

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 1 Page 1 of 1

Event Description: **Pump RBNS, 1LWD-2 fails to close: (N, BOP/SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	<p><b>Crew response:</b> BOP uses <b>OP/1/A/1104/007 Encl 4.1</b> to pump the Reactor Building Normal Sump (RBNS).</p> <p><u>OP/1/A/1104/007 Encl 4.1</u></p> <ul style="list-style-type: none"> <li>• Verify MWHUT level adequate to receive waste volume.</li> <li>• Position the following:                             <ul style="list-style-type: none"> <li>○ Open 1LWD-1 (RB NORMAL SUMP ISOLATION)</li> <li>○ Open 1LWD-2 (RB NORMAL SUMP ISOLATION).</li> </ul> </li> <li>• Start one or both of the following:                             <ul style="list-style-type: none"> <li>○ 1A RB NORM SUMP PUMP</li> <li>○ 1B RB NORM SUMP PUMP.</li> </ul> </li> </ul> <p style="text-align: center;"><b><u>NOTE:</u></b></p> <p>Changes in LAWT levels may occur during pumping. RIA Alarms may be indicative of gas leakage. If RBNS level was above 14" when pumps were started a level increase following securing the RBNS pumps may occur.</p> <ul style="list-style-type: none"> <li>• <b><u>WHEN</u></b> RBNS level is at desired level or ≈ 6" (low level alarm), <b><u>THEN</u></b> ensure pump(s) stopped.</li> <li>• Position the following:                             <ul style="list-style-type: none"> <li>○ Close 1LWD-1 (RB NORMAL SUMP ISOLATION)</li> <li>○ Close 1LWD-2 (RB NORMAL SUMP ISOLATION).</li> </ul> </li> </ul> <p><b>NOTE: 1LWD-2 will fail to close</b></p> <p>SRO will refer to <b>TS 3.6.3</b> (Containment Isolation) Condition A. De-energize 1LWD-1 within 4 hours.</p>
		<p><b>The event is complete when TS 3.6.3 is referred to or when determined by the Lead Examiner.</b></p>







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Event Description: **1A RBCU rupture (C, BOP/SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>SRO may conservatively enter to AP/05, Earthquake</p> <ul style="list-style-type: none"> <li>• Dispatch operators to perform plant inspections</li> </ul> <p><b>Note: No damage will be reported.</b></p> <ul style="list-style-type: none"> <li>• *Notify SPOC to develop the Strong Motion Accelerometer tape.</li> <li>• *Verify NO fuel handling activities in progress.</li> </ul> <p><b>* These items may not be completed depending on how soon the next event is started.</b></p>
	SRO	<p><b>When the RBCU has been isolated, or at the direction of the Lead Examiner this event is completed.</b></p>



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Event Description: **Letdown High Temperature Interlock Failure (C, OATC/SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	<ul style="list-style-type: none"> <li>• Re-establish normal makeup through 1HP-120.</li> <li>• Notify SPOC to initiate repairs on 1HP-5.</li> <li>• Verify seal injection flow reduced in Step 4.7.</li> <li>• Re-establish normal RCP seal injection flow.</li> <li>• Position the standby HPI pump switch to AUTO.</li> </ul> <p><b>WHEN</b> repairs are complete on 1HP-5 (LETDOWN ISOLATION) (East Pen Rm), <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"> <li>A. __ Locally turn 1HP-5 handwheel fully clockwise.</li> <li>B. __ <b>EXIT</b> TS 3.6.3.</li> </ul> <p><b>Exit</b> this procedure</p>
		<p><b>When 1HP-5 is manually opened and NEO is stationed locally then this event is complete or when directed by Lead Examiner.</b></p>



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Event Description: **1A SGTL 1 - 50 gpm over 10 minutes: (SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	<p><b>Crew response:</b>  <u>AP/31</u> (Primary to Secondary Leakage) ...continued</p> <ul style="list-style-type: none"> <li>• Make notifications of primary to secondary leakage per OMP 1-14</li> <li>• Initiate a unit shutdown using the following as necessary to meet requirements of Encl 5.1 (Unit Shutdown Requirements):                             <ul style="list-style-type: none"> <li>○ OP/1/A/1102/004 (Operation at Power)</li> <li>○ OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown)</li> </ul> </li> <li>• <b>IAAT</b> primary to secondary leakage increases, <b>THEN</b> modify shutdown as required by Encl 5.1 (Unit Shutdown Requirements).</li> <li>• Notify Radwaste to stop all liquid releases in progress until sample results assure release rates within limits.</li> <li>• Stop all gaseous releases in progress until sample results assure release rates within limits.</li> <li>• Make up to the UST only as necessary to maintain UST level &gt; 7'.</li> </ul>
		<p><b>Event is complete when EOP entry is made or when directed by the lead examiner.</b></p>









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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p><b>Crew response:</b></p> <p><u>Rule 3</u> (Loss of Main Feedwater) only</p> <ul style="list-style-type: none"> <li>• <b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency), <b>AND</b> any of the following exist:                             <ul style="list-style-type: none"> <li>○ RCS pressure reaches 2300 psig <b>OR</b></li> <li>○ NDT limit ___ Pzr level reaches 375" [340" acc]</li> <li>○ <b>THEN PERFORM</b> Rule 4 (Initiation of HPI Forced Cooling).</li> </ul> </li> <li>• Start EFDW pumps to feed all intact SGs (TDEFWP)</li> <li>• Verify any SCM <math>\leq 0^{\circ}\text{F}</math>; RNO If overcooling or exceeding Rule 7 limits, <b>THEN</b> throttle EFDW as necessary.</li> <li>• Initiate Encl. 5.9, Extended EFW Operation</li> <li>• Make up to the UST</li> <li>• Start TDEFWP BEARING OIL COOLING PUMP</li> </ul>
	SRO	<p>SRO will transfer to the <u>BLACKOUT</u> tab.</p> <ul style="list-style-type: none"> <li>• Notify plant staff Emergency Dose limits are in affect.</li> <li>• Direct an RO to announce plant conditions using the plant page and notify the OSM to reference EP and NSD 202.</li> <li>• SRO will direct the BOP to perform Encl. 5.38 (Restoration of Power)</li> </ul>

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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	ALL	<p><b>Crew response:</b></p> <p>Encl. 5.38 (Restoration of Power)</p> <ul style="list-style-type: none"> <li>• Position the following to OFF:                             <ul style="list-style-type: none"> <li>○ 1A MD EFDWP</li> <li>○ 1B MD EFDWP</li> </ul> </li> <li>• Feed and steam available SGs as necessary to stabilize RCS P/T.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><b>NOTE:</b></p> <p>Feeding SGs with EFDW is desired above HPI Forced Cooling. Step 6 should be performed prior to re-performing Rule 3.</p> </div> <ul style="list-style-type: none"> <li>• <b>IAAT</b> EFDW from any source is insufficient to maintain stable RCS P/T, <b>THEN</b> notify SSF operator that feeding SGs with SSF ASW is required.</li> <li>• <b>IAAT</b> power is restored to any of the following:                             <ul style="list-style-type: none"> <li>• 1TC</li> <li>• 1TD</li> <li>• 1TE</li> </ul> <p><b>THEN</b> Initiate AP/11 (Recovery from Loss of Power). (SEE NEXT PAGE FOR AP/11 steps) <b>GO TO</b> Subsequent Actions Tab</p> </li> </ul> <p>SRO will transfer to the Subsequent Actions tab.</p> <p>SRO will transfer to the SGTR tab</p>
	SRO	

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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p><b>Crew response:</b> RO will perform <u>Encl. 5.38</u> (Restoration of Power) <b>(CT-8) (Not met if Encl. 5.38 completed with power NOT restored.)</b></p> <ul style="list-style-type: none"> <li>• Place 1HP-31 in HAND and reduce demand to 0.</li> <li>• Close 1HP-21.</li> <li>• Verify MFB1/2 energized (NOT); GO TO Step 8</li> <li>• Verify CT-1 indicates ~ 4160 volts (NOT); GO TO Step 18</li> <li>• Verify both STNDY Busses de-energized</li> <li>• Verify both Keowee units operating (NOT)</li> <li>• Emergency start Keowee units</li> <li>• Notify Keowee Operator to place all Keowee units in Oconee Control.</li> <li>• Ensure one of the following is closed for an operating Keowee unit: <ul style="list-style-type: none"> <li>○ UNIT 1 EMER FDR ACB 3 (restores power)</li> </ul> </li> <li>• Verify CT-4 indicates ≈ 4160 volts.</li> <li>• Place the following transfer switches in MAN: <ul style="list-style-type: none"> <li>○ CT4 BUS 1 AUTO/MAN</li> <li>○ CT4 BUS 2 AUTO/MAN</li> </ul> </li> <li>• Place the following switches in ON: <ul style="list-style-type: none"> <li>○ STBY BUS 1 SYNCHRONIZING</li> <li>○ STBY BUS 2 SYNCHRONIZING</li> </ul> </li> <li>• Close the following breakers: <ul style="list-style-type: none"> <li>○ SK1 CT4 STBY BUS 1 FEEDER</li> <li>○ SK2 CT4 STDY BUS 2 FEEDER</li> </ul> </li> <li>• Place the following switches in OFF: <ul style="list-style-type: none"> <li>○ STBY BUS 1 SYNCHRONIZING</li> <li>○ STBY BUS 2 SYNCHRONIZING</li> </ul> </li> <li>• Verify Standby Bus #1 energized.</li> <li>• Place the following switches in MAN: <ul style="list-style-type: none"> <li>○ MFB1 AUTO/MAN</li> <li>○ MFB2 AUTO/MAN</li> <li>○ STANDBY 1 AUTO/MAN</li> <li>○ STANDBY 2 AUTO/MAN</li> </ul> </li> <li>• Open the following breakers: <ul style="list-style-type: none"> <li>○ N1<sub>1</sub> MFB1 NORMAL FDR</li> <li>○ N2<sub>1</sub> MFB2 NORMAL FDR</li> <li>○ E1<sub>1</sub> MFB1 STARTUP FDR</li> <li>○ E2<sub>1</sub> MFB2 STARTUP FDR</li> </ul> </li> <li>• Close the following breakers: <ul style="list-style-type: none"> <li>○ S1<sub>1</sub> STBY BUS 1 TO MFB1</li> <li>○ S2<sub>1</sub> STBY BUS 2 TO MFB2</li> </ul> </li> </ul>

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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p><b>Crew response:</b></p> <p>Having just completed Encl. 5.38, the SRO may direct an RO to perform AP/11</p> <p><u>AP/11 (Recovery from Loss of Power).</u></p> <ul style="list-style-type: none"> <li>• Announce AP entry using the PA system.</li> <li>• Verify load shed has initiated</li> <li>• Verify load shed is complete as indicated by LOAD SHED COMPLETE on any ES Module (Channel 1 or 2).</li> </ul> <p>Close the following breakers:</p> <ul style="list-style-type: none"> <li>• 1TC INCOMING FDR BUS 1/2</li> <li>• 1TD INCOMING FDR BUS 1/2</li> <li>• 1TE INCOMING FDR BUS 1/2</li> </ul> <p>Verify CT-1 is energizing a MFB. (It's NOT)</p> <p>Verify a 230KV Switchyard Isolation has occurred. (It has NOT)</p> <p>Simultaneously press RESET on both of the following pushbuttons to reset Main Feeder Bus Monitor Panel Load Shed Circuitry:</p> <ul style="list-style-type: none"> <li>• MFB UNDERVOLTAGE CHANNEL 1/2 RESET</li> </ul> <p>Verify all condensate flow has been lost for &lt; 25 minutes and condensate operation is desired.</p> <p>Place all HWP control switches to OFF.</p> <p>Place all CBP control switches to OFF.</p> <p>Place 1FDW-53/65 in MANUAL and close.</p> <p>Place 1C-10 FAIL SWITCH in MANUAL.</p> <p>Close 1C-10.</p> <p>Using a plant page, clear TB Basement and TB third floor of non-essential personnel.</p> <p>Start one HWP.</p>

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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p><b>An RO could be performing Encl. 5.5, once power has been restored, as described below.</b></p> <p><b>Crew response:</b> RO will make up to RCS per <u>Encl. 5.5</u> (Pzr and LDST Level Cont)</p> <ul style="list-style-type: none"> <li>• Utilize the following as necessary to maintain desired Pzr level: <ul style="list-style-type: none"> <li>• Standby HPI pump</li> <li>• 1HP-26</li> <li>• 1HP-7</li> <li>• 1HP-5</li> <li>• 1HP-120 setpoint or valve demand</li> </ul> </li> <li>• <b>IAAT LDST level CANNOT be maintained, THEN open 1HP-24, open 1HP-25 and close 1HP-16.</b></li> </ul> <p><b>NOTE: 1HP 24 and 1HP-25 fail closed.</b></p> <ul style="list-style-type: none"> <li>• <b>IF both BWST suction valves (1HP-24 and 1HP-25) are closed, THEN perform the following: (CT-30) (CT requires supplying HPI suction from LPI before HPI pumps lose suction. i.e. low/cycling amps.)</b> <ul style="list-style-type: none"> <li>• Start 1A LPI PUMP.</li> <li>• Start 1B LPI PUMP.</li> <li>• Open the following: <ul style="list-style-type: none"> <li>• 1LP-15</li> <li>• 1LP-16</li> <li>• 1LP-9</li> <li>• 1LP-10</li> <li>• 1LP-6</li> <li>• 1LP-7</li> </ul> </li> </ul> </li> <li>• <b>IF two LPI Pumps are running only to provide HPI pump suction, THEN secure one LPI pump.</b></li> <li>• Dispatch an operator to open 1HP-363 (LETDOWN LINE TO LPI PUMP SUCTION BLOCK)</li> </ul>

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Event Description: **Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p><b>Once power is restored and the SRO has transferred out of the SBO tab to Subsequent Actions and finally to the SGTR tab</b></p> <p><b>Crew response:</b> <u>SGTR tab</u></p> <ul style="list-style-type: none"> <li>• Maintain Pzr level 140" - 180"</li> <li>• Start A and B Outside Air Booster Fan <b>(CT-27)</b></li> <li>• Notify Unit 3 to start 3A and 3B Outside Air Booster Fans</li> <li>• Monitor RIAs 16 and 17 to identify all SGs with a tube rupture.</li> <li>• Notify RP to survey both MS lines for radiation.</li> <li>• Secure any unnecessary offsite release paths. (Main Vacuum Pumps, TDEFDWP, Emergency Steam Air Ejector, etc.)</li> <li>• Open the following:               <ul style="list-style-type: none"> <li>○ 1HP-24</li> <li>○ 1HP-25</li> </ul> </li> </ul> <p><b>NOTE: 1HP-24 and 1HP-25 fail closed. See previous page for step to align</b></p> <ul style="list-style-type: none"> <li>• Secure makeup to LDST.</li> <li>• Maintain both SG pressures &lt; 950 psig using <u>either</u> of the following: 1) TBVs 2) Dispatch two operators to perform Encl 5.24 (Operation of the ADVs)</li> <li>• Minimize core SCM using the following methods: <b>(CT-7) (Will fail CT if SCM is lost due to reduction in SCM. Progress must be made in reducing SCM.)</b> <ul style="list-style-type: none"> <li>○ De-energize all Pzr heaters</li> <li>○ Use Pzr spray</li> <li>○ Maintain Pzr level 140" - 180"</li> </ul> </li> <li>• <b>IAAT RCS de-pressurization methods are inadequate in minimizing core SCM,</b> <ul style="list-style-type: none"> <li>○ Cycle PORV as necessary</li> </ul> </li> </ul>
		<p><b>When crew takes action to minimize SCM or when directed by the lead examiner, the event is complete.</b></p>

### CRITICAL TASKS

1. CT-24, ATWS
2. CT-30, Control RCS Inventory
3. CT-27, Implementation of Control Room Habitability Guidance
4. CT-7, Minimize SCM
5. CT-8, Electrical Power Alignment



Facility: **Oconee**

Scenario No.: **2 RO IS**

Op-Test No.: **1**

Examiners: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions:

- 100% Reactor Power (SNAP-205)

Turnover:

- SASS in Manual
- AMSAC/DSS bypassed for I&E testing
- 1NI-9 OOS, to be replaced next outage
- "1A" SG AFIS Digital Channel 1 auto-initiate circuit OOS- TS
- "A" Condensate Booster Pump OOS, breaker to be replaced
- 1B MFDWP on Handjack for MGU work; completed; NEO on station at 1B MFDWP
- I&E performing instrument calibrations

Event No.	Malfunction No.	Event Type*	Event Description
0a	Pre-Insert		AMSAC/DSS bypassed
0b	Pre-Insert MNI082		NI-9 OOS
0c	Pre-Insert AOR		"A" AFIS circuit disabled "B" AFIS circuit disabled
0d	Pre-Insert		ES channels 7 and 8 fail to actuate
0e	Pre-Insert		1HP-26 failed closed
0f	Pre-Insert		1A MDEFWP fails to start
1		N, BOP, SRO	Remove/restore 1B MFWP from Hand Jack
2	Override	C, BOP, SRO	Inadvertent ES Channel 4 actuation (TS)
3	Override	C, OATC, SRO	Pressurizer Spray Valve fails open
4	MPI050 MPI080	I, OATC, SRO	RC Loop B Flow Fails LOW (TS?) Small RCS Leak (TS)
5	MPS400	C, BOP, SRO	RCS Leak, 50 gpm (TS)
6		R, OATC, SRO	Manual power reduction due to RCS Leak
7	MSS370, 100	M, ALL	1B Main Steam line break in RB ES Channels 7 & 8 fail to actuate

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

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Event Description: **Remove 1B MFWP from Handjack (N, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>SRO</p> <p>BOP</p>	<p>Direct BOP to perform OP/1/A/1106/002 B (FWPT Operation), Encl. 4.13, Taking the 1B FDWPT Off Handjack.</p> <p>BOP, use the above procedure Encl. 4.13, and remove the 1B FDWPT from Handjack and restore speed control to the 1B MGU (motor gear unit)</p> <p>Initial Conditions:</p> <ol style="list-style-type: none"> <li>1. Motor gear unit (MGU) operable from 1B MAIN FDW PUMP (ICS) station.</li> <li>2. 1B FDWPT controlled from Motor Speed Changer.</li> <li>3. Review Limits and Precautions</li> </ol> <p>Procedure</p> <ol style="list-style-type: none"> <li>1. Remove tag from 1B Main FDWP (ICS) station</li> <li>2. Run 1B MAIN FDW PUMP (ICS) station to "HSS" (high speed stop)</li> <li>3. Establish communications with the local NEO</li> <li>4. Exercise the 1B MGU (ICS) station by running MGU down to the LSS and then Back up to HSS; verify smooth operation.</li> <li>5. Turn FWT 1B HANDJACK switch to "OFF"</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE: Two successful decreases verifies control with Motor Gear Unit</p> </div> <ol style="list-style-type: none"> <li>6. Decrease 1B MAIN FDW PUMP (ICS) until 1B FDWPT controlled by 1B MAIN FDW PUMP (ICS) station</li> <li>7. Increase 1B FDWPT Motor Speed Changer.</li> <li>8. Verify 1B FDWPT speed does <b>NOT</b> increase.</li> <li>9. Run 1B FWPT Motor Speed Changer to "HSS".</li> </ol> <p><b>IF</b> U1 is in Mode 1 or 2 with 1A FDWPT in auto:</p> <ol style="list-style-type: none"> <li>10. Verify 1A MAIN FDW PUMP (ICS) in "AUTO".</li> <li>11. Place 1B MAIN FDW PUMP (ICS) in "AUTO".</li> <li>12. Verify ICS adjusts 1B FDWPT speed to balance suction flow.</li> </ol>
		<p><b>Event is complete when the 1B FDWPT (ICS) station is in AUTO, or when directed by the lead examiner the event is completed.</b></p>





Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 4

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**Event Description: RC Loop B Flow fails LOW: (I, OATC/SRO)  
Small RCS Leak (TS)**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p><b>Plant response:</b></p> <p>Statalarms:</p> <ul style="list-style-type: none"> <li>• 1SA-2/A-4, RC Loop B Flow Low</li> <li>• 1SA-2/A-5, RC Total Flow Low</li> <li>• 1SA-1/A-1, RP Channel A Trip</li> <li>• 1SA-1/A-3, RP Channel A Flux/Imb/Flow Trip</li> </ul> <p>Control board indications:</p> <ul style="list-style-type: none"> <li>• RCS Flow meter shows Loop B flow at zero.</li> <li>• RPS Channel A trips.</li> <li>• B S/G FDW Flow instrument shows a reduction in FDW, and the A S/G FDW Flow indicates increasing flow or off-scale High.</li> <li>• DELTA Tc meter indicates a large Delta Temp.</li> <li>• RB normal sump level slowly increasing</li> </ul> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• The crew stabilizes using the “Plant Transient Response” process.</li> <li>• Take Diamond and BOTH FDW Masters to MANUAL; stabilizes the unit.</li> <li>• SRO may enter AP/2 (Excessive RCS Leakage) if the increase in RB normal sump rate is observed. (highly unlikely due to size of leak.)</li> <li>• SRO refers to AP/28, ICS Instrument Failures and notifies SPOC.</li> </ul> <p><u>AP/28, ICS Instrument Failures (Case 4E RCS Flow Failure) will:</u></p> <ul style="list-style-type: none"> <li>○ Ensure DIAMOND and BOTH FDW Masters in MANUAL.</li> <li>○ Notify SPOC to select a valid RCS flow input to ICS and investigate and repair the failed RCS flow instrumentation.</li> <li>○ Ensure any associated requirements of PT/1/A/0600/001 (Periodic Instrument Surveillance)</li> <li>○ <b>WHEN</b> notified by SPOC a valid RCS flow input has been restored, <b>THEN GO TO</b> Encl 5.1 (Placing ICS in AUTO).</li> </ul> <p><b>Note: Crew may refer to PT/600/001 (Periodic Instrument Surveillance) and TS 3.3.1 (RPS Instrumentation) due to “A” RPS Channel trip and may choose to place “A” RPS to manual Bypass.</b></p>
		<p><b>Event is complete when the SRO has reached the WHEN step in AP/28 or when directed by the Lead Examiner.</b></p>



Op-Test No.: \_\_\_\_\_ Scenario No.:   2   Event No.:   5  

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Event Description: **RCS Leak: (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
		<p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• Place 1HP-14 in NORMAL</li> <li>• Announce AP entry using the PA system.</li> <li>• Initiate Encl 5.1 (Leak Rate Determination).</li> <li>• <b>IAAT</b> additional makeup flow to LDST is desired,                    <b>AND</b> 1A Bleed Transfer Pump is operating,                    <b>THEN</b> dispatch an operator to close 1CS-48 (1A BHUT RECIRC)</li> <li>• Notify the OSM to reference the Emergency Plan and OMP 1-14 (Notifications).</li> <li>• Notify the STA and RP.</li> <li>• Shut down using: <ul style="list-style-type: none"> <li>• OP/1/A/1102/004 (OPS At Power) Enclosure 4.2 (Power Reduction)</li> <li>• AP/29 (Rapid Unit Shutdown)</li> </ul> </li> </ul> <p>Simulator operator: If the SRO elects to shutdown using Ops At Power, call as the OSM and direct the crew to use AP/29.</p>
		<p><b>When the SRO has made the decision to shutdown, or when directed by the lead examiner the event is completed.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.:   2   Event No.:   6  

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Event Description: **Manual Power Reduction: (R, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>SRO</p> <p>BOP</p>	<p>SRO directs shutdown per <u>AP/29 (Rapid Unit Shutdown)</u>:</p> <ul style="list-style-type: none"> <li>• Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown)               <ul style="list-style-type: none"> <li>• Stop 1A &amp; 1B MSRH DRN PUMP</li> <li>• Place 1FDW-53 and 1FDW-56 in MANUAL and close.</li> <li>• Place 1HD-37 and 1HD-52 in DUMP.</li> <li>• Start the following pumps:                   <ul style="list-style-type: none"> <li>➢ 1A &amp; 1B FDWP Seal Injection Pump</li> <li>➢ 1A &amp; 1B FDWP Aux Oil Pump</li> </ul> </li> <li>• WHEN NI Power <math>\leq</math> 80%, Secure 1E1 &amp; 1E2 HTR DRN PUMPs</li> </ul> </li> </ul> <p>Transfer electrical auxiliaries</p> <ul style="list-style-type: none"> <li>• Place 1TA &amp; 1TB AUTO/MAN transfer switch in MAN</li> <li>• Close 1TA SU 6.9 KV FDR</li> <li>• Verify 1TA NORMAL 6.9 KV FDR opens</li> <li>• Close 1TB SU 6.9 KV FDR</li> <li>• Verify 1TB NORMAL 6.9 KV FDR opens</li> <li>• Place MFB1 AUTO/MAN transfer switches in MAN</li> <li>• Place MFB2 AUTO/MAN transfer switches in MAN</li> <li>• Close E1<sub>1</sub> MFB1 STARTUP FDR</li> <li>• Verify N1<sub>1</sub> MFB1 NORMAL FDR opens</li> <li>• Close E2<sub>1</sub> MFB2 STARTUP FDR</li> <li>• Verify N2<sub>1</sub> MFB2 NORMAL FDR opens</li> </ul>







Op-Test No.: \_\_\_\_\_ Scenario No.:   2   Event No.:   8  

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Event Description: **1B Main Steam line break in RB (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><u>Excessive Heat Transfer (EHT) tab</u> will:</p> <ul style="list-style-type: none"> <li>• Ensure Rule 5 (Main Steam Line Break) in progress or complete.</li> <li>• Close 1FDW-41 and 1FDW-44.</li> <li>• Close 1FDW-382, 1MS-26, 1MS-76, 1MS-36, 1MS-84, 1FDW-369.</li> <li>• Throttle HPI per Rule 6</li> <li>• Verify letdown in service</li> <li>• Feed and steam all intact SGs to stabilize RCS P/T. <b>(CT-11)</b></li> <li>• Verify 1MS-24/33 are closed.</li> <li>• Open 1AS-8</li> <li>• Close 1SSH-1, 1SSH-3, 1SSH-9.</li> <li>• Minimize SCM using the following methods as necessary: <b>(CT-7)</b> <ul style="list-style-type: none"> <li>➤ De-energize all PZR heaters</li> <li>➤ Use PZR spray</li> <li>➤ Throttle HPI</li> <li>➤ Use PORV</li> </ul> </li> <li>• Maintain RCP NPSH.</li> <li>• Initiate Enclose 5.16 (SG Tube-to-Shell <math>\Delta</math> T Control)</li> <li>• <b>GO TO</b> FCD tab (if one SG is isolated).</li> </ul>
	SRO	<p><u>Forced Cooldown tab</u></p> <ul style="list-style-type: none"> <li>• Establish and maintain appropriate level and pressure in <u>available intact</u> SGs.</li> </ul>
		<p><b>When directed by the Lead Examiner the event and scenario is completed.</b></p>

## CRITICAL TASKS

1. CT-17, Isolate Overcooling SG
2. CT-11, Control SG pressure to Maintain RC Temperature Constant.
3. CT-7, Minimize SCM
4. CT-1, Trip All RCPs



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Facility: <b>Oconee</b>		Scenario No.: <b>3 R0 IS</b>		Op-Test No.: <b>1</b>	
Examiners: _____			Operators: _____		
_____			_____		
_____			_____		
Initial Conditions:					
<ul style="list-style-type: none"> <li>88% Reactor Power (SNAP 224)</li> </ul>					
Turnover:					
<ul style="list-style-type: none"> <li>PT/1/A/0290/003, Turbine Valve Movement, in progress</li> <li>SASS in MANUAL for I&amp;E troubleshooting</li> <li>GWD Tank 1B release is in progress</li> </ul>					
Event No.	Malf. No.	Event Type*	Event Description		
0a	Pre-Insert		SASS in manual		
0b	Pre-Insert MSS330		TD EFDW Pump Fails to start		
0c	Pre-Insert MPI290		Block All Turbine Trips Except Manual		
0d	Pre-Insert		1C HPI Pump Fails to Start		
1		N, BOP, SRO	PT/1/A/0290/003, Turbine Valve Movement, in progress; testing CV1		
2	MPI 281	I, OATC, SRO	$\Delta T_c$ Fails High		
3		SRO	Loss of Oil on the 1B MDEFDW Pump (TS)		
4	MSS200	C, BOP, SRO	Vacuum leak		
5	MPS290 Override	C, BOP, SRO	1A CC Pump trips (1B CC Pump fails to auto start)		
6	MSS570	SRO	UST leak (TS)		
7		R, OATC, SRO	Manual unit shutdown due to UST level		
8	MSS010 MSS020	C, OATC, SRO	Main FDW pumps trips Main Turbine Fails to trip (Lockout EHC Pumps)		
9	MPS260	M, ALL	Loss of EFDW (last 1A MDEFWP) - CBP feed		
10	Override	M, ALL	CBPs trip -Loss of ALL FDW - HPI Forced Cooling		

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

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Op-Test No.: \_\_\_\_\_

Scenario No.: **3**

Event No.: 1

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Event Description: **PT: Turbine Valve Movement At Power: (N; BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>Crew response:</b></p> <p>The BOP should use the in progress procedure PT/1/A/0290/003 (Turbine Valve Movement) Enclosure 13.2, Control Valve Movement At Power, at step 2.6 to test CV1:</p> <p>___ <b>IF</b> required, select "Control Valve 1 &amp; 2 Test".</p> <p>___ Verify "Test Permissive" is ON.</p> <p>___ Record CV1 pretest position: % Open.</p> <p>___ Select "Initiate Test" for Control Valve 1 Test.</p> <p><b>IF</b> any of the following conditions occur, select "Abort CV1 Test":</p> <ul style="list-style-type: none"> <li>• NI POWER changes &gt; 2%. (R.M.)</li> <li>• SG Feedwater flow &gt; 5.7 X 10<sup>6</sup> lbm/hr.</li> <li>• ICS Turbine Master trips to HAND. (R.M.)</li> <li>• Turbine vibration &gt; 10 mils for &gt; 5 seconds.</li> </ul> <p><b>IF</b> "Test Failed" is "ON" <b>AND</b> CV1 is <b>NOT</b> fully closed, select "Abort CV1 Test".</p> <p><b>IF</b> "Test Failed" is "ON" <b>AND</b> CV1 remains closed perform the following:</p> <ul style="list-style-type: none"> <li>• Do <b>NOT</b> select "Abort CV1 Test". (R.M.)</li> <li>• Notify WCC &amp; Engineering that the (FASV) for the Control Valve under test is stuck in the energized state.</li> </ul> <p><b>NOTE:</b> Control Valves which are not in their normal position could result in asymmetrical loading on the Turbine bearings.</p> <ul style="list-style-type: none"> <li>• Monitor Turbine Vibrations closely if in this abnormal state.</li> </ul> <p>___ Verify CV1 "Test Successful" ON.</p> <p>___ Verify CV1 test indicator reset.</p> <p>___ Verify CV1 within ± 5.0% of pretest position.</p> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>• Verify acceptance criteria met.</li> <li>• <b>IF</b> acceptance criteria <b>NOT</b> met, notify SRO.</li> </ul> <p>___ Stop Standby EHC pump.</p> <p>___ Place Standby EHC pump control switch to "AUTO".</p>

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		<b>When the PT is completed and EHC pumps returned to normal alignment or when directed by the Lead Examiner this event is completed.</b>
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Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 2 Page 1 of 1

Event Description:  $\Delta T_c$  fails HIGH: (I, OATC/SRO)

Time	Position	Applicant's Actions or Behavior
	ALL OATC	<p><b>Plant Response:</b></p> <ul style="list-style-type: none"> <li>FDW flow will ratio incorrectly based on the failure</li> <li>"A" FDW flow will increase causing "A" loop <math>T_c</math> to decrease.</li> <li>"B" FDW flow will decrease causing "B" loop <math>T_c</math> to increase.</li> <li>This will cause actual <math>\Delta T_c</math> to increase (become more negative). Failure to adjust FDW flow will result in QPT.</li> <li>Statalarm 1SA-02/B-5, RC Cold Leg Diff. Temperature High, will actuate if actual <math>\Delta T_c</math> increases to <math>\pm 5^\circ F</math></li> </ul> <p><b>Crew Response:</b></p> <ul style="list-style-type: none"> <li>Crew should perform Plant Transient Response (PTR) <ul style="list-style-type: none"> <li>Diagnose the <math>\Delta T_c</math> failure by observing the <math>\Delta T_c</math> meter on 1UB1. It should return to zero but is staying a + 3.5 degrees.</li> <li>Take the Diamond and Feedwater Masters to MANUAL and re-ratio feedwater using the loop <math>T_c</math> meters to return actual <math>\Delta T_c</math> to near zero.</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Refer to AP/28 (ICS Instrument Failures)</li> <li>Verify Entry is due to an Instrument Failure</li> <li>Verify plant parameters stable</li> <li>GO TO Section 4F, <math>\Delta T_c</math> Failure</li> <li>Ensure 1A &amp; 1B FDW Masters and Delta <math>T_c</math> are in HAND.</li> <li>Re-ratio feedwater flow to establish <math>\sim 0^\circ F \Delta T_c</math></li> <li>Ensure any associated requirements of PT/1/A/0600/001 are met</li> </ul>
		<b>When the SRO reaches the WHEN step (5) in Section 4F or when directed by the lead examiner this event is completed.</b>

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Op-Test No.: _____		Scenario No.: <b>3</b>	Event No.: <b>3</b>	Page 1 of 1
Event Description: <b>Loss of Oil on the 1B MDEFDW Pump; (TS, SRO)</b>				
Time	Position	Applicant's Actions or Behavior		
	SRO	<p><b>Note: A NEO will call the control room and state the following:</b>  <b>"The 1B MDEFDW pump has an oil leak and no oil is visible in the bubbler."</b></p> <p><b>Booth Operator: Start Event 4 after waiting ~2-3 minutes</b></p> <p><b>Crew response:</b>  The SRO should determine that the 1B MDEFDW pump is inoperable and refer to TS 3.7.5 (Emergency Feedwater System)  TS 3.7.5 Condition A with a 7 day completion time is in affect.  Notify SPOC to investigate and repair. May place the 1B MDEFDW pump is OFF and/or direct that the breaker for the 1B MDEFDW pump should be opened.</p>		
		<p><b>When the TS has been referenced and when directed by the Lead Examiner the event is completed.</b></p>		

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Op-Test No.: _____	Scenario No.: <b>3</b>	Event No.: <b>4</b>	Page 1 of 1
Event Description: <b>Vacuum Leak: (C; BOP, SRO)</b>			
Time	Position	Applicant's Actions or Behavior	
		<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• 1SA-03/A-6, COND VACUUM LOW</li> <li>• OAC alarm, Main Condenser Vacuum LOW</li> </ul> <p><b>Crew response:</b></p> <p>Refer to the ARG and AP/27, Loss of Condenser Vacuum.</p> <p><u>AP/27</u>: Loss of Condenser Vacuum</p> <ol style="list-style-type: none"> <li>1. <b>IAAT</b> condenser vacuum is <math>\leq 22</math>" Hg, THEN trip RX.</li> <li>2. Dispatch operators to perform Encl. 5.1 (Main Vacuum Pump Alignment) and look for vacuum leaks.</li> <li>3. Start all Main Vacuum Pumps.</li> </ol> <p><b>Booth Operator: Open V-22, 24, 26, 28, and 30 using MANUAL Valves; THEN wait 3 mins and call as NEO and report that the MVPs are aligned to the Unit 1 Main Condenser</b></p> <ol style="list-style-type: none"> <li>4. Ensure 1V-186 is closed.</li> </ol> <p><b>Booth Operator: per lead examiner direction FIRE TIMER 15 to reset vacuum leak; do not allow the crew to trip the Rx on low (~22" Hg) vacuum</b></p> <ol style="list-style-type: none"> <li>5. Ensure Stm pressure to Stm Air Eject A, B, C &gt; 255 psig.</li> <li>6. Verify Stm Seal Hdr Press &gt; 1.5 psig.</li> <li>7. Start 1D CCW pump.</li> <li>8. Verify Condensate flow <math>\geq 2300</math> gpm.</li> <li>9. <b>WHEN</b> condenser vacuum is stable, <b>AND</b> Encl 5.1 (Main Vacuum Pump Alignment) is complete, <b>THEN EXIT</b> this procedure.</li> </ol> <p><b>Cue: (Booth Operator): Once vacuum has been stabilized call the CR as the NEO and report that the vacuum leak has been isolated (1A FWP Pumping trap) and reset the vacuum malfunction. OR reset at the direction of the Lead Examiner.</b></p>	
		<p><b>When vacuum has been recovered or when directed by the lead Examiner, the event is complete.</b></p>	

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Time	Position	Applicant's Actions or Behavior
Op-Test No.: _____ Scenario No.: <b>3</b> Event No.: <b>5</b> Page 1 of 3		
Event Description: <b>1A CC Pump trips, 1B CC Pump Fails to Auto Start: (C; BOP, SRO)</b>		
		<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• 1SA-9/B-1, CC CRD RETURN FLOW LOW</li> <li>• 1SA-9/C-1, CC COMP COOLING RETURN FLOW LOW</li> <li>• 1SA-2/C-1, LETDOWN TEMPERATURE HIGH</li> <li>• 1HP-5 (Letdown Isolation) will close due to high letdown temperature</li> <li>• CC Total Flow Low</li> <li>• Component Cooling Pressure Low</li> </ul> <p><b>Crew Response:</b></p> <ul style="list-style-type: none"> <li>• Refer to ARG 1SA-9/B-1</li> <li>• Determine low flow is due to CC Pump failure AND Standby CC Pump did NOT start and perform the following: <ul style="list-style-type: none"> <li>➤ Verify CC Surge Tank level &gt; 18"</li> <li>➤ Start Standby CC Pump</li> </ul> </li> </ul> <p><b>Note: The SRO may not initiate AP/20 if the standby pump is started per the ARG.</b></p>
	BOP	
	SRO	<ul style="list-style-type: none"> <li>• Initiate AP/20 (Loss of Component Cooling) <ul style="list-style-type: none"> <li>• <b>IAAT</b> ≥ two CRD stator temperatures ≥ 180°F, <b>THEN</b> trip RX. (~ 4 minutes)</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Open 1CC-7 and 1CC-8</li> <li>• Verify CC Surge Tank level ≥ 12".</li> <li>• Manually start the Standby CC Pump</li> <li>• Verify CC TOTAL FLOW &gt; 575 gpm</li> <li>• If Letdown &gt; 130°F, THEN: <ul style="list-style-type: none"> <li>• Close 1HP-5,</li> <li>• Initiate AP/032 (Loss of Letdown)</li> </ul> </li> </ul>

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Op-Test No.: \_\_\_\_\_

Scenario No.: **3**Event No.: **5**

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Event Description: **1A CC Pump trips, 1B CC Pump Fails to Auto Start: (C; BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>SRO</p> <p>BOP/ OATC</p> <p>BOP</p>	<p><b>Crew Response:</b></p> <ul style="list-style-type: none"> <li>• If AP/20 (Loss of Component Cooling) not entered, Statalarm 1SA-2/C-1 will direct initiating AP/32 (Loss of Letdown)</li> </ul> <p><u>AP/32</u>, Loss of Letdown:</p> <ul style="list-style-type: none"> <li>• Place 1HP-120 in HAND and reduce demand to zero.</li> <li>• Initiate makeup to LDST as required (Encl. 5.5 or OP/1/A/1103/004)</li> <li>• Notify Chemistry of the following: <ul style="list-style-type: none"> <li>➢ Current RCS boron sample is needed for possible unit shutdown.</li> <li>➢ Normal letdown line is isolated.</li> </ul> </li> <li>• <b>IAAT Pzr level <math>\geq</math> 260", AND letdown <b>CANNOT</b> be established, THEN initiate unit shutdown at <math>\approx</math> 20%/min per AP/29 (Rapid Unit Shutdown).</b></li> <li>• <b>IAAT Pzr level <math>\geq</math> 375", THEN trip Rx.</b></li> <li>• Verify CC system in operation.</li> <li>• Position the standby HPI pump switch to OFF.</li> <li>• Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW</li> <li>• Verify loss of letdown is due to L/D temperature high and then <b>GO TO</b> Step 4.28.</li> <li>• <b>WHEN</b> letdown can be re-established, <b>THEN</b> ensure proper operation of the CC System.</li> <li>• Close 1HP-6 and 1HP-7.</li> <li>• Open the following: <ul style="list-style-type: none"> <li>➢ 1HP-1</li> <li>➢ 1HP-2</li> <li>➢ 1HP-3</li> <li>➢ 1HP-4</li> </ul> </li> </ul>

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Op-Test No.: \_\_\_\_\_

Scenario No.: **3**Event No.: **5**

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Event Description: **1A CC Pump trips, 1B CC Pump Fails to Auto Start: (C; BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/ OATC  BOP	<p><b>Crew Response:</b></p> <ul style="list-style-type: none"> <li>• Verify letdown temperature &lt; 135°F (<b>it is not</b>)</li> <li>• Open 1HP-13.</li> <li>• Close the following: <ul style="list-style-type: none"> <li>➤ 1HP-8</li> <li>➤ 1HP-9&amp;11</li> </ul> </li> <li>• Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.</li> <li>• Open 1HP-5.</li> <li>• Throttle open 1HP-7 to establish ≈ 20 gpm.</li> <li>• <b>WHEN</b> letdown temperature &lt; 130°F, <b>THEN</b> place LETDOWN HI TEMP INTLK BYP switch in NORMAL.</li> <li>• Open 1HP-6.</li> <li>• Adjust 1HP-7 to control desired (~77 gpm) letdown flow.</li> <li>• Re-establish normal makeup through 1HP-120.</li> <li>• Re-establish normal RCP seal injection flow.</li> <li>• Position the standby HPI pump switch to AUTO.</li> </ul>
		<p><b>This event is complete when Seal Flow is returned to normal (32 gpm) or when directed by the lead examiner.</b></p>

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Op-Test No.: _____	Scenario No.: <b>3</b>	Event No.: <b>6</b>	Page 1 of 1
Event Description: <b>UST Leak: (TS, SRO)</b>			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>OAC Alarm - Turbine Sump Pumps A and B ON</li> <li>1SA-06/A-11, UPPER SURGE TANK LEVEL LOW; occurs later at 6'</li> </ul> <p><b>CREW RESPONSE:</b></p> <p><b>Booth Operator: As an NEO call (or radio) the CR and report "Water is leaking out of the UST; is running down the UST Riser piping. I can't tell where the leak is coming from."</b></p> <p><u>1SA-06/A-11</u> UPPER SURGE TANK LEVEL LOW (comes in later; 6')</p> <div style="border: 1px solid black; padding: 5px;"> <p>NOTE: When UST level reaches 7.5 ft., Train 1 and Train 2 UST Riser Auto Isol Actuated will isolate the Hotwell</p> </div>	
	SRO	<ul style="list-style-type: none"> <li>Open DW-4 (#1 UST Makeup Control)</li> <li>Ensure CST pumps aligned to pump to CST UST.</li> <li>Check hotwell level to determine if hotwell level control valves have malfunctioned</li> <li>Check system for leaks if it appears that water is being lost.</li> <li>SRO should determine that TS 3.7.6 (UST and HW) is not met. <ul style="list-style-type: none"> <li>➤ Condition A and the Required Action is to be in MODE 3 in 12 hours.</li> </ul> </li> <li>SRO should determine a unit shutdown is required.</li> <li>Direct unit shutdown per AP/29 (Rapid Unit Shutdown)</li> </ul> <p><b>Booth Operator: If candidate elects to use OP for Unit Shutdown, call as the OSM, direct use of AP-29 for shutdown of the unit.</b></p>	
		<p><b>Event is complete when a unit shutdown is directed by the SRO or when directed by the Lead Examiner.</b></p>	

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Op-Test No.: _____	Scenario No.: <b>3</b>	Event No.: <b>7</b>	Page 1 of 1
Event Description: <b>Manual unit shutdown due to UST level: (R; OATC, SRO)</b>			
Time	Position	Applicant's Actions or Behavior	
	SRO	<b>Crew response:</b>	
	BOP	<p><u>AP/29</u> (Rapid Unit Shutdown)</p> <p><u>Initiate Encl 5.1</u> (Support Actions During Rapid Unit Shutdown).</p> <ul style="list-style-type: none"> <li>• Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown).</li> <li>• Start the following pumps: <ul style="list-style-type: none"> <li>___ 1A FDWP SEAL INJECTION PUMP</li> <li>___ 1A FDWP AUXILIARY OIL PUMP</li> <li>___ 1B FDWP AUXILIARY OIL PUMP</li> <li>___ 1B FDWP SEAL INJECTION PUMP</li> </ul> </li> <li>• <b>WHEN</b> CTP is <math>\leq</math> 80%, <b>THEN</b> continue. <ul style="list-style-type: none"> <li>___ Stop 1E HTR DRN PUMP.</li> <li>___ Place 1HD-254 switch to OPEN.</li> <li>___ Stop 1E2 HTR DRN PUMP.</li> <li>___ Place 1HD-276 switch to OPEN.</li> </ul> </li> <li>• Verify Turbine-Generator shutdown is required.</li> <li>• Transfer 6.9 KV electrical auxiliaries by placing 1TA/1TB transfer switches to MAN, Closing 1TA/1TB SU 6.9 KV FDR and verifying 1TA/1TB NORMAL 6.9 KV FDR opens.</li> <li>• Transfer 4 KV electrical auxiliaries by placing MFB1/MFB2 transfer switches to MAN, Closing E1 (Startup FDR) and verifying N1 (Normal FDR) opens. Closing E2 (Startup FDR) and verifying N2 (Normal FDR) opens</li> <li>• Notify CR SRO that unit auxiliaries have been transferred.</li> </ul>	
	SRO/ OATC	<p><u>AP/29</u> (Rapid Unit Shutdown) .....</p> <ul style="list-style-type: none"> <li>• Announce AP entry using the PA system.</li> <li>• Verify ICS in AUTO. (<b>its NOT</b>) RNO 1. ___ Initiate manual power reduction to desired power level (15%)</li> </ul>	
		<b>Event is complete when reactor power has been reduced 5% or when directed by the Lead Examiner.</b>	

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Op-Test No.: _____		Scenario No.: <b>3</b>	Event No.: 8	Page 1 of 2
Event Description:		<b>Main FDW Pumps Trip: Main Turbine Fails to trip (Lockout EHC Pumps) (C, OATC, SRO)</b>		
Time	Position	Applicant's Actions or Behavior		
CT-18	SRO	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>Both Main FDW pump trips resulting in a reactor trip.</li> <li>The Main Turbine should trip but does not. This will result in a reduction of steam pressure in both SGs until actions are taken to trip the turbine. This will result in RCS overcooling until the turbine is tripped.</li> </ul> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>SRO will enter the EOP.</li> <li>OATC will perform <u>Immediate Manual Actions</u> <ul style="list-style-type: none"> <li>➤ Depress REACTOR TRIP pushbutton</li> <li>➤ Verify reactor power &lt; 5% FP and decreasing</li> <li>➤ Depress turbine TRIP pushbutton.</li> <li>➤ Verify all turbine stop valves closed</li> </ul> </li> </ul> <p><b>Note: The OATC should diagnose that the turbine did NOT trip and then perform the RNO step which will stop and lockout both EHC pumps. This will cause the turbine to trip. (CT-18)</b></p> <p><b>Note: If AFIS actuates prior to the Main Turbine being Tripped, this critical task is NOT met.</b></p> <ul style="list-style-type: none"> <li>➤ Verify RCP seal injection available.</li> </ul>		
	OATC			
	BOP	<ul style="list-style-type: none"> <li>BOP will perform a <u>Symptoms Check</u> and with SRO concurrence perform RULE 3 (loss of Main FDW only) (1A MD EFDW pump will be the only pump feeding a SG.)</li> <li><u>Encl. 5.9</u> will be performed per Rule 3: <ul style="list-style-type: none"> <li>➤ Place 1FDW-316 in MANUAL and Close</li> <li>➤ Locally open 1FDW-313 and 1FDW-314</li> <li>➤ Throttle open 1FDW-316. (Feeds both SGs w/ 1A MDEFWP)</li> </ul> </li> </ul>		
	SRO	<ul style="list-style-type: none"> <li>The SRO will transfer to Subsequent Actions. OATC will perform Encl. 5.5 (Pzr and LDST Level Control) while the SRO reads to him.</li> </ul>		
		<b>Event is complete plant is stable and Subsequent Actions are in progress or when directed by the lead examiner.</b>		

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Op-Test No.: _____		Scenario No.: <b>3</b>	Event No.: 8	Page 2 of 2
Event Description:		<b>Main FDW Pumps Trip: Main Turbine Fails to trip (Lockout EHC Pumps) (C, OATC, SRO)</b>		
Time	Position	Applicant's Actions or Behavior		
	SRO BOP/ OATC	<p><b>Crew response:</b></p> <p><u>Subsequent Actions:</u></p> <ul style="list-style-type: none"> <li>• Verify all control rods fully inserted</li> <li>• Verify Main FDW in operation (<b>RNO</b>) Ensure Rule 3 in progress</li> <li>• Verify TBVs maintaining ~ 1010 psig</li> <li>• Verify 1RIA-40 operable with OFF GAS BLOWER operating</li> <li>• Dispatch an operator with Encl 5.29 (MSRV Locations) to ensure all MSRVs have reseated</li> <li>• Verify ES required (<b>RNO</b>) Initiate Encl. 5.5</li> <li>• Open PCB 20 &amp; 21</li> <li>• Open Generator &amp; Exciter Field Breaker</li> <li>• Verify Aux Bldg &amp; Turb Bldg Instrument Air pressure &gt; 90 psig</li> <li>• Verify ICS/NNI power available</li> <li>• Verify all 4160 v switchgear energized</li> <li>• Verify both SGs &gt; 550 psig</li> <li>• Ensure Rule 3 in progress and SG levels approaching setpoint</li> <li>• Verify any RCP operating</li> </ul>		
		<b>Event is complete plant is stable and Subsequent Actions are in progress or when directed by the lead examiner.</b>		

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Op-Test No.: _____	Scenario No.: <b>3</b>	Event No.: 9	Page 1 of 2
Event Description: <b>LOSS of EFDW - CBP Feed: (M, ALL)</b> <b>When directed by the lead examiner, trip the 1A MD EFDW Pump.</b>			
Time	Position	Applicant's Actions or Behavior	
	SRO	<p><b>Plant response:</b> Control board indications:</p> <ul style="list-style-type: none"> <li>• Loss of EFDW flow as indicated on Total EFDW flow gauge</li> <li>• 1A MD EFDW pump will indicate tripped (red light off)</li> </ul> <p><b>Crew response:</b> SRO will transfer to <u>LOHT</u> tab:</p> <ul style="list-style-type: none"> <li>• Ensure Rule 3 in progress; (*BOP re-performs Rule 3 – see below)</li> <li>• <b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency), <b>AND</b> any of the following exists: <ul style="list-style-type: none"> <li>• RCS pressure reaches 2300 psig <b>OR</b> NDT limit</li> <li>• Pzr level reaches 375" [340" acc]</li> </ul> </li> </ul> <p><b>THEN GO TO</b> Step 4. (<b>RNO – perform steps below</b>)</p> <ul style="list-style-type: none"> <li>• Reduce operating RCPs to one pump/loop</li> <li>• <b>IF</b> EFDW flow has been re-established to any SG per Rule 3 (Loss of Main or Emergency FDW) or Encl 5.27 (Alternate Methods for Controlling EFDW Flow), <b>THEN GO TO</b> Step 71.</li> </ul> <p><b>WHEN</b> any of the following exists: (<b>SRO will wait at this step</b>)</p> <ul style="list-style-type: none"> <li>➤ Unit 1 EFDW available</li> <li>➤ EFDW aligned from another unit</li> <li>➤ Main FDW pump available <b>AND</b> reset</li> </ul> <p><b>THEN GO TO</b> Step 53.</p>	
	BOP	<p>*<u>Re-perform Rule 3</u>, Loss of Main or Emergency FDW</p> <ul style="list-style-type: none"> <li>• <b>IAAT NO</b> SGs can be fed with FDW...</li> <li>• Start EFDW pumps to feed all intact SGs. (<b>none will operate</b>)</li> <li>• Verify any EFDW pump operating. (<b>none</b>)</li> <li>• Place following in MANUAL and CLOSE: 1FDW-315 and 1FDW-316</li> <li>• Verify BOTH: Any <u>CBP</u> operating AND TBVs available on an <u>intact</u> SG</li> </ul> <p>.....BOP actions in Rule 3 for aligning CBP feed continued on next page</p>	

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Op-Test No.: _____		Scenario No.: <b>3</b>	Event No.: 9	Page 2 of 2
Event Description: <b>Loss of EFDW - CBP Feed: (M, ALL)</b>				
Time	Position	Applicant's Actions or Behavior		
CT-11	BOP	<p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• Select OFF for both digital channels on AFIS HEADER A and AFIS HEADER B.</li> <li>• Place Startup Block valve control switch for 1FDW-33 and 1FDW-42 in OPEN:</li> <li>• Simultaneously position Startup Control (1FDW-35 and 1FDW-44) valves 10 - 20% open on all intact SGs:</li> <li>• Close the following 1FDW-32, 1FDW-41, 1FDW-31, and 1FDW-40.</li> <li>• Lower SG pressure in available SGs to <math>\approx</math> 500 psig.</li> <li>• Control FDW flow to stabilize RCS P/T by throttling the following as necessary Startup Control valves <u>AND</u> TBVs. (CT-11)</li> <li>• Notify CR SRO that CBP feed is in progress.</li> <li>• Place the 1FDW-38 and 1FDW-47 switches to OPEN.</li> <li>• Place the following 1FDW-36 and 1FDW-45 switches to CLOSE.</li> <li>• Dispatch an operator to perform Encl 5.26 (Manual Start of TDEFDWP).</li> <li>• Verify cross-tie with Unit 2 is desired.</li> <li>• Dispatch an operator to open 2FDW-313/314 (2A/2B EFDW LINE DISCH TO 2A S/G X-CONN)</li> <li>• Dispatch another operator to 1FDW-313 have them notify the CR when in position</li> <li>• <b>WHEN</b> either of the following exists: <ul style="list-style-type: none"> <li>➤ Alternate unit EFW cross connects are open</li> <li>➤ 1 TD EFDW PUMP is operating</li> </ul> <b>THEN</b> continue. </li> </ul> <p><b>Booth Operator: Verify it is appropriate and FIRE TIMER to fail Pzr Spray "as-is" (closed) so that RCS pressure can increase faster to 2300 psig.</b></p>		
		<p><b>When CBP feed established or when directed by the lead Examiner, this event is completed</b></p>		

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Op-Test No.: _____		Scenario No.: <b>3</b>	Event No.: 10	Page 1 of 2
Event Description: <b>CBPs Trip - Loss of ALL FDW - HPI Forced Cooling: (M, ALL)</b>				
Time	Position	Applicant's Actions or Behavior		
	BOP	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• Startup flow gauge goes to zero</li> </ul> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• Re-perform Rule 3, Loss of Main or Emergency FDW</li> <li>• <b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency), <b>AND</b> any of the following exist: <ul style="list-style-type: none"> <li>• RCS pressure reaches 2300 psig <b>OR</b> NDT limit</li> <li>• Pzr level reaches 375" [340" acc]</li> </ul> </li> <li>• <b>THEN PERFORM</b> Rule 4 (Initiation of HPI Forced Cooling).</li> <li>• Start EFDW pumps to feed all intact SGs. (<b>NO EFWPs available</b>)</li> <li>• Verify any EFDW pump operating.</li> <li>• Place the following in MANUAL and close 1FDW-315 and 1FDW-316</li> <li>• Verify 1 TD EFDW PUMP is available for manual start.</li> <li>• Verify cross-tie with Unit 2 is desired.</li> <li>• Dispatch an operator to open 2FDW-313/314 (2A/2B EFDW LINE DISCH TO 2A S/G X-CONN)</li> <li>• Dispatch another operator to 1FDW-313 have them notify the CR when in position</li> <li>• <b>WHEN</b> either of the following exists: <ul style="list-style-type: none"> <li>○ Alternate unit EFW cross connects are open</li> <li>○ 1 TD EFDW PUMP is operating</li> </ul> </li> <li>• <b>THEN</b> continue.</li> </ul>		
	SRO/ OATC	<ul style="list-style-type: none"> <li>• <b>IAAT NO</b> SGs can be fed with FDW (Main/CBP/Emergency), <b>AND</b> any of the following exist: <ul style="list-style-type: none"> <li>➤ RCS pressure reaches 2300 psig <b>OR</b> NDT limit</li> <li>➤ Pzr level reaches 375" [340" acc]</li> </ul> </li> <li>• <b>THEN PERFORM</b> Rule 4 (Initiation of HPI Forced Cooling).</li> </ul>		



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**CRITICAL TASKS**

1. CT-18, Turbine Trip
2. CT-11, Control SG Pressure to Maintain RCS Temperature Constant
3. CT-14, Initiate HPI Forced Cooling



March, 2009

Facility: **Oconee**Scenario No.: **4 R0 IS**Op-Test No.: **1**

Examiners: \_\_\_\_\_

Operators: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Initial Conditions:

- 75% Reactor Power EOL (SNAP222)

## Turnover:

- AMSAC/DSS bypassed for I&E testing
- SASS in Manual for I&E testing
- 1B GWD Tank release in progress
- TD EFDWP OOS for maintenance
- Keowee Unit 2 OOS for unplanned reasons
- Keowee Unit 1 aligned to underground (ACB-3 Closed)
- Operability test of Keowee Unit 1 is to be performed per PT/620/009 (Keowee Hydro Operation) after turnover and before startup continues, ONS to perform remote Keowee start. Begin at Encl. 13.1 at Step 2.2

Event No.	Malfunction No.	Event Type*	Event Description
0a	Pre-Insert Updater		AMSAC/DSS bypassed
0b	Pre-Insert Updater		1C HPIP fail to start
0c	Pre-Insert Updater		1RC-4 failed open
0d	Pre-Insert MEL180		Keowee Unit 2 Emergency Lockout
0e	Pre-insert		Block All Reactor Trips, including manual pb
1		N, BOP, SRO	Operability test Keowee Unit 1
2	MPS360	C, OATC, SRO	1HP-31 fails OPEN
3	Updater	C, BOP, SRO	Operating LPSW pump trips, Standby fails to auto start (TS)
4	MCS004	I, OATC, SRO	Controlling Tave fails HIGH
5	Updater	C, BOP, SRO	HPSW Jockey pump trip, altitude valve fail CLOSED (SLC)
6	MCR021 MCR022	C, OATC, SRO	Dropped Control Rod, Manual Power Reduction (TS)
7	MPI300 Override MSS010 MSS020	M, ALL	2 <sup>nd</sup> dropped CR ATWS – UNPP Main FDW Pumps Trip PORV fails OPEN after lifting - AOR

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



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 1 Page 2 of 3

Event Description: **Operability test Keowee Unit 1 (N, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>PT/620/009</u> (Continued)</p> <ul style="list-style-type: none"> <li>• Verify CT4 energized by 13.8 KV Underground Power Path:</li> <li>• <b>IF</b> both Standby Buses are <b>NOT</b> energized, perform the following: <ul style="list-style-type: none"> <li>➤ Ensure TS 3.8.1 Condition D has been entered for Underground Power Path.</li> <li>➤ IF overhead power path is inoperable, ensure TS 3.8.1 Condition I has been entered.</li> </ul> </li> <li>• IF Standby Bus 1 <u>NOT</u> energized <ul style="list-style-type: none"> <li>• Verify ~ 4.16 KV on CT4 Volts</li> <li>• Ensure CT5 BUS 1 AUTO/MAN transfer switch in MAN</li> <li>• Ensure CT4 BUS 1 AUTO/MAN transfer switch in MAN</li> <li>• Place STBY BUS 1 SYNCHRONIZING switch to ON</li> <li>• Close SK1 CT4 STBY BUS 1 FEEDER</li> <li>• Verify ~ 4.16 KV on Standby Bus 1 Volts</li> <li>• Open SK1 CT4 STBY BUS 1 FEEDER</li> <li>• Place STBY BUS 1 SYNCHRONIZING switch to OFF</li> <li>• Place CT4 BUS 1 AUTO/MAN transfer switch to AUTO</li> </ul> </li> <li>• IF Standby Bus 2 <u>NOT</u> energized <ul style="list-style-type: none"> <li>• Verify ~ 4.16 KV on CT4 Volts</li> <li>• Ensure CT5 BUS 2 AUTO/MAN transfer switch in MAN</li> <li>• Ensure CT4 BUS 2 AUTO/MAN transfer switch in MAN</li> <li>• Place STBY BUS 2 SYNCHRONIZING switch to ON</li> <li>• Close SK2 CT4 STBY BUS 2 FEEDER</li> <li>• Verify ~ 4.16 KV on Standby Bus 2 Volts</li> <li>• Open SK2 CT4 STBY BUS 2 FEEDER</li> <li>• Place STBY BUS 2 SYNCHRONIZING switch to OFF</li> <li>• Place CT4 BUS 2 AUTO/MAN transfer switch to AUTO</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 1 Page 3 of 3

Event Description: **Operability test Keowee Unit 1 (N, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>PT/620/009</u> (Continued)</p> <ul style="list-style-type: none"> <li>• IF SK breakers were cycled, perform the following as desired                             <ul style="list-style-type: none"> <li>• Ensure TS 3.8.1 Condition D has been exited</li> <li>• IF overhead Power Path is inoperable, ensure TS 3.8.1 has been exited</li> </ul> </li> <li>• <b>IF</b> KHU-1 was started from Oconee Control Room, perform the following:\                             <ul style="list-style-type: none"> <li>• Position UNIT 1 SYNC 230 KV switch to "AUTO".</li> <li>• Verify ACB 1 KEOWEE 1 GENERATOR BKR closed.</li> </ul> </li> </ul> <p><b>CAUTION:</b> Do <b>NOT</b> lower MVARs to less than zero (0) before taking the KHU off line. This will prevent excitation current from burning the contacts on the generator breakers when KHU-1 is shut down.</p> <ul style="list-style-type: none"> <li>• Perform the following concurrently as required:                             <ul style="list-style-type: none"> <li>➤ Adjust load to zero (0) MWs with UNIT 1 SPEED CHANGER MOTOR.</li> <li>➤ Adjust MVARs to zero (0) with UNIT 1 AUTO VOLTAGE ADJUSTER.</li> </ul> </li> <li>• Place UNIT 1 LOCAL MASTER switch to "STOP" <b>AND</b> hold in "STOP" position for &gt; 10 seconds.</li> </ul> <p><b>NOTE:</b> Placing UNIT 1 MASTER SELECTOR to "AUTO" shuts off the AC H.P. Lift Pump and closes the Generator Cooling Water valve. This action prevents KHU-1 from creeping.</p> <ul style="list-style-type: none"> <li>• Ensure UNIT 1 MASTER SELECTOR to "AUTO".</li> <li>• Verify TURBINE 1 GATE POSITION indicator is at zero (0).</li> <li>• Notify Keowee to place KHU-1 MASTER TRANSFER switch in "LOCAL".</li> <li>• Ensure UNIT 1 SYNC 230 KV selector in "AUTO".</li> <li>• Perform the following:                             <ul style="list-style-type: none"> <li>➤ Verify acceptance criteria met.</li> <li>➤ <b>IF</b> acceptance Criteria <b>NOT</b> met, notify SRO.</li> </ul> </li> </ul>
		<p><b>Event is complete when operability test is finished, or when directed by the lead examiner.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 2 Page 1 of 1

Event Description: **1HP-31 Fails Open: (C; OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	<p><b>Note: This event is run in parallel with event 1.</b></p> <p><b>Plant response:</b> 1SA2/B-2 (HP RCP Seal Inlet Header Flow <b>High/Low</b>) (42 gpm)</p> <p><b>Crew response:</b> <u>ARG for 1SA2/B-2:</u> High Alarm</p> <ul style="list-style-type: none"> <li>• Verify high seal flow conditions with individual RCP seal indications</li> <li>• 1HP-31 may have failed open/mid-position. Take manual control of 1HP-31 and throttle to maintain 32 gpm.</li> <li>• IF flow <u>CANNOT</u> be reduced in above manner, adjust 1HP-31 (RCP Seal Flow Control) per OP/1/A/1104/002 (HPI system)</li> </ul>
		<p><b>When flow is reduced manually to ~ 32 gpm or when directed by the lead examiner this event is completed.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 3 Page 1 of 1

Event Description: **Operating LPSW pump trips, Standby fails to auto start: (C, BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• 1SA-9/A-9 (LPSW Header A Press Low)</li> <li>• LPSW Header A/B Pressure Low</li> </ul> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• Refer to ARG for 1SA-9/A-9 (LPSW Header A/B Press Low)                             <ul style="list-style-type: none"> <li>➤ Refer to AP/24 (Loss of LPSW)</li> </ul> </li> </ul> <p><u>AP/24</u> (Loss of LPSW)</p> <ul style="list-style-type: none"> <li>• Start all available (NOT previously cavitating) LPSW pumps. (C)</li> <li>• Verify normal LPSW System operation is restored. (Yes)</li> </ul>
	SRO	<p style="text-align: center;"><b><u>NOTE:</u></b></p> <p>The SRO should call SPOC to troubleshoot the reason for the suction valve closing, the Auto Start failure and determine if the "A" LPSW pump was damaged due loss of suction.</p> <p>The SRO should refer to TS:</p> <ul style="list-style-type: none"> <li>• <b>TS 3.7.7</b> (Low Pressure Service Water System) Condition "A" applies. Restore required LPSW pump to operable status. 72 hours completion time.</li> <li>• <b>TS 3.3.28</b> (LPSW pump Auto-Start Circuitry) Condition "A". Restore Auto-Start Circuitry to operable. 7 day completion time.</li> </ul>
		<p><b>Event is complete when SRO has referred to TS or when directed by the Lead Examiner.</b></p>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 5 Page 1 of 2

Event Description: **HPSW Jockey pump trip, altitude valve fail closed: (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>SRO BOP</p>	<p><b>Plant Response:</b></p> <ul style="list-style-type: none"> <li>• Stat Alarm 1SA9/A-8 (HPSW HEADER A/B PRESS LOW)</li> <li>• Stat Alarm 1SA9/D-8 (HPSW JOCKEY PUMP OFF)</li> <li>• HPSW system pressure decreasing.</li> </ul> <p><b>Crew Response:</b></p> <p>Refer to ARG 1SA9/A-8, 1SA9/D-8 <u>1SA9/A-8 (and 1SA9/D-8)</u></p> <ul style="list-style-type: none"> <li>• Verify (call SPOC) proper jockey pump operation</li> <li>• <b>IF</b> HPSW Header Pressure continues to decrease <b>AND</b> Elevated Storage Tank Level is <b>NOT</b> dropping; i.e., altitude valve stuck closed and jockey pump not providing adequate supply, <u>manually start a HPSW Pump.</u></li> <li>• Refer to OP/0/A/1104/011 (High Pressure Service Water).</li> </ul> <p><u>OP/0/A/1104/011 Limits &amp; Precautions</u></p> <ul style="list-style-type: none"> <li>• HPSW Pumps A &amp; B have a minimum flow requirement of 1450 gpm.</li> <li>• Normal system flow demand is approximately 200 gpm.</li> <li>• <b>IF</b> altitude valve closes while an HPSW pump is still running, pump will be deadheaded.</li> <li>• Do <b>NOT</b> operate an HPSW pump with altitude valve isolated, unless provisions have been made to ensure pump will <b>NOT</b> be operated below its minimum flow.</li> <li>• SLC 16.9.8a requires any time a Turbine Driven Emergency Feedwater Pump <b>OR</b> a HPI Pump is required to be operable, EWST level shall be ≥ 70,000 gallons.</li> <li>• HPSW Pump(s) can operate with the Altitude Valve closed <b>AND NO</b> additional system flow for ≤ 15 minutes.</li> <li>• Open Fire Hydrant for minimum flow.</li> </ul> <p><b>Note: If flow not established pump will trip in 15 minutes.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 5 Page 2 of 2

Event Description: **HPSW Jockey pump trip, altitude valve fail closed: (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>Crew Response:</b></p> <p>Refer to SLC 16.9.8a (HPSW requirements to support loss of LPSW and CCW).</p> <p>HPSW shall be available as follows:</p> <ol style="list-style-type: none"> <li>a. HPSW shall be available to provide the backup cooling water to HPI Pump motor coolers.</li> <li>b. EWST level shall be <math>\geq</math> 70,000 gallons.</li> <li>c. HPSW shall be available to provide backup cooling water to the Turbine Driven Emergency Feedwater Pump bearing oil cooler</li> </ol> <p>Condition A:</p> <ul style="list-style-type: none"> <li>• Operations perform Risk Assessment considering equipment out of service.</li> </ul> <p><u>AND</u></p> <ul style="list-style-type: none"> <li>• Log unavailability duration in the Operations Log for Maintenance Rule performance monitoring.</li> </ul>
		<p><b>When it is determined that the HPSW pump has to be cycled (or left running if a hydrant is opened) or when directed by the lead examiner this event is completed.</b></p>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 6 Page 2 of 2

Event Description: **Dropped Control Rod, Manual Power Reduction (C, OATC/SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>Crew Response:</b></p> <p>SRO should refer to TS for the dropped control rod.</p> <ul style="list-style-type: none"> <li>• Enter TS 3.1.4 (Control Rod Group Alignment Limits) Condition A: (One trippable CR inoperable or not aligned to within 6.5% of its group average height or both).               <ol style="list-style-type: none"> <li>1. Restore Control Rod Alignment</li> </ol> <p>OR</p> <ol style="list-style-type: none"> <li>2. Verify SDM <u>OR</u> Initiate Boron to restore SDM</li> </ol> <p><u>AND</u></p> <p>Reduce Thermal Power to <math>\leq 60\%</math> of allowable thermal power</p> <p><u>AND</u></p> <p>Reduce nuclear overpower trip setpoints (flux/flow imb) to <math>\leq 65.5\%</math> of the allowable thermal power</p> <p><u>AND</u></p> <p>Verify the potential ejected rod worth is within assumptions of rod ejection analysis.</p> </li> <li>• Ensure requirements of TS 3.2.3 (Quadrant Power Tilt) are met.</li> </ul>
		<p><b>When TS 3.1.4 is entered, or when directed by the lead examiner this event is completed.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7 Page 1 of 6

Event Description: **2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN  
1RC-4 Fails OPEN (M, ALL)**

Time	Position	Applicant's Actions or Behavior
		<p><b>Plant Response:</b></p> <ul style="list-style-type: none"> <li>• Second Control Rod drops</li> <li>• Rod bottom lights for second dropped control rod</li> <li>• MFWPs trip</li> <li>• MD EFDWPs start</li> <li>• SG levels decrease and go dry</li> <li>• RCS Pressure decreases</li> <li>• Pzr level decreases initially, then increases</li> </ul> <p><b>Crew Response:</b></p> <p>Upon recognizing the second dropped control rod, the crew manually trips the reactor.</p> <ul style="list-style-type: none"> <li>• OATC performs IMAs; determines that reactor did not trip and performs Rule 1 (ATWS)</li> </ul> <p><b>Rule 1 (CT-24) (30 seconds to drive control rods or initiate emergency boration)</b></p> <ul style="list-style-type: none"> <li>• Initiate manual control rod insertion to the IN LIMIT.</li> <li>• Notify CR SRO to <b>GO TO UNPP</b> tab.</li> <li>• Open the following: <ul style="list-style-type: none"> <li>➤ 1HP-24 <u>AND</u> 1HP-25</li> </ul> </li> <li>• Ensure <u>only one</u> of the following operating: <ul style="list-style-type: none"> <li>➤ 1A HPI PUMP</li> <li>➤ 1B HPI PUMP</li> </ul> </li> <li>• Start 1C HPI PUMP.</li> </ul> <p><b>NOTE: The 1C HPIP will NOT start</b></p> <p>RNO: Start the standby HPIP and open 1HP-409</p> <ul style="list-style-type: none"> <li>• Open the following: <ul style="list-style-type: none"> <li>➤ 1HP-26 <u>AND</u> 1HP-27</li> </ul> </li> <li>• Dispatch one operator to open 600V CRD breakers on the following: <ul style="list-style-type: none"> <li>➤ 1X9-5C (U-1 CRD NORM FDR BKR)</li> <li>➤ 2X1-5B (U-1 CRD ALTERNATE FDR BKR)</li> </ul> </li> <li>• <b>EXIT</b> this rule.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7 Page 2 of 6

Event Description: **2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN  
1RC-4 Fails OPEN (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	ALL	<p><b>Crew Response:</b></p> <p><u>UNPP tab</u></p> <ul style="list-style-type: none"> <li>• Ensure Rule 1 (ATWS / Unanticipated Nuclear Power Production) is in progress or complete.</li> <li>• Verify Main FDW is operating and in AUTO. (In Manual-RNO) <ul style="list-style-type: none"> <li>➢ IF Mn FDW is in MANUAL, THEN adjust MFW flow as necessary to control RCS temperature</li> </ul> </li> <li>• <b>IAAT</b> Main FDW is <b>NOT</b> operating, <b>THEN</b> perform the following: <ul style="list-style-type: none"> <li>➢ Trip the turbine-generator.</li> <li>➢ Start all available EFDW pumps</li> </ul> </li> <li>• <b>IAAT</b> all power range NIs are &lt; 5% FP, <b>THEN</b> trip the turbine-generator</li> <li>• Verify any wide range NI &gt; 1% FP.</li> <li>• Open the following: <ul style="list-style-type: none"> <li>➢ 1RC-4</li> <li>➢ 1HP-5</li> </ul> </li> <li>• Maximize letdown.</li> <li>• Secure makeup to LDST. {8}</li> <li>• <b>WHEN</b> all wide range NIs are ≤ 1% FP, <b>AND</b> decreasing, <b>THEN</b> continue.</li> <li>• Adjust SG pressure as necessary to stabilize RCS temperature using either of the following: <ul style="list-style-type: none"> <li>• TBVs</li> <li>• Dispatch two operators to perform Encl 5.24 (Operation of the ADVs).</li> </ul> </li> <li>• Throttle HPI per Rule 6 (HPI). (<b>Should not throttle due to PORV open</b>)</li> <li>• Adjust letdown flow as desired.</li> <li>• Verify RCP seal injection available</li> <li>• <b>GO TO</b> Subsequent Actions tab.</li> </ul>

Op-Test No.: _____	Scenario No.: 4	Event No.: 7	Page 3 of 6
Event Description: <b>2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN 1RC-4 Fails OPEN (M, ALL)</b>			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p><b>Crew Response:</b></p> <p>Completes a symptom check and then performs Rule 3 (Loss of Main Feedwater)</p> <p><u>Rule 3</u></p> <ul style="list-style-type: none"> <li>• Verify <u>any</u> EFDW pump operating. (MDEFWPs running)</li> <li>• Verify any SCM ≤ 0°F.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling.</p> </div> <ul style="list-style-type: none"> <li>• <b>IF</b> overcooling, <b>OR</b> exceeding limits in Rule 7 (SG Feed Control), <b>THEN</b> throttle EFDW, as necessary. <b>(CT-16) (Throttle less than 600 gpm / MDEFDW pump within 3 minutes.)</b></li> <li>• <b>IAAT</b> Unit 1 EFDW is in operation, <b>THEN</b> initiate Encl 5.9 (Extended EFDW Operation).</li> </ul> <p><u>Encl 5.9</u></p> <ul style="list-style-type: none"> <li>• Perform the following as required to maintain UST level &gt; 7.5':               <ul style="list-style-type: none"> <li>➤ Makeup with demin water.</li> <li>➤ Place CST pumps in AUTO.</li> </ul> </li> </ul>	

Op-Test No.: _____		Scenario No.: 4	Event No.: 7	Page 4 of 6
Event Description: <b>2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN 1RC-4 Fails OPEN (M, ALL)</b>				
Time	Position	Applicant's Actions or Behavior		
	SRO/BOP/ OATC	<p><b>Plant Response:</b></p> <p>With the PORV and 1RC-4 failed open and only 2 HPIPs to fill the RCS, SCM will slowly decrease to zero (saturation) while the Pzr fills. When solid, pressure will increase and SCM will be re-established</p> <p><b>Crew Response:</b></p> <p>The SRO will transfer to the Subsequent Actions tab from the UNPP tab.</p> <p><u>Subsequent Actions tab</u></p> <ul style="list-style-type: none"> <li>• Verify all control rods fully inserted.</li> <li>• Verify TBVs controlling SG pressure at desired setpoint.</li> <li>• Dispatch an operator with Encl 5.29 (MSRV Locations) to verify all MSRVs have reseated.</li> <li>• Initiate Encl 5.5 (Pzr and LDST Level Control).</li> <li>• Open PCB 20 and PCB 21</li> <li>• Perform the following:             <ul style="list-style-type: none"> <li>➤ Open the Generator Field Breaker.</li> <li>➤ Position EXCITATION switch to OFF.</li> </ul> </li> <li>• Verify Aux Bldg and Turbine Bldg Instrument Air pressure ≥ 90 psig.</li> <li>• Verify ICS/NNI power available.</li> </ul> <p><b>Note: When subcooling is lost, the OATC/BOP will perform Rule 2 (Loss of Subcooling Margin) and the SRO will transfer to the LOSCM tab.</b></p>		

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7 Page 5 of 6

Event Description: **2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN 1RC-4 Fails OPEN (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	BOP/ OATC	<p><b>Plant Response:</b> Loss of Subcooling Margin</p> <p><b>Crew Response:</b> BOP/OATC will perform Rule 2 (Loss of Subcooling Margin).</p> <p><u>Rule 2</u></p> <ul style="list-style-type: none"> <li>• <b>IAAT</b> all the following exist: <ul style="list-style-type: none"> <li>➤ Any SCM ≤ 0°F</li> <li>➤ Rx power ≤ 1%</li> <li>➤ ≤ 2 minutes elapsed since loss of SCM</li> </ul> </li> <li>• <b>THEN</b> Stop all RCPs. <b>(CT-1, Trip All RCPs)</b></li> <li>• Open 1HP-24 and 1HP-25</li> <li>• Start all available HPI pumps.</li> <li>• Open 1HP-26 and 1HP-27.</li> <li>• Verify at least two HPI pumps are operating using two diverse indications.</li> <li>• <b>IAAT</b> the following limits are exceeded 1A &amp; 1B HPI pumps operating with 1HP-409 open and Total flow of 950 gpm (incl. seal injection) <b>THEN</b> throttle HPI to maximize flow ≤ flow limit.</li> <li>• Select OFF on AFIS HEADER A and B</li> <li>• Establish 300 gpm to 1A and 1B SGs.</li> <li>• <b>IAAT</b> any SCM ≤ 0°F, <b>THEN</b> feed to the LOSCM setpoint in all intact SGs.</li> <li>• <b>IF</b> SCM &gt; 0 F, <b>THEN</b> control EFDW as required to raise level in intact SGs to proper setpoint per Rule 7 (SG Feed Control)</li> <li>• Place FDW block valve switches for 1FDW-33, 1FDW-31, 1FDW-42, and 1FDW-40 in CLOSE:</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7 Page 6 of 6

Event Description: 2<sup>nd</sup> dropped CR, ATWS, Main FDW Pumps Trip, PORV fails OPEN (M, ALL)

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	<p><b>Plant Response:</b> Loss of Subcooling Margin</p> <p><b>Crew Response:</b> The SRO will transfer to the LOSCM tab</p> <p><u>LOSCM tab</u></p> <ul style="list-style-type: none"> <li>• Verify all of the following exist: <ul style="list-style-type: none"> <li>• <b>NO</b> RCPs operating</li> <li>• HPI flow in both HPI headers</li> <li>• Adequate total HPI flow per Figure 1 (Total Required HPI Flow)</li> </ul> </li> <li>• Open 1AS-40 while closing 1MS-47.</li> <li>• Perform the following: <ul style="list-style-type: none"> <li>• Control steaming and feed rates on all intact SGs to maintain cooldown rate within Tech Spec limits:  Tcold &gt; 280°F: ≤ 50°F / ½ hr  Tcold ≤ 280°F: ≤ 25°F / ½ hr  Utilize either TBVs or ADVs: <b>(CT-11 Control SG Pressure to Maintain RC Temperature)</b></li> </ul> </li> <li>• Close 1RC-4.</li> </ul> <p><b>NOTE: 1RC-4 will not close.</b></p> <ul style="list-style-type: none"> <li>• Close 1GWD-17, 1HP-1, 1HP-2, and 1RC-3</li> <li>• Maintain SG pressure &lt; RCS pressure utilizing TBVs or ADVs</li> <li>• Verify primary to secondary heat transfer exists.</li> <li>• Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control).</li> <li>• Verify required RCS makeup flow within normal makeup capability. <b>(it is NOT)</b></li> </ul> <p><b>NOTE: RCS makeup flow exceeds normal makeup capability.</b></p> <ul style="list-style-type: none"> <li>• <b>GO TO</b> LOCA CD tab.</li> </ul>
		<p><b>When transfer to LOCA CD tab is made, or when directed by the lead examiner this event is completed.</b></p>

**CRITICAL TASKS**

1. CT-24, ATWS
2. CT-16, FW Flow Control
3. CT-1, Trip All RCPs
4. CT-11, Control SG Pressure to Maintain RC Temperature



March, 2009

Facility: **Oconee**Scenario No.: **5 R0 IS**Op-Test No.: **1**

Examiners: \_\_\_\_\_

Operators: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_

## Initial Conditions:

- 0.01% below POAH (SNAP 225)

## Turnover:

- Unit 1 Startup in progress
- SASS in manual
- CFT pressure low, requires N<sub>2</sub> addition
- Startup procedure at step 2.32

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		1C HPI Pump fails to start
0b	Pre-insert MPS350		1A RBCU fails to receive ES signal
1	Override	N, BOP, SRO	Pressurize "A" CFT with N <sub>2</sub> 1N-298 (N <sub>2</sub> Fill CFT 1A), fails OPEN (TS)
2		R, OATC, SRO	Increase power to 3% and place ICS in AUTO
3	MPI150	I, OATC, SRO	PZR "A" RTD Fails LOW (TS)
4	MPS120 Override	C, BOP, SRO	1A HPI Pump sheared shaft and standby HPI pump fails to start (TS)
5	MPS247	C, BOP, SRO	1B1 RCP Lower Seal Failure
6	Override	C, OATC, SRO	Continuous Rod Withdrawal
7	MPS400	M, ALL	SBLOCA 1C HPI Pump fails to start requiring rapid RCS C/D due to degraded HPI
8	MPS400	M, ALL	LBLOCA

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

D-1

Op-Test No.: _____ Scenario No.: 5 Event No.: 1 Page 1 of 1		
Event Description: <b>Pressurize "A" CFT; N2 1N-298 fails OPEN (N, BOP/SRO)</b>		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Crew response:</p> <ul style="list-style-type: none"> <li>• Refer to OP/1104/001, Enclosure 4.7 (Pressure Makeup To CFTs Using Nitrogen) to adjust CFT pressure.</li> </ul> <ol style="list-style-type: none"> <li>1. Direct an NEO to open 1N-137 (CFTs Supply) <ul style="list-style-type: none"> <li>➤ <b>Cue: Time compression used to open 1N-137. This is used to speed the opening of the valve. It would take time for the NEO to travel from work control to the Auxiliary Building.</b></li> </ul> </li> <li>2. Open 1N-298 (N<sub>2</sub> Fill CFT 1A)</li> <li>3. Monitor 1A CFT pressure</li> <li>4. WHEN pressurization of 1A CFT is complete, close 1N-298</li> <li>5. Determine 1N-298 has failed to close: <ul style="list-style-type: none"> <li>• Red "open" light lit</li> <li>• CFT pressure continues to increase</li> </ul> </li> <li>6. Inform the SRO. <ul style="list-style-type: none"> <li>• Direct the NEO to close 1N-137 (CFTs Supply).</li> </ul> </li> </ol> <p><b>Note: If 1N-137 is not closed the CFT pressure will continue to increase, possibly outside of TS limits.</b></p>
	SRO	<ol style="list-style-type: none"> <li>7. Verify 1A CFT pressure is stable.</li> </ol>
		<b>When CFT pressurization is stopped or when directed by the lead examiner this event is completed.</b>

Op-Test No.: \_\_\_\_\_ Scenario No.: 5 Event No.: 2 Page 1 of 1

Event Description: **Increase reactor power to 3% and place ICS in AUTO: (R, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>SRO/OATC</p> <p>BOP</p>	<p><b>Crew response:</b> <u>OP/1/A/1102/001</u> (Controlling Procedure for Unit Startup)</p> <p><b>NOTE:</b> POAH is normally achieved from 0.05 to 0.15% power on Wide Range Indications.</p> <p>When POAH is achieved: TBVs will begin to open, 1HP-120 will begin to close, TAVE will increase, &amp; SUR will decrease with negative Moderator Temperature Coefficient.</p> <ul style="list-style-type: none"> <li>• Begin reactor power increase to ≈3% FP. (Manual Control Rod Withdrawal).</li> <li>• Begin raising 1HP-120 (RC VOLUME CONTROL) setpoint to ≈ 220" as power increases.</li> <li>• At ≈3% Power as indicated on NI-5, NI-6, and NI-9 (ICS median select):</li> <li>• Place REACTOR MASTER to "AUTO".</li> <li>• Place DIAMOND to "AUTO".</li> <li>• Ensure TURBINE MASTER Setpoint to ≈ 885 psig.</li> </ul>
		<p><b>Event is complete when ICS is placed in AUTO or when directed by the lead examiner.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: **5** Event No.: **3** Page 1 of 1

Event Description: **PZR "A" RTD Fails LOW: (I, BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p><b>Plant response:</b></p> <p>Statalarms:</p> <ul style="list-style-type: none"> <li>• 1SA-2/C-3, RC Pressurizer Level Hi/Low</li> <li>• OAC, RC PZR level 1&amp;3 mismatch</li> <li>• OAC, RC PZR level 2&amp;3 mismatch</li> </ul> <p>Board indications:</p> <ul style="list-style-type: none"> <li>• PZR level 1 and 2 indicates ≈ 133 inches</li> <li>• PZR level 3 indicates ≈ 220 inches and slowly increasing</li> </ul> <p><b>Crew response:</b></p> <p>Refer to the ARG:</p> <ul style="list-style-type: none"> <li>• Check alternate PZR level indications.</li> <li>• Check for proper Makeup/Letdown flows and adjust to restore proper level.                             <ul style="list-style-type: none"> <li>○ RO may take 1HP-120 to manual to control PZR level.</li> </ul> </li> <li>• Refer to Technical Specification 3.4.9, Pressurizer.</li> <li>• Refer to Technical Specification 3.3.8, PAM Instrumentation.                             <ul style="list-style-type: none"> <li>○ Condition H applies</li> </ul> </li> <li>• Refer to PT/1/A/0600/001 (Periodic Instrument Surveillance).                             <ul style="list-style-type: none"> <li>○ Select PZR level 3 for level control.</li> </ul> </li> <li>• Call SPOC to repair PZR "A" RTD</li> </ul>
		<p><b>This event is complete when PZR level 3 has been selected and 1HP-120 returned to AUTO or when directed by the lead examiner.</b></p>

March, 2009

Op-Test No.: \_\_\_\_\_ Scenario No.: 5 Event No.: 4 Page 1 of 2  
 Event Description: "1A" HPI Pump sheared shaft and the standby HPI pump fails to auto start: (C; BOP, SRO) TS

Time	Position	Applicant's Actions or Behavior
	BOP SRO BOP	<p><b>Plant response:</b></p> <p>Statalarms:</p> <ul style="list-style-type: none"> <li>• 1SA-2/B-2 (HP RCP Seal Injection Flow High/Low)</li> <li>• 1SA-2/C-2 (HP Injection Pump Disch. Header Pressure High/Low)</li> </ul> <p>Board indications:</p> <ul style="list-style-type: none"> <li>• RC Makeup Flow = ~0 gpm</li> <li>• RCP SI flow = ~0 gpm</li> <li>• 1A HPI Pump amps low = ~10 amps</li> <li>• PZR level will begin to decrease and LDST level will begin to increase.</li> </ul> <p><b>Crew response:</b></p> <p>Refer to ARGs: Refer to AP/14</p> <p><u>AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection)</u></p> <ul style="list-style-type: none"> <li>• Announce AP entry</li> <li>• Verify <u>any</u> HPI pump operating (go to RNO)             <ul style="list-style-type: none"> <li>➤ Close 1HP-5 (Letdown Isolation)</li> <li>➤ Place 1HP-120 in HAND and closed</li> <li>➤ Place 1HP-31 in HAND and closed</li> <li>➤ Attempt to start the Standby HPIP (1B HPIP starts)</li> </ul> </li> <li>• <u>Slowly</u> open 1HP-31 in small increments until <math>\approx 8</math> gpm/RCP is achieved.</li> <li>• Re-establish normal makeup through 1HP120.</li> <li>• Reduce 1HP-7 demand to 0%.</li> <li>• Close 1HP-6</li> <li>• Open the following:             <ul style="list-style-type: none"> <li>➤ 1HP-1 (1A Letdown Cooler Inlet)</li> <li>➤ 1HP-2 (1B Letdown Cooler Outlet)</li> <li>➤ 1HP-3 (1A Letdown Cooler Inlet)</li> <li>➤ 1HP-4 (1B Letdown Cooler Outlet)</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: **5** Event No.: **4** Page 2 of 2

Event Description: **“1A” HPI Pump sheared shaft and the standby HPI pump fails to auto start: (C; OATC, SRO) TS**

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> <li>• Open 1HP-5</li> <li>• Throttle open 1HP-7 for ≈ 20 gpm letdown flow.</li> <li>• Open 1HP-6</li> <li>• Adjust 1HP-7 for desired letdown flow.</li> <li>• Place 1HP-31 in AUTO.</li> </ul> <p>Refer to Tech Spec 3.5.2 High Pressure Injection</p> <ul style="list-style-type: none"> <li>• Condition “A”</li> <li>• Required Action: Restore HPI pump to OPERABLE status</li> <li>• Completion Time: 72 hours</li> </ul> <p><b>Note: Due to sequence of events, SRO may not review the TS during the scenario. Follow-up questions may be required to ensure knowledge of this competency.</b></p>
		<p><b>This event is complete when 1HP-31 is placed in AUTO or when directed by the Lead Examiner.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 5 Event No.: 5 Page 1 of 2

Event Description: **1B1 RCP lower Seal Failure: (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	<p>BOP</p> <p>SRO</p> <p>SRO</p> <p>BOP</p>	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• 1SA-06/C-5, RC PUMP 1B1 CAVITY PRESS HI/LOW</li> <li>• 1SA-06/C-6, RC PUMP 1B1 SEAL RETURN FLOW HI/LOW</li> </ul> <p><b>Crew response:</b></p> <p>Refer to the ARGs</p> <p><u>Refer to AP/16</u> , Abnormal RCP Operations</p> <ul style="list-style-type: none"> <li>• Notify OSM to request evaluation by RCP Component Engineer.</li> <li>• <b>IAAT</b> the failure is identified, <b>THEN GO TO</b> the applicable section: 4A Seal Failure</li> <li>• Stop the affected RCP (1B1)</li> <li>• <b>IAAT</b> any of the following indicate loss of all RCP seals: <ul style="list-style-type: none"> <li>➤ RB RIAs increasing or in alarm (<b>RIA-4, 43 - 46</b>)</li> <li>➤ RCS Tave constant with LDST level decreasing more than normal</li> <li>➤ Quench Tank level rate increasing</li> <li>➤ RB Normal Sump rate increasing</li> </ul> </li> </ul> <p><b>THEN</b> initiate AP/02 (Excessive RCS Leakage).</p> <ul style="list-style-type: none"> <li>• Verify the following are open: <ul style="list-style-type: none"> <li>➤ 1HP-20</li> <li>➤ 1HP-21</li> </ul> </li> <li>• <b>IAAT</b> RCP has been shutdown for &gt;30 minutes, <b>THEN</b> close the associated RCP motor cooler inlet/outlet valve (1LPSW-9 &amp; 10)</li> </ul>
		<p><b>When the 1B1 RCP has been secured or when directed by the lead Examiner, the event is complete.</b></p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 5 Event No.: 6 Page 1 of 1

**Event Description: Continuous Rod Withdrawal: (I, OATC)**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p><b>Plant response:</b></p> <ul style="list-style-type: none"> <li>• Control Rods withdrawing without operator action</li> <li>• NI-5 thru NI-9 indicate increasing reactor power</li> <li>• SURs on Wide Range NIs increasing</li> <li>• OUT light lit on Diamond</li> </ul> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• The candidates should utilize the “Plant Transient Response” process to stabilize the plant and recognize that control rods are withdrawing without a valid signal.</li> <li>• Verbalize to the SRO reactor power level and direction of movement.</li> <li>• Place the Diamond and both FDW Masters in MANUAL to stabilize the plant.                             <ul style="list-style-type: none"> <li>➤ The crew should insert control rods and monitor reactor power and wide range startup rate to stabilize the plant</li> </ul> </li> <li>• The SRO should:                             <ul style="list-style-type: none"> <li>• Refer to SOMP 1-02, Reactivity Management, Attachment 9.1 and discuss a recovery plan</li> <li>• Contact SPOC to investigate the continuous rod withdrawal.</li> </ul> </li> </ul> <p><b>Note: The ICS will remain in manual for the remainder of the scenario.</b></p>
		<p><b>When the plant is stable or when directed by the lead examiner this event is completed.</b></p>



Op-Test No.: \_\_\_\_\_ Scenario No.: **5** Event No.: **7** Page 2 of 6

Event Description: **SBLOCA: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>RCS saturates; obtain SRO concurrence to perform Rule 2</p> <p><u>Rule 2, Loss of SCM</u></p> <ul style="list-style-type: none"> <li>• <b>IAAT</b> all the following exist: <ul style="list-style-type: none"> <li>➤ Any SCM <math>\leq 0^{\circ}\text{F}</math></li> <li>➤ Rx power <math>\leq 1\%</math></li> <li>➤ <math>\leq 2</math> minutes elapsed since loss of SCM</li> </ul> </li> <li><b>THEN</b> perform Stop all RCPs</li> <li>• Open 1HP-24/25</li> <li>• Start all <u>available</u> HPI pumps. (Only 1B HPIP will be left)</li> <li>• Open 1HP-26/27</li> <li>• Verify at least two HPI pumps are operating using two diverse indications. (RNO – only one HPIP)</li> <li>• Maximize HPI flow <math>\leq 475</math> gpm (including seal injection for A hdr)</li> <li>• Dispatch two operators to align ADVs</li> <li>• Select OFF on both Digital Channels on AFIS HEADER A&amp;B</li> <li>• Notify CR SRO to: <ul style="list-style-type: none"> <li>➤ Suspend Rule 3 until directed by LOSCM tab</li> <li>➤ Degraded HPI exists</li> </ul> </li> <li>• <b>EXIT</b> this rule</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: **5** Event No.: **7** Page 3 of 6

Event Description: **SBLOCA: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p>OATC will perform Enclosure 5.1 (ES actuation)</p> <p><u>Enclosure 5.1</u></p> <ul style="list-style-type: none"> <li>• Determine all ES channels should have actuated based on RCS pressure and RB pressure.</li> <li>• Verify all ES digital channels associated with actuation setpoints have actuated.</li> <li>• Place HPI in Manual.</li> <li>• Verify Rule 2 in progress or complete.</li> <li>• Verify any RCP operating</li> <li>• RNO: <b>GO TO</b> Step 8</li> <li>• <b>IAAT</b> ES Channels 3 &amp; 4 are actuated, <b>THEN GO TO</b> Step 12.</li> <li>• Place the following in manual control: <ul style="list-style-type: none"> <li>➤ 1A LPI PUMP</li> <li>➤ 1LP-17</li> <li>➤ 1B LPI PUMP</li> <li>➤ 1LP-18</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head.</p> </div> <ul style="list-style-type: none"> <li>• <b>IAAT</b> any LPI pump is operating against a shutoff head, <b>THEN</b> at the CR SRO's discretion, stop affected LPI pumps. (CT) (<b>Within 30 minutes</b>)</li> <li>• Start A and B OUTSIDE AIR BOOSTER FAN (CT-27) (<b>30 minutes from the LOCA</b>)</li> <li>• Notify Unit 3 to start 3A and 3B OUTSIDE AIR BOOSTER FANS</li> <li>• Verify the following are open: <ul style="list-style-type: none"> <li>➤ 1CF-1</li> <li>➤ 1CF-2</li> </ul> </li> <li>• Verify 1HP-410 closed.</li> <li>• Secure makeup to the LDST.</li> <li>• Verify all ES channel 1 - 4 components in the ES position. (Yes)</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 5 Event No.: 7 Page 4 of 6

Event Description: **SBLOCA: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p><u>Enclosure 5.1 (Continued)</u></p> <ul style="list-style-type: none"> <li>• Close 1LPSW-139.</li> <li>• Place the following in FAIL OPEN:               <ul style="list-style-type: none"> <li>➤ 1LPSW-251 FAIL SWITCH</li> <li>➤ 1LPSW-252 FAIL SWITCH</li> </ul> </li> <li>• Verify either of the following:               <ul style="list-style-type: none"> <li>➤ Three LPSW pumps operating</li> <li>➤ Two LPSW pumps operating when Tech Specs only requires two to be operable</li> </ul> </li> <li>• Open the following:               <ul style="list-style-type: none"> <li>➤ 1LPSW-4</li> <li>➤ 1LPSW-5</li> </ul> </li> <li>• Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service).</li> <li>• Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.</li> <li>• <b>IAAT</b> ES channels 5 &amp; 6 have actuated, <b>THEN</b> perform Step 40.</li> <li>• Verify all ES channel 5 &amp; 6 components in the ES position. <b>(1A RBCU will not be in required - LOW speed)</b></li> <li>• Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open</li> </ul>





Op-Test No.: \_\_\_\_\_ Scenario No.: **5** Event No.: **8** Page 1 of 1

Event Description: **LBLOCA (M, All)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p><b>Plant Response:</b>                      RCS pressure decreases rapidly                      Core and Loop Subcooling Margins indicate '0' or '-0' (flashing)                      ES Channels 1-8 if not previously actuated will now actuate</p> <p><b>Crew response:</b></p> <ul style="list-style-type: none"> <li>• RO performing Encl. 5.1, ES Actuation, must recognize that the <u>IAAT Step 14</u> will need to be performed and LPI Pumps restarted. (<b>CT-4, Initiate LPI</b>)</li> <li>• SRO may direct an RO to perform a Symptoms Check:</li> <li>• RO performs Symptom Check</li> <li>• Crew should recognize LOSCM IAAT Step 6 now exists.</li> </ul> <p><u>LOSCM IAAT Step 6:</u></p> <ul style="list-style-type: none"> <li>• <b>IAAT</b> either of the following exists:                             <ul style="list-style-type: none"> <li>➤ <u>  </u> LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm</li> <li>➤ <u>  </u> Only one LPI header in operation with hdr flow ≥ 2900 gpm</li> </ul> </li> </ul> <p><b>THEN GO TO LOCA CD tab.</b></p> <p><u>LOCA CD tab</u></p> <ul style="list-style-type: none"> <li>• Perform the following:                             <ul style="list-style-type: none"> <li>➤ <u>  </u> Ensure all RBCUs in low speed.</li> <li>➤ <u>  </u> Open 1LPSW-18.</li> <li>➤ <u>  </u> Open 1LPSW-21.</li> <li>➤ <u>  </u> Open 1LPSW-24.</li> </ul> </li> <li>• Initiate Encl 5.35 (Containment Isolation).</li> <li>• Start all RB Aux fans</li> <li>• Dispatch an operator to remove the tags and close the Core Flood Tank Isolation valves</li> <li>• Dispatch a operators to locally isolate the SGs</li> <li>• <b>WHEN</b> CETCs are ≤ 400°F, <b>THEN</b> continue in this procedure.</li> </ul>
		<p><b>When transfer to LOCA Cooldown tab or when directed by the lead examiner, this event is completed</b></p>

## CRITICAL TASKS

1. CT-1, Trip ALL RCPs
2. CT-10, Establish EFDW flow and Feed SGs
3. CT- 27, Implementation of Control Room Habitability Guidance
4. CT-5, Control HPI
5. CT-4, Initiate LPI

