SPP Southwest Power Pool

System Impact Study for Generation Interconnection Request

GEN-2004-005

SPP Tariff Studies

(#GEN-2004-005)

December 2004

Executive Summary

<OMITTED TEXT>Customer has requested a System Impact Study to evaluate a proposal to add up to 275MW of coal-fired generation at an existing City Utilities Springfield, Missouri plant in Greene County, MO. The requested in-service date is March 1, 2009.

The Customer has proposed the addition of 275MW of coal-fired generation at the site. The unit will be interconnected to the existing Southwest Power Station (SWPS) 161kV substation.

The network upgrade requirements include expansion of the SWPS 161kV bus and installation of three (3) new 161kV circuit breakers. This expansion would provide terminals for the unit generator step up transformer and station service transformer necessary for the generation interconnection. The estimated cost of this network upgrade is $2,500,000 with construction completed by the station in-service date of March 1, 2009.

During the single-contingency analysis performed as part of the System Impact Study, it was found that during the 2010 Winter Peak time period, the Southwest Power Administration 161kV line from Springfield to Clay overloads for the outage of the City Utilities Southwest Power Station to James River Power Station 161kV line. This overload can be mitigated by replacement of the Springfield disconnect switches. The cost of this upgrade is estimated at $200,000 and would increase the emergency rating to 188MVA from 167MVA. The lead-time for this upgrade is estimated at 12 months.

The total estimated cost of the required network upgrades for interconnection is $2,700,000.

Short circuit analysis will be performed as part of the Facility Study performed by the Transmission Owner if the customer wishes to proceed.

Transient stability analysis indicates that for more probable disturbances with normal fault clearing times, system stability is maintained. Three-phase to ground faults were applied at numerous locations on the surrounding transmission system including simulated loss of generation at SWPS unit #1 and the planned unit #2. No fault resulted in either angular or voltage instability. No upgrades are required at this time to maintain system stability.

Transmission Service is not analyzed during the interconnection impact study.

1. Introduction

1.1 Project Description

<OMITTED TEXT>Customer has requested an System Impact Study to evaluate a proposal to add up to 275MW of coal-fired generation at an existing City Utilities Springfield, Missouri plant in Greene County, MO. The requested in-service date is March 1, 2009.

1.2 Study Methodology

The Interconnection System Impact Study investigates the effect of new generation on system performance during normal and contingency conditions. Deliverability of power to final customers is not analyzed. Those facilities that are affected only by the interconnection of the generation are analyzed in the Interconnection System Impact Study. Separate studies evaluate the impact of deliverability of the plants output.

Comparison of the base case, which excludes any proposed facilities, to the study case, which includes the proposed Customer unit, reveals any system constraints that result from the proposed generation addition. The analysis cases are based on the SPP 2004 Series, Update 4 models representing the 2010 summer peak and 2010 winter peak. The proposed plant is modeled at maximum output of 275MW for all study cases.

The proposed plant is to be located in the City Utilities, Springfield Missouri (SPRM) transmission system.

Full AC contingency analysis (ACCC) is used to investigate the limiting constraints of the transmission system during contingency events. The analysis is performed using Shaw PTI's PSS/E v. 29.5. Comparisons are made between the cases with and without the Customer generation in service in order to identify the severity and cause of the overloading conditions. All branches in the SPRM system and surrounding control areas and all ties with SPRM are monitored for overloads exceeding 100% of emergency rating (Rate B). A TDF of 3% is required before a facility is flagged as impacted. Buses are monitored for voltage deviations exceeding +/- 5% of nominal.

2. Powerflow Analysis

2.1 2010 Summer Peak

Added generation at the Customer facility results in no base case overloads on the transmission system. During single contingency analysis, no overloading occurs as a result of outages of transmission facilities in the 2010 Summer Peak case.

2.2 2010 Winter Peak

Added generation at the Customer facility results in no base case overloads on the transmission system. During single contingency analysis, one facility is overloaded as a result of a separate outage of transmission facilities in the 2010 Winter Peak case. The table below shows the facility impacted by the addition of the proposed generation.

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload
10WP	SPRM	SWPA	CLAY - SPRINGFIELD 161KV	167	41.039	103.79	38.109	JAMES RIVER - SOUTHWEST 161KV

SPRM has included a second 161kV circuit from SWPS – Battlefield in the SPP 2010 models. This line was considered a proposed facility and was removed from service for the contingency analysis. The line was closed to determine if the above contingency overload was mitigated by the line. Loading on the Clay – Springfield 161kV line increased slightly by including the proposed SWPS – Battlefield 161kV line in the case. However, the loading increase was minimal and would still be mitigated by the replacement of the disconnect switches at Springfield discussed later.

3. Interconnection Network Upgrades

3.1 Interconnection Substation

The Customer plant will be interconnected with the 161kV transmission system at the SWPS substation in Greene County, MO. The existing 161kV bus will be expanded to accommodate the new generating unit and a new station service transformer. Three (3) 161kV circuit breakers will be added to accommodate the new unit. The estimated cost of the interconnection substation work is $2,500,000.

3.2 161kV Upgrades

After the installation of the proposed generation, the Southwest Power Administration (SWPA) Springfield to Clay 161kV line must be upgraded to alleviate the overload that occurs during the outage of the SWPS to James River Power Station 161kV line. Upgrade of this facility will include replacement of the disconnect switches at Springfield to increase the emergency rating to 188MVA. The estimated cost of this upgrade is $200,000.

The preliminary cost estimates for the network upgrade facilities are listed in Table 1 below. An estimated project schedule will be included in the Facility Study.

Table 1 – Summary of Network Upgrade Costs for Interconnection

Stand Alone Network Upgrades	
Description	Cost
SWPS 161kV substation facilities and equipment to facilitate interconnection	$2,500,000
Total Stand Alone Network Upgrades	***$2,500,000***

Other Required Network Upgrades	
Description	Cost
Disconnect switches at Springfield on SWPA Springfield – Clay 161kV	$200,000
Total Other Required Network Upgrades	***$200,000***
Total Required Network Upgrades	***$2,700,000***

The facilities mentioned above are required only for interconnection of the generation facility.

4. Short Circuit Analysis

A short circuit study will be conducted by SPRM as part of the Facility Study to determine if fault current levels exceed equipment ratings at SPRM facilities.

5. Transient Stability Analysis

Transient Stability analysis was performed to verify dynamic system response to disturbances on the system using the 2010 summer peak model. The customer provided the machine data for the proposed Customer plant. Typical values were provided for a 334MVA generator with an ESST1A exciter. This data was used to create a PTI dynamics model for the Customer plant. The machine data for the remaining system was obtained from the current SPP dynamics data files modified to include all previously queued plants proposed for the study period. Selected three-phase fault scenarios were simulated. Machines in the SPRM system and surrounding control areas were monitored for stability. A list of the faults applied is in Table 2 below.

Table 2 Selected Faults

Fault #	Fault Description
FLT_1_3PH	Three Phase fault at Southwest Power Station (SWPS) on the SWPS-SWDisposal 161kV line
FLT_2_3PH	Three Phase fault at Brookline on the SWPS – Brookline 161kV line
FLT_3_3PH	Three Phase fault at the line midpoint on the SWPS – James River Power Station 161kV line
FLT_4_3PH	Three Phase fault at Battlefield on the SWDisposal – Battlefield 161kV line
FLT_5_3PH	Three Phase fault at Springfield on the Springfield – Clay 161kV line
FLT_6_3PH	Three Phase fault at Brookline on the Brookline – Flint Creek 345kV line
FLT_7_3PH	Three Phase fault at Main on the Battlefield – Main 161kV line
FLT_8_3PH	Three Phase fault at Brookline on the Brookline – Morgan 161kV line
FLT_9_3PH	Three Phase fault at Brookline on the Brookline – Junction 161kV line
FLT_10	Trip SWPS unit #1
FLT_11	Trip Customer plant (SWPS unit #2)
FLT_12_3PH	Three Phase fault at SWPS on the SWPS – Battlefield 161kV line

The faults above were applied in four scenarios:

1. A basecase without the Customer plant online, and the proposed SWPS – Battlefield 161kV line out-of-service
2. A basecase without the Customer plant online, and the proposed SWPS – Battlefield 161kV line in-service
3. A case with the Customer generation online at 275MW and the proposed SWPS – Battlefield 161kV line out-of-service.
4. A case with the Customer generation online at 275MW and the proposed SWPS – Battlefield 161kV line in-service.

The proposed SWPS – Battlefield line does not affect system stability whether the line is in-service or not. The line also has minimal effect on powerflow contingency results. Plots of machine angles and selected system voltages for all scenarios analyzed are attached in the Appendices to this report.

6. Conclusion

This System Impact Study was requested by Customer to assess the interconnection requirements for the addition of 275MW of new generation in Greene County, MO. The analysis evaluates the impact of introducing the new generation on the power system during normal operation and contingency conditions.

The addition of 275MW generating capacity at the proposed site results in the overloading of a transmission facility during an outage on the 161kV system. Replacement of the disconnect switches at the SWPA Springfield substation on the Springfield – Clay 161kV line are required for the plant interconnection. Estimated lead-time for this network upgrade is 12 months.

Network upgrades are also required at the SWPS substation to accommodate the proposed plant. Expansion of the 161kV bus and installation of three (3) 161kV circuit breakers is necessary for the new unit terminal and station service transformer. Land acquisition and environmental impact issues are not included in the cost of constructing interconnection facilities. The total estimated cost for the network upgrades, including those outside of the SWPS 161kV substation, is $2,700,000. An estimated project schedule will be determined during the Facility Study.

The costs do not include any costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies when the Customer requests transmission service through Southwest Power Pool's OASIS.

Appendix A-1

Plots of Fault Simulations

Plots of selected machine angle response during faults

Scenario:
2010 Summer Peak
Basecase (SWPS-Battlefield 161kV out of service)
[No Customer Plant – No Network Upgrades]

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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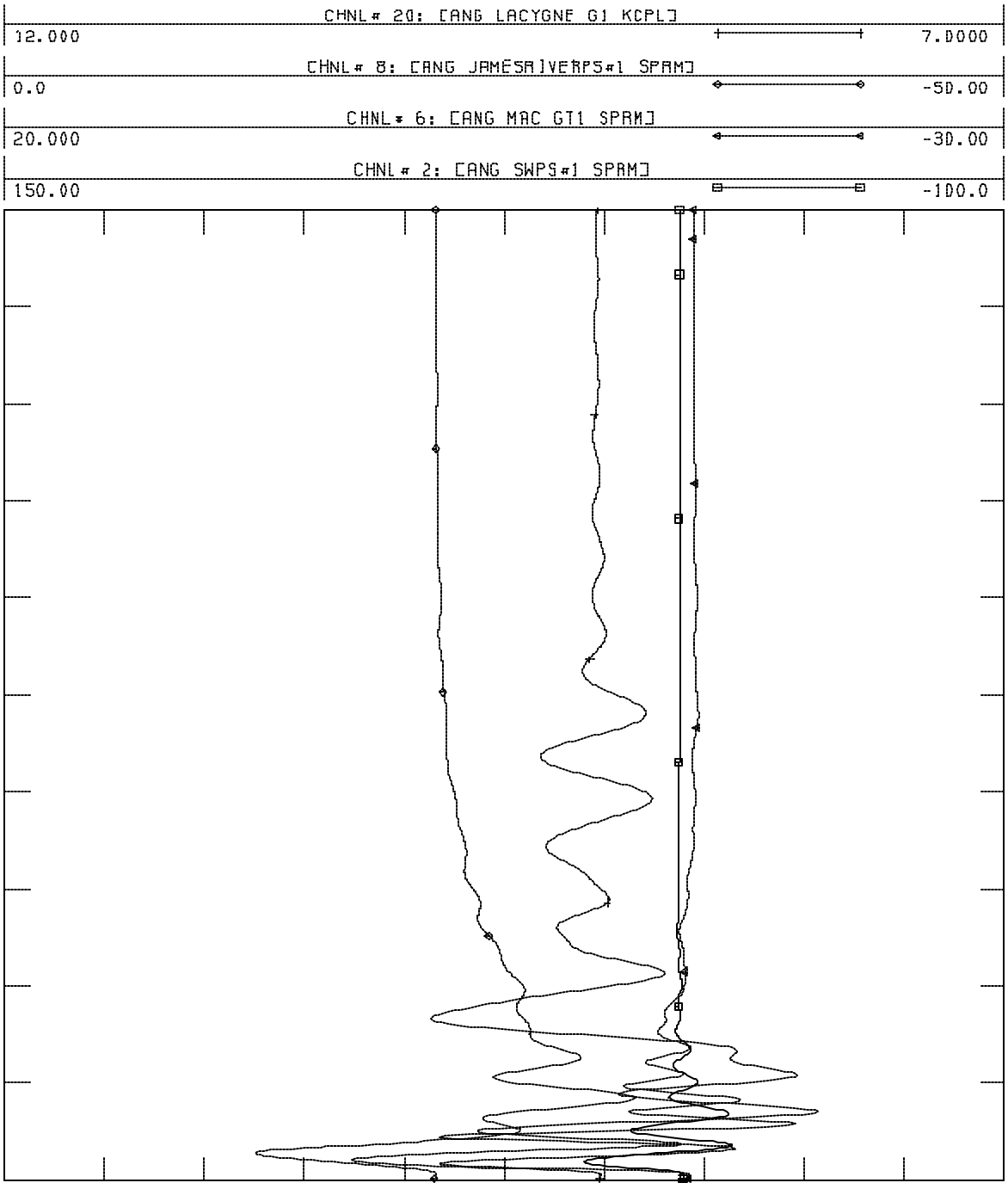

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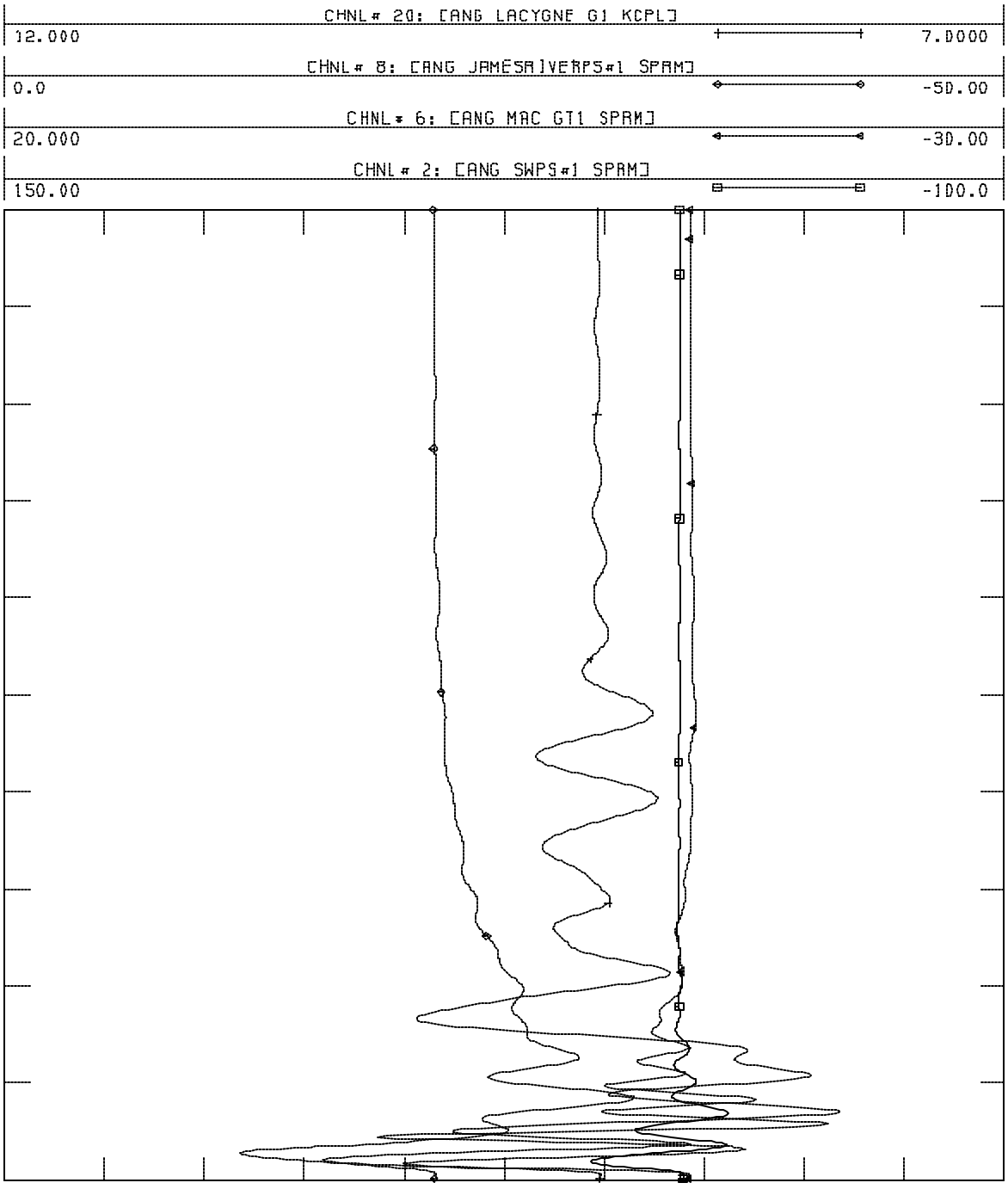

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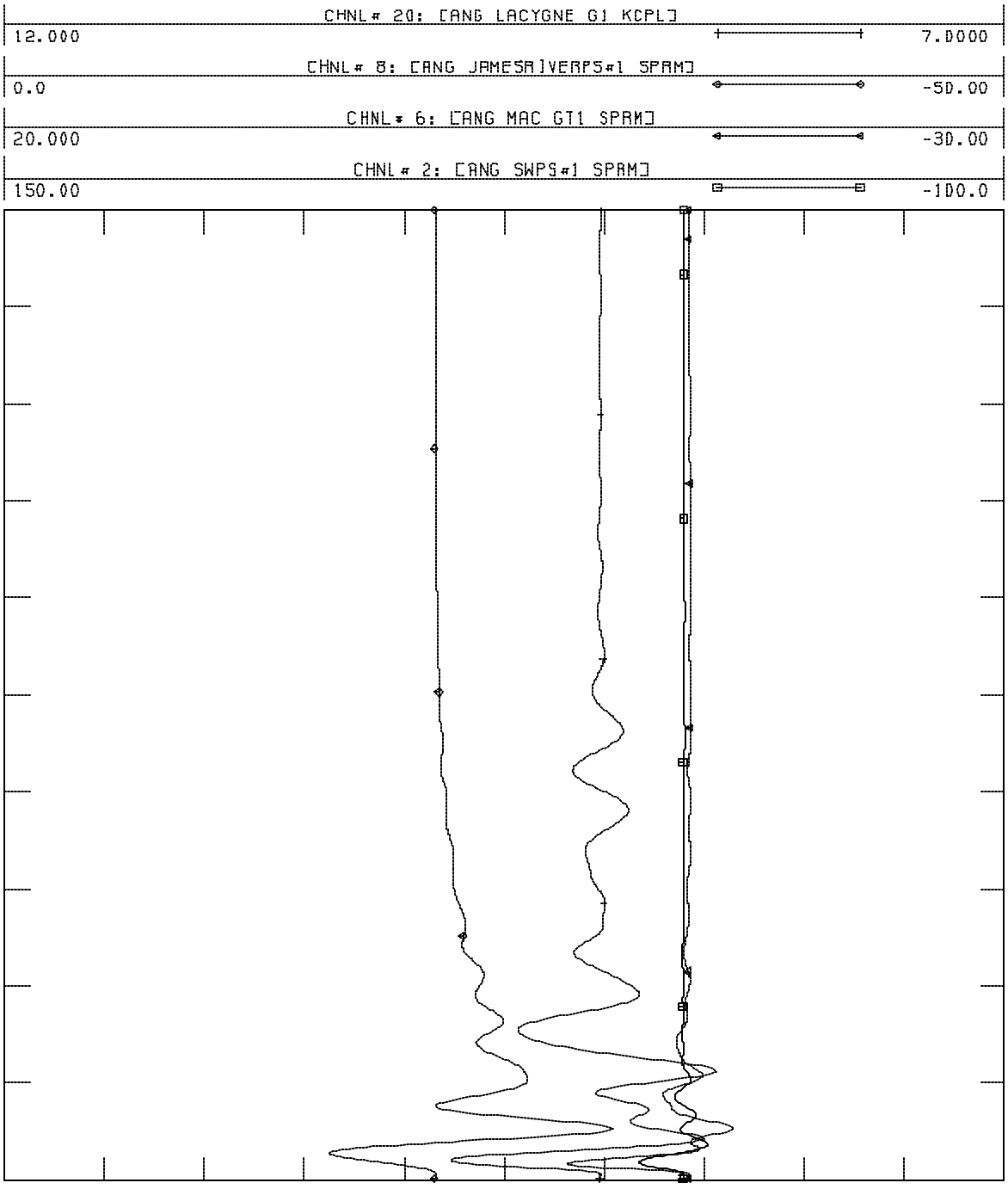

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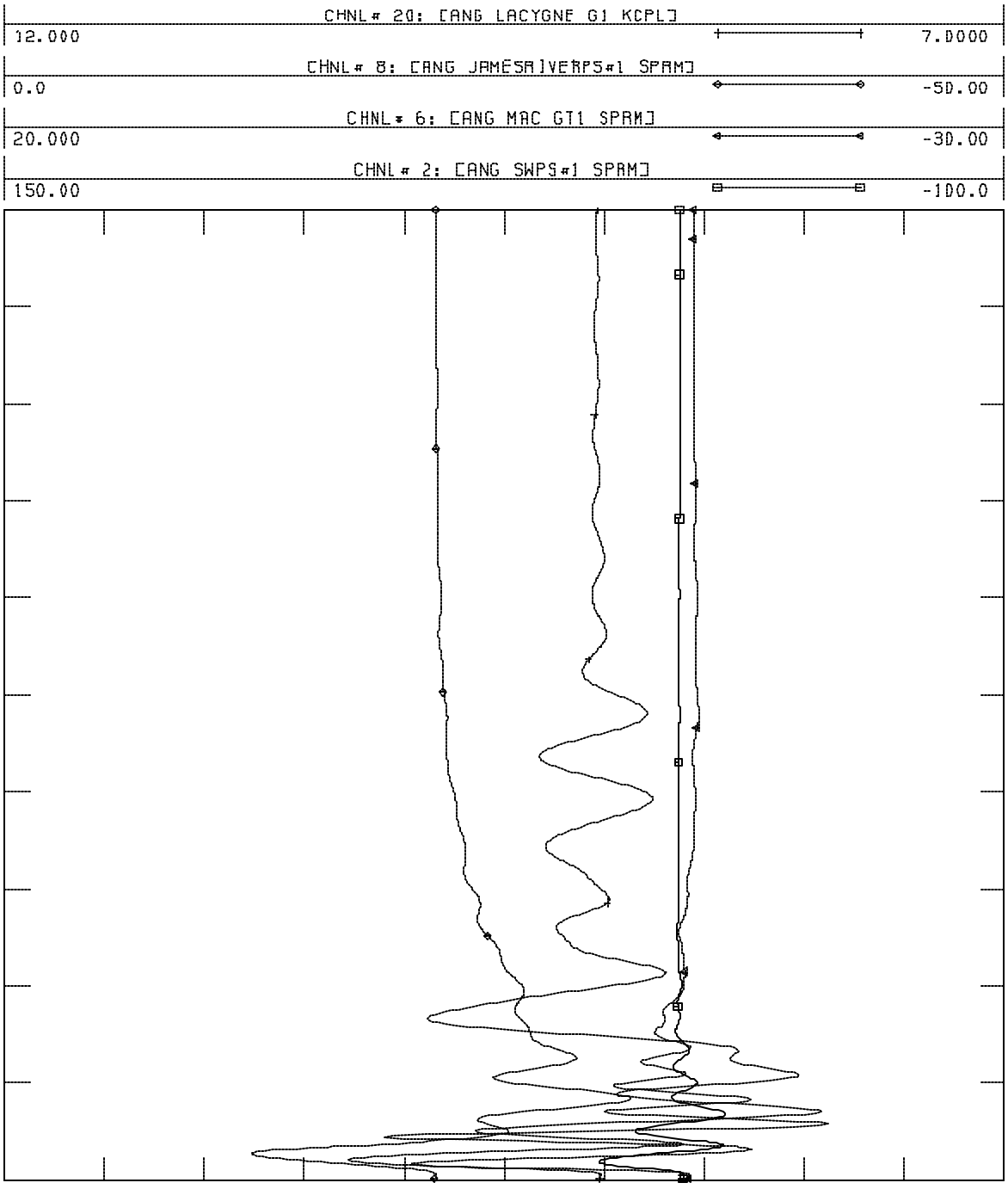

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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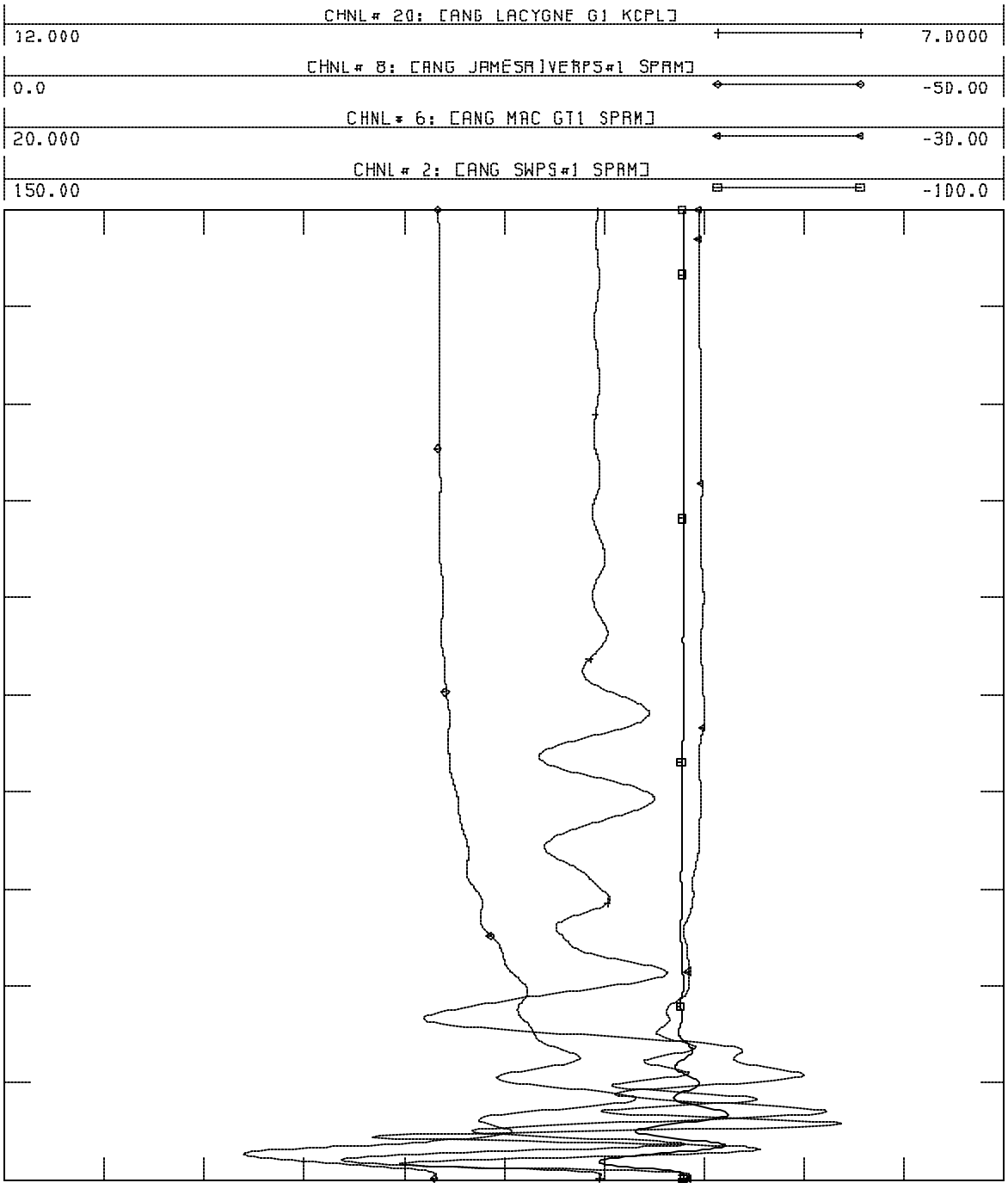

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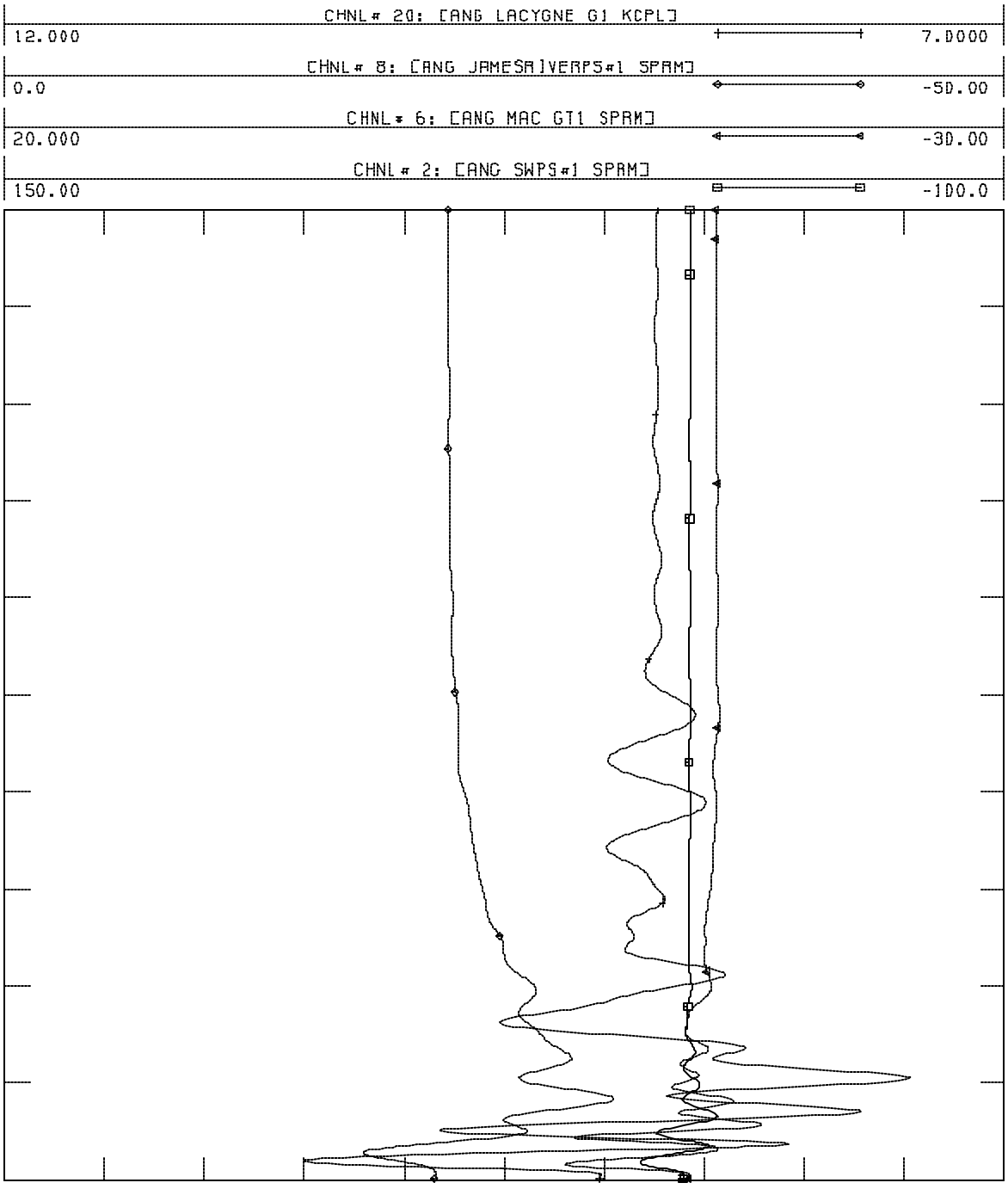

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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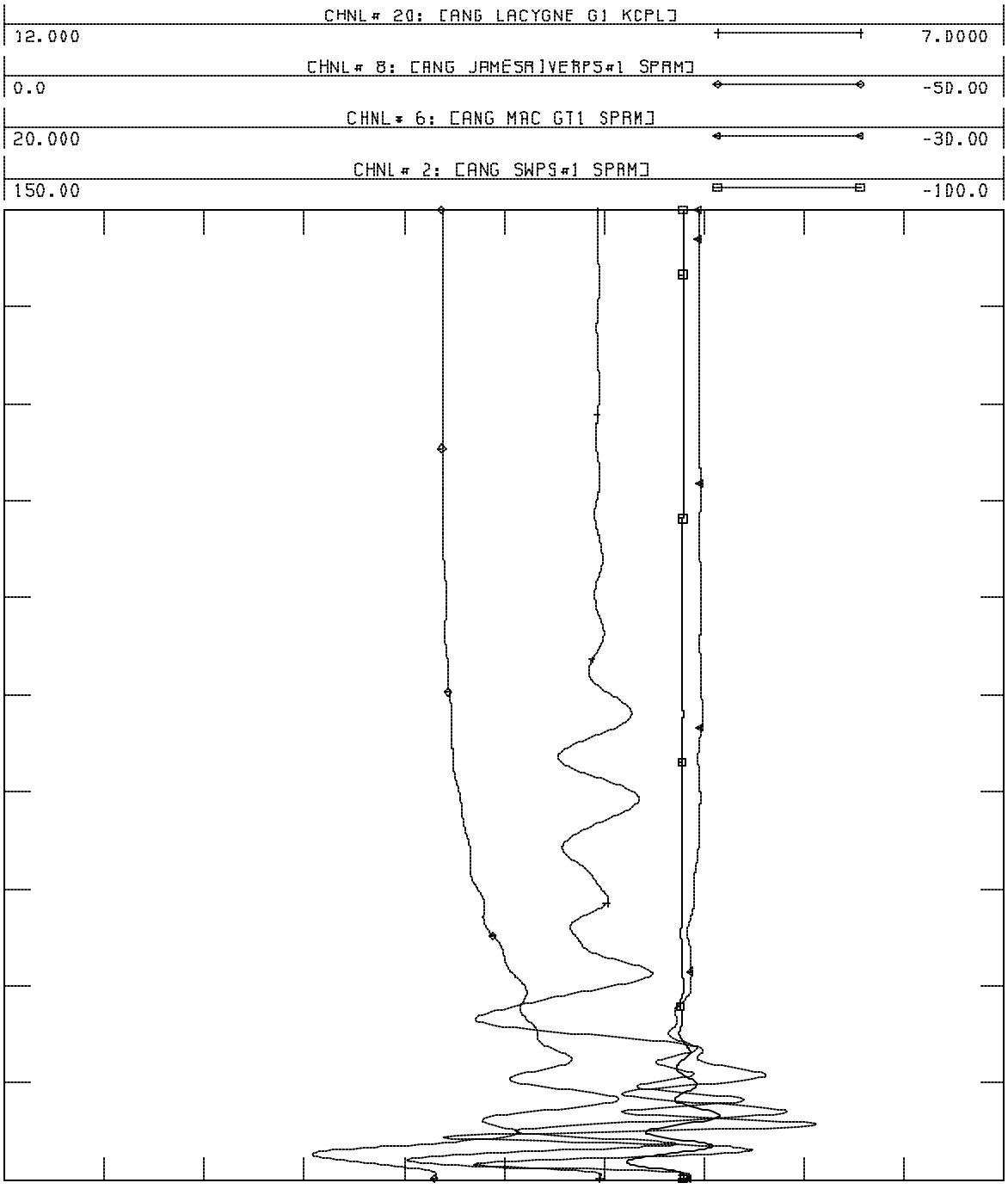

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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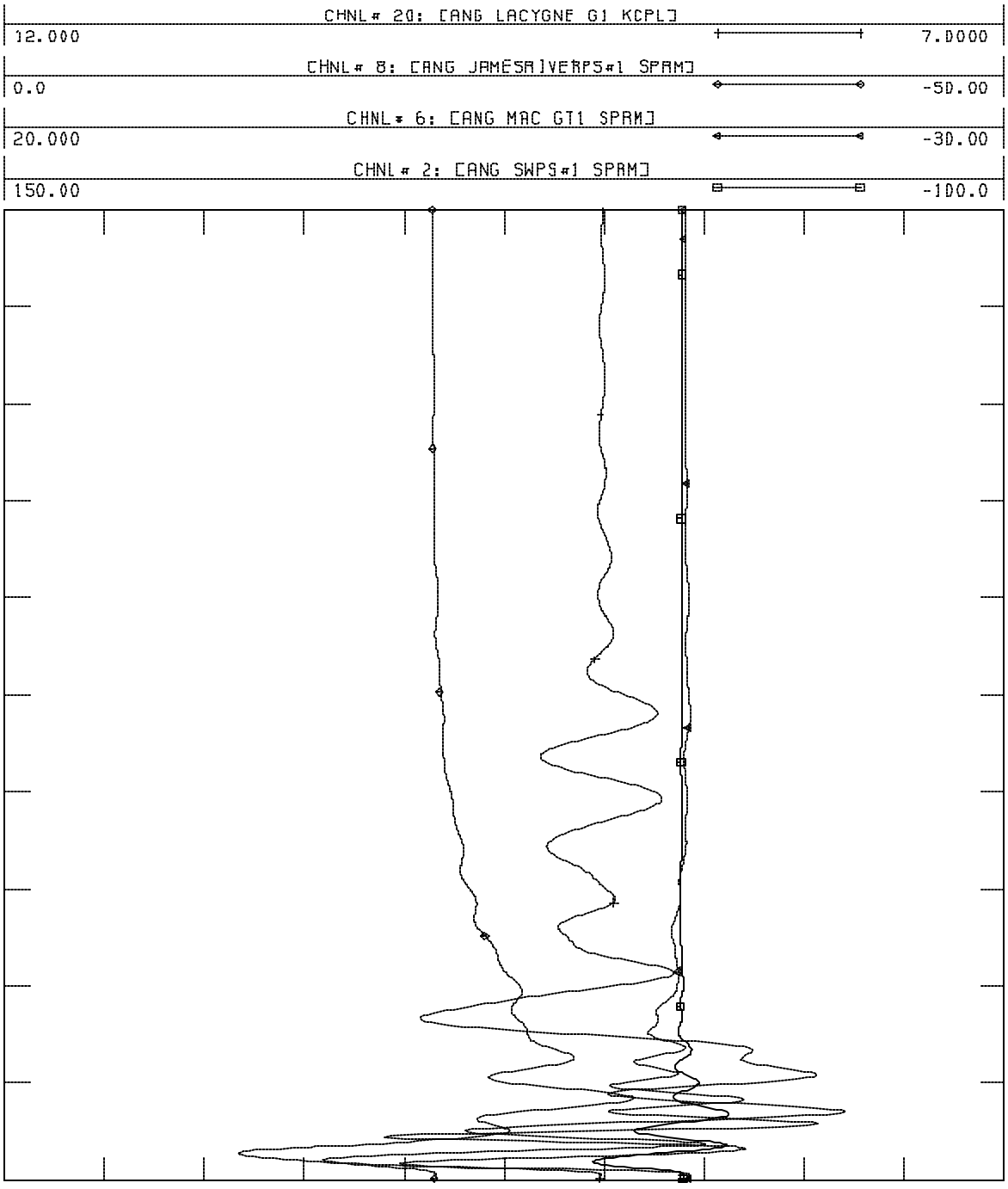

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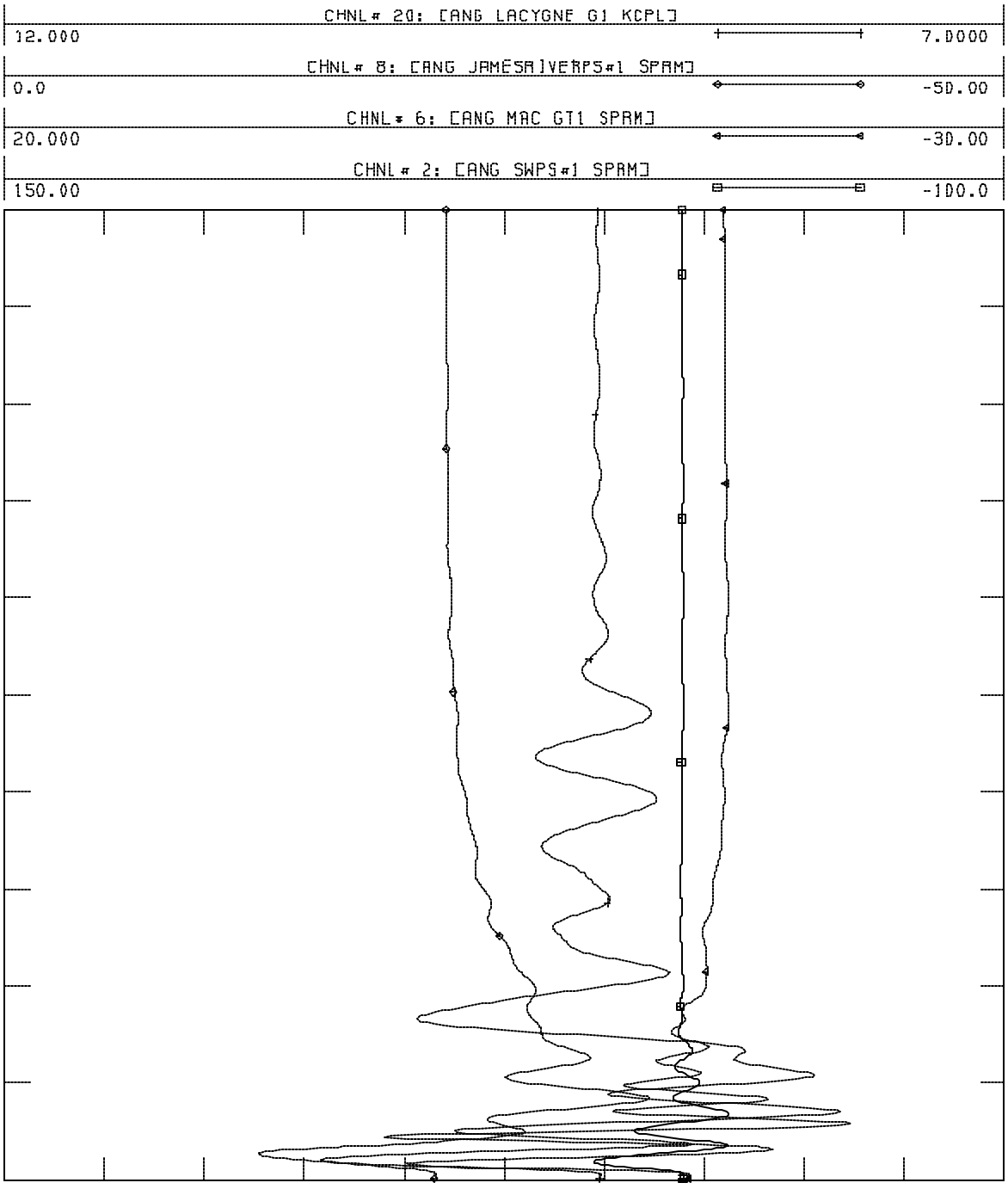

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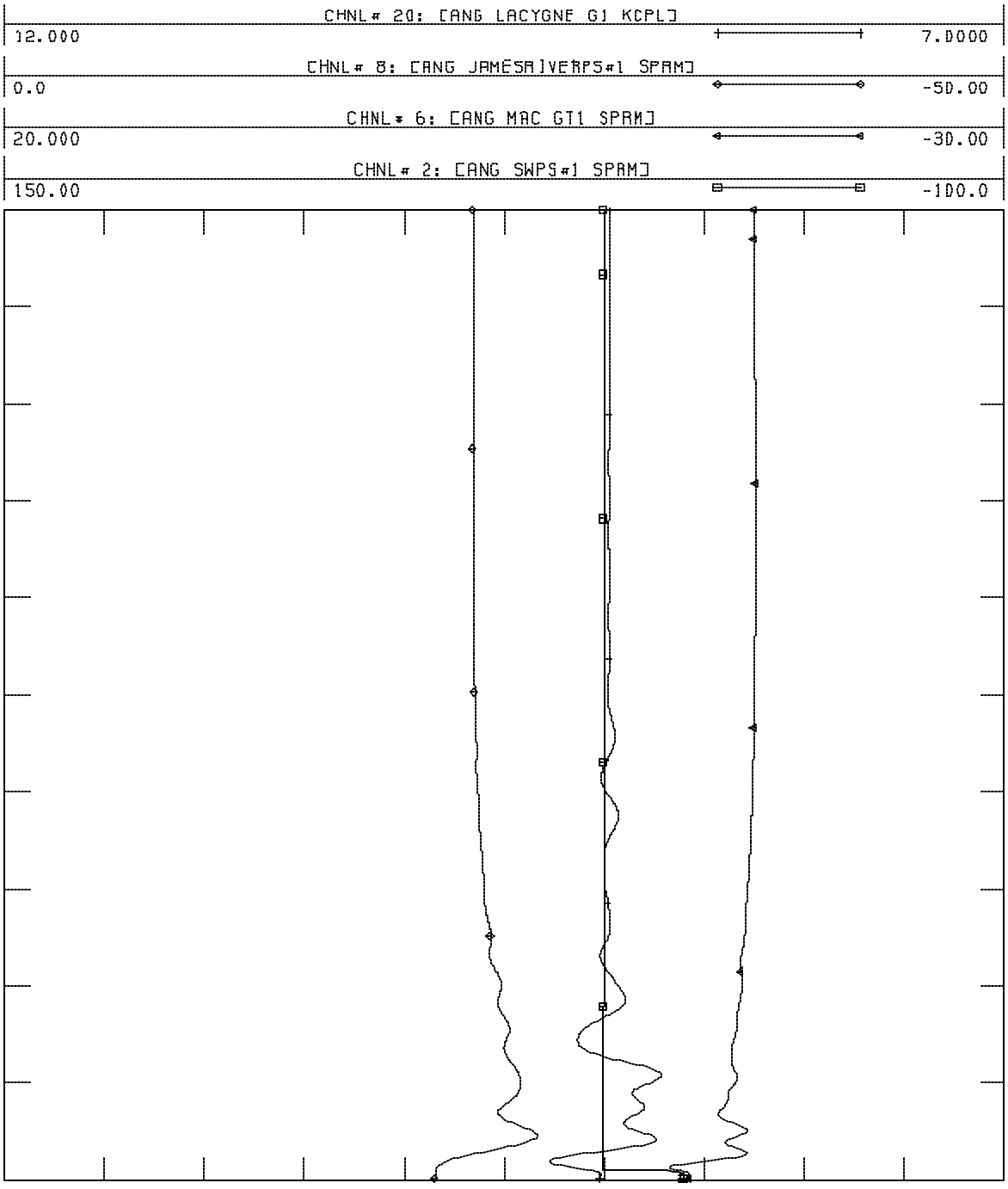

Appendix A-2

Plots of Fault Simulations

Plots of selected bus voltage response during faults

Scenario:
2010 Summer Peak
Basecase (SWPS-Battlefield 161kV out of service)
[No Customer Plant – No Network Upgrades]

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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CHNL # 348: EVOLTAGE CLAY 161KV]

2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]

2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]

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CHNL # 334: EVOLTAGE SWPS 161KV]

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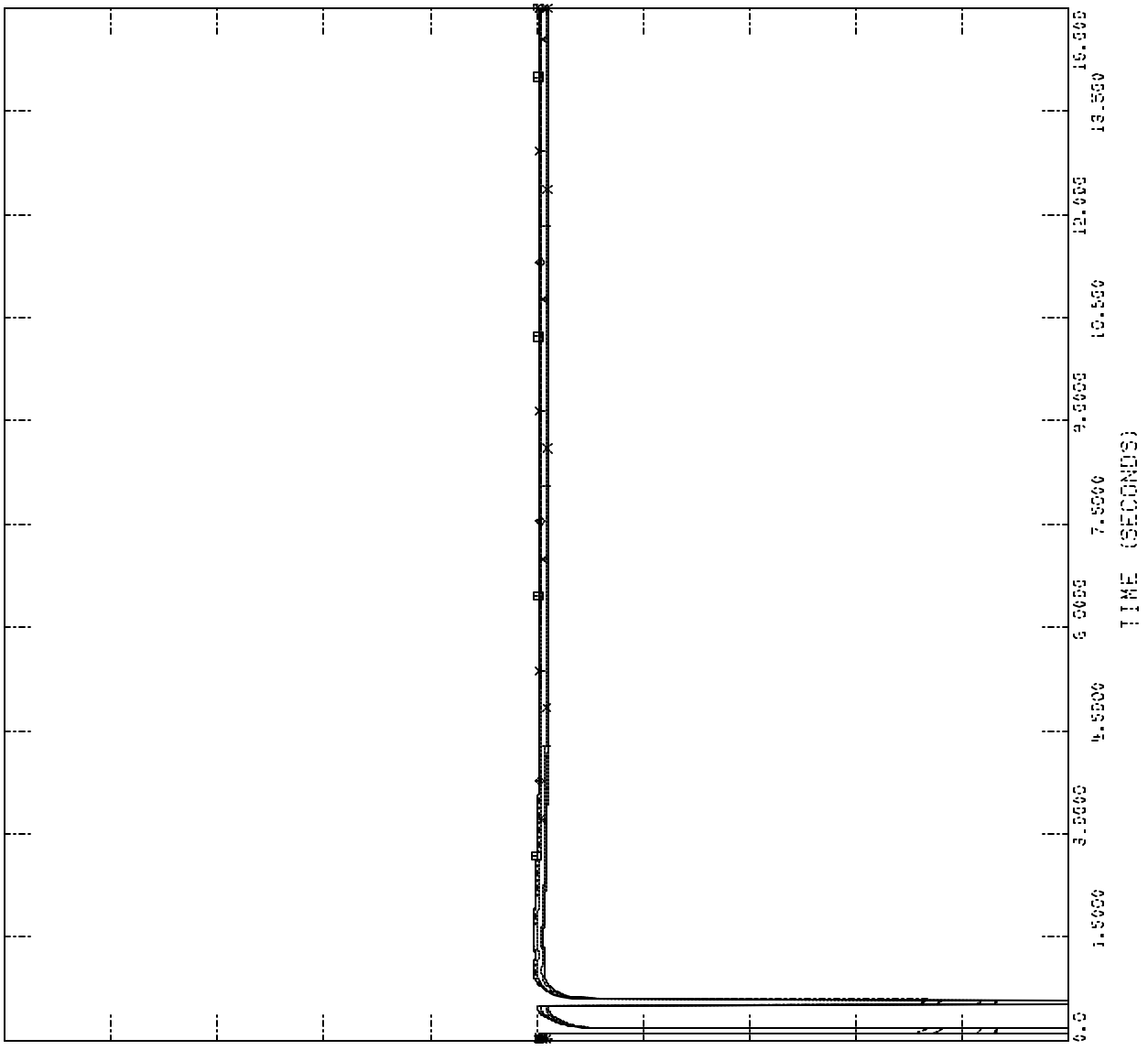

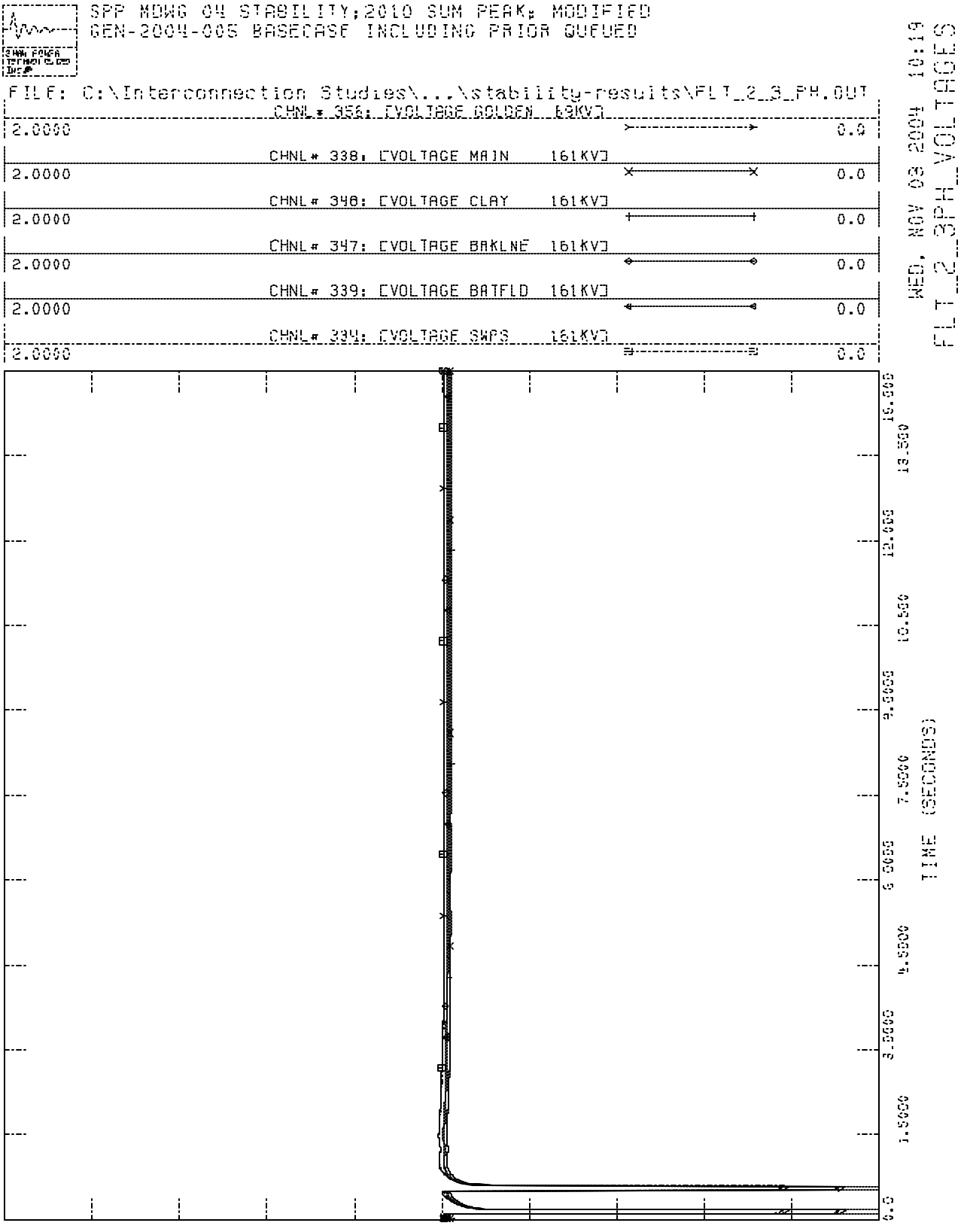
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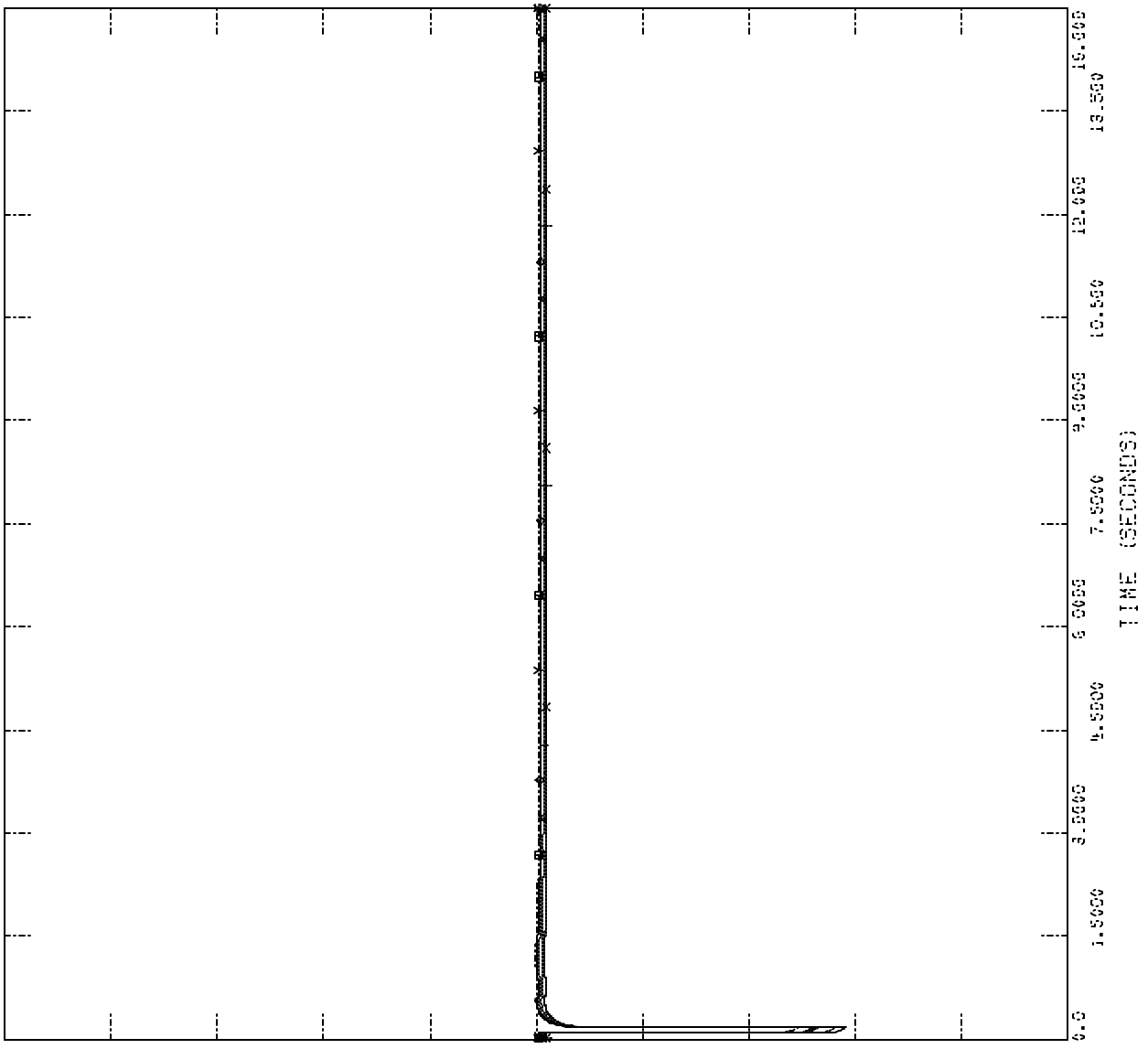

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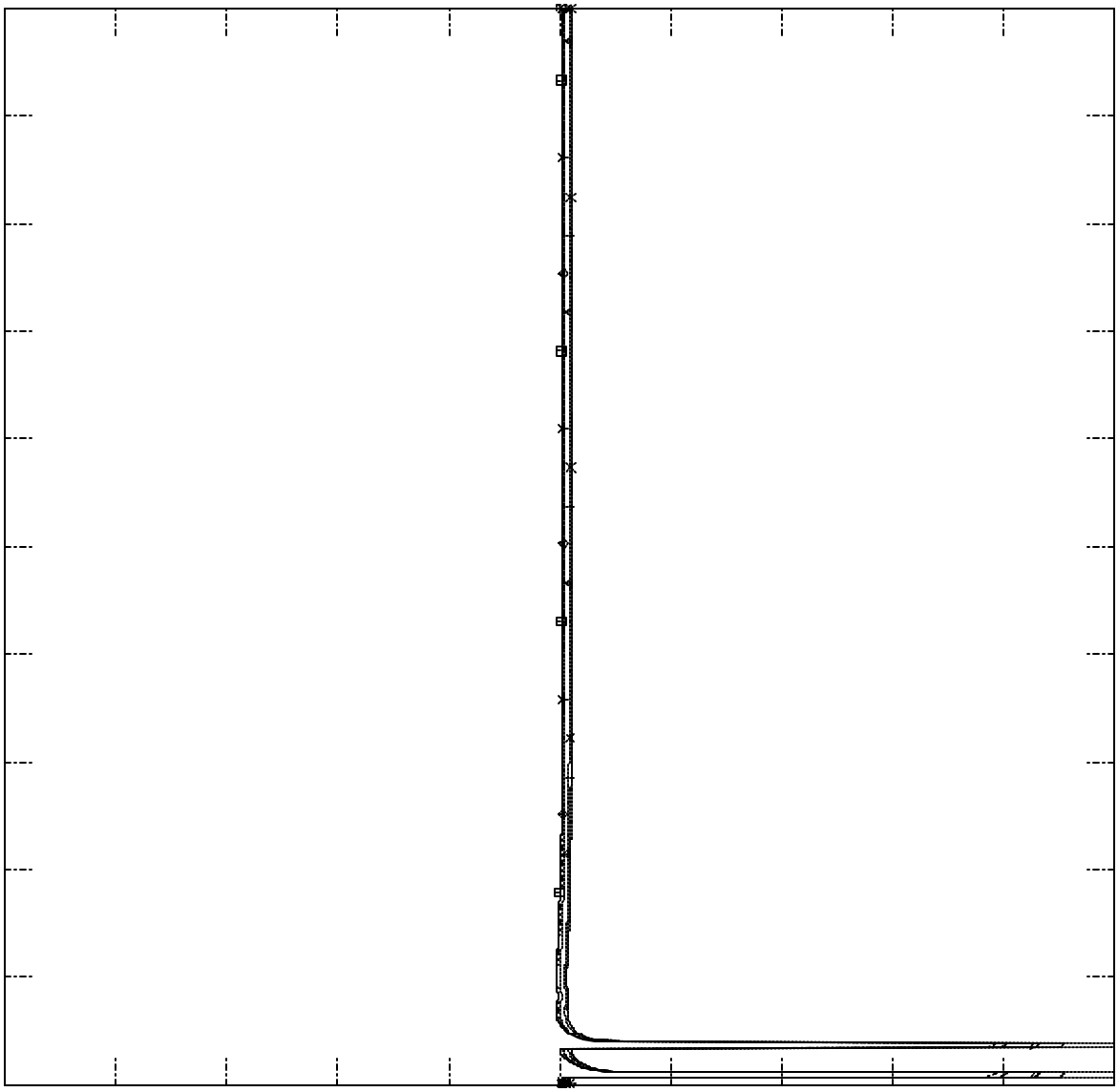

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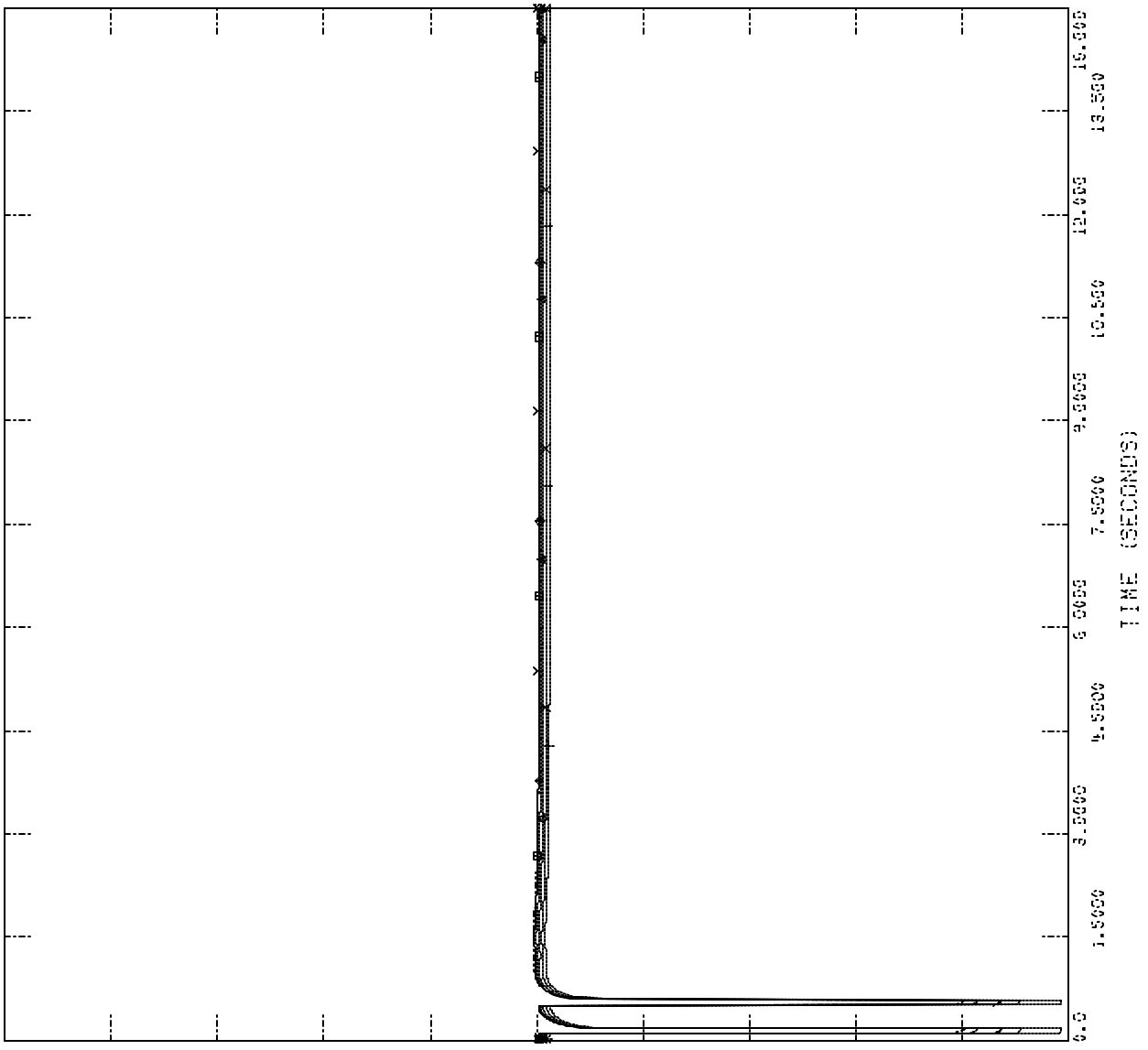

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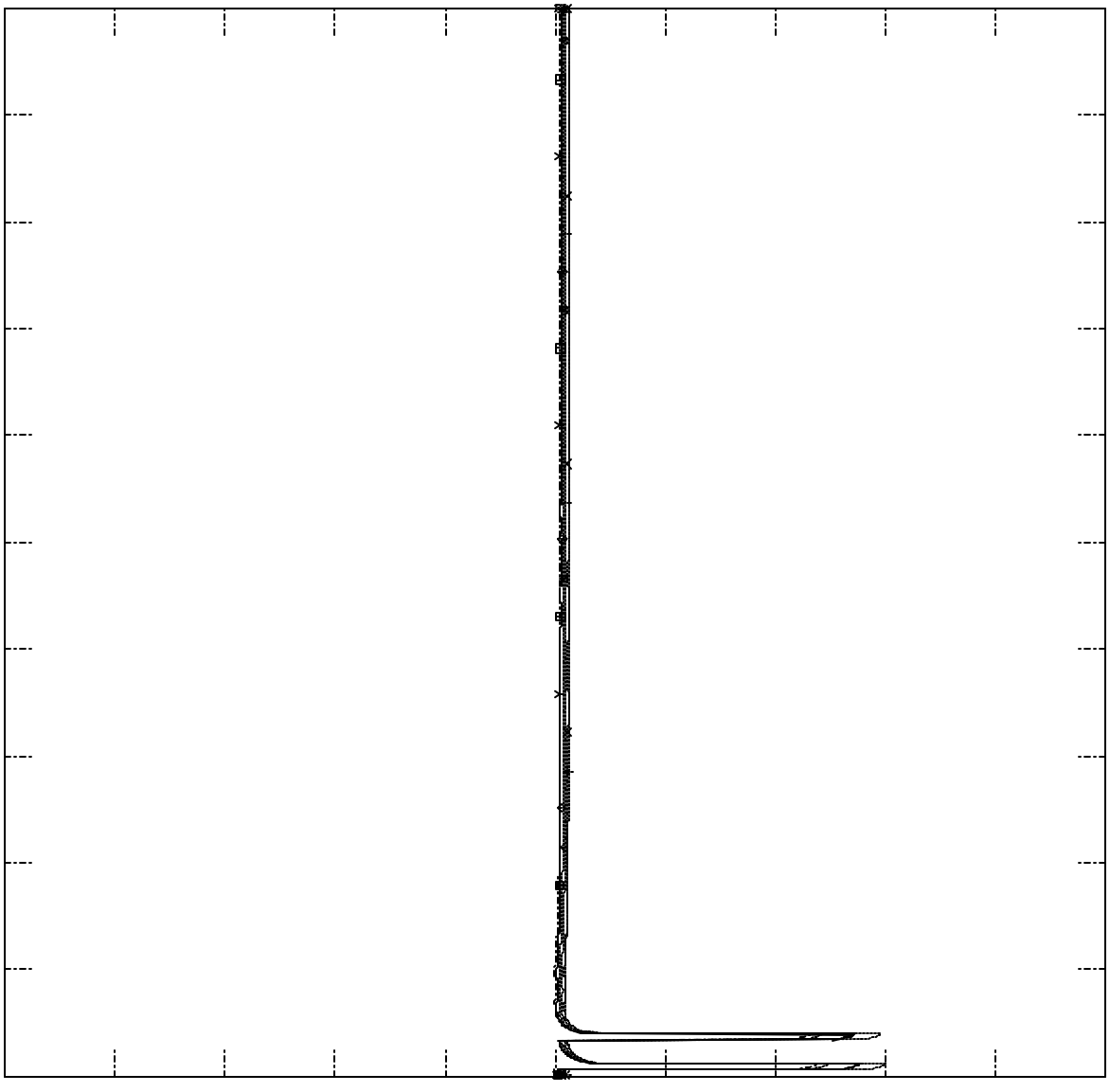

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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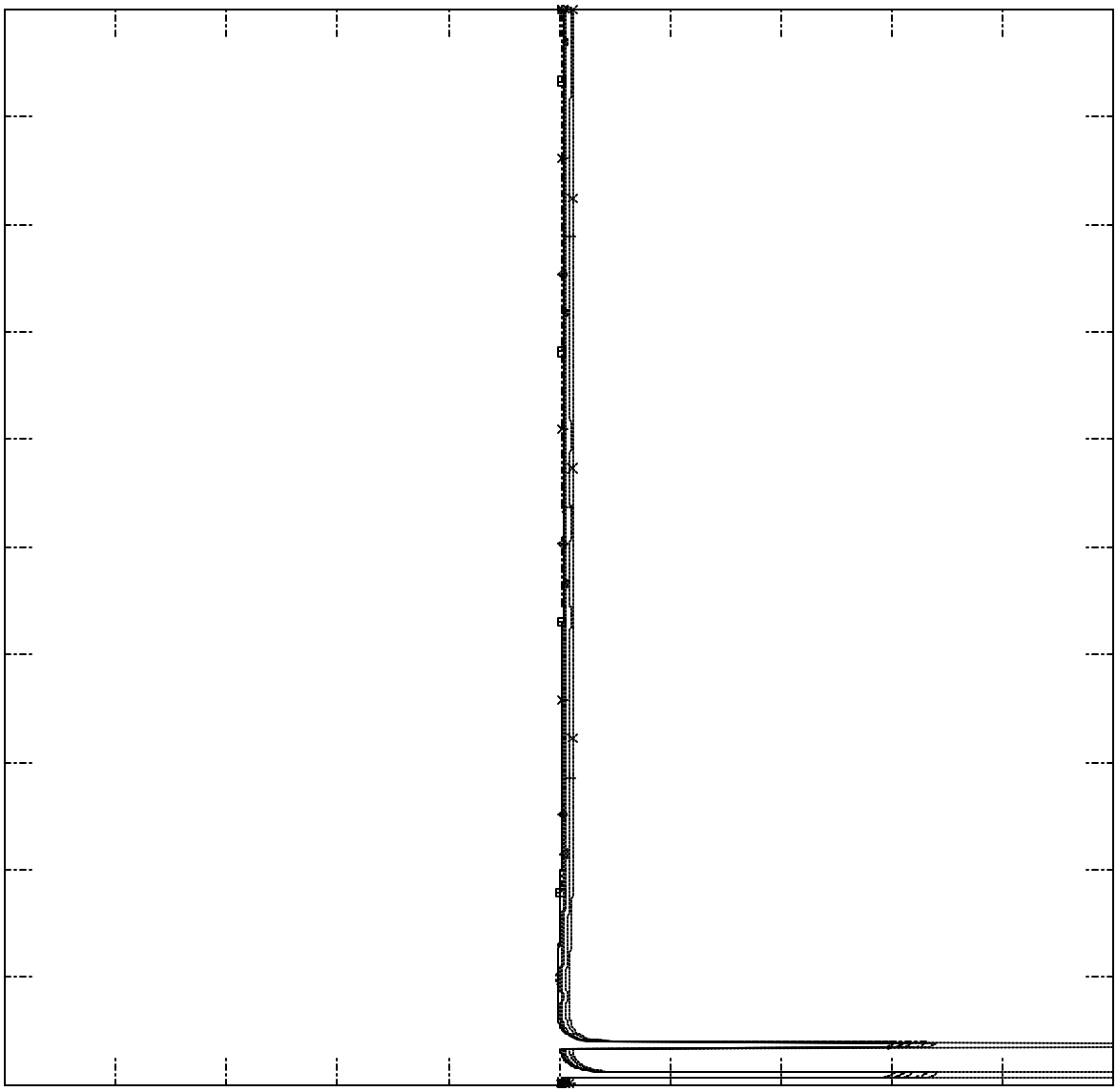

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SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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FLT 8 3PH VOLTAGES

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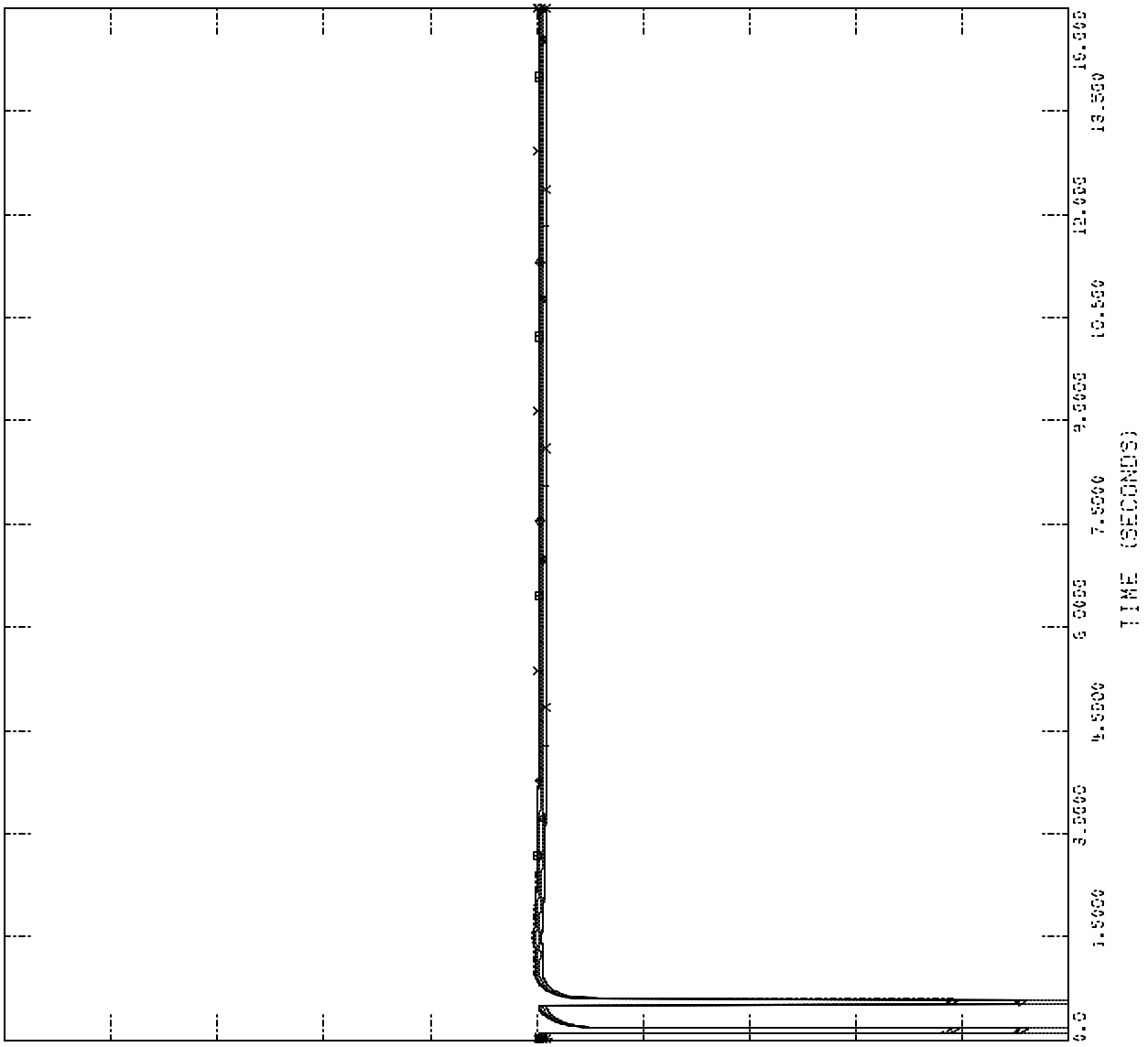

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GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

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FLT 9 VOLTAGES

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CHNL # 348: [VOLTAGE CLAY 161KV]
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CHNL # 347: [VOLTAGE BAKLNE 161KV]
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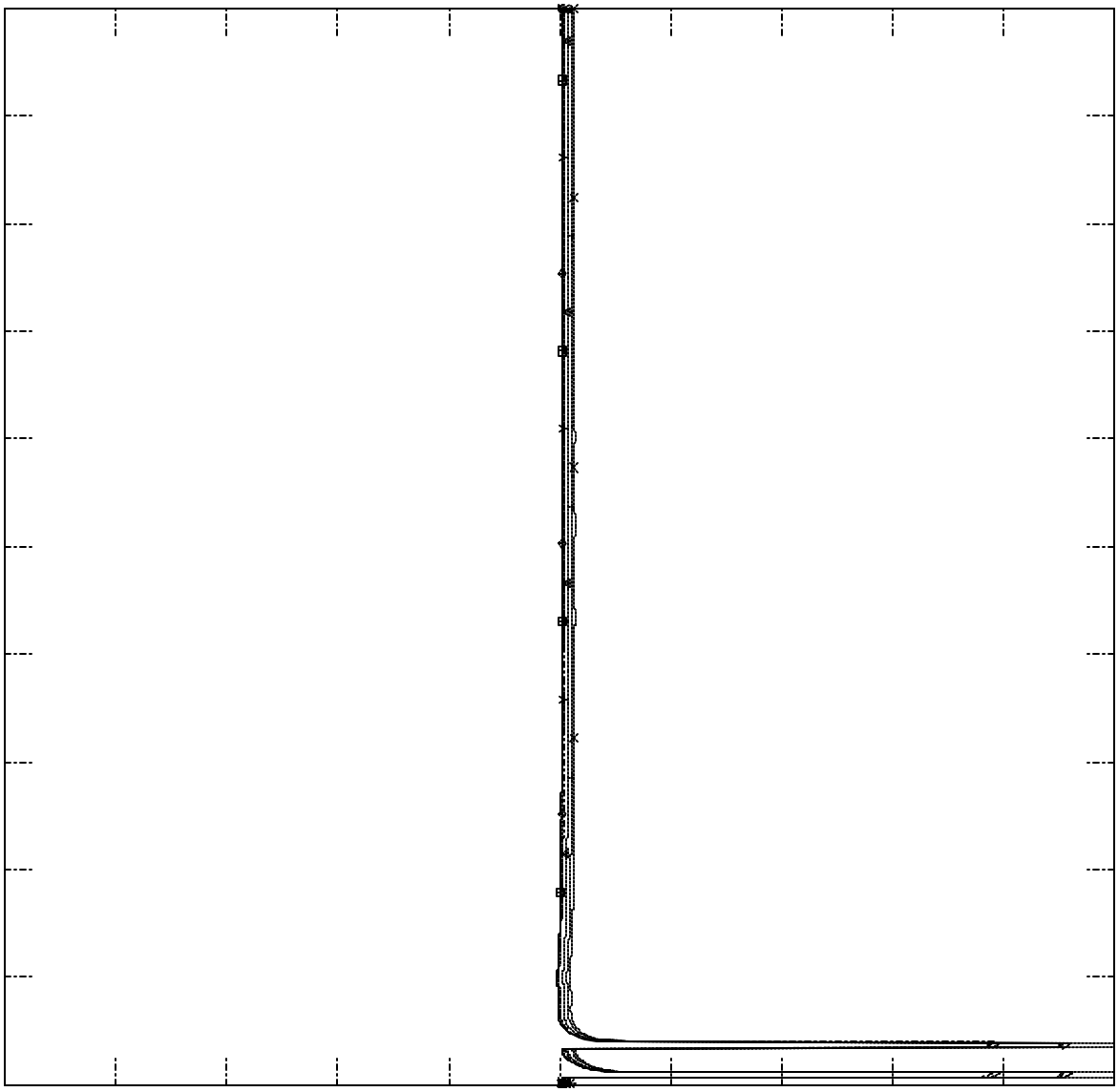


TIME (SECONDS)

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

WED, NOV 03 2004 10:19

FLT 10 VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

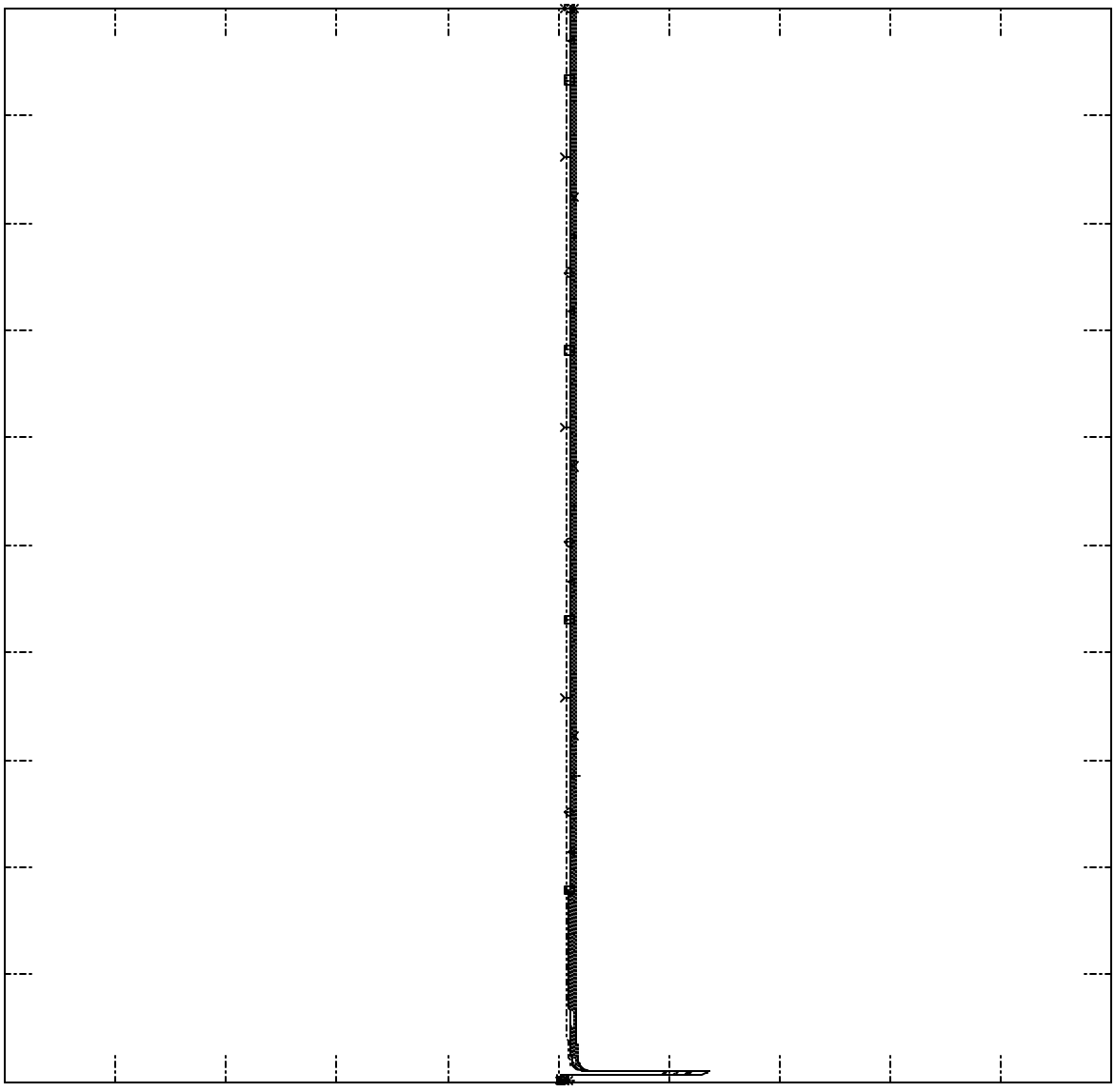
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



Appendix B-1

Plots of Fault Simulations

Plots of selected machine angle response during faults

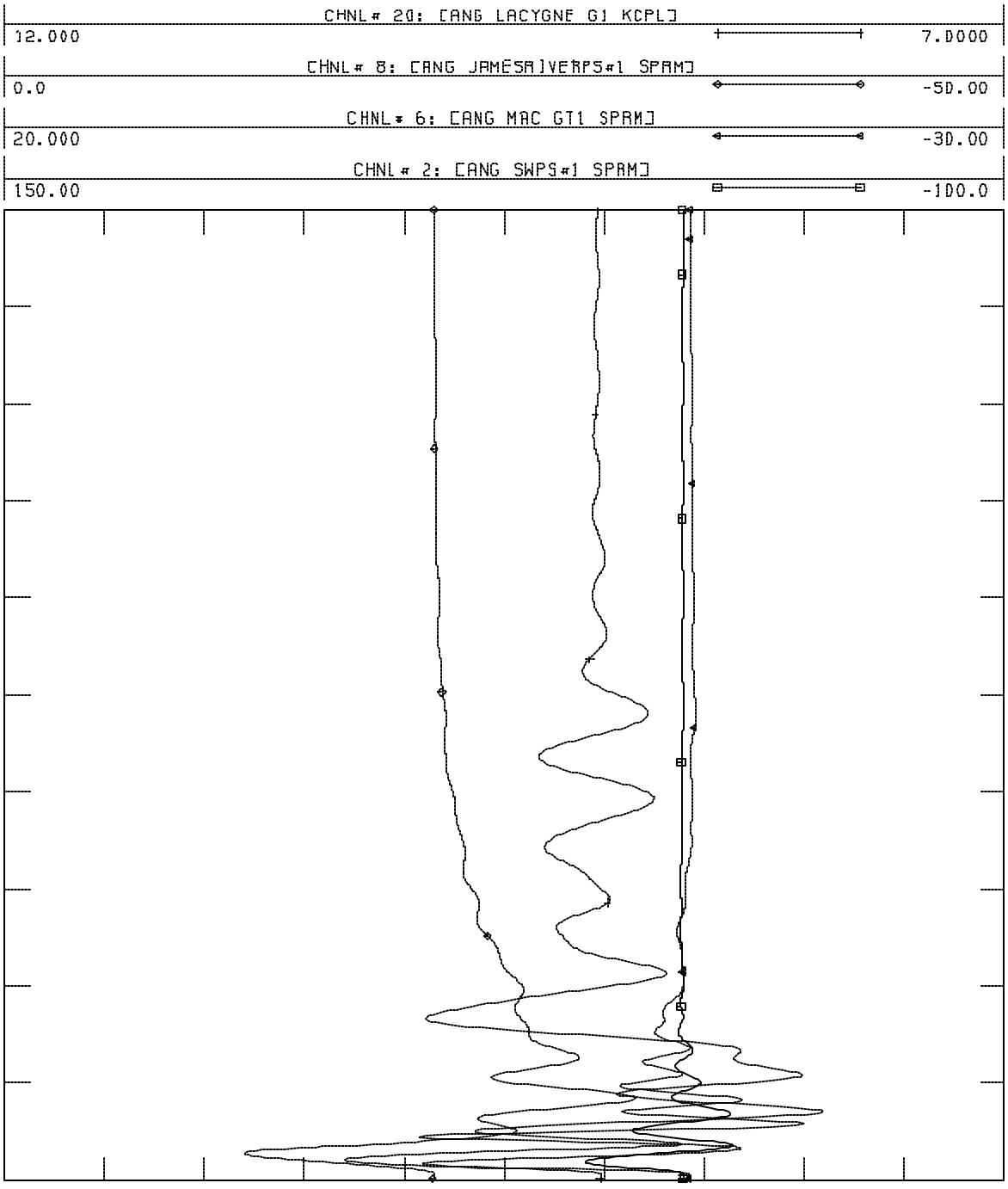
Scenario:
2010 Summer Peak
Basecase_2 (SWPS-Battlefield 161kV in service)
[No Customer Plant – No Network Upgrades]

SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_1_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_1_3PH_MACHINE ANGLES

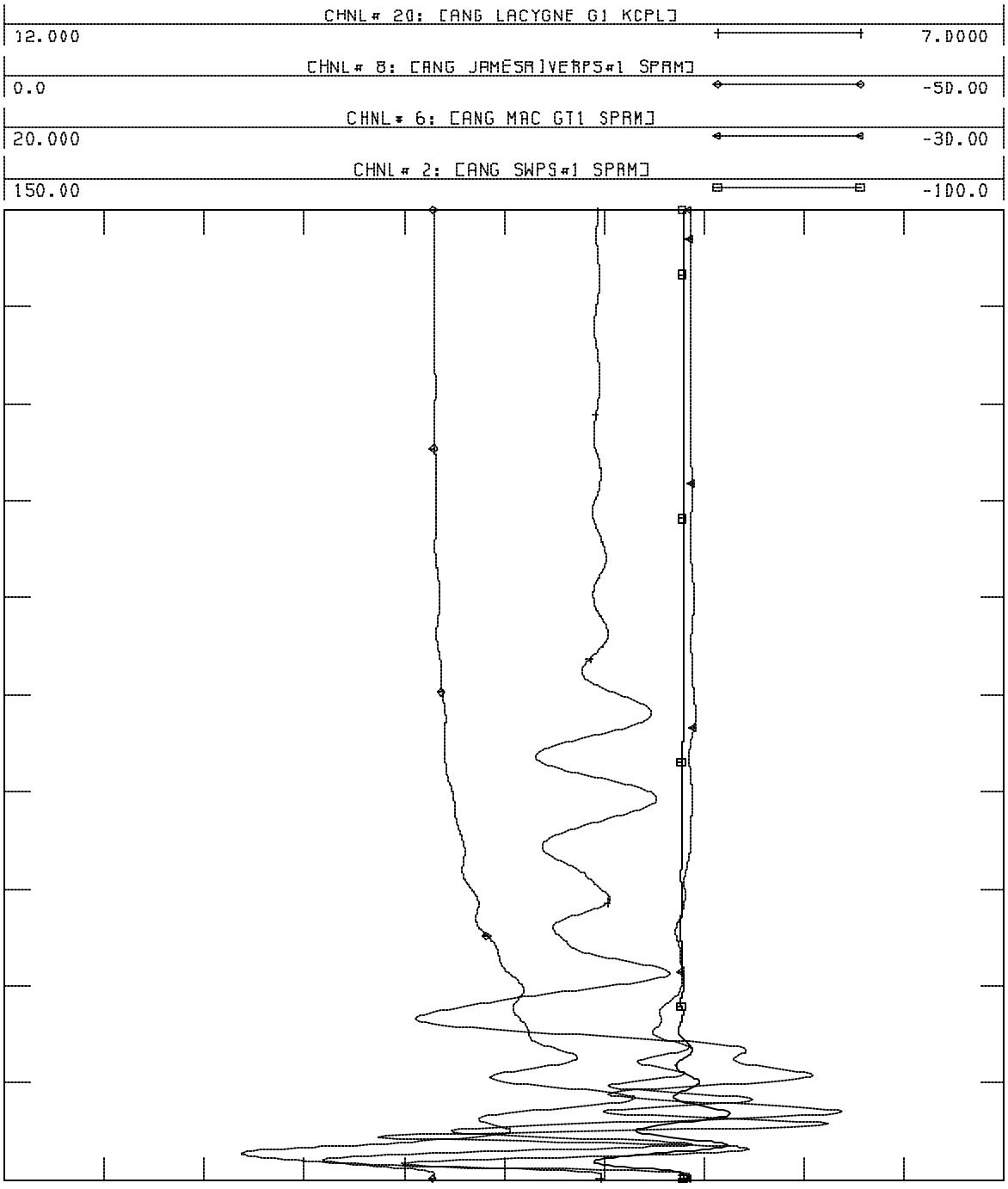


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_2_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_2_3PH_MACHINE ANGLES

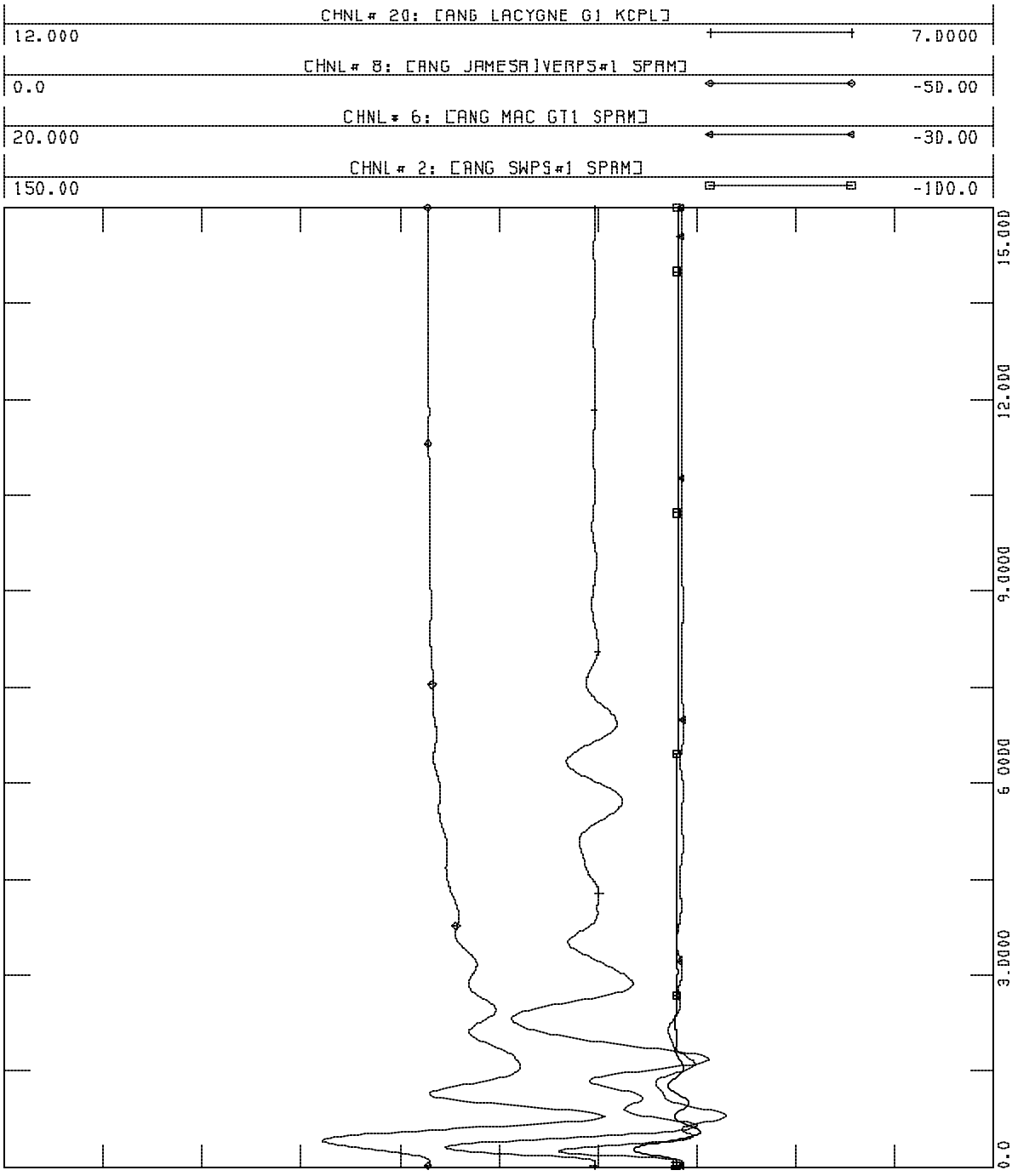


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_3_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_3_3PH_MACHINE ANGLES

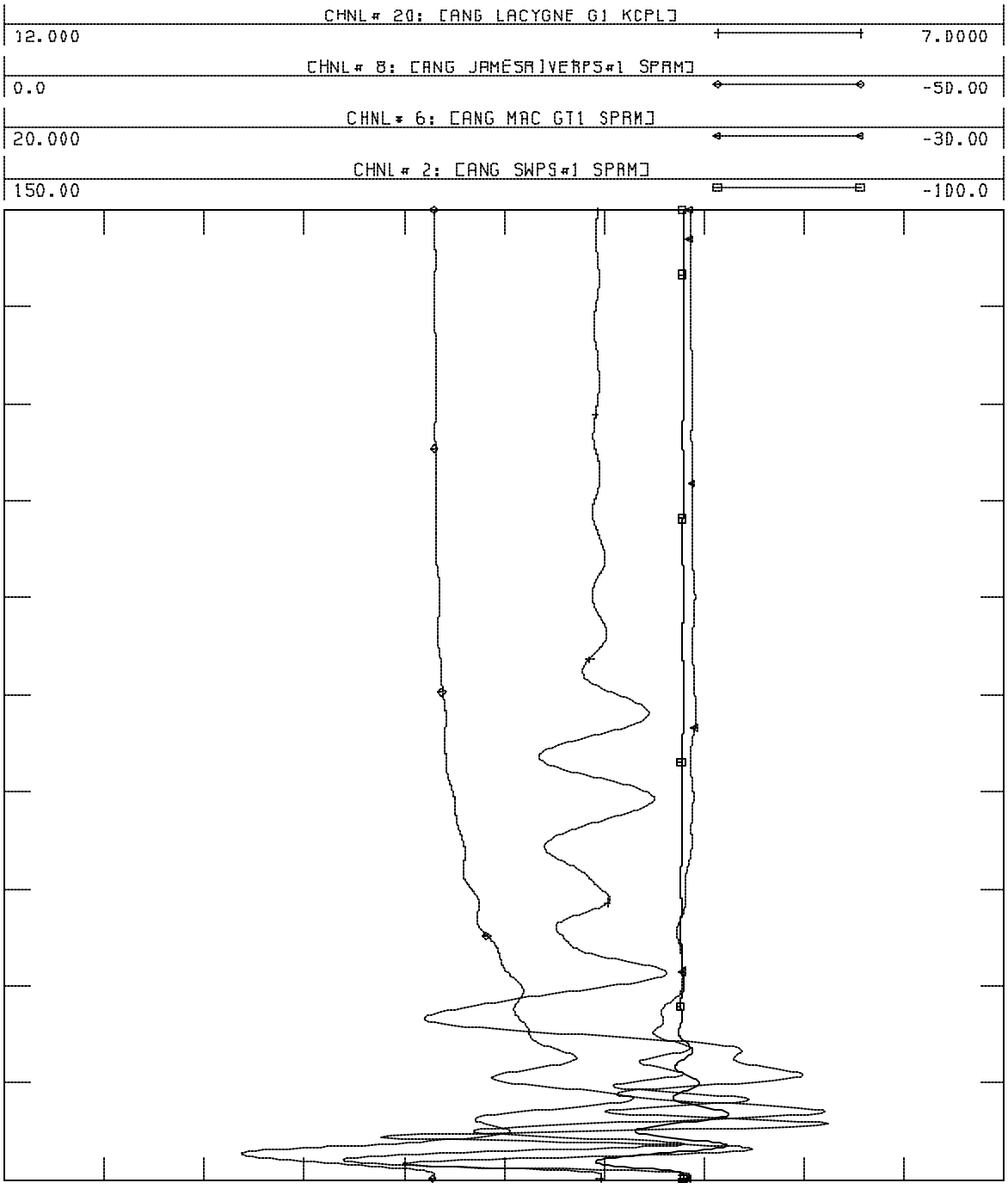


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_4_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_4_3PH_MACHINE ANGLES

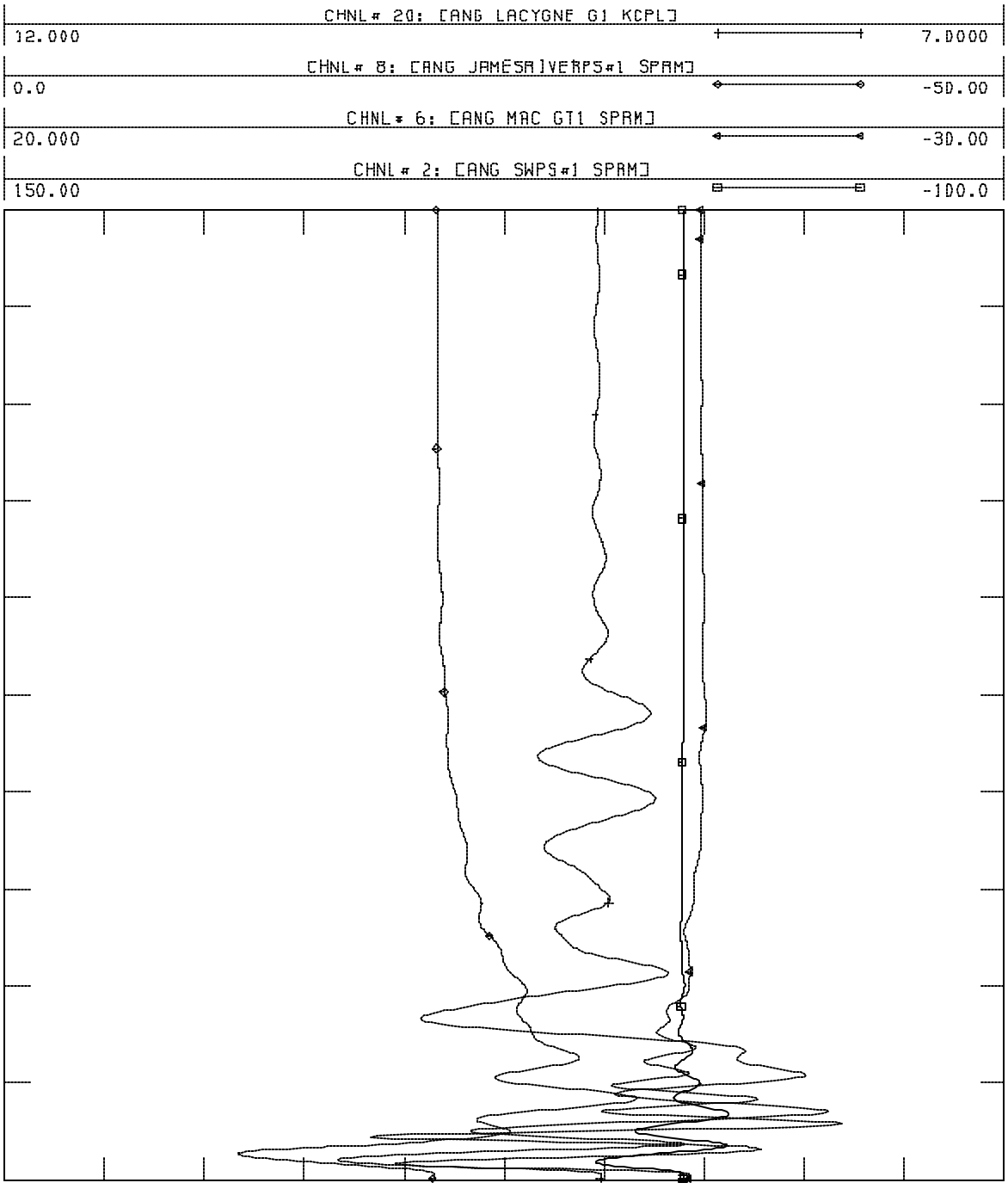


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_5_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_5_3PH_MACHINE ANGLES

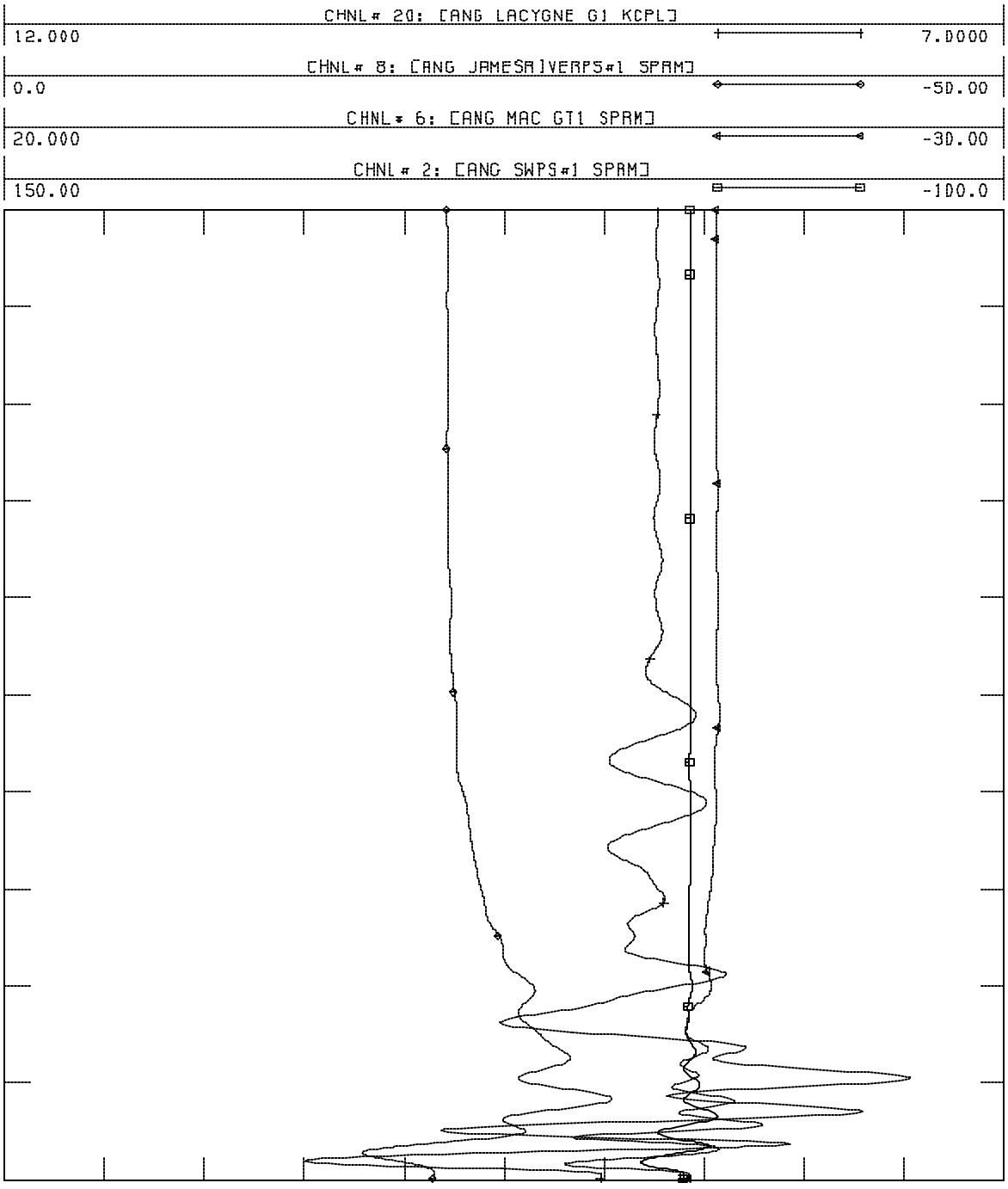


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_6_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_6_3PH_MACHINE ANGLES

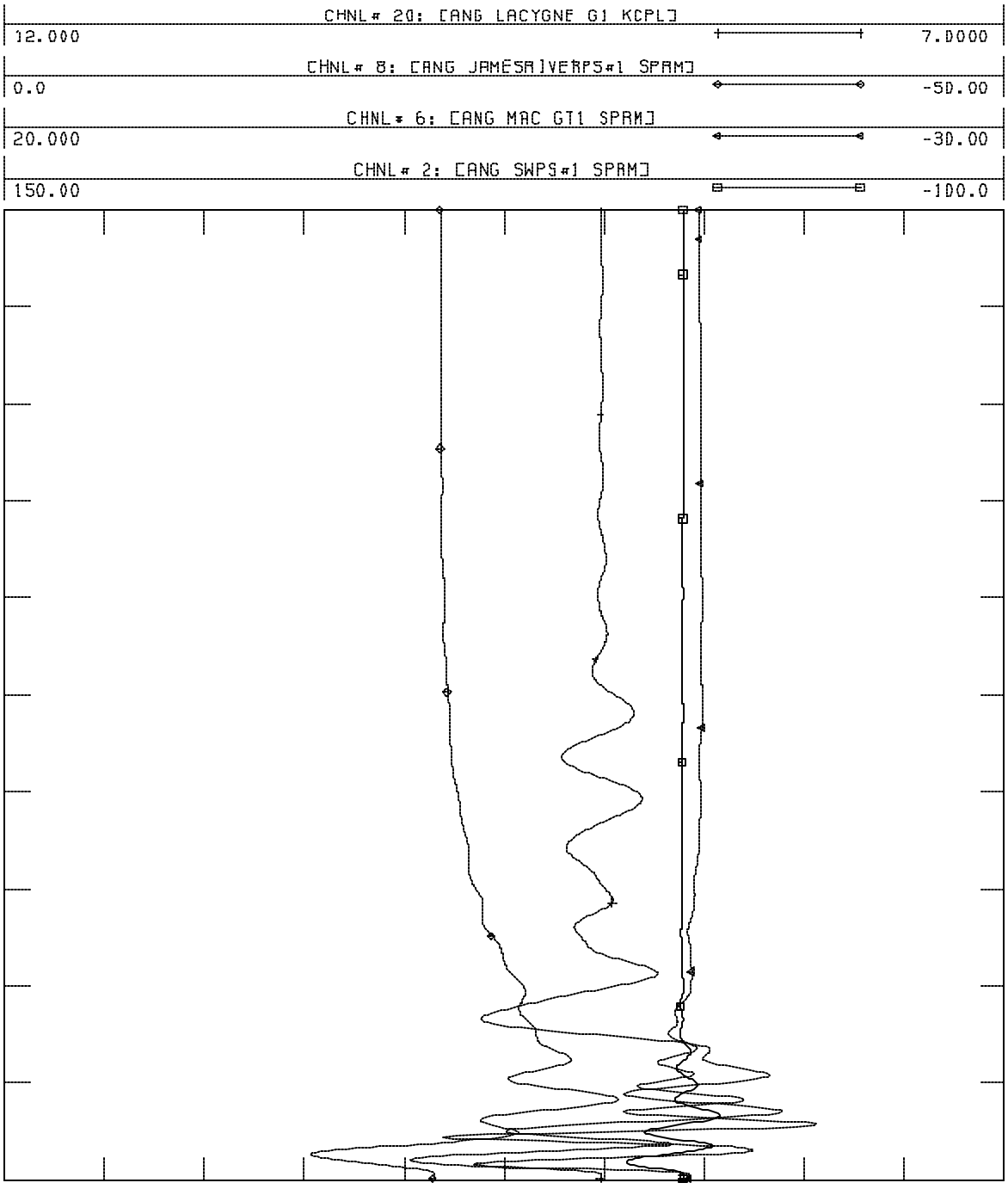


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_7_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_7_3PH_MACHINE ANGLES

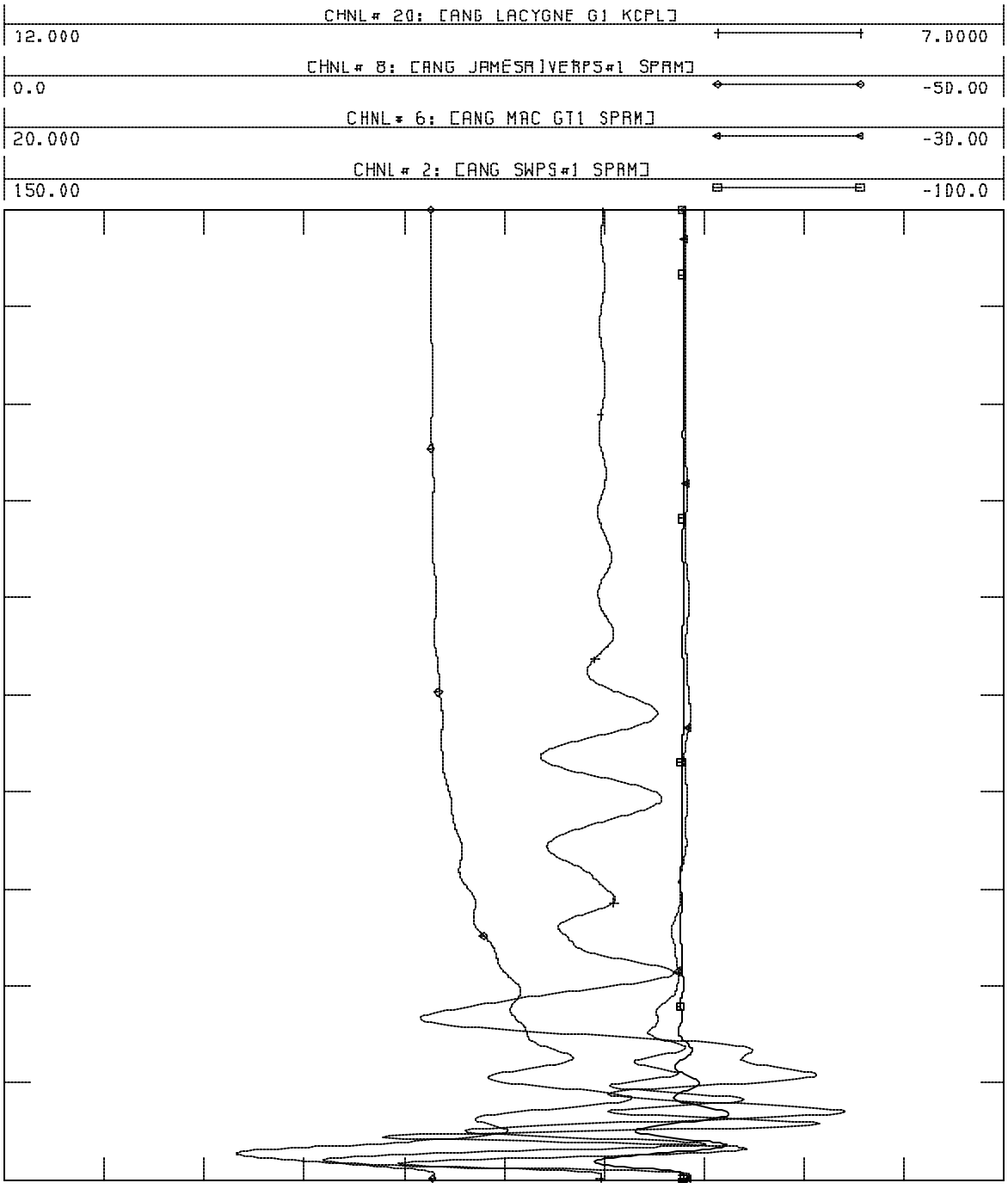


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_8_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_8_3PH_MACHINE ANGLES

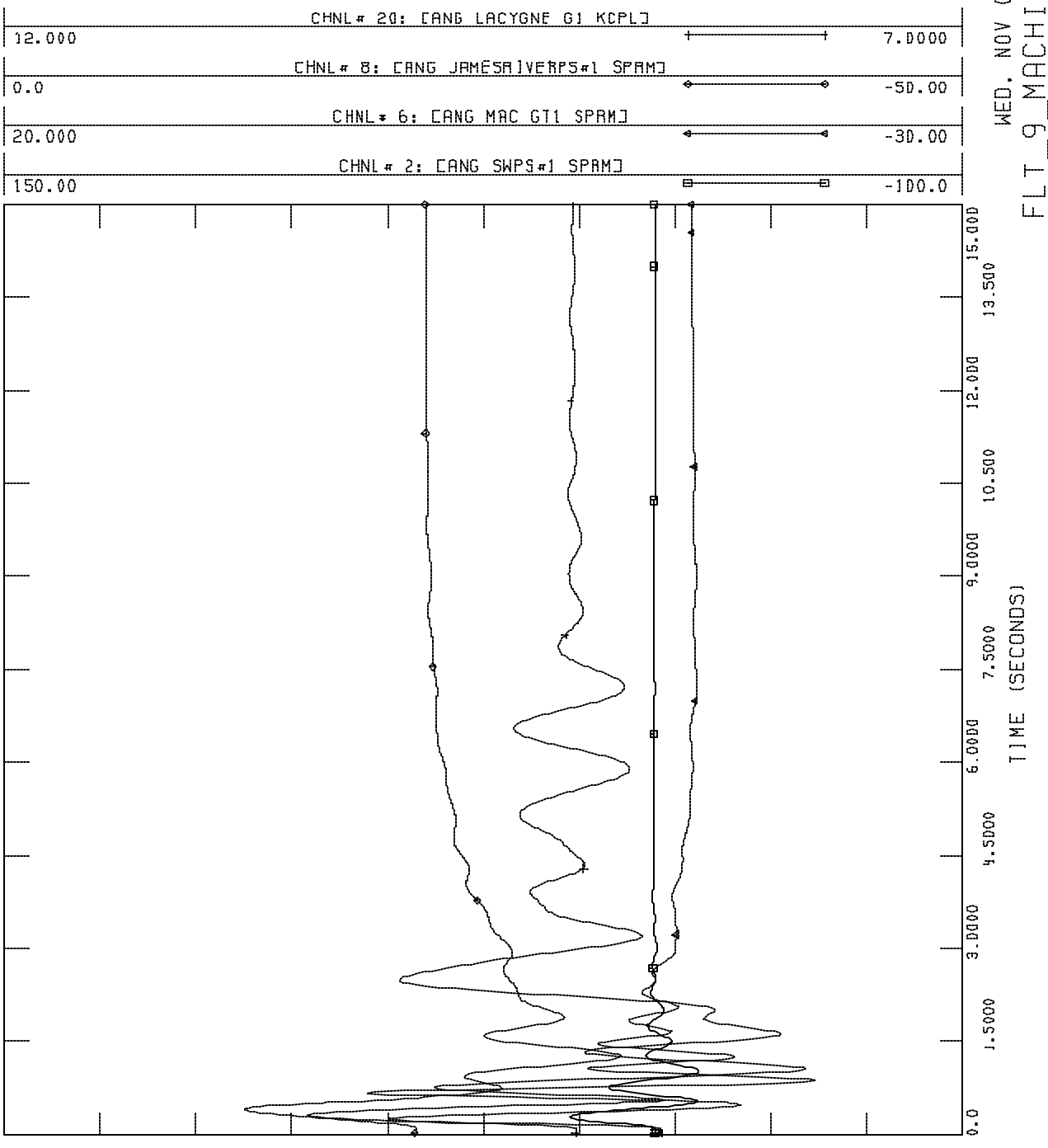


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_9_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_9_MACHINE ANGLES

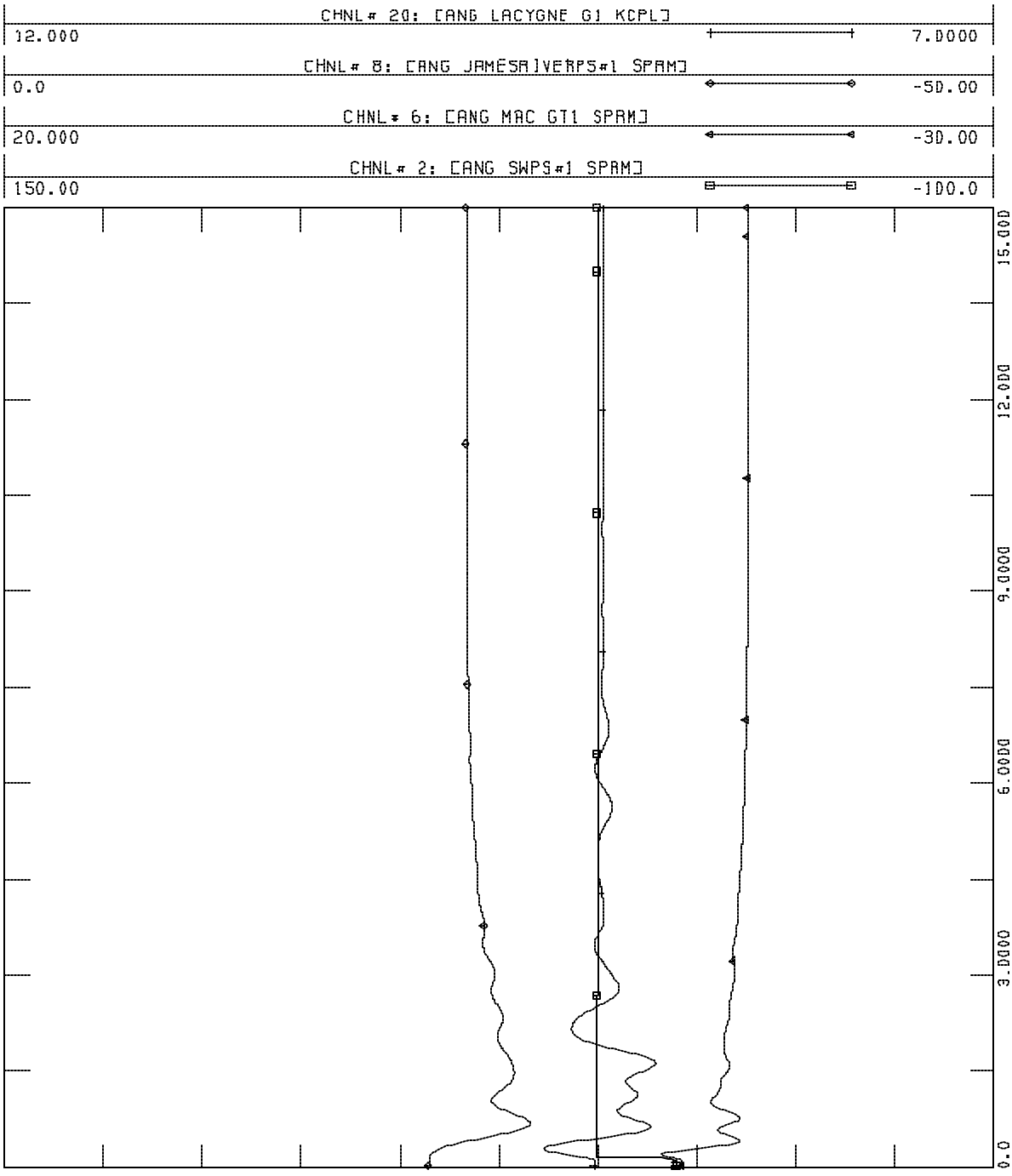


SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

WED. NOV 03 2004 13:31

FLT_10_MACHINE ANGLES

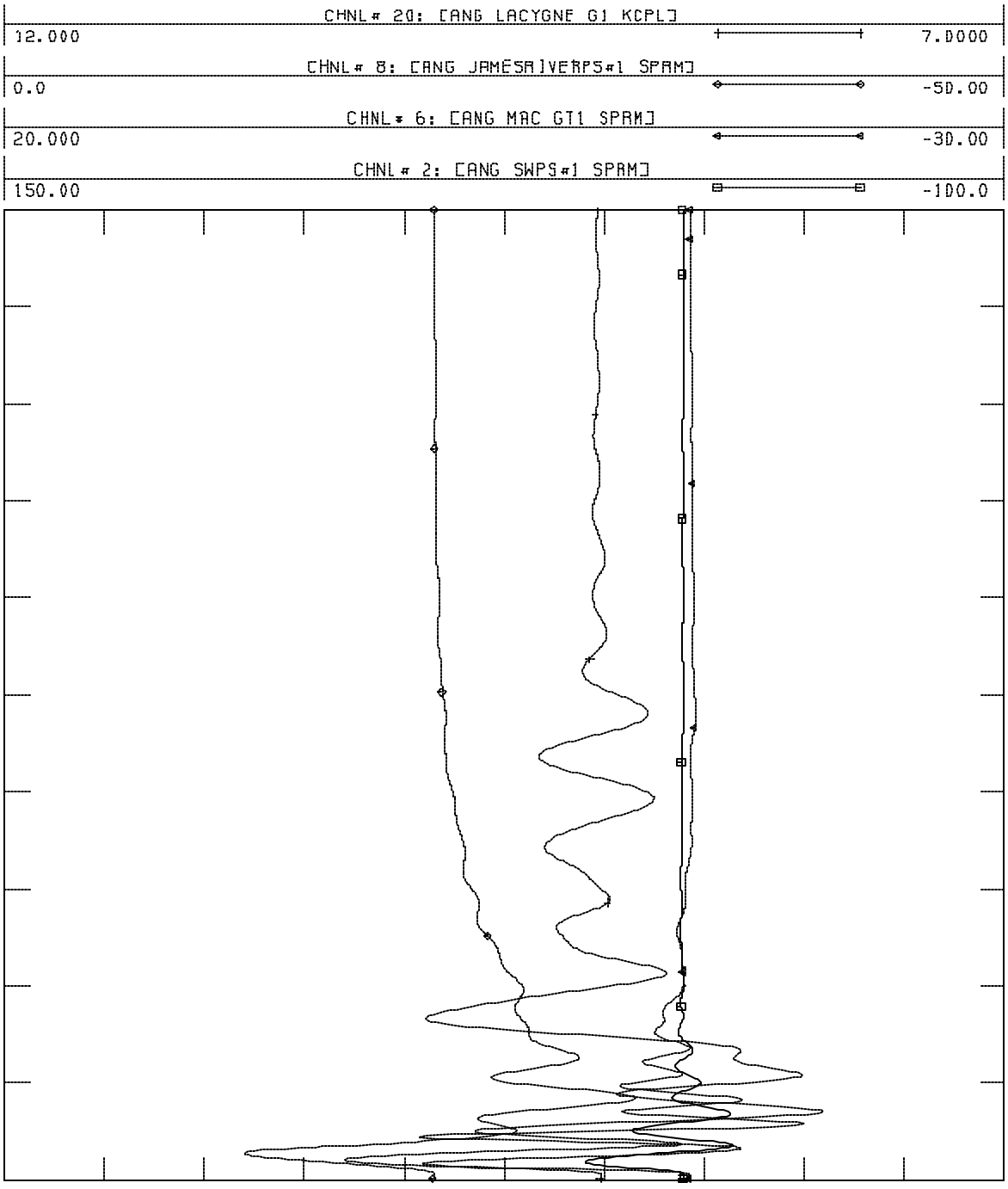


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_12_3_PH.OUT

WED. NOV 03 2004 13:31

FLT_12_3PH_MACHINE ANGLES



Appendix B-2

Plots of Fault Simulations

Plots of selected bus voltage response during faults

Scenario:
2010 Summer Peak
Basecase_2 (SWPS-Battlefield 161kV in service)
[No Customer Plant – No Network Upgrades]

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_1_3_PH.OUT

WED, NOV 03 2004 13:25

FLT 1 3PH VOLTAGES

CHNL # 356: EVOLTAGE GOLDEN 69KV]

2.0000 0.0

CHNL # 338: EVOLTAGE MAIN 161KV]

2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]

2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]

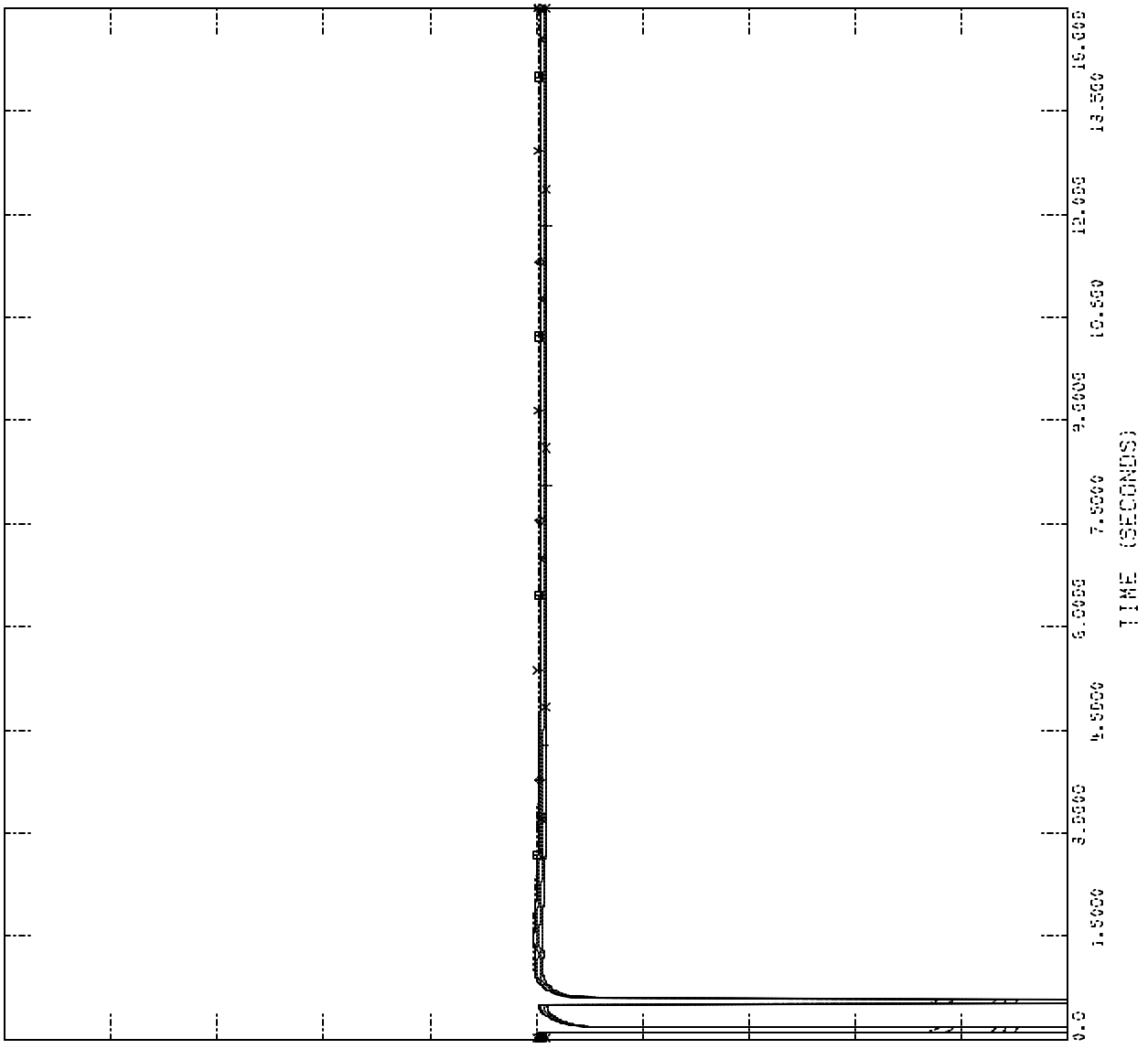
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]

2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]

2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_2_3_PH.OUT

FLT 2 3PH VOLTAGES
WED, NOV 03 2004 13:25

CHNL # 356: EVOLTAGE GOLDEN 69KV]
2.0000 0.0

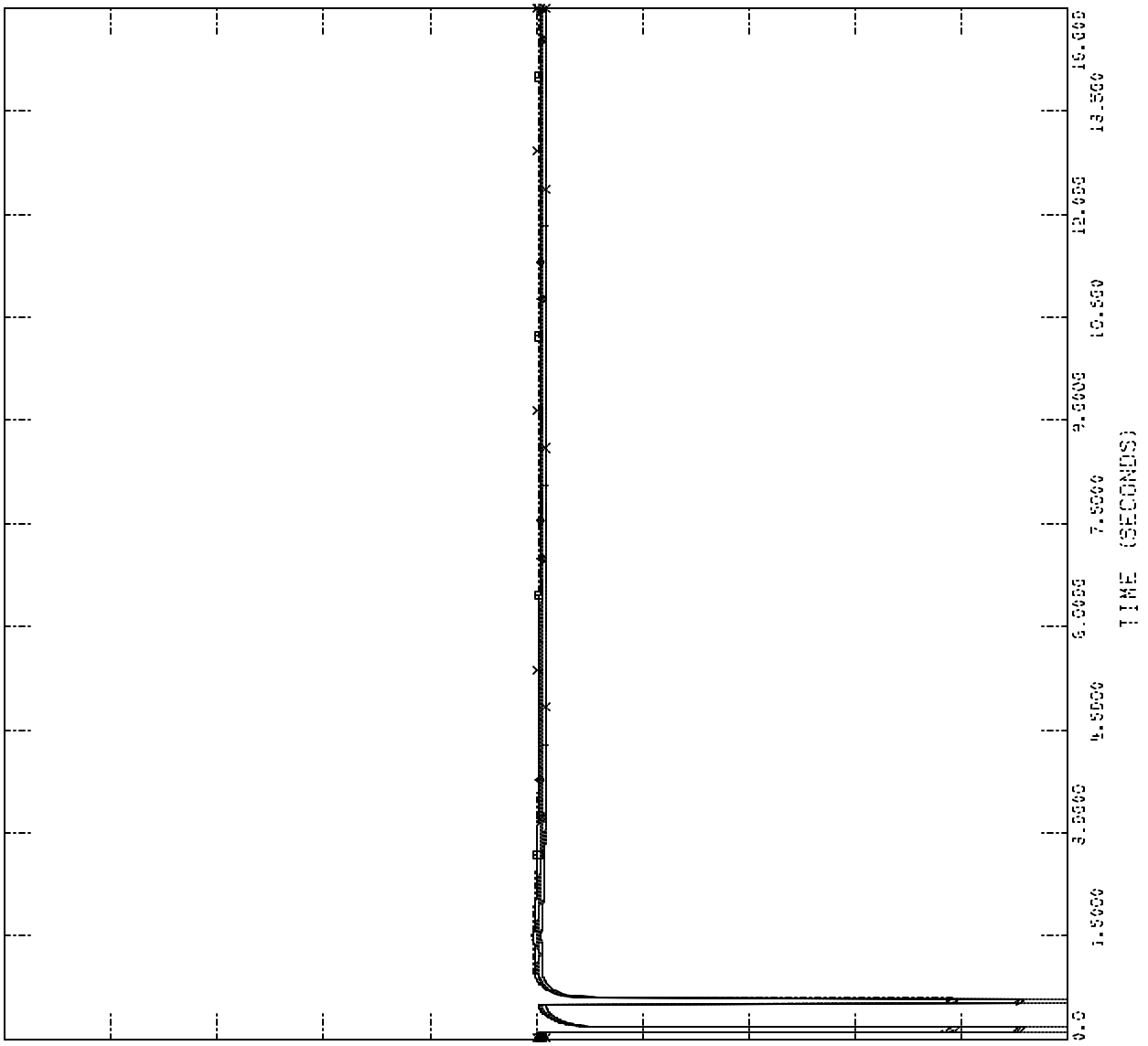
CHNL # 338: EVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_3_3_PH.OUT

CHNL # 356: EVOLTAGE GOLDEN 69KV]
2.0000 0.0

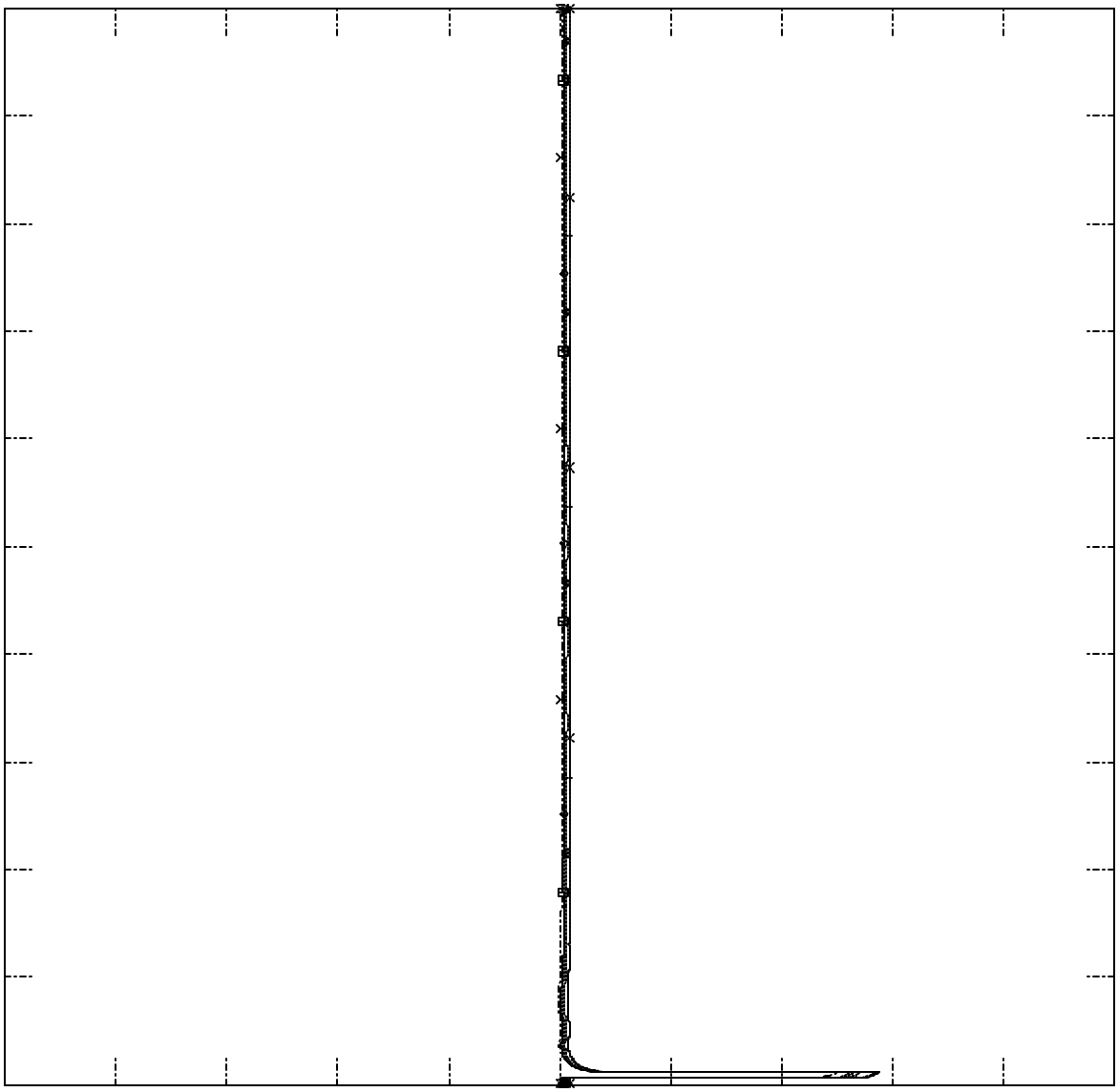
CHNL # 338: EVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]
2.0000 0.0

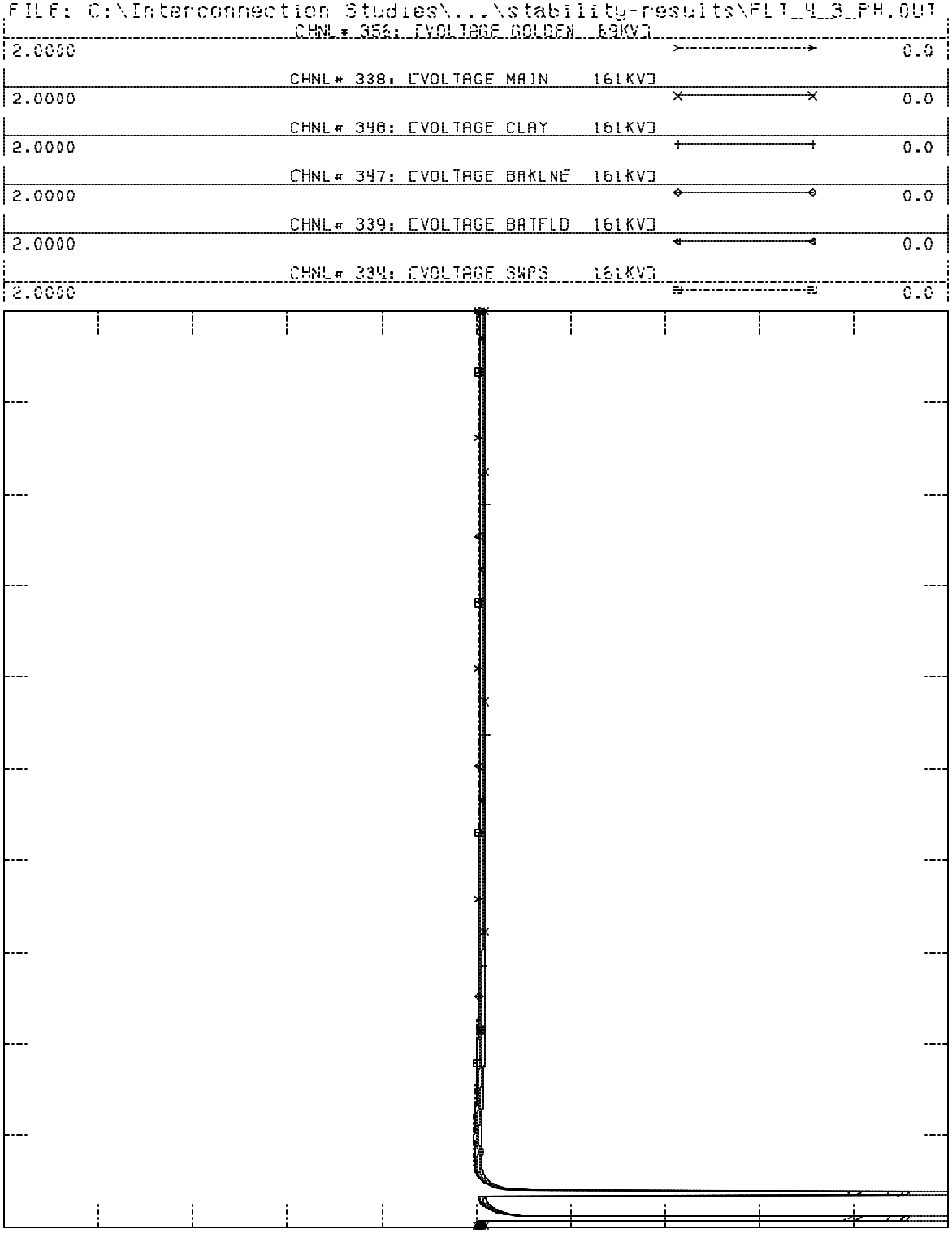
CHNL # 334: EVOLTAGE SWPS 161KV]
2.0000 0.0



FLT_3_3PH_VOLTAGES
WED, NOV 03 2004 13:25

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_4_3_PH.OUT



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_S_3_PH.OUT

WED, NOV 03 2004 13:25

FLT_S_3PH_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

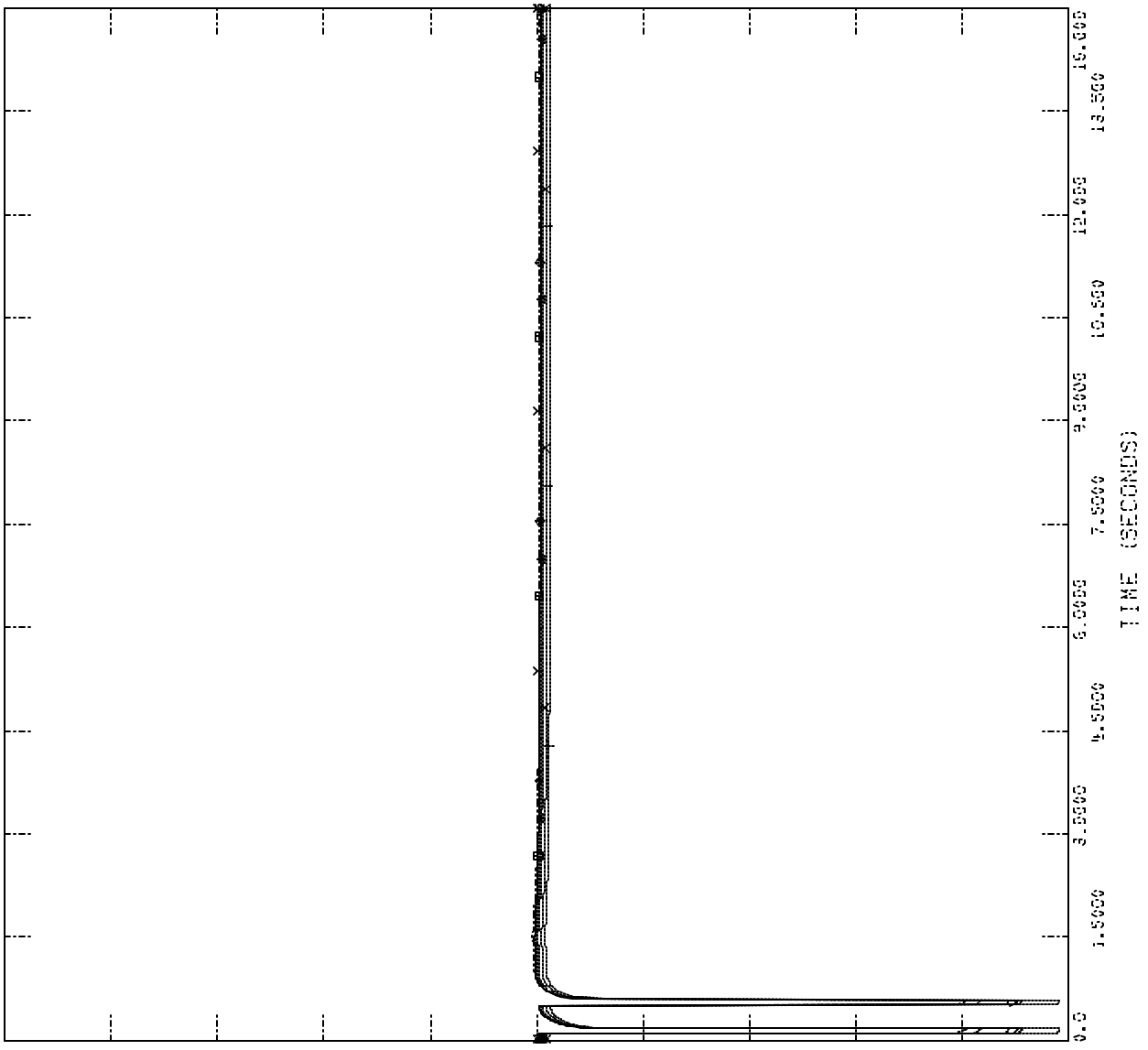
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_6_3PH.OUT

CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000 0.0

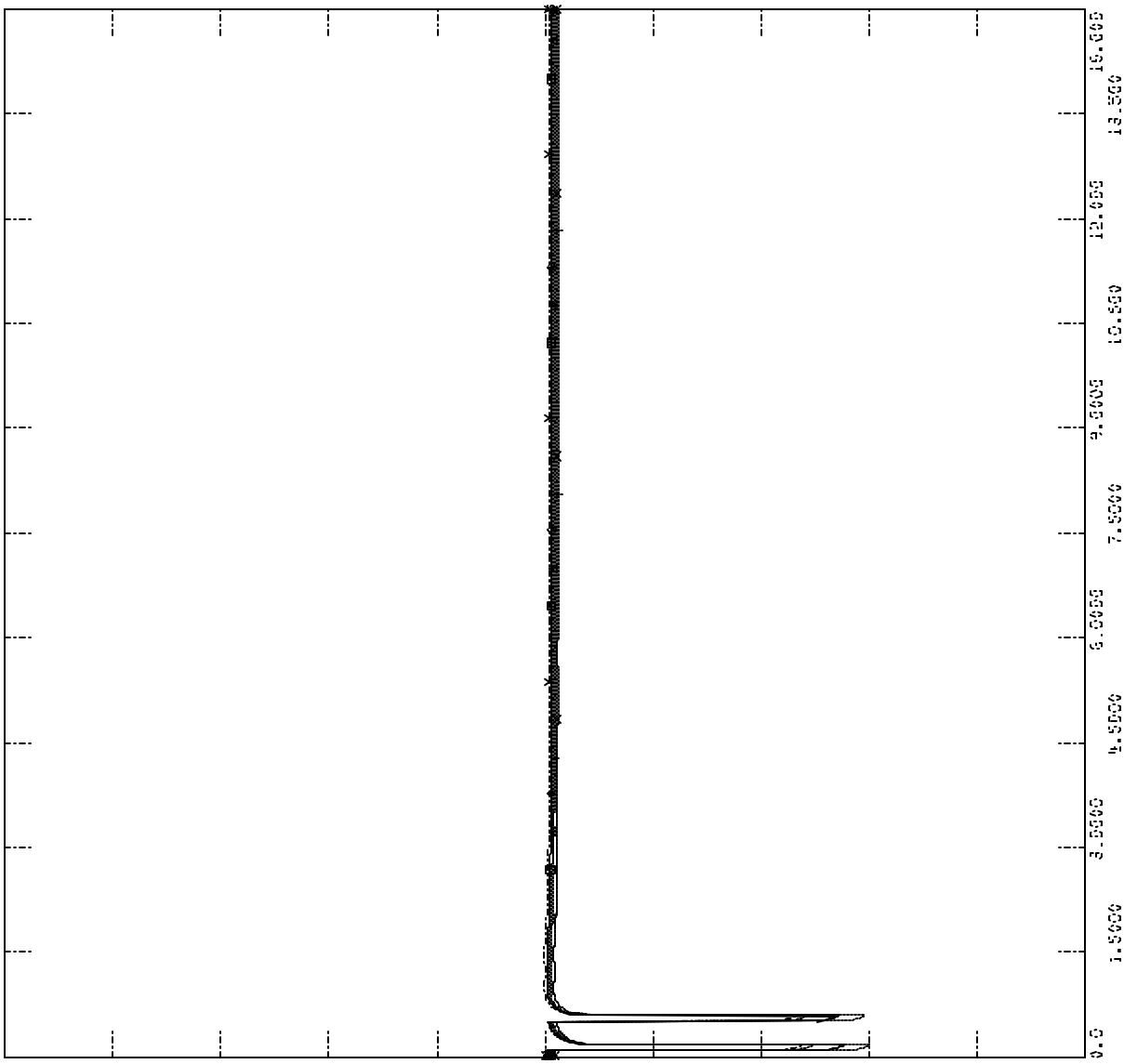
CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000 0.0



FLT_6_3PH_VOLTAGES
WED, NOV 03 2004 13:25

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_7_3PH.OUT

CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000 0.0

CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000 0.0

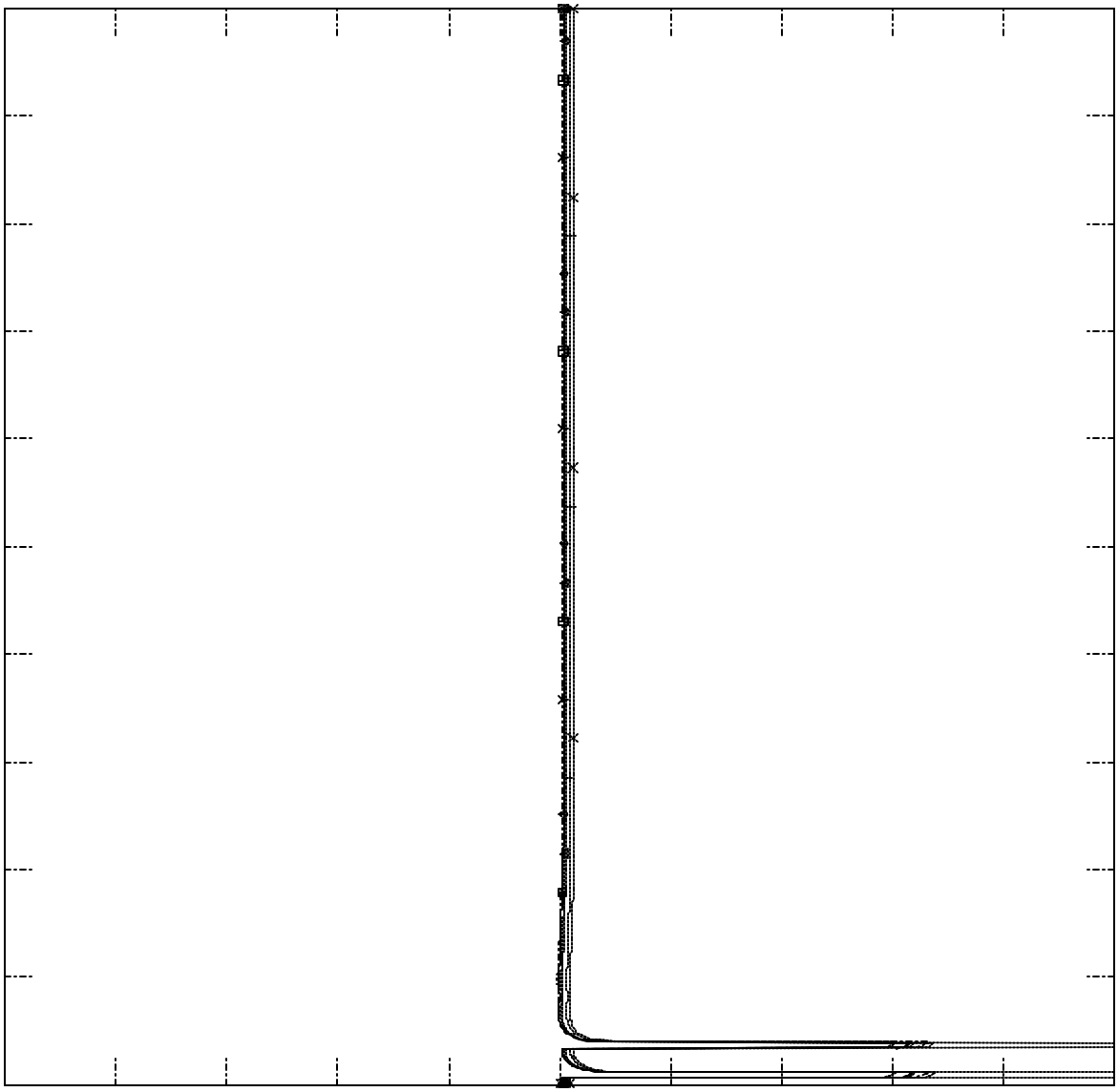
CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000 0.0

FLT_7_3PH_VOLTAGES
WED, NOV 03 2004 13:25



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_8_3_PH.OUT

WED, NOV 03 2004 13:25

FLT 8 3PH VOLTAGES

CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000 0.0

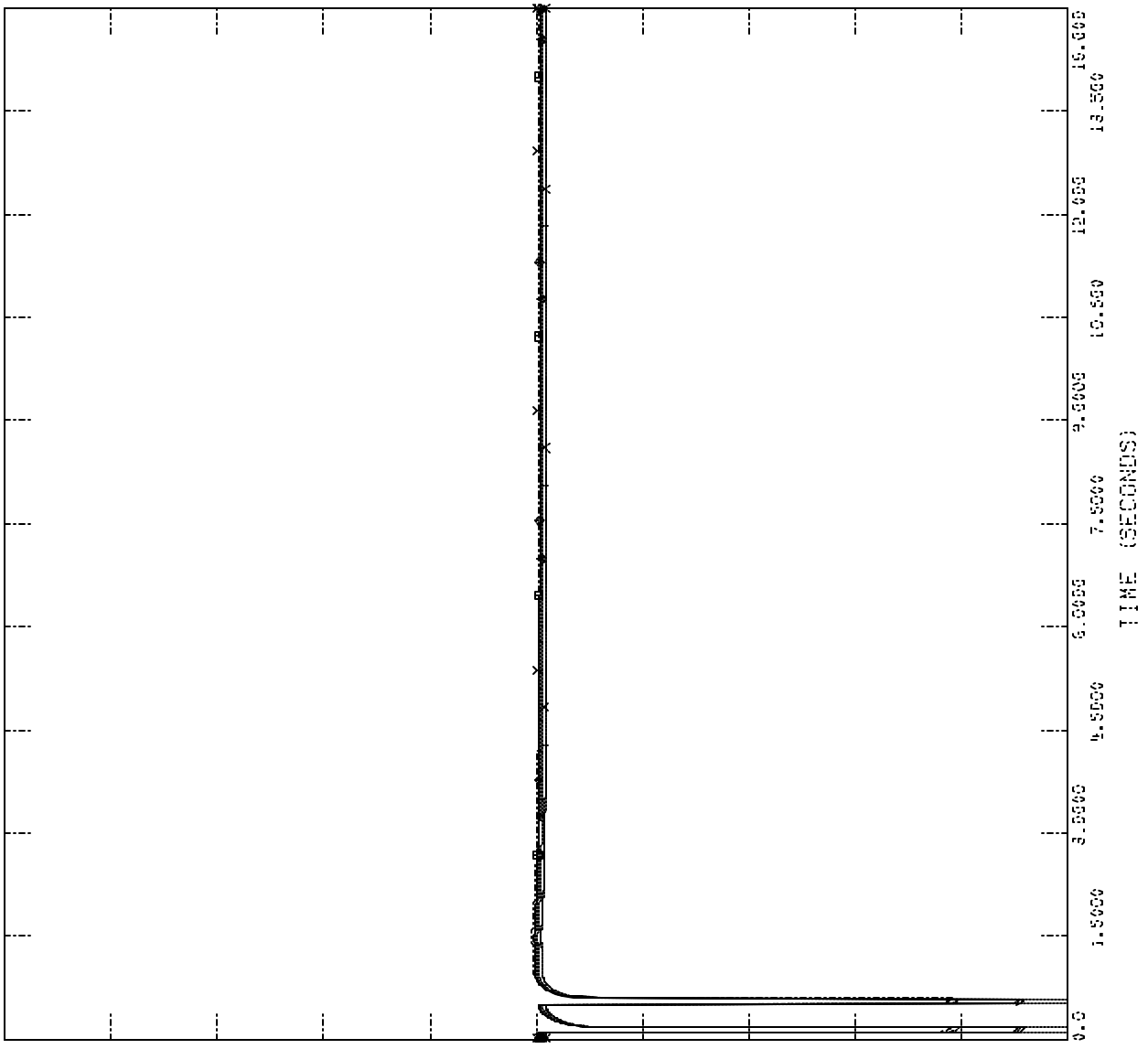
CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000 0.0

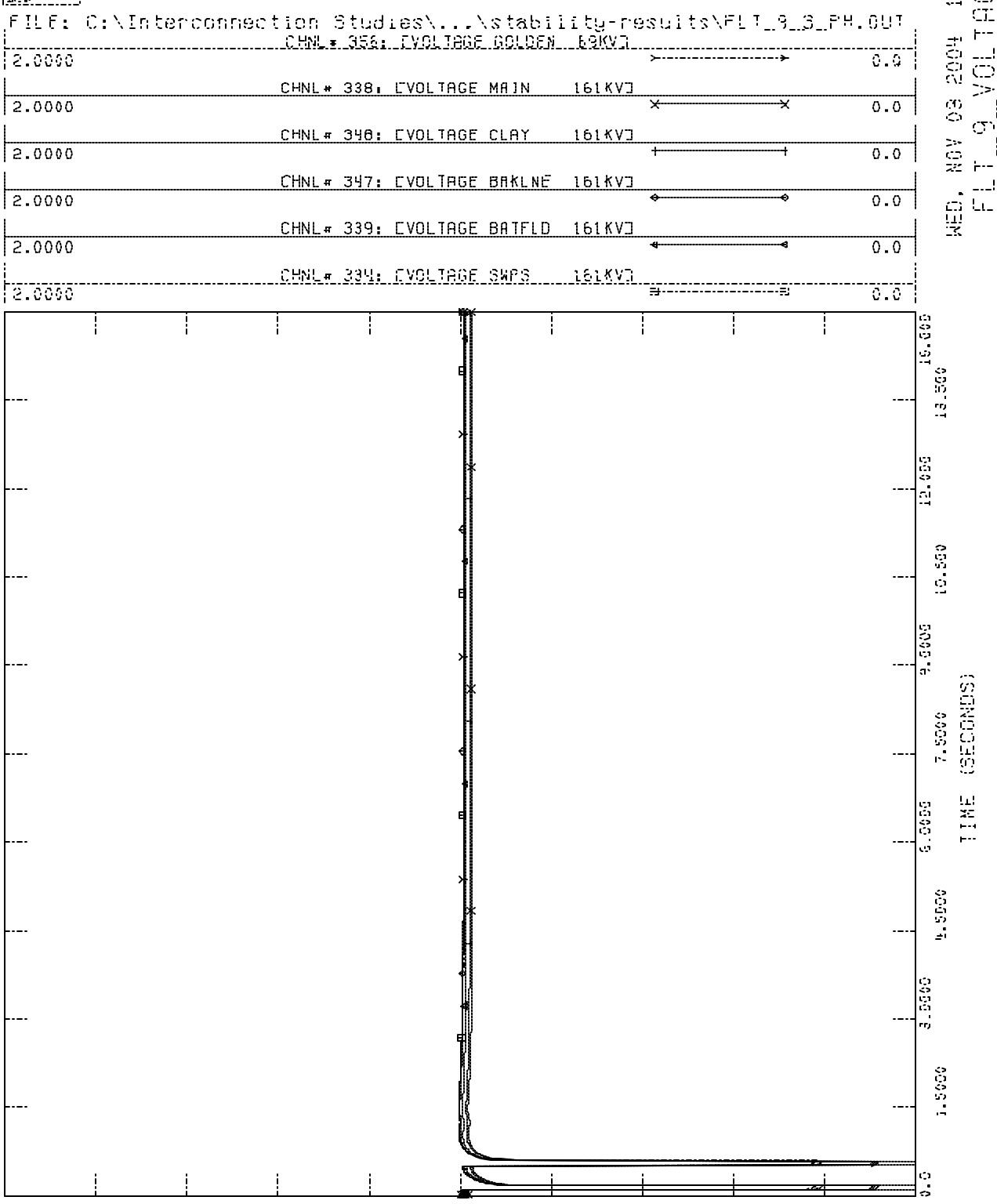
CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_9_3_PH.OUT

WED, NOV 03 2004 13:25
FLT_9_VOLTAGES



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

WED, NOV 03 2004 13:25
FLT_10_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

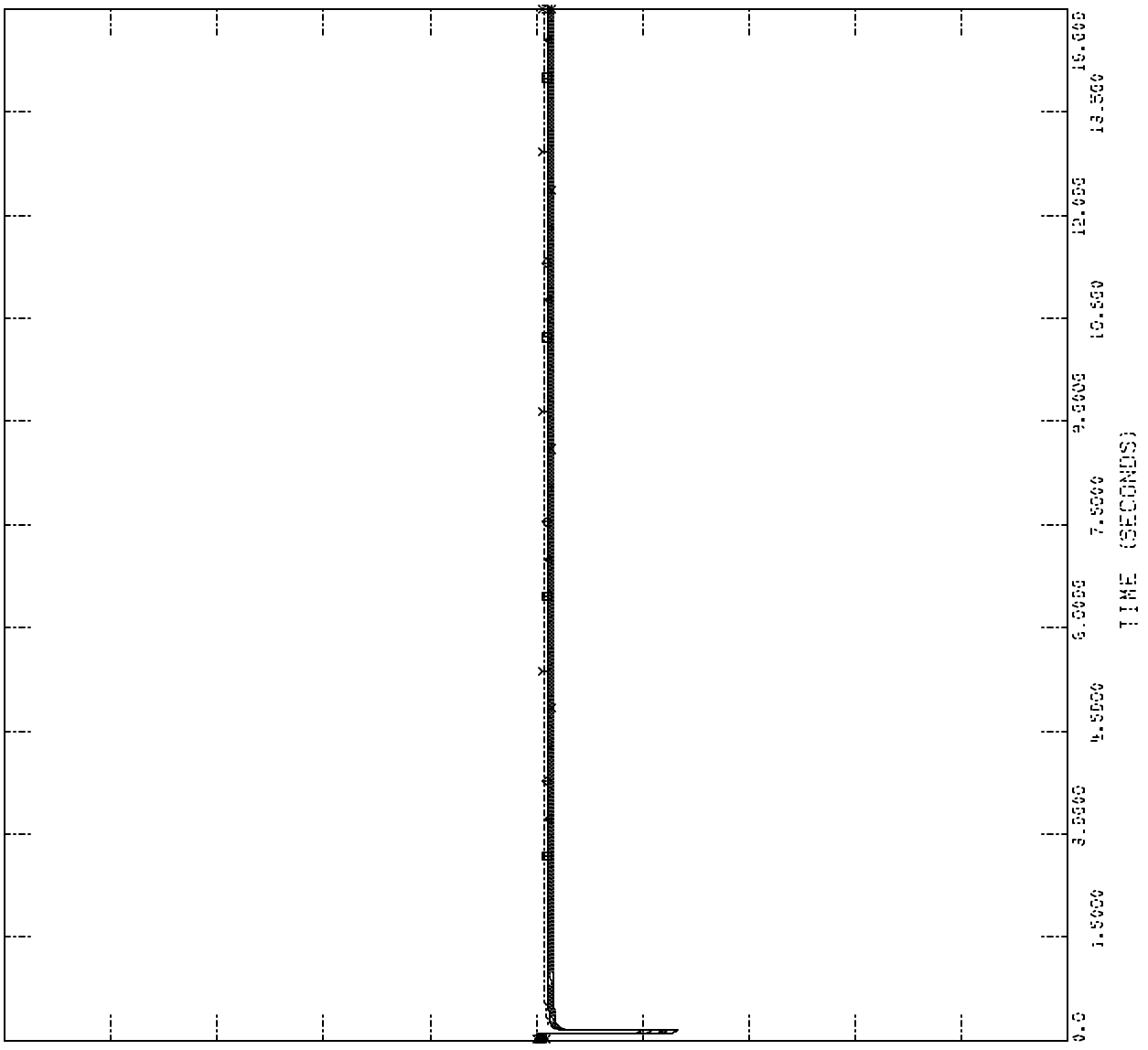
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_12_3_PH.OUT

WED, NOV 03 2004 13:25

FLT 12 3PH VOLTAGES

CHNL # 356: EVOLTAGE GOLDEN 69KV]

2.0000 0.0

CHNL # 338: EVOLTAGE MAIN 161KV]

2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]

2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]

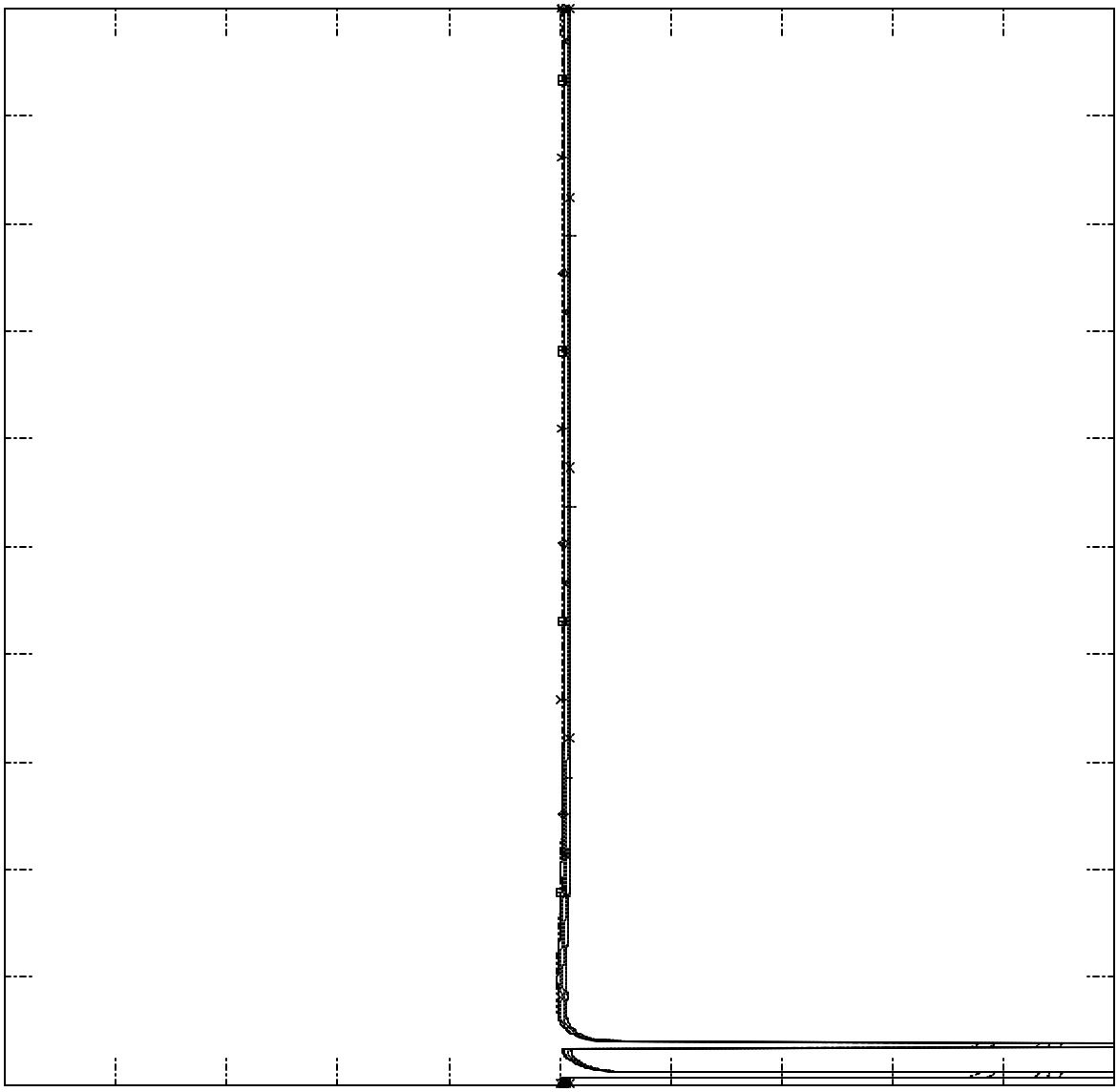
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]

2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]

2.0000 0.0



Appendix C-1

Plots of Fault Simulations

Plots of selected machine angle response during faults

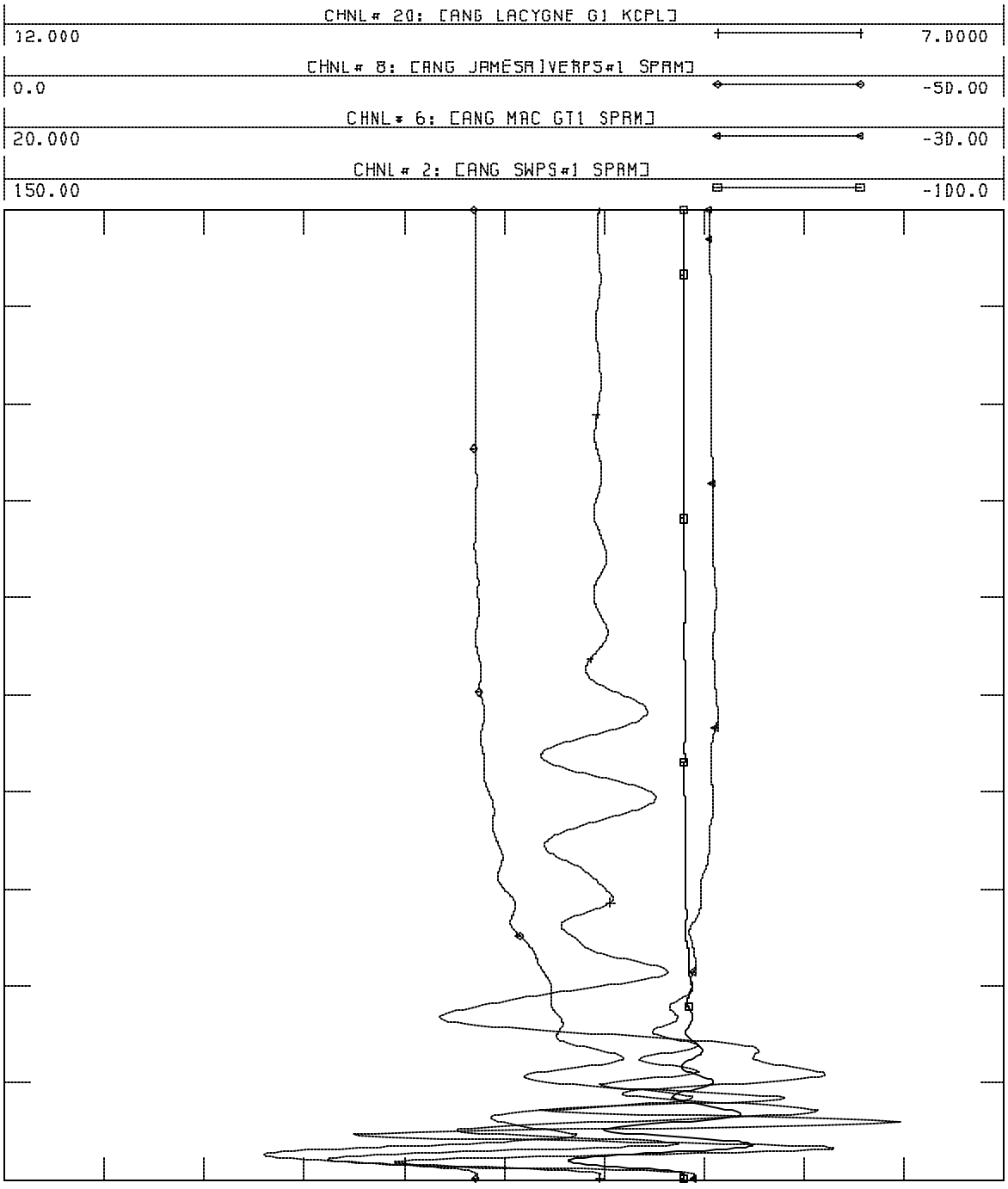
Scenario:
2010 Summer Peak
275MW (SWPS-Battlefield 161kV out of service)
[No Customer Plant – No Network Upgrades]

SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_1_3_PH.OUT

TUE, NOV 02 2004 13:01

FLT_1_3PH_MACHINE ANGLES

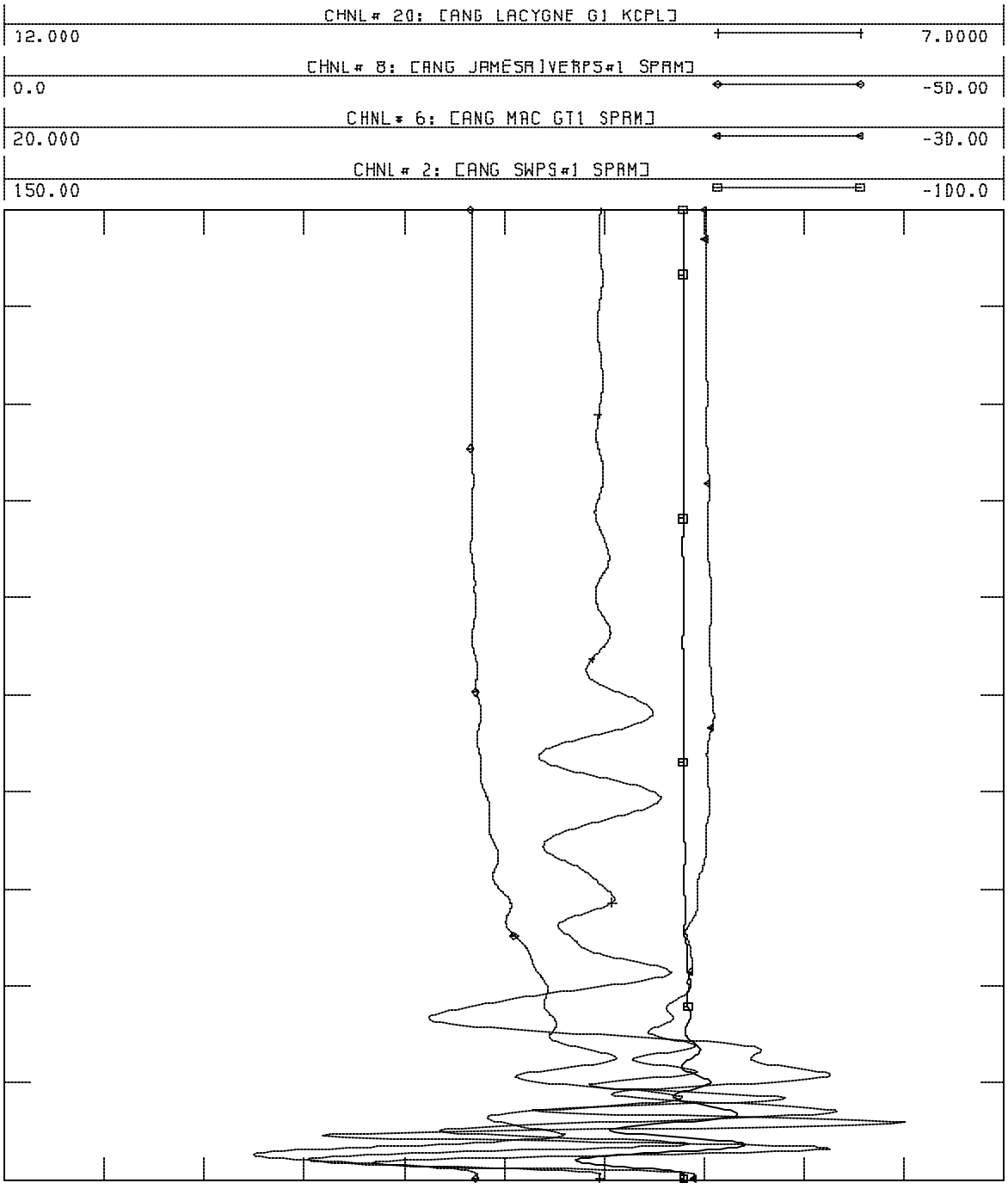


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_2_3_PH.OUT

TUE, NOV 02 2004 13:01

FLT_2_3PH_MACHINE ANGLES

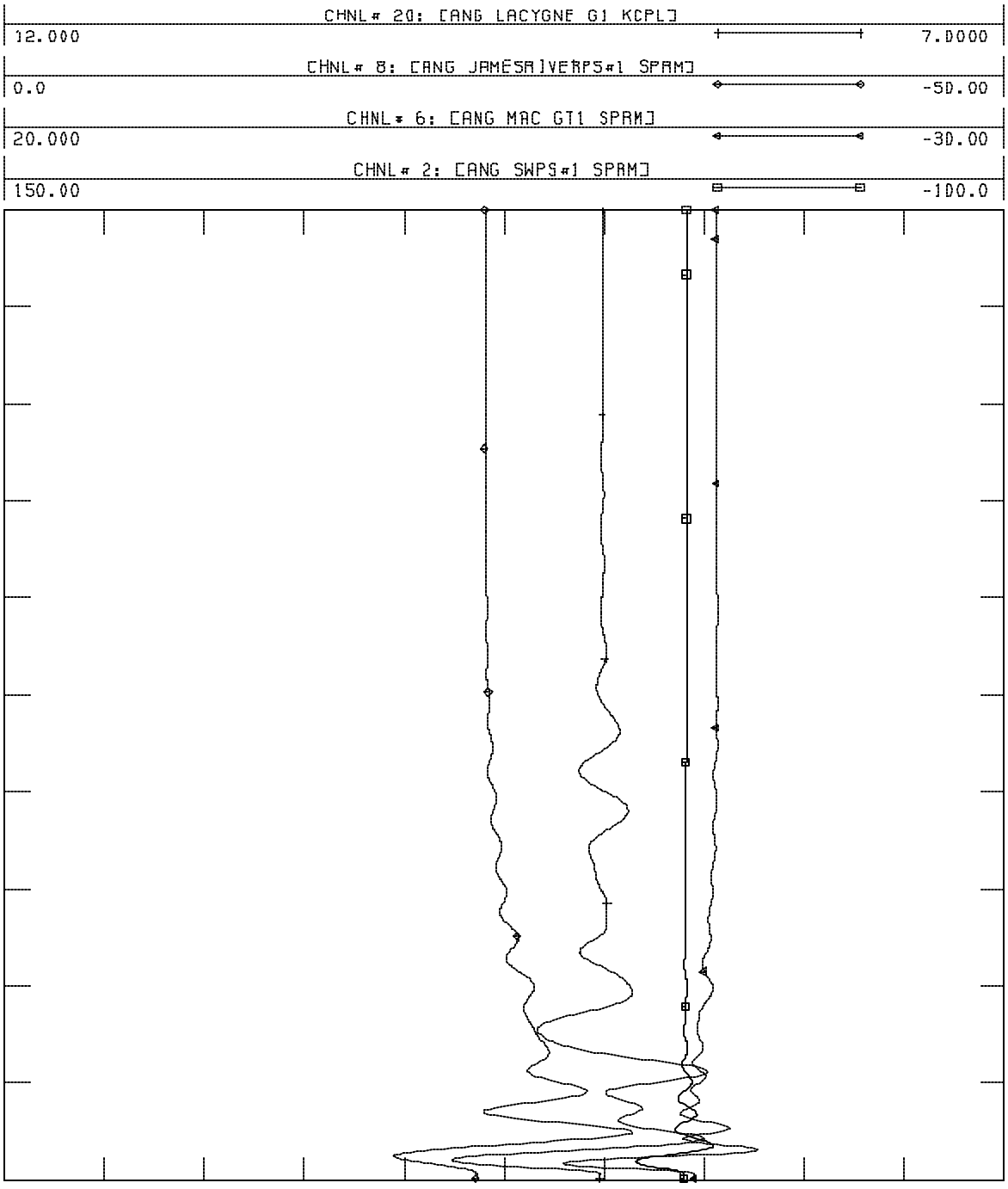


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_3_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_3_3PH_MACHINE ANGLES

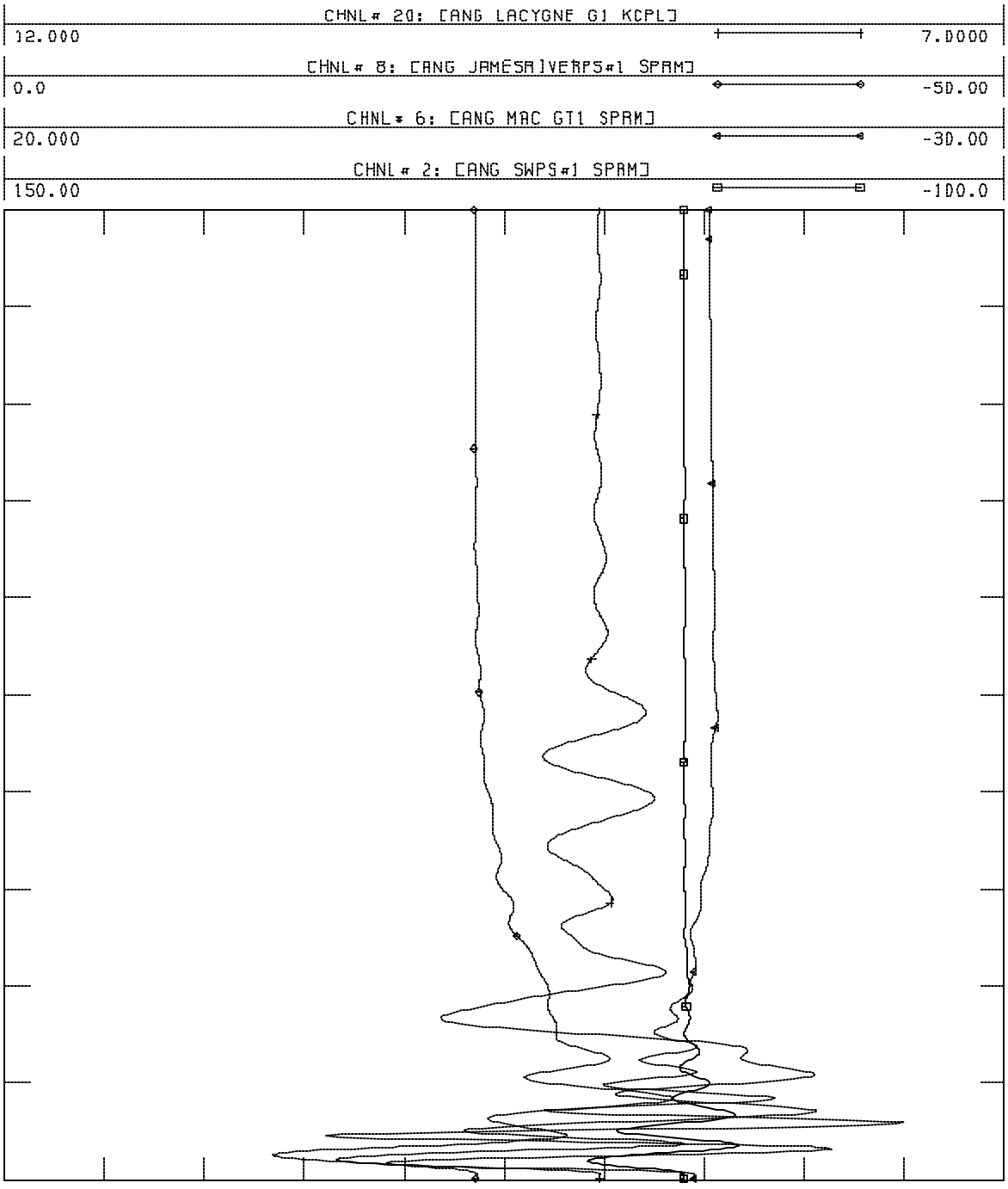


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_4_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_4_3PH_MACHINE ANGLES

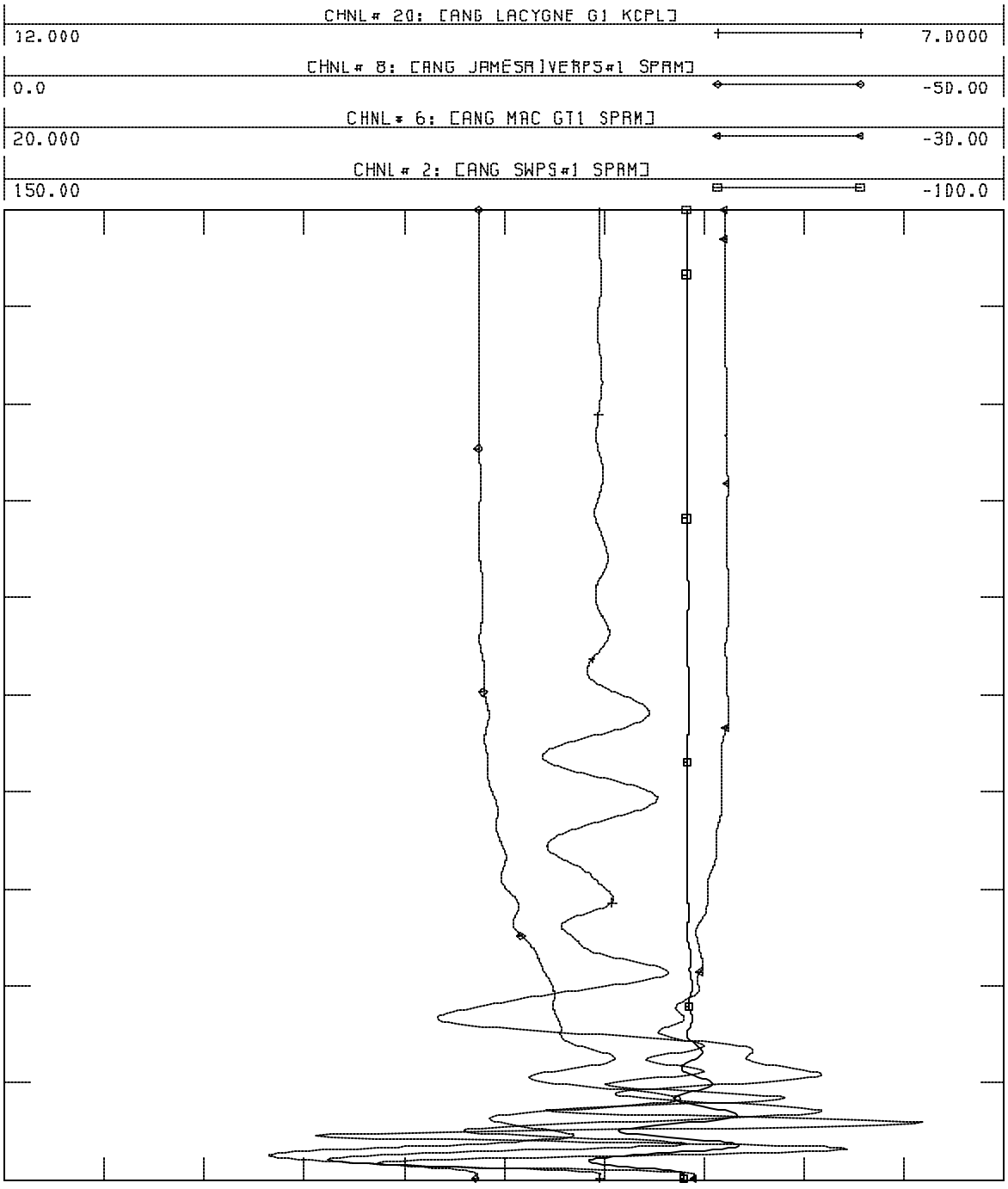


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_5_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_5_3PH_MACHINE ANGLES

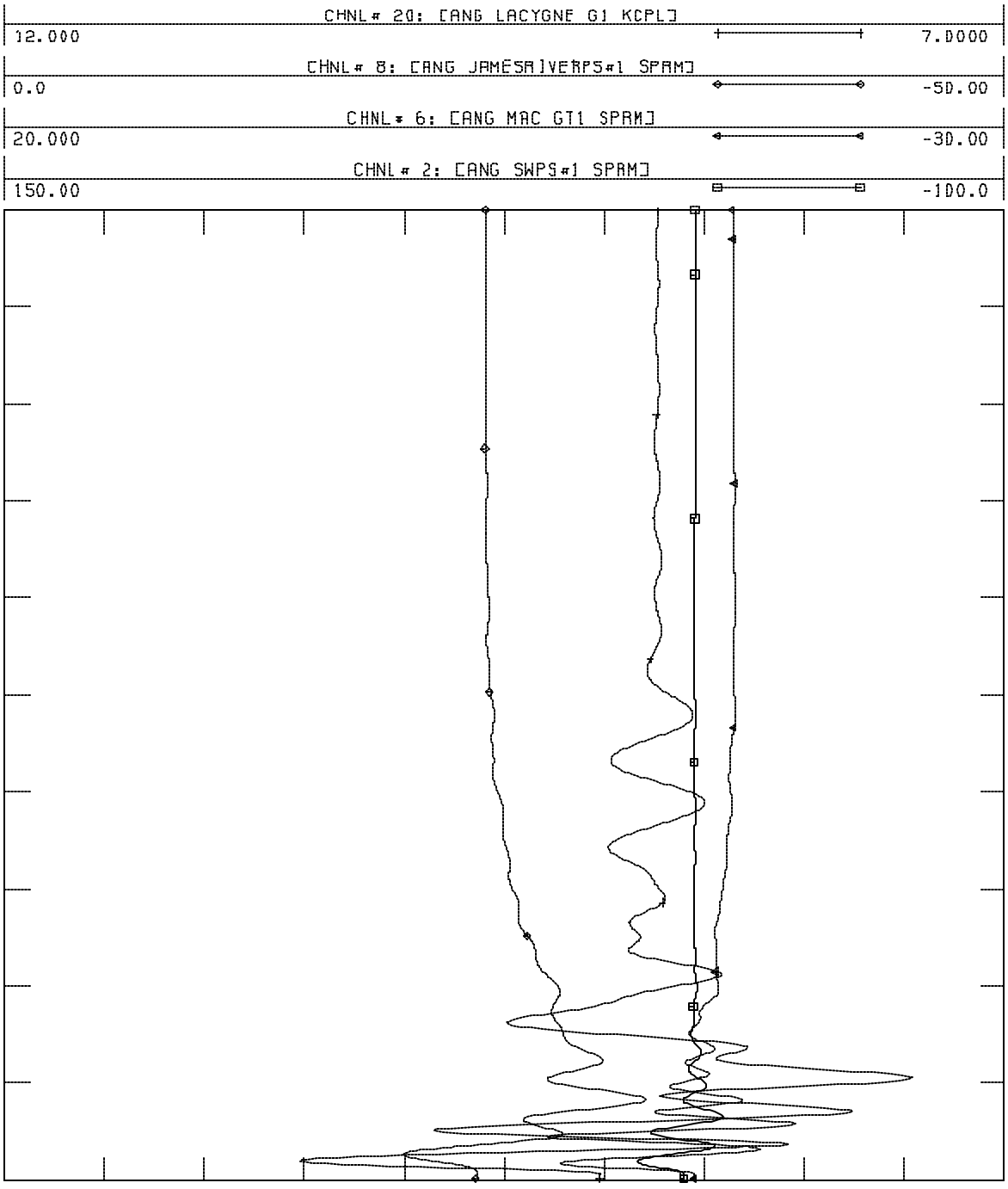


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_6_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_6_3PH_MACHINE ANGLES

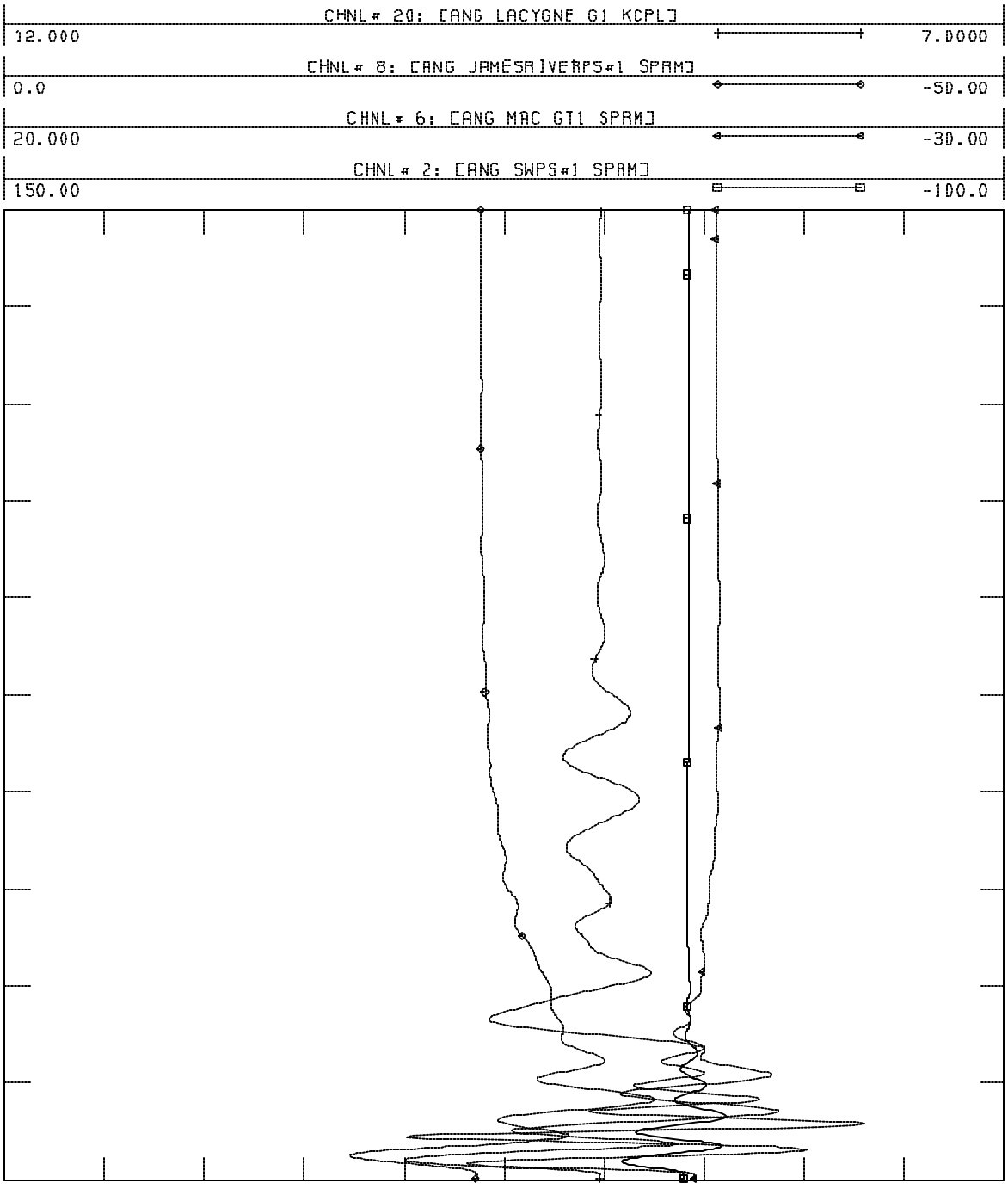


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_7_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_7_3PH_MACHINE ANGLES

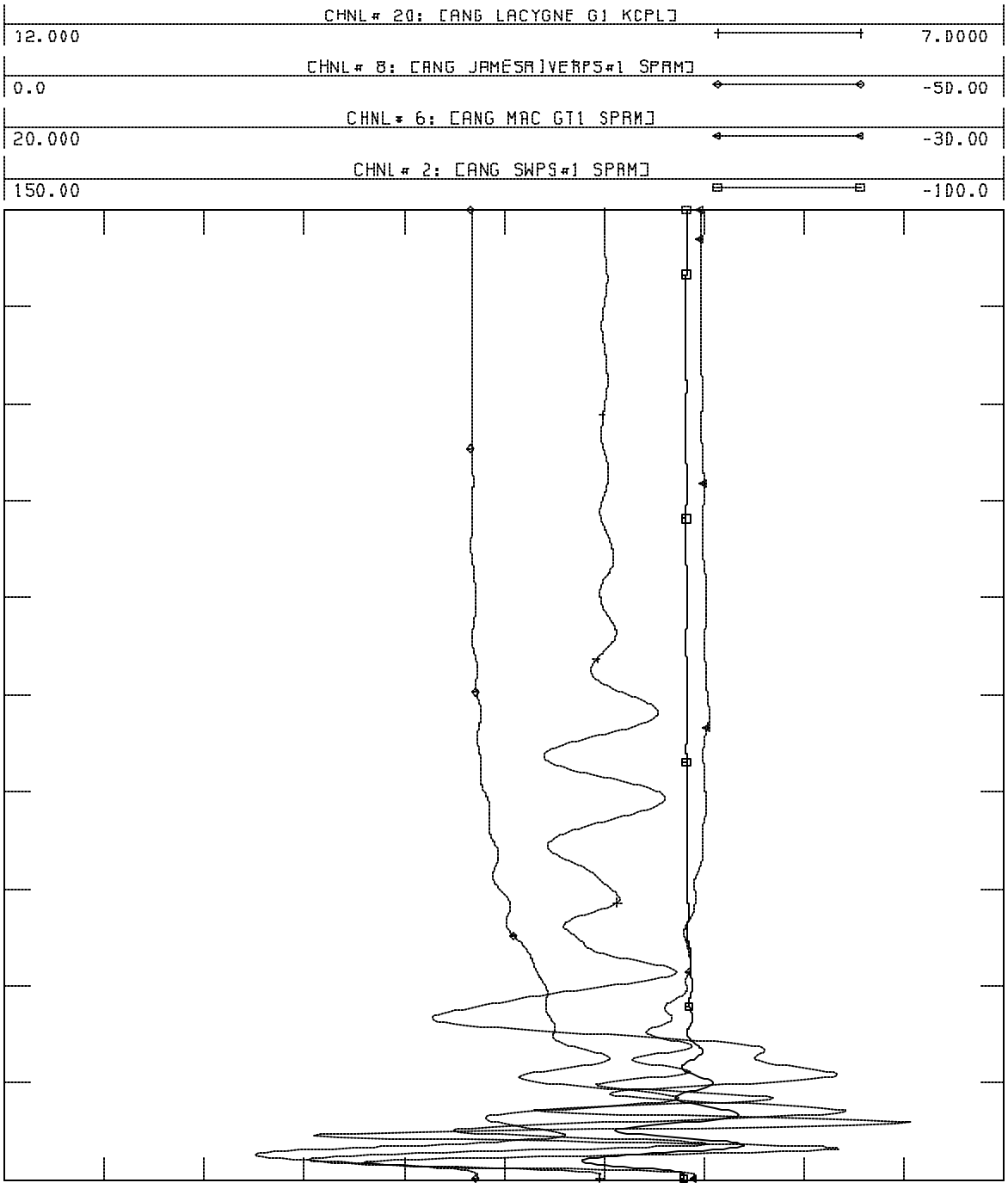


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_8_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_8_3PH_MACHINE ANGLES

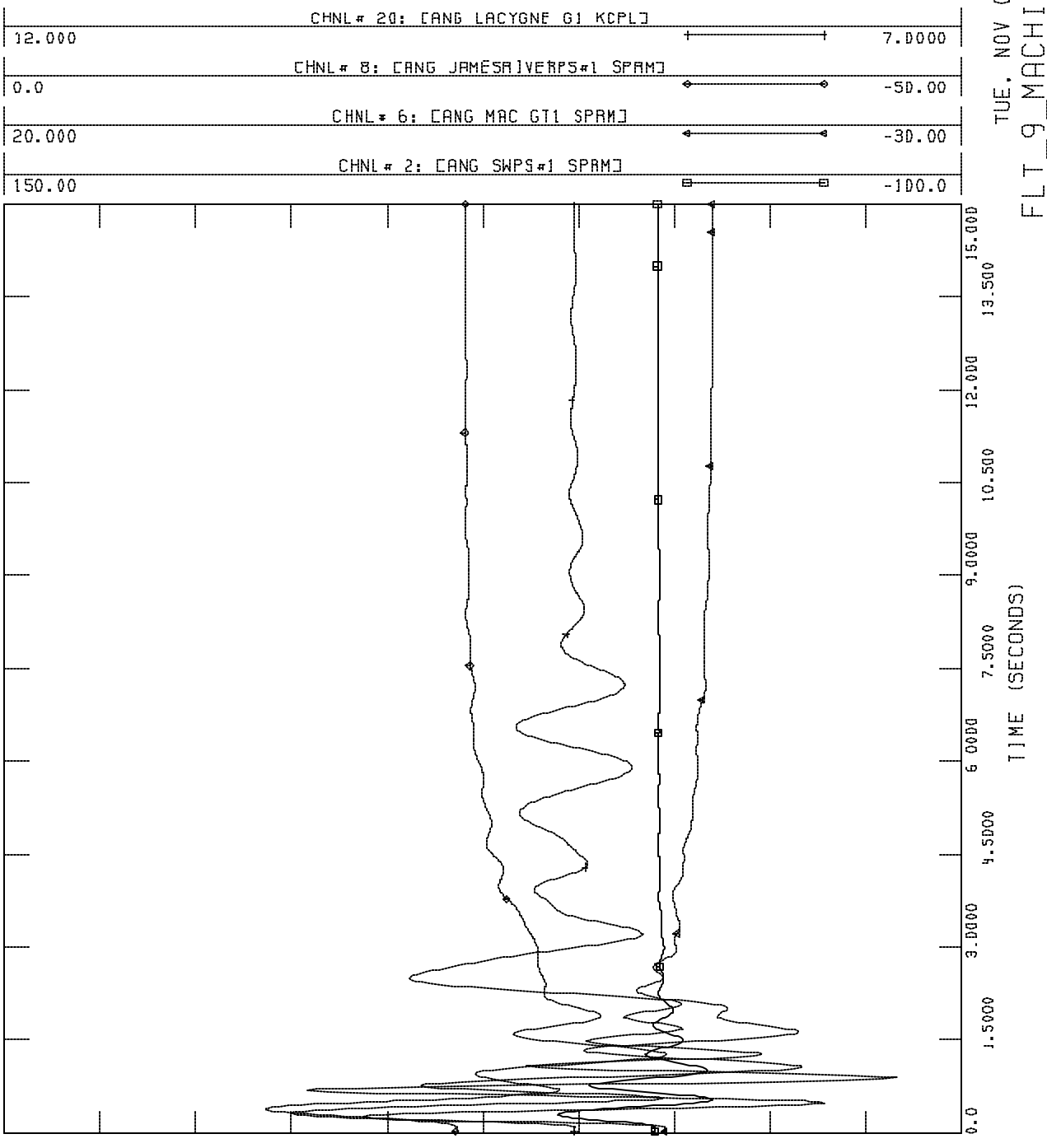


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_9_3_PH.OUT

TUE, NOV 02 2004 13:02

FLT_9_MACHINE ANGLES

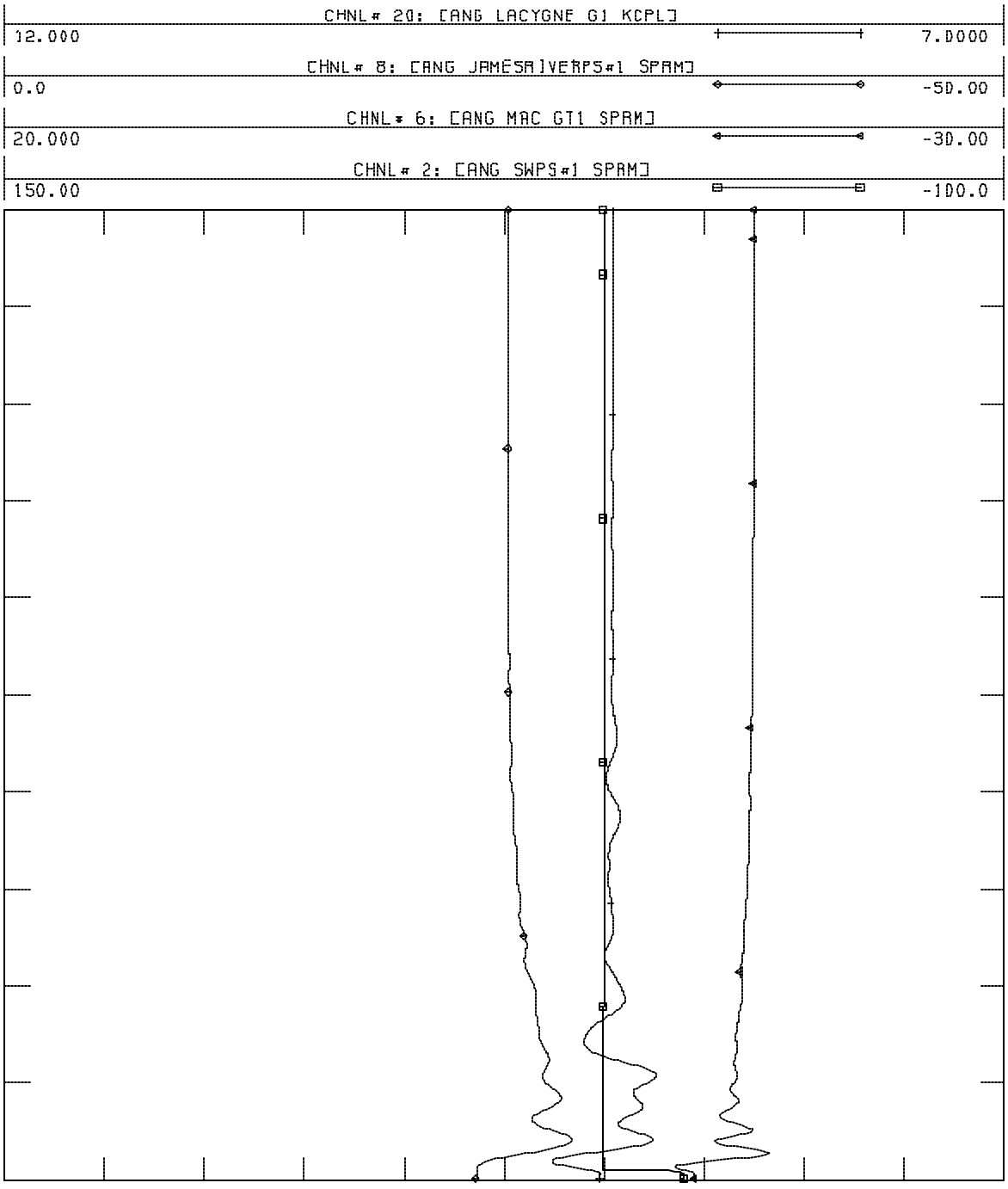


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

TUE, NOV 02 2004 13:02

FLT_10_MACHINE ANGLES

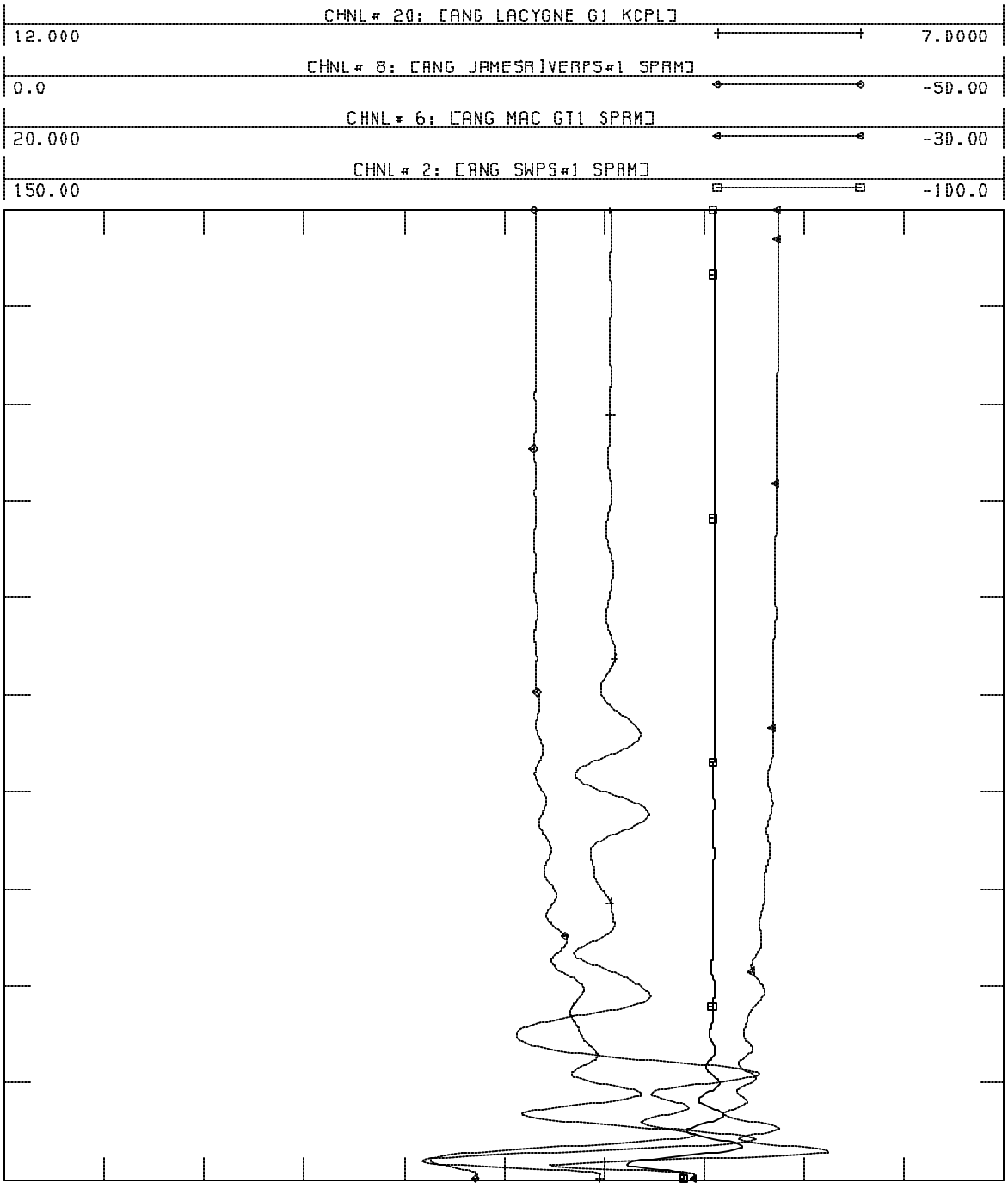


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_11_drop_unit_2.OUT

TUE, NOV 02 2004 13:02

FLT_11_MACHINE ANGLES



Appendix C-2

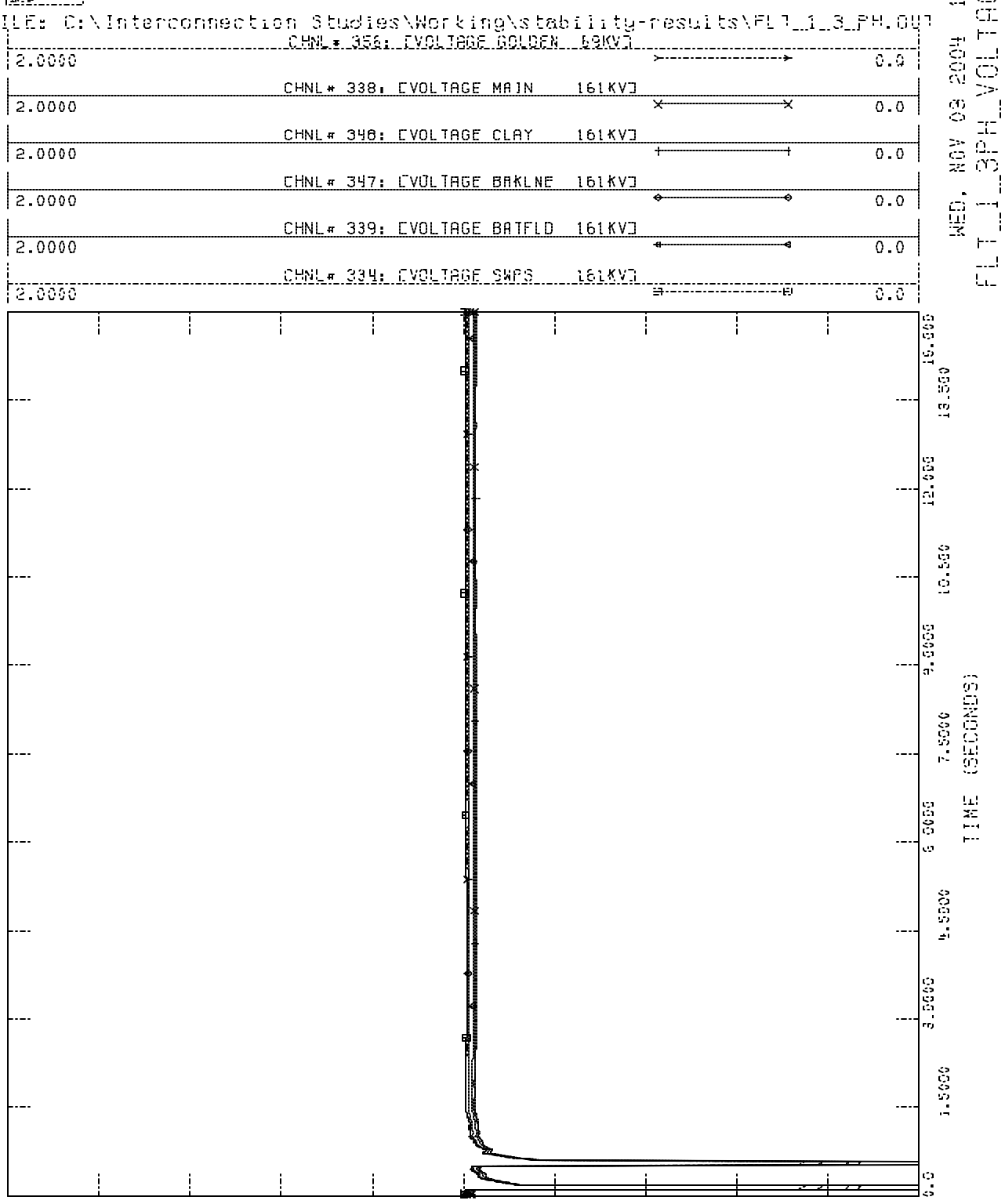
Plots of Fault Simulations

Plots of selected bus voltage response during faults

Scenario:
2010 Summer Peak
275MW (SWPS-Battlefield 161kV out of service)
[No Customer Plant – No Network Upgrades]

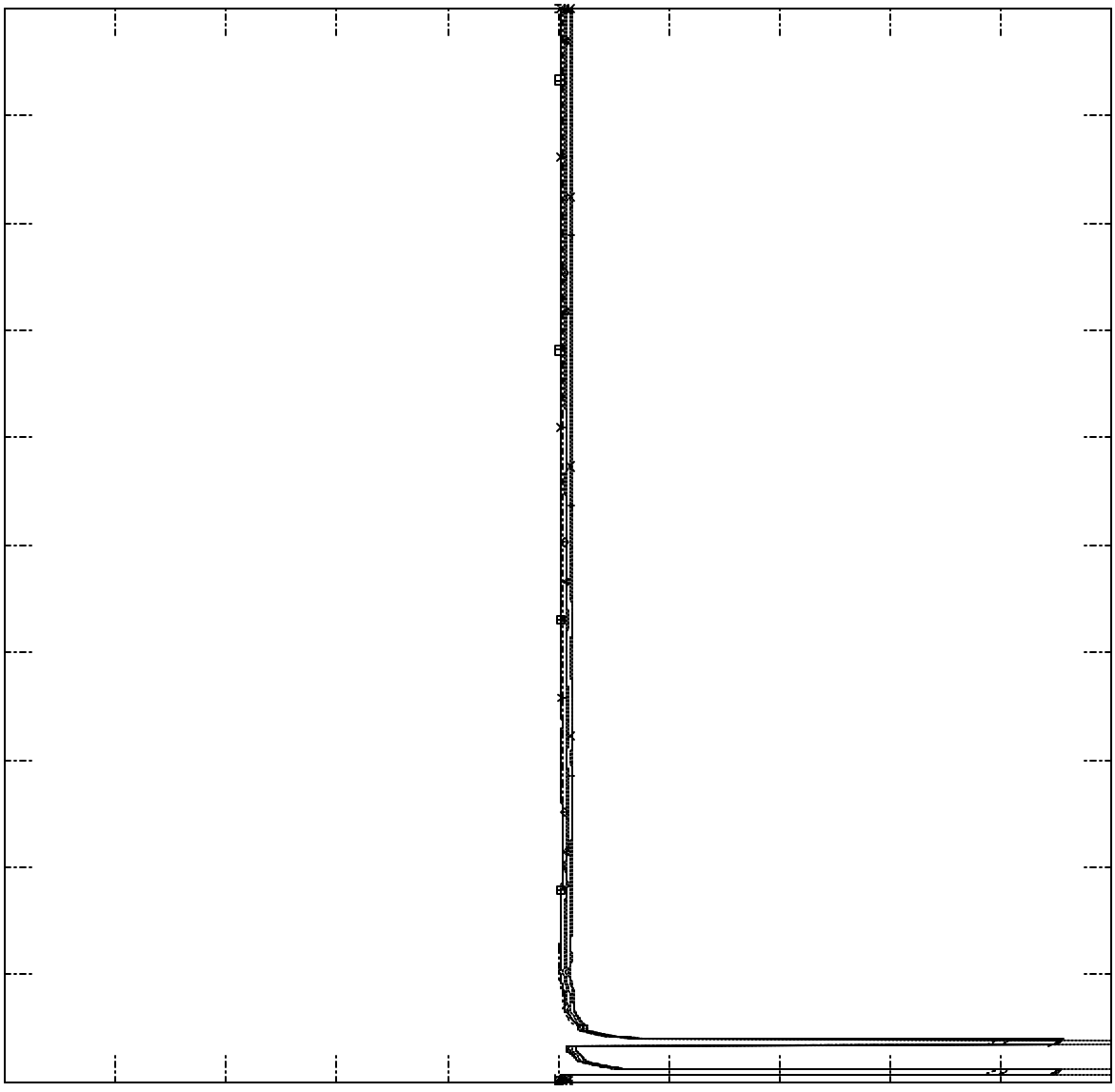
SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FL7_1_3_PH.OUT



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_2_3PH.OUT



FLT_2_3PH_VOLTAGES
WED, NOV 03 2004 10:10

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FLT_3_3_PH.OUT

FLT 3 3PH VOLTAGES
WED, NOV 03 2004 10:10

CHNL # 356: EVOLTAGE GOLDEN 69KV]
2.0000 0.0

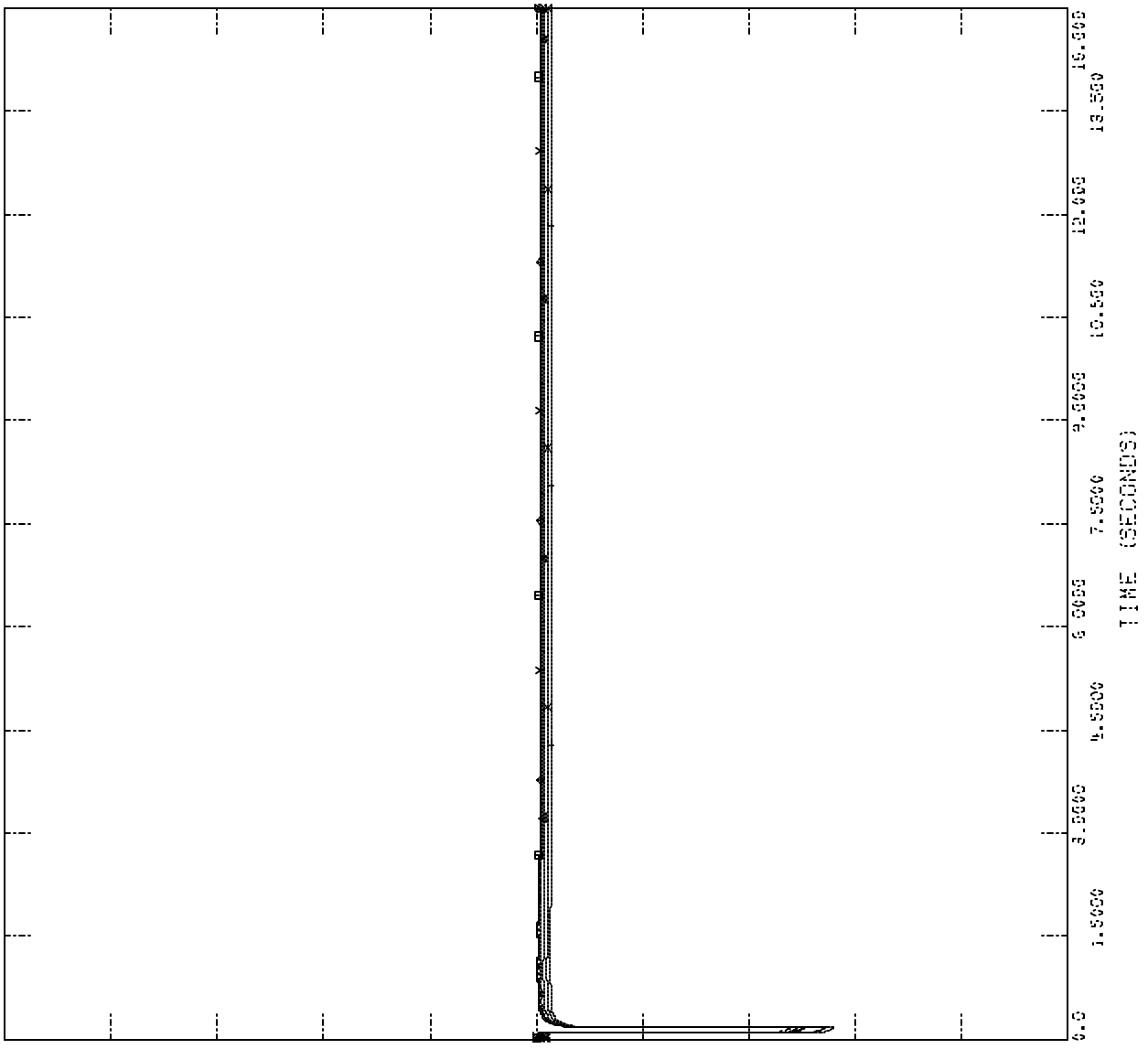
CHNL # 338: EVOLTAGE MAIN 161KV]
2.0000 0.0

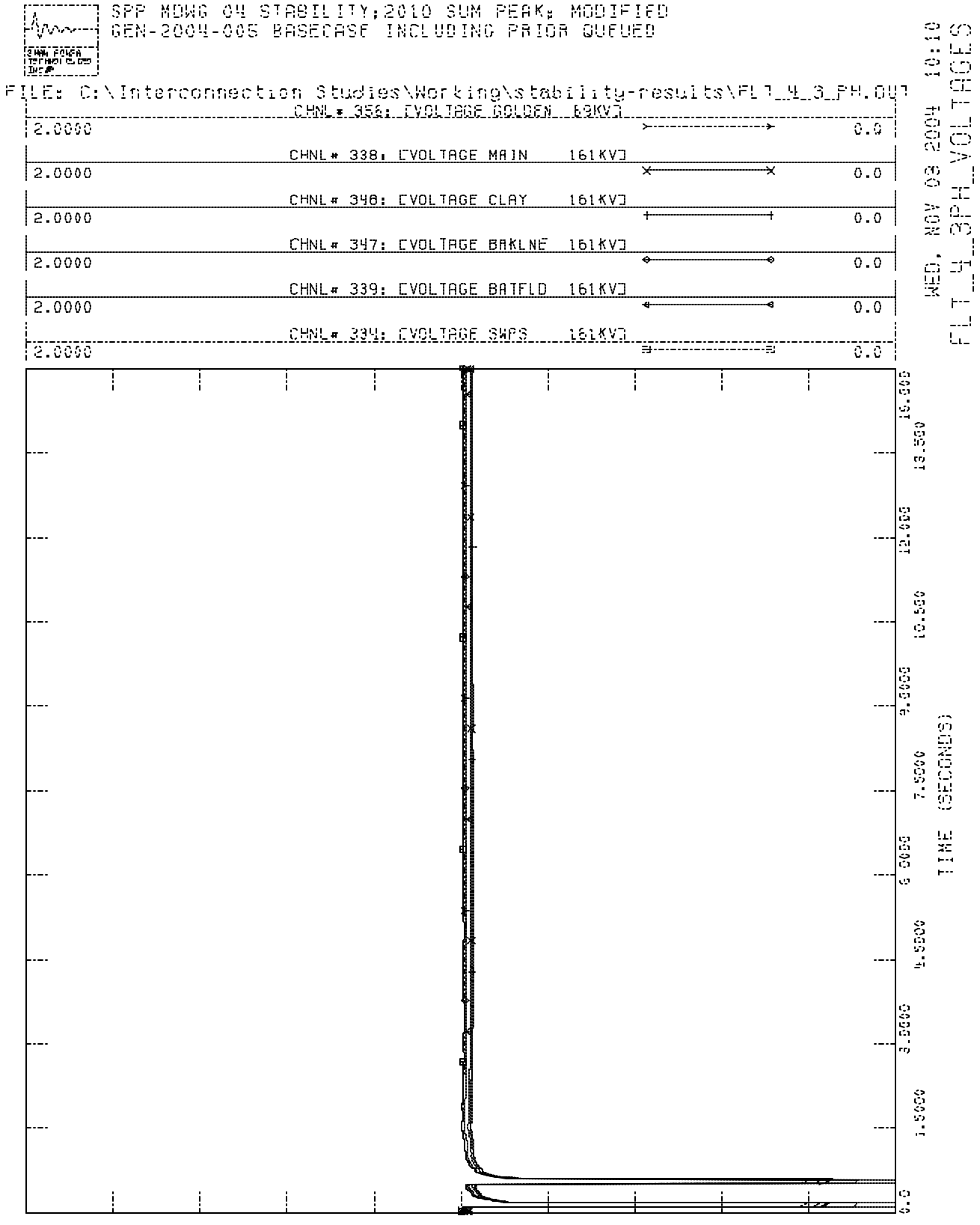
CHNL # 348: EVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]
2.0000 0.0

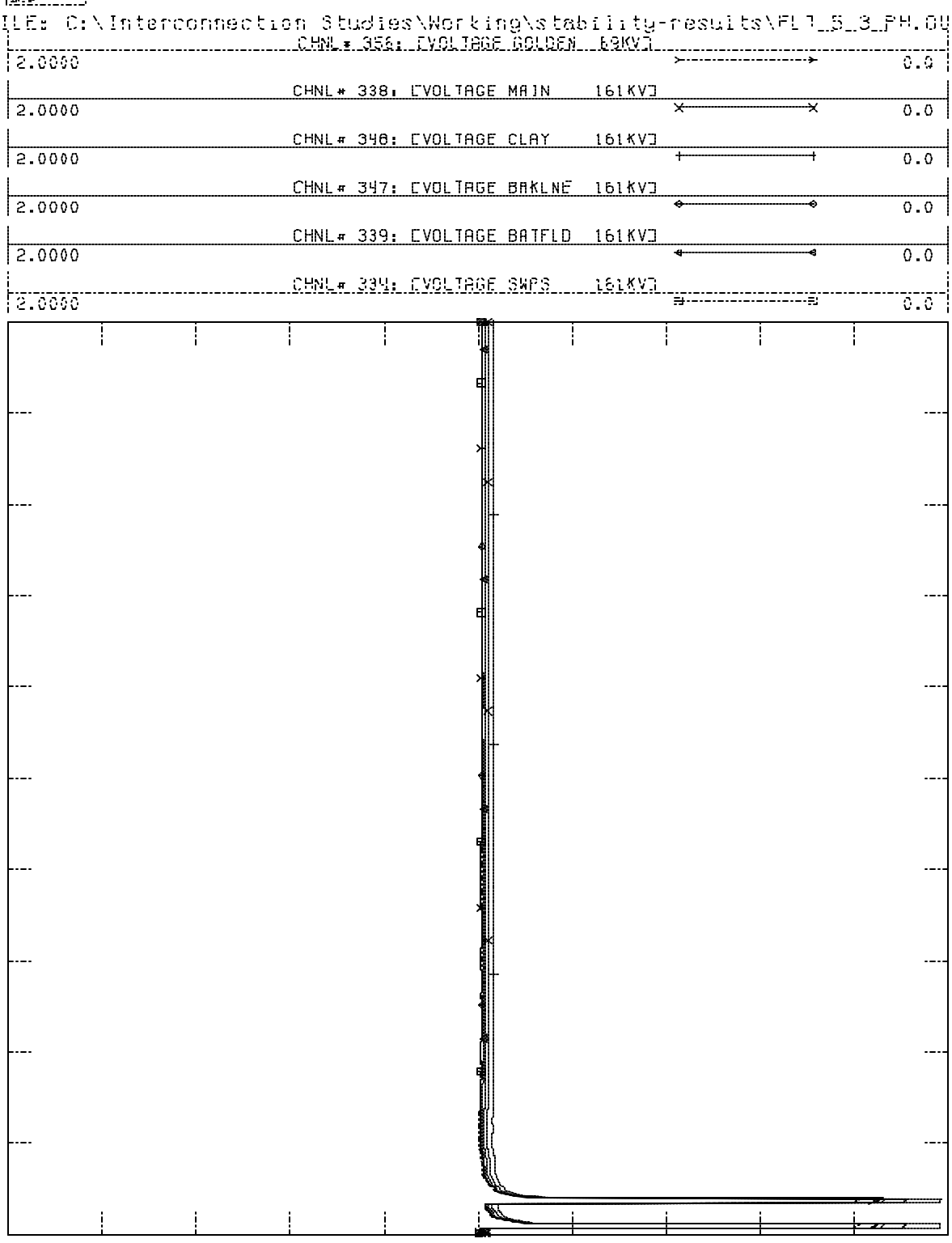
CHNL # 334: EVOLTAGE SWPS 161KV]
2.0000 0.0




SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED
FILE: C:\Interconnection Studies\Working\stability-results\FL7_4_3_PH.OUT
CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000
0.0
CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000
0.0
CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000
0.0
CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000
0.0
CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000
0.0
CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000
0.0
FLT 4 3PH VOLTAGES
WED, NOV 03 2004 10:10
15.000
13.500
12.000
10.500
9.0000
7.5000
6.0000
4.5000
3.0000
1.5000
0.0
TIME (SECONDS)

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

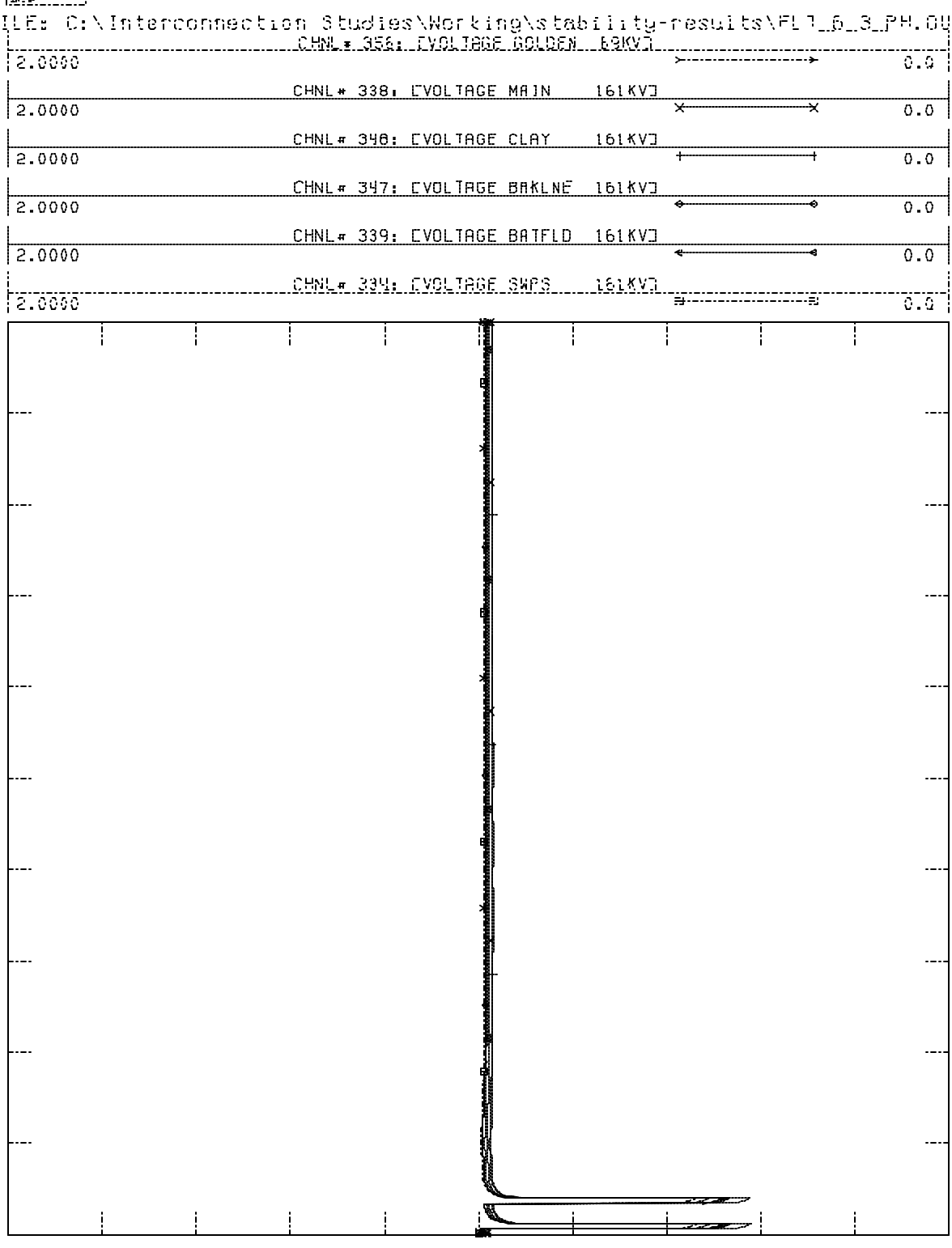
FILE: C:\Interconnection Studies\Working\stability-results\FL7_5_3_PH.OUT



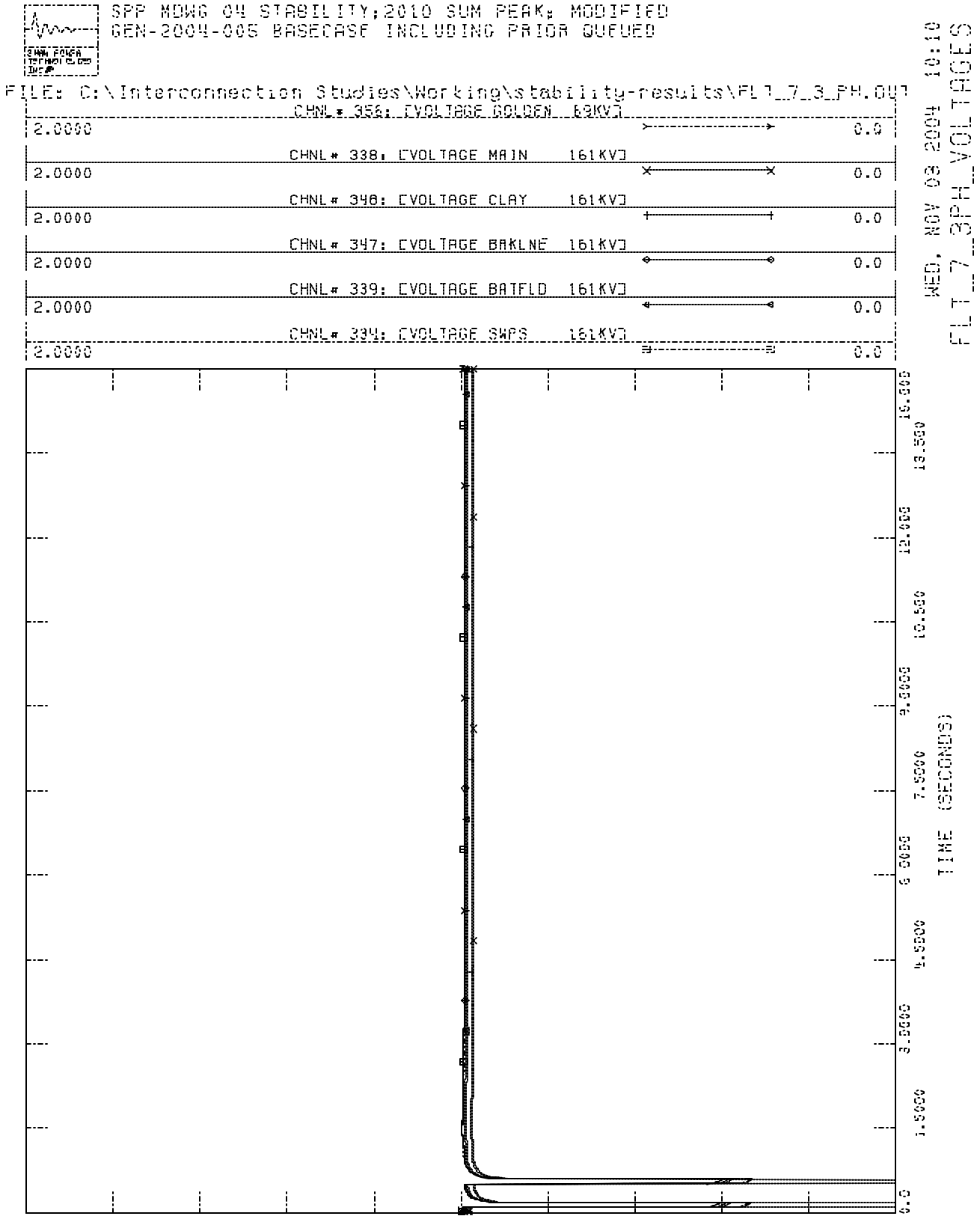
WED, NOV 03 2004 10:10
FL7_5_3PH_VOLTAGES

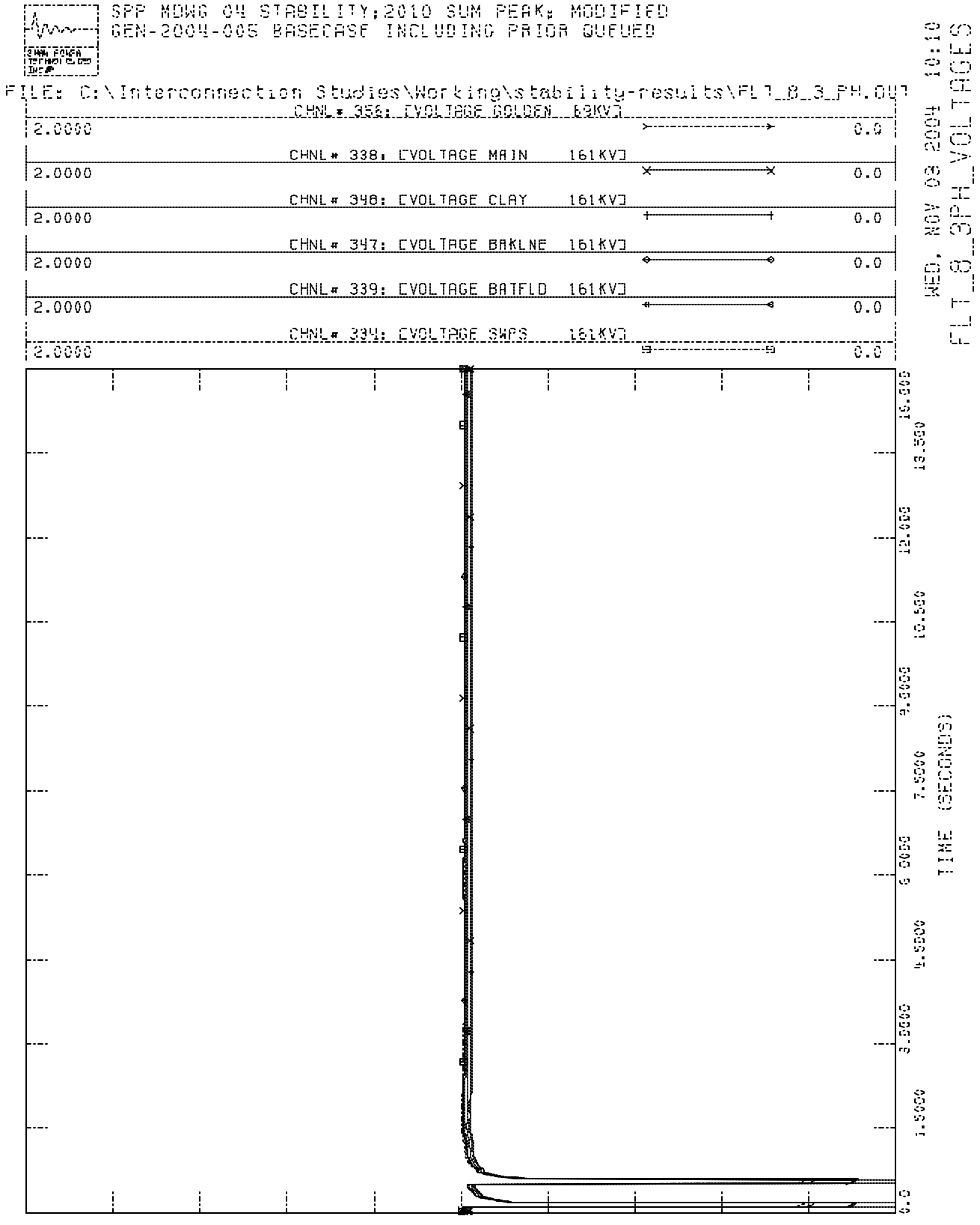
SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FL7_6_3_PH.OUT



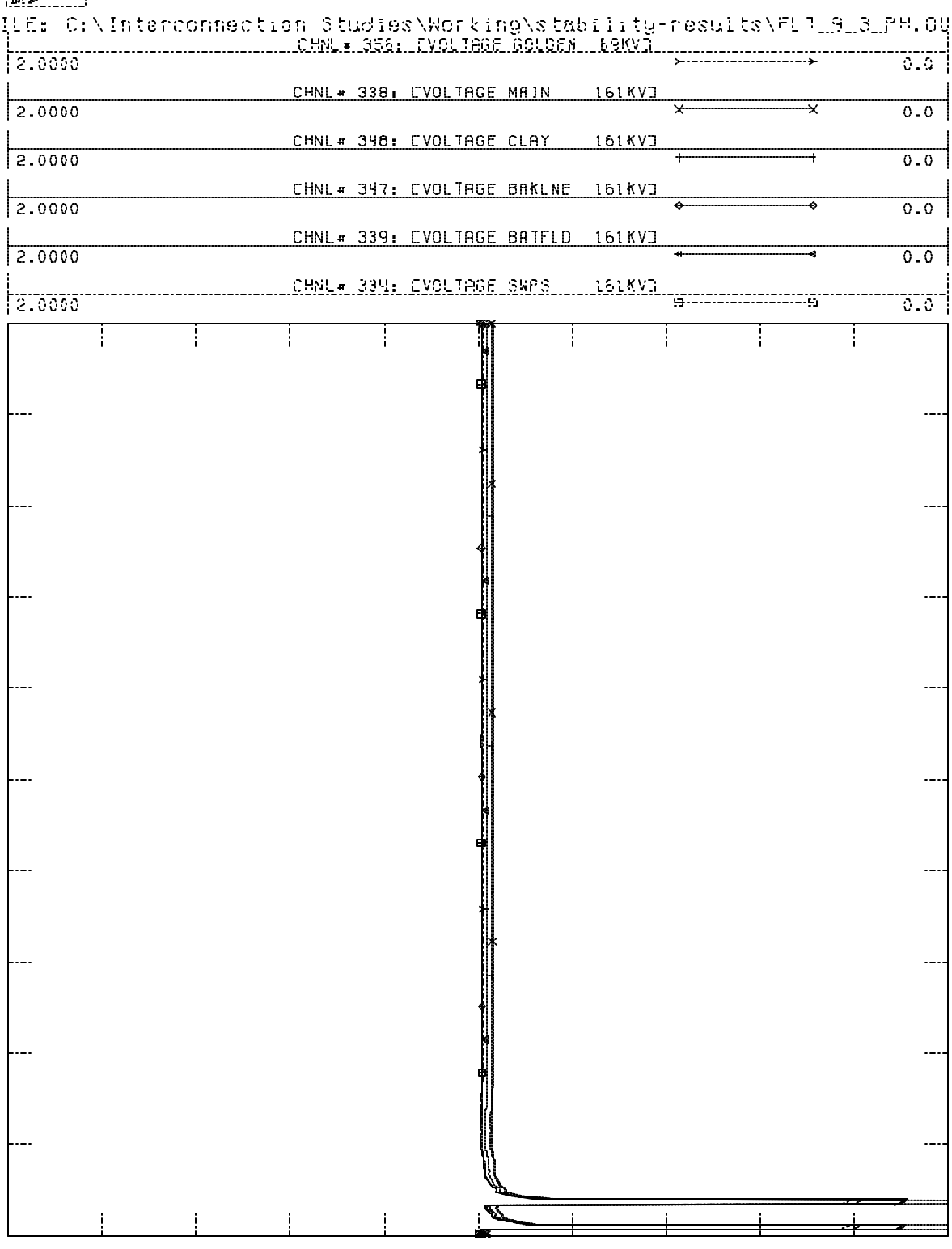
FL7_6_3PH_VOLTAGES
WED, NOV 03 2004 10:10


SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED
FILE: C:\Interconnection Studies\Working\stability-results\FL7_7_3_PH.OUT
CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000
0.0
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000
0.0
CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000
0.0
CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000
0.0
CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000
0.0
CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000
0.0
FL7_7_3PH_VOLTAGES
WED, NOV 03 2004 10:10
0.0
1.5000
3.0000
4.5000
6.0000
7.5000
9.0000
10.500
12.000
13.500
TIME (SECONDS)


SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED
FILE: C:\Interconnection Studies\Working\stability-results\FLT_8_3_PH.OUT
CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000
0.0
CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000
0.0
CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000
0.0
CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000
0.0
CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000
0.0
CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000
0.0
FLT_8_3PH_VOLTAGES
WED, NOV 03 2004 10:10
TIME (SECONDS)

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\Working\stability-results\FL7_9_3_PH.OUT



WED, NOV 03 2004 10:10
FL7_9_3_VOLTAGES

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FL7_10_drop_unit_1.OUT

WED, NOV 03 2004 10:10
FL7_10_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

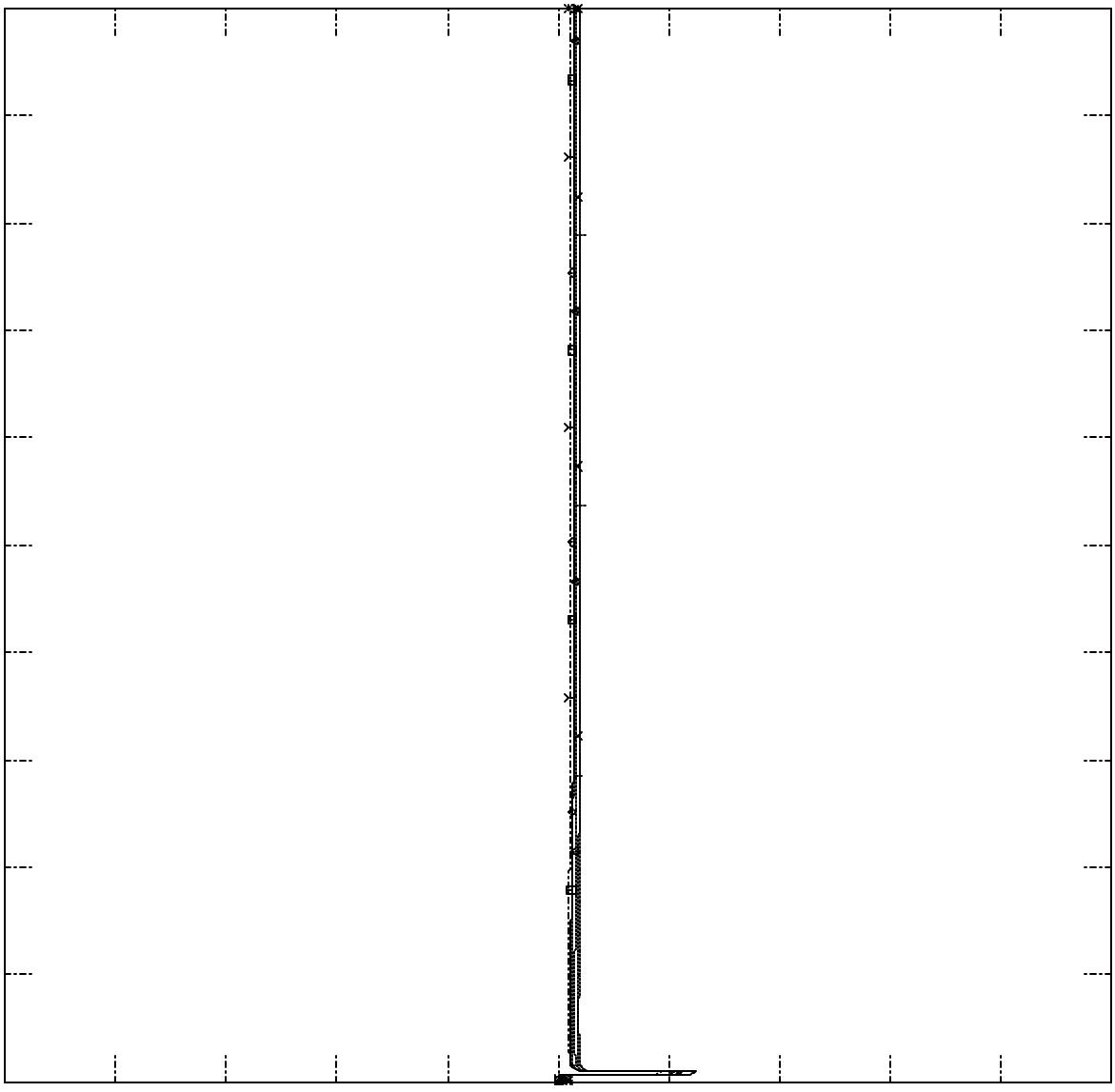
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_11_drop_unit_2.OUT

WED, NOV 03 2004 10:10
FLT_11_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

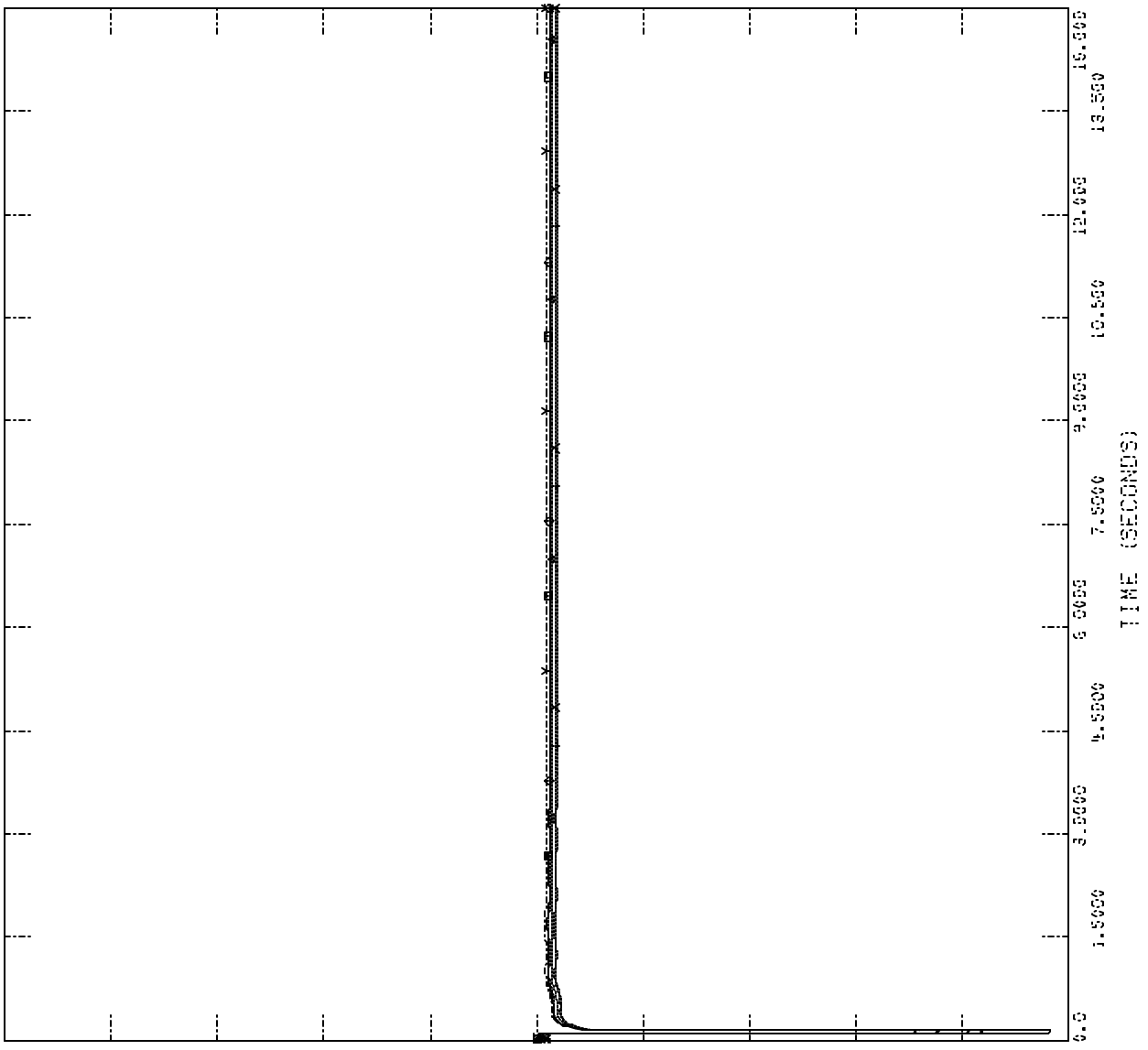
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



Appendix D-1

Plots of Fault Simulations

Plots of selected machine angle response during faults

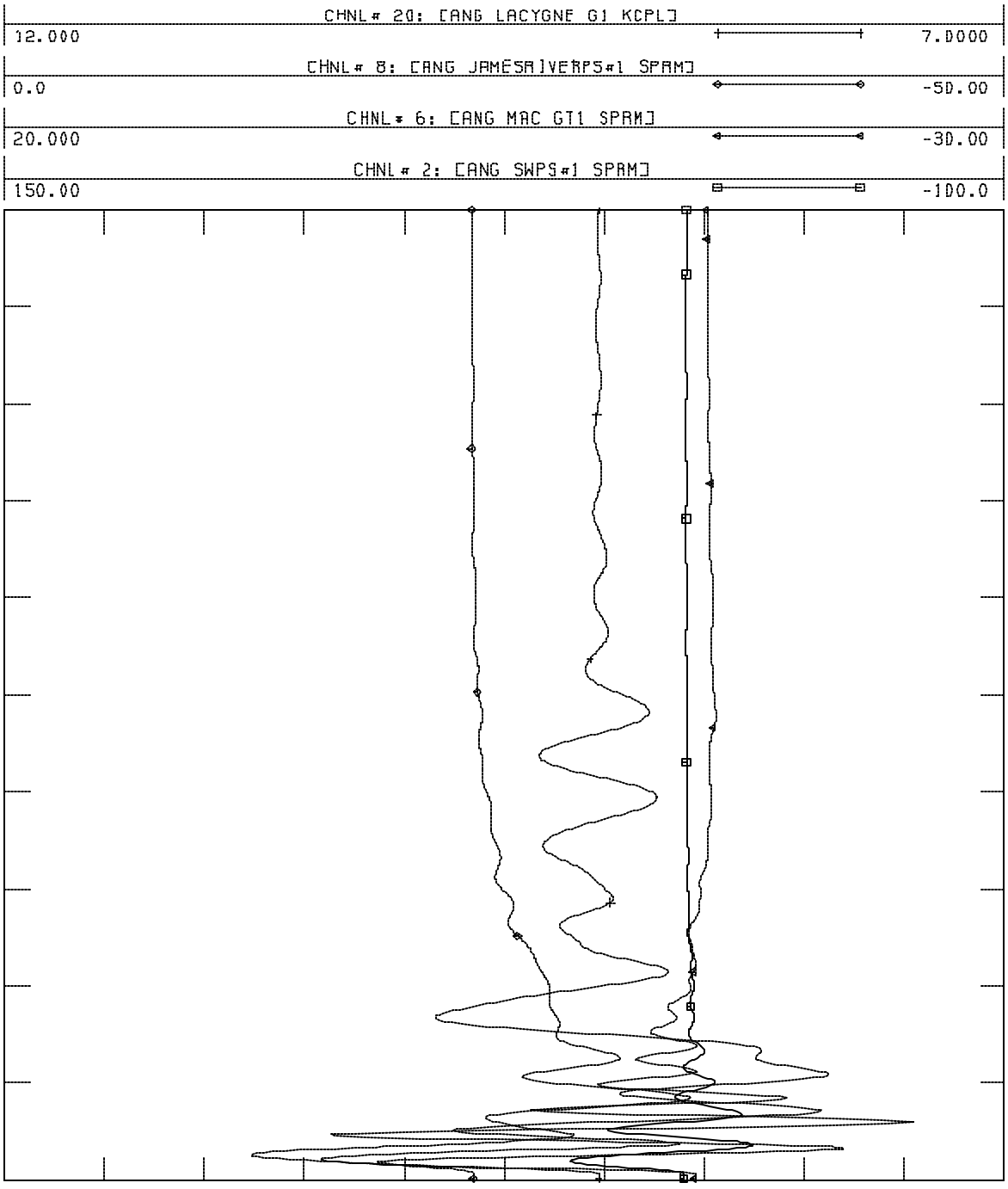
Scenario:
2010 Summer Peak
275MW_2 (SWPS-Battlefield 161kV in service)
[No Customer Plant – No Network Upgrades]

SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_1_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_1_3PH_MACHINE ANGLES

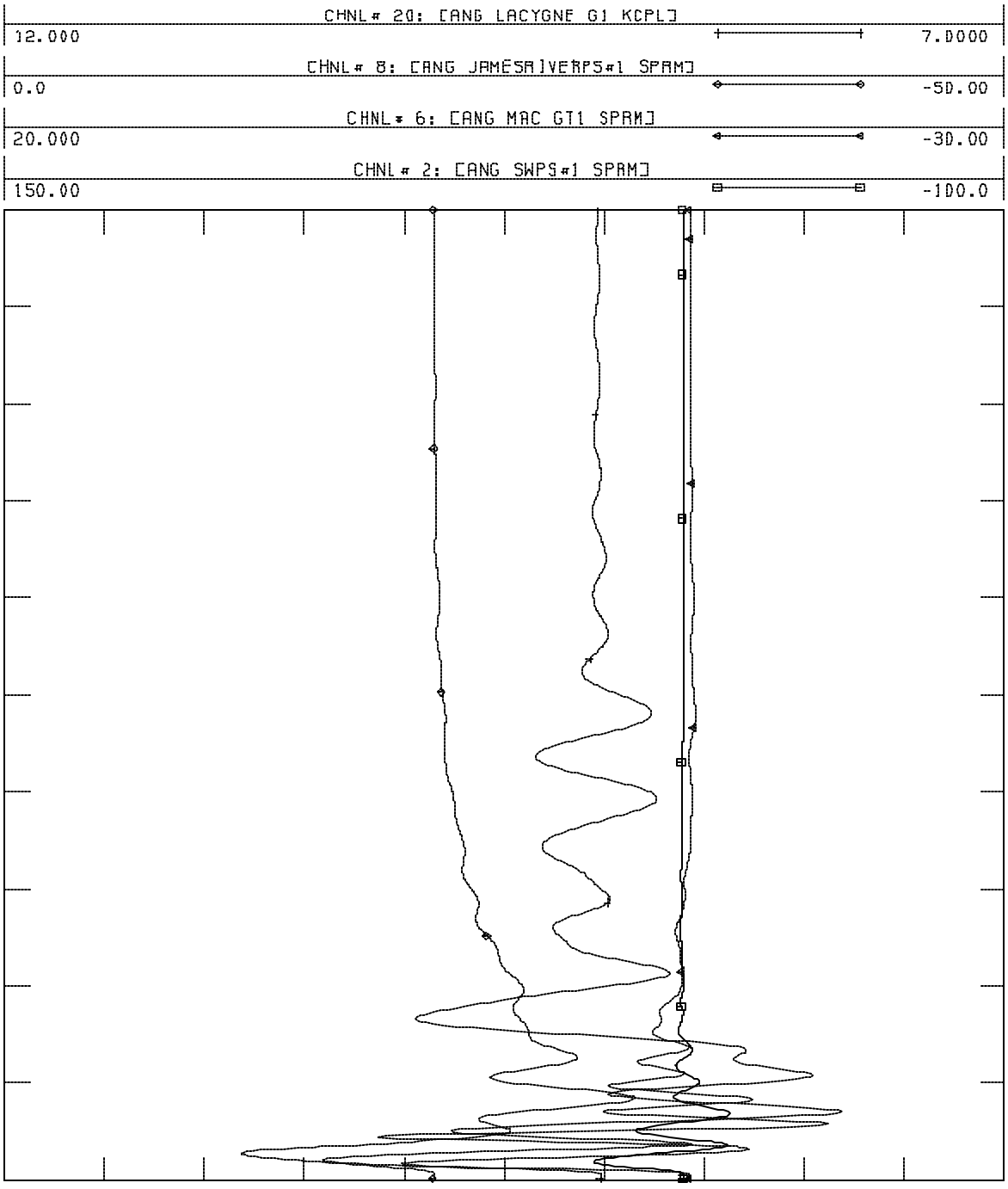


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_2_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_2_3PH_MACHINE ANGLES

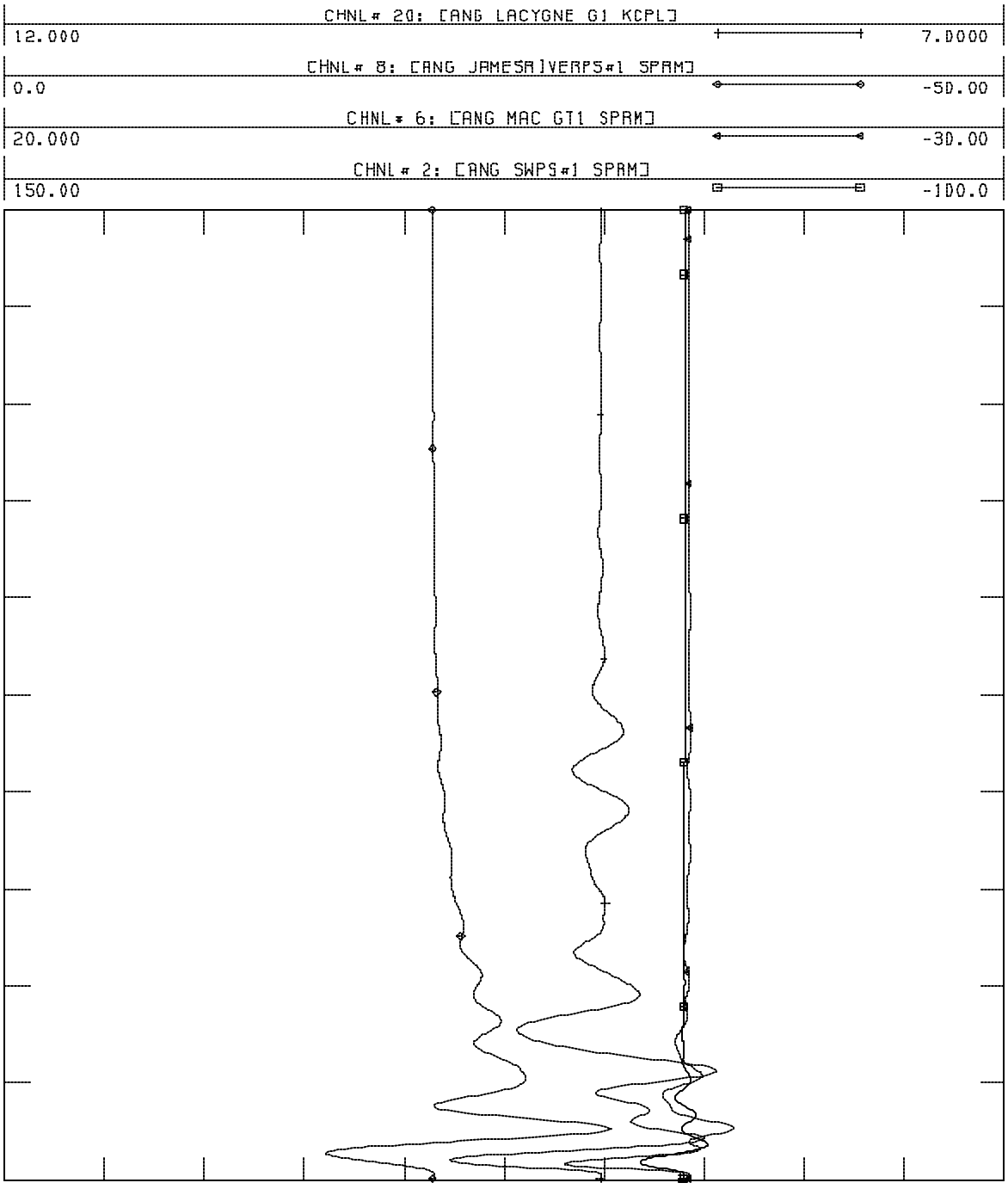


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_3_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_3_3PH_MACHINE ANGLES

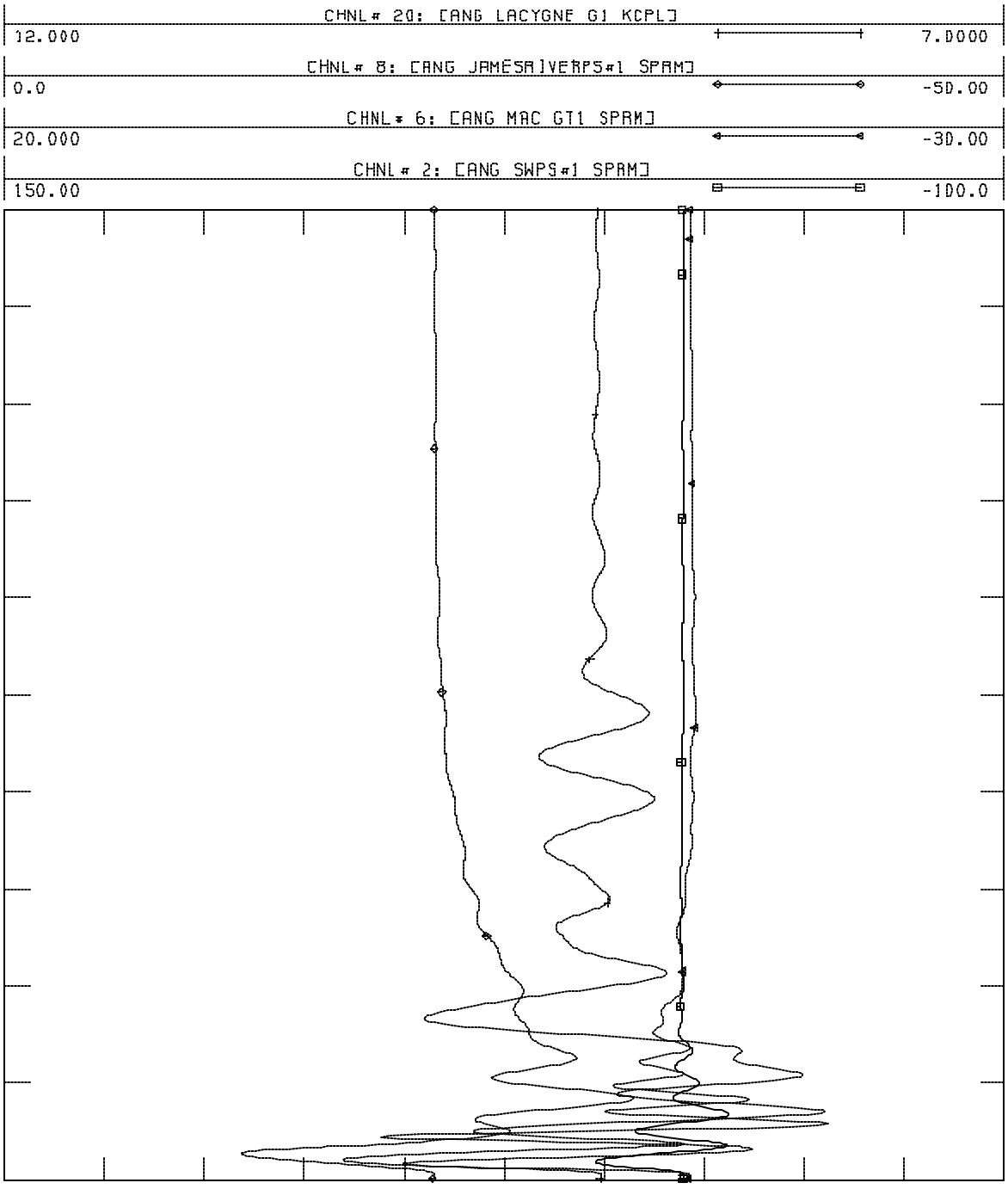


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_4_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_4_3PH_MACHINE ANGLES

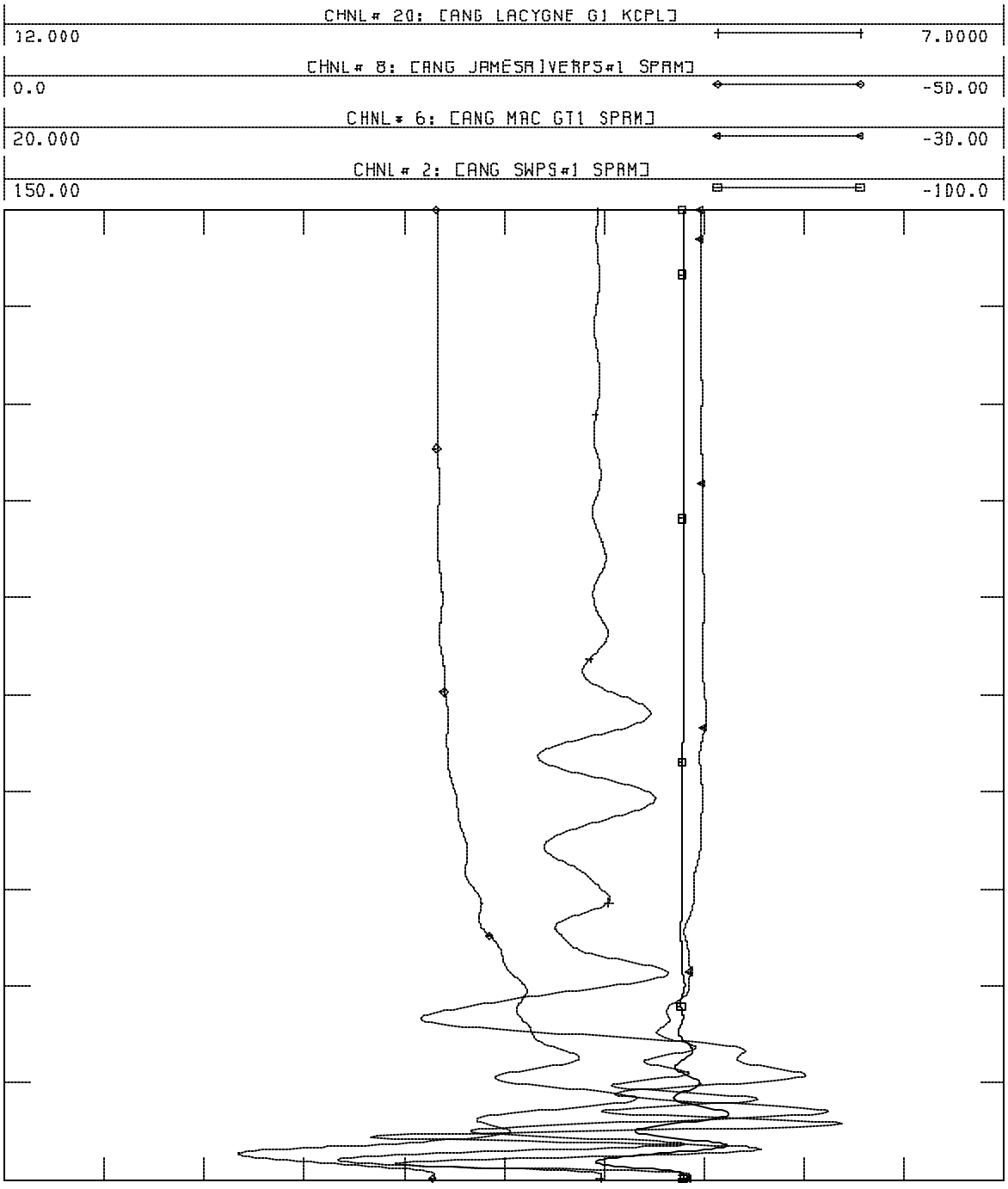


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_5_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_5_3PH_MACHINE ANGLES

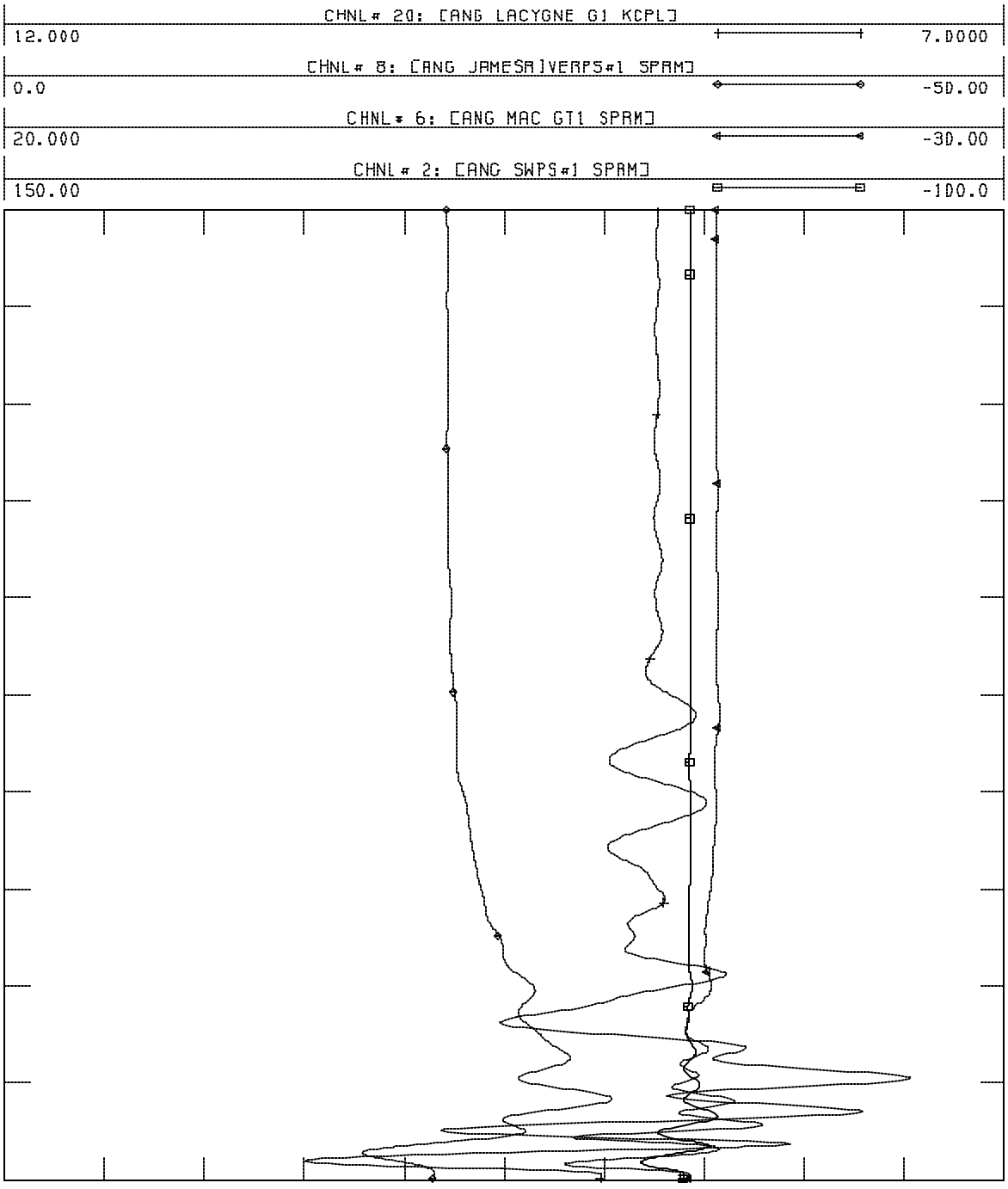


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_6_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_6_3PH_MACHINE ANGLES

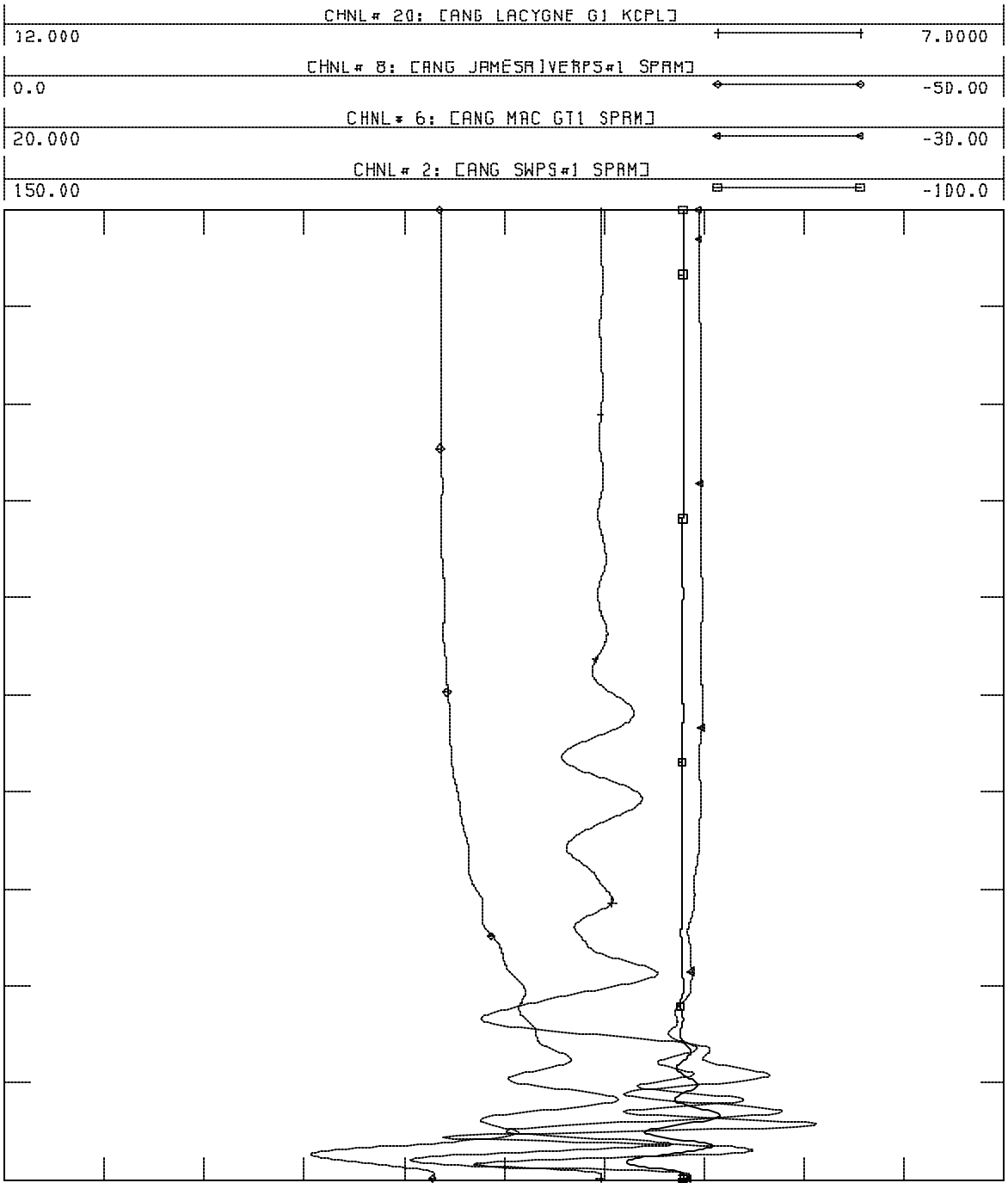


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_7_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_7_3PH_MACHINE ANGLES

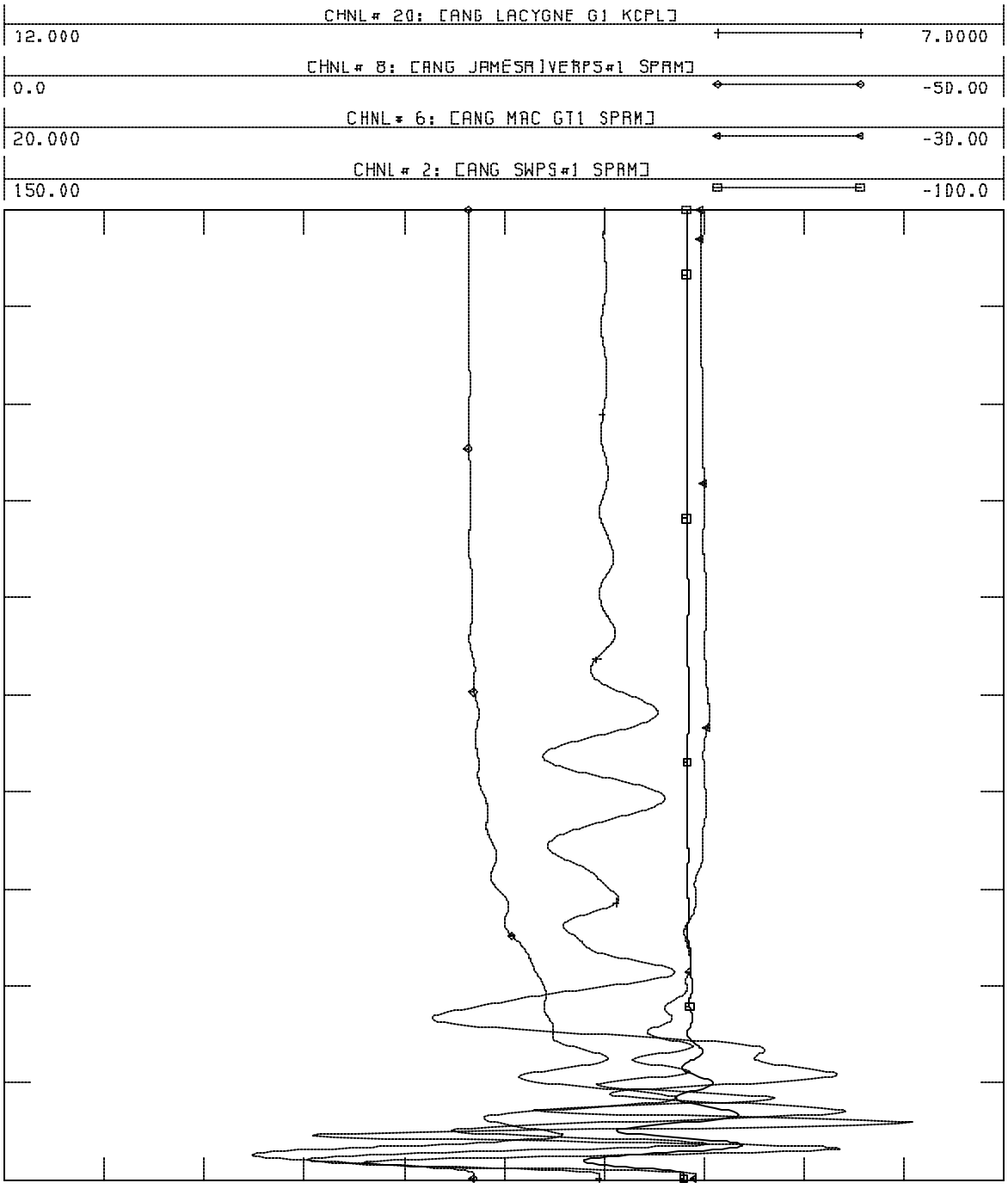


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_8_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_8_3PH_MACHINE ANGLES

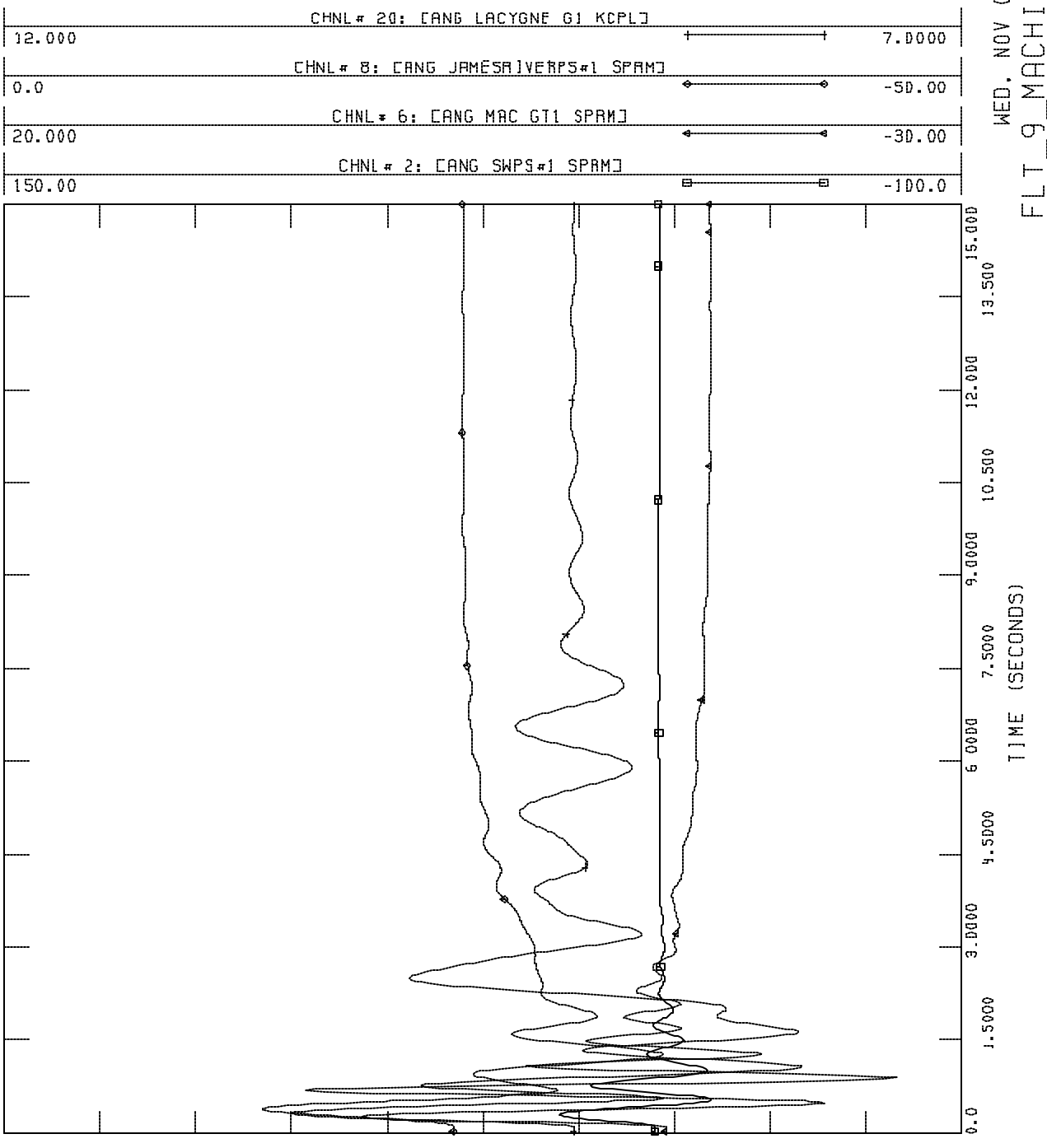


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_9_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_9_MACHINE ANGLES

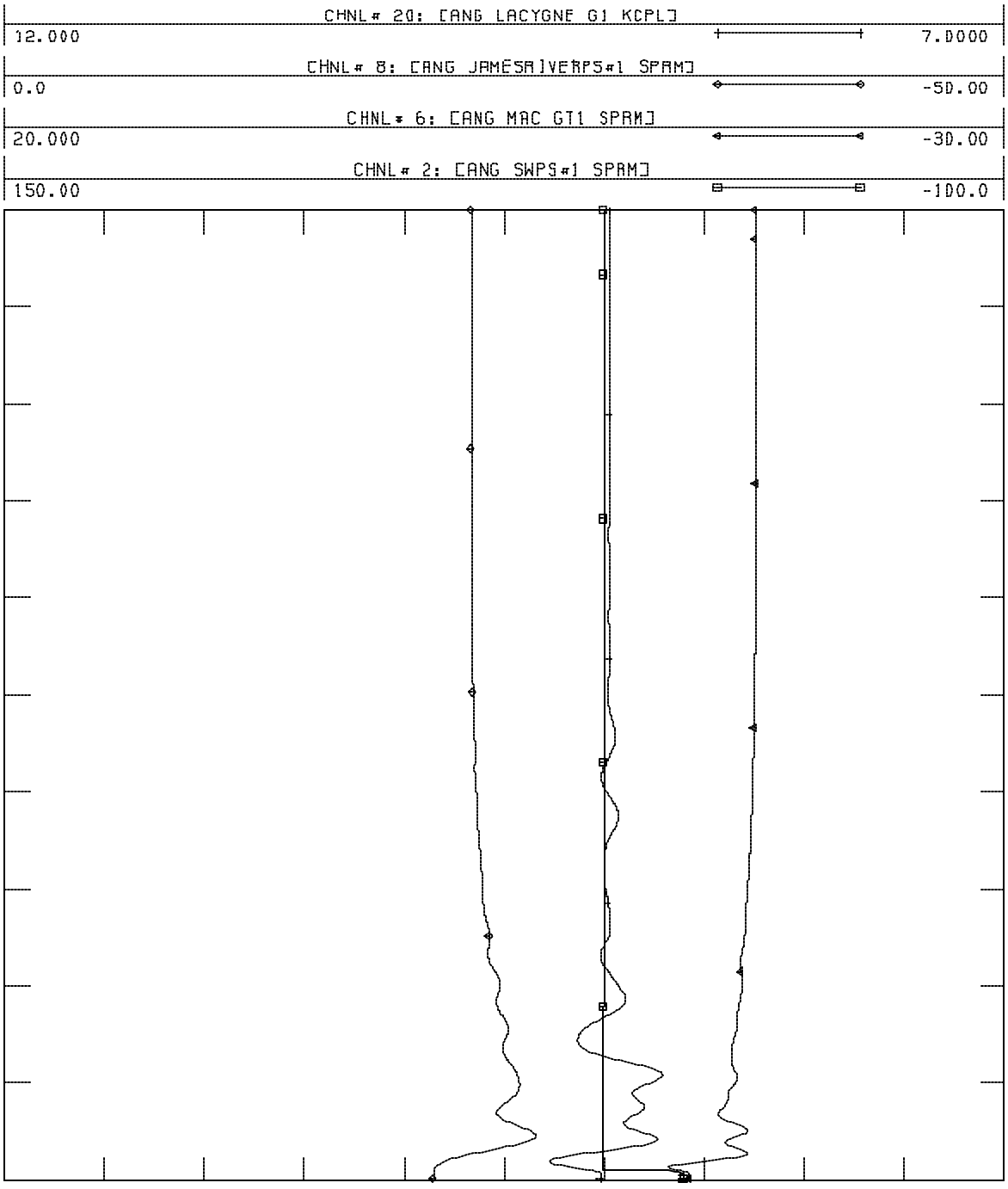


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

WED. NOV 03 2004 13:47

FLT_10_MACHINE ANGLES

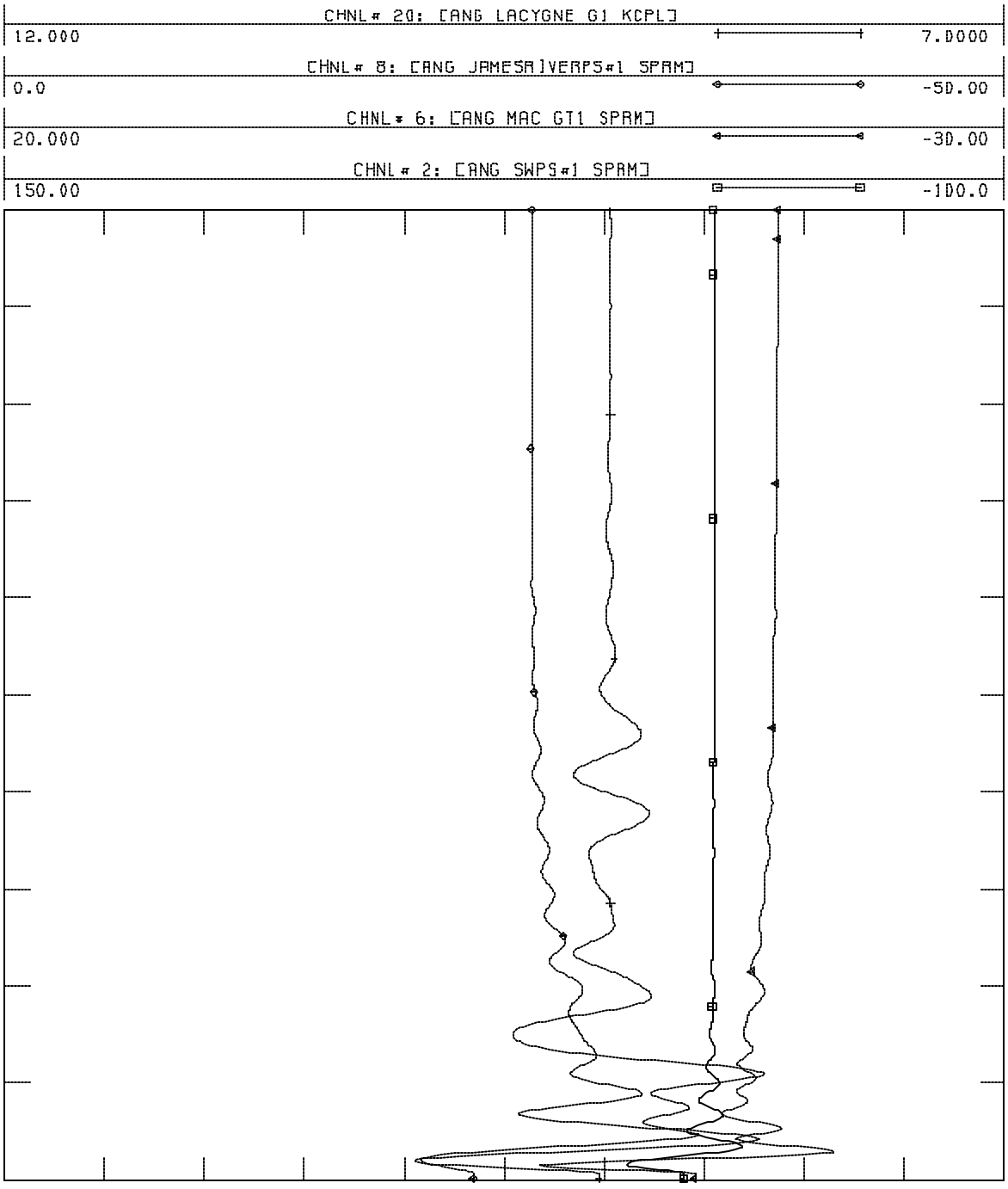


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_11_drop_unit_2.OUT

WED. NOV 03 2004 13:47

FLT_11_MACHINE ANGLES

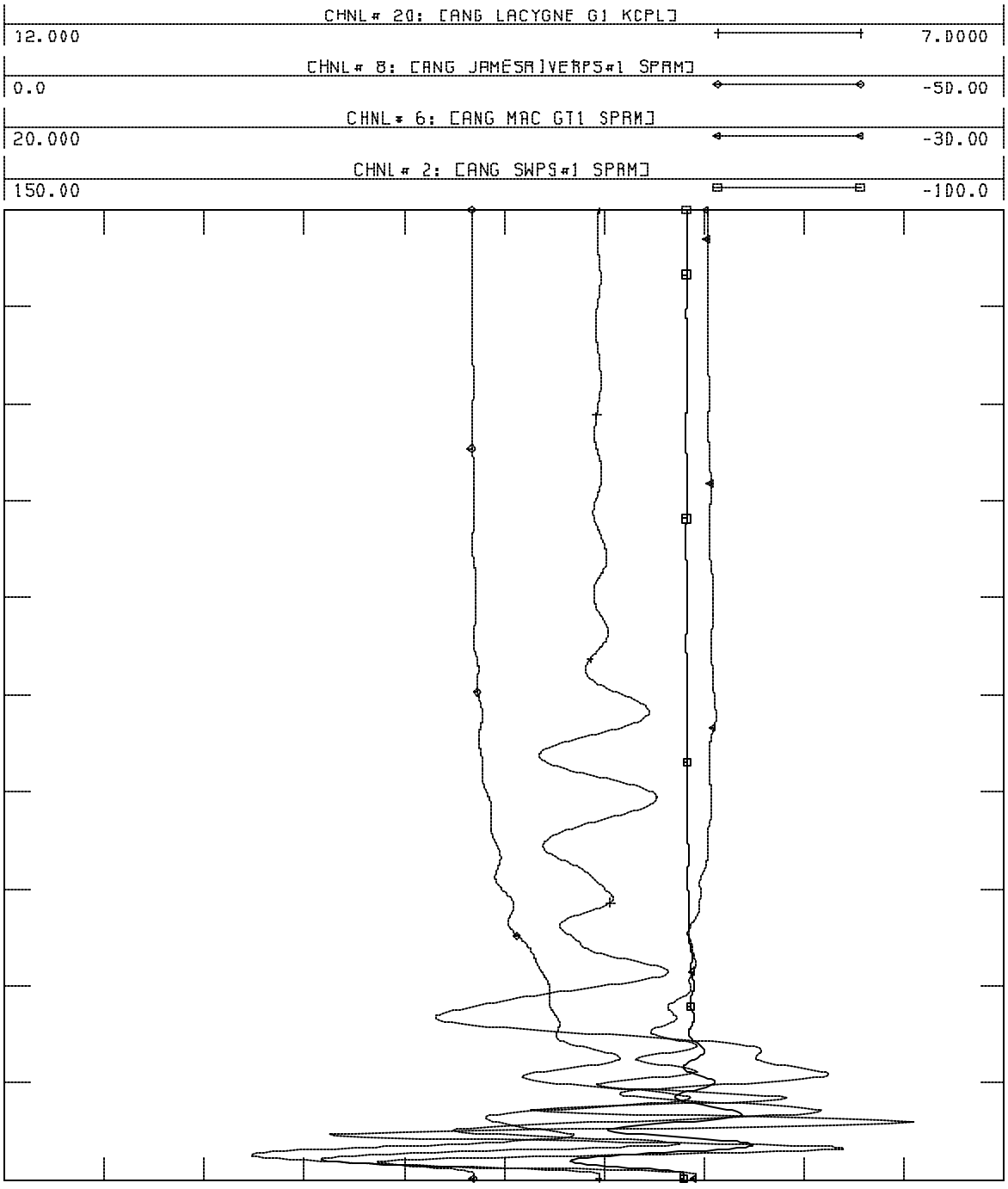


SPP MDWG 04 STABILITY:2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_12_3_PH.OUT

WED. NOV 03 2004 13:47

FLT_12_3PH_MACHINE ANGLES



Appendix D-2

Plots of Fault Simulations

Plots of selected bus voltage response during faults

Scenario:
2010 Summer Peak
275MW_2 (SWPS-Battlefield 161kV in service)
[No Customer Plant – No Network Upgrades]

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_1_3_PH.OUT

WED, NOV 03 2004 13:40

FLT 1 3PH VOLTAGES

CHNL # 356: EVOLTAGE GOLDEN 69KV]
2.0000 0.0

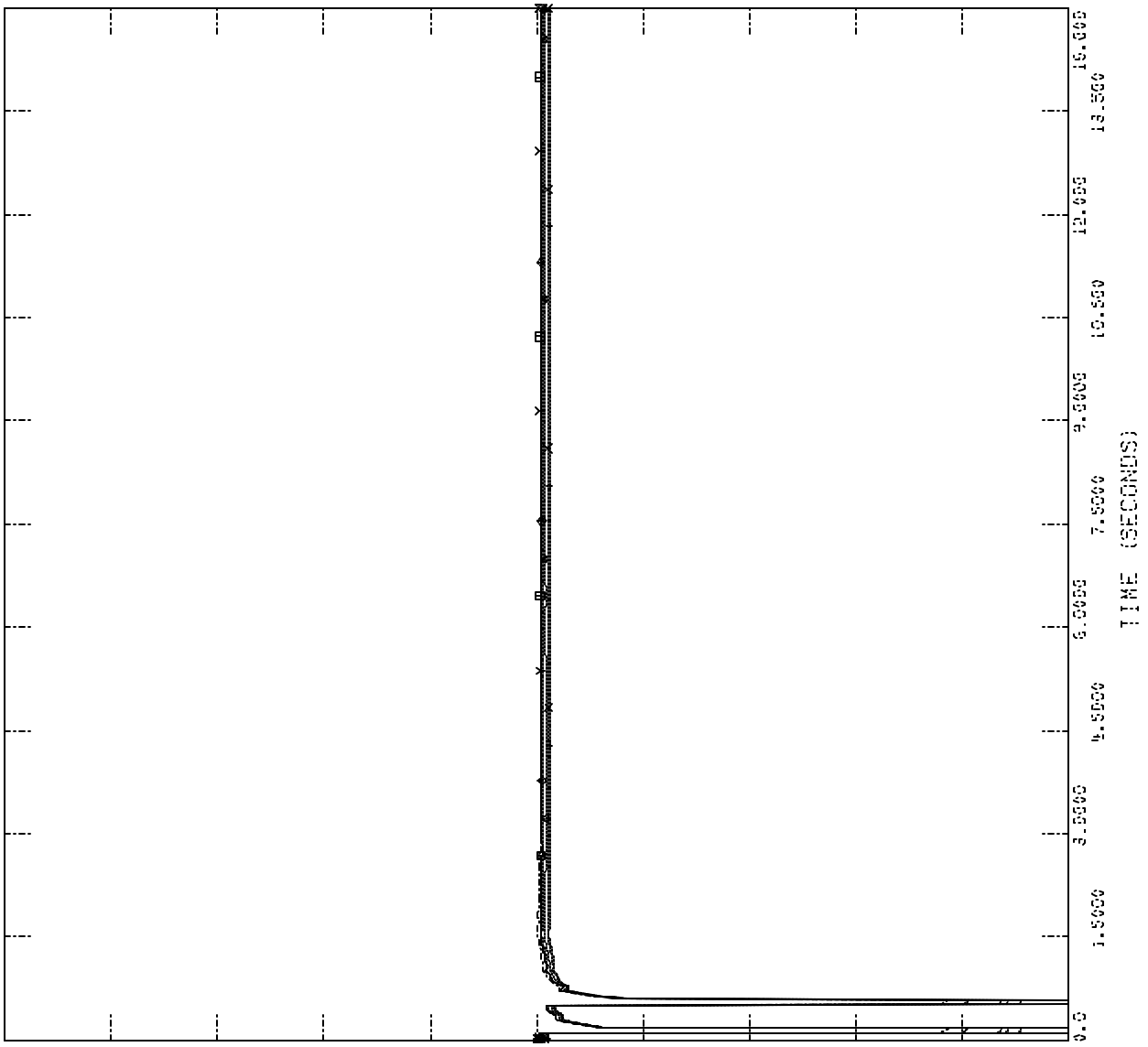
CHNL # 338: EVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_2_3_PH.OUT

FLT_2_3PH_VOLTAGES
WED, NOV 03 2004 13:40

CHNL # 356: EVOLTAGE GOLDEN 69KV]
2.0000 0.0

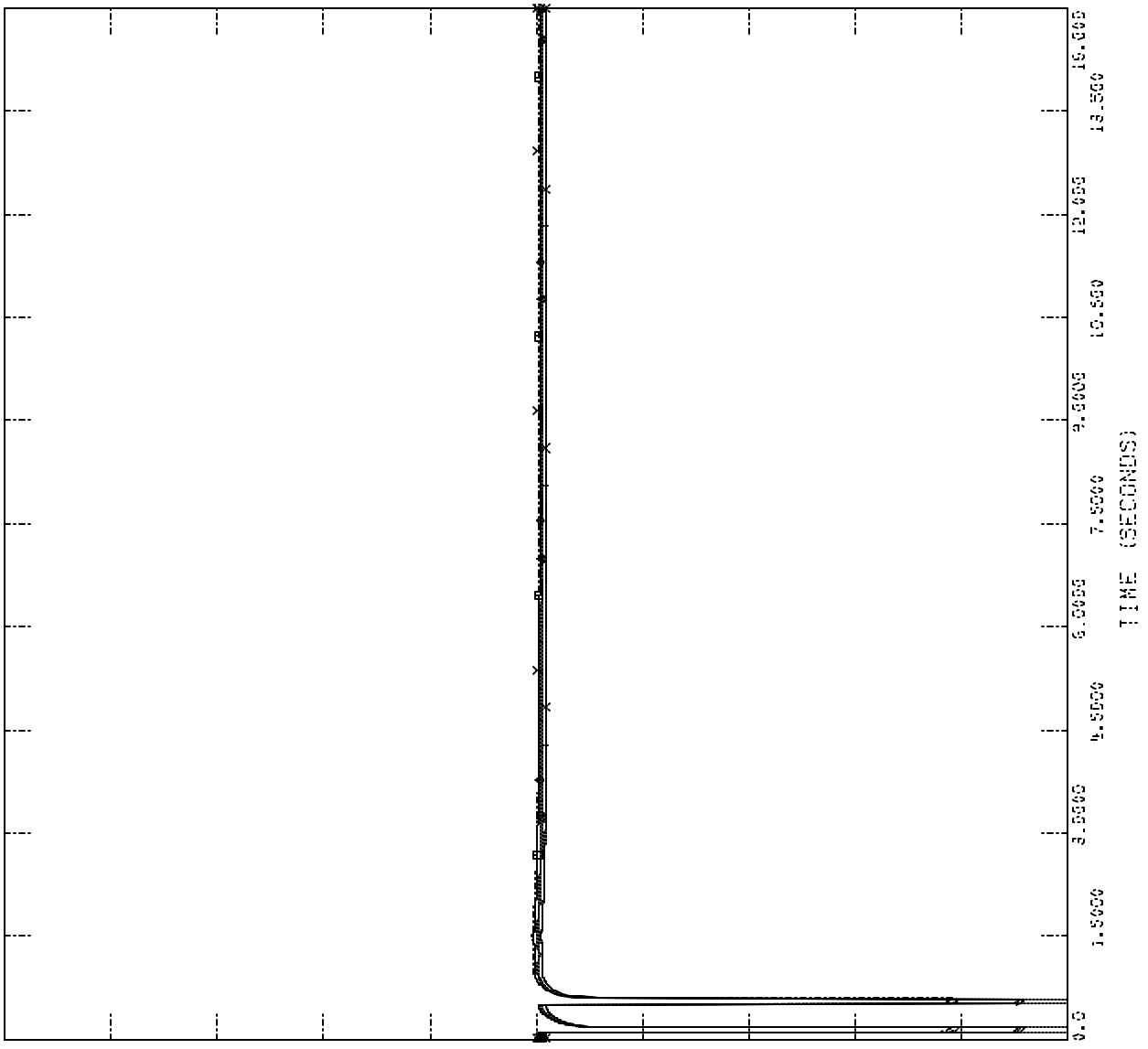
CHNL # 338: EVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]
2.0000 0.0

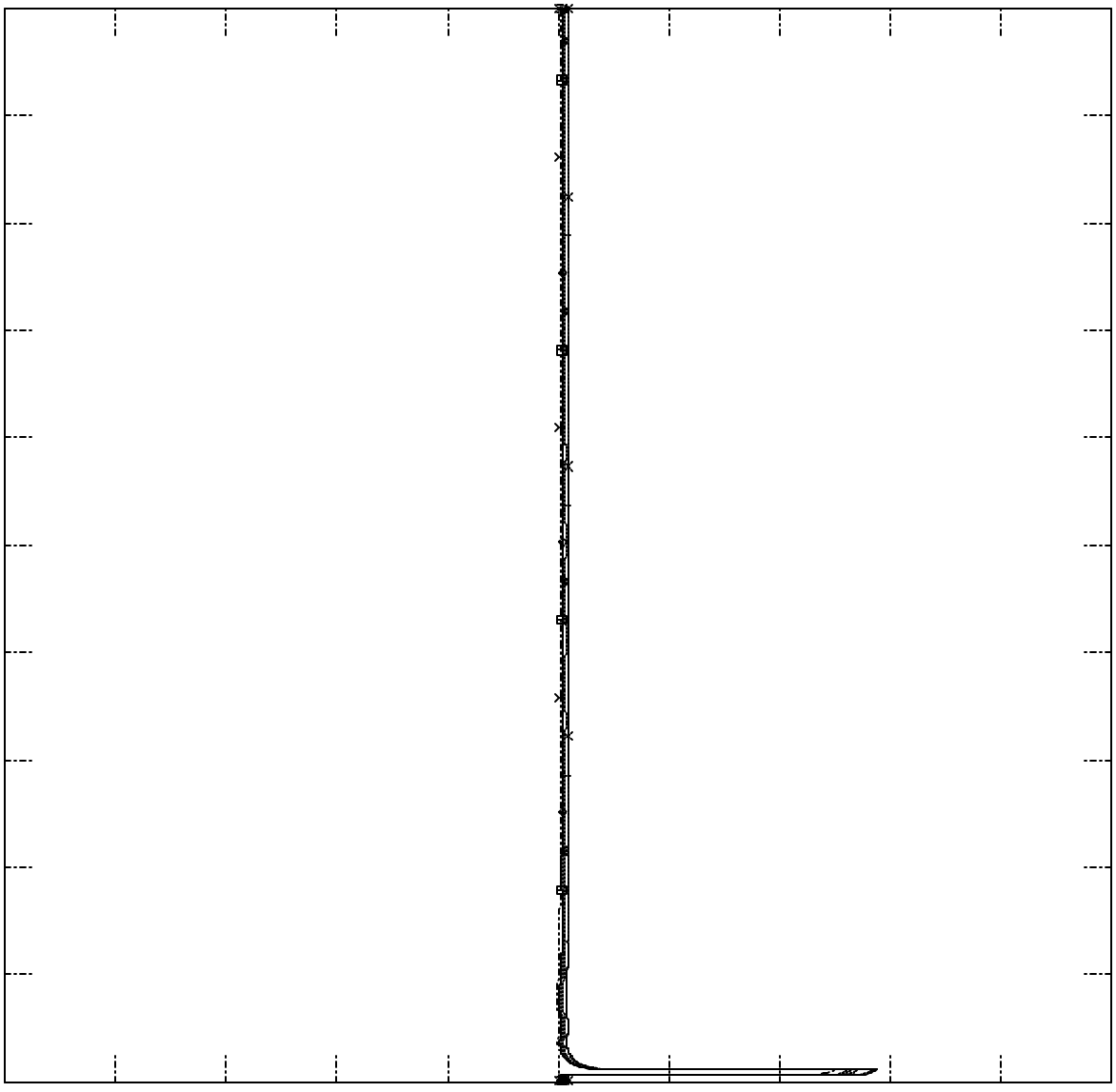
CHNL # 339: EVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

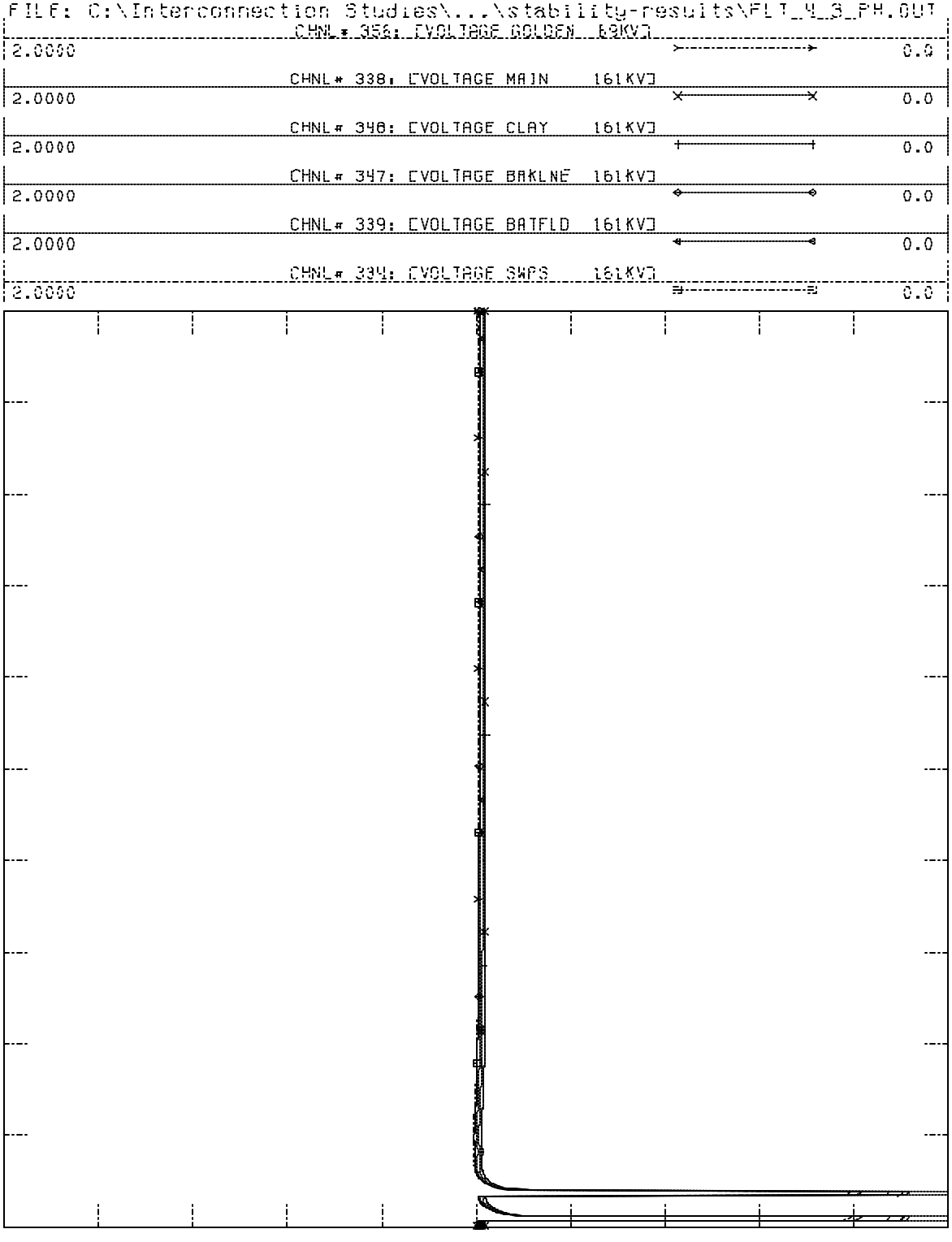
FILE: C:\Interconnection Studies\...\stability-results\FLT_3_3_PH.OUT



FLT_3_3PH_VOLTAGES
WED, NOV 03 2004 13:40

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_4_3_PH.OUT



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_S_3_PH.OUT

CHNL # 356: CVOLTAGE GOLDEN 69KV]
2.0000 0.0

CHNL # 338: CVOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: CVOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: CVOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: CVOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: CVOLTAGE SWPS 161KV]
2.0000 0.0

FLT_S_3PH_VOLTAGES
WED, NOV 03 2004 13:40

15.000
12.500
10.000
7.5000
5.0000
2.5000
0.0

TIME (SECONDS)

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_6_3PH.OUT

CHNL # 356: EVOLTAGE GOLDEN 69KV]

2.0000 0.0

CHNL # 338: EVOLTAGE MAIN 161KV]

2.0000 0.0

CHNL # 348: EVOLTAGE CLAY 161KV]

2.0000 0.0

CHNL # 347: EVOLTAGE BAKLNE 161KV]

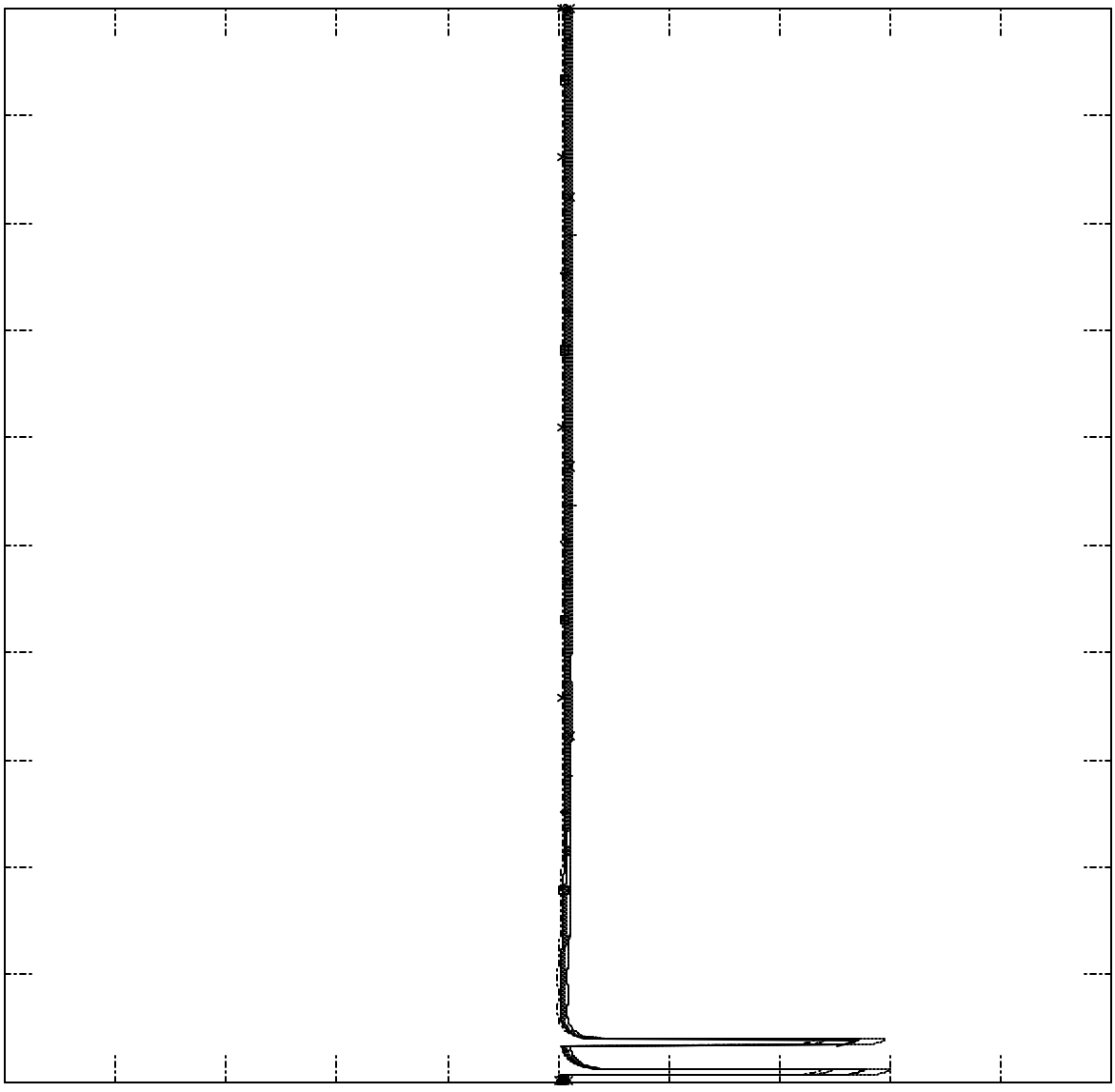
2.0000 0.0

CHNL # 339: EVOLTAGE BATFLD 161KV]

2.0000 0.0

CHNL # 334: EVOLTAGE SWPS 161KV]

2.0000 0.0



FLT_6_3PH_VOLTAGES
WED, NOV 03 2004 13:40

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_7_3_PH.OUT

FLT_7_3PH_VOLTAGES
WED, NOV 03 2004 13:40

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

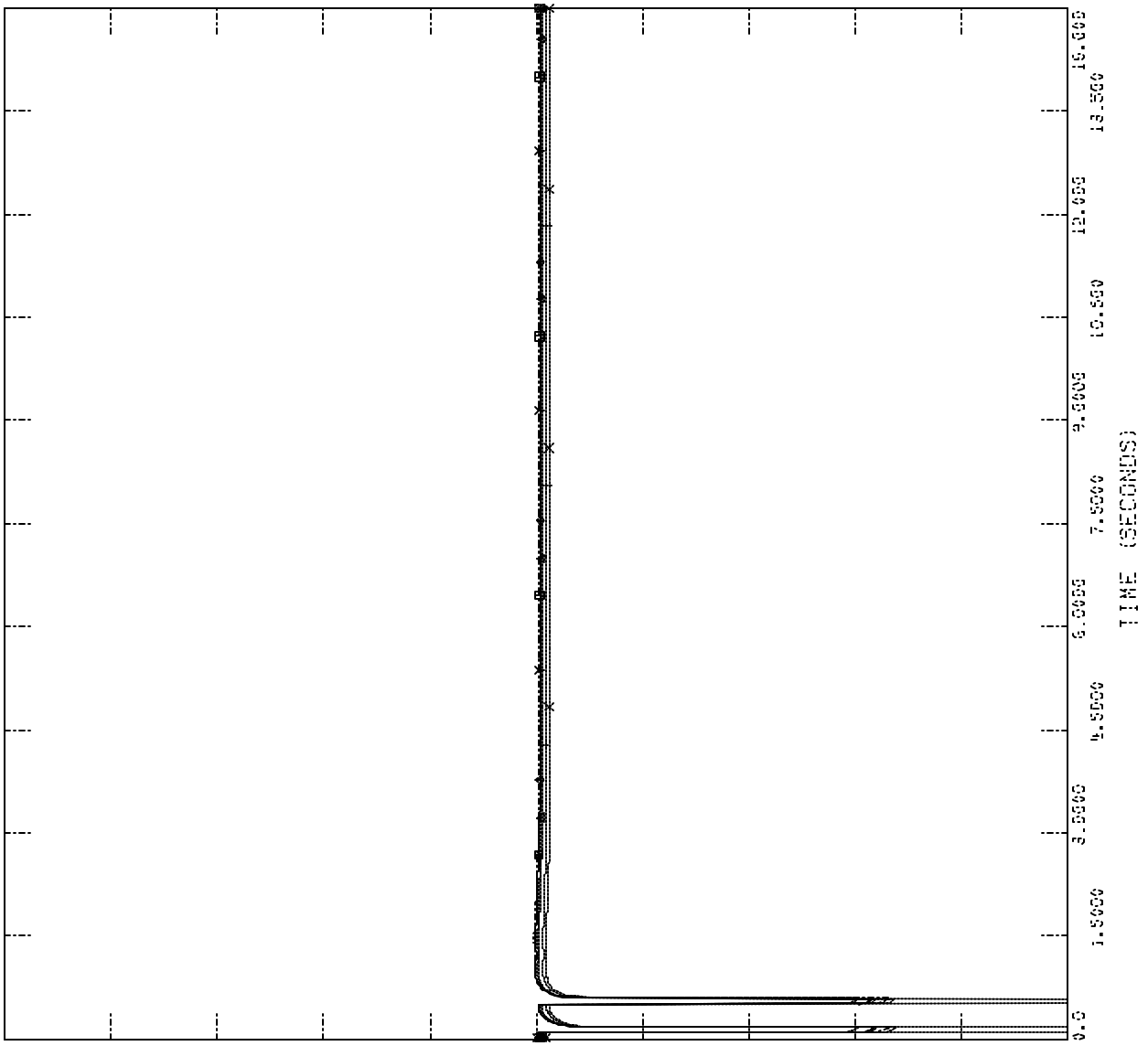
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

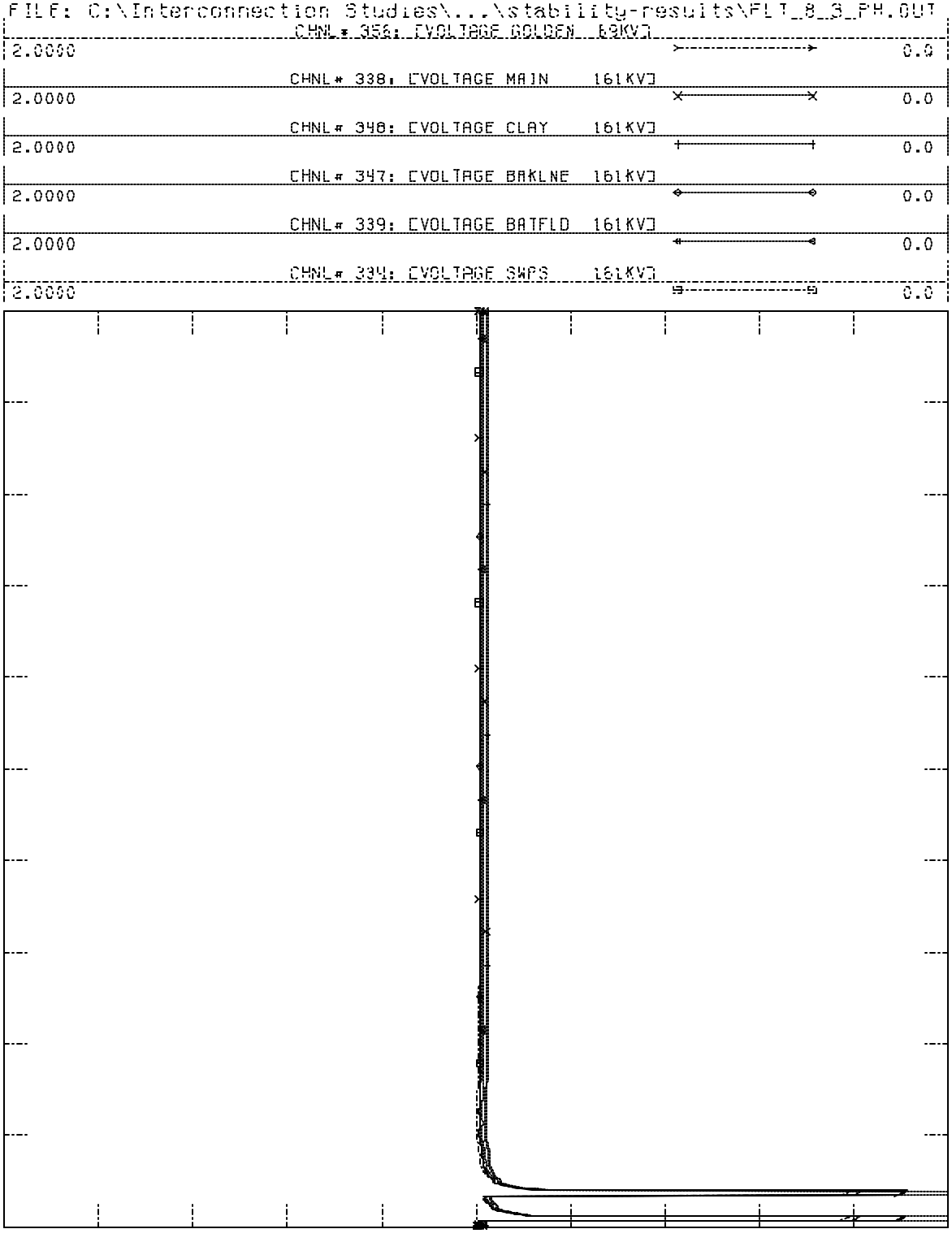
CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_8_3_PH.OUT



FLT_8_3PH_VOLTAGES
WED, NOV 03 2004 13:40

SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_9_3_PH.OUT

WED, NOV 03 2004 13:40

FLT 9 VOLTAGES

CHNL # 356: CVOLTAGE GOLDEN 69KV]

2.0000 0.0

CHNL # 338: CVOLTAGE MAIN 161KV]

2.0000 0.0

CHNL # 348: CVOLTAGE CLAY 161KV]

2.0000 0.0

CHNL # 347: CVOLTAGE BAKLNE 161KV]

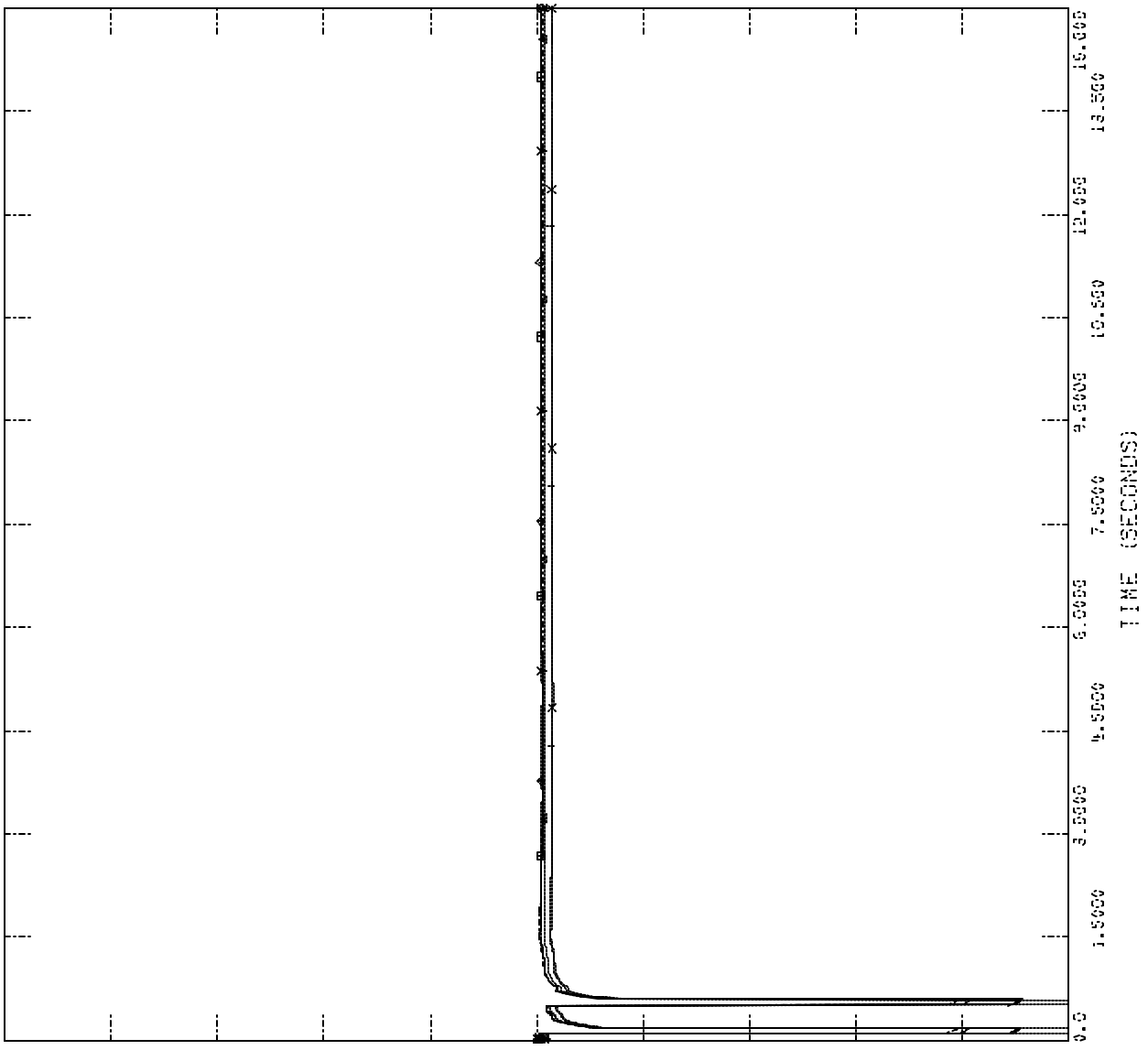
2.0000 0.0

CHNL # 339: CVOLTAGE BATFLD 161KV]

2.0000 0.0

CHNL # 334: CVOLTAGE SWPS 161KV]

2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_10_drop_unit_1.OUT

WED, NOV 03 2004 13:40
FLT_10_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

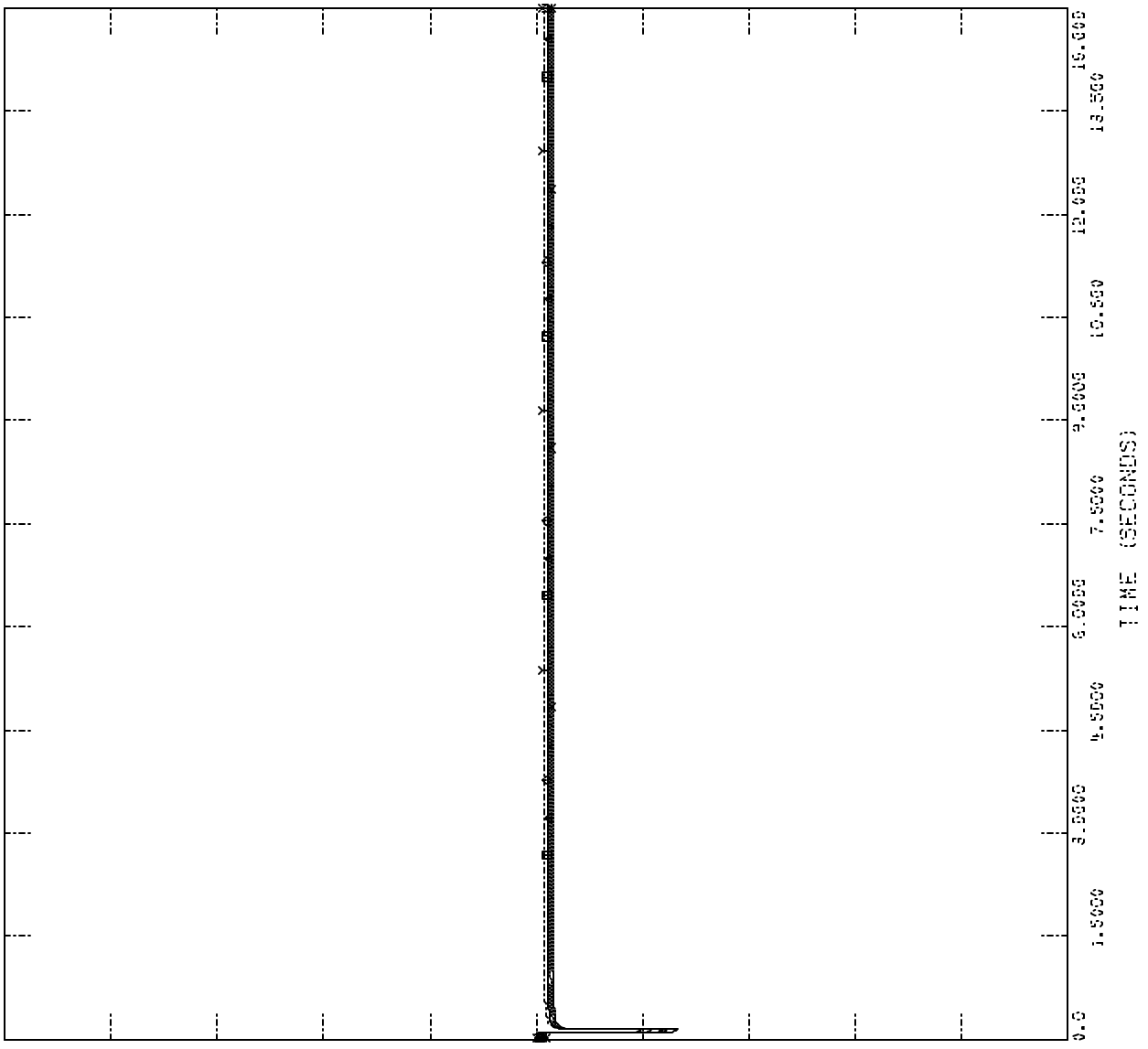
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: ...\stability-results\FLT_11_drop_unit_2.OUT

WED, NOV 03 2004 13:40
FLT_11_VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

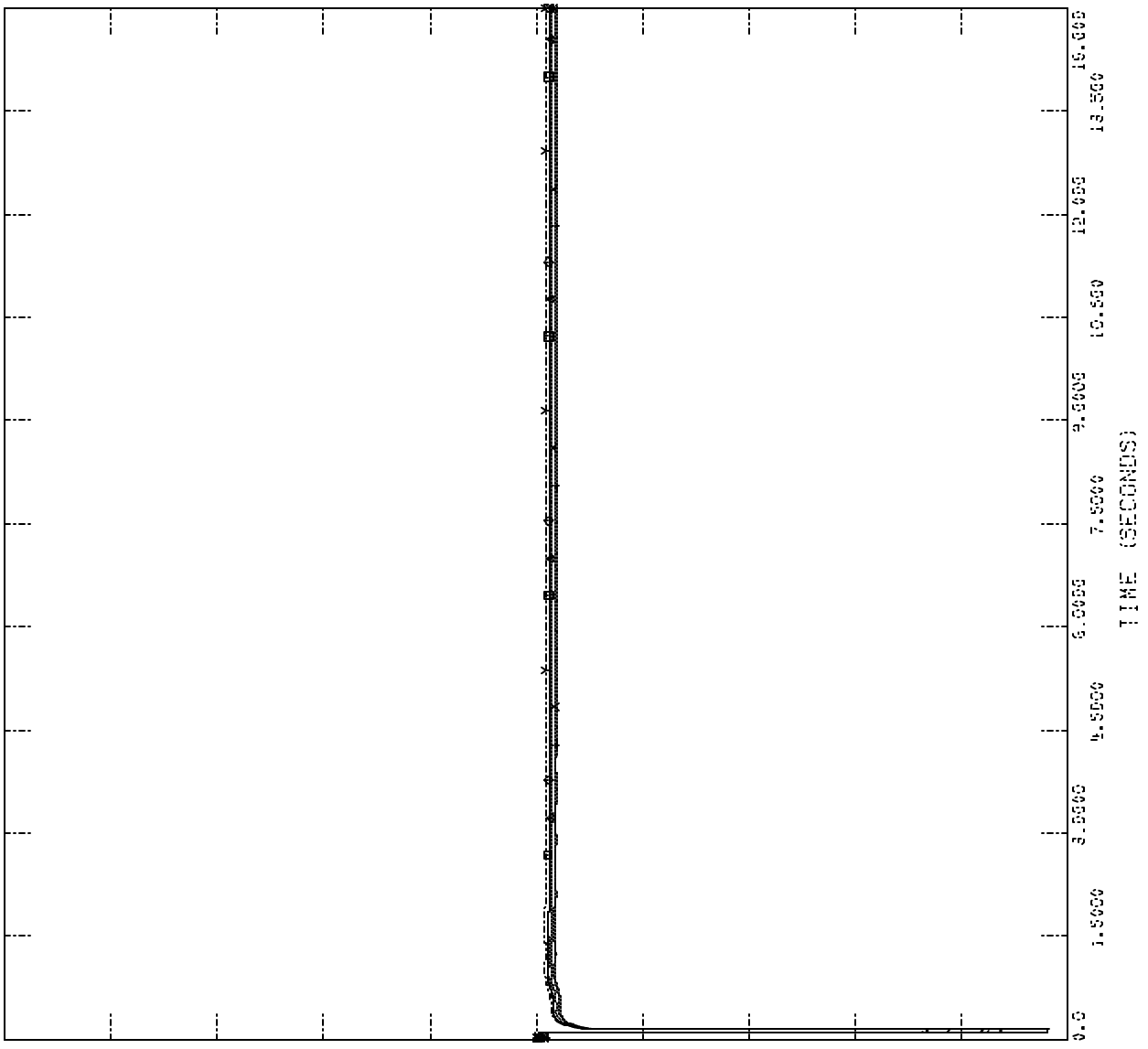
CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0



SPP MDWG 04 STABILITY;2010 SUM PEAK; MODIFIED
GEN-2004-005 BASECASE INCLUDING PRIOR QUEUED

FILE: C:\Interconnection Studies\...\stability-results\FLT_12_3PH.OUT

WED, NOV 03 2004 13:40

FLT 12 3PH VOLTAGES

CHNL # 356: [VOLTAGE GOLDEN 69KV]
2.0000 0.0

CHNL # 338: [VOLTAGE MAIN 161KV]
2.0000 0.0

CHNL # 348: [VOLTAGE CLAY 161KV]
2.0000 0.0

CHNL # 347: [VOLTAGE BAKLNE 161KV]
2.0000 0.0

CHNL # 339: [VOLTAGE BATFLD 161KV]
2.0000 0.0

CHNL # 334: [VOLTAGE SWPS 161KV]
2.0000 0.0