NOTE: PRESS HARD YOU ARE MAKING FIVE (5) COPIES

ADMINISTRATIVE PROCEDURE 3
ON-THE-SPOT CHANGE

Train A

CHANGE TYPE: [X] PERMANENT (GREEN) [ ] *TEMPORARY (ORANGE)

*EXPIRES:

PROCEDURE TITLE Response Time Test of S.S.P.S Logic Rx Trip

ALL ON-THE-SPOT CHANGES TO BE CONSIDERED FOR APPLICABILITY TO BOTH UNITS.

[X] UNIT 1 PROCEDURE NO. 1PD-18.4.002 REV. NO. 0 CHANGE NO. 1

[X] UNIT 2 PROCEDURE NO. 2PD-18.4.002 REV. NO. 0 CHANGE NO. 1

PROPOSED CHANGE: page 7 Step 8.1 Add: (S.R. H.V. Block CKT)

Add. Step 8.2.1 Lift wires: A Train BB629 Terminal 8
B Train K629 Terminal 9

Caution: Terminals may be energized (~~115VAC~~ 125VDC) ER

(Source Range High Flux at Shut Down Ann. Alarm)

Page 17

Add Step 9.8.1 Caution: Terminals may be energized (~~115VAC~~ 125VDC) ER

Reconnect wires: A Train BB629 Terminal 8
B Train K629 Terminal 9

REASON FOR CHANGE:

Procedure Clarification

So Source Range High Flux at Shut Down Ann. Alarm will not be disabled.

ACTION TAKEN FOR OTHER UNIT:

Same

AUTHORIZATION: [signature] **SUPERVISOR IN CHARGE; D. D. Jansen DUTY SENIOR SHIFT SUPERVISOR OR SHIFT SUPERVISOR; 11-15-82 DATE

**SIGNATURE ALSO VERIFIES THAT APPLICABILITY TO BOTH UNITS HAS BEEN CONSIDERED.

POST CHANGE-REVIEW/APPROVAL

ACCEPTABLE:

YES	NO		
X		[signature] DEPARTMENT HEAD	11/16/82 DATE
X		[signature] SQAE	11/18/82 DATE
MEETING NO. 82	106	[signature] SORC (CHAIRMAN)	11/24/82 DATE
✓		H. J. [signature] MANAGER - SALEM GENERATING STATION	11/24/82 DATE

RETURN COMPLETED OR REJECTED FORM TO DEPARTMENT REQUESTING CHANGE.

FOLLOW-UP TO REJECTED ON-THE-SPOT CHANGE

ACTION TAKEN:

8303160579 830314
PDR ADOCK 05000272
S PDR

PERFORMED BY: ______ SIGNATURE ______ DATE

RETURN TO DEPARTMENT HEAD FOR ROUTING THROUGH POST CHANGE-REVIEW/APPROVAL CYCLE.

FORM AP-3-1 REV. 9

NOTE: PRESS HARD YOU ARE MAKING FIVE (5) COPIES

ADMINISTRATIVE PROCEDURE 3
ON-THE-SPOT CHANGE

CHANGE TYPE: [X] PERMANENT (GREEN) [ ] *TEMPORARY (ORANGE)

*EXPIRES:

PROCEDURE TITLE Response Time Test of S.S.P.S. Logic Rx Trip Train A

ALL ON-THE-SPOT CHANGES TO BE CONSIDERED FOR APPLICABILITY TO BOTH UNITS.

[X] UNIT 1 PROCEDURE NO. 1PD-18.4.002 REV. NO. 0 CHANGE NO. 1

[X] UNIT 2 PROCEDURE NO. 2PD-18.4.002 REV. NO. 0 CHANGE NO. 1

PROPOSED CHANGE: Page 18

Add Step 9.12

If the Shift Supervisor wants the Safety Injection Block ~~reinstalled~~ reinstated, jumper terminals 2 and 6 on TD1 and have the Control Operator depress the S.I. Reset for Trains A & B.

Senior Shift Supervisor / Shift Supervisor

REASON FOR CHANGE:

To Add S.I. Block

ACTION TAKEN FOR OTHER UNIT:

Same

AUTHORIZATION: **SUPERVISOR IN CHARGE — DUTY SENIOR SHIFT SUPERVISOR OR SHIFT SUPERVISOR — 11/12/82 DATE

**SIGNATURE ALSO VERIFIES THAT APPLICABILITY TO BOTH UNITS HAS BEEN CONSIDERED.

POST CHANGE-REVIEW/APPROVAL

ACCEPTABLE:

YES	NO		
X		DEPARTMENT HEAD	DATE 11/16/82
X		SORC	DATE 11/18/82
MEETING NO. 82	106	SORC (CHAIRMAN)	DATE 11/24/82
✓		MANAGER - SALEM GENERATING STATION	DATE 11/24/82

RETURN COMPLETED OR REJECTED FORM TO DEPARTMENT REQUESTING CHANGE.

FOLLOW-UP TO REJECTED ON-THE-SPOT CHANGE

ACTION TAKEN:

PERFORMED BY: SIGNATURE DATE

RETURN TO DEPARTMENT HEAD FOR ROUTING THROUGH POST CHANGE-REVIEW/APPROVAL CYCLE.

SALEM NUCLEAR GENERATING STATION

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ELECTRIC GENERATION DEPARTMENT

PROCEDURE APPROVAL COVER SHEET

SAFETY RELATED

PROCEDURE: 1PD-18.4.002 - RESPONSE TIME TEST OF SOLID STATE

REMARKS: PROTECTION SYSTEM LOGIC - Rx TRIP, TRAIN A

REV	SUBMITTED	EED APPROVED	QA REVIEWED	PERF. ENGR. APPROVED	SORC REVIEWED	STA. SUPT. APPROVED
0	MP [illegible] 6/23/82	N/A MPB 6/23/82	[illegible] 6/30/82	[illegible] 6/28/82	82-65	H.J. [illegible] 7/1/82

X

SALEM GENERATING STATION

PERFORMANCE DEPARTMENT (I & C)

TEST PROCEDURE

NUMBER – 1PD-18.4.002
REV. NO. 0
DATE 5/3/82
PAGE 1 OF 28

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

1.0 Purpose:

1.1 To obtain the response time from the Hagan bistable switches and other inputs through the SSPS Logic to the reactor trip breaker UV coil.

1.2 To obtain the response time from the UV coil to the opening of the reactor trip breakers.

1.3 To be used in conjunction with other procedures for the total response time of the Reactor Trip signal from sensor to the opening of the reactor trip breakers.

2.0 References:

2.1 Performance Department Manual.

2.2 Reactor Protection System Logic Diagrams - 221050 thru 221065.

2.3 Westinghouse Instruction Manual - Solid State Protection.

2.4 Hagan Interconnection Diagrams - 220000 thru 220092.

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

3.0 Precautions:

3.1 Special care should be taken in the removal and handling of wire, connections, and test equipment on energized equipment.

3.2 Care should be taken in the use of the visicorder, such that a minimum quantity of the light sensitive paper is wasted.

4.0 Limitations and Actions:

4.1 None stated.

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

5.0 Test Equipment:

Device	PD No.	Recal. Date
Visicorder Model 1912		
Test Leads & Jumpers	N/A	N/A
Test Resistor for Hagan Input Signals	N/A	N/A
Toggle Switches (4)	N/A	N/A
Latern Type 6VDC Battery (2) or Equiv.	N/A	N/A

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

6.0 Prerequisites:

6.1 The Reactor will be shut down and the plant will be in the refueling mode of operation (Modes 5 or Mode 6).

_____
Senior Shift Supervisor/Shift Supervisor

_____
Date/Time

6.2 The Senior Shift Supervisor/Shift Supervisor has granted permission to perform this procedure.

_____
Senior Shift Supervisor/Shift Supervisor

_____
Date/Time

6.3 The individual assigned to perform this procedure is qualified to do so in accordance with the Solid State Protection System Qualification Card.

_____
Job Supervisor

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

6.0 Prerequisites: (Continued)

6.4 The Control Operator responsible for the portion of the plant to be tested is aware of all the alarms and indications which will be affected by the performance of this procedure. Specifically, Coolant Temperatures must be determined from Loop Wide Range Indication, Coolant Pressure read from the Loop Hot Leg Indication, Pressurizer Level from the Cold Calibration Channel Indication, and Steam Generator Level from the Wide Range Indication.

_____
Control Operator

6.5 Have the Control Operator place the pressurizer level controller in Manual.

_____
Control Operator

6.6 Instrumentation shall have been energized and operating for at least one half hour to attain equilibrium conditions.

_____
Job Supervisor

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

7.0 System Line-up:

7.1 None stated.

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

8.0 Instructions: Initial

8.1 Lift the following leads at the NIS:

8.1.1 Rack 78 - TB123-1 _____

8.1.2 Rack 79 - TB223-1 _____
(S.R. H.V. Block CRT)

8.2 Install a jumper across TB507-4 and TB507-5 in both Train A and Train B. _____
CAUTION: Terminals maybe energized (125VDC OR ~~115VAC~~)

8.2.1 Lift wires: A Train - BB 629 Terminal # 8 _____ A
B Train - K 629 Terminal # 9 _____ B
(Source Range High Flux at Shut Down Annc. Alarm)

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8.3 Place the Input Error Inhibit switch for Train B in the "Inhibit" position. _____

8.4 Place the Train A Mode Selector switch in the "Test" position. _____

8.5 Clear all Reactor Trip Signals by installing test jumpers or resistors as specified in Table I. _____

8.6 Connect Visicorder Channel 1 to the output terminals of the Bistable Switch under test as shown in Table 2 (115 VAC). _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.7 Connect Visicorder Channel 2 to UV coil terminals TB508-1 and TB508-2 (+43 VDC) in SSPS Train A Output Cabinet. _____

8.8 Place the coincident bistable switch or switches as listed in Table 2 to the TRIP position. _____

8.9 Adjust the visicorder to obtain a good quality step function trace. _____

8.10 Verify the UV coil voltage at approximately 43 VDC on the LOGIC TEST PANEL meter (UV COIL VOLTAGE) in the SSPS OUTPUT LOGIC BAY. _____

8.11 Start the visicorder and immediately place the bistable switch under test to the TRIP position. _____

8.12 Stop the visicorder after the UV coils are de-energized. Record on Table 2 the elapsed time from the trip signal to the time the UV coil voltage decays to 30% of its initial value. Label all visicorder traces, and store visicorder paper for future reference. _____

8.13 Repeat Steps 8.5 through 8.12 for the bistables as indicated in Table 2, Step 1 through 4. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.14 For Steps 5 through 48 in Table 2, the P7 permissive must be present. Actuate P7 by placing the Operation Selector switch to the Detector A and B position on power range drawers N41 and N42 and increase (clockwise) the Detector A and Detector B Test Signal until the POWER RANGE P10 PERMISSIVE light energizes. (Note: Depress BLOCK POWER RANGE "A" and BLOCK POWER RANGE "B" at the control bezel when power range test signals are above the P7 permissive and reset the rate trip as necessary.) _____

8.14.1 For Steps 25 through 36, connect channel 3 of the visicorder to coil contacts 5 and 6 on K633. _____

8.14.2 For Steps 25A through 36A, connect channel 3 of the visicorder to coil contacts 5 and 6 on K634. _____

NOTE: The UV Coil will remain de-energized for this step.

8.15 Repeat Step 8.6 through 8.12 for the bistable as indicated in Table 2, Step 5 through 36. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.16 For Steps 37 through 48 in Table 2, the P8 permissive must be present. Actuate P8 by placing the Operation Selector switch to the Detector A and B position on power range drawers N41 and N42. Increase (clockwise) the Detector A and Detector B Test Signal until the POWER RANGE P8 PERMISSIVE light energizes. (Note: Depress BLOCK POWER RANGE "A" and BLOCK POWER RANGE "B" at the control bezel when the power range test signals are above the P7 permissive and reset the rate trip as necessary.) _____

8.17 Repeat Step 8.6 through 8.12 for the bistable as indicated in Table 2, Steps 37 through 48. _____

8.18 For Steps 37 through 63 in Table 3, the P7 permissive must be present. Actuate P7 by placing the Operation Selector switch to the Detector A and B position on power range drawers N41 and N42. Increase (clockwise) the Detector A and Detector B Test Signal until the POWER RANGE P10 PERMISSIVE light energizes. (Note: Depress BLOCK POWER RANGE "A" and BLOCK POWER RANGE "B" at the control bezel when the power range test signals are above the P7 permissive and reset the rate trip as necessary.) _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.19 CAUTION: Terminals may be energized (115VAC). Connect channel 3 of visicorder to coil contacts 5 and 6 on K632. Short terminal 1 to 5 on A.R. timer. _____

8.20 Disconnect the field wires connected to the terminals listed in Table 3, Steps 37 through 40. _____

8.21 Connect a toggle switch across terminals. (Toggle switch in OFF position will produce a trip.) _____

8.22 Connect visicorder channel 1 across the terminals. _____

8.23 Repeat Steps 8.7 through 8.12 for Table 3, Steps 37 through 40. (For a coincident channel trip, place the toggle switch to OFF.) _____

8.24 Remove the toggle switches from terminals of Table 3, Steps 37 through 40 and reconnect the field wires. _____

8.25 Disconnect the field wires connected to the terminals listed in Table 3, Steps 41 through 44. _____

8.26 Connect a toggle switch across each terminal. (Toggle switch in OFF position will produce a trip.) _____

8.27 Connect visicorder Channel 1 across the terminals. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.28 Repeat Steps 8.7 through 8.12 for Table 3, Steps 41 through 44. (For a coincident channel trip, place the toggle switch to OFF.) _____

8.29 Remove the toggle switches from the terminals of Table 3, Steps 41 through 44 and reconnect the field wires. _____

NOTE: For Steps 45 through 56 in Table 3, the channel under the coincident channel bistables are actuated by placing the operations selector switch to the Detector A and B position on the power range drawers in the NIS cabinets, and increasing (clockwise) the Detector A and Detector B Test Signal potentiometers until the required trip light energizes on the drawer.

8.30 Connect visicorder Channel 1 to the terminals listed in Table 3 for the channel under test. Repeat Steps 8.7 through 8.12 for Table 3, Steps 45 through 55. _____

8.31 Connect visicorder Channel 1 to the terminals listed in Table 3 Step 56. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.32 The Senior Shift Supervisor/Shift Supervisor has verified the following breakers are cleared and tagged: No. 11 Control Rod Power Supply M-G breaker on No. 1E 460VAC bus and No. 12 Control Rod Power Supply M-G Breaker on No. 1G 460 VAC bus.

_____

Senior Shift Supervisor/Shift Supervisor

_____

Date/Time

8.33 Connect Channel 3 of the visicorder to the Spare "B" contact of the auxiliary switch of Reactor Trip Breaker A. _____

8.34 Connect the spare conductors of cable RP363-AT (located in the bypass breaker terminal cabinet) to TB3 terminals 11 & 12 in the Trip Breaker terminal cabinet. _____

8.35 Connect the spare conductors of cable RP363-AT (located in the SSPS Train A Logic Cabinet) to the visicorder. (Note: In series with one conductor, connect a 6VDC latern-type battery.) _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.36 Close Reactor Trip Breaker A from the control console and repeat Steps 8.7 through 8.12 for Table 3, Step 56. To close the trip breaker, place the Mode Selctor Switch in Operate. _____

Response Time of Reactor Trip Breaker A _____

8.37 Remove the connections made in Step 8.33. Place the Mode Selector Switch in Test. _____

8.38 CAUTION: Terminals may be energized (115VAC) Disconnect the field wires connected to the terminals listed in Table 3, Steps 57 through 59. _____

8.39 Connect a toggle switch across each terminal. (Toggle switch in OFF position will produce a trip.) _____

8.40 Connect visicorder Channel 1 across the terminals. _____

8.41 Repeat Steps 6.7 through 6.12 for Table 3, Steps 57 through 59. (For a coincident channel trip, place the toggle switch to OFF.) _____

8.42 Remove the toggle switches from terminals of Table 3, Steps 57 through 59 and reconnect the field wires. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

8.0 Instructions: (Continued) Initial

8.43 Disconnect the field wires connected to the terminals listed in Table 3, Steps 60 through 63. _____

8.44 Connect a toggle switch across each terminal. (Toggle switch in OFF position will produce a trip.) _____

8.45 Connect visicorder Channel 1 across the terminals. _____

8.46 Repeat Steps 6.7 through 6.12 for Table 3, Steps 60 through 63. (For a coincident channel trip, place the toggle switches to OFF.) _____

8.47 Remove the toggle switches from terminals of Table 3, Steps 60 through 63 and reconnect the field wires. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

		Initial
9.0	Return To Normal:	
9.1	Remove visicorder Channels 1 through 3 from the SSPS Equipment Cabinets.	_____
9.2	Remove test resistors, jumpers, and reland leads in the Hagan and SSPS cabinets as indicated in Table I.	_____
9.3	Remove test equipment and jumpers from reactor trip breaker terminal cabinet.	_____
9.4	Return NIS power range drawers to normal and clear any associated alarms.	_____
9.5	Place the Input Error Inhibit switch for Train A in "Inhibit".	_____
9.6	Place the Mode Selector switch for Train A in the "Operate" position.	_____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

9.0 Return To Normal: (Continued) Initial

9.7 Initiate the Safety Injection Blocks for both TRAIN A and TRAIN B from the Control Bezel.

Steam Line S.I. Block

A _____

B _____

Pressurizer S.I. Block

A _____

B _____

9.8 Place the Input Error Inhibit switch for both TRAIN A and TRAIN B in the "NORMAL" position.

CAUTION: Terminals may be energized (125 VDC) for

A _____

9.8.1 Reconnect wires: A Train - BB629 Terminal #8
B Train - K629 Terminal #9

B _____

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9.9 Remove the jumper from TB507-4 and TB507-5 in both TRAIN A and TRAIN B. _____

9.10 Verify that the Green and the Amber General Warning Test LED's in both TRAINS are LIT. _____

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

9.0 Return To Normal: (Continued) Initial

9.11 Reconnect the Leads lifted at the following locations:

9.11.1 NIS Rack 78 - TB 123-1 _____

9.11.2 NIS Rack 79 - TB 223-1 _____

9.12 If the Shift Supervisor wants the Safety Injection Block reinstated ~~reinstalled~~, Jumper terminals 2 and 6 on TD1 and have the Control Operator depress the S.I. Reset for Trains A+B.

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_____
Senior Shift Supervisor / Shift Supervisor

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

10.0 Remarks: W.O._____ I.O._____

11.0 Completion:

11.1 Completed By:_____ _____ _____
Technician Date Time

11.2 Approved By:_____ _____ _____
Supervisor Date Time

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

TABLE I

A. Test Resistors installed in the following Test Jacks and the CT switch placed in TEST:

I. REACTOR COOLANT TEMPERATURE

TJ-411-1 Rack 2	TJ-421-1 Rack 6	TJ-431-1 Rack 13	TJ-441-1 Rack 15
TJ-412-1 Rack 2	TJ-422-1 Rack 6	TJ-432-1 Rack 13	TJ-442-1 Rack 15

NOTE: To clear LOW TAVG signals, open states block connections 1, 2, 3, 4, 6, 7, 8 and 9 in the above racks.

II. REACTOR COOLANT FLOW

TJ-414 Rack 3	TJ-424 Rack 3	TJ-434 Rack 3	TJ-444 Rack 3
TJ-415 Rack 7	TJ-425 Rack 7	TJ-435 Rack 7	TJ-445 Rack 7
TJ-416 Rack 12	TJ-426 Rack 12	TJ-436 Rack 12	TJ-446 Rack 12

III. PRESSURIZER PRESSURE

TJ-455 Rack 1	TJ-456 Rack 10	TJ-457 Rack 12	TJ-474 Rack 14

IV. STEAM GENERATOR LEVEL

TJ-517 Rack 31	TJ-527 Rack 31	TJ-537 Rack 31	TJ-547 Rack 31
TJ-518 Rack 11	TJ-528 Rack 11	TJ-538 Rack 11	TJ-548 Rack 11
TJ-519 Rack 8	TJ-529 Rack 4	TJ-539 Rack 4	TJ-549 Rack 8

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

TABLE I (Continued)

B. Install the following Jumpers in SSPS INPUT RELAY BAY:

I. TURBINE AUTO STOP OIL

TB-109-1 to TB-109-2
TB-209-1 to TB-209-2
TB-308-1 to TB-308-2

II. TURBINE STEAM STOP VALVES

TB-109-3 to TB-109-4
TB-209-3 to TB-209-4
TB-308-3 to TB-308-4
TB-407-3 to TB-407-4

III. REACTOR COOLANT PUMP BREAKERS

TB-109-9 to TB-109-10
TB-209-9 to TB-209-10
TB-308-9 to TB-308-10
TB-407-9 to TB-407-10

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

TABLE II

STEP	BISTABLE UNDER TEST	RACK	TERMINALS HAGAN RACK	COINCIDENT CHANNEL	RACK	TIME RESPONSE	
						UV COIL	
OVERTEMPERATURE DELTA T							
1	BS-411C	2	TB 1-11&12	BS-441C	15		
2	BS-421C	6	TB 2-5&6	BS-441C	15		
3	BS-431C	13	TB 3-3&4	BS-441C	15		
4	BS-441C	15	TB 3-3&4	BS-431C	13		
PRESSURIZER PRESSURE/LOW (ABOVE P7)							
5	BS-455C	1	TB 1-7&8	BS-474A	14		
6	BS-456C	10	TB 2-9&10	BS-474A	14		
7	BS-457C	12	TB 4-1&2	BS-474A	14		
8	BS-474A	14	TB 3-1&2	BS-457C	12		
PRESSURIZER PRESSURE HIGH							
9	BS-455A	1	TB 1-1&2	BS-474C	14		
10	BS-456A	10	TB 2-3&4	BS-474C	14		
11	BS-457A	12	TB 3-7&8	BS-474C	14		
12	BS-474C	14	TB 2-11&12	BS-457A	12		
LOSS OF FLOW TWO LOOP (ABOVE P-7 AND BELOW P-8)							
13	BS-414	3	TB 2-7&8	BS-416	12		
				BS-424	3		
				BS-425	7		
14	BS-415	7	TB 2-7&8	BS-416	12		
				BS-424	3		
				BS-425	7		
15	BS-416	12	TB 2-3&4	BS-414	3		
				BS-424	3		
				BS-425	7		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

TABLE II

STEP	BISTABLE UNDER TEST	RACK	TERMINALS HAGAN RACK	COINCIDENT CHANNEL	RACK	TIME RESPONSE	
						UV COIL	
16	BS-424	3	TB 2-11&12	BS-426	12		
				BS-414	3		
				BS-415	7		
17	BS-425	7	TB 2-11&12	BS-426	12		
				BS-414	3		
				BS-415	7		
18	BS-426	12	TB 2-7&8	BS-424	3		
				BS-414	3		
				BS-415	7		
19	BS-434	3	TB 3-3&4	BS-436	12		
				BS-414	3		
				BS-415	7		
20	BS-435	7	TB 3-3&4	BS-436	12		
				BS-414	3		
				BS-415	7		
21	BS-436	12	TB 2-11&12	BS-434	3		
				BS-414	3		
				BS-415	7		
22	BS-445	7	TB 3-7&8	BS-446	12		
				BS-414	3		
				BS-415	7		
23	BS-444	3	TB 3-7&8	BS-446	12		
				BS-414	3		
				BS-415	7		
24	BS-446	12	TB 3-3&4	BS-444	3		
				BS-414	3		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

TABLE II

STEP	BISTABLE UNDER TEST	RACK	TERMINALS HAGAN RACK	COINCIDENT CHANNEL	RACK	TIME RESPONSE	
						UV COIL	K633.
				BS-415	7		
STEAM GENERATOR WATER LEVEL LOW-LOW							
25	BS-517B	31	TB 1-9&10	BS-519B	8		
26	BS-518B	11	TB 1-3&4	BS-519B	8		
27	BS-519B	8	TB 2-5&6	BS-517B	31		
28	BS-527B	31	TB 2-3&4	BS-529B	4		
29	BS-528B	11	TB 1-11&12	BS-529B	4		
30	BS-529B	4	TB 1-3&4	BS-527B	31		
31	BS-537B	31	TB 2-9&10	BS-539B	4		
32	BS-538B	11	TB 2-7&8	BS-539B	4		
33	BS-539B	4	TB 1-7&8	BS-537B	31		
34	BS-547B	31	TB 3-3&4	BS-549B	8		
35	BS-548B	11	TB 3-3&4	BS-549B	8		
36	BS-549B	8	TB 2-9&10	BS-547B	31		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC - Rx Trip, Train A

TABLE II

STEP	BISTABLE UNDER TEST	RACK	TERMINALS HAGAN RACK	COINCIDENT CHANNEL	RACK	TIME RESPONSE	
						UV COIL	K634
25A	BS-517B	31	TB 1-9&10	BS-519B	8		
				BS-549B	8		
				BS-548B	11		
26A	BS-518B	11	TB 1-3&4	BS-519B	8		
				BS-549B	8		
				BS-548B	11		
[illegible]A	BS-519B	8	TB 2-5&6	BS-517B	31		
				BS-549B	8		
				BS-548B	11		
28A	BS-527B	31	TB 2-3&4	BS-529B	4		
				BS-549B	8		
				BS-548B	11		
29A	BS-528B	11	TB 1-11&12	BS-529B	4		
				BS-549B	8		
				BS-548B	11		
30A	BS-529B	4	TB 1-3&4	BS-527B	31		
				BS-549B	8		
				BS-548B	11		
31A	BS-537B	31	TB 2-9&10	BS-539B	4		
				BS-549B	8		
				BS-548B	11		
32A	BS-538B	11	TB 2-7&8	BS-539B	4		
				BS-549B	8		
				BS-548B	11		
33A	BS-539B	4	TB 1-7&8	BS-537B	31		
				BS-549B	8		
				BS-548B	11		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

TABLE II

STEP	BISTABLE UNDER TEST	RACK	TERMINALS HAGAN RACK	COINCIDENT CHANNEL	RACK	TIME RESPONSE	
						UV COIL	K634
STEAM GENERATOR WATER LEVEL LOW-LOW AND START MOTOR DRIVEN AUX F.W. PUMP							
34A	BS-547B	31	TB 3-3&4	BS-549B	8		
				BS-529B	4		
				BS-528B	11		
35A	BS-548B	11	TB 3-3&4	BS-549B	8		
				BS-529B	4		
				BS-528B	11		
36A	BS-549B	8	TB 2-9&10	BS-547B	31		
				BS-529B	4		
				BS-528B	11		
RC LOSS OF FLOW SINGLE LOOP (ABOVE P8)							
37	BS-414	3	TB 2-7&8	BS-416	12		
38	BS-415	7	TB 2-7&8	BS-416	12		
39	BS-416	12	TB 2-3&4	BS-414	3		
40	BS-424	3	TB 2-11&12	BS-426	12		
41	BS-425	7	TB 2-11&12	BS-426	12		
42	BS-426	12	TB 2-7&8	BS-424	3		
43	BS-434	3	TB 3-3&4	BS-436	12		
44	BS-435	7	TB 3-3&4	BS-436	12		
45	BS-436	12	TB 2-11&12	BS-434	3		
46	BS-444	3	TB 3-7&8	BS-446	12		
47	BS-445	7	TB 3-7&8	BS-446	12		
	BS-446	12	TB 3-3&4	BS-444	3		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

TABLE III

STEP	CHANNEL UNDER TEST	SSPS INPUT TERMINALS	SSPS INPUT TERMINALS	COINCIDENT CHANNEL	TIME RESPONSE	
					UV COIL	K632
RCP UNDERVOLTAGE (ABOVE P7)						
37	Bus H	TB 109-5	TB 109-6	Channel 3 (F)		
38	Bus E	TB 209-5	TB 209-6	Channel 3 (F)		
39	Bus F	TB 308-5	TB 308-6	Channel 1 (H)		
40	Bus G	TB 407-5	TB 407-6	Channel 1 (H)		
RCP UNDER FREQUENCY (ABOVE P7)						
41	Bus H	TB 108-9	TB 108-10	Channel 3 (F)		
42	Bus E	TB 208-9	TB 208-10	Channel 3 (F)		
43	Bus F	TB 307-9	TB 307-10	Channel 1 (H)		
44	Bus G	TB 409-1	TB 409-2	Channel 1 (H)		
POWER RANGE LOW FLUX LEVEL TRIP						
45	N41	TB 102-7	TB 102-8	N42		
46	N42	TB 202-7	TB 202-8	N41		
47	N43	TB 301-7	TB 301-8	N41		
48	N44	TB 401-7	TB 401-8	N41		
POWER RANGE HIGH FLUX LEVEL TRIP						
49	N41	TB 102-9	TB 102-10	N42		
50	N42	TB 202-9	TB 202-10	N41		
51	N43	TB 301-9	TB 301-10	N41		
52	N44	TB 401-9	TB 401-10	N41		

TITLE RESPONSE TIME TEST OF SOLID STATE PROTECTION SYSTEM LOGIC – Rx Trip, Train A

TABLE III

STEP	CHANNEL UNDER TEST	SSPS INPUT TERMINALS	SSPS INPUT TERMINALS	COINCIDENT CHANNEL	TIME RESPONSE	
					UV COIL	
POWER RANGE NEGATIVE RATE TRIP						
53	N41	TB 106-7	TB 106-8	N42		
54	N42	TB 207-1	TB 207-2	N41		
55	N43	TB 304-11	TB 304-12	N41		
56	N44	TB 405-9	TB 405-10	N41		
TURBINE AUTO STOP OIL PRESSURE SWITCHES						
57	1	TB 109-1	TB 109-2	2		
58	2	TB 209-1	TB 209-2	3		
59	3	TB 308-1	TB 308-2	1		
TURBINE STEAM STOP VALVES						
60	1	TB 109-3	TB 109-4	2, 3, 4		
61	2	TB 209-3	TB 209-4	1, 3, 4		
62	3	TB 308-3	TB 308-4	1, 2, 4		
63	4	TB 407-3	TB 407-4	1, 2, 3		