

**FINAL AS-ADMINISTERED SCENARIOS**

**FOR THE DRESDEN INITIAL EXAMINATION - JUNE 2002**

MLD22240058 ✓

# ***Dresden Generating Station***

## **SIMULATOR EXERCISE GUIDE**

**ILT 01-1 NRC EXAM**

**SCENARIO**

**ILT-N-1**

**Rev. 01**

**05/02**

**DEVELOPED BY:**

\_\_\_\_\_  
Exam Author

\_\_\_\_\_  
Date

**APPROVED BY:**

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Facility Representative

\_\_\_\_\_  
Date

| Facility: <u>Dresden</u>   | Scenario No: <u>ILT-N-1</u> | Op-Test No: <u>ILT 01-1</u> |   |
|--|-----------------------------|-----------------------------|---|
| Examiners: _____   |                             | Operators: _____            |   |
| _____  |                             | _____                       |   |
| _____  |                             | _____                       |   |
| <p><u>Initial Conditions:</u> ~33% reactor power; IRM channel 16 out of service; 2B EHC Pump OOS; Unit 3 is in Mode 4.</p> <p><u>Turnover:</u> Unit startup in progress; raise recirc flow, then transfer FWLC to 3-element control.</p> |                             |                             |   |
| Event No.  | Malfunction No.             | Event Type*                 | Event Description   |
| 1  | N/A                         | R NSO<br>SRO                | raise reactor power recirculation flow  |
| 2  | N/A                         | N NSO<br>SRO                | transfer FWLC to 3-element control  |
| 3  | EHD626                      | I ANSO<br>SRO               | spurious opening of main turbine bypass valve   |
| 4  | NIA5POT                     | I NSO                       | ARPM channel 5 fails downscale  |
| 5  | NII15POT<br>B15             | C NSO<br>SRO                | ARPM channel 5 companion IRM 15 spike upscale causing partial half-scam                               |
| 6  | K49<br>T12                  | C ANSO<br>SRO               | main feed breaker to Bus 23-1 trips with failure of emergency diesel generator to start automatically |
| 7  | B12<br>AW4                  | M                           | ALL failure of RPS to deenergize and ARI to initiate  |
| 8  | H31, H32,<br>H33, H44       |                             | ANSO<br>SRO trip of all reactor feed pumps  |

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

Op-Test No: ILT 01-1Scenario No.: ILT-N-1Event No.: 1Page 1 of 1

Event Description: The team raises power using recirculation flow.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>NSO</b>  | Performs the following actions per DGP 01-01, Unit Startup, and DOP 0202-03, Reactor Recirculation Flow Control System Operation:<br>Raises recirculation pump speed using the master controller potentiometer.<br>Verifies expected power increase. |
|      | <b>SRO</b>  | Directs raising reactor power per DGP 01-01, Unit Startup, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, by raising recirculation pump speed.  |
|      |             | <b>ROLE PLAY:</b><br>QNE: request for a ramp rate, respond "limit ramp rate to 250 MWe/hr".  |
|      | <b>ANSO</b> | Monitors panels and assists as directed.   |
|      |             | <b>Event 1 Completion Criteria:</b><br>– Annunciator 902-5 G-8, 1-Element FW Control Active at Hi Flow, received.<br>– Significant power increase<br>– AND, at the direction of the NRC chief examiner.  |

Op-Test No: ILT 01-1      Scenario No.: ILT-N-1      Event No.: 2      Page 1 of 1

Event Description: The crew transfers Feedwater Level Control System to 3-Element control.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>NSO</b>  | <p>Performs the following actions per DOP 0600-06, Feedwater Regulating Valve (FRV) Operation:</p> <ul style="list-style-type: none"> <li>Verifies the AUTO Control mode pushbutton is not amber.</li> <li>Verifies that annunciator 902-5 G-8, 1-Element FW Control Active at Hi Flow, is in alarm.</li> <li>Verifies that FWLCS is in Master Auto.</li> <li>Depresses AUTO pushbutton and verifies that the AUTO and 3-ELEM white indicating lights are lit and the 1-ELEM light goes out.</li> </ul>            |
|      | <b>SRO</b>  | <p>Directs transferring FWLC to 3-Element Control per DOP 0600-06, Feedwater Regulating Valve (FRV) Operation.</p> <p>Note: RPV level may take a couple of inch swing during the transfer to 3-Element Control, so the NSO may take Manual Control of the FRV. If the crew requests Instrument Maintenance (IMD) assistance to check out FWLC, tell the crew that you are time compressing and that IMD reports the FWLC system is functioning normally. The crew should then transfer FWLC back to AUTO Mode.</p> |
|      | <b>ANSO</b> | <p>Monitors panels and assists as directed.</p>  |
|      |             | <p><b>Event 2 Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>– FWLC in 3-Element Control.</li> <li>– AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1      Scenario No.: ILT-N-1      Event No.: 3      Page 1 of 1

Event Description: The main turbine bypass valve #1 opens spuriously. The valve is closed when the ANSO takes manual action at the EHC control panel

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 1, which works in conjunction with trigger 2 to open the #1 turbine bypass valve until the partial open light is lit</p> <p>If after 2 minutes the team has not noticed the bypass valve open, activate trigger 16, which works in conjunction with trigger 17 to open the #1 turbine bypass valve until the full open light is lit and the bypass valve open alarm is received.</p> <p>Note: when the crew depresses the bypass valve jack decrease pushbutton, triggers 18 and 19 will activate to delete the bypass jack increase pushbutton and light overrides.</p> |
|      | <b>ANSO</b> | <p>Performs the following actions per DAN 902-7 G-3, Turb Byp Vlv Open, and/or DOA 5650-03, Turbine Control Valve or Bypass Valve Failed Open, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies reactor pressure stable</li> <li><input type="checkbox"/> Verifies bypass valve should be closed</li> <li><input type="checkbox"/> Closes the bypass valve with the bypass valve jack.</li> </ul>   |
|      | <b>NSO</b>  | <p>Acknowledges and announces alarm 902-5 C-8, Main Stm-Turbine Stm 10% Mismatch. He should recognize it alarmed due to the bypass valve opening.</p>  |
|      | <b>SRO</b>  | <p>Enters and directs performance of DOA 5650-03, Turbine Control Valve or Bypass Valve Failed Open.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Places startup on hold.</li> <li><input type="checkbox"/> Notifies Shift Manager.</li> </ul> <p>May refer to the site technical requirements and determine:</p> <p>ITS 3.3.1.1 is not applicable.</p> <p>ITS 3.3.6.1 is not applicable.</p> <p>ITS 3.7.7 is not applicable.</p>   |
|      |             | <p><b><u>ROLE PLAY:</u></b></p> <p>After the crew closes the bypass valve, call the control room as the IM Supervisor and report "my crew was hooking up a Fluke to take readings on the bypass valve control circuits in panel 903-31 in the AEER. The technician thinks he inadvertently shorted between two terminal points that may have caused the bypass jack to operate. Then he discovered he was in the wrong panel. He was in the 902-31 panel instead of the 903-31 panel. The Unit 2 EHC Control system should operate normally now".</p> <p>Respond as groups notified.</p>   |
|      |             | <p><b><u>Event 3 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- Bypass valve closed</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1      Scenario No.: ILT-N-1      Event No.: 4 & 5      Page 1 of 1

Event Description: APRM channel 5 fails downscale. IRM 15 spikes upscale and a partial half-scam occurs. The NSO inserts a complete half-scam. The SRO addresses the technical specification requirements for the APRM channel. The APRM channel is bypassed but the half-scam should not be reset by the NSO.

| Time | Position | Applicant's Actions or Behavior   |
|------|----------|---|
|      |          | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 3, which fails APRM 5 downscale and 5 seconds later spikes IRM 15 upscale.</p> <p>NOTE: trigger 4 activates on the half scam signal to remove IRM 15 upscale so it appears to be a spike.</p> <p>NOTE: If the team attempts to reset the half scam, trigger 5 will activate to fail the fuses for scam groups B2 and B3.</p>                |
|      | NSO      | <p>Performs the following actions per DOA 0500-02, Partial 1/2 or Full Scram Actuation:</p> <ul style="list-style-type: none"> <li>Recognizes and announces partial half scam.</li> <li>Manually scrams RPS channel B. (immediate action)</li> <li>Determines all channel B scam solenoid lights are off.</li> </ul>  |
|      | SRO      | <p>Enters and directs performance of DOA 0500-02, Partial 1/2 or Full Scram Actuation.</p>  |
|      | NSO      | <p>Performs the following actions per DAN 902-5 C-6, APRM Downscale, as directed:</p> <ul style="list-style-type: none"> <li>Compares to other APRMs.</li> <li>Notifies SRO</li> <li>Bypasses APRM channel 5.</li> </ul>  |
|      | ANSO     | <p>Performs the following actions per DAN 902-5 C-6, APRM Downscale, as directed:</p> <ul style="list-style-type: none"> <li>Checks APRM parameters on 902-37 panel.</li> </ul>   |
|      | SRO      | <p>References plant Technical documents:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> ITS Table 3.3.1.1.A-1, verifies sufficient RPS APRM trip channels (2 available / 2 required for B channel)</li> <li><input type="checkbox"/> TRM Table T3.3.a-1, verifies sufficient APRM rod block channels available (5 available / 4 required)</li> </ul> <p>Directs bypassing APRM 5.</p> <p>Notifies the Shift Manager and IMD.</p> |
|      |          | <p><b><u>Events 4 &amp; 5 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- RPS channel B manually scrambled.</li> <li>- APRM 5 bypassed.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-1Event No.: 6Page 1 of 2

Event Description: The main feed breaker to Bus 23-1 then trips and the 2/3 EDG fails to automatically start. The 2/3 EDG does run when manually started by the ANSO and power is restored to Bus 23-1.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>ANSO</b> | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 6, which inserts failure of RPS to deenergize, pulls ARI fuses, and main feed breaker to MCC 23-1 trip with failure of 2/3 EDG to start automatically</p> <p>Diagnoses that Bus 23-1 has lost power and that the 2/3 EDG failed to auto start to pick up the bus</p> <p>Should perform the following actions of DGA 12, Partial or Complete Loss of AC Power, and DOA 6600-01, Diesel Generator Failure:</p> <ul style="list-style-type: none"> <li>Places the 2/3 EDG control switch to start.</li> <li>Dispatches an operator to the 2/3 EDG with Attachment A.</li> <li>Verifies power restored to Bus 23-1 and Bus 28.</li> <li>Resets annunciators and verifies the ones remaining are expected.</li> <li>Dispatches an operator to check the U2 EDG trouble alarm</li> </ul> <p>May perform the following actions of DOA 6500-10, 4KV Circuit Breaker Trip if time permits:</p> <ul style="list-style-type: none"> <li>Dispatches NLO to check for signs of fault or overload.</li> <li>Verifies no other reason for trip.</li> </ul> |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to check Bus 23-1 feed breaker at Bus 23 (wait 3 min):</p> <p>Report "The Bus 23-1 feed breaker at Bus 23 is open and there are no targets up at the breaker".</p> <p>NLO to check Bus 23-1 feed breaker at Bus 23-1 (wait 3 min):</p> <p>Report "The Bus 23-1 feed breaker at Bus 23-1 is open and there are no targets up at the breaker".</p> <p>NLO to perform Attachment A of DOA 6600-01:</p> <p>Respond "I will get a copy of Attachment A of DOA 6600-01 and complete it for the 2/3 EDG".</p> <p><b><u>SIMULATOR OPERATOR/ROLE PLAY:</u></b></p> <p>NLO to check U2 EDG trouble alarm (wait 3 min):</p> <p>Activate trigger 12 then report "the alarms were circulating lube oil and turbo charger lube oil pumps trouble alarms. The pumps are operating normally and the alarms have reset".</p>  |



Op-Test No: ILT 01-1Scenario No.: ILT-N-1Event No.: 6Page 2 of 2

Event Description: The main feed breaker to Bus 23-1 then trips and the 2/3 EDG fails to automatically start. The 2/3 EDG does run when manually started by the ANSO and power is restored to Bus 23-1.

| Time | Position   | Applicant's Actions or Behavior  |
|------|------------|--|
|      | <b>SRO</b> | <p>Enters and directs actions for the following as time permits:</p> <ul style="list-style-type: none"> <li>DGA 12, Partial or Complete Loss of AC Power.</li> <li>DOA 6600-01, Diesel Generator Failure.</li> <li>DOA 0500-05, Loss of Reactor Protection System Bus.</li> <li>DOA 6500-01, 4KV Bus Failure.</li> <li>DOA 6500-10, 4KV Circuit Breaker Trip.</li> </ul> <p>The major actions to direct are:</p> <ul style="list-style-type: none"> <li>Starting the 2/3 EDG</li> <li>Verifying major loads reenergize.</li> </ul>   |
|      | <b>SRO</b> | <p>Notifies Shift Manager and EMD.</p> <p><b><u>Role Play:</u></b></p> <p>Acknowledge requests for actions not already addressed earlier. If the crew request status of previous requests, report "I am working on it as fast as I can".</p> <p>QNE to check thermal limits.</p> <p>Report "No thermal limits where violated".</p> <p><b>NOTE:</b> The intent here is to proceed to the next event soon after the 2/3 EDG is started and the crew has begun to address recovery of equipment. Equipment recovery is not necessary for the remainder of the scenario.</p> <p><b><u>Event 6 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- 2/3 EDG supplying Bus 23-1.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul> |

Event Description: A spurious RPS Channel A scram begins an ATWS condition. The team should perform the ATWS DEOP and insert the control rods. The RFPs trip and the crew should use HPCI for RPV level control.

| Time  | Position   | Applicant's Actions or Behavior   |   |  |
|---|--|---|---|--|
|   |  | <b><u>SIMULATOR OPERATOR:</u></b><br>At the discretion of the NRC chief examiner, activate trigger 7, which causes a spurious RPS channel A half scam and trips the RFPs.   |   |  |
|   | <b>NSO</b>   | Performs the following actions per DGP 02-03, Reactor Scram:<br>Presses scram pushbuttons<br>Places mode switch in shutdown<br>Check rods inserted; discovers rods not inserted.<br>Initiates ARI, checks rods, announces ATWS condition.<br><br>Performs the following actions per DGP 02-03, Reactor Scram:<br>Verifies turbine and generator tripped (only if Group 1 has occurred or reactor power has dropped low enough that this should occur)<br>Inserts SRM/IRMs   |   |  |
|   | <b>NSO / ANSO</b>  | Performs DEOP 400-5, Failure to Scram, actions as directed:<br>Places ADS to inhibit<br>Places both CS pumps in PTL<br><br><u>Power Leg</u><br>Inserts IRMs & SRMs<br>√ <b>Performs Alternate Rod Insertion. (see specific actions below)</b><br>√ <b>May Inject SBLC.</b><br><br><u>Level Leg</u> <table><tr><td><b>Rx Power &gt;6%</b><br/>√ <b>Terminates and Prevents injection except boron and CRD until RPV/L is ≤ -35 in.</b><br/>√ <b>Maintains RPV/L between -164 in. and the level lowered to.</b></td><td><b>Rx Power ≤6%</b><br/>Maintains level between -164 and 48 in.</td></tr></table><br><u>Pressure Leg</u><br>Verifies turbine/bypass valves maintaining RPV/P <1060 psig.<br>If MSIVs isolate, maintains <1060 psig using IC, ADSVs and / or HPCI. | <b>Rx Power &gt;6%</b><br>√ <b>Terminates and Prevents injection except boron and CRD until RPV/L is ≤ -35 in.</b><br>√ <b>Maintains RPV/L between -164 in. and the level lowered to.</b> | <b>Rx Power ≤6%</b><br>Maintains level between -164 and 48 in. |
| <b>Rx Power &gt;6%</b><br>√ <b>Terminates and Prevents injection except boron and CRD until RPV/L is ≤ -35 in.</b><br>√ <b>Maintains RPV/L between -164 in. and the level lowered to.</b> | <b>Rx Power ≤6%</b><br>Maintains level between -164 and 48 in. |   |   |  |
|   |  | <b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br>Operator to jumper the MSIV Group1 -59 in. and offgas hi hi radiation isolations (wait 5 min):<br><br>Activate trigger 8 (jumps the MSIV Group1 -59 in. and offgas hi hi radiation isolations) and report "the MSIV Group1 -59 in. and offgas hi hi radiation isolations are jumpered".  |   |  |

Event Description: A spurious RPS Channel A scram begins an ATWS condition. The team should perform the ATWS DEOP and insert the control rods. The RFPs trip and the crew should use HPCI for RPV level control.

| Time  | Position                                  | Applicant's Actions or Behavior   |                        |                     |   |   |   |  |
|---|---|---|------------------------|---------------------|---|---|---|--|
|   | <b>SRO</b>                                | <p>Enters and directs performance of DGP 02-03, Reactor Scram, and DEOP 100, RPV Control.</p> <p>Due to report of ATWS condition, exits DEOP 100 and enters and directs performance of DEOP 400-05, Failure to Scram.</p> <p>Placing ADS to inhibit</p> <p>Placing both CS pumps in PTL</p> <p><u>Power Leg</u></p> <p>√ <b>Directs any of the following control rod insertion methods</b> (first two most preferred) per DEOP 500-05, Alternate Insertion of Control Rods:</p> <ul style="list-style-type: none"><li>• step G.2: pulling scram channel A solenoid power supply fuses.</li><li>• step G.4: venting the scram air header.</li><li>• step G.5: using the scram test switches.</li><li>• step G.6: manually driving of withdrawn control rods.</li></ul> <p>√ <b>May direct Injecting SBLC</b></p> <p><u>Level Leg</u></p> <p>Verification water level instruments are accurate</p> <p>Verification any required automatic actions have occurred</p> <p>Directing jumpers installed for MSIV low level and Off Gas high Rad isolations</p> <table><tr><td><u>Rx Power &gt;6%</u></td><td><u>Rx Power ≤6%</u></td></tr><tr><td>√ <b>Terminating and Preventing injection except boron and CRD</b> until RPV/L is ≤ -35 in.</td><td>Maintaining level between -164 and 48 in.</td></tr><tr><td>√ <b>Maintaining RPV/L between -164 in. and the level lowered to.</b></td><td></td></tr></table> <p><u>Pressure Leg</u></p> <p>Maintaining &lt;1060 psig using turbine/bypass valves.</p> <p>If MSIVs isolate, maintaining &lt;1060 psig using IC, ADSVs or HPCI.</p> | <u>Rx Power &gt;6%</u> | <u>Rx Power ≤6%</u> | √ <b>Terminating and Preventing injection except boron and CRD</b> until RPV/L is ≤ -35 in. | Maintaining level between -164 and 48 in. | √ <b>Maintaining RPV/L between -164 in. and the level lowered to.</b> |  |
| <u>Rx Power &gt;6%</u>  | <u>Rx Power ≤6%</u>                       |   |                        |                     |   |   |   |  |
| √ <b>Terminating and Preventing injection except boron and CRD</b> until RPV/L is ≤ -35 in. | Maintaining level between -164 and 48 in. |   |                        |                     |   |   |   |  |
| √ <b>Maintaining RPV/L between -164 in. and the level lowered to.</b>                       |   |   |                        |                     |   |   |   |  |

Event Description: A spurious RPS Channel A scram begins an ATWS condition. The team should perform the ATWS DEOP and insert the control rods. The RFPs trip and the crew should use HPCI for RPV level control.

| Time | Position | Applicant's Actions or Behavior  |
|------|----------|--|
|      |          | <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p><b>Note:</b> For the first two requested actions below, wait about 10 minutes and / or at the discretion of the NRC chief examiner</p> <ol style="list-style-type: none"> <li>1. Operator to pull scram channel A solenoid power supply fuses:<br/>Activate trigger 10 (pulls Channel A RPS fuses and trips reactor feed pumps) and then after the fuses are all pulled report "the scram channel A solenoid power supply fuses are pulled".</li> <li>2. Operator to vent the scram air header:<br/>Activate trigger 11 (vents the scram air header) and report "I have vented the scram air header".</li> <li>3. Operator to use the individual scram test switches (wait 2 min):<br/>Go to Instructor Station screen ROD5 and begin simulating flipping the scram test switches. Follow the guidance in DEOP 500-05 for selecting rods.</li> </ol> |
|      | NSO      | <p>If directed, attempts to drive withdrawn control rods in per step G.6 of DEOP 500-05, Alternate Insertion of Control Rods:<br/>May close CRD 25 charging water valve.<br/>Throttles open the CRD FCV.<br/>May start a second CRD pump.<br/>May maximize drive water pressure using the CRD 8 valve<br/>Bypasses the RWM.<br/>Applies an insert signal to insert rods in the following order:</p> <ul style="list-style-type: none"> <li>• intermediate 16-32</li> <li>• deep 4-14</li> <li>• shallow 34-48</li> </ul>   |
|      |          | <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>NLO to close CRD 25 valve (wait 3 min):<br/>Activate trigger 9 (closes the CRD 25 valve) and report "the CRD 25 valve is closed".</p>  |
|      | NSO      | Reports that all rods are inserted.  |
|      | ANSO     | Restores RPV level to +8 to +48 inches as directed.<br>Begins cooldown as directed.  |
|      | SRO      | When receives report that all rods are inserted, exits DEOP 400-05, Failure to Scram and enters DEOP 100 and directs:<br>Controlling RPV water level between +8 to +48 inches.<br>May direct depressurizing the RPV at <100 °F/hr.   |

Op-Test No: ILT 01-1Scenario No.: ILT-N-1Event No.: 7 & 8Page 4 of 4

Event Description: A spurious RPS Channel A scram begins an ATWS condition. The team should perform the ATWS DEOP and insert the control rods. The RFPs trip and the crew should use HPCI for RPV level control.

| Time | Position | Applicant's Actions or Behavior  |
|------|----------|--|
|      |          | <p><b>Critical Tasks: (identified by ✓ in guide)</b></p> <p>With a reactor scram required and the reactor not shutdown, <b>TAKE ACTION TO REDUCE POWER</b> by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.</p> <p>During an ATWS with conditions met to perform power/level control <b>TERMINATE AND PREVENT INJECTION</b>, with exception of boron and CRD, into the RPV until conditions are met to re-establish injection. (May not apply if power becomes &lt;6% before the step requiring this action is reached)</p> <p>When conditions are met to establish injection use available injection systems to <b>MAINTAIN</b> RPV water level above -164".</p> <p><b>Scenario Completion Criteria:</b></p> <ul style="list-style-type: none"><li>- Control rods inserted.</li><li>- Plant stabilized.</li><li>- AND, at the direction of the NRC chief examiner.</li></ul> |

# ***Dresden Generating Station***

## **SIMULATOR EXERCISE GUIDE**

**ILT 01-1 NRC EXAM**

**SCENARIO**

**ILT-N-2**

**Rev. 01**

**05/02**

**DEVELOPED BY:**

\_\_\_\_\_  
Exam Author

\_\_\_\_\_  
Date

**APPROVED BY:**

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

|                          |                             |                             |
|--------------------------|-----------------------------|-----------------------------|
| Facility: <u>Dresden</u> | Scenario No: <u>ILT-N-2</u> | Op-Test No: <u>ILT 01-1</u> |
| Examiners: _____         |                             | Operators: _____            |
| _____                    |                             | _____                       |
| _____                    |                             | _____                       |

**Initial Conditions:** Unit in Mode 2 at approximately 2% reactor power; IRM channel 16 out of service; 2B EHC Pump OOS; Unit 3 is in Mode 4.

**Turnover:** Unit startup in progress; return TBCCW pump 2B to service following maintenance, then continue power ascension

| Event No. | Malf. No. | Event Type* |          | Event Description   |
|-----------|-----------|-------------|----------|---|
| 1         | N/A       | N           | ANSO SRO | swap TBCCW pumps  |
| 2         | N/A       | R           | NSO SRO  | raise reactor power by withdrawing control rods           |
| 3         | RODC13DO  | C           | NSO SRO  | control rod double notches during withdrawal              |
| 4         | NII12POT  | I           | NSO SRO  | IRM channel fails upscale                                 |
| 5         | PCPDWTOR  | I           | ANSO SRO | drywell to torus differential pressure controller failure |
| 5a        | AT23      | I           | ANSO SRO | fails 2A Rx Bldg to Torus vacuum breaker open             |
| 6         | HP8       | C           | ANSO SRO | circulating water pump trip                               |
| 7         | CSBRKSEV  | M           | ANSO SRO | lowering torus level from ECCS suction line break         |
| 8         | J33       | C           | ANSO SRO | loss of EHC system  |

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

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 1Page 1 of 1

Event Description: Maintenance has been completed on TBCCW pump 2B and the SRO directs the ANSO to switch running pumps and place the TBCCW pump 2B in service.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>ANSO</b> | <p>Performs the following actions per DOP 3800-01, Turbine Building Closed Cooling Water System(TBCCW):</p> <ul style="list-style-type: none"> <li>Directs NLO to verify 2B TBCCW pump suction and discharge valves open.</li> <li>Directs NLO to verify 2B TBCCW pump oil levels.</li> <li>Starts 2B TBCCW pump and verifies proper operation.</li> <li>Stops 2A TBCCW pump.</li> <li>Verifies system parameters normal.</li> </ul> <p><b>ROLE PLAY:</b></p> <p>NLO to verify 2B TBCCW pump suction and discharge valves open (wait 1 min):</p> <p>Report "2B TBCCW pump suction and discharge valves are open".</p> <p>NLO to verify 2B TBCCW pump oil levels (wait 1 min):</p> <p>Report "2B TBCCW pump oil levels are normal".</p> <p>NLO to report on operation of 2B TBCCW pump:</p> <p>Report "2B TBCCW pump is operating normally".</p> <p>NLO to check TBCCW system parameters after 2A pump is secured: (wait 1 min)</p> <p>Report "TBCCW system parameters are normal".</p> |
|      | <b>SRO</b>  | Directs swapping from 2A TBCCW pump to 2B TBCCW pump per DOP 3800-01, Turbine Building Closed Cooling Water System (TBCCW).  |
|      | <b>NSO</b>  | Monitors panels and assists as directed.   |
|      |             | <p><b>Event 1 Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>– 2B TBCCW pump running and 2A TBCCW pump stopped.</li> <li>– AND, at the direction of the NRC chief examiner.</li> </ul>  |



Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 2Page 1 of 1

Event Description: The NSO, as directed by the SRO, then continues the power ascension for unit startup by control rod withdrawal.

| Time | Position                   | Applicant's Actions or Behavior   |
|------|----------------------------|---|
|      | <b>NSO</b>                 | <p>Performs the following actions per DOP 0400-01, Reactor Manual Control System Operation, and DGP 03-04, Control Rod Movements, as directed</p> <p><u>Verifies the following prior to moving any control rod:</u></p> <ul style="list-style-type: none"> <li>Control rod selected on the select matrix is correct rod.</li> <li>Second Verification requirements satisfied.</li> <li>Rod Out Permit light is illuminated.</li> <li>Drive water pressure at nominal 260 psid.</li> </ul> <p><u>Withdraws rods as follows:</u></p> <ul style="list-style-type: none"> <li>Moves Rod Out Notch Override (RONOR) Switch to NOTCH OVERRIDE position (use of RONOR switch is optional) and the Rod Movement Control switch to ROD OUT.</li> <li>Verifies ON light illuminated and proper Control Rod Timer operation.</li> <li>Releases switches before target position is reached.</li> <li>Verifies rod settles to target position and proper response of nuclear instrumentation.</li> </ul> |
|      | <b>ANSO / or Surrogate</b> | <p>Performs second verification checks.</p> <p><u>For first rod in a step:</u></p> <ul style="list-style-type: none"> <li>Verifies correct control rod pattern</li> <li>Verifies correct step and array.</li> <li>Verifies RWM rod blocks enabled</li> </ul> <p><u>For all rods moved:</u></p> <ul style="list-style-type: none"> <li>Verifies correct control rod selected.</li> <li>Verifies planned control rod motion is correct.</li> <li>Immediately notify the NSO of errors during rod motion.</li> <li>Verifies control rod at target position.</li> </ul>   |
|      | <b>SRO</b>                 | <p>Directs pulling control rods.</p> <ul style="list-style-type: none"> <li>Reviews REMA.</li> <li>Designates second verifier.</li> <li>Directs NSO to pull rods.</li> </ul>  |
|      |                            | <p><b><u>Event 2 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- Sufficient power increase.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 3Page 1 of 1

Event Description: During the control rod withdrawal, a control rod double notches beyond the withdraw limit and must be repositioned.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>NSO</b>  | <p>Two possible paths can occur:</p> <p><b>Either:</b> Observes and announces that control rod N-13 has moved to position 14 (1 notch beyond its target position) and responds to alarms:<br/> 902-5 B-3, Rod Worth Min Block<br/> 902-5 C-3, Rod Out Block</p> <p>Should perform the following actions per DOA 0300-12, Mispositioned Control Rod:<br/> Discontinues rod movement and notifies SRO.<br/> Moves the mispositioned rod to its target position.<br/> Records in DOS-0300-06, Control Rod Abnormality Record.</p> <p><b>Or:</b> When observes rod N-13 moving past its target position of 12, then:<br/> Uses the Emerg Rod In position of the Rod Out Notch Override switch to move the rod back to its target position prior to it latching in to position 14.<br/> Notifies the SRO.<br/> Records in DOS-0300-06, Control Rod Abnormality Record.</p> |
|      | <b>SRO</b>  | <p>May enter and direct performance of DOA 0300-12, Mispositioned Control Rod.</p> <p>Notifies the Shift Manager.<br/> May refer to ITS 3.1.3 and determine that no actions are required.</p> <p>May enter DOA 0300-05, Inoperable or Failed Control Rod Drives.</p> <p><b>ROLE PLAY:</b></p> <p>Respond as the Shift Manager.</p> <p><b>QNE:</b> If crew requests guidance from the QNE, respond "I recommend inserting rod N-13 to position 12."</p>  |
|      | <b>ANSO</b> | <p>Monitors panels and assists as directed.</p> <p><b>Event 3 Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>- Rod returned to target position</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 4Page 1 of 1

Event Description: IRM channel 12 then fails upscale and a half-scam occurs on the RPS "A" channel. The NSO bypasses the failed IRM channel and the SRO addresses the technical specification requirements for the failure.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 1, fails IRM 12 channel upscale</p>  |
|      | <b>NSO</b>  | <p>Should perform the following actions per DAN 902-5 C-15:</p> <p>If not in the RUN Mode, verifies the following occurred:</p> <ul style="list-style-type: none"> <li>• Channel A half scram</li> <li>• Rod Block.</li> </ul> <p>Verifies IRM 12 readings against other IRMs on 902-5 panel.</p> <p>Verifies IRM range switch in correct position</p> <p>Bypasses IRM 12 after T. S. compliance verified by SRO.</p> <p>Resets RPS channel A per DOP 0500-07, Insertion/Reset of Manual Half Scram, as follows:</p> <ul style="list-style-type: none"> <li>• Verifies half scram no longer required</li> <li>• Turns the Scram Reset switch in each direction and verifies all eight white group solenoid lights are lit.</li> <li>• Verifies alarm 902-5 A-10, Channel A Manual Trip, resets.</li> </ul> |
|      | <b>ANSO</b> | <p>Should perform the following actions per DAN 902-5 C-10:</p> <p>Verifies IRM 12 readings against other IRMs on 902-36 panel.</p> <p>Verifies IRM 12 function switch in operate.</p> <p>Verifies power supplies operating properly.</p>  |
|      | <b>SRO</b>  | <p>Should references plant technical documents:</p> <ul style="list-style-type: none"> <li>• ITS Table 3.3.1.1.A-1, verifies sufficient RPS IRM trip channels (3 available / 3 required for A channel) for Mode 2.</li> <li>• TRM Table T3.3.a-1, verifies sufficient APRM rod block channels available (7 available / 6 required) for Mode 2.</li> </ul> <p>Should direct IRM 12 bypassed and the half scram reset per DOP 0500-07, Insertion/Reset of Manual Half Scram.</p> <p>Notifies the Shift Manager and IMD.</p>  |
|      |             | <p><b><u>Role Play:</u></b></p> <p>Respond as persons notified.</p>  |
|      |             | <p><b><u>Event 4 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- IRM 12 bypassed.</li> <li>- Half scram reset.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 5Page 1 of 1

Event Description: Drywell to Torus differential pressure then begins to decrease and pressure control is regained when the ANSO takes manual control of the Drywell to Torus differential pressure controller.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 2, which causes drywell to torus differential pressure controller input to fail high causing the demand to fail to 0%.</p>   |
|      | <b>ANSO</b> | <p>Acknowledges and announces alarm 902-4 B-15, DW to Torus DP Hi/Lo, and performs the following:</p> <p>Should diagnose failure of the drywell to torus differential pressure controller AUTO mode of operation.</p> <p>Performs any of the following as directed:</p> <p>Places the drywell to torus differential pressure controller to MAN and controls the drywell to torus differential pressure manually;</p> <p>AND / OR, vents the torus to Reactor Building Ventilation per DOP 1600-01, Normal Pressure Control of the Drywell or Torus:</p> <ul style="list-style-type: none"> <li>• Verifies atmospheric sample results allow venting.</li> <li>• Verifies U2 Reactor Building Ventilation operating.</li> <li>• Verifies AO 2-1601-91 open.</li> <li>• Opens AO 2-1601-24. (closes when desired to stop venting)</li> <li>• Opens AO 2-1601-61. (closes when desired to stop venting)</li> </ul> <p>May close AO 2-1601-58 per DOP 1600-05, Primary Containment Inerting and Atmosphere Control.</p> |
|      | <b>SRO</b>  | <p>To maintain Primary Containment pressures to those specified in DOP 1600-05, Primary Containment Inerting and Atmosphere Control, should direct performance of any of the following:</p> <p>Placing the drywell torus differential pressure controller to MAN and controlling Drywell to Torus differential pressure manually;</p> <p>AND / OR, venting the torus to Reactor Building Ventilation per DOP 1600-01, Normal Pressure Control of the Drywell or Torus, to maintain the required differential pressure.</p> <p>May direct closing AO 2-1601-58 per DOP 1600-05, Primary Containment Inerting and Atmosphere Control.</p> <p>May notify IMD.</p>   |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p>  |
|      |             | <p><b><u>ROLE PLAY:</u></b></p> <p>IMD to investigate drywell pressure controller:</p> <p>Respond "I will send a technician to investigate".</p>   |
|      |             | <p><b><u>Event 5 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- Drywell to Torus differential pressure control in progress.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 5.aPage 1 of 1

Event Description: A drifting Rx Bldg to Torus differential pressure instrument will cause the 2A Rx Bldg to Torus Vacuum Breaker to fail open. The Unit Supervisor should reference the Technical Specifications.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 6, which causes 2A Rx Bldg to Torus Vacuum Breaker to fail open.</p>  |
|      | <b>ANSO</b> | <p>Acknowledges and announces alarms 902-3 B-14, and 902-3 C14, and performs the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Evaluates Rx Bldg to Torus DP to determine if valve should have opened.</li> <li><input type="checkbox"/> Directs a NLO to check the AO 2-1601-20A valve.</li> <li><input type="checkbox"/> Notifies IMD to perform DIS 1600-3, Torus to Reactor Building Vacuum Breakers Trip Unit Calibration.</li> </ul>   |
|      | <b>SRO</b>  | <p>References Technical Specifications and determines:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> ITS 3.6.1.7.A, close the open vacuum breaker within 7 days.</li> <li><input type="checkbox"/> ITS 3.0.4, cannot change mode.</li> </ul> <p>Notifies Shift Manager and IMD.</p>   |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to investigate 2-1601-20A, 2A Rx Bldg to Torus Vacuum Breaker: (wait 3 min)</p> <p>Report "the 2-1601-20A, 2A Rx Bldg to Torus Vacuum Breaker is open. I see nothing abnormal"</p> <p>Respond as groups notified.</p> <p><b><u>Event 5a Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- Unit Supervisor has addressed Technical Specifications.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul> |

Op-Test No: ILT 01-1Scenario No.: ILT-N-2Event No.: 6Page 1 of 1

Event Description: Circulating water pump 2C then trips on overload and the ANSO manually starts circulating water pump 2A to maintain condenser vacuum.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>ANSO</b> | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 3, which trips 2C Circulating Water pump.</p> <p>Performs the following actions per DAN 902-7 A-15, Circ Wtr PP Trip, DOA 4400-01, Circulating Water System Failure, and DOA 6500-10, 4KV Circuit Breaker Trip, as directed:</p> <ul style="list-style-type: none"> <li>Starts 2B Circulating Water pump. (immediate action)</li> <li>Verifies condenser vacuum returning to normal.</li> <li>Verifies 2C Circulating Water pump discharge valve closes.</li> <li>Sends NLO to check 2C Circulating Water pump breaker and operation of 2B Circulating Water pump.</li> <li>Places 2C Circulating Water pump control switch in PTL.</li> <li>Verifies Circulating Water Flow reversal valves lined up normally.</li> <li>May send NLO to check cribhouse bar racks and traveling screens.</li> </ul> |
|      | <b>SRO</b>  | <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to 2C Circulating Water pump breaker (wait 3 min)</p> <p>Report "2C Circulating Water pump breaker has an overcurrent target up".</p> <p>NLO to check 2B Circulating Water pump operation (wait 2 min)</p> <p>Report "2B Circulating Water pump is operating normally".</p> <p>NLO to check cribhouse bar racks and traveling screens (wait 3 min)</p> <p>Report "the cribhouse bar racks and traveling screens are clear".</p> <p>Enters and directs performance of DOA 4400-01, Circulating Water System Failure, and DOA 6500-10, 4KV Circuit Breaker Trip.</p> <p>Notifies the Shift Manager and EMD.</p>   |
|      | <b>NSO</b>  | <p><b><u>Role Play:</u></b></p> <p>Respond as persons notified.</p> <p>Monitors panels and assists as directed.</p>  |
|      |             | <p><b><u>Event 6 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- 2B Circulating Water pump started.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>   |

Event Description: An ECCS suction line break occurs resulting in a lowering torus water level. HPCI spuriously initiates. HPCI should be secured, the reactor should be scrammed and an emergency depressurization should be performed as directed by the DEOP for primary containment control.

| Time | Position | Applicant's Actions or Behavior  |
|------|----------|--|
|      | ANSO     | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 4, which starts an ECCS suction line break in the torus basement and spuriously initiates HPCI after 5 minutes.</p> <p>When the unit is manually scrammed, verify trigger 5 automatically activates to trip 2A EHC Pump.</p> <p><b>Note:</b> It takes about 30 minutes for torus level to reach 12 feet. At the discretion of the lead NRC examiner, use the cues later in this event to jump ahead in time to expedite the level drop if desired.</p> <p>Reports the following alarms:</p> <ul style="list-style-type: none"> <li>• 902-4 C-23 Torus Narrow Range Wtr Lvl Lo</li> <li>• 923-4 A-3 U2 E RBFD Sump Lvl Hi Hi</li> <li>• 923-4 B-2 U2 W RBFD Sump Lvl Hi Hi</li> </ul> <p>Checks the torus narrow range level indicator. Reports level dropping.</p> <p>Directs NLO to perform DOS 1600-02, Torus Level Verification Using Local Sight Glass.</p> <p>Directs NLO to investigate leakage to torus basement.</p> <p>Verifies proper operation of the RBFD Sump pumps. (will require resetting the Group 2 isolation at both the 902-5 panel and the 923-4 panel for the sump pumps to operate if a Group 2 Isolation occurs)</p> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to perform DOS 1600-02, Torus Level Verification Using Local Sight Glass: (wait 5 min)</p> <p>Report "Local Torus level is (use value from variable ppc232, unless it is &lt;20", then report it is below the sightglass)".</p> <p>NLO to investigate leakage (wait 2 min):</p> <p>Report "There is a large rupture from a pipe attached between the torus shell and the torus suction ring header near the East LPCI Corner room. The torus basement floor is covered with water". There is no valve on the line".</p> <p>NLO to report LPCI corner status (wait 2 min):</p> <p>Report "there is no water in either LPCI corner room".</p> <p>Maintenance to determine if the leak can be stopped (wait 3 min);</p> <p>Report "Maintenance cannot stop the leak".</p> |



Event Description: An ECCS suction line break occurs resulting in a lowering torus water level. HPCI spuriously initiates. HPCI should be secured, the reactor should be scrammed and an emergency depressurization should be performed as directed by the DEOP for primary containment control.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>ANSO</b> | <p>Performs the following actions per DEOP 200-01, Primary Containment Control, as directed:</p> <p>May attempt to add water to the torus by opening the HPCI 14 valve.</p> <p>Monitors/Reports DEOP 200-01 entry parameters.</p> <p>✓ <b>Prevents HPCI operation</b> by placing the HPCI 4 valve in PTL.</p>   |
|      | <b>ANSO</b> | <p>Performs the following actions per DOA 0040-02, Localized Flooding in Plant, as directed:</p> <p>Makes PA announcement.</p> <p>Directs NLO to investigate leakage to torus basement.</p> <p>Notifies Radiation Protection and Security as time permits.</p> <p><b>Cue: (if desired for time compression)</b> (to be handled by Lead Examiner)</p> <p>When torus level is &lt; 14.5 feet and/or at the discretion of the lead NRC examiner, cue the crew that we are taking a time jump and that both torus wide range level meters indicate 12.5 feet and are dropping at about 0.1 ft per minute.</p>   |
|      | <b>SRO</b>  | <p>Enters and directs performance of DEOP 0200-01, Primary Containment Control:</p> <p>May attempt to add water to the torus by opening the HPCI 14 valve.</p> <p>May decide to anticipate RPV Blowdown:</p> <ul style="list-style-type: none"> <li>• directs a manual scram per DGP 02-03, Reactor Scram.</li> <li>• enters DEOP 100, RPV Control.</li> <li>• directs opening turbine bypass valves.</li> </ul> <p>✓ <b>Directs ANSO to secure HPCI</b> by placing the HPCI 4 valve in PTL before torus level reaches 12 feet.</p> <p>Enters DEOP 0300-01, Secondary Containment Control, and directs:</p> <p>If Reactor Building Ventilation Isolates when unit is scrammed, directs restarting Reactor Building Ventilation.</p> |
|      | <b>ANSO</b> | <p>Performs DEOP 300-01, Secondary Control, as directed:</p> <p>Time permitting, restarts Reactor Building Ventilation (if it isolates when the reactor is scrammed).</p>   |
|      | <b>NSO</b>  | <p>✓ <b>Performs DGP 02-03, Reactor Scram</b>, as directed:</p> <p>Presses scram pushbuttons</p> <p>Places mode switch in shutdown</p> <p>Checks rods inserted</p> <p>Maintain RPV/L between +25 and +35 inches or as directed by DEOPs</p>   |



Event Description: An ECCS suction line break occurs resulting in a lowering torus water level. HPCI spuriously initiates. HPCI should be secured, the reactor should be scrammed and an emergency depressurization should be performed as directed by the DEOP for primary containment control.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>ANSO</b> | <p>When attempts to open bypass valves (if directed), reports that the 2B EHC pump tripped.</p> <p><b>Cue: (if time compression was used above)</b></p> <p>10 minutes after the initial time compression cue and/or at the discretion of the lead NRC examiner, cue the crew that both torus wide range level meters indicate 11.5 feet and are dropping at about 0.1 ft per minute.</p>   |
|      | <b>SRO</b>  | <p>When informed that torus level is approaching 11 feet:</p> <p>✓ <b>Directs a manual scram</b> (if not already directed above) per DGP 02-03, Reactor Scram.</p> <p>Enters DEOP 0400-02, Emergency Depressurization, and directs:</p> <p>Initiation of Iso Condenser to maximum flow</p> <p>Verification that SP/L &gt;6 feet.</p> <p>✓ <b>Opening all ADS valves</b></p> <p>Verification all relief valves are open.</p>  |
|      | <b>ANSO</b> | <p>Performs DEOP 0400-02, Emergency Depressurization, actions as directed:</p> <p>Initiates Iso Condenser to maximum flow</p> <p>Verifies that SP/L &gt;6 feet.</p> <p>✓ <b>Opens all ADS valves</b></p> <p>Verifies all relief valves are open.</p> <p><b>Critical Tasks: (identified by ✓ in guide)</b></p> <p>With reactor at power and suppression pool water level cannot be maintained in the safe region of the heat capacity temperature limit, <b>MANUALLY SCRAM</b> the reactor.</p> <p>When it is determined that suppression pool water level cannot be held above 12 feet wide range (level of HPCI exhaust), <b>TRIP AND PREVENT HPCI</b> operation irrespective of adequate core cooling.</p> <p>When it is determined that suppression pool water level cannot be held above 11 feet wide range (level of the downcomers), <b>INITIATE</b> emergency depressurization.</p> <p><b>Scenario Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>- HPCI secured.</li> <li>- Reactor scrammed.</li> <li>- RPV depressurization in progress.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul> |

# ***Dresden Generating Station***

## **SIMULATOR EXERCISE GUIDE**

**ILT 01-1 NRC EXAM**

**SCENARIO**

**ILT-N-3**

**Rev. 01**

**05/02**

**DEVELOPED BY:**

\_\_\_\_\_  
Exam Author

\_\_\_\_\_  
Date

**APPROVED BY:**

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

|  |                             |                             |
|--|-----------------------------|-----------------------------|
| Facility: <u>Dresden</u>   | Scenario No: <u>ILT-N-3</u> | Op-Test No: <u>ILT 01-1</u> |
| Examiners: _____   |                             | Operators: _____            |
| _____  |                             | _____                       |
| _____  |                             | _____                       |
| <p><u>Initial Conditions:</u> Approximately 78% reactor power; IRM channel 16 out of service; 2B EHC Pump out of service; Unit 3 is in Mode 4.</p> <p><u>Turnover:</u> Unit shutdown in progress for forced outage; shutdown reactor condensate pump 2B, then continue power reduction for unit shutdown</p> |                             |                             |

| Event No. | Malf. No.                   | Event Type* |          | Event Description   |
|-----------|-----------------------------|-------------|----------|---|
| 1         | N/A                         | N           | ANSO SRO | shutdown condensate pump for unit shutdown  |
| 2         | N/A                         | R           | NSO SRO  | lower reactor power by reducing recirculation flow  |
| 3         | SER1375<br>FWDOP2<br>FWDOP5 | C           | NSO SRO  | reactor feed pump 2B failure  |
| 4         | ADS3ESD                     | I           | ANSO SRO | spurious ADS valve opening  |
| 5         | K11<br>MGDSCBTR             | C           | ANSO SRO | stator cooling water pump trips on overload and standby pump fails to start automatically |
| 6         | RLLMLS                      | I           | NSO SRO  | feedwater level control system setpoint drifts high                                       |
| 7         | F44                         | M           | ALL      | small recirculation loop break  |
| 8         | ACDTP21<br>ACDCL21          |             | ANSO SRO | TR 22 feed to Bus 21 fails to close   |
| 9         | HP8VBKR<br>HPLCL8           |             | ANSO SRO | HPCI injection valve failure  |

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

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 1Page 1 of 1

Event Description: The team continues the shut down by securing 2B Condensate Pump.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>SRO</b>  | Directs ANSO to secure 2B Condensate Pump per DOP 3300-03, Condensate System Shutdown.   |
|      | <b>ANSO</b> | <p>Performs the following actions per DOP 3300-03, Condensate System Shutdown, to shutdown 2B Condensate Pump as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies Reactor Feed Pump Suction Pressure &gt;230 psig.</li> <li><input type="checkbox"/> Verifies closed the hydrogen isolation valves. (on turnover)</li> <li><input type="checkbox"/> Stops 2B Condensate Pump</li> <li><input type="checkbox"/> Selects 2B Condensate Pump for standby.</li> <li><input type="checkbox"/> Directs NLO to verify Condensate Pre-filter operating parameters.</li> </ul>  |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to verify 2B Condensate Pump hydrogen isolation valves closed:<br/>Report "hydrogen isolation valves are closed".</p> <p>NLO to verify 2B Condensate Pump stopped rotating:<br/>Report "2B Condensate Pump has stopped rotating".</p> <p>NLO to verify Condensate Pre-filter operating parameters (wait 2 min):<br/>Report: Condensate Pre-filter operating parameters are normal."</p> <p><b><u>Event 1 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- 2B Condensate Pump secured.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul> |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 2Page 1 of 1

Event Description: The team reduces power using recirculation flow.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>NSO</b>  | Performs the following actions per DGP 02-01, Unit Shutdown, and DOP 0202-03, Reactor Recirculation Flow Control System Operation: <ul style="list-style-type: none"> <li><input type="checkbox"/> Lowers recirculation pump speed using the master controller potentiometer.</li> <li><input type="checkbox"/> Verifies expected power reduction.</li> </ul> |
|      | <b>SRO</b>  | Directs reducing reactor power per DGP 02-01, Unit Shutdown, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, by lowering recirculation pump speed.  |
|      | <b>ANSO</b> | Monitors panels and assists as directed.  |
|      |             | <b>Event 2 Completion Criteria:</b> <ul style="list-style-type: none"> <li>– Significant power reduction</li> <li>– AND, at the direction of the NRC chief examiner.</li> </ul>   |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 3Page 1 of 3

Event Description: A 2B RFP low lube oil condition will require the team to start 2C RFP and secure 2B RFP.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>NSO</b>  | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 1, which inserts 2B RFP low oil pressure and causes failure of its auxiliary oil pump to start.</p> <p>Performs the following actions per DAN 902-6 H-8, 2B RFP Brg Oil Press Lo:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Attempts to start 2B RFP Auxiliary Oil Pump.</li> <li><input type="checkbox"/> Directs NLO to report 2B RFP oil pressure, oil reservoir level and check for oil leaks.</li> <li><input type="checkbox"/> Informs SRO 2B RFP is running with low oil pressure and the auxiliary oil pump will not start.</li> </ul> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to check 2B RFP (wait 2 min):</p> <p>Report "2B RFP oil pressure is 16 psig. Oil reservoir level is low. There is a large amount of oil on the pump base-plate The oil had not reached the base plate drain yet. I plugged the base plate drain".</p> <p>NLO to check 2B RFP Aux Oil pump breaker: (wait 2 min)</p> <p>Report "I see no problems with 2B RFP Aux Oil pump breaker".</p> |
|      | <b>SRO</b>  | <p>Directs starting 2C RFP and securing 2B RFP.</p> <p>Contacts the Shift Manager, and appropriate maintenance departments.</p>   |
|      | <b>ANSO</b> | Monitors panels and assists as directed.  |
|      | <b>NSO</b>  | <p>Starts 2C RFP per DOP 3200-03, Startup of second Reactor Feed Pump or Shifting to Alternate Reactor Feed Pump, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> May direct NLO to perform pre-startup checks.</li> <li><input type="checkbox"/> Places RFPs Standby selector switch in OFF.</li> <li><input type="checkbox"/> Closes the discharge valve.</li> <li><input type="checkbox"/> Opens the recirculation valve.</li> <li><input type="checkbox"/> Verifies RPV level stable.</li> <li><input type="checkbox"/> Starts discharge valve opening.</li> <li><input type="checkbox"/> Starts the RFP. (should start it on Bus 22 per procedure)</li> <li><input type="checkbox"/> Verifies RPV level stable.</li> <li><input type="checkbox"/> Closes the recirculation valve.</li> <li><input type="checkbox"/> Directs NLO to perform post-startup checks.</li> <li><input type="checkbox"/> Verifies auxiliary oil pump stops.</li> </ul>   |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 3Page 2 of 3

Event Description: A 2B RFP low lube oil condition will require the team to start another RFP and secure 2B RFP.

| Time | Position   | Applicant's Actions or Behavior   |
|------|------------|---|
|      | <b>NSO</b> | <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to perform RFP pre-startup checks (wait 5 min):</p> <p>Respond "I have completed the requested RFP startup pre-checks per step G.1 through G.11 of DOP 3200-03".</p> <p>NLO to perform post-startup checks: (wait 5 min)</p> <p>Respond "The RFP post-startup checks are completed per G.31 of DOP 3200-03".</p> <p>Performs the following actions per DOP 3200-05, Reactor Feed Pump Shutdown, to shutdown 2B RFP as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies zinc injection is not lined up to 2B RFP (may not wait on this).</li> <li><input type="checkbox"/> Places RFPs standby selector switch to OFF.</li> <li><input type="checkbox"/> Opens the recirculation valve.</li> <li><input type="checkbox"/> Verifies RPV level stable.</li> <li><input type="checkbox"/> Closes the discharge valve.</li> <li><input type="checkbox"/> Verifies RPV level stable.</li> <li><input type="checkbox"/> Stops the RFP.</li> <li><input type="checkbox"/> Verifies the running RFP amps below 1115 amps.</li> <li><input type="checkbox"/> Closes the recirculation valve.</li> <li><input type="checkbox"/> Has NLO verify the RFP has come to rest.</li> <li><input type="checkbox"/> Has NLO adjust zinc injection to ~20 gpm.</li> <li><input type="checkbox"/> Has NLO verify 2-5772-48B closed.</li> </ul> <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to verify lineup of zinc injection (wait 1 min):</p> <p>Respond "Zinc injection is lined up to 2A RFP".</p> <p>NLO to verify 2B RFP has come to rest (wait 1 min):</p> <p>Respond "2B RFP has stopped rotating".</p> <p>NLO to verify 2B RFP is not rotating in reverse direction:</p> <p>Respond "2B RFP is not rotating in reverse direction".</p> <p>NLO to adjust zinc injection to ~20 gpm (wait 2 min):</p> <p>Respond "I adjusted zinc injection to ~20 gpm".</p> <p>NLO to verify 2-5772-48B closed (wait 1 min):</p> <p>Respond "5772-48B is closed".</p> |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 3Page 3 of 3

Event Description: A 2B RFP low lube oil condition will require the team to start another RFP and secure 2B RFP.

| Time | Position | Applicant's Actions or Behavior   |
|------|----------|---|
|      |          | <b>Event 3 Completion Criteria:</b> <ul style="list-style-type: none"><li>- 2C RFP started</li><li>- 2B RFP shutdown</li><li>- AND, at the direction of the NRC chief examiner.</li></ul> |



Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 4Page 1 of 1

Event Description: The E ADSV setpoint will drift low causing it to open. The team should close it by placing its control switch in OFF.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 2, which sets the E ADS valve's setpoint to 890 psig causing it to open.</p>   |
|      | <b>ANSO</b> | <p>Performs the following actions per DAN 902-3 E-12, 2E Electromatic Relief Vlv Open:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies valve actually open by checking any of the following: <ul style="list-style-type: none"> <li>• Valve position indication</li> <li>• Generator output decrease.</li> <li>• Acoustic monitor tripped.</li> <li>• Increasing tailpipe temperature.</li> <li>• Torus temperature increasing</li> </ul> </li> <li><input type="checkbox"/> Notifies SRO the valve is open.</li> </ul>   |
|      | <b>SRO</b>  | Enters and directs performance of DOA 0250-01, Relief Valve Failure.   |
|      | <b>ANSO</b> | <p>Performs DOA 0250-01, Relief Valve Failure, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Places the 2E Electromatic Relief valve control switch to OFF. (immediate action)</li> <li><input type="checkbox"/> Verifies RPV level stable. (immediate action)</li> <li><input type="checkbox"/> Verifies and reports the valve closed.</li> <li><input type="checkbox"/> Resets the acoustic monitor.</li> </ul>   |
|      | <b>SRO</b>  | <p>References Technical Specifications and determines:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> ITS 3.6.2.1, Suppression Pool Average Temperature, is not applicable.</li> <li><input type="checkbox"/> ITS 3.5.1.G, ECCS, if decides the failure does affect its ADS function, then restore the ADS valve to OPERABLE status within 14 days, otherwise, this is not applicable.</li> <li><input type="checkbox"/> ITS 3.4.3.A, Safety and Relief Valves, restore the relief valve to OPERABLE status within 14 days.</li> <li><input type="checkbox"/> ITS SR 3.6.1.8.2, Suppression Chamber to Drywell Vacuum Breakers, perform a functional test of each required vacuum breaker within 12 hours.</li> </ul> |
|      |             | <p><b><u>Event 4 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- 2E Electromatic Relief valve closed.</li> <li>- Referenced Technical Specifications.</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>   |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 5Page 1 of 1

Event Description: The 2A stator cooling water pump trips on overload and the standby pump fails to start automatically. The team should manually start the 2B stator cooling water pump.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>ANSO</b> | <p><b><u>SIMULATOR OPERATOR:</u></b><br/>At the discretion of the NRC chief examiner, activate trigger 3, which causes 2A stator cooling water pump to trip on overload and 2B to fails to auto start.</p> <p>Announces the following alarms:</p> <ul style="list-style-type: none"> <li>- DAN 902-7 B-10, Stator Clg PP Trip</li> <li>- DAN 902-7 C-3, Turb Stator Coolant Runback</li> </ul> <p>Performs appropriate actions per DOA 7400-01, Failure of the Stator Coolant System:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Starts 2B Stator Cooling Water Pump (Immediate Action)</li> <li><input type="checkbox"/> Verifies Runback condition clears.</li> <li><input type="checkbox"/> Sends NLO to verify 2B Stator Cooling Water Pump operating normally.</li> </ul> <p>Performs appropriate actions per DOA 6700-06, 480V Circuit Breaker Trip:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sends NLO to check breaker and 2A Stator Cooling Water Pump for cause of trip.</li> <li><input type="checkbox"/> Places 2A Stator Cooling Water Pump control switch in PTL.</li> </ul> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br/>NLO to acknowledge stator cooling water trouble alarm: (wait 2 min)<br/>Activate trigger 9 and report "I have acknowledged stator cooling water trouble alarm. The alarms were Inlet Pressure Low and Turbine Runback".<br/>NLO to check operation of 2B Stator Cooling Water Pump: (wait 2 min)<br/>Report "2B Stator Cooling Water Pump is operating normally".<br/>NLO to check cause of 2A Stator Cooling Water Pump trip (wait 2 min)<br/>Report "2A Stator Cooling Water Pump trip on overload".</p> |
|      | <b>SRO</b>  | <p>Enters and directs performance of DOA 7400-01, Failure of the Stator Coolant System.</p> <p>Enters and directs performance of DOA 6700-06, 480V Circuit Breaker Trip.</p> <p>Notifies Work Week Manager, IMD and/or EMD</p>   |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b><u>ROLE PLAY:</u></b><br/>Respond to calls for assistance.</p> <p><b><u>Event 5 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- 2B Stator Cooling Water Pump started</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-3Event No.: 6Page 1 of 1

Event Description: The FWLC system setpoint will begin drifting up. The team should take manual control of the FWLC system.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 7, which causes feedwater level control system setpoint to drift high (to 60") over 10 min.</p> <p>If the crew scrams the unit, begin the next event.</p>  |
|      | <b>NSO</b>  | <p>Observes and announces RPV level rising or responds to alarm 902-5 E-8, RPV Lvl Hi.</p> <p>Performs the following actions per DOA 0600-01 Transient Level Control:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Takes manual control of the Feedwater Regulating Valves.</li> <li><input type="checkbox"/> Restores level to within band specified by the SRO</li> </ul> |
|      | <b>SRO</b>  | <p>Enters and directs performance of DOA 0600-01 Transient Level Control.</p> <p>Notifies Shift Manager and IMD.</p>   |
|      |             | <p><b><u>ROLE PLAY:</u></b></p> <p>Respond to calls for assistance.</p>  |
|      |             | <p><b><u>Cue:</u></b></p> <p>If ANSO goes to check OIS screen, prompt him that the OIS Monitor is blank.</p>   |
|      | <b>ANSO</b> | <p>Monitors panels and assists as directed.</p>  |
|      |             | <p><b><u>Event 6 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>– Feedwater level control system under manual control.</li> <li>– AND, at the direction of the NRC chief examiner.</li> </ul>   |

Event Description: A small recirculation loop break occurs with a loss of high pressure injection. The team should perform the RPV Control and Primary Containment Control DEOPs. Due to the loss of high pressure injection and RPV level dropping to TAF, the team should Emergency Depressurize and restore RPV level with low pressure injection systems.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 8, causes a 2% recirc loop leak and failure of the HPCI 8 vlv to open.</p>   |
|      | <b>NSO</b>  | <p>Announces Reactor Scram on high Drywell pressure.</p> <p>Performs the following actions per DGP 02-03, Reactor Scram, and DEOP 100, RPV Control, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Places Mode Switch to Shutdown and depresses the Scram pushbuttons.</li> <li><input type="checkbox"/> Checks rods inserted.</li> <li><input type="checkbox"/> Maintains RPV level as directed by SRO.</li> <li><input type="checkbox"/> Checks turbine and generator tripped.</li> <li><input type="checkbox"/> Checks recirc pumps run back to minimum speed.</li> <li><input type="checkbox"/> Inserts SRMs and IRMs</li> </ul>   |
|      | <b>ANSO</b> | <p>Should inform the SRO that High Pressure Feedwater and HPCI are not available.</p>  |
|      | <b>SRO</b>  | <p>Enters DEOP 100, RPV Control, due to high PC/P and/or low RPV/L and performs/directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Entering DGP 2-3</li> <li><input type="checkbox"/> Verification of water level instrument accuracy</li> <li><input type="checkbox"/> Verification of all isolations, ECCS and EDGs starts</li> <li><input type="checkbox"/> Holding RPV/L +8 to +48 inches</li> <li><input type="checkbox"/> Maintaining RPV/P &lt;1060 psig</li> </ul> <p>When informed no high pressure feed is available other than CRD, then directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Inhibiting ADS before -59 inches.</li> <li><input type="checkbox"/> Initiating the isolation condenser</li> <li><input type="checkbox"/> Directing use of high pressure Alternate Injection systems. (SBLC and CRD Crosstie)</li> <li><input type="checkbox"/> Verifies at least two low pressure injection systems available.</li> <li><input type="checkbox"/> Waits until RPV level drops to TAF.</li> <li><input type="checkbox"/> Verifies any low pressure system lined up with a pump running</li> </ul> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>NLO to lineup CRD crosstie (wait 5 min.):</p> <p>Verify trigger 10 is activated then report "the CRD crosstie is lined up".</p> |

Event Description: A small recirculation loop break occurs with a loss of high pressure injection. The team should perform the RPV Control and Primary Containment Control DEOPs. Due to the loss of high pressure injection and RPV level dropping to TAF, the team should Emergency Depressurize and restore RPV level with low pressure injection systems.

| Time | Position          | Applicant's Actions or Behavior  |
|------|-------------------|--|
|      |                   | <b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br>NLO to lineup makeup to SBLC Boron tank (wait 5 min.):<br>Verify trigger 11 is activated then report "makeup is lined up to SBLC Boron tank".   |
|      | <b>SRO</b>        | Before RPV level reaches -164 inches, enters DEOP 400-02, Emergency Depressurization, and directs: <ul style="list-style-type: none"> <li><input type="checkbox"/> Initiation of Iso Condenser to maximum flow</li> <li><input type="checkbox"/> Verification that SP/L &gt;6 feet.</li> <li><input checked="" type="checkbox"/> <b>Opening all ADS valves</b></li> <li><input type="checkbox"/> Verification all relief valves are open</li> </ul>  |
|      | <b>ANSO</b>       | Performs DEOP 400-02, Emergency Depressurization, as directed: <ul style="list-style-type: none"> <li><input type="checkbox"/> Prevents injection from LPCI/CS pumps not needed for core cooling per Hard Card, LPCI INJ/CC CONTROL/SHUTDOWN</li> <li><input type="checkbox"/> Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER</li> <li><input type="checkbox"/> Verifies SP/L &gt;6 feet</li> <li><input checked="" type="checkbox"/> <b>Opens all ADS valves</b></li> <li><input type="checkbox"/> Verifies all relief valves are open</li> </ul> |
|      | <b>SRO</b>        | <b>✓ Directs NSO/ANSO to control RPV level above TAF</b> using any of the preferred injection systems listed below: <ul style="list-style-type: none"> <li>- Condensate</li> <li>- Core Spray</li> <li>- LPCI</li> </ul>   |
|      | <b>NSO / ANSO</b> | <b>✓ Restores RPV level to that directed by the SRO (above TAF)</b> using the systems specified by the SRO.  |

Event Description: A small recirculation loop break occurs with a loss of high pressure injection. The team should perform the RPV Control and Primary Containment Control DEOPs. Due to the loss of high pressure injection and RPV level dropping to TAF, the team should Emergency Depressurize and restore RPV level with low pressure injection systems.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>SRO</b>  | <p>Enters DEOP 200-1, Primary Containment Control, when PC/P reaches 2 psig and performs/directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Monitoring of PC/P</li> <li><input type="checkbox"/> Initiation of torus sprays before PC/P of 9 psig</li> <li><input type="checkbox"/> When PC/P is above 9 psig or before DW/T reaches 281°F: <ul style="list-style-type: none"> <li>• Verification of DSIL</li> <li>• Tripping of recirc pumps</li> <li>• Tripping of DW coolers</li> <li>• Initiation of DW sprays</li> </ul> </li> <li><input type="checkbox"/> Monitoring of DW/T (drywell sprays may be initiated for temperature control)</li> <li><input type="checkbox"/> Monitoring of SP/T and initiation of torus cooling</li> <li><input type="checkbox"/> Monitors SP/L</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors</li> </ul>  |
|      | <b>ANSO</b> | <p>Performs DEOP 200-1, Primary Containment Control, actions as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Monitors PC/P and initiates torus sprays and drywell sprays per Hard Card LPCI/CCSW OPERATION, as directed</li> <li><input type="checkbox"/> Monitors DW/T</li> <li><input type="checkbox"/> Monitors SP/T and initiates torus cooling per Hard Card LPCI/CCSW OPERATION as directed</li> <li><input type="checkbox"/> Monitors SP/L</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors</li> </ul> <p><b>ROLE PLAY:</b></p> <p>NLO to check EDG operation (wait 3 min)</p> <p>Report "Both EDGs are operating normally"</p> <p><b>Critical Tasks: (identified by ✓ in guide)</b></p> <p>With Reactor pressure greater than shutoff head of the low pressure systems and when RPV water level reaches <b>TAF</b>, <b>INITIATE</b> emergency depressurization, before level reaches Minimum Zero-Injection RPV Water Level.</p> <p>Action is taken to restore RPV water level above <b>TAF</b> by <b>OPERATING</b> available low pressure systems, when RPV pressure decreases below the shutoff head of low pressure systems.</p> <p><b>Scenario Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>- Performed Emergency Depressurization</li> <li>- Restored RPV level above TAF</li> <li>- AND, at the direction of the NRC chief examiner.</li> </ul> |

# *Dresden Generating Station*

## **SIMULATOR EXERCISE GUIDE**

**ILT 01-1 NRC EXAM**

**SCENARIO**

**ILT-N-5**

**Rev. 01**

**05/02**

**DEVELOPED BY:**

\_\_\_\_\_  
Exam Author

\_\_\_\_\_  
Date

**APPROVED BY:**

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

|  |                             |                             |
|--|-----------------------------|-----------------------------|
| Facility: <u>Dresden</u>   | Scenario No: <u>ILT-N-5</u> | Op-Test No: <u>ILT 01-1</u> |
| Examiners: _____ Operators: _____<br>_____<br>_____  |                             |                             |
| <u>Initial Conditions:</u> Approximately 78% reactor power; IRM channel 16 out of service; 2B EHC Pump OOS; Unit 3 is in Mode 4. |                             |                             |
| <u>Turnover:</u> Power reduction in progress for drywell entry.  |                             |                             |

| Event No. | Malf. No.                                    | Event Type* |          | Event Description   |
|-----------|--|-------------|----------|---|
| 1         | N/A  | N           | ANSO SRO | rotating idle SDC pumps   |
| 2         | N/A  | R           | NSO SRO  | lower reactor power by reducing recirculation flow              |
| 3         | MGGH2CON                                     | I           | ANSO SRO | main generator hydrogen temperature controller output fails low |
| 4         | ICTUBLK                                      | C           | ANSO SRO | isolation condenser tube leak                                   |
| 5         | N/A  | C           | NSO SRO  | CRD pump failure  |
| 6         | RRMAFDBK                                     | I           | NSO SRO  | recirculation pump controller speed signal failure              |
| 7         | CIGP1I                                       | M           | ALL      | spurious group 1 actuation and reactor scram                    |
| 8         | RDHLVFPA<br>RDHLVFPB<br>RDHLDEGA<br>RDHLDEGB |             | ALL      | SDV partial hydraulic lock (ATWS)                               |
| 9         | SCRLFVAD<br>SCRLFVBD                         |             | NSO SRO  | SBLC pump relief valves fail open                               |

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



Op-Test No: ILT 01-1      Scenario No.: ILT-N-5      Event No.: 1      Page 1 of 1

Event Description: The ANSO, as directed by the SRO, performs DOP 1000-06, Rotating Idle SDC Pumps.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>SRO</b>  | Directs ANSO to perform DOP 1000-06, Rotating Idle SDC Pumps.   |
|      | <b>ANSO</b> | <p>Performs the following actions per DOP 1000-06, Rotating Idle SDC Pumps:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies the following valves closed: <ul style="list-style-type: none"> <li>• MO 2-1001-2A, B &amp; C.</li> <li>• MO 2-1001-4A, B &amp; C.</li> </ul> </li> <li><input type="checkbox"/> Places each SDC pump control switch to start and then within 3 sec places each pump control switch to stop.</li> <li><input type="checkbox"/> Requests operator to confirm rotation for each pump.</li> </ul> |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b>ROLE PLAY:</b></p> <p>NLO to confirm SDC pump rotation:<br/>Report "the (requested pump) rotated".</p> <p><b>Event 1 Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>- DOP 1000-06 completed.</li> <li>- OR, at the direction of the NRC chief examiner.</li> </ul>   |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 2Page 1 of 1

Event Description: The NSO lowers reactor power by reducing recirculation flow following direction by the SRO.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>NSO</b>  | Performs the following actions per DGP 03-01, Routine Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation: <ul style="list-style-type: none"> <li><input type="checkbox"/> Lowers recirculation pump speed using the master controller potentiometer.</li> <li><input type="checkbox"/> Verifies expected power reduction.</li> </ul> |
|      | <b>SRO</b>  | Directs reducing reactor power per DGP 03-01, Routine Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, by lowering recirculation pump speed.  |
|      | <b>ANSO</b> | Monitors panels and assists as directed.  |
|      |             | <b>Event 2 Completion Criteria:</b> <ul style="list-style-type: none"> <li>— Sufficient power reduction.</li> <li>— OR, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 3Page 1 of 1

Event Description: Alarms are then received due to high main generator hydrogen temperature resulting from a failed controller. Hydrogen temperature is restored after the controller is placed in manual and adjusted by the ANSO.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>ANSO</b> | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 2, which fails the main generator hydrogen temperature controller output.</p> <p>Verify trigger 3 automatically activates when the main generator hydrogen temperature controller is placed to MAN.</p> <p>Performs the following actions per DAN 902-7 E-11, H2 Seal Oil &amp; Alterrex Pnl Trouble and DAN 2252-7 A-8,.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Directs NLO to local panel 2252-7 to determine alarm received.</li> <li><input type="checkbox"/> Diagnosis that the main generator hydrogen cooler temperature controller auto mode has failed and places in MAN mode and restores temperature to normal band.</li> </ul> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>NLO to panel 2252-7 (wait 2 min):</p> <p>Activate trigger 4 then Report "the alarm is A-8, Machine Gas Temperature High, and I have acknowledged it".</p> <p>NLO to check hydrogen cooler TCV operation: (wait 1 min)</p> <p>Report "the hydrogen cooler TCV appears to be operating normally".</p> |
|      | <b>SRO</b>  | <p>Directs ANSO to take manual control of the main generator hydrogen temperature controller.</p> <p>Notifies Shift Manager and IMD of controller problem.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>Respond as individual notified.</p>   |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p> <p><b><u>Event 3 Completion Criteria:</u></b></p> <ul style="list-style-type: none"> <li>- Takes Manual control of the main generator hydrogen temperature controller.</li> <li>- OR, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 4Page 1 of 2

Event Description: Alarms are received due to an isolation condenser tube leak. The isolation condenser is manually isolated by the ANSO. The SRO addresses the technical specification requirements for the inoperable isolation condenser.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR:</u></b><br/>At the discretion of the NRC chief examiner, activate trigger 5 which inserts an Isolation Condenser tube leak (0.5%).</p>  |
|      | <b>ANSO</b> | <p>Performs the following actions per DAN 902-3 C-4, Isol Condr Temp Hi, and / or DOA 1300-01, Isolation Condenser Tube Leak:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> May try to reseal the MO 2-1301-3 valve: <ul style="list-style-type: none"> <li>• Closes MO 2-1301-4</li> <li>• Opens MO 2-1301-3</li> <li>• Closes MO 2-1301-3</li> <li>• Opens MO 2-1301-4</li> <li>• Opens AO 2-1301-17 &amp; 20</li> <li>• Checks indication that leak has stopped</li> </ul> </li> <li><input type="checkbox"/> Isolates the Isolation Condenser by closing: <ul style="list-style-type: none"> <li>• MO 2-1301-1</li> <li>• MO 2-1301-2</li> <li>• MO 2-1301-3</li> <li>• MO 2-1301-4</li> <li>• AO 2-1301-17 &amp; 20</li> <li>• MO 2-1301-10</li> <li>• MO 2-4399-74</li> </ul> </li> </ul>  |
|      | <b>SRO</b>  | <p>Enters DOA 1300-01, Isolation Condenser Tube Leak, and directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> May try resealing the MO 2-1301-3</li> <li><input type="checkbox"/> Isolating the Isolation Condenser.</li> <li><input type="checkbox"/> Radiation Protection to survey below the IC vent.</li> <li><input type="checkbox"/> Security to limit access below IC vent.</li> <li><input type="checkbox"/> Chemistry Department to sample IC shell side for activity.</li> <li><input type="checkbox"/> Declares IC inoperable.</li> </ul> <p>References Technical Specifications and determines:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> ITS 3.5.3.A.1; verifies HPCI system operable immediately.</li> <li><input type="checkbox"/> ITS 3.5.3.A.2; restore IC system to OPERABLE within 14 days</li> </ul> <p>Notifies Shift Manager and MMD of IC tube leak.</p> |
|      | <b>NSO</b>  | <p>Monitors panels and assists as directed.</p>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 4Page 2 of 2

Event Description: Alarms are received due to an isolation condenser tube leak. The isolation condenser is manually isolated by the ANSO. The SRO addresses the technical specification requirements for the inoperable isolation condenser.

| Time | Position | Applicant's Actions or Behavior  |
|------|----------|--|
|      |          | <p><b>ROLE PLAY:</b><br/>Respond as departments contacted.</p> <p>When Isolation Condenser shell side temperature reaches 212 deg. F, phone the control room as Security and report "there is steam coming out of a pipe on the south side of the reactor building".</p> <p>After the above report, phone the control room as Radiation Protection and report "radiation levels are slightly elevated on the isolation condenser level in the reactor building."</p> |
|      |          | <p><b>Event 4 Completion Criteria:</b></p> <ul style="list-style-type: none"><li>- Isolation Condenser isolated.</li><li>- Technical Specifications referenced.</li><li>- OR, at the direction of the NRC chief examiner.</li></ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 5Page 1 of 1

Event Description: A field report is received that the 2B CRD pump is failing due to rapid oil loss from a leak. The NSO shutdowns the 2B CRD pump and starts the 2A CRD pump.

| Time | Position    | Applicant's Actions or Behavior   |
|------|-------------|---|
|      | <b>NSO</b>  | <p><b>ROLE PLAY:</b></p> <p>At the discretion of the NRC chief examiner, report as NLO that "the 2B CRD pump is rapidly losing oil from the pump outboard bearing".</p> <p>Performs the following actions per DOP 0300-01, Control Rod Drive System Startup and Operation:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> May direct the NLO to perform pre-startup checks per the procedure.</li> <li><input type="checkbox"/> Verifies 2A CRD pump discharge valve MO 2-0301-2A open.</li> <li><input type="checkbox"/> Starts 2A CRD pump.</li> <li><input type="checkbox"/> Stops 2B CRD pump</li> <li><input type="checkbox"/> Verifies charging water pressure between 1450 to 1500 psig.</li> <li><input type="checkbox"/> Directs NLO to perform post-startup checks per the procedure.</li> </ul> |
|      | <b>SRO</b>  | <p><b>ROLE PLAY:</b></p> <p>NLO to perform 2A CRD pump pre-startup checks (wait 3 min):</p> <p>Report "I have completed the pre-startup checks for 2A CRD pump".</p> <p>NLO to perform 2A CRD pump post-startup checks (wait 3 min):</p> <p>Report "I have completed the post-startup checks for 2A CRD pump".</p> <p>Directs NSO to swap CRD pumps per DOP 0300-01, Control Rod Drive System Startup and Operation;</p> <p>OR, directs NSO to immediately swap CRD pumps per DOA 0300-01, Control Rod Drive System Failure.</p> <p>Notifies Shift Manager and MMD of CRD pump problem.</p>   |
|      | <b>ANSO</b> | <p>Monitors panels and assists as directed.</p> <p><b>Event 5 Completion Criteria:</b></p> <ul style="list-style-type: none"> <li>- CRD pumps swapped.</li> <li>- OR, at the direction of the NRC chief examiner.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 6Page 1 of 2

Event Description: The speed control signal fails low for recirculation pump 2A and the pump flow increase is stopped when the NSO locks out the scoop tube.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      | <b>NSO</b>  | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate trigger 6, which fails the 2A Recirculation Pump speed feedback signal.</p> <p>Performs the following actions per DAN 902-4 E-6, 2A/B Recirc PPs Speed Mismatch, and DOA 0202-03, Reactor Recirculation System Flow Control Failure:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Places the 2A M-G Set Scoop Tube Power Lockout Reset Switch in the Lockout position.</li> <li><input type="checkbox"/> Verifies Core thermal power &lt;2927 MWth.</li> <li><input type="checkbox"/> Completes actions of 2A Recirc M-G Lockout in DOP 0202-12, Recirculation Pump Motor Generator Set Scoop Tube Operation. <ul style="list-style-type: none"> <li>• Places both recirc pump speed control transfer stations to manual.</li> <li>• Runs 2A Recirc M-G Set speed demand to minimum.</li> <li>• Places caution card on its Lockout Reset switch.</li> </ul> </li> <li><input type="checkbox"/> Coordinates with licensed operator at the 2A Recirc M-G Set Scoop Tube to lower its speed to match 2B Recirc M-G Set per DOP 0202-12, Recirculation Pump Motor Generator Set Scoop Tube Operation.</li> </ul> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>Licensed Operator to lower 2A Recirc M-G Set speed locally (wait 3 min)</p> <p>Report "I am ready to begin lowering 2A Recirc M-G Set speed". When directed to lower the speed, toggle trigger 7 active and then inactive about every 10 seconds to "bump" the speed down until the NSO directs stopping the speed drop.</p> |
|      | <b>SRO</b>  | <p>Enters and directs performance of DOA 0202-03, Reactor Recirculation System Flow Control Failure.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enters and directs performance of DGA 7, Unpredicted Reactivity Addition.</li> <li><input type="checkbox"/> Contacts QNE.</li> <li><input type="checkbox"/> May request NLO to take local speed readings</li> <li><input type="checkbox"/> Directs NSO to coordinate with a licensed operator at the 2A Recirc M-G Set Scoop Tube to lower its speed to match 2B Recirc M-G Set.</li> <li><input type="checkbox"/> Notifies Shift Manager and IMD of controller problem.</li> </ul>   |
|      | <b>ANSO</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Begins working through the steps of DGA 7, Unpredicted Reactivity Addition, but will not have time to complete the required actions.</li> </ul>  |

Op-Test No: ILT 01-1Scenario No.: ILT-N-5Event No.: 6Page 2 of 2

Event Description: The speed control signal fails low for recirculation pump 2A and the pump flow increase is stopped when the NSO locks out the scoop tube.

| Time | Position | Applicant's Actions or Behavior   |
|------|----------|---|
|      |          | <p><b><u>ROLE PLAY:</u></b></p> <p>NLO to obtain local speed of the 2A Recirc MG Set: (Wait 5 min for initial reading, 1 min for subsequent)</p> <p>Take variable RRNMGGGEN(1) times 1150 RPM and report the result as the 2A Recirc MG Set speed.</p> <p>NLO to obtain local speed of the 2B Recirc MG Set: (Wait 1 min)</p> <p>Take variable RRNMGGGEN(2) times 1150 RPM and report the result as the 2B Recirc MG Set speed.</p> <p><b><u>Event 6 Completion Criteria:</u></b></p> <ul style="list-style-type: none"><li>- Efforts in progress to lower 2A Recirc M-G Set speed.</li><li>- OR, at the direction of the NRC chief examiner.</li></ul> |



Event Description: A spurious group 1 isolation and a reactor scram occurs. A partial hydraulic lock of the scram discharge volume results in an ATWS. The SBLC system fails due pump relief valves failing open. The crew initiates alternate SBLC injection.

| Time | Position   | Applicant's Actions or Behavior   |
|------|------------|---|
|      |            | <p><b><u>SIMULATOR OPERATOR:</u></b><br/>At the discretion of the NRC chief examiner, activate trigger 8, which inserts a spurious Group 1 Isolation and SBLC relief valve setpoint drift.</p> <p><b><u>ROLE PLAY:</u></b><br/>Five minutes after the start of this event, call the Control Room as an IMD Supervisor and report "While checking the Main Steam Line Flow instruments in the LPCI corner room, I slipped and fell into the instrument rack. I do not require medical attention".</p>  |
|      | <b>NSO</b> | <p>Performs the following actions per DGP 02-03, Reactor Scram:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Presses scram pushbuttons</li> <li><input type="checkbox"/> Places mode switch in shutdown</li> <li><input type="checkbox"/> Checks rods inserted; discovers ATWS condition</li> <li><input type="checkbox"/> Initiates ARI</li> <li><input type="checkbox"/> Verifies recirc pump speed at minimum.</li> </ul>   |
|      | <b>SRO</b> | <p>Enters DEOP 0100, RPV Control. When receives report that ATWS condition exists, exits DEOP 100 and enters DEOP 400-5, Failure to Scram, and directs the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Placing ADS to inhibit</b></li> <li><input type="checkbox"/> Placing both CS pumps in PTL</li> </ul> <p><b><u>Power Leg</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Running back recirc to minimum.</li> <li><input type="checkbox"/> Tripping the recirc pumps</li> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Directing Alternate Rod Insertion</b> per DEOP 500-05: <ul style="list-style-type: none"> <li>• manually driving rods.</li> <li>• repeated scram/resets.</li> </ul> </li> <li><input type="checkbox"/> Initiating SBLC before SP/T of 110°F.</li> </ul> <p><b><u>Level Leg</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verification water level instruments are accurate</li> <li><input type="checkbox"/> Verification any required automatic actions have occurred</li> <li><input type="checkbox"/> Directing jumpers installed for MSIV low level and Off Gas high Rad isolations</li> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Terminating and Preventing injection except boron and CRD</b> until RPV/L is <math>\leq -35</math> inches.</li> <li><input type="checkbox"/> If SP/T is above 110°F, lets level drop until: <ul style="list-style-type: none"> <li>• Power is below 6%, OR</li> <li>• Level drops to -143 in. (TAF), OR</li> <li>• All ADSVs stay closed and PC/P stays below 2 psig</li> </ul> </li> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Re-establishing injection to MAINTAIN RPV water level above -164 inches.</b></li> </ul> <p><b><u>Pressure Leg</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Dropping RPV/P to 945 psig using ADSVs</li> <li><input type="checkbox"/> Maintaining &lt;1060 psig using HPCI/ADSVs</li> </ul> |

Event Description: A spurious group 1 isolation and a reactor scram occurs. A partial hydraulic lock of the scram discharge volume results in an ATWS. The SBLC system fails due pump relief valves failing open. The crew initiates alternate SBLC injection.

| Time | Position          | Applicant's Actions or Behavior   |
|------|-------------------|---|
|      | <b>NSO / ANSO</b> | <p>Performs DEOP 400-5, Failure to Scram, actions as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Places ADS to inhibit</b></li> <li><input type="checkbox"/> Places both CS pumps in PTL</li> </ul> <p><u>Power Leg</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Trips recirculation pumps</li> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Performs Alternate Rod Insertion.</b> (see below for specific actions)</li> <li><input type="checkbox"/> Initiates boron injection. Reports SBLC has failed to inject.</li> </ul> <p><u>Level Leg</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Terminates and Prevents injection except boron and CRD</b> until RPV/L is <math>\leq</math> -35 inches.</li> <li><input type="checkbox"/> If SP/T is above 110°F, lets level drop until: <ul style="list-style-type: none"> <li>• Power is below 6%, OR</li> <li>• Level drops to -143 in. (TAF), OR</li> <li>• All ADSVs stay closed and PC/P stays below 2 psig</li> </ul> </li> <li><input type="checkbox"/> <input checked="" type="checkbox"/> <b>Re-establishes injection to MAINTAIN RPV water level above -164 inches.</b></li> </ul> <p><u>Pressure Leg</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Drops RPV/P to 945 psig ADSVs</li> <li><input type="checkbox"/> Maintains &lt;1060 psig using HPCI/ADSVs</li> </ul> |
|      | <b>NSO</b>        | <p><input checked="" type="checkbox"/> <b>Performs manual control rod insertion</b> per DEOP 500-05, Alternate Insertion of Control Rods, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bypasses the RWM</li> <li><input type="checkbox"/> Starts the second CRD pump</li> <li><input type="checkbox"/> Maximizes drive water pressure using one or more of the methods in DEOP 500-05.</li> <li><input type="checkbox"/> Inserts rods using RONOR in EMERG IN or the normal rod movement control switch</li> </ul>  |
|      | <b>NSO</b>        | <p><input checked="" type="checkbox"/> <b>Performs repeated scram/resets</b> per DEOP 500-05, Alternate Insertion of Control Rods, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Depresses close pushbuttons for SDV vent and drain valves</li> <li><input type="checkbox"/> If RPV/L &lt; -59 inches, directs pulling ARI fuses.</li> <li><input type="checkbox"/> Attempts to reset scram</li> <li><input type="checkbox"/> Directs scram jumpers installed.</li> <li><input type="checkbox"/> Resets the scram</li> <li><input type="checkbox"/> Verifies all scram valves closed</li> <li><input type="checkbox"/> Opens the SDV vent and drains</li> <li><input type="checkbox"/> When 902-5 C-1 clears, scrams reactor</li> <li><input type="checkbox"/> Repeats as necessary</li> </ul>   |

Event Description: A spurious group 1 isolation and a reactor scram occurs. A partial hydraulic lock of the scram discharge volume results in an ATWS. The SBLC system fails due pump relief valves failing open. The crew initiates alternate SBLC injection.

| Time | Position    | Applicant's Actions or Behavior  |
|------|-------------|--|
|      |             | <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br/>           Operator to jumper the MSIV Group1-59 in. and offgas hi hi radiation isolations (wait 5 min):<br/>           Activate trigger 9 and report "the MSIV Group1-59 in. and offgas hi hi radiation isolations are jumpered".</p> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br/>           Operator to pull ARI fuses (wait 5 min):<br/>           Verify trigger 10 activated and report "the ARI fuses are pulled".<br/>           Operator to install scram jumpers (wait 5 min):<br/>           Verify trigger 11 activated and report "the scram jumpers are installed".</p>   |
|      | <b>SRO</b>  | <input type="checkbox"/> Based on failure of SBLC to inject, directs performance of DEOP 0500-01, Alternate Standby Liquid Control Injection.  |
|      | <b>SRO</b>  | Enters DEOP 200-1, Primary Containment Control, when PC/P reaches 2 psig and performs/directs: <ul style="list-style-type: none"> <li><input type="checkbox"/> May direct starting Drywell Coolers per DEOP 0500-02.</li> <li><input type="checkbox"/> Initiation of torus sprays before PC/P of 9 psig</li> <li><input type="checkbox"/> When PC/P is above 9 psig or before DW/T reaches 281°F: (may not reach these levels)               <ul style="list-style-type: none"> <li>• Verification of DSIL</li> <li>• Tripping of recirc pumps</li> <li>• Tripping of DW coolers</li> <li>• Initiation of DW sprays</li> </ul> </li> <li><input type="checkbox"/> Initiation of torus cooling</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors</li> </ul> |
|      | <b>ANSO</b> | Performs DEOP 200-1, Primary Containment Control, actions as directed: <ul style="list-style-type: none"> <li><input type="checkbox"/> May start Drywell Coolers after jumpers installed per DEOP 0500-02.</li> <li><input type="checkbox"/> May initiate torus sprays and drywell sprays per Hard Card LPCI/CCSW OPERATION, as directed</li> <li><input type="checkbox"/> Initiates torus cooling per Hard Card LPCI/CCSW OPERATION as directed</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors</li> </ul> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b><br/>           Operator to install jumpers to defeat DW Cooler trips (wait 5 min):<br/>           Verify trigger 12 activated and report "the DW Cooler trip jumpers are installed".</p>    |

Event Description: A spurious group 1 isolation and a reactor scram occurs. A partial hydraulic lock of the scram discharge volume results in an ATWS. The SBLC system fails due pump relief valves failing open. The crew initiates alternate SBLC injection.

| Time | Position   | Applicant's Actions or Behavior  |
|------|------------|--|
|      |            | <p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>After the crew has reset the scram and at the discretion of the NRC chief examiner, RUN CAEP File CtrHydLk.cae which will remove the SDV hydraulic lock.</p>   |
|      | <b>SRO</b> | <p>Based on report that all rods are inserted, exits DEOP 400-05, Failure to Scram, and enters DEOP100, RPV Control and directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Securing Boron injection if any was started.</li> <li><input type="checkbox"/> Restoring RPV level to +8 to +48 inches.</li> <li><input type="checkbox"/> Develop a cooldown strategy (i.e.; reopen MSIVs and/or restart RWCU)</li> </ul>   |
|      | <b>NSO</b> | <p>Reports that all rods inserted and performs the following as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Restores level to +8 to +48 inches.</li> </ul> <p><b>Critical Tasks: (identified by ✓ in guide)</b></p> <p>With a reactor scram required and the reactor not shutdown, <b>TAKE ACTION TO REDUCE POWER</b> by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.</p> <p>With a reactor scram required, reactor not shutdown, and conditions for ADS blowdown are met, <b>INHIBIT ADS</b> to prevent an uncontrolled RPV depressurization, to prevent causing a significant power excursion.</p> <p>During an ATWS with conditions met to perform power/level control <b>TERMINATE AND PREVENT INJECTION</b>, with exception of boron and CRD, into the RPV until conditions are met to re-establish injection.</p> <p>When conditions are met to re-establish injection use available injection systems to <b>MAINTAIN</b> RPV water level above -164".</p> |
|      |            | <p><b><u>Scenario Completion Criteria:</u></b></p> <p>Control rods inserted.</p> <p>RPV level and pressure stabilized.</p> <p>OR, at the direction of the NRC chief examiner.</p>  |