

RR 3/14/65

Sim Scenarios -



## Millstone Station Unit 2 Operator Training

### SIMULATOR EXERCISE GUIDE

I. Title: LOIT Simulator Evaluation #1

ID Number: ES04LI1

Revision: 0

II. Initiated:

Daniel A. Pantalone

Developer

01/24/2005

Date

III. Reviewed:

R. J. Ashley

Reviewer

1/26/05

Date

IV. Approved:

Operator Training Supervisor

1/31/05

Date

Title: Simulator Evaluation  
ID Number: ES04LI1

Revision: 0

---

## TABLE OF CONTENTS

### SECTIONS LISTED IN ORDER:

1. Cover Page
  2. Table of Contents
  3. Exercise Overview
  4. Instructor Guide / Summary
  5. Scenario Initial Conditions
- Attachments
- Validation Checklist
  - Training Turnover Sheet

## EXERCISE OVERVIEW

1. Purpose:
  1. Evaluate the licensees' ability, as a team and individually, to safely and responsibly operate the plant during normal plant operations, abnormal operating conditions and emergency operating conditions.
  - b. Evaluate licensees in the following areas, as applicable:
    - 1) Ability of the crew to perform crew-dependent (and time-critical) tasks.
    - 2) Ability of individuals to perform critical tasks.
    - 3) Ability of the crew to:
      - a) Understand/interpret alarms/annunciators
      - b) Diagnose events/conditions based on signals/readings
      - c) Understand plant/systems response
      - d) Comply with/use procedures and Technical Specifications
      - e) Properly communicate information/proper crew interactions
      - f) Perform control board operations
    - 4) Ability of each individual to:

- a) Respond and correctly interpret annunciators
- b) Correctly diagnose events
- c) Properly interpret integrated system response
- d) Comply with and use Technical Specifications
- e) Comply with and use procedures
- f) Properly perform control board operations
- g) Demonstrate a responsible attitude
- h) Properly communicate information and interact with the rest of the crew

2. Exercise Brief:

The simulator will be prepared for the evaluation and the licensees will be briefed on the conduct of the evaluation and the areas in which they will be evaluated.

The simulator will be initialized in Mode 1, NOP/NOT, EOL, Equilibrium Xe, 35 ppm boron, Z2 protected and 24E tied to 24D.

Four hours prior to taking the shift, an minor earth quake  $< 0.09g$  ZPA was felt and verified by the USGS Earthquake Information Center.

All actions for the AOP 2562, "Earth Quake" have been performed.

Due to a slow rise in CTMT Sump, AOP 2568 "RCS Leak" was implemented.

A CTMT entry was made per AOP 2568, step 5.2.d, and there is a small flange leak on 2-CH-442 "Letdown Iso Vlv".

Leakage is categorized as Identified Leakage  $\sim 5.0$  gpm.

The crew is periodically pumping the CTMT Sump to ensure RCS leak does not degrade.

Management has determined that the next crew will shutdown the plant. This will provide time for engineering to develop a repair plan, notify the necessary people and brief the next crew.

Unit 3 declared an UE/D1. The event is now terminated.

SP-2654B "Forcing Sprays" is scheduled for the beginning of shift.

RC-200 AVMS (Pzr Safety Vlv) is Out of Service

3. Scenario Summary:

Shortly after taking the shift, the crew will experience the following:

Title: Simulator Evaluation  
ID Number: ES04LI1

Revision: 0

- Loss of "C" SW Pp. requiring the "B" SW Pp. be started on Z2.
- Failure of 6A Heater High Level Dump valve requiring the valve placed in manual and controlled from the Foxboro screen.
- The Pzr PORV "RC- 402" will develop a leak. This will puts the crew into TSAS TSAS 3.4.2 "Safeties Valves" and require the Block Vlv to be closed.
- After the block valve is closed per the ARP, the leak on CH-442 will increase and the crew will enter AOP-2575 "Rapid Downpower"
- The crew commences a Rapid Downpower per "AOP 2575" and AOP 2568 "RCS Leakage".
- During the Rapid Downpower, leak degrades forcing the crew to trip.
- EOP 2525 will be followed by EOP 2532 "LOCA".
- The crew will start the cooldown in EOP 2532.
- While in EOP 2532, the "A" CAR Fan will experience high vibrations requiring it to be tripped.
- During the cooldown in EOP 2532, a SGTR occurs in #1 S/G. forcing the crew into EOP 2540.
- The crew will select success path "CI-1" and transition to EOP 2540E.

The scenario can be terminated when the "A" CAR is secured and the crew has successfully isolated the #1 S/G.

4. Plant/Simulator differences that may affect the scenario are:

None

5. Duration: 2.0 hours

All Control Room Conduct, Operations and Communications shall be in accordance with Master Manual 14 (MP-14). Review the Simulator Operating Limits (design limits of plant) and Simulator Modeling Limitations and Anomalous Response List prior to performing this training scenario. The instructor should be aware if any of these limitations may be exceeded.

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		Utilizing an open room, brief the crew on the conduct of the evaluation and the areas in which they will be evaluated.	INST		
		<u>For Turnover Brief:</u> Read "Exercise Brief" on pg. 36 to the examinees. 100% power, EOL, Equilibrium Xenon 35 ppm boron / Blend ratio – 165 PMW/1 BA SG Blowdown - ~25 gpm each 24E aligned to bus 24D Provide and review T/O sheet SP-2654B "Forcing Sprays" is scheduled for beginning of shift. Work Control is available to perform tasks outside the control room. Read "Dynamic Simulator Examination Briefing Sheet" from NTP 144	INST		
T <sub>Initial</sub>	IC-92 or equivalent	<u>Simulator Setup and Initial Conditions:</u> EOC Eq Xe, LL = 6.80, SGBD = 25/25, EB Purge	INST		
		<ul style="list-style-type: none"> <li>- Hang the Z2 Protected Sign</li> <li>- Shift the Xties for RBCCW, SW and HPSI</li> <li>- Close SI-411 &amp; 655, Open SI 412 &amp; 653 (C-01)</li> <li>- Close RB 211C, Open RB 211D (C-06)</li> </ul>	INST		

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
	EDR14 (RO) EDR15 (RI) SWR22 (22F) CVR11 (22F) RC-27	<ul style="list-style-type: none"> <li>- Close SW 97A. Open SW 97B (C-06)</li> <li>- BKR 24E from 24C (A305)</li> <li>- BKR 24E from 24D (A408)</li> <li>- 'B' SW Pp. Strainer power supply .</li> <li>- 'B' SW Pp. Charging Pp. kirk key supply</li> <li>- "RC 200 AVMS" failure.</li> <li>- On the Foxboro display, insure you can bypass the 6A Feedwater Heater level detector L5043A.</li> <li>- Ensure "RC200 AVMS" does not alarm or cause the annunciator on C-02 or indicate on RC05E</li> <li>- Ensure BKR A408 "24E to 24D" is closed.</li> <li>- Reset the RCS Leak Rate, verify at 0 gpm.</li> </ul>			
	RC-04 @ 0.5%	RCS Head Vent Leak ~ 3.5 gpm.			
	RUN	Go to RUN			
T1		If the crew is delaying forcing sprays, call as Jim Kunze and prompt the crew to start.	US           PPO PPO	US directs the PPO to commence forcing sprays. <ul style="list-style-type: none"> <li>- Crew may have a short briefing</li> <li>- SP 2654B is approved for implementation.</li> <li>- Backup Heaters are placed to 'CLOSE'</li> <li>- PIC-100Y setpoint is lowered               <ul style="list-style-type: none"> <li>- 50% output</li> <li>- HIC-110E/F controller start to rise.</li> </ul> </li> <li>- Pzr Press adjusted to ~ 2250 psia</li> </ul>	SP-2654B

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	Annunciator 'PZR PRESS DEVIATION' - Informs the US this is an expected alarm for Forcing Sprays. - The ARP does not have to opened or implemented.	ARP 2590B (C06/D37)
		<b>Trip of 'C' SW Pump</b>			<b>AE-1 TM-1</b>
T2	SW-01C	After crew completes Forcing Sprays. trip the "C" SW Pp.			
		The SPO has several options to mitigate this event. He may: - Start the "B" SW Pp. and align it to the "B" SW HDR, Per GDL-200, "Skill of Trade." - Uses the ARP to start the "B" SW Pp. - Wait for the US to direct his actions per AOP-2565 "Loss of SW".			
		While one attempt to restart the 'C' SW Pp. is	SPO	Reports the "C" SW Pp tripped and Annunciator, "SW PUMP 'C' OVERLOAD/TRIP (C-06, BA4) - With US direction, reset the "C" SW Pp and attempt one restart.	GDL-600



## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>allowed by GDL 600, the US should not direct a restart for the following reasons:</p> <ul style="list-style-type: none"> <li>- Annunciator (C-06,BA4) indicates a faulted pump motor.</li> <li>- The "B" SW Pp. is available to replace the "C" SW Pp.</li> </ul>		<p>or</p> <ul style="list-style-type: none"> <li>- With US permission, starts the "B" SW Pp and aligns it to the "B" SW HDR.</li> </ul>	GDL-200 ARP C06/BA4 AOP-2565
		The US may first enter AOP-2565 or the ARP, the sequence is not critical. It is important that both procedures are eventually checked for complete implementation.			
		<b>Response to Annunciator</b> C-06 BA-4, "SW PUMP C OVERLOAD/TRIP".			ARP 2590E
			US	Enters the ARP, or directs the SPO to enter the ARP.	ARP 2590E
			SPO	<p>Checks the following to determine if alarm is valid (C-06)</p> <ul style="list-style-type: none"> <li>- Pump red light is not lit and amber light is lit, with 0 amps.</li> <li>- Low flow on components served by header.</li> <li>- If alarm is valid, Go To AOP 2565. "Loss of SW"</li> </ul> <p>Refer to OP 2326A, "SW System" and perform actions to place "B" SW pump in</p>	ARP 2590E

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				service on Fac. 2.	
		<b>Entry into AOP 2565 "Loss of SW"</b>			
		US should not direct an attempt to restart the 'C' SW Pp	US	Determines that Annunciator (C-06/BA4) "SW PUMP C OVERLOAD/TRIP" is lit. - If lit, do not restart the "C" SW Pp.	AOP 2565
			US	Directs the SPO to start the 'B' SW Pp.	AOP 2565
		US enters Section 6.0 of AOP 2565.			
			US SPO	Directs the SPO from Section 6 of AOP 2565. - Place the "C" SW Pp. in "PTL" - Ensure SW-97A, "Discharge Xtie" Closed - Ensure SW-97B "Discharge Xtie" Open. - Start the 'B' SW Pp. - Check Ann. (C06/A19A) "SW Pp. 'B' SIAS/LNP Start Manually Blocked" lit.	AOP 2565
			US/SPO	Direct a PEO to place the "SIAS/LNP Actuation Signal HS 6484A" in NORMAL.	
			US	Directs a PEO to Stop Sodium Hypochlorite to the "C" SW Pp.	OP 2328A
			SPO	Monitors	AOP 2565

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				<ul style="list-style-type: none"> <li>- 'B' SW Header Flow</li> <li>- Pump Pressure</li> <li>- Motor Amps</li> </ul>	
			US	<p>Sends, or directs Work Control to send a PEO</p> <ul style="list-style-type: none"> <li>- to check the 'C' SW Pp. breaker A407</li> <li>- to check the 'C' SW Pp.</li> <li>- Directs Work Control to contact maintenance to assist in determining the condition of the 'C' SW Pp.</li> </ul>	AOP 2565
		<p><i>As PEO, wait 5 min. then report</i></p> <ul style="list-style-type: none"> <li>- Sodium Hypochlorite is secured to the "C" SW Pp.</li> <li>- The 'C' SW Pp looks normal.</li> <li>- 'B' SW Pp. Packing Leakoff, Lube Water Flow, Noise and Vibration and Discharge Press are satisfactory.</li> <li>- Strainer D/P cell is vented and satisfactory.</li> </ul>			
		<p><i>As Electrical Maintenance and PEO wait 10 min. then report:</i></p> <ul style="list-style-type: none"> <li>- Breaker A407 is tripped and has one dropped flag.</li> <li>- Looks like the breaker opened on Over Current.</li> </ul>			

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<i>If asked, report it will take hours to determine if and where the fault is.</i>			
			US	Logs into LCO 3.7.4.1 "SW SYSTEM" and TRM 7.1.21 "APPEN R SW SYSTEM"	AOP 2565
		<p>"B" SW Pp won't auto start on a SIAS until HS-6484A "SIAS /LNP Start Signal" is placed in the NORMAL.</p> <ul style="list-style-type: none"> <li>- LCO 3.7.4.1 applies until HS 6484 is placed in the normal position.</li> </ul> <p>This guidance is not in AOP 2565, but is in the following:</p> <ul style="list-style-type: none"> <li>- OP-2326A "SW System".</li> <li>- ARP-2590E (C06/7, AA19)</li> </ul>			
			US	Directs a PEO to place the "SIAS /LNP Start Signal HS 6484A" to NORMAL	OP 2326A step 4.5.20 ARP-2590E C06, AA19
	SWR 31 (NORM)	<p>Wait 5 min. and insert the remote. "SIAS/LNP Actuation Signal HS 6484A" in NORMAL.</p> <p>Call the CR and report switch in NORMAL.</p>	INST		

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		Section 7 evaluates key plant parameters to ensure there are no other problems. - The US may direct the PPO or SPO to complete Section 7 and advise for any parameters not in the normal range.	Inst.		
			US	Logs out of LCO 3.7.4.1 and TRM 7.1.21	
		<b>Heater 6A Level Hi Annunciator</b>			
T3	FW 38B @0% 180 sec ramp	Fail FW Heater 6A level transmitter (LT5043A) fails downscale. - Actual level in the heater rises to ~ 20 inches due to the "averaged" level lowering.	Inst.		<b>AE-2</b> <b>TM-2</b>
		<b>If necessary, modify the FW 38B to ensure level does not reach 34 inches. Use the PPC to monitor the actual heater level.</b> - Heater 6A level stabilized at ~ 20" during the validation with no adjustment to the malfunction.	Inst		
		US can direct the SPO to implement the ARP or direct the steps himself.	US	Responds to alarm C05. BA-20, "HEATER 6A LEVEL HI"	ARP 2590D, BA-20, "HEATER 6A LEVEL HI"
			SPO	Displays "Heaters 4A/5A/6A" screen on the Foxboro display.	ARP 2590D

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			US	Directs a PEO to check <ul style="list-style-type: none"> <li>- local level gauge.</li> <li>- Valve lineup</li> <li>- Controller malfunction and air connection.</li> </ul>	ARP 2590D
		The actual heater level should stabilize at ~ 20 “, no reason to trip the plant.	US	If Foxboro indications reaches 34 inches or local level gage exceeds 34 inches <ul style="list-style-type: none"> <li>- Trip the Rx, Trip turbine.</li> <li>- Close both MSIVs.</li> <li>- Stop all condensate pumps and perform EOP2525.</li> </ul>	ARP 2590D
		<i>As PEO wait 3 minutes and report:</i> <ul style="list-style-type: none"> <li>- All air lines are intact.</li> <li>- Heater 6A siteglass reads. ~ 20 inches</li> <li>- Display the Feedwater heater level on the PPC, and report the level of the good transmitter.</li> </ul>	Inst		
			SPO	If one transmitter does not agree with the other transmitter and sight glass, Bypass the faulty transmitter on the Foxboro display.	ARP 2590D
		The crew may opt to place the High and Normal Level Dump valves into manual before bypassing LT 5043A to preclude another Feedwater heater	SPO	SPO selects and bypasses “LT 5043A”. <ul style="list-style-type: none"> <li>- If the SPO does not place the valves in</li> </ul>	

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>transient caused by suddenly bypassing the faulted transmitter.</p> <ul style="list-style-type: none"> <li>- This is supported by GDL 600 step 2.2 "Manual Operation of Controllers".</li> </ul> <p>If the crew follows the ARP and does not go to manual first, the resultant transient will not trip the plant.</p>		<p>manual.</p> <ul style="list-style-type: none"> <li>- 6A Heater and 5A Heater Hi and Low level annunciators will alarm on C-05.</li> <li>- The heater levels will stabilize within minutes.</li> </ul>	
			US	Submit a TR/CR to I&C to repair "LT-5043A".	ARP 2590D

## SECTION 4

ID Number ES041L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<b>RC-402 "PORV" Leakage</b>			
T4	RC06A @ 1.5%	RC-402 leakage Pzr Press will lower to ~ 2240 psia and stabilize.			<b>AE-3</b> <b>TM-3</b>
		<b>Note: The leak is too small for the "Acoustic Vlv Monitor" (AVMS) for RC-402 to detect.</b> <ul style="list-style-type: none"> <li>- Annunciator C02/3 A-11, "AVMS Alarm" will not energize.</li> <li>- The US may refer to this ARP knowing it would be required if the AVMS were operating properly.</li> </ul>			
		If the crew calls the OMOC or Kunze, direct the crew to start a plant shutdown at a rapid controlled rate.			
			PPO	Report Annunciator "Pzr Relief Valve Dis Temp Hi" is alarming.	ARP 2590B C02/3, C42 Disch Temp Hi.
			PPO	Monitor for <ul style="list-style-type: none"> <li>- Quench Tank Pressure, Temp, and Level.</li> <li>- If alarm conditions is reached on quench tank, Refer to P 2301A. "PDT"</li> </ul>	ARP 2590B



## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				and QT Operation. -	
			US	Refer to LCO 3.4.3 "Relief Valves" and LCO 3.4.6.2 "RCS Leakage"	ARP 2590B
		US can direct the PPO or SPO to determine the RCS Leak Rate.  The US may direct that the leak rate be restarted to get an accurate leak rate.	US	Access the PPC Leak Rate.	
		The PPO should monitor the AVMS and determine they do not indicate RC-402, 404 (PORVs) or RC-201 (Safety) are leaking.	PPO	Determine Leaking PORV - Monitor AVMS	ARP 2590B
		If the PPO closes RC-405 first, the "DIS TEMP" will not decrease. The procedure directs RC-405 to be opened and RC-403 closed.  - When RC-403 is closed, the "DIS TEMP" will decrease indicating the correct PORV is isolated.	US/PPO	If unable to determine leaking PORV - Close RC-403 or RC-405 - Monitor "PORV DIS TEMP" TI-106	ARP 2590B
		<b>Response to Annunciators C-03, A36 "QT Hi/Lo" and C-03, B36 "QT Press Hi"</b>			
		NOTE 1: The crew may not respond to the above annunciators because they are in AOP -2568 "RCS Leak".			

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		NOTE 2: If the crew implements the above ARPs, there is guidance to trip the plant. <b>If the crew orders the reactor tripped, insert T-6 (RC04 @ 70%)</b>			
			US/ CREW	If high pressure is due to relief or safety valve blowdown and cannot be isolated. Go to EOP 2525 "Standard Post Trip Actions" and perform required actions. <ul style="list-style-type: none"><li>- Trip the plant and carry out EOP 2525.</li></ul>	ARP 2590B-206 step 5 C-03, B36
		<b>OP 2301A "PDT and QT Operation"</b>			
		NOTE 1: The crew may use OP 2301A to reduce QT Level, Pressure and Temperature. This is not required if they are in AOP-2568 "RCS Leak".			
		NOTE 2: If the crew uses OP 2301A, they may use one or both of the following sections: 4.1 Recirc and Cooling the QT and PDT 4.5 Emptying QT			
		The US will direct the PPO to implement OP 2301A.	PPO	<ul style="list-style-type: none"><li>- Verify closed LRR-64.1/54.1. "PDT/QT Recirc-Cool" vlvs</li><li>- Open LRR-57.1/62.1 "QT Recirc/Clg" vlvs</li><li>- Verify open RB-240, "QT/PDT Hx RBCCW Out" vlvs.</li></ul>	OP-2301A step 4.1

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				-	
			PPO	<ul style="list-style-type: none"> <li>- Open RC-401 "QT Drain"</li> <li>- If PDT pressure is higher than QT pressure: <ul style="list-style-type: none"> <li>- Verify closed, GR-11.1 and GR-11.2 "PDT Disch Isolations".</li> <li>- Open LRR-47.1 "PDT Vent"</li> <li>- OPEN RC-400 "QT Vent"</li> </ul> </li> </ul>	OP-2301A step 4.5
		<b>Rising RCS Leakage</b>		-	
T5	RC-04 @ 5.0%	RCS Head Vent Leak ~ 35 gpm.			
		<b>Enter AOP-2568 "RCS Leak"</b>			
		The US may hand off Section 3.0 of AOP-2568 to the PPO or SPO, requiring the SPO to report any parameters out to the normal range.	US	Directs entry into AOP 2568 and performs Plant Assessment.	AOP 2568, Sec. 3.0
		<p>The US or PPO/SPO should find all the parameters necessary to complete Section 3.0 within the required range with the possible exception of:</p> <ul style="list-style-type: none"> <li>- Pzr Level</li> <li>- Pzr Pressure</li> </ul>			

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The PPO/SPO may need to report low Pzr Level and ensure max charging and min. letdown.	US/PPO	If Pzr Lvl is not 35 to 70% - Manually operate Charging and Letdown.	AOP 2568 Step. 3.2
		The PPO/SPO may need to report low Pzr Pressure - BU Heaters should already be ON.	US/PPO	If Pzr Press not 2225 to 2300# - Place all BU Heaters to "ON". - Ensure Spray Vlvs closed.	AOP 2568 Step. 3.3
		If the US handed off Section 3.0 to the SPO, the US will implement Section 4.0.			AOP 2568. Sect. 4.0
			US/PPO	If RCS leakage exceeds available charging capability, TRIP the Rx. and Go To EOP 2525. - The leak rate is not > charging capacity. - No need to trip at this time.	AOP 2568. Step 4.1
			US/PPO /SPO	Direct RCS Leak Rate - The operator access the PPC and reports present leak rate.	AOP 2568. Step 4.3

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>The US may have previously done an RCS Leak Rate.</p> <p>If leakage is &gt;25 gpm.</p> <ul style="list-style-type: none"> <li>- SM must classify "Unusual Event / D1" per "BU2" Identified Leakage &gt; 25 gpm.</li> </ul>	<p>US / Crew</p> <p>SM</p>	<p>Initiates Leak Rate Determination.</p> <p>US should determine leak rate &gt; 10 gpm identified leakage.</p> <p>Classify per FAP06</p> <ul style="list-style-type: none"> <li>- UE/D1 per BU2 if leakage &gt;25 gpm.</li> </ul> <p>Log into LCO 3.4.6.2</p> <p>Refer to AOP 2575 and start a Rapid Downpower</p>	<p>AOP 2568, Step 4.4</p> <p>FAP06</p>
		The US may personally implement, or handoff, Section 5.0.	US/SPO	Implement Section 5 to ensure no other leaks.	AOP 2568 Section 5
		If requested, report no activity in RBCCW and no leakage in Aux. Bldg. After a minimum of 20 minutes for a visual inspection. (Time may be adjusted if multiple personnel are assigned to the inspection)		Crew attempts to identify leak location by performing applicable steps of AOP 2568. May direct chemistry sample RBCCW System or have PEO observe CVCS piping in Aux. Bldg.	AOP 2568
		<b>Enter AOP 2575 "Rapid Downpower"</b>			
				Crew determines that identified RCS leak rate exceeds T/S 3.4.6.2 limit and begins to initiate a plant shutdown per AOP 2575.	AOP 2568, AOP 2575

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			SM US SM SM	Make the following notifications - CONVEX and ISO - Health Physics - OMOC - Unit 3	AOP 2575 Step 3.4-7
			US	IF parameters associated with automatic reactor or turbine trips are challenged, manually TRIP reactor and Go To EOP 2525. "Standard Post Trip Actions." - Trip criteria should not be challenged.	AOP 2575 Step 3.8
		Due to the low pressure condition, the B/U Heaters should already be on and the spray vlvs shut.	US/PPO	Initiate forcing sprays. - This step have already been completed.	AOP 2575 Step 3.9
		Due to loss of inventory, step 3.11, "BORATING FROM RWST" is not the optimal method to reduce power. - Loss of inventory causes extra Chg. Pps. to turn on which accelerates the downpower rate. - This will exacerbate the loss of pressure.			

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			US/PPO	Insert Group 7 five to ten steps.	AOP 2575 Step 3.12
			PPO	START additional charging pumps as required.	AOP 2575 Step 3.13
		<ul style="list-style-type: none"> <li>- A controlled downpower of &gt;20%/hr. is reasonable, unless RCS pressure is challenged.</li> <li>- If RCS pressure is challenged, &lt;20%/hr. should be directed.</li> </ul>	PPO	Based on plant conditions, SELECT the appropriate boron addition rate from the tables.	AOP 2575 Step 3.14
			PPO	Borates to charging pump suction: ADJUST setpoint of "BORIC ACID FLOW" controller, "FC-210Y," to flowrate determined in step 3.14. <ul style="list-style-type: none"> <li>- OPEN "RWST TO CHG SUCT, CH-504."</li> <li>- PLACE "MAKEUP MODE SEL" switch in "MANUAL."</li> <li>- START a boric acid pump, and CHECK boric acid pump discharge pressure greater than 98 psig.</li> <li>- OPEN "VCT MAKEUP BYPASS, CH-196."</li> </ul>	AOP 2575 Step 3.15

ID Number ES04LI1

## SECTION 4

Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The PPO must determine the neutral blend ratio and add the gpm. of Boric Acid that corresponds to the % power reduction, as specified on Table-2. - The neutral blend should be listed on the turnover sheet.	US/PPO	IF required, "VCT Lvl" dropping, Refer To Attachment 3 "Heavy Blend to Maintain VCT Level," to make-up to the VCT.	AOP 2575 Step 3.12
		When the crew has established a controlled downpower, to approximately 95%, or if they trip, increase the leak.	INST		
T6	RC04A @ 70%	Head Leak ~ 500 gpm	INST		<b>MA-1</b>
		<b>Rx Trip EOP-2525</b>			<b>TM-4</b>
			Crew	Identify rapidly rising RCS leakage. - May initiate a manual trip if quick enough. Respond to trip IAW EOP 2525.	
		Note: US will pose questions regarding these aspects of each safety function. PPO and SPO responses critical to proper diagnosis and key actions are <b>Bold</b> in the following sections.	US	Query PPO and SPO on the status of Safety Functions as delineated in EOP 2525: Reactivity Control (PPO) - Reactor Maintenance of Vital Auxiliaries (SPO)	EOP 2525



## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>US/PPO should initiate SIAS, CIAS &amp; EBFAS at approximately 1800 psia.</p> <p><b>CT-1 Trip 2 RCPs (LOCA-13)</b></p> <p><b>CT-2 Secure all RCP within 5 min. of loss of NPSH. (2260 3.1.1)</b></p>		<ul style="list-style-type: none"><li>- Turbine</li><li>- Electrical buses</li><li>- SW &amp; RBCCW</li></ul> <p>RCS Inventory Control (PPO)</p> <ul style="list-style-type: none"><li>- Pzr level &amp; Subcooled margin (SCM), value &amp; trend</li></ul> <p><b>If Pzr Lvl is not 20 to 80%, the PPO should</b></p> <ul style="list-style-type: none"><li>- <b>manually operate charging and letdown to compensate for Pzr Lvl.</b></li></ul> <p>RCS Pressure Control (PPO)</p> <p><b>If Pzr. Press &lt; 1714 psia</b></p> <ul style="list-style-type: none"><li>- <b>ensure SIAS, CIAS, EBFAS &amp; CRAC</b></li><li>- <b>secure one RCP per loop</b></li><li>- <b>secure all RCPs if &lt; NPSH</b></li><li>- <b>ensure PORVs closed, if open, close the Block Vlv.</b></li></ul> <p>Core Heat Removal (PPO)</p> <ul style="list-style-type: none"><li>- RCP status</li><li>- Loop delta-T</li><li>- Th SCM</li></ul> <p>RCS Heat Removal (SPO)</p>	<p>OP-2260</p> <p><b>CT-1</b></p> <p><b>CT-2</b></p>

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				<ul style="list-style-type: none"> <li>- SG pressures 880-920#</li> <li>- RCS Tc 530-535 °F</li> <li>- SG levels, value &amp; trend</li> <li>- RCS SCM</li> </ul> <p>Containment (CTMT) Isolation (PPO)</p> <ul style="list-style-type: none"> <li>- Radmonitors inside CTMT <b>in alarm and rising. (R7891 Refuel Floor)</b></li> <li>- outside CTMT, steam plant. not in alarm or rising.</li> <li>- CTMT pressure &gt;1# <b>and rising.</b></li> </ul> <p><b>If CTMT Press <math>\geq</math> 4.42 psig.</b></p> <ul style="list-style-type: none"> <li>- <b>Initiate SIAS, CIAS, EBFS, CRAC &amp; MSI</b></li> </ul> <p>CTMT Temperature &amp; Pressure Control (PPO)</p> <ul style="list-style-type: none"> <li>- CTMT temperature &gt; 120° F</li> <li>- CTMT pressure &gt;1# <b>and rising.</b></li> <li>- <b>Ensure at least 2 CARs with RBCCW</b></li> </ul> <p><b>If CTMT Press &gt; 9.48 psig,</b></p> <ul style="list-style-type: none"> <li>- <b>Ensure CSAS actuated.</b></li> <li>- <b>All CS Pps. &gt; 1300 gpm.</b></li> </ul>	

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
				CTMT Combustible Gas Control (PPO) <ul style="list-style-type: none"> <li>- CTMT temperature &gt; <b>120° F</b></li> <li>- CTMT pressure &gt;1# and rising.</li> <li>- <b>Place CTMT Aux Fans in Slow</b></li> <li>- <b>Start all PIR Fans</b></li> </ul>	
			US	Query PPO & SPO regarding the status of EOP 2525 subsequent actions	EOP 2525
			SPO	Report subsequent actions complete and verified when accomplished.	EOP 2525
			PPO	Report subsequent actions complete and verified when accomplished.	EOP 2525
		Verify that the STA has independently diagnosed the event	US	Query board operators re: safety function status, perform diagnostic flowchart, and diagnose small break LOCA, transition to EOP 2532.	EOP 2525 <b>EU-1</b>
			STA	Evaluate and concur.	
		<b>Enter EOP 2532 "LOCA"</b>			
			US	Directs SFSCs for EOP 2532 be initiated.	

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		Classification will be done as an Admin JPM later.	SM	Classifies event as either an Alert, C-1 based on RCB2, 3 or 4.	MP-26-EPI-FAP06
			STA	Verify that the STA has independently classified the event	
		NOTE 1: The <b>BOOTH INSTRUCTOR</b> must remove the following IO when the <ul style="list-style-type: none"> <li>- CAR Fan is stopped</li> <li>- and the reset button "CAR FAN VIB RESET" is pressed.</li> </ul>			
		NOTE 2: 1 minute after the US returns the "Annunciator Silence Switch" to NORMAL, insert the following IO.			
T7	IO "C-01 A4" (ON)	IO " <b>ON</b> " Annunciator C-01 A4, "CTMT AIR RECIRC FAN 'A' VIBRATION HI"	PPO	Reports annunciator for "CTMT AIR RECIRC FAN 'A' VIBRATION HI" energized.	<b>EM-1</b> <b>TM-5</b>
	IO "C-01 A4" (Delete)		US/PPO	Implements the ARP for C-01,A4. <ul style="list-style-type: none"> <li>- Stop "A" CAR fan per OP-2323A.</li> <li>- Monitor CTMT for increasing pressure, temp and moisture.</li> <li>- Submit TR to maintenance.</li> </ul>	2590A-013
		When directed by Chemistry to sample SGs. after ~30 min delay report both SGs < MDA.	Inst. / SPO	Direct Chemistry to sample SG(s).	EOP 2532

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		NOTE: Give the PPO time to identify the High CAR Vibration before inserting the following malfunction. We don't want to mask the HI VIBRATION annunciator.			
T8	SG02A @ 60% (60 sec.)	#1 S/G Tube Rupture ~ 750 gpm. If the MSIVs are open, the SJAE should show a rise indicating a SGTR in #1 S/G. If MSIVs are closed, the SJAE won't rise but the SGBD RM will rise and the #1 S/G Level will eventually show an unusual rise indicating a SGTR in #1 S/G.			
			PPO	Verify SIAS, CIAS, EBFAS, and CRAC on C-01X - Check SI Flow adequate - Ensure all available Chg. Pp. operating. - Ensure vital switch gear cooling	EOP 2532 Step 5
		<b>CT-2 Secure all RCP within 5 min. of loss of NPSH. (2260 3.1.1)</b>	PPO	If RCS Press < NPSH - Trip all RCPs - close steam dumps to condenser - spray valves	EOP 2532 Step 6 <b>CT-2</b>

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	Isolate the LOCA <ul style="list-style-type: none"> <li>- Ensure valves are closed for isolating LOCA</li> <li>- Check not RBCCW Radmonitor.</li> <li>- Check RBCCW Surge Tk not rising</li> </ul>	EOP 2532 Step 7
			PPO	Check LOCA NOT Outside CTMT <ul style="list-style-type: none"> <li>- Check Radmonitors outside CTMT on PPC</li> </ul>	EOP 2532 Step 8
			US/PPO/ SPO	Place Hydrogen Analyzers in Service <ul style="list-style-type: none"> <li>- EOP 2541 Appendix 19.</li> </ul>	EOP 2532 Step 9 <b>MA-2</b> <b>TM-6</b>
		When the crew determines they have a SGTR in #1 S/G, move forward in this guide to EOP 2540.	PPO	If CTMT pressure is >4.42 psig or CTMT Radmonitors are in alarm <ul style="list-style-type: none"> <li>- Ensure SIAS, CIAS, EBFAS, MSI &amp; CRAC.</li> <li>- Start all available CAR Fans with RBCCW Flow.</li> </ul>	EOP 2532 Step 10
			PPO	If CTMT Press. > 9.48 psig. <ul style="list-style-type: none"> <li>- Ensure CS Pps. running</li> <li>- Ensure CS Flow &gt; 1300 gpm.</li> </ul>	EOP 2532 Step 11
			SPO	If MSIVs are closed, open AR-17 "Vacuum Breaker"	EOP 2532 Step 12

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			SPO	If MSIVs are open - Align Condenser Air Removal to Unit 2 stack	EOP 2532 Step 15
		- The operators will commence a rapid cooldown within the Tech Spec limits.	SPO	Initiate a controlled cooldown - If MSIVs Open, use SD/BP Vlv's - If MSIVs Closed, use ADVs.	EOP 2532 Step 17
		- SIAS flow must be capable of recovering/maintaining RCS pressure. - The crew should establish and maintain the RCS press. vs temp. within the PT Curve.	PPO	Initiate a controlled depressurization of the RCS to SDC conditions. - If no RCPs use Aux Spray - If RCPs running use Main Spray	EOP 2532 Step 18
		Major change in plant conditions (tube rupture) requiring transition to Functional Recovery (2540)		When crew recognizes they have a LOCA with a S/G Tube Rupture. - Implement the Diagnostic Flow Chart (2541 Appendix 1) - Confirms 2 events requiring Functional Recovery (EOP 2540)	OP 2260 Step 1.19.2 <b>EC-1</b>
		<b>EOP 2540 "Functional Recovery"</b>	US	Crew transitions to EOP 2540 "Functional Recovery".	<b>EU-2</b>

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity		Task Assign	Expected Actions		Standard
		The SM should classify the event as - Alert/C1 per RCB4		SM	Classify the Event		FAP06 EOP 2540 Step 1
		Note: Classification will be accomplished in JPM-A4SRO.					
				US	- Enter time in Safety Function Tracking Page - Ensure Master Silence in Off		EOP 2540 Step 2
				US/SPO	Sample both S/Gs - Open the Sample Vlvs. MS-191A/B - Direct Chem to sample both S/Gs for activity and boron. - When samples are reported, close MS-191A/B		EOP 2540 Step 4
		Hydrogen Analyzers may already be in service.		US/SPO	Place Hydrogen Analyzers in service.		EOP 2540 Step 5
				US	Identify the Success Paths using RATS.		EOP 2540 Step 6
Safety Function		Success Path			Equipment Operating	SFSC MET	Priority
Reactivity Control		RC-1	CEA Insertion		Y	Y	



## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions		Standard
Maintenance of Vital DC Power	MVA-DC-1	Battery Chargers/Station Batteries		Y	Y	
Maintenance of Vital AC Power	MVA-AC-1	RSST		Y	Y	
RCS Inventory Control	IC-2	Safety Injection		Y	Y	
RCS Pressure Control	PC-2	Saturated		Y	Y	
RCS and Core Heat Removal	HR-2	SI operating		Y	Y	
Containment Isolation	CI-1	Automatic/Manual		N	N	<sup>1</sup>
Containment Temperature and Pressure Control	CTPC-2	CARs (Emerg)		Y	Y	
Containment Combustible Gas Control	CCGC-1	Hydrogen Recombiners		Y	Y	
			US	Directs the STA to verify the Safety Function are satisfied for the chosen success paths.		EOP 2540 Step 8

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The US should transition to EOP 2540E.	US	Perform operator actions for chosen success paths based on priority assigned.	EOP 2540 Step 9 <b>EU-3</b> <b>EC-2</b>
		<b>Transition to EOP 2540E</b>	US	Transitions to EOP 2540E "Containment Isolation"	EOP 2540 Step 9
			US/PPO	If CTMT Press. > 4.42 psig or CTMT Radmonitors rising or in alarm.  - US directs the PPO to ensure SIAS, CIAS, EBFAS AND MSI on C-01 and C-01X.	EOP 2540E Step 1
		The crew will identify the #1 S/G as faulted by one or all of the following.  - Feed Flow/Steam Flow mismatch - SGBD radmonitor - SJAE radmonitors	US/ CREW	If a SGTR is indicated, identify and isolate the most affected S/G.  - US references EOP 2541 Appendix 12	EOP 2540E Step 2
		<b>CT-3 Cooldown to <math>\leq 515^{\circ}</math> Th.</b>			<b>CT-3</b>
		Maximum controllable rate is characterized by a rate that does not further degrade the conditions of the plant.  Efforts should be made to preserve NPSH, Subcooling and Pzr/Head Levels, while trying to limit S/G level by isolating the S/G as soon as possible.	US/SPO	Commence an RCS cooldown at maximum controllable rate to $<515$ Th in both S/Gs.  - If the condenser is available SD/BP Vlvs will be used.  - IF the condenser is not available, both ADVs will be used.	EOP 2541 Append 12 Step 1

## SECTION 4

ID Number ES04L11Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The US should give the PPO a pressure range the does not violate any of the listed limits.	US/PPO	Depressurize the RCS using main or aux. spray while maintaining the following limits: <ul style="list-style-type: none"> <li>- NPSH if RCPs are operating</li> <li>- Within 50 psig of the #1 S/G.</li> <li>- Within the P/T Curve</li> </ul>	EOP 2541 Append 12 Step 2
		If HPSI throttle/stop criteria is met, the PPO should limit injection flow to stabilize Pzr. Level and promote depressurization.	US/PPO	If HPSI throttle/stop criteria are met: <ul style="list-style-type: none"> <li>- Control charging and letdown</li> <li>- Throttle or stop HPSI flow.</li> </ul>	EOP 2541 Append 12 Step 2
		<b>CT-4 Isolate the faulted S/G within 60 minutes of evidence of a tube rupture. (OP 2260 3.3.1)</b>			<b>CT-4</b>
			US/SPO	Directs the SPO to isolate #1 S/G per Appendix 12	EOP 2541 Append 12 Step 6

## SECTION 4

ID Number ES04LI1Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			SPO	Isolates #1 S/G by: 1. #1 ADV in AUTO @ 920 psia and closed. 2. Close MSIV 3. Close MSIV Bypass 4. Close FW-41A (FRV) 5. Close FW-42A (FRV Block Vlv) 6. Close FW-5A (MF Isolation Check) 7. Ensure closed MS-220 (Blowdown Vlv) 8. Pull-to-Lock both AFW Override handswitches 9. Close FW-43A (Aux FRV) 10. Close FW-12A (Aux FW Check vlv) 11. Close MS-201 (TDAFP Steam Supply) 12. Close MS-265 (MS Low Pt. Drain) 13. Check all safety vlvs closed	
		The scenario can be terminated when the crew has successfully isolated the #1 S/G.			

Section 4  
SUMMARY

Title: Simulator Evaluation

ID Number: ES04LI1

Revision: 0

---

CRITICAL TASKS

- CT-1: Trip 2 RCPs (LOCA-13)**
- CT-2: Secure all RCP within 5 min. of loss of NPSH.**
- CT-3 Cooldown to  $\leq 515^{\circ}$  Th.**
- CT-4: Isolate the most effected S/G.**

Section 5  
SCENARIO INITIAL CONDITIONS

Title: Simulator Evaluation

ID Number: ES04LI1

Revision: 0

Initial Conditions

- 100% power, NOP/NOT, EOL, Equilibrium Xenon
- 35 ppm boron / Blend ratio – 165 PMW / 1 BA
- Z2 is protected
- SG Blowdown - ~25 gpm each
- 24E aligned to bus 24D

Out of Service Equipment

RC-200 AVMS

Crew Instructions

The simulator will be prepared for the evaluation and the licensees will be briefed on the conduct of the evaluation and the areas in which they will be evaluated.

The simulator will be initialized in Mode 1, NOP/NOT, EOL, Equilibrium Xe, 35 ppm boron, Z2 protected and 24E tied to 24D.

Four hours prior to taking the shift, an minor earth quake < 0.09g ZPA was felt and verified by the USGS Earthquake Information Center.

All actions for the AOP 2562, “Earth Quake” have been performed.

Due to a slow rise in CTMT Sump, AOP 2568 “RCS Leak” was implemented.

A CTMT entry was made per AOP 2568, step 5.2.d, and there is a small flange leak on 2-CH-442 “Letdown Iso Vlv”.

Leakage is categorized as Identified Leakage ~ 5.0 gpm.

The crew is periodically pumping the CTMT Sump to ensure RCS leak does not degrade.

Management has determined that the next crew will shutdown the plant. This will provide time for engineering to develop a repair plan, notify the necessary people and brief the next crew.

Unit 3 declared an UE/D1. The event is now terminated.

SP-2654B “Forcing Sprays” is scheduled for the beginning of shift.

RC-200 AVMS (Pzr Safety Vlv) is Out of Service

ATTACHMENT  
VALIDATION CHECKLIST

Title: Simulator Evaluation

ID Number: ES04LI1

Revision: 0

Verified By:

Remote functions:

All remote functions contained in the guide are certified.



Malfunctions:

All malfunctions contained in the guide are certified



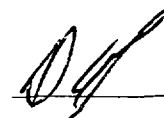
Initial Conditions:

The initial condition(s) contained in the guide are certified  
or have been developed from certified ICs.



Simulator Operating Limits:

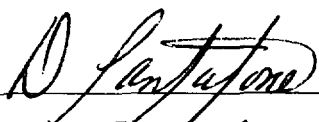
The simulator guide has been evaluated for operating  
limits and/or anomalous response.



Test Run:

The scenario contained in the guide has been test run  
on the simulator. Simulator response is reasonable and as expected.



  
\_\_\_\_\_  
Actions Completed

01/28/05  
\_\_\_\_\_  
Date

**SHIFT TURNOVER REPORT**

<b>DATE-TIME</b> Today 0515	<b>PREPARED BY</b> Unit Supervisor / "NIGHT" Shift	<b>SHIFT</b> 18:00 - 06:00
--------------------------------	---	-------------------------------

<b>PLANT STATUS:</b>		
<b>MODE:</b> 1	<b>RX POWER:</b> 100 %	
<b>MEGAWATTS:</b> Thermal: 2699 MWTH	<b>PZR PRESS:</b> 2250 psia	
Electric: 915 MWe	<b>RCS T-AVE:</b> 572 degrees F	
<b>RCS</b> Identified: 3.5 gpm	<b>PROTECTED:</b> Train/Facility	
<b>LEAKAGE:</b> Unidentified: 0.33gpm		
Date/Time: Today 0015		<b>Z2 (YELLOW)</b>

<b>TS LCO and TRM ACTION Statements Coming Due (if more than one ACTION requirement per LCO, list each separately)</b>						
<b>Date</b>	<b>Time</b>	<b>LCO</b>	<b>Action</b>	<b>Action Requirement</b>	<b>Equipment</b>	<b>Reason</b>

<b>Continuous TS LCO and TRM ACTION Statements in effect (if more than one ACTION requirement per LCO, list each separately)</b>				
<b>Action Requirement</b>	<b>LCO</b>	<b>Action</b>	<b>Equipment</b>	<b>Reason</b>
Infinite action: Establish hourly fire watch.	TRMAS 3.7.10	1	See AIL	See Active Impairment List.
Infinite action: Attachment 1 of OP 2301A	TSAS 3.3.3.8	a/3	RC-200	Failed SP 2410A

<b>OD COMPENSATORY ACTIONS / Temp LOGS (Bold: Tech Specs, Italics: TRM)</b>	

<b>EVOLUTIONS IN PROGRESS &amp; NOTES</b>	<b>Reference /Date</b>
3 to 4 gpm leak on CH-442 CTMT Sump is being pumped periodically to monitor RCS Leakage SP-2654B "Forcing Pzr Sprays for Boron Equalization" is approved for completion on this watch.	Today

## Unit 2 Chemistry

**ON-LINE STATUS REPORT**

<b>REACTOR COOLANT</b>		<b>Time 06:25</b>	
<b>Parameter</b>	<b>Reading</b>	<b>Parameter</b>	<b>Reading</b>
Power	100 %	Fluoride	0.81 ppb
Tave	572 deg F	Chloride	1.75 ppb
Boron	35 ppm	Oxygen	<5 ppb

Blend Ratio:	165 : 1
--------------	---------



Attachment  
Guide No.: ES04LI1  
SCENARIO ATTRIBUTES CHECKLIST

Scenario Title:	<u>LOIT Simulator Evaluation</u>	Number:	<u>ES04LI1</u>
Technical Reviewer:	<u>D. A. Pantalone</u>	Date:	<u>12/03/2004</u>

QUALITATIVE ATTRIBUTES

- Y 1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 2. The scenario consists mostly of related events.
- Y 3. Each event description consists of:
- the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the expected Emergency Plan classification
  - the event termination point (if applicable)
- Y 4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 5. The events are valid with regard to physics and thermodynamics.
- Y 6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- N/A 7. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 8. The simulator modeling is not altered.
- Y 9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the scenario.

**Attachment**  
**Guide No.: ES04LI1**  
**SCENARIO ATTRIBUTES CHECKLIST**

**Note:** Following criteria list scenario traits that are numerical (quantitative) in nature. Credited malfunctions tasks and procedures should be bolded in the evaluation guide.

- |   |   |
|---|---|
| 1. Total Malfunctions (TM) - Include EMs – (5 – 8)  | 6 |
| <ul style="list-style-type: none"><li>1. Trip of 'C' SW Pump</li><li>2. Fail FW Heater 6A level transmitter downscale.</li><li>3. RC-402 "PORV" Leakage</li><li>4. RCS Leakage &gt; Charging</li><li>5. CTMT AIR RECIRC FAN 'A' VIBRATION HI</li><li>6. #1 S/G Tube Rupture ~ 750 gpm.</li></ul>  |   |
| 2. Malfs after EOP entry (EMs) – (1 – 2)  | 1 |
| <ul style="list-style-type: none"><li>1. CTMT AIR RECIRC FAN 'A' VIBRATION HI</li></ul>   |   |
| 3. Abnormal Events (AE) – (2 – 4)   | 3 |
| <ul style="list-style-type: none"><li>1. Trip of 'C' SW Pump</li><li>2. Fail FW Heater 6A level transmitter downscale.</li><li>3. RC-403 "PORV" Leakage</li></ul>   |   |
| 4. Major Transients (MA) – (1 – 2)  | 2 |
| <ul style="list-style-type: none"><li>1. RCS Leakage &gt; Charging</li><li>2. #1 S/G Tube Rupture ~ 750 gpm.</li></ul>  |   |
| 5. EOPs entered requiring substantive actions (EU) - (1 – 2)  | 3 |
| <ul style="list-style-type: none"><li>1. EOP 2532 "Loss of Coolant Accident"</li><li>2. EOP 2540 "Functional Recovery"</li><li>3. EOP 2540E "Functional Recovery of Containment Isolation.</li></ul>  |   |
| 6. EOP Contingencies requiring substantive actions (EC) – (0-2)   | 2 |
| <ul style="list-style-type: none"><li>1. Major change in plant conditions (tube rupture) requiring transition to Functional Recovery (EOP 2540)</li><li>2. Evaluation of Success Path/Safety Functions requiring transition to Functional Recovery of Containment Integrity (EOP 2540E)</li></ul> |   |

**Attachment**  
**Guide No.: ES04LI1**  
**SCENARIO ATTRIBUTES CHECKLIST**

7. Critical Tasks (CT)- (2 – 3) 5
- 1. Trip 2 RCPs (LOCA-13)
  - 2. Secure all RCP within 5 min. of loss of NPSH.
  - 3. Perform a plant cooldown  $\leq 515^{\circ}$  Th
  - 4. Isolate the most affected S/G.
8. Approximate Scenario Run Time: 60 to 90 min. Total 120
9. Technical Specifications exercised during the scenario. (Y/N) Y

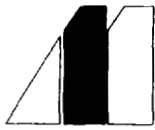
Attachment

Guide No.: ES04LI1

SCENARIO ATTRIBUTES CHECKLIST

**IC-92 ES04LI1    Load Limit Pot Setting = 6.80**

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
ASI Upper	4.70	4.72	4.73	4.67
ASI Lower	4.73	4.68	4.75	4.67
Nuclear Power	4.56	4.82	4.68	4.67
$\Delta T$ Power	3.91	4.10	3.92	4.07
Tcold Cal.	4.80	4.80	4.80	4.85



## Millstone Station Unit 2 Operator Training


### SIMULATOR EXERCISE GUIDE

I. Title: LOIT Simulator Evaluation #2

ID Number: ES04LI2

Revision: 0


II. Initiated:

  
R. J. Ashe  
Developer

1/12/05

Date

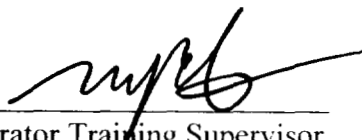
III. Reviewed:

  
Daniel A. Pantalone  
Reviewer

01/19/05

Date

IV. Approved:

  
Operator Training Supervisor

1/31/05

Date

## TABLE OF CONTENTS

### SECTIONS LISTED IN ORDER:

1. Cover Page
2. Table of Contents
3. Exercise Overview
4. Instructor Guide / Summary
5. Scenario Initial Conditions Attachments
  - Validation Checklist
  - Training Turnover Sheet

## EXERCISE OVERVIEW

1. Purpose:
  - a. Evaluate the licensees' ability, as a team and individually, to safely and responsibly operate the plant during normal plant operations, abnormal operating conditions and emergency operating conditions.
  - b. Evaluate licensees in the following areas, as applicable:
    - 1) Ability of the crew to perform crew-dependent (and time-critical) tasks.
    - 2) Ability of individuals to perform critical tasks.
    - 3) Ability of the crew to:
      - a) Understand/interpret alarms/annunciators
      - b) Diagnose events/conditions based on signals/readings
      - c) Understand plant/systems response
      - d) Comply with/use procedures and Technical Specifications
      - e) Properly communicate information/proper crew interactions
      - f) Perform control board operations
    - 4) Ability of each individual to:
      - a) Respond and correctly interpret annunciators
      - b) Correctly diagnose events
      - c) Properly interpret integrated system response
      - d) Comply with and use Technical Specifications
      - e) Comply with and use procedures
      - f) Properly perform control board operations
      - g) Demonstrate a responsible attitude
      - h) Properly communicate information and interact with the rest of the crew

Title: Simulator Evaluation

ID Number: ES04LI2

Revision: 0

2. Exercise Brief:

The simulator will be prepared for the evaluation and the licensees will be briefed on the conduct of the evaluation and the areas in which they will be evaluated.

The simulator will be initialized to IC-91 or equivalent, critical at 1% power, BOL, positive MTC, 1680 ppm Boron. There are no surveillances in progress. A snow storm has been predicted for the area with accumulation of 3-5 inches. Winds are presently from the West-Southwest at 20-25 mph. Snow has already started to fall. The crew will be instructed to raise power to 4% and stabilize in preparation for Turbine warm up in accordance with OP 2203, Plant Startup.

During the power ascension, the dilution valve will fail to close resulting in adding more PMW than desired. The crew will stop the power ascension and take action to stop the dilution. After the crew stabilizes power, the "D" Circulating Water Screen D/P will rise to the point that the "D" Circulating Water Pump trips. The crew will enter AOP 2517, Circulating Water Malfunctions, and perform steps associated with the loss of a Circulating Water Pump. While the crew is performing steps of AOP 2517, Channel Y Pressurizer Pressure transmitter will fail high resulting in the opening of the spray valves. The US will direct the PPO to either take manual control of Channel Y pressurizer pressure or swap to Channel X. When the crew contacts the I&C Department concerning the failed pressure transmitter, annunciator C-8 on C-05, Main Steam Isol Valve Air Press Lo, will alarm. The crew will respond to the annunciator by referencing the appropriate Annunciator Response Procedure. Shortly after the annunciator alarms, the #2 MSIV will close. This will result in an Excess Steam Demand in the Enclosure Building. The crew should manually trip the reactor. During the performance of EOP 2536, Excess Steam Demand, VA-20 will suddenly deenergize. The loss of VA-20 will result in the opening of the #2 Aux Feed Regulating Valve. The crew must take action to stop feed to #2 S/G.

The scenario may be terminated when the S/G has been isolated and actions have been taken to prevent exceeding PTS limits.

3. Plant/Simulator differences that may affect the scenario are:

None

4. Duration: 1.5 hours

All Control Room Conduct, Operations and Communications shall be in accordance with Master Manual 14 (MP-14). Review the Simulator Operating Limits (design limits of plant) and Simulator Modeling Limitations and Anomalous Response List prior to performing this training scenario. The instructor should be aware if any of these limitations may be exceeded.

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>Initial</sub>	IC-91 or equivalent	<u>Simulator Setup and Initial Conditions:</u> 1% Power, BOL, RCS Boron 1680 ppm.			
	CHR06 (22.8) CHR07 (223.4) CHR08 (23.6) CHR09 (224.1) CHR10 (23.1) CHR11 (222.9)	Insert a remote function for wind direction from the West-Southwest at 23 mph.			
	RP04A RP04B RP04C RP04D RP27A	Insert malfunctions to prevent all four Reactor trip buttons from tripping the reactor.  Insert a malfunction to prevent an automatic Reactor trip.			<b>TM 7</b>
		Ensure all 4 Circ Water Pumps are operating.			
		Set blowdown to 40 gpm on both S/Gs.			
		Ensure the following FRV Bypass Valve positions: #1 – 33.2% #2 – 33.7%			
		Ensure conditions are stable prior to the crew taking the shift.			



## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>Provide the crew with the following information:</p> <ul style="list-style-type: none"> <li>◇ 1% power, BOL, positive MTC</li> <li>◇ Group 7 CEAs @ 135 steps</li> <li>◇ 1680 ppm boron</li> <li>◇ Blend ratio – 2.5:1</li> <li>◇ SG Blowdown - 40 gpm each</li> <li>◇ Condensate on short recycle</li> <li>◇ “A” Main Feed Pump in operation</li> <li>◇ Vacuum being maintained with the Hoggers</li> <li>◇ 24E aligned to Bus 24C</li> <li>◇ Forcing Pressurizer Sprays</li> <li>◇ 2 Charging Pumps running</li> <li>◇ Snow storm in progress (20-25 mph winds)</li> <li>◇ No surveillances due.</li> </ul>			
		<p>Provide the following documents:</p> <ul style="list-style-type: none"> <li>• OP 2203, Plant Startup, signed off up through step 4.5.10.</li> <li>• Attachments 1 and 2 of OP 2203 on the SPO and PPO desks.</li> <li>• Reactivity Plan</li> </ul> <p>Direct the crew to raise power to approximately 4% using dilution to begin Main Turbine warm up. Reactor Engineering would prefer to use dilution to raise power. Dilution should be done in 25 gallon increments. Rods will be used above 5% power for ASI control.</p>			

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>0</sub>	CV28A (7)	When the crew begins the third dilution of 25 gallons to raise power to 4%, insert a malfunction to prevent the Dilution Valve, CH-210X, from closing.	PPO	When the PMW counter reaches '0', observe continuous flow of PMW to the RCS. Inform the US of the condition.	MP-14 <b>TM 1</b> <b>AE 1</b>
		When requested as I&C, inform the crew that you will obtain the appropriate paperwork and trouble shoot the problem.	US	Direct the PPO to close VCT Makeup Bypass, CH-196 or place the Makeup Selector Switch in a position to prevent dilution. Inform RE and the I&C Dept.	ARP 2590C
			PPO	Close VCT Makeup Bypass, CH-196 or place the Makeup Mode Selector Switch to the Manual or Borate position. Observe '0' PMW flow to the RCS. Inform the US that PMW flow is secured.	ARP 2590C <b>CT 1</b>
		NOTE: The US may provide a specific value, as long the plant does NOT enter MODE 1 ( $\geq 5\%$ power).  <b>CT 1 Establish reactivity control. Stop the dilution within 5. (Dilution must be stopped to prevent an unplanned entry into MODE 1).</b>	US	Direct the PPO to monitor plant parameters and ensure reactor power does NOT exceed 5%. If power approaches 5%, direct the PPO to either insert group 7 CEAs or borate to maintain power $< 5\%$ .	MP-14

1

(

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>1</sub>	CW02D (100%) Ramp=460 sec.	When the plant has stabilized, insert a malfunction to cause the "D" Circ Water Screen D/P to increase.	SPO	Observe rise in "D" Circ Water Screen D/P or acknowledge Annunciator D-10 on C-05, Traveling Screen ΔP.	MP-14 <b>TM 2</b> <b>AE 2</b>
		After a 5-10 minute delay, report as the PEO that all requested actions are complete. Also report that the "D" traveling screen is NOT rotating. It appears that a pin has sheared. All other traveling screens are operating properly.	US/SM	Enter AOP 2517, Circulating Water Malfunctions, and perform Initial Actions. Direct a PEO to: <ul style="list-style-type: none"> <li>• Start both screen wash pumps.</li> <li>• Place all traveling screens in fast.</li> <li>• Check screen wash pump strainer D/Ps less than 4 psid.</li> <li>• Check all screens rotating</li> <li>• Monitor traveling screen D/P</li> <li>• Place screen wash trash basket in service</li> <li>• Notify Environmental Services-Nuclear</li> </ul>	ARP 2590E-056       OP 2327
			US	When D/P approaches 30", direct SPO to perform actions of AOP 2517, Section 5.	AOP 2517

## SECTION 4

ID Number ES04LJ2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The US may <u>or</u> may NOT direct cross tying "D" Water Box with "C" Water Box. Steps in <i>italics</i> are optional.	SPO	Trip the "D" Circ Water Pump. Close CW-11E, "D" Water Box Inlet <i>Cross tie water boxes:</i> <ul style="list-style-type: none"> <li>Place "D" Circ Water pump in Pull-To-Lock</li> <li>Ensure CW-11D, "D" Circ Water Box Outlet, is open</li> <li>Open CW-12C, Condenser 1B Inlet Cross-Tie</li> </ul>	AOP 2517
			SPO	Check condenser backpressure is $\leq 4.5$ in. Hg.	AOP 2517
		Optional. Only required if water boxes are cross tied.	US	<i>Inform Unit 3 that water boxes are cross tied.</i>	AOP 2517
		Optional. Only required if water boxes are cross tied.	SPO	<i>Update PPC Condenser Performance Report to indicate actual Circ Water valve positions.</i>	AOP 2517
			US/SM	Notify Environmental Services-Nuclear of Circ Pump trip.	AOP 2517
			US	Inform maintenance of the "D" Screen failure and direct them to troubleshoot and repair.	MP-14

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>2</sub>	RX01B (100%) Ramp=250 sec.	When the crew has cross tied water boxes, insert a malfunction to fail Channel Y Pressurizer Pressure transmitter high.	PPO	Observe the Channel Y pressurizer pressure rising and Channel X Pressurizer pressure lowering. Observe "PZR Pressure Selected Channel Deviation Hi/Lo" annunciator and "Pressurizer CH Y Pres Hi/Lo" annunciators.	MP-14 <b>TM 3</b> <b>AE 3</b>
			US	Direct the PPO to perform ARP actions for the annunciator.	MP-14
			PPO	With US concurrence (or direction) perform one of the following: <ul style="list-style-type: none"> <li>• Shift Pressurizer pressure control to channel X.</li> <li>• Manually close the spray valves.</li> <li>• Place channel Y Pressurizer pressure control in Manual.</li> </ul>	ARP 2590B-212 or 220
		When informed of the Pressurizer pressure transmitter failure, report that I&C will obtain the appropriate paperwork and commence troubleshooting.	US/SM	Inform the I&C Dept. of the failure of Channel Y Pressurizer pressure.	ARP 2590B-212 or 220

## SECTION 4

ID Number ES04L12Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T3	I/O 'ON' annunciator C-8 on C-05	When the crew has completed the actions of ARP 2590A-159, insert a malfunction to cause an alarm on C-05, Main Steam Isol Valve 2 Air Pres Lo, C-8.	SPO	Observe annunciator C-8, Main Steam Isol Valve 2 Air Pres Lo on C-05.	MP-14 <b>TM 4</b>
		When dispatched as a PEO, repeat back any direction, but do NOT provide any further report.	US/SM	Direct a PEO to: <ul style="list-style-type: none"> <li>• Observe local Instrument Air header pressure.</li> <li>• Check both channel solenoid vents are NOT venting.</li> <li>• Insect for Instrument Air line leaks. <ul style="list-style-type: none"> <li>○ If possible, reconnect any broken air lines.</li> </ul> </li> </ul>	ARP 2590D-031
			US	Direct crew to perform EOP 2525 if the MSIV closes.	ARP 2590D-031
		When directed as Maintenance, report that you will send someone out to investigate.	US/SM	Direct Maintenance to trouble shoot and/or repair.	ARP 2590D-031

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T4	MS06B MS02B (7%) Ramp=400 sec.	Approximately 5 minutes after the low pressure alarm is annunciated, insert a malfunction to fail close the #2 MSIV and cause a steam line break upstream of the valve in the Enclosure Building.	Crew	Observe closure of #2 MSIV.  After the MSIV has closed, observe lowering S/G pressures, lowering RCS temperatures, and lowering RCS pressure.	MP-14 <b>TM 5</b> <b>TM 6</b> <b>MA2</b>
			US	Direct a manual Reactor trip and performance of EOP 2525.	MP 16
		<b>CT 2: Establish reactivity control. Open CEDM MG set breakers to trip the reactor within 2 minutes of pressing the manual trip pus buttons or automatic Reactor trip signal.</b>	PPO	Presses manual Reactor trip push buttons and observes a failure of the Reactor to trip.  Opens the CEDM MG set output breakers and observes a Reactor trip.	<b>CT 2</b>
			US/SM	Place Master Alarm Silence in SILENCE. Announce "Unit 2 trip" on the plant paging system.	OP 2260
			US	Query board operators regarding the status of safety functions.	OP 2260

SECTION 4

ID Number ES04LJ2

Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The PPO may also manually initiate MSI on low SG pressure.	PPO	<p>Complete and report SPTA:</p> <ul style="list-style-type: none"> <li>- Ensures Reactivity safety function is being met: <ul style="list-style-type: none"> <li>o Reactor is tripped. (Performed contingency action to trip the CEDM MG output breakers.)</li> <li>o All CEAs are inserted.</li> <li>o Power is going down.</li> <li>o SUR is negative.</li> </ul> </li> <li>- Verifies RCS Inventory safety function is being met: <ul style="list-style-type: none"> <li>o Reports Letdown is isolated and all available Charging Pumps are running.</li> </ul> </li> <li>- Verifies RCS Pressure safety function is being met: <ul style="list-style-type: none"> <li>o Reports heaters are off due to low level</li> <li>o Reports spray valves are closed</li> <li>o Reports PORVs and Safeties are closed.</li> <li>o When Pressurizer pressure falls to less than 1800 psia, manually initiates SIAS, or verifies automatic SIAS when pressure falls below 1714 psia.</li> <li>o Reports SIAS, CIAS, EBFAS, and MSI.</li> </ul> </li> </ul>	<p>EOP 2525</p> <p><b>EC 1</b></p>



## SECTION 4

ID Number ES04L12Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		If RCS pressure lowers to NPSH setpoint, secure all RCPs.		<ul style="list-style-type: none"> <li>- Verifies Core Heat Removal established. <ul style="list-style-type: none"> <li>o Two RCPs are operating (one in each loop).</li> </ul> </li> <li>- Reports value and trend of RCS subcooling.</li> <li>- Verifies Containment Integrity safety function is being met by verifying CTMT pressure, temperature, and rad monitor readings. <ul style="list-style-type: none"> <li>o Observes all rad monitors are normal.</li> </ul> </li> </ul>	
		<b>CT 3: Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of the initiation of the ESD.</b>	SPO	<p>Complete and report SPTA:</p> <ul style="list-style-type: none"> <li>• Trip turbine, stop valves closed, MWe indicate 0, and 8T&amp;9T open</li> <li>• All electrical buses are energized</li> <li>• Both SW and RBCCW facilities running</li> <li>• Verifies status of Core Heat Removal <ul style="list-style-type: none"> <li>o MSIVs closed due to low SG pressure. #2 lower than #1.</li> <li>o ADVs and safety valves are closed</li> <li>o Feed flow is NOT excessive</li> <li>o Place both Auxiliary Feed Override/Man/Start/Reset hand switches in Pull-To-Lock</li> <li>o Feeding #1 SG <u>only</u> with Auxiliary Feed to restore level to 40-70%.</li> </ul> </li> </ul>	<p>EOP 2525</p> <p><b>EC 2</b></p> <p><b>CT 3</b></p>

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		This action will be performed when #2 S/G is empty as indicated by a rise in RCS temperature	SPO	Adjust #1 ADV to stabilize RCS temperature.	EOP 2525
			SPO	Performs subsequent actions: <ul style="list-style-type: none"> <li>• Ensures Vacuum Breaker, AR-17, is open</li> <li>• Opens subcooling valve, HD-106</li> <li>• Stops both Heater Drains Pumps</li> <li>• Isolated both Main Feed Pumps</li> <li>• Ensures only one Condensate Pump is running</li> <li>• Verifies Instrument Air pressure is &gt;90 psig</li> </ul>	EOP 2525
			PPO / SPO	When queried, report completion and verification of subsequent actions.	OP 2260
			US	Refers to Diagnostic Flow Chart and determines that EOP 2536, Excess Steam Demand is the appropriate procedure.	EOP 2525 <b>EU 1</b>
			US/STA	Direct the performance of Safety Function Status Checks for EOP 2536	EOP 2536
			US	Direct Chemistry to obtain samples of #1 SG and analyze for Boron and activity. Direct SPO to close S/G sample valves when samples have been taken.	EOP 2536

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		Event is classified as an <b>Alert, Charlie-One</b> (BA2), based on an unisolable steam line break outside Containment.	US/SM	Ensure event is classified.	EOP 2536
			US	Open place keeper and enter EOP entry time Return Master Silence switch to Normal	EOP 2536
			US	Direct PPO to: <ul style="list-style-type: none"> <li>• Check SIAS Actuation</li> <li>• Optimize Safety Injection</li> </ul>	EOP 2536
			PPO	Ensure: <ul style="list-style-type: none"> <li>• At least one train of SIAS, CIAS, and EBFAS have actuated by checking blue lights on C-01X</li> <li>• Safety Injection flow is adequate using Appendix 2, Figures.</li> <li>• All available Charging Pumps are running.</li> <li>• Vital Switchgear Cooling is in operation on C-80</li> </ul>	EOP 2536
			US	Direct SPO to ensure MSI has properly actuated and to verify open the vacuum breaker, AR-17.	EOP 2536
			SPO	Observe conditions on C-01X to ensure proper actuation of MSI or observe indications on C-05 and C-06/7.	EOP 2536

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	Verify 2 RCPs in each loop are stopped with the respective spray valve closed. <i>If Pressurizer pressure lowers to less than minimum NPSH, then stop remaining RCPs.</i>	EOP 2536
			US	Determine that #2 S/G is the 'most affected'.	EOP 2536
			SPO	Commence actions to isolate the #2 S/G.	EOP 2536
T4	ED16B	While the SPO is isolating #2 S/G, insert a malfunction to trip the supply breaker to Vital Instrument Bus, VA-20.	Crew	Observe loss of power to components powered by VA-20.	<b>TM 8</b> <b>EM 1</b> <b>MA 2</b>
			US	Recognize a significant change in plant conditions and refer to the Diagnostic Flow Chart.	OP 2260 <b>EC 3</b>
		The US may direct the SPO to stop Auxiliary Feed to the #2 S/G prior to referencing the Diagnostic Flow Chart. It is acceptable (desired) per OP 2260, EOP User Guide, to take actions to stabilize the plant prior to referencing an approved procedure provided the appropriate procedure is used after taking those actions.	US	Using the Diagnostic Flow Chart, determine that EOP 2536, Excess Steam Demand, is still the appropriate procedure and direct the SPO to stop Auxiliary Feed to #2 S/G.	EOP 2525

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
	FWR60 (Man) FWR64 (0)	<b>CT 4: Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of the initiation of when #2 Auxiliary Feed Regulating Valve opened.</b> If requested, as the PEO, close #2 Aux Feed Reg Valve, FW-43B.	SPO	Close 2-FW-44, Aux Feed X-Tie Valve <u>or</u> Stop the running Aux. Feed Pump(s) <u>or</u> Dispatch a PEO to manually close #2 Aux Feed Regulating Valve, FW-43B.	MP 16 <b>CT 4</b>
	MSR13 (RI)	When directed, as the PEO, close the disconnect for MS-202.	SPO	Complete actions to isolate #2 S/G by ensuring: <ul style="list-style-type: none"> <li>• #2 MSIV is closed</li> <li>• #2 MSIV Bypass is closed.</li> <li>• ADV Quick Open Permissive in Off.</li> <li>• #2 Main Feed Block Valve, FW-42B, is closed</li> <li>• #2 Main Feed Air Assist Check Valve, FW-5B, is closed</li> <li>• #2 S/G steam Supply to Terry Turbine, MS-202, is closed</li> <li>• #2 S/G Blowdown Isolation, MS-220B, is closed</li> <li>• Both Auxiliary Feed Override/Man/Start/Reset hand switches are in Pull-To-Lock</li> <li>• #2 Aux Feed Regulating Valve, FW-43B, is closed</li> <li>• #2 Main Steam Low Point Drain, MS-266B, is closed</li> <li>• #2 Main Steam Safety Valves are closed</li> </ul>	EOP 2536

## SECTION 4

ID Number ES04LI2Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			US	Verify most affected S/G has been isolated: <ul style="list-style-type: none"> <li>• Lowest steam pressure</li> <li>• Lowest level</li> <li>• Lowest cold leg temperature</li> </ul>	EOP 2536
		<p>The SPO will stabilize RCS temperature with #1 ADV when the #2 S/G indicates empty. The PPO will lower or maintain RCS pressure to prevent exceeding 200°F subcooling. This step may need to be pulled forward to prevent exceeding the PTS limit.</p> <p><b>CT-5: Limit Tc subcooling (CET subcooling if all RCPs are secured) to <math>\leq 200^{\circ}\text{F}</math>.</b></p> <ul style="list-style-type: none"> <li>• Lower RCS pressure using Main (or Auxiliary) Spray Valve.</li> <li>• Establish RCS temperature control using the #1 ADV when #2 S/G indicates empty.</li> </ul>	SPO / PPO	<p>Stabilize RCS temperature.</p> <ul style="list-style-type: none"> <li>• Open unaffected ADV to stabilize RCS temperature.</li> </ul> <p>Maintain RCS within the RCS P/T limit:</p> <ul style="list-style-type: none"> <li>• Manually control Pressurizer heaters and spray.</li> <li>• If HPSI throttle stop criteria are met: <ul style="list-style-type: none"> <li>○ Control Charging and Letdown</li> <li>○ Throttle or stop HPSI Pumps.</li> </ul> </li> </ul>	<p>EOP 2536</p> <p><b>CT 5</b></p>
			PPO	<p>Throttle/Stop HPSI Pumps when the following conditions are met:</p> <ul style="list-style-type: none"> <li>• RCS subcooling is above minimum operating limits of the P/T Curve</li> <li>• Pressurizer level <math>&gt;20\%</math></li> <li>• At least one S/G available to remove heat at 40-70% or being restored</li> <li>• Reactor Vessel level <math>\geq 43\%</math></li> </ul>	EOP 2541

ID Number ES04LI2

SECTION 4

Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	Restore Letdown to limit rise in Pressurizer level and pressure.	EOP 2541
		The session may be terminated when the crew has taken action to prevent exceeding a Tc subcooling value of 200°F.			

## SECTION 4 SUMMARY

Title: Simulator Evaluation

ID Number: ES04LI1

Revision: 0

---

### CRITICAL TASKS

- CT 1: Establish reactivity control. Stop the dilution within 5 minutes (Dilution must be stopped to prevent an unplanned entry into MODE 1).**
- CT 2: Establish reactivity control. Open CEDM MG set breakers to trip the reactor within 2 minutes of pressing the manual trip pus buttons or automatic Reactor trip signal.**
- CT 3: Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of the initiation of the ESD.**
- CT 4: Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of the initiation of when #2 Auxiliary Feed Regulating Valve opened.**
- CT-5: Limit Tc subcooling (CET subcooling if all RCPs are secured) to  $\leq 200^{\circ}\text{F}$ .**
- Establish RCS temperature control using the #1 ADV when #2 S/G indicates empty.
  - Lower RCS pressure using Main (or Auxiliary) Spray Valve.



SECTION 5  
SCENARIO INITIAL CONDITIONS

Title: Simulator Evaluation

ID Number: ES04LII

Revision: 0

---

Initial Conditions

- ◇ 1% power, BOL. positive MTC
- ◇ Gp 7 CEAs @ 135 steps
- ◇ 1680 ppm boron
- ◇ Blend ratio – 2.5:1
- ◇ SG Blowdown - 40 gpm each
- ◇ Condensate on short recycle
- ◇ “A” Main Feed Pump in operation
- ◇ Vacuum being maintained with the Hoggens
- ◇ 24E aligned to Bus 24C
- ◇ Forcing Pressurizer Sprays
- ◇ 2 Charging Pumps running
- ◇ Snow storm in progress Expect 3-5” (20-25 mph winds)
- ◇ No surveillances due.

Out of Service Equipment

None

Crew Instructions

Raise power to approximately 4% using dilution to begin Main Turbine warm up. Reactor Engineering would prefer to use dilution to raise power. Dilution should be done in 25 gallon increments. Rods will be used above 5% power for ASI control. OP 2203, Plant Startup, is signed off up through step 4.5.10.

ATTACHMENT  
VALIDATION CHECKLIST

Title: Simulator Evaluation

ID Number: ES04LI2

Revision: 0

Remote functions:

All remote functions contained in the guide are certified.

Verified By:

Daf

Malfunctions:

All malfunctions contained in the guide are certified

Daf

Initial Conditions:

The initial condition(s) contained in the guide are certified  
or have been developed from certified ICs.

Daf

Simulator Operating Limits:

The simulator guide has been evaluated for operating  
limits and/or anomalous response.

Daf

Test Run:

The scenario contained in the guide has been test run  
on the simulator. Simulator response is reasonable and as expected.

Daf

D. P. [Signature]  
Actions Completed

03/14/25  
Date

**SHIFT TURNOVER REPORT**

<b>DATE-TIME</b> Today 0515	<b>PREPARED BY</b> Unit Supervisor / "NIGHT" Shift	<b>SHIFT</b> 18:00 - 06:00
--------------------------------	---	-------------------------------

<b>PLANT STATUS:</b>		
MODE: 2	RX POWER: 1 %	
MEGAWATTS: Thermal: 30 MWTH	PZR PRESS: 2250 psia	
Electric: 0 MWe	RCS T-AVE: 533 degrees F	
RCS Identified: 0.073 gpm	PROTECTED: Train/Facility	
LEAKAGE: Unidentified: 0.032 gpm		
Date/Time: Today 0015		<b>Z2 (YELLOW)</b>

TS LCO and TRM ACTION Statements Coming Due (if more than one ACTION requirement per LCO, list each separately)

Date	Time	LCO	Action	Action Requirement	Equipment	Reason

Continuous TS LCO and TRM ACTION Statements in effect (if more than one ACTION requirement per LCO, list each separately)

Action Requirement	LCO	Action	Equipment	Reason
Infinite action: Establish hourly fire watch.	TRMAS 3.7.10	1	See AIL	See Active Impairment List.

**OD COMPENSATORY ACTIONS / Temp LOGS (Bold: Tech Specs, Italics: TRM)**

	Today
--	-------

EVOLUTIONS IN PROGRESS & NOTES	Reference /Date
Plant startup. Raise power to 4%, using dilution only, for warming the Main Turbine.	OP 2203 Today
Forcing Pressurizer sprays. Two Charging Pumps operating.	OP 2203 Today
"A" Main Feed Pump in operation.	OP 2203 Today
Condensate on short recycle.	OP 2203 Today
Snow storm in progress. Expect 3-5". Winds at 20-25 mph.	CONVEX Today

**Unit 2 Chemistry****ON-LINE STATUS REPORT**

REACTOR COOLANT		Time 06:25	
Parameter	Reading	Parameter	Reading
Power	1 %	Fluoride	0.81 ppb
Tave	532 deg F	Chloride	1.75 ppb
Boron	1680 ppm	Oxygen	<5 ppb

Blend Ratio:	2.5 : 1
--------------	---------

Attachment

SCENARIO ATTRIBUTES CHECKLIST

Scenario Title:	<u>LOIT Simulator Evaluation</u>	Number:	<u>ES04L12</u>
Technical Reviewer:	<u>R. J. Ashe</u>	Date:	<u>1/12/05</u>

QUALITATIVE ATTRIBUTES

- Y 1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 2. The scenario consists mostly of related events.
- Y 3. Each event description consists of:
- the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the expected Emergency Plan classification
  - the event termination point (if applicable)
- Y 4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 5. The events are valid with regard to physics and thermodynamics.
- Y 6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- N/A 7. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 8. The simulator modeling is not altered.
- Y 9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the scenario.

Attachment

Guide No.: ES04LI2

SCENARIO ATTRIBUTES CHECKLIST

**Note:** Following criteria list scenario traits that are numerical (quantitative) in nature. Credited malfunctions tasks and procedures should be bolded in the evaluation guide.

- |  |          |
|--|----------|
| 1. Total Malfunctions (TM) - Include EMs – (5 – 8)   | <u>8</u> |
| <ul style="list-style-type: none"><li>1. Failure of dilution controller (PMW flow continues)</li><li>2. "D" Circ Water Screen D/P increases causing "D" Circ Water Pump trip</li><li>3. Control Room Radiation Monitor, RM-9799A, fails high</li><li>4. Main Steam Isol Valve 2 Air Pres Lo, Annunciator C-8 on C-05 alarms</li><li>5. #2 MSIV fails closed</li><li>6. Steam line break upstream of #2 MSIV in the Enclosure Building</li><li>7. Failure of trip push buttons and automatic trip failure</li><li>8. The supply breaker to Vital Instrument Bus, VA-20, trips</li></ul> |          |
| 2. Malfs after EOP entry (EMs) – (1 – 2)   | <u>1</u> |
| <ul style="list-style-type: none"><li>1. The supply breaker to Vital Instrument Bus, VA-20, trips</li></ul>  |          |
| 3. Abnormal Events (AE) – (2 – 4)  | <u>3</u> |
| <ul style="list-style-type: none"><li>1. Failure of dilution controller (PMW flow continues)</li><li>2. "D" Circ Water Screen D/P increases causing "D" Circ Water Pump trip</li><li>3. Control Room Radiation Monitor, RM-9799A, fails high</li></ul>   |          |
| 4. Major Transients (MA) – (1 – 2)   | <u>2</u> |
| <ul style="list-style-type: none"><li>1. Steam line break upstream of #2 MSIV in the Enclosure Building</li><li>2. The supply breaker to Vital Instrument Bus, VA-20, trips</li></ul>  |          |
| 5. EOPs entered requiring substantive actions (EU) - (1 – 2)   | <u>1</u> |
| <ul style="list-style-type: none"><li>1. EOP 2536, Excess Steam Demand</li></ul>   |          |
| 6. EOP Contingencies requiring substantive actions (EC) – (0-2)  | <u>3</u> |
| <ul style="list-style-type: none"><li>1. Verify RCS Pressure safety function is being met</li><li>2. Place both Auxiliary Feed Override/Man/Start/Reset hand switches in Pull-To-Lock</li><li>3. Recognize a significant change in plant conditions and refer to the Diagnostic Flow Chart.</li></ul>  |          |

7. Critical Tasks (CT)- (2 – 3)

5

1. Establish reactivity control. Stop the dilution to prevent exceeding 5% power unplanned entry into MODE 1). (If required, boration or CEDM insertion may be used.)
2. Establish reactivity control. Open CEDM MG set breakers to trip the reactor within 2 minutes of pressing the manual trip pus buttons or automatic Reactor trip signal.
3. Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of initiation of the ESD.
4. Isolate Auxiliary Feedwater to the #2 S/G from the Control Room within 10 minutes of #2 Auxiliary Feed Regulating Valve opening.
5. Limit Tc subcooling (CET subcooling if all RCPs are secured) to <200°F.
  - Establish RCS temperature control using the #1 ADV when #2 S/G indicates empty.
  - Throttle/stop HPSI Pumps when the appropriate conditions are met (if required).
  - Restore Letdown (if required).

8. Approximate Scenario Run Time: 60 to 90 min.

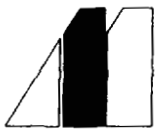
Total 80

9. Technical Specifications exercised during the scenario.

(Y/N) Y

**IC-91      ES04LI2**

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>ASI Upper</u>	4.85	4.82	4.85	4.82
<u>ASI Lower</u>	4.85	4.82	4.87	4.82
<u>Nuclear Power</u>	4.69	4.68	4.68	4.68
<u><math>\Delta T</math> Power</u>	1.32	2.19	1.29	1.07
<u>Tcold Cal.</u>	4.89	4.91	4.82	4.96



## Millstone Station Unit 2 Operator Training

### SIMULATOR EXERCISE GUIDE

I. Title: LOIT Simulator Evaluation #3

ID Number: ES04LI3

Revision: 0

II. Initiated:

Richard J. Ashley  
R. J. Ashley  
Developer

1/13/05  
Date

III. Reviewed:

David A. Lefebvre  
Reviewer

01/19/05  
Date

IV. Approved:

[Signature]  
Operator Training Supervisor

1/31/05  
Date



## TABLE OF CONTENTS

### SECTIONS LISTED IN ORDER:

1. Cover Page
  2. Table of Contents
  3. Exercise Overview
  4. Instructor Guide / Summary
  5. Scenario Initial Conditions
- Attachments
- Validation Checklist
  - Training Turnover Sheet

## EXERCISE OVERVIEW

1. Purpose:
  - a. Evaluate the licensees' ability, as a team and individually, to safely and responsibly operate the plant during normal plant operations, abnormal operating conditions and emergency operating conditions.
  - b. Evaluate licensees in the following areas, as applicable:
    - 1) Ability of the crew to perform crew-dependent (and time-critical) tasks.
    - 2) Ability of individuals to perform critical tasks.
    - 3) Ability of the crew to:
      - a) Understand/interpret alarms/annunciators
      - b) Diagnose events/conditions based on signals/readings
      - c) Understand plant/systems response
      - d) Comply with/use procedures and Technical Specifications
      - e) Properly communicate information/proper crew interactions
      - f) Perform control board operations
    - 4) Ability of each individual to:
      - a) Respond and correctly interpret annunciators
      - b) Correctly diagnose events
      - c) Properly interpret integrated system response
      - d) Comply with and use Technical Specifications
      - e) Comply with and use procedures
      - f) Properly perform control board operations
      - g) Demonstrate a responsible attitude
      - h) Properly communicate information and interact with the rest of the crew

## 2. Exercise Brief:

The simulator will be prepared for the evaluation and the licensees will be briefed on the conduct of the evaluation and the areas in which they will be evaluated.

The simulator will be initialized to IC 90 or equivalent; 100% power, BOL, Equilibrium Xe, 1201 ppm boron. There are no surveillances in progress. The Turbine Driven Auxiliary Feed Pump is tagged out for a pump bearing replacement and is scheduled for return on the next shift. Radwaste Ventilation Fan, F-16, is out of service for filter replacement. Containment pressure is now reading 21 inches of water. Containment must be depressurized after the crew assumes the shift.

After the crew has initiated depressurizing Containment, the PPC will be lost requiring entry into Tech Specs and a down power. The crew will enter AOP 2518, Loss of the PPC, and perform the applicable steps. When the crew has reduced power by a few percent, Channel "C" Pressurizer Pressure will fail low resulting in several annunciators. The crew will review the annunciators and select the appropriate Annunciator Response Procedure. The PPO will bypass the appropriate channels of RPS, ESAS, and Automatic Auxiliary Feed. After the crew has bypassed the appropriate channels and has logged into the appropriate Tech Spec Action Statements, condenser vacuum will begin to degrade. The crew will enter AOP 2574, Loss of Condenser Vacuum, and take the appropriate actions to include continuing the down power (started earlier) to slow the loss of vacuum. When the crew has taken the appropriate actions and has determined that a continuation of the down power is warranted, condenser vacuum will degrade more rapidly resulting in a (manual or automatic) plant trip. On the trip, the RSST will fail to automatically transfer and both Emergency Diesels will energize their respective buses. This will result in a loss of all Condensate Pumps. Additionally, the "B" Auxiliary Feed Pump is severely degraded, resulting in minimal flow from that pump. The crew will perform the actions of EOP 2525, Standard Post Trip Actions and transfer to EOP 2528, Loss of Off Site Power/Loss of Forced Circulation. While performing EOP 2528, the "A" Diesel Generator will trip, ultimately resulting in a loss of all feedwater ("B" Auxiliary Feed Pump will NOT be sufficient to restore S/G levels). The crew will rediagnose the event and will transfer to EOP 2537, Loss of All Feedwater, which will require initiation of Once-Thru-Cooling. During the initiation of OTC, the "C" HPSI Pump will NOT automatically start, requiring it to be manually started.

The scenario may be terminated when the crew has determined that they must transfer to EOP 2540, Functional Procedure.

Title: Simulator Evaluation

ID Number: ES04LI3

Revision: 0

---

3. Plant/Simulator differences that may affect the scenario are:

None

4. Duration: 1.5 hours

All Control Room Conduct, Operations and Communications shall be in accordance with Master Manual 14 (MP-14). Review the Simulator Operating Limits (design limits of plant) and Simulator Modeling Limitations and Anomalous Response List prior to performing this training scenario. The instructor should be aware if any of these limitations may be exceeded.

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>Initial</sub>	IC 90 or equivalent	<u>Simulator Setup and Initial Conditions:</u> 100% power, BOL, Equilibrium Xe, 1201 ppm.			
	Using IDT, set CHMDRY to 1.284e05 E5	Raise Containment pressure to read 22 inches of water.			
	Under CH, I/O OFF G for HS8137 (2)	I/O off <u>both</u> green lights for F-16			
	ED02 on BT9	Loss of the RSST on the plant trip			<b>TM 5</b>
	ES03J	Failure of "C" HPSI Pump to automatically start on SIAS (failure of AM-614).			<b>TM 8 EM 2</b>
	FWR22 (Local) FW20C (Trip)	Disable the Terry Turbine and place a yellow tag on the Terry Turbine Steam Admission Valve, SV-4188.			
	FW30B (100%) Ramp=300 sec. BT37	Gradual degradation of the "B" Aux Feed Pump.			<b>TM 6 MA 2</b>
	MSR13 (RI) MSR12 (RO) MSR13 (RO)	Rack in breaker for MS-202. Close Steam Supplies To Terry Turbine, MS-201 and MS-202, and insert remotes to rack out the associated breakers. Place yellow tags on valve hand switches			
	RC-27	Ensure "RC200 AVMS" does NOT cause the annunciator on C-02 or indicate on RC05E			
		Ensure blowdown is set to 40 gpm each S/G.			

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<p>Provide the crew with the following turnover info, allow the crew to walk-down the boards, and perform briefing. The crew should indicate that they have 'taken the watch.'</p> <ul style="list-style-type: none"> <li>◇ 100 % power, BOL, Equilibrium Xenon</li> <li>◇ 1201 ppm boron</li> <li>◇ Blend ratio - 3.4:1</li> <li>◇ SG Blowdown - 40 gpm each</li> <li>◇ 24E aligned to bus 24C</li> <li>◇ Terry Turbine out for bearing replacement</li> <li>◇ F-16 out for filter replacement</li> <li>◇ RC-200, AVMS is out of service.</li> <li>◇ Enclosure Building Purge using Main Exhaust has been in continuous operation for several months.</li> <li>◇ Provide crew with OP 2314B, section 4.13. Steps 4.13.1 through 4.13.7 are signed off as complete.</li> </ul>			
T <sub>0</sub>		<p><u>Ensure the surrogate directs the PPO to depressurize Containment.</u> If the crew does NOT initiate actions to depressurize Containment, as Chemistry, call the SM and ask when they started the Containment depressurization.</p>	US/PPO	Brief the crew on the depressurization of Containment.	MP-14

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<u>Ensure the H2 Purge Valves associated with the same facility EBFS Fan are opened.</u>	PPO	Place EBFAS in operation as follows: <ul style="list-style-type: none"> <li>Align Condenser Air Removal to Unit 2 Stack. <ul style="list-style-type: none"> <li>Open EB-57, Cond Air Removal to Unit 2 Stack (C-06)</li> <li>Close EB-56, Cond Air Removal to Millstone Stack (C-06)</li> <li>Close EB-55, Cond Air Removal to Millstone Stack (C-06)</li> </ul> </li> <li>Start "A" EBFAS Fan (C-01) <ul style="list-style-type: none"> <li>Open EB-50, EBFS Suction Damper</li> <li>Open EB-51, Header "A" Isolation</li> <li>Start F-25, "A" EBFS Fan</li> <li>Check EB-52, Fan "A" Discharge Damper, opens</li> </ul> </li> <li>Monitor for proper operation.</li> </ul>	OP 2314B OP 2314G
		After a short delay, as the PEO, report that the Hydrogen Purge Flow Limiting Butterfly Valve in the 38'6" East Penetration Room is open.	PPO	Open Facility 1 Hydrogen Purge Valves. EB-100 and EB-99, on C-01, and direct a PEO to open the associated Hydrogen Purge Flow Limiting Butterfly Valve. EB-194, in the 38'6" East Penetration Room.	OP 2314B
			US	Record start time in SM Log.	OP 2314B
		As Chemistry, acknowledge the time Containment venting was started.	US	Notify Chemistry that Containment venting is in progress.	OP 2314B

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>1</sub>	PC01	Once the crew has initiated Containment depressurization, insert a malfunction to cause a loss of the PPC.	Crew	While observing the PPC, note a failure of the PPC to update any parameter. Observe 'Computer Inop' alarm on C-08	MP-14 <b>TM 1</b> <b>AE 1</b>
		After a 5-10 minute delay, report as Computer Services that the PPC has a significant malfunction and that troubleshooting has begun. An update will be provided when more information is available.	US/SM	Enter AOP 2518, Loss of the PPC. Direct a PEO to complete Attachment 1 of AOP 2518.	MP-14
			US	Log into TSAS 3.1.3.3d. All pulse counter channels are inoperable.	AOP 2518
	RPR35 (NORM)	Examinee will need to contact the Booth Instructor to place the PWR RATIO HI/LO switch in the "OPER" position.	PPO	Place PWR RATIO HI/LO, B12B switch to "OPER" (Inside RC-22, Front, Rack #9) and observe Annunciator BB12 on C-04.	AOP 2518
			US	Log into TSAS 3.2.1a. ASI is outside the power dependent limits on the Power Ratio Recorder. ASI must be restored to within the limits within one hour.	AOP 2518 Tech Specs
			US	Brief the crew on entry into AOP 2575, Rapid Downpower, and the use of Attachments 1, 5, and 6.	MP-14
			US/SM	<ul style="list-style-type: none"> <li>Inform HP, CONVEX, ISO New England, Unit 3 and other personnel required by MP-01-SM-GDL1.01</li> <li>Brief crew on plant trip criteria.</li> </ul>	AOP 2518 AOP 2575

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	Initiate forcing sprays.	AOP 2575
			SPO	Maintain S/G levels 55 to 70% during the down power.	AOP 2575
		The crew should Borate from the RWST as the preferred method.	US	Determine that a 5 to 10% down power is required to restore the power dependent limits on the Power Ratio Recorder. Select the desired method of Boration for the down power. <ul style="list-style-type: none"> <li>• From the RWST (preferred)</li> <li>• From the on service BAST</li> </ul>	AOP 2575
		If the crew initiates the down power using CEA insertion, then ensure they use Step 4.11 of OP 2302A.  If asked, report as the PEO that baseline data has been recorded.	PPO	Commence Boration from the RWST to one charging pump to commence lowering power.	AOP 2575
			SPO /PPO	Using Load Limit Pot, adjust Turbine load to follow Reactor power and maintain Tavg on program. (Attachment 5)	AOP 2575



## SECTION 4

ID Number ES04L13Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>2</sub>	RP10C (0)	When the crew has reduced power by approximately 3-5%, insert a malfunction to fail Channel "C" Pressurizer Pressure transmitter low.	PPO	Observe the TM-LP TRIP CH C annunciator (DA-3 on C-04).	MP-14 <b>TM 2</b>
			US	Direct the PPO to perform ARP actions for the annunciator.	MP-14
			PPO	Compare Channel "C" Pressurizer Pressure and TM-LP set point to the other safety channels.	ARP 2590C-023
			US	Enter TS 3.3.1.1, Action 2. Enter TS 3.3.2.1, Action 2	Tech Specs
			PPO	Obtain the necessary keys and bypass the following: <ul style="list-style-type: none"> <li>• Channel "C" TM-LP Trip (RPS)</li> <li>• Channel "C" High Pressurizer Pressure Trip (RPS)</li> <li>• Sensor Cabinet "C" Pressurizer Pressure Bistable (ESAS)</li> <li>• Channel "C" ATWS (C-100)</li> </ul>	ARP 2590C-023

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>3</sub>	FW33 (3%) Ramp=350 sec.	When the crew has completed the actions of ARP 2590C-023, insert a malfunction to cause condenser vacuum to degrade to 5-5.5 inches Hg abs. <u>Do NOT allow vacuum to degrade to the manual trip setpoint.</u>	Crew	Observe and report lowering vacuum, lowering electrical output, or Low Vacuum alarm.	MP-14 <b>TM 3</b> <b>AE 2</b>
		US should inform the crew that a plant trip will be initiated when/if condenser vacuum lowers to between 6 and 7 inches Hg abs.	US	Brief crew on entry into AOP 2574, Loss of Condenser Vacuum, plant trip criteria, and the need to reduce power if vacuum continues to degrade.	AOP 2574
	FW33 (1%)	<u>Adjust the loss of vacuum malfunction to allow vacuum to continue to degrade, but maintain it below the manual trip setpoint.</u>	SPO	<ul style="list-style-type: none"> <li>Start "A" and "B" Mechanical Vacuum Pumps.</li> <li>Ensure Condenser Air Removal is aligned to the Millstone Stack through "A" Condenser Air Removal Fan.</li> <li>Ensure proper operation of the Circulating Water System.</li> <li>Check steam seal pressure between 2 and 6 psig.</li> <li>Check Condensate Surge Tank level is &gt;15% and NOT lowering</li> <li>Check Exhaust Hood Temperature is less than 175°F.</li> <li>Ensure 2-AR-17, Vacuum Breaker, is closed.</li> </ul>	AOP 2574

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
	FWR19(Open) FWR20(Open) FW33 (var.)	When dispatched as a PEO, open the Mechanical Vacuum Pump suction valves.  Vacuum should improve slightly then stabilize. Set the loss of vacuum malfunction as required to maintain approximately 5-5.5 inches Hg absolute.  After 5-10 minutes, report that the Mechanical Vacuum Pump suction valves are open and that a second set of Air Ejectors has been placed in service.  Report that there is NO obvious indication of a vacuum leak.	US/SM	Direct a PEO to: <ul style="list-style-type: none"> <li>• Open Mechanical Vacuum Pump individual and combined suction valves.</li> <li>• Place a second set of SJAE in service.</li> <li>• Check for proper operation of the Atmospheric Drain Collecting Tank level control system.</li> <li>• Check for water seal in Vacuum Breaker.</li> <li>• Check condenser expansion joint loop seal is filled.</li> <li>• Inspect for leakage.</li> </ul>	AOP 2574
			US	Determines vacuum is NOT stabilizing and directs the crew to continue the down power per AOP 2575.	AOP 2574 AOP 2575
T4	FW33 (100%)	When the US has determined that vacuum is NOT stabilizing, insert a malfunction to cause a rapid degradation of condenser vacuum.	Crew	Observe rapidly lowering condenser vacuum and loss of main generator output.	MP-14 <b>TM 4</b> <b>MA 1</b>
			US	Direct a manual plant.	MP-14
			US/SM	Place Master Alarm Silence in SILENCE. Announce "Unit 2 trip" on the plant paging system. Direct performance of EOP 2525.	OP 2260
			US	Query board operators regarding the status of safety functions.	OP 2260

# SECTION 4

ID Number ES04LI3

Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			PPO	<p>Complete and report SPTA:</p> <ul style="list-style-type: none"> <li>• Ensures Reactivity safety function is being met: <ul style="list-style-type: none"> <li>★ Reactor is tripped</li> <li>★ All CEAs are inserted.</li> <li>★ Power is going down.</li> <li>★ SUR is negative.</li> </ul> </li> <li>• Verifies RCS Inventory safety function is being met <ul style="list-style-type: none"> <li>★ Pressurizer level is between 35 and 70%</li> </ul> </li> <li>• Verifies RCS Pressure safety function is being met: <ul style="list-style-type: none"> <li>★ Pressurizer pressure is between 2225 and 2300 psia.</li> </ul> </li> <li>• Verifies Core Heat Removal established. <ul style="list-style-type: none"> <li>★ NO RCPs are operating and placed Tavg controller, HIC-4265 in manual and closed.</li> <li>★ Reports loop delta T less than 10°F.</li> <li>★ Reports value and trend of RCS subcooling.</li> </ul> </li> <li>• Verifies Containment Integrity safety function is being met by verifying CTMT pressure, temperature, and radiation monitor readings are normal.</li> </ul>	EOP 2525

## SECTION 4

ID Number ES04L13Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		May report that "B" Auxiliary Feed Pump discharge pressure is lowering; pump is degraded.	SPO	<p>Complete and report SPTA:</p> <ul style="list-style-type: none"> <li>• Trip turbine, stop valves closed, MWe indicate 0, and 8T&amp;9T open</li> <li>• Electrical alignment is as follows: <ul style="list-style-type: none"> <li>★ 25A and 25B are deenergized</li> <li>★ 24A and 24B are deenergized</li> <li>★ 24C and 24D are energized by their respective Diesel Generators</li> <li>★ 201A and 201B are energized</li> <li>★ VA10 and VA20 are energized</li> </ul> </li> <li>• Both SW and RBCCW facilities running</li> <li>• Verifies status of Core Heat Removal <ul style="list-style-type: none"> <li>★ Reports value and trend of both S/G pressures (880 to 902 psig).</li> <li>★ Reports RCS Tc value and trend. (530 to 535°F).</li> <li>★ Reports value and trend of both S/G levels between 40 and 70 or being restored to this band.</li> <li>★ Reports both motor driven Auxiliary Feed Pumps operating.</li> <li>★ Concurs with US report of subcooling value.</li> </ul> </li> </ul>	EOP 2525

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
	IAR10 (Open)	When dispatched as the PEO, after 5-10 minutes, report that Station Air has been cross tied with Unit 3.	SPO	Performs subsequent actions: <ul style="list-style-type: none"> <li>• Announces and opens Vacuum Breaker, AR-17</li> <li>• Opens subcooling valve, HD-106</li> <li>• Stops both Heater Drains Pumps</li> <li>• Isolated both Main Feed Pumps</li> <li>• Ensures only one Condensate Pump is running</li> <li>• Verifies Instrument Air pressure is &gt;90 psig</li> <li>★ Dispatches a PEO to align Station with Unit 3 and cross ties Station Air with Instrument Air.</li> </ul>	EOP 2525
			PPO / SPO	When queried, report completion and verification of subsequent actions.	OP 2260
			US	Refers to Diagnostic Flow Chart and determines that EOP 2528, Loss of Off Site Power/Loss of Forced Circulation is the appropriate procedure.	EOP 2525 <b>EU 1</b>
			US/STA	Directs the performance of Safety Function Status Checks for EOP 2528	EOP 2528

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		<i>Event is classified as an <b>Unusual Event, Delta-One</b>, based on PUI, Loss of Off Site Power for greater than 15 minutes.</i>	SM	<i>Ensure event is classified.</i>	EOP 2528
			US	Open place keeper and enter EOP entry time Return Master Silence switch to Normal	EOP 2528
			US	Direct SPO to: <ul style="list-style-type: none"> <li>• Close both MSIVs</li> <li>• Ensure both MSIV bypass valves are closed.</li> <li>• Open AR-17, Condenser Vacuum Breaker</li> </ul>	EOP 2528
T4	ED05C	While the SPO is verifying MSIV closure, insert a malfunction to cause an overload trip of Bus 24C.	SPO	Verifies: <ul style="list-style-type: none"> <li>• Both MSIVs are closed.</li> <li>• Both MSIV Bypass Valves are closed.</li> <li>• AR-17, Vacuum Breaker is open.</li> </ul>	EOP 2528 <b>TM 7,</b> <b>EM 1,</b> <b>MA 2</b>
			Crew	Observe indications for the loss of Bus 24C.	MP-16
			SPO	Observes "A" DG running with NO cooling water and emergency trips "A" DG.	OP 2260 EOP 2525
			US	Inform the crew that a significant change in plant conditions requires the Diagnostic Flow Chart to be performed again.	OP 2260

## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			SPO	Observes lowering discharge pressure on "B" Aux Feed Pump.	MP 14
			Crew	Determines that a loss of all feedwater has occurred and that EOP 2537, Loss of All Feedwater, must be entered.	OP 2260 <b>EU 2</b>
			US	Briefs crew on entry into EOP 2537.	OP 2260
			US/STA	Directs the performance of Safety Function Status Checks for EOP 2537.	EOP 2537
			US	Directs: <ul style="list-style-type: none"> <li>• All RCPs to be stopped.</li> <li>• HIC-4165, Tavg Controller placed in Manual and closed.</li> <li>• Pressurizer Spray Valves, RC-100E and RC-100F, to be placed in Manual and closed.</li> </ul>	EOP 2537
			PPO	<ul style="list-style-type: none"> <li>• Ensures all RCPs are secured.</li> <li>• Places HIC-4165, Tavg Controller, in Manual and closed.</li> <li>• Places Pressurizer Spray Valves, RC-100E and RC-100F in Manual and closed.</li> </ul>	EOP 2537



## SECTION 4

ID Number ES04LI3Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
		The Note prior to this step states that OTC should be initiated prior to SG level reaching 70" if two trains of HPSI, PORVs and ADVs are NOT available.	US	Directs the PPO to initiate Once-Thru-Cooling	EOP2537 <b>EC 1</b>
		<p><b>CT-1 Once-Thru-Cooling must be initiated prior to reaching 70 inches in the lowest Steam Generator or for a &gt;5°F rise in Tc. (OTC will be initiated early due to loss of one facility.)</b></p> <p><b>CT-2 "C" HPSI Pump must be started prior to opening the PORVs.</b></p> <p>PORV Block Valve, RC-403, is deenergized (has NO open indication), but will remain open when deenergized.</p>	SPO	<p>Initiates Once-Thru-Cooling by the following:</p> <ul style="list-style-type: none"> <li>• Turns off both Proportional Heaters.</li> <li>• Places all Backup Heaters in Pull-To-Lock.</li> <li>• Opens both Atmospheric Dump Valves</li> <li>• Manually actuates SIAS.</li> <li>• Ensures HPSI Pumps have started. <ul style="list-style-type: none"> <li>○ Recognizes "C" HPSI Pump did NOT start and manually starts it.</li> </ul> </li> <li>• Ensures all HPSI Injection Valves are open.</li> <li>• Ensures all available Charging Pumps are running.</li> <li>• Ensures both PORV Block Valves are open.</li> <li>• When "C" HPSI Pump has started, opens both PORVs.</li> <li>• Informs US when complete.</li> </ul>	<p>EOP 2537 <b>CT-1</b></p> <p><b>CT-2</b></p>

ID Number ES04LI3

SECTION 4

Revision: 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
			US	When OTC has been established, briefs crew on entry into EOP 2540, Functional Recovery Procedure.	OP 2537
		The session may be terminated when the crew completes the brief for EOP 2540 entry.			

SECTION 4  
SUMMARY

Title: Simulator Evaluation

ID Number: ES04LI3

Revision: 0

---

CRITICAL TASKS

- CT-1 Once-Thru-Cooling must be initiated prior to reaching 70 inches in the lowest Steam Generator or when a >5°F uncontrolled rise in Tc is observed. (OTC will be initiated early due to loss of one facility.)**
- CT-2 "C" HPSI Pump must be started prior to opening the PORVs.**

SECTION 5  
SCENARIO INITIAL CONDITIONS

Title: Simulator Evaluation

ID Number: ES04LI3

Revision: 0

---

Initial Conditions

- ◇ 100 % power, BOL, Equilibrium Xenon
- ◇ 1201 ppm boron
- ◇ Blend ratio - 3.4:1
- ◇ SG Blowdown - 40 gpm each
- ◇ 24E aligned to bus 24C
- ◇ Terry Turbine out for bearing replacement
- ◇ F-16 out for filter replacement
- ◇ Enclosure Building Purge using Main Exhaust has been in continuous operation for several months.
- ◇ Containment pressure is 21". Conditions have been verified as acceptable to depressurize Containment.
- ◇ A work control staff is available to perform tasks outside of the Control Room.

Out of Service Equipment

- ◇ The Turbine Driven Auxiliary Feed Pump is out of service for a bearing replacement.
- ◇ Radwaste Fan, F-16 is out of service for filter replacement.
- ◇ RC-200, AVMS is out of service.

Crew Instructions

Depressurize Containment per OP 2314B, Containment and Enclosure Building Purge. Steps 4.13.1 through 4.13.7 are complete. The 10 minute averages for the Containment Rad Monitors have been compared to the latest Chemistry grab sample and are acceptable for depressurization. Containment Rad Monitor readings have been logged into the SM log. Enclosure Building Purge has been in continuous operation for the past 3 months. Chemical use has been prohibited in the Enclosure Building for the past week.

ATTACHMENT  
VALIDATION CHECKLIST

Title: Simulator Evaluation

ID Number: ES02LI3

Revision: 0

Remote functions:

All remote functions contained in the guide are certified.

Verified By:



Malfunctions:

All malfunctions contained in the guide are certified



Initial Conditions:

The initial condition(s) contained in the guide are certified  
or have been developed from certified ICs.



Simulator Operating Limits:


The simulator guide has been evaluated for operating  
limits and/or anomalous response.



Test Run:

The scenario contained in the guide has been test run  
on the simulator. Simulator response is reasonable and as expected.



1/19   
Actions Completed

1/19/05  
Date

**SHIFT TURNOVER REPORT**

<b>DATE-TIME</b> Today 0515	<b>PREPARED BY</b> Unit Supervisor / "NIGHT" Shift	<b>SHIFT</b> 18:00 - 06:00
--------------------------------	---	-------------------------------

**PLANT STATUS:**

<b>MODE:</b> 1	<b>RX POWER:</b> 100%
<b>MEGAWATTS:</b> Thermal: 2698 MWTH	<b>PZR PRESS:</b> 2250 psia
Electric: 913 MWe	<b>RCS T-AVE:</b> 572 degrees F
<b>RCS LEAKAGE:</b> Identified: 0.12gpm	<b>PROTECTED:</b> Train/Facility
Unidentified: 0.03gpm	<b>Z1 (RED)</b>
Date/Time: Today 0015	

**TS LCO and TRM ACTION Statements Coming Due (if more than one ACTION requirement per LCO, list each separately)**

Date	Time	LCO	Action	Action Requirement	Equipment	Reason
Today	0430	3.7.1.2	a.	With one Auxiliary Feed Pump inoperable, restore the required Auxiliary Feed Pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.	Terry Turbine	Terry Turbine tagged for bearing replacement
Today	0430	7.1.15, item A	b.1 and b.2	With valve inoperable from C-10, perform Actions b.1, b.2 for fire areas R-1 and R-13.	SV-4188, AFW Steam Supply Valve	Terry Turbine tagged for bearing replacement
Today	0430	7.1.15, item B	b.1 and b.2	With Pump/Turbine inoperable, from either location, perform actions b.1 and b.1 for fire areas R-3, R-11, R-16, and R-17.	P-4 and H-21 AFW Pump and Turbine Governor Control	Terry Turbine tagged for bearing replacement
Today	0430	7.1.15, item C	b.1 and b.2	With the valve closed or disconnect closed, perform actions b.1 and b.1 for fire areas R-1, R-2, and R-13.	2-MS-202, AFW Steam Supply Valve from SG 2, MOV	Terry Turbine tagged for bearing replacement

**Continuous TS LCO and TRM ACTION Statements in effect (if more than one ACTION requirement per LCO, list each separately)**

Action Requirement	LCO	Action	Equipment	Reason
Infinite action: Establish hourly fire watch.	TRMAS 3.7.10	1	See AIL	See Active Impairment List.
Infinite action: Attachment 1 of OP 2301A	TSAS 3.3.3.8	a/3	RC-200	Failed SP 2410A

**OD COMPENSATORY ACTIONS / Temp LOGS (Bold: Tech Specs, Italics: TRM)**

--

**EVOLUTIONS IN PROGRESS & NOTES**

	Reference /Date
The 10 minute averages for the Containment Rad Monitors have been compared to the latest Chemistry grab sample and are acceptable for depressurization. Containment Rad Monitor readings have been logged into the SM log. Enclosure Building Purge has been in continuous operation for the past 3 months. Chemical use has been prohibited in the Enclosure Building for the past week.	OP 2314B Today

## Unit 2 Chemistry

### ON-LINE STATUS REPORT

REACTOR COOLANT		Time 06:25	
Parameter	Reading	Parameter	Reading
Power	100 %	Flouride	0.81 ppb
Tave	572 deg F	Chloride	1.75 ppb
Boron	1201 ppm	Oxygen	<5 ppb

Blend Ratio:	3.4 : 1
--------------	---------

Attachment

SCENARIO ATTRIBUTES CHECKLIST

Scenario Title:	<u>LOIT Simulator Evaluation</u>	Number:	<u>ES04LI3</u>
Technical Reviewer:	<u>R. J. Ashe</u>	Date:	<u>12/6/04</u>

QUALITATIVE ATTRIBUTES

- Y 1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 2. The scenario consists mostly of related events.
- Y 3. Each event description consists of:
- the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the expected Emergency Plan classification
  - the event termination point (if applicable)
- Y 4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 5. The events are valid with regard to physics and thermodynamics.
- Y 6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- NA 7. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 8. The simulator modeling is not altered.
- Y 9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the scenario.



Attachment

Guide No.: ES04LI3

SCENARIO ATTRIBUTES CHECKLIST

**Note:** Following criteria list scenario traits that are numerical (quantitative) in nature. Credited malfunctions tasks and procedures should be bolded in the evaluation guide.

- |   |                 |
|---|-----------------|
| 1. Total Malfunctions (TM) - Include EMs – (5 – 8)  | <u>8</u>        |
| <ul style="list-style-type: none"><li>1. Loss of the PPC</li><li>2. Fail Channel "C" Pressurizer pressure transmitter low</li><li>3. Degrading Condenser vacuum</li><li>4. Loss of Condenser vacuum</li><li>5. Loss of RSST</li><li>6. Degradation of "B" Aux Feed Pump</li><li>7. Loss of Bus 24C</li><li>8. Failure of "C" HPSI Pump to automatically start</li></ul> |                 |
| 2. Malfs after EOP entry (EMs) – (1 – 2)  | <u>2</u>        |
| <ul style="list-style-type: none"><li>1. Loss of Bus 24C after entry into EOP 2528</li><li>2. Failure of "C" HPSI Pump to start after SIAS initiation</li></ul>   |                 |
| 3. Abnormal Events (AE) – (2 – 4)   | <u>2</u>        |
| <ul style="list-style-type: none"><li>1. Loss of the PPC</li><li>2. Degrading Condenser vacuum</li></ul>  |                 |
| 4. Major Transients (MA) – (1 – 2)  | <u>2</u>        |
| <ul style="list-style-type: none"><li>1. Loss of Condenser vacuum resulting in plant trip</li><li>2. Loss of Bus 24C resulting in Loss of All Feedwater</li></ul>   |                 |
| 5. EOPs entered requiring substantive actions (EU) - (1 – 2)  | <u>2</u>        |
| <ul style="list-style-type: none"><li>1. Transition from EOP 2525 to EOP 2528</li><li>2. Transition from EOP 2528 to EOP 2537</li></ul>   |                 |
| 6. EOP Contingencies requiring substantive actions (EC) – (0-2)   | <u>1</u>        |
| <ul style="list-style-type: none"><li>1. Initiate Once-Thru-Cooling</li></ul>   |                 |
| 7. Critical Tasks (CT)- (2 – 3)   | <u>2</u>        |
| <ul style="list-style-type: none"><li>1. Once-Thru-Cooling must be initiated prior to reaching 70 inches in the lowest Steam Generator or when a &gt;5°F uncontrolled rise in Tc is observed. (OTC will be initiated early due to loss of one facility.)</li><li>2. "C" HPSI Pump must be started prior to opening the PORVs.</li></ul>                                 |                 |
| 8. Approximate Scenario Run Time: 60 to 90 min.   | Total <u>75</u> |
| 9. Technical Specifications exercised during the scenario.  | (Y/N) <u>Y</u>  |

**IC-90****ES04LI3 Load Limit Pot Setting = 5.85**

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>ASI Upper</u>	4.68	4.65	4.66	4.63
<u>ASI Lower</u>	4.85	4.72	4.76	4.74
<u>Nuclear Power</u>	4.66	4.988	4.80	4.85
<u><math>\Delta T</math> Power</u>	3.90	4.10	3.92	4.07
<u>Tcold Cal.</u>	4.80	4.80	4.80	4.90

# MILLSTONE POWER STATION




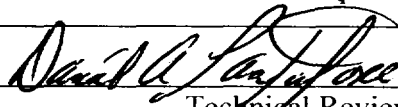
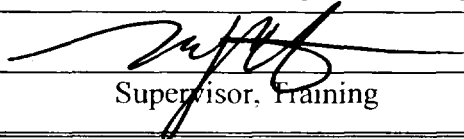
## SIMULATOR EXAM GUIDE APPROVAL SHEET

Lesson Title: LOIT Simulator Evaluation #4 (Spare)

Revision: 0

ID Number: ES04LI4 (Spare)

This document is the property of the Millstone Power Station which controls its distribution. Further transfer, copying, or modification of this document is strictly prohibited without the written consent of the Millstone Power Station.

Submitted by:	R. J. Ashev 	2/28/05
	Developer	Date
Reviewed by:		03/07/05
	Technical Reviewer	Date
Approved by:	N/A	N/A
	Assistant Manager, Unit 2 Operations (Optional)	Date
Approved by:		3/9/05
	Supervisor, Training	Date

SIMULATOR EXAM GUIDE  
SUMMARY OF CHANGES

1. None in Revision 0, Change 0.

SIMULATOR EXAM GUIDE  
TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

1. Exam Overview
2. Scenario Initial Conditions Sheet
3. Exam Guide
4. Exam Guide Summary
5. STA Follow-up Questions

Attachments

1. Validation Checklists
2. Shift Turnover Sheet
3. Scenario Attribute Checklist

## EXAM OVERVIEW

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number: ES04L14 (Spare)

Revision: 0

1. Purpose:

- a. Evaluate the licensees' ability, as a team and individually, to safely and responsibly operate the plant during normal plant operations, abnormal operating conditions and emergency operating conditions.
- b. Evaluate licensees in the following areas, as applicable:
  - 1) Ability of the crew to perform crew-dependent (and time-critical) tasks.
  - 2) Ability of individuals to perform critical tasks.
  - 3) Ability of the crew to:
    - a) Understand/interpret alarms/annunciators
    - b) Diagnose events/conditions based on signals/readings
    - c) Understand plant/systems response
    - d) Comply with/use procedures and Technical Specifications
    - e) Properly communicate information/proper crew interactions
    - f) Perform control board operations
  - 4) Ability of each individual to:
    - a) Respond and correctly interpret annunciators
    - b) Correctly diagnose events
    - c) Properly interpret integrated system response
    - d) Comply with and use Technical Specifications
    - e) Comply with and use procedures
    - f) Properly perform control board operations
    - g) Demonstrate a responsible attitude
    - h) Properly communicate information and interact with the rest of the crew

2. Exam brief:

The simulator will be prepared for the evaluation and the licensees will be briefed on the conduct of the evaluation and the areas in which they will be evaluated.

The simulator will be initialized to IC-89 (or equivalent) at 100% power. BOL, Eq Xe. 1201 ppm boron. The "C" Charging Pump is out of service for seal replacement. "B" Charging Pump is aligned to Facility 2.

The site experienced a minor seismic event (0.08g ZPA) 6 hours earlier, AOP 2562, Earthquake, was entered, and a UE/D-1 declared by Unit 3. All seismic instruments have been or are being evaluated and accessible plant piping systems have been fully inspected including a tour of containment, (limited by accessibility at power). No indications of damage or leakage were noted. Management is discussing options for a plant shutdown to conduct full accessibility inspections of systems inside containment.

Shortly after the crew takes the shift, the "A" RBCCW Pump will trip. The crew will restore Facility 1 RBCCW by starting the "B" RBCCW Pump. The US will enter and exit TSAS 3.7.3.1 due to the loss and restoration of RBCCW to Facility 1. When the crew enters section 7.0 of AOP 2564, Loss of RBCCW, Charging header flow will begin to lower. The crew should diagnose this as a degraded "A" Charging Pump. The PPO will start "B" Charging Pump and secure "A" Charging Pump. The US will enter TSAS 3.5.2 and TRMAS 3.1.2.4 and TRM 7.1.1, Table 7.1.1-1, Item A, actions b.1 and b.2. When the US has addressed the appropriate administrative requirements for the "A" Charging Pump, Channel B cold leg temperature transmitter, TE112CB, will become 'noisy' causing the following annunciators to alarm intermittently: RX POWER  $\Delta$ T CH DEVIATION, RPS PRE TRIP, TM-LP TRIP CH B, PRESSURIZER CH B TM-LP SETPOINT HI/LO, and Computer Alarm, LOOP 1B Cold Leg Temp Lo. The crew should reference the appropriate ARP and bypass RPS Channel B Hi Power, TM-LP, and LPD trips. Additionally, they should request I&C to isolate and remove Channel B cold leg temperature transmitter, TE112CB.

When the crew has completed actions associated with Channel B cold leg temperature transmitter, TE112CB, a S/G Tube Leak of ~ 5 gpm will occur in #2 S/G. The US should reference T.S.A.S. 3.4.6.2.b and AOP 2569, Steam Generator Tube Leak. A down power should be commenced in accordance with AOP 2575, Rapid Downpower.

At ~ 95% (or at the discretion of the examiners), the S/G Tube Leak will increase in size such that pressurizer level cannot be maintained, requiring that the Unit be tripped. The US will direct that the unit be manually tripped and that EOP 2525 be carried out.

Upon completion of EOP 2525, the US should enter EOP 2534 and direct that SFSCs be taken every 15 minutes.

When SIAS is actuated, AM-523 will fail to actuate components to their SIAS position/condition. (A & B RBCCW TCV, A SW Header to TBCCW, CH-501, CH-515, and #1 & #2 SIT Outlet Isolations). Additionally, when SIAS is initiated, the "A" HPSI Pump will slowly degrade.

When RCS pressure lowers to 1450 psia, the "C" HPSI pump will be lost. With the "A" HPSI Pump degraded, the US should elect to start the "B" HPSI pump, which is aligned to Facility 1.

When #2 SG has been isolated, an unisolable steam leak will develop on #2 S/G in the Enclosure Building. This steam leak develops from a cracked butt weld on the Main Steam line side of 2-MS-3B, which is unisolable. With 2 events occurring, the US should direct entry into EOP 2540.

The scenario may be terminated when EOP 2540 has been entered, success paths selected, feed has been isolated to #2 S/G and RCS pressure is being reduced to minimize the differential, and actions to address challenged success paths are being carried out by the crew.

3. Plant/Simulator differences that may affect the scenario are:

The simulator does not model the Loose Part Monitor Panel. Operators will be provided the information for their annunciator response from the simulator instructor.

4. Duration of Exam: 1.5 hours.

All Control Room Conduct, Operations and Communications shall be in accordance with Master Manual 14 (MP-14). Review the Simulator Operating Limits (design limits of plant) and Simulator Modeling Limitations and Anomalous Response List prior to performing this training scenario. The instructor should be aware if any of these limitations may be exceeded.



## SIMULATOR EXAM GUIDE

### SCENARIO INITIAL CONDITIONS

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number: ES04LI4 (Spare)

Revision: 0

#### Out of Service Equipment

“C” Charging Pump out for seal replacement. “B” Charging Pump is aligned to Facility 2.

#### Crew Instructions

The plant has been at 100% power for 30 days following a Refueling Outage.

There are no surveillances due.

It is day shift, normal weekday.

Facility 1 is protected.

The site experienced a minor seismic event, (0.08g ZPA). 6 hours earlier, AOP 2562, Earthquake, was entered and a UE/D-1 declared by Unit 3. All seismic instruments have been or are being evaluated and accessible plant piping systems are being fully inspected. A tour of containment (limited by accessibility at power) has been performed. No indications of damage or leakage have been noted by operators. Management is discussing options for a plant shutdown to conduct full accessibility inspections of systems inside containment.

## SIMULATOR EXAM GUIDE

All Control Room Conduct, Operations and Communications shall be in accordance applicable Unit Procedures.

"Review the Simulator Operating Limits (design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded."  
(NSEM 6.02)

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
		<u>Initial Conditions</u>			
T <sub>0</sub>	IC-89	IC-89 (or equivalent), 100% BOL, 1201 ppm, Eq Xe, LL@6.67, EB Purge, SGBD @ 25/25 gpm, Blend = 3.4:1			
	ES03C	<p>Actuation module AM523 fails to actuate when SIAS is initiated. The following components fail to actuate:</p> <ul style="list-style-type: none"> <li>• SW3.2B (FAC1 SW to TBCCW Hxs)</li> <li>• SW8.1A ("A" RBCCW Hx TCV)</li> <li>• SW8.1B ("B" RBCCW Hx TCV)</li> <li>• CH501 (VCT Outlet Valve)</li> <li>• CH515 (FAC1 L/D Isolation Valve)</li> <li>• SI614 (#1 SIT Outlet)</li> <li>• SI624 (#2 SIT Outlet)</li> </ul>			<b>TM-7 EM-1</b>
	SI05A (100) Ramp=600 sec.	"A" HPSI Pump slowly degrades after starting.			<b>TM-8 EM-2</b>
	SI04C on BT20	Loss of the "C" HPSI pump when RCS pressure is <1450 psia.			<b>TM-9 EM-3</b>
		<p>Place the simulator in run.</p> <p>Place the Charging Pump select switch in '2-3' and place the "C" Charging Pump hand switch in Pull-To-Lock, ("A" Pump running).</p>			

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
	CVR10 (RO)	Rack out the "C" Charging Pump breaker and place a yellow tag on the hand switch.			
	CVR11 (22F)	Ensure "B" Charging Pump is on Facility 2 (22F). Ensure lamacoid for Facility 2 is displayed on C-02			
		<p>Perform the actions of the Simulator Examination Briefing Sheet and provide the SM with a turnover.</p> <p>Provide the following information:</p> <ul style="list-style-type: none"> <li>The plant has been at 100% power for 30 days following a Refueling Outage. It is day shift, normal weekday. There are no surveillances due.</li> <li>Charging Pump "C" is out for a seal replacement. Charging Pump "B" is on Facility 2.</li> <li>The site experienced a minor seismic event, (0.08g ZPA) approximately 6 hours earlier. AOP 2562, Earthquake, was entered and a UE/D-1 declared by Unit 3. All seismic instruments have been or are being evaluated and accessible plant piping systems are being fully inspected including a tour of containment, (limited by accessibility at power). No indications of damage or leakage have been noted by operators. Management is discussing options for a plant shutdown to conduct full accessibility inspections of systems inside containment.</li> </ul>	Crew	Walk down control boards.	MP 14

# **Simulator Team Guide**

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04L14 (Spare)

Revision 0

Time	IDA/Malf	Instructor Information / Activity	Task Assign	Expected Actions	Standard
T <sub>1</sub>	CC01A	Insert a malfunction to trip the "A" RBCCW Pump.	Crew	Observe the loss of the "A" RBCCW Pump	MP-14
			US	Direct SPO to ensure "B" RBCCW Pump is aligned to Facility 1 and Start "B" RBCCW Pump.	AOP 2564 <b>TM 1</b> <b>AE 1</b>
		When dispatched as the PEO (maintenance), report that there are NO obvious problems. You will continue to troubleshoot.	SPO	Performs the following: <ul style="list-style-type: none"> <li>Ensures Pump B Discharge Crosstie Valve to A Header, RBA-251A, is open.</li> <li>Starts "B" RBCCW Pump</li> <li>Place "A" RBCCW Pump hand switch in Pull-To-Lock.</li> <li>Observes and acknowledges the RBCCW PUMP B SIAS/LNP MANUALLY BLOCKED annunciator on C-06.</li> <li>Dispatches a PEO (maintenance) to look for any problems with the breaker or the pump.</li> </ul>	AOP 2564

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
			US	Direct the performance of Section 7, Plant Assessment.	AOP 2564
			PPO	Report: <ul style="list-style-type: none"> <li>• Adequate Shutdown Margin exists; all CEA are fully withdrawn.</li> <li>• Pressurizer level is 65% and stable</li> <li>• Pressurizer is 2250 psia (nominal) and stable.</li> <li>• Three CAR Fans are operating in slow speed.</li> </ul>	AOP 2564
			SPO	Reports: <ul style="list-style-type: none"> <li>• Steam Generator levels are 70% and stable.</li> <li>• Two facilities of RBCCW and Service Water are in service.</li> </ul>	AOP 2564
			US	<ul style="list-style-type: none"> <li>• Notifies Maintenance.</li> <li>• Enters and exits TSAS 3.7.3.1</li> <li>• Enters TRM 7.1.20, Item H.</li> <li>• Determines NO reportability.</li> </ul>	AOP 2564

## Simulator Team Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
T <sub>2</sub>	CV22 (100%) Ramp=200 sec.	While the crew is discussing/briefing the loss of "A" RBCCW Pump, insert a malfunction to cause a degradation of the "A" Charging Pump.	PPO	Observe and report lowering Charging flow, Pressurizer level, or LOW CHARGING FLOW annunciator.	MP-14 <b>TM 2</b> <b>AE 2</b>
		If dispatched as a PEO or maintenance, report that the "A" Charging Pump is making a loud banging noise.	US	Direct the PPO to determine the cause of the lower Charging flow and to reference the appropriate ARP.	MP-14
			PPO	Check Charging flow. Ensure and report the Charging Header Isolation Valves, CH-518, CH-519, and CH-429, are open.	ARP 2590B-057
			PPO	Determines and reports Pressurizer level is lowering slowly.	ARP 2590B-057
			US	Directs the PPO to start "B" Charging Pump and place "A" Charging Pump in Pull-To-Lock.	ARP 2590B-057
			PPO	Starts "B" Charging Pump and places "A" Charging Pump in Pull-To-Lock.	ARP 2590B-057
			US	Logs into TSAS 3.5.2, TRM 3.1.2.4 and TRM 7.1.1, Table 7.1.1-1, Item A, actions b.1 and b.2.	ARP 2590B-057 Tech Specs TRM

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
T <sub>3</sub>	RP01F (100%) Ramp=250 sec.	While the crew is discussing/briefing the loss of the "A" Charging Pump, insert a malfunction to cause Loop 1B Cold Leg Transmitter, TE-112CB, to become 'noisy.'	PPO	Observe and report the following annunciator as they alarm: <ul style="list-style-type: none"> <li>• RX POWER ΔT CH DEVIATION</li> <li>• RPS PRE TRIP</li> <li>• TM-LP TRIP CH B</li> <li>• PRESSURIZER CH B TM-LP SETPOINT HI/LO</li> <li>• Computer Alarm, LOOP 1B Cold Leg Temp Lo</li> </ul>	MP-14 <b>TM 3</b> <b>AE 3</b>
		Report as I&C. Inform the crew that you will troubleshoot the problem.	US	Directs the PPO to reference the appropriate ARP. Informs I&C.	MP-14
			PPO	Observe Channel "B" pressurizer pressure indication and compare to other channels. Report observations.	ARP-2590C-022
			PPO	Observe Th and Tc instruments. Report Channel "B" Tc is 'noisy.'	ARP-2590C-022
			PPO	With concurrence of the US, bypasses Channel "B" RPS TMLP, High Power, and LPD trips.	ARP 2590B-022
	Delete RP01F	As I&C report that the transmitter Weidmuller pin was a little corroded. Pin has been fixed.	US	Enter TSAS 3.3.1.1, Action 2.  Request I&C to isolate and repair transmitter.	ARP 2590B-022 Tech Specs



## Simulator Team Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04L14 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
T <sub>4</sub>	SG01B(50) Ramp=200 sec.	Insert a malfunction which will cause a S/G Tube Leak of ~ 5 gpm.	Crew	Identify the loss of RCS inventory and determine that the leakage is S/G tube leakage within the capacity of the available Charging Pumps.	<b>TM-4</b> <b>AE-4</b>
			SPO	Observe N-6 and SJAE radiation monitors for increasing counts. Note rising counts on #2 S/G N-16 rad monitor.	
			US	Determine that the leakage is S/G tube leakage within the capacity of the available Charging Pumps.	
			US	Direct entry into AOP 2569, Steam Generator Tube Leak.  Direct Chemistry to sample both S/Gs for boron and activity.  Refer to Tech Spec 3.4.6.2c and identify that the Unit must come off line.	AOP 2569   Tech Specs
			SM	Refer to RAC 14 and classify this event as an Echo due to a S/D required by TS's. (UE/D-1 if leakage determined to be $\geq 10$ gpm.) Make required notifications of the downpower.	RAC 14

## Simulator Team Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
		The down power rate should be 50% per hour or greater. The Boration source should be the on service BAST.	US	Brief the PPO and SPO of the required down power, the rate, and the method of reactivity addition. Should include caution regarding reduced M/U capability.	AOP 2575
			PPO	Commence boration to the suction of the Charging Pumps.  If necessary, insert CEAs to maintain ASI.	
			SPO	As Rx power is reduced, lower turbine load.	

# **Simulator Team Guide**

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

T <sub>5</sub>	SG02B(15)	<b>After the downpower is initiated, increase the severity of the S/G Tube Leak to ~ 450 gpm.</b>	Crew	After the Main Steam Line Radiation Monitor alarm identify that the S/G Tube Leakage has increased.	<b>TM-6 MA-1</b>
			US	Direct that the reactor be tripped and EOP 2525 be commenced when: <ul style="list-style-type: none"> <li>• MSL RM alarms and is confirmed</li> </ul> <p align="center"><b>OR</b></p> <ul style="list-style-type: none"> <li>• Primary to secondary leakage exceeds the Chg Pp capacity.</li> </ul>	AOP 2569
			PPO	Report: <ul style="list-style-type: none"> <li>• Reactor tripped</li> <li>• All CEAs fully inserted</li> <li>• Power going down</li> </ul>	EOP 2525
			SPO	Report: <ul style="list-style-type: none"> <li>• Turbine tripped</li> <li>• All steam admission valves are closed</li> <li>• Generator Megawatts are zero</li> <li>• 8T and 9T are opened</li> </ul>	
			US	Commence query of both control board operators to identify the status of the plant	

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
			PPO	Report: <ul style="list-style-type: none"> <li>• Pressurizer level &lt; 20% and going down</li> <li>• Pressurizer pressure &lt; 1900 psia</li> </ul>	
		PPO will normally manually initiate SIAS at 1800 psia. Manual initiation of SIAS is NOT required.	US	Direct the PPO to manually actuate SIAS at some RCS pressure > 1714 psia.	
			SPO	Report: At least 1 S/G level being returned to 40-70% on Main Feed	
			PPO	Report: <ul style="list-style-type: none"> <li>• CTMT conditions normal</li> <li>• Rad Monitors NORMAL with the following exceptions: <ul style="list-style-type: none"> <li>- SJAE</li> <li>- S/G Blowdown</li> <li>- #2 S/G MS Rad Monitor</li> <li>- #2 N-16</li> </ul> </li> </ul>	
			US	Query the control operators to identify the status of performance and verification of the subsequent actions of EOP 2525.	

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
		<p>The "C" HPSI will trip when RCS Pressure &lt;1450 psia. The timing of the pump trip depends on the action of the crew and, therefore, may happen before or after this point.</p> <p>If the "A" HPSI is still running, it is NOT required that the "B" HPSI Pump be started. It is only required if the "A" HPSI is already degraded.</p>	US	Direct the PPO to place "C" HPSI in PTL, enable and start "B" HPSI, assuming the "B" HPSI was NOT started to replace the loss of the "A" HPSI.	
		<p>As the Turbine Building PEO, report that the "C" HPSI pump breaker has tripped, but it is NOT evident why the trip occurred.</p> <p>As electrical Maintenance, report that you will investigate the problem with the "C" HPSI pump breaker. (If requested, CANNOT determine the problem with the "A" HPSI Pump).</p>	US	<p>Direct the Turbine Building PEO to check out "C" HPSI pump breaker, A403.</p> <p>Request Maintenance to check the "C" HPSI breaker (and possibly the "A" HPSI Pump).</p>	
			PPO	<p>Report SIAS has been manually actuated, some components failed to actuate.</p> <p>"A" and "C" (or "B" and "D") RCPs are secured.</p>	OP 2260

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
			US	Uses the diagnostic flow chart to update the shift as to the status of the plant.  A SGTR has occurred, directs entry into EOP 2534.	EOP 2525
			SM	<i>Concurs with entry into EOP 2534.</i>  <i>Classifies the event as an Alert/C1</i>	EOP 2525  EOP 2534
		S/G isolation may be successfully completed when the RCS has been cooled down to < 515°F per EOP 2534.  <b>SGTR-7: Perform a plant cooldown to a Th of &lt; 515°F.</b>	US	Enters EOP 2534 and directs that EOP 2534 SFSCs be completed every 15 min  Refers to EOP 2534 and directs that Chemistry sample both S/Gs for boron and activity.  Directs the SPO to cooldown the RCS at the maximum controllable rate using either the SD & BP Valves or the ADVs at a rate which allows the continued use of the RCPs.	<b>EU-1</b>     <b>CT-1</b>
		<b>SGTR-9: Secure RCPs within 5 minutes of exceeding NPSH limit.</b>	Crew	Monitor RCP NPSH and secure RCPs if inadequate.	EOP 2534 <b>CT-2</b>

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
			SPO	Commence cooling down the RCS using BOTH S/Gs at a MAXIMUM and CONTROLLABLE rate dumping steam to the condenser.	
		This malfunction may be observed earlier.	Crew	Identify the degraded "A" HPSI pump when flow degrades to 0 gpm.	
			US	Direct the PPO to place "A" HPSI in PTL, enable and start "B" HPSI, assuming the "B" HPSI was not started to replace the loss of the "C" HPSI.	
		As Aux Building PEO: Nothing apparent.	US	Direct the Aux Building PEO to check out "A" HPSI pump.	
		<p><b>SGTR-6: Start the "B" HPSI Pump within 15 minutes of NOT satisfying the SI Flow Curve (OPTIONAL).</b></p> <p><b>This critical task is critical <u>only</u> if the "B" HPSI is started as a result of NOT satisfying the SI flow curve. The SI flow curve is applicable when RCS pressure is less than 1250 psia (HPSI shutoff head).</b></p>	US		<b>CT-3</b>
			SPO	Notify the US when RCS T <sub>H</sub> < 515°F.	

# **Simulator Exam Guide**

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
		<b>SGTR-5: Isolate the affected S/G is isolated in accordance with EOP 2534 within 60 minutes of the Reactor trip.</b>	US	Direct the SPO to isolate the #2 S/G per EOP 2534.	<b>CT-4</b>
T <sub>6</sub>	MS02B (2%) Ramp=20 sec.	Actuate an Excess Steam Demand in the Enclosure Building after the #2 SG has been isolated.	Crew	Identify the abnormal SG and RCS response.	<b>TM-6 MA-2 EM-4</b>
			US	Directs entry into EOP 2540 since 2 events (a SGTR and an ESD) are occurring.  Directs Chemistry to sample both S/Gs for boron and activity.	
			SM	Concurs with the entry into EOP 2540.	
				Selects EOP 2540 on SPDS and directs that EOP 2540 SFSCs be completed every 15 minutes.  Enters EOP 2540 and proceeds to identify the success paths which are currently in use and to identify which Safety Functions are in jeopardy.	<b>EOP 2534 EU-2</b>
			SM	<i>Concurs with entry into EOP 2540.</i>  <i>Classifies the event as an SAE/C2</i>	EOP 2540



# Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>			<u>Standard</u>
			US	The following Success Paths are being used to accomplish the safety Functions:			EOP 2540
			US	<u>SF</u>	<u>EQUIP</u>	<u>SAT</u>	EOP 2540
				RC-1	Y	Y	
				MVA-DC-1	Y	Y	
				MVA-AC-1	Y	Y	
				IC-2	Y	Y	
				PC-2	Y	Y	
				HR-2	Y	Y	
				CI-1	Y	N	
				CTPC-1	Y	Y	
				CCGC-1	Y	Y	
		#2 S/G may have already been isolated while in EOP 2534.	US	Enters EOP 2540E to verify or recover the CTMT Integrity Safety Function.			<b>EC-1</b>

## Simulator Exam Guide

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number ES04LI4 (Spare)

Revision 0

<u>Time</u>	<u>IDA/Malf</u>	<u>Instructor Information / Activity</u>	<u>Task Assign</u>	<u>Expected Actions</u>	<u>Standard</u>
			US	Enters EOP 2540D to verify recovery of RCS Heat Removal.	<b>EC-2</b>
		May already be accomplished in previous EOP.	US	Direct the SPO to isolate #2 S/G per EOP 2540D	EOP 2540D
When directed	MSR13 (RI)	Unlock, Close and Lock the disconnect for 2-MS-202. Set MSR13 to rack in (RI) and report that the disconnect for 2 MS-202 is closed and locked.	US	Direct Maintenance or Aux Building PEO to close and lock the disconnect for 2-MS-202, to isolate the Terry Turbine from #2 S/G.	
		<b>HR-3: Establish RCS heat removal by stabilizing RCS temperature using #1 ADV when #2 S/G is almost blown dry (CETs begin to rise).</b>	US	Directs the SPO to stabilize RCS temperature by using #1 S/G ADV per EOP 2540D when the RCS cooldown begins to slow down.	<b>CT-4</b>
		The session may be terminated when feed and steam to #2 S/G are secured and RCS pressure is being reduced to minimize the differential. RCS cooldown will be controlled by the blowdown of #2 S/G.			

## EXAM GUIDE SUMMARY

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number: ES04LI4 (Spare)

Revision: 0

1. Critical Tasks

**CT-1 SGTR-7: Perform a plant cooldown to a Th of < 515°F.**

**CT-2 SGTR-9: Secure RCPs within 5 minutes of exceeding NPSH limit.**

**CT-3 SGTR-3: Start the "B" HPSI within 15 minutes of NOT satisfying the SI Flow Curve. (OPTIONAL)**

**CT-4 SGTR-5: Isolate the affected S/G is isolated in accordance with EOP 2534 within 60 minutes of the Reactor trip.**

**CT-5 HR-3: Establish RCS heat removal by stabilizing RCS temperature using #1 ADV when #2 S/G is almost blown dry (CETs begin to rise).**

# SIMULATOR EXAM GUIDE

## VALIDATION CHECKLIST

Title: LOIT Simulator Evaluation #4 (Spare)

ID Number: ES04LI4 (Spare)

Revision: 0

### Initial Conditions:

The initial condition(s) contained in the guide are certified or have been developed from certified ICs.

Verified By:

RR

### Test Run:

The scenario contained in the guide has been test run on the simulator. Simulator response is reasonable and as expected.

RR

### Simulator Operating Limits:

The simulator guide has been evaluated for operating limits and/or anomalous response.

RR

### For Examination Scenario:

The Scenario Attributes Checklist is complete and attached. This is not required for Progress Review Exams

RR

RR. Riley  
Action Complete

3/4/05  
Date

**SHIFT TURNOVER REPORT**

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor / "NIGHT" Shift	18:00 - 06:00

**PLANT STATUS:**

MODE: 1	RX POWER: 100%
MEGAWATTS: Thermal: 2698 MWTH	PZR PRESS: 2250 psia
Electric: 913 MWe	RCS T-AVE: 572 degrees F
RCS LEAKAGE: Identified: 0.12gpm	PROTECTED: Train/Facility
Unidentified: 0.03gpm	Z1 (RED)
Date/Time: Today 0015	

**TS LCO and TRM ACTION Statements Coming Due (if more than one ACTION requirement per LCO, list each separately)**

Date	Time	LCO	Action	Action Requirement	Equipment	Reason
Today	0600	TRM 7.1.1, Table 7.1.1-1, Item C	a	With P18C inoperable from C-10, ensure P18B is operable from C-10 or perform Actions b.1, b.2 for Fire Areas R-1 R-13. With P18C inoperable from CR, perform Actions b.1, b.2 for Fire Area R-4.	"C" Charging Pump	Seal replacement.

**Continuous TS LCO and TRM ACTION Statements in effect (if more than one ACTION requirement per LCO, list each separately)**

Action Requirement	LCO	Action	Equipment	Reason
Infinite action: Establish hourly fire watch.	TRMAS 3.7.10	1	See AIL	See Active Impairment List.

**OD COMPENSATORY ACTIONS / Temp LOGS (Bold: Tech Specs, Italics: TRM)**

--	--

**EVOLUTIONS IN PROGRESS & NOTES**

Reference /Date
Inspection of plant systems for leakage due to seismic event.
Today

## Unit 2 Chemistry

**ON-LINE STATUS REPORT**

REACTOR COOLANT				Time 06:25			
Parameter		Reading		Parameter		Reading	
Power		100 %		Fluoride		0.81 ppb	
Tave		572 deg F		Chloride		1.75 ppb	
Boron		1201 ppm		Oxygen		<5 ppb	
Blend Ratio:		3.4 : 1					

Attachment

SCENARIO ATTRIBUTES CHECKLIST

Scenario Title:	<u>LOIT Simulator Evaluation</u>	Number:	<u>ES04L14</u>
Technical Reviewer:	<u>R. J. Ashby</u>	Date:	<u>2/28/05</u>

QUALITATIVE ATTRIBUTES

- Y 1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 2. The scenario consists mostly of related events.
- Y 3. Each event description consists of:
- the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the expected Emergency Plan classification
  - the event termination point (if applicable)
- Y 4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 5. The events are valid with regard to physics and thermodynamics.
- Y 6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- Y 7. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 8. The simulator modeling is not altered.
- Y 9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the scenario.

Attachment

**Guide No.: ES04LI2**

**SCENARIO ATTRIBUTES CHECKLIST**

**Note:** Following criteria list scenario traits that are numerical (quantitative) in nature. Credited malfunctions tasks and procedures should be bolded in the evaluation guide.

- |   |          |
|---|----------|
| 1. Total Malfunctions (TM) - Include EMs – (5 – 8)  | <u>9</u> |
| <ul style="list-style-type: none"><li>1. Trip of the "A" RBCCW Pump</li><li>2. Degradation of the "A" Charging Pump</li><li>3. Loop 1B Cold Leg Transmitter, TE-112CB 'noisy'</li><li>4. Tube leak in #2 Steam Generator</li><li>5. Tube rupture in #2 Steam Generator</li><li>6. Excess steam demand in the Enclosure Building</li><li>7. Actuation Module AM523 fails to actuate</li><li>8. "A" HPSI Slowly degrades</li><li>9. Loss of "C" HPSI Pump</li></ul> |          |
| Malfs after EOP entry (EMs) – (1 – 2)   | <u>4</u> |
| <ul style="list-style-type: none"><li>1. Actuation Module AM523 fails to actuate</li><li>2. "A" HPSI slowly degrades</li><li>3. Loss of "C" HPSI Pump</li><li>4. Excess steam demand in the Enclosure Building</li></ul>  |          |
| 3. Abnormal Events (AE) – (2 – 4)   | <u>4</u> |
| <ul style="list-style-type: none"><li>1. Trip of the "A" RBCCW Pump</li><li>2. Degradation of the "A" Charging Pump</li><li>3. Loop 1B Cold Leg Transmitter, TE-112CB 'noisy'</li><li>4. Tube leak in #2 Steam Generator</li></ul>  |          |
| 4. Major Transients (MA) – (1 – 2)  | <u>2</u> |
| <ul style="list-style-type: none"><li>1. Tube rupture in #2 Steam Generator</li><li>2. Excess steam demand in the Enclosure Building</li></ul>  |          |
| 5. EOPs entered requiring substantive actions (EU) - (1 – 2)  | <u>2</u> |
| <ul style="list-style-type: none"><li>1. EOP 2534, Steam Generator Tube Rupture</li><li>2. EOP 2540, Functional Recovery Procedure</li></ul>  |          |

Attachment

Guide No.: ES04LI2

SCENARIO ATTRIBUTES CHECKLIST

- |    |  |          |
|----|--|----------|
| 6. | EOP Contingencies requiring substantive actions (EC) – (0-2)   | 2        |
|    | 1. Enter EOP 2540E, Containment Integrity  |          |
|    | 2. Enter EOP 2540D, RCS Heat Removal   |          |
| 7. | Critical Tasks (CT)- (2 – 3)   | 4        |
|    | 1. SGTR-7: Perform a plant cooldown to a Th of < 515°F.  |          |
|    | 2. SGTR-9: Secure RCPs within 5 minutes of exceeding NPSH limit.   |          |
|    | 3. SGTR-3: Start the “B” HPSI Pump within 15 minutes of not satisfying the SI Flow Curve.  |          |
|    | 4. SGTR-5: Isolate the affected S/G is isolated within 60 minutes of the Reactor trip, in accordance with EOP 2534.                    |          |
|    | 5. HR-3: Establish RCS heat removal by stabilizing RCS temperature, using #1 ADV when #2 S/G is almost blown dry (CETs begin to rise). |          |
| 8. | Approximate Scenario Run Time: 60 to 90 min.   | Total 80 |
|    | Technical Specifications exercised during the scenario.  | (Y/N) Y  |



**IC-89**

**ES04LI4**

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>ASI Upper</u>	4.67	4.64	4.67	4.67
<u>ASI Lower</u>	4.86	4.75	4.83	4.82
<u>Nuclear Power</u>	4.65	4.78	4.68	4.66
<u><math>\Delta T</math> Power</u>	3.92	4.10	3.92	4.03
<u>Tcold Cal.</u>	4.71	4.70	4.870	4.72