

Facility: **Point Beach**Scenario No.: **1**OP-Test No.: **2007301**Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_**Initial Conditions:** Unit 1 is at 100% power MOL 8010 MWD/MT. Boron Concentration is 756 PPM. Unit 2 is at 100% power.**Turnover:** 1P-15A Safety Injection Pump is OOS. The oiler on the inboard pump bearing was damaged and a Maintenance crew is working the job to completion. TSAC 3.5.2.A was entered 6 hours ago and the pump is expected back for operability testing in about 3 hours. 1W-3A CRDM Shroud Fan is OOS due to motor bearing failure.Today is Sunday, present clock time is real time. An RP Tech and Chemistry Tech are on-site. A crew of Maintenance personnel are working 1P-15A to completion.The objective of the shift is to maintain stable plant conditions.

Event No.	Malf. No.	Event Type*	Event Description
1		C – BOP TS-SRO	P-32A Service Water Pump Trip (with reduced head capacity on two running SW pumps)
2		C – RO C – SRO TS-SRO	Steam Generator Tube Leak on 'A' SG
3		R - RO N – BOP N – SRO	Downpower due to SGTL on 'A' SG
4		I – RO I – SRO TS-SRO	1PT-485, Turbine First Stage Pressure Transmitter Fails High
5		M-ALL	SGTR on 'A' SG
6		C - RO	Reactor Trip manual push buttons on 1C04 fail to operate
7		C-BOP	P-38B MDAFW Pump and 1P-29 TDAFW Pump fail to auto start

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

	<b>SIMULATOR EXERCISE GUIDE (SEG)</b>
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SITE: POINT BEACH

SEG # PB-ILT-07N-001

SEG TITLE: 2007 NRC EXAM SCENARIO #1

REV. # 0  
DRAFT

PROGRAM: INITIAL LICENSE TRAINING

#: PB-ILT

COURSE:

#:

TOTAL TIME: 2.0

Additional site-specific signatures may be added as desired.

Developed by:	<b>Russell Joplin</b>	
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	<i>(Simulator Scenario Development Checklist.)</i>	
Validated by:		
	<i>Validation Lead Instructor</i>	<i>Date</i>
	<i>(Simulator Scenario Validation Checklist.)</i>	
Approved by:		
	<i>Training Supervision</i>	<i>Date</i>

### Guide Requirements

**Goal of Training:**

**To have the crew successfully respond to a SW pump trip, PT-485 failure, SG Tube Leak and Tube Rupture. Embedded within these events is the expectation to properly utilize Technical Specifications.**

**Learning Objectives:**

None

**Prerequisites:**

1. Simulator available
2. Students enrolled in Initial License Program

**Training Resources:**

1. Floor Instructor as Shift Manager
2. Floor Instructor as Shift Technical Advisor
3. Simulator Booth Operator
4. Communicator
5. NRC Examiners

**References:**

1. AOP-6C U1, Uncontrolled Motion of RCCA(s)
2. AOP-24, Response to Instrument Malfunction
3. 0-SOP-IC-001 White, Removal of Safeguards or Protection Sensor From Service – White Channels
4. AOP-3 U1, Steam Generator Tube Leak
5. AOP-9A Service Water System Malfunction
6. AOP-17A U1, Rapid Power Reduction
7. EOP-0 U1, Reactor Trip or Safety Injection
8. EOP-3 U1, Steam Generator Tube Rupture
9. Technical Specifications

**Commitments:**

None

**Evaluation Method:**

Simulator performance will be evaluated by NRC Examiners IAW NUREG-1021

**Operating Experience:**

None

**Related PRA Information:**

None

## QUANTITATIVE ATTRIBUTES

### **Malfunctions:**

#### *Before EOP Entry:*

1. P-32A Service Water Pump Trips with degraded head capacity on other running SW pumps
2. 'A' SG Tube Leak
3. 1PT-485, Turbine First Stage Pressure Transmitter fails HIGH

#### *After EOP Entry:*

1. Reactor Trip manual pushbuttons on 1C04 fail to operate
2. P-38B, 'B' MDAFW Pump and 1P-29, Unit 1 TDAFW Pump fail to auto start

### **Abnormal Events:**

1. 1PT-485 Failure
2. P-32A SW pump Trip
3. 'A' SG Tube Leak

### **Major Transients:**

1. Steam Generator Tube Rupture on 'A' SG

### **Critical Tasks:**

1. RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to Pressurizer level reaching 10%.
2. E3-A Isolate feedwater flow into, and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.
3. E3-D Terminate SI before a RED simulator Out Of Limits alarm reached (S/G full to MSIV) and control RCS pressure and make up flow so that primary and secondary inventory are stable before the end of the scenario.

## **SCENARIO OVERVIEW:**

### **INITIAL CONDITIONS:**

1. This scenario can be run from the following Specific IC set:

- IC-162, Created from IC-2

2. The following equipment is OOS:

- 1P-15A, 'A' Safety Injection Pump
- 1W-3A, 'A' CRDM Shroud Fan

### **SEQUENCE OF EVENTS:**

#### **Event 1: P-32A Service Water Pump Trip**

- After completion of crew turnover and examinees have assumed the watch, P-32A, 'A' SW pump trips (per Lead Examiner).
- Crew responds using AOP-9A, Service Water System Malfunction.
- Crew starts additional Service Water Pump(s) as necessary to maintain system pressure using AOP-9A or Alarm Response guidance.
- Crew places tripped pump ('A') to pullout and directs AO to shut SW-10, P-32A discharge valve.
- SRO addresses Technical Specifications for failure.

#### **Event 2: 'A' SG Tube Leak**

- Upon stabilization of plant following SW pump malfunction and on Lead examiner's direction, 'A' SG develops a small tube leak.
- Crew responds using AOP-3, SG Tube Leak.
- SRO addresses Technical Specifications for tube leakage.

#### **Event 3: Downpower due to SG Tube Leak**

- Crew determines need for rapid power reduction using AOP-17A, Rapid Power Reduction.
- Crew prepares for downpower and begins boration and turbine ramp.

**Event 4: 1PT-485, Turbine First Stage Pressure Transmitter Fails High**

- Once stable downpower rate has been established, 1PT-485, Turbine First Stage Pressure Transmitter Fails High.
- The crew responds with AOP-6C and/or AOP-24 to ensure resulting rod motion is not required and places rod control in manual.
- Using AOP-6C, crew restores  $T_{avg}$  using rods in manual.
- SRO addresses Technical Specifications for failure.

**Event 5: Steam Generator Tube Rupture**

- Once the PT-485 failure is addressed, 'A' SG has a tube rupture which ramps in over six minutes.
- Examinees recognize increased tube leak rate and determine that a trip is required.

**Event 6: Manual Reactor Trip buttons on 1C04 fail**

- Manual Reactor Trip buttons on 1C04 do not work and RO must trip the reactor from 1C03.
- RO also initiates manual SI and CI.
- Crew enters EOP-0 and completes immediate actions.
- BOP completes Attachment A of EOP-0.
- Transition is made to EOP-3, Steam Generator Tube Rupture

**Event 7: P-38B MDAFW Pump and 1P-29 TDAFW Pumps fail to auto start**

- P-38B MDAFW and 1P-29 TDAFW Pumps fails to auto start on either the LOFWTT or SI signal.
- BOP starts these pumps during Attachment A of EOP-0.

**NOTE: Table may be modified as needed to include all scenario time-line items**

**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): IC-162 Unit 1 <ul style="list-style-type: none"> <li>• Mode: 1</li> <li>• Burnup: 8010MWD/MT</li> <li>• Power: 100%</li> <li>• Boron: (CB): 756 ppm</li> <li>• Temperature: NOT</li> <li>• Pressure: NOP</li> <li>• Xenon: Equilibrium</li> <li>• Rods: Bank D @ 220 steps</li> <li>• Generator: ~530 Mwe</li> </ul>	(RO/BOP/SRO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		Place OOS tags on 1P-15A and W-3A. Place protected equipment tags on 1P-15B.
	2. Simulator Pre-brief in Classroom: <ul style="list-style-type: none"> <li>a. Simulator Differences List</li> <li>b. Crew Positions</li> </ul>		
	3. COMPLETE TURNOVER: <ul style="list-style-type: none"> <li>a. Review applicable current Unit Status</li> <li>b. Review relevant At-Power Risk status (Unit 1 is GREEN)</li> <li>c. Review current LCOs not met and Action Requirements</li> <li>d. Verify crew performs walk down of control boards and reviews turnover checklists.</li> <li>e. Crew takes the shift.</li> </ul>		

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EVENT 1: P-32A, 'A' SW Pump Trip (with degraded head capacity on running SW pumps.)</b> After crew assumes the watch, P-32A pump trips.</p> <p><b>Note: Preferred SW Header pressure is 50-65 psig per OI-70. Pressure should be controlled between 50-90 psig.</b></p> <p><b>Booth:</b> (When asked the P32 A SW pump motor is hot to the touch and the breaker is tripped on overcurrent)</p> <p><b>Booth:</b> If an AO is dispatched to look at the diesel low flow alarm, inform control room &lt;695 gpm (alarm setpoint) if alarm is in or &gt;695 if alarm is clear.</p> <p><b>Booth:</b> (When requested, insert LOA trigger to shut SW-10 and report valve shut)</p>	<p>BOP</p> <p>SRO</p> <p>RO/BOP</p> <p>SRO</p> <p>BOP</p> <p>SRO</p>	<p>Announces pump trip and refers to ARB C01 A 3-5 for Low Service Water Header Pressure. May recommend starting an additional SW pump.</p> <p>Acknowledges alarms/concurs with starting additional SW pump. Enters AOP-9A, Service Water Malfunction.</p> <p>Checks Forebay Level &gt; -11 Ft. (-7.3 ft) Checks Pumpbay Level &gt; -11Ft. (-7.1 ft) Checks Annunciator for Screen DP – Clear. Check SW Header Pressure Low Alarm – Clear.</p> <p>Note: Alarm is currently clear, but SRO and BOP should recognize that the alarm was the reason AOP was entered and enter RNO column to ensure proper actions are taken.</p> <p>Start additional SW pumps to maintain header pressure (likely already done). Place P-32A in Pullout IAW Step 4.d RNO. Direct AO to Shut SW-10, P-32A Discharge Valve.</p> <p>Proceed to Step 9. Notify DCS. Address TSACs. Request SM check Emergency Plan.</p>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Booth:</b> (Communicate that RK 31 and 32 have power available)</p> <p>NOTE: Alarm is now clear and crew should proceed to step 5</p> <p><b>Booth:</b> If asked to walk down the systems, report back nothing abnormal has been found.</p> <p>End of Event. Proceed to next event at Lead Examiner discretion</p>	<p>BOP</p> <p>SRO</p> <p>BOP</p> <p>Crew</p> <p>SRO</p>	<p>Check Supply Header Integrity – Satisfactory. Check Zurn Strainer Power and Alarms. Ensure SW header valves – Open. Check Component Alarms – Clear.</p> <p>Return to Step 1 of AOP-9A.</p> <p>Check Forebay Level. Check Pumpbay Level. Check Screen Alarm Clear. Check Header Alarm Clear. Check Zurn Strainers – Normal. Check Component Alarms – Clear. Check SW System – Intact.</p> <p>Return to Procedure in effect, exit AOP-9A.</p> <p>Addresses Tech Specs for failure. <b>TSAC 3.7.8.A for BOTH units with 1 SW pump inoperable.</b></p>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>EVENT 2: Steam Generator Tube Leak on 'A' SG</b>	RO	Announces Unit 1 A Steam Line Radiation High Alarm.
		BOP	Refers to ARB 1C20 C 1-2 for above alarm and RMSARB for 1RE-231 and addresses RMS server.
		SRO	Enters AOP-3, Steam Generator Tube Leak. Addresses Fold Out Page.
		RO	Check SI Not Required (Continuous Action <b>(CA)</b> ). -PZR level w/in 10% of Program. - Subcooling > 30°F.
			Check Rx Trip Not Required <b>(CA)</b> . -Rx Critical. -Chg aligned to VCT.
			Check PZR Level – Stable or trending to program <b>(CA)</b> . -Controls charging to maintain level.
		RO/BOP	Check PZR Pressure – Stable or trending to program Check Rx Makeup control – proper concentration, armed and in auto.
		SRO	Notify DCS, Chem and communicate E-plan need to SM.

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>'A' SG Tube Leak continued</p> <p><b>Note: The RO should determine the leak rate to be approximately 20-30 GPM.</b></p>	<p>Crew</p> <p>SRO</p> <p>SRO</p>	<p>Identify Leaking SG – uses High Main Steam Line alarm to identify 'A' SG as leaking.</p> <p>Determine Leak Rate – RO should be able to determine leak rate using charging/letdown balance. Otherwise, SRO requests performance of CAMP 014 from chemistry or OI-55 to determine rate.</p> <p>Addresses note regarding TS leakage requirement and recognizes violation of <b>TS 3.4.13</b>.</p> <p>Checks RX shutdown required – leakage clearly exceeds 75 GPD and requires a shutdown.</p> <p>Addresses caution regarding time clock and RMS alarm.</p> <p>Determines action based on step 10 of AOP-3. Leak is &gt; 75GPD and has risen more than 30 GPD over the last hour. Power to be reduced to &lt;50% in one hour and in MODE 3 in following 2 hours. <b>(CA)</b></p> <p>Enters AOP-17A, Rapid Power Reduction.</p>
	<b>Event 3: Rapid Power Reduction IAW AOP-17A</b>	SRO	Determines desired power level and ramp rate and announces to CR – SRO determines that unit must be <50% within one hour of receipt of High Radiation Alarm and that the unit is at 100% power.

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>Rapid power reduction continued</p> <p>Note: If excessive ramp rate is selected, crew will have difficulty maintaining VCT level and may manually trip due to Charging Pump swap over to RWST.</p>	<p>SRO</p> <p>RO</p> <p>BOP</p> <p>RO</p> <p>BOP</p> <p>RO</p> <p>BOP</p> <p>SRO</p> <p>BOP</p>	<p>SRO also determines that the unit needs to be taken off line and could direct BOP to set the endpoint at 0% on the turbine.</p> <p>Requests SM to notify PSS.</p> <p>Checks Rod control in Auto.</p> <p>Selects Rate Reduction method, likely Operator Auto – Impulse IN per the note prior to step 4.</p> <p>Commences boration, should refer to ROD 1.3 for power reduction boration and rod bank requirements <b>(CA)</b>.</p> <p>Check PZR Pressure – Stable or trending to program <b>(CA)</b>.</p> <p>Check PZR Level – Stable at or trending to program <b>(CA)</b>.</p> <p>Check SG levels – controlling in Auto <b>(CA)</b>.</p> <p>Maintain <math>T_{avg}</math> – Checks <math>T_{avg}</math> within limits <b>(CA)</b>.</p> <p>Check MFW Seal Water Pumps Running - Contacts U1 Turbine Operator to Start 1P-99A and B.</p> <p>Determines endpoint is MODE 3.</p> <p>May transfer auxiliary loads.</p>
	(Booth Operator: when requested, start 1P-99A and B by inserting LOA and report to BOP when started)		

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 4: 1PT-485, Turbine First Stage Pressure Transmitter fails High</b></p> <p>Once downpower ramp has been established and control rods have begun to move in, Lead Examiner will direct inserting PT-485 failure. Failure will cause rods to step OUT</p> <p><math>T_{ref}</math> is clipped at 570°F</p> <p>At some point after the initial failure the crew may trip the reactor rather than attempt to continue a rapid shutdown with Rods in Manual. If this occurs, increase 'A' SG tube leak to 9% over 6 minutes as soon as the trip is completed.</p>	<p>RO</p> <p>SRO</p> <p>Crew</p> <p>RO</p> <p>RO</p> <p>RO/SRO</p> <p>RO</p> <p>SRO</p>	<p>Identifies outward rod motion, recommends placing rod control in Manual and may suspend load ramp.</p> <p>Concurs with recommendation, directs placing rods in Manual and enters AOP-6C, Uncontrolled Rod Motion (preferred) (May also enter AOP-24).</p> <p>Check Rod Motion Required – determines that rod motion was opposite to that required for down power.</p> <p>Maintain RCS <math>T_{avg}</math> – checks <math>T_{avg}</math> within allowed band (CA).</p> <p>Check RCS <math>T_{avg}</math> at or Trending to <math>T_{ref}</math> – <math>T_{ref}</math> will need to be calculated by the RO. RO should determine that <math>T_{avg}</math> is higher than <math>T_{ref}</math> and needs to insert rods to restore <math>T_{avg}</math> to program.</p> <p>Check Control Rods – Above Minimum Insertion Limit. Determines rods are well above minimum insertion limit.</p> <p>Verify AFD within limit – Checks DFMOOB Clear. Alarm should be clear. This is a continuous action step which may come into play as rods are driven to stabilize <math>T_{avg}</math>.</p> <p>Check Rod Motion due to Instrument Malfunction.</p> <p>Go to AOP-24.</p>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 5: Steam Generator Tube Rupture</b> When entry into AOP-24 is made and on Lead Examiner's direction, increase Tube Leakage on 'A' SG to 9% over 6 minutes</p> <p><b>Event 6: Reactor Trip Manual Buttons on 1C04 fail to operate.</b></p> <p><b>CRITICAL TASK: Trip the reactor prior to Pressurizer level reaching 10%</b></p> <p>SG Tube Rupture Response continued</p>	<p>Crew</p> <p>RO</p> <p>SRO/RO</p>	<p>Recognizes increased leak rate and uses fold out page/continuous action guidance from AOP-3 to trip the reactor.</p> <p>Inserts Manual Trip. Buttons on 1C04 fail to operate. RO directs BOP to standby at 1B01 and 1B02 control switches and uses trip buttons on C01 to Trip the reactor, which is successful.</p> <p>RO inserts manual SI and CI also and carries out Immediate Actions of EOP-0.</p> <p>Verify Reactor Trip – RTBs open, bottom lights all lit, IRPIs on bottom, Flux lowering.</p> <p>Verify Turbine Trip – Turbine Stop Valves both shut:.</p> <ul style="list-style-type: none"> <li>-SL and SR lights lit OR.</li> <li>-Turbine Stop Valves Two Closed Alarm OR</li> <li>-Turbine Valves Bistable both lit.</li> </ul> <p>Verify Safeguards Buses – At least one 4160 and one 480 V Bus energized.</p> <ul style="list-style-type: none"> <li>- Checks voltage on buses and breaker configuration</li> </ul> <p>Check if SI is Actuated – should be performed manually.</p> <ul style="list-style-type: none"> <li>- SI and RHR pumps both running.</li> <li>- 'A' SI is tagged out. May reinitiate SI and CI.</li> </ul> <p>Verifies Immediate Action steps.</p>

Retention: Life of Plant

Retain in: Training Program File

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>SG Tube Rupture Response continued</p> <p><b>Event 7: P-38B, 'B' MDAFW pump and 1P-29, TDAFW pump fail to Auto Start.</b></p> <p>1P-29 may get a start signal depending on power and when the SI signal is generated. P-38B should have auto started on the SI. P-38B can be started per OM 3.7 after immediate actions or per the guidance in Attachment A. If the crew waits to start AFW per Attachment A, the attachment will have them start 1P-29 and P-38B.</p>	<p>Crew RO/BOP</p> <p>BOP</p> <p>RO</p>	<p>Addresses Fold Out Page.</p> <p>Isolates Feed Flow to 'A' SG if level is &gt;29%. P-38A PCV is taken to manual and shut and/or discharge valve to 'A' SG is taken to Manual and Shut. If 1P-29, TDAFW Pump is running, it may be stopped or isolation valve to 'A' SG taken to shut.</p> <p>Performs Attachment A (See Marked Up Attachment. All Conditions normal except for P-38B MDAFW Pump and 1P-29 TDAFW Pump have failed to start automatically). BOP starts 1P-29 and/or P-38B as conditions dictate.</p> <p>Verifies Secondary Heat Sink - &gt;29% in at least one SG. Adjusts AFW flow to 'B' SG as desired to maintain level. 'A' SG should be isolated per Fold Out Page and should not require feed.</p> <p>Verify RCP Seal Cooling – Lab seals on both RCPs should be &gt;20".</p> <p>Verify RCS Temp Control (CA) – RO should set 'A' ADV to match current SG pressure to ensure RCS temperature does not rise unacceptably. May lower AFW flow as needed after verifying &gt;29% in 'B' SG.</p> <p>Check PZR PORVs both shut.</p> <p>Check Normal spray valves both shut.</p> <p>Check Aux spray valve shut.</p>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	SG Tube Rupture Response continued	RO	Check if RCPs should remain running –
		SRO	Direct STA to monitor CSFSTs. Verify Containment Sump Recirc not required (CA) – RWST level should still be over 90%.
		RO	Check if Secondary System is intact – SG pressures should not be lowering uncontrollably.
			Check if SG tubes are intact – ‘A’ SG has indications of a rupture (high radiation, rising level).
			Request SM contact RP and Chemistry for Main Steam Line surveys and SG samples.
		SRO	Transition to EOP-3.

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-3 Actions for SGTR	SRO	Addresses Cautions regarding identification and isolation of ruptured SG, Chem Sampling and Fold Out Page.
		Crew	Reviews Fold Out Page – None of the items on the Fold Out Page should require action at this time.
		RO	Check if RCPs should remain running (CA) – RCPs may not be running.
		Crew	Identify Ruptured SG – identifies ‘A’ as ruptured.
		RO/BOP	Shut MSIV on ruptured SG – 1MS-2018 should already be shut.
		BOP	Reset Loss of FW Turbine Trip – depresses LOFWTT reset pushbutton and alarm reset buttons to clear LOFWTT alarm.
			Minimize Steam Dump from Ruptured SG: <ul style="list-style-type: none"> <li>- 1HC-468 in auto at 1050.</li> <li>- 1MS-2016, ‘A’ ADV shut.</li> <li>- Shuts 1MS-2020, TDAFW supply if open.</li> <li>- Determines that 1MS-234, MSIV bypass valve is shut under admin control.</li> </ul>

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SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-3 actions continued</p> <p>(Booth Operator: when directed by BOP, insert LOA to shut 1MS-235 and report both valves shut, 1MS-228 is not modeled on Simulator)</p> <p><b>CRITICAL TASK: Isolate feedwater flow into, and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.</b></p>	<p>BOP</p> <p>Crew</p> <p>BOP</p> <p>RO/SRO</p> <p>SRO</p> <p>BOP</p>	<p>Isolate flow from ruptured SG:</p> <ul style="list-style-type: none"> <li>- Shuts 1MS-5958 and 2042 if open.</li> <li>- Dispatches AO to shut 1MS-235 and 228 locally, should remind AO that the SG is ruptured and rad levels may be elevated.</li> </ul> <p>Check if Feed Flow to Ruptured SG should be stopped (CA) – level in ‘A’ SG should be &gt;29%, thus BOP will secure P-38A MDAPFW pump (in pullout) and shut AF-4023 and 1AF-4001 to secure feed from MDAPFW and TDAFWP. <b>Should recognize impact on Unit 2 and inform U2 operator of action. (TSAC 3.7.5.C).</b></p> <p>Verify Ruptured SG not needed for cooldown – checks ‘B’ SG available for cooldown and ‘A’ MSIV shut.</p> <p>Check ruptured SG pressure &gt;430 psig – should be well above 430 psig in ‘A’ SG.</p> <p>Determine Target Core Exit Temp:</p> <p>RO reports pressure in ruptured SG, expected to be near 1050, thus target temp should be 490°F.</p> <p>Addresses notes prior to step 11 concerning cooldown rate and RCP trip criteria.</p> <p>Cooldown RCS to Target Temperature – Since ‘B’ MSIV is shut, should open ‘B’ ADV fully in manual.</p>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-3 Steps continued	RO	Check PORVs and Block Valves – PORVs should be shut and block valves open with power.
			Check PZR safety valves – Shut.
		BOP	Stabilize intact SG level (CA) – direction to maintain SG level 29-65% during cooldown.
			Lock in SI Signal – manually actuates SI and CI and trips SI bistables in racks behind control boards.
		SRO	Addresses caution regarding loss of offsite power.
		BOP	Reset SI, CI and 1B-03 and 1B-04 Lockouts – performs resets on rear of C01 panel.
			Check 4160 Safeguards buses both energized from offsite – verifies buses energized from 1X04.
			Reestablish IA to Containment:
			-Starts second IA compressor on C01 Rear.
			-Checks IA pressure – should be 100 PSIG.
			-Opens IA-3047, listening for click of IA relay and sets timer for reminder to do the same for IA-3048.
		RO	Check if RHR pumps should be stopped – checks RCS pressure >425 psig and stops both RHR pumps and monitors RCS pressure (CA).

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-3 steps continued	RO	Verify Charging Flow – Aligns charging to RWST and establishes maximum charging.
		Crew	Check if RCS cooldown should be stopped – crew checks RCS temperature and stops cooldown when CETs < Target Temp. This step may be performed earlier if conditions are met.
		BOP	Shuts ‘B’ ADV to stop cooldown. Check ruptured SG pressure stable or trending higher – intention of step is to ensure DP can be maintained between SGs. SG pressure should be stable but may be lowering slightly due to cooldown.
		RO	Check RCS Subcooling > 35°F – should be substantial subcooling.
		SRO	Determine if the RCPs are running and proceed to depressurize RCS. SRO should quickly brief RO and BOP about intent of depressurization steps and criteria for stopping depressurization.
		RO	Opens sprays or PORV to depressurize RCS – Verifies sprays or PORV shut.

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-3 steps continued</p> <p><b>CRITICAL TASK: Terminate SI before a RED simulator Out Of Limits alarm reached (S/G full to MSIV) and control RCS pressure and make up flow so that primary and secondary inventory are stable before the end of the scenario.</b></p>	<p>Crew</p> <p>BOP RO</p> <p>Crew</p>	<p>Determines SI pump may be stopped:</p> <ul style="list-style-type: none"> <li>- Subcooling &gt; 35°F</li> <li>- Heat Sink available</li> <li>- RCS pressure trending higher</li> <li>- PZR level &gt; 10%</li> </ul> <p>Stops running ('B') SI pump ('A' is tagged out). Verifies charging flow and stabilizes PZR level. Verify SI flow not required – verifies Subcooling and PZR Level adequate. Checks Rx Makeup armed and in auto and VCT level &gt;17% - should realign RMW pump. Establishes Letdown by opening letdown isolations, setting HC-130 and opening one or two orifice isolations. Establishes charging from VCT. Determines action to take based on SG trend and PZR level to stop SG leakage.</p>
	Once Crew has control of SG leakage, scenario may be terminated per Lead Examiner's direction.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-0 Attachment A action             Booth: (Inform BOP that SW-LW-61 and 62 are shut when asked)	BOP	<p>Verify feedwater isolation:</p> <ul style="list-style-type: none"> <li>- Feedwater Regulating and Bypass Valves SHUT.</li> <li>- Both main feed pumps tripped.</li> <li>- MFP discharge MOVs - BOTH SHUT.</li> </ul> <p>Verify containment isolation:</p> <ul style="list-style-type: none"> <li>- CI Panels A and B ALL LIGHTS LIT.</li> <li>- RS-SA-9 SHUT.</li> <li>- No other valves open under administrative control (SM may be asked to verify this).</li> </ul> <p>Verify AFW Actuation:</p> <ul style="list-style-type: none"> <li>- Checks both motor driven AFW pumps running.</li> <li>- May start 1P-29 and P-38B if not previously done.</li> </ul> <p>Check both SI pumps running.</p> <ul style="list-style-type: none"> <li>- A is not running, but is isolated.</li> </ul> <p>Check both RHR pumps running.</p> <p>Check only one CCW pump running.</p> <p>Verify Service Water Alignment:</p> <ul style="list-style-type: none"> <li>- 6 service water pumps running. (P32A not running).</li> <li>- Service water isolation valves shut.</li> <li>- Direct AO to locally check SW-LW-61 or SW-LW-62 shut.</li> </ul>

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-0 Attachment A action	BOP	<p>Verify Containment Accident Cooling Units Running</p> <ul style="list-style-type: none"> <li>- All accident fans running.</li> <li>- 1SW-2907 &amp; 2908 OPEN.</li> <li>- Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.</li> </ul> <p>Check Control Room Ventilation IN ACCIDENT MODE:</p> <ul style="list-style-type: none"> <li>- At least one control room recirc fan RUNNING.</li> <li>- Control room damper solenoid valve PURPLE LIGHT LIT.</li> </ul> <p>Check if Main Steam Lines Can Remain Open, checks both MSIVs SHUT.</p> <p>Verify proper SI valve alignment:</p> <ul style="list-style-type: none"> <li>- Unit 1 SI active status panel ALL LIGHTS LIT.</li> <li>- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT.</li> </ul> <p>Verify containment spray not required: Containment Pressure remained &lt; 25 PSIG.</p> <p>Verify SI Flow:</p> <ul style="list-style-type: none"> <li>- RCS wide range pressure &lt;1400 psig.</li> <li>- Check SI pumps flow indicated.</li> <li>- RCS wide range pressure &lt; [425] 200 psig.</li> </ul> <p>This ends the steps of EOP-0 Attachment A.</p>

SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
Preload	PPL	OVR	OVR1PPL033	OFF	-	-	RX Trip A train buttons 1C04 fail
Preload	PPL	OVR	OVR1PPL034	OFF	-	-	RX Trip B train buttons 1C04 fail
Preload	SWS	PMP	PMP1SWS002C	85	-	-	P-32B SW Pump degraded head
Preload	SWS	PMP	PMP1SWS004C	85	-	-	P-32D SW Pump degraded head
Preload	SGN	VLV	VLV1SGN015	4 - Fail to auto open	-	-	1MS-2019 TDAFW STM supply fails to auto open
Preload	SGN	VLV	VLV1SGN016	4 - Fail to auto open	-	-	1MS-2020 TDAFW STM supply fails to auto open
Preload	AFW	BKR	BKR1AFW002	4 - Fail to auto close	-	-	P38B MDAFW Pump breaker fails to auto close
Preload	EPS	LOA	LOA1EPS102	Racked out	-	-	1P15A SI Pump breaker rack out
Preload	SIS	LOA	LOA1SIS017	OPEN	-	-	1SI-866 1P-15A SI Pump discharge MOV breaker*
Preload	SIS	VLV	VLV1SIS046	1-Fail CTL PWR Fuse	-	-	1SI-896 1P-15A SI Pump suction MOV*
Preload	CNM	BKR	BKR1CNM017	6-Fail CTL PWR Fuse	-	-	1W-3A CRDM Shroud fan bkr
1	SWS	BKR	BKR1SWS001	1 - TRIP	-	-	P32A SW Pump breaker trip

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
3	MSS	XMT	XMT1MSS008A	650	-	45 sec	PT-485 fails high
5	RCS	MAL	MAL1RCS008A	.5	-	60 sec	A SG tube rupture
16	SWS	LOA	LOA1SWS001	0	-	120 sec	P32A Pump discharge valve SW-10
17	CFW	LOA	LOA1CFW083	ON	-	-	1P-99A SGFP Seal Water Pump
17	CFW	LOA	LOA1CFW084	ON	60	-	1P-99B SGFP Seal Water Pump
18	SGN	LOA	LOA1SGN023	0	-	120 sec	1MS235 RW steam supply

- Ensure valve is closed prior to inserting this preload.

**Simulator Booth to track these values for monitoring critical task.**

**VSGNV1 (1) S/G A Volume**

**VSGNV1 (2) S/G B Volume**

**2600 YELLOW**

**2685 RED**

**2691 SOLID**

Historical Record:      Developed for the ILT 2007 NRC Exam.

### Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- |  |          |         |
|--|----------|---------|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools.  | Yes      | No<br>X |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes      | No<br>X |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.   | Yes<br>X | No      |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified.   | Yes<br>X | No      |
| 5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.  | Yes<br>X | No      |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.  | Yes<br>X | No      |
| 7. The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.  | Yes<br>X | No      |
| 8. The scenario includes related industry experience.  | Yes      | No<br>X |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.  | Yes      | No<br>X |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

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## Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- |  |          |    |
|--|----------|----|
| 1. The desired initial condition(s) could be achieved.   | Yes<br>X | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.  | Yes<br>X | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.  | Yes<br>X | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.  | Yes<br>X | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response.  | Yes<br>X | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes<br>X | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.   | Yes<br>X | No |

Discrepancies noted (Check "none" or list items found)

☒ None

SMAR = Simulator Action Request

SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

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Retention: Life of Plant

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Facility: **Point Beach**Scenario No.: **2**OP-Test No.: **2007301**Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Initial Conditions:** Unit 1 is at 47% power, performing OP-1C, Startup to Power Operation at Step 5.125. Unit 1 is at BOL with a boron Concentration of 1530 PPM. Unit 1 rod control is in Manual. Unit 2 is at 100% power.

**Turnover:** 1P-15A Safety Injection Pump is OOS. The oiler on the inboard pump bearing was damaged and a Maintenance crew is working the job to completion. TSAC 3.5.2.A was entered 6 hours ago and the pump is expected back for operability testing in about 3 hours. 1W-3A CRDM Shroud Fan is OOS due to motor bearing failure.

Today is Sunday, present clock time is real time. An RP Tech and Chemistry Tech are on-site. A crew of Maintenance personnel are working 1P-15A to completion.

The objective of the shift is to maintain stable plant conditions and raise Unit 1 to full load when requested.

Event No.	Malf. No.	Event Type*	Event Description
1		I - RO I - SRO TS -SRO	1LT-427, PZR Level Channel (White) Fails Low
2		R-RO N-BOP N-SRO	1W-3B CRDM Shroud Fan Trips/Rapid power reduction
3		C - RO C - SRO TS -SRO	Loop 'A' RTD Bypass Line Leak at 25 GPM
4		M - ALL	Small Break LOCA (500 GPM)
5		C - ALL	All Automatic and manual trips fail. (ATWS)
6		C - BOP	1P-15B Fails to Auto Start

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

	<h2>SIMULATOR EXERCISE GUIDE (SEG)</h2>
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SITE: POINT BEACH

SEG # PB-ILT-07N-002

SEG TITLE: 2007 NRC EXAM SCENARIO #2

REV. # 0  
DRAFT

PROGRAM: INITIAL LICENSE TRAINING

#: PB-ILT

COURSE:

#:

TOTAL TIME: 2.0 HOURS

Additional site-specific signatures may be added as desired.

Developed by:	<b>Russell Joplin</b> <i>Instructor</i>	<i>Date</i>
Reviewed by:	<b>Andrew Zommers</b> <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	<i>Date</i>
Validated by:	<i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	<i>Date</i>
Approved by:	<i>Training Supervision</i>	<i>Date</i>

### Guide Requirements

<b>Goal of Training:</b>	<b>To have the crew successfully respond to a PZR level failure, Shroud fan trip, plant downpower, SBLOCA with an ATWS. Embedded within these events is the expectation to properly utilize Technical Specifications.</b>
<b>Learning Objectives:</b>	None
<b>Prerequisites:</b>	<ol style="list-style-type: none"> <li>1. Simulator available</li> <li>2. Students enrolled in Initial License Program</li> </ol>
<b>Training Resources:</b>	<ol style="list-style-type: none"> <li>1. Floor Instructor as Shift Manager</li> <li>2. Floor Instructor as Shift Technical Advisor</li> <li>3. Simulator Booth Operator</li> <li>4. Communicator</li> <li>5. NRC Examiners</li> </ol>
<b>References:</b>	<ol style="list-style-type: none"> <li>1. AOP 1-D, Chemical and Volume Control System Malfunction</li> <li>2. AOP-24, Response to Instrument Malfunction</li> <li>3. 0-SOP-IC-001 White, Removal of Safeguards or Protection Sensor From Service – White Channels</li> <li>4. ARB 1C04 1C 2-9, Containment or Aux Bldg Vent System Air Flow Low</li> <li>5. AOP-17A, Rapid Power Reduction</li> <li>6. AOP-1A, Reactor Coolant Leak</li> <li>7. CSP-S.1, Response to Nuclear Power Generation/ATWS</li> <li>8. EOP-0, Reactor Trip or Safety Injection</li> <li>9. EOP-1, Loss of Reactor or Secondary Coolant</li> <li>10. CSP-C.2, Response to Degraded Core Cooling</li> <li>11. Technical Specifications</li> </ol>
<b>Commitments:</b>	None
<b>Evaluation Method:</b>	Simulator performance will be evaluated by NRC Examiners IAW NUREG 1021
<b>Operating Experience:</b>	None
<b>Related PRA Information:</b>	None

## QUANTITATIVE ATTRIBUTES

### **Malfunctions:**

#### *Before EOP Entry:*

1. 1LT-427, Pressurizer Level Channel (White) Fails Low
2. 1W-3B CRDM Shroud Fan Trips
3. Rapid Power Reduction
4. Loop 'A' RTD Bypass Line Leak

#### *After EOP Entry:*

1. ATWS
2. SB LOCA
3. 1P-15B, 'B' SI Pump Fails to Start

### **Abnormal Events:**

1. 1LT-427, Pressurizer Level Channel (White) Fails Low
2. RTD Bypass Line Leak
3. 1P-15B Fails to Start on SI

### **Major Transients:**

1. ATWS
2. SB LOCA on Loop 'A' RTD Bypass Line

### **Critical Tasks:**

1. E-0 – I: Manually start at least one SI pump prior to transition out of EOP-0.
2. FR-S.1—C: Insert negative reactivity into the core by at least one of the following methods before completing the immediate action steps of CSP-S.1:
  - De-energizing 1B-01 and 1B-02
  - Insert control rods

**SCENARIO OVERVIEW:****INITIAL CONDITIONS:**

1. This scenario can be run from the following Specific IC set:
  - IC-163
2. The following equipment is OOS:
  - 1P-15A, 'A' Safety Injection Pump (need relay and OOS tag on Control Board)
  - 1W-3A, 'A' CRDM Shroud Fan (need OOS tag on Control Board)

**SEQUENCE OF EVENTS:****Event 1: 1LT-427, PZR Level Channel Fails Low**

- After completion of crew turnover and examinees have assumed the watch, 1LT-427, PZR Level Channel Fails Low.
- Crew enters AOP-1D and determines 1LT-427 has failed and proceeds to Step 48 of AOP.
- RO takes action to minimize charging
- SRO refers to LCO 3.3.1, LCO 3.3.3, and LCO 3.4.9 if PZR exceeds parametric value.
- Crew should swap PZR controlling channel per ARB and restore Letdown and Charging to normal.

**Event 2: 1W-3B CRDM Shroud Fan Trips/Rapid Power Reduction**

- RO responds to annunciator 1C04 1C 2-9, Containment or Auxiliary Bldg Ventilation System Flow Low using ARB
- ARB directs rapid power reduction using AOP-17A, Rapid Power Reduction
- Crew coordinates to lower unit power at 1% per minute

**Event 3: Loop 'A' RTD Bypass Line Leak at 25 GPM (RCS Leak)**

- Once Chief Examiner determines that power reduction is sufficient, Loop 'A' RTD bypass line develops a 25 GPM leak and crew enters AOP-1A, Reactor Coolant Leak.
- Crew determines that neither SI nor Rx Trip is required and RO raises charging speed to maintain Pressurizer Level.
- Crew enters diagnostic phase of AOP-1A and begins to determine leak location. Crew will possibly isolate Letdown and Charging.

**Event 4: Small Break LOCA (Response to SBLOCA on next page)**

- Once these are isolated or at Chief Examiners discretion, raise RCS leak to 500 GPM over 10 minutes.

**Event 5: All Automatic and Manual Reactor Trips fail (ATWS)**

- Crew will determine that leak size has increased and PZR level can no longer be maintained. Crew will attempt to insert a manual trip.
- Trip breakers will remain shut and 1B02 will not deenergize, giving an ATWS.
- RO will ensure inward rod motion is being maintained and direct entry into CSP-S.1
- RO will direct the BOP to trip the Turbine while ensuring that inward rod motion is being maintained. Initially, the rod control system will be providing a higher rod speed than manual and RO may choose to allow the auto rod motion to continue while monitoring. Before auto rod motion stops, the RO will place Rod Control Selector Switch to Manual and continue to drive rods in.
- Crew will contact the AO and direct the opening of the Reactor Trip Breakers Locally. Two minutes after this call is received, the booth operator will delete the RTB malfunctions and open the Trip Breakers and communicate this to the Crew.
- During the time the RO is driving rods, the BOP will carry out CSP-S.1 steps to verify AFW, establish Boration, etc. Once RTBs are opened, crew will complete actions in CSP-S.1 and return to EOP-0, Step 1.

**Event 4 (Continued): Small Break LOCA Response**

- Following completion of CSP-S.1, Crew will return to Step 1 of EOP-0 and complete Immediate Actions and initiate SI, if not already completed. Crew will progress to Step 16 of EOP-0 and transition to EOP-1, Loss of Reactor or Secondary Coolant.
- Just before or sometime after the transition to EOP-1, Containment pressure will rise to 5 PSIG and subcooling will degrade to <80°F.
- Once these conditions occur, the STA will report that an ORANGE PATH entry condition exists for Core Cooling status tree and transition to CSP-C.2, Response to Degraded Core Cooling will be made.
- Crew will take action in CSP-C.2 through Step 14 and check RVLIS indications. Crew should recognize that Vessel Level is stable and continue to secure one RCP and verify SI Accumulator availability.
- Crew will then commence a cooldown using ADVs. Once cooldown is started, scenario will be terminated per Lead Examiner's direction.

**Event 6: 1P-15B Fails to Auto Start**

- Upon initiation of SI, 1P-15B, 'B' SI Pump fails to auto start
- BOP should recognize that 'B' SI pump failed to start and manually start the pump or start it during performance of CSP-S.1, Attachment A or EOP-0, Attachment A.

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**NOTE: Table may be modified as needed to include all scenario time-line items**

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): IC-163 from IC-4 Unit 1 <ul style="list-style-type: none"> <li>• Mode: 1</li> <li>• Burnup: BOL, raising power from initial SU</li> <li>• Power: 47%</li> <li>• Boron: (CB): 1530</li> <li>• Temperature: NOT</li> <li>• Pressure: NOP</li> <li>• Xenon: Equilibrium</li> <li>• Rods: Bank D @ 187 steps</li> <li>• Generator: ~240 MWe</li> </ul>	(RO/BOP/S RO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		Install OOS labels for 1P-15A and 1W-3A. Install protected equipment label for 1P-15B.
	2. Simulator Pre-brief in Classroom: <ol style="list-style-type: none"> <li>a. Simulator Differences List</li> <li>b. Crew Positions</li> </ol>		
	3. COMPLETE TURNOVER: <ol style="list-style-type: none"> <li>a. Review applicable current Unit Status</li> <li>b. Review relevant At-Power Risk status (Unit 1 is GREEN)</li> <li>c. Review current LCOs not met and Action Requirements</li> <li>d. Verify crew performs walk down of control boards and reviews turnover checklists.</li> <li>e. Crew takes the shift.</li> </ol>		

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EVENT 1: 1LT-427, PZR Level Transmitter Fails Low.</b> After crew assumes the watch, 1LT-427, PZR Level Transmitter Fails Low.</p> <p>LCO 3.4.9 addressed by the SRO if parametric value reached.</p> <p>If asked by the SRO, Shift Manager directs defeating the failed PZR level channel per the ARB and maintain charging in manual until PZR level is restored to program.</p>	<p>RO</p> <p>RO/BOP</p> <p>SRO</p> <p>SRO/RO</p> <p>SRO</p> <p>SRO/RO</p> <p>Crew</p>	<p>Acknowledges PZR High/Lo Level alarm and informs Crew. RO recognizes loss of Letdown and recommends going to minimum charging.</p> <p>RO/BOP address the ARB's for alarms associated with the PZR Level failure</p> <p>Directs entry into AOP-1D, CVCS Malfunction or AOP-24 Instrument Failure.</p> <p>Verifies no RCS leak in progress.</p> <p>Addresses notes prior to step 2 and determines 1LT-427 failure section of AOP should be performed. Continues to step 48.</p> <p>RO recognizes PZR Level exceeds parametric value of 48% and informs the SRO. (May occur depending on timing of actions)</p> <p>Crew should swap to different controlling PZR level per ARB 1C04 1C 1-3 Pressurizer Level High or Low</p> <p>Restore Letdown and Charging to normal per AOP-1D.</p>

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>1LT-427, PZR Level Transmitter Fails Low. (cont'd)</b></p> <p>LCO 3.3.1 and LCO 3.3.3 addressed by the SRO.</p> <p><b>SM should inform SRO that the 4<sup>th</sup> license will reference AOP-21.</b></p> <p>In order to save scenario time, the package for removing the channel from service will be prepared by the exam team before the scenario and will be provided to the Crew when they ask for it to be prepared.</p> <p>If asked by the SRO, Shift Manager directs maintaining charging in manual until PZR level is restored to program.</p> <p>Per Lead Examiner, once Letdown is restored with charging still in manual, proceed to next event.</p>	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO/SRO</p> <p>RO/BOP</p> <p>SRO</p> <p>SRO</p> <p>SRO</p> <p>BOP</p> <p>Crew</p> <p>BOP</p> <p>BOP</p>	<p>Crew may enter AOP-24 Response to Instrument Malfunction prior to swapping controlling channels.</p> <p>Identifies 1LT-427 PZR Level as failed instrument.</p> <p>Checks that instrument is controlling channel for PZR Level Program.</p> <p>Ensures that Charging is in manual and minimum.</p> <p>Return affected parameter to desired value – ensures that PZR level is returning to program value.</p> <p>References step regarding performance of AOP-21.</p> <p>Addresses caution regarding currently tripped bistables – this does not apply as no other bistables are tripped.</p> <p>Directs removal of failed instrument IAW 0-SOP-IC-001 WHITE.</p> <p>Place White PZR level to defeat</p> <p>Restore Charging to Automatic</p> <p>Trip PZR High Level trip bistable</p> <p>Remove channel from scan</p>

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>EVENT 2: Loss of 1W-3B, Running CRDM Shroud Fan trips / Rapid Power Reduction</b> f. Upon direction of Lead Examiner, insert trigger to trip 'B' CRDM Shroud Fan.  g. When sent to local breaker for shroud fan, report that the breaker has tripped. If requested to close breaker, report that breaker will not stay closed.  h. If Electrical Maintenance was contacted to look at the breaker, report back it will take several hours to troubleshoot the problem.	RO   BOP   SRO  SRO	Announce failure and refers to Alarm Response Book for Motor Breaker Trip and Containment or Aux Bldg Vent System Air Flow Low.  Inspects PAB/Containment ventilation control station on rear of 1C04 and determines only available CRDM shroud fan has tripped. May attempt restart with SRO concurrence. Should contact AO to look at local breaker for fan.  1W3-B control switch might be placed in pullout to clear control board alarms.  Using guidance in ARB 1C04 1C 2-9, directs rapid power reduction IAW AOP-17A.  Announces entry into AOP-17A, Rapid Power Reduction. Determines desired power level and ramp rate and announces to CR – SRO determines that unit be ramped at 1% per minute as directed by ARB.

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Rapid power reduction continued	SRO	SRO also determines that the unit needs to be taken off line and could direct BOP to set the endpoint at 0% on the turbine.
		SRO	Requests SM to notify PSS.
		RO	Places Rod control to Auto.
		Crew	Selects Rate Reduction method, likely Operator Auto – Impulse IN per the note prior to step 4.
		RO	Commences boration, should refer to ROD 1.3 for power reduction boration and rod bank requirements <u>Continuous Action Step (CA)</u> .
			Check PZR Pressure – Stable or trending to program (CA).
			Check PZR Level – Stable at or trending to program (CA).
			Check SG levels – controlling in Auto (CA).
			Maintain Tavg – Checks Tavg within limits (CA).
		BOP	Check MFW Seal Water Pumps Running – Running at beginning of scenario.
		RO	
		BOP	Determines endpoint is off-line.
		SRO	

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>Rapid Power Reduction continued</p> <p>Once Unit Auxiliaries are shifted and with concurrence of Lead Examiner, insert 25 GPM RCS leak.</p> <p>AO reports that local gland steam pressure is 4.0 PSIG</p> <p>AO reports OS-48 and 50 are shut, valves are not modeled on the simulator.</p>	SRO/ BOP	<p>Checks single feed train in operation – Already done due to plant conditions.</p> <p>Isolate SGBD if desired.</p> <p>Transfer Unit auxiliary loads to Station Aux Transformer – Should transfer auxiliaries as follows:</p> <ul style="list-style-type: none"> <li>- Close 1A-03 to 1A-01 Tie Breaker, 1A52-37</li> <li>- Open bus 1A-01 Normal Feed, 1A52-01</li> <li>- Close 1A-04 to 1A-02 Tie Breaker, 1A52-55</li> <li>- Open bus 1A-02 Normal Feed, 1A52-17</li> </ul> <p>Contact AO for local gland steam pressure.</p> <p>Contact AO to isolate OS-48 and 50 Crossover Steam Dump drain bottle isolations.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 3: Loop 'A' RTD Bypass Line Leak at 25 GPM</b> Once downpower ramp has been established and with concurrence of Lead Examiner, 25 GPM RCS leak on RTD bypass line develops</p> <p>Indications of an RCS leak would be 1RE-211/212 radiation monitors in alarm, rising containment humidity, Sump A rising, VCT level lowering and the automatic charging pump speeding up.</p> <p>SRO may address Technical Specifications at this time due to RCS leakage. If TS not addressed here, a scenario follow-up question will be needed. <b>LCO 3.4.13</b> is not met due to unidentified leakage exceeding 1 GPM.</p> <p>As the leak is unisolable, the Lead Examiner will direct when the team is prepared to make the leak larger and booth operator will increase the leak to 500 GPM over 10 minutes.</p> <p><b>Event 4: Small Break LOCA</b> (Event is initiated here, but the response will be done following ATWS response)</p>	<p>Crew</p> <p>SRO</p> <p>RO</p> <p>SRO</p> <p>SRO/RO</p> <p>Crew</p>	<p>Recognizes indications of leakage inside containment: Rising humidity, Sump 'A' alarm and RMS alarms.</p> <p>Enters AOP-1A, Reactor Coolant Leak.</p> <p>Check SI not required (CA): Adequate PZR Level and Subcooling. Check Rx Trip not required (CA): Charging Aligned to VCT. Check Pressurizer Level (CA): stable or trending to program, Adjusts Charging as needed to maintain PZR level and RCP Lab Seals. Check Pressurizer Pressure: Stable or trending to program. Check Rx Makeup Controls: Set for proper blend, armed and in auto.</p> <p>Request SM notify DCS and implement E-Plan. SRO may Address Tech Specs. Directs performance of steps 7 through 18. These steps include directions to isolate letdown and charging and various other leakage possibilities.</p> <p>Recognizes leak has grown and PZR level cannot be maintained and returns to step 1 to initiate Rx Trip and SI.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 5: All Auto and Manual Trips fail (ATWS)</b></p> <p><b>CRITICAL TASK: Insert Negative Reactivity into the core before completing Immediate Action Steps of CSP-S.1</b></p> <p>When contacted by crew to go to U1 Rod Drive Room, acknowledge request. After 2 minutes and with lead examiner concurrence, delete RTB malfunctions and open RTBs.</p>	<p>RO</p> <p>BOP</p> <p>RO</p> <p>Crew</p> <p>BOP</p> <p>SRO</p> <p>BOP</p>	<p>Attempts to trip reactor using 1C04 pushbuttons.</p> <p>Attempts to trip reactor using C01 pushbuttons.</p> <p>Directs BOP to deenergize B01 and B02.</p> <p>Deenergizes B01. B02 will not deenergize.</p> <p>Announces entry into CSP-S.1 and begins driving control rods in.</p> <p>Directs BOP to trip turbine manually.</p> <p>Announces ATWS and contacts AO to go to Unit 1 Rod Drive Room.</p> <p>Trips turbine manually, verifies turbine tripped.</p> <p>Addresses Fold Out Page.</p> <p>Verifies AFW actuation: checks both MDAFW pumps running, checks TDAFW pump running if SG levels &lt;25% [51%].</p> <p>Aligns Charging suction to RWST: Open 1CV-112B, Closes 1CV-112A.</p> <p>Establishes Emergency Boration: Establish Max Charging, Start BATP, Open 1CV-350, Emergency Borate Valve.</p> <p>Check SI Actuated: IF SI actuates during CSP-S.1, BOP will perform Attachment A.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	ATWS Continued	RO/BOP	Check PZR Pressure: <2335
		RO/BOP	Check RTBs open and Turbine Tripped: if AO has not yet been dispatched to Rod Drive Room, step will prompt crew to do so. Turbine should have been tripped at step 2.
	If contacted to locally verify dilution flowpaths, wait 2 minutes and report dilution flowpaths isolated.	Crew	RO/BOP should check dilution flowpaths in the Control Room and dispatch the PAB AO to check the others on the list.
		Crew	Checks RCS Cold Leg > 543°F. If Cold Leg Temp is < 543°F, will stop any steam dumping in progress.
		Crew	Crew should determine that an uncontrolled cooldown is not in progress and proceed to step 18.
		Crew	At Step 18, crew checks Core Exit TCs and determines they are well under 1200°F. Crew determines that the RTBs are now open and power is lowering as expected.
			Stops Boration since all rods are inserted.
		RO	Transitions back to Step 1 of EOP-0.
		SRO	

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 4: SBLOCA Response EOP 0</b></p> <p>When Containment Pressure exceeds 5 PSIG, the crew should announce Adverse Containment and used bracketed [ ] setpoints in EOP Performance.</p> <p>NOTE: Once Adverse conditions are reached and subcooling degrades to &lt;80°F, the STA will report an ORANGE Path for Core Cooling Status Tree. When this report is received by the SRO, <b>the crew will transition to CSP-C.2.</b> (See page 21 for CSP-C.2 actions) This will likely happen just before or some time after the transition to EOP-1.</p> <p><b>Event 6: 1P-15B, 'B' SI Pump fails to auto start</b></p> <p><b>Event 4: SBLOCA Response continued</b></p>	<p>RO/SRO</p> <p>BOP</p> <p>Crew</p> <p>BOP</p>	<p>Verifies Reactor Trip – RO reports that the Rx was not tripped due to failures but is now tripped. Crew should reenergize B-01 and may reenergize stripped MCCs. (1B-43 and 1B-11)</p> <p>Verify Turbine Trip – Turbine is tripped.</p> <p>Verify 4160 and 480 safeguards buses energized – All safeguards buses energized from off-site power.</p> <p>Check if SI is actuated – SI will likely not have actuated automatically in CSP-S.1. If not, the RO will actuate SI now based on Pressurizer Level &lt;10%.</p> <p>May note that 1P-15B had failed to start and start 'B' SI Pump.</p> <p>Addresses Fold Out Page: RCP trip criteria will likely not be met, if so, RO trips RCPs.</p> <p>Containment Pressure will likely not yet be &gt; 5PSIG, if so, adverse containment will be declared.</p> <p>Performs Attachment A. (See following section of this SEG for Att. A Actions).</p> <p>Verifies SG levels &gt; 29[51%] and controls AFW flow to maintain SG levels.</p>

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	SB LOCA Continued EOP 0	RO	Checks RCP Lab Seals > 20".
			Verifies RCS Temperature Control (CA):
			Controls ADVs in Automatic to stabilize RCS cold leg temps.
			Checks PORVs Shut.
			Checks Spray Valves – All Shut.
			Checks RCPs running – If running and subcooling <30[60], stops both RCPs after verifying SI pump delivering flow.
			Direct STA to monitor CSFSTs.
		SRO	Verify Sump Recirc not required (CA) – checks RWST level and RCS pressure. Determines sump recirc not required.
		RO	Checks Secondary System intact – No indication of faulted SG.
			Checks SG Tubes Intact – No CR indications of Tube leakage.
			Requests local steam line surveys and SG samples.
			Checks RCS intact inside containment – recognizes indications of RCS break inside containment.
		SRO	Announces transition to EOP-1.
		SRO/RO	
		SRO	
	<b>CRITICAL TASK: Manually start at least one SI pump prior to transition out of EOP-0 (This task should have been completed during performance of Att. A for EOP-0 or CSP-S.1)</b>		

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-1 for SBLOCA</p> <p>NOTE: Once Adverse conditions are reached and subcooling degrades to &lt;80°F, the STA will report an ORANGE Path for Core Cooling Status Tree. When this report is received by the SRO, <b>the crew will transition to CSP-C.2.</b> (See page 21 for CSP-C.2 actions) This will likely happen just before or some time after the transition to EOP-1. When this happens, the remaining actions of EOP-1 (or EOP-0) will not be performed.</p> <p>If contacted for local surveys, report normal background levels for steam lines.</p>	<p>Crew</p> <p>RO</p> <p>RO/BOP</p> <p>RO</p> <p>SRO</p> <p>BOP</p>	<p>Addresses Fold Out Page:</p> <ul style="list-style-type: none"> <li>- RCP trip criteria may be met if not previously tripped</li> </ul> <p>Check if RCPs should remain running – May be stopped already. Check Secondary System intact – Secondary is intact Stabilize SG Levels (<b>CA</b>) – Controls AFW to maintain SG levels and determines tubes are intact.</p> <p>Check Secondary Radiation normal – no indications of a tube leak/rupture.</p> <p>Check PORVs and Block Valves (<b>CA</b>) – PORVs Shut, Blocks Open. Addresses Caution regarding loss of offsite power following SI reset.</p> <p>Resets SI, CI and 1B03/1B04 non-safeguards lockouts Checks 4160 Safeguards Buses – both energized Reestablishes IA to Containment:</p> <ul style="list-style-type: none"> <li>- Starts second IA compressor</li> <li>- Checks IA pressure</li> <li>- Opens IA-3047 then waits ~3 minutes</li> <li>- Opens IA-3048</li> </ul>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-1 Steps continued	RO	Verifies Charging Flow – May establish max charging depending on pressurizer level.
		Crew	Evaluates whether SI can be terminated: <ul style="list-style-type: none"> <li>- SI flow will not be able to be terminated due to leak size with a single SI pump available.</li> <li>- Continues to Step 14.</li> </ul>
		BOP	Check if Containment Spray should be stopped – Containment Spray should not have actuated.
		RO/BOP	Check if RHR pumps should be stopped – checks RCS pressure > 425 PSIG and stable and stops both RHR pumps. (CA) Monitors RCS pressure.
		SRO	Determines Safeguards buses powered from offsite and requests EDGs be stopped.
	SM – When requested to stop EDGs, inform SRO that the 4 <sup>th</sup> license will be responsible for stopping EDGs	Crew	Initiate evaluation of plant status <ul style="list-style-type: none"> <li>- Checks one train available for sump recirc.</li> <li>- Checks CR radiation normal.</li> <li>- Requests Samples.</li> </ul>



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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	CSP-C.2 Actions	SRO	Addresses notes regarding RCPs and Foldout Page Foldout Page items for Sump Recirc and AFW Switchover will require no action. Crew will note that containment is Adverse. Verify Sump Recirc is not required – Not required by plant conditions
		Crew	
		BOP	Verify SI Valve Alignment – notes that ‘A’ SI train is out of service. Other ECCS systems aligned as expected. Verify SI Flow in Both Trains – As noted above, ‘A’ SI train is OOS. Should verify max. charging IAW RNO.
		Crew	Check RCS Wide Range Pressure < 425, will not be. Continue with step 4.
		RO	Resets SI, CI and 1B-03 and 1B-04 Non-Safeguards Equipment Lockouts.
		BOP	Check 4160 Safeguards buses energized from off-site Reestablish IA to containment <ul style="list-style-type: none"> <li>• Starts 2<sup>nd</sup> IA compressor</li> <li>• Checks IA pressure</li> <li>• Opens 1IA-3047, then after ~3 minutes, 1IA-3048</li> </ul>
		RO	Check RCS Vent Paths – Power available to PORVs, PORVs shut and Block valves open. Remaining valves are deenergized and shut.

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	CSP-C.2 Actions	SRO/RO	Check Both RCPs stopped – No, both are running, go to step 13.
		SRO RO	Addresses note regarding normal RCP conditions. Maintain Support Conditions for Running RCPs – ensures RCP parameters normal
		SRO/RO	Checks Vessel Level with table – since both RCPs are running and containment is adverse, must have >120 ft WR level, will not be met. Check Vessel Level Trend – Vessel level will be stable.
		RO	
	In the unlikely event that the crew determines that vessel level is rising, the crew will return to step 1 and repeat the steps already taken, then they will again arrive at this step. At some point, they will determine that level has stabilized and will continue to step 16	Crew	Proceeds to step 16 to Check RCPs – determines both are running. Stops one RCP.
		SRO/BOP	Checks Accumulators – Pressure is ~750 PSIG and accumulator outlet valves are open with no power.
	If crew wishes to energize 1SI-841A and B to check valve position, insert trigger 10 to power the valves.	SRO	Addresses note regarding faulted/ruptured SG
		BOP	Stabilize Intact SG Level – determines that SG levels are >51% and feed flow being controlled to maintain level. Addresses caution regarding CSP-P.1.
		SRO	
		BOP	Depressurized Both SGs to 200 PSIG, not to exceed 100°F/hr Cooldown Rate using ADVs.
	Once cooldown has been established, terminate scenario per Lead Examiner's direction.		

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-0 (CSP-S.1) Attachment A actions</p> <p>Where there is a difference in Att. A Actions, the CSP-S.1 Actions will be denoted by parentheses ( ).</p> <p><b>Event 6: 1P-15B, 'B' SI Pump fails to auto start</b></p> <p>When contacted regarding status of SW-LW-61/62, verify on Simulator that valves are shut and report same to BOP.</p>	BOP	<p>(Verify Safeguards Buses Energized).</p> <p>Verify feedwater isolation:</p> <ul style="list-style-type: none"> <li>- Feedwater Regulating and Bypass Valves SHUT.</li> <li>- Both main feed pumps tripped.</li> <li>- MFP discharge MOVs - BOTH SHUT.</li> </ul> <p>Verify containment isolation:</p> <ul style="list-style-type: none"> <li>- CI Panels A and B ALL LIGHTS LIT</li> <li>- RS-SA-9 SHUT.</li> <li>- No other valves open under administrative control (SM may be asked to verify this).</li> </ul> <p>Verify AFW Actuation:</p> <ul style="list-style-type: none"> <li>- Checks both motor driven AFW pumps running.</li> </ul> <p>Check both SI pumps running.</p> <ul style="list-style-type: none"> <li>- A is not running, but is isolated</li> <li>- (Manually actuates both trains of SI)</li> <li>- (Starts B SI Pump)</li> <li>- If B has not yet been started, starts B SI pump.</li> </ul> <p>Check both RHR pumps running.</p> <p>Check only one CCW pump running.</p> <p>Verify Service Water Alignment:</p> <ul style="list-style-type: none"> <li>- 6 service water pumps running.</li> <li>- Service water isolation valves shut.</li> <li>- Direct AO to locally check SW-LW-61 or SW-LW-62 shut.</li> </ul>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-0 Attachment A actions continued	BOP	<p>Verify Containment Accident Cooling Units Running</p> <ul style="list-style-type: none"> <li>- All accident fans running.</li> <li>- 1SW-2907 &amp; 2908 OPEN.</li> <li>- Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.</li> </ul> <p>Check Control Room Ventilation IN ACCIDENT MODE:</p> <ul style="list-style-type: none"> <li>- At least one control room recirc fan RUNNING</li> <li>- Control room damper solenoid valve PURPLE LIGHT LIT</li> </ul> <p>Check if Main Steam Lines Can Remain Open, checks both MSIVs SHUT, as appropriate.</p> <p>(Not contained in CSP-S.1 Attachment A) Verify proper SI valve alignment:</p> <ul style="list-style-type: none"> <li>- Unit 1 SI active status panel ALL LIGHTS LIT</li> <li>- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT</li> </ul> <p>Verify containment spray not required: Containment Pressure &lt; 25 PSIG</p> <p>Verify SI Flow:</p> <ul style="list-style-type: none"> <li>- RCS wide range pressure &lt;1400 psig</li> <li>- Check SI pumps flow indicated</li> <li>- RCS wide range pressure &lt; [425] 200 psig</li> </ul> <p>This ends the steps of EOP-0 Attachment A.</p>

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SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
Preload	EPS	LOA	LOA1EPS102	Racked out	-	-	1P15A SI Pump breaker rack out
Preload	SIS	LOA	LOA1SIS017	OPEN	-	-	1SI-866 1P-15A SI Pump discharge MOV breaker*
Preload	SIS	VLV	VLV1SIS046	1-Fail CTL PWR Fuse	-	-	1SI-896 1P-15A SI Pump suction MOV*
Preload	CNM	BKR	BKR1CNM017	6-Fail CTL PWR Fuse	-	-	1W-3A CRDM Shroud fan bkr
Preload	SIS	BKR	BKR1SIS002	4-Fail Auto Close	-	-	1P-15B SI Pump Fails to Auto Start
Preload	PPL	MAL	MAL1PPL001A	3-Fails to Open	-	-	‘A’ RTB Fails to Open
Preload	PPL	MAL	MAL1PPL001B	3-Fails to Open	-	-	‘B’ RTB Fails to Open
Preload	EPS	BKR	BKR1EPS003	5-Fails As Is	-	-	High Side Breaker to X-12 Fails Closed
Preload	EPS	BKR	BKR1EPS024	5-Fails As Is	-	-	1B02 Normal Feed Fails Closed
1	RCS	XMT	XMT1RCS008A	0	-	20 sec	1LT-427 PZR Level Fails Low

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SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
3	CNM	BKR	BKR1CNM018	1-Trip	15 sec	-	1W-3B CRDM Fan Trips
5	RCS	MAL	MAL1RCS003B	25 GPM	15 sec	20 sec	Loop A RTD Bypass Line Leak
10	SIS	LOA	LOA1SIS012	Close	15 sec	-	Bkr for 1SI-841A
10	SIS	LOA	LOA1SIS013	Close	2 min	-	Bkr for 1SI-841B

**\* Ensure valve is closed prior to inserting this preload.**

**PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft**

Historical Record: Developed for ILT 2007 NRC Exam.

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

**Simulator Scenario Development Checklist**

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- |  |          |         |
|--|----------|---------|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools.  | Yes      | No<br>X |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes      | No<br>X |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.   | Yes<br>X | No      |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified.   | Yes<br>X | No      |
| 5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.  | Yes<br>X | No      |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.  | Yes<br>X | No      |
| 7. The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.  | Yes<br>X | No      |
| 8. The scenario includes related industry experience.  | Yes      | No<br>X |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.  | Yes      | No<br>X |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- |  |          |    |
|--|----------|----|
| 1. The desired initial condition(s) could be achieved.   | Yes<br>X | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.  | Yes<br>X | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.  | Yes<br>X | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.  | Yes<br>X | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response.  | Yes<br>X | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes<br>X | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.   | Yes<br>X | No |

Discrepancies noted (Check "none" or list items found) ☒ None  
 SMAR = Simulator Action Request

SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

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Facility: **Point Beach**Scenario No.: **2a**OP-Test No.: **2007301**Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Initial Conditions:** Unit 1 is at 47% power, performing OP-1C, Startup to Power Operation at Step 5.125. Unit 1 is at BOL with a boron Concentration of 1530 PPM. Unit 1 rod control is in Manual. Unit 2 is at 100% power.

**Turnover:** 1P-15A Safety Injection Pump is OOS. The oiler on the inboard pump bearing was damaged and a Maintenance crew is working the job to completion. TSAC 3.5.2.A was entered 6 hours ago and the pump is expected back for operability testing in about 3 hours. 1W-3A CRDM Shroud Fan is OOS due to motor bearing failure.

Today is Sunday, present clock time is real time. An RP Tech and Chemistry Tech are on-site. A crew of Maintenance personnel are working 1P-15A to completion.

The objective of the shift is to maintain stable plant conditions and raise Unit 1 to full load when requested.

Event No.	Malf. No.	Event Type*	Event Description
1		I - RO I - SRO TS -SRO	1LT-427, PZR Level Channel (White) Fails Low
2		R-RO N-BOP N-SRO	1W-3B CRDM Shroud Fan Trips/Rapid power reduction
3		C - RO C - SRO TS -SRO	Loop 'A' RTD Bypass Line Leak at 25 GPM
4		M - ALL	Small Break LOCA (500 GPM)
5		C - ALL	All Automatic and manual trips fail. (ATWS)
6		C - BOP	1P-15B Fails to Auto Start

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

	<h2>SIMULATOR EXERCISE GUIDE (SEG)</h2>
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SITE: POINT BEACH

SEG # PB-ILT-07N-002

SEG TITLE: 2007 NRC EXAM SCENARIO #2

REV. # 0  
DRAFT

PROGRAM: INITIAL LICENSE TRAINING

#: PB-ILT

COURSE:

#:

TOTAL TIME: 2.0 HOURS

Additional site-specific signatures may be added as desired.

Developed by:	<b>Russell Joplin</b> <i>Instructor</i>	<i>Date</i>
Reviewed by:	<b>Andrew Zommers</b> <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	<i>Date</i>
Validated by:	<i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	<i>Date</i>
Approved by:	<i>Training Supervision</i>	<i>Date</i>

### Guide Requirements

<b>Goal of Training:</b>	<b>To have the crew successfully respond to a PZR level failure, Shroud fan trip, plant downpower, SBLOCA with an ATWS. Embedded within these events is the expectation to properly utilize Technical Specifications.</b>
<b>Learning Objectives:</b>	None
<b>Prerequisites:</b>	<ol style="list-style-type: none"> <li>1. Simulator available</li> <li>2. Students enrolled in Initial License Program</li> </ol>
<b>Training Resources:</b>	<ol style="list-style-type: none"> <li>1. Floor Instructor as Shift Manager</li> <li>2. Floor Instructor as Shift Technical Advisor</li> <li>3. Simulator Booth Operator</li> <li>4. Communicator</li> <li>5. NRC Examiners</li> </ol>
<b>References:</b>	<ol style="list-style-type: none"> <li>1. AOP 1-D, Chemical and Volume Control System Malfunction</li> <li>2. AOP-24, Response to Instrument Malfunction</li> <li>3. 0-SOP-IC-001 White, Removal of Safeguards or Protection Sensor From Service – White Channels</li> <li>4. ARB 1C04 1C 2-9, Containment or Aux Bldg Vent System Air Flow Low</li> <li>5. AOP-17A, Rapid Power Reduction</li> <li>6. AOP-1A, Reactor Coolant Leak</li> <li>7. CSP-S.1, Response to Nuclear Power Generation/ATWS</li> <li>8. EOP-0, Reactor Trip or Safety Injection</li> <li>9. EOP-1, Loss of Reactor or Secondary Coolant</li> <li>10. CSP-C.2, Response to Degraded Core Cooling</li> <li>11. Technical Specifications</li> </ol>
<b>Commitments:</b>	None
<b>Evaluation Method:</b>	Simulator performance will be evaluated by NRC Examiners IAW NUREG 1021
<b>Operating Experience:</b>	None
<b>Related PRA Information:</b>	None

## QUANTITATIVE ATTRIBUTES

### **Malfunctions:**

#### *Before EOP Entry:*

1. 1LT-427, Pressurizer Level Channel (White) Fails Low
2. 1W-3B CRDM Shroud Fan Trips
3. Rapid Power Reduction
4. Loop 'A' RTD Bypass Line Leak

#### *After EOP Entry:*

1. ATWS
2. SB LOCA
3. 1P-15B, 'B' SI Pump Fails to Start

### **Abnormal Events:**

1. 1LT-427, Pressurizer Level Channel (White) Fails Low
2. RTD Bypass Line Leak
3. 1P-15B Fails to Start on SI

### **Major Transients:**

1. ATWS
2. SB LOCA on Loop 'A' RTD Bypass Line

### **Critical Tasks:**

1. E-0 – I: Manually start at least one SI pump prior to transition out of EOP-0.
2. FR-S.1—C: Insert negative reactivity into the core by at least one of the following methods before completing the immediate action steps of CSP-S.1:
  - De-energizing 1B-01 and 1B-02
  - Insert control rods

**SCENARIO OVERVIEW:****INITIAL CONDITIONS:**

1. This scenario can be run from the following Specific IC set:
  - IC-163
2. The following equipment is OOS:
  - 1P-15A, 'A' Safety Injection Pump (need relay and OOS tag on Control Board)
  - 1W-3A, 'A' CRDM Shroud Fan (need OOS tag on Control Board)

**SEQUENCE OF EVENTS:****Event 1: 1LT-427, PZR Level Channel Fails Low**

- After completion of crew turnover and examinees have assumed the watch, 1LT-427, PZR Level Channel Fails Low.
- Crew enters AOP-1D and determines 1LT-427 has failed and proceeds to Step 48 of AOP.
- RO takes action to minimize charging
- SRO refers to LCO 3.3.1, LCO 3.3.3, and LCO 3.4.9 if PZR exceeds parametric value.
- Crew should swap PZR controlling channel per ARB and restore Letdown and Charging to normal.

**Event 2: 1W-3B CRDM Shroud Fan Trips/Rapid Power Reduction**

- RO responds to annunciator 1C04 1C 2-9, Containment or Auxiliary Bldg Ventilation System Flow Low using ARB
- ARB directs rapid power reduction using AOP-17A, Rapid Power Reduction
- Crew coordinates to lower unit power at 1% per minute

**Event 3: Loop 'A' RTD Bypass Line Leak at 25 GPM (RCS Leak)**

- Once Chief Examiner determines that power reduction is sufficient, Loop 'A' RTD bypass line develops a 25 GPM leak and crew enters AOP-1A, Reactor Coolant Leak.
- Crew determines that neither SI nor Rx Trip is required and RO raises charging speed to maintain Pressurizer Level.
- Crew enters diagnostic phase of AOP-1A and begins to determine leak location. Crew will possibly isolate Letdown and Charging.

**Event 4: Small Break LOCA (Response to SBLOCA on next page)**

- Once these are isolated or at Chief Examiners discretion, raise RCS leak to 500 GPM over 10 minutes.

**Event 5: All Automatic and Manual Reactor Trips fail (ATWS)**

- Crew will determine that leak size has increased and PZR level can no longer be maintained. Crew will attempt to insert a manual trip.
- Trip breakers will remain shut and 1B02 will not deenergize, giving an ATWS.
- RO will ensure inward rod motion is being maintained and direct entry into CSP-S.1
- RO will direct the BOP to trip the Turbine while ensuring that inward rod motion is being maintained. Initially, the rod control system will be providing a higher rod speed than manual and RO may choose to allow the auto rod motion to continue while monitoring. Before auto rod motion stops, the RO will place Rod Control Selector Switch to Manual and continue to drive rods in.
- Crew will contact the AO and direct the opening of the Reactor Trip Breakers Locally. Two minutes after this call is received, the booth operator will delete the RTB malfunctions and open the Trip Breakers and communicate this to the Crew.
- During the time the RO is driving rods, the BOP will carry out CSP-S.1 steps to verify AFW, establish Boration, etc. Once RTBs are opened, crew will complete actions in CSP-S.1 and return to EOP-0, Step 1.

**Event 4 (Continued): Small Break LOCA Response**

- Following completion of CSP-S.1, Crew will return to Step 1 of EOP-0 and complete Immediate Actions and initiate SI, if not already completed. Crew will progress to Step 16 of EOP-0 and transition to EOP-1, Loss of Reactor or Secondary Coolant.
- Just before or sometime after the transition to EOP-1, Containment pressure will rise to 5 PSIG and subcooling will degrade to <80°F.
- Once these conditions occur, the STA will report that an ORANGE PATH entry condition exists for Core Cooling status tree and transition to CSP-C.2, Response to Degraded Core Cooling will be made.
- Crew will take action in CSP-C.2 through Step 14 and check RVLIS indications. Crew should recognize that Vessel Level is stable and continue to secure one RCP and verify SI Accumulator availability.
- Crew will then commence a cooldown using ADVs. Once cooldown is started, scenario will be terminated per Lead Examiner's direction.

**Event 6: 1P-15B Fails to Auto Start**

- Upon initiation of SI, 1P-15B, 'B' SI Pump fails to auto start
- BOP should recognize that 'B' SI pump failed to start and manually start the pump or start it during performance of CSP-S.1, Attachment A or EOP-0, Attachment A.

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NOTE: Table may be modified as needed to include all scenario time-line items

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): IC-163 from IC-4 Unit 1 <ul style="list-style-type: none"> <li>• Mode: 1</li> <li>• Burnup: BOL, raising power from initial SU</li> <li>• Power: 47%</li> <li>• Boron: (CB): 1530</li> <li>• Temperature: NOT</li> <li>• Pressure: NOP</li> <li>• Xenon: Equilibrium</li> <li>• Rods: Bank D @ 187 steps</li> <li>• Generator: ~240 MWe</li> </ul>	(RO/BOP/S RO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		Install OOS labels for 1P-15A and 1W-3A. Install protected equipment label for 1P-15B.
	2. Simulator Pre-brief in Classroom: <ol style="list-style-type: none"> <li>Simulator Differences List</li> <li>Crew Positions</li> </ol>		
	3. COMPLETE TURNOVER: <ol style="list-style-type: none"> <li>Review applicable current Unit Status</li> <li>Review relevant At-Power Risk status (Unit 1 is GREEN)</li> <li>Review current LCOs not met and Action Requirements</li> <li>Verify crew performs walk down of control boards and reviews turnover checklists.</li> <li>Crew takes the shift.</li> </ol>		

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EVENT 1: 1LT-427, PZR Level Transmitter Fails Low.</b> After crew assumes the watch, 1LT-427, PZR Level Transmitter Fails Low.</p> <p>LCO 3.4.9 addressed by the SRO if parametric value reached.</p> <p>If asked by the SRO, Shift Manager directs defeating the failed PZR level channel per the ARB and maintain charging in manual until PZR level is restored to program.</p>	<p>RO</p> <p>RO/BOP</p> <p>SRO</p> <p>SRO/RO</p> <p>SRO</p> <p>SRO/RO</p> <p>Crew</p>	<p>Acknowledges PZR High/Lo Level alarm and informs Crew. RO recognizes loss of Letdown and recommends going to minimum charging.</p> <p>RO/BOP address the ARB's for alarms associated with the PZR Level failure</p> <p>Directs entry into AOP-1D, CVCS Malfunction or AOP-24 Instrument Failure.</p> <p>Verifies no RCS leak in progress.</p> <p>Addresses notes prior to step 2 and determines 1LT-427 failure section of AOP should be performed. Continues to step 48.</p> <p>RO recognizes PZR Level exceeds parametric value of 48% and informs the SRO. (May occur depending on timing of actions)</p> <p>Crew should swap to different controlling PZR level per ARB 1C04 1C 1-3 Pressurizer Level High or Low</p> <p>Restore Letdown and Charging to normal per AOP-1D.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>1LT-427, PZR Level Transmitter Fails Low. (cont'd)</b></p> <p>LCO 3.3.1 and LCO 3.3.3 addressed by the SRO.</p> <p><b>SM should inform SRO that the 4<sup>th</sup> license will reference AOP-21.</b></p> <p>In order to save scenario time, the package for removing the channel from service will be prepared by the exam team before the scenario and will be provided to the Crew when they ask for it to be prepared.</p> <p>If asked by the SRO, Shift Manager directs maintaining charging in manual until PZR level is restored to program.</p> <p>Per Lead Examiner, once Letdown is restored with charging still in manual, proceed to next event.</p>	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO/SRO</p> <p>RO/BOP</p> <p>SRO</p> <p>SRO</p> <p>SRO</p> <p>BOP</p> <p>Crew</p> <p>BOP</p> <p>BOP</p>	<p>Crew may enter AOP-24 Response to Instrument Malfunction prior to swapping controlling channels.</p> <p>Identifies 1LT-427 PZR Level as failed instrument.</p> <p>Checks that instrument is controlling channel for PZR Level Program.</p> <p>Ensures that Charging is in manual and minimum.</p> <p>Return affected parameter to desired value – ensures that PZR level is returning to program value.</p> <p>References step regarding performance of AOP-21.</p> <p>Addresses caution regarding currently tripped bistables – this does not apply as no other bistables are tripped.</p> <p>Directs removal of failed instrument IAW 0-SOP-IC-001 WHITE.</p> <p>Place White PZR level to defeat</p> <p>Restore Charging to Automatic</p> <p>Trip PZR High Level trip bistable</p> <p>Remove channel from scan</p>

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>EVENT 2: Loss of 1W-3B, Running CRDM Shroud Fan trips / Rapid Power Reduction</b> f. Upon direction of Lead Examiner, insert trigger to trip 'B' CRDM Shroud Fan.  g. When sent to local breaker for shroud fan, report that the breaker has tripped. If requested to close breaker, report that breaker will not stay closed.  h. If Electrical Maintenance was contacted to look at the breaker, report back it will take several hours to troubleshoot the problem.	RO   BOP   SRO  SRO	Announce failure and refers to Alarm Response Book for Motor Breaker Trip and Containment or Aux Bldg Vent System Air Flow Low.  Inspects PAB/Containment ventilation control station on rear of 1C04 and determines only available CRDM shroud fan has tripped. May attempt restart with SRO concurrence. Should contact AO to look at local breaker for fan.  1W3-B control switch might be placed in pullout to clear control board alarms.  Using guidance in ARB 1C04 1C 2-9, directs rapid power reduction IAW AOP-17A.  Announces entry into AOP-17A, Rapid Power Reduction. Determines desired power level and ramp rate and announces to CR – SRO determines that unit be ramped at 1% per minute as directed by ARB.

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Rapid power reduction continued	SRO	SRO also determines that the unit needs to be taken off line and could direct BOP to set the endpoint at 0% on the turbine.
		SRO	Requests SM to notify PSS.
		RO	Places Rod control to Auto.
		Crew	Selects Rate Reduction method, likely Operator Auto – Impulse IN per the note prior to step 4.
		RO	Commences boration, should refer to ROD 1.3 for power reduction boration and rod bank requirements <u>Continuous Action Step (CA)</u> .
			Check PZR Pressure – Stable or trending to program (CA).
			Check PZR Level – Stable at or trending to program (CA).
			Check SG levels – controlling in Auto (CA).
			Maintain Tavg – Checks Tavg within limits (CA).
		BOP	Check MFW Seal Water Pumps Running – Running at beginning of scenario.
		RO	
		BOP	Determines endpoint is off-line.
		SRO	

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>Rapid Power Reduction continued</p> <p>Once Unit Auxiliaries are shifted and with concurrence of Lead Examiner, insert 25 GPM RCS leak.</p> <p>AO reports that local gland steam pressure is 4.0 PSIG</p> <p>AO reports OS-48 and 50 are shut, valves are not modeled on the simulator.</p>	SRO/ BOP	<p>Checks single feed train in operation – Already done due to plant conditions.</p> <p>Isolate SGBD if desired.</p> <p>Transfer Unit auxiliary loads to Station Aux Transformer – Should transfer auxiliaries as follows:</p> <ul style="list-style-type: none"> <li>- Close 1A-03 to 1A-01 Tie Breaker, 1A52-37</li> <li>- Open bus 1A-01 Normal Feed, 1A52-01</li> <li>- Close 1A-04 to 1A-02 Tie Breaker, 1A52-55</li> <li>- Open bus 1A-02 Normal Feed, 1A52-17</li> </ul> <p>Contact AO for local gland steam pressure.</p> <p>Contact AO to isolate OS-48 and 50 Crossover Steam Dump drain bottle isolations.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 3: Loop 'A' RTD Bypass Line Leak at 25 GPM</b> Once downpower ramp has been established and with concurrence of Lead Examiner, 25 GPM RCS leak on RTD bypass line develops</p> <p>Indications of an RCS leak would be 1RE-211/212 radiation monitors in alarm, rising containment humidity, Sump A rising, VCT level lowering and the automatic charging pump speeding up.</p> <p>SRO may address Technical Specifications at this time due to RCS leakage. If TS not addressed here, a scenario follow-up question will be needed. <b>LCO 3.4.13</b> is not met due to unidentified leakage exceeding 1 GPM.</p> <p>As the leak is unisolable, the Lead Examiner will direct when the team is prepared to make the leak larger and booth operator will increase the leak to 500 GPM over 10 minutes.</p> <p><b>Event 4: Small Break LOCA</b> (Event is initiated here, but the response will be done following ATWS response)</p>	<p>Crew</p> <p>SRO</p> <p>RO</p> <p>SRO</p> <p>SRO/RO</p> <p>Crew</p>	<p>Recognizes indications of leakage inside containment: Rising humidity, Sump 'A' alarm and RMS alarms.</p> <p>Enters AOP-1A, Reactor Coolant Leak.</p> <p>Check SI not required (<b>CA</b>): Adequate PZR Level and Subcooling. Check Rx Trip not required (<b>CA</b>): Charging Aligned to VCT. Check Pressurizer Level (<b>CA</b>): stable or trending to program, Adjusts Charging as needed to maintain PZR level and RCP Lab Seals. Check Pressurizer Pressure: Stable or trending to program. Check Rx Makeup Controls: Set for proper blend, armed and in auto.</p> <p>Request SM notify DCS and implement E-Plan. SRO may Address Tech Specs. Directs performance of steps 7 through 18. These steps include directions to isolate letdown and charging and various other leakage possibilities.</p> <p>Recognizes leak has grown and PZR level cannot be maintained and returns to step 1 to initiate Rx Trip and SI.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 5: All Auto and Manual Trips fail (ATWS)</b></p> <p><b>CRITICAL TASK: Insert Negative Reactivity into the core before completing Immediate Action Steps of CSP-S.1</b></p> <p>When contacted by crew to go to U1 Rod Drive Room, acknowledge request. After 2 minutes and with lead examiner concurrence, delete RTB malfunctions and open RTBs.</p>	<p>RO</p> <p>BOP</p> <p>RO</p> <p>Crew</p> <p>BOP</p> <p>SRO</p> <p>BOP</p>	<p>Attempts to trip reactor using 1C04 pushbuttons.</p> <p>Attempts to trip reactor using C01 pushbuttons.</p> <p>Directs BOP to deenergize B01 and B02.</p> <p>Deenergizes B01. B02 will not deenergize.</p> <p>Announces entry into CSP-S.1 and begins driving control rods in.</p> <p>Directs BOP to trip turbine manually.</p> <p>Announces ATWS and contacts AO to go to Unit 1 Rod Drive Room.</p> <p>Trips turbine manually, verifies turbine tripped.</p> <p>Addresses Fold Out Page.</p> <p>Verifies AFW actuation: checks both MDAFW pumps running, checks TDAFW pump running if SG levels &lt;25% [51%].</p> <p>Aligns Charging suction to RWST: Open 1CV-112B, Closes 1CV-112A.</p> <p>Establishes Emergency Boration: Establish Max Charging, Start BATP, Open 1CV-350, Emergency Borate Valve.</p> <p>Check SI Actuated: IF SI actuates during CSP-S.1, BOP will perform Attachment A.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	ATWS Continued	RO/BOP	Check PZR Pressure: <2335
		RO/BOP	Check RTBs open and Turbine Tripped: if AO has not yet been dispatched to Rod Drive Room, step will prompt crew to do so. Turbine should have been tripped at step 2.
	If contacted to locally verify dilution flowpaths, wait 2 minutes and report dilution flowpaths isolated.	Crew	RO/BOP should check dilution flowpaths in the Control Room and dispatch the PAB AO to check the others on the list.
		Crew	Checks RCS Cold Leg > 543°F. If Cold Leg Temp is < 543°F, will stop any steam dumping in progress.
		Crew	Crew should determine that an uncontrolled cooldown is not in progress and proceed to step 18.
		Crew	At Step 18, crew checks Core Exit TCs and determines they are well under 1200°F. Crew determines that the RTBs are now open and power is lowering as expected.
			Stops Boration since all rods are inserted.
		RO	Transitions back to Step 1 of EOP-0.
		SRO	

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 4: SBLOCA Response EOP 0</b></p> <p>When Containment Pressure exceeds 5 PSIG, the crew should announce Adverse Containment and used bracketed [ ] setpoints in EOP Performance.</p> <p>NOTE: Once Adverse conditions are reached and subcooling degrades to &lt;80°F, the STA will report an ORANGE Path for Core Cooling Status Tree. When this report is received by the SRO, <b>the crew will transition to CSP-C.2.</b> (See page 21 for CSP-C.2 actions) This will likely happen just before or some time after the transition to EOP-1.</p> <p><b>Event 6: 1P-15B, 'B' SI Pump fails to auto start</b></p> <p><b>Event 4: SBLOCA Response continued</b></p>	<p>RO/SRO</p> <p>BOP</p> <p>Crew</p> <p>BOP</p>	<p>Verifies Reactor Trip – RO reports that the Rx was not tripped due to failures but is now tripped. Crew should reenergize B-01 and may reenergize stripped MCCs. (1B-43 and 1B-11)</p> <p>Verify Turbine Trip – Turbine is tripped.</p> <p>Verify 4160 and 480 safeguards buses energized – All safeguards buses energized from off-site power.</p> <p>Check if SI is actuated – SI will likely not have actuated automatically in CSP-S.1. If not, the RO will actuate SI now based on Pressurizer Level &lt;10%.</p> <p>May note that 1P-15B had failed to start and start 'B' SI Pump.</p> <p>Addresses Fold Out Page: RCP trip criteria will likely not be met, if so, RO trips RCPs.</p> <p>Containment Pressure will likely not yet be &gt; 5PSIG, if so, adverse containment will be declared.</p> <p>Performs Attachment A. (See following section of this SEG for Att. A Actions).</p> <p>Verifies SG levels &gt; 29[51%] and controls AFW flow to maintain SG levels.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	SB LOCA Continued EOP 0	RO	Checks RCP Lab Seals > 20". Verifies RCS Temperature Control (CA): Controls ADVs in Automatic to stabilize RCS cold leg temps. Checks PORVs Shut. Checks Spray Valves – All Shut. Checks RCPs running – If running and subcooling <30[60], stops both RCPs after verifying SI pump delivering flow. Direct STA to monitor CSFSTs.
	<b>CRITICAL TASK: Manually start at least one SI pump prior to transition out of EOP-0 (This task should have been completed during performance of Att. A for EOP-0 or CSP-S.1)</b>	SRO RO	Verify Sump Recirc not required (CA) – checks RWST level and RCS pressure. Determines sump recirc not required. Checks Secondary System intact – No indication of faulted SG. Checks SG Tubes Intact – No CR indications of Tube leakage. Requests local steam line surveys and SG samples. Checks RCS intact inside containment – recognizes indications of RCS break inside containment.
		SRO	Announces transition to EOP-1.
		SRO/RO	
		SRO	

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-1 for SBLOCA</p> <p>NOTE: Once Adverse conditions are reached and subcooling degrades to &lt;80°F, the STA will report an ORANGE Path for Core Cooling Status Tree. When this report is received by the SRO, <b>the crew will transition to CSP-C.2.</b> (See page 21 for CSP-C.2 actions) This will likely happen just before or some time after the transition to EOP-1. When this happens, the remaining actions of EOP-1 (or EOP-0) will not be performed.</p> <p>If contacted for local surveys, report normal background levels for steam lines.</p>	<p>Crew</p> <p>RO</p> <p>RO/BOP</p> <p>RO</p> <p>SRO</p> <p>BOP</p>	<p>Addresses Fold Out Page:</p> <ul style="list-style-type: none"> <li>- RCP trip criteria may be met if not previously tripped</li> </ul> <p>Check if RCPs should remain running – May be stopped already. Check Secondary System intact – Secondary is intact Stabilize SG Levels (<b>CA</b>) – Controls AFW to maintain SG levels and determines tubes are intact.</p> <p>Check Secondary Radiation normal – no indications of a tube leak/rupture.</p> <p>Check PORVs and Block Valves (<b>CA</b>) – PORVs Shut, Blocks Open. Addresses Caution regarding loss of offsite power following SI reset.</p> <p>Resets SI, CI and 1B03/1B04 non-safeguards lockouts Checks 4160 Safeguards Buses – both energized Reestablishes IA to Containment:</p> <ul style="list-style-type: none"> <li>- Starts second IA compressor</li> <li>- Checks IA pressure</li> <li>- Opens IA-3047 then waits ~3 minutes</li> <li>- Opens IA-3048</li> </ul>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-1 Steps continued	RO	Verifies Charging Flow – May establish max charging depending on pressurizer level.
		Crew	Evaluates whether SI can be terminated: <ul style="list-style-type: none"> <li>- SI flow will not be able to be terminated due to leak size with a single SI pump available.</li> <li>- Continues to Step 14.</li> </ul>
		BOP	Check if Containment Spray should be stopped – Containment Spray should not have actuated.
		RO/BOP	Check if RHR pumps should be stopped – checks RCS pressure > 425 PSIG and stable and stops both RHR pumps. (CA) Monitors RCS pressure.
		SRO	Determines Safeguards buses powered from offsite and requests EDGs be stopped.
	SM – When requested to stop EDGs, inform SRO that the 4 <sup>th</sup> license will be responsible for stopping EDGs	Crew	Initiate evaluation of plant status <ul style="list-style-type: none"> <li>- Checks one train available for sump recirc.</li> <li>- Checks CR radiation normal.</li> <li>- Requests Samples.</li> </ul>



## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	CSP-C.2 Actions  (ENDED SCENARIO per Lead Examiner after crew entered CSP-C.2)	SRO	Addresses notes regarding RCPs and Foldout Page Foldout Page items for Sump Recirc and AFW Switchover will require no action. Crew will note that containment is Adverse. Verify Sump Recirc is not required – Not required by plant conditions
		Crew	
		BOP	Verify SI Valve Alignment – notes that ‘A’ SI train is out of service. Other ECCS systems aligned as expected. Verify SI Flow in Both Trains – As noted above, ‘A’ SI train is OOS. Should verify max. charging IAW RNO.
		Crew	Check RCS Wide Range Pressure < 425, will not be. Continue with step 4.
		RO	Resets SI, CI and 1B-03 and 1B-04 Non-Safeguards Equipment Lockouts.
		BOP	Check 4160 Safeguards buses energized from off-site Reestablish IA to containment <ul style="list-style-type: none"> <li>Starts 2<sup>nd</sup> IA compressor</li> <li>Checks IA pressure</li> <li>Opens 1IA-3047, then after ~3 minutes, 1IA-3048</li> </ul>
		RO	Check RCS Vent Paths – Power available to PORVs, PORVs shut and Block valves open. Remaining valves are deenergized and shut.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>CSP-C.2 Actions</p> <p>(NOT EVALUATED)</p> <p>In the unlikely event that the crew determines that vessel level is rising, the crew will return to step 1 and repeat the steps already taken, then they will again arrive at this step. At some point, they will determine that level has stabilized and will continue to step 16</p> <p>If crew wishes to energize 1SI-841A and B to check valve position, insert trigger 10 to power the valves.</p> <p>Once cooldown has been established, terminate scenario per Lead Examiner's direction.</p>	<p>SRO/RO</p> <p>SRO RO</p> <p>SRO/RO</p> <p>RO</p> <p>Crew</p> <p>SRO/BOP</p> <p>SRO</p> <p>BOP</p> <p>SRO</p> <p>BOP</p>	<p>Check Both RCPs stopped – No, both are running, go to step 13.</p> <p>Addresses note regarding normal RCP conditions. Maintain Support Conditions for Running RCPs – ensures RCP parameters normal</p> <p>Checks Vessel Level with table – since both RCPs are running and containment is adverse, must have &gt;120 ft WR level, will not be met. Check Vessel Level Trend – Vessel level will be stable.</p> <p>Proceeds to step 16 to Check RCPs – determines both are running. Stops one RCP.</p> <p>Checks Accumulators – Pressure is ~750 PSIG and accumulator outlet valves are open with no power.</p> <p>Addresses note regarding faulted/ruptured SG</p> <p>Stabilize Intact SG Level – determines that SG levels are &gt;51% and feed flow being controlled to maintain level. Addresses caution regarding CSP-P.1.</p> <p>Depressurized Both SGs to 200 PSIG, not to exceed 100°F/hr Cooldown Rate using ADVs.</p>

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>EOP-0 (CSP-S.1) Attachment A actions</p> <p>Where there is a difference in Att. A Actions, the CSP-S.1 Actions will be denoted by parentheses ( ).</p> <p>(NOT EVALUATED)</p> <p><b>Event 6: 1P-15B, 'B' SI Pump fails to auto start</b></p> <p>When contacted regarding status of SW-LW-61/62, verify on Simulator that valves are shut and report same to BOP.</p>	BOP	<p>(Verify Safeguards Buses Energized).</p> <p>Verify feedwater isolation:</p> <ul style="list-style-type: none"> <li>- Feedwater Regulating and Bypass Valves SHUT.</li> <li>- Both main feed pumps tripped.</li> <li>- MFP discharge MOVs - BOTH SHUT.</li> </ul> <p>Verify containment isolation:</p> <ul style="list-style-type: none"> <li>- CI Panels A and B ALL LIGHTS LIT</li> <li>- RS-SA-9 SHUT.</li> <li>- No other valves open under administrative control (SM may be asked to verify this).</li> </ul> <p>Verify AFW Actuation:</p> <ul style="list-style-type: none"> <li>- Checks both motor driven AFW pumps running.</li> </ul> <p>Check both SI pumps running.</p> <ul style="list-style-type: none"> <li>- A is not running, but is isolated</li> <li>- (Manually actuates both trains of SI)</li> <li>- (Starts B SI Pump)</li> <li>- If B has not yet been started, starts B SI pump.</li> </ul> <p>Check both RHR pumps running.</p> <p>Check only one CCW pump running.</p> <p>Verify Service Water Alignment:</p> <ul style="list-style-type: none"> <li>- 6 service water pumps running.</li> <li>- Service water isolation valves shut.</li> <li>- Direct AO to locally check SW-LW-61 or SW-LW-62 shut.</li> </ul>

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP-0 Attachment A actions continued  (NOT EVALUATED)	BOP	<p>Verify Containment Accident Cooling Units Running</p> <ul style="list-style-type: none"> <li>- All accident fans running.</li> <li>- 1SW-2907 &amp; 2908 OPEN.</li> <li>- Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.</li> </ul> <p>Check Control Room Ventilation IN ACCIDENT MODE:</p> <ul style="list-style-type: none"> <li>- At least one control room recirc fan RUNNING</li> <li>- Control room damper solenoid valve PURPLE LIGHT LIT</li> </ul> <p>Check if Main Steam Lines Can Remain Open, checks both MSIVs SHUT, as appropriate.</p> <p>(Not contained in CSP-S.1 Attachment A) Verify proper SI valve alignment:</p> <ul style="list-style-type: none"> <li>- Unit 1 SI active status panel ALL LIGHTS LIT</li> <li>- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT</li> </ul> <p>Verify containment spray not required: Containment Pressure &lt; 25 PSIG</p> <p>Verify SI Flow:</p> <ul style="list-style-type: none"> <li>- RCS wide range pressure &lt;1400 psig</li> <li>- Check SI pumps flow indicated</li> <li>- RCS wide range pressure &lt; [425] 200 psig</li> </ul> <p style="text-align: center;">This ends the steps of EOP-0 Attachment A.</p>

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
Preload	EPS	LOA	LOA1EPS102	Racked out	-	-	1P15A SI Pump breaker rack out
Preload	SIS	LOA	LOA1SIS017	OPEN	-	-	1SI-866 1P-15A SI Pump discharge MOV breaker*
Preload	SIS	VLV	VLV1SIS046	1-Fail CTL PWR Fuse	-	-	1SI-896 1P-15A SI Pump suction MOV*
Preload	CNM	BKR	BKR1CNM017	6-Fail CTL PWR Fuse	-	-	1W-3A CRDM Shroud fan bkr
Preload	SIS	BKR	BKR1SIS002	4-Fail Auto Close	-	-	1P-15B SI Pump Fails to Auto Start
Preload	PPL	MAL	MAL1PPL001A	3-Fails to Open	-	-	‘A’ RTB Fails to Open
Preload	PPL	MAL	MAL1PPL001B	3-Fails to Open	-	-	‘B’ RTB Fails to Open
Preload	EPS	BKR	BKR1EPS003	5-Fails As Is	-	-	High Side Breaker to X-12 Fails Closed
Preload	EPS	BKR	BKR1EPS024	5-Fails As Is	-	-	1B02 Normal Feed Fails Closed
1	RCS	XMT	XMT1RCS008A	0	-	20 sec	1LT-427 PZR Level Fails Low

Retention: Life of Plant

Retain in: Training Program File

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
3	CNM	BKR	BKR1CNM018	1-Trip	15 sec	-	1W-3B CRDM Fan Trips
5	RCS	MAL	MAL1RCS003B	25 GPM	15 sec	20 sec	Loop A RTD Bypass Line Leak
10	SIS	LOA	LOA1SIS012	Close	15 sec	-	Bkr for 1SI-841A
10	SIS	LOA	LOA1SIS013	Close	2 min	-	Bkr for 1SI-841B

**\* Ensure valve is closed prior to inserting this preload.**

**PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft**

Historical Record:    Developed for ILT 2007 NRC Exam.

## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

**Simulator Scenario Development Checklist**

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- |  |          |         |
|--|----------|---------|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools.  | Yes      | No<br>X |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes      | No<br>X |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.   | Yes<br>X | No      |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified.   | Yes<br>X | No      |
| 5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.  | Yes<br>X | No      |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.  | Yes<br>X | No      |
| 7. The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.  | Yes<br>X | No      |
| 8. The scenario includes related industry experience.  | Yes      | No<br>X |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.  | Yes      | No<br>X |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

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Retention: Life of Plant

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## PB-ILT-07N-002, INITIAL NRC EXAM SCENARIO #2, Rev. 0 Draft

## Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- |  |          |    |
|--|----------|----|
| 1. The desired initial condition(s) could be achieved.   | Yes<br>X | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.  | Yes<br>X | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.  | Yes<br>X | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.  | Yes<br>X | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response.  | Yes<br>X | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes<br>X | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.   | Yes<br>X | No |

Discrepancies noted (Check "none" or list items found) ☒ None  
 SMAR = Simulator Action Request

SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

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Retention: Life of Plant

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Facility: **Point Beach**Scenario No.: **3a**OP-Test No.: **2007301**Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Initial Conditions:** Unit 1 is at ~3% power MOL 8010 MWD/MT preparing to raise power and roll the turbine. Boron Concentration is 1173 PPM. Unit 2 is at 100% power.

**Turnover:** 1P-15A Safety Injection Pump is OOS. The oiler on the inboard pump bearing was damaged and a Maintenance crew is working the job to completion. TSAC 3.5.2.A was entered 6 hours ago and the pump is expected back for operability testing in about 3 hours. 1W-3A CRDM Shroud Fan is OOS due to motor bearing failure.

Today is Sunday, present clock time is real time. An RP Tech and Chemistry Tech are on-site. A crew of Maintenance personnel are working 1P-15A to completion.

The objective of the shift is to continue Unit 1 power ascension. LCO 3.0.4.b was utilized and a risk assessment was completed to allow entry into Mode 1 with 1P-15A OOS. Reactor Engineering has requested that the power ascension be made using control rods for rod position concerns. Mode Change Checklist to enter MODE 1 has been completed.

Event No.	Malf. No.	Event Type*	Event Description
1		R – RO N – BOP N – SRO	OP-1C Up Power from 3% to ~12%
2		I – RO I – SRO TS-SRO	T-404A, Loop B T Hot Fails High
3		C – RO C – SRO	1P-2A, 'A' Charging Pump Winding Ground and pump trip
4		<del>TS-SRO</del>	<del>Call from Chemistry that EDG Fuel Oil Tank sample is out of specification</del> EVENT NOT USED
5		C – RO C – SRO	Steam Leak from 'B' SG I/S Containment w/ Auto Rx Trip Failure
6		M – ALL	Steam Line Break on 'B' SG
7		C - BOP	Failure of MSIVs to Auto close

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

	<b>SIMULATOR EXERCISE GUIDE (SEG)</b>
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SITE: POINT BEACH

SEG # PB-ILT-07N-003

SEG TITLE: 2007 NRC EXAM SCENARIO #3

REV. # 0 DRAFT

PROGRAM: INITIAL LICENSE TRAINING

#: PB-ILT

COURSE:

#:

TOTAL TIME: 2.0 HOURS

Additional site-specific signatures may be added as desired.

Developed by:	<b>Russell Joplin</b>	
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	<b>Andrew Zommers</b>	
	<i>Instructor</i>	<i>Date</i>
	( <i>Simulator Scenario Development Checklist.</i> )	
Validated by:		
	<i>Validation Lead Instructor</i>	<i>Date</i>
	( <i>Simulator Scenario Validation Checklist.</i> )	
Approved by:		
	<i>Training Supervision</i>	<i>Date</i>

### Guide Requirements

**Goal of Training:**

**To have the crew successfully raise power to ~12% from 3%, respond to T-404A, Loop B T<sub>hot</sub> failure, respond to a Steam Leak and Steam Line Break on 'B' SG. Embedded within these events is the expectation to properly utilize Technical Specifications.**

**Learning Objectives:**

None

**Prerequisites:**

1. Simulator available
2. Students enrolled in Initial License Program

**Training Resources:**

1. Floor Instructor as Shift Manager
2. Floor Instructor as Shift Technical Advisor
3. Simulator Booth Operator
4. Communicator
5. NRC Examiners

**References:**

1. OP-1C, Startup to Power Operation, Unit 1
2. TS 80 Sampling of Emergency Fuel Oil Tanks (Quarterly)
3. AOP-24, Response to Instrument Malfunction
4. 0-SOP-IC-001 Yellow, Removal of Safeguards or Protection Sensor from Service, Yellow Channel
5. AOP-1D, CVCS Malfunction
6. AOP-2A, Secondary Coolant Leak
7. EOP-0, Reactor Trip or Safety Injection
8. EOP-2, Faulted Steam Generator Isolation
9. EOP-1, Loss of Reactor or Secondary Coolant
10. Technical Specifications and Technical Requirements Manual

**Commitments:**

None

**Evaluation Method:**

Simulator performance will be evaluated by NRC Examiners IAW NUREG 1021

**Operating Experience:**

None

**Related PRA Information:**

None

Retention: Life of Plant

Retain in: Training Program File

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## QUANTITATIVE ATTRIBUTES

### **Normal Events/Reactivity Manipulations:**

1. Raise power from ~3% IAW OP-1C, Startup to Power Operation, Unit 1

### **Malfunctions:**

#### *Before EOP Entry:*

1. T-404A, Loop B T<sub>hot</sub> Fails High
2. 1P-2A, 'A' Charging Pump Winding Ground and Trip
3. ~~Chemistry calls SRO with EDG Fuel Oil Tank sample results (EVENT NOT USED)~~
4. 'B' Steam Line Leak Inside Containment

#### *After EOP Entry:*

1. MSIVs fail to Auto close

### **Abnormal Events:**

1. T-404A, Loop B T<sub>hot</sub> Fails High
2. 1P-2A, 'A' Charging pump winding ground and trip
3. Steam Leak on 'B' Steam Line Inside Containment

### **Major Transients:**

1. Steam Line Break on 'B' Main Steam Line

### **Critical Tasks:**

1. RT-7: When a reactor trip is procedurally called for, initiate a manual reactor trip prior to 5 psig in Containment.
2. E-2 – A: Isolate the faulted SG before transition out of EOP-2.

## SCENARIO OVERVIEW:

### INITIAL CONDITIONS:

1. This scenario can be run from the following Specific IC set:
  - IC-161, Created from a Unit 1 low power IC
2. The following equipment is OOS:
  - 1P-15A, 'A' Safety Injection Pump
  - 1W-3A, 'A' CRDM Shroud Fan

### SEQUENCE OF EVENTS:

#### Event 1: Normal Up Power IAW OP-1C

- After completion of crew turnover and examinees have assumed the watch, crew is directed to raise power IAW OP-1C at step 5.24.2
- Crew pulls control rods to raise power from 3% to 12%.
- Crew monitors plant parameters as necessary
- Crew announces entry into MODE 1 when power is 5%

#### Event 2: T-404A, Loop B T<sub>hot</sub> instrument fails high.

- Upon reaching ~12% power, T-404A, Loop B T<sub>hot</sub> instrument fails high.
- Pressurizer program level will rise to 45.8% and auto charging pump will speed up to attempt to raise level. RO should take auto pump to manual to control level.
- Crew suspends power increase and enters AOP-24, Response to Instrument Malfunction
- Crew implements AOP-24 and removes channel from service IAW 0-SOP-IC-001 Yellow Removal of Safeguards or Protection Sensor from Service, Yellow Channel
- SRO addresses Technical Specifications for failure

#### Event 3: 1P-2A, 'A' Charging Pump Ground and Trip

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Retention: Life of Plant

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- Once Technical Specifications have been addressed and channel is removed from service, 1P-2A Charging Pump develops a winding ground and trips ~3 minutes later
- Crew responds using AOP-1D, CVCS Malfunction
- Crew starts 'B' Charging Pump and restores PZR Level
- SRO addresses Technical Requirements Manual for failure.

**Event 4: Chemistry calls with an out of spec EDG fuel oil sample** – EVENT NOT USED

- ~~During the up power Chemistry calls Operations with a high particulate EDG fuel oil sample.~~
- ~~SRO acknowledges the information and addresses Technical Specifications.~~

**Event 5: 'B' SG steam leak with Auto Reactor Trip failure**

- Once plant is stable following Charging Pump failure, 'B' Steam Line begins to leak inside containment.
- Auto Reactor Trip is failed and crew must trip Reactor prior to reaching 5 PSIG inside containment.
- Reactor will be manually tripped when Containment pressure reaches 2 PSIG
- Once Reactor is tripped, Steam Line leak becomes a Steam Line Break

**Event 6: 'B' Main Steam Line Break**

- Crew responds to SLB with EOP-0.
- Crew will proceed through EOP-0 then to EOP-2 to isolate faulted 'B' SG.
- Crew will then enter EOP-1 and scenario will terminate upon transition to EOP-1.

**Event 7: MSIVs fail to Auto close**

- Due to relay and bistable failures, MSIVs will not automatically close.
- BOP identifies these failures during performance of Attachment A of EOP-0.

## PB-ILT-07N-003, INITIAL NRC EXAM SCENARIO 3, Rev. 0 Draft

**NOTE:** Table may be modified as needed to include all scenario time-line items

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): IC-161 Unit 1 <ul style="list-style-type: none"> <li>• Mode: 2</li> <li>• Burnup: 8010</li> <li>• Power: 3%</li> <li>• Boron: (CB): 1173 ppm</li> <li>• Temperature: NOT</li> <li>• Pressure: NOP</li> <li>• Xenon: Equilibrium</li> <li>• Rods: Bank D @ 145 steps</li> <li>• Generator: 0 Mwe</li> </ul>	(RO/BOP/SRO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		Place OOS labels on 1P-15A and 1W-3A. Place protected equipment label on 1P-15B.
	2. Simulator Pre-brief in Classroom: <ul style="list-style-type: none"> <li>a. Simulator Differences List</li> <li>b. Crew Positions</li> </ul>		
	3. COMPLETE TURNOVER: <ul style="list-style-type: none"> <li>a. Review applicable current Unit Status</li> <li>b. Review relevant At-Power Risk status (Unit 1 is GREEN)</li> <li>c. Review current LCOs not met and Action Requirements</li> <li>d. Verify crew performs walk down of control boards and reviews turnover checklists.</li> <li>e. Crew takes the shift.</li> </ul>		

Retention: Life of Plant

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## PB-ILT-07N-003, INITIAL NRC EXAM SCENARIO 3, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EVENT 1: Raise Power from 3% toward 17%</b></p> <p><b>NOTE:</b> Have the Shift Manager prompt the crew to shift Feedwater control to MFRV's if desired by Lead Examiner.</p> <p><b>End of evolution:</b> Proceed to next event at Lead Examiner discretion.</p>	<p>Crew</p> <p>RO</p> <p>BOP</p>	<p>Briefs power ascension (may be performed in classroom prior to beginning of the scenario).</p> <p>Withdraws rods and adjust steam demand as needed to establish power increase.</p> <p>Shifts Feedwater control to Main Feed Reg Valves at ~10% power. <b>(NORMAL for BOP)</b></p>

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## PB-ILT-07N-003, INITIAL NRC EXAM SCENARIO 3, Rev. 0 Draft

## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>Event 2: T-404A, Loop B Thot Fails High</b>	RO	Recognizes instrument failure for the Yellow channel. Recommends placing the automatic charging pump in Manual to keep Pressurizer level from rising above program level.
		SRO	SRO acknowledged recommendation and alarms.
		RO/BOP	RO/BOP address the ARB's for alarms associated with the Thot failure.
		SRO	Enter AOP-24 Response to Instrument Malfunction.
		Crew	Identifies T-404A, Loop B Thot as failed instrument.
		RO	Checks that instrument is controlling channel for PZR Level Program.
			Ensures that Charging is in manual.
	<b>T-404A Instrument failure continued</b>	RO	Return affected parameter to desired value – ensures that PZR level is returning to program value.
		SRO	References step regarding performance of AOP-21. SM should inform SRO that the 4 <sup>th</sup> license will reference AOP-21.
			Addresses caution regarding currently tripped bistables – this does not apply as no other bistables are tripped.
			Directs removal of failed instrument IAW 0-SOP-IC-001 YELLOW.
	In order to save scenario time, the package for removing the channel from service will be prepared by the exam team before the scenario and will be provided to the Crew when they ask for it to be prepared.		

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Removal of T-404A IAW 0-SOP-IC-001 Yellow</b></p>          <p><b>Note: Although the switch names have “Unit 2” on the label, they are Unit 1 Switches</b></p>	<p>SRO</p>          <p>RO</p>          <p>BOP</p>          <p>Crew</p>          <p>RO</p>	<p>Refers to 0-SOP-IC-002, Technical Specification LCO-Instrument Cross Reference to determine applicable Technical Specifications.</p> <p>Verifies that applicable pages of 0-SOP-IC-001 Yellow are present and other pages have been discarded.</p> <p>Conducts pre-job brief for instrument removal.</p> <p>Obtains SM permission to remove instrument.</p> <p>Directs performance of Att. A Actions.</p> <p>Place Rods in Manual – Already done due to power level.</p> <p>In C-107, Place Tavg defeat SW to LOOP B UNIT2 (Loop B2).</p> <p>In C-108, Place Delta-T Defeat SW to LOOP B UNIT2.</p> <p>Desired to leave Rods in Manual due to power level.</p> <p>Places following Bistables to Trip: Overpower Trip. OP Rod Stop. Over Temp Trip. OT Rod Stop. HIGH Tavg. LOW Tavg (Proving Lamp should light).</p> <p>Acknowledges Alarms.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>Removal of T-404A IAW 0-SOP-IC-001 Yellow</b>	BOP/RO SRO RO SRO	Removes T-404 and T-408 PPCS Points from Scan. Returns to AOP-24. May return Charging pump to auto. Addresses Technical Specification for failure – <ul style="list-style-type: none"> <li>• TS Table 3.3.1.-1 item 5.</li> <li>• TS Table 3.3.1.-1 item 6.</li> <li>• TS Table 3.3.2.-1 item 4d-3.</li> </ul> Returns to OP-1C.

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>Event 3: 1P-2A, 'A' Charging Pump Winding Ground and Trip</b></p> <p><b>Booth Operator/Communicator:</b> When directed to go investigate 1B-03 Ground Fault, wait 2 minutes and report that one light is bright and the other two are dim on the local ground fault panel. If contacted again following pump trip, inform crew that all ground fault lights are now the same intensity.</p> <p><b>Booth Operator/Communicator:</b> When sent out to investigate Charging pump and associated breaker, inform control room breaker is tripped on overcurrent and motor is hot to the touch.</p> <p><b>Booth Operator/Communicator:</b> If sent to check charging pump relief, wait 2 minutes and report charging reliefs on Unit 1 are <b>NOT</b> lifting</p> <p><b>(Insert next malfunction per Lead Examiner.)</b></p>	<p>BOP</p> <p>Crew</p> <p>SRO</p> <p>RO</p> <p>RO</p> <p>SRO</p>	<p>Announces 1B-03 Ground Fault Alarm (C02 D 3-2) and refers to Alarm Response Book.</p> <p>Contacts AO to investigate 1B-03 Ground Fault.</p> <p>May begin to shift loads powered from 1B-03.</p> <p>When 'A' charging pump trips, enter AOP-1D, CVCS Malfunction.</p> <p>Checks RCS Leak not in progress Continuous action (<b>CA</b>)</p> <p>Addresses Foldout page and notes.</p> <p>Determines Chg Pump trip and goes to Step 3.</p> <p>Check any charging pump running – C should be running.</p> <p>Check Charging Flow Stable – Should answer yes.</p> <p>Check Charging Pump relief not lifted – no indication of lifting relief. May dispatch AO.</p> <p>Check VCT Level – Should be &gt; 17%</p> <p>Check Charging System response: Should start 'B' Charging Pump and adjust lab seals using CV-142. May place 'A' charging pump in pullout.</p> <p>Requests DCS Notification.</p> <p>Refers to TRM for Charging Pump requirements.</p>

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><del>EVENT 4: (Initiate per Lead Examiner during up power) Work Control Center calls the Control room after Chemistry calls with Fuel Oil results taken during the performance of TS 80, Sampling of Emergency Fuel Oil Tanks (Quarterly). T-175A EDG Fuel Oil Storage Tank (fuel oil tanks for G01 and G02 EDGs) particulate was greater than the acceptance criteria of 10mg/L and an AR is being generated at this time. The sample results were confirmed by Chemistry to be accurate.</del></p> <p><b>(EVENT NOT USED)</b></p> <p><b>Event 5: 'B' SG Steam Leak Inside Containment with Auto Rx Trip Failure</b></p> <p><b>NOTE: Steps 4 through 10 may be performed in any order and are diagnostic.</b></p> <p><b>CRITICAL TASK: Initiate a manual reactor trip prior to 5 psig in Containment</b></p>	<p>SRO</p> <p>Crew</p> <p>SRO</p> <p>Crew</p> <p>RO</p> <p>Crew</p> <p>Crew</p>	<p>SRO reviews Technical Specifications and determines LCO 3.8.3 Diesel Fuel Oil and Starting Air is not met. TSAC 3.8.3.B must be entered.</p> <p>Responds to Containment Sump 'A' Alarm and rising humidity in containment. Checks RMS clear.</p> <p>Enters AOP-2A, Secondary Coolant Leak.</p> <p>Determines if secondary coolant leak hazardous to personnel or equipment. <b>(CA)</b></p> <p>Maintain plant within limits. <b>(CA)</b></p> <p>Maintain RCS Tavg. <b>(CA)</b></p> <p>Check containment conditions normal, crew may perform actions to lower pressure in containment.</p> <p>Recognizes increased leak rate and uses fold out page/continuous action guidance from AOP-2A to trip the reactor.</p>
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Retain in:	Training Program File		

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>B' SG Steam Leak Inside Containment with Auto Rx Trip Failure (cont'd)</b>	RO	<p>Inserts Manual Trip.</p> <p>Verify Reactor Trip – RTBs open, bottom lights all lit, IRPIs on bottom, Flux lowering</p> <p>Verify Turbine Trip – Turbine Stop Valves both shut:</p> <ul style="list-style-type: none"> <li>-SL and SR lights lit OR</li> <li>-Turbine Stop Valves Two Closed Alarm OR</li> <li>-Turbine Valves Bistable both lit</li> </ul> <p>Verify Safeguards Buses – At least one 4160 and one 480 V Bus energized</p> <ul style="list-style-type: none"> <li>- Checks voltage on buses and breaker configuration</li> </ul> <p>Check if SI is Actuated – may have automatically at this point. RO may insert manual SI and CI during this step.</p>
		SRO/RO	Verifies Immediate Action steps

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>Event 6: Steam Line Break on 'B' SG</b>	Crew	Fold out page criteria reviewed.
		Crew	Isolate feed flow to faulted S/G per foldout page.
		BOP	Perform Attachment A (steps listed later).
		SRO/RO	Review notes and verify heat sink.
			Verify lab seal cooling.
			Verify RCS Temp control <b>(CA)</b> .
			Check PZR PORV's shut.
			Verify Sprays shut.
			Check if RCP's should remain running.
		SRO/STA	Start monitoring critical safety functions.
		SRO/RO	Verify Sump Recirc not required <b>(CA)</b> .
		Crew	Check if Secondary is intact and then transition to EOP-2 due to faulted S/G.

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<b>Steam Line Break on ‘B’ SG (cont’d)</b>	Crew RO BOP BOP BOP RO BOP      RO Crew	Review foldout page data and take required actions. Check if RCP’s should remain running. Check if secondary is intact. Stabilize intact S/G levels. Check Secondary RMS normal. Check PORV’s and block valves shut. Reset SI. Reset CI. Reset B-03 and B04 lockouts. Check 4160 energized from offsite power. Re-establish IA to containment. Verify Charging flow. Check if SI should be terminated.
	<b>Scenario may be terminated at any time per Lead Examiners discretion.</b>		

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## SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EOP-0 Attachment A action EOP-0 Attachment A action</b></p> <p><b>Booth: (Inform BOP that SW-LW-61 and 62 are shut when asked)</b></p>	BOP	<p>Verify feedwater isolation:</p> <ul style="list-style-type: none"> <li>- Shuts Feedwater Regulating and Bypass Valves.</li> <li>- Both main feed pumps tripped.</li> <li>- MFP discharge MOVs - BOTH SHUT.</li> </ul> <p>Verify containment isolation:</p> <ul style="list-style-type: none"> <li>- CI Panels A and B ALL LIGHTS LIT.</li> <li>- RS-SA-9 SHUT.</li> <li>- No other valves open under administrative control (SM may be asked to verify this).</li> </ul> <p>Verify AFW Actuation:</p> <ul style="list-style-type: none"> <li>- Checks both motor driven AFW pumps running.</li> </ul> <p>Check both SI pumps running.</p> <ul style="list-style-type: none"> <li>- A is not running, but is isolated.</li> </ul> <p>Check both RHR pumps running.</p> <p>Check only one CCW pump running.</p> <p>Verify Service Water Alignment:</p> <ul style="list-style-type: none"> <li>- 6 service water pumps running. (P32A not running).</li> <li>- Service water isolation valves shut.</li> <li>- Direct AO to locally check SW-LW-61 or SW-LW-62 shut.</li> </ul>

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p><b>EOP-0 Attachment A action (cont'd)</b></p>       <p><b>Event 7: MSIVs fail to Auto close</b></p>	BOP	<p>Verify Containment Accident Cooling Units Running</p> <ul style="list-style-type: none"> <li>- All accident fans running.</li> <li>- 1SW-2907 &amp; 2908 OPEN.</li> <li>- Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.</li> </ul> <p>Check Control Room Ventilation IN ACCIDENT MODE:</p> <ul style="list-style-type: none"> <li>- At least one control room recirc fan RUNNING.</li> <li>- Control room damper solenoid valve PURPLE LIGHT LIT.</li> </ul> <p><b>Check if Main Steam Lines Can Remain Open, shuts both MSIVs due to relay and bistable failures if not previously done.</b></p> <p>Verify proper SI valve alignment:</p> <ul style="list-style-type: none"> <li>- Unit 1 SI active status panel ALL LIGHTS LIT.</li> <li>- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT.</li> </ul> <p>Verify containment spray not required: Containment Pressure remained &lt; 25 PSIG.</p> <p>Verify SI Flow:</p> <ul style="list-style-type: none"> <li>- RCS wide range pressure &lt;1400 psig.</li> <li>- Check SI pumps flow indicated.</li> <li>- RCS wide range pressure &lt; [425] 200 psig.</li> </ul> <p>This ends the steps of EOP-0 Attachment A.</p>

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SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
Preload	PPL	MAL	MAL1PPL001A	1-Auto Fail	-	-	RX Trip A breaker fail auto open
Preload	PPL	MAL	MAL1PPL001B	1-Auto Fail	-	-	RX Trip B breaker fail auto open
Preload	EPS	LOA	LOA1EPS102	Racked out	-	-	1P15A SI Pump breaker rack out
Preload	SIS	LOA	LOA1SIS017	OPEN	-	-	1SI-866 1P-15A SI Pump discharge MOV breaker*
Preload	SIS	VLV	VLV1SIS046	1-Fail CTL PWR Fuse	-	-	1SI-896 1P-15A SI Pump suction MOV*
Preload	CNM	BKR	BKR1CNM017	6-Fail CTL PWR Fuse	-	-	1W-3A CRDM Shroud fan bkr
Preload	PPL	RLY	RLY1PPL068	2-Fail as is	-	-	1SI 10X Relay fail as is
Preload	PPL	RLY	RLY1PPL070	2-Fail as is	-	-	1SI 20X Relay fail as is
1	RCS	XMT	XMT1RCS029A	650	15 sec	20 sec	Loop B T <sub>hot</sub> fails High
3	CVC	MOT	MOT1CVC001	1-Winding Ground	10 sec	-	'A' Charging Pump motor winding ground
5	SGN	MAL	MAL1SGN003B	500,000	10 sec	30 min	'B' SG Steam Line Break inside Cont
17	SGN	LOA	LOA1SGN025	0	-	-	1MS-237 RW Steam isolation
Preload	PPL	BST	BST1PPL058	1-Fail as is	-	-	1PC-946A CTMT Press Hi Bistable

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SIMULATOR INPUT SUMMARY							
Event Trigger	System	Type	Code	Value	Delay	Ramp	Description
Preload	PPL	BST	BST1PPL062	1-Fail as is	-	-	1PC-948A CTMT Press Hi Bistable
Preload	PPL	BST	BST1PPL066	1-Fail as is	-	-	1PC-950A CTMT Press Hi Bistable

\* Ensure valve is closed prior to inserting this preload.

Historical Record:      Developed for the ILT 2007 NRC Exam.

### Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- |  |          |         |
|--|----------|---------|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools.  | Yes      | No<br>X |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes      | No<br>X |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.   | Yes<br>X | No      |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified.   | Yes<br>X | No      |
| 5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.  | Yes<br>X | No      |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.  | Yes<br>X | No      |
| 7. The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.  | Yes<br>X | No      |
| 8. The scenario includes related industry experience.  | Yes      | No<br>X |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.  | Yes      | No<br>X |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

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## Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- |  |          |    |
|--|----------|----|
| 1. The desired initial condition(s) could be achieved.   | Yes<br>X | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.  | Yes<br>X | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.  | Yes<br>X | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.  | Yes<br>X | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response.  | Yes<br>X | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes<br>X | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.   | Yes<br>X | No |

Discrepancies noted (Check "none" or list items found)      ☒ None  
 SMAR = Simulator Action Request

SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_ SMAR: \_\_\_\_\_

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

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