

SIMULATOR EXERCISE GUIDE

TITLE : SLOW LOSS OF HP FEEDWATER HEATING ON B STRING, 3A FPC PUMP TRIP,
RFP TRIP, LOSS OF ALL FEEDWATER, UNISOLABLE RCIC STEAM LINE BREAK,
2 OR MORE AREA RAD LEVELS ABOVE MAX SAFE.

REVISION : 0

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PROGRAM : BFN Hot License Training

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

NUCLEAR TRAINING				
REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF CHANGES	DATE	PAGES AFFECTED	REVIEWED BY
0	Initial	01/19/2008	All	csf

- I. PROGRAM: BFN Licensed Operator Requalification Training
- II. COURSE: License Requalification Training (Simulator Exercise Guide)
- III. TITLE: SLOW LOSS OF HP FEEDWATER HEATING ON B STRING, FPC PUMP TRIP, RFP TRIP, LOSS OF ALL FEEDWATER, UNISOLABLE RCIC STEAM LINE BREAK, 2 OR MORE AREA RAD LEVELS ABOVE MAX SAFE.
- IV. LENGTH OF LESSON: 1 ½ to 2 hours
- V. Training 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)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, annunciator, abnormal, and emergency procedures.
 - 4. Use step text procedural compliance.
 - B. Enabling Objectives
 - 1. The operating crew will alternate stator coolant pumps as directed by 3-OI-35A section 6.4.
 - 2. The operating crew will recognize and respond to a high pressure heater string isolation as directed by 3-ARP-9-6A and 3-AOI-6-1A.
 - 3. The operating crew will recognize and respond to a spurious FPC system trip and will place the 3B pump I/S in accordance with 3-ARP-94 win 1 and 3-AOI-78-1.
 - 4. The operating crew will recognize and respond to a RFP Trip with 3-AOI-3-1.
 - 5. The operating crew will recognize and respond to a loss of feedwater event and Rx SCRAM.
 - 6. The operating crew will recognize and respond to unisolable RCIC steam line break, 2 or more area rad levels above max safe requiring Emergency Depressurization.

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)

VIII. Console Operator Instructions

A. Scenario File Summary

1.	File: bat HLTS3-1 MF/RF/IOR#	Description
a)	ior zlofcv712[2] on	Fails 71-2 and 71-3 open
b)	ior zlofcv713[2] on	
c)	ior zlohs712a[2] on	
d)	ior zlohs713a[2] on	
e)	ior ypovfcv712 fail_now	
f)	ior ypovfcv713 fail_now	
g)	imf rm10h (e1 :25) 30	HCU-East rad ≈ 30 mr/hr
h)	imf rm10j (e1 :25) 25	HCU-West rad ≈ 25 mr/hr
i)	imf rm10p (e1 2:00) 50	CS/RCIC area rad 50mr/hr
j)	imf DG01D	D D/G Fails to Start
k)	imf DG02D	D D/G Trip Protective Relay Operation
l)	ior zlo3hS2113ed10a[1] OFF	1836 Green Light Off
m)	mrf DG01D open	Opens logic breaker
n)	imf rp08a	Auto scram failure
o)	imf rp08b	Auto scram failure
p)	imf rp14b	Bypass valve failure
q)	ior zdihs47130b null	BPV jack null
2.	File: bat HLTS3-1-1 MF/RF/IOR#	Description
a)	mmf rm10p 1000 6:00	RCIC rad to max in 6 mins.
b)	mmf rm10h 1000 13:00	HCU-West to Max in 13 mins.
c)	mmf rm10j 1000 14:00	HCU- East to Max in 14 mins.
d)	imf rc09 100 7:00	RCIC steam leak
e)	imf ad01b 0	MSRV 1-19 fails closed
f)	imf ad01f 0	MSRV 1-34 fails closed
g)	Imf ad03b	MSRV 1-19 Stuck Closed
h)	Imf ad03f	MSRV 1-34 Stuck Closed
3.	File: bat HLTS3-1-2 MF/RF/IOR#	Description
i)	imf fw08b 30	RFP 3B Discharge Check Valve Sticks
j)	imf fw13b (none, :10)	3B RFPT trips on Thrust Brng Wear

IX. Console Operator Instructions

B. Console Operators Manipulations

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup	rst 28	100% power MOC
Sim. Setup	restorepref	Establishes Preference Keys
Sim. Setup	HLTS3-1 setup	Verify Preference Keys
Sim. Setup	esc	Clears Popup Window
Sim. Setup	F3	trg e1 MODESW Assigns trigger
Sim. Setup	F4	bat HLTS3-1 see file summary
Sim. Setup	manual	Tag D D/G with Hold notices

ROLE PLAY:

- (After Stator coolant pumps alternated) As AUO, report 3-FIS-035-0065 reading 610 gpm.
- 3-PI-035-0064 is reading 47 psig.
- 3-HS-035-0040 selected for "A-RES" Stator Coolant pump on panel 25-114.

When requested to reset local Stator Coolant panel alarm then: F5 mrf an01b reset Allows resetting MCR alarm

ROLE PLAY: As an IM report that HPCI rupture diaphragm pressure switch PS-73-20B has failed low.

When directed from the Floor then: F6 imf fw05b 100 8:00 'B' HP heater string isolation

ROLE PLAY: If sent to investigate which valve is open, wait 2 minutes and report 3-LCV-22B light is out (B2 high level dump)

ROLE PLAY: At \approx 79% power, as the Reactor Engineer, recommend inserting the first group of Emergency Insert Control Rods.

If asked to reset local Cond Demin alarm F7 mrf an01d reset allows reset of control room alarm

After conditions stabilized or as directed by Floor Instr. F8 imf sw10a Trips 3A FPC pump

ROLE PLAY: (If asked) As AUO, report 3-78-506, 511, & crosstie 507 are open & 3-78-510 (B hx outlet) is closed

ROLE PLAY: (If asked) As RW UO, 3-FRC-78-24 is in manual & set to 0%

If asked to throttle 3-FCV-78-66 F9 ior zlohs7866a[2] on
If asked to close 3-FCV-78-66 F10 dor zlohs7866a[2]

ROLE PLAY: (If asked) As Rx Bldg AUO, report 3B pump discharge pressure is 140 psig (PI-78-16 on 9-25-16)

ROLE PLAY: If sent to inspect breaker on 3A FPC pump, report bkr was found tripped and will not test

After FPC restored and as directed by Floor Instr. F11 bat HLTS3-1-2 Trips 3B RFP on thrust brng wear with check valve failure at 30%.

ROLE PLAY: If sent to check 3B RFP report that there is no apparent cause but you will continue to check

NOTE: Mark the time when RPV level reaches +2 inches to ensure Critical Task completion of inserting a manual scram within 60 seconds of reaching +2 inches.

When directed by Lead Examiner F12 imf fw13a Trips 3A RFP on thrust brng wear

If doesn't start on low level <shift>F1 imf rc02 Start of RCIC

After HPCI is in manual control and injecting up to -50" or directed by Lead Examiner then: <shift>F2 imf hp07 HPCI 120V failure

After 10 minutes of RCIC operations or directed by Lead Examiner then: <shift>F4 bat HLTS3-1-1 Max. Rad (2 areas in 13 mins.)

ROLE PLAY: If directed to close RCIC valves 71-2 & 3 locally, respond that you are waiting on RadCon to enter the Reactor building.

If decided to attempt to close valves locally: mrf rc05k emer 71-2 to emerg
mrf rc05s emer 71-3 to emerg

To return transfer switch to normal mrf rc05k norm 71-2 to norm
mrf rc05s norm 71-3 to norm

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

1. All rods are fully inserted.
2. Reactor water level is in the normal band.
3. Emergency Depressurization has been completed.

X. Scenario Summary

With the unit operating at 100%, the crew will alternate Stator Cooling Water Pumps per 3-OI-35A. Then the operating crew will experience a slow loss of FW HTR level control on the B high pressure heater string. Once the heater is isolated and power reduced, a trip of 3A FPC pump will require the operator to start 3B FPC pump per 3-OI-78. When plant conditions are stable the 3B Reactor Feedwater Pump will trip, the crew will respond per 3-AOI-3-1. After conditions stabilize, The crew will experience a loss of the remaining RFPs which will require the crew to scram and utilize RCIC for level control. The reactor will NOT scram automatically. When RCIC is initiated it develops a steam leak which cannot be isolated forcing the crew to emergency depressurize based on 2 Area Rad Monitors above maximum safe. If HPCI is used for water level control the crew will experience a problem with the flow controller to respond in automatic. Eventually, HPCI will experience a failure of the 120V AC power supply and HPCI will no longer function.

- 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. Terminate the scenario when the following conditions are satisfied or at the direction of the Lead Examiner:
 - 1. All rods fully inserted
 - 2. Reactor Water level normal
 - 3. Emergency Depressurize on 2 area RADS above max safe value

XI. Simulator Event Guide

Event 1a: NORMAL OPERATIONS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>Alternate Stator Cooling Pumps IAW 3-OI-35A, sect. 6.4.</p> <p>[1] START the Standby Stator Cooling Water Pump A(B) by placing GEN STATOR CLG WATER PUMP 3A(B), 3-HS-35-35A(36A) on Panel 3-9-8 to START.</p> <p>[2] STOP the Stator Cooling Water Pump B(A) by placing GEN STATOR CLG WATER PUMP 3B(A), 3-HS-35-36A(35A) on Panel 3-9-8 to STOP.</p> <p>[3] VERIFY the STATOR COOLING WATER GEN INLET FLOW, 3-FIS-035-0065, indicates Min. 595 to Max. 732 gpm on Panel 25-114.</p> <p>[4] VERIFY the STATOR COOLING WATER GEN INLET PRESS, 3-PI-035-0064, indicates 42 (22 psig and 20 psig head) to 52 psig on Panel 25-114.</p> <p>[5] VERIFY the pump control switch for the stator cooling water pump stopped in Step [2] above, (3A), is returned to AUTO on Panel 3-9-8.</p> <p>[6] SELECT STATOR COOLING WATER PUMPS SEL, 3-HS-035-0040 (A-RES-CO-B-RES) on Panel 25-114 to the non-operating pump.</p>
	ATC/BOP	Identify the improper lens configuration on Stator Cooling Water pumps and swap the lenses or informs the SRO.

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Event 1b: HPCI PRESSURE SWITCH FAILURE

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	Responds to Report by IMs of HPCI rupture diaphragm pressure switch failure (3-PS-73-20B), by relaying information to SRO.
	SRO	Consults Tech Spec 3.3.6.1 Function 3c and determines only three pressure switches are required.
	SRO	Determines an INFORMATION ONLY LCO must be written for HPCI pressure switch 3-PS-73-20B.

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Event 2: SLOW LOSS OF HP FEEDWATER HEATING ON “B” STRING

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	Announces “BYPASS VALVE TO CONDENSER NOT CLOSED” and refers to 3-ARP-9-6A, win 18.
	ATC/BOP	<p>A. CHECK heater high or low level or moisture separator high or low level alarm window illuminated on Panel 3-9-6 or 3-9-7 to identify which bypass valve is opening.</p> <p>B. DISPATCH personnel to check which valve's light is extinguished on junction box 34-21, Col T-13 J-LINE, elevation 565'.</p>
	SRO	Direct an Upper Power Runback due to RFP speed above 5050 rpm.
	ATC	Initiates an Upper Power Runback of Recirc Pumps.
	ATC/BOP	Announces “HEATER B2 LEVEL HIGH” and refers to 3-ARP-9-6A, win 9.
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		VERIFY Automatic action - Drain valve to condenser 3-LCV-6-22B opens.
		<p>A. CHECK the following indications:</p> <ul style="list-style-type: none"> • Condensate flow recorder 2-29, Panel 3-9-6. Rising flow is a possible indication of a tube leak. • Heater B2 shell pressure, 3-PI-5-22 and drain cooler B5 flow, 3-FI-6-34, Panel 3-9-6. High or rising shell pressure or drain cooler flow is possible indication of a tube leak.

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Event 2: SLOW LOSS OF HP FEEDWATER HEATING ON “B” STRING

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>B. CHECK drain valve 3-FCV-6-95 open.</p> <p>C. CHECK level on ICS screen, FEEDWATER HEATER LEVEL(FWHL).</p> <ul style="list-style-type: none"> • IF the 3B2 heater indicates HIGH (Yellow), THEN VERIFY proper operation of the Drain and Dump valves. • DISPATCH personnel to local Panel 3-LPNL-925-562C to VERIFY and MANUALLY control the level. <p>D. IF a valid HIGH HIGH level is received, THEN</p> <p>GO TO 3-AOI-6-1A or 3-AOI-6-1C.</p>
	ATC/BOP	Announces B1 and B2 HP htr. Extraction isolation
	SRO	<p>DIRECTS Crew to enter 3-AOI-6-1A</p> <p>Contacts Reactor Engineer</p>

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Event 2: SLOW LOSS OF HP FEEDWATER HEATING ON “B” STRING

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>3-AOI-6-1A</p> <p>Performs immediate actions;</p> <p>REDUCE Core Thermal Power to ε 5% below initial power level to maintain thermal margin.</p>
	ATC/BOP	<p>Performs subsequent actions</p> <p>[1] REFER TO 3-OI-6 for turbine/heater load restrictions.</p> <p>[2] REQUEST Reactor Engineer EVALUATE and ADJUST thermal limits, as required.</p> <p>[3] ADJUST reactor power and flow as directed by Reactor Engineer/Unit Supervisor to stay within required thermal and feedwater temperature limits. REFER TO 3-GOI-100-12 or 3-GOI-100-12A for the power reduction.</p>
	SRO	<p>Directs isolating FW to B HP heater string</p> <p>Directs power reduction to < 79% power (Mid-power runback) per 3-OI-6, III 1 HEATERS OUT (Tube and Shell Side)** One HP string 920 MWe (79%)</p> <p>Enters 3-GOI-100-12, Power Maneuvering</p> <p>Notifies Rx Eng. And ODS of Feedwater Heater isolation and power reduction</p>

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Event 2: SLOW LOSS OF HP FEEDWATER HEATING ON “B” STRING

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>Closes the following FW valves (Attachment 1)</p> <p>3-FCV-3-31, HP HTR 3B2 FW INLET ISOL VALVE</p> <p>3-FCV-3-76, HP HTR 3B1 FW OUTLET ISOL VALVE</p> <p>Performs a mid-power runback ~79%</p>
	ATC/BOP	<p>[4] ISOLATE heater drain flow from the feedwater heater string that isolated by closing the appropriate FEEDWATER HEATER A-2(B-2) or (C-2) DRAIN TO HTR A-3(B-3) or (C-3), 3-FCV-6-94(95) or (96). (Closes 3-FCV-6-95)</p> <p>[5] VERIFY automatic actions occur. REFER TO Attachment 1.</p> <p>VERIFY automatic actions</p> <p>The High Pressure Heater Extraction Isolation Valves and Moisture Separator Level Control Isolation valves close.</p> <p>3-FCV-5-9, HP HEATER 3B1 EXTR ISOL VLV</p> <p>3-FCV-5-21, HP HEATER 3B2 EXTR ISOL VLV</p> <p>3-FCV-6-74, MOISTURE SEP LC RES B1 ISOL VLV</p> <p>3-FCV-6-172, MOISTURE SEP LC RES B2 ISOL VLV</p>

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Event 2: SLOW LOSS OF HP FEEDWATER HEATING ON “B” STRING

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	Crew	<p>[6] MONITOR TURB THRUST BEARING TEMPERATURE, 3-TR-47-23, for rises in metal temperature and possible active/passive plate reversal.</p> <p>[7] DETERMINE cause which required heater isolation and PERFORM necessary corrective action. i.e. Recognizes HTR level lowers as a result of isolating the Condensate side of 3B HP HTR string (i.e. tube leak)</p>
	SRO	Direct ATC to insert the first group of control rods on the Emergency Shove Sheet per Reactor Engineer recommendation.
	ATC	Insert the first group of rods on the Emergency Shove Sheet using a peer check as directed by Rx Engineer & Unit Supervisor

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Event 3: Trip of 3A FPC pump

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	Crew	Recognizes 3A FPC pump trip, responds per the ARP
	ATC/BOP	Resets MOTOR TRIPOUT 3-ARP-9-8C (W33)
	ATC/BOP	<p>Performs the following:</p> <p>Responds to alarm FPC system abnormal 3-ARP-9-4C (W 1)</p> <p>A. DISPATCH personnel to Panels 25-15 and 25-16 to determine the cause of the alarm.</p> <p>H. IF Fuel Pool Cooling System failure has occurred, THEN REFER TO 3-AOI-78-1.</p> <p>Enters 3-AOI-78-1 to start the standby FPC pump</p> <p>Immediate Actions – None</p> <p>Subsequent actions</p> <p>4.2[3] IF fuel pool cooling system failure is from loss of cooling, THEN: (Otherwise N/A) PERFORM the following:</p> <p>[3.1] START idle FUEL POOL COOLING PUMP 3B(3A).</p>

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Event 3: Trip of 3A FPC pump

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		Coordinates with Rx Bldg AUO and Radwaste UO to start 3B FPC pump
		Verifies discharge pressure >120 psig with AUO
		Directs RW UO and Rx Bldg AUO to place demin in service
SRO/BOP		Dispatch AUO/EMs to check breaker for 3A FPC pump
SRO		Directs restoration of system after cause is determined
SRO		Evaluate Tech. Spec. (TRM 3.9.2/3.9.3)
SRO		Determine TRM 3.9.2 Action (A) applies to maintain FP temperature below 150°F.

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Event 4: 3B RFPT Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	Announces "RFPT " Abnormal" alarm" and trip of RFPT 'B'.
	ATC/BOP	Recognize that RFPT "B" speed still indicates ~4000 rpm after the trip.
	ATC/BOP	Recognize that RFPT "A" and "C" are running at the upper speed limiter.
	ATC/BOP SRO	Diagnose the possibility that the discharge check valve on RFPT "B" has not closed.

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Event 4: 3B RFPT Trip

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	ATC/BOP	Refers to ARP 9-6C and take required action
		A. VERIFY reactor power is within the capacity of operating RFPs.
		B. CHECK core limits.
		C. WHEN RFPT coasts down to zero speed, unless RFPT is rolling on minimum flow, THEN VERIFY turning gear motor starts and engages.
		D. REFER TO 3-AOI-3-1 or 3-OI-3, Section 8.1.

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Event 4: 3B RFPT Trip

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	ATC/BOP	Enters 3-AOI-3-1

[1] **VERIFY** applicable automatic actions.

C. Recirc Pumps receive run back signal to 75% speed at 27" (normal range) if the discharge flow of a RFP is less than 889,000 lb/hr 19% (rated flow).

[2] IF level OR Feedwater flow is lowering due to loss of Condensate, Condensate Booster, or Feedwater Pump(s), THEN REDUCE Recirc flow as required to avoid scram on low level.

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Event 4: 3B RFPT Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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[9] IF RFPs are in automatic control, THEN
VERIFY 3-LIC-46-5 raises flow of operating RFPs.

**[12] IF a RFPT has tripped and is NOT required to maintain level, THEN
SECURE tripped RFPT. REFER TO 3-OI-3.**

**[14] IF unit remains on-line, THEN
RETURN Reactor water level to normal operating level of 33" (normal
range).**

SRO	Dispatches AUO to RFP to determine cause of trip
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ATC/BOP	Verifies that unit stable
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Verifies Rx Thermal limits

SRO	Contacts maintenance to check reason for RFPT trip
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NOTE: LEAD EXAMINER notify Console Instructor when ready to trip the next RFP (i.e. next event)

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Event 5: 3A and 3C RFP Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION</u>
	ATC/BOP	Recognizes 3A RFP trip and need for reactor scram
	ATC/BOP	Recognize Auto scram failure (If not manually scrammed prior) (Critical Task)
	SRO	Directs Reactor scram (Critical Task)
	ATC	Manually scrams the reactor and performs 3-AOI-100-1 actions -mode switch in S/D -checks power lowering -reports all rods in -recognizes trip of 3C RFP and informs SRO all RFP's are tripped
	BOP	Trip Turbine / verify isolations
	SRO	Enters 3-EOI-1 on low reactor water level Directs level be controlled by: -RCIC -CRD -HPCI -Enter AOI-100-1

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Event 5: 3A and 3C RFP Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION</u>
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ATC/BOP	Utilizes RCIC for reactor water level control	
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-RCIC (App 5C)

1. IF BOTH of the following exist:

RPV Pressure is at or below 50 psig, AND

Bypass of RCIC low RPV pressure isolation interlocks is necessary, THEN ... EXECUTE EOI Appendix 16A concurrently with this procedure.

2. IF BOTH of the following exist:

High temperature exists in the RCIC area, AND

SRO directs bypass of RCIC High temperature Isolation interlocks, THEN ... PERFORM the following:

a. EXECUTE EOI Appendix 16K concurrently with this procedure.

b. RESET auto isolation logic using RCIC AUTO-ISOL LOGIC A(B) RESET 3-XS-71-51A(B) pushbuttons.

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Event 5: 3A and 3C RFP Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION</u>
	BOP	<p>3. VERIFY RESET and OPEN 3-FCV-71-9, RCIC TURB TRIP/THROT VALVE RESET.</p> <p>4. VERIFY 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller in AUTO with setpoint at 600 gpm.</p>
<hr/> <hr/>		<p>5. OPEN the following valves:</p> <p>3-FCV-71-39, RCIC PUMP INJECTION VALVE</p> <p>3-FCV-71-34, RCIC PUMP MIN FLOW VALVE</p> <p>3-FCV-71-25, RCIC LUBE OIL COOLING WTR VLV.</p> <p>6. PLACE 3-HS-71-31A, RCIC VACUUM PUMP, handswitch in START.</p> <p>7. OPEN 3-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC Turbine.</p>

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Event 5: 3A and 3C RFP Trip

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION</u>
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|--|--|--|
| | | 8. CHECK proper RCIC operation by observing the following: |
| | | a. RCIC Turbine speed accelerates above 2100 rpm. |
| | | b. RCIC flow to RPV stabilizes and is controlled automatically at 600 gpm. |
| | | c. 3-FCV-71-40, RCIC Testable Check Vlv, opens by observing 3-ZI-71-40A, DISC POSITION, red light illuminated. |
| | | d. 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE, closes as flow rises above 120 gpm. |

SRO	Enters 3-EOI-3 on Rx Bldg Hi Rad
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Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	If HPCI is used, recognizes auto control failure and places HPCI controller in manual
	ATC/BOP	Recognizes and reports high area temperature for RCIC room
		Recognizes RCIC failure to isolate and attempts to manually isolate it
	SRO	Directs RCIC be isolated locally
	Crew	Monitors area radiation levels
	SRO	Determines has two area radiation levels above max safe IAW 3-EOI-3 and directs emergency depressurization by opening 6 ADS valves (C2) (Critical Task)

EXAMINER NOTE: Of the 6 ADS valves, 2 will fail to open and the candidate will have to open additional valves (any two) until six are open.

ATC/BOP	Opens 6 ADS valves and recognizes 2 valves failed to open and opens 2 additional valves (Critical Task)
	Verifies RFP discharge valves closed before uncontrolled injection on lowering Rx pressure

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Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	<p>Directs RPV level be maintained between +2" and +51" with one or more of the following: (After emergency depressurization.) (Critical Task)</p> <p>-LPCI</p> <p>-Core Spray</p> <p>-Condensate</p>
	ATC/BOP	<p>After emergency depressurization maintains RPV water level TAF and restores level +2" to +51" with one or more of the following: (Critical Task)</p> <p>-LPCI</p> <p>-Core Spray</p> <p>-Condensate</p> <p>App 6A Condensate</p> <p>1. VERIFY CLOSED the following Feedwater heater return valves:</p> <p>3-FCV-3-71, HP HTR 3A1 LONG CYCLE TO CNDR</p> <p>3-FCV-3-72, HP HTR 3B1 LONG CYCLE TO CNDR</p> <p>3-FCV-3-73, HP HTR 3C1 LONG CYCLE TO CNDR.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>2. VERIFY CLOSED the following RFP discharge valves:</p> <p>3-FCV-3-19, RFP 3A DISCHARGE VALVE</p> <p>3-FCV-3-12, RFP 3B DISCHARGE VALVE</p> <p>3-FCV-3-5, RFP 3C DISCHARGE VALVE.</p> <p>3. VERIFY OPEN the following drain cooler inlet valves:</p> <p>3-FCV-2-72, DRAIN COOLER 3A5 CNDS INLET ISOL VLV</p> <p>3-FCV-2-84, DRAIN COOLER 3B5 CNDS INLET ISOL VLV</p> <p>3-FCV-2-96, DRAIN COOLER 3C5 CNDS INLET ISOL VLV</p> <p>4. VERIFY OPEN the following heater outlet valves:</p> <p>3-FCV-2-124, LP HEATER 3A3 CNDS OUTL ISOL VLV</p> <p>3-FCV-2-125, LP HEATER 3B3 CNDS OUTL ISOL VLV</p> <p>3-FCV-2-126, LP HEATER 3C3 CNDS OUTL ISOL VLV.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u> ATC/BOP	<u>EXPECTED ACTIONS</u>
		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
		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

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>App 6D Core Spray Sys I (Loop II similar)</p> <ol style="list-style-type: none"> 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

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>App 6B RHR Sys I (Loop II similar)</p> <p>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.</p> <p>2. VERIFY OPEN 3-FCV-74-1, RHR PUMP 3A SUPPR POOL SUCT VLV.</p> <p>3. VERIFY OPEN 3-FCV-74-12, RHR PUMP 3C SUPPR POOL SUCT VLV.</p> <p>4. VERIFY CLOSED the following valves:</p> <p>3-FCV-74-61, RHR SYS I DW SPRAY INBD VLV</p> <p>3-FCV-74-60, RHR SYS I DW SPRAY OUTBD VLV</p> <p>3-FCV-74-57, RHR SYS I SUPPR CHBR/POOL ISOL VLV</p> <p>3-FCV-74-58, RHR SYS I SUPPR CHBR SPRAY VALVE</p> <p>3-FCV-74-59, RHR SYS I SUPPR POOL CLG/TEST VLV.</p> <p>5. VERIFY RHR Pump 3A and/or 3C running.</p> <p>6. WHEN ... RPV pressure is below 450 psig, THEN ... VERIFY OPEN 3-FCV-74-53, RHR SYS I LPCI INBD INJECT VALVE.</p> <p>7. IF RPV pressure is below 230 psig, THEN ... VERIFY CLOSED 3-FCV-68-79, RECIRC PUMP 3B DISCHARGE VALVE.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>8. THROTTLE 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE, as necessary to control injection.</p> <p>9. MONITOR RHR Pump NPSH using Attachment 1.</p> <p>10. PLACE RHRSW pumps in service as soon as possible on ANY RHR Heat Exchangers discharging to the RPV.</p> <p>11. THROTTLE the following in-service RHRSW outlet valves to maintain flow between 1350 and 4500 gpm:</p> <p>3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV</p> <p>3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV.</p> <p>12. NOTIFY Chemistry that RHRSW is aligned to in-service RHR heat exchangers.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	<p>After 3-EOI-2 entered on high SP water level or temperature</p> <p>directs the following:</p> <p>- H₂O₂ analyzers placed in service</p>
	ATC/BOP	Places H₂O₂ analyzers in service
	SRO	Directs all available Suppression Pool cooling be placed into service due to Suppression Pool water temperature
	ATC/BOP	<p>App 17A</p> <p>1. IF Adequate core cooling is assured, THEN ... BYPASS LPCI Injection Valve Timers as necessary using EOI Appendices 16F and 16G.</p> <p>Calls for App 16F&G</p> <p>2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:</p> <p>a. VERIFY at least one RHRSW pump supplying each EECW header.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
<hr/>	ATC/BOP	<p>b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).</p> <p>c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 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>d. IF Directed by SRO, THEN ... PLACE the following keylock switches in MANUAL OVERRIDE:</p> <p>3-XS-74-122, RHR SYS I LPCI 2/3 CORE HEIGHT OVRD.</p> <p>3-XS-74-130, RHR SYS II LPCI 2/3 CORE HEIGHT OVRD.</p> <p>e. IF LPCI INITIATION Signal exists, THEN ... MOMENTARILY PLACE the following in select:</p> <p>3-XS-74-121, RHR SYS I CTMT SPRAY/CLG VLV SELECT.</p> <p>3-XS-74-129, RHR SYS II CTMT SPRAY/CLG VLV SELECT.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	<p>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.</p> <p>g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.</p> <p>h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.</p> <p>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:</p> <p>Between 7,000 and 10,000 gpm for one-pump operation. OR</p> <p>At or below 13,000 gpm for two-pump operation.</p>

XI. Simulator Event Guide

Event 6: RCIC STEAM LEAK/LOSS OF HPCI

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC/BOP	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).
		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.l.

Terminate scenario when emergency depressurization has occurred and Rx water level is under control.

XII. Crew Critical Tasks (If an evaluated scenario)

	<u>Task</u>	<u>SAT/UNSAT</u>
1.	Maintains reactor water level above TAF	<hr/>
2.	Emergency depressurize based on 2 areas radiation above maximum safe with a primary system discharging to secondary containment (within 5 minutes)	<hr/>
3.	Recognize auto scram failure within one minute. (If not manually scrammed)	<hr/>

XIII. Scenario Verification Data

<u>EVENT</u>	<u>TASK#</u>	<u>K/A</u>	<u>RO</u>	<u>SR</u> <u>Q</u>	<u>CONTROL MANIPULATION</u>
1. Loss of HP Feedwater Heating	U-068-NO-10 U-006-AB-01 S-006-AB-01 T-000-AD-17	295014	3.7	3.9	B17
2. 3A FPC pump trip					
3. RFPs Trip	U-003-AB-01 S-003-AB-01 U-003-NO-08 T-000-AD-17	295001A2.01 295001A4.02 295009G12	3.7 3.9 3.8	3.7 3.7 4.4	B3
4. HPCI Pressure Switch Failure	U-073-AL-19 S-000-AD-27	206000A2.09 2.1.12	3.5 2.9	3.7 4.0	B5
5. RCIC Leak/MSL Leak	U-000-EM-10 U-000-EM-11 S-000-EM-10 S-000-EM-12 U-000-EM-01 U-000-EM-02 U-000-EM-03 S-000-EM-01 S-000-EM-02 S-000-EM-03 U-000-EM-14 S-000-EM-15 S-000-EM-24 T-000-AD-04 T-000-EM-09 T-000-EM-11 T-000-EM-16	295033 295032 2.4.38 295026	3.6 3.5 3.8 3.6 3.5 3.9 3.9 2.2 3.6	3.9 3.6 4.4 4.2 4.1 4.5 4.5 4.0 3.8	A7,B14,A12, B15,I4,I20

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS 3-1

- 5 Total Malfunctions Inserted; List: (4-8)
- 1) High Pressure Heater Isolation
 - 2) 3A FPC pump trip
 - 3) RFPT trip
 - 4) RCIC steam leak
 - 5) RCIC failure to isolate (auto or manual)
 - 6) HPCI 120V Failure
 - 7) RPS Auto Scram Failure
 - 8) BPV Failure
 - 9) ARI Automatic Failure
- 3 Malfunctions That Occur After EOI Entry; List: (1-4)
- 1) RCIC steam leak
 - 2) RCIC isolation failure (auto or manual)
 - 3) Two ADS valve failures
- 3 Abnormal Events; List (1-3)
- 1) HP Heater Isol. (ARPs)
 - 2) 3A FPC pump trip. (AOI & ARP)
 - 3) RFPTs trip (ARP, AOI)
- 1 Major Transients; List: (1-2)
- 1) RCIC Steam Line Break
- 3 EOIs used; List: (1-3)
- 1) EOI-1
 - 2) EOI-2
 - 3) EOI-3
- 1 EOI Contingencies Used; List: (0-3)
- 1) C2
- 90 Run Time (minutes)
- 29 EOI Run Time (minutes); 30 % of Scenario EOI Run Time
- 3 Crew Critical Tasks
- yes Technical Specifications Exercised (yes/no)

XIV. SHIFT TURNOVER INFORMATION

Equipment out of service/LCOs: Unit 3 has been operating for 193 days, Unit 2 has been operating
for 56 days. Unit 1 has been operating for 290 days.

3ED Diesel Generator is tagged for water jacket leakage repair. Day 2 of LCO, will be returned to service
this shift.

Operation/Maintenance for the Shift: Support scheduled maintenance and testing activities

Alternate Stator Cooling Water Pumps per 3-OI-35A, Sect 6.4 for scheduled maintenance on 3A Stator
Cooling Water Pump. HPCI SR in progress for rupture disk pressure switches by IM's.

Unusual Conditions/Problem Areas: Fuel leakers on U3 are currently @ RFI 60,000.

Storms passing through the region, No Watches in effect for the immediate area.

3C RFP was oscillating approximately 30 RPM during the last shift, but currently working properly and
being monitored. 3C RFP is operating in automatic to collect data for next 24 hours. A trouble shooting
plan is being developed.

Facility: BFN

Scenario Number: HLTS-3-1

Op-Test Number: HLT0610

Examiners: _____

Operators: _____

_____**Initial Conditions:**

Unit 3 has been operating for 192 days. Unit 2 has been operating for 56 days. Unit 1 has been operating for 274 days. 3ED Diesel Generator is tagged for water jacket leakage repair. Day 2 of the LCO. Expected to be returned to service this shift. Fuel leakers on U3 are currently at RFI 60,000. Thunderstorms are passing through the region, but no watches are in effect for the immediate area. The 3C RFP was oscillating approximating 30 RPM during last shift, but is now working properly and being monitored. The 3C RFP Pump is operating in automatic in order to collect data for the next 24 hours. A trouble shooting plan is being developed.

Turnover:

Support scheduled maintenance and testing activities. Alternate Stator Cooling Water Pumps per 3-OI-35A, Sect 6.3 per scheduled OPA.

Event Number	Malfunction Number	Event Type*	Event Description
1	mrf an01b reset	N-ATC N-BOP N-SRO	The crew will alternate Stator Cooling Water Pumps using 3-OI-35A.
1	N/A	I-BOP TS-SRO	The crew will respond to a HPCI Rupture Diaphragm pressure switch PS-73-20B failure.
2	imf fw05b 100 8:00	R-ATC C-BOP R-SRO	The crew will respond to a 3B HP FW heater isolation using 3-AOI-6-1. The crew will reduce power to ~91% using a recirc flow reduction. The crew will isolate feedwater to the 3B FW heater string. The crew will further reduce power to <79% using a recirc flow reduction.
3	imf sw10a	C-BOP C-SRO	The crew will respond to a trip of the 3A Fuel Pool Cooling pump using 3-AOI-78-1.
4	imf fw13b	C-ATC C-BOP C-SRO	The crew will respond to a trip of the 3B Reactor Feedwater Pump (RFP) using 3-AOI-3-1 and 3-OI-3.
5	bat NRCrfpactrip	M All	The crew will respond to a total loss of feedwater and reactor scram.
6	bat HLTS04-1	M All	The crew will respond to a RCIC steam leak into secondary containment. The crew will anticipate Emergency Depressurization or perform Emergency Depressurization due to secondary containment high radiation.

* (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) imf rd01b	3B CRDP trip
k) imf hp09	Failure of HPCI to auto isolate
l) ior zdihs718a close	Fails RCIC
m) ior ypovfcv718 fail_power	Keeps the 71-8 valve closed
n) imf rp11 (e1 1:00)	MSIV logic fuse failure

2. File: bat RRPVIB

<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
Simulator setup	restorepref	Establishes Function Keys
Simulator setup	HLTS3-2 setup	Verify Function Keys
Simulator setup	esc	Clears Function Key Popup
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 7.11
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: If asked, state that the anti-rotation collar markings are aligned.

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 then:	F10 and F11	imf cr02a 75 3:00 Core power oscillations imf th22 (none 1:30) 100 Bottom head leak
When requested, wait 3 minutes	F12	bat app16fg Defeats RHR injection valve timers

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	Responds to Reactor Bldg Hi Rad alarm per 3-ARP-9-3A window 22 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.) Determines HPCI area source of hi rad 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. C. NOTIFY RADCON. 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 E. IF the TSC is manned and a "VALID" radiological condition exists, THEN REQUEST the TSC to evacuate non-essential personnel from affected areas.

XI. Simulator Event Guide (Continued)

Event 3b: HPCI Steam Line Break

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
		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>
	BOP	<p>[4] VERIFY the following valves OPEN to drain the HPCI steam lines.</p> <p>MN STM LINE DRAIN INBD VLV, 3-FCV-1-55</p> <p>OUTBD ISOLATION VLV, 3-FCV-1- -56,</p> <p>[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:</p> <p>[5.1] OPEN the HPCI TURB EXH CNDS POT LCV, 3-LCV-73-8.</p> <p>[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.</p>
	SRO	<p>Determines unit in 14 day LCO (TS 3.5.1.C – HPCI inop. Verify RCIC OPERABLE by administrative means)</p> <p>Determines unit in 72 hour LCO (TS 3.5.1.D - HPCI and C RHR Inop)</p> <p>Tech. Specs. 3.6.1.3.B.1, on FCV 73-2 or 73-3 when tagged (1 hour to close and de-activate)</p> <p><u>EXAMINER NOTE:</u> 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.</p>

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)
	BOP	4.2.3 Other Actions and Documentation

[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	Announces Recirc “3A” high vibration alarm 3-ARP-9-4A window 20 Consults ARP for Panel 9-4 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. B. CHECK for a rise in Drywell equip sump pumpout rate due to seal leakage. 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. D. IF alarm seals in, THEN ADJUST pump speed slightly to try reset the alarm. 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. F. IF pump operation continues, THEN RECORD pump 3A seal parameters hourly on Attachment 1, Page 22 of this ARP.

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	<p>Identifies Seal Failure via Instrumentation</p> <p>Recognizes lowering pressure on Recirc Pump A #1 seal</p> <p>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.</p> <p>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.</p>
	SRO	<p>Directs crew to watch for signs of increased leakage</p>
	ATC	<p>Acknowledges Recirc Pump A seal leakoff high alarm; 3-ARP-9-4A window 18, informs SRO.</p> <p>Recognizes lowering pressure on Recirc Pump A outboard seal; informs SRO</p> <p>Monitors drywell parameters; notes pressure and temperature increasing; informs SRO</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	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> <p>1. SHUTDOWN Recirc Pump 3A by depressing RECIRC DRIVE 3A SHUTDOWN, 3-HS-96-19.</p> <p>2. VERIFY TRIPPED, RECIRC DRIVE 3A NORMAL FEEDER, 3-HS-57-17.</p> <p>3. VERIFY TRIPPED, RECIRC DRIVE 3A ALTERNATE FEEDER, 3-HS-57-15.</p> <p>4. CLOSE Recirculation Pump 3A suction valve.</p> <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> <p>5. CLOSE Recirculation Pump 3A discharge valve.</p> <p>6. REFER TO 3-AOI-68-1A or 3-AOI-68-1B AND 3-OI-68.</p> <p>7. DISPATCH personnel to secure Recirculation Pump 3A seal water.</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>
	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>
	SRO	Directs venting per 3-AOI-64-1
		<u>EXAMINER NOTE:</u> Venting may not be performed based on Drywell pressure.
	BOP	Vents per 3-AOI-64-1
		[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	<p>1. VERIFY at least one SGTS train in service.</p> <p>2. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54):</p> <p>3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV,</p> <p>3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE,</p> <p>3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV,</p> <p>3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE.</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>
		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>
		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	<p>- Directs RPV pressure controlled 800 to 1000 psig with one or more of the following:</p> <p>- MSRV's (App 11A)</p> <p>- RCIC (App 11B) (will not work)</p> <p>- Directs RPV level be maintained between +2" to +51" with one or more of the following:</p> <p>-RCIC (App 5C) (will not work)</p> <p>-CRD (App 5B)</p>
	BOP	<p>Controls pressure 800 to 1000 psig with one or more of the following:</p> <p>- MSRV's (App 11A)</p> <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>
		<p>2. IF BOTH of the following exist:</p> <p>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:</p> <p>a. IF CRD Pump 3A is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.</p> <p>b. IF CRD Pump 3B is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.</p> <p>c. OPEN the following valves to increase CRD flow to the RPV:</p> <p>3-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV</p> <p>3-PCV-85-27, CRD CLG WATER PRESS CONTROL VLV</p> <p>3-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.</p>
BOP		Reports 3B CRD pump tripped

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> <p><input type="checkbox"/> 3-THV-085-0527, CRD PUMP DISCH THROTTLING (RB NE, el 565')</p> <p><input type="checkbox"/> 3-BYV-085-0551, CRD PUMP TEST BYPASS (RB NE, el 565').</p>
	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> <p>1. Place Analyzer isolation bypass keylock switches to bypass.</p> <p>2. Select DW or Supp Chmbr and momentarily pull out select switch handle to start sample pumps.</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 SP cooling be placed in service per App 17A
	BOP	Places SP cooling in service per App 17A
		<p>1. IF Adequate core cooling is assured, THEN ... BYPASS LPCI Injection Valve Timers as necessary using EOI Appendices 16F and 16G.</p> <p>2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:</p> <p>a. VERIFY at least one RHRSW pump supplying each EECW header.</p> <p>b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).</p> <p>c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 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>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
		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	<p>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.</p> <p>g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.</p> <p>h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.</p> <p>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:</p> <p>Between 7,000 and 10,000 gpm for one-pump Operation. OR</p> <p>At or below 13,000 gpm for two-pump operation.</p> <p>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).</p>

XI. Simulator Event Guide (Continued)

EVENT 6: MSIV CLOSURE/LOCA (continued)

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTION(S)</u>
		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.l.
ATC/BOP		Monitors containment parameters
SRO		Enters EOI-2 on DW pressure and re-enters EOI-1 and directs the following: <ul style="list-style-type: none"> - 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>
	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>
	BOP	<p>6. WHEN ... EITHER of the following exists:</p> <p>Before Suppression Pool pressure drops below 0 psig, OR</p> <p>Directed by SRO to stop Suppression Chamber Sprays, THEN ... STOP Suppression Chamber Sprays as follows:</p> <p>a. CLOSE 3-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE.</p> <p>b. VERIFY CLOSED 3-FCV-74-100, RHR SYS I U-2 DISCH XTIE</p> <p>c. IF..... RHR operation is desired in ANY other mode, THEN... EXIT this EOI Appendix.</p> <p>d. STOP RHR Pumps 3A and 3C (3B and 3D).</p> <p>e. CLOSE 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.</p>

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	Trips Recirc. pumps
	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	<p>After entering C1 align all available injection systems for injection.</p> <p>-Containment sprays terminated</p> <p>When water level reaches TAF (-162") and before - 200 directs the following:</p> <p>Enters C2 (Critical step)</p> <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	<p>Restores RPV water level +2" to +51" using: (Critical step)</p> <p>-RHR</p> <p>-Core Spray</p> <p>-Condensate</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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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>
		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>
		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

Facility: BFN

Scenario Number: HLTS-3-2

Op-Test Number: HLT0610

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 7.11 (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 90% using Recirc flow (3-GOI-100-12, step 5.132) at 8 Mwe per minute.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	N-BOP	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	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.
4	imf rd01a	C-ATC	Recognize and respond to a 3A CRD pump trip using 3-AOI-85-3.
5	imf ad01g 40	C-BOP C-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	M All	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

SIMULATOR EXERCISE GUIDE

TITLE : POWER REDUCTION, CORE SPRAY 3D PUMP INADVERTANT START,
RECIRCULATION PUMP TRIP, REACTOR POWER OSCILLATIONS, ATWS WITH
MSIVS OPEN

REVISION : 0

DATE : January 20, 2008

PROGRAM : BFN Operator Training – HLT

PREPARED BY: _____ \ _____
(Operations Instructor) Date

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

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

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

NUCLEAR TRAINING				
REVISION/SROAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL	01/20/08	All	csf

I. PROGRAM: BFN Operator Training

II. COURSE: Examination Guide

III. TITLE: POWER REDUCTION, CORE SPRAY SR FAILURE, RECIRCULATION PUMP TRIP, REACTOR POWER OSCILLATIONS, ATWS WITH MSIVS OPEN

IV. LENGTH OF LESSON: 1 to 1 ½ hours

V. Training 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, abnormal, annunciator, and emergency procedures.

B. Enabling Objectives

1. The operating crew will recognize and respond to an inadvertent start of a Core Spray pump and determine required actions per Technical Specifications.
2. The operating crew will recognize and respond to a recirculation pump trip with reactor power oscillations in accordance with 3-AOI-68-1.
3. The operating crew will recognize and respond to CRD pump 3A trip per 3-AOI-85-3.
4. The operating crew will recognize and respond to an ATWS in accordance with EOI-1 and C-5.
5. The operating crew will recognize and respond to high radiation in accordance with EOI-3.

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

IX. Console Operation Instructions

A. Scenario File Summary

1. File: bat HLTS3-3

<u>MF/RF/IOR</u>	<u>DESCRIPTION</u>
1) imf fw26b 0	'B' FW flow failure
2) bat tohpci	Tags out HPCI
3) imf th23 (e3 0) 2.5 15:00	Fuel failure
4) imf rp08a	RPS A1 scram failure
5) imf rp08b	RPS A2 scram failure
6) trg e1 CSD	Set trigger e1 to file CSD
7) trg e2 CSDHS	Set trigger e2 to file CSDHS
8) trg e3 MODESW	Set trigger e3 to file MODESW
9) trg e1= dor zdihs7542a	Trigger e1 initiates command
10) trg e2= ior zloil7542 on	Trigger e2 initiates command
11) imf tc02 0	Fails Bypass valves closed

2. File: bat HLTS3-3-1

<u>MF/RF/IOR</u>	<u>DESCRIPTION</u>
1) imf th03a (none 10:00)	Trips 3A Recirc. pump
2) imf th03b	Trips 3B Recirc. pump
3) imf cr02a 65 10:00	Power Oscillations
4) bat atws90	90% Hydraulic ATWS
5) Imf tc01 (e3 5:00)	Fail bypass valves closed 5 min after mode sw

3. File bat tohpci

<u>MF/RF/IOR</u>	<u>DESCRIPTION</u>
1) ior ypomtrglesh fail__cn__po ior ypoxfcvcv733a close	Tag gland seal exhaustor 73-3 close
2) ior ypoxfcvcv733 fail__now ior ypoxfcvcv7316 fail__now	Tag FCV 73-3 Tag FCV 73-16
3) ior ypoxfcvcv7381 fail__now	Tag FCV 73-81
4) ior zdihs7347a ptl	Tag HPCI Aux oil pump
5) ior zohs7347a[1] off	
6) imf hp05	HPCI trip

4. File bat HLTS3-3-4

<u>MF/RF/IOR</u>	<u>DESCRIPTION</u>
1) trg e4 RODDRIFT trg e4 = dmfc rd07r2627	Stops drifting rod motion at notch 42.

IX. Console Operation Instructions

A. Scenario File Summary

5. File bat app01f

MF/RF/IOR

DESCRIPTION

- 1) mrf rp13a byp
- 2) mrf rp13b byp

Bypasses automatic scrams
(Appendix 1F)

6. File bat app02

MF/RF/IOR

DESCRIPTION

- 1) mrf rp12a test
- 2) mrf rp12b test

Bypasses ARI
(Appendix 2)

7. File bat app08ae

MF/RF/IOR

DESCRIPTION

- 1) mrf rp06a byp
- 2) mrf rp06b byp
- 3) mrf rp06c byp
- 4) mrf rp06d byp
- 5) mrf rp14a byp
- 6) mrf rp14b byp

Bypasses MSIV isolation on low
RPV water level (Appendix 8A)

Bypasses Rx Bldg ventilation
isolation on low RPV level

8. File bat atws90east

MF/RF/IOR

DESCRIPTION

- 1) imf rd17a
- 2) imf rd09a 90

SDV level switch failure
90% hydraulic ATWS East SDV

9. File bat sdvtd

MF/RF/IOR

DESCRIPTION

- a) dmf rd17a
- b) dmf rd17b
- c) imf rd17a (none 7:00)
- d) imf rd17a (none 7:00)

Deletes SDV level switch failure

Inserts level switch failure after 7
minutes

IX. Console Operation Instructions

B. Console Operator Manipulations

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim.Setup	reset 28	100% MOC
Sim. Setup	restorepref HLTS3-3	Establishes Function Keys
Sim. Setup	setup	Verify Function Keys
Sim. Setup	esc	Clears Function Key Popup
Sim.Setup	F3	See scenario file summary (bat HLTS3-3)
Sim.Setup	manual	Tag out HPCI. Hang out of service cover on "B" FW Flow Indicator
Sim.Setup	manual	HPCI AOP and SPE pumps in PTL. Place Main Generator Voltage Regulator in Manual

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
2 minutes after Unit at 95% power	F4 ior zdihs7542a start	Core Spray pump 3D start
When CS "D" Starts:	bat CSD	bat CSD
If lockout light does not illuminate when CS pump stopped, then	F5 lor zloil7542 on	Illuminates lockout light
2 minutes after Tech Specs addressed for CS pump	F6 imf rd072627 in	Control Rod 26-27 drifting in.
	bat HLTS3-3-4	Assigns trg e4 to stop rod motion at notch 42.

ROLE PLAY: As AUO at HCU 18-35, REPORT – The scram inlet riser is hot to the touch.

ROLE PLAY: As AUO at HCU 18-35, REPORT – 3-SHV-85-588 valve is closed.

ROLE PLAY: Respond as needed as AUO at HCU and as Operator at pnl 9-16 in AUX INST ROOM.

ROLE PLAY: As AUO at HCU 18-35, REPORT – solenoids operating normally (no chattering) and the valve stems indicate closed. Also, when directed, REPORT – 3-SHV-85-588 is open.

↓MORE FOLLOWS↓

IX. Console Operation Instructions

B. Console Operator Manipulations

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
When directed by Chief Examiner:	<shift>F2 bat HLTS3-3-1	Initiates Recirc pump trips and power oscillations. ATWS
After scram inserted	<shift>F3 bat sdv	SDV switches enabled
When appendix 2 requested, wait 3 minutes	<shift>F4 bat app02	Bypass ATWS/ARI circuit
When requested to perform appendix 1F, wait 5 minutes	<shift>F5 bat app01f	Jumper out scram logic
When requested to perform Appendix 8A and 8E, wait 5 minutes	<shift> F6 bat app08ae	Allows restart of Reactor/Refuel zone ventilation
When scram is reset	<shift> F7 bat sdvtd	SDV switches enabled
If requested to close 3-FCV-85-586, wait 5 minutes	<shift> F8 mrf rd06 close	Provides drive water pressure for rod insertion
If requested to open 3-FCV-85-586, wait 1 minute	<shift> F9 mrf rd06 open	Pressurizes charging water header
When Reactor is manually scrammed (2 nd time)	<shift>F3 bat sdv	SDV switches enabled
When Reactor is scram reset (2 nd time)	<shift> F7 bat sdvtd	SDV switches enabled
	<shift> F10 dmf cr02a	Removes power oscillations
	<shift> F11 bat atws-1	Deletes ATWS

Terminate the scenario when the following conditions are satisfied or upon request of the Chief Examiner:

1. All rods fully inserted.
2. RPV water level +2" to +51."
3. Reporting requirements made.

IX. SCENARIO SUMMARY:

The unit is operating at 100% power with a 5% power reduction scheduled. HPCI is tagged out for maintenance on the Auxiliary Oil Pump and is expected to be returned to service within the next 36 hours. It has been out of service for 14 hours.

The Main Generator voltage regulator was placed in Manual to allow PMs on the Automatic regulator. PMs are complete and the voltage regulator can be returned to Automatic.

Core Spray 3D pump inadvertent start is received and the Crew must consult Tech Specs to determine required actions.

Control Rod 26-27 drifts inadvertently into the core and stops at Notch 42.

3B Recirc pump trips, resulting in power oscillations with some fuel failure. While responding to the power oscillations per AOI-68-1, 3A Recirc pump trips and a manual scram must be inserted. The crew will experience a hydraulic ATWS and respond per 3-EOI-1. The SDV will fail to drain totally, thus requiring two additional reactor scrams to insert control rods.

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. All rods inserted
2. Water level +2" to +51"
3. Reporting requirements have been made

XI. Simulator Event Guide

Event 1a: POWER REDUCTION

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	ATC	<p>Reduces 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	Peer checks during power reduction

XI. Simulator Event Guide

Event 1b: VOLTAGE REGULATOR TO AUTOMATIC

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	Directs BOP to return voltage regulator to automatic per 3-OI-47 section 8.14.
	BOP	<p>VERIFY VOLTAGE REGULATOR MAN/AUTO SEL, 3-HS-57-27, is in MAN.</p> <p>PLACE GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 3-HS-57-26, to RAISE UNTIL the upper limit is reached (red light illuminated).</p> <p>PLACE GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 32-HS-57-26, to LOWER UNTIL the lower limit is reached (green light illuminated).</p> <p>ADJUST GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 3-HS-57-26, UNTIL GEN TRANSFER VOLTS, 2-EI-57-41, indicates zero.</p> <p>PLACE VOLTAGE REGULATOR MAN/AUTO SEL, 3-HS-57-27, in AUTO.</p> <p>VERIFY GEN VOLT REGULATOR TRIP TO MAN, 3-EA-57-132 (3-XA-55-8A, window 3) alarms.</p> <p>RESET GEN VOLT REGULATOR TRIP TO MAN, 3-EA-57-132 (3-XA-55-8A, window 3).</p>

XI. Simulator Event Guide

Event 2: SPURIOUS START OF 3D CORE SPRAY PUMP

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	Reports start of 3D Core Spray pump and verifies no valid automatic start signal.
	SRO	Directs trip of 3D Core Spray pump
	BOP	Trips 3D Core Spray pump. Informs SRO that Lockout indicator for 3D Core Spray Pump is illuminated indicating the pump will not start automatically if needed.
	SRO	Consults Tech Spec 3.5.1 determines that 3.5.1.A is a 7 day Action Statement for 3D Core Spray pump and 3.5.1.D is a 72 hour Action Statement in effect with HPCI and one (1) Low Pressure ECCS system inoperable.

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>Announces "Rod Drift" alarm 3-ARP-9-5A window 28</p> <p>A. DETERMINE which rod is drifting from Full Core Display.</p> <p>Identifies rod 26-27 as drifting in.</p> <p>B. IF rod drifting in, THEN REFER TO 3-AOI-85-5.</p> <p>C. IF rod drifting out, THEN REFER TO 3-AOI-85-6.</p> <p>D. REFER TO Tech Spec Section 3.1.3, 3.10.8.</p>
	ATC	Recognizes that Rod 26-27 stops moving at Notch 42.
	SRO	Directs actions per 3-AOI-85-5
	SRO	Directs rod be continuously inserted to 00

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	3-AOI-85-5 Immediate Actions
<u>NA</u>		[1] IF multiple rods are drifting into core, THEN MANUALLY SCRAM Reactor. REFER TO 3-AOI-100-1. Subsequent Actions [1] IF the Control Rod travels greater than two notches from its intended position, THEN INSERT Control Rod to position 00 using CONTINUOUS IN. (otherwise N/A)
	ATC	[2] NOTIFY Reactor Engineer.
	ATC	[3] CHECK Thermal Limits on ICS (RUN OFFICIAL 3D). [4] ADJUST control rod pattern as directed by Reactor Engineer and CHECK Thermal Limits on ICS (RUN OFFICIAL 3D).

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		<p>[5] IF CRD Cooling Water Header DP is excessive and causing the control rod drift, THEN ALTERNATELY ADJUST tape setpoint of CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, and position of CRD DRIVE WATER PRESS CONTROL VLV, 3-HS-85-23A, to establish the following conditions (otherwise N/A):</p> <ul style="list-style-type: none"> <input type="checkbox"/> CRD CLG WTR HDR DP, 3-PDI-85-18A, of about 20 psid, and <input type="checkbox"/> CRD DRIVE WTR HDR DP, 3-PDI-85-17A, between 250 and 270 psid, and <input type="checkbox"/> CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, between 40 and 65 gpm.
ATC		<p>Directs AUO to check the following per 3-AOI-85-5:</p> <p>[6] VERIFY scram pilot air header aligned to scram inlet and outlet valves.</p> <p>[7] CHECK CRD SCRAM OUTLET VALVE, 3-FCV-085-39B, for leakage as indicated by the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Scram riser for affected HCU has higher than normal Temperature <input type="checkbox"/> CRD SCRAM OUTLET VALVE, 3-FCV-085-39B, producing flow noise

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>[8] CHECK CRD SCRAM INLET VALVE, 3-FCV-085-39A, for leakage as follows:</p> <p>[8.1] CHECK insert riser for affected HCU for higher than normal temperature.</p>
	ATC	<p>Directs AUO to perform the following;</p> <p>[8.2] CLOSE CHARGING WATER SOV, 3-SHV-085-588 and OBSERVE CRD ACCUMULATOR NITROGEN SIDE PRESS, 3-PI-085-034, for lowering trend.</p>
	SRO	<p>Declares accumulator inoperable per Tech Spec 3.1.5.A and addresses actions (when charging water is isolated)</p> <div style="border: 1px solid black; padding: 5px;"> <p>EXAMINER NOTE: With charging water isolated to the HCU, the control rod no longer satisfies the OPERABILITY requirement that the control rod is capable of being scrammed even if the rod is fully inserted.</p> </div>
	ATC	<p>After report from AUO thart scram inlet valve is leaking, Directs scrambling of affected rod from panel 9-16 in Aux. Inst. Room</p>

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>[9] IF either Scram Inlet or Outlet Valve is found to be leaking, THEN PERFORM the following to scram the control rod (otherwise N/A):</p> <p>[9.1] ESTABLISH communications between Control Room and the following locations:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hydraulic control unit affected, elevation 565, Reactor Building <input type="checkbox"/> Panel 3-9-16 in Auxiliary Instrument Room, elevation 593, Control Bay <p>[9.2] VERIFY CLOSED CHARGING WATER SOV, 3-SHV-085-588.</p>
	ATC	<p>[9.3] INITIATE individual rod scram by actuating selected rod scram switch on Panel 3-9-16 to its scram (DOWN) position.</p> <p>[9.4] VERIFY control rod has reached FULL IN on Panel 3-9-5.</p> <p>[9.5] IF attempting to reseal scram valves, THEN RETURN rod scram switch for associated control rod to its normal (UP) position at Panel 3-9-16,.</p>
	ATC	<p>Have AUO check locally;</p> <p>[9.6] CHECK solenoid operation of CRD SCRAM INLET and OUTLET VALVES 3-FCV-85-39A and 3-FCV-85-39B, (they should function normally without chatter or abnormal buzzing.)</p> <p>[9.7] CHECK stem travel indicators on CRD SCRAM INLET and OUTLET VALVES 3-FCV-85-39A and 3-FCV-85-39B. IF either scram valve indicates OPEN, THEN NOTIFY control room.</p>

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>[9.8] CHECK blue Scram indicator light on Full Core Display extinguished.</p> <p>[9.9] RESET Rod Drift Alarm and CHECK DRIFT indicator light on Full Core Display extinguished. (N/A if rod is still drifting in)</p> <p>[9.10] CHECK annunciator CONTROL ROD DRIFT (3-XA-55-5A, Window 28) reset. (N/A if rod is still drifting in)</p>
	ATC	<p>Have AUO perform the following;</p> <p>[9.11] SLOWLY OPEN CHARGING WATER SOV, 3-SHV-085-588.</p>
	ATC	<p>[9.12] CHECK amber ACCUM indicator light on Full Core Display extinguished.</p> <p>[9.13] CHECK red indicating light for associated HCU extinguished on local Panel 3-28-4(3-25-22).</p> <p>[9.14] NOTIFY Site Engineering.</p> <p>[9.15] INITIATE a work order.</p>

XI. Simulator Event Guide

Event 3: CONTROL ROD DRIFT IN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
<u>N/A</u>		<p>[10] IF insert directional control valve is suspected of leaking, THEN ATTEMPT to reseal valve as follows (otherwise N/A):</p> <p>[10.1] INSERT control rod one notch.</p> <p>[10.2] NOTIFY Site Engineering.</p> <p>[10.3] INITIATE a work order.</p>
<u>N/A</u>		<p>[11] IF attempts to stop control rod drifting are unsuccessful, THEN PERFORM the following (otherwise N/A):</p> <p>[11.1] VERIFY control rod drive is at position 00 or "FULL IN".</p> <p>[11.2] REMOVE associated HCU from service.</p> <p>REFER TO 3-OI-85 and Tech Spec 3.1.3.</p>
ATC		Reports to SRO rod settles to 00 position
SRO		Initiates actions to determine CR operability and suggests actions including maintenance and inspection.
ATC		De-selects and re-selects Rod 26-27 to clear RBM DOWNSCALE 3-ARP-9-5A (W 31).

XI. Simulator Event Guide

Event 4: RECIRCULATION PUMP TRIP/POWER OSCILLATIONS/ATWS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	Recognizes B Recirculation pump trip
	SRO	Directs 3-AOI-68-1 entry
		Contacts Rx Engr to place APRM's in SLO mode (If time permits)
	ATC/BOP	<p>[1] IF both Recirc Pumps are tripped in modes 1 or 2, THEN (Otherwise N/A),</p> <p>A. SCRAM the Reactor.</p> <p>[2] IF Region I or II of the Power to Flow Map (Illustration 1) is entered, THEN (Otherwise N/A)</p> <p>IMMEDIATELY take actions to INSERT control rods to less than 95.2% loadline. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation.</p> <p>[3] RAISE core flow to greater than 45%. Refer to 3-OI-68.</p>

XI. Simulator Event Guide

Event 4: RECIRCULATION PUMP TRIP/POWER OSCILLATIONS/ATWS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		[4] INSERT control rods to exit regions if not already exited. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation.
		Inserts rods on emergency shove sheet Critical Task
		[5] CLOSE tripped Recirc Pump discharge valve 3-FCV-68-79.
		[6] MAINTAIN operating Recirc pump flow less than 46,600 gpm. Refer to 3-OI-68.
		Verifies flow on A Recirc pump < 46,600 gpm
		[7] [NER/C] WHEN plant conditions allow, THEN, (Otherwise N/A) MAINTAIN operating jet pump loop flow greater than 41 x 106 lbm/hr (3-FI-68-46 or 3-FI-68-48). [GE SIL 517]
		Verifies jet pump flow > 41,100 lbm/hr

XI. Simulator Event Guide

Event 4: RECIRCULATION PUMP TRIP/POWER OSCILLATIONS/ATWS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
		[10] [NER/C] WHEN the Recirc Pump discharge valve has been closed for at least five minutes (to prevent reverse rotation of the pump) [GE SIL-517], THEN (N/A if Recirc Pump was isolated in Step 4.2[8]) OPEN Recirc Pump discharge valve as necessary to maintain Recirc Loop in thermal equilibrium.
ATC		Recognizes power oscillations
ATC/BOP		Notices failure to Scram on OPRM Trip or anticipates trip and inserts a manual scram (Critical Task)
SRO		Directs manual reactor scram (Critical Task)
ATC		Inserts manual scram
		Places Mode switch in shutdown
		Recognizes hydraulic ATWS
		Provides scram report

XI. Simulator Event Guide

Event 4: RECIRCULATION PUMP TRIP/POWER OSCILLATIONS/ATWS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	Enters EOI-1/C-5 and verifies
		Verifies Mode switch to shutdown
		ARI initiated
		Directs ADS inhibited (Critical Task)
	BOP	Inhibits ADS (Critical Task)
	SRO	Directs Appendix 1F and Appendix 2
	BOP	Contacts AUO to perform outside portions of App 1F & 2

XI. Simulator Event Guide

Event 4: RECIRCULATION PUMP TRIP/POWER OSCILLATIONS/ATWS

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	Directs Appendix 1D
	ATC	<p>1. VERIFY at least one CRD pump in service.</p> <p>2. IF Reactor Scram or ARI CANNOT be reset, THEN ... DISPATCH personnel to CLOSE 3-SHV-085-0586, CHARGING WATER SOV (RB NE, EI 565 ft).</p> <p>Dispatches AUO to close 3-SHV-85-586.</p> <p>3. VERIFY REACTOR MODE SWITCH in SHUTDOWN.</p> <p>4. BYPASS Rod Worth Minimizer.</p> <p>5. REFER to Attachment 2 and INSERT control rods in the area of highest power Critical Task</p>

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	Recognizes 3A Recirc pump trip, if not tripped by ATC Operator due to ATWS
	Crew	Recognize and reports “OG Pretreatment Radiation High” “OG Annual Release Limit Exceeded” “Turbine Building High Radiation” Notifies RadCon, and Chemistry Evacuates appropriate area of Turb. Bldg.
	SRO	Directs RPV pressure be maintained 800-1000 psig
	BOP	Controls RPV pressure between 800-1000 psig with SRVs

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	SRO	<p>Directs water level be lowered to control power per Appendix 4 (Critical Task)</p> <p>Directs Appendix 8A and 8E be performed</p> <p>Reports SAE 1.2-S</p>
	ATC	<p>1. PREVENT injection to RPV from the following systems in any order as required: (Critical Task)</p> <p>a. HPCI</p> <p>1) IFHPCI Turbine is NOT at zero speed, THENPRESS and HOLD 3-HS-73-18A, HPCI TURBINE TRIP push-button.</p> <p>2) WHENHPCI Turbine is at zero speed, THENPLACE 3-HS-73-47A, HPCI AUXILIARY OIL PUMP control switch in PULL TO LOCK and RELEASE 3-HS-73-18A, HPCI TURBINE TRIP push-button.</p>
	BOP	<p>b. RCIC</p> <p>1) IFDIRECTED by SRO to allow RCIC injection, THENEXIT step 1.b.</p> <p>2) PRESS 3-HS-71-9A, RCIC TURBINE TRIP push-button to trip RCIC Turbine.</p>

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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	BOP	c. CORE SPRAY
--	-----	---------------

NOTE: Following receipt of an automatic initiation signal, it is NOT necessary to wait until the pump actually starts before performing the next step.

Following an initiation signal, PLACE ALL Core Spray pump control switches in STOP.

	BOP	d. LPCI SYSTEM I
--	-----	------------------

PREVENT injection by EITHER of the following methods:

Following automatic pump start, PLACE RHR SYSTEM I pump control switches in STOP.

OR

BEFORE RPV pressure drops below 450 psig,

1) VERIFY Appendix 16F has been performed, AND

2) VERIFY CLOSED 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
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	BOP	e. LPCI SYSTEM II
--	-----	-------------------

PREVENT injection by EITHER of the following methods:

Following automatic pump start, PLACE RHR SYSTEM II pump control switches in STOP.

OR

BEFORE RPV pressure drops below 450 psig,

1) VERIFY Appendix 16G has been performed, AND

2) VERIFY CLOSED 3-FCV-74-66, RHR SYS II LPCI OUTBD INJECT VALVE.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>f. CONDENSATE and FEEDWATER</p> <p>1) LOWER RFPT 3A(3B)(3C) speed to minimum setting (approximately 600 rpm) using ANY of the following methods on Panel 3-9-5:</p> <p>Using 3-LIC-46-5, REACTOR WATER LEVEL CONTROL PDS, in MANUAL AND individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in AUTO,</p> <p>OR</p> <p>Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL,</p> <p>OR</p> <p>Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR.</p> <p>2) CLOSE the following valves BEFORE RPV pressure drops below 450 psig:</p> <p>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-LCV-3-53, RFW START-UP LEVEL CONTROL.</p> <p>3) TRIP RFPTs as necessary to prevent injection by DEPRESSING the following push-buttons:</p> <p>3-HS-3-125A, RFPT 3A TRIP 3-HS-3-151A, RFPT 3B TRIP 3-HS-3-176A, RFPT 3C TRIP.</p>

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	Crew	Monitors suppression pool temperature Calls AUO to perform App 8A & 8E
	ATC	After Appendix 1F and 2 complete resets scram and drains SDV
	ATC	App 1F 2. WHEN ... RPS Logic has been defeated, THEN ... RESET Reactor Scram. 3. VERIFY OPEN Scram Discharge Volume vent and drain valves. 4. DRAIN SDV UNTIL the following annunciators clear on Panel 3-9-4: <input type="checkbox"/> WEST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (3-XA-55-4A, Window 1) <input type="checkbox"/> EAST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (3-XA-55-4A, Window 29).

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	Continues to insert control rods per Appendix1D
	BOP	Maintains water level as directed with RFP / RCIC
	BOP	Maintains Pressure control using the following appendices: 11D Main Steam line Drains 11F RFPT 11A SRV's
	BOP	App 11D 2. VERIFY hotwell pressure below -7 in. Hg. 3. CONTROL RPV pressure with Main Steam line drains as follows: a. VERIFY PCIS reset. b. OPEN the following valves (Panel 3-9-3): <input type="checkbox"/> 3-FCV-1-55, MN STM LINE DRAIN INBD ISOLATION VLV <input type="checkbox"/> 3-FCV-1-56, MN STM LINE DRAIN OUTBD ISOLATION VLV <input type="checkbox"/> 3-FCV-1-58, UPSTREAM MSL DRAIN TO CONDENSER 4. THROTTLE 3-FCV-1-59, DOWNSTREAM MSL DRAIN TO CONDENSER, as necessary to control cooldown rate.

XI. Simulator Event Guide

Event 6: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	App 11F 2. VERIFY MSIVs open. 3. VERIFY Hotwell Pressure at or below -7 in. Hg. 4. PLACE RFPTs in service as follows: a. VERIFY the following: 1) At least one condensate pump running. 2) At least one condensate booster pump running. 3) Condensate System aligned to supply suction to RFPs. b. VERIFY Main Oil Pump running for EACH RFPT to be started. c. VERIFY CLOSED 3-FCV-3-19(12)(5), RFP 3A(3B)(3C) DISCHARGE VALVE. d. DEPRESS 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER, and VERIFY amber light is illuminated.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	e. DEPRESS 3-HS-3-124A(150A)(175A), RFPT 3A(3B)(3C) TRIP RESET.
		f. PLACE 3-HS-46-112A(138A)(163A), RFPT 3A(3B)(3C) START/LOCAL ENABLE, in START.
		g. CHECK RFPT 3A(3B)(3C) speed increases to approximately 600 rpm.
		h. VERIFY OPEN 3-FCV-3-20(13)(6), RFP 3A(3B)(3C) MIN FLOW VALVE.
		i. PLACE 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER in RAISE to raise RFPT speed, maintaining discharge pressure less than 1250 psig.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
-------------	-----------------	-------------------------

BOP		
-----	--	--

App 11A

2. IF Suppression Pool level is at or below 5.5 ft, THEN ... CLOSE MSRVS and CONTROL RPV pressure using other options.

3. OPEN MSRVS using the following sequence to control RPV pressure as directed by SRO:

- 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

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	When alarms WEST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (3-XA-55-4A, Window 1) EAST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (3-XA-55-4A, Window 29). Are clear, directs 3-85-586 re-opened and after accumulator alarms are clear, Inserts manual scram (Critical Task)
	Crew	Recognizes some control rod movement, but all control rods not in
	SRO	Directs reactor reset, drain SDV, and re-scam (Critical Task) Directs SLC injection if Torus temperature approaches 110 deg. Enters EOI-2 on Torus water level Directs Venting per Appendix 12 Directs placing H₂O₂ monitors in service

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	<p>Performs Appendix 12 to vent Torus</p> <ol style="list-style-type: none"> 1. VERIFY at least one SGTS train in service. 2. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): <ul style="list-style-type: none"> 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. 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.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	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.

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

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	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

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<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>Stable flow as indicated on controller, AND</p> <p>3-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished, AND</p> <p>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 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

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	Maintains water level as directed to control power
	ATC	After SDV drained and after accumulators recharged, scrams reactor again and verifies all rods in (Critical Task)
	SRO	Directs level be restored +2" to +51" (Critical Task)
	SRO	Directs SLC stopped (if injected)
	Crew	Recognize RM-90-29A Rx Bldg High Radiation (conditional)
	BOP	Evacuates Reactor Building
	SRO	Enters EOI-3 on high Rx Bldg radiation and directs ventilation restored per Appx 8F.

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	<p>App 8F</p> <p>1. VERIFY PCIS Reset.</p> <p>2. PLACE Refuel Zone Ventilation in service as follows (Panel 3-9-25):</p> <p>a. VERIFY 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS, control switch is in OFF.</p> <p>b. PLACE 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS, control switch to SLOW A (SLOW B).</p> <p>c. CHECK two SPLY/EXH A(B) green lights above 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS, control switch extinguish and two SPLY/EXH A(B) red lights illuminate.</p> <p>d. VERIFY OPEN the following dampers:</p> <p>. 3-FCO-64-5, REFUEL ZONE SPLY OUTBD ISOL DMPR</p> <p>. 3-FCO-64-6, REFUEL ZONE SPLY INBD ISOL DMPR</p> <p>. 3-FCO-64-9, REFUEL ZONE EXH OUTBD ISOL DMPR</p> <p>. 3-FCO-64-10, REFUEL ZONE EXH INBD ISOL DMPR.</p>

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		<p>3. PLACE Reactor Zone Ventilation in service as follows (Panel 3-9-25):</p> <p>a. VERIFY 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS, control switch is in OFF.</p> <p>b. PLACE 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS, control switch in SLOW A (SLOW B).</p> <p>c. CHECK two SPLY/EXH A(B) green lights above 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS, control switch extinguish and two SPLY/EXH A(B) red lights illuminate.</p> <p>d. VERIFY OPEN the following dampers:</p> <p>3-FCO-64-13, REACTOR ZONE SPLY OUTBD ISOL DMPR</p> <p>. 3-FCO-64-14, REACTOR ZONE SPLY INBD ISOL DMPR</p> <p>. 3-FCO-64-42, REACTOR ZONE EXH INBD ISOL DMPR</p> <p>. 3-FCO-64-43, REACTOR ZONE EXH OUTBD ISOL DMPR.</p>

XI. Simulator Event Guide

Event 5: ATWS WITH FUEL FAILURE/FAILURE OF SDV TO DRAIN

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
_____	ATC/BOP	<p>Announces MAIN STEAM LINE RADIATION HIGH-HIGH Annunciator 3-ARP-9-3A window 27 (if received)</p> <p>A. VERIFY alarm on 3-RM-90-136 thru 137 on Panel 3-9-10.</p> <p>B. CONFIRM main steam line radiation level on recorder 3-RR-90-135, Panel 3-9-2.</p> <p>C. IF alarm is VALID and scram has NOT occurred, THEN PERFORM the following:</p> <p>IF core flow is above 60%, THEN</p> <ol style="list-style-type: none">1. LOWER core flow to between 50-60%.2. MANUALLY SCRAM the Reactor.3. REFER TO 3-AOI-100-1. <p>D. IF plant conditions DO NOT require the execution of 3-C-5, Power/Level Control, THEN VERIFY the MSIV's CLOSED.</p> <p>E. NOTIFY RADCON.</p>

XII. Crew Critical Tasks (CCT)

	<u>TASK</u>	<u>SAT/UNSAT</u>
1.	Manual scram due to Scram failure of OPRM Trip within one minute.	_____
2.	Prevent ADS actuation.	_____
3.	Controls power by :	
	• Inserting control rods per RC/Q-21.	_____
	• Lowering reactor water level per EOI-C-5.	_____
4.	Maintains RPV water level above -180" with rods out	_____

XIII. Scenario Verification Data

<u>EVENT</u>	<u>K/A Number</u>	<u>RO</u>	<u>SRO</u>
1. Control Rod Drift	201002A2.02	3.2	3.3
2. APRM Failure	215005A2.03 2.1.12	3.6 2.9	3.7 4.0
3. Recirculation Pump Trip/Power Oscillations/ATWS	295001 295025 295037	3.3 3.8 3.9	3.4 3.9 4.0

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-3-3

- 7 Total malfunctions Inserted; List: (4-8)
1. Recirc Trip
 2. Power Oscillations
 3. ATWS
 4. Fuel Failure
 5. Core Spray pump 3D trip
 6. Control Rod Drift
- 2 Malfunctions That Occur After EOI Entry; List: (1-4)
- 1) ATWS
 - 2) Fuel Failure
- 2 Abnormal Events; List: (1-3)
- 1) Control Rod Drift
 - 2) Recirc Trip
- 2 Major Transients; List: (1-2)
- 1) ATWS
 - 2) 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); 50 % of Scenario EOI Run Time
- 4 Crew Critical Tasks (2-5)
- Yes Technical Specifications Exercised (yes/no)

XV. SHIFT TURNOVER INFORMATION

Equipment out of service/LCOs: HPCI tagged out for 14 hours to repair Auxiliary Oil Pump. Expected
back in 3 hours. Flow indicator 3-78B out of service, IM's are looking for a new transmitter. Main
Generator voltage regulator in manual for PMs on Automatic voltage regulator. Spare RBCCW pump in
service to Unit 2.

Operation/Maintenance for the Shift: Reduce power to 95% with recirculation flow due to high river water
temperature. PMs on voltage regulator complete, return voltage regulator to automatic.

Unusual Conditions/Problem Areas: None

Facility: BFN

Scenario Number: HLTS-3-3

Op-Test Number: HLT0610

Examiners: _____

Operators: _____

_____**Initial Conditions:**

The HPCI system is tagged out for 14 hours to repair the Auxiliary Oil Pump. It is expected back in 3 hours. Flow indicator 3-78B is out of service. Instrument Mechanics are looking for a new transmitter. The Main Generator voltage regulator has been placed in Manual for PMs on the Automatic voltage regulator. The spare RBCCW pump in service to Unit 2.

Turnover:

Reduce power to 95% using recirculation flow due to low system load requirements. PMs on the voltage regulator are complete. Return the Main Generator voltage regulator to Automatic operation.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	R-ATC R-SRO	The ATC operator will reduce reactor power to 95% using recirc flow using 3-OI-68.
1	N/A	N-BOP N-SRO	The BOP operator will return the Main Generator voltage regulator to Automatic using 3-OI-47.
2	ior zdihs7542a start	C-BOP C-SRO TS-SRO	The crew will recognize and respond to an inadvertent start of the 3D Core Spray pump. The SRO will address Tech Specs.
3	imf rd07 xx-xx	R-ATC C-SRO	The crew will recognize and respond to a control rod drifting into the core using 3-AOI-85-5.
4	imf ed12a	C All	The crew will recognize and respond to a loss of 3A 480V RMOV board.
5	bat NRC/ HLTS10-1	M All	The crew will recognize and respond to a recirc pump trip, power oscillations, scram and ATWS.
6	Timed out from batch file	M All	The crew will recognize and respond to a fuel failure during the ATWS recovery actions.

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

SIMULATOR EVALUATION GUIDE

TITLE : RWM FAILURE, CRD PUMP TRIP, RBCCW PUMP TRIP, FEED
PUMP CONTROL FAILURE, FUEL FAILURE, RWCU LINE BREAK
WITH FAILURE TO ISOLATE, RAPIDLY DEPRESSURIZE WITH 2
AREAS APPROACHING MAXIMUM SAFE RADIATION LEVELS

REVISION : 0

DATE : January 20, 2008

PROGRAM : BFN Operator Training – HLT

PROVIDE COPY OF 3-GOI-100-1A TO EXAMINEES

PREPARED BY: _____ / _____
(Operations Instructor) 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

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL	2/5/2008	All	R.M. Spadoni

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: RWM FAILURE, CRD PUMP TRIP, RBCCW PUMP TRIP, FEEDPUMP CONTROL FAILURE, FUEL FAILURE, RWCU LINE BREAK WITH FAILURE TO ISOLATE, RAPIDLY DEPRESSURIZE WITH 2 AREAS APPROACHING MAXIMUM SAFE RADIATION LEVELS AND EMERGENCY DEPRESSURIZE AFTER 2 AREAS REACH MAXIMUM SAFE RADIATION LEVELS
- 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 start and warm-up "B" RFP In accordance with OI-6 section 5.7.
 - 2. The operating crew will recognize and respond to a failure of RWM in accordance with 3-OI-85-5 and Tech. Specs.
 - 3. The operating crew will recognize and respond to a CRD pump trip in accordance with 3-AOI-85-3.

4. The operating crew will recognize and respond to a RBCCW pump trip in accordance with 3-AOI-70-1.
5. The operating crew will recognize and respond to Feedpump control failure in accordance with 3-AOI-3-1.
6. The operating crew will recognize and respond to a fuel failure in accordance with ARPs and EOI-3.
7. The operating crew will recognize and respond to a break in the RWCU system and rapidly depressurize the RPV.

- 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 HLTS3-4

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.)	ior zdihs691 null	Fails 69-1 to close
b.)	imf cu04 25	RWCU suction line break
c.)	imf cu06	
d.)	bat 7048FTC	fail 70-48 to not auto close

2. File: bat HLTS3-4-1

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.)	imf rm10g 1000 5:00	Fails rm14 upscale
b.)	imf rm10e 1000 10:00	Fails rm09 upscale

3. File: bat 7048ftc

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.)	ior zlohs7048a[2] on	Override red light on
b.)	ior ypovfcv7048 fail_power_now	Fails power to valve
c.)	trg e1=bat 7048-1	Set trigger to 70-48 HS
d.)	Imf fw10c	Fail 3C RFP auto trips

4. File: bat 7048-1

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.)	dor zlohs7048a[2]	Delete Override on red light
b.)	dor ypovfcv7048	Restore power to valve

5. File: bat HLTS3-4-4

	<u>MF/RF/IOR#</u>	<u>Description</u>
a.)	imf fw30c (none 0) 60 30 50	Run up and stop 3C RFP controller in manual

VIII. Console Operator Instructions

B. Console Operator Manipulations

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup	Reset IC 9	~9% power, MOC
Sim. Setup	Manual	Place Hold Order Tags on A RFP suction and discharge valves
Sim. Setup	Manual	Ensure RWM is latched with no Insert or Withdrawal blocks and comp/prog lights reset, rod group 39 – 06-47 selected
Sim. Setup	Manual	Verify 3A RFP suct & disch valve lights extinguished. If not, bat 3arfptag
Sim Setup	<Shift F1> bat 7048ftc	Set 70-48 to not close on low pressure and fail 3C RFP auto trips

After RFP warmed and When requested by Examiner	F3	Fails RWM (imf rd14a)
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ROLE PLAY: If asked, have not performed a startup with RWM bypassed within last calendar quarter

ROLE PLAY: If requested to verify open 3-1-155 and 3-1-156, report that they are open

After Tech Specs addressed for RWM	imf rd01a	Trips 3A CRD Pump.
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ROLE PLAY: When sent to investigate the trip of 3A CRD Pump, report that the breaker is tripped on over-current.

After the crew starts 3B CRD pump and with Lead Examiners concurrence:	F8	Trips A RBCCW pump (imf sw02a)
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VIII. Console Operator Instructions (continued)

B. Console Operator Manipulations

If requested to align spare RBCCW pump to Unit 3 Wait 3 minutes	F9	Aligns spare RBCCW pump to Unit 3 (mrf sw02 align)
If requested to reset local RWCU panel alarms	F12	mrf an01e reset
After spare RBCCW pump aligned and RWCU returned to service	<Shift F3> Bat HLTS3-4-4	Fails RFP governor in raise direction in manual for 30 sec
Two (2) Minutes after Feedpump governor problem	F6	fuel failure (imf th23 5 15:00)
When directed by examiner	F7	RWCU line break with failure to isolate (bat HLTS3-4)

ROLE PLAY: If requested to attempt to close 69-1 locally at the breaker, wait 5 minutes and report it will not close

ROLE PLAY: If requested to check Aux Inst rm, report 835 A&C and 835 B&D reading 90 deg F and fairly steady

After attempts to close 69-1 are made	F10	Causes Rad monitors to reach max (bat HLTS3-4-1)
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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. RPV rapidly depressurized
3. RPV emergency depressurized

IX. Scenario Summary

The plant is at approximately 9% power withdrawing control rods to open sufficient bypass valves to roll the main turbine . “B” RFP needs to be started and warmed in preparation for water level control.

During the control rod withdrawal, the RWM will experience a program fault which will block rod movement. Tech. Specs will be addressed and control rod withdrawal will continue when a second licensed operator is present to ensure withdrawal is in accordance with the BPWS.

A CRD pump will trip causing the crew to start the standby CRD pump.

An RBCCW pump will trip causing RWCU to be secured and the spare RBCCW pump aligned to Unit 3 and the RWCU system returned to service.

The In-service RFP will experience a governor fault causing it to inject cold water into the RPV causing a power spike and some fuel failure. Later the RWCU system develops and leak and fails to isolate requiring entry into EOI-3 and subsequent rapid depressurization due to 2 areas approaching max safe radiation levels.

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.

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|----|-----|-------|
| 1. | SRO | _____ |
| 2. | ATC | _____ |
| 3. | BOP | _____ |

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. RPV rapidly depressurized
3. RPV emergency depressurized when 2 areas are above max safe values.

XI. Simulator Event Guide

EVENT 1: Warming up second RFP

TIME	<u>POSITION</u>	EXPECTED ACTIONS
	SRO	Directs warming up B RFP in accordance with 3-OI-3
	BOP	Warms up “B” RFP utilizing section 5.6 of 3-OI-3.
		3-ARP-9-6C window 32
		A. VERIFY reactor Feedpump flow on Panel 3-9-6.
	<u>N/A</u>	B. REFER TO 3-OI-3, Section 8.7.
	<u>N/A</u>	C. IF annunciation is caused by RFW Control System malfunction, THEN REQUEST assistance from Site Engineering and IMs.

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EVENT 1: Warming up second RFP

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	<p>Place in auto and verify open RFP min flow valve 3-FCV-3-13</p> <p>Place 3B start/local enable 3-HS-46-138A in start and observe RFP accelerates to 600 rpm</p> <p>Verify no abnormal rubbing or vibration is observed</p> <p>Raise speed to ~1000 rpm using 3-HS-46-9A</p> <p>Place TG motor 3-HS-3-127A in Auto</p> <p>Depress 3B trip 3-HS-3-127A and verify HP and LP stop valves close</p> <p>Verify TG auto engages or RFP rolling on min flow</p> <p>Depress 3B trip reset 3-HS-3-150A and verify blue light extinguishes and HP and LP stop valves open</p> <p>Place 3B start/local enable 3-HS-46-138A in start and observe RFPT speed increases to ~ 600 rpm</p>

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EVENT 2: RWM FAILURE

TIME	POSITION	EXPECTED ACTIONS
	ATC	Announces “RWM ROD BLOCK” 3-XA-55-5B window 35 alarm and refers to ARP. A. CHECK RWM panel for error. B. CHECK rod position and COMPARE it with Control Rod Movement Data Sheet (3-SI-4.3.B.1.a) (3-SR-3.1.3.5(A)). C. IF RWM becomes inop, THEN REFER TO 3-OI-85 and Tech Spec 3.1, 3.3, Table 3.3.2.1-1.
	SRO	Directs ATC to bypass RWM per OI-85 Refers to T.S. 3.1, 3.3, table 3.3.2.1-1 Contacts Rx Engineer

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EVENT 2: RWM FAILURE

TIME	POSITION	EXPECTED ACTIONS
	ATC	3-OI-85 section 8.17

[1] VERIFY the following initial conditions are satisfied:

- The Shift Manager/Reactor Engineer has directed the Rod Worth Minimizer to be bypassed.
- A second licensed operator is available to verify control rod position.

[2] REVIEW all Precautions and Limitations in Section 3.4.

[3] PLACE RWM SWITCH PANEL, 3-XS-85-9025, in BYPASS.

[4] CHECK the Manual Bypass light is illuminated.

[5] CHECK all other indications on the Rod Worth Minimizer Operator's Panel are extinguished.

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EVENT 2: RWM FAILURE

TIME	POSITION	EXPECTED ACTIONS
	ATC	[6] CHECK the Blue Rod Out Permit light above 3-HS-85-48 is illuminated.
		[7] RESET CONTROL ROD WITHDRAWAL BLOCK annunciator (3-XA-55-5A, Window 7).
	SRO	Determines T.S. 3.3.2.1 condition C.2.1-1 & 2.2 applies. Greater than 12 rods withdrawn and 2nd person to verify compliance with BPWS.

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EVENT 3: CRD PUMP 3A TRIP

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>Recognize annunciator MOTOR TRIPOUT 3-ARP-9-8c (W 33) is in alarm.</p> <p>Acknowledges and resets MOTOR TRIPOUT annunciator.</p> <p>Recognize 3A CRD pump has tripped and performs Immediate Operator Actions in accordance with 3-AOI-85-3, "CRD System Failure."</p>

4.1 Immediate Actions

- [1] **IF** operating CRD PUMP has **TRIPPED AND** STANDBY CRD PUMP is **AVAILABLE, THEN**
(Otherwise **N/A**)

PERFORM the following at Panel 3-9-5:

- [1.1] **PLACE** CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, in MAN at minimum setting.

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EVENT 3: CRD PUMP 3A TRIP

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	ATC	<p>[1.2] START associated standby CRD Pump using one of the following:</p> <ul style="list-style-type: none">• CRD PUMP 3B, using 3-HS-85-2A• CRD Pump 3A, using 3-HS-85-1A
		<p>[1.3] ADJUST CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, to establish the following conditions:</p> <p>CRD CLG WTR HDR DP, 3-PDI-85-18A, approximately 20 psid.</p> <p>CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, between 40 and 65 gpm.</p>
		<p>[1.4] BALANCE CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, and PLACE in AUTO or BALANCE.</p>

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EVENT 4: LOSS OF 3A RBCCW pump

TIME	POSITION	EXPECTED ACTIONS
	BOP	<p>Responds to loss of RBCCW pump 3A trip and attempts to restart 3A RBCCW pump and reports it failed to start.</p> <p>3-ARP-9-4C window 12</p> <p>A. VERIFY 3-FCV-70-48 CLOSING/CLOSED.</p> <p>Reports that the 3-FCV-70-48 sectionalizing valve failed to close.</p> <p>B. VERIFY RBCCW pumps A and B in service.</p> <p>C. VERIFY RBCCW surge tank low level alarm is reset.</p> <p>D. DISPATCH personnel to check the following:</p> <ul style="list-style-type: none"><input type="checkbox"/> RBCCW surge tank level locally.<input type="checkbox"/> RBCCW pumps for proper operation. <p>E. REFER TO 3-AOI-70-1 for RBCCW System failure and 3-OI-70 for starting spare pump.</p>

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EVENT 4: LOSS OF 3A RBCCW pump

TIME	POSITION	EXPECTED ACTIONS
	SRO	Directs securing RWCU pumps per 3-AOI-70-1
	BOP	Immediate Actions
		[1] IF RBCCW Pump(s) has tripped, THEN: ATTEMPT to restart tripped pump(s).
		[2] IF RBCCW Pump(s) cannot be restarted, THEN: (Otherwise N/A) SHUT DOWN RWCU System Pumps. (Reference TRM 3.4.1)
		Secures RWCU pumps and reports that the 3-FCV-70-48 sectionalizing valve failed to close.
	N/A	IF Reactor is at power AND Drywell Cooling cannot be immediately restored, AND core flow is above 60%, THEN: (Otherwise N/A):
	N/A	REDUCE core flow to between 50-60%.
	N/A	MANUALLY SCRAM the Reactor and PLACE Mode Switch to SHUTDOWN. REFER TO 3-AOI-100-1.
	N/A	SHUT DOWN both Recirc Pumps.
	N/A	<input type="checkbox"/> DEPRESS RECIRC DRIVE 3A SHUTDOWN, 3-HS-96-19.
	N/A	<input type="checkbox"/> DEPRESS RECIRC DRIVE 3B SHUTDOWN, 3-HS-96-20.
	N/A	INITIATE a 90°F/HR cooldown rate. REFER TO 3-AOI-100-1.
	N/A	IF any EOI entry condition is met, THEN: (Otherwise N/A)

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EVENT 4: LOSS OF 3A RBCCW pump

TIME	POSITION	EXPECTED ACTIONS
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**[3] IF unable to restart a tripped pump, THEN:
(Otherwise N/A) PLACE Spare RBCCW Pump in service.
REFER TO 3-OI-70.**

**REQUEST Unit 1 to place the spare RBCCW pump in
service to support Unit 3 operation. (REFER TO 1-OI-70).**

**Contacted U1 Operator to place the spare pump in
service to Unit 3.**

Back to 3-AOI-70-1

**[4] IF RBCCW flow was restored to two pump operation
THEN: (Otherwise N/A)**

**[4.1] REOPEN RBCCW SECTIONALIZING VLV, 3--HS--70-
48A. After Spare RBCCW pump placed in service,
(conditional, SRO may not direct valve to be opened
after failure to auto close and if so, will NOT place
RWCU in service.)**

**[4.2] RESTORE the RWCU system to operation. (REFER
TO 3-OI-69)**

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EVENT 4: LOSS OF 3A RBCCW pump

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	<p>3-OI-69 section 5.1 [8]</p> <p>RWCU Pump Startup</p> <p>[1] REVIEW precautions and limitations in Section 3.0.</p> <p>[2] VERIFY RWCU prestartup requirements in Section 4.0 have been completed.</p> <p>[3] VERIFY RESET the RWCU Group 3 isolation using PCIS DIV I RESET, 3-HS-64-16A-S32 and PCIS DIV II RESET, 3-HS-64-16A-S33 at Panel 3-9-4.</p> <p>[4] IF a condition exists which could have caused 3-FCV-069-0094 to isolate, THEN VERIFY OPEN 3-FCV-069-0094, RWCU SYSTEM APP R FLOW CONTROL VLV, locally. (Unit 3 Rx Bldg, EI 593' R-17 S-Line).</p> <p>[5] VERIFY RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL, 3-TIC-069-0010A is in MANUAL, and FULL OPEN demand is on 3-TCV-70-49. (REFER TO Illustration 5)[BFPER 03-000348-000]</p> <p>[6] VERIFY CLOSED the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> RWCU BLOWDOWN PRESS CONTROL VLV, using 3-HC-69-15 <input type="checkbox"/> RWCU BLOWDOWN TO MAIN CNDR, using 3-HS-69-16A <input type="checkbox"/> RWCU BLOWDOWN TO RADWASTE, using 3-HS-69-17A

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EVENT 4: LOSS OF 3A RBCCW pump

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		<p>[7] IF a Caution Order is present on the control room hand switch for RWCU PUMP 3A(3B) informing operator that 3-SHV-070-0573A(0573B) is closed, THEN PERFORM the following:</p> <p>[7.1] OPEN 3-SHV-070-0573A(0573B), RWCU PUMP A(B) CLG WTR INLET.</p> <p>[7.2] REMOVE Caution Order from the control room hand switch for RWCU PUMP 3A(3B) informing operator that 3-SHV-070-0573A(0573B) is CLOSED.</p> <p>[8] NOTIFY chemistry RWCU is being placed in service and to check the durability monitor.</p> <p>[9] VERIFY OPEN the following valves:</p> <ul style="list-style-type: none">• RWCU INBD SUCT ISOLATION VALVE, 3-FCV-69-1• RWCU OUTBD SUCT ISOLATION VALVE, 3-FCV-69-2• RWCU DEMIN BYPASS VALVE, 3-FCV-69-8 <p>[10] OPEN 3-FCV-069-0012 by one of the two methods described below.</p>

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EVENT 4: LOSS OF 3A RBCCW pump

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	<ul style="list-style-type: none"> • PLACE 3-HS-69-12A in the OPEN position, THEN RETURN 3-HS-69-12A to the NORM position when intermediate position (red and green light) is indicated. • PLACE 3-HS-69-12A in the OPEN position, THEN RETURN 3-HS-69-12A to the NORM position when FULL OPEN position (red light only) is indicated.
	N/A	<p>[11] PLACE seal purge in operation to pump(s) to be placed in service. REFER TO Section 8.2.</p> <p>[12] START RWCU RECIRC PUMP 3A(3B) using control switch 3-HS-69-4A(4B)-A, and A RISE flow, using RWCU RETURN ISOLATION VALVE, 3-HS-69-12A, to prevent low flow trip.</p> <p>[13] IF two pump operation is desired, THEN START the second RWCU RECIRC PUMP 3B(3A) using control switch 3-HS-69-4B(4A)-A, and A RISE flow using RWCU RETURN ISOLATION VALVE, 3-HS-69-12A, to prevent low flow trip.</p> <p>[14] IF the RWCU filter-demineralizers is to be placed in service, THEN REFER TO Section 6.2. (all local actions except Operator closing 3-FCV-69-8 valve as AUO rolls demins in service)</p>

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EVENT 4: LOSS OF 3A RBCCW pump

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		3-ARP-9-4B window 24
		A. DISPATCH personnel to local Panel 25-3, to determine cause of alarm.
		B. IF alarm is valid, THEN REFER TO 3-ARP-25-3 for appropriate operator action.
		C. IF this alarm meets the requirements AND the Shift Manager desires the annunciator to be disabled, THEN REFER TO OPDP-4.
	BOP	Coordinates with AUO to roll demins in service
	SRO	Dispatches personnel to investigate pump loss
		May contact Rx Engineer about heat balance
		Contacts Chemistry
		Reviews TRM LCO 3.4.1 and verify it does not apply whether RWCU is placed in service or not.

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EVENT 5: FEEDWATER CONTROLLER FAILURE

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	ATC	Observes period rise by meter or annunciator and checks for cause of reactivity addition
	ATC	Ranges IRMs as necessary to prevent a reactor scram
	BOP	Attempts to take control of A RFP by adjusting 3-HS-46-8C and reports that "C" RFP cannot be controlled

IF Feedwater Control System has failed, THEN
PERFORM the following:

PLACE individual RFPT Speed Control Raise/Lower
switches in MANUAL GOVERNOR (depressed position
with amber light illuminated).

ADJUST RFP Discharge flows with RFPT Speed Control
Raise/Lower switches as necessary to maintain level.

**IF level continues to rise, THEN TRIP a RFP, as
necessary.**

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EVENT 5: FEEDWATER CONTROLLER FAILURE

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	SRO	Directs tripping “C” RFP and using “B” RFP for RPV level control (Critical Task)
	BOP	Trips “C” RFP by depressing 3-HS3-125C and raises “B” RFP speed by using 3-HS-46-9B (Critical Task)
	BOP	Opens “B” RFP discharge valve 3-HS-3-12B when “B” RFP discharge pressure is within 250 lbs of reactor pressure.

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EVENT 6: FUEL FAILURE DUE TO COLD WATER INJECTION

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	Announces “TURBINE BUILDING HIGH RADIATION” 3-ARP-9-3A window 27 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.) IF the TSC is NOT manned, THEN USE public address system to evacuate area where high airborne conditions exist.
	N/A	IF the TSC is manned, THEN REQUEST the TSC to evacuate non-essential personnel from affected areas. NOTIFY RADCON. MONITOR other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in.

XI. Simulator Event Guide

EVENT 6: FUEL FAILURE DUE TO COLD WATER INJECTION

<u>TIME</u>	<u>POSITION</u>	<u>EXPECTED ACTIONS</u>
	BOP	Announces “RX BLDG HIGH RADIATION” and determines which area and evacuates that area. North and South RWCU area.
	N/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.)
		IF the alarm is from the HPCI Room while Flow testing is being performed, THEN REQUEST personnel at the HPCI Quad to validate conditions
		NOTIFY RADCON.
		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
		MONITOR other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in.

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EVENT 6: FUEL FAILURE DUE TO COLD WATER INJECTION

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	Announces “OFF-GAS ANNUAL RELEASE LIMIT EXCEEDED” 3-ARP-9-4C window 27 To determine if the Off Gas Annual Release Rate Limit is exceeded, PERFORM the following: VERIFY alarm condition on the following: <ul style="list-style-type: none">• OFFGAS PRETREATMENT RADIATION recorder, 3-RR-90-157 on Panel 3-9-2• OG PRETREATMENT RAD MON RTMR radiation monitor, 3-RM-90-157 on Panel 3-9-10 CHECK off-gas flow and monitor sample flow normal. NOTIFY RADCON.
	BOP/SRO	Notifies Chemistry to perform analysis and Radcon
	SRO	Declares a NOUE on a valid OG pretreatment rad alarm.

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EVENT 6: FUEL FAILURE DUE TO COLD WATER INJECTION

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	REQUEST Chemistry perform radiochemical analysis to determine source.
	N/A	WITH OPS MGT and Shift Manager's permission, PLACE charcoal beds in parallel with another unit. REFER TO 3-OI-66.
		IF fuel damage is suspected, THEN REFER TO 3-SI-4.6.B.5 (3-SR-3.4.6.1) for dose equivalent iodine - 131 determination.
		REFER TO 0-SI-4.8.B.1.a.1 and 3-SI-4.6.B.6 (3-SR-3.4.6.1-a) for ODCM compliance and to determine if power level reduction is required.
		IF directed by Shift Manager or Unit Supervisor, THEN REDUCE reactor power to maintain off-gas radiation within ODCM limits.
		REFER TO EPIP-1.

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EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	BOP	Reports on RWCU leak detection alarms 3-ARP-9-3D window 17
	N/A	<p>IF this alarm is received in conjunction with RWCU ISOL LOGIC CHANNEL A TEMP HIGH [3-XA-55-5B, window 32] and RWCU ISOL LOGIC CHANNEL B TEMP HIGH [3-XA-55-5B, window 33], THEN EXIT this procedure and GO TO 3-ARP-9-5B. Otherwise,</p> <p>CHECK RWCU Leak Detection System temperatures on Panel 3-9-21 and Panels 9-83, 9-84, 9-85 and 9-86 in the auxiliary instrument room. . The 834 and 835 Temp Loops are also displayed on ICS under 'HPTURB' for Main Steam Tunnel and 'RWCU' for the Pipe Trench.</p> <p>IF high temperature is indicated on TS 69-29D, E, F, G or H or TIS 69-835A, B, C, or D, THEN ENTER 3-EOI-3 Flowchart.</p> <p>CHECK Rx Bldg. RWCU system ARMs, 3-RI-90-13A and 14A on Panel 3-9-11, and Rx Zone Exhaust Rad Monitor, 3-RR-90-142 on Panel 3-9-2.</p> <p>DISPATCH personnel to investigate the affected area.</p>
	SRO	Enters EOI-3 on either high temp or high radiation

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EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	ATC	Recognizes that 69-1 failed to isolate and attempts to manually close
	Crew	Directs outside personnel to attempt to close 69-1 locally at the breaker.
	SRO	Directs Rx Scram before any area temp is above the maximum safe operating temperature.
	ATC	Scrams reactor and provides scram report
	SRO	Directs ATC to perform actions of 3-AOI-100-1

XI. Simulator Event Guide

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	SRO/BOP	Continue to monitor and trend secondary area temps and radiation levels
	BOP	Reports that 2 areas are approaching maximum safe radiation levels
	SRO	Directs rapid depressurization of the RPV using BPVs
	BOP	Opens all BPVs using the Jack
	BOP/ATC	Coordinate level control during depressurization to prevent flooding the RPV
	BOP	Determines that 2 areas are above max safe radiation values
	SRO	Determines that Emergency Depressurization is Required and enters C2 (Critical Task)
		Directs BOP to open all ADS valves (Critical Task)
	BOP	Opens all ADS valves (Critical Task)

XI. Simulator Event Guide

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		Reports Main Steam Line Radiation High – High 3-ARP-9-3A window 27
		A. VERIFY the alarm on 2-RM-90-136 and 2-RM-90-137 on Panel 2-9-10.
		B. CONFIRM main steam line radiation level on recorder 2-RR-90-135, Panel 2-9-2.
		C. IF alarm is valid and Reactor Scram has not occurred, THEN PERFORM the following:
		1. IF core flow is above 60% THEN LOWER core flow to between 50-60%..
		2. MANUALLY SCRAM the Reactor.
		3. REFER to 2-AOI-100-1 .
		D. IF plant conditions DO NOT require execution of 2-C-5, THEN VERIFY the MSIV's closed.
		E. NOTIFY RADCON.
		F. VERIFY actions of 2-ARP-9-3A Window 7 have been completed.
		G. IF Technical Specification limits are exceeded, THEN REFER TO EPIP-1.

XI. Simulator Event Guide

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
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3-ARP-9-3A window 7

A. CHECK following radiation recorders:

1. MAIN STEAM LINE RADIATION monitor, 2-RR-90-135 on Panel 2-9-2.

2. OFFGAS PRETREATMENT RADIATION, 2-RR-90-157 on Panel 2-9-2.

3. OFFGAS RADIATION, 2-RR-90-160 on Panel 2-9-2.

4. OFFGAS POST-TREATMENT RADIATION, 2-RR-90-265 on Panel 2-9-2.

5. STACK GAS RADIATION, 0-RR-90-147 on Panel 1-9-2.

B. NOTIFY RADCON.

C. [NRC/C] NOTIFY Chemistry to perform radiochemical analysis of primary coolant. [NCO 940247001]

XI. Simulator Event Guide

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
	SRO	Directs Rx water level be maintained +2 - +51 using Condensate, Core Spray, or RHR 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

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		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

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
		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

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
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App 6D (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

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
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App 6B (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.

XI. Simulator Event Guide

EVENT 7: RWCU LINE SUCTION BREAK

<u>TIME</u>	POSITION	EXPECTED ACTIONS
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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

	<u>TASKS</u>	<u>SAT/UNSAT</u>
1.	Trips "C" RFP prior to reaching Main Steam Lines (120" on 3-55 level instrument)	_____
2.	Emergency Depressurize when 2 areas reach maximum safe values. (Within 5 minutes)	_____

XIII. Scenario Verification Data

<u>EVENT</u>	<u>TASK NUMBER</u>	<u>K/A</u>	<u>RO</u>	<u>SR</u> <u>O</u>	<u>CONTROL</u> <u>MANIPULATION</u>
1.	Warm up RFP	259001 A4.02	3.9	3.7	
2.	RWM Failure	201006 A4.01	3.2	3.4	
3.	CRD Pump Trip	201001 A2.01	3.2	3.3	
4.	RBCCW Pump Trip	295018 AK3.03 AA1.01 AK3.04	3.1 3.3 3.3	3.4 3.4 3.3	
5.	RFP Governor failure	259001 A2.07 295008 AA1.08	3.7 3.5	3.8 3.5	
6.	Fuel Failure	295014 AA1.05 AA1.07	3.9 4.0	3.9 4.1	
7.	RWCU Line Break	295033 EA1.05 EK3.01	3.9 3.3	4.0 3.5	

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-3-4

- 7 Total Malfunctions Inserted; List: (5-8)
- 1) RWM Failure
 - 2) CRD Pump trip
 - 3) RFP controller failure
 - 4) Fuel Damage
 - 5) RWCU line break
 - 6) "A" RBCCW pump trip
 - 7) Failure of 69-1 to close
 - 8) Failure of RFPs to trip on Hi level
- 1 Malfunctions That Occur After EOI Entry; List: (1-2)
- 1) RWCU line Break
- 3 Abnormal Events; List: (2-4)
- 1) RFP control failure
 - 2) CRD Pump trip
 - 3) RBCCW pump trip
- 1 Major Transients; List: (1-2)
- 1) RWCU line break (small LOCA)
- 2 EOIs used; List: (1-2)
- 1) EOI-1
 - 2) EOI-3
- 1 EOI Contingencies Used; List: (0-2)
- 1) C2
- 63 Run Time (minutes)
- 52 EOI Run Time (minutes); 83 % of Scenario EOI Run Time
- 2 Crew Critical Tasks (2-3)
- Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs 3A RFP is uncoupled and awaiting overspeed testing.

Suction, Discharge and Minimum Flow valves are tagged.

Operations/Maintenance For the Shift: Continue with reactor startup at step 5.69.8 of
3-GOI-100-1A. Continue with warm-up of "B" RFP per OI-3 at step 5.6.[18]. Thrust
bearing/ Overspeed/ Stop Valve and Control Valve tests are complete for "B" RFP.

Place 3B RFP 100 psig below reactor pressure.

Unusual Conditions/Problem Areas: Power System Alert in effect for the next 36
Hours.

Facility: BFN Scenario Number: HLTS-3-4 Op-Test Number: HLT0610

Examiners: _____

Operators: _____

Initial Conditions:

The unit is starting up following a refuel outage. Reactor power is at ~ 1%. "C" RFP is uncoupled for performance of turbine overspeed testing. Currently at step 5.76.8 of 2-GOI-100-1A.

Turnover:

The 3C RFP is uncoupled and the suction and discharge valves are tagged for performance of turbine overspeed. Currently at step 5.76.8 of 3-GOI-100-1A and at step 5.6.13 of 3-OI-3 for warming 3B RFP.

Event Number	Malfunction Number	Event Type*	Event Description
1	none	R-ATC N-BOP R-SRO	Crew will continue to pull rods to increase power and start warming up 2B RFP
2	imf rd14a	I-ATC I-SRO TS-SRO	Crew will respond to a RWM failure. SRO references ITS
3	imf sw02a trip 7048FTC	C-BOP C-SRO	Crew will respond to a RBCCW pump trip Crew manually closes 70-48 after fails to auto close
4	ior zdihs468a imf th23 5	C-BOP C-SRO	Crew will respond to feedwater controller malfunction which results in cold water injection
5	imf th23 5	M All	Crew responds to fuel failure after cold water injection
6	imf cu04 25 ior zdihs691 null	M All	Crew responds to a RWCU line break and scrams reactor before any area reaches max safe value.

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