WATTS BAR NUCLEAR PLANT
UNIT 1
POWER ASCENSION TEST PACKAGE COVERSHEET

Test No. 1-PAT-1.3 Package Revision No. 2

Title Large Load Reduction Test

PREPARATION

The systems and equipment have met the requirements contained herein. Deficiencies, if any, are listed in the Deficiency Log.

Prepared by: Hugh Phillips Date: 05/23/96

REVIEW AND APPROVAL SIGNATURES

Reviewed by: Craig Martin Date: 6-5-96
Reactor Eng. Section Supervisor

TRG Meeting No. TRG #107

TRG Review: Date: 6/5/96
TRG Chairman

Approved by: R. Purcell Date: 6/5/96
Plant Manager

9606120291 960607
PDR ADOCK 05000390
P PDR

TEST SUMMARY REPORT

1.0 TEST SUMMARY

The test began on 5/10/96 and was field complete on 5/12/96. There were 3 Change notices written during the performance of the test and 4 deficiencies were initiated as a result of the test performance. The procedure was performed during the 100% test plateau as required by 1-PAT-8.0.

2.0 OBJECTIVE

The large load reduction test demonstrates the ability of the primary and secondary side systems, including the automatic control systems, to sustain a 50% step decrease in turbine generator load. The automatic control systems tested are the rod control system (non-safety related), steam generator level control system (safety related), steam dump system (non-safety related), and the pressurizer pressure/level control system (safety related). The procedure satisfied the requirements of FSAR Chapter 14, Table 14.2-2 Sheet 35 as written.

3.0 TEST DATA COMPARISON

The data was evaluated for acceptability by TVA and Westinghouse.

The acceptance criteria for the test are:

1. Neither the reactor nor the turbine tripped. *Neither the reactor nor turbine tripped*
2. A safety injection (SI) was not initiated. *An SI was not initiated.*
3. None of the steam generator safety valves lifted. *No S/G safeties or PORVs opened.*
4. None of the pressurizer safety valves lifted. *No pressurizer safeties or PORVs opened.*
5. Stability was achieved without manual intervention. *Stability was achieved without manual intervention. See DN-1 for description.*

All of the above criteria were met. (See DN-2 description).

The Review criteria for the test are:

1. Turbine load was reduced by approximately 603 MWe (579 to 627 MWe). *Actual turbine load was decreased 585 MWe. See DN-3 for description.*

2. Steam generator levels remained within ± 15 % of the program level.

	At Maximum Level	*At Minimum Level*
SG No. 1 Level Difference	*8.2%*	*-4.9%*
SG No. 2 Level Difference	*7.7%*	*-5.1%*
SG No. 3 Level Difference	*8.7%*	*-4.8%*
SG No. 4 Level Difference	*7.5%*	*-5.0%*

3. Pressurizer pressure swings were less than + 110, -160 psi from initial pressure. *Actual Pressurizer pressure swings were +37, -77 psig from the initial pressure.*

4. Main feedwater header pressure oscillations are less than ± 3% within 300 seconds after the change in steam flow. *Actual feedwater header pressure oscillations were 2.4%.*

5. RCS average temperature (T_{avg}) did not undershoot the final temperature by more than 3°F. *Actual T_{avg} undershoot was 0°F.*

6. RCS average temperature (T_{avg}) did not peak above the initial temperature by more than 5°F. *Actual T_{avg} overshoot was 2°F.*

7. RCS average temperature (T_{avg}) was controlled by the steam dump control system, as demonstrated by the steam dump valves actuating and modulating (did not cycle between open and close) to control RCS average temperature (T_{avg}) oscillations within 2°F (peak to valley). *Actual T_{avg} oscillations during steam dump operations were 2.3°F on loop 1.*

8. RCS average temperature (T_{avg}) was controlled by the rod control system, after steam dump valve operation was terminated, as demonstrated by RCS average temperature (T_{avg}) oscillations remaining within 5°F (peak to valley). *Actual T_{avg} oscillations after steam dump valve operation was terminated were 0°F.*

9. Steam dump valve operation was for less than 8 minutes after the load reduction, as demonstrated by valve demand signal or valve indication. *Actual steam dump operation was 7 minutes 51 sec.*

10. The rod control system caused rod motion at maximum speed. *The rod control system reached the maximum speed for a total of 80 seconds.*

All of the above listed review criteria were met (See DN-2 and DN-3 descriptions).

The load reduction was initiated by entering a calculated setter based on the operating power the turbine (100.7%). The new setter value (47.3%) was entered into the EHC panel and the load rate was set to 200 %/min. The "GO" button on the EHC panel was then depressed and the load reduction was initiated. During the reduction the EHC system toggled into IMP OUT mode and stopped the transient. The value shown on the load reference was 61.5%. Approximately 2.5 minutes later the No. 3 heater drain tank bypassed to the condenser and initiated a BOP runback to approximately 48% power. Data collection equipment continued to collect data until the Test Director determined that stable conditions had been achieved. As the Test director was determining stability the unit operator manually closed 1-FCV-6-209A Main Feed Pump Turbine Condenser Drain Tank bypass valve because the valve does not auto close. This action occurred after the test director had determined the plant was stable but prior to his releasing the plant back to operations.

The total reduction in load as calculated by the procedure was 569 MWe. This value was 10 MWe less than the minimum allowable for review criteria due to the method used to determine the load reduction. Load increased approximately 40 MWe after the load value was recorded in the procedure but prior to the initiation of the load reduction. Deficiency Notice 3 was written to document the calculations using the load value (1177 MWe) prior to

the load reduction and the value when stability was achieved (592 MWe). Using these values the overall reduction was 585 MWe which satisfied the review criteria.

Using generator load the first step was approximately 27%. Generator load then slowly increased until the second reduction was initiated. This second reduction was approximately 26% for an overall load reduction of 49%. The response of turbine impulse pressure drove the transient. Impulse pressure was reduced from 586.9 (95.8%) to 572.4 (49.4%). This calculates to an initial drop of 46.4%. Impulse pressure then increased to 579 (70.5%) until the second runback occurred. After the second runback impulse pressure stabilized to 571.9 (47.8%). This calculates to a total reduction as determined by impulse pressure to 48%.which is equivalent to 579 MWe.

The two step reduction was caused by impulse pressure being greater than 20% from the load reference. This difference resulted in the EHC system overriding the operation in progress and switching the control to IMP OUT. When it was switched the control system stopped the evolution in progress, determined where the valves were, and set the load reference to that value.

4.0 CHANGE NOTICES

There were three change notices written during the performance of the test. All changes were reviewed and approved by the Test Review Group.

CN-1	Added step to section 4.3 for recording the status of the standby feedwater pump during the test.
CN-2	Added step to section 3.0 to clarify this test as a planned event.
CN-3	Corrected scaling error on Appendix B.

5.0 TEST DEFICIENCIES

There were four deficiencies notices written for this test performance.

DN-1 Closed	This DN was written to document the manual action taken by the Unit Operator to close 1-FCV-6-209A prior to being notified by the Test Director that normal plant operations could resume. The TD had already determined that stability had been achieved and was in the process of performing the steps leading to the notification of the Operations staff that normal plant operations could resume. Because the plant had already been declared stable by the TD this manual action does not violate the acceptance criteria. No retest nor corrective action is required.

DN-2
Closed

This DN was written to document the two step load reduction and the data evaluation performed by Westinghouse. All the acceptance criteria are preceded by a statement which states that "... The plant can sustain a large step reduction in turbine load of approximately 50% (48% to 52%) as demonstrated by meeting the following ..." The review criteria has a similar statement for all the criteria with the exception of the magnitude of the load reduction. The actual load reduction was achieved in two steps with approximately 2.5 minutes between steps. The load reduction was evaluated by Westinghouse (WAT-D-10219) and their conclusion was the transient did not diverge and reached steady state values without any instabilities. The NSSS control systems (S/G level control, Pressurizer pressure/level control system, rod control, and steam dump control) performed as designed and would have functioned as designed if the load reduction occurred in one step. Also there would have been sufficient margin to the trip set points for pressurizer pressure and S/G levels. The margin to lifting of either a primary or secondary safety valve was also sufficient. Based on the Westinghouse evaluation no retest was required or performed.

DN-3
Closed

This DN was written to document the failure to meet the review criteria for the magnitude of the load reduction. The values recorded in the procedure were taken from Q0340A on the process computer and recorded some time prior to the initiation of the load reduction. Using data recorded by the data acquisition system (DAS) from the period just prior to the initiation of the load reduction and after stability was achieved yields an overall load reduction of 585 MWe which falls within the acceptable range of the review criteria. Based on these values no corrective action or retest is required.

DN-4
Closed

This DN was written to document an incorrect reference on a Data Sheet back to a step in the procedure. The correct value was used to complete the data sheet. No corrective action or retest is required.

6.0 JUSTIFICATION FOR ACCEPTANCE

The Westinghouse reviews concluded that the performance showed that the control systems responded as designed and would have controlled their respective systems if the load reduction had occurred in a single step. Based on this review and that no additional information on setpoint adjustments would be gained from a reperformance this test should be accepted for approval.

7.0 CONCLUSIONS

Based of the above justifications and the test results contained within this Power Ascension Test, 1-PAT-1.3 is recommended for approval.

Craig Mueller / 6-5-96
Test Director Date

Supervisor / 6/5/96
Date

LARGE LOAD REDUCTION TEST

QUALITY RELATED

Recommend Approval

Craig Moulton / 5-1-96
Sponsor Date

VERIFIED FOR USE
SIG / INITIAL 5/2/96 DATE

Final Approval

R. Purcell / 5-1-96
Plant Manager Date

TEST DESCRIPTION

This procedure demonstrates the ability of primary and secondary plant systems, including automatic control systems, to sustain a 50% load reduction without manual intervention.

The plant is at steady-state conditions with control systems in automatic prior to starting this transient test. A rapid 50% reduction in load is initiated using the turbine-generator control system. Primary and secondary plant parameters are monitored throughout the transient until stability is achieved.

Test data will be evaluated to determine if control system setpoint changes are required to improve plant transient response.

This test procedure is performed at 100% power, as specified in 1-PAT-8.0, "Test Sequence for 100% Plateau".

Level of USE: CONTINUOUS

REVISION NUMBER	EFFECTIVE DATE	PAGES AFFECTED	DESCRIPTION OF REVISION
0	1/6/95	ALL	New test procedure which incorporates the startup test requirements delineated in WAT/WBT-SU-3.4.8, Rev. 0 , "Large Load Reduction Tests," and FSAR Chapter 14, Table 14.2-2, Sheet 35, Amendment 88, "Large Load Reduction."
1	2/17/95	5 to 10, 12, 14 to 30, 33, 35 to 37, 39 to 53, 73 to 75	Changed TI-57 to TI-58 throughout test. Section 2.0-- updated references, removed revision levels, added WAT-D-9884. Section 3.0 -- Clarified steps. Section 4.1 -- made editorial changes. Section 4.2 -- Reworded to actions steps and made editorial changes. Section 4.3 -- Reordered sequence of steps and made editorial changes, added step to ensure FSAR prerequisite and added step to ensure SI annunciator alarm is in service. Section 5.0 -- Updated review criteria to agree with WAT-D-9884 and made editorial changes. Section 6.0 -- Added methods for determining acceptance criteria and made editorial changes. Sections 7.0, 8.0, App A, B, & C -- Made editorial changes. Data Sheet 2 -- Revised method for determining FW press oscillation and made editorial changes.
2	5/10/96	ALL	Major revision. Remove procedure from Admin Hold, all open items are closed. Added option for performing test with EHC in 'IMP OUT' or 'IMP IN'. Suspended AOI-11 during test. Deleted Appendix G. Made additional changes based on test performance at Simulator, also made editorial changes.
CN-1	5/15/96	2 & 23	Added step to Section 4.3 for recording the status of the Standby Feedwater Pump during the test.
CN-2	5/15/96	2 & 10	Added step to Section 3.0 to clarify this test as a planned event.
CN-3		2 & 52	Corrected scaling error on Appendix B.

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1.0 INTRODUCTION

1.1 Test Objectives

The objective of this procedure is to demonstrate the ability of primary and secondary side systems, including automatic control systems, to sustain a 50% step decrease in turbine generator load.

This procedure satisfies the requirements of FSAR Chapter 14, Table 14.2-2 Sheet 35.

1.2 Test Frequency/Conditions

This test procedure is performed at 100% power, as specified in 1-PAT-8.0, "Test Sequence for 100% Plateau".

2.0 REFERENCES

2.1 Performance References

TI-58, NET DAQ Data Acquisition System

2.2 Developmental References

A. Watts Bar FSAR Chapter 14.0, Table 14.2-2, Sheet 35, Amendment 91.

B. Nuclear Regulatory Commission Regulatory Guide 1.68, Rev. 2, Appendix A, Section 5, paragraph hh .

C. Tennessee Valley Authority Watts Bar Nuclear Station Unit 1 and 2 Precautions, Limitations and Set Points for Nuclear Steam Supply Systems (PLS), Rev. 8.

D. WAT/WBT-SU-3.4.8, Rev. 0, Large Load Reduction Tests

E. WAT/WBT-SU-2.8.2, Rev. 2, Automatic Steam Generator Level Control

2.2 **Developmental References** (continued)

F. Setpoint and Scaling Documents:

SSD-1-LPP-1-33, Steam Generator Header Pressure Steam Dump Control
SSD-1-LPT-1-73, Steam Dump Valve Control Setpoint

SSD-1-LPP-2-1, Condenser Zone A Hotwell Range Pressure
SSD-1-LPP-2-7, Condenser Zone B Hotwell Range Pressure
SSD-1-LPP-2-10, Condenser Zone C Hotwell Range Pressure

SSD-1-LPP-3-1, Feedwater Heater Supply Header Press
SSD-1-LPF-3-35, Steam Generator 1 Level Control
SSD-1-LPF-3-48, Steam Generator 2 Level Control
SSD-1-LPF-3-90, Steam Generator 3 Level Control
SSD-1-LPF-3-103, Steam Generator 4 Level Control
SSD-1-LPL-3-231, Steam Generator 1 Level Program
SSD-1-LPL-3-232, Steam Generator 2 Level Program
SSD-1-LPL-3-233, Steam Generator 3 Level Program
SSD-1-LPL-3-234, Steam Generator 4 Level Program

SSD-1-LPS-46-20, MFPT A and B Speed Control
SSD-1-LPS-46-20A, MFPT A Speed Indication
SSD-1-LPS-46-20B, MFPT B Speed Indication

SSD-1-T-68-2, Delta T/Tavg Loop 1 PS I
SSD-1-T-68-25, Delta T/Tavg Loop 2 PS II
SSD-1-T-68-44, Delta T/Tavg Loop 3 PS III
SSD-1-T-68-67, Delta T/Tavg Loop 4 PS IV
SSD-1-LPT-68-2A, Auctioneered Delta T, Tavg
SSD-1-LPL-68-339A, Pressurizer Level Control
SSD-1-LPP-68-340A, Pressurizer Pressure Control

SSD-1-LPS-85-412, CRD Speed and Direction Control
SSD-1-LPZ-85-442A, Rod Insertion Limit Bank D

G. Westinghouse PGBU Letter, dated March 6, 1992, G. Gaul to W. Elliott, subject "Turbine Backpressure Limits"

H. WCAP-9159, Setpoint Study for Tennessee Valley Authority Watts Bar Units 1 and 2

2.2 Developmental References (continued)

I. 47K1110-1, Rev. 2, "Maximum Guaranteed Throttle Flow - 2 MFPT's"

J. Westinghouse Process Control Block Diagrams (contract 54114-1):

Dwg. 108D408, Sh. 7, Loop 1 Delta T / Tavg
Dwg. 108D408, Sh. 8, Loop 2 Delta T / Tavg
Dwg. 108D408, Sh. 9, Loop 3 Delta T / Tavg
Dwg. 108D408, Sh. 10, Loop 4 Delta T / Tavg
Dwg. 108D408, Sh. 23, Rod Control
Dwg. 108D408, Sh. 24, Rod Control
Dwg. 108D408, Sh. 25, Steam Dump & Feed Pump Speed Control
Dwg. 108D408, Sh. 26, Pressurizer Pressure Control
Dwg. 108D408, Sh. 27, Pressurizer Level Control
Dwg. 108D408, Sh. 30, Rod Insertion Limit
Dwg. 108D408, Sh. 32, Tavg / Auctioneer Tavg Deviation Alarms
Dwg. 108D408, Sh. 33, Steam Generator Level Control

K. Wiring Diagrams:

45N1642-3, Rev. Z, Unit Control Board Panel 1-M-3
45N1642-4, Rev. J, Unit Control Board Panel 1-M-3
45N1685-3, Rev. M, Turbo-Gen Aux Relay Panel 1-R-70

L. Power Ascension Procedure:

1-PAT-8.0, Test Sequence for 100% Plateau.

M. Vendor Manuals:

WBN-VTM-W120-2991, Westinghouse Eagle 21 Process Protection System Technical Manual (contract 54114-1)

WBN-VTM-K034-0010, Acruex Autodata Ten/50 Computing Measurement and Control System Technical Manual (contract 834528)

2.2 **Developmental References** (continued)

N. Plant Procedures:

IMI-99.101, Connection of the Man Machine Interface Cart to a Protection Set Rack

1-SI-68-28, Primary Radiochemistry Requirements

AOI-11, Loss of Condenser Vacuum

ARI-81-87, Annunciator Response instruction

SOI-1.2, Steam Dump System

O. WAT-D-9884, Final Issue of Startup Procedure Review/Acceptance Criteria, dated 12/20/94 (T33 941221 814)

P. Technical Specifications

TS 3.1.7
TS 3.2.3
TS 3.4.1
SR 3.4.16.2

3.0 PRECAUTIONS AND LIMITATIONS

A. Load reductions with the control rods near their insertion limits, should be avoided in order to keep the rods within the normal band.

B. If any instability in automatic controls is experienced before or during the transient, the control should be switched to manual to prevent a reactor trip or a Technical Specification violation. The cause of the instability should be identified and corrected prior to proceeding with the test or a retest.

C. As a result of the load reduction, the Axial Flux Difference may fall outside of the limits specified in the COLR. Follow the requirements of Technical Specification 3.2.3.

D. Fuel preconditioning requirements must be met for all load increases.

E. Manual Control Rod movement during test load reduction or stabilization period will generally invalidate test results.

F. Access to the Steam Vault Rooms shall be limited and controlled during this test. Steam Generator Safeties or Steam Generator PORVs may actuate during this test.

G. This test will require performance of Technical Specification Surveillance Requirement 3.4.16.2, regarding 15% power change and RCS Iodine sampling. See 1-SI-68-28, Primary Radiochemistry Requirements.

H. Rod Insertion Alarms (LO and LO-LO) may actuate during the initial stages of the transient. These alarms are expected to clear shortly after their initiation as power decreases. Boration should only be initiated if the alarm is actuated and power has decreased to near the expected final value. Borate only as required to maintain rods above the Rod Insertion Limit LO-LO Alarm. Procedure ARI-81-87 for alarms 87A and 87B should be suspended during this test. However, Technical Specification 3.1.7 remains applicable.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

I. Technical Specification 3.4.1 requires RCS pressure to be greater than 2214 psig. The applicability note is for a thermal power step increase per the bases. This test performs a step decrease.

J. Condenser zone pressures during the test load reduction are expected to exceed the steady state values existing before the reduction. Annunciator alarm "CONDENSER VACUUM LO" 1-XA-55-3A, window 46C, may be initiated for a brief period. Condenser zone pressures are being recorded during the transient to trend periods when back pressure exceeds 5.5 in Hg. Operating the turbine at degraded conditions for five minutes or longer requires a turbine shutdown and inspection. Procedure AOI-11, Loss of Condenser Vacuum, will be suspended for this test. If vacuum does not improve to clear the annunciator alarm "CONDENSER VACUUM LO" 1-XA-55-3A, window 46C, within five minutes then the turbine will be tripped. Inspection requirements for startup will be determined by Engineering.

None of the automatic turbine trips have been disabled. The Low Vacuum Trip (>7 In Hg) is still in-service. If backpressure exceeds 7 In. Hg., the turbine should be manually tripped.

K. This test has the potential to result in a plant trip, and subsequent Feedwater Isolation and Auxiliary Feedwater Actuation. This would be considered a planned event, thus would not require a report to the USNRC under 10CFR50.72 and 10CFR50.73. However, should a trip occur a courtesy phone call should be made to the USNRC Site Resident Inspector. CN-2

4.0 PREREQUISITES ACTIONS

NOTE: *Sections 4.1, 4.2, and 4.3 may be performed concurrently.*

4.1 Preliminary Actions

NOTE: *Preliminary Actions may be performed in any order.*

[1] **CONDUCT** a detailed pretest briefing, and

DOCUMENT the briefing in the Chronological Test Log and include a list of the attendees.

_____ 15/12/96

NOTE: *IMI-99.101 provides instructions for connecting the Man Machine Interface (MMI).*

[2] **ENSURE** that a Maintenance Work Order has been issued for I&C Maintenance to support and to assist with this test. The WO should have provisions to connect test equipment and troubleshoot.

RECORD the WO number below:

WO# WR C340172
minor maint.

_____ 15/10/96

[3] **REVIEW** the TACF Log, and

ENSURE that no TACFs will prevent the conduct of this test nor invalidate the test results.

_____ 15/11/96

4.1 **Preliminary Actions** (continued)

[4] **REVIEW** the Clearance Book, and

ENSURE that no clearances will prevent the conduct of this test nor invalidate the test results.

15/10/96

[5] **ENSURE** that the following test procedures have been performed for the 100% Power Test Plateau, and there are no test discrepancies preventing the conduct of the test procedure.

1-PAT-1.2 Load Swing Test
1-PAT-1.9 Automatic Steam Generator Level Control

15/12/96

[6] **ENSURE** that a TACF has been processed to install a dropping resistor in the Steam Dump Demand indicating loop. This resistor provides a signal to the test equipment. See APPENDIX E for recommended installation to be used with the TACF.

ENSURE that the loop has been function tested since the installation of the voltage dropping resistor.

Loop	TACF Number	TACF Installed	Functionally Tested
1-LPT-1-33	1-95-16-1	☑	☑

15/10/96

4.1 **Preliminary Actions** (continued)

[7] **ENSURE** that the following loops are within their calibration interval. These loops will be used to judge Acceptance Criteria associated with the opening of Pressurizer and Steam Generator Safeties.

Loop	Calibration Date	Calibration Due Date
1-XR-1-5	2/14/95	10/19/96
1-LPX-1-300A	6/10/94	9/16/96
1-LPX-1-300B	6/10/94	9/16/96
1-LPX-1-300D	6/10/94	9/16/96
1-LPX-1-300E	6/10/~~96~~ 94 AJS 5/14/96	9/16/96
1-LPX-1-300F	6/10/94	9/16/96
1-LPX-1-301A	6/10/94	9/16/96
1-LPX-1-301B	6/10/94	9/16/96
1-LPX-1-301D	6/10/94	9/16/96
1-LPX-1-301E	6/10/94	9/16/96
1-LPX-1-301F	6/10/94	9/16/96
1-LPX-1-302A	6/10/94	9/16/96
1-LPX-1-302B	6/10/94	9/16/96

4.1 Preliminary Actions (continued)

[7] (continued)

Loop	Calibration Date	Calibration Due Date
1-LPX-1-302D	6/10/94	9/16/96
1-LPX-1-302E	6/10/94	9/16/96
1-LPX-1-302F	6/10/94	9/16/96
1-LPX-1-303A	6/10/94	9/16/96
1-LPX-1-303B	6/10/94	9/16/96
1-LPX-1-303D	6/10/94	9/16/96
1-LPX-1-303E	6/10/94	9/16/96
1-LPX-1-303F	6/10/94	9/16/96
1-LPX-68-363	12/8/95	3/30/97
1-LPX-68-364	12/8/95	3/30/97
1-LPX-68-365	12/8/95	3/30/97
1-LPT-68-328	6/14/94	6/14/99
1-LPT-68-329	5/10/96 ~~3/22/94~~	3/22/99
1-LPT-68-330	2/10/95	2/10/00
1-LPT-68-331	8/8/95	8/1/00

15/10/96

4.1 **Preliminary Actions** (continued)

[8] **ENSURE** that additional personnel are available to monitor the following:

- Panel 0-M-25 acoustic monitor for Pressurizer Safeties and PORVs positions. ☑
- Panel 1-M-4 to monitor Pressurizer Safeties and PORVs discharge temperatures. ☑
- Panel 1-R-77 for Steam Generator Safeties and PORVs positions. ☑
- Outside the North and South Steam Vaults to observe the tailpipe exhausts from the Steam Generator Safeties. ☑
- P2500 computer points for Condenser Backpressure. ☑

15/12/96

[9] **REQUEST** Operations to notify the Load Dispatcher approximately four hours before the planned load transient, and

OBTAIN concurrence to reduce load by approximately 600 MWe.

5/12/96

4.2 Measuring and Test Equipment, Parts, and Supplies

NOTE 1: *Test equipment of equivalent or better specification may be substituted for equipment specified.*

NOTE 2: *Steps in Section 4.2 may be performed concurrently.*

[1] ENSURE that Strip Chart Recorders (NA if using DAS) are available, and

Quantity: Twenty-Nine channels minimum, sixty-two recommended
Mfg: Yokogawa
Model: ORM1300

RECORD the information below and on Appendixes A and B ☐ NA

M&TE ID No.	Calibration Date	Calibration Due Date
		NA

NA

[2] ENSURE that a Stop Watch (to time Steam Dumps) is available, and

Quantity: one
Accuracy: ±0.1 sec/hr
Range: at least 1 hour

RECORD the information below:

M&TE ID No.	Calibration Date	Calibration Due Date
903103	10/19/95	10/19/96

15/12/96

4.2 Measuring and Test Equipment, Parts, and Supplies (continued)

[3] ENSURE that a Digital Multi-Meter (to scale channels) is available (NA if using DAS), and

Quantity: One
Mfg: Keithley
Model: 197

RECORD the information below and on Appendixes A and B. NA

M&TE ID No.	Calibration Date	Calibration Due Date
NA	NA	NA

NA /

[4] ENSURE that a Digital Multi-Meter (to scale Eagle 21channels) is available and

Quantity: At least one
Mfg: Fluke
Model: 8842A

RECORD the calibration information below.

M&TE ID No.	Calibration Date	Calibration Due Date
890648 *	2-15-96	5-15-96
890649 **	2-14-96	5-14-96

B. Hugh Pliff 15-11-96

* Used for 1-R-2, 1-R-10 and 1-R-13, BHP 5-11-96
** Used for 1-R-6, BHP 5-11-96

4.2 Measuring and Test Equipment, Parts, and Supplies (continued)

[5] ENSURE that a Voltage Source is available (NA if using DAS).

Variable 0 to 5 Vdc (to scale channels)

NA /

[6] ENSURE that the Data Acquisition System (controlled by TI-58, NA if using Strip Charts) is available.

- Configured for the points listed on Appendixes A and B ☑
- Points are scaled per Appendixes A and B ☑
- Scan rate set (scan rate of 5 scan/sec is recommended) ☑
- Adequate memory is available to store the collected data ☑
- Manual Event Marker Setup ☑
- Copy of Configuration file attached to the test package. ☑

AJS 15/12/96

[7] ENSURE that at least one MMI (Man Machine Interface) cart with required accessories is available.

AJS 15/10/96

4.3 Field Preparations

[1] OBTAIN approval from shift operations to commence Field Preparations for this test.

15-11-96

Shift Operations Supervisor/Unit SRO Date

NOTE: *The remaining Field Preparation steps may be performed concurrently.*

[2] ENSURE that I&C has the MMI(s) available at the Process Protection Panels.

B. Hugh Elliott 15-11-96

NOTE: *APPENDIXES A and B list parameters to be monitored during the load reduction. It is desirable to monitor all of the points listed in these appendixes, but this may not be possible because of the availability of test equipment. As a minimum all points listed in APPENDIX B are to be monitored, and at least one of the RCS and Steam Generator Loops listed in APPENDIX A must be monitored.*

[3] IF monitoring test points in more than one protection cabinet, THEN

NOTIFY Operations that Annunciator Alarm "PROC PROT > 1 SET DOORS OPEN", 1-XA-55-6A, window 115F, will be initiated during the next Step.

MARK this step NA, if monitoring test points in only one protection cabinet.

B. Hugh Elliott 15-11-96

4.3 Field Preparations (continued)

[4] ENSURE that the MMIs have configured and scaled the trending test points per Appendix A.

RECORD the assigned Trend TP Number in Appendix A and Appendix C.

PLACE NA on sheets containing points not to be monitored.

Panel	TPs Scaled	TP Number Recorded		Not Monitored
		Appendix A	Appendix C	
1-R-2	☑	☑	☑	☐ NA
1-R-6	☑	☑	☑	☐ NA
1-R-10	☑	☑	☑	☐ NA
1-R-13	☑	☑	☑	☐ NA

15-11-96

[5] ENSURE that the DAS and/or Strip Chart Recorders are scaled to the ranges in APPENDIX A for at least one RCS and Steam Generator Loop, and

LABEL each channel (Point ID and Engineering Units) for Strip Chart Recorders.

15/12/96

[6] ENSURE that the DAS and/or Strip Chart Recorders are scaled to the ranges in APPENDIX B, and

LABEL each channel (Point ID and Engineering Units) for Strip Chart Recorders.

15/12/96

4.3 Field Preparations (continued)

[7] CONNECT the DAS and/or Strip Chart Recorders as follows:

[A] IF using Strip Chart Recorders, THEN

CONNECT an External Trigger I/O among the recorders. (NA for DAS) NA

[B] ESTABLISH communications between the Control Room and the Auxiliary Instrument Room. ☑

[C] CONNECT to the applicable test points listed on Appendix A and Appendix B. ☑

B. Hugh Pletts 15-11-96

[8] RUN the DAS or Strip Chart Recorders for a few minutes, and

ENSURE that recorded parameters are in agreement with plant indications, and that DAS clock and computer clock are synchronized.

15/12/96

[9] ESTABLISH Trend Blocks for the computer points listed on Appendix D. A trend interval of ten seconds is recommended.

15/12/96

[10] ENSURE that panel 1-R-177 (Steam Generator Safeties and PORVs position) is in service.

B. Hugh Pletts 15-11-96

[11] ENSURE that Pressurizer Valve Acoustic Monitor, 1-XX-68-363, at panel 0-M-25 is in service.

B. Hugh Pletts 15-11-96

4.3 Field Preparations (continued)

[12] ENSURE that Reactor Power Level is between 95% and 100%, and

RECORD NIS Power as indicated on U1150 or the highest level recorded on 1-NR-92-145.

Power 95.8% Source -- recorder ☐ or computer ☑

15/12/96

[13] ENSURE that control rods are positioned such that the load reduction is expected to be accomplished without violation of rod insertion limits. It is recommended to position Control Bank D between 200 and 215 steps.

15/12/96

[14] ENSURE that the Steam Dump Control System is in the Tavg mode.

- STEAM DUMP FSV "A", 1-HS-1-103A is ON ☑
- STEAM DUMP FSV "B", 1-HS-1-103B is ON ☑
- STEAM DUMP MODE, 1-HS-1-103D is in Tavg ☑

15/12/96

[15] ENSURE that speed controls for the MFPTs are in AUTOMATIC.

- MFPT A & B MASTER SPEED CONTROL, 1-PC-46-20 in AUTO ☑
- MFPT A SPEED CONTROL, 1-SIC-46-20A in AUTO ☑
- MFPT B SPEED CONTROL, 1-SIC-46-20B in AUTO ☑

15/12/96

4.3 **Field Preparations** (continued)

[16] **ENSURE** that all MFW Reg Valve Controllers are in AUTOMATIC:

- SG 1-MFW REG VLV Controller, 1-FIC-3-35 is in AUTO ☑
- SG 2-MFW REG VLV Controller, 1-FIC-3-48 is in AUTO ☑
- SG 3-MFW REG VLV Controller, 1-FIC-3-90 is in AUTO ☑
- SG 4-MFW REG VLV Controller, 1-FIC-3-103 is in AUTO ☑

15/12/96

[17] **ENSURE** that the Steam Generator Program Level "SG LEVEL - NIS BIAS" Controllers are in AUTOMATIC:

- NUC PWR-SG1, LEVEL CONTROL, 1-LIC-3-231 is in AUTO ☑
- NUC PWR-SG2, LEVEL CONTROL, 1-LIC-3-232 is in AUTO ☑
- NUC PWR-SG3, LEVEL CONTROL, 1-LIC-3-233 is in AUTO ☑
- NUC PWR-SG4, LEVEL CONTROL, 1-LIC-3-234 is in AUTO ☑

15/12/96

NOTE: *If the Standby Feedwater Pump is run for normal plant operation, then the pump should be left in its normal configuration.*

CN-1

[17A] **RECORD** the status of the Standby Feedwater Pump.

Secured ☑

Running ☐

15/12/96

4.3 Field Preparations (continued)

[18] **ENSURE** the Steam Generator Power Operated Relief Valve "SG PORV CONTROL" Controllers are in AUTOMATIC and set at approximately 87% (1125 PSIG).

- SG 1 PORV 1-PIC-1-6A for 1-PCV-1-5 in AUTO ☑
  1-HS-1-6 in P AUTO ☑
- SG 2 PORV 1-PIC-1-13A for 1-PCV-1-12 in AUTO ☑
  1-HS-1-13 in P AUTO ☑
- SG 3 PORV 1-PIC-1-24A for 1-PCV-1-23 in AUTO ☑
  1-HS-1-24 in P AUTO ☑
- SG 4 PORV 1-PIC-1-31A for 1-PCV-1-30 in AUTO ☑
  1-HS-1-31 in P AUTO ☑

AJ 15/12/96

[19] **ENSURE** that the Pressurizer Level Control System is in AUTOMATIC:

- CHRG FLOW / PZR LEVEL CONTROL,
  1-LIC-68-339 is in AUTO ☑

AND

- CHARGING FLOW PZR LEVEL CONTROL,
  1-HIC-62-93A is in AUTO ✓

  OR ☑

  PD PMP SPEED CONTROL,
  1-SIC-68-339A is in AUTO

AJ 15/12/96

4.3 **Field Preparations** (continued)

[20] **ENSURE** that the Pressurizer Pressure Control System is in AUTOMATIC:

- PZR PRESS MASTER CONTROL, 1-PIC-68-340A is in AUTO ☑
- LOOP 1 SPRAY CONTROL, 1-PIC-68-340D is in AUTO ☑
- LOOP 2 SPRAY CONTROL, 1-PIC-68-340B is in AUTO ☑
- CONTROL HEATERS D, 1-HS-68-341F is in P AUTO, and ☑
  Energized ☑
- BACKUP HEATERS A-A, 1-HS-68-341A is in A-P AUTO, and ☑
  Not Energized ☑
- BACKUP HEATERS B-B, 1-HS-68-341D is in A-P AUTO, and ☑
  Not Energized ☑

NOTE: *If the 'C' backup heaters are energized for normal plant operation, the switch should be left in its normal position (auto after on). Check the status of the backup heaters.*

- BACKUP HEATERS C, 1-HS-68-341H is in P AUTO, and ☑

  ON ☑

  OFF ☐

DB 15/12/96

4.3 Field Preparations (continued)

[21] ENSURE that Pressurizer Pressure is between 2220 PSIG and 2250 PSIG as indicated on 1-PR-68-340 or computer point P0480A.

RECORD the pressure. Source -- recorder ☑ or computer ☐

Pressurizer Pressure 2246 Psig

15/12/96

[22] ENSURE that Rod Control is in AUTOMATIC .

- 1-RBSS is in AUTO ☑

15/12/96

[23] ENSURE that the RCS average temperature (Tavg) is within 1.5 °F of the RCS reference temperature (Tref) as indicated on 1-TR-68-2B or with computer points T0496A and T0499A.

RECORD the temperatures. Source -- recorder ☑ or computer ☐

Tref 586.8 °F

Auct Tavg 587.1 °F

Difference = |(Tref) - (Tavg)|

= 0.3 °F

15/12/96

4.3 Field Preparations (continued)

[24] ENSURE that Pressurizer Level is at Program Level of approximately 60% (57% to 62%) as indicated on 1-LR-68-339 or computer point L0480A.

RECORD the level. Source -- recorder ☑ or computer ☐

Pressurizer Level 59 Percent

15/12/96

[25] ENSURE that Steam Generator Levels are at Program Level of approximately 66.5% (63% to 70%) for full power as indicated on 1-FR-3-35, 48, 90, and 103; or computer points L0400A, L0420A, L0440A, and L0460A.

RECORD the levels. Source -- recorder ☐ or computer ☑

SG No. 1 Level 63.7 Percent
SG No. 2 Level 64.1 Percent
SG No. 3 Level 65.6 Percent
SG No. 4 Level 64.4 Percent

15/12/96

4.3 Field Preparations (continued)

[26] ENSURE that the following plant parameters are stable based on control room or computer indications. It is suggested to trend the listed computer points.

- Reactor Power is changing less than ±1% in a 15 minute interval. (U1118) ☑
- RCS Tavg is changing less than ± 1.5 °F in a 15 minute interval. (T0499A) ☑
- Pressurizer Pressure is changing less than ±25 psi in a 15 minute interval. (P0480A or P0481A) ☑
- Steam Generator Levels are changing less than ±3% in a 15 minute interval. (L0400A, L0420A, L0440A, L0460A) ☑
- Pressurizer Level is changing less than ±5% in a 15 minute interval. (L0480A or L0481A) ☑

15/12/96

[27] ENSURE that the difference in Boron Concentration between the RCS and the Pressurizer is within 50 ppm. Samples should have been taken within four hours of starting the test, and

RECORD RCS Boron Concentration on Data Sheet 1.

15/12/96

4.3 Field Preparations (continued)

[28] SELECT the EHC System control method (IMP IN or IMP OUT) to be used for this test, and

INDICATE the method. IMP IN ☑ IMP OUT ☐

15/12/96

[29] ENSURE that Safety Injection Annunciator 1-XA-55-4A, window 70A, "SI Actuated" is in service.

15/12/96

[30] ENSURE that the Control Room Operators are aware that manual intervention is allowed to prevent a plant trip or to gain control of a system oscillation.

15/12/96

[31] ENSURE that the Control Room Operators are aware that Boration is permitted and may be required to clear the "ROD INSERTION LIMIT LO-LO" Alarm, 1-XA-55-4B, window 87B, during the transient. See Precautions and Limitations 3.0, H.

15/12/96

[32] ENSURE that the Control Room Operators are aware that procedure AOI-11, "Loss of Condenser Vacuum" is suspended for this test. The turbine will be tripped for any of the following reasons:

[A] Condenser backpressure remains equal to or greater than 5.5 IN HG in any of the three zones after five minutes.

[B] Condenser backpressure exceeds 7 IN HG in any zone.

[C] Directed by the Shift Operations Supervisor / Unit SRO or Test Director.

15/12/96

5.0 ACCEPTANCE CRITERIA/REVIEW CRITERIA

5.1 Acceptance Criteria

The plant can sustain a large step reduction in turbine generator load of approximately 50% (48% to 52%) as demonstrated by meeting the following requirements:

A. Neither the Reactor nor the Turbine tripped. (Step 6.1 [20A]) BHP 5-22-96
DN-2 /

B. A Safety Injection was not initiated. (Step 6.1 [20B]) BHP 5-22-96
DN-2 /

C. None of the Steam Generator Safety Valves lifted. (Step 6.1 [20C])
BHP 5-22-96
DN-2 /

D. None of the Pressurizer Safety Valves lifted. (Step 6.1 [20D]) BHP 5-22-96
DN-2 /

NOTE 1: *Stable in the following criteria is defined as plant parameters trending towards a steady-state value without sustained or diverging oscillations. Plant recorders or strip chart recorders should be used to judge stability.*

NOTE 2: *Initiation of boration to restore Control Rods above the Low-Low Rod Insertion Limit, is NOT considered manual intervention.*

E. Stability was achieved without manual intervention. (Step 6.1 [20E])
BHP 5-22-96
DN-2 /

5.2 Review Criteria

5.2.1 Review Criteria for Turbine Load

Turbine Load was reduced by approximately 603 MWe (579 to 627 MWe). (Section 6.2, Step [3])

BHP 5-22-96
DN-3 /

5.2.2 Review Criteria for Plant Control

Following a large step reduction in turbine generator load of approximately 50% (48% to 52%) plant control systems operate to maintain the following conditions during the transient (Data Sheet 2):

A. Steam Generator Levels remained within +15%, -15% of the program level.

SG No. 1	BHP 5-22-96 DN-2 /	SG No. 2	BHP 5-22-96 DN-2 /
SG No. 3	BHP 5-22-96 DN-2 /	SG No. 4	BHP 5-22-96 DN-2 /

B. Pressurizer Pressure swings were less than +110, -160 psi from initial pressure.

BHP 5-22-96
DN-2 /

C. Main Feedwater Header Pressure oscillations are less than ±3% within 300 seconds after the change in steam flow (load change).

BHP 5-22-96
DN-2 /

D. RCS average temperature (Tavg) did not undershoot the final temperature by more than 3 °F.

BHP 5-22-96
DN-2 /

5.2.2 **Review Criteria for Plant Control** (continued)

E. RCS average temperature (Tavg) did not peak above the initial temperature by more than 5 °F.

BHP 5-22-96
DN-2 /

F. RCS average temperature (Tavg) was controlled by the Steam Dump Control System, as demonstrated by the Steam Dump Valves actuating and modulating (did not cycle between open and close) to control RCS average temperature (Tavg) oscillations within 2 °F (peak to valley).

BHP 5-22-96
DN-2 /

G. RCS average temperature (Tavg) was controlled by the Rod Control System, after Steam Dump Valve operation was terminated, as demonstrated by RCS average temperature (Tavg) oscillations remaining within 5 °F (peak to valley).

BHP 5-22-96
DN-2 /

H. Steam Dump Valve operation was for less than 8 minutes after the load reduction, as demonstrated by valve Demand Signal or valve indication.

BHP 5-22-96
DN-2 /

I. The Rod Control System caused rod motion at maximum speed.

BHP 5-22-96
DN-2 /

6.0 PERFORMANCE

[1] **NOTIFY** shift operations that the Preliminary Actions and Field Preparations for Section 6.0 are complete, and

OBTAIN permission to perform Section 6.0.

JEBaker / 5/12/96

Shift Operations Supervisor/Unit SRO Date

6.1 Large Load Reduction

[1] **ASSIGN** and **STATION** personnel at panel 0-M-25 to monitor Pressurizer Safety and PORV positions, at panel 1-M-4 to monitor discharge temperature from the pressurizer Safety Valves and time Steam Dump Valves, at panel 1-R-177 to monitor Steam Generator Safety and PORV positions, and outside the north and south steam vaults to monitor the tailpipes for the Steam Generator Safeties and PORVs.

ENSURE that assigned personnel are familiar with indications that indicate that a valve had opened.

- Person stationed at 0-M-25 ☑
- Person stationed at panel 1-M-4 (temperatures) ☑
- Person stationed at panel 1-M-4 (Steam Dump Valves) ☑
- Person stationed at 1-R-177 ☑
- Outside North Steam Vault ☑
- Outside South Steam Vault ☑
- P2500 computer (points for Condenser Backpressure) ☑

15/12/96

[2] **RECORD** the Initial Condition data on Data Sheet 1.

15/12/96

6.1 **Large Load Reduction** (continued)

[3] **ENSURE** that the Trend Blocks for the computer points listed on Appendix D are printing.

AB 15/12/96

[4] **RECORD** the Current Electrical Load from the Plant Computer and the Current Setter value from the EHC Control Panel.

Current Electrical Load (Q0340A) 1137.1 MWe

Current Setter Value 100.7 %

AB 15/12/96

[5] **DETERMINE** the New Electrical Load by subtracting 603 MWe from the Current Electrical Load.

New Electrical Load = 1137.1 MWe - 603 MWe
Step [4]

New Electrical Load = 534.1 MWe

AB 15/12/96

[6] **DETERMINE** the EHC System Setter Value for the Load Reduction as follows:

[A] **IF** the EHC System is to be controlled by "IMP IN", **THEN**

DETERMINE the New Setter Value for the EHC Control Panel by substituting into the following equation.

$$\text{New Setter Value} = \frac{\text{(New Electrical Load)}}{\text{(Current Electrical Load)}} \times \text{(Current Setter Value)}$$

$$= \frac{534.1 \text{ MWe (Step [5])}}{1137.1 \text{ MWe (Step [4])}} \times 100.7 \text{ \% (Step [4])}$$

New Setter Value = 47.3 %

6.1 **Large Load Reduction** (continued)

[6] (continued)

[B] **IF** the EHC System is to be controlled by "IMP OUT", **THEN**

DETERMINE the New Setter Value for the EHC Control Panel for the above 'New Electrical Load' by interpolating between the nearest Megawatt values (Q0340A) recorded in the sequence document appendix titled "Megawatts vs Turbine EHC Setter Value for IMP OUT".

RECORD the New Setter Value.

New Setter Value = NA %

[C] **PLACE** NA in the blanks for the control method not used.

15/12/96

15/12/96
Second Party

[7] **ENSURE** that the following computer points are being monitored:

P2263A	Condenser Zone A Backpressure	☑
P2264A	Condenser Zone B Backpressure	☑
P2265A	Condenser Zone C Backpressure	☑

15/12/96

[8] **REQUEST** Operations to notify the Load Dispatcher that the planned load reduction is imminent.

15/12/96

6.1 Large Load Reduction (continued)

[9] **REQUEST** Operations to announce over the plant paging system that the 50% Large Load Reduction is about to commence.

15/12/96

[10] **ADJUST** the EHC Turbine Control to provide a 50% Load Reduction at a rate of 200% per minute.

- Setter adjusted to value determined at Step [6] ☑
- Load Rate set to 200% per minute. ☑

15/12/96

CAUTION: Condenser zone pressures during the test load reduction are expected to exceed the steady state values existing before the reduction. Annunciator alarm "CONDENSER VACUUM LO" 1-XA-55-3A, window 46C, may be initiated for a brief period. Condenser zone pressures are being recorded during the transient to trend periods when back pressure exceeds 5.5 in Hg. Operating the turbine at degraded conditions for five minutes or longer requires a turbine shutdown and inspection. Procedure AOI-11, Loss of Condenser Vacuum, will be suspended for this test. If vacuum does not improve within five minutes (in all three zones), then the turbine should be tripped. Inspection requirements for startup will be determined by Engineering.

None of the automatic turbine trips have been disabled. The Low Vacuum Trip (>7 In Hg) is still in-service. If backpressure exceeds 7 In. Hg, the turbine should be manually tripped.

[11] START SCANNING and STORING the DAS / Strip Chart points specified on Appendix A and Appendix B. DAS scan rate or strip chart speed is at the discretion of the Test Director. A DAS scan rate of 5 scans per second or a chart speed of 20 mm per second is recommended.

15/12/96

6.1 **Large Load Reduction** (continued)

NOTE: *Steps [12] through [17] initiate the load rejection and obtains data during the first few minutes of the transient. Ensure that test personnel are familiar with the steps and are prepared to obtain the specified data. These steps may be performed concurrently.*

[12] **DEPRESS** the EHC Turbine Control "GO" button to initiate the transient.

PULSE the Event Marker or **MARK** the traces to indicate the start of the transient.

416 5/16/96

[13] **WHEN** greater than 50% power (P-9)

AND Condenser backpressure stays equal to or greater than 5.5 In HG in any of the three zones for five minutes

OR Condenser backpressure exceeds 7 In HG in any zone,

MANUALLY TRIP the reactor then **ENSURE** turbine is tripped;

OR

WHEN less than 50% power (P-9)

AND Condenser backpressure stays equal to or greater than 5.5 In HG in any of the three zones for five minutes,

OR Condenser backpressure exceeds 7 In HG in any zone,

MANUALLY TRIP the turbine

OR

IF Condenser backpressure improves within five minutes after the initiation of the Load Rejection, **THEN**

MARK this step is NA.

NA

5/12/96 ~~5/18/96~~

6.1 **Large Load Reduction** (continued)

NOTE: *The time recorded in the next step is used as an aid in correlating test events with data recorded by the plant computer, alarm printer, and/or DAS.*

[14] **RECORD** the time that the Load Reduction was initiated.

Tstart: 916

15/12/96

[15] **START** the Stop Watch when the Steam Dump Valves start to open, as indicated by 1-XX-55-4A lights on panel 1-M-4.

15/12/96

[16] **ENSURE** that a rapid load reduction has occurred.

15/12/96

[17] **STOP** the Stop Watch when the Steam Dump Valves go closed, as indicated by 1-XX-55-4A lights on panel 1-M-4.

RECORD the elapsed time.

Time: 6 minutes 5 seconds

15/12/96

6.1 **Large Load Reduction** (continued)

NOTE 1: *Initiation of boration to restore Control Rods above the Low-Low Rod Insertion Limit, is NOT considered manual intervention, but should be minimized during stabilization.*

NOTE 2: *Stable in the following step is defined as the listed parameter trending towards a steady-state value without sustained or diverging oscillations. It is recommended to observe plant recorders or strip chart recorders to judge if the plant is stable. Anticipated time to achieve stability following the large load reduction is a nominal twenty minutes.*

[18] **ENSURE** that the following plant parameters are stable:

- Reactor Power ☑
- RCS Tavg ☑
- Pressurizer Pressure ☑
- Steam Generator Levels ☑
- Pressurizer Level ☑
- Turbine Impulse Pressure ☑

AB 15/12/96

NOTE: *The time recorded in the next step is used as an aid in correlating test events with data recorded by the plant computer, alarm printer, and/or DAS.*

[19] **RECORD** the approximate time that stability was achieved.

PULSE the Event Marker or **MARK** the traces to indicate the end of the transient.

Tstable: 0432

AB 15/12/96

6.1 **Large Load Reduction** (continued)

[20] **ENSURE** the following Criteria:

[A] Neither the Reactor nor the Turbine tripped (**Acc. Crit. 5.1 [A]**)

- Rod Bottom Lights -- **not** lit ☑

- **RECORD** Generator Load. 567.2 Mwe (Q0340A)

15/12/96

[B] A Safety Injection was not initiated. (**Acc. Crit. 5.1 [B]**)

- Safety Injection Annunciator 1-XA-55-4A, window 70A,"SI Actuated" is not illuminated.

15/12/96

NOTE: *Several indicators (visual, temperature, and acoustic) are available to determine whether safeties lifted during the transient. Visual observation of the tailpipe exhaust is the preferred means for the Steam Generator Safeties. MCR temperature indicators are the preferred means for the Pressurizer Safeties.*

[C] None of the Steam Generator Safety Valves lifted, and

INDICATE the method used to determine that none of the Steam Generator Safety Valves lifted. (**Acc. Crit. 5.1 [C]**)

- Visual -- No Steam exhausted from the tailpipes for the Safeties ☑

- Acoustic Monitoring -- No alarms at 1-R-177 for the Safeties ☐

15/12/96

6.1 **Large Load Reduction** (continued)

[20] (continued)

[D] None of the Pressurizer Safety Valves lifted, and

INDICATE the method used to determine that none of the Pressurizer Safety Valves lifted. **(Acc. Crit 5.1 [D])**

- Temperature Indication -- No rise in any of the PZR Safety tailpipe temperatures ☑
- Acoustic Monitoring -- No alarms at 0-M-24 for the Safeties ☐ N/A

15/12/96

[E] Stability was achieved without manual intervention. **(Acc. Crit 5.1.[E])**

See Test Log 0432 and 0500 5/12/96

5/12/96 DN-1 BHP 5.12.96

~~15/12/96~~

[21] **RECORD** the required minimum, maximum, and final conditions on Data Sheet 1.

5/12/96

NOTE: *The resetting of C-7 in the next step may be inhibited for several minutes (less than five minutes) because of the time constant in the turbine impulse pressure derivative circuit.*

[22] **RESET** the Steam Dump Control System mode per SOI-1.2.

15/12/96

[23] **ENSURE** that Annunciator, 1-XA-55-4A, window 66E, "C-7 LOSS OF LOAD STM DUMP INTERLOCK" is not illuminated.

5/12/96

6.1 **Large Load Reduction** (continued)

NOTE: *The time recorded in the next step is used as an aid in correlating test events with data recorded by the plant computer, alarm printer, and/or DAS.*

[24] **STOP** data collection / recording and **RECORD** the stop time.

Tstop: 0448

AB 15/12/96

NOTE: *The remaining steps in Section 6.1 may be performed concurrently.*

[25] **NOTIFY** Operations that test data acquisition is complete, and that plant operations may resume per operating procedures.

AB 15/12/96

[26] **STOP** the Plant Computer Trends.

AB 15/12/96

[27] **OBTAIN** the Computer Trends, Strip Charts, and/or DAS data; and

LABEL the printouts and/or disc with the following information:

Test:	1-PAT-1.3	☑
Section:	6.1	☑
Date:	5/12/96	☑
Time:	0500	☑
Plateau Power Level:	100	☑
Chart Speed:	N/A (NA for DAS)	☐ NA

AB 15/12/96

6.1 **Large Load Reduction** (continued)

[28] **ENSURE** that the Process Controls and Process Protection Panels are restored by performing Appendix C.

15/12/96

[29] **NOTIFY** Operations (SOS or Unit SRO) that field testing and restoration are complete.

15/12/96

6.2 Data Review

[1] **IF** using DAS, **OBTAIN** plots of the recorded plant parameters. Hard copies of the data showing minimum and maximum values will be useful in completing this Section.

MARK this step NA, if Strip Chart Recordings are to be used in data reduction.

B. Hugh Pluntz 5-12-96

NOTE: *The following step compares data obtained during the Load Reduction. Results of these comparisons will be used for Review Criteria, and possible control system tuning. The preferred source of data is from the DAS or the Strip Charts generated during the transient. If information is not available from the DAS or the Strip Charts, information from Data Sheet 1 or Computer Trends may be used as a substitute.*

[2] **DETERMINE** the following from the data generated during the Large Load Reduction. DAS or Strip Charts is the preferred source of information. See APPENDIX F to help interpret data.

RECORD information on Data Sheet 2.

[A] **RECORD** Maximum and Minimum Steam Generator Levels and the associated Program Level Setpoints at the points where the deviation from Program Level Setpoint is the largest. ☑

[B] **RECORD** Initial, Maximum, and Minimum Pressurizer Pressure. ☑

[C] **RECORD** Maximum and Minimum FW Header Pressures approximately 300 seconds after the load change. ☑

[D] **RECORD** the Final Tavg and the Lowest Tavg (undershoot) temperatures. ☑

[E] **RECORD** the Initial Tavg and the Highest Tavg (peak) temperatures. ☑

6.2 **Data Review** (continued)

[2] (continued)

[F] **RECORD** the maximum and minimum Tavg (peak to next valley) during Steam Dump operation (modulation). ☑

[G] **RECORD** the maximum and minimum Tavg (peak to next valley) after Steam Dump operation. ☑

[H] **RECORD** the time when the Steam Dump Valve Demand Signal starts increasing and when the Steam Dump Valve Demand Signal stops decreasing. ☑

[I] **TRANSFER** the Steam Dump operating time from Section 6.1, Step [17]. ☑

[J] **DETERMINE** the total time that control rod operated at Maximum Rod Speed (~72steps/min). ☑

[K] **PERFORM** the calculations on the data sheet. ☑

B. Hugh Plutt 5-12-96

[3] **DETERMINE** the Electrical Load Reduction by substituting values from Data Sheet 1 into the following equation. **(Rev. Crit. 5.2.1)**

Electrical Load Reduction = Initial Generator Output - Final Generator Output

= 1134.4 MWe - 565.3 MWe

= 569 MWe

B. Hugh Plutt 15-12-96

[4] **COMPARE** the test results from the Large Load Reduction with the requirements of Review Criteria 5.2.1 and 5.2.2.

DOCUMENT acceptance by signing in Section 5.2.

BHP 5-22-96

DN-2 1

6.2 **Data Review** (continued)

[5] **COMPARE** the test results from the Large Load Reduction with the requirements of Acceptance Criteria 5.1

DOCUMENT acceptance by signing in Section 5.1 BHP 5-22-96

DN-2 /

7.0 POST PERFORMANCE ACTIVITY

NOTE *Restoration was performed in the body of the test.*

8.0 RECORDS

8.1 QA Records

The following documents are QA records and are handled in accordance with the approved Document Control Records Management (DCRM) Program:

Completed Test Package

8.2 Non-QA Records

None

APPENDIX A
DAS / Strip Chart Recorder Scaling and Connections for RCS and SGs
Page 1 of 4

RCS Loop No. 1 and Steam Generator No. 1

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	SIGNAL RANGE	Connected 1st	Connected 2nd
1-R-2	T-411 TfH Ave	6	RCS Loop 1 Average Hot Leg Temp	0.0 to 1.0 Vdc 550 to 650 F ☑	☑	☑
1-R-2	T-411 TfC Ave	5	RCS Loop 1 Average Cold Leg Temp	0.0 to 1.0 Vdc 510 to 610 F ☑	☑	☑
1-R-2	TP/412C	NA	RCS Loop 1 Average Temperature	0.2 to 1.0 Vdc 530 to 630 F ☑	☑	☑
1-R-2	TP/411E1	NA	RCS Loop 1 Delta T	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-2	TP/411F1	NA	RCS Loop 1 OPΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-2	TP/411G1	NA	RCS Loop 1 OTΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-15	FP/512E	NA	Steam Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-15	FP/510E	NA	Feedwater Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-15	FP/510F	NA	FW Reg Valve Demand Signal	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-15	LP/517C	NA	SG No 1 Level	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-15	LP/496D	NA	Level Setpoint	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑

NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
Chart Recorder			
DMM			

REMARKS:

PERFORMED BY: Date: 5/11/96

SECOND PARTY: Date: 5-11-96

APPENDIX A
DAS / Strip Chart Recorder Scaling and Connections for RCS and SGs
Page 2 of 4

RCS Loop No. 2 and Steam Generator No. 2

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	SIGNAL RANGE	Connected 1st	Connected 2nd
1-R-6	T-421 TfH Ave	6	RCS Loop 2 Average Hot Leg Temp	0.0 to 1.0 Vdc 550 to 650 F ☑	☑	☑
1-R-6	T-421 TfC Ave	5	RCS Loop 2 Average Cold Leg Temp	0.0 to 1.0 Vdc 510 to 610 F ☑	☑	☑
1-R-6	TP/422C	NA	RCS Loop 2 Average Temperature	0.2 to 1.0 Vdc 530 to 630 F ☑	☑	☑
1-R-6	TP/421E1	NA	RCS Loop 2 Delta T	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-6	TP/421F1	NA	RCS Loop 2 OPΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-6	TP/421G1	NA	RCS Loop 2 OTΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-19	FP/522E	NA	Steam Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-19	FP/520E	NA	Feedwater Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-19	FP/520F	NA	FW Reg Valve Demand Signal	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-19	LP/527C	NA	SG No 2 Level	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-19	LP/497D	NA	Level Setpoint	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑

NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
Chart Recorder			
DMM			

REMARKS: _____

PERFORMED BY: [signature] Date: 5/11/96

SECOND PARTY: [signature] Date: 5-11-96

APPENDIX A
DAS / Strip Chart Recorder Scaling and Connections for RCS and SGs
Page 3 of 4

RCS Loop No. 3 and Steam Generator No. 3

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	SIGNAL RANGE	Connected 1st	Connected 2nd
1-R-10	T-431 TfH Ave	6	RCS Loop 3 Average Hot Leg Temp	0.0 to 1.0 Vdc 550 to 650 F ☑	☑	☑
1-R-10	T-431 TfC Ave	5	RCS Loop 3 Average Cold Leg Temp	0.0 to 1.0 Vdc 510 to 610 F ☑	☑	☑
1-R-10	TP/432C	NA	RCS Loop 3 Average Temperature	0.2 to 1.0 Vdc 530 to 630 F ☑	☑	☑
1-R-10	TP/431E1	NA	RCS Loop 3 Delta T	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-10	TP/431F1	NA	RCS Loop 3 OPΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-10	TP/431G1	NA	RCS Loop 3 OTΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-21	FP/532E	NA	Steam Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-21	FP/530E	NA	Feedwater Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-21	FP/530F	NA	FW Reg Valve Demand Signal	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-21	LP/537C	NA	SG No 3 Level	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-21	LP/498D	NA	Level Setpoint	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑

NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
Chart Recorder			
DMM			

REMARKS: _____

PERFORMED BY: _____ Date: 5/11/96

SECOND PARTY: _____ Date: 5-11-96

APPENDIX A
DAS / Strip Chart Recorder Scaling and Connections for RCS and SGs
Page 4 of 4

RCS Loop No. 4 and Steam Generator No. 4

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	SIGNAL RANGE	Connected 1st	Connected 2nd
1-R-13	T-441 TfH Ave	6	RCS Loop 4 Average Hot Leg Temp	0.0 to 1.0 Vdc 550 to 650 F ☑	☑	☑
1-R-13	T-441 TfC Ave	5	RCS Loop 4 Average Cold Leg Temp	0.0 to 1.0 Vdc 510 to 610 F ☑	☑	☑
1-R-13	TP/442C	NA	RCS Loop 4 Average Temperature	0.2 to 1.0 Vdc 530 to 630 F ☑	☑	☑
1-R-13	TP/441E1	NA	RCS Loop 4 Delta T	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-13	TP/441F1	NA	RCS Loop 4 OPΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-13	TP/441G1	NA	RCS Loop 4 OTΔT Setpoint	0.2 to 1.0 Vdc 0 to 150 % ☑	☑	☑
1-R-23	FP/542E	NA	Steam Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-23	FP/540E	NA	Feedwater Flow	0.1 to 0.5 Vdc 0 to 4.5 MPPH ☑	☑	☑
1-R-23	FP/540F	NA	FW Reg Valve Demand Signal	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-23	LP/547C	NA	SG No 4 Level	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑
1-R-23	LP/499D	NA	Level Setpoint	0.1 to 0.5 Vdc 0 to 100 % ☑	☑	☑

NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
Chart Recorder			
DMM			

REMARKS: _____

PERFORMED BY: [signature] Date: 5/11/96

SECOND PARTY: [signature] Date: 5-11-96

APPENDIX B
DAS / Strip Chart Recorder Scaling and Connections for Controllers
Page 1 of 2

PNL	POINT ID	DESCRIPTION	SIGNAL RANGE	Connected 1st	Connected 2nd
1-R-16	PP/507A	Steam Header Pressure	0.1 to 0.5 Vdc 0 to 1300 Psig ☑	☑	☑
1-R-16	PP/508A	Feedwater Header Pressure	0.1 to 0.5 Vdc 200 to 1500 Psig ☑	☑	☑
1-R-16	PP/509A	ΔP Setpoint (FW-Stm)	0.1 to 0.5 Vdc 45 to 225 Psi ☑	☑	☑
1-R-16	PP/509B	Actual ΔP (FW-Stm)	0.1 to 0.5 Vdc 45 to 225 Psi ☑	☑	☑
1-R-16	PP/509C	MFPT Speed Demand	0.1 to 0.5 Vdc 3000 to 5850 RPM ☑	☑	☑
1-R-16	TB-16K Pts 1 & 5	Steam Dump Valve Demand	1.0 to 5.0 Vdc 0 to 100% ☑	☑	☑
1-R-70	TB-19 Pts 4 & 5	Main Generator Megawatts	1.0 to 5.0 Vdc 0 to 1600 MW ☑	☑	☑

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NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
DMM			

REMARKS: _____

PERFORMED BY: _____ Date: 5/11/96

SECOND PARTY: _____ Date: 5-11-96

APPENDIX B
DAS / Strip Chart Recorder Scaling and Connections for Controllers
Page 2 of 2

PNL	POINT ID	DESCRIPTION	SIGNAL RANGE		Connected 1st	Connected 2nd
1-R-15	PP/455L	Pressurizer Pressure	1.0 to 5.0 Vdc 1700 to 2500 Psig	☑	☑	☑
1-R-15	PP/455M	Master Pressure Controller Output	0.1 to 0.5 Vdc 0 to 100%	☑	☑	☑
1-R-18	LP/459E	Pressurizer Level	1.0 to 5.0 Vdc 0 to 100%	☑	☑	☑
1-R-18	TP/505B	Tref from Turbine Impulse Pressure	0.1 to 0.5 Vdc 530 to 630 F	☑	☑	☑
1-R-24	TP/412K	Auctioneered Tavg	0.1 to 0.5 Vdc 530 to 630 F	☑	☑	☑
1-R-25	JP/412E	Auctioneered NIS Power	0.1 to 0.5 Vdc 0 to 120%	☑	☑	☑
1-R-25	ZP/442A	Rod Position for Control Bank D	0 to 3.465 Vdc 0 to 231 Steps	☑	☑	☑
1-R-25	SP/412B	Rod Speed	9.500 to 2.130Vdc 72 to 8 Steps/Min	☑	☑	☑
302 1-R-123	TP-15	Condenser Zone A NR Press (1-PT-2-1)	0.1 to 0.5 Vdc 0 to 11 In Hg Abs	☑	☑	☑
303 1-R-123	TP-16	Condenser Zone C NR Press (1-PT-2-10)	0.1 to 0.5 Vdc 0 to 11 In Hg Abs	☑	☑	☑
304 1-R-124	TP-69	Condenser Zone B NR Press (1-PT-2-7)	0.1 to 0.5 Vdc 0 to 11 In Hg Abs	☑	☑	☑

CN-3

NOTE: *Second Party verification is only required for connecting the test points and not scaling recorders nor configuring the DAS.*

Test Equipment	M&TE ID No:	Cal. Date:	Cal. Due Date:
Chart Recorder	N/A		
DMM			

REMARKS: _____

PERFORMED BY: _____ Date: 5/11/96

SECOND PARTY: _____ Date: 5-11-96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 1 of 6

RCS Loop No. 1 and Steam Generator No. 1

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-2	T-411 TfH Ave	6	RCS Loop 1 Average Hot Leg Temp	☑	☑
1-R-2	T-411 TfC Ave	5	RCS Loop 1 Average Cold Leg Temp	☑	☑
1-R-2	TP/412C	NA	RCS Loop 1 Average Temperature	☑	☑
1-R-2	TP/411E1	NA	RCS Loop 1 Delta T	☑	☑
1-R-2	TP/411F1	NA	RCS Loop 1 OPΔT Setpoint	☑	☑
1-R-2	TP/411G1	NA	RCS Loop 1 OTΔT Setpoint	☑	☑
1-R-15	FP/512E	NA	Steam Flow	☑	☑
1-R-15	FP/510E	NA	Feedwater Flow	☑	☑
1-R-15	FP/510F	NA	FW Reg Valve Demand Signal	☑	☑
1-R-15	LP/517C	NA	SG No 1 Level	☑	☑
1-R-15	LP/496D	NA	Level Setpoint	☑	☑

REMARKS: _____

PERFORMED BY: [signature] Date: 5/12/96

SECOND PARTY: [signature] Date: 5/12/96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 2 of 6

RCS Loop No. 2 and Steam Generator No. 2

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-6	T-421 TfH Ave	6	RCS Loop 2 Average Hot Leg Temp	☑	☑
1-R-6	T-421 TfC Ave	5	RCS Loop 2 Average Cold Leg Temp	☑	☑
1-R-6	TP/422C	NA	RCS Loop 2 Average Temperature	☑	☑
1-R-6	TP/421E1	NA	RCS Loop 2 Delta T	☑	☑
1-R-6	TP/421F1	NA	RCS Loop 2 OPΔT Setpoint	☑	☑
1-R-6	TP/421G1	NA	RCS Loop 2 OTΔT Setpoint	☑	☑
1-R-19	FP/522E	NA	Steam Flow	☑	☑
1-R-19	FP/520E	NA	Feedwater Flow	☑	☑
1-R-19	FP/520F	NA	FW Reg Valve Demand Signal	☑	☑
1-R-19	LP/527C	NA	SG No 2 Level	☑	☑
1-R-19	LP/497D	NA	Level Setpoint	☑	☑

REMARKS: _____

PERFORMED BY: [signature] Date: 5/12/96

SECOND PARTY: [signature] Date: 5/12/96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 3 of 6

RCS Loop No. 3 and Steam Generator No. 3

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-10	T-431 TfH Ave	6	RCS Loop 3 Average Hot Leg Temp	☑	☑
1-R-10	T-431 TfC Ave	5	RCS Loop 3 Average Cold Leg Temp	☑	☑
1-R-10	TP/432C	NA	RCS Loop 3 Average Temperature	☑	☑
1-R-10	TP/431E1	NA	RCS Loop 3 Delta T	☑	☑
1-R-10	TP/431F1	NA	RCS Loop 3 OPΔT Setpoint	☑	☑
1-R-10	TP/431G1	NA	RCS Loop 3 OTΔT Setpoint	☑	☑
1-R-21	FP/532E	NA	Steam Flow	☑	☑
1-R-21	FP/530E	NA	Feedwater Flow	☑	☑
1-R-21	FP/530F	NA	FW Reg Valve Demand Signal	☑	☑
1-R-21	LP/537C	NA	SG No 3 Level	☑	☑
1-R-21	LP/498D	NA	Level Setpoint	☑	☑

REMARKS: _____

PERFORMED BY: Bert Cox Date: 5/12/96

SECOND PARTY: Anthony J Bellon Date: 5/12/96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 4 of 6

RCS Loop No. 4 and Steam Generator No. 4

PNL	POINT ID	Trend TP NUMBER ASSIGNED	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-13	T-441 TfH Ave	6	RCS Loop 4 Average Hot Leg Temp	☑	☑
1-R-13	T-441 TfC Ave	5	RCS Loop 4 Average Cold Leg Temp	☑	☑
1-R-13	TP/442C	NA	RCS Loop 4 Average Temperature	☑	☑
1-R-13	TP/441E1	NA	RCS Loop 4 Delta T	☑	☑
1-R-13	TP/441F1	NA	RCS Loop 4 OPΔT Setpoint	☑	☑
1-R-13	TP/441G1	NA	RCS Loop 4 OTΔT Setpoint	☑	☑
1-R-23	FP/542E	NA	Steam Flow	☑	☑
1-R-23	FP/540E	NA	Feedwater Flow	☑	☑
1-R-23	FP/540F	NA	FW Reg Valve Demand Signal	☑	☑
1-R-23	LP/547C	NA	SG No 4 Level	☑	☑
1-R-23	LP/499D	NA	Level Setpoint	☑	☑

REMARKS: _____

PERFORMED BY: [signature] Date: 5/12/96

SECOND PARTY: Anthony J Palm Date: 5/12/96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 5 of 6

PNL	POINT ID	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-16	PP/507A	Steam Header Pressure	☑	☑
1-R-16	PP/508A	Feedwater Header Pressure	☑	☑
1-R-16	PP/509A	ΔP Setpoint (FW-Stm)	☑	☑
1-R-16	PP/509B	Actual ΔP (FW-Stm)	☑	☑
1-R-16	PP/509C	MFPT Speed Demand	☑	☑
1-R-16	TB-16K Pts 1 & 5	Steam Dump Valve Demand	☑	☑
1-R-70	TB-19 Pts 4 & 5	Main Generator Megawatts	☑	☑

REMARKS: _____

PERFORMED BY: [signature] Date: 5/12/96

SECOND PARTY: Anthony J Beck Date: 5/12/96

APPENDIX C
DAS / Strip Chart Recorder Removal
Page 6 of 6

PNL	POINT ID	DESCRIPTION	Disconnected 1st	Disconnected 2nd
1-R-15	PP/455L	Pressurizer Pressure	☑	☑
1-R-15	PP/455M	Master Pressure Controller Output	☑	☑
1-R-18	TP/505B	Tref from Turbine Impulse Pressure	☑	☑
1-R-18	LP/459E	Pressurizer Level	☑	☑
1-R-24	TP/412K	Auctioneered Tavg	☑	☑
1-R-25	JP/412E	Auctioneered NIS Power	☑	☑
1-R-25	ZP/442A	Rod Position for Control Bank D	☑	☑
1-R-25	SP/412B	Rod Speed	☑	☑
1-R-123	TP-15	Condenser Zone A NR Press (1-PT-2-1)	☑	☑
1-R-123	TP-16	Condenser Zone C NR Press (1-PT-2-10)	☑	☑
1-R-124	TP-69	Condenser Zone B NR Press (1-PT-2-7)	☑	☑

REMARKS: _____

PERFORMED BY: [signature] Date: 5/12/94

SECOND PARTY: [signature] Date: 5/12/94

APPENDIX D
Computer Points
Page 1 of 2

Point ID	Description	In Scan	Trend Block
U1118	Reactor Thermal Power	✓	✓
Q0340A	Unit Generator Gross MWe	✓	✓
T0499A	Auctioneered Tavg	✓	✓
T0400A	RCS Loop 1 Tavg	✓	✓
T0420A	RCS Loop 2 Tavg	✓	✓
T0440A	RCS Loop 3 Tavg	✓	✓
T0460A	RCS Loop 4 Tavg	✓	✓
P0480A	Pressurizer Pressure	✓	✓
P0481A	Pressurizer Pressure	✓	✓
L0480A	Pressurizer Level	✓	✓
L0481A	Pressurizer Level	✓	✓
N0049A	NIS Power	✓	✓
N0050A	NIS Power	✓	✓
N0051A	NIS Power	✓	✓
N0052A	NIS Power	✓	✓
U1150	Power Range NIS Average	✓	✓
U1169	Power Range RMP Average	✓	✓
T0407A	Loop 1 OPΔT Setpoint	✓	✓
T0427A	Loop 2 OPΔT Setpoint	✓	✓
T0447A	Loop 3 OPΔT Setpoint	✓	✓
T0467A	Loop 4 OPΔT Setpoint	✓	✓
T0410A	Loop 1 OTΔT Setpoint	✓	✓
T0430A	Loop 2 OTΔT Setpoint	✓	✓
T0450A	Loop 3 OTΔT Setpoint	✓	✓
T0470A	Loop 4 OTΔT Setpoint	✓	✓
T0403A	RCS Loop 1 Delta T	✓	✓
T0423A	RCS Loop 2 Delta T	✓	✓
T0443A	RCS Loop 3 Delta T	✓	✓
T0463A	RCS Loop 4 Delta T	✓	✓
U0052	Control Bank D Step Counter	✓	✓

REMARKS: _____

PERFORMED BY: Anthony J. Fabian Date: 5/12/96

REVIEWED BY: B. Hugh Pluttz Date: 5-12-96

APPENDIX D
Computer Points
Page 2 of 2

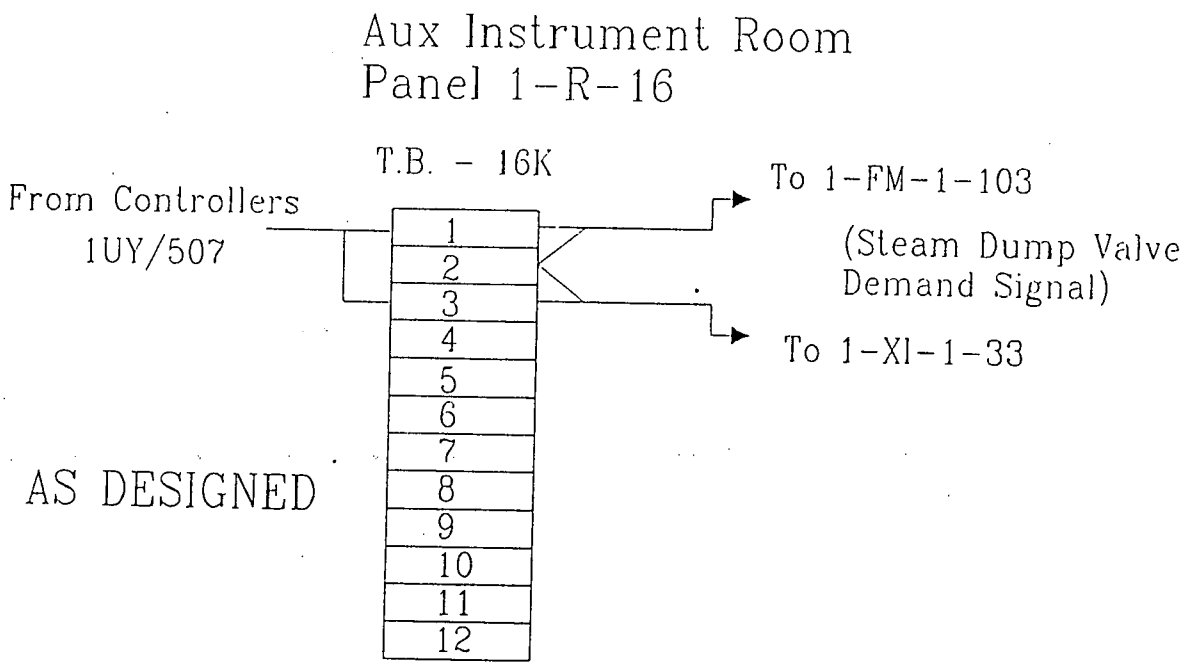
Point ID	Description	In Scan	Trend Block
T0418A	SG 1 FW Inlet Temperature	☑	☑
T0438A	SG 2 FW Inlet Temperature	☑	☑
T0458A	SG 3 FW Inlet Temperature	☑	☑
T0478A	SG 4 FW Inlet Temperature	☑	☑
P0398A	Turbine Impulse Pressure (P505)	☑	☑
P0399A	Turbine Impulse Pressure (P506)	☑	☑
P0496A	Steam Header Pressure	☑	☑
P2214A	MFP 1A Discharge Pressure	☑	☑
P2215A	MFP 1B Discharge pressure	☑	☑
F0403A	SG 1 FW Flow	☑	☑
F0423A	SG 2 FW Flow	☑	☑
F0443A	SG 3 FW Flow	☑	☑
F0463A	SG 4 FW Flow	☑	☑
F0405A	SG 1 Stm Flow	☑	☑
F0425A	SG 2 Stm Flow	☑	☑
F0445A	SG 3 Stm Flow	☑	☑
F0465A	SG 4 Stm Flow	☑	☑
L0400A	SG 1 NR Level	☑	☑
L0420A	SG 2 NR Level	☑	☑
L0440A	SG 3 NR Level	☑	☑
L0460A	SG 4 NR Level	☑	☑
P2263A	Condenser Zone A Backpressure	☑	☑
P2264A	Condenser Zone B Backpressure	☑	☑
P2265A	Condenser Zone C Backpressure	☑	☑

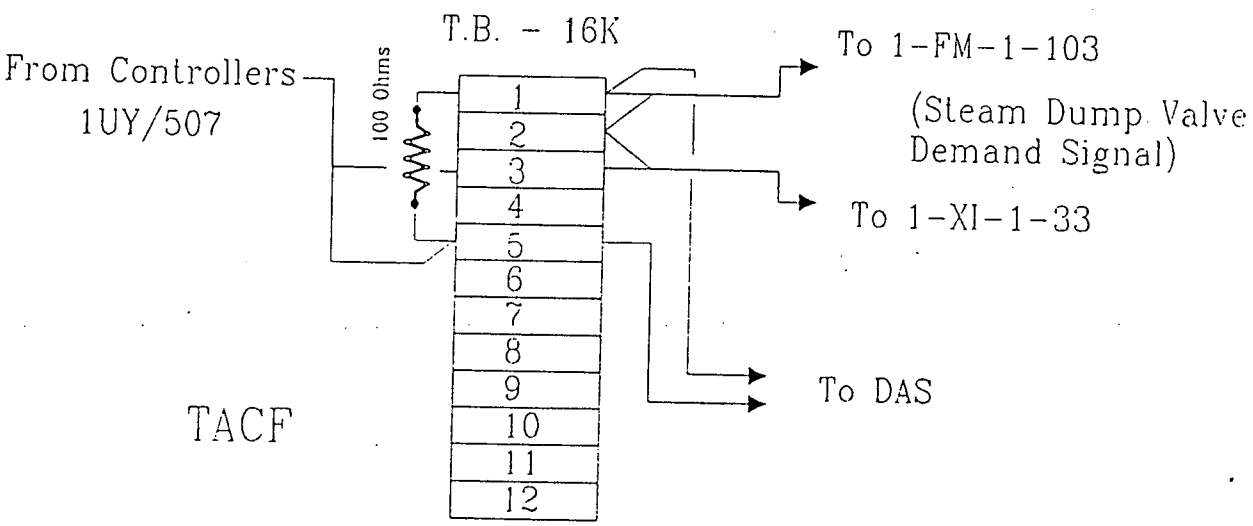
REMARKS: _____

PERFORMED BY: Anthony J Belin Date: 5/12/96

REVIEWED BY: B Hugh Phillips Date: 5-21-96

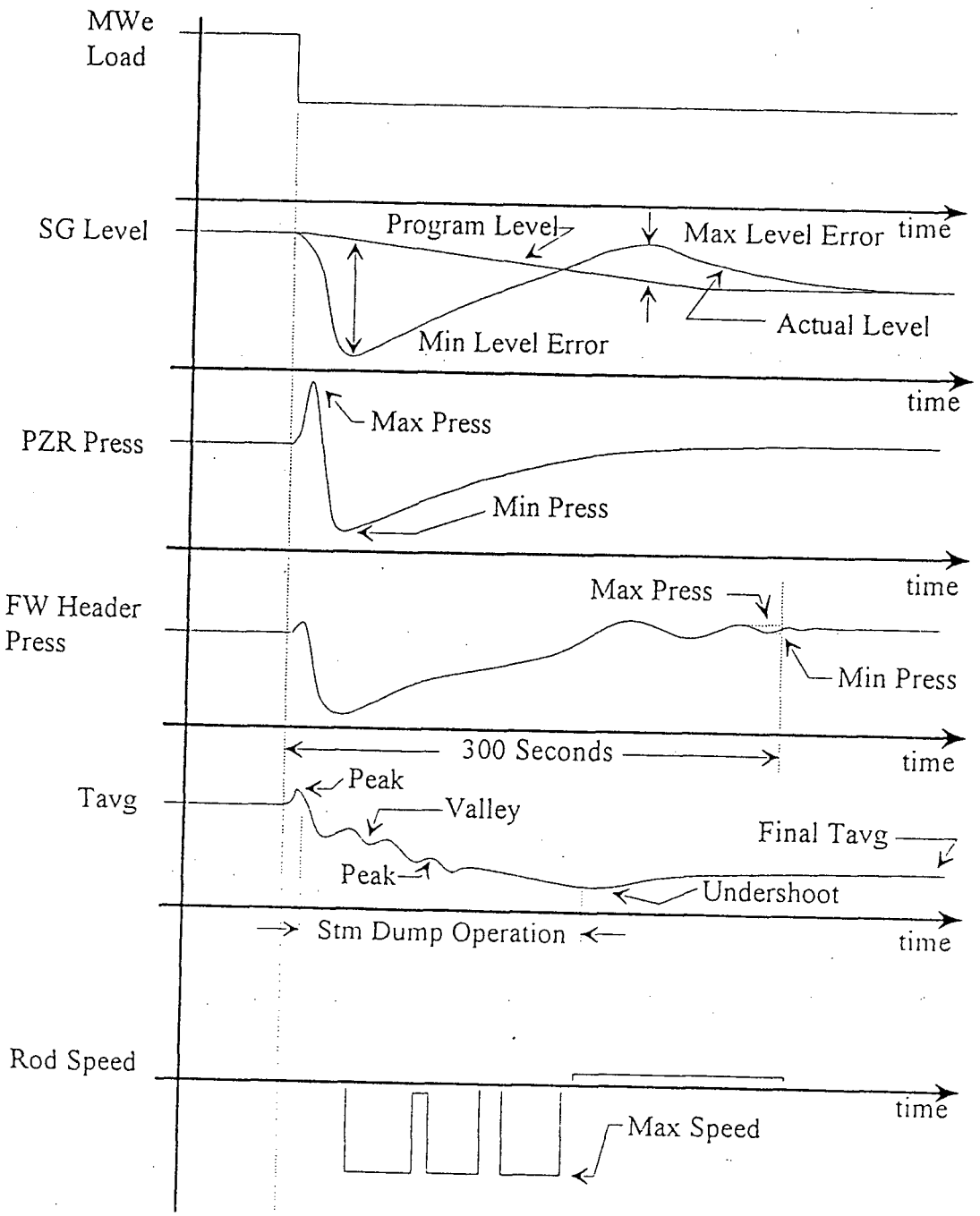
APPENDIX E
Recommended TACF Installations
Page 1 of 1





Reference: 1-47043, CD-16 (Contract 54114-1)
45N1665-3

APPENDIX F
Response to Large Load Reduction
Page 1 of 1



DATA SHEET 1
Main Control Room Indicators and Recorders
Page 1 of 3

Plant Parameter (Units)	Instrument *	Initial Condition	Transient		Final Condition
			Min Value	Max Value	
Generator Output (MWe)	Q0340A	1134.4 MW	NA	NA	565.3
Steam Flow SG No. 1 (MPPH)	1-FR-3-35	3.2 MPPH	1.55	3.35	1.6
Steam Flow SG No. 2 (MPPH)	1-FR-3-48	3.4 MPPH	1.4	3.4	1.8
Steam Flow SG No. 3 (MPPH)	1-FR-3-90	3.6 MPPH	1.8	3.6	1.85
Steam Flow SG No. 4 (MPPH)	1-FR-3-103	3.65 MPPH	1.75	3.65	1.9
FW Flow SG No. 1 (MPPH)	1-FR-3-35	3.05 MPPH	1.4	3.05	1.55
FW Flow SG No. 2 (MPPH)	1-FR-3-48	3.65 MPPH	1.7	3.65	1.85
FW Flow SG No. 3 (MPPH)	1-FR-3-90	3.6 MPPH	1.7	3.6	1.8
FW Flow SG No. 4 (MPPH)	1-FR-3-103	3.35 MPPH	1.6	3.35	1.75
SG Level No. 1 (%)	1-FR-3-35	57 %	46	57	46
SG Level No. 2 (%)	1-FR-3-48	64 %	51	64	51
SG Level No. 3 (%)	1-FR-3-90	66 %	54	66	54
SG Level No. 4 (%)	1-FR-3-103	65 %	53	65	53
SG No. 1 Prog Level (%)	1-LR-3-43	64 %	52	64	52
SG No. 2 Prog Level (%)	1-LR-3-98	66 %	53	66	53

* If an alternate indication is used, note in the REMARKS".

REMARKS: _____

PERFORMED BY: Robert B. Fry Date: 5/12/96

REVIEWED BY: Anthony J. Baker Date: 5/12/96

DATA SHEET 1
Main Control Room Indicators and Recorders
Page 2 of 3

Plant Parameter (Units)	Instrument *	Initial Condition	Transient		Final Condition
			Min Value	Max Value	
FW Temperature - Lp 1 (F)	T0418A	437.5 °F	NA	NA	382.7
FW Temperature - Lp 2 (F)	T0438A	436.3 °F	NA	NA	381.3
FW Temperature - Lp 3 (F)	T0458A	437.3 °F	NA	NA	382.1
FW Temperature - Lp 4 (F)	T0478A	436.8 °F	NA	NA	381.6
Turbine Impulse Press. (%)	1-PI-1-72	97%	NA	NA	48%
Turbine Impulse Press. (%)	1-PI-1-73	97%	NA	NA	48%
FWPT - A Speed (RPM)	1-SI-46-20A	5000 RPM	NA	NA	4200
FWPT - B Speed (RPM)	1-SI-46-20B	5000 RPM	NA	NA	3900
Steam Header Pressure (PSIG)	1-PI-1-33	995 psig	NA	NA	1020
FW Header Pressure (PSIG)	1-PI-3-1	1190 psig	NA	NA	1150
PZR PORV Dischg Temperature (F)	1-TI-68-331	215	NA	NA	215
PZR Safety Dischg Temperature (F)	1-TI-68-328	148	NA	NA	148
PZR Safety Dischg Temperature (F)	1-TI-68-329	135	NA	NA	135
PZR Safety Dischg Temperature (F)	1-TI-68-330	145	NA	NA	145

* If an alternate indication is used, note in the REMARKS".

REMARKS: _____

PERFORMED BY: [signature] RBD 5/12/96 Date: 5/12/96

REVIEWED BY: [signature] Date: 5/12/96

DATA SHEET 1
Main Control Room Indicators and Recorders
Page 3 of 3

Plant Parameter (Units)	Instrument *	Initial Condition	Transient		Final Condition
			Min Value	Max Value	
RCS Loop 1 ΔT (%)	1-TI-68-2D	97	NA	NA	55
RCS Loop 2 ΔT (%)	1-TI-68-25D	97	NA	NA	56
RCS Loop 3 ΔT (%)	1-TI-68-44D	97	NA	NA	54
RCS Loop 4 ΔT (%)	1-TI-68-67D	97	NA	NA	55
OPΔT Setpoint (%)	1-TR-68-2A	108	108	108	108
OTΔT Setpoint (%)	1-TR-68-2A	111	105	133	133
RCS Loop ΔT (%)	1-TR-68-2A	96	53	96	54
NIS Power (%)	1-NR-92-145	98	51	98	51.5
Pressurizer Pressure (PSIG)	1-PR-68-340	2245	2170	2280	2257
Pressurizer Level (%)	1-LR-68-339	58	42	62	42
Tavg - Auctioneered (F)	1-TR-68-2B	587	571	589	571
Tref (F)	1-TR-68-2B	586	571	586	571
Control Bank D1 (Steps)	Step Counter 1-CBD G1	210	NA	NA	116
Control Bank D2 (Steps)	Step Counter 1-CBD G2	209	NA	NA	115
BA Batch Counter (Gallons)	1-FQ-62-139	670197	NA	NA	670197
PWS Batch Counter (Gallons)	1-FQ-62-142	816289	NA	NA	816289
Boron Concentration (PPM)	Operator Logs	859	NA	NA	NA

* If an alternate indication is used, note in the REMARKS".

REMARKS:

PERFORMED BY: _____ Date: 5/12/96

REVIEWED BY: _____ Date: 5/12/96

DATA SHEET 2
Plant Parameter Response to Large Load Reduction
Page 1 of 3

Parameter	Standard	Maximum	Minimum	Comparison (Rev Crit 5.2.2[A])
SG No. 1 Level	Prog Level = 56.4 %	Max Level = 64.6 %		Difference (1) = 8.2 %
	Prog Level = 61.5 %		Min Level = 56.6 %	Difference (2) = -4.9 %
SG No. 2 Level	Prog Level = 56.7 %	Max Level = 64.4 %		Difference (1) = 7.7 %
	Prog Level = 60.9 %		Min Level = 55.8 %	Difference (2) = -5.1 %
SG No. 3 Level	Prog Level = 57.6 %	Max Level = 66.3 %		Difference (1) = 8.7 %
	Prog Level = 62.1 %		Min Level = 57.3 %	Difference (2) = -4.8 %
SG No. 4 Level	Prog Level = 57.0 %	Max Level = 64.5 %		Difference (1) = 7.5 %
	Prog Level = 60.5 %		Min Level = 55.5 %	Difference (2) = -5.0 %

(1) Difference = Max Level - Prog Level

(2) Difference = Min Level - Prog Level

NOTE: *If source of information is other than DAS or Strip Charts record source in the REMARKS.*

REMARKS:

PERFORMED BY: B. Hugh Clutter Date: 5-12-96

REVIEWED BY: [illegible] Date: 5/14/96

DATA SHEET 2
Plant Parameter Response to Large Load Reduction
Page 2 of 3

Parameter	Standard	Maximum	Minimum	Comparison
Pressurizer Pressure	Initial Pressure = 2242 Psig	Max Pressure = 2279 Psig		Swing (3) = 37 psi (Rev Crit 5.2.2[B])
			Min Pressure = 2165 Psig	Swing (4) = -77 psi (Rev Crit 5.2.2[B])
FW Header Pressure		Max Pressure = 1269.7 Psig	Min Pressure = 1208.4 Psig	(5) Oscillation = 30.7 PSI (6) Oscillation = 2.4% (Rev Crit 5.2.2[C])
RCS Average Temperature	Final Tavg * = 571 F		Lowest Tavg * = 571 F	Undershoot (7) = 0 F (Rev Crit 5.2.2 [D])
	Initial Tavg * = 587 F	Highest Tavg * = 589 F		Peak (8) = 2 F (Rev Crit 5.2.2 [E])

(3) Swing = Max Press - Initial Press (4) Swing = Min Press - Initial Press

(5) Oscillation = [(Max Pressure - Min Pressure) ÷ 2]

(6) Oscillation = [(Max Pressure - Min Pressure) ÷ (1300 x 2)] x 100%

(7) Undershoot = Lowest Tavg - Final Tavg (8) Peak = Highest Tavg - Initial Tavg

NOTE: *If source of information is other than DAS or Strip Charts record source in the REMARKS.*

REMARKS: * Loop 1 Tavg

PERFORMED BY: B. Hugh Plutty Date: 5-12-96

REVIEWED BY: [illegible] Date: 5/14/96

DATA SHEET 2
Plant Parameter Response to Large Load Reduction
Page 3 of 3

Parameter	Standard	Maximum	Minimum	Comparison
RCS Average Temperature	(With Stm Dumps)	Max Tavg * = 579.6 F	Min Tavg * = 577.3 F	Oscillation (9) = 2 F (Rev Crit 5.2.2[F])
	(No Stm Dumps)	Max Tavg * = 571.0 F	Min Tavg * = 570.6 F	Oscillation (9) = 0 F (Rev Crit 5.2.2 [G])
Steam Dump Operation		Valves Start to Open (10) Start Time = 5 sec	Valves Closed (11) End Time = 7 min and 56 sec	Stop Watch (12) = 6 min 5 sec DN-4 B/HP 5.12.96 Recorder Time (13) = 7 min 51 sec (Rev Crit 5.2.2[H])
Rod Speed		Maximum Rod Speed Start Time = 5 sec = 64 sec = 157 sec = 188 sec = 202 sec	Maximum Rod Speed End Time = 41 sec = 67 sec = 183 sec = 193 sec = 212 sec	Time (13) 36 sec 3 sec 26 sec + 5 sec 10 sec = 80 sec (Total) (Rev Crit 5.2.2[I])

(9) Oscillation = Max Tavg - Min Tavg

(10) Time when Steam Dump Valve Demand Signal starts increasing.

(11) Time when Steam Dump Valve Demand Signal stops decreasing.

(12) Section 6.1, Step [16] (13) Time = End Time - Start Time

NOTE: *If source of information is other than DAS or Strip Charts record source in the REMARKS.*

REMARKS: *Loop 1 Tavg

PERFORMED BY: B. Hugh Pluff Date: 5-12-96

REVIEWED BY: N S E? Date: 5/16/96

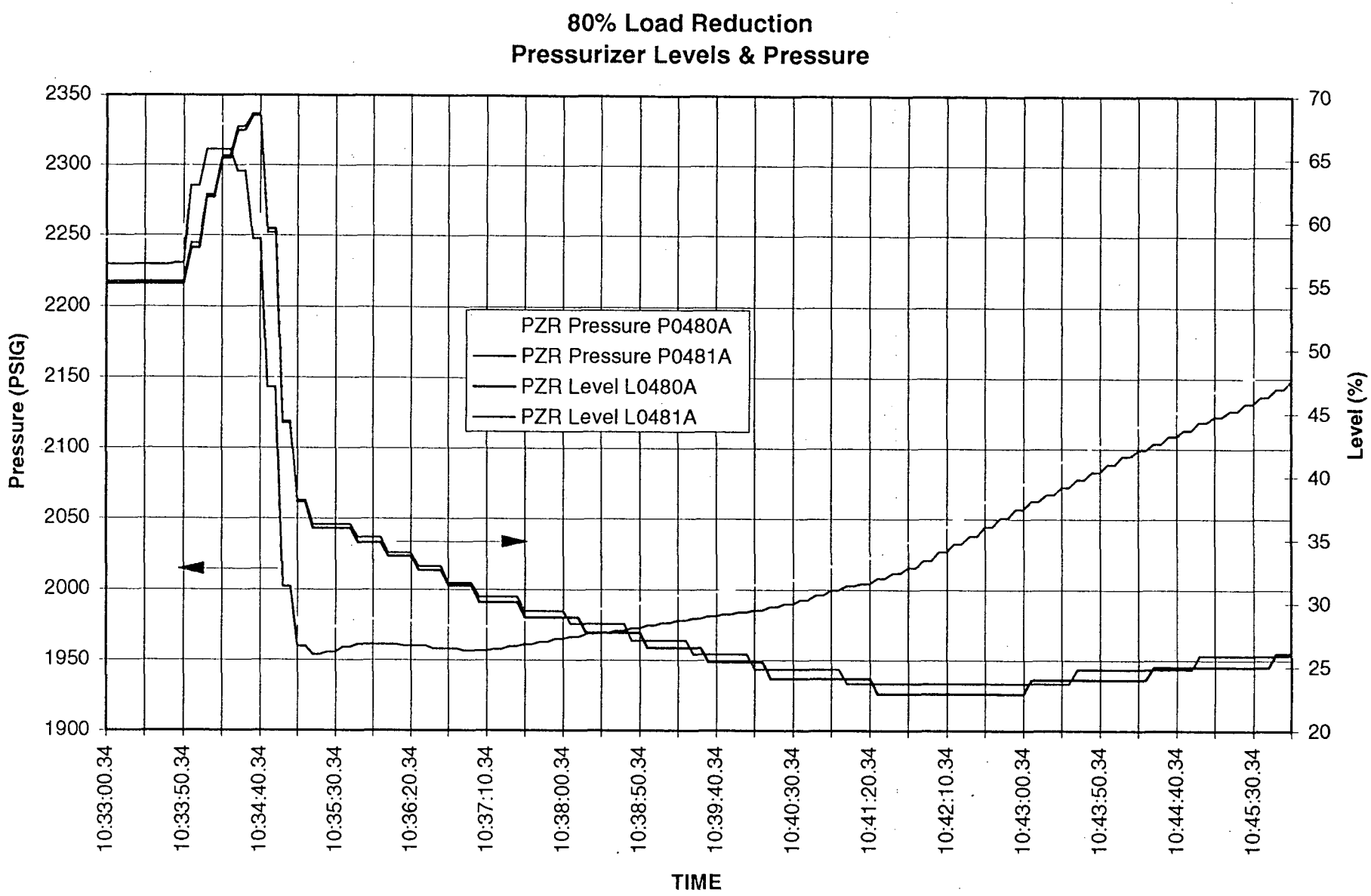
SOURCE NOTES

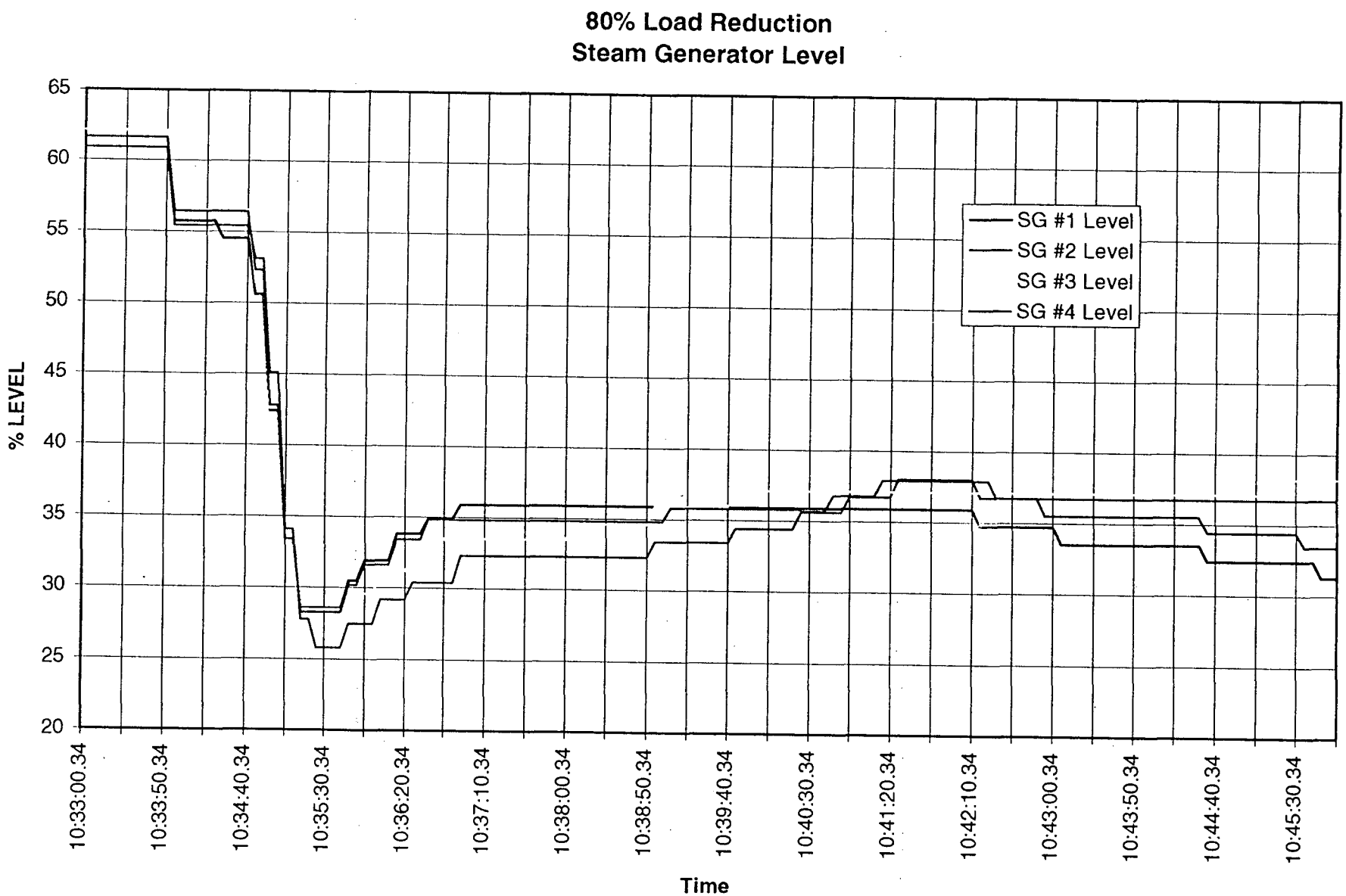
Page 1 of 1

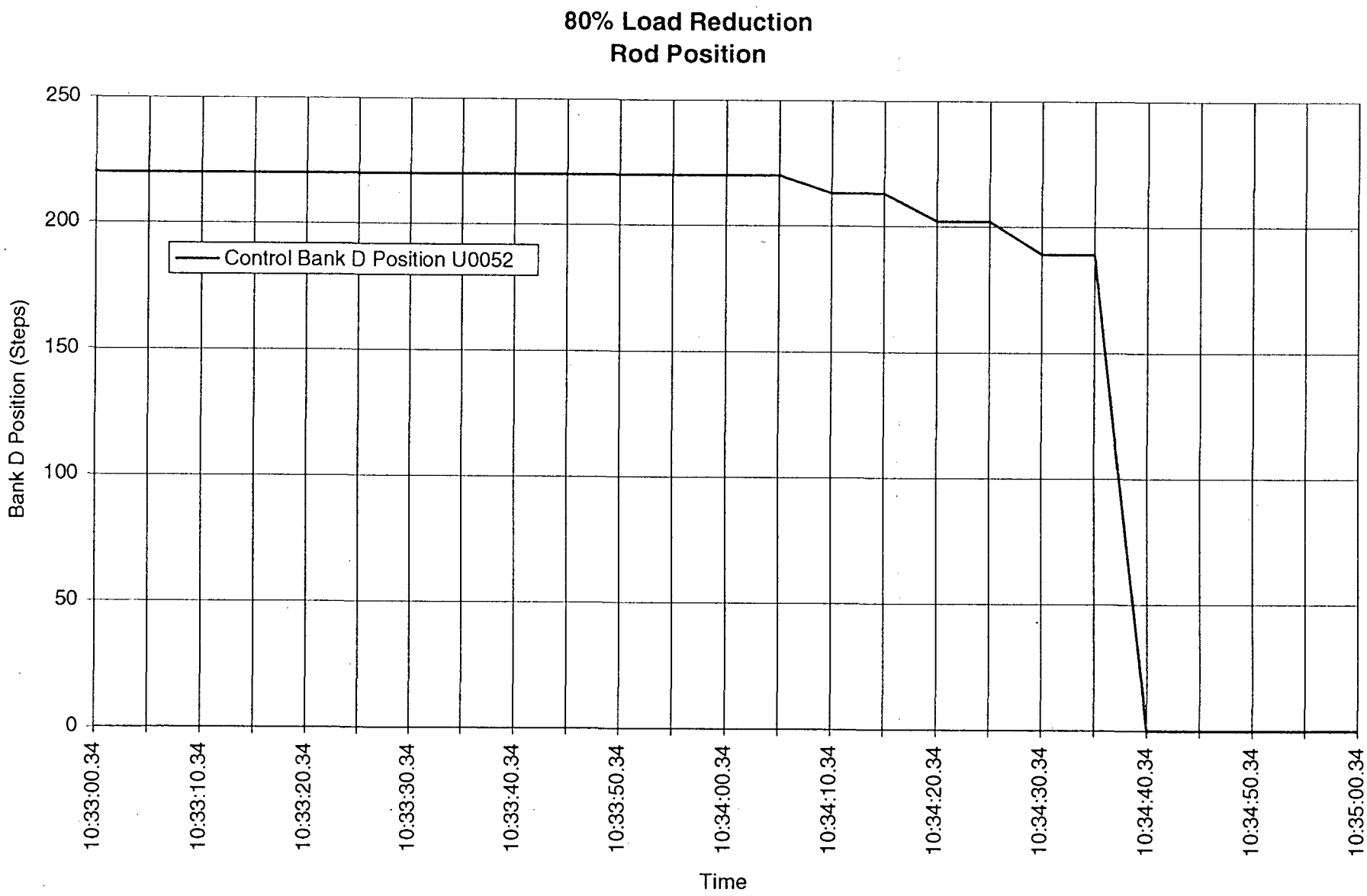
Source Note	Source Document	Summary
None		

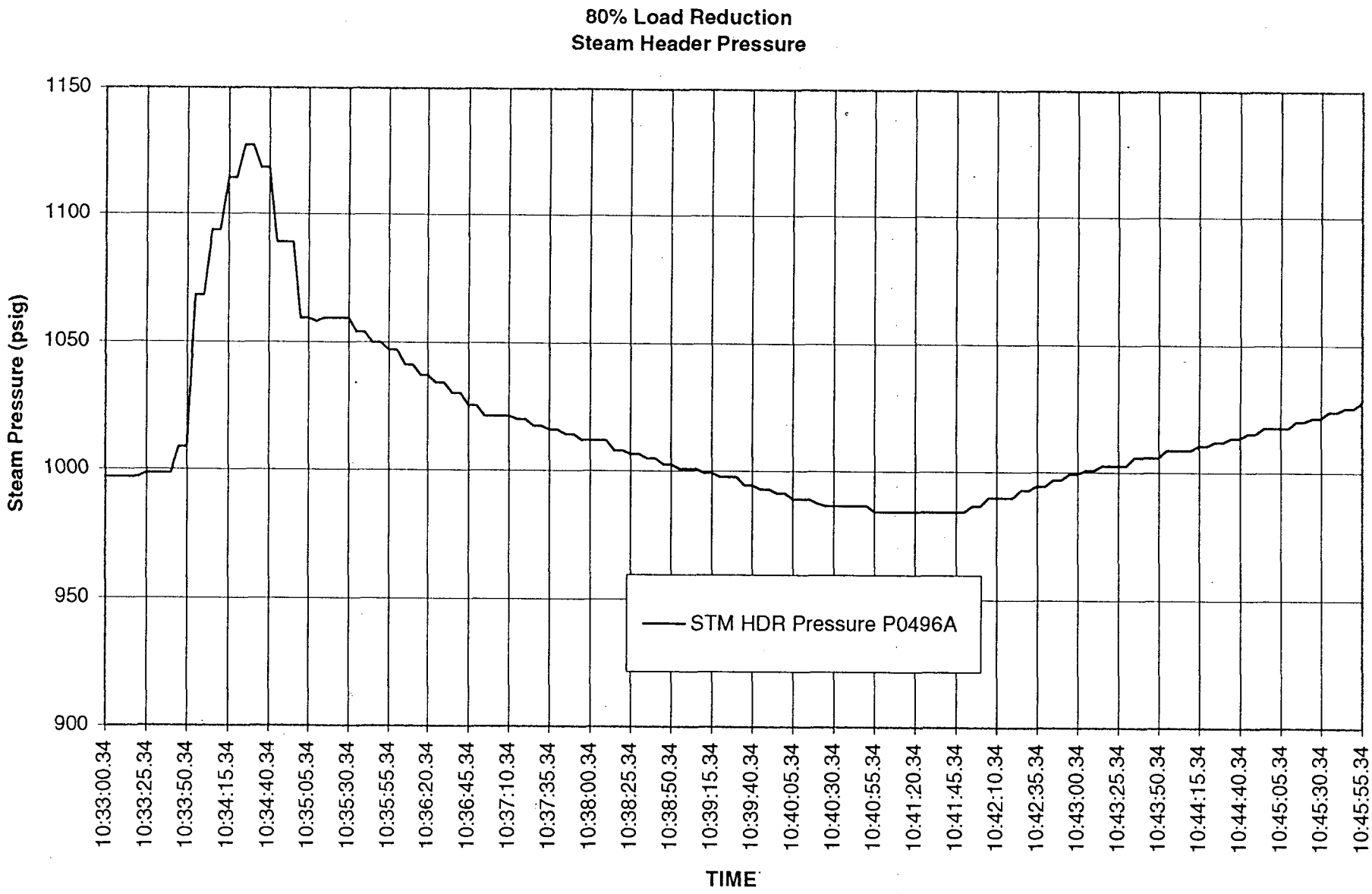
ATTACHMENT 4

Supporting data (charts and tabular data) from the 80% load reduction event


80% Load Reduction
Pressurizer Levels & Pressure
Pressure (PSIG)
2350
2300
2250
2200
2150
2100
2050
2000
1950
1900
Level (%)
70
65
60
55
50
45
40
35
30
25
20
PZR Pressure P0480A
PZR Pressure P0481A
PZR Level L0480A
PZR Level L0481A
10:33:00.34
10:33:50.34
10:34:40.34
10:35:30.34
10:36:20.34
10:37:10.34
10:38:00.34
10:38:50.34
10:39:40.34
10:40:30.34
10:41:20.34
10:42:10.34
10:43:00.34
10:43:50.34
10:44:40.34
10:45:30.34
TIME


80% Load Reduction
Steam Generator Level
% LEVEL
65
60
55
50
45
40
35
30
25
20
SG #1 Level
SG #2 Level
SG #3 Level
SG #4 Level
10:33:00.34
10:33:50.34
10:34:40.34
10:35:30.34
10:36:20.34
10:37:10.34
10:38:00.34
10:38:50.34
10:39:40.34
10:40:30.34
10:41:20.34
10:42:10.34
10:43:00.34
10:43:50.34
10:44:40.34
10:45:30.34
Time


80% Load Reduction
Rod Position
Control Bank D Position U0052
Bank D Position (Steps)
250
200
150
100
50
0
10:33:00.34
10:33:10.34
10:33:20.34
10:33:30.34
10:33:40.34
10:33:50.34
10:34:00.34
10:34:10.34
10:34:20.34
10:34:30.34
10:34:40.34
10:34:50.34
10:35:00.34
Time


80% Load Reduction
Steam Header Pressure
Steam Pressure (psig)
1150
1100
1050
1000
950
900
STM HDR Pressure P0496A
10:33:00.34
10:33:25.34
10:33:50.34
10:34:15.34
10:34:40.34
10:35:05.34
10:35:30.34
10:35:55.34
10:36:20.34
10:36:45.34
10:37:10.34
10:37:35.34
10:38:00.34
10:38:25.34
10:38:50.34
10:39:15.34
10:39:40.34
10:40:05.34
10:40:30.34
10:40:55.34
10:41:20.34
10:41:45.34
10:42:10.34
10:42:35.34
10:43:00.34
10:43:25.34
10:43:50.34
10:44:15.34
10:44:40.34
10:45:05.34
10:45:30.34
10:45:55.34
TIME

80% Load Reduction

April 14, 1996

"TIME"	Control Bank D Position U0052	STM HDR Pressure P0496A	SG #1 Level L0400A	SG #2 Level L0420A	SG #3 Level L0440A	SG #4 Level L0460A	PZR Level L0480A	PZR Level L0481A	PZR Pressure P0480A	PZR Pressure P0481A
10:30:00.34	220	993.8	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:05.34	220	993.8	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:10.34	220	993.8	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:15.34	220	993.8	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:20.34	220	993.8	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:25.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:30.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:30:35.34	220	992.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2227.5
10:30:40.34	220	992.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2227.5
10:30:45.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:30:50.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:30:55.34	220	992.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:00.34	220	992.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:05.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:10.34	220	991.3	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:15.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:20.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2244.6	2226.1
10:31:25.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:31:30.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2245.6	2227.5
10:31:35.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2227.5
10:31:40.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2227.5
10:31:45.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2227.5
10:31:50.34	220	993	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2227.5
10:31:55.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2229
10:32:00.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2246.6	2229
10:32:05.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:32:10.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:32:15.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:32:20.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:32:25.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2229.5
10:32:30.34	220	994.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2229.5
10:32:35.34	220	996	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:32:40.34	220	996	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:32:45.34	220	996	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:32:50.34	220	996	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:32:55.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:00.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:05.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:10.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:15.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:20.34	220	997	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:25.34	220	998.5	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:30.34	220	998.5	60.9	60.9	62.1	61.6	55.1	55.3	2248	2229.5
10:33:35.34	220	998.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2229.5
10:33:40.34	220	998.5	60.9	60.9	62.1	61.6	55.1	55.3	2249	2229.5
10:33:45.34	220	1008.8	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:33:50.34	220	1008.8	60.9	60.9	62.1	61.6	55.1	55.3	2249	2230.5
10:33:55.34	220	1068.3	55.7	55.4	56.5	56.4	57.9	58.3	2305.1	2285.1
10:34:00.34	220	1068.3	55.7	55.4	56.5	56.4	57.9	58.3	2305.1	2285.1
10:34:05.34	220	1093.8	55.7	55.4	56.5	56.4	61.9	62.1	2329.1	2311
10:34:10.34	213	1093.8	55.7	55.4	56.5	56.4	61.9	62.1	2329.1	2311
10:34:15.34	213	1114.3	55.7	55.4	56.5	56.4	65	65.2	2329.1	2311
10:34:20.34	202	1114.3	55.7	55.4	56.5	56.4	65	65.2	2329.1	2311
10:34:25.34	202	1127	54.5	55.4	56.5	56.4	67.2	67.5	2313.5	2295.4
10:34:30.34	189	1127	54.5	55.4	56.5	56.4	67.2	67.5	2313.5	2295.4
10:34:35.34	189	1118.3	54.5	55.4	56.5	56.4	68.4	68.5	2264.6	2247.5
10:34:40.34	0	1118.3	54.5	55.4	56.5	56.4	68.4	68.5	2264.6	2247.5
10:34:45.34	0	1089	50.6	53.1	51.4	52.3	59.4	59.1	2156.8	2143.1

80% Load Reduction

April 14, 1996

"TIME"	Control Bank D Position U0052	STM HDR Pressure P0496A	SG #1 Level L0400A	SG #2 Level L0420A	SG #3 Level L0440A	SG #4 Level L0460A	PZR Level L0480A	PZR Level L0481A	PZR Pressure P0480A	PZR Pressure P0481A
10:34:50.34	0	1089	50.6	53.1	51.4	52.3	59.4	59.1	2156.8	2143.1
10:34:55.34	0	1089	42.4	45.1	42.6	42.8	44.3	44.2	2015.1	2002
10:35:00.34	0	1059.5	42.4	45.1	42.6	42.8	44.3	44.2	2015.1	2002
10:35:05.34	0	1059.5	33.4	34.1	33.4	33.4	38	38.1	1975.1	1959.5
10:35:10.34	0	1058	33.4	34.1	33.4	33.4	38	38.1	1975.1	1959.5
10:35:15.34	0	1059.5	28.6	27.8	28.5	28.3	35.9	36.2	1970.8	1953.6
10:35:20.34	0	1059.5	28.6	27.8	28.5	28.3	35.9	36.2	1970.8	1953.6
10:35:25.34	0	1059.5	28.6	25.8	28.5	28.3	35.9	36.2	1973.6	1955.6
10:35:30.34	0	1059.5	28.6	25.8	28.5	28.3	35.9	36.2	1973.6	1955.6
10:35:35.34	0	1054	28.6	25.8	28.5	28.3	35.9	36.2	1977	1959
10:35:40.34	0	1054	28.6	25.8	28.5	28.3	35.9	36.2	1977	1959
10:35:45.34	0	1050	30.5	27.5	29.6	30.2	34.8	35.2	1978	1961
10:35:50.34	0	1050	30.5	27.5	29.6	30.2	34.8	35.2	1978	1961
10:35:55.34	0	1047	31.9	27.5	29.6	31.6	34.8	35.2	1979	1961
10:36:00.34	0	1047	31.9	27.5	29.6	31.6	34.8	35.2	1979	1961
10:36:05.34	0	1041.3	31.9	29.2	31.2	31.6	33.7	34	1977.5	1961
10:36:10.34	0	1041.3	31.9	29.2	31.2	31.6	33.7	34	1977.5	1961
10:36:15.34	0	1037.3	33.8	29.2	31.2	33.4	33.7	34	1977.5	1960
10:36:20.34	0	1037.3	33.8	29.2	31.2	33.4	33.7	34	1977.5	1960
10:36:25.34	0	1034.3	33.8	30.4	32.3	33.4	32.6	32.9	1977.5	1960
10:36:30.34	0	1034.3	33.8	30.4	32.3	33.4	32.6	32.9	1977.5	1960
10:36:35.34	0	1030.3	34.9	30.4	32.3	34.8	32.6	32.9	1975.6	1958
10:36:40.34	0	1030.3	34.9	30.4	32.3	34.8	32.6	32.9	1975.6	1958
10:36:45.34	0	1025.5	34.9	30.4	33.5	34.8	31.4	31.6	1974.6	1958
10:36:50.34	0	1025.5	34.9	30.4	33.5	34.8	31.4	31.6	1974.6	1958
10:36:55.34	0	1021.5	35.9	32.3	33.5	34.8	31.4	31.6	1973.6	1956.5
10:37:00.34	0	1021.5	35.9	32.3	33.5	34.8	31.4	31.6	1973.6	1956.5
10:37:05.34	0	1021.5	35.9	32.3	33.5	34.8	30.1	30.5	1973.6	1956.5
10:37:10.34	0	1021.5	35.9	32.3	33.5	34.8	30.1	30.5	1973.6	1956.5
10:37:15.34	0	1020	35.9	32.3	33.5	34.8	30.1	30.5	1974.6	1957.5
10:37:20.34	0	1020	35.9	32.3	33.5	34.8	30.1	30.5	1974.6	1957.5
10:37:25.34	0	1017.5	35.9	32.3	33.5	34.8	30.1	30.5	1976.6	1959.5
10:37:30.34	0	1017.5	35.9	32.3	33.5	34.8	30.1	30.5	1976.6	1959.5
10:37:35.34	0	1016	35.9	32.3	33.5	34.8	28.9	29.4	1978.5	1961
10:37:40.34	0	1016	35.9	32.3	33.5	34.8	28.9	29.4	1978.5	1961
10:37:45.34	0	1014.3	35.9	32.3	33.5	34.8	28.9	29.4	1980.5	1962.9
10:37:50.34	0	1014.3	35.9	32.3	33.5	34.8	28.9	29.4	1980.5	1962.9
10:37:55.34	0	1012	35.9	32.3	33.5	34.8	28.9	29.4	1981.9	1964.9
10:38:00.34	0	1012	35.9	32.3	33.5	34.8	28.9	29.4	1981.9	1964.9
10:38:05.34	0	1012	35.9	32.3	34.6	34.8	28.9	28.4	1983.4	1966.3
10:38:10.34	0	1012	35.9	32.3	34.6	34.8	28.9	28.4	1983.4	1966.3
10:38:15.34	0	1008	35.9	32.3	34.6	34.8	27.7	28.4	1984.9	1968.3
10:38:20.34	0	1008	35.9	32.3	34.6	34.8	27.7	28.4	1984.9	1968.3
10:38:25.34	0	1006.5	35.9	32.3	34.6	34.8	27.7	28.4	1986.4	1969.3
10:38:30.34	0	1006.5	35.9	32.3	34.6	34.8	27.7	28.4	1986.4	1969.3
10:38:35.34	0	1004.8	35.9	32.3	34.6	34.8	27.7	28.4	1988.3	1970.8
10:38:40.34	0	1004.8	35.9	32.3	34.6	34.8	27.7	28.4	1988.3	1970.8
10:38:45.34	0	1002.5	35.9	32.3	34.6	34.8	27.7	27.1	1990.3	1972.6
10:38:50.34	0	1002.5	35.9	32.3	34.6	34.8	27.7	27.1	1990.3	1972.6
10:38:55.34	0	1000.8	35.9	33.4	35.9	34.8	26.5	27.1	1992.3	1974.6
10:39:00.34	0	1000.8	35.9	33.4	35.9	34.8	26.5	27.1	1992.3	1974.6
10:39:05.34	0	1000.8	35.9	33.4	35.9	35.8	26.5	27.1	1993.6	1976.1
10:39:10.34	0	999.3	35.9	33.4	35.9	35.8	26.5	27.1	1993.6	1976.1
10:39:15.34	0	999.3	35.9	33.4	35.9	35.8	26.5	27.1	1995.6	1978
10:39:20.34	0	997.8	35.9	33.4	35.9	35.8	26.5	27.1	1995.6	1978
10:39:25.34	0	997.8	35.9	33.4	35.9	35.8	26.5	26	1997.1	1979.5
10:39:30.34	0	997.8	35.9	33.4	35.9	35.8	26.5	26	1997.1	1979.5
10:39:35.34	0	994.5	35.9	33.4	35.9	35.8	25.4	26	1998.5	1981

80% Load Reduction

April 14, 1996

"TIME"	Control Bank D Position U0052	STM HDR Pressure P0496A	SG #1 Level L0400A	SG #2 Level L0420A	SG #3 Level L0440A	SG #4 Level L0460A	PZR Level L0480A	PZR Level L0481A	PZR Pressure P0480A	PZR Pressure P0481A
10:39:40.34	0	994.5	35.9	33.4	35.9	35.8	25.4	26	1998.5	1981
10:39:45.34	0	993	35.9	34.4	37.1	35.8	25.4	26	1999.5	1982.4
10:39:50.34	0	993	35.9	34.4	37.1	35.8	25.4	26	1999.5	1982.4
10:39:55.34	0	991.3	35.9	34.4	37.1	35.8	25.4	26	2002	1983.9
10:40:00.34	0	991.3	35.9	34.4	37.1	35.8	25.4	26	2002	1983.9
10:40:05.34	0	989	35.9	34.4	37.1	35.8	25.4	24.8	2003.4	1985.4
10:40:10.34	0	989	35.9	34.4	37.1	35.8	25.4	24.8	2003.4	1985.4
10:40:15.34	0	989	35.9	34.4	37.1	35.8	24.1	24.8	2004.4	1987.8
10:40:20.34	0	987.5	35.9	34.4	37.1	35.8	24.1	24.8	2004.4	1987.8
10:40:25.34	0	986.5	35.9	35.6	37.1	35.8	24.1	24.8	2006.9	1989.8
10:40:30.34	0	986.5	35.9	35.6	37.1	35.8	24.1	24.8	2006.9	1989.8
10:40:35.34	0	986.5	35.9	35.6	37.1	35.8	24.1	24.8	2009.8	1992.6
10:40:40.34	0	986.5	35.9	35.6	37.1	35.8	24.1	24.8	2009.8	1992.6
10:40:45.34	0	986.5	35.9	35.6	37.1	36.8	24.1	24.8	2013.1	1996.1
10:40:50.34	0	986.5	35.9	35.6	37.1	36.8	24.1	24.8	2013.1	1996.1
10:40:55.34	0	984.3	35.9	36.7	37.1	36.8	24.1	24.8	2016.6	1999.5
10:41:00.34	0	984.3	35.9	36.7	37.1	36.8	24.1	24.8	2016.6	1999.5
10:41:05.34	0	984.3	35.9	36.7	37.1	36.8	24.1	23.7	2019.5	2002.5
10:41:10.34	0	984.3	35.9	36.7	37.1	36.8	24.1	23.7	2019.5	2002.5
10:41:15.34	0	984.3	35.9	36.7	37.1	37.9	24.1	23.7	2022.5	2003.9
10:41:20.34	0	984.3	35.9	36.7	37.1	37.9	24.1	23.7	2022.5	2003.9
10:41:25.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2025.4	2007.9
10:41:30.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2025.4	2007.9
10:41:35.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2029.3	2011.8
10:41:40.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2029.3	2011.8
10:41:45.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2033.8	2015.6
10:41:50.34	0	984.3	35.9	38	37.1	37.9	22.9	23.7	2033.8	2015.6
10:41:55.34	0	986.5	35.9	38	37.1	37.9	22.9	23.7	2038.6	2020.5
10:42:00.34	0	986.5	35.9	38	37.1	37.9	22.9	23.7	2038.6	2020.5
10:42:05.34	0	989.8	35.9	38	37.1	37.9	22.9	23.7	2044.4	2026.9
10:42:10.34	0	989.8	35.9	38	37.1	37.9	22.9	23.7	2044.4	2026.9
10:42:15.34	0	989.8	34.7	36.7	37.1	37.9	22.9	23.7	2049.8	2032.3
10:42:20.34	0	989.8	34.7	36.7	37.1	37.9	22.9	23.7	2049.8	2032.3
10:42:25.34	0	993	34.7	36.7	37.1	36.7	22.9	23.7	2056.1	2038.1
10:42:30.34	0	993	34.7	36.7	37.1	36.7	22.9	23.7	2056.1	2038.1
10:42:35.34	0	994.5	34.7	36.7	37.1	36.7	22.9	23.7	2062.5	2044.4
10:42:40.34	0	994.5	34.7	36.7	37.1	36.7	22.9	23.7	2062.5	2044.4
10:42:45.34	0	997	34.7	36.7	37.1	36.7	22.9	23.7	2068.4	2050.8
10:42:50.34	0	997	34.7	36.7	37.1	36.7	22.9	23.7	2068.4	2050.8
10:42:55.34	0	999.3	34.7	35.5	37.1	36.7	22.9	23.7	2074.8	2057.1
10:43:00.34	0	999.3	34.7	35.5	37.1	36.7	22.9	23.7	2074.8	2057.1
10:43:05.34	0	1000.8	33.5	35.5	37.1	36.7	24	23.7	2081	2062.5
10:43:10.34	0	1000.8	33.5	35.5	37.1	36.7	24	23.7	2081	2062.5
10:43:15.34	0	1002.5	33.5	35.5	37.1	36.7	24	23.7	2086	2067.4
10:43:20.34	0	1002.5	33.5	35.5	37.1	36.7	24	23.7	2086	2067.4
10:43:25.34	0	1002.5	33.5	35.5	37.1	36.7	24	23.7	2090.9	2072.8
10:43:30.34	0	1002.5	33.5	35.5	37.1	36.7	24	23.7	2090.9	2072.8
10:43:35.34	0	1005.8	33.5	35.5	37.1	36.7	24	24.8	2096.3	2078.1
10:43:40.34	0	1005.8	33.5	35.5	37.1	36.7	24	24.8	2096.3	2078.1
10:43:45.34	0	1005.8	33.5	35.5	37.1	36.7	24	24.8	2101.6	2083.5
10:43:50.34	0	1005.8	33.5	35.5	37.1	36.7	24	24.8	2101.6	2083.5
10:43:55.34	0	1008.8	33.5	35.5	37.1	36.7	24	24.8	2106.9	2088.9
10:44:00.34	0	1008.8	33.5	35.5	37.1	36.7	24	24.8	2106.9	2088.9
10:44:05.34	0	1008.8	33.5	35.5	37.1	36.7	24	24.8	2112.3	2094.8
10:44:10.34	0	1008.8	33.5	35.5	37.1	36.7	24	24.8	2112.3	2094.8
10:44:15.34	0	1010.5	33.5	35.5	37.1	36.7	24	24.8	2116.3	2099.1
10:44:20.34	0	1010.5	33.5	35.5	37.1	36.7	24	24.8	2116.3	2099.1
10:44:25.34	0	1012	33.5	35.5	37.1	36.7	25	24.8	2121.6	2104

80% Load Reduction

April 14, 1996

"TIME"	Control Bank D Position U0052	STM HDR Pressure P0496A	SG #1 Level L0400A	SG #2 Level L0420A	SG #3 Level L0440A	SG #4 Level L0460A	PZR Level L0480A	PZR Level L0481A	PZR Pressure P0480A	PZR Pressure P0481A
10:44:30.34	0	1012	33.5	35.5	37.1	36.7	25	24.8	2121.6	2104
10:44:35.34	0	1013.5	32.4	34.4	37.1	36.7	25	24.8	2126	2108.9
10:44:40.34	0	1013.5	32.4	34.4	37.1	36.7	25	24.8	2126	2108.9
10:44:45.34	0	1015.3	32.4	34.4	37.1	36.7	25	24.8	2130.9	2113.3
10:44:50.34	0	1015.3	32.4	34.4	37.1	36.7	25	24.8	2130.9	2113.3
10:44:55.34	0	1017.5	32.4	34.4	37.1	36.7	25	25.9	2136.8	2119.1
10:45:00.34	0	1017.5	32.4	34.4	37.1	36.7	25	25.9	2136.8	2119.1
10:45:05.34	0	1017.5	32.4	34.4	37.1	36.7	25	25.9	2141.1	2123
10:45:10.34	0	1017.5	32.4	34.4	37.1	36.7	25	25.9	2141.1	2123
10:45:15.34	0	1020	32.4	34.4	37.1	36.7	25	25.9	2145.5	2127
10:45:20.34	0	1020	32.4	34.4	37.1	36.7	25	25.9	2145.5	2127
10:45:25.34	0	1021.5	32.4	34.4	38.2	36.7	25	25.9	2149.9	2132.4
10:45:30.34	0	1021.5	32.4	34.4	38.2	36.7	25	25.9	2149.9	2132.4
10:45:35.34	0	1024	32.4	33.4	38.2	36.7	25	25.9	2155.3	2137.3
10:45:40.34	0	1024	32.4	33.4	38.2	36.7	25	25.9	2155.3	2137.3
10:45:45.34	0	1025.5	31.3	33.4	38.2	36.7	26.1	25.9	2160.6	2142.6
10:45:50.34	0	1025.5	31.3	33.4	38.2	36.7	26.1	25.9	2160.6	2142.6
10:45:55.34	0	1027.8	31.3	33.4	38.2	36.7	26.1	25.9	2166.5	2148.5

ENCLOSURE 2

FSAR CHANGE

TABLE 14.2-2

(Sheet 35 of 38)

LARGE LOAD REDUCTION
TEST SUMMARY

OBJECTIVE

To demonstrate the ability of primary and secondary side systems, including automatic control systems, to sustain a 50% step decrease (See Note) in turbine generator load.

PREREQUISITES

1. The reactor is stable at the 100% power test plateau.

2. Pressurizer pressure, pressurizer level, steam dump, rod control, steam generator level, and feedwater pump speed controls are in automatic.

TEST METHOD

Recorders are connected to monitor plant parameters (e.g., reactor power, RCS temperature and pressure, pressurizer level, feedwater and steam flows, steam generator levels, feedwater pump speed, and feedwater presssure) during the transient. Turbine governor valves are positioned to produce approximately a 50% step decrease (See Note) in generator load. Parameters are allowed to stabilize.

ACCEPTANCE CRITERIA

1. Reactor and turbine do not trip.

2. Safety injection is not initiated.

3. Pressurizer and steam generator safety valves do not lift.

4. Monitored plant parameters stabilize without manual intervention.

Note:

WBN performed this test for Unit 1 on May 12, 1996. The decrease in load occurred in two steps instead of one step due to the response of the main turbine control system. TVA and Westinghouse review of the test data determined that the test demonstrated that the dynamic response of the plant is in accordance with design for the large load reduction. All acceptance criteria were met during actual test performance, and an evaluation concluded acceptance criteria would have been met had the test been performed as a single step decrease in turbine generator load.