

Facility: BFN Scenario Number: HLTS-3-2 Op-Test Number: HLT0707

Examiners: _____

Operators: _____

Initial Conditions:

Unit 3 is at 79% power. 3C RHR Pump is out of service. T.S 3.5.1.A.1, 3.6.2.3, 3.6.2.4, 3.6.2.5 have been entered. Unit 3 is 6 hours into a seven day LCO. Appendix R LCO addressed and in LCO tracking. Loop II of RHR has been vented within the hour in preparation for placing Torus cooling in service. Valve 3-FCV-73-36 seal-in circuit has been disabled per step 7.6 of 3-SR-3.5.1.7

Turnover:

Continue with 3-SR-3.5.1.7 which is in progress and is complete up to Step 7.4 [1] (HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure). Alternate EHC Pumps per section 6.3 of 3-OI-47A. Increase reactor power to 85% using Recirc flow (3-GOI-100-12, step 5.132) with no pre-conditioning limitations. Reactor Engineering will evaluate further power changes.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	N-BOP N-SRO	The crew will alternate EHC pumps using 3-OI-47A.
2	N/A	R-ATC R-SRO	The crew will continue with power ascension using 3-GOI-12 and 3-OI-68.
3	N/A	N-BOP	The BOP Operator will continue performance of a HPCI surveillance.
4	imf hp08	C-BOP C-SRO TS-SRO	The crew will recognize and respond to a HPCI steam line break. HPCI will fail to auto isolate and must be manually isolated. The SRO will enter and execute EOI-3.
5	imf ad01g 40	C-ATC C-SRO TS-SRO	The crew will recognize and respond to a stuck open SRV using 3-AOI-1-1.
6.	bat RRPVIB imf cr02a 75 3:00	C-ATC C-BOP C-SRO	The crew will recognize and respond to a recirc pump high vibration, dual seal failure, trip, core power oscillations and scram. The crew will carry out actions using EOI-1 & 2 and 3-AOI-100-1.
7	imf th22 100 1:30	M-All	The crew will recognize and respond to a MSIV Closure and LOCA using EOI-1 & 2. The crew will monitor and control primary containment until reactor water level approaches TAF. The crew will transition to EOI C-1 and perform Emergency Depressurization to enable level restoration using low pressure systems.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: BFN Scenario Number: HLTS-3-5 Op-Test Number: HLT 0707

Examiners: _____

Operators: _____

Initial Conditions: The unit is at 73% power with the 3A CRD Pump in standby and ready for a PMT this shift. 3B CRD pump is in service. 3B RFP is warming after maintenance to the oil system.

Turnover: The Reactor is at 73% Power because Recirc Pump 3A VFD tripped last night due to a logic card failure. Power was being restored when an oil leak developed on the 3B RFP. The 3B RFP was leaking at approximately 1 gallon every 30 minutes. Maintenance has completed repairs and the clearance is picked up. The RFP was placed in warming last shift. Plans are to return 3B RFP to service per 3-OI-3 section 5.7 and place in Auto, then return reactor power to 100% with control rod withdrawal and Recirc flow per 3-GOI-100-12 step 5.

Event Number	Malfunction Number	Event Type*	Event Description
1	none	R-ATC N-BOP R-SRO	Place 3B RFP back in service and increase Rx power with control rod withdrawal and Recirc flow increase.
2	imf ed09a	C-ATC C-BOP TS-SRO C-SRO	Loss of 4KV Shutdown Board "3EA" (Bus Lockout) Loss causes loss of operating CRD pump for ATC, a loss of RPS "A" for ATC, a loss of RBCCW for BOP, a loss of RWCU and FPC for BOP, a loss of SJAE for BOP and a Tech Spec reference and multiple component failures for SRO.
3	none	C-ATC C-BOP C-SRO	ATC will swap CRD pumps and restore RPS power. BOP will restore RBCCW, RWCU, FPC and re-start SJAE. SRO will establish priorities for the above restoration activities.
4	none	TS-SRO	Low oil level is reported on 3B Core Spray pump.
5	imf hp01	C-BOP C-SRO TS-SRO	HPCI inadvertently initiates and injects to the RPV without a valid initiation signal.
6	imf tc07 100	C-ATC C-BOP C-SRO	EHC leak. BOP must lock out EHC pumps and trip Main Turbine. ATC reduces power and scrams Reactor.
7	bat atws95east imf th23 20	M-All	ATWS with fuel failure. SRO and crew respond per EOI-1, EOI-2 and C-5

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: BFN Scenario Number: HLTS-3-6 Op-Test Number: HLT 0707

Examiners: _____

Operators: _____

Initial Conditions: Unit at 70% power due to 3A Condensate Booster Pump out of service for oil leak. CRD Pump 3B tagged out for breaker work. 3-FCV-74-100 tagged out for maintenance on the actuator, valve has a mechanical locking device installed and is closed. Actuator is removed. HPCI injection valves tagged for replacement of contactors in supply breakers. A 14 day LCO (TS 3.5.1) has been entered. Work has been completed and the clearance has been released.

Turnover: CRD Timer has been replaced, perform CRD Timer Test per 3-OI-85 section 8.14, then withdraw rods per RE instructions to establish rod pattern. When 3A CBP is restored, continue to raise power and monitor pump amps. (step 5.16 of 3-GOI-100-12). When HPCI clearance is picked up, perform PMT per WO (copy attached) prior to making HPCI operable. EM connecting MOVAT equipment to Sys 69 valves, should be invisible to control room personnel.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	N-BOP N-SRO	The crew will alternate EHC pumps using 3-OI-47A.
2	None	N-ATC	ATC performs CRD Timer test per 3-OI-85.
3	None	R-ATC R-SRO	Raise Reactor Power by control rod withdrawal.
4	imf rd05r4639	C-ATC C-SRO ITS-SRO	Control Rod 46-39 uncouples during Control Rod movement, ATC responds per AOI. Tech Spec call for SRO.
5	ior zdihs691 close	C-BOP ITS-SRO	BOP responds to RWCU inadvertent isolation. Tech Spec call for SRO.
6	ior zdihs682a1a off	C-ATC C-SRO	ATC responds to loss of VFD cooling water system.
7	ior zdihs719a trip	C-BOP C-SRO ITS-SRO	BOP responds to RCIC trip and performs HPCI PMT. SRO refers to Tech Specs.
8	imf ad01b 25	C-BOP ITS-SRO	BOP responds to stuck open MSRV which results in rising Suppression Chamber pressure due to a tailpipe break. SRO address Tech Specs for ADS valve failure and direct manual scram before DW pressure exceeds 2.45 psig.
9	imf pc14 50	M-All	Crew responds to lowering Suppression Pool level due to an un-isolable leak.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: BFN Scenario Number: HLTS-3-7 Op-Test Number: HLT 0707Examiners: _____

_____Operators: _____

Initial Conditions: Unit 3 is at 100% rated power. HPCI was tagged out 8 hours ago for repair to the Gland Seal Exhauster. Expected return to service is in 6 hours. A 14 day LCO Action has been entered in accordance with TSR 3.5.1.

Turnover: Maintain 100% power. Unit 3 has been operating for 187 days. Unit 1 and Unit 2 are at 100% power. Perform 3-SR-3.3.1.1.8(11) REACTOR PROTECTION SYSTEM MANUAL SCRAM FUNCTIONAL TEST. Severe thunderstorms are expected to pass through the area for the next 4 hours. Limestone County is currently under a tornado watch.

Event Number	Malfunction Number	Event Type*	Event Description
1	none	N-ATC N-SRO	The ATC will perform 3-SR-3.3.1.1.8(11) REACTOR PROTECTION SYSTEM MANUAL SCRAM FUNCTIONAL TEST.
2	mrf rd10r1839 scram	R-ATC R-SRO TS-SRO	The operating crew will recognize and respond to a control rod scram in accordance with 3-AOI-85-5.
3	imf ad01f	C-BOP C-SRO	The operating crew will recognize and respond to a stuck open SRV in accordance with 3-AOI-1-1.
4	none	TS-SRO	The operating crew will recognize and respond to an inoperable ADS valve and HPCI in accordance with Technical Specifications.
5	imf th33a imf th22	M-ALL	The operating crew will recognize and respond to a steam line break per the ARPs and EOIs.
6	imf ed01	M-ALL	The operating crew will recognize and respond to a loss of offsite power per 0-AOI-57-1A.
7	imf dg01a imf dg03d	C-BOP	The operating crew will recognize and respond to diesel generator failures per 0-AOI-57-1A.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: BFN Scenario Number: HLTS-3-8 Op-Test Number: HLT 0707Examiners: _____

_____Operators: _____

Initial Conditions: Unit 3 is at ~1% power with a unit startup in progress. Currently at step 5.0[68] of 3-GOI-100-1A, Rod Group 17, control rod 30-11. 3C RFP is in service at 850 psig for level control. 3B CRD pump has been tagged for bearing replacement. IRM "G" is bypassed due to periodic noise spikes. System Engineering is monitoring IRM operation.

Turnover: Continue start-up. Commence inerting the Suppression Chamber per 3-OI-76 Section 5.1. The potential for icing of power lines due to freezing rain has been reported by Transmission Power Services.

Event Number	Malfunction Number	Event Type*	Event Description
1	none	N-BOP	The operating crew will commence inerting the suppression chamber per 3-OI-76.
2	none	R-ATC R-SRO	The operating crew will withdraw control rods in accordance with 3-OI-85 and 3-GOI-100-1A.
3	none	N-ATC	Place 3C RFP in service per 3-OI-3.
4	imf rd02a	C-ATC C-SRO	The operating crew will recognize and respond to a failed CRD Flow Control valve per 3-AOI-85-3.
5	imf nm05c	C-ATC C-SRO TS-SRO	The operating crew will recognize and respond to a failed IRM instrument per 3-OI-92 and Tech. Specs.
6		C-BOP C-SRO TS-SRO	The operating crew will recognize and respond to a failed H2/O2 analyzer in accordance with ARPs and Tech. Specs.
7	imf ed07a	C-BOP C-SRO	The operating crew will recognize and respond to a trip of 480V Unit Board 3A per ARPs.
8	imf nm05b	M-ALL	The operating crew will recognize and respond to another IRM instrument failure and subsequent Rx. Scram.
9	imf th33c	M-ALL	The operating crew will respond to 3-EOI-1 and 3-EOI-2 entry conditions for failure to scram and drywell leak.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

SIMULATOR EVALUATION GUIDE

TITLE : HPCI STEAMLINE BREAK, SRV FAILURE, RECIRC PUMP TRIP, DRYWELL LEAK ,
EMERGENCY DEPRESSURIZATION ON LEVEL (C1)

REVISION : 0

DATE : January 19, 2008

PROGRAM : BFN Operator Training - Hot License

PREPARED BY: _____ \ _____
(Operations Instructor) Date

REVIEWED BY: _____ \ _____
(Operations Training Manager or Designee) Date

CONCURRED: _____ \ _____
(Operations Superintendent or Designee) (Required for Exam Scenarios only) Date

VALIDATION BY: _____ \ _____
(Operations SRO) (Required for Exam Scenarios only) Date

Requires copy of 3-SR-3.5.1.7 (current rev.) completed up to step 7.11 to be provided to crew at turnover

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL	1/19/08	All	csf

- I. Program: BFN Operator Training
- II. Course: Hot License Training
- III. Title: HPCI STEAMLINE BREAK, SRV FAILURE, RECIRC PUMP TRIP, DRYWELL LEAK , EMERGENCY DEPRESSURIZATION ON LEVEL (C1)
- IV. Length of Scenario: ≈ 1 to $1 \frac{1}{2}$ hours
- V. Examination Objectives:
 - A. Terminal Objective
 - 1. Perform routine shift turnover, plant assessment and routine shift operation in accordance with BFN procedures.
 - 2. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, abnormal, annunciator and emergency procedures.
 - B. Enabling Objectives:
 - 1. The operating crew will alternate EHC pumps.
 - 2. The operating crew will continue power ascension from $\approx 79\%$ power.
 - 3. The operating crew will experience a HPCI steam line break during performance of 3-SR-3.5.1.7 , HPCI Flow Rate, with a failure of HPCI to auto isolate.
 - 4. The operating crew will recognize and respond to a safety-relief valve failed open.
 - 5. The operating crew will recognize and respond to a high vibration and trip of 3A Recirc pump.
 - 6. The operating crew will recognize and respond to reactor power oscillations by scrambling the reactor.
 - 7. The operating crew will recognize and respond to a high drywell pressure condition.
 - 8. The operating crew will Emergency De-pressurize when in C1 before reactor water level reaches -180".

VI. References: The procedures used in the simulator are controlled copies and are used in development and performance of simulator scenarios. Scenarios are validated prior to use, and any procedure differences will be corrected using the procedure revision level present in the simulator. Any procedure differences noted during presentation will be corrected in the same manner. As such, it is expected that the references listed in this section need only contain the reference material which is not available in the simulator.

VII. Training Materials:

- A. Calculator
- B. Control Rod Insertion Sheet
- C. Stopwatch
- D. Hold Order/Caution tags
- E. Annunciator window covers
- F. Steam tables

VIII. Console Operators Instructions

A. Scenario File Summary

1. File: bat HLTS3-2

<u>MF/RF/1OR#</u>	<u>Description</u>
a) trg e1 MODESW	Sets trigger
b) trg e2 adssrv1-22	Sets trigger
c) ior zlohs7416a[1] off	Tag Out 3C RHR
d) imf rh01c	3C RHR Pump trip
e) ior ypobkrpmpcrh fail_power	Control power for RHR 3C breaker
f) mrf hw01 fast	Advances all charts
g) imf th33b (e1 0) 1 2:00	B MSL break in DW
h) imf th21 (e1 5:00) 0.5 10:00	Recirc. line break
i) imf rd01a (e1 10:00)	3A CRDP trip
j) mmf cr02a (e1 0) 0 1:00	Reduces oscillations after the scram
k) imf rd01b	3B CRDP trip
l) imf hp09	Failure of HPCI to auto isolate
m) ior zlohs718a[1] on	Fails 71-8 green light on
n) ior ypovfcv718 fail_now	Keeps the 71-8 valve closed
o) imf rp11 (e1 1:00)	MSIV logic fuse failure

2. File: bat RRPVAVIB

<u>MF/RF/1OR#</u>	<u>Description</u>
1) imf th12a	Inserts Vibration Alarm
2) imf th10a (none 1:)	Fails Recirc Pump A Inboard Seal
3) imf th11a (none 2:)	Fails Recirc Pump A Outboard Seal)
4) ior zdihs681 open	Prevents Recirc Pump A Suction Valve Closure

B. Console Operators Manipulations

<u>ELAP. TIME</u>	<u>PFK#</u>	<u>DESCRIPTION/ACTION</u>
Simulator setup	rst 28	≈ 78 %Power MOC, use mid-power runback push button (snapshot 246)
Simulator setup	F3	bat HLTS3-2 See Scenario File Summary
Simulator setup	manual	Place suppression pool cooling in service (Loop II)
Simulator setup	manual	Place HO tags on '3C' RHR pump
Simulator setup	manual	Place TESTING/MAINT frames on Panel 9-3F, Windows 5, 11, 26 for HPCI 3-SR-3.5.1.7 complete up to step 7.4 [11]
Simulator setup	manual	Provide a copy of 3-SR-3.6.2.1.1, Suppression Chamber Water Temperature Checks.
Simulator setup	manual	Verify lens covers on EHC pumps are correct

ROLE PLAY: When asked for local EHC pressure, (3-PI-047-0001(0002)) indicates 1625 psig. (3-OI-47A section 6.3 step [4].

ROLE PLAY: When asked, EHC pump 3B EHC PUMP SUCTION FILTER and EHC AUX PUMP SUCTION FILTERS, indicate CLEAN, (3-OI-47A section 6.3 step [11].

ROLE PLAY: When asked, MANUAL FLOW CONTROL VALVE, 3-047-0588, is set at 2.0 turns clockwise. (3-OI-47A section 6.3 step [12].

ROLE PLAY: When asked, HPCI suction pressure is 34 psig on 3-PI-73-28B (step 7.4[1.1]).

When HPCI is at rated pressure and flow	F4	imf hp08	Steam leak into HPCI room
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ROLE PLAY: AUO at HPCI quad. Reports a large steam leak on HPCI and present location is elev. 565 Rx.Bldg.

When directed by Lead Instructor	F6	imf ad01c 40	Fails SRV-1-22 open
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When RO cycles SRV then:	F7	dmf ad01c	SRV-1-22 closes
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When directed by Lead Instructor	F8	bat RRPVIB	Recirc Pump A high vibration, seal failure, suction valve fails to close and power oscillations.
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ROLE PLAY: When dispatched to check 3A Recirc Vibration, wait 2 minutes and report back swinging 10 to 14 mils.

C. Console Operators Manipulations

<u>ELAP. TIME</u>	<u>PFK#</u>	<u>DESCRIPTION/ACTION</u>	
When 'A' Recirc trips	F9	dmf th12a	Deletes vibration high alarm
4 min. after 3A recirc. pump trip	F10	imf cr02a 75 3:00	Core power oscillations
then:	and F11	imf th22 (none 1:30) 100	Bottom head leak

Terminate the scenario when the following conditions are satisfied are at the direction of the Lead Examiner.

1. RPV water level +2" to +51"
2. Drywell sprayed
3. Emergency Depressurization completed

IX. Scenario Summary

Given Unit 3 at 79% power, the crew will alternate EHC pumps and resume power ascension to 100%. As 3-SR-3.5.1.7, HPCI Flow Rate, is continued the crew will experience a ruptured HPCI steam line with a failure of HPCI to automatically isolate. Manual HPCI isolation will be possible. As power ascension is continued, an SRV fails open but can be closed as steps of 3-AOI-1-1 are performed. The crew experiences high vibration with a subsequent trip and seal leakage on the 3A Recirc Pump resulting in high drywell pressure. When the diesel generators automatically start the 3ED diesel generator fails to auto start but can be manually started. Finally, the crew will Emergency Depressurizes before reactor water level reaches -200".

X. Information to Floor Instructors:

- A. Ensure recorders are inking and recording and ICS is active and updating.
- B. Assign Crew Positions based on the required rotation.
 - 1. SRO: Unit Supervisor
 - 2. ATC: Board Unit Operator
 - 3. BOP: Desk Unit Operator
- C. Conduct a shift turnover with the Unit Supervisor.
- D. Direct the shift crew to review the control board and take note of present conditions, alarms, etc.
- E. Terminate the scenario when the following conditions are satisfied are at the request of the floor/lead instructor/evaluator.
 - 1. RPV water level +2" to +51"
 - 2. Emergency Depressurization completed

XI. Simulator Event Guide

Event 1: Alternate EHC Pumps

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	ATC/BOP	Receive crew briefing and walk boards down
	SRO	Directs BOP to alternate EHC pumps
	BOP	Alternates EHC Pumps in accordance with 3-OI-47A section 6.3

[1] VERIFY EHC Sys is in service. REFER TO Section 5.1.

[2] REVIEW Precautions & Limitations listed in Section 3.0.

[3] START the non-operating EHC PUMP 3B(3A) using EHC HYD FLUID PUMP 3B(3A), 3-HS-47-2A(1A).

[4] CHECK the started EHC pump EHC HYD PUMP A(B) DISCH PRESS, 3-PI-047-0001(0002), indicates between 1550 psig and 1750 psig, locally at the EHC skid. (AUO reports 1625 psig)

[5] IF the started EHC pump discharge pressure is NOT between 1550 psig and 1750 psig, THEN ADJUST the pressure compensator for the started EHC pump to adjust pump discharge pressure. REFER TO Step 8.6[1].

[6] STOP EHC PUMP 3A(3B) using EHC HYD FLUID PUMP 3A(3B), 3-HS-47-1A(2A).

XI. Simulator Event Guide

Event 1: Alternate EHC Pumps

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
<hr/>		<p>[7] CHECK EHC HEADER PRESSURE, 3-PI-47-7, indicates between 1550 psig and 1650 psig.</p> <p>[8] IF EHC header pressure is NOT between 1550 psig and 1650 psig, THEN ADJUST the pressure compensator for the operating EHC pump to adjust EHC header pressure. REFER TO Step 8.6[2].</p> <p>[9] IF there are any disagreement flags, THEN RESET disagreement flags by placing the operating pump handswitch, EHC HYD FLUID PUMP 3A(3B), 3-HS-47-1A(2A), to START.</p> <p>[10] CHECK the started EHC PUMP 3B(3A) MTR AMPS, 3-EI-47-2(1), indicates less than 140 amps.</p> <p>[11] VERIFY EHC Pump 3B(3A), EHC PUMP SUCTION FILTER and EHC AUX PUMP SUCTION FILTERS, indicate CLEAN, locally at the EHC skid.</p> <p>[12] [NER/C] VERIFY MANUAL FLOW CONTROL VALVE, 3-047-0588, is set at 2.0 turns clockwise. [INPO SOER 84-006]</p>
<hr/>	BOP	Swaps lens covers for EHC pumps based on new lineup

XI. Simulator Event Guide (Continued)

Event 2: Power Ascension

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs power ascension per 3-GOI-100-12 step 6.2 and 3-OI-68
	ATC	<p>Raises reactor power in accordance with 3-GOI-100-12 and 3-OI-68</p> <p>[1] IF NOT in single loop operation, THEN ADJUST Recirc Pump speeds 3A using, RAISE SLOW (MEDIUM), 3-HS-96-15A(15B)/LOWER SLOW(MEDIUM) 3-HS-96-17A(17B), push-buttons, to achieve balanced jet pump flows. AND/OR ADJUST Recirc Pump speed 3B using, RAISE SLOW (MEDIUM), 3-HS-96-6A(16B) /LOWER SLOW(MEDIUM) 3-HS-96-18A(18B), pushbuttons, to achieve balanced jet pump flows.</p> <p>[2] WHEN desired to control Recirc Pumps 3A and/or 3B speed with the RECIRC MASTER CONTROL, THEN ADJUST Recirc Pump speed 3A & 3B using the following push buttons as required:</p> <p>RAISE SLOW, 3-HS-96-31</p> <p>RAISE MEDIUM, 3-HS-96-32</p> <p>LOWER SLOW, 3-HS-96-33</p> <p>LOWER MEDIUM, 3-HS-96-34</p> <p>LOWER FAST, 3-HS-96-35</p>
	BOP	Performs as peer checker for recirc flow changes

XI. Simulator Event Guide (Continued)

Event 3a: HPCI Surveillance

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs BOP to continue with 3-SR-3.5.1.7 at step 7[11]
	BOP	<p>[11] ALIGN HPCI System for a manual start by performing the following steps:</p> <p>[11.1] CHECK HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33 is in AUTO and SET to control at 500 (5,000 gpm).</p> <p>IF required, THEN DEPRESS AUTO operation mode transfer switch and ADJUST setpoint using Setpoint up/down keys.</p> <p>[11.2] PLACE HPCI STEAM PACKING EXHAUSTER by placing 3-HS-73-10A to START.</p> <p>[11.3] VERIFY 3-FCV-73-36, using HPCI/RCIC CST TEST VLV 3-HS-73-36A, is OPEN.</p> <p>[11.4] OPEN 3-FCV-73-35, using HPCI PUMP CST TEST VLV, 3-HS-73-35A.</p> <p>[12] START the HPCI turbine by performing the following:</p> <p>[12.1] [NER] VERIFY communication is established with Operations personnel in HPCI Room. [IE 93-67]</p> <p>[12.2] [NER] REQUEST Operations personnel in HPCI Room, to ensure that all unnecessary personnel have exited HPCI Room. [IE 93-67]</p> <p>[12.3] [NER] ANNOUNCE HPCI turbine startup over plant public address system. [IE 93-67]</p>

XI. Simulator Event Guide (Continued)

Event 3a: HPCI Surveillance

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	[12.4] PLACE HPCI AUXILIARY OIL PUMP 3-HS-73-47A to START.
		[12.5] OPEN 3-FCV-73-30, using HPCI PUMP MIN FLOW VALVE, 3-HS-73-30A.
		[12.6] ENSURE personnel are ready to monitor 3-FCV-73-18 for smooth operation. AND NOTIFY the personnel monitoring that the next step will open 3-FCV-73-18.
		[12.7] OPEN 3-FCV-73-16, using HPCI TURBINE STEAM SUPPLY VLV, 3-HS-73-16A.
		[12.8] OBSERVE that the following actions occurs:
		<input type="checkbox"/> HPCI AUXILIARY OIL PUMP starts.
		<input type="checkbox"/> [NRC/C] HPCI TURBINE STOP VALVE 3-FCV-73-18 opens by observing 3-ZI-73-18 position indicating lights. [Appendix R]
		<input type="checkbox"/> HPCI TURBINE CONTROL VALVE 3-FCV-73-19 partially or fully opens by observing 3-ZI-73-19 position indicating lights.

XI. Simulator Event Guide (Continued)

Event 3a: HPCI Surveillance

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
		<input type="checkbox"/> [NRC/C] HPCI PUMP MIN FLOW VALVE 3-FCV-73-30 closes when HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33 indicates approximately ≥ 125 (≤ 1250 gpm) flow. [Appendix R]
		<input type="checkbox"/> HPCI turbine speed rises to greater than 2400 rpm as indicated on HPCI TURBINE SPEED 3-SI-73-51.
		<input type="checkbox"/> HPCI STM LINE CNDS INBD/OUTBD DR VLVS 3-FCV-73-6A and 3-FCV-73-6B close by observing 3-ZI-73-6A and 3-ZI-73-6B position indicating lights.
		<input type="checkbox"/> HPCI AUXILIARY OIL PUMP stops as turbine speed rises.
		[12.9] VERIFY Smooth operation of 3-FCV-73-18 and mark results below. Yes _____ No _____
		<input type="checkbox"/> IF the Answer above is "NO", THEN NOTIFY System Engineer to initiate a WO and proceed with test. (Otherwise N/A)
		[12.10] VERIFY RESET the following annunciators:
		<input type="checkbox"/> HPCI PUMP DISCH FLOW LOW 3-FA-73-33 (3-XA-55-3F, window 5)
		<input type="checkbox"/> HPCI TURBINE TRIPPED 3-ZA-73-18 (3-XA-55-3F, window 11)
		<input type="checkbox"/> HPCI TURBINE GLAND SEAL DRAIN PRESSURE HIGH 3-PA-73-46 (3-XA-55-3F, window 14)
		<input type="checkbox"/> HPCI TURBINE BEARING OIL PRESSURE LOW 3-PA-73-47 (3-XA-55-3F, window 19)
		[12.11] VERIFY system flow, discharge pressure, and turbine speed are stable prior to performing the next step.

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	<p>Responds to Reactor Bldg Hi Rad alarm per 3-ARP-9-3A window 22</p> <p>A. DETERMINE area with high radiation level on Panel 3-9-11. (Alarm on Panel 3-9-11 will automatically reset if radiation level lowers below setpoint.)</p> <p>Determines HPCI area source of hi rad</p> <p>B. IF the alarm is from the HPCI Room while Flow testing is being performed, THEN REQUEST personnel at the HPCI Quad to validate conditions.</p> <p>C. NOTIFY RADCON.</p> <p>D. IF the TSC is NOT manned and a "VALID" radiological condition exists., THEN USE public address system to evacuate area where high airborne conditions exist</p> <p>E. IF the TSC is manned and a "VALID" radiological condition exists, THEN REQUEST the TSC to evacuate non-essential personnel from affected areas.</p>

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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F. MONITOR other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in.

G. IF a CREV initiation is received, THEN

1. VERIFY CREV A(B) Flow is ≥ 2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213) within 5 hours of the CREV initiation. [BFPER 03-017922]

2. IF CREV A(B) Flow is NOT ≥ 2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213) THEN
PERFORM the following: (Otherwise N/A) [BFPER 03-017922]

a. STOP the operating CREV per 0-OI-31.

b. START the standby CREV per 0-OI-31.

SRO

Enters EOI-3 on High Rad. / High Temp.

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	Responds to HPCI Leak Detection Temp Hi alarm per 3-ARP-9-3F window 10
		A. CHECK HPCI temperature switches on LEAK DETECTION SYSTEM TEMPERATURE, 3-TI-69-29 on Panel 3-9-21.
		B. IF high temperature is confirmed, THEN ENTER 3-EOI-3 Flowchart.
		C. CHECK following on Panel 3-9-11 and NOTIFY RADCON if rising radiation levels are observed:
		1. HPCI ROOM EL 519 RX BLDG radiation indicator, 3-RI-90-24A.
		2. RHR WEST ROOM EL 519 RX BLDG radiation indicator, 3-RI-90-25A.
		D. DISPATCH personnel to investigate for leaks consistent with ALARA considerations in HPCI Turbine Area (EI 519) and HPCI Steam Supply Area (EI 550).
		Recognizes HPCI not isolated when isolation lights are illuminated
		Notifies Unit Supervisor HPCI failed to isolate and 3-FCV-73-2 and 3-FCV-73-3 are still open.

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs HPCI manually isolated (Critical step)
	BOP	Manually isolates HPCI steam supply by closing 3-FCV-73-2 and 3-FCV-73-3 (Critical step)
	ATC	Receives EOI-3 entry on flood level in HPCI room 3-ARP-9-4c window 10 A. DISPATCH personnel to VISUALLY CHECK the HPCI room. B. IF possible, THEN DETERMINE the source of the leak and the leak rate.
	SRO	Re-enters EOI-3 on flood level
	BOP	Notifies Rad Con and Fire Protection Monitors for lowering temperature and radiation levels in HPCI area (after successful isolation)

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs entry into 3-AOI-64-2B
	BOP	Immediate Actions
		[1] VERIFY automatic actions occur.
		HPCI Turbine TRIPS.
		HPCI STEAM LINE INBD ISOL VALVE, 3-FCV-73-2 CLOSES.
		HPCI STEAM LINE OUTBD ISOL VALVE, 3-FCV-73-3 CLOSES.
		HPCI STEAM LINE WARM-UP VALVE, 3-FCV-73-81 CLOSES.
		HPCI PUMP MIN FLOW VALVE, 3-FCV-73-30 CLOSES.
		HPCI SUPPR POOL INBD SUCT VLV, 3-FCV-73-26 CLOSES.
		HPCI SUPPR POOL OUTBD SUCT VLV, 3-FCV-73-27 CLOSES.
		HPCI TURBINE STOP VALVE, 3-FCV-73-18 CLOSES.

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	<p>Subsequent Actions</p> <p>[1] IF ANY EOI entry condition is met, THEN ENTER the appropriate EOI(s).</p> <p>[2] DISPATCH an operator to the HPCI Turbine room to investigate.</p> <p>[3] CHECK the following monitors for a rise in activity or area temperature:</p> <p>AREA RADIATION, 3-RR-90-1, Point 23 (RM-90-24), Panel 3-9-2</p> <p>AIR PARTICULATE RAD MON, 3-MON-90-50, Address 024 (3-RM-90-58), Panel 3-9-2</p> <p>RB & TB REFUELING ZONE EXH RAD MONITOR, 0-CONS-90-362, Address 08, 3-RM-90-250, Panel 1-9-44</p> <p>LEAK DET SYS, TI-69-29, Panel 3-9-21, DEPRESS pushbutton to read TS-73-55A through 55D.</p>

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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BOP		[4] VERIFY the following valves OPEN to drain the HPCI steam lines.
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MN STM LINE DRAIN INBD VLV, 3-FCV-1-55

OUTBD ISOLATION VLV, 3-FCV-1- -56,

[5] IF the HPCI TURBINE EXH DRAIN POT LEVEL HIGH 3-LA-73-8 (3-XA-55-3F, Window 33) annunciator is in alarm, THEN PERFORM the following:

[5.1] OPEN the HPCI TURB EXH CNDS POT LCV, 3-LCV-73-8.

[5.2] WHEN the annunciator HPCI TURBINE EXH DRAIN POT LEVEL HIGH resets, THEN **CLOSE the HPCI TURB EXH CNDS POT LCV, 3-LCV-73-8.**

SRO		Determines unit in 14 day LCO (TS 3.5.1.C – HPCI inop. Verify RCIC OPERABLE by administrative means)
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Determines unit in 72 hour LCO (TS 3.5.1.D - HPCI and C RHR Inop)

Tech. Specs. 3.6.1.3.B.1, on FCV 73-2 or 73-3 when tagged (1 hour to close and de-activate)

EXAMINER NOTE: When the valves are closed they are now considered OPERABLE because they are in the required position following an isolation signal, however the isolation logic is still INOPERATIVE.

XI. Simulator Event Guide (Continued)

Event 4: SRV-1-22 Fails Open

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	CREW	Recognizes SRV open <ul style="list-style-type: none">• Main Steam Relief Valve Open alarm• lowering generator output
	SRO	Directs response per 3-AOI-1-1
	BOP	Immediate Action <p>[1] IDENTIFY stuck open relief valve by OBSERVING the following:</p> <p>SRV TAILPIPE FLOW MONITOR, 3-FMT-1-4, on Panel 3-9-3, OR</p> <p>MSRV DISCHARGE TAILPIPE TEMPERATURE, 3-TR-1-1 on Panel 3-9-47.</p> <p>Determines SRV-1-22 from acoustic monitor</p> <p>[2] WHILE OBSERVING the indications for the affected Relief valve on the Acoustic Monitor; CYCLE the affected relief valve control switch several times as required:</p> <p>CLOSE to OPEN to CLOSE positions</p> <p>Cycles relief valve and reports SRV closed</p> <p>[3] IF all SRVs are CLOSED, THEN CONTINUE at Step 4.2.3. (Otherwise N/A)</p>

XI. Simulator Event Guide (Continued)

Event 4: SRV-1-22 Fails Open (continued)

TIME	POSITION	EXPECTED ACTION(S)
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	BOP	4.2.3 Other Actions and Documentation
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[1] IF ANY EOI entry condition is met, THEN ENTER the appropriate EOI(s).

[2] REFER TO Technical Specifications Sections 3.5.1 and 3.4.3 for Automatic Depressurization System and relief valve operability requirements.

[3] INITIATE suppression pool cooling as necessary to maintain suppression pool temperature less than 95°F.

[4] IF the relief valve can NOT be closed AND suppression pool temperature Can NOT be maintained less than or equal to 95°F, THEN PLACE the reactor Mode 4 in accordance with 3-GOI-100-12A.

[5] DOCUMENT actions taken and INITIATE Work Order for the valve.

SRO	Evaluates Tech Spec operability of ADS valve IAW TS 3.5.1(H) and 3.4.3(A). Determines valve operable and 3.5.1.H is not applicable, but requests Eng. evaluation. (Functional evaluation)
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XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>Announces Recirc "3A" high vibration alarm 3-ARP-9-4A window 20</p> <p>Consults ARP for Panel 9-4</p> <p>A. CHECK temperatures for RECIRC PMP MTR 3A WINDING AND BRG TEMP recorder, 3-TR-68-58 on Panel 3-9-21 are below those listed for 3-XA-55-4A, Window 13.</p> <p>B. CHECK for a rise in Drywell equip sump pumpout rate due to seal leakage.</p> <p>C. DISPATCH personnel to 3-LPNL-925-0412 (Vibration Mon. System) on EL 565' (S-R17) and REPORT the Vibration Data for Pump A to the Unit Operator and any other alarm indications. The person shall advise the Unit Operator of any changes in the vibration values.</p> <p>D. IF alarm seals in, THEN ADJUST pump speed slightly to try reset the alarm.</p> <p>E. IF unable to reset alarm, THEN CONSULT with Shift Manager, and with his concurrence, SHUTDOWN the Recirc pump and REFER TO 3-AOI-68-1A or 3-AOI-68-1B.</p> <p>F. IF pump operation continues, THEN RECORD pump 3A seal parameters hourly on Attachment 1, Page 22 of this ARP.</p>

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	Contacts Reactor Engineer
	ATC	Announces Recirc A Seal Leakage Alarm 3-ARP-9-4A window 25 A. DETERMINE initiating cause by comparing No. 1 and 2 seal cavity pressure indicators on Panel 3-9-4 or ICS. Plugging of No. 1 RO - No. 2 seal cavity pressure indicator drops toward zero, and control leakage lowers to ≤ 0.5 gpm. Plugging of No. 2 RO - No. 2 seal pressure approaches no. 1 seal pressure and control leakage lowers to ≤ 0.5 gpm. Failure of No. 1 seal - No. 2 seal pressure is greater than 50% of the pressure of No. 1. The controlled leakage will be ≥ 0.9 gpm. Failure of No. 2 seal - no. 2 seal pressure is less than 50% of the No. 1 seal.

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	Identifies Seal Failure via Instrumentation Recognizes lowering pressure on Recirc Pump A #1 seal B. RECORD pump seal parameters hourly on Attachment 1, Page 28 of this procedure, unless other acceptable compensatory methods for recording these parameters is evaluated and approved by Engineering. C. IF single seal failure is indicated, THEN INITIATE seal replacement as soon as possible. Continued operation is permissible if Drywell leakrate is within T.S. limits.
	SRO	Directs crew to watch for signs of increased leakage
	ATC	Acknowledges Recirc Pump A seal leakoff high alarm; 3-ARP-9-4A window 18, informs SRO. Recognizes lowering pressure on Recirc Pump A outboard seal; informs SRO Monitors drywell parameters; notes pressure and temperature increasing; informs SRO

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	When vibration report received or dual seal failure is reported, directs 'A' Recirc Pump tripped
	ATC	<p>C. IF dual seal failure is indicated, THEN</p> <ol style="list-style-type: none"> 1. SHUTDOWN Recirc Pump 3A by depressing RECIRC DRIVE 3A SHUTDOWN, 3-HS-96-19. 2. VERIFY TRIPPED, RECIRC DRIVE 3A NORMAL FEEDER, 3-HS-57-17. 3. VERIFY TRIPPED, RECIRC DRIVE 3A ALTERNATE FEEDER, 3-HS-57-15. 4. CLOSE Recirculation Pump 3A suction valve. <p>- REPORT to SRO of failure of suction valve to close.</p> <p>Directs AUO to close Recirc Pump suction valve locally at Board.</p> <ol style="list-style-type: none"> 5. CLOSE Recirculation Pump 3A discharge valve. 6. REFER TO 3-AOI-68-1A or 3-AOI-68-1B AND 3-OI-68. 7. DISPATCH personnel to secure Recirculation Pump 3A seal water.

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	[2] Checks Power to flow map to verify in region 1 or 2 Informs SRO of being in region 1 Checks APRMs and LPRMs for indication of power oscillations Informs SRO of Power Oscillations
	SRO	Directs inserting emergency shove sheet control rods
	BOP	Keeps SRO informed as drywell pressure approaches 2.45 psig

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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	SRO	Directs venting per 3-AOI-64-1
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EXAMINER NOTE: Venting may not be performed based on Drywell pressure.

	BOP	Vents per 3-AOI-64-1
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[3] VENT Drywell as follows:

[3.1] CLOSE SUPPR CHBR INBD ISOLATION VLV 3-FCV-64-34 (Panel 3-9-3).

[3.2] VERIFY OPEN, DRYWELL INBD ISOLATION VLV, 3-FCV-64-31 (Panel 3-9-3).

[3.3] VERIFY 3-FIC-84-20 is in AUTO and SET at 100 scfm (Panel 3-9-55).

[3.4] VERIFY Running, required Standby Gas Treatment Fan(s) SGTS Train(s) A, B, C (Panel 3-9-25).

[3.5] IF required, THEN REQUEST Unit 1 Operator to START Standby Gas Treatment Fan(s) SGTS Train(s) A, B. (Otherwise N/A)

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		[3.6] IF required, THEN RECORD venting data in 3-SI-4.7.A.2.a (Otherwise N/A)
		[3.7] PLACE 3-FCV-84-20 CONTROL DW/SUPPR CHBR VENT, 3-HS-64-35, in OPEN (Panel 3-9-3).
		[3.8] MONITOR stack release rates to prevent exceeding ODCM limits.
		Directs Logs person to monitor release rates
	SRO	Directs manual reactor scram prior to reaching 2.45psig DW pressure
	ATC	Scrams the reactor

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	Directs 3-AOI-100-1
	ATC	Carry out actions of 3-AOI-100-1
	SRO	Enters EOI- 1 & 2 at 2.45 psig drywell pressure
	SRO	Directs venting per Appendix 12
	BOP	1. VERIFY at least one SGTS train in service. 2. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): 3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV, 3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE, 3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV, 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE.

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		3. IF ... While executing this procedure to vent the Suppression Chamber, Suppression Pool water level can not be determined to be below 20 ft, THEN . PERFORM step 13 to secure the vent path and reenter this procedure if further venting is required.
		4. IF ... While executing this procedure, the desired vent path is lost or can not be established, THEN . PERFORM step 13 to secure the vent path and reenter this procedure if further venting is required.
BOP		5. IF ... While executing this procedure, CAD addition per SAMG-2, Step G-4 OR G-9, is to begin, THEN . BEFORE CAD is initiated, PERFORM Step 13 to secure the vent path.

NOTE: Venting may be accomplished using EITHER:

3-FIC-84-19, PATH B VENT FLOW CONT, OR

3-FIC-84-20, PATH A VENT FLOW CONT.

NOTE: Unless the TSC recommends otherwise, venting the Drywell DIRECTLY should be performed ONLY if the Suppression Chamber can NOT be vented.

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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6. IF ... ANY of the following exists:

Suppression Pool water level can not be determined to be below 20 ft, OR

Suppression Chamber can NOT be vented, OR

SRO orders DIRECT drywell venting, THEN CONTINUE in this procedure at:

Step 10 to vent the Drywell through 3-FCV-84-19, OR

Step 11 to vent the Drywell through 3-FCV-84-20.

7. CONTINUE in this procedure at:

Step 8 to vent the Suppression Chamber through 3-FCV-84-19, OR

Step 9 to vent the Suppression Chamber through 3-FCV-84-20.

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
<hr/>	BOP	<p>8. VENT the Suppression Chamber using 3-FIC-84-19, PATH B VENT FLOW CONT, as follows:</p> <p>a. PLACE keylock switch 3-HS-84-35, DW/SUPPR CHBR VENT ISOL BYP SELECT, to SUPPR-CHBR position (Panel 3-9-54).</p> <p>b. VERIFY OPEN 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE (Panel 3-9-54).</p> <p>c. PLACE 3-FIC-84-19, PATH B VENT FLOW CONT, in AUTO with setpoint at 100 scfm (Panel 3-9-55).</p> <p>d. PLACE keylock switch 3-HS-84-19, 3-FCV-84-19 CONTROL, in OPEN (Panel 3-9-55).</p> <p>e. VERIFY 3-FIC-84-19, PATH B VENT FLOW CONT, is indicating approximately 100 scfm.</p> <p>f. CONTINUE in this procedure at step 12.</p>

XI. Simulator Event Guide (Continued)

Event 5: Recirc Vibration, Seal Leakage, Power Oscillations and Scram (Continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	<p>12. ADJUST 3-FIC-84-19, PATH B VENT FLOW CONT, or 3-FIC-84-20, PATH A VENT FLOW CONT, as applicable, to maintain ALL of the following:</p> <p><input type="checkbox"/> Stable flow as indicated on controller, AND</p> <p><input type="checkbox"/> 3-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished, AND</p> <p><input type="checkbox"/> Release rates as determined below:</p> <p>i. IF. . .PRIMARY CONTAINMENT FLOODING per C-1, Alternate Level Control, is in progress THEN. .MAINTAIN release rates below those specified in Attachment 2.</p> <p>ii. IF. . .Severe Accident Management Guidelines are being executed, THEN. .MAINTAIN release rates below those specified by the TSC SAM Team.</p> <p>iii. IF. . .Venting for ANY other reason than items i or ii above, THEN. .MAINTAIN release rates below <input type="checkbox"/><input type="checkbox"/> Stack release rate of $1.4 \times 10^7 \mu\text{Ci/s}$ AND 0-SI-4.8.B.1.a.1 release fraction of 1.</p>
	BOP	<p>Contacts LOG AUO to monitor release rates</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	<ul style="list-style-type: none">- Directs RPV pressure controlled 800 to 1000 psig with one or more of the following:<ul style="list-style-type: none">- MSRV's (App 11A)- RCIC (App 11B) (will not work)- Directs RPV level be maintained between +2" to +51" with one or more of the following:<ul style="list-style-type: none">-RCIC (App 5C) (will not work)-CRD (App 5B)
	BOP	<p>Controls pressure 800 to 1000 psig with one or more of the following:</p> <ul style="list-style-type: none">- MSRV's (App 11A) <p>1. IF Drywell Control Air is NOT available, THEN ... EXECUTE EOI Appendix 8G, CROSSTIE CAD TO DRYWELL CONTROL AIR, CONCURRENTLY with this procedure.</p> <p>2. IF Suppression Pool level is at or below 5.5 ft, THEN ... CLOSE MSRVs and CONTROL RPV pressure using other options.</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	<p>3. OPEN MSRVs using the following sequence to control RPV pressure as directed by SRO:</p> <ul style="list-style-type: none"> a. 1 3-PCV-1-179 MN STM LINE A RELIEF VALVE. b. 2 3-PCV-1-180 MN STM LINE D RELIEF VALVE. c. 3 3-PCV-1-4 MN STM LINE A RELIEF VALVE. d. 4 3-PCV-1-31 MN STM LINE C RELIEF VALVE. e. 5 3-PCV-1-23 MN STM LINE B RELIEF VALVE. f. 6 3-PCV-1-42 MN STM LINE D RELIEF VALVE. g. 7 3-PCV-1-30 MN STM LINE C RELIEF VALVE. h. 8 3-PCV-1-19 MN STM LINE B RELIEF VALVE. i. 9 3-PCV-1-5 MN STM LINE A RELIEF VALVE. j. 10 3-PCV-1-41 MN STM LINE D RELIEF VALVE. k. 11 3-PCV-1-22 MN STM LINE B RELIEF VALVE. l. 12 3-PCV-1-18 MN STM LINE B RELIEF VALVE. m. 13 3-PCV-1-34 MN STM LINE C RELIEF VALVE.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	Recognizes MSIV closures and reports to SRO.
	BOP	Controls RPV level +2 to +51 with one or more of the following: RCIC (App 5C) (will not work) CRD (App 5B)
	BOP	CRD (App 5B) 1. IF Maximum injection flow is NOT required, THEN ... VERIFY CRD aligned as follows: a. VERIFY at least one CRD pump in service and aligned to Unit 3 CRD system. b. ADJUST 3-FIC-85-11, CRD SYSTEM FLOW CONTROL, as necessary to obtain flow rate of 65 to 85 gpm. c. THROTTLE 3-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV, to maintain 250 to 350 psid drive water header pressure differential. d. EXIT this procedure.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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2. IF BOTH of the following exist:

CRD is NOT required for rod insertion, AND Maximum injection flow is required,
THEN ... LINE UP ALL available CRD pumps to the RPV as follows:

a. IF CRD Pump 3A is available, THEN ... VERIFY RUNNING CRD Pump
3A or 3B.

b. IF CRD Pump 3B is available, THEN ... VERIFY RUNNING CRD Pump
3A or 3B.

c. OPEN the following valves to increase CRD flow to the RPV:

3-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV

3-PCV-85-27, CRD CLG WATER PRESS CONTROL VLV

3-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.

BOP	Reports 3B CRD pump tripped
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XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

TIME	POSITION	EXPECTED ACTIONS
	BOP	<p>d. ADJUST 3-FIC-85-11, CRD SYSTEM FLOW CONTROL, on Panel 9-5 to control injection WHILE maintaining 3-PI-85-13A, CRD ACCUM CHG WTR HDR PRESS, above 1450 psig, if possible.</p> <p>e. IFAdditional flow is necessary to prevent or mitigate core damage, THENDISPATCH personnel to fully open the following valves as required:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 3-THV-085-0527, CRD PUMP DISCH THROTTLING (RB NE, el 565') <input type="checkbox"/> 3-BYV-085-0551, CRD PUMP TEST BYPASS (RB NE, el 565').
	SRO	<p>Directs determining the cause of the isolation</p> <p>Directs H₂O₂ Analyzers placed in service</p>
	BOP	<p>Places H₂O₂ Analyzers in service</p> <ol style="list-style-type: none"> 1. Place Analyzer isolation bypass keylock switches to bypass. 2. Select DW or Supp Chmbr and momentarily pull out select switch handle to start sample pumps.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs SP cooling be placed in service per App 17A
	BOP	Places SP cooling in service per App 17A

1. IF Adequate core cooling is assured, THEN ... BYPASS LPCI Injection Valve Timers as necessary using EOI Appendices 16F and 16G.

2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:

a. VERIFY at least one RHRSW pump supplying each EECW header.

b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).

c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow:

3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV

3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV

3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV

3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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d. IF Directed by SRO, THEN ... PLACE the following keylock switches in MANUAL OVERRIDE:

3-XS-74-122, RHR SYS I LPCI 2/3 CORE HEIGHT OVRD.

3-XS-74-130, RHR SYS II LPCI 2/3 CORE HEIGHT OVRD.

e. IF LPCI INITIATION Signal exists, THEN ... MOMENTARILY PLACE the following in select:

3-XS-74-121, RHR SYS I CTMT SPRAY/CLG VLV SELECT.

3-XS-74-129, RHR SYS II CTMT SPRAY/CLG VLV SELECT.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	f. IF 3-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN ... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.

g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.

h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.

i. THROTTLE 3-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 3-FI-74-50(64), RHR SYS I(II) FLOW:

Between 7,000 and 10,000 gpm for one-pump Operation. OR

At or below 13,000 gpm for two-pump operation.

j. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE (VERIFY CLOSED 3-BKR-074-0007(0030) on 480V RMOV Board 3D(3E), Compartment 4E(4E), if required).

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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k. **MONITOR RHR Pump NPSH using Attachment 1.**

l. **NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.**

m. IF Additional Suppression Pool Cooling flow is necessary, THEN ...
PLACE additional RHR and RHRSW pumps in service using Steps 2.b through 2.i.

ATC/BOP	Monitors containment parameters
---------	--

SRO	Enters EOI-2 on DW pressure and re-enters EOI-1 and directs the following:
-----	---

- **Verify all available DW coolers in service**

SRO	Directs cooldown
-----	-------------------------

ATC/BOP	Verify all available DW coolers in service
---------	---

ATC/BOP	Commences a cooldown as directed
---------	---

SRO	Determines cannot maintain suppression chamber pressure less than 12 psig and directs suppression chamber sprayed
-----	--

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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	BOP	
--	-----	--

		Sprays suppression chamber per App 17C
--	--	---

1. BEFORE Suppression Chamber pressure drops below 0 psig, CONTINUE in this procedure at Step 6.

2. IF Adequate core cooling is assured, OR Directed by EOI-2 to spray the Suppression Chamber irrespective of adequate core cooling, THEN ... **BYPASS LPCI Injection Valve Timers as necessary using EOI Appendices 16F and 16G.**

3. IF Directed by SRO to spray the Suppression Chamber using Standby Coolant Supply, THEN ... CONTINUE in this procedure at Step 7.

4. IF Directed by SRO to spray the Suppression Chamber using Fire Protection, THEN ... CONTINUE in this procedure at Step 8.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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5. INITIATE Suppression Chamber Sprays as follows:

a. VERIFY at least one RHRSW pump supplying each EECW header.

b. IF..... EITHER of the following exists:

LPCI Initiation signal is NOT present, OR

Directed by SRO, THEN... PLACE keylock switch 3-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD, in MANUAL OVERRIDE.

c. MOMENTARILY PLACE 3-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT, switch in SELECT.

d. IF..... 3-FCV-74-53(67), RHR SYS I(II) INBD INJECT VALVE, is OPEN, THEN... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) OUTBD INJECT VALVE.

e. VERIFY OPERATING the desired RHR System I(II) pump(s) for Suppression Chamber Spray.

f. VERIFY OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.

g. OPEN 3-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	<p>h. IF..... RHR System I(II) is operating ONLY in Suppression Chamber Spray mode, THEN... CONTINUE in this procedure at Step 5.k.</p> <p>i. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE (VERIFY CLOSED 3-BKR-074-0007(0030) on 480V RMOV Board 3D(3E), Compartment 4E(4E), if required).</p> <p>j. RAISE system flow by placing the second RHR System I(II) pump in service as necessary.</p> <p>k. MONITOR RHR Pump NPSH using Attachment 2.</p> <p>l. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).</p> <p>m. THROTTLE the following in-service RHRSW outlet valves to obtain between 1,350 and 4,500 gpm flow:</p> <p>3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV</p> <p>3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV</p> <p>3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV</p> <p>3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV.</p> <p>n. NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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	BOP	6. WHEN ... EITHER of the following exists:
--	-----	---

Before Suppression Pool pressure drops below 0 psig, OR

Directed by SRO to stop Suppression Chamber Sprays, THEN ... **STOP Suppression Chamber Sprays as follows:**

a. CLOSE 3-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE.

b. VERIFY CLOSED 3-FCV-74-100, RHR SYS I U-2 DISCH XTIE

c. IF..... RHR operation is desired in ANY other mode, THEN... EXIT this EOI Appendix.

d. STOP RHR Pumps 3A and 3C (3B and 3D).

e. CLOSE 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	<p>When SC pressure exceeds 12 psig or if SRO determines cannot maintain DW temp. <280 then directs the following:</p> <ul style="list-style-type: none">- Ensures Recirc. pumps shutdown- DW blowers secured- DW sprayed per App 17B
	ATC	<p>Trips Recirc. pumps</p>
	BOP	<p>Secures DW blowers</p> <p>Requests 16F & 16G be performed</p> <p>Sprays the DW using RHR per App 17B</p> <p>1. BEFORE Drywell pressure drops below 0 psig, CONTINUE in this procedure at Step 7.</p> <p>2. IF Adequate core cooling is assured, OR Directed to spray the Drywell irrespective of adequate core cooling, THEN ... BYPASS LPCI Injection Valve Timers as necessary using EOI Appendices 16F and 16G.</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	<p>3. VERIFY Recirc Pumps and Drywell Blowers shutdown.</p> <p>4. IF Directed by SRO to spray the Drywell using Standby Coolant supply, THEN ... CONTINUE in this procedure at Step 8.</p> <p>5. IF Directed by SRO to spray the Drywell using Fire Protection, THEN ... CONTINUE in this procedure at Step 9.</p> <p>6. INITIATE Drywell Sprays as follows:</p> <p>a. VERIFY at least one RHRSW pump supplying each EECW header.</p> <p>b. IF..... EITHER of the following exists:</p> <p>LPCI Initiation signal is NOT present, OR</p> <p>Directed by SRO, THEN... PLACE keylock switch 3-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD, in MANUAL OVERRIDE.</p> <p>c. MOMENTARILY PLACE 3-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT, switch in SELECT.</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
		d. IF..... 3-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.
		e. VERIFY OPERATING the desired System I(II) RHR pump(s) for Drywell Spray.
		f. OPEN the following valves:
		3-FCV-74-60(74), RHR SYS I(II) DW SPRAY OUTBD VLV
		3-FCV-74-61(75), RHR SYS I(II) DW SPRAY INBD VLV.
		g. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE (VERIFY CLOSED 3-BKR-074-0007(0030) on 480V RMOV Board 3D(3E), Compartment 4E(4E), if required).

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	<p>h. IF..... Additional Drywell Spray flow is necessary, THEN... PLACE the second System I(II) RHR Pump in service.</p> <p>i. MONITOR RHR Pump NPSH using Attachment 2.</p> <p>j. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).</p> <p>k. THROTTLE the following in-service RHRSW outlet valves to obtain between 1,350 and 4,500 gpm RHRSW flow:</p> <p>3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV</p> <p>3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV</p> <p>3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV</p> <p>3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV.</p> <p>l. NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	SRO	Directs DW sprays/SC sprays be stopped when that area reaches 0 psig
	BOP	Stops DW/SC sprays when that area reaches 0 psig
		Monitors containment parameters
	SRO	Monitors RPV water level, determines level is lowering. Re-enters EOI-1 at +2" RPV level
		- Directs performance of App 7B (SLC)
	ATC	Calls Rx Bldg AUO to perform App 7B
	Crew	Monitors Drywell / PSC / and RPV water level
	SRO	Enters C1 at \approx -100" to - 122"
		Directs ADS inhibited
	ATC	Closes RFP discharge valves
		Reports 3A CRDP tripped

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	BOP	Inhibits ADS
	SRO	After entering C1 align all available injection systems for injection. -Containment sprays terminated When water level reaches TAF (-162") and before - 200 directs the following: Enters C2 (Critical step) <ul style="list-style-type: none"> - Six ADS valves opened (Critical step) - RPV level returned +2" to +51"
	BOP	When directed by US terminates Containment Sprays and lines up RHR for LPCI
	BOP	Opens and verifies open 6 ADS valves (Critical step)
	SRO	Directs restoring Rx level with Condensate, Core Spray, or RHR (Critical step)
	SRO	Classifies event as Site Area Emergency (1.1-S1)
ATC/BOP		Restores RPV water level +2" to +51" using: (Critical step) -RHR -Core Spray -Condensate

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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App 6A Condensate

1. VERIFY CLOSED the following Feedwater heater return valves:

3-FCV-3-71, HP HTR 3A1 LONG CYCLE TO CNDR

3-FCV-3-72, HP HTR 3B1 LONG CYCLE TO CNDR

3-FCV-3-73, HP HTR 3C1 LONG CYCLE TO CNDR.

2. VERIFY CLOSED the following RFP discharge valves:

3-FCV-3-19, RFP 3A DISCHARGE VALVE

3-FCV-3-12, RFP 3B DISCHARGE VALVE

3-FCV-3-5, RFP 3C DISCHARGE VALVE.

3. VERIFY OPEN the following drain cooler inlet valves:

3-FCV-2-72, DRAIN COOLER 3A5 CNDS INLET ISOL VLV

3-FCV-2-84, DRAIN COOLER 3B5 CNDS INLET ISOL VLV

3-FCV-2-96, DRAIN COOLER 3C5 CNDS INLET ISOL VLV

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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4. VERIFY OPEN the following heater outlet valves:

3-FCV-2-124, LP HEATER 3A3 CNDS OUTL ISOL VLV

3-FCV-2-125, LP HEATER 3B3 CNDS OUTL ISOL VLV

3-FCV-2-126, LP HEATER 3C3 CNDS OUTL ISOL VLV.

5. VERIFY OPEN the following heater isolation valves:

3-FCV-3-38, HP HTR 3A2 FW INLET ISOL VLV

3-FCV-3-31, HP HTR 3B2 FW INLET ISOL VLV

3-FCV-3-24, HP HTR 3C2 FW INLET ISOL VLV

3-FCV-3-75, HP HTR 3A1 FW OUTLET ISOL VLV

3-FCV-3-76, HP HTR 3B1 FW OUTLET ISOL VLV

3-FCV-3-77, HP HTR 3C1 FW OUTLET ISOL VLV

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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6. VERIFY OPEN the following RFP suction valves:

3-FCV-2-83, RFP 3A SUCTION VALVE

3-FCV-2-95, RFP 3B SUCTION VALVE

3-FCV-2-108, RFP 3C SUCTION VALVE.

7. VERIFY at least one condensate pump running.

8. VERIFY at least one condensate booster pump running.

9. ADJUST 3-LIC-3-53, RFW START-UP LEVEL CONTROL, to control injection (Panel 3-9-5).

10. VERIFY RFW flow to RPV.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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App 6D or 6E Core Spray Sys I (Loop II similar)

1. VERIFY OPEN the following valves:

3-FCV-75-2, CORE SPRAY PUMP 3A SUPPR POOL SUCT VLV

3-FCV-75-11, CORE SPRAY PUMP 3C SUPPR POOL SUCT VLV

3-FCV-75-23, CORE SPRAY SYS I OUTBD INJECT VALVE.

2. VERIFY CLOSED 3-FCV-75-22, CORE SPRAY SYS I TEST VALVE.

3. VERIFY CS Pump 3A and/or 3C RUNNING.

4. WHEN ... RPV pressure is below 450 psig, THEN ... THROTTLE 3-FCV-75-25, CORE SPRAY SYS I INBD INJECT VALVE, as necessary to control injection at or below 4000 gpm per pump.

5. MONITOR Core Spray Pump NPSH using Attachment 1.

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
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App 6B or 6C RHR Sys I (Loop II similar)

1. IF Adequate core cooling is assured AND It becomes necessary to bypass LPCI Injection Valve Timers to control injection, THEN ... EXECUTE EOI Appendix 16F concurrently with this procedure

2. VERIFY OPEN 3-FCV-74-1, RHR PUMP 3A SUPPR POOL SUCT VLV.

3. VERIFY OPEN 3-FCV-74-12, RHR PUMP 3C SUPPR POOL SUCT VLV.

4. VERIFY CLOSED the following valves:

3-FCV-74-61, RHR SYS I DW SPRAY INBD VLV

3-FCV-74-60, RHR SYS I DW SPRAY OUTBD VLV

3-FCV-74-57, RHR SYS I SUPPR CHBR/POOL ISOL VLV

3-FCV-74-58, RHR SYS I SUPPR CHBR SPRAY VALVE

3-FCV-74-59, RHR SYS I SUPPR POOL CLG/TEST VLV.

5. VERIFY RHR Pump 3A and/or 3C running.

6. WHEN ... RPV pressure is below 450 psig, THEN ... VERIFY OPEN 3-FCV-74-53, RHR SYS I LPCI INBD INJECT VALVE.

7. IF RPV pressure is below 230 psig, THEN ... VERIFY CLOSED 3-FCV-68-79, RECIRC PUMP 3B DISCHARGE VALVE.

XII. Crew Critical Tasks

Task

- 1) Manually isolate HPCI before 2 areas exceed Maximum Safe Radiation or Temperature levels.
- 2) Emergency depressurizes RPV based upon not being able to maintain reactor water level above -162, but before reaching - 200"
- 3) Restores / maintains water level above – 162" after ED

XIII. SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-3-2

9 Total Malfunctions Inserted; List: (4-8)

- 1) HPCI steam line break
- 2) RBCCW 3A pump trips
- 3) 3A Recirc. high vibration
- 4) 3A Recirc pump suction valve fails open and will not close
- 5) Failure of ADS/SRV 1-22
- 6) Drywell Leak
- 7) CRD pump 3B fails to start
- 8) CRD pump 3A trips
- 9) RCIC 71-8 fails to open

3 Malfunctions That Occur After EOI Entry; List: (1-4)

- 1) CRD pump 3B fails to start
- 2) CRD pump 3A trips
- 3) RCIC 71-8 fails to open

2 Abnormal Events; List: (1-3)

- 1) SRV fails open
- 2) HPCI steam line break

2 Major Transients; List: (1-2)

- 1) Loss of all high pressure makeup
- 2) Drywell Leak

3 EOIs used; List: (1-3)

- 1) EOI-1
- 2) EOI-2
- 3) EOI-3

2 EOI Contingencies Used; List: (0-3)

- 1) C1
- 2) C2

90 Run Time (minutes)

45 EOI Run Time (minutes); 50 % of Scenario EOI Run Time

3 Crew Critical Tasks (2-5)

Yes Technical Specifications Exercised (yes/no) - Technical Requirements Manual

XIV. Shift Turnover Information

Equipment out of service/LCOs: 3C RHR Pump is out of service. T.S 3.5.1.A.1,

3.6.2.3, 3.6.2.4, 3.6.2.5 have been entered. Unit 2 is 6 hours into a seven day LCO.

Appendix R LCO addressed and in LCO tracking.

Operation/Maintenance for the Shift: Unit 3 is at 79% power, Alternate EHC Pumps per section
of OI 47A. Increase reactor power to 85% using Recirc flow (GOI-100-12, step 5.132) with no
pre-conditioning limitations. Reactor Engineering will evaluate any further power changes.

Continue with 3-SR-3.5.1.7 which is in progress and is complete up to Step 7.11 (HPCI Main and
Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure).

Loop II RHR has been placed in Torus cooling and 3-SR-3.6.2.1.1 needs to be started 5 minutes
before starting HPCI. Units 1 & 2 are at 100% power,.

Unusual Conditions/Problem Areas: 3-FCV-73-36 seal-in circuit has been disabled per step 7.6 of
3-SR-3.5.1.7

BFN Unit 3	HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure	3-SR-3.5.1.7 Rev. 0047 Page 47 of 101
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Date _____

7.4 HPCI Main Pump and Booster Pump Testing (continued)

[11] **RECORD** following data:

Parameter/Indicator	Indicated Value	Acceptable Range
HPCI SYSTEM FLOW 3-FIC-73-33 or ICS	gpm	≥ 5,000 gpm
HPCI PUMP DISCH PRESS 3-PI-73-31A	psig	≥ _____ (Step 7.4[1.3])
HPCI TURBINE SPEED 3-SI-73-51	rpm	≥ 2,400 rpm
HPCI TURB EXH PRESS 3-PI-73-21A	psig	≤ 40 psig
REACTOR WIDE RANGE PRESS A 3-PI-3-54	psig	≥ 950 psig ≤ 1040 psig

_____(AC)

[12] **RECORD** following data:

Parameter/Indicator	Indicated Value	Acceptable Range
HPCI PUMP SUCT Press 3-PI-73-28A	psig	≥ 10 psig

BFN Unit 3	HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure	3-SR-3.5.1.7 Rev. 0047 Page 48 of 101
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Date _____

7.4 HPCI Main Pump and Booster Pump Testing (continued)

CAUTION

The HPCI pump set differential pressure is very sensitive to minor turbine speed and pump set flow adjustments. Therefore, it is anticipated that the UO will be required to make minor speed and flow rate adjustments in order to properly establish the ASME OM Code operating point.

- [13] **PLACE** HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33 in
MANUAL as follows:

DEPRESS the MANUAL operation mode transfer switch on
3-FIC-73-33. _____

- [14] **ADJUST** HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33
MANUAL operation lever, until approximately 3800 rpm on
HPCI TURBINE SPEED 3-SI-73-51. _____

- [15] **ADJUST** HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33
MANUAL operation lever, to achieve 3790 to 3810 rpm turbine
speed, using hand held tachometer.

AND

RECORD final turbine speed below:

HPCI Turbine Speed (M&TE) _____ rpm _____

- [16] **VERIFY** HPCI test condition flow rate as follows:

- [16.1] **IF** ICS is utilized to obtain HPCI flow rate data, **THEN**

CHECK that no gross instrument channel failures have
occurred by noting that ICS-displayed HPCI flow rate is
within 100 gpm of flow rate indicated on HPCI SYSTEM
FLOW/CONTROL 3-FIC-73-33. (Otherwise **N/A**) _____

BFN Unit 3	HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure	3-SR-3.5.1.7 Rev. 0047 Page 49 of 101
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Date _____

7.4 HPCI Main Pump and Booster Pump Testing (continued)

[16.2] **THROTTLE** 3-FCV-73-35, using HPCI PUMP CST TEST VLV, 3-HS-73-35A to obtain either of the following:

- An ICS display reading of 4950 to 5050 gpm.

OR

- 495 to 505 (4950 to 5050 gpm) as indicated on HPCI SYSTEM FLOW/CONTROL 3-FIC-73-33

[17] **ALLOW** HPCI pump set to operate until steady-state conditions are achieved, **THEN**

VERIFY conditions of Steps 7.4[15] and 7.4[16] are met.

NOTE

The indicator on 3-PI-73-31B may oscillate due to pump generated pressure pulses. Should this condition exist, an average between the predominate high and low readings should be recorded as the indicated value.

[18] **OBTAIN** the HPCI pump data as follows:

[19] On Panel 3-LPNL-25-0050

PERFORM the following:

[19.1] **OBSERVE** 3-PI-73-31B, while performing the following to verify unobstructed instrumentation.

CLOSE and **OPEN** PANEL ISOL VLV TO 3-PI-73-31B, 3-PISV-73-9013 several times.

[19.2] **IF** required to stabilize 3-PI-73-31B indicator, **THEN**

THROTTLE PANEL ISOL VLV TO 3-PI-73-31B, 3-PISV-73-9013, as required to stabilize 3-PI-73-31B.
(Otherwise **N/A**)

BFN Unit 3	HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure	3-SR-3.5.1.7 Rev. 0047 Page 50 of 101
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Date _____

7.4 HPCI Main Pump and Booster Pump Testing (continued)

NOTE

HPCI pump discharge pressure has no required range because it is a function of pump speed and flow.

[20] **COMPLETE** following table entries stipulated below:

Parameter/Indicator	Indicated Value	Required Value
HPCI SYSTEM FLOW 3-FIC-73-33 or ICS	gpm	4,950- 5,050 gpm
HPCI MAIN PUMP DISCH PRESS 3-PI-073-0031B (HPCI RM)	psig	SEE NOTE ABOVE
HPCI TURBINE SPEED HAND-HELD TACHOMETER	rpm	3790-3810 rpm
HPCI TURB EXH PRESS 3-PI-73-21A	psig	≤ 40 psig
REACTOR WIDE RANGE PRESS A 3-PI-3-54	psig	≥ 950 psig ≤ 1040 psig
HPCI PUMP SUCTION PRESS 3-PI-073-0028B (HPCI RM)	psig	≥ 10 psig

_____(AC)

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
SURVEILLANCE PROCEDURE

3-SR-3.6.2.1.1

SUPPRESSION CHAMBER WATER TEMPERATURE CHECK

REVISION 3

QUALITY RELATED

PREPARED BY: Keith Smith

RESPONSIBLE ORGANIZATION: OPERATIONS

APPROVED BY: TONY ELMS

EFFECTIVE DATE: 08/06/2003

LEVEL OF USE: **CONTINUOUS USE**

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003
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PAGES AFFECTED: 4, 6, 11,

REVISION DESCRIPTION: IC-04 - PER 03-011119-000

Page 4 Added step 3.6, explaining the reason the Suppression Pool Cooling should be minimized.

Page 6, Step 7.5, added reference to step 3.6.

Page 11, Added, steps 7.11 and 7.12, to remove the suppression pool cooling. This is to minimize the time that suppression pool temperature is in service.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 1 of 15
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1.0 INTRODUCTION

1.1 Purpose

This procedure is performed to monitor the Suppression pool average temperature in conformance with the requirements specified in Technical Specifications 3.6.2.1.

1.2 Scope

This procedure documents the surveillance requirements for suppression pool average temperatures and verification of frequency for different LCO requirements of Suppression pool average temperatures. This procedure monitors suppression pool average temperature while performing testing that adds heat to the suppression pool and also while not performing testing that adds heat to the suppression pool. This procedure is performed in conjunction with 3-SR-2 to fully satisfy SR 3.6.2.1.1.

1.3 Frequency

Surveillance Requirement 3-SR-3.6.2.1.1 is to be performed every 5 minutes when performing testing that adds heat to the suppression pool.

LCO 3.6.2.1 A.1 for Suppression pool average temperature $>95^{\circ}\text{F}$ but $\leq 110^{\circ}\text{F}$, and not performing testing that adds heat to the suppression pool, requires verification of temperature once per hour

LCO 3.6.2.1.A.2 for Suppression pool average temperature $>95^{\circ}\text{F}$ but $\leq 110^{\circ}\text{F}$, and not performing testing that adds heat to the suppression pool, has a required action to Restore suppression pool average temperature to $\leq 95^{\circ}\text{F}$ within 24 hours.

LCO 3.6.2.1.D.2 for Suppression pool average temperature $>110^{\circ}\text{F}$ but $\leq 120^{\circ}\text{F}$, requires verification that suppression pool average temperature $\leq 120^{\circ}\text{F}$ Once per 30 minutes.

1.4 Applicability

MODES 1,2, and 3.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 2 of 15
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2.0 References

2.1 Technical Specifications.

Section 3.6.2.1 Suppression Pool Average Temperature

Section 3.6.2.2 Suppression Pool Water Level

Section 3.6.2.6 Drywell to Suppression Chamber Differential pressure

2.2 FSAR

Section 5.2

Section 14.6

2.3 Plant Instructions

3-EOI-2, Primary Containment Control.

3-OI-71, RCIC System Operating Instruction.

3-OI-73, HPCI System Operating Instruction.

3-OI-74, RHR System Operating Instruction.

3-SR-2, Instrument Checks and Observations.

SPP-8.1, Conduct of Testing.

2.4 Plant Drawings

3-47E610-64-1, Mechanical Control Diagram - Primary Containment.

3-47E610-64-3, Mechanical Control Diagram - Primary Containment.

2.5 Other Documents

GE SIL No. 106 R2, Suppression Pool Temperature Monitoring and Control.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 3 of 15
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3.0 Precaution and Limitations

3.1 The following instrumentation shall be used for performance of this Surveillance Procedure:

3.1.1 Suppression pool temperature:

- At Panel 3-9-3, SUPPR POOL BULK TEMP, 3-TI-64-161, and SUPPR POOL BULK TEMP, 3-TI-64-162.
- At Panel 25-32, SUPPR POOL TEMPERATURE, 3-TI-64-55B.

3.1.2 Suppression pool level:

- At Panel 3-9-3, SUPPR POOL WATER LEVEL, 3-LI-64-54A,
or
- SUPPR POOL WATER LEVEL, 3-LI-64-66.

3.1.3 Drywell to suppression chamber differential pressure:

- At Panel 3-9-3, DW/SUPPR CHBR DIFF PRESS, 3-PDI-64-137,
or
- DW/SUPPR CHBR DIFF PRESS, 3-PDI-64-138.

3.1.4 Suppression Chamber Air Temperature:

At Panel 3-9-3, Suppression Chamber Temperature/Pressure, 3-XR-64-52 (Red Pen).

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 4 of 15
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- 3.2 Drywell to Suppression chamber differential pressure may fall below 1.1 psid during heat addition.
- 3.3 [NER/C] If RHR Suppression Pool Cooling is not in service, a potential for thermal stratification during ECCS component and relief valve testing exists. Monitoring the suppression pool using 3-TI-64-55B and 3-XR-64-52 (Red Pen) can give indication of potential thermal stratification. Increases in the difference between bulk temperature and these indicators may require Suppression Pool Cooling to obtain a valid temperature reading. [GE SIL 106 R2]
- 3.4 Tech Specs 3.6.2.1 requires entry into an LCO if Suppression Pool temperature is:
- Greater than 95°F with no testing being performed which adds heat to the Suppression Pool.
- or
- Greater than 105°F with testing being performed which adds heat to the Suppression Pool.
- 3.5 When Suppression Pool temperature is greater than 95°F but less than 105°F, while performing testing that adds heat to the Suppression pool, then the Tech Spec LCO 3.6.2.1 may be entered after removing the heat source from to the Suppression pool. (i.e. HPCI, RCIC and SRV's.)
- Tech Spec requires stopping any tests that is adding Heat to the Suppression Pool if Suppression Pool Temp is greater than 105°F.
- 3.6 Suppression Pool Cooling should be minimized per 3-OI-74. This is based upon water hammer on pump restart during a Station Blackout and a DBA LOCA, caused by draining portion of the system while in Suppression Pool Cooling. Therefore the time Suppression Pool Cooling is in service goes against the Safety Analysis time allowance.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 5 of 15
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DATE _____

INITIALS

4.0 PREREQUISITES

- 4.1 This copy of 3-SR-3.6.2.1.1 is verified the most current revision. _____
- 4.2 This procedure should be performed by the UO or his designee. _____

5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

None.

6.0 ACCEPTANCE CRITERIA

- 6.1 Responses which fail to meet the following acceptance criteria shall constitute unsatisfactory surveillance procedure results and require immediate notification of the Unit Supervisor at the time of failure.
- 6.1.1 When performing testing that adds heat to the suppression pool, verify suppression pool average temperature is within the applicable limits. The pool temperature shall be verified $< 105^{\circ}\text{F}$ and logged every 5 minutes until the heat addition is terminated.
- 6.1.2 Suppression pool average temperature shall be restored to $\leq 95^{\circ}\text{F}$ within 24 hours of exceeding 95°F when not performing testing that adds heat to the suppression pool.
- 6.1.3 Suppression pool average temperature shall be verified $\leq 110^{\circ}\text{F}$ once per hour when suppression pool average pool temperature $> 95^{\circ}\text{F}$ but $\leq 110^{\circ}\text{F}$.
- 6.1.4 Suppression pool average temperature shall be verified $\leq 120^{\circ}\text{F}$ once per 30 minutes when Suppression pool average temperature $> 110^{\circ}\text{F}$ but $\leq 120^{\circ}\text{F}$
- 6.2 Steps which determine the above criteria are designated by (AC) next to the initials blank.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 6 of 15
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DATE _____

INITIALS

7.0 PROCEDURE STEPS

7.1 All Precautions and Limitations in Section 3.0 have been reviewed. _____

7.2 All Prerequisites listed in Section 4.0 have been satisfied. _____

7.3 **RECORD** the date and time started, reason for test, and plant conditions on Attachment 1, Surveillance Procedure Review Form. _____

7.4 **MONITOR** suppression pool average temperature, suppression pool level, and drywell to suppression chamber differential pressure. _____

7.5 **VERIFY** suppression pool cooling is in service per 3-OI-74.
(REFER TO step 3.6.) _____

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 7 of 15
---------------	--	--

DATE _____

INITIALS

NOTE:

Steps 7.6, 7.7, 7.8, 7.9, 7.10 shall be performed concurrently during the performance of this procedure.

7.6 **IF** any test that adds heat to the Suppression Pool is being performed,
THEN:

MONITOR Suppression Pool Average Temperature as follows:
(Otherwise N/A this section.)

7.6.1 On Attachment 2, using Suppression Pool Average Temperatures 3-TI-64-161 and 3-TI-64-162. (Use additional copies of Attachment 2 as necessary.)

- **INITIATE** and **RECORD** Data in Table 1.1 every five minutes during heat addition.

And

VERIFY suppression pool average temperature $\leq 105^{\circ}\text{F}$ by
initialing on Attachment 2.

_____ (AC)

7.6.2 **IF** Suppression Pool average temperature $\geq 105^{\circ}\text{F}$, **THEN**

PERFORM the following: (Otherwise N/A.)

7.6.2.1 **SUSPEND** all testing that adds heat to the suppression pool
immediately.

_____ (AC)

7.6.2.2 **RECORD** the date and time on Attachment 2 Step C.

And

ENTER Tech Spec LCO.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 8 of 15
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DATE _____

INITIALS

NOTES:

- 1) Steps 7.6, 7.7, 7.8, 7.9, 7.10 shall be performed concurrently during the performance of this procedure.
- 2) Section 7.7 may be marked N/A if Suppression Pool Cooling is in service and table 1.2 on Attachment 2.

7.7 **IF** any test that adds heat to the Suppression Pool is being performed,
THEN:

[NER/C] **MONITOR** for thermal stratification.
(N/A this section if suppression pool cooling is in service.)

7.7.1 On Attachment 2,

INITIATE and **RECORD** data in Table 1.2 every 15 minutes,
(Use additional copies of Attachment 2's as necessary.)
[GE SIL 106 R2]:

- Suppression Pool Temperature using 3-TI-64-55B on Panel 3-25-32.
- Suppression Chamber Air Temperature using 3-XR-64-52 Red Pen on Panel 3-9-3.

7.7.2 **COMPARE** the four temperature readings taken on table 1.1 (step 7.6.1) and table 1.2 (step 7.7.1), that corresponds to the 15 minute time interval of step 7.7.1 on Attachment 2.

7.7.3 **IF** any instrument reading deviates more than 10°F from another instrument reading, **THEN**

INFORM the Unit Supervisor that temperature stratification (localized heating) may be occurring.

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 9 of 15
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DATE _____

INITIALS

NOTES:

1) Steps 7.6, 7.7, 7.8, 7.9, 7.10 shall be performed concurrently during the performance of this procedure.

2) Step 7.8.1 will be met if section 7.6 is being performed and monitoring every 5 minutes as required.

7.8 **WHEN** Suppression Pool average temperature becomes > 95°F, **THEN**

PERFORM the following: (N/A this section and Attachment 2 Step A and Step B, if 95°F average Suppression Pool temperature was never exceeded.)

7.8.1 On Attachment 2, Table 1.1 Suppression Pool Average Temperatures 3-TI-64-161 and 3-TI-64-162.
(Use additional copies of Attachment 2 as necessary.).

- **INITIATE** and **RECORD** the Suppression Pool Average Temperatures data Once per hour.

And

VERIFY suppression pool average temperature $\leq 110^{\circ}\text{F}$ by initialing on Attachment 2.

_____ (AC)

7.8.2 **RECORD** on Attachment 2 the condition that applies

- **IF** NO testing is being performed that adds heat to the Suppression Pool, **THEN**

RECORD the time and date on Attachment 2 Step A when the Suppression Pool average temperature becomes greater than 95°F and **ENTER** Tech Spec LCO.
(Otherwise N/A this step and N/A Attachment 2 Step A.)

- **IF** testing that does add heat to the Suppression Pool is being performed, **THEN**

RECORD the time and date that the test is secured on Attachment 2 Step B and **ENTER** Tech Spec LCO.
(Otherwise N/A this step and N/A Attachment 2 Step B.)

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 10 of 15
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DATE _____

INITIALS

NOTE:

Steps 7.6, 7.7, 7.8, 7.9, 7.10 shall be performed concurrently during the performance of this procedure.

7.9 **WHEN** Suppression pool average temperature is greater than 110°F,
THEN:

PERFORM the following: (Otherwise N/A this section and N/A Attachment 2 Step E.)

7.9.1 **RECORD** Time/Date Suppression pool average temperature exceeds 110 °F on Attachment 2 Step E. _____

7.9.2 **VERIFY** suppression pool average temperature $\leq 120^{\circ}\text{F}$ Once per 30 minutes and Log on Attachment 2 . _____

7.9.3 **PLACE** Reactor in MODE 4 in 36 hours. _____ (AC)

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 11 of 15
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DATE _____

INITIALS

NOTE:

Steps 7.6, 7.7, 7.8, 7.9, 7.10 shall be performed concurrently during the performance of this procedure.

7.10 **WHEN** Suppression Pool average temperature is restored to less than 95°F, **THEN**

PERFORM the following: (N/A this section and Attachment 2, Step D, if 95°F average Suppression Pool temperature was never exceeded.)

7.10.1 **RECORD** the time and date on Attachment 2, Step D. _____

7.10.2 **CALCULATE** time above 95°F by using times recorded in Steps 7.10.1 and the condition that applies in step 7.8.2:

Time above 95°F _____.

7.10.3 **VERIFY** time above 95°F is less than 24 hours.
(REFER TO Attachment 2.) _____ (AC)

7.11 **WHEN** desired Suppression Pool Temperature is achieved as determined by the Unit Supervisor, **THEN**

SECURE Suppression Pool Cooling per 3-OI-74. (REFER TO step 3.6.)
(N/A if suppression Pool Cooling will remain in service for another test.) _____

7.12 **IF** Suppression Pool Cooling is to remain in service, **THEN**

RECORD in Post Test Remarks and Narrative Logs the reason system will remain in service. (Otherwise N/A.) _____

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 12 of 15
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DATE _____

INITIALS

7.13 **COMPLETE** Attachment 1, Surveillance Procedure Review Form up to Unit Supervisor Review.

7.14 **NOTIFY** Unit 3 Operator this procedure is complete.

7.15 **NOTIFY** Unit Supervisor that this procedure is complete and provide status of any Corrective Actions or unsatisfactory performance.

8.0 ILLUSTRATIONS/ATTACHMENTS

8.1 Attachment 1 - Surveillance Procedure Review Form.

8.2 Attachment 2 - Suppression Pool Average Temperature Log .

END OF TEXT

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 13 of 15
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ATTACHMENT 1
(Page 1 of 1)

SURVEILLANCE PROCEDURE REVIEW FORM

REASON FOR TEST:	DATE/TIME STARTED_____
____Scheduled Surveillance	DATE/TIME COMPLETED_____
____System Inoperable (Explain in Remarks)	PLANT CONDITIONS_____
____Maintenance (WO No. _____)	
____Other (Explain in Remarks)	
PRE-TEST REMARKS:_____	

PERFORMED BY:		
<u>Initials</u>	<u>Name (Print)</u>	<u>Name (Signature)</u>
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Delays or Problems (If yes, explain in POST-TEST REMARKS)?	____Yes	____No
Acceptance Criteria Satisfied?	____Yes	____No
If the above answer is no, the Unit Supervisor shall determine if an LCO exists.		
LCO	____Yes	____No

UNIT SUPERVISOR_____ Date_____

=====

INDEPENDENT REVIEWER (SRO)_____ Date_____

=====

SCHEDULING COORDINATOR_____ Date_____

=====

POST-TEST REMARKS:_____

BFN UNIT 3	SUPPRESSION CHAMBER WATER TEMPERATURE CHECK	3-SR-3.6.2.1.1 Rev 0003 Page 15 of 15
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ATTACHMENT 2
(Page 2 of 2)

SUPPRESSION POOL AVERAGE TEMPERATURE LOG

Record the time and Date for the following conditions as required from the appropriate steps.

- A) [Step 7.8.2] Time/Date Suppression Pool average temperature exceeded 95°F while not performing any tests that adds heat to the suppression pool. (N/A if not applicable.)

_____/_____
Time Date

- B) [Step 7.8.2] Time/Date when the testing that adds heat to the Suppression Pool is secured with the average Suppression Pool temperature greater than 95°F. (N/A if not applicable.)

_____/_____
Time Date

- C) [Step 7.6.2.2] Time/Date Suppression Pool average temperature exceeded 105°F while performing testing that adds heat to the suppression pool. (N/A if not applicable.)

_____/_____
Time Date

- D) [Step 7.10.1] Time/Date Suppression Pool average temperature restored below 95°F. (N/A if not applicable.)

_____/_____
Time Date

- E) [Step 7.9.1] Time/Date Suppression pool average temperature exceeded 110 °F. (N/A if not applicable.)

_____/_____
Time Date

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL	10/08/2008		

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Lesson Title: RETURN 3A RFP TO SERVICE FROM WARMING MODE, RETURN POWER TO 100% WITH CONTROL ROD WITHDRAWAL AND RECIRC FLOW INCREASE, LOSS OF 4KV SHUTDOWN BOARD 3EA, LOW OIL LEVEL ON 3B CORE SPRAY PUMP, INADVERTENT HPCI INITIATION AND INJECTION, EHC PUMP LEAK/SCRAM, ATWS/FUEL FAILURE, BPV FAIL CLOSED.
- IV. Length of Lesson: 1.5 hour
- V. Examination Objectives
 - A. Terminal Objectives
 - 1. Perform routine shift turnover, plant assessment, and routine shift operation in accordance with BFN procedures.
 - 2. Given uncertain or degrading conditions, the operating crew will use team skills to conduct proper diagnostics and make conservative operational decisions to remove equipment/unit from operation. (SOER 94-1 and SOER 96-01)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, abnormal, annunciator and emergency procedures.
 - 4. Use step text procedural compliance (WANO).

B. Enabling Objectives

1. The operating crew will return 3B RFP to service.
2. The operating crew will increase Rx power with control rod withdrawal and Recirc flow increase
3. The operating crew will recognize and respond to a low oil level in 3B Core Spray pump.
4. The operating crew will recognize and respond to a Loss of 4KV Shutdown Board 3EA, (Loss of CRD Pump 3B).
5. The Operating Crew will recognize and respond to an inadvertent initiation and injection of the HPCI system.
6. The Operating Crew will respond to an un-isolable EHC Leak and manually scram the reactor.
7. The Crew will respond to a Hydraulic ATWS and Fuel Failure without bypass valves by inserting control rods and lowering level.

- VI. References: The procedures used in the simulator are controlled copies and are used in development and performance of simulator scenarios. Scenarios are validated prior to use, and any procedure differences will be corrected using the procedure revision level present in the simulator. Any procedure differences noted during presentation will be corrected in the same manner. As such, it is expected that the references listed in this section need only contain the reference material which is not available in the simulator.
- VII. Training Materials: **(If needed, otherwise disregard)**
- A. Calculator
 - B. Control Rod Insertion Sheet
 - C. Stopwatch
 - D. Hold Order / Caution tags
 - E. Annunciator window covers
 - F. Steam tables

VIII. Console Operators Instructions

A. Scenario File Summary

MF/RF/IOR#

Description

File: bat HLTS 3-5

- a. bat atws95east
- b. imf th23 (e1 1:00) 20 4:00

ATWS
Fuel failure

File bat HLTS 3-5-1

- a. mrf dg01a open
- b. mrf dg04a stop

Open 3EA DG logic breaker
locally stop 3EA DG

File bat SGT_Stop

- a. mrf pc01a stop
- b. mrf pc01b stop
- c. mrf pc01c stop

VIII. Console Operators Instructions

G. Console Operators Manipulations

<u>ELAP TIME</u>	<u>IC/MF/RF</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup		IC-26 73% power MOC (Snap 247)
Sim. Setup		See Scenario Summary (bat HLTS3-5)
Sim. Setup	manual	Verify 3A CRD pump OOS and 3B CRD pump I/S

ROLE PLAY: When called to close 3-6-155 and 3-6-156 report that they are closed.

When 3B RFP is returned to Auto and all control rods have been withdrawn

Loss of 4KV Shutdown Bd. 3EA (imf ed09a)

ROLE PLAY: Plant AUO reports that 4KV Shutdown Board indicates that the feeder breaker Overcurrent flag is up and the bus is locked out.

ROLE PLAY: AUO reports back to the Control Room that the 3A CRD pump is operating normally if requested to by Control Room operators.

If requested to re-start RPS MG set:

Restart RPS MG set (mrf rp01 reset)

If requested to secure SBT

Secures A SBT
Secures B SBT
Secures C SBT
(bat SGT_stop)

If requested to secure "3EA" DG locally

Opens logic breaker and shuts down the "3EA" DG (bat HLTS3-5-3)

If requested to secure CREV:

Secure "A" CREV (mrf fp05a)

If requested to reset ATU gross failure alarms in Aux Instrument Room:

Reset ATU gross failures (mrf rp09 reset)

VIII. Console Operators Instructions

B. Console Operators Manipulations

ELAP TIME	DESCRIPTION/ACTION
If directed to re-close VFD cooling water pumps 3A1 and 3B1:	Re-close VFD Cooling Water Pump breaker for 3A1 (mrf th18a close)
Then:	Re-close VFD Cooling Water Pump breaker for 3B1 (mrf th18b close)
When directed to restart UPS AC motor generator:	(ior an:ov:xa558b[35] alarm_off)

ROLE PLAY: When Fuel Pool Cooling pumps are being re-started, provide completed Appendix A form required by 3-OI-78 step 5.1 [7.1]. (attached)

ROLE PLAY: When directed, report FPC F/D BYPASS ISOL VLV A, 3-FCV-078-66 is OPEN.

ROLE PLAY: When directed, report FPC PUMP 3A (3B) DISCH PRESS LOW, 3-PIS-78-11 (16) indicates >120 psig.

ROLE PLAY: When directed by the Chief Examiner: Call the Unit Operator and report, as the Reactor Building AUO, that you discovered that 3B Core Spray pump oil level is NOT visible in the sight glass.

When directed by Chief Examiner:

Inadvertent HPCI initiation. (imf hp01)

When directed by Chief Examiner, Insert EHC Leak

High pressure EHC leak (imf tc07 50)

VIII. Console Operators Instructions

C. Console Operators Manipulations

ELAP TIME

DESCRIPTION/ACTION

ROLE PLAY: AUO sent to respond to the EHC leak reports that a weld has blown out on the common discharge piping of the EHC system. EHC high pressure fluid is spraying on the EHC skid. System isolation is not possible.

When Reactor is scrammed	Restores SDV hi level alarms (bat SDV)
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If requested to perform App. 1F and 2, wait 5 minutes	Bypasses scrams and ARI (bat app01f) (bat app02)
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When scram is reset	Deletes ATWS (bat atws-1)
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If requested to close 3-85- 586, wait 5 minutes	Closes 3-85-586 (mrf rd06 close)
--	----------------------------------

ROLE PLAY: AUO Reports that the 3-85-586 is closed

If requested to perform App. 8A,E, wait 2 minutes (make sure an actual group 6 exists before inserting)	Bypasses low level interlocks on MSIVs, Reactor Bldg. Ventilation (bat app08ae)
--	--

If requested to open 3-85-586 then:	Opens 3-85-586 (mrf rd06 open)
--	--------------------------------

ROLE PLAY: AUO Reports that the 3-85-586 is open

Terminates the scenario when the following conditions are satisfied or upon request of Lead Evaluator:

1. All rods are inserted.
2. Water level has been restored + 2" to + 51" with feedwater.
3. A cooldown has begun.

IX. Scenario Summary

The unit is at 73% power with the 3A CRD Pump in standby and ready for a PMT this shift. The crew will return 3B RFP to service and increase power with a combination of control rod withdrawal and recirc flow increase.

The crew will experience a trip of the normal feeder breaker to the "3EA" 4KV Shutdown Board (Bus lockout). The 3B CRD Pump will trip and 3A CRD pump will be placed in-service.

The 4KV bus lockout will also result in a loss of the following equipment:

- RPS Bus "A"
- RBCCW pump 3A and closure of 70-48
- RWCU isolation due to loss of RBCCW flow
- Fuel Pool Cooling pump 3A trip
- SJAE "A" trip
- Recirc VFD Cooling water pumps

The crew will respond to a report of low oil in the 3B Core Spray pump.

The Crew will respond to an inadvertent initiation and injection of HPCI without a valid initiation signal. The SRO will address actions required by Technical Specifications.

An EHC high pressure leak will require the crew to manually scram the Reactor. An ATWS and subsequent fuel failure also occur. Turbine Bypass Valve accumulators bleed down and cause the Bypass Valves to close.

The crew will control RPV pressure using alternate pressure control systems.

The crew will lower RPV level and control level between – 50" and TAF using feedwater and condensate.

X. Information to Evaluators:

- A. Ensure recorders are inking and recording and ICS is active and updating.
- B. Assign Crew Positions based on the required rotation.
 - 1. SRO: Shift Manager/Unit Supv. _____
 - 2. ATC: Board Unit Operator _____
 - 3. BOP: Desk Unit Operator _____
- C. Conduct a shift turnover with the Shift Manager and provide the Shift Manager with a copy of the Shift Turnover.
- D. Direct the shift crew to review the control board and take note of present conditions, alarms, etc.
- E. Terminate the scenario when the following conditions are satisfied are at the request of the floor/lead instructor/evaluator.
 - 1. All rods inserted
 - 2. Water level restored +2" - +51" with feed water.
 - 3. Cooldown started on SRVs and/or alternate pressure control systems

XI. Simulator Event Guide

EVENT 1: Place 3B RFP back in service and increase Rx power with control rod withdrawal and Recirc flow increase.

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs placing 3B RFP back in service per 3-OI-3 section 5.7
BOP	_____	Places 2B RFP back in service iaw 3-OI-3 section 5.7 <ul style="list-style-type: none"> • Closes 3-FCV-6-125, LP above seat drains • Closes 3-FCV-6-126, LP below seat drains • Closes 3-FCV-6-127, HP above seat drains • Closes 3-FCV-6-128, HP below seat drains • Closes 3-FCV-6-129, 1st stage drains <p>Calls AUO to close 3-6-155 and 3-6-156</p>
ATC	_____	Performs peer check of RFP return to service
SRO	_____	Directs power increase per the RCP and 3-GOI-100-12 Notifies ODS of impending power increase
ATC	_____	Increases Rx power with control rod withdrawal When all remaining control rods are withdrawn, commences Recirc flow increase at the PC rate.

Event Terminus: 3B RFP returned to service and all remaining control rods have been withdrawn.

XI. Simulator Event Guide

EVENT 2: Loss of 4KV Shutdown Board "3EA" (Bus Lockout)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
CREW	___	Identifies/Reports a loss of 4KV S/D Board "3EA"
BOP	___	Recognizes 3EA D/G starts and fails to load
BOP	___	Attempts to load DG by placing 0-HS-211-A-22A in close and recognizes failure to close
ATC	___	Recognizes 3B CRD pump trip
Crew	___	Identifies loss of power to RHR 3A, CS 3A, and RHRSW A3.
Crew	___	Identifies loss of power to 3A RBCCW pump and closure of 70-48 sectionalizing valve.
Crew	___	Identifies loss of operating SJAE.
Crew	___	Identifies RWCU pumps tripped due to NRHX high temperature.
Crew	___	Identifies loss of Fuel Pool Cooling Pump 3A.
BOP	___	Dispatches AUO to 4KV SD Bd 3EA
SRO	___	Directs 3EA D/G shutdown per 3-OI-82 and AUO to monitor while running
SRO	___	Directs 480 VAC Shutdown board 3A transfer to alternate per OI-57B and ARPs
SRO	___	Contacts Electrical Maintenance to trouble shoot the 4KV SD Bd

XI. Simulator Event Guide

EVENT 3: **System Restoration following 4KV SD Board 3EA loss**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	___	Directs placing 3A CRD pump in service per 3-AOI- 85-3
ATC	___	Places 3-FIC-85-11 in Man. and Minimum Starts 3A CRD pump 3-HS-85-1A in start Adjusts 3-FIC-85-11 to establish Delta-P, Flow Places 3-FIC-85-11 in Auto
SRO	___	Enters T.S. LCO 3.8.7 and declares "A" DG INOP (3.8.1) 7 days Declares 'A' Shutdown Board INOP (5 days) Enters Appendix R LCO for DG and S/D board Directs power availability SR performed Direct Unit 1 UO to perform ILL-3 of 0-OI-57B
BOP	___	Verifies all SGT starts and Refuel Ventilation isolates
BOP	___	Directs AUO to shutdown DG "3EA" per OI-82
SRO	___	Directs SBGT and Ventilation restored to normal after BOP transfers 3A S/D bd to alt and restores RPS
BOP	___	Utilizes 3-AOI-64-2D to restore ventilation.
	___	Takes 3-HS-64-3A to off then back to either SLOW A or SLOW B
ATC/ BOP	___	Restores RBCCW and re-opens 70-48 per 3-OI-70.
ATC/ BOP	___	Restores RWCU to operation per 3-OI-69.
BOP	___	Restores SJAE per 3-OI-66
BOP	___	Restores Fuel Pool Cooling per 3-OI-78

Event Terminus: Tech. Specs addressed and systems returned to normal

XI. Simulator Event Guide

EVENT 4: Low Oil Level on 3B Core Spray pump

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	___	Recognizes Tech Spec operability issue with low oil level on 3B Core Spray pump.
SRO	___	Addresses Tech Spec section 3.5.1.H.1 and determines that 3.0.3 must be entered immediately.
SRO	___	Initiates a Priority 1 Work Order to restore 3B Core Spray pump oil level.
SRO	___	Recognize that a 4-hour report to the NRC is required due to a Tech Spec required shutdown.
SRO	___	Directs ATC to halt power ascension.

Event Terminus: Tech Spec evaluation complete and Priority 1 WO issued to restore 3B Core Spray pump oil level.

XI. Simulator Event Guide

EVENT 5: Inadvertent HPCI initiation without a valid signal

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Recognizes and responds to an inadvertent HPCI initiation and reports it to the SRO.
BOP	_____	Verifies by multiple indications that the initiation signal is not valid and reports it to the SRO.
SRO	_____	Directs BOP to trip HPCI and place the Aux Oil Pump in Pull-to-Lock.
SRO	_____	Addresses Tech Spec section 3.5.1.D and determine that HPCI must be returned to service in 72 hours with 3A RHR and 3A Core Spray INOPERABLE.
SRO	_____	Directs Instrument Mechanics to investigate the HPCI initiation logic.

XI. Simulator Event Guide

EVENT 6: **EHC LEAK / SCRAM**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Recognizes and reports "EHC Reservoir Level Low "Alarm
BOP	_____	Responds per ARP 3-XA-55-7B
BOP	_____	Monitors EHC pump for fluctuations in amperage and pressure
SRO	_____	Dispatches AUO's to add fluid and find leak
SRO	_____	Contact Environmental to help contain EHC fluid
SRO	_____	Directs Radwaste to lockout floor and equipment drain sumps
ATC/ BOP SRO	_____	Reports low EHC pressure
	_____	Directs ATC to insert manual Scram and enter AOI-100-1 Directs BOP to trip turbine and lockout EHC pumps
ATC	_____	Inserts Manual Scram and takes actions per AOI-100-1
BOP	_____	Locks out EHC pumps by placing 3-HS-47-2A in Pull To Lock 3-HS-47-1A in Pull To Lock

XI. Simulator Event Guide

Event 7: **ATWS / FUEL FAILURE**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Reports all rods not in and performs the following: <ul style="list-style-type: none">• Mode Switch to SHUTDOWN• Initiates ARI• Recognizes and reports power is greater than 5% and Recirc Pumps NOT tripped• Inserts SRMs/IRMs
SRO	_____	Enters EOI-1 and C5 and directs/ensures the following: <ul style="list-style-type: none">• Mode Switch to SHUTDOWN• ARI Initiated (both channels)• Recirc Pumps reduced to minimum and tripped
SRO	_____	Directs ADS inhibited
BOP	_____	Inhibits ADS
SRO	_____	Directs appendix 4 to lower water level until level < -50"
ATC	_____	Lowers RFP speed to 600 RPM or until level reaches -50"
BOP	_____	Performs Appendix 4, locks out HPCI

XI. Simulator Event Guide

Event 7: **ATWS / FUEL FAILURE** (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs Appendix 1F, 2, and 1D be performed
SRO	_____	Directs 8A, 8E be performed
BOP	_____	Recognizes turbine trip and loss of Bypass valves as accumulators depressurize
SRO	_____	Directs reactor pressure maintained less than 1073 psig with one or more of the following: - MSRV's - Main steam line drains - RFP's
BOP	_____	Reports Torus temp >95 and or drywell pressure above 2.45 psig (if applicable)
SRO	_____	Enters EOI-2 and directs all available S/P cooling placed in service per Appx. 17A and directs venting per Appx. 12
BOP	_____	Reports TB High Rad'n alarm and evacuates appropriate areas
	_____	Reports OG Pretreatment Rad High Alarm
BOP	_____	Maintains reactor pressure less than 1073 with one or more of the following: - MSRV's - Main Steam Line drains (App 11D) - RFP (App 11F)
ATC	_____	Directs AUO to close 3-85-586 per Appendix 1D if necessary
SRO	_____	Directs SLC Injection before Torus Temperature reaches 110 deg F
ATC	_____	Injects SLC per Appx. 3A

XI. Simulator Event Guide

Event 7: **ATWS / FUEL FAILURE (continued)**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Recognizes and Reports the Reactor Building Area Radiation monitors are in alarm and Rad levels in the Rx Building are increasing.
SRO	_____	Orders evacuation of the Reactor Building, Notifies Rad Con, Ensures announcements are made. Enters EOI-3 on Rx Bldg Hi rad
BOP	_____	Places suppression pool cooling in service per appendix 17A
ATC	_____	When 3-85-586 closed or scram reset, Bypasses RWM, Drives rods utilizing EMERGENCY IN in a spiral manner per Appendix 1D
ATC	_____	Resets scram, Verifies SDV vents and drains open, Monitors SDV High level alarms
ATC	_____	After SDV drained the BUO directs the 3-85-586 valve opened, and inserts another manual scram after all the accumulators have recharged per appendix 1F
ATC	_____	Verifies rod motion and reports that all control rods are fully inserted
SRO	_____	Exits EOI-1, RC/Q after rods are inserted or SLC tank level is <43%.

XI. Simulator Event Guide

Event 7: **ATWS / FUEL FAILURE (continued)**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs RPV level restored and maintained + 2" to + 51" RWL
SRO	_____	Directs termination of SLC injection if the system was initiated
ATC	_____	Maintains RPV level within band as directed by SRO
SRO	_____	Declares a Site Area Emergency per EPIP-1 EAL 1.2-S

XI. Simulator Event Guide

XII. Crew Critical Tasks

	<u>TASK</u>	<u>SAT/UNSAT</u>
1.	Inhibits ADS	_____
2.	Control power by one or more of the following: - Lowers RWL to <-50" per C-5 - Insert control rods per RC/Q	_____
3.	Inject SLC prior to exceeding 110 deg F Torus temperature per RC/Q.	_____

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-3-5

- 5 Total Malfunctions Inserted; List: (4-8)
 - 1. Loss of 4KV Shutdown Board
 - 2. Inadvertent HPCI initiation
 - 3. EHC Leak
 - 4. ATWS
 - 5. Fuel Failure

- 1 Malfunctions That Occur After EOI Entry; List: (1-4)
 - 1. Fuel failure

- 2 Abnormal Events; List: (1-3)
 - 1) Loss of 4KV Shutdown Board (CRD Pump)
 - 2) Inadvertent HPCI initiation

- 1 Major Transients; List: (1-2)
 - 1) ATWS/Fuel Failure

- 3 EOIs used; List: (1-3)
 - 1) EOI-1
 - 2) EOI-2
 - 3) EOI-3

- 1 EOI Contingencies Used; List: (0-3)
 - 1) C5

- 75 Run Time (minutes)

- 35 EOI Run Time (minutes); 46.6 % of Scenario EOI Run Time

- 3 Crew Critical Tasks

- Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs 3A CRD Pump ready for PMT after speed increaser inspection, Mechanical Maintenance due to perform this shift. 3B CRD pump is in Service. 3B RFP is warming after maintenance to the oil system.

Operations/Maintenance For the Shift

The Reactor is at 73% Power because Recirc Pump 3A VFD tripped last night due to a logic card Failure. Power was being restored when an oil leak developed on the 3B RFP. The 3B RFP was leaking at approximately 1 gallon every 30 minutes.

Maintenance has completed repairs and the clearance is picked up. The RFP was placed in warming last shift. Plans are to return 3B RFP to service per 3-OI-3 section 5.7 and place in Auto and return reactor power to 100% with control rod withdrawal and Recirc flow per 3-GOI-100-12 step 5 [17.5]

Unusual Conditions/Problem Areas Remnants of Hurricane Hermon will pass thru this area today, severe weather is possible.



Browns Ferry Nuclear Plant

Unit 3

Surveillance Procedure

3-SR-3.8.7.1

**Weekly Check of Power Availability to Required AC and DC Power
Distribution Subsystems**

Revision 0011

Quality Related

Level of Use: Continuous Use

Effective Date: 11-04-2007

Responsible Organization: OPS, Operations

Prepared By: Michael S. Rice

Approved By: John T. Kulisek

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 2 of 14
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Current Revision Description

Pages Affected: All

Type of Change: XP conversion

Tracking Number: 013

PCRs: 07000440

This procedure has been converted from word 95 to word 2003 (XP) using Rev 10.
(PCR 07000440)

Minor editorial changes throughout. No rev bars.

Added step 7.0[3] to notify the Unit Operator the test is about to commence to provide consistency with other procedures.

Added SR key number to Attachment 1 for scheduling.

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 3 of 14
-----------------------	---	--

Table of Contents

1.0	INTRODUCTION	4
1.1	Purpose	4
1.2	Scope.....	4
1.3	Frequency.....	4
1.4	Applicability.....	4
2.0	REFERENCES	5
2.1	Technical Specifications	5
2.2	UFSAR.....	5
2.3	Plant Instructions	5
2.4	Plant Drawings.....	5
3.0	PRECAUTIONS AND LIMITATIONS	6
4.0	PREREQUISITES.....	7
5.0	SPECIAL TOOLS AND RECOMMENDED EQUIPMENT	7
6.0	ACCEPTANCE CRITERIA	7
7.0	PROCEDURE STEPS	8
8.0	ILLUSTRATIONS/ATTACHMENTS	13
	Attachment 1: Surveillance Procedure Review Form.....	14

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 4 of 14
-----------------------	---	--

1.0 INTRODUCTION

1.1 Purpose

This procedure is performed to verify indicated power availability to required AC and DC electrical power distribution subsystems presented in Unit 3 Technical Specification (Bases) Table B 3.8.7-1 in conformance with the requirements specified in Technical Specification Surveillance Requirements (SR) 3.8.7.1 and 3.8.8.1.

1.2 Scope

This procedure verifies the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures the required power is readily available for motive as well as control functions for critical system loads connected to these buses.

This procedure and 2-SR-3.8.7.1 fully satisfies Unit 3's SR 3.8.7.1 and 3.8.8.1.

1.3 Frequency

Once every seven days.

1.4 Applicability

Modes 1, 2, 3, 4, and 5, during movement of irradiated fuel assemblies in the secondary containment.

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 5 of 14
-----------------------	---	--

2.0 REFERENCES

2.1 Technical Specifications

Section 3.8.7, Distribution Systems - Operating.

Section 3.8.8, Distribution Systems - Shutdown.

2.2 UFSAR

Section 8.4, Normal Auxiliary Power System.

Section 8.5, Standby A-C Power Supply and Distribution.

Section 8.6, 250 - VDC Power Supply and Distribution.

2.3 Plant Instructions

OPDP-1, Conduct of Operations.

SPP-8.1, Conduct of Testing.

2.4 Plant Drawings

0-15E500-1, Key Diagram of Standby Auxiliary Power System.

3-15E500-3, Key Diagram of Normal & Standby Auxiliary Power System.

0-45E701-1, Wiring Diagram, Battery Bd 1, Panels 1-7, Single Line.

0-45E702-1, Wiring Diagram, Battery Board 2, Panels 1-7, Single Line.

0-45E703-1, Wiring Diagram, Battery Board 3, Panels 1-7, Single Line.

0-45E709-1, Wiring Diagram, Shutdown Bds 250V Btry & Chgr, Single Line.

3-45E709-2, Wiring Diagram, Shutdown Bds 250V Btry & Chgr, Single Line.

<p>BFN Unit 3</p>	<p>Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems</p>	<p>3-SR-3.8.7.1 Rev. 0011 Page 6 of 14</p>
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3.0 PRECAUTIONS AND LIMITATIONS

- A. This procedure may be performed in any plant operating condition subject to the approval of the Unit Supervisor (US).
- B. This procedure will require the performer to obtain various readings from local indications since all required readings are **NOT** available from any Control Room.
- C. 480V Shutdown Board, 480V Diesel Auxiliary Board, SGT Board, 480V RMOV Board D or E voltages that appear to exceed 500 volts requires EM assistance in verifying the AØ to BØ, BØ to CØ, and CØ to AØ voltages using a multimeter. Measured voltages exceeding 508 volts requires notification of Site Engineering.
- D. When the voltage for an electrical board appears to be outside its allowable range, the event should be recorded in the post-test remarks and a Work Order should be generated to have Electrical Maintenance verify the board voltage.

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 7 of 14
-----------------------	---	--

Date _____

4.0 PREREQUISITES

- [1] **VERIFY** this copy of the Surveillance Procedure is verified the most current revision. _____
- [2] **VERIFY** one (1) operator is available to perform this surveillance procedure. _____
- [3] **VERIFY** Electrical Maintenance personnel are informed that this Surveillance Procedure is to be performed in order to obtain 480V SGT BD voltage. _____

5.0 SPECIAL TOOLS AND RECOMMENDED EQUIPMENT

- [1] Analog or Digital Multimeter (**N/A** if **NOT** used)

ID Number: _____ Cal Due Date: _____

6.0 ACCEPTANCE CRITERIA

- A. Responses which fail to meet the acceptance criteria stated in Section 6.0 shall constitute unsatisfactory surveillance procedure results and require immediate notification of the Unit Supervisor at the time of failure and documentation in accordance with SPP-8.1, Conduct of Testing.
 - 1. AC and DC electrical power distribution subsystem is functioning properly, as verified by the buses energized and proper voltage is available on the buses.
- B. Steps which determine the above criteria are designated by (AC) next to the initials blank.

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 8 of 14
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Date _____

7.0 PROCEDURE STEPS

[1] **VERIFY** the following initial conditions:

- All Precautions and Limitations in Section 3.0 have been reviewed. _____
- All Prerequisites listed in Section 4.0 are satisfied. _____

[2] **OBTAIN** permission from the Unit Supervisor (US) to perform this procedure. _____

US

[3] **NOTIFY** Unit Operator (UO) that this test is about to commence. _____

[4] **RECORD** the date and time started, reason for test, and plant conditions on Attachment 1, Surveillance Procedure Review Form. _____

NOTES

- 1) The following steps can be performed in any convenient order.
- 2) Specific voltmeters are **NOT** listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[5] **VERIFY** proper voltage available for the following boards and **RECORD** voltages:

A. 4KV SD BD A VOLTAGE (See Step 7.0[6])

Voltage _____ (3950 - 4400 VOLTS) _____

B. 4KV SD BD B VOLTAGE (See Step 7.0[6] and 7.0[7])

Voltage _____ (3950 - 4400 VOLTS) _____

C. 4KV SD BD D VOLTAGE (See Step 7.0[7])

Voltage _____ (3950 - 4400 VOLTS) _____

D. 4KV SD BD 3EA VOLTAGE

Voltage _____ (3950 - 4400 VOLTS) _____ (AC)

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 9 of 14
-----------------------	---	--

Date _____

7.0 PROCEDURE STEPS (continued)

E. 4KV SD BD 3EB VOLTAGE

Voltage_____ (3950 - 4400 VOLTS) _____(AC)

F. 4KV SD BD 3EC VOLTAGE

Voltage_____ (3950 - 4400 VOLTS) _____(AC)

G. 4KV SD BD 3ED VOLTAGE

Voltage_____ (3950 - 4400 VOLTS) _____(AC)

CAUTION

480V Shutdown Board, 480V Diesel Auxiliary Board, SGT Board, 480V RMOV Board D or E voltages that appear to exceed 500 volts requires EM assistance in verifying the AØ to BØ, BØ to CØ, and CØ to AØ voltages locally using a multimeter. Measured voltages exceeding 508 volts requires notification of Site Engineering.

NOTE

IF EM measures voltage locally at a 480 volt board due to indicating greater than 500 volts, only the highest reading Ø to Ø voltage need be recorded.

H. 480V SD BD 1A VOLTAGE

Voltage_____

• **VERIFY** Voltage \geq 440 VOLTS _____(AC)

• **VERIFY** Voltage \leq 508 VOLTS _____

I. 480V SD BD 3A VOLTAGE

Voltage_____

• **VERIFY** Voltage \geq 440 VOLTS _____(AC)

• **VERIFY** Voltage \leq 508 VOLTS _____

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 10 of 14
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Date _____

7.0 PROCEDURE STEPS (continued)

J. 480V SD BD 3B VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

K. 480V RMOV BD 3A VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)

L. 480V RMOV BD 3B VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)

M. 480V RMOV BD 3D VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

N. 480V RMOV BD 3E VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

O. 480V SGT BD VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 11 of 14
---------------	--	--

Date _____

7.0 PROCEDURE STEPS (continued)

P. 480V DSL AUX BD A VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

Q. 480V DSL AUX BD B VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

R. 480V DSL AUX BD 3EA VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

S. 480V DSL AUX BD 3EB VOLTAGE

Voltage_____

- **VERIFY** Voltage \geq 440 VOLTS _____(AC)
- **VERIFY** Voltage \leq 508 VOLTS _____

T. 250V Unit DC BD 1 (Battery BD 1) VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

U. 250V Unit DC BD 2 (Battery BD 2) VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

V. 250V Unit DC BD 3 (Battery BD 3) VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 12 of 14
-----------------------	---	---

Date _____

7.0 PROCEDURE STEPS (continued)

W. 250V DC RMOV BD 3A VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

X. 250V DC RMOV BD 3B VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

Y. 250V DC RMOV BD 3C VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

Z. 250V SD BD DC DISTRIBUTION PANEL SB-A
VOLTAGE (See Step 7.0[8])

Voltage_____ (248 - 280 VOLTS) _____

AA. 250V SD BD DC DISTRIBUTION PANEL SB-B
VOLTAGE (See Step 7.0[8] and 7.0[9])

Voltage_____ (248 - 280 VOLTS) _____

BB. 250V SD BD DC DISTRIBUTION PANEL SB-D
VOLTAGE (See Step 7.0[9])

Voltage_____ (248 - 280 VOLTS) _____

CC. 250V SD BD DC DISTRIBUTION PANEL SB-3EB
VOLTAGE

Voltage_____ (248 - 280 VOLTS) _____(AC)

[6] **CHECK** 4KV SD BD A OR 4KV SD BD B VOLTAGE is
satisfactory (See Steps 7.0[5]A and 7.0[5]B). _____(AC)

[7] **CHECK** 4KV SD BD D OR 4KV SD BD B VOLTAGE is
satisfactory (See Steps 7.0[5]B and 7.0[5]C). _____(AC)

[8] **CHECK** 250V SD BD DC DISTRIBUTION PANEL A OR 250V
SD BD DC DISTRIBUTION PANEL B VOLTAGE is
satisfactory (See Steps 7.0[5]Z and 7.0[5]AA). _____(AC)

[9] **CHECK** 250V SD BD DC DISTRIBUTION PANEL D OR 250V
SD BD DC DISTRIBUTION PANEL B VOLTAGE is
satisfactory (See Steps 7.0[5]AA and 7.0[5]BB). _____(AC)

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 13 of 14
-----------------------	---	---

Date _____

7.0 PROCEDURE STEPS (continued)

[10] **COMPLETE** Attachment 1, Surveillance Procedure Review Form, up to Unit Supervisor Review. _____

[11] **NOTIFY** the Unit Supervisor (US) this surveillance procedure is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory performances. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1 - Surveillance Procedure Review Form.

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0011 Page 14 of 14
-----------------------	---	---

**Attachment 1
(Page 1 of 1)**

Surveillance Procedure Review Form

REASON FOR TEST:

- ☐ Scheduled Surveillance
- ☐ System Inoperable (Explain in Remarks)
- ☐ Maintenance (WO No. _____)
- ☐ Other (Explain in Remarks)

DATE/TIME STARTED _____

DATE/TIME COMPLETED _____

PLANT CONDITIONS _____

PRE-TEST REMARKS: _____

PERFORMED BY:

<u>Initials</u>	<u>Name (Print)</u>	<u>Name (Signature)</u>
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Delays or Problems (If yes, explain in POST-TEST REMARKS)? ☐ Yes ☐ No

Acceptance Criteria Satisfied? ☐ Yes ☐ No

If the above answer is no, the Unit Supervisor shall determine if an LCO exists. LCO ☐ Yes ☐ No

UNIT SUPERVISOR _____ Date _____

INDEPENDENT REVIEWER _____ Date _____

SCHEDULING COORDINATOR _____ Date _____

POST-TEST REMARKS: _____

SIMULATOR EVALUATION GUIDE

TITLE : ALTERNATE EHC PUMPS, CRD TIMER TEST, CONTROL ROD
ADJUSTMENT, CONTROL ROD 34-19 UNCOUPLED, SPURIOUS
RWCU ISOLATION, RECIRC DRIVE 3A COOLING WATER PUMP
FAILURE, RCIC TRIP, MSRV TAILPIPE BREAK IN SUPPRESSION
CHAMBER, UN-ISOLABLE LEAK IN SUPPRESSION CHAMBER.

REVISION : 0

DATE : October 9, 2008

PROGRAM : BFN Operator Training

**THIS SCENARIO REQUIRES STOPWATCH, PROVIDE WO PMT AND ROD PULL SHEET
TO CANDIDATES AT TURNOVER. (PMT & Turnover at end of this Evaluation Guide)**

PREPARED BY: _____ \ _____
(Operations Instructor) Date

REVIEWED BY: _____ \ _____
(BFN Lead Examiner or Designee) Date

REVIEWED BY: _____ \ _____
(Operations Training Manager or Designee) Date

CONCURRED: _____ \ _____
(Operations Superintendent or Designee) Date

VALIDATION
BY: _____ \ _____
(Operations US) (Required for Exam Scenarios only) Date

NUCLEAR TRAINING				
REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF CHANGES	DATE	PAGES AFFECTED	REVIEWED/REVISED BY
0	INITIAL	09/08/08	All	Spadoni

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: ALTERNATE EHC PUMPS, CRD TIMER TEST, CONTROL ROD ADJUSTMENT, CONTROL ROD 34-19 UNCOUPLED, SPURIOUS RWCU ISOLATION, RECIRC DRIVE 3A COOLING WATER PUMP FAILURE, RCIC TRIP, MSRV TAILPIPE BREAK IN SUPPRESSION CHAMBER, UN-ISOLABLE LEAK IN SUPPRESSION CHAMBER.
- IV. Length of Lesson: 1.5 hours
- V. Examination Objectives:
 - A. Terminal Objective
 - 1. Perform routine shift turnover, plant assessment and routine shift operation in accordance with BFN procedures.
 - 2. Given uncertain or degrading conditions, the operating crew will use team skills to conduct proper diagnostics and make conservative operational decisions to remove equipment/unit from operation. (SOER 94-1)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, abnormal, annunciator and emergency procedures.
 - 4. Use step text procedural compliance (WANO).

B. Enabling Objectives:

1. The operating crew will perform CRD Timer Test.
2. The operating crew will raise power with control rods per RE instructions.
3. The crew will respond to an uncoupled control rod (46-39)
4. The operating crew will respond to Spurious RWCU isolation.
5. The operating crew will respond to Recirc Drive 3A Cooling Water pump failure(s) which should lead to removing the Recirc pump from service.
6. The operating crew will recognize and respond to a broken MSRV tailpipe in the Suppression Chamber per 3-AOI-64-1.
7. The operating crew will recognize and respond to an un-isolable leak in the Suppression Chamber per 3-EOI-1 and 2.
8. The crew will spray the Suppression Chamber to maintain containment pressure less than 2.45 psig and the RPV will be depressurized when Suppression Chamber level cannot be maintained above 11.5 feet..

VI. References: The procedures used in the simulator are controlled copies and are used in development and performance of simulator scenarios. Scenarios are validated prior to use, and any procedure differences will be corrected using the procedure revision level present in the simulator. Any procedure differences noted during presentation will be corrected in the same manner. As such, it is expected that the references listed in this section need only contain the reference material which is not available in the simulator.

A. SOER 94-01

B. SOER 96-01

VII. Training Materials:

- A. Calculator (If required)
- B. Control Rod Insertion Sheet (If required)
- C. Stopwatch (If required)
- D. Hold Order / Caution tags (If required)
- E. Annunciator window covers (If required)
- F. Steam tables (If required)
- F. LCO/Appendix R Tracking Log
- G. Calculator
- H. Spray Cleaner
- I. Rags
- J. Markers

VIII. Console Operator Instructions

A. Scenario File Summary

1 File bat HLTS 3-6

	MF/RF/IOR#	Description
a)	trg e1 3ARHRSTART	Assigns trigger to 3A RHR pump switch
b)	trg e2 3A2VFDCOOL	Sets trigger e2 to 3a2 cooling water pump handswitch
c)	imf fw02a	3A Condensate Booster Pump Trip
d)	imf rh01b	Prevents 3B RHR pump manual start
e)	imf rh01d	Prevents 3B RHR pump manual start
f)	ior zlohs0256a[1] off	Green light off for 3A Condensate Booster Pump
g)	ior zlohs0256a[2] off	White light off for 3A Condensate Booster Pump
h)	ior ypovfcv74100 fail_power_now	FCV 74-100 tag out
i)	imf rd05r4639	46-39 Rod uncoupled
j)	imf rd01b	CRD Pump Tagout
k)	ior zlohs852a [1] off	CRD Pump Tagout
l)	ior zdihs852a stop	CRD Pump Tagout
m)	ior zlohs7334a[2] off	HPCI tagout
n)	ior zlohs7344a[1] off	HPCI tagout
o)	mrf th18b trip	Open breaker for 3A VFD 3A2 cooling water pump
p)	trg e1= imf pc14 50	Trigger e2 initiates a leak in the suppression chamber when 3A RHR pump is started.
q)	trg e2= mrf th18b close	Trigger e2 allows 3A2 VFD cooling pump to start manually.
r)	Imf rp06	Auto scram failure

VIII. Console Operator Instructions

B. Scenario File Summary

2. File: bat HLTS3-6-1

	MF/RF/IOR#	Description
a)	dor zlohs7334a[2]	Deletes override for red light
b)	dor zlohs7344a[1]	Deletes override for green light

3. File: bat app08e

	MF/RF/IOR#	Description
a)	mrf rp14a	Bypass Group 6 inboard low level/high drywell pressure interlocks
b)	mrf rp14b	Bypass Group 6 outboard low level/high drywell pressure interlocks

VIII. Console Operator Instructions

B. Console Operator Manipulations

<u>ELAPSED TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup		IC-26, 70% power (SNAP 258)
Sim. Setup		See scenario summary bat HLTS3-6
Sim Setup	manual	a. Tag 73-34 and 73-44, b. Tag 3A CBP c. Tag 3B CRD Pump, d. Tag FCV 74-100
Sim Setup	manual	Reset alarms – Hit fault reset on “A” Recirc & reset alarms
Instructor	manual	Provide turnover sheet, PMT, and pull sheet to crew

ROLE PLAY: When requested as Reactor Engineer, Notify the control room that thermal limits will be checked and permission is granted to try and recouple rod 34-19 per 3-AOI-85-2

When rod is inserted to 46	allows recoupling control rod (dmf rd05r3419)
When requested by examiner	RWCU isolation (ior zdihs691[2] close)
Just before role play below	Return 69-1 Norm (dor zdihs691[2])

VIII. Console Operator Instructions (Continued)

B. Console Operator Manipulations

ROLE PLAY: 5 minutes after RWCU isolates, Call as electrician foreman and report that while performing a WO on Unit 3, an electrician jumpered contacts 3 to 4 of relay 16AK26 which closed the 3-HS-69-1 valve. The electrician was on the wrong Unit – the jumper was removed and Unit 3 is restored to normal. A PER will be generated.

ROLE PLAY: Act as RB AUO and report demins properly in hold and you are raising flow when requested to place them in service.

ELAPSED TIME	DESCRIPTION/ACTION
When asked to reset local alarm	(mrf an01e reset) – allows control room alarm reset.
2 minutes after tech specs addressed	Trips 3A VFD cooling water pump 3A1 (ior zdihs682a1a off)
after low flow alarm cleared	Trips 3A VFD cooling water pump 3A2 (ior zdihs682a2a off)

ROLE PLAY: If RB AUO is dispatched to check 3A1 VFD cooling water pumps, after 2 minutes report local breaker tripped and won't reset. If sent to VFD to check temps (after both pumps tripped), report VFD is too hot to approach.

4 minutes after 3A VFD cooling water pump is lost	RCIC Turbine trips (ior zdihs719a trip)
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ROLE PLAY: Personnel dispatched to RCIC report latch broken on overspeed trip mechanism for RCIC

ROLE PLAY: When SRO requests HPCI clearance status, inform SRO that you are standing by to close breakers for 73-34 and 73-44.

VIII. Console Operator Instructions (Continued)

C. Console Operator Manipulations

ELAPSED TIME	DESCRIPTION/ACTION
When requested to turn on breakers for 73-34 and 73-44	Allow PMT for HPCI valves (bat HLTS3-6-1)
When directed by Chief Examiner:	Opens MSRV 1-19 to 25% with the tailpipe broken in the Suppression Chamber at 25% severity. (imf ad01b 25)
When directed to pull fuses for MSRV 1-19:	Removes power from MSRV 1-19. (mrf ad01b out)
If directed to re-install fuses for MSRV 1-19:	Restores power to MSRV 1-19. (mrf ad01b in)

ROLE PLAY: When directed to investigate flooding alarms in Unit 3 Reactor building, wait three minutes and report that there is a very large leak upstream of the 3A RHR pump suction valve, 74-1, and it can NOT be isolated.

When asked to perform appendix 8e, wait 5 minutes	Allows Reactor Building ventilation restoration (bat app08e)
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Terminate the scenario when the following conditions are satisfied or when requested by Lead Evaluator:

- RPV has been depressurized.
- Reactor level stable between + 2" and + 51"

IX. Scenario Summary

The unit is operating at 70% power. The 3B Condensate Booster Pump is out of service for repair of an oil leak. HPCI Injection valves tagged for contactor replacement in the breakers. Currently in a 14 day LCO via Tech Spec 3.5.1. FCV 74-100 is tagged out for maintenance.

The crew will perform a CRD Timer Test per 3-OI-85 section 8.14 and alternate EHC pumps per 3-OI-47A section 6.2.

The crew will commence to raise power by pulling control rods, Control Rod 34-19 will uncouple and the crew will respond to an uncoupled rod per 3-AOI-85-2.

The crew will respond to a spurious RWCU System isolation and restore the system to service.

The crew will respond to failure of 3A Recirc Drive Cooling Water pump A. Followed shortly afterwards by B. The crew should secure 3A Recirc Pump.

The crew will respond to an inadvertent trip of the RCIC turbine. 12 hour LCO that may be exited if HPCI is returned to operable status.

The crew will respond to a stuck open MSRV which results in rising Suppression Chamber pressure due to a broken tailpipe in the Suppression Chamber air space. The SRO will direct venting the Suppression Chamber per 3-AOI-64-1. The SRO may direct a manual scram before Drywell pressure reaches 2.45 psig. The reactor fails to automatically scram, therefore a manual scram must be directed after exceeding 2.45 psig.

When 3A RHR pump is started for Suppression Chamber sprays, a leak develops on the Suppression Chamber causing a loss of Suppression Pool water level. If RHR Loop II operation is attempted, 3B and 3D RHR pumps will not start manually. The SRO will enter and execute 3-EOI-1 and 3-EOI-2. The SRO will direct HPCI Aux Oil Pump to be placed in Pull-to-Lock before Suppression Pool level drops below 12.75 feet. When it is determined that Suppression Pool level cannot be maintained above 11.5 feet, the crew may anticipate Emergency Depressurization and rapidly depressurize the RPV using Bypass Valves. Otherwise, Emergency Depressurization must be initiated when Suppression Pool level drops below 11.5 feet due to uncovering the downcomer pipes.

X. Floor Instructor Instructions

A. Assign crew positions (assign positions based on evaluation requirements for personnel).

1. SRO : Unit Supervisor
2. ATC : Board Unit Operator
3. BOP : Desk Unit Operator

B. Review the shift briefing information with the operating crew. Provide SRO with a copy of Shift Turnover Sheet, Reactivity Plan, and pull sheet for scenario.

C. Direct the shift crew to review the control boards and take note of present conditions, alarms, etc.

D. Ensure recorders are inking and recording and ICS is active and updating. Note any deficiencies during shift briefing.

E. Terminate the scenario when the following conditions are satisfied or upon request of Lead Examiner:

1. RPV has been depressurized.
2. RPV level at + 2" to + 51"

XI. Simulator Event Guide

Event 1: **Alternate EHC Pumps**

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
	ATC/BOP	Receive crew briefing and walk boards down
	SRO	Directs BOP to alternate EHC pumps
	BOP	Alternates EHC Pumps in accordance with 3-OI-47A section 6.3

[1] VERIFY EHC Sys is in service. REFER TO Section 5.1.

[2] REVIEW Precautions & Limitations listed in Section 3.0.

[3] START the non-operating EHC PUMP 3B(3A) using EHC HYD FLUID PUMP 3B(3A), 3-HS-47-2A(1A).

[4] CHECK the started EHC pump EHC HYD PUMP A(B) DISCH PRESS, 3-PI-047-0001(0002), indicates between 1550 psig and 1750 psig, locally at the EHC skid. (AUO reports 1625 psig)

[5] IF the started EHC pump discharge pressure is NOT between 1550 psig and 1750 psig, THEN ADJUST the pressure compensator for the started EHC pump to adjust pump discharge pressure. REFER TO Step 8.6[1].

[6] STOP EHC PUMP 3A(3B) using EHC HYD FLUID PUMP 3A(3B), 3-HS-47-1A(2A).

XI. Simulator Event Guide

Event 1: Alternate EHC Pumps

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
<hr/>		<p>[7] CHECK EHC HEADER PRESSURE, 3-PI-47-7, indicates between 1550 psig and 1650 psig.</p> <p>[8] IF EHC header pressure is NOT between 1550 psig and 1650 psig, THEN ADJUST the pressure compensator for the operating EHC pump to adjust EHC header pressure. REFER TO Step 8.6[2].</p> <p>[9] IF there are any disagreement flags, THEN RESET disagreement flags by placing the operating pump handswitch, EHC HYD FLUID PUMP 3A(3B), 3-HS-47-1A(2A), to START.</p> <p>[10] CHECK the started EHC PUMP 3B(3A) MTR AMPS, 3-EI-47-2(1), indicates less than 140 amps.</p> <p>[11] VERIFY EHC Pump 3B(3A), EHC PUMP SUCTION FILTER and EHC AUX PUMP SUCTION FILTERS, indicate CLEAN, locally at the EHC skid.</p> <p>[12] [NER/C] VERIFY MANUAL FLOW CONTROL VALVE, 3-047-0588, is set at 2.0 turns clockwise. [INPO SOER 84-006]</p>
<hr/>	BOP	Swaps lens covers for EHC pumps based on new lineup

XI. Simulator Event Guide

Event 2: **PERFORM CRD TIMER TEST**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
CREW	_____	Accepts shift turnover
SRO	_____	Directs ATC to perform CRD Timer Test per 3-OI-85 section 8.14.
ATC	_____	REVIEW all Precautions and Limitations in Section 3.2 and 3.3.

PLACE WITHDRAW AUXILIARY TIMER TEST, 3-HS-85-3A/S6, in TEST AND HOLD for at least two seconds.

CHECK the white indicating light above the WITHDRAW AUXILIARY TIMER TEST, 3-HS-85-3A/S6 illuminates.

CHECK the red indicating light above the WITHDRAW AUXILIARY TIMER TEST, 3-HS-85-3A/S6 illuminates after approximately two seconds.

CHECK CONTROL ROD SELECT BLOCK TIMER MALFUNCTION annunciator(3-XA-55-5A, Window 21) in alarm.

PLACE WITHDRAW AUXILIARY TIMER TEST, 3-HS-85-3A/S6 in RESET.

CHECK all Reactor Manual Control System WITHDRAW AUXILIARY TIMER TEST, 3-HS-85-3A/S6 indicating lights are extinguished.

RESET CONTROL ROD SELECT BLOCK TIMER MALFUNCTION annunciator (3-XA-55-5A, Window 21).

XI. Simulator Event Guide

Event 2: **PERFORM CRD TIMER TEST** (Continued)

POSN	<u>TIME</u>	EXPECTED ACTIONS
ATC	_____	<p>NOTE:</p> <p>The following steps will allow the RMCS timer to be operationally checked without the possibility of moving a control rod.</p> <p>LOWER the CRD DRIVE WTR HDR DP, 3-PDI-85-17A to less than 75 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 3-HS-85-23A.</p> <p>SELECT a peripheral control rod by depressing the appropriate CRD ROD SELECT push-button, 3-XS-85-40.</p> <p>ATTEMPT to withdraw the peripheral control rod using CRD CONTROL SWITCH, 3-HS-85-48 while observing the RMCS timer in the Auxiliary Instrument Room and/or the indicating lights on Panel 3-9-5.</p> <p>IF while performing this section Rod Motion is observed, THEN IMMEDIATELY RELEASE CRD CONTROL SWITCH 3-HS-85-48 and CONTACT System Engineer.</p> <p>RAISE the CRD DRIVE WTR HDR DP, 3-PDI-85-17A to between 250 psid and 270 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 3-HS-85-23A.</p>

XI. Simulator Event Guide

Event 2: **PERFORM CRD TIMER TEST** (Continued)

POSN	<u>TIME</u>	EXPECTED ACTIONS
ATC		<p>FURTHER tests or checks shall not be performed without direction of the Unit Supervisor.</p> <p>REPEAT step 8.14.11 as required to determine that the RMCS timer is operating as required. IF the RMCS timer is not operating as required, THEN GENERATE a WO.</p> <p>IF the RMCS timer is operating as required, THEN RAISE the CRD DRIVE WTR HDR DP, 3-PDI-85-17A to between 250 psid and 270 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 3-HS-85-23A.</p>
BOP	<u> </u>	Peer Checks manipulations

Event 3: **RAISE POWER USING CONTROL RODS**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs ATC to withdraw rods per movement sheet
ATC	_____	Withdraws rods per movement sheet
BOP	_____	Peer Checks rod withdrawals

XI. Simulator Event Guide

Event 4: **CONTROL ROD 34-19 UNCOUPLED**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
CREW	_____	Recognizes symptoms of an uncoupled rod
SRO	_____	Directs ATC to respond to uncoupled rod per 3-AOI-85-2
SRO	_____	Notifies Reactor Engineer of uncoupled rod per 3-AOI-85-2 and requests permission to proceed with recoupling rod 34-19. Refers to Tech. Specs. 3.1.3 and declares rod INOP while uncoupled.
ATC	_____	Performs actions to recouple rod per 3-AOI-85-2, section 4.2.3
		IF the control rod drive is at position 48 and with Reactor Engineer concurrence, THEN
		NOTCH INSERT the control rod drive to position 46 to attempt to couple the control rod.
		RESET associated annunciators.
		NOTCH WITHDRAW the control rod drive to position 48.
		PERFORM a coupling check.
SRO	_____	Determines rod is operable

XI. Simulator Event Guide

Event 5: **RWCU ISOLATION**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
Crew	_____	Recognizes RWCU Isolation, responds per the ARP 3-ARP-9-4B 3-XA-55-4B win 10 (RWCU flow low) & win 24 RWCU demin abnor 3-XA-55-8C WIN 33 Motor tripout
SRO	_____	Enters 3-AOI-64-2a
SRO	_____	Contacts Rx Engineer for heat balance
SRO	_____	Notify Chemistry and RadCon
SRO	_____	Evaluate Tech. Spec. (TRM TSR 3.4.1) Monitor conductivity every 4 hours (not in mode 4 or 5) Chemistry, sampling required (If not returned to service)
SRO	_____	Directs restoration of system after cause is determined
BOP	_____	Restores RWCU per 3-OI-69 -Verifies RWCU Filters are in Hold -Opens 3-FCV-69-1 -Opens 3-FCV-69-8 -Opens 3-FCV-69-12 for pump startup -Start one RWCU pump and open 3-FCV-69-12 to achieve > 56 gpm -Start the second RWCU pump and attain ~300 gpm flow -coordinate with RB AUO and place demins in service
BOP	_____	Notifies Chemistry
BOP	_____	Notifies Rx. Engineer

XI. Simulator Event Guide

Event 6: **VFD COOLING WATER PUMP FAILURES**
[VARIABLE FREQ DRIVE]

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Announces Recirc Drive 3A Coolant Flow Low. Informs SRO 3A VFD Cooling Water Pump 3A1 has tripped and 3A2 failed to start.
SRO	_____	Directs ATC to refer to ARP.
ATC	_____	Consults ARP, starts Recirc Drive 3A2 Cooling Water pump. 3-ARP-9-4A 3-XA-55-4A WIN 12 Verifies flow on ICS, resets annunciators
SRO	_____	Directs Outside US to check on problem with 3A1 cooling water pump
ATC	_____	Announces Recirc Drive 3A Coolant Flow Low. Informs SRO 3A VFD Cooling Water Pump 3A2 has tripped and 3A1 or 3A2 failed to re-start.
SRO	_____	Directs trip of 3A Recirc Pump and entry into 3-AOI-68-1A
ATC	_____	Removes 3A Recirc pump
ATC	_____	When Region I of the Power to Flow Map is entered IMMEDIATELY take actions to INSERT control rods to less than 95.2% loadline.

XII. Simulator Event Guide

Event 6: **VFD COOLING WATER PUMP FAILURES**
[VARIABLE FREQ DRIVE]

POSN	<u>TIME</u>	EXPECTED ACTIONS
ATC	_____	Raises core flow to greater than 45%.
ATC	_____	Inserts control rods to exit regions
ATC/ BOP	_____	Close Recirc Pump discharge valve on tripped pump.
ATC	_____	MAINTAIN operating Recirc pump flow less than 46,600 gpm. Refer to 3-OI-68.
ATC	_____	Maintains operating jet pump loop flow greater than 41 x 10 ⁶ lbm/hr
SRO	_____	Addresses Tech Spec 3.4.1 for Single Loop Operations. Request RE implement SR-3.4.1(SLO) within 24 hours.

XIII. Simulator Event Guide

Event 7: **INADVERTANT TRIP OF RCIC TURBINE**

POSN	TIME	EXPECTED ACTIONS
BOP	_____	Announces RCIC Turbine tripped refers to ARP 3-XA-55-3B win 14.
SRO	_____	Dispatches field personnel to investigate and troubleshoot RCIC turbine trip.
SRO	_____	Declares RCIC Inop per TS 3.5.3.A, 12 hour LCO due to inop HPCI Mode 3 required within 12 hours and Reactor Pressure <150 psig within 35 hours.
SRO	_____	SRO requests status of HPCI
SRO	_____	Directs BOP to perform PMT for 3-FCV-73-34 and 44.
BOP	_____	Performs timing of 3-FCV-73-34 and 44 per WO

1. CLOSE and TIME 3-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 3-HS-73-34A and RECORD the stroke time below:

3-FCV-73-34 CLOSING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
N/A		N/A

2. OPEN and TIME 3-FCV-73-44 using HPCI PUMP INJECTION VALVE 3-HS-73-44A and RECORD the stroke time below.

3-FCV-73-44 OPENING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
15.6 - 21.0		30.0

3. VERIFY the stroke time recorded is less than or equal to the maximum value listed.

EVENT 7 INADVERTANT TRIP OF RCIC TURBINE (Continued)

POSN	TIME	EXPECTED ACTIONS																		
BOP	_____	<p>4. CLOSE and TIME 3-FCV-73-44 using HPCI PUMP INJECTION VALVE, 3-HS-73-44A and RECORD the stroke time below:</p> <table border="1"> <tr> <th colspan="3">3-FCV-73-44 CLOSING TIME (SEC)</th></tr> <tr> <th>NORMAL</th><th>MEASURED</th><th>MAXIMUM</th></tr> <tr> <td>16.6 - 22.4</td><td></td><td>30.0</td></tr> </table> <p>5. VERIFY the stroke time recorded is less than or equal to the maximum value listed.</p> <p>6. OPEN and TIME 3-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 3-HS-73-34A and RECORD stroke time below:</p> <table border="1"> <tr> <th colspan="3">3-FCV-73-34 OPENING TIME (SEC)</th></tr> <tr> <th>NORMAL</th><th>MEASURED</th><th>MAXIMUM</th></tr> <tr> <td>12.8 - 17.4</td><td></td><td>26.7</td></tr> </table> <p>7. VERIFY the stroke time recorded is less than or equal to the maximum value listed.</p>	3-FCV-73-44 CLOSING TIME (SEC)			NORMAL	MEASURED	MAXIMUM	16.6 - 22.4		30.0	3-FCV-73-34 OPENING TIME (SEC)			NORMAL	MEASURED	MAXIMUM	12.8 - 17.4		26.7
3-FCV-73-44 CLOSING TIME (SEC)																				
NORMAL	MEASURED	MAXIMUM																		
16.6 - 22.4		30.0																		
3-FCV-73-34 OPENING TIME (SEC)																				
NORMAL	MEASURED	MAXIMUM																		
12.8 - 17.4		26.7																		
8. PMT COMPLETE																				
SRO	_____	Reviews PMT, declares HPCI operable. RCIC now in 14 day LCO.																		

XIV. Simulator Event Guide

Event 8: **MSRV tailpipe break in Suppression Chamber**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Recognizes MSRV 1-19 is open. Performs immediate actions of 3-AOI-1-1.
SRO	_____	Addresses Tech Specs for MSRV 1-19 (ADS valve) 3.5.1.E.1 (Restore ADS valve to OPERABLE status in 14 days)
BOP	_____	Recognizes rising Suppression Chamber pressure.
SRO	_____	Directs ATC to enter 3-AOI-64-1 and vent the Suppression Chamber.
ATC	_____	Initiates Suppression Chamber venting in accordance with 3-AOI-64-1.
SRO	_____	Determines that Drywell pressure will exceed 2.45 psig and directs manual scram. (conservative decision making)
Crew	_____	Recognizes that an automatic scram did not occur at 2.45 psig. (CRITICAL TASK)
SRO	_____	Directs ATC to initiate a manual reactor scram
ATC	_____	Inserts a manual scram; Places mode switch in shutdown verifies all rods in makes scram report
BOP	_____	Continues actions per 3-AOI-1-1 for MSRV 1-19.
SRO	_____	Enters EOI-1 on low level and directs: -Verifications of group isolations and initiations -entry into AOI-100-1 -verifies Turbine Bypass valves controlling pressure

XV. Simulator Event Guide

Event 8: **MSRV tailpipe break in Suppression Chamber**

POSN	<u>TIME</u>	EXPECTED ACTIONS
SRO	_____	Enters EOI-2 and re-enters EOI-1 when drywell pressure exceeds 2.45 psig .
BOP	_____	Verifies Diesel generators start
BOP	_____	Directs AUO to monitor D/G
SRO	_____	Directs the following: <ul style="list-style-type: none"> • All available drywell cooling in service • Venting per App 12 • H₂/O₂ Analyzers placed in service
BOP	_____	Verifies all drywell blowers in service
BOP	_____	Vents per Appendix 12
BOP	_____	Places H ₂ /O ₂ Analyzers in service using keylock bypass switches.
BOP	_____	Monitors containment parameters and reports rate of rise of suppression chamber pressure and drywell pressure
SRO	_____	Determines venting and plant cooldown will not maintain suppression chamber pressure <12 psig and:
SRO	_____	Directs BOP to initiate Suppression Pool Sprays in accordance with 3-EOI-Appendix 17C.
BOP	_____	Initiates Suppression Pool Sprays in accordance with 3-EOI-Appendix 17C.

XI. Simulator Event Guide

Event 9: **Un-isolable leak in Suppression Chamber**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces the following annunciators in quick succession: <ul style="list-style-type: none">• RHR LOOP I PUMP ROOM FLOOD LEVEL HIGH (9-4C W17)• CORE SPRAY LOOP I RCIC PUMP ROOM FLOOD LEVEL HIGH (9-4C W24)• SUPPR CHMB RM FLOOD LEVEL HIGH (9-4C W3)• RHR LOOP II PUMP ROOM FLOOD LEVEL HIGH (9-4C W30)• CORE SPRAY LOOP II RCIC PUMP ROOM FLOOD LEVEL HIGH (9-4C W31)
SRO	_____	Dispatch personnel to visually check the secondary containment.
SRO	_____	Enter 3-EOI-3 flowchart.

Evaluator Note: The progression through 3-EOI-3 will eventually lead to the conclusion that two areas are greater than Max Safe values but depressurization will NOT reduce the leak into secondary containment. The flowchart will then direct a normal reactor shutdown, which has already been accomplished. At this point, the SRO should then focus on 3-EOI-2 actions to address the problem.

BOP	_____	Determine that Suppression Pool level is lowering and report to the SRO.
SRO	_____	Address 3-EOI-2 path SP/L for lowering SP level.

XI. Simulator Event Guide

Event 9: **Un-isolable leak in Suppression Chamber (continued)**

- SRO _____ Direct ATC/BOP to perform 3-EOI-Appendix 18 to add water to the Suppression Pool.
- ATC/
BOP _____ Address 3-EOI-Appendix 18 to add water to the Suppression Pool.
- SRO _____ Direct HPCI operation be prevented by placing the Aux Oil Pump control switch in Pull-to-Lock before Suppression Pool level reaches 12.75 feet.
(Critical Task)
- BOP _____ Place the HPCI Aux Oil Pump control switch in Pull-to-Lock.

Evaluator Note: Once the report is received that the leak is significant and un-isolable, the SRO may make the decision that "Emergency Depressurization is Required." The decision step states "Can Suppression Pool Level be maintained above 11.5 feet." If this determination is made early enough, the SRO may take advantage of anticipating Emergency Depressurization and rapidly depressurize the RPV using Main Turbine Bypass Valves.

- SRO _____ Anticipate Emergency Depressurization and direct the RPV be rapidly depressurized using Main Turbine Bypass Valves.
(Critical Task) (conditional)
- ATC/
BOP _____ Open Main Turbine Bypass Valves using the Bypass Valve manual Jack.
- SRO _____ When Suppression Pool level approaches or exceeds 11.5 feet, direct Emergency Depressurization using MSRVs in accordance with 3-EOI-C2.
(Critical Task)

XI. Simulator Event Guide

Event 9: **Un-isolable leak in Suppression Chamber (continued)**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Opens six ADS valves to initiate Emergency Depressurization.

NOTE: ADS MSRV 1-19 is failed open to 25% at this point. The crew may decide to open an additional non-ADS MSRV in place of 1-19. If not, MSRV 1-19 will come full open when the switch is placed in OPEN, which satisfies the requirement of six ADS valves.

Crew	_____	Recognize that an Accident Signal (CASx) will be received when RPV pressure drops below 450 psig if Drywell pressure is still above 2.45 psig.
SRO	_____	Direct ECCS pumps not required for injection be secured when the CASx signal is received.
BOP	_____	Secure ECCS pumps as necessary to restore and maintain RPV level +2 to +51 inches.
SRO	_____	Classifies the event as a SITE AREA EMERGENCY (2.1-S) due to Suppression Pool level below 11.5 feet, which is in the UNSAFE area of Curve 2.1-S (PSP Curve).

XII. Crew Critical Tasks

	<u>TASK</u>	<u>SAT/UNSAT</u>
1.	Manually Scram the Reactor within 1 minute of automatic scram signal at 2.45 psig DW pressure.	<hr/>
2.	Prevent HPCI operation with Suppression Pool level below 12.75 feet.	<hr/>
3.	Emergency Depressurize the RPV within 5 minutes of Suppression Pool level dropping below 11.5 feet.	<hr/>

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-7

- 10 Total Malfunctions Inserted; List: (4-8)
- 1) Suppression Chamber leak
 - 2) Stuck Open MSRV
 - 3) MSRV tailpipe break in Suppression Chamber
 - 4) Control Rod Uncoupled
 - 5) RWCU Isolation valve closure
 - 7) RCIC Trip
 - 8) Recirc Drive 3A Cooling water pump trip
 - 9) RHR 3B and 3D manual start failure
 - 10) Auto scram failure
- 4 Malfunctions That Occur After EOI Entry; List: (1-4)
- 1) Suppression Chamber leak
 - 2) RHR 3B and 3D manual start failure
 - 3) Auto scram failure
- 3 Abnormal Events; List: (1-3)
- 1) Control Rod Uncoupled
 - 2) RWCU isolation
 - 3) Recirc Drive 3A Cooling water pump trip
- 1 Major Transients; List: (1-2)
- 1) Suppression Chamber leak
- 3 EOIs used; List: (1-3)
- 1) EOI-1
 - 2) EOI-2
 - 3) EOI-3
- 1 EOI Contingencies Used; List: (0-3)
- 1) C2
- 80 Run Time (minutes)
- 35 EOI Run Time (minutes); 44 % of Scenario EOI Run Time
- 3 Crew Critical Tasks (2-5)
- Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs Unit at 70% power due to 3A Condensate Booster Pump out of service for oil leak. 3-FCV-74-100 tagged out for maintenance on the actuator, valve has a mechanical locking device installed and is closed. Actuator is removed. HPCI injection valves tagged for replacement of contactors in supply breakers. A 14 day LCO (TS 3.5.1) has been entered. Work has been completed and the clearance has been released. 3B CRD pump is tagged for bearing replacement.

Operations/Maintenance for the Shift: Alternate EHC Pumps per section 6.2 of 3-OI 47A. CRD Timer has been replaced, perform CRD Timer Test per 3-OI-85 section 8.14, then withdraw rods per RE instructions to establish rod pattern. When 3A CBP is restored, continue to raise power and monitor pump amps. (step 5.16 of 3-GOI-100-12). When HPCI clearance is picked up, perform PMT per WO (copy attached) prior to making HPCI operable. HLT class in the plant performing JPM's.

Unusual Conditions/Problem Areas Reactor Engineer expects Xenon to build-in over next few hours.

WO XX-XXXXXX-XX PMT

1. **CLOSE** and **TIME** 3-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 3-HS-73-34A and **RECORD** the stroke time below:

3-FCV-73-34 CLOSING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
N/A		N/A

2. **OPEN** and **TIME** 3-FCV-73-44 using HPCI PUMP INJECTION VALVE, 3-HS-73-44A and **RECORD** the stroke time below:

3-FCV-73-44 OPENING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
15.6 - 21.0		30.0

3. **VERIFY** the stroke time recorded is less than or equal to the maximum value listed.

4. **CLOSE** and **TIME** 3-FCV-73-44 using HPCI PUMP INJECTION VALVE, 3-HS-73-44A and **RECORD** the stroke time below:

3-FCV-73-44 CLOSING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
16.6 - 22.4		30.0

5. **VERIFY** the stroke time recorded is less than or equal to the maximum value listed.

6. **OPEN** and **TIME** 3-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 3-HS-73-34A and **RECORD** stroke time below:

3-FCV-73-34 OPENING TIME (SEC)		
NORMAL	MEASURED	MAXIMUM
12.8 - 17.4		26.7

7. **VERIFY** the stroke time recorded is less than or equal to the maximum value listed.

8. **PMT COMPLETE**

Performed By: _____

Reviewed By: _____

Stopwatch Calibration Date: _____

SIMULATOR EVALUATION GUIDE

TITLE : ROD SCRAM, SRV FAILURE, LOSS OF OFFSITE POWER,
STEAM LINE BREAK WITHIN DRYWELL, FAILURE OF DIESELS

REVISION : 0

DATE : October 9, 2008

PROGRAM : BFN Operator Training - HLT

PREPARED BY: _____ / _____
(Operations Instructor) Date

REVIEWED BY: _____ / _____
(LOR Lead Instructor or Designee) Date

REVIEWED BY: _____ / _____
(Operations Training Manager or Designee) Date

CONCURRED : _____ / _____
(Operations Superintendent or Designee) Date

VALIDATION : _____ / _____
BY (Operations SRO: Required for Exam Scenarios Only) Date

LOGGED-IN: _____ / _____
(Librarian) Date

TASKS LIST
UPDATED: _____ / _____
Date

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0		09/08/08	All	Spadoni

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: ROD SCRAM, SRV FAILURE, LOSS OF OFFSITE POWER, STEAM LINE BREAK WITHIN DRYWELL, FAILURE OF DIESELS
- IV. Length of Scenario: 1 to 1 ½ hours
- V. Examination Objectives:
 - A. Terminal Objective
 - 1. Perform routine shift turnover, plant assessment and routine shift operation in accordance with BFN procedures.
 - 2. Given uncertain or degrading conditions, the operating crew will use team skills to conduct proper diagnostics and make conservative operational decisions to remove equipment/unit from operation. (SOER 94-1 and SOER 96-01)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, annunciator, abnormal, and emergency procedures.
 - B. Enabling Objectives:
 - 1. The operating crew will recognize and respond to a control rod scram in accordance with 3-AOI-85-5.
 - 2. The operating crew will recognize and respond to a stuck open SRV in accordance with 3-AOI-1-1.
 - 3. The operating crew will recognize and respond to an inoperable ADS valve and HPCI in accordance with Technical Specifications.
 - 4. The operating crew will recognize and respond to a steam line break per the ARPs and EOIs.
 - 5. The operating crew will recognize and respond to a loss of offsite power and diesel generator failures per 0-AOI-57-1A.

- VI. References: The procedures used in the simulator are controlled copies and are used in development and performance of simulator scenarios. Scenarios are validated prior to use, and any procedure differences will be corrected using the procedure revision level present in the simulator. Any procedure differences noted during presentation will be corrected in the same manner. As such, it is expected that the references listed in this section need only contain the reference material which is not available in the simulator.
- VII. Training Materials: **(If needed, otherwise disregard)**
- A. Calculator
 - B. Control Rod Insertion Sheet
 - C. Stopwatch
 - D. Hold Order / Caution tags
 - E. Annunciator window covers
 - F. Steam tables

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat HLTS 3-7

<u>MF/RF/IOR#</u>	<u>Description</u>
1) trg e1 MODESW	Assigns trigger #1 to the Mode Switch
2) trg e2 adssrv1-34	Assigns trigger #2 to the MSRV 1-34 control switch
3) trg e3 BSCRAMLIGHT	Assigns trigger #3 to the B Manual scram button light.
4) bat tohpci	Tags out HPCI lights
5) imf dg01a	Fails DG 'A' from auto starting
6) imf dg03d	Fails DG 'D' output breaker from automatically closing
7) ior zloxi8546 off	one rod permissive light
8) imf rc04 (e1 0) 0	Fails RCIC auto controller
9) imf fw14c (e1 :15)	Trips 3C RFP
10) trg e2 = dmf ad01f	Trigger #2 deletes ad01f malfunction
11) imf ad02f (e2 :02)	Initiates malfunction when trigger #2 fires
12) trg e3 = mrf rd10f2239 scram	Modifies remote function to scram rod 22-39 when "B" manual scram pushbutton is pushed.

2. File: bat tohpci

<u>MF/RF/IOR#</u>	<u>Description</u>
1) ior ypovfcv7316 fail_now	FCV 73-16 power
2) ior ypovfcv733 fail_now	FCV 73-3 power
3) ior ypovfcv7381 fail_now	FCV 73-81 control power
4) ior zdihs7347a ptl	Aux. oil pump failure
5) ior zlohs7347a[1] off	Aux. oil pump light
6) ior ypomtrglehx fail_cn_po	Removes power from gland exhaust

3. File: bat HLTS3-7-2

<u>MF/RF/IOR#</u>	<u>Description</u>
1) imf ed06b	Loss of CSST B
2) imf th33a (none 5:00) 5 10:00	Steam line break
3) imf ed01 (none 9:00)	Loss of offsite power
4) imf th22 (none 14:00) 100 10:00	Rx bottom head drain leak

4. File: bat eecw

1) ior zdihs6753b reset	Opens 67-53 from 25-32
2) ior xdihs6751b reset	Opens 67-51 from 25-32
3) ior zdihs6750b reset	Opens 67-50 from 25-32

5. File: bat app07b

1) mrf s101 on	Aligns SLC to Test Tank for injection to vessel
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6. File: bat eecw-1

<u>MF/RF/IOR#</u>	<u>Description</u>
1) dor zdihs6753b reset	Opens 67-53 from 25-32
2) dor xdihs6751b reset	Opens 67-51 from 25-32
3) dor xdihs6750b reset	Opens 67-50 from 25-32

VIII. Console Operator Instructions

B. Console Operator Manipulations

ELAP TIME

DESCRIPTION/ACTION

Sim. Setup

100% power, MOC

manual

Close FCV 73-3, 81; Aux. oil pump and Gland Exhauster in pull to lock.

manual

Tag 73-2 & 3, 81, & 16, Aux. Oil Pump, Gland Seal Exhauster.

See scenario summary (bat HLTS3-7)

ELAP TIME

DESCRIPTION/ACTION

Whenever B half scram is reset

mrf rd10r2239 norm

ROLE PLAY: If requested to check on cause of scrambled control rod, wait 5 minutes and report that fuse 5A-F19A (18-39) is blown. Fuse has been replaced.

ROLE PLAY: When requested for R.E. guidance, suggest lowering power with recirc to 90% and notch withdraw control rod 22-39 back to notch 14

Two minutes after rod is withdrawn back to position 48

stuck open SRV 1-34 (imf ad01f 50)

ROLE PLAY: 3 minutes after requested, report fuse 3E-F6J is blown in panel 25-32.

If requested to replace fuse

Re-opens SRV

Then:

Restores power to MSRV 1-19

After Tech Spec addressed
for ADS valve failure and
shutdown commenced

LOSP (bat HLTS3-7-2)

ROLE PLAY: **Reactor Engineer directs inserting emergency rods while he loads RWM.**

ROLE PLAY: **As the Incident Commander contact the SM on CSST spraying (no fire just spraying).**

When requested to restore
EECW to RBCCW, Air
Compressor wait 3 minutes

Opens 67-50, 67-51 and 67-53 from 25-32 (bat eecw)

ROLE PLAY: **Report EECW valves reset at 25-32**

NOTE: After bat eecw
entered then

Allows valves to reclose if another signal comes in (bat eecw-1)

When asked to reset
Control Air Compressor
wait 7 min

Resets, restarts Control Air compressors A, D, and G (bat ca)

When asked to Reset RPS
wait 5 min

Resets RPS circuit protectors (bat rpsreset)

If requested to perform
Appendix 7b, wait 20
minutes

Aligns SLC to Test Tank (bat app07b)

Terminate the scenario when the following conditions are satisfied or when requested by Chief Examiner:

1. Reactor Water level restored between +2 to +51"
2. Cooldown begun

IX. Scenario Summary

With the Unit at 100% power with HPCI out of service, a control rod will scram into the core. After replacing the fuel and recovering the control rod, an ADS relief valve fails open. When cycling the valve per the AOI, the valve closes, but the control power fuses blow. After addressing Tech Specs for HPCI with an inoperable ADS valve, a loss of offsite power occurs. One diesel fails to auto start, and one fails to auto tie to its 4KV Shutdown Board. The RCIC flow controller fails in auto, requiring operation in manual. Shortly after the loss of offsite power, a steam line breaks inside containment causing a drywell pressure/temperature increase.

X. Information to Evaluators:

- A. Ensure recorders are inking and recording and ICS is active and updating.
- B. Assign Crew Positions based on the required rotation.
 - 1. SRO: Unit Supervisor _____
 - 2. ATC: Board Unit Operator _____
 - 3. BOP: Desk Unit Operator _____
- C. Conduct a shift turnover with the Shift Manager and provide the Shift Manager with a copy of the Shift Turnover.
- D. Direct the shift crew to review the control board and take note of present conditions, alarms, etc.
- E. Terminate the scenario when the following conditions are satisfied are at the request of the floor/lead instructor/evaluator.
 - 1. Reactor water level restored at +2" to +51"
 - 2. Drywell sprayed
 - 3. Cooldown begun

XI. Simulator Event Guide

EVENT 1: ROD SCRAM

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Performs 3-SR-3.3.1.1.8(11)
ATC	_____	Reports Control Rod Drift alarm and control rod 22-39 has scrammed
	_____	Identifies drifting rod on full core display
SRO	_____	Directs actions per SR and doesn't reset scram for at least 10 seconds
	_____	When determined that a blown fuse exists, directs replacement
ATC	_____	Does not reset scram for 10 seconds.
SRO	_____	Directs power reduced to 90% per R.E. instructions
ATC	_____	Reduces recirc flow until power 90%
SRO	_____	Directs control rod 22-39 withdrawn to position 14 per R.E. direction
ATC	_____	Notch withdraws control rod 22-39 to position 14

XI : Simulator Event Guide

EVENT 2: SRV FAILURE WITH HPCI OUT OF SERVICE

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces alarm "Main Steam" Relief valve open
	_____	Identifies open SRV as 1-34 via acoustic monitor
SRO	_____	Refers to 3-AOI-1-1 and directs actions
BOP	_____	Cycles SRV 1-34
	_____	Announces that SRV 1-34 indicates closed
	_____	Reports loss of green light on SRV 1-34
SRO	_____	Directs outside SRO to check fuses.
SRO	_____	Reviews Tech. Spec 3.5.1.H and enters LCO 3.0.3
SRO	_____	Directs crew to begin preparation for shutdown
	_____	Contacts Reactor Engineer
BOP	_____	Reviews 3-GOI-100-12A
SRO	_____	Contacts ODS to inform him of required S/D

XI. Simulator Event Guide

EVENT 3: LOSS OF 161KV LINE

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
Crew	_____	Identifies Trinity 161KV line loss
B/D/U	_____	Respond to CSST ARPs 9-8 & 9-26 0-GOI-300-4
SM/SRO	_____	Directs clearing of breaker switch misalignments, trip of associated MODs. Refers to 0-GOI-300-4.
Crew	_____	Responds to Fire Alarm on CSST
SRO	_____	Contacts outside SRO to check switchyard and dispatches Fire Protection to switchyard
SRO	_____	Contacts Southwest Dispatcher regarding 161KV problem

XI. Simulator Event Guide

EVENT 4: LOSP WITH DIESEL FAILURES and STEAM LINE BREAK

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Announces Rx Scram, provides scram report
Crew	_____	Identifies loss of offsite power
SRO	_____	Enters EOI-1
	_____	Directs 0-A0I-57-1A be performed
	_____	Directs pressure be maintained 800-1000 psig using MSRVs
	_____	Directs level be maintained above -162 (+2 to +51" with RCIC)
BOP	_____	Announces failure of 'A' Diesel Generator to start and failure of 'D' Diesel Generator to tie to shutdown board
BOP	_____	Starts 'A' Diesel and verifies/ties to S/D Bd; Manually tie 'D' Diesel to Shutdown Bd.
BOP	_____	Controls Rx pressure as directed
BOP	_____	When RCIC is used for level control identifies controller failure and takes manual control
SRO	_____	Direct entry into AOI-100-1

XI. Simulator Event Guide

EVENT 4: LOSP WITH DIESEL FAILURES and STEAM LINE BREAK(Cont)

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Directs RPS MG sets, EECW & Control air restored
ATC	_____	Starts/verifies RBCCW pumps in service
ATC	_____	Start Diesel Fire pump
SRO	_____	-Contacts Operations Duty Specialist (ODS) of loss of all Offsite Power -EAL 5.1-U (Declare NOUE)
CREW	_____	Prior to starting RHR, all motor breakers on associated Bd must be tripped
SRO	_____	Directs Appendix 5B and may direct App. 7B
ATC	_____	Starts/aligns 1B CRD pump per App. 5B and may begin App. 7B (SLC)
SRO	_____	At 2.45 psig in the drywell, enters EOI- 2.
SRO	_____	Directs H2/O2 Sample pumps be returned to service Cautions crew of loading restrictions prior to start of RHR
SRO	_____	Directs venting per Appx.12

XI. Simulator Event Guide

EVENT 4: LOSP WITH DIESEL FAILURES and STEAM LINE BREAK(Cont)

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Vents the Suppression Chamber per Appx. 12
SRO	_____	Directs Suppression Pool Sprays placed in service per Appx.17C before suppression chamber pressure reaches 12 psig
BOP	_____	Sprays the Suppression Chamber per Appx. 17C
ATC	_____	Directs restart of 'A','D', 'G' control air compressor
	_____	Directs reset of EECW lockouts on panel 25-32
BOP	_____	Identifies rise in Drywell Pressure and Temp.
SRO	_____	Directs all available DW Blowers in Service
ATC	_____	Places all blowers in service
Crew	_____	Monitors DWP and DWT
SRO	_____	Directs cooldown be started
ATC	_____	Starts cooldown at <100 degrees F

XI. Simulator Event Guide

EVENT 4: LOSP WITH DIESEL FAILURES and STEAM LINE BREAK(Cont)

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Reports Suppression Chamber pressure is 12 psig
SRO	_____	Directs Drywell Blowers stopped Directs Recirc Pumps Tripped Directs Drywell Sprayed per Appx. 17B
CREW	_____	Recognize load shed and failure of "D" DG to re-tie to board
CREW	_____	Verify that SBGT A and B re-start after 40 seconds
CREW	_____	Recognize Unit priority re-trip and failure of "D" DG to re-tie again
BOP	_____	Injects with RHR/CS to maintain RPV water level above -162 when pressure is low enough.

XII. Crew Critical Tasks

	<u>TASKS</u>	<u>SAT/UNSAT</u>
1.	Maintains RPV water level above TAF (-162")	<hr/>
2.	Spray the drywell after Suppression Pool Pressure exceeds 12 psig or Before Drywell temperature exceeds 280 degrees F.	<hr/>
3.	Restore electrical power to at least 1 train of SGT = must have 2 SGT trains operating	<hr/>

XIII. Scenario Verification Data

<u>EVENT</u>	<u>TASK NUMBER</u>	<u>K/A</u>	<u>RO</u>	<u>SRO</u>	<u>CONTROL MANIPULATION</u>
1.	U-085-AB-05 S-085-AB-05	201003A2.03	3.4	3.7	B6
2.	U-001-AB-01 S-001-AB-01 S-000-AD-27	239002A2.02 295013	4.1 3.3	4.2 3.5	
3.	U-57A-AB-03 S-57A-AB-03 U-068-AL-13	295003 202001A2.10	3.5 3.5	3.6 3.9	A10
4.	U-57A-AB-01 S-57A-AB-01 U-000-EM-01 S-000-EM-01 U-000-EM-02 S-000-EM-02 U-000-EM-03 S-000-EM-03 U-000-AB-04 S-000-AB-03 S-000-EM-06 U-000-EM-07	295031 295025 295006 295018 295019 295026	4.1 3.8 3.9 3.2 3.0 3.6	4.2 3.9 4.0 3.3 3.0 3.8	A10,B14 A9, A13
5.	U-000-EM-05 S-000-EM-05 U-000-EM-04 S-000-EM-04 S-000-EM-21 S-000-EM-23	295024 295028 2.4.38	3.7 3.5 2.2	3.7 3.8 4.0	A6

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-14

- 8 Total Malfunctions Inserted; List: (5-8)
- 1) Individual Rod Scram
 - 2) SRV Failure (open)
 - 3) SRV Fuse Failure
 - 4) LOSP
 - 5) 'A' DG Failure
 - 6) 'D' DG Failure
 - 7) Steam Line Break
 - 8) RCIC Failure
- 4 Malfunctions That Occur After EOI Entry; List: (1-2)
- 1) 'A' DG Failure
 - 2) 'D' DG Failure
 - 3) Steam Line Break
 - 4) RCIC Failure
- 2 Abnormal Events; List: (2-4)
- 1) Control Rod Scram
 - 2) SRV Open (AOI)
- 2 Major Transients; List: (1-2)
- 1) LOSP
 - 2) Steam Line Break (Small LOCA)
- 2 EOIs used; List: (1-2)
- 1) EOI-1
 - 2) EOI-2
- 0 EOI Contingencies Used; List: (0-2)
None
- 63 Run Time (minutes)
- 52 EOI Run Time (minutes); 83 % of Scenario EOI Run Time
- 3 Crew Critical Tasks (2-3)
- Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs

HPCI was tagged out 8 hours ago for repair to the Gland Seal Exhauster.

Expected back in 6 hours.

Operations/Maintenance For the Shift

Maintain 100% power. Operating 187 days. Unit 1 and 2 are at 100% power.

Perform 3-SR-3.3.1.1.8(11) REACTOR PROTECTION SYSTEM MANUAL SCRAM

FUNCTIONAL TEST

Unusual Conditions/Problem Areas:

Severe thunderstorms in area for next 24 hours

BFN UNIT 3	CONTROL ROD COUPLING INTEGRITY CHECK	3-SR-3.1.3.5(A) REV 0014 Page 12 of 359
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ATTACHMENT 2
(Page 1 of 2)

Date TODAY

CONTROL ROD MOVEMENT DATA SHEET

[illegible]REMARKS⁴ :

NOTES:

- (1) RWM Group may be marked "N/A" if not applicable (i.e., when above the LPSP).
- (2) For all rod moves to position "48", this signoff verifies coupling integrity was checked in accordance with 3-OI-85.
- (3) Second-party verification by a second UO, RE, or STA is required ONLY when the RWM is inoperable or bypassed with core thermal power < 10%. A Peer Checker (not required in emergencies) may initial when second party is not required. "N/A" if not applicable.
- (4) Record the rod number and any problems encountered, as applicable.

Reviewed by: US / TODAY Issued by RE / TODAY
Unit Supervisor Date Reactor Engineer Date



Browns Ferry Nuclear Plant

Unit 3

Surveillance Procedure

3-SR-3.3.1.1.8(11)

Reactor Protection System Manual Scram Functional Test

Revision 0005

Quality Related

Level of Use: Continuous Use

Effective Date: 09-22-2008

Responsible Organization: OPS, Operations

Prepared By: Michael S. Rice @ 6934

Approved By: John T. Kulisek

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 2 of 18
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Current Revision Description

Pages Affected: All

Type of Change: XP Conversion & DCN Tracking Number: 007

PCRs: 08000148

DCN: 51657

This procedure was converted from Word 95 to Word 2003 using Rev 4.

Minor editorial changes (no rev bars)

Deleted hand grenage icon from P&L section. This is no longer used in Operations Procedures.

Added computer points SOE178 and SOE179 to the procedure. These were added in DCN 51657. Placing the Reactor Scram Reset Switch to the Reset GP 1/4 position will reset the SOE178 and SOE179 computer points if tripped. Changes made ensure the computer pointns operate as designed. See drawings 3-730E915-6 and 3-730E915RH-11, 12, & 18. (PCR 08000148)

Added SR key number to Attachment 1 for Scheduling.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 3 of 18
-----------------------	---	--

Table of Contents

1.0	INTRODUCTION	4
1.1	Purpose	4
1.2	Scope.....	4
1.3	Frequency.....	4
1.4	Applicability	4
2.0	REFERENCES	5
2.1	Technical Specifications	5
2.2	Final Safety Analysis Report.....	5
2.3	GE Drawings.....	5
3.0	PRECAUTIONS AND LIMITATIONS	6
4.0	PREREQUISITES.....	7
5.0	SPECIAL TOOLS AND EQUIPMENT RECOMMENDED	7
6.0	ACCEPTANCE CRITERIA	7
7.0	PROCEDURE STEPS	8
7.1	Initial Requirements and Notifications.....	8
7.2	RPS Manual Scram Channel A Functional Test	10
7.3	RPS Manual Scram Channel B Functional Test	13
7.4	Completion and Notifications	16
8.0	ILLUSTRATIONS/ATTACHMENTS	16
Attachment 1: Surveillance Procedure Review Form.....		17
Attachment 2: Control Room Components Affected by Surveillance Procedure Performance		18

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 4 of 18
-----------------------	---	--

1.0 INTRODUCTION

1.1 Purpose

This surveillance procedure performs a functional test of the manual scram push-buttons in conformance with the requirements specified in Technical Specification Table 3.3.1.1-1(Function 11). This procedure meets the requirements of SR 3.3.1.1.14. This procedure, also, partially satisfies the requirements of SR 3.10.3.1 and 3.10.4.1.

1.2 Scope

This surveillance procedure completely satisfies the manual scram functional test requirements of Technical Specification 3.3.1.1.

This procedure provides overlap testing 3-SR-3.3.1.1.12 by verifying Scram Solenoid Group A and B Logic Reset lights extinguish with the associated RPS channel trip. This partially satisfies SR 3.3.1.1.14, Logic System Functional Test.

1.3 Frequency

Once every 92 days.

1.4 Applicability

The SR requirements of this procedure are applicable in Modes 1 and 2. Mode 5 is also applicable with any control rod withdrawn from a core cell containing one or more fuel assemblies.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 5 of 18
-----------------------	---	--

2.0 REFERENCES

2.1 Technical Specifications

Section 3.3.1.1, 3.10.3 and 3.10.4

2.2 Final Safety Analysis Report

Section 7.2, Reactor Protection System

2.3 GE Drawings

3-730E915-6, Elementary Diagram Reactor Protection System

3-730E915 Sh. 7, Elementary Diagram Reactor Protection System

3-730E915RF Sh. 11, Elementary Diagram Reactor Protection System

3-730E915RF Sh. 12, Elementary Diagram Reactor Protection System

3-730E915-13, Elementary Diagram Reactor Protection System

3-730E915 Sh. 14, Elementary Diagram Reactor Protection System

3-730E915 Sh. 17, Elementary Diagram Reactor Protection System

3-730E915RF Sh. 18, Elementary Diagram Reactor Protection System

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 6 of 18
-----------------------	---	--

3.0 PRECAUTIONS AND LIMITATIONS

- A. If any control rod actually scrams during performance of this test, wait at least 10 seconds before resetting the scram to ensure that the scram has gone to completion.
- B. Corrective Actions shall be handled in accordance with SPP-8.1, Conduct of Testing.
- C. The following annunciators should alarm during the performance of this test:

REACTOR CHANNEL A MAN SCRAM (3-XA-55-5B, window 8)

REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9)
- D. The following Integrated Computer System (ICS) points should alarm during the performance of this test:

Point SOE033

Point SOE034

Point SOE178

Point SOE179
- E. The Critical Step warning designates a step or series of steps for an activity which requires additional focus, attention, and increased awareness. The Operator performing these steps for the activity needs to ensure the Unit Supervisor and other Control Room staff are aware of the evolution. PEER checks are required for this activity and short briefs need to be made prior to performing the evolution. Included in the briefs are worst case scenario and contingencies.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 7 of 18
-----------------------	---	--

Date _____

4.0 PREREQUISITES

- [1] **VERIFY** this copy of 3-SR-3.3.1.1.8(11) is the most current revision. _____
- [2] **VERIFY** no other tests or maintenance are in progress which could initiate any of the logic in the Reactor Protection System. _____

5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

None

6.0 ACCEPTANCE CRITERIA

- A. Responses which fail to meet the acceptance criteria stated in this section shall constitute unsatisfactory SR results and require immediate notification of the Unit Supervisor at the time of failure.
 - 1. Control Rod Logic Reset Solenoid Group A indicating lights (4) on Panel 3-9-5 are extinguished when Reactor Scram A push-button on Panel 3-9-5 is depressed.
 - 2. Control Rod Logic Reset Solenoid Group B indicating lights (4) on Panel 3-9-5 are extinguished when Reactor Scram B push-button on Panel 3-9-5 is depressed.
- B. Steps which verify acceptance criteria are designated by (AC) next to the initial blanks.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 8 of 18
-----------------------------	---	--

Date _____

7.0 PROCEDURE STEPS

7.1 Initial Requirements and Notifications

- [1] **VERIFY** Precautions and Limitations in Section 3.0 have been reviewed. _____
- [2] **VERIFY** Prerequisites listed in Section 4.0 are satisfied. _____
- [3] **VERIFY** the following on Panel 3-9-5:
 - Control Rod Logic Reset Solenoid Group A red indicating lights (4) illuminated. _____
 - Control Rod Logic Reset Solenoid Group B red indicating lights (4) illuminated. _____
 - System A Back-Up Scram Valve lights 3-IL-99-5A/AB illuminated. _____
 - System B Back-Up Scram Valve lights 3-IL-99-5A/CD illuminated. _____
 - Reactor Scram A push-button extinguished. _____
 - Reactor Scram B push-button extinguished. _____
 - Annunciator REACTOR CHANNEL A MAN SCRAM (3-XA-55-5B, window 8) reset. _____
 - Annunciator REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9) reset. _____
- [4] **CHECK** the following Unit 3 ICS points indicate NOTTRIP using the SOE status display on any available ICS workstation or ICS alarm printer:
 - SOE033 _____
 - SOE034 _____
 - SOE178 _____
 - SOE179 _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 9 of 18
-----------------------------	---	--

Date _____

7.1 Initial Requirements and Notifications (continued)

- [5] **OBTAIN** permission from the Unit Supervisor to perform this test. [LER 259/89023] _____
US
- [6] [NRC/C] **NOTIFY** the Unit Operator (UO) before commencing this instruction. [LER 259/82032] _____
- [7] **PERFORM** the following:
- [7.1] **DISCUSS** with the UO the effects this procedure has on plant equipment/status. _____
- [7.2] **INFORM** UO that the Integrated Computer System (ICS) will be affected during performance of this procedure and that ICS alarms may be received. _____
- [7.3] **GIVE** copy of Attachment 2, Control Room Components Affected by Surveillance Procedure Performance, to the UO as a reminder that this channel is in test. _____
- [8] **RECORD** the start date, start time, reason for the test, plant conditions, and any pre-test remarks on Attachment 1, Surveillance Procedure Review Form. _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 10 of 18
---------------	---	--

Date _____

7.2 RPS Manual Scram Channel A Functional Test

Start of Critical Step(s)

- [1] **MOMENTARILY DEPRESS** Reactor Scram A push-button, Panel 3-9-5.

End of Critical Step(s)

- [2] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A indicating lights (4) extinguished. _____ (AC)
- One System A Back-Up Scram Valve light 3-IL-99-5A/AB and System B Back-Up Scram Valve light 3-IL-99-5A/CD extinguished. _____
- Reactor Scram A push-button illuminated. _____
- Annunciator REACTOR CHANNEL A MAN SCRAM (3-XA-55-5B, window 8) in alarm. _____

- [3] **VERIFY** the following ICS points indicate TRIP:

- SOE033 _____
- SOE178 _____

- [4] **MOMENTARILY PLACE** Scram Reset switch, Panel 3-9-5, to Reset Gp 1/4 position. _____

- [5] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A lights 1 and 4 illuminated, and lights 2 and 3 extinguished. _____
- Both System A Backup Scram Valve lights 3-IL-99-5A/AB illuminated. _____
- One System B Backup Scram Valve light 3-IL-99-5A/CD illuminated, and one System B Backup Scram Valve light 3-IL-99-5A/CD extinguished. _____
- Annunciator REACTOR CHANNEL A MAN SCRAM (XA-55-5B, window 8) will **NOT** reset. _____
- Reactor Scram A push-button illuminated. _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 11 of 18
---------------	---	--

Date _____

7.2 RPS Manual Scram Channel A Functional Test (continued)

[6] **VERIFY** ICS point SOE178 indicates NOTTRIP.

Start of Critical Step(s)

[7] **MOMENTARILY DEPRESS** Reactor Scram A push-button.

End of Critical Step(s)

[8] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A lights 1 and 4 extinguished.
- One System A Backup Scram Valve light 3-IL-99-5A/AB extinguished.

[9] **VERIFY** the following ICS points indicate TRIP:

- SOE033
- SOE178

[10] **MOMENTARILY PLACE** Scram Reset switch, Panel 3-9-5 to Reset Gp 2/3 position.

[11] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A lights 2 and 3 illuminated, and lights 1 and 4 extinguished.
- Both System B Backup Scram Valve lights 3-IL-99-5A/CD illuminated.
- One System A Backup Scram Valve light 3-IL-99-5A/AB on System A Backup Scram Valve light illuminated, and one System A Backup Scram Valve light 3-IL-99-5A/AB extinguished.
- Annunciator REACTOR CHANNEL A MAN SCRAM (3-XA-55-5B, window 8) will **NOT** reset.
- Reactor Scram A push-button illuminated.

[12] **VERIFY** ICS point SOE033 indicates NOTTRIP.

[13] **VERIFY** ICS point SOE178 indicates TRIP.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 12 of 18
---------------	---	--

Date _____

7.2 RPS Manual Scram Channel A Functional Test (continued)

[14] **MOMENTARILY PLACE** Scram Reset switch, Panel 3-9-5, to Reset Gp 1/4 position. _____

[15] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A red indicating lights (4) illuminated. _____
- Control Rod Logic Reset Solenoid Group B red indicating lights (4) illuminated. _____
- System A Back-Up Scram Valve lights 3-IL-99-5A/AB illuminated. _____
- System B Back-Up Scram Valve lights 3-IL-99-5A/CD illuminated. _____
- Reactor Scram A push-button extinguished. _____
- Annunciator REACTOR CHANNEL A MAN SCRAM (3-XA-55-5B, window 8) reset. _____

[16] **VERIFY** the following computer points indicates NOTTRIP.

- ICS point SOE033 _____
- ICS point SOE034 _____
- ICS point SOE178 _____
- ICS point SOE179 _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 13 of 18
---------------	---	--

Date _____

7.3 RPS Manual Scram Channel B Functional Test

Start of Critical Step(s)

- [1] **MOMENTARILY DEPRESS** Reactor Manual Scram B push-button, Panel 3-9-5. _____

End of Critical Step(s)

- [2] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group B indicating lights (4) extinguished. _____ (AC)
- One System B Backup Scram Valve light 3-IL-99-5A/CD and one System A Backup Scram Valve light 3-IL-99-5A/AB extinguished. _____
- Reactor Scram B push-button illuminated. _____
- Annunciator REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9) in alarm. _____

- [3] **VERIFY** the following ICS points indicate TRIP:

- SOE034 _____
- SOE179 _____

- [4] **MOMENTARILY PLACE** the Scram Reset switch, Panel 3-9-5 to Reset Gp 1/4 position. _____

- [5] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group B lights 1 and 4 illuminated and lights 2 and 3 extinguished. _____
- Both System B Backup Scram Valve lights 3-IL-99-5A/CD illuminated. _____
- One System A Backup Scram Valve light 3-IL-99-5A/AB illuminated and one System A Backup Scram Valve light 3-IL-99-5A/AB extinguished. _____
- Annunciator REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9) will **NOT** reset. _____
- Reactor Scram B push-button illuminated. _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 14 of 18
---------------	---	--

Date _____

7.3 RPS Manual Scram Channel B Functional Test (continued)

[6] **VERIFY** ICS point SOE179 indicates NOTTRIP.

Start of Critical Step(s)

[7] **MOMENTARILY DEPRESS** Reactor Scram B push-button.

End of Critical Step(s)

[8] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group B lights 1 and 4 extinguished.
- One System B Backup Scram Valve light 3-IL-99-5A/CD extinguished.

[9] **VERIFY** the following ICS points indicate TRIP:

- SOE034
- SOE179

[10] **MOMENTARILY PLACE** Scram Reset switch, Panel 3-9-5, to Reset Gp 2/3 position.

[11] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group B lights 2 and 3 illuminated, and lights 1 and 4 extinguished.
- Both System A Backup Scram Valve lights 3-IL-99-5A/AB illuminated.
- One System B Backup Scram Valve light 3-IL-99-5A/CD illuminated and one System B Backup Scram Valve light 3-IL-99-5A/CD extinguished.
- Annunciator REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9) will **NOT** reset.
- Reactor Scram B push-button illuminated.

[12] **VERIFY** ICS point SOE034 indicates NOTTRIP.

[13] **VERIFY** ICS point SOE179 indicates TRIP.

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 15 of 18
---------------	---	--

Date _____

7.3 RPS Manual Scram Channel B Functional Test (continued)

[14] **MOMENTARILY PLACE** Scram Reset switch, Panel 3-9-5, to Reset Gp 1/4 position. _____

[15] **VERIFY** the following on Panel 3-9-5:

- Control Rod Logic Reset Solenoid Group A red indicating lights (4) illuminated. _____
- Control Rod Logic Reset Solenoid Group B red indicating lights (4) illuminated. _____
- System A Back-Up Scram Valve lights 3-IL-99-5A/AB illuminated. _____
- System B Back-Up Scram Valve lights 3-IL-99-5A/CD illuminated. _____
- Reactor Scram B push-button extinguished. _____
- Annunciator REACTOR CHANNEL B MAN SCRAM (3-XA-55-5B, window 9) reset. _____

[16] **VERIFY** the following computer points indicates NOTTRIP.

- ICS point SOE033 _____
- ICS point SOE034 _____
- ICS point SOE178 _____
- ICS point SOE179 _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 16 of 18
-----------------------	---	---

Date _____

7.4 Completion and Notifications

- [1] **NOTIFY** the Unit Operator that this test is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory test results. _____
- [2] **COMPLETE** Attachment 1, Surveillance Procedure Review Form up to Unit Supervisor's review. _____
- [3] **NOTIFY** the Unit Supervisor that this test is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory test results. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1: Surveillance Procedure Review Form

Attachment 2: Control Room Components Affected By Surveillance Instruction Performance

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 17 of 18
-----------------------	---	---

**Attachment 1
(Page 1 of 1)**

Surveillance Procedure Review Form

REASON FOR TEST:

- ☐ Scheduled Surveillance
☐ System Inoperable (Explain in Remarks)
☐ Maintenance (WO No. _____)
☐ Other (Explain in Remarks)

DATE/TIME STARTED _____

DATE/TIME COMPLETED _____

PLANT CONDITIONS _____

PRE-TEST REMARKS: _____

PERFORMED BY:

<u>Initials</u>	<u>Name (Print)</u>	<u>Name (Signature)</u>
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Delays or Problems (If yes, explain in POST-TEST REMARKS)? ☐ Yes ☐ No
 Acceptance Criteria Satisfied? ☐ Yes ☐ No
 If the above answer is no, the Unit Supervisor shall determine if an LCO exists. LCO ☐ Yes ☐ No

UNIT SUPERVISOR _____ Date _____

INDEPENDENT REVIEWER (OPS) _____ Date _____

SCHEDULING COORDINATOR _____ Date _____

POST-TEST REMARKS: _____

BFN Unit 3	Reactor Protection System Manual Scram Functional Test	3-SR-3.3.1.1.8(11) Rev. 0005 Page 18 of 18
-----------------------	---	---

**Attachment 2
(Page 1 of 1)**

Control Room Components Affected by Surveillance Procedure Performance

UNID	DESCRIPTION	LOCATION
3-XA-55-5B Window 8	Annunciator REACTOR CHANNEL A MAN SCRAM	Panel 3-9-5
3-XA-55-5B Window 9	Annunciator REACTOR CHANNEL B MAN SCRAM	Panel 3-9-5
	ICS point SOE033	
	ICS point SOE034	
N/A	INDICATING LIGHTS SCRAM SOLENOID GROUP A LOGIC RESET	Panel 3-9-5
N/A	BACK-UP SCRAM VALVE INDICATING LIGHTS	Panel 3-9-5

The purpose of this sheet is to give the Unit Operator a log of the local alarms and indications in the main control room that will be affected by performance of this surveillance procedure. This sheet is for operator information only and the photocopy of this sheet given to Unit Operator should be discarded upon notification that the instruction is complete.

SIMULATOR EVALUATION GUIDE

TITLE : UNIT 3 - Containment Inerting, Control Rod Withdrawal, IRM Failures CRD Flow Control Failure, H2/O2 Analyzer Failure, 3A Unit Board Failure, ATWS, Steam Line Break in Containment, Drywell Spray Failure, Emergency Depressurization.

REVISION : 0

DATE : October 12, 2008

PROGRAM : BFN Operator Training - HLT

PREPARED BY: _____ / _____
(Operations Instructor) Date

REVIEWED BY: _____ / _____
(LOR Lead Instructor or Designee) Date

REVIEWED BY: _____ / _____
(Operations Training Manager or Designee) Date

CONCURRED : _____ / _____
(Operations Superintendent or Designee) Date

VALIDATION : _____ / _____
BY (Operations SRO: Required for Exam Scenarios Only) Date

LOGGED-IN: _____ / _____
(Librarian) Date

TASKS LIST
UPDATED: _____ / _____
Date

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL ISSUE	10/12/08	All	

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: Containment Inerting, Control Rod Withdrawal, IRM Failures
CRD Flow Control Failure, H2/O2 Analyzer Failure, 3A Unit
Board Failure, ATWS, Steam Line Break in Containment,
Drywell Spray Failure, Emergency Depressurization.
- IV. Length of Scenario: 1 hour
- V. Examination Objectives:
 - A. Terminal Objective
 - 1. Perform routine shift turnover, plant assessment and routine shift operation in accordance with BFN procedures.
 - 2. Given uncertain or degrading conditions, the operating crew will use team skills to conduct proper diagnostics and make conservative operational decisions to remove equipment/unit from operation. (SOER 94-1 and SOER 96-01)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, annunciator, abnormal, and emergency procedures.
 - B. Enabling Objectives:
 - 1. The operating crew will commence inerting the suppression chamber per OI-76.
 - 2. The operating crew will withdraw control rods in accordance with OI-85 and GOI-100-1A.
 - 3. The operating crew will recognize and respond to a failed CRD Flow Control valve per AOI-85-3.
 - 4. The operating crew will recognize and respond to a failed IRM instrument per OI-92 and Tech. Specs.

5. The operating crew will recognize and respond to a failed H2/O2 analyzer I.A.W. ARPs and Tech. Specs.
6. The operating crew will recognize and respond to a trip of 480V Unit Board 3A per ARPs.
7. The operating crew will recognize and respond to another IRM instrument failure and subsequent Rx. Scram.
8. The operating crew will respond to EOI-1 and EOI-2 entry conditions for failure to scram and drywell leak.

- VI. References: The procedures used in the simulator are controlled copies and are used in development and performance of simulator scenarios. Scenarios are validated prior to use, and any procedure differences will be corrected using the procedure revision level present in the simulator. Any procedure differences noted during presentation will be corrected in the same manner. As such, it is expected that the references listed in this section need only contain the reference material which is not available in the simulator.
- VII. Training Materials: **(Only list those items needed for this scenario which are not normally available in the simulator.)**
- A. Calculator **(If needed, otherwise omit)**
 - B. Control Rod Insertion Sheet **(if different then the standard sheet, otherwise omit)**
 - C. Stopwatch **(If needed, otherwise omit)**
 - D. Hold Order / Caution tags **(If needed, otherwise omit)**
 - E. Annunciator window covers **(If needed due to lit alarms, otherwise omit)**
 - F. Steam tables **(If needed, otherwise omit)**

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat HLTS 3-8

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.	bat atws100	Hydraulic ATWS
b.	mrf eg02 resA	prevents the standby stator water cooling pump to auto start
c.	ior zdixs927as4b null	Prevents "B" side IRM bypass joystick from working
d.	imf nm05g 100	Fails IRM "G" high
e.	ior zdihs7475a null	prevents drywell spray on Loop 2
f.	ior an:xa557a22 alarm_off	Prevents ann. for stator cooling trouble
g.	imf rp09c	fails "B" RPS manual channel.

VIII. Console Operator Instructions

A. Scenario File Summary

3. File: bat app01F

MF/RF/IOR#

Description

- | | | |
|----|--|---------------------|
| a. | mrf rp13a byp
mrf rp13b byp
mrf rp13e byp
mrf rp13d byp | Auto Scram bypasses |
|----|--|---------------------|

4. File: bat app02

MF/RF/IOR#

Description

- | | | |
|----|----------------------------------|-------------------|
| a. | mrf rp12a test
mrf rp12b test | Auto ARI bypassed |
|----|----------------------------------|-------------------|

VIII. Console Operator Instructions

B. Console Operator Manipulations

<u>ELAP. TIME</u>		<u>DESCRIPTION/ACTION</u>
Sim. Setup		≈ 1%, Start-up (IC-8)
Sim. Setup		Inserts Batch file (bat HLTS 3-8) See file
Sim. Setup	Manual	Bypass G IRM, Reset ½ scram, acknowledge annunciators and reset.
Sim. Setup		Secure purge filter fan (mrf pc06 stop) Close containment purge valves

When first bypass
valve is open 10-
15 % and C RFP
is in service for
level control

Fails CRD Flow Control Valve
(imf rd02a)

ROLE PLAY: When asked to align the "B" FCV wait 3 minutes and Report that
Steps 3.1 thru 3.7 of 3-OI-85 section 6.3 are complete

When requested
by board operator
to place 3-XS-85-
11 to "B" valve

Swaps CRD Flow Control Valve
(imf rd05 b)

ROLE PLAY: When asked for stabilizing flow (step [11], report 6 gpm

VIII. Console Operator Instructions

B. Console Operator Manipulations

<u>ELAP. TIME</u>	<u>DESCRIPTION/ACTION</u>
2 minutes after CRD flow control valve returned to service and after torus is being inerted	Fails H2/O2 analyzer
When directed by lead examiner	imf ed07a. 480V Unit Board 3A failure
ROLE PLAY: As OSUS report that there is an overcurrent lockout on 3A 480V Unit Board.	
When directed by lead examiner	imf nm05C Fails "C" IRM high
After Tech. Specs. addressed for IRM "C"	imf nm05b 100 3:00 Slowly fails IRM "B" high
After 5 control rods inserted per OI-85	imf th33c 10 12:30 Starts steam leak in drywell
If Requested to perform Appx. 1F wait 6 minutes	Defeats auto scram signals (bat app01f)
If requested to perform Appx.2, wait 6 minutes	Defeats ARI (bat app02)

VIII. Console Operator Instructions

c. Console Operator Manipulations

<u>ELAP. TIME</u>	<u>DESCRIPTION/ACTION</u>
If requested to perform Appx 8A and 8E	bypasses -122 MSIV isolation and Group 6 2.45 and +2 inch isolation (bat app08ae)
Before Drywell Sprays are attempted	Fails power to Loop1 drywell spray valve (ior ypovfcv7460 fail_power_now)

Terminate the scenario when the following conditions are satisfied are at the request of the floor/lead instructor/evaluator.

1. Emergency Depressurization completed
2. Water level restored +2" to +51"
3. Reporting requirements completed

IX. Scenario Summary

Given the unit at ~1% power with a unit startup in progress the crew will commence inerting the suppression chamber and continue with control rod withdrawal for startup. After the first RFP is placed in service and the bypass valves start to open, the CRD flow control valve will fail forcing the crew to place the alternate flow control valve in service. After containment inerting is in progress a failure of the "B" H₂/O₂ analyzer will occur. During the startup another IRM will fail forcing the crew to recognize the Tech. Spec. implications. A loss of 480V Unit Board 3A will occur with several automatic functions failing to occur. After the Unit Board failure another IRM will fail with a resultant ATWS. The crew will respond per AOI-100-1 to insert control rods. After rod insertion has begun a steam line break will occur causing drywell pressure to rise to the point where Drywell sprays are required. The drywell sprays for both loops are inoperable causing the crew to emergency depressurize with control rods still withdrawn.

X. Information to Floor Instructor:

- A. Ensure recorders are inking and recording and ICS is active and updating.
- B. Assign Crew Positions based on the required rotation.
 - 1. SRO: Unit Supervisor _____
 - 2. ATC: Board Unit Operator _____
 - 3. BOP: Desk Unit Operator _____
- C. Conduct a shift turnover with the Shift Manager and provide the Shift Manager with a copy of the Shift Turnover.
- D. Direct the shift crew to review the control board and take note of present conditions, alarms, etc.
- E. Terminate the scenario when the following conditions are satisfied are at the request of the floor/lead instructor/evaluator.
 - 1. Emergency Depressurization completed
 - 2. Water level restored +2" to +51"
 - 3. Reporting requirements completed

XI. Simulator Event Guide

Event 1: Containment Inerting and rod withdrawal

<u>POSITION</u>	<u>EXPECTED ACTIONS</u>	<u>SAT/UNSAT/COMMENTS</u>
SRO	Directs power increase re-commenced with control rods per GOI-100-1A	_____
	Directs steam loads transferred from aux boilers to nuclear steam	_____
ATC	Place "C" RFP in service per OI-3	_____
ATC	Withdraw control rods per OI-85	_____
BOP	Commence inerting the suppression Chamber per OI-76 section 5.1	_____

XI. Simulator Event Guide

Event 2: CRD flow control valve failure

<u>POSITION</u>	<u>EXPECTED ACTIONS</u>	<u>SAT/UNSAT/COMMENTS</u>
ATC	Recognizes and reponds to FCV 85-11A failing closed	_____
SRO	Directs actions per AOI-85-3	_____
ATC	Directs AUO to line up "B" FCV per OI-85 section 6.3	_____
ATC	Places Flow controller to balance match flow then place in manual	_____
ATC	Raises manual adjust pot to raise flow then places controller to balance then Auto	_____
ATC	Directs AUO to remove 85-11A from service.	_____
SRO	Recognizes that CRD temps are >350 and declares them slow per T.S. 3.1.4-1 and TI-393	_____

XI. Simulator Event Guide

Event 3: H2/O2 Analyzer Failure

<u>POSITION</u>	<u>EXPECTED ACTIONS</u>	<u>SAT/UNSAT/COMMENTS</u>
BOP	Responds to Annunciator for H2/O2 analyzer malfunction	_____
BOP	Recognizes failure of the "B" Analyzer and swaps the "A" analyzer to Suppression Chamber	_____
SRO	Refers to Tech. Spec. 3.6.3.2 and TRM 3.6.2 and determines no action required	_____

XI. Simulator Event Guide

Event 4: IRM FAILURE

<u>POSITION</u>	<u>EXPECTED ACTIONS</u>	<u>SAT/UNSAT/COMMENTS</u>
ATC	Recognizes 1/2 scram and IRM "C" failed high	_____
SRO	Recognizes that IRM "G" already bypassed and cannot bypass IRM "C"	_____
SRO	Refers to Tech. Specs and determines that less than required IRMs are operable and places channel in trip or Trip system in Trip. (3.3.1) within 12 hours.	_____

Event 5: Loss of 480V Unit Board 3A

CREW

Recognize loss of 480V Unit Board 3A

Recognize trip of 3A Bus Duct Cooling fan and starts 3B Bus Duct cooling Fan

Recognize failure of 3B Stator Water Cooling pump to auto start and manually starts 3B Stator Water Cooling Pump.

Verifies/Starts 3B EHC pump

SRO

Dispatches Outside Unit Supervisor to check on 3A 480V Unit Board

Event 6: "B" IRM Failure Upscale/ Scram/ATWS

<u>POSITION</u>	<u>EXPECTED ACTIONS</u>	<u>SAT/UNSAT/COMMENTS</u>
ATC	Recognizes IRM "B" failing upscale and attempts to range up.	_____
ATC	Reports failure to range to US	_____
SRO	Directs manual scram	_____
ATC	Manually scrams reactor	_____
	Reports failure to scram and initiates a channel of ARI	_____
ATC		_____
ATC	Reports all rods NOT inserted	_____
ATC	Reports power < 5%	_____
SRO	Recognizes that no entry conditions exist for EOIs and directs BUO to take actions per AOI-100-1.	_____
SRO	Directs RPV water level be controlled +2" to +51"	_____
BOP	Controls water level +2" to +51" with RFPs, HPCI, RCIC	_____
SRO	Directs using AOI-100-1 & 3-OI-85 to insert control rods	_____
ATC	Recognizes that scram is reset and drives control rods per OI-85	_____ _____
SRO	Declares Alert (1.2.A)	_____

Event 7: Steam Leak in Drywell

- | | |
|------|--|
| Crew | Identifies drywell pressure/temperature rise |
| SRO | Enters EOI-2 on high drywell temperature above 160 F, and enters EOI-1 and re-enters EOI-2 when drywell pressure exceeds 2.45 psig . |
| SRO | Verifies appropriate group isolations |
| SRO | Enters C5 and directs ADS inhibited and Appendices 8A and 8E performed |
| SRO | Verifies Diesel generators start |
| BOP | Directs AUO to monitor D/G |
| SRO | Directs the following: <ul style="list-style-type: none">• All available drywell cooling in service• Venting per App 12• "A" H₂/O₂ Analyzers placed in service |
| BOP | Verifies all drywell blowers in service |
| BOP | Vents per Appendix 12 |
| BOP | Places "A" H ₂ /O ₂ Analyzers in service using keylock bypass switches |

- BOP Monitors containment parameters and reports rate of rise of suppression chamber pressure and drywell temperature
- SRO Determines venting will not maintain suppression chamber pressure <12 psig and:
- SRO Directs Torus Sprays be placed in service per Appendix 17C

BOP	Places Torus sprays in service per Appendix 17C	
SRO	When PSC pressure exceeds 12 psig or if determines drywell temperature to exceed 280 degrees F <ul style="list-style-type: none"> • verifies in Safe Region of DW spray curve verifies SP level <18 feet	
SRO	Directs drywell blowers and Recirc pumps removed from service	
SRO	Directs drywell sprays initiated per Appx. 17b	
BOP	Attempts to spray drywell and determines neither loop of drywell sprays are operable.	_____
SRO	Determines that conditions are such that the drywell temperature cannot be maintained below 280 F and Emergency Depressurization is Required	_____
SRO	Directs all injection into the RPV be stopped and prevented except from CRD, SLC, and RCIC per Appx. 4	_____
BOP/ATC	Stops and prevents injection from HPCI, Core Spray, RHR, and Cond/FW per Appx. 4	_____
SRO	Enters C2 and directs 6 ADS valves opened	_____
BOP	Opens 6 ADS valves	_____
SRO	Directs injection re-commenced not before 190 psig	_____
BOP/ATC	Re-commences injection at 190 psig with either condensate or RHR	_____

SRO	Directs RPV level restored to 2-51 inches with either condensate or RHR
BOP/ATC	Restores RPV level to +2 TO +51 inches while monitoring power.
BOP	Monitors torus temperature and reports to US prior to 110 F
SRO	Directs SLC injection prior to 110 F per Appx. 3A if not sub-critical (conditional)
ATC	Injects SLC per Appx. 3A

XII. Crew Critical Tasks (If an evaluated scenario)

	<u>Task</u>	<u>SAT/UNSAT</u>
1.	Inhibit ADS	_____
2.	Emergency depressurize before drywell temperature exceeds 280 °F	_____
3.	Stop and prevent injection per Appx 4 prior to emergency depressurizing.	_____
4.	Maintain RPV level above -180 inches	_____
5.	Inject SLC prior to 110 °F (conditional)	_____

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS3-8

- 7 Total Malfunctions Inserted; List: (4-8)
- 1) IRM failure
 - 2) H2/O2 Analyzer failure
 - 3) CRD flow control valve failure
 - 4) Electrical/Hydraulic ATWS
 - 5) Steam leak in drywell
 - 6) Drywell spray valve failures
 - 7) 3A Unit Board failure
- 1 Malfunctions That Occur After EOI Entry; List: (1-4)
- 1) Drywell spray valve failure
- 3 Abnormal Events; List (1-3)
- 1) CRD flow control valve (AOI-85-3)
 - 2) ATWS (AOI-100-1)
 - 3) ARPs (480V Unit Board 3A)
- 3 Major Transients; List: (1-2)
- 1) ATWS
 - 2) MSL Leak in drywell
 - 3) Emergency Depressurization
- 2 EOIs used; List: (1-3)
- 1) EOI-1
 - 2) EOI-2
- 2 EOI Contingencies Used; List: (0-3)
- 1) C2
 - 2) C5
- 70 Run Time (minutes)
- 28 EOI Run Time (minutes); 40 % of Scenario EOI Run Time
- 4 Crew Critical Tasks
- yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs

"G" IRM bypassed

Operations/Maintenance For the Shift

Commence Inerting the Suppression Chamber per OI-76 Section 5.1

Continue start-up. Currently at step 5.0[68] of GOI-100-1A

Rod Group 17, control rod 30-11

Place "3C" RFP in service at 850 psig for level control.

3B CRD pump tagged for bearing replacement

Unusual Conditions/Problem Areas

Potential for icing of lines due to freezing rain
