U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-388/84-38

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: September 4-6, 18-21, 1934

Inspectors: D. J. Florek 10/24/84
D. J. Florek, Lead Reactor Engineer date

Approved by: L. Bettenhausen 10/24/84
L. Bettenhausen, Chief, Test Programs Section date

Inspection Summary: Inspection on September 4-6, 18-21, 1984 (Report No. 50-388/84-38)

Areas Inspected: Routine, unannounced inspection of Unit 2 Startup Test Program during test condition TC-3. Inspection included witnessing the conduct of feedwater pump testing, recirculation pump trips, HPCI performance testing and turbine generator trip; startup test results evaluation; test plateau review; and scram review. The inspection involved 48 hours on site by one region based inspector.

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

DETAILS

1. Persons Contacted

Pennsylvania Power and Light Company

J. Blakeslee, Supervisor of Operations Acting
R. Byram, Techical Supervisor
F. Butler, I&C Supervisor
T. Clymer, NQA Coordinator
T. Iorfida, Plant Engineering Supervisor
*H. Keiser, Plant Superintendent
J. Klucar, Lead Shift Test Engineer
R. Kreider, QA Engineer
C. McClain, PORC Secretary
T. Nork, Startup Coordinator
*R. Prego, Operations Quality Assurance Supervisor
M. Sager, Nuclear Plant Engineer
*R. Sheranko, Startup Test Group Supervisor
C. Smith, Power Production Engineer Nuclear
D. Thompson, Assistant Plant Superintendent
J. Todd, Compliance Engineer
J. Zentz, Startup Test Engineer

General Electric Corporation

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

Bechtel Power Corporation

P. McDaniel, Engineer

U.S. Nuclear Regulatory Commission

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

The inspector also contacted several other licensee employees including members of the technical, engineering and Quality Assurance staffs, shift supervisors, unit supervisors, reactor and auxiliary operators.

*Denotes those present at exit on September 21, 1984

2. Startup Test Program

References

-- SSES Final Safety Analysis Report
-- 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 Administrative Procedure

2.1 Startup Test Witnessing

Scope

The inspector witnessed portions of the following 4 startup tests and one hot functional test.

ST-23.3 "Feedwater Level Setpoint Changes", Test performed September 19, 1984

ST-39.5 "Feedwater Piping During Feedwater Pump Turbine Trip", Test performed September 19, 1984

ST-30.2 "Recirc Two Pump Trip", Test performed September 20, 1984

ST-27.1 "Turbine Trip", Test performed September 20, 1984

HF-252-076 "HPCI Flow Performance", Test performed September 6, 1984

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

Findings

ST-23.3

ST-23.3 was conducted on September 19, 1984 at approximately 0947 hours. The inspector verified that an official test copy was maintained, adequate personnel were available to conduct the test and their performance was satisfactory. Communication was established for the test and a briefing for all test personnel was conducted prior to testing. Prerequisites sampled indicated they were satisfied. Data was quickly assessed. The inspector observed that initial conditions included the reactor at 71% power and reactor water level at 35 inches. Testing was conducted in both single and three element control. A five inch positive step increase in level and subsequent five inch step decrease in level was observed. No divergent oscillations were noted. No unacceptable conditions were noted.

ST-39.5

This test was conducted on September 19, 1984 at approximately 1145 hours. The inspector observed that an official test copy was maintained and adequate personnel were available to conduct the test. The inspector observed the pre-test briefing and noted that as part

of the briefing the startup group discussed the possibilities of obtaining a recirc pump runback should reactor level fall below 30 inches with one feedwater pump in a tripped condition. Communications were established between test personnel. The plant initial conditions included reactor power at 70%. The operators raised reactor water level to approximately 38 inches which was still within the operating range. During the test, reactor feedwater pump A flow was manually increased to its design rating 4.7 Mlb/hr. The B and C reactor feedwater pumps automatically compensated by reducing flow to 2.1 and 2.5 Mlb/hr. During the trip of the A feedwater pump, reactor level decreased and the B&C reactor feedwater pumps increased speed to restore level. Reactor water level dropped to below 30 inches and the recirculation pumps ran back. Power was reduced to approximately 54%. The licensee is evaluating whether the feedwater system response is adequate. The startup test which is a dynamic piping vibration response during a feedwater pump trip was acceptable. No unacceptable conditions were noted.

ST-30.2

This test was conducted on September 20, 1984 at approxmately 0943 hours. An official test copy was maintained. Adequate personnel were assigned with adequate communication established. The prerequisites sampled indicated they were satisfied. Crew actions were adequate. The reactor was at 71% power and reactor water level was at 32 inches. The feedwater control was aligned in a three element mode with the "B" level sensor in control. Following the recirculation pump trips, reactor power level was at 34% at 0944 hours and 36% at 0959 hours. Reactor water level was within the normal band. Data was quickly assessed. No unacceptable conditions were noted.

ST-27.1

The turbine trip was initiated on September 20, 1984 at 2030 hours. An official test copy was maintained. Crew assignments and performance were adequate. Communication was established between testing personnel. Test briefings were conducted prior to the test. Prerequisites sampled were satisfied.

Prior to the test, the reactor was at 73% with reactor water level at approximately 35 inches. The feedwater control system was in three element control with the "B" level controlling. The inspector observed that the operator correctly left the mode switch in RUN for the three minutes established in the test procedure. The MSIV isolation at 850 psig while the mode switch is in RUN was not obtained as expected. After three minutes the operator manually tripped the B reactor feedwater pump. The inspector did not observe any safety relief operation (SRV). The peak reactor pressure was approximately 1010 psig; this is less than the lowest SRV setpoint. The lowest observed reactor water level was 5 inches. Feedwater heater strings

A and B isolated during the turbine trip, as had been experienced on previous unplanned turbine trips and are being investigated by the licensee. No unacceptable conditions were noted.

HF-252-076

The inspector witnessed portions of the HPCI performance test and observed that the licensee was monitoring suppression pool temperature. When testing was terminated, suppression pool temperature was 102°F. No unacceptable conditions were noted.

2.2 Test Results Evaluation

Scope

The 54 test results for procedures listed in Appendix A were reviewed. Inspection report 50-388/84-21, Section 2.6, describes the scope of the test results evaluation inspection.

Findings

Except as noted below, each test and change therein was approved in accordance with the administrative procedures; test objectives were met; test exceptions were noted; all data was obtained; test steps and data sheets were properly signed; and independent evlauation of test data was performed; test results were compared with acceptance criteria; TRC/POR review had been performed on those test results indicated by an asterisk (*) in Appendix A; QA reviewed the test results; and test briefings were conducted prior to the conduct of each test. The acceptance of test results by appropriate management will be assessed in a subsequent inspection. A summary of each startup test is provided in the following discussion.

ST-1.7 Chemistry Data

Chemistry data was taken at 50% and 74% power. TER 107 was identified at 50% power due to inability to perform analysis of metallic solids. When metallic analysis was performed at 75% power, the acceptance criteria were satisfied. A summary of Reactor Water Cleanup Influent chemistry is shown below.

	50% power	74% power	Acceptance Criteria
Conductivity umho/cm	.39	.828	$\leq$ 1.0
Chloride ppb	20	<20	$\leq$ 200
pH	7.3	7.6	5.6 to 8.6

ST-2.1 Radiation Survey

This test was performed at 74% power and all acceptance criteria were satisfied.

ST-5.7 Scram Timing of Selected Rods During the Turbine Trip

Scram times of five rods were assessed and all met the acceptance criteria of $\leq$ 7.0 seconds to position 5.

Rod	Scram Time (Sec)
34-55	2.3
30-43	2.345
30-35	2.345
34-39	2.4
50-47	2.280

ST-7.5 Bottom Head Drain Temperature Data

One test exception was identified due to the recirculation flow temperature in loop A not being operational. Loop B temperature data was used. Acceptance criteria were met.

ST-11.3 LPRM Calibration

During the review the inspector noted that 4 LPRM's were bypassed and could not be assessed against the acceptance criteria. The licensee indicated that a test exception should be prepared and issued TER-129. The remaining LPRM gain adjustment factors were within the acceptance criteria.

ST-12.2 APRM Calibration at 50% Power

All APRM's were indicating within 1/2% of rated OD-3 calculated thermal power and the APRM's were reading greater than or equal to thermal power.

APRM	Core Thermal Power
A 48	47
C 47	
E 47	
B 47	
D 47	
F 48	

ST-12.2 APRM Calibration at 75% Power

No readjustment of previous calibrations was required

As Found	Actual
A 72	71
C 71	
E 71	
B 71	

D 72
F 71

Acceptance criteria were satisfied.

ST-13.2 LPRM Substitute Value

Acceptance criteria were satisified.

ST-13.3 Bundle Power Symmetry

Using the asymmetric option in the process computer and BUCLE a comparison of outputs was assessed.

	Process Computer		BUCLE	
	Location	Value	Location	Value
MCPR	51-40	1.996	51-40	1.994
LHGR	9-20-4	9.44	9-20-4	9.45
APLHGR	9-20-4	8.20	9-20-4	8.21

All acceptance criteria were satisifed.

ST-14.1 RCIC CST to CST at Low Pressure

With the reactor at 159 psig, RCIC CST to CST was initiated. The RCIC turbine did not trip. 600 GPM was achieved in less than 7 seconds. The turbine speed peak was 2564 rpm. All aceptance criteria were satisifed.

ST-14.3 RCIC First Cold Quick Start Injection to Reactor Vessel at Rated Conditions

With the reactor at 15% power and 921 psig, RCIC was manually initiated. RCIC injected greater than 600 gpm in approximately 16 seconds, did not trip and had a speed peak of 3936 rpm. Two test exceptions were noted TER-101 identified that the dp switches are set greater than the test-derived calculated values, which was also observed on previous tests. TER-102 noted controller output oscillations, but these were later analyzed as normal performance.

ST-14.3 RCIC Second Cold Quick Start Injection to Reactor Vessel at Rated Conditions

With the reactor at 51% and reactor pressure at 940 psig, RCIC was manually initiated. RCIC injected greater than 600 gpm in approximately 11 seconds, did not trip and had a speed peak of 3959 rpm.

Two test exceptions were noted: TER-104 noted a fine white mist over the RCIC turbine and TER-105 identified the same problem with the dp switches as discussed above.

ST-14.4 RCIC Low Pressure Quick Start Reactor Vessel Injection

With the reactor at 162 psig, RCIC was manually initiated. RCIC injected greater than 600 gpm in approximately 9 seconds with a turbine speed peak of 4500 rpm. All acceptance criteria were met.

ST-15.1 HPCI Low Pressure CST to CST

With reactor at 159 psig HPCI was manually initiated for CST to CST injection. HPCI delivered 5000 gpm in 17 seconds with a speed peak of 2900 rpm. NPSH available was 45 ft. All acceptance criteria were satified.

ST-15.2 HPCI Reactor Vessel Injection

With the reactor at 67% power and reactor water level of 33" HPCI was manually initiated to feed the reactor vessel. HPCI achieved 5000 gpm in approximately 19 seconds, did not trip and had the first speed peak of 1900 rpm and the second at 4050 rpm. Reactor power increased to 75% due to cold water injection. The inspector questioned whether precautions will be established to assure the licensed power level will not be exceeded when this test is performed during TC-6 conditions. The licensee representative indicated that administrative controls on the test schedule establishing testing at power levels would be utilized. The acceptance criteria were satisifed.

ST-16.2 Recirculation One Pump Trip Recovery Data

Acceptance criteria were satisifed. Maximum temperature difference between loops was 1°F. Maximum temperature difference between steam dome and bottom head drain line temperature was 17°F.

ST-16.2 Recirculation Two Pump Trip Recovery Data

All acceptance criteria were satisfied. Maximum difference between loops was 1°F. Maximum difference between steam dome and bottom head drain line temperature was 23°F. Maximum temperature difference between the loop and vessel during restart was 17°F.

ST-17.4 Feedwater Piping Expansion at Rated Temperature

All level one criteria were satisifed. Test exceptions TER-115 on 56 supports failing level 2 criteria and TER-116 on 12 supports failing hot deflections were identified.

ST-18.1 TIP Uncertainty

Acceptance criteria were met. Total TIP uncertainty was 2.64% with an acceptance criteria of 6%. TER-113 was identified and subsequently dispositioned to calculate the random noise and geometric uncertainty.

ST-19.2 Core Performance at 50% Power

With the reactor at 47.5%

CMFCP = .47
CMFLPD = .46
CMAPR = .455

Acceptance criteria were satisified.

ST-19.2 Core Performance at 75% Power

With reactor at 71.3%

CMFCP = .609
CMFLPD = .646
CMAPR = .631

Acceptance criteria were satisifed.

ST-22.1 Pressure Regulator

With the reactor at 47.2% and reactor pressure of 935 psig, the response to 10 psi pressure steps was stable. The response to failed pressure regulator simulations was acceptable. Acceptance criteria were satisfied.

ST-23.2 Feedwater Pump Manual Flow Step Changes

The test was performed on each feedwater pump. The reactor was at approximately 71% power and in 3 element feedwater control. Test exceptions were identified for each pump. For pump A, TERs 118, 119, 120 and 124 were written. For pump B, TER-170 was written. For pump C, TERs 125, 126 and 127 were written. Test exceptions were all against level 2 criteria. All level 1 criteria were satisifed.

ST-23.3 Feedwater Level Setpoint Changes

There was no divergence in parameters. The response was stable. The acceptance criteria were satisified.

ST-27.1 Turbine Trip

With the reactor at 73% power reactor water level at 34 inches and reactor pressure at 950 psig, a turbine trip was initiated. Following the turbine trip and reactor scram, minimum water level reached was 7 inches. Reactor peak pressure was 1019 psig and the minimum pressure reached was 870 psig. All level 1 acceptance criteria were satisfied. The bypass valve performance was:

Turbine trip	51.715 sec
Start of stop valve closure	51.885 sec
Scram	51.895 sec
Bypass valves begin to open	51.940 sec
Bypass valves 80% open	52.115 sec

The feedwater level control response was acceptable.

The recirculation pumps tripped at 51.9 seconds with the following coastdown performance:

% Flow	Pump A (sec)	Pump B (sec)
100	0	0
95	.65	.62
90	.98	.96
85	1.23	1.33
80	1.45	1.69
75	1.95	2.1
70	2.3	2.38
65	2.8	2.74
60	3.1	3.16

ST-29.1 Recirc Pump A Flow Control Steps in Local Manual

The test was conducted at 51% power. Plant response was stable for a 7% step. TER 111 was identified because the margin to test flux trip at 100% was less than 5%. This was resolved when corrected for the reduced flow biased trip setpoints allocated to this test condition per R.G. 1.68.

ST-29.1 Recirc Pump B Flow Control Steps in Local Manual

The test was conducted at 50.4% power. Plant response was stable for a 5% step. TER-108 was identified similar to TER-111 above.

ST-29.3 Recirc Flow Steps in Master Manual

The test was conducted at 50.6% power. Plant response was stable for step responses. TER-110 was identified similar to TER-111 above.

ST-30.1 One Recirculation Pump Trip

The reactor was at 71.8% power at the time of pump trip. Following the pump trip, reactor power stabilizied at approximately 49%. Parameters did not diverge and the reactor did not trip. Acceptance criteria were satisifed. TER-123 was identified because one data point was out of service.

ST-30.2 Two Recirc Pumps Trip

With reactor power at 71.6% and core flow at 98% both recirculation pumps were tripped. Coastdown performance for the first 3 seconds is listed below:

% Flow	A Pump (sec)	B Pump (sec)
100	0	0
95	.7	.65
90	1.0	.95
85	1.2	1.25
80	1.45	1.55
75	1.75	1.70
70	2.15	2.25
65	2.55	2.6
60	3.0	3.1

Sensor time constants were .445 seconds and .450 seconds. The pumps tripped at 0944. Recirc pump A was stated at 1035 and recirc pump B was started at 1055.

Thermal limits during the test:

	Initial (0855)	Following Trip (1002)	After Restart of Pumps (1058)
Reactor Power	71.6%	36.9%	48.6%
CMFCP	.611	.584	.582
CMFLPD	.628	.394	.441
CMAPR	.621	.384	.439

Recirc pump coastdown satisfied acceptance criteria.

ST-30.3 Recirc Pump Runback

The runback test was performed during the pump runback associated with ST-39.5. Recirc pump runbacks were normal during the A and B feedwater pump trips with recirc pumps speeds of 46% and 49% for the A and B pump respectively. For the C feedwater pump trip, it took approximately 3 minutes for the recirc pump trip to occur and the recirc pump speeds stabilized at 46% and 48%. The licensee is investigating the cause for the delay. This will be reviewed in a subsequent inspection.

ST-30.4 Recirc System Limitor Verification

Acceptance criteria were satisfied ST-33.3 was run in conjunction with this test.

ST-32.2 Containment Steady State Temperatures

Reactor power was 38%. TER-100 was identified since the minimum temperature inside the base of shield wall was less than 100°F (78°F actual). All level 1 criteria were satisifed. A summary of measured temperature against acceptance criteria follows.

Description	Value °F	Acceptance Criteria °F
CRD Area	113	<185
Average Drywell	125	<135
Max Local Drywell	138	<150
Max Average CRD	109	<135
Min CRP Area	104	>100
Min Temp Inside Base of Shield Wall	78	>100
Recirc Pump Motor Aver	126.5	<128
Max	127	<135
Max Local Steam Tunnel	105	<125
Min Average Drywell Head	136.5	>135
Max Local Drywell Head	137	<150
Max Support Skirt Flange	95	<150

ST-32.3 Containment Temperature After Scram

Post test temperatures were stable. Acceptance criteria were satisfied with the exception of the inside base of shield wall similar to ST-32.2 above. TER-121 was written.

ST-33.1 Steady State Vibration Main Steam Inside Drywell

This test was conducted at 50% and 75% power. Acceptance criteria were satisfied.

ST-33.2 Steady State Vibration Main Steam and Feedwater Outside Drywell

This test was conducted at 50% and 75% power. Acceptance criteria were met for the operable piping at 50% (one feedpump was not operational) and all piping at 75%.

ST-33.3 Steady State Vibration Recirc Piping

TER-109 was identified because data was not retrievable onsite. Off site analysis of data indicated acceptance criteria were satisfied.

ST-33.4 HPCI Steady State Piping Vibration

Acceptance criteria were satisfied. However TER-128 was written because HPCI suction from the suppression pool was not tested.

ST-35.1 Recirc System Flow Calibration

TER-106 was identified due to process computer drive flow indication being greater than the calculated drive flow value. Jet pump total core flow was determined to be 1.22% of calculated with an acceptance criteria of less than 2%.

ST-37.1 Offgas Data Collection

With reactor at 52% all acceptance criteria were satisified.

ST-39.1 Main Steam Piping Vibration During Turbine Trip

Acceptance criteria were satisfied.

ST-39.3 Piping Vibration During Recirc Pump Trips and Restarts

This test was performed five times. Vibration levels were negligible. Acceptance criteria were satisfied.

ST-39.5 Feedwater Piping Vibration During Feedwater Pump Trips

This test was performed on all three feedwater pumps. Acceptance criteria for vibration levels were met. A summary of initial and minimum water levels for each pump trip is found below.

Feedwater Pump Trip	Initial Water Level (inches)	Minimum Water Level (inches)
A	37	28
B	35	24
C	35	23

2.3 Power Level Plateau Data Review

Scope

The inspector witnessed the conduct of TRC Meeting 84-32 and PORC Meeting 84-192 to determine that the review of completed startup tests, test change notices, and test exceptions were conducted in accordance with the administrative procedures.

Findings

The inspector witnessed TRC/PORC review of the following startup test procedures ST-33.1, 33.1, 33.2, 33.2, 33.3, 35.1 and 37.1. The following test exceptions were reviewed TER-1, 59, 61, 62, 63, 64, 65, 73, 74, 83, 98, 99, 106, 109 and 113. The TRC/PORC assessed that as of September 16, 1984, 19.3 equivalent full power days had accumulated and the startup test program will be completed prior to accumulating 120 equivalent full power days.

No unacceptable conditions were noted.

2.4 Test Exception Resolution

The inspector reviewed the closeout response to the following test exceptions TER-1, 59, 61, 62, 63, 64, 65, 74, 83, 98, 99, 100, 101, 102, 103, 105, 106, 107, 108,109, 110, 111, 112, and 113 to determine the adequacy of the response and to determine that they were in accordance with the administrative procedure.

Findings

No unacceptable conditions were noted. Open test exceptions and future test exceptions will be reviewed in a subsequent inspection.

3.0 Quality Assurance Interface

The inspector observed Quality Assurance personnel conducting surveillance reviews during the conduct of HF-252.076, ST-27.1 and ST-23.3. The inspector also observed QA personnel from the Hope Creek Nuclear facility observing the conduct of ST-27.1 The inspector observed several QA personnel reviewing completed startup tests results prior to review of the procedures by the TRC/PORC. Test results identified in Appendix A were reviewed by QA.

Based on a sampling of the QA reviews, technical and administrative comments were provided by QA. No unacceptable conditions were noted.

4.0 Scram Review

The inspector reviewed the licensee actions resulting from the two turbine trips and reactor scrams on August 26 and 28, 1984. High level in the "B" moisture separator drain tank caused a turbine trip during performance of combined intermediate valve (CIV) testing at approximately 45% power.

Following the second event, the licensee investigation identified that one of the three 42" lines from the high pressure turbine to the A moisture separator was full of water due to a drain valve failure. At 45% power, when the CIV on the "A" side of the turbine was closed, sufficient delta pressure was reached to allow the water to migrate into the B moisture separator at a rate faster than can be drained away. The turbine tripped

on high level in the B moisture separator. Following the turbine trip water hammer was apparently induced as indicated by pipe support damage in the 42" pipe. The licensee repaired the damaged support and visually inspected the piping system. The licensee repaired the drain valve. Following the repairs, the combined intermediate valve testing was subsequently performed at various power levels with no unanticipated results. No unnacceptable conditions were noted.

5.0 Tours of Facility

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 also observed work in progress, housekeeping and cleanliness.

No unacceptable conditions were noted.

6.0 Exit Interview

At the conclusion of the site inspection on September 21, 1984 an exit meeting was 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

Test Results Reviewed

1. ST-1.7* "Chemistry Data-Power Ascension Tests", Revision 1 Test Implemented August 23, 1984

2. ST-1.7* "Chemistry Data-Power Ascension Tests", Revision 1 Test Implemented September 11, 1984

3. ST-2.1 "Radiation Surveying", Revision 5 Test Implemented September 11, 1984

4. ST-5.7 "Scram Timing During Planned Scrams", Revision 3 Test Implemented September 20, 1984

5. ST-7.5* "Bottom Head Drain Temperature Data" Revision 1 Test Implemented August 21, 1984

6. ST-1.3 "LPRM Calibration With Process Computer" Revision 2 Test Implemented September 11, 1984

7. ST-12.2* "APRM Calibratoin at High Power 50%", Revision 2 Test Implemented September 8, 1984

8. ST-12.2 "APRM Calibration at High Power 75%", Revision 2 Test Implemented September 12, 1984

9. ST-13.2* "LPRM Substitute Valve and Base Distribution" Revision 1 Test Implemented September 5, 1984

10. ST-13.3 "Bundle Power Symmetry" Revision 1, Test Implemented Data Not Obtained

11. ST-14.1* "RCIC Condensate Storage Tank Injection", Revision Test Implemented September 3, 1984

12. ST-14.3* "RCIC Rated Pressyre Auto Quick Start to Vessel", Revision 3 Test Implemented August 17, 1984

13. ST-14.3* "RCIC Rated Pressure Auto Quick Start to Vessel", Revision 3 Test Implemented August 21, 1984

14. ST-14.4* "RCIC Low Presusre Auto Quick Start to Vessel" Revision 3 Test Implemented September 3, 1984

15. ST-15.1* "HPCI Condensate Storage Tank Injection", Revision 2 Test Implemented September 3, 1984

16. ST-15.2 "HPCI Reactor Vessel Injections", Revision 2 Test Implemented September 19, 1984

17. ST-16.2 "Recirculation One Pump Trip Recovery Data", Revision 1 Test Implemented September 20, 1984

18. ST-16.2 "Recirculation Two Pump Trip Recovery Data" Revision 1, Test Implemented September 20, 1984

19. ST-17.4 "Feedwater Piping at Rated Temperature" Revision 3 Test Implemented September 11, 1984

20. ST-18.1 "TIP Uncertainty Determination" Revision 2 Test Implemented September 12, 1984

21. ST-19.2* "Core Performance Using Procewss Computer", Revision 2 Test Implemented September 8, 1984

22. ST-19.2 "Core Performance Usng Process Computer at 50% Power" Revision 2 Test Implemented September 12, 1984

23. ST-22.1* "Pressure Regulator Control Valve Controlling at 75% Power" Revision 1 Test Implemented August 23, 1984.

24. ST-23.2 "Feedwater (A) Manual Flow Step Changes", Revision 2 Test Implemented September 19, 1984

25. ST-23.2 "Feedwater (B) Manual Flow Step Changes", Revision 2 Test Implemented September 19, 1984

26. ST-23.2 "Feedwater (C) Manual Flow Step Changes", Revision 2 Test Implemented September 19, 1984

27. ST-23.3 "Feedwater Level Setpoint Changes", Revision 2 Test Implemented September 19, 1984

28. ST-27.1 "Turbine Trip", Revision 2 Test Implemented September 20, 1984

29. ST-29.1* "Recirc A Flow Steps in Local Manual", Revision 2 Test Implemented September 9, 1984

30. ST-29.1* "Recirc B Flow Steps in Local Manual", Revision 2 Test Implemented September 9, 1984

31. ST-29.3* "Recirc Flow Steps in Master Manual", Revision 0 Test Implemented September 9, 1984

32. ST-30.1 "Recirc One Pump Trip", Revision 3 Test Implemented September 20, 1984

33. ST-30.2 "Recirc Two Pump Trip", Revision 3 Test Implemented September 20, 1984

34. ST-30.3 "Recirc Pump Runback" Revision 1 Test Implemented September 19, 1984

35. ST-30.4* "Recirc System Limitor Verification" Revision 3 Test Implemented September 9, 1984

36. ST-32.2* "Containment Temperature at Steady State", Revision 4 Test Implemented August 10, 1984

37. ST-32.3 "Containment Temperature After Reactor Scram", Revision 4 Test Implemented September 20, 1984

38. ST-33.1* "Steady State Vibration 50% Power Main Steam Piping Inside Drywell" Revision 2 Test Implemented September 8, 1984

39. ST-33.1* "Steady State Vibration 75% Power Main Steam Piping Inside Drywell" Revision 2 Test Implemented September 11, 1984

40. ST-33.2* "Steady State Vibration 50% Power Main Steam and Feedwater Outside Drywell" Revision 1 Test Implemented September 8, 1984

41. ST-33.2* "Steady State Vibration 75% Power Main Steam and Feedwater Outside Drywell" Revision 1 Test Implemented September 11, 1984

42. ST-33.3* "Steady State Vibration Recirc Piping" Revision 1 Test Implemented September 9, 1984

43. ST-33.4 "Steady State Vibration HPCI CST to Vessel", Revision 3 Test Implemented September 20, 1984

44. ST-35.1* "Recirc System Flow Calibration", Revision 2 Test Implemented August 19, 1984

45. ST-37.1* "Offgas Data Collection", Revision 2 Test Implemented August 22, 1984

46. ST-39.1 "Main Steam Piping During Turbine Trip" Revision 3 Test Implemented September 20, 1984

47. ST-39.3 "Recirc Piping During Single Pump Trips" Revision 2 Test Implemented September 20, 1984

48. ST-39.3 "Recirc Piping During Single Pump Restarts" Revision 2 Test Implemented September 20, 1984

49. ST-39.3 "Recirc Piping During Two Pump Trips" Revision 2 Test Implemented September 20, 1984

50. ST-39.3 "Recirc Piping During A Pump Restarts" Revision 2 Test Implemented September 20, 1984

51. ST-39.3 "Recirc Piping During B Pump Restarts", Revision 2 Test Implemented September 20, 1984

52. ST-39.5 "Feedwater Piping During Feedwater Pump A Turbine Trips", Revision 3 Test Implemented September 19, 1984

53. ST-39.5 "Feedwater Piping Druing Feedwater Pump B Turbine Trips" Revision 3 Test Implemented September 19, 1984

54. ST-39.5 "Feedwater Piping During Feedwater Pump C Turbine Trips" Revision 3, Test Implemented September 19, 1984.

*Those that have received TRC/PORC Review.