Facility: **Browns Ferry NPP** Scenario No.: **3-09** Op-Test No.: **HLT 0801**

Examiners:	

Operators:		
	SRO:	**SROU-1**
	ATC:	**RO-1**
	BOP:	**RO-2**

Initial Conditions: Unit 3 is at 95% power following turbine valve testing. One loop of RHRSW is tagged for repair of FCV 23-34, 3A RHR Hx SW OUTLET VLV; which is inoperable. 3B CRD pump is tagged for breaker maintenance.

Turnover: Units 1 and 2 are at 100%. On Unit 3, turbine valve testing has just been completed. Raise power to 100% with Recirc@ 10 MWe/min. Support maintenance on RHRSW valve which is expected to be repaired in 12 hours. Thunderstorm warnings are in effect for Limestone County for the next 2 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	------	R-ATC N-SRO	Raise power
2	fw13a	C-SRO C-ATC N-BOP	RFP 3A failure/trip – 3-AOI-3-1 response and power reduction, Restores tripped RFP per 3-OI-3
3	rd25	I-ATC TS-SRO	RPIS failure on Control Rod 14-35
4	mc01e 4	C-BOP C-SRO	3C Condenser waterbox develops a tube leak requiring isolation of the waterbox
5	hp01	TS-SRO C-BOP	Inadvertent HPCI Initiation
6	th23 3 th35a 8 Multiple	M-ALL	Fuel Failure MSL leak with failure to auto-isolate Stuck Open SRV, HPCI/RCIC/CRD Failure

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

ANTICIPATED EAL: 1.1-S-1 – SITE AREA

Facility: Browns Ferry NPP Scenario No.: 3-09 (2) Op-Test No.: HLT 0801

Examiners:	

Operators:		
	SRO:	SROI-1
	ATC:	RO-3
	BOP:	RO-4

Facility: Browns Ferry NPP Scenario No.: 3-09 (3) Op-Test No.: HLT 0801

Examiners:	

Operators:		
	SRO:	SROI-4
	ATC:	RO-5
	BOP:	RO-6

ANTICIPATED EAL: 1.1-S-1 – SITE AREA

Unit three is at 95% power following turbine valve testing. One loop of RHRSW is tagged for repair of FCV 23-34.

The crew will raise power with Recirc.

3A RFP will receive an inadvertent trip. The crew will reduce power per AOI-3-1 to within the capacity of the running RFPs (< 5050 rpm) and return the pump to service per 3-OI-3.

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

The 3C NS Condenser waterbox develops a tube leak and the Crew will respond per 3-AOI-3-1 and 3-OI-27.

A HPCI inadvertent initiation is received and the crew will respond per 3-AOI-3-1.

Foreign material and conductivity in the vessel causes fuel failure. A subsequent Main Steam Line Break and Group 1 isolation signal occurs. 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 HPCI system failure. When RCIC is operated, it will trip locally and area radiation levels will preclude immediate restoration. The 3A CRD pump trips. SLC should be aligned to the test tank.

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

ANTICIPATED EAL: 1.1-S-1 – SITE AREA

SIMULATOR EVALUATION GUIDE

TITLE: RAISE POWER WITH RECIRC, RFP FAILURE, RPIS FAILURE FOR A ROD, CONDENSER TUBE LEAK, INADVERTANT HPCI START, 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: Jan. 16, 2009

PROGRAM: BFN Operator Training – Hot License

RCP required (95% - 100% w/Recirc flow @ 10MWe/min) – Provide marked up copy of 3-GOI-100-12 signed thru step 5.0[6.2] and with steps 5.0[7] thru 5.0[19] marked N/A

An RPHP may be required for re-starting tripped RFP (attached).

PREPARED: _____ \ _____
(Operations Instructor) Date

REVIEWED: _____ \ _____
(LOR Lead Instructor or Designee) Date

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

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

VALIDATED: _____ \ _____
(Operations SRO) (Required for Exam Scenarios) Date

LOGGED-IN: _____ \ _____
(Librarian) Date

TASK LIST UPDATED _____ \ _____
Date

Nuclear Training

Revision/Usage Log

Revision Number	Description of Changes	Date	Pages Affected	Revised
0	Initial	01/16/09	All	csf
1	Added NRC revisions	6/23/09	ALL	BKC

I. Program: BFN Operator Training

II. Course: Examination Guide

III. Title: RAISE POWER WITH RECIRC, RFP FAILURE, RPIS FAILURE FOR A ROD, CONDENSER TUBE LEAK, INADVERTANT HPCI START, 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 – 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, annunciator, abnormal, and emergency procedures.

B. Enabling Objectives:

1. The operating crew will raise power with recirc IAW GOI-100-12.

2. The operating crew will respond to a failure of RFP 3A per 3-AOI-3-1.

3. 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.

4. The operating crew will respond to a Condenser tube leak per 3-AOI-3-1 and 3-OI-27.

5. The operating crew will respond to an Inadvertent HPIC initiation.

6. The operating crew will recognize and respond to fuel failure in accordance with ARPs.

7. The operating crew will recognize and respond to a Main Steam line break and failure of MSIVs to auto isolate per EOI-3.

8. The operating crew will recognize and respond to a stuck open SRV in accordance with AOI-1-1 and EOI-2.

9. 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.

VII. Training Materials: (If needed, otherwise disregard)

A. Calculator

B. Control Rod Insertion Sheets

C. Stopwatch

D. Hold Order / Caution Order tags

E. Annunciator window covers

F. Steam tables

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat hlts-3-09

MF/RF/OR#		Description
1)	trg e1 MODESW	Set trigger
2)	trg e3 1-179	Set trigger
3)	trg e4 RCIC	Set trigger
4)	imf rd01a (e1 0)	Trip CRD pump 3A
5)	imf fw13c (e1 0)	Trip RFW pump 3C
6)	imf fw13b (e1 0)	Trip RFW pump 3B
7)	mmf th23 10 (e1 0) 1:00	Fuel failure
8)	imf ad01m 100 (e3 0)	SRV 1-179 fail open
9)	imf rc03 (e4 0)	RCIC trip on low suction
10)	imf sw03a	Tag RHRSW A1 pump
11)	imf sw03b	Tag RHRSW A2 pump
12)	ior zlohs231a[1] off	RHRSW A1 green light off
13)	ior ypobkrrhrswpa1 fail_ccoil	RHRSW A1 bkr
14)	ior zlohs235a[1] off	RHRSW A2 green light off
15)	ior ypobkrrhrswpa2 fail_ccoil	RHRSW A2 bkr
16)	ior zlozi2331 off	RHRSW 23-31 red light off
17)	ior ypovfcv2334 fail_power	RHRSW FCV-23-34 breaker
18)	ior zaopi234 0	RHRSW A pressure = 0 psig
19)	ior zdihs7117a null	Null RCIC torus suction valve HS
20)	imf rp15a	MSIV ch A group 1 isolation fail
21)	imf rp15b	MSIV ch B group 1 isolation fail
22)	imf rd01b	Tag 3B CRD pump
23)	ior zlohs852a[1] off	3B CRD pump green light off
24)	ior an:xa553a27 alarm_off	Disable Main Steam line RAD HIHI ann
25)	ior zaori9020a .02	Override RI

1. File: bat fuelfailhpci

MF/RF/OR#		Description
1)	imf hp07 (none 3:00)	HPCI 120V Power Failure
2)	lmf th23 3 10:00	Fuel Failure

IX. Console Operators Instructions

HLTS 3-09

ELAP TIME		DESCRIPTION/ACTION
Simulator Setup	manual	Reset to IC 242 ~95% power rst 242 PW = david
Simulator Setup		Main batch file – see summary bat hlts-3-09
Simulator Setup	manual	Place H.O. card on 3B CRD pump, A1 & A2 RHRSW pumps and FCV-23-34

---

2 minutes after power raised to 100% or when directed by lead evaluator….		imf fw13a trips 3A RFW pump
	AND after it trips	
		dmf fw13a Removes trip

ROLE PLAY: **If sent to investigate 3A RFW pump trip, report Radcon performing a survey in the 3A RFW pump room accidentally tripped the pump**

When RFP is recovered or when directed by lead evaluator…..		imf rd25 Loss of RPIS on rod 14-35

ROLE PLAY: **If dispatched as IM's to check individual circuit cards in panel 9-27, report card is fine, must be a reed switch failure**

ROLE PLAY: **If contacted as Reactor Engineer, recommend notch insert control rod 14-35 one notch and see if rod indicates position 46, if so, leave at position 46. (Provide RCP and shove sheet)**

5 minutes after the rod is repositioned or when directed by the lead evaluator….		imf mc01e 4 5:00 Condenser tube leak 3C NS

ROLE PLAY: **4 minutes after requested, Chemistry reports Conductivity of "C" Hotwell is**

highest

If directed to close FCV-27-70 to 20%		sev mcvfcv2770 0.2 Throttle 3C NS outlet

If directed to close FCV-27-78 to 20%		sev mcvfcv2778 0.2 Throttle 3C SS outlet

ROLE PLAY: **Report 3-FCV-27-46 (38) is/are throttled**

ROLE PLAY: **If notified as Ops Management of impending Unit shutdown, respond,**

additional personnel will be called in

3 minutes after waterbox isolated or when directed by the lead evaluator…….		imf hp01 HPCI inadvertent initiation

After the Tech Spec call is made on HPCI inoperable…		bat fuelfailhpci fuel failure with HPCI 120 VAC failure
	AND	
		imf th35a (none 6:00) 8 6:00 Steam line A steam leak in steam tunnel

ROLE PLAY: **When asked to check on HPCI, the fuse was replaced and blew again immediately. 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 -45 minutes if there is one in the warehouse**
(Updates on status may be provided as requested with progress toward success indicated)

After scram

ROLE PLAY: **If sent to investigate trip of 3A CRD pump, report breaker appears to be damaged and Elec Maint has been contacted to repair**

ROLE PLAY: **If sent to investigate trip of 3B and 3C RFW pumps, report nothing unusual noted in either pump room**

When requested to open breaker for PCV 1-179, wait 3 minutes……		mrf ad01m out Opens breaker for PCV 1-179

When requested to close breaker for PCV 1-179…		mrf ad01m in Closes breaker for PCV 1-179

If requested to shutdown HWC……..		mrf og09 shutdown Removes HWC from service

ROLE PLAY: **If asked to check RWCU temp ATU's in Aux Inst rm, report 68-835 A-D reading 90°F to 92 °F**

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. I am currently trying to get Radcon to put me on an RWP to get to the RCIC room**

NOTE: monitor FW flow. If condensate injection is observed prior to ED…		imf fw18 100 Rupture the RFW header

At about 450 psig prior to ED. Leave open if ED is initiated earlier		dmf ad01m Closes PCV 1-179

If requested to perform App 7B, wait 25 minutes		bat app07b Align SLC to test tank

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

1) MSIV's closed

2) Emergency Depressurization completed

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

X. Scenario Summary:

Unit three is at 95% power following turbine valve testing. One loop of RHRSW is tagged for repair of FCV 23-34.

The crew will raise power with Recirc.

3A RFP will receive an inadvertent trip. The crew will reduce power per AOI-3-1 to within the capacity of the running RFPs (< 5050 rpm) and return the pump to service per 3-OI-3.

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

The 3C NS Condenser waterbox develops a tube leak and the Crew will respond per 3-AOI-3-1 and 3-OI-27.

A HPCI inadvertent initiation is received and the crew will respond per 3-AOI-3-1.

Foreign material and conductivity in the vessel causes fuel failure. A subsequent Main Steam Line Break and Group 1 isolation signal occurs. 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 HPCI system failure. When RCIC is operated, it will trip locally and area radiation levels will preclude immediate restoration. The 3A CRD pump trips. SLC should be aligned to the test tank.

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

XI. 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 US with a copy of the shift turnover sheet for the scenario.

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

D. Ensure recorders are inking are 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. MSIV's closed

2. Emergency Depressurization completed

3. RPV level being maintained + 2 to + 51 "or recovering

XII. Simulator Event Guide:

Event 1: Raise Power With Recirc

Position	Expected Actions	Time/Comments
SRO	Notify ODS of power increase	
	Direct return of U3 to Full Power using Recirc Flow per 3-GOI-100-12 step 5[20] and 3-OI-68	
ATC	Raises Power w/Recirc using 3-GOI-100-12 and **3-OI-68, section 6.2**	
	[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)(FAST) 3-HS-96-17A(17B)(17C), push-buttons, to achieve balanced jet pump flows. **AND/OR** ADJUST Recirc Pump speed 3B using, RAISE SLOW (MEDIUM), 3-HS-96-16A(16B)/LOWER SLOW(MEDIUM)(FAST) 3-HS-96-18A(18B)(18C), push-buttons, to achieve balanced jet pump flows	
	[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: RAISE SLOW, 3-HS-96-31 RAISE MEDIUM, 3-HS-96-32 LOWER SLOW, 3-HS-96-33 LOWER MEDIUM, 3-HS-96-34 LOWER FAST, 3-HS-96-35	
BOP	Provides peer check for Recirc adjustment	
	Continue to monitor BOP (transfer volts, condensate flow, etc)	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure

Position	Expected Actions	Time/Comments
ATC	Announces 3-9-6C- Window 1, "RFPT A Abnormal" alarm and trip of RFPT 'A'.	
	Announces 3-9-6C Window 23, "RFPT TRIP CIRCUIT ABNORMAL."	
	Announces 3-9-6C Window 29, "RFPT TRIPPED."	
	Announces 3-9-6C Window 32, "RFP DISCH FLOW LOW."	
SRO	Directs Entry into 3-AOI-3-1	
	Directs Reactor Power lowered as needed to maintain operating RFP's speed < 5050 rpm per 3-OI-68	
ATC	Reduces reactor power as necessary to maintain Rx level or verifies Recirc runbacks	
	Reduces reactor power as necessary to maintain RFP speed < 5050 rpm as directed by SRO	
	Splits Recirc Pump speeds by 60 rpm if maintained between 1200 & 1300 rpm per OI-68	
BOP	Refers to ARP, 3-AOI-3-1 and/or 3-OI-3 and takes required actions	
SRO	Dispatches AUO to RFP to determine cause of trip	
ATC	Verifies unit stable, Power, Level, Pressure	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Directs RFP returned to service after report of spurious trip per 3-AOI-3-1, section 4.2 or 3-OI-3, section 8.1 / 5.7	
BOP	Returns RFP to service per 3-AOI-3-1 Subsequent actions (preferred) **OR** 3-OI-3, section 8.1 / 5.7	
	3-AOI-3-1 4.2 (preferred method)	**NO RPHP** if this section used
	[11] IF RFPT has tripped and it is needed to maintain level, THEN PERFORM the following: [11.1] OBTAIN Unit Supervisor permission to restart RFPT.	
	[11.2] RESET trip by using pushbutton.	
	[11.3] DEPRESS RFPT Speed Control Raise/Lower switch to MANUAL GOVERNOR position.	
	[11.4] PLACE RFPT Start/Local enable switch to START.	
	[11.5] VERIFY RFPT accelerates to approximately 600 rpm.	
	[11.6] IF Fast Recovery of RFPT is desired, THEN PERFORM the following: [11.6.1] OBTAIN Unit Supervisor's permission to perform fast recovery of RFPT.	
	[11.6.2] VERIFY Reactor Water Level Control PDS in AUTO and SELECT Column 2.	
	[11.6.3] VERIFY Reactor Water Level Control PDS level setpoint set at desired level.	
	[11.6.4] PULL individual RFPT Speed Control Raise/Lower switch to FEEDWATER CONTROL position AND VERIFY amber light at switch is extinguished.	
	[11.6.5] PLACE individual RFPT Speed Control PDS in AUTO.	
	[11.7] IF Slow Recovery of RFPT in MANUAL GOVERNOR is desired, THEN RAISE RFPT speed using RFPT Speed Control Raise/Lower switch until desired flow is obtained.	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

BOP	[11.8] IF Slow Recovery of RFPT using individual RFPT Speed Control PDS is desired, THEN PERFORM the following: [11.8.1] VERIFY Column 3 selected and MANUAL selected on individual RFPT speed Control PDS.	
	[11.8.2] PULL individual RFPT Speed Control Raise/Lower switch to FEEDWATER CONTROL position.	
	[11.8.3] RAISE RFPT speed using Ramp Up/Ramp Down pushbuttons to obtain desired flow.	
	[14] IF unit remains on-line, THEN RETURN Reactor water level to normal operating level of 33" (normal range).	
	8.1 RFPT Trip Recovery (ALTERNATE OPTION) [1] VERIFY complete actions of Alarm Response RFPT TRIPPED, 3-XA-55-6C Window 29	
	[2] CHECK CLOSED RFP 3A(3B)(3C) DISCH TESTABLE CHECK VLV, 3-FCV-3-94(93)(92), by one of the following: • Observe RFP discharge flow indicator • Locally listening to check valve slam A. IF testable check valve did NOT close, THEN CLOSE tripped RFP discharge and suction valves	
	[3] IF desired to place alternate RFP/RFPT in service AND another RFPT is available, THEN PERFORM applicable action: (Otherwise N/A) • IF no RFP/RFPT in service, THEN REFER TO Section 5.5 • IF any RFP/RFPT in service, THEN REFER TO Section 5.7 A. WHEN either Section 5.5 or 5.7 is complete, THEN GO TO Step 8.1[1]	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[4] IF cause of RFPT trip is already corrected AND tripped RFPT will be returned to service, THEN PERFORM applicable action: (Otherwise N/A) • IF no RFP/RFPT in service, THEN GO TO Section 5.5 • IF any RFP/RFPT in service, THEN GO TO Section 5.7	
	3-OI-3, section 5.7	
	5.7 Placing the Second and Third RFP/RFPT In Service	
	[1] BEFORE placing a RFPT in service: [1.1] NOTIFY Radiation Protection that an RPHP is in effect for the impending action to place RFPT 3A(3B)(3C) in service. RECORD time Radiation Protection notified in NOMS Narrative Log [BFN PER 126211] [1.2] VERIFY appropriate data and signatures recorded on Appendix A per Appendix A instructions [Tech Spec 5.7] [BFN PER 126211]	

Evaluator Note: Provide signed RPHP to SRO

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[2] IF RFP/RFPT is NOT warmed, reset and rolling, THEN PERFORM the following: (Otherwise N/A)	**Step 2 is N/A**
	[2.1] DEPRESS RFPT 3A(3B)(3C) TRIP RESET, 3-HS-124A(150A)(175A).	
	[2.2] DEPRESS RFPT Speed Control Raise/Lower switch to MANUAL GOVERNOR position.	
	[2.3] PLACE RFPT Start/Local enable switch to START.	
	[2.4] VERIFY RFPT accelerates to approximately 600 rpm.	
	[3] VERIFY RFP 3A(3B)(3C) MIN FLOW VALVE, 3-HS-3-20(13)(6), in OPEN position • CHECK OPEN MIN FLOW VALVE, 3-FCV-3-20(13)(6)	
	[4] SLOWLY RAISE speed of RFPT using RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER, 3-HS-46-8A(9A)(10A), to establish flow and maintain level in vessel	
	[5] WHEN RFPT discharge pressure is within 250 psig of reactor pressure, THEN VERIFY OPEN RFP 3A(3B)(3C) DISCHARGE VALVE, 3-FCV-3-19(12)(5)	
	[6] SLOWLY RAISE RFPT speed using RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch, 3-HS-46-8A(9A)(10A), to slowly raise RFP discharge pressure and flow on the following indications (Panel 3-9-6): • RFP Discharge Pressure - RFP 3A(3B)(3C), 3-PI-3-16A(9A)(2A) • RFP Discharge Flow - RFP 3A(3B)(3C), 3-FI-3-20(13)(6)	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[7] WHEN sufficient flow is established to maintain RFP 3A(3B)(3C) MIN FLOW VALVE, 3-FCV-3-20(13)(6), in CLOSED position (approximately 2 x 10_6 lbm/hr), THEN PLACE RFP 3A(3B)(3C) MIN FLOW VALVE, 3-HS-3-20(13)(6), in AUTO	
	[8] OBSERVE lowering in speed and discharge flows of other operating RFPs	
	[9] IF transferring RFPT from MANUAL GOVERNOR to individual RFPT Speed Control PDS, THEN PERFORM the following: (Otherwise N/A) [9.1] PULL RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch, 3-HS-46-8A(9A)(10A), to FEEDWATER CONTROL position [9.2] VERIFY amber light at switch extinguished above RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch, 3-HS-46-8A(9A)(10A) [9.3] PERFORM the following on RFPT 3A(3B)(3C) SPEED CONTROL(PDS), 3-SIC-46-8(9)(10) (Panel 3-9-5): [9.3.1] SELECT Column 3 [9.3.2] VERIFY PDS in MANUAL	
	[10] IF transferring control of RFPT from individual RFPT Speed Control PDS to "AUTO" control using REACTOR WATER LEVEL CONTROL PDS, 3-LIC-46-5, THEN PERFORM the following: (Otherwise N/A) [10.1] VERIFY REACTOR WATER LEVEL CONTROL (PDS), 3-LIC-46-5 is functioning properly and ready to control second or third RFP [10.2] SLOWLY RAISE RFP discharge flow and pressure by raising RFP speed [10.3] WHEN RFP speed is approximately equal to operating RFP(s) speed, THEN PERFORM the following on RFPT 3A(3B)(3C) SPEED CONTROL (PDS), 3-SIC-46-8(9)(10): [10.3.1] PLACE PDS in AUTO [10.3.2] VERIFY Column 3 selected	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[11] WHEN RFP in automatic mode on REACTOR WATER LEVEL CONTROL, (PDS) 3-LIC-46-5, THEN CLOSE the following valves: • RFPT 3A(3B)(3C) LP STOP VLV ABOVE SEAT DR, 3-FCV-6-120(125)(130) • RFPT 3A(3B)(3C) LP STOP VLV BELOW SEAT DR, 3-FCV-6-121(126)(131) • RFPT 3A(3B)(3C) HP STOP VLV ABOVE SEAT DR, 3-FCV-6-122(127)(132) • RFPT 3A(3B)(3C) HP STOP VLV BELOW SEAT DR, 3-FCV-6-123(128)(133) • RFPT 3A(3B)(3C) FIRST STAGE DRAIN VLV, 3-FCV-6-124(129)(134) • RFPT A(B)(C) HP STEAM SHUTOFF ABOVE SEAT DRAIN, 3-FCV-006-0153(0155)(0157) (local control) • RFPT A(B)(C) LP STEAM SHUTOFF ABOVE SEAT DRAIN, 3-FCV-006-0154(0156)(0158) (local control)	
	[12] VERIFY CLOSED the following valves on first RFP started in Section 5.5: • RFPT 3A(3B)(3C) LP STOP VLV ABOVE SEAT DR, 3-FCV-6-120(125)(130) • RFPT 3A(3B)(3C) LP STOP VLV BELOW SEAT DR, 3-FCV-6-121(126)(131) • RFPT A(B)(C) LP STEAM SHUTOFF ABOVE SEAT DR, 3-FCV-006-0154(0156)(0158) (local control)	

XII. Simulator Event Guide:

Event #2: RFP 3A Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[13] VERIFY both RFPT Main Oil Pumps running	
	[14] IF desired to stop Turning Gear for in service RFPT, THEN PLACE appropriate handswitch in STOP and RETURN to AUTO: • RFPT 3A TURNING GEAR MOTOR, 3-HS-3-101A • RFPT 3B TURNING GEAR MOTOR, 3-HS-3-127A • RFPT 3C TURNING GEAR MOTOR, 3-HS-3-152A	
	[15] REFER TO Section 6.0. • CONTROL and MONITOR RFW system operation	
	Notify SRO that 3A RFP is returned to service	

XII. Simulator Event Guide:

Event # 3: Rod Position Failure

Position	Expected Actions	Time/Comments
Crew	Announces alarm 9-5A window 28, "CONTROL ROD DRIFT"	
ATC	B. DETERMINE which rod is drifting from Full Core Display	
	Identifies rod 14-35 has no position indication on full core and 4-rod display	
	B. IF rod drifting in, THEN REFER TO 3-AOI-85-5	
	C. IF rod drifting out, THEN REFER TO 3-AOI-85-6	
	D. REFER TO Tech Spec Section 3.1.3	
SRO	Determines rod is not drifting but RPIS indication has failed	
	Directs entry into 3-AOI-85-4, "Loss of RPIS"	
	Enters LCO 3.1.3 and notes that insertion of the rod to an operable position indication (46) is allowed	
	SR 3.1.3.1 The position of each control rod must be determined to ensure adequate information on control rod position is available to the operator for determining control rod OPERABILITY and controlling rod patterns. Control rod position may be determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.	

XII. Simulator Event Guide:

Event # 3: Rod Position Failure (continued)

	T.S. 3.1.3	
	Separate Condition entry is allowed for each control rod. ---------- ---------- CONDITION REQUIRED ACTION COMPLETION TIME A. One withdrawn control rod stuck. ----------NOTE---------- Rod worth minimizer (RWM) may be bypassed as allowed by LCO 3.3.2.1, "Control Rod Block Instrumentation," if required, to allow continued operation. ---------- **A.1** Verify stuck control rod separation criteria are met. Immediately AND **A.2** Disarm the associated control rod drive (CRD). 2 hours **A.3** Perform SR 3.1.3.2 and SR 3.1.3.3 for each withdrawn OPERABLE control rod. 24 hours from discovery of Condition A concurrent with THERMAL POWER greater than the low power setpoint (LPSP) of the RWM AND **A.4** Perform SR 3.1.1.1. 72 hours	**Condition A is N/A**

XII. Simulator Event Guide:

Event # 3: Rod Position Failure (continued)

	B. Two or more withdrawn control rods stuck. **B.1** Be in MODE 3. 12 hours	**Condition B is N/A**
	C. One or more control rods inoperable for reasons other than Condition A or B. **C.1** ----------NOTE---------- RWM may be bypassed as allowed by LCO 3.3.2.1, if required, to allow insertion of inoperable control rod and continued operation. ---------- Fully insert inoperable control rod. 3 hours AND C.2 Disarm the associated CRD. 4 hours	**Condition C is Applicable until the rod is moved to a position with an operable PIS (position 46)**
	D. ----------NOTE---------- Not applicable when THERMAL POWER > 10% RTP. ---------- Two or more inoperable control rods not in compliance with banked position withdrawal sequence (BPWS) and not separated by two or more OPERABLE control rods. **D.1** Restore compliance with BPWS. 4 hours OR **D.2** Restore control rod to OPERABLE status. 4 hours	**Condition D is N/A**
	E. Required Action and associated Completion Time of Condition A, C, or D not met. OR Nine or more control rods inoperable. **E.1** Be in MODE 3. 12 hours	**Condition E is N/A**
ATC	Reports to SRO that Power is STABLE	
	3-AOI-85-4 4.1 Immediate Actions [1] STOP all control rod movement	
	4.2 Subsequent Actions [1] CHECK with Operations Superintendent and Reactor Engineer for actions to be taken in a timely manner	

XII. Simulator Event Guide:

Event #3: Rod Position Failure (continued)

Position	Expected Actions	Time/Comments
ATC	[2] CHECK with Technical Support to help determine the extent of loss of RPIS	
	[3] IF control rod was in motion when RPIS failed and position of that control rod can NOT be determined, THEN CONSIDER that Control Rod Inoperable. REFER TO Tech. Spec. 3.1.3 N/A	
	[4] IF control rod movement is required with a total loss of RPIS, THEN MANUALLY SCRAM reactor N/A	
	[5] REFER TO EPIP-1	
SRO	SRO verifies the EPIP's do not apply	
ATC	[6] VERIFY ON Breaker 612, PANEL 3-9-27 ROD POSITION INFO SYS FEED FROM UNIT PREFERRED 120VAC, at Panel 3-9-9 Cabinet 6	

Evaluator Note: When Operator goes around back to check bkr 612, report that breaker is closed

ATC	[7] IF half or all control rod position indications on Full Core Display are off, THEN PERFORM the following: N/A	

XII. Simulator Event Guide:

Event #3: Rod Position Failure (continued)

Position	Expected Actions	Time/Comments
ATC	[8] IF an individual control rod position indication is off on Full Core Display or 4-Rod Display, THEN CHECK individual circuit cards in Panel 3-9-27 for proper operation	
	[9] IF an individual reed switch position indicator is out-of-service on Full Core Display or 4-Rod Display, THEN RECORD control rod coordinates and position in Unit Operators Log N/A	
	[10] [NER/C] IF unable to restore position indication for an individual control rod or rods, THEN CHECK with Reactor Engineer and DETERMINE additional corrective action	
	4.4 Alternate Methods of Determining Control Rod Position of A Single Control Rod	
	[1] IF the "TENS" Digit for an individual reed switch position indicator is out-of-service on Full Core Display and 4-Rod Display for the Control Rod, THEN VERIFY the following: • The Associated Control Rod was NOT being moved when the loss of reed switch Position for the "TENS" Digit occurred • No Drift Alarm is present for the associated Control Rod • The "ONES" Digit is at its original expected position	

XII. Simulator Event Guide:

Event #3: Rod Position Failure (continued)

Position	Expected Actions	Time/Comments
ATC	[1.1] IF all three of the bullets in 4.4[1] are satisfied, THEN The associated Control Rod can be assured it is in its required/intended position N/A	
	[1.2] IF any of the three bullets in 4.4[1] cannot be met, THEN 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) (bullets 2 & 3 cannot be met)	
	[2] IF the "ONES" Digit for an individual reed switch position indicator is out-of-service on Full Core Display and 4-Rod Display for the Control Rod, THEN 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)	
SRO	When provided the RCP for the rod movement, direct rod 14-35 inserted to position 46 to see if RPIS indications return	
ATC	Notches rod 14-35 to position 46 and verifies that the RPIS indications have returned	
	Reports RPIS restored on rod 14-35 to SRO	
SRO	Directs rod 14-35 to remain in position 46	
	Notifies Reactor Engineer	
	Directs initiation of WO	

XII. Simulator Event Guide:

Event #4: Condenser Tube Leak

Position	Expected Actions	Time/Comments
Crew	Reports alarm 9-6B window 6, "Condensate Demin Abnormal"	
	9-6B-Window 19 "CNDS PUMP DISCHARGE CNDCT HIGH"	
BOP	A. CHECK system flow conductivity, and system DP, on Panel 3-9-6 for abnormalities.	
	B. DISPATCH personnel to determine problem with condensate demineralizers.	
	C. IF High Conductivity exists, THEN REFER TO 3-AOI-2-1.	
	Checks SPDS screen "COND ALA" – condenser alarms	
SRO	After UO report of high conductivity, directs entry into 3-AOI-2-1, Reactor Coolant High Conductivity	
BOP	**4.2 Subsequent Actions** [1] LOWER reactor power, as necessary, to maintain radiation levels in main steam lines below the "Main Steam Line Radiation High-High" (3-XA-55-3A, Window 27) setpoint. REFER TO 3-GOI-100-12A.	
	[2] MONITOR reactor vessel water conductivity on REACTOR WATER CLEANUP BEFORE DEMIN (CONDUCTIVITY), 3-CR-43-11A, on Panel 3-9-4.	
	[3] NOTIFY Chemistry to sample reactor water. REFER TO 3-SI-4.6.B.1-4.	
	[4] IF condenser hotwell inleakage is suspected, THEN PERFORM the following:	
	[4.1] ISOLATE and DRAIN the condenser water boxes (one at a time). REFER TO 3-OI-27 [4.1.1] OBSERVE reactor water conductivity and off gas flow rate. (After the leaking water box is isolated and drained, Reactor water conductivity should begin to lower within 30-45 minutes. OFF-GAS flow rate could raise.)	

XII. Simulator Event Guide:

Event #4: Condenser Tube Leak (continued)

Position	Expected Actions	Time/Comments
SRO	When Chemistry calls and reports conductivity highest in 3C condenser, directs isolating and draining 3S CCW waterboxes per 3-OI-27	
BOP	Starts removing waterboxes per 3-OI-27 section 8.17	
	8.17 Removing a Waterbox from Service for Leak Check [1] IF time permits, THEN COLLECT the Amertap System balls and SHUT DOWN the Amertap System from the waterboxes to be removed. REFER TO 3-OI-27B. N/A	
	[2] IF the waterbox being removed from service is 3A1(SS), THEN SHUT DOWN Debris Filter REFER TO Section 7.2 N/A	
	[3] CLOSE the CNDR 3A1(3A2)(3B1)(3B2) **(3C1)(3C2),** OFFGAS SHUTOFF VALVE to the waterbox to be removed from service using 3-HS-66-A(3A)(4A)(5A**)(6A)(7A**) on Panel 3-9-8	
	[4] CLOSE the CNDR 3A(3B)(3C) CCW OUTLET SO VALVE (on the waterbox to be removed) to approximately 20% open as follows:	
	[4.1] WHILE performing the following steps, MONITOR condenser vacuum closely	
	[4.2] PLACE handswitch CNDR 3A(B)(C) NS(SS) CCW OUTL SHUTOFF VLV 2-HS-027-38(46,54,62,**70,78**)A (3-PNLA-009-0020) in CLOSE and release to close valve to ≈5% open	

XII. Simulator Event Guide:

Event #4: Condenser Tube Leak (continued)

Position	Expected Actions	Time/Comments
BOP	[4.3] AS necessary to maintain Condenser Vacuum greater than 25 inches Hg, SLOWLY THROTTLE OPEN the remaining CNDR 3A(3B)**(3C)** CCW OUTLET SHUTOFF VALVEs by using the following OPEN/CLOSE/STOP pushbutton on Panel 25-116 • CNDR 3A NS CCW OUTL SHUTOFF VLV, 3-HS-027-0038D • CNDR 3A SS CCW OUTL SHUTOFF VLV, 3-HS-027-0046D • CNDR 3B NS CCW OUTL SHUTOFF VLV, 3-HS-027-0054D • CNDR 3B SS CCW OUTL SHUTOFF VLV, 3-HS-027-0062D • **CNDR 3C NS CCW OUTL SHUTOFF VLV, 3-HS-027-0070D** • **CNDR 3C SS CCW OUTL SHUTOFF VLV, 3-HS-027-0078D**	
	Reports annunciator 3-9-20A Window 10 "CNDR C NS WATER BOX LEVEL LOW " to US.	
	[4.4] IF necessary, THEN REDUCE LOAD and MAINTAIN condenser vacuum greater than 25 inches Hg to get the CNDR 3A(3B)(3C) CCW OUTLET SHUTOFF VALVE NS(SS) (on the waterbox to be removed) to approximately 20 percent open **(Should not be necessary)**	

XII. Simulator Event Guide:

Event #4: Condenser Tube Leak (continued)

Position	Expected Actions	Time/Comments
BOP	[5] CLOSE the CNDR 3A(3B**)(3C)** CCW INLET SHUTOFF VALVE for the waterbox to be removed from service using the appropriate switch on Panel 3-9-20: • CNDR 3A NS CCW INLET SHUTOFF VLV, 3-HS-27-31A • CNDR 3A SS CCW INLET SHUTOFF VLV, 3-HS-27-39A • CNDR 3B NS CCW INLET SHUTOFF VLV, 3-HS-27-47A • CNDR 3B SS CCW INLET SHUTOFF VLV, 3-HS-27-55A • **CNDR 3C NS CCW INLET SHUTOFF VLV, 3-HS-27-63A** • **CNDR 3C SS CCW INLET SHUTOFF VLV, 3-HS-27-71A**	
	Notices Conductivity lowering after CLOSING 3C NS waterbox inlet valve	
	[6] IF DESIRED CLOSE NASH valves step 8.3[11.2] and drain the waterbox step 8.3[18]. (otherwise N/A)	
	[7] ADJUST the position the remaining CNDR CCW OUTLET SHUTOFF VALVES to optimize CCW System performance by performing Section 6.1	

XII. Simulator Event Guide:

Event #5: Inadvertent HPCI Initiation

Position	Expected Actions	Time/Comments
SRO	Checks Tech Specs 3.4.6 and TRM 3.4.1 and determine neither apply unless conductivity exceeded 2 µmho/cm (then 3.4.1 would apply)	
	3.4.6 RCS Specific Activity LCO 3.4.6 The specific activity of the reactor coolant shall be limited to DOSE EQUIVALENT I-131 specific activity ≤ 3.2 µCi/gm. APPLICABILITY: MODE 1, MODES 2 and 3 with any main steam line not isolated.	
	TRM 3.4.1 CHEMISTRY PARAMETERS — COLUMN E(3) APPLICABLE CONDITION Operation of HWC Following Noble Metal Chemical Application CHLORIDE (ppm) — ≤ 0.2 CONDUCTIVITY (µmho/cm at 25°C) — ≤ 2.0 pH — 5.6-8.8	
ATC	Reports Rx Power lowering, RPV Level stable & RFPs RPMs decreasing	

XII. Simulator Event Guide:

Event #5: Inadvertent HPCI Initiation

CREW	**OPDP-1, Conduct of Operations** A. The onshift crew is responsible for the following: 2. Closely monitor thermal power during steady state power operation with the goal of maintaining the one-hour thermal power average at or below the licensed thermal power limit. If the core thermal power average for a one-hour period is found to exceed the licensed thermal power limit, take prompt (typically no more than10 minutes from point of discovery) action to ensure that thermal power is less than or equal to licensed thermal power limit.	
	C. Unit Operators are charged to: 1. Monitor reactor parameters to ensure the unit is operating within prescribed bands and monitor prescribed parameters and instrumentation to verify plant response is as expected during reactivity manipulations. If, after investigation, the unit is determined to be operating above its licensed core thermal power limit take prompt (typically no more than10 minutes from point of discovery) action to reduce power below the core thermal power limit.	
BOP	Reports to US that HPCI is starting with injection into RPV	
SRO	Announces to crew entry into 3-AOI-3-1, "Loss Of Reactor Feedwater or Reactor Water Level High/Low."	
SRO	Directs BOP to trip HPCI and place Aux Oil pump in Pull-to-Lock per 3-AOI-3-1.	

XII. Simulator Event Guide:

Event #5: Inadvertent HPCI Initiation (continued)

Position	Expected Actions	Time/Comments
	3-AOI-3-1	
BOP	[15] IF any of the following are **inadvertently injecting** into the Reactor, AND are not required for level control, THEN STOP injection by tripping pump, closing discharge valves, or with flow reduction, as appropriate: **A. HPCI and/or RCIC with reactor pressure > 450 psi** B. HPCI, RCIC, RHR, Core Spray, or feedwater/condensate with reactor pressure ≤ 450 psi	
	Trips HPCI with trip pushbutton	
	Places HPCI Aux Oil pump in Pull-to-Lock	
	Announces alarm 3-9-3E Window 11, " HPCI TURBINE TRIPPED"	
	Monitors HPCI coast down	
ATC	[24] IF unit remains on-line, THEN PERFORM the following: ☐ RETURN Reactor water level to normal operating level of 33"(normal range). ☐ REQUEST Nuclear Engineer check core limits.	
	Monitors RPV Level restoration back to normal.	

XII. Simulator Event Guide:

Event #5: Inadvertent HPCI Initiation (continued)

Position	Expected Actions	Time/Comments
SRO	**References T.S. 3.5.1**	
	ACTIONS ----------NOTE----- ---------- LCO 3.0.4.b is not applicable to HPCI. ---------- ---------- CONDITION REQUIRED ACTION COMPLETION TIME **A.** One low pressure ECCS injection/spray subsystem inoperable. OR One low pressure coolant injection (LPCI) pump in both LPCI subsystems inoperable. **A.1** Restore low pressure ECCS injection/spray subsystem(s) to OPERABLE status. 7 days	**Condition A is N/A**
	B. Required Action and associated Completion Time of Condition A not met. **B.1** Be in MODE 3. 36 hours AND **B.2** Be in MODE 4. 12 hours	**Condition B is N/A**
	C. HPCI System inoperable. C.1 Verify by administrative means RCIC System is OPERABLE. Immediately AND **C.2** Restore HPCI System to OPERABLE status. 14 days	**Condition C is APPLICABLE**
	D. HPCI System inoperable. AND Condition A entered. **D.1** Restore HPCI System to OPERABLE status. 72 hours OR **D.2** Restore low pressure ECCS injection/spray subsystem to OPERABLE status. 72 hours	**Condition D is N/A**

XII. Simulator Event Guide:

Event #5: Inadvertent HPCI Initiation (continued)

Position	Expected Actions	Time/Comments
SRO	**E.** One ADS valve inoperable. **E.1** Restore ADS valve to OPERABLE status. 14 days	**Condition E is N/A**
	F. One ADS valve inoperable. AND Condition A entered. **F.1** Restore ADS valve to OPERABLE status. 72 hours OR **F.2** Restore low pressure ECCS injection/spray subsystem to OPERABLE status. 72 hours	**Condition F is N/A**
	G. Two or more ADS valves inoperable. OR Required Action and associated Completion Time of Condition C, D, E, or F not met. **G.1** Be in MODE 3. 12 hours AND **G.2** Reduce reactor steam dome pressure to □ 150 psig. 36 hours	**Condition G is N/A**
	H. Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A. OR HPCI System and one or more ADS valves inoperable. **H.1** Enter LCO 3.0.3. Immediately	**Condition H is N/A**

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure

Position	Expected Actions	Time/Comments
BOP	Announces alarm 9-3A window 5, OG Pre Treatment Radiation High. Responds per ARP	
	A. VERIFY high radiation on following: 1. OFFGAS PRETREATMENT RADIATION recorder, 3-RR-90-157 on Panel 3-9-2 2. OFFGAS RADIATION recorder, 3-RR-90-160 on Panel 3-9-2 3. OG PRETREATMENT RAD MON RTMR, 3-RM-90-157 on Panel 3-9-10 4. OFFGAS RAD MON RTMR, 3-RM-90-160 on Panel 3-9-10	
	B. CHECK off-gas flow normal	
	C. CHECK following radiation recorders and associated radiation monitors: 1. MAIN STEAM LINE RADIATION, 3-RR-90-135 on Panel 3-9-2 2. OFFGAS POST-TREATMENT RADIATION, 3-RR-90-265 on Panel 3-9-2 3. STACK GAS/CONT RM RADIATION FROM STACK GAS, 0-RR-90-147 on Panel 1-9-2	
	D. NOTIFY RADCON	
	E. REQUEST Chemistry perform radiochemical analysis to determine source	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	F. IF Offgas System Isolation Valve, 3-FCV-66-28 is manually restrained in the OPEN position and it has been determined that this is a valid alarm, THEN UNRESTRAIN Offgas System Isolation Valve, 3-FCV-66-28	
	G. REFER TO 0-SI-4.8.B.1.a.1 and 1(2)(3)-SR-3.4.6.1(A) for ODCM compliance and to determine if power level reduction is required	
	H. IF directed by Unit Supervisor, THEN REDUCE reactor power to maintain off-gas radiation within ODCM limits	
	I. IF ODCM limits are exceeded, THEN REFER TO EPIP-1	
SRO	Notifies Chem Lab to Sample	
	Declares NOUE (1.4-U)	
BOP	Announces alarm 9-3A window 5, TURBINE BLDG AREA RADIATION HIGH	
	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.)	
	B. IF the TSC is NOT manned, THEN USE public address system to evacuate area where high airborne conditions exist.	
	C. IF the TSC is manned, THEN REQUEST the TSC to evacuate non-essential personnel from affected areas.	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	D. NOTIFY RADCON.	
	E. MONITOR other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in.	
	F. IF alarm is due to sensor malfunction, THEN REFER TO 0-OI-55.	
	Check instruments and reports increase in radiation RR-90-157 (OG Pretrt) RR-90-135 (MSL Rad)	
	Evacuates Turbine Building via plant announcement, per ARP	
SRO	Notifies Rad Con	
BOP	Announces alarm 9-3A window 22, RX BLDG AREA RADIATION HIGH	
	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.)	
	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	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	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.	
	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.	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	H. IF alarm is due to malfunction, THEN REFER TO 0-OI-55.	
	I. ENTER 3-EOI-3 Flowchart.	
	J. REFER TO 3-AOI-79-1 or 3-A01-79-2 if applicable.	
	Checks RB instruments to determine affected areas	
	Evacuates Reactor Building via plant announcement, per ARP	
SRO	Notifies Rad Con	
	Enters 3-EOI-3 on 9-3A window 22, RX BLDG AREA RADIATION HIGH Alarm [Table 4] (may direct power reduction with recirc flow)	
	Priority is the SC/R leg of 3-EOI-3 – at least one area is > MAX NORMAL level [answers YES to SC/R-2]	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	Recognize and announce Group 6 isolation on high radiation	
	Reports alarm 9-3D window 24, MAIN STEAM LINE LEAK DETECTION TEMP HIGH and verifies on TI 1-60A	
	A. CHECK the following temperature indications: • MN STEAM TUNNEL TEMP temperature indicator, 3-TIS-1-60A on Panel 3-9-3 • Temperature Switches 3-TS-1-60B, -60C, or -60D window(s) on Panel 3-9-21 • RWCU Piping in the Main Steam Tunnel temperature indicators, 3-TIS-69-834A(B)(C)(D), Auxiliary Instrument Room Panels 9-83(84)(85)(86) OR ICS 'HPTURB' mimic.	
	B. CHECK the following flow indications: • MAIN STEAM LINE FLOW A(B)(C)(D), 3-FI-46-1(2)(3)(4) on Panel 3-9-5 • RFW FLOW LINE A(B), 3-FI-3-78A(78B) on Panel 3-9-5 • RFP 3A(3B)3C) flow indicators, 3-FI-3-20(13)(6) on Panel 3-9-6	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	C. IF RCIC is NOT in service AND 3-FI-71-1A(B), RCIC STEAM FLOW indicates flow, THEN ISOLATE RCIC and VERIFY Temperatures lowering.	
	D. CHECK for elevated RAD Levels on the following Instruments: • 3-RM-90-20, CRD-HCU West • 3-RM-90-29, Suppression Pool	
	E. IF HPCI is injecting with elevated Suppression Pool Temperature, THEN CONSIDER securing HPCI to determine if it is the source of the leak.	
	F. IF Rx Bldg main steam tunnel temperature is above 160°F on 3-TIS-1-60A on Panel 3-9-3, THEN PERFORM the following: 1. ENTER 3-EOI-3 Flowchart 2. VERIFY Rx Zone fans, 3-HS-64-11A at Panel 3-9-25, in fast speed 3. VERIFY Steam Vault Exhaust Booster Fan in service. REFER TO 3-OI-30B	
	G. IF turbine building main steam tunnel temperature is above 160°F on 3-TS-1-60B, -60C, or -60D on Panel 3-9-21, THEN DISPATCH personnel to 480V AC Turb Bldg Vent Bd 3A (TB, El 617') to verify TB fans and the Mechanical Spaces Exhaust Fan running	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Directs Core Flow Runback	
	Renters 3-EOI-3 on any SC Area Temp above MAX NORMAL per Table 3 (RB Steam Tunnel)	
	Priorities are now both SC/T & SC/R legs of 3-EOI-3	
	Determines YES to 3-EOI-3 steps SC/R-4 & SC/T-5	
	Enters 3-EOI-1 from both steps SC/R-6 & SC/T-7 and Directs manual scram	
ATC	Manually scrams and verifies all rods inserted	
SRO	After ALL rods in, per 3-EOI-1 step RC/Q-2, exits RC/Q Leg & enters 3-AOI-100-1, Reactor Scram Directs.	
	Directs ATC to carry out actions of 3-AOI-100-1, Reactor Scram	
ATC	Carries out 3-AOI-100-1 actions	
	Mode switch in S/D	
	Gives scram report	
	Trips main turbine	
	Verify Recirc pumps at minimum	
Crew	Verifies Group 2, 3, 6 and 8 isolations	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	Closes MSIVs prior to isolation	**Critical Task #1**
	Reports MSIVs not closed on MSL high temp (189°F) on panel 9-3D alarms	
SRO	Directs MSIV closure, if not already directed	
BOP	Closes MSIVs	**Critical Task #1**
SRO	3-EOI-1 priorities are the RC/P & RC/L legs (RC/Q is not, due to all rods in)	
	MSIVs cannot be re-opened based on step RC/P-9, therefore step RC/P-11 is utilized	
	Directs pressure control 800 to 1000 psig using SRV's, Appendix-11A," ALTERNATE RPV PRESSURE CONTROL SYSTEMS MSRVs," (MSIVs are closed)	
	Per step RC/L-4 directs level control + 2" to + 51" using RCIC, Appendix-5C, "INJECTION SYSTEM LINEUP RCIC," or HPCI, Appendix-5D, "INJECTION SYSTEM LINEUP HPCI," (MSIVs are closed)	
	Answers YES to step RC/L-5 (1st time thru)	
BOP	Controls pressure as directed using SRVs, Appendix-11A, ALTERNATE RPV PRESSURE CONTROL SYSTEMS MSRVs," (MSIVs are closed)	
	1. IF ..... Drywell Control Air is NOT available, THEN ... EXECUTE EOI Appendix 8G, "CROSSTIE CAD TO DRYWELL CONTROL AIR," CONCURRENTLY with this procedure.	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
	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	
BOP	Attempts to control level as directed using HPCI, Appendix-5D, "INJECTION SYSTEM LINEUP HPCI," and RCIC, Appendix-5C, "INJECTION SYSTEM LINEUP RCIC"	
	Reports HPCI failure (120V Power Alarm)	
	Reports annunciator 3-9-3F Window 5, HPCI PUMP DISCH FLOW LOW in alarm	
	Reports annunciator 3-9-3F Window 7, HPCI 120 VAC POWER FAILURE, in alarm	
	Reports RCIC TRIP and failure to reset	
SRO	Dispatches AUO to reset RCIC	
	Dispatches OS-US to troubleshoot / replace HPCI power supply fuses	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	Reports PCV 1-179 failure to close after use	
SRO	Directs entry into 3-AOI-1-1, "Relief Valve Stuck Open"	
BOP	Enters 3-AOI-1-1, "Relief Valve Stuck Open," and performs immediate operator actions	
	4.1 Immediate Action [1] IDENTIFY stuck open relief valve by OBSERVING the following: • SRV TAILPIPE FLOW MONITOR, 3-FMT-1-4, on Panel 3-9-3, OR • MSRV DISCHARGE TAILPIPE TEMPERATURE, 3-TR-1-1 on Panel 3-9-47	
	[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: CLOSE to OPEN to CLOSE positions	
	[3] IF all SRVs are CLOSED, THEN CONTINUE at Step 4.2.3. (Otherwise N/A) N/A	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Directs actions to close PCV 1-179 per 3-AOI-1-1 outside control room	
BOP	**4.2.1 Attempt to close valve from Panel 9-3:** [1] PLACE the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the OFF position	
	[2] PLACE the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the ON position	
	[3] IF all SRVs are CLOSED, THEN CONTINUE at Step 4.2.3. (Otherwise N/A) N/A	
	[4] PLACE MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202 in INHIBIT:	
	[5] IF relief valve closes, THEN OPEN breaker or PULL fuses as necessary using Attachment 1 (Unit 3 SRV Solenoid Power Breaker/Fuse Table)	
	[6] PLACE MSRV AUTO ACTUATION LOGIC INHIBIT 3-XS-1-202, in AUTO	
	Uses table at step 7 to determine which step to proceed to (4.2.2[12])	
	[12] IF 3-PCV-1-179 is NOT closed, THEN PERFORM the following: (Otherwise N/A this section.) [12.1] REMOVE the power from 3-PCV-1-179 by performing one of the following: (Otherwise N/A): A. OPEN the following breaker: (Preferred method) • 3B 250V RMOV, Compartment 8C2 OR B. In 3-LPNL-925-0658, (El 593' 3B Electric Board Room, South Wall) PULL the following fuses as necessary: • Fuse 3-FU1-001-0179A • Fuse 3-FU1-001-0179B	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	[12.2] IF the valve does NOT close, THEN CLOSE breaker or REINSTALL fuses removed in Step 4.2.2[12.1].	
	[12.3] CONTINUE at Step 4.2.3	
	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 (per OI-74)	
	[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	
	Reports 3-PCV 1-179 does not close	
SRO	Directs RHR placed in Suppression Pool cooling per 3-OI-74	
	Reviews Tech Specs 3.5.1 and 3.4.3 and determined no active LCO exists	
	E. One ADS valve inoperable. — E.1 Restore ADS valve to OPERABLE status. — 14 days F. One ADS valve inoperable. AND Condition A entered. — F.1 Restore ADS valve to OPERABLE status. — 72 hours OR F.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status. — 72 hours (continued)	3-PCV-1-179 is **NOT** an ADS SRV. TS 3.5.1 is **NOT** applicable.

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	**T.S.3.4.3** 3.4.3 Safety/Relief Valves (S/RVs) LCO 3.4.3 The safety function of 12 S/RVs shall be OPERABLE. APPLICABILITY: MODES 1, 2, and 3.	Have 13 SRVs, only need 12. This would be tracked, but **NO** actions required.
	Enters 3-EOI-2 at 95°F suppression pool temperature (Priority is SP/T Leg)	
	Directs all available RHR placed in Suppression Pool Cooling per Appendix-17A, "RHR SYSTEM OPERATION SUPPRESSION POOL COOLING"	
BOP	Places all available Suppression Pool Cooling in service per **Appendix-17A**, "RHR SYSTEM OPERATION SUPPRESSION POOL COOLING"	
	1. IF.....Adequate core cooling is assured, OR Directed to cool the Suppression Pool irrespective of adequate core cooling, THEN.....BYPASS LPCI injection valve auto open signal as necessary by PLACING 3-HS-74-155A(B), LPCI SYS I(II) OUTBD INJ VLV BYPASS SEL in BYPASS.	
	2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:	
	a. VERIFY at least one RHRSW pump supplying each EECW header.	
	b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).	
	c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	d. IF ..... Directed by SRO, THEN.....PLACE 3-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD in MANUAL OVERRIDE.	
	e. IF .....LPCI INITIATION Signal exists, THEN.....MOMENTARILY PLACE 3-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT in SELECT.	
	f. IF ..... 3-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN..... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.	
	g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.	
	h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.	
	i. THROTTLE 3-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 3-FI-74-50(64), RHR SYS I(II) FLOW: • Between 7000 and 10000 gpm for one-pump operation. OR • At or below 13000 gpm for two-pump operation.	
	j. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.	
	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.	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Re-evaluates 3-EOI-1 step RC/L-5 and answers NO	
	From 3-EOI-1 step RC/L-8, Directs Appendix-7B, "Alternate RPV Injection System Lineup SLC System"	
ATC	Performs Appendix-7B, "Alternate RPV Injection System Lineup SLC System," by injecting with SLC from the Boron tank or dispatching AUO to align SLC suction to the 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, 3-FCV-3-19(12)(5)	
SRO	Enters C1, Directs ADS inhibited	
BOP	Inhibits ADS	**Critical Task #2**
	Reports DG starts	
	Dispatches AUO to monitor D/G's	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	When level decreases to TAF determines/verifies that sufficient injection sources are available to not enter steam cooling and enters C2. i.e. Will Emergency Depressurize somewhere between -162 and -180"	
	Directs RHR be realigned from Suppression Pool Cooling to injection	
BOP	Secures Suppression Pool Cooling and aligns RHR for injection	**Critical Task #4, if 2/3 core height override used in APP-17A**, "RHR System Operation in Suppression Pool Cooling Mode"
SRO	Directs opening 6 ADS valves before -180"	
BOP	Opens 6 ADS valves as directed	**Critical Task #3**
SRO	Directs BOP to inject with ECCS until level is above -122" then secure systems to not exceed to maintain + 51"; Directs restoration of Suppression Pool Cooling after RWL control is established	
BOP	Operates and secures ECCS injection as directed / reestablishes Suppression Pool Cooling as directed	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Per 3-EOI-1 step RC/L-4, Directs restoring level + 2" to + 51" with Core Spray, Appendix-6D, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM," / Appendix-6 E, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM II"	
BOP	Recover level with CS Loop I, **3-EOI Appendix-6D**, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM,"	
	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	

XII. Simulator Event Guide:

Event #6: Fuel Damage/MSL Leak / Stuck Open SRV / HPCI/RCIC/CRD Failure (continued)

Position	Expected Actions	Time/Comments
BOP	Restore level to + 2" to + 51" with CS Loop II, **3-EOI Appendix-6E**, "Injection Subsystems Lineup-Core Spray System II"	
	1. VERIFY OPEN the following valves: • 3-FCV-75-30, CORE SPRAY PUMP 3B SUPPR POOL SUCT VLV • 3-FCV-75-39, CORE SPRAY PUMP 3D SUPPR POOL SUCT VLV • 3-FCV-75-51, CORE SPRAY SYS II OUTBD INJECT VALVE	
	2. VERIFY CLOSED 3-FCV-75-50, CORE SPRAY SYS II TEST VALVE	
	3. VERIFY CS Pump 3B and/or 3D RUNNING	
	4. WHEN ... RPV pressure is below 450 psig, THEN ... THROTTLE 3-FCV-75-53, CORE SPRAY SYS II INBD INJECT VALVE, as necessary to control injection at or below 4000 gpm per pump	
	5. MONITOR Core Spray Pump NPSH using Attachment 1	
SRO	Classifies event as Site Area Emergency (1.1-S1)	
	1.1-S1 **NOTE** Reactor water level can NOT be maintained above -162 inches. (TAF) OPERATING CONDITION: ALL	

XIII. Crew Critical Tasks:

	TASK	SAT/UNSAT
1)	Isolates MSIVs prior to '2' 3-EOI-3 Area Radiations / Temperatures reaching Max Safe	
2)	Prevent Automatic Depressurization	
3)	Emergency Depressurizes when below TAF and before level drops to -180"	
4)	If SRO directs 2/3 core height override then the SRO will verify that the RHR system is fully realigned for injection when required (contingent – if directed)	

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

1. **MSIV's closed**
2. **Emergency Depressurization completed**
3. **RPV level being maintained + 2 to + 51 "or recovering**

XV. SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER: HLTS-3-09

10 Total Malfunctions Inserted: List (4-8)
1) RFP failure
2) RPIS failure
3) Condenser Waterbox Tube Leak
4) Inadvertent HPCI Start
5) Fuel Failure
6) MSL Leak with MSIV Auto Close Failure
7) Stuck Open SRV
8) HPCI failure
9) RCIC trip
10) CRD Pump 3A trip

5 Malfunctions that occur after EOI entry: List (1-4)
1) MSL Leak with MSIV Auto Close Failure
2) Stuck Open SRV
3) HPCI failure
4) RCIC trip
5) CRD Pump 3A trip

5 Abnormal Events: List (1-3)
1) RFP failure
2) Condenser Waterbox Tube Leak
3) Inadvertent HPCI Start
4) Fuel Failure
5) Stuck Open SRV

2 Major Transients: List (1-2)
1) Fuel Failure
2) MSL Leak

3 EOI's used: List (1-3)
1) EOI-1
2) EOI-2
3) EOI-3

2 EOI Contingencies used: List (0-3)
1) C1
2) C2

80 Run Time (minutes)

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

4 Crew Critical Tasks: (2-5)

YES Technical Specifications Exercised (Yes/No) – TRM, TS 3.5.1

SHIFT TURNOVER SHEET

Equipment Out of Service/LCO's:

FCV 23-34, RHR HX 3A RHRSW OUTLET VLV, repair underway, clearance has 3A RHR Hx inop for containment cooling. Out of service 6 hours, expected back in 12 hours. 30 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. 3B CRD pump is tagged for breaker maintenance.

Operations/Maintenance for the Shift:

Raise Unit 3 to 100% power at 10MWe/min. Support maintenance on RHRSW valve. Power was reduced for turbine valve testing which has been completed. Units 1 and 2 are at 100% power

Unusual Conditions/Problem Areas:

Thunderstorm warning in effect next 2 hours in Limestone County

Appendix A
(Page 2 of 2)

Name Of Radiation Protection Person Notified: Joe Neutron

Date: Today Time: Now

Step# 5[16] Procedure: 3-GOI-100-12 (if not this procedure) Rev: Current

RPHP Required by OI? ___(Y) X (N) RPHP Required For GOI? X (Y) ___(N)

RCI-17 Controls Necessary? X (Y) ____(N)

Radiation Protection Supervisor Signature for Release

Joe Neutron Date: Today Time: Now

Comments: For returning Rx Power to 100% after RFP recovery

Name Of Radiation Protection Person Notified: _____

Date: _____ Time: _____

Step#_____ Procedure: _____ (if not this procedure) Rev:_____

RPHP Required by OI? ____(Y) ____(N) RPHP Required For GOI? ____(Y) ____(N)

RCI-17 Controls Necessary? ____(Y) ____(N)

Radiation Protection Supervisor Signature for Release

_____ Date: _____ Time: _____

Comments: _____

FORWARD copies of completed Appendix pages to Radiation Protection Supervisor.

Appendix A
(Page 2 of 2)

Name Of Radiation Protection Person Notified: Joe Neutron

Date: Today Time: Now

Step# 5.7[1] Procedure: 3-OI-3 (if not this procedure) Rev: Current

RPHP Required by OI? ___(Y) X (N) RPHP Required For GOI? X (Y) ___(N)

RCI-17 Controls Necessary? X (Y) ____(N)

Radiation Protection Supervisor Signature for Release

Joe Neutron Date: Today Time: Now

Comments: For returning 3A RFP to service

Name Of Radiation Protection Person Notified: _____

Date: _____ Time: _____

Step#_____ Procedure: _____ (if not this procedure) Rev:_____

RPHP Required by OI? ___(Y) ____(N) RPHP Required For GOI? ____(Y) ___(N)

RCI-17 Controls Necessary? ___(Y) ____(N)

Radiation Protection Supervisor Signature for Release

_____ Date: _____ Time: _____

Comments: _____

FORWARD copies of completed Appendix pages to Radiation Protection Supervisor.

Table 3.4.1-1
Coolant Chemistry Limits[1]

CHEMISTRY PARAMETERS	COLUMN A APPLICABLE CONDITION Prior To Startup And At Steaming Rates < 100,000 lb/hr	COLUMN B APPLICABLE CONDITION Steaming Rates > 100,000 lb/hr	COLUMN C APPLICABLE CONDITION Reactor Not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition	COLUMN D[2] APPLICABLE CONDITION Noble Metal Chemical Application and Subsequent Reactor Coolant Cleanup	COLUMN E[3] APPLICABLE CONDITION Operation of HWC Following Noble Metal Chemical Application
CHLORIDE (ppm)	≤ 0.1	≤ 0.2	≤ 0.5	≤ 0.1	≤ 0.2
CONDUCTIVITY (µmho/cm at 25°C)	≤ 2.0	≤ 1.0	≤ 10.0	≤ 20.0	≤ 2.0
pH	5.6-8.6	5.6-8.6	5.3-8.6	4.3-9.9	5.6-8.8

Facility: **Browns Ferry NPP** Scenario No.: **3-12** Op-Test No.: **HLT 0801**

Examiners:	

Operators:		
	SRO:	SROU-1
	ATC:	RO-2
	BOP:	RO-1

Initial Conditions: Unit 3 is at 100% power. The 3B Diesel Generator is tagged for annual maintenance and the Main Generator Voltage Regulator is in MANUAL following a monthly Electrical Maintenance PM. Thunderstorm warnings in area.

Turnover: Units 1 and 2 are at 100%. On Unit 3, return the Main Generator Voltage Regulator to AUTO. Lower power to 92% with Recirc to perform 3-SR-3.1.3.3, Control Rod Exercise Test for Partially Withdrawn Control Rods. Support maintenance on 3B Diesel Generator.

Event No.	Malf. No.	Event Type*	Event Description
1	------	N-BOP N-SRO	Return Generator Voltage Regulator to Auto
2	------	R-ATC N-SRO	Lower power
3	------	N-ATC N-SRO	Perform CRD Exercise per 3-SR-3.1.3.3
4	nm16a	I-ATC TS-SRO	APRM Hi/INOP trip - bypass APRM 1
5	sw03J	C-BOP C-SRO TS-SRO	Trip of C3 EECW - ARP response and manual start of A3 EECW pump that fails to Auto start
6	rc02	C-BOP TS-SRO	Secure RCIC after inadvertent start
7	eg07 25	C-ALL	Make-up H_2 when leak noticed, power reduction / scram / turbine trip
8	ed01	M-ALL	Loss of Off-Site Power / HPCI aux oil pump fails to operate / D/G '3C' fails to automatically tie to the shutdown board
9	rc09 100	M-ALL	Unisolable RCIC steam leak

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

ANTICIPATED EAL: 3.1-S – SITE AREA

Facility: Browns Ferry NPP Scenario No.: 3-12 (2) Op-Test No.: HLT 0801

Examiners:	

Operators:		
	SRO:	SROI-1
	ATC:	RO-4
	BOP:	RO-3

Facility: Browns Ferry NPP Scenario No.: 3-12 (3) Op-Test No.: HLT 0801

Examiners:	

Operators:		
	SRO:	SROI-2
	ATC:	RO-6
	BOP:	RO-5

The unit is at 100% with '3B' Diesel Generator out of service for annual maintenance. Currently in the first day of a 7 day LCO for the Diesel Generator.

The Crew will perform actions necessary to return the Generator Voltage Regulator to Automatic per 3-OI-47.

The Crew will lower Reactor Power to 92% per 3-GOI-100-12 to perform 3-SR-3.1.3.3 Control Rod Exercise Test for Partially Withdrawn Control Rods.

APRM #1 receives a critical fault due to an input/output card failure, which requires it to be bypassed.

C3 EECW pump trips and will not restart requiring starting of the A3 EECW pump, which fails to Auto start.

RCIC receives an inadvertent auto start signal which requires the crew to secure RCIC.

A Hydrogen leak on the generator occurs which will result in decision to trip the turbine. When the turbine is tripped, breaker failures occur and result in loss of offsite power.

HPCI aux oil pump fails to operate, but can be restored if crew requests maintenance to investigate (after RCIC is placed in service).

When RCIC is used a steam leak occurs and RCIC fails to auto isolate and cannot be manually isolated. The RCIC steam leak will require an emergency depressurization be performed due to High area temperatures/rad levels.

Diesel Generator '3C' starts, but fails to automatically tie to the shutdown board, but may be manually tied on.

SIMULATOR EVALUATION GUIDE

TITLE: APRM FAILURE, TRIP OF C3 EECW PUMP, INADVERTANT START OF RCIC, GENERATOR HYDROGEN LEAK, LOSS OF OFFSITE POWER, HPCI AUX OIL PUMP FAILURE, RCIC STEAM LINE BREAK WITHOUT ISOLATION

REVISION: 0

DATE: Jan. 11, 2009

PROGRAM: BFN Operator Training – Hot License

An RCP is required to lower power 100% - 92% - provide at turnover

Marked up copy of 3-SR-3.1.3.3, Control Rod Exercise Test for Partially Withdrawn Control Rods required (marked up thru step 7.0 – include Attachments 2 and 3 marked up)

PREPARED: _____ \ _____
(Operations Instructor) Date

REVIEWED: _____ \ _____
(LOR Lead Instructor or Designee) Date

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

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

VALIDATED: _____ \ _____
(Operations SRO) (Required for Exam Scenarios) Date

LOGGED-IN: _____ \ _____
(Librarian) Date

TASK LIST UPDATED _____ \ _____
Date

Nuclear Training

Revision/Usage Log

Revision Number	Description of Changes	Date	Pages Affected	Revised
0	Initial	01/11/09	All	csf

I. Program: BFN Operator Training

II. Course: Examination Guide

III. Title: APRM FAILURE, TRIP OF C3 EECW PUMP, INADVERTANT START OF RCIC, GENERATOR HYDROGEN LEAK, LOSS OF OFFSITE POWER, HPCI AUX OIL PUMP FAILURE, RCIC STEAM LINE BREAK WITHOUT ISOLATION

IV. Length of Scenario – 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, annunciator, abnormal, and emergency procedures.

B. Enabling Objectives:

1. The operating crew will perform actions necessary to return the Generator Voltage Regulator to Automatic per 3-Oi-47.

2. The operating crew will lower Reactor Power per 3-GOI-100-12.

3. The operating crew will perform 3-SR-3.1.3.3 Control Rod Exercise Test for Partially Withdrawn Control Rods.

4. The operating crew will recognize and respond to an APRM failure per ARPs and OIs and Technical Specifications.

5. The operating crew will recognize and respond to a trip of C3 EECW pump

6. The operating crew will recognize and respond to an inadvertent start of RCIC.

7. The operating crew will recognize and respond to a loss of generator hydrogen per ARPs.

8. The operating crew will recognize and respond to a loss of offsite power with a diesel out of service, per 0-AOI-57-1A.

9. The operating crew will recognize and respond to a RCIC steam line break without isolation; in accordance with the EOIs and AOIs.

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 Sheets

C. Stopwatch

D. Hold Order / Caution Order tags

E. Annunciator window covers

F. Steam tables

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat hlts-3-12

	MF/RF/OR#	Description
1)	imf dg06b	DG '3B' fails to start
2)	mrf dg01b open	DG '3B' logic bkr open
3)	ior zdi3hs35234a[3] close	Fails Bkr 234 closed
4)	ior zlo3hs35234a[4] on	Fails Red light on
5)	ior zlo3hs35234a[3] on	Fails Red light on
6)	ior zlo3hs35234a[1] off	Fails Green light off
7)	ior zdihs7553a null	Removes amber light
8)	imf dg03c	D/G '3C' Tie Bkr Auto failure
9)	imf sw07a	Auto start failure of A3 EECW pump

2. File: bat hlts-3-12-1

	MF/RF/OR#	Description
1)	ior an:ov:xa553b[27] alarm_off	Overrides alarm
2)	imf eg07 25 35:00	Generator H_2 leak
3)	imf rc02	RCIC auto start

3. File: bat hlts-3-12-2

MF/RF/OR#		Description
1)	imf rc09 (none 10:00) 100 30:00	100% steam leak in RCIC Room
2)	imf rc10	RCIC failure to Auto Isolate
3)	imf ed01	Loss of offsite power
4)	bat hlthpaop	Fails HPCI aux oil pump & green light
5)	ior zdihs712a open	FCV-71-2 fails as is
6)	ior zdihs713a open	FCV-71-3 fails as is
7)	mmf eg07 .01 :10	Reduces generator H_2 leak
8)	ior zaoti7569a 0	Overrides indicator downscale

4. File: bat hlts-3-12-3

MF/RF/OR#		Description
1)	ior zaoti7569b 165 5:00	Overrides CS room temp ind. To 165°F
2)	ior zaori9026a 3 4:00	Overrides CS I/RCIC rm rad to max safe
3)	ior zaori9027a 3 4:45	Overrides CS II rm rad to max safe

5. File: bat hlteecw

MF/RF/OR#		Description
1)	ior zdihs6753b	Allows opening EECW from 25-32
2)	ior zdihs6751b	Allows opening EECW from 25-32
3)	ior zdihs6750b	Allows opening EECW from 25-32
4)	bat hlteecw-1	Execute bat file

6. File: bat hlteecw-1

MF/RF/OR#		Description
1)	dor zdihs6753b	Allows valves to reclose on low pressure
2)	dor zdihs6751b	Allows valves to reclose on low pressure
3)	dor zdihs6750b	Allows valves to reclose on low pressure
4)	bat hltrpsreset	Execute bat file

7. File: bat hltrpsreset

MF/RF/OR#		Description
1)	mrf rp01 reset	Reset RPS A
2)	mrf rp02 reset	Reset RPS B
3)	bat hltca	Execute bat file

8. File: bat hltca

MF/RF/OR#		Description
1)	mrf ia05a reset	Reset A air compressor
2)	mrf ia05d reset	Reset D air compressor
3)	mrf ia09 reset	Reset G air compressor

9. File: bat hlthpaop

MF/RF/OR#		Description
1)	imf hp05	fails HPCI aux oil pump
2)	ior zlohs7347a[1] off	fails HPCI aux oil pump green light

10. File: bat hlthpaop-1

MF/RF/OR#		Description
1)	dmf hp05	Restores HPCI aux oil pump
2)	dor zlohs7347a[1]	

IX. Console Operators Instructions

HLTS 3-12

ELAP TIME		DESCRIPTION/ACTION
Simulator Setup	manual	100% Power MOC reset 238 (david) ****Lower power slightly to get within 100% limits if necessary**
Simulator Setup		See File summary (bat hlts-3-12)
Simulator Setup	manual	Verify Voltage Regulator in Manual
Simulator Setup	manual	Tag 3B D/G

After power reduction and one rod has been exercised		APRM 1 Critical Fault (imf nm16a)

ROLE PLAY: **If Operator tries to check pnl 9-14, Floor Examiner will provide what Operator should see – APRM Blue Bypass Lights are illuminated on pnl 3-9-14 voters for APRM 1**

2 min After Tech Specs addressed for the APRM		Trip of C3 EECW pump (imf sw03J)

ROLE PLAY: **If dispatched to check C3 EECW pump breaker, report breaker tripped on overload and breaker smells burnt but no visible smoke or flames**

ROLE PLAY: **If called to investigate failure of A3 EECW Pump to auto-start, wait 2 minutes and report that pump will have to be secured to continue troubleshooting**

ROLE PLAY: **If dispatched to Intake to visually inspect EECW pumps, wait 3 minutes and report everything looks the same as when inspected on rounds earlier except that A3 is running instead of C3**

4 minutes after A3 EECW started and TS addressed		Inadvertent start of RCIC & Starts the H_2 leak on generator (bat hlts-3-12-1)

ROLE PLAY: **If sent to Aux Inst Rm, report a burning smell in pnl 9-32 – contacted EM to troubleshoot**

ROLE PLAY: **After 5 minutes (as EM) report a short in panel – repair time unknown**

ROLE PLAY: **If sent to pnl 25-31, report relays 13AK2, 13AK3, 13AK4, and 13AK37 energized**

ROLE PLAY: **If dispatched as AUO to the local panel, wait 2 minutes and report that the "Machine Gas Pressure" alarm is illuminated.**

ROLE PLAY: **30 seconds AFTER Hydrogen addition is initiated, then report as the AUO that while you were in the area, you heard a noise and went to investigate. You found a leak on one of the generator manways that cannot be isolated.**

If requested to reset local H_2 panel		Resets local panel alarm (mrf an01b reset)

If necessary, modify leak rate to slow leakage to allow crew time to add Hydrogen.		Make leak smaller (mmf eg07 15 35:00)

If Crew opens both H2 makeup valves to try to raise pressure		Make leak bigger (mmf eg07 50 3:00)

Immediately after turbine is tripped		Reduces hydrogen leak & LOSP & others/see summary (bat hlts-3-12-2)

ROLE PLAY: **If directed to check on status of offsite power, report that 500 kv system was lost due to failure of 234 to trip and problems with 5264 and 5268 trip circuits. Will continue to work to restore power. Not sure why 161kv system was lost**

ROLE PLAY: **If requested to trip 234 breaker locally, report it will not trip**

ROLE PLAY: **If requested to energize '3B' KV S/D Bd from U2, report as U2 that they cannot support due to their loading requirement.**

If requested to reset EECW valves, reset RPS, & Control Air, wait 5 minutes		Resets EECW, RPS, & CA (bat hlteecw)

ROLE PLAY: **If sent to investigate HPCI aux oil pump, wait 4 minutes and report control power fuses blown in 250v RMOV bd 3A compartment 4A.**

After maintenance requested and RCIC placed in service		Fix HPCI aux oil pump (bat hlthpaop-1)

ROLE PLAY: **(If requested, after entering above bat file) Call and report HPCI aux oil pump control power fuses replaced.**

If requested to close 71-2 & 3 from breaker		Xfer switch Emergency (mrf rc05k emer)
		Xfer switch Emergency (mrf rc05s emer)

ROLE PLAY: **Report Valves will not close from Bkr MCC**

If requested to return Xfer SW to norm		Xfer switch Normal (mrf rc05k norm)
		Xfer switch Normal (mrf rc05s norm)

ROLE PLAY: **Report xfer switches have been returned to Normal**

When requested by examiner		Overrides 2nd indicator to 165°F and ramps RM-90-26 and 27 to max safe Rad (bat hlts-3-12-3)

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

1) Emergency Depressurization has been initiated

2) Water level restored to +2" to +51" (or recovering)

X. Scenario Summary:

The unit is at 100% with '3B' Diesel Generator out of service for annual maintenance. Currently in the first day of a 7 day LCO for the Diesel Generator.

The Crew will perform actions necessary to return the Generator Voltage Regulator to Automatic per 3-OI-47.

The Crew will lower Reactor Power to 92% per 3-GOI-100-12 to perform 3-SR-3.1.3.3 Control Rod Exercise Test for Partially Withdrawn Control Rods.

APRM #1 receives a critical fault due to an input/output card failure, which requires it to be bypassed.

C3 EECW pump trips and will not restart requiring starting of the A3 EECW pump, which fails to Auto start.

RCIC receives an inadvertent auto start signal which requires the crew to secure RCIC.

A Hydrogen leak on the generator occurs which will result in decision to trip the turbine. When the turbine is tripped, breaker failures occur and result in loss of offsite power.

HPCI aux oil pump fails to operate, but can be restored if crew requests maintenance to investigate (after RCIC is placed in service).

When RCIC is used a steam leak occurs and RCIC fails to auto isolate and cannot be manually isolated. The RCIC steam leak will require an emergency depressurization be performed due to High area temperatures/rad levels.

Diesel Generator '3C' starts, but fails to automatically tie to the shutdown board, but may be manually tied on.

XI. 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 US with a copy of the shift turnover sheet for the scenario.

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

D. Ensure recorders are inking are 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. Emergency Depressurization has been initiated

2. Water level restored to +2" to +51" (or recovering)

XII. Simulator Event Guide:

Event #1: Return 90P to Automatic

Position	Expected Actions	Time/Comments
SRO	Directs returning voltage regulator to automatic IAW 3-OI-47, section 8.14.	
BOP	Transfers 90P to automatic IAW **3-OI-47, section 8.14.**	
	[1] VERIFY VOLTAGE REGULATOR MAN/AUTO SEL, 3-HS-57-27, is in MAN.	
	[2] PLACE GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 3-HS-57-26, to RAISE UNTIL the upper limit is reached (red light illuminated).	
	[3] PLACE GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 3-HS-57-26, to LOWER UNTIL the lower limit is reached (green light illuminated).	
	[4] ADJUST GENERATOR FIELD VOLTAGE AUTO ADJUST (90P), 3-HS-57-26, UNTIL GEN TRANSFER VOLTS, 3-EI-57-41, indicates zero.	
	[5] PLACE VOLTAGE REGULATOR MAN/AUTO SEL, 3-HS-57-27, in AUTO.	
	[6] VERIFY GEN VOLT REGULATOR TRIP TO MAN, 3-EA-57-132 (3-XA-55-8A, window 3) alarms.	
	[7] RESET GEN VOLT REGULATOR TRIP TO MAN, 3-EA-57-132 (3-XA-55-8A, window 3).	
	Notify SRO Main Generator Voltage Regulator returned to Automatic.	

XII. Simulator Event Guide:

Event #2: Lower power to 92%

Position	Expected Actions	Time/Comments
SRO	Notifies ODS of power drop	
	Direct lowering U3 Power to 92% using Recirc Flow per 3-GOI-100-12 step 5.0[6] and 3-OI-68 step 6.2	
Crew	Notifies Chemistry and RADCON of power drop	
ATC	[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)(FAST) 3-HS-96-17A(17B)(17C), push-buttons, to achieve balanced jet pump flows.	
	AND/OR	
	ADJUST Recirc Pump speed 3B using, RAISE SLOW (MEDIUM), 3-HS-96- 16A(16B) / LOWER SLOW(MEDIUM)(FAST) 3-HS-96-18A(18B)(18C),push-buttons, to achieve balanced jet pump flows.	
	AND/OR	
	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: RAISE SLOW, 3-HS-96-31 RAISE MEDIUM, 3-HS-96-32 LOWER SLOW, 3-HS-96-33 LOWER MEDIUM, 3-HS-96-34 LOWER FAST, 3-HS-96-35	
	If speeds are between 1200 and 1300 rpm then speeds should be mismatched by 60 rpm	
BOP	Provides peer check for Recirc adjustment	
	Continue to monitor BOP (transfer volts, condensate flow, etc)	

XII. Simulator Event Guide:

Event #3: Perform 3-SR-3.1.3.3

Position	Expected Actions	Time/Comments
SRO	Direct performance of 3-SR-3.1.3.3	
ATC	Performs **3-SR-3.1.3.3**	
	7.0 PROCEDURE STEPS [1] VERIFY that the following initial conditions are satisfied: [1.1] Precautions and limitations in Section 3.0 have been reviewed.	
	[1.2] Prerequisites listed in Section 4.0 are satisfied.	
	[1.3] INITIATE load reduction of _____% as recommended by Reactor Engineering. Shift Manager (SM) signoff may be N/A whenever no known fuel failure exists and as specified in Reactivity Control Plan. [PER 03-001862-000]	
	[2] OBTAIN permission from Unit Supervisor (US) to perform this surveillance:	
	[3] RECORD start date and time, reason for test, plant conditions, and any pre-test remarks on Attachment 1, Surveillance Procedure Review Form.	
	[4] OBTAIN process computer printout of initial control rod positions and RECORD on the printout the Panel 3-9-5 indication for any rod which has a substituted or unknown position listed.	

XII. Simulator Event Guide:

Event #3: Perform 3-SR-3.1.3.3

Position	Expected Actions	Time/Comments
ATC	[5] IF there are no partially withdrawn control rods (See Attachments 2 and 3), THEN N/A Steps 7.0[6] through 7.0[20]; otherwise, N/A this step whenever there exists one or more partially withdrawn control rods.	
	[6] START CRD Exercise Monitor function on ICS; otherwise, N/A this step anytime ICS or RWM is inoperable (This function is controlled under the OPERATIONS SUPPORT menu).	
	[7] VERIFY that CRD POWER 3-HS-85-46 is ON prior to control rod movement.	
	[8] VERIFY CRD system flow is at 55-60 gpm prior to performing rod exercise.	
	[9] VERIFY Drive Water dP is 250-270 psid prior to performing rod exercise.	
	[10] EXERCISE an operable, partially withdrawn control rod as follows: [10.1] SELECT desired control rod by DEPRESSING appropriate CRD ROD SELECT pushbutton 3-XS-85-40. [10.2] OBSERVE the following for selected control rod: • VERIFY CRD ROD SELECT pushbutton is brightly ILLUMINATED • VERIFY white light on the Full Core Display ILLUMINATED • VERIFY Rod Out Permit light is ILLUMINATED	

XII. Simulator Event Guide:

Event #3: Perform 3-SR-3.1.3.3

Position	Expected Actions	Time/Comments
ATC	[11] INSERT control rod one notch by performing the following: [11.1] PLACE CRD CONTROL SWITCH 3-HS-85-48 in ROD IN and RELEASE [11.2] OBSERVE control rod settles into the desired position and ROD SETTLE light extinguishes	
	[12] WITHDRAW selected control rod one notch by performing the following: [12.1] PLACE and HOLD CRD CONTROL SWITCH 3-HS-85-48 in ROD OUT NOTCH [12.2] OBSERVE control rod settles into the desired position and ROD SETTLE light extinguishes	
	Exercises one rod	

XII. Simulator Event Guide:

Event #4: APRM #1 FAILURE

Position	Expected Actions	Time/Comments
ATC	Announces alarm "APRM Hi/Inop/Trip" and "Rod withdrawal block".	
	Consults ARP.	
	Determines that APRM 1 has critical self test fault.	

NOTE: Floor Examiner will provide what Operator should see at pnl 3-9-14 – APRM Blue Bypass Lights are illuminated on pnl 3-9-14 voters for APRM 1

SRO	Directs bypassing APRM 1 and consults Tech. Specs section 3.3.1.1-1 and TRM table 3.3.4-1 and determines that no further actions required. Information ONLY TS required. For TS 3.3.1.1 Functions 2b, 2c, 2d, 2e. For TRM 3.3.4 Functions 1a, 1c, 1d	**Information ONLY TS**
ATC	Bypasses APRM 1 per OI-92B, section 6.1	
	[1] REVIEW all precautions and limitations. REFER TO Section 3.0.	
	[2] PLACE APRM BYPASS, 3-HS-92-7B/S3, to desired channel to be bypassed.	
	[3] CHECK BLUE BYPASSED lights illuminated on Panel 3-9-14 Voters.	
	[4] VERIFY white bypass light on Panel 3-9-5 is illuminated.	
	Resets alarms.	

XII. Simulator Event Guide:

Event #5: C3 EECW PUMP TRIP

Position	Expected Actions	Time/Comments
BOP	Announces Alarms; 9-8C win 33, "Motor Tripout," 9-20A win 35, "EECW South Hdr DG Section Press Low," and 9-23B win 26, "4KV SD Bd Bkr Motor OL Or Trip."	
	Reports C3 EECW pump tripped.	
	Reports A3 EECW pump failed to Auto start.	
SRO	Directs entry into ARP for 9-20A win 35, "EECW South Hdr DG Section Press Low,"	
	Directs A3 EECW pump manually started.	
BOP	Responds per ARP 3-9-20A win 35.	
	A. CHECK indications: 1. Header pressure 0-PI-67-24/3 on Unit 3 Panel 9-20 2. EECW S HDR PUMP B FLOW, 0-FI-67-6A/3 on Panel 3-9-20 3. EECW S HDR PUMP D FLOW, 0-FI-67-12A/3 on Panel 3-9-20	
	B. CHECK Panel 3-9-3 for status of north header pump(s) breaker lights and pump motor amps normal	
	C. NOTIFY Unit Supervisor, U1 and U2	
	D. START standby pump for affected header. REFER TO 0-OI-67	
	Clears disagreement on C3 EECW pump	

XII. Simulator Event Guide:

Event #5: C3 EECW PUMP TRIP

Position	Expected Actions	Time/Comments
BOP	CHECK Panel 3-9-3 for status of north header pump(s) breaker lights and pump motor amps normal.	
	START A3 pump using RHRSW PUMP A3(C3) EECW NORTH HDR, 0-HS-23-**85A/3**(91A/3) on Unit 3, and verifies all alarms reset	
	E. DISPATCH Personnel to check affected pump room and header for abnormal conditions	
	F. IF low pressure is due to line rupture, THEN N/A	
	DISPATCH Personnel to check affected pump room and header for abnormal conditions.	
	Dispatches personnel to check charging spring on A3 EECW pump after start, VERIFY Pump upper and lower motor bearing oil level is in the normal operating range, AND NOTIFY Chemistry of running RHRSW (EECW) pump(s).	
SRO	Refers to Tech Specs 3.7.2 and determines no action is required (No Required pumps INOP – 3 required), Appendix R Requirements – Close / Trip capability from Main Control Room. Restore in 7 days or post fire watches.	
	Contact Maintenance Shift Manager to report problem.	

XII. Simulator Event Guide:

Event #6: INADVERTANT AUTO START OF RCIC

Position	Expected Actions	Time/Comments
CREW	Recognizes RCIC auto started and injected to RPV	
SRO	Determines that RPV water levels are normal and directs RCIC secured	
BOP	Secures RCIC by tripping RCIC and refers to 3-OI-71	
	[1] VERIFY the following initial conditions are satisfied: A. RCIC System is in operation or RCIC Turbine was tripped. REFER TO Section 6.0 or 8.4. B. All RPV low-low water level RCIC initiation signals have cleared N/A	
	[2] REVIEW Precautions and Limitations in Section 3.0	
	[3] DEPRESS RCIC AUTO-INIT RESET pushbutton, 3-XS-71-52 and CHECK RCIC AUTO-INIT amber light, 3-IL-71-52 extinguished N/A	
	[4] DEPRESS RCIC TURBINE TRIP pushbutton, 3-HS-71-9A, and VERIFY RCIC TURB TRIP/THROT VALVE, 3-FCV-71-9, closes	
	[5] CLOSE RCIC TURBINE STEAM SUPPLY VLV, 3-FCV-71-8 N/A	

XII. Simulator Event Guide:

Event #6: INADVERTANT AUTO START OF RCIC (continued)

Position	Expected Actions	Time/Comments
BOP	[6] CHECK RCIC TURBINE SPEED, 3-SI-71-42A, is zero rpm	
	[7] VERIFY CLOSED RCIC PUMP MIN FLOW VALVE, 3-FCV-71-34	
	[8] NOTIFY Radiation Protection that RCIC System is shutdown. RECORD time Radiation Protection notified in the NOMS Narrative Log. [BFN PER 126211]	
	The rest of procedure is N/A since initiation signal sealed in – cannot return to standby readiness	
SRO	Checks Tech. Specs. And determines that 3.5.3. condition A applies	
	A1- Verify HPCI operable and	
	A2- Restore to operable within 14 days	
	App-R, 7 days on 71-9 (must remain open)	
	Calls Maintenance Manager for repairs on RCIC	
	Announces to Crew that RCIC is INOP but available for injection, if necessary	

XII. Simulator Event Guide:

Event #7: Hydrogen Leak

Position	Expected Actions	Time/Comments
BOP	Announces alarm 9-7A window 29, "Gen Hydrogen System Abnormal"	
	Consults ARP 3-9-7A Window 29	
	A. CHECK H2 pressure on 3-PI-35-17A on Panel 3-9-8	
	B. VERIFY alarm by dispatching personnel to check the H2 Control Cabinet (Elevation 565') and inform the Unit Operator of alarm status	
	C. REFER TO 3-OI-35 as required to correct abnormal condition	
	Reports H_2 Pressure lowering	
	Checks H_2 purity on 3-9-8 and reports no change	
	Checks Seal oil pressure on 3-9-8 and reports pressure 8-10 psig above H_2 pressure and lowering	
	Checks Generator H_2 pressure versus Load Curve in 3-OI-35 or 3-OI-47	
SRO	Directs personnel to look for H_2 Leaks and directs BOP to add H_2 per 3-OI-35	

XII. Simulator Event Guide:

Event #7: Hydrogen Leak

NOTE: **Floor Examiner will provide cue that "Beginning of Hydrogen Fill" Data has been recorded in the spreadsheet.**

Position	Expected Actions	Time/Comments
BOP	Monitors H_2 pressure and generator temperatures	
	Adds H_2 per **3-OI-35**	
	[1] REVIEW Precautions and Limitations in Section 3.0	
	[2] ENTER the Beginning of Generator Hydrogen Fill data in the hydrogen usage spreadsheet	
	[3] IF it is desired to add hydrogen using PCV-35-9 bypass valve, THEN (otherwise N/A): N/A	
	[4] OPEN the desired H2 FLOW CONTROL VALVE(s). • H2 FLOW CONTROL VALVE A, 3-FCV-35-4A • H2 FLOW CONTROL VALVE B, 3-FCV-35-4B	
	[5] IF pressure in generator does not begin to rise, as indicated on 3-PI-035-0015 or 3-PI-035-17A, THEN (otherwise N/A) • VERIFY INSTALLED spool piece downstream of SEC CONT STA H2 TO GEN SHUTOFF valve, 3-SHV-35-547 • VERIFY OPEN SEC CONT STA H2 TO GEN SHUTOFF valve, 3-SHV-35-547 N/A	
	Evacuates Turbine floor when notified of H_2 leak on generator	
SRO	Directs load reduction via Recirc pumps to stay within capability curve per the RCP	

XII. Simulator Event Guide:

Event #7: Hydrogen Leak

Position	Expected Actions	Time/Comments
ATC	[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)(FAST) 3-HS-96-17A(17B)(17C), push-buttons, to achieve balanced jet pump flows. AND/OR ADJUST Recirc Pump speed 3B using, RAISE SLOW (MEDIUM), 3-HS-96-16A(16B)/LOWER SLOW(MEDIUM)(FAST) 3-HS-96-18A(18B)(18C), push-buttons, to achieve balanced jet pump flows.	
	[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: RAISE SLOW, 3-HS-96-31 RAISE MEDIUM, 3-HS-96-32 LOWER SLOW, 3-HS-96-33 LOWER MEDIUM, 3-HS-96-34 LOWER FAST, 3-HS-96-35	
	Inserts rods per the RCP (If needed to continue load drop)	
SRO	Directs Rx Scram and Turbine trip	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER

Position	Expected Actions	Time/Comments
ATC	Manually Scrams Rx	
	Provides Scram report to SRO Power Level Pressure	
Crew	Reports MSIV closure	
	Verify PCIS isolations (1,2,3,6, & 8)	
BOP	Trips Main Turbine	
	Reports failure of bkr 234 to trip	
	Identifies loss of offsite power	
SRO	Enters 3-EOI-1 do to Reactor Level < (+) 2 inches	
	Directs Reactor Pressure be maintained < 1073 psig using MSRV per App-11A, "ALTERNATE RPV PRESSURE CONTROL SYSTEMS MSRVs"	
	Directs level be maintained 2"-51" using HPCI App-5D, "INJECTION SYSTEM LINEUP HPCI," / RCIC App-5C, "INJECTION SYSTEM LINEUP RCIC"	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	Maintains Reactor pressure per Appendix-11A, ""ALTERNATE RPV PRESSURE CONTROL SYSTEMS MSRVs"	
	1. IF ..... Drywell Control Air is NOT available, THEN ... EXECUTE EOI Appendix 8G, "CROSSTIE CAD TO DRYWELL CONTROL AIR," CONCURRENTLY with this procedure	
	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. 3-PCV-1-179 MN STM LINE A RELIEF VALVE. b. 3-PCV-1-180 MN STM LINE D RELIEF VALVE. c. 3-PCV-1-4 MN STM LINE A RELIEF VALVE. d. 3-PCV-1-31 MN STM LINE C RELIEF VALVE. e. 3-PCV-1-23 MN STM LINE B RELIEF VALVE. f. 3-PCV-1-42 MN STM LINE D RELIEF VALVE. g. 3-PCV-1-30 MN STM LINE C RELIEF VALVE. h. 3-PCV-1-19 MN STM LINE B RELIEF VALVE. i. 3-PCV-1-5 MN STM LINE A RELIEF VALVE. j. 3-PCV-1-41 MN STM LINE D RELIEF VALVE. k. 3-PCV-1-22 MN STM LINE B RELIEF VALVE. l. 3-PCV-1-18 MN STM LINE B RELIEF VALVE. m. 3-PCV-1-34 MN STM LINE C RELIE VALVE.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	Starts RCIC per Appendix-5C, "INJECTION SYSTEM LINEUP RCIC"	
	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 , "Bypassing RCIC Low Reactor Pressure Isolation Interlocks," 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, "Bypassing RCIC High Temperature Isolation," concurrently with this procedure b. RESET auto isolation logic using RCIC AUTO-ISOL LOGIC A(B) RESET 3-XS-71-51A(B) pushbuttons	
	3. VERIFY RESET and OPEN 3-FCV-71-9, RCIC TURB TRIP/THROT VALVE RESET	
	4. VERIFY 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller in AUTO with setpoint at 600 gpm	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	5. OPEN the following valves: • 3-FCV-71-39, RCIC PUMP INJECTION VALVE • 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE • 3-FCV-71-25, RCIC LUBE OIL COOLING WTR VLV	
	6. PLACE 3-HS-71-31A, RCIC VACUUM PUMP, handswitch in START	
	7. OPEN 3-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC Turbine	
	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	
	9. IF ..... BOTH of the following exist: • RCIC Initiation signal is NOT present, AND • RCIC flow is below 60 gpm, THEN ... VERIFY OPEN 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	10. ADJUST 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller as necessary to control injection	
	11. IF ..... It is desired to align RCIC suction to the Suppression Pool, THEN ... PERFORM the following: a. OPEN 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE b. OPEN 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE c. WHEN ... 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE, and 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE, are fully open, THEN ... VERIFY CLOSED 3-FCV-71-19, RCIC CST SUCTION VALVE NOTE: Step 12.b must be performed promptly following Step 12.a to avoid loss of suction path	
	12. IF ..... It is desired to align RCIC suction to the Condensate Storage Tank, THEN ... PERFORM the following: a. CLOSE 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE b. WHEN ... 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE starts traveling closed, THEN ... OPEN 3-FCV-71-19, RCIC CST SUCTION VALVE c. CLOSE 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	If HPCI used (Appendix-5D), "INJECTION SYSTEM LINEUP HPCI"	
	VERIFY 3-IL-73-18B, HPCI TURBINE TRIP RX LVL HIGH, amber light extinguished.	
	VERIFY at least one SGTS train in operation	
	VERIFY 3-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller in AUTO and set for 5,000 gpm. NOTE: HPCI Auxiliary Oil Pump will NOT start UNTIL 3-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, starts to open.	
	PLACE 3-HS-73-47A, HPCI AUXILIARY OIL PUMP, handswitch in START.	
	Reports failure of HPCI aux oil pump.	
	Request maintenance on HPCI aux oil pump.	
ATC	Reports that '3C' Diesel failed to tie to S/D Bd.	
SRO	Directs '3C' Diesel be manually tied to S/D Bd.	
	Direct entry into 3-AOI-100-1, "Reactor Scram."	
	Directs execution of 0-AOI-57-1A, "Loss of Offsite Power (161 and 500 KV)/Station Blackout"	

NOTE: **If HPCI restored, Procedure continued on page 47 of Simulator Event Guide.**

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
ATC	As time permits, performs actions per 3-AOI-100-1.	
	Executes **0-AOI-57-1A.**	
	4.1 Immediate Actions	
	[1] VERIFY Diesel Generators have started and tied to respective 4kV Shutdown Boards, THEN DISPATCH personnel to Diesel Generators	
	Closes breaker for 3C D/G tie to 4KV S/D bd	
	[2] VERIFY two EECW Pumps (not using the same EECW strainer) are in service supplying Diesel Generators. [2.1] IF two EECW Pumps (not using the same EECW strainer) are not in service supplying Diesel Generators, THEN PERFORM Attachment 9 (Cooling water is required to be established within 8 minutes) (Otherwise N/A).	
	[3] PERFORM the following to ensure at least one train of Diesel Generator Room Fans are energized: • VERIFY 480V DSL Aux Board A or B energized. • VERIFY 480V DSL Aux Board 3EA or 3EB energized.	
	Clears electrical feeder disagreements	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

NOTE: Priorities will be to restore EECW, Control Air, and RPS. This will be directed to Outside Unit Supervisor by phone.

Position	Expected Actions	Time/Comments
ATC	4.2 Subsequent Actions	
	[1] IF ANY EOI entry condition is met, THEN REFER TO the appropriate EOI(s). (Otherwise N/A)	
	[2] VERIFY automatic actions and PERFORM any that failed to occur.	
	[3] WHEN EECW header pressure is restored above the reset pressure setpoint (psig) for the valves listed below, THEN FCV-67-50 - 92 FCV-67-51 - 113 RESET EECW supplies to Control Air compressors and RBCCW, at Unit 1 Panel 1-LPNL-925-0032 and Unit 2,3 Panels 2(3)-25-32. REFER TO the EECW to the RCW Crossties for Control Air & RBCCW section of 0-OI-67.	
	[4] START Control Air Compressors G, A, and D as required and MONITOR system pressure. REFER TO 0-AOI-32-1. [4.1] IF an air compressor trips on high temperature, THEN (Otherwise N/A) NOTIFY Unit Supervisor for instructions.	
	[5] REFER TO 1(2)(3)-AOI-32-2, "Loss of Control Air," as necessary	
	[6] PLACE RPS MG Sets A and B in service. REFER TO 1(2,3)-OI-99.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
ATC	NOTES 1) Station Blackout (SBO) is defined as a loss of 161 and 500kV systems and a failure of the two diesel generators which supply normal power to the two 480 V Shutdown Boards on a unit. Exiting the SBO can occur through Cross-connect capabilities as long as it does not place the Non-SBO unit in jeopardy. Analysis takes credit for only one unit being in an SBO Event. 2) This section is to be performed if at anytime during the loss of 161 and 500 kV Offsite power, the required Diesel Generators (for the Unit's 480 V Shutdown Bds) become inoperable thereby placing the unit in a SBO event. All times start with the recognition of an SBO Event, except for the time since shutdown. 3) The purpose of the alternate curves are to replace the normal curves (especially the PSP curve) which would force an Emergency Depressurization (thus losing RCIC level control) before the end of the 4 hour coping period of the SBO analysis. Cooldown must be commenced as soon as possible at near maximum allowable rates to ensure that reactor pressure on the SBO unit is below 235 psig before 155 minutes have elapsed. 4) To support one unit in a LOOP/LOCA and another unit in a LOOP, 3 RHR pumps, 2 Core Spray pumps, 3 RHRSW pumps and 2 EECW pumps are required long term (greater than 10 minutes). The unit in the LOOP requires one RHR pump and one RHRSW pump for long term cooling requirements. DG load management will ensure the 2 hour de-rated DG limit is not exceeded by manually removing non-required loads.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
ATC	[7] IF the unit(s) is under a "Station Blackout" THEN PERFORM the following: (Otherwise N/A and PROCEED TO Step 4.2[8]) N/A	
	[8] START the Diesel Driven Fire Pump. REFER TO 0-OI-26. N/A	
	[9] PLACE the 43 switch for the following Busses/Boards in MANUAL: • Start Busses 1B, 2B, 1A, 2A. • Unit Boards 1 (2) (3), A (B) (C) • Common Boards A, B	
	[10] [NRC/C] IF containment isolation is required, THEN VERIFY the following containment isolation valves closed UNLESS they are required to be open by EOIs (RG 1.155): • FCV-1-56 MN STM LINE OUTBD DRAIN ISOL • FCV-69-2 RWCU OUTBD SUCT ISOLATION • FCV-71-3 RCIC OUTBD SUCT ISOLATION • FCV-71-18 RCIC SUPPR POOL OUTBD SUCT VALVE • FCV-73-3 HPCI STEAM LINE OUTBD ISOL VALVE • FCV-73-26 HPCI SUPPR POOL INBD SUCTION VLV • FCV-73-30 HPCI MAIN PUMP MINIMUM FLOW VLV • FCV-74-47 RHR SHUTDOWN COOLING SUCT OUTBD ISOL VLV	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
ATC	[11] VERIFY the following boards are energized. IF NOT, THEN REFER TO Attachment 1 to restore affected busses while continuing with this instruction. 4KV Shutdown Boards 3EA, 3EB, 3EC, 3ED 480V Shutdown Boards 3A, 3B 480V DSL Aux Boards 3EA, 3EB 480V RMOV Boards 3A, 3B **480V Control Bay Vent Boards B** 480V HVAC Board. B	
SRO	Enters 3-EOI-2 do to Suppression Pool Temp > 95 °F	
	Directs venting per Appendix-12, "PRIMARY CONTAINMENT VENTING," and H_2O_2 analyzers in service.	
BOP	Places H_2O_2 Analyzers in service per 3-EOI-2.	
	1. Place Analyzer isolation bypass keylock switches to bypass	
	2. Select DW or Supp Chmbr and momentarily pull out select switch handle to start sample pumps	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	Vents Containment per **Appendix-12**, "Primary Containment Venting".	
	1. VERIFY at least one SGTS train in service.	
	2. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): • 3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV, • 3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE, • 3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV, • 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE.	
	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.	
	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.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	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:
	  o Step 10 to vent the Drywell through 3-FCV-84-19, OR
	  o 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.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

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

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	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: • Stable flow as indicated on controller, AND • 3-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished, AND • Release rates as determined below:	
	i. IF. . .PRIMARY CONTAINMENT FLOODING per C-1, Alternate Level Control, is in progress THEN. .MAINTAIN release rates below those specified in Attachment 2.	
	ii. IF. . .Severe Accident Management Guidelines are being executed, THEN. .MAINTAIN release rates below those specified by the TSC SAM Team.	
	iii. IF. . .Venting for ANY other reason than items i or ii above, THEN. .MAINTAIN release rates below Stack release rate of 1.4×10^7 µCi/s AND 0-SI-4.8.B.1.a.1 release fraction of 1.	
	Contacts LOG AUO to monitor release rates	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
SRO	Directs all available RHR be placed in Suppression Pool Cooling per App-17A, "RHR SYSTEM OPERATION SUPPRESSION POOL COOLING," after motor breakers tripped per AOI-57-1A	
BOP	Places available RHR in Suppression Pool cooling per **Appendix-17A**, "RHR SYSTEM OPERATION SUPPRESSION POOL COOLING"	
	1. IF.....Adequate core cooling is assured, OR Directed to cool the Suppression Pool irrespective of adequate core cooling, THEN.....BYPASS LPCI injection valve auto open signal as necessary by PLACING 3-HS-74-155A(B), LPCI SYS I(II) OUTBD INJ VLV BYPASS SEL in BYPASS.	
	2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:	
	a. VERIFY at least one RHRSW pump supplying each EECW header.	
	b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).	
	c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV • 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	d. IF ..... Directed by SRO, THEN.....PLACE 3-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD in MANUAL OVERRIDE.	
	e. IF .....LPCI INITIATION Signal exists, THEN.....MOMENTARILY PLACE 3-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT in SELECT.	
	f. IF ..... 3-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN..... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.	
	g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.	
	h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.	
	i. THROTTLE 3-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 3-FI-74-50(64), RHR SYS I(II) FLOW: • Between 7000 and 10000 gpm for one-pump operation. OR • At or below 13000 gpm for two-pump operation.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	j. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.	
	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.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
SRO	Directs 3B CRD pump placed in service for level control, as needed per App-5B, "INJECTION SYSTEM LINEUP CRD."	
ATC	Places 3B CRD pump in service per **Appendix-5B**, "INJECTION SYSTEM LINEUP CRD."	
	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.	
	2. IF ..... BOTH of the following exist: • CRD is NOT required for rod insertion, AND • Maximum injection flow is required, THEN ... LINE UP ALL available CRD pumps to the RPV as follows:	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
ATC	a. IF ..... CRD Pump 3A is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.	
	b. IF ..... CRD Pump 3B is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.	
	c. OPEN the following valves to increase CRD flow to the RPV: • 3-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV • 3-PCV-85-27, CRD CLG WATER PRESS CONTROL VLV • 3-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.	
	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.	
	e. IF .....Additional flow is necessary to prevent or mitigate core damage, THEN .....DISPATCH personnel to fully open the following valves as required: • 3-THV-085-0527, CRD PUMP DISCH THROTTLING (RB NE, el 565') • 3-BYV-085-0551, CRD PUMP TEST BYPASS (RB NE, el 565').	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	When notified by maintenance that HPCI aux oil pump control power fuses replaced (if requested), initiates HPCI for level control per Appendix-5D, "INJECTION SYSTEM LINEUP HPCI."	
	1. IF ..... Suppression Pool level drops below 12.75 ft during HPCI operation, THEN ... TRIP HPCI and CONTROL injection using other options.	
	2. IF ..... Suppression Pool level CANNOT be maintained below 5.25 in., THEN ... EXECUTE EOI Appendix 16E, "Bypassing HPCI High Suppression Pool Water Level Suction Transfer Interlock," concurrently with this procedure to bypass HPCI High Suppression Pool Water Level Suction Transfer Interlock.	
	3. IF ..... BOTH of the following exist: • High temperature exists in the HPCI area, AND • SRO directs bypass of HPCI High Temperature Isolation interlocks, THEN ... PERFORM the following: a. EXECUTE EOI Appendix 16L, "Bypassing HPCI High Temperature Isolation" concurrently with this procedure b. RESET auto isolation logic using HPCI AUTO-ISOL LOGIC A(B) RESET 3-XS-73-58A(B) pushbuttons.	
	4. VERIFY 3-IL-73-18B, HPCI TURBINE TRIP RX LVL HIGH, amber light extinguished.	
	5. VERIFY at least one SGTS train in operation.	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	6. VERIFY 3-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller in AUTO and set for 5,000 gpm NOTE: HPCI Auxiliary Oil Pump will NOT start UNTIL 3-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, starts to open.	
	7. PLACE 3-HS-73-47A, HPCI AUXILIARY OIL PUMP, handswitch in START.	
	8. PLACE 3-HS-73-10A, HPCI STEAM PACKING EXHAUSTER, handswitch in START.	
	9. OPEN the following valves: • 3-FCV-73-30, HPCI PUMP MIN FLOW VALVE • 3-FCV-73-44, HPCI PUMP INJECTION VALVE	
	10. OPEN 3-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, to start HPCI Turbine	
	11. CHECK proper HPCI operation by observing the following: a. HPCI Turbine speed accelerates above 2400 rpm b. 3-FCV-73-45, HPCI Testable Check Vlv, opens by observing 3-ZI-73-45A, DISC POSITION, red light illuminated c. HPCI flow to RPV stabilizes and is controlled automatically at 5000 gpm d. 3-FCV-73-30, HPCI PUMP MIN FLOW VALVE, closes as flow exceeds 1200 gpm	
	12. VERIFY HPCI Auxiliary Oil Pump stops and the shaftdriven oil pump operates properly	
	13. WHEN ... HPCI Auxiliary Oil Pump stops, THEN ... PLACE 3-HS-73-47A, HPCI AUXILIARY OIL PUMP, handswitch in AUTO	

XII. Simulator Event Guide:

Event #8: LOSS OF OFFSITE POWER (continued)

Position	Expected Actions	Time/Comments
BOP	14. ADJUST 3-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller as necessary to control injection	
	15. IF ..... It is desired to align HPCI suction to the Suppression Pool, THEN ... PERFORM the following: a. OPEN 3-FCV-73-26, HPCI SUPPR POOL INBD SUCT VALVE b. OPEN 3-FCV-73-27, HPCI SUPPR POOL OUTBD SUCT VALVE c. WHEN ....3-FCV-73-26, HPCI SUPPR POOL INBD SUCT VALVE, and 3-FCV-73-27, HPCI SUPPR POOL OUTBD SUCT VALVE, are fully open, THEN ....VERIFY CLOSED 3-FCV-73-40, HPCI CST SUCTION VALVE NOTE: Step 16.b must be performed promptly following Step 16.a to avoid loss of suction path.	
	16. IF ..... It is desired to align HPCI suction to the Condensate Storage Tank, THEN ... PERFORM the following: a. CLOSE 3-FCV-73-26, HPCI SUPPR POOL INBD SUCT VALVE b. WHEN ....3-FCV-73-26, HPCI SUPPR POOL INBD SUCT VALVE starts traveling closed, THEN ....OPEN 3-FCV-73-40, HPCI CST SUCTION VALVE c. CLOSE 3-FCV-73-27, HPCI SUPPR POOL OUTBD SUCT VALVE	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION

Position	Expected Actions	Time/Comments
BOP	Announces alarm 9-3D window 10, "RCIC Steam Line Leak Detection Temp. High"	
	Checks temperature on Panel 9-21	
SRO	Enters 3-EOI-3 on RCIC Area Temperature (or Rad)	
BOP	Announces failure of RCIC to isolate Auto or manual	
SRO	Directs RCIC isolation valves be closed locally	
Crew	Identify 3-TS-71-41A above max. safe value	
SRO	Directs cooldown at < 100°F	
BOP	Starts cooldown using MSRVs and/or HPCI (if repaired/needed)	
Crew	Monitors Containment parameters	
	Reports High radiation in CS/RCIC room 90-26a Evacuates that area of Rx Bldg	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
ATC/BOP	Reports alarm 3-9-3E window 29, "CS Pump room high Humidity/temp high," and recognizes the B/D CS room temperatures are rising	
	Report '2' areas above Max Safe on Temperature or Radiation	
SRO	Enters C-2 do to '2' areas above Max Safe on Temperature or Radiation and directs Emergency Depressurization	
BOP	Opens 6 ADS valves **CRITICAL TASK (2)** Emergency depressurizes when two Rx Bldg area Temperatures or Radiation exceed maximum safe operating values (within 5 minutes)	
	Verifies 6 ADS valves open	
SRO	Directs level be maintained 2"-51" with Core Spray (App-**6D**, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM I," or **6E**, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM II") or RHR (App-**6B**, "INJECTION SUBSYSTEMS LINEUP RHR SYSTEM I LPCI MODE," or **6C**, "INJECTION SUBSYSTEMS LINEUP RHR SYSTEM II LPCI MODE")	
BOP	Maintains level +2" to +51", trims/throttles pumps as necessary **CRITICAL TASK (1)** Maintains RPV water level above TAF (-162")	
	Recover level with CS Loop I 3-EOI Appendix-6D, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM I,"	
	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	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
BOP	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	
	Recover level with CS Loop II 3-EOI Appendix-6E, "INJECTION SUBYSTEMS LINEUP CORE SPRAY SYSTEM II"	
	1. VERIFY OPEN the following valves: • 3-FCV-75-30, CORE SPRAY PUMP 3B SUPPR POOL SUCT VLV • 3-FCV-75-39, CORE SPRAY PUMP 3D SUPPR POOL SUCT VLV • 3-FCV-75-51, CORE SPRAY SYS II OUTBD INJECT VALVE	
	2. VERIFY CLOSED 3-FCV-75-50, CORE SPRAY SYS II TEST VALVE	
	3. VERIFY CS Pump 3B and/or 3D RUNNING	
	4. WHEN ... RPV pressure is below 450 psig, THEN ... THROTTLE 3-FCV-75-53, CORE SPRAY SYS II INBD INJECT VALVE, as necessary to control injection at or below 4000 gpm per pump	
	5. MONITOR Core Spray Pump NPSH using Attachment 1	
	Restores Reactor Level +2" to +51" with RHR I per 3-EOI Appendix-6B, , "INJECTION SUBSYSTEMS LINEUP RHR SYSTEM I LPCI MODE,"	
	1. IF.....Adequate core cooling is assured, AND It becomes necessary to bypass the LPCI injection valve auto open signal to control injection, THEN.....PLACE 3-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in BYPASS	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
BOP	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	
	8. THROTTLE 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE, as necessary to control injection	
	9. MONITOR RHR Pump NPSH using Attachment 1	
	10. PLACE RHRSW pumps in service as soon as possible on ANY RHR Heat Exchangers discharging to the RPV	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
BOP	11. THROTTLE the following in-service RHRSW outlet valves to maintain flow between 1350 and 4500 gpm: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV	
	12. NOTIFY Chemistry that RHRSW is aligned to in-service RHR heat exchangers	
	Restores Reactor Level +2" to +51" with RHR II per 3-EOI Appendix-6C, "INJECTION SUBSYSTEMS LINEUP RHR SYSTEM II LPCI MODE"	
	1. IF.....Adequate core cooling is assured, AND It becomes necessary to bypass the LPCI injection valve auto open signal to control injection, THEN.....PLACE 3-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in BYPASS	
	2. VERIFY OPEN 3-FCV-74-24, RHR PUMP 3B SUPPR POOL SUCT VLV	
	3. VERIFY OPEN 3-FCV-74-35, RHR PUMP 3D SUPPR POOL SUCT VLV	
	4. VERIFY CLOSED the following valves: • 3-FCV-74-75, RHR SYS II DW SPRAY INBD VLV • 3-FCV-74-74, RHR SYS II DW SPRAY OUTBD VLV • 3-FCV-74-71, RHR SYS II SUPPR CHBR/POOL ISOL VLV • 3-FCV-74-72, RHR SYS II SUPPR CHBR SPRAY VALVE • 3-FCV-74-73, RHR SYS II SUPPR POOL CLG/TEST VLV	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
BOP	5. VERIFY RHR Pump 3B and/or 3D running	
	6. WHEN.....RPV pressure is below 450 psig, THEN.....VERIFY OPEN 3-FCV-74-67, RHR SYS II LPCI INBD INJECT VALVE	
	7. IF.....RPV pressure is below 230 psig, THEN.....VERIFY CLOSED 3-FCV-68-3, RECIRC PUMP 3A DISCHARGE VALVE	
	8. THROTTLE 3-FCV-74-66, RHR SYS II LPCI OUTBD INJECT VALVE, as necessary to control injection	
	9. MONITOR RHR Pump NPSH using Attachment 1	
	10. PLACE RHRSW pumps in service as soon as possible on ANY RHR Heat Exchangers discharging to the RPV	
	11. THROTTLE the following in-service RHRSW outlet valves to maintain flow between 1350 and 4500 gpm: • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV	
	12. NOTIFY Chemistry that RHRSW is aligned to in-service RHR heat exchangers	

XII. Simulator Event Guide:

Event #9: RCIC LEAK WITHOUT ISOLATION (continued)

Position	Expected Actions	Time/Comments
Crew	Recognizes load shed during depressurization (>2.45 psig DW and <450 psig Rx)	
ATC	Recognizes that "3C" DG failed to tie on again and ties "3C" DG to board	
SRO	Directs EECW valves reset, Air comp restarted and RPS restored again	
ATC/BOP	Secures pumps as necessary to maintain level +2 to + 51 "	
SRO	Classifies event as SAE 3.1-S	
	3.1-S | | | TABLE | US An unisolable Primary System leak is discharging into Secondary Containment AND Any area temperature exceeds the Maximum Safe Operating Temperature limit listed in Table 3.1. OPERATING CONDITION: Mode 1 or 2 or 3 SITE EMERGENCY	

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

1. **Emergency Depressurization has been initiated**
2. **Water level restored to +2" to +51" (or recovering)**

XIII. Crew Critical Tasks:

	TASK	SAT/UNSAT
1)	Maintains RPV water level above TAF (-162")	
2)	Emergency depressurizes when two Rx Bldg area Temperatures or Radiation exceed maximum safe operating values (within 5 minutes)	

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER: HLTS-3-12

9 Total Malfunctions Inserted: List (4-8)
1) APRM #1 FAILURE
2) C3 EECW pump Trip
3) Inadvertant start or RCIC
4) Generator H2 Leak
5) LOSP
6) HPCI Aux Oil Pump Failure
7) RCIC Leak
8) RCIC Isolation Failure (Auto and Manual)
9) DG '3C' Failure to auto tie

4 Malfunctions that occur after EOI entry: List (1-4)
1) HPCI Aux Oil Pump Failure
2) RCIC Leak
3) RCIC Isolation Failure
4) DG '3C' Failure to auto tie

3 Abnormal Events: List (1-3)
1) C3 EECW pump Trip
2) Generator H2 Leak
3) LOSP

2 Major Transients: List (1-2)
1) LOSP
2) RCIC Leak

3 EOI's used: List (1-3)
1) EOI-1
2) EOI-2
3) EOI-3

1 EOI Contingencies used: List (0-3)
1) C-2

80 Run Time (minutes)

45 EOI Run Time (minutes): 56 % of Scenario Run Time

2 Crew Critical Tasks: (2-5)

YES Technical Specifications Exercised (Yes/No) – TRM

SHIFT TURNOVER SHEET

Equipment Out of Service/LCO's:

3B diesel generator tagged out for annual maintenance 15 hours ago. Expected back in 5 days. 7 day LCO on D/G in effect per T.S. 3.8,1.B. Main Generator Voltage Regulator is in manual, Electrical Maintenance has just completed monthly PM on 90P rheostat.

Operations/Maintenance for the Shift:

Support Maint on "3B" Diesel Generator. Return Main Generator voltage regulator (90P) to automatic per 3-OI-47, section 8.14. Lower power to 92% and perform 3-SR-3.1.3.3 Control Rod Exercise Test for Partially Withdrawn Control Rods, continue at step 7.0.

Units 1&2 at 100% power.

Unusual Conditions/Problem Areas:

Thunderstorm warnings are in effect for the next 6 hours

Appendix A
(Page 2 of 2)

Name Of Radiation Protection Person Notified: Joe Neutron

Date: Today Time: Now

Step# 5[16] Procedure: 3-GOI-100-12 (if not this procedure) Rev: Current

RPHP Required by OI? ___(Y) X (N) RPHP Required For GOI? X (Y) ___(N)

RCI-17 Controls Necessary? X (Y) ____(N)

Radiation Protection Supervisor Signature for Release

Joe Neutron Date: Today Time: Now

Comments: For returning Rx Power from 90% to 100%

Name Of Radiation Protection Person Notified: _____

Date: _____ Time: _____

Step#_____ Procedure: _____ (if not this procedure) Rev:_____

RPHP Required by OI? ___(Y) ____(N) RPHP Required For GOI? ____(Y) ___(N)

RCI-17 Controls Necessary? ___(Y) ____(N)

Radiation Protection Supervisor Signature for Release

_____ Date: _____ Time: _____

Comments: _____

FORWARD copies of completed Appendix pages to Radiation Protection Supervisor.

SECONDARY CONTAINMENT TEMPERATURE

Description	
	UNUSUAL EVENT
	ALERT
3.1-S TABLE US An unisolable Primary System leak is discharging into Secondary Containment AND Any area temperature exceeds the Maximum Safe Operating Temperature limit listed in Table 3.1. OPERATING CONDITION: Mode 1 or 2 or 3	SITE EMERGENCY

Facility: **Browns Ferry NPP** Scenario No.: **3-16** Op-Test No.: **HLT 0801**

Examiners:	

Operators:		
	SRO:	SROU-1
	ATC:	SROI-1
	BOP:	RO-4

Initial Conditions: Unit 3 is at 100% power with an 8% power reduction scheduled. HPCI is currently tagged to repair the Auxiliary Oil Pump; and Feedwater Flow Indicator 3-78B is out of service with the IM Technicians searching for a replacement transmitter.

Turnover: Units 1 and 2 are at approximately 92%. On Unit 3, reduce power to 92% due to low system load demand. Continue with performance of Core Spray II Flow Rate SR (in progress). Support maintenance on HPCI; which is expected back in three hours. Additionally, support maintenance on Feedwater Flow Indicator 3-78B. Thunderstorm warnings are in effect for the next 4 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	------	R-ATC N-SRO	Lowers power
2	cs01d	C-BOP TS-SRO	Core Spray Flow rate SR where 3D Core Spray Pump fails
3	rd07r2631	I-ATC TS-SRO	Respond to drifting Control Rod per 3-AOI-85-5, Rod Drift In
4	pc12d	C-BOP C-SRO	3A Reactor Zone Exhaust Fan belts shear, swap fans
5	multiple	C-ATC C-SRO	3A Recirc Pump speed failure (increase), trip pump, insert rods Power oscillations with failure to scram, insert rods, manual scram
6	multiple th23 4	M-ALL	ATWS / Fuel failure

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

ANTICIPATED EAL: 1.2-S – SITE AREA

Facility: Browns Ferry NPP Scenario No.: 3-16 (2) Op-Test No.: HLT 0801

Examiners:	

Operators:		
	SRO:	SURROGATE
	ATC:	SROI-2
	BOP:	RO-6

ANTICIPATED EAL: 1.2-S – SITE AREA

The unit is operating at 100% power with a 8% 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 3 hours. It has been out of service for 14 hours.

While performing the Core Spray Loop II Flowrate SR (3-SR-3.5.1.6(CS II)) a trip of 3D Core Spray pump is received and the Crew must consult Tech Specs to determine required actions.

A control rod will drift into the core and the crew will respond IAW appropriate procedures.

The belts will shear on 3A Rx Zone exhaust fan causing a low Rx bldg dp and corresponding alarm where the crew will start standby fan per ARP and 3-AOI-30B

3A Recirc pump speed control failure (> 1500 rpm), the crew will not be able to lower speed and will respond per 3-AOI-68-3 and have to trip the pump and will respond per 3-AOI-68-1A. The Reactor will enter Region 2 of the power to flow map and power oscillations will increase until the OPRM trip setpoint is exceeded. The crew will recognize failure to auto scram and will insert a manual scram (If manual scram not already inserted prior to OPRM's exceeding scram setpoint).

The crew will experience a hydraulic ATWS and respond per 3-EOI-1 and C5. The crew will have to lower RWL to control power per C5 and App-4, "Prevention of Injection." The SDV will fail to drain totally, thus requiring multiple reactor scrams to insert control rods.

Due to the Fuel failure from the power oscillations, The Main Steam Line Rad HiHi alarm will be received and the crew will recognize Not to close MSIV's until after the control rods have all been inserted.

ANTICIPATED EAL: 1.2-S – SITE AREA

SIMULATOR EVALUATION GUIDE

TITLE: POWER REDUCTION, CORE SPRAY LOOP II FLOWRATE SR WITH FAILURE OF 3D PUMP, ROD DRIFT IN, RECIRCULATION PUMP RUNAWAY/TRIP, REACTOR POWER OSCILLATIONS, ATWS WITH MSIVS OPEN

REVISION: 0

DATE: Feb. 1, 2009

PROGRAM: BFN Operator Training – Hot License

Examiner Note: This scenario requires a copy of 3-SR-3.5.1.6(CS II) complete thru step 7.3, ICS NOT available, DVM is required

RCP required for power reduction to 92% with Recirc flow (Provide at turnover)

PREPARED: _____ \ _____
(Operations Instructor) Date

REVIEWED: _____ \ _____
(LOR Lead Instructor or Designee) Date

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

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

VALIDATED: _____ \ _____
(Operations SRO) (Required for Exam Scenarios) Date

LOGGED-IN: _____ \ _____
(Librarian) Date

TASK LIST UPDATED _____ \ _____
Date

Nuclear Training

Revision/Usage Log

Revision Number	Description of Changes	Date	Pages Affected	Revised
0	Initial	02/01/09	All	csf

I. Program: BFN Operator Training

II. Course: Examination Guide

III. Title: POWER REDUCTION, CORE SPRAY LOOP II FLOWRATE SR WITH FAILURE OF 3D PUMP, RPS LEVEL INSTRUMENT FAILURE RECIRCULATION PUMP RUNAWAY/TRIP, REACTOR POWER OSCILLATIONS, ATWS WITH MSIVS OPEN

IV. Length of Scenario – 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, annunciator, abnormal, and emergency procedures.

B. Enabling Objectives:

1. The operating crew will reduce Reactor power to ~ 92% IAW 3-GOI-100-1 and 3-OI-68.

2. The operating crew will recognize and respond to a failure of a Core Spray pump 3D during a flowrate SR and determine required actions per Technical Specifications

3. The operating crew will recognize and respond to a control rod drift in per AOI-85-5

4. The operating crew will recognize and respond to sheared belts on 3A Rx Zone exhaust fan and respond per ARP and 3-AOI-30B

5. The operating crew will recognize and respond to the 3A Recirc pump speed control failure (and subsequent manual trip) in accordance with 3-AOI-68-3 and 3-AOI-68-1A

6. The operating crew will recognize and respond to reactor power oscillations in accordance to 3-AOI-68-1A and 3-GOI-100-1

7. The operating crew will recognize and respond to an ATWS in accordance with EOI-1 and C5

8. The operating crew will recognize and respond to high suppression pool temperature in accordance with EOI-1 and EOI-2.

9. 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 Sheets

C. Stopwatch

D. Hold Order / Caution Order tags

E. Annunciator window covers

F. Steam tables

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat hlts-3-16

	MF/RF/OR#	Description
1)	imf fw26b 0	'B' FW flow failure
2)	imf tc02 0	Fails bypass valves closed
3)	bat tohpci	Tags out HPCI
4)	trg e1 MODESW	Sets trigger
5)	trg e2 CSDSTART	Sets trigger
6)	trg e3 RXZFANS	Sets trigger
6)	imf th23 (e1 0) 4 15:00	Fuel failure
7)	imf rp08a	RPS A1 scram failure
8)	imf rp08b	RPS A2 scram failure
9)	imf cs01d (e2 0:30)	CS pump 3D trip after 30 seconds
10)	dor an:xa553d[32] (e3 0)	Delete alarm after fan swap

2. File: bat hlt2631scram

	MF/RF/OR#	Description
1)	imf rd08r2631 0	Scram 26-31 from 9-16 & simulate closing 85-588 valve
2)	mrf rd10r2631 scram	

3. File: bat hlt2631reset

	MF/RF/OR#	Description
1)	mrf rd10r2631 norm	reset scram switch on 26-31 from 9-16 & remove drift
2)	dmf rd07r2631	

4. File: bat hlts-3-16-1

MF/RF/OR#		Description
1)	imf pc12d	Shears 3A Rx Zone Exh Fan belts
2)	ior an:ov:xa553d[32] alarm_on	Ann – Rx bldg low dp sealed in

5. File: bat hlts-3-16-2

MF/RF/OR#		Description
1)	bat 3ainc	3A Recirc pump runaway (~1535 rpm)

6. File: bat hlts-3-16-3

MF/RF/OR#		Description
1)	imf cr02a 55 6:00	Power Oscillations
2)	bat atws95east	95% Hydraulic ATWS east side

7. File: bat tohpci

MF/RF/OR#		Description
1)	ior ypomtrglesh fail_cn_po	Tag gland seal exhauster
2)	ior ypovfcv733a close	73-3 close
3)	ior ypovfcv733 fail_now	Tag FCV 73-3
4)	ior ypovfcv7316 fail_now	Tag FCV 73-16
5)	ior ypovfcv7381 fail_now	Tag FCV 73-81
6)	ior zdihs7347a ptl	Tag HPCI Aux oil pump
7)	ior zohs7347a[1] off	Green light off
8)	imf hp05	HPCI trip

8. File: bat app01f

MF/RF/OR#		Description
1)	mrf rp13a byp	Bypasses automatic scrams
2)	mrf rp13b byp	
3)	mrf rp13c byp	
4)	mrf rp13d byp	

9. File: bat app02

MF/RF/OR#		Description
1)	mrf rp12a test	Bypasses ARI
2)	mrf rp12b test	

10. File: bat app08ae

MF/RF/OR#		Description
1)	mrf rp06a byp	Bypasses Gp 1 isolation on low level
2)	mrf rp06b byp	
3)	mrf rp06c byp	
4)	mrf rp06d byp	
5)	mrf rp14a byp	Bypasses Gp 6 isolation on low level
6)	mrf rp14b byp	

11. File: bat atws95east

MF/RF/OR#		Description
1)	imf rd17a	SDV level switch failure
2)	imf rd09a 95	95% hydraulic ATWS east side

12. File: bat sdv

MF/RF/OR#		Description
1)	dmf rd17a	Deletes SDV level switch failure
2)	dmf rd17b	

13. File: bat sdvtd

MF/RF/OR#		Description
1)	dmf rd17a	Deletes SDV level switch failure
2)	dmf rd17b	
3)	imf rd17a (none 8:00)	Inserts level switch failure after 8 minutes
4)	imf rd17a (none 8:00)	

IX. Console Operators Instructions

HLTS 3-16

ELAP TIME		DESCRIPTION/ACTION
Simulator Setup	manual	100% MOC reset 255 (david)
Simulator Setup	verify	imf fw26b 0 imf tc02 0 bat tohpci imf rp08a imf rp08b trg e1 MODESW trg e2 CSDSTART trg e3 RXZFANS
Simulator Setup	manual	Tag out HPCI. Hang out of service cover on "B" FW Flow Indicator. Place toilet bowl on ann. 9-6C win 14
Simulator Setup	manual	Start A3 EECW pump, place HPCI AOP and Cond pumps in PTL, place testing borders on ann windows 9-3C/10, 9-3F/1, 9-23C/33, and 9-23D/33

ROLE PLAY: **At SR step 7.3[1] report CS static suction pressures at 6 psig (both pumps). Also at 6 psig on temporary gauges.**

ROLE PLAY: **At SR step 7.3[2] report Motor power on indicating light is extinguished (3B 480v rmov / 8B) and <u>NO</u> air flow can be felt above either CS pump motor**

ROLE PLAY: **At SR step 7.3[6.6] report pressure is 248 psig**

ROLE PLAY: **At SR step 7.3[6.9] report lowest pressure observed is 220 psig**

ROLE PLAY: **At SR step 7.3[7.2] report DVM reading 349 mV**

ROLE PLAY: **At SR step 7.3[7.3] report suction pressure as 5 psig (IF asked for local discharge pressure, it is 259 psig)**

ROLE PLAY: **If asked for 3-FM-75-49 mV reading (step 7.3[7.6]) report DVM reading 349 mV**

ROLE PLAY: **At SR step 7.3[9] report vibration readings obtained and all readings are acceptable**

ROLE PLAY: **At SR step 7.3[10] report Motor power on indicating light is illuminated (3B 480v RMOV / 8B) and flow detected above both pump motors**

ROLE PLAY: **IF asked at SR step 7.3[11], report pump started and tripped**

3 minutes after Tech. Specs. Addressed for tripped CS pump		Drift Control Rod 26-31 in (imf rd07r2631)

ROLE PLAY: **When contacted as Rx Engineer, repeat will check and monitor thermal limits**

ROLE PLAY: **When dispatched to HCU as AUO, report:**

- **Scram pilot air header aligned to scram inlet and outlet valves**
- **Scram riser has higher than normal temperatures**
- **Scram outlet valve 3-FCV-85-39A has flow noise**

ROLE PLAY: **When directed to close 3-SHV-85-588, wait 1 minute and report valve closed. If asked status of accumulator pressure, report accumulator Nitrogen pressure is stable.**

ROLE PLAY: **Establish communications as Operator at 9-16 and AUO at HCU**

If requested to scram rod 26-31 from 9-16, wait 1 minute		Scram Control Rod 26-31 (bat hlt2631scram)

ROLE PLAY: **Notify Unit 3 Operator that the scram switch for Rod 26-31 is in "Scram" (down position).**

When requested to return scram test switch to normal		Remove Scram/Drift (bat hlt2631reset)

ROLE PLAY: **As UO in Aux Instrument Room, notify U3 Operator that the scram switch for Rod 26-31 is in "Normal" (up position).**

ROLE PLAY: **As AUO at HCU, report solenoids operated normally without chatter buzzing, and the Scram Inlet and Outlet Valve Stems indicate closed.**
or **Also, IF asked, the flow noise seems to have stopped)**

When requested to slowly valve in charging water (open 85-588), wait 1 minute		Open 85-588 (mmf rd08r2631 100)

ROLE PLAY: **Call Unit 3 Operator and report 85-588 valve is open**

ROLE PLAY: **As Rx Engineer, report that you will evaluate recovery of Control Rod 26-31.**

After 85-588 valve opened or when directed by lead evaluator…		Shear belts on 3A Rx Zone exh (bat hlts-3-16-1)

ROLE PLAY: **If directed to check local bldg d/p, report Rx Zone d/p of +0.2 psid**

ROLE PLAY: **If directed to investigate 3A Rx Zone exhaust fan locally, report all belts are sheared (motor running but not fan)**

When 3B Rx zone fans placed I/S, VERIFY alarm gets deleted (otherwise, manually delete by pushing button)		Delete override on d/p alarm (dor an:xa553d[32])

ROLE PLAY: **If directed to check local bldg dp after 3B fans placed in service, report Rx Zone dp (- 0.27 psid) (If 3A fans secured but 3B fans not started, report dp 0.0 psid)**

3 minutes after 3B Rx Zone fans placed in service		3A Recirc runaway (bat hlts-3-16-2)
Upon tripping of the 3A Recirc Pump		Power oscillations - ATWS (bat hlts-3-16-3)
Immediately after scram		Enable SDV switches (bat sdv)
If requested to close 3-85-586 wait 5 minutes		closes 85-586 (mrf rd06 close)

ROLE PLAY: **Call and report 3-85-586 closed**

If requested to perform Appendix 2 wait 3 minutes		bypasses ARI scram (bat app02)
If requested to perform Appendix 1F wait 5 minutes		bypasses auto scram signals (bat app01f)

ROLE PLAY: **Call and report App-2 & 1F complete**

As soon as scram is reset		Disables SDV switches for 8 min. (bat sdvtd)
If requested to perform Appendix 8A & E wait 6 minutes		PCIS Group bypasses (bat app08ae)

ROLE PLAY: **Call and report App-8A & 8E complete**

When requested to open 2-85-586		Opens 3-85-586 (mrf rd06 open)

ROLE PLAY: **Call and report 3-85-586 open**

When Reactor Water Level is lowered for power control…		Delete power oscillations (dmf cr02a)
Immediately after 2nd scram		Enable SDV switches (bat sdv)
As soon as 2nd scram is reset		Disable SDV switches for 8 min (bat sdvtd)
After 2nd scram reset if Lead Examiner is satisfied with RC/Q usage and power control		Removes ATWS (bat atws-1)

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

1) All rods fully inserted

2) MSIV's closed after all control rods inserted and C-5 exited

2) RPV water level +2" to +51" (or recovering)

X. Scenario Summary:

The unit is operating at 100% power with a 8% 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 3 hours. It has been out of service for 14 hours.

While performing the Core Spray Loop II Flowrate SR (3-SR-3.5.1.6(CS II)) a trip of 3D Core Spray pump is received and the Crew must consult Tech Specs to determine required actions.

A control rod will drift into the core and the crew will respond IAW appropriate procedures.

The belts will shear on 3A Rx Zone exhaust fan causing a low Rx bldg dp and corresponding alarm where the crew will start standby fan per ARP and 3-AOI-30B

3A Recirc pump speed control failure (> 1500 rpm), the crew will not be able to lower speed and will respond per 3-AOI-68-3 and have to trip the pump and will respond per 3-AOI-68-1A. The Reactor will enter Region 2 of the power to flow map and power oscillations will increase until the OPRM trip setpoint is exceeded. The crew will recognize failure to auto scram and will insert a manual scram (If manual scram not already inserted prior to OPRM's exceeding scram setpoint).

The crew will experience a hydraulic ATWS and respond per 3-EOI-1 and C5. The crew will have to lower RWL to control power per C5 and App-4, "Prevention of Injection." The SDV will fail to drain totally, thus requiring multiple reactor scrams to insert control rods.

Due to the Fuel failure from the power oscillations, The Main Steam Line Rad HiHi alarm will be received and the crew will recognize Not to close MSIV's until after the control rods have all been inserted.

XI. Floor Instructor Instructions

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

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

B. Review the shift briefing information with the operating crew. Provide US with a copy of the shift turnover sheet for the scenario.

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

D. Ensure recorders are inking are 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. All rods fully inserted

2. RPV water level +2" to +51" (or recovering)

XII. Simulator Event Guide:

Event #1: Lower Rx Power with Recirc Flow

Position	Expected Actions	Time/Comments
SRO	Notifies ODS of power drop	
	Direct lowering U3 Power to 92% using Recirc Flow per 3-GOI-100-12 step 5.0[6] and 3-OI-68 step 6.2	
Crew	Notifies Chemistry and RADCON of power drop	
ATC	[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)(FAST) 3-HS-96-17A(17B)(17C), push-buttons, to achieve balanced jet pump flows.	
	AND/OR	
	ADJUST Recirc Pump speed 3B using, RAISE SLOW (MEDIUM), 3-HS-96- 16A(16B) / LOWER SLOW(MEDIUM)(FAST) 3-HS-96-18A(18B)(18C),push-buttons, to achieve balanced jet pump flows.	
	AND/OR	
	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: RAISE SLOW, 3-HS-96-31 RAISE MEDIUM, 3-HS-96-32 LOWER SLOW, 3-HS-96-33 LOWER MEDIUM, 3-HS-96-34 LOWER FAST, 3-HS-96-35	
	If speeds are between 1200 and 1300 rpm then speeds should be mismatched by 60 rpm	
BOP	Provides peer check for Recirc adjustment	
	Continue to monitor BOP (transfer volts, condensate flow, etc)	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
SRO	Directs BOP to continue with Core Spray flowrate SR 3-SR-3.5.1.6(csII)	
BOP	Resumes Core Spray Loop II Flow rate SR 3-SR-3.5.1.6(csII) at step 7.3, performs required manipulations per the SR	
	7.3 Core Spray Pump Flow and Valve Testing [1] VERIFY CS Pump 3B and 3D pretest static suction pressures are adequate and RECORD below: records pump suction pressures	
	[2] CHECK Core Spray NE Room Cooler Fan is NOT operating as follows: • On 480V RMOV Board 3B, Compartment 8B (El 593') CHECK the fan motor Power On light 3-IL-064-0073 is extinguished. • Above CS Pump 3B, CHECK that no air flow can be felt from the duct louvers while standing next to the pump. • Above CS Pump 3D, CHECK that no air flow can be felt from the duct louvers while standing next to the pump.	
	[3] START CS Pump 3B using 3-HS-75-33A.	
	[4] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A to obtain an average CS LOOP II flow of 3200 gpm as indicated by 3-FI-75-49. [BFPER98-004734-000]	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[5] CHECK the following annunciators on Panels 3-9-3 and 3-9-23C are in alarm: • CORE SPRAY SYS II PUMP B START (3-XA-55-3F, window 1) • RHR OR CS PUMPS RUNNING ADS BLOWDOWN PERMISSIVE (3-XA-55-3C, window 10) • CORE SPRAY PUMP 3B RUNNING (3-XA-55-23C, window 33)	
	[6] PERFORM the following to verify 3-CKV-075-0570B operation: [6.1] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A to obtain a CS LOOP II flow of approximately 1800 gpm as indicated by 3-FI-75-49	
	[6.2] VERIFY CORE SPRAY SYS II MIN FLOW VALVE, 3-FCV-75-37 opens	
	[6.3] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A to obtain a flow of approximately 2800 gpm as indicated by 3-FI-75-49	
	[6.4] VERIFY CORE SPRAY SYS II MIN FLOW VALVE, 3-FCV-75-37 is closed	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[6.5] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE 3-HS-75-50A to obtain a flow of approximately 3200 gpm as indicated by 3-FI-75-49	
	[6.6] On 3-LPNL-25-0060, RECORD the local CS Pump 3B discharge pressure below using 3-PI-075-0035: CS Pump 3B Disch Press ____ psig	
	[6.7] NOTIFY Operations personnel to monitor CS Pump 3B discharge pressure measured locally by 3-PI-075-0035 on 3-LPNL-25-0060 for minimum reading obtained while opening the CORE SPRAY SYS II MIN FLOW VALVE 3-FCV-75-37	
	[6.8] CONTINUOUSLY HOLD the CORE SPRAY SYS II MIN FLOW VALVE, 3-HS-75-37A, in the OPEN position until Step 7.3[6.10]	
	[6.9] RECORD below the lowest CS Pump 3B discharge pressure measured locally by 3-PI-075-0035 on 3-LPNL-25-0060: CS Pump 3B Disch Press ____ psig	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[6.10] RELEASE 3-HS-75-37A to the AUTO position	
	[6.11] CALCULATE the change in CS Pump 3B discharge pressure as stipulated below: Initial Discharge Pressure ____psig (Step 7.3[6.6]) Lowest Discharge Pressure - ___psig (Step 7.3[6.9]) Discharge Pressure Change = ___psi	
	[6.11.1] VERIFY calculation performed is correct (IV)	
	[6.12] CHECK the discharge pressure change recorded is greater than or equal to 10 psid	
	[6.13] CHECK CORE SPRAY SYS II MIN FLOW VALVE 3-FCV-75-37 is closed by noting valve position indicating lights above 3-HS-75-37A	
	[7] PERFORM the following ASME OM Code pump flow and pressure measurements for CS Pump 3B operation:	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[7.1] IF the ICS is available to obtain CS LOOP II flow rate data, THEN PERFORM the following; (Otherwise N/A.) [7.1.1] CHECK no gross instrument channel failures have occurred by noting the ICS-displayed flow rate is within 100 gpm of the flow rate shown on CORE SPRAY SYS II FLOW Indicator 3-FI-75-49 [7.1.2] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A to obtain an average ICS display reading of 3200 gpm. [BFPER98-004734-000]	
	[7.2] IF the ICS is NOT available to obtain CS LOOP II flow rate data, THEN THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A to obtain an average reading of 349 mV (□0.5 mV) at the DVOM installed at Panel 3-9-19; (Otherwise N/A). [BFPER98-004734-000]	
	[7.3] WHEN stable conditions are obtained, THEN PERFORM the following: • RECORD CS Pump 3B suction pressure from Pressure Gauge A, (Ensure appropriate scale is used.) CS Pump 3B suction press (M&TE) ___psig • RECORD the pressure reading at 3-PI-075-0035 below: CS Pump 3B discharge pressure _____psig	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[7.4] CALCULATE CS Pump 3B differential pressure as follows and VERIFY the differential pressure meets the acceptance criteria: Discharge Pressure ____ psig (Step 7.3[7.3]) Suction Pressure - ____ psig (Step 7.3[7.3]) Differential Pressure = ____ psid Acceptance Criteria: 223.6 to 273.4 psid	
	[7.5] VERIFY calculation is correct (IV)	
	[7.6] RECORD the following data for CS Pump 3B: Core Spray Sys II Flow, or ICS Display ___gpm AC=3200gpm Core Spray Sys II Disch Pressure 3-PI-75-48 ___psig AC=N/A Core Spray Sys II Flow 3-FM-75-49 ___mV AC=349mV± 0.5mV Core Spray Pump 3B Motor Current 3-EI-75-33 ___amps AC=N/A 4kV Shutdown Bd 3EC Voltage _____VAC AC=N/A N/A reading for 3-FM-75-49, CS SYS II FLOW, if DVOM was NOT installed	
	[8] [QMDS] NOTIFY EM to perform 0-TI-230 vibration measurements as indicated on Attachment 4 for CS Pump 3B	
	[9] RECORD CS Pump 3B vibration readings below: AA__ AH1__ AH2__ BH__ CH1__ CH2__ in/sec	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
BOP	[10] CHECK the Core Spray NE Room Cooler Fan is ON as follows: • On 480V RMOV Board 3B, Compartment 8B (El 593') CHECK the fan motor Power On indicating light 3-IL-064-0073 is illuminated • Above CS Pump 3B CHECK that air flow from the duct louver can be felt while standing next to the pump • Above CS Pump 2D CHECK that air flow from the duct louver can be felt while standing next to the pump	
	[11] START CS Pump 3D using 3-HS-75-42A	
	[12] THROTTLE 3-FCV-75-50 using CORE SPRAY SYS II TEST VALVE, 3-HS-75-50A as necessary to obtain a CS LOOP II flow of 6250 to 6350 gpm as indicated by 3-FI-75-49 or ICS display	
	• Reports trip of 3D Core Spray pump 30 seconds after starting per the SR	

XII. Simulator Event Guide:

Event #2: Core Spray Pump Failure

Position	Expected Actions	Time/Comments
SRO	Directs SR stopped at point where failure occurred. May request clearance for 3D Core Spray pump	
	Contact maintenance to investigate pump trip	
	Directs UO to secure 3B Core Spray pump	
	Consults Tech Spec 3.5.1 A, C, and D determines that a 72 hour LCO is in effect with HPCI and one (1) Low Pressure ECCS system inoperable. Also a 7 day LCO is in effect for Condition A for one low pressure ECCS injection/spray subsystem inoperable.	
	Briefs Crew on Tech Spec requirements of Core Spray pump INOP with HPCI INOP	
	Notifies Shift Maintenance Manager	
BOP	Stops SR performance (May use OI-75 to back out of Surveillance)	
	Stops 3B Core Spray pump	

XII. Simulator Event Guide:

Event #3: CONTROL ROD DRIFT

Position	Expected Actions	Time/Comments
ATC	Announces "Control Rod Drift" alarm	
	A. DETERMINE which rod is drifting from Full Core Display.	
	Identifies rod 26-31 as drifting in and is > 2 notches from original position	
	B. IF rod drifting in, THEN REFER TO 3-AOI-85-5.	
SRO	Directs actions per 3-AOI-85-5	
	Directs rod be continuously inserted to 00	
	REFER TO Tech Spec Section 3.1.3, 3.10.8.	
ATC	IMMEDIATE [1] IF multiple rods are drifting into core, THEN MANUALLY SCRAM Reactor. REFER TO 3-AOI-100-1.	
	SUBSEQUENT [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)	
	[2] NOTIFY Reactor Engineer. (May be SRO)	
	[3] CHECK Thermal Limits on ICS (RUN OFFICIAL 3D).	
SRO	Informs Reactor Engineer of drifting rod and directs an RCP to restore rod back to it's original position (if drifting problem can be corrected)	
ATC	[4] ADJUST control rod pattern as directed by Reactor Engineer and CHECK Thermal Limits on ICS (RUN OFFICIAL 3D).	
	[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):	

XII. Simulator Event Guide:

Event #3: CONTROL ROD DRIFT (continued)

Position	Expected Actions	Time/Comments
ATC	• CRD CLG WTR HDR DP, 3-PDI-85-18A, of about 20 psid, and	
	• CRD DRIVE WTR HDR DP, 3-PDI-85-17A, between 250 and 270 psid, and	
	• CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, between 40 and 65 gpm.	
	NOTE: All observations and checks made in the following steps should be made as a comparison and relative to the other Hydraulic Control Units.	
	[6] VERIFY scram pilot air header aligned to scram inlet and outlet valves.	
	[7] CHECK CRD SCRAM OUTLET VALVE, 3-FCV-085-39B, for leakage as indicated by the following:	
	• Scram riser for affected HCU has higher than normal temperature	
	• CRD SCRAM OUTLET VALVE, 3-FCV-085-39B, producing flow noise	
	[8] CHECK CRD SCRAM INLET VALVE, 3-FCV-085-39A, for leakage as follows:	
	[8.1] CHECK insert riser for affected HCU for higher than normal temperature.	
	NOTE: The CRD accumulator is considered inoperable per Technical Specifications 3.1.5 when the charging water is isolated.	
SRO	Directs charging water to 26-31 be closed	
ATC	[8.2] CLOSE CHARGING WATER SOV, 3-SHV-085-588 and OBSERVE CRD ACCUMULATOR NITROGEN SIDE PRESS, 3-PI-085-034, for lowering trend.	
SRO	Declares accumulator inoperable per Tech Spec 3.1.5 and addresses actions (when charging water is isolated)	
	Directs scram of affected rod from panel 9-16 in Aux. Inst. Room	

XII. Simulator Event Guide:

Event #3: CONTROL ROD DRIFT (continued)

Position	Expected Actions	Time/Comments
ATC	NOTES: 1) If either the Scram Inlet or Outlet valve is found to be leaking, the preferred action is to scram the affected rod at Panel 3-9-16 and initiate corrective maintenance if necessary.	
	2) Individual control rod scram to attempt to reset scram valves may be performed at discretion of Unit Supervisor. Reactor Engineer will determine impact on core thermal limits and preconditioning envelope.	
	[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):	
	[9.1] ESTABLISH communications between Control Room and the following locations:	
	• Hydraulic control unit affected, elevation 565, Reactor Building	
	• Panel 3-9-16 in Auxiliary Instrument Room, elevation 593, Control Bay	
	[9.2] VERIFY CLOSED CHARGING WATER SOV, 3-SHV-085-588. (AUO)	
	NOTE: Panel 3-9-16, containing the Rod Scram Switches is locked and a key from the Unit 3 Control Room key cabinet will be required to perform the next step.	
	[9.3] INITIATE individual rod scram by actuating selected rod scram switch on Panel 3-9-16 to its scram (DOWN) position. (AUO)	
	[9.4] VERIFY control rod has reached FULL IN on Panel 3-9-5.	
	[9.5] IF attempting to reseat scram valves, THEN RETURN rod scram switch for associated control rod to its normal (UP) position at Panel 3-9-16. (AUO)	

XII. Simulator Event Guide:

Event #3: CONTROL ROD DRIFT (continued)

Position	Expected Actions	Time/Comments
ATC	[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.) (AUO)	
	[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. (AUO)	
	[9.8] CHECK blue Scram indicator light on Full Core Display extinguished.	
	[9.9] RESET Rod Drift Alarm and CHECK DRIFT indicator light on Full Core Display extinguished. (N/A if rod is still drifting in)	
	[9.10] CHECK annunciator CONTROL ROD DRIFT (3-XA-55-5A, Window 28) reset. (N/A if rod is still drifting in)	
	[9.11] SLOWLY OPEN CHARGING WATER SOV, 3-SHV-085-588. (AUO)	
	[9.12] CHECK amber ACCUM indicator light on Full Core Display extinguished.	
	[9.13] CHECK red indicating light for associated HCU extinguished on local Panel 3-28-4(3-25-22).	
	[9.14] NOTIFY Site Engineering.	
	[9.15] INITIATE a work order.	
SRO	Declares Rod 26-31 operable when charging water restored.	

XII. Simulator Event Guide:

Event #4: Shear of 3A Rx Zone Exhaust fan belts

Position	Expected Actions	Time/Comments
BOP	Announces alarm 3-9-3D window 32 Reactor zone differential pressure low	
SRO	Directs BOP to respond per ARP	
BOP	A. IF the alarm is intermittent, THEN CHECK for high wind conditions (ex., >20 mph) on ICS	
	B. IF high wind conditions CANNOT be confirmed, THEN REQUEST personnel to check local Reactor Building differential pressure	
	C. IF alarm is due to high wind conditions, THEN EOI-3 entry is NOT required	
	D. IF alarm is valid, THEN NOTIFY Unit Supervisor of 3-EOI-3 entry condition	
	When building dp is reported + 0.2 psig, notifies SRO of EOI-3 entry condition	
SRO	Enters EOI-3 do to Secondary CTMT Dp ≥ (-) .17 inches wc	
	Directs BOP to investigate Rx Bldg exhaust fan for proper operation	
BOP	E. REQUEST personnel to check fans locally for any apparent problems	
	Checks fans on pnl 9-25	
	Notices Rx Zone exhaust flow reading 0 but fans indicate running	

XII. Simulator Event Guide:

Event #4: Shear of 3A Rx Zone Exhaust fan belts

Position	Expected Actions	Time/Comments
BOP	F. REFER TO 3-OI-30B and PLACE standby fan in service to restore normal differential pressure	
	When noticed exhaust flow 0 or when AUO reports exhaust fan belts sheared, enters 3-AOI-30B-1 and 3-OI-30B places 3B fans in service	
	6.1 Alternating Reactor Zone Supply and Exhaust Fans [1] VERIFY the Reactor Zone supply and exhaust fans are operating. REFER TO Section 5.1	
	[2] REVIEW all Precautions and Limitations in Section 3.0	
	[3] IF Reactor Zone Supply and Exhaust Fans will NOT be operated in fast speed, THEN SHUT DOWN Steam Vault Exhaust Booster Fan. REFER TO Section 7.4. (N/A if Reactor Building Ventilation has been lost and it desired to run the booster fan to cool the steam tunnel) N/A	
	[4] PLACE REACTOR ZONE FANS AND DAMPERS Switch, 3-HS-64-11A, in OFF	
	[5] [II/C] VERIFY dampers close and fans stop as indicated by illuminated green lights above the following switches: • REACTOR ZONE SPLY OUTBD ISOL DMPR, 3-HS-64-13 • REACTOR ZONE SPLY INBD ISOL DMPR, 3-HS-64-14 • REACTOR ZONE EXH INBD ISOL DMPR, 3-HS-64-42 • REACTOR ZONE EXH OUTBD ISOL DMPR, 3-HS-64-43 • REACTOR ZONE FANS AND DAMPERS, 3-HS-64-11A [II/B-92-072]	

XII. Simulator Event Guide:

Event #4: Shear of 3A Rx Zone Exhaust fan belts

Position	Expected Actions	Time/Comments
BOP	[6] PLACE REACTOR ZONE FANS AND DAMPERS Switch, 3-HS-64-11A, in SLOW A (SLOW B) to start alternate fans	
	[7] VERIFY dampers open and fans start as indicated by illuminated red lights above the following switches: • REACTOR ZONE SPLY OUTBD ISOL DMPR, 3-HS-64-13 • REACTOR ZONE SPLY INBD ISOL DMPR, 3-HS-64-14 • REACTOR ZONE EXH INBD ISOL DMPR, 3-HS-64-42 • REACTOR ZONE EXH OUTBD ISOL DMPR, 3-HS-64-43 • REACTOR ZONE FANS AND DAMPERS, 3-HS-64-11A	
	[8] IF fast speed Reactor Zone Supply and Exhaust Fan operation is required, five minutes should be allowed after slow start for the discharge dampers to FULLY OPEN, THEN [8.1] PLACE REACTOR ZONE FANS AND DAMPERS switch, 3-HS-64-11A, in FAST A (FAST B) [8.2] VERIFY that the two green lights A(B) remain extinguished and the two red lights A(B) remain illuminated above REACTOR ZONE FANS AND DAMPERS Switch, 3-HS-64-11A	
	Places "B" Fans in fast speed after 5 minutes	

XII. Simulator Event Guide:

Event #4: Shear of 3A Rx Zone Exhaust fan belts

Position	Expected Actions	Time/Comments
BOP	[9] VERIFY the following conditions: [9.1] VERIFY REACTOR ZONE PRESS DIFFERENTIAL Indicator, 3-PDIC-064-0002, on 3-LPNL-925-0213, located at R17-P El 639', indicates between -0.25 inches and -0.40 inches H_2O [9.2] IF REACTOR ZONE PRESS DIFFERENTIAL Indicator, 3-PDIC-64-2, is NOT between -0.25 inches and -0.40 inches H_2O, THEN REFER TO 3-AOI-30B-1, Reactor Building Ventilation Failure	
	[10] IF required, THEN START Steam Vault Exhaust Booster Fan. REFER TO Section 5.4 N/A	
	Verifies low building dp alarm clears and notifies SRO	
SRO	Exits EOI-3 when low bldg dp alarm clears	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations

Position	Expected Actions	Time/Comments
ATC	Notices 3A Recirc pump speed increasing by; • actually seeing pump speed increase • actually seeing core flow increase • noticing Rx Power (MWe or APRM's) increasing	
SRO	Directs entry into 3-AOI-68-3	
	Directs lowering speed of 3A Recirc pump	
ATC	Attempts to lower speed of 3A Recirc pump using individual lower fast/lower medium/lower slow pushbuttons (may also try master lower fast/lower medium/lower slow pushbuttons – but they will not work either)	
	Notifies SRO of inability to lower 3A Recirc pump speed	
SRO	Directs tripping 3A Recirc pump	
	Directs entering 3-AOI-68-1A for tripped pump / core flow lowering	
	Contacts Management	
	Contacts ODS / SW dispatcher of power drop	
ATC	May dispatch licensed operator with key locally to VFD (but will NOT be able to wait for him/her to get there before having to trip 3A pump)	
	Trips / Shutdown 3A Recirc pump by depressing 3-HS-96-19	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations (cont)

Position	Expected Actions	Time/Comments
ATC	Enters 3-AOI-68-1A	
	Subsequent Actions	
	[1] IF both Recirc Pumps are tripped in modes 1 or 2, THEN (Otherwise N/A),	
	A. SCRAM the Reactor.	
	A. RESTART affected Reactor Recirculation pumps. Refer to 3-OI-68 Section 8.0.	
	[2] IF the ΔT between the Rx vessel bottom head temperature and the moderator temperature precludes restart of a Recirc pump, OR forced Recirculation flow CANNOT be established for any reason, THEN (Otherwise NA)	
	B. INITIATE a plant cooldown to prevent exceeding the pressure limit for the Rx vessel bottom head temperature indicated on 3-PNL-9-47, 3-TR-56-4 pt. 10 and based on Tech Specs Figure 3.4.9-1.	
	C. INFORM the Unit Supervisor, Tech Spec 3.4.1 requires the Reactor be placed in Mode 3 in 12 hours. Refer to 3-GOI-100-12A and Tech Specs 3.4.1.B.	
	[2] IF Region I or II of the Power to Flow Map (Illustration 1) is entered, THEN (Otherwise N/A) IMMEDIATELY take actions to INSERT control rods to less than 95.2% loadline. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation.	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations (cont)

Position	Expected Actions	Time/Comments
ATC	[3] RAISE core flow to greater than 45%. Refer to 3-OI-68.	
	[4] INSERT control rods to exit regions if not already exited. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation.	
	[5] CLOSE tripped Recirc Pump discharge valve.	
	[6] MAINTAIN operating Recirc pump flow less than 46,600 gpm. Refer to 3-OI-68.	
	[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]	
	[8] IF Recirc Pump was tripped due to dual seal failure, THEN (Otherwise N/A)	
	[8.1] VERIFY TRIPPED, RECIRC DRIVE 3A(3B) NORMAL FEEDER, 3-HS-57-17(14).	
	[8.2] VERIFY TRIPPED, RECIRC DRIVE 3A(3B) ALTERNATE FEEDER, 3-HS-57-15(12).	
	[8.3] CLOSE tripped recirc pump suction valve using, RECIRC PUMP 3A(3B) SUCTION VALVE, 3-HS-68-1(77).	
	[8.4] IF it is evident that 75°F between the dome AND the idle Recirc loop cannot be maintained, THEN COMMENCE plant shut down and cool down. Refer to 3-GOI-100-12A.	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations (cont)

Position	Expected Actions	Time/Comments
ATC	[9] NOTIFY Reactor Engineer to PERFORM the following: • Tech Specs 3.4.1 • 3-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation • 0-TI-248, Core Flow Determination in Single Loop Operation	
	[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.	
	[11] REFER TO the following ICS screens to help determine the cause of recirc pump trip/core flow lowering. VFDPMPA(VFDPMPB), VFDAAL(VFDBAL)	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations (cont)

Position	Expected Actions	Time/Comments
ATC	[12] CHECK parameters associated with Recirc Drive and Recirc Pump/Motor 3A(3B) on ICS and 3-TR-68-58(84) to determine cause of trip.	
	[13] PERFORM visual inspection of tripped Reactor Recirc Drive.	
	[14] PERFORM visual inspection of Reactor Recirc Pump Drive relay boards for relay targets.	
	[15] IF necessary, THEN (Otherwise N/A) Refer to Illustration 5 of 3-OI-68 for Reactor Recirc Pump trips.	
	[16] INITIATE actions required to make the necessary repairs. (Otherwise N/A)	
	[17] For Single Loop Operation, PERFORM the following:	
	[17.1] Refer to 3-OI-68 for guidance on single loop operation.	
	[17.2] Refer to Tech Specs 3.4.1.	
	[17.3] WHEN available, THEN RETURN tripped Recirc Pump to service. Refer to 3-OI-68.	

XII. Simulator Event Guide:

Event #5: 3A Recirc Pump Runaway / Trip / Power Oscillations (cont)

Position	Expected Actions	Time/Comments
Crew	Notifies Rx Engineer to perform; • 3-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation • 0-TI-248, Core Flow Determination in Single Loop Operation	
SRO	Checks Tech Specs 3.4.1	
ATC	Monitors Reactor for power oscillations	
	Recognizes power oscillations	
	Notifies SRO of power oscillations	
	When recognizes the Rx failed to scram when OPRM setpoint exceeded, inserts manual scram (contingent – manual scram may be inserted prior to exceeding scram setpoint – SRO conservative decision making) **CRITICAL TASK (1)** Insert manual scram within 1 minute of OPRM failure to scram (conditional – Crew may insert manual scram prior to OPRM's exceeding trip setpoint)	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	Recognizes hydraulic ATWS	
	Takes mode switch to shutdown	
	Initiates one channel of ARI	
	Gives scram report	
SRO	Enters 3-EOI-1 do to Scram Condition and Reactor Power > 5% and C5 because it can not been determined that the Reactor will remain subcritical without Boron Injection under all conditions.	
	Directs initiating 2nd channel of ARI	
	Directs tripping 3B Recirc pump	
ATC	Initiates 2nd channel of ARI	
	Trips 3B Recirc pump	
	Reports Rx power > 5%	
Crew	Announces Rx scram	
SRO	Directs ADS inhibited	
BOP	Inhibits ADS **CRITICAL TASK (2)** Prevent Auto ADS actuation	
	Recognizes and report Main Turbine Trip and Bypass Valves failed closed.	
SRO	Directs bypassing scrams per App-1F, "Manual Scram"	
	Directs bypassing ARI per App-2, "Defeating ARI Logic Trips"	
	Directs ATC to insert control rods per App-1D, "Insert Control Rods Using Reactor Manual Control System"	
BOP	Calls for App-1F, "Manual Scram," and App-2, "Defeating ARI Logic Trips"	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	Performs App-1D, "Insert Control Rods Using Reactor Manual Control System"	
	1. VERIFY at least one CRD pump in service	
	2. IF ..... Reactor Scram or ARI CANNOT be reset, THEN ... DISPATCH personnel to CLOSE 3-SHV-085-0586, CHARGING WATER SOV (RB NE, El 565 ft)	
	3. VERIFY REACTOR MODE SWITCH in SHUTDOWN	
	4. BYPASS Rod Worth Minimizer	
	5. REFER to Attachment 2 and INSERT control rods in the area of highest power as follows: a. SELECT control rod b. PLACE CRD NOTCH OVERRIDE switch in EMERG ROD IN position UNTIL control rod is NOT moving inward c. REPEAT Steps 5.a and 5.b for each control rod to be inserted **CRITICAL TASK (3)** Controls power by : Inserting control rods per RC/Q-21 Lowering water level per C5 and App-4, "Prevention of Injection"	
	6. WHEN ... NO further control rod movement is possible or desired, THEN ... DISPATCH personnel to VERIFY OPEN 3-SHV-085-0586, CHARGING WATER SOV (RB NE, El 565 ft)	
Crew	Recognizes and reports Group 2, 3, and 6 isolations if water level decrease below +2"	
SRO	Directs App-8A, "Bypassing Group 1 Low Low Low Level Isolation Interlocks" and App-8E, "Bypassing Group 6 RPV Low Level and High Drywell Pressure Isolation Interlocks"	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
SRO	Directs Rx pressure be maintained 800 – 1000 psig with any of the following; • MSRV's – App-11A, "Alternate RPV Pressure Control Systems- MSRVs" • MSL Drains – App-11D, "Alternate RPV Pressure Control Systems- Main Steam Line Drains and/or Turbine and RFPT Drains"	
BOP	Controls Rx pressure as directed with App-11A, "Alternate RPV Pressure Control Systems- MSRVs"	
	1. IF ..... Drywell Control Air is NOT available, THEN ... EXECUTE EOI Appendix 8G, "Crosstie CAD Trains to Drywell Control Air," CONCURRENTLY with this procedure.	
	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	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	Controls Rx pressure as directed with App-11D, "Alternate RPV Pressure Control Systems- Main Steam Line Drains and/or Turbine and RFPT Drains" (If directed)	
	1. IF ..... BOTH of the following exist: • Emergency RPV Depressurization is required, AND • Group 1 Isolation Signal exists, THEN ... EXIT this procedure and ENTER EOI Appendix 11H, "Alternate RPV Pressure Control Systems- Main Condenser"	
	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): o 3-FCV-1-55, MN STM LINE DRAIN INBD ISOLATION VLV o 3-FCV-1-56, MN STM LINE DRAIN OUTBD ISOLATION VLV o 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	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	5. IF ..... At least one main steam line is open AND EITHER of the following exist: • Turbine bypass valves are NOT available, OR • Additional RPV pressure control is necessary, THEN ... CONTROL RPV pressure with Main Turbine and RFPT drains as follows: a. OPEN the following Main Turbine Drain valves (Panel 3-9-7): o 3-FCV-6-100, STOP VALVE 1 BEFORE SEAT DR VLV o 3-FCV-6-101, STOP VALVE 2 BEFORE SEAT DR VLV o 3-FCV-6-102, STOP VALVE 3 BEFORE SEAT DR VLV o 3-FCV-6-103, STOP VALVE 4 BEFORE SEAT DR VLV b. OPEN the following RFPT drain valves (Panel 3-9-6): o 3-FCV-6-122, RFPT 3A HP STOP VLV ABOVE SEAT DR o 3-FCV-6-127, RFPT 3B HP STOP VLV ABOVE SEAT DR o 3-FCV-6-132, RFPT 3C HP STOP VLV ABOVE SEAT DR	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
SRO	Directs Rx water level be lowered to control power to -50" per C5 and App-4, "Prevention of Injection" **CRITICAL TASK (3)** Controls power by : Inserting control rods per RC/Q-21 Lowering water level per C5 and App-4, "Prevention of Injection"	
BOP	Performs Appendix-4, "Prevention of Injection," on 9-3 as follows:	
	1. PREVENT injection to RPV from the following systems in any order as required:	
	a. HPCI 1) IF ..... HPCI Turbine is NOT at zero speed, THEN..... PRESS and HOLD 3-HS-73-18A, HPCI TURBINE TRIP push-button 2) WHEN ..... HPCI Turbine is at zero speed, THEN..... PLACE 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	
	b. RCIC 1) IF ..... DIRECTED by SRO to allow RCIC injection, THEN..... EXIT step 1.b 2) PRESS 3-HS-71-9A, RCIC TURBINE TRIP push-button to trip RCIC Turbine	
	c. CORE SPRAY NOTE: After 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	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
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) PLACE 3-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL, in BYPASS AND 2) VERIFY CLOSED 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE	
	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) PLACE 3-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL, in BYPASS AND 2) VERIFY CLOSED 3-FCV-74-66, RHR SYS II LPCI OUTBD INJECT VALVE	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	Performs Appendix-4, "Prevention of Injection," on 9-5 & 9-6 as follows:	
	f. CONDENSATE and FEEDWATER	
	1) LOWER RFPT 3A(3B)(3C) speed to minimum setting (approximately 600 rpm) using ANY of the following methods on Panel 3-9-5: o 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, OR o Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL, OR o Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	2) CLOSE the following valves BEFORE RPV pressure drops below 450 psig: o 3-FCV-3-19, RFP 3A DISCHARGE VALVE o 3-FCV-3-12, RFP 3B DISCHARGE VALVE o 3-FCV-3-5, RFP 3C DISCHARGE VALVE o 3-LCV-3-53, RFW START-UP LEVEL CONTROL	
	3) TRIP RFPTs as necessary to prevent injection by DEPRESSING the following push-buttons: o 3-HS-3-125A, RFPT 3A TRIP o 3-HS-3-151A, RFPT 3B TRIP o 3-HS-3-176A, RFPT 3C TRIP	
SRO	When Rx water level is lowered to -50", directs water level be maintained -50" to -162" with RFP's per App-5A, "Injection System Lineup-Condensate/Feedwater" (directed water level band may be smaller if directed by SRO, i.e. -50" to -100")	
ATC	Re-establishes injection with a RFP in the directed water level band per App-5A, "Injection System Lineup-Condensate/Feedwater"	
	1. VERIFY Condensate System in service, supplying suction to RFPs	
	2. VERIFY OPEN MSIVs, supplying steam to RFPTs	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	3. VERIFY Hotwell Pressure below -7 in. Hg	
	4. VERIFY CLOSED 3-FCV-1-121(129)(137), RFPT 3A(3B)(3C) LP STEAM SUPPLY VALVE	
	5. VERIFY OPEN 3-FCV-1-125(133)(141), RFPT 3A(3B)(3C) HP STEAM SUPPLY VALVE	
	6. DEPRESS 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER, and VERIFY amber light is illuminated	
	7. VERIFY a Main Oil Pump is running for RFPT to be started	
	8. VERIFY for EACH of the following pushbuttons, the green light is illuminated and the red light is extinguished: • 3-HS-3-208A, RX WTR LVL CH A HI RFPT/MT TRIP RESET • 3-HS-3-208B, RX WTR LVL CH B HI RFPT/MT TRIP RESET	
	9. VERIFY OPEN the following valves: • 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	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments

ATC	10. DEPRESS 3-HS-3-124A(150A)(175A), RFPT 3A(3B)(3C) TRIP RESET, and CHECK the following:
	• Blue light extinguished
	• HP Stop Valve open as indicated by red light above the following, as applicable:
	  ○ 3-HS-3-108, RFPT 3A HP STOP VLV TEST
	  ○ 3-HS-3-134, RFPT 3B HP STOP VLV TEST
	  ○ 3-HS-3-159, RFPT 3C HP STOP VLV TEST
	• LP Stop Valve open as indicated by red light above the following, as applicable:
	  ○ 3-HS-3-107, RFPT 3A LP STOP VLV TEST
	  ○ 3-HS-3-133, RFPT 3B LP STOP VLV TEST
	  ○ 3-HS-3-158, RFPT 3C LP STOP VLV TEST	

	11. VERIFY OPEN 3-FCV-3-20(13)(6), RFP 3A(3B)(3C) MIN FLOW VALVE	
	12. PLACE 3-HS-46-112A(138A)(163A), RFPT 3A(3B)(3C) START/LOCAL ENABLE, in START	
	13. CHECK RFPT 3A(3B)(3C) speed increases to approximately 600 rpm	
	14. VERIFY OPEN 3-FCV-3-19(12)(5), RFP 3A(3B)(3C) DISCHARGE VALVE	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	15. RAISE RFPT 3A(3B)(3C) speed UNTIL RFP discharge pressure is approximately equal to RPV pressure using ANY of the following methods on Panel 3-9-5: • Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR, OR • Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL, OR • Using 3-LIC-46-5, REACTOR WATER LEVEL CONTROL PDS, in MANUAL with individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in AUTO	
	16. SLOWLY RAISE speed of RFPT UNTIL RFW flow to the RPV is indicated using ANY of the following methods on Panel 3-9-5: • Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR, OR • Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL, OR • Using 3-LIC-46-5, REACTOR WATER LEVEL CONTROL PDS, in MANUAL with individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in AUTO	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	17. ADJUST RFPT speed as necessary to control injection using ANY of the following methods on Panel 3-9-5: • Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR, OR • Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL, OR • Using 3-LIC-46-5, REACTOR WATER LEVEL CONTROL PDS, in MANUAL with individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in AUTO	
	18. WHEN ... RPV level is approximately equal to desired level AND automatic level control is desired, THEN ... PLACE 3-LIC-46-5, REACTOR WATER LEVEL CONTROL PDS, in AUTO with individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in AUTO	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure

Position	Expected Actions	Time/Comments
ATC	Continues in Appendix-1D, "Insert Control Rods Using Reactor Manual Control System"	
	When notified that App-2, "Defeating ARI Logic Trips," is complete and outside portion of App-1F, "Manual Scram," is complete, continues in Appendix-1F and resets scram and starts draining SDV's	
	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: • 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)	
	5. DISPATCH personnel to VERIFY OPEN 3-SHV-085-0586, CHARGING WATER SOV	
	NOTE: If EOI Appendix 2, "Defeating ARI Logic Trips," has been executed, ARI initiation or reset will NOT be possible or necessary in Step 6	
	6. WHEN ... CRD Accumulators are recharged, THEN ... INITIATE manual Reactor Scram and ARI **CRITICAL TASK (3)** Controls power by : Inserting control rods per RC/Q-21 Lowering water level per C5 and App-4, "Prevention of Injection"	
	7. CONTINUE to perform Steps 1 through 6 UNTIL ANY of the following exists: • ALL control rods are inserted to or beyond position 02, OR • NO inward movement of control rods is observed, OR • SRO directs otherwise	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
Crew	Recognize and reports "OG Pretreatment Radiation High" and "OG Annual Release Limit Exceeded", notifies RadCon, and Chemistry	
SRO	When the Suppression Pool temperature reaches 95°F (or level -1"), enters EOI-2 and directs; • all available Suppression Pool cooling per App-17A, "RHR System Operation in Suppression Pool Cooling Mode" • H_2O_2 Analyzers placed in service • vent containment per App-12, "Primary Containment Venting," (if needed)	
BOP	Places suppression pool cooling in service per Appendix-17A, "RHR System Operation in Suppression Pool Cooling Mode"	
	1. IF.....Adequate core cooling is assured, OR Directed to cool the Suppression Pool irrespective of adequate core cooling, THEN.....BYPASS LPCI injection valve auto open signal as necessary by PLACING 3-HS-74-155A(B), LPCI SYS I(II) OUTBD INJ VLV BYPASS SEL in BYPASS.	
	2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:	
	a. VERIFY at least one RHRSW pump supplying each EECW header.	
	b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV • 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV	
	d. IF ..... Directed by SRO, THEN.....PLACE 3-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD in MANUAL OVERRIDE.	
	e. IF .....LPCI INITIATION Signal exists, THEN.....MOMENTARILY PLACE 3-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT in SELECT.	
	f. IF ..... 3-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN..... VERIFY CLOSED 3-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.	
	g. OPEN 3-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.	
	h. VERIFY desired RHR pump(s) for Suppression Pool Cooling are operating.	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	i. THROTTLE 3-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 3-FI-74-50(64), RHR SYS I(II) FLOW: • Between 7000 and 10000 gpm for one-pump operation. OR • At or below 13000 gpm for two-pump operation.	
	j. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.	
	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.	
	Places H_2O_2 Analyzers in service per EOI-2	
	1. Place Analyzer isolation bypass keylock switches to bypass	
	2. Select DW or Supp Chmbr and momentarily pull out select switch handle to start sample pumps	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	Vents Containment per Appendix-12, "Primary Containment Venting," (If directed)	
	1. VERIFY at least one SGTS train in service.	
	2. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): • 3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV, • 3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE, • 3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV, • 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE.	
	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.	
	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.	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	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:
	  o Step 10 to vent the Drywell through 3-FCV-84-19, OR
	  o 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.	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

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

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	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: • Stable flow as indicated on controller, AND • 3-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished, AND • Release rates as determined below:	
	i. IF. . .PRIMARY CONTAINMENT FLOODING per C-1, Alternate Level Control, is in progress THEN. .MAINTAIN release rates below those specified in Attachment 2.	
	ii. IF. . .Severe Accident Management Guidelines are being executed, THEN. .MAINTAIN release rates below those specified by the TSC SAM Team.	
	iii. IF. . .Venting for ANY other reason than items i or ii above, THEN. .MAINTAIN release rates below Stack release rate of 1.4×10^7 µCi/s AND 0-SI-4.8.B.1.a.1 release fraction of 1.	
	Contacts LOG AUO to monitor release rates	
Crew	Recognizes fuel damage from multiple Rad alarms and recognizes MSL Hi Hi Rad alarm	
SRO	Directs MSIV remain open due to ongoing ATWS	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
ATC	After SDV drained (alarms 9-4A windows 1 and 28 clear) directs 85-586 re-opened (If closed)	
	After accumulators recharged, inserts 2nd scram	
	Recognizes some control rod movement, but all control rods not in	
SRO	Directs reactor reset, drain SDV, and re-scram	
	Directs SLC injection (conditional – if Suppression Pool temp ≥110°F)	
ATC	After SDV drained again, inserts 3rd scram	
	Recognizes and reports all control inserted on scram	
BOP	Verifies all rods in	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
SRO	Exits C5 to RCL (EOI-1) do to all Control Rods inserted	
	Exits RCQ do to all Control Rods inserted and directs OATC enter 3-AOI-100-1	
	Directs level be restored +2" to +51" with RCIC (App-5C, "Injection System Lineup- RCIC") , and/or CRD (App-5B, "Injection System Lineup-CRD") **CRITICAL TASK (4)** When all rods are inserted restores and maintains RPV water level above TAF	
	Directs SLC stopped (if injected)	
	Directs closing MSIV's due to MSL Hi Hi alarm and no longer in C5	
ATC	Performs actions in AOI-100-1	
BOP	Aligns and injects with RCIC per Appendix-5C, "Injection System Lineup- RCIC"	
	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, "Bypassing RCIC Low Reactor Pressure Isolation Interlocks"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, "Bypassing RCIC High Temperature Isolation," concurrently with this procedure b. RESET auto isolation logic using RCIC AUTO-ISOL LOGIC A(B) RESET 3-XS-71-51A(B) pushbuttons	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	3. VERIFY RESET and OPEN 3-FCV-71-9, RCIC TURB TRIP/THROT VALVE RESET	
	4. VERIFY 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller in AUTO with setpoint at 600 gpm	
	5. OPEN the following valves: • 3-FCV-71-39, RCIC PUMP INJECTION VALVE • 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE • 3-FCV-71-25, RCIC LUBE OIL COOLING WTR VLV	
	6. PLACE 3-HS-71-31A, RCIC VACUUM PUMP, handswitch in START	
	7. OPEN 3-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC Turbine	
	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	
	9. IF ..... BOTH of the following exist: • RCIC Initiation signal is NOT present, AND • RCIC flow is below 60 gpm, THEN ... VERIFY OPEN 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	10. ADJUST 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller as necessary to control injection	
	11. IF ..... It is desired to align RCIC suction to the Suppression Pool, THEN ... PERFORM the following: a. OPEN 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE b. OPEN 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE c. WHEN ... 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE, and 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE, are fully open, THEN ... VERIFY CLOSED 3-FCV-71-19, RCIC CST SUCTION VALVE NOTE: Step 12.b must be performed promptly following Step 12.a to avoid loss of suction path	
	12. IF ..... It is desired to align RCIC suction to the Condensate Storage Tank, THEN ... PERFORM the following: a. CLOSE 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE b. WHEN ... 3-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE starts traveling closed, THEN ... OPEN 3-FCV-71-19, RCIC CST SUCTION VALVE c. CLOSE 3-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	Aligns and injects with CRD per Appendix-5B, "Injection System Lineup- CRD"	
	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.	
	2. IF ..... BOTH of the following exist: • CRD is NOT required for rod insertion, AND • Maximum injection flow is required, THEN ... LINE UP ALL available CRD pumps to the RPV as follows:	
	a. IF ..... CRD Pump 3A is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.	
	b. IF ..... CRD Pump 3B is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	c. OPEN the following valves to increase CRD flow to the RPV: • 3-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV • 3-PCV-85-27, CRD CLG WATER PRESS CONTROL VLV • 3-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.	
	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.	
	e. IF .....Additional flow is necessary to prevent or mitigate core damage, THEN .....DISPATCH personnel to fully open the following valves as required: • 3-THV-085-0527, CRD PUMP DISCH THROTTLING (RB NE, el 565') • 3-BYV-085-0551, CRD PUMP TEST BYPASS (RB NE, el 565').	

XII. Simulator Event Guide:

Event #6: ATWS with Fuel Failure (cont)

Position	Expected Actions	Time/Comments
BOP	Stops SLC (if injected)	
	Closes MSIV's when directed **CRITICAL TASK (5)** Close MSIV's within 5 minutes of exiting C5	
Crew	Recognize RM-90-29A Rx Bldg High Radiation (conditional)	
	Evacuates Rx Bldg	
SRO	If Rx Bldg High Rad alarm received, enters EOI-3 (conditional)	
	Classifies event as a Site Area Emergency (1.2-S)	

XIII. Crew Critical Tasks:

	TASK	SAT/UNSAT
1)	Insert manual scram within 1 minute of OPRM failure to scram (conditional – Crew may insert manual scram prior to OPRM's exceeding trip setpoint)	
2)	Prevent Auto ADS actuation	
3)	Controls power by : Inserting control rods per RC/Q-21 Lowering water level per C5 and App-4, "Prevention of Injection"	
4)	When all rods are inserted restores and maintains RPV water level above TAF	
5)	Close MSIV's within 5 minutes of exiting C5	

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER: HLTS-3-16

7 Total Malfunctions Inserted: List (4-8)
1) Core Spray failure (SR)
2) Rx Zone fan failure
3) Recirc pump runaway/trip
4) Power Oscillations
5) Failure of OPRM's to auto scram
6) ATWS
7) Fuel failure

2 Malfunctions that occur after EOI entry: List (1-4)
1) ATWS
2) Fuel failure

2 Abnormal Events: List (1-3)
1) Rx Zone fan failure
2) Recirc pump runaway/trip

2 Major Transients: List (1-2)
1) ATWS
2) Fuel failure

3 EOI's used: List (1-3)
1) EOI-1
2) EOI-2
3) EOI-3

1 EOI Contingencies used: List (0-3)
1) C5

90 Run Time (minutes)

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

5 Crew Critical Tasks: (2-5)

YES Technical Specifications Exercised (Yes/No) – TRM

SHIFT TURNOVER SHEET

Equipment Out of Service/LCO's:

HPCI tagged out for 14 hours to repair Auxiliary Oil Pump. Expected back in 3 hours. T.S. 3.5.1. , 14 days LCO. Feedwater flow indicator 3-78B out of service, IM's are looking for a new Transmitter. Loop II Core Spray Room Cooler Thermostat has been disabled in accordance Core Spray Loop II Flow Rate SR 3-SR-3.5.1.6(CS II). TRM 3.3.3.2 Condition A.2 entered. Required Channel must be restored within 24 hours.

Operations/Maintenance for the Shift:

Reduce power to 92% with recirculation flow (due to system load not required). Core Spray Loop II Flow Rate SR 3-SR-3.5.1.6(CS II) in progress, continue SR at step 7.3.[1], Digital Voltmeter will be required do to ICS not available. Prejob brief completed for SR and power reduction. Units 1 & 2 are at 92% power

Unusual Conditions/Problem Areas:

Severe thunderstorms in area for the next 4 hours

Facility: Browns Ferry Scenario No.: **3-17** Op-Test No.: 0801

Examiners:	

Operators:	SRO:	
	ATC:	
	BOP:	

Initial Conditions: 6% power with RHR Loop II tagged and 3A & B RFP's being tagged

Turnover: Lower power to < 5%, swap steam loads, place Mode switch in Mode 2. Severe thunderstorm warnings for the next 10 to 12 hours.

Event No.	Malf. No.	Event Type*	(Credited Position) / Event Description
1	n/a	R-ATC N-SRO	Lower power to < 5%
2	n/a	N-BOP N-SRO	place SJAE & OG preheaters on Aux steam
3	rd01a	C-ATC C-SRO	Mode Switch to Start / Hot Standby and 3A CRD Failure
4	nm05a 100	I-ATC TS-SRO	Respond to IRM failure upscale (after in Mode 2) (bypass)
5	ypomtro2pmpb	C-BOP TS-SRO	Respond to failure of O_2 sample pump, swap analyzers
6	fw13c	C-BOP C-SRO	Respond to 3C RFP trip and place RCIC in service per 3-OI-71, Reactor Core Isolation Cooling System
7	mult	M-ALL	Respond to scram / ATWS
8	th33a 10	M-ALL	Respond to Steam line break in Drywell / Terminate and Prevent / Emergency Depressurize at – 180"

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

ANTICIPATED EAL: 1.1-S-1 – SITE AREA

Starting ~ 6% power, the crew will lower power to < 5%% by inserting control rods per 3-GOI-100-12A, RCP, and 3-OI-85

Turbine sealing steam has already been swapped to aux boiler steam and the crew will swap the operating SJAE and Off-Gas Preheater from nuclear steam to aux boiler steam per 3-GOI-100-12A and 3-OI-66

The crew will continue the power reduction and respond to 3A CRD pump trip per 3-AOI-85-3

After the Mode Switch is placed in Mode 2, 3A IRM fails upscale and will cause a ½ scram and the crew will by-pass the IRM and reset the ½ scram

The H_2O_2 Analyzer selected for the Drywell will fail requiring swapping the Analyzer selected for Suppression Chamber to the Drywell

The only remaining RFP will trip (shortly after low oil level alarm and low bearing oil pressure alarms) and the crew will respond per 3-AOI-3-1 and place RCIC in service per 3-OI-71, but power is still too high for RCIC alone and HPCI aux oil pump will not start, requiring a manual scram

Several control rods (9) fail to insert on the scram and will not be able to be inserted. The rods are clustered together and the Reactor Engineer will determine that the Reactor will NOT remain subcritical under all conditions

A Drywell leak will cause level to lower and Drywell pressure to increase and the crew will respond per EOI-1, EOI-2, and C-5 to spray the Suppression Chamber and Drywell before having to terminate and prevent prior to emergency depressurization when level drops to -180".

Only 2 ADS valves will open, requiring opening 3 additional valves (for a total of 5 valves which changes MARF to 230 psig)

ANTICIPATED EAL: 1.1-S-1 – SITE AREA

SIMULATOR EVALUATION GUIDE

TITLE: Downpower from ~6% to ~1%, respond to 3A CRD pump trip, IRM failure upscale and ½ scram, swap steam loads to aux boiler, RFP trip – swap to RCIC, close MSIV's and maintain level with RCIC until a Drywell leak develops and level lowers to -180" and the crew will Terminate and prevent and Emergency Depressurize (opening 3 additional valves to get a total of 5) and re-commence injection at MARF of 230 psig

REVISION: 0

DATE: Mar. 7, 2009

PROGRAM: BFN Operator Training – Hot License

RCP required for power reduction from ~6% to ~1% by inserting Control Rods (Provide at turnover)

Verify IRM recorders have alarms set for 75 per 3-GOI-100-12A step 5.0[32.5]

PREPARED: _____ \ _____
(Operations Instructor) Date

REVIEWED: _____ \ _____
(LOR Lead Instructor or Designee) Date

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

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

VALIDATED: _____ \ _____
(Operations SRO) (Required for Exam Scenarios) Date

LOGGED-IN: _____ \ _____
(Librarian) Date

TASK LIST UPDATED _____ \ _____
Date

Nuclear Training

Revision/Usage Log

Revision Number	Description of Changes	Date	Pages Affected	Revised
0	Initial	03/07/09	All	csf

I. Program: BFN Operator Training

II. Course: Examination Guide

III. Title: Downpower from ~6% to ~1%, respond to 3A CRD pump trip, IRM failure upscale and ½ scram, swap steam loads to aux boiler, RFP trip – swap to RCIC, close MSIV's and maintain level with RCIC until a Drywell leak develops and level lowers to -180" and the crew will Terminate and prevent and Emergency Depressurize (opening 3 additional valves to get a total of 5) and re-commence injection at MARF of 230 psig

IV. Length of Scenario – 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, annunciator, abnormal, and emergency procedures.

B. Enabling Objectives:

1. The operating crew will lower power to < 5% by inserting control rods per 3-GOI-100-12A and 3-OI-85

2. The operating crew will swap steam loads from nuclear steam to aux boiler steam per 3-OI-66

3. The operating crew will continue to lower power and place the Mode Switch in Mode 2 and will recognize and respond to a trip of 3A CRD pump and place 3B in service per 3-AOI-85-3

4. The operating crew will recognize and respond to an IRM failure upscale and subsequent ½ scram and recovery per 3-OI-92A and 3-OI-99

5. The operating crew will recognize and respond to a trip of the H_2O_2 Analyzer aligned to the Drywell and will swap analyzers

6. The operating crew will recognize and respond to a trip of the only remaining RFP per 3-AOI-3-1 and place RCIC in service per 3-OI-71

7. The operating crew will recognize and respond to an ATWS and Drywell leak per EOI-1, EOI-2, and C-5

8. The operating crew will terminate and prevent injection and emergency depressurize the Reactor when level drops to -180" per Appendix-4, "Prevention of Injection" and C-2

9. The operating crew will recognize and respond to a Drywell control air leak and open additional relief valves when ADS valves fail to open (total of 5 that can open causing MARF to be 230 psig)

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 Sheets

C. Stopwatch

D. Hold Order / Caution Order tags

E. Annunciator window covers

F. Steam tables

VIII. Console Operator Instructions

A. Scenario File Summary

1. File: bat hlts-3-17

MF/RF/OR#		Description
1)	mrf ms01 on	Aux boilers in service
2)	mrf pc06 start	Pri Cont Purge Filter Fan I/S
3)	mrf eg03 oos	Gen Core monitor OOS
4)	imf fw13a	Places trip on RFP 3A
5)	imf fw13b	Places trip on RFP 3B
6)	imf hp05	Prevents HPCI aux oil pump from starting
7)	lor zdihs7347a[1] null	Prevents Manual start of HPCI Aux Oil Pump
8)	imf ad03a	Fail closed (electrically) ADS valve 1-5
9)	imf ad03b	Fail closed (electrically) ADS valve 1-19
10)	imf ad03c	Fail closed (electrically) ADS valve 1-22
11)	imf ad03d	Fail closed (electrically) ADS valve 1-18
12)	ior zdihs0142[1] close/auto	Fail handswitch on SRV 1-42
13)	bat rhr2to	Tag 3B & 3D RHR pump motors only
14)	bat hlts-3-17-1	Stick 9 control rods (all in a close cluster)
15)	bat hlts-3-17-6	Tag 3A & 3B RFP's – start sw, steam valves, pump suction and discharge valves
16)	ior zdihs7117a[1] null	Null RCIC CST suction valve
17)	mrf ia02 align	Align CA to DWCA
18)	sev iavhcv311736 1	Open 32-1736
19)	ior zdihs8550a[2] close	85-50 overridden closed
20)	ior zdihs8448[1] close	Tag N2 to DW
21)	ior zdihs8449[1] close	
22)	ior zdihs848ab[1] off	
23)	ior zdihs848cd[1] off	

2. File: bat hlts-3-17-1

MF/RF/OR#		Description
1)	imf rd06r2227	Stick 9 control rods (grouped together)
2)	imf rd06r2631	
3)	imf rd06r3431	
4)	imf rd06r2623	
5)	imf rd06r3035	
6)	imf rd06r3027	
7)	imf rd06r2235	
8)	imf rd06r2639	
9)	imf rd06r3043	

3. File: bat hlts-3-17-2

MF/RF/OR#		Description
1)	ior zdihs03153a[3] stop	Trip 3C3 EBOP
2)	ior zlohs03153a[1] on	Override green light

4. File: bat hlts-3-17-3

MF/RF/OR#		Description
1)	dor an:ov:xa556c[26]	Delete oil pressure alarm override after oil pumps secured
2)	dor an:ov:xa556c[16]	

5. File: bat hlts-3-17-6

MF/RF/OR#		Description
1)	ior zdihs46112a[1] norm	Tag 3A & 3B RFP's – start / local enable switch, HP & LP steam valves, suction, discharge, and min flow valves
2)	ior zdihs46138a[1] norm	
3)	ior zlohs46112a[2] off	
4)	ior zlohs46138a[2] off	
5)	ior zlohs03124[1] off	
6)	ior zlohs03150[1] off	
7)	ior zlohs01125a[1] off	
8)	ior zlohs01121a[1] off	
9)	ior zlohs01133a[1] off	
10)	ior zlohs01129a[1] off	
11)	ior zlohs01125a[2] off	
12)	ior zlohs01121a[2] off	
13)	ior zlohs01133a[2] off	
14)	ior zlohs01129a[2] off	
15)	ior zdihs0319a[1] null	
16)	ior zlohs0319a[2] off	
17)	ior zlohs0319a[1] off	
18)	ior zdihs0283a[1] null	
19)	ior zlohs0283a[2] off	
20)	ior zlohs0283a[1] off	
21)	ior zdihs0312a[1] null	
22)	ior zlohs0312a[2] off	
23)	ior zlohs0312a[1] off	
24)	ior zdihs0295a[1] null	
25)	ior zlohs0295a[2] off	
26)	ior zlohs0295a[1] off	
27)	ior ypovfcv0320 fail_control_power	
28)	ior ypovfcv0313 fail_control_power	

6. File: bat hlts-3-17-7

MF/RF/OR#		Description
1)	ior an:ov:xa556c[26] alarm_on	1st low oil press alarm
2)	ior zdihs03156a[1] test	Auto start of EBOP 3C3 oil pump
3)	useless commands for time delay	
4)	ior an:ov:xa556c[4] alarm_on	Low oil level alarm
5)	useless commands for time delay	
6)	ior an:ov:xa556c[16] alarm_on	2nd low oil press alarm
7)	imf fw13c (none :15)	Trip 3C RFP after 10 sec time delay
8)	imf th22 100	Bottom drain leak

7. File: bat app07b

MF/RF/OR#		Description
1)	mrf sl01 align	Align SLC to test tank

8. File: bat rhr2to

MF/RF/OR#		Description
1)	ior ypobkrpmpbrh fail_power	Tag 3B & 3D RHR pump motors only
2)	ior ypobkrpmpdrh fail_power	

IX. Console Operators Instructions

HLTS 3-17

ELAP TIME		DESCRIPTION/ACTION
Simulator Setup	manual	~ 6% power MOC reset IC-233 (david)
Simulator Setup		Main batch file – see summary bat hlts-3-17
Simulator Setup	manual	Place in run and reset RWM – should latch into group 51 with rod 30-31 selected (clear rod block alarms if in)

Simulator Setup	manual (should be 16 cards total)	Pnl 9-5 - Push in on 3A RFP Speed Control (3-HS-46-8A) Pnl 9-5 - Push in on 3B RFP Speed Control (3-HS-46-9A) Place HO cards on all the following: Pnl 9-3 - 3B RHR pump HS (3-HS-74-28A) Pnl 9-3 - 3D RHR pump HS (3-HS-74-39A) Pnl 9-6 - 3A RFP LP Steam valves (3-HS-1-121A) Pnl 9-6 - 3A RFP HP Steam valves (3-HS-1-125A) Pnl 9-6 - 3B RFP LP Steam valves (3-HS-1-129A) Pnl 9-6 - 3B RFP HP Steam valves (3-HS-1-133A) Pnl 9-6 - 3A RFP start / local enable HS (3-HS-46-112A) Pnl 9-6 - 3B RFP start / local enable HS (3-HS-46-138A) Pnl 9-6 - 3A RFP Discharge valve (3-HS-3-19A) Pnl 9-6 - 3A RFP Suction valve (3-HS-2-83A) Pnl 9-6 - 3A RFP Min Flow valve (3-HS-3-20) Pnl 9-6 - 3B RFP Discharge valve (3-HS-3-12A) Pnl 9-6 - 3B RFP Suction valve (3-HS-2-95A) Pnl 9-6 – 3B RFP Min Flow valve (3-HS-3-13) Pnl 9-54 – CAD A Cross Tie to DWCA (3-HS-84-48) Pnl 9-54 – Suppr Chbr / DW CAD 3A Sply Sel (3-HS-84-8A/B) Pnl 9-55 – CAD B Cross Tie to DWCA (3-HS-84-49) Pnl 9-55 – Suppr Chbr / DW CAD 3B Sply Sel (3-HS-84-8C/D)

ROLE PLAY: **If requested as Aux Boiler AUO, report Aux Boilers in service and pressure is 180 psig (OI-66 step 8.12[1.3])**

ROLE PLAY: **When requested, report 3-12-679 is open (SJAE STM SPLY valve) (OI-66 step 8.12[2])**

ROLE PLAY: **When requested, report STEAM TO SJAE STAGE I & II pressure at 3-PI-001-0150 and 0152 on Panel 25-105, is 180 psig (OI-66 step 8.12[3])**

When requested - OI-66 step 8.12 [5]		Low Steam pressure permissive mrf og10 norm

ROLE PLAY: **Report SJAE TRAIN PERMISSIVE 3-HS-001-0375 is in NORM (OI-66 step 8.12 [5])**

When requested - OI-66 step 8.12 [6]		manual valve to 3A SJAE open mrf og03a open
	or	
		manual valve to 3B SJAE open mrf og03b open

ROLE PLAY: **Report AUX STM TO SJAE A(B) 1ST, 2ND & 3RD STG, 3-HS-12-3A(5A) open (OI-66 step 8.12 [6]) (report the valve associated with the SJAE they are trying to place in service)**

When requested - OI-66 step 8.12 [9.1] & [9.2]		Steam inlet to 3A preheater open mrf og04a aux
	and	
		Steam inlet to 3B preheater open mrf og04b aux

ROLE PLAY: **When requested, report AUX STEAM TO OFF-GAS PREHEATER A and B, 3-HS-12-74B and 3-HS-12-75B are open (OI-66 step 8.12 [9.1 & 9.2])**

ROLE PLAY: **When requested, report MAIN STEAM TO OFF-GAS PREHEATER 3A and 3B, 3-HS-1-176C and 3-HS-1-176D are closed (OI-66 step 8.12 [9.3 & 9.4])**

After Mode Switch taken to Mode 2		Trip 3A CRD pump imf rd01a

ROLE PLAY: **If dispatched to investigate trip of 3A CRD pump, report breaker tripped on overload and the pump motor extremely hot**

ROLE PLAY: **If asked to check 3B CRD pump, report all oil levels are good and slinger rings are turning**

After 3B CRD Pump actions are taken.		Fail IRM A upscale imf nm05a 100 0:40

ROLE PLAY: **If dispatched to check / align control air to drywell control air, report That 3-SHV-32-332 valve is unlocked and open and the 3-SHV-32-327B is closed. The tagging crew is in the Process of tagging N_2 to Containment**

3 minutes after Tech Spec call on bypassed IRM A, or when directed by lead evaluator		Fail O_2 sample pump B (DW) ior ypomtro2pmpb fail_control_power

ROLE PLAY: **If dispatched to investigate loss of O_2 sample pump, report pump is extremely hot and the rotor is locked up**

ROLE PLAY: **(3 minutes after O_2 sample pump swapped) As AUO on rounds, report a large puddle of oil visible on floor between the turbine and pump of 3C RFP. Oil discharge pressure is 150 psig and lowering and bearing oil pressure is 45 psig and lowering. The oil tank indicates that level is lowering**

2 minutes after AUO report		3C RFP EBOP auto starts & low press alarm – RFP trips on low pressure alarm / low level, after time delay – small DW leak bat hlts-3-17-7

ROLE PLAY: **If dispatched to investigate 3C RFP after trip, wait 1 minute and report nothing notable except oil puddle is larger**

ROLE PLAY: **Respond as needed as Radwaste UO if contacted to lock-out U3 Turbine bldg floor drain sump pumps**

If 3C RFP oil pumps secured		clear low oil pressure alarms bat hlts-3-17-3

When EOI-2 entered on Drywell temperature		RCIC trip on low suction pressure imf rc03

6 minutes after scram or sooner if needed to get level down sooner		Recirc leak in Drywell imf th21 1 15:00

If dispatched to close 3-85-586 valve, wait 3 minutes		Close 3-85-586 mrf rd06 close

ROLE PLAY: **Call and report 3-85-586 closed**

If dispatched to open 3-85-586 valve, wait 1 minute		Open 3-85-586 mrf rd06 open

ROLE PLAY: **Call and report 3-85-586 open**

If dispatched to perform App-7B, wait 25 minutes		Align SLC to test tank bat app07b

ROLE PLAY: **If directed to perform any sections of 3-OI-85 section 8.19 to insert stuck control rods, (i.e. vent overpiston area, etc.) repeat back directions (but you'll never get there) If called back requesting status report you lost your TLD badge and you're at the Radcon office**

ROLE PLAY: **If dispatched to investigate HPCI aux oil pump failure to start, wait 4 minutes and report everything looks normal at breaker and at HPCI skid**

If requested to test breaker for HPCI aux oil pump, or if Maintenance dispatched to look at breaker		Green light off for HPCI AOP – simulate racking out breaker ior zlohs7347a[1] off

ROLE PLAY: **If requested to test breaker for HPCI aux oil pump, or if Maintenance dispatched to look at breaker, report breaker will not test and that maintenance is troubleshooting**

If requested to rack HPCI AOP breaker back in		Green light on for HPCI AOP – simulate racking in breaker dor zlohs7347a[1]

ROLE PLAY: **If requested to make determination if the Rx will remain subcritical under all conditions without boron, after 5 minutes call back as Reactor Engineer and report that the Rx will <u>NOT</u> remain subcritical under all conditions**

When Suppression Chamber sprays placed in service		Break the "A" DWCA header imf ia02a

ROLE PLAY: **If dispatched to investigate loss of Drywell Control Air A header, Wait 5 minutes and report no indications of a leak outside of Containment and all valves aligned properly**

After 4 minutes (but prior to crew trying to ED)		Bring in alarm MS Relief Accum Press Low (9-3E win 35) ior an:ov:xa5533d[18] alarm_on

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

1) Emergency Depressurization completed

2) Reactor water level restored to 2" to 51" (or recovering)

X. Scenario Summary:

Starting ~ 6% power, the crew will lower power to < 5%% by inserting control rods per 3-GOI-100-12A, RCP, and 3-OI-85

Turbine sealing steam has already been swapped to aux boiler steam and the crew will swap the operating SJAE and Off-Gas Preheater from nuclear steam to aux boiler steam per 3-GOI-100-12A and 3-OI-66

The crew will continue the power reduction and respond to 3A CRD pump trip per 3-AOI-85-3

After the Mode Switch is placed in Mode 2, 3A IRM fails upscale and will cause a ½ scram and the crew will by-pass the IRM and reset the ½ scram

The H_2O_2 Analyzer selected for the Drywell will fail requiring swapping the Analyzer selected for Suppression Chamber to the Drywell

The only remaining RFP will trip (shortly after low oil level alarm and low bearing oil pressure alarms) and the crew will respond per 3-AOI-3-1 and place RCIC in service per 3-OI-71, but power is still too high for RCIC alone and HPCI aux oil pump will not start, requiring a manual scram

Several control rods (9) fail to insert on the scram and will not be able to be inserted. The rods are clustered together and the Reactor Engineer will determine that the Reactor will NOT remain subcritical under all conditions

A Drywell leak will cause level to lower and Drywell pressure to increase and the crew will respond per EOI-1, EOI-2, and C-5 to spray the Suppression Chamber and Drywell before having to terminate and prevent prior to emergency depressurization when level drops to -180".

Only 2 ADS valves will open, requiring opening 3 additional valves (for a total of 5 valves which changes MARF to 230 psig)

XI. 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 US with a copy of the shift turnover sheet for the scenario.

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

D. Ensure recorders are inking are 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. Emergency Depressurization completed

2. Reactor water level restored to 2" to 51" (or recovering)

XII. Simulator Event Guide:

Event #1: Continue lowering power per 3-GOI-100-12A

Position	Expected Actions	Time/Comments
SRO	Directs ATC to continue in 3-GOI-100-12A at step 5.0[32] to get < 5% power	
ATC	Continues to lower Reactor Power per 3-GOI-100-12A by inserting control rods	
	PLACE all IRM Range switches on Range 10. (N/A if power is less than Range 10 and indication is between approximately 25 and 75.)	
	INSERT all operable IRMs or VERIFY full-in.	
	SELECT IRM on both IRM/RBM recorders.	
	VERIFY IRM recorder High Alarm setpoint programmed ON with setpoint at 75.	
	SELECT IRM on all IRM/APRM recorders.	
	Continues to lower power by inserting control rods per the RCP, shove sheets, and RWM (step 5.0[33])	
	RANGE IRMs down as necessary to maintain between approximately 25 and 75 using IRM range switches.	
	When power is < 5% stops lowering power to allow BOP to swap steam loads (step 5.0[33])	

XII. Simulator Event Guide:

Event #2: Swap SJAE and Off-Gas Preheaters to Aux Boiler steam

Position	Expected Actions	Time/Comments
SRO	Directs BOP to swap SJAE and OG preheaters to Aux steam per 3-OI-66 section 8.12	
BOP	CHECK all Precautions and Limitations in Section 3.0 have been reviewed.	
	CHECK SJAE and/or preheaters are in service using main steam.	
	CHECK Swapping to Aux Boiler Steam has been directed by Shift Manager or 3-GOI-100-12A.	
	CHECK Auxiliary Boiler(s) in service per 0-OI-12 and boiler pressure greater than or equal to 165 psig	
	Directs AUO VERIFY OPEN the SJAE STM SPLY valve, 3-12-679 (T13.5-H EL 565') locally to open 3-12-679 and verify pressures 170 – 250 psig	
	PLACE both of the following to CLOSE at Panel 3-9-7. A. SJAE 3A PRESS CONTROLLER, 3-HS-1-150 B. SJAE 3B PRESS CONTROLLER, 3-HS-1-152	
	Directs AUO locally to VERIFY in NORM SJAE TRAIN PERMISSIVE 3-HS-001-0375.	
	Directs AUO locally to DEPRESS the open pushbutton for AUX STM TO SJAE A(B) 1ST, 2ND & 3RD STG, 3-HS-12-3A(5A) for the SJAE to be returned to service, UNTIL the valve is fully open at JB 3525 El. 586' T12-C	

XII. Simulator Event Guide:

Event #2: Swap SJAE and Off-Gas Preheaters to Aux Boiler steam (cont)

Position	Expected Actions	Time/Comments
BOP	MONITOR hotwell pressure as indicated on HOTWELL TEMP AND PRESS recorder, 3-XR-2-2, on Panel 3-9-6 AND VERIFY proper operation of SJAE placed in service.	
	PLACE the following valves to CLOSE at Panel 3-9-7. A. STEAM TO SJAE 3A, 3-HS-1-155A B. STEAM to SJAE 3B, 3-HS-1-156A	
	Directs AUO locally to SWAP steam to the preheaters at JB 6305 located in the Turbine Building breezeway: (T13 B-Line El 586')	

XII. Simulator Event Guide:

Event #3: Mode Switch to Start / Hot Standby and 3A CRD Failure

Position	Expected Actions	Time/Comments
SRO	Directs ATC to continue in 3-GOI-100-12A step 5.0[34])	
ATC	OBTAIN Unit Supervisor's permission and VERIFY or PLACE REACTOR MODE SWITCH in START & HOT STANDBY position.	
	Places Reactor Mode Switch in Start & Hot Standby position	
SRO	NOTIFY Instrument Maintenance to PERFORM OR VERIFY within required frequency the following surveillances: (Required to be performed within 12 hours of entering the Mode 2 from Mode 1) A. 3-SR-3.3.1.1.3(IRMs) (N/A if a condition is reached within 12 hours where IRM operability is not required by Tech Specs.) B. 3-SR-3.3.1.2.5&6, Source Range Monitor (SRM) Functional Test With Reactor Mode Switch Not In Run Position	
	NOTIFY Instrument Maintenance to PERFORM OR VERIFY within required frequency the following surveillance's: A. 3-SR-3.3.1.1.13 (APRM-1-4), Average Power Range Monitor Calibration-APRM-1-4. (N/A if not required.) B. 3-SR-3.3.1.1.16(APRM 1-4), Average Power Range Monitor Functional Test-APRM-1-4. (N/A if not required.) C. 3-SR-3.3.1.1.14(2e), Average Power Range Monitor (APRM) 2-OUT-OF-4 Voter Logic Functional Test.) **(N/A** if not required)	
ATC	CONTINUE inserting control rods in accordance with 3-SR-3.1.3.5(A), Control Rod Movement Data Sheets.	

XII. Simulator Event Guide:

Event #3: Mode Switch to Start / Hot Standby and 3A CRD Failure (cont)

Position	Expected Actions	Time/Comments
Crew	Announces alarm 9-8C window 33 "Motor Tripout"	
ATC	Recognizes 3A CRD pump tripped	
SRO	Directs entry into 3-AOI-85-3, CRD System Failure	
ATC	Performs Immediate Operator actions of 3-AOI-85-3	
	[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	

XII. Simulator Event Guide:

Event #3: Mode Switch to Start / Hot Standby and 3A CRD Failure (cont)

Position	Expected Actions	Time/Comments
ATC	[1.2] START associated standby CRD Pump using one of the following: • CRD PUMP 3B, using 3-HS-85-2A • CRD Pump 3A, using 3-HS-85-1A	
	[1.3] ADJUST CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, to establish the following conditions: • CRD CLG WTR HDR DP, 3-PDI-85-18A, approximately 20 psid • CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, between 40 and 65 gpm	
	[1.4] BALANCE CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, and PLACE in AUTO or BALANCE	
	[2] IF operating CRD PUMP has tripped and BACKUP CRD PUMP is NOT available, THEN (Otherwise N/A) N/A	
	[3] IF Reactor Pressure is LESS THAN 900 PSIG AND ANY ONE of the following conditions exist: • In service CRD Pump tripped and NEITHER CRD Pump can be started, OR • Charging Water Pressure can NOT be restored and maintained above 940 PSIG, THEN PERFORM the following: (Otherwise N/A) N/A	

XII. Simulator Event Guide:

Event #3: Mode Switch to Start / Hot Standby and 3A CRD Failure (cont)

Position	Expected Actions	Time/Comments
ATC	Subsequent Actions	
	[1] IF Reactor Pressure is GREATER THAN OR EQUAL TO 900 PSIG AND • Charging Water Pressure can NOT be restored and maintained above 940 PSIG within 20 minutes, AND • Two or more Scram accumulators inop, and associated control rod NOT fully inserted, THEN PERFORM the following: (Otherwise **N/A**) [1.1] IF core flow is above 60%, THEN REDUCE core flow to between 50-60%. [1.2] Manually SCRAM Reactor, PLACE the reactor mode switch in the shutdown position immediately. [1.3] REFER TO 3-AOI-100-1.	

XII. Simulator Event Guide:

Event #3: Mode Switch to Start / Hot Standby and 3A CRD Failure (cont)

Position	Expected Actions	Time/Comments
ATC	[2] IF operating CRD Pump has NOT tripped, THEN PERFORM the following: (REFER TO 3-OI-85) (Otherwise N/A) [2.1] VERIFY FULL OPEN CRD PUMPS 3A & 3B UNIT 3 SUCTION, 3-FCV-85-56. [2.2] IF running CRD Pump suction pressure is approaching 18-inches HG absolute, THEN ALTERNATE CRD Pumps. [2.3] IF in-service filter differential pressure is greater than 20.5 psid, THEN ALTERNATE CRD drive water filters. [2.4] IF system flow is high or low, THEN SHIFT CRD Flow Control Valves. [2.5] IF system flow and pressure is unstable during control rod movement, THEN SHIFT CRD Stabilizing Valve sets. [2.6] IF air is suspect to be in system, THEN VENT air from Drive Water Header using DRIVE WATER HDR VENT, 3-VTV-085-0592, at elevation 565' south end of west HCU bank.	
	[3] IF CRD System hydraulic pressure is restored, THEN RESTORE Control Rod Drive System alignment. REFER TO 3-OI-85. (Otherwise N/A) Refers to 3-OI-85	
SRO	Notify Reactor Engineering, Work Control and Maintenance to investigate 3A CRD pump failure	
Crew	Dispatches AUO to investigate 3A CRD pump failure	

XII. Simulator Event Guide:

Event #4: IRM Failure

Position	Expected Actions	Time/Comments
ATC	Announces alarm 3-XA-55-3-5A window 26 IRM HIGH	
	VERIFY alarm by multiple indications.	
	VERIFY control rod block.	
	RANGE OR BYPASS affected channel as desired.	
ATC/BOP	Announces alarm 3-XA-55-3-5A window 33 IRM CH A, C, E, G HI-HI/INOP and 3-XA-55-3-5B window 1 REACTOR CHANNEL A AUTO SCRAM	
ATC	STOP any reactivity changes.	
	NOTIFY Reactor Engineer.	
SRO	Directs bypassing failed IRM per 3-OI-92A section 6.1 and Reset ½ scram and affected systems per 3-OI-99 section 6.1	
ATC	Bypasses IRM per **3-OI-92A section 6.1**	
	REVIEW precautions and limitations in Section 3.0	
	PLACE the appropriate IRM Bypass selector switch to the BYPASS position: • IRM BYPASS, 3-HS-92-7A/S4A	
	CHECK Bypassed light is illuminated.	
	Resets ½ scram per **3-OI-99 section 6.1**	
	VERIFY Reactor Protection System in prestartup/standby readiness alignment in accordance with Section 4.0	
	REVIEW Precautions and Limitations in Section 3.0.	
	VERIFY RPS Bus for tripped channel energized.	
	CHECK trip signals NOT present.	
	MOMENTARILY PLACE SCRAM RESET, 3-HS-99-5A/S5, as follows: A. RESET FIRST B. RESET SECOND C. NORMAL	

XII. Simulator Event Guide:

Event #4: IRM Failure (continued)

Position	Expected Actions	Time/Comments
SRO	Refers to Tech Spec Table 3.3.1.1-1, TRM Tables 3.3.4-1 and 3.3.5-1 and determines that Information ONLY LCO required	
	Table 3.3.1.1-1 (page 1 of 3) Reactor Protection System Instrumentation 1. Intermediate Range Monitors FUNCTION . a. Neutron Flux - High. b. Inop APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS 2 5(a) **REQUIRED CHANNELS PER TRIP SYSTEM** **3** **3** CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 G H SURVEILLANCE REQUIREMENTS SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.6 SR 3.3.1.1.9 SR 3.3.1.1.14 ALLOWABLE VALUE 120/125 divisions of full scale 120/125 divisions of full scale	**Information LCO ONLY**
	Table 3.3.4-1 (page 1 of 3) Control Rod Block Instrumentation 2. Intermediate Range Monitors a. IRM Upscale (c) 2 -mode **6- # channels required** B from action TSR 3.3.4.1 -SRs TSR 3.3.4.3 TSR 3.3.4.6 108/125 of full scale -allowable valve b. IRM Downscale (c) (f) 2 -mode **6 -# channels required** B -from action TSR 3.3.4.1- SRs TSR 3.3.4.3 TSR 3.3.4.6 5/125 of full scale -allowable value	**Information LCO ONLY**

XII. Simulator Event Guide:

Event #4: IRM Failure (continued)

Position	Expected Actions	Time/Comments
SRO	c. IRM Detector Not in Startup Position (c) 2 -mode **6 - # channels required** B – from action TSR 3.3.4.4- SRs TSR 3.3.4.7 (g) - allowable value d. IRM Inoperative (c) 2 -mode **6 - # channels required** B – from action TSR 3.3.4.3 - SRs (h)- allowable value	**Information LCO ONLY**
	TABLE 3.3.5-1Surveillance Instrumentation 2. Control Rod Motion a. Control Rod Position (a) 1,2 - mode **1(b) – required channels** C – from action TSR 3.3.5.2 - SRs Indicators 00-48 – type indication and range b. Neutron Monitoring (a) 1,2 - mode 1(c) – required channels C – from action TSR 3.3.5.3 - SRs TSR 3.3.5.4 TSR 3.3.5.7 TSR 3.3.5.8 TSR 3.3.5.9 SRM Indicators 0.1-10_6 cps **IRM – type indication and range** **Indicators 0-125 LPRM Indicators** **0-125**	**Information LCO ONLY**
	Notify Work Control and Maintenance to investigate.	

XII. Simulator Event Guide:

Event #4: IRM Failure (continued)

ATC	CHECK the following conditions: A. All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights illuminated. B. The following four lights illuminated: • SYSTEM A BACKUP SCRAM VALVE, 3-IL-99-5A/AB • SYSTEM B BACKUP SCRAM VALVE, 3-IL-99-5A/CD C. Scram Discharge Volume vent and drain valves indicate open. D. Points SOE033 (Channel A3 manual scram) and SOE035 (Channels A1&A2 Auto Scram) on ICS computer or on the First Out Printer reads "NOT TRIP" for RPS "A". E. Points SOE034 (Channel B3 manual scram) and SOE036 (Channels B1&B2 Auto Scram) on ICS computer or on the First Out Printer reads "NOT TRIP" for RPS "B".	

XII. Simulator Event Guide:

Event #5: H_2O_2 Analyzer Failure

Position	Expected Actions	Time/Comments
BOP	Announces alarm 3-XA-55-3-7C window 22, DRYWELL/SUPPR CHAMBER H_2O_2 ANALYZER FAILURE	
	CHECK Panel 3-9-54 and 3-9-55 for abnormal indicating lights such as low flow, H2 or O2 downscale, pump off, etc. (low flow, H2 or O2 downscale, and pump off may exist if analyzer(s) are in standby)	
	Notes that the Analyzer selected for the Drywell shows the O_2 sample pump tripped / not running and the low flow white light illuminated	
	If attempts to re-start the tripped O_2 sample pump by pulling 3-HS-76-59, notes that pump failed to start	
	DISPATCH personnel to Panels 25-340 and 25-420 or 25-341	
	Notifies SRO to REFER TO Tech Spec 3.3.3.1, Technical Requirements Manual Section 3.6.2	
	Swaps the operable Analyzer from Suppression Chamber to Drywell	

XII. Simulator Event Guide:

Event #5: H_2O_2 Analyzer Failure (continued)

SRO	Refers to TRM 3.6.2 and acknowledges that TRM 3.6.2 do not apply under the current conditions	
	LCO 3.6.2 Primary Containment oxygen concentration monitors shall be OPERABLE. APPLICABILITY: MODE 1 during the time period a. From 24 hours after THERMAL POWER is > 15% RTP following startup, to b. 24 hours prior to reducing THERMAL POWER to < 15% RTP prior to the next scheduled reactor shutdown.	**No action required, inside 24 hour S/D window**
	A. One or more primary containment oxygen concentration monitors inoperable. ----------NOTE---------- Only applicable if there is loss of monitoring capability of the drywell or suppression chamber. ---------- A.1 Begin alternate sampling and analyze results. Immediately AND Every 7 days thereafter	
	Notify Work Control and Maintenance to investigate.	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP

Position	Expected Actions	Time/Comments
SRO	Directs ATC to continue in 3-GOI-100-12A step 5.0[38]	
ATC	[38] CONTINUE inserting control rods in accordance with 3-SR-3.1.3.5(A), Control Rod Movement Data Sheets.	
	[39] MONITOR power reduction on IRMs, keeping them on scale between approximately 25 and 75 using IRM range switches.	
	[40] [NER/C] IF Reactor cooldown starts to occur prior to control rods being fully inserted, THEN TERMINATE cooldown or COORDINATE control rod manipulation with cooldown to prevent inadvertent criticality.	
	[41] [NER/C] IF the following conditions occur simultaneously: ☐ Reactor is subcritical or at very low power (IRMs on Range 6 or less), AND ☐ Unintentional cooldown or other positive reactivity event occurs, AND ☐ Power rises or Reactor goes critical, THEN PERFORM the following: [41.1] INSERT control rods using 3-SR-3.1.3.5(A).	
	[41.2] MONITOR Reactor power on SRMs and/or IRMs.	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP

Position	Expected Actions	Time/Comments
ATC	[41.3] IF Power rises rapidly, THEN PERFORM the following with Unit Supervisor concurrence: ☐ IMMEDIATELY SCRAM Reactor. ☐ PLACE REACTOR MODE SWITCH in SHUTDOWN.	
	[41.4] RECORD cause of unintentional cooldown in the NOMS Narrative log.	
	[41.5] STOP this procedure performance, GO TO 3-AOI-100-1, THEN CONTINUE in this procedure at Step 5.0[42] when re-entry is directed by 3-AOI-100-1. [INPO SER 91-024, SER 92-008, NRC IEN 92-39]	
	[42]If it is desired to close the MSIVs as directed by the Unit Supervisor, Then (Otherwise, N/A.) Perform Attachment 3 and continue in the procedure as directed by the Unit Supervisor	
BOP	Notifies SRO of AUO report of oil leak in 3C RFP room (call from TB AUO)	
	Announces alarm 3-XA-55-3-6C window 4 RFPT OIL TANK LEVEL ABNORMAL	
	Directs AUO to ADD oil as needed per 3-OI-20. (all field steps)	
	Announces alarm 3-XA-55-3-6C window 26 RFPT BRG OIL PRESS LOW, quickly followed by 3-XA-55-3-6C window 16 RFPT BRG OIL PRESS LOW	
	If not manually secured, announces 3C RFP tripped (15 seconds after second oil pressure low alarm	
	Recognizes 3C RFP trip is still present and, therefore, not available to re-start	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP (continued)

NOTE: Crew may elect to Scram the Reactor prior to attempting to start RCIC or HPCI.

Position	Expected Actions	Time/Comments
SRO	Directs entry into 3-AOI-3-1	
	Directs placing RCIC per 3-OI-71 and or HPCI in service per 3-OI-73 to restore / maintain Rx level	
BOP	**3-AOI-3-1 SECTION 4.2**	
	[1] VERIFY applicable automatic actions.	
	[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. (at minimum flow)	
	[3] IF any EOI entry condition is met, THEN ENTER the appropriate EOI(s).	
	Actions for Low Reactor Water Level or Loss of Feedwater [4] IF Feedwater Control System has failed, THEN [4.1] PLACE individual RFPT Speed Control Raise/Lower switches in Manual Governor (depressed position with amber light illuminated). [4.2] ADJUST RFP Discharge flows with RFPT Speed Control Raise/Lower switches as necessary to maintain level.	
	[5] IF a Feedwater Flow signal fails (FI-3-78A,78B), THEN PERFORM the following: [5.1] OBTAIN Unit Supervisor's permission to bypass failed Feedwater Flow Instrument in Unit 3 Computer Room or Unit 3 Aux Instrument Room. REFER TO 3-OI-3. [5.2] IF both Feedwater Flow Instruments fail, THEN VERIFY level control transfers to SINGLE ELEMENT.	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP (continued)

Position	Expected Actions	Time/Comments
BOP	[6] IF a Steam Flow signal fails (FI-46-1,2,3,4), THEN PERFORM the following: [6.1] OBTAIN Unit Supervisor's permission, to bypass failed Steam Flow Instrument in Unit 3 Computer Room or Unit 3 Aux Instrument Room. REFER TO 3-OI-3. [6.2] IF three Steam Flow Instruments fail, THEN VERIFY level control transfers to SINGLE ELEMENT.	
	[7] IF Reactor Water Level signal fails (LI-3-53, 60, 206, 253), THEN OBTAIN Unit Supervisor's permission, to PERFORM the following: [7.1] BYPASS failed level instrument on Panel 3-9-5. REFER TO 3-OI-3. [7.2] IF four level instruments fail, THEN PERFORM the following: [7.2.1] VERIFY level control transfers to MANUAL. [7.2.2] MAINTAIN level in MANUAL mode.	
	[8] VERIFY all Safety/Relief Valves closed.	
	[9] IF RFPs are in automatic control, THEN VERIFY 3-LIC-46-5 raises flow of operating RFPs. (NONE AVAILABLE)	
	[10] IF RFPs are in manual control, THEN RAISE speed of operating RFPs. (NONE AVAILABLE)	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP (continued)

Position	Expected Actions	Time/Comments
BOP	[11] IF RFPT has tripped and it is needed to maintain level, THEN PERFORM the following: [11.1] OBTAIN Unit Supervisor permission to restart RFPT. [11.2] RESET trip by using pushbutton. [11.3] DEPRESS RFPT Speed Control Raise/Lower switch to MANUAL GOVERNOR position. [11.4] PLACE RFPT Start/Local enable switch to START. [11.5] VERIFY RFPT accelerates to approximately 600 rpm.	
	Recognizes 3C RFP trip is still present and, therefore, not available to re-start	
	Places RCIC in service per **3-OI-71 section 5.2**	
	[1] VERIFY the RCIC System is in Standby Readiness. REFER TO Section 4.0.	
	[2] NOTIFY Radiation Protection of the impending action to manually start the RCIC System. RECORD time Radiation Protection notified in the NOMS Narrative Log	
	[3] REVIEW all Precautions and Limitations in Section 3.0.	
	[4] OBTAIN 3-SR-3.6.2.1.1 to check Suppression Pool level and temperature every 5 min.	
	[5] ESTABLISH communication with the personnel locally at the RCIC turbine.	
	[6] ENSURE all unnecessary personnel have exited the general area of the RCIC turbine and rupture discs prior to rolling the RCIC turbine.	
	[7] ANNOUNCE on the plant PA system, "Unit Three is starting RCIC, all unnecessary personnel stay clear of the NW RX BLDG. QUAD."	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP (continued)

Position	Expected Actions	Time/Comments
BOP	[8] OPEN RCIC LUBE OIL COOLING WTR VLV, 3-FCV-71-25.	
	[9] START RCIC VACUUM PUMP, 3-HS-71-31A.	
	[10] OPEN RCIC PUMP INJECTION VALVE, 3-FCV-71-39.	
	[11] OPEN RCIC PUMP MIN FLOW VALVE, 3-FCV-71-34.	
	[12] START RCIC Turbine by opening RCIC TURBINE STEAM SUPPLY VLV, 3-FCV-71-8 and OBSERVE the following: • RCIC Turbine speed accelerates above 2100 rpm, on RCIC TURBINE SPEED indicator, 3-SI-71-42A • Flow to the RPV stabilizes and is controlled automatically at 600 gpm • RCIC TESTABLE CHECK VLV, 3-FCV-71-40, DISC POSITION indicates open • RCIC PUMP MIN FLOW VLV, 3-FCV-71-34, is closed when flow is above 120 gpm • RCIC STEAM LINE DR INBD and OUTBD ISOL VLVs, 3-FCV-71-6A and -6B, close	
	[13] REFER TO Section 6.0 to control and monitor RCIC turbine operation.	

XII. Simulator Event Guide:

Event #6: Continue lowering power per 3-GOI-100-12A / 3C RFP TRIP (continued)

Position	Expected Actions	Time/Comments
BOP	If attempted to places HPCI in service per **3-OI-73 section 5.2**	
	[1] VERIFY HPCI is in Standby Readiness. REFER TO Section 4.0.	
	[2] NOTIFY Radiation Protection of the impending action to manually start the HPCI System. RECORD time Radiation Protection notified in the NOMS Narrative Log.	
	[3] REVIEW Precautions and Limitations in Section 3.0.	
	[4] OBTAIN 3-SR-3.6.2.1.1 to check Suppression Pool level and temperature every 5 minutes.	
	[5] **VERIFY** HWC has been set to the desired setpoint (if required) to lower radiation levels in the area.	
	[6] REQUEST SGTS placed in operation.	
	[7] ESTABLISH communication with the AUO locally in the HPCI room.	
	[8] DEPRESS and HOLD HPCI AUX OIL PUMP, 3-HS-73-47B, START pushbutton (local) for approximately 2 minutes to prime the oil system.	
	Reports to US that the HPCI aux oil pump failed to start	
	[9] **NOTIFY** Radiation Protection that an RPHP exist for the impending action to manually start the HPCI turbine. **RECORD** time Radiation Protection notified in the NOMS Narrative Log. [BFN PER 126211]	
	The rest of 5.2 is N/A due to failure	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

SRO	After BOP report about HPCI aux oil pump failure and / or when discovered inadequate high pressure injection systems available to maintain Reactor level, directs manual scram **NOTE: Crew may elect to Scram the Reactor prior to attempting to start RCIC or HPCI.**	
ATC	Inserts manual scram and enters 3-AOI-100-1– [1] DEPRESS REACTOR SCRAM A and B, 3-HS-99-5A/S3A and 3-HS-99-5A/S3B, on Panel 3-9-5. notes that some control rods did not insert on the scram	
	[4] PLACE REACTOR MODE SWITCH, 3-HS-99-5A-S1, in the SHUTDOWN position.	
	[5]IF all control rods CAN NOT be verified fully inserted, THEN (Otherwise N/A) INITIATE ARI by ARMing and Depressing ARI Manual Initiate, 3-HS-68-119A OR ARI Manual Initiate, 3-HS-68-119B	
	[6] REPORT the following status to the US: • "All rods in" or "rods out " • Power level • Mode Switch is in Shutdown • Reactor pressure • MSIV position • Reactor Level is recovering or lowering.	
	[1] VERIFY SCRAM DISCH VOL VENT & DR VLVS closed by green indicating lights at SDV Display on Panel 3-9-5.	
SRO	[8.1] IF all rods are NOT inserted to Position 02 or beyond, THEN DIRECT Reactor Engineer to commence determination that the reactor will remain subcritical under all conditions without boron.	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
SRO	Enter 3-EOI-1 do to Reactor Level < (+) 2 inches	
	Per 3-EOI-1 step RC/Q-2, Exits RC/Q and directs OATC to insert control rods with 3-OI-85 (8.19)	**Rx is Subcritical & NO boron is injected**
	Verifies Reactor pressure being maintained on bypass valves per RC/P Leg	
	Per step C5-2 Directs ADS inhibited	
	Per step C5-4, Directs Isolation Interlocks bypassed per App-8A, "Bypassing Group 1 Low Low Low Level Isolation Interlocks" and App-8E, "Bypassing Group 6 RPV Low Level and High Drywell Pressure Isolation Interlocks" (keeps MSIVs open)	
BOP	Inhibits ADS	**CRITICAL TASK**
Crew	Recognizes and reports Group 2, 3, 6, and 8 isolations if water level decreases below (+) 2"	
BOP	Calls for App-8A, "Bypassing Group 1 Low Low Low Level Isolation Interlocks" (ALL field steps) and App-8E, "Bypassing Group 6 RPV Low Level and High Drywell Pressure Isolation Interlocks" (ALL field steps)	
SRO	Per step C5-15, Directs Rx water level be maintained (+) 2" to (+) 51" with RCIC per App-5C, "Injection System Lineup- RCIC"	
	3-EOI-1 priority is the RC/L & RC/Q Legs (RCIC is available & HPCI is Unavailable) (Power is low, but all rods are not inserted)	
	C-5 priority is controlling RPV level & power (power is reported @ < range 7 on IRMs)	
	Per 3-EOI-1 step RC/Q-4, Directs initiating 2nd channel of ARI	
ATC	Initiates 2nd channel of ARI	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
BOP	Performs **3-EOI Appendix-5C** to inject with RCIC	
	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, "Bypassing RCIC Low Reactor Pressure Isolation Interlocks," concurrently with this procedure.	
	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:	
	VERIFY RESET and OPEN 3-FCV-71-9, RCIC TURB TRIP/THROT VALVE RESET.	
	VERIFY 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller in AUTO with setpoint at 600 gpm.	
	OPEN the following valves: • 3-FCV-71-39, RCIC PUMP INJECTION VALVE • 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE • 3-FCV-71-25, RCIC LUBE OIL COOLING WTR VLV.	
	PLACE 3-HS-71-31A, RCIC VACUUM PUMP, handswitch in START.	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
	OPEN 3-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC Turbine.	
	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 VLV, closes as flow rises above 120 gpm.	
	IF ..... BOTH of the following exist: RCIC Initiation signal is NOT present, AND RCIC flow is below 60 gpm, THEN ... VERIFY OPEN 3-FCV-71-34, RCIC PUMP MIN FLOW VALVE.	
	ADJUST 3-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller as necessary to control injection.	
	Monitor containment parameters	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
ATC	Insert control rods per **3-OI-85 section 8.19**	
	[1] If Removal and Replacement of RPS Scram Solenoid Fuses is desired, Then: N/A	
	[2] If Venting and Repressurizing the Scram Pilot Air Header is desired, Then: N/A	
	[3] If it is desired to Individually Scram Control Rods, Then: (if this section is tried on the 8 rods that will not drive in –the support people needed will encounter obstacles such that they will not be available) N/A	
	[4] If it is desired to Insert Control Rods Using Reactor Manual Control System, then:	
	[4.1] VERIFY the reactor scram has been reset. REFER TO 3-AOI-100-1 (scram will not be able to be reset after Drywell pressure > 2.45 – unless the SRO called for App-2, "Defeating ARI Logic Trips" & 1F, "Manual Scram," prior to exiting RC/Q)	
	[4.2] IF scram CANNOT be reset, THEN CLOSE CHARGING WATER SHUTOFF, 3-SHV-085-0586 (RB, EL 565, NE Corner).	
	[4.3] REVIEW all Precautions and Limitations in Section 3.0.	
	[4.4] DEMAND, Print Rod Position Log, to edit control rod positions.	
	[4.5] BYPASS the Rod Worth Minimizer. REFER TO Section 8.17.	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
ATC	**3-OI-85 section 8.17** Manual Bypass of the Rod Worth Minimizer	
	[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.	
	[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).	
	Back to 3-OI-85 section 8.19	
	[4.6] REFER TO Illustration 4 and DEPRESS the appropriate CRD Rod Select pushbutton on 3-XS-85-40.	
	[4.7] CHECK the backlit CRD ROD SELECT pushbutton is brightly illuminated and that the white indicating light on the Full Core Display is illuminated.	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
ATC	[4.8] CONTINUOUSLY INSERT the control rod to Position 00, by holding the CRD CONTROL SWITCH, 3-HS-85-48, in ROD IN or CRD NOTCH OVERRIDE SWITCH, 3-HS-85-47 in EMERG ROD IN.	
	[4.9]IF a control rod is difficult to insert, THEN REFER TO Section 8.16.	
	[4.10] REPEAT Steps 8.19[4.6] through 8.19[4.8] for each Control Rod to be inserted	
	Reports No rod movement on initial attempt to insert rods	
	3-OI-85 section 8.16	
	[1] VERIFY the control rod will NOT notch in, in accordance with Section 6.7 or Section 8.19	
	[2] REVIEW all Precautions and Limitations in Section 3.0.	
	[3] [NRC/C] IF RWM is enforcing, THEN VERIFY RWM operable and LATCHED in to the correct ROD GROUP. [NRC IR 84-02] (bypassed)	
	[4] CHECK CRD SYSTEM FLOW is between 40 gpm and 65 gpm, indicated by 3-FIC-85-11	
	[5] CHECK CRD DRIVE WTR HDR DP, 3-PDI-85-17A is between 250 psid and 270 psid	

XII. Simulator Event Guide:

Event #7: Reactor SCRAM / ATWS (continued)

Position	Expected Actions	Time/Comments
ATC	[6] IF CRD SYSTEM FLOW or CRD DRIVE WTR HDR DP had to be adjusted, THEN PROCEED to Section 6.7.	
	If control rod motion is observed, but the CRD fails to notch-in with normal operating drive water pressure, Then: N/A (rods won't move)	
	If the control rod problem is believed to be air in the hydraulic system, Then Flush the control rod by placing CRD control switch, 3-HS-85-48, in ROD IN, for several minutes Or until the control rod begins to insert N/A	
	If Manual Insertion of Control Rods by Venting the Over Piston Area is desired, Then: (if this section is tried on the 9 rods that will not drive in –the support people needed will encounter obstacles such that they will not be available) May dispatch operator to perform this but will not occur.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak

Position	Expected Actions	Time/Comments
Crew	Report increase in Drywell pressure and temperature	
SRO	At 2.45 psig Drywell pressure or 160°F Drywell temperature, re-enters 3-EOI-2 and EOI-1	
	Directs BOP to place available H_2O_2 system in service per 3-EOI-2 step PC/H-1	
	Directs BOP to vent containment per App-12, "Primary Containment Venting"	
BOP	Places H_2O_2 analyzer in service per 3-EOI-2	
	Place Analyzer isolation bypass keylock switches to bypass	
	Select DW or Supp Chmbr and momentarily pull out select switch handle to start sample pumps	
	Vents Containment per 3-EOI Appendix-12, "Primary Containment Venting"	
	[1] VERIFY at least one SGTS train in service.	
	[2] VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): • 3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV, • 3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE, • 3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV, • 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	[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.	
	[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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

BOP	[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.	
	[8.a] PLACE keylock switch 3-HS-84-35, DW/SUPPR CHBR VENT ISOL BYP SELECT, to SUPPR-CHBR position (Panel 3-9-54).	
	[8.b] VERIFY OPEN 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE (Panel 3-9-54).	
	[8.c] PLACE 3-FIC-84-19, PATH B VENT FLOW CONT, in AUTO with setpoint at 100 scfm (Panel 3-9-55).	
	[8.d] PLACE keylock switch 3-HS-84-19, 3-FCV-84-19 CONTROL, in OPEN (Panel 3-9-55).	
	[8.e] VERIFY 3-FIC-84-19, PATH B VENT FLOW CONT, is indicating approximately 100 scfm.	
	[8.f] CONTINUE in this procedure at step 12.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	[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: • Stable flow as indicated on controller, AND • 3-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished, AND • Release rates as determined below: i. IF. . .PRIMARY CONTAINMENT FLOODING per C-1, Alternate Level Control, is in progress, THEN. .MAINTAIN release rates below those specified in Attachment 2. ii.IF. . .Severe Accident Management Guidelines are being executed, THEN. .MAINTAIN release rates below those specified by the TSC SAM Team. iii. IF. . .Venting for ANY other reason than items i or ii above, THEN. .MAINTAIN release rates below • Stack release rate of 1.4 x 107 µCi/s ____ AND • 0-SI-4.8.B.1.a.1 release fraction of 1.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	[13] WHEN ... ANY of the following exists: Venting is no longer required, OR Pressure in the space being vented approaches zero, OR Directed by SRO, OR Directed by Step 3, 4, or 5, THEN ... SECURE venting as follows: a. VERIFY the following keylock switches in OFF (Panel 3-9-54): 3-HS-84-35, DW/SUPPR CHBR VENT ISOL BYP SELECT 3-HS-84-36, SUPPR CHBR/DW VENT ISOL BYP SELECT. b. VERIFY keylock switch 3-HS-84-20, 3-FCV-84-20 ISOLATION BYPASS, in NORMAL (Panel 3-9-55). c. VERIFY keylock switch 3-HS-84-19, 3-FCV-84-19 CONTROL, in CLOSE (Panel 3-9-55). d. VERIFY CLOSED the following valves (Panel 3-9-3 or Panel 3-9-54): 3-FCV-64-31, DRYWELL INBOARD ISOLATION VLV, 3-FCV-64-29, DRYWELL VENT INBD ISOL VALVE, 3-FCV-64-34, SUPPR CHBR INBOARD ISOLATION VLV, 3-FCV-64-32, SUPPR CHBR VENT INBD ISOL VALVE. e. VERIFY CLOSED 3-FCV-64-141, DRYWELL DP COMP BYPASS VALVE (Panel 3-9-3). END OF TEXT	
SRO	Determines that Suppression Chamber and Drywell Pressure cannot be maintained < 12 psig and directs the Suppression Chamber sprayed per App-17C, "RHR System Operation-Suppression Chamber Sprays"	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	Sprays Suppression Chamber per **Appendix-17C**, "RHR System Operation-Suppression Chamber Sprays" (only Loop I available)	
	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 to spray the Suppression Chamber irrespective of adequate core cooling, THEN.....BYPASS LPCI injection valve auto open signal as necessary by PLACING 3-HS-74-155A(B), LPCI SYS I(II) OUTBD INJ VLV BYPASS SEL in BYPASS.	
	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.	
	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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	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.	
	h. IF ..... RHR System I(II) is operating ONLY in Suppression Chamber Spray mode, THEN..... CONTINUE in this procedure at Step 5.k.	
	i. VERIFY CLOSED 3-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.	
	j. RAISE system flow by placing the second RHR System I(II) pump in service as necessary.	
	k. MONITOR RHR Pump NPSH using Attachment 2.	
	l. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).	
	m. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm flow: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV • 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV	
	n. NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	6. WHEN.....EITHER of the following exists: • Before Suppression Pool pressure drops below 0 psig, OR • Directed by SRO to stop Suppression Chamber Sprays, THEN.....STOP Suppression Chamber Sprays as follows:	
	a. CLOSE 3-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE.	
	b. VERIFY CLOSED 3-FCV-74-100, RHR SYS I U-2 DISCH XTIE	
	c. IF .....RHR operation is desired in ANY other mode, THEN..... EXIT this EOI Appendix.	
SRO	Directs App-5B, "Injection System Lineup- CRD" if all attempts have been exhausted trying to insert the stuck rods	
ATC	**App-5B**, "Injection System Lineup- CRD"	
	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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
ATC	2. IF ..... BOTH of the following exist: • CRD is NOT required for rod insertion, AND • Maximum injection flow is required, THEN ... LINE UP ALL available CRD pumps to the RPV as follows: a. IF ..... CRD Pump 3A is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B. b. IF ..... CRD Pump 3B is available, THEN ... VERIFY RUNNING CRD Pump 3A or 3B.	
	Reports 3B CRD pump will Not start and 3-FCV-85-50 will Not open	
	Dispatches personnel to investigate 3B CRD and 3-FCV-85-50	
BOP	Reports RCIC tripped and will Not reset	
	Dispatches personnel to investigate RCIC loss	
SRO	When Drywell temperature approaches 280°F or Suppression Chamber pressure exceeds 12 psig, directs the following; • Verify Suppression Pool level is below 18 ft • Verify in safe area of Curve 5 • Verify Recirc pumps tripped • Secure Drywell blowers • Spray the Drywell per App-17B, "RHR System Operation- Drywell Sprays"	**EOI-2 PC/P Leg**

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	**3-EOI APPENDIX-17B**, "RHR System Operation-Drywell Sprays" 1. BEFORE Drywell pressure drops below 0 psig, CONTINUE in this procedure at Step 7.	
	2. IF.....Adequate core cooling is assured, OR Directed to spray the Drywell irrespective of adequate core cooling, THEN.....BYPASS LPCI injection valve auto open signal as necessary by PLACING 3-HS-74-155A(B), LPCI SYS I(II) OUTBD INJ VLV BYPASS SEL in BYPASS.	
	3. VERIFY Recirc Pumps and Drywell Blowers shutdown.	
	4. IF.....Directed by SRO to spray the Drywell using Standby Coolant *N/A*	
	5. IF.....Directed by SRO to spray the Drywell using Fire Protection, *N/A*	
	6. INITIATE Drywell 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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	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) 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.	
	h. IF ..... Additional Drywell Spray flow is necessary, THEN.....PLACE the second System I(II) RHR Pump in service.	
	i. MONITOR RHR Pump NPSH using Attachment 2.	
	j. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	k. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-46, RHR HX 3B RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV • 3-FCV-23-52, RHR HX 3D RHRSW OUTLET VLV.	
	l. NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.	
	Reports drywell pressure and temperature decrease	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	Announces alarm 9-3E window 35 / DRYWELL CONTROL AIR PRESS LOW	
	Refer To 3-AOI-32A-1	
	Realizes from turnover that plant control air is supplying DWCA and steps to align CAD would not serve any purpose (and is tagged)	
SRO	Directs AUO / Outside US to verify alignment of Control air to DWCA	
BOP	Announces alarm 9-3D window 18 / MAIN STEAM RELIEF VLV AIR ACCUM PRESS LOW	
	Check Drywell Control Air System, if malfunctioning, refer to 3-AOI-32A-1	
BOP	Continues to monitor RWL decrease	
SRO	Determines cannot restore/maintain RPV level above – 180" per step C5-16	
	Directs to Stop and Prevent ALL injection into the RPV except from RCIC, CRD, and SLC (App-4), "Prevention of Injection," per step C5-20	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
ATC	Performs **Appendix-4**, "Prevention of Injection," on pnl 9-5 and 9-6	
	1. PREVENT injection to RPV from the following systems in any order as required: f. CONDENSATE and FEEDWATER 1) LOWER RFPT 3A(3B)(3C) speed to minimum setting (approximately 600 rpm) using ANY of the following methods on Panel 3-9-5: • 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, OR • Using individual 3-SIC-46-8(9)(10), RFPT 3A(3B)(3C) SPEED CONTROL PDS in MANUAL, OR • Using individual 3-HS-46-8A(9A)(10A), RFPT 3A(3B)(3C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR. 2) CLOSE the following valves BEFORE RPV pressure drops below 450 psig: • 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. 3) TRIP RFPTs as necessary to prevent injection by DEPRESSING the following push-buttons: • 3-HS-3-125A, RFPT 3A TRIP • 3-HS-3-151A, RFPT 3B TRIP • 3-HS-3-176A, RFPT 3C TRIP.	**CRITICAL TASK** **ALL RFPs are OOS/ tripped**

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	Performs **Appendix-4**, "Prevention of Injection," on pnl 9-3	
	1. PREVENT injection to RPV from the following systems in any order as required: c. CORE SPRAY NOTE: After 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.	**CRITICAL TASK**
	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)PLACE 3-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL, in BYPASS. AND 2) VERIFY CLOSED 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE. 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) PLACE 3-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL, in BYPASS. AND 2) VERIFY CLOSED 3-FCV-74-66, RHR SYS II LPCI OUTBD INJECT VALVE.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
SRO	Enters 3-EOI-C2, Emergency Depressurization, Directs opening 6 ADS valves per step C2-7	
BOP	Reports only 2 ADS valves able to be opened	
SRO	Directs opening additional valves until 6 are open (if possible) per step C2-9	
BOP	Opens additional valves and reports only 5 can be opened per step C2-9	**CRITICAL TASK**
SRO	Per step C5-22, Directs no additional injection until MARF is achieved (5 valves – 230 psig)	
	Once MARF pressure is obtained, directs Slowly raising RPV level with Condensate App-6A, "Injection Subsystems Lineup-Condensate," or RHR I App-6B, "Injection Subsystems Lineup-RHR System I LPCI Mode" and restore level to + 2" to + 51"	
ATC	Recover level with Condensate, **3-EOI Appendix-6A,** "Injection Subsystems Lineup-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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
ATC	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.	
	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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
ATC	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.	
	Manually make-up (bypass) to the Hotwell from the CST as needed	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	Restores Reactor Level +2" to +51" with RHR I per **3-EOI APPENDIX-6B**, "Injection Subsystems Lineup-RHR System I LPCI Mode" (Loop 1 only) per step C5-13	**CRITICAL TASK**
	1. IF.....Adequate core cooling is assured, AND It becomes necessary to bypass the LPCI injection valve auto open signal to control injection, THEN.....PLACE 3-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in BYPASS.	
	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.	

XII. Simulator Event Guide:

Event #8: Drywell Leak / Drywell Control Air Leak (continued)

Position	Expected Actions	Time/Comments
BOP	7. IF.....RPV pressure is below 230 psig, THEN.....VERIFY CLOSED 3-FCV-68-79, RECIRC PUMP 3B DISCHARGE VALVE.	
	8. THROTTLE 3-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE, as necessary to control injection.	
	9. MONITOR RHR Pump NPSH using Attachment 1.	
	10. PLACE RHRSW pumps in service as soon as possible on ANY RHR Heat Exchangers discharging to the RPV.	
	11. THROTTLE the following in-service RHRSW outlet valves to maintain flow between 1350 and 4500 gpm: • 3-FCV-23-34, RHR HX 3A RHRSW OUTLET VLV • 3-FCV-23-40, RHR HX 3C RHRSW OUTLET VLV.	
	12. NOTIFY Chemistry that RHRSW is aligned to in-service RHR heat exchangers.	
SRO	Directs Drywell Sprays placed back in service when level > TAF (Appendix-17B, "RHR System Operation- Drywell Sprays") (If needed and in the safe area of the Spray Curve)	
BOP	Places Drywell sprays back in service if directed per Appendix-17B, "RHR System Operation- Drywell Sprays" (refer to previous 17B)	
SRO	Declares Site Area Emergency 1.1-S-1	

XIII. Crew Critical Tasks:

	TASK	SAT/UNSAT
1)	Prevent Auto ADS actuation	
2)	Terminate and prevent injection prior to Emergency Depressurize	
3)	Emergency Depressurize when required by EOI's – When level reaches (-)180"	
4)	Restore/Recover Reactor water level above top of active fuel (-)162"	

NOTE: **Terminate the scenario when the following conditions are satisfied or upon request of evaluator:**

1) ED complete

2) RPV water level +2" to +51" (or recovering)

SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER: HLTS-3-17

_9_ Total Malfunctions Inserted: List (4-8)

1) 3A CRD Pump Trip
2) H_2O_2 Analyzer Failure
3) IRM Failure
4) RFP Trip
5) HPCI Aux Oil Pump failure
6) ATWS
7) Drywell Leak
8) DW Control air header break / Failure of ADS valves
9) 3B CRD trip

_4_ Malfunctions that occur after EOI entry: List (1-4)

1) ATWS
2) Drywell Leak
3) DW Control air header break / Failure of ADS valves
4) 3B CRD trip

_4_ Abnormal Events: List (1-3)

1) 3A CRD Pump Trip
2) IRM Failure
3) H_2O_2 Analyzer Failure
4) RFP Trip

_2_ Major Transients: List (1-2)

1) ATWS
2) Drywell leak

_2_ EOI's used: List (1-3)

1) EOI-1
2) EOI-2

_2_ EOI Contingencies used: List (0-3)

1) C-5
2) C-2

_____ Run Time (minutes)

_____ EOI Run Time (minutes): _ % of Scenario Run Time

_4_ Crew Critical Tasks: (2-5)

YES Technical Specifications Exercised (Yes/No) – TRM

SHIFT TURNOVER SHEET

Equipment Out of Service/LCO's:

3A and 3B RFP's are being tagged for outage work. Loop II RHR is tagged to bridge and megger their motors, 7 day LCO's for T.S. 3.5.1.A and 3.6.2.3A, 4A, & 5A.

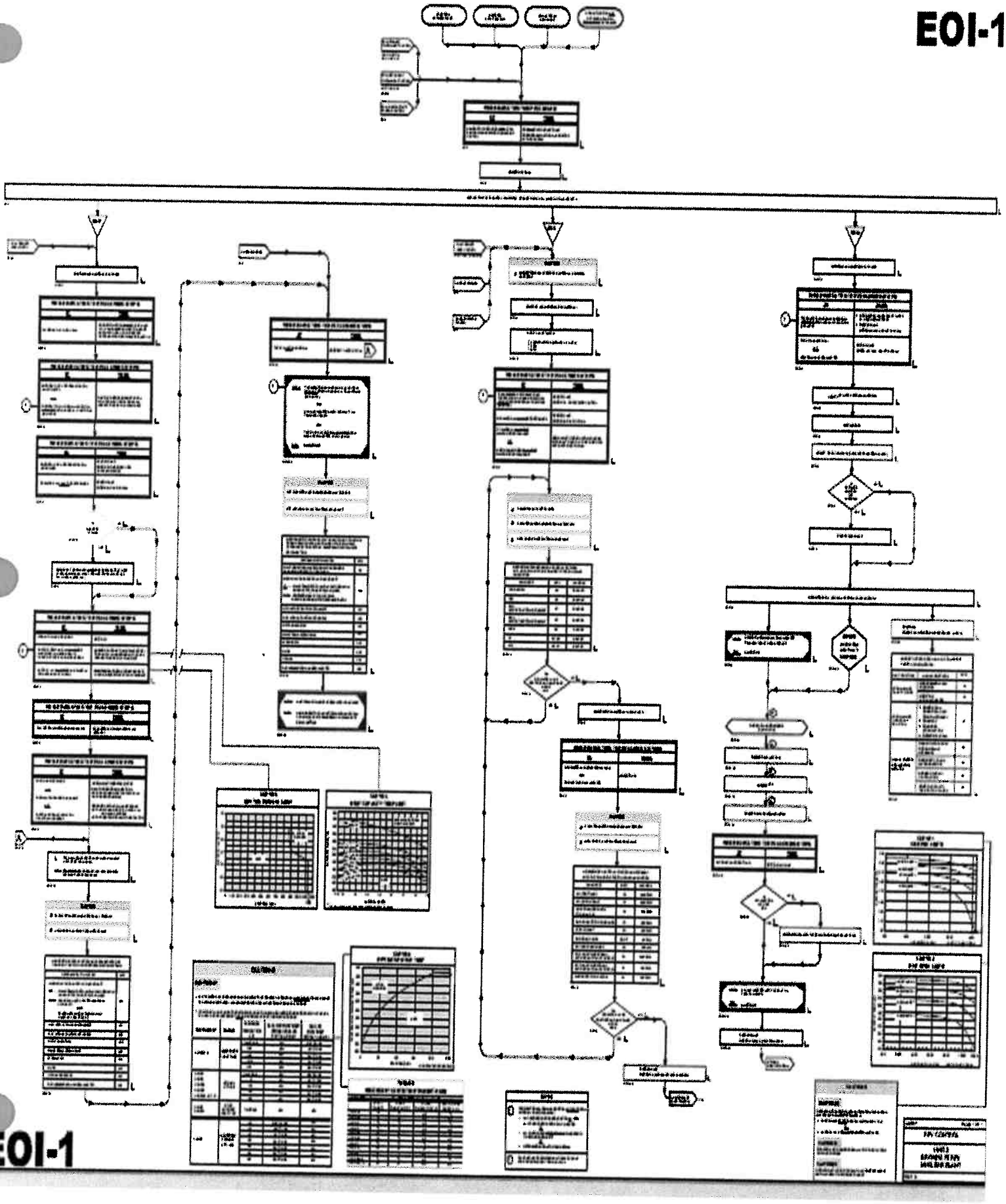
Operations/Maintenance for the Shift:

Continue to lower power with control rods per 3-GOI-100-12A step 5.0[32] until < 5% and then stop to place SJAE's and OG pre-heaters on aux boiler steam (Turbine seal steam has already been swapped to aux boiler steam). The IM's have completed all SR's for SRM's and IRM's and they have been declared Operable. Place Mode in START & HOT STANDBY. H2O2 Analyzers are in service in preparation for de-inerting Primary Containment. Continue lowering power to ~ 1% and close MSIV's per 3-GOI-100-12A Attachment 3 (step 5.0[42]). Maintain Rx power ~ 1% while Drywell inspection and turbine work is performed. Control air has been aligned to DWCA and all N_2 to Containment is being tagged out.

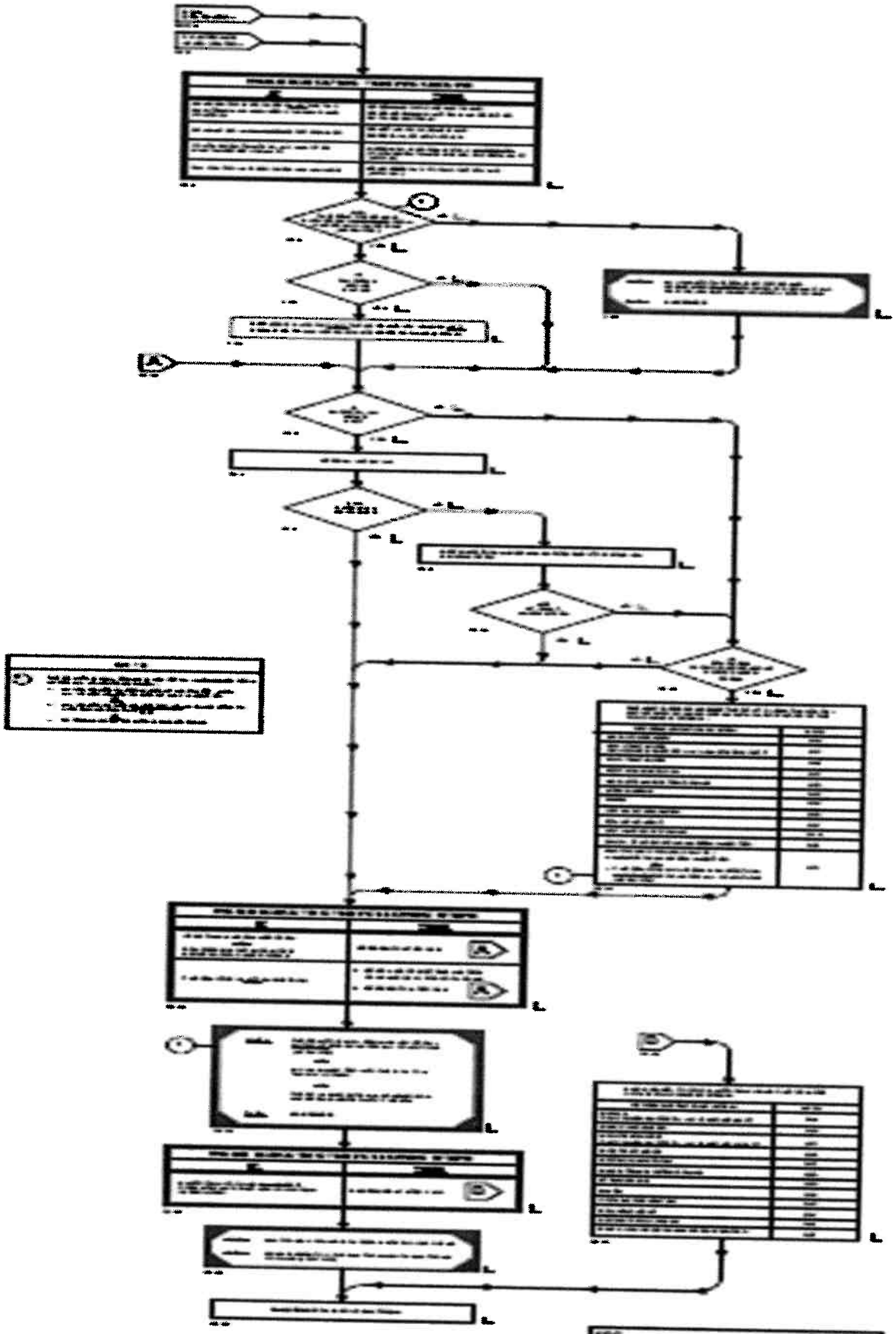
Unusual Conditions/Problem Areas:

Severe thunderstorm warnings in area for the next 10 to 12 hours.

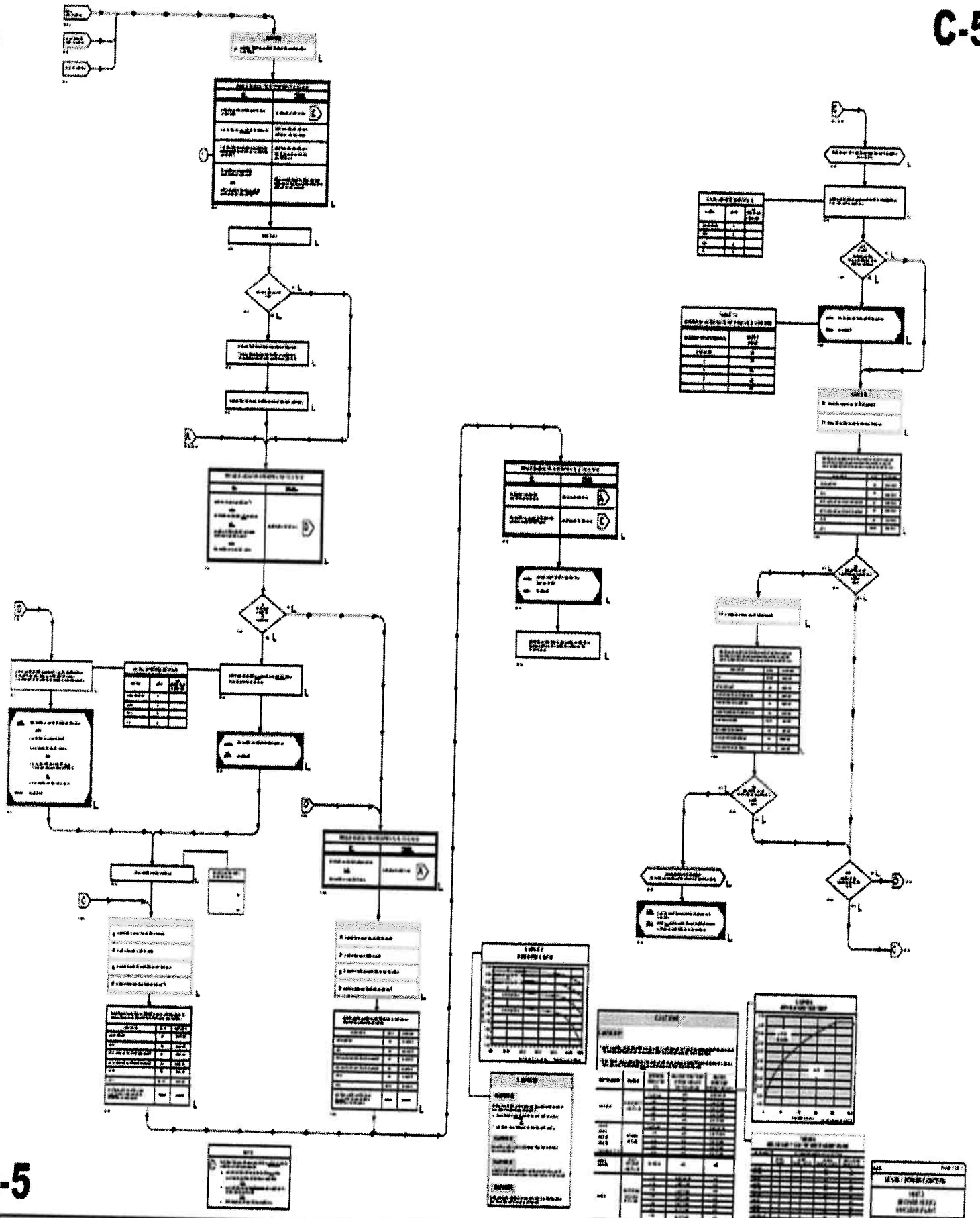
EOI-1



3-C-2 EMERGENCY RPV DEPRESSURIZATION

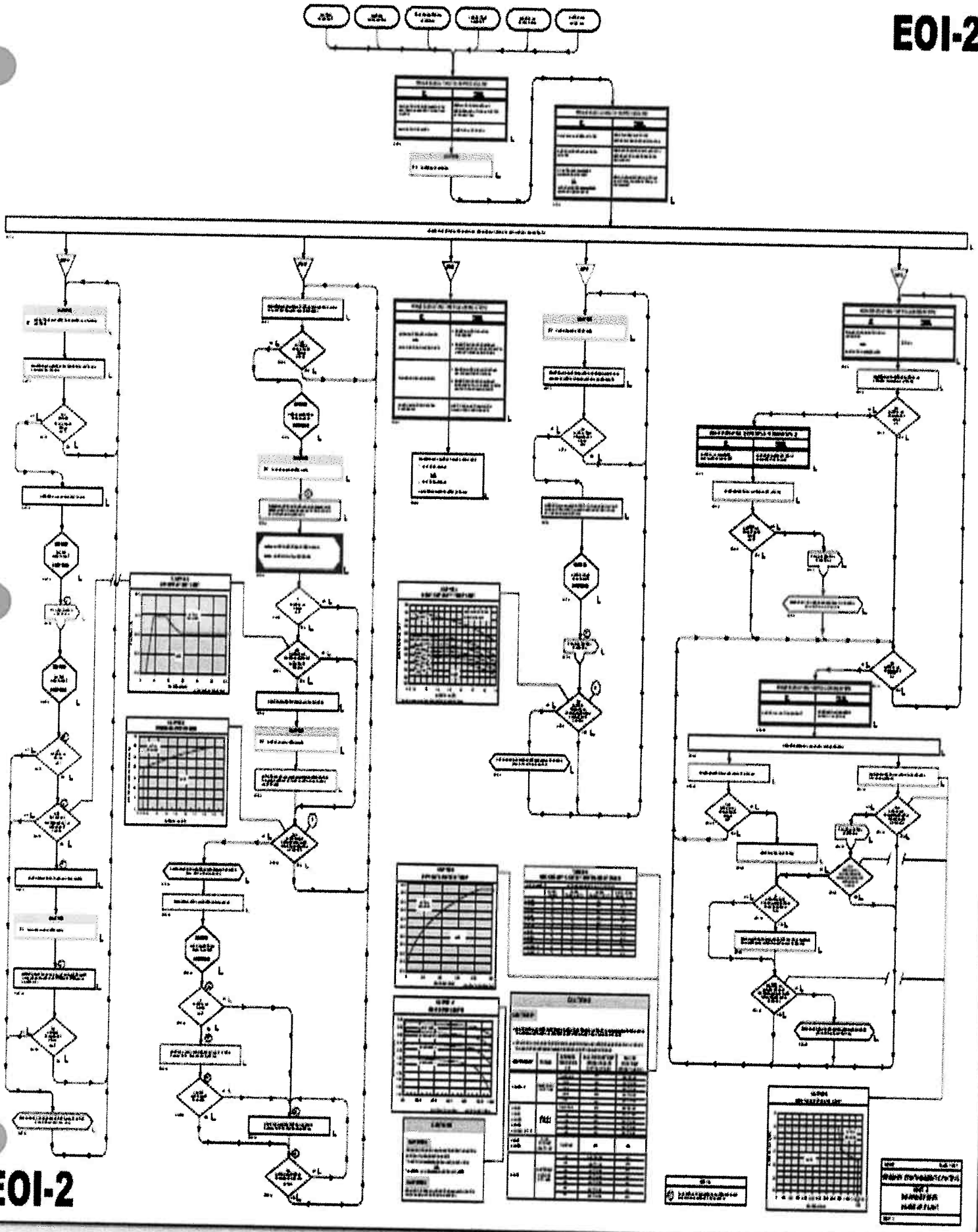


C-5



C-5

EOI-2



EOI-2