COACHELV	230.00	1	1.2000
0.5000	x	vbus	21076 MIRIID	230.00	1	1.2000
0.5000	⊕	vbus	19399 BUCK161	161.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

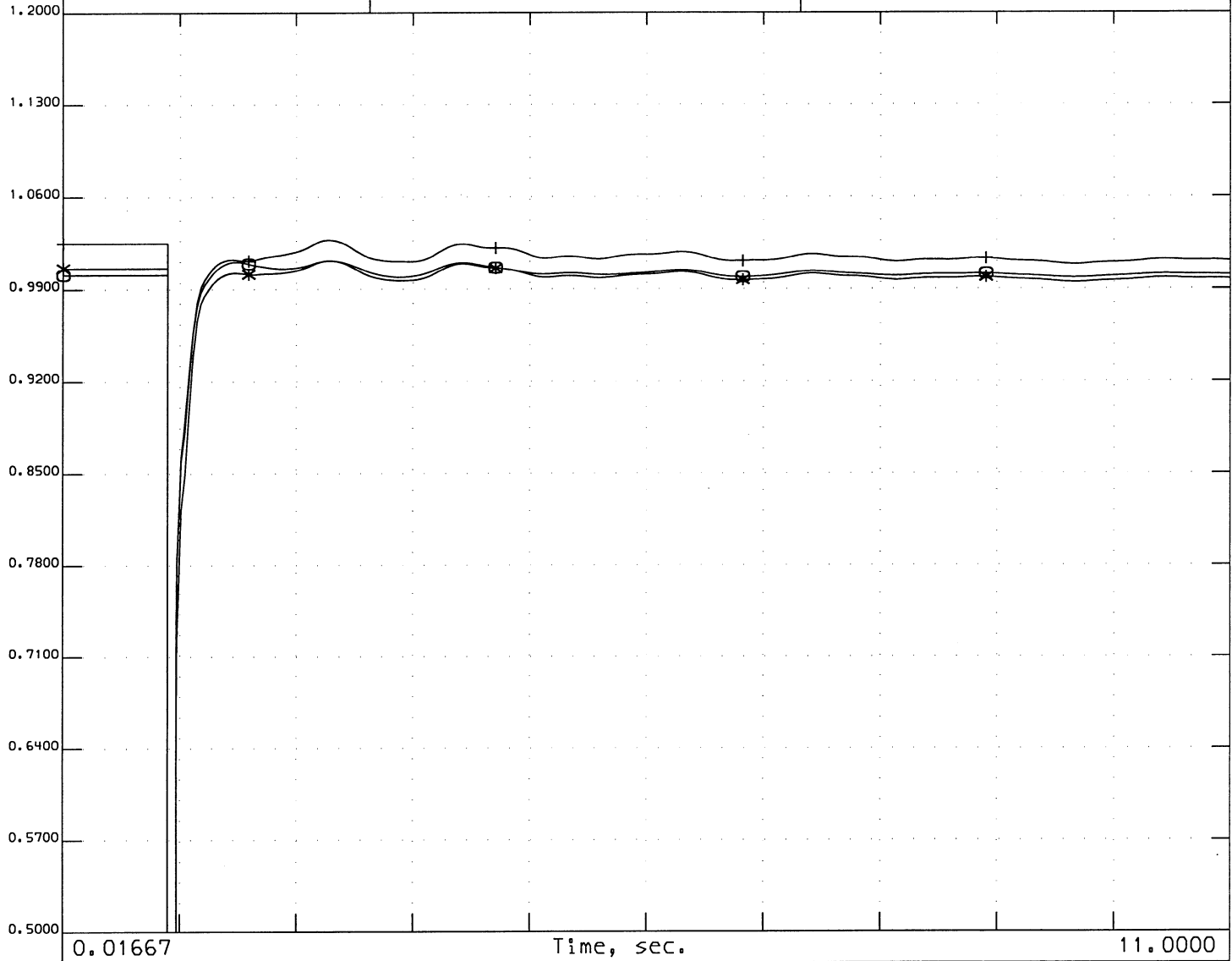
Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:58 2002

dvrnrg-n1sum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	□	vbus	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbus	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbus	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

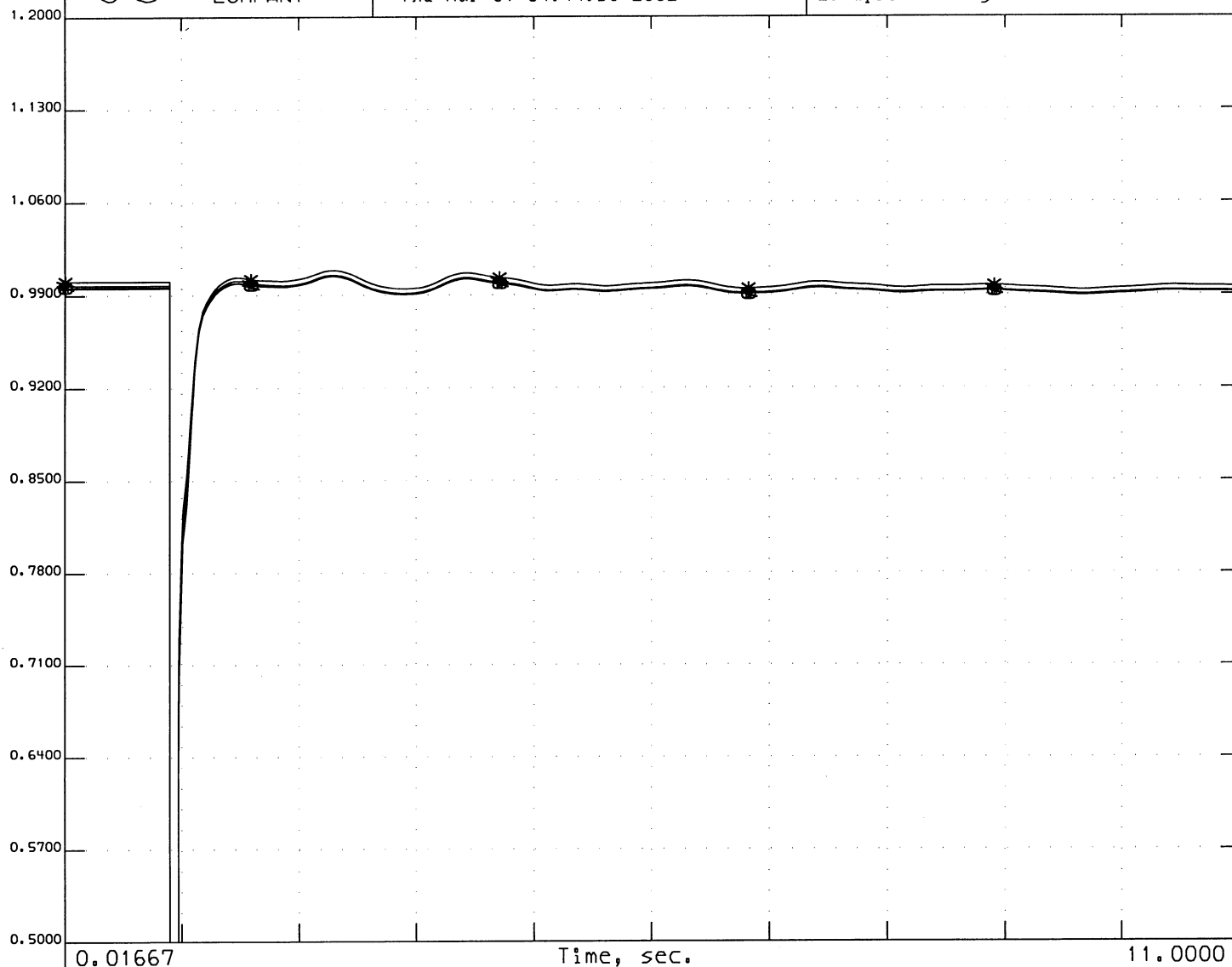
Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-n1sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:58 2002

dvrnrg-nlsum.chf
C:\upslf112\blythesum1040d.sav



0.5000	O	vb1	24817	EISENHOW	115.00	1	1.2000
0.5000	+	vb1	24818	FARREL	115.00	1	1.2000
0.5000	*	vb1	24816	SANTA RO	115.00	1	1.2000
0.5000	#	vb1	24820	THORNHIL	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

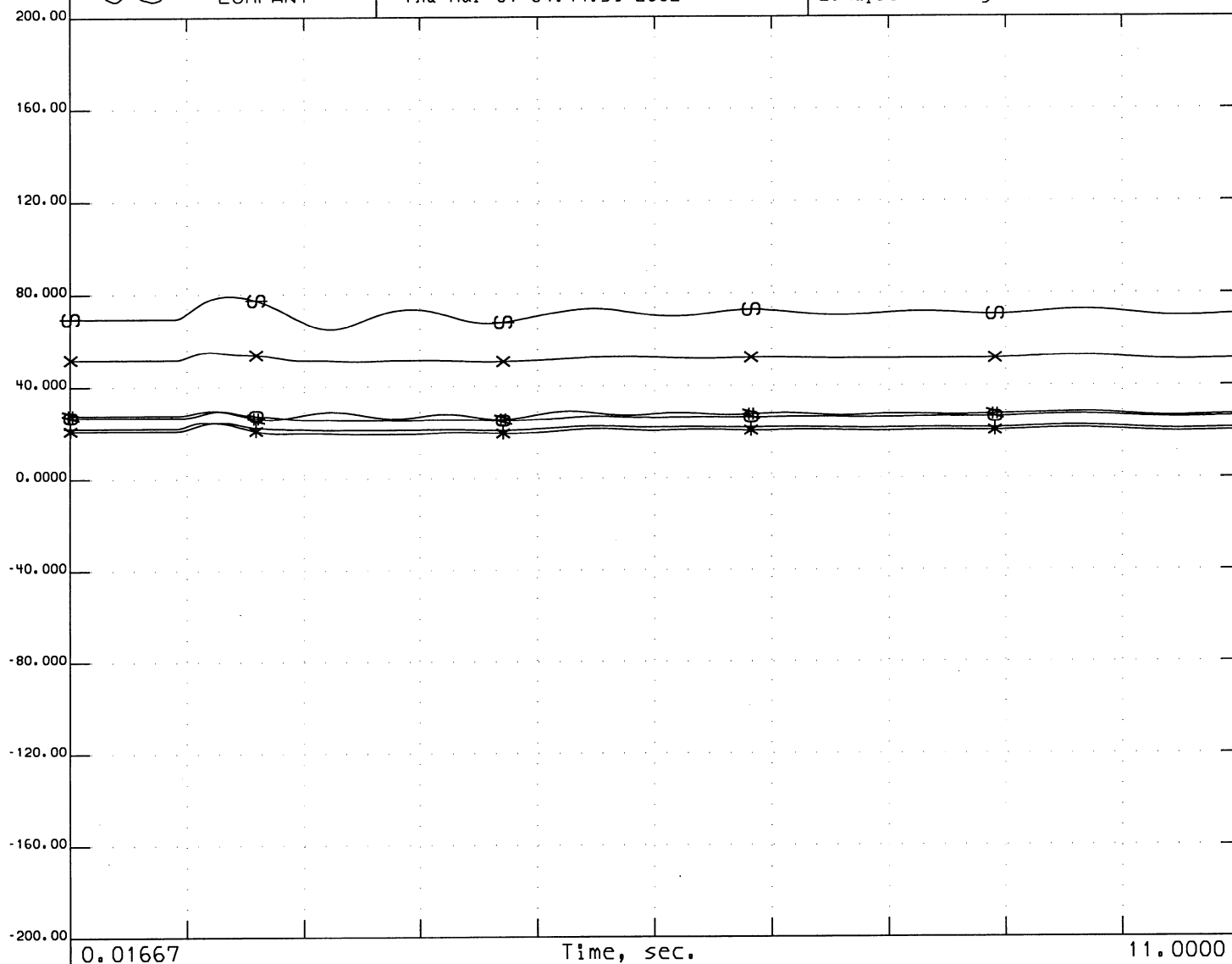
Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-nlsum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:44:59 2002

dvrnrg-n1sum.chf
C:\ups\l112\blythesum1040d.sav



-200.0	O	ang	24050 MTNVIST1	15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4	18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4	18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2	22.00	2	200.00
-200.0	X	ang	14931 PALOVRD1	24.00	1	200.00
-200.0	S	ang	19401 BUCKST1	16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Devers - Mirage 230 KV Line

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + dvrnrg-n1sum.swt

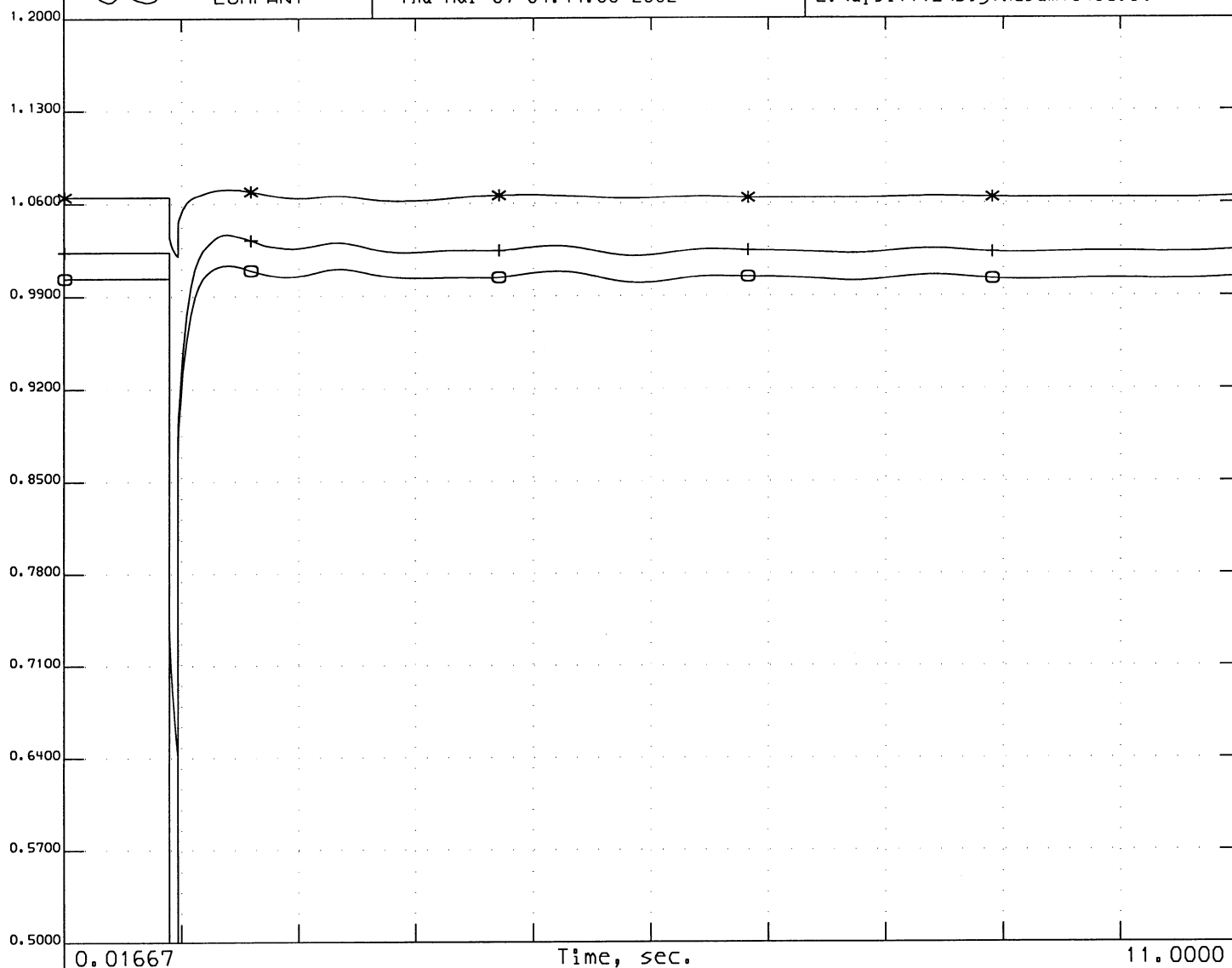
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blythesum1040d.sav
blythesum1040d.dyd
TITLE
2004 Summer
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt
RUN 10.0
CC
*
* CC ***** BLYTHE 1040MW SYSTEM IMPACT STUDY *****
*
* CC APPLY A 5 CYCLE 3-PHASE FAULT ON THE DEVERS 230 BUS
* CC
FB 0.0 "DEVERS " 230
* CLEAR FAULT
CFB 5.0 "DEVERS " 230
DL 5.0 "DEVERS " 230. "MIRAGE " 230. "1 "
DL 5.0 "COACHELV" 230. "DEVERS " 230. "1 "
```



GENERAL
ELECTRIC
COMPANY

TERMINAL_VOLTGE_MAGN
Thu Mar 07 04:44:08 2002

devers-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.01667		Time, sec.					11.0000	
0.5000	O	vbus	24801	DEVERS	500.00	1	1.2000	
0.5000	+	vbus	24151	VALLEYSC	500.00	1	1.2000	
0.5000	*	vbus	15021	PALOVORDE	500.00	1	1.2000	

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

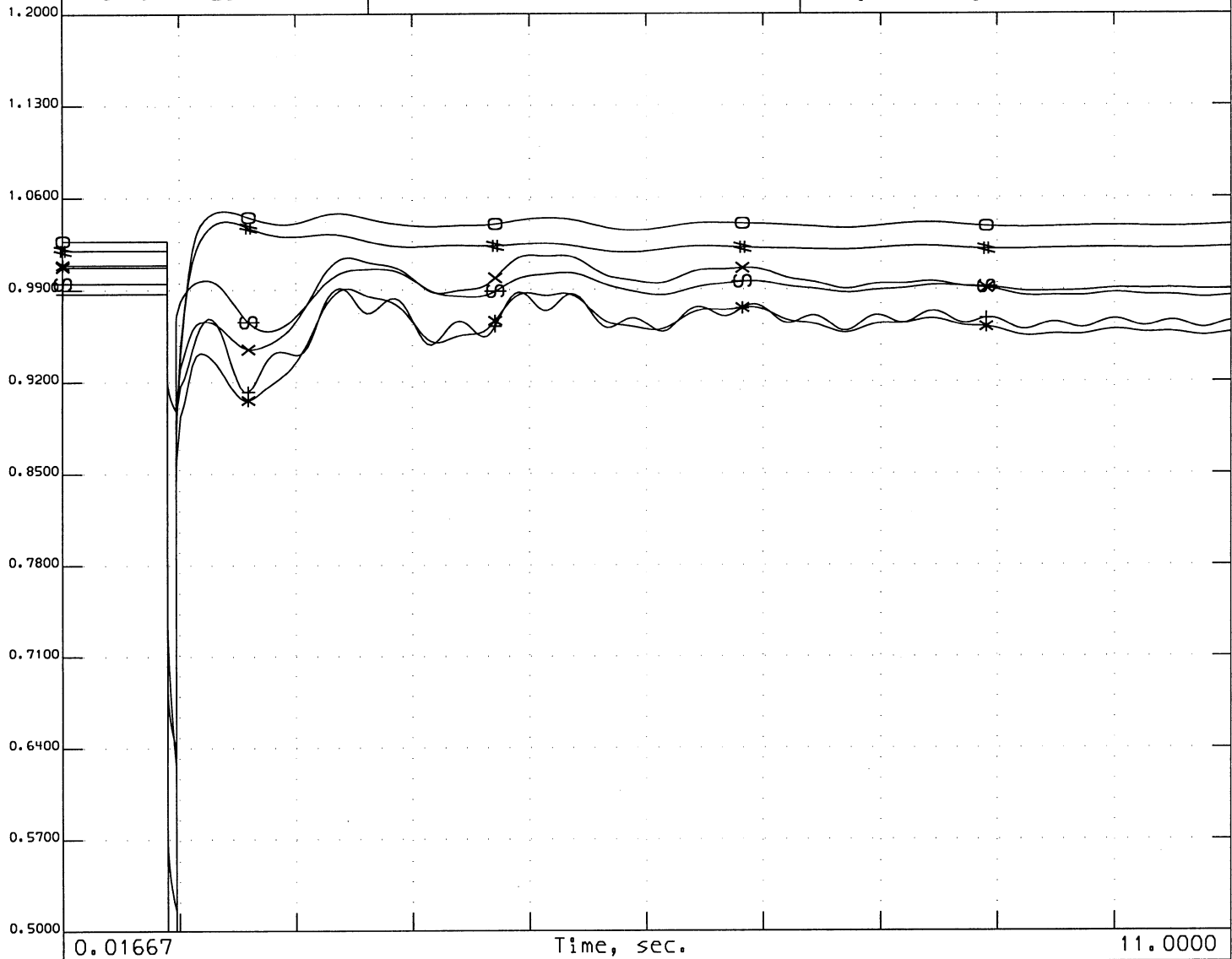
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:10 2002

devers-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.5000	O	vbus	24804	DEVERS	230.00	1	1.2000
0.5000	+	vbus	25401	EAGLEMTN	230.00	1	1.2000
0.5000	*	vbus	24806	MIRAGE	230.00	1	1.2000
0.5000	#	vbus	24132	SANBRDNO	230.00	1	1.2000
0.5000	X	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	\$	vbus	19400	BUCK230	230.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

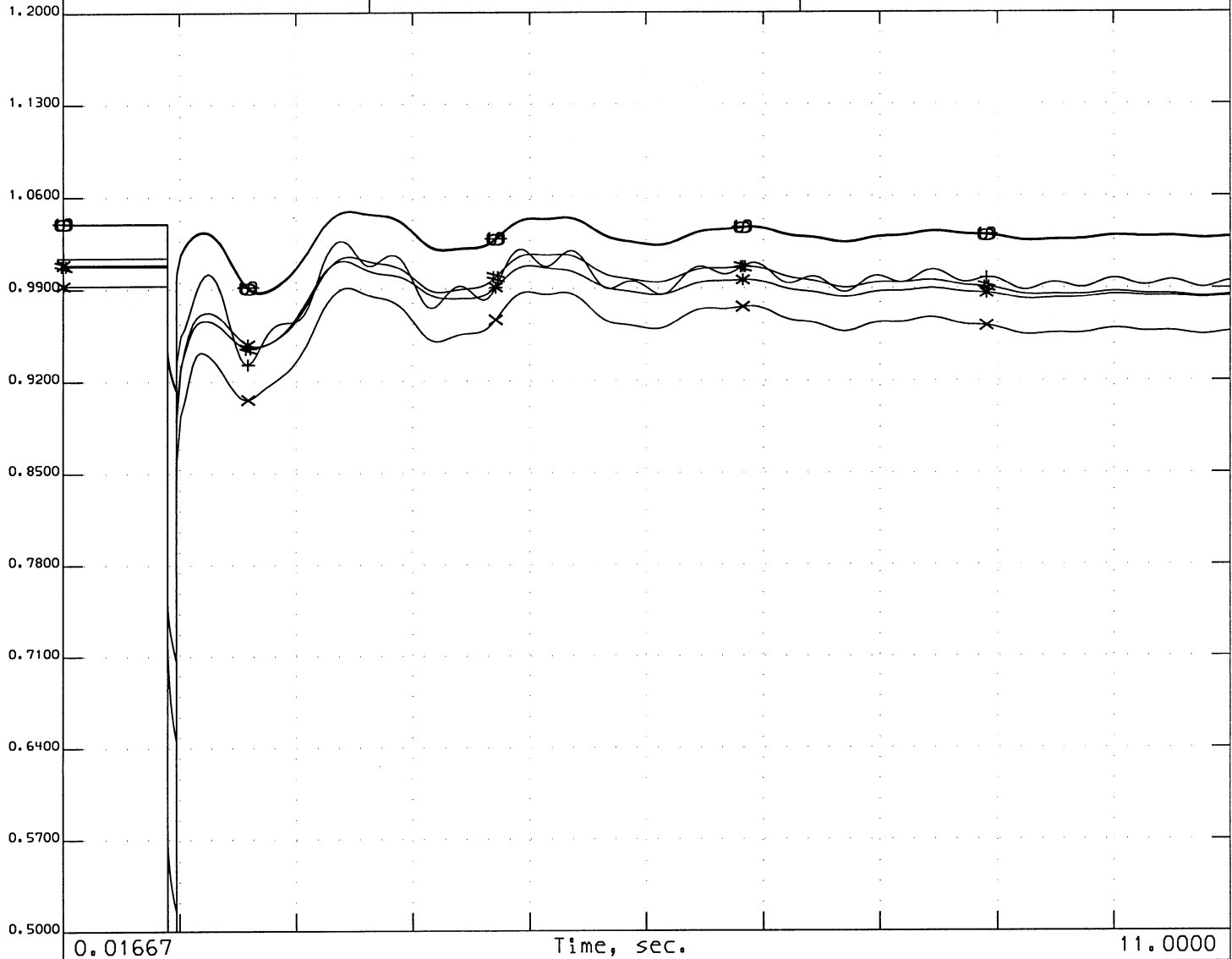
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt



GENERAL
ELECTRIC
COMPANY

500KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:12 2002

devers-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.01667		Time, sec.				11.0000	
0.5000	○	vbus	24017	BLYTHESC	161.00	1	1.2000
0.5000	+	vbus	24035	EAGLEMTN	161.00	1	1.2000
0.5000	*	vbus	21006	COACHELV	161.00	1	1.2000
0.5000	#	vbus	21007	COACHELV	230.00	1	1.2000
0.5000	X	vbus	21076	MIRIID	230.00	1	1.2000
0.5000	⊗	vbus	19399	BUCK161	161.00	1	1.2000

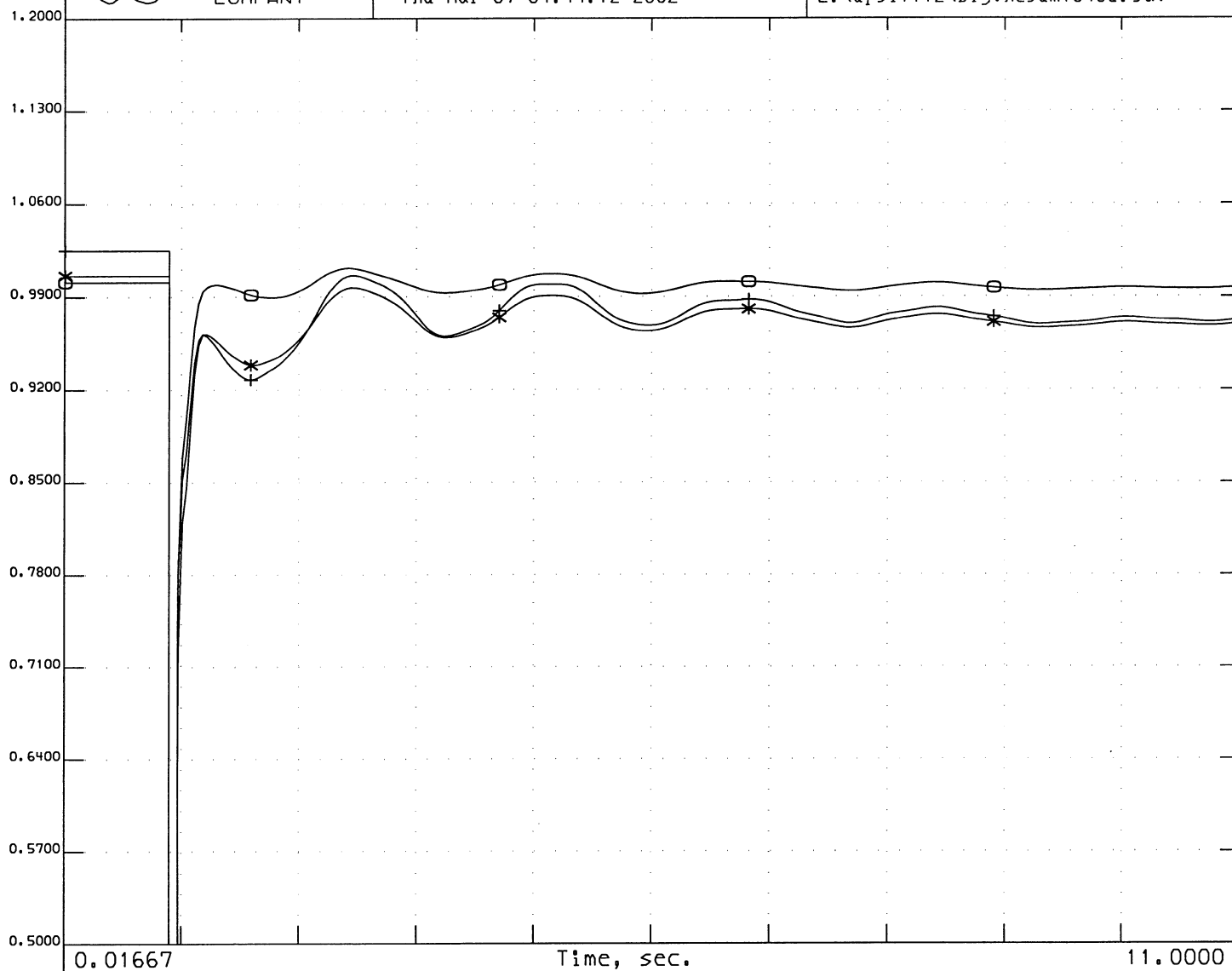
2004 Summer
5-CYCLE 3-Phase Fault on Devers 500KV Bus
Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines
SYSTEM STABILITY STUDY CASES
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:12 2002

devers-n2sum.chf
C:\upslf112\blythesum1040d.sav



0.5000	○	vbush	24805	DEVERS	115.00	1	1.2000
0.5000	+	vbush	24807	MIRAGE	115.00	1	1.2000
0.5000	*	vbush	24821	TAMARISK	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

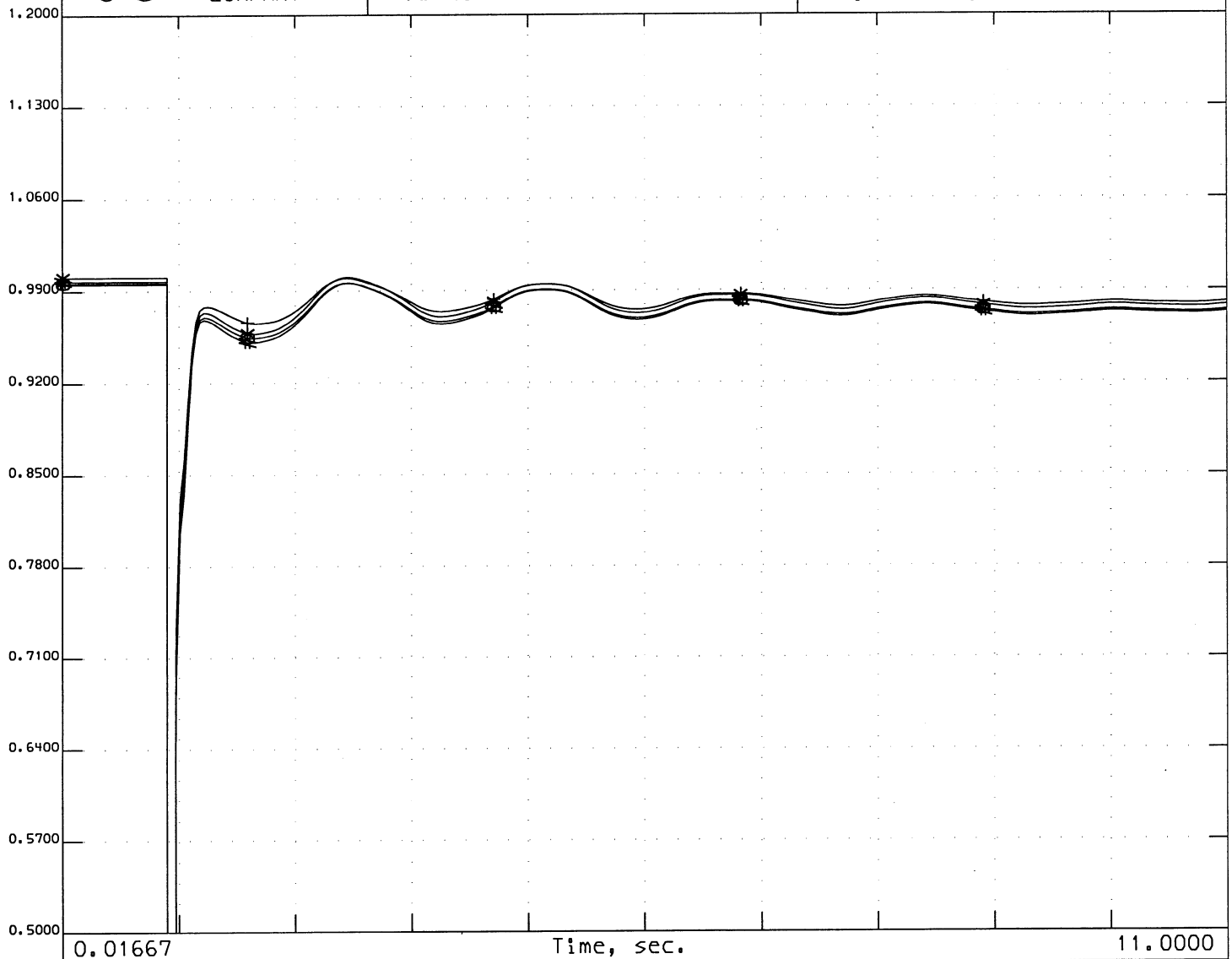
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt



GENERAL
ELECTRIC
COMPANY

230KV_BUS_VOLTGE_MAG
Thu Mar 07 04:44:12 2002

devers-n2sum.chf
C:\ups1f112\blythesum1040d.sav



0.5000	O	vbul	24817 EISENHOW	115.00	1	1.2000
0.5000	+	vbul	24818 FARREL	115.00	1	1.2000
0.5000	*	vbul	24816 SANTA RO	115.00	1	1.2000
0.5000	#	vbul	24820 THORNHIL	115.00	1	1.2000

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

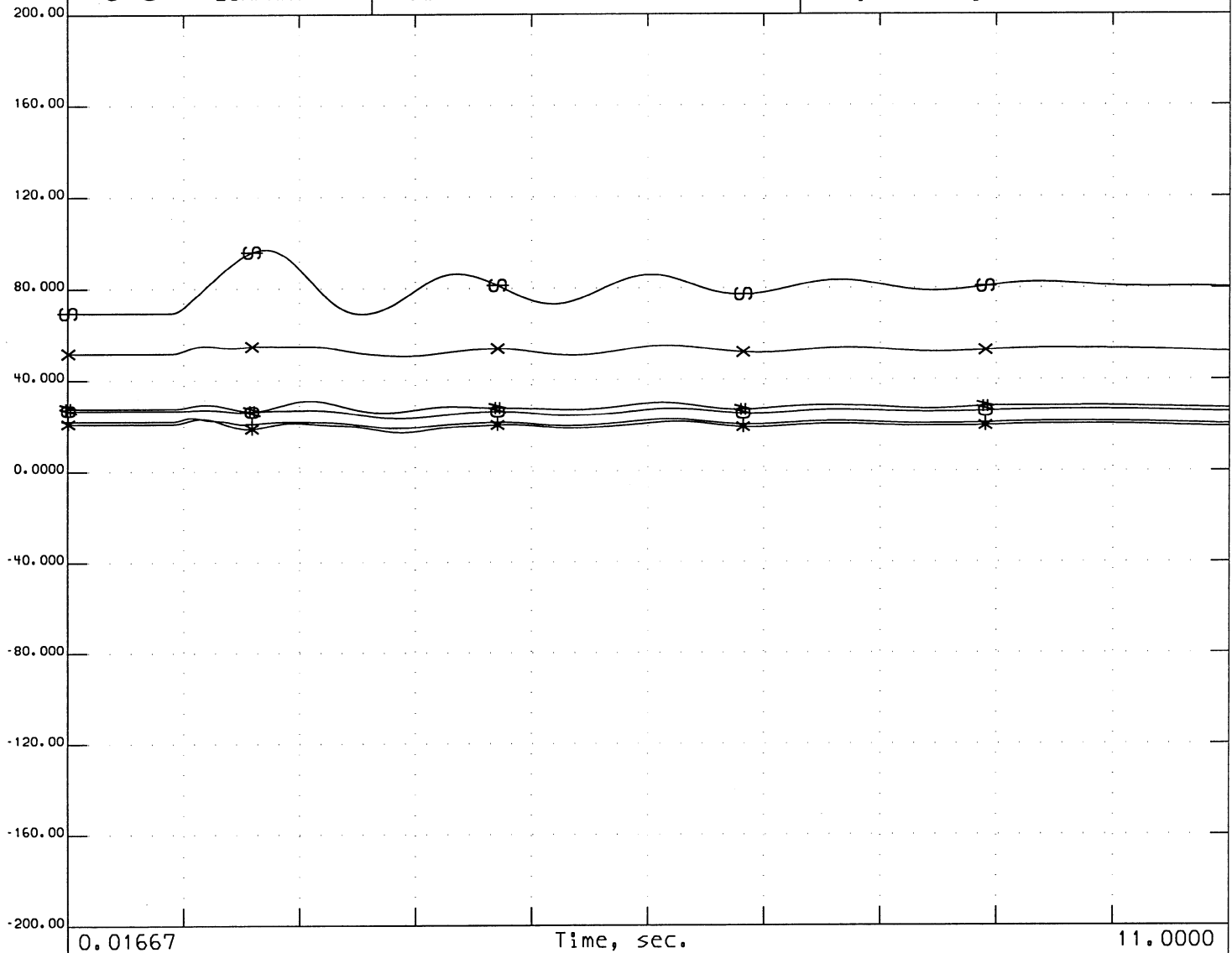
Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt



GENERAL
ELECTRIC
COMPANY

RELATIVE_ROTOR_ANGLE
Thu Mar 07 04:44:13 2002

devers-n2sum.chf
C:\ups\l112\blythesum1040d.sav



-200.0		Time, sec.		11.0000	
-200.0	○	ang	24050 MTNVIST1 15.50	1	200.00
-200.0	+	ang	24053 MTNVIST4 18.00	H	200.00
-200.0	*	ang	24053 MTNVIST4 18.00	L	200.00
-200.0	#	ang	24129 S.ONOFR2 22.00	2	200.00
-200.0	x	ang	14931 PALOVRD1 24.00	1	200.00
-200.0	⊕	ang	19401 BUCKST1 16.00	S1	200.00

2004 Summer

5-CYCLE 3-Phase Fault on Devers 500KV Bus

Contingency-Remove Coachelv - Devers & Devers - Mirage 230 KV Lines

SYSTEM STABILITY STUDY CASES

Blythesum1040d.sav + Blythesum1040d.dyd + devers-n2sum.swt