HOPE CREEK No 1
GENERATOR OPERATING GUIDE

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PREPARED BY

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INTRODUCTION

This Operating Guide has been prepared for the operation of the Hope Creek Generating Unit No. 1 in conjunction with the operation of Salem Generating Units Nos. 1 and 2 for the following operating combinations:

1. Single Unit - Hope Creek No. 1 alone, i.e. no Salem units
2. Two Unit - Hope Creek No. 1 and one Salem unit
3. Three Unit - Hope Creek No. 1 and Salem Nos. 1 and 2

OBJECTIVE

The objective of this analysis was to provide a generator operating guide for Hope Creek No. 1 unit. The Operating Guide has been prepared to provide guidance to the PSE&G System and Hope Creek and Salem Generating Station operators, based on stability consideration for various system conditions. This guide is in the form of tables and curves which specify operating limits in terms of unit and system imposed restrictions.

RESULTS

The results of this analysis are in the form of a summary tabulation and generator capability curves for each of the three operating combinations of Hope Creek No. 1 and Salem Nos. 1 and 2, specified in the Introduction for various system conditions.

The summary tabulation lists for each of the three generator operating combinations; the maximum MW, minimum MVAR and resultant generator terminal and 500-kV bus voltage conditions for the Hope Creek and Salem generating units (see Exhibits 2, 3 and 4). These constraints are necessary to maintain generator stability following the critical fault condition for various transmission system configurations. This analysis observed a maximum generator terminal bus voltage of 1.05 pu and a maximum generator step-up transformer high side voltage of 1.10 pu.

The conditions which impact generator operability are; the 500-kV transmission configuration (Exhibit 1), system and generator terminal voltages and system generation dispatch, i.e. MW level of generator output and the number of generators running in the area being studied. Therefore, the guide was prepared using a 40% of peak load case dispatched for a minimum generation schedule. Critical cases were tested at the 75% and 100% of peak load level.

In addition to each summary tabulation, a set of generator capability curves showing the Hope Creek and Salem operating limitations for each operating combination appears in Appendix 1, Exhibits 5 to 42. These exhibits are the manufacturers' machine design capabilities on which are superimposed stability and voltage constraints for probable system transmission configurations.

Single Unit Operation - Hope Creek No. 1

Based on the analysis performed, there are no stability limits requiring generation MW output reduction of the Hope Creek No. 1 unit when the Salem No. 1 and 2 units are out of service. This is true for the following conditions and at all load levels:

- all transmission in-service
- maintenance outage of any one of the following 500-kV lines;
  - Salem-Deans (5021)
  - Hope Creek-Salem (5037)
  - Keeney-Peach Bottom (5014)
  - Salem-New Freedom (5024)
  - Hope Creek-New Freedom (5023)
  - Deans-Branchburg (5019)
- maintenance outage of any one Hope Creek 500-kV circuit breaker; 50X, 51X, 52X, 60X or 61X

The minimum MVAR absorptive capability limit for the Hope Creek machine in all but one case is determined by the minimum generator terminal bus voltage of .95 pu. However, for the unavailability of the Hope Creek-Keeney (5015) 500-kV line transient stability considerations require a 0 MVAR minimum output with the Hope Creek unit at full MW output. Also, terminal voltage values listed in Exhibit 2 should be observed.

The single unit Hope Creek results are in the summary tabulation, Exhibit 2. The corresponding capability curves are in Appendix 1, Exhibits 5 to 9. The corresponding Power Vs. Rotor Angle and Rotor Angle Vs. Time curves for Hope Creek No. 1 are shown in Appendix 3, Exhibits 77 to 84.

Two Unit Operation - Hope Creek No. 1 and Salem No. 1 or 2

The operation of two units was analyzed and appropriate limits were determined for the Hope Creek unit running with one of the two Salem units. There were no MW reductions from full output required for operation of two units for the following conditions:

- all transmission in service
- maintenance outage of any one of the following 500-kV lines;

  Hope Creek-Salem (5037)
  Keeney-Peach Bottom (5014)
  Salem-New Freedom (5024)
  Hope Creek-New Freedom (5023)
  Deans-Branchburg (5019)

- maintenance outage of any one Hope Creek 500-kV circuit breaker; 50X, 51X, 52X, 60X or 61X.

Two 500-kV line maintenance outages, the Hope Creek-Keeney 500-kV line and the Salem-Deans 500-kV line, require a reduction from full MW output of the Hope Creek unit and the single Salem unit. A MW reduction is necessary to maintain transient stability even though the generating units have not reached their maximum MVAR capability. The maximum MVAR output is limited by the system voltage. These results are in the two unit summary tabulation, Exhibit 3. The corresponding capability curves are in Appendix 1, Exhibits 10 to 21. The corresponding Power Vs. Rotor Angle and Rotor Angle Vs. Time curves for Hope Creek No. 1, Salem No. 1 and No. 2 are shown in Appendix 3, Exhibits 85 to 92.

Three Unit Operation - Hope Creek No. 1 and Salem No. 1 and 2

The operation of all three units was analyzed and appropriate limits were determined for each unit. There were no MW reductions required for operation of three units for the following conditions; however, reactive output ranging from 125 to 300 MVAR was required to maintain stability:

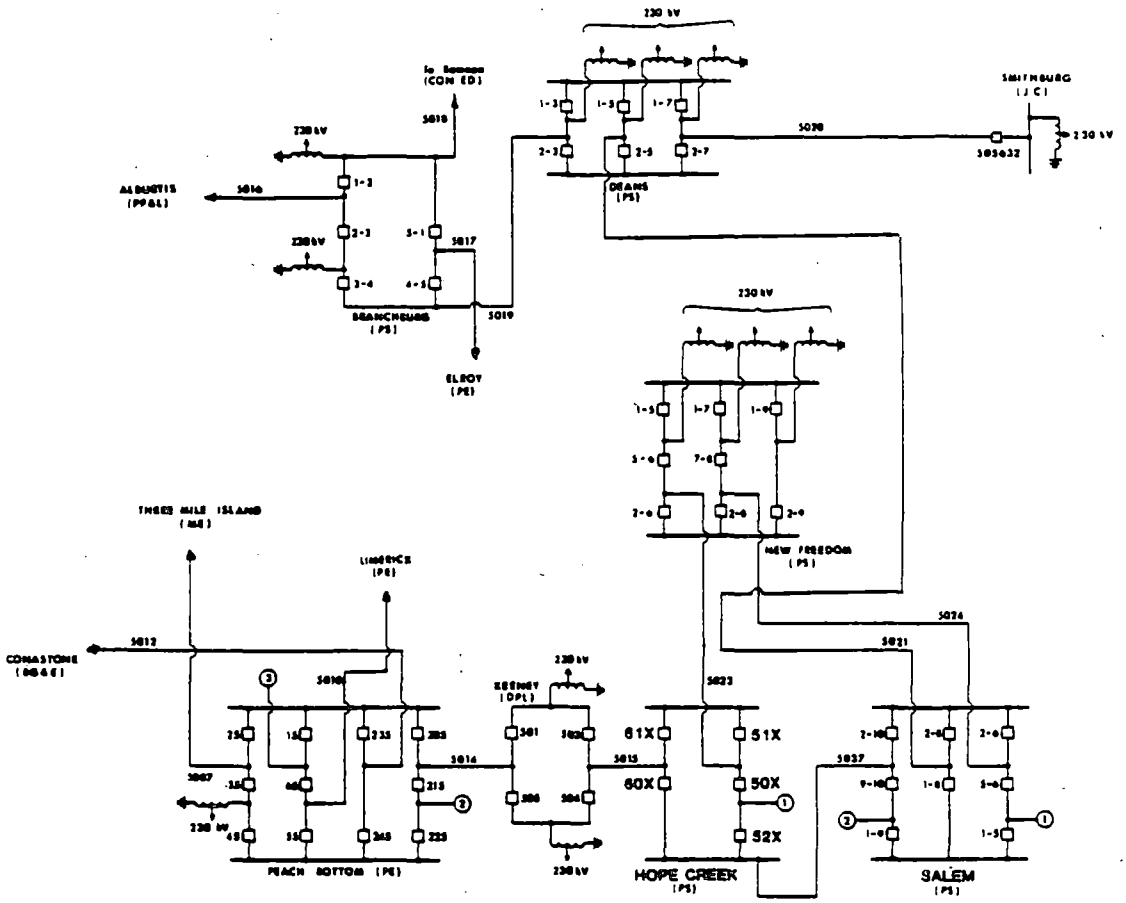
- all transmission in service
- maintenance outage of any one of the following 500-kV lines;

  Keeney-Peach Bottom (5014)
  Salem-New Freedom (5024)
  Hope Creek-New Freedom (5023)
  Deans-Branchburg (5019)

- maintenance outage of any one Hope Creek 500-kV circuit breaker 50X, 51X, 52X, 60X or 61X.

Two 500-kV line maintenance outages, the Hope Creek-Keeney or the Salem-Deans, require a reduction from full MW output of all three units. In addition, the maintenance outage of the Hope Creek-Salem 500-kV line requires a reduction from full MW output of Salem units only. With the tie between Hope Creek 500-kV bus and Salem 500-kV bus unavailable, the 500-kV bus voltages are not equal, thus permitting the higher Hope Creek MVAR output needed to maintain stability without a MW reduction.

The corresponding MW reductions, MVAR reactive output requirements and resultant terminal and 500-kV voltages appear in the three unit summary tabulation, Exhibit 4. The three unit generator capability curves for Hope Creek No. 1 and Salem Nos. 1 and 2 appear in Appendix 1, Exhibits 22 to 42. The corresponding Power Vs. Rotor Angle and Rotor Angle Vs. Time curves for Hope Creek No. 1 are shown in Appendix 3, Exhibits 93 to 100.



1987 PJM 500-KV SYSTEM

VICINITY OF HOPE CREEK AND SALEM GENERATING AND SWITCHING STATIONS

DEC 1986

EXHIBIT 1

Summary of Hope Creek/Salem Limits - Single Unit Operation

Hope Creek No. 1 With Salem No. 1 and Salem No. 2 Not Running

500-kV Transmission System Configuration Maintenance Outage	Hope Creek and Salem Generator Terminal and 500-kV Conditions - 40% of Peak Load						
	Critical 3ϕ Faulted Line[1]	Maximum MW	Minimum[2] MVAR	Terminal Voltage - PU[3]	500-kV Voltage - PU[3]	Case[4] No.	Reference[5] Exhibits
None - All Transmission In Service	Hope Creek-Keeney	1100	-75	.95	1.06	S1BASE	5,77
Hope Creek-Keeney	Salem-Deans	1100	0	.98	1.08	S1M1	6,78
Salem-Deans	Hope Creek-Keeney	1100	0	.95	1.05	S1M5	8,82
Hope Creek-Salem	Hope Creek-Keeney	1100	0	.96	1.06	S1M3	8,80
Salem-New Freedom	Hope Creek-Keeney	1100	-50	.95	1.06	S1M4	7,81
Hope Creek-New Freedom	Hope Creek-Keeney	1100	-50	.95	1.06	S1M2	7,79
Keeney-Peach Bottom	Salem-Deans	1100	-125	.95	1.08	S1M6	9,83
Deans-Branchburg	Hope Creek-Keeney	1100	-75	.95	1.07	S1M7	5,84
Hope Creek CB - 50X 51X 52X 60X 61X	Hope Creek-Keeney Hope Creek-Salem Hope Creek-Keeney Hope Creek-N. Freedom Hope Creek-Salem	1100	0	.96	1.07	-	8

[1]Fault applied to the "from" end of line

[2]Negative values indicate leading reactive machine output

[3]Terminal and 500-kV bus voltages are a result of system conditions and Hope Creek MVAR output and step-up transformer tap setting of 1.092.

[4]Case number reference Appendix 2 Rotor Angle Vs. Time Curves

[5]Reference Exhibits; Appendix 1 Generator Capability Curves, Appendix 2 Rotor Angle Vs. Time Curves

EXHIBIT 2

Summary of Hope Creek/Salem Limits - Two Unit Operation

Hope Creek No. 1 With Salem No. 1 or Salem No. 2 Running

500-kV Transmission System Configuration Maintenance Outage	Hope Creek and Salem Generator Terminal and 500-kV Conditions - 40% of Peak Load										
	Critical 3ϕ Faulted Line[1]	Maximum MW		Minimum MVAR[2]		Terminal Voltage - PU[3]		500-kV Voltage - PU[3]		Case[4] No.	Reference[5] Exhibits
		HC 1	Salem 1 or 2	HC 1	Salem 1 or 2	HC 1	Salem 1 or 2	HC	Salem		
None - All Transmission In Service	Hope Creek-Keeney	1100	1123/1162	0	0	.95	.95	1.05	1.05	S2BASE	10,14,18,85
Hope Creek-Keeney	Salem-Deans	950	973/1012	125	125	1.01	1.01	1.10	1.10	S2M1	11,15,19,86
Salem-Deans	Hope Creek-Keeney	900	923/962	225	225	1.03	1.03	1.10	1.10	S2M5	12,16,20,90
Hope Creek-Salem	Salem-Deans	1100	1123/1162	0	0	.95	.95	1.05	1.05	S2M3	10,14,18,88
Salem-New Freedom	Hope Creek-Keeney	1100	1123/1162	50	50	.96	.96	1.05	1.05	S2M4	13,17,21,89
Hope Creek-New Freedom	Hope Creek-Keeney	1100	1123/1162	50	50	.96	.96	1.05	1.05	S2M2	13,17,21,87
Keeney-Peach Bottom	Salem-Deans	1100	1123/1162	0	0	.95	.95	1.06	1.06	S2M6	10,14,18,91
Deans-Branchburg	Hope Creek-Keeney	1100	1123/1162	0	0	.95	.95	1.05	1.05	S2M7	10,14,18,92
Hope Creek CB - 50X	Hope Creek-Keeney	1100	1123/1162	0	0	.95	.95	1.05	1.05	-	10,14,18
51X	Hope Creek-Salem	1100	1123/1162	50	50	.96	.96	1.06	1.06	-	13,17,21
52X	Hope Creek-Keeney	1100	1123/1162	0	0	.95	.95	1.05	1.05	-	10,14,18
60X	Hope Creek-N. Freedom	1100	1123/1162	50	50	.96	.96	1.06	1.06	-	13,17,21
61X	Hope Creek-Salem	1100	1123/1162	50	50	.96	.96	1.06	1.06	-	13,17,21

[1] Fault applied to the "from" end of line

[2] Negative values indicate leading reactive machine output

[3] Terminal and 500-kV bus voltages are a result of system conditions and Hope Creek and Salem MVAR output and step-up transformer tap setting of 1.092.

[4] Case number reference Appendix 2 Rotor Angle Vs. Time Curves

[5] Reference Exhibits; Appendix 1 Generator Capability Curves, Appendix 2 Rotor Angle Vs. Time Curves

EXHIBIT 3

Summary of Hope Creek/Salem Limits - Three Unit Operation

Hope Creek No. 1 With Salem No. 1 and No. 2 Running

500-kV Transmission System Configuration Maintenance Outage	Critical 3ϕ Faulted Line[1]	Hope Creek and Salem Generator Terminal and 500-kV Conditions - 40% of Peak Load: Maximum MW			Minimum MVAR[2]			Terminal Voltage - PU[3]			500-kV Voltage - PU[3]		Case[4] No.	Reference[5] Exhibits
		HC 1	Salem 1	Salem 2	HC 1	Salem 1	Salem 2	HC 1	Salem 1	Salem 2	HC	Salem		
None - All Transmission In Service	Hope Creek-Keeney	1100	1123	1162	200	200	200	1.01	1.01	1.01	1.08	1.08	S3BASE	22,29,36,93
Hope Creek-Keeney	Salem-Deans	800	823	862	125	125	125	1.02	1.02	1.02	1.10	1.10	S3M1	23,30,37,94
Salem-Deans	Hope Creek-Keeney	800	823	862	200	200	200	1.03	1.03	1.03	1.10	1.10	S3M5	24,31,38,95
Hope Creek-New Freedom	Hope Creek-Keeney	1100	1123	1162	275	275	275	1.03	1.03	1.03	1.09	1.09	S3M2	25,32,39,96
Hope Creek-Salem	Salem-Deans	1100	1073	1112	300	225	225	1.03	1.03	1.03	1.09	1.10	S3M3	26,33,40,97
Salem-New Freedom	Hope Creek-Keeney	1100	1123	1162	250	250	250	1.02	1.02	1.02	1.09	1.09	S3M4	27,34,41,98
Keeney-Peach Bottom	Salem-Deans	1100	1123	1162	225	225	225	1.03	1.03	1.03	1.10	1.10	S3M6	28,35,42,99
Deans-Branchburg	Hope Creek-Keeney	1100	1123	1162	225	225	225	1.02	1.02	1.02	1.09	1.09	S3M7	28,35,42,100
Hope Creek CB - 50X	Hope Creek-Keeney	1100	1123	1162	275	275	275	1.04	1.04	1.04	1.10	1.10	S3CB1	25,32,39,101
51X	Hope Creek-Salem	1100	1123	1162	250	250	250	1.03	1.03	1.03	1.10	1.10	S3CB2	27,34,41,102
52X	Hope Creek-Keeney	1100	1123	1162	250	250	250	1.03	1.03	1.03	1.10	1.10	S3CB2	27,34,41,102
60X	Hope Creek-New Freedom	1100	1123	1162	275	275	275	1.04	1.04	1.04	1.10	1.10	S3CB1	25,32,39,101
61X	Hope Creek-Salem	1100	1123	1162	250	250	250	1.03	1.03	1.03	1.10	1.10	S3CB2	27,34,41,102

[1] Fault applied to the "from" end of line

[2] Negative values indicate leading reactive machine output

[3] Terminal and 500-kV bus voltages are a result of system conditions and Hope Creek and Salem MVAR output and step-up transformer tap setting of 1.092

[4] Case number reference Appendix 2 Rotor Angle Vs. Time Curves

[5] Reference Exhibits; Appendix 1 Generator Capability Curves, Appendix 2 Rotor Angle Vs. Time Curves

EXHIBIT 4

DISCUSSION

Power Flow Assumptions and Simulations

An updated version of the 1987 Hope Creek MAAC Filing base case power flow was used to develop simulations for the 100%, 75% and 40% of peak load conditions. This was done to establish the voltage and power flow patterns for the 500-kV transmission system in the vicinity of Hope Creek and Salem Generating Station.

- The 100% peak load level PJM case was economically dispatched, with a PJM economy import of 3000 MW.

- The 75% of peak load level PJM case was economically dispatched, with a PJM economy import of 3600 MW.

- The 40% of peak load level PJM case was economically dispatched, with a PJM economy import of 1000 MW.

The net base interchange for the three load levels was modelled as follows:

Unit Name	Unit MW Capability	CEI/NYSEG Share - MW	MW Export - Load Level Peak	75%	40%
Homer City 1	620	310	310	310	310
Homer City 2	614	307	0*	0*	0*
Homer City 3	650	325	325	325	325
Seneca	390	304	304	164**	-343***
Load in GPU Served by NYPA			-107	-100	-60
			832	699	232
Base Economy Import (-)			-3,000	-3,600	-1,000
Net Base Interchange			-2,168	-2,901	-768

*Unit assumed out-of-service
**Capacity reduction due to water level
***Pumping load (343 MW CEI, 105 MW GPU)

The PJM generating units were dispatched without EFOR deration. Generator unavailability was accounted for by discrete outages, primarily on the 500-kV system. The combination of one Peach Bottom unit and one Susquehanna unit out of service was assumed as the most critical 500-kV unit outage combination. In addition, the following is a listing of some of the underlying generators assumed out of service:

- Three Mile Island No. 1
- Martins Creek Nos. 3 and 4
- Eddystone Nos. 3 & 4
- Indian River No. 2
- Homer City No. 2
- Sewaren No. 2
- Linden No. 2

The PJM 500-kV and 230-kV switched capacitors were modelled explicitly. The capacitors were switched on for the 100% and 75% of peak load levels and switched off for the 40% of peak load level.

A Power Flow Simulation System Summary and 500-kV power flow transcription for each of the the following base case power flow simulations are included as exhibits and in Appendix 2.

Base Case - Power Flow Simulation

40% of peak load	- 1 unit	- Hope Creek
	- 2 units	- Hope Creek/Salem
	- 3 units	- Hope Creek/Salem
75% of peak load	- 3 units	- Hope Creek/Salem
100% peak load	- 3 units	- Hope Creek/Salem

In addition, a 500-kV power flow transcription corresponding to each of the 500-kV transmission maintenance outages is also provided in Appendix 2 (see case listings Exhibit 43, 53 and 63).

At the invitation of PSE&G, modifications to generation dispatch data, power flow simulation representation and transient stability data were submitted by Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company. In addition, General Public Utilities provided several data revisions. A description of these changes is summarized in Appendix 4.

Transient Stability Analysis

The transient stability analysis employed the TRANSTAB program to assess the stability of the system and the performance of the Hope Creek and Salem units. The major portion of the analysis involved the development of generator MW, MVAR and voltage limits for each of the three unit operating combinations, i.e. number of Hope Creek and Salem units running corresponding to the 40% of peak load level. The limits to unit operation refer to those constraints required to maintain stability following critical contingencies with the pre-contingency transmission system configured with all facilities in-service and with selected transmission lines and circuit breakers scheduled out of service for maintenance.

1. Machine Representation

The transient stability analysis was based on the most current and appropriate generator unit and unit step-up transformer data used by PJM. This data is defined by the following and appears in Appendix 6.

a. PJM Units

- . synchronous rotor data
- . excitation system data
- . governor system data

b. Individual Outside World Units - represented with synchronous rotor data.

c. Equivalent Outside World Units - buses without specific machine data available. A classical representation was developed based on a "unit machine" concept for which the number of unit machines on a bus would be a function of the total net MW generation (generation minus load)

on an equivalent bus divided by the MW size of the unit machine, i.e. 400 MW. For example, a bus having a net 2000 MW of generation has data developed for five machines based on a unit machine of 400 MW.

2. Generator Terminal Representation

The following generator terminal buses were simulated in detail, i.e. the unit MW and MVAR gross output and auxiliary load represented explicitly. These loads were represented on the appropriate generator terminal or 500-kV bus, or distributed between the two.

Generator Name	Gross MW Output	Auxiliary Load MW	(MVAR)
Hope Creek No. 1	1100	33.0	(25.0)
Salem No. 1	1123	39.0	(29.0)
Salem No. 2	1162	39.0	(29.0)
Peach Bottom No. 2	1091	29.0	(14.1)
Keystone No. 1	880	33.5	(29.0)
Keystone No. 2	880	33.5	(29.0)
Conemaugh No. 1	880	26.0	(16.0)
Conemaugh No. 2	880	20.0	(14.0)
Limerick No. 1 (230 kV)	1093	36.5	(17.7)

All other PJM and outside world generators were represented by a net MW and MVAR output with no auxiliary loads simulated.

3. System Load Representation

The simulation of system load was:

a. MW load represented by constant current model;

b. MVAR load represented by constant impedance model.

4. Stability Simulations

Stability simulations were made for each of the three operating combinations with the Hope Creek and Salem units at full MW output. The system was tested with the following transmission configurations:

- all transmission in-service
- various 500-kV line maintenance outages
- various Hope Creek 500-kV circuit breaker maintenance outages

for two types of fault conditions:

- 3ø fault with primary clearing of 3.5 cycles

- 1ø fault with breaker failure protection, ie. 3.5 cycles primary clearing plus an additional 4.5 cycles for a total back up clearing time of 8.0 cycles. A short circuit analysis was done in order to determine the impedances needed to simulate the unbalanced fault conditions.

It should be noted that the Power Vs. Rotor Angle curves in Appendix 3 are for either the Hope Creek or Salem units. These are representative of the response of the Salem No. 1 and 2 units when running. This is true for all cases except those that deal with the Hope Creek-Salem (5037) 500-kV line in terms of either an unscheduled or scheduled outage. With this line in-service, the Hope Creek and Salem 500-kV buses can be considered as one. With this line out-of-service or involved in a switching scenario, the Hope Creek and Salem 500-kV busses are electrically about 90 miles apart and this is evident as seen in the Rotor Angle Vs. Time curve of Exhibits 88 and 96.

a. Stability simulation for all transmission in-service:

- fault at Hope Creek end of Hope Creek-Keeney (5015) 500 kV
- fault at Hope Creek end of Hope Creek-New Freedom (5023) 500 kV
- fault at Hope Creek end of Hope Creek-Salem (5037) 500 kV
- fault at Salem end of Salem-Deans (5021) 500 kV
- fault at Salem end of Salem-New Freedom (5024) 500 kV
- fault at Peach Bottom end of Peach Bottom-Keeney (5014) 500 kV

The results of this analysis document only the most critical case, i.e. most limiting or restrictive MW, MVAR and voltage conditions for each fault tested. The minimum MVAR output of the Hope Creek and Salem units was determined with the units operating within voltage constraints on the generator terminal, 230-kV and 500-kV system buses. The voltage constraint was to maintain a pre-contingency voltage within $\pm$5% of nominal on generator terminal and system 230-kV buses and within +10% on 500-kV buses. This recognizes that the allowable voltage rise for a post-contingency condition for a 230-kV bus would be an additional 5%. Further, the allowance of the 500-kV voltages as high as 110% is conditioned upon post-contingency voltages on the 500-kV system not exceeding 110% following any single contingency.

If any simulation was unstable for a particular set of generator output conditions, the MVAR output was increased until stability was attained. If however a limitation was reached, either generator MVAR output, system or generator terminal bus voltage, and the simulation remained unstable, the Hope Creek and Salem MW output was reduced until stability was attained.

b. Stability simulations with 500-kV transmission maintenance outages:

The fault analysis procedure described in section 4a above was applied to power flow simulations of the 500-kV transmission maintenance outages. This included Hope Creek and Salem Switching Station outlets and lines emanating from the next station beyond, i.e. Deans and Keeney, as follows:

- Hope Creek-Keeney (5015)
- Hope Creek-New Freedom (5023)
- Hope Creek-Salem (5037)
- Salem-New Freedom (5024)
- Salem-Deans (5021)
- Keeney-Peach Bottom (5014)
- Deans-Branchburg (5019)

The operating constraints with these scheduled outages were determined, with regard to generator MW and MVAR output, generator unit terminal voltage, and 230-kV and 500-kV system voltage conditions.

c. Stability simulations with Hope Creek 500-kV circuit breaker maintenance outages:

The analysis in this section was limited to a 3ϕ fault condition cleared in primary time. The following tabulation indicates for each Hope Creek circuit breaker outage, the critical line faulted and the additional line outaged resulting from bus sectionalizing and isolation following primary clearing. It was determined that a minimum reactive output of from 250 to 275 MVAR from each of the Hope Creek and Salem units was required (see Exhibit 4).

Hope Creek 500-kV Circuit Breaker (CB) Maintenance Outage

CB #	500-kV Faulted Line Name*	500-kV Faulted Line Desig.	Additional Line Outaged by Becoming Isolated Name	Additional Line Outaged by Becoming Isolated Desig.	Remaining Hope Creek Outlet
50X	HC-KNY	5015	HC-NF	5023	HC-SLM
51X	HC-SLM	5037	HC-KNY	5015	HC-NF
52X	HC-KNY	5015	HC-SLM	5037	HC-NF
60X	HC-NF	5023	HC-KNY	5015	HC-SLM
61X	HC-SLM	5037	HC-KNY	5015	HC-NF

*Fault on HC end of line
HC - Hope Creek
NF - New Freedom
SLM - Salem
KNY - Keeney

d. Stability simulation for the 75% of peak load and 100% peak load condition:

The condition which results in the most critical maintenance outage case at the 40% of peak load level was also tested in the 75% and 100% of peak load level case. The purpose was to confirm that the operating restrictions that were determined for the 40% of peak load condition remained valid for the higher load level and greater PJM import conditions. The results of the 75% of peak load and 100% peak load

simulations are in the form of Power Vs. Rotor Angle and Rotor Angle Vs. Time curves and are in Appendix 4, Exhibits 103 and 104. These results can be compared with the same critical fault condition tested under the 40% of peak load analysis (see Exhibit 93). It is evident that the simulation for the 40% of peak load condition produced results which were more restrictive in terms of generating unit operation than for either the 75% of peak load or 100% peak load condition.

It should be noted that the MVAR output of the Hope Creek and Salem units was greater in both the 75% of peak load and 100% peak load cases than in the 40% of peak load level case. The higher MVAR output was needed to maintain a voltage on each of the generator terminal buses at 100%. A 225 MVAR output from each of the Hope Creek and Salem machines, as was the case in the 40% of peak load case, would have resulted in a terminal voltage below 100% for the higher load level simulations. The generator terminal bus voltage in the 40% of peak load case was 102%.

e. Stability simulation for transmission line reclosure

Three transient stability simulations were made to demonstrate the impact of reclosing a 500-kV line in the vicinity of the Hope Creek/Salem Generating Station. In each case, the particular line was assumed to be scheduled out of service prior to reclosure. The system was at a steady-state condition prior to line reclosure. These simulations were made prior to the determination of required MW reductions for 500-kV maintenance outage conditions. Therefore, they do not

correspond directly to those cases presented under the 500-kV transmission maintenance outage section (4b) as to generator MW output reductions. However, this does not affect the conclusions reached. The three 500-kV lines were:

- Hope Creek-Salem (5037)
- Salem-Deans (5021)
- Hope Creek-Keeney (5015)

The Power Vs. Rotor Angle and Rotor Angle Vs. Time results indicate that none of the line reclosures had any appreciable impact on generator stability (see Exhibits 105, 106 and 107). It is evident that the magnitude of oscillation is a direct function of the criticalness of the facility being reclosed.

f. Stability simulation for transmission line tripping and reclosure

A stability simulation was made which imposed a three phase fault on the Hope Creek-Keeney (5015) 500-kV line at Hope Creek, cleared the fault in primary time, 3.5 cycles and then reclosed the line after a one second delay. Exhibit 108 shows the Power Vs. Rotor Angle and Rotor Angle Vs. Time curves for this simulation. The Salem No. 2 rotor angle oscillates with diminishing magnitude until attaining steady-state operation near the initial operating rotor angle.

The rotor angle returns along the power curve from its point of maximum swing, 109°; which corresponds to .6 seconds after the line is tripped. The line is reclosed in an additional .4 seconds which corresponds to a point when the rotor angle

swings back to 72°. The power at this point, i.e time t- line reclose, is approximately 1160 MW. The magnitude to which the power output rises at time t+ line reclose, is about 1420 MW. It is evident, from the power curve, that reclosing the line in less than 1.0 second results in a greater power output increase for time t+ line reclose. Allowed to go long enough without line reclosure, the rotor angle would reach a steady-state value and this condition then devolves to a simple line reclosure scenario which is discussed previously in section 4e. It is concluded that the pre-Hope Creek line reclosure delay on the Hope Creek-Keeney (5015) 500-kV circuit of 1.0 second remains acceptable after the Hope Creek generating unit is placed in service.

g. Stability simulation for generating unit tripping

Two simulations of the loss of the Hope Creek generating unit were made and the results are shown in Exhibits 109 and 110. Exhibit 109 shows the Power Vs. Rotor Angle and Rotor Angle Vs. Time curves for the Salem No. 2 unit and indicates that there is little impact resulting from simply tripping the Hope Creek unit, i.e. no fault. Further, the Rotor Angle Vs. Time curve for various 500-kV generating units shows only a minimal impact.

The second simulation applied a 3ϕ fault on the 500-kV terminal of the Hope Creek generator step-up transformer. The fault, along with the Hope Creek generator, was cleared in primary time, 3.5 cycles. The results are shown in Exhibit 110 and indicates that there were no stability related problems.

h. Stability simulation for 1ø fault with breaker failure protection

The analysis of a 1ø fault with breaker failure protection focused on the three unit operating combination. However, a two unit case simulating the same contingency as in the three unit case is presented for comparison. It is evident after comparing the results that the most restrictive operating scenario is the condition of three unit operation and a 3ø fault cleared in primary time.

To simulate the 1ø fault condition, a short circuit analysis was performed to obtain data needed to calculate sequence impedances.

When considering the Hope Creek Switching Station arrangement three fault locations were considered. In each case following primary clearing, the fault remains for an additional 4.5 cycles and causes the additional loss of either;

- a second 500-kV transmission path, or
- the Hope Creek generating unit.

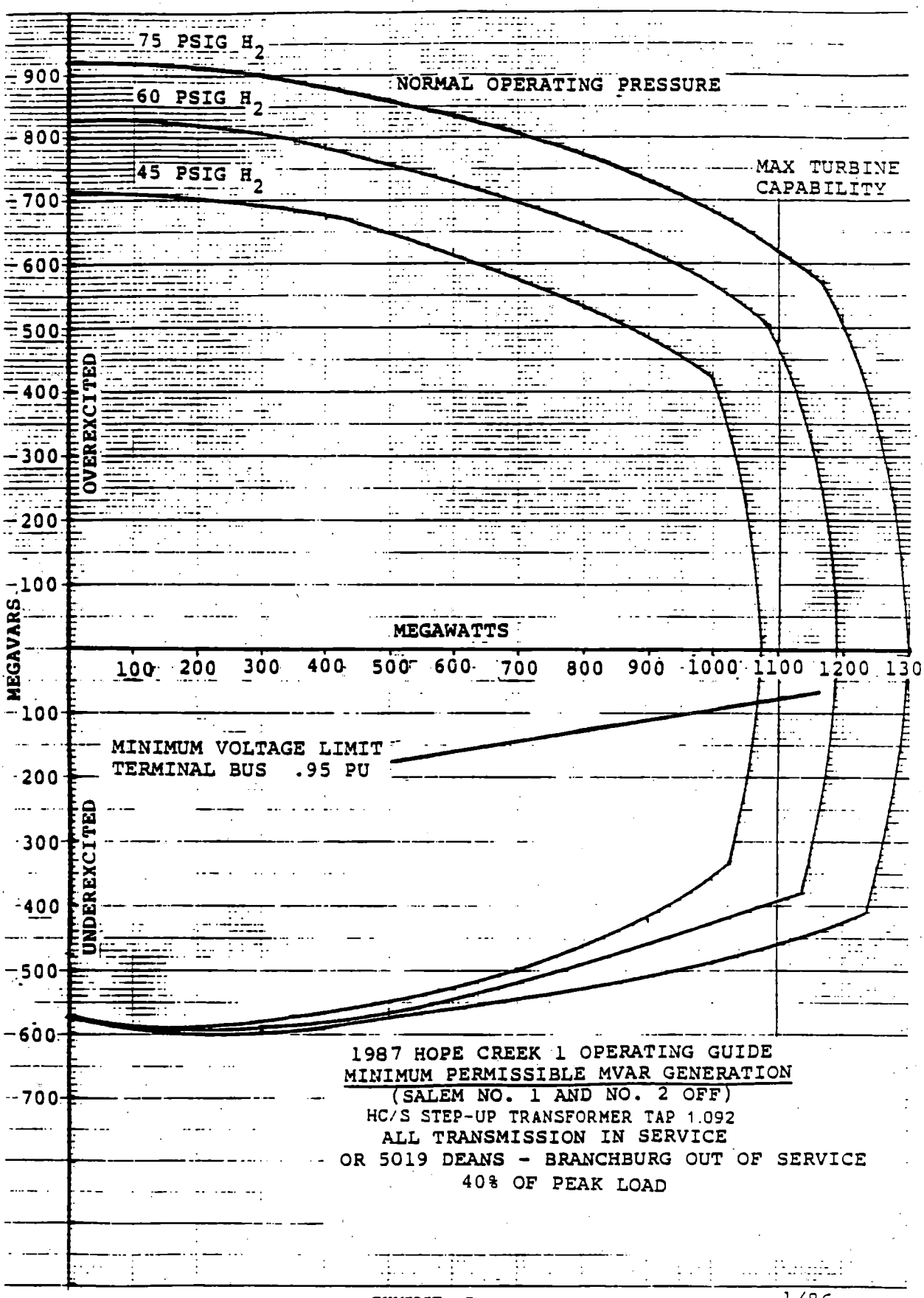
In the first case, a 1ø fault was applied to the Hope Creek end of the Hope Creek-Salem (5037) 500-kV line. The three phases of the faulted line were cleared at the Salem terminal in primary time, 3.5 cycles. At Hope Creek, it was assumed that the circuit breaker 52X operated normally but that the pole of circuit breaker 60X corresponding to the faulted phase failed to operate. This allows the fault to continue for an additional 4.5 cycles.

At the end of 8 cycles, breaker failure protection time, circuit breaker 61X at Hope Creek and the appropriate circuit breakers at Keeney, in an additional 2 cycles, operate to isolate the fault. The result of this simulation is shown in Exhibit 111. This result can be compared to the two unit Hope Creek/Salem operating condition shown in Exhibit 112 which is not as severe with application of the same fault simulation. Further, this result can be judged as not as severe as the 40% of peak load case which simulated a 3ø fault with primary clearing, see Exhibit 100.

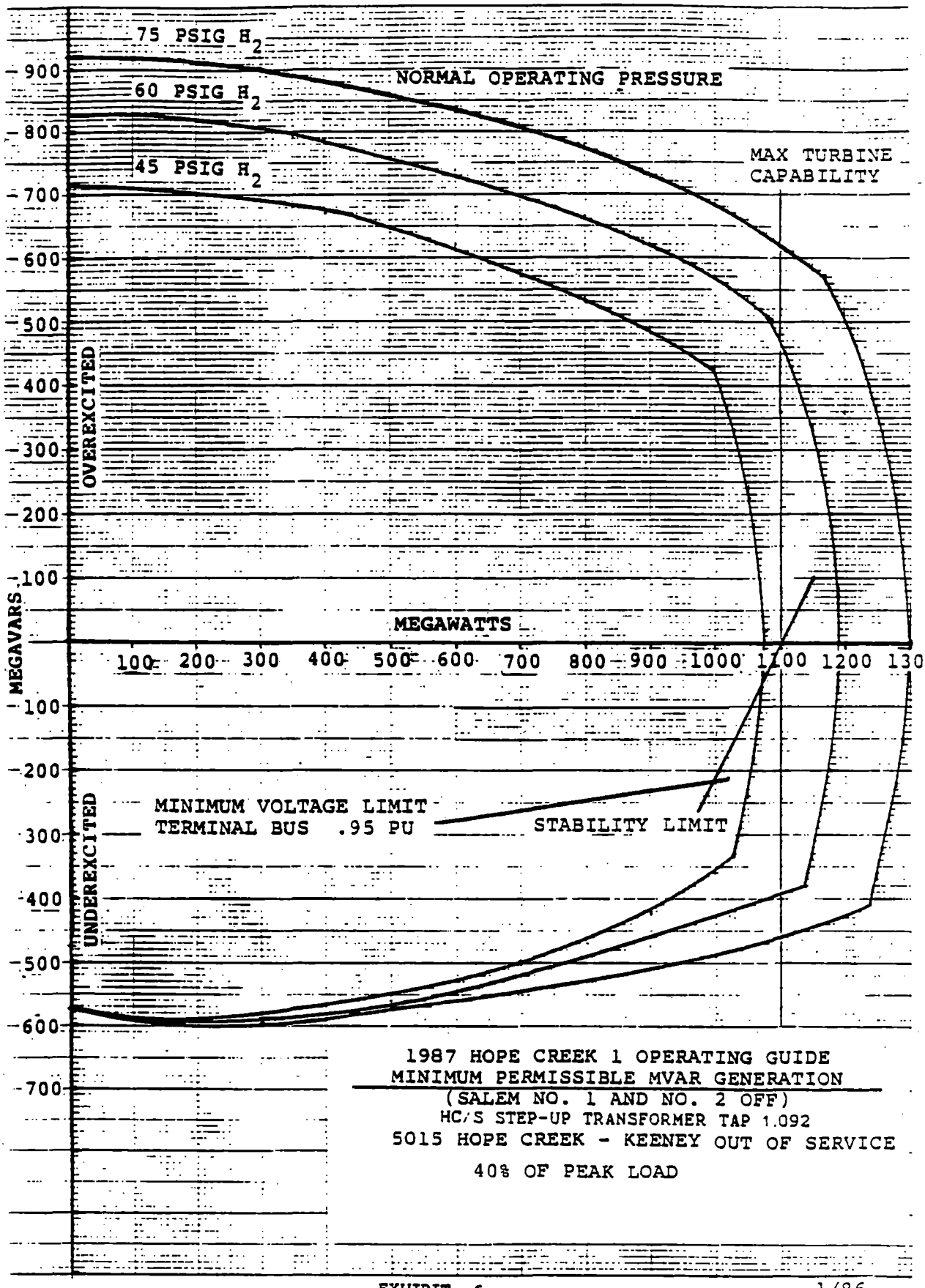
The second case develops as a result of the application of a 1ø fault on either the Hope Creek-Salem (5037) or Hope Creek-New Freedom (5023) 500-kV line at Hope Creek. In the case of the Hope Creek-Salem line, the pole of circuit breaker 52X, corresponding to the faulted phase failed to operate. This results in the tripping of the Hope Creek generating unit via operation of breaker fault protection and operation of circuit breaker 50X. This result is shown in Exhibit 113. Similarly, a 1ø fault on the Hope Creek-New Freedom (5023) line results in the loss of that line, and failure of the 50X circuit breaker results in the loss of the Hope Creek generating unit with the operation of circuit breaker 52X (see Exhibit 114).

APPENDIX 1

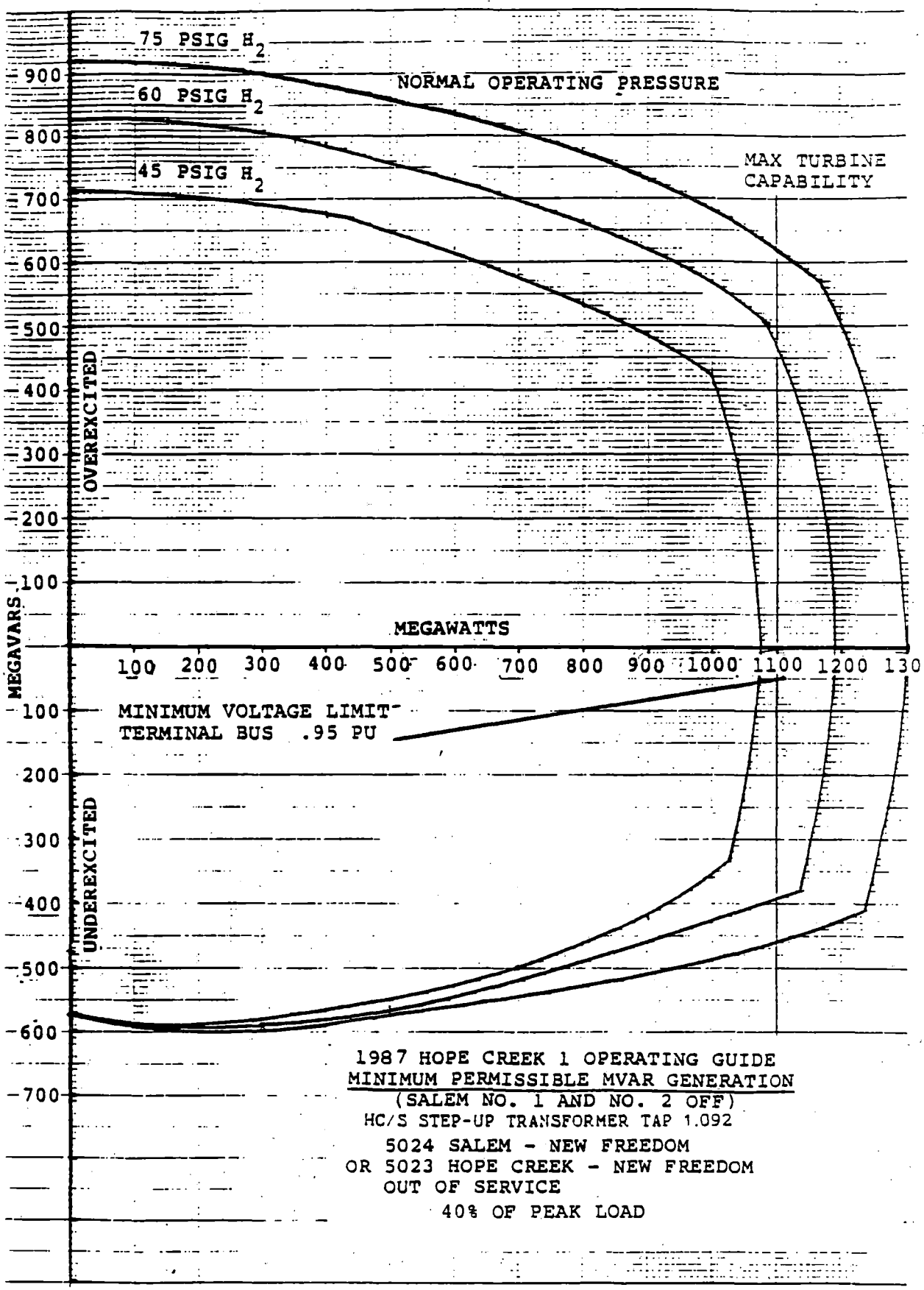
GENERATOR CAPABILITY CURVES



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(SALEM NO. 1 AND NO. 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
OR 5019 DEANS - BRANCHBURG OUT OF SERVICE
40% OF PEAK LOAD



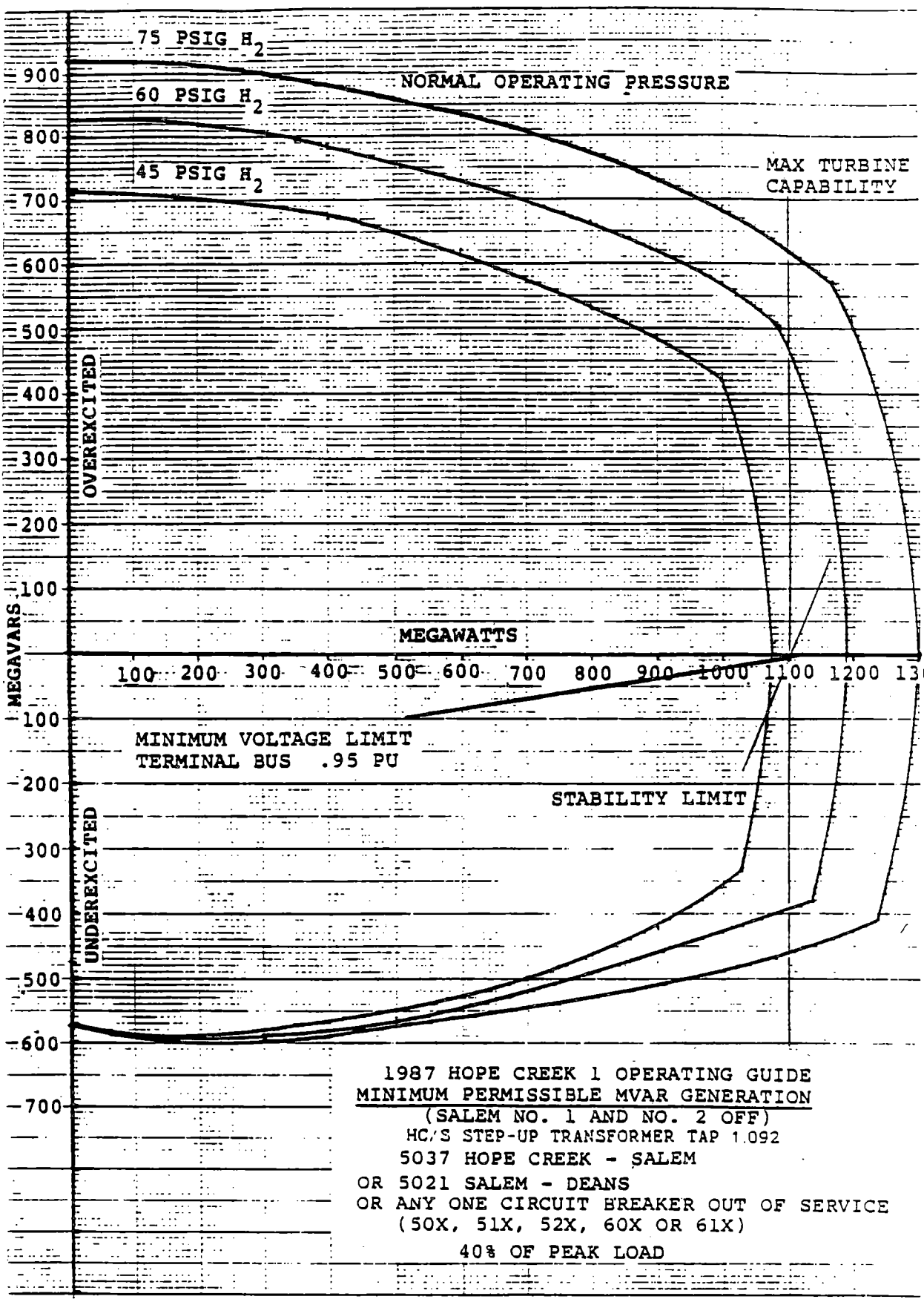
1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(SALEM NO. 1 AND NO. 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



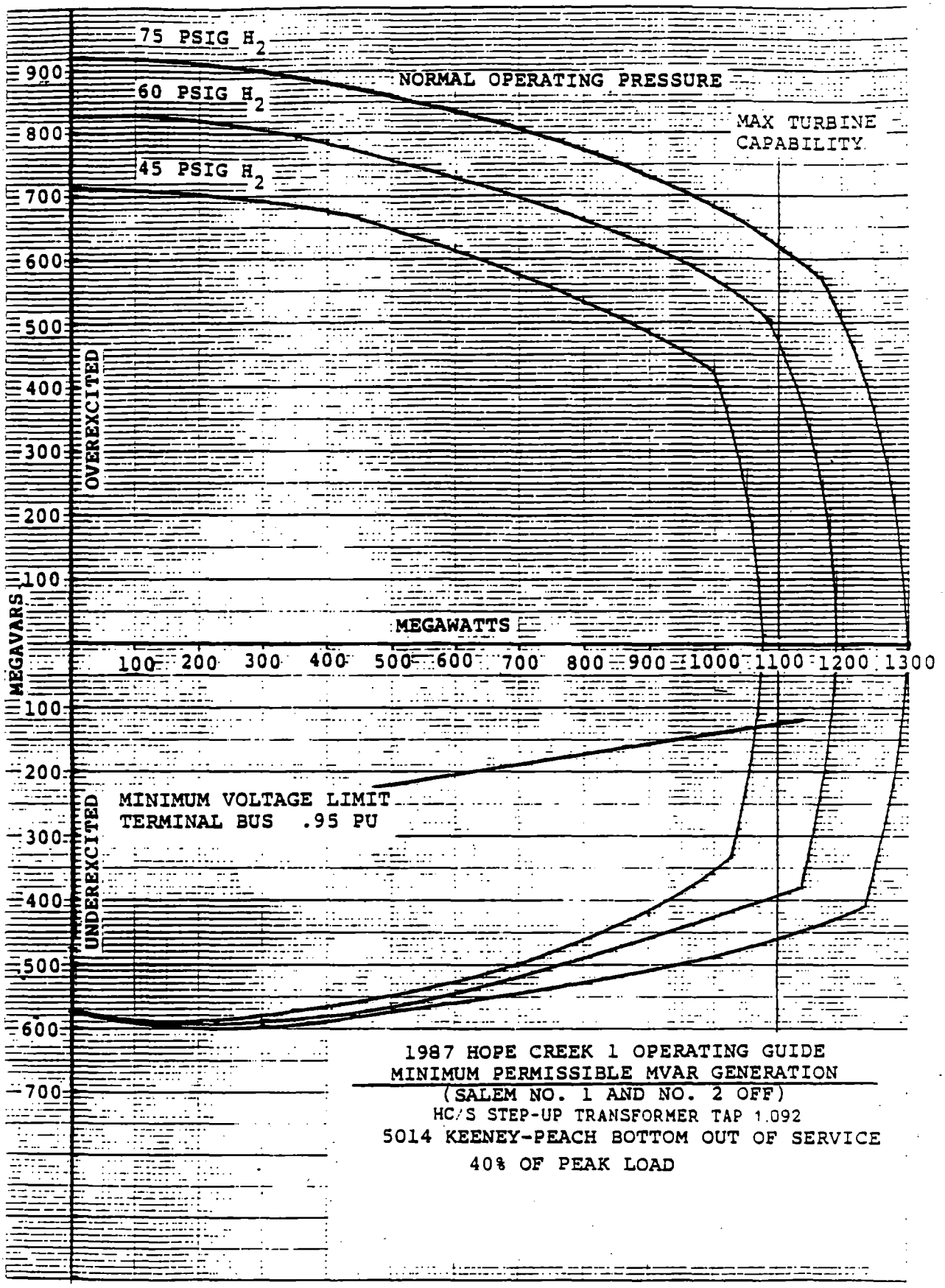
1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(SALEM NO. 1 AND NO. 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5024 SALEM - NEW FREEDOM
OR 5023 HOPE CREEK - NEW FREEDOM
OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 7

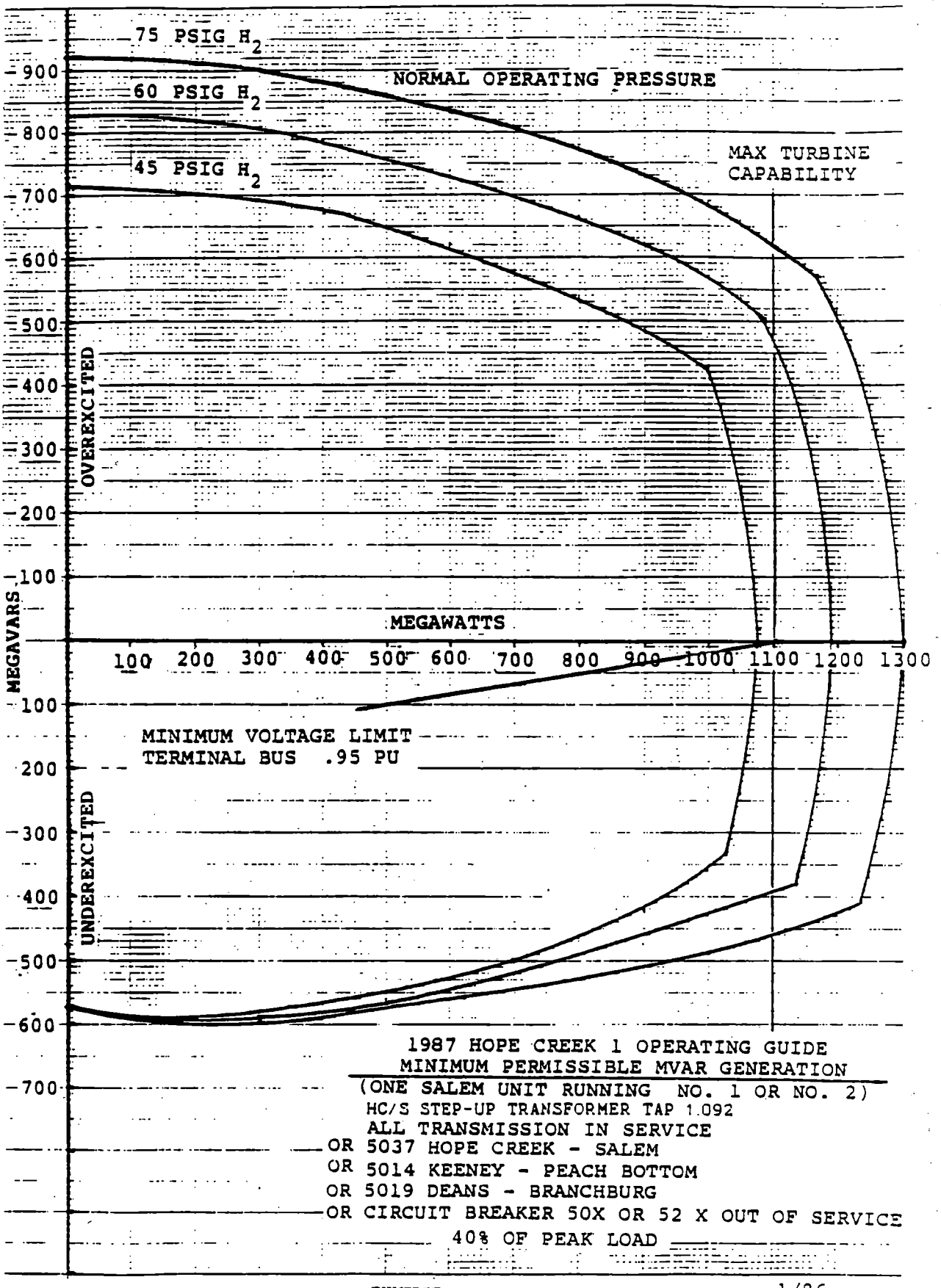
1/86



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(SALEM NO. 1 AND NO. 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5037 HOPE CREEK - SALEM
OR 5021 SALEM - DEANS
OR ANY ONE CIRCUIT BREAKER OUT OF SERVICE
(50X, 51X, 52X, 60X OR 61X)
40% OF PEAK LOAD

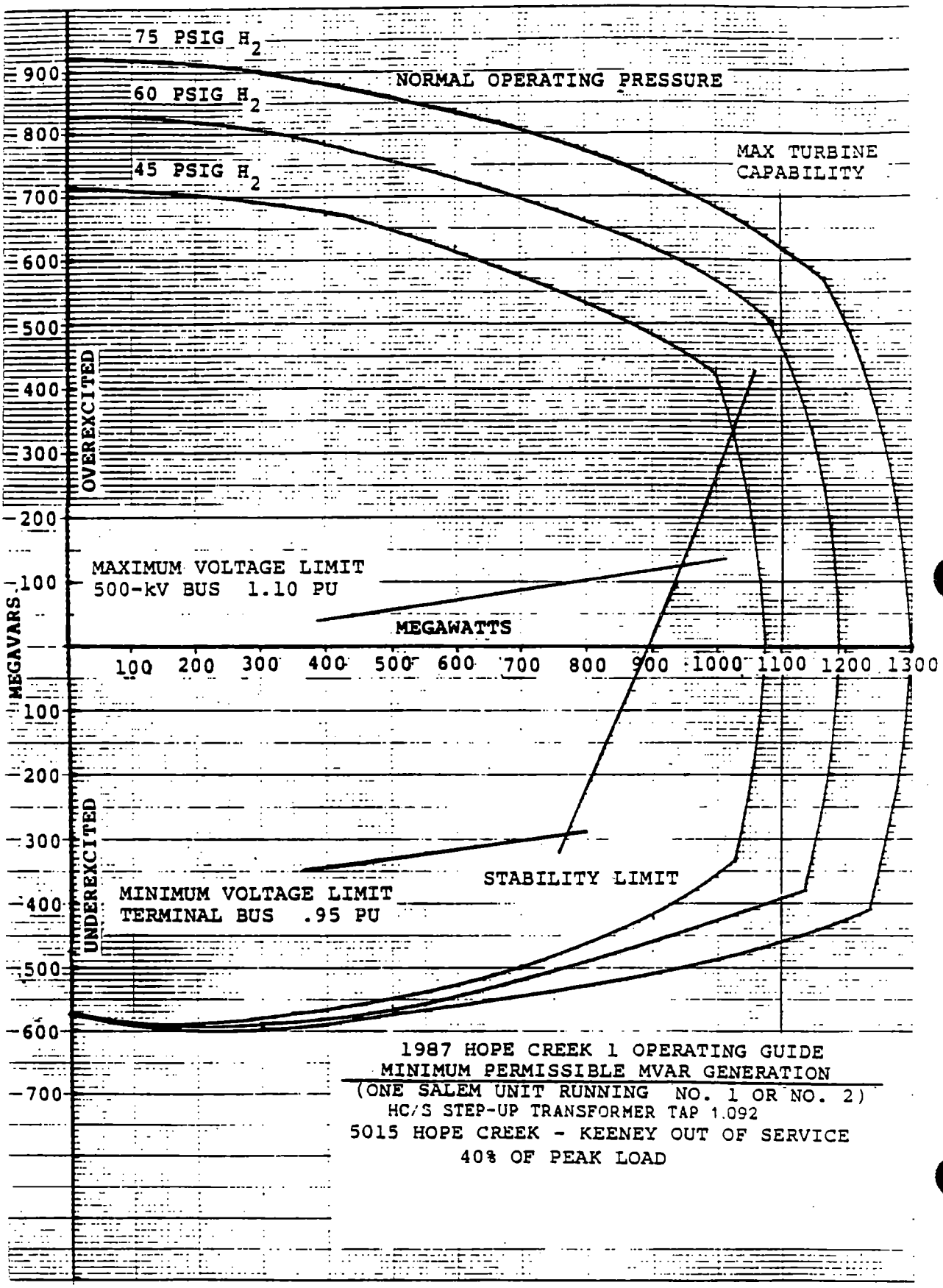


1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(SALEM NO. 1 AND NO. 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5014 KEENEY-PEACH BOTTOM OUT OF SERVICE
40% OF PEAK LOAD

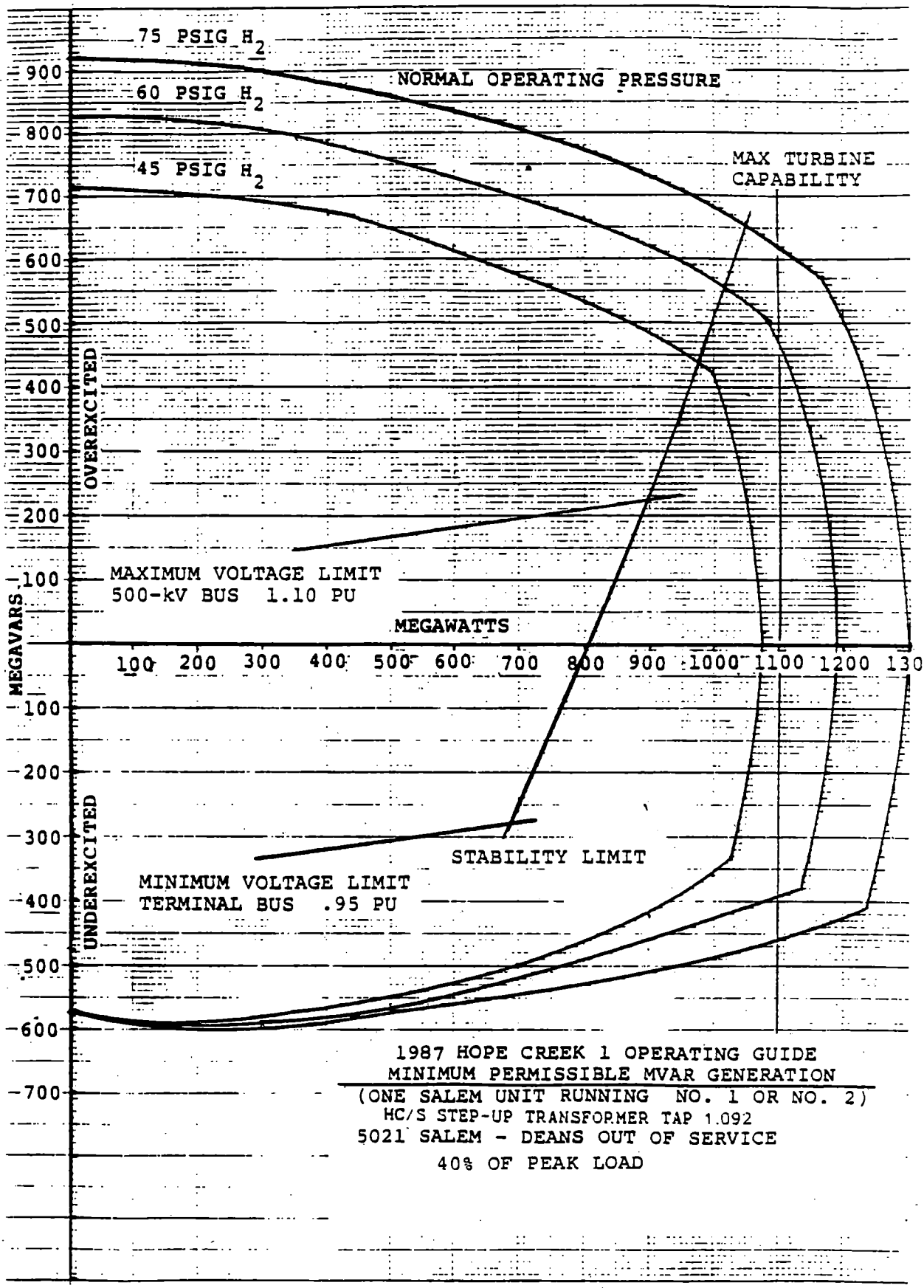


1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

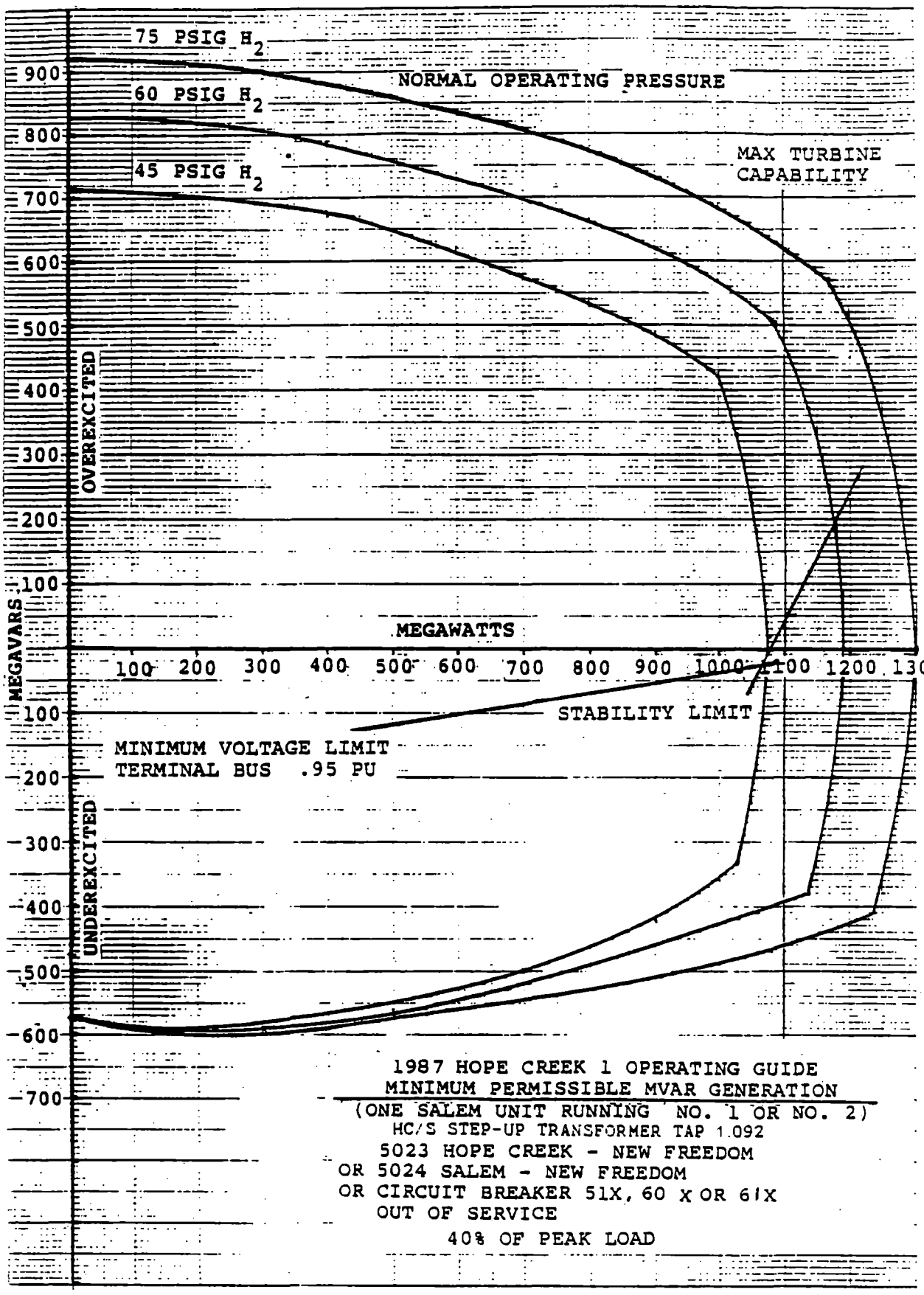
(ONE SALEM UNIT RUNNING NO. 1 OR NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
OR 5037 HOPE CREEK - SALEM
OR 5014 KEENEY - PEACH BOTTOM
OR 5019 DEANS - BRANCHBURG
OR CIRCUIT BREAKER 50X OR 52 X OUT OF SERVICE
40% OF PEAK LOAD



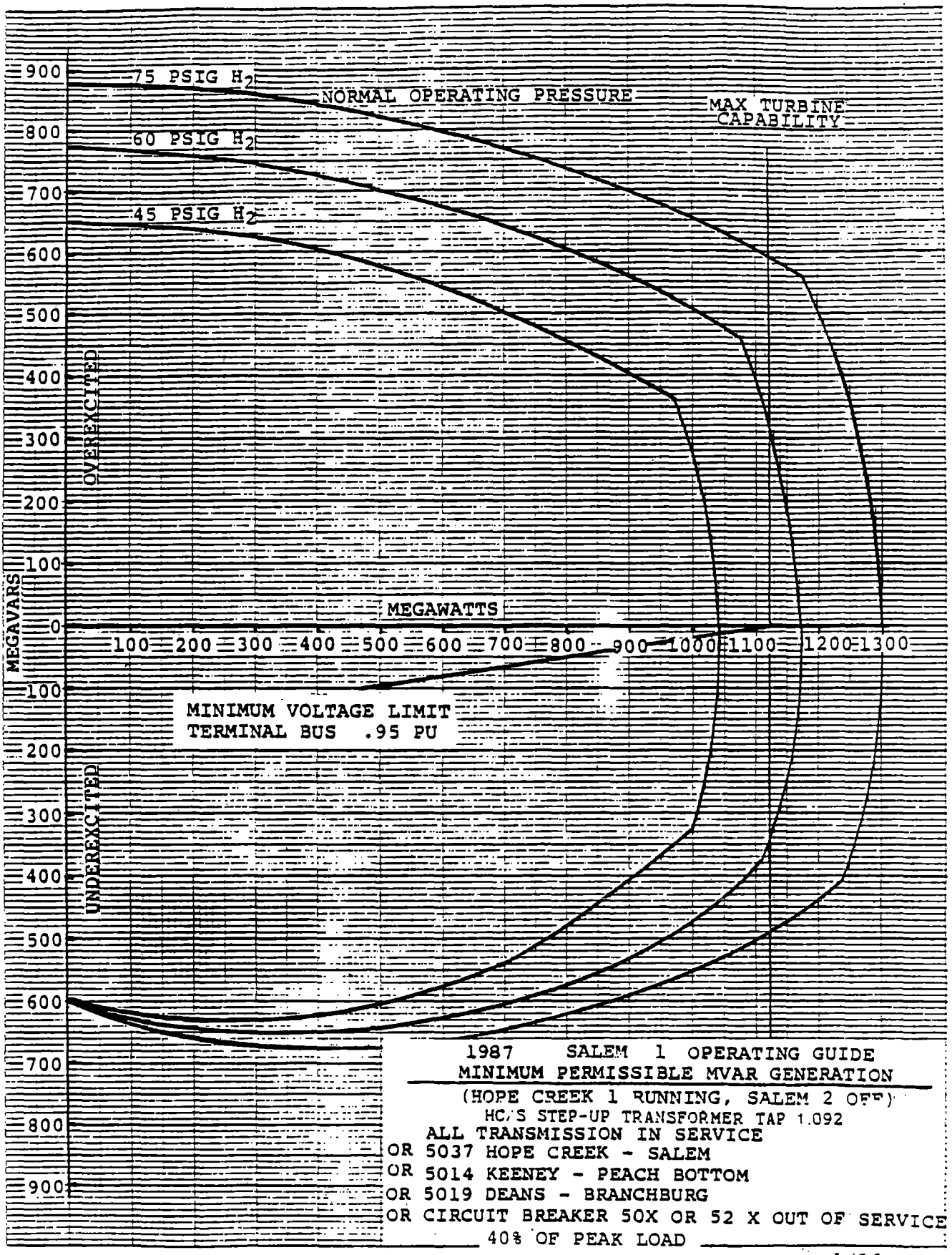
1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(ONE SALEM UNIT RUNNING NO. 1 OR NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(ONE SALEM UNIT RUNNING NO. 1 OR NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(ONE SALEM UNIT RUNNING NO. 1 OR NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5023 HOPE CREEK - NEW FREEDOM
OR 5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 60 X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 1 OPERATING GUIDE

MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 RUNNING, SALEM 2 OFF)

HC/S STEP-UP TRANSFORMER TAP 1.092

ALL TRANSMISSION IN SERVICE

OR 5037 HOPE CREEK - SALEM

OR 5014 KEENEY - PEACH BOTTOM

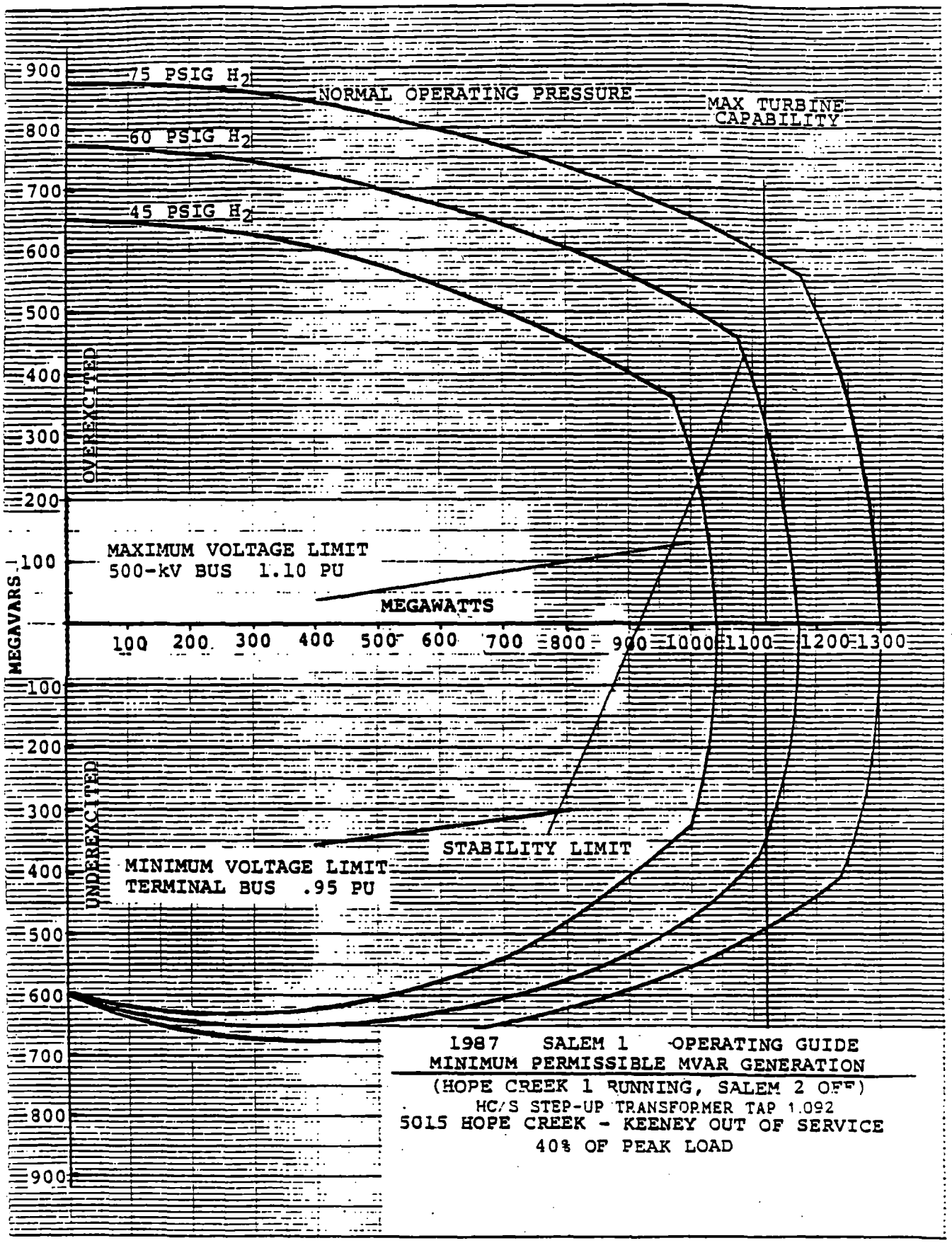
OR 5019 DEANS - BRANCHBURG

OR CIRCUIT BREAKER 50X OR 52 X OUT OF SERVICE

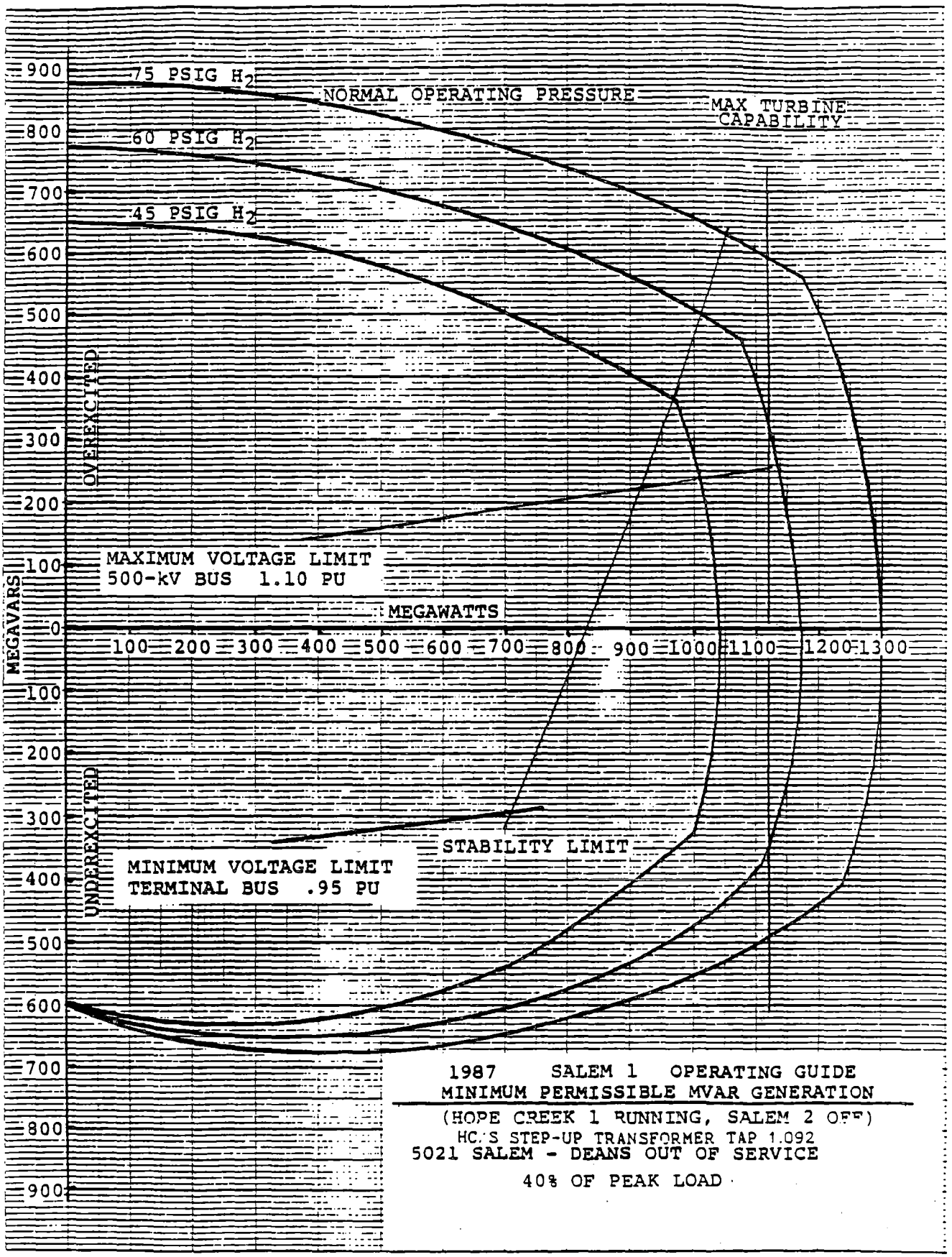
40% OF PEAK LOAD

EXHIBIT 14

1/86

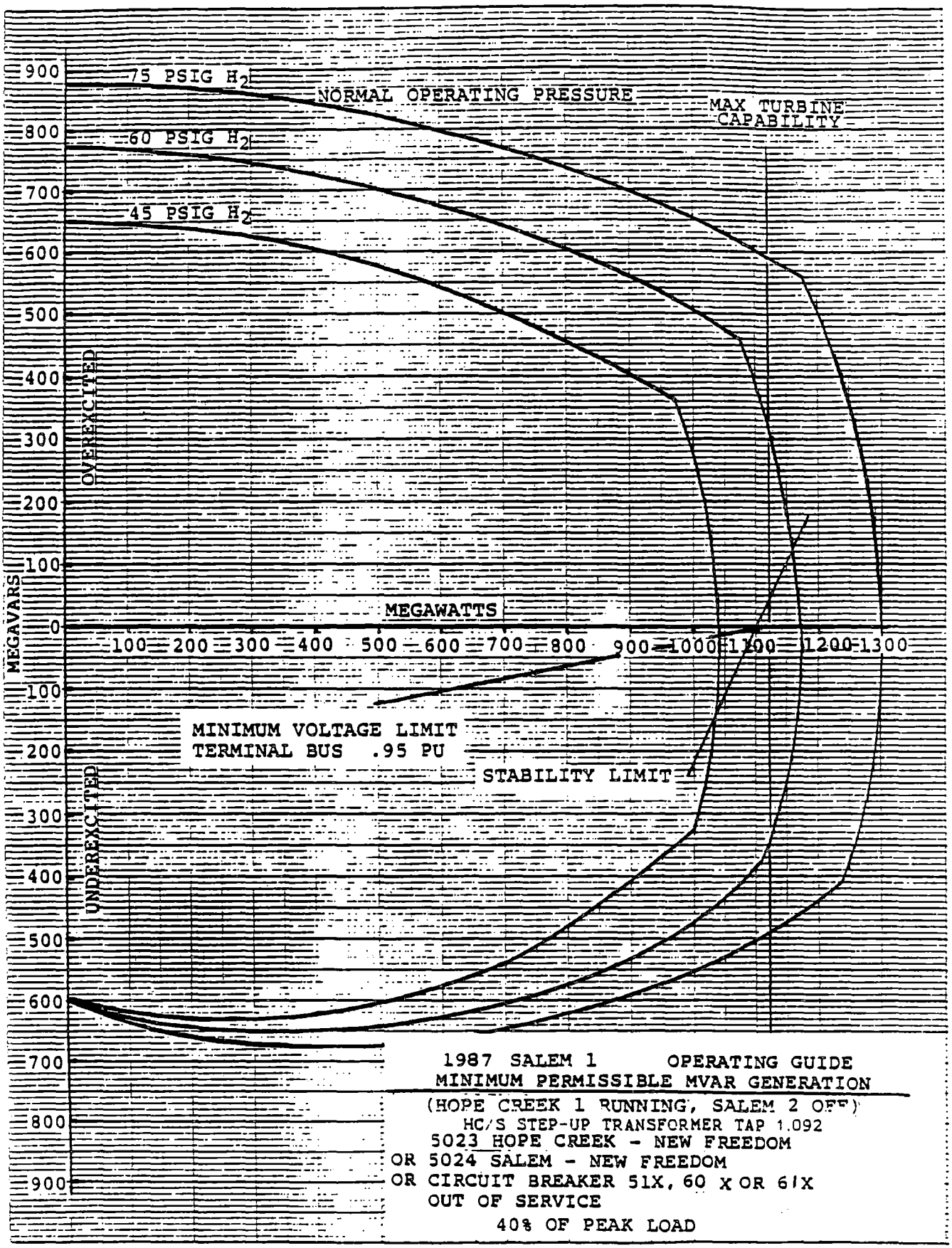


1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 RUNNING, SALEM 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



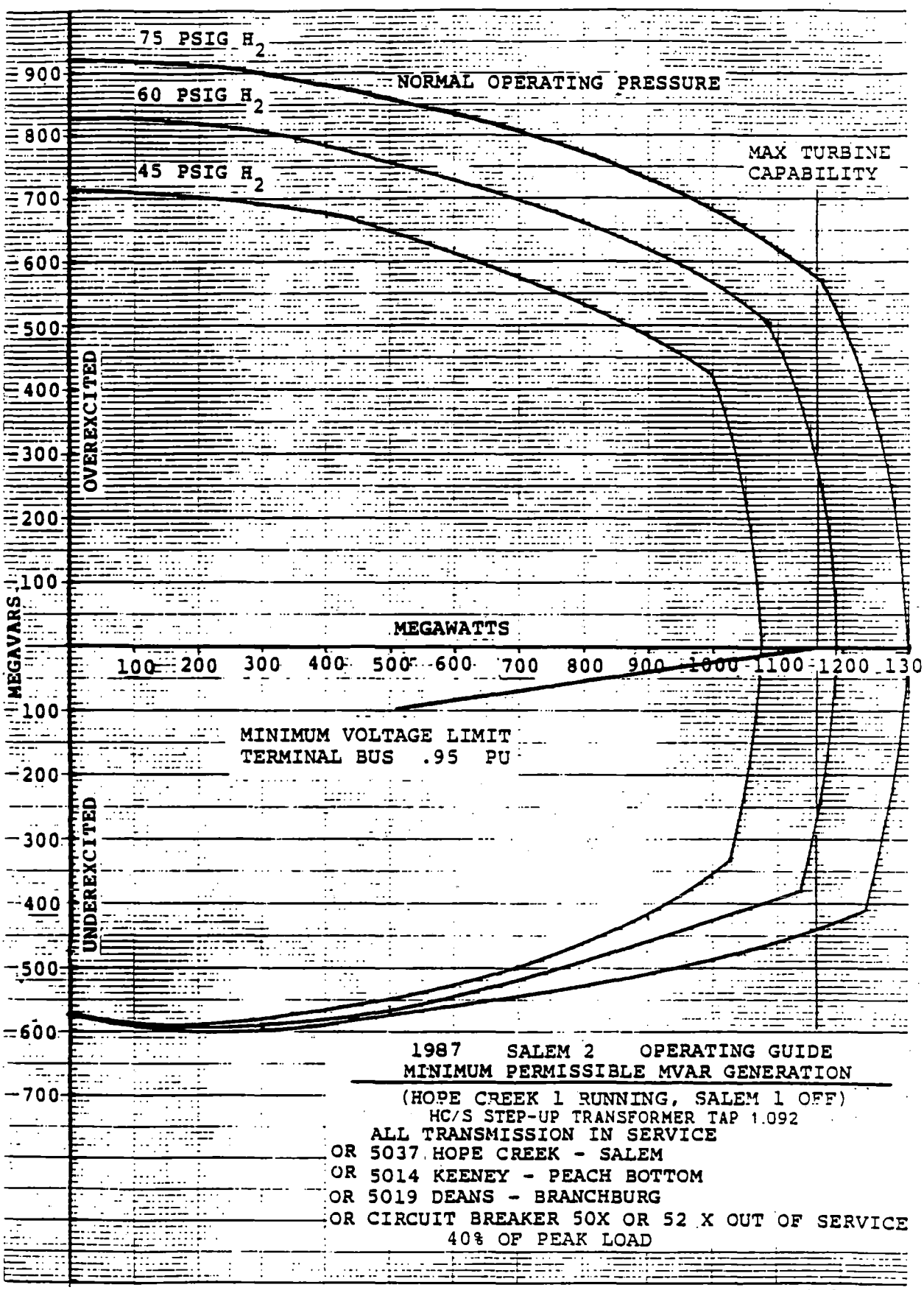
1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 RUNNING, SALEM 2 OFF)
HC.S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE
40% OF PEAK LOAD



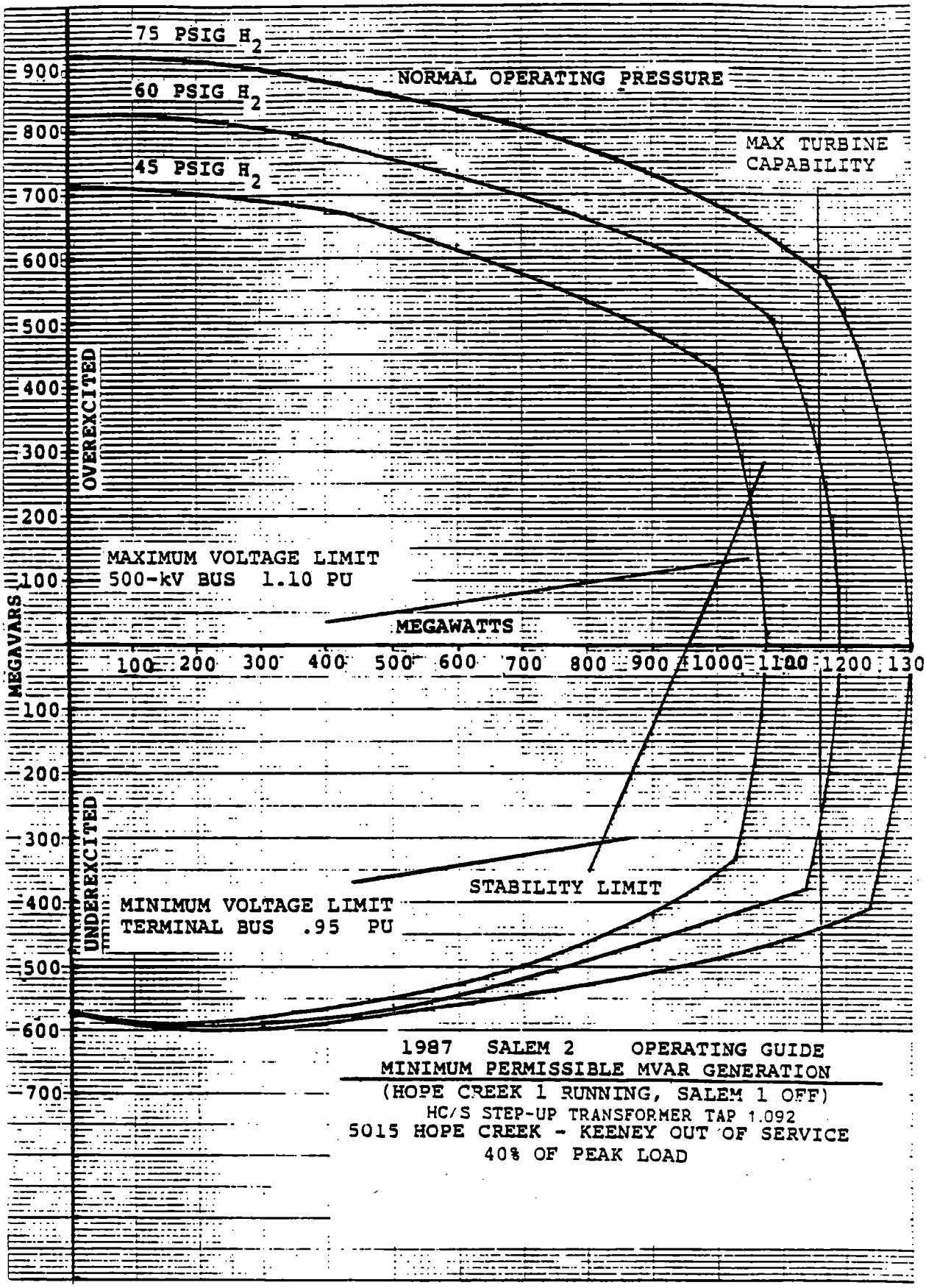
1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

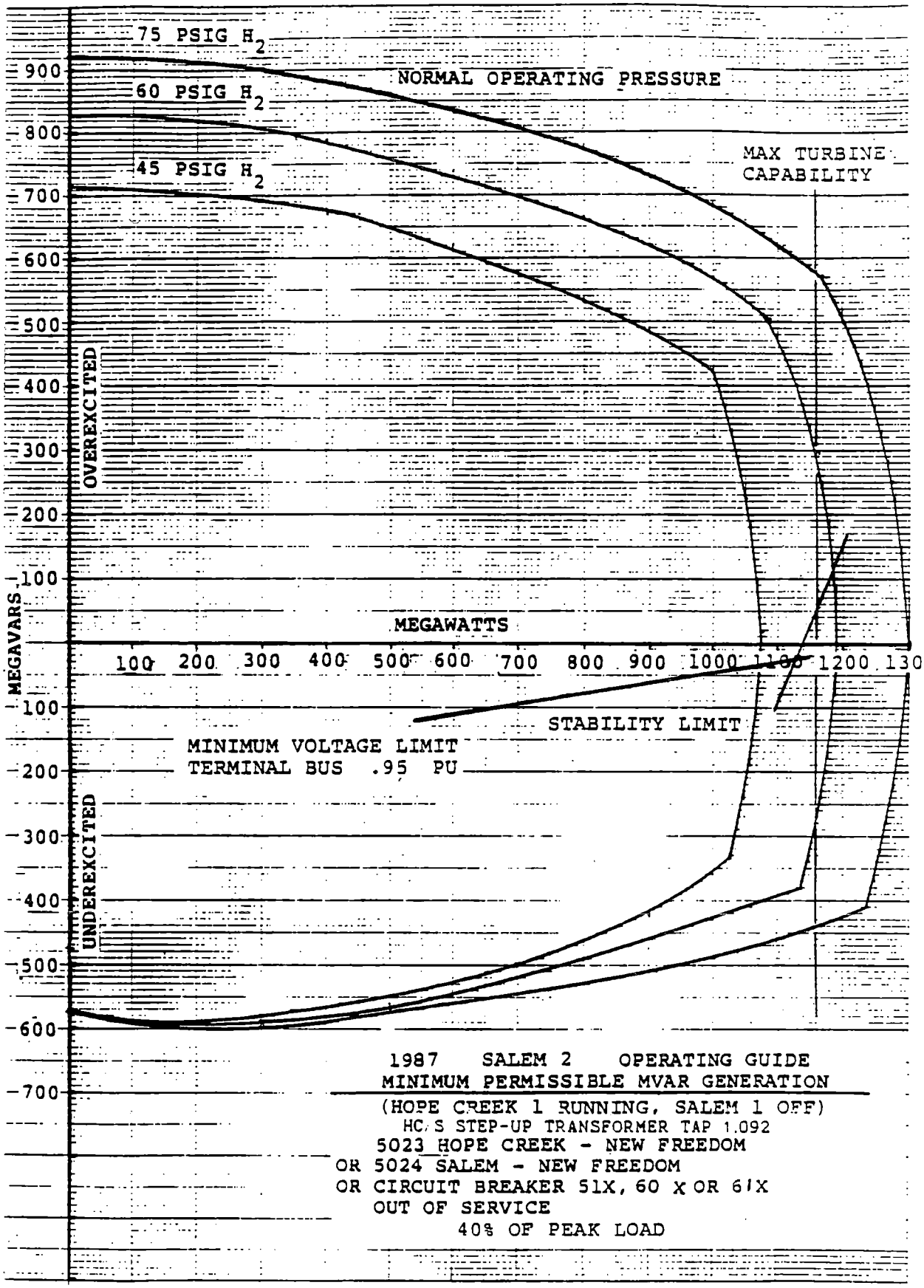
(HOPE CREEK 1 RUNNING, SALEM 2 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5023 HOPE CREEK - NEW FREEDOM
OR 5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 60 X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

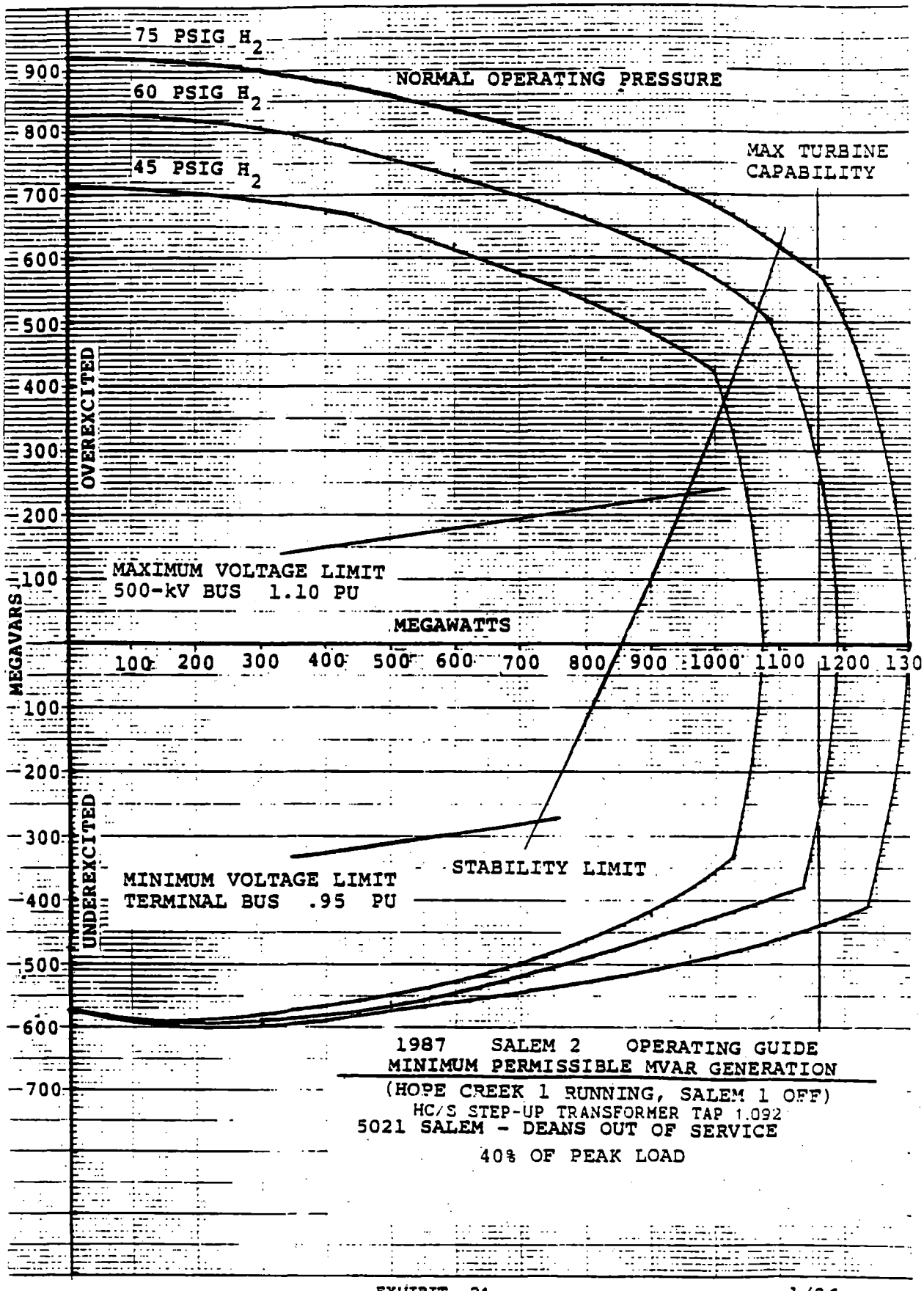
(HOPE CREEK 1 RUNNING, SALEM 1 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
OR 5037 HOPE CREEK - SALEM
OR 5014 KEENEY - PEACH BOTTOM
OR 5019 DEANS - BRANCHBURG
OR CIRCUIT BREAKER 50X OR 52 X OUT OF SERVICE
40% OF PEAK LOAD


75 PSIG H_2
NORMAL OPERATING PRESSURE
60 PSIG H_2
MAX TURBINE CAPABILITY
45 PSIG H_2
OVEREXCITED
MAXIMUM VOLTAGE LIMIT
500-kV BUS 1.10 PU
MEGAWATTS
MEGAVARS
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
UNDEREXCITED
STABILITY LIMIT
MINIMUM VOLTAGE LIMIT
TERMINAL BUS .95 PU
1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 RUNNING, SALEM 1 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

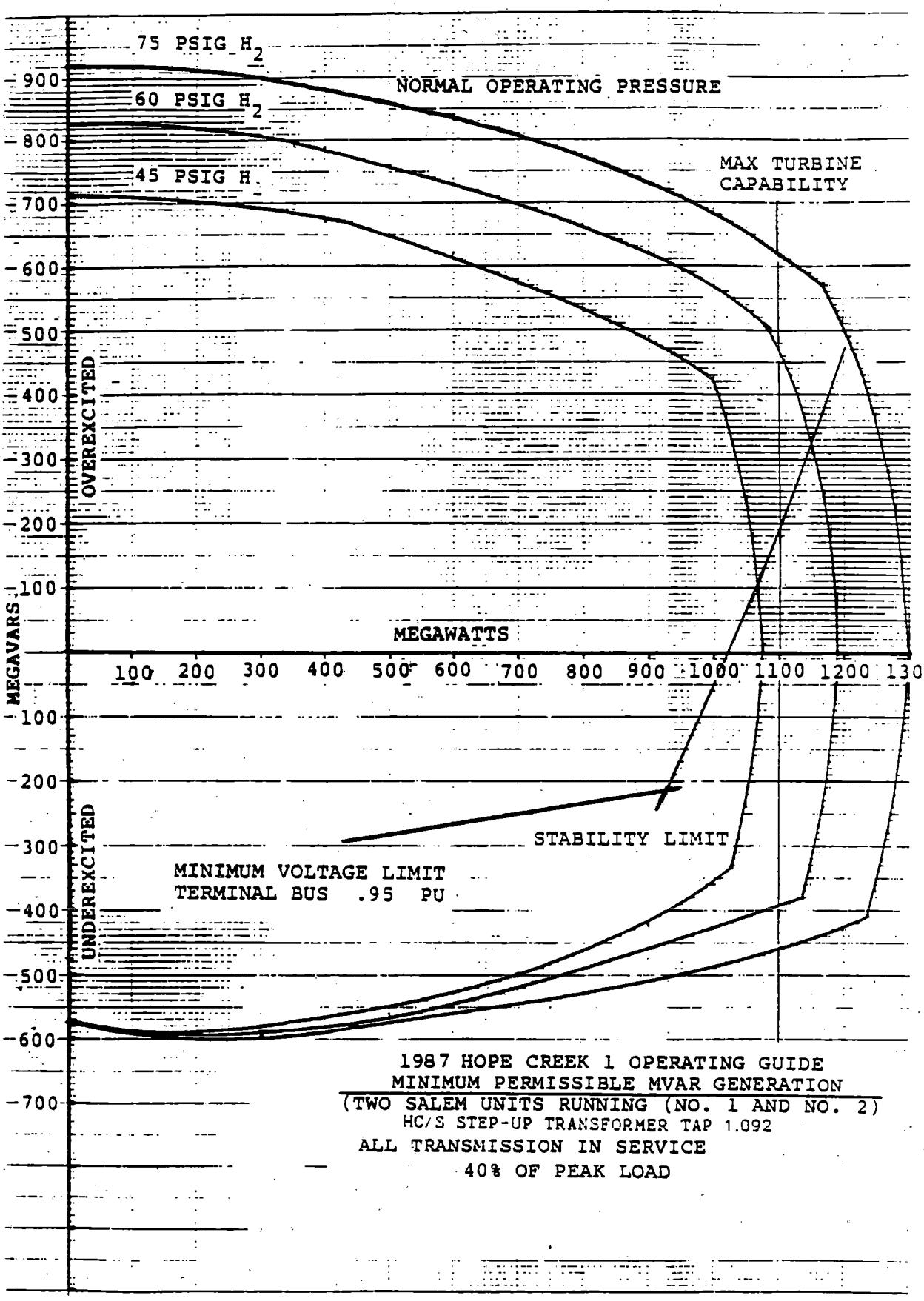
(HOPE CREEK 1 RUNNING, SALEM 1 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5023 HOPE CREEK - NEW FREEDOM
OR 5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 60 X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD



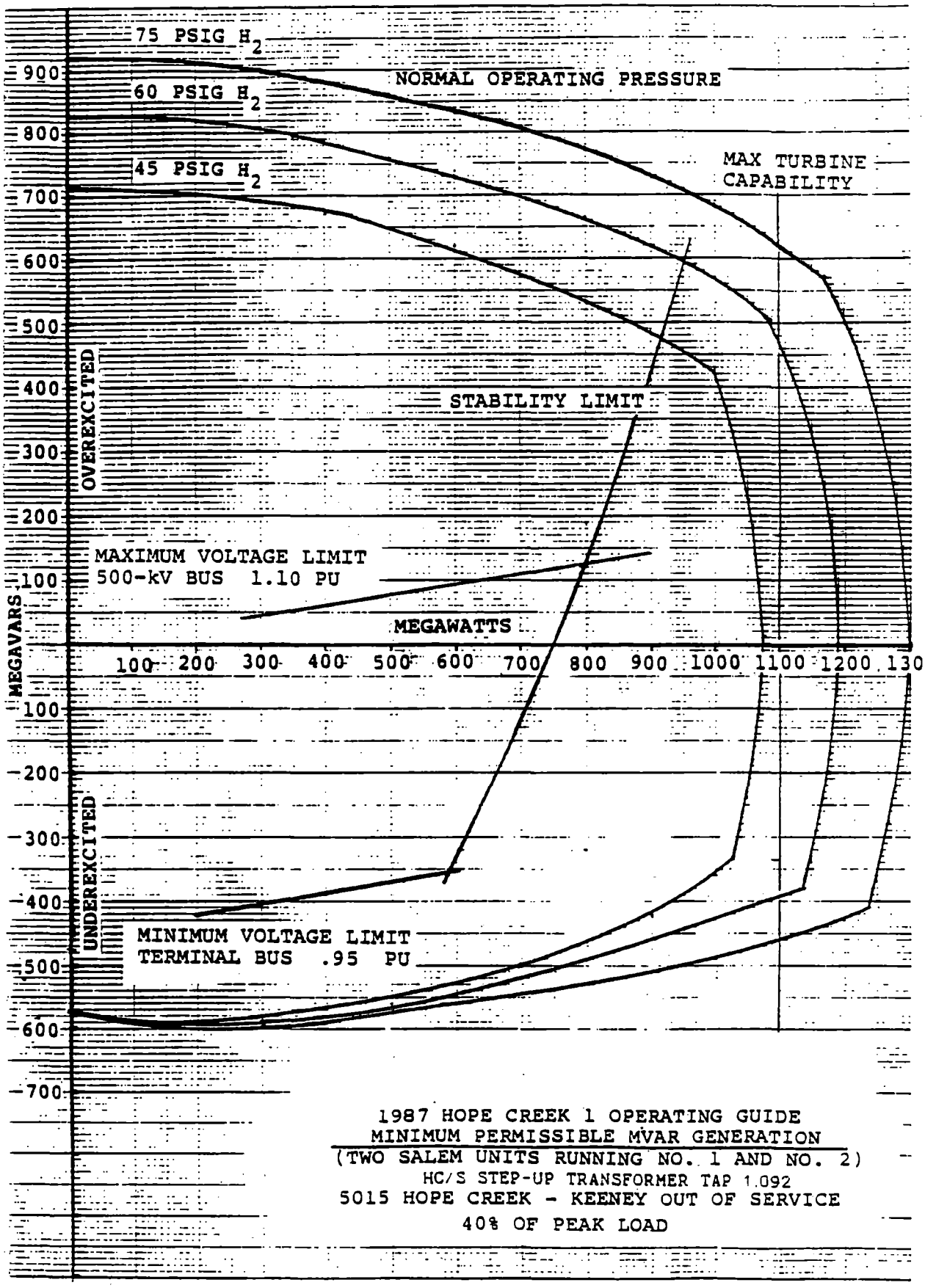
1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 RUNNING, SALEM 1 OFF)
HC/S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE

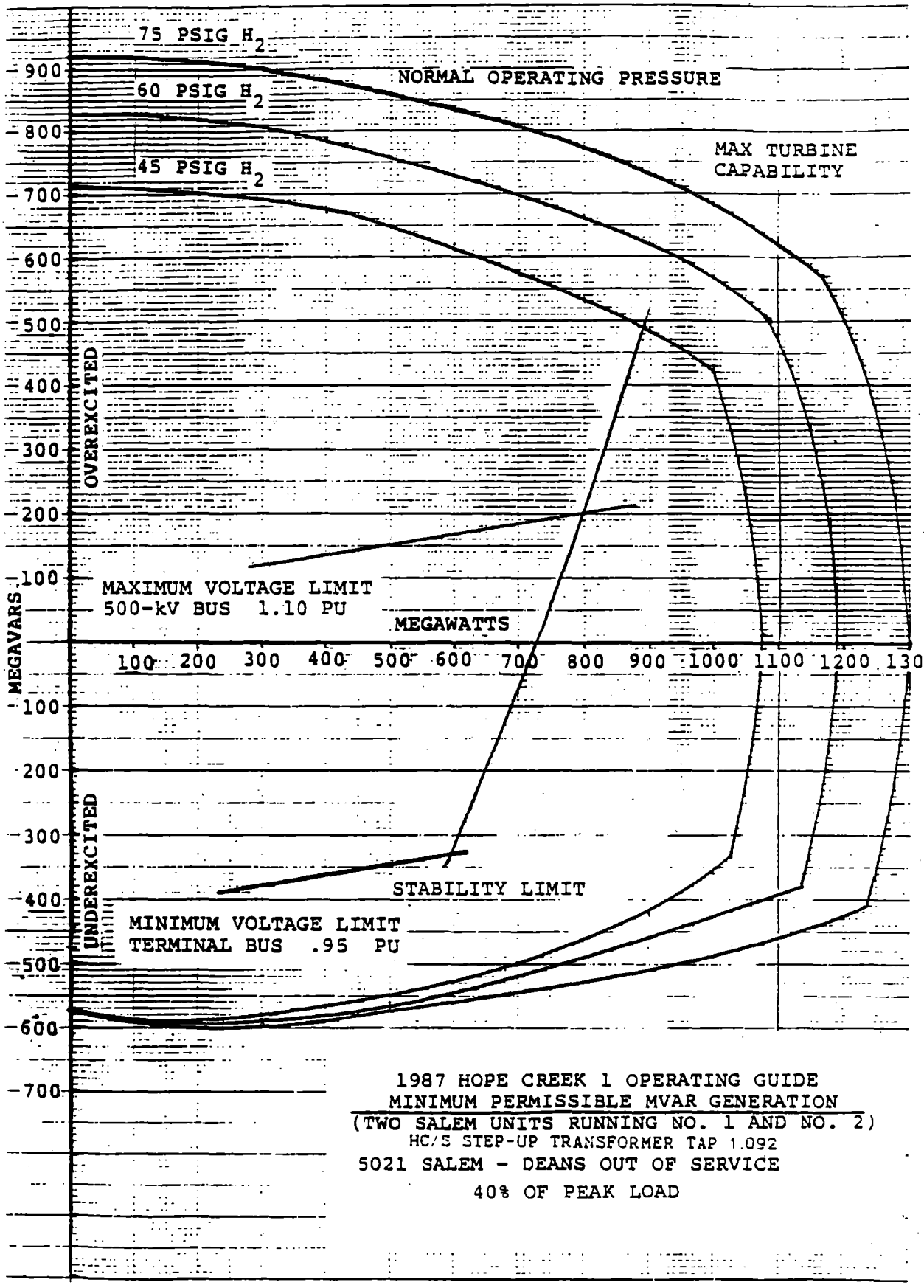
40% OF PEAK LOAD



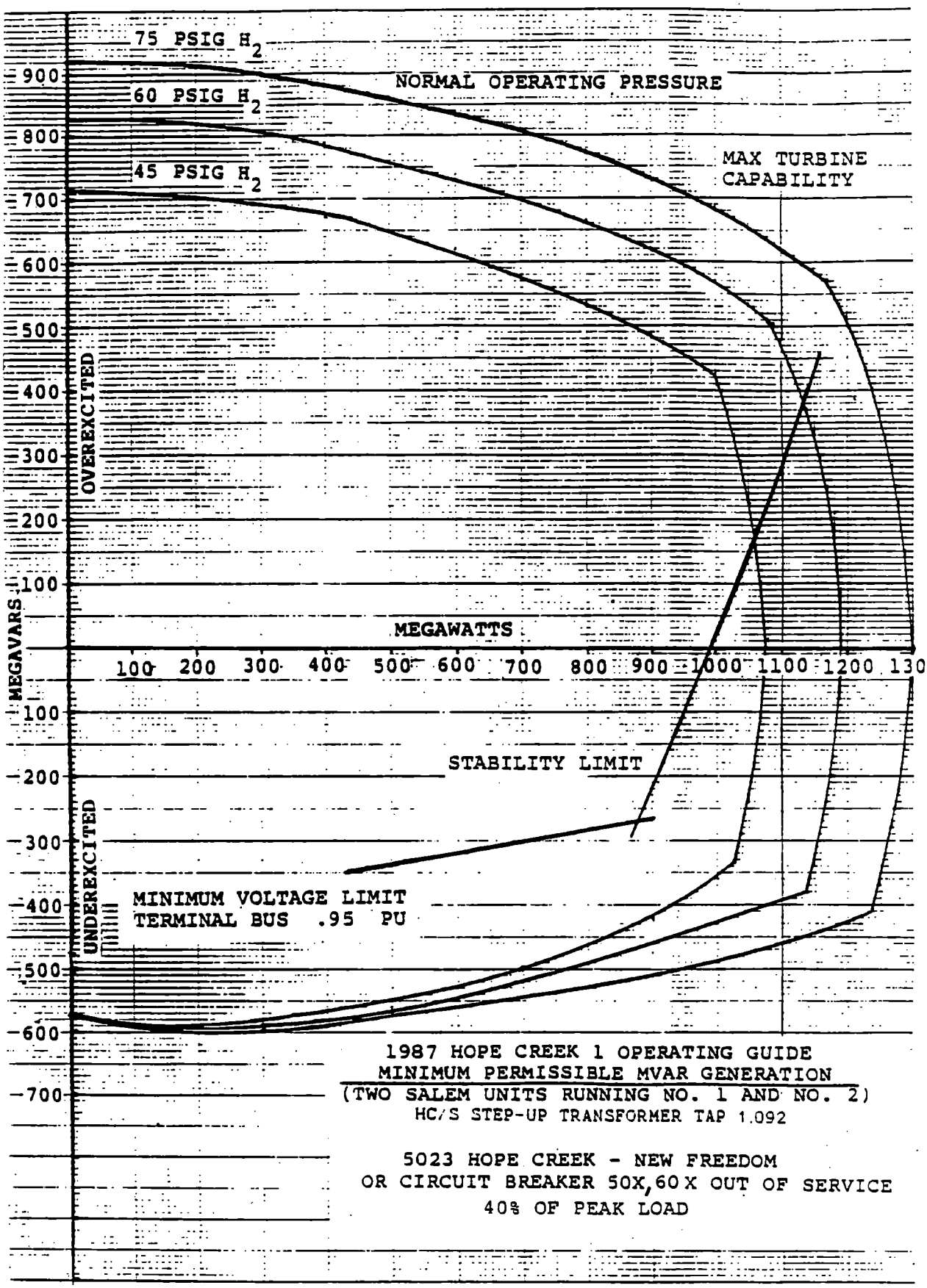
1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING (NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE

MINIMUM PERMISSIBLE MVAR GENERATION

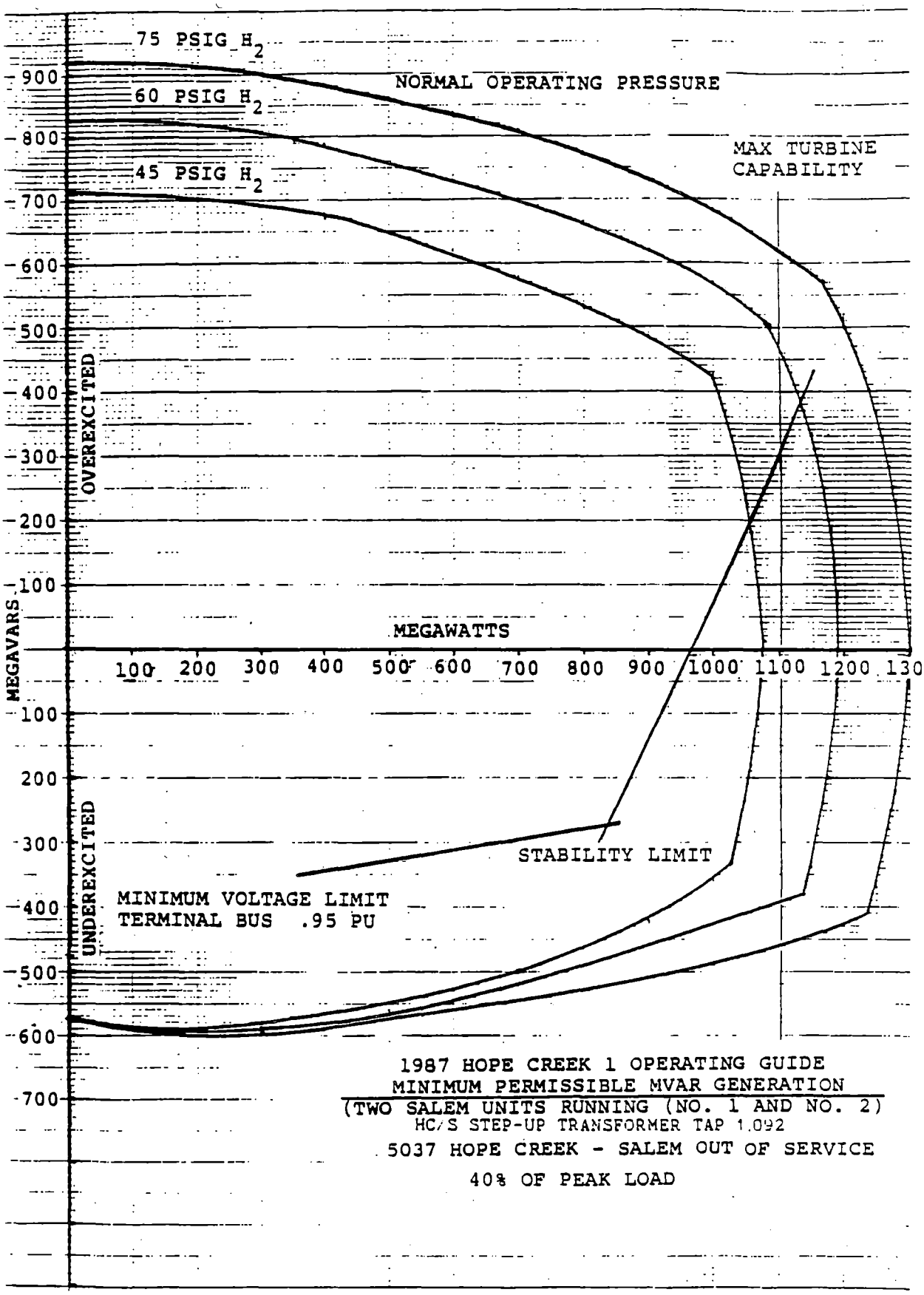
(TWO SALEM UNITS RUNNING NO. 1 AND NO. 2)

HC/S STEP-UP TRANSFORMER TAP 1.092

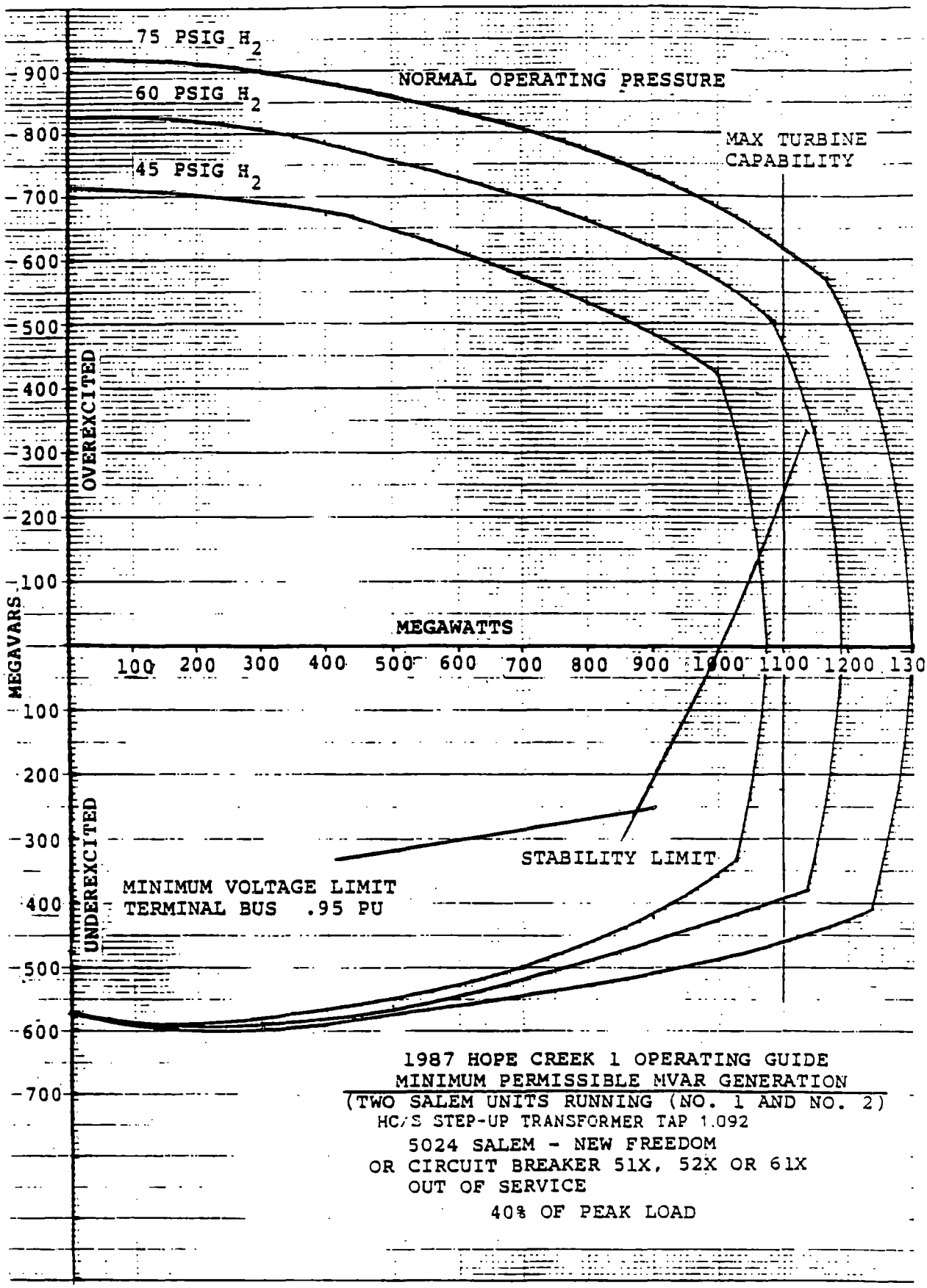
5023 HOPE CREEK - NEW FREEDOM

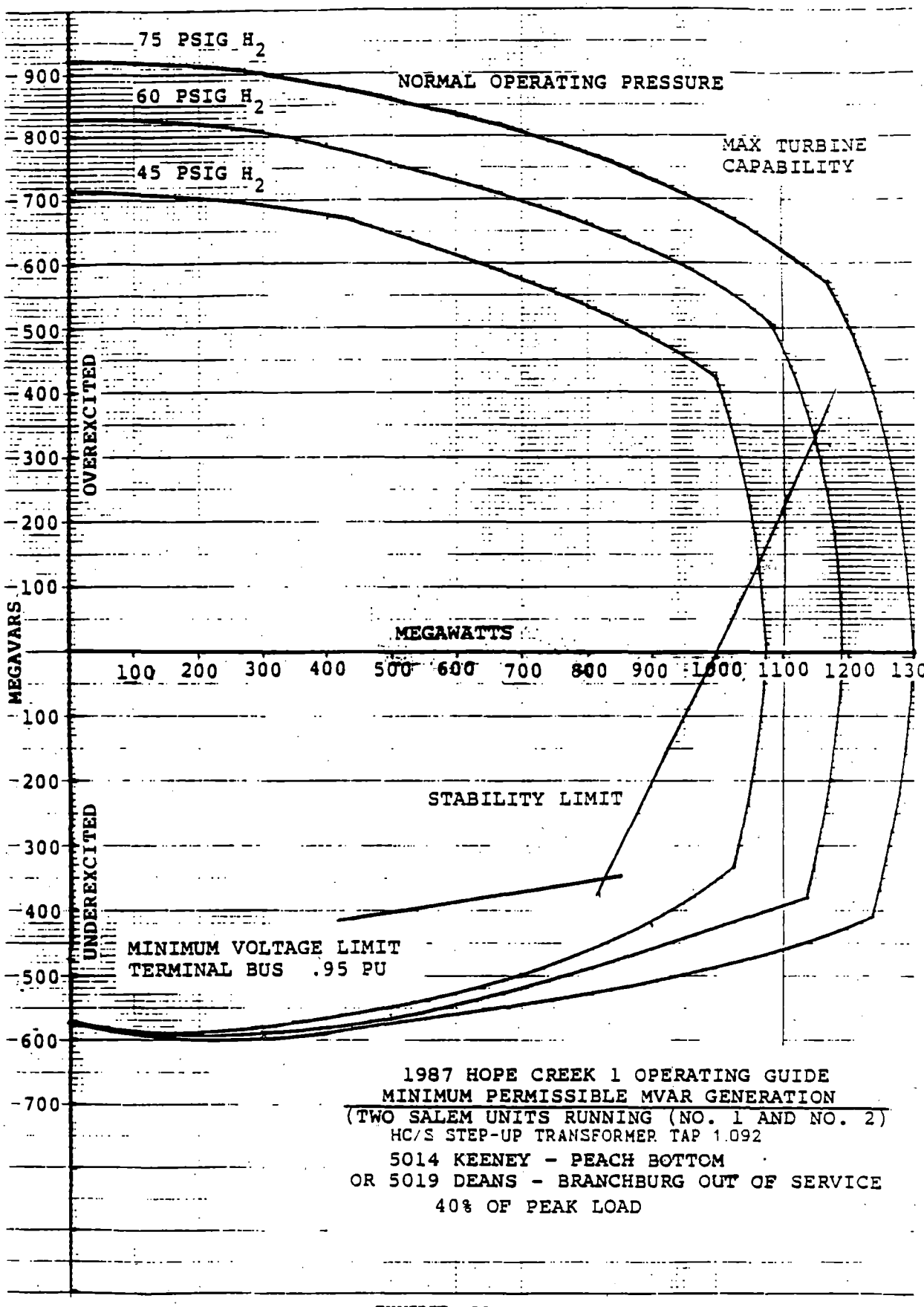
OR CIRCUIT BREAKER 50X,60X OUT OF SERVICE

40% OF PEAK LOAD

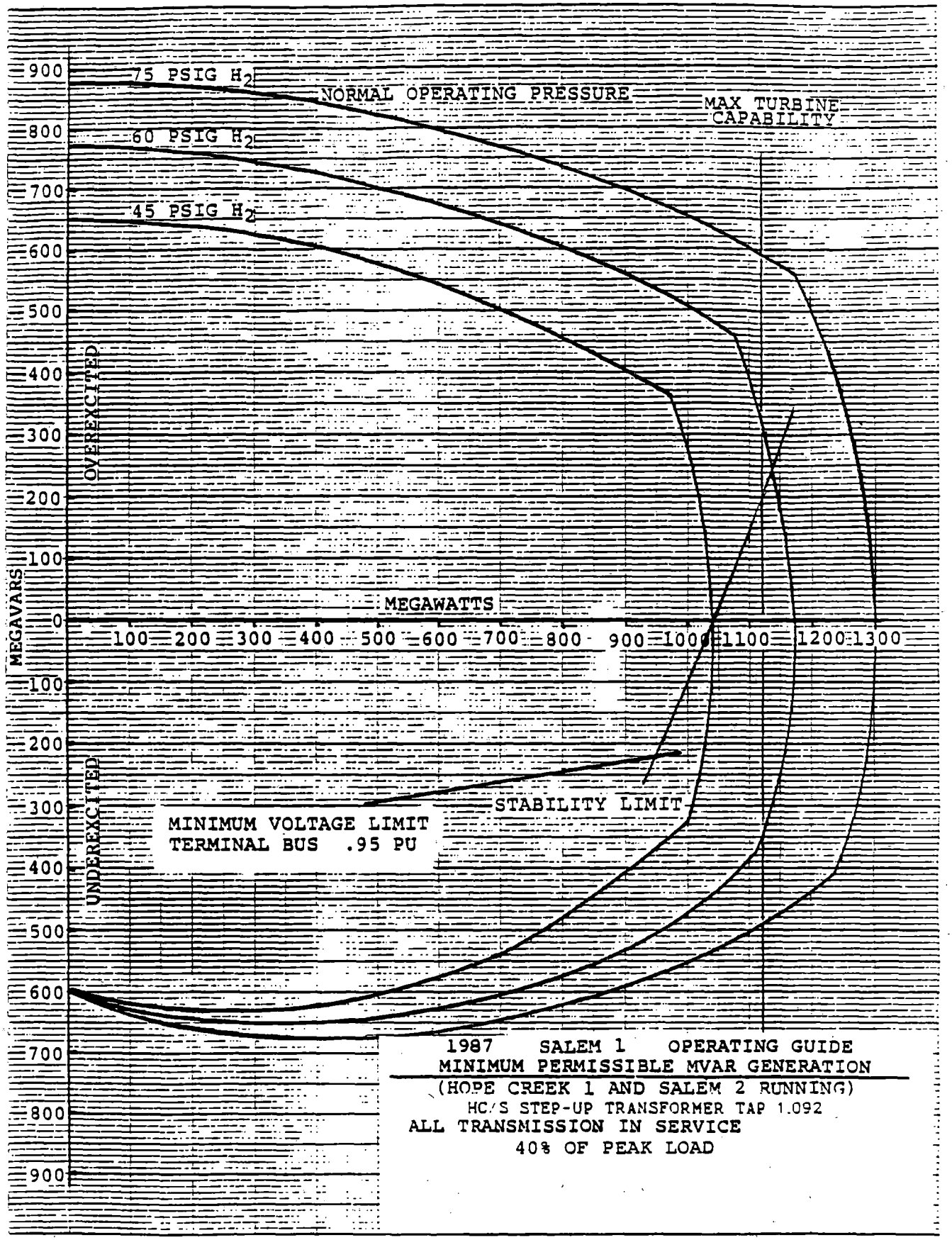


1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING (NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5037 HOPE CREEK - SALEM OUT OF SERVICE
40% OF PEAK LOAD

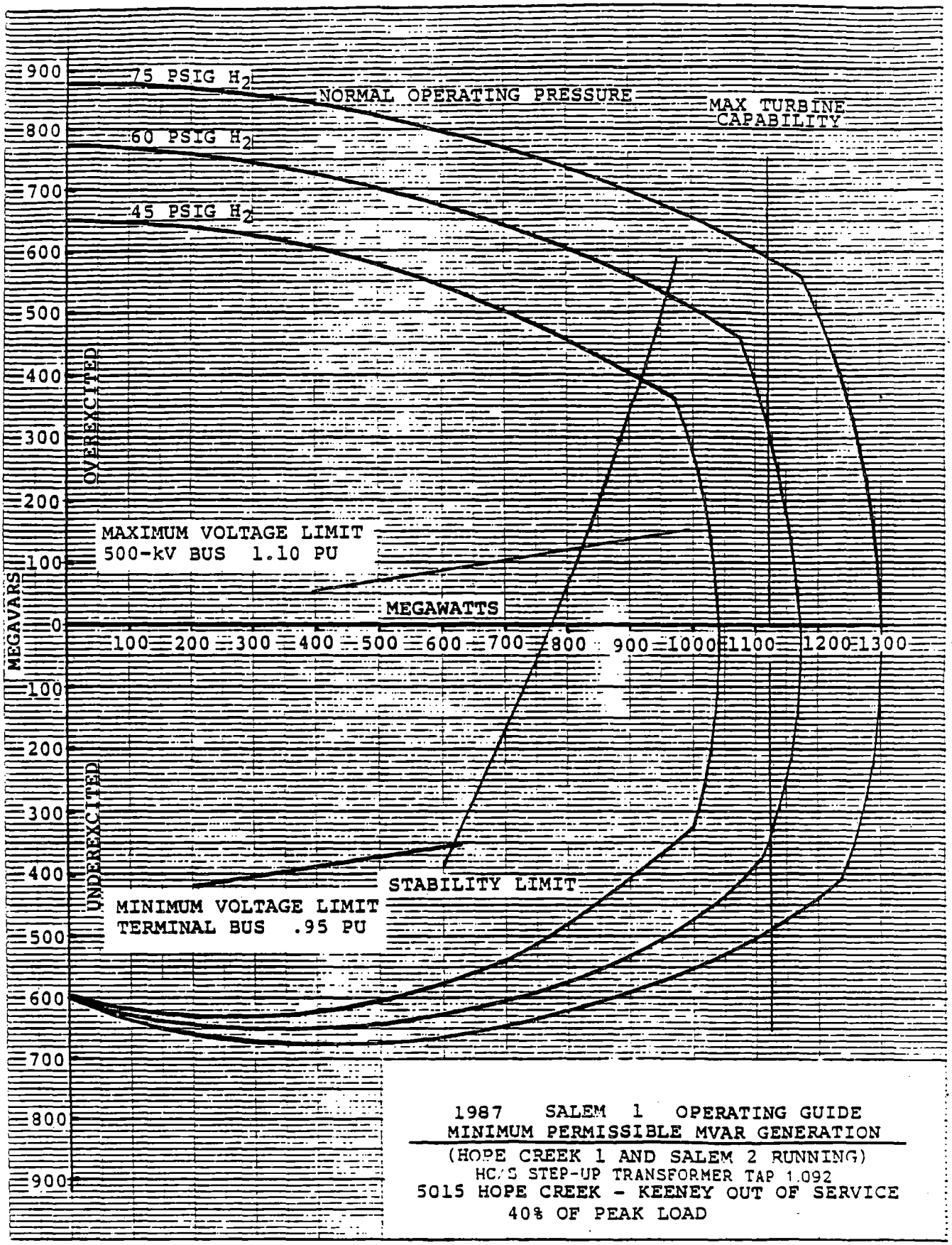

75 PSIG H_2
NORMAL OPERATING PRESSURE
60 PSIG H_2
MAX TURBINE CAPABILITY
45 PSIG H_2
OVEREXCITED
MEGAVARS
MEGAWATTS
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
UNDEREXCITED
STABILITY LIMIT
MINIMUM VOLTAGE LIMIT
TERMINAL BUS .95 PU
1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING (NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 52X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD



1987 HOPE CREEK 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(TWO SALEM UNITS RUNNING (NO. 1 AND NO. 2)
HC/S STEP-UP TRANSFORMER TAP 1.092
5014 KEENEY - PEACH BOTTOM
OR 5019 DEANS - BRANCHBURG OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
40% OF PEAK LOAD

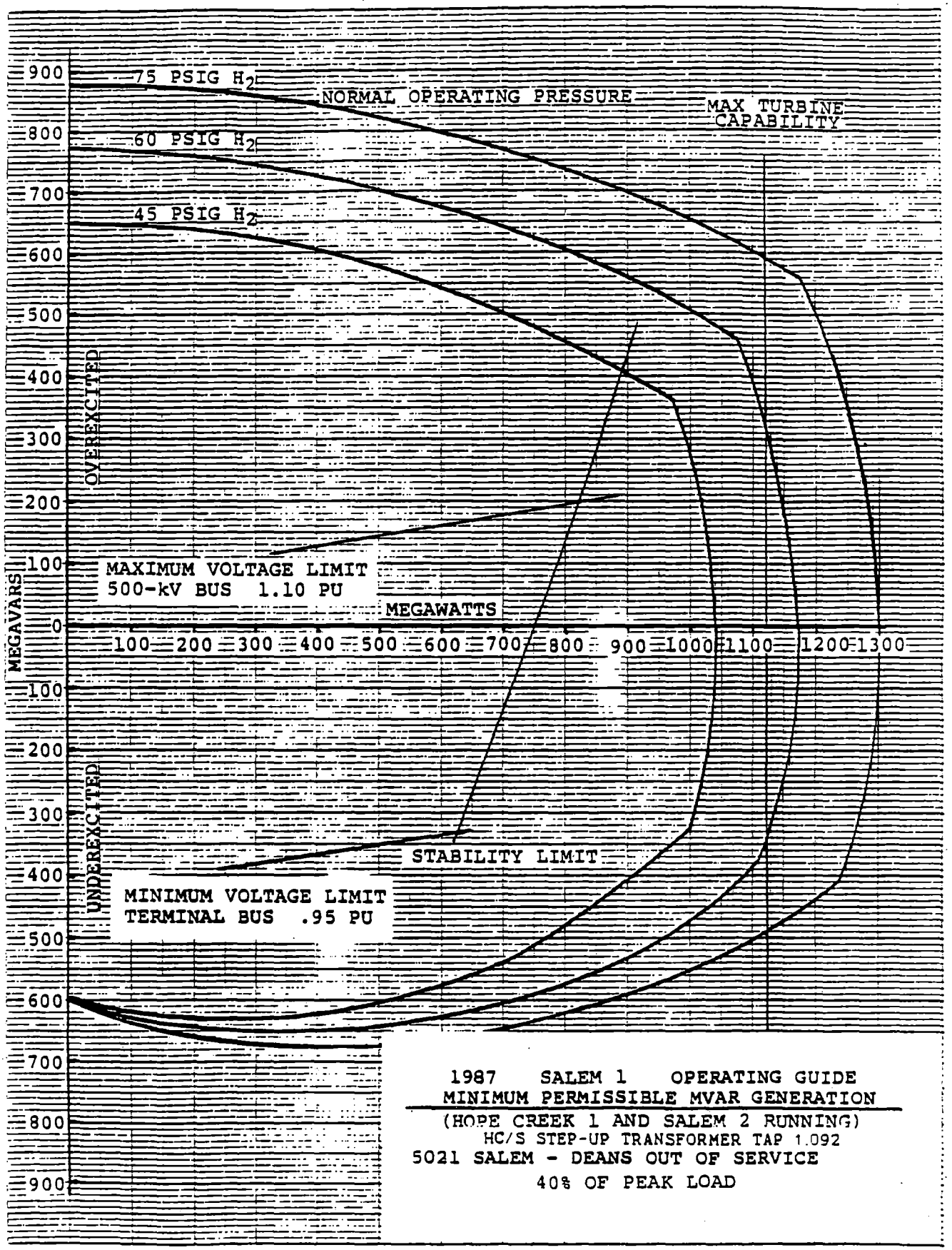


1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 30

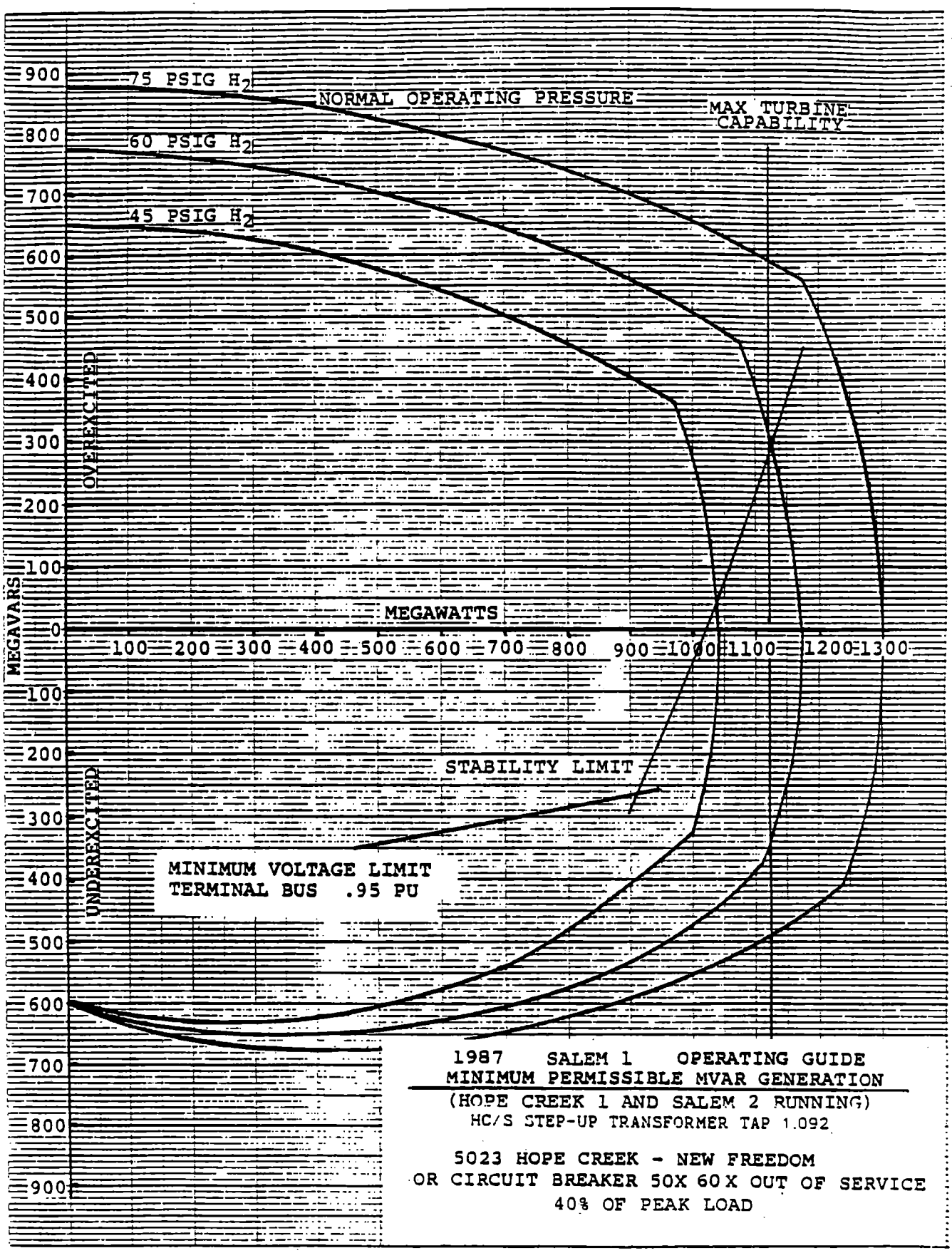
1/86



1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE
40% OF PEAK LOAD

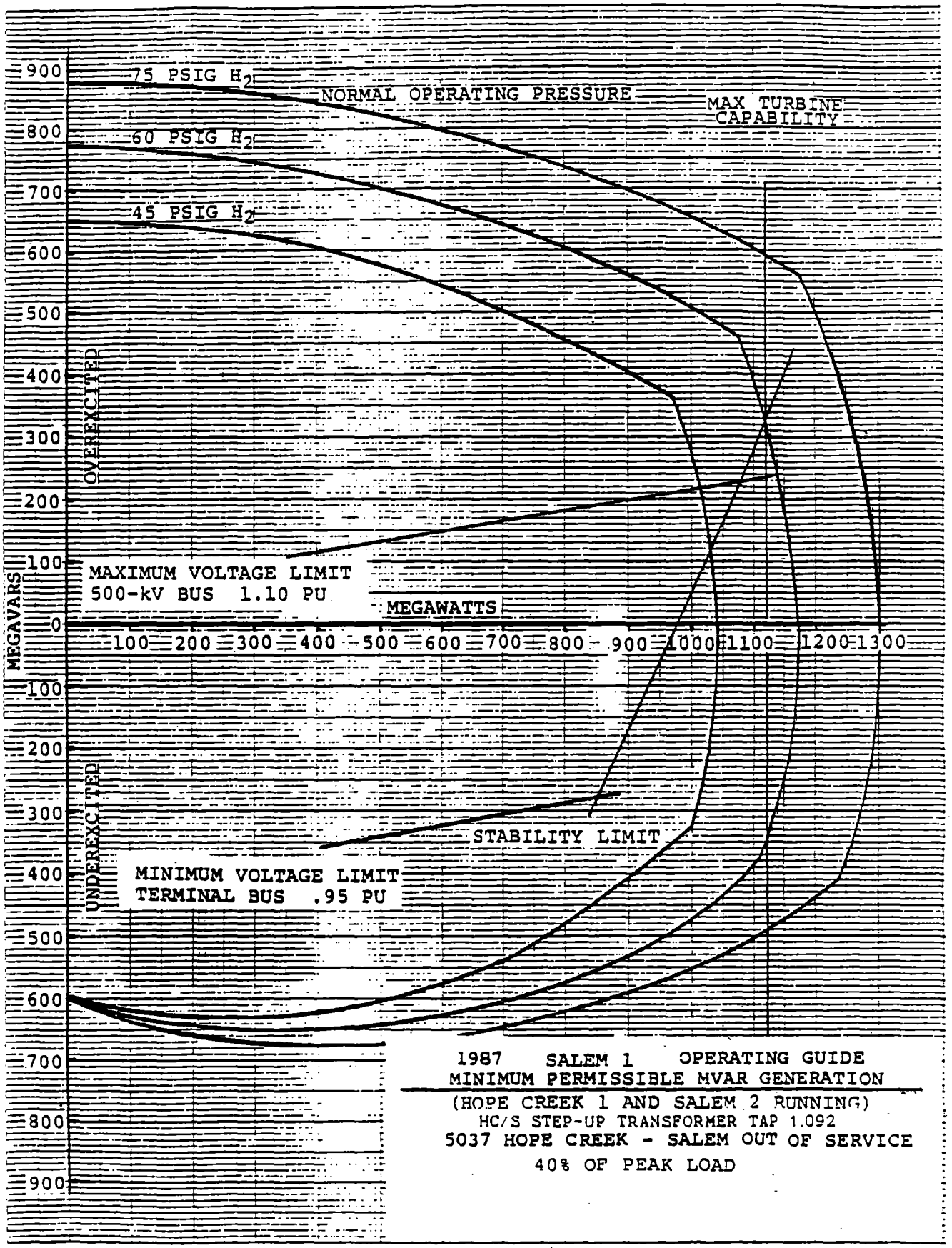
EXHIBIT 31

1/86



1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092

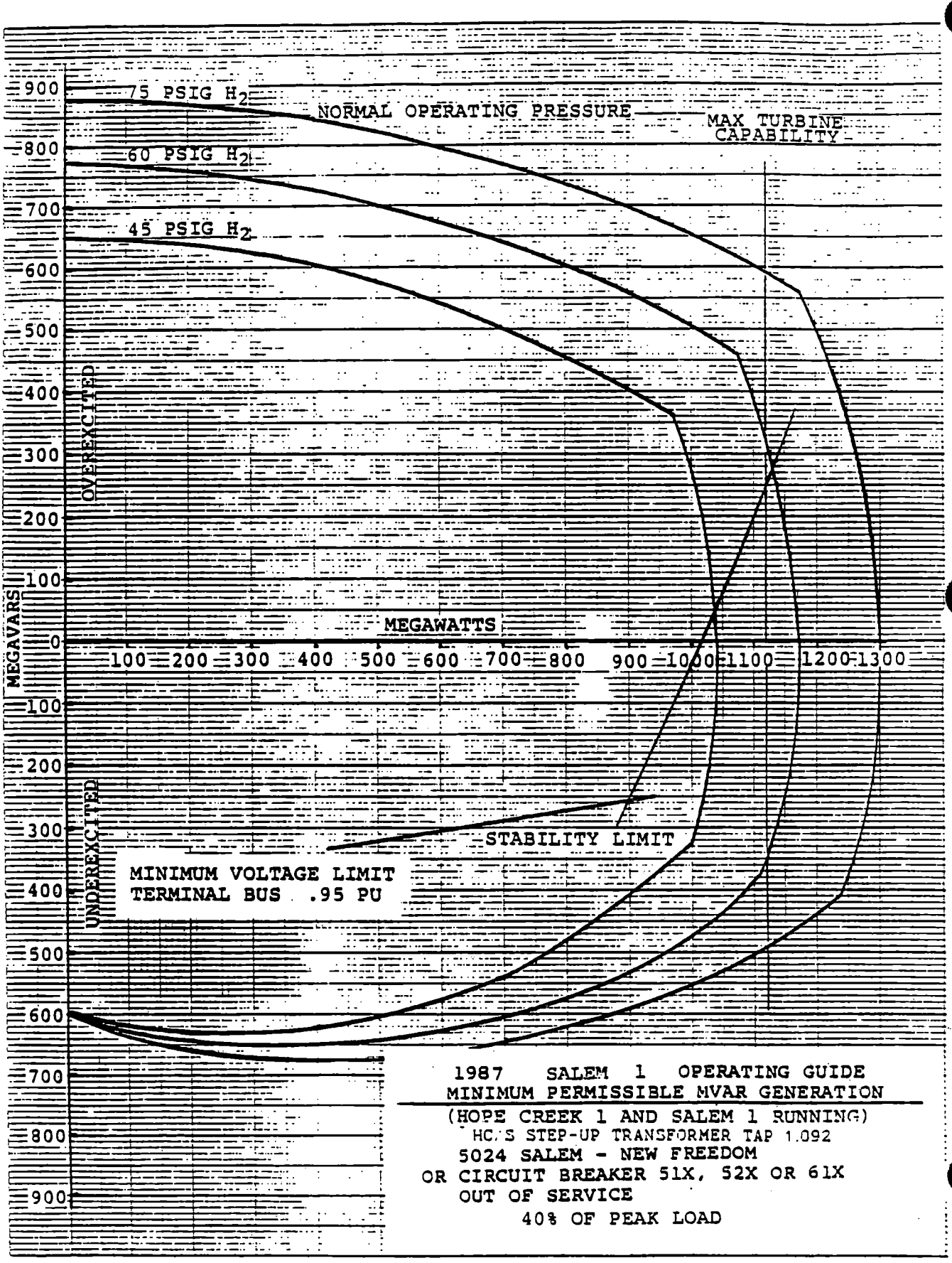
5023 HOPE CREEK - NEW FREEDOM
OR CIRCUIT BREAKER 50X 60X OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5037 HOPE CREEK - SALEM OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 33

1/86

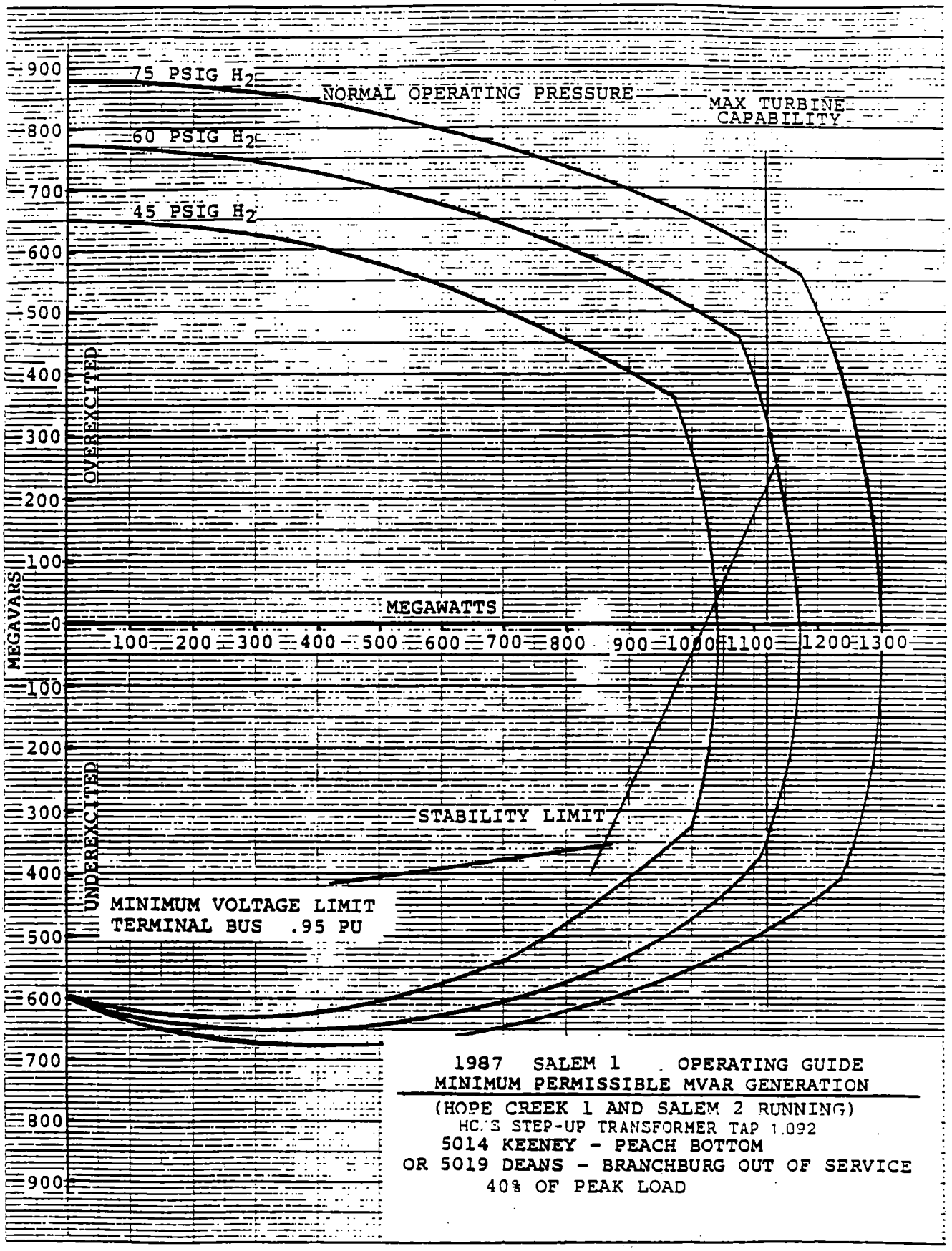


1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 52X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 34

1/86

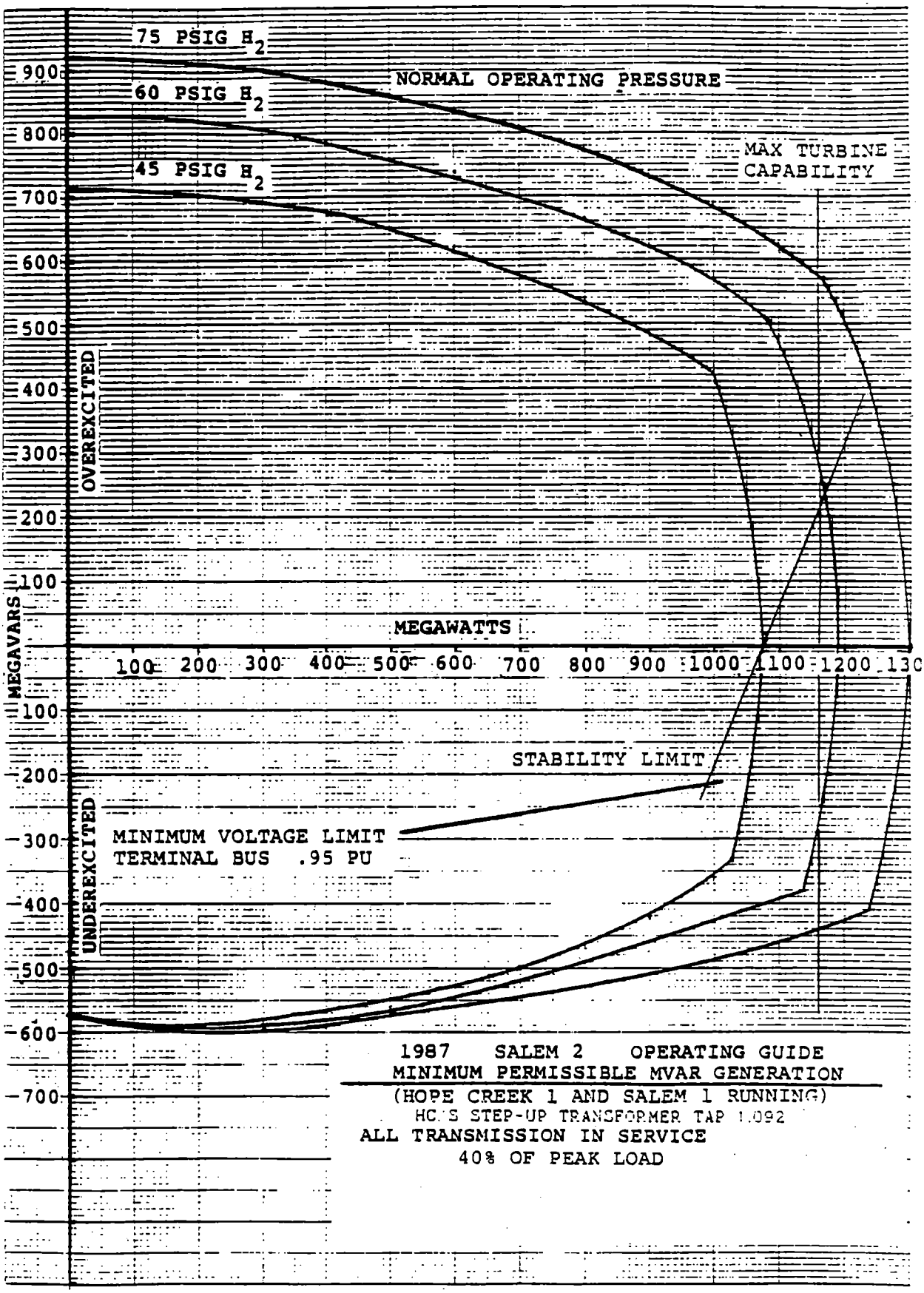


1987 SALEM 1 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 AND SALEM 2 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5014 KEENEY - PEACH BOTTOM
OR 5019 DEANS - BRANCHBURG OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 35

1/86

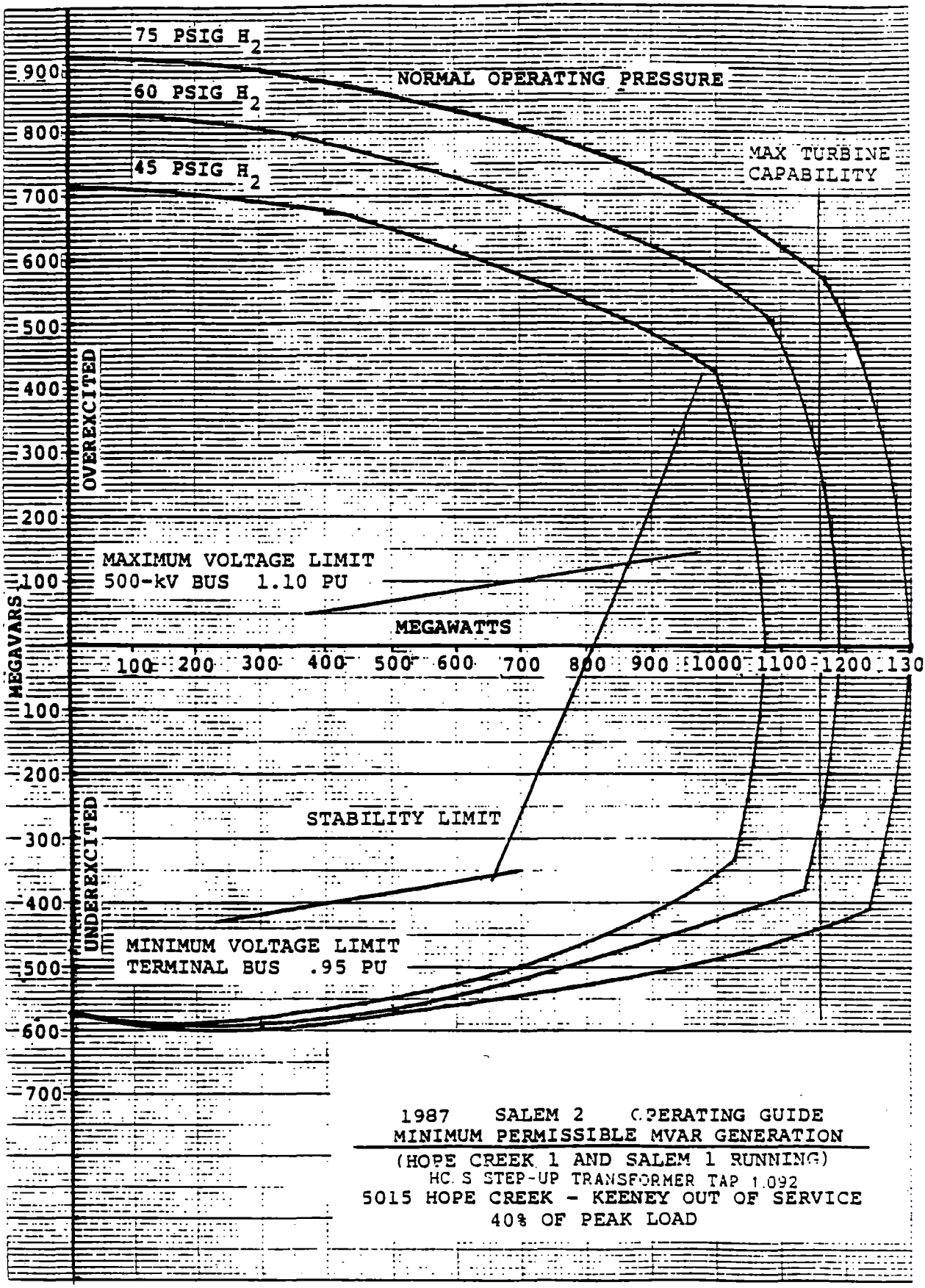


1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC.S STEP-UP TRANSFORMER TAP 1.092
ALL TRANSMISSION IN SERVICE
40% OF PEAK LOAD

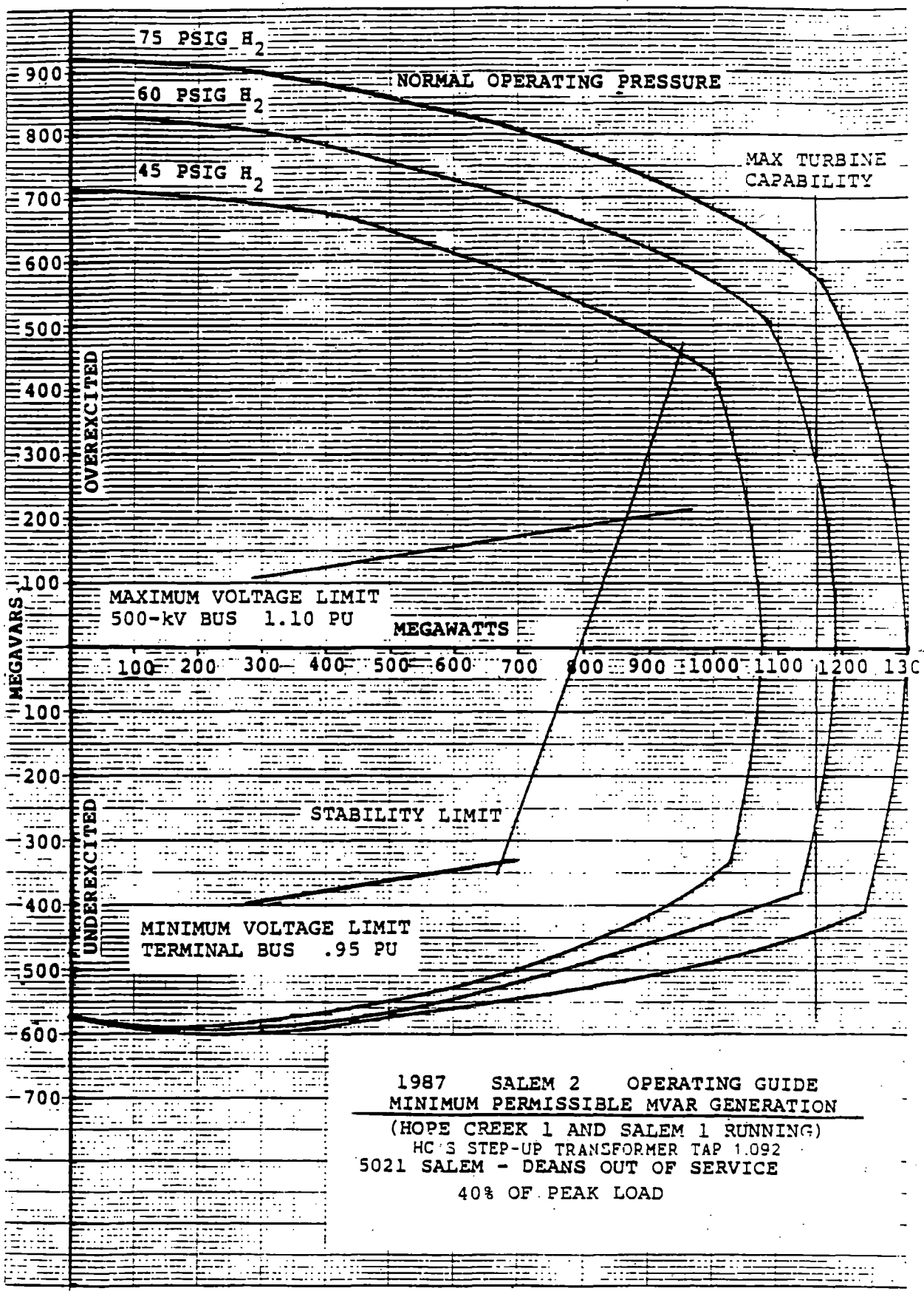
10 Squares to the Inch

EXHIBIT 36

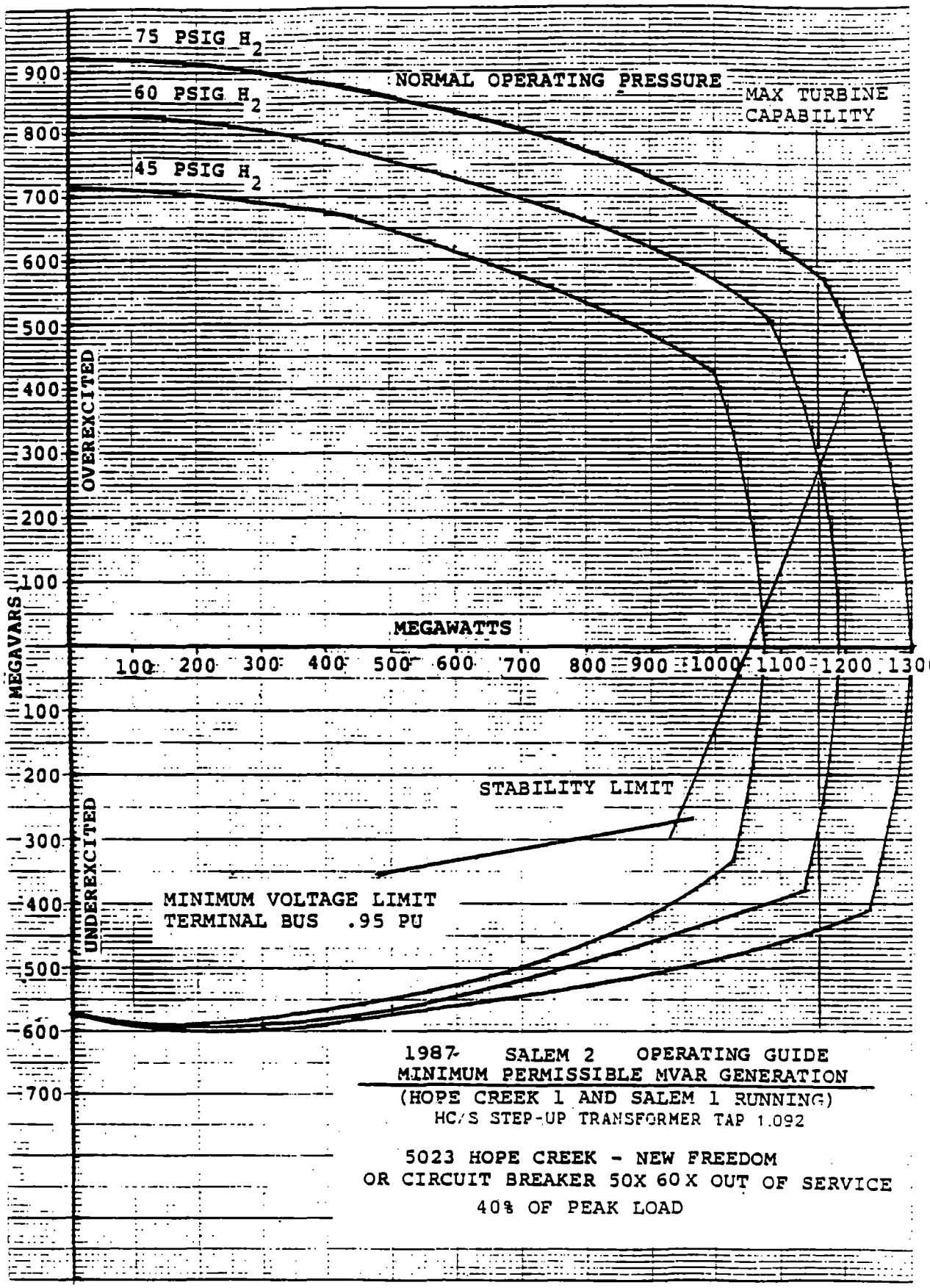
1/86



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC.S STEP-UP TRANSFORMER TAP 1.092
5015 HOPE CREEK - KEENEY OUT OF SERVICE
40% OF PEAK LOAD



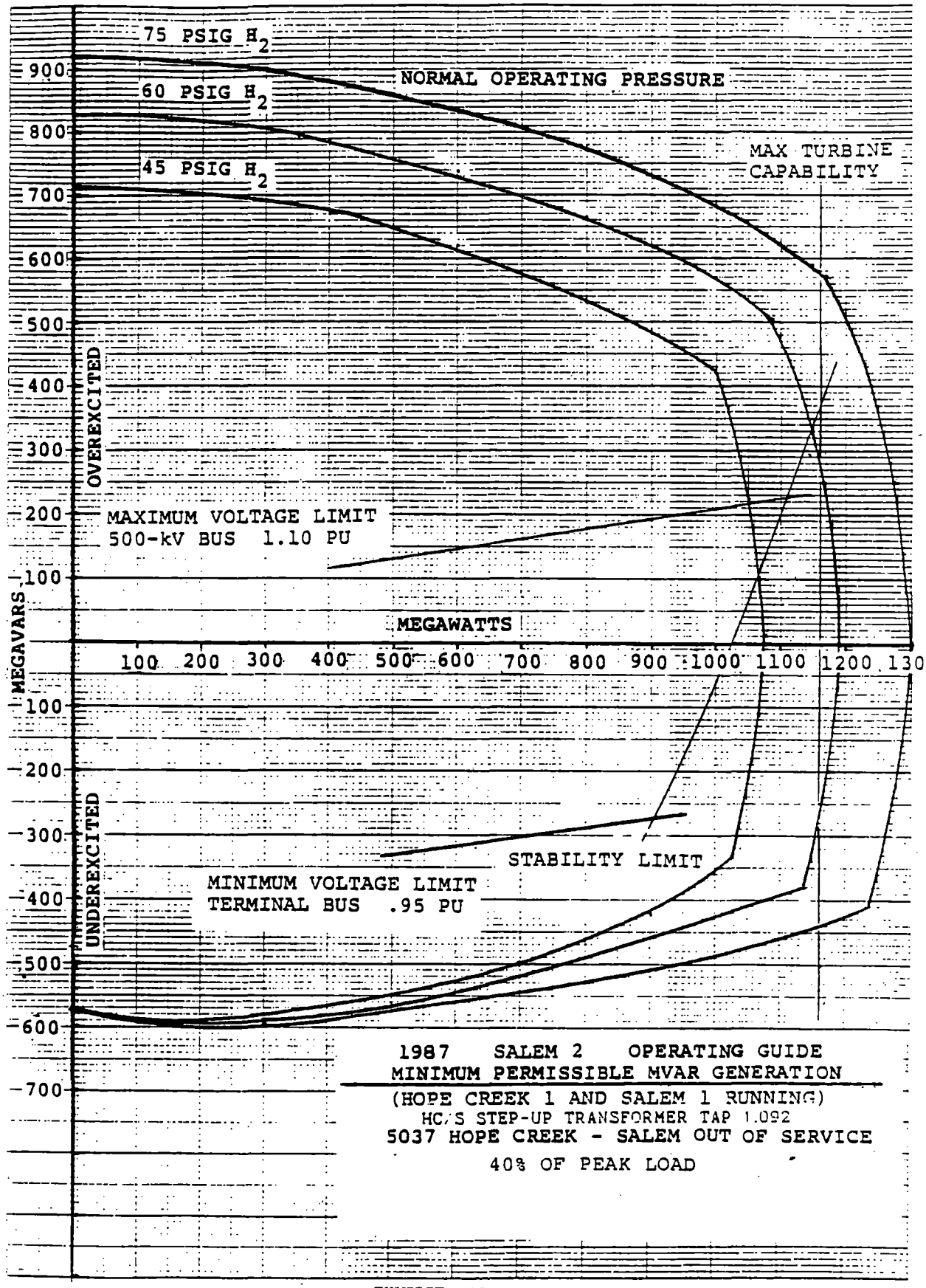
1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC-S STEP-UP TRANSFORMER TAP 1.092
5021 SALEM - DEANS OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION

(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092

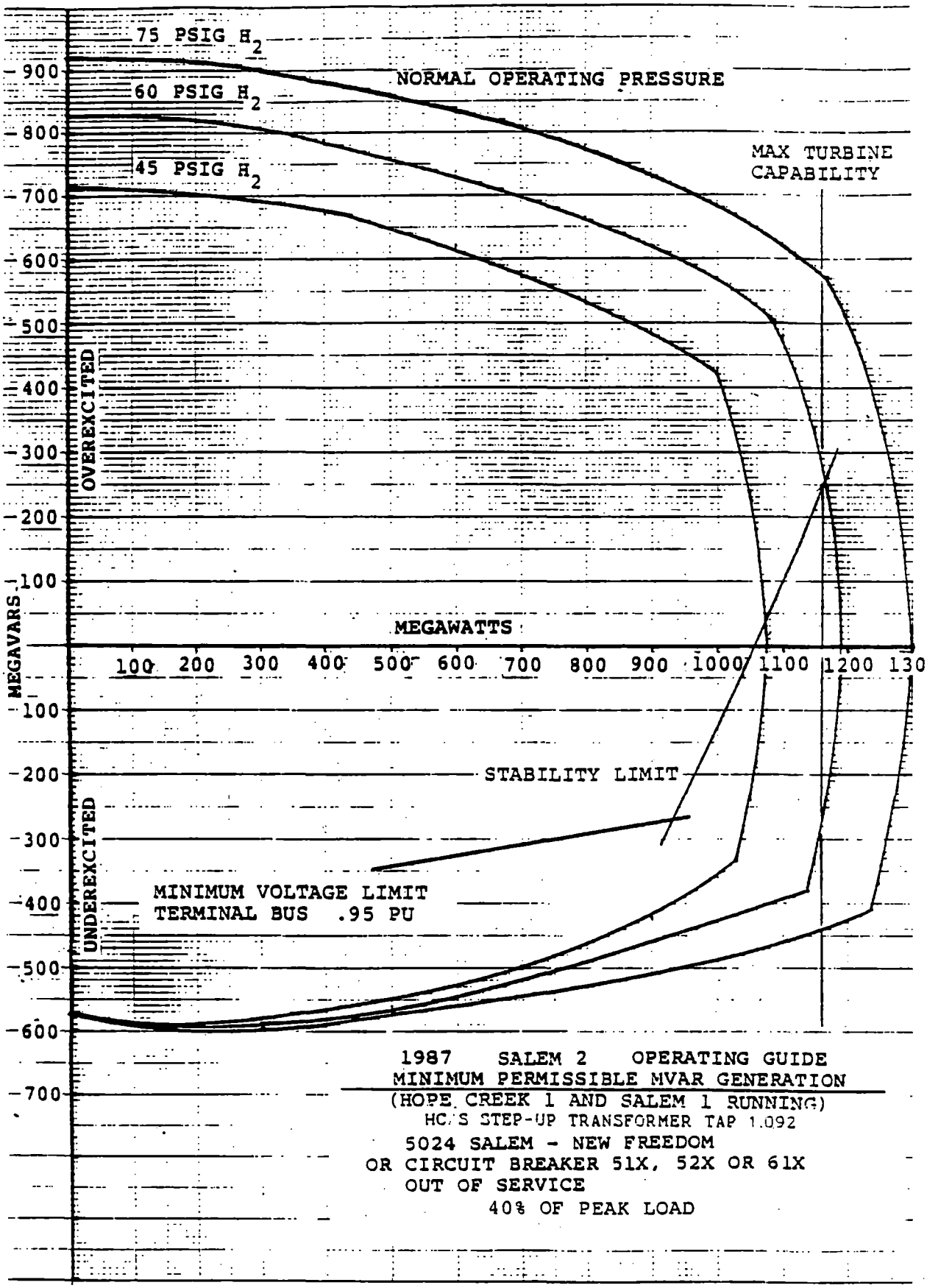
5023 HOPE CREEK - NEW FREEDOM
OR CIRCUIT BREAKER 50X 60X OUT OF SERVICE
40% OF PEAK LOAD



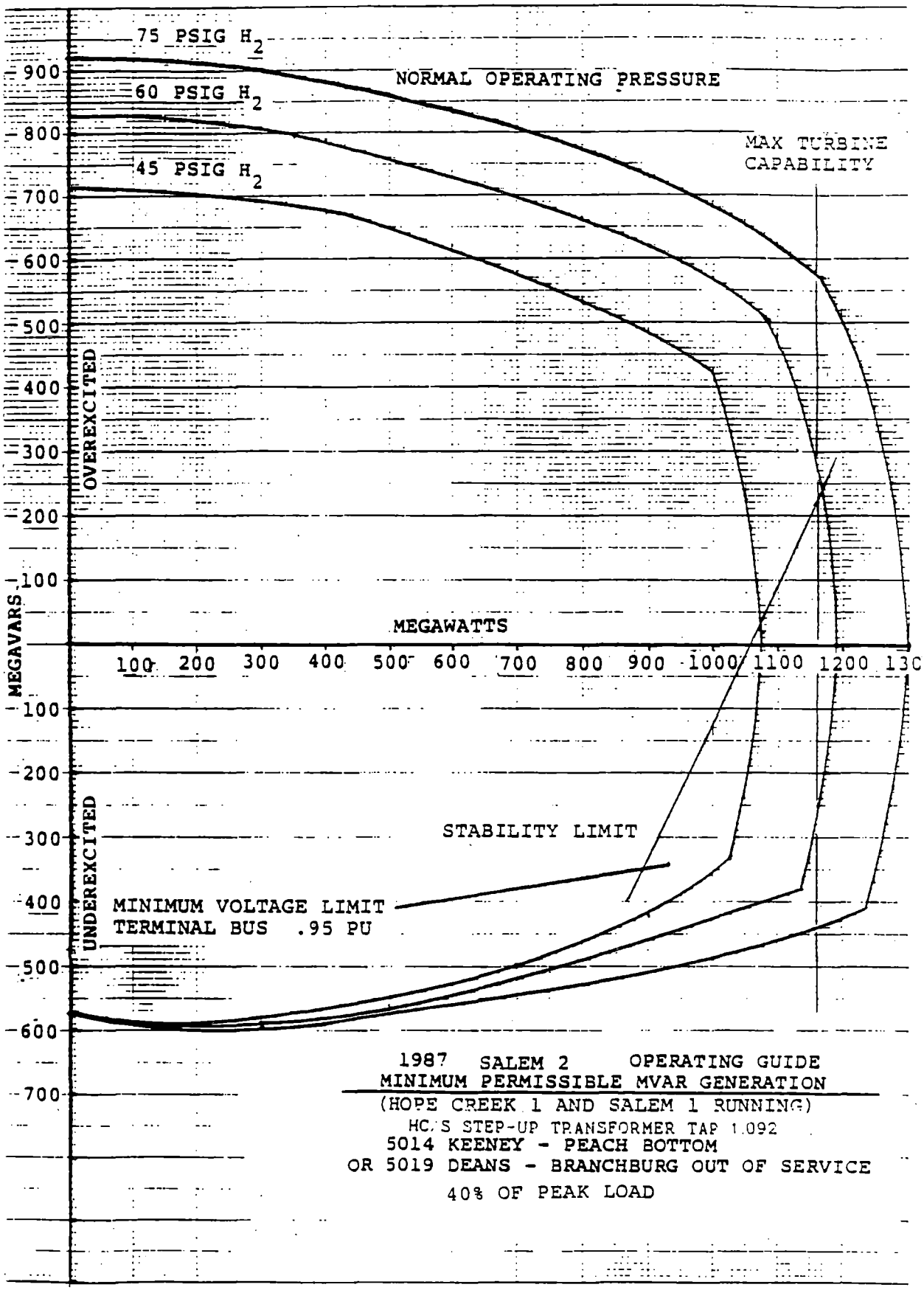
1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5037 HOPE CREEK - SALEM OUT OF SERVICE
40% OF PEAK LOAD

EXHIBIT 40

1/86



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5024 SALEM - NEW FREEDOM
OR CIRCUIT BREAKER 51X, 52X OR 61X
OUT OF SERVICE
40% OF PEAK LOAD



1987 SALEM 2 OPERATING GUIDE
MINIMUM PERMISSIBLE MVAR GENERATION
(HOPE CREEK 1 AND SALEM 1 RUNNING)
HC/S STEP-UP TRANSFORMER TAP 1.092
5014 KEENEY - PEACH BOTTOM
OR 5019 DEANS - BRANCHBURG OUT OF SERVICE
40% OF PEAK LOAD

APPENDIX 2

POWER FLOW SIMULATIONS

HOPE CREEK OPERATING GUIDE

SINGLE UNIT POWER FLOW CASE LISTING

HOPE CREEK NO. 1 IN-SERVICE SALEM NO. 1 AND 2 NOT RUNNING

EXHIBIT NO.	CASE	DESCRIPTION
45	1BASE	1987 40% SUMMER PEAK LOAD LEVEL PJM IMPORTS = 768 MW PS IMPORTS = 2000 MW NO EFORS (DISCRETE UNIT OUTAGES) - PJM ECONOMIC DISPATCH HOPE CREEK AT FULL MW OUTPUT AND -75 MVAR OUTPUT SALEM NO. 1 AND 2 NOT RUNNING PEACH BOTTOM NO. 3 AND SUSQUEHANNA NO. 2 OUT OF SERVICE BASE CASE - ALL TRANSMISSION IN SERVICE
46	1M1	AS BASE - ONE UNIT AT FULL MW AND 0 MVAR OUTPUT HOPE CREEK-KEENEY 500-KV CIRCUIT (5015) ON MAINTENANCE
47	1M2	AS BASE - ONE UNIT AT FULL MW AND -50 MVAR OUTPUT HOPE CREEK-NEW FREEDOM 500-KV CIRCUIT (5023) ON MAINTENANCE
48	1M3	AS BASE - ONE UNIT AT FULL MW AND 0 MVAR OUTPUT HOPE CREEK-SALEM 500-KV CIRCUIT (5037) ON MAINTENANCE
49	1M4	AS BASE - ONE UNIT AT FULL MW AND -50 MVAR OUTPUT SALEM-NEW FREEDOM 500-KV CIRCUIT (5024) ON MAINTENANCE
50	1M5	AS BASE - ONE UNIT AT FULL MW AND 0 MVAR OUTPUT SALEM-DEANS 500-KV CIRCUIT (5021) ON MAINTENANCE
51	1M6	AS BASE - ONE UNIT AT FULL MW AND -125 MVAR OUTPUT PEACH BOTTOM-KEENEY 500-KV CIRCUIT (5014) ON MAINTENANCE
52	1M7	AS BASE - ONE UNIT AT FULL MW AND 0 MVAR OUTPUT DEANS-BRANCHBURG 500-KV CIRCUIT (5019) ON MAINTENANCE

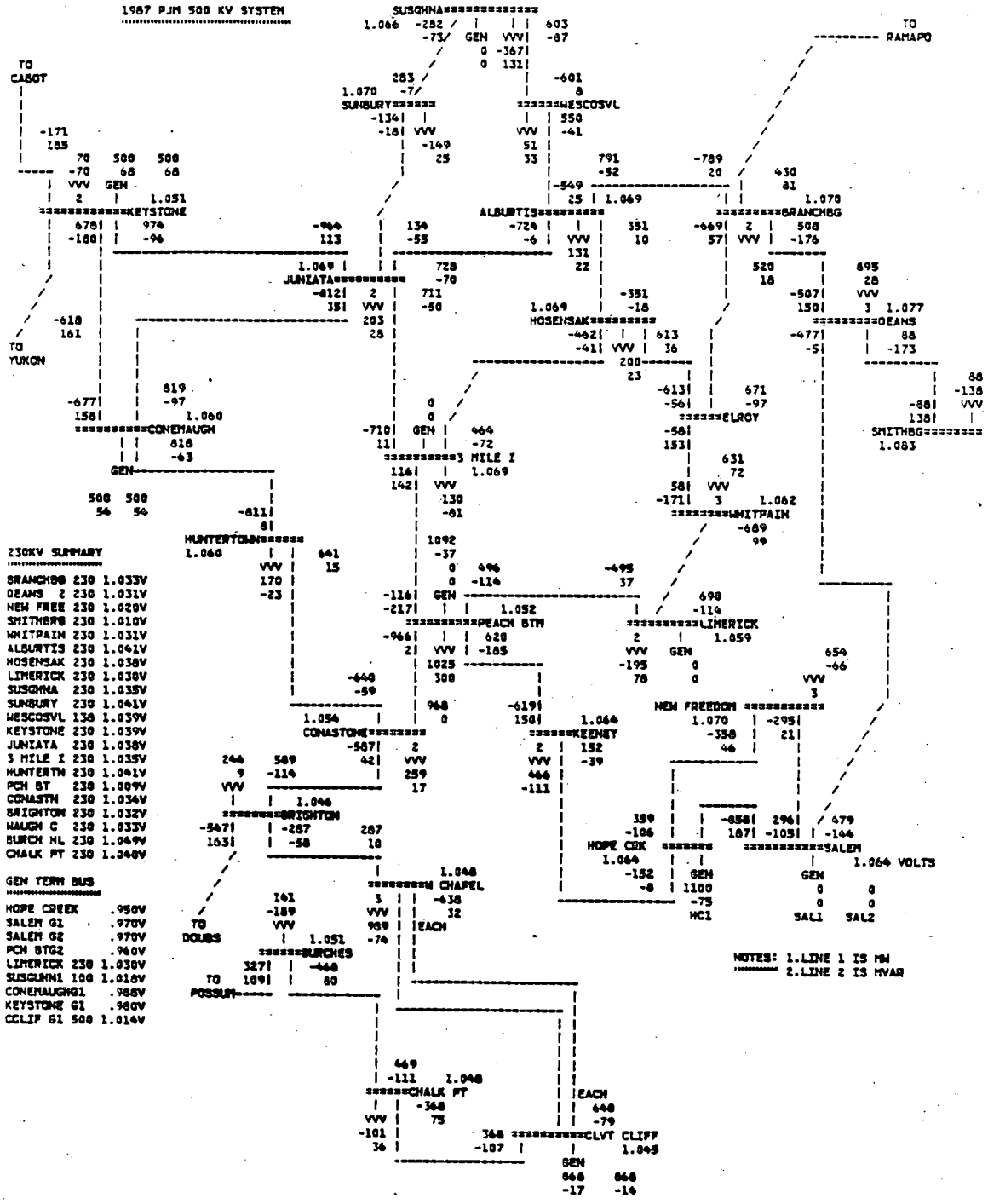
POWER FLOW SIMULATION - SYSTEM SUMMARY

AREA NAME	GENERATION		INTERCHANGE (EXPORTS)		AREA SYSTEM LOAD		AREA SYSTEM BUS LOAD		AREA SYSTEM LOSSES		AREA CHARGING	AREA STATIC	UNUSED VARGEN
	MW	MVAR	MW	MVAR	MW	MVAR	MW	MVAR	MW	MVAR	MVAR	MVAR	MVAR
PUBLIC SERVICE ELECTRIC & GAS CO.	1004.	67.	-2127.	696.	3131.	-628.	3103.	301.	28.	-928.	1451.	0.	2363.
PHILADELPHIA ELECTRIC CO.	630.	13.	-1932.	-423.	2562.	436.	2526.	817.	36.	158.	485.	537.	1313.
JERSEY CENTRAL POWER & LIGHT	248.	160.	-1055.	207.	1303.	-48.	1284.	-10.	19.	165.	192.	202.	210.
ATLANTIC ELECTRIC	437.	76.	-156.	28.	593.	48.	587.	186.	7.	-2.	77.	135.	145.
DELMARVA POWER & LIGHT CO.	517.	194.	-193.	220.	710.	-26.	704.	167.	6.	-70.	141.	121.	770.
EASTERN PJM TOTAL	2836.	509.	-5463.	727.	8299.	-218.	8203.	1460.	96.	-677.	2347.	995.	4802.
PENNSYLVANIA ELECTRIC CO.	636.	280.	-67.	150.	703.	130.	672.	144.	32.	-14.	386.	0.	1020.
METROPOLITAN EDISON CO.	208.	91.	-414.	105.	622.	-14.	612.	35.	10.	-3.	115.	46.	108.
PENNSYLVANIA POWER & LIGHT CO.	2710.	-38.	877.	-254.	1841.	216.	1788.	441.	53.	205.	363.	429.	2290.
BALTIMORE GAS & ELECTRIC CO.	387.	346.	-1480.	106.	1867.	240.	1847.	244.	19.	-2.	204.	0.	39.
POTOMAC ELECTRIC CO.	2061.	207.	275.	420.	1786.	-212.	1761.	881.	25.	-528.	977.	563.	2586.
WESTERN PJM TOTAL	6010.	887.	-810.	526.	6820.	361.	6680.	1745.	139.	-342.	2044.	1038.	6042.
TOTAL PJM UNDERLYING	8846.	1396.	-6273.	1253.	15119.	143.	14884.	3205.	235.	-1019.	4391.	2033.	10844.
PJM 500KV	5928.	102.	5471.	556.	457.	-454.	383.	262.	73.	-716.	3283.	0.	2685.
TOTAL PJM SYSTEM	14774.	1498.	-801.	1809.	15575.	-311.	15267.	3467.	308.	-1735.	7674.	2033.	13529.

HOPE CREEK OPERATING GUIDE - 1 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
- 75 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1BASE
ALL 500-KV CIRCUITS IN SERVICE

EXHIBIT 44



HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL

PJM IMPORTS = 768 MW

PS IMPORTS = 2000 MW

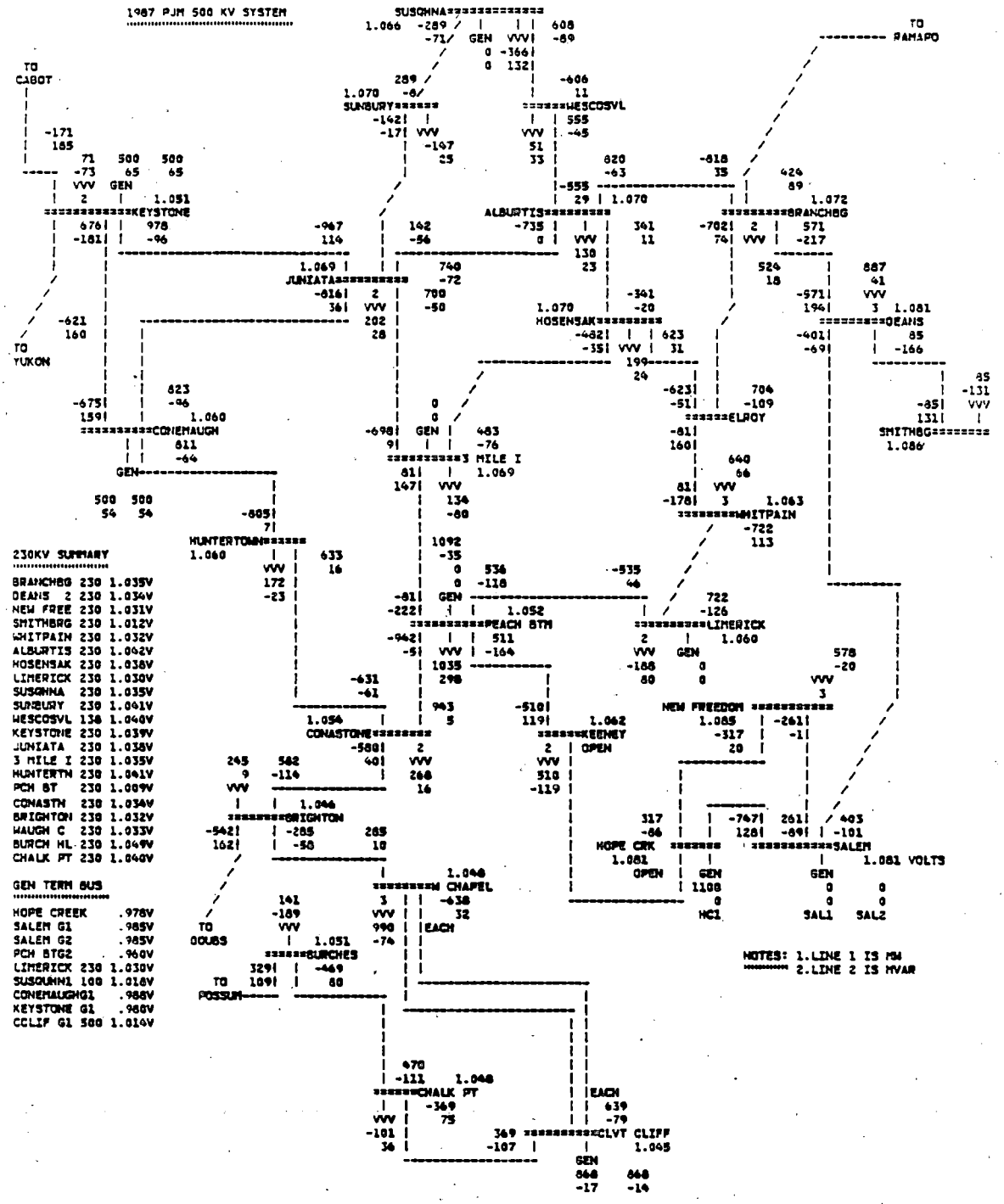
NO EFORS - PJM ECO. DISPATCH

HC 1 AT FULL MW OUTPUT AND

- 75 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1BASE

ALL 500-KV CIRCUITS IN SERVICE



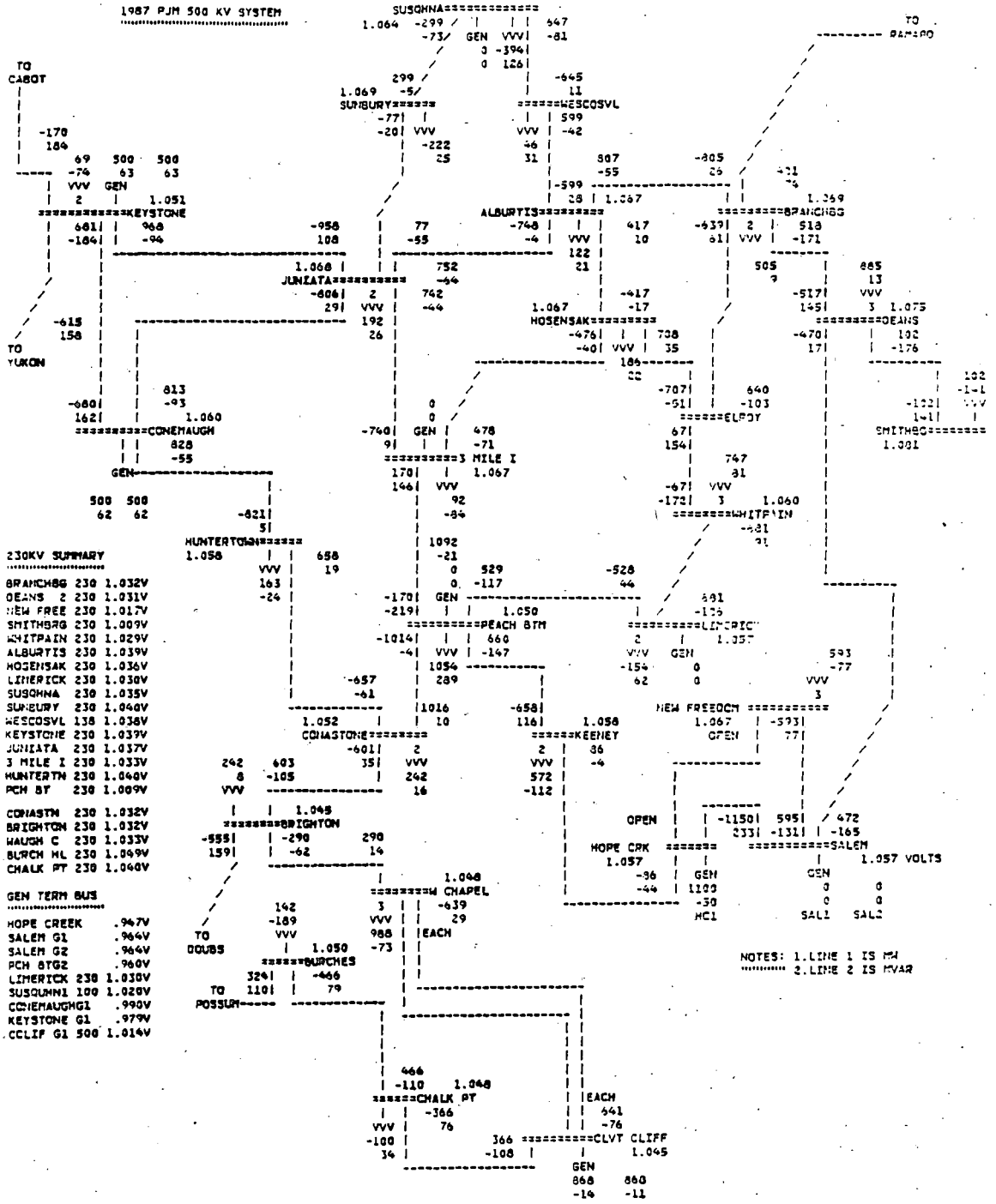
HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
0 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M1

HOPE CREEK-KEENEY 500-KV CIRCUIT
(5015) ON MAINTENANCE

EXHIBIT 46

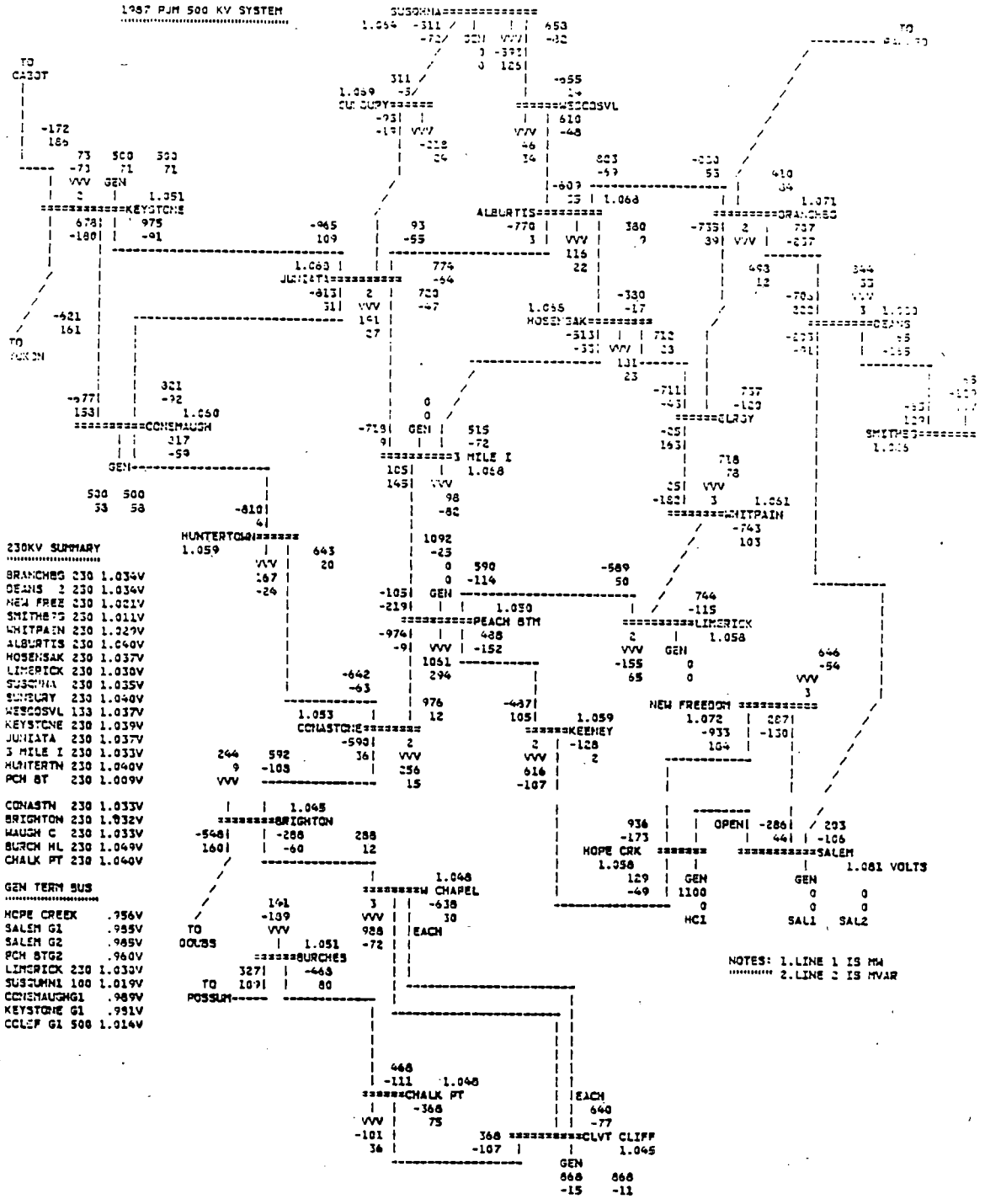


HOPE CREEK OPERATING GUIDE - 1 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
-50 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M2

HOPE CREEK-NEW FREEDOM 500-KV
CIRCUIT (5023) ON MAINTENANCE

EXHIBIT 47

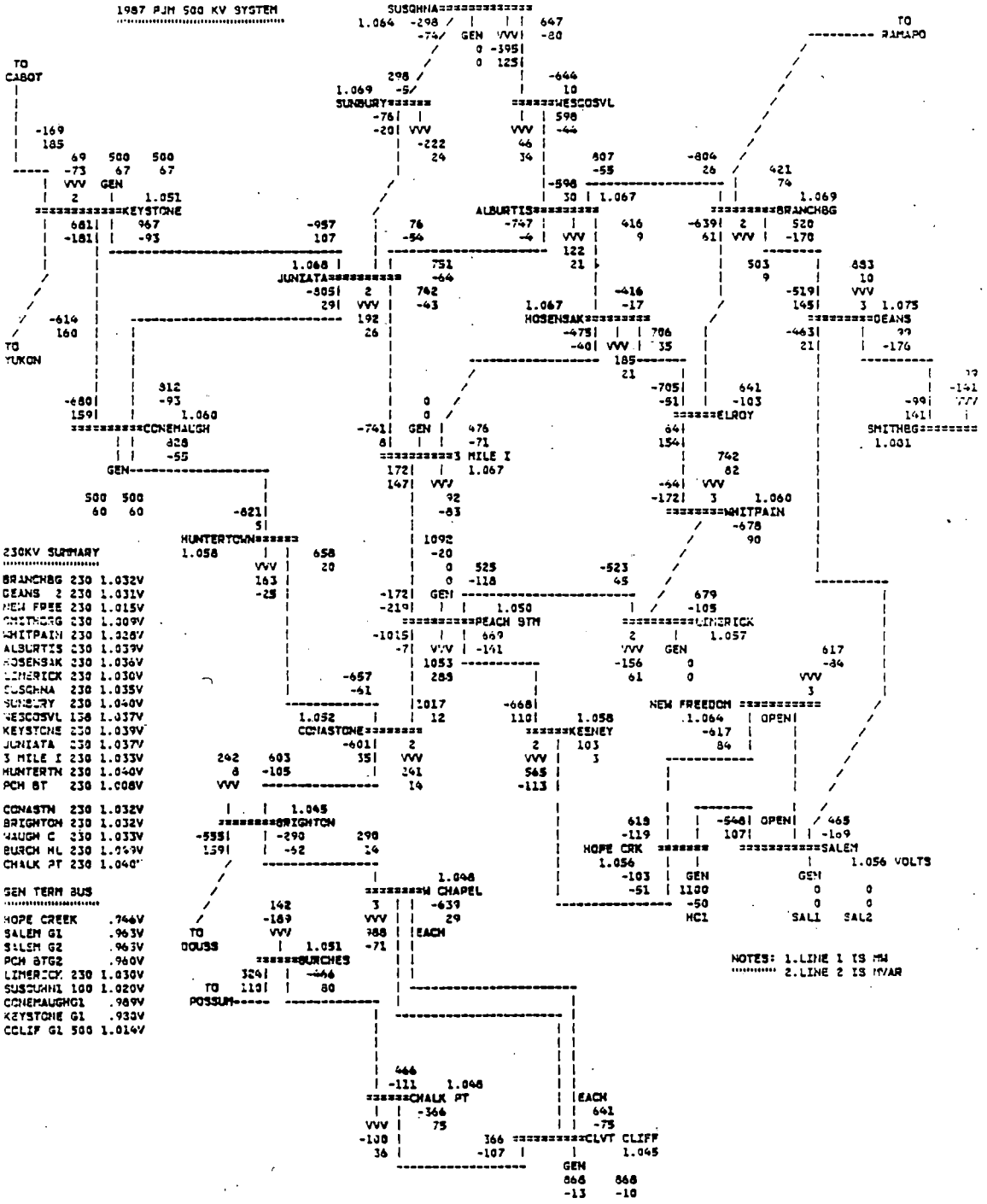


HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
0 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M3

HOPE CREEK-SALEM 500-KV CIRCUIT
(5037) ON MAINTENANCE

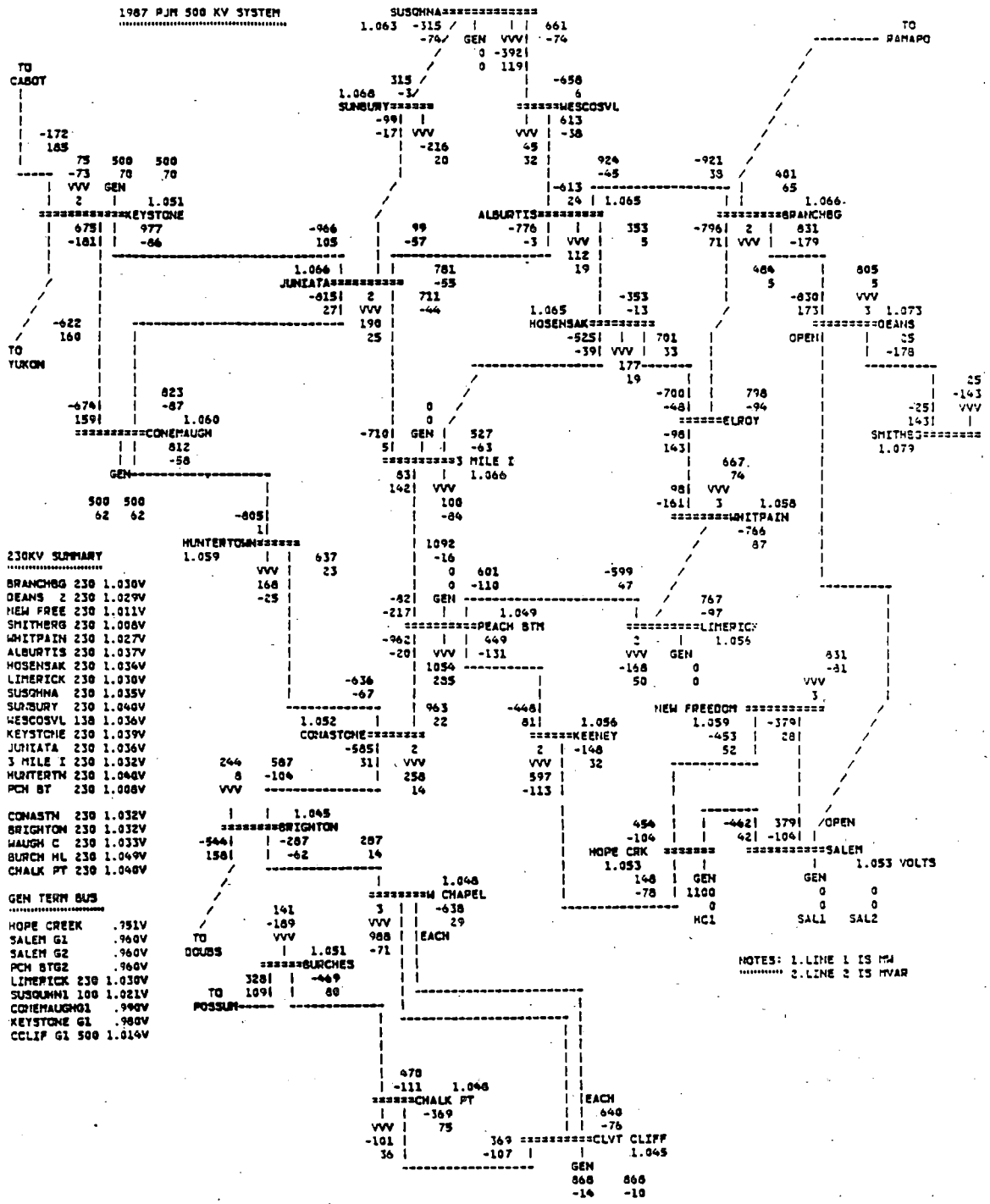


HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
- 50 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M4

SALEM-NEW FREEDOM 500-KV CIRCUIT
(5024) ON MAINTENANCE

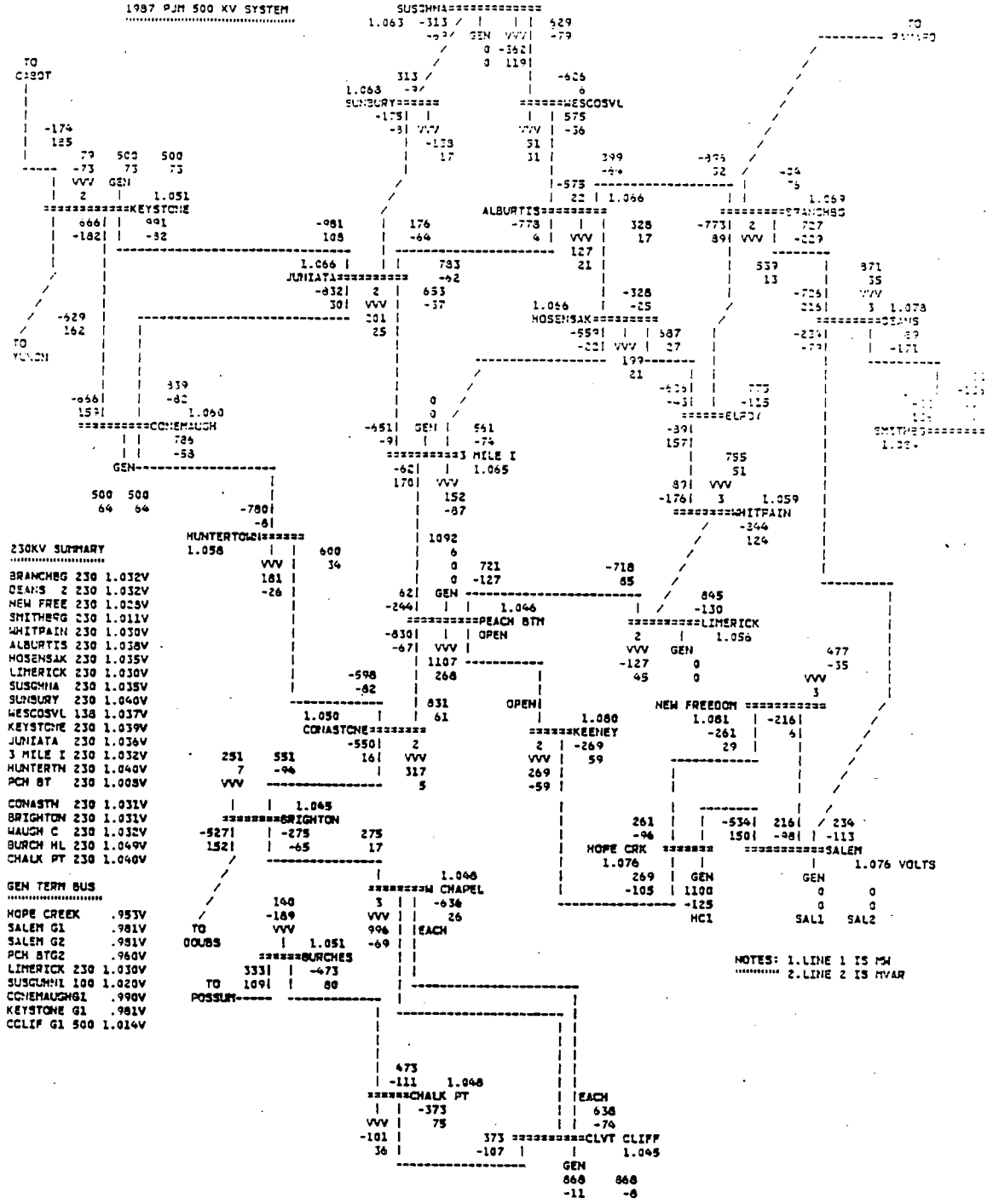


HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
0 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M5

SALEM-DEANS 500-KV CIRCUIT
(5021) ON MAINTENANCE

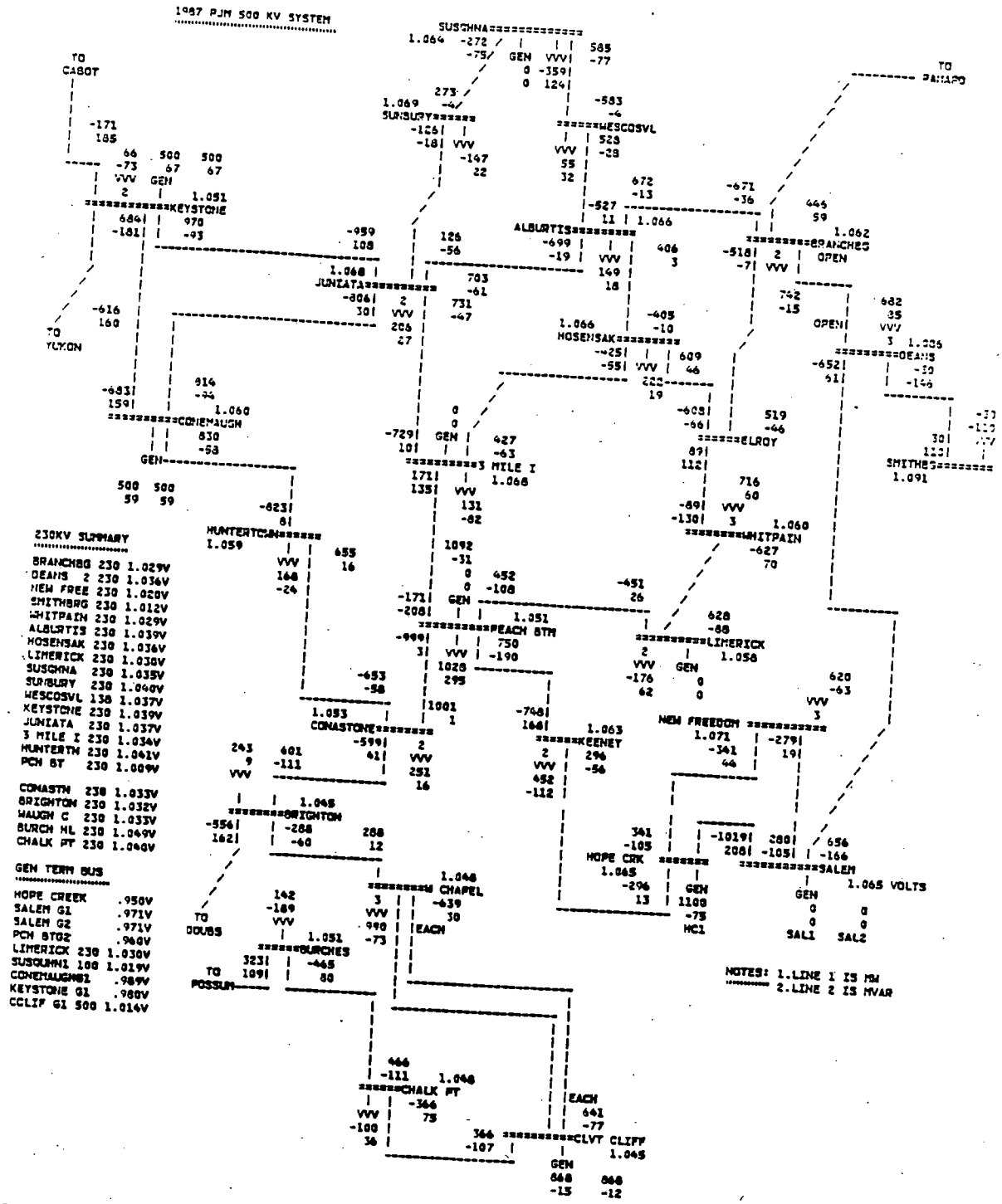


HOPE CREEK OPERATING GUIDE - 1 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
-125 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M6

PEACH BOTTOM-KEENEY 500-KV CIRCUI
(5014) ON MAINTENANCE



HOPE CREEK OPERATING GUIDE - 1 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC 1 AT FULL MW OUTPUT AND
- 75 MVAR OUTPUT

TRANSMISSION CONDITIONS: 1M7

DEANS-BRANCHBURG 500-KV CIRCUIT (5019) ON MAINTENANCE

EXHIBIT 52

HOPE CREEK OPERATING GUIDE

TWO UNIT POWER FLOW CASE LISTING

HOPE CREEK NO. 1 AND SALEM NO. 1 OR 2 IN-SERVICE

EXHIBIT NO.	CASE	DESCRIPTION
55	2BASE	1987 40% SUMMER PEAK LOAD LEVEL PJM IMPORTS = 768 MW PS IMPORTS = 2000 MW NO EFORS(DISCRETE UNIT OUTAGES) - PJM ECONOMIC DISPATCH HC/SALEM AT FULL MW OUTPUT AND 0 MVAR OUTPUT EACH PEACH BOTTOM NO. 3 AND SUSQUEHANNA NO. 2 OUT OF SERVICE BASE CASE - ALL TRANSMISSION IN SERVICE
56	2M1	AS BASE - TWO UNIT AT 150 MW REDUCTION AND 125 MVAR OUTPUT EACH HOPE CREEK-KEENEY 500-KV CIRCUIT (5015) ON MAINTENANCE
57	2M2	AS BASE - TWO UNIT AT FULL MW AND 50 MVAR OUTPUT EACH HOPE CREEK-NEW FREEDOM 500-KV CIRCUIT (5023) ON MAINTENANCE
58	2M3	AS BASE - TWO UNIT AT FULL MW AND 0 MVAR OUTPUT EACH HOPE CREEK-SALEM 500-KV CIRCUIT (5037) ON MAINTENANCE
59	2M4	AS BASE - TWO UNIT AT FULL MW AND 50 MVAR OUTPUT EACH SALEM-NEW FREEDOM 500-KV CIRCUIT (5024) ON MAINTENANCE
60	2M5	AS BASE - TWO UNIT AT 200 MW REDUCTION AND 225 MVAR OUTPUT (EACH) SALEM-DEANS 500-KV CIRCUIT (5021) ON MAINTENANCE
61	2M6	AS BASE - TWO UNIT AT FULL MW AND 0 MVAR OUTPUT EACH PEACH BOTTOM-KEENEY 500-KV CIRCUIT (5014) ON MAINTENANCE
62	2M7	AS BASE - TWO UNIT AT FULL MW AND 0 MVAR OUTPUT EACH DEANS-BRANCHBURG 500-KV CIRCUIT (5019) ON MAINTENANCE

POWER FLOW SIMULATION - SYSTEM SUMMARY

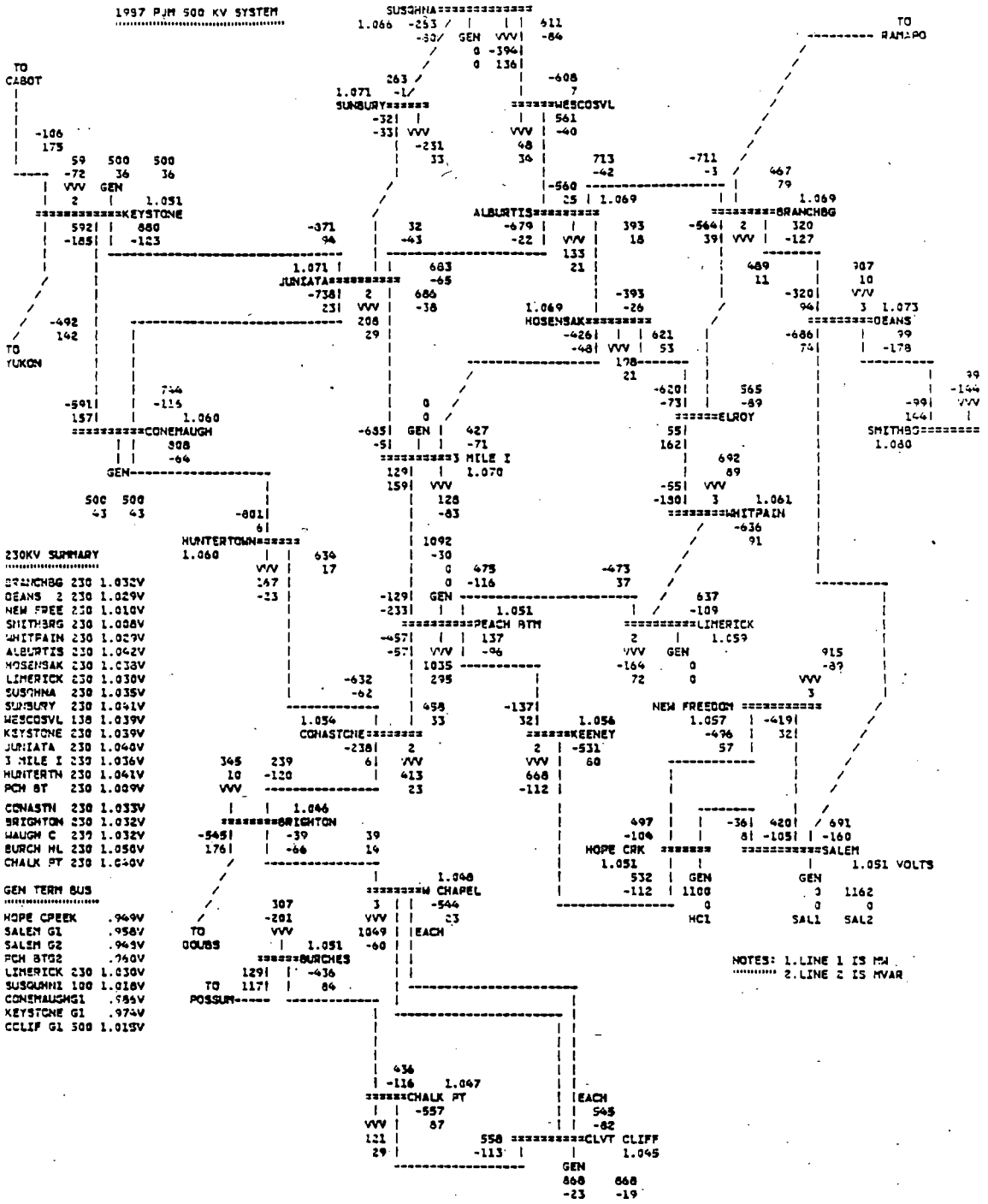
AREA NAME	GENERATION MW	GENERATION MVAR	INTERCHANGE (EXPORTS) MW	INTERCHANGE (EXPORTS) MVAR	AREA SYSTEM LOAD MW	AREA SYSTEM LOAD MVAR	AREA SYSTEM BUS LOAD MW	AREA SYSTEM BUS LOAD MVAR	AREA SYSTEM LOSSES MW	AREA SYSTEM LOSSES MVAR	AREA CHARGING MVAR	AREA STATIC MVAR	UNUSED VARGEN MVAR
PUBLIC SERVICE ELECTRIC & GAS CO.	1120.	94.	-2012.	681.	3132.	-588.	3103.	301.	29.	-887.	1451.	0.	2466.
PHILADELPHIA ELECTRIC CO.	228.	47.	-2333.	-379.	2561.	426.	2526.	817.	35.	147.	482.	537.	1279.
JERSEY CENTRAL POWER & LIGHT	248.	165.	-1054.	229.	1302.	-64.	1284.	-10.	17.	149.	192.	202.	205.
ATLANTIC ELECTRIC	402.	81.	-192.	33.	594.	48.	587.	186.	7.	-2.	77.	134.	154.
DELMARVA POWER & LIGHT CO.	378.	239.	-332.	254.	710.	-15.	704.	167.	7.	-60.	140.	121.	708.
EASTERN PJM TOTAL	2376.	626.	-5923.	818.	8299.	-192.	8203.	1460.	95.	-653.	2342.	994.	4812.
PENNSYLVANIA ELECTRIC CO.	636.	267.	-66.	148.	702.	119.	672.	144.	31.	-25.	386.	0.	1033.
METROPOLITAN EDISON CO.	208.	88.	-413.	109.	621.	-21.	612.	35.	9.	-10.	115.	46.	111.
PENNSYLVANIA POWER & LIGHT CO.	2976.	-49.	1134.	-283.	1842.	233.	1788.	441.	54.	221.	363.	430.	2301.
BALTIMORE GAS & ELECTRIC CO.	250.	256.	-1611.	54.	1861.	201.	1847.	244.	14.	-40.	202.	0.	13.
POTOMAC ELECTRIC CO.	1238.	95.	-537.	523.	1775.	-429.	1761.	881.	13.	-745.	979.	563.	2915.
WESTERN PJM TOTAL	5308.	656.	-1493.	552.	6801.	104.	6680.	1745.	120.	-599.	2046.	1038.	6374.
TOTAL PJM UNDERLYING	7684.	1282.	-7416.	1370.	15100.	-88.	14884.	3205.	215.	-1252.	4388.	2032.	11186.
PJM 500KV	7090.	87.	6635.	409.	455.	-322.	383.	262.	72.	-583.	3275.	0.	2775.
TOTAL PJM SYSTEM	14774.	1368.	-781.	1770.	15555.	-410.	15267.	3467.	287.	-1835.	7663.	2032.	13962.

HOPE CREEK OPERATING GUIDE - 2 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
0 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2BASE

ALL 500-KV CIRCUITS IN SERVICE

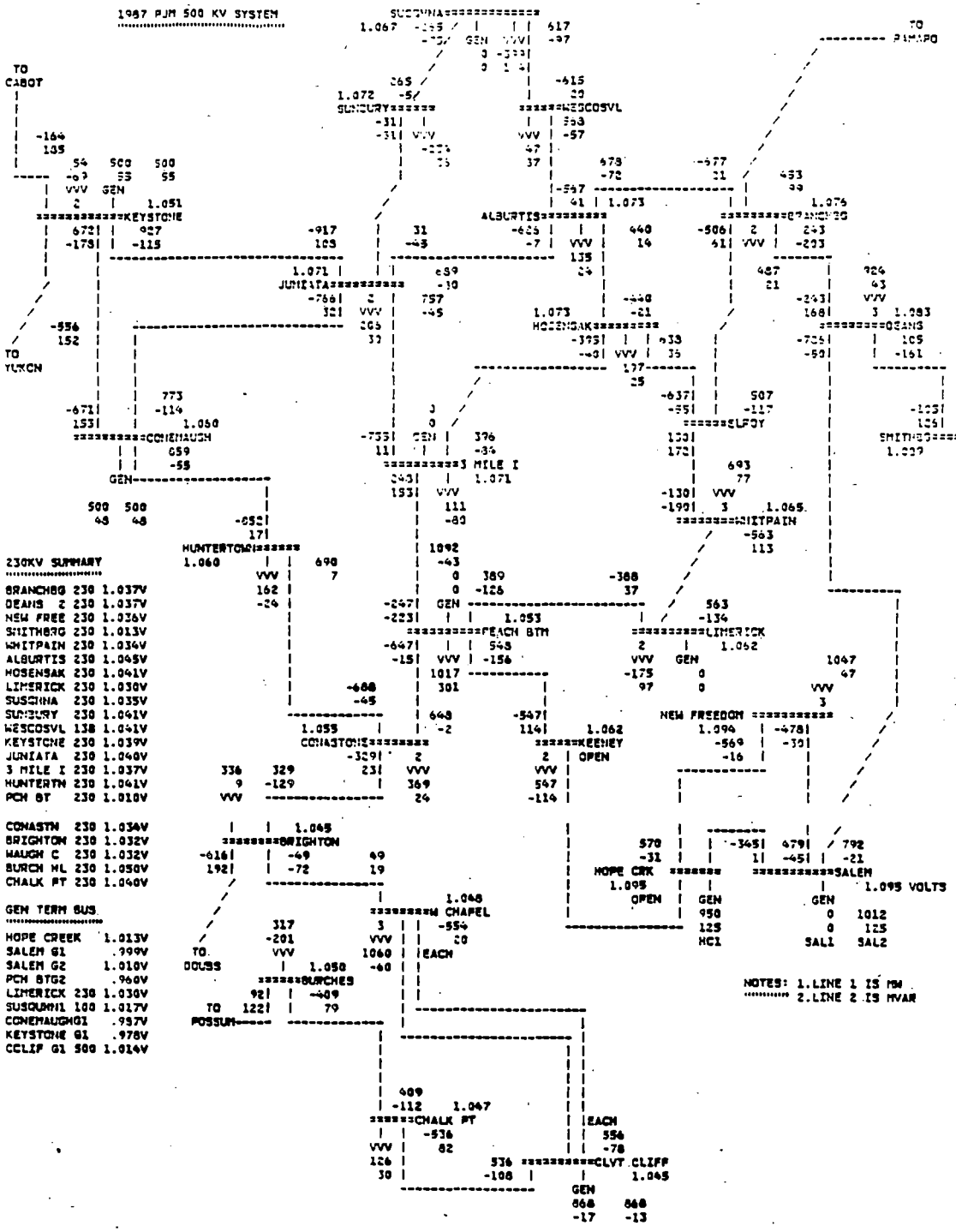
EXHIBIT 54



HOPE CREEK OPERATING GUIDE - 2 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
0 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2BASE

ALL 500-KV CIRCUITS IN SERVICE



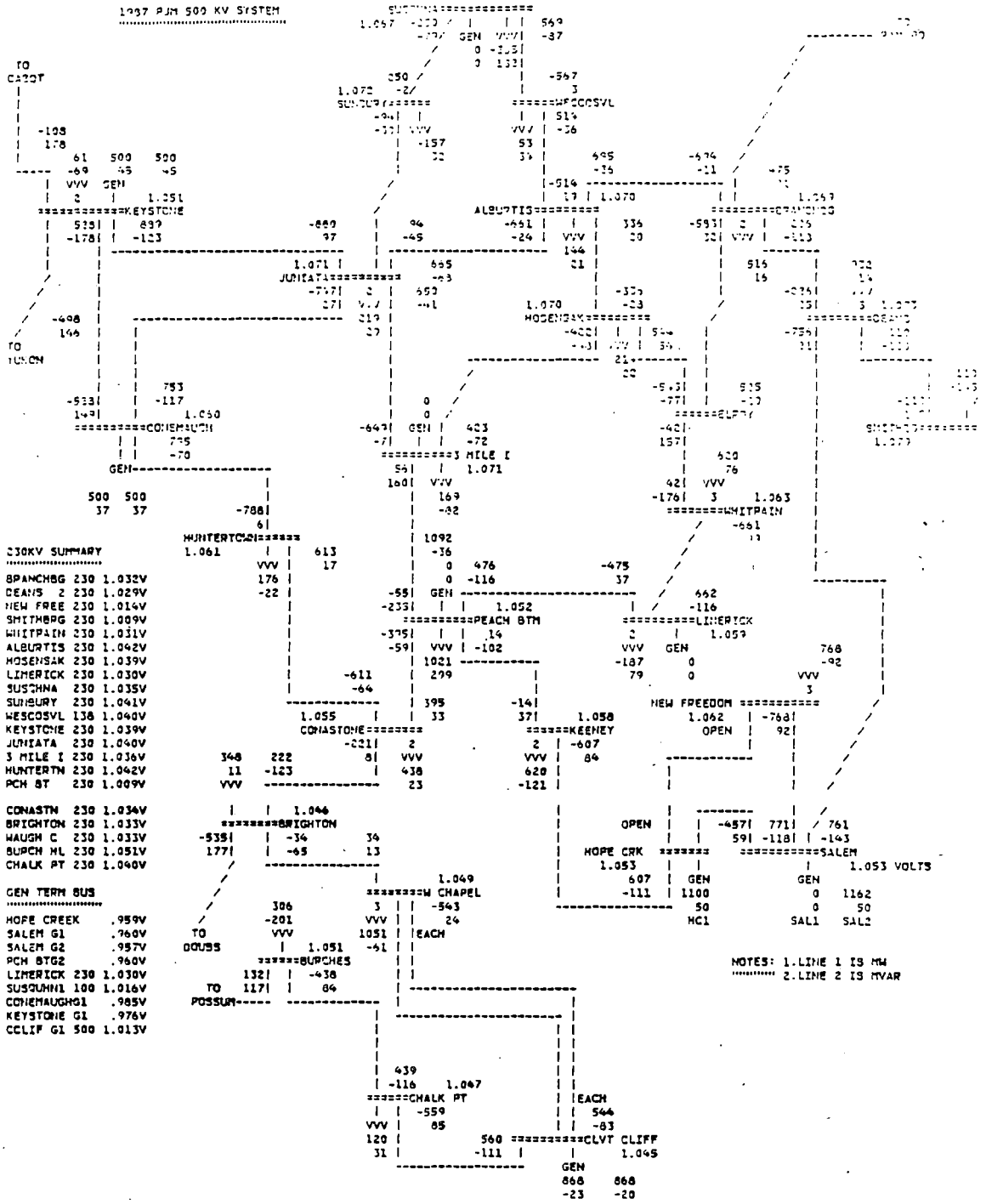
HOPE CREEK OPERATING GUIDE - 2 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT 150 MW REDUCTION AND
125 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M1

HOPE CREEK-KEENEY 500-KV CIRCUIT
(5015) ON MAINTENANCE

EXHIBIT 56



HOPE CREEK OPERATING GUIDE - 2 UNIT

1987 40% SUMMER PEAK LOAD LEVEL

PJM IMPORTS = 768 MW

PS IMPORTS = 2000 MW

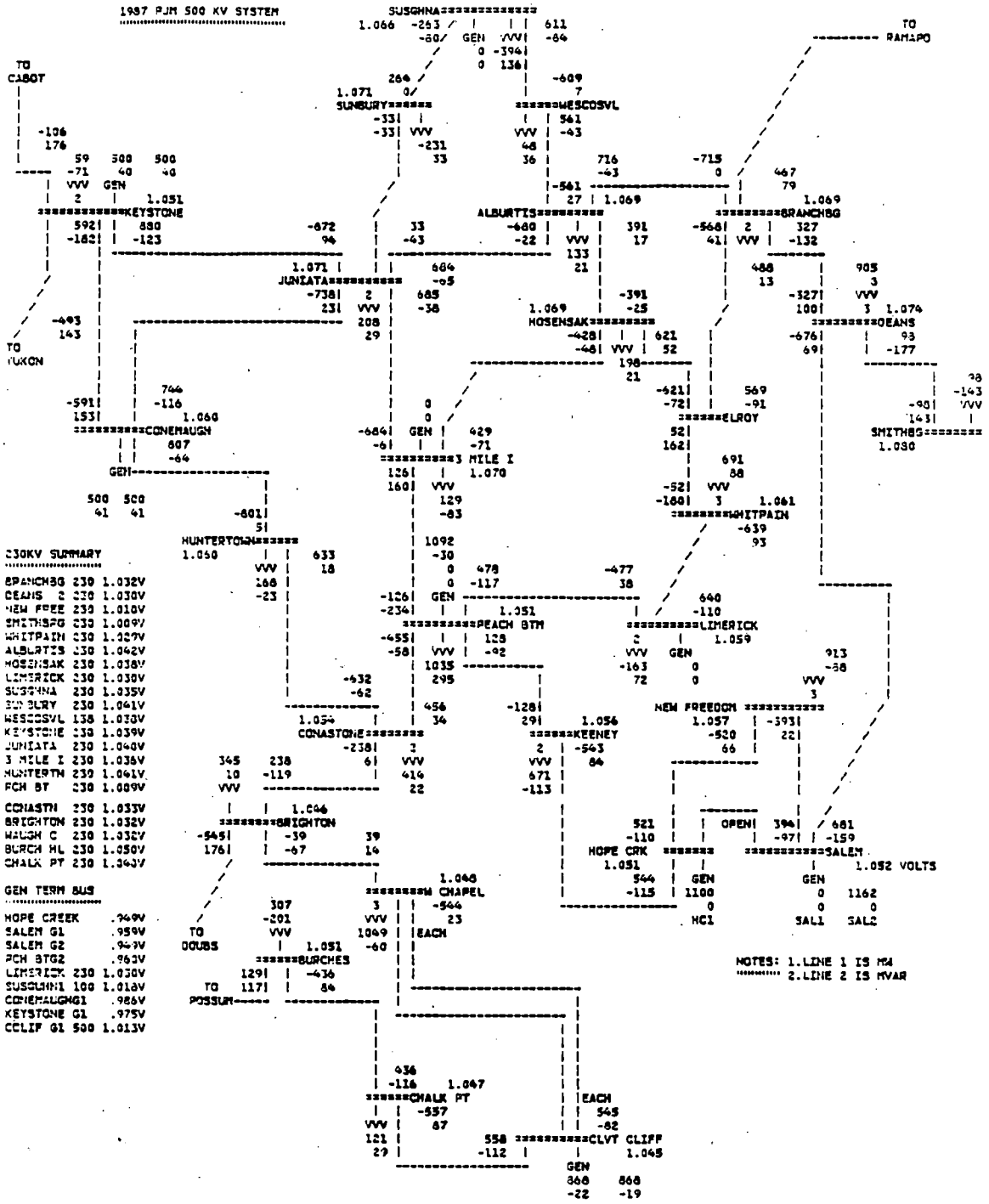
NO EFORS - PJM ECO. DISPATCH

HC1/SAL2 AT FULL MW OUTPUT AND
50 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M2

HOPE CREEK-NEW FREEDOM 500-KV
CIRCUIT (5023) ON MAINTENANCE

EXHIBIT 57

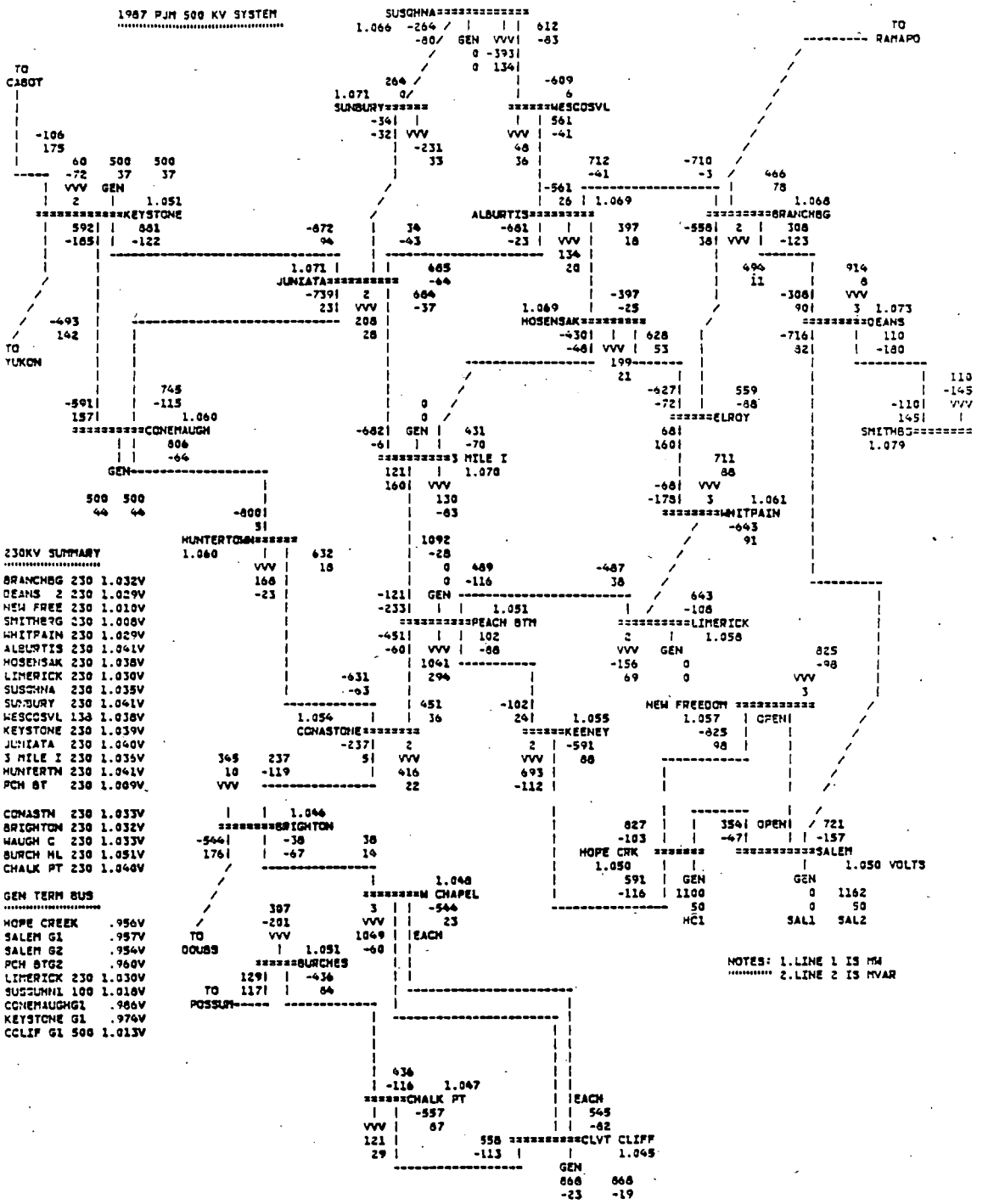


HOPE CREEK OPERATING GUIDE - 2 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
0 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M3

HOPE CREEK-SALEM 500-KV CIRCUIT
(5037) ON MAINTENANCE



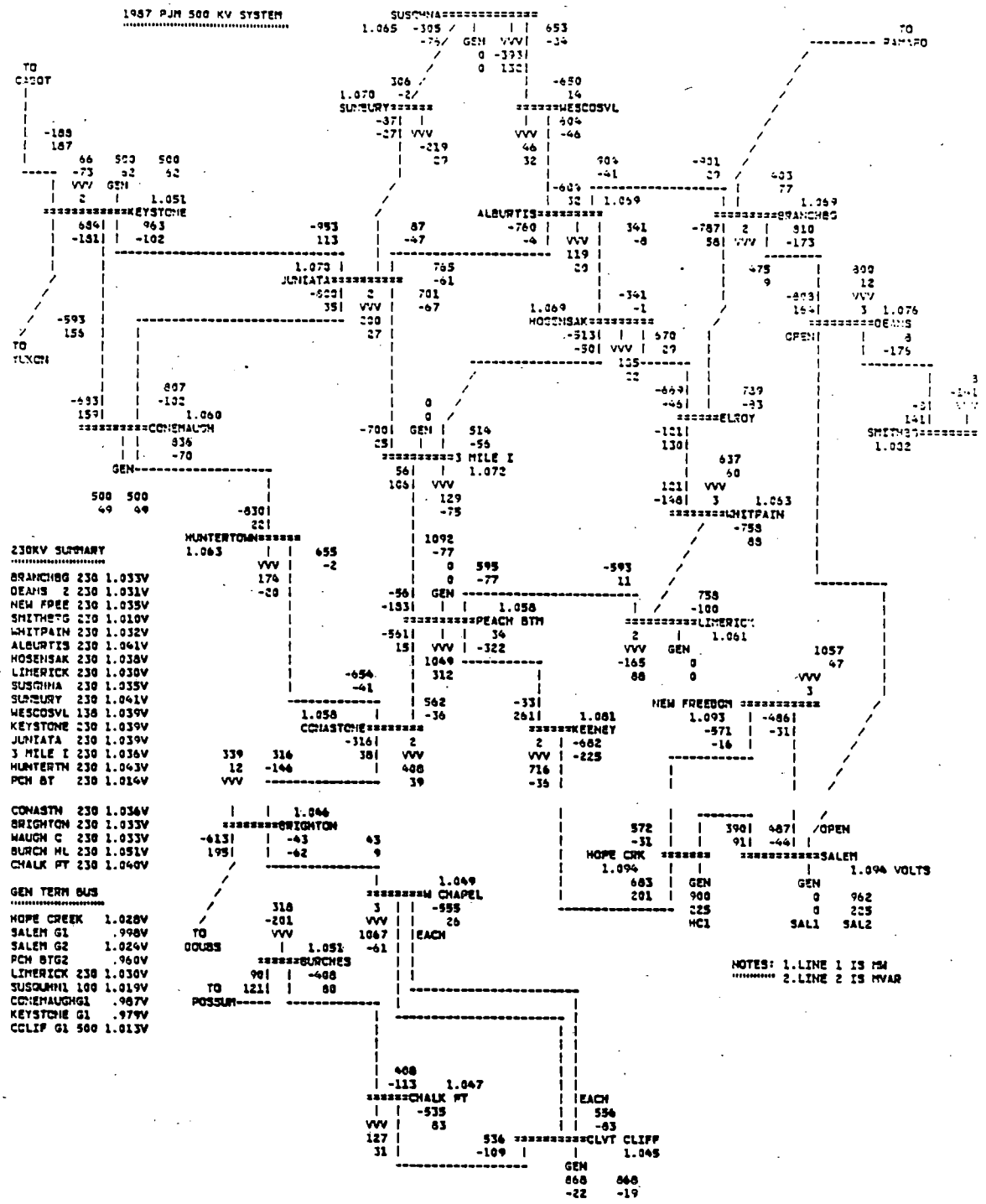
HOPE CREEK OPERATING GUIDE - 2 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
50 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M4

SALEM-NEW FREEDOM 500-KV CIRCUIT
(5024) ON MAINTENANCE

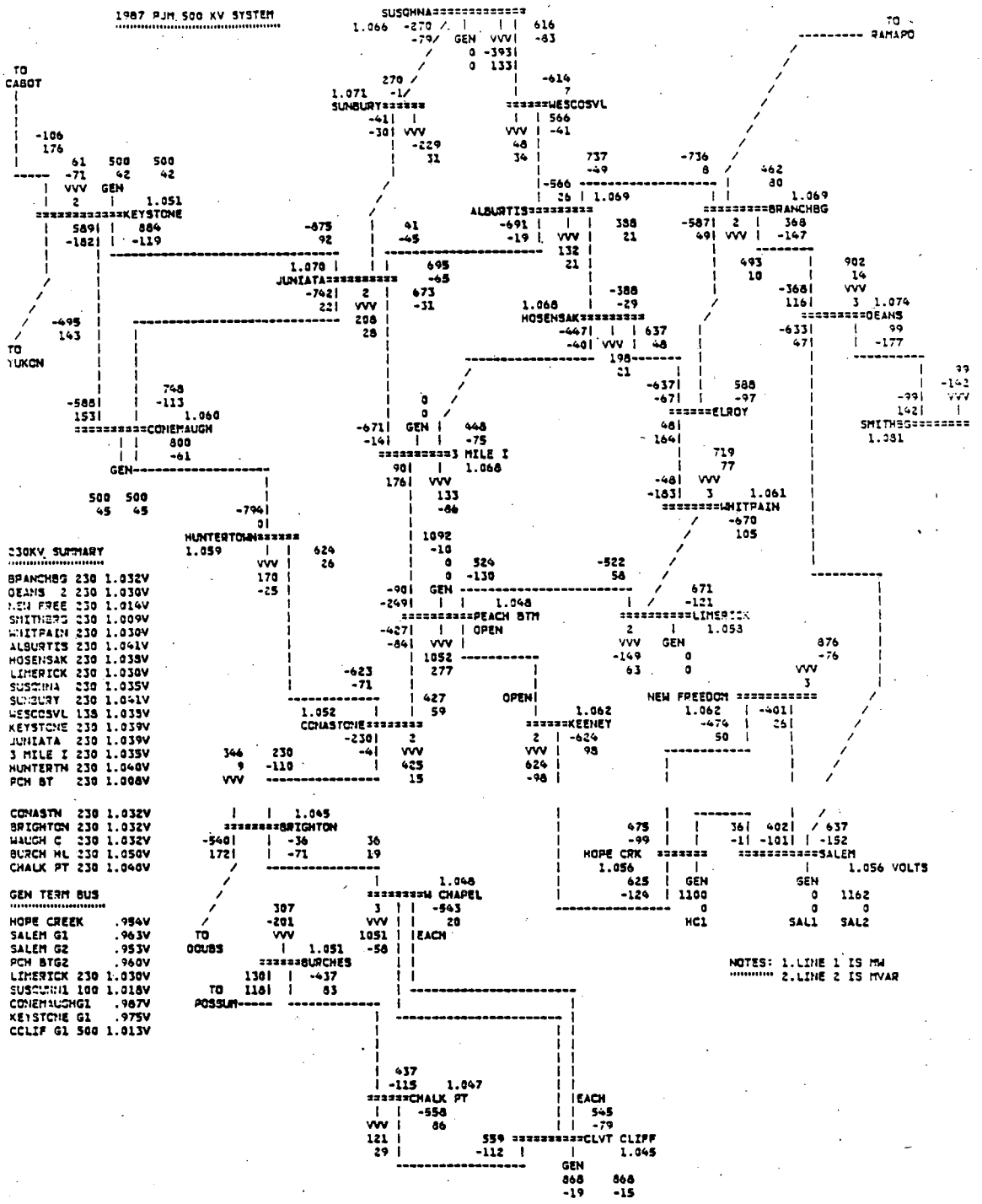
EXHIBIT 59



HOPE CREEK OPERATING GUIDE - 2 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT 200 MW REDUCTION AND
225 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M5

SALEM-DEANS 500-KV CIRCUIT
(5021) ON MAINTENANCE

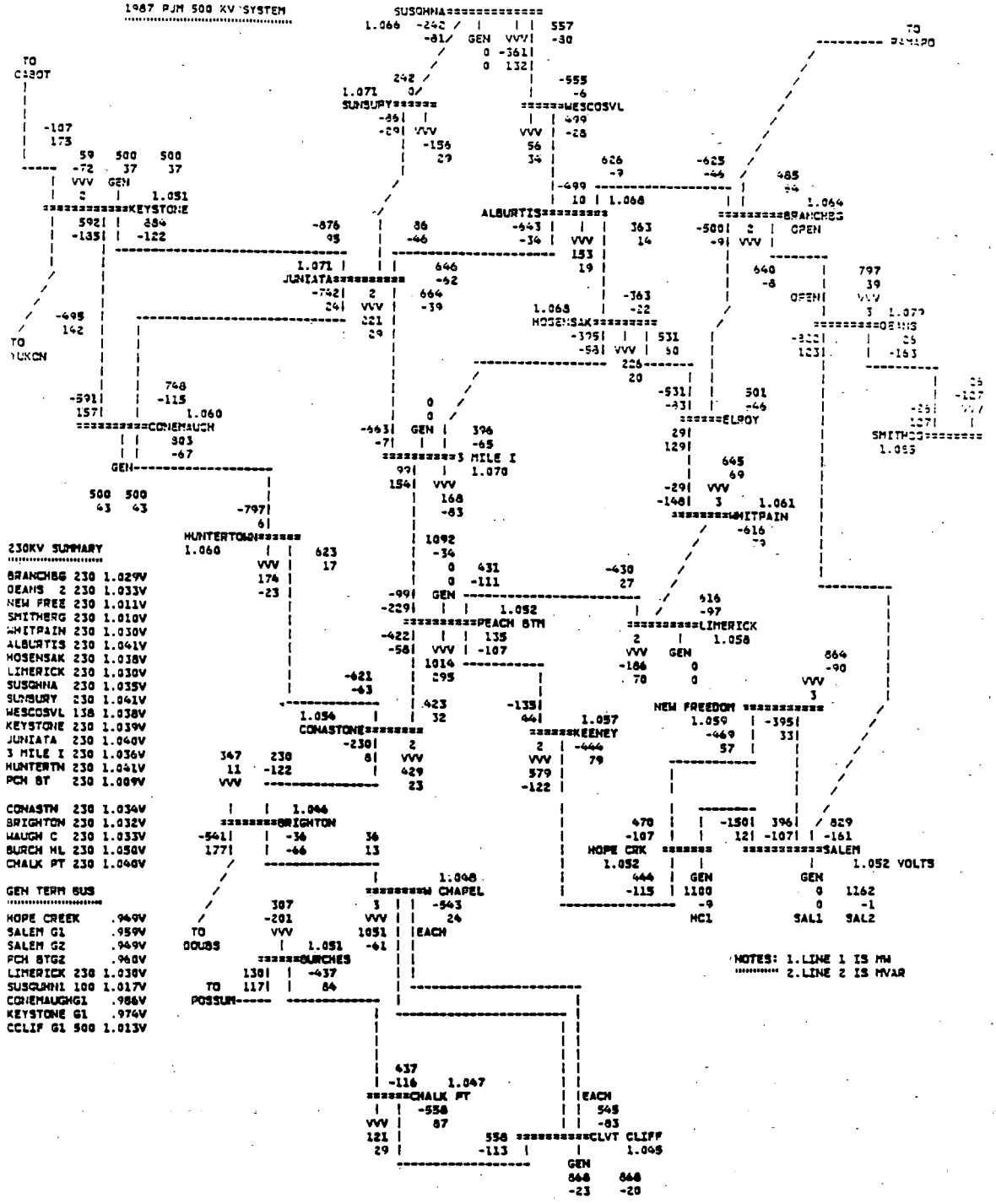


HOPE CREEK OPERATING GUIDE - 2 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
0 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M6

PEACH BOTTOM-KEENEY 500-KV CIRCUIT (5014) ON MAINTENANCE

EXHIBIT 61



HOPE CREEK OPERATING GUIDE - 2 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL2 AT FULL MW OUTPUT AND
0 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 2M7

DEANS-BRANCHBURG 500-KV CIRCUIT
(5019) ON MAINTENANCE

EXHIBIT 62

HOPE CREEK OPERATING GUIDE

THREE UNIT POWER FLOW CASE LISTING

HOPE CREEK NO. 1, SALEM NO. 1 AND NO. 2 IN-SERVICE

EXHIBIT NO.	CASE	DESCRIPTION
65	3BASE	1987 40% SUMMER PEAK LOAD LEVEL PJM IMPORTS = 768 MW PS IMPORTS = 2000 MW NO EFORS (DISCRETE UNIT OUTAGES) - PJM ECONOMIC DISPATCH HC/SLM 1 & 2 AT FULL MW AND 200 MVAR OUTPUT - EACH PEACH BOTTOM NO. 3 AND SUSQUEHANNA NO. 2 OUT OF SERVICE BASE CASE - ALL TRANSMISSION IN SERVICE
66	3M1	AS BASE - THREE UNIT AT 300 MW REDUCTION AND 125 MVAR OUTPUT EACH HOPE CREEK-KEENEY 500-KV CIRCUIT (5015) ON MAINTENANCE
67	3M2	AS BASE - THREE UNIT AT FULL MW AND 275 MVAR OUTPUT EACH HOPE CREEK-NEW FREEDOM 500-KV CIRCUIT (5023) ON MAINTENANCE
68	3M3	AS BASE - SALEM NO. 1 AND 2 AT 50 MW REDUCTION AND 225 MVAR OUTPUT EACH HOPE CREEK NO. 1 AT FULL MW OUTPUT AND 300 MVAR OUTPUT - HOPE CREEK-SALEM 500-KV CIRCUIT (5023) ON MAINTENANCE
69	3M4	AS BASE - THREE UNIT AT FULL MW AND 250 MVAR OUTPUT EACH SALEM-NEW FREEDOM 500-KV CIRCUIT (5024) ON MAINTENANCE
70	3M5	AS BASE - THREE UNIT AT 300 MW REDUCTION AND 200 MVAR OUTPUT EACH SALEM-DEANS 500-KV CIRCUIT (5021) ON MAINTENANCE
71	3M6	AS BASE - THREE UNIT AT FULL MW AND 225 MVAR OUTPUT EACH PEACH BOTTOM-KEENEY 500-KV CIRCUIT (5014) ON MAINTENANCE
72	3M7	AS BASE - THREE UNIT AT FULL MW AND 225 MVAR OUTPUT EACH DEANS-BRANCHBURG 500-KV CIRCUIT (5019) ON MAINTENANCE
74	3BASE-75	1987 75% SUMMER PEAK LOAD LEVEL PJM IMPORTS = 2901 MW PS IMPORTS = 3500 MW NO EFORS (DISCRETE UNIT OUTAGES) - PJM ECONOMIC DISPATCH HC/SLM 1 & 2 AT FULL MW AND 200 MVAR OUTPUT PEACH BOTTOM NO. 3 AND SUSQUEHANNA NO. 2 OUT OF SERVICE BASE CASE - ALL TRANSMISSION IN SERVICE
76	3BASE-100	1987 100% SUMMER PEAK LOAD LEVEL PJM IMPORTS = 2168 MW PS IMPORTS = 3900 MW NO EFORS (DISCRETE UNIT OUTAGES) - PJM ECONOMIC DISPATCH HC/SLM 1 & 2 AT FULL MW AND 200 MVAR OUTPUT PEACH BOTTOM NO. 3 AND SUSQUEHANNA NO. 2 OUT OF SERVICE BASE CASE - ALL TRANSMISSION IN SERVICE

POWER FLOW SIMULATION - SYSTEM SUMMARY

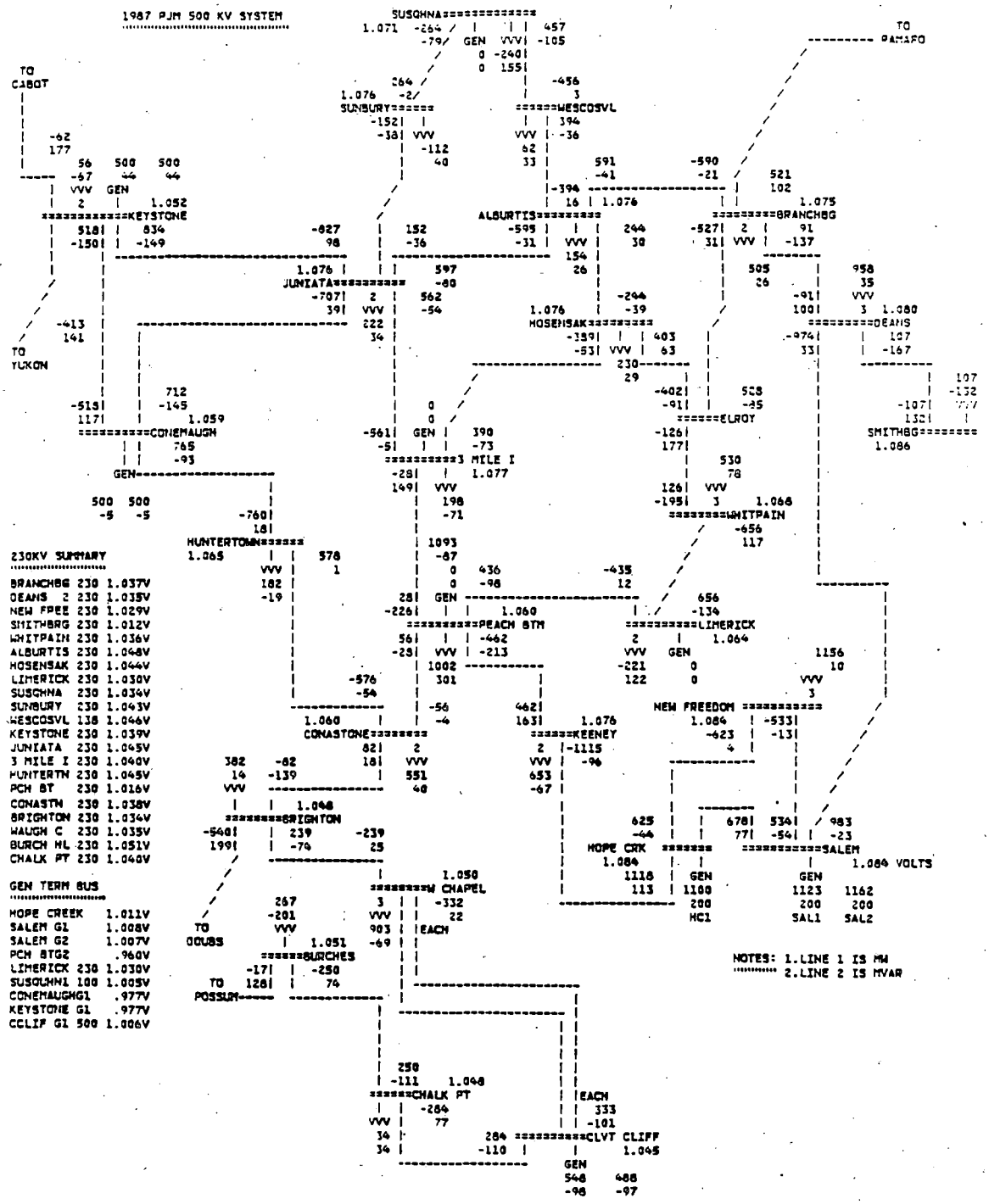
AREA NAME	GENERATION MW	GENERATION MVAR	INTERCHANGE (EXPORTS) MW	INTERCHANGE (EXPORTS) MVAR	AREA SYSTEM LOAD MW	AREA SYSTEM LOAD MVAR	AREA SYSTEM BUS LOAD MW	AREA SYSTEM BUS LOAD MVAR	AREA SYSTEM LOSSES MW	AREA SYSTEM LOSSES MVAR	AREA CHARGING MVAR	AREA STATIC MVAR	UNUSED VARGEN MVAR
PUBLIC SERVICE ELECTRIC & GAS CO.	1004.	55.	-2132.	614.	3136.	-559.	3103.	301.	33.	-859.	1451.	0.	2375.
PHILADELPHIA ELECTRIC CO.	544.	-71.	-2012.	-450.	2556.	380.	2526.	817.	30.	102.	487.	539.	1271.
JERSEY CENTRAL POWER & LIGHT	247.	135.	-1055.	198.	1302.	-63.	1284.	-10.	17.	150.	193.	203.	235.
ATLANTIC ELECTRIC	280.	105.	-318.	52.	598.	52.	587.	186.	10.	1.	78.	134.	169.
DELMARVA POWER & LIGHT CO.	432.	151.	-278.	176.	710.	-25.	704.	167.	6.	-68.	143.	122.	796.
EASTERN PJM TOTAL	2507.	375.	-5794.	589.	8301.	-214.	8203.	1460.	97.	-674.	2351.	998.	4846.
PENNSYLVANIA ELECTRIC CO.	634.	257.	-69.	136.	703.	121.	672.	144.	31.	-23.	387.	0.	1043.
METROPOLITAN EDISON CO.	208.	77.	-413.	101.	621.	-24.	612.	35.	9.	-13.	116.	46.	122.
PENNSYLVANIA POWER & LIGHT CO.	2429.	-217.	600.	-319.	1829.	102.	1788.	441.	41.	92.	365.	432.	2469.
BALTIMORE GAS & ELECTRIC CO.	250.	254.	-1610.	61.	1860.	193.	1847.	244.	13.	-47.	204.	0.	15.
POTOMAC ELECTRIC CO.	1238.	71.	-536.	511.	1774.	-441.	1761.	881.	12.	-759.	980.	562.	2939.
WESTERN PJM TOTAL	4759.	442.	-2027.	490.	6786.	-48.	6680.	1745.	106.	-749.	2051.	1040.	6588.
TOTAL PJM UNDERLYING	7266.	817.	-7821.	1080.	15087.	-263.	14884.	3205.	203.	-1423.	4402.	2038.	11434.
PJM 500KV	7514.	397.	7060.	782.	454.	-385.	383.	262.	71.	-646.	3319.	0.	3065.
TOTAL PJM SYSTEM	14780.	1214.	-762.	1861.	15542.	-647.	15267.	3467.	274.	-2068.	7721.	2038.	14499.

HOPE CREEK OPERATING GUIDE - 3 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
200 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3BASE

ALL 500-KV CIRCUITS IN SERVICE

EXHIBIT 64

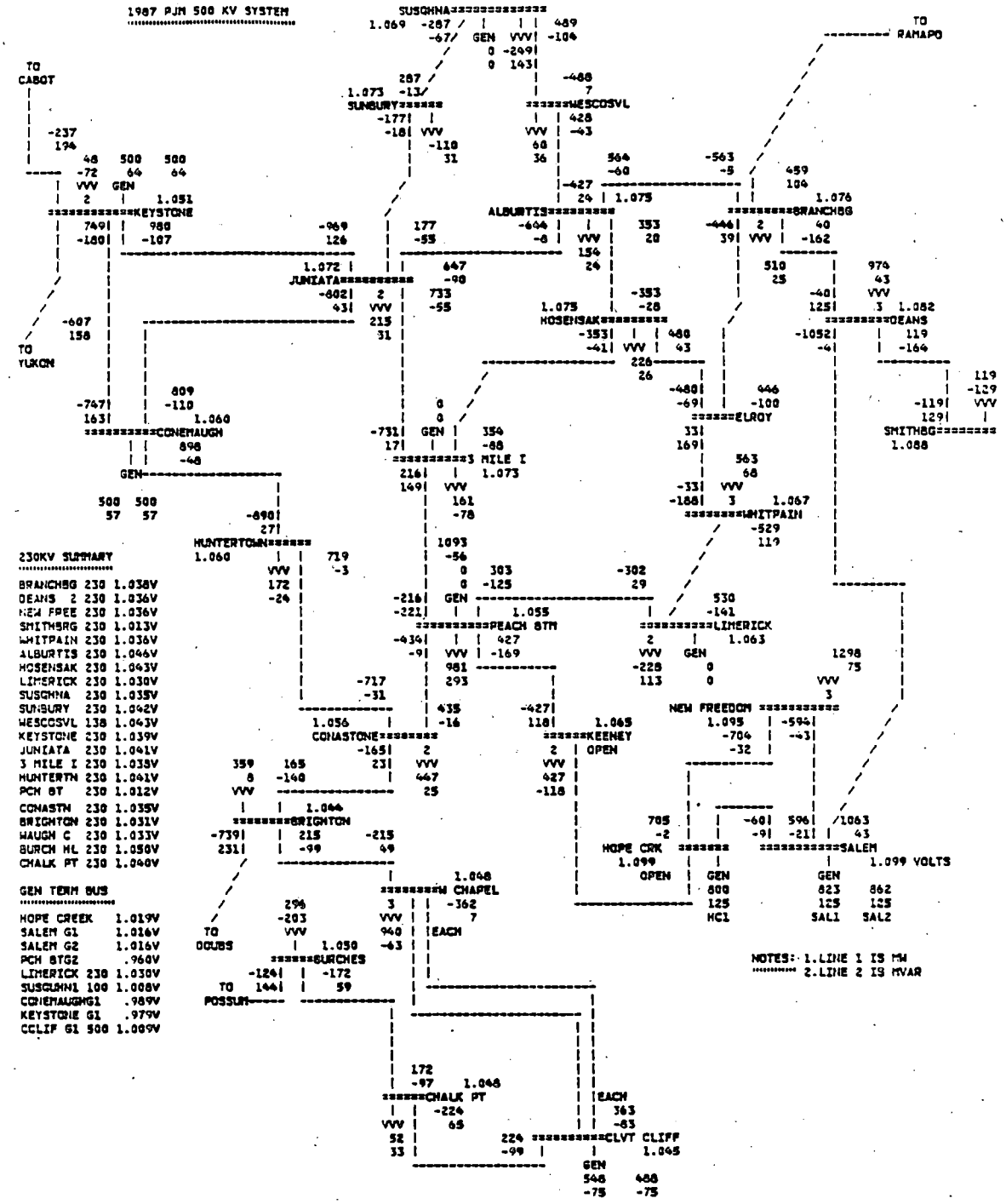


HOPE CREEK OPERATING GUIDE - 3 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
200 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3BASE

ALL 500-KV CIRCUITS IN SERVICE

EXHIBIT 65



HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL

PJM IMPORTS = 768 MW

PS IMPORTS = 2000 MW

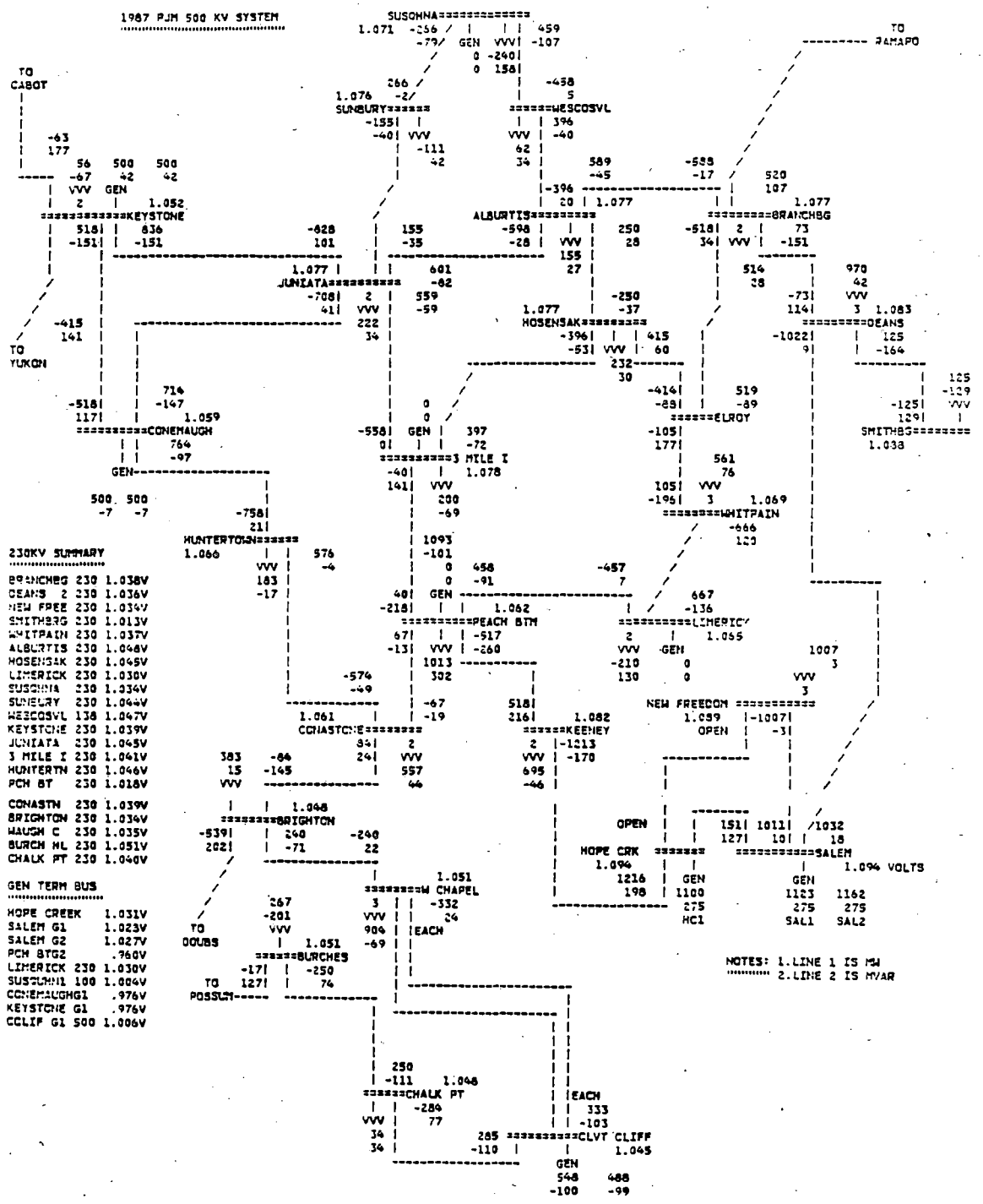
NO EFORS - PJM ECO. DISPATCH

HC1/SAL1&2 AT 300 MW REDUCTION AND 125 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M1

HOPE CREEK-KEENEY 500-KV CIRCUIT (5015) ON MAINTENANCE

EXHIBIT 66



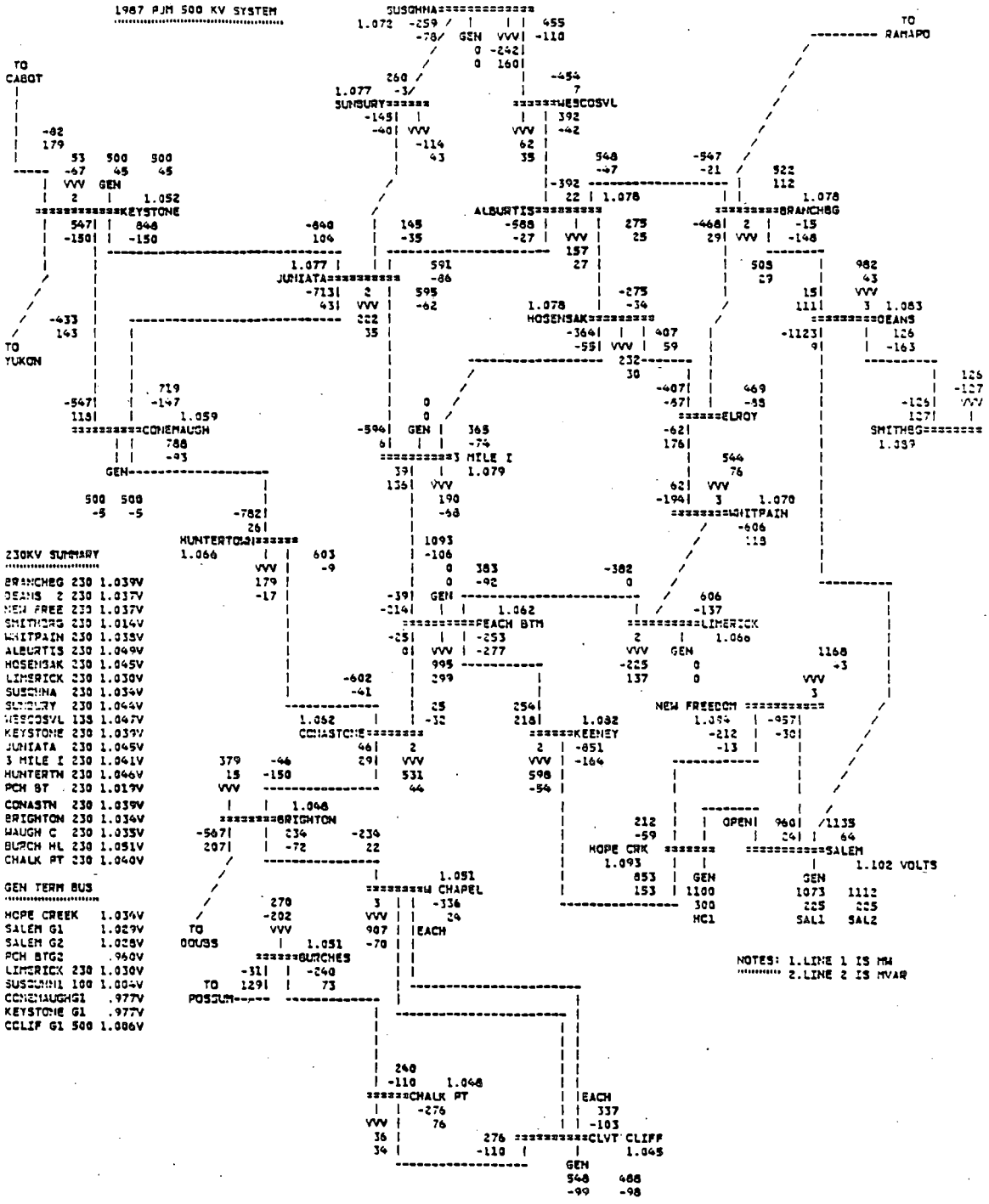
HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
275 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M2

HOPE CREEK-NEW FREEDOM 500-KV
CIRCUIT (5023) ON MAINTENANCE

EXHIBIT 67



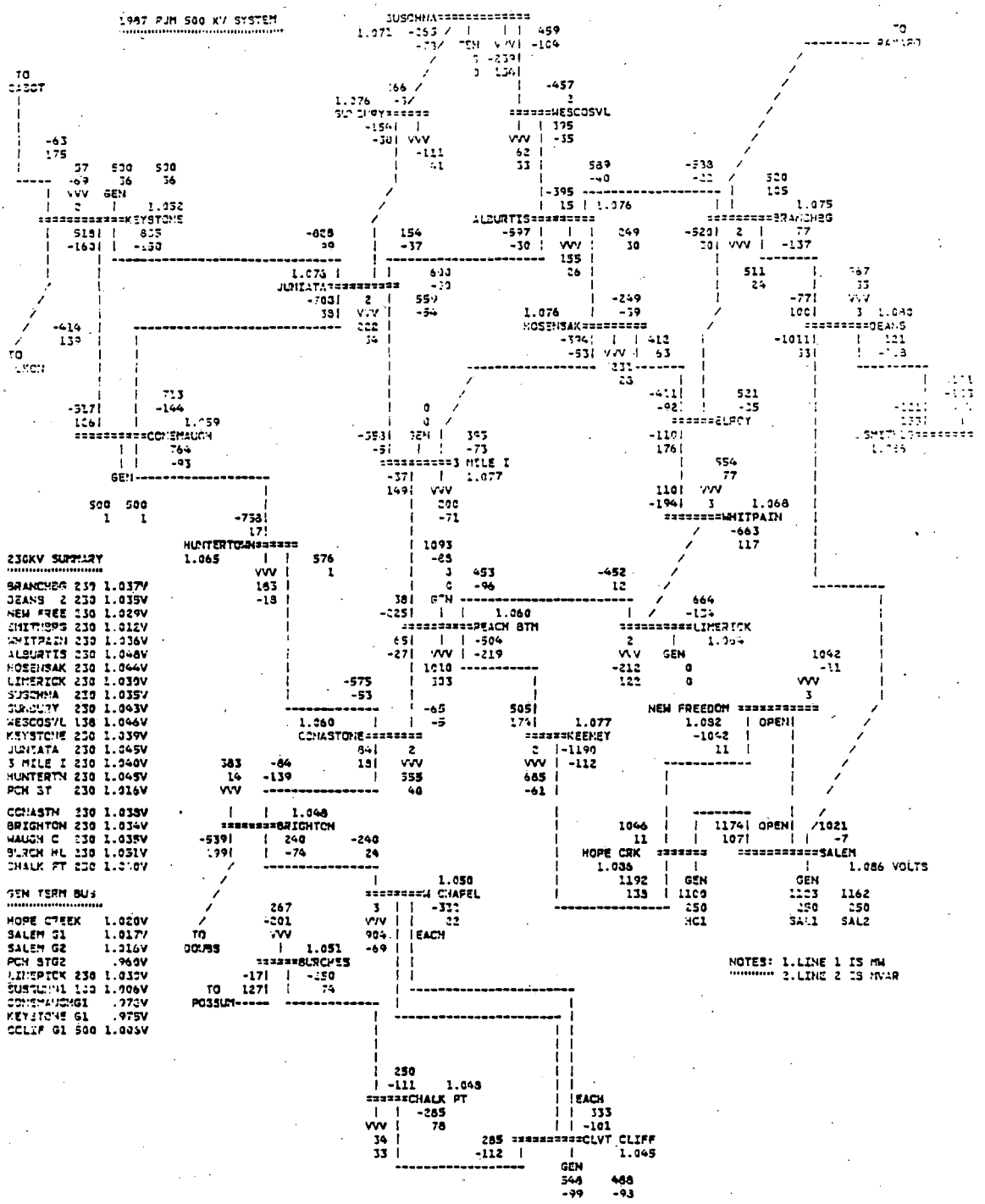
HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
SALEM AT 50 MW REDUCTION AND
225 MVAR OUTPUT (EACH)
HOPE CREEK 1 AT FULL MW OUTPUT AND
300 MVAR OUTPUT

TRANSMISSION CONDITIONS: 3M3

HOPE CREEK-SALEM 500-KV CIRCUIT
(5037) ON MAINTENANCE

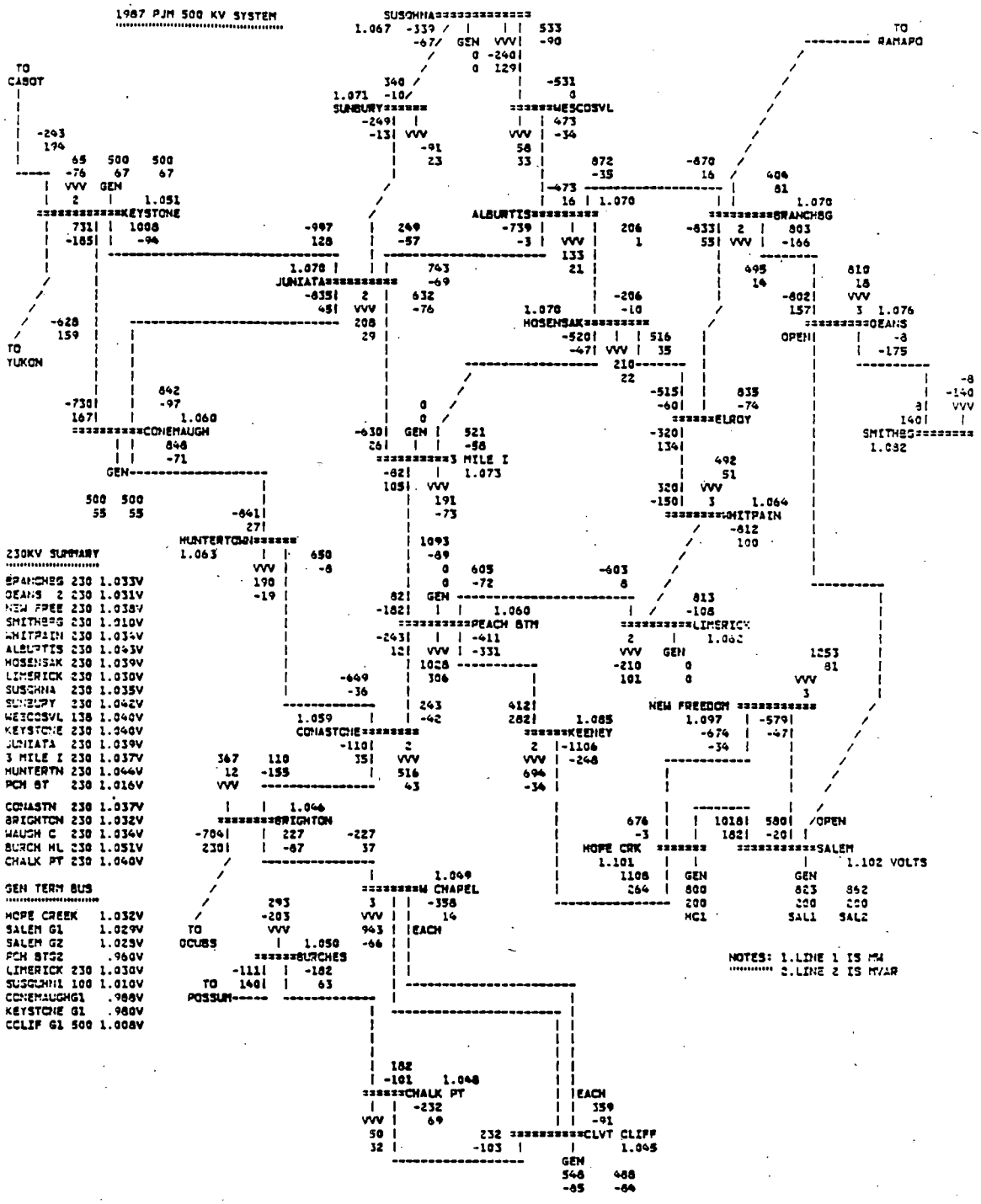
EXHIBIT 68



HOPE CREEK OPERATING GUIDE - 3 UNIT
1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
250 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M4

SALEM-NEW FREEDOM 500-KV CIRCUIT
(5024) ON MAINTENANCE

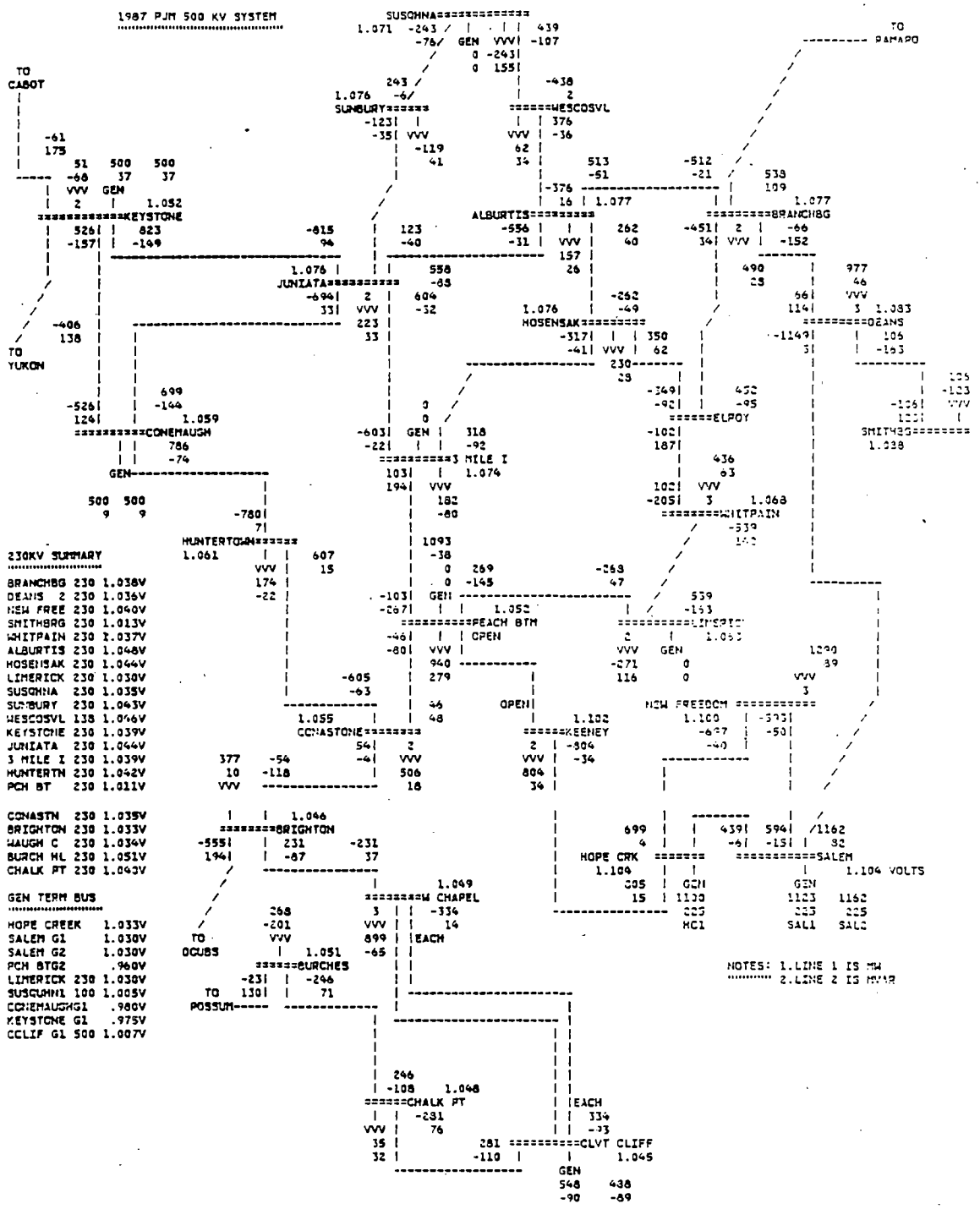


HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT 300 MW REDUCTION AND
200 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M5

SALEM-DEANS 500-KV CIRCUIT
(5021) ON MAINTENANCE



HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL

PJM IMPORTS = 768 MW

PS IMPORTS = 2000 MW

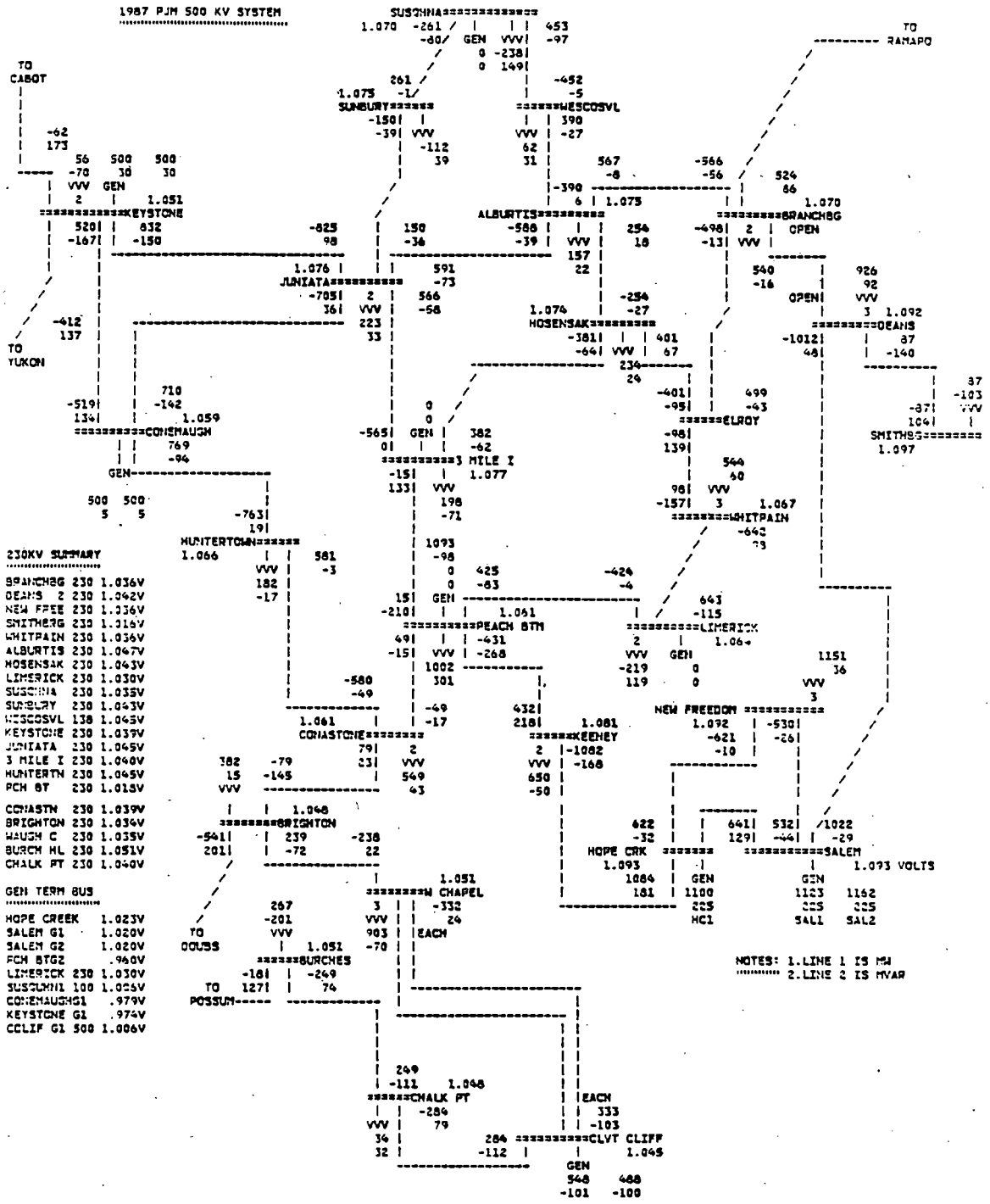
NO EFORS - PJM ECO. DISPATCH

HC1/SAL1&2 AT FULL MW OUTPUT AND
225 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M6

PEACH BOTTOM-KEENEY 500-KV
CIRCUIT (5014) ON MAINTENANCE

EXHIBIT 71



HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 40% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 768 MW
PS IMPORTS = 2000 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
225 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3M7

DEANS-BRANCHBURG 500-KV CIRCUIT
(5019) ON MAINTENANCE

EXHIBIT 72

POWER FLOW SIMULATION - SYSTEM SUMMARY

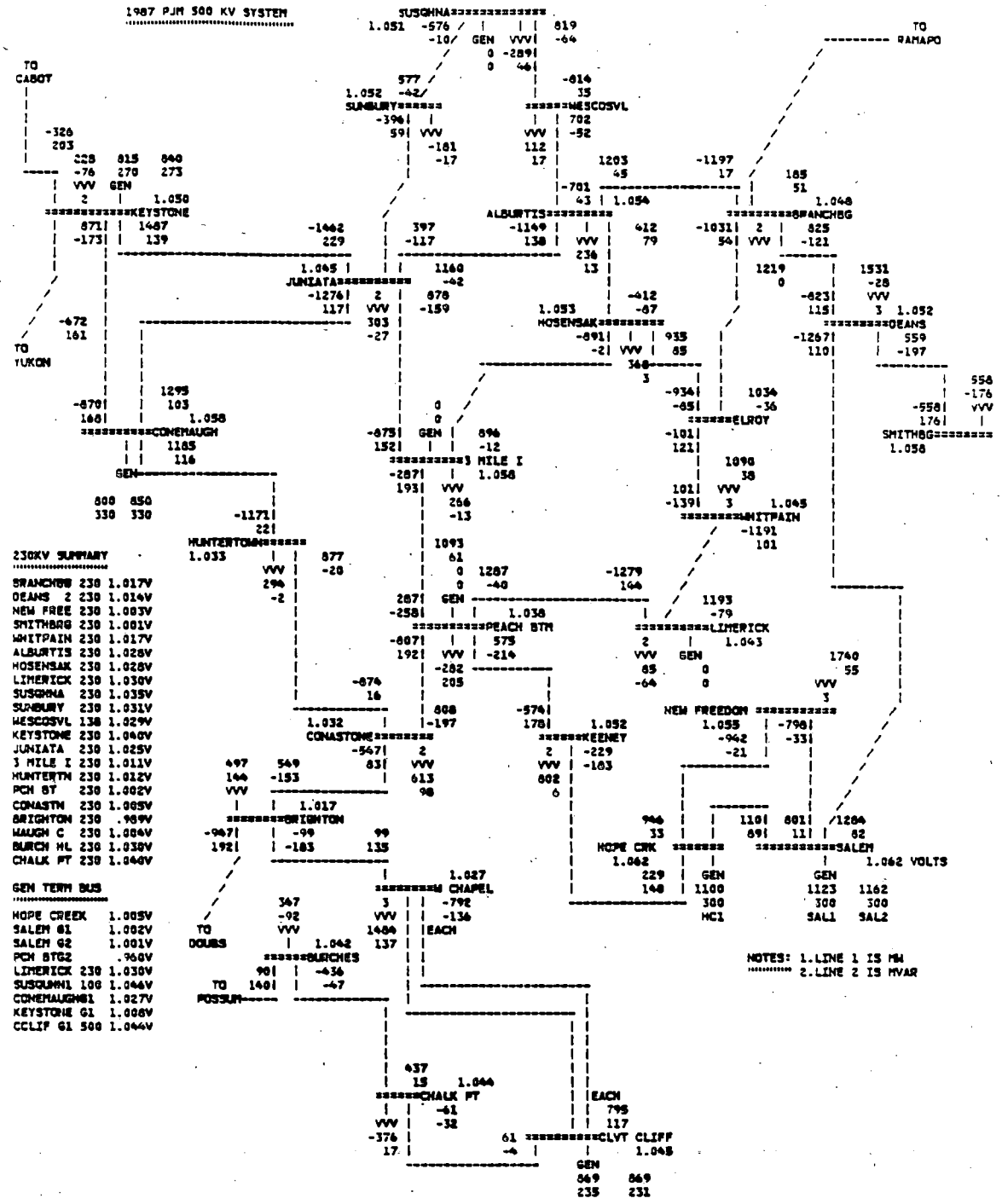
AREA NAME	GENERATION MW	GENERATION MVAR	INTERCHANGE (EXPORTS) MW	INTERCHANGE (EXPORTS) MVAR	AREA SYSTEM LOAD MW	AREA SYSTEM LOAD MVAR	AREA SYSTEM BUS LOAD MW	AREA SYSTEM BUS LOAD MVAR	AREA SYSTEM LOSSES MW	AREA SYSTEM LOSSES MVAR	AREA CHARGING MVAR	AREA STATIC MVAR	UNUSED VARGEN MVAR
PUBLIC SERVICE ELECTRIC & GAS CO.	3920.	974.	-3927.	1103.	7847.	-129.	7757.	751.	90.	-63.	1431.	818.	1405.
PHILADELPHIA ELECTRIC CO.	4502.	1086.	-1811.	-313.	6313.	1399.	6181.	2000.	131.	1358.	478.	1968.	1632.
JERSEY CENTRAL POWER & LIGHT	1090.	281.	-2212.	45.	3302.	237.	3211.	-26.	91.	1043.	183.	781.	137.
ATLANTIC ELECTRIC	737.	313.	-775.	-100.	1512.	413.	1467.	465.	45.	268.	74.	321.	48.
DELMARVA POWER & LIGHT CO.	1705.	482.	-87.	90.	1792.	393.	1760.	417.	32.	264.	134.	288.	218.
EASTERN PJM TOTAL	11954.	3137.	-8812.	824.	20766.	2312.	20376.	3608.	389.	2870.	2301.	4174.	3439.
PENNSYLVANIA ELECTRIC CO.	1917.	477.	182.	72.	1735.	406.	1679.	360.	56.	194.	383.	149.	896.
METROPOLITAN EDISON CO.	258.	169.	-1305.	-46.	1563.	215.	1530.	87.	33.	242.	110.	115.	58.
PENNSYLVANIA POWER & LIGHT CO.	6012.	1242.	1418.	400.	4594.	842.	4469.	1103.	125.	1234.	354.	1494.	1833.
BALTIMORE GAS & ELECTRIC CO.	2010.	1039.	-2658.	-9.	4668.	1048.	4618.	610.	49.	441.	195.	0.	435.
POTOMAC ELECTRIC CO.	4529.	1363.	45.	5.	4484.	1358.	4403.	2202.	81.	546.	938.	1391.	1287.
WESTERN PJM TOTAL	14726.	4290.	-2317.	422.	17043.	3869.	16700.	4362.	344.	2657.	1981.	3148.	4509.
TOTAL PJM UNDERLYING	26680.	7427.	-11130.	1246.	37810.	6181.	37077.	7970.	733.	5526.	4282.	7323.	7948.
PJM 500KV	9521.	2630.	8960.	154.	561.	2476.	383.	262.	177.	2853.	3189.	638.	1132.
TOTAL PJM SYSTEM	36201.	10057.	-2170.	1400.	38371.	8657.	37460.	8232.	910.	8379.	7471.	7960.	9080.

HOPE CREEK OPERATING GUIDE - 3 UNIT
1987 100% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 2168 MW
PS IMPORTS = 3900 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND

TRANSMISSION CONDITIONS: 3BASE-100

ALL 500-KV CIRCUITS IN SERVICE

EXHIBIT 73



HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 100% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 2168 MW
PS IMPORTS = 3900 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
300 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3BASE-100

ALL 500-KV CIRCUITS IN SERVICE

POWER FLOW SIMULATION - SYSTEM SUMMARY

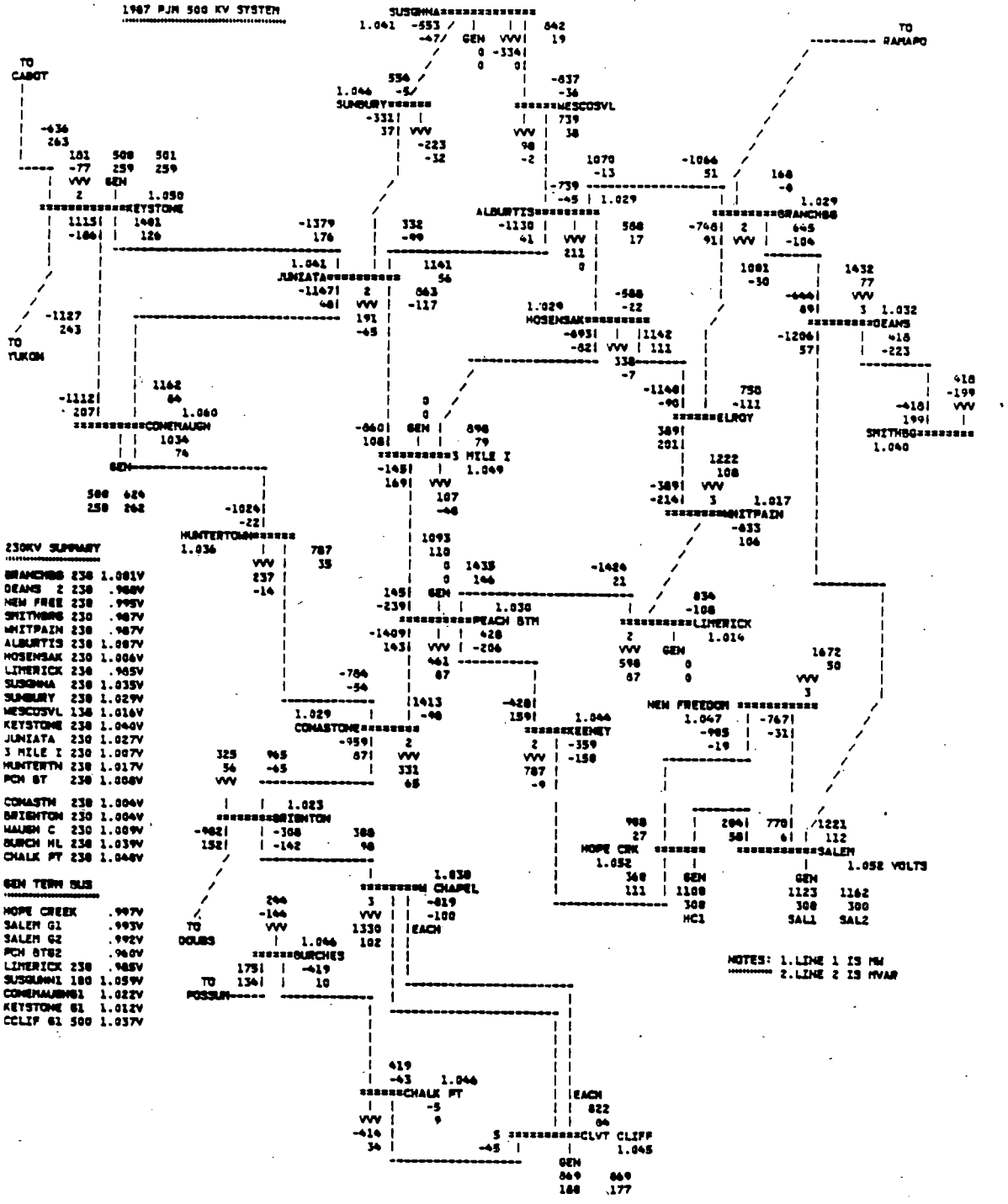
AREA NAME	GENERATION MW	GENERATION MVAR	INTERCHANGE (EXPORTS) MW	INTERCHANGE (EXPORTS) MVAR	AREA SYSTEM LOAD MW	AREA SYSTEM LOAD MVAR	AREA SYSTEM BUS LOAD MW	AREA SYSTEM BUS LOAD MVAR	AREA SYSTEM LOSSES MW	AREA SYSTEM LOSSES MVAR	AREA CHARGING MVAR	AREA STATIC MVAR	UNUSED VARGEN MVAR
PUBLIC SERVICE ELECTRIC & GAS CO.	2349.	1359.	-3540.	814.	5889.	545.	5821.	1577.	68.	-238.	1422.	792.	924.
PHILADELPHIA ELECTRIC CO.	1039.	275.	-3786.	-383.	4825.	658.	4736.	1347.	89.	630.	467.	1316.	519.
JERSEY CENTRAL POWER & LIGHT	658.	212.	-1800.	155.	2458.	57.	2408.	12.	49.	518.	179.	472.	74.
ATLANTIC ELECTRIC	651.	156.	-472.	-1.	1123.	157.	1100.	239.	23.	123.	75.	204.	245.
DELMARVA POWER & LIGHT CO.	1468.	442.	118.	204.	1350.	238.	1320.	275.	30.	225.	135.	261.	230.
EASTERN PJM TOTAL	6165.	2444.	-9479.	789.	15644.	1655.	15384.	3449.	260.	1257.	2279.	3045.	1992.
PENNSYLVANIA ELECTRIC CO.	1366.	328.	62.	119.	1304.	209.	1259.	308.	44.	51.	384.	150.	971.
METROPOLITAN EDISON CO.	218.	196.	-963.	-4.	1181.	199.	1147.	107.	34.	216.	108.	124.	3.
PENNSYLVANIA POWER & LIGHT CO.	4713.	1109.	1243.	396.	3470.	713.	3352.	508.	118.	1041.	349.	836.	1394.
BALTIMORE GAS & ELECTRIC CO.	1313.	665.	-2197.	-166.	3518.	831.	3464.	515.	45.	319.	193.	0.	228.
POTOMAC ELECTRIC CO.	4016.	949.	648.	380.	3368.	569.	3303.	627.	65.	237.	955.	293.	1624.
WESTERN PJM TOTAL	11626.	3245.	-1206.	724.	12832.	2521.	12525.	2065.	307.	1865.	1990.	1403.	4222.
TOTAL PJM UNDERLYING	17791.	5690.	-10685.	1513.	28476.	4177.	27909.	5514.	566.	3122.	4268.	4448.	6213.
PJM 500KV	8341.	2397.	7787.	60.	554.	2337.	383.	262.	171.	2390.	3142.	315.	1365.
TOTAL PJM SYSTEM	26132.	8087.	-2898.	1573.	29030.	6514.	28292.	5776.	737.	5511.	7410.	4763.	7578.

HOPE CREEK OPERATING GUIDE - 3 UNIT
1987 75% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 2901 MW
PS IMPORTS = 3500 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
300 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3BASE-75

ALL 500-KV CIRCUITS IN SERVICE

EXHIBIT 75



HOPE CREEK OPERATING GUIDE - 3 UNIT

1987 75% SUMMER PEAK LOAD LEVEL
PJM IMPORTS = 2901 MW
PS IMPORTS = 3500 MW
NO EFORS - PJM ECO. DISPATCH
HC1/SAL1&2 AT FULL MW OUTPUT AND
300 MVAR OUTPUT (EACH)

TRANSMISSION CONDITIONS: 3BASE-75

ALL 500-KV CIRCUITS IN SERVICE

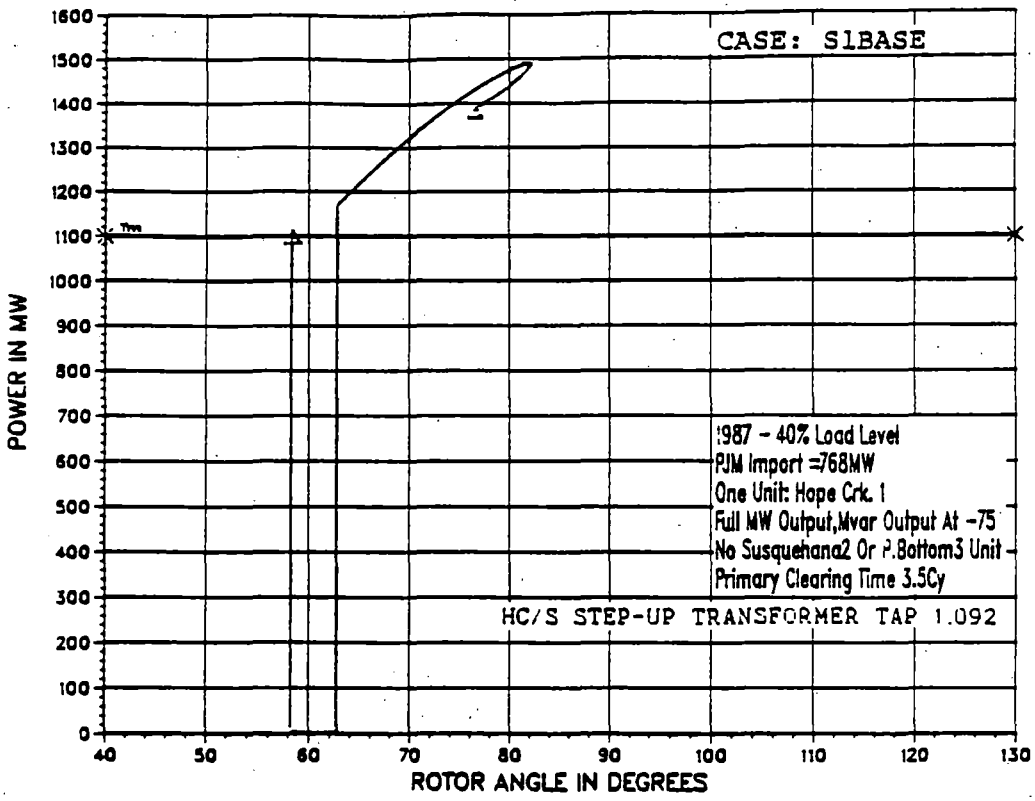
APPENDIX 3

POWER Vs. ROTOR ANGLE

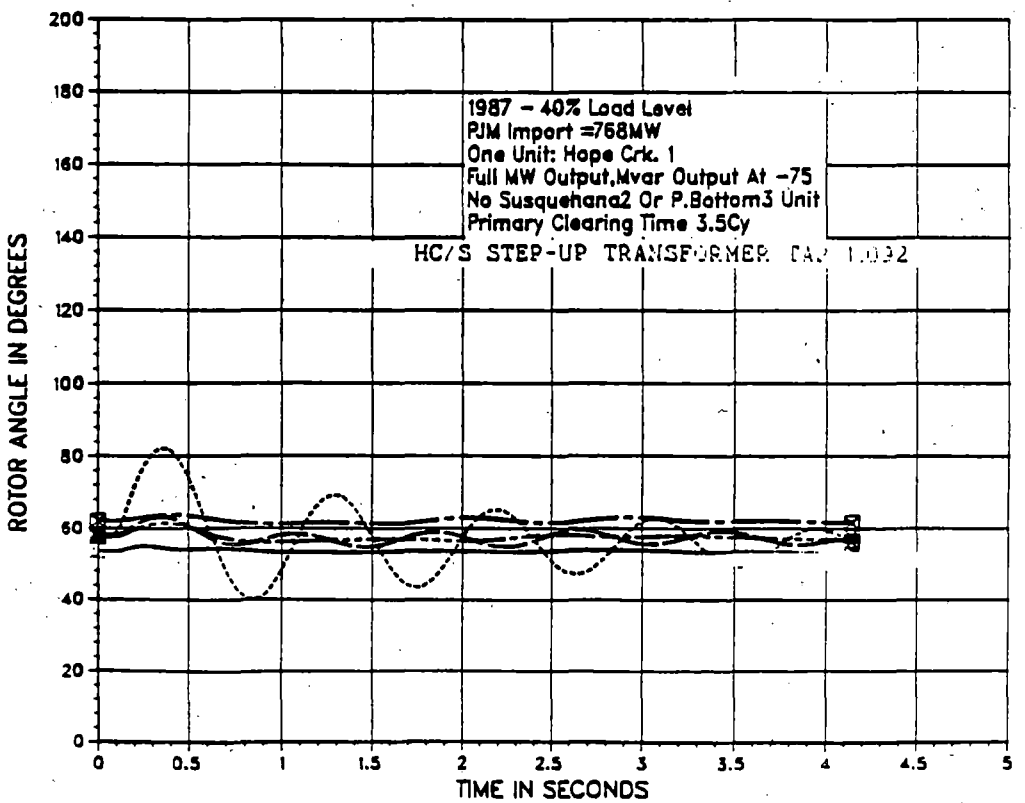
AND

ROTOR ANGLE Vs. TIME CURVES

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
ALL IN CASE
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv



Legend
△ Hope Crk. No. 1
× Tm

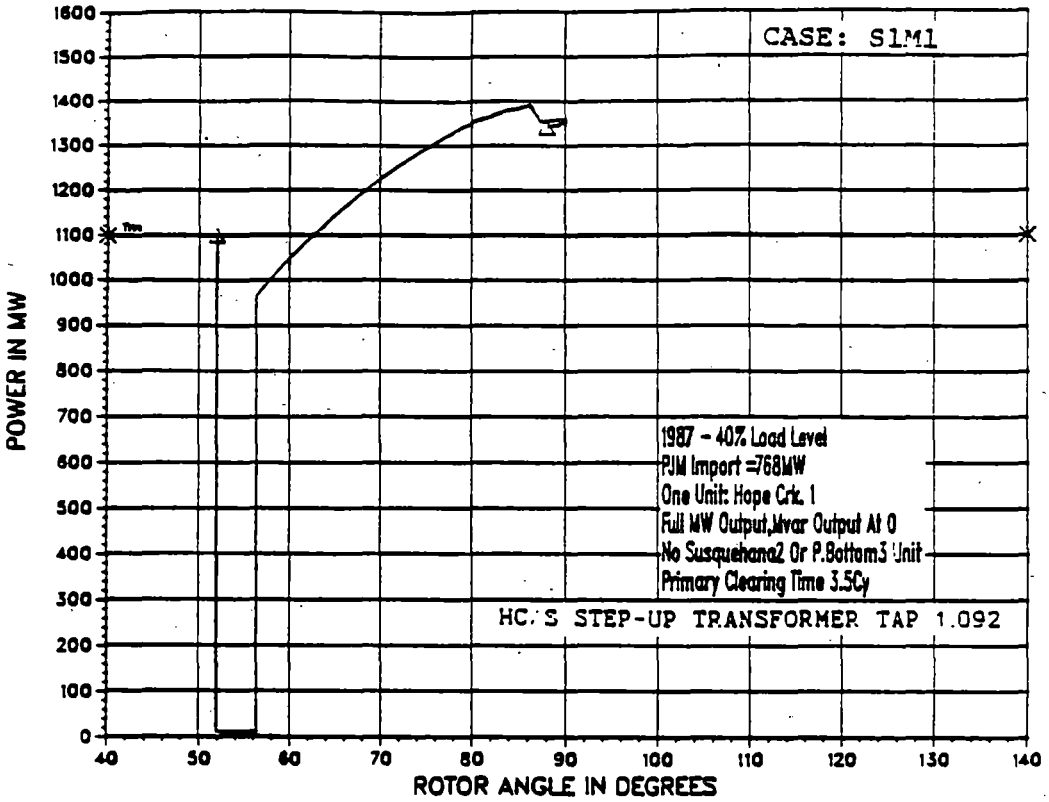


Legend
△ Keystone No.2
× Peach Bottom No.
□ Susquehana No.1
⊠ Colliff No.1
⊠ Hope Crk. No. 1

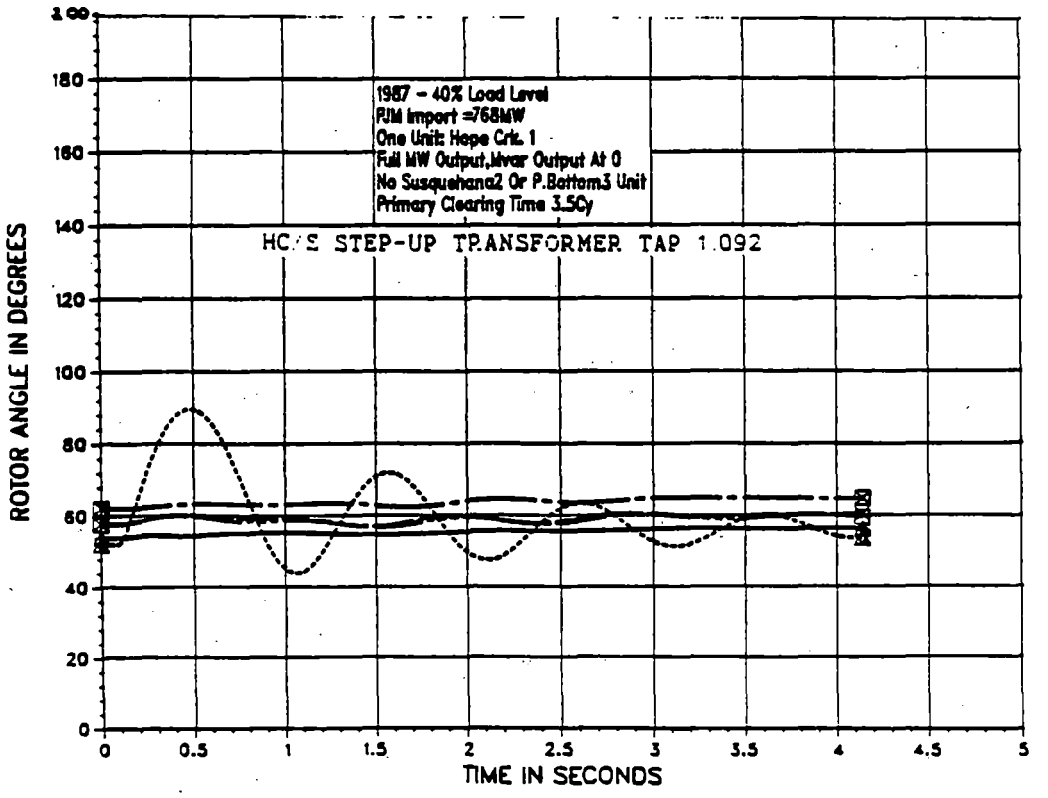
R01AHK2

EXHIBIT 77

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–KEENEY
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Salem 500kv



Legend
△ Hope Crk. No. 1
× Tm

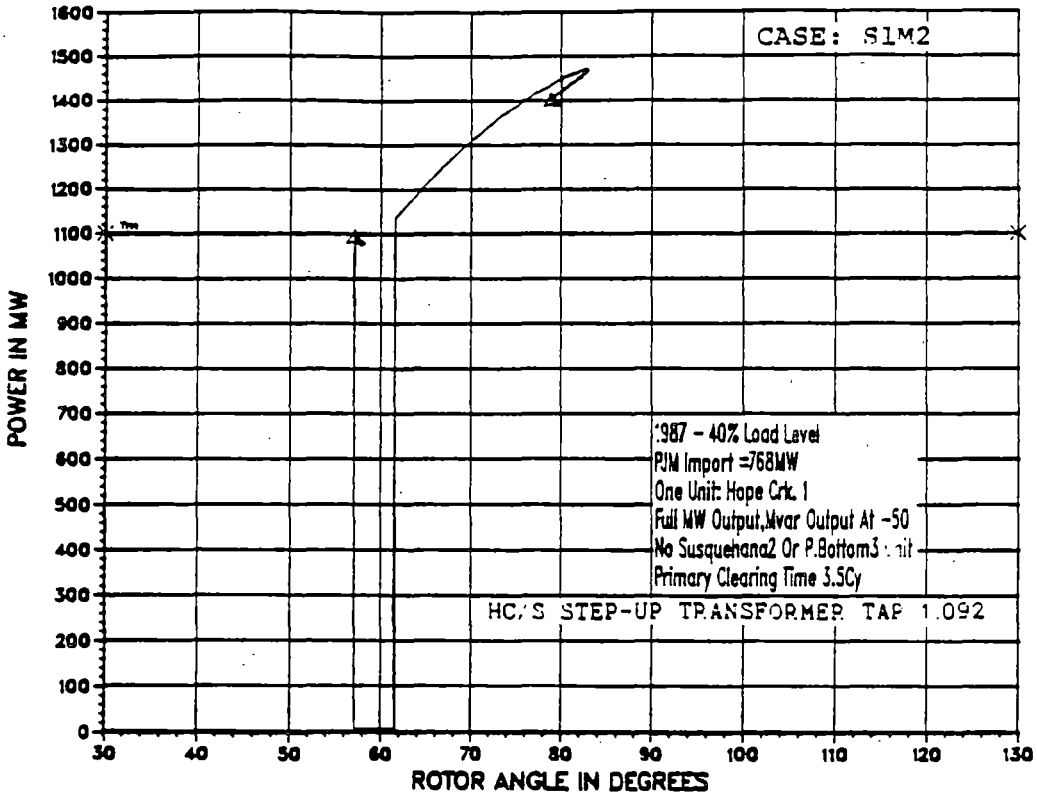


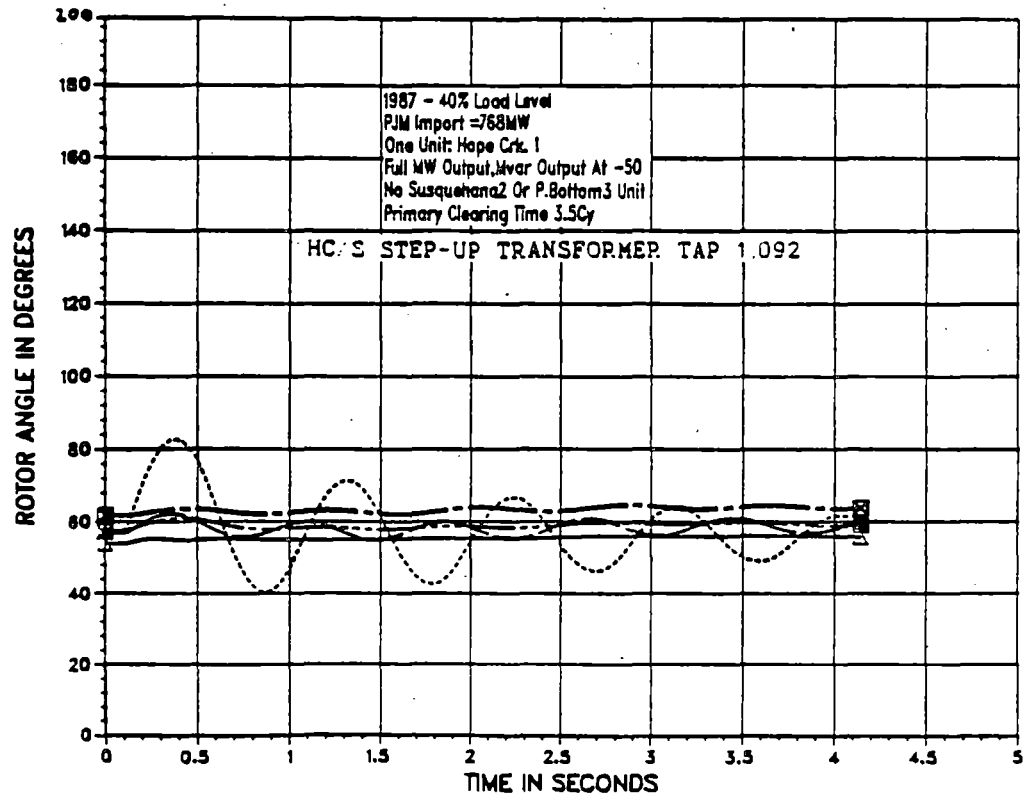
Legend
△ Keystone No.2
× Peach Bottom No.1
□ Susquehana No.1
⊠ Calif No.1
⊠ Hope Crk. No. 1

EXHIBIT 78

R01MISD

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE-HOPE CRK.-NJFREEDOM
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.-Keeney
At Hope Crk 500kv

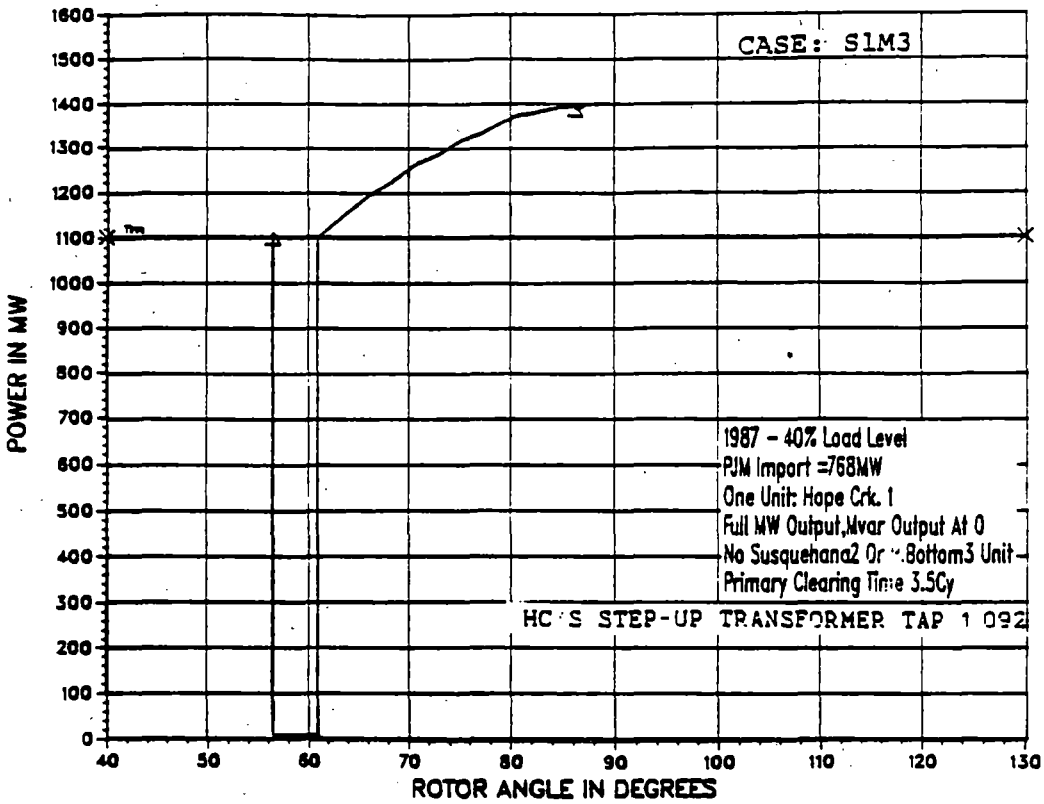




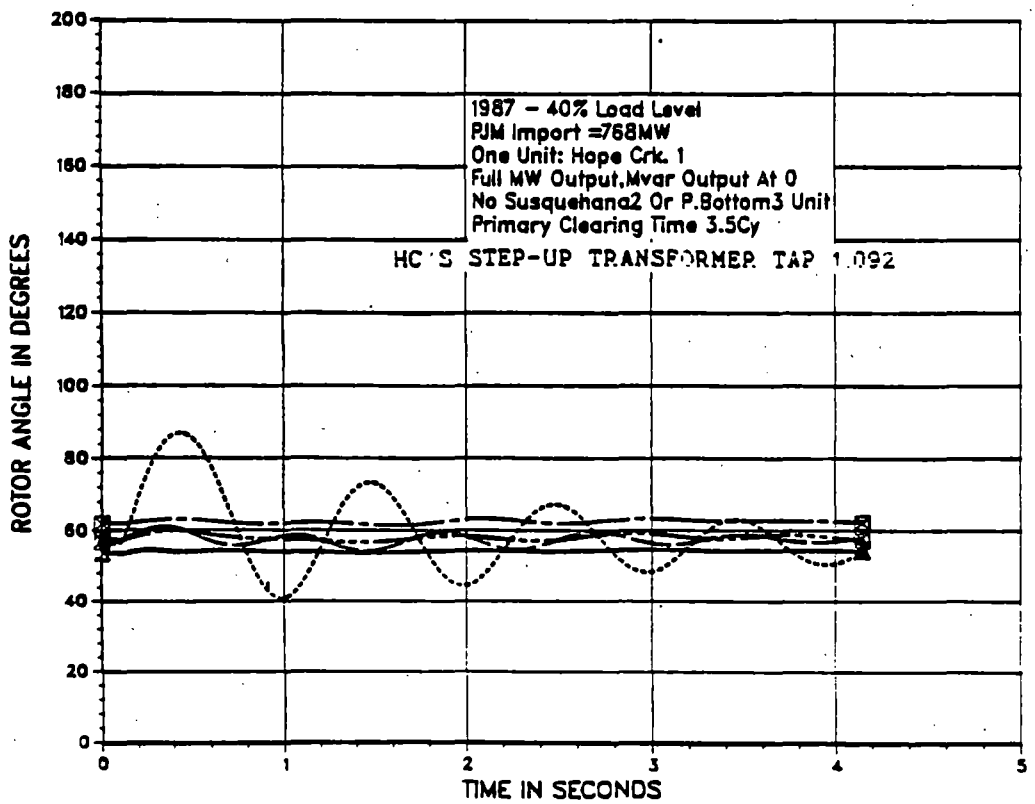
RO1M2HK2

EXHIBIT 79

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–SALEM
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv



Legend
△ Hope Crk. No. 1
× Tm

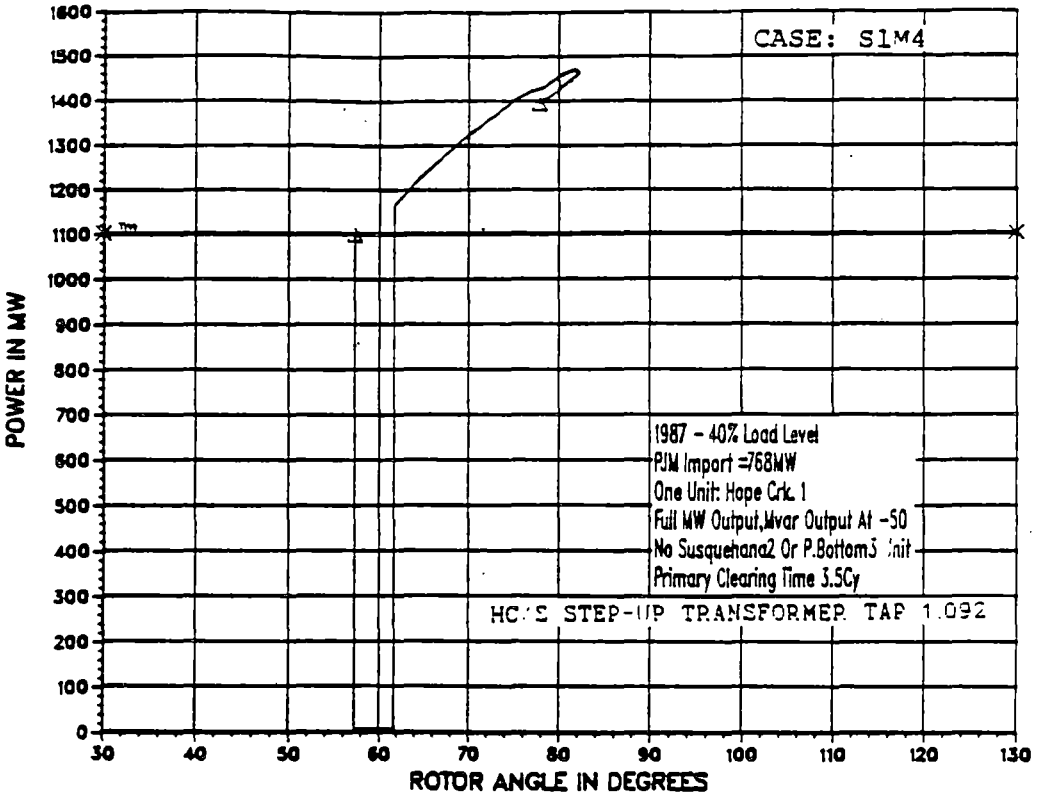


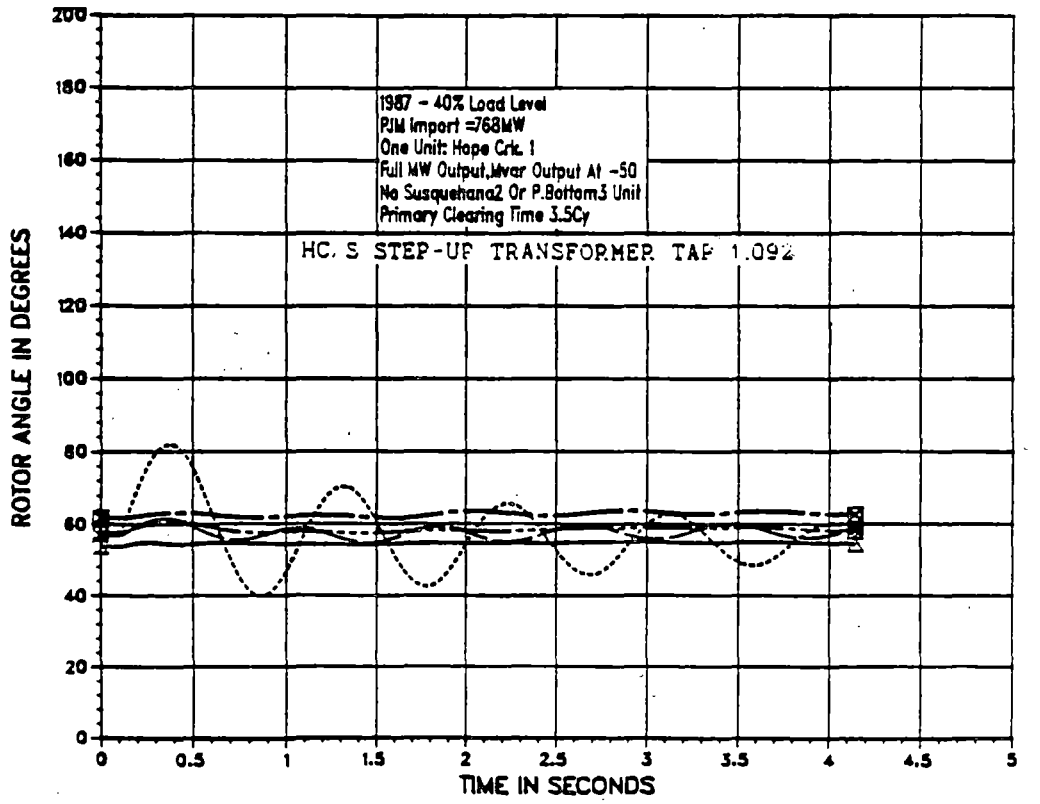
Legend
△ Keystone No.2
× Peach Bottom No.
□ Susquehana No.1
⊠ Calliff No.1
⊠ Hope Crk. No. 1

ROIM3HK2

EXHIBIT 80

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM—NJFREEDOM
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.—Kearney
At Hope Crk 500kv

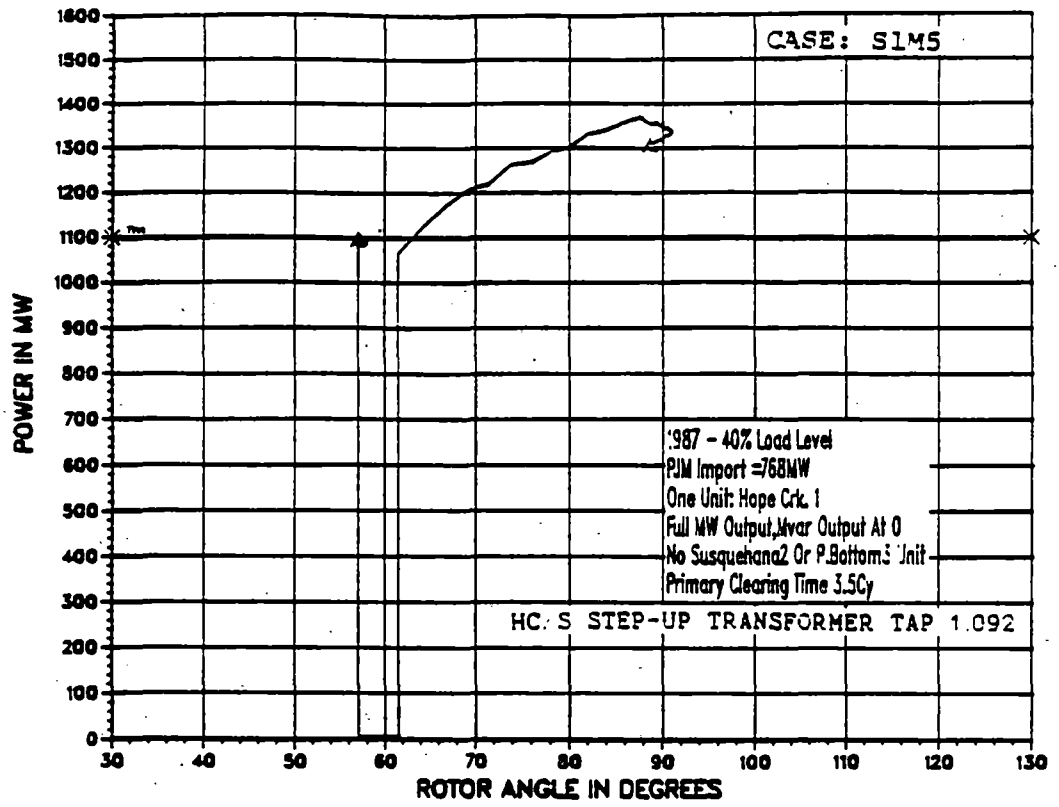


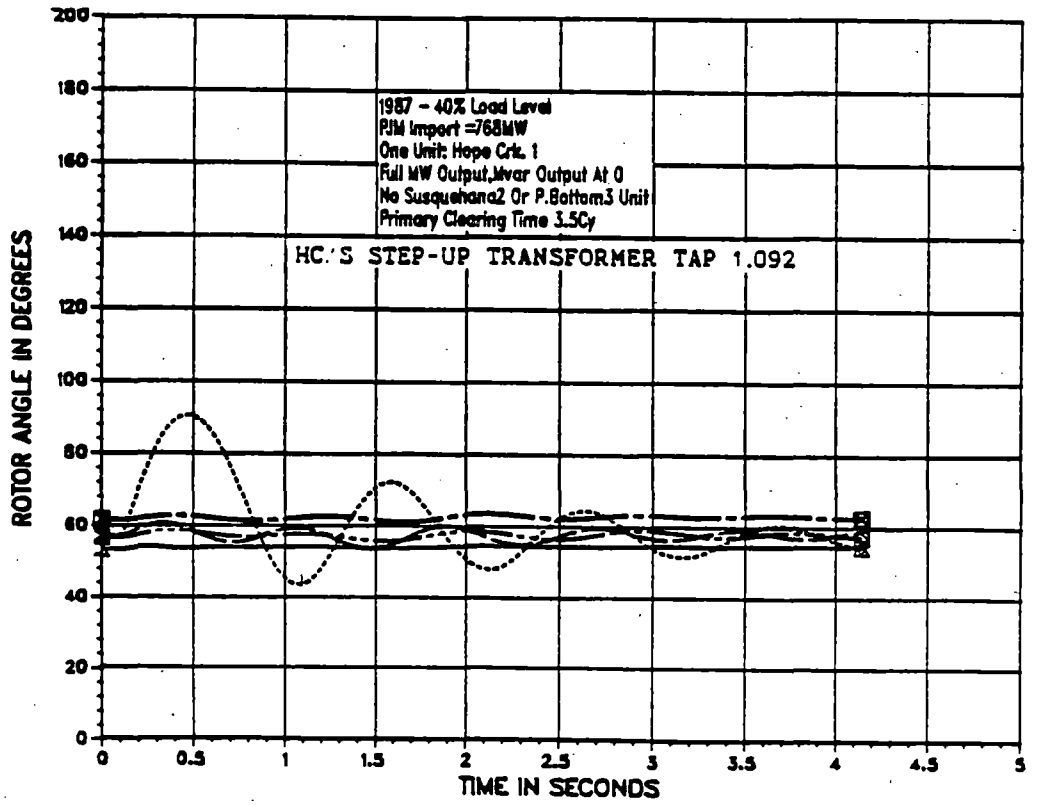


R01M4HK

EXHIBIT 81

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM--DEANS
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.--Keeney
At Hope Crk 500kv

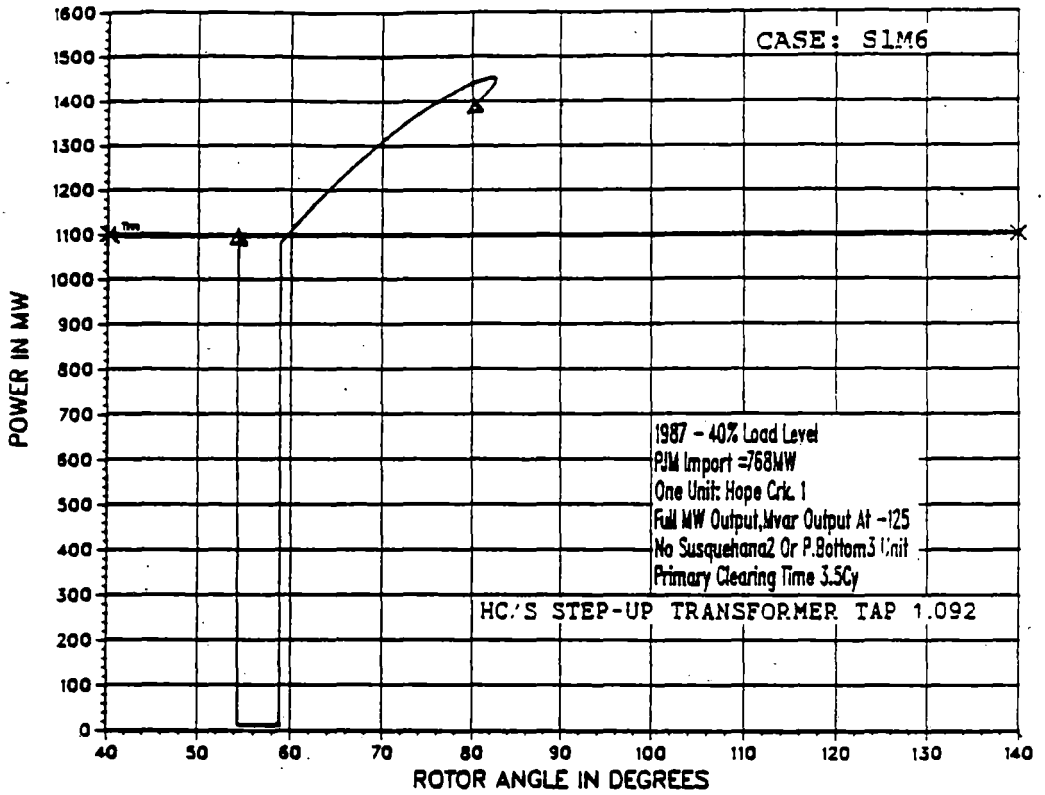




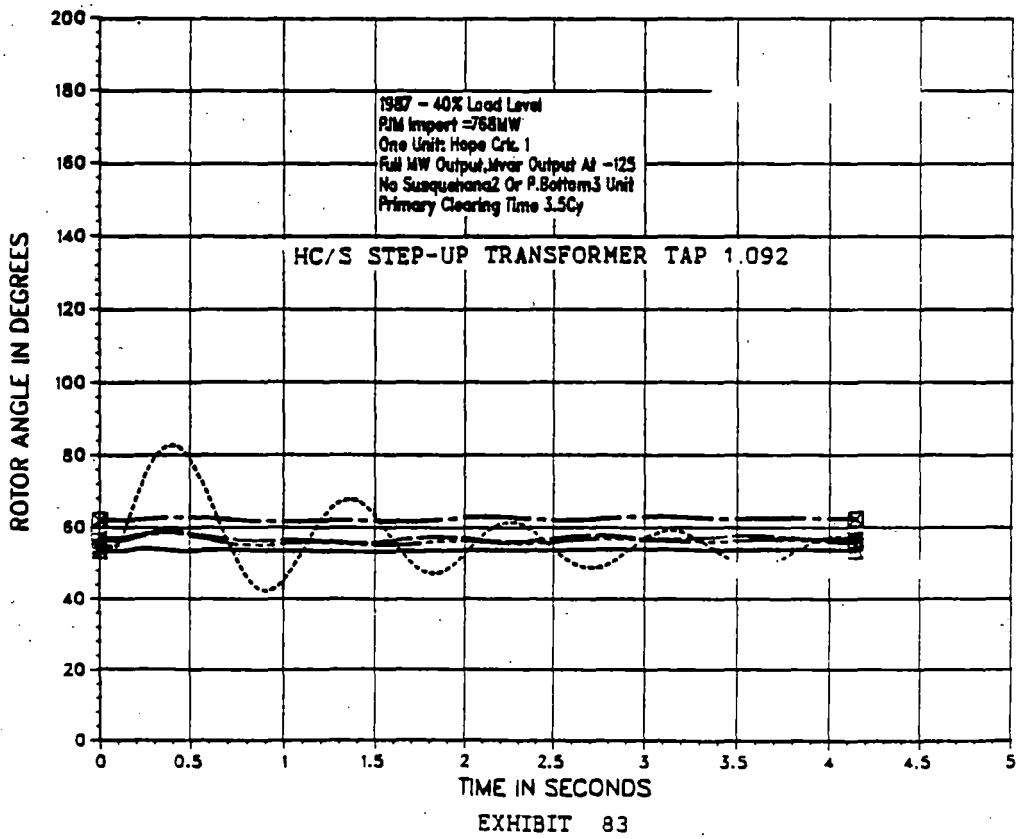
R01M5HK

EXHIBIT 82

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:KEENEY–P.BOTTOM
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Hope Crk 500kv



Legend
△ Hope Crk. No. 1
× Tm

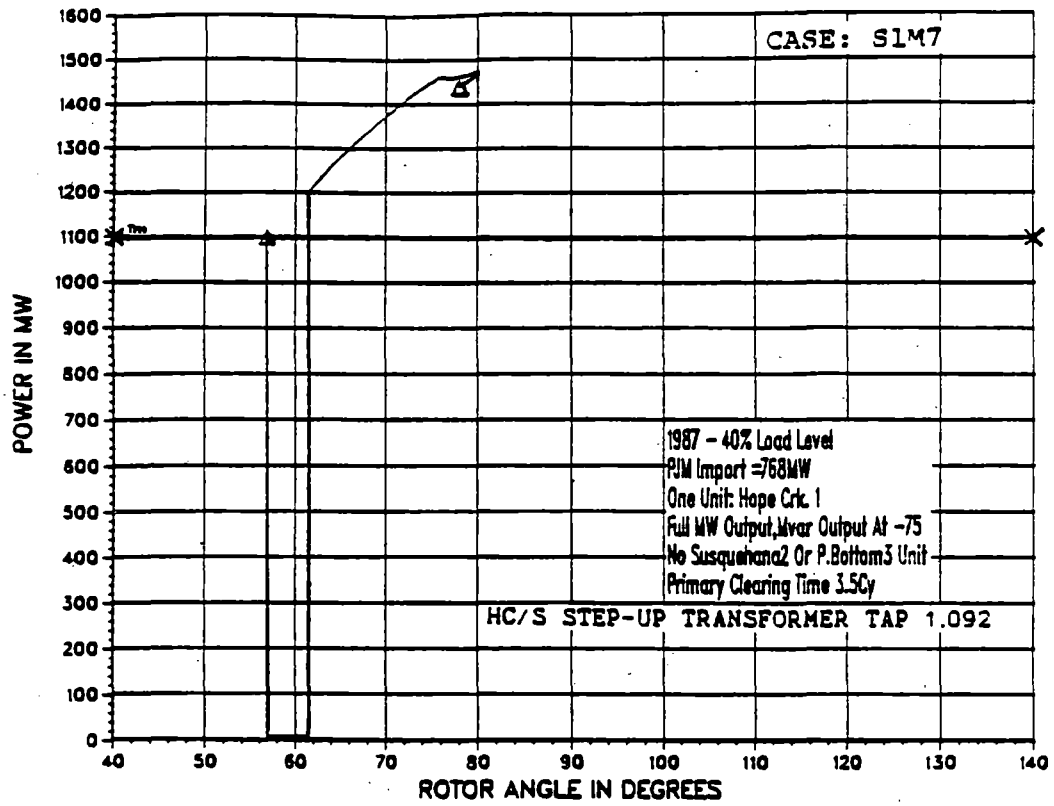


Legend
△ Keystone No.2
× Peach Bottom No.1
□ Susquenana No.1
⊠ Cclift No.1
⊠ Hope Crk. No. 1

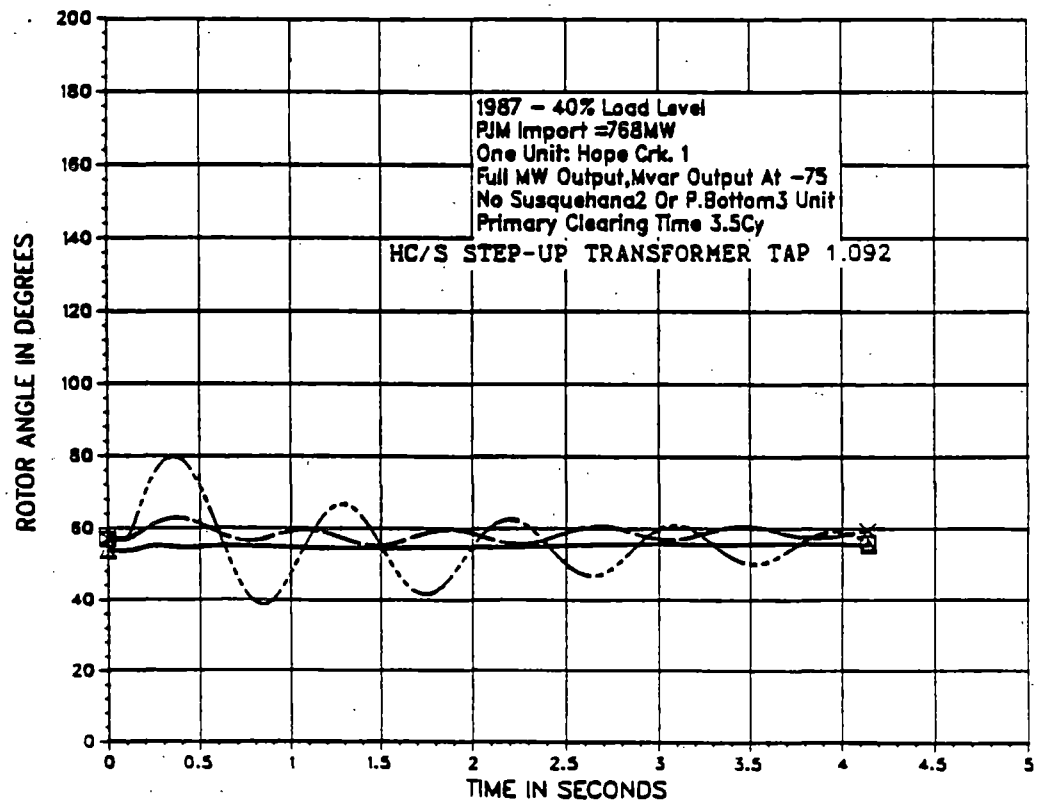
R01M6SD

EXHIBIT 83

1987 SALEM/HOPE CRK. ONE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE : DEANS – BRANCHBURG
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv



Legend
△ Hope Crk. No. 1
× Tm

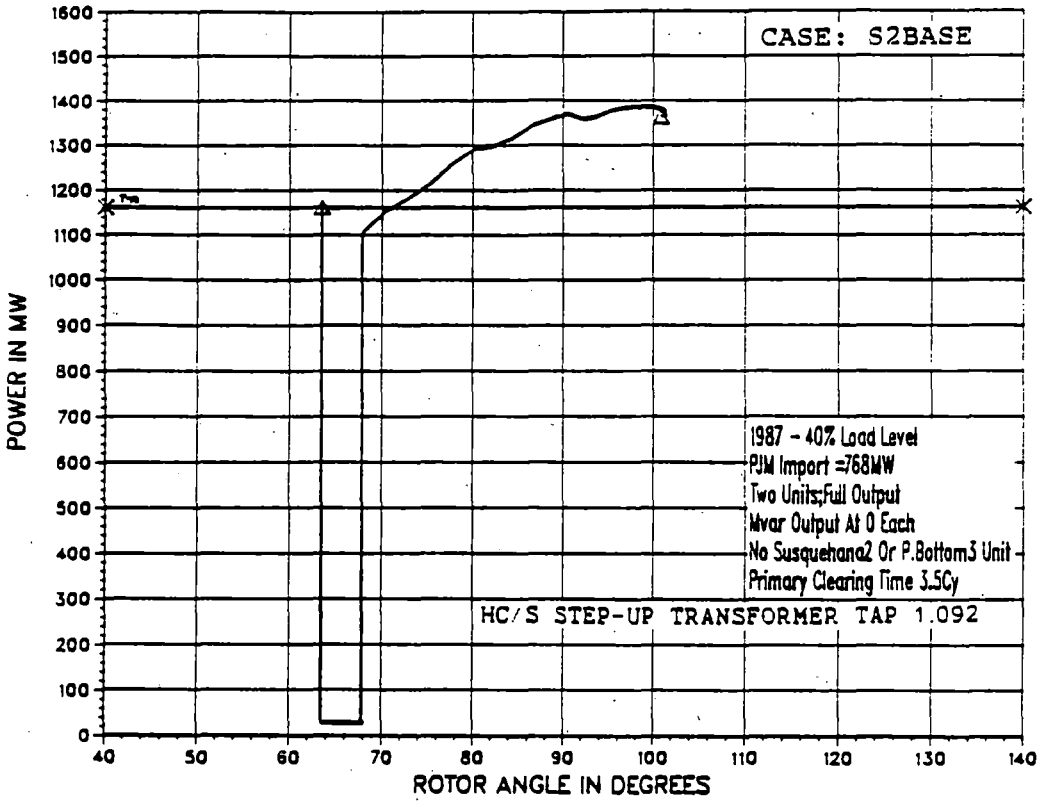


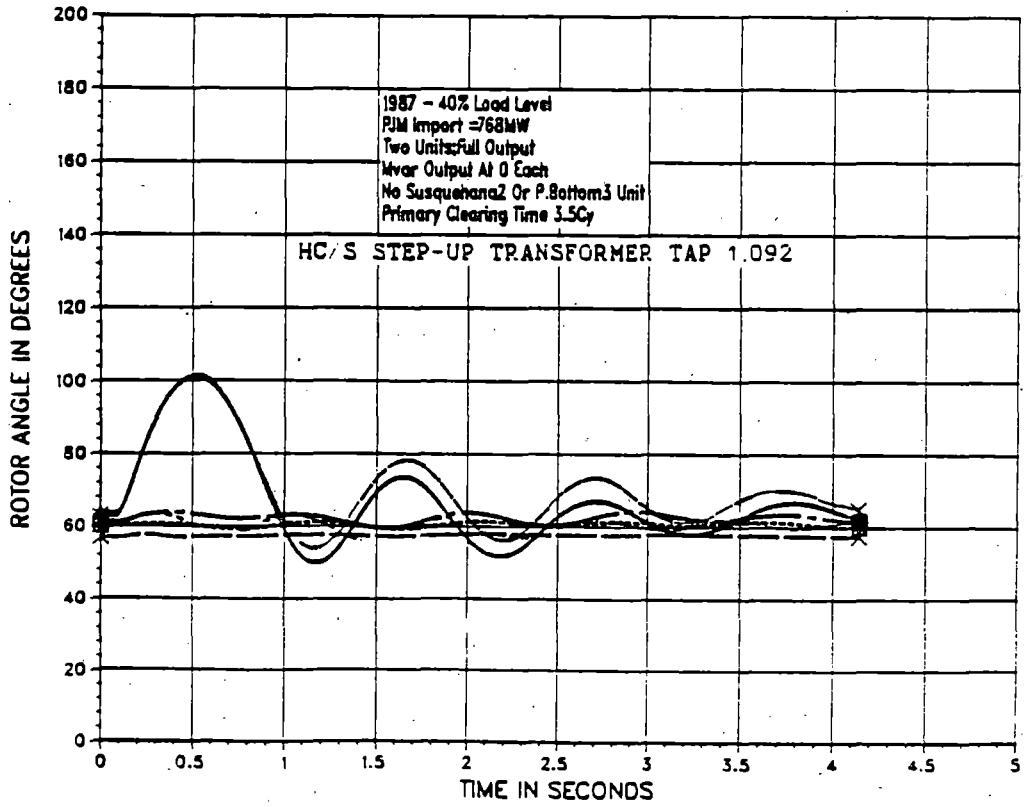
Legend
△ Keystone No.2
× Peach Bottom No.1
□ Susquehana No.1

EXHIBIT 84

R01M7HK

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk. 500kv

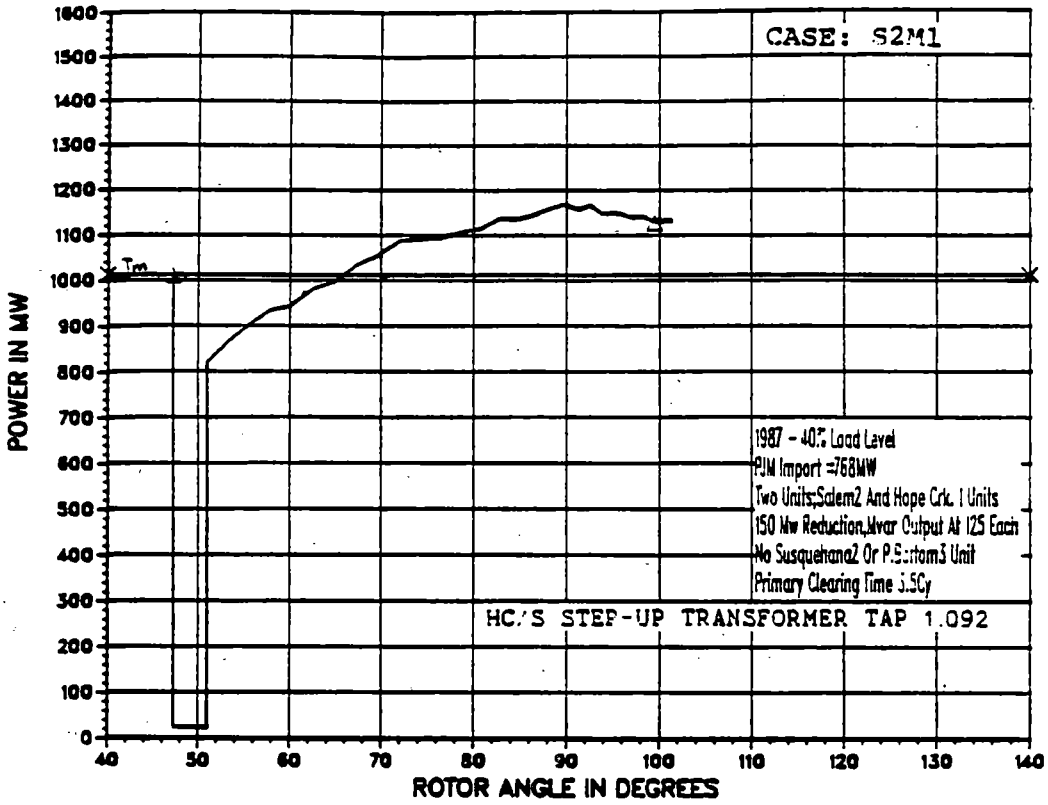


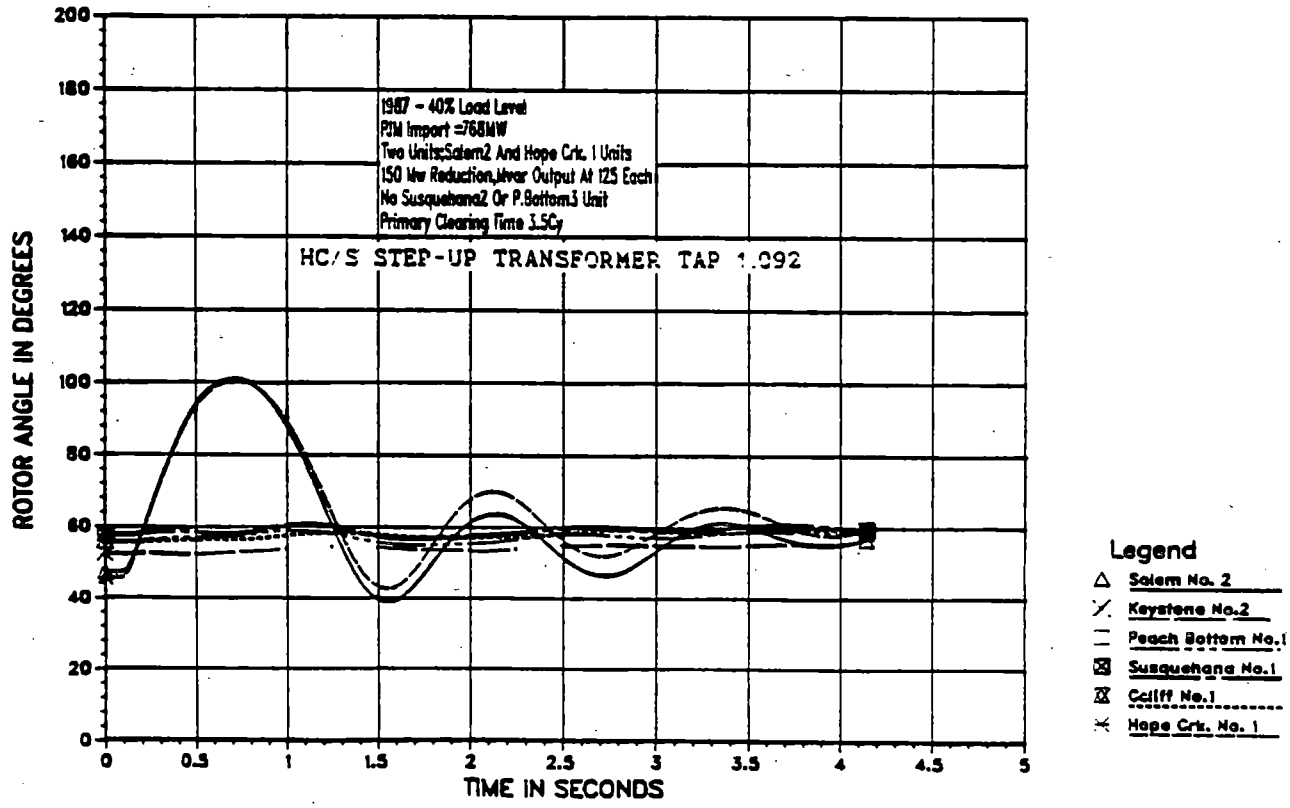


RO2AHK

EXHIBIT 85

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–KEENEY
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Salem 500kv

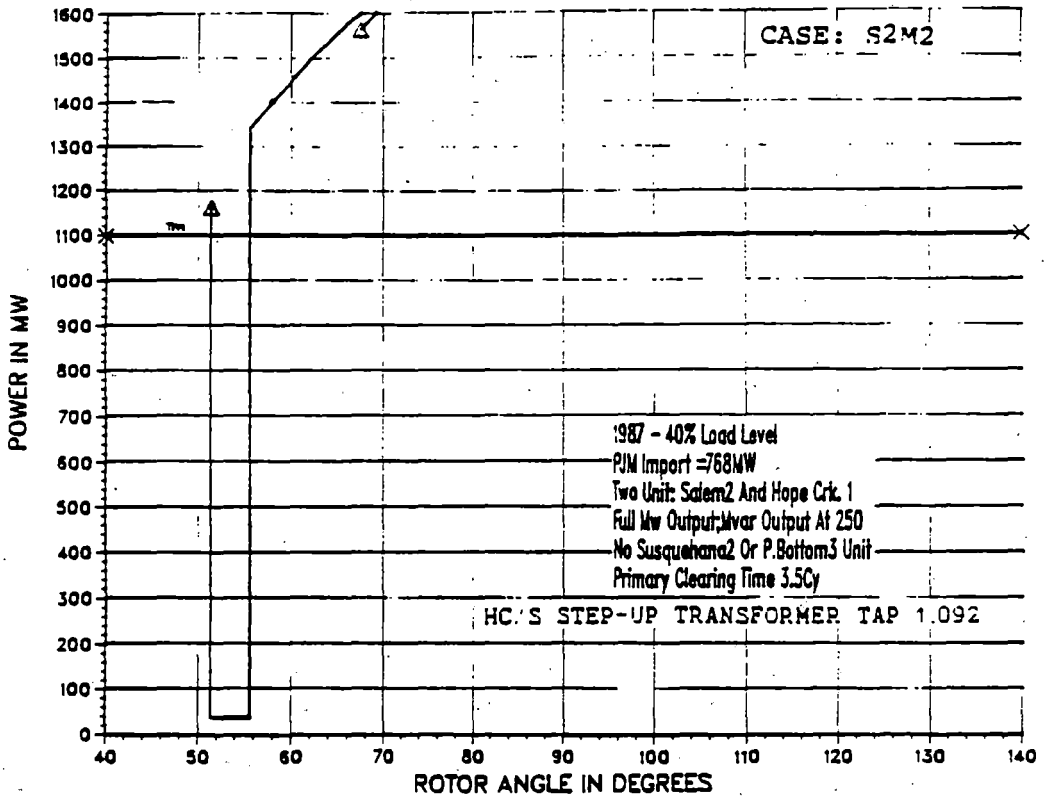


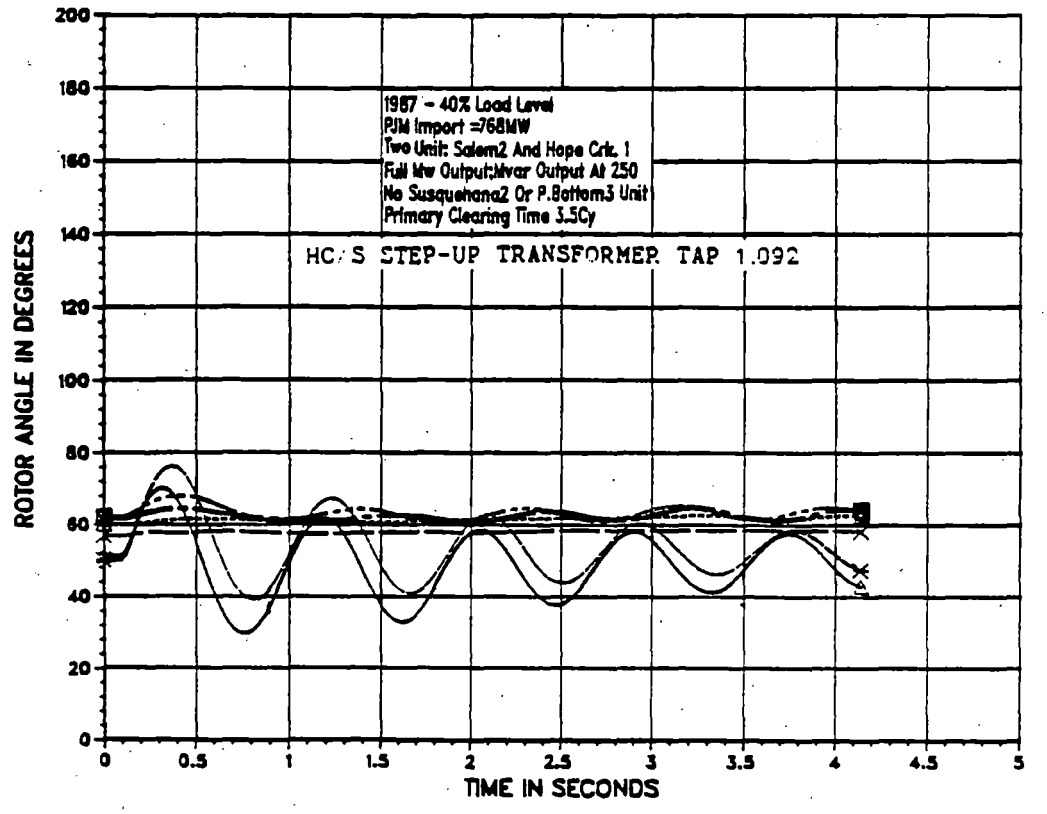


R02M1SD

EXHIBIT 86

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–N.FREEDOM
Hope Crk. No.1 Power vs. Angle
Three Phase Line Fault Hope Crk.–Salem
At Hope Crk 500kv

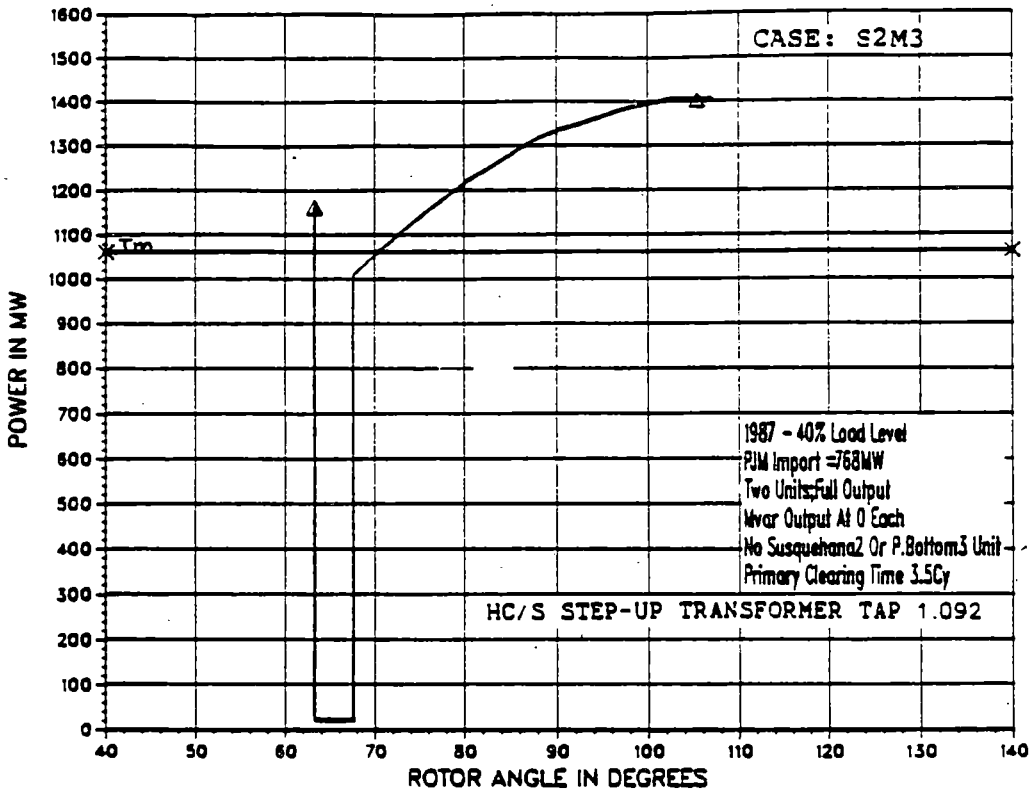


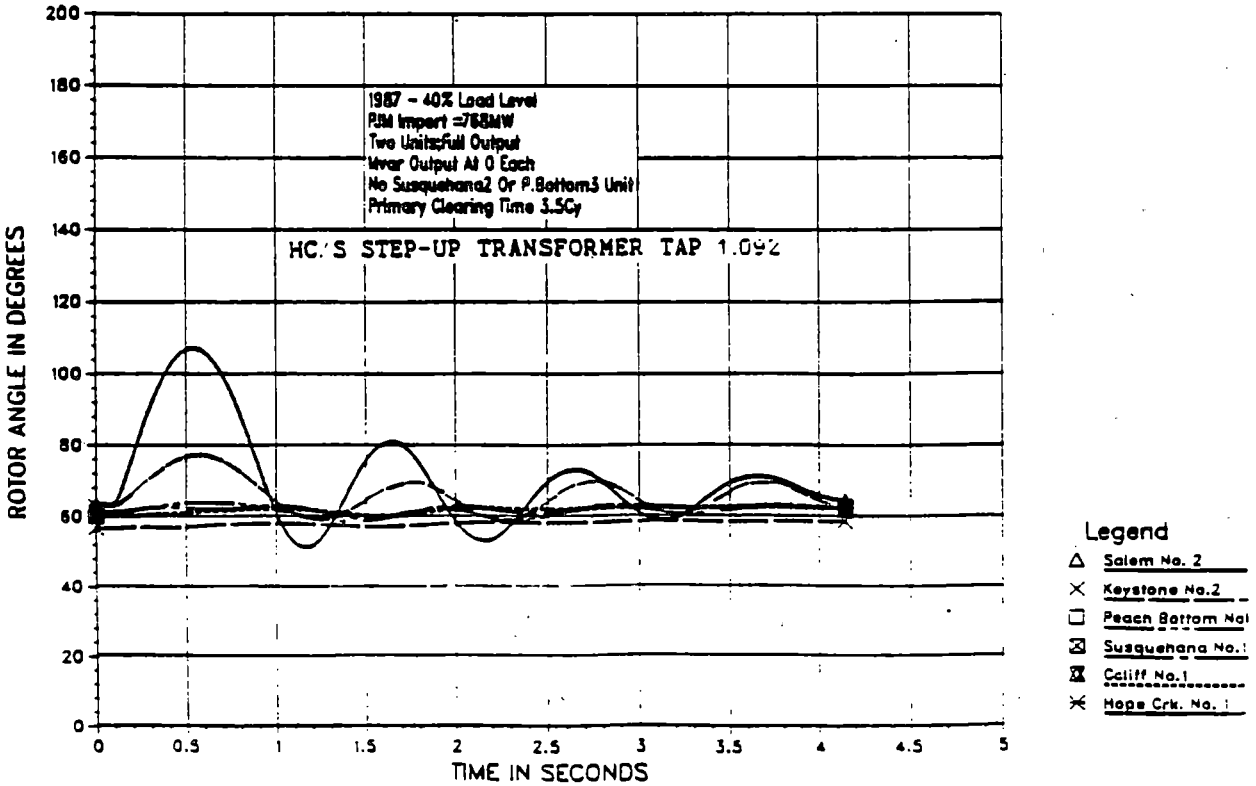


R02M2HS

EXHIBIT 87

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–SALEM
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Salem 500kv

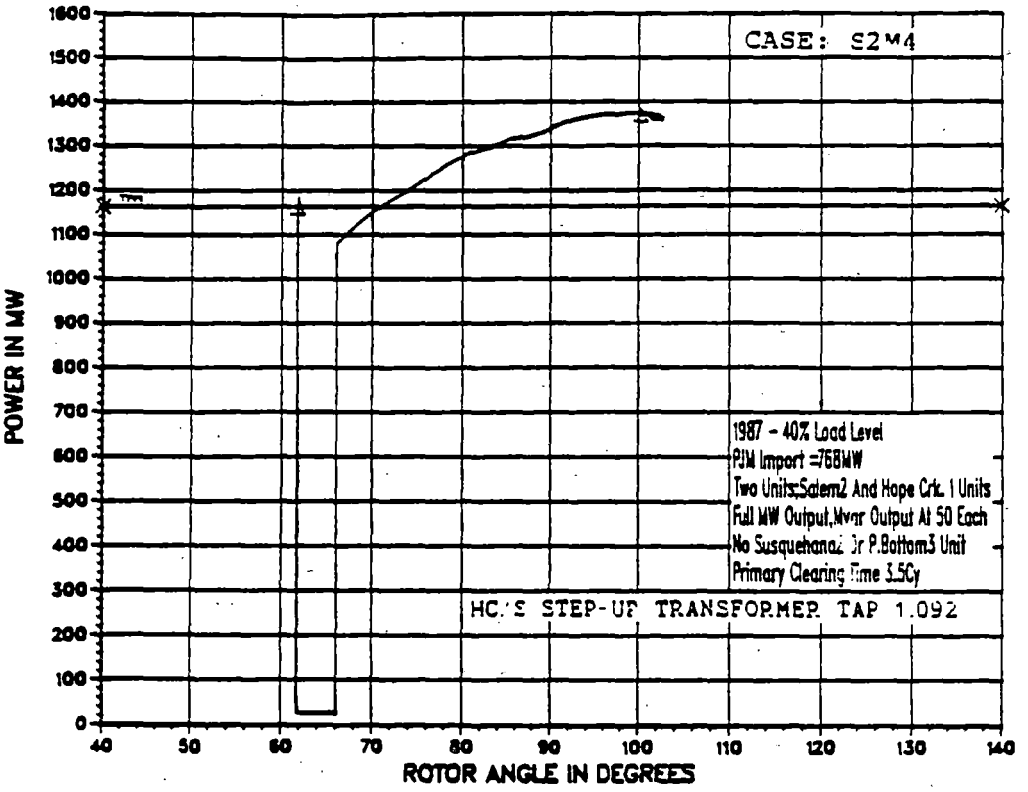


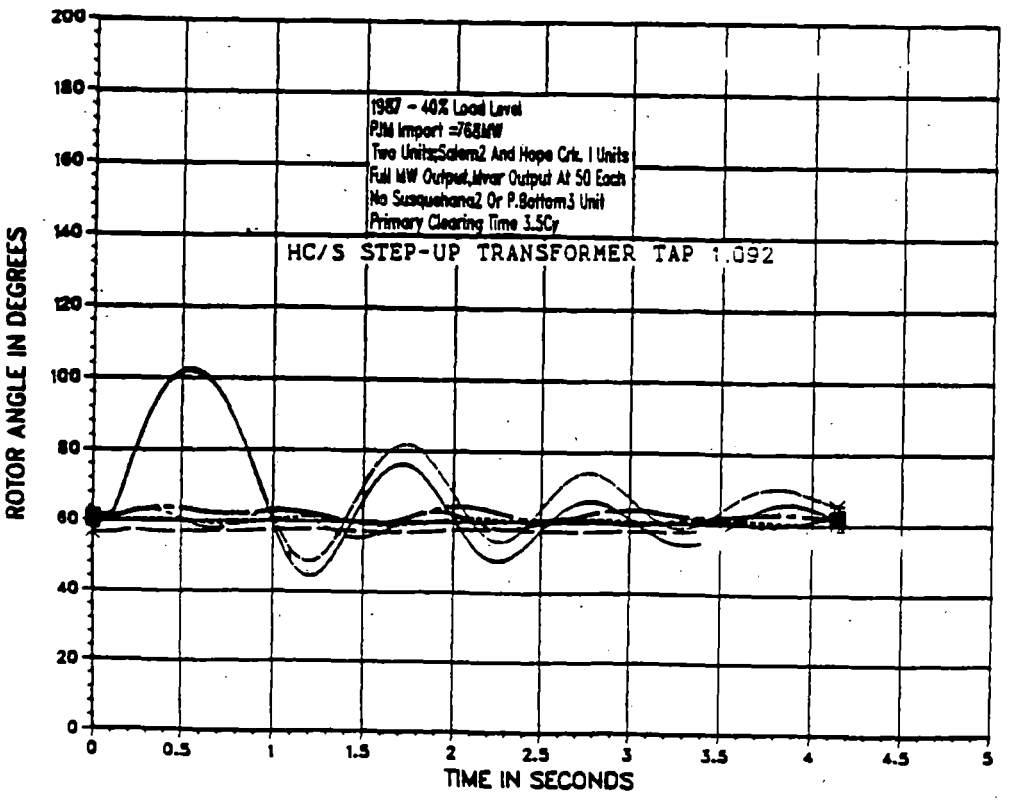


R02M3SD

EXHIBIT 88

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM-N.FREEDOM
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.-Keeney
At Hope Crk 500kv

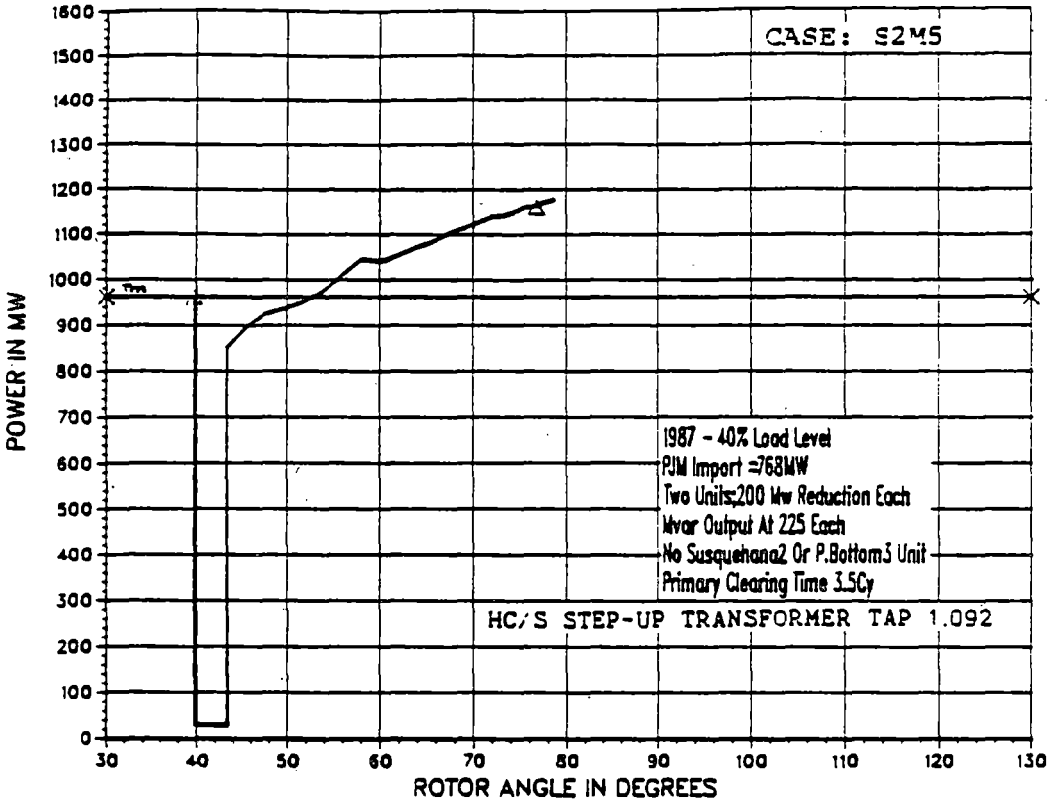




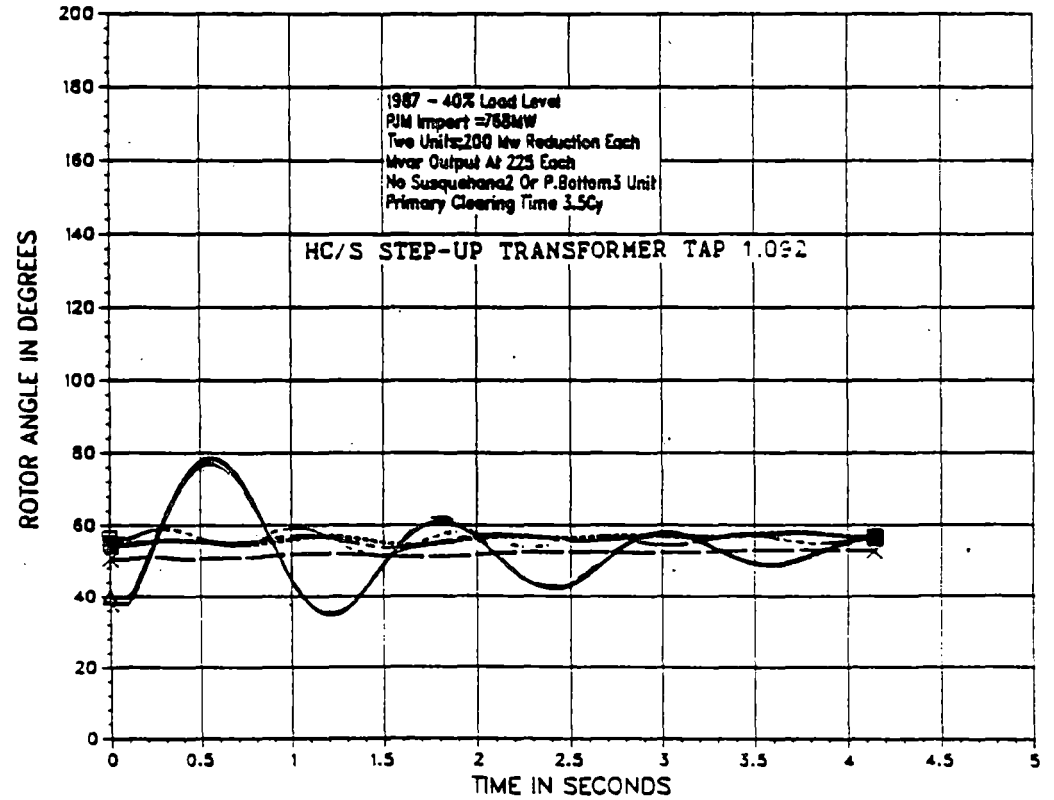
R02M4HK

EXHIBIT 89

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM – DEANS
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv



Legend
Δ Salem No. 2
× Tm

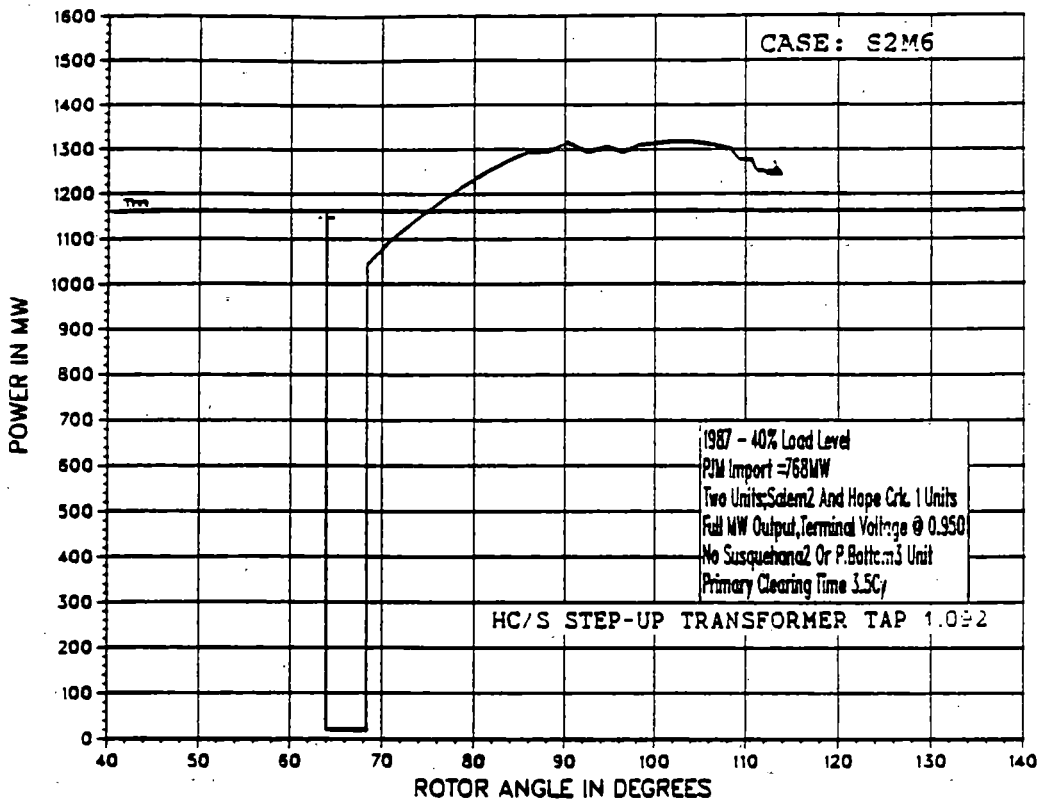


Legend
Δ Salem No. 2
× Keystone No.2
□ Peach Bottom No.
⊠ Susquehana No.1
⊠ Calif No.1
✳ Hope Crk. No. 1

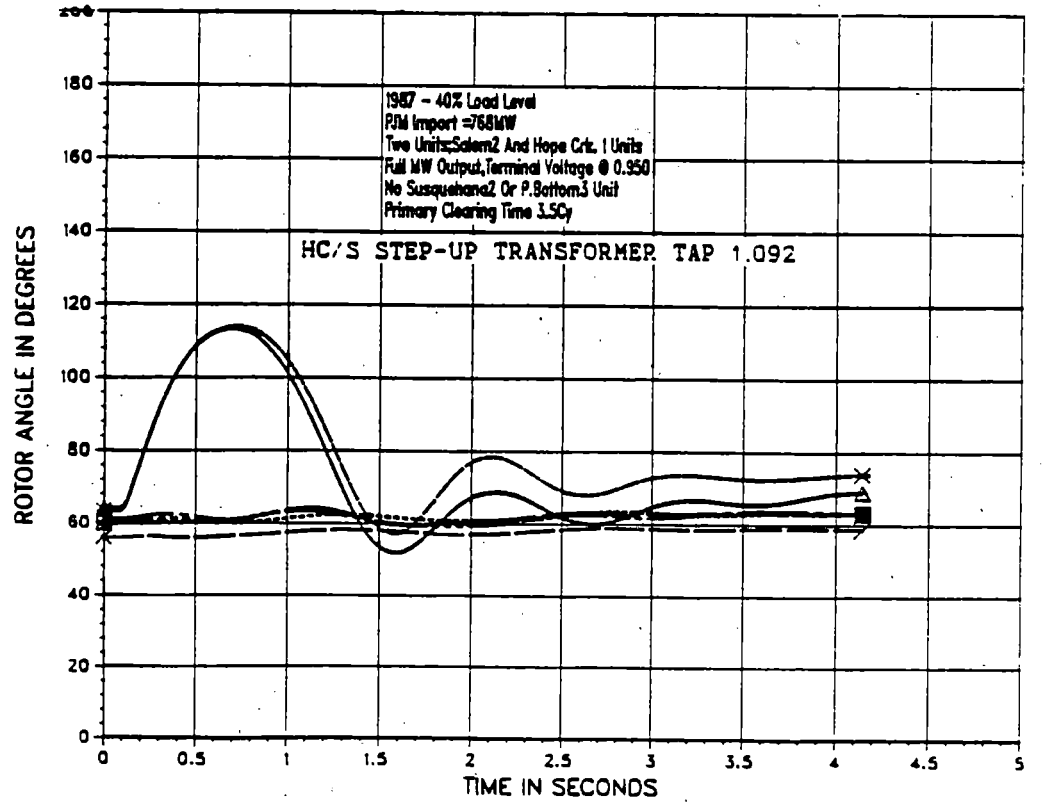
EXHIBIT 90

R02M5HK

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE : KEENEY – P.BOTTOM
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Salem 500kv



Legend
Δ Salem No. 2
× Tm

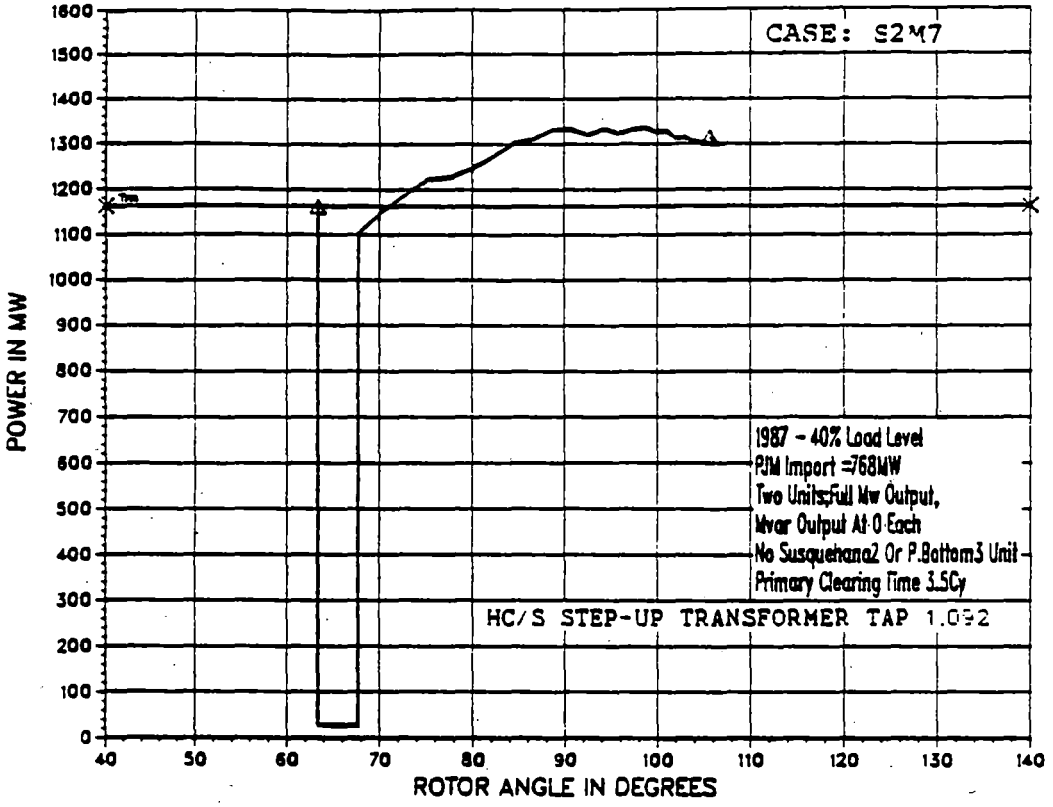


Legend
Δ Salem No. 2
× Keystone No.2
□ Peach Bottom No
⊠ Susquehana No.
⊠ Cliff No.1
✳ Hope Crk. No. 1

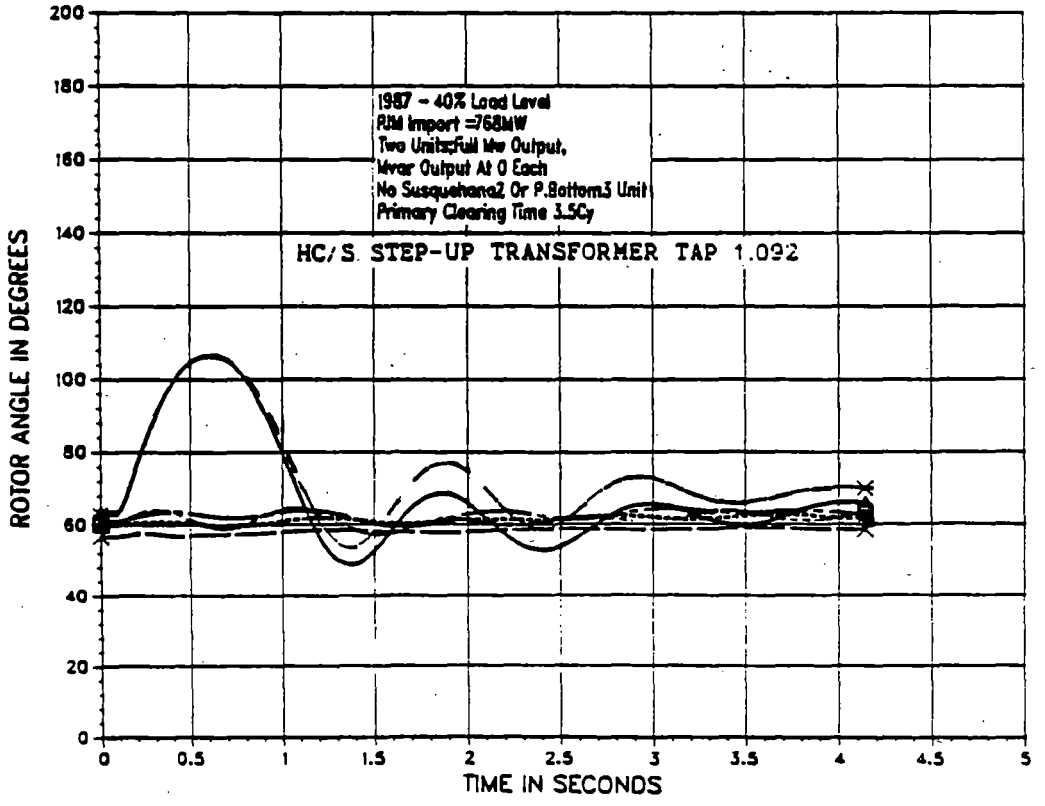
R02M6SD

EXHIBIT 91

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:DEANS–BRANCHBURG 500KV LINE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk. 500kv



Legend
- Δ Salem No. 2
- × Tm

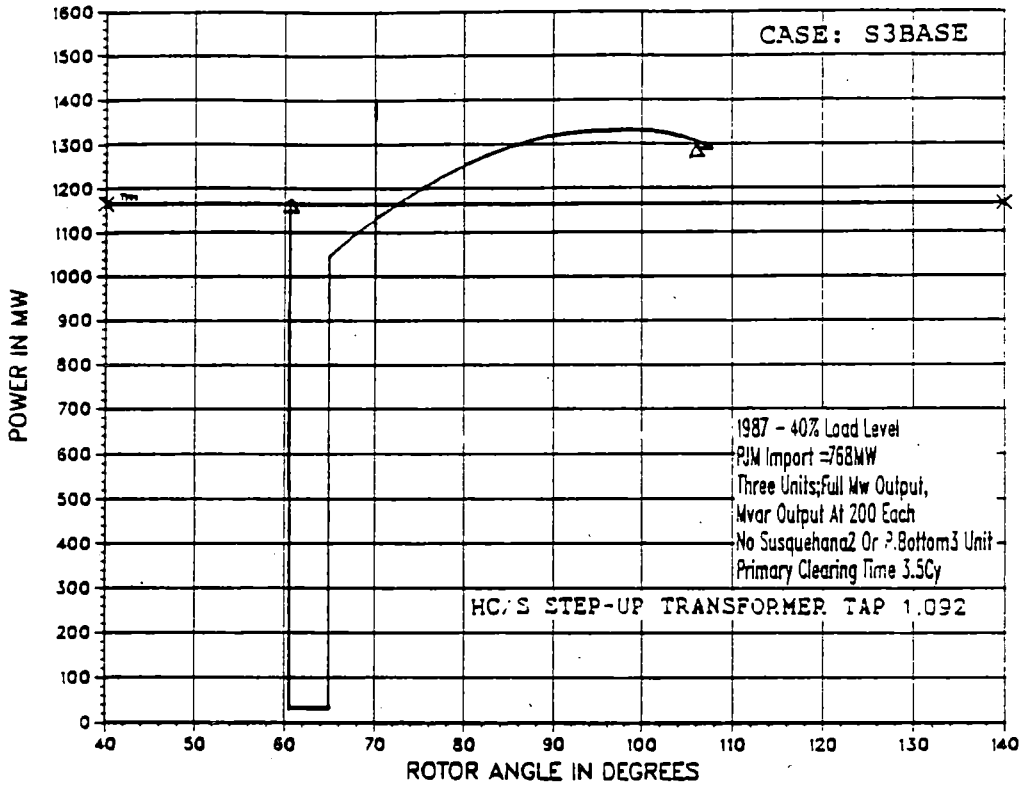


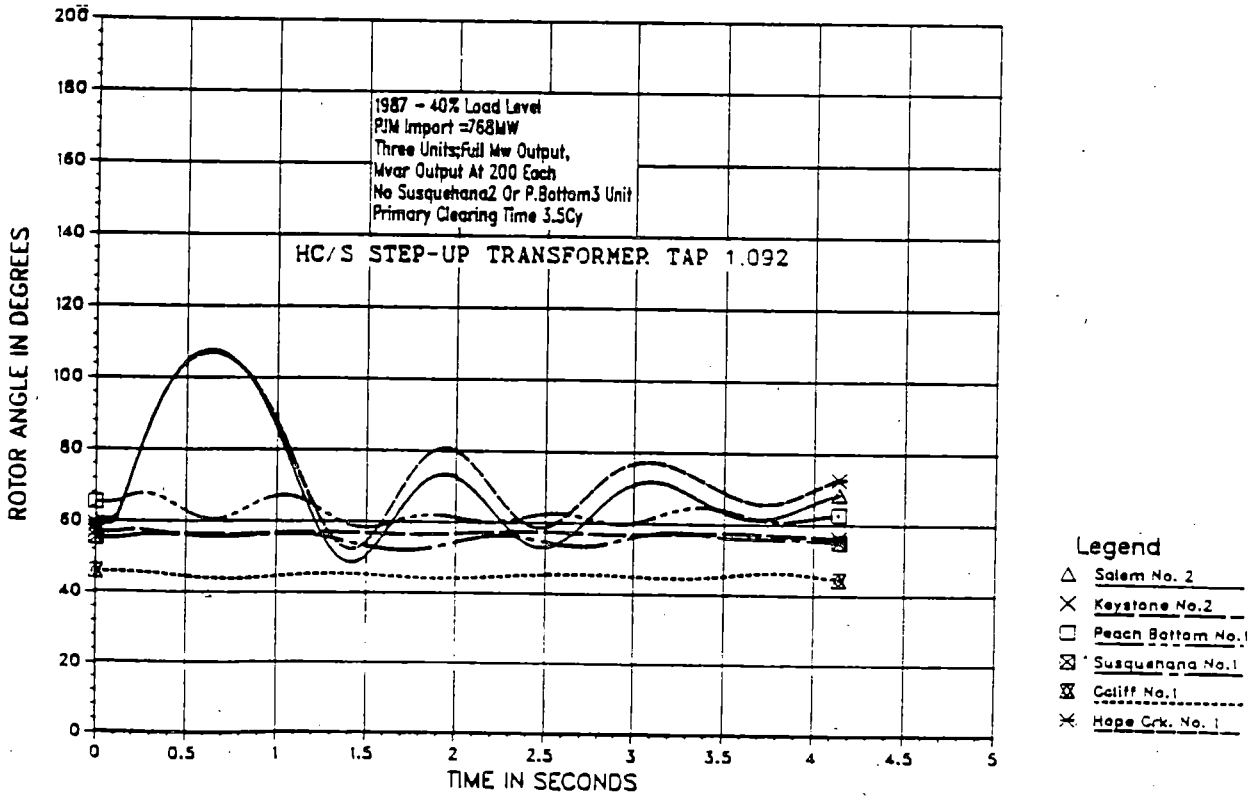
Legend
- Δ Salem No. 2
- × Keystone No.2
- ▢ Peach Bottom No
- ⊠ Susquehana No.1
- ⊠ Calliff No.1
- ✳ Hope Crk. No. 1

RO2M7HK

EXHIBIT 92

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk. 500kv

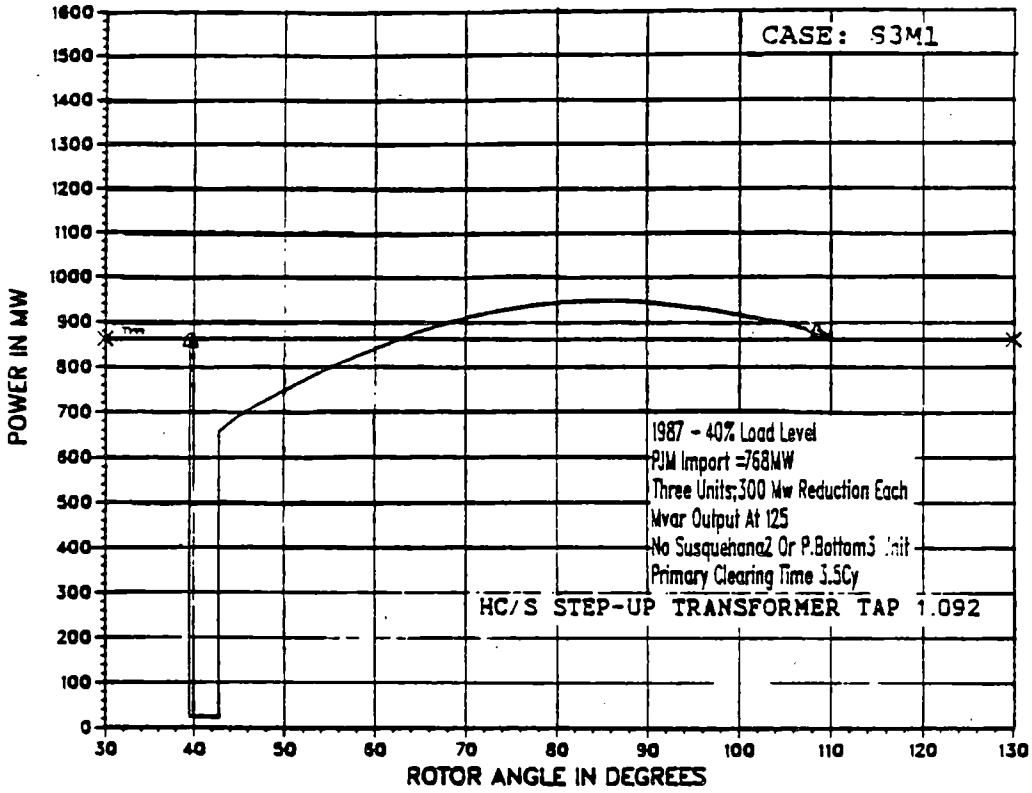




RO3AHK

EXHIBIT 93

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.—KEENEY
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem—Deans
At Salem 500kv



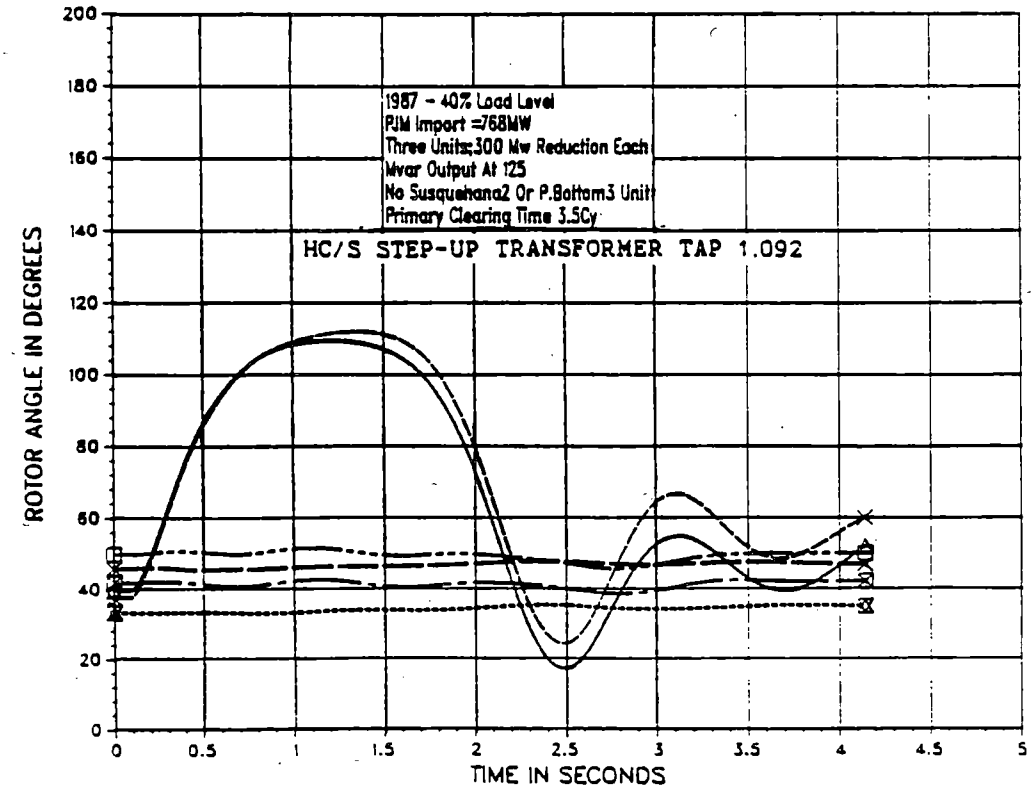
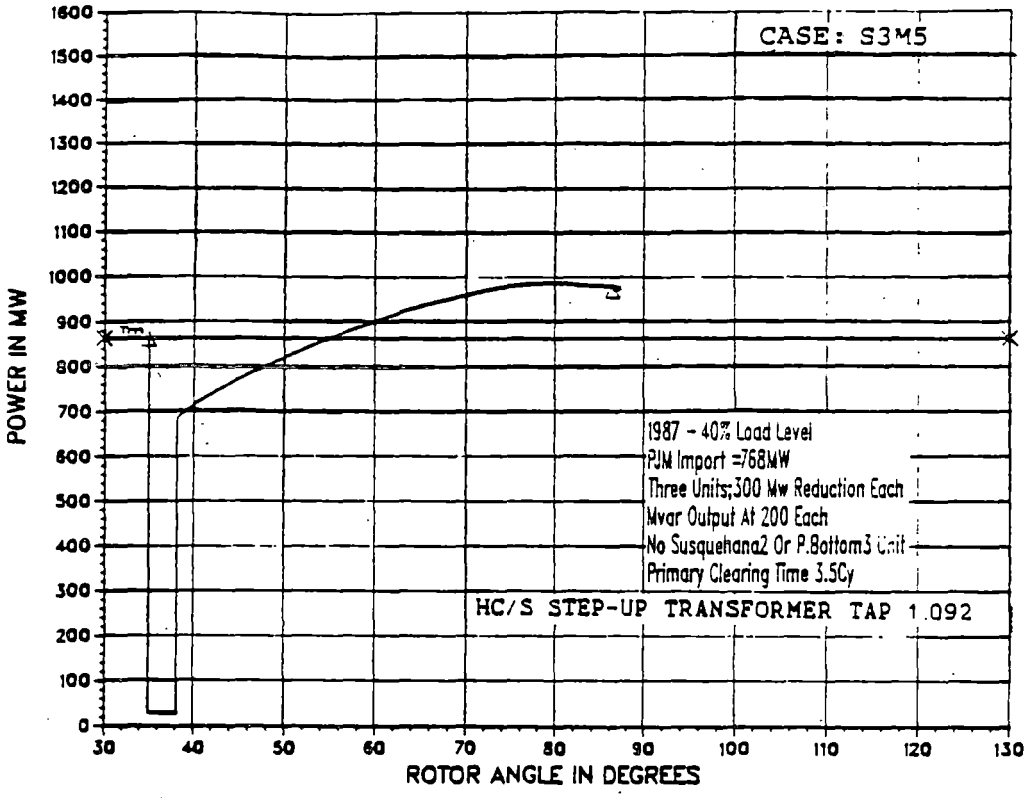
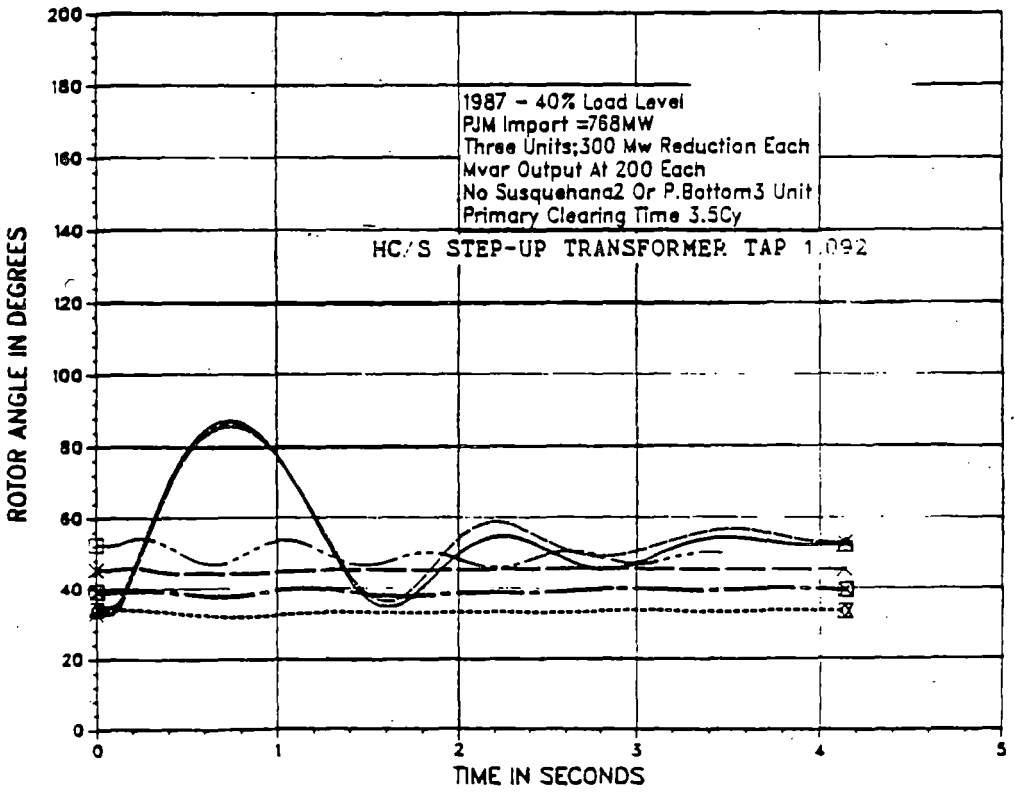


EXHIBIT 94

RO3MISD

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM – DEANS
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv

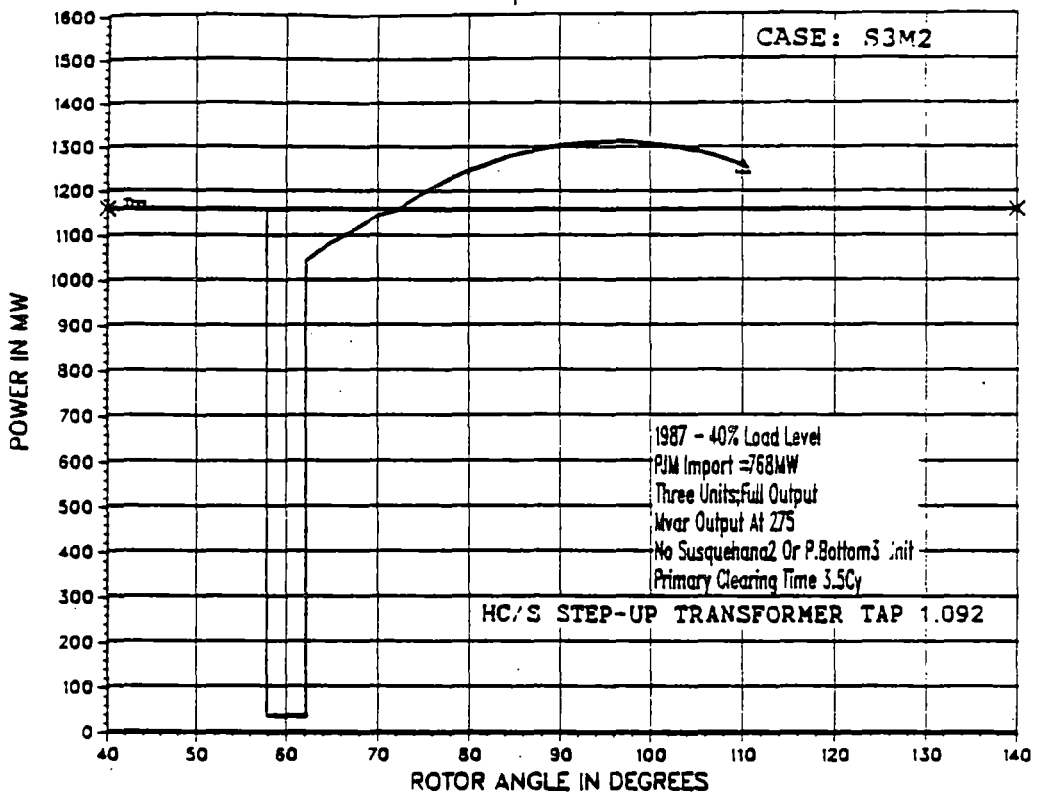


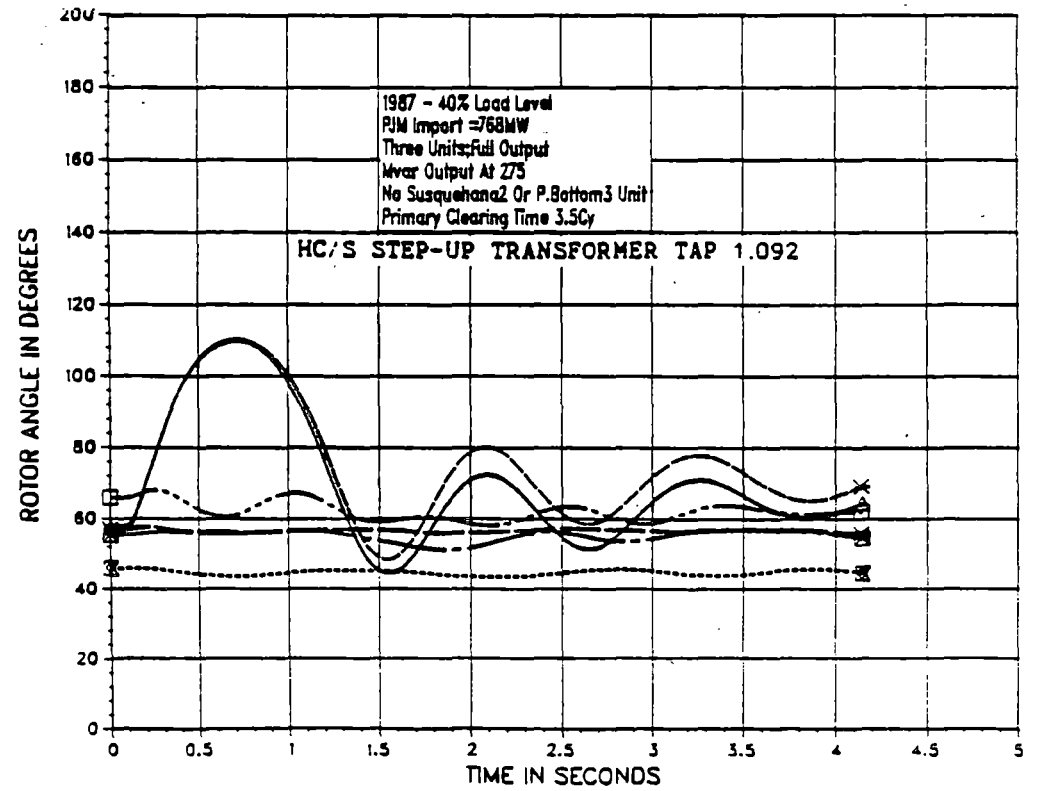


R03M5HK

EXHIBIT 95

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.-N.FREEDOM
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.-Keeney
At Hope Crk 500kv

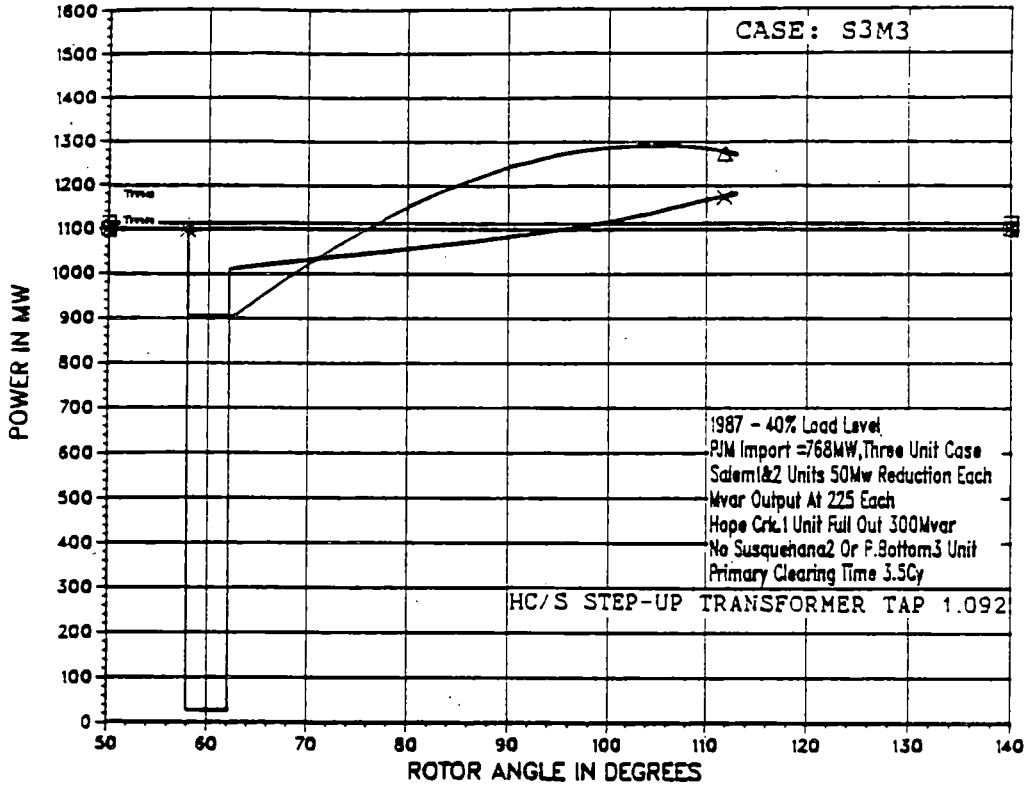


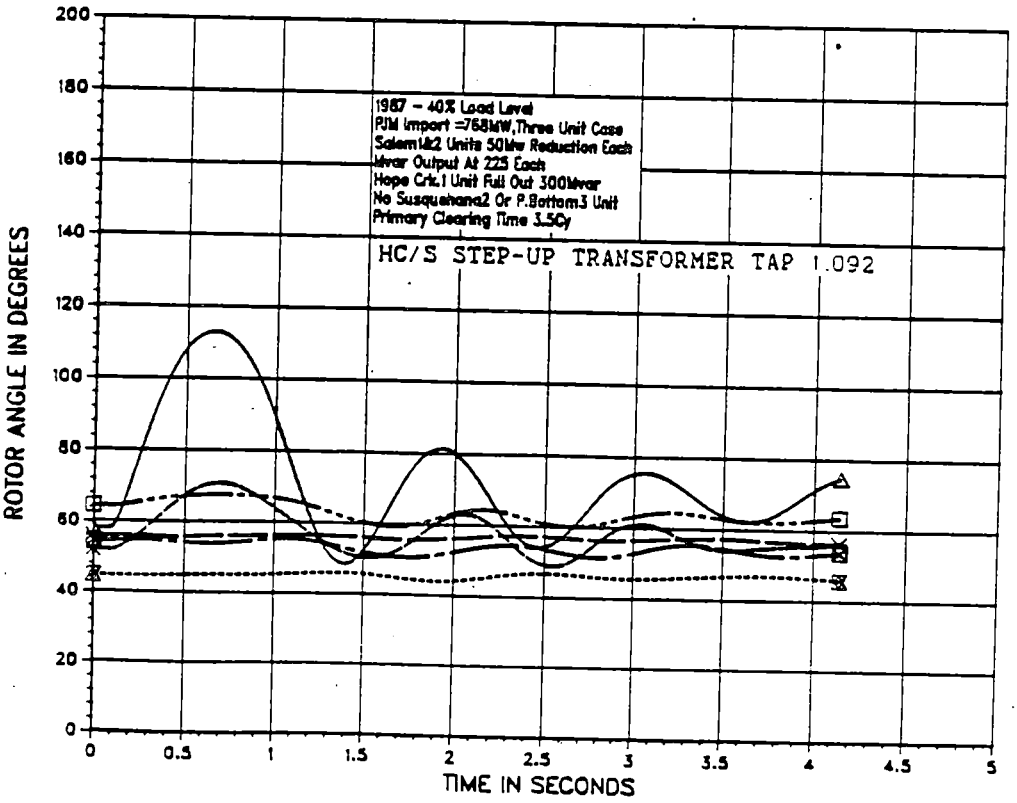


:03M2HK

EXHIBIT 96

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.-SALEM
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem-Deans
At Salem 500kv

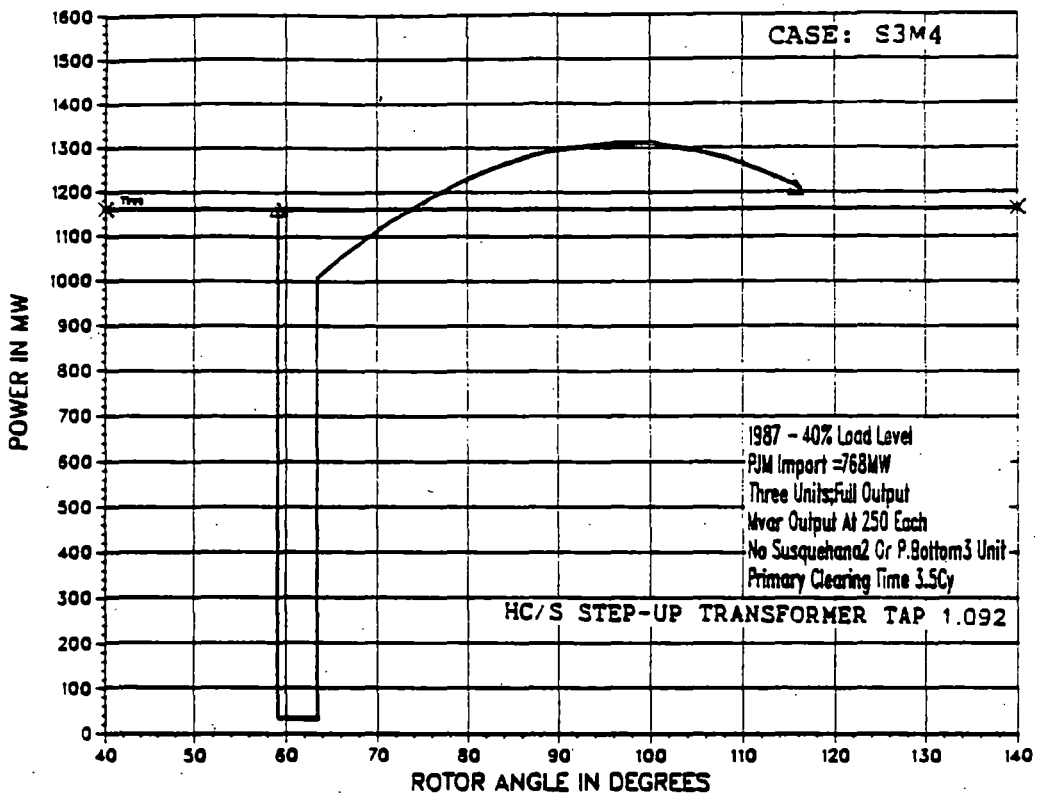




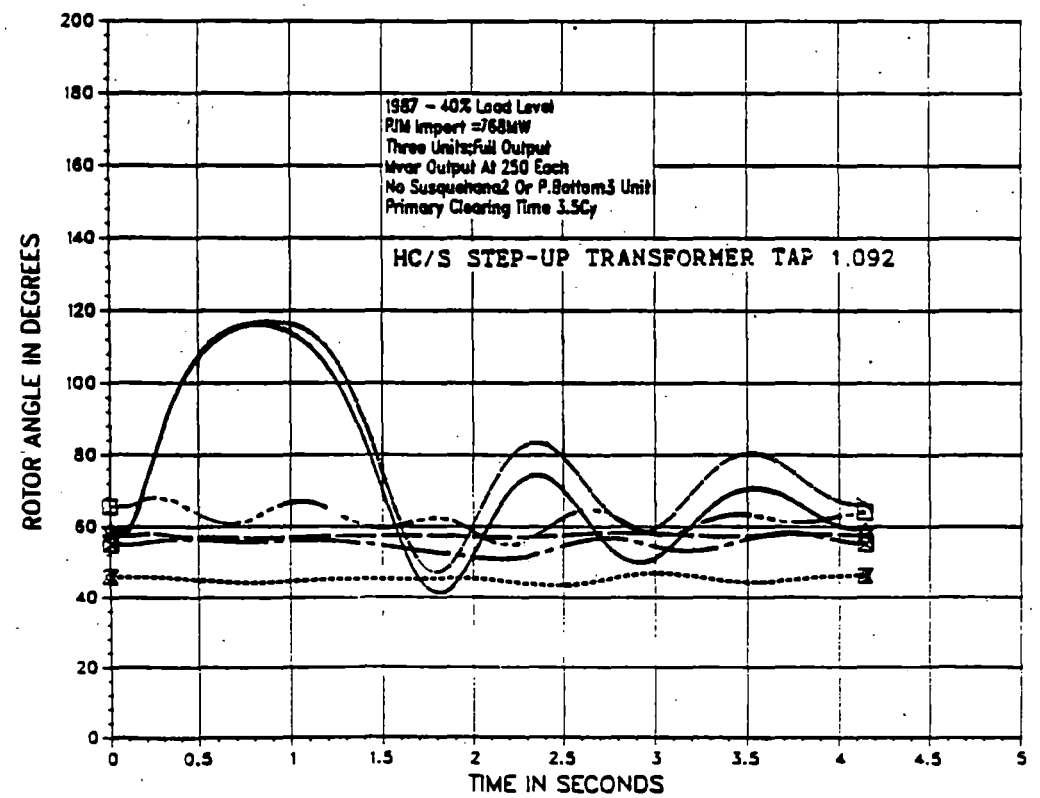
RO3M3SD2

EXHIBIT 97

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM–N.FREEDOM
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk 500kv



Legend
△ Salem No. 2
× Tm

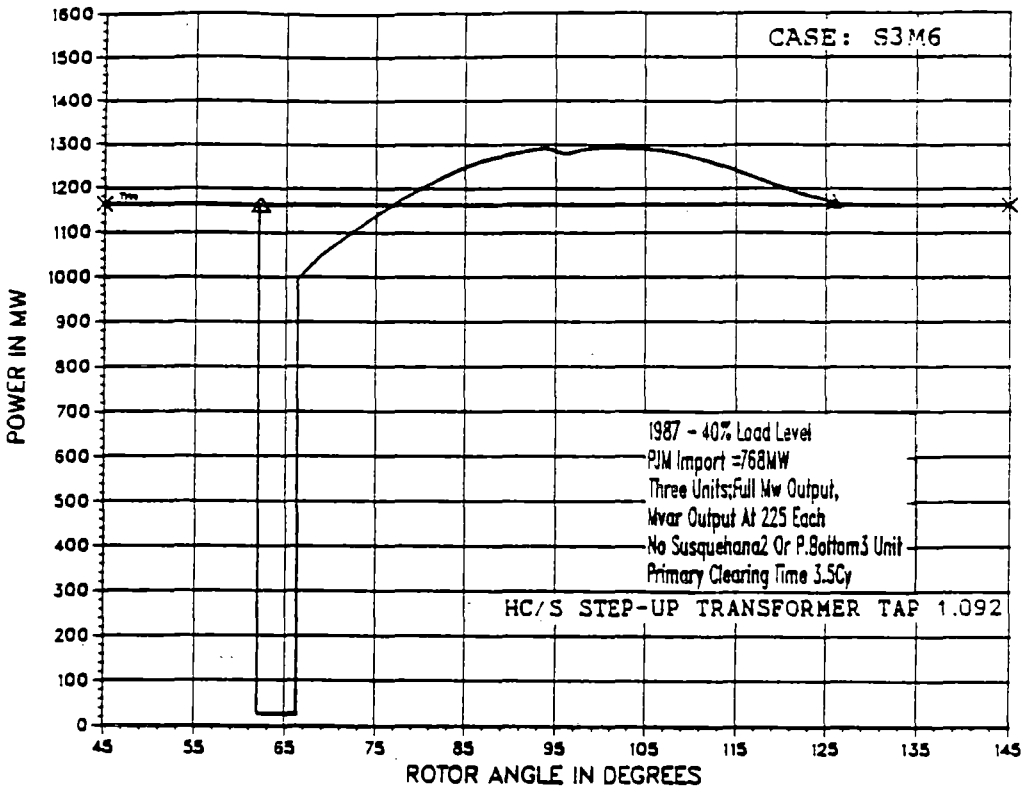


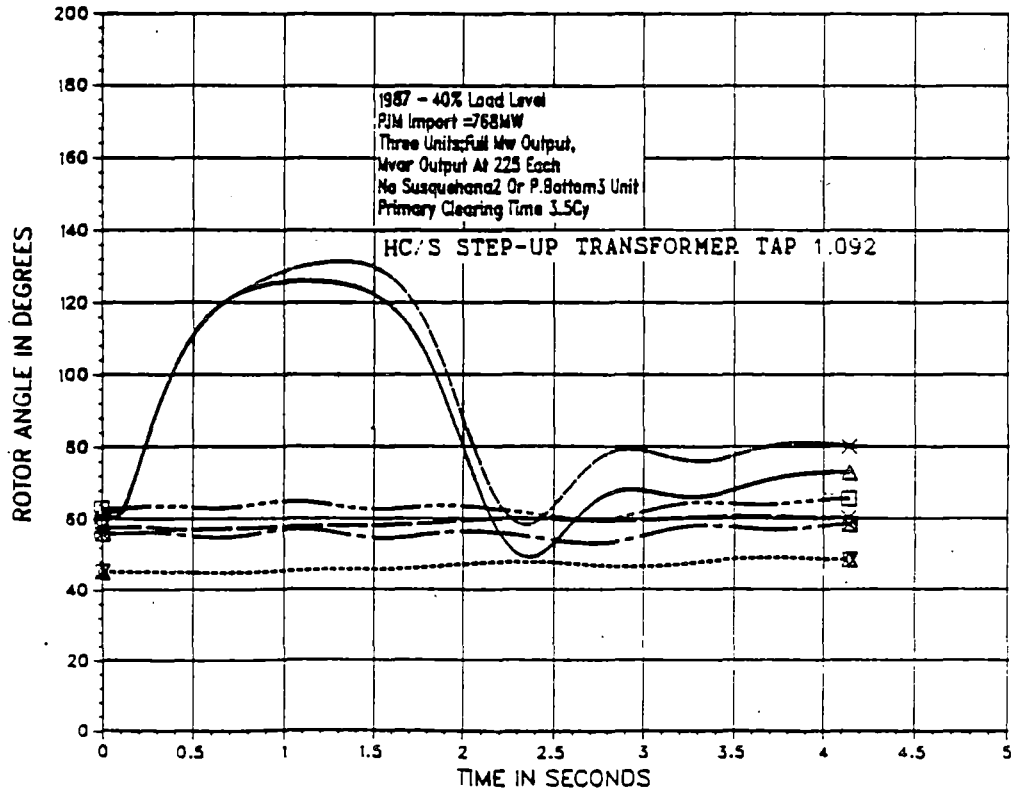
Legend
△ Salem No. 2
× Keystone No.2
□ Peach Bottom No.
⊠ Susquehana No.1
⧈ Cetiff No.1
✳ Hope Crk. No. 1

RO3M4HK

EXHIBIT 98

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE : KEENEY – P.BOTTOM
Salem No.2 Power vs. Angle
Three Phase Line Fault Salem–Deans
At Salem 500kv

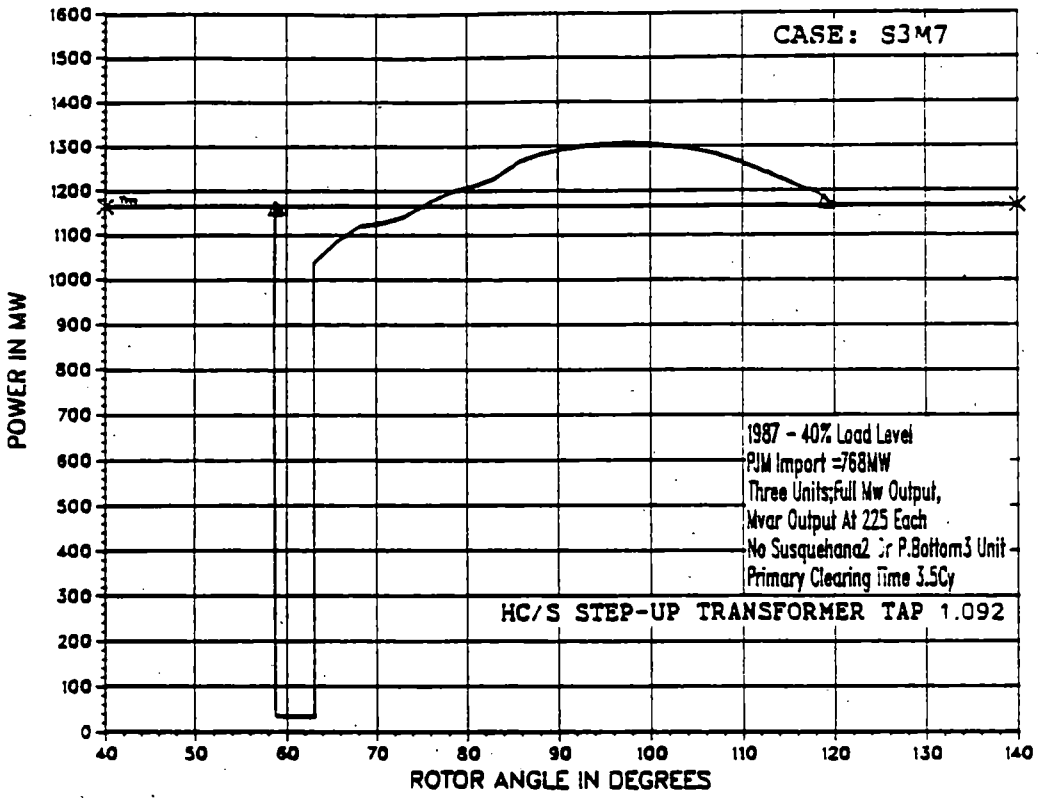


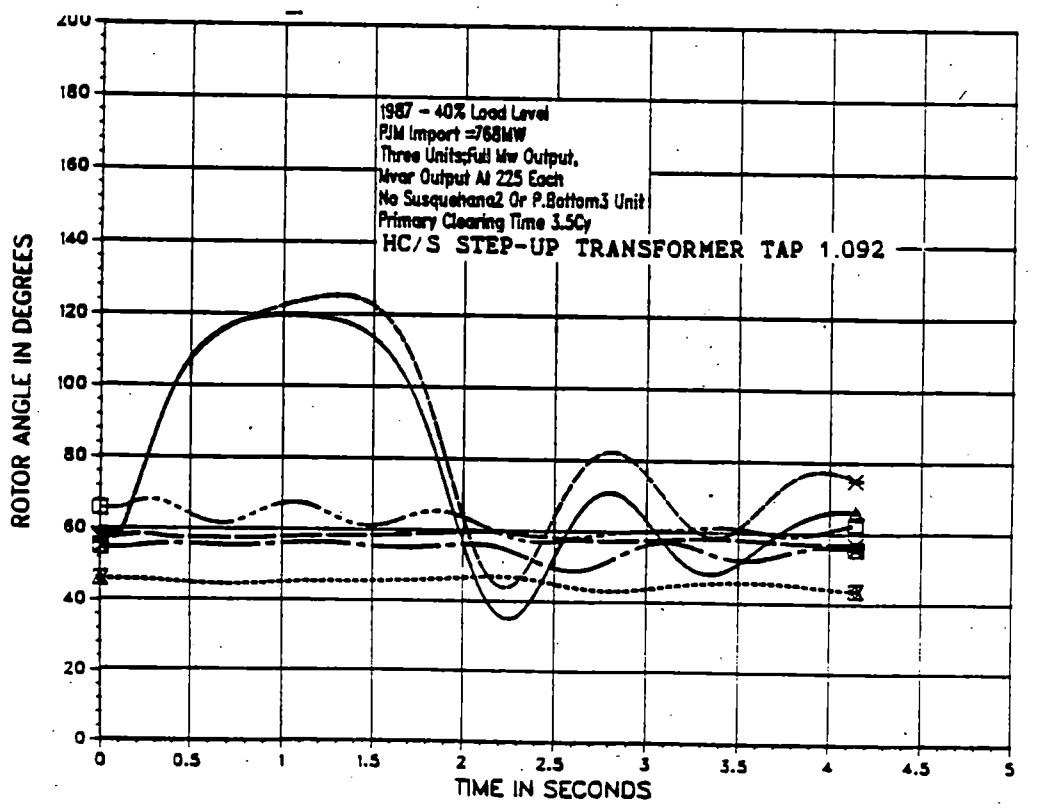


R03M6SD

EXHIBIT 99

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:DEANS–BRANCHBURG 500KV LINE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk. 500kv

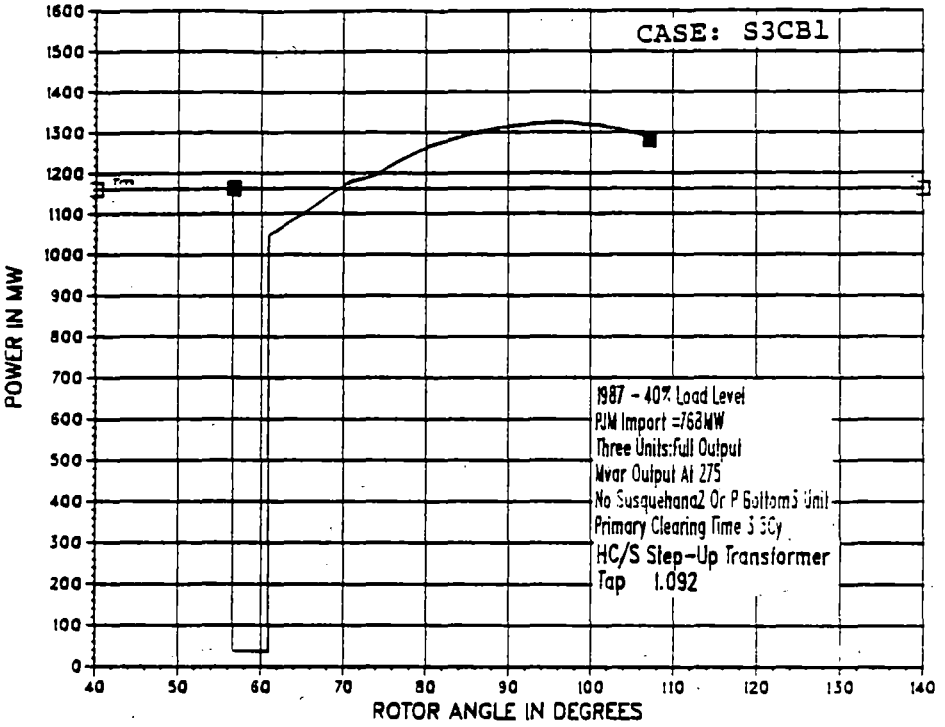


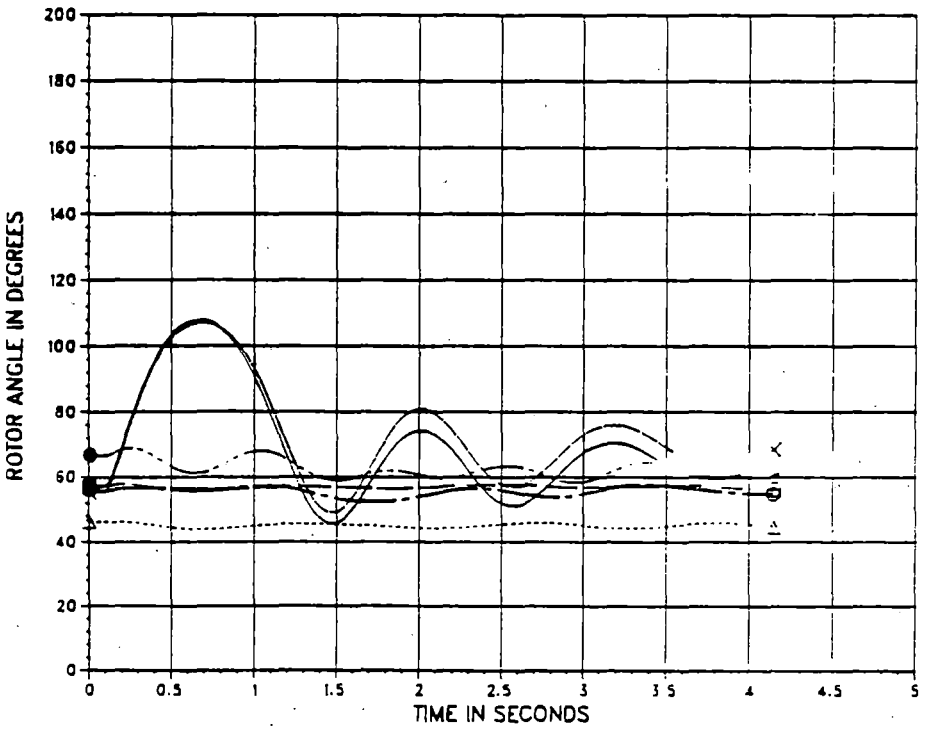


RO3M7HK

EXHIBIT 100

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:CB 50X OR 60X
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk, Also Trip Hope Crk.–N.Freedom

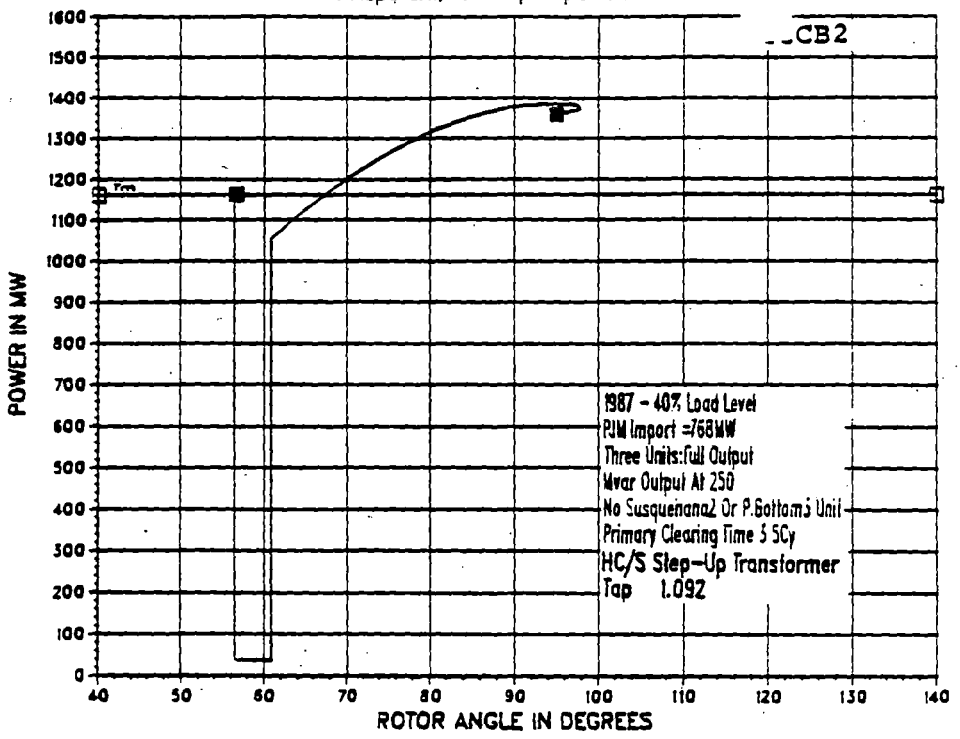


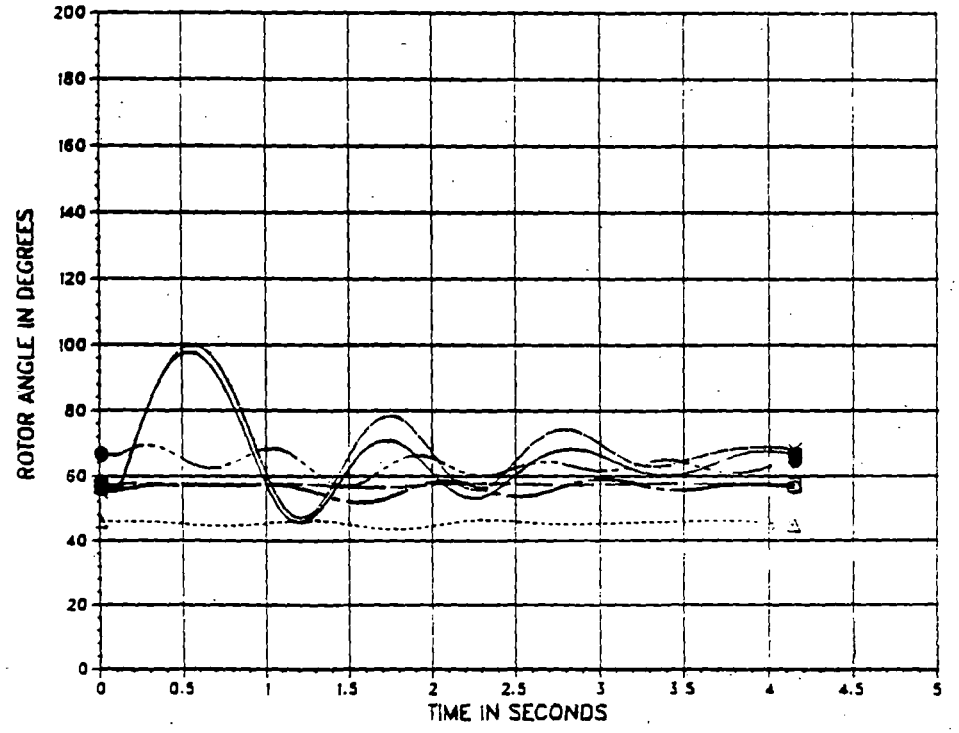


RO3CB1HK

EXHIBIT 101

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:CB 51X ,OR 52X ,OR 61X
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk, Also Trip Hope Crk.–Salem

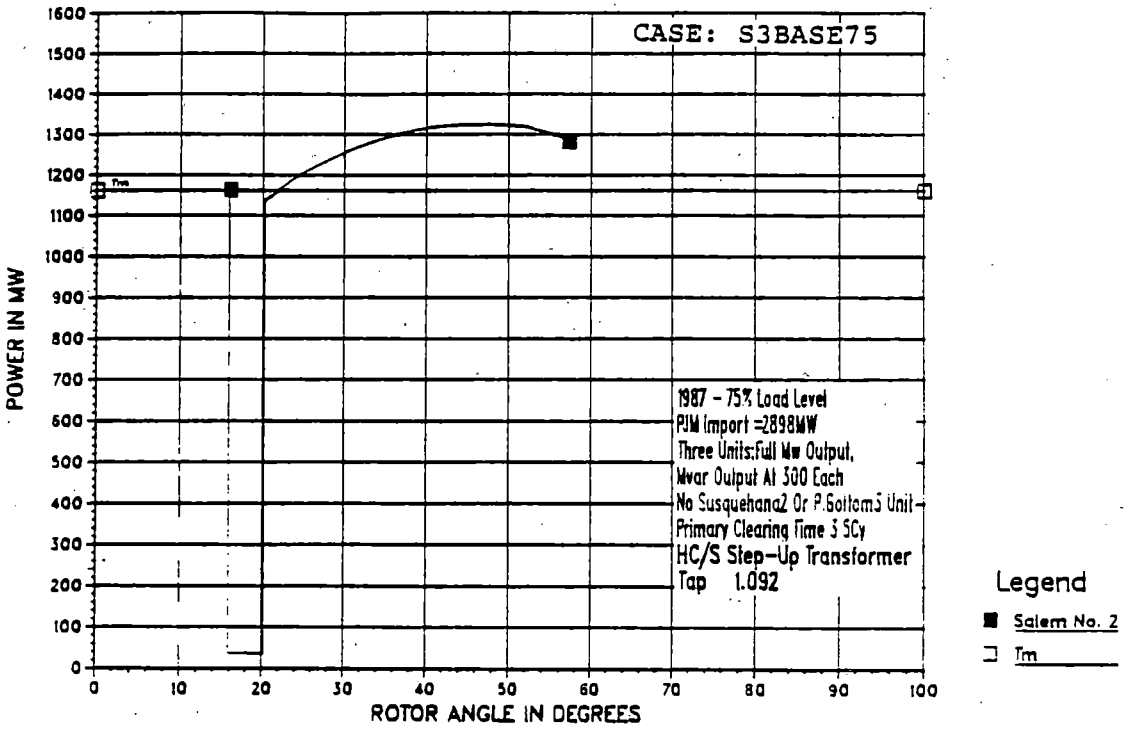


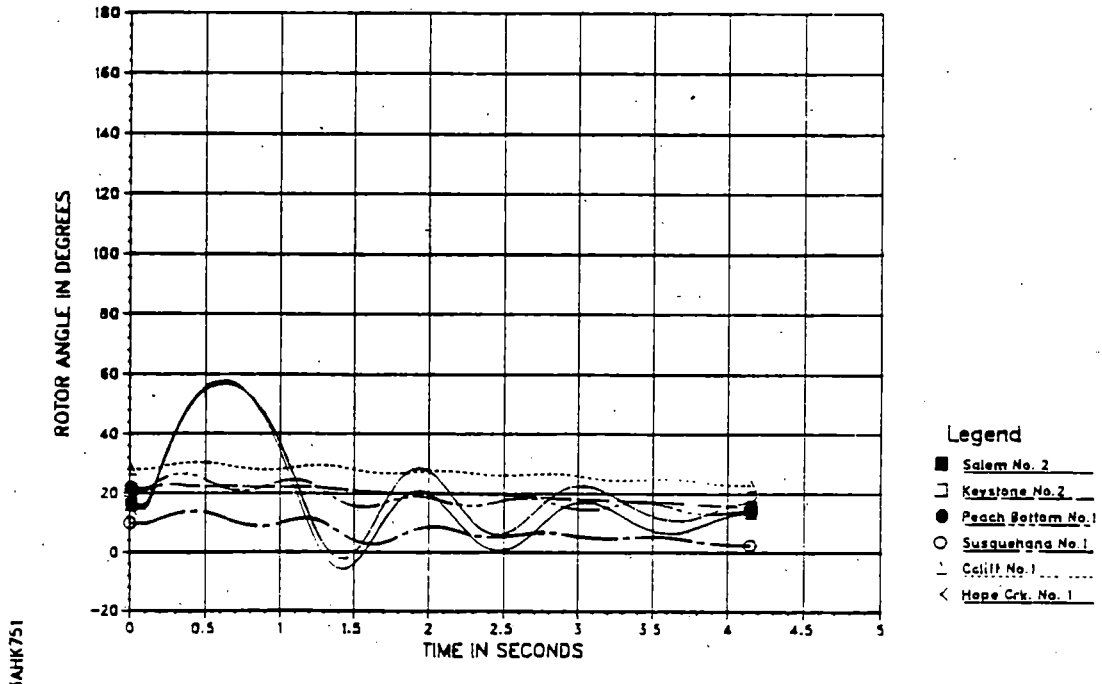


RO3CB2HK

EXHIBIT 102

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem2 Power Vs. Rotor Angle
Three Phase Line Fault Hope Crk.-Keeney
At Hope Crk. 500kv
75 % Load Level Base Case

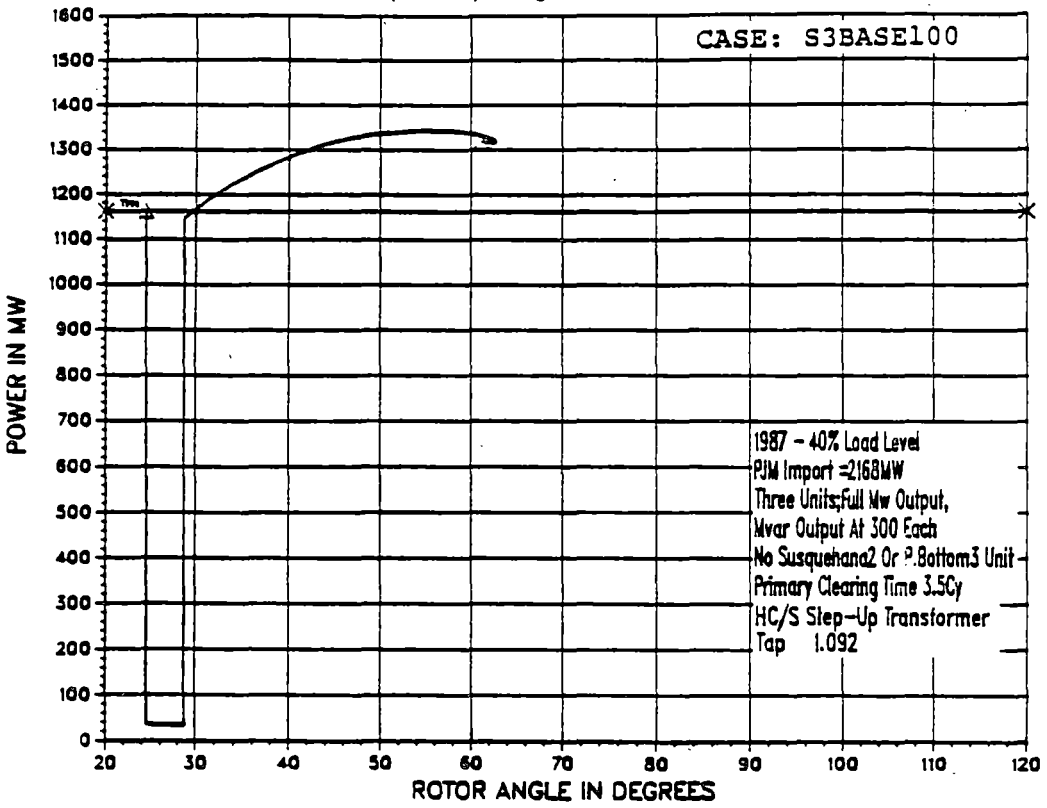


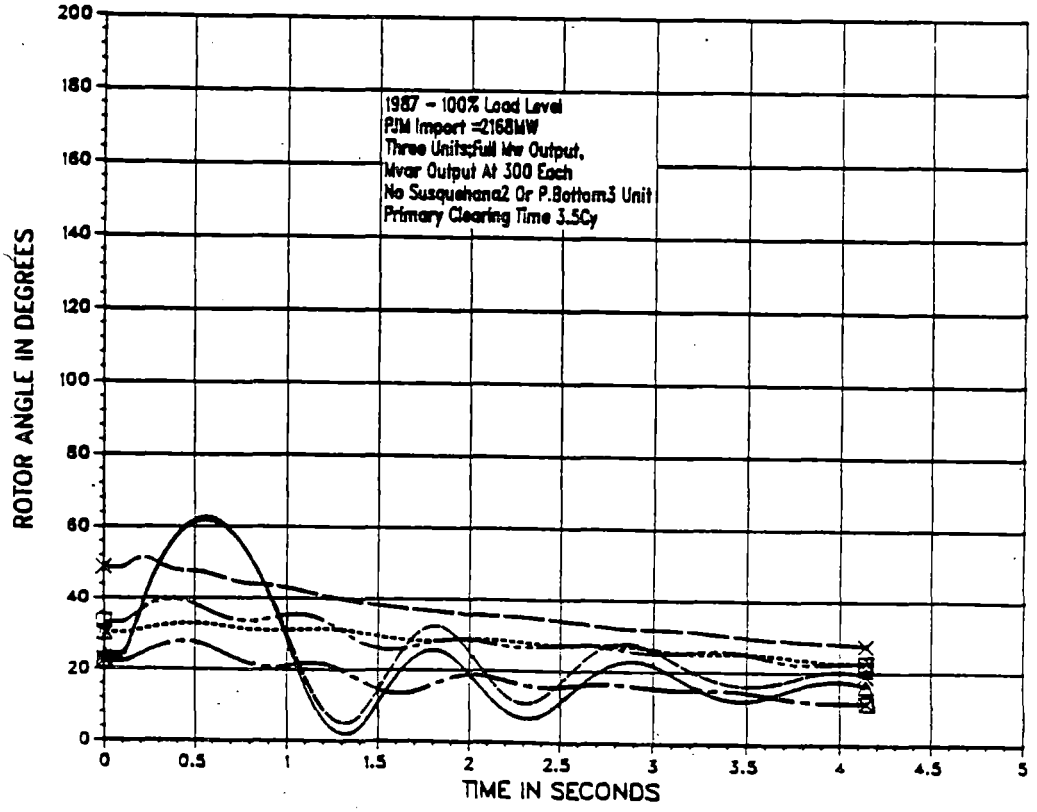


R3AHK751

EXHIBIT 103

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Kearney
At Hope Crk. 500kv
Hope Crk. Operating Guide 100% Load Level

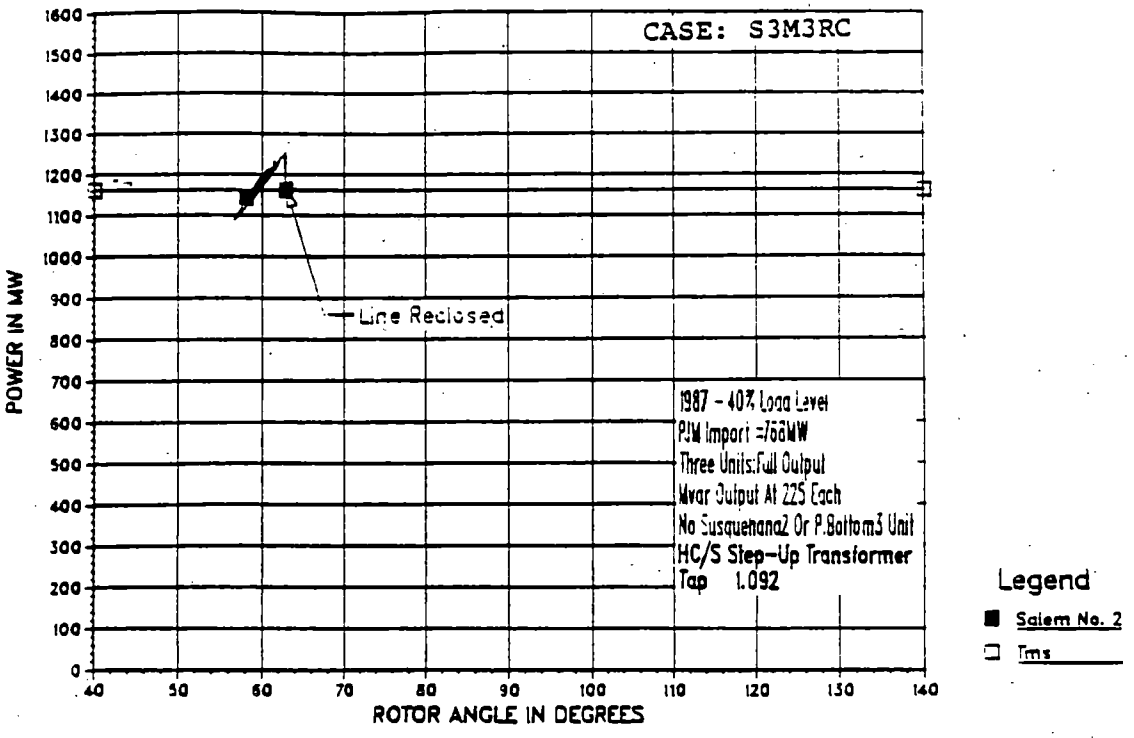


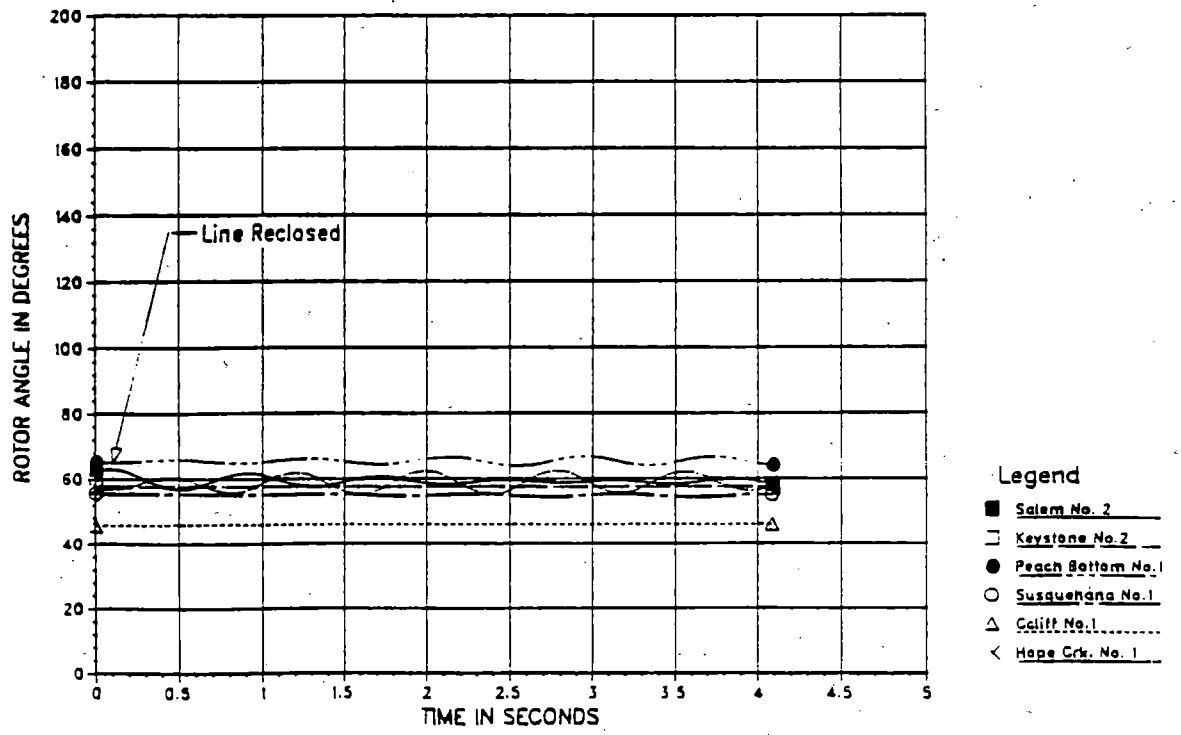


R3AHK100

EXHIBIT 104

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–SALEM
Salem No.2 Power vs. Angle
No Fault; Hope Crk.–Salem Line Reclosed

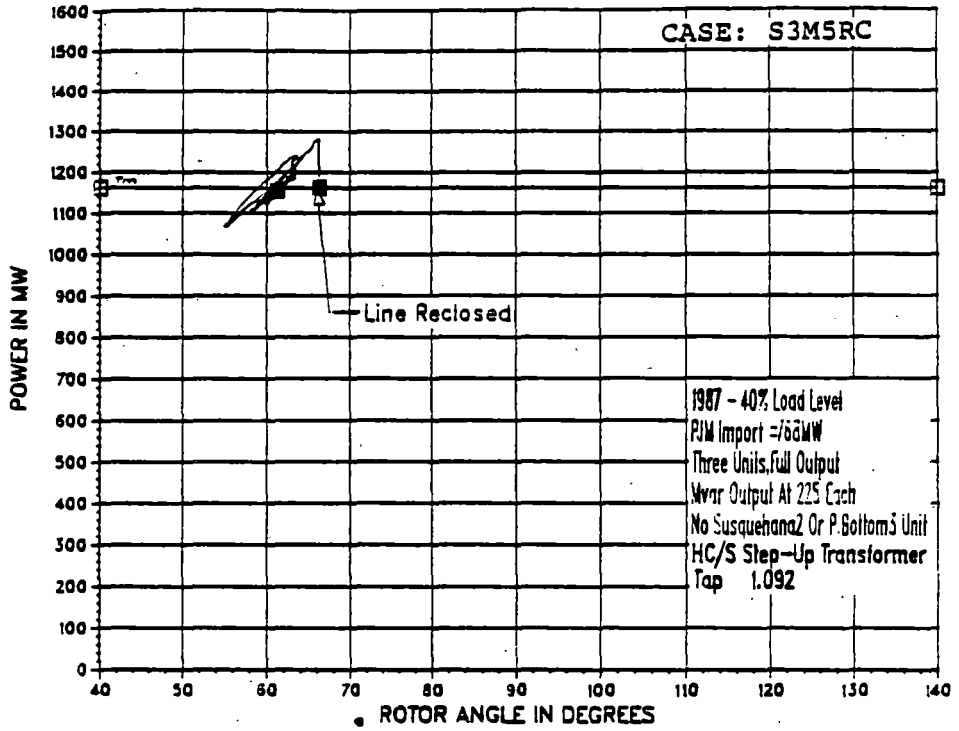


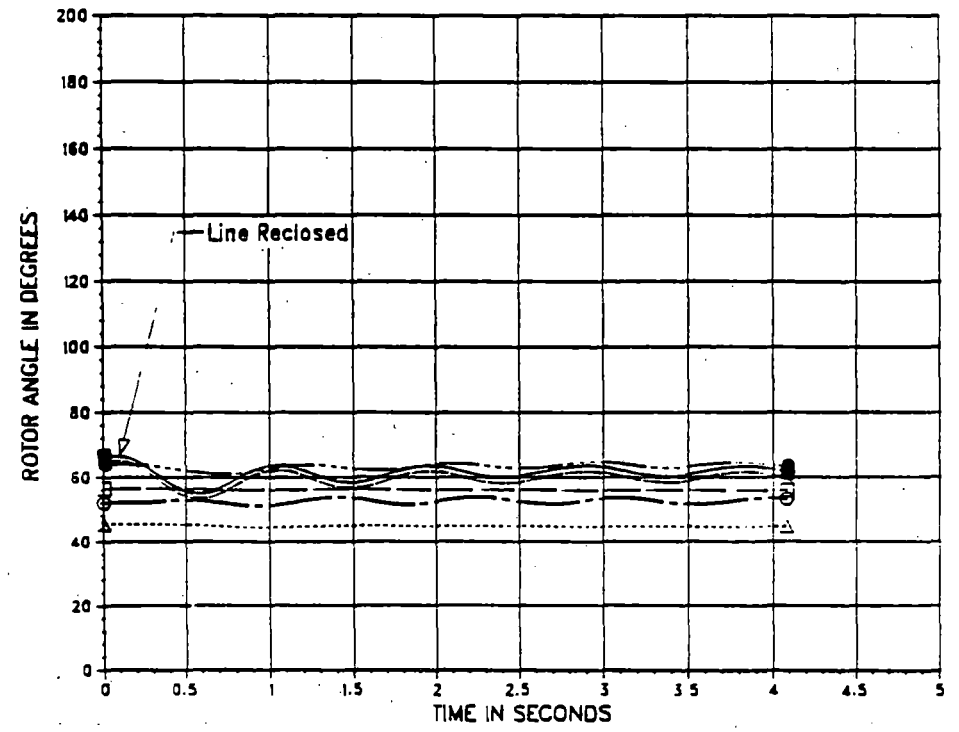


RO3M3RCL

EXHIBIT 105

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:SALEM – DEANS
Salem No.2 Power vs. Angle
No Fault ;Salem–Deans Line Reclosed

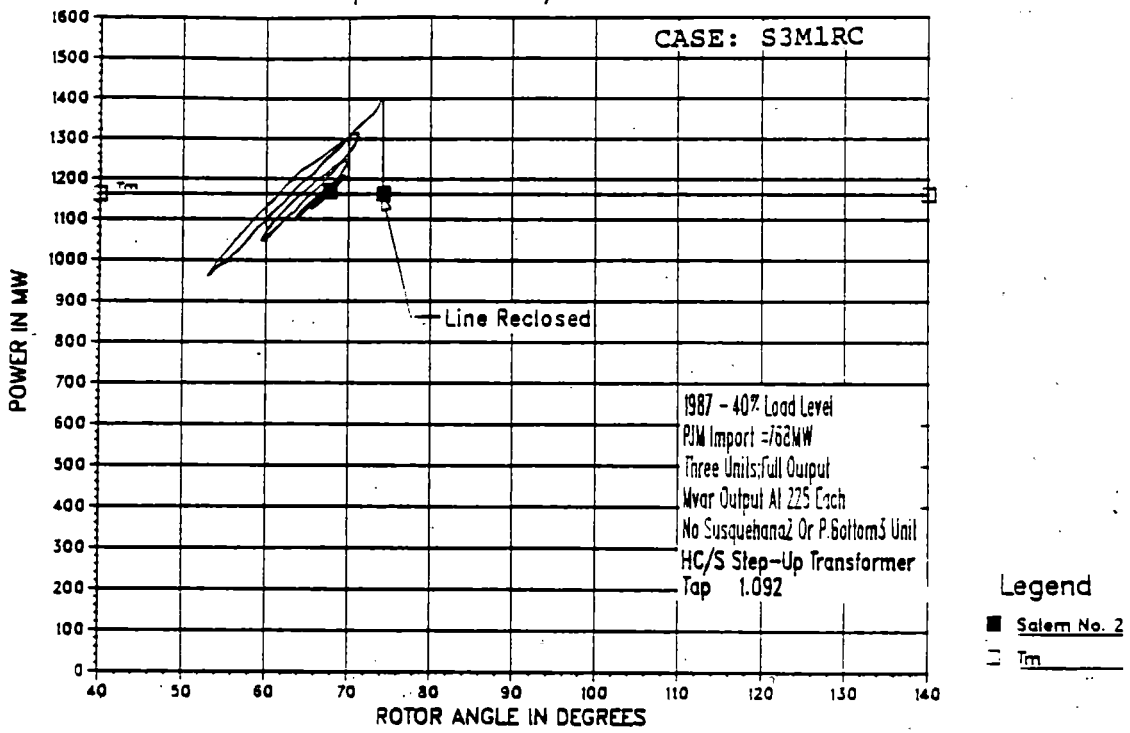


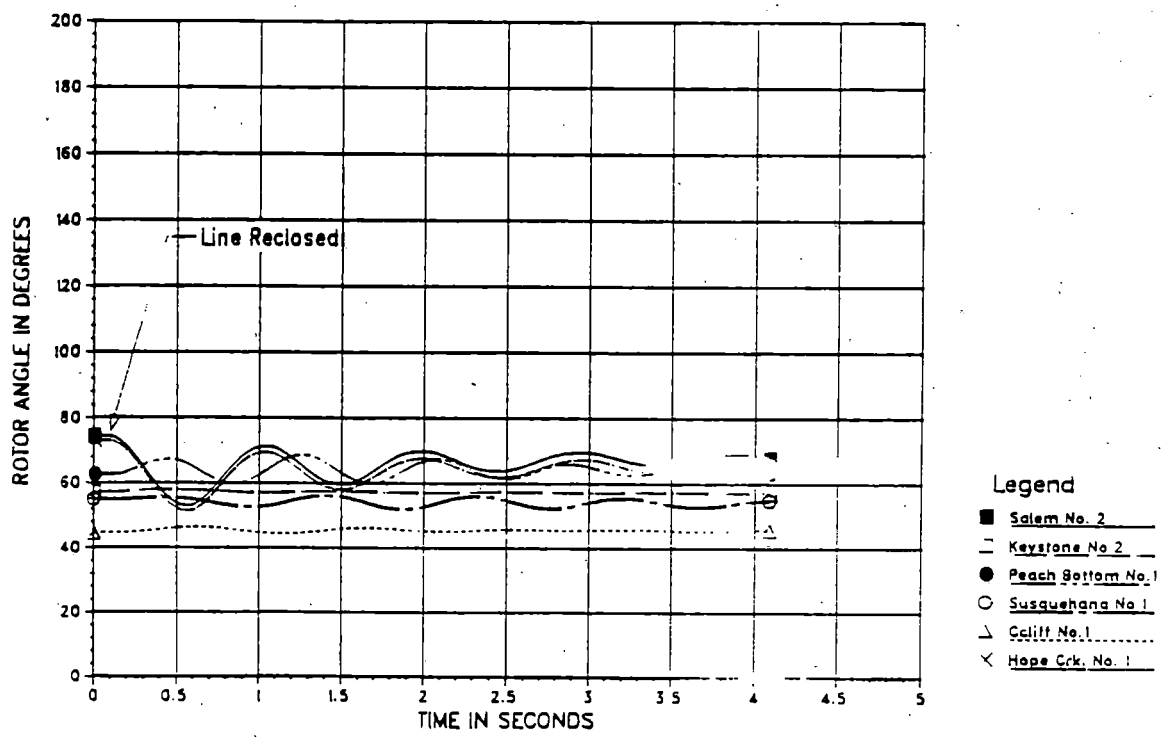


RO3M5RCL

EXHIBIT 106

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:HOPE CRK.–KEENEY
Salem No.2 Power vs. Angle
Hope Crk. – Keeney Line Reclose

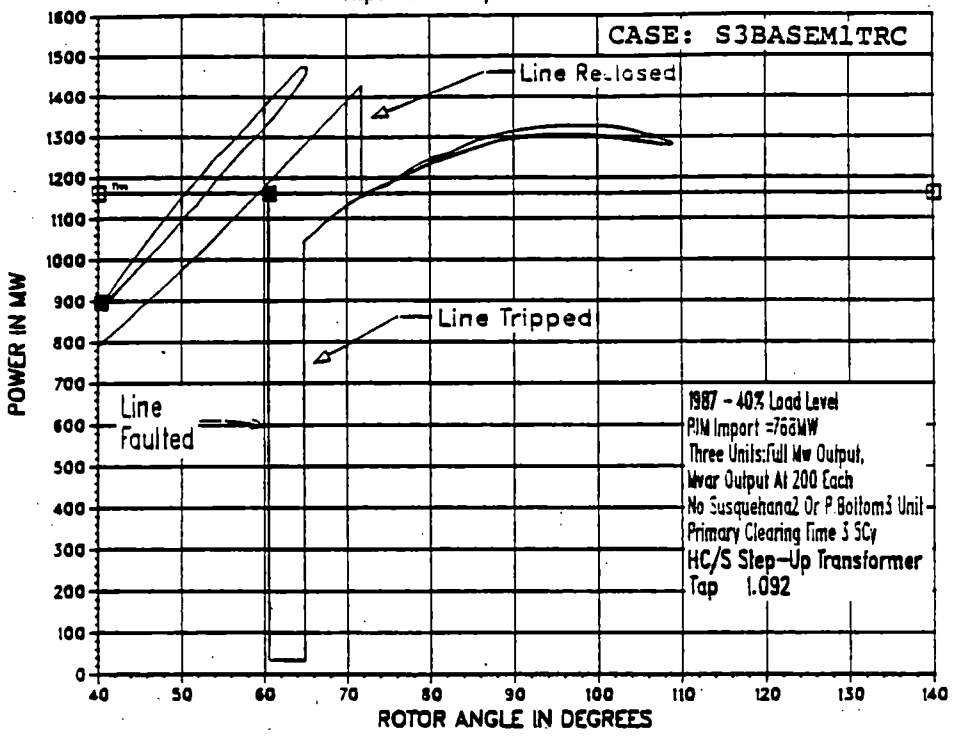




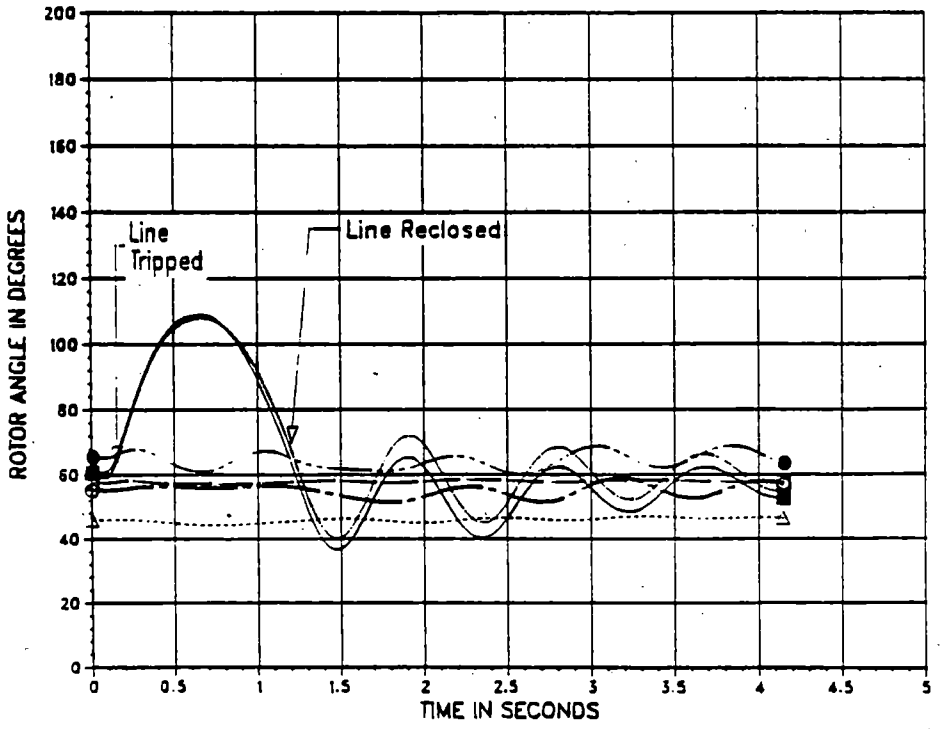
R03MIRCL

EXHIBIT 107

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Three Phase Line Fault Hope Crk.–Keeney
At Hope Crk. 500kv
Hope Crk.–Keeney Reclose After 1 Second



Legend
- Salem No. 2
- Tm

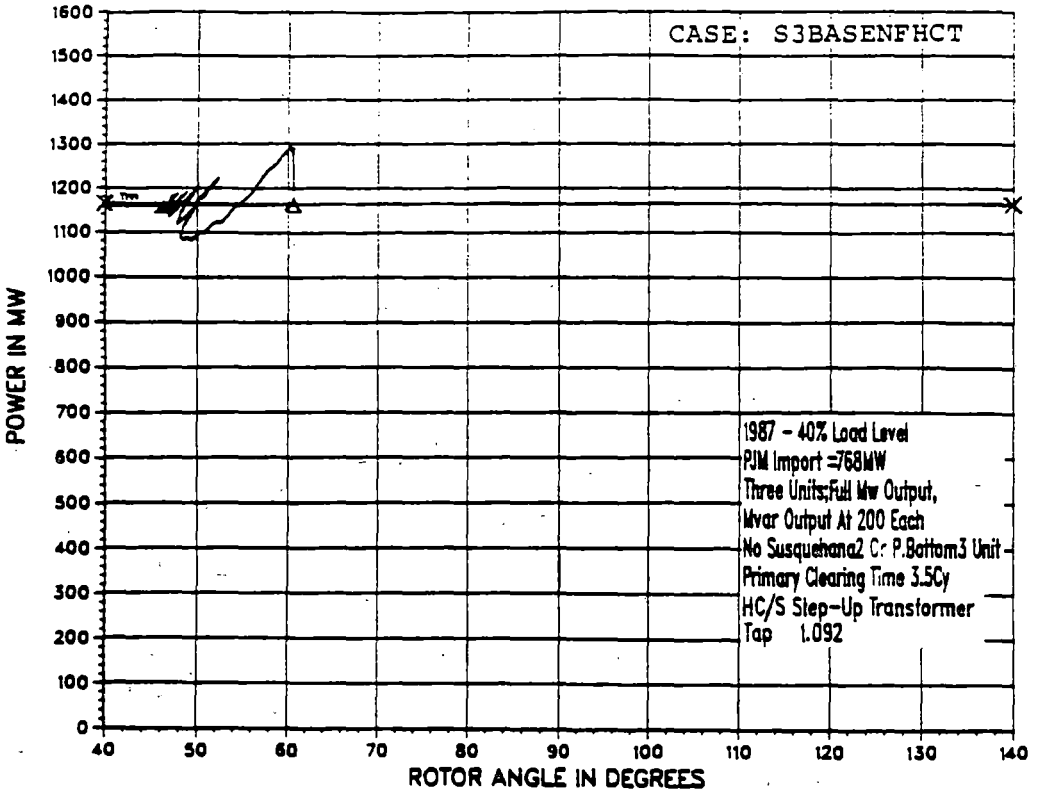


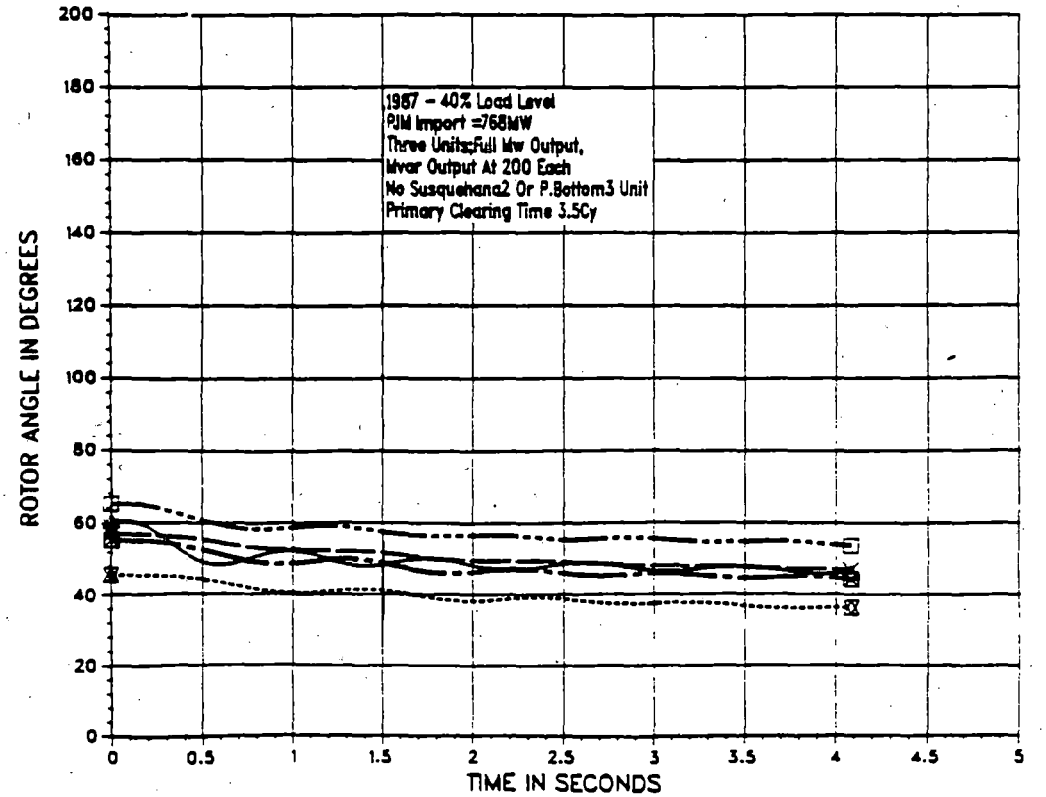
Legend
- Salem No. 2
- Keystone No.2
- Peach Bottom No.1
- Susquehana No.1
- Cliff No.1
- Hope Crk. No. 1

FLTHKRCL

EXHIBIT 108

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Hope Crk. No. 1 Tripped

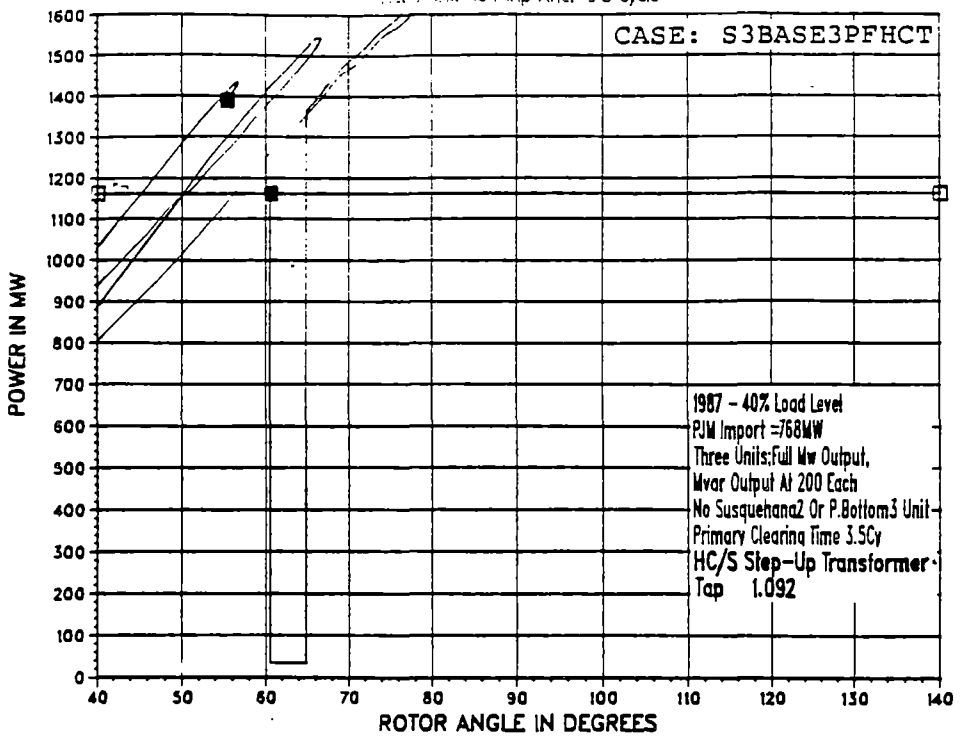


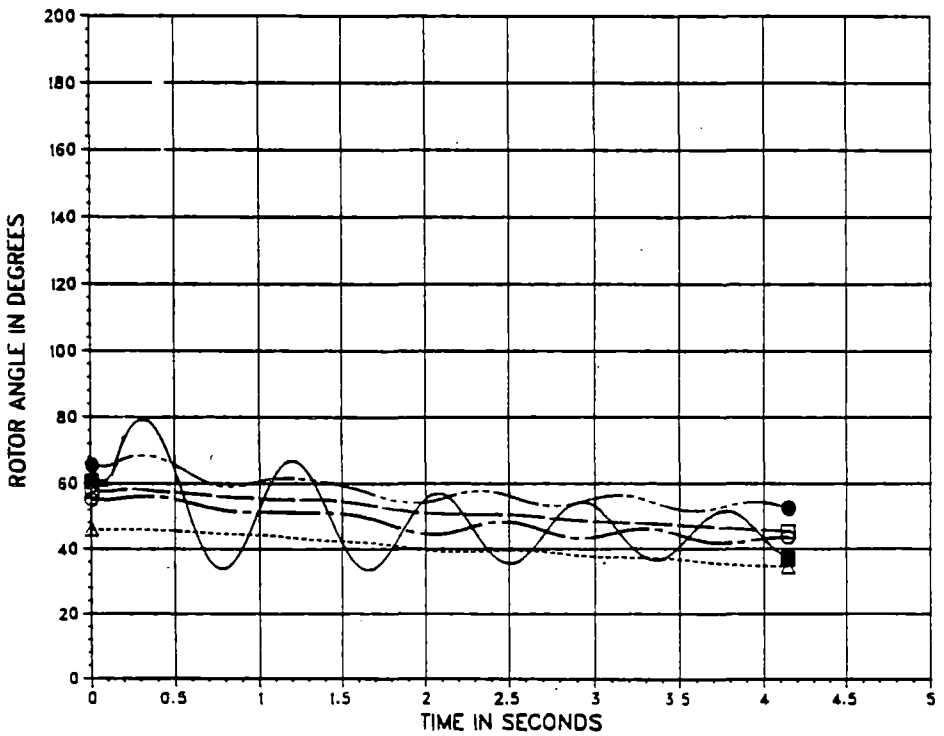


ICTRIP

EXHIBIT 109

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No 2 Power vs Angle
Three Phase Fault Hope Crk. No.1 Transformer
At Hope Crk. 500 kV
Hope Crk. No 1 Trip After 3 5 Cycle

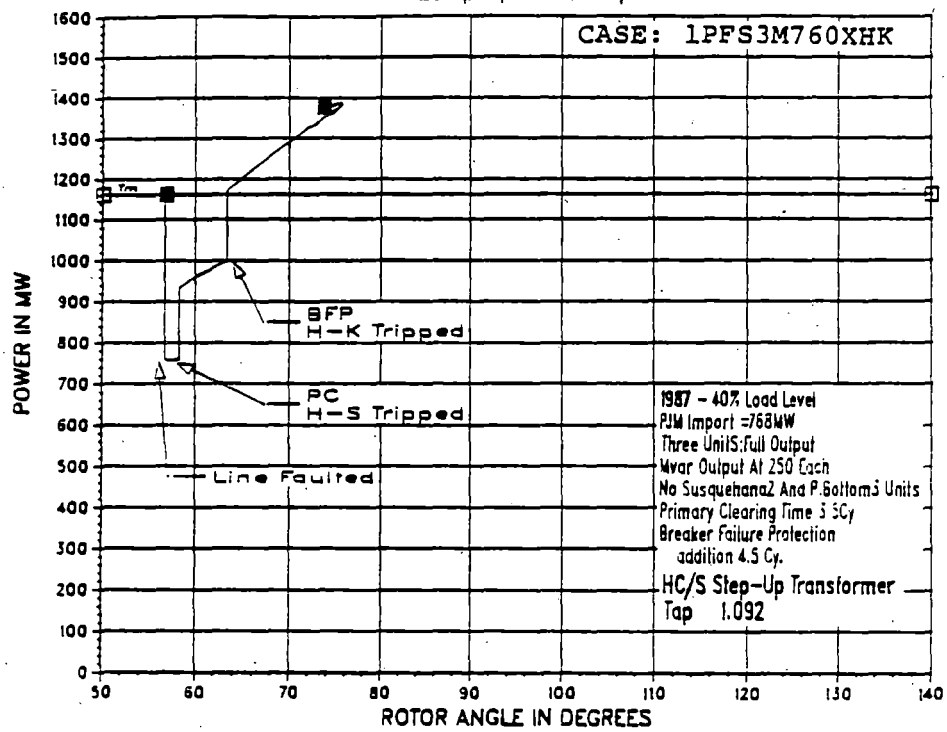




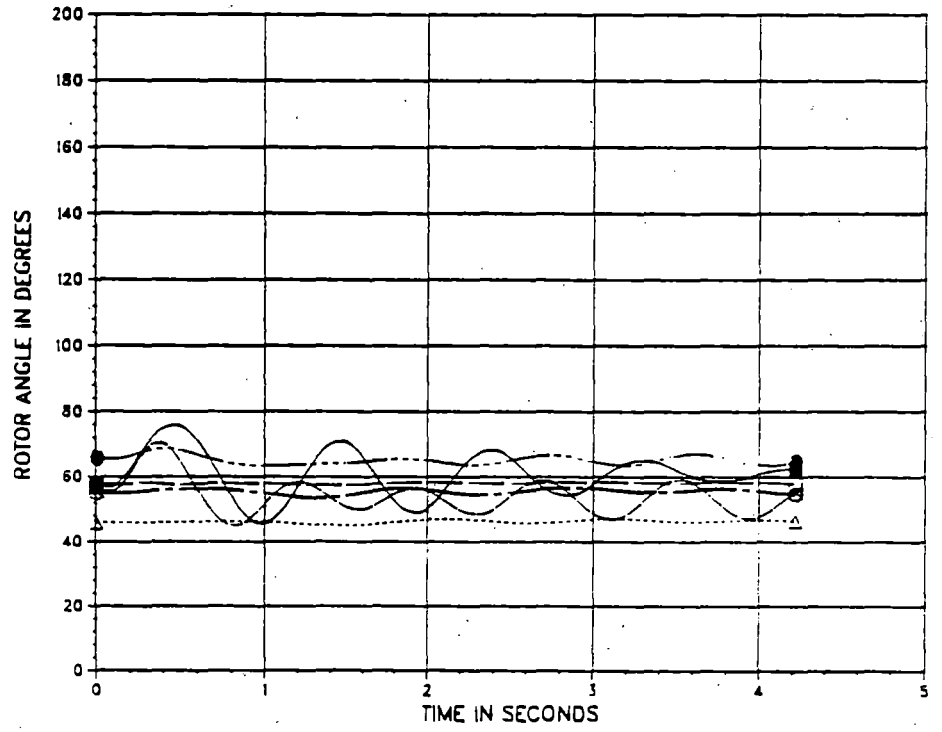
HCTRIP1

EXHIBIT 110

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:DEANS – BRANCHBURG
Salem No.2 Power vs. Angle
Single Phase Fault Hope Crk.–Salem
At Hope Crk .STUCK BREAKER:CB 60X
Also Trip Hope Crk.–Keeney



Legend
- Salem No. 2
- Tm



Legend
- Salem No. 2
- Keystone No 2
- Peach Bottom No.1
- Susquehana No.1
- Cclliff No.1
- Hope Crk. No. 1

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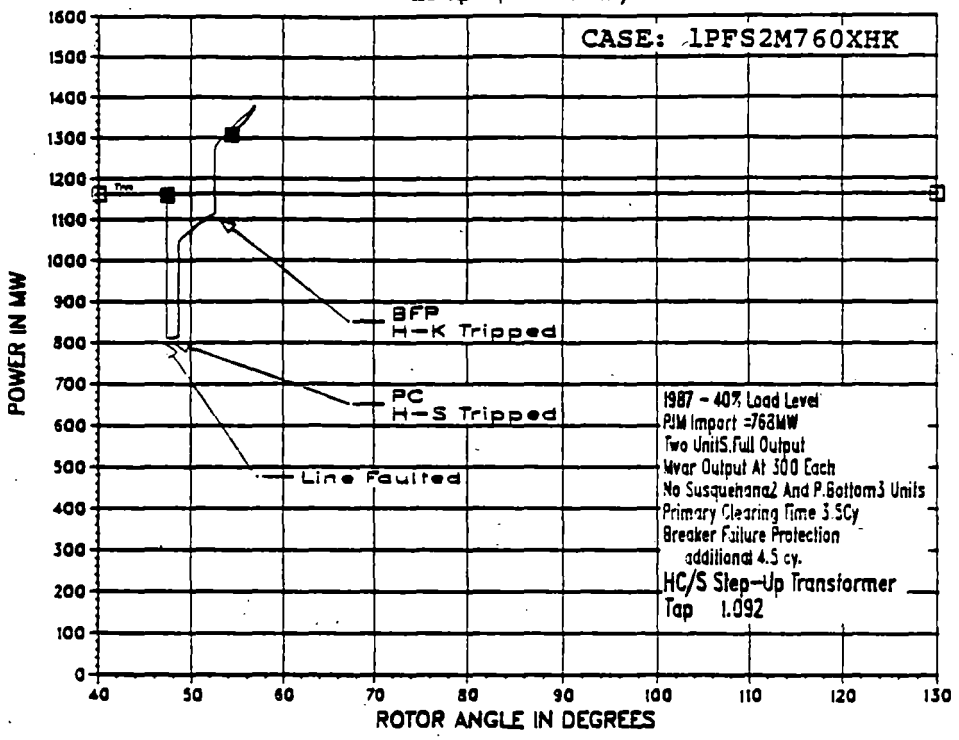
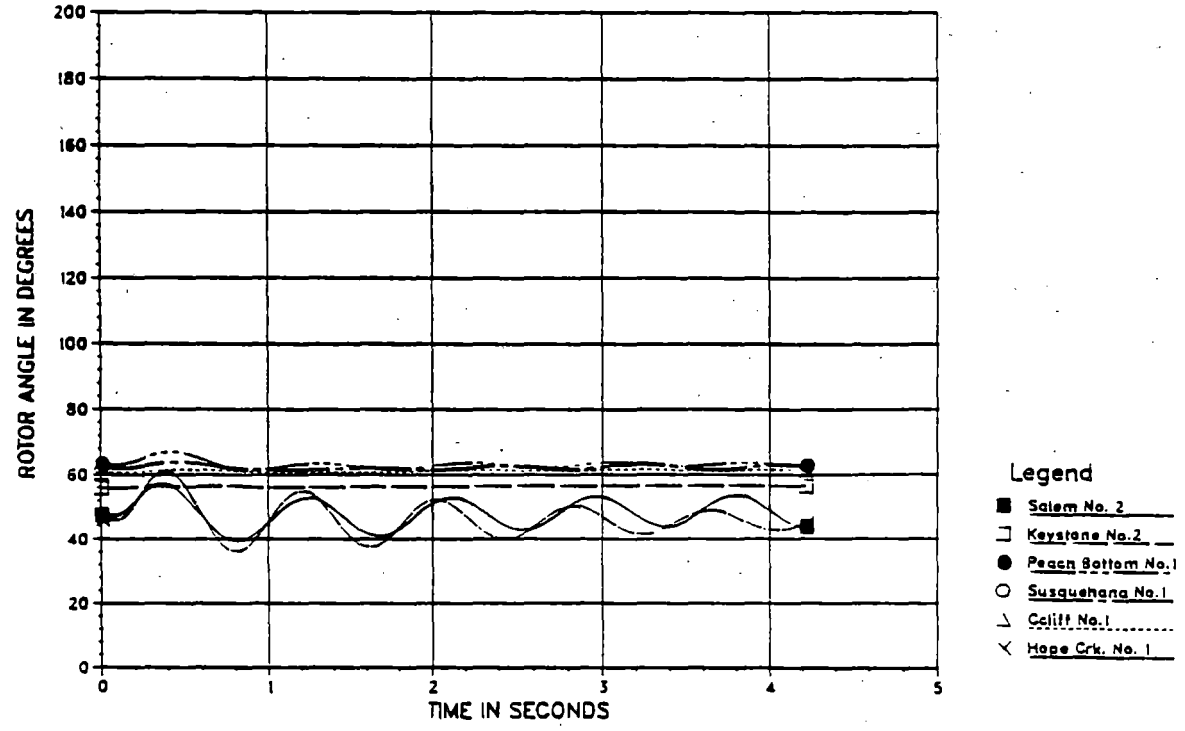
EXHIBIT 111

1987 SALEM/HOPE CRK. TWO UNIT OPERATING GUIDE
MAINTENANCE OUTAGE:DEANS – BRANCHBURG
Salem No.2 Power vs. Angle
Single Phase Fault Hope Crk.–Salem
At Hope Crk 500kv .STUCK BREAKER-CB 60X
Also Trip Hope Crk.–Keeney

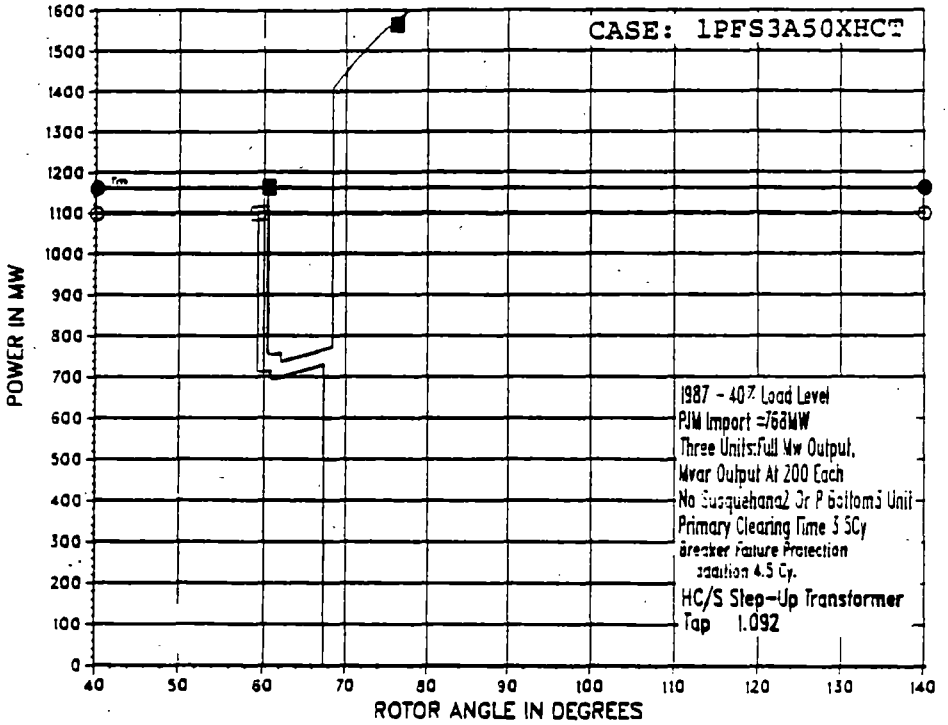


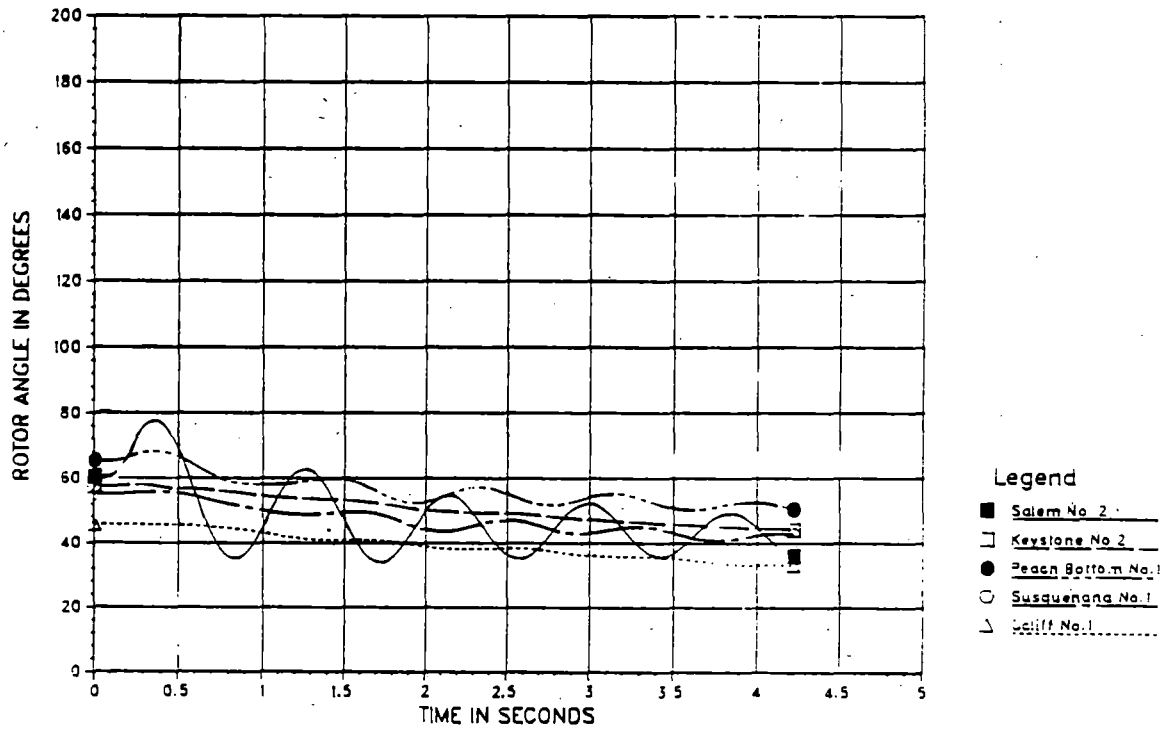


R2S60M7T

EXHIBIT 112

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Single Phase Fault Hope Crk.-New Freedom
At Hope Crk. 500kv ; 50% Stuck Breaker
Hope Crk. No.1 Trip After 4.5 Cycle

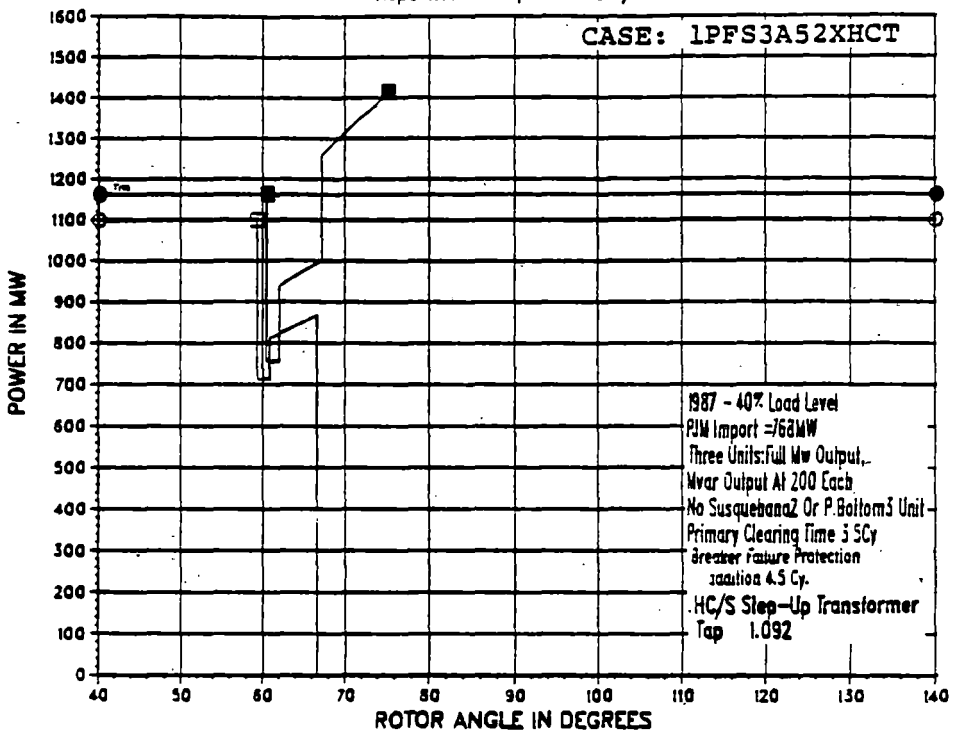


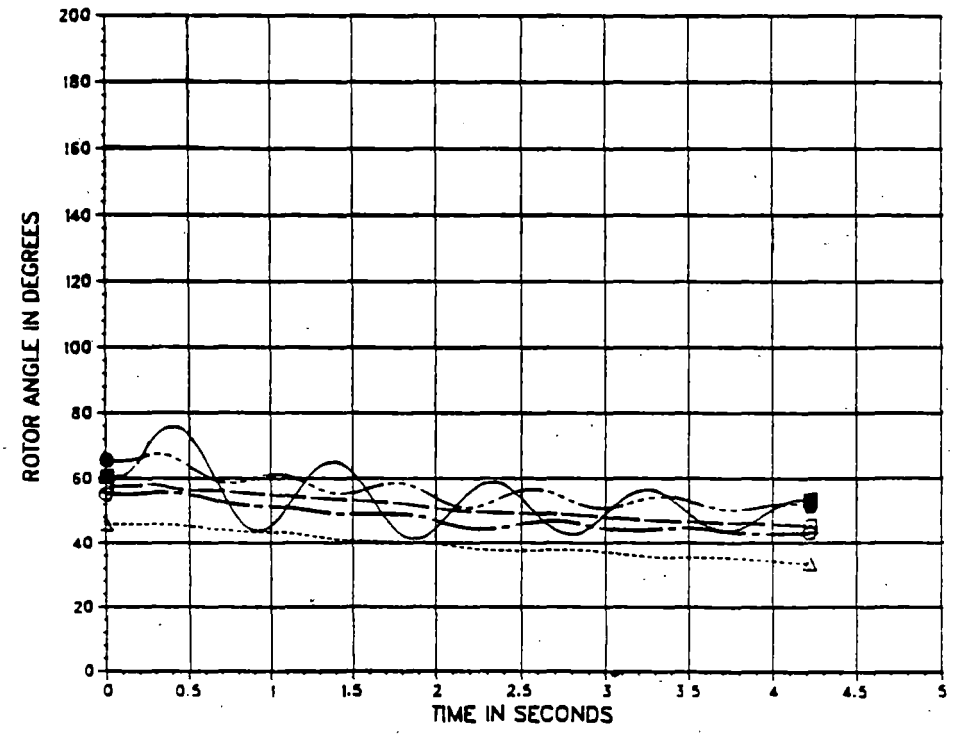


R3HN50SB

EXHIBIT 113

1987 SALEM/HOPE CRK. THREE UNIT OPERATING GUIDE
ALL IN CASE
Salem No.2 Power vs. Angle
Single Phase Fault Hope Crk.–Salem
At Hope Crk. 500kv ; 52X Stuck Breaker
Hope Crk. No.1 Trip After 4.5 Cycle





R3HS52SB

EXHIBIT 114

APPENDIX 4

SIMULATION MODIFICATIONS

PE, DPL, AND ACE

PE, DPL and ACE Data Modifications
Dispatch, Power Flow and Stability

The resulting operating curves were a result of running the Transtab stability program which required (1) a power flow simulation with specific operating conditions represented and (2) a data file representing generator characteristics.

At the request of PSE&G, PE, DPL and ACE submitted information which updated the following:

1. 1987 Hope Creek Unit No. 1 - MAAC Filing Power Flow Simulation and Dispatch Data

2. Generator stability data representation

The following is a summary of major data and representation changes suggested by PE, DPL and ACE.

Generator Dispatch

PE Changes of dispatch data for the following machines included MW, MVAR and heat rate information:

Conowingo 1-6
Conowingo 7
Eddystone 1
Eddystone 2
Richmond 1-8
Richmond 9
Schuykill 1
South wk AB 1 and 2
South wk DC 1
Barbadoes AB 1, 2 and 3
Barbadoes CD 1
Plymouth Meeting D
Richmond 13
Cromby DSL 2 1, 2 and
Muddy Run 1-8
Limerick 1
Peach Bottom 2

DPL — The following units were turned on in DPL as must run generation:

Dela City
Edgemoore 3, 4 and 5
Indian River 1 and 3

The following units were removed from the generation schedule:

Edgemoor 1 and 2
Kellam 69

ACE — No changes to dispatch data.

Power Flow Simulation

PE — Numerous changes were submitted and incorporated into the power flow simulation which included:

1. line representation - impedance, charging, and ratings.

2. transformer representation - impedance, taps and voltage data.

Several specific and more noteworthy are:

1. Peach Bottom No. 2 auxiliary bus load representation.

2. Peach Bottom No. 2 minimum reactive limit changed to -175 MVAR and a generator terminal bus voltage regulated at .96 pu in order to maintain the 500-kV voltage at 1.06 pre-contingency and for a post-contingency condition to 1.075 pu maximum.

3. Limerick No. 1 (230 kV) auxiliary bus load representation.

4. Muddy Run units No. 1-8 revised from four units on a terminal bus to paired units (i.e. 1&2, 3&4, 5&6) modelled each through a step-up transformer to a separate 230-kV high side bus.

DPL No significant modifications were submitted.

ACE No significant modifications were submitted.

Stability Data

Modifications included rotor, excitation and governor data for the following units:

PE
- Peach Bottom 2 & 3
- Limerick 1
- Eddystone 1 hp and 1p
- Eddystone 2 hp and 1p
- Schuykill 3
- Conowingo 7
- Seward
- Shawville
- Susquehanna 1

DPL
- Edgemoor 3, 4 and 5
- Vienna 8
- Indian River 1, 2, 3 and 4
- Del City 1, 2 and 3

ACE No significant changes

APPENDIX 5

SCOPE AND PROCEDURE

HOPE CREEK GENERATING STATION OPERATING GUIDE
(HOPE CREEK/SALEM)

SCOPE AND PROCEDURES

I. INTRODUCTION

This operating guide is for the operation of Hope Creek Unit No. 1, in conjunction with the operation of both Salem Units No. 1 and 2, due to their close electrical proximity.

The Hope Creek Transmission Project, consisting of 500-kV facility additions and rearrangements which integrated it with the 500-kV transmission of the Lower Delaware Valley Transmission Project, was completed and put into service in March, 1985.

II. SCOPE

This operating guide will provide the PSE&G System, Hope Creek Generating Station and Salem Generating Station Operators with guidance in operating these units based on stability considerations for various system conditions.

The operating guide will be prepared from results obtained from power flow analysis, economic generation dispatches, short circuit analysis, and transient stability analysis.

The analysis and subsequent results will focus on the following three Hope Creek/Salem unit operating combinations:

a. Hope Creek No. 1, Salem Nos. 1 and 2 (3 unit)
b. Hope Creek No. 1 and Salem No. 1 or 2 (2 unit)
c. Hope Creek No. 1 (single unit)

The results are to be determined considering the following:

a. Transient Stability

- stability with MAAC criteria tests
- stability with selected PJM 500-kV lines scheduled out for maintenance
- stability with selected Hope Creek circuit breakers scheduled out for maintenance

b. Voltage limits - maintain voltages on generator terminal buses and bulk system high voltage buses within criteria.

c. Minimum Excitation Limit - individual unit basis

III. PROCEDURES

A. Power Flow Simulations

Using an updated version of the 1987 Hope Creek MAAC Filing base case power flow simulations will be made for 100%, 75% and 40% of peak load conditions, to establish the voltage and power flow patterns for the vicinity of Hope Creek and Salem Generating Stations.

- For the 100% load level, PJM will be dispatched economically, with an import of 3000 MW reserve economy purchase.
- For the 75% load level PJM will be dispatched economically, with a 3600 MW reserve economy purchase.
- For the 40% load level, all of PJM will be dispatched economically, with the actual PJM interchange a function of whether jointly owned units are normally on or off (i.e. Homer City and Seneca) for this load level.

At all load levels, the generating units will be dispatched without EFOR deration with unit unavailability to be accounted for by discrete unit outages, primarily on the 500-kV system. The most critical combination of 500-kV unit outages will be used to establish operating limits (i.e. one Peach Bottom unit and one Susquehanna unit). Discrete unit forced and maintenance outages for underlying units will be based on a distribution similar to that used in the 1986 PJM Maximization of Economic Imports (MEI) Study.

B. Transient Stability Analysis

The Transient Stability Analysis will determine the stability of the system and the performance of the new Hope Creek Unit at the 40% of peak load level. Also to be determined are the terminal voltage and minimum MVAR output requirements of the Hope Creek and Salem units needed to maintain stability for normal, scheduled and unscheduled transmission outage conditions and selected circuit breaker scheduled outage for a range of most probable system voltages.

The study results will document all assumptions regarding voltage and reactive constraints at key buses. Also, for analysis purposes, where voltages are near their limits, potential voltage rises due to generator or transmission line outages will be investigated. If the power flow analysis indicates that reactive output of major generating units are at or near their stated reactive capability limit, the case will be rerun with the limit modified to provide a margin on the unit's reactive output.

For those cases where transmission line maintenance outages may have a major effect on the PJM import limits, import levels will be modified if it is deemed that such a change would significantly impact the stability margin at the Hope Creek/Salem complex.

For those cases where Hope Creek/Salem units output reduction is required for stability considerations and the generation dispatch associated with such reductions would be expected to cause a major effect on the PJM import limits, import levels will be modified if it is further deemed that such redispatch would significantly impact the stability margin at the Hope Creek/Salem complex.

Critical cases will be tested under 75% and peak load level conditions to ensure unit and system stability under these load levels and PJM import levels.

1. Machine Representation

The transient stability analysis will be based on generator unit and unit transformer data used by PJM which is most current and appropriate and categorized as follows:

a. PJM Units

- synchronous rotor data
- excitation system data
- governor system data

b. Individual Outside World Units - as above with at least synchronous rotor data.

c. Equivalent Outside World Units - buses without specific machine data available. Develop a classical representation based on a "unit machine" concept for which the number of unit machines on a bus would be a function of the total net MW generation (generation minus load) on an equivalent bus divided by the MW size of the unit machine (i.e. a bus having a net 2000 MW of generation would have data developed for five machines based on a unit machine of 400 MW).

2. Generator Terminal Representation

The Hope Creek and Salem generator terminal buses will be represented explicitly with the unit MW and MVAR gross output and with auxiliary load represented. Station use at major generating stations electrically close to the Hope Creek/Salem complex will also be represented in this manner.

3. System Load Representation

The representation of system load will be:

a. MW load constant current

b. MVAR load constant impedance

c. underlying system capacitors will be netted with load

d. PJM 500-kV and 230-kV switched capacitors will be modelled explicitly. The capacitors will be switched on for the peak and 70% load levels and switched off for the 40% load level.

4. Stability Simulations

a. Stability simulation with unscheduled transmission contingencies with Hope Creek and Salem units at full MW output for three-phase faults with primary clearing and single-phase faults with delayed clearing:

- fault at Hope Creek end of Hope Creek-Keeney (5015) 500-kV

- fault at Hope Creek end of Hope Creek-New Freedom (5023) 500-kV

- fault at Hope Creek end of Hope Creek-Salem (5037) 500-kV
- fault at Salem end of Salem-Deans (5021) 500-kV
- fault at Salem end of Salem-New Freedom (5024) 500 kV

If any simulations are unstable:

- MVAR output will be increased until stability is reached
- MW output will be decreased only if MVAR and/or voltage limitations are exceeded

b. Stability simulations with scheduled transmission outages:

- Redo the above fault analysis for conditions simulating 500-kV line maintenance outages for each of the Hope Creek and Salem Switching Station outlets and also for the maintenance outage of the Keeney-Peach Bottom 500-kV line and the Deans-Branchburg 500 kV line. Where appropriate, outages of more distant lines will be included in the analysis.

c. Stability simulations with the following Hope Creek 500kV circuit breaker scheduled out for maintenance:

Same procedure as "a".

Hope Creek 500 kV Breaker Maintenance Outage

CB #	Faulted Line*	Desig.	Remaining Hope Creek Outlets
60X	HC-NF	5023	HC-SLM
61X	HC-SLM	5037	HC-NF
50X	HC-KNY	5015	HC-SLM
	HC-SLM	5037	HC-NF & HC-KNY
51X	HC-SLM	5037	HC-NF
52X	HC-KNY	5015	HC-NF
	HC-NF	5023	HC-KNY & HC-SLM

*Fault on HC end of line.

IV. EXPECTED RESULTS

a. The following exhibits will be prepared to demonstrate the transient performance of the Hope Creek and Salem units:

- power versus rotor angle
- rotor angle versus time (to 4 seconds)

Also, rotor angle versus time (to 4 seconds) exhibits for the following selected units will be provided to demonstrate system transient stability:

500-kV Peach Bottom
Susquehanna
Keystone/Conemaugh

230-kV Oyster Creek
Edge Moor

138-kV England

b. Generating unit capability curves for Hope Creek No. 1 and Salem Nos. 1 and 2 will be prepared to show the unit operating limits for all probable system voltages.

JP/RAL:lh
8/7/85

APPENDIX 6

TRANSIENT STABILITY SIMULATION

MACHINE DATA

SYNCHRONOUS ROTOR DATA

BUS	NAME	XPRIMD (PU)	XQ (PU)	XD (PU)	XL (PU)	H MWS/MVA	AS	BS	TPRIMDO	TORQUE (MW)	TERMINAL VOLTAGE MAGNITUDE	TERMINAL VOLTAGE ANGLE	EPRIMD (PU)
396	EDDYSTG1	0.1307	0.7270	0.7330	0.0710	2.93	0.159	9.800	4.77	80.0	0.960	-8.68	0.8704
396	EDDYSTG1	0.1638	0.7030	0.7080	0.0780	18.72	0.013	8.060	4.30	80.0	0.960	-8.68	0.8918
397	EDDYSTG2	0.1154	0.7980	0.8370	0.0550	10.57	0.015	8.750	9.70	80.0	0.958	-7.92	0.8411
397	EDDYSTG2	0.1154	0.7980	0.8370	0.0550	10.57	0.015	8.750	9.70	80.0	0.958	-7.92	0.8411
343	CONO7-13	0.7700	1.4750	2.5250	0.5000	1.48	0.069	6.933	6.00	31.0	1.078	-8.12	1.0668
1117	IND RIV 1	0.1749	1.5420	1.5830	0.0710	4.12	0.037	7.520	6.73	30.0	1.021	-4.94	0.9607
1128	IND RIV 3	0.1300	0.7798	0.8170	0.0770	6.28	0.017	8.342	3.80	50.0	1.000	-5.44	0.7949
1086	DELA CITY 1	0.8750	5.8630	5.2500	0.3560	1.18	0.021	6.843	3.60	27.0	1.061	-3.53	0.8463
1087	DELA CITY 2	0.8750	5.8630	5.2500	0.3560	1.18	0.021	6.843	3.60	27.0	1.061	-3.53	0.8463
6	CCLIF G1 500	0.0355	0.1545	0.1658	0.0211	44.83	0.010	9.640	7.20	548.0	1.006	1.25	0.8275
7	CCLIF G2 500	0.0448	0.1635	0.1675	0.0236	33.57	0.020	7.480	5.95	468.0	1.006	0.94	0.8512
10	CONEMAUGHG1	0.0474	0.3211	0.3358	0.0294	7.39	0.021	8.047	4.20	262.0	0.978	15.12	0.8188
10	CONEMAUGHG1	0.0567	0.3374	0.3576	0.0303	28.97	0.024	8.130	8.60	238.0	0.978	15.12	0.8382
126	CONEMAUGHG2	0.0474	0.3211	0.3358	0.0294	7.39	0.021	8.047	4.20	262.0	0.978	15.12	0.8188
126	CONEMAUGHG2	0.0567	0.3374	0.3576	0.0303	28.97	0.024	8.130	8.60	238.0	0.978	15.12	0.8382
17	KEYSTONE G1	0.0564	0.3441	0.3459	0.0332	6.71	0.028	6.931	5.11	255.0	0.975	16.62	0.8419
17	KEYSTONE G1	0.0769	0.3304	0.3393	0.0386	19.38	0.009	8.524	6.85	245.0	0.975	16.62	0.8923
125	KEYSTONE G2	0.0564	0.3441	0.3459	0.0332	6.71	0.028	6.931	5.11	255.0	0.975	16.62	0.8418
125	KEYSTONE G2	0.0769	0.3304	0.3393	0.0386	19.38	0.009	8.524	6.85	245.0	0.975	16.62	0.8923
20	PCH STG2	0.0281	0.1281	0.1359	0.0164	52.51	0.009	9.090	7.30	1093.0	0.960	5.52	0.7444
25	SALEM G1	0.0394	0.1590	0.1630	0.0192	46.15	0.013	9.360	6.12	1123.0	1.017	11.12	1.0362
26	SALEM G2	0.0312	0.1277	0.1346	0.0165	51.50	0.012	7.000	6.90	1162.0	1.016	11.43	0.9998
38	HOPE CREEK	0.0312	0.1277	0.1346	0.0165	48.30	0.012	7.000	6.90	1100.0	1.020	11.86	1.0044
55	ERIE SO. 115	0.3360	1.2200	1.2200	0.3090	4.82	0.020	8.080	6.40	14.0	1.034	7.10	1.0279
74	HOMER CTY 1G	0.0479	0.2587	0.2617	0.0295	20.12	0.035	7.799	5.60	300.0	1.016	13.63	0.8404
73	HOMER CTY G3	0.0357	0.2459	0.2569	0.0199	18.95	0.016	8.581	4.08	330.0	1.013	15.54	0.8525
99	SENECA GEN	0.0957	0.1716	0.2878	0.0689	31.57	0.020	8.000	9.50	-450.0	1.020	-14.47	1.2458
101	SEWARD 115	0.1105	0.5950	0.6140	0.0798	11.65	0.030	7.850	6.45	60.0	1.039	8.52	0.9977
104	SHAMVIL G230	0.1247	0.7468	0.7879	0.0723	5.48	0.015	8.287	3.90	130.0	0.989	8.17	0.9123
104	SHAMVIL G230	0.1247	0.7468	0.7879	0.0723	5.48	0.015	8.287	3.90	130.0	0.989	8.17	0.9123
106	SHAMVILLE 18	0.1056	0.9200	0.9520	0.0600	6.08	0.012	8.614	5.60	60.0	1.025	5.47	1.0166
106	SHAMVILLE 18	0.1056	0.9200	0.9520	0.0600	6.08	0.024	7.035	5.60	60.0	1.025	5.47	1.0166
164	PORTLND G11S	0.1672	1.5588	1.6373	0.0882	2.48	0.020	7.620	5.60	31.5	1.050	-10.32	1.0318
164	PORTLND G11S	0.2530	1.2380	1.2900	0.1100	5.32	0.021	8.157	5.00	31.5	1.050	-10.32	1.0691
165	PORTLND G230	0.1283	1.1000	1.1408	0.0700	3.63	0.022	8.591	5.60	72.5	1.030	-9.31	0.9465
165	PORTLND G230	0.2127	1.0733	1.1267	0.0933	8.98	0.029	6.999	6.30	72.5	1.030	-9.31	0.9962
205	OYSTR CK GEN	0.0545	0.2371	0.2502	0.0305	33.92	0.018	6.860	5.70	620.0	0.983	0.58	0.8809
220	YARDS CK GEN	0.1552	0.2642	0.3944	0.1074	14.22	0.049	5.915	12.00	-411.0	1.028	-21.74	1.2198
236	BRUNNER1 100	0.0796	0.4260	0.4341	0.0486	12.71	0.043	6.243	4.48	123.0	0.999	-2.38	0.9291
237	BRUNNER2 100	0.0663	0.3640	0.3716	0.0407	14.10	0.013	10.437	5.40	125.0	0.999	-2.83	0.9423
238	BRUNNER3 100	0.0363	0.2104	0.2212	0.0238	21.82	0.054	5.394	4.00	359.0	0.999	-2.02	0.7954
283	MONTOUR1 100	0.0296	0.2170	0.2279	0.0179	21.34	0.021	7.617	4.20	358.0	0.982	5.94	0.8088
284	MONTOUR2 100	0.0291	0.2198	0.2308	0.0176	24.48	0.022	7.450	4.30	455.0	0.982	6.92	0.7537
289	MTN CRK1 100	0.1100	0.8364	0.8710	0.0544	5.48	0.058	3.710	5.90	83.0	1.018	-5.83	0.9524
290	MTN CRK2 100	0.1057	0.8704	0.9048	0.0510	5.61	0.059	3.710	6.20	83.0	0.994	-7.10	0.6814
327	SUSQUHN1 100	0.0328	0.1297	0.1359	0.0176	44.60	0.026	4.581	6.70	760.0	1.006	4.75	0.8025
342	LIM G1-22	0.0352	0.1338	0.1398	0.0198	46.81	0.018	7.950	6.10	1093.0	0.973	2.27	0.8703
335	CROMBY81	0.0752	0.7910	0.7910	0.0674	7.68	0.037	6.900	6.00	60.0	1.025	-7.27	0.9528
221	MUDDYRN1,2	0.0710	0.1455	0.2318	0.0323	13.42	0.038	0.078	7.00	-240.0	0.965	-18.48	0.9491
222	MUDDYRN3,4	0.0710	0.1455	0.2318	0.0323	13.42	0.038	0.078	7.00	-240.0	0.967	-17.88	0.9512

* BASE - 100 MVA AND MACHINE TERMINAL BUS VOLTAGE

SYNCHRONOUS ROTOR DATA

BUS	NAME	XPRIMD (PU)	XQ (PU)	XD (PU)	XL (PU)	H MWS/MVA	AG	BG	TPRIMDO	TORQUE (MW)	TERMINAL MAGNITUDE	VOLTAGE ANGLE	EPRIMQ (PU)
223	MUDDYRMS.6	0.0710	0.1455	0.2318	0.0323	13.42	0.038	0.078	7.00	-240.0	0.967	-17.94	0.9511
224	MUDDYRNT.8	0.0710	0.1455	0.2318	0.0323	13.42	0.038	0.078	7.00	-240.0	0.967	-17.94	0.9511
575	BERGEN 138	0.0736	0.3801	0.4230	0.0736	12.96	0.017	8.730	4.04	75.0	1.032	-20.60	1.0660
575	BERGEN 138	0.0736	0.3801	0.4230	0.0736	12.96	0.017	8.730	4.04	75.0	1.032	-20.60	1.0660
584	BURLNGTN GEN	0.0850	0.5788	0.6270	0.0850	9.43	0.030	8.550	5.35	15.0	1.050	-14.70	1.1461
619	HUDSON G1	0.0449	0.3170	0.3210	0.0449	18.70	0.020	8.000	5.20	135.0	0.979	-20.00	0.8232
620	HUDSON G2	0.0471	0.2590	0.2628	0.0471	27.92	0.020	8.000	5.63	275.0	0.982	-16.16	0.5399
641	LINDEN GEN	0.0906	0.5688	0.6220	0.0697	7.77	0.089	10.088	7.30	64.5	1.050	-19.08	1.0805
641	LINDEN GEN	0.0906	0.5688	0.6220	0.0697	7.77	0.089	10.088	7.30	64.5	1.050	-19.08	1.0805
655	MERCER G1	0.0875	0.8280	0.8400	0.0844	8.53	0.017	8.730	5.90	67.5	0.992	-9.50	0.8823
655	MERCER G1	0.0875	0.8280	0.8400	0.0844	9.10	0.017	8.730	5.90	67.5	0.992	-9.50	0.8823
656	MERCER G2	0.0875	0.8280	0.8400	0.0844	8.53	0.017	8.730	5.90	67.5	0.992	-9.50	0.8823
656	MERCER G2	0.0875	0.8280	0.8400	0.0844	9.10	0.017	8.730	5.90	67.5	0.992	-9.50	0.8823
683	SEWAREN 138	0.1128	1.1050	1.1168	0.0	5.25	0.0	0.0	0.0	15.0	1.041	-19.04	1.0139
683	SEWAREN 138	0.1148	1.0148	1.0350	0.0	7.38	0.0	0.0	0.0	15.0	1.041	-19.04	1.0162
767	ZORANEB1 115	0.1272	0.7768	0.8125	0.0737	6.05	0.019	8.699	3.70	120.0	1.034	-5.57	1.1015
786	ZWAG G3 115	0.0520	0.2660	0.2788	0.0446	24.88	0.030	7.460	6.10	130.0	0.993	-8.57	1.0577
828	CHALK PT GN1	0.0784	0.7521	0.7816	0.0442	9.90	0.020	8.500	5.80	79.5	1.045	-0.78	0.9708
828	CHALK PT GN1	0.0784	0.7521	0.7816	0.0442	10.88	0.020	8.500	5.80	79.5	1.045	-0.78	0.9708
829	CHALK PT GN2	0.0784	0.7521	0.7816	0.0442	9.90	0.020	8.500	5.80	79.5	1.045	-0.84	0.9712
829	CHALK PT GN2	0.0784	0.7521	0.7816	0.0442	10.88	0.020	8.500	5.80	79.5	1.045	-0.84	0.9712
830	CHALK PT GN3	0.0373	0.2586	0.2788	0.0215	17.79	0.020	8.580	4.08	111.0	1.045	-2.24	1.0401
831	CHALK PT GN4	0.0373	0.2586	0.2788	0.0215	18.81	0.020	8.580	4.08	111.0	1.045	-2.15	0.8987
833	DICKERSN GN1	0.1626	1.4435	1.5130	0.0870	2.58	0.020	9.088	5.48	35.0	1.015	-2.76	1.0363
833	DICKERSN GN1	0.2583	1.2435	1.2957	0.1087	7.71	0.020	9.000	5.10	35.0	1.015	-2.76	1.0855
834	DICKERSN GN2	0.1626	1.4435	1.5130	0.0870	2.58	0.020	9.000	5.48	35.0	1.015	-2.79	1.0368
834	DICKERSN GN2	0.2583	1.2435	1.2957	0.1087	7.71	0.020	9.000	5.10	35.0	1.015	-2.79	1.0861
835	DICKERSN GN3	0.1626	1.4435	1.5130	0.0870	2.58	0.020	9.000	5.48	35.0	1.015	-2.74	1.0355
835	DICKERSN GN3	0.2583	1.2435	1.2957	0.1087	7.71	0.020	9.000	5.10	35.0	1.015	-2.74	1.0845
839	MORGANTN GN1	0.0447	0.2573	0.2644	0.0257	22.44	0.020	8.580	3.90	179.0	1.026	-1.65	0.9598
840	MORGANTN GN2	0.0447	0.2573	0.2644	0.0257	22.46	0.020	8.580	3.90	180.0	1.026	-1.59	0.9728
852	POTOMAC G-2	0.1928	1.1058	1.1688	0.0797	4.98	0.020	8.080	6.10	36.0	0.998	-3.93	0.9168
853	POTOMAC G-3	0.1299	1.1994	1.2561	0.0788	4.66	0.020	7.000	5.90	31.0	0.998	-2.97	0.9291
854	POTOMAC G-4	0.1299	1.1994	1.2561	0.0788	4.66	0.020	7.000	5.90	31.0	0.990	-3.85	0.9229
855	POTOMAC G-5	0.1299	1.1994	1.2561	0.0788	4.66	0.020	7.000	5.90	31.0	0.998	-4.65	0.9102
915	O/W #1 GEN	0.1780	1.3210	1.3878	0.1469	3.64	0.020	8.000	6.00	78.0	1.025	-5.82	0.9207
916	O/W 11KV-0	0.1780	1.3210	1.3878	0.1469	3.64	0.020	8.000	6.00	49.0	0.958	-5.13	0.7672
924	ENGLAND81	0.1048	1.0108	1.0488	0.0	6.37	0.0	0.0	0.0	70.0	1.056	-12.13	1.0645
925	ENGLAND82	0.1469	0.8288	0.8598	0.0	6.91	0.0	0.0	0.0	68.0	1.056	-12.94	1.0789
1898	EDGE MOOR 3	0.2298	1.6398	1.7118	0.0968	2.47	0.036	7.262	5.68	27.8	1.000	-5.82	1.0383
1899	EDGE MR 4	0.1298	0.7758	0.8098	0.0748	6.42	0.017	8.342	3.88	58.0	1.000	-6.15	1.0441
1121	DNB RIV 4	0.0718	0.3648	0.3848	0.0348	11.93	0.030	7.520	4.78	68.0	1.000	-5.78	0.9337
1100	EDGE MR 5	0.0578	0.3528	0.3558	0.0328	15.46	0.039	6.264	5.24	79.0	1.000	-7.63	1.0447
1197	01ALBRIG	0.1208	0.1208	0.1208	0.0	10.00	0.0	0.0	0.0	180.0	0.982	5.13	1.1189
1207	01BELMON	0.0362	0.2078	0.2178	0.0228	16.46	0.031	7.638	5.08	1008.0	1.050	20.24	0.8686
1239	01FTMART	0.0458	0.2648	0.2778	0.0274	20.25	0.006	13.198	3.68	545.0	1.050	18.69	0.8280
1239	01FTMART	0.0458	0.2648	0.2778	0.0274	20.25	0.006	13.198	3.68	545.0	1.050	18.69	0.8280
1246	01HARRIS	0.0459	0.2368	0.2398	0.0284	22.06	0.034	8.198	5.23	900.0	1.050	19.14	0.8414
1246	01HARRIS	0.0459	0.2368	0.2398	0.0284	22.06	0.034	8.198	5.23	900.0	1.050	19.14	0.8414
1267	01MITCHE	0.0708	0.0708	0.0708	0.0	11.58	0.0	0.0	0.0	285.0	0.995	9.28	1.0198

* BASE - 100 MVA AND MACHINE TERMINAL BUS VOLTAGE

SYNCHRONOUS ROTOR DATA

BUS	NAME	XPRIMD (PU)	XQ (PU)	XD (PU)	XL (PU)	H MWS/MVA	AG	BG	TPRIMDO	TORQUE (MW)	TERMINAL MAGNITUDE	VOLTAGE ANGLE	EPRIMD (PU)
1333	04ASHTEL	0.0659	0.0659	0.0659	0.0	22.04	0.0	0.0	0.0	405.0	1.018	6.28	1.2170
1336	04AVON	0.0562	0.0562	0.0562	0.0	25.57	0.0	0.0	0.0	352.0	1.007	2.73	1.1115
1447	AK 2 3 20	0.1139	0.7732	0.8168	0.0668	3.84	0.043	5.570	4.00	88.1	1.000	-30.79	1.0894
1447	AK 2 3 20	0.1593	0.7301	0.7566	0.0796	15.59	0.021	7.250	5.10	96.9	1.000	-30.79	1.1488
1448	AK 3 3 22	0.0445	0.2848	0.2941	0.0261	22.61	0.021	7.720	4.10	461.0	1.030	-20.44	1.0591
1451	AST 3 3 20	0.1139	0.7723	0.8168	0.0668	3.84	0.043	5.570	4.00	162.8	1.000	-29.43	1.0034
1451	AST 3 3 20	0.1593	0.7301	0.7566	0.0796	15.59	0.022	7.090	5.10	179.2	1.000	-29.43	1.0827
1452	AST 4 3 20	0.0965	0.6454	0.6630	0.0502	5.21	0.030	7.660	6.06	179.9	1.000	-29.64	1.0962
1452	AST 4 3 20	0.1638	0.7930	0.8192	0.1038	16.48	0.007	9.530	5.91	170.1	1.000	-29.64	1.2383
1453	AST 5 3 20	0.0965	0.6454	0.6630	0.0502	5.21	0.048	6.550	5.31	181.4	1.000	-29.57	0.9919
1453	AST 5 3 20	0.1638	0.7930	0.8192	0.1038	16.48	0.041	7.700	5.90	171.6	1.000	-29.57	1.0930
1531	RAV 1 3 20	0.1274	0.7453	0.7783	0.0731	3.39	0.017	7.688	3.60	176.0	1.000	-24.18	1.0263
1531	RAV 1 3 20	0.1364	0.6570	0.6736	0.0640	15.97	0.025	7.490	7.30	196.0	1.000	-24.18	1.0518
1247	01MATFLD	0.0510	0.2910	0.2940	0.0330	24.87	0.020	9.840	5.58	510.0	1.050	17.72	0.9048
1247	01MATFLD	0.0510	0.2910	0.2940	0.0330	24.87	0.020	9.840	5.58	495.0	1.050	17.72	0.9067
1247	01MATFLD	0.0510	0.2910	0.2940	0.0330	24.87	0.020	9.840	5.58	495.0	1.050	17.72	0.9067
1532	RAV 2 3 20	0.0623	0.0623	0.0623	0.0	15.45	0.0	0.0	0.0	378.0	1.000	-24.21	1.1421
1582	PT. JEFF2138	0.0400	0.0400	0.0400	0.0	50.00	0.0	0.0	0.0	947.0	1.010	-8.18	1.1769
1323	15BEAVR	0.0566	0.0566	0.0566	0.0	33.24	0.0	0.0	0.0	1695.0	1.015	19.53	1.4179
1335	04AVON	0.0428	0.2366	0.2391	0.0285	25.57	0.012	6.990	5.17	650.0	1.000	6.46	1.0364
1341	04EASTLK	0.0331	0.2328	0.2421	0.0205	22.15	0.005	8.500	3.50	650.0	1.000	10.32	0.8748
1342	04EASTLK	0.0331	0.2328	0.2421	0.0205	22.15	0.005	8.500	3.50	611.0	1.025	5.10	1.0096
1438	04PERRY	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1205.0	1.010	11.42	1.1632
1663	ALBY STM3 13	0.0325	0.2555	0.2675	0.0188	19.04	0.017	9.160	5.08	388.0	1.000	-3.51	0.8979
1700	DUNKGEN33 13	0.0794	0.6258	0.6528	0.0428	10.97	0.019	8.620	5.50	210.0	1.000	26.70	0.8768
1701	DUNKGEN43 13	0.0794	0.6258	0.6528	0.0428	10.97	0.019	8.620	5.50	210.0	1.000	26.70	0.8768
1704	DUNK115G3 13	0.0965	0.0965	0.0965	0.0	5.98	0.0	0.0	0.0	197.0	1.000	30.23	1.1009
1724	HNTLY23.3 23	0.0623	0.0623	0.0623	0.0	15.45	0.0	0.0	0.0	388.0	1.004	26.99	1.0208
1725	HNTLY67G3 13	0.0794	0.6258	0.6528	0.0428	10.97	0.019	8.620	5.50	210.0	1.023	33.06	0.9660
1726	HNTLY68G3 13	0.0794	0.6258	0.6528	0.0428	10.97	0.019	8.620	5.50	210.0	1.023	33.10	0.9662
1503	IND PT 23 22	0.0386	0.1750	0.1810	0.0340	46.28	0.023	7.480	6.66	884.0	1.030	-11.17	1.0601
1533	RAV 3 3 22	0.0726	0.3720	0.3750	0.0630	6.90	0.043	7.480	6.53	422.1	1.030	-20.35	1.1341
1533	RAV 3 3 22	0.0540	0.3120	0.3240	0.0500	41.10	0.043	7.480	9.47	457.2	1.030	-20.35	1.1547
1768	OSWEGO 33345	0.0700	0.0700	0.0700	0.0	11.96	0.0	0.0	0.0	840.0	1.055	32.45	1.3617
1768	OSWEGO 33345	0.0546	0.2174	0.2191	0.0232	27.30	0.020	10.010	5.23	840.0	1.055	32.45	1.1412
1835	9MI PT 1G3 23	0.0736	0.2669	0.2839	0.0308	34.80	0.020	7.840	6.70	592.0	1.025	37.89	1.0249
1837	9MI PT 73765	0.0311	0.1259	0.1326	0.0165	48.47	0.009	9.365	6.80	1000.0	1.038	36.04	0.9065
1844	BOMLINE 3 20	0.0471	0.2490	0.2560	0.0247	18.97	0.013	3.670	3.40	600.0	1.086	-0.01	0.9541
1879	AST6 GEN3 26	0.0394	0.1917	0.1927	0.0243	27.30	0.027	7.710	4.61	208.0	1.020	-30.36	1.0897
1849	BOMLIN203 20	0.0471	0.2490	0.2560	0.0247	18.97	0.013	3.670	3.40	600.0	1.050	0.68	0.8584
1890	MOSES 1 1115	0.0593	0.1238	0.4038	0.0423	15.18	0.028	8.460	5.00	488.0	1.029	28.95	0.9931
1891	MOSES 2 1230	0.0593	0.1238	0.4038	0.0423	15.18	0.028	8.460	5.00	488.0	1.030	30.40	1.0957
1894	MIAG115H2115	0.0444	0.1074	0.1874	0.0314	25.62	0.026	8.450	5.00	487.0	1.052	28.68	1.1454
1916	GINMA1152115	0.0480	0.0480	0.0480	0.0	28.80	0.0	0.0	0.0	468.8	1.035	22.37	1.1237
1952	MFLD 1+22 13	0.1106	0.2936	0.4170	0.0851	21.38	0.040	6.820	11.00	193.2	1.043	-1.54	1.2239
1963	LAKEVIEW1 18	0.0300	0.0300	0.0300	0.0	63.00	0.0	0.0	0.0	1663.0	1.050	35.89	1.2663
1979	DANSKAMA2115	0.0623	0.0623	0.0623	0.0	15.45	0.0	0.0	0.0	332.8	1.020	-14.02	1.1125
1681	CHAT 7651765	0.0450	0.0450	0.0450	0.0	47.00	0.0	0.0	0.0	800.0	1.050	32.34	1.2147
2116	POSSUM	0.0623	0.0623	0.0623	0.0	15.45	0.0	0.0	0.0	30.0	1.000	-6.59	1.0253
2117	POSSUM	0.0623	0.0623	0.0623	0.0	15.45	0.0	0.0	0.0	294.0	1.000	-6.88	1.0877

* BASE - 100 MVA AND MACHINE TERMINAL BUS VOLTAGE

SYNCHRONOUS ROTOR DATA

BUS	NAME	XPRIMD (PU)	XD (PU)	XQ (PU)	XL (PU)	H MWS/MVA	AS	BD	TPRIMDO	TORQUE (MW)	TERMINAL MAGNITUDE	VOLTAGE ANGLE	EPRIMD (PU)
1882	FITZ 3451345	0.0400	0.1900	0.2020	0.0232	43.50	0.011	8.500	7.80	821.0	1.045	31.52	1.0128
1573	YORKTOWN	0.0752	0.7520	0.7520	0.0	7.60	0.0	0.0	0.0	66.0	1.003	-12.07	1.0525
1574	YORKTOWN	0.0752	0.7520	0.7520	0.0	7.60	0.0	0.0	0.0	101.0	1.000	-14.37	1.0083
2151	02MANSFL	0.0177	0.0177	0.0177	0.0	61.64	0.0	0.0	0.0	2475.0	1.015	19.45	1.1868
2158	02SAMMIS	0.0205	0.0205	0.0205	0.0	84.60	0.0	0.0	0.0	1900.0	1.015	18.25	1.1403
2165	03DAV-BE	0.0460	0.0460	0.0460	0.0	46.18	0.0	0.0	0.0	904.0	1.015	6.56	1.1650
2172	BRUNSW 2	0.0580	0.0580	0.0580	0.0	40.00	0.0	0.0	0.0	790.0	1.000	-2.12	1.0790
2207	MARSHALL	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	332.0	1.010	3.03	1.0287
2207	MARSHALL	0.0300	0.0300	0.0300	0.0	500.00	0.0	0.0	0.0	1328.0	1.010	3.03	1.1234
2210	OCONEE 2	0.0300	0.0300	0.0300	0.0	500.00	0.0	0.0	0.0	1488.0	1.000	8.32	1.1568
2210	OCONEE 2	0.0250	0.0250	0.0250	0.0	90.00	0.0	0.0	0.0	372.0	1.000	8.32	1.0183
2236	STUART	0.0050	0.0050	0.0050	0.0	1150.00	0.0	0.0	0.0	777.0	1.025	11.00	1.0428
2237	06CLIFTY	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	184.0	1.026	15.23	1.0195
2237	06CLIFTY	0.0050	0.0050	0.0050	0.0	1150.00	0.0	0.0	0.0	1654.0	1.026	15.23	1.0184
2285	19FERMI	0.0050	0.0050	0.0050	0.0	1150.00	0.0	0.0	0.0	983.7	1.025	8.64	1.0299
2285	19FERMI	0.0320	0.0320	0.0320	0.0	67.33	0.0	0.0	0.0	189.3	1.025	8.64	1.0283
2286	19SC 67	0.0400	0.0400	0.0400	0.0	46.36	0.0	0.0	0.0	788.0	1.030	7.08	1.2136
2348	05JE AMO	0.0187	0.0187	0.0187	0.0	91.22	0.0	0.0	0.0	1708.0	0.980	18.47	1.1078
1883	6ILB 3451345	0.0225	0.0542	0.0842	0.0162	74.40	0.020	7.870	15.00	996.0	1.035	2.04	1.1065
1885	IND PT 33 22	0.0386	0.1750	0.1810	0.0340	46.20	0.023	7.400	6.66	1033.0	1.030	-10.37	1.1032
1892	MIAG 2301230	0.0400	0.0400	0.0400	0.0	50.00	0.0	0.0	0.0	974.0	1.035	28.58	1.2189
1893	MIAG1LSE2115	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	658.0	1.052	26.89	1.2212
2349	05JE AMO	0.0300	0.0300	0.0300	0.0	80.00	0.0	0.0	0.0	18.0	1.013	15.19	1.0129
2349	05JE AMO	0.0050	0.0050	0.0050	0.0	1150.00	0.0	0.0	0.0	162.0	1.013	15.19	1.0129
2353	05KAMMER	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	780.0	1.000	16.72	1.1221
2354	05KAMMER	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	780.0	0.975	17.47	1.0423
2361	05MOUNTN	0.0350	0.0350	0.0350	0.0	80.00	0.0	0.0	0.0	130.0	0.980	20.70	0.9659
2361	05MOUNTN	0.0050	0.0050	0.0050	0.0	1150.00	0.0	0.0	0.0	1170.0	0.980	20.70	0.9622
2002	ROSETON 1345	0.0590	0.2680	0.2796	0.0434	19.47	0.017	7.680	4.00	1200.0	1.020	-4.12	0.9369
2379	05TANNER	0.0480	0.0480	0.0480	0.0	28.00	0.0	0.0	0.0	552.0	1.010	9.44	0.9586
2016	BATH CDU	0.0300	0.0300	0.0300	0.0	63.00	0.0	0.0	0.0	1840.0	1.058	15.58	1.1910
2032	CHESTERF	0.0357	0.2130	0.2220	0.0240	24.45	0.020	8.200	4.00	991.0	1.009	-4.57	0.8811
2099	MDR ANNA	0.0432	0.1550	0.1590	0.0219	32.80	0.013	9.450	6.00	616.4	1.043	2.41	0.9890
2099	MDR ANNA	0.0432	0.1550	0.1590	0.0219	32.80	0.013	9.450	6.00	616.4	1.043	2.41	0.9890
2099	MDR ANNA	0.0433	0.1570	0.1660	0.0231	41.50	0.013	9.250	5.90	635.1	1.043	2.41	0.9856
1541	SURRY 23	0.0435	0.1753	0.1805	0.0221	24.10	0.020	7.500	6.71	775.0	1.017	-5.77	1.0532
1542	SURRY 50	0.0435	0.1753	0.1805	0.0221	24.10	0.020	7.500	6.71	775.0	1.035	-3.47	0.9366
2810	RAR RVR 1156	0.0734	0.3395	0.3530	0.0561	18.17	0.024	7.513	4.73	38.0	1.025	-16.18	1.0485
2164	03BAYSHO	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	558.0	0.995	0.52	1.0872
2171	BRUNSW 1	0.0380	0.0380	0.0380	0.0	52.00	0.0	0.0	0.0	790.0	1.000	-1.98	1.0527
2175	MAYO	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	720.0	1.020	4.22	0.9971
2178	ROB 230	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	665.0	1.020	-9.46	1.1417
2179	ROX SE	0.0200	0.0200	0.0200	0.0	120.00	0.0	0.0	0.0	2495.0	1.020	4.53	1.2077
2202	BELEWS C	0.0200	0.0200	0.0200	0.0	120.00	0.0	0.0	0.0	2280.0	1.010	3.78	1.1918
2203	CATAWBA	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1145.0	1.010	0.36	1.2630
2206	JOCASSEE	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	610.0	1.001	8.13	1.1182
2208	MCGUIRE	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1285.0	1.010	1.81	1.2647
2209	MCGUIRE	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1188.0	1.042	4.72	1.2093
2211	OCONEE 5	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	660.0	1.040	8.77	1.1865
2218	A.M.HILL	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	500.0	1.030	-16.00	1.1727

* BASE - 100 MVA AND MACHINE TERMINAL BUS VOLTAGE

SYNCHRONOUS ROTOR DATA

BUS	NAME	XPRIMD (PU)	XQ (PU)	XD (PU)	XL (PU)	H MWS/MVA	AG	BG	TPRIMDO	TORQUE (MW)	TERMINAL VOLTAGE MAGNITUDE	TERMINAL VOLTAGE ANGLE	EPRIMD (PU)
2221	SUMMER	0.0400	0.0400	0.0400	0.0	50.00	0.0	0.0	0.0	900.0	1.040	-3.50	1.1201
2223	WATERTEE	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	700.0	1.030	-7.17	1.1432
2230	MINYAM	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	800.0	1.040	-9.97	1.1211
2238	06KYGER	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1020.0	1.001	13.07	1.1784
2248	16CHESHC	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	562.0	1.008	8.11	1.1079
2283	18LUDING	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1510.0	1.049	16.56	1.1502
2286	19[illegible]12	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1500.0	1.030	8.64	1.2600
2287	19MCNP34	0.0350	0.0350	0.0350	0.0	60.00	0.0	0.0	0.0	1500.0	1.030	7.95	1.2490
2326	05DC COO	0.0397	0.0397	0.0397	0.0	51.60	0.0	0.0	0.0	420.0	1.000	7.75	0.9871
2326	05DC COO	0.0397	0.0397	0.0397	0.0	99.70	0.0	0.0	0.0	630.0	1.000	7.75	0.9914
2327	05DC COO	0.0320	0.0320	0.0320	0.0	67.00	0.0	0.0	0.0	1050.0	1.030	6.75	1.1336
2339	05FM BAK	0.0390	0.0390	0.0390	0.0	28.50	0.0	0.0	0.0	850.0	1.010	17.17	1.0580
2341	05SAVIN	0.0170	0.0170	0.0170	0.0	104.80	0.0	0.0	0.0	2600.0	0.980	20.75	1.0878
2296	KAMMER 1	0.0450	0.0450	0.0450	0.0	45.00	0.0	0.0	0.0	420.0	1.009	14.00	1.1104
2380	05TIDD	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	500.0	1.004	16.01	1.1090
2381	05TIDD	0.0500	0.0500	0.0500	0.0	40.00	0.0	0.0	0.0	600.0	1.010	16.19	1.0540
1203	01ARMSTR	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	300.0	1.005	8.40	1.0768
1626	MILLIKEN2115	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	221.8	1.052	12.36	1.1169
1732	HUNT115G3 13	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	273.0	1.007	28.17	1.1104
1784	ROTRUM.13115	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	200.0	1.000	-6.06	1.1571
1856	LOVETT 13138	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	371.0	1.020	-17.25	1.0900
1964	L33P PS 1230	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	200.0	1.030	31.17	1.0201
1965	L34P PS 1230	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	200.0	1.030	31.17	1.0201
2022	BREMO	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	201.0	1.000	10.53	1.0054
2074	KERR	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	200.0	1.000	-2.98	1.0020
2182	SUT 230	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	371.0	1.000	-5.86	1.0535
2191	ASH SE	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	392.0	1.010	1.64	1.1019
2200	ALLEN	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	408.0	1.041	-2.33	1.1801
2201	ALLEN 23	0.0500	0.0500	0.0500	0.0	20.00	0.0	0.0	0.0	472.0	1.006	-0.02	1.1299
2205	HARTWELL	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	300.0	1.000	3.37	1.1225
2219	CANADY	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	300.0	1.030	-15.39	1.0953
2220	FAIRFIEL	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	408.0	1.041	-3.39	1.2020
2222	URQUHART	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	200.0	1.020	-11.28	1.1039
2229	CLARK HL	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	300.0	1.009	-4.61	1.0299
2318	05BREED	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	300.0	1.049	12.69	1.0525
2363	05RUSKNG	0.0500	0.0500	0.0500	0.0	20.00	0.0	0.0	0.0	468.0	1.000	12.21	1.0961
2370	05ROCKPR	0.0600	0.0600	0.0600	0.0	15.00	0.0	0.0	0.0	390.0	1.015	16.35	1.0413
2376	05SPNRAI	0.0700	0.0700	0.0700	0.0	10.00	0.0	0.0	0.0	350.0	1.054	13.34	1.0078

* BASE - 100 MVA AND MACHINE TERMINAL BUS VOLTAGE

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	KA	TA	VAMAX	VAMIN	KE	TE	TSE	AEX	BEX
396	EDDYSTG1	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
396	EDDYSTG1	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
397	EDDYSTG2	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.044	0.566	1.000	0.001600	1.465
397	EDDYSTG2	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.044	0.566	1.000	0.001600	1.465
343	CC#97-13	6	MD-C-ACT	0.05	0.0	4.00	0.0	1.000	1.918	0.0	0.005200	1.555
1117	IND RIV 1	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1120	IND RIV 3	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1086	DELA CITY 1	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1087	DELA CITY 2	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	CCLIF G1 500	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.037	0.278	0.952	0.005800	1.178
7	CCLIF G2 500	5	MAGN-AMP	400.00	0.02	6.08	-6.08	1.000	0.900	1.000	0.014200	1.600
10	CONEMAUGHG1	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.061	0.690	1.045	0.000100	2.460
10	CONEMAUGHG1	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.065	0.640	1.496	0.000100	2.605
126	CONEMAUGHG2	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.061	0.690	1.045	0.000100	2.460
126	CONEMAUGHG2	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.065	0.640	1.496	0.000100	2.605
17	KEYSTONE G1	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
17	KEYSTONE G1	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
125	KEYSTONE G2	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
125	KEYSTONE G2	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
20	PCH BT62	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.064	0.605	1.378	0.000094	2.580
25	SALEM G1	5	MAGN-AMP	400.00	0.02	9.55	-8.59	1.000	1.088	1.000	0.059000	1.100
26	SALEM G2	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.061	0.577	1.000	0.000105	2.430
38	HOPE CREEK	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.060	0.569	1.000	0.059000	1.100
55	ERIE SO. 115	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	HOMER CTY 1G	5	MAGN-AMP	400.00	0.02	7.55	-7.55	1.000	0.790	1.000	0.342785	0.595
73	HOMER CTY G3	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.063	0.626	1.020	0.000100	2.650
99	SENECA GEN	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
101	SEWARD 115	5	MAGN-AMP	150.00	0.15	3.50	-3.50	1.000	0.0	1.000	0.0	0.0
104	SHAMVIL G230	5	MAGN-AMP	150.00	0.15	5.50	-5.50	1.000	0.0	1.000	0.0	0.0
104	SHAMVIL G230	5	MAGN-AMP	150.00	0.15	5.50	-5.50	1.000	0.0	1.000	0.0	0.0
106	SHAMVILLE 1B	5	MAGN-AMP	150.00	0.15	4.40	-4.40	1.000	0.0	1.000	0.0	0.0
106	SHAMVILLE 1B	5	MAGN-AMP	150.00	0.15	4.40	-4.40	1.000	0.0	1.000	0.0	0.0
164	PORTLND G11S	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.567	0.350	0.001643	1.663
164	PORTLND G11S	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.059	0.648	0.350	0.001643	1.958
165	PORTLND G230	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.058	0.559	0.350	0.001643	1.638
165	PORTLND G230	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.567	0.350	0.001643	1.661
205	OYSTR CK GEN	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.027	0.253	1.000	0.005828	1.083
220	YARDS CK GEN	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.050	0.565	1.000	0.001643	1.654
236	BRUNNER1 100	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.176	0.984	1.000	0.003900	1.605
237	BRUNNER2 100	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.173	0.975	1.000	0.003900	1.590
238	BRUNNER3 100	5	MAGN-AMP	80.50	0.06	1.00	-1.00	-0.045	0.518	1.000	0.001680	1.498
283	MONTOUR1 100	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.043	0.484	0.968	0.001600	1.424
284	MONTOUR2 100	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.042	0.472	0.968	0.001600	1.390
289	MTN CRK1 100	3	AMPLDYNE	39.00	0.20	1.00	-1.00	-0.057	0.639	0.350	0.001600	1.870
290	MTN CRK2 100	3	AMPLDYNE	41.50	0.20	1.00	-1.00	-0.056	0.635	0.350	0.001600	1.850
327	SUSQUHN1 100	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.047	0.525	1.320	0.001600	1.522
342	LIM G1-22	5	MAGN-AMP	400.00	0.02	1.00	-1.00	-0.059	0.559	1.260	0.000147	2.374
385	CROMBYG1	5	MAGN-AMP	25.00	0.02	1.00	-1.00	-0.045	0.500	0.360	0.001600	1.445
221	MUDDYRN1,2	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
222	MUDDYRN3,4	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	KA	TA	VAMAX	VAMIN	KE	TE	TSE	AEX	BEX
223	MUDDYRN5,6	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
224	MUDDYRN7,8	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
575	BERGEN 138	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
575	BERGEN 138	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
584	BURLNGTN GEN	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
619	HUDSON G1	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.555
620	HUDSON G2	5	MAGN-AMP	400.00	0.02	8.20	-8.20	1.000	1.300	1.000	0.059000	1.000
641	LINDEN GEN	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
641	LINDEN GEN	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
655	MERCER G1	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
655	MERCER G1	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
656	MERCER G2	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
656	MERCER G2	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
683	SEWAREN 138	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
683	SEWAREN 138	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
767	ZCRANEG1 115	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.046	0.519	0.350	0.001600	1.522
786	ZMAG G3 115	5	MAGN-AMP	400.00	0.05	3.50	-3.50	-0.170	0.950	1.000	0.003900	1.560
828	CHALK PT GN1	5	MAGN-AMP	39.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
828	CHALK PT GN1	5	MAGN-AMP	39.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
829	CHALK PT GN2	5	MAGN-AMP	39.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
829	CHALK PT GN2	5	MAGN-AMP	39.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
830	CHALK PT GN3	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.062	0.589	1.020	0.000097	2.501
831	CHALK PT GN4	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.062	0.589	1.020	0.000097	2.501
833	DICKERSN GN1	3	AMPLDYNE	34.50	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
833	DICKERSN GN1	3	AMPLDYNE	34.25	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
834	DICKERSN GN2	3	AMPLDYNE	34.50	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
834	DICKERSN GN2	3	AMPLDYNE	34.25	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
835	DICKERSN GN3	5	MAGN-AMP	34.50	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.465
835	DICKERSN GN3	3	AMPLDYNE	34.25	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
839	MORGANTN GN1	5	MAGN-AMP	40.00	0.02	7.30	-7.30	1.000	0.800	1.000	0.120000	0.855
840	MORGANTN GN2	5	MAGN-AMP	40.00	0.02	7.30	-7.30	1.000	0.800	1.000	0.120000	0.855
852	POTOMAC G-2	6	NO-C-ACT	0.05	0.0	1.00	0.0	0.051	0.500	1.000	0.001050	1.465
853	POTOMAC G-3	6	NO-C-ACT	0.05	0.0	1.00	0.0	0.051	0.500	1.000	0.001050	1.465
854	POTOMAC G-4	6	NO-C-ACT	0.05	0.0	1.00	0.0	0.051	0.500	1.000	0.001050	1.465
855	POTOMAC G-5	6	NO-C-ACT	0.05	0.0	1.00	0.0	0.051	0.500	1.000	0.001050	1.465
915	O/W #1 GEN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
918	O/W 11KV-0	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
924	ENGLAND#1	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
925	ENGLAND#2	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1098	EDGE MOOR 3	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.465
1099	EDGE MR 4	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.044	0.500	1.000	0.001600	1.400
1121	IND RIV 4	3	AMPLDYNE	400.00	0.01	11.10	-2.60	1.000	0.410	0.160	2.150000	0.270
1188	EDGE MR 5	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1207	01BELMON	8	ROTAREGT	500.00	0.01	6.40	-6.40	1.000	0.250	0.0	0.537000	0.120
1239	01FTMART	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.046	0.514	1.000	0.001200	1.250
1239	01FTMART	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.046	0.514	1.000	0.001200	1.250
1246	01HARRIS	5	MAGN-AMP	400.00	0.02	8.45	-8.45	1.000	1.535	1.000	0.167000	0.432
1246	01HARRIS	5	MAGN-AMP	400.00	0.02	8.45	-8.45	1.000	1.535	1.000	0.167000	0.432
1447	AK 2 3 20	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.050	0.570	0.350	0.001700	1.660
1447	AK 2 3 20	5	MAGN-AMP	25.00	0.20	1.00	-1.00	-0.050	0.520	0.350	0.001700	1.660

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	KA	TA	VAMAX	VAMIN	KE	TE	TSE	AEX	BEX
1448	AK 3 3 22	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.570	0.350	0.017500	1.290
1451	AST 3 3 20	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.570	0.200	0.001900	1.610
1451	AST 3 3 20	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.520	0.200	0.001500	1.540
1452	AST 4 3 20	5	MAGN-AMP	150.00	0.20	2.48	-2.48	0.290	0.800	0.500	0.000874	1.990
1452	AST 4 3 20	5	MAGN-AMP	150.00	0.20	2.72	-2.72	0.240	0.830	0.500	0.002365	1.630
1453	AST 5 3 20	5	MAGN-AMP	150.00	0.20	2.48	-2.48	0.330	0.760	0.500	0.000460	2.270
1453	AST 5 3 20	5	MAGN-AMP	150.00	0.20	2.72	-2.72	0.260	0.830	0.500	0.001700	1.670
1531	RAV 1 3 20	5	MAGN-AMP	41.00	0.10	1.00	-1.00	-0.050	0.540	1.000	0.001500	1.540
1531	RAV 1 3 20	5	MAGN-AMP	55.00	0.10	1.00	-1.00	-0.050	0.540	1.000	0.001298	1.640
1247	01HATFLD	5	MAGN-AMP	400.00	0.02	6.45	-6.45	1.000	0.733	1.000	0.218000	0.315
1247	01HATFLD	5	MAGN-AMP	400.00	0.02	6.45	-6.45	1.000	0.733	1.000	0.218000	0.315
1247	01HATFLD	5	MAGN-AMP	400.00	0.02	6.45	-6.45	1.000	0.733	1.000	0.218000	0.315
1335	04AVON	5	MAGN-AMP	400.00	0.02	8.81	-8.81	1.000	0.940	1.000	0.167000	0.708
1341	04EASTLK	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.055	0.253	0.617	0.005800	1.060
1342	04EASTLK	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.055	0.253	0.617	0.005800	1.060
1663	ALBY STM3 13	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.060	0.500	0.350	0.001636	2.016
1700	DUNKGEN33 13	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.500	0.350	0.001636	1.668
1701	DUNKGEN43 13	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.500	0.350	0.001636	1.668
1725	HNTLY67G3 13	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.500	0.350	0.001636	1.668
1726	HNTLY66G3 13	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.050	0.500	0.350	0.001636	1.668
1503	IND PT 23 22	5	MAGN-AMP	400.00	0.02	11.10	-11.10	1.000	1.430	1.000	0.003900	1.555
1533	RAV 3 3 22	5	MAGN-AMP	160.00	0.22	3.00	-3.00	0.257	0.422	0.280	0.001600	1.670
1533	RAV 3 3 22	5	MAGN-AMP	160.00	0.22	3.00	-3.00	0.205	0.422	0.280	0.001600	1.670
1768	OSWEGO 33345	5	MAGN-AMP	400.00	0.03	5.90	-5.90	1.000	0.770	1.000	0.894400	0.825
1835	9MI PT 1G3 23	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.050	0.500	1.000	0.001111	1.473
1837	9MI PT 73765	5	MAGN-AMP	400.00	0.03	7.85	-7.85	1.000	1.190	1.000	0.021916	1.532
1844	BOWLINE 3 20	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.044	0.508	1.030	0.001600	1.455
1879	AST6 GEN3 26	3	AMPLDYNE	400.00	0.03	5.90	0.0	1.000	0.733	1.000	0.092100	0.837
1845	SCHLIN203 20	5	MAGN-AMP	50.00	0.02	1.00	-1.00	-0.044	0.500	1.030	0.001600	1.455
1890	MOSES 1 1115	3	AMPLDYNE	16.50	0.20	1.00	-1.00	-0.037	0.250	1.000	0.005800	1.150
1891	MOSES 2 1230	3	AMPLDYNE	16.50	0.20	1.00	-1.00	-0.037	0.250	1.000	0.005800	1.150
1894	NIA0115M2115	3	AMPLDYNE	23.10	0.20	1.00	-1.00	-0.044	0.500	0.350	0.001600	1.000
1952	NFLD 1+22 13	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.050	0.379	1.000	0.005370	1.613
1882	FITZ 3451345	5	MAGN-AMP	50.00	0.20	1.00	-1.00	0.052	0.578	1.594	0.001700	1.260
1573	YORKTOWN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1574	YORKTOWN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1883	GILB 3451345	3	AMPLDYNE	50.00	0.06	1.00	-1.00	-0.044	0.327	1.000	0.005800	1.060
1885	IND PT 33 22	5	MAGN-AMP	400.00	0.02	11.10	-11.10	1.000	1.430	1.000	0.003900	1.555
2002	ROSETON 1345	3	AMPLDYNE	50.00	0.02	1.00	-1.00	-0.053	0.588	0.350	0.005800	1.200
2032	CHESTERF	5	MAGN-AMP	50.00	0.06	1.00	-1.00	-0.044	0.508	1.000	0.001636	1.593
2099	MOR ANNA	5	MAGN-AMP	400.00	0.03	7.89	-7.89	1.000	1.110	1.000	0.051000	1.137
2099	MOR ANNA	5	MAGN-AMP	400.00	0.03	7.89	-7.89	1.000	1.110	1.000	0.051000	1.137
2099	MOR ANNA	5	MAGN-AMP	400.00	0.03	7.45	-7.45	1.000	1.230	1.000	0.040200	1.204
1541	SURRY 23	5	MAGN-AMP	400.00	0.02	6.89	-6.89	1.000	0.940	1.000	0.016230	1.411
1542	SURRY 50	5	MAGN-AMP	400.00	0.02	6.89	-6.89	1.000	0.940	1.000	0.016230	1.411
2810	RAR RVR 1156	3	AMPLDYNE	25.00	0.20	1.00	-1.00	-0.060	0.677	0.350	0.001643	1.985

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	MU	KG	KQ1	KQ2	TQ	KP	KI	BMO	VAO
396	EDDYSTG1	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
396	EDDYSTG1	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
397	EDDYSTG2	3	AMPLDYNE	0.091	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
397	EDDYSTG2	3	AMPLDYNE	0.091	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
343	CONO7-13	6	NO-C-ACT	0.0	1.000	0.0	0.0	20.00	0.0	0.0	1.0000	0.0
1117	IND RIV 1	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1120	IND RIV 3	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1086	DELA CITY 1	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1087	DELA CITY 2	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	CCLIF G1 500	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
7	CCLIF G2 500	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
10	CONEMAUGHG1	5	MAGN-AMP	0.097	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
10	CONEMAUGHG1	5	MAGN-AMP	0.097	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
126	CONEMAUGHG2	5	MAGN-AMP	0.097	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
126	CONEMAUGHG2	5	MAGN-AMP	0.097	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	KEYSTONE G1	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	KEYSTONE G1	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	KEYSTONE G2	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	KEYSTONE G2	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	PCH STG2	5	MAGN-AMP	0.070	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
25	SALEM G1	5	MAGN-AMP	0.050	1.000	0.0	0.0	0.00	0.0	0.0	1.0000	0.0
26	SALEM G2	5	MAGN-AMP	0.092	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
38	HOPE CREEK	5	MAGN-AMP	0.091	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
55	ERIE SO. 115	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	HOMER CTY 1G	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
73	HOMER CTY G3	5	MAGN-AMP	0.090	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
99	SENECA GEN	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	SEWARD 115	5	MAGN-AMP	0.001	1.000	0.0	0.0	1.00	0.0	0.0	0.0	0.0
104	SHAWVIL G230	5	MAGN-AMP	0.001	1.000	0.0	0.0	1.00	0.0	0.0	0.0	0.0
104	SHAWVIL G230	5	MAGN-AMP	0.001	1.000	0.0	0.0	1.00	0.0	0.0	0.0	0.0
106	SHAWVILLE 18	5	MAGN-AMP	0.001	1.000	0.0	0.0	1.00	0.0	0.0	0.0	0.0
106	SHAWVILLE 18	5	MAGN-AMP	0.001	1.000	0.0	0.0	1.00	0.0	0.0	0.0	0.0
164	PORTLND G11S	3	AMPLDYNE	0.259	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
164	PORTLND G11S	3	AMPLDYNE	0.385	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
165	PORTLND G230	3	AMPLDYNE	0.089	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
165	PORTLND G230	3	AMPLDYNE	0.091	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
205	OYSTR CK GEN	5	MAGN-AMP	0.041	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220	YAPOS CK GEN	5	MAGN-AMP	0.090	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
236	BRUNNER1 100	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.01	0.0	0.0	0.0	0.0
237	BRUNNER2 100	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.01	0.0	0.0	0.0	0.0
238	BRUNNER3 100	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.01	0.0	0.0	0.0	0.0
283	MONTOUR1 100	5	MAGN-AMP	0.081	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
284	MONTOUR2 100	5	MAGN-AMP	0.078	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
289	MTN CRK1 100	3	AMPLDYNE	0.150	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
290	MTN CRK2 100	3	AMPLDYNE	0.156	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
327	SUSQUHN1 100	5	MAGN-AMP	0.069	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
342	LIM G1-22	5	MAGN-AMP	0.070	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
385	CROMBYG1	5	MAGN-AMP	0.230	1.000	101.00	0.0	0.06	0.0	0.0	0.0	0.0
221	MUDDYRN1,2	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
222	MUDDYRN3,4	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	MU	KG	KQ1	KQ2	TQ	KP	KI	BMD	VAG
223	MUDDYRN5.6	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
224	MUDDYRN7.8	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
575	BERGEN 138	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
575	BERGEN 138	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
584	BURLNGTN GEN	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619	HUDSON G1	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
620	HUDSON G2	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
641	LINDEN GEN	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
641	LINDEN GEN	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
655	MERCER G1	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
655	MERCER G1	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
656	MERCER G2	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
656	MERCER G2	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
663	SEWAREN 138	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
663	SEWAREN 138	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
767	ZCRANEG1 115	3	AMPLDYNE	0.239	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
786	ZN1G G1 115	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
828	CHALK PT GN1	5	MAGN-AMP	0.051	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
828	CHALK PT GN1	5	MAGN-AMP	0.051	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
829	CHALK PT GN2	5	MAGN-AMP	0.051	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
829	CHALK PT GN2	5	MAGN-AMP	0.051	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
830	CHALK PT GN3	5	MAGN-AMP	0.092	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
831	CHALK PT GN4	5	MAGN-AMP	0.092	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
833	OICKERSN GN2	3	AMPLDYNE	0.157	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
833	OICKERSN GN1	3	AMPLDYNE	0.168	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
834	OICKERSN GN2	3	AMPLDYNE	0.157	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
834	OICKERSN GN2	3	AMPLDYNE	0.168	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
835	OICKERSN GN3	5	MAGN-AMP	0.055	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
835	OICKERSN GN3	3	AMPLDYNE	0.168	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
839	MORGANTN GN1	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
840	MORGANTN GN2	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
852	POTOMAC G-2	6	NO-C-ACT	0.0	1.000	0.0	0.0	20.00	0.0	0.0	1.0000	0.0
853	POTOMAC G-3	6	NO-C-ACT	0.0	1.000	0.0	0.0	20.00	0.0	0.0	1.0000	0.0
854	POTOMAC G-4	6	NO-C-ACT	0.0	1.000	0.0	0.0	20.00	0.0	0.0	1.0000	0.0
855	POTOMAC G-5	6	NO-C-ACT	0.0	1.000	0.0	0.0	20.00	0.0	0.0	1.0000	0.0
915	O/W 81 GEN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
918	O/W 11KV-0	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
924	ENGLAND81	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
925	ENGLAND82	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1098	EDGE MOOR 3	3	AMPLDYNE	0.230	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1099	EDGE MR 4	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1121	IND RIV 4	3	AMPLDYNE	0.094	1.000	0.0	0.0	0.01	0.0	0.0	1.0000	0.0
1100	EDGE MR 5	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1207	01BELMON	8	ROTARECT	0.035	1.000	0.0	0.0	0.01	0.2500	0.9000	1.0000	0.0
1239	01FTHART	5	MAGN-AMP	0.082	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1239	01FTHART	5	MAGN-AMP	0.082	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1246	01HARRIS	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1246	01HARRIS	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1447	AK 2 3 20	5	MAGN-AMP	0.260	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1447	AK 2 3 20	5	MAGN-AMP	0.237	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXCITATION SYSTEM DATA

MACHINE	NAME	TYPE	NAME	MU	KB	KQ1	KQ2	TQ	KP	KI	SMO	VAC
1448	AK 3 3 22	3	AMPLDYNE	0.050	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1451	AST 3 3 20	3	AMPLDYNE	0.255	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1451	AST 3 3 20	3	AMPLDYNE	0.415	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1452	AST 4 3 20	5	MAGN-AMP	0.100	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1452	AST 4 3 20	5	MAGN-AMP	0.100	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1453	AST 5 3 20	5	MAGN-AMP	0.100	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1453	AST 5 3 20	5	MAGN-AMP	0.100	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1531	RAV 1 3 20	5	MAGN-AMP	0.087	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1531	RAV 1 3 20	5	MAGN-AMP	0.086	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1247	01HATFLD	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1247	01HATFLD	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1247	01HATFLD	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1335	04AVON	5	MAGN-AMP	0.030	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1341	04EASTLK	5	MAGN-AMP	0.087	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1342	04EASTLK	5	MAGN-AMP	0.087	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1663	ALBY STN3 13	3	AMPLDYNE	0.229	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1700	DUNKGEN33 13	3	AMPLDYNE	0.229	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1701	DUNKGEN43 13	3	AMPLDYNE	0.229	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1725	HNTLY67G3 13	3	AMPLDYNE	0.229	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1726	HNTLY68G3 13	3	AMPLDYNE	0.229	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0
1503	IND PT 23 22	5	MAGN-AMP	0.030	1.000	101.00	0.0	0.0	0.0	0.0	0.0	0.0
1533	RAV 3 3 22	5	MAGN-AMP	0.043	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1533	RAV 3 3 22	5	MAGN-AMP	0.043	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1768	OSWEGO 33345	5	MAGN-AMP	0.060	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1835	9M PT 1G3 23	5	MAGN-AMP	0.088	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1837	9MI PT 73765	5	MAGN-AMP	0.060	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1844	BOWLINE 3 20	5	MAGN-AMP	0.089	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1879	AST6 GEN3 26	3	AMPLDYNE	0.060	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1845	BOWLIN203 20	5	MAGN-AMP	0.089	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1890	MOSES 1 1115	3	AMPLDYNE	0.060	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1891	MOSES 2 1230	3	AMPLDYNE	0.060	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1894	NIAG115MG115	3	AMPLDYNE	0.060	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1952	NFLD 1+22 13	5	MAGN-AMP	0.061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1882	FITZ 3451345	5	MAGN-AMP	0.058	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1573	YORKTOWN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1574	YORKTOWN	1	FLUXLINK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1883	GILB 3451345	3	AMPLDYNE	0.052	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1885	IND PT 33 22	5	MAGN-AMP	0.030	1.000	101.00	0.0	0.0	0.0	0.0	0.0	0.0
2002	ROSETON 1345	3	AMPLDYNE	0.050	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2032	CHESTERF	5	MAGN-AMP	0.080	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
2099	NOR ANNA	5	MAGN-AMP	0.060	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
2099	NOR ANNA	5	MAGN-AMP	0.060	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
2099	NOR ANNA	5	MAGN-AMP	0.060	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1541	SURRY 23	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
1542	SURRY 50	5	MAGN-AMP	0.040	1.000	0.0	0.0	0.0	0.0	0.0	1.0000	0.0
2010	RAR RVR 1158	3	AMPLDYNE	0.108	1.000	0.0	0.0	0.06	0.0	0.0	0.0	0.0

GOVERNOR SYSTEM DATA

BUS	NAME	TYPE	NAME	1/FR	TMAX	T3	T4	D	T5	TC	T5	D12
196	EDDYSTG1	2	GOVERNOR	0.4438	168.00	0.0	2.66	2.22	0.20	0.39	13.10	0.0
196	EDDYSTG1	2	GOVERNOR	0.5600	201.00	0.0	2.66	2.80	0.20	0.39	13.10	0.0
197	EDDYSTG2	2	GOVERNOR	0.5570	196.00	0.0	2.29	2.78	0.20	0.36	13.10	0.0
197	EDDYSTG2	2	GOVERNOR	0.5570	196.00	0.0	2.29	2.78	0.20	0.36	13.10	0.0
343	CONO7-13	2	GOVERNOR	0.3330	44.00	11.00	-2.00	0.40	13.57	0.50	1.00	0.0
6	CCLIF G1 500	2	GOVERNOR	2.9400	913.00	0.0	0.98	14.42	0.20	0.79	3.25	0.0
10	CONEMAUGHG1	2	GOVERNOR	1.4591	457.00	0.0	4.45	7.69	0.20	0.42	8.00	54.16
10	CONEMAUGHG1	2	GOVERNOR	1.3469	423.00	0.0	0.0	6.98	0.20	0.42	8.00	-71.92
126	CONEMAUGHG2	2	GOVERNOR	1.4591	457.00	0.0	4.45	7.69	0.20	0.42	8.00	54.16
126	CONEMAUGHG2	2	GOVERNOR	1.3469	423.00	0.0	0.0	6.98	0.20	0.42	8.00	-71.92
17	KEYSTONE G1	2	GOVERNOR	1.5441	273.00	0.0	5.08	7.39	0.20	0.42	8.00	100.08
17	KEYSTONE G1	2	GOVERNOR	1.4426	252.00	0.0	0.0	7.11	0.20	0.42	8.00	-100.94
125	KEYSTONE G2	2	GOVERNOR	1.5441	273.00	0.0	5.08	7.39	0.20	0.42	8.00	100.08
125	KEYSTONE G2	2	GOVERNOR	1.4426	252.00	0.0	0.0	7.11	0.20	0.42	8.00	-100.94
20	PCH STG2	2	GOVERNOR	3.9000	1150.00	0.0	0.0	17.92	0.01	0.02	0.77	0.0
25	SALEM G1	2	GOVERNOR	2.6000	1170.00	0.0	1.76	18.90	0.10	0.18	6.00	0.0
26	SALEM G2	2	GOVERNOR	4.0300	1209.00	0.0	1.83	18.90	0.10	0.18	6.00	0.0
38	HOPE CREEK	2	GOVERNOR	2.6000	1100.00	0.0	1.76	18.90	0.10	0.18	6.00	0.0
74	HOMER CTY 1G	2	GOVERNOR	1.8320	325.00	0.0	3.17	10.50	0.04	0.38	10.00	0.0
73	HOMER CTY G3	2	GOVERNOR	2.1000	350.00	0.0	1.45	11.33	0.07	0.20	5.00	0.0
99	SENECA GEN	2	GOVERNOR	1.4464	-450.00	12.50	-2.50	15.00	10000.00	10000.00	10000.00	0.0
101	SEWARD 115	2	GOVERNOR	0.6667	70.00	0.0	1.40	1.33	0.20	0.13	5.00	0.0
104	SHAWVIL G230	2	GOVERNOR	0.5500	170.10	0.0	1.48	2.33	0.20	0.13	5.00	0.0
104	SHAWVIL G230	2	GOVERNOR	0.5500	170.10	0.0	1.48	2.33	0.20	0.13	5.00	0.0
106	SHAWVILLE 18	2	GOVERNOR	0.3333	70.00	0.0	1.40	1.08	0.20	0.13	5.00	0.0
106	SHAWVILLE 18	2	GOVERNOR	0.3333	70.00	0.0	1.48	1.08	0.20	0.13	5.00	0.0
164	PORTLND G115	2	GOVERNOR	0.2500	48.00	0.0	4.69	1.42	0.20	0.13	5.00	16.33
164	PORTLND G115	2	GOVERNOR	0.2500	40.00	0.0	0.0	1.42	0.20	0.13	5.00	-20.75
165	PORTLND G230	2	GOVERNOR	0.3883	80.00	0.0	6.11	2.10	0.20	0.13	5.00	18.97
165	PORTLND G230	2	GOVERNOR	0.3883	80.00	0.0	0.0	2.10	0.20	0.13	5.00	-25.24
205	OYSTR CK GEN	2	GOVERNOR	2.1400	670.01	0.0	3.30	10.67	0.20	0.20	10.00	0.0
220	YARDS CK GEN	2	GOVERNOR	1.2543	-419.00	18.50	-3.70	14.00	10000.00	10000.00	10000.00	0.0
236	BRUNNER1 100	2	GOVERNOR	1.1100	150.00	0.0	3.20	5.00	0.20	0.13	10.00	0.0
237	BRUNNER2 100	2	GOVERNOR	1.2350	165.00	0.0	3.10	6.70	0.20	0.20	10.00	0.0
238	BRUNNER3 100	2	GOVERNOR	2.5100	470.00	0.0	1.45	13.10	0.30	0.25	6.40	0.0
283	MONTOUR1 100	2	GOVERNOR	2.4100	400.00	0.0	2.56	12.80	0.20	0.20	8.00	0.0
284	MONTOUR2 100	2	GOVERNOR	2.4500	480.00	0.0	2.56	13.60	0.20	0.20	8.00	0.0
289	MTN CRK1 100	2	GOVERNOR	0.4420	100.00	0.0	0.0	2.60	0.20	0.08	0.05	0.0
290	MTN CRK2 100	2	GOVERNOR	0.4420	100.00	0.0	0.0	2.60	0.20	0.08	0.05	0.0
327	SUSQUHN1 100	2	GOVERNOR	3.8500	1101.00	0.0	3.04	18.33	0.30	0.20	9.50	0.0
348	LIR G1-22	2	GOVERNOR	3.6800	1265.00	0.0	0.0	16.40	0.01	0.02	9.50	0.0
385	CROMBYG1	2	GOVERNOR	0.4800	143.00	0.0	1.58	2.39	0.20	0.15	5.10	0.0
221	MUDDYRN1,2	2	GOVERNOR	0.4000	220.00	11.15	-2.23	15.20	229.64	0.60	1.12	0.0
222	MUDDYRN3,4	2	GOVERNOR	0.4000	220.00	11.15	-2.23	15.20	229.64	0.60	1.12	0.0
223	MUDDYRN5,6	2	GOVERNOR	0.4000	220.00	11.15	-2.23	15.20	229.64	0.60	1.12	0.0
224	MUDDYRN7,8	2	GOVERNOR	0.4000	220.00	11.15	-2.23	15.20	229.64	0.60	1.12	0.0
575	BERGEN 138	2	GOVERNOR	0.9000	110.00	0.0	1.50	3.00	0.30	0.10	5.00	0.0
575	BERGEN 138	2	GOVERNOR	0.9000	110.00	0.0	1.50	3.00	0.30	0.10	5.00	0.0
584	BURLNGTN GEN	2	GOVERNOR	0.6900	25.00	0.0	1.25	0.75	0.20	0.13	5.00	0.0
619	HUDSON G1	2	GOVERNOR	1.3300	178.00	0.0	1.60	2.66	0.10	0.18	6.00	0.0

GOVERNOR SYSTEM DATA

BUS	NAME	TYPE	NAME	1/FR	TMAX	T3	T4	D	T5	TC	T5	D12
620	HUDSON #2	2	GOVERNOR	2.0600	350.00	0.0	1.60	7.80	0.10	0.18	6.00	0.0
641	LINDEN GEN	2	GOVERNOR	0.8600	70.00	0.0	0.63	1.66	0.25	0.12	2.52	0.0
641	LINDEN GEN	2	GOVERNOR	0.8600	70.00	0.0	0.63	1.66	0.25	0.12	2.52	0.0
655	MERCER G1	2	GOVERNOR	0.4950	70.88	0.0	1.50	1.13	0.0	0.10	5.00	0.0
655	MERCER G1	2	GOVERNOR	0.4950	70.88	0.0	1.50	1.13	0.0	0.10	5.00	0.0
656	MERCER G2	2	GOVERNOR	0.4950	70.88	0.0	1.50	1.13	0.0	0.10	5.00	0.0
656	MERCER G2	2	GOVERNOR	0.4950	70.88	0.0	1.50	1.13	0.0	0.10	5.00	0.0
767	ZCRANE61 115	2	GOVERNOR	0.6400	192.00	0.0	1.46	3.20	0.20	0.13	5.00	0.0
828	CHALK PT GN1	2	GOVERNOR	0.5500	165.00	0.0	1.25	2.75	0.20	0.13	5.00	53.55
828	CHALK PT GN1	2	GOVERNOR	0.5500	165.00	0.0	1.25	2.75	0.20	0.13	5.00	-53.55
829	CHALK PT GN2	2	GOVERNOR	0.5500	165.00	0.0	1.25	2.75	0.20	0.13	5.00	53.55
829	CHALK PT GN2	2	GOVERNOR	0.5500	165.00	0.0	1.25	2.75	0.20	0.13	5.00	-53.55
830	CHALK PT GN3	2	GOVERNOR	2.0100	601.00	0.0	1.50	2.00	0.30	0.10	5.00	0.0
831	CHALK PT GN4	2	GOVERNOR	2.0000	600.00	0.0	1.50	6.20	0.30	0.10	5.00	0.0
833	DICKERSN GN1	2	GOVERNOR	0.3030	91.00	0.0	1.25	1.52	0.20	0.13	5.00	24.93
833	DICKERSN GN1	2	GOVERNOR	0.3030	91.00	0.0	1.25	1.52	0.20	0.13	5.00	-21.65
834	DICKERSN GN2	2	GOVERNOR	0.3050	91.00	0.0	1.25	1.53	0.20	0.13	5.00	24.93
834	DICKERSN GN2	2	GOVERNOR	0.3050	92.00	0.0	1.25	1.53	0.20	0.13	5.00	-21.65
835	DICKERSN GN3	2	GOVERNOR	0.3050	89.00	0.0	1.25	1.53	0.20	0.13	5.00	0.0
835	DICKERSN GN3	2	GOVERNOR	0.3050	92.00	0.0	1.25	1.53	0.20	0.13	5.00	-21.65
839	MORGANTN GN1	2	GOVERNOR	1.8530	555.00	0.0	1.50	9.27	0.30	0.10	5.00	0.0
840	MORGANTN GN2	2	GOVERNOR	1.8530	555.00	0.0	1.50	9.27	0.30	0.10	5.00	0.0
852	POTOMAC G-2	2	GOVERNOR	0.3170	45.00	0.0	0.0	0.60	0.20	0.08	0.05	0.0
853	POTOMAC G-3	2	GOVERNOR	0.3170	45.00	0.0	1.25	0.53	0.20	0.13	5.00	0.0
854	POTOMAC G-4	2	GOVERNOR	0.3170	45.00	0.0	1.25	0.53	0.20	0.13	5.00	0.0
855	POTOMAC G-5	2	GOVERNOR	0.3170	45.00	0.0	1.25	0.53	0.20	0.13	5.00	0.0
1098	EDGE MOOR 3	2	GOVERNOR	0.2500	75.00	0.0	3.00	1.25	0.30	0.30	10.00	0.0
1099	EDGE MR 4	2	GOVERNOR	0.5000	150.00	0.0	3.00	2.50	0.30	0.30	10.00	0.0
1121	IND RIV 4	2	GOVERNOR	1.2630	320.00	0.0	1.25	6.42	0.15	0.12	5.00	0.0
1207	01BELMON	2	GOVERNOR	3.3300	1000.00	0.0	2.42	16.75	0.18	0.20	8.00	0.0
1239	01FTMART	2	GOVERNOR	1.8000	550.50	0.0	1.46	8.90	0.20	0.23	5.27	0.0
1239	01FTMART	2	GOVERNOR	1.8000	550.50	0.0	1.46	8.90	0.20	0.23	5.27	0.0
1244	01HARRIS	2	GOVERNOR	3.0000	900.00	0.0	2.42	15.00	0.18	0.20	8.00	0.0
1244	01HARRIS	2	GOVERNOR	3.0000	900.00	0.0	2.42	15.00	0.18	0.20	8.00	0.0
1447	AK 2 3 20	2	GOVERNOR	0.3000	162.00	0.0	4.29	1.50	0.20	0.15	8.50	46.17
1447	AK 2 3 20	2	GOVERNOR	0.3500	181.00	0.0	0.0	1.65	0.20	0.15	8.50	-25.02
1448	AK 3 3 22	2	GOVERNOR	1.6400	556.00	0.0	2.38	7.70	0.20	0.15	8.50	0.0
1451	AST 3 3 20	2	GOVERNOR	0.6000	175.00	0.0	4.29	2.90	0.20	0.15	8.50	46.17
1451	AST 3 3 20	2	GOVERNOR	0.6500	195.00	0.0	0.0	3.20	0.20	0.15	8.50	-25.02
1531	RAV 1 3 20	2	GOVERNOR	0.5680	190.00	0.0	3.86	2.94	0.20	0.15	8.50	42.03
1531	RAV 1 3 20	2	GOVERNOR	0.6550	221.00	0.0	0.0	3.28	0.20	0.15	20.00	-30.90
1247	01HATFLD	2	GOVERNOR	1.6700	583.00	0.0	2.93	8.34	0.18	0.20	10.00	0.0
1247	01HATFLD	2	GOVERNOR	1.6700	583.00	0.0	2.93	8.34	0.18	0.20	10.00	0.0
1247	01HATFLD	2	GOVERNOR	1.6700	583.00	0.0	2.93	8.34	0.18	0.20	10.00	0.0
1335	04AVON	2	GOVERNOR	2.1700	680.00	0.0	3.68	10.84	0.04	0.05	12.00	0.0
1341	04EASTLK	2	GOVERNOR	2.1700	650.00	0.0	3.60	10.84	0.07	0.05	14.00	0.0
1342	04EASTLK	2	GOVERNOR	2.1400	650.00	0.0	3.60	10.70	0.07	0.05	14.00	0.0
1663	ALBY STN3 13	2	GOVERNOR	1.4700	120.00	0.0	0.0	7.37	2.00	0.13	4.50	0.0
1700	DUNKGEN33 13	2	GOVERNOR	0.7000	251.00	0.0	1.97	3.50	0.30	0.20	5.99	0.0
1701	DUNKGEN43 13	2	GOVERNOR	0.7000	251.00	0.0	2.04	3.50	0.30	0.20	5.99	0.0

GOVERNOR SYSTEM DATA

BUS	NAME	TYPE	NAME	L/FR	TMAX	T3	T4	D	T3	TC	T5	D12
1725	HNTLY67G3 13	2	GOVERNOR	0.7000	251.00	0.0	1.97	3.50	0.30	0.20	5.99	0.0
1726	HNTLY68G3 13	2	GOVERNOR	0.7000	251.00	0.0	2.04	3.50	0.30	0.20	5.99	0.0
1503	IND PT 23 22	2	GOVERNOR	2.8800	1075.00	0.0	1.69	14.40	0.20	0.20	6.50	0.0
1533	RAV 3 3 22	2	GOVERNOR	1.4100	450.00	0.0	5.62	7.04	0.20	0.24	9.84	89.90
1533	RAV 3 3 22	2	GOVERNOR	1.5300	500.00	0.0	0.0	7.62	0.20	0.24	9.84	-40.70
1768	OSWEGO 33345	2	GOVERNOR	5.6000	1700.00	0.0	1.54	28.00	0.15	1.80	6.00	0.0
1835	9MI PT 163 23	2	GOVERNOR	1.9738	641.00	0.0	1.59	9.87	0.20	0.20	5.00	0.0
1837	9MI PT 73765	2	GOVERNOR	3.3330	1210.00	0.0	2.16	16.67	0.15	1.80	6.00	0.0
1844	BOWLINE 3 20	2	GOVERNOR	2.0000	622.00	0.0	1.40	10.00	0.20	0.15	5.00	0.0
1845	BOWLIN203 20	2	GOVERNOR	2.0000	622.00	0.0	1.40	10.00	0.20	0.15	5.00	0.0
1952	NFLD 1+22 13	2	GOVERNOR	0.6730	260.00	9.65	-1.93	3.37	74.40	0.20	0.96	0.0
1885	IND PT 33 22	2	GOVERNOR	3.4400	1075.00	0.0	1.69	17.72	0.20	0.20	6.50	0.0
2032	CHESTERF	2	GOVERNOR	3.4300	1050.00	0.0	2.08	17.12	0.20	0.0	8.00	0.0
2099	NOR ANNA	2	GOVERNOR	2.0600	985.00	0.0	1.64	10.28	0.10	0.0	6.00	0.0
2099	NOR ANNA	2	GOVERNOR	2.0500	985.00	0.0	1.64	10.28	0.10	0.0	6.00	0.0
2099	NOR ANNA	2	GOVERNOR	2.1200	993.00	0.0	2.04	10.59	0.15	0.0	6.00	0.0
1541	SURRY 23	2	GOVERNOR	2.8500	855.00	0.0	1.62	14.25	0.04	0.0	6.00	0.0
1542	SURRY 50	2	GOVERNOR	2.5900	800.00	0.0	1.62	12.92	0.04	0.0	6.00	0.0
2810	RAR RVR 1158	2	GOVERNOR	1.2232	40.00	0.0	1.58	1.84	0.20	0.13	5.00	0.0