

Draft Submittal

(Pink Paper)

SIMULATOR SCENARIOS

DRAFT

SIMULATOR

SCENARIOS

Facility: BFN

Scenario Number: HLTS-1(0606)

Op-Test Number: HLT0606

Examiners: _____

Operators: _____

Initial Conditions: Unit 2 at 90% power. Loop I RHR Hx's tagged, clearance has both 2A & 2C RHR Hx inop for containment cooling. Out of service 6 hours, expected back in 12 hours. 7 day LCO entered per T.S. 3.7.1, 3.6.2.3, 3.6.2.4, 3.6.2.5. All Appendix R, T.S. LCO's have been addressed. 1B CRD pump is tagged for breaker maintenance.

Turnover: Raise Unit 2 to 100% power at 10MWe/min. Support maintenance on Loop I RHR Hx valves. Power was reduced for turbine valve testing which has been completed.

Event Number	Malfunction Number	Event Type*	Event Description
1	None	R-ATC N-SRO	ATC will raise Reactor power with Recirc flow to rated
2	imf th30v 0	TS,I-SRO	2-LIS-3-203B fails downscale. ITS must be referenced by SRO
3	imf fw30a	C-SRO C-ATC C-BOP	2A RFPT woodward governor fails high, ATC reduces power, BOP performs shutdown of RFP, ATC restores power to rated.
4	imf rd25	C-SRO C-ATC TS-SRO	Control Rod 14-35 loss of position indication. ATC must insert control rod per AOI to restore position indication. ITS referenced by SRO.
5	imf th23 20 imf th35a 8	C-SRO C-ATC C-BOP	Fuel failure with resultant hi radiation. ATC must reduce power. BOP evacuates hi rad areas
6	imf ad01m 100 imf rp15a, b imf hp07 imf rc03 imf rd01a	M-All	Stuck open SRV with high pressure injection source failures. TAF will be reached with ED to enable low pressure systems to restore level

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

SIMULATOR EVALUATION GUIDE

TITLE : RAISE POWER WITH RECIRC, RPS LOW LEVEL INSTRUMENT FAILURE, RFP FAILURES, RPIS FAILURE FOR A ROD, FUEL FAILURE, MAIN STEAM LEAK, MSRV FAILS OPEN, HPCI INVERTER FAILURE, RCIC TRIP, CRD PUMP FAILURE, CONTINGENCY C1, EMERGENCY DEPRESSURIZE BEFORE LEVEL REACHES -180"

REVISION : 0

DATE : May 19, 2007

PROGRAM : BFN Operator Training

PREPARED BY: _____ \ _____
(Operations Instructor) Date

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

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

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

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

NUCLEAR TRAINING				
REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF CHANGES	DATE	PAGES AFFECTED	REVIEWED/REVISED BY
0	INITIAL	05/19/07	All	

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: RAISE POWER WITH RECIRC, RPS LOW LEVEL INSTRUMENT FAILURE, RFP FAILURES, RPIS FAILURE FOR A ROD, FUEL FAILURE, MAIN STEAM LEAK, MSRV FAILS OPEN, HPCI INVERTER FAILURE, RCIC TRIP, CRD PUMP FAILURE, CONTINGENCY C1, EMERGENCY DEPRESSURIZE BEFORE LEVEL REACHES -180"
- IV. Length of Scenario: 11/2 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.
 - 3. Use step text procedural compliance (WANO).

B. Enabling Objectives:

1. The operating crew will raise power with recirc IAW GOI-100-12.
2. The operating crew will recognize and respond to an inadvertent half scram due to instrument failure in accordance with ARPs and Technical Specifications.
3. The operating crew will respond to a failure of RFP A per 2-AOI-3-1.
4. The operating crew will respond to a control rod reed switch failure and move the rod to a position with an operable detector per technical specifications.
5. The operating crew will recognize and respond to fuel failure in accordance with ARPs.
6. The operating crew will recognize and respond to a Main Steam line break and failure of MSIVs to auto isolate per EOI-3.
7. The operating crew will recognize and respond to a stuck open SRV in accordance with AOI-1-1 and EOI-2.
8. The operating crew will respond to RPV low water level due to HPCI, RCIC and CRD pump failure in accordance with EOI-1, RC/L C1, and C2.

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

A. SOER 94-01

B. SOER 96-01

VII. Training Materials:

A. Calculator (If required)

B. Control Rod Insertion Sheet (If required)

C. Stopwatch (If required)

D. Hold Order / Caution tags (If required)

E. Annunciator window covers (If required)

F. Steam tables (If required)

F. LCO/Appendix R Tracking Log

G. Calculator

H. Spray Cleaner

I. Rags

J. Markers

VIII. Scenario Summary

Unit two is at 90% power following turbine valve testing. One loop of RHRSW is tagged for repair of FCV 23-34. The crew will raise power with recirc. An inadvertent half scram will occur due to an instrument failure. The crew will respond per ARPs and Tech. Specs.

A RFP governor failure will run RFP A to maximum speed. The crew will reduce power per AOI-3-1 to within the capacity of the running RFPs.

A control rod reed switch will fail and the crew will reposition the rod to restore tech spec compliance.

Loose objects in the vessel cause fuel failure, main steam line leak, and Group 1 isolation signal. The MSIVs fail to auto close and must be manually closed.

When SRVs are cycled to maintain reactor pressure, PCV 1-179 will stick open resulting in decreasing RPV inventory and pressure. When an attempt to use HPCI is made a power failure occurs, resulting in system failure. When RCIC is operated, it will trip locally and radiation levels will preclude immediate restoration. 2A CRD pump trips. SLC should be lined to the test tank.

The scenario is terminated when the RPV level is depressurized due to inability to maintain level above – 180”.

IX. Console Operator Instructions

A. Scenario File Summary

1. File: bat NRC/HLTS01

	MF/RF/IOR#	Description
a.	trg e1 HPCI trg e2 MODESW trg e3 RCIC trg e4 1-179	Sets triggers for HPCI start, Mode Switch out of Run RCIC start MSRV 1-179 HS to open
b.	ior zlozi2331 off ior zlozi2337 off ior ypovfcv2334 fail_power ior ypovfcv2340 fail_power ior zaopi234 0 ior zaopi2311 0	Tag Loop I RHR Hx outlet valves.
c.	ior zdihs719d normal	RCIC trip appears to also be mechanical
d.	imf rp15a imf rp15b	Failure of MSIV closure on group 1 isolation
e.	imf hp07 (e1 0)	Loss of HPCI 120V AC power
f.	imf ad01m (e4 0) 100	Stuck open SRV
g.	imf rc03 (e3 0)	RCIC trip
h.	imf rd01a (e2 0)	CRD pump trip
i.	imf rd01b ior zlohs852a[1] off	Tagout of 1B CRD pump
j.	mrf sw07 aligned	Aligns RHRSW pump to EECW
k.	imf fw13c (e2 :2)	Common mode failure of RFPs
L	imf fw13b (e2 2)	
m.	trg e2 = bat NRC/HLTS01-2	Raise fuel failure amount
n.	lor an:xa553a27 alarm_off	Override alarm MSL hihi rad
o.	mrf hwo1 fast	Advance recorders
p.	ior 2dihs7117a null	Null RCIC Torus suction valve H.S.

2. File bat NRC/HLTS01-1

	MF/RF/IOR#	Description
a.	Imf th23 5 10:00	Fuel failure
b.	Imf th35a (none 6:00) 8 6:00	MSL break

3. File bat NRC/HLTS01-2

	MF/RF/IOR#	Description
a.	mmf th23 20 1:00	Fuel rupture

4. File bat NRC/HLTS01-3 (NOT USED)

	MF/RF/IOR#	Description
a.	dor zdihs719d normal dmf rc03	Fix RCIC

5. File bat NRC/HLTS01-4

	MF/RF/IOR#	Description
a.	imf fw30a	Woodward gov speed failure on 2A RFP
b.	imf fw13a (none :90)	Trips 2A RFP after 90 seconds – if not tripped by crew

IX. Console Operator Instructions

B. Console Operator Manipulations

UNSECURE file NRC - PW maryanne

<u>ELAPSED TIME</u>	<u>IC/MF/RF/PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup	rst 27	90% power MOC
Sim. Setup	restorepref NRC/HLTS01	Establishes Preference Keys
Sim. Setup	Setup	Verify Preference Keys
Sim. Setup	Esc	Clears Popup Window
Sim. Setup	manual	Reduce power to 90% with recirc. (NA if IC is at 90% power)
Sim. Setup	F3 (bat NRC/HLTS01)	See scenario summary
Sim. Setup	Manual	Place hold order tags on FCV 23-34, 40; zi-23-37/31 vlv pos. ind.; CRD pump 1B.

Provide RCP for return to 100% with Recirc flow

<u>ELAP TIME</u>	<u>IC/MF/RF/PK#</u>	<u>DESCRIPTION/ACTION</u>
After power rise of 5% or when directed by lead evaluator	F4 (imf th30v 0)	Fails LIS 3-203B downscale

ROLE PLAY: Wait 2 min, report LIS 3-203B about 0 inches in Aux. Inst. Room

5 min after Tech specs addressed or when directed by the lead evaluator	F5 bat NRC/HLTS01- 4	Woodward governor speed failure on 2A RFP and pump trip after 90 sec time delay
When the plant is stable and RFP is secured or when directed by the lead evaluator	F6 imf rd25	Fail RPIS position for CR 14-35

ROLE PLAY: If the failed position is not noticed in 5 minutes and with lead evaluator concurrence, call as reactor engineer and report powerplex won't run a case. Ask, "Is there a problem with the rod position indication?" (The RE hasn't determined which rod is at fault at this time.)

IX. Console Operator Instructions

B. Console Operator Manipulations

ELAP TIME	IC/MF/RF/PK#	DESCRIPTION/ACTION
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ROLE PLAY: Have Rx Engr provide RCP and shove sheet for rod 14-35

5 min after the rod is repositioned or when directed by the lead evaluator	F7 (bat NRC/HLTS01-1)	5% fuel failure and MSL leak
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ROLE PLAY: If requested to crosstie OG charcoal beds with other Units, call and notify Unit 2 that Unit 1 will perform the necessary actions.

When requested to open breaker for PCV 1-179, wait 3 min	F8 (mrf ad01m out)	Opens breaker for PCV 1-179 2B 250v RMOV bd / 8C2
If requested to close breaker for PCV 1-179	F9 (mrf ad01m in)	Closes breaker for PCV 1-179 2B 250v RMOV bd / 8C2
If requested to shutdown HWC	F10 (mrf og09 shutdown)	Removes HWC from service

ROLE PLAY: If asked to check RWCU Temp ATU's in Aux Inst. Room, Report 69-835 A-D Reading 120°F.

ROLE PLAY: When asked to check on HPCI, the fuse was replaced and blew again. It smells like there is a burned transformer in the inverter. A FINN team member is here and thinks they can replace the inverter in 30 to 45 minutes if there is one in the warehouse. (updates on status may be provided as requested with progress toward success indicated)

ROLE PLAY: As the RB AUO, when directed to investigate RCIC, wait 1 minute then report back that your alarming dosimeter went off and you saw a CAM in alarm when you entered the building. You are going to get Radcon to help see if you can safely get to the RCIC Room.

IX. Console Operator Instructions

B. Console Operator Manipulations

<u>ELAPSED TIME</u>	<u>IC/MF/RF/PFK</u>	<u>DESCRIPTION/ACTION</u>
At about 450 psig prior to ED. Leave open if ED is initiated earlier	F11 (dmf ad01m)	Closes PCV-1-179
If requested to perform Appendix 7B, wait 20 min.	<shift>F1 (bat app07b)	Aligns SLC to Test Tank

Terminate the scenario when the following conditions have been satisfied or upon request of the Lead Examiner.

-RPV water level restored to + 2 to + 51" (Lead examiner may desire to terminate when satisfactory progress to achieve this standard is observed)

-Reporting requirements have been made

SECURE file NRC - PW maryanne

X. Information to Evaluators:

- A. Ensure recorders are inking and recording and ICS is active and updating.
- B. Assign Crew Positions based on evaluation needs.
 - 1. SRO: Unit Supervisor/Shift Manager _____
 - 2. ATC: Board Unit Operator _____
 - 3. BOP: Desk Unit Operator _____
- C. SURROGATE BOP briefed to only close MSIVs when directed by SRO.
- D. Conduct a shift turnover with the Shift Manager and provide the Shift Manager with a copy of the Shift Turnover.
- E. Direct the shift crew to review the control board and take note of present conditions, alarms, etc.
- F. Terminate the scenario when the following conditions are satisfied or at the request of the Lead Evaluator:
 - 1. RPV level being maintained + 2 to + 51 "
 - 2. Reporting requirements have been met

XI. Simulator Event Guide

Event 1: RAISE POWER WITH RECIRC

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Notifies ODS of power ascension
SRO	_____	Directs ATC to raise power at 10 MWE/min per 2-GOI-100-12
ATC	_____	Raises power to rated IAW 2-GOI-100-12 and OI-68 Section 6.2 with Recirc

ADJUST Recirc Pump speeds 2A using, RAISE SLOW (MEDIUM), 2-HS-96-15A(15B)/LOWER SLOW(MEDIUM) 2-HS-96-17A(17B), push-buttons, to achieve balanced jet pump flows. N/A for Single Loop Operation.

AND/OR

ADJUST Recirc Pump speed 2B using, RAISE SLOW (MEDIUM), 2-HS-96-16A(16B)/LOWER SLOW(MEDIUM) 2-HS-96-18A(18B), push-buttons, to achieve balanced jet pump flows. N/A for Single Loop Operation.

or

WHEN desired to control Recirc Pumps 2A and/or 2B speed with the RECIRC MASTER CONTROL, THEN ADJUST Recirc Pump speed 2A & 2B using the following push buttons as required.

RAISE SLOW, 2-HS-96-31
RAISE MEDIUM, 2-HS-96-32
LOWER SLOW, 2-HS-96-33
LOWER MEDIUM, 2-HS-96-34
LOWER FAST, 2-HS-96-35

XI. Simulator Event Guide

Event 2: RPS LEVEL INSTRUMENT FAILURE

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Announces half scram Reports half scram due to level from 2-XA-55-4A-2 Verifies RPV level normal Refers to 2-9-4 ARP
ATC/ SRO	_____	Dispatches individual to Auxiliary Instrument Room to check LIS 3-203 B and D
SRO	_____	Consults Tech Specs, 3.3.1.1, 3.3.6.1, 3.3.6.2, 3.3.7.1 determines Required actions are to place in trip in 12 hrs. References 2-OI-99 and 2-OI-64 to remove fuse 2-FU1-3- 203BA (5AF6B) to ensure circuit remains tripped.
SRO	_____	Directs IMs to troubleshoot and repair.
SRO	_____	Conducts briefing on loss of instrumentation.

XI. Simulator Event Guide

Event 3: RFP A FAILURE

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Responds to RFP A ABN and RFP DISCH FLOW LOW annunciators (may attempt manual control of RFP A)
SRO	_____	Directs RFP 2A trip and power reduction per AOI-3-1, or receive Recirc runback on low RWL per OI-68 8.13
ATC	_____	Trips 2A RFP and initiates upper power runback and/or reduces recirc flow and lowers running RFP speed to <5850 rpm. (if applicable)
		IF desired to reduce Reactor Power to approximately 90%, THEN
		PERFORM the following (Otherwise N/A):
		[2.1] DEPRESS RECIRC PUMPS UPPER POWER RUNBACK push-button, 2-HS-68-42.
		[2.2] VERIFY the following:
		<input type="checkbox"/> Push-button backlight blinks until setpoint is reached.
		<input type="checkbox"/> Reactor power lowers to approximately 90%.
	_____	Enters 2-AOI-68-1 for core flow reduction
SRO	_____	Contacts Maintenance
	_____	Notifies ODS of power reduction
BOP	_____	Shutdown 2A RFP per 2-OI-3 section 7.1[13]

BOP

VERIFY Turning Gear motor starts and engages when RFPT coasts down to zero speed unless RFP is rolling on minimum flow.

CLOSE RFP 2A DISCHARGE VALVE, 2-FCV-3-19.

PLACE RFP 2A MIN FLOW VALVE, 2-HS-3-20, in CLOSE.

VERIFY Turning Gear is engaged.

With Unit Supervisor approval, CLOSE the RFP 2A SUCTION VALVE, 2-FCV-2-83.

CLOSE the following applicable valve (Panel 2-9-6):
☐ RFPT 2A LP STEAM SUPPLY VALVE, 2-FCV-1-121.

CLOSE the following applicable valve (Panel 2-9-6):
☐ RFPT 2A HP STEAM SUPPLY VALVE, 2-FCV-1-125.

OPEN the following drain valves for the RFPT being removed from service:

- A. RFPT 2A LP STOP VLV ABOVE SEAT DR, 2-FCV-6-120.
- B. RFPT 2A LP STOP VLV BELOW SEAT DR, 2-FCV-6-121.
- C. RFPT 2A HP STOP VALVE ABOVE SEAT DR, 2-FCV-6-122.
- D. RFPT 2A HP STOP VLV BELOW SEAT DR, 2-FCV-6-123.
- E. RFPT 2A FIRST STAGE DRAIN VLV, 2-FCV-6-124.
- F. RFPT 2A HP STEAM SHUTOFF ABOVE SEAT DRAIN, 2-FCV-6-153, Local Control.
- G. RFPT A LP STEAM SHUTOFF ABOVE SEAT DRAIN, 2-FCV-6-154, Local Control.

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Event 4: ROD POSITION FAILURE

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	<p>Identifies rod 14-35 has no position indication Enters 2-AOI-85-4</p> <p>Immediate Actions [1] STOP all control rod movement.</p> <p>Subsequent Actions IF an individual control rod position indication is off on Full Core Display or 4-Rod Display, THEN: CHECK individual circuit cards in Panel 2-9-27 for proper operation. IF unable to restore position indication for an individual control rod or rods, THEN: NOTIFY Reactor Engineer and DETERMINE additional corrective action. Control Rods may be moved to an Operable Position Indication as a means of position verification (REFER TO Tech Spec Bases SR 3.1.3.1). As a minimum, rod position will be verified, preferably with an independent position indication or other method (i.e., TIP trace).</p>
SRO	_____	<p>Notifies Reactor Engineer Enters LCO 3.1.3.1 and directs insertion of the rod to an operable position indication (46) with Rx Engr concurrence and RCP</p>
ATC	_____	<p>Inserts rod 14-35 to position 46 and reports indication is restored</p>
SRO	_____	<p>Exits LCO 3.1.3.1</p>
SRO	_____	<p>Directs initiation of WO</p>

XI. Simulator Event Guide

Event 5: FUEL DAMAGE/MSL LEAK

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces alarms as follows and responds per ARP: - OG Annual Release Limit Exceeded - OG Pre Trt. Rad High <ul style="list-style-type: none"> • Checks off-gas flow • Notifies Radcon
SRO	_____	Notifies Chem Lab to Sample Declares NOUE (1.4-U)
BOP	_____	Announce alarm and respond per ARP - Turbine Bldg area radiation high <ul style="list-style-type: none"> • Check instruments as follows, reporting increase in radiation RR-90-157 (OG Pretrt) RR-90-135 (MSL Rad)
SRO	_____	Evacuates Turbine Building per ARP Notifies Rad. Con.
BOP	_____	Announce alarm and respond per ARP - Reactor Building Radiation High <ul style="list-style-type: none"> • Checks RB instruments to determine affected areas • Notifies SRO of entry into EOI-3
SRO	_____	Evacuates Reactor Building per ARP Notifies Rad Con
SRO	_____	Enters 2-EOI-3 (may direct power reduction per RCP for prep for shutdown or urgent load reduction)

XI. Simulator Event Guide

Event 5: FUEL DAMAGE/MSL LEAK (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Recognize and announce Group 6 isolation on high radiation
BOP	_____	Reports alarm "Main Steam Tunnel Temp High" and verifies on TI 1-60A Notifies SRO of new entry into EOI-3
SRO	_____	Directs Core Flow Runback
SRO	_____	Renters 2-EOI-3
SRO	_____	Enters EOI-1 and Directs manual scram
ATC	_____	DEPRESS RECIRC PUMPS CORE FLOW RUNBACK push-button, 2-HS-68-44. [4.2] VERIFY the following: <input type="checkbox"/> Push-button backlight blinks until setpoint is reached. <input type="checkbox"/> Core flow lowers to approximately 60%.
	_____	Manually scrams and verifies all rods inserted
	_____	Gives Scram report
SRO	_____	Directs ATC to carry out actions of 2-AOI-100-1
ATC	_____	Carries out 2-AOI-100-1 actions - Mode switch in S/D - Trips main turbine - Verify recirc pumps at minimum - Verifies Gp 2, 3, 6 and 8 isolations

XI. Simulator Event Guide

Event 5: FUEL DAMAGE/MSL LEAK (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Closes MSIVs prior to isolation Or Reports MSIVs not closed on MSL high temp (189 F) on panel 9-5 alarms.
SRO	_____	Directs MSIV closure, if not already directed
BOP	_____	Closes MSIVs
ATC	_____	Announces CRD Pump Trip and loss of RFPs
SRO	_____	Directs pressure control 800 to 1000 psig
		Directs level control + 2" to + 51" using
		- RCIC(5D)
		- HPCI (5C)
BOP	_____	Controls pressure as directed using SRVs; (11A)
		Attempts to control level as directed using HPCI (5C) and/or RCIC (5D)

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Event 6: STUCK OPEN SRV, HPCI/RCIC/CRD FAILURE

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Reports HPCI failure (120V Power Alarm)
BOP	_____	Reports RCIC TRIP
		Reports failure of RCIC to reset
SRO	_____	Dispatches AUO to reset RCIC
		Dispatches OS-US to replace HPCI power supply fuses
BOP	_____	Reports PCV 1-179 failure to close after use
BOP	_____	Cycles PCV 1-179 per AOI-1-1 and reports valve remains open
SRO	_____	Directs actions to close PCV 1-179 per AOI-1-1 outside control room
BOP	_____	Reports PCV 1-179 does not close
BOP	_____	Monitors torus temperature

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Event 6: STUCK OPEN SRV, HPCI/RCIC/CRD FAILURE (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Enters EOI-2 at 95 degrees F Torus temperature
SRO	_____	Directs available RHR placed in suppression pool cooling.
BOP	_____	Places all available Torus Cooling I/S
SRO	_____	Directs Appendix 8G (if applicable)
SRO	_____	Directs Appendix 7B Alt RPV Injection (SLC)
ATC	_____	Performs Appendix 7B
	_____	DISPATCH personnel to Unit 2 SLC pump area to line up SLC Test Tank
	_____	Verifies recirc pumps trip at -45"
SRO	_____	Directs preventing flooding vessel via Condensate system by closing RFP discharge valves
ATC	_____	Closes RFP discharge valves
BOP	_____	Performs Appendix 8G (if directed)
SRO	_____	Enters C1, Directs ADS inhibited
BOP	_____	Inhibits ADS

XI. Simulator Event Guide

Event 6: STUCK OPEN SRV, HPCI/RCIC/CRD FAILURE (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Reports DG starts; Dispatches AUO to monitor
SRO	_____	When level decreases to TAF determines/verifies that sufficient injection sources are available to not enter steam cooling and enters C-2 to emergency depressurize before RPV level reaches -180"
SRO	_____	Directs RHR be realigned from Torus Cooling to injection per C-1
BOP	_____	Secures Torus Cooling and aligns RHR for injection
SRO	_____	Directs opening 6 ADS valves
BOP	_____	Opens 6 ADS valves as directed
SRO	_____	Directs BOP to inject with ECCS until level is above -122" then secure systems to not exceed + 51"; Directs restoration of Torus Cooling after RWL control is established.
BOP	_____	Operates and secures ECCS injection as directed/reestablishes Torus Cooling as directed
SRO	_____	Directs ATC to restore level + 2" to + 51" with Condensate, Core Spray, or RHR
ATC	_____	Injects with Condensate, Core Spray, or RHR to restore level +2 " to + 51"
SRO	_____	Classifies event as Site Area Emergency (1.1-S1)

XII. Crew Critical Tasks

	<u>Task</u>	<u>SAT/UNSAT</u>
1.	Isolates MSIVs when indications of a leak are received	_____
2.	Inhibits ADS	_____
3.	Emergency Depressurizes when below TAF and before level drops to -180"	_____

Additional Individual Critical Task

If SRO directs 2/3 core height override then the SRO will verify that the RHR system is fully realigned for injection when required.

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-1

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

- 1) LT failure
- 2) RFP failure
- 3) RPIS failure
- 4) Fuel Failure
- 5) MSL Leak with MSIV Auto Close Failure
- 6) Stuck Open SRV
- 7) HPCI 120v power failure
- 8) RCIC trip on low suction pressure
- 9) 2A CRD pump trip

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

- 1) MSIV Auto Close Failure
- 2) Stuck open SRV
- 3) HPCI 120v power failure
- 4) RCIC trip on low suction pressure
- 5) 2A CRD pump trip

3 Abnormal Events; List: (1-3)

- 1) Fuel Failure
- 2) Stuck open SRV
- 3) RFP trip

3 Major Transients; List: (1-2)

- 1) Fuel Failure
- 2) MSL Leak
- 3) Loss of High Pressure Injection

3 EOIs used; List: (1-3)

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

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

- 1) C1, C2

80 Run Time (minutes)

35 EOI Run Time (minutes); 46 % of Scenario EOI Run Time

3 Crew Critical Tasks (2-5)

Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs Loop I RHR Hx's tagged, clearance has both 2A & 2C
RHR Hx inop for containment cooling. Out of service 6 hours, expected back in 12 hours. 7
day LCO entered per T.S. 3.7.1, 3.6.2.3, 3.6.2.4, 3.6.2.5. All Appendix R, T.S. LCO's have
been addressed. 1B CRD pump is tagged for breaker maintenance.

Operations/Maintenance For the Shift Raise Unit 2 to 100% power at 10MWe/min. Support
maintenance on Loop I RHR Hx valves. Power was reduced for turbine valve testing which
has been completed.

Unusual Conditions/Problem Areas Thunderstorm warning in effect next 2 hours in
Limestone County.

Facility: BFN Scenario Number: HLTS-2(0606) Op-Test Number: HLT0606

Examiners: _____

Operators: _____

Initial Conditions: Unit at 70% power due to 2A Condensate Booster Pump out of service for oil leak. CRD Pump 1B tagged out for breaker work . 2-FCV-74-100 tagged out for maintenance on the actuator, valve has a mechanical locking device installed and is closed. Actuator is removed. HPCI injection valves tagged for replacement of contactors in supply breakers. A 14 day LCO (TS 3.5.1) has been entered. Work has been completed and the clearance has been released.

Turnover: CRD Timer has been replaced, perform CRD Timer Test per 2-OI-85 section 8.14, then withdraw rods per RE instructions to establish rod pattern. When 2A CBP is restored, continue to raise power and monitor pump amps. (step 5.16 of 2-GOI-100-12). When HPCI clearance is picked up, perform PMT per WO (copy attached) prior to making HPCI operable. EM connecting MOVAT equipment to Sys 69 valves, should be invisible to control room personnel.

Event Number	Malfunction Number	Event Type*	Event Description
1	None	N-ATC	ATC performs CRD Timer test per OI-85
2	None	R-ATC R-SRO	Raise Reactor Power by control rod withdrawal
3	imf rd05r4639	C-ATC C-SRO ITS-SRO	Control Rod 46-39 uncouples during Control Rod movement, ATC responds per AOI. Tech Spec call for SRO.
4	ior zdihs691 close	C-BOP C-SRO ITS-SRO	BOP responds to RWCU inadvertent isolation. Tech Spec call for SRO
5	ior zdihs682a1a off	C-ATC C-SRO	ATC responds to loss of VFD cooling water system.
6	ior zdihs719a trip	C-BOP C-SRO ITS-SRO	BOP responds to RCIC trip and performs HPCI PMT. SRO refers to Tech Specs.
7	imf ed08c imf fw02b	M-All	Crew responds to loss of feedwater
8	imf th21 imf th33a	M-All	Crew responds to Recirc suction line leak. C1 entry on low water level. Drywell sprays required.

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

SIMULATOR EVALUATION GUIDE

TITLE : CRD TIMER TEST, CONTROL ROD ADJUSTMENT, CONTROL ROD
46-39 UNCOUPLED, SPURIOUS RWCU ISOLATION, RECIRC DRIVE
2A COOLING WATER PUMP FAILURE, RCIC TRIP, LOSS OF NORMAL
FEEDWATER, SMALL BREAK LOCA INSIDE PRIMARY
CONTAINMENT, HPCI AUX OIL PUMP FAILURE.

REVISION : 0

DATE : February 23, 2006

PROGRAM : BFN Operator Training

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

PREPARED BY: _____ \ _____
(Operations Instructor) Date

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

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

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

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

NUCLEAR TRAINING				
REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF CHANGES	DATE	PAGES AFFECTED	REVIEWED/REVISED BY
0	INITIAL	02/23/06	All	RWM
1	General	06/16/07	All	CSF

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: CRD TIMER TEST, CONTROL ROD ADJUSTMENT, CONTROL ROD 46-39 UNCOUPLED, SPURIOUS RWCU ISOLATION, RECIRC DRIVE 2A COOLING WATER PUMP FAILURE, LOSS OF NORMAL FEEDWATER, SMALL BREAK LOCA INSIDE PRIMARY CONTAINMENT, HPCI AUX OIL PUMP FAILURE.
- IV. Length of Lesson: 1.5 hours
- V. Examination Objectives:
 - A. Terminal Objective
 - 1. Perform routine shift turnover, plant assessment and routine shift operation in accordance with BFN procedures.
 - 2. Given uncertain or degrading conditions, the operating crew will use team skills to conduct proper diagnostics and make conservative operational decisions to remove equipment/unit from operation. (SOER 94-1)
 - 3. Given abnormal conditions, the operating crew will place the unit in a stabilized condition per normal, abnormal, annunciator and emergency procedures.
 - 4. Use step text procedural compliance (WANO).

B. Enabling Objectives:

1. The operating crew will perform CRD Timer Test.
2. The operating crew will raise power with control rods per RE instructions.
3. The crew will respond to an uncoupled control rod (46-39)
4. The operating crew will respond to Spurious RWCU isolation.
5. The operating crew will respond to Recirc Drive 2A Cooling Water pump failure.
6. The operating crew will recognize and respond to a loss of feedwater per 2-EOI-1.
7. The operating crew will recognize and respond to a small LOCA per 2-EOI-1 and 2, RCIC Trips.
8. The crew will spray the drywell to maintain containment less than 280 degrees F and pressure below PSP limit. HPCI will be returned to service and Reactor Water Level will be restored.

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

A. SOER 94-01

B. SOER 96-01

VII. Training Materials:

A. Calculator (If required)

B. Control Rod Insertion Sheet (If required)

C. Stopwatch (If required)

D. Hold Order / Caution tags (If required)

E. Annunciator window covers (If required)

F. Steam tables (If required)

F. LCO/Appendix R Tracking Log

G. Calculator

H. Spray Cleaner

I. Rags

J. Markers

VIII. Console Operator Instructions

A. Scenario File Summary

1 File bat NRC/HLTS07

	MF/RF/IOR#	Description
a)	trg e1 MODESW	Assigns trigger
b)	imf fw02a	2A Condensate Booster Pump Trip
c)	ior zlohs0256a[1] off	Green light off for 2A Condensate Booster Pump
d)	ior zlohs0256a[2] off	White light off for 2A Condensate Booster Pump
e)	imf th21 (e1 8:00) 0.5 15:00 imf th33a (e1 0) 3.5 5:00	Leak in Drywell
f)	imf pc16a (e1 4:00) imf pc16b (e1 4:00) imf pc16c (e1 4:00)	Drywell Vacuum Breaker Rupture
g)	ior ypovfcv74100 fail_power_now	FCV 74-100 tag out
h)	mrf hw01 fast	Advance recorders
i)	imf rd05r4639	46-39 Rod uncoupled
j)	imf rd01b	CRD Pump Tagout
k)	ior zlohs852a [1] off	CRD Pump Tagout
l)	ior zdihs852a stop	CRD Pump Tagout
m)	ior zlohs7334a[2] off	HPCI tagout
n)	ior zlohs7344a[1] off	HPCI tagout
o)	ior zdihs7347a ptl	HPCI Aux Oil pump in pull to lock
p)	mrf th18b trip	Open breaker for 2A VFD 2A2 cooling water pump
q)	ior zlohs682a2a[1] on	Green light on for 2A2 cooling water pump
r)	ior zlohs682a2a[2] off	Red light off for 2A2 cooling water pump
s)	trg e2 2A2VFDCOOL	Sets trigger e2 to 2a2 cooling water pump handswitch
t)	trg e2= bat NRC/HLTS07-3	Trigger e2 initiates file bat NRC/HLTS7-3

VIII. Console Operator Instructions

B. Scenario File Summary

2. File: bat NRC/HLTS07-1

	MF/RF/IOR#	Description
a)	imf ed08c (none :20)	Trips unit Board 2C 20 sec after file triggered
b)	imf fw02b (none 1:50)	Trips 2B Condensate Booster pump (on overload)

3. File: bat NRC/HLTS07-2

	MF/RF/IOR#	Description
a)	ior zdihs691 close	Close fcv 69-1
b)	trg e4 691close	
c)	trg e4= dor zdihs691	Remove override
d)	bat rwcudeminsout	Places demins in hold

4. File: bat NRC/HLTS07-3

	MF/RF/IOR#	Description
a)	mrf th18b close	Closes breaker for 2A2 cooling water pump
b)	dor zlohs682a2a[1]	Deletes override for green light
c)	dor zlohs682a2a[2]	Deletes override for red light

Console Operator Instructions

B. Scenario File Summary

5. File: bat NRC/HLTS07-4

	MF/RF/IO#	Description
a)	dor zlohs7334a[2]	Closes breaker for 2A2 cooling water pump
b)	dor zlohs7334a[2]	Deletes override for green light

6. File: bat rwcudeminsin

	MF/RF/IO#	Description
a)	mrf cu01 55 1:00	Roll in demin A
b)	mrf cu02 55 1:00	Roll in demin B

7. File: bat rwcudeminsout

	MF/RF/IO#	Description
a)	mrf cu01 0 :30	Roll out demin A
b)	mrf cu02 0 :30	Roll out demin B

VIII. Console Operator Instructions

B. Console Operator Manipulations
UNSECURE file NRC - PW maryanne

<u>ELAPSED TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup	pwrst 111	70% power, SU
Sim. Setup	restorepref NRC/HLTS07	Establishes Preference Keys
Sim. Setup	setup	Verify Preference Keys
Sim. Setup	esc	Clears Popup Window
Sim. Setup	F3 bat NRC/HLTS07	See scenario summary bat NRC/HLTS07
Sim Setup	manual	a. Tag 73-34 and 73-44, b. Tag 2B CBP c. Tag 1B CRD Pump, d. Tag FCV 74-100
Sim Setup	manual	Reset alarms – Hit fault reset on “A” Recirc
Instructor	manual	Provide turnover sheet, PMT, and RCP & pull sheet to crew

ROLE PLAY: When requested as Reactor Engineer, Notify the control room that thermal limits will be checked and permission is granted to try and recouple rod 46-39 per 2-AOI-85-2

When rod is inserted to 46	F4	allows recoupling control rod (dmf rd05r4639)
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MORE FOLLOWS ↓

VIII. Console Operator Instructions (Continued)

B. Console Operator Manipulations

ELAPSED TIME	PFK	DESCRIPTION/ACTION
When requested by examiner	F5	RWCU isolation (bat NRC/HLTS07-2)

ROLE PLAY: 5 minutes after Call as EM supervisor and report the crew installing a mod for improving MOVATS test capabilities accidentally landed a new lead being installed in the FCV-69-1 close circuit on a hot terminal. The circuit is restored to normal and work is stopped.

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

When ready to restore demins to service	F6	Places RWCU demins in service (bat rwcudeminsin)
When asked to reset local alarm	<shift>F4	(mrf an01e reset) – allows control room alarm reset.
2 minutes after tech specs addressed	F7	Trips 2A VFD cooling water pump 2A1 (ior zdihs682a1a off)

ROLE PLAY: If RBAUO is dispatched to check 2A1 VFD cooling water pump, after 2 minutes report local breaker is tripped and won't reset.

2 minutes after 2A2 VFD cooling water pump is in service	F8	RCIC Turbine trips (ior zdihs719a trip)
--	----	--

ROLE PLAY: Personnel dispatched to RCIC report latch broken on overspeed trip mechanism for RCIC

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

When requested to turn on breakers for 73-34 and 73-44	F9	Allow PMT for HPCI valves (bat NRC/HLTS07-4)
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MORE FOLLOWS ↓

VIII. Console Operator Instructions (Continued)

C. Console Operator Manipulations

ELAPSED TIME	PFK	DESCRIPTION/ACTION
2 minutes after HPCI is returned to operable status	F10	Loss of 4kv Unit board 2C and feedwater (bat NRC/HLTS07-1)

ROLE PLAY: If Requested, AFTER RWL drops below -122" and C1 entered, Maintenance notifies CR that HPCI Aux Oil pump Control Power Fuses have been replaced

After RWL drops below, -122" or per Lead Instructor	F11	Allows start of HPCI Aux Oil pump and system injects (dor zdihs7347a)
When asked to perform appendix 8e, wait 5 minutes	F12	Allows Reactor Building ventilation restoration (bat app08e)

If necessary, mmf th21 up to a value of 1.0 in order to raise torus pressure above 12 psig.

If requested to pump down the torus	<shift> F1	Lines up and starts RHR drain pump A (bat app18rhra)
	or <shift> F2	Lines up and starts RHR drain pump B (bat app18hrb)
When requested wait 25 minutes	<shift> F3	bat app07b (Aligns SLC for injection)

Terminate the scenario when the following conditions are satisfied or when requested by Lead Evaluator:

Drywell pressure is below PSP
Reactor level stable between + 2" and + 51"

SECURE file NRC - PW maryanne

IX. Scenario Summary

The unit is operating at 70% power. The 2B Condensate Booster Pump is out of service for repair of an oil leak. HPCI Injection valves tagged for contactor replacement in the breakers. Currently in a 14 day LCO via Tech Spec 3.5.1. FCV 74-100 is tagged out for maintenance.

The crew will perform a CRD Timer Test per 2-OI-85 section 8.14.

The crew will commence to raise power by pulling control rods, Control Rod 46-39 will uncouple and the crew will respond to an uncoupled rod per 2-AOI-85-2.

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

The crew will respond to failure of 2A Recirc Drive Cooling Water pump A.

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

A spurious low suction pressure signal will cause a loss of condensate booster pump 2A. Condensate Booster pump 2C will trip due to an overcurrent lockout of 2C Unit board. A loss of normal feedwater will occur and the reactor will scram.

HPCI fails to initiate (Loss of Aux Oil Pump Control Power) , A small RPV suction leak occurs, requiring venting, suppression pool sprays, and drywell sprays per EOI-2. Three drywell vacuum breakers rupture causing a partial loss of pressure suppression function. Maintenance activities allow restoration of HPCI and Reactor water level is restored before level reaches -180"

X. Floor Instructor Instructions

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

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

- B. Review the shift briefing information with the operating crew. Provide SRO with a copy of Shift Turnover Sheet, Reactivity Plan, and pull sheet for scenario.
- C. Direct the shift crew to review the control boards and take note of present conditions, alarms, etc.
- D. Ensure recorders are inking and recording and ICS is active and updating. Note any deficiencies during shift briefing.
- E. Terminate the scenario when the following conditions are satisfied or upon request of Lead Examiner:
1. Drywell pressure is below PSP
 2. RPV level at + 2" to + 51"

XI. Simulator Event Guide

Event 1: **PERFORM CRD TIMER TEST**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
CREW	_____	Accepts shift turnover
SRO	_____	Directs ATC to perform CRD Timer Test per 2-OI-85 section 8.14.
ATC	_____	<p>REVIEW all Precautions and Limitations in Section 3.2 and 3.3.</p> <p>PLACE WITHDRAW AUXILIARY TIMER TEST, 2-HS-85-3A/S6, in TEST AND HOLD for at least two seconds.</p> <p>CHECK the white indicating light above the WITHDRAW AUXILIARY TIMER TEST, 2-HS-85-3A/S6 illuminates.</p> <p>CHECK the red indicating light above the WITHDRAW AUXILIARY TIMER TEST, 2-HS-85-3A/S6 illuminates after approximately two seconds.</p> <p>CHECK CONTROL ROD SELECT BLOCK TIMER MALFUNCTION annunciator(2-XA-55-5A, Window 21) in alarm.</p> <p>PLACE WITHDRAW AUXILIARY TIMER TEST, 2-HS-85-3A/S6 in RESET.</p> <p>CHECK all Reactor Manual Control System WITHDRAW AUXILIARY TIMER TEST, 2-HS-85-3A/S6 indicating lights are extinguished.</p> <p>RESET CONTROL ROD SELECT BLOCK TIMER MALFUNCTION annunciator (2-XA-55-5A, Window 21).</p>

Event 1: **PERFORM CRD TIMER TEST** (Continued)

POSN	TIME	EXPECTED ACTIONS
ATC	_____	<p>NOTE: The following steps will allow the RMCS timer to be operationally checked without the possibility of moving a control rod.</p> <p>LOWER the CRD DRIVE WTR HDR DP, 2-PDI-85-17A to less than 75 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 2-HS-85-23A.</p> <p>SELECT a peripheral control rod by depressing the appropriate CRD ROD SELECT push-button, 2-XS-85-40.</p> <p>ATTEMPT to withdraw the peripheral control rod using CRD CONTROL SWITCH, 2-HS-85-48 while observing the RMCS timer in the Auxiliary Instrument Room and/or the indicating lights on Panel 2-9-5.</p> <p>IF while performing this section Rod Motion is observed, THEN IMMEDIATELY RELEASE CRD CONTROL SWITCH 2-HS-85-48 and CONTACT System Engineer.</p> <p>RAISE the CRD DRIVE WTR HDR DP, 2-PDI-85-17A to between 250 psid and 270 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 2-HS-85-23A.</p> <p>FURTHER tests or checks shall not be performed without direction of the Unit Supervisor.</p> <p>REPEAT step 8.14.11 as required to determine that the RMCS timer is operating as required. IF the RMCS timer is not operating as required, THEN GENERATE a WO.</p> <p>IF the RMCS timer is operating as required, THEN RAISE the CRD DRIVE WTR HDR DP, 2-PDI-85-17A to between 250 psid and 270 psid, using CRD DRIVE WATER PRESS CONTROL VLV, 2-HS-85-23A.</p>
BOP	_____	Peer Checks manipulations

Event 2: **RAISE POWER USING CONTROL RODS**

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

XI. Simulator Event Guide

Event 3: **CONTROL ROD 46-39 UNCOUPLED**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
CREW	_____	Recognizes symptoms of an uncoupled rod
SRO	_____	Directs ATC to respond to uncoupled rod per 2-AOI-85-2
SRO	_____	Notifies Reactor Engineer of uncoupled rod per 2-AOI-85-2 and requests permission to proceed with recoupling rod 46-39. Refers to Tech. Specs. 3.1.3 and declares rod INOP while uncoupled.
ATC	_____	Performs actions to recouple rod per 2-AOI-85-2, section 4.2.3 IF the control rod drive is at position 48 and with Reactor Engineer concurrence, THEN NOTCH INSERT the control rod drive to position 46 to attempt to couple the control rod. RESET associated annunciators. NOTCH WITHDRAW the control rod drive to position 48. PERFORM a coupling check.
SRO	_____	Determines rod is operable

XI. Simulator Event Guide

Event 4: **RWCU ISOLATION**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
Crew	_____	Recognizes RWCU Isolation, responds per the ARP
SRO	_____	Enters 2-AOI-64-2a
SRO	_____	Contacts Rx Engineer for heat balance
SRO	_____	Notify Chemistry and RadCon
SRO	_____	Evaluate Tech. Spec. (TRM TSR 3.4.1) Chemistry, sampling required (If not returned to service)
SRO	_____	Directs restoration of system after cause is determined
BOP	_____	Restores RWCU per 2-OI-69 (optional) -Verifies RWCU Filters are in Hold -Opens 2-FCV-69-1 -Opens 2-FCV-69-8 -Opens 2-FCV-69-12 for pump startup -Start one RWCU pump and open 2-FCV-69-12 to achieve > 56 gpm -Start the second RWCU pump and attain ~300 gpm flow -coordinate with RB AUO and place demins in service
BOP	_____	Notifies Chemistry
BOP	_____	Notifies Rx. Engineer

XI. Simulator Event Guide

Event 5: **VFD COOLING WATER PUMP FAILURE**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Announces Recirc Drive 2A Coolant Flow Low. Informs SRO 2A VFD Cooling Water Pump 2A1 has tripped and 2A2 failed to start.
SRO	_____	Directs ATC to refer to ARP.
ATC	_____	Consults ARP, starts Recirc Drive 2A2 Cooling Water pump. Verifies flow on ICS, resets annunciators
SRO	_____	Directs Outside US to check on problem with 2A1 cooling water pump

Event 6: **INADVERTANT TRIP OF RCIC TURBINE**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces RCIC Turbine tripped, refers to ARP
SRO	_____	Dispatches field personnel to investigate and troubleshoot RCIC turbine trip.
SRO	_____	Declares RCIC Inop per TS 3.5.3.A, 12 hour LCO due to inop HPCI. Mode 3 required within 12 hours and Reactor Pressure < 150 psig within 36 hours.
SRO	_____	SRO requests status of HPCI.
SRO	_____	Directs BOP to perform PMT for 2-FCV-73-34 and -44.
BOP	_____	Performs timing of 2-FCV-73-34 and -44 per WO

1. CLOSE and TIME 2-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 2-HS-73-34A and RECORD the stroke time below:

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

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

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

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

Event 6: **INADVERTANT TRIP OF RCIC TURBINE** (Continued)

POSN	TIME	EXPECTED ACTIONS																		
BOP	_____	<p>4. CLOSE and TIME 2-FCV-73-44 using HPCI PUMP INJECTION VALVE, 2-HS-73-44A and RECORD the stroke time below:</p> <table><tr><th colspan="3">2-FCV-73-44 CLOSING TIME (SEC)</th></tr><tr><th>NORMAL</th><th>MEASURED</th><th>MAXIMUM</th></tr><tr><td>16.6 - 22.4</td><td></td><td>30.0</td></tr></table> <p>5. VERIFY the stroke time recorded is less than or equal to the maximum value listed.</p> <p>6. OPEN and TIME 2-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 2-HS-73-34A and RECORD stroke time below:</p> <table><tr><th colspan="3">2-FCV-73-34 OPENING TIME (SEC)</th></tr><tr><th>NORMAL</th><th>MEASURED</th><th>MAXIMUM</th></tr><tr><td>12.8 - 17.4</td><td></td><td>26.7</td></tr></table> <p>7. VERIFY the stroke time recorded is less than or equal to the maximum value listed.</p> <p>8. PMT COMPLETE</p>	2-FCV-73-44 CLOSING TIME (SEC)			NORMAL	MEASURED	MAXIMUM	16.6 - 22.4		30.0	2-FCV-73-34 OPENING TIME (SEC)			NORMAL	MEASURED	MAXIMUM	12.8 - 17.4		26.7
2-FCV-73-44 CLOSING TIME (SEC)																				
NORMAL	MEASURED	MAXIMUM																		
16.6 - 22.4		30.0																		
2-FCV-73-34 OPENING TIME (SEC)																				
NORMAL	MEASURED	MAXIMUM																		
12.8 - 17.4		26.7																		
SRO	_____	<p>Reviews PMT, declares HPCI operable. RCIC now in 14 day LCO.</p>																		

XII. Simulator Event Guide

Event 7: **LOSS OF FEEDWATER**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces "Cnds Bstr Pump "2B" Suct Press Low" Alarm
BOP	_____	Announces Condensate Booster Pump 2B trip
Crew	_____	Identifies loss of 2C Unit board
ATC	_____	Announces loss of RFP's
SRO	_____	Directs manual scram
ATC	_____	Inserts a manual scram; Places mode switch in shutdown verifies all rods in makes scram report
BOP	_____	Trips main turbine
SRO	_____	Enters EOI-1 on low level and directs: -Verifications of group isolations and initiations -entry into AOI-100-1 -verifies Turbine Bypass valves controlling pressure
BOP	_____	Verifies Group isolations (2, 3, 6, & 8)
ATC	_____	Inserts SRMs & IRMs and follows power down Verifies Recirc pumps run back/trip Shutdown H2 water chemistry
SRO	_____	Dispatches US/AUO to check status of 2C Unit Board

XIII. Simulator Event Guide

Event 8: **RPV Recirc Suction Leak/LOCA**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
Crew	_____	Identifies drywell pressure/temperature rise
SRO	_____	Enters EOI-2 and re-enters EOI-1 when drywell pressure exceeds 2.45 psig .
BOP	_____	Verifies Diesel generators start
BOP	_____	Directs AUO to monitor D/G
BOP	_____	Notifies HPCI aux oil pump will not start – notifies SRO
SRO	_____	Directs the following: <ul style="list-style-type: none">• All available drywell cooling in service• Venting per App 12• H₂/O₂ Analyzers placed in service
BOP	_____	Verifies all drywell blowers in service
BOP	_____	Vents per Appendix 12
BOP	_____	Places H ₂ /O ₂ Analyzers in service using keylock bypass switches

XI. Simulator Event Guide

Event 8: **RPV Recirc Suction Leak/LOCA (continued)**

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Monitors containment parameters and reports rate of rise of suppression chamber pressure and drywell temperature
SRO	_____	Determines venting and plant cooldown will not maintain suppression chamber pressure <12 psig and:
SRO	_____	Directs Torus Sprays be placed in service per Appendix 17C
BOP	_____	Places Torus sprays in service per Appendix 17C
SRO	_____	Directs Appendix 7B, SLC from test tank
ATC/ BOP	_____	Calls AUO to perform Appendix 7B
SRO	_____	When PSC pressure exceeds 12 psig or if determines drywell temperature to exceed 280 degrees F <ul style="list-style-type: none"> • verifies in Safe Region of DW spray curve • verifies SP level <18 feet
SRO	_____	Directs drywell blowers and Recirc pumps removed from service
SRO	_____	Directs drywell sprays initiated per Appendix 17B
SRO	_____	Directs drywell sprays stopped before drywell pressure drops below 0 psig

XI. Simulator Event Guide

Event 8: **RPV Recirc Suction Leak/LOCA** (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Trips/verifies Recirc pumps tripped
BOP	_____	Removes drywell blowers from service or reports trips of blowers
BOP	_____	Initiates drywell sprays
Crew	_____	Continues to monitor Rx Level and containment parameters
SRO	_____	Directs ADS inhibited if RPV level lowers to -122 " or C1 entered
BOP	_____	Inhibits ADS with Keylocks
SRO	_____	Enters C1 at ~-122" and directs lining up all injection systems to the RPV
BOP	_____	Lines up RHR for injection

XI. Simulator Event Guide

Event 8: **RPV Recirc Suction Leak/LOCA** (continued)

<u>POSN</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs BOP to utilize HPCI to restore level when notified by Maintenance of the successful restoration of Aux Oil pump
BOP	_____	Verifies/places HPCI in service.
Crew	_____	Monitors PC temp and pressure
SRO	_____	Direct Drywell sprays removed before 0 psig Drywell Pressure
BOP	_____	Secures Drywell Sprays
SRO	_____	Directs level be maintained above -162 using available systems
BOP	_____	Maintains level above -162 using Core Spray, LPCI, & HPCI (If in service)
SRO	_____	Directs Drywell spray again (if required)
SRO	_____	Classifies event as an ALERT (2.1-A)

XII. Crew Critical Tasks

	<u>TASK</u>	<u>SAT/UNSAT</u>
1.	Maintain RPV water level above TAF	_____
2.	Maintain Suppression Chamber pressure below PSP	_____

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-2(0606)

- 9 Total Malfunctions Inserted; List: (4-8)
- 1) Loss of Normal Feedwater (Cond Booster pumps trip)
 - 2) Coolant Leak in Drywell
 - 3) Control Rod Uncoupled
 - 4) Drywell Vacuum Breaker Failures
 - 5) RWCU Isolation valve closure
 - 7) RCIC Trip
 - 8) Recirc Drive 2A Cooling water pump trip
 - 9) HPCI Aux Oil pump Power supply failure
- 3 Malfunctions That Occur After EOI Entry; List: (1-4)
- 1) Steam Leak in Drywell
 - 2) HPCI Aux Oil pump Power supply failure
 - 3) Drywell Vacuum Breaker Failure
- 3 Abnormal Events; List: (1-3)
- 1) Control Rod Uncoupled
 - 2) RWCU isolation
 - 3) Recirc Drive 2A Cooling water pump trip
- 2 Major Transients; List: (1-2)
- 1) Loss of Normal Feedwater
 - 2) Drywell Leak
- 2 EOIs used; List: (1-3)
- 1) EOI-1
 - 2) EOI-2
- 1 EOI Contingencies Used; List: (0-3)
- 1) C1
- 80 Run Time (minutes)
- 35 EOI Run Time (minutes); 44 % of Scenario EOI Run Time
- 2 Crew Critical Tasks (2-5)
- Yes Technical Specifications Exercised (yes/no)

SHIFT TURNOVER SHEET

Equipment Out of Service/LCOs Unit at 70% power due to 2A Condensate Booster Pump out of service for oil leak. CRD Pump 1B tagged out for breaker work . 2-FCV-74-100 tagged out for maintenance on the actuator, valve has a mechanical locking device installed and is closed. Actuator is removed. HPCI injection valves tagged for replacement of contactors in supply breakers. A 14 day LCO (TS 3.5.1) has been entered. Work has been completed and the clearance has been released.

Operations/Maintenance for the Shift: CRD Timer has been replaced, perform CRD Timer Test per 2-OI-85 section 8.14, then withdraw rods per RE instructions to establish rod pattern. When 2A CBP is restored, continue to raise power and monitor pump amps. (step 5.16 of 2-GOI-100-12). When HPCI clearance is picked up, perform PMT per WO (copy attached) prior to making HPCI operable. EM connecting MOVAT equipment to Sys 69 valves, should be invisible to control room personnel.

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

WO XX-XXXXX-XX PMT

1. **CLOSE** and **TIME** 2-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 2-HS-73-34A and **RECORD** the stroke time below:

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

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

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

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

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

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

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

6. **OPEN** and **TIME** 2-FCV-73-34 using HPCI PUMP DISCHARGE VALVE, 2-HS-73-34A and **RECORD** stroke time below:

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

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

8. **PMT COMPLETE**

Performed By: _____

Reviewed By: _____

Stopwatch Calibration Date: _____

Facility: BFN Scenario No.: HLT-3(0606) Op-Test No.: HLT0606

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:

"C" RFP is uncoupled and the suction and discharge valves are tagged for performance of turbine overspeed. Currently at step 5.76.8 of 2-GOI-100-1A and at step 5.6.13 of 2-OI-3 for warming 2B RFP.

Event No.	Malf. No.	Event Type*	Event Description
1	none	R-ATC N-BOP N-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	C-BOP C-SRO	Crew will respond to a RBCCW pump trip
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

SIMULATOR EVALUATION GUIDE

TITLE : RWM FAILURE, 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 : Apr. 5, 2007

PROGRAM : BFN Operator Training - HLT

PREPARED BY: _____ / _____
(Operations Instructor) Date

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

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

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

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

LOGGED-IN: _____ / _____
(Librarian) Date

TASKS LIST
UPDATED: _____ / _____
Date

NUCLEAR TRAINING REVISION/USAGE LOG				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	INITIAL	4/5/07	All	

- I. Program: BFN Operator Training
- II. Course: Examination Guide
- III. Title: RWM FAILURE, 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
- 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 2-OI-85-5 and Tech. Specs.
 - 3. The operating crew will recognize and respond to a RBCCW pump trip in accordance with 2-AOI-70-1.

4. The operating crew will recognize and respond to Feedpump control failure in accordance with 2-AOI-3-1.
5. The operating crew will recognize and respond to a fuel failure in accordance with ARPs and EOI-3.
6. 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 NRC/HLTS11

	<u>MF/RF/IO#</u>	<u>Description</u>
a.)	ior zdihs691 null	Fails 69-1 to close
b.)	imf cu04 25	RWCU suction line break

2. File: bat NRC/ HLTS11-1

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

VIII. Console Operator Instructions

B. Console Operator Manipulations **UNSECURE file NRC - PW marianne**

<u>ELAP TIME</u>	<u>PFK</u>	<u>DESCRIPTION/ACTION</u>
Sim. Setup	Pwrst 120 (csf)	1% power, MOC
Sim. Setup	restorepref NRC/HLTS11	Establishes Function Keys
Sim. Setup I	Manual	Place Hold Order Tags on C RFP suction and discharge valves
Sim. Setup	setup	Verify Function Keys
Sim. Setup	esc	Clears Function Key Popup
Sim. Setup	manual	Ensure RWM is latched with no Insert or Withdrawal blocks and comp/prog lights reset, rod group 39 – 06-47 selercted
Sim. Setup	Manual	Verify 2C RFP suct & disch valve lights extinguished. If not, bat 2crftag

After RFP warmed and
When requested by
Examiner

F3

Fails RWM (imf rd14a)

ROLE PLAY: If asked, have not performed a startup with RWM
bypassed within last calendar quarter

ROLE PLAY: If requested to verify open 2-1-155 and 2-1-156, report that they
are open

**After Tech Specs
addressed for RWM**

F8

Trips A RBCCW pump
(imf sw02a)

VIII. Console Operator Instructions (continued)

B. Console Operator Manipulations

If requested to align spare RBCCW pump to Unit 2 Wait 3 minutes	F9	Aligns spare RBCCW pump to Unit 2 (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	F4 followed immediately by F5	Fails RFP governor in raise direction.
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 NRC/ HLTS11)

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 140 deg F and fairly steady

After attempts to close 69-1 are made	F10	Causes Rad monitors to reach max (bat NRC/ HLTS11-1)
---------------------------------------	-----	---

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

SECURE file NRC - PW maryanne

IX. Scenario Summary

The plant is at approximately 2% 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.

An RBCCW pump will trip causing RWCU to be secured and the spare RBCCW pump aligned to Unit 2 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 a 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.

- 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

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
SRO	_____	Directs warming up B RFP in accordance with 2-OI-3
BOP	_____	Warms up "B" RFP utilizing section 5.6 of 2-OI-3.
	_____	Place in auto and verify open RFP min flow valve 2-FCV-3-13
	_____	Place 2B start/local enable 2-HS-46-138A in start and observe RFP accelerates to 600 rpm
	_____	Verify no abnormal rubbing or vibration is observed
	_____	Raise speed to ~1000 rpm using 2-HS-46-9A
	_____	Place TG motor 2-HS-3-127A in Auto
	_____	Depress 2B trip 2-HS-3-127A and verify HP and LP stop valves close
	_____	Verify TG auto engages or RFP rolling on min flow
	_____	Depress 2B trip reset 2-HS-3-150A and verify blue light extinguishes and HP and LP stop valves open
	_____	Place 2B start/local enable 2-HS-46-138A in start and observe RFPT speed increases to ~ 600 rpm

XI : Simulator Event Guide

EVENT 2: RWM FAILURE

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
ATC	_____	Announces "RWM ROD BLOCK" alarm and refers to ARP.
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
ATC	_____	Refers to section 8.17 of OI-85 and places 2-XS-85-9025 in Bypass.
ATC	_____	Checks manual bypass light lit and all others out.
SRO	_____	Determines T.S> 3.3.2.1 condition C applies. Greater than 12 rods withdrawn and 2 nd person to verify compliance with BPWS. (Examiner can be extra person)

XI. Simulator Event Guide

EVENT 3: LOSS OF 2A RBCCW pump

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Responds to loss of RBCCW pump 2A trip and attempts to restart 2A RBCCW pump and reports it failed to start.
SRO	_____	Directs securing RWCU pumps per 2-AOI-70-1
BOP	_____	Secures RWCU pumps and verifies that the 70-48 sectionalizing valve is closing.
US	_____	Directs placing Spare RBCCW pump in service.
	_____	Dispatches personnel to investigate pump loss
	_____	May contact Rx Engineer about heat balance
BOP	_____	After Spare RBCCW pump placed in service, re-opens 70-48 and returns RWCU to service per OI-69.
BOP	_____	Opens 69-8 Starts A(B) RWCU Pump Coordinates with AOU to roll demins in service Starts other RWCU Pump

XI. Simulator Event Guide

EVENT 4: FEEDWATER CONTROLLER FAILURE

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
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 2-HS-46-8A and reports that "A" RFP cannot be controlled
SRO	_____	Directs tripping "A" RFP and using "B" RFP for RPV level control
BOP	_____	Trips "A" RFP by depressing 2-HS3-125A and raises "B" RFP speed by using 2-HS-46-9A
BOP	_____	Opens "B" RFP discharge valve 2-HS-3-12A when "B" RFP discharge pressure is within 250 lbs of reactor pressure.

XI. Simulator Event Guide

EVENT 5: FUEL FAILURE DUE TO COLD WATER INJECTION

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces "TURBINE BUILDING HIGH RADIATION" and determines which area and evacuates that area.
	_____ _____	Announces "OFF-GAS ANNUAL RELEASE LIMIT EXCEEDED" and responds per ARP
BOP/SRO	_____	Notifies Chemistry to perform analysis and Radcon
SRO	_____	Declares a NOUE on a valid OG pretreatment rad alarm or Main Steam Line rad Hi Hi.

XI. Simulator Event Guide

EVENT 6: RWCU LINE SUCTION BREAK

<u>POSITION</u>	<u>TIME</u>	<u>EXPECTED ACTIONS</u>
BOP	_____	Announces "RX BLDG HIGH RADIATION" and determines which area and evacuates that area. North and South RWCU area.
BOP	_____	Reports on RWCU leak detection alarms
SRO	_____	Enters EOI-3 on either high temp or high radiation
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 2-AOI-100-1
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

XI. Simulator Event Guide

EVENT 6: RWCU LINE SUCTION BREAK (cont)

BOP	_____	Determines that 2 areas are above max safe radiation values
SRO	_____	Determines that Emergency Depressurization is Required and enters C2
	_____	Directs BOP to open all ADS valves
BOP	_____	Opens all ADS valves
SRO	_____	When the shutdown cooling pressure interlock clears, directs BOP to place shutdown cooling in service per Appx. 17D
BOP	_____	Places Shutdown Cooling in service per appendix 17D

XII. Crew Critical Tasks

	<u>TASKS</u>	<u>SAT/UNSAT</u>
1.	Trips "A" RFP prior to reaching Main Steam Lines	_____
2.	Rapidly Depressurizes prior to reaching 2 areas above maximum safe radiation levels.	_____
3.	Emergency Depressurize when 2 areas reach maximum safe values.	_____

XIII. Scenario Verification Data

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

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER HLTS-3(0606)

- 7 Total Malfunctions Inserted; List: (5-8)
- 1) RWM Failure
 - 2) RFP controller failure
 - 3) Fuel Damage
 - 4) RWCU line break
 - 5) "A" RBCCW pump trip
 - 6) Failure of 69-1 to close
 - 7) Failure of RFPs to trip on Hi level
- 1 Malfunctions That Occur After EOI Entry; List: (1-2)
- 1) RWCU line Break
- 2 Abnormal Events; List: (2-4)
- 1) RFP control failure
 - 2) 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 C RFP is uncoupled and awaiting overspeed testing.

Suction and Discharge valves are tagged.

Operations/Maintenance For the Shift: Continue with reactor startup at step 5.76.8 of
0-GOI-100-1A. Continue with warm-up of "B" RFP per OI-3 at step 5.6.17. Thrust
bearing/ Overspeed/ Stop Valve and Control Valve tests are complete for "B" RFP.

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