100MVA TRANSFORMER DAMAGE

CONTRACT NO. : **ONS-09-0-CO-4127**

PROJECT : **X GAS FIELD DEVELOPMENT (PHASES X)-132kV TEMPORARY POWER FROM MPC**

COMPANY : **X**

SITE : **X**

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XGAS FIELD DEVELOPMENT –
PHASES X
ONSHORE FACILITIES

Project No. : ONS-09-0-CO-4127		Doc. Class :	Scale : NTS
HIRBODAN		OIEC	IOEC

132kV TEMPORARY POWER FROM MPC
100MVA TRANSFORMER DAMAGE

DOCUMENT No.	NC-6340S-550-1600-000A	Sh. No. :	1 of 116	Rev. 0

TABULATION OF REVISED PAGES

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5	0	40	0	75	0
6	0	41	0	76	0
7	0	42	0	77	0
8	0	43	0	78	0
9	0	44	0	79	0
10	0	45	0	80	0
11	0	46	0	81	0
12	0	47	0	82	0
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14	0	49	0	84	0
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27	0	62	0	97	0
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1. INTRODUCTION

The phases X0 within the XGas Field Development project are designed to process the incoming hydrocarbon fluid by the sub-marine pipelines. The refinery is located at X Village, about 270 km South East of X city.

The Temporary Electrical Power required for phases 9 & 10 Gas Plant are supplied from Power Plant of Mobin Petrochemical Complex through 132kv underground cable line and a 132kV/33kV, 100MVA power transformer. The design studies of this supply are previously reported in NC-6340S-550-1600-0001rev1 (SWITCHING OVER VOLTAGE STUDY), NC-6340S-550-1600-0002rev1 (LOAD FLOW STUDY), NC-6340S-550-1600-0003rev1 (SHORT CIRCUIT STUDY), NC-6340S-550-1600-0004rev0 (RELAY SETTING STUDY), and NC-6340S-550-1600-0005rev1 (MOTOR STARTING STUDY).

At 5:47 afternoon of 09 Feb.2009, normal operation became suddenly disrupted. According to the operators a huge burning fire came out from 100MVA transformer. The trip was triggered off by the relays according to the event lists, but the explosion of the transformer Cable Box brought a huge fire that was extinguished by the official fire department plant of 9&10.

2. SCOPE

The objective of this document is to find out the causes of the events through analysis. In order to investigate the causes of the faults including those related to the operation malfunctions, design problems, protection recovery or tuning problems, studies as described in the followings are performed.

3. SYSTEM DESCRIPTION AND INPUT DATA

3.1. Reference Documents

DW 6340S 120 1633 0001	General Single Line Diagram
NC 6340S 120 1634 0001	Electrical Load Summary
NC 6340S 999 1630 0020	Short Circuit and Load Flow Study
NC 6340S 999 1630 0021	Dynamic Stability Study
SPY 2 0900 EL ST 001	X GAS FIELD DEVELOPMENT PHASES Y ONSHORE
SPY 2 0900 EL ST 002	FACILITIES TRANSMISSION OF 100MVA DUAL REDUNDANT
SPY 2 0900 EL ST 004	TEMPORARY ELECTRICAL POWER STUDIES
NC 6340S 550 1600 001	Switching Overvoltage Study (for 100MVA transformer)
NC 6340S 550 1600 002	Load Flow Study (for 50MVA transformer)
NC 6340S 550 1600 003	Short Circuit Study (for 100MVA transformer)
NC 6340S 550 1600 004	Relay Settings Study (for 50MVA transformer)

NC 6340S 550 1600 005 Motor Starting Study (for 50MVA transformer)
VP-6340S-1600-LG-0001-077 Relay Settings of GAS PLANT

3.2. System Analysis Software

PASHA (Power Apparatus and System Homological Analysis), Version 2008, was used for performing the studies. The software is product of TOM and serving the electrical utilities and the industries for twenty four years worldwide.

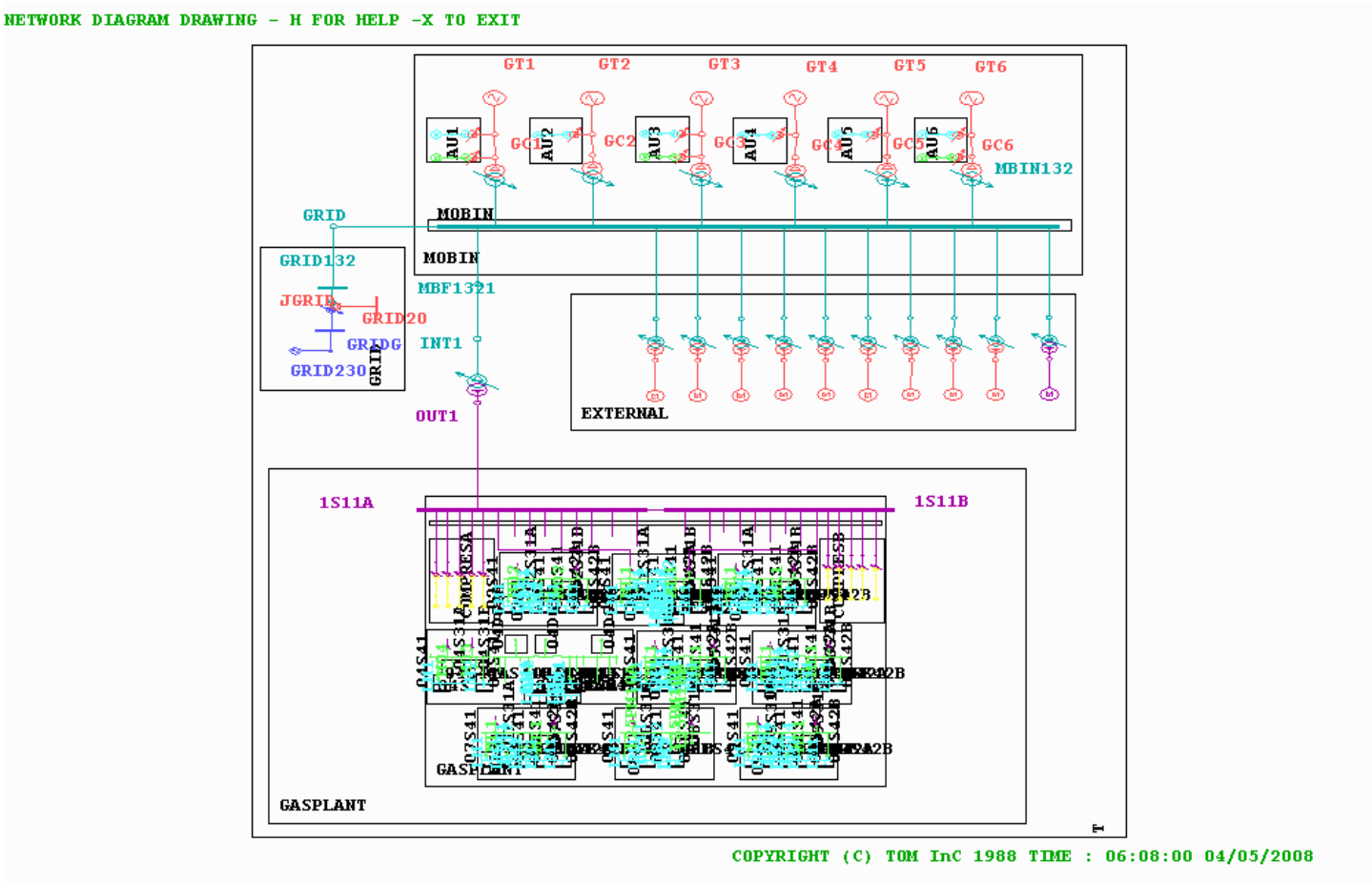
3.3. Electrical System Representation

3.3.1. Network Topology

Single line diagram of the involving plants are used to produce the study power system. Figure 1 shows a view of the overall electrical network represented in the present studies. **Drawing DW-6340S-550-1600-0005** which is included in the last page of this report shows the single line diagram of Figure 1 more clearly in a situation considered just before the damage occurred. Please refer to the appendix I which shows how the load flow condition of the GAS PLANT before fault condition is obtained from the available data. Also please refer to appendix IV for the list of motors that are assumed to be out and the load requirements of the substations and plant equipment considered.

Gas plant single line diagram as represented in drawing DW 6340S 120 1633 0001 is represented in PASHA software (please refer to document NC 6340S 550 1600 002 for details of this representation). For plant electrical system representation, 11 KV motor loads are represented separately based on their dynamic models. Some of 6 KV motor loads are also represented separately based on their dynamic models. Other 6KV motors and 400 V induction motor loads are summed and represented as equivalent motor loads on their corresponding bus bars. Static loads are lumped represented on their appropriate locations. The peak worst condition load is actually 83MW-47MVAR (96MVA), but prior to the event the plant load was 33MW and 21MVAR (39MVA) on 33KV side (please refer to appendix I). Considering 0.8MVAR no load consumption of the transformer this would be 33MW and 22MVAR (40MVA). Therefore, the loads of the plant approximately halved to mature this overall load demand. This is clearly listed in appendix IV.

Figure 1: The overall view of the study system



3.1.1. Network Parameters and Data

The network data are provided in two groups. One is from PASHA data bases which contains the fundamental data of equipment, usually based on the equipment ratings. The second one is according to PASHA edit pages which includes the drawn equipment data on system base.This is selected to be 10MVA.

Table IV.1 in appendix IV shows the input data base and Table IV.2 in appendix IV shows the actual input data provided in PASHA edit pages which reported by PASHA Transient Stability (T/S) and Frequency Dynamic (F/D) program.

4. REPORTS AVAILABLE

Prior to the start of the studies the following reports about the events were issued and were made available to us at March 2009:

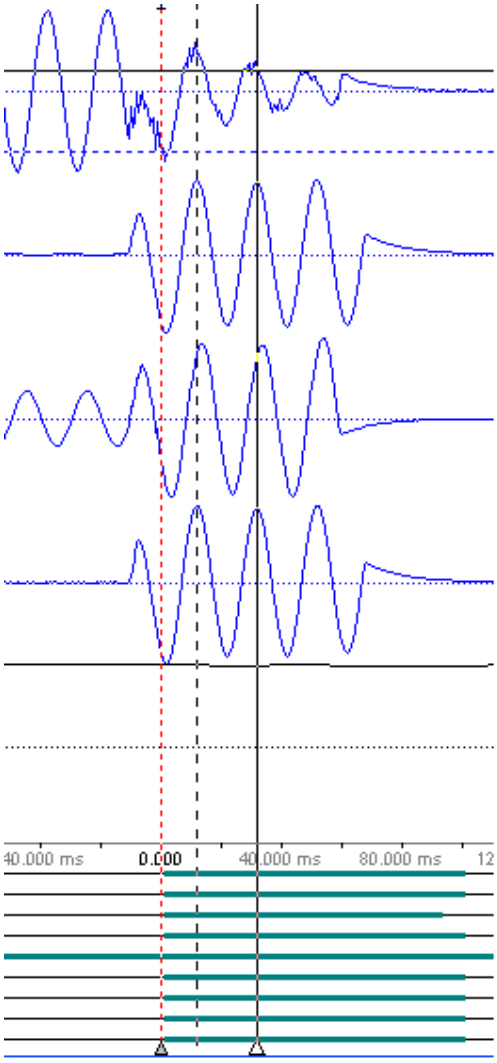
a) 100MVA transformer Firing – In Persian – Issued by OIEC.
b) Report of the event and its causes – In Persian – Issued by X TRANSFO, we heard that it has been issued but it is not available to us.

5. RECORDS AVAILABLE

Apart from the drawings and the data sheets of the plant components, the following records and observations are used to provide the conclusions:

a) A site visit
b) Event lists (please refer to APPENDIX I, APPENDIX II, and APPENDIX III)
c) Records of the fault currents from relay P123 in MOBIN is represented in figure 2 (for more details please refer to APPENDIX I, APPENDIX II, and APPENDIX III)
d) Records of the fault currents from relay P541 in MOBIN is represented in figure 3 (for the details please refer to APPENDIX I, APPENDIX II, and APPENDIX III)
e) Records of the fault currents from relay 7SJ611 in the transformer incoming represented in figure 4 (for more details please refer to APPENDIX I, APPENDIX II, and APPENDIX III)
f) The cable box damage pictures (figure 5). The location of the single phase fault is from a burning spot on the 132KV conductor toward the beneath of the screws of the supporting insulation as shown in the figure by red boxes.
g) Many other pictures of firing effects, some of them are represented in figure 6.

Figure 2: Current waveform recorded by the P123 relay at MOBIN. Autoscale is on.



Title	RMS	InstPeak
Ia	66.148	79.196
Ib	12745.693	17935.062
Ic	417.424	585.485
Ie	13147.544	18416.803
Frequency	49.571	49.450

A Relay 1 (Trip)	N	N	18:52:08.2
A Relay 2	N	N	18:52:08.2
A Relay 3	N	N	18:52:08.2
A Relay 4	N	N	18:52:08.2
A Relay 0 (Watchdog)	A	A	
A Relay 5	N	N	18:52:08.2
A Relay 6	N	N	18:52:08.2
A Relay 7	N	N	18:52:08.2
A Relay 8	N	N	18:52:08.2

Figure 3: Current waveform recorded by the P541 relay at MOBIN. Autoscale is on.

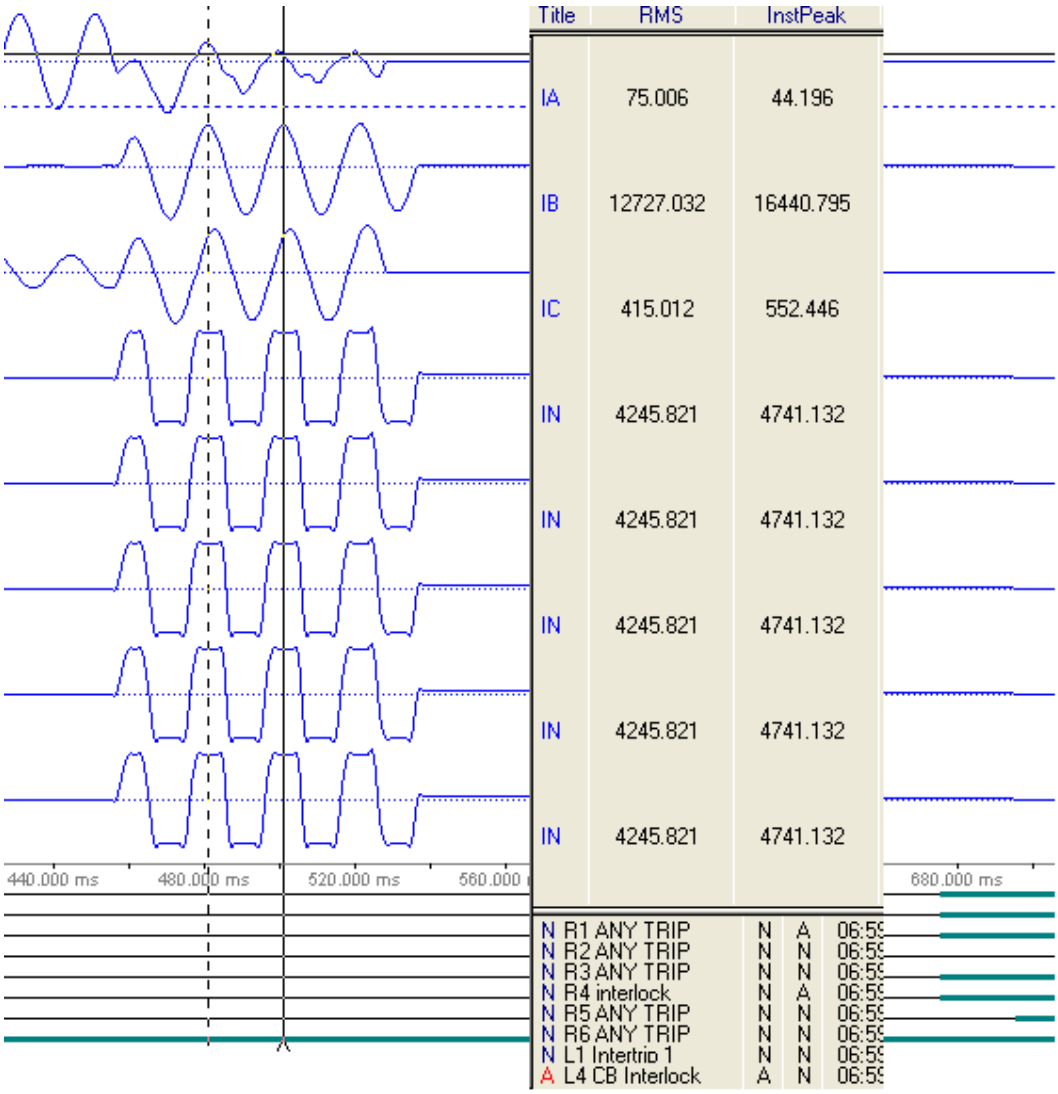


Figure 4: Current waveform recorded by the 7SJ611 relay at GAS PLANT. Autoscale is on.

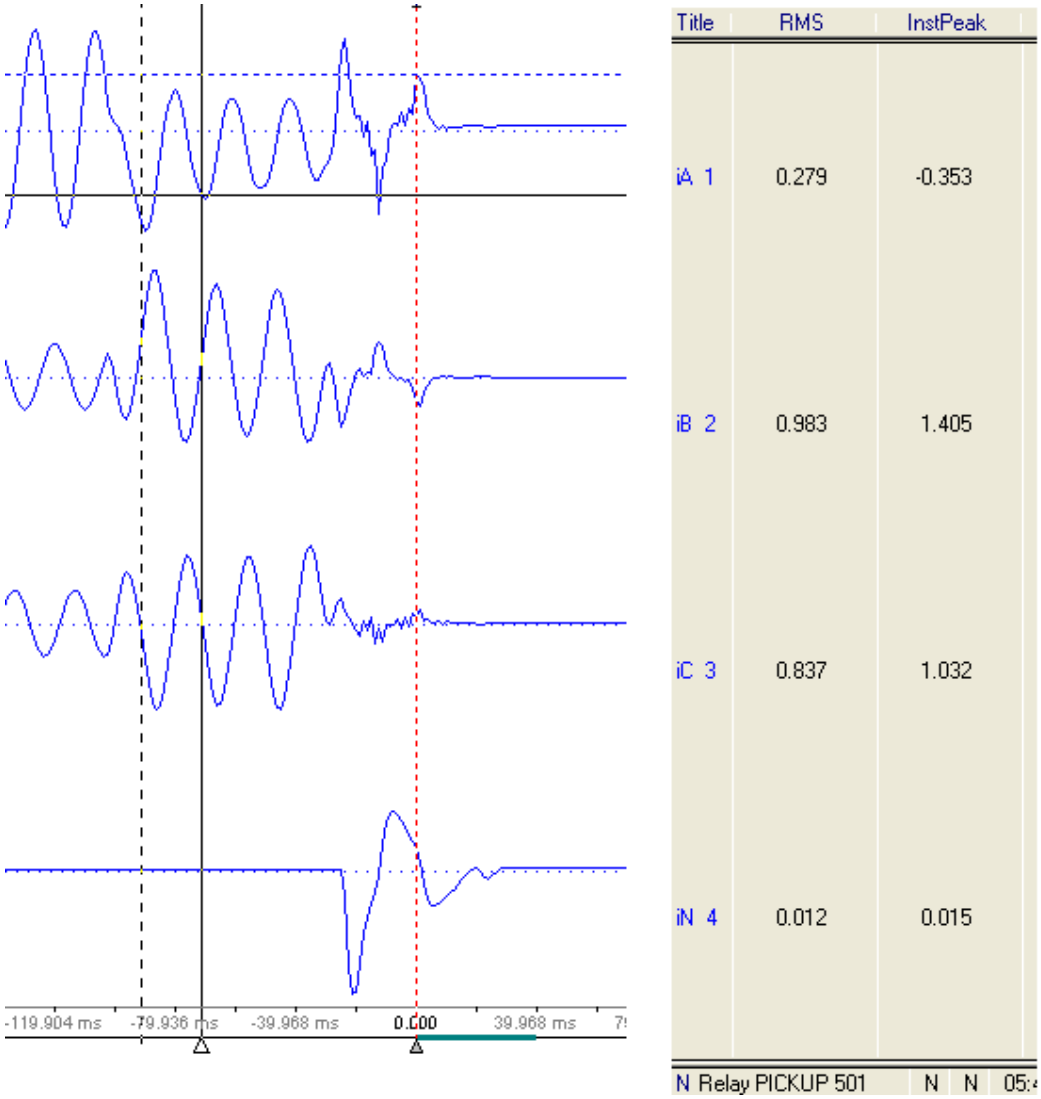


Figure 5: Cable Box Damage, showing the location of single phase fault

Figure 6: Transformer Damage

6. MODELLINGS AND SIMULATION RESULTS

The following simulation studies are used:

1) Appendix I manipulates the three phase instantaneous values of the recorded currents which are shown in figures 2,3 ,4 (i.e. the available records of the event) in order to provide some other useful variables such as the active and reactive power consumption prior to fault, the magnitude of the currents, and etc. The formula used to find out the required variables are described in appendix I.
2) Load flow studies prior to the fault are also described in appendix I. This provides a deep insight of the plant condition before the occurrence of the event.
3) Three phase transient stability run for a single phase fault inside the transformer are performed in appendix II. The exact match of the simulation results and those recorded are found in this appendix. It is shown that the fault had been happened when the voltage of the related phase was passing its maximum peak point, and therefore it is concluded that the insulation breakdown is the cause for the occurrence of single phase fault.
4) The transient behavior of the network including the relays behaviors are simulated in appendix III. It has been shown that the simulation results and the actual relays behaviors are matching each other. It is concluded that the protection systems have done their jobs very precise and fast.
5) Protection event lists are discussed in appendix III too.

7. SEQUENCE OF THE EVENTS

The following sequence of the events can be recognized:

a) The magnitude of the recorded currents and simulated voltages shown in appendix I and II, suggest that at the time when the Yellow phase voltage passing its peak, a single phase fault starts to be initiated in this phase. Figure 5 shows the actual location of the fault inside the Cable Box of the transformer. Figure AII.1 in appendix II shows the exact location of fault in transformer schematics.
b) The relay P123 at MOBIN has distinguished the fault first (please refer to Appendix III) and ordered the interruption of 132KV Circuit Breaker. This is a 70 Millisecond (3.5 Cycle) interrupting circuit breaker, and therefore, had interrupted the circuit after the elapsed time. The time for

recognition of the fault, plus ordering command, plus the interruption of the Circuit breaker all together last for 80 Milliseconds. The current after this time is the discharging current of the capacitors of the 132 cable, which last for five milliseconds.

c) At the same instant of time or so, *when the single phase fault was still at its initiation time, a remote interrupt was received to the 33KV circuit breaker. This circuit breaker had interrupted the 33KV incoming of the GAS Plant at 65 millisecond.* The time for receiving the remote interruption order, plus ordering time, plus interruption of the Circuit breaker all together lasts for 81 Milliseconds. The simulation shows this (Appendix II), otherwise the induction motor contribution would be more in magnitude than the recoded data. The current lasting after this time is because of the oscillation of the burning transformer magnetizing energy and the 132KV cable capacitor, which last about 20 milliseconds and recorded by 7SJ611 relay.

d) For the action of the other relays during and after fault interruption please refer to Appendix III.

e) An explosion had occurred after the interruption, or during the last 20 milliseconds oscillation mentioned in section C. The current waveforms before this time do not show any explosion indication. However, the explosion was not due to the oscillation since it is too weak as the current waveform indicates, but it was because of the existence of the gas inside the Cable Box as described in section 9. The possible causes of the initial fault and the explosion are described in the next two sections.

8. CAUSE OF INITIAL SINGLE PHASE FAULT

Since the fault had occurred at the instant of voltage passing its peak, we suspect that the fault had initiated because of the insulation breakdown. The insulation we are talking about is actually one of the supports of the 132KV conductor inside the Cable Box of the transformer, figure 5. This is obvious from the visual inspection. Since the fault had not ended at the bottom screw point, we suspect that the insulation had a crack in the bottom side. This crack might have been occurred when the installators were either screwing the top or the bottom screws. The gap of the crack was there until the single phase short circuit occurred.

9. CAUSE OF CABLE BOX EXPLOSION

As mentioned above the existence of a crack inside the support insulator of the cable box of the

transformer, is the main reason of initiation of the single phase fault. Since the fault was removed very rapidly by the protection system through the circuit breakers, we did not expect any explosion. In such an instant the fault must be extinguished and the oil must be expanded a little and the safety valves must operate. But in our case a huge explosion occurred. The following reasons for the explosion are possible:

a) Gas had been collected inside the cable box during the operation of the transformer because of the exsitance of crack gap inside the support insulator and the oil burning and possible partial discharge at this point. The Bokholtz however must warn this collection of the gas. In actual situation no Bokholtz warning were reported. This might be either because Bokholtz or its wirings had some problems. The test reports for wirings are available, which shows their proper action during the testing. Therefore, it remains that the Bokholtz had some problem itself. This must be further investigated by the transformer manufacturer.

b) The more possible reason of the explosion needs again further investigation and this is addressed in the next sentences. The fault in the surface of the insulation support, caused the oxidation of the insulation, this new material in conjunction with oil might have been explosive.

10. CONCLUSIONS

The possible cause of the single phase fault and the consequences explosion after the interruption of the fault are described. By using the recoded data and by the help of simulation it is shown that the protective devices had been removed the electrical fault very rapidly, indeed as soon as it was possible. However, some comments are mentioned in the appendix III, for the action of the differential relay, which had not any effect in this particular event sequence but must be considered for the future..

APPENDIX I

MANUPULASION OF CURRENT WAVEFORMS

The available waveform records from the event are those that are shown in Figures AI.1, AI.2, and AI.3. Table of these figures show the magnitude and phase currents prior to the fault extracted from these records (please refer to appendix II which describes the fault and appendix III which figure AIII.5 shows the location of the relays). These values will lead us to find out the exact condition of the network prior to the fault as described in the followings:

1. P.U. Base

10MVA, 132KV, 43.74A

2. Extracted *values*

Relay P123 current prior to fault: Ired=157.92 A, Iyel=156.331A. Iblu=156.325A, In=0.722A

Angles respect to fault occurrence: red=208.535, yel=87.96, blu=329.415

Relay P541 at MOBIN current prior to fault : Ired=148.194A, Iyel=149.702, Iblu=152.475, In=0.0

Angles respect to fault occurrence: red=189.951, yel=63.755, blu=305.929

Relay 7SJ611 at GAS PLANT 9&10 current prior to fault with CT ratio of 500:1 : Ired=0.358, Iyel=0.356, Iblu=0.355, Inat33KV=0.012

Relay 7SJ611 at GAS PLANT 9&10 current prior to fault: Ired=179A, Iyel=178A, Iblu=177.5A, In=3A (Refers to the neutranl of transformer in the secondary)

Angles respect to fault occurrence: red=164.964, yel=44.509, blu=285.245

Relay P541 at GAS PLANT 9&10 : No record is available to us

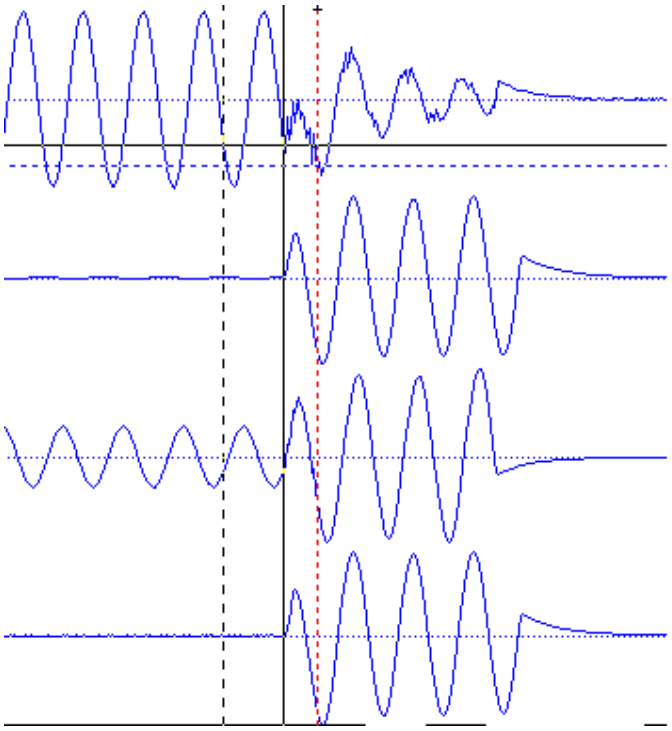
3. Calculated values

Due to sampling rate effect the angles of the currents are not trustable, (the sampling rate for 7SJ611 is 300HZ therefore about 23 degree error in angle and for P123 is 600HZ therefore about 11.5 degree error in angle). Knowing this we have to trust on the RMS values of the currents. The difference between the currents of P123 and P541 is due to the DFT manipulation performed in P541. Having known these facts the sending end and receiving end currents of the 132KV cables are assumed to be 153A and 179A respectively prior to the fault. Knowing these values will let us to find the sending end voltage and the receiving end power consumption either using the basic load flow equations or performing some load flow to match these currents.

On the other hand, the no load consumption of the transformer must also be considered. Figure AI.4 shows the result of load flow for a case measured four months before the event. Having known the measured values for voltages and powers and the tap position at that time, it can be concluded that the no load consumption of the transformer is about 0.8MVAR. The measured values was: voltage= 32.47KV , P= 4.5MW , Q= 2.1MVAR , tap=+1.67% .

By consideration of the above facts, the load flow result prior to the event is shown in figures AI.5and AI.6. Figure AI.5 shows that the plant consumption was 33MW and 22MVAR, including the no load consumption of transformer, the automatic tap was adjusted on -3.3% and the voltage magnitude on MOBIN 132KV busbar was 0.997P.U. Prior to the occurrence of fault.

Figure AI.1: Current waveform recorded by the P123 relay at MOBIN. Autoscale is on.



Ia	157.806	-135.765	208.535°
Ib	156.226	10072.032	87.960°
Ic	155.576	-223.446	329.415°
Ie	0.819	-1.381	201.034°

Figure AI.2: Current waveform recorded by the P541 relay at MOBIN. Autoscale is on.

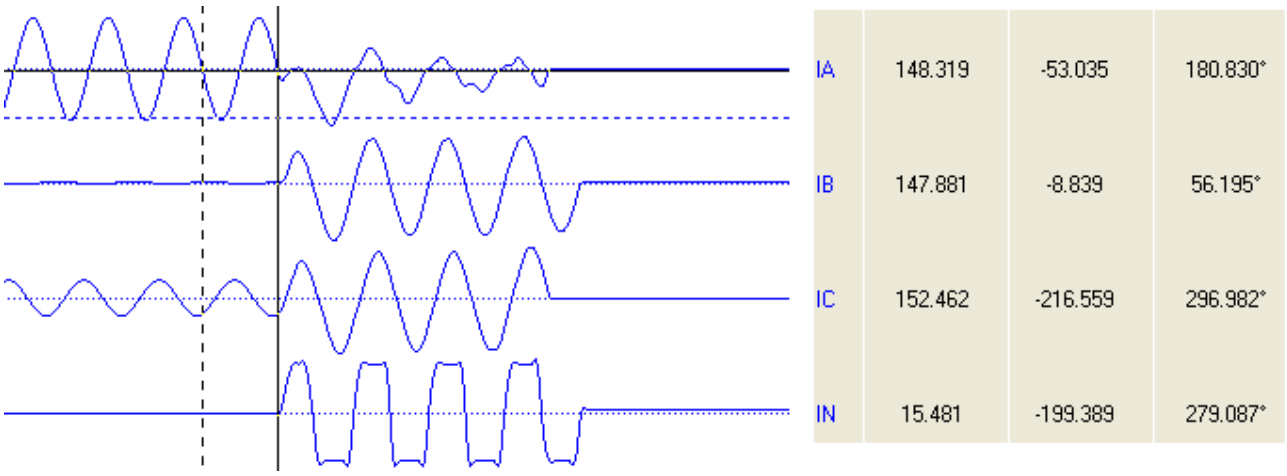
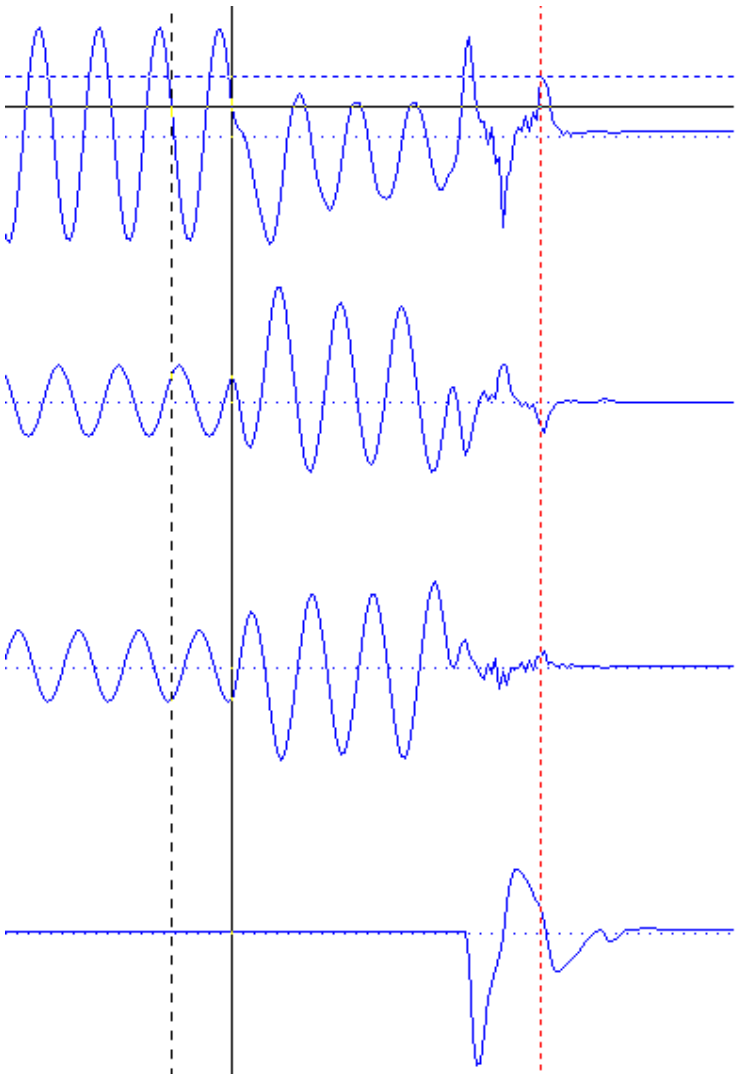


Figure AI.3: Current waveform recorded by the 7SJ611 relay at GAS PLANT. Autoscale is on.



iA 1	0.358	0.505	164.964°
iB 2	0.356	0.348	44.509°
iC 3	0.355	-0.487	285.245°
iN 4	0.012	0.012	0.000°

Figure AI.4: Four months before the events, the network had been seen in the following load flow condition

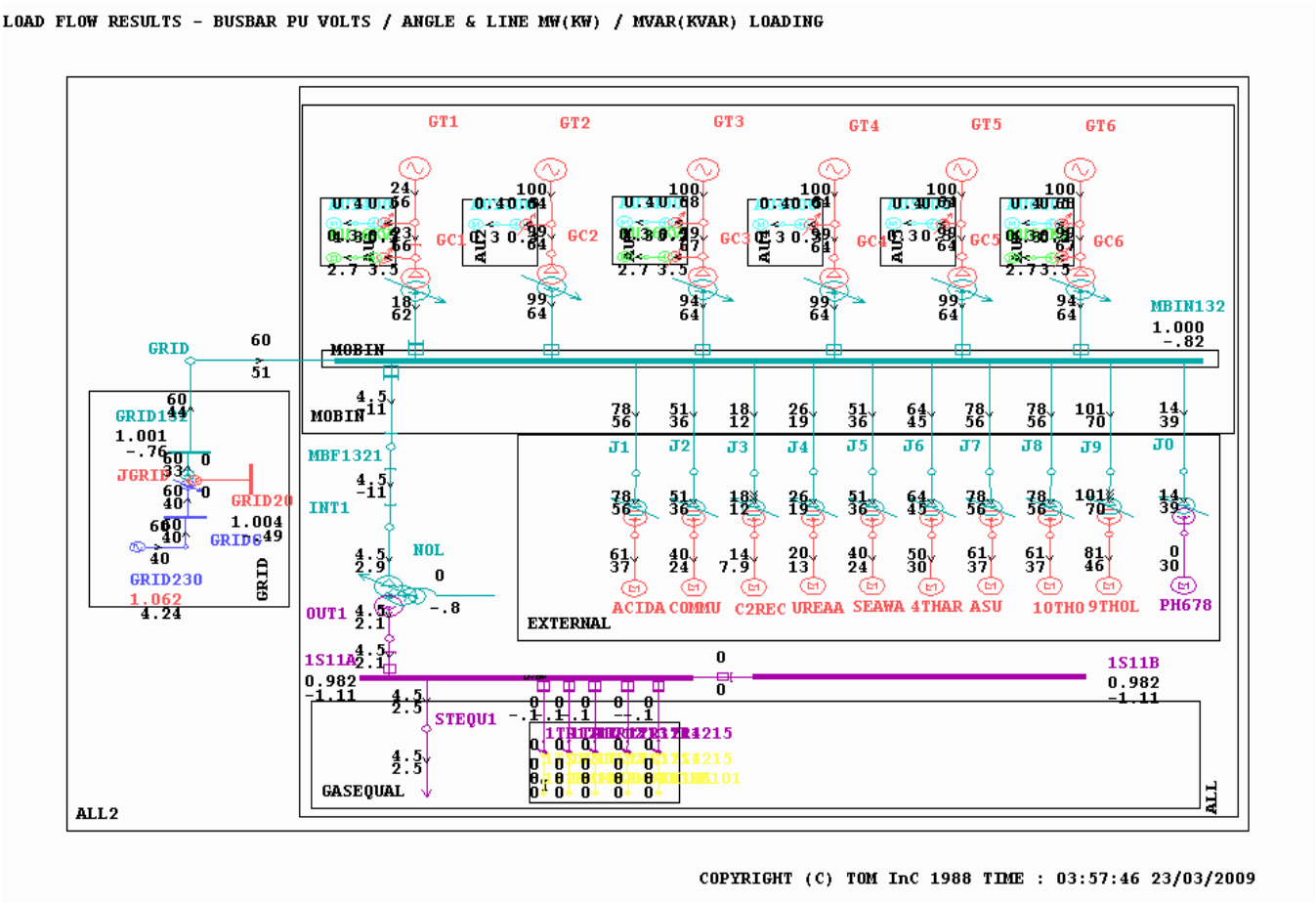


Figure AI.5: Load flow condition just before the single phase fault MW-MVAR flows are shown

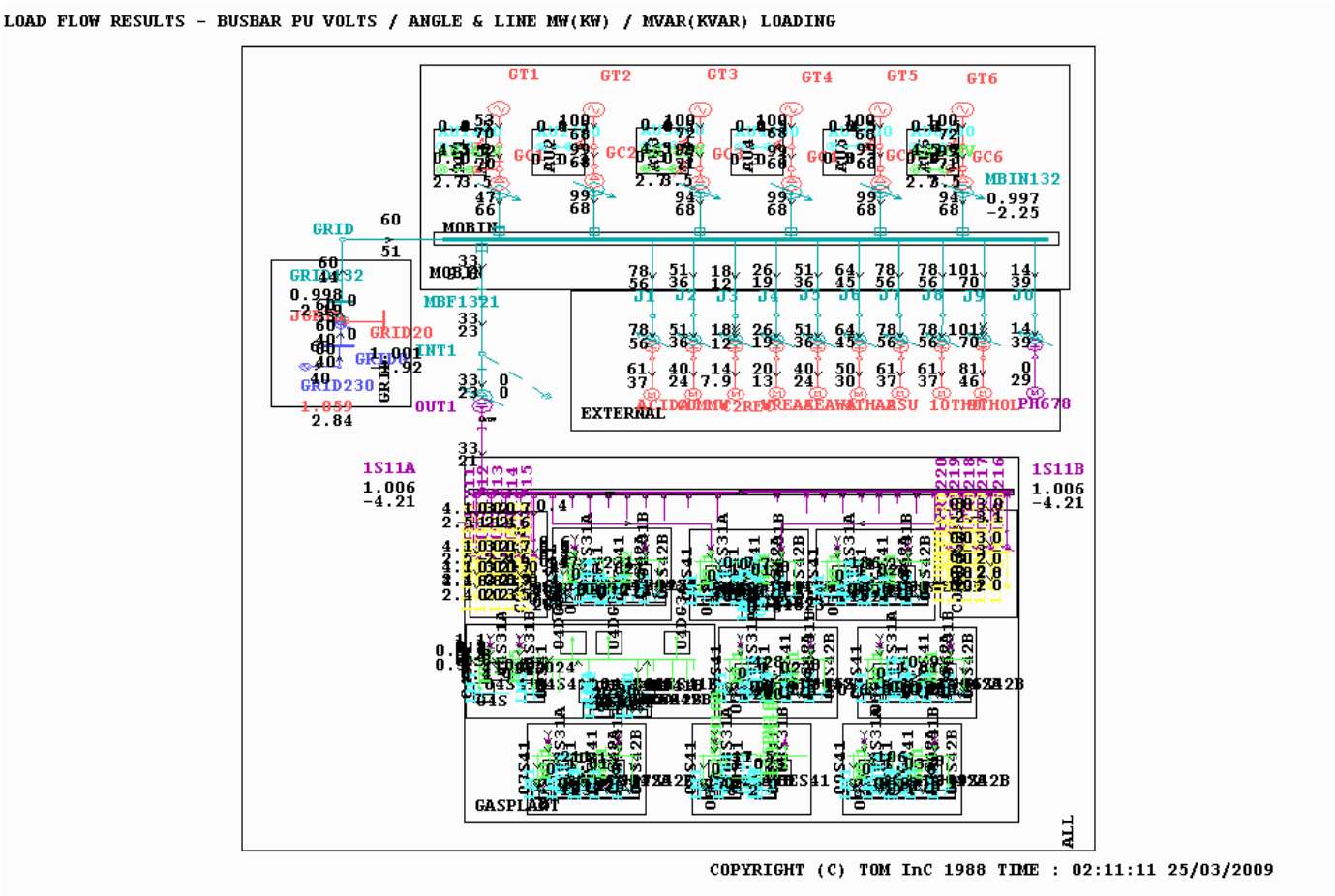
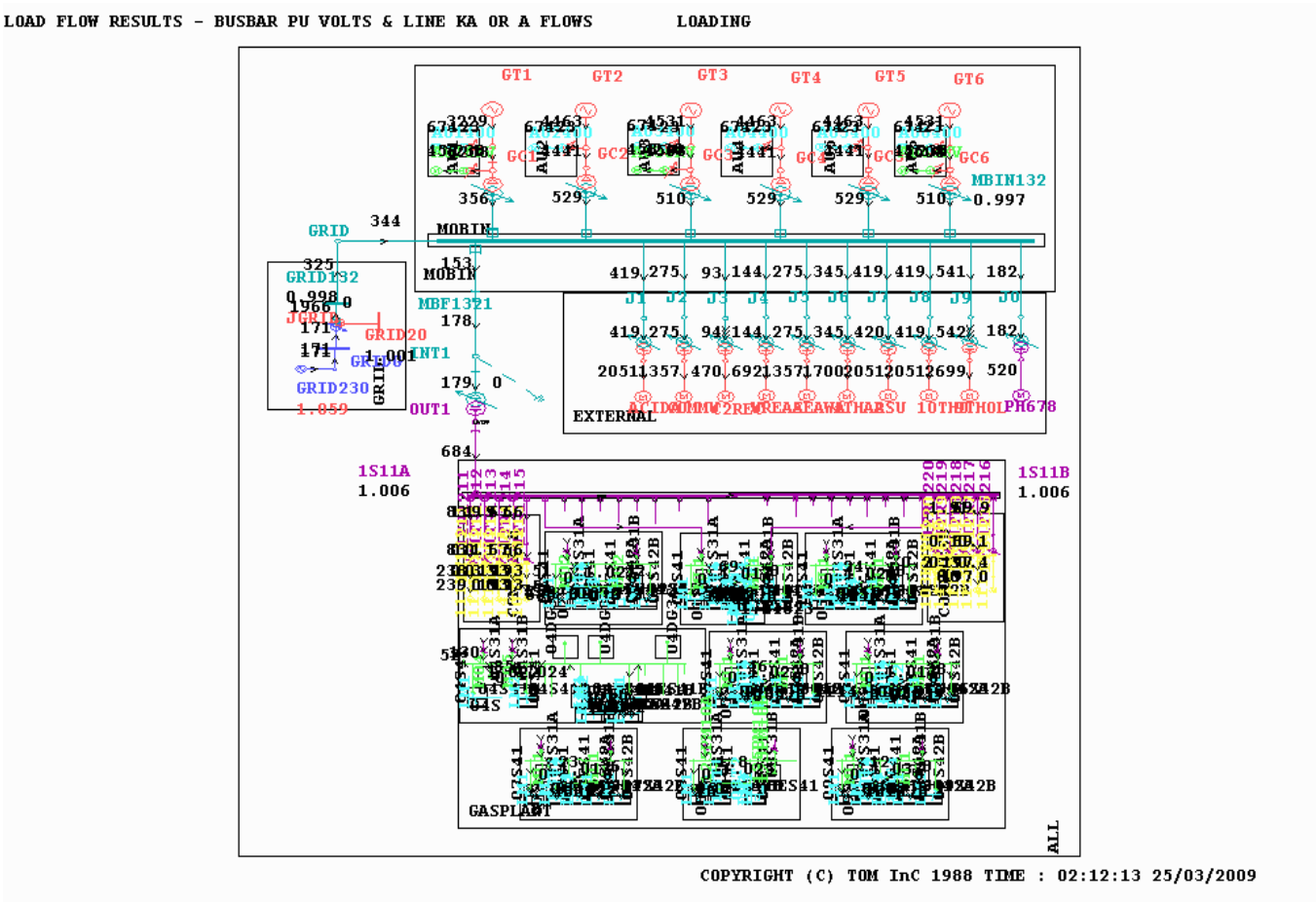


Figure AI.6: Load flow condition just before the single phase fault current flows are shown



APPENDIX II

SINGLE PHASE FAULT SIMULATION RESULTS

The available waveforms and the transformer damage properties indicate that a single phase fault occurred inside the Cable Box of 100MVA transformer. The location of the fault is shown in figure AII.1. Small spot of the arc on the conductor side shows that the fault has cleared very rapidly by the protection systems; this will be further discussed on appendix III. The fault had damaged the surface of the insulation support while it was crossing the support. The records from the event where the cursor shows the magnitude of the fault currents are shown in Figures AII.2, AII.3, and AII.4 (please refer to appendix III which figure AIII.5 shows the location of the relays). The tables beside to these figures show the fault currents extracted from these records at the cursor position. From these values the following variables during the single phase fault can be recognized:

1. P.U. Base

10MVA, 132KV, 43.74A

2. Extracted *values*

Relay P123 fault current RMS: Ired=66.148 A, Iyel=12745.693A. Iblu=417.424A, In=13147.544A

Instantaneous values at peak: red=79.196A, yel=17935.062A, blu=585.485A,In=18416.803A

Relay P541 at MOBIN fault current : Ired=75.006A, Iyel=12727.032, Iblu=415.012, In=4245.821

Instantaneous values at peak: red=44.196A, yel=16440.795A, blu=552.446A,In=4741.132A

Relay 7SJ611 at GAS PLANT 9&10fault current with CT ratio of 500:1 : Ired=0.279, Iyel=0.983, Iblu=0.837, Inat33KV CT 250:1=0.012

Instantaneous values at peak: red=-0.353, yel=1.405, blu=1.032,In=0.015

Relay 7SJ611 at GAS PLANT 9&10 current prior to fault: Ired=139.5A, Iyel=491.5A, Iblu=418.5A, In=3A (Refers to the neutral of transformer in the secondary)

Instantaneous values at peak: red=-176.5A, yel=702.5A, blu=516.0A

Relay P541 at GAS PLANT 9&10 : No record is available to us

3. SIMULATION RESULTS

Due to sampling rates effect the angles of the currents are not trustable, (the sampling rate for 7SJ611 is 300HZ therefore about 23 degree error in angle and for P123 is 600HZ therefore about 11.5 degree error in angle), therefore they are not shown in the recorded figures. Knowing this we have to trust on the RMS and peak values of the currents. The difference between the currents of P123 and P541 is due to the DFT manipulation performed in P541 and some current transformer errors.

PASHA three phase transient stability has been employed to simulate the single phase fault. The results are shown in Figures AII.5 till AII.10. In the simulation we placed the fault on RED phase (phase a), while in actual situation the fault had been occurred in yellow phase. The reader must change the name of the phases accordingly.

Comparing the figures AII.5 and AII.10 we can conclude that the single phase fault had occurred when the voltage was in its maximum peak. This is important since it will lead us to conclude that the single phase fault was because of the insulation break down. The short circuit location is shown in figure AII.1, which had happened across the insulation support.

Other comparisons and conclusions might also be made:

1- The figures show that the current waveforms are exactly match those obtained by the respectful relays.
2- The figures do not show the oscillation token place between the capacitor of the cable and the transformer that was burning, since they are fast transient phenomena.
3- The figures do not show the saturation of neutral CT as it is happened in the actual event.

Figure AII.1: Inside the 100MVA transformer cable box. The figure shows the single phase short circuit location occurred on the 132KV conductor toward the support end.

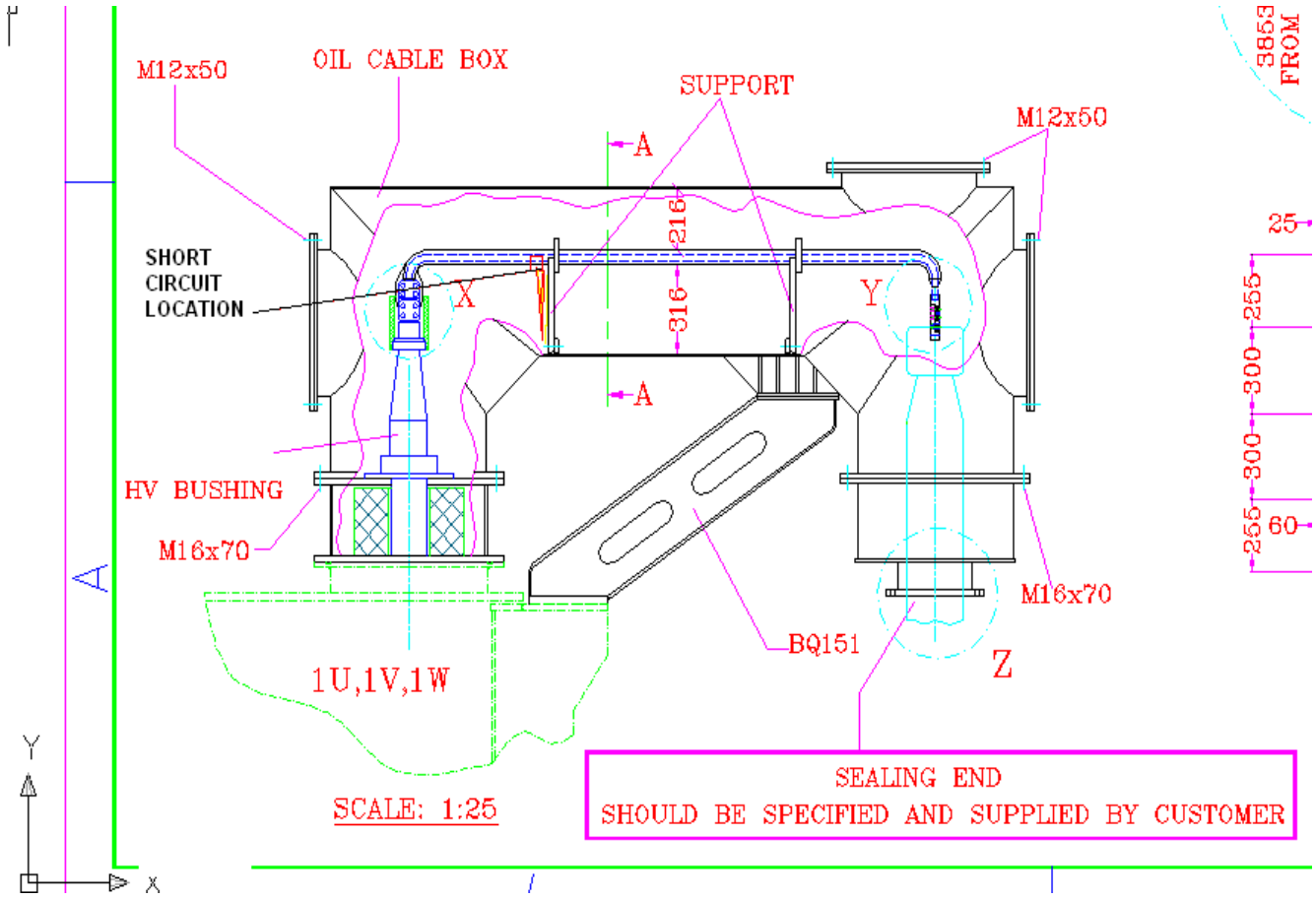
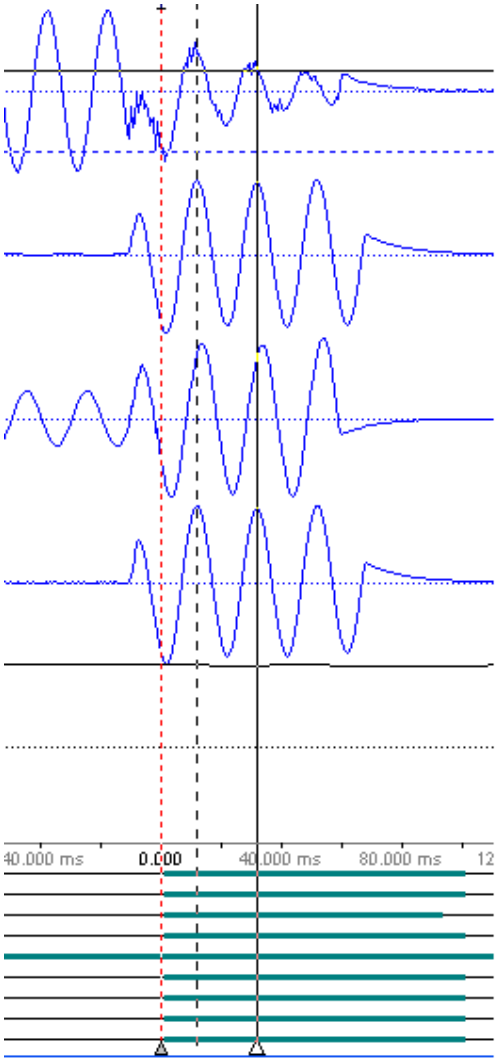


Figure AII.2: Current waveform recorded by the P123 relay at MOBIN. Autoscale is on.



Title	RMS	InstPeak
Ia	66.148	79.196
Ib	12745.693	17935.062
Ic	417.424	585.485
Ie	13147.544	18416.803
Frequency	49.571	49.450

A Relay 1 (Trip)	N	N	18:52:08.2
A Relay 2	N	N	18:52:08.2
A Relay 3	N	N	18:52:08.2
A Relay 4	N	N	18:52:08.2
A Relay 0 (Watchdog)	A	A	
A Relay 5	N	N	18:52:08.2
A Relay 6	N	N	18:52:08.2
A Relay 7	N	N	18:52:08.2
A Relay 8	N	N	18:52:08.2

Figure AII.3: Current waveform recorded by the P541 relay at MOBIN. Autoscale is on.

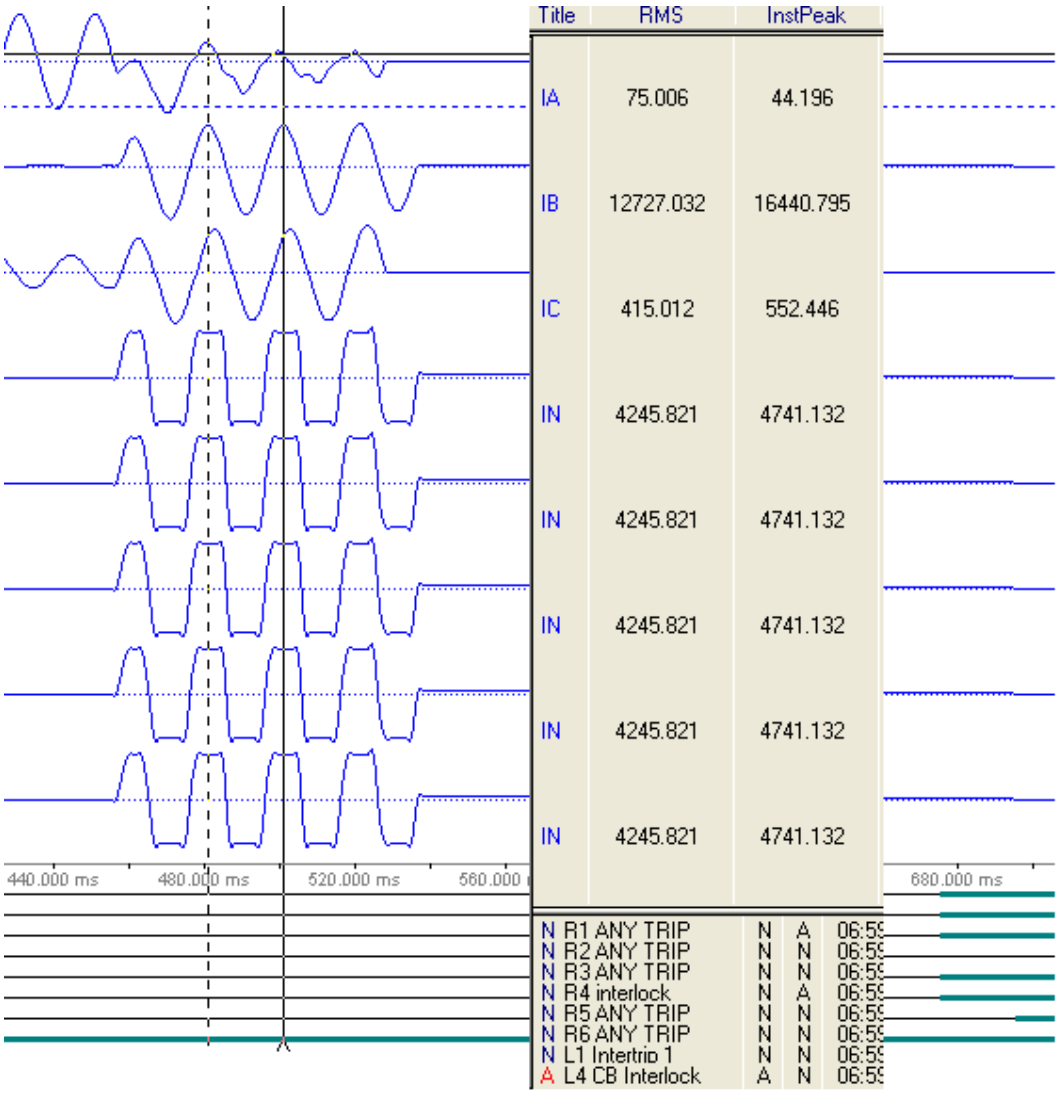


Figure AII.4: Current waveform recorded by the 7SJ611 relay at GAS PLANT. Autoscale is on.

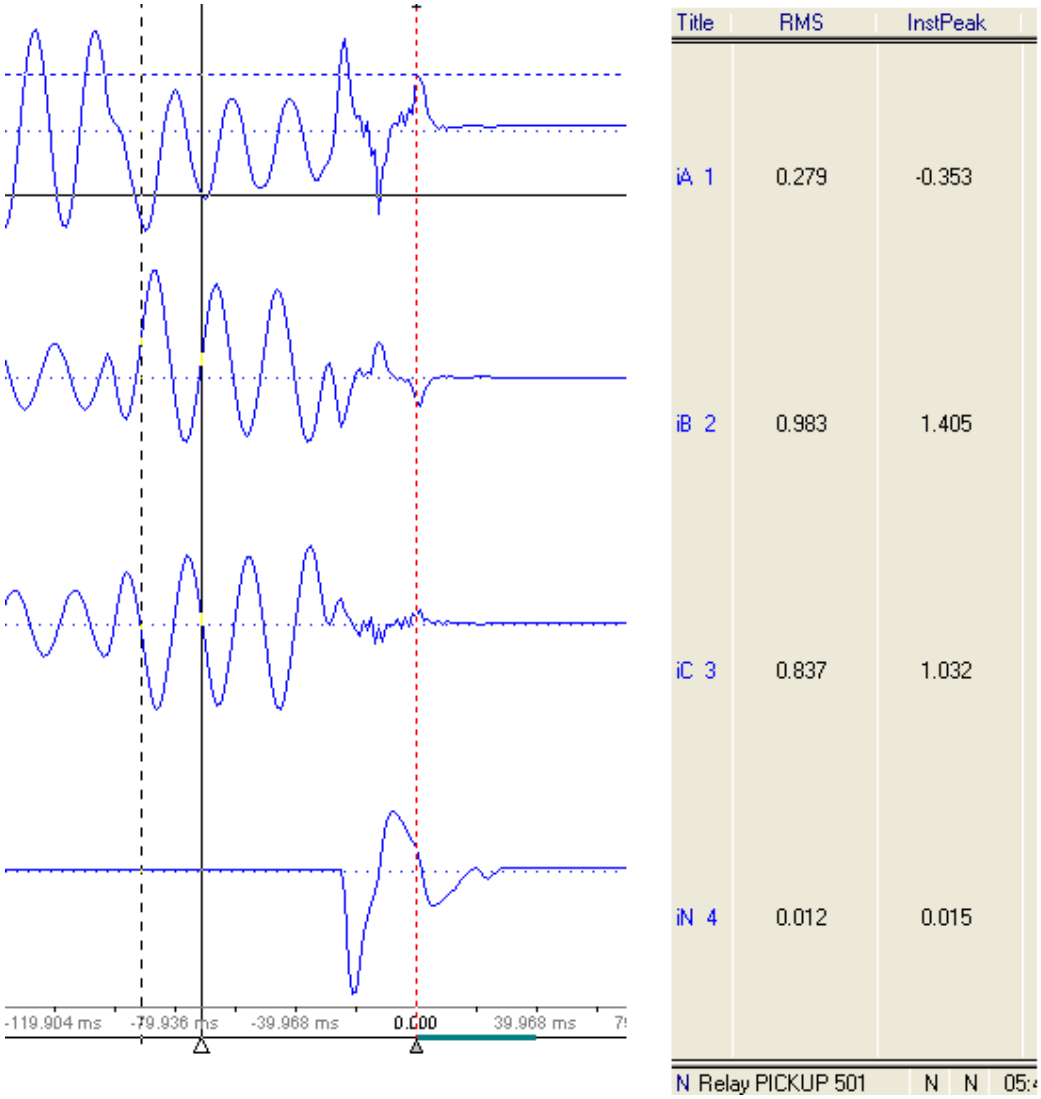
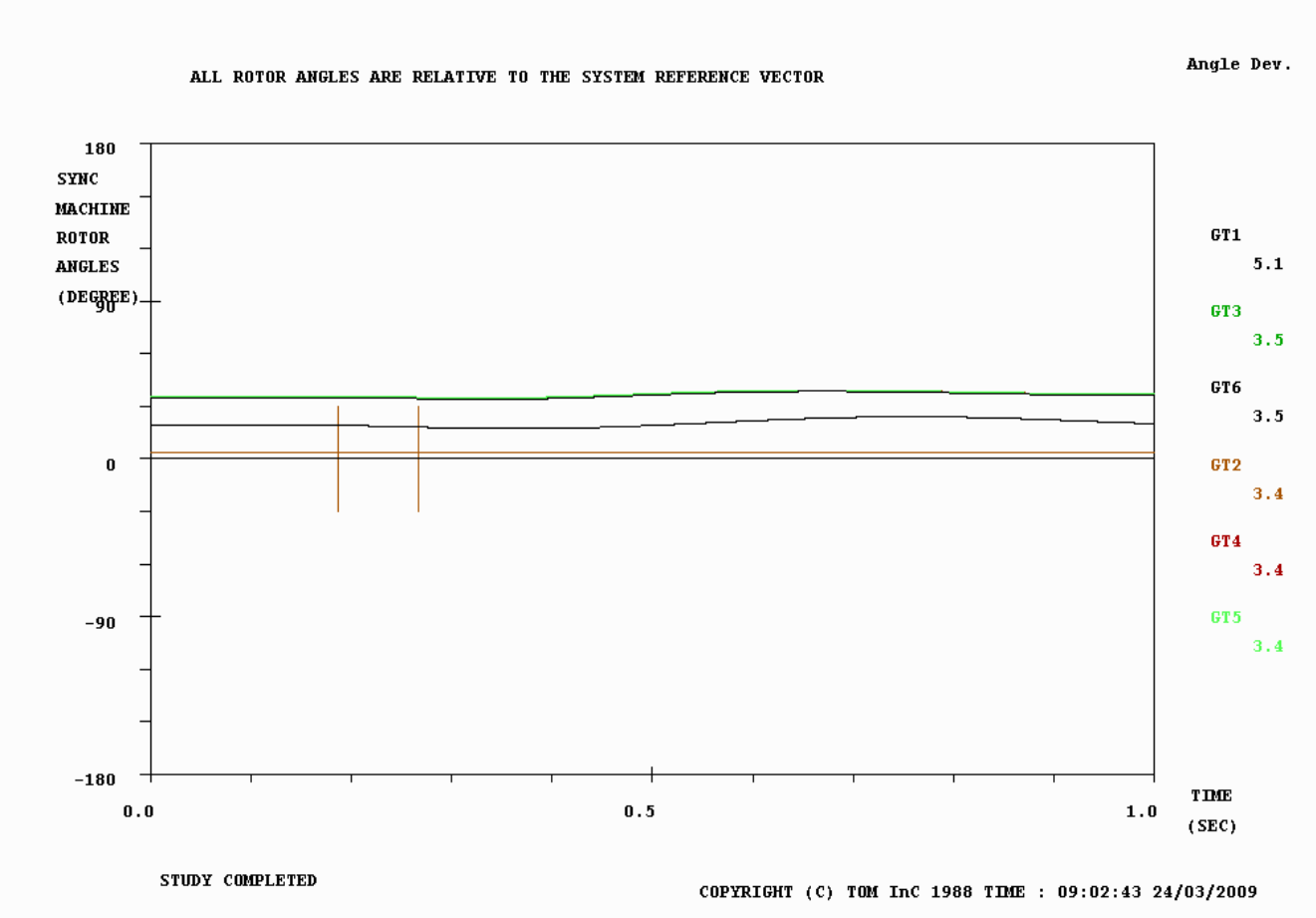


Figure AII.4: PASHA three phase transient stability run for a fault on INT1. P123 relays opened the line between MBF132 and MBF1321. The line OUT1 to 1S11A is opened because of interlock trip.




```
SHUNT OF IMPEDANCE  0.00170 +J  0.00745 P.U. APPLIED TO BUS INT1     AT TIME 0.1870 SECONDS
-------------------------------------------------------------------------------------------------------------------------

LINE OF IMPEDANCE  0.00001 +J  0.00002 P.U. SWITCHED OUT BETWEEN BUSES MBIN132  AND MBF1321  AT TIME 0.2670 SECONDS
DUE TO SEND. END O/C RELAY HISET OPERATION (TRIPPING TIME = 0.1970 SEC)
-------------------------------------------------------------------------------------------------------------------------

LINE OF IMPEDANCE  0.00000 +J  0.00001 P.U. SWITCHED OUT BETWEEN BUSES OUT1     AND 1S11A    AT TIME 0.2671 SECONDS
DUE TO SEND. END O/C RELAY HISET OPERATION (TRIPPING TIME = 0.1970 SEC)
-------------------------------------------------------------------------------------------------------------------------

                                                    COPYRIGHT (C) TOM InC 1988 TIME : 09:04:12 24/03/2009
```

Figure AII.5: PASHA three phase transient stability run for a fault on INT1. The figure shows the variation of the voltage and currents in P.U. values. The current base value is 43.74A. Graph 2 must be compared with figure AII.2 and graph 3 must be compared with figure AII.3. For the currents Black shows phase (a) i.e. red phase, Green shows phase (c) i.e. blue phase, Brown shows phase (b) i.e.yellow phase .

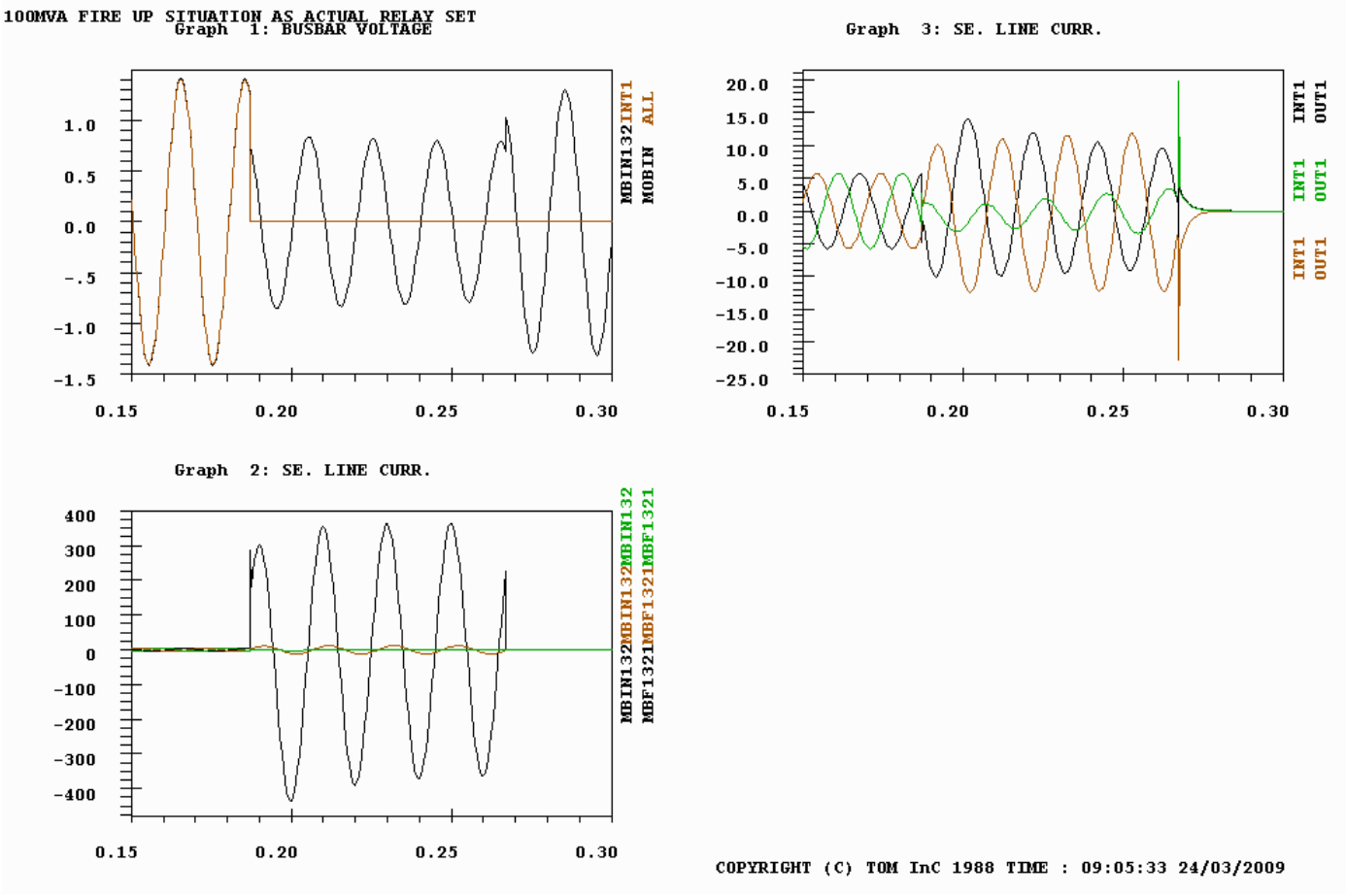


Figure AII.6: The voltage waveform of figure AII.5, graph1.

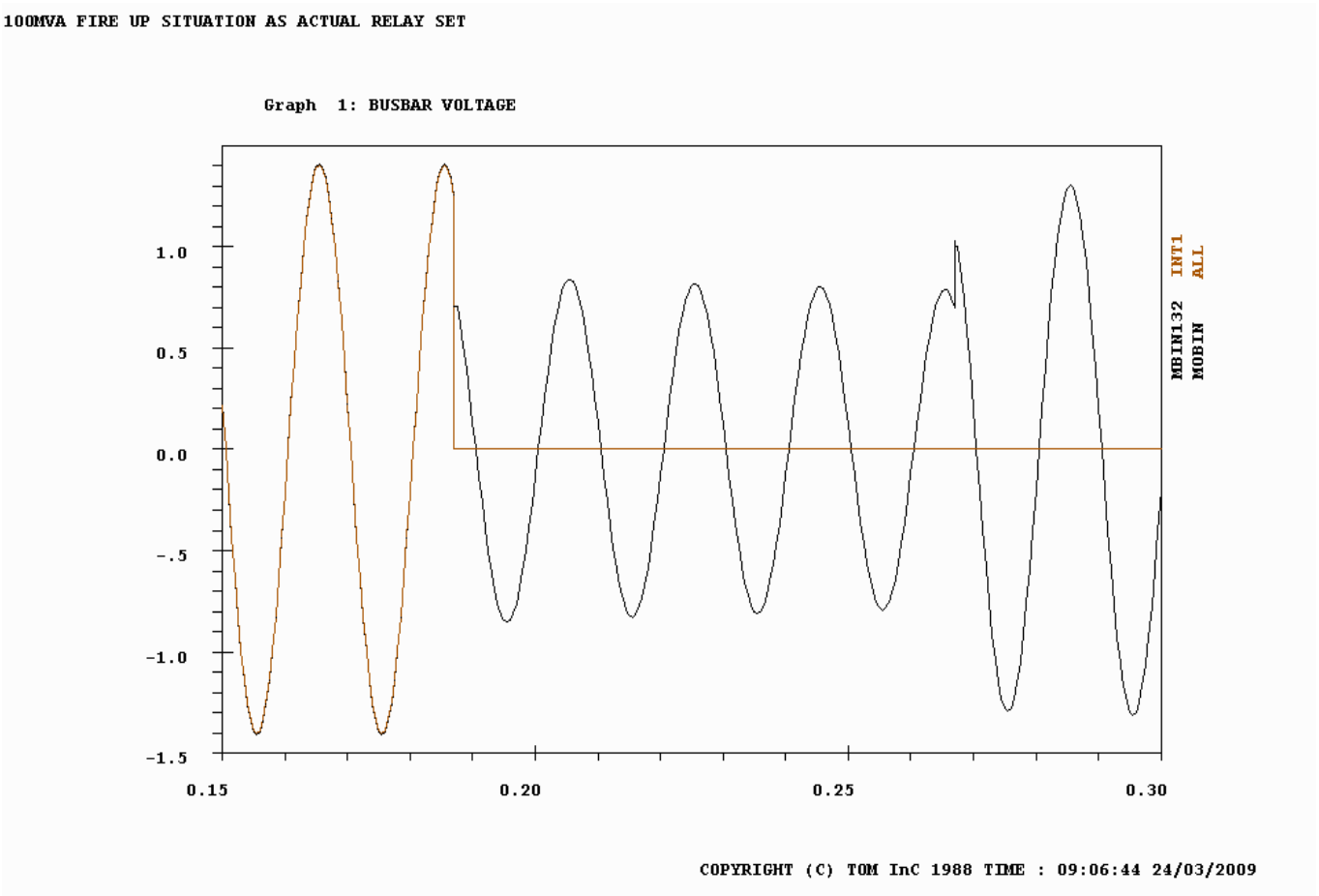


Figure AII.7: The current waveform of figure AII.5, graph 2.

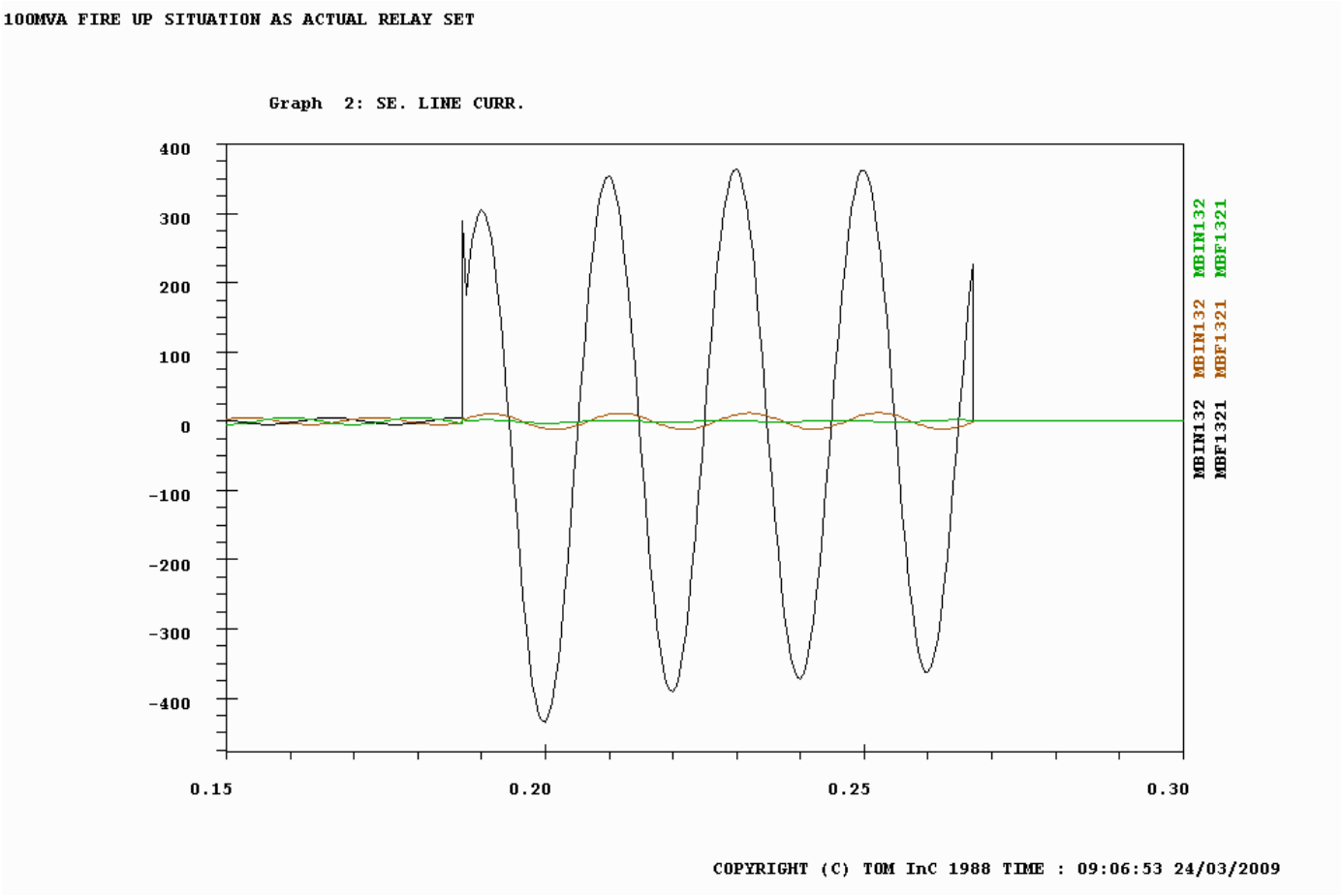


Figure AII.8: The current waveform of figure AII.5, graph 3.

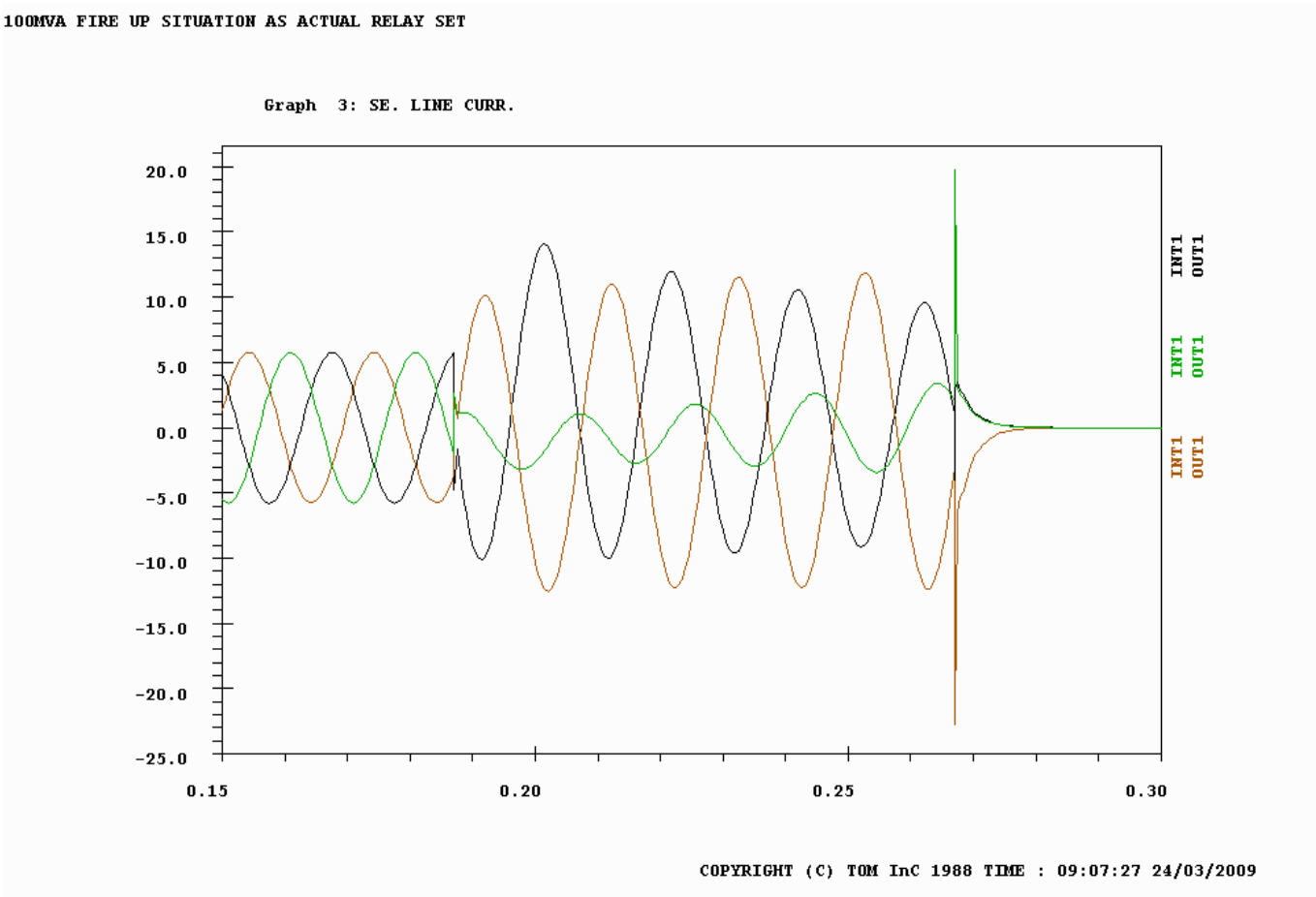


Figure AII.9: The current waveforms of figure AII.5, graph 2, or figure AII.7 in separate scales.

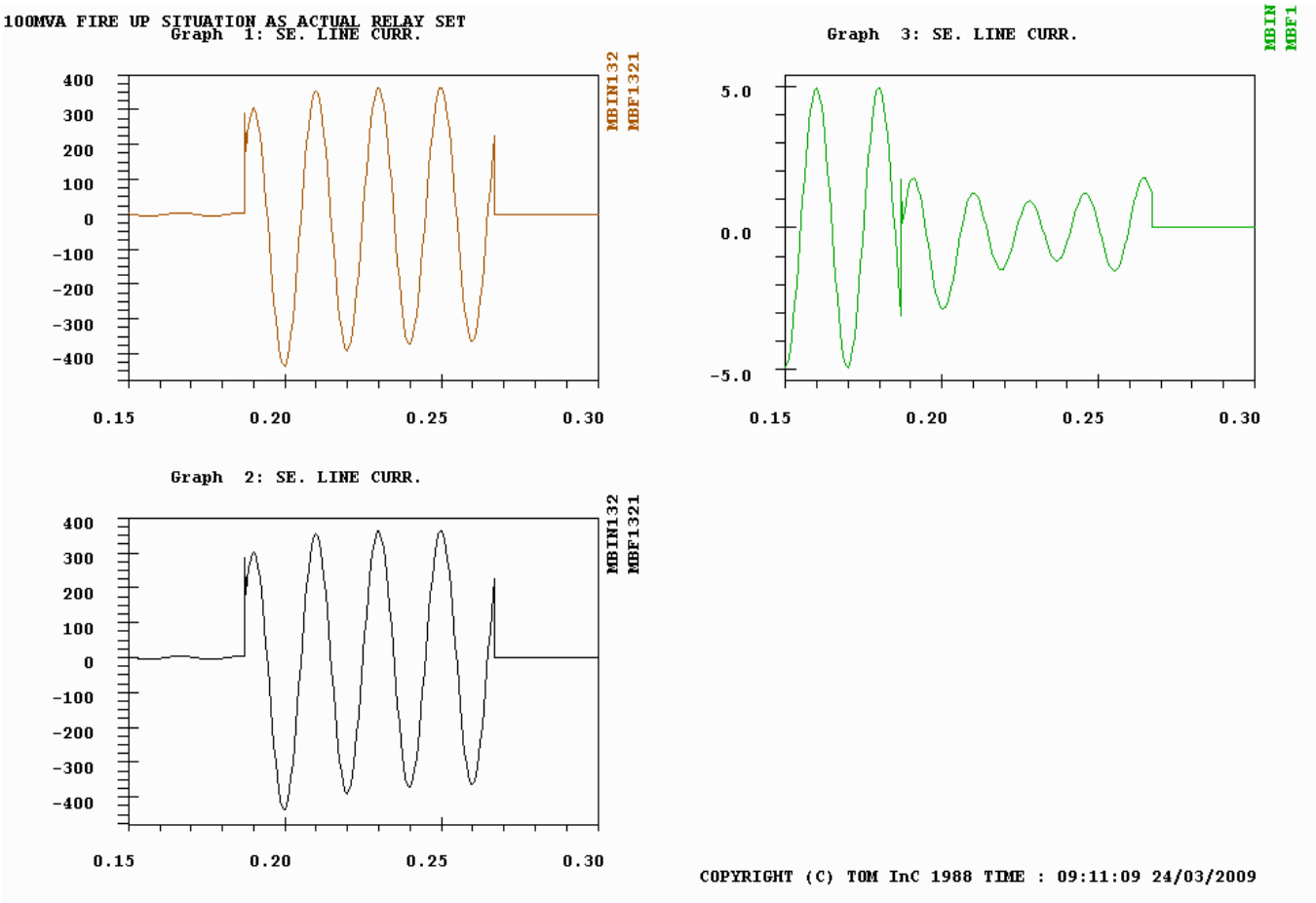
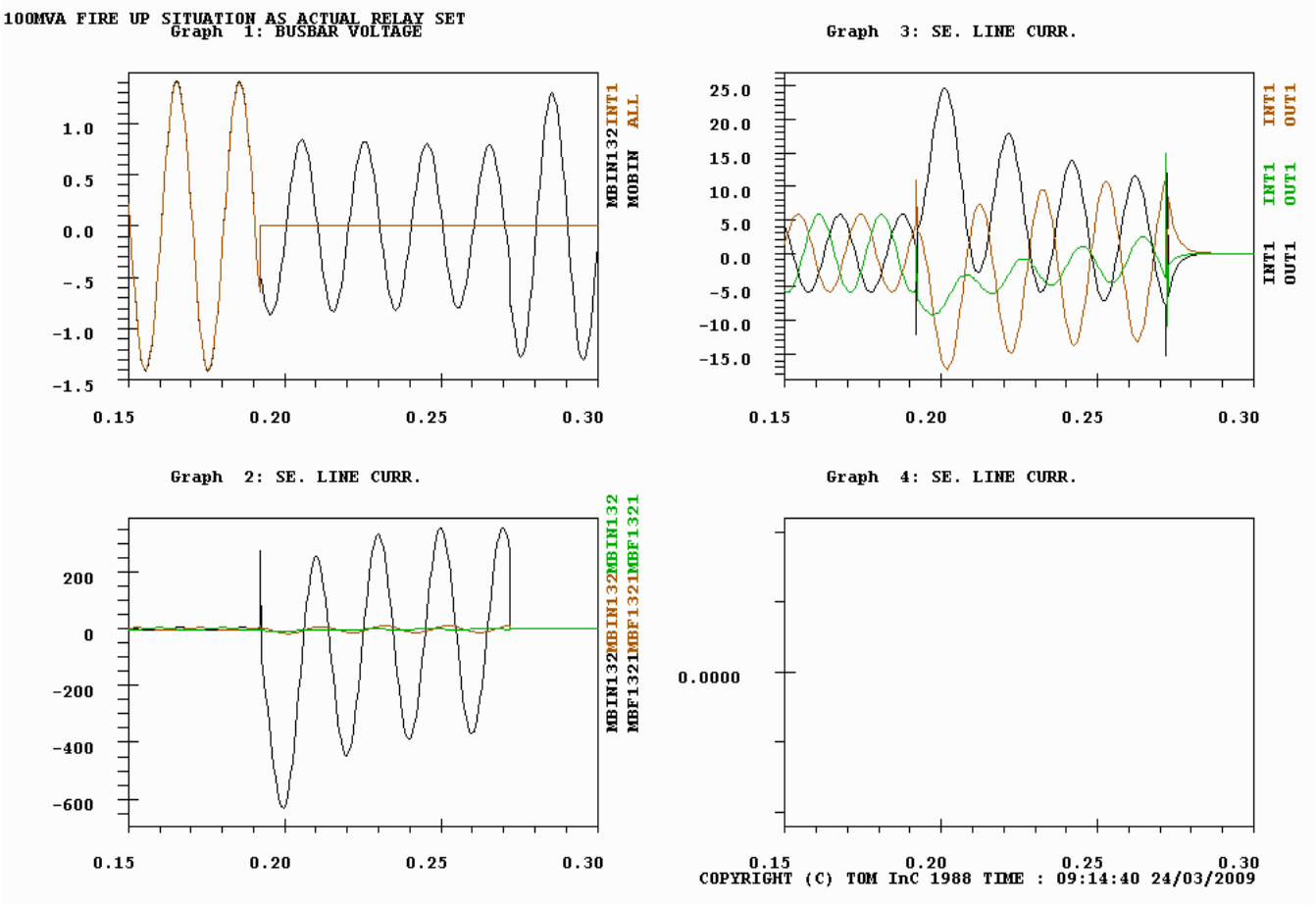


Figure AII.10: PASHA three phase transient stability run for a fault on INT1. The figure shows the variation of the voltage and currents in P.U. values. The instant of the fault is changed to show that the DC offset is dependent to the instant of the fault. This is not actually for the damage event. The damage event variables are drawn on figure AII.5, where the phase (a) voltage was in the maximum at the instant of single phase fault.



APPENDIX III

THE RELAY AND CIRCUIT BREAKERS ACTIONS

As it is just mentioned in Appendix II, the available waveforms and the transformer damage properties indicate that a single phase fault occurred inside the Cable Box of 100MVA transformer. The location of the fault is shown in figure AII.1 and it is shown in figure AIII.1 for simplicity of reading. Small spot of the arc on the conductor side shows that the fault had been cleared very rapidly by the protection systems. The fault had damaged the surface of the insulation support while it was crossing the support. The records from the event and the relays actual settings are shown in Figures AIII.2, AIII.3, and AIII.4. The tables beside to these figures show the actual implemented settings of the relays, for those that are related to the event. The relays types and their location inside the network is shown in figure AIII.5. The fault location is shown in this figure too.

1. RELAYS ACTIONS

From the figures shown the following actions can be recognized:

1- The relay P123 at MOBIN saw the fault and order to trip the circuit breaker, due to its I>>> settings in zero interruption time. The MOBIN 132 circuit breaker has opened the fault after 0.080 seconds including the fault measuring time and the contactor opening and ordering times.
2- The 33KV circuit breaker at GAS PLANT had received the remote intertrip, and opens the breaker after 0.081 seconds. This includes all the contactor and itertrip times.
3- The relay P541 saw the fault due to IDIFF>> and it is expected to order for tripping, but the PIT (Permissive Interruption Time) of this relay was set on 200 Milliseconds, and therefore, it postponed the tripping command for 200 milliseconds. However, the fault had been cleared long before this command came to the circuit breakers. It must be noted that the PIT time is not correct for this relay and it is not set according to the recommendation of us. The PIT must be set at zero for diffrential relays at our plant situation.
4- The relay 7SJ611 had not seen the fault. But after the interruption of the circuit in both ends, it sees a current flowing to the earth. The current is actually coming from the capacitor discharging in the 33KV side and the GAS PLANT motors and loads unbalanced discharge currents during and after the opening of the 33KV circuit breaker. The 51Ns sees this current and that is why it has recorded the event and fortunately it is available to us.

Figure AIII.1: Inside the 100MVA transformer cable box. The figure shows the single phase short circuit location occurred on the 132KV conductor toward the support end.

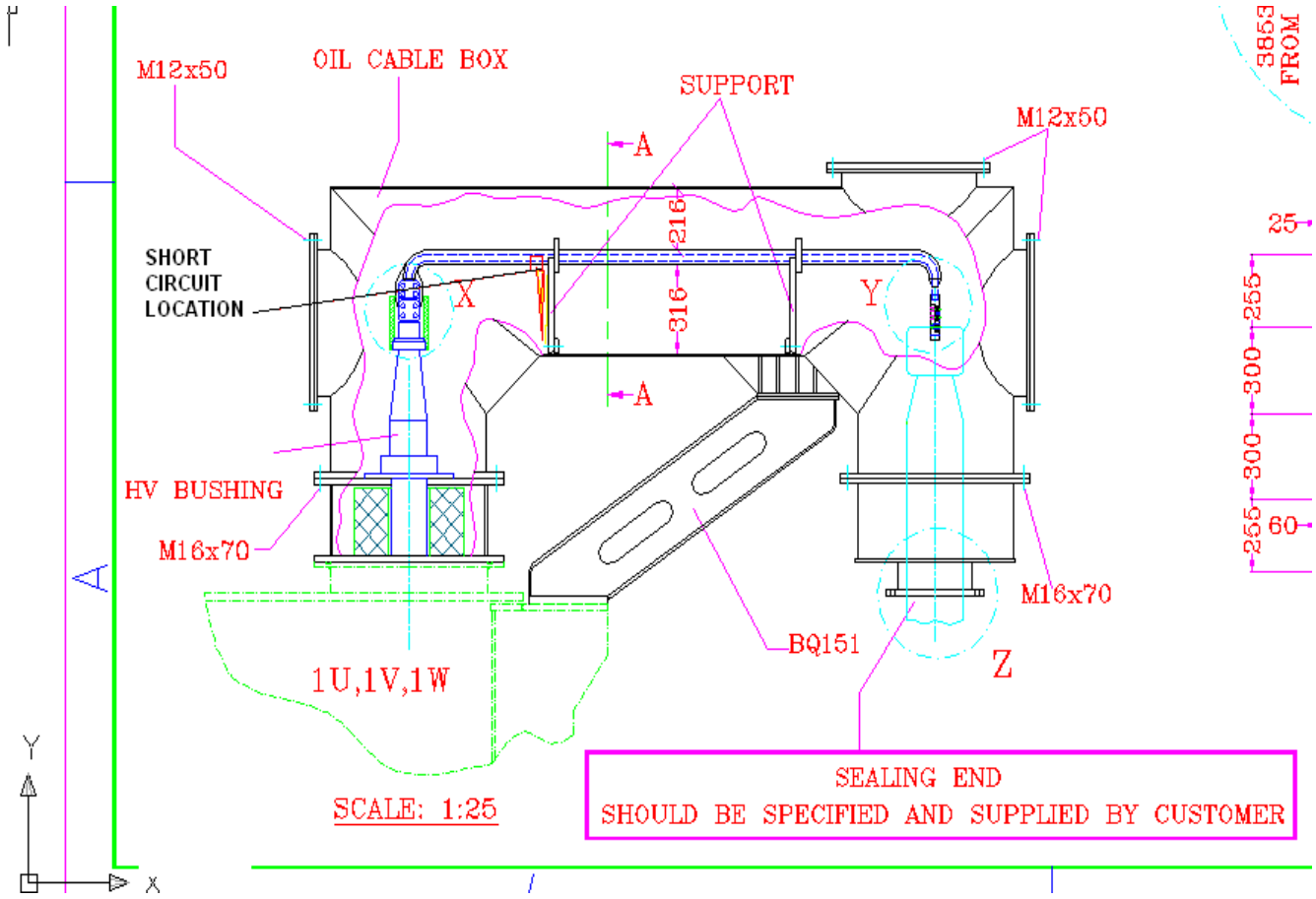
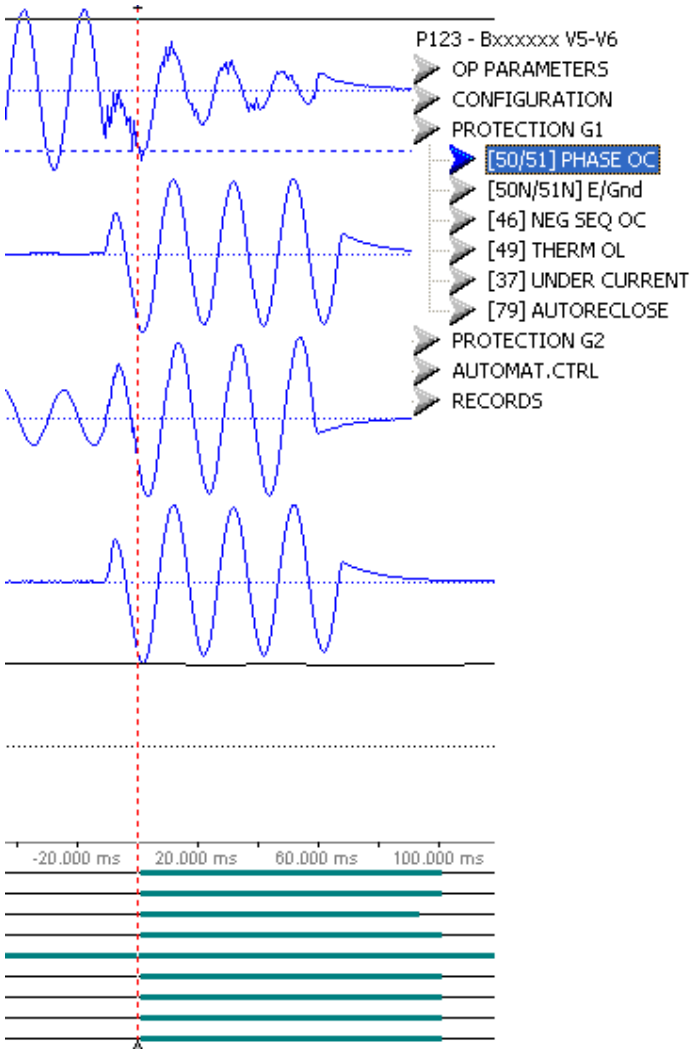


Figure AIII.2: Current waveform recorded by the P123 relay at MOBIN and its actual settings. Autoscale is on.



Edited	Name	
	Function I>	Yes
	I>	0.30 In
	Delay Type	IDMT
	Idmt	SI (IEC
	Tms	0.075
	t Reset	0.04 s
	Function I>>	Yes
	I>>	1.50 In
	Delay Type	DMT
	tI>>	0.10 s
	tReset	0.04 s
	Function I>>>	Yes
	I>>>	3.00 In
	tI>>>	0.00 s

N	Relay 1 (Trip)	N	N	18:52
N	Relay 2	N	N	18:52
N	Relay 3	N	N	18:52
N	Relay 4	N	N	18:52
A	Relay 0 (Watchdog)	A	A	
N	Relay 5	N	N	18:52
N	Relay 6	N	N	18:52
N	Relay 7	N	N	18:52
N	Relay 8	N	N	18:52

Figure AIII.3: Current waveform recorded by the P541 relay at MOBIN. Autoscale is on.

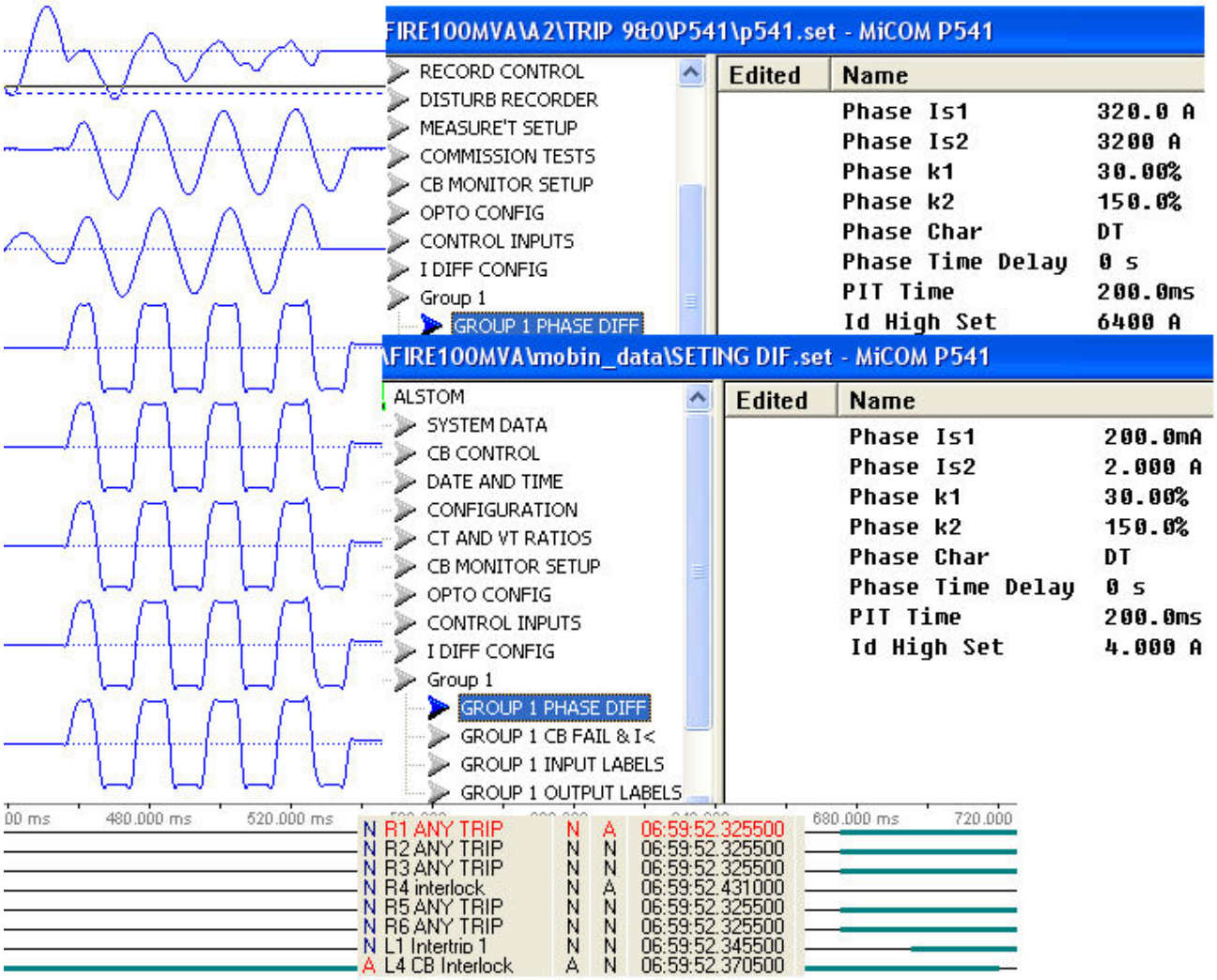


Figure AIII.4: Current waveform recorded by the 7SJ611 relay at GAS PLANT. Autoscale is on.

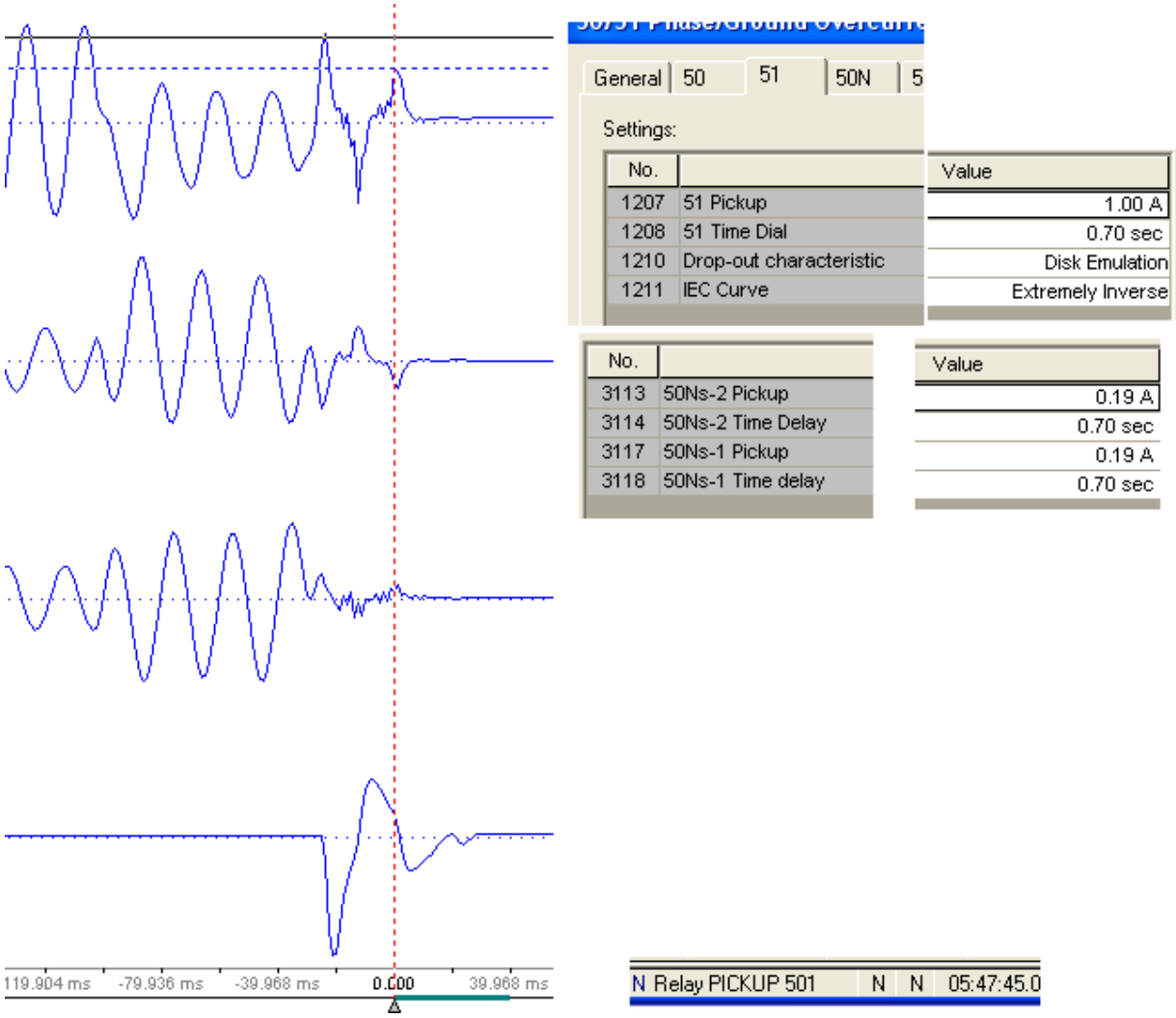
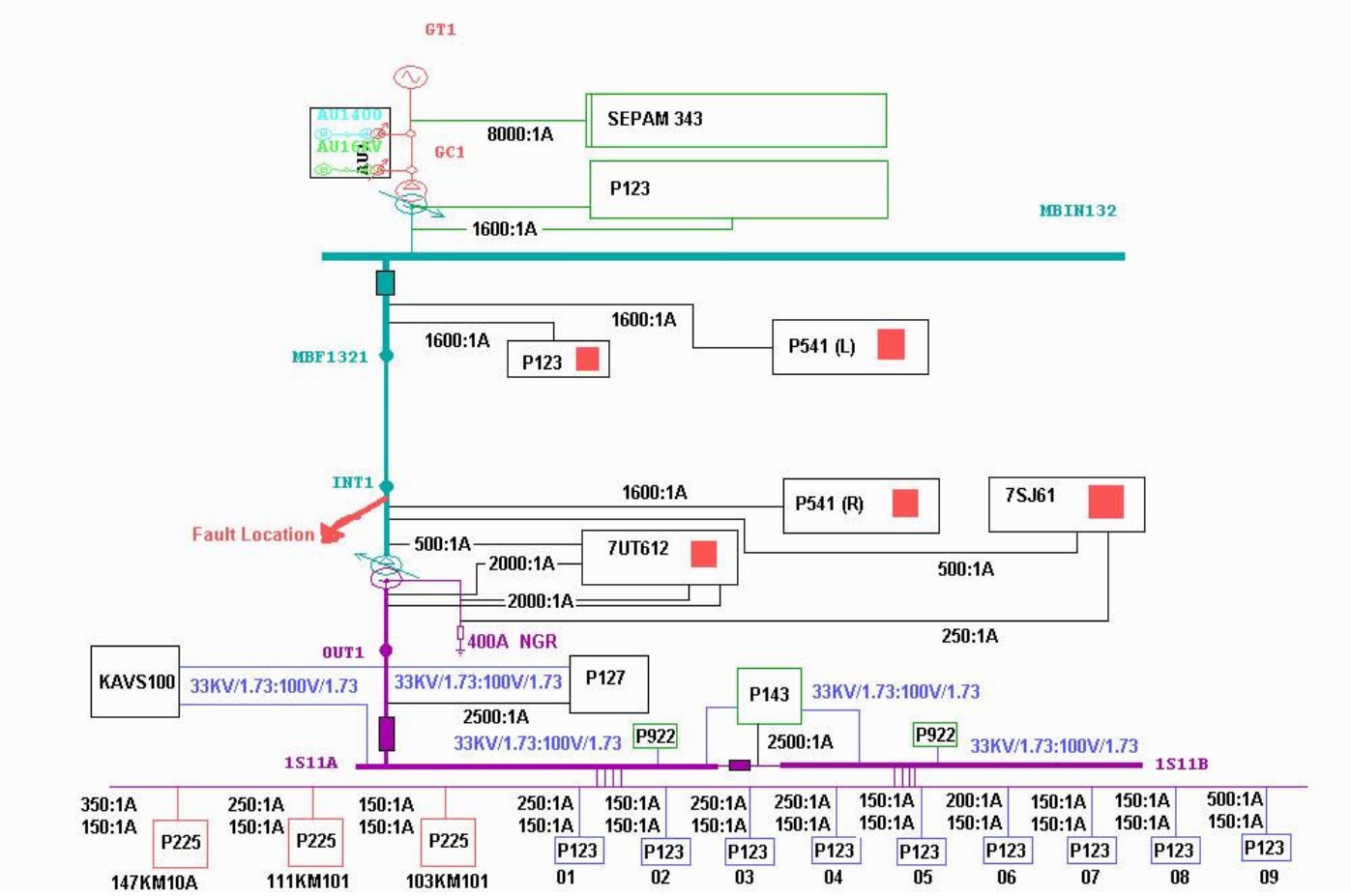


Figure AIII.5: Relays types and their location inside the network.



APPENDIX IV

NETWORK DATA

The network data are provided in two groups. One is from PASHA data bases which contains the fundamental data of equipment, usually based on the equipment ratings. The second one is according to PASHA edit pages which includes the drawn equipment data on system base.This is selected to be 10MVA. Table IV.1 shows the input data base and Table IV. shows the actual input data provided in PASHA edit pages which reported by PASHA Transient Stability (T/S) and Frequency Dynamic (F/D) program.

Table IV.1 Data base for system equipment

CABLES AND LINES DATA BASE

CABLE SIZE	Type MANUFACT.	PASHA LIB.	RATING MVA	RATING KV	RESISTANCE PU/KM	REACTANCE PU/KM	SUSEPTANCE PU/KM	ZERO SEQUENCE RESISTANCE-PU/KM	ZERO SEQUENCE REACTANCE-PU/KM
1(500)	ABHAR	32150000	100	132	0.00028	0.00086	0.000983	0.00084	0.0026
1(95)	33MCUN3	33109500	15	33	0.00326	0.00175	0.00399	0.01025	0.0047
1(120)	33MCUN3	33112000	18	33	0.00309	0.00202	0.00357	0.00977	0.00496
1(150)	11MCUN3	11115000	6	11	0.00752	0.0058	0.00248	0.02365	0.0119
1(120)	6MCUS3	6112000	3.63	6	0.01834	0.01038	0	0.05777	0.02552
1(95)	6MCUS3	6109500	3.2	6	0.02042	0.00948	0	0.06432	0.02331
1(150)	1MCUN3	6118500	0.38	0.6	0.15348	0.0931	0	0.48346	0.22024
Used for Tie connections and those not known	FICT	33	100	33		0.0001			0.0003
	FICT	15	160	15		0.0001			0.0003
	FICT	6	5	6		0.0001			0.0003
	FICT	400	2	0.4		0.0001			0.0003
	FICT	474	2	0.4		0.0001			0.0003

Note : RATING MVA IS OBTAINED FROM CABLE CURRENT CAPACITY, RATINGS ARE THE PU BASES TOO

TRANSFORMERS DATA BASE

RATING (BASE) MVA	U1/U2 KV/KV	CONNECTION TYPE **	PASHA LIB.	RESISTANCE PU	REACTANCE PU	ZERO SEQUENCE RESISTANCE PU*	ZERO SEQUENCE REACTANCE PU	MIN. TAP	TAP STEP	MAX. TAP	RATIO DV	Type or MANUFACT.
MOBIN Transformer												
160	138/15	XD11	1	0.00345	0.14196	0.00345	0.11539	-10	1.25	10	-0.05	160
Hirbodan Transformer to 9-10												
100	132/33	DX1	3	0.00185	0.0963	13.12385*	0.09756	-15	1.67	15		100
Gas Plant Transformers												
20	33/6.3	DX11	71	0.00671	0.12482	109.9782	0.12482	-5	2.5	5	0.045	IOEC
15	33/11.5	DX11	72	0.00654	0.06216	75.3131	0.06216	-5	2.5	5	0.045	IOEC
10	33/11.5	DX11	73	0.00677	0.05962	50.21115	0.05962	-5	2.5	5	0.05	IOEC
10	33/6.3	DX11	74	0.00603	0.08328	54.99178	0.08328	-5	2.5	5	0.05	IOEC
10	33/6.3	DX11	75	0.00693	0.08321	54.99268	0.08321	-5	2.5	5	0.05	IOEC
8	33/6.3	DX11	76	0.00693	0.08321	43.99553	0.08321	-5	2.5	5	0.045	IOEC
6.3	33/11.5	DX11	77	0.00513	0.06981	31.63389	0.06981	-5	2.5	5	0.05	IOEC
6.3	33/6.3	DX11	78	0.00711	0.07115	34.64813	0.07115	-5	2.5	5	0.05	IOEC
5	33/6.3	DX11	79	0.00589	0.07126	27.49876	0.07126	-5	2.5	5	0.05	IOEC
4	33/6.3	DX11	80	0.01011	0.07078	22.00441	0.07078	-5	2.5	5	0.05	IOEC
4	33/6.3	DX11	81	0.00625	0.07123	22.00054	0.07123	-5	2.5	5	0.05	IOEC
2.5	6/0.42	DX11	82	0.00977	0.10454	0.00977	0.10454	-5	2.5	5	0.05	IOEC
2.5	6/0.42	DX11	83	0.01241	0.10426	0.01241	0.10426	-5	2.5	5	0.05	IOEC
2	6/0.42	DX11	84	0.01116	0.07922	0.01116	0.07922	-5	2.5	5	0.05	IOEC
2	6/0.42	DX11	85	0.01294	0.07895	0.01294	0.07895	-5	2.5	5	0.05	IOEC
1.6	6/0.42	DX11	86	0.0118	0.06138	0.0118	0.06138	-5	2.5	5	0.05	IOEC
1.6	6/0.42	DX11	87	0.00872	0.06189	0.00872	0.06189	-5	2.5	5	0.05	IOEC
0.63	6/0.42	DX11	88	0.0116	0.03828	0.0116	0.03828	-5	2.5	5	0.05	IOEC
0.63	6/0.42	DX11	89	0.0097	0.03881	0.0097	0.03881	-5	2.5	5	0.05	IOEC
0.63	6/0.42	DX11	90	0.01228	0.03807	0.01228	0.03807	-5	2.5	5	0.05	IOEC
0.4	6/0.42	DX11	91	0.01228	0.03807	0.01228	0.03807	-5	2.5	5	0.05	IOEC
**30A and 50A grounding resistor considered for all the above 11.5KV and 6KV side correspondingly,												
MOBIN Auxiliary Transformer												
1.25	15/.4	DX1	31	0.00941	0.05926	0.00941	0.05926	-5	2.5	5		1.25
6.6	15/6	DX1	32	0.00941	0.05926	0.00941	0.05926	-5	2.5	5		6.6

***400A grounding resistor considered,**

****X means Yn and from simulation point of view DY11 is equal to DY5, and DY1 is equal to DY7,**

MOTORS DATA BASE

RATED	PASHA	VOLTAGE	BASE	MAGNETIZING	STATOR		ROTOR		OTHERS		
KW	LIB.	KV	MVA	REACT.-PU	RESIST.-PU	REACT-PU	RESIST.-PU	REACT.-PU	Type or Manufacturer	H (Sec.) (total) (driven)	Driven TYPE*
160	9016000	6	0.293	5.329	0.0188	0.1165	0.0205	0.1165	116KM101	0.14	0.8,0
250	9025000	6	0.293	3.418	0.0294	0.0747	0.0132	0.0747	116PM111	0.15	0.8,0
900	9090000	6	1.04	4.157	0.0226	0.0898	0.0101	0.0898	125PM102	0.8	0.8,0
1000	9100000	6	1.154	3.747	0.0182	0.0761	0.0082	0.0761	125PM101	1	0.8,0
3100	9310000	11	4.192	1.829	0.0285	0.1094	0.0128	0.1094	103KM101	0.6	0,0.9
3100	9310001	11	4.197	1.822	0.0343	0.109	0.0154	0.109	103KM201	0.6	0,0.9
5750	9575000	11	6.674	3.486	0.0338	0.1091	0.0152	0.1091	111kM101	1.5	0,0.67
5750	9575001	11	6.674	3.408	0.016	0.0995	0.0072	0.0995	111KM201	1.5	0,0.67
5750	9575002	11	6.674	3.408	0.016	0.0995	0.0072	0.0995	111KM401	1.5	0,0.67
5750	9575003	11	6.754	3.717	0.0145	0.0996	0.0065	0.0996	111KM501	1.5	0,0.67
7320	9732000	11	8.501	3.638	0.016	0.1107	0.0072	0.1107	147KM101	3.8	0,0.8
7320	9732001	11	8.203	4.825	0.0346	0.109	0.0155	0.109	147KM101	3.8	0,0.8
7320	9732004	11	8.385	4.158	0.0061	0.1332	0.0209	0.0888	147KM101	3.8	0,0.8
5750	9575004	11	6.66	3.759	0.0061	0.1334	0.0211	0.0889	111KM101	1.5	0,0.67
3100	9310004	11	4.189	1.859	0.016	0.1344	0.0134	0.0896	103KM101	0.6	0,0.9

***Driven Type: Mechanical Torque Formula=$(A+B(1-s)+C(1-s)^2)$Tmo where A+B+C=1, B and C is written and s is slip.**

LUMPED LOADS DATA BASE

RATED	PASHA	VOLTAGE	BASE	MAGNETIZING	STATOR		ROTOR		OTHERS		
KVA	LIB.	KV	MVA	REACT.-PU	RESIST.-PU	REACT-PU	RESIST.-PU	REACT.-PU	% STATIC Load	H (Sec.) (total) (driven)	Driven TYPE*
2262	8226200	6	2.262	3.2	0.0145	0.0905	0.0065	0.0905	0	2	0,0.8
791	8079100	6	0.791	3.297	0.0216	0.0899	0.0097	0.0899	0	0.7	0,0.8
2300	8230000	6	2.3	3.312	0.0145	0.0904	0.0065	0.0904	0	2	0,0.8
1300	8130000	6	1.3	3.312	0.0145	0.0904	0.0065	0.0904	0	1.1	0,0.8
1452	8145200	6	1.452	3.333	0.0145	0.0905	0.0065	0.0905	0	1.2	0,0.8
1042	8104200	6	1.042	3.271	0.0216	0.0899	0.0097	0.0899	0	0.9	0,0.8
1452	8145200	6	1.452	3.333	0.0145	0.0905	0.0065	0.0905	0	1.1	0,0.8
1042	8104200	6	1.042	3.271	0.0216	0.0899	0.0097	0.0899	0	0.9	0,0.8
559	8055900	6	0.559	3.285	0.0216	0.0899	0.0097	0.0899	0	0.5	0,0.8
201	8020100	6	0.201	3.285	0.0216	0.0899	0.0097	0.0899	0	0.2	0,0.8
6500	8650000	6	6.5	3.059	0.0145	0.0905	0.0065	0.0905	0	3.2	0,0.8
6000	8600000	6	6	3.059	0.0145	0.0905	0.0065	0.0905	0	3	0,0.8
307	8030700	0.4	0.307	2.879	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
68	8006800	0.4	0.068	2.832	0.0413	0.0961	0.029	0.0961	20	0.07	0,0
76	8007600	0.4	0.076	3.467	0.0413	0.0961	0.029	0.0961	20	0.08	0,0
703	8070300	0.4	0.703	3.466	0.0413	0.0961	0.029	0.0961	20	0.7	0,0
745	8074500	0.4	0.745	3.466	0.0413	0.0961	0.029	0.0961	20	0.74	0,0
1080	8108000	0.4	1.08	8.665	0.031	0.1281	0.0387	0.1281	40	1	0,0
819	8081900	0.4	0.819	16.3	0.031	0.1281	0.0387	0.1281	40	0.8	0,0
394	8039400	0.4	0.394	3.466	0.0413	0.0961	0.029	0.0961	20	0.4	0,0
52	8005200	0.4	0.052	3.467	0.0413	0.0961	0.029	0.0961	20	0.05	0,0
647	8064700	0.4	0.647	2.247	0.0413	0.0961	0.029	0.0961	20	0.65	0,0
300	8030000	0.4	0.3	2.247	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
846	8084600	0.4	0.846	2.094	0.0413	0.0961	0.029	0.0961	20	0.85	0,0
356	8035600	0.4	0.356	2.094	0.0413	0.0961	0.029	0.0961	20	0.36	0,0
288	8028800	0.4	0.288	3.466	0.0413	0.0961	0.029	0.0961	20	0.29	0,0
76	8007600	0.4	0.076	3.467	0.0413	0.0961	0.029	0.0961	20	0.08	0,0
1177	8117700	0.4	1.177	2.247	0.0413	0.0961	0.029	0.0961	20	1.2	0,0
300	8030000	0.4	0.3	2.247	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
1072	8107200	0.4	1.072	2.247	0.0413	0.0961	0.029	0.0961	20	1.1	0,0

***Driven Type: Mechanical Torque Formula=$(A+B(1-s)+C(1-s)^2)$Tmo where A+B+C=1, B and C is written and s is slip.**

LUMPED LOADS DATA BASE (continued 1)

RATED	PASHA	VOLTAGE	BASE	MAGNETIZING	STATOR		ROTOR		OTHERS		
KVA	LIB.	KV	MVA	REACT.-PU	RESIST.-PU	REACT-PU	RESIST.-PU	REACT.-PU	% Load	H (Sec.) (total) (driven)	Driven TYPE*
548	8054800	0.4	0.548	2.247	0.0413	0.0961	0.029	0.0961	20	0.55	0,0
540	8054000	0.4	0.54	3.466	0.0413	0.0961	0.029	0.0961	20	0.54	0,0
339	8033900	0.4	0.339	3.466	0.0413	0.0961	0.029	0.0961	20	0.34	0,0
4	8000400	0.4	0.004	3.964	0.0362	0.1098	0.0332	0.1098	30	0.004	0,0
308	8030800	0.4	0.308	3.466	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
184	8018400	0.4	0.184	3.466	0.0413	0.0961	0.029	0.0961	20	0.2	0,0
76	8007600	0.4	0.076	3.467	0.0413	0.0961	0.029	0.0961	20	0.08	0,0
353	8035300	0.4	0.353	2.552	0.0413	0.0961	0.029	0.0961	20	0.35	0,0
535	8053500	0.4	0.535	2.552	0.0413	0.0961	0.029	0.0961	20	0.54	0,0
305	8030500	0.4	0.305	2.832	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
72	8007200	0.4	0.072	2.832	0.0413	0.0961	0.029	0.0961	20	0.07	0,0
627	8062700	0.4	0.627	3.007	0.0413	0.0961	0.029	0.0961	20	0.063	0,0
500	8050000	0.4	0.5	3.007	0.0413	0.0961	0.029	0.0961	20	0.5	0,0
727	8072700	0.4	0.727	3.007	0.0413	0.0961	0.029	0.0961	20	0.73	0,0
500	8050000	0.4	0.5	3.007	0.0413	0.0961	0.029	0.0961	20	0.5	0,0
294	8029400	0.4	0.294	8.403	0.0171	0.2329	0.0704	0.2329	67	0.3	0,0
878	8087800	0.4	0.878	3.466	0.0413	0.0961	0.029	0.0961	20	0.88	0,0
746	8074600	0.4	0.746	3.014	0.0475	0.0835	0.0252	0.0835	8	0.75	0,0
297	8029700	0.4	0.297	3.466	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
48	8004800	0.4	0.048	3.466	0.0413	0.0961	0.029	0.0961	20	0.05	0,0
500	8050000	0.4	0.5	2.832	0.0413	0.0961	0.029	0.0961	20	0.5	0,0
316	8031600	0.4	0.316	2.832	0.0413	0.0961	0.029	0.0961	20	0.3	0,0
619	8061900	0.4	0.619	2.832	0.0413	0.0961	0.029	0.0961	20	0.6	0,0
489	8048900	0.4	0.489	2.832	0.0413	0.0961	0.029	0.0961	20	0.5	0,0
172	8017200	0.4	0.172	3.466	0.0413	0.0961	0.029	0.0961	20	0.17	0,0
20	8002000	0.4	0.02	3.47	0.0413	0.0961	0.029	0.0961	20	0.02	0,0
97	8009700	0.4	0.097	3.465	0.0413	0.0961	0.029	0.0961	20	0.1	0,0
24	8002400	0.4	0.024	3.466	0.0413	0.0961	0.029	0.0961	20	0.03	0,0
1148	8114800	0.4	1.148	3.466	0.0413	0.0961	0.029	0.0961	20	1.15	0,0
170	8017000	0.4	0.17	3.466	0.0413	0.0961	0.029	0.0961	20	0.17	0,0

***Driven Type: Mechanical Torque Formula=$(A+B(1-s)+C(1-s)^2)$Tmo where A+B+C=1, B and C is written and s is slip.**

LUMPED LOADS DATA BASE (continued 2)

RATED	PASHA	VOLTAGE	BASE	MAGNETIZING	STATOR		ROTOR		OTHERS		
KVA	LIB.	KV	MVA	REACT.-PU	RESIST.-PU	REACT-PU	RESIST.-PU	REACT.-PU	% Load	H (Sec.) (total) (driven)	Driven TYPE*
456	8045600	0.4	0.456	2.247	0.0413	0.0961	0.029	0.0961	20	0.46	0,0
171	8017100	0.4	0.171	2.247	0.0413	0.0961	0.029	0.0961	20	0.17	0,0
977	8097700	0.4	0.977	2.247	0.0413	0.0961	0.029	0.0961	20	0.98	0,0
826	8082600	0.4	0.826	2.247	0.0413	0.0961	0.029	0.0961	20	0.83	0,0
520	8052000	0.4	0.52	3.466	0.0413	0.0961	0.029	0.0961	20	0.52	0,0
517	8051700	0.4	0.517	3.466	0.0413	0.0961	0.029	0.0961	20	0.52	0,0
77	8007700	0.4	0.076	3.467	0.0413	0.0961	0.029	0.0961	20	0.08	0,0
MOBIN Auxilary Motor Loads											
5000	8000500	6	5	2.165	0.0354	0.1128	0.0145	0.0752	20	0.2093	0,1
500	8012500	0.4	0.5	1.953	0.0424	0.0821	0.0095	0.0547	20	0.046	0,1

***Driven Type: Mechanical Torque Formula=$(A+B(1-s)+C(1-s)^2)$Tmo where A+B+C=1, B and C is written and s is slip.**

GENERATOR DATA BASE

RATED POWER MVA	TYPE	RATED VOLTAGE KV	PASHA LIB.	RESISTANCE PU	REACTANCE PU	ZERO SEQUENCE RESISTANCE- PU	ZERO SEQUENCE REACTANCE- PU	H (SEC)
121.75	saturated	15	158	0.001	1.587	634.1156*	0.073	2.6
121.75	unsaturate	15	159	0.001	1.587	634.1156*	0.073	2.6
Gas Plant Diesels								
2.5	TYPICAL	6	92	0.0139	2.5	13.760**	0.07	1.7944
0.150	TYPICAL	0.4	150	0.0179	1.497	0.018	0.07	2.0

PASHA LIB.	DIRECT AXIS X'd	τ'd	X''d	τ''d	Xq	QUADRATURE AXES X'q	τ'q	X''q	τ''q
158	0.192	7.55	0.124	0.03					
159	0.197	7.55	0.144	0.03					
Gas Plant Diesels									
92	0.207	2.415	0.154	0.0202					
150	0.317	1.23	0.196	0.2604	0.949	0.949		0.217	0.0085

***10A grounding resistor considered**

****50A grounding resistor considered**

AVR DATA USED FOR MOBIN GENERATORS (IEEE MODEL 1)

TYPE	1234	: An integer number identifying each data base entry in PASHA.
FW-GAIN	100.0	: Forward gain Ka in pu. 100
FW-TC	10.0	: Forward time constant Ta in sec. 10b
FB-GAIN		: Feedback gain Kf in pu.
FB-TC		: Feedback time constant Tf in sec.
V-MAX		: Maximum regulator voltage limit Vmax in pu.
V-MIN		: Minimum regulator voltage limit Vmin in pu.
V-RATE		: Rate of change of regulator voltage in puV/sec.
IP-F-TC		: Input filter time constant Tr in sec.
EX-GAIN	1.0	: Exciter gain Ke in pu.
EX-TC	0.1	: Exciter time constant Te in sec.
EX-E-MAX	4.5	: Exciter ceiling voltage Emax in pu.
EX-E-MIN	0.0	: Exciter minimum voltage Emin in pu.
REG-TC	1.0	: Regulator amplifier time constant Tb in sec.
FB-AMP=TC		: Feedback amplifier time constant Td in sec.
EX-SAT1		: Exciter saturation function Se at75% of ceiling voltage.
EX-SAT2		: Exciter saturation function Se at ceiling voltage.

GOVERNOR DATA USED FOR MOBIN GENERATORS (IEEE MODEL)

TYPE	159	: An integer number identifying each data base entry in PASHA.
G-REG	4.0	: Governor regulation R. Enter as a positive number in per-unit or per-cent.
G-FLY-TC		: Governor flyball time constant Tb in sec.
G-TC1	0.5	: Governor control system time constant T1 in sec
G-TC2	1.25	: Governor control system time constant T2 in sec
G-TC3	0.7	: Governor control system time constant T3 in sec
T-TC1		: Turbine time constant T4 in sec.
T-TC2	0.7	: Turbine time constant T5 in sec.
MAX-T-PO	140	: Maximum turbine power in MW.
RAT-MVA	160	: The turbine rating in MVA.

Table IV.2: List of DATA which are represented in PASHA software

INPUT DATA

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SYSTEM TITLE: 100MVA FIRE UP SITUATION AS ACTUAL RELAY SET
STUDY TITLE:

SYSTEM MVA BASE =  10.000


PASHA ACTUAL DYNAMIC FAULT IS ACTIVE


B U S B A R    D A T A    I N P U T
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S Y N C H R O N O U S    G E N E R A T O R S

           GENERATION       GENERATOR IMPEDANCES PU     0-C TIME CONST
 BUSBAR      P       Q     RES    SYN-X  DA-TR-X DA-ST-X  TDO'    TDO"    AREA
  NAME     (MW)    (MVAR)   R       XD     XD'     XD"   (MSEC)  (MSEC)

GT1        52.84   69.96  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
GT2       100.00   68.44  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
GT3       100.00   71.63  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
GT4       100.00   68.44  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
GT5       100.00   68.44  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
GT6       100.00   71.63  0.0001  0.1303  0.0158  0.0102 7550.00   30.00 MOBIN
     WARNING - TDO' OF FOLLOWING MACHINE MISSING
GRIDG      60.00   40.00  0.0006  0.0025  0.0025  0.0000    0.00    0.00 GRID
04DG31A     0.00    0.00  0.0613 11.0250  0.9129  0.6791 2415.00   20.20 04DG3A
04DG31B     0.00    0.00  0.0613 11.0250  0.9129  0.6791 2415.00   20.20 04DG3B
04DG31C     0.00    0.00  0.0613 11.0250  0.9129  0.6791 2415.00   20.20 04DG3C
08DG        0.00    0.00  1.5372128.5573 27.2229 16.8318 1230.00  260.40 08ES41

END OF SYNCHRONOUS MACHINE DATA


S T A T I C    L O A D S

 BUSBAR        LOAD          INITIAL VOLTAGES             AREA
  NAME     P(MW)  Q(MVAR)    MAG(PU)  ANG(DEG)   VNOM.(KV)

MBIN132     0.00    0.00      0.9967  -2.249    132.000 MOBIN
GT6         0.00    0.00      1.0450   2.329     15.000 MOBIN
GT5         0.00    0.00      1.0450   2.584     15.000 MOBIN
GT4         0.00    0.00      1.0450   2.584     15.000 MOBIN
GT3         0.00    0.00      1.0450   2.329     15.000 MOBIN
GT2         0.00    0.00      1.0450   2.584     15.000 MOBIN
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GT1	0.00	0.00	1.0450	0.000	15.000	MOBIN
GC1	0.00	0.00	1.0448	-0.006	15.000	MOBIN
GC2	0.00	0.00	1.0448	2.571	15.000	MOBIN
GC3	0.00	0.00	1.0448	2.317	15.000	MOBIN
GC4	0.00	0.00	1.0448	2.571	15.000	MOBIN
GC5	0.00	0.00	1.0448	2.571	15.000	MOBIN
GC6	0.00	0.00	1.0448	2.317	15.000	MOBIN
INT1	0.00	0.00	0.9934	-2.450	132.000	ALL
1S11A	0.00	0.00	1.0058	-4.210	33.000	
MBF1321	0.00	0.00	0.9967	-2.252	132.000	ALL
GRID	0.00	0.00	0.9969	-2.243	132.000	ALL
J1	0.00	0.00	0.9965	-2.260	132.000	EXTERNAL
J2	0.00	0.00	0.9963	-2.266	132.000	EXTERNAL
J3	0.00	0.00	0.9966	-2.255	132.000	EXTERNAL
J4	0.00	0.00	0.9965	-2.258	132.000	EXTERNAL
J5	0.00	0.00	0.9965	-2.258	132.000	EXTERNAL
J6	0.00	0.00	0.9962	-2.270	132.000	EXTERNAL
J7	0.00	0.00	0.9961	-2.275	132.000	EXTERNAL
J8	0.00	0.00	0.9965	-2.260	132.000	EXTERNAL
J9	0.00	0.00	0.9965	-2.261	132.000	EXTERNAL
ACIDA	17.00	10.54	0.9973	-6.460	20.000	EXTERNAL
COMMU	10.71	6.64	0.9959	-6.667	20.000	EXTERNAL
C2REC	3.40	2.11	0.9937	-7.029	20.000	EXTERNAL
UREAA	6.12	3.79	0.9988	-6.205	20.000	EXTERNAL
SEAWA	10.71	6.64	0.9961	-6.657	20.000	EXTERNAL
4THAR	13.60	8.43	0.9961	-6.615	20.000	EXTERNAL
ASU	17.00	10.54	0.9969	-6.478	20.000	EXTERNAL
10THO	17.00	10.54	0.9973	-6.460	20.000	EXTERNAL
9THOL	20.40	12.64	0.9948	-6.844	20.000	EXTERNAL
AU1400	0.09	0.05	1.0794	-1.058	0.400	AU1
AU16KV	0.85	0.53	1.0625	-2.039	6.000	AU1
AU2400	0.09	0.05	1.0794	1.526	0.400	AU2
AU36KV	0.85	0.53	1.0625	0.284	6.000	AU3
AU3400	0.09	0.05	1.0794	1.271	0.400	AU3
AU4400	0.09	0.05	1.0794	1.526	0.400	AU4
AU5400	0.09	0.05	1.0794	1.526	0.400	AU5
AU66KV	0.85	0.53	1.0625	0.284	6.000	AU6
AU6400	0.09	0.05	1.0794	1.271	0.400	AU6
GRID132	0.00	0.00	0.9979	-2.194	132.000	GRID
GRID230	0.00	0.00	1.0586	2.841	230.000	GRID
JGRID	0.00	0.00	1.0006	-1.920	20.000	GRID
GRID20	0.00	0.00	1.0006	-1.920	20.000	GRID
GRIDG	0.00	0.00	1.0590	2.872	230.000	GRID
OUT1	0.00	0.80	1.0059	-4.208	33.000	ALL
J0	0.00	0.00	0.9946	-2.256	132.000	EXTERNAL
PH678	14.00	8.00	0.9922	-2.974	33.000	EXTERNAL
1S11B	0.00	0.00	1.0058	-4.210	33.000	
01TR3413	0.00	0.00	1.0182	-4.541	6.000	01ES41
01ES41	0.00	0.00	1.0447	-4.997	0.400	01ES41
LM1	0.00	0.20	1.0447	-4.998	0.400	01ES41
LM2	0.00	0.00	1.0447	-4.997	0.400	01ES41
01TR4413	0.00	0.00	1.0447	-4.996	0.400	01ES41

01T2	0.00	0.00	1.0333	-6.189	0.400	01ES41
01T3	0.00	0.00	1.0447	-4.997	0.400	01ES41
01T5	0.00	0.00	1.0447	-4.997	0.400	01ES42
01T6	0.00	0.00	1.0234	-7.740	0.400	01ES42
01ES42	0.00	0.00	1.0447	-4.997	0.400	01ES42
LM1	0.00	0.00	1.0447	-4.997	0.400	01ES42
01TR1311	0.00	0.00	1.0058	-4.210	33.000	01S
01TR3311	0.00	0.00	1.0170	-5.551	6.000	01S
01TR1312	0.00	0.00	1.0058	-4.211	33.000	01S
01TR3312	0.00	0.00	1.0240	-4.807	6.000	01S
ML1	0.00	0.00	1.0170	-5.557	6.000	01S31A
01S31A	0.00	0.00	1.0170	-5.555	6.000	01S
01S31B	0.00	0.00	1.0240	-4.808	6.000	01S
ML1	0.00	0.00	1.0240	-4.809	6.000	01S31B
01S41A	0.00	0.00	1.0418	-5.555	0.400	01S41
LM1	0.00	0.00	1.0418	-5.555	0.400	01S41A
01TR3411	0.00	0.00	1.0170	-5.555	6.000	01S41
01S41B	0.00	0.00	1.0333	-6.189	0.400	01S41
LM1	0.13	0.06	1.0333	-6.191	0.400	01S41B
01S42A	0.00	0.00	1.0234	-7.740	0.400	01S42A
LM1	0.41	0.13	1.0234	-7.743	0.400	01S42A
01S42B	0.00	0.00	1.0490	-4.808	0.400	01S42B
LM1	0.00	0.00	1.0490	-4.808	0.400	01S42B
01TR3412	0.00	0.00	1.0240	-4.809	6.000	01S41
01TR3415	0.00	0.00	1.0240	-4.808	6.000	01S42B
01TR4411	0.00	0.00	1.0418	-5.555	0.400	01S41
01TR4412	0.00	0.00	1.0333	-6.187	0.400	01S41
01TR3414	0.00	0.00	1.0170	-5.556	6.000	01S42A
01TR4414	0.00	0.00	1.0234	-7.738	0.400	01S42A
01TR4415	0.00	0.00	1.0490	-4.808	0.400	01S42B
01T1	0.00	0.00	1.0333	-6.189	0.400	01S41B
01T4	0.00	0.00	1.0234	-7.740	0.400	01S42A
02ES41	0.00	0.00	1.0486	-4.801	0.400	02ES41
LM1	0.00	0.00	1.0486	-4.801	0.400	02ES41
LM2	0.00	0.00	1.0486	-4.801	0.400	02ES41
02TR3413	0.00	0.00	1.0236	-4.801	6.000	02ES41
02TR4413	0.00	0.00	1.0486	-4.801	0.400	02ES41
02T2	0.00	0.00	1.0483	-4.650	0.400	02ES41
02TR1311	0.00	0.00	1.0056	-4.208	33.000	02S
02TR3311	0.00	0.00	1.0212	-4.678	6.000	02S
02TR1312	0.00	0.00	1.0057	-4.210	33.000	02S
02TR3312	0.00	0.00	1.0234	-4.649	6.000	02S
M02	0.00	0.00	1.0212	-4.679	6.000	02S31A
02S31A	0.00	0.00	1.0212	-4.679	6.000	02S
02S31B	0.00	0.00	1.0234	-4.650	6.000	02S
M02	0.00	0.00	1.0234	-4.650	6.000	02S31B
02S41A	0.00	0.00	1.0302	-5.420	0.400	02S41
LM1	0.00	0.07	1.0302	-5.421	0.400	02S41A
02S41B	0.00	0.00	1.0483	-4.650	0.400	02S41
LM1	0.00	0.00	1.0483	-4.650	0.400	02S41B
02S42A	0.00	0.00	1.0461	-4.679	0.400	02S42A
LM1	0.00	0.00	1.0461	-4.679	0.400	02S42A

02S42B	0.00	0.00	1.0388	-5.117	0.400	02S42B
LM1	0.06	0.04	1.0388	-5.118	0.400	02S42B
02TR3411	0.00	0.00	1.0212	-4.679	6.000	02S41
02TR4411	0.00	0.00	1.0302	-5.419	0.400	02S41
02TR3412	0.00	0.00	1.0234	-4.650	6.000	02S41
02TR4412	0.00	0.00	1.0483	-4.650	0.400	02S41
02TR3414	0.00	0.00	1.0212	-4.679	6.000	02S42A
02TR4414	0.00	0.00	1.0461	-4.679	0.400	02S42A
02TR3415	0.00	0.00	1.0234	-4.650	6.000	02S42B
02TR4415	0.00	0.00	1.0388	-5.117	0.400	02S42B
02T1	0.00	0.00	1.0483	-4.650	0.400	02S41B
03ES41	0.00	0.00	1.0486	-4.801	0.400	03ES41
LM1	0.00	0.00	1.0486	-4.801	0.400	03ES41
LM2	0.00	0.00	1.0486	-4.801	0.400	03ES41
03TR3413	0.00	0.00	1.0236	-4.801	6.000	03ES41
03TR4413	0.00	0.00	1.0486	-4.801	0.400	03ES41
03T2	0.00	0.00	1.0645	-5.302	0.400	03ES41
03TR1311	0.00	0.00	1.0056	-4.205	33.000	03S
03TR3311	0.00	0.00	1.0199	-4.545	6.000	03S
03TR1312	0.00	0.00	1.0055	-4.212	33.000	03S
03TR3312	0.00	0.00	1.0209	-4.944	6.000	03S
ML1	0.00	0.00	1.0198	-4.546	6.000	03S31A
03S31A	0.00	0.00	1.0198	-4.546	6.000	03S
03S31B	0.00	0.00	1.0208	-4.946	6.000	03S
ML1	0.00	0.00	1.0208	-4.947	6.000	03S31B
03S41A	0.00	0.00	1.0708	-4.546	0.400	03S41
LM1	0.00	0.00	1.0708	-4.546	0.400	03S41A
03S41B	0.00	0.00	1.0645	-5.302	0.400	03S41
LM1	0.00	0.03	1.0645	-5.303	0.400	03S41B
03S42A	0.00	0.00	1.0171	-6.325	0.400	03S42A
LM1	0.18	0.12	1.0171	-6.327	0.400	03S42A
03S42B	0.00	0.00	1.0347	-5.650	0.400	03S42B
LM1	0.00	0.00	1.0347	-5.651	0.400	03S42B
03TR3411	0.00	0.00	1.0198	-4.546	6.000	03S41
03TR4411	0.00	0.00	1.0708	-4.546	0.400	03S41
03TR3412	0.00	0.00	1.0208	-4.946	6.000	03S41
03TR4412	0.00	0.00	1.0645	-5.302	0.400	03S41
03TR3414	0.00	0.00	1.0198	-4.547	6.000	03S42A
03TR4414	0.00	0.00	1.0171	-6.322	0.400	03S42A
03TR3415	0.00	0.00	1.0208	-4.946	6.000	03S42B
03TR4415	0.00	0.00	1.0347	-5.649	0.400	03S42B
03T1	0.00	0.00	1.0645	-5.302	0.400	03S41B
04ES41A	0.00	0.00	1.0420	-4.634	0.400	04ES41A
LM1	0.00	0.00	1.0419	-4.634	0.400	04ES41A
LM2	0.00	0.00	1.0420	-4.634	0.400	04ES41A
04TR3413	0.00	0.00	1.0221	-4.664	6.000	04ES41A
04TR4413	0.00	0.00	1.0420	-4.634	0.400	04ES41A
04T3	0.00	0.00	1.0420	-4.634	0.400	04ES41A
04T5	0.00	0.00	1.0420	-4.634	0.400	04ES42A
04ES41B	0.00	0.00	1.0358	-5.825	0.400	04ES41B
LM1	0.06	0.03	1.0358	-5.826	0.400	04ES41B
04T6	0.00	0.00	1.0358	-5.826	0.400	04ES42B

LM2	0.00	0.00	1.0420	-4.634	0.400	04ES42A
04TR1311	0.00	0.00	1.0053	-4.205	33.000	04S
04TR3311	0.00	0.00	1.0221	-4.663	6.000	04S
04TR1312	0.00	0.00	1.0052	-4.213	33.000	04S
04TR3312	0.00	0.00	1.0236	-4.799	6.000	04S
04S31A	0.00	0.00	1.0221	-4.664	6.000	04S
04S31B	0.00	0.00	1.0236	-4.801	6.000	04S
04S41A	0.00	0.00	1.0470	-4.664	0.400	04S41
LM1	0.03	0.02	1.0358	-5.827	0.400	04ES42B
M04	0.00	0.00	1.0221	-4.665	6.000	04S31A
04S41B	0.00	0.00	1.0486	-4.801	0.400	04S41
LM21	0.01	0.01	1.0358	-5.827	0.400	04ES42B
M05	0.00	0.00	1.0236	-4.802	6.000	04S31B
04ES42A	0.00	0.00	1.0420	-4.634	0.400	04ES42A
04ES42B	0.00	0.00	1.0358	-5.827	0.400	04ES42B
LM1	0.00	0.00	1.0470	-4.664	0.400	04S41A
LM2	0.00	0.00	1.0486	-4.801	0.400	04S41B
04TR3411	0.00	0.00	1.0221	-4.664	6.000	04S41
04TR4411	0.00	0.00	1.0470	-4.664	0.400	04S41
04TR3412	0.00	0.00	1.0236	-4.801	6.000	04S41
04TR4412	0.00	0.00	1.0486	-4.801	0.400	04S41
04TR3414	0.00	0.00	1.0236	-4.802	6.000	04ES41B
04TR4414	0.00	0.00	1.0358	-5.824	0.400	04ES41B
04T4	0.00	0.00	1.0358	-5.826	0.400	04ES41B
04DG31A	0.00	0.00	1.0000	0.000	6.000	04DG3A
04DG32A	0.00	0.00	1.0000	0.000	6.000	04DG3A
04DG31B	0.00	0.00	1.0000	0.000	6.000	04DG3B
04DG32B	0.00	0.00	1.0000	0.000	6.000	04DG3B
04ES31A	0.00	0.00	1.0221	-4.664	6.000	04S
04ES31B	0.00	0.00	1.0236	-4.801	6.000	04S
04ES31C	0.00	0.00	1.0236	-4.801	6.000	04S
04DG31C	0.00	0.00	1.0000	0.000	6.000	04DG3C
04DG32C	0.00	0.00	1.0000	0.000	6.000	04DG3C
05ES41	0.00	0.00	1.0470	-4.664	0.400	05ES41
LM1	0.00	0.00	1.0470	-4.664	0.400	05ES41
LM2	0.00	0.00	1.0470	-4.664	0.400	05ES41
05TR3413	0.00	0.00	1.0221	-4.664	6.000	05ES41
05TR4413	0.00	0.00	1.0470	-4.664	0.400	05ES41
05T2	0.00	0.00	1.0405	-5.263	0.400	05ES41
05TR1311	0.00	0.00	1.0054	-4.210	33.000	05S
05TR3311	0.00	0.00	1.0221	-4.819	6.000	05S
05TR1312	0.00	0.00	1.0056	-4.211	33.000	05S
05TR3312	0.00	0.00	1.0270	-4.458	6.000	05S
ML1	0.00	0.00	1.0221	-4.820	6.000	05S31A
05S31A	0.00	0.00	1.0221	-4.820	6.000	05S
05S31B	0.00	0.00	1.0270	-4.459	6.000	05S
ML1	0.00	0.00	1.0270	-4.459	6.000	05S31B
05S41A	0.00	0.00	1.0355	-5.629	0.400	05S41
LM1	0.00	0.00	1.0355	-5.630	0.400	05S41A
05S41B	0.00	0.00	1.0405	-5.263	0.400	05S41
LM1	0.09	0.05	1.0405	-5.264	0.400	05S41B
05S42A	0.00	0.00	1.0300	-6.009	0.400	05S42A

LM1	0.13	0.07	1.0300	-6.010	0.400	05S42A
05S42B	0.00	0.00	1.0521	-4.459	0.400	05S42B
LM1	0.00	0.00	1.0521	-4.459	0.400	05S42B
05TR3411	0.00	0.00	1.0221	-4.820	6.000	05S41
05TR4411	0.00	0.00	1.0355	-5.627	0.400	05S41
05TR3412	0.00	0.00	1.0270	-4.459	6.000	05S41
05TR4412	0.00	0.00	1.0405	-5.261	0.400	05S41
05TR3414	0.00	0.00	1.0221	-4.821	6.000	05S42A
05TR4414	0.00	0.00	1.0301	-6.007	0.400	05S42A
05TR3415	0.00	0.00	1.0270	-4.459	6.000	05S42B
05TR4415	0.00	0.00	1.0521	-4.459	0.400	05S42B
05T1	0.00	0.00	1.0405	-5.263	0.400	05S41B
06ES41	0.00	0.00	1.0486	-4.801	0.400	06ES41
LM1	0.00	0.00	1.0486	-4.801	0.400	06ES41
06TR3413	0.00	0.00	1.0236	-4.801	6.000	06ES41
06TR4413	0.00	0.00	1.0486	-4.801	0.400	06ES41
06T2	0.00	0.00	1.0426	-4.926	0.400	06ES41
06TR1311	0.00	0.00	1.0051	-4.204	33.000	06S
06TR3311	0.00	0.00	1.0127	-4.979	6.000	06S
06TR1312	0.00	0.00	1.0052	-4.213	33.000	06S
06TR3312	0.00	0.00	1.0178	-4.925	6.000	06S
ML1	0.00	0.00	1.0127	-4.981	6.000	06S31A
06S31A	0.00	0.00	1.0127	-4.981	6.000	06S
06S31B	0.00	0.00	1.0178	-4.926	6.000	06S
ML1	0.00	0.00	1.0178	-4.928	6.000	06S31B
06S41A	0.00	0.00	1.0180	-6.628	0.400	06S41
LM1	0.16	0.08	1.0180	-6.630	0.400	06S41A
06S41B	0.00	0.00	1.0426	-4.926	0.400	06S41
LM1	0.00	0.00	1.0426	-4.926	0.400	06S41B
06S42A	0.00	0.00	1.0214	-6.306	0.400	06S42A
LM1	0.05	0.03	1.0213	-6.308	0.400	06S42A
06S42B	0.00	0.00	1.0338	-5.634	0.400	06S42B
LM1	0.00	0.00	1.0338	-5.635	0.400	06S42B
06TR3411	0.00	0.00	1.0127	-4.981	6.000	06S41
06TR4411	0.00	0.00	1.0180	-6.626	0.400	06S41
06TR3412	0.00	0.00	1.0178	-4.926	6.000	06S41
06TR4412	0.00	0.00	1.0426	-4.926	0.400	06S41
06TR3414	0.00	0.00	1.0127	-4.981	6.000	06S42A
06TR4414	0.00	0.00	1.0214	-6.304	0.400	06S42A
06TR3415	0.00	0.00	1.0178	-4.927	6.000	06S42B
06TR4415	0.00	0.00	1.0338	-5.633	0.400	06S42B
06T1	0.00	0.00	1.0426	-4.926	0.400	06S41B
07ES41	0.00	0.00	1.0470	-4.664	0.400	07ES41
LM1	0.00	0.00	1.0470	-4.664	0.400	07ES41
LM2	0.00	0.00	1.0470	-4.664	0.400	07ES41
07TR3413	0.00	0.00	1.0221	-4.664	6.000	07ES41
07TR4413	0.00	0.00	1.0470	-4.664	0.400	07ES41
07T2	0.00	0.00	1.0412	-5.270	0.400	07ES41
07TR1311	0.00	0.00	1.0051	-4.210	33.000	07S
07TR3311	0.00	0.00	1.0134	-5.566	6.000	07S
07TR1312	0.00	0.00	1.0055	-4.211	33.000	07S
07TR3312	0.00	0.00	1.0219	-4.874	6.000	07S

ML1	0.00	0.00	1.0133	-5.568	6.000	07S31A
07S31A	0.00	0.00	1.0133	-5.568	6.000	07S
07S31B	0.00	0.00	1.0219	-4.875	6.000	07S
ML1	0.00	0.00	1.0219	-4.875	6.000	07S31B
07S41A	0.00	0.00	1.0270	-6.390	0.400	07S41
LM1	0.09	0.05	1.0270	-6.391	0.400	07S41A
07S41B	0.00	0.00	1.0412	-5.270	0.400	07S41
LM1	0.00	0.00	1.0412	-5.271	0.400	07S41B
07S42A	0.00	0.00	1.0240	-6.571	0.400	07S42A
LM1	0.11	0.06	1.0240	-6.572	0.400	07S42A
07S42B	0.00	0.00	1.0381	-5.488	0.400	07S42B
LM1	0.00	0.00	1.0381	-5.489	0.400	07S42B
07TR3411	0.00	0.00	1.0133	-5.568	6.000	07S41
07TR4411	0.00	0.00	1.0270	-6.389	0.400	07S41
07TR3412	0.00	0.00	1.0219	-4.875	6.000	07S41
07TR4412	0.00	0.00	1.0412	-5.269	0.400	07S41
07TR3414	0.00	0.00	1.0133	-5.568	6.000	07S42A
07TR4414	0.00	0.00	1.0240	-6.570	0.400	07S42A
07TR3415	0.00	0.00	1.0219	-4.875	6.000	07S42B
07TR4415	0.00	0.00	1.0381	-5.488	0.400	07S42B
07T1	0.00	0.00	1.0412	-5.270	0.400	07S41B
08ES41	0.00	0.00	1.0447	-4.217	0.400	08ES41
LM1	0.00	0.00	1.0447	-4.217	0.400	08ES41
LM2	0.00	0.00	1.0447	-4.217	0.400	08ES41
08T2	0.00	0.00	1.0447	-4.217	0.400	08ES41
08DG1	0.00	0.00	1.0000	0.000	0.400	08ES41
08TR1311	0.00	0.00	1.0056	-4.203	33.000	08S
08TR3311	0.00	0.00	1.0250	-4.247	6.000	08S
08TR1312	0.00	0.00	1.0054	-4.172	33.000	08S
08TR3312	0.00	0.00	1.0210	-4.147	6.000	08S
125PM10D	0.00	0.00	1.0207	-4.121	6.000	08S31B
08S31A	0.00	0.00	1.0250	-4.247	6.000	08S
08S31B	0.00	0.00	1.0210	-4.147	6.000	08S
125PM10B	0.00	0.00	1.0208	-4.129	6.000	08S31B
08S41A	0.00	0.00	1.0437	-4.603	0.400	08S41
LM1	0.02	0.01	1.0437	-4.603	0.400	08S41A
08S41B	0.00	0.00	1.0447	-4.217	0.400	08S41
LM1	0.00	0.00	1.0447	-4.217	0.400	08S41B
08TR3411	0.00	0.00	1.0250	-4.247	6.000	08S41
08TR4411	0.00	0.00	1.0437	-4.603	0.400	08S41
08TR3412	0.00	0.00	1.0210	-4.147	6.000	08S41
08TR4412	0.00	0.00	1.0447	-4.217	0.400	08S41
08T1	0.00	0.00	1.0447	-4.217	0.400	08S41B
09ES41	0.00	0.00	1.0748	-4.801	0.400	09ES41
LM1	0.00	0.00	1.0748	-4.801	0.400	09ES41
LM2	0.00	0.00	1.0748	-4.801	0.400	09ES41
09TR3413	0.00	0.00	1.0236	-4.801	6.000	09ES41
09TR4413	0.00	0.00	1.0748	-4.801	0.400	09ES41
09T2	0.00	0.00	1.0733	-4.449	0.400	09ES41
09TR1311	0.00	0.00	1.0049	-4.198	33.000	09S
09TR3311	0.00	0.00	1.0330	-5.188	6.000	09S
09TR1312	0.00	0.00	1.0058	-4.211	33.000	09S

09TR3312	0.00	0.00	1.0511	-4.244	6.000	09S
ML1	0.00	0.00	1.0329	-5.193	6.000	09S31A
09S31A	0.00	0.00	1.0329	-5.191	6.000	09S
09S31B	0.00	0.00	1.0511	-4.244	6.000	09S
ML1	0.00	0.00	1.0511	-4.244	6.000	09S31B
09S41A	0.00	0.00	1.0466	-5.914	0.400	09S41
LM1	0.07	0.05	1.0466	-5.915	0.400	09S41A
09S41B	0.00	0.00	1.0733	-4.449	0.400	09S41
LM1	0.00	0.00	1.0733	-4.449	0.400	09S41B
09S42A	0.00	0.00	1.0597	-6.680	0.400	09S42A
LM1	0.16	0.11	1.0596	-6.682	0.400	09S42A
09S42B	0.00	0.00	1.1036	-4.244	0.400	09S42B
LM1	0.00	0.00	1.1036	-4.244	0.400	09S42B
09TR3411	0.00	0.00	1.0329	-5.192	6.000	09S41
09TR4411	0.00	0.00	1.0466	-5.913	0.400	09S41
09TR3412	0.00	0.00	1.0511	-4.244	6.000	09S41
09TR4412	0.00	0.00	1.0733	-4.448	0.400	09S41
09TR3414	0.00	0.00	1.0329	-5.192	6.000	09S42A
09TR4414	0.00	0.00	1.0597	-6.678	0.400	09S42A
09TR3415	0.00	0.00	1.0511	-4.244	6.000	09S42B
09TR4415	0.00	0.00	1.1036	-4.244	0.400	09S42B
09T1	0.00	0.00	1.0733	-4.449	0.400	09S41B
09T4	0.00	0.00	1.0597	-6.680	0.400	09S42A
08DG	0.00	0.00	1.0000	0.000	0.400	08ES41
1TR1215	0.00	0.00	1.0043	-4.186	33.000	COMPRESA
1TS1215	0.00	0.00	0.9986	-5.745	11.000	COMPRESA
103KM101	0.00	0.00	0.9971	-5.738	11.000	COMPRESA
103KM201	0.00	0.00	1.0304	-4.212	11.000	COMPRESB
1TR1220	0.00	0.00	1.0058	-4.212	33.000	COMPRESB
1TS1220	0.00	0.00	1.0304	-4.212	11.000	COMPRESB
111KM101	0.00	0.00	1.0366	-5.400	11.000	COMPRESA
1TR1211	0.00	0.00	1.0038	-4.205	33.000	COMPRESA
1TS1211	0.00	0.00	1.0375	-5.394	11.000	COMPRESA
111KM201	0.00	0.00	1.0562	-4.211	11.000	COMPRESA
1TR1212	0.00	0.00	1.0058	-4.211	33.000	COMPRESA
1TS1212	0.00	0.00	1.0562	-4.211	11.000	COMPRESA
111KM301	0.00	0.00	1.0562	-4.211	11.000	COMPRESA
1TR1213	0.00	0.00	1.0058	-4.211	33.000	COMPRESA
1TS1213	0.00	0.00	1.0562	-4.211	11.000	COMPRESA
111KM401	0.00	0.00	1.0562	-4.212	11.000	COMPRESB
1TR1216	0.00	0.00	1.0058	-4.212	33.000	COMPRESB
1TS1216	0.00	0.00	1.0562	-4.212	11.000	COMPRESB
111KM501	0.00	0.00	1.0391	-5.136	11.000	COMPRESB
1TR1217	0.00	0.00	1.0042	-4.201	33.000	COMPRESB
1TS1217	0.00	0.00	1.0397	-5.134	11.000	COMPRESB
111KM601	0.00	0.00	1.0562	-4.212	11.000	COMPRESB
1TR1218	0.00	0.00	1.0058	-4.212	33.000	COMPRESB
1TS1218	0.00	0.00	1.0562	-4.212	11.000	COMPRESB
147KM10A	0.00	0.00	1.0405	-4.814	11.000	COMPRESA
1TR1214	0.00	0.00	1.0058	-4.210	33.000	COMPRESA
1TS1214	0.00	0.00	1.0409	-4.814	11.000	COMPRESA
147KM10B	0.00	0.00	1.0516	-4.211	11.000	COMPRESB

1TR1219	0.00	0.00	1.0058	-4.210	33.000 COMPRESB
1TS1219	0.00	0.00	1.0516	-4.211	11.000 COMPRESB
125PM10A	0.00	0.00	1.0248	-4.230	6.000 08S31A
LM22	0.00	0.00	1.0486	-4.801	0.400 06ES41

END OF STATIC LOAD DATA

I N D U C T I O N M O T O R S

BUSBAR NAME	LOAD TYPE PASHA	P (MW)	Q (MVAR)	MOTOR IMPEDANCES PU STATOR RES	STATOR REACT	ROTOR 1 RES	ROTOR 1 REACT	ROTOR 2 RES	ROTOR 2 REACT	MAGNETISING REACT	AREA
ACIDA	8010000.	60.51	36.86	0.0000	0.0091	0.0012	0.0091	0.0000	0.0000	0.325	EXTERNAL
COMMU	8006300.	40.36	23.73	0.0000	0.0145	0.0020	0.0145	0.0000	0.0000	0.516	EXTERNAL
C2REC	8002000.	14.14	7.87	0.0001	0.0456	0.0062	0.0456	0.0000	0.0000	1.625	EXTERNAL
UREAA	8003600.	20.16	12.92	0.0001	0.0253	0.0035	0.0253	0.0000	0.0000	0.903	EXTERNAL
SEAWA	8006300.	40.36	23.74	0.0000	0.0145	0.0020	0.0145	0.0000	0.0000	0.516	EXTERNAL
4THAR	8008000.	50.44	29.94	0.0000	0.0114	0.0016	0.0114	0.0000	0.0000	0.406	EXTERNAL
ASU	8010000.	60.51	36.84	0.0000	0.0091	0.0012	0.0091	0.0000	0.0000	0.325	EXTERNAL
10THO	8010000.	60.51	36.86	0.0000	0.0091	0.0012	0.0091	0.0000	0.0000	0.325	EXTERNAL
9THOL	8012000.	80.76	46.16	0.0000	0.0076	0.0010	0.0076	0.0000	0.0000	0.271	EXTERNAL
AU16KV	8000500.	4.26	2.68	0.0885	0.2820	0.0362	0.1880	0.0000	0.0000	5.412	AU1
AU1400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU1
AU2400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU2
AU36KV	8000500.	4.26	2.68	0.0885	0.2820	0.0362	0.1880	0.0000	0.0000	5.412	AU3
AU3400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU3
AU4400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU4
AU5400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU5
AU66KV	8000500.	4.26	2.68	0.0885	0.2820	0.0362	0.1880	0.0000	0.0000	5.412	AU6
AU6400	8012500.	0.43	0.27	1.0612	2.0529	0.2383	1.3686	0.0000	0.0000	48.825	AU6
PH678	8010003.	0.00	29.47	0.0000	0.0091	0.0012	0.0091	0.0000	0.0000	0.325	EXTERNAL
LM1	8030700.	0.20	0.12	1.6834	3.9114	1.1816	3.9114	0.0000	0.0000	117.221	01ES41
LM2	8006800.	0.05	0.03	7.6001	17.6583	5.3345	17.6583	0.0000	0.0000	520.659	01ES41
ML1	8226200.	2.04	0.99	0.0800	0.4998	0.0358	0.4998	0.0000	0.0000	17.683	01S31A
ML1	8079100.	0.71	0.34	0.3413	1.4207	0.1530	1.4207	0.0000	0.0000	52.107	01S31B
LM1	8074500.	0.52	0.25	0.6937	1.6118	0.4869	1.6118	0.0000	0.0000	58.158	01S41B
LM1	8108000.	0.59	0.20	0.3589	1.4824	0.4478	1.4824	0.0000	0.0000	100.294	01S42A
LM1	8064700.	0.40	0.28	0.7988	1.8559	0.5607	1.8559	0.0000	0.0000	43.417	02S41A
LM1	8035600.	0.21	0.16	1.4517	3.3730	1.0190	3.3730	0.0000	0.0000	73.529	02S42B
ML1	8230000.	0.00	0.56	0.0787	0.4916	0.0352	0.4916	0.0000	0.0000	18.001	03S31A
ML1	8130000.	1.17	0.56	0.1392	0.8697	0.0623	0.8697	0.0000	0.0000	31.847	03S31B
LM1	8030000.	0.19	0.14	1.7227	4.0026	1.2092	4.0026	0.0000	0.0000	93.636	03S41B
LM1	8107200.	0.67	0.46	0.4821	1.1201	0.3384	1.1201	0.0000	0.0000	26.205	03S42A
LM1	8054800.	0.34	0.24	0.9431	2.1912	0.6620	2.1912	0.0000	0.0000	51.263	03S42B
LM1	8054000.	0.00	0.13	0.9570	2.2237	0.6718	2.2237	0.0000	0.0000	80.240	04ES41A
LM2	8000400.	0.00	0.00113	.0414343	.1066103	.6508343	.1066	0.0000	0.0000	********	04ES41A
LM1	8033900.	0.24	0.12	1.5245	3.5421	1.0701	3.5421	0.0000	0.0000	127.817	04ES41B
LM1	8018400.	0.13	0.06	2.8087	6.5260	1.9715	6.5260	0.0000	0.0000	235.495	04ES42B
LM21	8007600.	0.05	0.03	6.7999	15.8000	4.7731	15.8000	0.0000	0.0000	570.175	04ES42B
LM1	8062700.	0.42	0.23	0.8242	1.9151	0.5785	1.9151	0.0000	0.0000	59.954	05S41A

LM1	8050000.	0.34	0.18	1.0336	2.4016	0.7255	2.4016	0.0000	0.0000	75.183	05S41B
LM1	8072700.	0.49	0.27	0.7109	1.6517	0.4990	1.6517	0.0000	0.0000	51.710	05S42A
ML1	8145200.	0.00	0.35	0.1247	0.7787	0.0558	0.7787	0.0000	0.0000	28.690	06S31A
ML1	8104200.	0.94	0.44	0.2591	1.0785	0.1161	1.0785	0.0000	0.0000	39.234	06S31B
LM1	8087800.	0.61	0.30	0.5886	1.3676	0.4132	1.3676	0.0000	0.0000	49.348	06S41A
LM1	8074600.	0.61	0.29	0.7967	1.3997	0.4228	1.3997	0.0000	0.0000	50.505	06S42A
LM1	8051700.	0.36	0.18	0.9996	2.3226	0.7016	2.3226	0.0000	0.0000	83.809	06S42B
ML1	8055900.	0.50	0.24	0.4830	2.0103	0.2165	2.0103	0.0000	0.0000	73.457	07S31A
ML1	8020100.	0.18	0.09	1.3433	5.5908	0.6020	5.5908	0.0000	0.0000	204.302	07S31B
LM1	8050000.	0.34	0.18	1.0336	2.4016	0.7255	2.4016	0.0000	0.0000	75.183	07S41A
LM1	8031600.	0.21	0.12	1.6355	3.7999	1.1479	3.7999	0.0000	0.0000	112.032	07S41B
LM1	8061900.	0.41	0.23	0.8349	1.9399	0.5860	1.9399	0.0000	0.0000	57.189	07S42A
LM1	8048900.	0.33	0.19	1.0568	2.4556	0.7418	2.4556	0.0000	0.0000	72.394	07S42B
LM1	8009700.	0.07	0.03	5.3280	12.3788	3.7396	12.3788	0.0000	0.0000	446.578	08S41A
LM1	8002400.	0.02	0.01	21.5338	50.0315	15.1143	50.0315	0.0000	0.0000	1805.023	08S41B
ML1	8650000.	2.03	1.88	0.0278	0.1739	0.0125	0.1739	0.0000	0.0000	5.883	09S31A
LM1	8045600.	0.28	0.20	1.1333	2.6333	0.7955	2.6333	0.0000	0.0000	61.604	09S41A
LM1	8017100.	0.11	0.08	3.0223	7.0219	2.1213	7.0219	0.0000	0.0000	164.278	09S41B
LM1	8097700.	0.60	0.44	0.5290	1.2291	0.3713	1.2291	0.0000	0.0000	28.753	09S42A
M02	9016000.	0.15	0.07	0.6423	3.9734	0.7006	3.9734	0.0000	0.0000	181.807	02S31A
M02	9025000.	0.23	0.11	1.0016	2.5483	0.4493	2.5483	0.0000	0.0000	116.599	02S31B
M04	9090000.	0.82	0.36	0.2176	0.8632	0.0975	0.8632	0.0000	0.0000	39.964	04S31A
M05	9090000.	0.82	0.36	0.2176	0.8632	0.0975	0.8632	0.0000	0.0000	39.964	04S31B
103KM101	9310004.	2.70	2.48	0.0383	0.3207	0.0320	0.2138	0.0000	0.0000	4.437	COMPRESA
111KM101	9575004.	4.07	2.38	0.0091	0.2003	0.0316	0.1335	0.0000	0.0000	5.643	COMPRESA
111KM501	9575003.	3.24	2.19	0.0214	0.1475	0.0096	0.1475	0.0000	0.0000	5.503	COMPRESB
125PM10D	9100000.	0.00	0.31	0.1580	0.6594	0.0708	0.6594	0.0000	0.0000	32.468	08S31B
125PM10A	9100000.	0.00	0.32	0.1580	0.6594	0.0708	0.6594	0.0000	0.0000	32.468	08S31A
125PM10B	9100000.	0.00	0.31	0.1580	0.6594	0.0708	0.6594	0.0000	0.0000	32.468	08S31B
147KM10A	9732004.	3.03	2.34	0.0073	0.1589	0.0250	0.1059	0.0000	0.0000	4.959	COMPRESA

END OF INDUCTION MACHINE DATA

END OF BUSBAR DATA

B R A N C H D A T A I N P U T

BUSBAR		BRANCH IMPEDANCES (PU)					TRANSFORMER		AREA-TO-AREA		PASHA TYPE
FROM	TO	PPS AND NPS		ZPS		SUSC	TAP (%)	WINDING CODE			
		R	X	R	X	B					
GT1	GC1	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
GT2	GC2	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
GT3	GC3	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
GT4	GC4	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
GT5	GC5	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
GT6	GC6	0.0000	0.0000	0.0000	0.0001	0.0000			MOBIN	MOBIN	15.
MBIN132	GC1	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.
MBIN132	GC2	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.

MBIN132	GC3	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.
MBIN132	GC4	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.
MBIN132	GC5	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.
MBIN132	GC6	0.0002	0.0089	0.0002	0.0072	0.0000	-3.7	XD11	MOBIN	MOBIN	1.
MBIN132	MBF1321	0.0000	0.0000	0.0000	0.0001	0.0197			MOBIN	ALL	32150000.
MBF1321	INT1	0.0004	0.0012	0.0012	0.0037	1.3860			ALL	ALL	32150000.
GRID	MBIN132	0.0000	0.0000	0.0000	0.0001	0.6842			ALL	MOBIN	32180000.
MBIN132	J1	0.0000	0.0000	0.0000	0.0001	0.5701			MOBIN	EXTERNAL	32150000.
MBIN132	J2	0.0000	0.0001	0.0001	0.0002	0.2423			MOBIN	EXTERNAL	32140000.
MBIN132	J3	0.0000	0.0001	0.0001	0.0002	0.2423			MOBIN	EXTERNAL	32140000.
MBIN132	J4	0.0000	0.0001	0.0001	0.0002	0.2423			MOBIN	EXTERNAL	32140000.
MBIN132	J5	0.0000	0.0000	0.0000	0.0001	0.4846			MOBIN	EXTERNAL	32140000.
MBIN132	J6	0.0000	0.0001	0.0001	0.0002	0.2423			MOBIN	EXTERNAL	32140000.
MBIN132	J7	0.0000	0.0001	0.0001	0.0002	0.2423			MOBIN	EXTERNAL	32140000.
MBIN132	J8	0.0000	0.0000	0.0000	0.0001	0.5701			MOBIN	EXTERNAL	32150000.
MBIN132	J9	0.0000	0.0000	0.0000	0.0001	0.6842			MOBIN	EXTERNAL	32180000.
J1	ACIDA	0.0002	0.0100	0.6563	0.0100	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	22.
J2	COMMU	0.0003	0.0159	1.0417	0.0159	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	24.
J3	C2REC	0.0009	0.0500	3.2814	0.0500	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	26.
J4	UREAA	0.0005	0.0278	1.8230	0.0278	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	25.
J5	SEAWA	0.0003	0.0159	1.0417	0.0159	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	24.
J6	4THAR	0.0002	0.0125	0.8204	0.0125	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	23.
J7	ASU	0.0002	0.0100	0.6563	0.0100	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	22.
J8	10THO	0.0002	0.0100	0.6563	0.0100	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	22.
J9	9THOL	0.0002	0.0083	0.5469	0.0083	0.0000	-5.0	DX1	EXTERNAL	EXTERNAL	21.
GT1	AU1400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU1	31.
GC1	AU16KV	0.0143	0.0898	0.0143	0.0898	0.0000	0.0	DX11	MOBIN	AU1	32.
GT2	AU2400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU2	31.
GT3	AU3400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU3	31.
GC3	AU36KV	0.0143	0.0898	0.0143	0.0898	0.0000	0.0	DX11	MOBIN	AU3	32.
GT4	AU4400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU4	31.
GT5	AU5400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU5	31.
GT6	AU6400	0.0752	0.4741	0.0752	0.4741	0.0000	0.0	DX11	MOBIN	AU6	31.
GC6	AU66KV	0.0143	0.0898	0.0143	0.0898	0.0000	0.0	DX11	MOBIN	AU6	32.
GRID132	GRID	0.0001	0.0002	0.0002	0.0005	1.1796			GRID	ALL	32180000.
GRID230	JGRID	0.0008	0.0152	0.0007	0.0133	0.0000	0.0	XX0	GRID	GRID	2131251.
JGRID	GRID132	0.0000	0.0008	0.0000	0.0008	0.0000	0.0	XX0	GRID	GRID	2131252.
JGRID	GRID20	0.0000	0.0240	0.0000	0.0240	0.0000	0.0	XD11	GRID	GRID	2131253.
GRIDG	GRID230	0.0000	0.0001	0.0000	0.0000	0.0000			GRID	GRID	0.
INT1	OUT1	0.0002	0.0096	1.3124	0.0098	0.0000	-3.3	DX1	ALL	ALL	3.
OUT1	1S11A	0.0000	0.0000	0.0000	0.0000	0.0000			ALL		33.
J0	PH678	0.0002	0.0096	1.3124	0.0098	0.0000	-3.3	DX1	EXTERNAL	EXTERNAL	3.
MBIN132	J0	0.0002	0.0005	0.0005	0.0016	0.5996			MOBIN	EXTERNAL	32150000.
1S11A	1S11B	0.0000	0.0000	0.0000	0.0000	0.0000					33.
01ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01ES41	01ES41	400.
01ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			01ES41	01ES41	400.
01TR3413	01TR4413	0.1841	0.6076	0.1841	0.6076	0.0000	0.0	DX11	01ES41	01ES41	88.
01TR4413	01ES41	0.0000	0.0005	0.0000	0.0015	0.0000			01ES41	01ES41	474.
01ES41	01T3	0.0000	0.0005	0.0000	0.0015	0.0000			01ES41	01ES41	400.
01T3	01T5	4.5438	2.7563	14.3128	6.5203	0.0000			01ES41	01ES42	1115000.
01ES42	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01ES42	01ES42	400.
01T5	01ES42	0.0000	0.0005	0.0000	0.0015	0.0000			01ES42	01ES42	400.

01TR1311	01TR3311	0.0060	0.0833	54.9918	0.0833	0.0000	2.5	DX11	01S	01S	74.
01TR1312	01TR3312	0.0060	0.0833	54.9918	0.0833	0.0000	2.5	DX11	01S	01S	74.
01TR3311	01S31A	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S	6.
01TR3312	01S31B	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S	6.
01S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S31A	6.
01S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S31B	6.
01S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01S41	01S41A	400.
01S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01S41	01S41B	400.
01S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01S42A	01S42A	400.
01S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			01S42B	01S42B	400.
01TR3411	01TR4411	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	01S41	01S41	82.
01TR4411	01S41A	0.0000	0.0005	0.0000	0.0015	0.0000			01S41	01S41	474.
01TR3412	01TR4412	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	01S41	01S41	82.
01TR4412	01S41B	0.0000	0.0005	0.0000	0.0015	0.0000			01S41	01S41	474.
01TR3414	01TR4414	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	01S42A	01S42A	82.
01TR4414	01S42A	0.0000	0.0005	0.0000	0.0015	0.0000			01S42A	01S42A	474.
01TR3415	01TR4415	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	01S42B	01S42B	82.
01TR4415	01S42B	0.0000	0.0005	0.0000	0.0015	0.0000			01S42B	01S42B	474.
01S41B	01T1	0.0000	0.0005	0.0000	0.0015	0.0000			01S41	01S41B	400.
01S42A	01T4	0.0000	0.0005	0.0000	0.0015	0.0000			01S42A	01S42A	400.
01T4	01T6	4.5438	2.7563	14.3128	6.5203	0.0000			01S42A	01ES42	1115000.
01T1	01T2	0.0000	0.0005	0.0000	0.0015	0.0000			01S41B	01ES41	400.
01S31A	01TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S41	6.
01S31A	01TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S42A	6.
01S31B	01TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S41	6.
01S31B	01TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			01S	01S42B	6.
02ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			02ES41	02ES41	400.
02ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			02ES41	02ES41	400.
02TR3413	02TR4413	0.1540	0.6160	0.1540	0.6160	0.0000	2.5	DX11	02ES41	02ES41	89.
02TR4413	02ES41	0.0000	0.0005	0.0000	0.0015	0.0000			02ES41	02ES41	474.
02TR1311	02TR3311	0.0253	0.1770	55.0110	0.1770	0.0000	2.5	DX11	02S	02S	80.
02TR1312	02TR3312	0.0253	0.1770	55.0110	0.1770	0.0000	2.5	DX11	02S	02S	80.
02TR3311	02S31A	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S	6.
02TR3312	02S31B	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S	6.
02S31A	M02	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S31A	6.
02S31B	M02	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S31B	6.
02S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			02S41	02S41A	400.
02S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			02S41	02S41B	400.
02S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			02S42A	02S42A	400.
02S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			02S42B	02S42B	400.
02TR3411	02TR4411	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	02S41	02S41	84.
02TR4411	02S41A	0.0000	0.0005	0.0000	0.0015	0.0000			02S41	02S41	474.
02TR3412	02TR4412	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	02S41	02S41	84.
02TR4412	02S41B	0.0000	0.0005	0.0000	0.0015	0.0000			02S41	02S41	474.
02TR3414	02TR4414	0.0738	0.3836	0.0738	0.3836	0.0000	2.5	DX11	02S42A	02S42A	86.
02TR4414	02S42A	0.0000	0.0005	0.0000	0.0015	0.0000			02S42A	02S42A	474.
02TR3415	02TR4415	0.0738	0.3836	0.0738	0.3836	0.0000	2.5	DX11	02S42B	02S42B	86.
02TR4415	02S42B	0.0000	0.0005	0.0000	0.0015	0.0000			02S42B	02S42B	474.
02S41B	02T1	0.0000	0.0005	0.0000	0.0015	0.0000			02S41	02S41B	400.
02T1	02T2	0.0000	0.0005	0.0000	0.0015	0.0000			02S41B	02ES41	400.
02S31A	02TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S41	6.
02S31A	02TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S42A	6.

02S31B	02TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S41	6.
02S31B	02TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			02S	02S42B	6.
03ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			03ES41	03ES41	400.
03ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			03ES41	03ES41	400.
03TR3413	03TR4413	0.1540	0.6160	0.1540	0.6160	0.0000	2.5	DX11	03ES41	03ES41	89.
03TR4413	03ES41	0.0000	0.0005	0.0000	0.0015	0.0000			03ES41	03ES41	474.
03TR1311	03TR3311	0.0069	0.0832	54.9927	0.0832	0.0000	2.5	DX11	03S	03S	75.
03TR1312	03TR3312	0.0069	0.0832	54.9927	0.0832	0.0000	2.5	DX11	03S	03S	75.
03TR3311	03S31A	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S	6.
03TR3312	03S31B	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S	6.
03S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S31A	6.
03S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S31B	6.
03S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			03S41	03S41A	400.
03S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			03S41	03S41B	400.
03S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			03S42A	03S42A	400.
03S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			03S42B	03S42B	400.
03TR3411	03TR4411	0.0391	0.4182	0.0391	0.4182	0.0000	0.0	DX11	03S41	03S41	82.
03TR4411	03S41A	0.0000	0.0005	0.0000	0.0015	0.0000			03S41	03S41	474.
03TR3412	03TR4412	0.0391	0.4182	0.0391	0.4182	0.0000	0.0	DX11	03S41	03S41	82.
03TR4412	03S41B	0.0000	0.0005	0.0000	0.0015	0.0000			03S41	03S41	474.
03TR3414	03TR4414	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	03S42A	03S42A	82.
03TR4414	03S42A	0.0000	0.0005	0.0000	0.0015	0.0000			03S42A	03S42A	474.
03TR3415	03TR4415	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	03S42B	03S42B	82.
03TR4415	03S42B	0.0000	0.0005	0.0000	0.0015	0.0000			03S42B	03S42B	474.
03S41B	03T1	0.0000	0.0005	0.0000	0.0015	0.0000			03S41	03S41B	400.
03T1	03T2	0.0000	0.0005	0.0000	0.0015	0.0000			03S41B	03ES41	400.
03S31A	03TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S41	6.
03S31A	03TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S42A	6.
03S31B	03TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S41	6.
03S31B	03TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			03S	03S42B	6.
04TR3413	04TR4413	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	04ES41A	04ES41A	84.
04TR4413	04ES41A	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41A	04ES41A	474.
04TR1311	04TR3311	0.0069	0.0832	54.9927	0.0832	0.0000	2.5	DX11	04S	04S	75.
04TR1312	04TR3312	0.0069	0.0832	54.9927	0.0832	0.0000	2.5	DX11	04S	04S	75.
04TR3311	04S31A	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S	6.
04TR3312	04S31B	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S	6.
04TR3411	04TR4411	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	04S41	04S41	87.
04TR4411	04S41A	0.0000	0.0005	0.0000	0.0015	0.0000			04S41	04S41	474.
04TR3412	04TR4412	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	04S41	04S41	87.
04TR4412	04S41B	0.0000	0.0005	0.0000	0.0015	0.0000			04S41	04S41	474.
04TR3414	04TR4414	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	04ES41B	04ES41B	84.
04S31A	04TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S41	6.
04ES31B	04ES31C	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S	6.
05ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			05ES41	05ES41	400.
05ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			05ES41	05ES41	400.
05TR3413	05TR4413	0.1949	0.6043	0.1949	0.6043	0.0000	2.5	DX11	05ES41	05ES41	90.
05TR4413	05ES41	0.0000	0.0005	0.0000	0.0015	0.0000			05ES41	05ES41	474.
05TR1311	05TR3311	0.0113	0.1129	54.9970	0.1129	0.0000	2.5	DX11	05S	05S	78.
05TR1312	05TR3312	0.0113	0.1129	54.9970	0.1129	0.0000	2.5	DX11	05S	05S	78.
05TR3311	05S31A	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S	6.
05TR3312	05S31B	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S	6.
05S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S31A	6.

05S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S31B	6.
05S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			05S41	05S41A	400.
05S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			05S41	05S41B	400.
05S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			05S42A	05S42A	400.
05S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			05S42B	05S42B	400.
05TR3411	05TR4411	0.0647	0.3947	0.0647	0.3947	0.0000	2.5	DX11	05S41	05S41	85.
05TR4411	05S41A	0.0000	0.0005	0.0000	0.0015	0.0000			05S41	05S41	474.
05TR3412	05TR4412	0.0647	0.3947	0.0647	0.3947	0.0000	2.5	DX11	05S41	05S41	85.
05TR4412	05S41B	0.0000	0.0005	0.0000	0.0015	0.0000			05S41	05S41	474.
05TR3414	05TR4414	0.0647	0.3947	0.0647	0.3947	0.0000	2.5	DX11	05S42A	05S42A	85.
05TR4414	05S42A	0.0000	0.0005	0.0000	0.0015	0.0000			05S42A	05S42A	474.
05TR3415	05TR4415	0.0647	0.3947	0.0647	0.3947	0.0000	2.5	DX11	05S42B	05S42B	85.
05TR4415	05S42B	0.0000	0.0005	0.0000	0.0015	0.0000			05S42B	05S42B	474.
05S41B	05T1	0.0000	0.0005	0.0000	0.0015	0.0000			05S41	05S41B	400.
05T1	05T2	0.0000	0.0005	0.0000	0.0015	0.0000			05S41B	05ES41	400.
05S31A	05TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S41	6.
05S31A	05TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S42A	6.
05S31B	05TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S41	6.
05S31B	05TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			05S	05S42B	6.
06ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			06ES41	06ES41	400.
06TR3413	06TR4413	0.1841	0.6076	0.1841	0.6076	0.0000	2.5	DX11	06ES41	06ES41	88.
06TR4413	06ES41	0.0000	0.0005	0.0000	0.0015	0.0000			06ES41	06ES41	474.
06TR1311	06TR3311	0.0087	0.1040	54.9944	0.1040	0.0000	2.5	DX11	06S	06S	76.
06TR1312	06TR3312	0.0087	0.1040	54.9944	0.1040	0.0000	2.5	DX11	06S	06S	76.
06TR3311	06S31A	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S	6.
06TR3312	06S31B	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S	6.
06S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S31A	6.
06S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S31B	6.
06S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			06S41	06S41A	400.
06S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			06S41	06S41B	400.
06S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			06S42A	06S42A	400.
06S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			06S42B	06S42B	400.
06TR3411	06TR4411	0.0496	0.4171	0.0496	0.4171	0.0000	2.5	DX11	06S41	06S41	83.
06TR4411	06S41A	0.0000	0.0005	0.0000	0.0015	0.0000			06S41	06S41	474.
06TR3412	06TR4412	0.0496	0.4171	0.0496	0.4171	0.0000	2.5	DX11	06S41	06S41	83.
06TR4412	06S41B	0.0000	0.0005	0.0000	0.0015	0.0000			06S41	06S41	474.
06TR3414	06TR4414	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	06S42A	06S42A	84.
06TR4414	06S42A	0.0000	0.0005	0.0000	0.0015	0.0000			06S42A	06S42A	474.
06TR3415	06TR4415	0.0558	0.3961	0.0558	0.3961	0.0000	2.5	DX11	06S42B	06S42B	84.
06TR4415	06S42B	0.0000	0.0005	0.0000	0.0015	0.0000			06S42B	06S42B	474.
06S41B	06T1	0.0000	0.0005	0.0000	0.0015	0.0000			06S41	06S41B	400.
06T1	06T2	0.0000	0.0005	0.0000	0.0015	0.0000			06S41B	06ES41	400.
06S31A	06TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S41	6.
06S31A	06TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S42A	6.
06S31B	06TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S41	6.
06S31B	06TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			06S	06S42B	6.
07ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			07ES41	07ES41	400.
07ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			07ES41	07ES41	400.
07TR3413	07TR4413	0.1841	0.6076	0.1841	0.6076	0.0000	2.5	DX11	07ES41	07ES41	88.
07TR4413	07ES41	0.0000	0.0005	0.0000	0.0015	0.0000			07ES41	07ES41	474.
07TR1311	07TR3311	0.0156	0.1781	55.0014	0.1781	0.0000	2.5	DX11	07S	07S	81.
07TR1312	07TR3312	0.0156	0.1781	55.0014	0.1781	0.0000	2.5	DX11	07S	07S	81.

07TR3311	07S31A	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S	6.
07TR3312	07S31B	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S	6.
07S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S31A	6.
07S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S31B	6.
07S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			07S41	07S41A	400.
07S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			07S41	07S41B	400.
07S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			07S42A	07S42A	400.
07S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			07S42B	07S42B	400.
07TR3411	07TR4411	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	07S41	07S41	87.
07TR4411	07S41A	0.0000	0.0005	0.0000	0.0015	0.0000			07S41	07S41	474.
07TR3412	07TR4412	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	07S41	07S41	87.
07TR4412	07S41B	0.0000	0.0005	0.0000	0.0015	0.0000			07S41	07S41	474.
07TR3414	07TR4414	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	07S42A	07S42A	87.
07TR4414	07S42A	0.0000	0.0005	0.0000	0.0015	0.0000			07S42A	07S42A	474.
07TR3415	07TR4415	0.0545	0.3868	0.0545	0.3868	0.0000	2.5	DX11	07S42B	07S42B	87.
07TR4415	07S42B	0.0000	0.0005	0.0000	0.0015	0.0000			07S42B	07S42B	474.
07S41B	07T1	0.0000	0.0005	0.0000	0.0015	0.0000			07S41	07S41B	400.
07T1	07T2	0.0000	0.0005	0.0000	0.0015	0.0000			07S41B	07ES41	400.
07S31A	07TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S41	6.
07S31A	07TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S42A	6.
07S31B	07TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S41	6.
07S31B	07TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			07S	07S42B	6.
08ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			08ES41	08ES41	400.
08ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			08ES41	08ES41	400.
08ES41	08T2	0.0000	0.0005	0.0000	0.0015	0.0000			08ES41	08ES41	400.
08TR1311	08TR3311	0.0118	0.1425	54.9975	0.1425	0.0000	2.5	DX11	08S	08S	79.
08TR1312	08TR3312	0.0118	0.1425	54.9975	0.1425	0.0000	2.5	DX11	08S	08S	79.
08TR3311	08S31A	0.0000	0.0002	0.0000	0.0006	0.0000			08S	08S	6.
08TR3312	08S31B	0.0000	0.0002	0.0000	0.0006	0.0000			08S	08S	6.
08S31B	125PM10B	0.0101	0.0057	0.0318	0.0141	0.0000			08S	08S31B	6112000.
08S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			08S41	08S41A	400.
08S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			08S41	08S41B	400.
08TR3411	08TR4411	0.3070	0.9517	0.3070	0.9517	0.0000	2.5	DX11	08S41	08S41	91.
08TR4411	08S41A	0.0000	0.0005	0.0000	0.0015	0.0000			08S41	08S41	474.
08TR3412	08TR4412	0.3070	0.9517	0.3070	0.9517	0.0000	2.5	DX11	08S41	08S41	91.
08TR4412	08S41B	0.0000	0.0005	0.0000	0.0015	0.0000			08S41	08S41	474.
08S41B	08T1	0.0000	0.0005	0.0000	0.0015	0.0000			08S41	08S41B	400.
08T1	08T2	0.0000	0.0005	0.0000	0.0015	0.0000			08S41B	08ES41	400.
08S31A	08TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			08S	08S41	6.
08S31B	08TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			08S	08S41	6.
09ES41	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			09ES41	09ES41	400.
09ES41	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			09ES41	09ES41	400.
09TR3413	09TR4413	0.0558	0.3961	0.0558	0.3961	0.0000	0.0	DX11	09ES41	09ES41	84.
09TR4413	09ES41	0.0000	0.0005	0.0000	0.0015	0.0000			09ES41	09ES41	474.
09TR1311	09TR3311	0.0034	0.0624	54.9891	0.0624	0.0000	0.0	DX11	09S	09S	71.
09TR1312	09TR3312	0.0034	0.0624	54.9891	0.0624	0.0000	0.0	DX11	09S	09S	71.
09TR3311	09S31A	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S	6.
09TR3312	09S31B	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S	6.
09S31A	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S31A	6.
09S31B	ML1	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S31B	6.
09S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			09S41	09S41A	400.
09S41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			09S41	09S41B	400.

09S42A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			09S42A	09S42A	400.
09S42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			09S42B	09S42B	400.
09TR3411	09TR4411	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	09S41	09S41	82.
09TR4411	09S41A	0.0000	0.0005	0.0000	0.0015	0.0000			09S41	09S41	474.
09TR3412	09TR4412	0.0391	0.4182	0.0391	0.4182	0.0000	2.5	DX11	09S41	09S41	82.
09TR4412	09S41B	0.0000	0.0005	0.0000	0.0015	0.0000			09S41	09S41	474.
09TR3414	09TR4414	0.0391	0.4182	0.0391	0.4182	0.0000	0.0	DX11	09S42A	09S42A	82.
09TR4414	09S42A	0.0000	0.0005	0.0000	0.0015	0.0000			09S42A	09S42A	474.
09TR3415	09TR4415	0.0391	0.4182	0.0391	0.4182	0.0000	0.0	DX11	09S42B	09S42B	82.
09TR4415	09S42B	0.0000	0.0005	0.0000	0.0015	0.0000			09S42B	09S42B	474.
09S41B	09T1	0.0000	0.0005	0.0000	0.0015	0.0000			09S41	09S41B	400.
09S42A	09T4	0.0000	0.0005	0.0000	0.0015	0.0000			09S42A	09S42A	400.
09T1	09T2	0.0000	0.0005	0.0000	0.0015	0.0000			09S41B	09ES41	400.
09S31A	09TR3411	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S41	6.
09S31A	09TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S42A	6.
09S31B	09TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S41	6.
09S31B	09TR3415	0.0000	0.0002	0.0000	0.0006	0.0000			09S	09S42B	6.
08DG	08DG1	0.0000	0.0005	0.0000	0.0015	0.0000			08ES41	08ES41	400.
04S31A	M04	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S31A	6.
04S31B	M05	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S31B	6.
04S31B	04TR3412	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S41	6.
04DG31A	04DG32A	0.0000	0.0002	0.0000	0.0006	0.0000			04DG3A	04DG3A	6.
04DG31B	04DG32B	0.0000	0.0002	0.0000	0.0006	0.0000			04DG3B	04DG3B	6.
04DG31C	04DG32C	0.0000	0.0002	0.0000	0.0006	0.0000			04DG3C	04DG3C	6.
04TR4414	04ES41B	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41B	04ES41B	400.
04ES41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41A	04ES41A	400.
04ES41A	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41A	04ES41A	400.
04ES41B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41B	04ES41B	400.
04ES42A	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			04ES42A	04ES42A	400.
04ES41A	04T3	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41A	04ES41A	400.
04T3	04T5	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41A	04ES42A	400.
04T5	04ES42A	0.0000	0.0005	0.0000	0.0015	0.0000			04ES42A	04ES42A	400.
04ES41B	04T4	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41B	04ES41B	400.
04T4	04T6	0.0000	0.0005	0.0000	0.0015	0.0000			04ES41B	04ES42B	400.
04T6	04ES42B	0.0000	0.0005	0.0000	0.0015	0.0000			04ES42B	04ES42B	400.
04ES31A	04TR3413	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04ES41A	6.
04ES31C	04TR3414	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04ES41B	6.
1TR1215	1TS1215	0.0081	0.1108	50.2125	0.1108	0.0000	2.5	DX11	COMPRESA	COMPRESA	77.
1TS1215	103KM101	0.0033	0.0025	0.0102	0.0052	0.0004			COMPRESA	COMPRESA	11115000.
1TR1220	1TS1220	0.0081	0.1108	50.2125	0.1108	0.0000	2.5	DX11	COMPRESB	COMPRESB	77.
1TS1220	103KM201	0.0033	0.0025	0.0102	0.0052	0.0004			COMPRESB	COMPRESB	11115000.
1TR1211	1TS1211	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESA	COMPRESA	73.
1TS1211	111KM101	0.0016	0.0012	0.0049	0.0025	0.0007			COMPRESA	COMPRESA	11115000.
1TR1212	1TS1212	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESA	COMPRESA	73.
1TS1212	111KM201	0.0013	0.0010	0.0041	0.0021	0.0006			COMPRESA	COMPRESA	11115000.
1TR1213	1TS1213	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESA	COMPRESA	73.
1TS1213	111KM301	0.0013	0.0010	0.0041	0.0021	0.0006			COMPRESA	COMPRESA	11115000.
1TR1216	1TS1216	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESB	COMPRESB	73.
1TS1216	111KM401	0.0016	0.0012	0.0049	0.0025	0.0007			COMPRESB	COMPRESB	11115000.
1TR1217	1TS1217	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESB	COMPRESB	73.
1TS1217	111KM501	0.0013	0.0010	0.0041	0.0021	0.0006			COMPRESB	COMPRESB	11115000.
1TR1218	1TS1218	0.0068	0.0596	50.2111	0.0596	0.0000	0.0	DX11	COMPRESB	COMPRESB	73.

1TS1218	111KM601	0.0013	0.0010	0.0041	0.0021	0.0006			COMPRESB	COMPRESB	11115000.
1TR1214	1TS1214	0.0044	0.0414	50.2087	0.0414	0.0000	0.0	DX11	COMPRESA	COMPRESA	72.
1TS1214	147KM10A	0.0009	0.0007	0.0029	0.0014	0.0010			COMPRESA	COMPRESA	11115000.
1TR1219	1TS1219	0.0044	0.0414	50.2087	0.0414	0.0000	0.0	DX11	COMPRESB	COMPRESB	72.
1TS1219	147KM10B	0.0009	0.0007	0.0027	0.0014	0.0009			COMPRESB	COMPRESB	11115000.
08S31A	125PM10A	0.0101	0.0057	0.0318	0.0141	0.0000			08S	08S31A	6112000.
04ES42B	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			04ES42B	04ES42B	400.
04ES42B	LM21	0.0000	0.0005	0.0000	0.0015	0.0000			04ES42B	04ES42B	400.
04S41A	LM1	0.0000	0.0005	0.0000	0.0015	0.0000			04S41	04S41A	400.
04S41B	LM2	0.0000	0.0005	0.0000	0.0015	0.0000			04S41	04S41B	400.
1S11A	01TR1311	0.0001	0.0001	0.0003	0.0001	0.0003				01S	33112000.
1S11B	01TR1312	0.0001	0.0001	0.0003	0.0001	0.0003				01S	33112000.
1S11A	02TR1311	0.0025	0.0014	0.0079	0.0036	0.0069				02S	33109500.
1S11B	02TR1312	0.0025	0.0014	0.0079	0.0036	0.0069				02S	33109500.
1S11A	03TR1311	0.0014	0.0009	0.0045	0.0023	0.0054				03S	33112000.
1S11B	03TR1312	0.0014	0.0009	0.0045	0.0023	0.0054				03S	33112000.
1S11A	04TR1311	0.0035	0.0019	0.0111	0.0051	0.0097				04S	33109500.
1S11B	04TR1312	0.0035	0.0019	0.0111	0.0051	0.0097				04S	33109500.
1S11A	05TR1311	0.0036	0.0019	0.0113	0.0052	0.0099				05S	33109500.
1S11B	05TR1312	0.0036	0.0019	0.0113	0.0052	0.0099				05S	33109500.
1S11A	06TR1311	0.0037	0.0020	0.0116	0.0053	0.0102				06S	33109500.
1S11B	06TR1312	0.0037	0.0020	0.0116	0.0053	0.0102				06S	33109500.
1S11A	07TR1311	0.0038	0.0020	0.0120	0.0055	0.0105				07S	33109500.
1S11B	07TR1312	0.0038	0.0020	0.0120	0.0055	0.0105				07S	33109500.
1S11A	08TR1311	0.0174	0.0093	0.0547	0.0251	0.0479				08S	33109500.
1S11B	08TR1312	0.0174	0.0093	0.0547	0.0251	0.0479				08S	33109500.
1S11A	09TR1311	0.0020	0.0011	0.0063	0.0029	0.0220				09S	33109500.
1S11B	09TR1312	0.0020	0.0011	0.0063	0.0029	0.0220				09S	33109500.
04ES31A	01TR3413	0.0957	0.0444	0.3015	0.1093	0.0000			04S	01ES41	6109500.
04ES31A	05TR3413	0.1046	0.0486	0.3296	0.1195	0.0000			04S	05ES41	6109500.
04ES31A	07TR3413	0.0638	0.0296	0.2010	0.0728	0.0000			04S	07ES41	6109500.
04ES31C	06TR3413	0.1046	0.0486	0.3296	0.1195	0.0000			04S	06ES41	6109500.
04ES31C	03TR3413	0.0657	0.0305	0.2070	0.0750	0.0000			04S	03ES41	6109500.
04ES31C	02TR3413	0.0447	0.0207	0.1407	0.0510	0.0000			04S	02ES41	6109500.
04ES31C	09TR3413	0.0501	0.0232	0.1578	0.0572	0.0000			04S	09ES41	6109500.
04S31A	04ES31A	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S	6.
04S31B	04ES31C	0.0000	0.0002	0.0000	0.0006	0.0000			04S	04S	6.
1S11A	1TR1211	0.0037	0.0020	0.0116	0.0053	0.0102				COMPRESA	33109500.
1S11A	1TR1212	0.0037	0.0020	0.0116	0.0053	0.0102				COMPRESA	33109500.
1S11A	1TR1214	0.0001	0.0001	0.0003	0.0001	0.0003				COMPRESA	33112000.
1S11A	1TR1215	0.0038	0.0020	0.0120	0.0055	0.0105				COMPRESA	33109500.
1S11A	1TR1213	0.0037	0.0020	0.0116	0.0053	0.0102				COMPRESA	33109500.
1S11B	1TR1216	0.0036	0.0019	0.0113	0.0052	0.0099				COMPRESB	33109500.
1S11B	1TR1217	0.0036	0.0019	0.0113	0.0052	0.0099				COMPRESB	33109500.
1S11B	1TR1218	0.0036	0.0019	0.0113	0.0052	0.0099				COMPRESB	33109500.
1S11B	1TR1219	0.0001	0.0001	0.0003	0.0001	0.0003				COMPRESB	33112000.
1S11B	1TR1220	0.0038	0.0020	0.0120	0.0055	0.0105				COMPRESB	33109500.
08S31B	125PM10D	0.0152	0.0086	0.0477	0.0211	0.0000			08S	08S31B	6112000.
06ES41	LM22	0.0000	0.0005	0.0000	0.0015	0.0000			06ES41	06ES41	400.

BRANCH OUTAGES

BUSBAR FROM	BUSBAR TO	BRANCH IMPEDANCES (PU) PPS AND NPS R	PPS AND NPS X	ZPS R	ZPS X	SUSC B	STATUS	OUTAGE
01ES41	01T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
01T6	01ES42	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
01S31A	01S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
01S41A	01S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
01S42A	01S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
02ES41	02T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
02S31A	02S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
02S41A	02S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
02S42A	02S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
03ES41	03T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
03S31A	03S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
03S41A	03S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
03S42A	03S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
04S31A	04S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
04S41A	04S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
04ES31B	04ES31A	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
05ES41	05T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
05S31A	05S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
05S41A	05S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
05S42A	05S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
06ES41	06T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
06S31A	06S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
06S41A	06S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
06S42A	06S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
07ES41	07T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
07S31A	07S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
07S41A	07S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
07S42A	07S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
08ES41	08DG1	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
08S31A	08S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
08S41A	08S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
09ES41	09T2	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
09S31A	09S31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
09S41A	09S41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
09S42A	09S42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
04DG32A	04ES31A	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
04DG32B	04ES31B	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
04DG32C	04ES31C	0.0000	0.0002	0.0000	0.0006	0.0000	-1	LINE SWITCHED OUT
04ES41A	04ES41B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
04ES42A	04ES42B	0.0000	0.0005	0.0000	0.0015	0.0000	-1	LINE SWITCHED OUT
INT1	INT1	0.0000	0.0000	0.0000	0.0000	0.0000	-1	LINE SWITCHED OUT

END OF BRANCH DATA

1ELECTRICAL POWER-SYSTEM TRANSIENT-STABILITY STUDY

POWER-SYSTEM GROUP

TOM , LTD.

VERSION 9.9 OCTOBER 2008

SYSTEM TITLE: 100MVA FIRE UP SITUATION AS ACTUAL RELAY SET
STUDY TITLE:

SYSTEM FREQUENCY = 50.00 HERTZ
M.V.A. BASE = 10.0 M.V.A.

STEADY-STATE SYSTEM DATA

BUSBAR DATA INPUT

BUSBAR	VOLTAGE	ANGLE	LOAD MW	LOAD MVAR	GEN MW	GEN MVAR
MBIN132	0.99672	-2.24931	0.00000	0.00000		
GT6	1.04500	2.32911	0.00000	0.00000		
GT5	1.04500	2.58354	0.00000	0.00000		
GT4	1.04500	2.58354	0.00000	0.00000		
GT3	1.04500	2.32911	0.00000	0.00000		
GT2	1.04500	2.58354	0.00000	0.00000		
GT1	1.04500	0.00000	0.00000	0.00000		
GC1	1.04485	-0.00635	0.00000	0.00000		
GC2	1.04485	2.57147	0.00000	0.00000		
GC3	1.04484	2.31705	0.00000	0.00000		
GC4	1.04485	2.57147	0.00000	0.00000		
GC5	1.04485	2.57147	0.00000	0.00000		
GC6	1.04484	2.31705	0.00000	0.00000		
INT1	0.99336	-2.44957	0.00000	0.00000		
1S11A	1.00583	-4.20984	0.00000	0.00000		
MBF1321	0.99669	-2.25232	0.00000	0.00000		
GRID	0.99690	-2.24269	0.00000	0.00000		
J1	0.99648	-2.26020	0.00000	0.00000		
J2	0.99634	-2.26620	0.00000	0.00000		
J3	0.99660	-2.25526	0.00000	0.00000		

J4	0.99652	-2.25795	0.00000	0.00000
J5	0.99654	-2.25783	0.00000	0.00000
J6	0.99624	-2.27041	0.00000	0.00000
J7	0.99613	-2.27472	0.00000	0.00000
J8	0.99648	-2.26020	0.00000	0.00000
J9	0.99646	-2.26126	0.00000	0.00000
ACIDA	0.99727	-6.46008	17.00000	10.53565
COMMU	0.99590	-6.66715	10.71000	6.63746
C2REC	0.99369	-7.02906	3.40000	2.10713
UREAA	0.99876	-6.20459	6.12000	3.79284
SEAWA	0.99611	-6.65698	10.71000	6.63746
4THAR	0.99615	-6.61539	13.60000	8.42852
ASU	0.99690	-6.47763	17.00000	10.53565
10THO	0.99727	-6.46008	17.00000	10.53565
9THOL	0.99485	-6.84370	20.40000	12.64278
AU1400	1.07942	-1.05796	0.08500	0.05268
AU16KV	1.06247	-2.03942	0.85000	0.52678
AU2400	1.07942	1.52558	0.08500	0.05268
AU36KV	1.06247	0.28395	0.85000	0.52678
AU3400	1.07942	1.27116	0.08500	0.05268
AU4400	1.07942	1.52558	0.08500	0.05268
AU5400	1.07942	1.52558	0.08500	0.05268
AU66KV	1.06247	0.28395	0.85000	0.52678
AU6400	1.07942	1.27116	0.08500	0.05268
GRID132	0.99794	-2.19398	0.00000	0.00000
GRID230	1.05863	2.84134	0.00000	0.00000
JGRID	1.00056	-1.92016	0.00000	0.00000
GRID20	1.00056	-1.92016	0.00000	0.00000
GRIDG	1.05900	2.87200	0.00000	0.00000
OUT1	1.00585	-4.20795	0.00000	0.80000
J0	0.99458	-2.25630	0.00000	0.00000
PH678	0.99224	-2.97415	14.00000	8.00000
1S11B	1.00583	-4.21045	0.00000	0.00000
01TR3413	1.01818	-4.54055	0.00000	0.00000
01ES41	1.04473	-4.99711	0.00000	0.00000
LM1	1.04472	-4.99765	0.00000	0.20000
LM2	1.04473	-4.99723	0.00000	0.00000
01TR4413	1.04475	-4.99645	0.00000	0.00000
01T2	1.03332	-6.18897	0.00000	0.00000
01T3	1.04473	-4.99711	0.00000	0.00000
01T5	1.04473	-4.99711	0.00000	0.00000
01T6	1.02339	-7.74049	0.00000	0.00000
01ES42	1.04473	-4.99711	0.00000	0.00000
LM1	1.04473	-4.99711	0.00000	0.00000

01TR1311	1.00580	-4.21010	0.00000	0.00000
01TR3311	1.01703	-5.55118	0.00000	0.00000
01TR1312	1.00581	-4.21055	0.00000	0.00000
01TR3312	1.02401	-4.80687	0.00000	0.00000
ML1	1.01699	-5.55681	0.00000	0.00000
01S31A	1.01701	-5.55456	0.00000	0.00000
01S31B	1.02399	-4.80837	0.00000	0.00000
ML1	1.02399	-4.80914	0.00000	0.00000
01S41A	1.04181	-5.55456	0.00000	0.00000
LM1	1.04181	-5.55456	0.00000	0.00000
01TR3411	1.01701	-5.55456	0.00000	0.00000
01S41B	1.03332	-6.18897	0.00000	0.00000
LM1	1.03330	-6.19072	0.13410	0.06495
01S42A	1.02339	-7.74049	0.00000	0.00000
LM1	1.02338	-7.74323	0.41040	0.13489
01S42B	1.04897	-4.80837	0.00000	0.00000
LM1	1.04897	-4.80837	0.00000	0.00000
01TR3412	1.02399	-4.80908	0.00000	0.00000
01TR3415	1.02399	-4.80837	0.00000	0.00000
01TR4411	1.04181	-5.55456	0.00000	0.00000
01TR4412	1.03333	-6.18722	0.00000	0.00000
01TR3414	1.01700	-5.55567	0.00000	0.00000
01TR4414	1.02341	-7.73774	0.00000	0.00000
01TR4415	1.04897	-4.80837	0.00000	0.00000
01T1	1.03332	-6.18897	0.00000	0.00000
01T4	1.02339	-7.74049	0.00000	0.00000
02ES41	1.04860	-4.80135	0.00000	0.00000
LM1	1.04860	-4.80135	0.00000	0.00000
LM2	1.04860	-4.80135	0.00000	0.00000
02TR3413	1.02363	-4.80135	0.00000	0.00000
02TR4413	1.04860	-4.80135	0.00000	0.00000
02T2	1.04834	-4.64964	0.00000	0.00000
02TR1311	1.00564	-4.20821	0.00000	0.00000
02TR3311	1.02120	-4.67801	0.00000	0.00000
02TR1312	1.00566	-4.21015	0.00000	0.00000
02TR3312	1.02338	-4.64909	0.00000	0.00000
M02	1.02119	-4.67878	0.00000	0.00000
02S31A	1.02119	-4.67861	0.00000	0.00000
02S31B	1.02338	-4.64964	0.00000	0.00000
M02	1.02337	-4.64989	0.00000	0.00000
02S41A	1.03019	-5.42004	0.00000	0.00000
LM1	1.03017	-5.42112	0.00000	0.07406
02S41B	1.04834	-4.64964	0.00000	0.00000

LM1	1.04834	-4.64964	0.00000	0.00000
02S42A	1.04609	-4.67861	0.00000	0.00000
LM1	1.04609	-4.67861	0.00000	0.00000
02S42B	1.03878	-5.11739	0.00000	0.00000
LM1	1.03877	-5.11811	0.05696	0.04272
02TR3411	1.02118	-4.67906	0.00000	0.00000
02TR4411	1.03021	-5.41896	0.00000	0.00000
02TR3412	1.02338	-4.64964	0.00000	0.00000
02TR4412	1.04834	-4.64964	0.00000	0.00000
02TR3414	1.02119	-4.67861	0.00000	0.00000
02TR4414	1.04609	-4.67861	0.00000	0.00000
02TR3415	1.02337	-4.64993	0.00000	0.00000
02TR4415	1.03879	-5.11667	0.00000	0.00000
02T1	1.04834	-4.64964	0.00000	0.00000
03ES41	1.04860	-4.80135	0.00000	0.00000
LM1	1.04860	-4.80135	0.00000	0.00000
LM2	1.04860	-4.80135	0.00000	0.00000
03TR3413	1.02363	-4.80135	0.00000	0.00000
03TR4413	1.04860	-4.80135	0.00000	0.00000
03T2	1.06450	-5.30237	0.00000	0.00000
03TR1311	1.00560	-4.20481	0.00000	0.00000
03TR3311	1.01987	-4.54481	0.00000	0.00000
03TR1312	1.00550	-4.21153	0.00000	0.00000
03TR3312	1.02085	-4.94383	0.00000	0.00000
ML1	1.01983	-4.54575	0.00000	0.00000
03S31A	1.01985	-4.54575	0.00000	0.00000
03S31B	1.02083	-4.94570	0.00000	0.00000
ML1	1.02082	-4.94698	0.00000	0.00000
03S41A	1.07084	-4.54575	0.00000	0.00000
LM1	1.07084	-4.54575	0.00000	0.00000
03S41B	1.06450	-5.30237	0.00000	0.00000
LM1	1.06449	-5.30284	0.00000	0.03434
03S42A	1.01709	-6.32477	0.00000	0.00000
LM1	1.01706	-6.32710	0.17581	0.12271
03S42B	1.03471	-5.64979	0.00000	0.00000
LM1	1.03470	-5.65070	0.00000	0.00000
03TR3411	1.01985	-4.54575	0.00000	0.00000
03TR4411	1.07084	-4.54575	0.00000	0.00000
03TR3412	1.02083	-4.94590	0.00000	0.00000
03TR4412	1.06451	-5.30190	0.00000	0.00000
03TR3414	1.01983	-4.54668	0.00000	0.00000
03TR4414	1.01712	-6.32244	0.00000	0.00000
03TR3415	1.02083	-4.94607	0.00000	0.00000

03TR4415	1.03473	-5.64888	0.00000	0.00000
03T1	1.06450	-5.30237	0.00000	0.00000
04ES41A	1.04195	-4.63358	0.00000	0.00000
LM1	1.04194	-4.63359	0.00000	0.00000
LM2	1.04195	-4.63359	0.00000	0.00000
04TR3413	1.02210	-4.66430	0.00000	0.00000
04TR4413	1.04196	-4.63357	0.00000	0.00000
04T3	1.04195	-4.63358	0.00000	0.00000
04T5	1.04195	-4.63358	0.00000	0.00000
04ES41B	1.03581	-5.82499	0.00000	0.00000
LM1	1.03580	-5.82578	0.06102	0.02955
04T6	1.03580	-5.82621	0.00000	0.00000
LM2	1.04195	-4.63358	0.00000	0.00000
04TR1311	1.00530	-4.20514	0.00000	0.00000
04TR3311	1.02213	-4.66283	0.00000	0.00000
04TR1312	1.00524	-4.21291	0.00000	0.00000
04TR3312	1.02365	-4.79930	0.00000	0.00000
04S31A	1.02211	-4.66401	0.00000	0.00000
04S31B	1.02364	-4.80078	0.00000	0.00000
04S41A	1.04704	-4.66401	0.00000	0.00000
LM1	1.03579	-5.82724	0.03312	0.01604
M04	1.02210	-4.66492	0.00000	0.00000
04S41B	1.04860	-4.80078	0.00000	0.00000
LM21	1.03579	-5.82699	0.01368	0.00662
M05	1.02363	-4.80167	0.00000	0.00000
04ES42A	1.04195	-4.63358	0.00000	0.00000
04ES42B	1.03579	-5.82681	0.00000	0.00000
LM1	1.04704	-4.66401	0.00000	0.00000
LM2	1.04860	-4.80078	0.00000	0.00000
04TR3411	1.02211	-4.66401	0.00000	0.00000
04TR4411	1.04704	-4.66401	0.00000	0.00000
04TR3412	1.02364	-4.80078	0.00000	0.00000
04TR4412	1.04860	-4.80078	0.00000	0.00000
04TR3414	1.02362	-4.80193	0.00000	0.00000
04TR4414	1.03582	-5.82359	0.00000	0.00000
04T4	1.03580	-5.82560	0.00000	0.00000
04DG31A	1.00000	0.00000	0.00000	0.00000
04DG32A	1.00000	0.00000	0.00000	0.00000
04DG31B	1.00000	0.00000	0.00000	0.00000
04DG32B	1.00000	0.00000	0.00000	0.00000
04ES31A	1.02210	-4.66430	0.00000	0.00000
04ES31B	1.02363	-4.80135	0.00000	0.00000
04ES31C	1.02363	-4.80135	0.00000	0.00000
04DG31C	1.00000	0.00000	0.00000	0.00000

04DG32C	1.00000	0.00000	0.00000	0.00000
05ES41	1.04703	-4.66430	0.00000	0.00000
LM1	1.04703	-4.66430	0.00000	0.00000
LM2	1.04703	-4.66430	0.00000	0.00000
05TR3413	1.02210	-4.66430	0.00000	0.00000
05TR4413	1.04703	-4.66430	0.00000	0.00000
05T2	1.04052	-5.26257	0.00000	0.00000
05TR1311	1.00535	-4.20997	0.00000	0.00000
05TR3311	1.02211	-4.81881	0.00000	0.00000
05TR1312	1.00564	-4.21120	0.00000	0.00000
05TR3312	1.02704	-4.45811	0.00000	0.00000
ML1	1.02210	-4.81996	0.00000	0.00000
05S31A	1.02210	-4.81996	0.00000	0.00000
05S31B	1.02704	-4.45858	0.00000	0.00000
ML1	1.02704	-4.45858	0.00000	0.00000
05S41A	1.03548	-5.62863	0.00000	0.00000
LM1	1.03547	-5.62976	0.00000	0.00000
05S41B	1.04052	-5.26257	0.00000	0.00000
LM1	1.04051	-5.26370	0.08800	0.04750
05S42A	1.03005	-6.00880	0.00000	0.00000
LM1	1.03003	-6.01048	0.12795	0.06906
05S42B	1.05209	-4.45858	0.00000	0.00000
LM1	1.05209	-4.45858	0.00000	0.00000
05TR3411	1.02209	-4.82043	0.00000	0.00000
05TR4411	1.03549	-5.62749	0.00000	0.00000
05TR3412	1.02703	-4.45904	0.00000	0.00000
05TR4412	1.04053	-5.26144	0.00000	0.00000
05TR3414	1.02209	-4.82065	0.00000	0.00000
05TR4414	1.03006	-6.00712	0.00000	0.00000
05TR3415	1.02704	-4.45858	0.00000	0.00000
05TR4415	1.05209	-4.45858	0.00000	0.00000
05T1	1.04052	-5.26257	0.00000	0.00000
06ES41	1.04860	-4.80135	0.00000	0.00000
LM1	1.04860	-4.80135	0.00000	0.00000
06TR3413	1.02363	-4.80135	0.00000	0.00000
06TR4413	1.04860	-4.80135	0.00000	0.00000
06T2	1.04258	-4.92648	0.00000	0.00000
06TR1311	1.00509	-4.20378	0.00000	0.00000
06TR3311	1.01274	-4.97895	0.00000	0.00000
06TR1312	1.00523	-4.21264	0.00000	0.00000
06TR3312	1.01777	-4.92505	0.00000	0.00000
ML1	1.01272	-4.98056	0.00000	0.00000
06S31A	1.01272	-4.98056	0.00000	0.00000

06S31B	1.01776	-4.92648	0.00000	0.00000
ML1	1.01775	-4.92752	0.00000	0.00000
06S41A	1.01797	-6.62818	0.00000	0.00000
LM1	1.01796	-6.63032	0.15804	0.07654
06S41B	1.04258	-4.92648	0.00000	0.00000
LM1	1.04258	-4.92648	0.00000	0.00000
06S42A	1.02136	-6.30622	0.00000	0.00000
LM1	1.02134	-6.30804	0.05371	0.02601
06S42B	1.03383	-5.63411	0.00000	0.00000
LM1	1.03382	-5.63507	0.00000	0.00000
06TR3411	1.01271	-4.98143	0.00000	0.00000
06TR4411	1.01799	-6.62605	0.00000	0.00000
06TR3412	1.01776	-4.92648	0.00000	0.00000
06TR4412	1.04258	-4.92648	0.00000	0.00000
06TR3414	1.01272	-4.98130	0.00000	0.00000
06TR4414	1.02137	-6.30441	0.00000	0.00000
06TR3415	1.01776	-4.92688	0.00000	0.00000
06TR4415	1.03384	-5.63314	0.00000	0.00000
06T1	1.04258	-4.92648	0.00000	0.00000
07ES41	1.04703	-4.66430	0.00000	0.00000
LM1	1.04703	-4.66430	0.00000	0.00000
LM2	1.04703	-4.66430	0.00000	0.00000
07TR3413	1.02210	-4.66430	0.00000	0.00000
07TR4413	1.04703	-4.66430	0.00000	0.00000
07T2	1.04118	-5.26998	0.00000	0.00000
07TR1311	1.00512	-4.20998	0.00000	0.00000
07TR3311	1.01335	-5.56610	0.00000	0.00000
07TR1312	1.00548	-4.21107	0.00000	0.00000
07TR3312	1.02188	-4.87426	0.00000	0.00000
ML1	1.01333	-5.56829	0.00000	0.00000
07S31A	1.01334	-5.56773	0.00000	0.00000
07S31B	1.02187	-4.87505	0.00000	0.00000
ML1	1.02187	-4.87525	0.00000	0.00000
07S41A	1.02700	-6.38973	0.00000	0.00000
LM1	1.02699	-6.39089	0.08800	0.04750
07S41B	1.04118	-5.26998	0.00000	0.00000
LM1	1.04117	-5.27054	0.00000	0.00000
07S42A	1.02399	-6.57095	0.00000	0.00000
LM1	1.02398	-6.57237	0.10770	0.06104
07S42B	1.03807	-5.48841	0.00000	0.00000
LM1	1.03806	-5.48928	0.00000	0.00000
07TR3411	1.01333	-5.56820	0.00000	0.00000
07TR4411	1.02701	-6.38857	0.00000	0.00000

07TR3412	1.02187	-4.87528	0.00000	0.00000
07TR4412	1.04118	-5.26942	0.00000	0.00000
07TR3414	1.01333	-5.56831	0.00000	0.00000
07TR4414	1.02400	-6.56952	0.00000	0.00000
07TR3415	1.02187	-4.87541	0.00000	0.00000
07TR4415	1.03808	-5.48754	0.00000	0.00000
07T1	1.04118	-5.26998	0.00000	0.00000
08ES41	1.04467	-4.21683	0.00000	0.00000
LM1	1.04467	-4.21683	0.00000	0.00000
LM2	1.04467	-4.21683	0.00000	0.00000
08T2	1.04467	-4.21683	0.00000	0.00000
08DG1	1.00000	0.00000	0.00000	0.00000
08TR1311	1.00557	-4.20270	0.00000	0.00000
08TR3311	1.02500	-4.24686	0.00000	0.00000
08TR1312	1.00542	-4.17205	0.00000	0.00000
08TR3312	1.02102	-4.14663	0.00000	0.00000
125PM10D	1.02074	-4.12051	0.00000	0.00000
08S31A	1.02499	-4.24695	0.00000	0.00000
08S31B	1.02101	-4.14665	0.00000	0.00000
125PM10B	1.02083	-4.12923	0.00000	0.00000
08S41A	1.04368	-4.60319	0.00000	0.00000
LM1	1.04368	-4.60341	0.01746	0.00846
08S41B	1.04467	-4.21683	0.00000	0.00000
LM1	1.04467	-4.21687	0.00000	0.00000
08TR3411	1.02499	-4.24704	0.00000	0.00000
08TR4411	1.04369	-4.60296	0.00000	0.00000
08TR3412	1.02101	-4.14667	0.00000	0.00000
08TR4412	1.04468	-4.21679	0.00000	0.00000
08T1	1.04467	-4.21683	0.00000	0.00000
09ES41	1.07481	-4.80135	0.00000	0.00000
LM1	1.07481	-4.80135	0.00000	0.00000
LM2	1.07481	-4.80135	0.00000	0.00000
09TR3413	1.02363	-4.80135	0.00000	0.00000
09TR4413	1.07481	-4.80135	0.00000	0.00000
09T2	1.07328	-4.44856	0.00000	0.00000
09TR1311	1.00492	-4.19829	0.00000	0.00000
09TR3311	1.03299	-5.18792	0.00000	0.00000
09TR1312	1.00581	-4.21146	0.00000	0.00000
09TR3312	1.05108	-4.24427	0.00000	0.00000
ML1	1.03290	-5.19348	0.00000	0.00000
09S31A	1.03294	-5.19131	0.00000	0.00000
09S31B	1.05107	-4.24438	0.00000	0.00000
ML1	1.05107	-4.24438	0.00000	0.00000
09S41A	1.04657	-5.91396	0.00000	0.00000

LM1	1.04656	-5.91489	0.07479	0.05220
09S41B	1.07328	-4.44856	0.00000	0.00000
LM1	1.07327	-4.44883	0.00000	0.00000
09S42A	1.05967	-6.68032	0.00000	0.00000
LM1	1.05965	-6.68227	0.16023	0.11184
09S42B	1.10363	-4.24438	0.00000	0.00000
LM1	1.10363	-4.24438	0.00000	0.00000
09TR3411	1.03294	-5.19169	0.00000	0.00000
09TR4411	1.04659	-5.91303	0.00000	0.00000
09TR3412	1.05107	-4.24449	0.00000	0.00000
09TR4412	1.07328	-4.44830	0.00000	0.00000
09TR3414	1.03293	-5.19213	0.00000	0.00000
09TR4414	1.05970	-6.67837	0.00000	0.00000
09TR3415	1.05107	-4.24438	0.00000	0.00000
09TR4415	1.10363	-4.24438	0.00000	0.00000
09T1	1.07328	-4.44856	0.00000	0.00000
09T4	1.05967	-6.68032	0.00000	0.00000
08DG	1.00000	0.00000	0.00000	0.00000
1TR1215	1.00428	-4.18566	0.00000	0.00000
1TS1215	0.99864	-5.74502	0.00000	0.00000
103KM101	0.99713	-5.73757	0.00000	0.00000
103KM201	1.03042	-4.21190	0.00000	0.00000
1TR1220	1.00584	-4.21168	0.00000	0.00000
1TS1220	1.03042	-4.21186	0.00000	0.00000
111KM101	1.03664	-5.39994	0.00000	0.00000
1TR1211	1.00385	-4.20467	0.00000	0.00000
1TS1211	1.03753	-5.39351	0.00000	0.00000
111KM201	1.05618	-4.21133	0.00000	0.00000
1TR1212	1.00585	-4.21107	0.00000	0.00000
1TS1212	1.05618	-4.21131	0.00000	0.00000
111KM301	1.05618	-4.21133	0.00000	0.00000
1TR1213	1.00585	-4.21107	0.00000	0.00000
1TS1213	1.05618	-4.21131	0.00000	0.00000
111KM401	1.05618	-4.21196	0.00000	0.00000
1TR1216	1.00584	-4.21163	0.00000	0.00000
1TS1216	1.05618	-4.21192	0.00000	0.00000
111KM501	1.03908	-5.13611	0.00000	0.00000
1TR1217	1.00424	-4.20092	0.00000	0.00000
1TS1217	1.03970	-5.13389	0.00000	0.00000
111KM601	1.05617	-4.21187	0.00000	0.00000
1TR1218	1.00584	-4.21161	0.00000	0.00000
1TS1218	1.05617	-4.21185	0.00000	0.00000
147KM10A	1.04052	-4.81444	0.00000	0.00000

1TR1214	1.00579	-4.20965	0.00000	0.00000
1TS1214	1.04094	-4.81443	0.00000	0.00000
147KM10B	1.05163	-4.21071	0.00000	0.00000
1TR1219	1.00583	-4.21046	0.00000	0.00000
1TS1219	1.05163	-4.21069	0.00000	0.00000
125PM10A	1.02482	-4.22952	0.00000	0.00000
LM22	1.04860	-4.80135	0.00000	0.00000

LINE DATA INPUT

SENDING BUSBAR	RECEIVING BUSBAR	RESISTANCE P.U.	REACTANCE P.U.	SUSCEPTANCE P.U.	TAP P.C.
GT1	GC1	0.00000	0.00002	0.00000	0.00
GT2	GC2	0.00000	0.00002	0.00000	0.00
GT3	GC3	0.00000	0.00002	0.00000	0.00
GT4	GC4	0.00000	0.00002	0.00000	0.00
GT5	GC5	0.00000	0.00002	0.00000	0.00
GT6	GC6	0.00000	0.00002	0.00000	0.00
MBIN132	GC1	0.00022	0.00887	0.00000	0.83
MBIN132	GC2	0.00022	0.00887	0.00000	0.83
MBIN132	GC3	0.00022	0.00887	0.00000	0.83
MBIN132	GC4	0.00022	0.00887	0.00000	0.83
MBIN132	GC5	0.00022	0.00887	0.00000	0.83
MBIN132	GC6	0.00022	0.00887	0.00000	0.83
MBIN132	MBF1321	0.00001	0.00002	0.01966	0.00
MBF1321	INT1	0.00039	0.00121	1.38603	0.00
GRID	MBIN132	0.00001	0.00003	0.68417	0.00
MBIN132	J1	0.00001	0.00003	0.57014	0.00
MBIN132	J2	0.00002	0.00007	0.24231	0.00
MBIN132	J3	0.00002	0.00007	0.24231	0.00
MBIN132	J4	0.00002	0.00007	0.24231	0.00
MBIN132	J5	0.00001	0.00004	0.48462	0.00
MBIN132	J6	0.00002	0.00007	0.24231	0.00
MBIN132	J7	0.00002	0.00007	0.24231	0.00
MBIN132	J8	0.00001	0.00003	0.57014	0.00
MBIN132	J9	0.00001	0.00003	0.68417	0.00
J1	ACIDA	0.00018	0.01000	0.00000	-5.01
J2	COMMU	0.00029	0.01587	0.00000	-5.01
J3	C2REC	0.00093	0.04999	0.00000	-5.01
J4	UREAA	0.00051	0.02777	0.00000	-5.01
J5	SEAWA	0.00029	0.01587	0.00000	-5.01
J6	4THAR	0.00023	0.01250	0.00000	-5.01
J7	ASU	0.00018	0.01000	0.00000	-5.01

J8	10THO	0.00018	0.01000	0.00000	-5.01
J9	9THOL	0.00015	0.00833	0.00000	-5.01
GT1	AU1400	0.07525	0.47407	0.00000	-4.76
GC1	AU16KV	0.01425	0.08979	0.00000	-4.76
GT2	AU2400	0.07525	0.47407	0.00000	-4.76
GT3	AU3400	0.07525	0.47407	0.00000	-4.76
GC3	AU36KV	0.01425	0.08979	0.00000	-4.76
GT4	AU4400	0.07525	0.47407	0.00000	-4.76
GT5	AU5400	0.07525	0.47407	0.00000	-4.76
GT6	AU6400	0.07525	0.47407	0.00000	-4.76
GC6	AU66KV	0.01425	0.08979	0.00000	-4.76
GRID132	GRID	0.00006	0.00018	1.17960	0.00
GRID230	JGRID	0.00076	0.01516	0.00000	0.00
JGRID	GRID132	0.00000	0.00080	0.00000	0.00
JGRID	GRID20	0.00000	0.02400	0.00000	0.00
GRIDG	GRID230	0.00000	0.00010	0.00000	0.00
INT1	OUT1	0.00018	0.00963	0.00000	-3.34
OUT1	1S11A	0.00000	0.00001	0.00000	0.00
J0	PH678	0.00018	0.00963	0.00000	-3.34
MBIN132	J0	0.00017	0.00053	0.59963	0.00
1S11A	1S11B	0.00000	0.00001	0.00000	0.00
01ES41	LM1	0.00000	0.00050	0.00000	0.00
01ES41	LM2	0.00000	0.00050	0.00000	0.00
01TR3413	01TR4413	0.18413	0.60763	0.00000	-4.76
01TR4413	01ES41	0.00000	0.00050	0.00000	0.00
01ES41	01T3	0.00000	0.00050	0.00000	0.00
01T3	01T5	4.54376	2.75625	0.00000	0.00
01ES42	LM1	0.00000	0.00050	0.00000	0.00
01T5	01ES42	0.00000	0.00050	0.00000	0.00
01TR1311	01TR3311	0.00603	0.08328	0.00000	-2.38
01TR1312	01TR3312	0.00603	0.08328	0.00000	-2.38
01TR3311	01S31A	0.00000	0.00020	0.00000	0.00
01TR3312	01S31B	0.00000	0.00020	0.00000	0.00
01S31A	ML1	0.00000	0.00020	0.00000	0.00
01S31B	ML1	0.00000	0.00020	0.00000	0.00
01S41A	LM1	0.00000	0.00050	0.00000	0.00
01S41B	LM1	0.00000	0.00050	0.00000	0.00
01S42A	LM1	0.00000	0.00050	0.00000	0.00
01S42B	LM1	0.00000	0.00050	0.00000	0.00
01TR3411	01TR4411	0.03908	0.41818	0.00000	-2.38
01TR4411	01S41A	0.00000	0.00050	0.00000	0.00
01TR3412	01TR4412	0.03908	0.41818	0.00000	-2.38
01TR4412	01S41B	0.00000	0.00050	0.00000	0.00
01TR3414	01TR4414	0.03908	0.41818	0.00000	-2.38

01TR4414	01S42A	0.00000	0.00050	0.00000	0.00
01TR3415	01TR4415	0.03908	0.41818	0.00000	-2.38
01TR4415	01S42B	0.00000	0.00050	0.00000	0.00
01S41B	01T1	0.00000	0.00050	0.00000	0.00
01S42A	01T4	0.00000	0.00050	0.00000	0.00
01T4	01T6	4.54376	2.75625	0.00000	0.00
01T1	01T2	0.00000	0.00050	0.00000	0.00
01S31A	01TR3411	0.00000	0.00020	0.00000	0.00
01S31A	01TR3414	0.00000	0.00020	0.00000	0.00
01S31B	01TR3412	0.00000	0.00020	0.00000	0.00
01S31B	01TR3415	0.00000	0.00020	0.00000	0.00
02ES41	LM1	0.00000	0.00050	0.00000	0.00
02ES41	LM2	0.00000	0.00050	0.00000	0.00
02TR3413	02TR4413	0.15399	0.61596	0.00000	-2.38
02TR4413	02ES41	0.00000	0.00050	0.00000	0.00
02TR1311	02TR3311	0.02528	0.17695	0.00000	-2.38
02TR1312	02TR3312	0.02528	0.17695	0.00000	-2.38
02TR3311	02S31A	0.00000	0.00020	0.00000	0.00
02TR3312	02S31B	0.00000	0.00020	0.00000	0.00
02S31A	M02	0.00000	0.00020	0.00000	0.00
02S31B	M02	0.00000	0.00020	0.00000	0.00
02S41A	LM1	0.00000	0.00050	0.00000	0.00
02S41B	LM1	0.00000	0.00050	0.00000	0.00
02S42A	LM1	0.00000	0.00050	0.00000	0.00
02S42B	LM1	0.00000	0.00050	0.00000	0.00
02TR3411	02TR4411	0.05579	0.39609	0.00000	-2.38
02TR4411	02S41A	0.00000	0.00050	0.00000	0.00
02TR3412	02TR4412	0.05579	0.39609	0.00000	-2.38
02TR4412	02S41B	0.00000	0.00050	0.00000	0.00
02TR3414	02TR4414	0.07377	0.38360	0.00000	-2.38
02TR4414	02S42A	0.00000	0.00050	0.00000	0.00
02TR3415	02TR4415	0.07377	0.38360	0.00000	-2.38
02TR4415	02S42B	0.00000	0.00050	0.00000	0.00
02S41B	02T1	0.00000	0.00050	0.00000	0.00
02T1	02T2	0.00000	0.00050	0.00000	0.00
02S31A	02TR3411	0.00000	0.00020	0.00000	0.00
02S31A	02TR3414	0.00000	0.00020	0.00000	0.00
02S31B	02TR3412	0.00000	0.00020	0.00000	0.00
02S31B	02TR3415	0.00000	0.00020	0.00000	0.00
03ES41	LM1	0.00000	0.00050	0.00000	0.00
03ES41	LM2	0.00000	0.00050	0.00000	0.00
03TR3413	03TR4413	0.15399	0.61596	0.00000	-2.38
03TR4413	03ES41	0.00000	0.00050	0.00000	0.00

03TR1311	03TR3311	0.00693	0.08321	0.00000	-2.38
03TR1312	03TR3312	0.00693	0.08321	0.00000	-2.38
03TR3311	03S31A	0.00000	0.00020	0.00000	0.00
03TR3312	03S31B	0.00000	0.00020	0.00000	0.00
03S31A	ML1	0.00000	0.00020	0.00000	0.00
03S31B	ML1	0.00000	0.00020	0.00000	0.00
03S41A	LM1	0.00000	0.00050	0.00000	0.00
03S41B	LM1	0.00000	0.00050	0.00000	0.00
03S42A	LM1	0.00000	0.00050	0.00000	0.00
03S42B	LM1	0.00000	0.00050	0.00000	0.00
03TR3411	03TR4411	0.03908	0.41818	0.00000	-4.76
03TR4411	03S41A	0.00000	0.00050	0.00000	0.00
03TR3412	03TR4412	0.03908	0.41818	0.00000	-4.76
03TR4412	03S41B	0.00000	0.00050	0.00000	0.00
03TR3414	03TR4414	0.03908	0.41818	0.00000	-2.38
03TR4414	03S42A	0.00000	0.00050	0.00000	0.00
03TR3415	03TR4415	0.03908	0.41818	0.00000	-2.38
03TR4415	03S42B	0.00000	0.00050	0.00000	0.00
03S41B	03T1	0.00000	0.00050	0.00000	0.00
03T1	03T2	0.00000	0.00050	0.00000	0.00
03S31A	03TR3411	0.00000	0.00020	0.00000	0.00
03S31A	03TR3414	0.00000	0.00020	0.00000	0.00
03S31B	03TR3412	0.00000	0.00020	0.00000	0.00
03S31B	03TR3415	0.00000	0.00020	0.00000	0.00
04TR3413	04TR4413	0.05579	0.39609	0.00000	-2.38
04TR4413	04ES41A	0.00000	0.00050	0.00000	0.00
04TR1311	04TR3311	0.00693	0.08321	0.00000	-2.38
04TR1312	04TR3312	0.00693	0.08321	0.00000	-2.38
04TR3311	04S31A	0.00000	0.00020	0.00000	0.00
04TR3312	04S31B	0.00000	0.00020	0.00000	0.00
04TR3411	04TR4411	0.05448	0.38681	0.00000	-2.38
04TR4411	04S41A	0.00000	0.00050	0.00000	0.00
04TR3412	04TR4412	0.05448	0.38681	0.00000	-2.38
04TR4412	04S41B	0.00000	0.00050	0.00000	0.00
04TR3414	04TR4414	0.05579	0.39609	0.00000	-2.38
04S31A	04TR3411	0.00000	0.00020	0.00000	0.00
04ES31B	04ES31C	0.00000	0.00020	0.00000	0.00
05ES41	LM1	0.00000	0.00050	0.00000	0.00
05ES41	LM2	0.00000	0.00050	0.00000	0.00
05TR3413	05TR4413	0.19492	0.60426	0.00000	-2.38
05TR4413	05ES41	0.00000	0.00050	0.00000	0.00
05TR1311	05TR3311	0.01129	0.11293	0.00000	-2.38
05TR1312	05TR3312	0.01129	0.11293	0.00000	-2.38

05TR3311	05S31A	0.00000	0.00020	0.00000	0.00
05TR3312	05S31B	0.00000	0.00020	0.00000	0.00
05S31A	ML1	0.00000	0.00020	0.00000	0.00
05S31B	ML1	0.00000	0.00020	0.00000	0.00
05S41A	LM1	0.00000	0.00050	0.00000	0.00
05S41B	LM1	0.00000	0.00050	0.00000	0.00
05S42A	LM1	0.00000	0.00050	0.00000	0.00
05S42B	LM1	0.00000	0.00050	0.00000	0.00
05TR3411	05TR4411	0.06471	0.39473	0.00000	-2.38
05TR4411	05S41A	0.00000	0.00050	0.00000	0.00
05TR3412	05TR4412	0.06471	0.39473	0.00000	-2.38
05TR4412	05S41B	0.00000	0.00050	0.00000	0.00
05TR3414	05TR4414	0.06471	0.39473	0.00000	-2.38
05TR4414	05S42A	0.00000	0.00050	0.00000	0.00
05TR3415	05TR4415	0.06471	0.39473	0.00000	-2.38
05TR4415	05S42B	0.00000	0.00050	0.00000	0.00
05S41B	05T1	0.00000	0.00050	0.00000	0.00
05T1	05T2	0.00000	0.00050	0.00000	0.00
05S31A	05TR3411	0.00000	0.00020	0.00000	0.00
05S31A	05TR3414	0.00000	0.00020	0.00000	0.00
05S31B	05TR3412	0.00000	0.00020	0.00000	0.00
05S31B	05TR3415	0.00000	0.00020	0.00000	0.00
06ES41	LM1	0.00000	0.00050	0.00000	0.00
06TR3413	06TR4413	0.18413	0.60763	0.00000	-2.38
06TR4413	06ES41	0.00000	0.00050	0.00000	0.00
06TR1311	06TR3311	0.00867	0.10401	0.00000	-1.96
06TR1312	06TR3312	0.00867	0.10401	0.00000	-1.96
06TR3311	06S31A	0.00000	0.00020	0.00000	0.00
06TR3312	06S31B	0.00000	0.00020	0.00000	0.00
06S31A	ML1	0.00000	0.00020	0.00000	0.00
06S31B	ML1	0.00000	0.00020	0.00000	0.00
06S41A	LM1	0.00000	0.00050	0.00000	0.00
06S41B	LM1	0.00000	0.00050	0.00000	0.00
06S42A	LM1	0.00000	0.00050	0.00000	0.00
06S42B	LM1	0.00000	0.00050	0.00000	0.00
06TR3411	06TR4411	0.04965	0.41706	0.00000	-2.38
06TR4411	06S41A	0.00000	0.00050	0.00000	0.00
06TR3412	06TR4412	0.04965	0.41706	0.00000	-2.38
06TR4412	06S41B	0.00000	0.00050	0.00000	0.00
06TR3414	06TR4414	0.05579	0.39609	0.00000	-2.38
06TR4414	06S42A	0.00000	0.00050	0.00000	0.00
06TR3415	06TR4415	0.05579	0.39609	0.00000	-2.38
06TR4415	06S42B	0.00000	0.00050	0.00000	0.00
06S41B	06T1	0.00000	0.00050	0.00000	0.00

06T1	06T2	0.00000	0.00050	0.00000	0.00
06S31A	06TR3411	0.00000	0.00020	0.00000	0.00
06S31A	06TR3414	0.00000	0.00020	0.00000	0.00
06S31B	06TR3412	0.00000	0.00020	0.00000	0.00
06S31B	06TR3415	0.00000	0.00020	0.00000	0.00
07ES41	LM1	0.00000	0.00050	0.00000	0.00
07ES41	LM2	0.00000	0.00050	0.00000	0.00
07TR3413	07TR4413	0.18413	0.60763	0.00000	-2.38
07TR4413	07ES41	0.00000	0.00050	0.00000	0.00
07TR1311	07TR3311	0.01562	0.17807	0.00000	-2.38
07TR1312	07TR3312	0.01562	0.17807	0.00000	-2.38
07TR3311	07S31A	0.00000	0.00020	0.00000	0.00
07TR3312	07S31B	0.00000	0.00020	0.00000	0.00
07S31A	ML1	0.00000	0.00020	0.00000	0.00
07S31B	ML1	0.00000	0.00020	0.00000	0.00
07S41A	LM1	0.00000	0.00050	0.00000	0.00
07S41B	LM1	0.00000	0.00050	0.00000	0.00
07S42A	LM1	0.00000	0.00050	0.00000	0.00
07S42B	LM1	0.00000	0.00050	0.00000	0.00
07TR3411	07TR4411	0.05448	0.38681	0.00000	-2.38
07TR4411	07S41A	0.00000	0.00050	0.00000	0.00
07TR3412	07TR4412	0.05448	0.38681	0.00000	-2.38
07TR4412	07S41B	0.00000	0.00050	0.00000	0.00
07TR3414	07TR4414	0.05448	0.38681	0.00000	-2.38
07TR4414	07S42A	0.00000	0.00050	0.00000	0.00
07TR3415	07TR4415	0.05448	0.38681	0.00000	-2.38
07TR4415	07S42B	0.00000	0.00050	0.00000	0.00
07S41B	07T1	0.00000	0.00050	0.00000	0.00
07T1	07T2	0.00000	0.00050	0.00000	0.00
07S31A	07TR3411	0.00000	0.00020	0.00000	0.00
07S31A	07TR3414	0.00000	0.00020	0.00000	0.00
07S31B	07TR3412	0.00000	0.00020	0.00000	0.00
07S31B	07TR3415	0.00000	0.00020	0.00000	0.00
08ES41	LM1	0.00000	0.00050	0.00000	0.00
08ES41	LM2	0.00000	0.00050	0.00000	0.00
08ES41	08T2	0.00000	0.00050	0.00000	0.00
08TR1311	08TR3311	0.01178	0.14251	0.00000	-2.38
08TR1312	08TR3312	0.01178	0.14251	0.00000	-2.38
08TR3311	08S31A	0.00000	0.00020	0.00000	0.00
08TR3312	08S31B	0.00000	0.00020	0.00000	0.00
08S31B	125PM10B	0.01011	0.00572	0.00000	0.00
08S41A	LM1	0.00000	0.00050	0.00000	0.00
08S41B	LM1	0.00000	0.00050	0.00000	0.00

08TR3411	08TR4411	0.30700	0.95171	0.00000	-2.38
08TR4411	08S41A	0.00000	0.00050	0.00000	0.00
08TR3412	08TR4412	0.30700	0.95171	0.00000	-2.38
08TR4412	08S41B	0.00000	0.00050	0.00000	0.00
08S41B	08T1	0.00000	0.00050	0.00000	0.00
08T1	08T2	0.00000	0.00050	0.00000	0.00
08S31A	08TR3411	0.00000	0.00020	0.00000	0.00
08S31B	08TR3412	0.00000	0.00020	0.00000	0.00
09ES41	LM1	0.00000	0.00050	0.00000	0.00
09ES41	LM2	0.00000	0.00050	0.00000	0.00
09TR3413	09TR4413	0.05579	0.39609	0.00000	-4.76
09TR4413	09ES41	0.00000	0.00050	0.00000	0.00
09TR1311	09TR3311	0.00336	0.06241	0.00000	-4.35
09TR1312	09TR3312	0.00336	0.06241	0.00000	-4.35
09TR3311	09S31A	0.00000	0.00020	0.00000	0.00
09TR3312	09S31B	0.00000	0.00020	0.00000	0.00
09S31A	ML1	0.00000	0.00020	0.00000	0.00
09S31B	ML1	0.00000	0.00020	0.00000	0.00
09S41A	LM1	0.00000	0.00050	0.00000	0.00
09S41B	LM1	0.00000	0.00050	0.00000	0.00
09S42A	LM1	0.00000	0.00050	0.00000	0.00
09S42B	LM1	0.00000	0.00050	0.00000	0.00
09TR3411	09TR4411	0.03908	0.41818	0.00000	-2.38
09TR4411	09S41A	0.00000	0.00050	0.00000	0.00
09TR3412	09TR4412	0.03908	0.41818	0.00000	-2.38
09TR4412	09S41B	0.00000	0.00050	0.00000	0.00
09TR3414	09TR4414	0.03908	0.41818	0.00000	-4.76
09TR4414	09S42A	0.00000	0.00050	0.00000	0.00
09TR3415	09TR4415	0.03908	0.41818	0.00000	-4.76
09TR4415	09S42B	0.00000	0.00050	0.00000	0.00
09S41B	09T1	0.00000	0.00050	0.00000	0.00
09S42A	09T4	0.00000	0.00050	0.00000	0.00
09T1	09T2	0.00000	0.00050	0.00000	0.00
09S31A	09TR3411	0.00000	0.00020	0.00000	0.00
09S31A	09TR3414	0.00000	0.00020	0.00000	0.00
09S31B	09TR3412	0.00000	0.00020	0.00000	0.00
09S31B	09TR3415	0.00000	0.00020	0.00000	0.00
08DG	08DG1	0.00000	0.00050	0.00000	0.00
04S31A	M04	0.00000	0.00020	0.00000	0.00
04S31B	M05	0.00000	0.00020	0.00000	0.00
04S31B	04TR3412	0.00000	0.00020	0.00000	0.00
04DG31A	04DG32A	0.00000	0.00020	0.00000	0.00
04DG31B	04DG32B	0.00000	0.00020	0.00000	0.00

04DG31C	04DG32C	0.00000	0.00020	0.00000	0.00
04TR4414	04ES41B	0.00000	0.00050	0.00000	0.00
04ES41A	LM1	0.00000	0.00050	0.00000	0.00
04ES41A	LM2	0.00000	0.00050	0.00000	0.00
04ES41B	LM1	0.00000	0.00050	0.00000	0.00
04ES42A	LM2	0.00000	0.00050	0.00000	0.00
04ES41A	04T3	0.00000	0.00050	0.00000	0.00
04T3	04T5	0.00000	0.00050	0.00000	0.00
04T5	04ES42A	0.00000	0.00050	0.00000	0.00
04ES41B	04T4	0.00000	0.00050	0.00000	0.00
04T4	04T6	0.00000	0.00050	0.00000	0.00
04T6	04ES42B	0.00000	0.00050	0.00000	0.00
04ES31A	04TR3413	0.00000	0.00020	0.00000	0.00
04ES31C	04TR3414	0.00000	0.00020	0.00000	0.00
1TR1215	1TS1215	0.00815	0.11081	0.00000	-2.38
1TS1215	103KM101	0.00326	0.00251	0.00039	0.00
1TR1220	1TS1220	0.00815	0.11081	0.00000	-2.38
1TS1220	103KM201	0.00326	0.00251	0.00039	0.00
1TR1211	1TS1211	0.00677	0.05962	0.00000	-4.76
1TS1211	111KM101	0.00157	0.00121	0.00074	0.00
1TR1212	1TS1212	0.00677	0.05962	0.00000	-4.76
1TS1212	111KM201	0.00132	0.00102	0.00062	0.00
1TR1213	1TS1213	0.00677	0.05962	0.00000	-4.76
1TS1213	111KM301	0.00132	0.00102	0.00062	0.00
1TR1216	1TS1216	0.00677	0.05962	0.00000	-4.76
1TS1216	111KM401	0.00157	0.00121	0.00074	0.00
1TR1217	1TS1217	0.00677	0.05962	0.00000	-4.76
1TS1217	111KM501	0.00132	0.00102	0.00062	0.00
1TR1218	1TS1218	0.00677	0.05962	0.00000	-4.76
1TS1218	111KM601	0.00132	0.00102	0.00062	0.00
1TR1214	1TS1214	0.00436	0.04144	0.00000	-4.35
1TS1214	147KM10A	0.00091	0.00070	0.00097	0.00
1TR1219	1TS1219	0.00436	0.04144	0.00000	-4.35
1TS1219	147KM10B	0.00087	0.00067	0.00093	0.00
08S31A	125PM10A	0.01011	0.00572	0.00000	0.00
04ES42B	LM1	0.00000	0.00050	0.00000	0.00
04ES42B	LM21	0.00000	0.00050	0.00000	0.00
04S41A	LM1	0.00000	0.00050	0.00000	0.00
04S41B	LM2	0.00000	0.00050	0.00000	0.00
1S11A	01TR1311	0.00009	0.00006	0.00032	0.00
1S11B	01TR1312	0.00009	0.00006	0.00032	0.00
1S11A	02TR1311	0.00252	0.00135	0.00694	0.00
1S11B	02TR1312	0.00252	0.00135	0.00694	0.00
1S11A	03TR1311	0.00143	0.00094	0.00537	0.00

1S11B	03TR1312	0.00143	0.00094	0.00537	0.00
1S11A	04TR1311	0.00352	0.00189	0.00970	0.00
1S11B	04TR1312	0.00352	0.00189	0.00970	0.00
1S11A	05TR1311	0.00358	0.00192	0.00988	0.00
1S11B	05TR1312	0.00358	0.00192	0.00988	0.00
1S11A	06TR1311	0.00369	0.00198	0.01017	0.00
1S11B	06TR1312	0.00369	0.00198	0.01017	0.00
1S11A	07TR1311	0.00380	0.00204	0.01047	0.00
1S11B	07TR1312	0.00380	0.00204	0.01047	0.00
1S11A	08TR1311	0.01738	0.00933	0.04788	0.00
1S11B	08TR1312	0.01738	0.00933	0.04788	0.00
1S11A	09TR1311	0.00199	0.00107	0.02196	0.00
1S11B	09TR1312	0.00199	0.00107	0.02196	0.00
04ES31A	01TR3413	0.09571	0.04442	0.00000	0.00
04ES31A	05TR3413	0.10464	0.04856	0.00000	0.00
04ES31A	07TR3413	0.06381	0.02961	0.00000	0.00
04ES31C	06TR3413	0.10464	0.04856	0.00000	0.00
04ES31C	03TR3413	0.06572	0.03050	0.00000	0.00
04ES31C	02TR3413	0.04466	0.02073	0.00000	0.00
04ES31C	09TR3413	0.05009	0.02325	0.00000	0.00
04S31A	04ES31A	0.00000	0.00020	0.00000	0.00
04S31B	04ES31C	0.00000	0.00020	0.00000	0.00
1S11A	1TR1211	0.00369	0.00198	0.01018	0.00
1S11A	1TR1212	0.00369	0.00198	0.01018	0.00
1S11A	1TR1214	0.00009	0.00006	0.00032	0.00
1S11A	1TR1215	0.00380	0.00204	0.01048	0.00
1S11A	1TR1213	0.00369	0.00198	0.01018	0.00
1S11B	1TR1216	0.00358	0.00192	0.00988	0.00
1S11B	1TR1217	0.00358	0.00192	0.00988	0.00
1S11B	1TR1218	0.00358	0.00192	0.00988	0.00
1S11B	1TR1219	0.00009	0.00006	0.00032	0.00
1S11B	1TR1220	0.00380	0.00204	0.01048	0.00
08S31B	125PM10D	0.01516	0.00858	0.00000	0.00
06ES41	LM22	0.00000	0.00050	0.00000	0.00

SHUNT IMPEDANCE DENOTED BY - *

SYNCHRONOUS MACHINE DATA

M/C PARAMETERS

BUSBAR NAME	MACHINE NO	DATA MODEL	INERT. MVA	CONST.	REACTANCES (P.U.) TRANSIENT	SYNCHRONOUS	SUB-TRANSIENT	POT- RESIST	ARM. TRANSIENT	O/C TCS (SECS) SUB-TRANSIENT	SATN. FACT.

		BASE KWSKVA	D-AXIS	Q-AXIS	D-AXIS	Q-AXIS	D-AXIS	Q-AXIS	IER	(P.U.)	D-AXIS	Q-AXIS	D-AXIS	Q-AXIS
GT1	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GT2	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GT3	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GT4	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GT5	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GT6	4	10.00	31.655	0.0158	0.1303	0.1303	0.1303	0.0102	0.0102	0.000	0.0001	7.55	0.000	0.0300	0.0300	0.000
GRIDG	1	10.00	9.999	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.000	0.0006	99.99	9.999	0.0000	0.0000	0.000
04DG31A	4	10.00	0.449	0.912911	.025011	.025011	.0250	0.6791	0.6791	0.000	0.0613	2.41	0.000	0.0202	0.0202	0.000
04DG31B	4	10.00	0.449	0.912911	.025011	.025011	.0250	0.6791	0.6791	0.000	0.0613	2.41	0.000	0.0202	0.0202	0.000
04DG31C	4	10.00	0.449	0.912911	.025011	.025011	.0250	0.6791	0.6791	0.000	0.0613	2.41	0.000	0.0202	0.0202	0.000
08DG	4	10.00	0.03127	.222981	.4969*******	81.4969	16.8318	18.6352	0.000	1.5372	1.23	0.000	0.2604	0.0085	0.000	

BUSBAR NAME	M/C NO.	M/C POWER OUTPUT MW	MVAR	DAMPING FACTOR
GT1		52.84119	69.95929	0.00
GT2		100.00000	68.44049	0.00
GT3		100.00000	71.62746	0.00
GT4		100.00000	68.44049	0.00
GT5		100.00000	68.44049	0.00
GT6		100.00000	71.62746	0.00
GRIDG		60.00000	40.00000	0.00
04DG31A		0.00000	0.00000	0.00
04DG31B		0.00000	0.00000	0.00
04DG31C		0.00000	0.00000	0.00
08DG		0.00000	0.00000	0.00

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX
GT1	1	0.0000	100.00	10.000	1.000	9.999	-9.999	99.99	1.000	0.100	0.000	9.999	0.000	4.500	0.000	0.000	0.000	

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX
GT2	1	0.0000	100.00	10.000	1.000	9.999	-9.999	99.99	1.000	0.100	0.000	9.999	0.000	4.500	0.000	0.000	0.000	

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX

GT3 1 0.0000 100.0010.000 1.000 9.999 -9.999 99.99 1.000 0.100 0.000 9.999 0.000 4.500 0.000 0.000 0.000

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX
GT4	1	0.0000	100.0010.000	1.000	9.999	-9.999	99.99	1.000	0.100	0.000	9.999	0.000	4.500	0.000	0.000	0.000		

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX
GT5	1	0.0000	100.0010.000	1.000	9.999	-9.999	99.99	1.000	0.100	0.000	9.999	0.000	4.500	0.000	0.000	0.000		

AUTOMATIC VOLTAGE REGULATOR DATA

BUSBAR NAME	MC NO	AVR TYPE	FILTER T.C.	REG. GAIN	REG. T.CS. TA	TB	REG. LIMITS MAX	MIN	RATE	EXCITER GAIN	T.C.	F/BK GAIN	F/BK T.CS. TF	TD	EXCITER LIMITS MAX	MIN	SATN(SE) .75MAX	MAX
GT6	1	0.0000	100.0010.000	1.000	9.999	-9.999	99.99	1.000	0.100	0.000	9.999	0.000	4.500	0.000	0.000	0.000		

AVRS CONTROL LOCAL BUSBAR EXCEPT WHERE OTHERWISE SPECIFIED

THERMAL TURBINE GOVERNOR PARAMETERS

BUSBAR NAME	M/C NO.	SPEED REGULATION	FLYBALL GAIN	T.C.	CONTROL SYSTEM T.CS. T1	T2	T3	THERMAL T.C.	TURBINE LIMIT(MW)
GT3		0.2500	1.0000	0.0000	0.5000	1.2500	0.7000	0.7000	140.0000
GT4		0.2500	1.0000	0.0000	0.5000	1.2500	0.7000	0.7000	140.0000
GT5		0.2500	1.0000	0.0000	0.5000	1.2500	0.7000	0.7000	140.0000
GT6		0.2500	1.0000	0.0000	0.5000	1.2500	0.7000	0.7000	140.0000

INDUCTION MOTOR DATA

MOTOR PARAMETERS

BUSBAR NAME	MTR NO.	NO.OF CAGES	DATA MVA	RATED KV	INERTIA KWS/KVA	RESISTANCES(PU) STATOR	ROTOR	(--------- REACTANCES (P.U.) STATOR	ROTOR	MAGTIZING	O/C	TRANS	TQ-SL-CONS T.C.(SEC)	B	C
ACIDA	1		10.000	20.000	80.0000	0.00002	0.00125	0.0091	0.0091	0.3250	0.3341	0.0180	0.85084	0.80	0.00
COMMU	1		10.000	20.000	50.4000	0.00004	0.00198	0.0145	0.0145	0.5159	0.5304	0.0286	0.85084	0.80	0.00
C2REC	1		10.000	20.000	16.0000	0.00012	0.00625	0.0456	0.0456	1.6250	1.6706	0.0900	0.85084	0.80	0.00

UREAA	1	10.000	20.000	28.8000	0.00007	0.00347	0.0253	0.0253	0.9028	0.9281	0.0500	0.85084	0.80	0.00
SEAWA	1	10.000	20.000	50.4000	0.00004	0.00198	0.0145	0.0145	0.5159	0.5304	0.0286	0.85084	0.80	0.00
4THAR	1	10.000	20.000	64.0000	0.00003	0.00156	0.0114	0.0114	0.4063	0.4177	0.0225	0.85084	0.80	0.00
ASU	1	10.000	20.000	80.0000	0.00002	0.00125	0.0091	0.0091	0.3250	0.3341	0.0180	0.85084	0.80	0.00
10THO	1	10.000	20.000	80.0000	0.00002	0.00125	0.0091	0.0091	0.3250	0.3341	0.0180	0.85084	0.80	0.00
9THOL	1	10.000	20.000	96.0000	0.00002	0.00104	0.0076	0.0076	0.2708	0.2784	0.0150	0.85084	0.80	0.00
AU16KV	1	10.000	6.000	0.0837	0.08850	0.03625	0.2820	0.1880	5.4125	5.6945	0.4637	0.49178	0.00	1.00
AU1400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
AU2400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
AU36KV	1	10.000	6.000	0.0837	0.08850	0.03625	0.2820	0.1880	5.4125	5.6945	0.4637	0.49178	0.00	1.00
AU3400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
AU4400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
AU5400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
AU66KV	1	10.000	6.000	0.0837	0.08850	0.03625	0.2820	0.1880	5.4125	5.6945	0.4637	0.49178	0.00	1.00
AU6400	1	10.000	0.400	0.0018	1.06124	0.23828	2.0529	1.3686	48.8245	50.8775	3.3843	0.67051	0.00	1.00
PH678	1	10.000	33.000	80.0000	0.00002	0.00125	0.0091	0.0091	0.3250	0.3341	0.0180	0.85084	0.80	0.00
LM1	1	10.000	0.400	0.0074	1.68336	1.18161	3.9114	3.9114	117.2213	121.1327	7.6965	0.32631	0.00	0.00
LM2	1	10.000	0.400	0.0004	7.60010	5.33449	17.6583	17.6583	520.6591	538.3174	34.7374	0.32122	0.00	0.00
LM1	1	10.000	0.400	0.0005	6.79990	4.77310	15.8000	15.8000	570.1750	585.9750	31.1740	0.39078	0.00	0.00
ML1	1	10.000	6.000	0.3619	0.08002	0.03579	0.4998	0.4998	17.6835	18.1833	0.9859	1.61733	0.00	0.00
ML1	1	10.000	6.000	0.0443	0.34134	0.15297	1.4207	1.4207	52.1073	53.5279	2.8036	1.11384	0.00	0.00
LM1	1	10.000	0.400	0.0394	0.73513	0.51600	1.7081	1.7081	61.6347	63.3427	3.3701	0.39075	0.00	0.00
LM1	1	10.000	0.400	0.0441	0.69369	0.48691	1.6118	1.6118	58.1584	59.7702	3.1801	0.39074	0.00	0.00
LM1	1	10.000	0.400	0.0864	0.35889	0.44784	1.4824	1.4824	100.2937	101.7761	2.9433	0.72339	0.00	0.00
LM1	1	10.000	0.400	0.0524	0.47326	0.59056	1.9549	1.9549	248.7861	250.7410	3.8945	1.35150	0.00	0.00
LM1	1	10.000	0.400	0.0126	1.31167	0.92069	3.0477	3.0477	109.9725	113.0202	6.0132	0.39074	0.00	0.00
LM2	1	10.000	0.400	0.0002	9.93815	6.97618	23.0927	23.0927	833.4457	856.5384	45.5628	0.39082	0.00	0.00
LM1	1	10.000	0.400	0.0336	0.79877	0.56066	1.8559	1.8559	43.4171	45.2731	3.6358	0.25703	0.00	0.00
LM1	1	10.000	0.400	0.0072	1.72268	1.20916	4.0026	4.0026	93.6359	97.6385	7.8411	0.25703	0.00	0.00
LM1	1	10.000	0.400	0.0575	0.61087	0.42878	1.4194	1.4194	30.9413	32.3606	2.7765	0.24023	0.00	0.00
LM1	1	10.000	0.400	0.0103	1.45169	1.01896	3.3730	3.3730	73.5290	76.9019	6.5980	0.24023	0.00	0.00
LM1	1	10.000	0.400	0.0067	1.79445	1.25955	4.1694	4.1694	150.4420	154.6113	8.2263	0.39073	0.00	0.00
LM2	1	10.000	0.400	0.0005	6.79990	4.77310	15.8000	15.8000	570.1750	585.9750	31.1740	0.39078	0.00	0.00
ML1	1	10.000	6.000	0.3680	0.07870	0.03520	0.4916	0.4916	18.0008	18.4924	0.9701	1.67245	0.00	0.00
ML1	1	10.000	6.000	0.1144	0.13923	0.06227	0.8697	0.8697	31.8474	32.7171	1.7163	1.67245	0.00	0.00
LM1	1	10.000	0.400	0.1130	0.43908	0.30820	1.0202	1.0202	23.8669	24.8871	1.9986	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0072	1.72268	1.20916	4.0026	4.0026	93.6359	97.6385	7.8411	0.25703	0.00	0.00
LM1	1	10.000	0.400	0.0943	0.48209	0.33839	1.1201	1.1201	26.2047	27.3248	2.1943	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0241	0.94306	0.66195	2.1912	2.1912	51.2631	53.4544	4.2926	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0233	0.95703	0.67176	2.2237	2.2237	80.2399	82.4635	4.3874	0.39075	0.00	0.00
LM2	1	10.000	0.400	0.0000	113.04	135	103.65	079	343.1066	343.1066	**********	**********	676.9659	0.39095	0.00	0.00
LM1	1	10.000	0.400	0.0092	1.52448	1.07006	3.5421	3.5421	127.8166	131.3588	6.9888	0.39075	0.00	0.00
LM2	1	10.000	0.400	0.0074	1.67791	1.17777	3.8987	3.8987	140.6818	144.5804	7.6922	0.39075	0.00	0.00

LM1	1	10.000	0.400	0.0029	2.80867	1.97148	6.5260	6.5260	235.4950	242.0211	12.8761	0.39076	0.00	0.00
LM21	1	10.000	0.400	0.0005	6.79990	4.77310	15.8000	15.8000	570.1750	585.9750	31.1740	0.39078	0.00	0.00
LM1	1	10.000	0.400	0.0099	1.46401	1.02763	3.4017	3.4017	90.3650	93.7667	6.6799	0.29044	0.00	0.00
LM2	1	10.000	0.400	0.0231	0.96598	0.67804	2.2445	2.2445	59.6232	61.8677	4.4075	0.29044	0.00	0.00
LM1	1	10.000	0.400	0.0073	1.69441	1.18936	3.9370	3.9370	116.0730	120.0100	7.7449	0.32119	0.00	0.00
LM2	1	10.000	0.400	0.0004	7.17758	5.03834	16.6780	16.6780	491.6563	508.3343	32.8088	0.32115	0.00	0.00
ML1	1	10.000	6.000	0.1394	0.12466	0.05575	0.7787	0.7787	28.6899	29.4686	1.5368	1.68251	0.00	0.00
ML1	1	10.000	6.000	0.0750	0.25912	0.11612	1.0785	1.0785	39.2336	40.3121	2.1281	1.10501	0.00	0.00
LM1	1	10.000	0.400	0.0032	0.82425	0.57854	1.9151	1.9151	59.9540	61.8691	3.7709	0.34040	0.00	0.00
LM1	1	10.000	0.400	0.0200	1.03360	0.72550	2.4016	2.4016	75.1834	77.5849	4.7288	0.34040	0.00	0.00
LM1	1	10.000	0.400	0.0425	0.71087	0.49897	1.6517	1.6517	51.7096	53.3613	3.2523	0.34041	0.00	0.00
LM1	1	10.000	0.400	0.0200	1.03360	0.72550	2.4016	2.4016	75.1834	77.5849	4.7288	0.34040	0.00	0.00
LM1	1	10.000	0.400	0.0071	0.72512	2.99108	9.9011	9.9011	357.2752	367.1763	19.5353	0.39075	0.00	0.00
ML1	1	10.000	6.000	0.1394	0.12466	0.05575	0.7787	0.7787	28.6899	29.4686	1.5368	1.68251	0.00	0.00
ML1	1	10.000	6.000	0.0750	0.25912	0.11612	1.0785	1.0785	39.2336	40.3121	2.1281	1.10501	0.00	0.00
LM1	1	10.000	0.400	0.0618	0.58861	0.41315	1.3676	1.3676	49.3482	50.7158	2.6984	0.39073	0.00	0.00
LM1	1	10.000	0.400	0.0216	0.99385	0.69760	2.3092	2.3092	83.3231	85.6323	4.5561	0.39074	0.00	0.00
LM1	1	10.000	0.400	0.0448	0.79668	0.42283	1.3997	1.3997	50.5047	51.9044	2.7616	0.39074	0.00	0.00
LM1	1	10.000	0.400	0.0215	0.99961	0.70165	2.3226	2.3226	83.8094	86.1320	4.5826	0.39075	0.00	0.00
LM1	1	10.000	0.400	0.0071	1.74008	1.22137	4.0430	4.0430	145.8797	149.9227	7.9770	0.39072	0.00	0.00
LM2	1	10.000	0.400	0.0002	10.76689	7.55713	25.0158	25.0158	902.5117	927.5275	49.3568	0.39068	0.00	0.00
ML1	1	10.000	6.000	0.0224	0.48300	0.21646	2.0103	2.0103	73.4567	75.4670	3.9670	1.10977	0.00	0.00
ML1	1	10.000	6.000	0.0032	1.34327	0.60200	5.5908	5.5908	204.3018	209.8927	11.0328	1.10982	0.00	0.00
LM1	1	10.000	0.400	0.0200	1.03360	0.72550	2.4016	2.4016	75.1834	77.5849	4.7288	0.34040	0.00	0.00
LM1	1	10.000	0.400	0.0076	1.63545	1.14794	3.7999	3.7999	112.0317	115.8316	7.4752	0.32119	0.00	0.00
LM1	1	10.000	0.400	0.0297	0.83489	0.58603	1.9399	1.9399	57.1890	59.1289	3.8161	0.32117	0.00	0.00
LM1	1	10.000	0.400	0.0196	1.05684	0.74183	2.4556	2.4556	72.3938	74.8494	4.8307	0.32117	0.00	0.00
LM1	1	10.000	0.400	0.0023	3.00467	2.10900	6.9813	6.9813	251.8964	258.8777	13.7742	0.39072	0.00	0.00
LM2	1	10.000	0.400	0.0000	25.83702	18.13959	60.0460	60.0460	**********	**********	118.4741	0.39105	0.00	0.00
LM1	1	10.000	0.400	0.0008	5.32798	3.73959	12.3788	12.3788	446.5781	458.9569	24.4238	0.39066	0.00	0.00
LM1	1	10.000	0.400	0.0001	21.53378	15.11427	50.0315	50.0315	**********	**********	98.7137	0.39068	0.00	0.00
LM1	1	10.000	0.400	0.1056	0.45017	0.31598	1.0460	1.0460	37.7423	38.7883	2.0637	0.39074	0.00	0.00
LM2	1	10.000	0.400	0.0023	3.03999	2.13383	7.0634	7.0634	254.8771	261.9405	13.9364	0.39074	0.00	0.00
ML1	1	10.000	6.000	1.6640	0.02785	0.01245	0.1739	0.1739	5.8826	6.0565	0.3429	1.54799	0.00	0.00
ML1	1	10.000	6.000	1.4400	0.03017	0.01349	0.1884	0.1884	6.3728	6.5612	0.3715	1.54799	0.00	0.00
LM1	1	10.000	0.400	0.0168	1.13335	0.79550	2.6333	2.6333	61.6038	64.2371	5.1586	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0023	3.02230	2.12129	7.0219	7.0219	164.2780	171.3000	13.7560	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0766	0.52897	0.37129	1.2291	1.2291	28.7527	29.9818	2.4077	0.25704	0.00	0.00
LM1	1	10.000	0.400	0.0548	0.62567	0.43916	1.4537	1.4537	34.0089	35.4627	2.8478	0.25704	0.00	0.00
M02	1	10.000	6.000	0.0041	0.64234	0.70064	3.9734	3.9734	181.8073	185.7807	7.8618	0.84403	0.00	0.00
M02	1	10.000	6.000	0.0044	1.00157	0.44934	2.5483	2.5483	116.5988	119.1470	5.0420	0.84403	0.00	0.00
M04	1	10.000	6.000	0.0832	0.21763	0.09755	0.8632	0.8632	39.9636	40.8269	1.7082	1.33220	0.00	0.00
M05	1	10.000	6.000	0.0832	0.21763	0.09755	0.8632	0.8632	39.9636	40.8269	1.7082	1.33220	0.00	0.00
103KM101	1	10.000	11.000	0.2514	0.03830	0.03200	0.3207	0.2138	4.4370	4.7577	0.5247	0.46256	0.00	0.90

103KM201	1	10.000	11.000	0.2518	0.08177	0.03670	0.2597	0.2597	4.3417	4.6015	0.5047	0.39908	0.00	0.90
111KM101	1	10.000	11.000	0.9991	0.00912	0.03164	0.2003	0.1335	5.6432	5.8435	0.3307	0.58114	0.00	0.67
111KM201	1	10.000	11.000	1.0011	0.02397	0.01073	0.1491	0.1491	5.1067	5.2557	0.2939	1.55946	0.00	0.67
111KM301	1	10.000	11.000	1.0011	0.05058	0.02270	0.1635	0.1635	5.2235	5.3869	0.3220	0.75531	0.00	0.67
111KM401	1	10.000	11.000	1.0011	0.02397	0.01073	0.1491	0.1491	5.1067	5.2557	0.2939	1.55946	0.00	0.67
111KM501	1	10.000	11.000	1.0130	0.02144	0.00959	0.1475	0.1475	5.5033	5.6508	0.2911	1.87581	0.00	0.67
111KM601	1	10.000	11.000	1.0130	0.02144	0.00959	0.1475	0.1475	5.5033	5.6508	0.2911	1.87581	0.00	0.67
125PM10D	1	10.000	6.000	0.1154	0.15804	0.07077	0.6594	0.6594	32.4681	33.1274	1.3056	1.48998	0.00	0.00
125PM10A	1	10.000	6.000	0.1154	0.15804	0.07077	0.6594	0.6594	32.4681	33.1274	1.3056	1.48998	0.00	0.00
125PM10B	1	10.000	6.000	0.1154	0.15804	0.07077	0.6594	0.6594	32.4681	33.1274	1.3056	1.48998	0.00	0.00
147KM10A	1	10.000	11.000	3.1863	0.00733	0.02497	0.1589	0.1059	4.9590	5.1178	0.2626	0.64562	0.00	0.80
147KM10B	1	10.000	11.000	3.1170	0.04223	0.01895	0.1329	0.1329	5.8823	6.0152	0.2628	1.01013	0.00	0.80
LM22	1	10.000	0.400	0.0005	6.79990	4.77310	15.8000	15.8000	570.1750	585.9750	31.1740	0.39078	0.00	0.00

BUSBAR NAME	MOTOR NO.	MOTOR POWER INPUT MW	MVAR	SLIP P.C.
ACIDA		60.50774	36.85601	0.815
COMMU		40.36002	23.73146	0.867
C2REC		14.14023	7.87159	0.964
UREAA		20.15584	12.92202	0.750
SEAWA		40.35986	23.73706	0.866
4THAR		50.44247	29.94073	0.852
ASU		60.50814	36.83962	0.816
10THO		60.50774	36.85601	0.815
9THOL		80.75938	46.16132	0.914
AU16KV		4.26407	2.67601	1.609
AU1400		0.42715	0.26768	0.989
AU2400		0.42715	0.26768	0.989
AU36KV		4.26407	2.67600	1.609
AU3400		0.42715	0.26768	0.989
AU4400		0.42715	0.26768	0.989
AU5400		0.42715	0.26768	0.989
AU66KV		4.26407	2.67600	1.609
AU6400		0.42715	0.26768	0.989
PH678		0.00220	29.46614	0.000
LM1		0.20463	0.11620	2.479
LM2		0.04535	0.02604	2.482
LM1		0.00000	0.00000	100.000
**** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****				
ML1		2.03747	0.98598	0.790
ML1		0.71230	0.33506	1.168
LM1		0.00000	0.00000	100.000

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   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

LM1              0.51899        0.25263      2.641
LM1              0.59196        0.20296      2.740
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

LM1              0.40124        0.28011      2.396
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.21378        0.16259      2.282
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

LM2              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1              0.00239        0.56242      0.000
ML1              1.17024        0.55593      0.782
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.18538        0.13523      2.223

LM1              0.66581        0.45728      2.468
LM1              0.33967        0.23848      2.372
LM1              0.00153        0.13163      0.000
LM2              0.00241        0.00120      2.544
LM1              0.23607        0.11512      2.626

LM2              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.12813        0.06248      2.626
LM21             0.05292        0.02581      2.626
LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

LM1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1              0.42463        0.23025      2.566
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LM1             0.33839       0.18434      2.537
LM1             0.49271       0.26586      2.598
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1             0.00147       0.34802      0.000

ML1             0.93849       0.44293      1.185
LM1             0.61298       0.29523      2.736
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1             0.60812       0.28731      2.789
LM1             0.36013       0.17537      2.638

LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1             0.50376       0.23699      1.197
ML1             0.18100       0.08528      1.173
LM1             0.33900       0.18243      2.616

LM1             0.21083       0.12066      2.502
LM1             0.41389       0.23296      2.601
LM1             0.32636       0.18622      2.520
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

LM1             0.06748       0.03310      2.580
LM1             0.01669       0.00820      2.574
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM2             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
ML1             2.02500       1.88211      0.252

ML1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM1             0.28229       0.20121      2.311
LM1             0.10558       0.07790      2.183
LM1             0.60400       0.43783      2.247
LM1             0.00000       0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

M02             0.14719       0.07234      1.054
M02             0.23066       0.11092      1.066
M04             0.82261       0.36431      0.830
M05             0.82248       0.36467      0.827
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103KM101          2.70113        2.48338      1.028

103KM201          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
111KM101          4.07207        2.37581      1.312
111KM201          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
111KM301          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
111KM401          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****

111KM501          3.24020        2.18546      0.307
111KM601          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
125PM10D          0.00150        0.31451      0.000
125PM10A          0.00151        0.31703      0.000
125PM10B          0.00150        0.31457      0.000

147KM10A          3.03262        2.34281      0.750
147KM10B          0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****
LM22              0.00000        0.00000    100.000
   **** THE ABOVE MOTOR IS INITIALLY DISCONNECTED FROM SYSTEM ****



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*    NOTE - ANY NON-ESSENTIAL PARAMETERS MISSING FROM THE INPUT DATA HAVE    *
*    BEEN ASSIGNED APPROPRIATE VALUES FOR USE IN THE CALCULATION PROCESS,    *
*    AS SHOWN ABOVE. A VALUE INDICATED AS 9.999 OR 99.99 IS ACTUALLY 9999    *
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SHUNT LOADS
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BUSBAR     MEGAWATTS    MEGAVARS

ACIDA       17.00000    10.53565
COMMU       10.71000     6.63746
C2REC        3.40000     2.10713
UREAA        6.12000     3.79284
SEAWA       10.71000     6.63746
4THAR       13.60000     8.42852
ASU         17.00000    10.53565
10THO       17.00000    10.53565
9THOL       20.40000    12.64278
AU1400       0.08500     0.05268
AU16KV       0.85000     0.52678
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 AU2400       0.08500     0.05268
 AU36KV       0.85000     0.52678
 AU3400       0.08500     0.05268
 AU4400       0.08500     0.05268
 AU5400       0.08500     0.05268
 AU66KV       0.85000     0.52678
 AU6400       0.08500     0.05268
 OUT1         0.00000     0.80000
 PH678       14.00000     8.00000
 LM1          0.00000     0.20000
 LM1          0.13410     0.06495
 LM1          0.41040     0.13489
 LM1          0.00000     0.07406
 LM1          0.05696     0.04272
 LM1          0.00000     0.03434
 LM1          0.17581     0.12271
 LM1          0.06102     0.02955
 LM1          0.03312     0.01604
 LM21         0.01368     0.00662
 LM1          0.08800     0.04750
 LM1          0.12795     0.06906
 LM1          0.15804     0.07654
 LM1          0.05371     0.02601
 LM1          0.08800     0.04750
 LM1          0.10770     0.06104
 LM1          0.01746     0.00846
 LM1          0.07479     0.05220
 LM1          0.16023     0.11184
1TRANSIENT STABILITY    OUTPUT OF RESULTS
 ========================================
 SYSTEM TITLE:  100M VA F IRE  UP S ITUA TION  AS  ACTU AL R ELAY  SET
 STUDY TITLE:
 REF. M/C = NO.    ON BUS
 INTEGRATION STEP (SEC) = 0.000500
 STUDY DURATION   (SEC) = 0.001000
 PRINT INTERVAL   (SEC) = 0.000500
 SYNCH. M/C ANGLE LIMIT =90000.DEG
-SPECIFIED SWITCHING OPERATIONS
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 SWITCH     SWITCH     SENDING     RECEIVING       RESISTANCE      REACTANCE      SUSCEPTANCE     TAP
  TIME      IN/OUT      BUSBAR      BUSBAR        P.U.   -MW     P.U.-MVAR         P.U.         P.C.

 0.1870       IN       INT1                       0.00170        0.00745
+                                  *
-INDUCTION MOTOR SWITCHING OPERATIONS
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 BUSBAR   M/C     CONTACTOR OPERATIONS (SECS)          CONTACTOR SETTINGS
  NAME    NO.   OUT       IN      OUT       IN    DROP-OUT  PICK-UP   DELAY   LOCK-OUT START-DELAY
                                                  VOLTAGE  VOLTAGE    TIME     TIMER  SETTING(PC)
```

NO MOTOR SWITCHING OPERATIONS

INITIAL CONDITIONS

SYNCHRONOUS MACHINES

BUSBAR NAME	M/C NO.	ROTOR ANGLE DEGREES	POLE PRS SLPD	ROTOR SLIP P.U.	MECH. POWER MW	POWER OUTPUT ACTIVE MW	POWER OUTPUT REACTIVE MVAR	TERM. VOLTAGE P.U.	TERM. CURRENT P.U.	FIELD VOLTAGE P.U.	FIELD CURRENT P.U.	POWER FACTOR
GT1		18.95	0	0.0000	52.899	52.841	69.959	1.045	8.390	2.028	2.028	0.6027
GT2		35.86	0	0.0000	100.110	100.000	68.440	1.045	11.596	2.272	2.272	0.8252
GT3		35.07	0	0.0000	100.114	100.000	71.627	1.045	11.771	2.305	2.305	0.8130
GT4		35.86	0	0.0000	100.110	100.000	68.440	1.045	11.596	2.272	2.272	0.8252
GT5		35.86	0	0.0000	100.110	100.000	68.440	1.045	11.596	2.272	2.272	0.8252
GT6		35.07	0	0.0000	100.114	100.000	71.627	1.045	11.771	2.305	2.305	0.8130
GRIDG		3.51	0	0.0000	60.257	60.000	40.000	1.059	6.809	1.072	1.072	0.8321
04DG31A		0.00	0	0.0000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.0000
04DG31B		0.00	0	0.0000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.0000
04DG31C		0.00	0	0.0000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.0000
08DG		0.00	0	0.0000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.0000

AUTOMATIC VOLTAGE REGULATORS

BUSBAR NAME	M/C NO.	CONTROLLED BUS VOLTS	I/P FILTER SIGNAL	AMPLIFIER SIGNAL	FEEDBACK SIGNAL
GT1		1.045	1.045	2.028	0.000
GT2		1.045	1.045	2.272	0.000
GT3		1.045	1.045	2.305	0.000
GT4		1.045	1.045	2.272	0.000
GT5		1.045	1.045	2.272	0.000
GT6		1.045	1.045	2.305	0.000

THERMAL TURBINE GOVERNOR(S)

BUSBAR NAME	M/C NO.	FLYBALL SIGNAL (SLIP)	CONTROL SYSTEM SIGNALS (MW) C1	C2	CONTROL VALVE SETTING (MW) C3
GT3		0.0000	0.000	0.000	100.114
GT4		0.0000	0.000	0.000	100.110
GT5		0.0000	0.000	0.000	100.110
GT6		0.0000	0.000	0.000	100.114

INDUCTION MOTOR LOAD

BUSBAR NAME	M/C NO	ROTOR SLIP P.C.	MECH. POWER MW	POWER INPUT ACTIVE MW	POWER INPUT REACTIVE MVAR	TERM. VOLTAGE P.U.	TERM. CURRENT P.U.	TORQUE (MJ) LOAD	TORQUE (MJ) MOTOR	POWER FACTOR

ACIDA	0.8150	60.002	60.508	36.856	0.997	7.104	60.4951	60.4951	0.8540
COMMU	0.8668	40.001	40.360	23.731	0.996	4.701	40.3512	40.3513	0.8620
C2REC	0.9644	14.001	14.140	7.872	0.994	1.629	14.1369	14.1369	0.8737
UREAA	0.7503	20.001	20.156	12.922	0.999	2.397	20.1519	20.1519	0.8418
SEAWA	0.8664	40.001	40.360	23.737	0.996	4.701	40.3511	40.3511	0.8620
4THAR	0.8522	50.002	50.442	29.941	0.996	5.889	50.4316	50.4316	0.8599
ASU	0.8156	60.002	60.508	36.840	0.997	7.106	60.4955	60.4955	0.8541
10THO	0.8150	60.002	60.508	36.856	0.997	7.104	60.4951	60.4951	0.8540
9THOL	0.9141	80.003	80.759	46.161	0.995	9.350	80.7412	80.7412	0.8682
AU16KV	1.6094	4.000	4.264	2.676	1.062	0.474	4.0654	4.0654	0.8470
AU1400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
AU2400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
AU36KV	1.6094	4.000	4.264	2.676	1.062	0.474	4.0654	4.0654	0.8470
AU3400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
AU4400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
AU5400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
AU66KV	1.6094	4.000	4.264	2.676	1.062	0.474	4.0654	4.0654	0.8470
AU6400	0.9893	0.400	0.427	0.268	1.079	0.047	0.4040	0.4040	0.8474
PH678	0.0000	0.000	0.002	29.466	0.992	2.970	0.0000	0.0000	0.0001
LM1	2.4793	0.191	0.205	0.116	1.045	0.023	0.1961	0.1961	0.8696
LM2	2.4824	0.042	0.045	0.026	1.045	0.005	0.0434	0.0434	0.8671
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	0.7902	1.982	2.037	0.986	1.017	0.223	1.9978	1.9978	0.9001
ML1	1.1677	0.684	0.712	0.335	1.024	0.077	0.6921	0.6921	0.9049
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.6412	0.484	0.519	0.253	1.033	0.056	0.4973	0.4973	0.8991
LM1	2.7401	0.563	0.592	0.203	1.023	0.061	0.5785	0.5785	0.9459
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.3959	0.374	0.401	0.280	1.030	0.048	0.3832	0.3832	0.8200
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.2824	0.199	0.214	0.163	1.039	0.026	0.2041	0.2041	0.7960
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	0.0000	0.000	0.002	0.562	1.020	0.055	0.0000	0.0000	0.0043
ML1	0.7817	1.139	1.170	0.556	1.021	0.127	1.1478	1.1478	0.9033
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.2234	0.173	0.185	0.135	1.064	0.022	0.1774	0.1774	0.8079
LM1	2.4676	0.620	0.666	0.457	1.017	0.079	0.6354	0.6354	0.8243
LM1	2.3720	0.317	0.340	0.238	1.035	0.040	0.3245	0.3245	0.8184
LM1	0.0000	0.000	0.002	0.132	1.042	0.013	0.0000	0.0000	0.0116
LM2	2.5443	0.002	0.002	0.001	1.042	0.000	0.0023	0.0023	0.8953
LM1	2.6262	0.220	0.236	0.115	1.036	0.025	0.2263	0.2263	0.8988
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.6263	0.120	0.128	0.062	1.036	0.014	0.1228	0.1228	0.8988
LM21	2.6263	0.049	0.053	0.026	1.036	0.006	0.0507	0.0507	0.8988
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000

LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.5663	0.396	0.425	0.230	1.035	0.047	0.4067	0.4067	0.8791
LM1	2.5374	0.316	0.338	0.184	1.041	0.037	0.3242	0.3242	0.8782
LM1	2.5980	0.459	0.493	0.266	1.030	0.054	0.4717	0.4717	0.8801
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	0.0000	0.000	0.001	0.348	1.013	0.034	0.0000	0.0000	0.0042
ML1	1.1845	0.901	0.938	0.443	1.018	0.102	0.9116	0.9116	0.9043
LM1	2.7360	0.571	0.613	0.295	1.018	0.067	0.5867	0.5867	0.9009
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.7888	0.558	0.608	0.287	1.021	0.066	0.5736	0.5736	0.9042
LM1	2.6380	0.336	0.360	0.175	1.034	0.039	0.3451	0.3451	0.8991
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	1.1967	0.483	0.504	0.237	1.013	0.055	0.4892	0.4892	0.9049
ML1	1.1734	0.174	0.181	0.085	1.022	0.020	0.1759	0.1759	0.9046
LM1	2.6160	0.316	0.339	0.182	1.027	0.037	0.3245	0.3245	0.8806
LM1	2.5023	0.197	0.211	0.121	1.041	0.023	0.2019	0.2019	0.8679
LM1	2.6011	0.386	0.414	0.233	1.024	0.046	0.3959	0.3959	0.8714
LM1	2.5197	0.305	0.326	0.186	1.038	0.036	0.3125	0.3125	0.8686
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.5800	0.063	0.067	0.033	1.044	0.007	0.0647	0.0647	0.8978
LM1	2.5742	0.016	0.017	0.008	1.045	0.002	0.0160	0.0160	0.8977
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM2	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
ML1	0.2519	2.000	2.025	1.882	1.033	0.268	2.0051	2.0051	0.7325
ML1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM1	2.3110	0.264	0.282	0.201	1.047	0.033	0.2699	0.2699	0.8143
LM1	2.1825	0.099	0.106	0.078	1.073	0.012	0.1011	0.1011	0.8047
LM1	2.2465	0.565	0.604	0.438	1.060	0.070	0.5778	0.5778	0.8097
LM1	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
M02	1.0543	0.144	0.147	0.072	1.021	0.016	0.1455	0.1455	0.8975
M02	1.0661	0.222	0.231	0.111	1.023	0.025	0.2244	0.2244	0.9012
M04	0.8300	0.799	0.823	0.364	1.022	0.088	0.8057	0.8057	0.9143
M05	0.8272	0.799	0.822	0.365	1.024	0.088	0.8057	0.8057	0.9142
103KM101	1.0284	2.622	2.701	2.483	0.997	0.368	2.6493	2.6493	0.7362
103KM201	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
111KM101	1.3122	4.000	4.072	2.376	1.037	0.455	4.0532	4.0532	0.8637
111KM201	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
111KM301	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
111KM401	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
111KM501	0.3071	3.200	3.240	2.185	1.039	0.376	3.2099	3.2099	0.8290
111KM601	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
125PM10D	0.0000	0.000	0.002	0.315	1.021	0.031	0.0000	0.0000	0.0048
125PM10A	0.0000	0.000	0.002	0.317	1.025	0.031	0.0000	0.0000	0.0048
125PM10B	0.0000	0.000	0.002	0.315	1.021	0.031	0.0000	0.0000	0.0048
147KM10A	0.7502	3.000	3.033	2.343	1.041	0.368	3.0227	3.0227	0.7914
147KM10B	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000
LM22	100.0000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000	0.0000

BUSBAR VOLTAGES

BUSBAR	VOLTAGE	ANGLE	*	BUSBAR	VOLTAGE	ANGLE	*	BUSBAR	VOLTAGE	ANGLE	*	BUSBAR	VOLTAGE	ANGLE
MBIN132	0.997	-2.25		GT6	1.045	32.33		GT5	1.045	32.58		GT4	1.045	32.58
MBIN132	0.997	-122.25		GT6	1.045	-87.67		GT5	1.045	-87.42		GT4	1.045	-87.42
MBIN132	0.997	117.75		GT6	1.045	152.33		GT5	1.045	152.58		GT4	1.045	152.58
MBIN132	0.997	-2.25		GT6	1.045	32.33		GT5	1.045	32.58		GT4	1.045	32.58
GT3	1.045	32.33		GT2	1.045	32.58		GT1	1.045	30.00		GC1	1.045	29.99
GT3	1.045	-87.67		GT2	1.045	-87.42		GT1	1.045	-90.00		GC1	1.045	-90.01
GT3	1.045	152.33		GT2	1.045	152.58		GT1	1.045	150.00		GC1	1.045	149.99
GT3	1.045	32.33		GT2	1.045	32.58		GT1	1.045	30.00		GC1	1.045	29.99
GC2	1.045	32.57		GC3	1.045	32.32		GC4	1.045	32.57		GC5	1.045	32.57
GC2	1.045	-87.43		GC3	1.045	-87.68		GC4	1.045	-87.43		GC5	1.045	-87.43
GC2	1.045	152.57		GC3	1.045	152.32		GC4	1.045	152.57		GC5	1.045	152.57
GC2	1.045	32.57		GC3	1.045	32.32		GC4	1.045	32.57		GC5	1.045	32.57
GC6	1.045	32.32		INT1	0.993	-2.45		1S11A	1.006	-34.21		MBF1321	0.997	-2.25
GC6	1.045	-87.68		INT1	0.993	-122.45		1S11A	1.006	-154.21		MBF1321	0.997	-122.25
GC6	1.045	152.32		INT1	0.993	117.55		1S11A	1.006	85.79		MBF1321	0.997	117.75
GC6	1.045	32.32		INT1	0.993	-2.45		1S11A	1.006	-34.21		MBF1321	0.997	-2.25
GRID	0.997	-2.24		J1	0.996	-2.26		J2	0.996	-2.27		J3	0.997	-2.26
GRID	0.997	-122.24		J1	0.996	-122.26		J2	0.996	-122.27		J3	0.997	-122.26
GRID	0.997	117.76		J1	0.996	117.74		J2	0.996	117.73		J3	0.997	117.74
GRID	0.997	-2.24		J1	0.996	-2.26		J2	0.996	-2.27		J3	0.997	-2.26
J4	0.997	-2.26		J5	0.997	-2.26		J6	0.996	-2.27		J7	0.996	-2.27
J4	0.997	-122.26		J5	0.997	-122.26		J6	0.996	-122.27		J7	0.996	-122.27
J4	0.997	117.74		J5	0.997	117.74		J6	0.996	117.73		J7	0.996	117.73
J4	0.997	-2.26		J5	0.997	-2.26		J6	0.996	-2.27		J7	0.996	-2.27
J8	0.996	-2.26		J9	0.996	-2.26		ACIDA	0.997	-36.46		COMMU	0.996	-36.67
J8	0.996	-122.26		J9	0.996	-122.26		ACIDA	0.997	-156.46		COMMU	0.996	-156.67
J8	0.996	117.74		J9	0.996	117.74		ACIDA	0.997	83.54		COMMU	0.996	83.33
J8	0.996	-2.26		J9	0.996	-2.26		ACIDA	0.997	-36.46		COMMU	0.996	-36.67
C2REC	0.994	-37.03		UREAA	0.999	-36.20		SEAWA	0.996	-36.66		4THAR	0.996	-36.62
C2REC	0.994	-157.03		UREAA	0.999	-156.20		SEAWA	0.996	-156.66		4THAR	0.996	-156.62
C2REC	0.994	82.97		UREAA	0.999	83.80		SEAWA	0.996	83.34		4THAR	0.996	83.38
C2REC	0.994	-37.03		UREAA	0.999	-36.20		SEAWA	0.996	-36.66		4THAR	0.996	-36.62
ASU	0.997	-36.48		10THO	0.997	-36.46		9THOL	0.995	-36.84		AU1400	1.079	58.94
ASU	0.997	-156.48		10THO	0.997	-156.46		9THOL	0.995	-156.84		AU1400	1.079	-61.06
ASU	0.997	83.52		10THO	0.997	83.54		9THOL	0.995	83.16		AU1400	1.079	178.94
ASU	0.997	-36.48		10THO	0.997	-36.46		9THOL	0.995	-36.84		AU1400	1.079	58.94
AU16KV	1.062	57.96		AU2400	1.079	61.53		AU36KV	1.062	60.28		AU3400	1.079	61.27
AU16KV	1.062	-62.04		AU2400	1.079	-58.47		AU36KV	1.062	-59.72		AU3400	1.079	-58.73
AU16KV	1.062	177.96		AU2400	1.079	-178.47		AU36KV	1.062	-179.72		AU3400	1.079	-178.73
AU16KV	1.062	57.96		AU2400	1.079	61.53		AU36KV	1.062	60.28		AU3400	1.079	61.27
AU4400	1.079	61.53		AU5400	1.079	61.53		AU66KV	1.062	60.28		AU6400	1.079	61.27
AU4400	1.079	-58.47		AU5400	1.079	-58.47		AU66KV	1.062	-59.72		AU6400	1.079	-58.73
AU4400	1.079	-178.47		AU5400	1.079	-178.47		AU66KV	1.062	-179.72		AU6400	1.079	-178.73
AU4400	1.079	61.53		AU5400	1.079	61.53		AU66KV	1.062	60.28		AU6400	1.079	61.27
GRID132	0.998	-2.19		GRID230	1.059	2.84		JGRID	1.001	-1.92		GRID20	1.001	28.08
GRID132	0.998	-122.19		GRID230	1.059	-117.16		JGRID	1.001	-121.92		GRID20	1.001	-91.92
GRID132	0.998	117.81		GRID230	1.059	122.84		JGRID	1.001	118.08		GRID20	1.001	148.08

GRID132	0.998	-2.19	GRID230	1.059	2.84	JGRID	1.001	-1.92	GRID20	1.001	28.08
GRIDG	1.059	2.87	OUT1	1.006	-34.21	J0	0.995	-2.26	PH678	0.992	-32.97
GRIDG	1.059	-117.13	OUT1	1.006	-154.21	J0	0.995	-122.26	PH678	0.992	-152.97
GRIDG	1.059	122.87	OUT1	1.006	85.79	J0	0.995	117.74	PH678	0.992	87.03
GRIDG	1.059	2.87	OUT1	1.006	-34.21	J0	0.995	-2.26	PH678	0.992	-32.97
1S11B	1.006	-34.21	01TR3413	1.018	-4.54	01ES41	1.045	25.00	LM1	1.045	25.00
1S11B	1.006	-154.21	01TR3413	1.018	-124.54	01ES41	1.045	-95.00	LM1	1.045	-95.00
1S11B	1.006	85.79	01TR3413	1.018	115.46	01ES41	1.045	145.00	LM1	1.045	145.00
1S11B	1.006	-34.21	01TR3413	1.018	-4.54	01ES41	1.045	25.00	LM1	1.045	25.00
LM2	1.045	25.00	01TR4413	1.045	25.00	01T2	1.033	23.81	01T3	1.045	25.00
LM2	1.045	-95.00	01TR4413	1.045	-95.00	01T2	1.033	-96.19	01T3	1.045	-95.00
LM2	1.045	145.00	01TR4413	1.045	145.00	01T2	1.033	143.81	01T3	1.045	145.00
LM2	1.045	25.00	01TR4413	1.045	25.00	01T2	1.033	23.81	01T3	1.045	25.00
01T5	1.045	25.00	01T6	1.023	22.26	01ES42	1.045	25.00	LM1	1.045	25.00
01T5	1.045	-95.00	01T6	1.023	-97.74	01ES42	1.045	-95.00	LM1	1.045	-95.00
01T5	1.045	145.00	01T6	1.023	142.26	01ES42	1.045	145.00	LM1	1.045	145.00
01T5	1.045	25.00	01T6	1.023	22.26	01ES42	1.045	25.00	LM1	1.045	25.00
01TR1311	1.006	-34.21	01TR3311	1.017	-5.55	01TR1312	1.006	-34.21	01TR3312	1.024	-4.81
01TR1311	1.006	-154.21	01TR3311	1.017	-125.55	01TR1312	1.006	-154.21	01TR3312	1.024	-124.81
01TR1311	1.006	85.79	01TR3311	1.017	114.45	01TR1312	1.006	85.79	01TR3312	1.024	115.19
01TR1311	1.006	-34.21	01TR3311	1.017	-5.55	01TR1312	1.006	-34.21	01TR3312	1.024	-4.81
ML1	1.017	-5.56	01S31A	1.017	-5.55	01S31B	1.024	-4.81	ML1	1.024	-4.81
ML1	1.017	-125.56	01S31A	1.017	-125.55	01S31B	1.024	-124.81	ML1	1.024	-124.81
ML1	1.017	114.44	01S31A	1.017	114.45	01S31B	1.024	115.19	ML1	1.024	115.19
ML1	1.017	-5.56	01S31A	1.017	-5.55	01S31B	1.024	-4.81	ML1	1.024	-4.81
01S41A	1.042	24.45	LM1	1.042	24.45	01TR3411	1.017	-5.55	01S41B	1.033	23.81
01S41A	1.042	-95.55	LM1	1.042	-95.55	01TR3411	1.017	-125.55	01S41B	1.033	-96.19
01S41A	1.042	144.45	LM1	1.042	144.45	01TR3411	1.017	114.45	01S41B	1.033	143.81
01S41A	1.042	24.45	LM1	1.042	24.45	01TR3411	1.017	-5.55	01S41B	1.033	23.81
LM1	1.033	23.81	01S42A	1.023	22.26	LM1	1.023	22.26	01S42B	1.049	25.19
LM1	1.033	-96.19	01S42A	1.023	-97.74	LM1	1.023	-97.74	01S42B	1.049	-94.81
LM1	1.033	143.81	01S42A	1.023	142.26	LM1	1.023	142.26	01S42B	1.049	145.19
LM1	1.033	23.81	01S42A	1.023	22.26	LM1	1.023	22.26	01S42B	1.049	25.19
LM1	1.049	25.19	01TR3412	1.024	-4.81	01TR3415	1.024	-4.81	01TR4411	1.042	24.45
LM1	1.049	-94.81	01TR3412	1.024	-124.81	01TR3415	1.024	-124.81	01TR4411	1.042	-95.55
LM1	1.049	145.19	01TR3412	1.024	115.19	01TR3415	1.024	115.19	01TR4411	1.042	144.45
LM1	1.049	25.19	01TR3412	1.024	-4.81	01TR3415	1.024	-4.81	01TR4411	1.042	24.45
01TR4412	1.033	23.81	01TR3414	1.017	-5.56	01TR4414	1.023	22.26	01TR4415	1.049	25.19
01TR4412	1.033	-96.19	01TR3414	1.017	-125.56	01TR4414	1.023	-97.74	01TR4415	1.049	-94.81
01TR4412	1.033	143.81	01TR3414	1.017	114.44	01TR4414	1.023	142.26	01TR4415	1.049	145.19
01TR4412	1.033	23.81	01TR3414	1.017	-5.56	01TR4414	1.023	22.26	01TR4415	1.049	25.19
01T1	1.033	23.81	01T4	1.023	22.26	02ES41	1.049	25.20	LM1	1.049	25.20
01T1	1.033	-96.19	01T4	1.023	-97.74	02ES41	1.049	-94.80	LM1	1.049	-94.80
01T1	1.033	143.81	01T4	1.023	142.26	02ES41	1.049	145.20	LM1	1.049	145.20
01T1	1.033	23.81	01T4	1.023	22.26	02ES41	1.049	25.20	LM1	1.049	25.20
LM2	1.049	25.20	02TR3413	1.024	-4.80	02TR4413	1.049	25.20	02T2	1.048	25.35
LM2	1.049	-94.80	02TR3413	1.024	-124.80	02TR4413	1.049	-94.80	02T2	1.048	-94.65
LM2	1.049	145.20	02TR3413	1.024	115.20	02TR4413	1.049	145.20	02T2	1.048	145.35
LM2	1.049	25.20	02TR3413	1.024	-4.80	02TR4413	1.049	25.20	02T2	1.048	25.35
02TR1311	1.006	-34.21	02TR3311	1.021	-4.68	02TR1312	1.006	-34.21	02TR3312	1.023	-4.65
02TR1311	1.006	-154.21	02TR3311	1.021	-124.68	02TR1312	1.006	-154.21	02TR3312	1.023	-124.65
02TR1311	1.006	85.79	02TR3311	1.021	115.32	02TR1312	1.006	85.79	02TR3312	1.023	115.35

02TR1311	1.006	-34.21	02TR3311	1.021	-4.68	02TR1312	1.006	-34.21	02TR3312	1.023	-4.65
M02	1.021	-4.68	02S31A	1.021	-4.68	02S31B	1.023	-4.65	M02	1.023	-4.65
M02	1.021	-124.68	02S31A	1.021	-124.68	02S31B	1.023	-124.65	M02	1.023	-124.65
M02	1.021	115.32	02S31A	1.021	115.32	02S31B	1.023	115.35	M02	1.023	115.35
M02	1.021	-4.68	02S31A	1.021	-4.68	02S31B	1.023	-4.65	M02	1.023	-4.65
02S41A	1.030	24.58	LM1	1.030	24.58	02S41B	1.048	25.35	LM1	1.048	25.35
02S41A	1.030	-95.42	LM1	1.030	-95.42	02S41B	1.048	-94.65	LM1	1.048	-94.65
02S41A	1.030	144.58	LM1	1.030	144.58	02S41B	1.048	145.35	LM1	1.048	145.35
02S41A	1.030	24.58	LM1	1.030	24.58	02S41B	1.048	25.35	LM1	1.048	25.35
02S42A	1.046	25.32	LM1	1.046	25.32	02S42B	1.039	24.88	LM1	1.039	24.88
02S42A	1.046	-94.68	LM1	1.046	-94.68	02S42B	1.039	-95.12	LM1	1.039	-95.12
02S42A	1.046	145.32	LM1	1.046	145.32	02S42B	1.039	144.88	LM1	1.039	144.88
02S42A	1.046	25.32	LM1	1.046	25.32	02S42B	1.039	24.88	LM1	1.039	24.88
02TR3411	1.021	-4.68	02TR4411	1.030	24.58	02TR3412	1.023	-4.65	02TR4412	1.048	25.35
02TR3411	1.021	-124.68	02TR4411	1.030	-95.42	02TR3412	1.023	-124.65	02TR4412	1.048	-94.65
02TR3411	1.021	115.32	02TR4411	1.030	144.58	02TR3412	1.023	115.35	02TR4412	1.048	145.35
02TR3411	1.021	-4.68	02TR4411	1.030	24.58	02TR3412	1.023	-4.65	02TR4412	1.048	25.35
02TR3414	1.021	-4.68	02TR4414	1.046	25.32	02TR3415	1.023	-4.65	02TR4415	1.039	24.88
02TR3414	1.021	-124.68	02TR4414	1.046	-94.68	02TR3415	1.023	-124.65	02TR4415	1.039	-95.12
02TR3414	1.021	115.32	02TR4414	1.046	145.32	02TR3415	1.023	115.35	02TR4415	1.039	144.88
02TR3414	1.021	-4.68	02TR4414	1.046	25.32	02TR3415	1.023	-4.65	02TR4415	1.039	24.88
02T1	1.048	25.35	03ES41	1.049	25.20	LM1	1.049	25.20	LM2	1.049	25.20
02T1	1.048	-94.65	03ES41	1.049	-94.80	LM1	1.049	-94.80	LM2	1.049	-94.80
02T1	1.048	145.35	03ES41	1.049	145.20	LM1	1.049	145.20	LM2	1.049	145.20
02T1	1.048	25.35	03ES41	1.049	25.20	LM1	1.049	25.20	LM2	1.049	25.20
03TR3413	1.024	-4.80	03TR4413	1.049	25.20	03T2	1.064	24.70	03TR1311	1.006	-34.20
03TR3413	1.024	-124.80	03TR4413	1.049	-94.80	03T2	1.064	-95.30	03TR1311	1.006	-154.20
03TR3413	1.024	115.20	03TR4413	1.049	145.20	03T2	1.064	144.70	03TR1311	1.006	85.80
03TR3413	1.024	-4.80	03TR4413	1.049	25.20	03T2	1.064	24.70	03TR1311	1.006	-34.20
03TR3311	1.020	-4.54	03TR1312	1.005	-34.21	03TR3312	1.021	-4.94	ML1	1.020	-4.55
03TR3311	1.020	-124.54	03TR1312	1.005	-154.21	03TR3312	1.021	-124.94	ML1	1.020	-124.55
03TR3311	1.020	115.46	03TR1312	1.005	85.79	03TR3312	1.021	115.06	ML1	1.020	115.45
03TR3311	1.020	-4.54	03TR1312	1.005	-34.21	03TR3312	1.021	-4.94	ML1	1.020	-4.55
03S31A	1.020	-4.55	03S31B	1.021	-4.95	ML1	1.021	-4.95	03S41A	1.071	25.45
03S31A	1.020	-124.55	03S31B	1.021	-124.95	ML1	1.021	-124.95	03S41A	1.071	-94.55
03S31A	1.020	115.45	03S31B	1.021	115.05	ML1	1.021	115.05	03S41A	1.071	145.45
03S31A	1.020	-4.55	03S31B	1.021	-4.95	ML1	1.021	-4.95	03S41A	1.071	25.45
LM1	1.071	25.45	03S41B	1.064	24.70	LM1	1.064	24.70	03S42A	1.017	23.68
LM1	1.071	-94.55	03S41B	1.064	-95.30	LM1	1.064	-95.30	03S42A	1.017	-96.32
LM1	1.071	145.45	03S41B	1.064	144.70	LM1	1.064	144.70	03S42A	1.017	143.68
LM1	1.071	25.45	03S41B	1.064	24.70	LM1	1.064	24.70	03S42A	1.017	23.68
LM1	1.017	23.67	03S42B	1.035	24.35	LM1	1.035	24.35	03TR3411	1.020	-4.55
LM1	1.017	-96.33	03S42B	1.035	-95.65	LM1	1.035	-95.65	03TR3411	1.020	-124.55
LM1	1.017	143.67	03S42B	1.035	144.35	LM1	1.035	144.35	03TR3411	1.020	115.45
LM1	1.017	23.67	03S42B	1.035	24.35	LM1	1.035	24.35	03TR3411	1.020	-4.55
03TR4411	1.071	25.45	03TR3412	1.021	-4.95	03TR4412	1.065	24.70	03TR3414	1.020	-4.55
03TR4411	1.071	-94.55	03TR3412	1.021	-124.95	03TR4412	1.065	-95.30	03TR3414	1.020	-124.55
03TR4411	1.071	145.45	03TR3412	1.021	115.05	03TR4412	1.065	144.70	03TR3414	1.020	115.45
03TR4411	1.071	25.45	03TR3412	1.021	-4.95	03TR4412	1.065	24.70	03TR3414	1.020	-4.55
03TR4414	1.017	23.68	03TR3415	1.021	-4.95	03TR4415	1.035	24.35	03T1	1.064	24.70
03TR4414	1.017	-96.32	03TR3415	1.021	-124.95	03TR4415	1.035	-95.65	03T1	1.064	-95.30
03TR4414	1.017	143.68	03TR3415	1.021	115.05	03TR4415	1.035	144.35	03T1	1.064	144.70

03TR4414	1.017	23.68	03TR3415	1.021	-4.95	03TR4415	1.035	24.35	03T1	1.064	24.70
04ES41A	1.042	25.37	LM1	1.042	25.37	LM2	1.042	25.37	04TR3413	1.022	-4.66
04ES41A	1.042	-94.63	LM1	1.042	-94.63	LM2	1.042	-94.63	04TR3413	1.022	-124.66
04ES41A	1.042	145.37	LM1	1.042	145.37	LM2	1.042	145.37	04TR3413	1.022	115.34
04ES41A	1.042	25.37	LM1	1.042	25.37	LM2	1.042	25.37	04TR3413	1.022	-4.66
04TR4413	1.042	25.37	04T3	1.042	25.37	04T5	1.042	25.37	04ES41B	1.036	24.18
04TR4413	1.042	-94.63	04T3	1.042	-94.63	04T5	1.042	-94.63	04ES41B	1.036	-95.83
04TR4413	1.042	145.37	04T3	1.042	145.37	04T5	1.042	145.37	04ES41B	1.036	144.18
04TR4413	1.042	25.37	04T3	1.042	25.37	04T5	1.042	25.37	04ES41B	1.036	24.18
LM1	1.036	24.17	04T6	1.036	24.17	LM2	1.042	25.37	04TR1311	1.005	-34.21
LM1	1.036	-95.83	04T6	1.036	-95.83	LM2	1.042	-94.63	04TR1311	1.005	-154.21
LM1	1.036	144.17	04T6	1.036	144.17	LM2	1.042	145.37	04TR1311	1.005	85.79
LM1	1.036	24.17	04T6	1.036	24.17	LM2	1.042	25.37	04TR1311	1.005	-34.21
04TR3311	1.022	-4.66	04TR1312	1.005	-34.21	04TR3312	1.024	-4.80	04S31A	1.022	-4.66
04TR3311	1.022	-124.66	04TR1312	1.005	-154.21	04TR3312	1.024	-124.80	04S31A	1.022	-124.66
04TR3311	1.022	115.34	04TR1312	1.005	85.79	04TR3312	1.024	115.20	04S31A	1.022	115.34
04TR3311	1.022	-4.66	04TR1312	1.005	-34.21	04TR3312	1.024	-4.80	04S31A	1.022	-4.66
04S31B	1.024	-4.80	04S41A	1.047	25.34	LM1	1.036	24.17	M04	1.022	-4.66
04S31B	1.024	-124.80	04S41A	1.047	-94.66	LM1	1.036	-95.83	M04	1.022	-124.66
04S31B	1.024	115.20	04S41A	1.047	145.34	LM1	1.036	144.17	M04	1.022	115.34
04S31B	1.024	-4.80	04S41A	1.047	25.34	LM1	1.036	24.17	M04	1.022	-4.66
04S41B	1.049	25.20	LM21	1.036	24.17	M05	1.024	-4.80	04ES42A	1.042	25.37
04S41B	1.049	-94.80	LM21	1.036	-95.83	M05	1.024	-124.80	04ES42A	1.042	-94.63
04S41B	1.049	145.20	LM21	1.036	144.17	M05	1.024	115.20	04ES42A	1.042	145.37
04S41B	1.049	25.20	LM21	1.036	24.17	M05	1.024	-4.80	04ES42A	1.042	25.37
04ES42B	1.036	24.17	LM1	1.047	25.34	LM2	1.049	25.20	04TR3411	1.022	-4.66
04ES42B	1.036	-95.83	LM1	1.047	-94.66	LM2	1.049	-94.80	04TR3411	1.022	-124.66
04ES42B	1.036	144.17	LM1	1.047	145.34	LM2	1.049	145.20	04TR3411	1.022	115.34
04ES42B	1.036	24.17	LM1	1.047	25.34	LM2	1.049	25.20	04TR3411	1.022	-4.66
04TR4411	1.047	25.34	04TR3412	1.024	-4.80	04TR4412	1.049	25.20	04TR3414	1.024	-4.80
04TR4411	1.047	-94.66	04TR3412	1.024	-124.80	04TR4412	1.049	-94.80	04TR3414	1.024	-124.80
04TR4411	1.047	145.34	04TR3412	1.024	115.20	04TR4412	1.049	145.20	04TR3414	1.024	115.20
04TR4411	1.047	25.34	04TR3412	1.024	-4.80	04TR4412	1.049	25.20	04TR3414	1.024	-4.80
04TR4414	1.036	24.18	04T4	1.036	24.17	04DG31A	1.000	0.00	04DG32A	1.000	0.00
04TR4414	1.036	-95.82	04T4	1.036	-95.83	04DG31A	1.000	-120.00	04DG32A	1.000	-120.00
04TR4414	1.036	144.18	04T4	1.036	144.17	04DG31A	1.000	120.00	04DG32A	1.000	120.00
04TR4414	1.036	24.18	04T4	1.036	24.17	04DG31A	1.000	0.00	04DG32A	1.000	0.00
04DG31B	1.000	0.00	04DG32B	1.000	0.00	04ES31A	1.022	-4.66	04ES31B	1.024	-4.80
04DG31B	1.000	-120.00	04DG32B	1.000	-120.00	04ES31A	1.022	-124.66	04ES31B	1.024	-124.80
04DG31B	1.000	120.00	04DG32B	1.000	120.00	04ES31A	1.022	115.34	04ES31B	1.024	115.20
04DG31B	1.000	0.00	04DG32B	1.000	0.00	04ES31A	1.022	-4.66	04ES31B	1.024	-4.80
04ES31C	1.024	-4.80	04DG31C	1.000	0.00	04DG32C	1.000	0.00	05ES41	1.047	25.34
04ES31C	1.024	-124.80	04DG31C	1.000	-120.00	04DG32C	1.000	-120.00	05ES41	1.047	-94.66
04ES31C	1.024	115.20	04DG31C	1.000	120.00	04DG32C	1.000	120.00	05ES41	1.047	145.34
04ES31C	1.024	-4.80	04DG31C	1.000	0.00	04DG32C	1.000	0.00	05ES41	1.047	25.34
LM1	1.047	25.34	LM2	1.047	25.34	05TR3413	1.022	-4.66	05TR4413	1.047	25.34
LM1	1.047	-94.66	LM2	1.047	-94.66	05TR3413	1.022	-124.66	05TR4413	1.047	-94.66
LM1	1.047	145.34	LM2	1.047	145.34	05TR3413	1.022	115.34	05TR4413	1.047	145.34
LM1	1.047	25.34	LM2	1.047	25.34	05TR3413	1.022	-4.66	05TR4413	1.047	25.34
05T2	1.041	24.74	05TR1311	1.005	-34.21	05TR3311	1.022	-4.82	05TR1312	1.006	-34.21
05T2	1.041	-95.26	05TR1311	1.005	-154.21	05TR3311	1.022	-124.82	05TR1312	1.006	-154.21
05T2	1.041	144.74	05TR1311	1.005	85.79	05TR3311	1.022	115.18	05TR1312	1.006	85.79

05T2	1.041	24.74	05TR1311	1.005	-34.21	05TR3311	1.022	-4.82	05TR1312	1.006	-34.21
05TR3312	1.027	-4.46	ML1	1.022	-4.82	05S31A	1.022	-4.82	05S31B	1.027	-4.46
05TR3312	1.027	-124.46	ML1	1.022	-124.82	05S31A	1.022	-124.82	05S31B	1.027	-124.46
05TR3312	1.027	115.54	ML1	1.022	115.18	05S31A	1.022	115.18	05S31B	1.027	115.54
05TR3312	1.027	-4.46	ML1	1.022	-4.82	05S31A	1.022	-4.82	05S31B	1.027	-4.46
ML1	1.027	-4.46	05S41A	1.035	24.37	LM1	1.035	24.37	05S41B	1.041	24.74
ML1	1.027	-124.46	05S41A	1.035	-95.63	LM1	1.035	-95.63	05S41B	1.041	-95.26
ML1	1.027	115.54	05S41A	1.035	144.37	LM1	1.035	144.37	05S41B	1.041	144.74
ML1	1.027	-4.46	05S41A	1.035	24.37	LM1	1.035	24.37	05S41B	1.041	24.74
LM1	1.041	24.74	05S42A	1.030	23.99	LM1	1.030	23.99	05S42B	1.052	25.54
LM1	1.041	-95.26	05S42A	1.030	-96.01	LM1	1.030	-96.01	05S42B	1.052	-94.46
LM1	1.041	144.74	05S42A	1.030	143.99	LM1	1.030	143.99	05S42B	1.052	145.54
LM1	1.041	24.74	05S42A	1.030	23.99	LM1	1.030	23.99	05S42B	1.052	25.54
LM1	1.052	25.54	05TR3411	1.022	-4.82	05TR4411	1.035	24.37	05TR3412	1.027	-4.46
LM1	1.052	-94.46	05TR3411	1.022	-124.82	05TR4411	1.035	-95.63	05TR3412	1.027	-124.46
LM1	1.052	145.54	05TR3411	1.022	115.18	05TR4411	1.035	144.37	05TR3412	1.027	115.54
LM1	1.052	25.54	05TR3411	1.022	-4.82	05TR4411	1.035	24.37	05TR3412	1.027	-4.46
05TR4412	1.041	24.74	05TR3414	1.022	-4.82	05TR4414	1.030	23.99	05TR3415	1.027	-4.46
05TR4412	1.041	-95.26	05TR3414	1.022	-124.82	05TR4414	1.030	-96.01	05TR3415	1.027	-124.46
05TR4412	1.041	144.74	05TR3414	1.022	115.18	05TR4414	1.030	143.99	05TR3415	1.027	115.54
05TR4412	1.041	24.74	05TR3414	1.022	-4.82	05TR4414	1.030	23.99	05TR3415	1.027	-4.46
05TR4415	1.052	25.54	05T1	1.041	24.74	06ES41	1.049	25.20	LM1	1.049	25.20
05TR4415	1.052	-94.46	05T1	1.041	-95.26	06ES41	1.049	-94.80	LM1	1.049	-94.80
05TR4415	1.052	145.54	05T1	1.041	144.74	06ES41	1.049	145.20	LM1	1.049	145.20
05TR4415	1.052	25.54	05T1	1.041	24.74	06ES41	1.049	25.20	LM1	1.049	25.20
06TR3413	1.024	-4.80	06TR4413	1.049	25.20	06T2	1.043	25.07	06TR1311	1.005	-34.20
06TR3413	1.024	-124.80	06TR4413	1.049	-94.80	06T2	1.043	-94.93	06TR1311	1.005	-154.20
06TR3413	1.024	115.20	06TR4413	1.049	145.20	06T2	1.043	145.07	06TR1311	1.005	85.80
06TR3413	1.024	-4.80	06TR4413	1.049	25.20	06T2	1.043	25.07	06TR1311	1.005	-34.20
06TR3311	1.013	-4.98	06TR1312	1.005	-34.21	06TR3312	1.018	-4.93	ML1	1.013	-4.98
06TR3311	1.013	-124.98	06TR1312	1.005	-154.21	06TR3312	1.018	-124.93	ML1	1.013	-124.98
06TR3311	1.013	115.02	06TR1312	1.005	85.79	06TR3312	1.018	115.07	ML1	1.013	115.02
06TR3311	1.013	-4.98	06TR1312	1.005	-34.21	06TR3312	1.018	-4.93	ML1	1.013	-4.98
06S31A	1.013	-4.98	06S31B	1.018	-4.93	ML1	1.018	-4.93	06S41A	1.018	23.37
06S31A	1.013	-124.98	06S31B	1.018	-124.93	ML1	1.018	-124.93	06S41A	1.018	-96.63
06S31A	1.013	115.02	06S31B	1.018	115.07	ML1	1.018	115.07	06S41A	1.018	143.37
06S31A	1.013	-4.98	06S31B	1.018	-4.93	ML1	1.018	-4.93	06S41A	1.018	23.37
LM1	1.018	23.37	06S41B	1.043	25.07	LM1	1.043	25.07	06S42A	1.021	23.69
LM1	1.018	-96.63	06S41B	1.043	-94.93	LM1	1.043	-94.93	06S42A	1.021	-96.31
LM1	1.018	143.37	06S41B	1.043	145.07	LM1	1.043	145.07	06S42A	1.021	143.69
LM1	1.018	23.37	06S41B	1.043	25.07	LM1	1.043	25.07	06S42A	1.021	23.69
LM1	1.021	23.69	06S42B	1.034	24.37	LM1	1.034	24.36	06TR3411	1.013	-4.98
LM1	1.021	-96.31	06S42B	1.034	-95.63	LM1	1.034	-95.64	06TR3411	1.013	-124.98
LM1	1.021	143.69	06S42B	1.034	144.37	LM1	1.034	144.36	06TR3411	1.013	115.02
LM1	1.021	23.69	06S42B	1.034	24.37	LM1	1.034	24.36	06TR3411	1.013	-4.98
06TR4411	1.018	23.37	06TR3412	1.018	-4.93	06TR4412	1.043	25.07	06TR3414	1.013	-4.98
06TR4411	1.018	-96.63	06TR3412	1.018	-124.93	06TR4412	1.043	-94.93	06TR3414	1.013	-124.98
06TR4411	1.018	143.37	06TR3412	1.018	115.07	06TR4412	1.043	145.07	06TR3414	1.013	115.02
06TR4411	1.018	23.37	06TR3412	1.018	-4.93	06TR4412	1.043	25.07	06TR3414	1.013	-4.98
06TR4414	1.021	23.70	06TR3415	1.018	-4.93	06TR4415	1.034	24.37	06T1	1.043	25.07
06TR4414	1.021	-96.30	06TR3415	1.018	-124.93	06TR4415	1.034	-95.63	06T1	1.043	-94.93
06TR4414	1.021	143.70	06TR3415	1.018	115.07	06TR4415	1.034	144.37	06T1	1.043	145.07

06TR4414	1.021	23.70	06TR3415	1.018	-4.93	06TR4415	1.034	24.37	06T1	1.043	25.07
07ES41	1.047	25.34	LM1	1.047	25.34	LM2	1.047	25.34	07TR3413	1.022	-4.66
07ES41	1.047	-94.66	LM1	1.047	-94.66	LM2	1.047	-94.66	07TR3413	1.022	-124.66
07ES41	1.047	145.34	LM1	1.047	145.34	LM2	1.047	145.34	07TR3413	1.022	115.34
07ES41	1.047	25.34	LM1	1.047	25.34	LM2	1.047	25.34	07TR3413	1.022	-4.66
07TR4413	1.047	25.34	07T2	1.041	24.73	07TR1311	1.005	-34.21	07TR3311	1.013	-5.57
07TR4413	1.047	-94.66	07T2	1.041	-95.27	07TR1311	1.005	-154.21	07TR3311	1.013	-125.57
07TR4413	1.047	145.34	07T2	1.041	144.73	07TR1311	1.005	85.79	07TR3311	1.013	114.43
07TR4413	1.047	25.34	07T2	1.041	24.73	07TR1311	1.005	-34.21	07TR3311	1.013	-5.57
07TR1312	1.005	-34.21	07TR3312	1.022	-4.87	ML1	1.013	-5.57	07S31A	1.013	-5.57
07TR1312	1.005	-154.21	07TR3312	1.022	-124.87	ML1	1.013	-125.57	07S31A	1.013	-125.57
07TR1312	1.005	85.79	07TR3312	1.022	115.13	ML1	1.013	114.43	07S31A	1.013	114.43
07TR1312	1.005	-34.21	07TR3312	1.022	-4.87	ML1	1.013	-5.57	07S31A	1.013	-5.57
07S31B	1.022	-4.88	ML1	1.022	-4.88	07S41A	1.027	23.61	LM1	1.027	23.61
07S31B	1.022	-124.88	ML1	1.022	-124.88	07S41A	1.027	-96.39	LM1	1.027	-96.39
07S31B	1.022	115.12	ML1	1.022	115.12	07S41A	1.027	143.61	LM1	1.027	143.61
07S31B	1.022	-4.88	ML1	1.022	-4.88	07S41A	1.027	23.61	LM1	1.027	23.61
07S41B	1.041	24.73	LM1	1.041	24.73	07S42A	1.024	23.43	LM1	1.024	23.43
07S41B	1.041	-95.27	LM1	1.041	-95.27	07S42A	1.024	-96.57	LM1	1.024	-96.57
07S41B	1.041	144.73	LM1	1.041	144.73	07S42A	1.024	143.43	LM1	1.024	143.43
07S41B	1.041	24.73	LM1	1.041	24.73	07S42A	1.024	23.43	LM1	1.024	23.43
07S42B	1.038	24.51	LM1	1.038	24.51	07TR3411	1.013	-5.57	07TR4411	1.027	23.61
07S42B	1.038	-95.49	LM1	1.038	-95.49	07TR3411	1.013	-125.57	07TR4411	1.027	-96.39
07S42B	1.038	144.51	LM1	1.038	144.51	07TR3411	1.013	114.43	07TR4411	1.027	143.61
07S42B	1.038	24.51	LM1	1.038	24.51	07TR3411	1.013	-5.57	07TR4411	1.027	23.61
07TR3412	1.022	-4.88	07TR4412	1.041	24.73	07TR3414	1.013	-5.57	07TR4414	1.024	23.43
07TR3412	1.022	-124.88	07TR4412	1.041	-95.27	07TR3414	1.013	-125.57	07TR4414	1.024	-96.57
07TR3412	1.022	115.12	07TR4412	1.041	144.73	07TR3414	1.013	114.43	07TR4414	1.024	143.43
07TR3412	1.022	-4.88	07TR4412	1.041	24.73	07TR3414	1.013	-5.57	07TR4414	1.024	23.43
07TR3415	1.022	-4.88	07TR4415	1.038	24.51	07T1	1.041	24.73	08ES41	1.045	25.78
07TR3415	1.022	-124.88	07TR4415	1.038	-95.49	07T1	1.041	-95.27	08ES41	1.045	-94.22
07TR3415	1.022	115.12	07TR4415	1.038	144.51	07T1	1.041	144.73	08ES41	1.045	145.78
07TR3415	1.022	-4.88	07TR4415	1.038	24.51	07T1	1.041	24.73	08ES41	1.045	25.78
LM1	1.045	25.78	LM2	1.045	25.78	08T2	1.045	25.78	08DG1	1.000	0.00
LM1	1.045	-94.22	LM2	1.045	-94.22	08T2	1.045	-94.22	08DG1	1.000	-120.00
LM1	1.045	145.78	LM2	1.045	145.78	08T2	1.045	145.78	08DG1	1.000	120.00
LM1	1.045	25.78	LM2	1.045	25.78	08T2	1.045	25.78	08DG1	1.000	0.00
08TR1311	1.006	-34.20	08TR3311	1.025	-4.25	08TR1312	1.005	-34.17	08TR3312	1.021	-4.15
08TR1311	1.006	-154.20	08TR3311	1.025	-124.25	08TR1312	1.005	-154.17	08TR3312	1.021	-124.15
08TR1311	1.006	85.80	08TR3311	1.025	115.75	08TR1312	1.005	85.83	08TR3312	1.021	115.85
08TR1311	1.006	-34.20	08TR3311	1.025	-4.25	08TR1312	1.005	-34.17	08TR3312	1.021	-4.15
125PM10D	1.021	-4.12	08S31A	1.025	-4.25	08S31B	1.021	-4.15	125PM10B	1.021	-4.13
125PM10D	1.021	-124.12	08S31A	1.025	-124.25	08S31B	1.021	-124.15	125PM10B	1.021	-124.13
125PM10D	1.021	115.88	08S31A	1.025	115.75	08S31B	1.021	115.85	125PM10B	1.021	115.87
125PM10D	1.021	-4.12	08S31A	1.025	-4.25	08S31B	1.021	-4.15	125PM10B	1.021	-4.13
08S41A	1.044	25.40	LM1	1.044	25.40	08S41B	1.045	25.78	LM1	1.045	25.78
08S41A	1.044	-94.60	LM1	1.044	-94.60	08S41B	1.045	-94.22	LM1	1.045	-94.22
08S41A	1.044	145.40	LM1	1.044	145.40	08S41B	1.045	145.78	LM1	1.045	145.78
08S41A	1.044	25.40	LM1	1.044	25.40	08S41B	1.045	25.78	LM1	1.045	25.78
08TR3411	1.025	-4.25	08TR4411	1.044	25.40	08TR3412	1.021	-4.15	08TR4412	1.045	25.78
08TR3411	1.025	-124.25	08TR4411	1.044	-94.60	08TR3412	1.021	-124.15	08TR4412	1.045	-94.22
08TR3411	1.025	115.75	08TR4411	1.044	145.40	08TR3412	1.021	115.85	08TR4412	1.045	145.78

08TR3411	1.025	-4.25	08TR4411	1.044	25.40	08TR3412	1.021	-4.15	08TR4412	1.045	25.78
08T1	1.045	25.78	09ES41	1.075	25.20	LM1	1.075	25.20	LM2	1.075	25.20
08T1	1.045	-94.22	09ES41	1.075	-94.80	LM1	1.075	-94.80	LM2	1.075	-94.80
08T1	1.045	145.78	09ES41	1.075	145.20	LM1	1.075	145.20	LM2	1.075	145.20
08T1	1.045	25.78	09ES41	1.075	25.20	LM1	1.075	25.20	LM2	1.075	25.20
09TR3413	1.024	-4.80	09TR4413	1.075	25.20	09T2	1.073	25.55	09TR1311	1.005	-34.20
09TR3413	1.024	-124.80	09TR4413	1.075	-94.80	09T2	1.073	-94.45	09TR1311	1.005	-154.20
09TR3413	1.024	115.20	09TR4413	1.075	145.20	09T2	1.073	145.55	09TR1311	1.005	85.80
09TR3413	1.024	-4.80	09TR4413	1.075	25.20	09T2	1.073	25.55	09TR1311	1.005	-34.20
09TR3311	1.033	-5.19	09TR1312	1.006	-34.21	09TR3312	1.051	-4.24	ML1	1.033	-5.19
09TR3311	1.033	-125.19	09TR1312	1.006	-154.21	09TR3312	1.051	-124.24	ML1	1.033	-125.19
09TR3311	1.033	114.81	09TR1312	1.006	85.79	09TR3312	1.051	115.76	ML1	1.033	114.81
09TR3311	1.033	-5.19	09TR1312	1.006	-34.21	09TR3312	1.051	-4.24	ML1	1.033	-5.19
09S31A	1.033	-5.19	09S31B	1.051	-4.24	ML1	1.051	-4.24	09S41A	1.047	24.09
09S31A	1.033	-125.19	09S31B	1.051	-124.24	ML1	1.051	-124.24	09S41A	1.047	-95.91
09S31A	1.033	114.81	09S31B	1.051	115.76	ML1	1.051	115.76	09S41A	1.047	144.09
09S31A	1.033	-5.19	09S31B	1.051	-4.24	ML1	1.051	-4.24	09S41A	1.047	24.09
LM1	1.047	24.09	09S41B	1.073	25.55	LM1	1.073	25.55	09S42A	1.060	23.32
LM1	1.047	-95.91	09S41B	1.073	-94.45	LM1	1.073	-94.45	09S42A	1.060	-96.68
LM1	1.047	144.09	09S41B	1.073	145.55	LM1	1.073	145.55	09S42A	1.060	143.32
LM1	1.047	24.09	09S41B	1.073	25.55	LM1	1.073	25.55	09S42A	1.060	23.32
LM1	1.060	23.32	09S42B	1.104	25.76	LM1	1.104	25.76	09TR3411	1.033	-5.19
LM1	1.060	-96.68	09S42B	1.104	-94.24	LM1	1.104	-94.24	09TR3411	1.033	-125.19
LM1	1.060	143.32	09S42B	1.104	145.76	LM1	1.104	145.76	09TR3411	1.033	114.81
LM1	1.060	23.32	09S42B	1.104	25.76	LM1	1.104	25.76	09TR3411	1.033	-5.19
09TR4411	1.047	24.09	09TR3412	1.051	-4.24	09TR4412	1.073	25.55	09TR3414	1.033	-5.19
09TR4411	1.047	-95.91	09TR3412	1.051	-124.24	09TR4412	1.073	-94.45	09TR3414	1.033	-125.19
09TR4411	1.047	144.09	09TR3412	1.051	115.76	09TR4412	1.073	145.55	09TR3414	1.033	114.81
09TR4411	1.047	24.09	09TR3412	1.051	-4.24	09TR4412	1.073	25.55	09TR3414	1.033	-5.19
09TR4414	1.060	23.32	09TR3415	1.051	-4.24	09TR4415	1.104	25.76	09T1	1.073	25.55
09TR4414	1.060	-96.68	09TR3415	1.051	-124.24	09TR4415	1.104	-94.24	09T1	1.073	-94.45
09TR4414	1.060	143.32	09TR3415	1.051	115.76	09TR4415	1.104	145.76	09T1	1.073	145.55
09TR4414	1.060	23.32	09TR3415	1.051	-4.24	09TR4415	1.104	25.76	09T1	1.073	25.55
09T4	1.060	23.32	08DG	1.000	0.00	1TR1215	1.004	-34.19	1TS1215	0.999	-5.75
09T4	1.060	-96.68	08DG	1.000	-120.00	1TR1215	1.004	-154.19	1TS1215	0.999	-125.75
09T4	1.060	143.32	08DG	1.000	120.00	1TR1215	1.004	85.81	1TS1215	0.999	114.26
09T4	1.060	23.32	08DG	1.000	0.00	1TR1215	1.004	-34.19	1TS1215	0.999	-5.75
103KM101	0.997	-5.74	103KM201	1.030	-4.21	1TR1220	1.006	-34.21	1TS1220	1.030	-4.21
103KM101	0.997	-125.74	103KM201	1.030	-124.21	1TR1220	1.006	-154.21	1TS1220	1.030	-124.21
103KM101	0.997	114.26	103KM201	1.030	115.79	1TR1220	1.006	85.79	1TS1220	1.030	115.79
103KM101	0.997	-5.74	103KM201	1.030	-4.21	1TR1220	1.006	-34.21	1TS1220	1.030	-4.21
111KM101	1.037	-5.40	1TR1211	1.004	-34.20	1TS1211	1.038	-5.39	111KM201	1.056	-4.21
111KM101	1.037	-125.40	1TR1211	1.004	-154.20	1TS1211	1.038	-125.39	111KM201	1.056	-124.21
111KM101	1.037	114.60	1TR1211	1.004	85.80	1TS1211	1.038	114.61	111KM201	1.056	115.79
111KM101	1.037	-5.40	1TR1211	1.004	-34.20	1TS1211	1.038	-5.39	111KM201	1.056	-4.21
1TR1212	1.006	-34.21	1TS1212	1.056	-4.21	111KM301	1.056	-4.21	1TR1213	1.006	-34.21
1TR1212	1.006	-154.21	1TS1212	1.056	-124.21	111KM301	1.056	-124.21	1TR1213	1.006	-154.21
1TR1212	1.006	85.79	1TS1212	1.056	115.79	111KM301	1.056	115.79	1TR1213	1.006	85.79
1TR1212	1.006	-34.21	1TS1212	1.056	-4.21	111KM301	1.056	-4.21	1TR1213	1.006	-34.21
1TS1213	1.056	-4.21	111KM401	1.056	-4.21	1TR1216	1.006	-34.21	1TS1216	1.056	-4.21
1TS1213	1.056	-124.21	111KM401	1.056	-124.21	1TR1216	1.006	-154.21	1TS1216	1.056	-124.21
1TS1213	1.056	115.79	111KM401	1.056	115.79	1TR1216	1.006	85.79	1TS1216	1.056	115.79

1TS1213	1.056	-4.21	111KM401	1.056	-4.21	1TR1216	1.006	-34.21	1TS1216	1.056	-4.21
111KM501	1.039	-5.14	1TR1217	1.004	-34.20	1TS1217	1.040	-5.13	111KM601	1.056	-4.21
111KM501	1.039	-125.14	1TR1217	1.004	-154.20	1TS1217	1.040	-125.13	111KM601	1.056	-124.21
111KM501	1.039	114.86	1TR1217	1.004	85.80	1TS1217	1.040	114.87	111KM601	1.056	115.79
111KM501	1.039	-5.14	1TR1217	1.004	-34.20	1TS1217	1.040	-5.13	111KM601	1.056	-4.21
1TR1218	1.006	-34.21	1TS1218	1.056	-4.21	147KM10A	1.041	-4.81	1TR1214	1.006	-34.21
1TR1218	1.006	-154.21	1TS1218	1.056	-124.21	147KM10A	1.041	-124.81	1TR1214	1.006	-154.21
1TR1218	1.006	85.79	1TS1218	1.056	115.79	147KM10A	1.041	115.19	1TR1214	1.006	85.79
1TR1218	1.006	-34.21	1TS1218	1.056	-4.21	147KM10A	1.041	-4.81	1TR1214	1.006	-34.21
1TS1214	1.041	-4.81	147KM10B	1.052	-4.21	1TR1219	1.006	-34.21	1TS1219	1.052	-4.21
1TS1214	1.041	-124.81	147KM10B	1.052	-124.21	1TR1219	1.006	-154.21	1TS1219	1.052	-124.21
1TS1214	1.041	115.19	147KM10B	1.052	115.79	1TR1219	1.006	85.79	1TS1219	1.052	115.79
1TS1214	1.041	-4.81	147KM10B	1.052	-4.21	1TR1219	1.006	-34.21	1TS1219	1.052	-4.21
125PM10A	1.025	-4.23	LM22	1.049	-94.80						
125PM10A	1.025	-124.23	LM22	1.049	145.20						
125PM10A	1.025	115.77	LM22	1.049	25.20						
125PM10A	1.025	-4.23	LM22	1.049	-94.80						

LINE-FLOWS

				(---------- SENDING-END ----------)					(---------- RECEIVING-END ----------)				
SENDING BUSBAR	RECEIVING BUSBAR	R P.U.	X P.U.	CURRENT P.U.	CURRENT ANGLE	CURRENT DCoff	POWER P(MW)	POWER Q(MVAR)	CURRENT P.U.	CURRENT ANGLE	CURRENT DCoff	POWER P(MW)	POWER Q(MVAR)
MBIN132	MBF1321	0.00000	0.00000	3.488	-18.1	0.000	11.15	3.17	3.491	-18.3	0.000	-11.15	-3.20
MBIN132	MBF1321	0.00000	0.00000	3.488	-138.1	0.000	11.15	3.17	3.491	-138.3	0.000	-11.15	-3.20
MBIN132	MBF1321	0.00000	0.00000	3.488	101.9	0.000	11.15	3.17	3.491	101.7	0.000	-11.15	-3.20
INT1	OUT1	0.00000	0.00000	4.090	-37.2	0.000	11.13	7.72	3.953	-67.2	0.000	-11.12	-7.22
INT1	OUT1	0.00000	0.00000	4.090	-157.2	0.000	11.13	7.72	3.953	172.8	0.000	-11.12	-7.22
INT1	OUT1	0.00000	0.00000	4.090	82.8	0.000	11.13	7.72	3.953	52.8	0.000	-11.12	-7.22
OUT1	1S11A	0.00000	0.00000	3.911	-66.2	0.000	11.12	6.95	3.911	-66.2	0.000	-11.12	-6.95
OUT1	1S11A	0.00000	0.00000	3.911	173.8	0.000	11.12	6.95	3.911	173.8	0.000	-11.12	-6.95
OUT1	1S11A	0.00000	0.00000	3.911	53.8	0.000	11.12	6.95	3.911	53.8	0.000	-11.12	-6.95
1S11A	1S11B	0.00000	0.00000	1.191	-60.4	0.000	3.59	1.76	1.191	-60.4	0.000	-3.59	-1.76
1S11A	1S11B	0.00000	0.00000	1.191	179.6	0.000	3.59	1.76	1.191	179.6	0.000	-3.59	-1.76
1S11A	1S11B	0.00000	0.00000	1.191	59.6	0.000	3.59	1.76	1.191	59.6	0.000	-3.59	-1.76
INT1	INT1	0.00000	0.00000	0.000	0.0	0.000	0.00	0.00	0.000	0.0	0.000	0.00	0.00
INT1	INT1	0.00000	0.00000	0.000	0.0	0.000	0.00	0.00	0.000	0.0	0.000	0.00	0.00
INT1	INT1	0.00000	0.00000	0.000	0.0	0.000	0.00	0.00	0.000	0.0	0.000	0.00	0.00

END OF SYSTEM STUDY NO. 1

ONE SHEET OF DRAWING

IS ADDED IN THE NEXT PAGE:

PAGE IS CALLED

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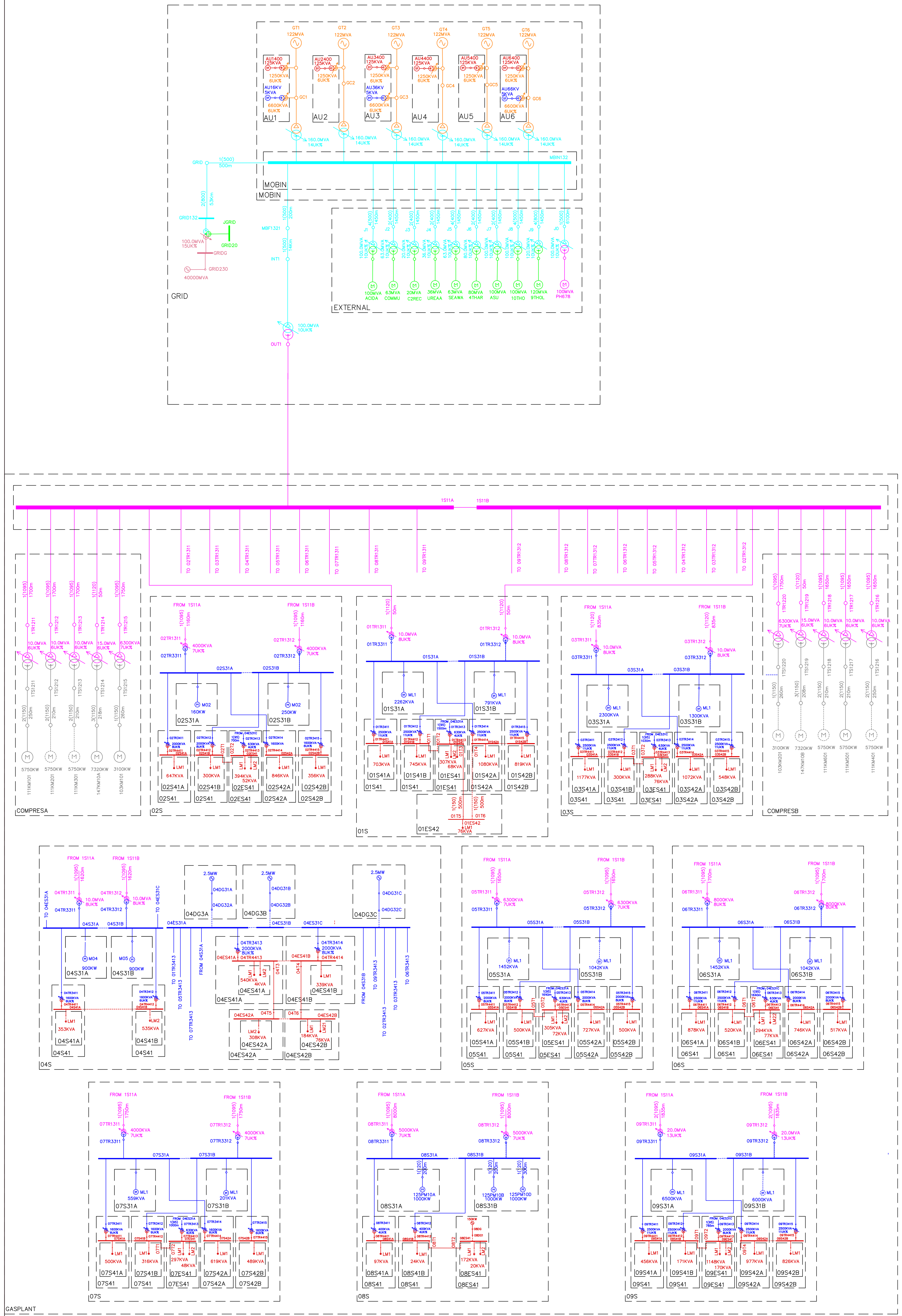

132 KVOLT LEVEL
33 KVOLT LEVEL
20 KVOLT LEVEL
15 KVOLT LEVEL
11 KVOLT LEVEL
6 KVOLT LEVEL
400 VOLT LEVEL
JUNCTION
TRANSFORMER
CABLE TRANSMISION LINES
OPEN
GENERATOR
SYN. MOTOR
INDUCTION MOTOR
LUMPED LOAD
LOAD
CIRCUIT BREAKER
M.C.C.B.
FUSE
THERMAL-FUSE-CONTACTOR
PHASE OVER CURRENT (OVER LOAD) RELAYS
EARTH OVER CURRENT RELAYS
LM,ML (In the names) Means Equvalance
AREA

NOTE

NOTE: THE VALUES ARE ROUNDED UP. FOR EXACT VALUES REFER TO THE CORRESPONDING REPORT.

REFERENCE DRAWINGS

Rev.	DESCRIPTION	DATE ISSUED	DESIGN	CHECK	AUTH.	HIR APPROVED	PPL
3							
2							
1							
0	FOR APPROVAL	MAR.2009	S.M.	S.M.K.	A.S.		

OWNER:

X GAS FIELD DEVELOPMENT
PHASES 9 & 10 ASSALUYEH-IRAN
ONSHORE FACILITIES

PROJECT: ONS-09-0-CO-4127 DOC. CLASS: SCALE: NONE

TITLE:

SINGLE LINE DIAGRAM
OVERAL PLANTS

DWG. NO. DW-6340S-550-1600-0005 SHEET NO. 1 OF 1 REV. 0