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OPPD
Omaha Public Power District

444 South 16th Street Mall
Omaha NE 68102-2247

April 15, 2002
LIC-02-0048

U. S. Nuclear Regulatory Commission
ATTN.: Document Control Desk
Washington, DC 20555

References:
1. Docket No. 50-285
2. Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk) dated April 1, 2002, "Fort Calhoun Station Unit No. 1 License Amendment Request, "Allowance to Perform Recirculation Actuation Logic Channel Functional Test"" (LIC-02-0040)
3. Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk) dated April 10, 2002, "Revision to Fort Calhoun Station Unit No. 1 License Amendment Request, "Allowance to Perform Recirculation Actuation Logic Channel Functional Test,"" (LIC-02-0044)

SUBJECT: Supplemental Information Supporting the License Amendment Request, "Allowance to Perform Recirculation Actuation Logic Channel Functional Test"

In Reference 3, Omaha Public Power District (OPPD) submitted an Application for Amendment of Facility Operating License to revise the Fort Calhoun Station (FCS) Unit No. 1 Technical Specifications (TS). This letter provides additional information supporting that request in response to a telephone discussion with Mr. A. B. Wang (NRC Project Manager) on April 10, 2002. This letter provides the proposed procedure and a description of testing required for Technical Specification surveillance of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test).

In previous performances of this testing as discussed in References 2 and 3, in the event of a safeguards initiation during testing, the dedicated operators were required to reset three lockout relays and open the recirculation minimum flow valve. This function was performed using Attachment 4 of either OP-ST-ESF-0009 or OP-ST-ESF-0010. The change to the above Engineered Safety Features (ESF) tests involves using an additional dedicated operator to maintain the recirculation minimum flow valve in the open position during testing of the Recirculation Actuation Signal (RAS) function. Instead of requiring restorative actions, per Attachment 4 to the procedure, to open the minimum recirculation flow path, the recirculation flow path is open during the testing assuring the availability of the Emergency Core Cooling

A001

System (ECCS) pumps. Should a RAS occur during any accident, the signal from the train not being tested will initiate closure of the other recirculation valve and thus perform the necessary safety function. Failure to perform the actions of Attachment 4 (primarily step 1), should an ESF actuation occur, would only result in the unnecessary continued opening of the recirculation and pump suction valves, preventing damage to the high and low pressure safety injection pumps if a pump dead head condition is present. Failure to perform the steps of Attachment 4 of OP-ST-ESF-0009/0010 would not have an adverse impact on the safety of the plant or prevent a critical safety function from occurring.

The recirculation minimum flow valves are two valves, in series, designed to allow the ECCS pumps to take suction from the Safety Injection Refueling Water Tank (SIRWT) and discharge back to the SIRWT if the Reactor Coolant System (RCS) pressure is above the shutoff head of any of the pumps.

Attached please find: 1) a draft copy of one of the two surveillance tests (Note that the other test is an identical procedure which tests the opposite safeguards train), 2) a description of the portion of the proposed test, 3) a picture of the control panel referenced in the description, 4) a description of the restoration action of the procedures (Attachment 4 of either OP-ST-ESF-0009 or 0010), and 5) a description of the simulator demonstration performed on the proposed surveillance test procedure. These attachments are provided for background and informational purposes only.

The information presented here in conjunction with the other correspondence (Reference 3) concludes that the proposed testing will not impact the health and safety of the public or plant safety.

I declare under penalty of perjury that the forgoing is true and correct. (Executed on April 15, 2002.)

If you have any questions or require additional information, please contact Dr. Richard Jaworski, at (402) 533-6833.

Sincerely,

R. T. Ridenoure
Division Manager
Nuclear Operations

RTR/EPM/rlj

Attachment 1. Draft Copy of Procedure OP-ST-ESF-0010
Attachment 2. Description of Recirculation Actuation Logic Channel Functional Test
Attachment 3. Photograph of Control Panels Referenced in Attachment 2
Attachment 4. Recirculation Actuation Signal (RAS) Restoration Attachment 4 to Either Procedure OP-ST-ESF-0009 or 0010
Attachment 5. Simulator Demonstration of the Proposed Test

c: E. W. Merschoff, NRC Regional Administrator, Region IV
A. B. Wang, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector
Division Administrator, Public Health Assurance, State of Nebraska
Winston & Straw

Attachment 1
Draft Copy of Procedure OP-ST-ESF-0010

Fort Calhoun Station
Unit No. 1

OP-ST-ESF-0010

SURVEILLANCE TEST

Title: CHANNEL B SAFETY INJECTION, CONTAINMENT SPRAY AND RECIRCULATION ACTUATION SIGNAL TEST

FC-68 Number: EC 29746

Reason for Change: Revision to FCS License Amendment request LIC-02-0044.

Requestor: N/A

Preparer: Stan Heyden

CHANNEL B SAFETY INJECTION, CONTAINMENT SPRAY AND RECIRCULATION ACTUATION SIGNAL TEST

SAFETY RELATED

1. PURPOSE

To satisfy, quarterly, the requirements of Technical Specification 3.1, Table 3-2, Item 3(a), 5(a) and 20(a) for Safety Injection (SIAS), Containment Spray (CSAS) and Recirculation (RAS) Actuation Testing.

2. REFERENCES/COMMITMENT DOCUMENTS

2.1 Technical Specifications:

- 2.3(2)i: Emergency Core Cooling System
- 2.7(2)j: Electrical Systems LCOs, Diesel Generators
- 2.15: Instrument and Control Systems LCO, Instrumentation and Controls
- 3.1, Table 3-2: Minimum Frequencies for Checks, Calibrations and Testing of Engineered Safety Features, Instrumentation and Controls
- 3.6.1: Safety Injection and Containment Cooling Systems Tests, Safety Injection System

2.2 USAR: Section 7.3; Engineered Safeguard Controls

2.3 Standing Orders:

- SO-G-23, Surveillance Test Program
- SO-O-30, Testing of Safety Related Equipment

2.4 Commitment Documents:

- AR 04959, LIC-87-0078
- AR 12818, LIC 92-0192
- AR 06564, IER 88-03
- AR 12050, LIC-91-0105
- LIC-91-0105

2.5 Condition Reports:

- CR 199601453
- CR 200200632

2.6

Drawing	File	Description
161F597, Sh 11	09801	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 12	09802	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 13	09803	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 14	09804	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 15	09805	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 16	09806	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 17	09807	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 18	09808	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F597, Sh 20	09810	Sequencer Safety and Test B, Panel AI-30B, Elementary Diagram
161F615, Sh 1	09841	Initiation Matrices A and B Schematic, SIRWT LO Level Containment High Pressure 2/4 matrices
161F615, Sh 2	45048	Initiation Matrices A and B Schematic, SIRWT LO Level Containment High Pressure 2/4 matrices

3. DEFINITIONS

None

4. TOOLS AND EQUIPMENT

4.1 Test Equipment Required/Used:

NOTE: During the course of this procedure, some portable or temporary test equipment may be used to prove operability of a plant component. All such equipment must be entered into the appropriate I&C Instrument Log.

EQUIPMENT	CALIBRATION OPPD NO./DUE DATE	INITIALS/DATE
Fluke 8060A Multimeter	_____/_____	_____/_____
_____	_____/_____	_____/_____

5. PRECAUTIONS AND LIMITATIONS

5.1 All anomalies and deficiencies shall be reported immediately to the immediate Supervisor and the Shift Manager, and noted on the Comment Sheet. An immediate check shall be made to verify Limiting Conditions for Operation, per Technical Specifications, have not been exceeded.

5.2 The System Engineer shall be notified within 24 hours of the completion of this test, of any marginal, unexpected or unacceptable results.

5.3 The component shall be left in the position desired and the new position recorded on the Comment Sheet, if the Shift Manager or plant conditions dictate that a component be returned to a position other than specified,.

5.4 Lockout relays shall not be reset until each initiating signal has been cleared.

5.5 Each switch lineup and step in this procedure shall be followed sequentially, unless otherwise noted.

5.6 Damage can result if any LPSI pump starts and operates for more than 30 minutes or HPSI pump starts and operates for more than three minutes in a no flow condition.

5.7 During the performance of this procedure line-ups will be established which will render portions of the Engineered Safety Features (ESF) System incapable of performing their design functions. Dedicated Operators will be required to be stationed to take appropriate action to restore the ESF system to an operable condition per Tech Spec 2.3(2)i.

5.8 During the performance of this procedure, lineups will be established which render Channel B ESF prime initiation and CIAS relays inoperable and require entry into TS 2.15(3). Performance of this procedure should proceed at a pace to minimize the necessity of taking actions to place the plant in Hot Shutdown (CR 199601453).

5.9 Prior to performance of this procedure, necessary repair parts, maintenance work documents and support personnel shall be available to allow prompt repairs, if required, to a prime initiation relay.

5.10 The following annunciators may alarm during this Surveillance Test:

- **PPLS A BLOCK** (CB-1,2,3, A4, E5)
- **WASTE DISPOSAL SYSTEM MALFUNCTION** (CB-10,11, A21, C-7L)
- **RM-065 CONTROL ROOM IODINE LOSS OF CONTROL POWER** (AI-106A, A106A, C-1L)
- **VA-46B CONTROL SWITCH OFF NORM (AI-106B, A106B, C-2U)**
- **CONTROL ROOM A/C SYSTEM VIAS LOCKED IN** (AI-106B, A106B, C-3L)
- **ON AUTO** (AI-43B, A41, A-1) (Not lit during test)
- **AI-43B TEST SWITCH OPERATED** (AI-43B, A41, A-5)
- **KEY REMOVED** (AI-30A, A30, E-5)
- **KEY REMOVED** (AI-30A, A33-1, A-7)
- **PANEL TROUBLE** (AI-30B, A36, B-3)
- **BUS 1B4A SAFEGUARD(S) OFF SEQUENCER** (AI-30B, A36, A-1)
- **BUS 1A4 SAFEGUARD(S) OFF SEQUENCER** (AI-30B, A36, A-2)
- **SEQUENCER AUTO START DEMAND** (AI-30B, A36, A-5)
- **SEQUENCER AUTO STANDBY** (AI-30B, A36, A-6)
- **BUS 1B4C SAFEGUARD(S) OFF SEQUENCER** (AI-30B, A36, B-1)
- **KEY REMOVED** (AI-30B, A36, A-3)
- **BUS 1B4B SAFEGUARD(S) OFF SEQUENCER** (AI-30B, A36, B-2)
- **TESTING** (AI-30B, A36, B-4)
- **KEY REMOVED** (AI-30B, A34-1, A-1)
- **KEY REMOVED** (AI-30A, A31, A-4)
- **COMPUTER STANDBY TEST** (AI-30B, A36, C-5)
- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30A, A33-1, H-5)
- **TESTING** (AI-30B, A34-1, A-2)
- **STLS-B SAFEGUARDS SIGNAL** (AI-30B, A34-1, B-5)
- **CPHS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-6)
- **PPLS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-7)
- **VENTILATION ISOLATION COMMAND**(AI-30B, A34-1, C-2)
- **CONTAINMENT ISOLATION COMMAND** (AI-30B, A34-1, C-3)
- **CONTAINMENT SPRAY COMMAND** (AI-30B, A34-1, C-4)
- **SAFETY INJECTION RECIRCULATION COMMAND** (AI-30B, A34-1, C-5)
- **SAFETY INJECTION COMMAND** (AI-30B, A34-1, C-6)
- **LPSI PUMP SI-1B OFF NORMAL** (AI-30B, A34-1, D-7)
- **SIRWT HDR #2 RECIRC VALVES OFF NORMAL** (AI-30B, A34-1, G-6)
- **LOAD SHED OFF NORMAL** (AI-30B, A34-1, H-1)
- **SPRAY VALVE HCV-345 HEADER ISOLATED** (AI-30B, A34-1, H-2)
- **TESTING 86B / CSAS** (AI-30B, A34-1, J-1)
- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30B, A34-1, H-3)
- **SWITCH NOT IN AUTO**, at D-2 Engine Control Panel
- **DIESEL ROOM CONTROL** (AI-30B, A37, A-3)
- **DIESEL AUTO START DEMAND** (AI-30B, A37, A-4)
- **DIESEL AUTO STANDBY** (AI-30B, A37, A-5) (Not lit during test)
- **DIESEL OFF AUTO** (AI-30B, A37, B-2)

5.10 (continued)

- **LOCAL ALARM ACTIVATED** (AI-30B, A37, C-4)
- **BKR OFF AUTO** (AI-30B, A37, D-2)
- **BKR PROTECTION OVERRIDE** (AI-30B, A37, D-3)
- **PANEL TROUBLE** (AI-30B, A37, E-2)

6. PREREQUISITES — INITIALS/DATE

6.1 Procedure Revision Verification:

Revision No._____ _____/_____

6.2 Calibration of test equipment has been verified. _____/_____

6.3 A Lead Person qualified to a minimum of Electrician category E08C is available for the performance of this test. _____/_____
EM Supv/Crew Leader

6.4 A prejob briefing has been conducted prior to the start of this test. _____/_____

6.5 All personnel initially participating in the performance of this test have completed the Surveillance Test Signature Sheet. _____/_____

6.6 No other test is in progress which could potentially affect this test, or if this test were performed, could have an effect on that test. _____/_____

NOTE: Dedicated Operators will be required at the following locations per Tech Spec 2.3(2)i:

- AI-30B for RAS testing only
- LCV-383-1 for RAS testing only
- HCV-385 for RAS testing only

6.7 The Dedicated Operators for LCV-383-1 and HCV-385 have been briefed on actions required to maintain SIRWT suction and recirc alignment for the HPSI/LPSI/CS pumps during RAS testing. _____/_____

NOTE: The operator performing this test may double as the Dedicated Operator for AI-30B.

6.8 The Dedicated Operator for AI-30B has been briefed on actions required to align minimum Recirculation to the SIRWT if an ESF actuation occurs during RAS testing. _____/_____

NOTE: Steps 6.9 and 6.10 may be N/A'd if the RCS is less than 300°F.

6.9 OP-ST-DG-0001 or OP-ST-ESF-0001, Diesel Generator Check for DG-1, has been successfully performed within the previous seven (7) days. _____/_____

6.10 All required Engineered Safeguards components associated with DG-1, are operable **[AR 04959]**. _____/_____
Shift Mgr

6.11 All SI Tanks and BOTH SDC Heat Exchangers are operable. _____/_____
Shift Mgr

6.12 Lockout relays are reset and power is available to the alarms for the following panels: (✓)

- AI-30A ___
- AI-30B ___
- AI-43A ___
- AI-43B ___ _____/_____

6.13 Containment Purge System, CPR, or other gaseous waste release is not in operation. _____/_____

6.14 ERF Computer is operable per OI-ERFCS-1, Emergency Response Facilities Computer System Normal Operation. _____/_____

NOTE: The most recently completed Checklist, OI-ES-1-CL-A, with deviations maintained on file, may be used for alignment verification.

NOTE: The Shift Manager may deviate from the normal OI-ES-1-CL-A if the equipment that is not aligned per OI-ES-1-CL-A is not required for the test.

6.15 IF RCS Pressure is greater than 600 psia AND a Pressurizer Steam Bubble exits, THEN all Engineered Safeguards panels and equipment are aligned per OI-ES-1-CL-A, Engineered Safeguard Controls.

_____/_____

6.16 IF the 480 volt buses are not in their normal alignment, per OI-EE-2-CL-A (Reference P&ID Figure 8.1-1), THEN consult OI-EE-2B to ensure that any loads to be started by this test, will not exceed a breaker trip setpoint. **[AR 12818]**.

_____/_____
Shift Mgr

6.17 Necessary repair parts, maintenance work documents and support personnel are available to allow prompt repairs, if required, to a prime initiation relay.

_____/_____
EM Supv/Crew Leader

6.18 Shift Manager authorizes performance of this test:

Shift Manager_____Date/Time_____/_____

NOTE: Performance of this test will render portions of the ESC system inoperable.

NOTE: Technical Specification 2.15 Table 2-4, permissible bypass condition for Containment High Radiation Signal is met if Containment Relief and Purge Valves are closed.

6.19 IF Electricians have installed a block on 86B/PPLS at the lockout relay, THEN:

6.19.1 Ensure **PPLS A BLOCK** (CB-1,2,3, A4, E6) is in alarm. _____/_____

6.19.2 Remove the block at 86B/PPLS. _____/_____
EM

_____/_____
Ind Verif

6.20 Based on current plant conditions, log entry into the following Tech Spec LCOs in the Control Room Log:

Tech Spec	Component	(✓)
• 2.7(2)j	DG-2	___
• 2.15(1)	86B1 Relays	___
• 2.15(3)	86B Prime Initiation Relays	___
• 2.15(3), 2.1.4	RM-051 and/or RM-052 (Cntmt)	___
• 2.4(2)	HCV-345	___
• 2.15(3)	B Channel CIAS Relays	___

_____/_____
CRS

7. PROCEDURE

(✓) INITIALS

7.1 SIAS Test Using 86B/PPLS Test Switch or 86B/CPHS Test Switch.

7.1.1 Circle the Test Switch to be used for this portion of this Test:

- 86B/PPLS
- 86B/CPHS

_____
CRS

7.1.2 Place the thermal overload bypass switches for the following valves in the desired position.

Lock No.	Description	Desired Position
	MCC-4C1	
• 3095	HCV-312	TEST
• 12	HCV-333	TEST
• 19	HCV-321	TEST
	MCC-4A1	
• 12	HCV-315	TEST
• 01	HCV-318	TEST
• 03	HCV-329	TEST

_____

PROCEDURE (✓) INITIALS

7.1.3 Ensure the control switches for the following valves are in AUTO and the valves are closed:

- HCV-315 ___
- HCV-318 ___
- HCV-312 ___
- HCV-321 ___
- HCV-329 ___
- HCV-333 ___ _____

CAUTION
Turn the switch firmly until the Endstop is reached for proper positioning **[AR 12050]**.

7.1.4 Place CS-B1/SP-B, Derived Signal Cutoff Switch in OFF (AI-30B). _____

7.1.5 Verify amber lights on the following derived relays are off (AI-30A):

- 86B1/CRHS ___
- 86B1/STLS ___
- 86B1/CPHS ___
- 86B1/PPLS ___ _____

7.1.6 Place CHAN "B" 480V LOAD SHED Switch in OFF and verify amber light goes off (AI-30B). _____

NOTE: B Channel CIAS is considered inoperable with HC-AI-43B, Isolation Valves CIAS Override SW in TEST.

NOTE: Key for HC-AI-43B located in Control Room Key Locker.

CAUTION
Annunciator indication occurs prior to the proper positioning of the CIAS Override Switch. Turn the switch firmly until the Endstop is reached for proper positioning **[AR 12050]**.

7.1.7 Place HC-AI-43B, Isolation Valves CIAS Override SW in TEST (AI-43B) **[AR 06564]**. _____

PROCEDURE (✓) INITIALS

7.1.8 Place the following Containment Spray Valves Test Switches in TEST, and verify each white light comes on:

- HC-344/TEST (AI-30A) ___
- HC-345/TEST (AI-30B) ___ _____

7.1.9 Verify that the following annunciators are in alarm:

- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30A, A-33-1, H-5) ___
- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30B, A-34-1, H-3) ___ _____

7.1.10 Place HC-345, Containment Spray Valve HCV-345 Control Switch in OVERRIDE (AI-30B). _____

7.1.11 Verify SPRAY VALVE HCV-345 HEADER ISOLATED (AI-30B, A34-1, H-2) annunciator is in. _____

7.1.12 Ensure 43-1/S2-1, DC Sequencer S2-1 Mode Selector Switch in EMERGENCY STANDBY (S2-1). _____

7.1.13 Place each S2-1 Sequencer Isolation Switch in Attachment 1, Sections I and II, in OFF and verify each off auto light comes on. _____

7.1.14 Place (D-2) Eng./Gen. Selector Switch 143/SS in LOCAL (D-2 Engine Control Panel). _____

7.1.15 Stop Containment Air Particulate Monitor RM-050/051 and/or RM-052 (Cntmt) Sample Pump per OI-RM-1, Radiation Monitoring - Normal and Accident Operation (AI-33A).

_____

CAUTION

The sample pump must be manually started in the event of an non-test VIAS signal if the Control Room Iodine Monitor Sample Pump Switch RM-065 is out of the AUTO mode.

7.1.16 Place Control Room Iodine Monitor RM-065, HC/RM-065, Sample Pump RE-065-PP in OFF (AI-106A). _____

PROCEDURE (✓) INITIALS

NOTE: Key for TEST Switch B/CSAS is in the key holder on panel AI-30A-S1-1.

7.1.17 Place Test Switch B/CSAS in TEST (S2-1). _____

7.1.18 Verify **TESTING 86-B/CSAS** (AI-30B, A34-1, J-1) is in alarm. _____

7.1.19 Verify the 86-B/CSAS lockout relay TRIPPED. _____

7.1.20 Verify the 86-B/VIAS lockout relay TRIPPED. _____

7.1.21 Place test switch B/CSAS in NORM (S2-1). _____

7.1.22 Reset lockout relay 86-B/CSAS (AI-30B). _____

7.1.23 Reset lockout relay 86-B/VIAS (AI-30B). _____

7.1.24 Verify **TESTING 86-B/CSAS** (AI-30B, A34-1, J-1) is clear. _____

7.1.25 Open HCV-746B, Containment Relief Valve (AI-44). _____

7.1.26 Open FCV-532C, Header Isolation Valve (AI-100). _____

7.1.27 Verify the following annunciators are clear:

- **PPLS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-7) ___
- **CPHS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-6) ___
- **SAFETY INJECTION COMMAND** (AI-30B, A34-1, C-6) ___
- **CONTAINMENT ISOLATION COMMAND** (AI-30B, A34-1, C-3) ___
- **VENTILATION ISOLATION COMMAND** (AI-30B, A34-1, C-2) ___ _____

7.1.28 Verify **SEQUENCER AUTO START DEMAND** (AI-30B, A-36, A-5) is clear (S2-1). _____

7.1.29 Verify the following annunciators are clear (D-2):

- **DIESEL AUTO START DEMAND** (AI-30B, A37, A-4) ___
- **BREAKER PROTECTION OVERRIDE** (AI-30B, A37, D-3) ___ _____

PROCEDURE (✓) INITIALS

NOTE: The Safety Actuation Matrix display is located on the bottom right portion of the ERF Computer CRT.

7.1.30 Verify the following indication is clear on the ERF Computer Safety Actuation Matrix Display:

- PPLS or CPHS ___
- SIAS ___
- CIAS ___
- VIAS ___
- DAS2 ___
- SS2 ___ _____

NOTE: The Diesel Sequencing Program will abort if the 86-1/S2-1 Lock Out Relay is not tripped within three (3) minutes after the Computer Standby S2-1/CPTR TEST is placed in TIMERS.

7.1.31 Place Computer Standby S2-1/CPTR in TIMERS (S2-1). _____

7.1.32 Verify **COMPUTER STANDBY TEST** (AI-30B, A36, C-5) is in alarm. _____

NOTE: During the performance of this procedure the LPSI loop injection valves under test will open. Operations may take manual control of SDC to reduce Shutdown Cooling transients.

NOTE: The Diesel Log will print-out automatically on the ERF Computer Master Hard Copy one (1) minute after receiving the 86-1/S2-1 trip signal.

7.1.33 Place test switch recorded in Step 7.1.1 to TEST, THEN release (AI-30B).

- 86B/PPLS Test Switch ___
- 86B/CPHS Test Switch ___ _____

7.1.34 Verify all required lockout relays TRIPPED, annunciators alarm, and ERF Computer Printout trips per Attachment 2. _____

7.1.35 Verify HCV-746B, Containment Relief Valve closed (AI-44). _____

PROCEDURE (✓) INITIALS

7.1.36 Verify FCV-532C, Header Isolation Valve closed (AI-100). _____

7.1.37 Verify the following parameters are in alarm on the ERF Computer Safety Actuation Matrix Display:

- PPLS or CPHS ___
- SIAS ___
- CIAS ___
- VIAS ___
- DAS2 ___
- SS2 ___ _____

7.1.38 Verify the following HPSI and LPSI Loop Isolation Valves are open (AI-30B):

- HCV-315 ___
- HCV-318 ___
- HCV-312 ___
- HCV-321 ___
- HCV-329 ___
- HCV-333 ___ _____

7.1.39 Verify the following Leakage Cooler Control Valves are closed (AI-30B):

- PCV-2929 ___
- PCV-2969 ___ _____

7.1.40 Verify the Channel B SIAS Load Shed Restart Permissive red light is on (AI-30B). _____

NOTE: Event times on the alarm typewriter are not accurate. Do not use the times to determine sequence timer times.

7.1.41 Verify Sequencer S2-1 Timer Operate lights are on, Timer Operate Signals are received (Computer) and timers TIMED-OUT within the setpoint range per Attachment 1, Section I.

_____

PROCEDURE (✓) INITIALS

7.2 CSAS Test using test switch B/CSAS.

7.2.1 Verify **CONTAINMENT SPRAY COMMAND** (AI-30B, A-34-1, C-4) is clear. _____

NOTE: The Safety Actuation Matrix display is located on the bottom right portion of the ERF Computer CRT.

7.2.2 Verify CSAS is clear on the ERF Computer Safety Actuation Matrix Display. _____

NOTE: Placing the Computer Standby S2-1/CPTR from TIMERS to OFF to TIMERS will reset the Diesel Sequencing Program. This program will abort if 86-B/CSAS is not tripped within one (1) minute after being reset.

7.2.3 Place Computer Standby S2-1/CPTR from TIMERS to OFF, then to TIMERS (S2-1). _____

NOTE: The Diesel Log will print-out automatically on the ERF Computer Master Hard Copy ninety (90) seconds after receiving the 86-B/CSAS trip signal.

7.2.4 Place Test Switch B/CSAS in TEST (S2-1). _____

7.2.5 Verify **TESTING 86B/CSAS** (AI-30B, A34-1, J-1) is in alarm. _____

7.2.6 Verify the following:

- 86-B/CSAS Relay TRIPPED ___
- Amber light for 86-B/CSAS off ___
- **CONTAINMENT SPRAY COMMAND** (AI-30B, A-34-1, C-4) is on ___
- ERF Computer Printout: tripped ___ _____

7.2.7 Verify CSAS is in alarm on the ERF Computer Safety Actuation Matrix Display. _____

PROCEDURE (✓) INITIALS

NOTE: Event times on the alarm typewriter are not accurate. Do not use the times to determine sequence timer times.

7.2.8 Verify Sequencer S2-1 Timer Operate lights are on, Timer Operate Signals are received (Computer) and timers TIMED-OUT within the setpoint range per Attachment 1, Section II. _____

7.2.9 Place test switch B/CSAS in NORM (S2-1). _____

7.2.10 Verify **TESTING 86B/CSAS** (AI-30B, A34-1, J-1) is clear. _____

7.2.11 Reset lockout relay 86-B/CSAS (AI-30B). _____

7.2.12 Verify 86-B/CSAS supervisory light is on. _____

7.2.13 Verify the following Sequence Timers are RESET by observing each Timer Operate light is off (S2-1):

- Containment Spray Pump SI-3B ___
- Containment Spray Pump SI-3C ___
- Containment Vent Fan VA-7C ___
- Containment Vent Fan VA-7D ___ _____

7.3 CSAS Test using Test Switch (86B/PPLS Test Switch or 86B/CPHS Test Switch) not circled in Step 7.1.1.

7.3.1 Circle the test switch to be used for this portion of this test:

- 86B/PPLS Test Switch
- 86B/CPHS Test Switch _____

7.3.2 Verify the annunciator of test switch circled in Step 7.3.1 is clear.

- **PPLS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-7) ___
- **CPHS-B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-6) ___ _____

7.3.3 Verify **CONTAINMENT SPRAY COMMAND** (AI-30B, A-34-1, C-4) is clear. _____

PROCEDURE (✓) INITIALS

NOTE: The Safety Actuation Matrix display is located on the bottom right portion of the ERF Computer CRT.

7.3.4 Verify the following indication is clear on the ERF Computer Safety Actuation Matrix Display:

- PPLS or CPHS ___
- CSAS ___ _____

NOTE: Lockout relay 86-B/PPLS or 86-B/CPHS will remain tripped from Section 7.1 and 7.2, depending upon which test switch (Step 7.1.1) caused the appropriate lockout relay to trip.

7.3.5 Place test switch (86B/PPLS or 86B/CPHS) recorded in Step 7.3.1 to TEST, then release (AI-30B).

- 86B/PPLS Test Switch ___
- 86B/CPHS Test Switch ___ _____

7.3.6 Verify all required lockout relays TRIPPED, annunciators alarm, and ERF Computer Printout trips per Attachment 3. _____

7.3.7 Verify the following parameters are in alarm on the ERF Computer Safety Actuation Matrix Display:

- PPLS ___
- CPHS ___
- CSAS ___ _____

7.3.8 Reset lockout relay (86-B/PPLS or 86-B/CPHS) TRIPPED by test switch in Step 7.3.5 (AI-30B):

- 86-B/PPLS ___
- 86-B/CPHS ___ _____

7.3.9 Reset lockout relay 86-B/CSAS (AI-30B). _____

7.3.10 Verify 86-B/CSAS supervisory light is on. _____

7.3.11 Place HC-345, Containment Spray Valve HCV-345 Control Switch in AUTO (AI-30B). _____

PROCEDURE (✓) INITIALS

7.3.12 Verify SPRAY VALVE HCV-345 HEADER ISOLATED (AI-30B, A34-1, H-2) annunciator clears. _____

7.3.13 Exit LCO 2.4(2) for HCV-345. _____

7.4 RAS Test using test switch TS/STLS

NOTE: RAS testing renders the following ESF components inoperable:

- LPSI pumps SI-1A/B
- HPSI pumps SI-2A/B/C
- CS Pumps SI-3B/C
- HCV-344
- SIRWT Suction LCV-383-1
- CONT Suction HCV-383-4
- SIRWT Recirc HCV-385

NOTE: The operator performing RAS testing may double as the Dedicated Operator for Attachment 4 per Tech Spec 2.3(2)i.

7.4.1 Station a Dedicated Operator at AI-30B with instructions to immediately perform Attachment 4 if an ESF actuation occurs during RAS testing:

Dedicated Operator_____ _____
CRS

7.4.2 Verify the following are clear (AI-30B):

- **TESTING** (AI-30B, A34-1, A-2) ___
- **STLS B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-5) ___
- **SAFETY INJECTION RECIRCULATION COMMAND** (AI-30B, A34-1, C-5) ___ _____

7.4.3 Verify the following ERF computer CRT displays are clear:

- STLS ___
- RAS ___ _____

7.4.4 Ensure HCV-385, SIRWT Recirc Isol Valve is open (AI-30B). _____

PROCEDURE (✓) INITIALS

7.4.5 Place HCV-383-4, SIRWT Hdr No. 2 Cntmt Suction Valve in PULL-TO-OVERRIDE (AI-30B). _____

7.4.6 Verify **SIRWT HDR #2 RECIRC VALVES OFF NORMAL** (AI-30B, A34-1, G-6) is in alarm. _____

NOTE: This step renders the following ESF components inoperable:

- LPSI pumps SI-1A/B
- HPSI pumps SI-2A/B/C
- CS Pumps SI-3B/C
- HCV-344
- SIRWT Suction LCV-383-1
- CONT Suction HCV-383-4
- SIRWT Recirc HCV-385

7.4.7 Log into Tech Spec 2.3(2)i 1 hour LCO for inoperability of the applicable components listed above. _____

7.4.8 Log into Tech Spec 2.4(2)a and 2.4(2)d 24 hour LCOs for SI-3B/C and HCV-344 inoperability. _____

7.4.9 Override and close HCV-344. _____

7.4.10 Verify **SPRAY VALVE HCV-344 HEADER ISOLATED** (AI-30A, A33-1, H-6) annunciator is in. _____

NOTE: This step opens Shutdown Cooling Heat Exch valves HCV-480 and HCV-485 (CCW).

NOTE: Test switch 86B/STLS must be held in TEST until the annunciator alarm for testing is received (AI-30B, A-34-1, A-2).

7.4.11 Station a Dedicated Operator at LCV-383-1, SIRWT Hdr No. 2 SIRWT Suction Valve Control Switch with direction to maintain LCV-383-1 control switch in open until directed by test Coordinator to release (AI-30B) (Ref Step 7.4.19).

Dedicated Operator_____ _____
CRS

PROCEDURE (✓) INITIALS

7.4.12 Station a Dedicated Operator at HCV-385, SIRWT Recirc Isol Valve with direction to maintain HCV-385 control switch in open until directed by test Coordinator to release (AI-30B) (Ref Step 7.4.20).

Dedicated Operator_____ _____
CRS

7.4.13 Place 86B/STLS Test Switch to TEST and verify **TESTING** (AI-30B, A34-1, A-2) in alarm, then release. _____

7.4.14 Verify the following RAS indications (AI-30B):

Relay	Position	Indicating Light		
• 86-B/STLS	TRIPPED	off	___	
• 86-B/RAS	TRIPPED	off	___	
• 86-BX/RAS	TRIPPED	N/A	___	_____

7.4.15 Verify the following are in alarm:

- **STLS B SAFEGUARD SIGNAL** (AI-30B, A34-1, B-5) ___
- **SAFETY INJECTION RECIRCULATION COMMAND** (AI-30B, A34-1, C-5) ___ _____

7.4.16 Verify the following ERF Computer Points printout:

- 86-B/STLS tripped ___
- 86-B/RAS tripped ___ _____

7.4.17 Verify the following ERF computer CRT displays are in alarm:

- STLS
- RAS

___
___ _____

PROCEDURE (✓) INITIALS

7.4.18 Sequentially reset the following lockout relays (AI-30B):

Relay	Supv Light	(✓)	INITIALS
• 86-B/STLS	on	___	
• 86-B/RAS	on	___	
• 86-BX/RAS	none	___	_____

7.4.19 Direct Dedicated Operator assigned to LCV-383-1 to release the control switch and ensure red light remains on (AI-30B). _____

7.4.20 Direct Dedicated Operator assigned to HCV-385 to release the control switch and ensure red light remains on (AI-30B). _____

7.4.21 Notify Dedicated Operators assigned to LCV-383-1 and HCV-385 that RAS testing is complete and they are no longer required. _____

7.4.22 Place Control Switch HCV-383-4 SIRWT Hdr No. 2 Cntmt Suction Valve in AUTO, then ensure valve remains closed (AI-30B). _____

7.4.23 Verify **SIRWT HDR #2 RECIRC VALVES OFF NORMAL** (AI-30B, A34-1, G-6) is clear. _____

7.4.24 Place Control Switch HCV-480 in CLOSE, then release and verify valve is closed. _____

7.4.25 Place Control Switch HCV-481 in CLOSE, then release and verify HCV-485 is closed. _____

NOTE: This voltage measurement verifies that SI-1B Auto-Start via the Sequencers is enabled (86BX/RAS contact 10-10C closed after reset).

NOTE: Nominal voltage is 120 to 140 VDC.

7.4.26 Using Multimeter (DMM), measure and record the voltage on Terminal Board R between Terminal Points 39 and 40 on Panel AI-30B:

Voltage_____

_____
EM

PROCEDURE (✓) INITIALS

7.4.27 IF Terminal Board R voltage reading was outside the specified tolerances, THEN immediately notify the Shift Manager. _____

7.4.28 Notify the Dedicated Operator assigned to Attachment 4 that RAS testing is complete and he/she is no longer required (N/A if doubling as Dedicated Operator). _____

7.4.29 Return HCV-344 to NORMAL. _____

7.4.30 Verify **SPRAY VALVE HCV-344 HEADER ISOLATED** (AI-30A, A33-1, H-6) annunciator is clear. _____

7.4.31 Exit 24 hour LCOs for SI-3B/C and HCV-344. _____

7.4.32 Exit 1 hour LCO 2.3(2)i. _____

7.5 ESF System Return to NORMAL

7.5.1 Reset lockout relay (86-B/PPLS or 86-B/CPHS) not reset in Step 7.3.8 (AI-30B).

- 86-B/PPLS
- 86-B/CPHS _____

7.5.2 Sequentially reset the following lockout relays:

• 86-B/SIAS	AI-30B	___	
• 86-BX/SIAS	AI-30B	___	
• 86-B/CIAS	AI-30B	___	
• 86-B/VIAS	AI-30B	___	
• 86-1/S2-1	S2-1	___	
• 86-2/S2-1	S2-1	___	
• 86-B/D2	D-2	___	
• 86B-OR/1AD2	D-2	___	_____

PROCEDURE (✓) INITIALS

7.5.3 Place the following HPSI and LPSI Loop Isolation valves in the required position (AI-30B):

Valve	HC	Valve		
• HCV-312	AUTO	CLOSE	___	
• HCV-315	AUTO	CLOSE	___	
• HCV-318	AUTO	CLOSE	___	
• HCV-321	AUTO	CLOSE	___	
• HCV-329	AUTO	CLOSE	___	
• HCV-333	AUTO	CLOSE	___	_____

7.5.4 Place DG-2 Engine Control Switch 143/SS in EMERG (DG-2 Engine Control Panel). _____

CAUTION

Annunciator Indication occurs prior to the proper positioning of the CIAS Override Switch. Turn the switch firmly until the endstop is reached for proper positioning **[AR 12050]**.

7.5.5 Place HC-AI-43B, Isolation Valves CIAS Override Switch in NORMAL (AI-43B). _____

7.5.6 Place S2-1/CPTR, Computer Standby, in OFF (AI-30B). _____

7.5.7 Verify **COMPUTER STANDBY TEST** (AI-30B, A36, C-5) is clear. _____

NOTE: On auto lights will not come on when equipment is in PULL-OUT. Note any equipment in PULL-OUT on the attachments and N/A the on auto light requirement.

7.5.8 Place each S2-1 Sequencer Isolation Switch in Attachment 1, Sections I and II, in ON and verify each Timer Operate light is off and each on auto light comes on. _____

7.5.9 Place HC-345/TEST, Containment Spray Valve HCV-345 Test Switch in OFF (AI-30B). _____

7.5.10 Place HC-344/TEST, Containment Spray Valve HCV-344 Test Switch in OFF (AI-30A). _____

PROCEDURE (✓) INITIALS

7.5.11 Verify that the following annunciators are clear:

- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30A, A33-1, H-5) ___
- **HCV-344/345 SET SPRAY PUMPS TEST PERMIT** (AI-30B, A34-1, H-3) ___ _____

CAUTION
Do not go past the EMERG. STDBY position to prevent a possible 480V Load Shed from occurring when the Channel B 480V Load Shed Switch is to be placed in EMERG. STDBY.

7.5.12 Place CHAN "B" 480V LOAD SHED Switch in EMERG STDBY (AI-30B). _____

7.5.13 IF block was removed from 86B/PPLS in Step 6.19, THEN reinstall block. _____
EM
_____
Ind Verif

CAUTION
Turn the switch firmly until the endstop is reached for proper positioning **[AR 12050]**.

7.5.14 Place CS-B1/SP-B, Derived Signal Cutoff Switch in EMERGENCY STANDBY (AI-30B). _____

7.5.15 Verify amber lights on the following derived relays are on (AI-30A):

- 86B1/CRHS ___
- 86B1/STLS ___
- 86B1/CPHS ___
- 86B1/PPLS ___ _____

PROCEDURE (✓) INITIALS

7.5.16 Verify the amber light is on for each valve. Notify the CRS if light is off.

Valve	Light On
• HCV-315	_____
• HCV-318	_____
• HCV-312	_____
• HCV-321	_____
• HCV-329	_____
• HCV-333	_____

_____

7.5.17 IF the amber light is off, THEN momentarily place the control switch in OVERRIDE position to reset the auto circuitry: (N/A if the Control Switch is in MANUAL)

- PCV-2929 ___
- PCV-2969 ___ _____

7.5.18 Place HC/RM-065, Sample Pump RE-065-PP in AUTO. _____

7.5.19 Depress 94B/VIAS-RESET pushbutton (AI-106B). _____

7.5.20 IF both Control Room Air Conditioners are running, THEN secure VA-46B per OI-VA-3. _____

7.5.21 IF applicable, THEN record Control Room Charcoal Filter VA-64B run time on OP-ST-SHIFT-0001. _____

7.5.22 Open Rad Monitor Sample Inlet Valves and ensure Outlet Valves are open:

- PCV-742E ___
- PCV-742G ___
- PCV-742F ___
- PCV-742H ___ _____

7.5.23 Place RM-050/051 and/or RM-052 (Cntmt)Sample Pump in service per OI-RM-1. _____

PROCEDURE (✓) INITIALS

7.5.24 Based on current plant conditions, log exit from the following Tech Spec LCOs in the Control Room Log:

Tech Spec	Component		
• 2.7(2)j	DG-2	___	
• 2.15(1)	86B1 Relays	___	
• 2.15(3)	86B Prime Initiation Relays	___	
• 2.15(3), 2.1.4	RM-050/051 or RM-052	___	
• 2.15(3)	B Channel CIAS Relays	___	_____

7.5.25 Place the Thermal Overload Bypass Switches in NORMAL:

Valve	Location		
• HCV-312	MCC-4C1	___	
• HCV-333	MCC-4C1	___	
• HCV-321	MCC-4C1	___	
• HCV-315	MCC-4A1	___	
• HCV-318	MCC-4A1	___	
• HCV-329	MCC-4A1	___	_____

7.5.26 Attach the copy of the Diesel Sequencing Log to this Test. _____

Completed by_____Date/Time_____/_____

8. RESTORATION

8.1 If required, ensure all valves and thermal overload switches associated with this test have been returned to an automatic ECCS mode per OI-ES-1, Engineered Safeguard Controls Normal Operation. _____/_____

8.2 The Surveillance Test Signature Sheet has been completed. _____/_____

8.3 Shift Manager notified this test is completed:

Shift Manager_____Date/Time_____/_____

9. ACCEPTANCE CRITERIA

9.1 All lockout relays, sequencer timers, switches, valves and miscellaneous components with their associated indicating lights and annunciators have performed as required.

10. TEST RECORD

10.1 This entire procedure and attached Diesel Sequencing Log.

11. REVIEW

11.1 Test data shall be evaluated by the STA and reviewed by the Shift Manager for acceptability within 24 hours of the completion of this test.

Evaluated by_____ Date/Time _____/_____
STA

Reviewed by_____ Date/Time _____/_____
Shift Manager

11.2 The System Engineer is responsible for reviewing the test data, trending, and identified deficiencies noted within the test. This test has been reviewed and found acceptable or deficiencies and actions taken have been noted on the Comment Sheet.

System Engineer_____ Date/Time _____/_____
Signature

Attachment 1 - Section I, S2-1 Sequencer Isolation Switches and Timers with 86-1/S2-1 Tripped

ERF COMP. POINT	COMPONENT	SEQUENCE ISOL. SWITCH REQ. (✓)		OFF AUTO LIGHT REQ. (✓)		TIMER OPERATE LIGHT REQ. (✓)		TIMER OPER. SIG COMPUTER REQ. (✓)		COMPUTER ACTUATION SIGNAL TIME REQUIRED (SEC.)	ACTUAL TIME (SEC.)	TIMER OPERATE LIGHT REQ. (✓)		SEQUENCE ISOL. SWITCH REQ. (✓)		ON AUTO LIGHT REQ. (✓)	
D1052	AC-10D	OFF		ON		ON		YES		15.0 - 21.0 SEC		OFF		ON		ON	
D1053	AC-10B	OFF		ON		ON		YES		2.0 - 3.5 SEC		OFF		ON		ON	
D1082	FW-1O	OFF		ON		ON		YES		27.0 - 33.0 SEC		OFF		ON		ON	
D1056	SI-1B	OFF		ON		ON		YES		2.0 - 3.5 SEC		OFF		ON		ON	
D1046	SI-2C (1)	OFF		ON		ON		YES		7.5 - 11.0 SEC		OFF		ON		ON	
N/A	CA-1C	OFF		N/A													
D1051	AC-3B	OFF		ON		ON		YES		2.0 - 3.5 SEC		OFF		ON		ON	
D1045	CH-1C	OFF		ON		ON		YES		15.5 - 20.5 SEC		OFF		ON		ON	
N/A	CA-1B	OFF		N/A													
D1049	AC-3C (2)	OFF		ON		ON		YES		7.5 - 11.0 SEC		OFF		ON		ON	
D1054	VA-3B	OFF		ON		ON		YES		15.0 - 21.0 SEC		OFF		ON		ON	
D1044	SI-2B	OFF		ON		ON		YES		2.0 - 3.5 SEC		OFF		ON		ON	
D1043	CH-1B	OFF		ON		ON		YES		7.5 - 11.0 SEC		OFF		ON		ON	

(1) TIMER OPERATE light, ON AUTO light, and TIMER OPERATE SIGNAL to computer are operable only when 480V Breaker BT-1B4A is closed. Write N/A in check boxes if the breaker is not closed.

(2) TIMER OPERATE light, ON AUTO light, and TIMER OPERATE SIGNAL to computer are operable only when 480V Breaker BT-1B4C is closed. Write N/A in check boxes if the breaker is not closed.

Completed by_____ Date/Time_____/_____

Attachment 1 - Section II, S2-1 Sequencer Isolation Switches and Timers with 86-1/S2-1 and 86-B/CSAS Tripped

ERF COMP. POINT	COMPONENT	SEQUENCE ISOL. SWITCH REQ. (✓)		OFF AUTO LIGHT REQ. (✓)		TIMER OPERATE LIGHT REQ. (✓)		TIMER OPER. SIG COMPUTER REQ. (✓)		COMPUTER ACTUATION SIGNAL TIME REQUIRED (SEC.)	ACTUAL TIME (SEC.)	TIMER OPERATE LIGHT REQ. (✓)		SEQUENCE ISOL. SWITCH REQ. (✓)		ON AUTO LIGHT REQ. (✓)	
D1050	SI-3C	OFF		ON		ON		YES		35.0 - 39.0 SEC		OFF		ON		ON	
D1055	VA-7D	OFF		ON		ON		YES		44.0 - 50.0 SEC		OFF		ON		ON	
D1047	SI-3B	OFF		ON		ON		YES		26.5 - 30.5 SEC		OFF		ON		ON	
D1048	VA-7C (2)	OFF		ON		ON		YES		44.0 - 50.0 SEC		OFF		ON		ON	

(2) TIMER OPERATE light, ON AUTO light, and TIMER OPERATE SIGNAL to computer are operable only when 480V Breaker BT-1B4C is closed. Write N/A in check boxes if breaker is not closed.

Completed by_____ Date/Time_____/_____

Reviewed by _____
Shift Manager

Attachment 2 - Tripped Relays for 86-B/PPLS or 86-B/CPHS Trip

LOCKOUT RELAY	PANEL	RELAY TRIPPED		AMBER LIGHT		ANNUNCIATOR	ANNUN. ALARM		ERF COMP PRINTOUT TRIPPED	
		REQ.	(✓)	REQ.	(✓)		REQ.	(✓)	REQ.	(✓)
86-B/PPLS (1)	AI-30B	YES		OFF		**PPLS-B SAFEGUARD SIGNAL** (AI-30B, A-34-1, B-7)	ON		YES	
86-B/CPHS (1)	AI-30B	YES		OFF		**CPHS-B SAFEGUARD SIGNAL** (AI-30B, A-34-1, B-6)	ON		YES	
86-B/SIAS	AI-30B	YES		OFF		**SAFETY INJECTION COMMAND** (AI-30B, A-34-1, C-6)	ON		YES	
86-BX/SIAS	AI-30B	YES		N/A	N/A	**SAFETY INJECTION COMMAND** (AI-30B, A-34-1, C-6)	ON		N/A	N/A
86-B/CIAS	AI-30B	YES		OFF		**CONTAINMENT ISOLATION COMMAND** (AI-30B, A-34-1, C-3)	ON		YES	
86-B/VIAS	AI-30B	YES		OFF		**VENTILATION ISOLATION COMMAND** (AI-30B, A-34-1, C-2)	ON		YES	
86-1/S2-1	S2-1	YES		OFF		**SEQUENCER AUTO START DEMAND** (AI-30B, A-36, A-5)	ON		YES	
86-2/S2-1	S2-1	YES		N/A	N/A	**SEQUENCER AUTO START DEMAND** (AI-30B, A-36, A-5)	ON		N/A	N/A
86-B/D2	D-2	YES		OFF		**DIESEL AUTO START DEMAND** (AI-30B, A-37, A-4)	ON		YES	
86B-OR/1AD2	D-2	YES		OFF		**BREAKER PROTECTION OVERRIDE** (AI-30B, A-37, D-3)	ON		YES	

(1) N/A appropriate Lockout Relay NOT TRIPPED by Test Switch in Step 7.1.33.

Completed by_____Date/Time_____/_____

Reviewed by_____
Shift Manager

Attachment 3 - Tripped Relays for 86-B/PPLS or 86-B/CPHS Trip

LOCKOUT RELAY	PANEL	RELAY TRIPPED		AMBER LIGHT		ANNUNCIATOR	ANNUN. ALARM		ERF COMP PRINTOUT TRIPPED	
		REQ.	(✓)	REQ.	(✓)		REQ.	(✓)	REQ.	(✓)
86-B/PPLS (1)	AI-30B	YES		OFF		**PPLS-B SAFEGUARD SIGNAL** (AI-30B, A-34-1, B-7)	ON		YES	
86-B/CPHS (1)	AI-30B	YES		OFF		**CPHS-B SAFEGUARD SIGNAL** (AI-30B, A-34-1, B-6)	ON		YES	
86-B/CSAS	AI-30B	YES		OFF		**CONTAINMENT SPRAY COMMAND** (AI-30B, A-34-1, C-4)	ON		YES	

(1) N/A appropriate Lockout Relay NOT TRIPPED by Test Switch in Step 7.3.5.

Completed by_____Date/Time_____/_____

Reviewed by_____
Shift Manager

Attachment 4 - RAS Restoration

PROCEDURE	(✓)	INITIALS
1. Sequentially RESET the following Lockout Relays (AI-30B).		
• 86-B/STLS	___	
• 86-B/RAS	___	
• 86-BX/RAS	___	_____
2. Release Control Switches for LCV-383-1 and HCV-385 ensuring both valves remain open (AI-30B).		_____
3. Place Control Switch HCV-383-4 SIRWT Hdr No. 2 Cntmt Suction Valve in AUTO, then verify HCV-383-4 remains closed (AI-30B).		_____
4. Ensure HC-AI-43B Isolation Valves CIAS Override Switch, is in NORMAL.		_____
5. Ensure HCV-344, is in NORMAL.		_____

Completed by_____Date/Time_____/_____

Surveillance Test Signature Sheet

All persons participating in the performance of this test shall enter their printed name, signature and initials below.

NAME (PRINT)	SIGNATURE	INITIALS

Comment Sheet

Attachment 2
Description of Recirculation Actuation Signal (RAS) Test

This description of the significant procedural steps is correlated to steps in the draft revision to Surveillance Test Procedure OP-ST-ESF-0010. Arrows labeled B1 through B6 on the accompanying photograph (Attachment 3) identifies the six control devices that are important to the test. This portion of the test will normally take 4 to 6 minutes and not more than 15 minutes to perform.

7.4.1 The Licensed Operator performing the test is designated as the dedicated operator to promptly perform Attachment 4 of the test procedure to return the affected equipment to its automatic alignment if an Engineered Safety Features (ESF) actuation occurs during the test. The ESF actuation is indicated by Pressurizer Pressure Low Signal (PPLS) or Containment Pressure High Signal (CPHS) initiation relays tripping on the Channel B ESF subsystem directly in front of the operator and on the Channel A ESF subsystem approximately six feet to his left, accompanied by numerous audible alarms.

Note: There are normally three dedicated operators: 1) The operator described above who performs the surveillance test and, if needed, the Attachment 4 realignment; 2) The operator described in step 7.4.11 below to hold the control switch to maintain the pump suction valve open; and 3) The operator described in step 7.4.12 below to hold the control switch to maintain the recirc valve open.

The test is written to allow the use of a fourth operator dedicated to the Attachment 4 realignment, but it is customary to have the operator performing the test serve this function. The optional use of a fourth operator would not cause over-crowding at the ESF control panel because he could observe the relays from several feet away then step forward, in the event of an ESF actuation, to perform Attachment 4. The use of a fourth operator does not significantly affect safety while performing the test because the second and third dedicated operators keep the necessary flowpaths available.

7.4.5 The containment suction valve switch (arrow B6) for the safety injection (SI) and containment spray (CS) pumps on the subsystem being tested is placed in PULL-TO-OVERRIDE to prevent opening the valve when RAS relays trip during the test.

7.4.9 One CS valve is placed in override to keep it closed in the event of an ESF actuation during the test. This protects the CS pump on the non-tested ESF subsystem from possible damage due to a runout condition if the CS pumps on the tested subsystem failed to run properly. The CS pumps on the tested subsystem are considered inoperable during the test but they would be started by backup actuation signals from the opposite ESF subsystem.

7.4.11 The second dedicated operator is stationed to hold the control switch (spring returned to NORMAL) for the Safety Injection Refueling Water Tank (SIRWT) suction valve (arrow B5) in the OPEN position. This keeps the valve open to maintain the normal suction source for the SI and CS pumps on the tested subsystem.

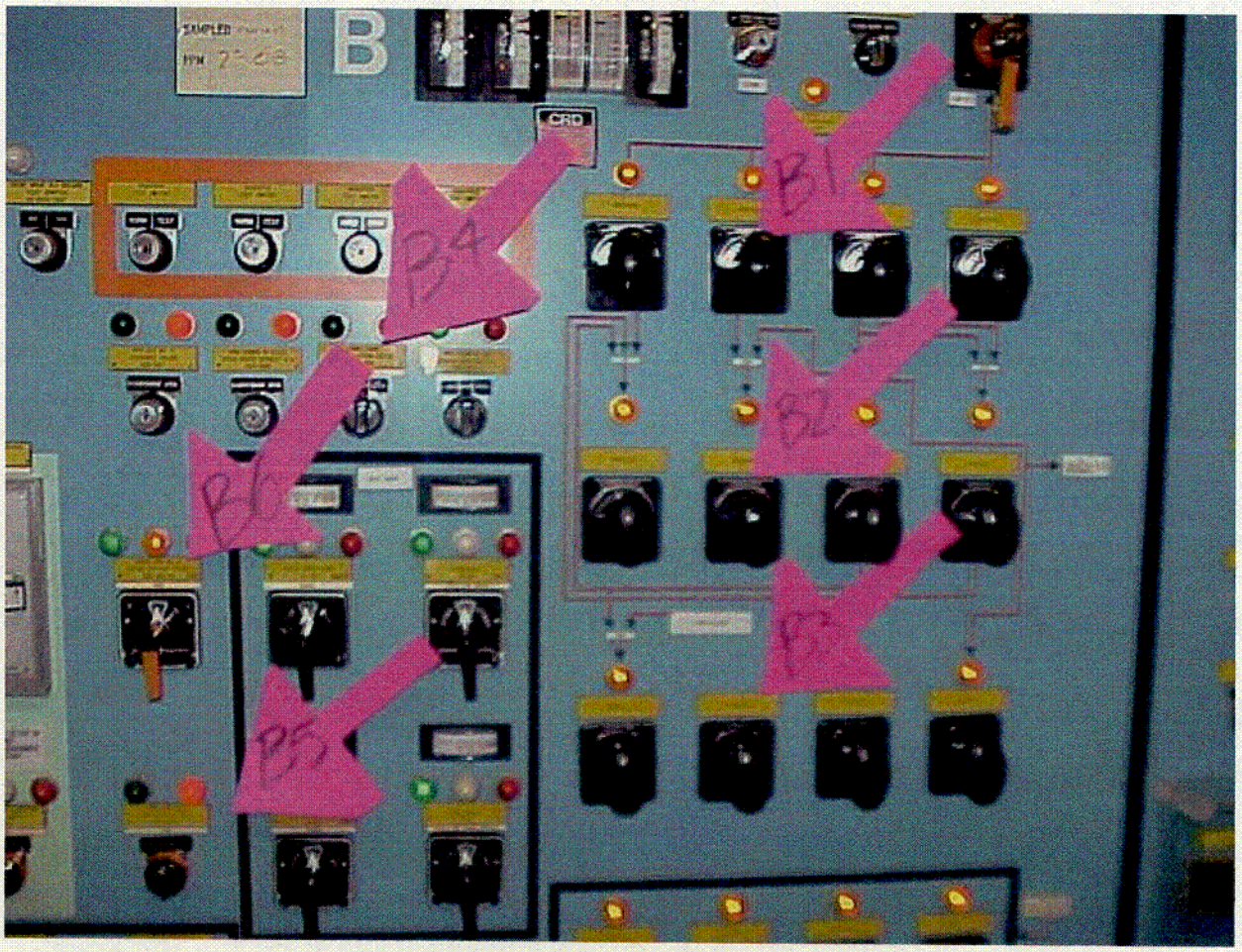
7.4.12 The third dedicated operator is stationed to hold the control switch (spring returned to NORMAL) for the SIRWT recirc isolation valve (arrow B4) in the OPEN position. This keeps the valve open to maintain the minimum recirc flowpath for all SI and CS pumps.

7.4.13 The RAS relays are tripped by initiating a SIRWT Low Signal (STLS) via the STLS test switch. STLS and RAS relays trip (arrows 1, 2, and 3). The second and third dedicated operators hold the switches (arrows B4 and B5) in OPEN. The first dedicated operator will perform Attachment 4 if an ESF actuation occurs before step 7.4.18 is completed.

7.4.18 The STLS and RAS relays are manually reset after verification that the expected alarms and indications occurred. At this time, the second and third dedicated operators are no longer needed to hold the switches in OPEN. The nominal time from step 7.4.13 to step 7.4.18 is approximately four minutes with a typical maximum time less that ten minutes. Fifteen minutes is considered to be a conservative maximum anticipated time.

The remainder of the test returns the ESF system to a normal alignment.

Attachment 3
Photograph of Control Board AI-30B Referenced in Attachment 2 and 4



C01

Attachment 4
Recirculation Actuation Signal (RAS) Restoration Actions
Attachment 4 to Either Procedure OP-ST-ESF-0009 or 0010

These actions are performed in the event of an ESF actuation during the RAS test. Steps 1, 3, 4, and 5 are done by the first dedicated operator. Step 2 is done by the second and third dedicated operators at the direction of the first dedicated operator. Refer to Attachment 3 arrows.

1. The actuation signals are manually reset (arrows 1, 2, and 3).

2. The control switches for the pump minimum recirc valve and SIRWT suction valve are released (arrows 4 and 5). Operator action is no longer needed to provide a suction path or protect all SI and CS pumps from running at shutoff head. It typically takes less than 20 seconds from the ESF actuation to the completion of this step, however steps 1 and 2 are not time critical because the dedicated operators maintain the flowpaths available.

Note: The consequence of inadvertent release of the recirc and SIRWT suction valve switches is completely recoverable and these valves will return to the open position by returning the switches to OPEN, either prior to or after the occurrence of an actuation

3. The containment suction valve control switch (arrow 6) is returned to AUTOMATIC. This provides a suction path for the SI and CS pumps in the tested subsystem when RAS occurs. This step will be completed promptly but is not needed until the water in the SIRWT is depleted. The SIRWT should provide the suction source for at least 20 minutes following a large break LOCA.

4. The containment isolation signal for the tested channel is returned to NORMAL. The non-tested channel closes each flowpath that is needed for containment isolation. This step is performed to ensure double valve isolation of each flowpath.

5. The containment spray valve is returned to automatic by placing the control switch in NORMAL to make the second containment spray header operable. The other containment spray header remained operable throughout the test.

Attachment 5
Simulator Demonstration of the Proposed Test

The Fort Calhoun Control Room Simulator has been used to demonstrate the acceptability of changes being made to the existing and long standing surveillance test OP-ST-ESF-0010 to incorporate dedicated operators as a means of maintaining system capability. The demonstrations and refinement of these revisions were conducted in two separate simulator sessions using the Fort Calhoun Control Room simulator to perform the Recirculation Actuation Signal portion of the test.

During the first session, using one dedicated operator to perform the test and a second dedicated operator to manipulate valve controls, three test simulations were performed: 1) OP-ST-ESF-0010 conducted during normal power operations, 2) OP-ST-ESF-0010 conducted with large break loss of coolant accident, 3) Repeat of OP-ST-ESF-0010 conducted with large break loss of coolant accident (LOCA). The first simulation demonstrated that the testing would require the operators to hold the safety injection tank pump inlet valves open for 4 minutes to complete signal testing under normal conditions. The second two tests demonstrated that pump inlet and mini recirculation valves could be returned to automatic control functions using Attachment 4 of OP-ST-ESF-0010 within one minute after actuation of the Pressurizer Pressure Low Signal (PPLS). Other minor procedural enhancements, such as streamlining the restoration of components following testing, were incorporated.

The second simulation session was conducted using one dedicated operator to perform the test and two additional dedicated operators to each hold OPEN one valve, the mini-flow recirculation valve or safety injection tank pump inlet header valve. No accident needed to be simulated because the purpose of this session was to test operator positioning and operability of the controls with three operators at the safeguards control panel. These simulations demonstrated: 1) operator placement, although in closer than normal separation, did not interfere with or impeded the operator's ability to perform assigned functions, 2) the effectiveness of procedural enhancements to minimize operator interactions and panel view obstructions, 3) the capability of each of the two dedicated valve switch operators to indefinitely maintain the switches in the OPEN position, 4) the ability to change hands on a switch handle to avoid hand fatigue, and 5) the control system's capability to immediately return valves to the OPEN position in the event of an inadvertent release of the valve control switch handle.

These simulator sessions resulted in procedure enhancements and demonstrated operator use of the procedure OP-ST-ESF-0010.