U.S. NUCLEAR REGULATORY COMMISSION
Region I

Report No. 50-388/84-27

Docket No. 50-388

License No. NPF-22 Priority - Category C

Licensee: Pennsylvania Power and Light Company

2 North Ninth Street

Allentown, Pennsylvania 18101

Facility Name: Susquehanna Steam Electric Station, Unit 2

Inspection At: Salem Township, Pennsylvania

Inspection Conducted: June 11-14, June 19-22 and June 25-27, 1984

Inspector: D. J. Florek, Reactor Engineer — 8/1/84 date

Approved By: L. H. Bettenhausen, Chief, Test Programs Section, DETP — 8/1/84 date

Inspection Summary: Inspection on June 11-14, June 19-22 and June 25-27, 1984 (Report No. 50-388/84-27)
Areas Inspected: Routine, unannounced inspection of Unit 2 startup test program including; procedure review, overall program, startup test witnessing, startup test results evaluation, plateau review and tours of the facility. The inspection involved 85 hours onsite by one region based inspector.

Results: Within the scope of this inspection, no items of noncompliance were identified.

DETAILS

1.0 Persons Contacted

Pennsylvania Power and Light Company

R. Byram, Technical Supervisor
° P. Capotosto, OQA
J. Doxey, Reactor Engineering Supervisor
T. Iorfida, Plant Engineering Supervisor
° H. Keiser, Superintendent of Plant
J. Klucar, Lead Shift Test Engineer
T. Markowski, Day Shift Supervisor
C. McClain, PORC Secretary
° T. Nork, Startup Coordinator
L. O'Neil, Maintenance Supervisor
H. Palmer, Operations Supervisor
+ R. Prego, OQA Supervisor
A. Roscioli, NPE
* R. Sheranko, Startup Test Group Supervisor
C. Smith, Reactor Engineer
+ D. Thompson, Assistant Superintendent of Plant
+ J. Todd, Compliance Engineer
R. Whery, Startup Test Engineer

General Electric Corporation

T. Czubakowski, Lead Startup Test Engineer
K. Mertes, Operations Manager

Bechtel Power Corporation

P. McDaniel, Engineering

U.S. Nuclear Regulatory Commission

R. Jacobs, Senior Resident Inspector
L. Plisco, Resident Inspector

The inspector also contacted other licensee employees, members of the technical and engineering staffs and operations staff including shift supervisors, unit supervisors and reactor operators.

* Denotes those present at exit meeting on June 14, 1984.
+ Denotes those present at exit meeting on June 22, 1984.
° Denotes those present at exit meeting on June 27, 1984.

2.0 Startup Test Program

References

- Susquehanna Steam Electric Station (SSES) Final Safety Analysis Report (FSAR)
- SSES Safety Evaluation Report and Supplements 1, 2, 3, 4 and 5
- Regulatory Guide 1.68, "Initial Test Programs for Water Cooled Reactor Power Plants"
- SSES Startup Test Schedule
- AD-TY-460 "Startup Test Administration Procedure"

2.1 Startup Test (ST) Procedure Review

Scope

The 18 procedures listed in Appendix A of this report were reviewed in accordance with the scope as defined in Inspection Report 50-388/84-12 Section 4.1.

Findings

The procedures reviewed were issued procedures except (ST-30.1 and ST-30.2) with appropriate management review indicated. The inspector discussed these procedures and changes to previously reviewed draft procedures with members of the Startup Test Group. ST-30.1 and ST-30.2 had not been issued based on a question asked by PORC. Based on the review of the procedures and discussions, the inspector verified that the test procedures reviewed are consistent with the FSAR commitments.

2.2 Startup Test Witnessing

Scope

The inspector witnessed portions of the following startup tests:

-- ST-10.1 IRM-SRM Overlap Verification
-- ST-14.1 RCIC Condensate Storage Tank Injection
-- ST-14.4 RCIC Low Pressure Auto Quick Start to Vessel
-- ST-15.1 HPCI Condensate Storage Tank Injection

Inspection Report 50-388/84-21, Section 2.5, describes the scope of the test witnessing inspections.

Findings

The inspector verified that an official test copy was maintained for each test. Minimum crew requirements were met for both the operating staff and the startup test engineers. Prerequisites sampled indicated that they were satisfied. The inspector observed that the test director briefed the operating staff prior to the conduct of the test. The inspector also observed the conduct of shift change briefings between the operations and startup groups for tests conducted over several shifts. This was identified as an inspector concern in a previous inspection. All data was obtained and quickly assessed. A summary of inspector observations of each startup test follows:

-- ST-10.1 IRM-SRM Overlap Verification

ST-10.1 was conducted on June 11, 1984 at approximately 5:30 PM. The SRM's were partially withdrawn when overlap data was taken, but were not further withdrawn during the conduct of this test. The first and last IRM to reach the onscale target and overlap values were observed.

IRM	ONSCALE TARGET	ACTUAL	SRM A	SRM B	SRM C	SRM D
C	5	5	220	440	230	160
B	5	5	1100	2300	1200	750

IRM	OVERLAP VALUE	ACTUAL	SRM A	SRM B	SRM C	SRM D
H	16	16	1500	2700	1400	970
B	16	16	5000	8600	4500	3000

IRM C was the first IRM to reach the onscale target. IRM B was the last IRM to reach the overlap value. The inspector assessed that the data met the acceptance criteria. Further discussion on IRM/SRM overlap data is contained in the test results evaluation section.

-- ST-14.1 RCIC Condensate Storage Tank Injection

This test was conducted on June 14, 1984 at 6:00 AM. This test was conducted at a nominal 150 psig reactor pressure. RCIC achieved a steady state flow of 600 gallon per minute with the discharge pressure of 260 psig at a turbine speed of 2000 rpm. The control system in both automatic and manual responded to the step changes. During the quick start portion of the test, the Level 1 acceptance criteria were met: the RCIC did not trip and flow was greater than 600 gpm after 30 seconds had elapsed. The quick start discharge pressure was simulated by the position of the discharge valve to the CST. This was established during the controller portion of the test.

-- ST-14.4 Low Pressure Auto Quick Start to Vessel

In this test, RCIC was manually initiated with flow discharging into the reactor vessel. This test was conducted on June 14, 1984 at 9:30 AM. The reactor was at 160 psig with the turbine bypass valve at 58% open. The inspector observed RCIC achieving 600 gpm in approximately 10 seconds. The maximum observed turbine speed during the quick start was 2500 rpm. The control system responded to the controller step changes from 600 gpm to 540 gpm to 600 gpm in both automatic and manual control. The reactor vessel level was +52 inches when the test was completed. The HPCI high reactor water level turbine trip alarm came in during this test. The inspector observed reset of the HPCI turbine when conditions were satisfied. The inspector ascertained that all Level 1 test acceptance criteria were satisfied.

-- ST-15.1 HPCI Condensate Storage Tank (CST) Injections

This test was conducted on June 27, 1984 at 1235 hours. The inspector observed a manual start of HPCI with flow discharging to the CST. The reactor was at 920 psig with reactor water level of 36 inches. The turbine bypass valve was 37% open. The steady state pump discharge was at 1020 psig with flow at 5000 gpm and turbine speed of 3600 rpm. The control system responded to the step changes in both the manual and automatic mode. The HPCI was then shut down with the CST discharge valve maintained in the position to simulate pump discharge pressure at vessel injection conditions. The auto quick start of HPCI was initiated at 1414 hours. The inspector observed that the turbine reached 5000 gpm in 21 seconds. Steady state conditions were 5000 gpm and turbine speed of 3700 rpm with reactor pressure 920 psig. A two hour run was begun following the quick start. The suppression pool temperature was monitored during this test. Suppression pool temperature at the time of the quick start was 83.7°F. When suppression pool temperature reached 103.6°F, the HPCI was shutdown at 1529 hours. HPCI run time was 1 hr. 15 minutes. Since the two hour run time could not be reached, a test exception was noted. The inspector noted that the Level 1 acceptance criteria were satisfied by this test.

2.3 Other Witnessing Activities

RCIC Testing

As described in Section 2.4, RCIC experienced difficulties with the lube oil system. The inspector witnessed portions of RCIC tests conducted during the trouble shooting activities. The inspector witnessed the RCIC test conducted on June 21, 1984 at 1145 hours. This test was conducted with the reactor critical and the MSIVs closed. Reactor pressure was 450 psig and reactor water level was 37 inches. Maintenance was being performed on the relief valves for the steam jet air ejectors which required closure of MSIV and Bypass valves. The inspector observed that communication was

maintained between the operator controlling RCIC and the operator controlling reactor power and water level. Communication was also maintained between the control room and local RCIC room. RCIC was brought up slowly. The reactor operator withdrew rods to maintain pressure as RCIC was started. Reactor water level was maintained by controlling water rejected by the reactor water cleanup. Reactor pressure was maintained stable at 450 psig during the test and water level changes were controlled by the operator. As RCIC was secured, rods were inserted to maintain 450 psig. The inspector did not identify any unacceptable conditions with this activity.

Unit 1 Reactor Scram

While the inspector was witnessing the conduct of hot functional test HF-293-030 Pressure Regulator Operation Verification on Unit 2 from the control room on June 13, 1984, a Unit 1 reactor scram from 100% power occurred at 1721 hours. Unit 2 testing was immediately secured. The inspector observed licensee activities following the Unit 1 reactor scram. The inspector observed that the reactor operators walked down their assigned control panels, taking immediate scram recovery action and relaying information to the unit supervisor on their actions and plant response. The unit supervisor (SRO) was taking a broader look at the plant and supervising the activities of the reactor operators. The shift supervisor was taking an even broader look at the plant response and the actions of the unit supervisor and reactor operators. The shift technical advisor was relaying information on the key plant parameters (level and pressure) and the trending of the plant parameters to the operators.

The inspector observed that the A diesel started, RCIC started, and the MSIV's did not close. The feed pumps were not available immediately after scram. When they were available and level was restored, RCIC was secured. The inspector observed numerous alarms at the time of scram, both in the main control panels and back panels. Main control room access was limited to the operator, unit supervisor, shift supervisor, shift technical advisor, all other personnel stayed clear of any control panel areas. Senior management personnel were available but stayed clear of the operation to recover from the scram. The inspector observed that the licensee's immediate response to the reactor scram was proper.

The inspector also witnessed portions of the scram recovery activities. The inspector observed members of the operations organization obtaining data to assist in determining if the plant response was as designed. The inspector observed the technical staff reviewing computer printouts of the plant response to the scram to determine the cause. No unacceptable conditions were noted.

A complete discussion on the scram and plant response will be contained in a Resident Inspector report for the period. The scram was apparently caused by loss of the incoming line to the T-10 transformer due to lightning. This caused a loss of signal to the feedwater system which locked feedwater flow at 100%. The loss of signal caused Recirculation Pump A to lock up at 100% flow and because of the power distribution caused Recirculation Pump B to run back. This run back reduced power. Since feedwater was at 100% flow and power was declining, a high water level tripped the turbine and feedwater pumps and caused the reactor scram.

2.4 Startup Test Results Evaluation

Scope

The 31 tests in Appendix B were reviewed for licensee evaluation of test results. Inspection Report 50-388/84-21, Section 2.6, tests listed describes the scope of the reviewed items.

Findings

Except as noted in the discussion that follows for each startup test, the inspector verified that the startup tests were approved and controlled, any test change was properly annotated and completed, test objectives were met, test exceptions were identified and resolved, retests were conducted if required, data sheets were completed, test steps and data were properly signed and dated, independent evaluation of test data, test results compared with acceptance criteria, QA review of results, test results approved by appropriate management (see plateau review Section 2.6). A summary of each startup test result follows.

ST-1.6 - Chemistry Data - Heatup Tests

No test exceptions. Acceptance criteria met.

ST-2.1 - Startup Test Program Radiation Survey

One Level 2 Test Exception (TER-20). Test exception results in same item as TER-1. TER-20 closed and referred to TER-1.

ST-5.1 - Insert-Withdrawal Checks

This test was initiated as a result of TER-28 to ST-5.6. TER-28 had 1 out of 4 rod withdrawal speeds in excess of the Level 1 criteria. The licensee performed ST-5.1 on the sequence A rods. Eighteen of the rods required readjustment to meet Level 1 criteria. This test will also be conducted on the B sequence rods.

ST-5.2 - Friction Measurements

One rod (50-47) failed both the friction and settling test. TER-40 was identified to resolve. Rod 50-47 met the acceptance criteria for rod scram times resulting in no immediate safety concern. Rod 50-47 scram times will be monitored during the startup program. TER-23 identified a Brush recorder out of calibration. Completed calibration indicated that the recorder was reading in the conservative direction. All other rods met acceptance criteria.

ST-5.3 - Zero and Rated Pressure Scram of Individual Rods

All rods met acceptance criteria with no test exceptions. The slowest rod to position 05 was 3.1 seconds. The fastest rod to position 05 was 2.0 seconds. The average rod to position 05 is 2.4 seconds.

ST-5.5 - Scram Testing of Selected Rods

All rods met acceptance criteria with no test exceptions.

ST-5.6 - Insert Withdrawal Checks of Selected Rods

One rod (50-51) withdrawal speed exceeded the Level 1 criteria. TER-28 was written to resolve. See summary for ST-5.1.

ST-7.1 - Blowdown Mode Performance Verification

One Level 2 Test Exception (TER-4) was identified. The plant could not reach blowdown flow of 123 gpm due to reaching limit on RBCCW. The test exception was resolved by analysis of actual plant conditions.

ST-7.3 - Normal Mode Performance Verification

Test met acceptance criteria with no test exceptions.

ST-7.4 - Calibration Verification of Reactor Bottom Flow Indicator

Test met acceptance criteria with no test exceptions.

ST-8.3 - Shutdown Cooling Mode

Shutdown cooling for Loop A of RHR was demonstrated. One Level 2 Test Exception (TER-30) was identified. Analysis of plant conditions at the time of the test resolved the test exception.

ST-9.1 - Water Level Instrument Calibration Verification

Met acceptance criteria with no test exceptions.

ST-10.1 - IRM-SRM Overlap Verification

Met acceptance criteria of SRM/IRM overlap at least 1/2 decade (based on Technical Specification 3.3.1) and the IRM's on scale before the SRMS exceed the rod block setpoint. The SRM's were partially withdrawn for this test but there was no SRM movement during the overlap. There were no test exceptions. The test met the acceptance criteria. However, FSAR Figure 7.6-14 indicates that the SRM/IRM overlap is one decade with the SRM's fully inserted. The data from this test and HF-278-039 were analyzed to see if the one decade of overlap with the SRM's fully inserted can be obtained. The analysis of data does not indicate a one decade overlap with the SRM's fully inserted. The licensee plans to conduct additional testing or analysis to resolve this item. This is considered an unresolved item (388/84-27-01).

ST-14.1 - RCIC Condensate Storage Tank Injection

This test was conducted at 150 psi reactor pressure and rated reactor pressure. The test conducted at 150 psi reactor pressure met acceptance criteria with no test exceptions.

The test conducted at rated reactor pressure met acceptance criteria with one Level 2 test exception. The turbine speed peak on quick start was 4733 rpm. There was no RCIC turbine trip on quick start. The steady state values for the two hour run were at 920 psig reactor pressure, 608 gpm flow rate with a discharge pressure of 1030 psig. The test exception noted that the calculated setpoint for the delta pressure switches was lower than actually set. This was also found on ST-14.2 and is discussed further there.

ST-14.2 - RCIC Vessel Injection

Three Level 2 test exceptions were identified. The Level 1 criteria were satisfied. The turbine did not trip on quick start and the pump reached 600 gpm in 14 seconds (acceptance criteria 30 seconds). The three Test Exceptions are: (1) turbine speed peak exceeded 4809 rpm (TER-42), (2) very small steam leak from RCIC turbine (TER-43), and (3) the delta pressure switches are set higher than the calculated limit (TER-47). Four quick starts were performed with the speed peaks of 5107, 5050, 4986, 5065 rpm. The turbine did not trip on any of the quick starts. The licensee plans to perform maintenance on the EGR valve and then retest. Similar problems were experienced on Unit 1. The steam leak was analyzed to be acceptable as is. The delta pressure switches will be retested after maintenance is performed.

In preparation for the RCIC test, the licensee experienced problems with the lube oil distribution between the bearings. Several attempts to modify orifices were not successful. Increasing the drain line size from 1" to 1½ inches, which made the Unit 2 lube oil system similar to Unit 1, resolved the problem. As discussed in Section 4.2, the inspector witnessed portions of the testing performed in the troubleshooting of the problem.

ST-14.4 - Low Pressure Auto Quick Start to the Vessel

The test met the acceptance criteria with no test exceptions. The peak speed peak was 2550 rpm.

ST-15.1 - HPCI Condensate Storage Tank Injection

Two Level 2 test exceptions were identified. The turbine reached 5000 gpm in 20.4 seconds and did not trip on quick start satisfying the Level 1 criteria. The turbine speed peak was 4440 rpm with the second peak of 4060 rpm. The turbine was not run at rated conditions for 2 hours but only ran for one hour and 15 minutes (TER-48) due to limits on suppression pool temperature. This was judged acceptable since the FSAR indicates a two hour run or until steady turbine and pump conditions are reached or until limits on plant operation are encountered. The other test exception (TER-49) was the NPSH available on the turbine (19 ft.) was less than required (21 ft.). TER-49 was not resolved at the plateau review described in Section 2.6 and must be resolved prior to increasing power level. Subsequent to completion of this inspection, the Senior Resident informed the inspector that a strainer had been left in the line and would be removed. Subsequent to removal of the strainer, a retest would be performed at a later date. This is an unresolved item (388/84-27-02).

ST-16.1 - Minimum Pump Speed Determination

The electrical low speed stops were set at greater than 2% of the mechanical speed stops. There were no test exceptions.

ST-17.1 - Base Condition Data Collection

All Level 1 criteria were satisfied.

Five test exceptions to Level 2 criteria were identified (TER-34, 35, 37, 38, 39). The inspector independently verified the test exception findings on pipe hangers and supports on portions of the HPCI, Core Spray and RHR lines). All test exceptions were resolved.

ST-17.2 - Intermediate and Rated Temperature Data Collection

All Level 1 criteria were satisfied. Fourteen test exceptions to Level 2 criteria were identified (TER-4, 7, 8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 21 and 22). All test exceptions were resolved.

ST-25.1 - MSIV Functional Test

The test met all acceptance criteria. There were no test exceptions.

ST-32.1 - Containment Temperature at End of Heatup

Two test exceptions to Level 2 criteria (TER-11, TER-32) were identified. TER-11 did not apply to the condition identified. In TER-32, the minimum undervessel temperature was 72°F with a limit of 100°F. Analysis for the short term was found acceptable. Additional short term operational procedures will be added. Long term solution to be based on solution to the similar problem that exists on Unit 1.

ST-33.3 - Steady State Vibration - Recirculation Piping

All acceptance criteria met with no test exceptions.

ST-36.6 - Steady State Vibration RCIC Reactor Steam Supply

One test exception to Level 2 criteria (TER-45) was noted. The scan frequency of the data only provided information up to 50 Hz, whereas the analysis required 100 Hz data. Data in the range of interest was acceptable. Confirmatory data are to be obtained during subsequent RCIC testing.

ST-37.1 - Gaseous Radwaste Data Collection

All acceptance criteria met with no test exceptions.

ST-37.3 - Gaseous Radwaste System Performance

One test exception identified (TER-44). Guard bed flow and inlet dewpoint were above allowable values.

	A Bed	B Bed
Guard Bed	Actual/Allowable	Actual/Allowable
flow (cfm)	70/40	90/40
inlet dewpoint °F	47°/40°	58°/40°

A similar problem was experienced on Unit 1. The long term solution is to wait for the problem to be resolved on Unit 1. The inlet HEPA filters will have to be removed because of moisture. Upon review of the data, the inspector questioned why main SJAE flow was recorded as zero. The data was not required to satisfy any acceptance criteria. The Lead Startup Test Engineer reviewed the startup test and indicated that the instrument read zero and was not operational. The Lead Startup Test Engineer stated that he would reiterate to the startup engineers the need to identify similar occurrences so that corrective action can be taken if they find them.

ST-39.4 - HPCI Piping During HPCI Turbine Trip

All acceptance criteria were satisfied with no test exceptions.

2.6 Power Level Plateau Data Review

Scope

The inspector witnessed conduct of the Test Review Committee (TRC) and Plant Operations Review Committee (PORC) during the heatup test plateau and just prior to proceeding into Test Condition 1. The inspector determined that all testing was completed and that all test exceptions had been resolved by the licensee and that the review was conducted in accordance with the administrative procedures.

Findings

The following TRC and PORC meetings were witnessed:

-- PORC Meeting 84-126 on June 13, 1984.

-- TRC Meeting 84-17 on June 22, 1984.

-- PORC Meeting 84-133 on June 22, 1984.

-- TRC Meeting 84-18 on June 27, 1984.

-- PORC Meeting 84-No Number Assigned Yet on June 27, 1984.

The inspector identified that the meetings were conducted with the minimum quorum. The PORC meeting on June 13, 1984 utilized the PORC Secretary as an alternate member. When the practice was questioned by the inspector, it was found to be authorized by the Plant Superintendent. This practice had also been identified by the Resident Inspectors in previous inspections and was in the process of being resolved.

Minutes of the meeting were being maintained. The TRC and PORC reviewed completed tests, test changes and test exceptions. The inspector ascertained that the administrative procedure was being followed. The inspector ascertained that all test results for the heatup plateau had been reviewed by the PORC and TRC. At the conclusion of this inspection, all test exceptions except TER-49 had been resolved and found acceptable by the TRC and PORC. The TRC and PORC meeting on June 27, 1984 had not concluded the resolution of TER-49 was acceptable at that time.

2.7 Overall Program

In Inspection Report 50-388/84-23, the inspector identified that one individual did not meet the ANSI 3.1 requirement for startup test personnel and that at that time the licensee had in process documentation justifying his participation in the startup program on the basis of related experience and alternate training. The inspector verified completion of this activity and acceptance by the plant supervisor of alternate training and related experience. The inspector had no further questions.

Inspection Report 50-388/84-23 also identified a concern regarding shift turnover between operations and startup test personnel when a test is conducted over several shifts. The inspector observed the conduct of shift turnover briefings between startup personnel and operations for tests in process. No further concerns were identified in this area.

3.0 QA Interface

The inspector reviewed QA Audit Report PL-NQA-Audit #0-84-04, "Audit of Nuclear Fueling", dated June 12, 1984. The audit verified compliance with various procedures associated with initial loading of nuclear fuel into SSES Unit 2. No unacceptable conditions were noted.

The inspector reviewed and discussed with members of the QA organization the method for performing audits and surveillances and keeping records of their accomplishments. Previous inspection had identified a concern with keeping track of the status of QA activities. The inspector reviewed the log records for surveillance activities. In addition, QA individuals had been assigned to the startup of Unit 2 to perform surveillance and audits and to keep up the records of ongoing and completed activities. The QA organization had planned to review ongoing testing of 11 STs during the heatup plateau. At the time of this inspection, the QA organization had performed surveillances or audits of 10 ongoing startup tests, some of which were different than originally planned. The inspector also verified that in the 16 cases reviewed, QA comments were submitted on completed startup tests and resolved by the startup test group. No unacceptable conditions were noted.

4.0 Local Criticality Data

The inspector reviewed the results of HF-200-085 Local Criticality Data Acquisition Tests, Revision 0, dated June 5, 1984. Three tests were conducted. These tests are not part of the startup program.

Test 1 Moderator Temp. 116°F

Control Rod	Critical Configuration
10-19 Center Rod	10-19 Notch 30
14-23	14-23 Notch 48
14-15	14-15 Notch 48
6-23	6-23 Notch 14
6-15	

Test 2 Moderator Temp. 119°F

10-23 Center Rod	10-23 Notch 30
6-27	6-27 Notch 48
6-19	6-19 Notch 48
14-19	14-19 Notch 8
14-27	

Test 3

Control Rod	Critical Configuration
10-15 Center Rod	10-15 Notch 26
14-11	14-11 Notch 48
14-19	14-19 Notch 48
6-19	6-19 Notch 16

This data will allow the licensee to determine individual rod worths for comparison with computer models. No unacceptable conditions were noted.

5.0 Plant Tours

The inspector made several tours of the facility during the course of the inspection including the reactor building, turbine building, control structure, and control room.

The inspector observed work in progress, housekeeping, cleanliness and storage and protection of components, piping and systems.

No items of noncompliance were identified and no unacceptable conditions were noted.

6.0 Exit Interview

At the conclusion of the site inspection on June 14, 1984, June 22, 1984 and June 27, 1984, exit meetings were conducted with the licensee's senior site representatives (denoted in Paragraph 1). The findings were identified and previous inspection items were discussed. At no time during this inspection was written material provided to the licensee by the inspector.

APPENDIX A

PROCEDURE REVIEW

1. ST-29.0, "Recirculation Flow Control System", Revision 3, dated February 14, 1984

2. ST-29.1, "Response to Step Inputs in Individual Local Manual Operations", Revision 2, dated February 13, 1984

3. ST-29.3, "Response to Step Inputs in Combined Master Manual Operation", Revision 0, dated March 23, 1984

4. ST-29.4, "Verification of Recirculation M-G Set High Speed Stops", Revision 0, dated February 14, 1984

5. ST-30.0, "Recirculation System", Revision 4, dated May 25, 1984

6. ST-30.1, "Recirculation System One Pump Trip", Revision 3, Draft Copy dated May 15, 1984

7. ST-30.2, "Recirculation Pump Trip (RPT) of Two Pumps", Revision 3, Draft Copy dated May 15, 1984

8. ST-30.3, "Recirculation Pump Runback", Revision 1, dated February 24, 1984

9. ST-30.4, "Recirculation System Limiter Verification", Revision 3, dated March 16, 1984

10. ST-35.0, "Recirculation System Flow Calibration", Revision 2, dated May 15, 1984

11. ST-35.1, "Recirculation System Flow Calibration", Revision 2, dated May 15, 1984

12. ST-32.0, "Containment Atmosphere and Main Steam Tunnel Cooling", Revision 3, dated March 13, 1984

13. ST-32.1, "Containment Temperature at End of Heatup", Revision 3, dated March 13, 1984

14. ST-32.2, "Containment Temperature at Steady State", Revision 3, dated March 13, 1984

15. ST-32.3, "Containment Temperature After Reactor Scram", Revision 3, dated March 13, 1984

16. ST-32.4, "Main Steam Penetration Concrete Temperature", Revision 2, dated March 21, 1984

17. ST-33.0, "Piping Steady State Vibration", Revision 2, dated March 16, 1984

18. ST-33.6, "Steady State Vibration RCIC, Reactor Steam Supply and Pump Discharge (Bechtel)", Revision 1, dated March 13, 1984

APPENDIX B

TEST RESULTS EVALUATION

1. ST-1.6, "Chemistry Data-Heatup Tests", Revision 1, Test Implemented May 21, 1984

2. ST-2.1, "Startup Test Program Radiation Surveying", Revision 5, Test Implemented May 21, 1984

3. ST-5.1, "Insert Withdrawal Checks", Revision 2, Test Implemented June 15, 1984

4. ST-5.2, "Friction Measurements", Revision 2, Test Implemented May 23, 1984

5. ST-5.2, "Friction Measurements", Revision 2, Test Implemented June 16, 1984

6. ST-5.3, "Zero and Rated Pressure Scram of Individual Rods", Revision 3, Test Implemented May 25, 1984

7. ST-5.5, "Scram Testing of Selected Rods", Revision 3, Test Implemented May 27, 1984

8. ST-5.6, "Insert Withdrawal Checks of Selected Rods", Test Implemented May 27, 1984

9. ST-7.1, "Blowdown Mode Performance Verification", Revision 2, Test Implemented June 18, 1984

10. ST-7.3, "Normal Mode Performance Vibration", Revision 2, Test Implemented June 18, 1984

11. ST-7.4, "Calibration Verification of Reactor Bottom Head Flow Indicator", Revision 1, Test Implemented May 25, 1984

12. ST-8.3, "Shutdown Cooling Mode", Revision 2, Test Implemented May 29, 1984

13. ST-9.1, "Water Level Instrument Calibration Verification", Revision 2, Test Implemented May 22, 1984

14. ST-10.1, "IRM-SRM Overlap Verification", Revision 4, Test Implemented May 8, 1984

15. ST-14.1, "RCIC Condensate Storage Tank Injection", Revision 3, Test Implemented June 14, 1984

16. ST-14.1, "RCIC Condensate Storage Tank Injection", Revision 3, Test Implemented June 20, 1984

17. ST-14.2, "RCIC Vessel Injection", Revision 3, Test Implemented June 23, 1984

18. ST-14.4, "Low Pressure Auto Quick Start to Vessel", Revision 3, Test Implemented June 14, 1984

19. ST-15.1, "HPCI Condensate Tank Injection", Revision 2, Test Implemented June 27, 1984

20. ST-16.1, "Minimum Pump Speed Determination", Revision 2, Test Implemented June 19, 1984

21. ST-17.1, "Base Condition Data Collection", Revision 2, Test Implemented April 3, 1984

22. ST-17.2, "Intermediate and Rated Temperature Data Collection", Revision 3, Test Implemented May 10, 1984

23. ST-17.2, "Intermediate and Rated Temperature Data Collection", Test Implemented May 17, 1984

24. ST-17.2, "Intermediate and Rated Temperature Data Collection", Test Implemented May 21, 1984

25. ST-25.1, "MSIV Functional Test", Revision 4, Test Implemented May 22, 1984

26. ST-32.1, "Containment Temperature at End of Heatup", Test Implemented May 21, 1984

27. ST-33.3, "Steady State Vibration Recirculation Piping", Revision 2, Test Implemented June 19, 1984

28. ST-33.6, "Steady State Vibration RCIC Reactor Steam Supply", Revision 1, Test Implemented June 20, 1984

29. ST-37.1, "Gaseous Radwaste Data Collection", Revision 2, Test Implemented May 24, 1984

30. ST-37.3, "Gaseous Radwaste System Performance", Revision 0, Test Implemented June 23, 1984

31. ST-39.4, "HPCI Piping During HPCI Turbine Trip", Revision 1, Test Implemented June 27, 1984