

Facility: **Oconee**Scenario No.: **1**Op-Test No.: **1**Examiners: P. CapehartOperators: C. Seymour **SRO**P. OttS. Magley **OATC**J. DeMarshallB.J. Westbrook **BOP**

Initial Conditions:

- Reactor Power = 75%

Turnover:

- SASS is in manual for calibration
- AMSAC/DSS is bypassed for calibration
- PSW is unavailable for Unit 1

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		Standby HPI Pump Auto Start Disabled
0b	Override		AMSAC/DSS Bypassed
0c	Override		SASS in Manual
1		N: OATC, SRO	CRD Movement PT (Group 1)
2	Override	C: BOP, SRO <b>(TS)</b>	1A CFT Low Pressure
3	MPS120	C: OATC, SRO <b>(TS)</b>	1A HPI Pump Sheared Shaft
4	MSS200 MSS200D	C: BOP, SRO <b>(TS)</b>	Condenser Vacuum Leak <b>(CT-1)</b>
5	Override	I: BOP, SRO	1A RPS Channel RC Pressure Fails High
6	MPI330	C: OATC, SRO <b>(TS)</b>	One Dropped Rod With Failure of Auto Runback Circuit
7	MSS260 MSS390	M: ALL	1B Main Steam Line Break Outside RB <b>(CT-2)</b> <ul style="list-style-type: none"><li>• 1A MD EFDW Pump Fails to Start</li><li>• Diverse HPI Fails to go to Bypass</li></ul>
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**SCENARIO 1 EVENT SUMMARY**

- Event 1:** When the crew takes the shift, the SRO will direct the OATC to perform PT/1/A/0600/015 Enclosure 13.2 (Control Rod Movement at Power). This will be performed for group 1 rods only.
- Event 2:** The pressure in the 1A Core Flood Tank (1A CFT) will be just above the alarm setpoint when the scenario begins. When this event is initiated, 1A CFT pressure will drop just low enough for the Statalarm to actuate. The BOP will then use OP/1/A/1104/001 Enclosure 4.7 to increase pressure in the 1A CFT to  $\approx 600$  psig. This evolution will require the SRO to enter TS 3.6.3.
- Event 3:** The 1A HPIP will experience a sheared shaft. Pump amps will lower to approximately 10-15 amps, discharge pressure and flow will drop to  $\approx 0$ . The 1B HPIP will not start in automatic requiring operator action. The crew will enter AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection), close 1HP-5, 1HP-120 and 1HP-31 and start the 1B HPIP. The crew should then restore the HPI System to normal. The SRO will enter TS for the loss of the 1A HPI Pump.
- Event 4:** The Main Condenser will experience a vacuum leak and will require the crew to start the Main Vacuum Pumps prior to the unit tripping on low condenser vacuum. After the crew dispatches operators to look for vacuum leaks, a report will be made to the control room and the SRO will be required to direct the AO to isolate the source of the leak. This event will require the SRO to evaluate Tech Specs and enter the appropriate conditions when the 4<sup>th</sup> CCW pump is started.
- Event 5:** The 1A RPS channel RCS pressure signal will fail high. The crew will refer to OP/1/A/1105/014 (Control Room Instrumentation Operation and Information) Enclosure 4.7 (Removal and Restoration of RPS Channels) to place the 1A RPS channel in Manual Bypass by procedure.
- Event 6:** Once the control rod drops into the core, the crew will perform Plant Transient Response (PTR) and the BOP will report that an automatic Runback is not occurring. The OATC will initiate a power reduction to  $\leq 55\%$  core thermal power at  $\geq 1\%/min$  (the power reduction must be at least 10% in order to meet the intent of the event). Since only the automatic runback has failed. The crew could enter the new desired power level and rate on CTPD and ICS will automatically reduce power. The dropped control rod will require the SRO to enter TS 3.1.4, TS 3.1.5, and TS 3.2.3.
- Event 7:** A MSLB will occur on the 1B SG. The SRO will direct an RO to perform a Symptoms Check. This operator should recognize the steam line break and perform Rule 5 for the steam line break. The SRO will transfer to the LOSCM tab (if SCM is lost) from the Subsequent Actions Parallel Action page, and then to the EHT tab for the steam line break. The 1A MD EFDW pump will fail to start which will require an RO to start the TD EFDW pump per Rule 5 to regain heat transfer in the intact SG. The crew will isolate the 1B SG and then transfer to the Forced Cooldown (FCD) tab.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **1**

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Event Description: **Control Rod Movement PT (Group 1) (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p><b>Examiner Note:</b> <i>During the Control Rod Movement PT, the Unit 1 CRS will assume the role of the dedicated Reactivity Management SRO.</i></p> <p style="text-align: right;"><b>PT/1/A/0600/015</b></p> <p><b>Crew response:</b> SRO directs the OATC to perform PT/1/A/0600/015, Encl. 13.2 (Control Rod Movement at Power).</p> <p><b>PT/1/A/0600/015, Encl. 13.2</b> <small>rev 29</small></p> <p>3.1 <b>WHILE</b> enclosure is in progress, monitor the following indications:</p> <ul style="list-style-type: none"><li>• CRD position</li><li>• Appropriate ranged NIs</li><li>• RCS temperature</li><li>• Neutron error</li></ul> <p>3.2 Ensure Rx Diamond and FDW Masters in Hand per Enclosure for Placing Rx Diamond/FDW Masters To Hand of OP/1/A/1102/004 A (ICS Operation).<b>(already in HAND)</b></p> <p>3.3 <b>IF AT ANY TIME</b> contingency actions directed by CRS, perform Section 4 (Contingency Actions)</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> When operating switches on Diamond, maintain switch depressed until light indication changes state.</p></div> <p>3.4 Perform the following: (R.M.)</p> <ul style="list-style-type: none"><li>• Ensure SEQ OR is ON.</li><li>• Ensure SAFETY RODS OUT BYPASS is ON.</li><li>• Ensure RUN is ON.</li><li>• Ensure SINGLE SELECT SWITCH selected to ALL.</li></ul> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> CRD Groups 1-6 are required to be <math>\geq 95\%</math> withdrawn for Shutdown Margin Calculation at Power enclosure of PT/1/A/1103/015 (Reactivity Balance Procedure) to be valid.</p></div> <p>3.5 <b>IF AT ANY TIME</b> <u>any</u> CRD Group 1-6 reaches 95% during insertion, stop inserting associated group. (R.M.)</p>

**This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the Lead Examiner.**

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Event Description: **Control Rod Movement PT (Group 1) (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>PT/1/A/0600/015</i></p> <p><b><u>Crew response:</u></b></p> <p>3.6 Perform the following to test CRD Group 1: (R.M.)</p> <p>___ 3.6.1 Ensure GROUP SELECT SWITCH to 1.</p> <p>___ 3.6.2 Ensure Group 1 CONTROL ON lights are ON. (PI panel)</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>1SA-2/C-10 "CRD Safety Rods Not At Upper Limit" will alarm when Safety Groups are inserted.</li><li>Control rods should <b><u>NOT</u></b> be left inserted. Rod withdrawal should commence immediately after insertion is complete.</li></ul></div> <p>___ 3.6.3 Perform the following:</p> <p style="margin-left: 40px;">A. Insert CRD Group 1.</p> <p style="margin-left: 40px;">B. <b><u>WHEN</u></b> <u>all</u> 100% lights OFF, stop insertion.</p> <p style="margin-left: 40px;">C. Withdraw Group 1 to 100% <b><u>until</u></b> CRD TRAVEL "Out" light OFF.</p> <p>___ 3.6.4 Verify <u>all</u> 100% lights are ON for Group 1. (PI Panel)</p> <p>___ 3.6.5 Verify unit is stable.</p> <p><b><i>Examiner Note: Steps 3.7 – 3.13 test Control Rod Groups 2-8. When completing the PT on GP 1 Control Rods, they should proceed to step 3.14 to return ICS to AUTOMATIC.</i></b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p><b><u>NOTE:</u></b> When operating switches on Diamond, maintain switch depressed until light indication changes state.</p></div> <p>3.14 Perform the following: (R.M.)</p> <ul style="list-style-type: none"><li>Ensure SEQ is ON.</li><li>Ensure GROUP SELECT SWITCH to OFF.</li><li>Ensure SAFETY RODS OUT BYPASS is OFF.</li></ul> <p>3.15 Return Rx Diamond and FDW Masters To Automatic per OP/1/A/1102/004 A (ICS Operation). <b>(page 5)</b></p>

**This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the Lead Examiner.**

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Event Description: **Control Rod Movement PT (Group 1) (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1102/004A Encl 4.1 (in progress)</i></p> <p><b>Crew Response:</b></p> <p><b><u>OP/1/A/1102/004A Encl 4.1</u></b> rev11</p> <p>2.9 <b><u>WHEN</u></b> required, place ICS back in auto as follows:</p> <p>2.9.1 Ensure "RATE SET" thumbwheels at 0.0.</p> <p>2.9.2 <b><u>IF</u></b> TURBINE MASTER is in manual <b>[N/A]</b></p> <p>2.9.3 <b><u>IF</u></b> Rx Master is in "HAND" <b>[N/A]</b></p> <p>2.9.4 <b><u>IF</u></b> DIAMOND is in manual, perform the following:</p> <p>A. Verify REACTOR MASTER in "AUTO".</p> <p>B. <b><u>IF both</u></b> SGs are off of Level Control, perform the following:</p> <p>1. <b><u>IF</u></b> selected Tave (O1E2086) is different from Tave setpoint (O1E2087) by more than <math>\pm 0.15^{\circ}\text{F}</math>, perform the following:</p> <p>a. <b><u>Simultaneously</u></b> perform the following:</p> <ul style="list-style-type: none"><li>• Ensure 1A FDW MASTER in "HAND"</li><li>• Ensure 1B FDW MASTER in "HAND"</li></ul> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b>NOTE</b></p><ul style="list-style-type: none"><li>• Cycling the setpoint selector may result in a Star Module failure. This is expected for this condition and entry into AP/1/A/1700/028 (ICS Instrument Failures) is <b><u>NOT</u></b> required. The Star Module failure shall be cleared before the ICS is returned to Auto.</li><li>• Reactor Master trips to "Hand" at 585.2°F.</li></ul></div> <p>b. On REACTOR MASTER, cycle Tave setpoint selector between 567°F and 583°F five times.</p> <p>c. <b><u>IF</u></b> Star Module failed, perform the following:</p> <p>1) Initiate Work Request to repair Star Module.</p> <p>2) <b><u>WHEN</u></b> Star Module repaired, continue procedure.</p> <p>d. On REACTOR MASTER adjust Tave setpoint (O1E2087) toward selected Tave (O1E2086).</p> <p>2. Verify selected Tave is within <math>\pm 0.15^{\circ}\text{F}</math> of Tave setpoint.</p>

**This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the Lead Examiner.**

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Event Description: **Control Rod Movement PT (Group 1) (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1102/004A Encl 4.1</i></p> <p><b><u>Crew Response:</u></b></p> <p>C. <b><u>IF</u></b> either SG is on Level Control, adjust Tave setpoint (O1E2087) to 579°F.</p> <p>D. Place DIAMOND in "AUTO".</p> <p>2.9.5 Ensure STM GENERATOR MASTER in "AUTO".</p> <p>2.9.6 <b><u>IF</u></b> 1A <b><u>OR</u></b> 1B FDW Master is in "HAND", perform the following:</p> <p>A. Perform the following:</p> <ul style="list-style-type: none"><li>• Select 1A FDW MASTER to "MEAS VAR"</li><li>• Select 1B FDW MASTER to "MEAS VAR"</li></ul> <p>B. <b><u>IF</u></b> 1A <b><u>OR</u></b> 1B FDW Master Measured Variable is <b><u>NOT</u></b> on the caret, perform the following:</p> <ol style="list-style-type: none"><li>1. Initiate Work Request to repair.</li><li>2. <b><u>WHEN</u></b> repairs are complete, continue procedure.</li></ol> <p>C. Verify the following:</p> <ul style="list-style-type: none"><li>• 1A FDW MASTER Measured Variable on the caret</li><li>• 1B FDW MASTER Measured Variable on the caret</li></ul> <p>D. Perform the following:</p> <ul style="list-style-type: none"><li>• Select 1A FDW MASTER to "POS"</li><li>• Select 1B FDW MASTER to "POS"</li></ul> <p>E. <b><u>Simultaneously</u></b> perform the following:</p> <ul style="list-style-type: none"><li>• Select 1A FDW MASTER to "AUTO"</li><li>• Select 1B FDW MASTER to "AUTO"</li></ul>

**This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **1**

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Event Description: **Control Rod Movement PT (Group 1) (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1102/004A Encl 4.1</i></p> <p><b>Crew Response:</b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"><p><b>CAUTION:</b> Adjusting THP, Tave or Delta Tc setpoint too fast can cause plant instability.</p></div> <p>2.10 <b>IF NOT</b> being controlled by another procedure, perform the following:</p> <p>2.10.1 <b>IF</b> THP (O1E2088) is <b>NOT</b> <math>\approx 885</math> psig, <u>slowly</u> adjust THP Setpoint (O1E2089) to <math>\approx 885</math> psig. (R.M.)</p> <p>2.10.2 <b>IF</b> Tave Setpoint (O1E2087) is <b>NOT</b> at <math>\approx 579^{\circ}\text{F}</math>, <u>slowly</u> adjust Tave setpoint to <math>\approx 579^{\circ}\text{F}</math>. (R.M.)</p> <p>2.10.3 <b>IF</b> Delta Tc is <b>NOT</b> <math>\approx 0.0</math>, adjust Delta Tc Setpoint (O1E2091) to <math>\approx 0.0^{\circ}\text{F}</math>. (R.M.)</p> <p>2.11 <b>IF</b> desired adjust CTP as follows: (R.M.)</p> <p>2.11.1 Review current mechanical maneuvering rates per PT/0/A/1103/020 (Power Maneuvering Predictions).</p> <p>2.11.2 <b>IF</b> desired to increase power, perform the following:</p> <p>A. <b>WHEN</b> ICS has been in full Auto (Integrated Mode) for <math>&gt; 10</math> minutes, continue at Step 2.11.3.</p> <p>2.11.3 Ensure selected "HOLD".</p> <p>2.11.4 Ensure desired setting selected ("% / MIN" or "% / HR") on "RATE" pushbuttons.</p> <p>2.11.5 Ensure desired rate selected on "RATE SET" thumbwheels.</p> <p>2.11.6 Insert desired CTPD SET using "INCREASE/DECREASE" pushbuttons.</p> <p>2.11.7 Ensure "HOLD" is <b>NOT</b> selected.</p> <p>2.11.8 <b>WHEN</b> desired CTP is achieved, return "RATE SET" thumbwheels to 0.0.</p>

**This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **2**

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Event Description: **1A CFT Low Pressure (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant Response:</u></b></p> <ul style="list-style-type: none"><li>• Statalarm 1SA-8/A-11 (Core Flood Tank A Pressure High/Low)</li><li>• OAC alarm O1A0074 (Core Flood Tank 1A Press)</li></ul> <p><b><u>Crew Response:</u></b></p> <p><b>OAC Alarm O1A0074</b></p> <p>HI-HI 1) Lower pressure per OP/1/A/1104/001 (Core Flood System)</p> <p>2) Refer to TS 3.5.1</p> <p>HI Evaluate lowering pressure per OP/1/A/1104/001</p> <p>LO Evaluate increasing pressure and/or level per OP/1/A/1104/001</p> <p>LO-LO 1) Increase pressure per OP/1/A/1104/001</p> <p>2) Refer to TS 3.5.1 (<b>N/A if CFT pressure is <math>\geq 575</math> psig</b>)</p> <p><b>Statalarm 1SA-8/A-11</b></p> <p>3.1 Refer to OP/1/A/1104/001 to adjust pressure as necessary</p> <p>3.2 Determine cause of alarm and correct</p> <p>The SRO will direct the BOP to pressurize 1A CFT with nitrogen.</p> <p><b><u>OP/1/A/1104/001 Enclosure 4.7</u></b> (Pressure Makeup to CFTs Using Nitrogen) rev 80</p> <p><b>1. Initial Conditions</b></p> <p>1.1 Verify high pressure nitrogen header in service.</p> <p>1.2 Review Limits and Precautions.</p> <div><p style="text-align: center;"><b><u>NOTE</u></b></p><p>Nitrogen regulator pressure on N-30 and N-33 should be set at 625 psig while adding nitrogen to CFTs.</p></div> <p><b>2. Procedure</b></p> <p>2.1 Notify operator to open 1N-137 (CFTs Supply). (A-2-Hallway)</p> <p><b><i>Booth Cue: When directed, open 1N-137 using MANUAL VALVES and open 1N-137 6% open and then notify the crew that 1N-137 is open.</i></b></p>

**This event is complete when 1N-137 is closed (Step 2.4), or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **2**

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Event Description: **1A CFT Low Pressure (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/001</i></p> <p><b><u>Crew response:</u></b></p> <p>2.2 <b><u>IF</u></b> required to increase pressure in 1A CFT:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>TS 3.6.3 Condition 'B' requires penetration flow path to be isolated within one hour. A check valve with flow secured through the valve is considered operable.</p></div> <p style="color: red;"><b>2.2.1 Enter Technical Specification 3.6.3 Condition 'A' and 'B'.</b></p> <p>2.2.2 Open 1N-298 (N2 FILL CORE FLOOD TANK 1A).</p> <p>2.2.3 <b><u>IF</u></b> 1N-128 (CFT 1A Supply) is closed, throttle 1N-128 (CFT 1A Supply) for a rate of <math>\leq 100</math> psig per 15 minutes (<math>\approx 6.6</math> psig/min). (A-4-409)</p> <p><b>Booth Cue: If dispatched to determine position of 1N-128, notify crew 1N-128 is throttled.</b></p> <p>2.2.4 Monitor 1A CFT pressure.</p> <p>2.2.5 <b><u>IF AT ANY TIME</u></b> ES actuation occurs, close 1N-298 (N2 FILL CORE FLOOD TANK 1A).</p> <p>2.2.6 <b><u>IF AT ANY TIME</u></b> 1N-298 fails to close, notify operator to close 1N-137 (CFTs Supply). (A-2-Hallway).</p> <p>2.2.7 <b><u>WHEN</u></b> pressurization of 1A CFT complete, close 1N-298 (N2 FILL CORE FLOOD TANK 1A).</p> <p>2.2.8 <b><u>IF</u></b> 1N-298 leaks past seat, close 1N-128 (CFT 1A Supply). (A-4-409)</p> <p>2.2.9 Evaluate exiting Technical Specification 3.6.3 Condition 'A' and 'B'.</p> <p>2.2.10 <b><u>IF</u></b> 1N-128 (CFT 1A Supply) closed in Step 2.2.8, place tag on 1N-128.</p> <p>2.3 <b><u>IF</u></b> required to increase pressure in 1B CFT: <b>(not required)</b></p> <p>2.4 Notify an operator to close 1N-137 (CFTs Supply). (A-2-Hallway)</p> <p><b>Booth Cue: When directed, close 1N-137 using MANUAL VALVES and notify crew 1N-137 is closed.</b></p> <p>2.5 Verify 1A CFT pressure stable.</p> <p>2.6 Verify 1B CFT pressure stable.</p> <p><b>Examiner Note: Event 3 should begin as the BOP closes 1N-298 (Step 2.2.7) to help ensure the OATC responds to the event.</b></p>

**This event is complete when 1N-137 is closed (Step 2.4), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **3**

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Event Description: **1A HPI Pump Sheared Shaft (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/014</i></p> <p><b><u>Plant Response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-2/B-2 (HP RCP Seal Injection Flow High/Low)</li><li>• 1SA-2/C-2 (HP Injection Pump Disch. Header Pressure High/Low)</li><li>• RC Makeup Flow ≈ 0 gpm</li><li>• RCP SI flow ≈ 0 gpm</li><li>• 1A HPI Pump amps low ≈ 10 amps</li><li>• PZR level will begin to lower and LDST level will begin to rise</li><li>• 1HP-120 throttles open due to PZR level lowering</li></ul> <p><b><u>Crew Response:</u></b></p> <p>BOP may refer to ARGs (Both ARGs direct referral to AP/14) SRO will refer to AP/1/A/1700/014</p> <p><b><i>Examiner Note: SRO may direct an RO to initiate EOP Encl 5.5 for inventory control (page 61)</i></b></p> <p><b><u>AP/1/A/1700/014</u></b> (Loss of Normal HPI Makeup and/or RCP Seal Injection) <i>rev 19</i></p> <p><b><u>Immediate Manual Actions</u></b></p> <p>3.1 <b>IAAT</b> RCP seal injection flow is lost, <b>AND</b> Component Cooling is lost, <b>THEN</b> perform the following:</p> <p>A. ___ Trip the Rx.</p> <p>B. ___ Stop <u>all</u> RCPs.</p> <p>C. ___ Initiate AP/25 (SSF EOP).</p> <p>3.2 <b>IAAT</b> loss of suction to operating HPI pumps is indicated:</p> <ul style="list-style-type: none"><li>• Motor amps low or cycling</li><li>• Discharge pressure low or cycling</li><li>• Abnormal LDST level trend</li></ul> <p><b>THEN GO TO</b> Step 3.3.</p> <p><b>RNO: GO TO</b> Step 4.7</p> <p><b><i>Examiner Note:</i></b></p> <ul style="list-style-type: none"><li>• <i>The Crew should diagnose a sheared shaft and proceed to step 4.7.</i></li><li>• <i>The Crew may place the 1A HPIP Switch in the OFF position.</i></li></ul>

**This event is complete when 1HP-31 is placed in AUTO or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **3**

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Event Description: **1A HPI Pump Sheared Shaft (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/014</i></p> <p><b><u>Crew Response:</u></b></p> <p><b><u>Subsequent Actions</u></b></p> <p>4.7 Announce AP entry using PA System.</p> <p>4.8 Verify <u>any</u> HPI pump operating.</p> <p><b><i>Examiner Note: With a sheared shaft on the 1A HPIP, Step 4.8 should be interpreted as no HPIPs operating</i></b></p> <p><b>RNO:</b> 1. ___ Close 1HP-5. 2. ___ Place 1HP-120 in HAND and close. 3. ___ Place 1HP-31 in HAND and close. 4. ___ Attempt to start the standby HPI pump. 5. ___ <b>IF</b> standby HPI pump started, <b>THEN GO TO</b> Step 4.129. 6. ___ <b>GO TO</b> Step 4.14.</p> <p><b><i>Booth Cue: If notified as FIN24 to investigate/repair the 1A HPIP and 1B HPIP failure to auto start, wait 5 minutes and report that the 1A HPIP has a sheared shaft.</i></b></p> <p><b><i>Booth Cue: If notified as an AO to investigate the 1A HPIP, wait 5 minutes and report that there are no obvious issues with 1A HPIP.</i></b></p> <p>4.129 Place 1HP-31 in HAND.</p> <p>4.130 <u>Slowly</u> open 1HP-31 in small increments until <math>\approx 8</math> gpm/RCP is achieved.</p> <p>4.131 Re-establish normal makeup through 1HP-120.</p> <p>4.132 Ensure proper operation of the Component Cooling System.</p> <p>4.133 Reduce 1HP-7 demand to 0%.</p> <p>4.134 Close 1HP-6.</p> <p><b><i>Booth Cue: If contacted as the WCC to rackout and/or tagout the 1A HPI pump, acknowledge the request. Wait 10 minutes and then use QwikStrike to remove the control power fuses from the 1A HPIP and report that the 1A HPIP has been tagged out.</i></b></p>

**This event is complete when 1HP-31 is placed in AUTO or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **3**

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Event Description: **1A HPI Pump Sheared Shaft (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p style="text-align: right;"><i>AP/1/A/1700/014</i></p> <p><b><u>Crew Response:</u></b></p> <p>4.135 Open the following:     ___ 1HP-1     ___ 1HP-2     ___ 1HP-3     ___ 1HP-4</p> <p>4.136 Open 1HP-5.</p> <p>4.137 Throttle open 1HP-7 for <math>\approx</math> 20 gpm letdown flow.</p> <p>4.138 Open 1HP-6.</p> <p>4.139 Adjust 1HP-7 for desired letdown flow.</p> <p>4.140 Open the following:     ___ 1HP-228     ___ 1HP-226     ___ 1HP-232     ___ 1HP-230</p> <p>4.141 Open 1HP-21.</p> <p>4.142 <b>IAAT</b> SEAL INLET HDR FLOW <math>\approx</math> 32 gpm, <b>THEN</b> place 1HP-31 in AUTO.</p> <p>4.143 Monitor RCP seal parameters.</p> <p>4.144 Maintain RCP seal injection flows as required.</p> <p>4.145 Log thermal cycle of 1A HPI header.</p> <p>4.146 <b>WHEN</b> conditions permit, <b>THEN EXIT</b> this procedure.</p> <hr/> <p><b><u>TS 3.5.2 HIGH PRESSURE INJECTION (HPI)</u></b></p> <p>Condition A.1 (72 hours) Restore HPI pump to OPERABLE status.</p> <hr/>

**This event is complete when 1HP-31 is placed in AUTO or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **4**

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Event Description: **Condenser Vacuum Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/027</i></p> <p><b><u>Plant Response:</u></b></p> <ul style="list-style-type: none"><li>1SA-3/A-6 (Condenser Vacuum Low) will alarm at 25" Hg</li></ul> <p><b><u>Crew Response:</u></b></p> <ul style="list-style-type: none"><li>The SRO may direct the BOP to refer to the Alarm Response Guide for 1SA-3/A-6</li><li>The SRO will enter AP/1/A/1700/027 (Loss of Condenser Vacuum)</li></ul> <p><b>1SA-3/A-6 (Condenser Vacuum Low)</b> <i>rev 064</i></p> <p>3.1 Refer to AP/1/A/1700/027 (Loss of Condenser Vacuum)</p> <p><b><u>AP/1/A/1700/027</u></b> (Loss of Condenser Vacuum) <i>rev 007</i></p> <p>4.1 Announce AP entry using the PA system.</p> <p>4.2 <b>IAAT</b> <u>both</u> of the following apply: ___ Condenser vacuum <math>\leq</math> 22" Hg ___ MODE 1 <u>or</u> 2 <b>THEN</b> trip the Rx.</p> <p>4.3 Dispatch operators to perform the following: ___ Perform Encl 5.1 (Main Vacuum Pump Alignment) ___ Look for vacuum leaks</p> <p><b>CT-1</b> 4.4 <b>Ensure <u>all</u> available Main Vacuum Pumps operating (A, B, &amp; C).</b> (Ensure the Main Vacuum Pumps are operating prior to the low vacuum Turbine trip of 21.75" Hg)</p> <p><b>Booth Cue: When contacted as an AO to perform AP/27 Encl 5.1, wait until after all MVPs are running and then use TIME COMPRESSION and call the Control Room to notify the crew that the Main Vacuum Pumps are aligned to Unit 1.</b></p> <p>4.5 Ensure 1V-186 is closed.</p> <p>4.6 Ensure Steam to Steam Air Ejector A, B, C &gt; 255 psig.</p> <p>4.7 Verify Steam Seal Header Press &gt; 1.5 psig.</p>

This event is complete when SRO reaches Step 4.10 of AP/27, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**

Scenario No.: **1**

Event No.: **4**

Page 2 of 2

Event Description: **Condenser Vacuum Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/027</i></p> <p><b><u>Crew Response:</u></b></p> <p>4.8 Ensure <u>all</u> available CCW pumps operating.</p> <p><b>Examiner Note:</b> <i>When the 4<sup>th</sup> CCW Pump is started, the LPSW Leakage Accumulator will alarm on the OAC requiring entry into TS 3.7.7 Condition B (7 days) Restore the LPSW WPS to OPERABLE status.</i></p> <p><b>Booth Cue:</b> <i>When contacted as an AO to look for vacuum leaks, wait until the 1D CCW pump is started and then report that a leak was found on the 1B Main FDW Pump pumping trap sight glass.</i></p> <p><b>Booth Cue:</b> <i>If directed as an AO to isolate the 1B FDW Pump pumping trap sight glass, <b>FIRE TIMER 11</b> to stop the vacuum leak and report that the sight glass is isolated and the vacuum leak has stopped.</i></p> <p>4.9 Verify Condensate flow <math>\geq</math> 2300 gpm</p> <p>4.10 Verify 1SSH-1 is closed</p> <p>4.11 <b>WHEN</b> condenser vacuum is stable, <b>AND</b> Encl 5.1 (Main Vacuum Pump Alignment) is complete, <b>THEN EXIT</b> this procedure</p> <p><b>Booth Cue:</b> <i>IF/when asked about the status of Encl 5.1, respond that using time compression, Encl 5.1 is complete.</i></p> <hr/> <p><b><u>TS 3.7.7 LOW PRESSURE SERVICE WATER</u></b></p> <p>Condition B (7 days) Restore the LPSW WPS to OPERABLE status.</p> <hr/>

This event is complete when SRO reaches Step 4.10 of AP/27, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **5**

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Event Description: **1A RPS Channel RC Pressure Fails High (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-1/A-6 (1A HI PRESS TRIP)</li><li>• 1SA-5/A-5 (1A RPS TROUBLE) actuates</li><li>• OAC alarm for 1A RPS RC PRESS DEV actuates</li></ul> <p><b><u>Crew response:</u></b></p> <p>Refer to ARG for 1SA-5/A5 (1A RPS TROUBLE)</p> <p>3.1 <b><u>IF</u></b> Reactor trips, <b><u>Go To</u></b> EP/1/A/1800/001 (Emergency Operating Procedure).</p> <p>3.2 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation and Information).</p> <p>3.3 Initiate Work Request for I&amp;E to investigate cause.</p> <p>Refer to ARG for 1SA-1/A-6 (1A HI PRESS TRIP)</p> <p>3.1 Check instrumentation to verify high pressure</p> <p>3.2 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation and Information)</p> <p><b>Refer to OP/1/A/1105/014</b> (Control Room Instrumentation Operation and Information) Enclosure 4.7 (Removal and Restoration of RPS Channels) <b>rev 44</b></p> <p style="text-align: right;"><b>OP/1/A/1105/014</b></p> <p><b>2. Initial Conditions</b></p> <p>2.1 Verify <b><u>one</u></b> of the following:</p> <p>2.1.1 A procedure requires RPS Channel to be placed in Trip or Bypass.</p> <p>2.1.2 Equipment failure requires RPS Channel to be placed in Trip or Bypass.</p> <p>2.2 Identify <b><u>affected</u></b> RPS Channel <b><u>1A</u></b> (1A, 1B, 1C, 1D)</p> <p><b><i>Booth Cue: After being contacted as FIN24 to investigate and repair the failure in 1A RPS Channel, if the crew delays placing the channel in Manual Bypass, call the crew as FIN24 and request the 1A RPS Channel be placed in MANUAL BYPASS to investigate and repair the failure.</i></b></p>

This event is complete when the 1A RPS Channel is placed in Manual Bypass (Step 3.1.1.C), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **5**

Page 2 of 2

Event Description: **1A RPS Channel RC Pressure Fails High (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1105/014</i></p> <p><b><u>Crew response:</u></b></p> <p><b>3. Procedure</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p><b>NOTE:</b> Placing RPS channel in Manual Bypass is preferred to minimize risk of Reactor trip.</p></div> <p>3.1 <b><u>IF</u></b> affected RPS channel is <b><u>NOT</u></b> required per TS 3.3.1, perform <b><u>one</u></b> of the following:</p> <p>3.1.1 <b><u>IF</u></b> Manual Bypass of <u>affected</u> RPS channel is desired, perform the following:</p> <ul style="list-style-type: none"><li>A. Obtain Key #314</li><li>B. Declare affected RPS Channel inoperable</li><li>C. Place affected RPS Channel MANUAL BYPASS keyswitch in "BYP" (Cab. 2, 4, 6, or 8)</li></ul> <p>3.1.2 <b><u>IF</u></b> Manual Trip of <u>affected</u> RPS channel is desired, perform the following:</p> <p><b>Examiner Note: Per the NOTE above, placing 1A RPS channel in Manual Bypass is preferred.</b></p> <p>3.2 <b><u>IF</u></b> <u>affected</u> RPS channel is required per TS 3.3.1, perform the following:</p> <p><b>Examiner Note: The 1A RPS channel is NOT required per TS since three RPS channels remain operable.</b></p> <p>3.3 <b><u>IF</u></b> RPS Channel removed from service due to equipment failure, perform the following:</p> <ul style="list-style-type: none"><li>___ Initiate Work Request</li><li>___ <b><u>IF</u></b> required per OMP 1-14 (notifications), perform appropriate notifications</li></ul> <p>3.4 <b><u>WHEN</u></b> notified by I&amp;E, restore RPS channels as follows:</p> <p><b>Examiner Note: The 1A RPS channel will remain bypassed for the remainder of the scenario.</b></p>

This event is complete when the 1A RPS Channel is placed in Manual Bypass (Step 3.1.1.C), or as directed by the Lead Examiner.



Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior						
		<p style="text-align: right;"><i>AP/1/A/1700/001</i></p> <p><b><u>Plant Response:</u></b></p> <ul style="list-style-type: none"><li>• Group 1 Rod 6 (Safety Rod) drops into the core</li><li>• Statalarm 1SA-2/A-10 (CRD GLOBAL TROUBLE)</li><li>• Statalarm 1SA-2/B-10 (CRD ASYMMETRIC ROD POSITION ERROR)</li><li>• Statalarm 1SA-2/D-9 (CRD OUT INHIBIT)</li><li>• Statalarm 1SA-4/C-1 (QUADRANT POWER TILT) (in at <b>≈ 2 minutes</b>)</li><li>• Statalarm 1SA-5/D-5 (1D RPS TROUBLE)</li><li>• Statalarm 1SA-2/C-11 (LOSS OF OAC CTP SIGNAL)</li></ul> <p><b><u>Crew Response:</u></b></p> <p>Crew should perform Plant Transient Response (PTR)</p> <ul style="list-style-type: none"><li>• OATC reports to the SRO reactor power level and direction of movement.</li><li>• The BOP reports expected AUTO Runback did not occur, and monitors RCS pressure and inventory and inserts Control Rods as needed.</li><li>• The OATC will adjust FDW and/or control rods as necessary to restore reactor power to the desired control band.</li><li>• The crew may place the Diamond and FDW Masters in HAND</li></ul> <p>SRO should enter AP/1/A/1700/001 (Unit Runback)</p> <p><b><u>AP/1/A/1700/001</u></b> (Unit Runback) <i>rev 15</i></p> <p>4.1 <b>GO TO</b> the most limiting section per the following table:</p> <table><tr><td>√</td><td><b>Section</b></td><td><b>Runback</b></td></tr><tr><td></td><td>4H</td><td>Asymmetric Control Rod (1%/min to 55%power)</td></tr></table> <p><b><u>Section 4H</u></b></p> <ol style="list-style-type: none"><li>1 <b>IAAT</b> a more limiting runback occurs, <b>THEN GO TO</b> Subsequent Actions Step 4.1.</li><li>2 <b>IAAT</b> more than one control rod is dropped <u>or</u> misaligned <math>\geq 6.5\%</math> (9") from the group average, <b>THEN</b> trip the Rx.</li></ol> <div><p style="text-align: center;"><b><u>NOTE</u></b></p><p>NIs should <b>NOT</b> be calibrated per guidelines contained in OP/1/A/1102/004 (Operation at Power) due to actual power re-distribution within the core as a result of a dropped/misaligned rod.</p></div> <ol style="list-style-type: none"><li>3 Verify Rx is critical.</li></ol>	√	<b>Section</b>	<b>Runback</b>		4H	Asymmetric Control Rod (1%/min to 55%power)
√	<b>Section</b>	<b>Runback</b>						
	4H	Asymmetric Control Rod (1%/min to 55%power)						

**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/001 Section 4H</i></p> <p><b>Crew response:</b></p> <p><b>Examiner Note: A Malfunction is set to fail the Auto runback circuit. The crew will proceed to the RNO.</b></p> <p>4. Verify power &gt; 55% when the rod was dropped <u>or</u> misaligned.</p> <p>5. Verify Rx runback to 55% <u>core thermal power</u> in progress.</p> <ul style="list-style-type: none"><li>• CTPD set at 55%</li><li>• ASYMETRIC RODS Runback Light lit</li><li>• CTP Demand decreasing</li><li>• Reactor power will decrease when the runback catches up with the initial power decrease from the dropped rod.</li></ul> <p><b>RNO:</b> 1. Initiate power reduction to <math>\leq 55\%</math> core thermal power at <math>\geq 1\%/min</math>.</p> <p>2. <b>IF</b> control rods will <u>not</u> insert manually, <b>THEN</b> perform the following:</p> <p>A. Trip reactor.</p> <p>B. <b>GO TO</b> Unit 1 EOP.</p> <p>6 Initiate Encl 5.1 (Control of Plant Equipment During Shutdown). <b>(page 20)</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b>NOTE</b></p><p>The following actions should be performed as quickly as possible due to the complexity of resetting RPS trip setpoints and Tech Spec time limits.</p></div> <p>7 Notify SPOC to perform the following:</p> <p>___ Investigate cause of dropped or misaligned control rod.</p> <p>___ <u>Prepare</u> to reduce the following trip setpoints:</p> <ul style="list-style-type: none"><li>• RPS Flux/Flow-Imbalance</li><li>• RPS High Flux</li></ul> <p>8 Notify the OSM to ensure the requirements of the following Tech Specs are met: <b>(page 22)</b></p> <p>___ TS 3.1.4 (Control Rod Group Alignment Limits)</p> <p>___ TS 3.1.5 (Safety Rod Position Limits)</p> <p>___ TS 3.2.3 (Quadrant Power Tilt)</p> <p><b>Booth Cue: When contacted as the SM to refer to TS 3.1.4 TS 3.1.5 &amp; TS 3.2.3, inform the team that the SM is occupied at Unit 3 and can NOT verify TS requirements at this time.</b></p>

**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior												
		<div>AP/1/A/1700/001 Section 4H</div> <div><b>Crew response:</b><div>9. Notify OSM to make notifications as required per OMP 1-14 (Notifications).</div><div><b>Booth Cue:</b> <i>When contacted as the SM to make notifications per OMP 1-14, state that you will refer to OMP 1-14.</i></div><div>10 Verify &gt; 1% SDM with allowance for the inoperable control rod per PT/1/A/1103/015 (Enclosure 13.18, Reactivity Balance Calculation) <u>within one hour</u>.</div><div>11 Reduce <u>core thermal power</u> ≤ the following limits, based on the number of RCPs operating, <u>within two hours</u>:<table><tr><th>RCPs</th><th>Allowable Thermal Power (% FP)</th></tr><tr><td>3</td><td>45</td></tr><tr><td><b>4</b></td><td><b>60</b></td></tr></table></div><div><div><b>NOTE</b></div><div>The following ensures adequate margin in preparation for resetting RPS trip setpoints.</div><div>12 <b>IAAT</b> the power decrease is complete, <b>AND</b> <u>any</u> NI is &gt; the following:<table><tr><th>RCPs</th><th>Maximum NI Power (% FP)</th></tr><tr><td>3</td><td>40</td></tr><tr><td><b>4</b></td><td><b>55</b></td></tr></table><div><b>THEN</b> reduce power until <u>all</u> NIs are ≤ the Maximum NI Power limit for the operating RCP combination per Encl 5.4 (Power Reduction).</div><div>13. <b>WHEN</b> all NIs are ≤ the Maximum NI Power limit for the operating RCP combination, <b>THEN</b> notify SPOC to reduce RPS trip setpoints per AM/1/A/0315/017 (TXS RPS Channel A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions)</div></div></div></div>	RCPs	Allowable Thermal Power (% FP)	3	45	<b>4</b>	<b>60</b>	RCPs	Maximum NI Power (% FP)	3	40	<b>4</b>	<b>55</b>
RCPs	Allowable Thermal Power (% FP)													
3	45													
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RCPs	Maximum NI Power (% FP)													
3	40													
<b>4</b>	<b>55</b>													

**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/001 Enclosure 5.1</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>AP/1/A/1700/001 Enclosure 5.1</u></b></p> <ol style="list-style-type: none"><li><b>IAAT</b> SRO determines all appropriate actions have been taken, <b>AND</b> the runback is complete, <b>THEN EXIT</b> this Enclosure.</li><li>Notify the WCC SRO to initiate Enclosure 5.2 (WCC SRO Support During Unit Runback;</li></ol> <p><b><i>Examiner Note: This scenario begins at 75% so steps 3 &amp; 4 have already been accomplished.</i></b></p> <ol style="list-style-type: none"><li>Start the following pumps: ___ 1A FDWP SEAL INJECTION PUMP ___ 1A FDWP AUXILIARY OIL PUMP ___ 1B FDWP AUXILIARY OIL PUMP ___ 1B FDWP SEAL INJECTION PUMP.</li><li><b>WHEN</b> CTP is <math>\leq 80\%</math>, <b>THEN</b> stop the following pumps ___ 1E1 HTR DRN PUMP ___ 1E2 HTR DRN PUMP</li><li><b>WHEN</b> CTP <math>\leq 65\%</math>, <b>THEN</b> continue this Enclosure.</li><li>Place the following in MANUAL and close: ___ 1FDW-53 ___ 1FDW-65</li></ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b> 1B FDWP is the preferred pump to shut down first.</p></div> <ol style="list-style-type: none"><li>Verify <u>both</u> Main FDWPs operating.</li><li>Verify 1B FDWP to be shut down first.</li><li>Adjust the FWP bias <u>counter-clockwise</u> to lower 1B FWP suction flow <math>\approx 1 \times 10^6</math> lb/hr &lt; 1A FWP suction flow.</li><li><b>GO TO</b> Step 12.</li><li><b>IAAT both</b> Main FDW pumps running, <b>AND both</b> of the following exist: ___ 1B Main FDW pump is first pump to be shut down ___ Any of the following alarms occur:<ul style="list-style-type: none"><li>1SA-16/A-3 (FWP B FLOW MINIMUM)</li><li>1SA-16/A-4 (FWP B FLOW BELOW MIN),</li></ul><b>THEN</b> trip 1B Main FDW Pump.</li></ol>

**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/001 Enclosure 5.1</i></p> <p><b><u>Crew response:</u></b></p> <p>13 <b>IAAT</b> <u>both</u> Main FDW pumps running, <b>AND</b> <u>both</u> of the following exist: ___ 1A Main FDW pump is first pump to be shut down ___ Any of the following alarms occur:     • 1SA-16/A-1 (FWP A FLOW MINIMUM)     • 1SA-16/A-2 (FWP A FLOW BELOW MIN), <b>THEN</b> trip 1A Main FDW Pump.</p> <p>14 <b>IAAT</b> the operating FDWP suction flow &lt; 1.5 x 10<sup>6</sup> lb/hr, <b>THEN</b> slowly throttle the associated recirc control valve to establish 2300 - 6000 gpm total Condensate flow: ___ 1FDW-53 ___ 1FDW-65</p> <p>15 Maintain Pzr level between 220"- 250".</p> <p><b>Examiner Note: The SRO should refer to Tech Specs and make the following determinations: (page 22-23)</b></p> <ul style="list-style-type: none"><li>• <b>TS 3.1.4 (Control Rod Group Alignment Limits), Condition A applies.</b></li><li>• <b>TS 3.1.5 (Safety Rod Position Limits), Condition A applies (Safety rods are in Groups 1 – 4)</b></li><li>• <b>TS 3.2.3 (Quadrant Power Tilt), Condition A applies (due to misaligned control rod) (If the highest Incore QPT exceeds +7.11 then Condition B would apply)</b></li></ul> <p>Tech Specs begin on the next page</p>

**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior																																			
		<div>AP/1/A/1700/001 Enclosure 5.1</div> <div>Crew response:</div> <div><table><tr><th colspan="6">Quadrant Power Tilt Setpoints</th></tr><tr><th rowspan="2">Core Power Level, %FP</th><th colspan="2">Steady State</th><th colspan="2">Transient</th><th>Maximum</th></tr><tr><th>0 - 30</th><th>&gt; 30</th><th>0 - 30</th><th>&gt; 30</th><th>&gt; 0</th></tr><tr><td>Full Incore</td><td>7.61</td><td>3.50</td><td>9.40</td><td>7.11</td><td>16.55</td></tr><tr><td>Out of Core</td><td>6.09</td><td>2.35</td><td>7.72</td><td>5.63</td><td>14.22</td></tr><tr><td>Backup Incore</td><td>3.87</td><td>2.25</td><td>4.81</td><td>3.63</td><td>10.07</td></tr></table><div>Referred to by TS 3.2.3</div></div> <div>Examiner Note: The SRO should refer to Tech Specs and make the following determinations:</div> <div><div>TS 3.1.5 SAFETY ROD POSITION LIMITS</div><div>Condition A (1 hour) Withdraw the rod fully</div><div>OR</div><div>(1 hour) Verify SDM is within the limit specified in the COLR</div><div>OR</div><div>(1 hour) Initiate boration to restore SDM to within limit</div><div>AND</div><div>(1 hour) Declare the rod inoperable</div></div> <div>Tech Specs are continued on the next page</div>	Quadrant Power Tilt Setpoints						Core Power Level, %FP	Steady State		Transient		Maximum	0 - 30	> 30	0 - 30	> 30	> 0	Full Incore	7.61	3.50	9.40	7.11	16.55	Out of Core	6.09	2.35	7.72	5.63	14.22	Backup Incore	3.87	2.25	4.81	3.63	10.07
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**This event is complete when Reactor power has been lowered > 10% and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **6**

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Event Description: **One Dropped Control Rod With Failure of AUTO Runback Circuit  
(C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Crew response:</u></b></p> <p><b><i>Examiner Note: The SRO should refer to Tech Specs and make the following determinations:</i></b></p> <hr/> <p><b><u>TS 3.1.4 CONTROL ROD GROUP ALIGNMENT LIMITS</u></b></p> <p>Condition A (1 hour) Restore CONTROL ROD alignment.</p> <p><u>OR</u></p> <p>(1 hour) Verify SDM is within the limit specified in the COLR</p> <p><u>OR</u></p> <p>(1 hour) Initiate boration to restore SDM to within limit</p> <p><u>AND</u></p> <p>(2 hours) Reduce THERMAL POWER to <math>\leq 60\%</math> of ALLOWABLE THERMAL POWER</p> <p><u>AND</u></p> <p>(10 hours) Reduce the nuclear overpower trip setpoints, based on flux and flux/flow imbalance, to <math>\leq 65.5\%</math> of the ALLOWABLE THERMAL POWER</p> <p><u>AND</u></p> <p>(72 hours) Verify the potential ejected rod worth is within the assumptions of the rod ejection analysis</p> <p><b><u>TS 3.2.3 QUADRANT POWER TILT</u></b></p> <p>Condition A (2 hours) Reduce THERMAL POWER <math>\geq 2\%</math> RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit</p> <p><u>AND</u></p> <p>(10 hours) Reduce nuclear overpower trip setpoints, based on flux and flux/flow imbalance, <math>\geq 2\%</math> RTP for each 1% of QPT greater than the steady state limit</p> <p><u>AND</u></p> <p>(24 hours) Restore QPT to <math>\leq</math> the steady state limit</p> <p>Condition B (30 min) Reduce THERMAL POWER <math>\geq 2\%</math> RTP from ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit</p> <p><u>AND</u></p> <p>(2 hours) Restore QPT to <math>\leq</math> to the transient limit</p> <hr/>

**This event is complete when Reactor power has been lowered  $> 10\%$  and FDW pump suction flow has been adjusted, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior										
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• Steam pressure on 1B SG begins to lower</li><li>• 1SA-2/A-9 (MS PRESSURE HIGH/LOW)</li><li>• 1SA-1/A-1, B-1, C-1, D-1, RP Channel Trip Statalarms</li><li>• ES Channels 1&amp; 2 will actuate</li><li>• 1SA-2/D-3 (RC Press High/Low)</li></ul> <p><b><u>Crew response:</u></b></p> <p><b><i>Examiner Note: The OATC will perform Immediate Manual Actions (IMAs) and the BOP will perform a Symptoms Check.</i></b></p> <p style="text-align: right;"><i>Immediate Manual Actions</i></p> <p><b><u>EOP Immediate Manual Actions</u></b> rev 01</p> <p>3.1 Depress REACTOR TRIP pushbutton</p> <p>3.2 Verify reactor power &lt; 5% FP and lowering</p> <p>3.3 Depress the turbine TRIP pushbutton</p> <p>3.4 Verify <u>all</u> turbine stop valves closed</p> <p>3.5 Verify RCP seal injection available</p> <div style="border: 1px solid red; padding: 5px; display: inline-block;"><b>Start CT-2: _____</b> <b>(See p.36 for stop time)</b></div> <p style="text-align: right;"><i>Symptoms Check</i></p>										
	OATC											
	BOP	<p>The BOP will verify the following:</p> <table><tr><td>Power Range NIs <b>NOT</b> &lt; 5% Power Range NIs <b>NOT</b> lowering</td><td>Rule 1, ATWS/Unanticipated Nuclear Power Production</td></tr><tr><td><b>Any SCM &lt; 0°F</b></td><td><b>Rule 2, Loss Of SCM</b></td></tr><tr><td>Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)</td><td>Rule 3, Loss of Main or Emerg FDW Rule 4, Initiation of HPI Forced Cooling (Inability to feed SGs and &gt; 2300 psig, NDT limit reached, or PZR level &gt; 375")</td></tr><tr><td><b>Uncontrolled Main steam line(s) pressure decrease</b></td><td><b>Rule 5, Main Steam Line Break</b></td></tr><tr><td>CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)</td><td>None (SGTR Tab is entered when identified SG Tube Leakage &gt; 25 gpm)</td></tr></table> <p>If SCM lowers to ≤ 0°F, an RO will perform Rule 2 (Loss of SCM) (page 32)</p> <p><b><i>Examiner Note: If SCM returns &gt; 0°F quickly (&lt; 2 min.), the CRS may direct the RO to re-perform Rule 2 and exit per step 1 RNO without securing RCPs.</i></b></p>	Power Range NIs <b>NOT</b> < 5% Power Range NIs <b>NOT</b> lowering	Rule 1, ATWS/Unanticipated Nuclear Power Production	<b>Any SCM &lt; 0°F</b>	<b>Rule 2, Loss Of SCM</b>	Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, Loss of Main or Emerg FDW Rule 4, Initiation of HPI Forced Cooling (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")	<b>Uncontrolled Main steam line(s) pressure decrease</b>	<b>Rule 5, Main Steam Line Break</b>	CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)
Power Range NIs <b>NOT</b> < 5% Power Range NIs <b>NOT</b> lowering	Rule 1, ATWS/Unanticipated Nuclear Power Production											
<b>Any SCM &lt; 0°F</b>	<b>Rule 2, Loss Of SCM</b>											
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, Loss of Main or Emerg FDW Rule 4, Initiation of HPI Forced Cooling (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")											
<b>Uncontrolled Main steam line(s) pressure decrease</b>	<b>Rule 5, Main Steam Line Break</b>											
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)											

**This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior												
	SRO	<div>LOSCM Tab</div> <p>An RO will perform Rule 5 (Main Steam Line Break) (page 36)</p> <p>SRO will review IMAs and transfer to the Subsequent Actions Tab.</p> <p><b>Crew Response:</b></p> <p>SRO will review the Subsequent Action Tab Parallel Action (Yellow) page (page 72) and transfer to the Loss of SCM Tab (LOSCM tab).</p> <p>If SCM is ≤ 0°F, the SRO will transfer to the LOSCM tab</p> <p><b>LOSCM Tab</b> rev 01</p> <ol style="list-style-type: none"><li>1. Ensure Rule 2 (Loss of SCM) is in progress or complete (page 32)</li><li>2. Verify LOSCM caused by excessive heat transfer</li><li>3. Verify EHT tab has been performed</li></ol> <p><b>RNO: GO TO EHT tab</b></p> <div>EHT Tab</div> <p><b>EHT Tab</b> rev 00</p> <p>SRO will review the EHT Tab Parallel Action (Yellow) page (page 73) and determine that ES has actuated and direct the OATC to perform Encl. 5.1 ES Actuation (page 52)</p> <p><b>Excessive Heat Transfer (EHT) Tab</b> rev 0</p> <ol style="list-style-type: none"><li>1. Verify any SG pressure &lt; 550 psig. [1A SG should be &lt; 550 psig at this point]</li><li>2. Ensure Rule 5 (Main Steam Line Break) in progress or complete.</li><li>3. Place the following in HAND and decrease demand to zero on all affected SGs:</li></ol> <table><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-32</td><td></td><td>1FDW-41</td></tr><tr><td></td><td>1FDW-35</td><td></td><td>1FDW-44</td></tr></table>		1A SG		1B SG		1FDW-32		1FDW-41		1FDW-35		1FDW-44
	1A SG		1B SG											
	1FDW-32		1FDW-41											
	1FDW-35		1FDW-44											

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior																																																				
		<p style="text-align: right;"><i>EHF Tab</i></p> <p><b>Crew Response:</b></p> <p>4. Close the following on <u>all affected</u> SGs:</p> <table border="1"><thead><tr><th></th><th><b>1A SG</b></th><th></th><th><b>1B SG</b></th></tr></thead><tbody><tr><td></td><td>1FDW-372</td><td></td><td>1FDW-382</td></tr><tr><td></td><td>1MS-17</td><td></td><td>1MS-26</td></tr><tr><td></td><td>1MS-79</td><td></td><td>1MS-76</td></tr><tr><td></td><td>1MS-35</td><td></td><td>1MS-36</td></tr><tr><td></td><td>1MS-82</td><td></td><td>1MS-84</td></tr><tr><td></td><td>1FDW-368</td><td></td><td>1FDW-369</td></tr></tbody></table> <p>5. Verify level in <u>both</u> SGs &lt; 96% O.R.</p> <p>6. <b>IAAT</b> <u>core</u> SCM is &gt; 0°F, <b>THEN</b> perform Steps 7 and 8</p> <p><b>RNO: GO TO</b> Step 9</p> <p>7. Throttle HPI per Rule 6 (HPI) (<b>page 69</b>)</p> <p>8. Verify letdown in service</p> <p><b>RNO: IF</b> desired to restore letdown, <b>THEN</b> initiate Encl 5.5 (Pzr and LDST Level Control). (<b>page 61</b>)</p> <p>9. Verify <u>any</u> SG has an intact secondary boundary (intact SG) <b>[1A SG is intact]</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b>NOTE</b></p><p>If only one SG is intact and has been isolated for SGTR, the following steps will unisolate and use it for heat removal.</p></div> <p>10. Open the following on <u>all intact</u> SGs:</p> <table border="1"><thead><tr><th>✓</th><th><b>1A SG</b></th><th>✓</th><th><b>1B SG</b></th></tr></thead><tbody><tr><td></td><td>1FDW-372</td><td></td><td>1FDW-382</td></tr><tr><td></td><td>1FDW-368</td><td></td><td>1FDW-369</td></tr><tr><td></td><td>1MS-17</td><td></td><td>1MS-26</td></tr></tbody></table> <p>11. Start MDEFDWP associated with <u>all intact</u> SGs:</p> <table border="1"><thead><tr><th>✓</th><th><b>1A SG</b></th><th>✓</th><th><b>1B SG</b></th></tr></thead><tbody><tr><td></td><td>1A MDEFDWP</td><td></td><td>1B MDEFDWP</td></tr></tbody></table> <p><b>RNO: Start TDEFDWP</b></p>		<b>1A SG</b>		<b>1B SG</b>		1FDW-372		1FDW-382		1MS-17		1MS-26		1MS-79		1MS-76		1MS-35		1MS-36		1MS-82		1MS-84		1FDW-368		1FDW-369	✓	<b>1A SG</b>	✓	<b>1B SG</b>		1FDW-372		1FDW-382		1FDW-368		1FDW-369		1MS-17		1MS-26	✓	<b>1A SG</b>	✓	<b>1B SG</b>		1A MDEFDWP		1B MDEFDWP
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This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EHT Tab</i></p> <p><b><u>Crew Response:</u></b></p> <p>12. Feed and steam <u>all intact</u> SGs to stabilize RCS P/T using <u>either</u>:</p> <ul style="list-style-type: none"><li>• TBVs</li><li>• Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs)</li></ul> <p>13. <b>GO TO</b> Step 32</p> <p>32. Verify <u>any</u>:</p> <p>___ HPI has operated in the injection mode while <b>NO</b> RCPs were operating</p> <p>___ A cooldown below 400°F at &gt; 100°F/hr has occurred</p> <p><b>RNO: GO TO</b> Step 34</p> <p>33. Initiate Rule 8 (Pressurized Thermal Shock (PTS) <b>(page 70)</b>)</p> <p>34. Verify <u>both</u> closed:</p> <p>___ 1MS-24</p> <p>___ 1MS-33</p> <p>35. Open 1AS-8</p> <p>36. Close 1SSH-9</p> <p>37. Perform notifications:</p> <p>___ Notify Chemistry to determine RCS boron concentration</p> <p>___ Notify Secondary Chemistry to check for indications of SGTR</p> <p>___ Notify RP to check for indications of SGTR</p> <p>38. <b>IAAT</b> RCS boron is determined to be insufficient for adequate SDM <b>THEN</b> initiate Encl 5.11 (RCS Boration)</p> <p>39. <b>IAAT</b> <u>all</u> exist:</p> <p>___ ES Bypass Permit satisfied</p> <p>___ <u>All</u> SCMs &gt; 0°F</p> <p>___ RCS pressure controllable</p> <p><b>THEN</b> perform Steps 40 - 41</p> <p><b>RNO: GO TO</b> Step 42</p>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EHF Tab</i></p> <p><b><u>Crew Response:</u></b></p> <p>40. Bypass <u>applicable</u> ES: To Bypass HPI: ___ Bypass HPI ES CH A,B,C To Bypass LPI: ___ Bypass LPI ES CH A,B,C</p> <p>41. Bypass <u>applicable</u> Diverse ES: To Bypass HPI: ___ Bypass Diverse HPI To Bypass LPI: ___ Bypass Diverse LPI</p> <p><b>RNO: IF <u>applicable</u> Diverse actuation circuit fails to bypass, THEN place the <u>applicable</u> Diverse actuation circuit to OVERRIDE.</b></p> <p>42. Verify <u>any</u> SG is dry.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• Minimizing SCM reduces tensile stress on the SG</li><li>• PORV should be used if Pzr spray is not available</li><li>• Procedure progression may continue when actions to minimize SCM are in progress</li></ul></div> <p>43. Maintain minimum SCM using the following methods <u>as necessary</u>: ___ De-energize <u>all</u> Pzr heaters ___ Use Pzr spray ___ Throttle HPI to maintain Pzr level &gt; 100" [180" acc] ___ Use PORV</p> <p>44. Verify <u>any</u> RCP operating</p> <p><b>RNO: GO TO Step 46.</b></p> <p>45. Maintain RCP NPSH</p> <ul style="list-style-type: none"><li>• OAC</li><li>• Encl 5.18 (P/T Curves)</li></ul>

**This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EHF Tab</i></p> <p><b><u>Crew Response:</u></b></p> <p>46. Initiate Encl 5.16 (SG Tube-to-Shell <math>\Delta T</math> Control) (page 71)</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"><p><b><u>NOTE</u></b></p><p>RCP 1A1 provides the best Pzr spray</p></div> <p>47. <b>IAAT</b> <u>all</u> exist:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> &lt; one RCP operating in <u>any</u> loop</li><li><input type="checkbox"/> All SCMs &gt; 0°F</li><li><input type="checkbox"/> RCP available in an idle loop</li></ul> <p><b>THEN</b> initiate Encl 5.6 (RCP Restart) to start one RCP in each idle loop</p> <p>48. <b>IAAT</b> <u>all</u> exist:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> RBS actuated</li><li><input type="checkbox"/> RB pressure &lt; 10 psig</li><li><input type="checkbox"/> 1RIA-57 <b>NOT</b> in alarm</li><li><input type="checkbox"/> 1RIA-58 <b>NOT</b> in alarm</li></ul> <p><b>THEN</b> stop <u>both</u> RBS pumps.</p> <p>49. <b>IAAT</b> Tcold approaches 470°F, <b>AND</b> <u>all</u> RCPs are operating, <b>THEN</b> ensure &lt; four RCPs are operating</p> <p>50. <b>IAAT</b> BWST level is <math>\leq 19'</math>, <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES)</p> <p>51. Verify <u>all</u> SCMs &gt; 0°F</p> <p>52. Verify indications of SGTR <math>\geq 25</math> gpm.</p> <p><b>RNO: GO TO</b> Step 54</p> <p>54. Verify required RCS makeup flow within normal makeup capability</p> <p>55. Verify <u>either</u>:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> <u>Any</u> SG isolated</li><li><input type="checkbox"/> <u>Any</u> SG has an unisolable steam leak</li></ul> <p>56. <b>GO TO</b> FCD tab</p>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Forced Cooldown Tab (FCD)</i></p> <p><b><u>Crew Response:</u></b></p> <p><b>Forced Cooldown Tab</b> <span style="color: red;">rev 0</span></p> <ol style="list-style-type: none"><li><b>IAAT</b> cooldown rate <b>CANNOT</b> be controlled within Tech Spec limits:<ul style="list-style-type: none"><li>Tcold ≥ 270°F: ≤ 50°F / ½ hr</li><li>Tcold &lt; 270°F: ≤ 25°F / ½ hr</li></ul><b>THEN GO TO EHT tab</b></li><li>Verify letdown in service</li></ol> <p><b>RNO:</b></p> <ol style="list-style-type: none"><li>Ensure CC System in operation</li><li><b>IF</b> 1A Letdown Cooler available, <b>THEN</b> open the following: ___ 1HP-1 ___ 1HP-3</li><li><b>IF</b> 1B Letdown Cooler available, <b>THEN</b> open the following: ___ 1HP-2 ___ 1HP-4</li><li>Close the following: ___ 1HP-6 ___ 1HP-7</li><li>Open 1HP-5</li><li>Adjust 1HP-7 for ≈ 20 gpm letdown</li><li>Open 1HP-6</li><li>Adjust 1HP-7 to control desired letdown flow</li></ol> <ol style="list-style-type: none"><li>Establish and maintain appropriate level per Rule 7 (SG Feed Control) <u>and</u> pressure in <u>available intact</u> SGs</li><li><b>IAAT</b> Tcold approaches 470°F, <b>THEN</b> ensure &lt; four RCPs operating</li></ol>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior												
		<div>Forced Cooldown Tab</div> <div>Crew Response:</div> <div>5 IAAT Tcold approaches 300°F, THEN ensure &lt; three RCPs operating</div> <div>6. IAAT all the following exist: __ ES Bypass Permit satisfied __ All SCMs &gt; 0°F __ RCS pressure controllable THEN perform Steps 7 - 8</div> <div>7. Bypass applicable ES: To Bypass HPI: __ Bypass HPI ES CH A,B,C To Bypass LPI: __ Bypass LPI ES CH A,B,C</div> <div>8. Bypass applicable Diverse ES: To Bypass HPI: __ Bypass Diverse HPI To Bypass LPI: __ Bypass Diverse LPI</div> <div>9. IAAT any SG is &lt; 700 psig, AND AFIS is NOT actuated on that SG, THEN select OFF on both Digital Channels 1&amp;2 for that header:<table><tr><td>√</td><td>A Header</td><td>√</td><td>B Header</td></tr><tr><td></td><td>DIG CH 1 OFF</td><td></td><td>DIG CH 1 OFF</td></tr><tr><td></td><td>DIG CH 2 OFF</td><td></td><td>DIG CH 2 OFF</td></tr></table></div> <div>10. Stabilize RCS temperature</div> <div>11. Close 1HP-26</div> <div>12. Stop 1C HPI pump</div> <div>13. Adjust 1HP-120 for desired setpoint</div>	√	A Header	√	B Header		DIG CH 1 OFF		DIG CH 1 OFF		DIG CH 2 OFF		DIG CH 2 OFF
√	A Header	√	B Header											
	DIG CH 1 OFF		DIG CH 1 OFF											
	DIG CH 2 OFF		DIG CH 2 OFF											

**This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><b>RULE 2</b></p> <p><b><u>Crew Response:</u></b></p> <p><b>Rule 2 (Loss of SCM) rev 01</b></p> <p>1. <b>IAAT</b> <u>all</u> exist:</p> <p>___ <u>Any</u> SCM <math>\leq 0^{\circ}\text{F}</math></p> <p>___ Rx power <math>\leq 1\%</math></p> <p>___ <math>\leq 2</math> minutes elapsed since loss of SCM</p> <p><b>THEN</b> perform Steps 2 and 3</p> <p><b>RNO: IF</b> all SCMs <math>&gt; 0^{\circ}\text{F}</math>, <b>THEN:</b></p> <p>A. Obtain CRS concurrence to exit Rule 2.</p> <p>B. <b>EXIT</b> Rule 2.</p> <p><b>Examiner Note: If SCM returns <math>&gt; 0^{\circ}\text{F}</math> quickly (<math>&lt; 2</math> min.), the CRS may direct the RO to re-perform Rule 2 and exit per step 1 RNO without securing RCPs.</b></p> <p>2. Stop <u>all</u> RCPs</p> <p>3. Notify CRS of RCP status</p> <p>4. Verify Blackout exists</p> <p><b>RNO: GO TO</b> Step 6</p> <p>6. Open 1HP-24 and 1HP-25</p> <p>7. Start <u>all available</u> HPI pumps</p> <p>8. <b>GO TO</b> Step 13</p> <p>13. Open 1HP-26 and 1HP-27</p> <p>14. Verify <u>at least two</u> HPI pumps are operating using two diverse indications</p>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.





Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><b>RULE 2</b></p> <p><b><u>Crew Response:</u></b></p> <p>19. Perform <u>both</u>:</p> <p>    ___ Place ES CH 1 in MANUAL.</p> <p>    ___ Place ES CH 2 in MANUAL</p> <p>20. Throttle HPI to maximize flow ≤ flow limit</p> <p>21. Notify CRS of HPI status</p> <p>22. Verify RCS pressure &gt; 550 psig</p> <p>23. <b>IAAT</b> <u>either</u> exists:</p> <p>    ___ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm</p> <p>    ___ <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm</p> <p>    <b>THEN GO TO</b> Step 24</p> <p><b>RNO: GO TO</b> Step 35</p> <p>35. <b>IAAT</b> TBVs are unavailable, <b>THEN</b>:</p> <p>    ___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs)</p> <p>    ___ Notify CRS that ADVs are being aligned for use</p> <p>36. Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit</p> <p><b>RNO:</b> Select OFF for <u>both</u> digital channels on AFIS HEADER A</p> <p>37. Verify 1SA-2/D-8 (AFIS HEADER B INITIATED) lit</p> <p>38. Verify <u>any</u> EFDW pump operating</p> <p><b>RNO:</b> Place in MANUAL <u>and</u> close:</p> <p>    ___ 1FDW-315            ___ 1FDW-316</p> <p>39. Start MD EFDW pumps on <u>all intact</u> SGs:</p> <p>    ___ 1A MD EFDWP      ___ 1B MD EFDWP</p> <p>40. Verify <u>any</u> EFDW pump operating</p> <p>41. Verify <u>both</u> SGs <u>intact</u></p> <p><b>RNO:</b> 1. Establish 450 gpm EFDW flow to the <u>intact</u> SG</p> <p>        2. <b>GO TO</b> Step 43</p> <p>43. Verify <u>both</u> MD EFDWPs operating</p> <p><b>RNO:</b> 1. <b>IF</b> 1 TD EFDW PUMP is operating, <b>OR NO</b> Main FDW pumps operating, <b>THEN GO TO</b> Step 45</p> <p>        2. <b>GO TO</b> Step 47</p>

**This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><b>RULE 2</b></p> <p><b><u>Crew Response:</u></b></p> <p>45. Trip <u>both</u> Main FDW pumps</p> <p>46. Place FDW block valve switches in CLOSE: ___ 1FDW-33 ___ 1FDW-31 ___ 1FDW-42 ___ 1FDW-41</p> <div style="border: 1px solid black; padding: 5px;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• SG levels must continue to increase until the SG Level Control Point is reached</li><li>• If Main FDW is feeding any SG, Rule 7 provides a different SG Level Control Point</li><li>• TS cooldown rates are <math>\leq 50^{\circ}\text{F}/\frac{1}{2}</math> hr when <math>T_{\text{cold}} \geq 270^{\circ}\text{F}</math> and <math>\leq 25^{\circ}\text{F}/\frac{1}{2}</math> hr when <math>T_{\text{cold}} &lt; 270^{\circ}\text{F}</math></li></ul></div> <p>47. Begin feeding <u>all intact</u> SGs to the appropriate SG Level Control Point in Rule 7 (SG Feed Control) using available feed sources; EFDW/Main FDW</p> <p>48. <b>IAAT</b> SG Level Control Point is reached, <b>THEN</b> maintain SG Level Control Point by feeding and steaming as necessary</p> <p>49. Notify CRS of SG feed status</p> <div style="border: 1px solid black; padding: 5px;"><p style="text-align: center;"><b><u>CAUTION</u></b></p><p>If 1 TD EFDW PUMP is being used for SG feed and Unit 1 is supplying the Auxiliary Steam header, reducing SG pressure below <math>\approx 250</math> psig can result in reduced pumping capability.</p></div> <p>50. <b>IAAT</b> SG pressure is <math>&gt;</math> RCS pressure, <b>THEN</b> reduce SG pressure <math>&lt;</math> RCS pressure using <u>either</u>: ___ TBVs ___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs)</p> <p>51. Verify <u>any</u> Main FDW pump operating</p> <p><b>RNO: GO TO</b> Step 58</p> <p>58. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete</p> <p>59. <b>WHEN</b> directed by CRS, <b>THEN EXIT</b></p>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior																																								
	<b>CT-2</b>	<div style="text-align: right;"><b>RULE 5</b></div> <p><b>Crew Response:</b></p> <p><b>Rule 5 (Main Steam Line Break) rev 01</b></p> <div style="border: 1px solid red; padding: 5px; float: right;">CT-2 Stop: _____</div> <p>1. Perform on <u>affected</u> headers:</p> <table border="1" style="width: 100%;"><thead><tr><th>√</th><th>A Header</th><th>√</th><th>B Header</th></tr></thead><tbody><tr><td></td><td>On AFIS HEADER A, depress CH. 1 INIT.</td><td></td><td>On AFIS HEADER B, depress CH. 1 INIT.</td></tr><tr><td></td><td>On AFIS HEADER A, depress CH. 2 INIT.</td><td></td><td>On AFIS HEADER B, depress CH. 2 INIT.</td></tr><tr><td></td><td>Select OFF for 1A MD EFDWP.</td><td></td><td>Select OFF for 1B MD EFDWP.</td></tr><tr><td></td><td>Trip <u>both</u> Main FDWPTs.</td><td></td><td>Trip <u>both</u> Main FDWPTs.</td></tr><tr><td></td><td>Close 1FDW-315.</td><td></td><td>Close 1FDW-316.</td></tr><tr><td></td><td>Place 1FDW-33 switch to CLOSE.</td><td></td><td>Place 1FDW-42 switch to CLOSE.</td></tr><tr><td></td><td>Place 1FDW-31 switch to CLOSE.</td><td></td><td>Place 1FDW-40 switch to CLOSE.</td></tr><tr><td></td><td>Close 1PSW-22.</td><td></td><td>Close 1PSW-24.</td></tr><tr><td></td><td>Close 1PSW-23.</td><td></td><td>Close 1PSW-25.</td></tr></tbody></table> <p><i>(Isolate the SG that is overcooling the RCS. Manually actuate AFIS within 10 minutes of the MSLB to isolate the SG and limit the overcooling)</i></p> <p>2. Verify 1 TD EFDW PUMP operating.</p> <p><b>RNO:</b> 1. IF MD EFDWP for the <u>intact</u> SG is operating, <b>THEN GO TO</b> Step 5. <b>[IT WILL NOT BE OPERATING]</b></p> <p>2. Start 1 TD EFDW PUMP</p> <p>3. Verify 1 TD EFDW PUMP is feeding <u>affected</u> SGs <b>[1FDW-315 is closed]</b></p> <p><b>RNO:</b> <b>GO TO</b> Step 5</p> <p>5. Verify 1B SG is an <u>affected</u> SG</p> <p><b>RNO:</b> <b>GO TO</b> Step 7</p> <p>6. Open 1AS-40 while closing 1MS-47</p>	√	A Header	√	B Header		On AFIS HEADER A, depress CH. 1 INIT.		On AFIS HEADER B, depress CH. 1 INIT.		On AFIS HEADER A, depress CH. 2 INIT.		On AFIS HEADER B, depress CH. 2 INIT.		Select OFF for 1A MD EFDWP.		Select OFF for 1B MD EFDWP.		Trip <u>both</u> Main FDWPTs.		Trip <u>both</u> Main FDWPTs.		Close 1FDW-315.		Close 1FDW-316.		Place 1FDW-33 switch to CLOSE.		Place 1FDW-42 switch to CLOSE.		Place 1FDW-31 switch to CLOSE.		Place 1FDW-40 switch to CLOSE.		Close 1PSW-22.		Close 1PSW-24.		Close 1PSW-23.		Close 1PSW-25.
√	A Header	√	B Header																																							
	On AFIS HEADER A, depress CH. 1 INIT.		On AFIS HEADER B, depress CH. 1 INIT.																																							
	On AFIS HEADER A, depress CH. 2 INIT.		On AFIS HEADER B, depress CH. 2 INIT.																																							
	Select OFF for 1A MD EFDWP.		Select OFF for 1B MD EFDWP.																																							
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	Place 1FDW-33 switch to CLOSE.		Place 1FDW-42 switch to CLOSE.																																							
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	Close 1PSW-22.		Close 1PSW-24.																																							
	Close 1PSW-23.		Close 1PSW-25.																																							

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><b>RULE 5</b></p> <p><b>Crew Response:</b></p> <p>7. <b>WHEN</b> overcooling is stopped, <b>THEN</b> adjust steaming of <u>unaffected</u> SG to maintain CETCs constant using <u>either</u>:</p> <p>___ TBVs</p> <p>___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs)</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b>CAUTION</b></p><p>Thermal shock conditions may develop if HPI is <b>NOT</b> throttled and RCS pressure <b>NOT</b> controlled.</p></div> <p>8. <b>WHEN</b> <u>all</u> exist:</p> <p>___ <u>Core</u> SCM &gt; 0°F</p> <p>___ Rx power ≤ 1%</p> <p>___ Pzr level increasing</p> <p><b>THEN</b> continue</p> <p>9. Verify ES HPI actuated</p> <p>10. Place Diverse HPI in BYPASS</p> <p><b>RNO:</b> Place Diverse HPI in OVERRIDE</p> <p>11. Perform <u>both</u>:</p> <p>___ Place ES CH 1 in MANUAL</p> <p>___ Place ES CH 2 in MANUAL</p> <p>12. Perform the following to stabilize RCS P/T:</p> <p>___ Throttle HPI</p> <p>___ Reduce 1HP-120 setpoint to control at &gt;100" [180" acc]</p> <p>___ Adjust steaming of <u>unaffected</u> SG as necessary to maintain CETCs constant</p> <p>13. <b>WHEN</b> CETCs have stabilized, <b>THEN</b> resume use of Tc for RCS temperature control</p> <p>14. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete <b>(page 38)</b></p> <p>15. Ensure Rule 8 (Pressurized Thermal Shock (PTS) is in progress or complete <b>(page 70)</b></p> <p>16. <b>WHEN</b> directed by CRS, <b>THEN EXIT</b></p>

**This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **1**Event No.: **7**

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Event Description: **1B Main Steam Line Break Outside RB (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><b>RULE 3</b> Rev 1</p> <p><b><u>Crew Response:</u></b></p> <p><b>Rule 3 (Loss of Main of Emergency FDW)</b></p> <p>1. Verify loss of MFDW and/or EFDW was due to <u>any</u> of the following:</p> <p>___ Turbine Building Flooding</p> <p>___ Actions taken to increase SG level due to Turbine Building Flooding</p> <p><b>RNO: GO TO Step 3</b></p> <p>3. <b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency/PSW), <b>AND</b> <u>any</u> of the following exist:</p> <p>___ RCS pressure reaches 2300 psig <b>OR</b> NDT limit</p> <p>___ Pzr level reaches 375" [340" acc]</p> <p><b>THEN PERFORM</b> Rule 4 (Initiation of HPI Forced Cooling)</p> <p>4. Start <u>operable</u> EFDW pumps, as required, to feed all <u>intact</u> SGs</p> <p>5. Verify <u>any</u> EFDW pump operating</p> <p>6. <b>GO TO</b> Step 38</p> <p>38. <b>IAAT</b> an EFDW valve <b>CANNOT</b> control in AUTO, <b>OR</b> manual operation of EFDW valve is desired to control flow/level, <b>THEN</b> perform Steps 39 - 43</p> <p><b>RNO: GO TO Step 44</b></p> <p>44. Verify <u>any</u> SCM <math>\leq 0^{\circ}\text{F}</math></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>CAUTION</u></b></p><p>ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling</p></div> <p><b>RNO: IF</b> overcooling, <b>OR</b> exceeding limits in Rule 7 (SG Feed Control), <b>THEN</b> throttle EFDW, as necessary</p> <p>45. <b>IAAT</b> Unit 1 EFDW is in operation, <b>THEN</b> initiate Encl 5.9 (Extended EFDW Operation) <b>(page 39)</b></p> <p>46. <b>WHEN</b> directed by CRS, <b>THEN EXIT</b></p>

This event is complete when the crew has transferred to the FCD tab (page 29), or as directed by the Lead Examiner.

## Enclosure 5.9

## Extended EFDW Operation Rev 1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
1. ___ Monitor EFDW parameters on EFW graphic display.									
2. ___ <b>IAAT</b> UST level is < 4', <b>THEN GO TO</b> Step 120.									
3. ___ <b>IAAT</b> feeding <u>both</u> SGs with one MD EFDWP is desired, <b>THEN</b> perform Steps 4 - 7.	___ <b>GO TO</b> Step 8.								
4. Place EFDW control valve on SG with <b>NO</b> EFDW flow to MANUAL and closed: <table><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>		1A SG		1B SG		1FDW-315		1FDW-316	
	1A SG		1B SG						
	1FDW-315		1FDW-316						
5. Locally open: ___ 1FDW-313 (1A EFDW Line Disch To 1A S/G X-Conn) (T-1, 1' N of M-16, 18' up) ___ 1FDW-314 (1B EFDW Line Disch To 1B S/G X-Conn) (T-1, 3' S of M-24, 10' up)									
6. ___ Ensure a MD EFDWP is operating.									
7. Throttle EFDW control valve on SG with <b>NO</b> EFDW flow to establish appropriate level per Rule 7 (SG Feed Control): <table><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>		1A SG		1B SG		1FDW-315		1FDW-316	
	1A SG		1B SG						
	1FDW-315		1FDW-316						
8. Perform as required to maintain UST level > 7.5': ___ Makeup with demin water. ___ Place CST pumps in AUTO.									
9. ___ <b>IAAT</b> <u>all</u> exist: ___ Rapid cooldown <b>NOT</b> in progress ___ MD EFDWP operating for each <u>available</u> SG ___ EFDW flow in <u>each</u> header < 600 gpm <b>THEN</b> place 1 TD EFDW PUMP switch in PULL TO LOCK.									

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. __ Verify 1 TD EFDW PUMP operating.	__ GO TO Step 12.
11. __ Start TD EFDWP BEARING OIL COOLING PUMP.	
<div><p style="text-align: center;"><b>NOTE</b></p><ul style="list-style-type: none"><li>• Loss of the condensate system for <math>\geq 25</math> minutes results in cooling down to LPI using the ADVs. If <b>NO</b> HWPs are operating, continuing this enclosure to restore the condensate system is a priority <u>unless</u> the CR SRO deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open.</li><li>• If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.</li></ul></div>	
12. __ Notify CR SRO to set priority based on the NOTE above <u>and</u> EOP activities.	
13. __ <b>IAAT</b> it is determined that condensate flow <b>CANNOT</b> be restored within 25 minutes, <b>THEN GO TO</b> Step 90.	
14. __ Verify <u>any</u> HWP operating.	1. __ Place <u>all</u> CBP control switches to OFF. 2. __ <b>GO TO</b> Step 20.
15. __ Verify <u>any</u> CBP operating.	1. __ <b>IF</b> AP/11 restarted a HWP, <b>THEN GO TO</b> Step 22. 2. __ <b>GO TO</b> Step 41.
16. __ Verify 1C COND BOOSTER PUMP operating. {12}	1. __ Ensure <u>only one</u> CBP is operating. 2. __ <b>GO TO</b> Step 18.
17. Stop: {12} __ 1A COND BOOSTER PUMP __ 1B COND BOOSTER PUMP	
18. __ Ensure <u>only one</u> HWP is operating.	
19. __ <b>GO TO</b> Step 44.	



## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20. <input type="checkbox"/> Verify a loss of power event caused the loss of the secondary system.	<input type="checkbox"/> <b>GO TO</b> Step 24.
21. <input type="checkbox"/> <u>Ensure</u> AP/11 (Recovery From Loss of Power) is in progress.	
22. <input type="checkbox"/> <b>WHEN</b> AP/11 (Recovery From Loss of Power) has restored 600v load centers, <b>AND</b> a HWP is operating, <b>THEN</b> dispatch an operator to start <u>all</u> CBP Aux Oil Pumps. (T-1/J-21)	
23. <input type="checkbox"/> <b>WHEN</b> notified that <u>all</u> CBP Aux Oil pumps are operating, <b>THEN GO TO</b> Step 41.	
24. <input type="checkbox"/> Place <u>all</u> HWP control switches to OFF.	
25. <input type="checkbox"/> Place <u>all</u> CBP control switches to OFF.	
26. Place valve switches to close until valve travel is initiated: <input type="checkbox"/> 1FDW-4 <input type="checkbox"/> 1FDW-9	<input type="checkbox"/> Continue.
27. Start: <input type="checkbox"/> 1A FDWP AUXILIARY OIL PUMP <input type="checkbox"/> 1B FDWP AUXILIARY OIL PUMP	Start as necessary: <input type="checkbox"/> 1A FDWP EMERGENCY BRNG OIL PUMP <input type="checkbox"/> 1B FDWP EMERGENCY BRNG OIL PUMP
28. Verify <u>both</u> : <input type="checkbox"/> FWPT A BRG LUBE OIL PRESS > 4 psig <input type="checkbox"/> FWPT B BRG LUBE OIL PRESS > 4 psig	1. <input type="checkbox"/> <b>IF both</b> FDW pumps have BRG LUBE OIL PRESS < 4 psig, <b>THEN GO TO</b> Step 90. 2. Perform for the FDW pump that has BRG LUBE OIL PRESS < 4 psig: <input type="checkbox"/> Close 1FDW-1 for 1A FDW pump. <input type="checkbox"/> Close 1FDW-6 for 1B FDW pump.
29. Place in MANUAL <u>and</u> close: <input type="checkbox"/> 1FDW-53 <input type="checkbox"/> 1FDW-65	

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. ___ Place 1C-10 FAIL SWITCH in MANUAL.	
31. ___ Close 1C-10.	
32. ___ Make plant page to clear basement and third floor of non-essential personnel.	
33. ___ Start <u>one</u> HWP.	
34. ___ Verify < 25 minutes elapsed since loss of condensate.	1. ___ Stop <u>all</u> HWPs. 2. ___ <b>GO TO</b> Step 90.
35. ___ Throttle 1C-10 controller 10% open to satisfy 25 minute system restart criteria.	
36. ___ <b>WHEN</b> FWP SUCT HDR PRESS (1VB3) is $\geq$ 100 psig, <b>THEN</b> open 1C-10.	
37. ___ Place 1C-10 FAIL SWITCH in FAIL OPEN.	
38. ___ Dispatch an operator to start <u>all</u> CBP Aux Oil Pumps. (T-1/J-21)	
39. Maximize total recirc flow < 1200 gpm with <u>one</u> of the following: ___ 1FDW-53 ___ 1FDW-65	
40. ___ <b>WHEN</b> five minutes have elapsed, <b>AND</b> notified that <u>all</u> CBP Aux Oil pumps are operating, <b>THEN</b> continue procedure.	
41. ___ Start a second HWP.	
42. ___ Start 1C COND BOOSTER PUMP. {12}	___ Start <u>one</u> available CBP.
43. ___ Stop <u>one</u> operating HWP.	
44. ___ Place control switch for <u>one</u> secured HWP in AUTO.	
45. ___ Place control switch for <u>one</u> secured CBP in AUTO.	

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
46. <input type="checkbox"/> Perform the following: <input type="checkbox"/> Position HWP LOAD SHED DEFEAT switch to a running HWP. <input type="checkbox"/> Position CBP LOAD SHED DEFEAT switch to a running CBP.	
47. Place in MANUAL: <input type="checkbox"/> 1FDW-53 <input type="checkbox"/> 1FDW-65	
48. Establish 2300 - 6000 gpm total recirc flow with <u>one</u> of the following: <input type="checkbox"/> 1FDW-53 <input type="checkbox"/> 1FDW-65	
49. <input type="checkbox"/> <b>IAAT</b> UST level <b>CANNOT</b> be maintained > 8.5', <b>THEN</b> locally open 1C-899 (Cond Recirc To UST Riser Throttle) (T-1/J-23).	
50. <input type="checkbox"/> <b>IAAT</b> UST level increases > 11', <b>THEN</b> perform as required: <input type="checkbox"/> Throttle demin water <input type="checkbox"/> Locally throttle 1C-899 (Cond Recirc To UST Riser Throttle) (T-1/J-23)	
51. Verify closed: <input type="checkbox"/> 1FDW-4 <input type="checkbox"/> 1FDW-9	<input type="checkbox"/> <b>GO TO</b> Step 58.

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
52. Position switches in CLOSE: ___ 1FDW-33 ___ 1FDW-31 ___ 1FDW-42 ___ 1FDW-40	
53. Ensure closed: ___ 1FDW-33 ___ 1FDW-31 ___ 1FDW-42 ___ 1FDW-40	
54. ___ Locally open: 1FDW-5 (1A FDWP Discharge Bypass) (T-1/SE of D-24 12' up) 1FDW-10 (1B FDWP Discharge Bypass) (T-1/N of D-26 9' up)	
55. ___ <b>WHEN</b> FWP DISCH HDR PRESS (1VB3) is approximately equal to <u>either</u> of the following: • O1A1014 (FDWP 1A DISCHARGE PRESS) • O1A1391 (FDWP 1B DISCHARGE PRESS) <b>THEN</b> open: ___ 1FDW-4 ___ 1FDW-9	

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
56. Locally close: ___ 1FDW-5 (1A FDWP Discharge Bypass) (T-1/SE of D-24 12' up) ___ 1FDW-10 (1B FDWP Discharge Bypass) (T-1/N of D-26 9' up)	
<div><b><u>NOTE</u></b> Windmill protection may have required closure of FDW pump suction valve.</div>	
57. Verify open: ___ 1FDW-1 ___ 1FDW-6	1. ___ <b>IF</b> required, notify the WCC SRO to initiate investigation. 2. ___ Note on Turnover sheet that FDW pump associated with closed valve is not available for use until problem resolved.
58. ___ <b>IAAT</b> it is desired to re-establish Main FDW, <b>THEN</b> initiate Encl (Re-establishing Main FDW) of OP/1/A/1106/002 (Condensate And FDW System).	
59. ___ <b>IAAT</b> EFDW has been secured per Encl (Re-establishing Main FDW) of OP/1/A/1106/002 (Condensate And FDW System), <b>THEN EXIT.</b>	

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. <input type="checkbox"/> <b>WHEN</b> UST level is < 4', <b>THEN</b> dispatch two operators to perform Encl 5.24 (Operation of the ADVs) in preparation for loss of vacuum. (PS)	
61. <input type="checkbox"/> Verify power available to 1V-186 by using valve position indicating light.	Dispatch an operator to be in position at 1V-186 (Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).

**NOTE**

1C-573 will be closed after vacuum is broken.

62. Dispatch an operator with a safety harness to 1C-573 (MD EFDWPs Suction From UST) (T-1, SW of E-24, 8' above floor) to: <input type="checkbox"/> Unlock <u>and</u> remove chain from 1C-573. Establish communication with Control Room.	
63. <input type="checkbox"/> <b>WHEN</b> UST level is < 3', <b>THEN</b> continue.	
64. <input type="checkbox"/> Open 1V-186.	<input type="checkbox"/> Notify operator to open 1V-186 (Main Condenser Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).
65. <input type="checkbox"/> Stop <u>all</u> main vacuum pumps.	
66. <input type="checkbox"/> Stop <u>all</u> CBPs.	
67. <input type="checkbox"/> Stop <u>all</u> HWP.s.	
68. Close: <input type="checkbox"/> 1MS-47 <input type="checkbox"/> 1AS-40	Dispatch an operator to close: <input type="checkbox"/> 1MS-49 (1A CSAE Steam Supply) (T-3/F-26) <input type="checkbox"/> 1MS-58 (1B CSAE Steam Supply) (T-3/G-26) <input type="checkbox"/> 1MS-67 (1C CSAE Steam Supply) (T-3/H-26)

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"><li>• 1C-573 is open unless Step 75 has been completed.</li><li>• While EFDW is secured, a transfer to LOHT is required <u>only</u> when directed by this enclosure <u>or</u> Rule 4 (Initiation of HPI Forced Cooling) conditions are met.</li></ul>	
69. <input type="checkbox"/> <b>IAAT</b> UST level is < 1', <b>AND</b> 1C-573 (MD EFDWPs Suction From UST) is open, <b>THEN</b> perform Steps 70 - 71.	<input type="checkbox"/> <b>GO TO</b> Step 72.
70. Perform the following: <input type="checkbox"/> Stop 1A MD EFDWP. <input type="checkbox"/> Stop 1B MD EFDWP.	
71. <input type="checkbox"/> Verify 1C-391 open.	1. <input type="checkbox"/> Stop 1TD EFDW PUMP. 2. Close: <input type="checkbox"/> 1FDW-315 <input type="checkbox"/> 1FDW-316
72. Perform the following: A. <input type="checkbox"/> Reduce MD EFDWP flow to < 440 gpm per pump. B. <input type="checkbox"/> Notify crew of MD EFDWP flow limit while aligned to hotwell.	
<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>Vacuum gage or computer can be used. Vacuum is broken when either start to flat line. Do NOT change scale on computer trend once started.</p>	
73. <input type="checkbox"/> <b>WHEN</b> vacuum is broken, <b>THEN</b> continue.	

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
74. ___ <b>IAAT MD EFDWPs are operating, OR available to operate, THEN PERFORM Steps 75 - 77.</b>	___ <b>GO TO</b> Step 78.
75. ___ Locally close 1C-573 (MD EFDWPs Suction From UST) (T-1, SW of E-24, 8' above floor).	1. ___ <b>IF 1TD EFDW PUMP is operating, OR operable, THEN GO TO</b> Step 78.  2. ___ <b>IF NO EFDW pumps are operating, THEN:</b>  A. Notify CR SRO that a LOHT exists from loss of EFDW suction source.  B. Notify CR SRO that Rule 3 will be performed to cross connect with alternate unit.  C. Consider <u>all</u> U1 EFDW pumps inoperable, <b>AND GO TO</b> Rule 3.
76. ___ Verify MD EFDWPs were stopped due to UST level < 1'.	___ <b>GO TO</b> Step 78.
77. Perform the following:  A. ___ Restart <u>all</u> MD EFDWPs that were stopped due to UST level < 1'.  B. ___ Resume feeding <u>available</u> SGs.	



## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
78. __ Verify 1 TD EFDW PUMP operating.	__ <b>GO TO</b> Step 82.
79. Dispatch operator to 1C-157 (TD EFDWP Suction From UST) to establish communication with CR (T-1/C-20).	
80. <b>WHEN</b> operator in place at 1C-157, <b>THEN</b> continue.	
81. __ Stop 1 TD EFDW PUMP.	
82. __ Locally close 1C-157 (TD EFDWP Suction From UST) (T-1/C-20).	<div>1. <b>IF NO</b> EFDW pumps are operating, <b>THEN:</b><div>A. Notify CR SRO that a LOHT exists from loss of EFDW suction source.</div><div>B. Notify CR SRO that Rule 3 will be performed to cross connect with alternate unit.</div><div>C. Consider <u>all</u> U1 EFDW pumps inoperable, <b>AND GO TO</b> Rule 3.</div></div> <div>2. __ <b>GO TO</b> Step 84.</div>
83. Open 1C-391.	<div>1. Attempt to locally open 1C-391 (TD EFDWP Suction From Hotwell) (T-1/C-20).</div> <div>2. <b>IF</b> 1C-391 <b>CANNOT</b> be opened, <b>AND NO</b> EFDW pumps are operating, <b>THEN:</b><div>A. Notify CR SRO that a LOHT exists from loss of EFDW suction source.</div><div>B. Notify CR SRO that Rule 3 will be performed to cross connect with alternate unit.</div><div>C. Consider <u>all</u> U1 EFDW pumps inoperable, <b>AND GO TO</b> Rule 3.</div></div>

**Enclosure 5.9**

**Extended EFDW Operation**

<p>84. <b>IAAT</b> 1 TD EFDW PUMP operation is desired, <b>AND</b> <u>all</u> exist:              ___ Hotwell level is &gt; 1".              ___ Vacuum is broken.              1 TD EFDW PUMP successfully aligned to hotwell.  <b>THEN:</b>          A. ___ Start 1 TD EFDW PUMP.          B. ___ Feed available SGs as required.</p>	
<p>85. Dispatch an operator to open:              1C-188 (Hotwell Emerg Makeup #1 Control Bypass) (T-1/W of E-24). {18}              1C-912 (UST Riser To HW Emerg Makeup #2 Auto Isol Bypass) (T-1/G-23)</p>	
<p>86. Notify TSC to <u>evaluate</u> methods to maintain secondary inventory including strategies located in EM 5.1 (Engineering Emergency Response Plan) and EM 5.2 (Evaluation By Station Management in the TSC - Beyond Design Basis Mitigation Strategies).</p>	

## Enclosure 5.9

## Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>87. <b>IAAT</b> hotwell level is <math>\leq 1''</math>, <b>THEN:</b></p> <p>A. <u>  </u> Stop <u>all</u> EFDWPs.</p> <p>B. Consider <u>all</u> U-1 EFDW pumps inoperable, <b>AND GO TO</b> Rule 3.</p>	
<p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"><li>• This step provides general plant directions for the SRO and Management team. The user shall continue after the notification has been made.</li><li>• Swapping from TBVs to ADVs prevents overfilling the hotwell/condenser.</li><li>• Securing steam seals limits the water (condensation) that reaches the oil systems. Vacuum must be broken to secure steam seals.</li><li>• Engineering will determine when to allow secondary system restart.</li><li>• Beginning a cooldown assumes HPI is operating. If the SSF is supplying seals, then further discussion with the Management team should be undertaken prior to cooldown.</li></ul>	
<p>88. Notify the CR SRO to direct the following <u>as time and resources allow</u>:</p> <ul style="list-style-type: none"><li>• Transfer steam control from TBVs to ADVs.<ul style="list-style-type: none"><li>• Operate ADVs per U1 EOP Encl 5.24 (Operation of ADVs).</li></ul></li><li>• Begin Unit cool down to LPI per OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) <u>using the ADVs</u>.</li><li>• Break vacuum per OP/1-2/A/1106/016 (Condenser Vacuum System).</li><li>• Secure Steam Seals per OP/1/A/1106/13 (Steam Seal System).</li></ul>	
<p>89. <b>WHEN</b> directed by CR SRO, <b>THEN EXIT.</b></p>	

## EOP Enclosure 5.1 (ES Actuation)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
<p>1. <input type="checkbox"/> Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>:</p> <table border="1"><thead><tr><th>✓</th><th>Actuation Setpoint (psig)</th><th>Associated ES Channel</th></tr></thead><tbody><tr><td><input type="checkbox"/></td><td>1600 (RCS)</td><td>1 &amp; 2</td></tr><tr><td><input type="checkbox"/></td><td>550 (RCS)</td><td>3 &amp; 4</td></tr><tr><td><input type="checkbox"/></td><td>3 (RB)</td><td>1, 2, 3, 4, 5, &amp; 6</td></tr><tr><td><input type="checkbox"/></td><td>10 (RB)</td><td>7 &amp; 8</td></tr></tbody></table>	✓	Actuation Setpoint (psig)	Associated ES Channel	<input type="checkbox"/>	1600 (RCS)	1 & 2	<input type="checkbox"/>	550 (RCS)	3 & 4	<input type="checkbox"/>	3 (RB)	1, 2, 3, 4, 5, & 6	<input type="checkbox"/>	10 (RB)	7 & 8	
✓	Actuation Setpoint (psig)	Associated ES Channel														
<input type="checkbox"/>	1600 (RCS)	1 & 2														
<input type="checkbox"/>	550 (RCS)	3 & 4														
<input type="checkbox"/>	3 (RB)	1, 2, 3, 4, 5, & 6														
<input type="checkbox"/>	10 (RB)	7 & 8														
<p>2. <input type="checkbox"/> Verify <u>all</u> ES channels associated with actuation setpoints have actuated.</p>	<p><b><u>NOTE</u></b></p> <p>Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure.</p> <p><input type="checkbox"/> Depress TRIP on <u>affected</u> ES logic channels that have <b>NOT</b> previously been actuated.</p>															
<p>3. <input type="checkbox"/> <b>IAAT</b> <u>additional</u> ES actuation setpoints are exceeded, <b>THEN</b> perform Steps 1 - 2.</p>																
<p>4. <input type="checkbox"/> <b>Place Diverse HPI in BYPASS.</b></p>	<p><input type="checkbox"/> <b>Place Diverse HPI in OVERRIDE.</b></p>															
<p>5. Perform <u>both</u>:</p> <p><input type="checkbox"/> Place ES CH 1 in MANUAL.</p> <p><input type="checkbox"/> Place ES CH 2 in MANUAL.</p>	<p><b><u>NOTE</u></b></p> <ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul> <p>1. <input type="checkbox"/> <b>IF</b> ES CH 1 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE.</p> <p>2. <input type="checkbox"/> <b>IF</b> ES CH 2 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</p>															

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <input type="checkbox"/> <b>IAAT</b> <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation <b>THEN</b> depress RESET on the required channel.	
7. <input type="checkbox"/> Verify Rule 2 in progress <u>or</u> complete.	<input type="checkbox"/> <b>GOTO</b> Step 74.
8. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> <b>GOTO</b> Step 10.
9. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
10. <input type="checkbox"/> <b>IAAT</b> ES Channels 5 <u>or</u> 6 is actuated, <b>THEN</b> perform Steps 11 - 15.	<input type="checkbox"/> <b>GOTO</b> Step 16.
11. Perform the following for actuated channels: <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div style="text-align: center;"><b><u>NOTE</u></b></div> <ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul> <div><p>1. <input type="checkbox"/> <b>IF</b> ES CH 5 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE.</p><p>2. <input type="checkbox"/> <b>IF</b> ES CH 6 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</p></div>
12. <input type="checkbox"/> Verify <u>any</u> RCP is operating	<input type="checkbox"/> <b>GO TO</b> Step 16
13. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
14. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
15. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ___ <b>IAAT</b> ES Channels 3 & 4 are actuated, <b>THEN GO TO</b> Step 17.	___ <b>GO TO</b> Step 54.
17. ___ Place Diverse LPI in BYPASS.	___ Place Diverse LPI in OVERRIDE.
18. Perform <u>both</u> : ___ Place ES CH 3 in MANUAL. ___ Place ES CH 4 in MANUAL.	<div><b>NOTE</b><ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul></div> <div>1. ___ <b>IF</b> ES CH 3 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE. 2. ___ <b>IF</b> ES CH 4 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</div>
<div><b>CAUTION</b> LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
19. ___ <b>IAAT</b> <u>any</u> LPI pump is operating against a shutoff head, <b>THEN</b> at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
20. ___ <b>IAAT</b> RCS pressure is < LPI pump shutoff head, <b>THEN</b> perform Steps 21 - 22.	___ <b>GOTO</b> Step 23.
21. Perform the following: ___ Open 1LP-17. ___ Start 1A LPI PUMP.	1. ___ Stop 1A LPI PUMP. 2. ___ Close 1LP-17.
22. Perform the following: ___ Open 1LP-18. ___ Start 1B LPI PUMP.	1. ___ Stop 1B LPI PUMP. 2. ___ Close 1LP-18.

**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>23. <input type="checkbox"/> <b>IAAT</b> 1A <u>and</u> 1B LPI PUMPs are off / tripped,  <b>AND</b> <u>all</u> exist:  <input type="checkbox"/> RCS pressure &lt; LPI pump shutoff head  <input type="checkbox"/> 1LP-19 closed  <input type="checkbox"/> 1LP-20 closed  <b>THEN</b> perform Steps 24 - 25.</p>	<p><input type="checkbox"/> <b>GO TO</b> Step 26.</p>
<p>24. Open:  <input type="checkbox"/> 1LP-9  <input type="checkbox"/> 1LP-10  <input type="checkbox"/> 1LP-6  <input type="checkbox"/> 1LP-7  <input type="checkbox"/> 1LP-17  <input type="checkbox"/> 1LP-18  <input type="checkbox"/> 1LP-21  <input type="checkbox"/> 1LP-22</p>	
<p>25. <input type="checkbox"/> Start 1C LPI PUMP.</p>	
<p>26. <input type="checkbox"/> <b>IAAT</b> 1A LPI PUMP fails while operating,  <b>AND</b> 1B LPI PUMP is operating,  <b>THEN</b> close 1LP-17.</p>	
<p>27. <input type="checkbox"/> <b>IAAT</b> 1B LPI PUMP fails while operating,  <b>AND</b> 1A LPI PUMP is operating,  <b>THEN</b> close 1LP-18.</p>	
<p>28. Start:  <input type="checkbox"/> A OUTSIDE AIR BOOSTER FAN  <input type="checkbox"/> B OUTSIDE AIR BOOSTER FAN</p>	
<p>29. Notify Unit 3 to start:  <input type="checkbox"/> 3A OUTSIDE AIR BOOSTER FAN  <input type="checkbox"/> 3B OUTSIDE AIR BOOSTER FAN</p>	

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: ___ 1CF-1 ___ 1CF-2	___ <b>IF</b> CR SRO desires 1CF-1 and 1CF-2 open, <b>THEN</b> open: ___ 1CF-1 ___ 1CF-2
31. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
32. ___ Secure makeup to the LDST.	
33. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ <b>IF</b> 1HP-3 fails to close, <b>THEN</b> close 1HP-1. 2. ___ <b>IF</b> 1HP-4 fails to close, <b>THEN</b> close 1HP-2. 3. ___ <b>IF</b> 1HP-20 fails to close, <b>AND NO</b> RCPs operating, <b>THEN</b> close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
34. ___ Verify Unit <u>2</u> turbine tripped.	___ <b>GOTO</b> Step 37.
35. ___ Close <u>2</u> LPSW-139.	
36. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
37. ___ Close 1LPSW-139.	
38. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
39. ___ Start <u>all available</u> LPSW pumps.	



## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when ___ Tech Specs only requires two operable	___ <b>GOTO</b> Step 42.
41. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ <b>IF</b> <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 <b>THEN</b> notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$ .
42. ___ <b>IAAT</b> BWST level $\leq 19'$ , <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
43. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). ( <b>PS</b> )	
44. ___ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. ___ <b>IAAT</b> ES channels 5 & 6 have actuated, <b>THEN</b> perform Step 46.	___ <b>GOTO</b> Step 47.
<div><b>NOTE</b> RBCU transfer to low speed will <b>NOT</b> occur until 3 minute time delay is satisfied.</div>	
46. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.

**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. ___ <b>IAAT</b> ES channels 7 & 8 have actuated, <b>THEN</b> perform Steps 48 - 49.	___ <b>GOTO</b> Step 50.
48. Perform <u>all</u> : ___ Place ES CH 7 in MANUAL. ___ Place ES CH 8 in MANUAL.	<div><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul></div> <div><p>1. ___ <b>IF</b> ES CH 7 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE.</p><p>2. ___ <b>IF</b> ES CH 8 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</p></div>
49. ___ Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
50. ___ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
51. ___ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
52. ___ <b>IAAT</b> conditions causing ES actuation have cleared, <b>THEN</b> initiate Encl 5.41 (ES Recovery).	
53. ___ <b>WHEN</b> CR SRO approves, <b>THEN EXIT.</b>	

**... END ...**

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>Unit Status</b> ES Channels 3 & 4 have <b>NOT</b> actuated.	
54. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
55. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
56. Verify open: ___ 1CF-1 ___ 1CF-2	___ <b>IF</b> CR SRO desires 1CF-1 and 1CF-2 open, <b>THEN</b> open: ___ 1CF-1 ___ 1CF-2
57. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
58. ___ Secure makeup to the LDST.	
59. ___ Verify all ES channel 1 & 2 components are in the ES position.	1. ___ <b>IF</b> 1HP-3 fails to close, <b>THEN</b> close 1HP-1. 2. ___ <b>IF</b> 1HP-4 fails to close, <b>THEN</b> close 1HP-2. 3. ___ <b>IF</b> 1HP-20 fails to close, <b>AND NO</b> RCPs operating, <b>THEN</b> close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
60. ___ Verify Unit <u>2</u> turbine tripped.	___ <b>GOTO</b> Step 63.
61. ___ Close <u>2</u> LPSW-139.	
62. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
63. ___ Close 1LPSW-139.	

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
64. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
65. ___ Start <u>all available</u> LPSW pumps.	
66. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when ___ Tech Specs only requires two operable	___ <b>GOTO</b> Step 68.
67. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ <b>IF</b> <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 <b>THEN</b> notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$ .
68. ___ <b>IAAT</b> BWST level $\leq 19'$ , <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
69. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). ( <b>PS</b> )	
70. ___ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
71. ___ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
72. ___ <b>IAAT</b> conditions causing ES actuation have cleared, <b>THEN</b> initiate Encl 5.41 (ES Recovery).	
73. ___ <b>WHEN</b> CR SRO approves, <b>THEN EXIT</b> .	

... END ...

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>NOTE</b> Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered.	
1. <input type="checkbox"/> Utilize the following as necessary to maintain <u>desired</u> Pzr level: <ul style="list-style-type: none"><li>• 1A HPI Pump</li><li>• 1B HPI Pump</li><li>• 1HP-26</li><li>• 1HP-7</li><li>• 1HP-120 setpoint or valve demand</li><li>• 1HP-5</li></ul>	<input type="checkbox"/> <b>IF</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level.
2. <input type="checkbox"/> <b>IAAT</b> <u>makeup</u> to the <u>LDST</u> is desired, <b>THEN</b> makeup from 1A BHUT.	
3. <input type="checkbox"/> <b>IAAT</b> it is desired to <u>secure</u> <u>makeup</u> to LDST, <b>THEN</b> secure makeup from 1A BHUT.	
4. <input type="checkbox"/> <b>IAAT</b> it is desired to <u>bleed</u> letdown flow to 1A BHUT, <b>THEN</b> perform the following: <ul style="list-style-type: none"><li>A. Open:<ul style="list-style-type: none"><li><input type="checkbox"/> 1CS-26</li><li><input type="checkbox"/> 1CS-41</li></ul></li><li>B. <input type="checkbox"/> Position 1HP-14 to BLEED.</li><li>C. <input type="checkbox"/> Notify SRO.</li></ul>	
5. <input type="checkbox"/> <b>IAAT</b> letdown <u>bleed</u> is <b>NO</b> longer desired, <b>THEN</b> position 1HP-14 to NORMAL.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>6. <input type="checkbox"/> <b>IAAT 1C HPI PUMP</b> is required, <b>THEN</b> perform Steps 7 - 9.</p> <hr/> <p>7. <input type="checkbox"/> Open:</p> <ul style="list-style-type: none"><li>• 1HP-24</li><li>• 1HP-25</li></ul>	<p><input type="checkbox"/> <b>GO TO</b> Step 10.</p> <hr/> <p>1. <input type="checkbox"/> <b>IF both</b> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"><li>A. <input type="checkbox"/> Start 1A LPI PUMP.</li><li>B. <input type="checkbox"/> Start 1B LPI PUMP.</li><li>C. Open:<ul style="list-style-type: none"><li><input type="checkbox"/> 1LP-15</li><li><input type="checkbox"/> 1LP-16</li><li><input type="checkbox"/> 1LP-9</li><li><input type="checkbox"/> 1LP-10</li><li><input type="checkbox"/> 1LP-6</li><li><input type="checkbox"/> 1LP-7</li></ul></li><li>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</li><li>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</li><li>F. <input type="checkbox"/> <b>GO TO</b> Step 8.</li></ul> <p>2. <input type="checkbox"/> <b>IF only one</b> BWST suction valve (1HP-24 or 1HP-25) is open, <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"><li>A. <input type="checkbox"/> <b>IF</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.</li><li>B. <input type="checkbox"/> <b>IF</b> &lt; 2 HPI pumps are operating, <b>THEN</b> start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.</li><li>C. <input type="checkbox"/> <b>GO TO</b> Step 9.</li></ul>

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>8. <input type="checkbox"/> Start 1C HPI PUMP.</p>	<p><input type="checkbox"/> <b>IF</b> at least two HPI pumps are operating, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.</p>
<p>9. Throttle the following as required to maintain desired Pzr level:</p> <p><input type="checkbox"/> 1HP-26</p> <p><input type="checkbox"/> 1HP-27</p>	<p>1. <input type="checkbox"/> <b>IF</b> at least two HPI pumps are operating, <b>AND</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level.</p> <p>2. <input type="checkbox"/> <b>IF</b> 1A HPI PUMP <u>and</u> 1B HPI PUMP are operating, <b>AND</b> 1HP-27 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.</p>

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <input type="checkbox"/> <b>IAAT LDST level CANNOT</b> be maintained, <b>THEN</b> perform Step 11.	<input type="checkbox"/> <b>GO TO</b> Step 12.
11. <input type="checkbox"/> Perform the following: <ul style="list-style-type: none"><li>• Open 1HP-24.</li><li>• Open 1HP-25.</li><li>• Close 1HP-16.</li></ul>	1. <input type="checkbox"/> <b>IF both</b> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following: <ul style="list-style-type: none"><li>A. <input type="checkbox"/> Start 1A LPI PUMP.</li><li>B. <input type="checkbox"/> Start 1B LPI PUMP.</li><li>C. Open:<ul style="list-style-type: none"><li><input type="checkbox"/> 1LP-15</li><li><input type="checkbox"/> 1LP-16</li><li><input type="checkbox"/> 1LP-9</li><li><input type="checkbox"/> 1LP-10</li><li><input type="checkbox"/> 1LP-6</li><li><input type="checkbox"/> 1LP-7</li></ul></li><li>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</li><li>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</li><li>F. <input type="checkbox"/> <b>GO TO</b> Step 13.</li></ul> 2. <input type="checkbox"/> <b>IF only one</b> BWST suction valve (1HP-24 or 1HP-25) is open, <b>AND</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.
<div><b><u>NOTE</u></b> Maintaining Pzr level &gt; 100" [180" acc] will ensure Pzr heater bundles remain covered.</div>	
12. <input type="checkbox"/> Operate Pzr heaters as required to maintain heater bundle integrity.	



**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. <input type="checkbox"/> <b>IAAT</b> additional makeup flow to LDST is desired, <b>AND</b> 1A BLEED TRANSFER PUMP is operating, <b>THEN</b> dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
14. <input type="checkbox"/> <b>IAAT</b> <u>two</u> Letdown Filters are desired, <b>THEN</b> perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
15. <input type="checkbox"/> <b>IAAT</b> <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired <b>THEN</b> perform Steps 16 - 34. {41}	<input type="checkbox"/> <b>GO TO</b> Step 35.
16. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown <b>CANNOT</b> be restored due to inability to restart the CC system. 2. <input type="checkbox"/> <b>GO TO</b> Step 35.
17. <input type="checkbox"/> Ensure only one CC pump running.	
18. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
19. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> <b>IF</b> 1HP-1 is closed due to 1HP-3 failing to close, <b>THEN GO TO</b> Step 21. 2. <input type="checkbox"/> <b>IF</b> 1HP-2 is closed due to 1HP-4 failing to close, <b>THEN GO TO</b> Step 21.
20. <input type="checkbox"/> <b>GO TO</b> Step 23.	
<b>NOTE</b> Verification of leakage requires visual observation of East Penetration Room.	
21. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<b>GO TO</b> Step 23.
22. <input type="checkbox"/> <b>GO TO</b> Step 35.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. <input type="checkbox"/> Monitor for unexpected conditions while restoring letdown.	
24. <input type="checkbox"/> Verify <u>both</u> letdown coolers to be placed in service.	1. <input type="checkbox"/> <b>IF</b> 1A letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-3  2. <input type="checkbox"/> <b>IF</b> 1B letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-4  3. <input type="checkbox"/> <b>GO TO</b> Step 26.
25. Open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-3 <input type="checkbox"/> 1HP-4	
26. <input type="checkbox"/> Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. <input type="checkbox"/> Notify CR SRO of problem. B. <input type="checkbox"/> <b>GO TO</b> Step 35.
27. <input type="checkbox"/> Close 1HP-6.	
28. <input type="checkbox"/> Close 1HP-7.	
29. <input type="checkbox"/> Verify letdown temperature < 125°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Close: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> <b>IF</b> <u>any</u> deborating IX is in service, <b>THEN</b> perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
30. <input type="checkbox"/> Open 1HP-5.	
31. <input type="checkbox"/> Adjust 1HP-7 for $\approx 20$ gpm letdown.	
32. <input type="checkbox"/> <b>WHEN</b> letdown temperature is < 125°F, <b>THEN</b> place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. <input type="checkbox"/> Open 1HP-6.	
34. <input type="checkbox"/> Adjust 1HP-7 to control desired letdown flow.	

**NOTE**

AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.

35. <input type="checkbox"/> <b>IAAT</b> it is determined that letdown is unavailable due to equipment failures <u>or</u> letdown system leakage, <b>THEN</b> notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. <input type="checkbox"/> <b>IAAT</b> > 1 HPI pump is operating, <b>AND</b> additional HPI pumps are <b>NO</b> longer needed, <b>THEN</b> perform the following:  A. <input type="checkbox"/> Obtain SRO concurrence to reduce running HPI pumps.  B. <input type="checkbox"/> Secure the desired HPI pumps.  C. <input type="checkbox"/> Place secured HPI pump switch in AUTO, if desired.	
37. <input type="checkbox"/> <b>IAAT</b> <u>all</u> the following conditions exist: <input type="checkbox"/> Makeup from BWST <b>NOT</b> required <input type="checkbox"/> LDST level > 55" <input type="checkbox"/> <u>All</u> control rods inserted <input type="checkbox"/> Cooldown Plateau <b>NOT</b> being used <b>THEN</b> close: <input type="checkbox"/> 1HP-24 <input type="checkbox"/> 1HP-25	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
38. <input type="checkbox"/> Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	<input type="checkbox"/> <b>GO TO</b> Step 40.
39. <input type="checkbox"/> <b>WHEN</b> 1CS-48 (1A BHUT Recirc) is <b>NO</b> longer needed to provide additional makeup flow to LDST, <b>THEN</b> perform the following: A. <input type="checkbox"/> Stop 1A BLEED TRANSFER PUMP. B. <input type="checkbox"/> Locally position 1CS-48 (1A BHUT Recirc) <u>one</u> turn open (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.). C. <input type="checkbox"/> Close 1CS-46. D. <input type="checkbox"/> Start 1A BLEED TRANSFER PUMP. E. <input type="checkbox"/> Locally throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. F. <input type="checkbox"/> Stop 1A BLEED TRANSFER PUMP.	
40. <input type="checkbox"/> Verify two Letdown Filters in service, <b>AND</b> <u>only one</u> Letdown filter is desired.	<input type="checkbox"/> <b>GO TO</b> Step 42.
41. Perform <u>one</u> of the following: <input type="checkbox"/> Place 1HP-17 switch to CLOSE. <input type="checkbox"/> Place 1HP-18 switch to CLOSE.	
42. <input type="checkbox"/> <b>WHEN</b> directed by CR SRO, <b>THEN EXIT</b> this enclosure.	

**... END ...**

**Rule 6**  
**HPI****HPI Pump Throttling**  
**Limits**

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled  $\leq 475$  gpm/pump (including seal injection for A header) when only one HPI pump is operating in a header.
- Total HPI flow must be throttled  $\leq 950$  gpm including seal injection when 1A and 1B HPI pumps are operating with 1HP-409 open.
- Total HPI flow must be throttled  $< 750$  gpm when all the following exist:
  - LPI suction is from the RBES
  - piggyback is aligned
  - either of the following exist:
    - only one piggyback valve is open (1LP-15 or 1LP-16)
    - only one LPI pump operating
- HPI may be throttled under the following conditions:

<b>HPI Forced Cooling in Progress:</b>	<b>HPI Forced Cooling NOT in Progress:</b>
<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• CETCs decreasing</li></ul>	<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>All</u> WR NIs <math>\leq 1\%</math></li><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• Pzr level increasing</li><li>• SRO concurrence required if throttling following emergency boration</li></ul>

**HPI Pump Minimum Flow Limit**

- Maintain  $\geq 170$  gpm indicated/pump. This is an instrument error adjusted value that ensures a real value of  $\geq 65$  gpm/pump is maintained. HPI pump flow less than minimum is allowed for up to 4 hours.

**Rule 8****Pressurized Thermal Shock (PTS)**

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**NOTE**

This rule is invoked under either of the following conditions:

- A cooldown below 400°F T<sub>c</sub> at > 100 °F/hr has occurred.
  - HPI has injected through an open or throttled open 1HP-26, 27, 409, 410 with all RCPs OFF.
- 
- SCM must be minimized. The following methods may be used at the discretion of the CR SRO:
    - Throttling HPI per Rule 6 (HPI)
    - De-energizing Pzr heaters
    - Using Pzr normal spray
    - Using Pzr aux spray
    - Using PORV
    - Throttling LPI {22}
  - Once RCS temperature is stable, a 1-hour hold of RCS temperature must be performed unless a LOCA, SGTR, or Blackout is in progress. Use T<sub>c</sub> in loop with an operating RCP or use CETCs if **NO** RCPs are operating.
  - Once invoked, SCM shall remain minimized until Engineering has performed an evaluation and determined that PTS restrictions **NO** longer apply. Starting RCPs and/or restoring cool down rates to normal values do **NOT** negate the need for this evaluation.

**Enclosure 5.16**  
**SG Tube-to-Shell  $\Delta T$  Control****NOTE**

- SG tube-to-shell  $\Delta T$  is calculated by the OAC with points displayed on Loop P/T displays as indicated below:

<b>1A SG <math>\Delta T</math></b>	<b>1B SG <math>\Delta T</math></b>
Bottom of Loop 'A' P/T display	Bottom of Loop 'B' P/T display
S/G TUBE/SHELL DT	S/G TUBE/SHELL DT

- SG tube-to-shell  $\Delta T$  limits:

<b>Stress</b>	<b>OAC Indication</b>
Tensile Stress Limit (Tubes colder than shell)	+130°F
Compressive Stress (Tubes hotter than shell)	-70°F

- IAAT** any SG tube-to-shell  $\Delta T$  approaches either limit, **THEN** take appropriate action per the following:

<b>Limit Approached</b>	<b>Action</b>
Tensile	<b>GO TO</b> Step 2
Compressive	<b>GO TO</b> Step 50

**Examiner Note:** *SG tube-to-shell  $\Delta T$  should not approach either limit for this scenario.*

## Subsequent Actions

EP/1/A/1800/001

## Parallel Actions

Page 1 of 1

	CONDITION	ACTIONS	
1.	PR NIs $\geq$ 5% FP <b>OR</b> NIs <b>NOT</b> decreasing	<b>GO TO</b> UNPP tab.	<b>UNPP</b>
2.	<u>All</u> 4160V SWGR de-energized {13}	<b>GO TO</b> Blackout tab.	<b>BLACKOUT</b>
3.	<u>Core</u> SCM indicates superheat	<b>GO TO</b> ICC tab.	<b>ICC</b>
4.	<u>Any</u> SCM = 0°F	<b>GO TO</b> LOSCM tab.	<b>LOSCM</b>
5.	<u>Both</u> SGs intentionally isolated to stop excessive heat transfer	<b>GO TO</b> EHT tab.	<b>LOHT</b>
6.	Loss of heat transfer (including loss of all Main and Emergency FDW)	<b>GO TO</b> LOHT tab.	
7.	Heat transfer is <u>or</u> has been excessive	<b>GO TO</b> EHT tab.	<b>EHT</b>
8.	Indications of SGTR $\geq$ 25 gpm	<b>GO TO</b> SGTR tab.	<b>SGTR</b>
9.	Turbine Building flooding <b>NOT</b> caused by rainfall event	<b>GO TO</b> TBF tab.	<b>TBF</b>
10.	Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	<b>ES</b>
11.	Valid ES actuation has occurred <u>or</u> should have	Initiate Encl 5.1 (ES Actuation).	<b>ES</b>
12.	Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	<ul style="list-style-type: none"> <li>Initiate AP/11 (Recovery from Loss of Power).</li> <li><b>IF</b> Encl 5.1 (ES Actuation) has been initiated, <b>THEN</b> reinitiate Encl 5.1.</li> </ul>	<b>ROP</b>
13.	RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	<b>EDL</b>
14.	Individual available to make notifications	<ul style="list-style-type: none"> <li>Announce plant conditions using PA system.</li> <li>Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).</li> </ul>	<b>NOTIFY</b>



**EHT**  
**Parallel Actions**

EP/1/A/1800/001  
Page 1 of 1

	<b>CONDITION</b>	<b>ACTIONS</b>	
1.	PR NIs $\geq$ 5% FP  <b>OR</b> NIs <b>NOT</b> decreasing	<b>GO TO</b> UNPP tab.	<b>UNPP</b>
2.	<u>All</u> 4160V SWGR de-energized	<b>GO TO</b> Blackout tab.	<b>BLACKOUT</b>
3.	<u>Core</u> SCM indicates superheat	<b>GO TO</b> ICC tab.	<b>ICC</b>
4.	<u>Any</u> SCM = 0°F <b>AND</b> HPI forced cooling <b>NOT</b> in progress	<b>IF</b> LOSCM tab has <b>NOT</b> been entered due to current EHT event <b>THEN GO TO</b> LOSCM tab.	<b>LOSCM</b>
5.	<u>Both</u> SGs intentionally isolated to stop excessive heat transfer after EHT tab initiated	<b>RETURN TO</b> beginning of EHT tab.	<b>LOHT</b>
6.	Loss of heat transfer <b>AND</b> at least one SG <b>NOT</b> isolated	<b>GO TO</b> LOHT tab.	
7.	Indications of excessive heat transfer in another SG after EHT tab initiated	<b>RETURN TO</b> beginning of EHT tab.	<b>EHT</b>
8.	Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	<b>ES</b>
9.	Valid ES actuation has occurred <u>or</u> should have	Initiate Encl 5.1 (ES Actuation).	<b>ES</b>
10.	Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	<ul style="list-style-type: none"> <li>Initiate AP/11 (Recovery from Loss of Power).</li> <li><b>IF</b> Encl 5.1 (ES Actuation) has been initiated, <b>THEN</b> reinitiate Encl 5.1.</li> </ul>	<b>ROP</b>
11.	RCS leakage > 160 gpm with letdown isolated  <b>OR</b> SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	<b>EDL</b>
12.	Individual available to make notifications	<ul style="list-style-type: none"> <li>Announce plant conditions using PA system.</li> <li>Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification /Reportability Evaluation).</li> </ul>	<b>NOTIFY</b>

## CRITICAL TASKS

- CT-1** Ensure the Main Vacuum Pumps are operating prior to the low vacuum Turbine trip of 21.75 inches Hg. (page 13)
- CT-2** (BWOOG CT-17) Isolate the SG that is overcooling the RCS. Manually actuate AFIS within 10 minutes of the MSLB to isolate the SG and limit the overcooling. (page 36)

<b>SAFETY: Take a Minute</b>			
<b>UNIT 0 (OSM)</b>			
SSF Operable: No U2/U3: Yes PSW Operable: No	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
<b>UNIT STATUS (CR SRO)</b>			
<b>Unit 1 Simulator</b>		<b>Other Units</b>	
Mode: 1		<b>Unit 2</b>	<b>Unit 3</b>
Reactor Power: 75%		Mode: 1	Mode: 1
Gross MWE: 698		100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action		EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm			
<b>Technical Specifications/SLC Items (CR SRO)</b>			
<b>Component/Train</b>	<b>OOS Date/Time</b>	<b>Restoration Required Date/Time</b>	<b>TS/SLC #</b>
AMSAC/DSS	Today/0300	7 Days	SLC 16.7.2
SSF	Today/0100	7 Days	TS 3.10.1
PSW	Today/0600	7 Days	TS 3.7.10
<b>Shift Turnover Items (CR SRO)</b>			
<b>Primary</b>			
<ul style="list-style-type: none"> <li>Due to unanalyzed condition, the SSF should be considered INOPERABLE for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).</li> <li>OATC is to perform PT/1/A/0600/015 Enclosure 13.2 (Control Rod Movement at Power) for Group 1 Control Rods only. While the Unit 1 SRO is in the role of Reactivity SRO, Unit 2 SRO will provide oversight for Unit 1.</li> <li>The Rx Diamond and FDW Masters are in Hand per OP/1/A/1102/004A Enclosure 4.1 (Placing Rx Diamond/FDW Masters To Hand) to perform the CRD Movement PT.</li> <li>1RIA-3 and 5 removed from RB</li> <li>SASS is in Manual for calibration</li> <li>Holding at 75% power per dispatcher</li> </ul>			
<b>Secondary</b>			
<ul style="list-style-type: none"> <li>AMSAC/DSS bypassed for calibration</li> <li>PSW Primary Pump is OOS. WCC preparing Protected Equipment package.</li> <li>Unit 2 is supplying the AS header</li> <li>1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event.</li> </ul>			
<b>Reactivity Management (CR SRO)</b>			
RCS Boron 69 ppmB	Gp 7 Rod Position: 77% Withdrawn	Batch additions as required for volume control.	
<b>Human Performance Emphasis (OSM)</b>			
Procedure Use and Adherence			

Facility: **Oconee**Scenario No.: **3**Op-Test No.: **1**Examiners: P. CapehartOperators: J. Arnett **SRO**J. DeMarshallL. Dull **OATC**P. OttM. Patterson **BOP**

Initial Conditions:

- Reactor Power = 50%

Turnover:

- SASS is in manual for calibration
- AMSAC/DSS is bypassed for calibration
- PSW is unavailable for Unit 1

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AMSAC/DSS Bypassed
0b	Override		SASS in Manual
1	Override	C: OATC, SRO	Pressurize LDST with Hydrogen
2	Override	C: BOP, SRO <b>(TS)</b>	1A CCW Pump Motor Stator Temperature High
3	MSS470	C: BOP, SRO <b>(TS)</b>	Recurring High Vibration on 1A RBCU
4	MPI241 MPI251	I: OATC, SRO	Loop 'B' Tcold Fails Low
5	MPS010 MPS010D	R: OATC, SRO <b>(TS)</b>	1A SGTR ( $\approx$ 60 gpm) Requiring Manual Power Reduction <b>(CT-1)</b>
6		N: BOP, SRO	Support Actions During Manual Power Reduction
7	MPI290	M: ALL	Reactor Fails to Trip (ATWS) <b>(CT-2)</b> <ul style="list-style-type: none"><li>1HP-27 Fails Closed</li></ul>
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**SCENARIO 3 EVENT SUMMARY**

- Event 1:** When the crew takes the shift, the SRO will direct the OATC to raise pressure in the LDST using OP/1/A/1106/017 (Hydrogen System) Enclosure 4.5 (Unit 1 LDST H2 Addition). 1H-1 (Hydrogen to LDST valve) will fail open and will require an RO to contact an AO to isolate Hydrogen locally to prevent over-pressurizing the LDST.
- Event 2:** The 1A CCW pump motor stator temperature will begin to rise. An OAC alarm will alert the crew of the issue and the BOP will refer to the alarm response for the OAC alarm. The BOP will refer to OP/1/A/1104/012A (CCW Pump Operation) Enclosures 4.1 (CCW Pump Startup) and 4.2 (CCW Pump Shutdown) to remove the 1A CCW pump from service and start the 1D CCW pump.
- Event 3:** OAC alarm O1D1361 (RBCU Fan 1A Vib) will alarm and the BOP will refer to the OAC alarm response. The first time the alarm comes in, it will be reset using the OAC alarm response guidance. After the first alarm is reset, it will alarm again in  $\approx 3$  minutes. This time the alarm will not reset and the BOP must secure the 1A RBCU. The SRO will declare the 1A RBCU inoperable and enter TS 3.6.5 Required Actions.
- Event 4:** Loop B Tc will fail low causing control rods to withdraw and feedwater demand to lower. The crew should perform Plant Transient Response (PTR) and place the ICS Diamond and FDW Loop Masters in MANUAL. The crew will perform AP/28 (ICS Instrument Failures). ICS will remain in MANUAL for the rest of the scenario.
- Event 5:** The 1A SG will experience a tube rupture of  $\approx 60$  gpm which will require entry into the SGTR tab of the EOP. The OATC will begin reducing Reactor power with ICS in manual in order to shut down the unit.
- Event 6:** After the power reduction begins in Event 5, the BOP will transfer auxiliary power to the startup transformer and then start the Outside Air Booster Fans.
- Event 7:** After Reactor power has been reduced  $> 10\%$  and the Outside Air Booster Fans have been started, both Main FDW Pumps will trip but the Reactor will fail to automatically or manually trip. The SRO will transfer to the UNPP tab of the EOP to mitigate this event and the OATC will perform Rule 1 (ATWS/UNPP). 1HP-27 will fail to open and the OATC will have to open 1HP-409 to align emergency boration through both HPI headers.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **1**

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Event Description: **Pressurize LDST with H2 (1H-1 will fail open) (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1106/017</i></p> <p><b>Crew response:</b> SRO directs the OATC to add H2 to the LDST using OP/1/A/1106/017 (Hydrogen System) Enclosure 4.5 (Unit 1 LDST H2 Addition).</p> <p><b><u>OP/1/A/1106/017 Enclosure 4.5</u></b> (Unit 1 LDST H2 Addition) <span style="color: red;">Rev 128</span> 2.1 Notify Chemistry of hydrogen addition prior to adding hydrogen. {21}</p> <div style="display: flex; justify-content: space-around;"><div>_____</div><div>_____</div></div> <div style="display: flex; justify-content: space-around;"><div>Person Notified</div><div>Date</div></div> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• OP/0/A/1108/001 (Curves And General Information) and computer may be referred to for LDST Pressure vs Level curve. {7}</li><li>• LDST Maximum Pressure vs Indicated Level Curve should <b><u>NOT</u></b> be exceeded when pressurizing LDST.</li><li>• If Unit 1 is shutdown and will be placed in MODE 5, Nitrogen should be added to LDST to maintain LDST Pressure vs Level.</li><li>• If Unit 1 is shutdown and will <b><u>NOT</u></b> be placed in MODE 5, Hydrogen should be added to LDST to maintain LDST Pressure vs Level.</li></ul></div> <p>2.2 Immediately prior to pressurization determine lowest reading of diverse LDST level indications: _____ inches.</p> <p>2.3 For existing LDST level determine LDST Pressure allowable per LDST Pressure vs Level curve: _____ psig.</p> <p>2.4 Notify Operator at H2 Cage to pressurize primary hydrogen.</p> <p><b>Booth Cue:</b> <i>When contacted as an AO to align primary H2 at the cage, respond that primary H2 is aligned at the cage.</i></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p><b>NOTE:</b> Operator should be in constant communication with CR to close 1H-26 if 1H-1 fails open.</p></div> <p><b>Booth Cue:</b> <i>When directed to open 1H-26, use Manual Valves and position 1H-93 and respond that 1H-26 is open.</i></p> <p>2.5 Direct Operator to open 1H-26 (LDST Block). (A-2-N of LDST Rm)</p>

**This event is complete when LDST Hydrogen addition is complete and 1H-26 is closed, or when directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **1**

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Event Description: **Pressurize LDST with H2 (1H-1 will fail open) (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1106/017</i></p> <p><b><u>Crew response:</u></b></p> <p><b><i>Examiner/Booth Note: Once LDST pressure is being increased, 1H-1 (LDST SUPPLY) will fail open.</i></b></p> <p>2.6 Direct Operator to use explosive detector to monitor the following: ___ Pressurized, non-welded H2 piping and fittings within local area of addition ___ Loop seal (A-2-N of LDST Rm)</p> <p>2.7 Cycle 1H-1 (H2 TO LDST) as required to pressurize LDST per LDST Pressure vs Level curve.</p> <p>2.8 <b><u>WHEN</u></b> Hydrogen addition complete, ensure closed 1H-1 (H2 TO LDST).</p> <p><b><i>Examiner Note: OATC should determine that 1H-1 has failed open and direct the AO to locally close 1H-26.</i></b></p> <p>2.9 Direct Operator to close 1H-26 (LDST Block). (A-2-N of LDST Rm)</p> <p><b><i>Booth Cue: When directed to close 1H-26, close 1H-93 and report that 1H-26 is closed.</i></b></p> <p>2.10 Ensure LDST pressure within LDST Pressure vs Level curve</p> <p>2.11 Notify Operator at H2 Cage to isolate primary hydrogen</p> <p><b><i>Booth Cue: When directed to isolate primary hydrogen at the H2 cage, respond that primary H2 is isolated at the H2 cage.</i></b></p> <p>2.12 Log LDST Hydrogen addition in Auto Log</p> <p><b><i>Examiner Note: The SRO may decide to lower LDST pressure, those steps begin on the next page.</i></b></p>
<b>This event is complete when LDST Hydrogen addition is complete and 1H-26 is closed, or when directed by the Lead Examiner.</b>		

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **1**

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Event Description: **Pressurize LDST with H2 (1H-1 will fail open) (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/002</i></p> <p><b><u>Crew response:</u></b></p> <p>SRO directs the OATC to vent LDST to GWD per OP/1/A/1104/002 (HPI System), Encl. 4.16, (Lowering LDST Pressure).</p> <p><b><u>OP/1/A/1104/002 (HPI System) Encl. 4.16 (Lowering LDST Pressure)</u></b> <span style="color: red;">Rev 172</span></p> <p>2.1 <b><u>IF</u></b> Operations requires reducing LDST Pressure, perform Section 3 (Operations Requires LDST Pressure Reduction)</p> <p>3.1 Close 1GWD-20 (LDST Vent Blk). (A-2-LDST Hatch Area)</p> <p>3.2 Open 1GWD-19 (LDST VENT).</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p><b>CAUTION:</b> LDST pressure should be within curves of Enclosure "LDST Pressure Vs Level" of OP/0/A/1108/001 (Curves and General Information).</p></div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p><b>NOTE:</b> If LDST pressure is &lt; 30 psig, leakage from BWST into HPI System may occur. (R.M.)</p></div> <p>3.3 Throttle open 1GWD-20 (LDST Vent Blk) until LDST pressure begins to <b><u>slowly</u></b> decrease <b><u>and</u></b> GWD system can maintain vent header. (A-2-LDST Hatch Area)</p> <p>3.4 <b><u>IF</u></b> required, start Standby GWD Compressor per OP/1-2/A/1104/018 (GWD System).</p> <p>3.5 <b><u>WHEN</u></b> desired LDST pressure obtained, close 1GWD-19 (LDST VENT).</p> <p>3.6 <b><u>IF</u></b> started, stop Standby GWD Compressor.</p> <p>3.7 Throttle <math>\approx</math> 1/4 turn open 1GWD-20 (LDST Vent Blk). (A-2-LDST Hatch Area)</p>
<b>This event is complete when LDST Hydrogen addition is complete and 1H-26 is closed, or when directed by the Lead Examiner.</b>		



Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **1**

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Event Description: **Pressurize LDST with H2 (1H-1 will fail open) (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/0/A/1108/001 rev 112</i></p> <p style="text-align: center;">Enclosure 4.39 LDST Pressure Vs. Level (All Units) (Instrument Error Included)</p> <p style="text-align: right;">OP/0/A/1108/001 Page 1 of 2</p> <p>The graph plots LDST Pressure (psig) on the y-axis (0 to 100) against LDST Indicated Level (inches) on the x-axis (0 to 100). Two curves are shown: Curve 1 (upper) and Curve 2 (lower). The area between the curves is shaded and labeled 'Permissible Op. Region'. A text box above Curve 1 states: 'Operation above and to the left of Curve 1 NOT PERMITTED: declare BOTH trains of HPI INOPERABLE.' A text box below Curve 2 states: 'Operation below and to the right of Curve 2 requires the compensatory actions listed on Page 2 of this enclosure.'</p> <p style="text-align: right;">LDST IM vs press.des Rev. 6 RTR 3/01/05</p>

This event is complete when LDST Hydrogen addition is complete and 1H-26 is closed, or when directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **2**

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Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <p>OAC alarm O1A0844 (CCW 1A MTR STATOR TEMP) HI-HI</p> <p><b><u>Crew response:</u></b></p> <p>The BOP will refer alarm response for OAC alarm O1A0844 (CCW 1A MTR STATOR TEMP)</p> <p style="text-align: right;"><b>OAC Alarm O1A0844</b></p> <p><b><u>Alarm Response for OAC Alarm O1A0844</u></b></p> <p>HI-HI 1) Refer to OP/1/A/1104/012 A (CCW Pump Operation) to remove the CCWP from service</p> <p>2) Notify System Engineer</p> <p>HI Display the graphic for 1A CCWP and monitor closely</p> <p><b><i>Examiner Note: It is acceptable to perform Enclosures 4.1 and 4.2 in any order.</i></b></p> <p style="text-align: right;"><b>OP/1/A/1104/012A Enclosure 4.1</b></p> <p><b><u>OP/1/A/1104/012 A Enclosure 4.1</u></b> (CCW Pump Startup) <b>rev 19</b></p> <p><b>1. Initial Conditions</b></p> <p>1.1 Verify seal water aligned to CCW Pump to be started per OP/0/A/1104/052 (SSW System)</p> <p>1.2 <b><u>IF</u></b> this is the 4th CCW pump to be started, perform the following on all operating Amertap Trains:</p> <ul style="list-style-type: none"><li>• Ensure CCW Pumps in "4". (1A1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "4". (1A2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "4". (1B1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "4". (1B2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "4". (1C1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "4". (1C2 Amertap Train Set-up 1 Screen)</li></ul> <p><b><i>Booth Cue: If dispatched as an AO to the intake to check CCW pump parameters, respond that pump parameters are normal.</i></b></p>

This event is complete when the 1A CCW pump is secured and the 1D CCW pump is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **2**

Page 2 of 4

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/012A Enclosure 4.1</i></p> <p><b><u>Crew response:</u></b></p> <p>1.3 <b><u>IF</u></b> this is the 1st, 2nd, <b><u>OR</u></b> 3rd CCW pump to be started, perform the following on all operating Amertap Trains:</p> <ul style="list-style-type: none"><li>• Ensure CCW Pumps in "3" (1A1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1A2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1B1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1B2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1C1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1C2 Amertap Train Set-up 1 Screen)</li></ul> <p>1.4 Review Limits and Precautions</p> <p><b>2. Procedure</b></p> <div><p><b>NOTE:</b> Do <b><u>NOT</u></b> operate CCW Pumps in the same header until adjacent CCW Pump discharge valves have fully repositioned to prevent CCW Pump discharge valve malfunction.</p></div> <p>2.1 <b><u>IF</u></b> this is the first CCW Pump to be started, verify closed CCW Pump discharge valves on adjacent CCW Pumps.</p> <p>2.2 Verify closed discharge valve on CCW Pump to be started</p> <div><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• CCW Pump starts when discharge valve <math>\approx</math> 20% open</li><li>• ESV Tank low vacuum alarms may occur during CCW Pump start</li><li>• LPSW Leakage Accumulator level is a function of LPSW System pressure. When CCW Pump status is changed, LPSW Leakage Accumulator level may exceed the limits of SR 3.7.7.1 until LPSW system pressure stabilizes. As a result, momentary entry into TS 3.7.7 Condition 'B' may be necessary.</li><li>• During two CCW pump operation, operating 1A CCWP and 1D CCWP should be avoided as much as possible since they are both powered from 1TC</li></ul></div> <p>2.3 Start desired CCW Pump: _____.</p> <p>2.4 Verify CCW Pump discharge valve opens</p> <p>2.5 Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running CCW Pump</p>

**This event is complete when the 1A CCW pump is secured and the 1D CCW pump is started, or as directed by the Lead Examiner.**

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Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/012A Enclosure 4.2</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>OP/1/A/1104/012A Enclosure 4.2</u></b> (CCW Pump Shutdown)</p> <p><b>1. Initial Conditions</b></p> <p>1.1 <b><u>IF</u></b> Enclosure "Hot Lake Water Surveillance" of OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) in effect, ensure System Engineer notified prior to stopping CCW Pump.</p> <p>_____</p> <p>Person Notified                      Date</p> <p>1.2 Review Limits and Precautions</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>NOTE:</b> LPSW Leakage Accumulator level is a function of LPSW System pressure. When CCW Pump status is changed, LPSW Leakage Accumulator level may exceed the limits of SR 3.7.7.1 until LPSW system pressure stabilizes. As a result, momentary entry into TS 3.7.7 Condition 'B' may be necessary.</p> </div> <p><b>2. Procedure</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• 1A and 1B CCWPs are on same CCW header</li> <li>• 1C and 1D CCWPs are on same CCW header</li> <li>• The CCW header CANNOT be credited as an operable ECCW header unless a CCWP discharge valve is open</li> <li>• During two CCW pump operation, operating 1A CCWP and 1D CCWP should be avoided as much as possible since they are both powered from 1TC</li> </ul> </div> <p>2.1 <b><u>IF</u></b> CCW header will still have an operating CCWP when desired CCWP is secured, perform the following:</p> <p>2.1.1 Stop desired CCW Pump: _____</p> <p>2.1.2 Verify CCW Pump discharge valve closes</p> <p>2.1.3 Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running CCW Pump</p> <p><b>Examiner Note:</b> <i>If the crew secures the 1A CCW pump and decides to operate with two CCW pumps, call as the SM and tell them Engineering requests 3 CCW pumps in operation.</i></p>

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Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **2**

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Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/012A Enclosure 4.2</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>OP/1/A/1104/012A Enclosure 4.2</u></b></p> <div style="border: 1px solid black; padding: 10px;"><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• An operable ECCW Header consists of having one of the two CCW Pump discharge valves on a CCW header open and the associated ESV Train aligned and operating</li><li>• Unit 1 and 2 can credit any combination of Unit 1 and Unit 2 ECCW headers, as long as Unit 3 is <b><u>NOT</u></b> crediting a Unit 2 ECCW Header</li><li>• Unit 1 <b><u>CANNOT</u></b> credit a Unit 3 ECCW Header</li><li>• Unit 2 ECCW headers <b><u>CANNOT</u></b> be credited for Unit 1 or 2 if being credited by Unit 3</li><li>• Unit 3 <b><u>CANNOT</u></b> credit a Unit 1 ECCW Header</li><li>• During two CCW pump operation, operating 1A CCWP and 1D CCWP should be avoided as much as possible since they are both powered from 1TC</li></ul></div> <p>2.2 <b><u>IF</u></b> CCW header will <b><u>NOT</u></b> have an operating CCWP when desired CCWP is secured, perform the following: <b>(N/A)</b></p> <p><b>Examiner Note:</b> <i>The 1B CCW pump will be operating so all Step 2.2 is not applicable.</i></p> <p>2.3 <b><u>IF</u></b> 4th CCW pump was stopped, perform the following on all operating Amertap Trains:</p> <ul style="list-style-type: none"><li>• Ensure CCW Pumps in "3" (1A1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1A2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1B1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1B2 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1C1 Amertap Train Set-up 1 Screen)</li><li>• Ensure CCW Pumps in "3" (1C2 Amertap Train Set-up 1 Screen)</li></ul> <p><b>Examiner Note:</b> <i>If the crew starts the 1D CCW pump and then secures the 1A CCW pump, TS 3.7.7 Condition B will apply due to the LPSW Leakage Accumulator OAC alarm</i></p> <hr/> <p><b><u>TS 3.7.7 (LOW PRESSURE SERVICE WATER SYSTEM)</u></b></p> <p>Condition B (7 days) Restore the LPSW WPS to OPERABLE status.</p>

This event is complete when the 1A CCW pump is secured and the 1D CCW pump is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **3**

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Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b><u>Plant Response:</u></b></p> <ul style="list-style-type: none"><li>• OAC alarm O1D1361 (RBCU Fan 1A Vib)</li></ul> <p><b><u>Crew response:</u></b></p> <ul style="list-style-type: none"><li>• Refer to OAC ARG</li><li>• BOP will attempt to reset vibration alarm (Panel 1AB3) (<b>It will reset the first time</b>)</li><li>• BOP will secure the 1A RBCU</li><li>• Contact engineering</li></ul> <p><b><u>OAC Alarm O1D1361</u></b></p> <ol style="list-style-type: none"><li>1) Depress the RBCU OAC Vibration alarm reset pushbutton</li><li>2) If the alarm doesn't clear stop the RBCU</li><li>3) Notify Engineering for an evaluation</li></ol>
	BOP	<p><b><i>Examiner Note: The crew may stop the 1A RBCU per the OAC alarm response guide.</i></b></p> <p><b><i>Examiner Note: There is a Limit &amp; Precaution in OP/1104/015 that states if RBCU vibration alarms cannot be promptly cleared, immediately stop the affected RBCU.</i></b></p> <p><b><i>Booth Cue: If the crew fails to start the 1B RBCU, contact the crew as the SM and request that the 1B RBCU be started in HIGH SPEED.</i></b></p> <p>SRO should refer to TS 3.6.5 (<b>page 13</b>)</p> <p><b><u>OP/1/A/1104/015</u></b> Enclosure 4.3 (RBCU Operation) <b>rev 43</b></p> <p><b>3. Stopping RBCU(s)</b></p> <div><p><b>NOTE:</b> When starting RBCUs <u>or</u> changing LPSW flows, RB pressure will change as RB temperature changes.</p></div> <p>3.1 Verify RB pressure within limits of PT/1/A/0600/001 (Periodic Instrument Surveillance).</p>

**This event is complete when the 1A RBCU is secured and the 1B RBCU is started, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **3**

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Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>OP/1/A/1104/015 Encl 4.3</i></p> <p><b><u>Crew response:</u></b></p> <p>3.2 <u>Begin</u> monitoring the following:</p> <ul style="list-style-type: none"><li>• RB pressure absolute pressure. (OAC Turn On 1RBPA).</li><li>• RB Temperature</li></ul> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> Stopping RBCUs can affect the following: RBCU bearing temperatures, RBCU vibration, RBNS level, 1RIA-47 level, RB pressure/temperature.</p></div> <p>3.3 Place desired switch to "OFF":</p> <p><input type="checkbox"/> <b>1A RBCU</b></p> <p><input type="checkbox"/> 1B RBCU</p> <p><input type="checkbox"/> 1C RBCU</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• When changing LPSW flows, RB pressure will change as RB temperature changes.</li><li>• Each RBCU must have <math>\geq 550</math> gpm Inlet Flow or <math>\geq 750</math> gpm Outlet Flow to meet flow requirements of SLC 16.9.12.</li></ul></div> <p>3.4 Position valves as required for RB cooling:</p> <p><input type="checkbox"/> 1LPSW-18 (1A RBCU OUTLET)</p> <p><input type="checkbox"/> 1LPSW-21 (1B RBCU OUTLET)</p> <p><input type="checkbox"/> 1LPSW-24 (1C RBCU OUTLET)</p> <p><b>4. Starting RBCUs</b></p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> When starting RBCUs <u>or</u> changing LPSW flows, RB pressure will change as RB temperature changes.</p></div> <p>4.1 Verify RB pressure within limits of PT/1/A/0600/001 (Periodic Instrument Surveillance).</p> <p>4.2 <u>Begin</u> monitoring RB pressure absolute pressure (OAC Turn On 1RBPA).</p> <p>4.3 <b>IF</b> personal inside containment, announce over plant page that starting RBCU.</p>

**This event is complete when the 1A RBCU is secured and the 1B RBCU is started, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **3**

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Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>OP/1/A/1104/015 Encl 4.3</i></p> <p><b><u>Crew response:</u></b></p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> Starting RBCUs can affect the following: RBCU bearing temperatures, RBCU vibration, RBNS level, 1RIA-47 level, RB pressure/temperature.</p></div> <p>4.4 Place desired switch to "HIGH <u>or</u> LOW":</p> <p><input type="checkbox"/> 1A RBCU</p> <p><input type="checkbox"/> <b>1B RBCU</b></p> <p><input type="checkbox"/> 1C RBCU</p> <p><b><i>Examiner Note: The 1B RBCU should be placed in HIGH speed.</i></b></p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> When changing LPSW flows, RB pressure will change as RB temperature changes.</p><p>Each RBCU must have <math>\geq 550</math> gpm Inlet flow or <math>\geq 750</math> gpm Outlet Flow to meet flow requirements of SLC 16.9.12.</p></div> <p>4.5 Position valves as required for RB cooling:</p> <p><input type="checkbox"/> 1LPSW-18 (1A RBCU OUTLET)</p> <p><input type="checkbox"/> 1LPSW-21 (1B RBCU OUTLET)</p> <p><input type="checkbox"/> 1LPSW-24 (1C RBCU OUTLET)</p>
	SRO	<p>SRO should refer to TS 3.6.5</p> <hr/> <p><b><u>TS 3.6.5 REACTOR BUILDING SPRAY AND COOLING TRAINS</u></b></p> <p>Condition B (7 days) Restore Reactor Building cooling train to OPERABLE status.</p> <hr/>

**This event is complete when the 1A RBCU is secured and the 1B RBCU is started, or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **4**

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Event Description: **Loop 'B' Tcold Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• Loop "1B" Tc Dixon meter low (520°F)</li><li>• Loop "1B" ΔT Dixon meter reads 70°F</li><li>• ΔTc meter reads low (+10°F; "A" loop Hot)</li><li>• Controlling NR Tave digital display reads ≈ 570°F</li><li>• Controlling Tave Chessell display reads ≈ 570°F</li><li>• 1SA-2/B-4 (RC Average Temperature High/Low)</li><li>• 1SA-2/B-5 (RC COLD LEG DIFF TEMP HIGH)</li><li>• 1SA-2/A-12 (ICS Tracking)</li></ul> <p><b><u>Crew response:</u></b></p> <p>When the Statalarms are received, the candidates should utilize the Plant Transient Response process to stabilize the plant.</p> <ul style="list-style-type: none"><li>• Diagnose the 1B Loop Tcold failure by observing the Loop B T<sub>C</sub> Dixon meter on 1UB1</li><li>• The OATC will place the Diamond and both FDW Masters in manual and re-ratio Feedwater to stabilize the plant</li></ul> <p>The OATC should:</p> <ul style="list-style-type: none"><li>• Communicate to the CRS the initial alarm (if applicable) followed by reactor power level and direction</li><li>• Place the appropriate ICS stations in manual (Diamond and both FDW Masters in this case) in manual if any of the following occur:<ul style="list-style-type: none"><li>○ NI power increasing above the pre-transient power level</li><li>○ Failed instrument is diagnosed</li><li>○ Invalid input exists and the CRS directs the ICS be placed in manual</li></ul></li><li>• Remain focused on reactor power level and FDW response during the transient</li></ul> <p>The BOP should:</p> <ul style="list-style-type: none"><li>• Determine if a valid ICS runback exists and inform the CRS</li><li>• Monitor plant response and verify operating limits <u>NOT</u> exceeded</li><li>• If ICS is placed in Manual, remain focused on RCS pressure, SG outlet pressure and RCS inventory</li></ul> <p>The SRO should:</p> <ul style="list-style-type: none"><li>• Refer to AP/28 (ICS Instrument Failures)</li><li>• Ensure FIN-24 (SPOC) is contacted to repair the failed instrument</li></ul>

**This event is complete when the SRO reaches Step 6 in AP/28 Section 4A, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **4**

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Event Description: **Loop 'B' Tcold Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior						
		<p style="text-align: right;"><i>AP/1/A/1700/028</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>AP/1/A/1700/028</u></b> (ICS Instrument Failures) <i>rev 20</i></p> <p>4.1 Provide control bands as required. <b>(OMP 1-18 Att. I)</b></p> <p><b><i>OMP 1-18 Attachment I:</i></b></p> <p><b><i>1. Plant Conditions Stable or <math>TPB \leq</math> Pre-transient Conditions</i></b></p> <ul style="list-style-type: none"><li><b><i>NI Power <math>\pm 1\%</math> not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power – 1%.</i></b></li><li><b><i>Current Tave <math>\pm 2^\circ\text{F}</math>.</i></b></li><li><b><i>Current SG Outlet Pressure <math>\pm 10</math> PSIG (N/A)</i></b></li><li><b><i>Delta Tc <math>0^\circ\text{F} \pm 2^\circ\text{F}</math>.</i></b></li></ul> <p>4.2 Initiate notification of the following: ___ OSM to reference the following:<ul style="list-style-type: none"><li>OMP 1-14 (Notifications)</li><li>Emergency Plan</li></ul>___ STA</p> <p>4.3 Verify a power transient <math>\geq 5\%</math> has occurred.</p> <p><b>RNO: GO TO</b> Step 4.5.</p> <p>4.4 Notify Rx Engineering and discuss the need for a maneuvering plan.</p> <p>4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6:</p> <ul style="list-style-type: none"><li>OAC alarm video</li><li>OAC display points</li><li>Control Board indications</li><li>SPOC assistance, as needed</li></ul> <p>4.6 <b>GO TO</b> the applicable section per the following table:</p> <table><tr><th></th><th>Section</th><th>Failure</th></tr><tr><td></td><td>4A</td><td>RCS Temperature</td></tr></table> <p><b><i>Examiner Note: If PZR level is <math>\geq 260''</math> (corrected for 285'') TS 3.4.9 Condition A will apply.</i></b></p> <hr/> <p><b><u>TS 3.4.9 (Pressurizer)</u></b></p> <p>Condition A (1 hour) Restore level to within limit.</p> <hr/>		Section	Failure		4A	RCS Temperature
	Section	Failure						
	4A	RCS Temperature						

This event is complete when the SRO reaches Step 6 in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **4**

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Event Description: **Loop 'B' Tcold Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/028 Section 4A</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>AP/1/A/1700/028 Section 4A</u></b> (RCS Temperature Failure)</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• If Tave instrument circuit failed high, the following may have occurred depending on initial ICS station status:<ul style="list-style-type: none"><li>• Unit to TRACK due to Rx Cross Limits</li><li>• Control Rod insertion</li><li>• Feedwater flow increase</li></ul></li><li>• If Tave instrument circuit failed low, the following may have occurred depending on initial ICS station status:<ul style="list-style-type: none"><li>• Unit to TRACK due to Rx Cross Limits</li><li>• Control Rod withdrawal</li><li>• Feedwater flow decrease</li><li>• Feedwater re-ratio</li></ul></li></ul></div> <ol style="list-style-type: none"><li>1. Ensure the following in HAND:<ul style="list-style-type: none"><li>___ 1A FDW MASTER</li><li>___ 1B FDW MASTER</li></ul></li><li>2. Ensure DIAMOND in MANUAL.</li><li>3. Notify SPOC to perform the following:<ul style="list-style-type: none"><li>___ Select a valid RCS Tave and Delta Tc input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function).</li><li>___ Investigate and repair the failed RCS temperature instrumentation.</li></ul></li><li>4. <b>PERFORM</b> an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument.</li><li>5. Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.</li></ol> <p><b>RNO:</b> Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).</p> <ol style="list-style-type: none"><li>6. <b>WHEN</b> notified by SPOC that a valid RCS Tave and Delta Tc input have been restored to ICS, <b>THEN GO TO</b> OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).</li></ol>

**This event is complete when the SRO reaches Step 6 in AP/28 Section 4A, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **5**

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Event Description: **1A SGTR (≈ 60 gpm) Requiring Manual Power Reduction (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-8/A-9 (RM AREA MONITOR RADIATION HIGH)</li><li>• 1SA-8/E-10 (N-16 RM PRIMARY TO SECONDARY TUBE LEAK)</li><li>• 1SA-8/D-10 (RM CSAE EXHAUST RADIATION HIGH)</li><li>• 1SA-8/B-9 (RM PROCESS MONITOR RADIATION HIGH)</li><li>• 1RIA-40 in alarm</li><li>• 1RIA 60 in alarm and indicating ≈ 60 gpm</li></ul> <p><b><u>Crew response:</u></b></p> <p>Once S/G tube leakage exceeds 25 gpm, the SRO will enter the SGTR tab of the EOP</p> <p>(CT-1- Start OABFs w/in 30 min) <b>CT-1 Start: _____</b> (see p. 20 or 28 for stop time)</p> <p><b>SGTR Tab</b></p> <p>1. Verify Rx tripped</p> <p><b>RNO:</b> 1. Maintain Pzr level 220" – 260" by initiating Encl 5.5 (Pzr and LDST Level Control) (<b>page 29</b>)</p> <p>2. <b>GO TO</b> Step 10</p> <p>10. <b>IAAT</b> Pzr level decreasing with <u>all</u> available HPI, <b>AND</b> Rx power is &gt; 18%, <b>THEN</b> perform the following:</p> <p>___ Trip the Rx</p> <p>___ <b>GO TO</b> IMA tab</p> <p>11. Verify <u>all</u>:</p> <p>___ Rx power &gt; 40%</p> <p>___ 1RIA-59 operable</p> <p>___ 1RIA-60 operable</p> <p><b>RNO:</b> 1. Estimate SGTR leak rate:</p> $\frac{\text{MU}}{\text{MU}} + \frac{\text{SI}}{\text{SI}} - \frac{\text{LD}}{\text{LD}} - \frac{\text{TSR}}{\text{TSR}} = \frac{\text{LR}}{\text{LR}} \text{ gpm}$ <p>Where: MU = Makeup Flow SI = Seal Inlet Hdr Flow LD = Letdown Flow TSR = Total Seal Return Flow LR = Leak Rate</p> <p>2. ___ <b>GO TO</b> Step 13.</p>

**This event is complete when power has been reduced > 10% and the Outside Air Booster Fans have been started, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **5**

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Event Description: **1A SGTR ( $\approx$  60 gpm) Requiring Manual Power Reduction (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>SGTR Tab</i></p> <p><b><u>Crew response:</u></b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>1RIA-59/60 and 1RIA-16/17 may indicate up to <math>\approx</math> 2% of the value of the opposite detector due to shine effects based on the close proximity of the steam lines and detectors.</p></div> <p>12. Determine leak rate using:     ___ 1RIA-59     ___ 1RIA-60</p> <p>13. Notify OSM of SGTR leak rate</p> <p>14. Verify ICS capable of power reduction in AUTO</p> <p><b>RNO:</b> 1. Initiate manual power reduction to &lt; 15%       2. <b>GO TO</b> Step 16</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>Encl 5.19 (Control of Plant Equipment During Shutdown for SGTR) will swap auxiliaries</p></div> <p>16. Initiate Encl 5.19 (Control of Plant Equipment During Shutdown for SGTR) (<b>page 20</b>)</p> <p>17. <b>WHEN</b> <u>both</u> exist:     ___ Reactor power is <math>\approx</math> 15% FP     ___ Unit auxiliaries have been transferred     <b>THEN</b> continue</p> <p>18. Depress turbine TRIP pushbutton</p> <p>19. Verify <u>all</u> TURBINE STOP VALVES closed</p> <p><b>RNO:</b> Place both EHC pumps in PULL TO LOCK</p> <p>20. Open:     ___ PCB 20     ___ PCB 21</p> <p>21. Verify Generator Field Breaker open</p> <p>22. Verify EXCITATION is OFF</p> <p>23. Verify TBVs controlling SG pressure as expected</p> <p>24. Reduce Rx power to <math>\leq</math> 5% FP</p>

**This event is complete when power has been reduced > 10% and the Outside Air Booster Fans have been started, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **5**

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Event Description: **1A SGTR (≈ 60 gpm) Requiring Manual Power Reduction (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>SGTR Tab</i></p> <p><b><u>Crew response:</u></b></p> <p>25. Perform both:</p> <p>A. Depress REACTOR TRIP pushbutton</p> <p>B. Stabilize RCS P/T as follows:</p> <ul style="list-style-type: none"><li>• TBVs in auto - reduce TBV setpoint, as needed, to prevent heatup</li><li>• TBVs in manual - throttle TBVs closed, as needed, to prevent cooldown</li><li>• ADVs in use - throttle ADVs closed, as needed, to prevent cooldown</li></ul> <p><b><i>Examiner Note: The Reactor will fail to trip and the SRO will refer to the Parallel Actions Page and then transfer to the UNPP tab.</i></b></p> <p>26. Maintain Pzr level 140" – 180" [175" – 215" acc]</p> <p>27. Dispatch an operator to open:</p> <p>___ 1XD-R3C (A Turb Bldg Sump Pump Bkr) (T-1, G-27)</p> <p>___ 1XE-R3D (B Turb Bldg Sump Pump Bkr) (T-1, J-27)</p> <p>28. Secure any unnecessary offsite release paths. (Main Vacuum Pumps, TDEFDWP, Emergency Steam Air Ejector, etc.)</p> <p>29. Verify Main FDW <u>or</u> EFDW controlling properly</p> <p>30. Open:</p> <p>___ 1HP-24</p> <p>___ 1HP-25</p> <p>31. Secure makeup to LDST</p> <p>32. Maintain <u>both</u> SG pressures &lt; 950 psig using <u>either</u>:</p> <p>___ TBVs</p> <p>___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) <b>(PS)</b></p> <p>33. <b>IAAT</b> <u>all</u> the following exist:</p> <p>___ <u>All</u> SCMs &gt; 0°F</p> <p>___ ES Bypass Permit satisfied</p> <p>___ RCS pressure controllable</p> <p><b>THEN</b> perform Steps 34 - 35</p> <hr/> <p><b><u>TS 3.4.13 RCS OPERATIONAL LEAKAGE</u></b></p> <p>Condition B (12 hours) Be in MODE 3 AND (36 hours) Be in MODE 5</p> <hr/>

**This event is complete when power has been reduced > 10% and the Outside Air Booster Fans have been started, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **6**

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Event Description: **Support Actions During Manual Power Reduction (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>EOP Enclosure 5.19</i></p> <p><b><u>Crew response:</u></b></p> <p><b>EOP Enclosure 5.19 (Control of Plant Equipment During Shutdown for SGTR)</b></p> <ol style="list-style-type: none"><li>Perform the following:<ol style="list-style-type: none"><li>Monitor RIAs to identify <u>all</u> SGs with a tube rupture:<ul style="list-style-type: none"><li>1RIA-16</li><li>1RIA-17</li><li>1RIA-59 when Rx power &gt; 40%</li><li>1RIA-60 when Rx power &gt; 40%</li></ul></li><li>Inform CRS of results</li></ol></li><li>Place 1TA AUTO/MAN transfer switch in MAN</li><li>Place 1TB AUTO/MAN transfer switch in MAN</li><li>Close 1TA SU 6.9 KV FDR</li><li>Close 1TB SU 6.9 KV FDR</li><li>Place MFB1 AUTO/MAN transfer switch in MAN</li><li>Place MFB2 AUTO/MAN transfer switch in MAN</li><li>Close E1<sub>1</sub> MFB1 STARTUP FDR</li><li>Close E2<sub>1</sub> MFB1 STARTUP FDR</li><li>Notify CRS that unit auxiliaries have been transferred</li><li>Start:<ul style="list-style-type: none"><li>___ TURBINE TURNING GEAR OIL PUMP</li><li>___ 1A through 1E TURBINE BRNG OIL LIFT PUMPS</li><li>___ TURBINE MOTOR SUCTION PUMP</li></ul></li><li>Start:<ul style="list-style-type: none"><li>___ A OUTSIDE AIR BOOSTER FAN</li><li>___ B OUTSIDE AIR BOOSTER FAN</li></ul></li></ol> <p style="text-align: right;"><b>CT-1 Stop: _____</b> (within 30 minutes of SGTR)</p> <p><b>Examiner Note:</b> <i>The Outside Air Booster Fans are also started per the SGTR tab Step 4 (page 28)</i></p>

**This event is complete when the Outside Air Booster Fans have been started (Step 12), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **6**

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Event Description: **Support Actions During Manual Power Reduction (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EOP Enclosure 5.19</i></p> <p><b><u>Crew response:</u></b></p> <p>13. Notify Unit 3 to start:</p> <p>    ___ 3A OUTSIDE AIR BOOSTER FAN</p> <p>    ___ 3B OUTSIDE AIR BOOSTER FAN</p> <p>14. Stop:</p> <p>    ___ 1A MSRHR DRN PUMP</p> <p>    ___ 1B MSRHR DRN PUMP</p> <p>15. Place in manual and close:</p> <p>    ___ 1FDW-53</p> <p>    ___ 1FDW-65</p> <p>16. Place in DUMP:</p> <p>    ___ 1HD-37</p> <p>    ___ 1HD-52</p> <p>17. Perform the following:</p> <p>    ___ Place 1A FDWP SEAL INJECTION PUMP switch to START</p> <p>    ___ Place 1B FDWP SEAL INJECTION PUMP switch to START</p> <p>    ___ Start 1A FDWP AUXILIARY OIL PUMP</p> <p>    ___ Start 1B FDWP AUXILIARY OIL PUMP</p> <p>18. <b>WHEN</b> Rx power is <math>\leq 80\%</math>, <b>THEN</b> stop:</p> <p>    ___ 1E1 HTR DRN PUMP</p> <p>    ___ 1E2 HTR DRN PUMP</p> <p>19. Verify <u>both</u> Main FDW pumps running</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• 1B Main FDW Pump is the preferred pump to be shutdown first.</li><li>• To lower 1B Main FDW Pump suction flow, bias is adjusted counter-clockwise.</li><li>• To lower 1A Main FDW Pump suction flow, bias is adjusted clockwise.</li></ul></div> <p>20. Adjust bias for first Main FDW pump desired to be shutdown until suction flow is <math>\approx 1 \times 10^6</math> lbm/hr less than remaining Main FDW pump suction flow</p>

**This event is complete when the Outside Air Booster Fans have been started (Step 12), or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **6**

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Event Description: **Support Actions During Manual Power Reduction (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EOP Enclosure 5.19</i></p> <p><b><u>Crew response:</u></b></p> <p>21. <b>WHEN</b> core thermal power is &lt; 65% FP, <b>THEN</b> continue</p> <p>22. <b>IAAT</b> <u>both</u> Main FDW pumps running, <b>AND</b> <u>both</u> of the following exist: ___ 1B Main FDW Pump is first pump to be shut down ___ <u>Any</u> of the following alarms occur:     • FWP B FLOW MINIMUM (1SA-16/A-3)     • FWP B FLOW BELOW MIN (1SA-16/A-4) <b>THEN</b> trip 1B Main FDW Pump</p> <p>23. <b>IAAT</b> <u>both</u> Main FDW pumps running, <b>AND</b> <u>both</u> of the following exist: ___ 1A Main FDW Pump is first pump to be shut down ___ <u>Any</u> of the following alarms occur:     • FWP A FLOW MINIMUM (1SA-16/A-1)     • FWP A FLOW BELOW MIN (1SA-16/A-2) <b>THEN</b> trip 1A Main FDW Pump</p> <p>24. Notify RP to survey <u>both</u> MS lines for radiation</p> <p>25. <b>WHEN</b> load is <math>\leq</math> 450 MWe, <b>THEN</b> continue</p> <p>26. Verify 1C COND BOOSTER PUMP operating</p> <p><b>RNO:</b> 1. Ensure <u>only one</u> CBP operating 2. <b>GO TO</b> Step 28</p> <p>27. Stop: ___ 1A COND BOOSTER PUMP ___ 1B COND BOOSTER PUMP</p> <p>28. Place the control switch for <u>one</u> shutdown CBP to AUTO</p> <p>29. Ensure CBP LOAD SHED DEFEAT switch positioned to a running CBP</p> <p>30. <b>WHEN</b> load is <math>\leq</math> 400 MWe, <b>THEN</b> stop: ___ 1D1 HTR DRN PUMP ___ 1D2 HTR DRN PUMP</p>

**This event is complete when the Outside Air Booster Fans have been started (Step 12), or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **6**

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Event Description: **Support Actions During Manual Power Reduction (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior								
		<p style="text-align: right;"><i>EOP Enclosure 5.19</i></p> <p><b><u>Crew response:</u></b></p> <p>31. <b>WHEN</b> load is <math>\leq 325</math> MWe, <b>THEN</b> ensure <u>only two</u> HWP's in operation</p> <p>32. Place the control switch for <u>one</u> shutdown HWP to AUTO</p> <p>33. Ensure HWP LOAD SHED DEFEAT switch positioned to a running HWP</p> <p>34. <b>IAAT</b> suction flow on the only operating Main FDW Pump is <math>&lt; 1.5 \times 10^6</math> lbm/hr, <b>THEN</b> throttle operating Main FDW pump recirc control valve to establish 2300 – 6000 gpm:</p> <table border="1"><tbody><tr><td>√</td><td><b>1A Main FDW Pump</b></td><td>√</td><td><b>1B Main FDW Pump</b></td></tr><tr><td></td><td>1FDW-53</td><td></td><td>1FDW-65</td></tr></tbody></table> <p>35. <b>WHEN</b> load is <math>\leq 225</math> MWe, <b>THEN</b> ensure <u>only one</u> HWP in operation</p> <p>36. Ensure HWP LOAD SHED DEFEAT switch positioned to a running HWP</p> <p>37. Notify WCC SRO to make notifications per Encl 5.2 (WCC SRO Support During Rapid Shutdown) of AP/29 (Rapid Unit Shutdown)</p> <p>38. <b>WHEN</b> directed by CRS, <b>THEN EXIT</b> this enclosure</p>	√	<b>1A Main FDW Pump</b>	√	<b>1B Main FDW Pump</b>		1FDW-53		1FDW-65
√	<b>1A Main FDW Pump</b>	√	<b>1B Main FDW Pump</b>							
	1FDW-53		1FDW-65							
<b>This event is complete when the Outside Air Booster Fans have been started (Step 12), or as directed by the Lead Examiner.</b>										

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **7**

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Event Description: **Reactor Fails to Trip (ATWS) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-1/B-1 (1B RPS TRIP)</li><li>• 1SA-1/C-1 (1C RPS TRIP)</li><li>• 1SA-1/D-1 (1D RPS TRIP)</li></ul> <p><b><u>Crew response:</u></b></p> <p><b><u>UNPP Tab</u></b></p> <p>1. Ensure Rule 1 (ATWS / Unanticipated Nuclear Power Production) is in progress or complete (<b>page 27</b>)</p> <p>2. Verify Main FDW is operating <u>and</u> in AUTO</p> <p>3. <b>IAAT</b> Main FDW is <b>NOT</b> operating, <b>THEN</b>:</p> <ul style="list-style-type: none"><li>A. Trip the turbine-generator</li><li>B. Start <u>all available</u> EFDW pumps</li><li>C. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete</li></ul> <p>4. <b>IAAT</b> <u>all</u> power range NIs are &lt; 5% FP, <b>THEN</b> perform Steps 5 – 6</p> <p><b>RNO: GO TO</b> Step 7</p> <p>5. Depress turbine TRIP pushbutton</p> <p>6. Verify <u>all</u> turbine stop valves closed</p> <p>7. Verify <u>any</u> wide range NI &gt; 1% FP</p> <p>8. Open 1RC-4</p> <p>9. Verify 1HP-5 open</p> <p>10. Maximize letdown using 1HP-7 while maintaining letdown temperature &lt; 120°F</p> <p>11. Verify Main FDW available</p> <p>12. Adjust Main FDW flow as necessary to control RCS temperature</p> <p>13. Verify overcooling in progress</p> <p><b>RNO: GO TO</b> Step 16</p>

*UNPP Tab*

**This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **7**

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Event Description: **Reactor Fails to Trip (ATWS) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
	<b>CT-2</b>	<p style="text-align: right;"><i>UNPP Tab</i></p> <p><b><u>Crew response:</u></b></p> <p>16. Secure makeup to LDST</p> <p>17. <b>WHEN</b> <u>all</u> wide range NIs are <math>\leq 1\%</math> FP, <b>AND</b> decreasing, <b>THEN</b> continue</p> <p><i>(Prior to exiting the UNPP tab, take the Reactor subcritical (<math>&lt; 1\%</math> power on WR NIs))</i></p> <p>18. Control RCS temperature as follows:</p> <p>___ Tave <math>\leq 555^{\circ}\text{F}</math> – Adjust SG pressure as <u>necessary</u> to stabilize RCS temperature using <u>either</u>:</p> <ul style="list-style-type: none"><li>• TBVs</li><li>• Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) <b>(PS)</b></li></ul> <p>___ Tave <math>&gt; 555^{\circ}\text{F}</math></p> <ul style="list-style-type: none"><li>• Utilize Rule 7 (SG Feed Control) to control SG feed rate as necessary to maintain cooldown rate within Tech Spec limits during the approach to the SG Level Control Point</li></ul> <p>19. Throttle HPI per Rule 6 (HPI) (<b>page 37</b>)</p> <p>20. <b>WHEN</b> RCS pressure <math>&lt; 2300</math> psig, <b>THEN</b> continue</p> <p>21. Verify PORV closed</p> <p>22. Adjust letdown flow as desired</p> <p>23. Verify RCP seal injection available</p> <p>24. <b>GO TO</b> Subsequent Actions (<b>next page</b>)</p> <p><b>Examiner Note:</b> <i>The SRO will transfer to the Subsequent Actions tab and then review the Parallel Actions page. The Parallel Actions page will direct the SRO to go to the SGTR tab. (<b>page 28</b>)</i></p>
This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.		

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **7**

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Event Description: **Reactor Fails to Trip (ATWS) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Subsequent Actions</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>Subsequent Actions</u></b></p> <p>4.1 Verify all control rods in Groups 1 – 7 fully inserted</p> <p>4.2 Verify Main FDW in operation</p> <p>4.3 Verify <u>either</u>:</p> <p>___ Main FDW overfeeding causing excessive temperature lowering</p> <p>___ Main FDW underfeeding causing SG level lowering below setpoint</p> <p><b>RNO: GO TO</b> Step 4.5</p> <p>4.5 <b>IAAT</b> Main FDW is operating, <b>AND</b> level in <u>any</u> SG is &gt; 96% on the Operating Range, <b>THEN</b> perform Steps 4.6 - 4.8</p> <p><b>RNO: GO TO</b> Step 4.9</p> <p>4.9 <b>IAAT</b> TBVs <b>CANNOT</b> control SG pressure at desired setpoint, <b>AND</b> TBVs <b>NOT</b> intentionally isolated, <b>THEN</b> manually control pressure in <u>affected</u> SGs using <u>either</u>:</p> <p>___ TBVs</p> <p>___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) (<b>PS</b>)</p> <p>4.10 Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating</p> <p>4.11 <b>GO TO</b> Step 4.14</p> <p>4.12 Verify abnormal RCS leakage existed prior to reactor trip</p> <p><b>RNO: GO TO</b> Step 4.14</p> <p>4.14 Verify <u>both</u> are closed:</p> <p>___ 1MS-17</p> <p>___ 1MS-26</p> <p><b>RNO:</b> Dispatch an operator with Encl 5.29 (MSRV Locations) to verify <u>all</u> MSRVs have reseated</p> <p>4.15 Verify ES is required</p> <p><b>RNO:</b> 1. Initiate Encl 5.5 (Pzr and LDST Level Control) (<b>page 29</b>)</p> <p>2. <b>GO TO</b> Step 4.17</p> <p>4.17 Open:</p> <p>___ PCB 20</p> <p>___ PCB 21</p>

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **7**

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Event Description: **Reactor Fails to Trip (ATWS) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Rule 1</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>Rule 1</u></b> (ATWS/Unanticipated Nuclear Power Production) <span style="color: red;">rev 01</span></p> <ol style="list-style-type: none"><li>1. Verify any Power Range NI <math>\geq</math> 5% FP</li></ol> <p><b>RNO:</b> 1. <b>IF</b> in MODE 1 <u>or</u> 2, <b>THEN GO TO</b> Step 2</p> <ol style="list-style-type: none"><li>2. <b>GO TO</b> Step 12</li></ol> <ol style="list-style-type: none"><li>2. Initiate manual control rod insertion to the IN LIMIT</li><li>3. Verify Main FDW is feeding the SGs</li></ol> <p><b>RNO:</b> Trip the turbine generator.</p> <ol style="list-style-type: none"><li>4. Notify CRS to <b>GO TO</b> UNPP tab (<b>page 24</b>)</li><li>5. Open:<ul style="list-style-type: none"><li>___ 1HP-24</li><li>___ 1HP-25</li></ul></li><li>6. Ensure <u>at least one</u> operating:<ul style="list-style-type: none"><li>___ 1A HPI PUMP</li><li>___ 1B HPI PUMP</li></ul></li><li>7. Start 1C HPI PUMP</li><li>8. Open:<ul style="list-style-type: none"><li>___ 1HP-26</li><li>___ 1HP-27</li></ul></li></ol> <p><b>RNO:</b> 1. <b>IF</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> open 1HP-410</p> <ol style="list-style-type: none"><li>2. <b>IF</b> <u>at least two</u> HPI pumps are operating, <b>AND</b> 1HP-27 will <b>NOT</b> open, <b>THEN:</b><ol style="list-style-type: none"><li>A. Start the standby HPI pump</li><li>B. Stop 1C HPI PUMP</li><li>C. Open 1HP-409</li></ol></li></ol> <p><b>Examiner Note:</b> <b>1HP-27 will NOT open and 1HP-409 must be opened to allow HPI flow to both HPI headers.</b></p> <ol style="list-style-type: none"><li>9. Dispatch <u>one</u> operator without wearing Arc Flash PPE to open 600V CRD breakers:<ul style="list-style-type: none"><li>___ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm)</li><li>___ 2X1-5B (U-1 CRD Alternate Fdr Bkr) (T-3/Dd-28)</li></ul></li><li>10. Verify <u>only two</u> HPI pumps operating</li><li>11. <b>EXIT</b></li></ol>

**This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **3**Event No.: **7**

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Event Description: **Reactor Fails to Trip (ATWS) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
	<b>CT-1</b>	<p style="text-align: right;"><i>SGTR tab</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>SGTR tab</u></b></p> <ol style="list-style-type: none"><li>1. Verify Rx tripped</li><li>2. Maintain Pzr level 140" – 180" [175" – 215" acc] by initiating Encl 5.5 (Pzr and LDST Level Control) (<b>page 29</b>)</li><li>3. Ensure Parallel Actions Page reviewed (<b>page 38</b>)</li><li>4. Start: ___ <b>A OUTSIDE AIR BOOSTER FAN</b> ___ <b>B OUTSIDE AIR BOOSTER FAN</b> <div style="border: 1px solid red; padding: 2px; display: inline-block;"><b>CT-1 Stop: _____</b></div> (within 30 minutes of SGTR)</li><li>5. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN</li><li>6. Perform the following: A. ___ Monitor RIAs 16 and 17 to identify <u>all</u> SGs with a tube rupture B. ___ Inform SRO of results</li><li>7. Dispatch an operator to open: ___ 1XD-R3C (A Turb Bldg Sump Pump Bkr) (T-1, G-27) ___ 1XE-R3D (B Turb Bldg Sump Pump Bkr) (T-1, J-27)</li><li>8. Notify RP to survey <u>both</u> MS lines for radiation</li><li>9. <b>GO TO</b> Step 28</li><li>28. Secure <u>any</u> unnecessary offsite release paths. (Main Vacuum Pumps, TDEFDWP, Emergency Steam Air Ejector, etc.)</li><li>29. Verify Main FDW <u>or</u> EFDW controlling properly</li><li>30. Open: ___ 1HP-24 ___ 1HP-25</li><li>31. Secure makeup to LDST</li><li>32. Maintain <u>both</u> SG pressures &lt; 950 psig using <u>either</u>: ___ TBVs ___ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs)</li></ol>

**This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.**

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<div><b>NOTE</b> Maintaining Pzr level &gt;100" [180" acc] will ensure Pzr heater bundles remain covered.</div>	
1.   ___ Utilize the following as necessary to maintain <u>desired</u> Pzr level: <ul style="list-style-type: none"><li>• 1A HPI Pump</li><li>• 1B HPI Pump</li><li>• 1HP-26</li><li>• 1HP-7</li><li>• 1HP-120 setpoint or valve demand</li><li>• 1HP-5</li></ul>	___ <b>IF</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level.
2.   ___ <b>IAAT</b> <u>makeup</u> to the <u>LDST</u> is desired, <b>THEN</b> makeup from 1A BHUT.	
3.   ___ <b>IAAT</b> it is desired to <u>secure makeup</u> to LDST, <b>THEN</b> secure makeup from 1A BHUT.	
4.   ___ <b>IAAT</b> it is desired to <u>bleed</u> letdown flow to 1A BHUT, <b>THEN</b> perform the following: A. Open: ___ 1CS-26 ___ 1CS-41 B. ___ Position 1HP-14 to BLEED. C. ___ Notify SRO.	
5.   ___ <b>IAAT</b> letdown <u>bleed</u> is <b>NO</b> longer desired, <b>THEN</b> position 1HP-14 to NORMAL.	



**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>6. <input type="checkbox"/> <b>IAAT 1C HPI PUMP</b> is required, <b>THEN</b> perform Steps 7 - 9.</p> <hr/> <p>7. <input type="checkbox"/> Open:</p> <ul style="list-style-type: none"><li>• 1HP-24</li><li>• 1HP-25</li></ul>	<p><input type="checkbox"/> <b>GO TO</b> Step 10.</p> <hr/> <p>1. <input type="checkbox"/> <b>IF</b> <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following:</p> <p>A. <input type="checkbox"/> Start 1A LPI PUMP.</p> <p>B. <input type="checkbox"/> Start 1B LPI PUMP.</p> <p>C. Open:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> 1LP-15</li><li><input type="checkbox"/> 1LP-16</li><li><input type="checkbox"/> 1LP-9</li><li><input type="checkbox"/> 1LP-10</li><li><input type="checkbox"/> 1LP-6</li><li><input type="checkbox"/> 1LP-7</li></ul> <p>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</p> <p>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</p> <p>F. <input type="checkbox"/> <b>GO TO</b> Step 8.</p> <p>2. <input type="checkbox"/> <b>IF</b> <u>only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, <b>THEN</b> perform the following:</p> <p>A. <input type="checkbox"/> <b>IF</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.</p> <p>B. <input type="checkbox"/> <b>IF</b> &lt; 2 HPI pumps are operating, <b>THEN</b> start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.</p> <p>C. <input type="checkbox"/> <b>GO TO</b> Step 9.</p>

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.   ___ Start 1C HPI PUMP.	___ <b>IF</b> at least two HPI pumps are operating, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.
9.   Throttle the following as required to maintain desired Pzr level: ___ 1HP-26 ___ 1HP-27	1.   ___ <b>IF</b> at least two HPI pumps are operating, <b>AND</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level. 2.   ___ <b>IF</b> 1A HPI PUMP <u>and</u> 1B HPI PUMP are operating, <b>AND</b> 1HP-27 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <input type="checkbox"/> <b>IAAT <u>LDST</u> level CANNOT</b> be maintained, <b>THEN</b> perform Step 11.	<input type="checkbox"/> <b>GO TO</b> Step 12.
11. <input type="checkbox"/> Perform the following: <ul style="list-style-type: none"><li>• Open 1HP-24.</li><li>• Open 1HP-25.</li><li>• Close 1HP-16.</li></ul>	1. <input type="checkbox"/> <b>IF both</b> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following: <ul style="list-style-type: none"><li>A. <input type="checkbox"/> Start 1A LPI PUMP.</li><li>B. <input type="checkbox"/> Start 1B LPI PUMP.</li><li>C. Open:<ul style="list-style-type: none"><li><input type="checkbox"/> 1LP-15</li><li><input type="checkbox"/> 1LP-16</li><li><input type="checkbox"/> 1LP-9</li><li><input type="checkbox"/> 1LP-10</li><li><input type="checkbox"/> 1LP-6</li><li><input type="checkbox"/> 1LP-7</li></ul></li><li>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</li><li>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</li><li>F. <input type="checkbox"/> <b>GO TO</b> Step 13.</li></ul> 2. <input type="checkbox"/> <b>IF <u>only one</u></b> BWST suction valve (1HP-24 or 1HP-25) is open, <b>AND</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.
<b><u>NOTE</u></b> Maintaining Pzr level > 100" [180" acc] will ensure Pzr heater bundles remain covered.	
12. <input type="checkbox"/> Operate Pzr heaters as required to maintain heater bundle integrity.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. <input type="checkbox"/> <b>IAAT</b> additional makeup flow to LDST is desired, <b>AND</b> 1A BLEED TRANSFER PUMP is operating, <b>THEN</b> dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
14. <input type="checkbox"/> <b>IAAT</b> <u>two</u> Letdown Filters are desired, <b>THEN</b> perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
15. <input type="checkbox"/> <b>IAAT</b> <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired <b>THEN</b> perform Steps 16 - 34. {41}	<input type="checkbox"/> <b>GO TO</b> Step 35.
16. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown <b>CANNOT</b> be restored due to inability to restart the CC system. 2. <input type="checkbox"/> <b>GO TO</b> Step 35.
17. <input type="checkbox"/> Ensure only one CC pump running.	
18. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
19. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> <b>IF</b> 1HP-1 is closed due to 1HP-3 failing to close, <b>THEN GO TO</b> Step 21. 2. <input type="checkbox"/> <b>IF</b> 1HP-2 is closed due to 1HP-4 failing to close, <b>THEN GO TO</b> Step 21.
20. <input type="checkbox"/> <b>GO TO</b> Step 23.	
<p style="text-align: center;"><b><u>NOTE</u></b> Verification of leakage requires visual observation of East Penetration Room.</p>	
21. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<b>GO TO</b> Step 23.
22. <input type="checkbox"/> <b>GO TO</b> Step 35.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
23. <input type="checkbox"/> Monitor for unexpected conditions while restoring letdown.	
24. <input type="checkbox"/> Verify <u>both</u> letdown coolers to be placed in service.	1. <input type="checkbox"/> <b>IF</b> 1A letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-3 2. <input type="checkbox"/> <b>IF</b> 1B letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-4 3. <input type="checkbox"/> <b>GO TO</b> Step 26.
25. Open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-3 <input type="checkbox"/> 1HP-4	
26. <input type="checkbox"/> Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. <input type="checkbox"/> Notify CR SRO of problem. B. <input type="checkbox"/> <b>GO TO</b> Step 35.
27. <input type="checkbox"/> Close 1HP-6.	
28. <input type="checkbox"/> Close 1HP-7.	
29. <input type="checkbox"/> Verify letdown temperature < 125°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Close: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> <b>IF</b> <u>any</u> deborating IX is in service, <b>THEN</b> perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
30. <input type="checkbox"/> Open 1HP-5.	
31. <input type="checkbox"/> Adjust 1HP-7 for $\approx 20$ gpm letdown.	
32. <input type="checkbox"/> <b>WHEN</b> letdown temperature is < 125°F, <b>THEN</b> place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. <input type="checkbox"/> Open 1HP-6.	
34. <input type="checkbox"/> Adjust 1HP-7 to control desired letdown flow.	

**NOTE**

AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.

35. <input type="checkbox"/> <b>IAAT</b> it is determined that letdown is unavailable due to equipment failures <u>or</u> letdown system leakage, <b>THEN</b> notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. <input type="checkbox"/> <b>IAAT</b> > 1 HPI pump is operating, <b>AND</b> additional HPI pumps are <b>NO</b> longer needed, <b>THEN</b> perform the following:  A. <input type="checkbox"/> Obtain SRO concurrence to reduce running HPI pumps.  B. <input type="checkbox"/> Secure the desired HPI pumps.  C. <input type="checkbox"/> Place secured HPI pump switch in AUTO, if desired.	
37. <input type="checkbox"/> <b>IAAT</b> <u>all</u> the following conditions exist: <input type="checkbox"/> Makeup from BWST <b>NOT</b> required <input type="checkbox"/> LDST level > 55" <input type="checkbox"/> <u>All</u> control rods inserted <input type="checkbox"/> Cooldown Plateau <b>NOT</b> being used <b>THEN</b> close: <input type="checkbox"/> 1HP-24 <input type="checkbox"/> 1HP-25	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
38. <input type="checkbox"/> Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	<input type="checkbox"/> <b>GO TO</b> Step 40.
39. <input type="checkbox"/> <b>WHEN</b> 1CS-48 (1A BHUT Recirc) is <b>NO</b> longer needed to provide additional makeup flow to LDST, <b>THEN</b> perform the following: A. <input type="checkbox"/> Stop 1A BLEED TRANSFER PUMP. B. <input type="checkbox"/> Locally position 1CS-48 (1A BHUT Recirc) <u>one</u> turn open (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.). C. <input type="checkbox"/> Close 1CS-46. D. <input type="checkbox"/> Start 1A BLEED TRANSFER PUMP. E. <input type="checkbox"/> Locally throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. F. <input type="checkbox"/> Stop 1A BLEED TRANSFER PUMP.	
40. <input type="checkbox"/> Verify two Letdown Filters in service, <b>AND</b> <u>only one</u> Letdown filter is desired.	<input type="checkbox"/> <b>GO TO</b> Step 42.
41. Perform <u>one</u> of the following: <input type="checkbox"/> Place 1HP-17 switch to CLOSE. <input type="checkbox"/> Place 1HP-18 switch to CLOSE.	
42. <input type="checkbox"/> <b>WHEN</b> directed by CR SRO, <b>THEN EXIT</b> this enclosure.	

**... END ...**

**Rule 6**  
**HPI****HPI Pump Throttling Limits**

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled  $\leq 475$  gpm/pump (including seal injection for A header) when only one HPI pump is operating in a header.
- Total HPI flow must be throttled  $\leq 950$  gpm including seal injection when 1A and 1B HPI pumps are operating with 1HP-409 open.
- Total HPI flow must be throttled  $< 750$  gpm when all the following exist:
  - LPI suction is from the RBES
  - piggyback is aligned
  - either of the following exist:
    - only one piggyback valve is open (1LP-15 or 1LP-16)
    - only one LPI pump operating
- HPI may be throttled under the following conditions:

<b>HPI Forced Cooling in Progress:</b>	<b>HPI Forced Cooling NOT in Progress:</b>
<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• CETCs decreasing</li></ul>	<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>All</u> WR NIs <math>\leq 1\%</math></li><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• Pzr level increasing</li><li>• SRO concurrence required if throttling following emergency boration</li></ul>

**HPI Pump Minimum Flow Limit**

- Maintain  $\geq 170$  gpm indicated/pump. This is an instrument error adjusted value that ensures a real value of  $\geq 65$  gpm/pump is maintained. HPI pump flow less than minimum is allowed for up to 4 hours.



**SGTR**

EP/1/A/1800/001 0G

**Parallel Actions**

Page 1 of 1

CONDITION	ACTIONS	
1. AFTER Rx trip pushbutton depressed: PR NIs $\geq$ 5% FP <b>OR</b> NIs <b>NOT</b> decreasing	<b>GO TO UNPP tab.</b>	<b>UNPP</b>
2. <u>All</u> 4160V SWGR de-energized	<b>GO TO</b> Blackout tab.	<b>BLACKOUT</b>
3. <u>Core</u> SCM indicates superheat	<b>GO TO</b> ICC tab.	<b>ICC</b>
4. <u>Any</u> SCM = 0°F, <b>AND</b> HPI Forced cooling <b>NOT</b> in progress	<b>IF NOT</b> previously performed, <b>THEN GO TO</b> LOSCM tab.	<b>LOSCM</b>
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	<b>GO TO</b> EHT tab.	<b>LOHT</b>
6. Loss of heat transfer	<b>GO TO</b> LOHT tab.	
7. Heat transfer is <u>or</u> has been excessive	<b>GO TO</b> EHT tab.	<b>EHT</b>
8. Indications of SGTR in another SG after SGTR tab initiated	<b>RETURN TO</b> beginning of SGTR tab.	<b>SGTR</b>
9. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	<b>ES</b>
10. Valid ES actuation has occurred <u>or</u> should have	Initiate Encl 5.1 (ES Actuation).	<b>ES</b>
11. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	<ul style="list-style-type: none"> <li>Initiate AP/11 (Recovery from Loss of Power).</li> <li><b>IF</b> Encl 5.1 (ES Actuation) has been initiated, <b>THEN</b> reinitiate Encl 5.1.</li> </ul>	<b>ROP</b>
12. Individual available to make notifications	<ul style="list-style-type: none"> <li>Announce plant conditions using PA system.</li> <li>Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).</li> <li>Notify plant staff that Emergency Dose Limits are in affect using PA system</li> </ul>	<b>NOTIFY and EDL</b>

## Subsequent Actions

EP/1/A/1800/001

## Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP  <b>OR</b>  NIs <b>NOT</b> decreasing	<b>GO TO</b> UNPP tab.	<b>UNPP</b>
2. <u>All</u> 4160V SWGR de-energized {13}	<b>GO TO</b> Blackout tab.	<b>BLACKOUT</b>
3. <u>Core</u> SCM indicates superheat	<b>GO TO</b> ICC tab.	<b>ICC</b>
4. <u>Any</u> SCM = 0°F	<b>GO TO</b> LOSCM tab.	<b>LOSCM</b>
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	<b>GO TO</b> EHT tab.	<b>LOHT</b>
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	<b>GO TO</b> LOHT tab.	
7. Heat transfer is <u>or</u> has been excessive	<b>GO TO</b> EHT tab.	<b>EHT</b>
8. Indications of SGTR $\geq$ 25 gpm	<b>GO TO</b> SGTR tab.	<b>SGTR</b>
9. Turbine Building flooding <b>NOT</b> caused by rainfall event	<b>GO TO</b> TBF tab.	<b>TBF</b>
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	<b>ES</b>
11. Valid ES actuation has occurred <u>or</u> should have	Initiate Encl 5.1 (ES Actuation).	<b>ES</b>
12. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	<ul style="list-style-type: none"> <li>Initiate AP/11 (Recovery from Loss of Power).</li> <li><b>IF</b> Encl 5.1 (ES Actuation) has been initiated, <b>THEN</b> reinitiate Encl 5.1.</li> </ul>	<b>ROP</b>
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	<b>EDL</b>
14. Individual available to make notifications	<ul style="list-style-type: none"> <li>Announce plant conditions using PA system.</li> <li>Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).</li> </ul>	<b>NOTIFY</b>

## CRITICAL TASKS

- CT-1** Start the Outside Air Booster Fans within 30 minutes of the SGTR (BWOG CT-27) (**page 20 or 28**)
- CT-2** Prior to exiting the UNPP tab, take the Reactor subcritical (i.e.  $< 1\%$  power on WR NIs) (**page 25**)

<b>SAFETY: Take a Minute</b>			
<b>UNIT 0 (OSM)</b>			
SSF Operable: No U2/U3: Yes PSW Operable: No	KHUs Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
<b>UNIT STATUS (CR SRO)</b>			
<b>Unit 1 Simulator</b>		<b>Other Units</b>	
Mode: 1		<b>Unit 2</b>	<b>Unit 3</b>
Reactor Power: 50%		Mode: 1	Mode: 1
Gross MWE: 476		100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action		EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm			
<b>Technical Specifications/SLC Items (CR SRO)</b>			
<b>Component/Train</b>	<b>OOS Date/Time</b>	<b>Restoration Required Date/Time</b>	<b>TS/SLC #</b>
AMSAC/DSS	Today/0300	7 Days	SLC 16.7.2
SSF	Today/0100	7 Days	TS 3.10.1
PSW	Today/0600	7 Days	TS 3.7.10
<b>Shift Turnover Items (CR SRO)</b>			
<b>Primary</b>			
<ul style="list-style-type: none"> <li>Due to unanalyzed condition, the SSF should be considered INOPERABLE for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).</li> <li>OATC is to add Hydrogen to the LDST using OP/1/A/1106/017 (Hydrogen System) Enclosure 4.5 (Unit 1 LDST H2 Addition). Pressurize the LDST to 30-32 psig.</li> <li>1RIA-3 and 5 removed from RB</li> <li>SASS is in Manual for calibration</li> <li>Holding at 50% power per the dispatcher</li> </ul>			
<b>Secondary</b>			
<ul style="list-style-type: none"> <li>AMSAC/DSS bypassed for calibration</li> <li>PSW Primary Pump is OOS. WCC preparing Protected Equipment package.</li> <li>Unit 2 is supplying the AS header</li> <li>1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event.</li> </ul>			
<b>Reactivity Management (CR SRO)</b>			
RCS Boron 83 ppmB	Gp 7 Rod Position: 57 % Withdrawn	Batch additions as required for volume control.	
<b>Human Performance Emphasis (OSM)</b>			
Procedure Use and Adherence			

Facility: **Oconee**Scenario No.: **4**Op-Test No.: **1**Examiners: J. DeMarshallOperators: L. Dull **SRO**P. OttM. Patterson **OATC**P. CapehartJ. Arnett **BOP**

Initial Conditions:

- Reactor Power = 3%

Turnover:

- SASS is in Manual for calibration
- AMSAC/DSS is bypassed for calibration

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AMSAC/DSS Bypassed
0b	Override		SASS in Manual
1		N: OATC, SRO	Swap HPI Pumps
2	Override	C: BOP, SRO	1A CBP Motor OB Bearing Temp High
3	MPI150	I: OATC, SRO <b>(TS)</b>	PZR "A" RTD Fails Low
4	MPS241 MPS241D	C: BOP, SRO	1A1 RCP Lower Seal Failure
5	Override	C: BOP, OATC, SRO <b>(TS)</b>	Inadvertent ES Channel 2 Actuation
6	MPS033 MPS033D MPS150 Override	M: ALL	Small Break LOCA <b>(CT-1 &amp; CT-2)</b> <ul style="list-style-type: none"><li>1C HPI Pump Fails to Start on ES <b>(CT-3)</b></li><li>1HP-3 Fails to Close on ES</li></ul>
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**SCENARIO 4 EVENT SUMMARY**

- Event 1:** When the crew takes the shift, the SRO will direct the OATC to perform OP/1/A/1104/002 Enclosure 4.24 (Swapping 1A and 1B HPI Pumps). The OATC will start the 1B HPI pump and secure the 1A HPI pump and then align the 1A HPI pump for automatic operation.
- Event 2:** The 1A Condensate Booster Pump (CBP) Motor Outboard (OB) Bearing temperature will begin to rise. An OAC alarm will alert the operators of the rising temperature. The BOP will remove the pump from service per OP/1/A/1106/002C (HWP and CBP Operation) Enclosure 4.3 (Swapping CBPs).
- Event 3:** The 'A' PZR RTD will fail low causing PZR levels 1 & 2 to indicate low. With SASS in manual, this will cause 1HP-120 to begin throttling open in an attempt to restore the indicated PZR level. Actual PZR level will start to rise and LDST level will begin to lower. The OATC may place 1HP-120 in Hand and stabilize PZR level. The SRO may direct the OATC to select PZR Level Channel 3 prior to referring to the procedure, which is allowed due to an automatic action that failed to occur. The crew will refer to OP/1/A/1105/014 which will direct them to select PZR Level Channel 3 as the controlling channel. The OATC should then return 1HP-120 to AUTO, if required. The SRO will evaluate Tech Specs and enter the appropriate conditions.
- Event 4:** The 1A1 RCP lower seal will fail and the crew will refer to Alarm Response Guides, which will direct entry into AP/16 (Abnormal RCP Operation). AP/16 will direct stopping the 1A1 RCP.
- Event 5:** This failure will result in two (2) HPI pumps operating as well as one of the BWST suction valves opening. Consequently there will be a boration of the RCS while the SRO, BOP, and OATC implement actions required by AP/1/A/1700/042 (Inadvertent ES Actuation) to return the HPI system and other ES components to their normal alignment. Two enclosures in the AP will be performed by the ROs to restore components to their normal alignment. Enclosure 5.1 (Required Operator Actions) will restore RCP support systems and RB RIAs to service. Enclosure 5.2 (Letdown Restoration) will restore letdown. The SRO will assess TS for applicability.
- Event 6:** Once the event is initiated, RCS pressure will begin to rapidly lower and ES Channel 1 will actuate on low RCS pressure and ES Channel 2 will be manually actuated. The SRO will direct an operator to perform EOP Enclosure 5.1 (ES Actuation). After a few minutes ES Channels 3-6 will also actuate. EOP Enclosure 5.1 will direct the operator to ensure all ES components are in their required position. 1C HPI pump will fail to start on ES and must be started manually. 1HP-3 will fail to close which will require 1HP-1 to be closed to isolate the Letdown flowpath. Shortly after ES Channels 1 & 2 actuate, the crew will observe at least one SCM indication  $\leq 0^{\circ}\text{F}$  which will require performing Rule 2 (Loss of SCM) and entry into the EOP LOSCM tab. Rule 2 requires the operator to stop all RCPs within 2 minutes of any SCM indication  $\leq 0^{\circ}\text{F}$ . While performing Rule 2, the 1C HPI pump will have to be started manually, if not already started per EOP Encl. 5.1, to obtain HPI flow in both headers. Rule 3 (Loss of Main or Emergency FDW) is performed as directed by Rule 2 to raise SG levels to the loss of SCM setpoint. EOP Enclosure 5.9 (Extended EFDW Operation) will be performed when directed by Rule 3.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **1**

Page 1 of 1

Event Description: **Swap HPI Pumps (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1104/002</i></p> <p><b><u>Crew response:</u></b></p> <p>SRO directs the OATC to perform OP/1/A/1104/002 Enclosure 4.24 (Swapping 1A and 1B HPI Pumps)</p> <p><b>OP/1/A/1104/002 Enclosure 4.24</b> (Swapping 1A and 1B HPI Pumps) <i>rev 172</i></p> <p>2.1.6 <b>WHILE</b> swapping of HPI Pumps is in progress, monitor the following indications: (R.M.)</p> <ul style="list-style-type: none"><li>• Appropriate ranged Nis</li><li>• Primary tank levels</li><li>• <b>IF</b> applicable, Neutron error</li><li>• <b>IF</b> applicable, CRD position</li></ul> <p><b>Booth Cue:</b> <i>If contacted as an AO to check HPI pump room and pump parameters, report that the HPI pump room is clear of personnel and pump parameters are normal.</i></p> <p>2.2 <b>IF</b> required to start 1A HPI Pump, perform the following: <b>N/A</b></p> <p>2.2.1 Start 1A HPI Pump</p> <p>2.2.2 Stop 1B HPI Pump</p> <p>2.2.3 Place 1B HPI Pump switch in "AUTO"</p> <p>2.3 <b>IF</b> required to start 1B HPI Pump, perform the following:</p> <p>2.3.1 Start 1B HPI Pump</p> <p>2.3.2 Stop 1A HPI Pump</p> <p>2.3.3 Place 1A HPI Pump switch in "AUTO"</p> <p>2.4 <b>IF</b> RCS makeup is required to compensate for final RCS boron change, makeup per OP/1/A/1103/004 (Soluble Poison Control). (R.M.)</p> <p>2.5 Perform the following:</p> <ul style="list-style-type: none"><li>• Record boron in Component Boron Concentration Log for Standby HPI Pump. (R.M.)</li><li>• Update Component Boron Concentration Log for HPI Pump placed in service. (R.M.)</li></ul>

**This event is complete when the 1A HPI Pump switch is placed in AUTO, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **2**

Page 1 of 3

Event Description: **1A CBP Motor OB Bearing Temp High (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• OAC alarm O1A0111 (CBP 1A MTR OB BEARING TEMP)</li></ul> <p><b><u>Crew response:</u></b></p> <ul style="list-style-type: none"><li>• The BOP should refer to Alarm Response for OAC alarm O1A0111</li></ul> <p>OAC Alarm Response for O1A0111 (CBP 1A MTR OB BEARING TEMP)</p> <p>HI-HI: 1. Remove the pump from service per OP/1/A/1106/002C (HWP and CBP Operation) <b>(next page)</b></p> <p>2. If required write a work request</p> <p>HI: 1. Dispatch an operator to check as applicable:</p> <ul style="list-style-type: none"><li>• Oil level, flow and any oil leaks</li><li>• Cooling water flow and cooling water leaks</li><li>• Air filter condition</li><li>• Evidence of bearing overheating</li></ul> <p>2. Trend the computer point and monitor closely</p> <p>3. Notify system engineer for evaluation</p> <p>4. If required issue an R&amp;R for cooling water temperature control bypass valve</p> <p>5. If required write a work request</p> <p><b>Booth Cue: If contacted as an AO to investigate the 1A CBP high OB bearing temperature, wait 5 minutes and report that the 1A CBP Motor OB Bearing is very hot to the touch.</b></p> <p><b>Booth Cue: If notified as an AO to check oil level, flow and any oil leaks, cooling water flow and cooling water leaks, air filter condition, and evidence of bearing overheating, wait 5 minutes and report that the OB motor bearing is making a loud noise.</b></p>

**This event is complete when 1A CBP is secured, or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **2**

Page 2 of 3

Event Description: **1A CBP Motor OB Bearing Temp High (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>OP/1/A/1106/002C</i></p> <p><b><u>Crew response:</u></b></p> <p><b><u>OP/1/A/1106/002C Encl 4.3</u></b> (Swapping CBPs) <i>rev 17</i></p> <p><b>1. Initial Conditions</b></p> <p>1.1 Review Limits and Precautions</p> <p><b>2. Procedure</b></p> <p>2.1 Position <u>any</u> of the following:</p> <ul style="list-style-type: none"><li>• <b><u>IF</u></b> desired ensure closed 1XGC-F1B (1A CBP Aux Oil Pump Bkr)</li><li>• <b><u>IF</u></b> desired ensure closed 1XGC-F1C (1B CBP Aux Oil Pump Bkr)</li><li>• <b><u>IF</u></b> desired ensure closed 1XGC-F1D (1C CBP Aux Oil Pump Bkr)</li></ul> <p>2.2 Position <u>any</u> of the following:</p> <ul style="list-style-type: none"><li>• <b><u>IF</u></b> desired ensure Racked-In 1TC-7 (1A CBP Mtr)</li><li>• <b><u>IF</u></b> desired ensure Racked-In 1TD-5 (1B CBP Mtr)</li><li>• <b><u>IF</u></b> desired ensure Racked-In 1TE-5 (1C CBP Mtr)</li></ul> <p>2.3 <b><u>IF</u></b> desired bypass Powdex per OP/1/A/1106/002 (Condensate And FDW System)</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• Number of operating HWP(s) is normally <math>\geq</math> number of operating CBP(s)</li><li>• During FDW system startup an additional HW pump is required prior to starting CBP until Condensate and FDW systems have been filled by high flow flushes</li></ul></div> <p>2.4 <b><u>IF</u></b> desired, start standby _____ HWP</p> <p>2.5 Start desired _____ CBP</p> <p>2.6 Stop desired _____ CBP</p> <p>2.7 <b><u>IF</u></b> desired, stop standby _____ HWP</p> <p>2.8 Ensure CBP LOAD SHED DEFEAT switch is positioned to running CBP</p> <p>2.9 Ensure HWP LOAD SHED DEFEAT switch is positioned to running HWP</p> <p><b><i>BOOTH CUE: When BOP goes to the Load Shed Defeat switches, proceed to Event 3.</i></b></p>

**This event is complete when 1A CBP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **2**

Page 3 of 3

Event Description: **1A CBP Motor OB Bearing Temp High (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>OP/1/A/1106/002C</i></p> <p><b><u>Crew response:</u></b></p> <p>2.10 <b><u>IF</u></b> desired, place standby _____ HWP switch in "AUTO"</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> If one or two CBP(s) are operating, standby CBP CR switch should be in "AUTO". Required pump maintenance may prevent having a standby pump available.</p></div> <p>2.11 <b><u>IF</u></b> desired, place standby _____ CBP switch in "AUTO"</p> <p>2.12 <b><u>IF</u></b> desired, place Powdex in service per OP/1/A/1106/002 (Condensate And FDW System)</p> <p>2.13 <b><u>IF</u></b> Unit 1 is in Mode 1, perform the following: (T-5-Heater Panel) <b>(N/A)</b></p> <ul style="list-style-type: none"><li>• Ensure closed 1HD-298 (Htr 1F1 Drain Lvl Control Byp)</li><li>• Ensure closed 1HD-303 (Htr 1F2 Drain Lvl Control Byp)</li><li>• Ensure closed 1HD-308 (Htr 1F3 Drain Lvl Control Byp)</li></ul>

**This event is complete when 1A CBP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **3**

Page 1 of 2

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• OAC alarm (RC PZR level 1&amp;3 mismatch)</li><li>• OAC alarm (RC PZR level 2&amp;3 mismatch)</li><li>• PZR level 1 and 2 indicates ≈ 95 inches</li><li>• PZR level 3 indicates ≈ 120 inches and slowly increasing</li></ul> <p><b><u>Crew response:</u></b></p> <p>Refer to <b>ARG 1SA-02/C-3</b> (RC Pressurizer Level High/Low): <b>rev 034</b></p> <p>3.1 Check alternate PZR level indications..</p> <p>3.2 Check for proper Makeup/Letdown flows and adjust to restore proper level.</p> <p><b><i>Examiner Note: The RO may take 1HP-120 to MANUAL to control Pzr level. If so, they should place it in AUTO after the failure is addressed.</i></b></p> <p><b><i>Examiner Note: The SRO may direct the OATC to select PZR level 3 prior to referencing OP/1/A/1105/014.</i></b></p> <p>3.1 Refer to the following procedures as required:</p> <ul style="list-style-type: none"><li>• AP/1/A/1700/002 (Excessive RCS Leakage)</li><li>• AP/1/A/1700/014 (Loss of Normal HPI M/U and/or RCP SI)</li><li>• AP/1/A/1700/032 (Loss of Letdown)</li></ul> <p>3.4 Refer to Technical Specification 3.4.9 (Pressurizer) <b>(does not apply)</b></p> <p>3.5 Refer to Technical Specification 3.3.8 (PAM Instrumentation) <b>(next page)</b></p> <p>3.6 Refer to OP/1/A/1105/014 Control Room Instrumentation Operation And Information <b>(next page)</b></p>

This event is complete when PZR level 3 has been selected, 1HP-120 is in Auto, and the SRO has referred to TS, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **3**

Page 2 of 2

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: right;"><i>OP/1/A/1105/014</i></p> <p><b><u>Crew response:</u></b></p> <p><b>OP/1/A/1105/014 Enclosure 4.11</b> (SASS Information) <i>rev 044</i></p> <p>3.2 SASS (Smart Automatic Signal Selector) Manual Operation</p> <p>3.2.1 <b><u>IF</u></b> "MISMATCH" light is on and "TRIP 'A'" or "TRIP 'B'" light is on, a SASS trip has occurred.</p> <p>A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8).</p> <p>B. Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8).</p> <p>3.2.2 <b><u>IF</u></b> "MISMATCH" light is on, a mismatch has occurred</p> <p>A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8).</p> <p>B. Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8). <b>(Select Pzr Level #3)</b></p> <p>3.2.3 Initiate a Work Request to repair faulty signal</p>
	SRO	<hr/> <p><b><u>TS 3.3.8 POST ACCIDENT MONITORING (PAM) INSTRUMENTATION</u></b></p> <p>Condition A (30 days) Restore required channel to OPERABLE status.</p> <hr/>

This event is complete when PZR level 3 has been selected, 1HP-120 is in Auto, and the SRO has referred to TS, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-06/A-5 (RC PUMP 1A1 SEAL CAVITY PRESS HI/LOW)</li><li>• OAC Alarm RCP 1A1 LOWER SEAL CAVITY PRESSURE HI HI</li><li>• OAC Alarm RCP 1A1 UPPER SEAL CAVITY PRESSURE HI HI</li><li>• OAC Alarm 1A1 UPPER &amp; LOWER SEAL ΔP</li></ul> <p><b><u>Crew response:</u></b></p> <p>Refer to the ARGs</p> <p>3.1 Upper/Lower Seal Cavity Pressure High</p> <p>3.1.1 <u>Go To</u> AP/1/A/1700/016, Abnormal RCP Operation, for limits and required action</p> <p>3.2 Upper/Lower Seal Cavity Pressure Low</p> <p>3.2.1 <b><u>IF</u></b> in Mode 1 or 2, <u>Go To</u> AP/1/A/1700/016, Abnormal RCP Operation, for limits and required action</p> <p style="text-align: right;"><b>AP/1/A/1700/016</b></p> <p><b><u>AP/1/A/1700/016</u></b> (Abnormal RCP Operation) <b>rev 35</b></p> <p>4.1 <b><u>IAAT either</u></b> apply:</p> <p>___ <u>Any</u> RCP meets <u>or</u> approaches Immediate Trip criteria of Encl 5.1 (RCP Immediate Trip Criteria)</p> <p>___ There is an immediate need to stop a RCP at this time</p> <p><b>THEN</b> perform Steps 4.2 - 4.12.</p> <p><b>(Immediate trip criteria will NOT be met)</b></p> <p><b>RNO: GO TO</b> Step 4.13 <b>(page 12)</b></p> <p><b><i>Examiner Note: It is acceptable for the SRO to take either procedure path to secure the 1A1 RCP. Step 4.13 is on (page 12).</i></b></p> <p>4.2 Verify MODE 1 <u>or</u> 2</p> <p>4.3 Verify three RCPs will remain operating after <u>affected</u> RCP is tripped</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/016</i></p> <p><b><u>Crew response:</u></b></p> <p>4.4 Verify Immediate Trip Criteria met</p> <p><b>RNO:</b> 1. <b>IF</b> Rx Power on <u>any</u> NI &gt; 70% <b>AND</b> time permits reducing power, <b>THEN</b> perform the following:</p> <p>A. Reduce Rx Power ≤ 70% using Encl 5.2 (Rapid Power Reduction)</p> <p>B. <b>WHEN</b> Rx Power ≤ 70%, <b>THEN GO TO</b> Step 4.6</p> <p>2. <b>IF</b> Rx power is ≤ 70% <b>THEN GO TO</b> Step 4.6</p> <p>3. <b>IF</b> time does <b>NOT</b> permit reducing power, <b>THEN</b> perform the following:</p> <p>A. Trip Rx</p> <p>B. Stop <u>affected</u> RCP</p> <p>C. <b>GO TO</b> Step 4.26</p> <p>4.5 Verify Rx power is ≤ 70% as indicated on <u>all</u> NIs</p> <p>4.6 Verify <u>any</u> SG on Low Level Limits</p> <p>4.7 Stop the <u>affected</u> RCP</p> <p>4.8 <b>GO TO</b> Step 4.26</p> <p>4.26 <b>IAAT</b> <u>any</u> of the following indicate external RCP seal leakage:</p> <ul style="list-style-type: none"><li>• RB RIAs increasing <u>or</u> in alarm</li><li>• RCS Tave constant with LDST level decreasing more than normal</li><li>• Quench Tank level rate increasing</li><li>• RB Normal Sump rate increasing</li><li>• Visual confirmation</li></ul> <p><b>THEN</b> initiate AP/02 (Excessive RCS Leakage)</p> <p>4.27 Initiate Encl 4.3 (Special Instructions for &lt; 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power). <b>(page 15)</b></p> <p>4.28 <b>IAAT</b> <u>either</u> of the following conditions is met:</p> <p>___ a RCP has been shut down for ≥ 3 hours</p> <p>___ a RCP with <u>high</u> oil level has been shut down</p> <p><b>THEN</b> close the associated RCP motor cooler inlet/outlet valve:</p> <p>___ 1LPSW-7&amp;8 (1A1 RCP)</p> <p>___ 1LPSW-9&amp;10 (1B1 RCP)</p> <p>___ 1LPSW-13&amp;14 (1A2 RCP)</p> <p>___ 1LPSW-11&amp;12 (1B2 RCP)</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/016</i></p> <p><b><u>Crew response:</u></b></p> <p>4.29 Verify a power reduction was performed to lower reactor power <math>\leq 70\%</math></p> <p><b>RNO: GO TO</b> Step 4.31</p> <p>4.31 <b>IAAT</b> <u>either</u> of the following has exceeded 260°F including transient situations:</p> <p>___ O1A1253 - O1A1256 (RCP UPPER SEAL HOUSING TEMP)</p> <p>___ O1A1910 - O1A1913 (RCP SEAL RETURN TEMP)</p> <p><b>THEN</b> closely monitor seal parameters for degradation until an Engineering evaluation is completed due to potential for seal ring and elastomer damage.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>Operating experience has shown that failure of RC Pump components located internal to the RCS can create loose debris which can lead to fuel clad failures. These type RC Pump failures may cause Loose Parts Monitor alarms immediately and increased RCS radioactivity later.</p></div> <p>4.32 Verify 1RIA 57 <u>or</u> 1RIA 58 have risen.</p> <p><b>RNO: GO TO</b> Step 4.34</p> <p>4.34 <b>IAAT</b> a RCP has been tripped due to exceeding Immediate Trip Criteria on a RCP <u>motor</u>, <b>THEN</b> contact RCP engineer prior to restart.</p> <p>4.35 <b>IAAT</b> <u>both</u> are met:</p> <p>___ There has been a failure of the DELTA Tc controller</p> <p>___ The DELTA Tc controller has been repaired</p> <p><b>THEN</b> initiate OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).</p> <p>4.36 Verify <u>any</u> RCP that was shut down had a high vibration alarm.</p> <p>4.37 Initiate a CR for Engineering to document potential vibration effects on RCS piping.</p> <p>4.38 <b>WHEN</b> conditions permit, <b>THEN EXIT</b> this procedure.</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior																		
		<p style="text-align: right;"><i>AP/1/A/1700/016</i></p> <p><b><u>Crew response:</u></b></p> <hr/> <p style="text-align: center;"><i>Alternate Path from Step 4.1</i></p> <hr/> <p>4.13 Announce AP entry using the PA system</p> <p>4.14 Notify SM to request evaluation by RCP Component Engineer</p> <p>4.15 <b>IAAT</b> the failure is identified, <b>THEN GO TO</b> the applicable section per the following table:</p> <table border="1"><thead><tr><th>√</th><th>Section</th><th>Failure</th></tr></thead><tbody><tr><td></td><td><b>4A</b></td><td><b>Seal Failure</b></td></tr><tr><td></td><td>4B</td><td>Abnormal Vibration</td></tr><tr><td></td><td>4C</td><td>High or Low Oil Pot Level</td></tr><tr><td></td><td>4D</td><td>Loss of Seal Return</td></tr><tr><td></td><td>4E</td><td>Abnormal RCP Temperatures</td></tr></tbody></table> <p><b><u>AP/1/A/1700/016 Section 4A</u></b> (RCP Seal Failure)</p> <p>1. <b>IAAT</b> <u>any</u> RCP meets immediate trip criteria of Encl 5.1, <b>THEN</b> perform Steps 2-11 (<b>Immediate trip criteria will NOT be met</b>)</p> <p><b>RNO: GO TO</b> Step 12</p> <p>12. <b>IAAT</b> <u>any</u> of the following indicate external RCP seal leakage:</p> <ul style="list-style-type: none"><li>• RB RIAs increasing <u>or</u> in alarm</li><li>• RCS Tave constant with LDST level decreasing more than normal</li><li>• Quench Tank level rate increasing</li><li>• RB Normal Sump rate increasing</li><li>• Visual confirmation</li></ul> <p><b>THEN</b> initiate AP/02 (Excessive RCS Leakage)</p> <p>13. Verify the following are open:</p> <p>___ 1HP-20</p> <p>___ 1HP-21</p>	√	Section	Failure		<b>4A</b>	<b>Seal Failure</b>		4B	Abnormal Vibration		4C	High or Low Oil Pot Level		4D	Loss of Seal Return		4E	Abnormal RCP Temperatures
√	Section	Failure																		
	<b>4A</b>	<b>Seal Failure</b>																		
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	4D	Loss of Seal Return																		
	4E	Abnormal RCP Temperatures																		

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior									
		<p style="text-align: right;"><i>AP/1/A/1700/016</i></p> <p><b><u>Crew response:</u></b></p> <p>14. Verify the following is open for the <u>affected</u> RCP:</p> <ul style="list-style-type: none"><li>• 1HP-228 (1A1 RCP)</li></ul> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• A single failed seal can transport debris to the other seals <u>and</u> damage them. A RCP with a failed seal should be secured as quickly as plant conditions allow.</li><li>• Use diverse indications, such as changes in other seal pressures, to ensure abnormal parameter is not a single instrument failure. For any seal failure, upper <u>and</u> lower seal cavity pressures should change from normal value.</li></ul></div> <p>15. <b>IAAT</b> <u>either</u> of the following conditions apply to an operating RCP:</p> <table><tr><td>√</td><td><b>RCS Pressure</b></td><td><b>ΔP across <u>any</u> seal</b></td></tr><tr><td></td><td><b>&gt; 1000 psig</b></td><td><b>≤ 100 psid</b></td></tr><tr><td></td><td>≤ 1000 psig</td><td>≤ 35 psid</td></tr></table> <p><b>OR</b> shut down of an RCP is desired, <b>THEN</b> perform Steps 16-26 to shut down the <u>affected</u> RCP.</p> <p>16. Verify MODE 1 <u>or</u> 2</p> <p>17. Verify three RCPs will remain operating after <u>affected</u> RCP is tripped</p> <p>18. Verify Rx power is ≤ 70% as indicated on <u>all</u> NIs</p> <p>19. Verify <u>any</u> SG on Low Level Limits</p> <p>20. Stop the <u>affected</u> RCP</p> <p>21. <b>GO TO</b> Step 25</p> <p><b><i>Examiner Note: The CRS may perform a Focus Brief with the crew prior to securing the RCP. However a Focus Brief is not required per SOMP 1-07 in this situation since the SGs are on low level limits and re-ratioing FDW will not be required.</i></b></p>	√	<b>RCS Pressure</b>	<b>ΔP across <u>any</u> seal</b>		<b>&gt; 1000 psig</b>	<b>≤ 100 psid</b>		≤ 1000 psig	≤ 35 psid
√	<b>RCS Pressure</b>	<b>ΔP across <u>any</u> seal</b>									
	<b>&gt; 1000 psig</b>	<b>≤ 100 psid</b>									
	≤ 1000 psig	≤ 35 psid									

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/016</i></p> <p><b><u>Crew response:</u></b></p> <p>25. Initiate Encl. 4.3 (Special Instructions for &lt; 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power). <b>(page 15)</b></p> <p>26. Initiate the following notifications:</p> <ul style="list-style-type: none"><li>___ Notify SM to make required notifications of OMP 1-14 (Notifications).</li><li>___ Notify Rx Engineering and request a power maneuver plan, if needed.</li><li>___ Notify SOC if load reduction was required.</li><li>___ Notify Chemistry to take RCS boron samples on a 1 hour frequency.</li></ul> <p>27. <b>IAAT</b> a RCP has been shut down for <math>\geq 3</math> hours <b>THEN</b> close the associated RCP motor cooler inlet/outlet valve:</p> <ul style="list-style-type: none"><li>___ 1LPSW-7&amp;8 (1A1 RCP)</li><li>___ 1LPSW-9&amp;10 (1B1 RCP)</li><li>___ 1LPSW-13&amp;14 (1A2 RCP)</li><li>___ 1LPSW-11&amp;12 (1B2 RCP)</li></ul> <p>28. Verify a power reduction was performed to lower reactor power <math>\leq 70\%</math></p> <p><b>RNO: GO TO</b> Step 30</p> <p>30. <b>IAAT</b> <u>either</u> of the following has exceeded 260°F including transient situations:</p> <ul style="list-style-type: none"><li>___ O1A1253 - O1A1256 (RCP UPPER SEAL HOUSING TEMP)</li><li>___ O1A1910 - O1A1913 (RCP SEAL RETURN TEMP)</li></ul> <p><b>THEN</b> closely monitor seal parameters for degradation until an Engineering evaluation is completed due to potential for seal ring <u>and</u> elastomer damage.</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior																										
		<div>OP/1/A/1102/004 Encl 4.3</div> <p><b><u>Crew response:</u></b></p> <p><b><u>OP/1/A/1102/004 (Operations At Power) Encl 4.3 (Special Instructions For &lt; 4 RCP Operations)</u></b> <span>Rev 152</span></p> <p>2.1 <b><u>IF</u></b> conditions permit, log the current quadrant power tilt and the position of the ΔTc controller prior to securing a RCP during power operations</p> <p>2.2 Perform <b><u>one</u></b> of the following: (Continue)</p> <ul style="list-style-type: none"><li>• Ensure TS 3.4.4 Condition A entered when fourth RCP secured</li><li>• Verify the following:<ul style="list-style-type: none"><li>___ O1E4021 (1A RPS Var Flux Trip Value) set at 79.75%</li><li>___ O1E4022 (1A RPS Var Flux Trip Value) set at 79.75%</li><li>___ O1E4023 (1A RPS Var Flux Trip Value) set at 79.75%</li><li>___ O1E4024 (1A RPS Var Flux Trip Value) set at 79.75%</li></ul></li></ul> <div><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• Instructions for performing OAC trends are located in Working With Trends enclosure of OP/0/A/1103/020 A (Operator Aid Computer Use)</li><li>• Only the first 6 points will be displayed initially; press "Page Down" key to see second 6 points</li></ul></div> <p>2.3 Using turn-on code T6 3RCP, digitally trend the following data at one minute intervals:</p> <table><tr><th><u>Point ID</u></th><th><u>Description</u></th></tr><tr><td><input type="checkbox"/> O1P0889</td><td>CORE THERMAL POWER BEST</td></tr><tr><td><input type="checkbox"/> O1P0877</td><td>INCORE IMBALANCE</td></tr><tr><td><input type="checkbox"/> O1E3335</td><td>API GROUP AVE FOR GROUP 7</td></tr><tr><td><input type="checkbox"/> O1E3336</td><td>API GROUP AVE FOR GROUP 8</td></tr><tr><td><input type="checkbox"/> O1P0737</td><td>INCORE TILT QUADRANT W-X</td></tr><tr><td><input type="checkbox"/> O1P0738</td><td>INCORE TILT QUADRANT X-Y</td></tr><tr><td><input type="checkbox"/> O1P0739</td><td>INCORE TILT QUADRANT Y-Z</td></tr><tr><td><input type="checkbox"/> O1P0740</td><td>INCORE TILT QUADRANT Z-W</td></tr><tr><td><input type="checkbox"/> O1I0828</td><td>RC COLD LEG A1 TEMP</td></tr><tr><td><input type="checkbox"/> O1I0829</td><td>RC COLD LEG A2 TEMP</td></tr><tr><td><input type="checkbox"/> O1I0830</td><td>RC COLD LEG B1 TEMP</td></tr><tr><td><input type="checkbox"/> O1I0831</td><td>RC COLD LEG B2 TEMP</td></tr></table>	<u>Point ID</u>	<u>Description</u>	<input type="checkbox"/> O1P0889	CORE THERMAL POWER BEST	<input type="checkbox"/> O1P0877	INCORE IMBALANCE	<input type="checkbox"/> O1E3335	API GROUP AVE FOR GROUP 7	<input type="checkbox"/> O1E3336	API GROUP AVE FOR GROUP 8	<input type="checkbox"/> O1P0737	INCORE TILT QUADRANT W-X	<input type="checkbox"/> O1P0738	INCORE TILT QUADRANT X-Y	<input type="checkbox"/> O1P0739	INCORE TILT QUADRANT Y-Z	<input type="checkbox"/> O1P0740	INCORE TILT QUADRANT Z-W	<input type="checkbox"/> O1I0828	RC COLD LEG A1 TEMP	<input type="checkbox"/> O1I0829	RC COLD LEG A2 TEMP	<input type="checkbox"/> O1I0830	RC COLD LEG B1 TEMP	<input type="checkbox"/> O1I0831	RC COLD LEG B2 TEMP
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<input type="checkbox"/> O1E3335	API GROUP AVE FOR GROUP 7																											
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<input type="checkbox"/> O1P0740	INCORE TILT QUADRANT Z-W																											
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<input type="checkbox"/> O1I0831	RC COLD LEG B2 TEMP																											

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1102/004 Encl 4.3</i></p> <p><b><u>Crew response:</u></b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"><p><b>NOTE:</b> The 100% Power Imbalance curves also apply for runs at reduced power.</p></div> <p>2.4 Maintain Control Rod position and Power Imbalance within COLR limits</p> <p>2.5 <b><u>IF</u></b> NI calibration <b><u>NOT</u></b> within requirements of Limit and Precaution Step 2.2.6, calibrate NIs to Thermal Power Best</p> <p>2.6 Perform the following per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions):</p> <p>2.6.1 Notify I&amp;E to reset RPS Overpower High Trip Setpoint for three RCP Operation</p> <p style="text-align: center;">_____ Person Notified _____ Date</p> <p>2.6.2 <b><u>IF AT ANY TIME</u></b> Quadrant Power Tilt problems exist, notify I&amp;E to Adjust Flux/Imbalance/Flow trip setpoints as required to comply with TS 3.2.3</p> <p style="text-align: center;">_____ Person Notified _____ Date</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"><p><b>NOTE:</b> The Maximum Allowed Power Setpoint (Pmax) is reduced when operating for extended periods when only three RCPs operating as a conservative action.</p></div> <p>2.6.3 <b><u>IF</u></b> expected to operate for an extended period of time with only 3 RCPs operating, notify I&amp;E to adjust Flux/Imbalance /Flow trip setpoints for 3 RCP operation</p> <p style="text-align: center;">_____ Person Notified _____ Date</p> <p>2.7 <b><u>IF AT ANY TIME</u></b> notified by I&amp;E that RPS Overpower High Trip Setpoint adjusted for three RCP Operation, perform the following:</p> <p>2.7.1 Verify the following:</p> <p style="margin-left: 40px;">___ 01E4021 (1A RPS Var Flux Trip Value) set at 79.75%</p> <p style="margin-left: 40px;">___ 01E4022 (1A RPS Var Flux Trip Value) set at 79.75%</p> <p style="margin-left: 40px;">___ 01E4023 (1A RPS Var Flux Trip Value) set at 79.75%</p> <p style="margin-left: 40px;">___ 01E4024 (1A RPS Var Flux Trip Value) set at 79.75%</p> <p>2.7.2 Evaluate exiting TS 3.4.4 condition A</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **4**

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Event Description: **1A1 RCP Lower Seal Failure (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>OP/1/A/1102/004 Encl 4.3</i></p> <p><b>Crew response:</b></p> <p>2.8 Initiate review of PT/1/A/0600/001 (Periodic Instrument Surveillance) to determine if any limits approached</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b></p><ul style="list-style-type: none"><li>• Operations Management/Reactor Engineering Group should be consulted for value to use for high flux alarm setpoint.</li><li>• Instructions for Adjusting Alarm Setpoints On The NI Recorder are in OP/0/A/1108/001 (Curves And General Information).</li></ul></div> <p>2.9 Adjust high flux alarm setpoint per Operations Management/Reactor Engineering Group recommendations. (Alarm setpoint is adjusted on the NI Recorder)</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> 'D' bleed pressure may <b>NOT</b> be high enough to run the FDWP turbines.</p></div> <p>2.10 Maintain Auxiliary Steam available to the FDWP turbines.</p> <p>2.11 <b>IF</b> 1SSH-9 (SSH DISCH CTRL BYPASS) is being used to control Steam Seal Header pressure, throttle 1SSH-9 as required to maintain desired SSH pressure</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE:</b> RCS pressure decrease in the loop with two RCPs running is expected. This may cause acceptance criteria of PT/1/A/0600/001 (Periodic Instrument Surveillance) <b>NOT</b> to be met.</p></div> <p>2.12 Place note on CR turnover sheet indicating the following:</p> <p>"Be aware of the effect of the indicated pressure on the margin to trip setpoint for the Reactor Protective System trips associated with RCS pressure"</p>

**This event is complete when 1A1 RCP is secured, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-1/B-10 (ES 2 Trip)</li><li>• 1SA-16/B-2 (EL CT-4 SB Bus 2 Breaker Closed)</li><li>• 2SA-17/A-5 (Keowee Statalarm Panel Alarm)</li><li>• 2SA-17/C-1 (KHU 1 Emergency Start Initiated)</li><li>• 2SA-18/C-1 (KHU 2 Emergency Start Initiated)</li><li>• 1SA-6/A-5, B-5, C-5, D-5 (RC Pump Seal Cavity Press Hi/Low) (<b>≈ 1 min later</b>)</li><li>• 1SA-6/D-7, E-5, E-6, E-7 (RC Pump Seal Return Temp High)</li><li>• Both Keowee Hydro Units Emergency Start</li></ul> <p><b><i>Examiner Note: Over time, rods may withdraw in response to BWST water injecting into the core.</i></b></p> <p style="text-align: right;"><b>AP/1/A/1700/042</b></p> <p><b><u>Crew response:</u></b></p> <p>The SRO will initiate <b>AP/1/A/1700/042</b> (Inadvertent ES Actuation) <b>rev 04</b></p> <p><b><i>Examiner Note: The SRO may direct either the BOP or the OATC to perform steps from this AP.</i></b></p> <p>4.1 Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <ul style="list-style-type: none"><li>___ Diverse HPI (<b>not actuated</b>)</li><li>___ ES Channel 1 (<b>not actuated</b>)</li><li>___ ES Channel 2</li></ul> <p>4.2 Perform the following on <u>all inadvertently actuated</u> system(s):</p> <ul style="list-style-type: none"><li>___ Ensure DIVERSE HPI BYPASS is in BYPASS (<b>does not apply</b>)</li><li>___ Ensure ES CH-1 is in MANUAL (<b>does not apply</b>)</li><li>___ Ensure ES CH-2 is in MANUAL</li></ul> <p>4.3 Throttle HPI, as required, to maintain <u>desired</u> Pzr level</p>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/042</i></p> <p><b><u>Crew response:</u></b></p> <p>4.4 Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ ES Channel 5 (<b>not actuated</b>)</p> <p>___ ES Channel 6 (<b>not actuated</b>)</p> <p><b>RNO:</b> 1. <b>IF</b> ES Channel 1, ES Channel 2, <u>or</u> Diverse HPI have <u>inadvertently actuated</u>, <b>AND</b> it is desired to restore letdown, <b>THEN</b> initiate AP/42 Encl 5.2 (Letdown Restoration) (<b>page 23</b>)</p> <p>2. <b>GO TO</b> Step 4.10</p> <p>4.10 Close 1HP-24 and 1HP-25</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>If personnel are available, progression should continue while Encl 5.1 (Required Operator Actions) is in progress.</p></div> <p>4.11 Ensure AP/42 Encl 5.1 (Required Operator Actions) is in progress (<b>page 21</b>)</p> <p>4.12 Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ Diverse LPI</p> <p>___ ES Channel 3</p> <p>___ ES Channel 4</p> <p><b>RNO:</b> <b>GO TO</b> Step 4.17</p> <p>4.17 Verify the Rx is critical</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>CAUTION</u></b></p><p>Do <b>NOT</b> add demin water to counter the boration until RCS boron concentration stabilizes to prevent a positive reactivity event.</p></div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>ICS in Auto means ICS is in control of Tave and Rx power.</p></div> <p>4.18 Verify ICS in Auto</p>

This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/042</i></p> <p><b><u>Crew response:</u></b></p> <p>4.19 Verify control rods are outside the desired control band</p> <p><b>RNO: GO TO</b> Step 4.21</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>It is expected that the Control Room SRO will begin AP/39 and transfer completion of AP/42 to another licensed operator; however, priorities will depend on the specific situation.</p></div> <p><b><i>Examiner Note:</i></b> <i>CRS may enter AP/39 due to withdrawal of control rods from the boration. (page 25)</i></p> <p>4.20. Initiate AP/39 (Unintentional Boration)</p> <p>4.21 Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p style="padding-left: 40px;"><input type="checkbox"/> ES Channel 1</p> <p style="padding-left: 40px;"><input type="checkbox"/> Diverse HPI</p> <p><b>RNO: GO TO</b> Step 4.24</p> <p>4.24 Notify SPOC to investigate <u>and</u> repair the cause of the inadvertent ES actuation, as necessary</p> <p>4.25 Initiate logging TS/SLC Entry/Exit, as applicable, in accordance with Encl 5.4 (TS/SLC Requirements) <b>(page 24)</b></p> <p>4.26 <b>WHEN</b> <u>all</u> of the following exist:</p> <p style="padding-left: 40px;"><input type="checkbox"/> Reason for inadvertent ES Channel <u>or</u> Diverse HPI/LPI actuation has been resolved</p> <p style="padding-left: 40px;"><input type="checkbox"/> ES Channel <u>or</u> Diverse HPI/LPI reset is desired</p> <p style="padding-left: 40px;"><input type="checkbox"/> OSM concurs</p> <p><b>THEN</b> continue</p>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**



Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/42 Enclosure 5.1</i></p> <p><b><u>Crew response:</u></b></p> <p><b>AP/1/A/1700/042 Enclosure 5.1</b> (Required Operator Actions)</p> <ol style="list-style-type: none"><li>1 Initiate announcement of AP entry using the PA system</li><li>2 Verify <u>any</u> of the following have <u>inadvertently actuated</u>: <input type="checkbox"/> Diverse HPI (<b>not actuated</b>) <input type="checkbox"/> ES Channel 1 (<b>not actuated</b>) <input type="checkbox"/> ES Channel 2</li><li>3 Open the following: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21</li><li>4 Open the following for operating RCPs: <input type="checkbox"/> 1HP-228 (1A1) <input type="checkbox"/> 1HP-226 (1A2) <input type="checkbox"/> 1HP-232 (1B1) <input type="checkbox"/> 1HP-230 (1B2)</li><li>5 Verify <u>any</u> of the following have <u>inadvertently actuated</u>: <input type="checkbox"/> ES Channel 7 (<b>not actuated</b>) <input type="checkbox"/> ES Channel 8 (<b>not actuated</b>)</li></ol> <p><b>RNO: GO TO</b> Step 9</p> <ol style="list-style-type: none"><li>9 Perform the following:<ol style="list-style-type: none"><li>A. Open the following to restore RB RIAs: <input type="checkbox"/> 1PR-7 <input type="checkbox"/> 1PR-8 <input type="checkbox"/> 1PR-9 <input type="checkbox"/> 1PR-10</li><li>B. From the ENABLE CONTROLS screen on the RIA View Node, perform the following: (For RIAs-47,48,49,49A)<ol style="list-style-type: none"><li>1. Select OFF for RB RIA sample pump</li><li>2. Start the RB RIA sample pump</li></ol></li></ol></li></ol>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/42 Enclosure 5.1</i></p> <p><b><u>Crew response:</u></b></p> <p>10. Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>    ___ Diverse HPI</p> <p>    ___ ES Channel 1</p> <p>11. Notify the following that the SSF is inop. due to the SSF power loss.</p> <p>    ___ Unit 2</p> <p>    ___ Unit 3</p> <p>    ___ Security</p> <p>12. <b>EXIT</b> this enclosure</p>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/42 Enclosure 5.2</i></p> <p><b><u>Crew response:</u></b></p> <p><b>AP/1/A/1700/042 Enclosure 5.2 Letdown Restoration</b></p> <ol style="list-style-type: none"><li>1. Verify a CC pump operating</li><li>2. Verify letdown is isolated</li><li>3. Close 1HP-5</li><li>4. Verify it is desired to place <u>both</u> letdown coolers in service</li><li>5. Open 1HP-1, 1HP-2, 1HP-3, and 1HP-4</li><li>6. Close 1HP-6</li><li>7. Close 1HP-7</li><li>8. Verify letdown temperature &lt; 135°F</li><li>9. Open 1HP-5</li><li>10. Adjust 1HP-7 for ≈ 20 gpm letdown</li><li>11. <b>WHEN</b> letdown temperature &lt; 130°F, <b>THEN</b> place LETDOWN HI TEMP INTLK BYP switch in NORMAL</li><li>12. Open 1HP-6</li><li>13. Adjust 1HP-7 to control desired letdown flow</li><li>14. <b>IAAT</b> it is desired to <u>bleed</u> letdown flow to 1A BHUT, <b>THEN</b> perform the following:<ol style="list-style-type: none"><li>A. Open the following:<ul style="list-style-type: none"><li>___ 1CS-26</li><li>___ 1CS-41</li></ul></li><li>B. Position 1HP-14 to BLEED</li><li>C. Notify SRO</li></ol></li><li>15. <b>IAAT</b> letdown <u>bleed</u> is <b>NO</b> longer desired, <b>THEN</b> position 1HP-14 to NORMAL</li><li>16. <b>WHEN</b> SRO approves, <b>THEN EXIT</b> this enclosure</li></ol>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/42 Enclosure 5.4</i></p> <p><b>Crew response:</b> <b>AP/1/A/1700/042 Enclosure 5.4</b> (TS/SLC Requirements)</p> <div style="border: 1px solid black; padding: 5px;"><p style="text-align: center;"><b>NOTE</b></p><p>TS/SLCs below are included as a reference. This list may <b>NOT</b> be complete based on the specific situation. Reference TS/SLC manuals.</p></div> <p><u>Any ES Channel</u></p> <ul style="list-style-type: none"><li>• TS 3.3.7 (Engineered Safeguards Protective System (ESPS) Digital Automatic Actuation Logic Channels) due to the automatic actuation logic being blocked if any ES channel is in MANUAL or ES Voters in OVERRIDE</li><li>• TS 3.3.5 (Engineered Safeguards Protective System (ESPS) Analog Instrumentation) due to inoperable ES instrumentation</li><li>• TS 3.5.4 (Borated Water Storage Tank (BWST) ) BWST level</li></ul> <p><u>ES Channel 1 or 2</u></p> <ul style="list-style-type: none"><li>• TS 3.4.15 (RCS Leakage Detection Instrumentation) due to Rx Bldg RIAs being out of service</li><li>• TS 3.10.1 (Standby Shutdown Facility(SSF)) for SSF inoperability due to the SSF power loss (ES Channel 1 only)</li><li>• TS 3.4.9 (Pressurizer) if PZR level is &gt; 260"</li></ul> <p><u>ES Channel 3 or 4</u></p> <ul style="list-style-type: none"><li>• TS 3.7.7 (Low Pressure Service Water (LPSW) System) if LPSW leakage accumulator level is outside allowable band. Evaluate OAC point O1E0507 (LPSW LEAKAGE ACCUMULATOR LEVEL). Notify Unit 2 to evaluate OAC point O2E0507 (LPSW LEAKAGE ACCUMULATOR LEVEL).</li></ul> <p><u>Any Diverse Actuation System</u></p> <ul style="list-style-type: none"><li>• SLC 16.7.6 (Diverse Actuation Systems) due to the automatic actuation logic being blocked if any Diverse Actuation system in OVERRIDE or BYPASS.</li></ul>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/039</i></p> <p><b>Crew response:</b></p> <p><b>AP/1/A/1700/039</b> (Unintentional Boration) <i>rev 02</i></p> <p>4.1 Announce AP entry using PA system.</p> <p>4.2 <b>IAAT</b> CTP &lt; 6%, <b>THEN</b> perform the following:</p> <p>A. Trip the Rx.</p> <p>B. <b>GO TO</b> Unit 1 EOP.</p> <p>4.3 <b>IAAT</b> <u>all</u> the following exist:</p> <p>___ ICS is in Automatic</p> <p>___ Control rods approach upper limit of desired operating band</p> <p><b>THEN</b> perform the following:</p> <p>A. Establish desired shutdown rate.</p> <p>B. Decrease CTP demand setpoint, as necessary.</p> <p>C. Adjust shutdown rate, as necessary, to maintain control rods within the desired band.</p> <p>4.4 <b>IAAT</b> <u>all</u> the following exist:</p> <p>___ ICS is in Manual</p> <p>___ Tave is outside the control band</p> <p><b>THEN</b> manually adjust FDW, as necessary, to maintain Tave within the control band until <u>both</u> SGs are on Low Level Limits.</p> <p>4.5 <b>IAAT</b> a power decrease is initiated,</p> <p><b>THEN</b> initiate Encl 5.1 (Unit Shutdown Support Actions).</p> <p>4.6 Take action to identify <u>and</u> terminate the boration, as necessary.</p> <p>4.7 Verify the source of the boration has been identified <u>and</u> terminated.</p> <p><b>RNO: GO TO</b> Step 4.12.</p> <p>4.8 Notify Chemistry to sample/analyze the following for boron concentration, as frequently as possible, until RCS boron concentration stabilizes:</p> <ul style="list-style-type: none"><li>• RCS</li><li>• LDST</li></ul> <p>4.9 Evaluate NI operability in accordance with OP/1/A/1102/004 (Operation At Power) Limits and Precautions.</p>

**This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **5**

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Event Description: **Inadvertent ES Channel 2 Actuation (C: BOP, OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>AP/1/A/1700/039</i></p> <p><b><u>Crew response:</u></b></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><p>Due to the power decrease initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure and/or OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown), as appropriate. Equivalent steps performed by this AP should be signed off as intent met. Any steps NOT performed by this AP must be evaluated by the SRO in preparation for power increase or continued shutdown.</p></div> <p>4.10 Initiate the following procedures, as appropriate based on plant conditions:</p> <ul style="list-style-type: none"><li>___ OP/1/A/1102/004 (Operation at Power) power reduction enclosure.</li><li>___ OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) Encl (SD To Mode 3 Following Rx Trip Or Rapid SD).</li></ul> <p>4.11 <b>WHEN</b> the plant is stable, <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"><li>A. Develop a Power Maneuver plan, as necessary.</li><li>B. <b>EXIT</b> this procedure.</li></ul> <hr/> <p><b><u>TS 3.3.7 ESPS DIGITAL AUTO ACTUATION LOGIC CHANNELS</u></b></p> <p><b><i>Condition A (1 hour) Place associated component(s) in ES configuration</i></b></p> <p style="text-align: center;"><b><u>OR</u></b></p> <p style="text-align: center;"><b><i>Declare the associated component(s) inoperable</i></b></p> <p><b><u>TS 3.4.15 RCS LEAKAGE DETECTION INSTRUMENTATION</u></b></p> <p><b><i>Condition B (24 hours) Analyze grab samples of the containment atmosphere</i></b></p> <p style="text-align: center;"><b><i>(30 days) Restore required containment atmosphere radioactivity monitor to OPERABLE status</i></b></p> <p><b><u>TS 3.4.9 PRESSURIZER</u></b></p> <p><b><i>Condition A (1 hour) Restore level to within limit</i></b></p> <p><b>Note: TS 3.4.9 only applies if Pzr level is <math>\geq 260</math>"</b></p> <hr/>
	SRO	

This event is complete when the SRO has referred to TS at step 4.25, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior												
		<p><b><u>Plant response:</u></b></p> <ul style="list-style-type: none"><li>• 1SA-2/D-3 (RC PRESS HI/LOW)</li><li>• RCS pressure and PZR level lowering</li><li>• ES Channels 1-6 actuate</li><li>• RCS subcooling margin will indicate 0°F shortly after the Rx trips</li><li>• Reactor Building Emergency Sump level will begin to rise</li></ul> <p><b><u>Crew response:</u></b></p> <p>The SRO will direct the OATC to perform IMAs.</p> <ul style="list-style-type: none"><li>3.1 Depress REACTOR TRIP pushbutton</li><li>3.2 Verify reactor power &lt; 5% FP and lowering</li><li>3.3 Depress the turbine TRIP pushbutton</li><li>3.4 Verify all turbine stop valves closed</li><li>3.5 Verify RCP seal injection available</li></ul> <p>The SRO will direct the BOP to perform a Symptoms Check</p> <table><tr><td>Power Range NIs <b>NOT</b> &lt; 5%</td><td>Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i></td></tr><tr><td>Power Range NIs <b>NOT</b> lowering</td><td></td></tr><tr><td>Any SCM &lt; 0°F</td><td>Rule 2, <i>Loss Of SCM</i></td></tr><tr><td>Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)</td><td>Rule 3, <i>Loss of Main or Emerg FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and &gt; 2300 psig, NDT limit reached, or PZR level &gt; 375")</td></tr><tr><td>Uncontrolled Main steam line(s) pressure decrease</td><td>Rule 5, <i>Main Steam Line Break</i></td></tr><tr><td>CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)</td><td>None (SGTR Tab is entered when identified SG Tube Leakage &gt; 25 gpm)</td></tr></table>	Power Range NIs <b>NOT</b> < 5%	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>	Power Range NIs <b>NOT</b> lowering		Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>	Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, <i>Loss of Main or Emerg FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")	Uncontrolled Main steam line(s) pressure decrease	Rule 5, <i>Main Steam Line Break</i>	CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)
Power Range NIs <b>NOT</b> < 5%	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>													
Power Range NIs <b>NOT</b> lowering														
Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>													
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, <i>Loss of Main or Emerg FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")													
Uncontrolled Main steam line(s) pressure decrease	Rule 5, <i>Main Steam Line Break</i>													
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)													
	OATC													
	BOP													

**This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p>SRO will transfer from the Subsequent Actions Tab to the LOSCM tab (<b>page 29</b>) from the Parallel Actions Page (<b>page 57</b>) to direct crew activities</p> <p>Once the RCS saturates, one of the ROs will perform Rule 2 (<b>page 33</b>)</p> <div style="border: 1px solid red; padding: 5px;"><b>CT-1 Start: _____</b> <b>(Stop on p. 33)</b></div> <p>(CT-1 – Secure all RCPs within 2 minutes of SCM <math>\leq 0^{\circ}\text{F}</math> per Rule 2)</p> <p>The RO not performing Rule 2 will begin performing Enclosure 5.1 due to ES actuation (<b>page 39</b>)</p> <div style="border: 1px solid red; padding: 5px;"><b>CT-2 Start: _____</b> <b>(Stop on p. 42)</b></div> <p>(CT-2 – Start OABFs within 30 minutes of LOCA)</p> <div style="border: 1px solid red; padding: 5px;"><b>CT-3 Start: _____</b> <b>(Stop on p. 33)</b></div> <p>(CT-3 - Start 1C HPI Pump or open 1HP-409 within 10 minutes of LOCA to provide flow in both HPI headers to preclude quarter core cooling)</p>
<b>This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.</b>		



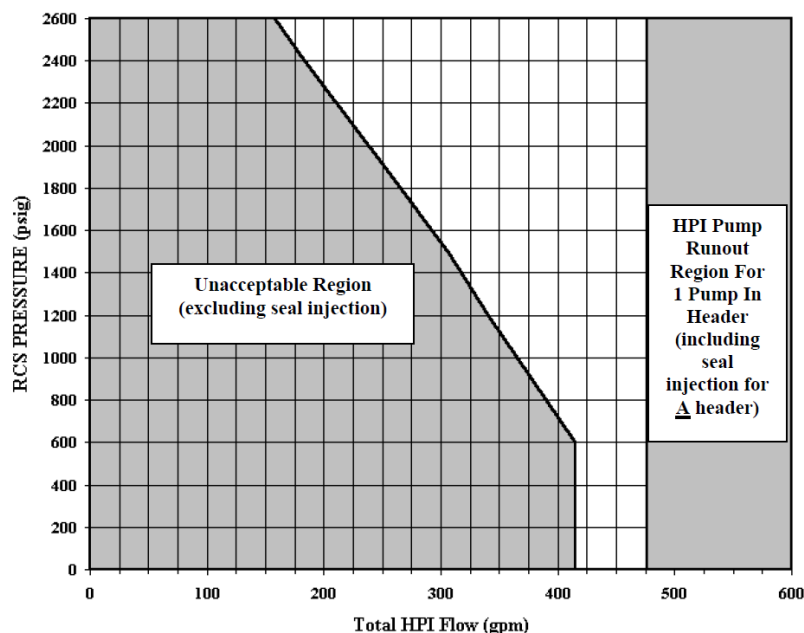
Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>LOSCM Tab</i></p> <p><b>Crew response:</b></p> <p><b>LOSCM tab rev 01</b></p> <ol style="list-style-type: none"><li>Ensure Rule 2 (Loss of SCM) is in progress or complete</li><li>Verify LOSCM caused by excessive heat transfer</li></ol> <p><b>RNO: GO TO Step 4</b></p> <ol style="list-style-type: none"><li><b>IAAT</b> <u>either</u> exists:<ul style="list-style-type: none"><li>LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B <math>\geq 3400</math> gpm</li><li><u>Only one</u> LPI header in operation with header flow <math>\geq 2900</math> gpm</li></ul><b>THEN GO TO</b> LOCA CD tab</li><li>Verify SSF activated per AP/25 with SSF RC Makeup required</li></ol> <p><b>RNO: GO TO Step 7</b></p> <ol style="list-style-type: none"><li>Verify <u>all</u> exist:<ul style="list-style-type: none"><li><u>NO</u> RCPs operating</li><li>HPI flow in <u>both</u> HPI headers</li><li>Adequate <u>total</u> HPI flow per Figure 1 (Total Required HPI Flow)</li></ul></li></ol>

Figure 1  
Total Required HPI Flow



This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Crew response:</u></b></p> <p><b>LOSCM tab</b> (continued)</p> <p>8. <b>GO TO</b> Step 104</p> <p>104. Open 1AS-40 while closing 1MS-47</p> <p>105. Verify HPI forced cooling in progress</p> <p><b>RNO:</b> Close 1RC-4</p> <p>106. Close 1GWD-17, 1HP-1, 1HP-2, and 1RC-3</p> <p>107. Verify <u>either</u>:</p> <ul style="list-style-type: none"><li>• <u>Core</u> superheated</li><li>• Rx vessel head level at 0"</li></ul> <p><b>RNO:</b> <b>GO TO</b> Step 109</p> <p>109. <b>IAAT</b> BWST level is <math>\leq 19'</math>, <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES)</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>CAUTION</u></b></p><p>If TDEFDWP is being used for SG feed, reducing SG pressure below <math>\approx 250</math> psig can result in reduced pumping capability</p></div> <p>110. Maintain SG pressure &lt; RCS pressure utilizing <u>either</u>:</p> <p>___ TBVs</p> <p>___ ADVs</p> <p>111. Verify <u>any</u> SG available for feeding/steaming</p> <p>112. Initiate Encl 5.16 (SG Tube-to-Shell <math>\Delta T</math> Control) (<b>page 58</b>)</p>

This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p><b><u>Crew response:</u></b></p> <p><b>LOSCM tab</b> (continued)</p> <p>113. Verify indications of SGTR exist</p> <p><b>RNO: GO TO</b> Step 116</p> <p>116. Verify HPI forced cooling in progress</p> <p><b>RNO: GO TO</b> Step 118</p> <p>118. Verify CETCs trend decreasing</p> <p>119. Verify primary to secondary heat transfer is excessive</p> <p><b>RNO: GO TO</b> Step 121</p> <p>121. Verify indications of SGTR <math>\geq 25</math> gpm</p> <p><b>RNO: GO TO</b> Step 123</p> <p>123. Verify required RCS makeup flow within normal makeup capability</p> <p><b>RNO: GO TO</b> LOCA CD tab (<b>page 32</b>)</p>
This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.		

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>LOCA Cooledown Tab</i></p> <p><b><u>Crew response:</u></b></p> <p><b>LOCA Cooledown Tab</b> rev 0</p> <ol style="list-style-type: none"><li>1. <b>IAAT</b> BWST level is <math>\leq 19'</math>, <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES)</li><li>2. Verify ES actuated</li><li>3. <b>GO TO</b> Step 7</li><li>7. Perform the following:<ul style="list-style-type: none"><li>• Ensure <u>all</u> RBCUs in low speed</li><li>• Open 1LPSW-18</li><li>• Open 1LPSW-21</li><li>• Open 1LPSW-24</li></ul></li><li>8. Initiate Encl 5.35 (Containment Isolation)</li><li>9. Start <u>all</u> RB Aux fans</li><li>10. <b>IAAT</b> <u>either</u> of the following exists:<ul style="list-style-type: none"><li>• LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B <math>\geq 3400</math> gpm</li><li>• <u>Only one</u> LPI header in operation with header flow <math>\geq 2900</math> gpm</li></ul><b>THEN GO TO</b> Step 11</li></ol> <p><b>RNO: GO TO</b> Step 43</p> <ol style="list-style-type: none"><li>43 Initiate Encl 5.36 (Equipment Alignment For Plant Shutdown)</li><li>44. <b>IAAT</b> <u>all</u> the following exist:<ul style="list-style-type: none"><li>___ All SCMs <math>&gt; 0^{\circ}\text{F}</math></li><li>___ RCS pressure <math>&gt;</math> LPI shutoff head</li><li>___ Required HPI within normal makeup capability</li></ul><b>THEN GO TO</b> Step 45</li></ol> <p><b>RNO: GO TO</b> Step 48</p> <ol style="list-style-type: none"><li>45. Verify primary to secondary heat transfer exists</li></ol>

**This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<div><b>Rule 2</b></div> <p><b>Crew response:</b></p> <p><b>Rule 2 (Loss of SCM) rev 01</b></p> <ol style="list-style-type: none"><li><b>IAAT</b> <u>all</u> exist:<ul style="list-style-type: none"><li>Any SCM <math>\leq 0^{\circ}\text{F}</math></li><li>Rx power <math>\leq 1\%</math></li><li><math>\leq 2</math> minutes elapsed since loss of SCM</li></ul><b>THEN</b> perform steps 2 &amp; 3</li><li><b>Stop</b> <u>all</u> <b>RCPs</b> (within 2 minutes of LOSCM) <b>CT-1 Stop:</b> _____</li><li>Notify CRS of RCP status</li><li>Verify Blackout exists</li></ol> <p><b>RNO: GO TO</b> Step 6</p> <ol style="list-style-type: none"><li>Open 1HP-24 &amp; 25 <b>CT-3 Stop:</b> _____</li><li><b>Start</b> <u>all</u> <u>available</u> <b>HPI Pumps</b> (within 10 minutes of LOCA)</li></ol> <p><b>Examiner Note:</b> The 1C HPI pump will fail to start on ES signal but will start manually.</p> <ol style="list-style-type: none"><li><b>GO TO</b> step 13</li><li>Open 1HP-26 &amp; 27</li><li>Verify <u>at least two</u> HPI pumps are operating using two diverse indications</li><li><b>IAAT</b> <math>\geq 2</math> HPI pumps operating and HPI flow in any header is in Unacceptable Region of Fig. 1, <b>THEN</b> perform Steps 16-21</li></ol> <p><b>RNO: GO TO</b> Step 17</p> <p style="text-align: center;">Figure 1 Required HPI Flow Per Header</p>

This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior														
	<b>CT-3</b>	<p style="text-align: right;"><i>Rule 2</i></p> <p><b><u>Crew response:</u></b></p> <p><b>Rule 2 ( Loss of SCM) (Continued)</b></p> <p>16. <b>Open in the <u>affected</u> header:</b> <i>(within 10 min of LOCA if 1C HPIP not started)</i></p> <table border="1"><tr><td>√</td><td><b>1A Header</b></td><td>√</td><td><b>1B Header</b></td></tr><tr><td></td><td>1HP-410</td><td></td><td><b>1HP-409</b></td></tr></table> <div style="border: 1px solid red; padding: 5px; display: inline-block;"><b>CT-3 Stop: _____</b></div> <p>17. <b>IAAT</b> flow limits are exceeded <b>THEN</b> perform Steps 18 – 20</p> <table border="1"><thead><tr><th>Pump Operation</th><th>Limit</th></tr></thead><tbody><tr><td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for <u>A</u> hdr)</td></tr><tr><td>1A &amp; 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr></tbody></table> <p><b>RNO: GO TO</b> Step 21</p> <p>18. Place Diverse HPI in BYPASS</p> <p>19. Perform <u>both</u>:</p> <ul style="list-style-type: none"><li>• Place ES CH 1 in MANUAL</li><li>• Place ES CH 2 in MANUAL</li></ul> <p>20. Throttle HPI to maximize flow ≤ flow limit</p> <p>21. Notify CRS of HPI status</p> <p>22. Verify RCS pressure &gt;550 psig</p> <p>23. <b>IAAT</b> <u>either</u> exists:</p> <ul style="list-style-type: none"><li>• LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm</li><li>• Only one LPI header in operation with header flow ≥ 2900 gpm</li></ul> <p><b>THEN GO TO</b> Step 24</p> <p><b>RNO: GO TO</b> Step 35</p>	√	<b>1A Header</b>	√	<b>1B Header</b>		1HP-410		<b>1HP-409</b>	Pump Operation	Limit	1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)	1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)
√	<b>1A Header</b>	√	<b>1B Header</b>													
	1HP-410		<b>1HP-409</b>													
Pump Operation	Limit															
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)															
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)															

**This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Rule 2</i></p> <p><b><u>Crew response:</u></b></p> <p><b>Rule 2 ( Loss of SCM) (Continued)</b></p> <p>35. <b>IAAT</b> TBVs are unavailable, <b>THEN</b></p> <p>A. Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of ADVs)</p> <p>B. Notify CRS the ADVs are being aligned for use</p> <p>36. Select OFF for <u>both</u> Digital Channels on AFIS HEADER A</p> <p>37. Select OFF for <u>both</u> Digital Channels on AFIS HEADER B</p> <p>38. Verify <u>any</u> EFDW pump operating</p> <p><b>RNO:</b> Place 1FDW 315 and 1FDW-316 in MANUAL and close</p> <p>39. Start MD EFDW pumps on <u>all intact</u> SGs:</p> <ul style="list-style-type: none"><li>• 1A MD EFDWP</li><li>• 1B MD EFDWP</li></ul> <p>40. Verify <u>any</u> EFDW pump operating</p> <p>41. Verify <u>both</u> SGs <u>intact</u></p> <p>42. Establish 300 gpm EFDW flow to <u>each</u> SG</p> <p>43. Verify <u>both</u> MD EFDWPs operating</p> <p>44. Place 1 TD EFDW PUMP in PULL TO LOCK</p> <p>45. Trip <u>both</u> Main FDW pumps</p> <p>46. Place FDW block valve switches in CLOSE:</p> <ul style="list-style-type: none"><li>• 1FDW-33</li><li>• 1FDW-31</li><li>• 1FDW-42</li><li>• 1FDW-40</li></ul>
<b>This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.</b>		

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Rule 2</i></p> <p><b><u>Crew response:</u></b></p> <p><b>Rule 2 ( Loss of SCM) (Continued)</b></p> <p>47. Begin feeding <u>all intact</u> SGs to the appropriate SG Level Control Point in Rule 7 (SG Feed Control) using available feed sources; EFDW/Main FDW</p> <p>48. <b>IAAT</b> SG Level Control Point is reached, <b>THEN</b> maintain SG Level Control Point by feeding and steaming as necessary</p> <p>49. Notify CRS of SG feed status</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><b><u>CAUTION</u></b></p><p>If 1 TD EFDW PUMP is being used for SG feed and Unit 1 is supplying the Auxiliary Steam header, reducing SG pressure below <math>\approx 250</math> psig can result in reduced pumping capability.</p></div> <p>50. <b>IAAT</b> SG pressure is <math>&gt;</math> RCS pressure, <b>THEN</b> reduce SG pressure <math>&lt;</math> RCS pressure using <u>either</u>:</p> <ul style="list-style-type: none"><li>• TBVs</li><li>• Dispatch <u>two</u> operators to perform Encl 5.24 (operation of the ADVs)</li></ul> <p>51. Verify <u>any</u> Main FDW pump operating</p> <p><b>RNO: GO TO</b> Step 58</p> <p>58. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete (<b>page 37</b>)</p> <p>59. <b>WHEN</b> directed by CRS, <b>THEN EXIT</b></p>

This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.



Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>Rule 3</i></p> <p><b><u>Crew response:</u></b></p> <p><b>Rule 3</b> (Loss of Main or Emergency Feedwater) <i>rev 01</i></p> <p>1. Verify loss of MFDW and /or EFDW was due to <u>any</u> of the following: ___ Turbine Building Flooding ___ Actions taken to increase SG level due to Turbine Building Flooding</p> <p><b>RNO: GO TO</b> Step 3</p> <p>3. <b>IAAT</b> NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), <b>AND</b> <u>any</u> of the following exist:</p> <ul style="list-style-type: none"><li>• RCS pressure reaches 2300 psig or NDT limit</li><li>• PZR level reaches 375" (340" acc)</li></ul> <p><b>THEN PERFORM</b> Rule 4 (HPI Forced Cooling)</p> <p>4. Start <u>operable</u> EFDW pumps, as required, to feed <u>all intact</u> SGs</p> <p>5. Verify <u>any</u> EFDW pump operating</p> <p>6. <b>GO TO</b> Step 38</p> <p>38. <b>IAAT</b> an EFDW valve <b>CANNOT</b> control in AUTO, <b>OR</b> manual operation of EFDW valve is desired to control flow/level, <b>THEN</b> perform Steps 39 - 43</p> <p><b>RNO: GO TO</b> Step 44</p> <p>44. Verify <u>any</u> SCM <math>\leq 0^{\circ}\text{F}</math></p> <p><b>RNO: IF</b> overcooling OR exceeding limits in Rule 7, <b>THEN</b> throttle EFDW as necessary</p> <p>45. <b>IAAT</b> Unit 1 EFDW is in operation, <b>THEN</b> initiate Encl 5.9 (Extended EFDW Operation) (<b>page 38</b>)</p> <p>46. <b>WHEN</b> directed by <b>CRS</b>, <b>THEN EXIT</b></p>

This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT18-1**Scenario No.: **4**Event No.: **6**

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Event Description: **Small Break LOCA (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: right;"><i>EOP Encl 5.9</i></p> <p><b>Crew response:</b></p> <p><b>EOP Encl 5.9</b> (Extended EFDW Operation) <i>rev 01</i></p> <ol style="list-style-type: none"><li>1. Monitor EFDW parameters on EFW graphic display</li><li>2. <b>IAAT</b> UST level is &lt; 4', <b>THEN GO TO</b> Step 120</li><li>3. <b>IAAT</b> feeding <u>both</u> SGs with one MD EFDWP is desired, <b>THEN</b> perform steps 4 - 7</li></ol> <p><b>RNO: GO TO</b> Step 8</p> <ol style="list-style-type: none"><li>8. Perform as required to maintain UST level &gt; 7.5'<ul style="list-style-type: none"><li>• Makeup with demin water</li><li>• Place CST pumps in AUTO</li></ul></li><li>9. <b>IAAT</b> <u>all</u> exist:<ul style="list-style-type: none"><li>___ Rapid cooldown <b>NOT</b> in progress</li><li>___ MD EFDWP operating for each <u>available</u> SG</li><li>___ EFDW flow in <u>each</u> header &lt; 600 gpm</li></ul><b>THEN</b> place 1 TD EFDW PUMP switch in PULL TO LOCK</li><li>10. Verify 1 TD EFDW PUMP operating</li></ol> <p><b>RNO: GO TO</b> Step 12</p> <ol style="list-style-type: none"><li>11. Start TD EFDWP BEARING Oil Cooling Pump</li></ol> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• Loss of the condensate system for ≥ 25 minutes results in cooling down to LPI using the ADVs. If <b>NO</b> HWPs are operating, continuing this enclosure to restore the condensate system is a priority <u>unless</u> the CR SRO deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open.</li><li>• If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.</li></ul></div> <ol style="list-style-type: none"><li>12. Notify CR SRO to set priority based on the NOTE above <u>and</u> EOP activities</li></ol> <p><b>Note: The SRO may determine that continuing in Encl 5.9 is not a priority at this time and direct the RO from the LOSCM Tab of the EOP. (page 29)</b></p>
This event is complete when the SRO transfers to the LOCA CD tab, or as directed by the Lead Examiner.		

## EOP Enclosure 5.1 (ES Actuation)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
<p>1. <input type="checkbox"/> Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>:</p> <table border="1"><thead><tr><th>✓</th><th>Actuation Setpoint (psig)</th><th>Associated ES Channel</th></tr></thead><tbody><tr><td><input type="checkbox"/></td><td>1600 (RCS)</td><td>1 &amp; 2</td></tr><tr><td><input type="checkbox"/></td><td>550 (RCS)</td><td>3 &amp; 4</td></tr><tr><td><input type="checkbox"/></td><td>3 (RB)</td><td>1, 2, 3, 4, 5, &amp; 6</td></tr><tr><td><input type="checkbox"/></td><td>10 (RB)</td><td>7 &amp; 8</td></tr></tbody></table>	✓	Actuation Setpoint (psig)	Associated ES Channel	<input type="checkbox"/>	1600 (RCS)	1 & 2	<input type="checkbox"/>	550 (RCS)	3 & 4	<input type="checkbox"/>	3 (RB)	1, 2, 3, 4, 5, & 6	<input type="checkbox"/>	10 (RB)	7 & 8	
✓	Actuation Setpoint (psig)	Associated ES Channel														
<input type="checkbox"/>	1600 (RCS)	1 & 2														
<input type="checkbox"/>	550 (RCS)	3 & 4														
<input type="checkbox"/>	3 (RB)	1, 2, 3, 4, 5, & 6														
<input type="checkbox"/>	10 (RB)	7 & 8														
<p>2. <input type="checkbox"/> Verify <u>all</u> ES channels associated with actuation setpoints have actuated.</p>	<p><b>NOTE</b></p> <p>Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure.</p> <p><input type="checkbox"/> Depress TRIP on <u>affected</u> ES logic channels that have <b>NOT</b> previously been actuated.</p>															
<p>3. <input type="checkbox"/> <b>IAAT</b> <u>additional</u> ES actuation setpoints are exceeded, <b>THEN</b> perform Steps 1 - 2.</p>																
<p>4. <input type="checkbox"/> Place Diverse HPI in BYPASS.</p>	<p><input type="checkbox"/> Place Diverse HPI in OVERRIDE.</p>															
<p>5. Perform <u>both</u>:</p> <p><input type="checkbox"/> Place ES CH 1 in MANUAL.</p> <p><input type="checkbox"/> Place ES CH 2 in MANUAL.</p>	<p><b>NOTE</b></p> <ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul> <p>1. <input type="checkbox"/> <b>IF</b> ES CH 1 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE.</p> <p>2. <input type="checkbox"/> <b>IF</b> ES CH 2 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</p>															

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <input type="checkbox"/> <b>IAAT</b> <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation <b>THEN</b> depress RESET on the required channel.	
7. <input type="checkbox"/> Verify Rule 2 in progress <u>or</u> complete.	<input type="checkbox"/> <b>GOTO</b> Step 74.
8. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> <b>GOTO</b> Step 10.
9. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
10. <input type="checkbox"/> <b>IAAT</b> ES Channels 5 <u>or</u> 6 is actuated, <b>THEN</b> perform Steps 11 - 15.	<input type="checkbox"/> <b>GOTO</b> Step 16.
11. Perform the following for actuated channels: <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div><p style="text-align: center;"><b><u>NOTE</u></b></p><ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul></div> <div>1. <input type="checkbox"/> <b>IF</b> ES CH 5 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE. 2. <input type="checkbox"/> <b>IF</b> ES CH 6 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</div>
12. <input type="checkbox"/> Verify <u>any</u> RCP is operating	<input type="checkbox"/> <b>GO TO</b> Step 16
13. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
14. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
15. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. <input type="checkbox"/> <b>IAAT</b> ES Channels 3 & 4 are actuated, <b>THEN GO TO</b> Step 17.	<input type="checkbox"/> <b>GO TO</b> Step 54.
17. <input type="checkbox"/> Place Diverse LPI in BYPASS.	<input type="checkbox"/> Place Diverse LPI in OVERRIDE.
18. Perform <u>both</u> : <input type="checkbox"/> Place ES CH 3 in MANUAL. <input type="checkbox"/> Place ES CH 4 in MANUAL.	<div><b>NOTE</b><ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul></div> <div>1. <input type="checkbox"/> <b>IF</b> ES CH 3 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE. 2. <input type="checkbox"/> <b>IF</b> ES CH 4 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</div>
<div><b>CAUTION</b> LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
19. <input type="checkbox"/> <b>IAAT</b> <u>any</u> LPI pump is operating against a shutoff head, <b>THEN</b> at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
20. <input type="checkbox"/> <b>IAAT</b> RCS pressure is < LPI pump shutoff head, <b>THEN</b> perform Steps 21 - 22.	<input type="checkbox"/> <b>GOTO</b> Step 23.
21. Perform the following: <input type="checkbox"/> Open 1LP-17. <input type="checkbox"/> Start 1A LPI PUMP.	1. <input type="checkbox"/> Stop 1A LPI PUMP. 2. <input type="checkbox"/> Close 1LP-17.
22. Perform the following: <input type="checkbox"/> Open 1LP-18. <input type="checkbox"/> Start 1B LPI PUMP.	1. <input type="checkbox"/> Stop 1B LPI PUMP. 2. <input type="checkbox"/> Close 1LP-18.

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. <input type="checkbox"/> <b>IAAT 1A and 1B LPI PUMPs</b> are off / tripped, <b>AND all</b> exist: <input type="checkbox"/> RCS pressure < LPI pump shutoff head <input type="checkbox"/> 1LP-19 closed <input type="checkbox"/> 1LP-20 closed <b>THEN</b> perform Steps 24 - 25.	<input type="checkbox"/> <b>GO TO</b> Step 26.
24. Open: <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7 <input type="checkbox"/> 1LP-17 <input type="checkbox"/> 1LP-18 <input type="checkbox"/> 1LP-21 <input type="checkbox"/> 1LP-22	
25. <input type="checkbox"/> Start 1C LPI PUMP.	
26. <input type="checkbox"/> <b>IAAT 1A LPI PUMP</b> fails while operating, <b>AND 1B LPI PUMP</b> is operating, <b>THEN</b> close 1LP-17.	
27. <input type="checkbox"/> <b>IAAT 1B LPI PUMP</b> fails while operating, <b>AND 1A LPI PUMP</b> is operating, <b>THEN</b> close 1LP-18.	
28. Start: <input type="checkbox"/> A OUTSIDE AIR BOOSTER FAN <input type="checkbox"/> B OUTSIDE AIR BOOSTER FAN	<b>CT- 2</b> <div style="border: 1px solid red; padding: 2px; display: inline-block;">CT-2 Stop: _____</div> (within 30 minutes of initiation of LOCA)
29. Notify Unit 3 to start: <input type="checkbox"/> 3A OUTSIDE AIR BOOSTER FAN <input type="checkbox"/> 3B OUTSIDE AIR BOOSTER FAN	

## EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, <b>THEN</b> open: ___ 1CF-1 ___ 1CF-2
31. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
32. ___ Secure makeup to the LDST.	
33. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ <b>IF 1HP-3 fails to close, THEN close 1HP-1.</b> 2. ___ <b>IF 1HP-4 fails to close, THEN close 1HP-2.</b> 3. ___ <b>IF 1HP-20 fails to close, AND NO RCPs operating, THEN close:</b> ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
34. ___ Verify Unit <u>2</u> turbine tripped.	___ <b>GOTO</b> Step 37.
35. ___ Close <u>2</u> LPSW-139.	
36. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
37. ___ Close 1LPSW-139.	
38. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
39. ___ Start <u>all available</u> LPSW pumps.	

**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ <b>GOTO</b> Step 42.
41. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ <b>IF both</b> are closed: ___ 1LPSW-4 ___ 1LPSW-5 <b>THEN</b> notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$ .
42. ___ <b>IAAT</b> BWST level $\leq 19'$ , <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
43. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). ( <b>PS</b> )	
44. ___ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. ___ <b>IAAT</b> ES channels 5 & 6 have actuated, <b>THEN</b> perform Step 46.	___ <b>GOTO</b> Step 47.
<div><div><b>NOTE</b></div><div>RBCU transfer to low speed will <b>NOT</b> occur until 3 minute time delay is satisfied.</div></div>	
46. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.



**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. <input type="checkbox"/> <b>IAAT</b> ES channels 7 & 8 have actuated, <b>THEN</b> perform Steps 48 - 49.	<input type="checkbox"/> <b>GOTO</b> Step 50.
48. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 7 in MANUAL. <input type="checkbox"/> Place ES CH 8 in MANUAL.	<div><b>NOTE</b><ul style="list-style-type: none"><li>• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.</li><li>• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</li></ul></div> <div>1. <input type="checkbox"/> <b>IF</b> ES CH 7 fails to go to MANUAL, <b>THEN</b> place ODD voter in OVERRIDE. 2. <input type="checkbox"/> <b>IF</b> ES CH 8 fails to go to MANUAL, <b>THEN</b> place EVEN voter in OVERRIDE.</div>
49. <input type="checkbox"/> Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	<input type="checkbox"/> Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
50. <input type="checkbox"/> Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
51. <input type="checkbox"/> Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
52. <input type="checkbox"/> <b>IAAT</b> conditions causing ES actuation have cleared, <b>THEN</b> initiate Encl 5.41 (ES Recovery).	
53. <input type="checkbox"/> <b>WHEN</b> CR SRO approves, <b>THEN EXIT.</b>	

**... END ...**

**EOP Enclosure 5.1**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><b>Unit Status</b> ES Channels 3 &amp; 4 have <b>NOT</b> actuated.</p>	
54. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
55. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
56. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, <b>THEN</b> open: ___ 1CF-1 ___ 1CF-2
57. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
58. ___ Secure makeup to the LDST.	
59. ___ Verify all ES channel 1 & 2 components are in the ES position.	1. ___ IF 1HP-3 fails to close, <b>THEN</b> close 1HP-1. 2. ___ IF 1HP-4 fails to close, <b>THEN</b> close 1HP-2. 3. ___ IF 1HP-20 fails to close, <b>AND NO</b> RCPs operating, <b>THEN</b> close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components <b>NOT</b> in ES position <u>and</u> initiate action to place in ES position if desired.
60. ___ Verify Unit <u>2</u> turbine tripped.	___ <b>GOTO</b> Step 63.
61. ___ Close <u>2</u> LPSW-139.	
62. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
63. ___ Close 1LPSW-139.	

**EOP Enclosure 5.1**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
64. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
65. ___ Start <u>all available</u> LPSW pumps.	
66. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ <b>GOTO</b> Step 68.
67. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ <b>IF</b> <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 <b>THEN</b> notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$ .
68. ___ <b>IAAT</b> BWST level $\leq 19'$ , <b>THEN</b> initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
69. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). ( <b>PS</b> )	
70. ___ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
71. ___ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
72. ___ <b>IAAT</b> conditions causing ES actuation have cleared, <b>THEN</b> initiate Encl 5.41 (ES Recovery).	
73. ___ <b>WHEN</b> CR SRO approves, <b>THEN EXIT</b> .	

**... END ...**

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>NOTE</b> Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered.	
1.   ___ Utilize the following as necessary to maintain <u>desired</u> Pzr level: <ul style="list-style-type: none"><li>• 1A HPI Pump</li><li>• 1B HPI Pump</li><li>• 1HP-26</li><li>• 1HP-7</li><li>• 1HP-120 setpoint or valve demand</li><li>• 1HP-5</li></ul>	___ <b>IF</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level.
2.   ___ <b>IAAT</b> <u>makeup</u> to the <u>LDST</u> is desired, <b>THEN</b> makeup from 1A BHUT.	
3.   ___ <b>IAAT</b> it is desired to <u>secure</u> <u>makeup</u> to LDST, <b>THEN</b> secure makeup from 1A BHUT.	
4.   ___ <b>IAAT</b> it is desired to <u>bleed</u> letdown flow to 1A BHUT, <b>THEN</b> perform the following: A. Open: ___ 1CS-26 ___ 1CS-41 B. ___ Position 1HP-14 to BLEED. C. ___ Notify SRO.	
5.   ___ <b>IAAT</b> letdown <u>bleed</u> is <b>NO</b> longer desired, <b>THEN</b> position 1HP-14 to NORMAL.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>6. <input type="checkbox"/> <b>IAAT 1C HPI PUMP</b> is required, <b>THEN</b> perform Steps 7 - 9.</p> <hr/> <p>7. <input type="checkbox"/> Open: • 1HP-24 • 1HP-25</p>	<p><input type="checkbox"/> <b>GO TO</b> Step 10.</p> <hr/> <p>1. <input type="checkbox"/> <b>IF <u>both</u></b> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following:</p> <p>A. <input type="checkbox"/> Start 1A LPI PUMP.</p> <p>B. <input type="checkbox"/> Start 1B LPI PUMP.</p> <p>C. Open: <input type="checkbox"/> 1LP-15 <input type="checkbox"/> 1LP-16 <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7</p> <p>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</p> <p>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</p> <p>F. <input type="checkbox"/> <b>GO TO</b> Step 8.</p> <p>2. <input type="checkbox"/> <b>IF <u>only one</u></b> BWST suction valve (1HP-24 or 1HP-25) is open, <b>THEN</b> perform the following:</p> <p>A. <input type="checkbox"/> <b>IF</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.</p> <p>B. <input type="checkbox"/> <b>IF</b> &lt; 2 HPI pumps are operating, <b>THEN</b> start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.</p> <p>C. <input type="checkbox"/> <b>GO TO</b> Step 9.</p>

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.   ___ Start 1C HPI PUMP.	___ <b>IF</b> at least two HPI pumps are operating, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.
9.   Throttle the following as required to maintain desired Pzr level: ___ 1HP-26 ___ 1HP-27	1.   ___ <b>IF</b> at least two HPI pumps are operating, <b>AND</b> 1HP-26 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-410 to maintain desired Pzr level. 2.   ___ <b>IF</b> 1A HPI PUMP <u>and</u> 1B HPI PUMP are operating, <b>AND</b> 1HP-27 will <b>NOT</b> open, <b>THEN</b> throttle 1HP-409 to maintain desired Pzr level.

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <input type="checkbox"/> <b>IAAT <u>LDST</u> level CANNOT</b> be maintained, <b>THEN</b> perform Step 11.	<input type="checkbox"/> <b>GO TO</b> Step 12.
11. <input type="checkbox"/> Perform the following: <ul style="list-style-type: none"><li>• Open 1HP-24.</li><li>• Open 1HP-25.</li><li>• Close 1HP-16.</li></ul>	1. <input type="checkbox"/> <b>IF both</b> BWST suction valves (1HP-24 and 1HP-25) are closed, <b>THEN</b> perform the following: <ul style="list-style-type: none"><li>A. <input type="checkbox"/> Start 1A LPI PUMP.</li><li>B. <input type="checkbox"/> Start 1B LPI PUMP.</li><li>C. Open:<ul style="list-style-type: none"><li><input type="checkbox"/> 1LP-15</li><li><input type="checkbox"/> 1LP-16</li><li><input type="checkbox"/> 1LP-9</li><li><input type="checkbox"/> 1LP-10</li><li><input type="checkbox"/> 1LP-6</li><li><input type="checkbox"/> 1LP-7</li></ul></li><li>D. <input type="checkbox"/> <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump.</li><li>E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</li><li>F. <input type="checkbox"/> <b>GO TO</b> Step 13.</li></ul> 2. <input type="checkbox"/> <b>IF <u>only one</u></b> BWST suction valve (1HP-24 or 1HP-25) is open, <b>AND</b> three HPI pumps are operating, <b>THEN</b> secure 1B HPI PUMP.
<div><b>NOTE</b> Maintaining Pzr level &gt; 100" [180" acc] will ensure Pzr heater bundles remain covered.</div>	
12. <input type="checkbox"/> Operate Pzr heaters as required to maintain heater bundle integrity.	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. <input type="checkbox"/> <b>IAAT</b> additional makeup flow to LDST is desired, <b>AND</b> 1A BLEED TRANSFER PUMP is operating, <b>THEN</b> dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
14. <input type="checkbox"/> <b>IAAT</b> <u>two</u> Letdown Filters are desired, <b>THEN</b> perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
15. <input type="checkbox"/> <b>IAAT</b> <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired <b>THEN</b> perform Steps 16 - 34. {41}	<input type="checkbox"/> <b>GO TO</b> Step 35.
16. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown <b>CANNOT</b> be restored due to inability to restart the CC system. 2. <input type="checkbox"/> <b>GO TO</b> Step 35.
17. <input type="checkbox"/> Ensure only one CC pump running.	
18. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
19. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> <b>IF</b> 1HP-1 is closed due to 1HP-3 failing to close, <b>THEN GO TO</b> Step 21. 2. <input type="checkbox"/> <b>IF</b> 1HP-2 is closed due to 1HP-4 failing to close, <b>THEN GO TO</b> Step 21.
20. <input type="checkbox"/> <b>GO TO</b> Step 23.	
<p style="text-align: center;"><b><u>NOTE</u></b> Verification of leakage requires visual observation of East Penetration Room.</p>	
21. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<b>GO TO</b> Step 23.
22. <input type="checkbox"/> <b>GO TO</b> Step 35.	



**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
23. <input type="checkbox"/> Monitor for unexpected conditions while restoring letdown.	
24. <input type="checkbox"/> Verify <u>both</u> letdown coolers to be placed in service.	1. <input type="checkbox"/> <b>IF</b> 1A letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-3 2. <input type="checkbox"/> <b>IF</b> 1B letdown cooler is to be placed in service, <b>THEN</b> open: <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-4 3. <input type="checkbox"/> <b>GO TO</b> Step 26.
25. Open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-3 <input type="checkbox"/> 1HP-4	
26. <input type="checkbox"/> Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. <input type="checkbox"/> Notify CR SRO of problem. B. <input type="checkbox"/> <b>GO TO</b> Step 35.
27. <input type="checkbox"/> Close 1HP-6.	
28. <input type="checkbox"/> Close 1HP-7.	
29. <input type="checkbox"/> Verify letdown temperature < 125°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Close: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> <b>IF</b> <u>any</u> deborating IX is in service, <b>THEN</b> perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
30. <input type="checkbox"/> Open 1HP-5.	
31. <input type="checkbox"/> Adjust 1HP-7 for $\approx 20$ gpm letdown.	
32. <input type="checkbox"/> <b>WHEN</b> letdown temperature is < 125°F, <b>THEN</b> place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. <input type="checkbox"/> Open 1HP-6.	
34. <input type="checkbox"/> Adjust 1HP-7 to control desired letdown flow.	

**NOTE**

AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.

35. <input type="checkbox"/> <b>IAAT</b> it is determined that letdown is unavailable due to equipment failures <u>or</u> letdown system leakage, <b>THEN</b> notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. <input type="checkbox"/> <b>IAAT</b> > 1 HPI pump is operating, <b>AND</b> additional HPI pumps are <b>NO</b> longer needed, <b>THEN</b> perform the following: A. <input type="checkbox"/> Obtain SRO concurrence to reduce running HPI pumps. B. <input type="checkbox"/> Secure the desired HPI pumps. C. <input type="checkbox"/> Place secured HPI pump switch in AUTO, if desired.	
37. <input type="checkbox"/> <b>IAAT</b> <u>all</u> the following conditions exist: <input type="checkbox"/> Makeup from BWST <b>NOT</b> required <input type="checkbox"/> LDST level > 55" <input type="checkbox"/> <u>All</u> control rods inserted <input type="checkbox"/> Cooldown Plateau <b>NOT</b> being used <b>THEN</b> close: <input type="checkbox"/> 1HP-24 <input type="checkbox"/> 1HP-25	

**Enclosure 5.5**  
**Pzr and LDST Level Control**

<b>ACTION/EXPECTED RESPONSE</b>	<b>RESPONSE NOT OBTAINED</b>
38. ___ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	___ <b>GO TO</b> Step 40.
39. ___ <b>WHEN</b> 1CS-48 (1A BHUT Recirc) is <b>NO</b> longer needed to provide additional makeup flow to LDST, <b>THEN</b> perform the following: A. ___ Stop 1A BLEED TRANSFER PUMP. B. ___ Locally position 1CS-48 (1A BHUT Recirc) <u>one</u> turn open (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.). C. ___ Close 1CS-46. D. ___ Start 1A BLEED TRANSFER PUMP. E. ___ Locally throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. F. ___ Stop 1A BLEED TRANSFER PUMP.	
40. ___ Verify two Letdown Filters in service, <b>AND</b> <u>only one</u> Letdown filter is desired.	___ <b>GO TO</b> Step 42.
41. Perform <u>one</u> of the following: ___ Place 1HP-17 switch to CLOSE. ___ Place 1HP-18 switch to CLOSE.	
42. ___ <b>WHEN</b> directed by CR SRO, <b>THEN EXIT</b> this enclosure.	

**... END ...**

**Rule 6**  
**HPI****HPI Pump Throttling**  
**Limits**

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled  $\leq 475$  gpm/pump (including seal injection for A header) when only one HPI pump is operating in a header.
- Total HPI flow must be throttled  $\leq 950$  gpm including seal injection when 1A and 1B HPI pumps are operating with 1HP-409 open.
- Total HPI flow must be throttled  $< 750$  gpm when all the following exist:
  - LPI suction is from the RBES
  - piggyback is aligned
  - either of the following exist:
    - only one piggyback valve is open (1LP-15 or 1LP-16)
    - only one LPI pump operating
- HPI may be throttled under the following conditions:

<b>HPI Forced Cooling in Progress:</b>	<b>HPI Forced Cooling NOT in Progress:</b>
<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• CETCs decreasing</li></ul>	<u>All</u> the following conditions must exist: <ul style="list-style-type: none"><li>• <u>All</u> WR NIs <math>\leq 1\%</math></li><li>• <u>Core</u> SCM <math>&gt; 0</math></li><li>• Pzr level increasing</li><li>• SRO concurrence required if throttling following emergency boration</li></ul>

**HPI Pump Minimum Flow Limit**

- Maintain  $\geq 170$  gpm indicated/pump. This is an instrument error adjusted value that ensures a real value of  $\geq 65$  gpm/pump is maintained. HPI pump flow less than minimum is allowed for up to 4 hours.

## Subsequent Actions

EP/1/A/1800/001

## Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP  <b>OR</b>  NIs <b>NOT</b> decreasing	<b>GO TO</b> UNPP tab.	<b>UNPP</b>
2. <u>All</u> 4160V SWGR de-energized {13}	<b>GO TO</b> Blackout tab.	<b>BLACKOUT</b>
3. <u>Core</u> SCM indicates superheat	<b>GO TO</b> ICC tab.	<b>ICC</b>
4. <u>Any</u> SCM = 0°F	<b>GO TO</b> LOSCM tab.	<b>LOSCM</b>
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	<b>GO TO</b> EHT tab.	<b>LOHT</b>
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	<b>GO TO</b> LOHT tab.	
7. Heat transfer is <u>or</u> has been excessive	<b>GO TO</b> EHT tab.	<b>EHT</b>
8. Indications of SGTR $\geq$ 25 gpm	<b>GO TO</b> SGTR tab.	<b>SGTR</b>
9. Turbine Building flooding <b>NOT</b> caused by rainfall event	<b>GO TO</b> TBF tab.	<b>TBF</b>
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	<b>ES</b>
11. Valid ES actuation has occurred <u>or</u> should have	Initiate Encl 5.1 (ES Actuation).	<b>ES</b>
12. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	<ul style="list-style-type: none"> <li>Initiate AP/11 (Recovery from Loss of Power).</li> <li><b>IF</b> Encl 5.1 (ES Actuation) has been initiated, <b>THEN</b> reinitiate Encl 5.1.</li> </ul>	<b>ROP</b>
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	<b>EDL</b>
14. Individual available to make notifications	<ul style="list-style-type: none"> <li>Announce plant conditions using PA system.</li> <li>Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).</li> </ul>	<b>NOTIFY</b>

**Enclosure 5.16**  
**SG Tube-to-Shell  $\Delta T$  Control**

**NOTE**

- SG tube-to-shell  $\Delta T$  is calculated by the OAC with points displayed on Loop P/T displays as indicated below:

<b>1A SG <math>\Delta T</math></b>	<b>1B SG <math>\Delta T</math></b>
Bottom of Loop 'A' P/T display	Bottom of Loop 'B' P/T display
S/G TUBE/SHELL DT	S/G TUBE/SHELL DT

- SG tube-to-shell  $\Delta T$  limits:

<b>Stress</b>	<b>OAC Indication</b>
Tensile Stress Limit (Tubes colder than shell)	+130°F
Compressive Stress (Tubes hotter than shell)	-70°F

- IAAT** any SG tube-to-shell  $\Delta T$  approaches either limit, **THEN** take appropriate action per the following:

<b>Limit Approached</b>	<b>Action</b>
Tensile	<b>GO TO</b> Step 2
Compressive	<b>GO TO</b> Step 50

**Examiner Note:** *SG tube-to-shell  $\Delta T$  should not approach either limit for this scenario.*

## CRITICAL TASKS

- CT-1** Secure all RCPs within two minutes of  $SCM \leq 0^{\circ}F$  per Rule 2 (BWOG CT-1) (page 33)
- CT-2** Start Outside Air Booster Fans within 30 minutes of initiation of LOCA (BWOG CT-27) (page 42)
- CT-3** Start 1C HPI Pump or open 1HP-409 within 10 minutes of LOCA to provide flow in both HPI headers to preclude quarter core cooling (page 33 or 34)

<b>SAFETY: Take a Minute</b>			
<b>UNIT 0 (OSM)</b>			
SSF Operable: No U2/U3: Yes PSW Operable: No	KHUs Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
<b>UNIT STATUS (CR SRO)</b>			
<b>Unit 1 Simulator</b>		<b>Other Units</b>	
Mode: 2		<b>Unit 2</b>	<b>Unit 3</b>
Reactor Power: 3%		Mode: 1	Mode: 1
Gross MWE: 0		100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action		EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm			
<b>Technical Specifications/SLC Items (CR SRO)</b>			
<b>Component/Train</b>	<b>OOS Date/Time</b>	<b>Restoration Required Date/Time</b>	<b>TS/SLC #</b>
AMSAC/DSS	Today/0300	7 Days	SLC 16.7.2
SSF	Today/0100	7 Days	TS 3.10.1
PSW	Today /0600	7 Days	TS 3.7.10
<b>Shift Turnover Items (CR SRO)</b>			
<b>Primary</b>			
<ul style="list-style-type: none"> <li>Due to unanalyzed condition, the SSF should be considered INOPERABLE for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).</li> <li>When in Mode 2, evaluate or restrict evolutions involving MS, FDW, and EFDW to minimize changes to RCS temperature and reactor power.</li> <li>The OATC is to swap HPI pumps per OP/1/A/1104/002 Encl 4.24 (Swapping 1A and 1B HPI Pumps)</li> <li>1RIA-3 and 5 removed from RB</li> <li>SASS is in Manual for calibration</li> <li>Power is being held at 3% for Reactor Engineering to update the maneuvering plan.</li> </ul>			
<b>Secondary</b>			
<ul style="list-style-type: none"> <li>AMSAC/DSS bypassed for calibration</li> <li>PSW Primary Pump is OOS. WCC preparing Protected Equipment package.</li> <li>Unit 2 is supplying the AS header</li> <li>1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event.</li> </ul>			
<b>Reactivity Management (CR SRO)</b>			
RCS Boron 1723 ppmB	Gp 7 Rod Position: 8 % Withdrawn	Batch additions as required for volume control.	
<b>Human Performance Emphasis (OSM)</b>			
Procedure Use and Adherence			



**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-104**  
**WITHDRAWAL OF SAFETY ROD GROUP 1 TO 50%**

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II  
JOB PERFORMANCE MEASURE

**Task Title:** Withdrawal of Safety Rod Group 1 To 50%

**Task Number:**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 minutes

**K/A Rating(s):**

System: 001  
K/A: A4.06  
Rating: 2.9/3.2

**Task Standard:**

Latch Group 1 Control Rods and withdraw Safety Rod Group 1 To 50% in accordance with  
OP/1/A/1105/019 (Control Rod Drive System) Encl. 4.3 (Withdrawal Of Safety Rod Group 1 To 50%)

**References:**

OP/1/A/1105/019 (Control Rod Drive System) Encl. 4.3 (Withdrawal Of Safety Rod Group 1 To 50%)  
OP/1/A/1102/001 (Controlling Procedure For Unit Startup) Enclosure 4.7 (Unit Startup From 532°F/2155  
psig to MODE 1)

**Tools/Equipment/Procedures Needed:**

OP/1/A/1105/019 (Control Rod Drive System) Encl 4.3 (Withdrawal Of Safety Rod Group 1 To 50%)  
Rev 29

**(Note: Below this line is used only for Initial NRC Exams)**

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**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

=====

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP** 211
2. **ENSURE** a clean in progress procedure available for candidate
3. Go To **RUN** when directed by the Lead Examiner

=====

### ***Directions without a SNAP:***

1. *Recall IC-8*
2. *Come out of FDW Clean-up per OP/1106/002A*
- 3.
- 4.
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 1 startup in progress following a 28 day refueling outage

$T_c = 331^{\circ}\text{F}$

RCS pressure  $\approx 528$  psig

OP/1/A/1102/001 (Controlling Procedure For Unit Startup) Enclosure 4.6 (Unit Startup From  $335^{\circ}\text{F}/540$  psig (MODE 3) to  $532^{\circ}\text{F}/2155$  psig (MODE 3) is in progress at step 2.12.4

OP/1/A/1105/019 (Control Rod Drive System) Enclosure 4.3 (Withdrawal Of Safety Rod Group 1 To 50%) is in progress and has been completed up to step 2.1.

### **INITIATING CUE**

The Control Room SRO directs you to continue with OP/1/A/1105/019 (Control Rod Drive System) Enclosure 4.3 (Withdrawal Of Safety Rod Group 1 To 50%) beginning at Step 2.1.

Manual Latch of Group 1 control rods is required.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	<p>Perform <b>one</b> of the following:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>NOTE:</b> The Reactor is manually tripped prior to the Shutdown Bypass automatic RPS trip on unit startup. For this reason, only Group 1 is required to be latched during a Unit Startup when RCS pressure &lt; 2100 psig.</p> </div> <p>___ 2.1.1 <b>IF</b> RCS pressure &lt; 2100 psig, perform Section 3 (Latch And PI Alignment Of Group 1 Only).</p> <p>___ 2.1.2 <b>IF</b> RCS pressure ≥ 2100 psig, perform Section 4 (Latch And PI Alignment Of Group 1 Thru Group 7).</p> <p><b>STANDARD:</b> Candidate determines that RCS pressure is ≈ 528 psig from the Initial Conditions on the cue sheet or verifies RCS pressure is &lt; 2100 psig from the RCS pressure gauge on UB1 and continues to Section 3.</p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	3.1	<p>Perform the following:</p> <p>___ Ensure RUN is ON</p> <p>___ Ensure SINGLE SELECT SWITCH to ALL</p> <p><b>STANDARD:</b> Determine control rod speed switch is selected to RUN by observing light indication on the Diamond panel located on UB1.</p> <p>Determine SINGLE SELECT SWITCH is selected to ALL on the Diamond panel located on UB1.</p> <p><b>Examiner Note: If asked about Concurrent Verification, state that the verifier agrees with whatever actions you decide to take.</b></p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

3	3.2	<p><b><u>WHILE</u></b> CRDs are moving, monitor the following indications:</p> <ul style="list-style-type: none"> <li>• CRD position</li> <li>• Appropriate ranged Nis</li> <li>• Startup Rate</li> </ul> <p><b><u>STANDARD:</u></b> As CRDs are withdrawn, monitor the above indications</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
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4	3.3	<p>Perform Latch and PI alignment of Group 1, as follows: (R.M.)</p> <p>3.3.1 *Ensure GROUP SELECT SWITCH to 1</p> <p>3.3.2 Verify <u>only</u> Group 1 CONTROL ON lights are ON. (PI panel)</p> <p>3.3.3 <b>IF</b> Manual Latch and PI Alignment desired, perform the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> A. *Ensure LATCH MANUAL is ON</li> <li><input type="checkbox"/> B. Ensure IN LIMIT BYPASS is ON</li> <li><input type="checkbox"/> C. *Insert Group 1 for ≈ 5 seconds</li> <li><input type="checkbox"/> D. Verify all 0% lights ON for Group 1 (PI Panel)</li> <li><input type="checkbox"/> E. Ensure LATCH MANUAL is OFF</li> <li><input type="checkbox"/> F. Ensure IN LIMIT BYPASS is OFF</li> <li><input type="checkbox"/> G. Select RPI RESET</li> <li><input type="checkbox"/> H. Verify Group 1 API/RPI indications agree (PI Panel)</li> </ul> <p>3.3.4 <b>IF</b> Auto Latch and PI Alignment desired, perform the following: N/A</p> <p><b><u>STANDARD:</u></b> *Candidate Rotates GROUP SELECT SWITCH to 1. Determines that only Group 1 CONTROL ON lights are ON on the PI panel. Determines from the cue sheet that manual latch and PI adjustment is desired. *Ensures the LATCH MANUAL light is ON by depressing the LATCH MANUAL pushbutton on the Diamond panel. Ensures IN LIMIT BYPASS light is ON by depressing the IN LIMIT BYPASS pushbutton on the Diamond panel. *Inserts Group 1 for ≈ 5 seconds. Verifies all 0% lights ON for Group 1 on the PI Panel. *Ensures the LATCH MANUAL light is OFF. Ensures the IN LIMIT BYPASS light is OFF. Selects RPI RESET pushbutton on the Diamond panel. Verifies Group 1 API/RPI indications agree on the PI Panel. Determines that Auto Latch is not desired.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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5	3.4	<p>Select FAULT RESET</p> <p><b><u>STANDARD:</u></b> Depresses the FAULT RESET pushbutton located on the diamond panel</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
6	3.5	<p>Select Group 1, as follows:</p> <p>3.5.1 Ensure GROUP SELECT SWITCH to 1</p> <p>3.5.2 Ensure <u>only</u> Group 1 CONTROL ON lights are ON (PI panel)</p> <p>3.5.3 *Ensure Group 1 at 50%</p> <p>3.5.4 Place GROUP SELECT SWITCH to OFF</p> <p><b><u>STANDARD:</u></b> Ensures GROUP SELECT SWITCH is selected to 1. Determines that only Group 1 CONTROL ON lights are ON on the PI panel. *Withdraw Group 1 control rods to <math>\approx</math> 50% (45 to 55%) Places GROUP SELECT SWITCH to the OFF position</p> <p><b><i>Examiner Note: If asked about Concurrent Verification, state that the verifier agrees with whatever actions you decide to take.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b><i>END TASK</i></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_



**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 4 | This step is required to manually latch Group 1 control rods. If performed incorrectly, the results would be the inability to withdraw Group 1 control rods to 50%. |
| 6 | This step is required to withdraw Group 1 control rods to 50%.  |

## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

Unit 1 startup in progress following a 28 day refueling outage

$T_c = 331^{\circ}\text{F}$

RCS pressure  $\approx 528$  psig

OP/1/A/1102/001 (Controlling Procedure For Unit Startup) Enclosure 4.6 (Unit Startup From  $335^{\circ}\text{F}/540$  psig (MODE 3) to  $532^{\circ}\text{F}/2155$  psig (MODE 3) is in progress at step 2.12.4

OP/1/A/1105/019 (Control Rod Drive System) Enclosure 4.3 (Withdrawal Of Safety Rod Group 1 To 50%) is in progress and has been completed up to step 2.1.

### **INITIATING CUE**

The Control Room SRO directs you to continue with OP/1/A/1105/019 (Control Rod Drive System) Enclosure 4.3 (Withdrawal Of Safety Rod Group 1 To 50%) beginning at Step 2.1.

Manual Latch of Group 1 control rods is required.

## REGION II JOB PERFORMANCE MEASURE

### RO-205a RESPOND TO RCS LEAK WHILE ON DHR

Administrative: No

Alternate Path: Yes

Alt Path Description: 1A Bleed Transfer Pump Fails to Start

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Respond to RCS Leak While on DHR

**Task Number:**

**Alternate Path:** Yes

**Time Critical:** No

**Validation Time:** 10 minutes

**K/A Rating(s):**

System: APE025

K/A: AA1.02

Rating: 3.8/3.9

**Task Standard:**

Initiate makeup to begin PZR level rise without exceeding HPI pump runout limits.

**References:**

AP/1/A/1700/026 (Loss of Decay Heat Removal)

AP/1/A/1700/002 (Excessive RCS Leakage)

**Tools/Equipment/Procedures Needed:**

AP/1/A/1700/026 (Loss of Decay Heat Removal) Enclosure 5.12 (RCS Makeup) Rev 26

**(Note: Below this line is used only for Initial NRC Exams)**

=====

**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

/ DATE

=====

### Comments


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP 212**
2. **IMPORT** files for RO-205a
3. **ENSURE** clean in-progress AP/26 Encl 5.12 available for candidate
4. **PLACE** simulator in **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

1. *Recall SNAP 128 (MLO)*
- 2.
- 3.
- 4.
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 1 is in normal DHR alignment

PZR level is being maintained at 150"  $\pm$  10"

RCS is vented and the loops are "dropped"

BWST level is 37 feet

HPI is available per DID sheet

AP/02 (Excessive RCS Leakage) was entered and it directed entry into AP/26 (Loss of Decay Heat Removal)

AP/02 Encl 5.6 (RCS Makeup) was **NOT** initiated

### **INITIATING CUE**

The Control Room Supervisor directs you to restore and maintain Pressurizer level to 140 – 160 inches using AP/1/A/1700/026 (loss of Decay Heat Removal) Enclosure 5.12 (RCS Makeup)

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION																													
1	1	<p><b>IAAT</b> makeup is NO longer desired, <b>THEN GO TO</b> Step 67.</p> <p><b><u>STANDARD:</u></b> Candidate determines that makeup is desired as directed by Control Room SRO in the Initiating Cue.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>																												
2	2	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"> <li>• Makeup methods listed below are in the order of preference.</li> <li>• Each method is effective only as long as the limitations listed are met.</li> <li>• If one source of makeup is NOT adequate, try another method.</li> <li>• It is acceptable to utilize methods in any sequence or in parallel, as needed, however, they are listed in the order of preference.</li> </ul> </div> <p>Utilize the appropriate Step as noted in table below to establish and maintain level within the desired band:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Method</th><th>Maximum Pressure</th><th>Other limitations</th><th>GO TO Step</th></tr> </thead> <tbody> <tr> <td><b>1A Bleed Transfer Pump</b></td><td><b>No Requirement</b></td><td></td><td><b>3</b></td></tr> <tr> <td>HPI Gravity makeup to RCS</td><td>RCS vented</td><td>HPI Available per DID sheet BWST level &gt; 43'</td><td>9</td></tr> <tr> <td>HPI Injection</td><td>No Requirement</td><td>BWST level &gt; 6' HPI Available per DID sheet</td><td>15</td></tr> <tr> <td>BWST makeup to LPI Pump (1LP-21/1LP-22)</td><td>RCS vented</td><td>BWST level &gt; 6' LPI Pump operating in <u>Normal</u> Mode</td><td>26</td></tr> <tr> <td>BWST Recirc Pump</td><td>Decay Heat Line Pressure &lt; 100 psig</td><td>Unit 1 BWST, Unit 2 BWST, or Unit 1&amp;2 SFP in purification FTC fill/drain <b>NOT</b> in progress</td><td>34</td></tr> <tr> <td>SF Cooling Pump from Unit 1&amp;2 SFP</td><td>Decay Heat Line Pressure &lt; 150 psig</td><td>Unit 1&amp;2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress</td><td>51</td></tr> </tbody> </table> <p><b><u>STANDARD:</u></b> Given the note above step 2, the candidate chooses the highest order of preference available (1A Bleed Transfer Pump) and proceeds to step 3.</p> <p><b><u>COMMENTS:</u></b></p>	Method	Maximum Pressure	Other limitations	GO TO Step	<b>1A Bleed Transfer Pump</b>	<b>No Requirement</b>		<b>3</b>	HPI Gravity makeup to RCS	RCS vented	HPI Available per DID sheet BWST level > 43'	9	HPI Injection	No Requirement	BWST level > 6' HPI Available per DID sheet	15	BWST makeup to LPI Pump (1LP-21/1LP-22)	RCS vented	BWST level > 6' LPI Pump operating in <u>Normal</u> Mode	26	BWST Recirc Pump	Decay Heat Line Pressure < 100 psig	Unit 1 BWST, Unit 2 BWST, or Unit 1&2 SFP in purification FTC fill/drain <b>NOT</b> in progress	34	SF Cooling Pump from Unit 1&2 SFP	Decay Heat Line Pressure < 150 psig	Unit 1&2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress	51	<p>___ SAT</p> <p>___ UNSAT</p>
Method	Maximum Pressure	Other limitations	GO TO Step																												
<b>1A Bleed Transfer Pump</b>	<b>No Requirement</b>		<b>3</b>																												
HPI Gravity makeup to RCS	RCS vented	HPI Available per DID sheet BWST level > 43'	9																												
HPI Injection	No Requirement	BWST level > 6' HPI Available per DID sheet	15																												
BWST makeup to LPI Pump (1LP-21/1LP-22)	RCS vented	BWST level > 6' LPI Pump operating in <u>Normal</u> Mode	26																												
BWST Recirc Pump	Decay Heat Line Pressure < 100 psig	Unit 1 BWST, Unit 2 BWST, or Unit 1&2 SFP in purification FTC fill/drain <b>NOT</b> in progress	34																												
SF Cooling Pump from Unit 1&2 SFP	Decay Heat Line Pressure < 150 psig	Unit 1&2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress	51																												

3	3	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Unit Status</b>  RCS Makeup using 1A Bleed Transfer Pump is desired. </div> <p>Ensure the following:  ___ 1HP-15 in manual  ___ 1HP-15 open</p> <p><b><u>STANDARD:</u></b> Candidate ensures 1HP-15 in manual with demand at full open and valve indicates fully open.</p> <p><b><u>COMMENTS:</u></b></p>	___ SAT  ___ UNSAT
4	4	<p>Open 1HP-16</p> <p><b><u>STANDARD:</u></b> Candidate fully opens 1HP-16 by rotating the control switch to the open position and observing RED light ON and GREEN light OFF</p> <p><b><u>COMMENTS:</u></b></p>	___ SAT  ___ UNSAT
5	5	<p>Start 1A BLEED TRANSFER PUMP</p> <p><b><u>STANDARD:</u></b> Candidate attempts to start the 1A Bleed Transfer Pump, but it will not start.  Candidate then refers to Step 5 <b>RNO</b>.</p> <p><b><u>COMMENTS:</u></b></p>	___ SAT  ___ UNSAT



6	5 RNO	<p style="text-align: center;"><b>[ALTERNATE PATH]</b></p> <p><b>GO TO</b> Step 2</p> <p><b><u>STANDARD:</u></b> Candidate returns to Step 2.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>																												
7	2	<p>Utilize the appropriate Step as noted in table below to establish <u>and maintain</u> level within the desired band:</p> <table border="1"> <thead> <tr> <th>Method</th> <th>Maximum Pressure</th> <th>Other limitations</th> <th>GO TO Step</th> </tr> </thead> <tbody> <tr> <td>1A Bleed Transfer Pump</td> <td>No Requirement</td> <td></td> <td>3</td> </tr> <tr> <td>HPI Gravity makeup to RCS</td> <td>RCS vented</td> <td>HPI Available per DID sheet BWST level &gt; 43'</td> <td>9</td> </tr> <tr> <td><b>HPI Injection</b></td> <td><b>No Requirement</b></td> <td><b>BWST level &gt; 6'</b> <b>HPI Available per DID sheet</b></td> <td><b>15</b></td> </tr> <tr> <td>BWST makeup to LPI Pump (1LP-21/1LP-22)</td> <td>RCS vented</td> <td>BWST level &gt; 6' LPI Pump operating in <u>Normal</u> Mode</td> <td>26</td> </tr> <tr> <td>BWST Recirc Pump</td> <td>Decay Heat Line Pressure &lt; 100 psig</td> <td>Unit 1 BWST, Unit 2 BWST, <u>or</u> Unit 1&amp;2 SFP in purification FTC fill/drain <b>NOT</b> in progress</td> <td>34</td> </tr> <tr> <td>SF Cooling Pump from Unit 1&amp;2 SFP</td> <td>Decay Heat Line Pressure &lt; 150 psig</td> <td>Unit 1&amp;2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress</td> <td>51</td> </tr> </tbody> </table> <p><b><u>STANDARD:</u></b> Candidate determines that the next order of priority available is "HPI Gravity Makeup to RCS", however the table requires BWST level to be &gt; 43 feet. Candidate determines that the BWST does not meet this requirement and proceeds to next option in table which is HPI Injection (BWST level &gt; 6 feet and HPI available per DID sheet). Candidate proceeds to Step 15</p> <p><b><u>COMMENTS:</u></b></p>	Method	Maximum Pressure	Other limitations	GO TO Step	1A Bleed Transfer Pump	No Requirement		3	HPI Gravity makeup to RCS	RCS vented	HPI Available per DID sheet BWST level > 43'	9	<b>HPI Injection</b>	<b>No Requirement</b>	<b>BWST level &gt; 6'</b> <b>HPI Available per DID sheet</b>	<b>15</b>	BWST makeup to LPI Pump (1LP-21/1LP-22)	RCS vented	BWST level > 6' LPI Pump operating in <u>Normal</u> Mode	26	BWST Recirc Pump	Decay Heat Line Pressure < 100 psig	Unit 1 BWST, Unit 2 BWST, <u>or</u> Unit 1&2 SFP in purification FTC fill/drain <b>NOT</b> in progress	34	SF Cooling Pump from Unit 1&2 SFP	Decay Heat Line Pressure < 150 psig	Unit 1&2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress	51	<p>___ SAT</p> <p>___ UNSAT</p>
Method	Maximum Pressure	Other limitations	GO TO Step																												
1A Bleed Transfer Pump	No Requirement		3																												
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BWST makeup to LPI Pump (1LP-21/1LP-22)	RCS vented	BWST level > 6' LPI Pump operating in <u>Normal</u> Mode	26																												
BWST Recirc Pump	Decay Heat Line Pressure < 100 psig	Unit 1 BWST, Unit 2 BWST, <u>or</u> Unit 1&2 SFP in purification FTC fill/drain <b>NOT</b> in progress	34																												
SF Cooling Pump from Unit 1&2 SFP	Decay Heat Line Pressure < 150 psig	Unit 1&2 SFP in purification with SF Cooling Pump FTC fill/drain <b>NOT</b> in progress	51																												

8	15	<p>Verify power on <u>any</u> HPI Pump</p> <p><b><u>STANDARD:</u></b> Candidate determines that all 3 HPI pumps have power available</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
9	16	<p>Open the following:</p> <p>___ 1HP-24</p> <p>___ 1HP-25</p> <p><b><u>STANDARD:</u></b> Candidate opens 1HP-24 &amp; 1HP-25 by rotating switches on 1UB1 to the open position and observing RED light illuminated and GREEN light OFF for each valve. To satisfy the critical step, at least one of these valves must be open in order to supply suction to the HPI pumps.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
10	17	<p>Close the following:</p> <p>___ 1HP-409</p> <p>___ 1HP-410</p> <p><b><u>STANDARD:</u></b> Candidate verifies 1HP-409 and 1HP-410 are closed by observing RED lights OFF and GREEN lights illuminated for both valves (These valves are already closed).</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

11	18	<p>Perform the following:</p> <p>___ Place 1HP-31 in HAND</p> <p>___ Reduce 1HP-31 demand to 0</p> <p><b><u>STANDARD:</u></b> Candidate verifies that 1HP-31 is in HAND and demand is zero.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
12	19	<p>Perform the following:</p> <p>___ Place 1HP-120 in HAND</p> <p>___ Reduce 1HP-120 demand to 0</p> <p><b><u>STANDARD:</u></b> Candidate verifies that 1HP-120 is in HAND and demand is zero.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
13	20	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b><u>NOTE</u></b>            An HPI Pump operating with 1HP-363 open will provide <math>\approx 35</math> gpm of makeup through the HPI Pump minimum recirc lines.         </div> <p>Start 1A <u>or</u> 1B HPI Pump</p> <p><b><u>STANDARD:</u></b> Candidate starts either the 1A or 1B HPI Pump and observes RED running light on and pump amps for the HPI pump started.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

14	21	<p>Verify RCS loops dropped</p> <p><b><u>STANDARD:</u></b> Candidate verifies the RCS loops are dropped based on the initial conditions given on the cue sheet.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
15	22	<p>Throttle the following, as necessary without exceeding 475 gpm, to maintain RV level &gt; 10" <u>and</u> within previous established level band, if possible:</p> <p>___ 1HP-409</p> <p>___ 1HP-410</p> <p><b><u>STANDARD:</u></b> Candidate throttles 1HP-409 and/or 1HP-410 and stops the Pressurizer level decrease and begins to return Pzr level to 140" to 160" without exceeding 475 gpm in either HPI header. To satisfy the critical step, the candidate must inject enough HPI to cause Pzr level to start rising without exceeding 475 gpm in either HPI header.</p> <p><b><i>Examiner Cue: When PZR level is being controlled and has begun returning to 150", inform the candidate that another operator will continue with this procedure.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><i>END TASK</i></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |    |   |
|----|---|
| 9  | Step is necessary to align HPI Injection to the RCS                         |
| 13 | Step is necessary to provide driving head for HPI Injection flow to the RCS |
| 15 | Step necessary to ensure HPI Injection flow is recovering RCS inventory     |

## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

Unit 1 is in normal DHR alignment

PZR level is being maintained at 150"  $\pm$  10"

RCS is vented and the loops are "dropped"

BWST level is 37 feet

HPI is available per DID sheet

AP/02 (Excessive RCS Leakage) was entered and it directed entry into AP/26 (Loss of Decay Heat Removal)

AP/02 Encl 5.6 (RCS Makeup) was **NOT** initiated

### **INITIATING CUE**

The Control Room Supervisor directs you to restore and maintain Pressurizer level to 140 – 160 inches using AP/1/A/1700/026 (loss of Decay Heat Removal) Enclosure 5.12 (RCS Makeup)

**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-302a**  
**PERFORM REQUIRED ACTIONS FOR FAILED**  
**LPI TRAIN**

Administrative: No

Alternate Path: Yes

Alt Path Description: 1A LPIP trips after it is started, requiring 1LP-17 to be closed

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II  
JOB PERFORMANCE MEASURE

**Task Title:** Perform Required Actions For Failed LPI Train

**Task Number:**

**Alternate Path:** Yes

**Time Critical:** No

**Validation Time:** 5 minutes

**K/A Rating(s):**

System: EPE011  
K/A: EA1.04  
Rating: 4.4/4.4

**Task Standard:**

1B LPI pump is started when RCS pressure decreases below LPI pump discharge pressure and 1LP-17 is closed after 1A LPI pump fails

**References:**

EOP Enclosure 5.1, ES Actuation Rev 01

**Tools/Equipment/Procedures Needed:**

EOP Enclosure 5.1, ES Actuation

**(Note: Below this line is used only for Initial NRC Exams)**

=====

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

=====

**Comments**




## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP 213**
2. **IMPORT** files for RO-302a
3. **ENSURE** clean in progress Enclosure 5.1 available
4. **RESET** flags on the LPI pump switches
5. **WHEN** directed by Lead Examiner, go to **RUN**

=====

### ***Directions without a SNAP:***

1. *Recall IC-41*
2. *Insert MPS400D at 27%, Insert False for variable ZLPI1AP (Gbl 00)*
3. *Manually actuate ES channels 7&8 if needed*
4. *Complete EOP Encl 5.1 up to Step 52*
5. *Set Event P2A26G1>.1 [Trips 1A LPIP After Start]*
6. *After Encl 5.1 is complete up to Step 52, save SNAP*
7. *To start JPM, insert MPS400D at 100% and go to run*

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

A LOCA has been in progress that initially stabilized RCS pressure at  $\approx 1100$  psig

ES Channels 1-8 have actuated on high RB pressure

The LOCA CD Tab is in progress

Steam Generator levels are being raised to the Loss of Subcooling Margin setpoint by the OATC

The LPI pumps were secured as directed by Enclosure 5.1 (ES Actuation) to prevent pump damage

Enclosure 5.1(ES Actuation) has been completed up to Step 52 with outstanding IAATs

RCS pressure is lowering rapidly

### **INITIATING CUE**

The Control Room Supervisor directs you, the Balance of Plant Operator, to continue in EOP Enclosure 5.1 (ES Actuation)

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	52	<p>REFER TO EOP Enclosure 5.1 IAAT Steps prior to Step 52 (since this was the exit point earlier)</p> <p><b><u>STANDARD:</u></b> Candidate checks IAAT steps to determine if any apply. Candidate determines that IAAT Step 20 applies once RCS pressure is &lt; <math>\approx</math> 200 psig. Candidate continues to Step 20.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	20	<p><b>IAAT</b> RCS Pressure is &lt; LPI pump shutoff head, <b>THEN</b> perform Steps 21 - 22</p> <p><b><u>STANDARD:</u></b> Candidate determines that RCS pressure is &lt; LPI pump shutoff head by observing RCS pressure on UB1. Candidate continues to Step 21</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

3	21	<p>Perform the following:          ___ Open 1LP-17          ___ Start 1A LPI PUMP</p> <p><b><u>STANDARD:</u></b> Candidate determines that 1LP-17 is open by observing the Red open light lit on 1UB2.</p> <p>Candidate places 1A LPI pump switch to START and observes Red lights on and white light off.</p> <p>Continue to Step 22</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
4	22	<p>Perform the following:          ___ Open 1LP-18          ___ *Start 1B LPI PUMP</p> <p><b><u>STANDARD:</u></b> Candidate determines that 1LP-18 is open by observing the Red open light lit on 1UB2.</p> <p>*Candidate places 1B LPI pump switch to START and observes Red lights on and white light off.</p> <p>Candidate goes back to Step 52</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5	52	<p><b><u>ALTERNATE PATH</u></b></p> <p>REFER TO EOP Enclosure 5.1 IAAT Steps prior to Step 52</p> <p><b><u>STANDARD:</u></b> Candidate checks IAAT steps to determine if any apply.</p> <p>Candidate determines that IAAT Step 26 now applies since the 1A LPI pump has tripped.</p> <p>Candidate continues to Step 26</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

6	26	<p><b>IAAT</b> 1A LPI pump fails while operating, <b>AND</b> 1B LPI pump is operating,  <b>THEN</b> close 1LP-17</p> <p><b><u>STANDARD:</u></b> Candidate determines that the 1A LPI Pump is off and the 1B LPI pump is operating.  *Candidate closes 1LP-17 and observes the green closed light on and red open light off.</p> <p><b><i>Examiner Cue: Another Operator will continue with this procedure.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
---	----	--	--

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 4 | This step is required to align the LPI flowpath and start the 1B LPI pump to inject water into the core.                    |
| 6 | This step is required to prevent backflow and damaging the 1A LPI pump and ensure maximum cooling is available to the core. |

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

A LOCA has been in progress that initially stabilized RCS pressure at  $\approx 1100$  psig

ES Channels 1-8 have actuated on high RB pressure

The LOCA CD Tab is in progress

Steam Generator levels are being raised to the Loss of Subcooling Margin setpoint by the OATC

The LPI pumps were secured as directed by Enclosure 5.1 (ES Actuation) to prevent pump damage

Enclosure 5.1(ES Actuation) has been completed up to Step 52 with outstanding IAATs

RCS pressure is lowering rapidly

**INITIATING CUE**

The Control Room Supervisor directs you, the Balance of Plant Operator, to continue in EOP Enclosure 5.1 (ES Actuation)

**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-503**

**Respond to Inadvertent Actuation of ES Channel 7**

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:



**REGION II**  
**JOB PERFORMANCE MEASURE**

**Task Title :** Respond to Inadvertent Actuation of ES Channel 7

**Task Number :**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 5 min

**K/A Rating(s):**

System: 026  
K/A: A4.01  
Rating: 4.5/4.3

**Task Standard:**

Secure Reactor Building Spray following inadvertent actuation of ES Channel 7.

**References:**

AP/1/A/1700/042 (Inadvertent ES Actuation) Rev. 04

**Tools/Equipment/Procedures Needed:**

AP/1/A/1700/042 (Inadvertent ES Actuation) Rev. 04

**(Note: Below this line is used only for Initial NRC Exams)**

=====

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

=====

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP 215**
2. **ENSURE** clean copies (RO and SRO) of AP/42 in place
3. Go To **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

1. ***Initialize simulator to desired IC. (Example Recall IC-41 100% EOL)***
2. ***Take any required action: (Example: Perform EOP Encl.5.1, stop RCPs, open pump breakers, throttle EFDW flow etc.)***
3. ***Activate Malfunctions, Build Timers and Overrides as required:***  
***(Example: Activate MPS400 @ 100% on AOR)***
4. ***Acknowledge alarms and Freeze the Simulator at desired point***
5. ***Save to a SNAP Number and password protect, as desired.***

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 1 is operating at 100% steady state

ES Channel 7 has inadvertently actuated

CRS has entered AP/1/A/1700/042 (Inadvertent ES Actuation)

### **INITIATING CUE**

The CRS directs you to perform AP/1/A/1700/042 (Inadvertent ES Actuation) for ES Channel 7.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	4.1	<p>Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ Diverse HPI</p> <p>___ ES Channel 1</p> <p>___ ES Channel 2</p> <p><b><u>STANDARD:</u></b> Candidate determines neither Diverse HPI, ES Channel 1, nor ES Channel 2 have inadvertently actuated. Proceeds to step 4.1 <b>RNO</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	4.1 RNO	<p><b>GO TO</b> Step 4.4</p> <p><b><u>STANDARD:</u></b> Candidate proceeds to step 4.4.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
3	4.4	<p>Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ ES Channel 5</p> <p>___ ES Channel 6</p> <p><b><u>STANDARD:</u></b> Candidate determines neither ES Channel 5 nor 6 have inadvertently actuated. Proceeds to step 4.4 <b>RNO</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

4	4.4 RNO	<p>1, ___ <b>IF</b> ES Channel 1, ES Channel 2, or Diverse HPI have inadvertently actuated, <b>AND</b> it is desired to restore letdown, <b>THEN</b> initiate AP/42 Encl 5.2 (Letdown Restoration).</p> <p>2. ___ <b>GO TO</b> Step 4.10.</p> <p><b><u>STANDARD:</u></b> Candidate determines neither ES Channel 1, ES Channel 2, nor Diverse HPI have inadvertently actuated. Proceeds to step 4.10.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
5	4.10	<p>Close the following:</p> <p>___ 1HP-24</p> <p>___ 1HP-25</p> <p><b><u>STANDARD:</u></b> Candidate verifies 1HP-24 green closed light ON and red open light OFF.</p> <p>Candidate verifies 1HP-25 green closed light ON and red open light OFF.</p> <p>Proceeds to step 4.11.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
6	4.11	<p style="text-align: center;"><b><u>NOTE</u></b></p> <div style="border: 1px solid black; padding: 5px;"> <p>If personnel are available, progression should continue while Encl 5.1 (Required Operator Actions) is in progress.</p> </div> <p>Ensure AP/42 Encl. 5.1 (Required Operator Actions) is in progress.</p> <p><b><u>STANDARD:</u></b> Candidate proceeds to AP/42 Encl. 5.1.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

7	Encl 5.1 1	<p>Initiate announcement of AP Entry using the PA system.</p> <p><b><u>STANDARD:</u></b> Candidate announces AP/42 entry using the PA system. Proceeds to step 2.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
8	2	<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>If channels are bypassed <u>or</u> in override, 1SA-1/A-10 (ES 1 Trip) and 1SA-1/B-10 (ES 2 Trip) will be off even though the channel may have actuated.</p> <p>Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ Diverse HPI ___ ES Channel 1 ___ ES Channel 2</p> <p><b><u>STANDARD:</u></b> Candidate determines neither Diverse HPI, ES Channel 1, nor ES Channel 2 have inadvertently actuated. Proceeds to step 2 <b>RNO</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
9	2 RNO	<p><b>GO TO</b> Step 5.</p> <p><b><u>STANDARD:</u></b> Candidate proceeds to step 5.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

10	5	<p>Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ ES Channel 7</p> <p>___ ES Channel 8</p> <p><b><u>STANDARD:</u></b> Candidate determines ES Channel 7 has inadvertently actuated. Proceeds to step 6.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
11	6	<p>Perform the following on <u>all inadvertently actuated</u> channel(s):</p> <p>___ *Ensure ES CH-7 is in MANUAL</p> <p>___ Ensure ES CH-8 is in MANUAL</p> <p><b><u>STANDARD:</u></b> *Candidate depresses the manual pushbutton for ES Channel 7 on 1UB2 and verifies the blue auto light OFF and the amber manual light ON. Proceeds to step 7.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
12	7	<p>Stop the following:</p> <p>___ *1A RBS Pump</p> <p>___ 1B RBS Pump</p> <p><b><u>STANDARD:</u></b> *Candidate rotates the control switch for 1A RBS Pump to the OFF position and verifies the green off light ON and the red on light OFF. Candidate verifies the 1B RBS Pump is off by observing the green off light ON and the red on light OFF. Proceeds to step 8.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

13	8	<p>Close the following:</p> <p>___ *1BS-1</p> <p>___ 1BS-2</p> <p><b><u>STANDARD:</u></b> *Candidate rotates the switch for 1BS-1 to the closed position (throttle valve) and verifies the green closed light ON and the red open light OFF.</p> <p>Candidate verifies 1BS-2 closed by observing the green closed light ON and the red open light OFF.</p> <p><b><i>Examiner Note: Inform the candidate that another operator will continue with the procedure.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b>END TASK</b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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TIME STOP: \_\_\_\_\_



**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
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11	This step is required to secure RBS.
----	--------------------------------------

12	This step is required to secure RBS.
----	--------------------------------------

13	This step is required to secure RBS.
----	--------------------------------------

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

Unit 1 is operating at 100% steady state

ES Channel 7 has inadvertently actuated

CRS has entered AP/1/A/1700/042 (Inadvertent ES Actuation)

**INITIATING CUE**

The CRS directs you to perform AP/1/A/1700/042 (Inadvertent ES Actuation) for ES Channel 7.

**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-605**  
**FUNCTIONAL VERIFICATION OF SK1 BREAKER**

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

**REGION II**  
**JOB PERFORMANCE MEASURE**

**Task Title:** Functional Verification of SK1 Breaker

**Task Number:**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 minutes

**K/A Rating(s):**

System: 062  
K/A: A4.01  
Rating: 3.3/3.1

**Task Standard:**

SK1 Breaker is closed and then opened after verifying  $\approx$  4.16KV on Standby Bus 1 and SK1 Auto/Man transfer switch is returned to auto.

**References:**

PT/0/A/0610/017 (Operablilty Test of 4160V Breakers)

**Tools/Equipment/Procedures Needed:**

PT/0/A/0610/017 (Operablilty Test of 4160V Breakers) Enclosure 13.12 (Functional Verification Of SK Breaker(s)) Rev 29

**(Note: Below this line is used only for Initial NRC Exams)**

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP** 216
2. **ENSURE** clean in-progress procedure in place for candidate
3. Go To **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

1. *Recall IC-41*
2. *Use QwikStrike to place both KHUs in Remote*
3. *Auto start both KHUs and load both units to  $\approx 70$  MWe*
4. *Use QwikStrike place both KHUs back in Local*
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Both Keowee Hydro Units are generating to the grid

The Underground Power Path was removed from service to perform maintenance on SK1 breaker

All maintenance work is complete

PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) is in progress to perform a functional verification of SK1 breaker.

### **INITIATING CUE**

The Control Room SRO directs you to continue with PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) beginning at Step 4.1 to perform functional verification of SK1 Breaker.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	4.1	<p><b><u>IF</u></b> functional verification of SK1 CT4 STBY BUS 1 FEEDER required, perform the following:</p> <p>4.1.1 Verify <math>\approx</math> 4.16 KV on CT4 Volts (2AB3)</p> <p>4.1.2 Ensure CT5 BUS 1 AUTO/MAN transfer switch in "MAN"</p> <p>4.1.3 *Ensure CT4 BUS 1 AUTO/MAN transfer switch in "MAN"</p> <p>4.1.4 *Ensure STBY BUS 1 SYNCHRONIZING switch in "ON"</p> <p>4.1.5 *Close SK1 CT4 STBY BUS 1 FEEDER</p> <p>4.1.6 Verify <math>\approx</math> 4.16 KV on Standby Bus 1 Volts (2AB3)</p> <p>4.1.7 *Open SK1 CT4 STBY BUS 1 FEEDER</p> <p>4.1.8 *Ensure STBY BUS 1 SYNCHRONIZING switch in "OFF"</p> <p>4.1.9 *Ensure CT4 BUS 1 AUTO/MAN transfer switch in "AUTO"</p> <p><b><u>STANDARD:</u></b> Verifies <math>\approx</math> 4.16 KV on CT4 Volts (2AB3)  Verifies the CT5 BUS 1 AUTO/MAN transfer switch in MAN  *Places the CT4 BUS 1 AUTO/MAN transfer switch in MAN  *Rotates the STBY BUS 1 SYNCHRONIZING switch to ON  *Closes SK1 CT4 STBY BUS 1 FEEDER  Verifies <math>\approx</math> 4.16 KV on Standby Bus 1 Volts (2AB3)  *Opens SK1 CT4 STBY BUS 1 FEEDER  Places the STBY BUS 1 SYNCHRONIZING switch in OFF  *Places CT4 BUS 1 AUTO/MAN transfer switch in AUTO</p> <p><b><i>Examiner Note: If asked about Concurrent Verification, state that the verifier agrees with whatever actions you decide to take.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b>END TASK</b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
1	This step is required to complete functional verification of SK1 breaker.



**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

Both Keowee Hydro Units are generating to the grid

The Underground Power Path was removed from service to perform maintenance on SK1 breaker

All maintenance work is complete

PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) is in progress to perform a functional verification of SK1 breaker.

**INITIATING CUE**

The Control Room SRO directs you to continue with PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) beginning at Step 4.1 to perform functional verification of SK1 Breaker.

**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-801**  
**OATC ACTIONS FOR CONTROL ROOM**  
**EVACUATION FOLLOWING A FIRE**

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:



## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP** 218
2. No Files
3. **ENSURE** clean procedure in place for candidate
4. Go To **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

1. *Recall IC-41*
2. *Perform AP/50 up to where Encl 5.5 is initiated*
- 3.
- 4.
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

A fire has occurred that requires evacuation of Unit 1 Control Room.

AP/1/A/1700/050 (Challenging Plant Fire) is in progress.

### **INITIATING CUE**

The CRS directs you to perform AP/1/A/1700/050 Encl. 5.5 (OATC Actions for Control Room Evacuation).

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	1	Position the following to OFF: ___ 1A MDEFDWP ___ 1B MDEFDWP  <b><u>STANDARD:</u></b> Places the switches for 1A and 1B MDEFDWP to OFF.  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT
2	2	Position 1TDEFDW Pump to PULL TO LOCK.  <b><u>STANDARD:</u></b> Places the switch for 1TDEFDW Pump to PULL TO LOCK.  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT
3	3	Trip <u>both</u> Main FDW Pumps.  <b><u>STANDARD:</u></b> Places both Main FDW Pump trip switches to trip. Observes stop valve position green closed lights illuminated and red open lights extinguished for each Main FDW Pump.  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT

4	4	<p>Place in MANUAL <u>and</u> close:</p> <p>___ 1FDW-315</p> <p>___ 1FDW-316</p> <p><b><u>STANDARD:</u></b> *Selects manual on 1FDW-315 controller.</p> <p>Observes the manual light illuminated and the auto light extinguished.</p> <p>Verifies 1FDW-315 closed by observing the green closed light illuminated and red open light extinguished.</p> <p>*Selects manual on 1FDW-316 controller.</p> <p>Observes the manual light illuminated and the auto light extinguished.</p> <p>Verifies 1FDW-316 closed by observing the green closed light illuminated and red open light extinguished.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5	5	<p>Close the following valves:</p> <p>___ 1HP-3</p> <p>___ 1HP-4</p> <p>___ 1HP-5</p> <p><b><u>STANDARD:</u></b> Places the switch for 1HP-3 to close and verifies the green closed light illuminated and the red open light extinguished.</p> <p>Places the switch for 1HP-4 to close and verifies the green closed light illuminated and the red open light extinguished.</p> <p>Places the switch for 1HP-5 to close and verifies the green closed light illuminated and the red open light extinguished.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

6	6	<p>Close the following valves:</p> <p>___ 1LP-21</p> <p>___ 1LP-22</p> <p><b><u>STANDARD:</u></b> Places the switch for 1LP-21 to close and verifies the green closed light illuminated and the red open light extinguished.</p> <p>Places the switch for 1LP-22 to close verifies the green closed light illuminated and the red open light extinguished.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
7	7	<p>Position the following to OFF:</p> <p>___ 1A RBS Pump</p> <p>___ 1B RBS Pump</p> <p><b><u>STANDARD:</u></b> Verifies 1A and 1B RBS Pumps OFF OR places the switches for 1A and 1B RBS Pumps to OFF.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
8	8	<p>Position the following to OFF:</p> <p>___ Standby HPI Pump</p> <p>___ Operating HPI Pump</p> <p><b><u>STANDARD:</u></b> Places the switch for the Standby HPI Pump to OFF.</p> <p>Places the switch for the Operating HPI Pump to OFF.</p> <p>Verifies the white off light illuminated and the red on lights extinguished.</p> <p><b><i>Examiner Cue: Another operator will continue with the procedure.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b><i>END TASK</i></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_



**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
1	This step is required to secure Emergency Feedwater prior to evacuation.
2	This step is required to secure Emergency Feedwater prior to evacuation.
3	This step is required to secure Main Feedwater prior to evacuation.
4	This step is required to secure Emergency Feedwater prior to evacuation.
5	This step is required to isolate letdown prior to evacuation.
6	This step is required to isolate LPI suction from the BWST prior to evacuation.
8	This step is required to secure HPI prior to evacuation.

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

A fire has occurred that requires evacuation of Unit 1 Control Room.

AP/1/A/1700/050 (Challenging Plant Fire) is in progress.

**INITIATING CUE**

The CRS directs you to perform AP/1/A/1700/050 Encl. 5.5 (OATC Actions for Control Room Evacuation).

**REGION II**  
**JOB PERFORMANCE MEASURE**

**RO-P403a**  
**INITIATE HPI FORCED COOLING**

Administrative: No

Alternate Path: Yes

Alt Path Description: 1HP-24 and 1HP-25 Fail Closed Requiring LPI Piggyback Alignment

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

**REGION II**  
**JOB PERFORMANCE MEASURE**

**Task Title:** Initiate HPI Forced Cooling

**Task Number:**

**Alternate Path:** Yes

**Time Critical:** No

**Validation Time:** 10 minutes

**K/A Rating(s):**

System: EPE074  
K/A: EA1.08  
Rating: 4.2/4.2

**Task Standard:**

Align HPI Forced Cooling with adequate flow for heat removal.

**References:**

EOP Rule 3 (Loss of Main or Emergency FDW)  
EOP Rule 4 (Initiate HPI Forced Cooling)  
TCA #26, Initiate HPI Forced Cooling when required

**Tools/Equipment/Procedures Needed:**

EOP Rule 3 (Loss of Main or Emergency FDW) rev. 01  
EOP Rule 4 (Initiate HPI Forced Cooling) rev. 01

**(Note: Below this line is used only for Initial NRC Exams)**

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**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

=====

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP** 214
2. **IMPORT** files for P403a
3. **RESET** flags for HPI and LPI pump switches
4. **ENSURE** clean in-progress Rule 3 available for candidate
5. **ENSURE** clean Rule 4 in place on control board
6. Go to **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

1. *Recall IC-41*
2. *Insert Malfunction to trip both FDW pumps (MSS010 & MSS020) and use QwikStrike to trip CBPs.*
3. *Perform Rule 3 and secure 1A2/1B1 RCPs per the LOHT tab*
4. *Fail 1RC-1 closed and go to freeze when RCS pressure reaches  $\approx 2275$  psig*
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 1 has tripped following a total loss of feedwater

Immediate Manual Actions are complete

The crew has been performing Rule 3 (Loss of Main or Emergency FDW) to regain heat transfer

Condensate Booster Pump feed could NOT be established and PSW Steam Generator feed is NOT available

Efforts to restore steam generator heat transfer per Rule 3 have NOT been successful

You are at Step 23 (WHEN step) in Rule 3

### **INITIATING CUE**

The CRS directs you to review outstanding IAAT Steps

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	Rule 3 IAAT Step 3	<p><b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency/PSW),  <b>AND</b> <u>any</u> of the following exist:            ___ RCS pressure reaches 2300 psig <b>OR</b> NDT limit            ___ Pzr level reaches 375" [340" acc]  <b>THEN PERFORM</b> Rule 4 (Initiation of HPI Forced Cooling).</p> <p><b><u>STANDARD:</u></b> Candidate announces the initiation of Rule 4 once RCS pressure reaches 2300 psig.</p> <p><b><i>Examiner Cue: If requested, provide concurrence (as CRS) for initiation of Rule 4.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	Rule 4 Step 1	<p>Verify <u>any</u> HPI pump powered from 1TC, 1TD, <u>or</u> 1TE can be operated.</p> <p><b><u>STANDARD:</u></b> The candidate recognizes one HPI pump is in operation and continues to Rule 4 Step 2.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

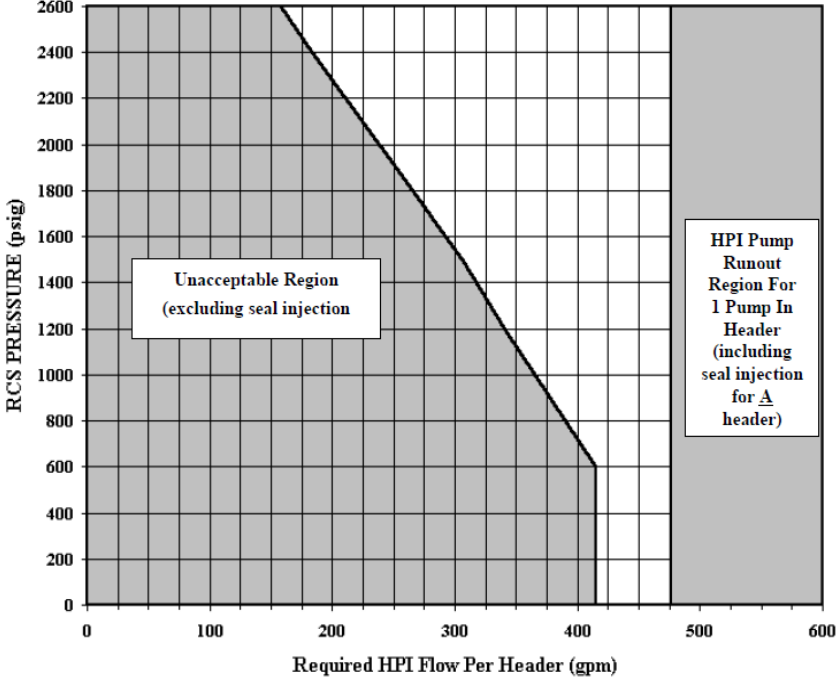
3	2	<p>Open: ___ 1HP-24 ___ 1HP-25</p> <p><b><u>STANDARD:</u></b> Candidate Rotates 1HP-24 switch on 1UB1 to the OPEN position and determines that 1HP-24 will NOT open by observing the green closed light on and red open light off.</p> <p>Candidate Rotates 1HP-25 switch on 1UB1 to the OPEN position and determines that 1HP-25 will NOT open by observing the green closed light on and red open light off.</p> <p>Continue to Step 2 RNO</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
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4	2 RNO	<p style="text-align: center;"><b>[ALTERNATE PATH]</b></p> <p>1. ___ <b>IF</b> <u>both</u> BWST suction valves (1HP-24 <u>and</u> 1HP-25) are closed, <b>THEN:</b></p> <p>A. ___ Start 1A LPI PUMP</p> <p>B. ___ Start 1B LPI PUMP</p> <p>C. Open:</p> <p style="padding-left: 40px;">___ 1LP-15</p> <p style="padding-left: 40px;">___ 1LP-16</p> <p style="padding-left: 40px;">___ 1LP-9</p> <p style="padding-left: 40px;">___ 1LP-10</p> <p style="padding-left: 40px;">___ 1LP-6</p> <p style="padding-left: 40px;">___ 1LP-7</p> <p>D. ___ <b>IF</b> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <b>THEN</b> secure one LPI pump</p> <p>E. ___ Dispatch an operator to open 1HP-363</p> <p>F. ___ <b>GO TO</b> Step 3</p> <p>2. ___ <b>IF</b> <u>only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, (N/A)</p> <p><b><u>STANDARD:</u></b> *Candidate starts the 1A and 1B LPI pumps on 1UB2 by rotating the control switches to the close position and observing red lights on and white lights off. <b>Only one LPI pump must be started to satisfy the critical step.</b></p> <p style="padding-left: 40px;">*Candidate opens the above valves by rotating the control switches located on 1UB2 to the open position and observing the red open lights on and green closed lights off.</p> <p style="padding-left: 40px;">Candidate stops either the 1A or 1B LPI pump by rotating the control switch on 1UB2 to the trip position and observing the red lights off and white light on.</p> <p style="padding-left: 40px;">Candidate notifies an operator to locally open 1HP-363.</p> <p style="padding-left: 40px;">Candidate continues to Step 3.</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;"><b>*CRITICAL STEP</b></p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
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5	3	<p>Start <u>all available</u> HPI pumps</p> <p><b><u>STANDARD:</u></b> Candidate starts the 1B and 1C HPI pumps by rotating the 1B HPI pump control switch to the START position and rotating the 1C HPI pump control switch to the CLOSE position located on 1UB1.</p> <p><b>*It is critical to start either the 1B or 1C HPI pump.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
6	4	<p>Open:</p> <p>___ *1HP-26</p> <p>___ 1HP-27</p> <p><b><u>STANDARD:</u></b> *The candidate Rotates and holds 1HP-26 switch on 1UB1 to the OPEN position and observes the green "CLOSED light go OFF and the red "OPEN" light come ON.</p> <p>The candidate locates 1HP-27 ('1B' HP Injection) on 1UB1 and verifies red 'OPEN' light is ON, and the green 'CLOSED' light is OFF</p> <p>Candidate continues to Step 5</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
7	5	<p>Open 1RC-4</p> <p><b><u>STANDARD:</u></b> The candidate locates 1RC-4 control switch on 1UB1 and verifies that the red "OPEN" indication is illuminated and the green "CLOSED" indication is extinguished.</p> <p><b><i>Examiner Note: This valve will already be open.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

8	6	<p>VERIFY flow exists in <u>any</u> HPI header.</p> <p><b><u>STANDARD:</u></b> The candidate locates HPI Flow Train A and B flow meters on 1UB1 and flow is verified.</p> <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>
9	7	<p>Perform the following:</p> <p>A. Place 1RC-66 SETPOINT SELECTOR to OPEN</p> <p>B. Depress 1RC-66 OPEN PERMIT pushbutton</p> <p><b><u>STANDARD:</u></b> The candidate:</p> <p>*Rotates 1RC-66 SETPOINT SELECTOR switch on 1UB1 to the OPEN position</p> <p>*Depresses 1RC-66 OPEN PERMIT pushbutton on 1UB1</p> <p>Verifies PORV is open by verifying that the red "OPEN" indication is illuminated and the PORV Flow Statalarm (1SA-18/A-1) is in alarm.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>__ SAT</p> <p>__ UNSAT</p>
10	8	<p>Verify <u>at least two</u> HPI pumps operating.</p> <p><b><u>STANDARD:</u></b> The candidate verifies that three HPI pumps are operating.</p> <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>

11	9	<p>Verify flow in <u>both</u> HPI headers is in the acceptable region of Figure 1 (Required HPI Flow Per Header).</p> <p><b><u>STANDARD:</u></b> The candidate verifies flow in both HPI headers is in the acceptable region of Figure 1 below.</p> <p style="text-align: center;"><b>Figure 1</b> Required HPI Flow Per Header</p>  <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>
12	10	<p>Verify flow exists in <u>any</u> HPI header</p> <p><b><u>STANDARD:</u></b> The candidate locates HPI Flow Train A and B flow meters on 1UB1. Loop A and Loop B flow is verified.</p> <p><b><i>Examiner Note: This flow has already been verified in Step 8.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>

13	11	<p>Perform the following:</p> <p>A. Place 1RC-66 SETPOINT SELECTOR to OPEN</p> <p>B. Depress 1RC-66 OPEN PERMIT pushbutton</p> <p><b><u>STANDARD:</u></b> The candidate:</p> <p>Verifies 1RC-66 SETPOINT SELECTOR switch on 1UB1 in the OPEN position.</p> <p>Depresses 1RC-66 OPEN PERMIT pushbutton on 1UB1.</p> <p>Verifies PORV is open by verifying that the red "OPEN" indication is illuminated and the PORV Flow Statalarm (1SA18/A1) is in alarm.</p> <p><b><i>Examiner Note: This has already been performed in Step 9.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>
14	12	<p>Verify &gt; one RCP operating.</p> <p><b><u>STANDARD:</u></b> Candidate determines that ALL RCPs are operating.</p> <p><b><u>COMMENTS:</u></b></p>	<p>__ SAT</p> <p>__ UNSAT</p>
15	13	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;"><b><u>NOTE:</u></b></p> <p><b>1A1 RCP provides the best Pzr spray and is preferred to be left running in case recovery from HPI forced cooling is performed and a Pzr bubble drawn.</b></p> </div> <p>Stop <u>all but one</u> RCP.</p> <p><b><u>STANDARD:</u></b> The candidate stops ALL but one RCP by rotating their control switches to "OFF" position.</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;"><b>CRITICAL STEP</b></p> <p>__ SAT</p> <p>__ UNSAT</p>

16	14	<p>IAAT the following limits are exceeded,</p> <table><tr><th>Pump Operation</th><th>Limit</th></tr><tr><td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for <u>A</u> hdr)</td></tr><tr><td>1A &amp; 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr></table> <p>THEN throttle HPI to maximize flow ≤ flow limit.</p> <p><b>STANDARD:</b> The candidate verifies header flows less than the limits in the table above.</p> <p><b>COMMENTS:</b></p>	Pump Operation	Limit	1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)	1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)	<p>__ SAT</p> <p>__ UNSAT</p>
Pump Operation	Limit								
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)								
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)								
17	15	<p>De-energize <u>all</u> PZR heaters.</p> <p><b>STANDARD:</b> The candidate:</p> <p>Rotates the PZR heater bank #1 switch on 1UB1 to the "OFF" position.</p> <p>Presses the OFF pushbutton controls for PZR heater banks 2, 3, and 4 on 1UB1</p> <p><b>COMMENTS:</b></p>	<p>__ SAT</p> <p>__ UNSAT</p>						

18	16	<p>Close 1HP-5</p> <p><b><u>STANDARD:</u></b> The candidate:</p> <p>Rotates the switch for 1HP-5 on 1UB1 to the closed position.</p> <p>Observes the red OPEN light go off and the green CLOSED light come on.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
19	17	<p>Close:</p> <p>___ TBVs</p> <p>___ 1FDW-35</p> <p>___ 1FDW-44</p> <p><b><u>STANDARD:</u></b> The candidate places the TBVs in HAND and reduces demand to zero using the toggle switch OR if the Turbine Master is in manual, verifies the TBVs are closed by observing the green closed light ON and the red open light OFF.</p> <p>The candidate places 1FDW-35 and 1FDW-44 to HAND and reduce demands to zero using the toggle switches.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

20	18	<p><b>IAAT <u>all</u> HPI is lost, THEN:</b>  A. <u>  </u> Stop <u>all</u> RCPs  B. <u>  </u> Position 1RC-66 SETPOINT SELECTOR to HIGH</p> <p><b><u>STANDARD:</u></b> The candidate verifies HPI is available and operating and that the step does not apply at this time.</p> <p><b><u>COMMENTS:</u></b></p>	<p><u>  </u> SAT</p> <p><u>  </u> UNSAT</p>
21	19	<p><b>WHEN directed by CRS, THEN EXIT.</b></p> <p><b><u>STANDARD:</u></b> The candidate announces that Rule 4 is complete with outstanding IAATs and returns the Cue sheet to the examiner indicating they have completed the JPM.</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: right;"><b><i>END TASK</i></b></p>	<p><u>  </u> SAT</p> <p><u>  </u> UNSAT</p>

TIME STOP: \_\_\_\_\_



**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
4	This step is required to align an LPI pump to supply suction to the HPI pumps.
5	This step is required to ensure 2 HPI pumps are operating
6	This step is required to align HPI flow to both HPI headers.
9	This step is required to open the PORV to initiate HPI Forced Cooling to cool the core.
15	This step is required to limit the heat input to the RCS.

## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

Unit 1 has tripped following a total loss of feedwater

Immediate Manual Actions are complete

The crew has been performing Rule 3 (Loss of Main or Emergency FDW) to regain heat transfer

Condensate Booster Pump feed could NOT be established and PSW Steam Generator feed is NOT available

Efforts to restore steam generator heat transfer per Rule 3 have NOT been successful

You are at Step 23 (WHEN step) in Rule 3

### **INITIATING CUE**

The CRS directs you to review outstanding IAAT Steps

## REGION II JOB PERFORMANCE MEASURE

### RO-S401a ALIGNMENT OF CONDENSATE RECIRC

Administrative: No

Alternate Path: Yes

Alt Path Description: 1C CBP fails to start requiring either 1A or 1B CBP to be started

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Establish Alignment of Condensate Recirc and set flow

**Task Number:**

**Alternate Path:** Yes

**Time Critical:** No

**Validation Time:** 10 minutes

**K/A Rating(s):**

System: APE054

K/A: G2.1.20

Rating: 4.6/4.6

**Task Standard:**

Perform the required actions in accordance with EOP Enclosure 5.9 (Extended EFDW Operation) to establish Condensate recirculation flow of 2300-6000 gpm.

**References:**

EP/1/A/1800/001 (Emergency Operating Procedure) Enclosure 5.9 (Extended EFDW Operation).

**Tools/Equipment/Procedures Needed:**

EP/1/A/1800/001 (Emergency Operating Procedure) Enclosure 5.9 (Extended EFDW Operation) Rev 01.

**(Note: Below this line is used only for Initial NRC Exams)**

=====

**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

/ DATE

=====

### Comments


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

### ***Directions with SNAP:***

1. **RECALL SNAP** 217
2. **IMPORT** files for RO-S401a
3. **ENSURE** PCB-21 switch green flag is showing
4. Go to **RUN** and acknowledge alarms
5. Go to **FREEZE**
6. **ENSURE** clean copy of in progress procedure in place for candidate
7. Go to **RUN** when directed by Lead Examiner

=====

### ***Directions without a SNAP:***

- 1.
- 2.
- 3.
- 4.
- 5.

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 1 was operating at 100% with PCB-21 open for maintenance.

Reactor trip occurred.

Slow transfer of unit auxiliaries resulted in a loss of the secondary.

AP/1/A/1700/011 (Recovery From Loss of Power) was initiated.

1A HWP has been re-started per AP/11.

All CBP Aux Oil pumps are operating.

EOP Encl. 5.9 (Extended EFDW Operation) is in progress and complete up to step 41.

### **INITIATING CUES**

The CRS directs you to continue in Enclosure 5.9 beginning at step 41 to establish Condensate Recirc.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	41	<p>Start a second HWP.</p> <p><b><u>STANDARD:</u></b> Rotate the 1B HWP switch (located on 1AB1) to the START position, verify the red ON light illuminates, and verify pump amps increase and return to normal.</p> <p>OR</p> <p>Rotate the 1C HWP switch (located on 1AB1) to the START position, verify the red ON light illuminates, and verify pump amps increase and return to normal.</p> <p>Continues to Step 42</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	42	<p>Start the 1C COND BOOSTER PUMP.</p> <p><b><u>STANDARD:</u></b> Rotate the 1C COND BOOSTER PUMP switch (located on 1AB1) to the START position. Observe that the red light is momentarily lit and then noting the amber OFF light is illuminated and the red ON lights are OFF.</p> <p>Continues to <b>RNO</b> to Step 9</p> <p><b><i>Examiner Note: The 1C Cond Booster Pump will trip immediately after starting.</i></b></p> <p><b><i>Examiner Note: The candidate may place the 1C CBP switch in the OFF position after the pump trips.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

3	42 RNO	<p style="text-align: center;"><b>[ALTERNATE PATH]</b></p> <p>1. Start <u>one</u> available CBP.</p> <p><b><u>STANDARD:</u></b> Rotate the 1A COND BOOSTER PUMP switch (located on 1AB1) to the START position. Observe the pump start by observing the Red ON lights illuminated and pump amps increase and then return to normal.</p> <p style="text-align: center;"><u>OR</u></p> <p>Rotate the 1B COND BOOSTER PUMP switch (located on 1AB1) to the START position. Observe the pump start by observing the Red ON lights illuminated and pump amps increase and then return to normal.</p> <p>Continues to Step 43</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;"><b>CRITICAL STEP</b></p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
4	43	<p>Stop <u>one</u> operating HWP.</p> <p><b><u>STANDARD:</u></b> Rotate the switch for a <u>running</u> HWP (Either 1A, 1B, or 1C) to the OFF position. Verify the Red ON lights OFF, and the amber OFF light illuminated.</p> <p><b><i>Examiner Note: 1SA-8/C-2 (FDW PUMP SEAL DIFFERENTIAL PRESSURE LOW) will actuate. This is an expected alarm.</i></b></p> <p>Continues to Step 44</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>



5	44	<p>Place the control switch for <u>one</u> secured HWP in AUTO</p> <p><b><u>STANDARD:</u></b> Place a non-running HWP switch in AUTO. Continues to Step 45</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
6	45	<p>Place the control switch for <u>one</u> secured CBP in AUTO.</p> <p><b><u>STANDARD:</u></b> Places a non-running CBP (1A or 1B) switch in AUTO. Continues to Step 46</p> <p><b><i>Examiner Note: 1C CBP switch should NOT be selected since the pump will not start.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
7	46	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>• Position HWP LOAD SHED DEFEAT switch to a running HWP.</li> <li>• Position CBP LOAD SHED DEFEAT switch to a running CBP</li> </ul> <p><b><u>STANDARD:</u></b> Position the HWP LOAD SHED DEFEAT switch to the running HWP, (1A, 1B, or 1C) Position the CBP LOAD SHED DEFEAT switch to the running CBP, (1A or 1B ) Continues to Step 47</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

8	47	<p>Place the following in MANUAL:</p> <ul style="list-style-type: none"> <li>• 1FDW-53</li> <li>• 1FDW-65</li> </ul> <p><b><u>STANDARD:</u></b> Locate the Moore controller on 1VB3 for each valve listed above and determine they are in MANUAL by the MANUAL light being Lit.</p> <p>Continues to Step 48</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
9	48	<p>Establish 2300-6000 gpm total recirc flow with <u>one</u> of the following:</p> <ul style="list-style-type: none"> <li>• 1FDW-53</li> <li>• 1FDW-65</li> </ul> <p><b><u>STANDARD:</u></b> Candidate locates the Moore controller for 1FDW-53 or 1FDW-65 on 1VB3 and uses the manual loader to adjust total recirc flow to 2300-6000 gpm.</p> <p><b><i>Examiner Cue: Inform candidate that another RO will complete this enclosure.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b><i>END TASK</i></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 3 | This step is required to properly align Condensate recirc.            |
| 9 | This step is required to establish proper flow for Condensate recirc. |

## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

Unit 1 was operating at 100% with PCB-21 open for maintenance.

Reactor trip occurred.

Slow transfer of unit auxiliaries resulted in a loss of the secondary.

AP/1/A/1700/011 (Recovery From Loss of Power) was initiated.

1A HWP has been re-started per AP/11.

All CBP Aux Oil pumps are operating.

EOP Encl. 5.9 (Extended EFDW Operation) is in progress and complete up to step 41.

### **INITIATING CUES**

The CRS directs you to continue in Enclosure 5.9 beginning at step 41 to establish Condensate Recirc.

# REGION II

## JOB PERFORMANCE MEASURE

### AO-101

### Swap Control Rod Drive Filters

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:



## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

The 1B CRD filter  $\Delta P$  is 11 psid

It has been determined that the operating CRD filters have to be swapped

### **INITIATING CUES**

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 (Component Cooling System) Encl. 4.19 (Placing 1A OR 1B CRD Filter In Service)



START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	<p>IF required, place 1A CRD Filter in service:</p> <p><b><u>STANDARD:</u></b> Per the cue sheet, the 1A CRD Filter will be placed in service.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	2.1.1	<p>Ensure open 1CC-72 (1A CRD Filter Inlet).</p> <p><b><u>STANDARD:</u></b> Candidate opens 1CC-72 by turning the hand wheel in the counter clockwise direction until it comes to a hard stop.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
3	2.1.2	<p>Open 1CC-136 (1A CRD Filter Sightglass Outlet).</p> <p><b><u>STANDARD:</u></b> Candidate opens 1CC-136 by turning hand wheel in the counter clockwise direction until it comes to a hard stop.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
4	2.1.3	<p>Throttle 1CC-73 (1A CRD Filter Vent) to vent 1A CRD Filter.</p> <p><b><u>STANDARD:</u></b> Candidate throttles open 1CC-73 by turning the hand wheel in the counter clockwise direction until flow is noticed in the sight glass.</p> <p><b>Examiner Cue: Several seconds after 1CC-73 is throttled open, inform the candidate that a solid stream is noticed in the sight glass.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

5	2.1.4	<p><b>WHEN</b> vented, position the following:</p> <ul style="list-style-type: none"> <li>• Close 1CC-73 (1A CRD Filter Vent)</li> <li>• Close 1CC-136 (1A CRD Filter Sightglass Outlet)</li> </ul> <p><b><u>STANDARD:</u></b> When the candidate notices a solid stream of water in the sightglass, they close 1CC-73 and 1CC-136 by turning the hand wheels in the clockwise direction until they come to a hard stop.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
6	2.1.5	<p>Open 1CC-74 (1A CRD Filter Outlet).</p> <p><b><u>STANDARD:</u></b> Candidate opens 1CC-74 by turning the valve in the counter clockwise direction until the handwheel comes to a hard stop.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
7	2.1.6	<p><b>IF</b> desired, remove 1B CRD Filter from service:</p> <ul style="list-style-type: none"> <li>• Close 1CC-92 (1B CRD Filter Inlet)</li> <li>• Close 1CC-93 (1B CRD Filter Outlet)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate closes 1CC-92 and 1CC-93 by turning the hand wheels in the clockwise direction until they come to a hard stop.</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 2 | This step is required to allow flow into the CRD filter.              |
| 5 | This step is required to prevent draining the CC system.              |
| 6 | This step is required to place the 1A CRD filter in the fluid stream. |
| 7 | This step is required to remove the 1B CRD filter from service        |

## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

The 1B CRD filter  $\Delta P$  is 11 psid

It has been determined that the operating CRD filters have to be swapped

### **INITIATING CUES**

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 (Component Cooling System) Encl. 4.19 (Placing 1A OR 1B CRD Filter In Service)

## REGION II JOB PERFORMANCE MEASURE

### AO-603

### Shutdown of Inverters During Station Blackout

Administrative: No

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: Yes

Time Critical Criteria: Power is removed from Inverters KI, KU, KX, and KOAC within 30 minutes

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Shutdown of Inverters During Station Blackout

**Task Number:**

**Alternate Path:** No

**Time Critical:** Yes

**Validation Time:** 15 min

**K/A Rating(s):**

System: EPE 055

K/A: EA1.04

Rating: 3.5/3.9

**Task Standard:**

Power is removed from Unit 2 inverters KI, KU, KX, and KOAC within 30 minutes

**References:**

EOP Enclosure 5.32 (Load Shed of Inverters During SBO) Rev 0

**Tools/Equipment/Procedures Needed:**

EOP Enclosure 5.32 (Load Shed of Inverters During SBO)

**(Note: Below this line is used only for Initial NRC Exams)**

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

### Comments


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS:**

A tornado which struck the Turbine Building and the Switchyard has resulted in a Loss of Onsite and Offsite Power on all three Units.

Unit 1, 2, and 3 TDEFDW Pumps are operating and feeding each units SGs respectively.

### **INITIATING CUES:**

The Control Room Operator directs you to perform EOP Enclosure 5.32 (Load Shed of Inverters During SBO) on Unit 2.

**THIS JPM IS TIME CRITICAL**



START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	1	<p>Verify <u>any</u> from the U2 Control Room personnel:</p> <p>___ EFDW is feeding <u>any</u> SG.</p> <p>___ SSF is feeding <u>any</u> SG.</p> <p>___ PSW is feeding <u>any</u> SG.</p> <p><b><u>STANDARD:</u></b> Candidate determines EFDW is feeding Unit 2 SGs and proceeds to step 2.</p> <p><b><i>EXAMINER CUE: If contacted as Unit 2 personnel, state that Unit 2 TDEFDW Pump is feeding Unit 2 SGs.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	2	<p>Open the following breakers (Unit 2 Equipment Room):</p> <ul style="list-style-type: none"> <li>• 2KI Static Inverter DC Input</li> <li>• 2KX Static Inverter DC Input</li> <li>• 2KU Static Inverter DC Input</li> </ul> <p><b><u>STANDARD:</u></b> Locates the 2KI Static Inverter in Unit 2's Equipment Room and OPENS the DC INPUT Breaker</p> <p>Locates the 2KX Static Inverter in Unit 2's Equipment Room and OPENS the DC INPUT Breaker.</p> <p>Locates the 2KU Static Inverter in Unit 2's Equipment Room and OPENS the DC INPUT Breaker</p> <p><b><i>EXAMINER NOTE: Power must be removed from KI, KU, &amp; KX within 30 minutes.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

3	3	<p>Perform <u>either</u>:</p> <ul style="list-style-type: none"> <li>• Place 2DP-F6E ( 2KOAC Computer Static Inverter Bkr) in OFF (T-3, L-31)</li> <li>• Open DC INPUT breaker on 2KOAC Inverter (A-6-602, Vent Equipment Rm)</li> </ul> <p><b><u>STANDARD:</u></b> Locates breaker F6E (2KOAC Computer Static Inverter Bkr) on MCC 2DP and places it in the “OFF” position.</p> <p><b>OR</b></p> <p>Opens DC INPUT breaker on 2KOAC Inverter (A-6-602, Vent Equipment Rm)</p> <p><b><i>EXAMINER NOTE: Power must be removed from KOAC within 30 minutes.</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
---	---	---	---

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
2	This step is required to de-energize the essential inverters. Power must be removed from KI, KU, & KX within 30 minutes.
3	This step is required to de-energize the KOAC inverter. Power must be removed from KOAC within 30 minutes.

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS:**

A tornado which struck the Turbine Building and the Switchyard has resulted in a Loss of Onsite and Offsite Power on all three Units.

Unit 1, 2, and 3 TDEFDW Pumps are operating and feeding each units SGs respectively.

**INITIATING CUES:**

The Control Room Operator directs you to perform EOP Enclosure 5.32 (Load Shed of Inverters During SBO) on Unit 2.

**THIS JPM IS TIME CRITICAL**

**REGION II**  
**JOB PERFORMANCE MEASURE**

**AO-802a**

**Isolate HPSW and LPSW During an Auxiliary  
Building Flood**

Administrative: No

Alternate Path: Yes

Alt Path Description: HPSW-959 will not close

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

**REGION II**  
**JOB PERFORMANCE MEASURE**

**Task Title:** Isolate HPSW and LPSW during an AB Flood

**Task Number:** N/A

**Alternate Path:** Yes

**Time Critical:** No

**Validation Time:** 15 min

**K/A Rating(s):**

System: BW/A07  
K/A: AA2.2  
Rating: 3.3/3.7

**Task Standard:**

Isolate portions of the HPSW and LPSW systems during an AB Flood using AP/3/A/1700/030 AUXILIARY BUILDING FLOOD

**References:**

AP/3/A/1700/030 Rev 19

**Tools/Equipment/Procedures Needed:**

AP/3/A/1700/030 Encl. 5.1 (HPSW AB Flood Isolation) and Encl. 5.2 (LPSW AB Flood Isolation)

**(Note: Below this line is used only for Initial NRC Exams)**

**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

DATE

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

All 3 units are at 100% power

Unit 3 Auxiliary Building flooding is occurring

The source of flood water has not yet been determined

### **INITIATING CUE**

The Control Room Supervisor directs you to perform AP/3/A/1700/030 Enclosure 5.1 (HPSW AB Flood Isolation) AND Enclosure 5.2 (LPSW AB Flood Isolation)



START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1		<i><b>Examiner Note:</b> If candidate performs Enclosure 5.2 first, it begins on JPM step 7.</i>	
2	En.5.1 1	<p><b>IAAT</b> the source of flooding is isolated, <b>THEN</b> notify Control Room.</p> <p><b><u>STANDARD:</u></b> The candidate notes the source of flooding is not isolated.</p> <p><i><b>Examiner Cue:</b> If asked, flooding is still occurring.</i></p> <p>Candidate continues to step 2.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

3	2	<p style="text-align: center;"><b>NOTE</b></p> <p>Keys for valve locks are available in <u>any</u> Emergency Equipment cabinet.</p> <p style="text-align: center;"><b>[ALTERNATE PATH]</b></p> <p>Close HPSW-959 (HPSW SUPPLY TO FLOW LIMITER BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers).</p> <p><b><u>STANDARD:</u></b> The candidate locates and attempts to close HPSW- 959.</p> <p><b><i>Examiner Note: Operators would normally carry keys to these locks.</i></b></p> <p><b><i>Examiner Cue: When the candidate locates and attempts to close HPSW-959, inform candidate that HPSW-959 chain will not move.</i></b></p> <p>Candidate continues to step 2 RNO.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
4	2 RNO	<p>Close HPSW-962 (HPSW SUPPLY TO AUX BLDG BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers).</p> <p><b><u>STANDARD:</u></b> The candidate locates and closes HPSW-962 rotating it in the clockwise direction until it stops.</p> <p><b><i>Examiner Cue: When the candidate simulates rotating the hand wheel in the clockwise direction, inform the candidate that the hand wheel rotated fully clockwise and the valve is closed.</i></b></p> <p>Candidate continues to step 3.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

5	3	<p>Notify control Room HPSW isolation is complete.</p> <p><b><u>STANDARD:</u></b> The candidate notifies the control Room HPSW isolation is complete.</p> <p>Candidate continues to step 4.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
6	4	<p><b>EXIT</b> this enclosure.</p> <p><b><u>STANDARD:</u></b> Candidate EXITS enclosure 5.1 and proceeds to Enclosure 5.2</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
7	En.5.2 1	<p><b>IAAT</b> the source of flooding is isolated, <b>THEN</b> notify Control Room.</p> <p><b><u>STANDARD:</u></b> The candidate notes the source of flooding is not isolated.</p> <p><b><i>Examiner Cue: If asked, flooding is still occurring.</i></b></p> <p>Candidate continues to step 2</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

8	2	<p>Close 3LPSW-844 (AUX BLDG AHU SUPPLY) (T-1/M-46, 6' SE).</p> <p><b><u>STANDARD:</u></b> The candidate locates and closes 3LPSW-844 rotating it in the clockwise direction until it stops.</p> <p><b><i>Examiner Cue: When the candidate simulates rotating the hand wheel in the clockwise direction, inform the candidate that the valve hand wheel rotated fully clockwise and the valve is closed.</i></b></p> <p>Candidate continues to step 3.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
9	3	<p>Close 3LPSW-770 (AUX BLDG AHU SUPPLY) (T-1/M-46, 8' S).</p> <p><b><u>STANDARD:</u></b> The candidate locates and closes 3LPSW-770 rotating it in the clockwise direction until it stops..</p> <p><b><i>Examiner Cue: When the candidate simulates rotating the hand wheel in the clockwise direction, inform the candidate that the valve hand wheel rotated fully clockwise and the valve is closed.</i></b></p> <p>Candidate continues to step 4.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

10	4	<p>Open 3LPSW-501 (UNIT 3 AHU RETURN TO STORM DRAINS) (T-1/L-47, W 12' up).</p> <p><b><u>STANDARD:</u></b> The candidate locates and opens 3LPSW-501 rotating it in the counter-clockwise direction until it stops.</p> <p><b><i>Examiner Cue:</i></b> <i>When the candidate simulates rotating the hand wheel in the counter-clockwise direction, inform the candidate that the valve hand wheel rotated fully counter-clockwise and the valve is open.</i></p> <p>Candidate continues to step 5.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
11	5	<p>Close 3LPSW-500 (UNIT 3 AHU RETURN TO CCW DISCHARGE) (T-1/L-47, NW 12' up).</p> <p><b><u>STANDARD:</u></b> The candidate locates and closes 3LPSW-500 rotating it in the clockwise direction until it stops.</p> <p><b><i>Examiner Cue:</i></b> <i>When the candidate simulates rotating the hand wheel in the clockwise direction, inform the candidate that the valve hand wheel rotated fully clockwise and the valve is closed.</i></p> <p>Candidate continues to step 6.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

12	6	<p>Notify Unit 3 Control Room LPSW isolation is complete.</p> <p><b><u>STANDARD:</u></b> The candidate notifies the Control Room LPSW isolation is complete.</p> <p>Candidate continues to step 7.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
13	7	<p><b>EXIT</b> this enclosure.</p> <p><b><u>STANDARD:</u></b> Candidate EXITS enclosure 5.2 and returns CUE Sheet to examiner.</p> <p><b><u>COMMENTS:</u></b></p> <p><b><i>END TASK</i></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
4	Step ensures proper isolation of HPSW leak.
8	Step ensures proper isolation of LPSW leak.
9	Step ensures proper isolation of LPSW leak.
11	Step ensures proper isolation of LPSW leak.

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

All 3 units are at 100% power

Unit 3 Auxiliary Building flooding is occurring

The source of flood water has not yet been determined

**INITIATING CUE**

The Control Room Supervisor directs you to perform AP/3/A/1700/030 Enclosure 5.1 (HPSW AB Flood Isolation) AND Enclosure 5.2 (LPSW AB Flood Isolation)



# REGION II JOB PERFORMANCE MEASURE

## ADM-107 DETERMINE IF RO LICENSE REQUIREMENTS ARE MET

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Determine if RO License requirements are met per NSD 512 for minimum On-Shift Experience

**Task Number:** N/A

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 10 Min

**K/A Rating(s):**

System: Generic

K/A: 2.1.4

Rating: 3.3/3.8

**Task Standard:**

Determine requirements of NSD 512 are NOT met.

**References:**

NSD 512 (Maintenance of RO/SRO NRC Licenses) Rev 7

**Tools/Equipment/Procedures Needed:**

NSD 512 (Maintenance of RO/SRO NRC Licenses)

**(Note: Below this line is used only for Initial NRC Exams)**

=====

**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

/ \_\_\_\_\_  
DATE

=====

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Today's date is 3/29/18. You are a Reactor Operator. Your work history for March of this year is as follows:

3/12/18	Worked 12 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
3/13/18	Worked 8 hours as OATC on Unit 1 and 4 hours OATC doing crew JIT training on Simulator A (day shift). Took turnover at beginning and gave turnover at end of both of these assignments.
3/14/18	Worked 10 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift.
3/19/18	Worked 12 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
3/20/18	Worked 12 hours as OATC on Unit 3 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
3/21/18	Worked 6 hours as OATC on Unit 3 and 6 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and did NOT give turnover at end of shift.
3/27/18	Worked 12 hours as AO on Unit 3 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.

### **INITIATING CUES**

The SM directs you to review your work history for March and determine if you meet NSD 512 requirements to maintain an active RO license for the following quarter and explain your answer below.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
		<b>Examiner note: The critical element of the evaluation of each day is to determine if the requirement is met or not met.</b>	
1		<p>Evaluate 3/12/18 work period</p> <p><b><u>STANDARD:</u></b> Determines that requirement is met. Required position for 12 hours with Turnover at beginning and end of shift.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
2		<p>Evaluate 3/13/18 work period</p> <p><b><u>STANDARD:</u></b> Determines that requirement is not met because Simulator time does not count toward maintain RO license requirements</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
3		<p>Evaluate 3/14/18 work period</p> <p><b><u>STANDARD:</u></b> Determines that requirement is not met. No turnover at end of shift and &lt; 12 hours worked in position.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

4		<p>Evaluate 3/19/18 work period</p> <p><b><u>STANDARD:</u></b> <b>Determines that requirement is met.</b> Required position for 12 hours with Turnover at beginning and end of shift.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5		<p>Evaluate 3/20/18 work period</p> <p><b><u>STANDARD:</u></b> <b>Determines that requirement is met.</b> Required position for 12 hours with Turnover at beginning and end of shift.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
6		<p>Evaluate 3/21/18 work period</p> <p><b><u>STANDARD:</u></b> <b>Determines that requirement is not met.</b> No turnover at end of shift and position not filled for entire shift.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
7		<p>Evaluate 3/27/18 work period</p> <p><b><u>STANDARD:</u></b> <b>Determines that AO is not a required position</b> and cannot be credited toward maintenance of RO license</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

8		<p>Compares credited time vs minimum requirements</p> <p><b><u>STANDARD:</u></b> Determines that there are only 3 – 12 hour shifts that can be credited and therefore the minimum fourth quarter requirements to maintain an active RO License are not met.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
---	--	--	---

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
1	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met
2	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
3	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
4	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
5	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
6	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
7	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
8	This step makes the determination regarding minimum license requirement.



**CANDIDATE CUE SHEET****(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

Today's date is 3/29/18. You are a Reactor Operator. Your work history for March of this year is as follows:

- |         |   |
|---------|---|
| 3/12/18 | Worked 12 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.  |
| 3/13/18 | Worked 8 hours as OATC on Unit 1 and 4 hours OATC doing crew JIT training on Simulator A (day shift). Took turnover at beginning and gave turnover at end of both of these assignments. |
| 3/14/18 | Worked 10 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift.  |
| 3/19/18 | Worked 12 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.  |
| 3/20/18 | Worked 12 hours as OATC on Unit 3 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.   |
| 3/21/18 | Worked 6 hours as OATC on Unit 3 and 6 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and did NOT give turnover at end of shift.                             |
| 3/27/18 | Worked 12 hours as AO on Unit 3 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.   |

**INITIATING CUES**

The SM directs you to review your work history for March and determine if you meet NSD 512 requirements to maintain an active RO license for the following quarter and explain your answer below.

## REGION II JOB PERFORMANCE MEASURE

### ADM-113

### Determine Time for SFP to Reach 180°F

Alternate Path: (No)

Alt Path Failure: \_\_\_\_\_

Time Critical: (No)

Time Critical Criteria: \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

EP Review By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Determine Time for SFP to Reach 180°F

**Task Number:**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 10 minutes

**K/A Rating(s):**

System: GEN  
K/A: 2.1.25  
Rating: 3.9/4.2

**Task Standard:**

Tables in AP/1-2/A/1700/035 (Loss of SFP Cooling And/Or Level) are used to determine total time required for SFP temperature to reach 180°F

**References:**

AP/1-2/A/1700/035 (Loss of SFP Cooling And/Or Level) Rev 19

**Tools/Equipment/Procedures Needed:**

AP/1-2/A/1700/035 Encl. 5.4 (Unit 1-2 SFP Time to Reach 180°F, 200 °F)

=====

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

=====

### **Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. **N/A**

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

- Unit 1 is at 100% stable
- Unit 1 EFPD = 263
- Unit 2 EFPD = 32
- Unit 2 was operating at 100% when it experienced a Unit blackout
- SSF has been activated for Unit 2
- Unit 2 RCMUP is aligned and operating
- 2HP-426 is being cycled to maintain Pressurizer Level as directed by AP/25
- AP/1-2/A/1700/035 (Loss of SFP Cooling And/Or Level) has been initiated
- Unit 1 & 2 SFP level = 0.0 ft stable
- Unit 1 & 2 SFP temperature = 112°F

### **INITIATING CUES**

CRS has directed you to utilize AP/35 Enclosure 5.4 and determine the time for Unit 1&2 SFP to reach 180 °F.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	1, 2 3	<p>1. Refer to tables A, B, and C below.</p> <p>2. <u>ONLY</u> one row from <u>one</u> table below applies</p> <p>3. Check the row in Table A, B, or C that applies to current conditions, <u>and</u> then use Tables listed on subsequent pages of Encl 5.4, as directed, to calculate SFP heat up times.</p> <p><b><u>STANDARD:</u></b> Candidate selects Table B and then chooses to use Table 10 based on:</p> <ul style="list-style-type: none"> <li>• SSF Event in progress for U1 or U2 with Unit letdown going to SFP</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• U1 <u>and</u> U2 each have 177 Fuel Assemblies in RB</li> </ul> <p>Candidate proceeds to step 4.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

2	4	<p style="text-align: center;"><b>NOTE</b></p> <p>Steps 4, and 5 below are used to determine Time (days). Time (days) is the number of days since Reactor shutdown associated with the most recent batch of Spent Fuel discharged to the SFP.</p> <p>Steps 6, and 7 provide guidance on how to round off current SFP temperature and Time (days), as determined by Steps 4, or 5; to the most conservative value.</p> <p><b>IF</b> any:          ___ U1 is in a Refueling Shutdown outage          ___ U2 is in a Refueling Shutdown outage</p> <p><b><u>STANDARD:</u></b> Candidate determines the step is not applicable since neither U1 nor U2 is in a Refueling outage.          Proceeds to step 5.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
3	5	<p><b>IF</b> U1 and U2 are <b>NOT</b> in a Refueling outage,  <b>THEN:</b>          Time (days) = (Determine U1 and U2 Core EFPD. Use smaller of the two numbers.) + 20 Days.</p> <p><b><u>STANDARD:</u></b> Candidate selects the lower EFPD unit (Unit 2 = 32 days) and adds 20, which results in <b>52 days</b>.          Proceeds to step 6.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

4	6	<p><b>IF</b> actual SFP temperature is between values in table, <b>THEN</b> use higher temperature in table.</p> <p><b><u>STANDARD:</u></b> Candidate determines actual SFP temperature = 112°F from the cue sheet and the temperature columns available on Table 10 are 110 and 115. Candidate determines temperature column to use is the higher temperature of <b>115</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5	7	<p><b>IF</b> actual Time (days) is between times in table, <b>THEN</b> use shorter time in Table.</p> <p><b><u>STANDARD:</u></b> Candidate determines that 52 days determined in step 3 is between 51 and 54 days on far left column of Table 10. Candidate determines the time to use is the shorter time of <b>51 days</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
6	Table 10	<p>Find the Time in hours based on the intersection of the <b>51</b> day row and the <b>115</b> degree column on Table 10 (page 33 of 63).</p> <p><b><u>STANDARD:</u></b> Based on the intersection of the 51 day row and the 115 degree column, determine that <b>13.4 hours</b> is the time to reach 180°F</p> <p><b><u>COMMENTS:</u></b></p> <p><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_



## **CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
1	Required to determine the time to reach 180 °F
3	Required to determine the time to reach 180 °F
4	Required to determine the time to reach 180 °F
5	Required to determine the time to reach 180 °F
6	Required to determine the time to reach 180 °F

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

- Unit 1 is at 100% stable
- Unit 1 EFPD = 263
- Unit 2 EFPD = 32
- Unit 2 was operating at 100% when it experienced a Unit blackout
- SSF has been activated for Unit 2
- Unit 2 RCMUP is aligned and operating
- 2HP-426 is being cycled to maintain Pressurizer Level as directed by AP/25
- AP/1-2/A/1700/035 (Loss of SFP Cooling And/Or Level) has been initiated
- Unit 1 & 2 SFP level = 0.0 ft stable
- Unit 1 & 2 SFP temperature = 112°F

**INITIATING CUES**

CRS has directed you to utilize AP/35 Enclosure 5.4 and determine the time for Unit 1&2 SFP to reach 180 °F.

## **REGION II JOB PERFORMANCE MEASURE**

### **ADM-207**

## **Surveillance of 1A Bleed Transfer Pump Following Maintenance**

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title :** Surveillance of 1A Bleed Transfer Pump Following Maintenance

**Task Number :**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 min

**K/A Rating(s):**

System: GENERIC

K/A: 2.2.12

Rating: (3.7/4.1)

**Task Standard:**

Perform PT/1/A/0251/017 (RC Bleed Transfer Pump Test) for 1A Bleed Transfer Pump and determine that acceptance criteria is met.

**References:**

PT/1/A/0251/017 (RC Bleed Transfer Pump Test) and Test Data Sheet

**Tools/Equipment/Procedures Needed:**

PT/1/A/0251/017 (RC Bleed Transfer Pump Test) Rev. 34

Test Data Sheet

**(Note: Below this line is used only for Initial NRC Exams)**

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

### Comments


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

***Directions with SNAP:***

**N/A**

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Maintenance was performed on 1A Bleed Transfer Pump during the previous shift.

Maintenance is complete.

1A Bleed Transfer Pump clearance has been restored.

### **INITIATING CUE**

The CRS directs you to perform PT/1/A/0251/017 (RC Bleed Transfer Pump Test) for 1A Bleed Transfer Pump beginning at step 12.1 and using the following data, determine whether or not acceptance criteria is met.

O1E0170 "1A BHUT Level" = 130 inches stable

1CS-46 is closed

1HP-16 is closed

With pump operating:

- 1CS-48 throttled to 159 gpm stable (1PG-1000)
- Discharge pressure (1PG-84) = 98 psig stable (after 2 minutes at required flow)
- Vibration readings are:
  - Measurement Point MOA = 0.0618 in/sec
  - Measurement Point MOX = 0.0598 in/sec
  - Measurement Point MIX = 0.0636 in/sec
  - Measurement Point PIX = 0.0385 in/sec
  - Measurement Point MOY = 0.1702 in/sec
  - Measurement Point MIY = 0.1510 in/sec
  - Measurement Point PIY = 0.0543 in/sec

Vibration Instrument ID Number ONS-192648.

Vibration Transducer ID Number ONS-8625.

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	12.1	<div>NOTE: Pumps may be tested in any order or at the same time.</div> <p><b>IF</b> scheduled, test 1A RC Bleed Transfer pump as follows:</p>	
2	12.1.1	<p>Determine suction pressure as follows:</p> <p>A. Record O1E0170 "1A BHUT Level": _____</p> <p>B. * Calculate suction pressure as follows:            ( _____ ) X 0.036 = _____ (psig)                                1A BHUT Level                      (Suction Pressure)</p> <p>C. Verify suction pressure <math>\geq</math> 1.0 psig.</p> <p><b>STANDARD:</b> Candidate records O1E0170 "1A BHUT Level" of 130 inches from cue sheet.            * Candidate calculates suction pressure of <b>4.68 psig (4.68 – 5 psig)</b>            Candidate verifies suction pressure <math>\geq</math> 1.0 psig.            Proceeds to step 12.1.2.</p> <p><b>COMMENTS:</b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
3	12.1.2	<div>NOTE: 1CS-46 and 1HP-16 are closed for double isolation from HPI system. (R.M.)</div> <p>Ensure closed the following: (R.M.)</p> <p>___ 1CS-46 (1A RC BLEED TRANSFER PUMP DISCHARGE)</p> <p>___ 1HP-16 (LDST MAKEUP ISOLATION)</p> <p><b>STANDARD:</b> Candidate determines 1CS-46 and 1HP-16 are closed per the cue sheet and proceeds to step 12.1.3.</p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

4	12.1.3	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>CAUTION: IF</b> 1CS-46 and 1HP-16 leak past the seat, RCS boron concentration could change.         </div> <p>Start 1A Bleed Transfer pump.</p> <p><b><u>STANDARD:</u></b> Candidate documents starting 1A Bleed Transfer pump and proceeds to step 12.1.4.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
5	12.1.4	<p>Ensure 1CS-48 (1A BHUT Recirc) throttled to Acceptable Flow Band on data sheet. (AB/1- RC Bleed Transfer Pump Room) (1PG-1000)</p> <p><b><u>STANDARD:</u></b> Candidate determines 1CS-148 throttled to Acceptable Flow Band on data sheet (159 gpm) per cue sheet and proceeds to step 12.1.5.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



6	12.1.5	<p>After 2 minutes at required flow, perform the following: (1CS-PU-0003)</p> <p>A. Record Discharge Pressure (1PG-84): _____ psig</p> <p>B. Record Suction Pressure from step 12.1.1B : _____ psig</p> <p>C. * Calculate developed head:</p> $\text{Discharge} - \text{Suction} = \frac{\text{_____}}{\text{Developed Head}} \text{ psid}$ <p>D. Record developed head on data sheet.</p> <p>E. Obtain and record all other data required on data sheets.</p> <p><b><u>STANDARD:</u></b> Candidate records discharge pressure of 98 psig from cue sheet.</p> <p>Candidate records suction pressure from step 12.1.1B of 4.68 psig.</p> <p>* Candidate calculates developed head (discharge – suction) to be <b>93.32 psig (93 – 93.32 psig)</b></p> <p>Candidate records developed head on the data sheet.</p> <p>Candidate obtains the following from the cue sheet and records on the data sheet:</p> <p><b>1A Bleed Transfer pump flow = 159 gpm</b></p> <p><b>Vibration readings:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Measurement Point MOA = 0.0618 in/sec</b></li> <li>▪ <b>Measurement Point MOX = 0.0598 in/sec</b></li> <li>▪ <b>Measurement Point MIX = 0.0636 in/sec</b></li> <li>▪ <b>Measurement Point PIX = 0.0385 in/sec</b></li> <li>▪ <b>Measurement Point MOY = 0.1702 in/sec</b></li> <li>▪ <b>Measurement Point MIY = 0.1510 in/sec</b></li> <li>▪ <b>Measurement Point PIY = 0.0543 in/sec</b></li> </ul> <p><b><u>COMMENTS:</u></b></p>	<p><b>*CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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7	12.1.6	<p>Throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. (AB/1- RC Bleed Transfer Pump Room)</p> <p><b><u>STANDARD:</u></b> Candidate determines discharge pressure is 98 psig from the cue sheet and proceeds to step 12.1.7.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
8	12.1.7	<p>Record instrument ID numbers:</p> <ul style="list-style-type: none"> <li>• Vibration Instrument ID Number _____</li> <li>• Vibration Transducer ID Number _____</li> </ul> <p><b><u>STANDARD:</u></b> Candidate records Vibration Instrument ID Number ONS-192648.</p> <p>Candidate records Vibration Transducer ID Number ONS-8625.</p> <p>Proceeds to step 12.1.8.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
9	12.1.8	<p>Perform <b><u>one</u></b> of the following:</p> <ul style="list-style-type: none"> <li>• Verify acceptance criteria 11.1 met.</li> <li>• <b>IF</b> acceptance criteria <b>NOT</b> met, notify SRO.</li> </ul> <p><b><u>STANDARD:</u></b> Candidate determines acceptance criteria 11.1 is met.</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
2	This step is required to calculate suction pressure that will be used later in the procedure to calculate developed head.
6	This step is required to calculate developed head.
9	This step is required to determine acceptance criteria is met.

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

Maintenance was performed on 1A Bleed Transfer Pump during the previous shift.

Maintenance is complete.

1A Bleed Transfer Pump clearance has been restored.

**INITIATING CUE**

The CRS directs you to perform PT/1/A/0251/017 (RC Bleed Transfer Pump Test) for 1A Bleed Transfer Pump beginning at step 12.1 and using the following data, determine whether or not acceptance criteria is met.

O1E0170 "1A BHUT Level" = 130 inches stable

1CS-46 is closed

1HP-16 is closed

With pump operating:

- 1CS-48 throttled to 159 gpm stable (1PG-1000)
- Discharge pressure (1PG-84) = 98 psig stable (after 2 minutes at required flow)
- Vibration readings are:
  - Measurement Point MOA = 0.0618 in/sec
  - Measurement Point MOX = 0.0598 in/sec
  - Measurement Point MIX = 0.0636 in/sec
  - Measurement Point PIX = 0.0385 in/sec
  - Measurement Point MOY = 0.1702 in/sec
  - Measurement Point MIY = 0.1510 in/sec
  - Measurement Point PIY = 0.0543 in/sec

Vibration Instrument ID Number ONS-192648.

Vibration Transducer ID Number ONS-8625.

**(Shall be administered on same day as ADM-S300)**

## **REGION II JOB PERFORMANCE MEASURE**

### **ADM-306**

#### **Determine the Maximum Permissible Stay Time Within Emergency Dose Limits (EDL)**

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Determine the Maximum Permissible Stay Time Within Emergency Dose Limits.

**Task Number:**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 min

**K/A Rating(s):**

System: Generic

K/A: 2.3.4

Rating: 3.2/3.7

**Task Standard:**

Determine the Maximum Permissible Stay Time Within the Emergency Dose Limits

**References:**

PD-RP-ALL-0001 9Radiation Worker Responsibilities0 Rev 09

OMP 1-18 (Implementation Standard During Abnormal And Emergency Events) Rev 41

AD-EP-ALL-0205 (Emergency Exposure Controls) Rev 1

**Tools/Equipment/Procedures Needed:**

Calculator

Note tablet

**(Note: Below this line is used only for Initial NRC Exams)**

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**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

/ DATE

=====

### Comments


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Steam Generator Tube Rupture has occurred on Unit 3

Emergency Dose Limits in effect is announced on the PA system

Before assuming today's shift, AO "A" has received 1.26 Rem TEDE this year, and AO "A" has not received any dose for this event except as specified below.

The following tasks are required to be performed:

#	TASK	TIME REQUIRED	DOSE RATE
1	Close 3C-573	8 min	8.45 R/hr
2	Open 3FDW-313	5 min	19.75 R/hr
3	Open all Unit 3's ADVs		9.35 R/hr

**Note: No dose is received while traveling between tasks.**

**Tasks 1, 2, 3 are not for lifesaving or protecting valuable property.**

### **INITIATING CUE**

AO "A" has completed tasks 1 and 2 in the time required.

Determine how long (in minutes) that AO "A" has to complete task 3 without exceeding Emergency Dose Limits.

**ROUND ALL CALCULATIONS TO TWO (2) DECIMAL PLACES**



START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1		<b>Examiner Note:</b> <ul style="list-style-type: none"> <li>• <i>Candidate may perform these steps in a different order; however, the calculated stay time must be correct.</i></li> <li>• <i>EDL is 5 Rem per event (LOCA or SGTR).</i></li> <li>• <i>Current exposure for the year is not counted toward the Emergency Dose Limits (EDL). (Note following step 5.1 in AD-EP-ALL-0205)</i></li> </ul>	
2		Determine dose received while performing task 1.  <b><u>STANDARD:</u></b> Determine dose received while performing task 1. $8.45 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 8 \text{ min} = 1.1266 \text{ R}$ <b>(1.1 to 1.13 R)</b>  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT
3		Determine dose received while performing task 2.  <b><u>STANDARD:</u></b> Determine dose received while performing task 2. $19.75 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 5 \text{ min} = 1.6458 \text{ R}$ <b>(1.58 to 1.65 R)</b>  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT
4		Determine dose remaining from EDLs.  <b><u>STANDARD:</u></b> Determine dose remaining from EDLs. $5\text{R} - 1.12\text{R} - 1.65\text{R} = 2.23\text{R}$ <b>(2.22 to 2.32 R)</b>  <b><u>COMMENTS:</u></b>	<b>CRITICAL STEP</b>  ___ SAT  ___ UNSAT

5		<p>Determine time available for the AO to complete task 3 without exceeding EDL.</p> <p><b><u>STANDARD:</u></b> Stay time is calculated to be:</p> $\frac{\text{Available Dose}}{\text{Dose Rate}} = \frac{2.23\text{R}}{9.35 \text{ R/hr}} = .24 \text{ hr} \times \frac{60 \text{ min}}{1\text{hr}} = \mathbf{14.4 \text{ min}}$ <p style="text-align: center;"><b>(13.8 to 15 Minutes)</b></p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
-----------------------	--------------------

- |   |   |
|---|---|
| 1 | This step is required to calculate stay time. |
| 2 | This step is required to calculate stay time. |
| 3 | This step is required to calculate stay time. |
| 4 | This step is required to calculate stay time. |

**CANDIDATE CUE SHEET****(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

Steam Generator Tube Rupture has occurred on Unit 3

Emergency Dose Limits in effect is announced on the PA system

Before assuming today's shift, AO "A" has received 1.26 Rem TEDE this year, and AO "A" has not received any dose for this event except as specified below.

The following tasks are required to be performed:

#	TASK	TIME REQUIRED	DOSE RATE
1	Close 3C-573	8 min	8.45 R/hr
2	Open 3FDW-313	5 min	19.75 R/hr
3	Open all Unit 3's ADVs		9.35 R/hr

**Note: No dose is received while traveling between tasks.**

**Tasks 1, 2, 3 are not for lifesaving or protecting valuable property.**

**INITIATING CUE**

AO "A" has completed tasks 1 and 2 in the time required.

Determine how long (in minutes) that AO "A" has to complete task 3 without exceeding Emergency Dose Limits.

**ROUND ALL CALCULATIONS TO TWO (2) DECIMAL PLACES**

## REGION II

### JOB PERFORMANCE MEASURE

#### ADM-S105

### PERFORM A POWER IMBALANCE VERIFICATION AND DETERMINE ANY REQUIRED ACTIONS AND COMPLETION TIMES

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:



## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. **NONE**

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

- Unit 1 had a transient from 100% power.
- The Reactor Calculations package is **NOT** running.
- All other equipment is operable.
- PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits.
- Minimum incore detector operability requirements have been verified met per PT/0/A/1103/019 (Backup Incore Detector System).

### **INITIATING CUE**

The SRO directs you to:

1. Perform Axial Power Imbalance verification in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2).
2. Determine all Tech Spec Conditions, Required Actions, and Completion times, if any.

**TECH SPEC CONDITION (s)**\_\_\_\_\_

- **REQUIRED ACTION (s) / COMPLETION TIME (s)**\_\_\_\_\_



START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1		<p>PT/1/A/0600/001, SR 3.2.2.1 Axial Power Imbalance Operating Limit:  <b>IF</b> &gt; 40% RTP, verify Power imbalance within operational alarm limits in COLR.</p> <p><b>IF</b> Reactor Calculations package is <b>NOT</b> running on computer, refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).</p> <p><b>STANDARD:</b> Determine reactor power is greater than 40%.  Determine Reactor Calculation package is <b>NOT</b> running per Initial Conditions and refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).</p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	3.2.3	<p>OP/1/A/1105/014 Encl. 4.13</p> <p>IF Reactor Calculations package is <b>NOT</b> running, verify minimum incore detector operability requirements are met. Refer to PT/0/A/1103/019 (Backup Incore Detector System).</p> <p><b>STANDARD:</b> Determine the minimum incore detector operability requirements are met from the initiating cue.</p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

3	3.2.4	<p>Order of preference of measurement systems to determine axial imbalance and quadrant power tilt is as follows:</p> <p>A. Incore Detectors (Computer Reactor Calculation Package).</p> <p>B. Outcore Detectors (Power Range Outcore Detectors).</p> <p>C. Backup Incore Detectors. Refer to PT/0/A/1103/019 (Backup Incore Detector System).</p> <p><b><u>STANDARD:</u></b> Candidate reviews step and determines Outcore Detectors should be used. Continues to Step 3.2.5</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
4	3.2.5	<p><b>IF</b> at least one power range outcore detector is <b>NOT</b> operable in each quadrant (NI-5 thru NI-8), outcore detectors shall <b>NOT</b> be used to measure axial imbalance or quadrant power tilt</p> <p><b><u>STANDARD:</u></b> Determine NI-5 thru NI-8 are operable and can be used to measure axial imbalance.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
5	3.2.6	<p><b>IF</b> Outcore Detectors (Power Range Outcore Detectors) are needed for tilt calculations, contact Rx Engineering group to perform PT/0/A/1103/018 (Excore Tilt Calculations).</p> <p><b><u>STANDARD:</u></b> Determine this step does not apply because they are not determining tilt calculation at this time.</p> <p><b><i>EXAMINER CUE: If asked, notify the candidate that tilt calculations are not required.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

6	3.2.7	<p><b>IF</b> Outcore Detectors (Power Range Outcore Detectors) are needed for imbalance calculations, refer to the following alternate method for determining (%) Reactor Power Axial Imbalance:</p> $\frac{NI-5^* + NI-6^* + NI-7^* + NI-8^*}{4} = \% \text{ Imbalance (Avg.)}$ <p>* Use Imbalance CR gauges reading for each NI.</p> <p><b><u>STANDARD:</u></b> Using the attached NI graphic determine that % Imbalance (Avg.) is - <b>19.2%</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
7		<p>Refer to the Unit 1 COLR to determine if the calculated outcore imbalance is within the limit for current plant conditions.</p> <p><b><u>STANDARD:</u></b> Determine the calculated outcore imbalance (- 19.2%) exceeds the limit (- 17.7%) for current plant conditions.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
8		<p>Reference Tech Specs to determine required actions.</p> <p><b><u>STANDARD:</u></b> Enter TS 3.2.2 Condition A: Restore AXIAL POWER IMBALANCE to within limits within 2 hours.</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 6 | This step is required to determine average imbalance.                             |
| 7 | This step is required to determine if imbalance is within the limits of the COLR. |
| 8 | This step is required to determine actions required by Tech Specs.                |

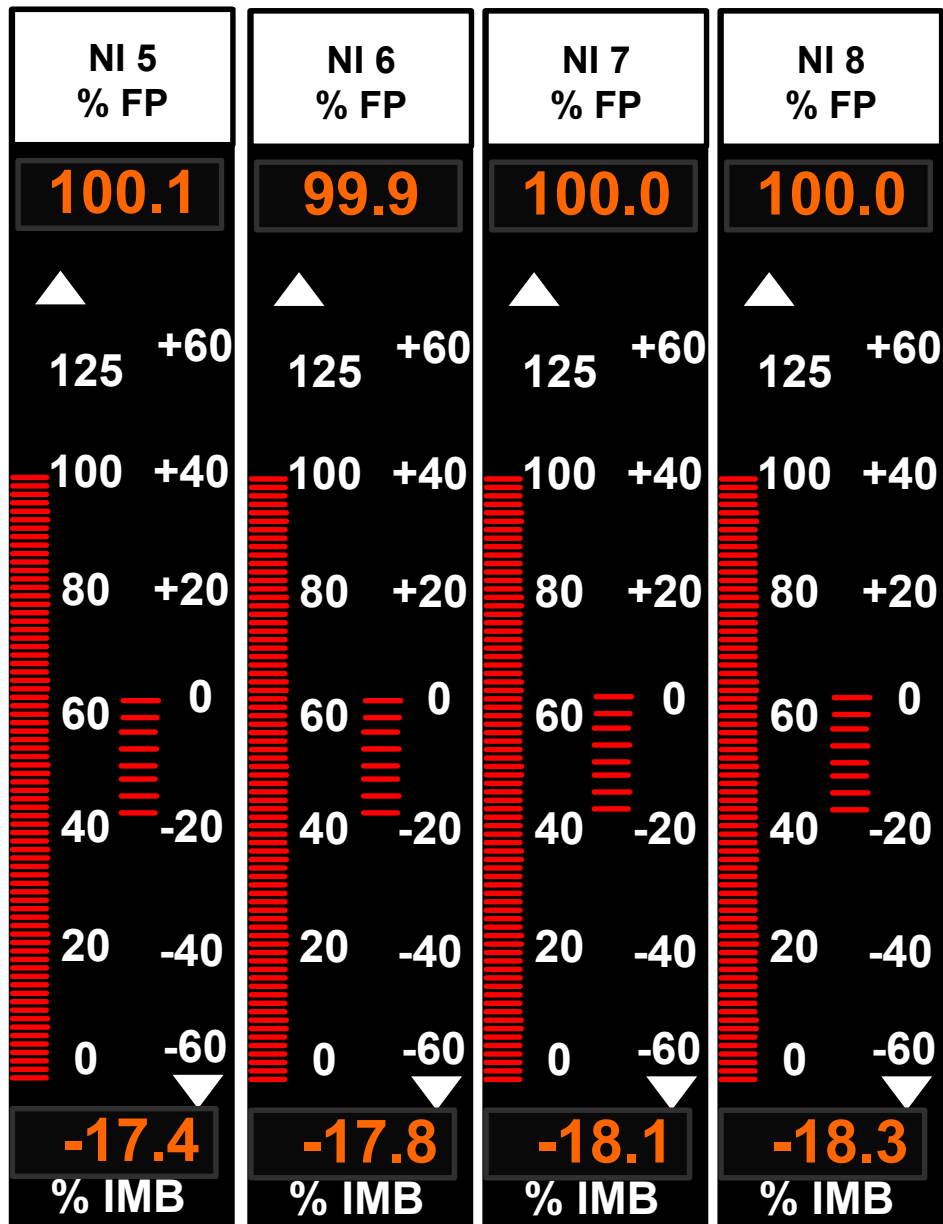
BACKUP INCORE CHART "A"		
POINT #	%	Location
1	158.6	G09-L2
2	112.1	G09-L4
3	98.6	G09-L6
4	159.2	E09-L2
5	111.8	E09-L4
6	98.4	E09-L6
7	158.8	G05-L2
8	97.5	G05-L6
9	159.9	M07-L2
10	99.2	M07-L6
11	158.6	K11-L2
12	98.1	K11-L6
13	157.8	F13-L2
14	158.6	D05-L2
15	112.3	F13-L4
16	158.1	C06-L2
17	99.6	C06-L6
18	98.8	F13-L6
19	97.6	O10-L6
20	98.3	L03-L6
21	159.6	L03-L2
22	98.6	D05-L6
23	158.7	O10-L2
24	111.9	D05-L4

BACKUP INCORE CHART "B"		
POINT #	%	Location
1	98.6	E07-L6
2	97.4	G11-L6
3	99.2	M09-L6
4	*OOS	K05-L6
5	*OOS	K05-L4
6	*OOS	L06-L2
7	*OOS	L06-L4
8	*OOS	L06-L6
9	156.2	M09-L2
10	*OOS	K05-L2
11	159.2	G11-L2
12	*OOS	E07-L2
13	158.2	C10-L2
14	98.1	C10-L6
15	*OOS	F03-L2
16	98.5	F03-L6
17	*OOS	N04-L2
18	112.1	N04-L4
19	*OOS	N04-L6
20	159.3	O06-L2
21	*OOS	O06-L4
22	*OOS	O06-L6
23	*OOS	L13-L2
24	98.8	L13-L6

Note: Listed points with values are "in calibration".

\* Work Request written

# POWER RANGE NI'S



## **CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

### **INITIAL CONDITIONS**

- Unit 1 had a transient from 100% power.
- The Reactor Calculations package is **NOT** running.
- All other equipment is operable.
- PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits.
- Minimum incore detector operability requirements have been verified met per PT/0/A/1103/019 (Backup Incore Detector System).

### **INITIATING CUE**

The SRO directs you to:

1. Perform Axial Power Imbalance verification in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2).
2. Determine all Tech Spec Conditions, Required Actions, and Completion times, if any.

**TECH SPEC CONDITION (s)** \_\_\_\_\_

- **REQUIRED ACTION (s) / COMPLETION TIME (s)** \_\_\_\_\_

## REGION II JOB PERFORMANCE MEASURE

### ADM-S110 CALCULATION OF PRIMARY TO SECONDARY LEAK RATE AND DETERMINATION OF SHUTDOWN REQUIREMENTS

Alternate Path: (No)

Alt Path Failure: \_\_\_\_\_

Time Critical: (No)

Time Critical Criteria: \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

EP Review By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Calculation of Primary to Secondary Leak Rate and determination of shutdown requirements

**Task Number:**

**Alternate Path:** (No)

**Time Critical:** (No)

**Validation Time:** 15 Minutes

**K/A Rating(s):**

System: Gen  
K/A: 2.1.7  
Rating: 4.4/4.7

**Task Standard:**

Utilize AP/1/A/1700/031 (Primary to Secondary Leakage) Subsequent Actions to determine correct calculation enclosure to use to quantify the leak rate, and enclosure to determine unit shutdown requirements.

Utilize AP/1/A/1700/031 (Primary to Secondary Leakage) Enclosure 5.5 (Calculation of Primary to Secondary Leak Rate using 1RIA-40) and RCS Samples to correctly calculate SG Tube Leak flow rate.

Utilize AP/1/A/1700/031 (Primary to Secondary Leakage), Enclosure 5.1 (Unit Shutdown Requirements) to determine shutdown requirements based on quantified leak rate from Enclosure 5.5.

**References:**

AP/1/A/1700/031, Primary to Secondary Leakage Rev 21

**Tools/Equipment/Procedures Needed:**

AP/1/A/1700/031 complete up thru Step 4.25  
Calculator

=====

**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

=====

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

- Unit 1 Reactor power = 37% stable
- AP/1/A/1700/031 (Primary to Secondary Leakage) entered due to suspected leakage > 5 gpd but < 25 gpm
- 1RIA-40 (from View Node information) = 768 cpm
  - Spiked as high as 1063 cpm approximately 2 hours ago
- Off Gas Blower is in operation
- OAC primary to secondary leak rate calculation became unavailable at shift turnover
- RP and Primary Chemistry sample results are as follows:
  - Total Xe 133 equivalent activity (from RP CSAE off-gas sample) =  $2.1 \text{ E-5 } \mu\text{Ci/ml}$
  - Total Xe 133 activity (from RP CSAE off-gas sample) =  $2.23 \text{ E-5 } \mu\text{Ci/ml}$
  - RCS Xe 133 equivalent corrected (from Primary Chemistry RCS sample) =  $0.328 \mu\text{Ci/ml}$
  - RCS Xe 133 activity (from Primary Chemistry RCS sample) =  $0.301 \mu\text{Ci/ml}$
  - CSAE off-gas flow = 12.5 scfm

### **INITIATING CUES**

AP/1/A/1700/031 is complete up thru Step 4.25. You are to continue in the AP and determine the primary to secondary leak rate and make a recommendation for required time to shutdown based on the calculated leak rate. Document the primary to secondary leak rate and your operational recommendation below.

Another operator will make all required log entries.

**LEAK RATE** \_\_\_\_\_

**TIME REQUIRED TO BE IN MODE 3** \_\_\_\_\_

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	4.26	<p><b>PERFORM</b> Encl.5.5 (Calculation of Primary to Secondary Leak Rate using 1RIA-40).</p> <p><b>STANDARD:</b> Candidate proceeds to Enclosure 5.5</p> <p><b>COMMENTS:</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
2	Encl 5.5 1	<p>Obtain RCS Xe 133 equivalent corrected from latest available Primary Chemistry RCS sample. _____ (mCi/ml)</p> <p><b>STANDARD:</b> Candidate must pick the RCS Xe 133 equivalent corrected from the Initial conditions (0.328 <math>\mu</math>Ci/ml).</p> <p><b>COMMENTS:</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
3	2	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;"><b>NOTE</b></p> <p>The maximum indicated 1RIA-40 count rate (the peak of any spikes) should be used to calculate leak rate. {15}</p> </div> <p>Obtain 1RIA-40 counts from the Control Room RIA View Node. (1VB2) _____ cpm</p> <p><b>STANDARD:</b> Candidate obtains the 1RIA-40 spike counts (from initial conditions) per the NOTE preceding Step 2 (1063 cpm).</p> <p><b>COMMENTS:</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

4	3	<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>Total CSAE off-gas flow has been conservatively assumed, as required by PIP O-07-5869 CA 1, to be 100 ft<sup>3</sup>/min . This may cause indicated SG tube leak rate to be greater than actual SG tube leak rate.</p> <p>Determine primary to secondary leak rate from the following formulas:</p> $\text{Leak rate} = 100 \frac{\text{ft}^3}{\text{min}} \times \frac{\text{IRIA-40 (cpm)}}{\text{RCS Xe 133 eq corr } (\mu\text{Ci/ml})} \times \frac{3.67\text{E-4 (gal)(min)}(\mu\text{Ci/ml})}{(\text{ft}^3)(\text{day})(\text{cpm})}$ $\text{Leak rate} = \frac{100 \text{ ft}^3}{\text{min}} \times \frac{\text{cpm}}{\mu\text{Ci/ml}} \times \frac{3.67\text{E-4 (gal)(min)}(\mu\text{Ci/ml})}{(\text{ft}^3)(\text{day})(\text{cpm})} = \underline{\hspace{2cm}} \text{ gpd}$ <p><b><u>STANDARD:</u></b> Candidate calculates the SGTTL size as follows per Encl. 5.5. formula, determines leak rate is <b>118.9 gpd (118 to 119 gpd)</b>.</p> <p>Candidate exits enclosure 5.5. Returns to step 4.27.</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;"><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5	4.27	<p><b>GO TO</b> the appropriate step based on Primary to Secondary Leak Rate:</p> <p><b><u>STANDARD:</u></b> Candidate determines that the <b>GO TO</b> step is 4.93 based on leak rate calculation 100 gpd to &lt; 25 gpm, and proceeds to that step.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

6	4.93	<p>Initiate log readings from the following every 15 minutes in the Auto Log:</p> <ul style="list-style-type: none"> <li>• 1RIA-16</li> <li>• 1RIA-17</li> <li>• 1RIA-40</li> <li>• 1RIA-59 (when Rx power &gt; 40 %)</li> <li>• 1RIA-60 (when Rx power &gt; 40 %)</li> </ul> <p><b><u>STANDARD:</u></b> Per the cue sheet, another operator will make all log entries.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
7	4.94	<p>Initiate a unit shutdown to meet requirements of Encl 5.1 (Unit Shutdown Requirements) using the following, as applicable:</p> <ul style="list-style-type: none"> <li>• AP/29 (Rapid Unit Shutdown)</li> <li>• OP/1/A/1102/004 (Operation at Power)</li> <li>• OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate proceeds to Enclosure 5.1</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

8	Encl 5.1	<p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"> <li>• The time limits for all conditions begin when the associated leak rate is first quantified, typically by OAC point O1P1599 or 1RIA-59/60 reading. Although grab samples may be collected to validate leak size, the time limits begin from the first quantified leak rate.</li> <li>• For items 1&amp;2, shutdown must commence immediately.</li> <li>• For items 3-5, commencement of shutdown may be delayed until leak rate is confirmed by grab samples, however the time limit begins when the leak rate was first quantified.</li> <li>• Continuous Primary to Secondary Leakage Monitoring is provided by the following methods: 1-OAC Point O1P1599 (EST TOTAL PRI TO SEC LEAKRATE) including 1RIA-40 operable with CSAE OFF-GAS BLOWER operating 2-1RIA-59 and 1RIA-60 operable with power &gt; 40%</li> <li>• If shutdown begins based on crediting 1RIA-59 and 1RIA-60 (1RIA-40 inoperable), the time limit does <b>NOT</b> change when Rx power is decreased below 40%.</li> </ul> <p><b><u>STANDARD:</u></b> Candidate utilizes the Table and Notes in AP/31 Encl. 5.1, Unit Shutdown Requirements, and determines the time to be in Mode 3 based on a leak rate of 118.9 gpd to be 3 hours. Unit 1 must be shut down and in <b>Mode 3 within 3 hours.</b></p> <p style="text-align: center;"><b>Leak Rate = 118 - 119 gpd</b></p> <p style="text-align: center;"><b>Time Required to be in Mode 3 = 3 hours</b></p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b>END TASK</b></p>	<p style="text-align: center;"><b>CRITICAL STEP</b></p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
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TIME STOP: \_\_\_\_\_

## **CRITICAL STEP EXPLANATIONS**

<b>SEQ STEP #</b>	<b>Explanation</b>
2	Required to calculate the leak rate correctly
3	Required to calculate the leak rate correctly
4	Required to calculate the leak rate correctly
8	Required to determine time of shutdown to Mode 3



**CANDIDATE CUE SHEET****(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

- Unit 1 Reactor power = 37% stable
- AP/1/A/1700/031 (Primary to Secondary Leakage) entered due to suspected leakage
  - > 5 gpd but < 25 gpm
- 1RIA-40 (from View Node information) = 768 cpm
  - Spiked as high as 1063 cpm approximately 2 hours ago
- Off Gas Blower is in operation
- OAC primary to secondary leak rate calculation became unavailable at shift turnover
- RP and Primary Chemistry sample results are as follows:
  - Total Xe 133 equivalent activity (from RP CSAE off-gas sample) =  $2.1 \text{ E-5 } \mu\text{Ci/ml}$
  - Total Xe 133 activity (from RP CSAE off-gas sample) =  $2.23 \text{ E-5 } \mu\text{Ci/ml}$
  - RCS Xe 133 equivalent corrected (from Primary Chemistry RCS sample) =  $0.328 \mu\text{Ci/ml}$
  - RCS Xe 133 activity (from Primary Chemistry RCS sample) =  $0.301 \mu\text{Ci/ml}$
  - CSAE off-gas flow = 12.5 scfm

**INITIATING CUES**

AP/1/A/1700/031 is complete up thru Step 4.25. You are to continue in the AP and determine the primary to secondary leak rate and make a recommendation for required time to shutdown based on the calculated leak rate. Document the primary to secondary leak rate and your operational recommendation below.

Another operator will make all required log entries.

**LEAK RATE** \_\_\_\_\_

**TIME REQUIRED TO BE IN MODE 3** \_\_\_\_\_

## **REGION II JOB PERFORMANCE MEASURE**

### **ADM-S201 DETERMINE TECH SPEC REQUIREMENTS FOR INOPERABLE PZR HEATERS**

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title :** Determine Tech Spec Requirements for Inoperable PZR Heaters

**Task Number :**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 min

**K/A Rating(s):**

System: Generic

K/A: 2.2.40

Rating: 3.4/4.7

**Task Standard:**

Determine that minimum number of PZR heaters for SSF operability are NOT operable and as a result TS 3.10.1 Condition A must be entered. The Required Action and Completion Time is to restore SSF ASW system to Operable within 7 days.

**References:**

Technical Specifications

**Tools/Equipment/Procedures Needed:**

Technical Specifications

**(Note: Below this line is used only for Initial NRC Exams)**

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**Candidate:** \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_ / \_\_\_\_\_  
NAME SIGNATURE DATE

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**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 2 is operating at 100% power.

Number of SSF Bank 2 Pressurizer Heaters available = 16

### **INITIATING CUES**

The SM directs you to:

1. Determine if the required number of SSF Bank 2 Pressurizer Heaters are operable.

As a result of your determination above, document all applicable Conditions, Required Actions, and Completion Times (if any) below.

**TECH SPEC CONDITION (s)** \_\_\_\_\_

- **REQUIRED ACTION (s) / COMPLETION TIME (s)** \_\_\_\_\_

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1		<p>Candidate will evaluate Tech Spec requirements.</p> <ul style="list-style-type: none"> <li>Evaluate TS B 3.10.1 for Unit 2</li> </ul> <p><b><u>STANDARD:</u></b> Determine that:</p> <ul style="list-style-type: none"> <li>For Unit 2 the maximum allowed PZR Steam Space Leakage is 0.0 gpm.</li> <li>Number of Bank 2 PZR heaters required is 17.</li> <li>As a result the minimum number of PZR heaters for SSF operability are NOT operable.</li> </ul> <p><b><i>Examiner Note: If candidate asks about PZR Steam Space leakage, respond that it is 0 gpm.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

2		<p>Candidate will evaluate the Table on Page B 3.10.1-4.</p> <p><b><u>STANDARD:</u></b> Determine that the SSF ASW system inoperable,</p> <ul style="list-style-type: none"> <li>• TS 3.10.1 Condition A ONLY should be entered.</li> <li>• Required Action and Completion Time is to restore SSF ASW system to Operable within 7 days</li> </ul> <p><b><i>EXAMINER NOTE: Normally the SSF ASW System being inoperable would render ALL of the SSF systems inoperable. However, if the SSF ASW System is inoperable due to inoperable PZR heaters, the other SSF systems remain operable. (Note below table on page 3.10.1-4)</i></b></p> <p><b><u>COMMENTS:</u></b></p> <p><b>END OF TASK</b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- 1 This step is required to determine if required SSF PZR heaters are operable.
- 2 This step is required to ensure compliance with Tech Specs.



**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS**

Unit 2 is operating at 100% power.

Number of SSF Bank 2 Pressurizer Heaters available = 16

**INITIATING CUES**

The SM directs you to:

1. Determine if the required number of SSF Bank 2 Pressurizer Heaters are operable.

As a result of your determination above, document all applicable Conditions, Required Actions, and Completion Times (if any) below.

**TECH SPEC CONDITION (s)** \_\_\_\_\_

- **REQUIRED ACTION (s) / COMPLETION TIME (s)** \_\_\_\_\_

**(Shall be administered on same day as ADM-306)**

## **REGION II JOB PERFORMANCE MEASURE**

### **ADM-S300**

### **Calculate Dose Received and Determine Approval Level Required to Exceed Emergency Dose Limits (EDL)**

Administrative: Yes

Alternate Path: No

Alt Path Description: \_\_\_\_\_

Time Critical: No

Time Critical Criteria: \_\_\_\_\_

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

## REGION II JOB PERFORMANCE MEASURE

**Task Title:** Calculate Dose Received and Determine Approval Level Required to Exceed Emergency Dose Limits (EDL)

**Task Number:**

**Alternate Path:** No

**Time Critical:** No

**Validation Time:** 15 min

**K/A Rating(s):**

System: Generic

K/A: 2.3.4

Rating: 3.2/3.7

**Task Standard:**

Calculate Dose Received and Determine Approval Level Required to Exceed Emergency Dose Limits (EDL)

**References:**

PD-RP-ALL-0001 (Radiation Worker Responsibilities) Rev 09

OMP 1-18 (Implementation Standard During Abnormal And Emergency Events) Rev 41

AD-EP-ALL-0205 (Emergency Exposure Controls) Rev 1

**Tools/Equipment/Procedures Needed:**

Calculator

Note tablet

**(Note: Below this line is used only for Initial NRC Exams)**

**Candidate:** \_\_\_\_\_

NAME

Time Start: \_\_\_\_\_

Time Finish: \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

**Examiner:** \_\_\_\_\_

NAME

SIGNATURE

DATE

**Comments**


## **SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS**

1. N/A

## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

A Large Break LOCA has occurred on Unit 3

TSC and OSC are activated

Emergency Dose Limits in effect is announced on the PA system

The following tasks are required to be performed:

<b>TASK</b>	<b>TIME REQUIRED</b>	<b>DOSE RATE</b>
1	8 min	12.45 R/hr
2	11 min	16.75 R/hr
3	9 min	9.35 R/hr

**Note: No dose is received while traveling between tasks.**

### **INITIATING CUE**

Refer to the above information. Tasks 1, 2, and 3 have been assigned to AO "A".

Determine the total dose that AO "A" will receive while completing the above tasks.

State the approval level position(s), if any, required to allow completion of the above tasks for the purpose of protecting valuable property.

### **ROUND ALL CALCULATIONS TO TWO (2) DECIMAL PLACES**

**AO "A" TOTAL DOSE** \_\_\_\_\_

**APPROVAL LEVEL REQUIRED** \_\_\_\_\_

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1		<p>Determine dose received while performing task 1.</p> <p><b><u>STANDARD:</u></b> Determine dose received while performing task 1.  <math>12.45 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 8 \text{ min} = 1.66 \text{ R}</math>  <b>(1.62 to 1.67 R)</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
2		<p>Determine dose received while performing task 2.</p> <p><b><u>STANDARD:</u></b> Determine dose received while performing task 2.  <math>16.75 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 11 \text{ min} = 3.07 \text{ R}</math>  <b>(3.02 to 3.08 R)</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
3		<p>Determine dose received while performing task 3.</p> <p><b><u>STANDARD:</u></b> Determine dose received while performing task 3.  <math>9.35 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 9 \text{ min} = 1.40 \text{ R}</math>  <b>(1.39 to 1.41 R)</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

4		<p>Determine the total dose that will be received from performing Tasks 1, 2, and 3.</p> <p><b><u>STANDARD:</u></b> Determine the total dose that will be received from performing Tasks 1, 2, and 3:  <math>1.66 \text{ R} + 3.07 \text{ R} + 1.40 \text{ R} = \mathbf{6.13 \text{ R} (6.04 \text{ R to } 6.20 \text{ R})}</math></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>
5		<p>State the approval level position(s), if any, required to allow completion of the above tasks to protect valuable property.</p> <p><b><u>STANDARD:</u></b> Candidate determines the dose required to complete Tasks 1, 2, and 3 is &gt; 5 Rem and will require approval from the:</p> <ul style="list-style-type: none"> <li>• <b>Emergency Coordinator (EC)</b></li> </ul> <p><b><i>Examiner Note: Shift Manager would be incorrect since the TSC is activated.</i></b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 1 | This step is required to calculate total dose received.     |
| 2 | This step is required to calculate total dose received.     |
| 3 | This step is required to calculate total dose received.     |
| 4 | This step is required to calculate total dose received.     |
| 5 | This step is required to determine approval level required. |



**CANDIDATE CUE SHEET****(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

A Large Break LOCA has occurred on Unit 3

TSC and OSC are activated

Emergency Dose Limits in effect is announced on the PA system

The following tasks are required to be performed:

<b>TASK</b>	<b>TIME REQUIRED</b>	<b>DOSE RATE</b>
1	8 min	12.45 R/hr
2	11 min	16.75 R/hr
3	9 min	9.35 R/hr

**Note: No dose is received while traveling between tasks.**

**INITIATING CUE**

Refer to the above information. Tasks 1, 2, and 3 have been assigned to AO "A".

Determine the total dose that AO "A" will receive while completing the above tasks.

State the approval level position(s), if any, required to allow completion of the above tasks for the purpose of protecting valuable property.

**ROUND ALL CALCULATIONS TO TWO (2) DECIMAL PLACES****AO "A" TOTAL DOSE \_\_\_\_\_****APPROVAL LEVEL REQUIRED \_\_\_\_\_**

**REGION II**  
**JOB PERFORMANCE MEASURE**

**ADM-S406**  
**DETERMINE THE APPROPRIATE EMERGENCY**  
**ACTION LEVEL**

Alternate Path: No

Alt Path Description: N/A

Time Critical: Yes

Time Critical Criteria: EAL determined within 15 minutes

Prepared By:	_____	Date:	_____
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EP Review By:	_____	Date:	_____
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Reviewed By:	_____	Date:	_____
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Approved By:	_____	Date:	_____
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REGION II  
JOB PERFORMANCE MEASURE

**Task Title:** Determine the Appropriate Emergency Action Level

**Task Number:**

**Alternate Path:** No

**Time Critical:** Yes

**Validation Time:** 15 min

**K/A Rating(s):**

System: Generic  
K/A: 2.4.41  
Rating: 2.9/4.6

**Task Standard:**

Appropriate Emergency Action Level is determined for given plant conditions.

**References:**

RP/0/A/1000/01 (Emergency Classification) Rev 6  
EAL Wallcharts  
BASIS Document (Volume “A”, Section “D” of the Emergency Plan)

**Tools/Equipment/Procedures Needed:**

RP/0/A/1000/01 (Emergency Classification) Rev 6  
EAL Wallcharts  
BASIS Document (Volume “A”, Section “D” of the Emergency Plan)

(Note: Below this line is used only for Initial NRC Exams)

Candidate: \_\_\_\_\_  
NAME

Time Start: \_\_\_\_\_  
Time Finish: \_\_\_\_\_

Performance Rating: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Performance Time: \_\_\_\_\_

Examiner: \_\_\_\_\_  
NAME

\_\_\_\_\_  
SIGNATURE / DATE

**Comments**


## **READ TO OPERATOR**

### **DIRECTIONS TO STUDENT**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS**

Unit 3 at 100% power

B6T-06 (PSW Primary Pump Bkr) is out of service for PM

Both Unit 3 LPSW pumps fail due to rapid clogging of the LPSW Pump's suction strainers

Unit 3 reactor is manually tripped

3A, 3B, and 3C Hotwell Pumps trip and lockout

U3 TD EFDW pump tripped

3A and 3B MD EFDW pumps fail due to loss of cooling water

AOs are unable to cross-connect with Unit 1 or 2 Emergency Feedwater

HPI Forced Cooling has been initiated

Reactor Building pressure = 1 psig rising

### **INITIATING CUE**

The CRS directs you to determine the appropriate Emergency Action Level, per the above information

**Inform the examiner when you have made the classification**

**THIS IS A TIME CRITICAL JPM**

**Note: Do not use Emergency Coordinator's judgment as the basis for classifying the event**

START TIME: \_\_\_\_\_

SEQ STEP	PROC STEP	DESCRIPTION	
1	1	<p>Determine the Emergency Action Level.</p> <p><b><u>STANDARD:</u></b> Candidate refers to the EAL Wallchart EAL- HOT MODES 1, 2, 3 &amp; 4, Table F-1 Fission Product Barrier Threshold Matrix and determines HPI forced cooling initiated is a Potential Loss of the RCS Barrier.</p> <p>Candidate then refers to <b>F</b> Fission Product Barriers FA1.1 - <b>Any</b> loss or <b>any</b> potential loss of either Fuel Clad or RCS barrier (Table F-1).</p> <p>Candidate classifies the event as:</p> <p><b><u>ALERT (FA1.1)</u></b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>CRITICAL STEP</b></p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: \_\_\_\_\_

**CRITICAL STEP EXPLANATIONS****SEQ  
STEP #****Explanation**

- |   |   |
|---|---|
| 1 | This step is required for the candidate to utilize the EAL Wallchart and determine the conditions meet an Alert classification within 15 minutes. |
|---|---|

**CANDIDATE CUE SHEET****(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

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**Operator Note: Complete ALL blanks below.**

**OPERATOR NAME:** \_\_\_\_\_

**EAL CLASSIFICATION: (Include EAL #)**

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