

Facility: **Oconee**Scenario No.: **1**Op-Test No.: **1**

Examiners: _____

Operators: _____ **SRO**

_____ **OATC**

_____ **BOP**

Initial Conditions:

- Reactor power is 88% CTP

Turnover:

- 1MS-82 and 1MS-84 closed in support of maintenance. TDEFWP supply from AS only.
- Unit 2 has the AS header.
- Perform PT/1/A/0290/003, Encl. 13.2 (Control Valve Movement at Power) for Control Valve 1 (Only)

Event No.	Malfunction No.	Event Type*	Event Description
0a	MPI 300		Block all Rx Trips except Manual
0b	Override		Override Rx Trip pushbutton
0c	Override		Standby CC pump auto start
1		N: BOP, SRO	PT/1/A/0290/003, Encl. 13.2 (Control Valve Movement at Power) in progress: testing CV1
2	MSS200	C, BOP, SRO (TS)	Vacuum Leak
3	MPS 290	C: BOP, SRO	Operating CC pump trips and standby fails to start
4	MCS008	I: OATC, SRO	Selected Tcold Fails HIGH
5	MCR021	R: OATC, SRO (TS)	Dropped Control Rod Requires Manual power reduction
6	MCR070	C: OATC, SRO	Seismic event requires manual Rx trip but Rx fails to trip (ATWS)
7	MPS400	M: All	SBLOCA <ul style="list-style-type: none">1C HPI Pump fails to start

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

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **1**

Page 1 of 1

Event Description: **PT/1/A/0290/003, Encl. 13.2 (Control Valve Movement at Power) in progress: testing CV1**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Crew Response:</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>2.6.1 IF required, select "Control Valve 1 & 2 Test".</p> <p>2.6.2 Verify "Test Permissive" is ON.</p> <p>2.6.3 Record CV1 pretest position: % Open.</p> <p>2.6.4 Select "Initiate Test" for Control Valve 1 Test.</p> <p>2.6.5 IF any of the following conditions occur, select "Abort CV1 Test":</p> <ul style="list-style-type: none">• NI POWER changes > 2%. (R.M.)• ICS Turbine Master trips to HAND. (R.M.)• Turbine vibration > 10 mils for > 5 seconds. <p>2.6.6 IF "Test Failed" is "ON" AND CV1 is NOT fully closed, select "Abort CV1 Test".</p> <p>2.6.7 IF "Test Failed" is "ON" AND CV1 remains closed perform the following:</p> <ul style="list-style-type: none">• Do NOT select "Abort CV1 Test". (R.M.)• Notify WCC & Engineering that the (FASV) for the Control Valve under test is stuck in the energized state. <p>NOTE: 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">• Monitor Turbine Vibrations closely if in this abnormal state. <p>2.6.8 Perform EITHER for CV1:</p> <p>A. Verify "Test Successful" indicated for CV1.</p> <p>B. IF "Test Successful" NOT indicated for CV1, verify CV1 moved towards closed position.</p> <p>2.6.9 Verify CV1 test indicator reset.</p> <p>2.6.10 Verify CV1 within $\pm 5.0\%$ of pretest position.</p> <p>Booth Cue: As the Standby EHC pump is being secured, FIRE TIMER 2 to initiate Event 2.</p> <p>2.7 IF desired:</p> <p>2.7.1 Stop Standby EHC pump.</p> <p>2.7.2 Place Standby EHC pump control switch to "AUTO".</p> <p>Booth Cue: If dispatched to clear the Turbine Panel alarm, on the updater screen change the state of ACKN1SA4C7 to "True"</p>

This event is complete when Standby EHC pump is OFF, or as directed by the lead examiner

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **2**

Page 1 of 2

Event Description: **Vacuum Leak**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Plant Response:</p> <ul style="list-style-type: none">1SA-3/A-6, Condenser Vacuum Low (25" Hg) <p>Crew response:</p> <p>1SA-3/A-6, Condenser Vacuum Low</p> <p>3.1 Refer to AP/1/A/1700/027</p> <p>AP/1/A/1700/027 (Loss of Condenser Vacuum)</p> <p>4.1 Announce AP entry using the PA system.</p> <p>4.2 IAAT both of the following apply:</p> <ul style="list-style-type: none">___ Condenser vacuum \leq 22" Hg___ MODE 1 or 2 <p>THEN trip the Rx.</p> <p>4.3 Dispatch operators to perform the following:</p> <ul style="list-style-type: none">___ Perform Encl 5.1 (Main Vacuum Pump Alignment)(PS)___ Look for vacuum leaks <p>4.4 Ensure <u>all</u> available Main Vacuum Pumps operating (A, B, & C)</p> <p><u>Booth Cue:</u> After all MVPs are running, using TIME COMPRESSION, call the Control Room to notify the operator that the Main Vacuum Pumps are aligned to Unit 1.</p> <p>4.5 Ensure 1V-186 is closed</p> <p>4.6 Ensure Steam to Steam Air Ejector A, B, C > 255 psig</p> <p>4.7 Verify Steam Seal Header Press > 1.5 psig</p> <p>4.8 Ensure <u>all</u> available CCW pumps operating</p> <p><u>Examiner Note:</u> Soon after the 4th CCW Pump is started, OAC point O1E0507 (LPSW Leakage Accumulator Level) will come into alarm. This alarm will mean that the LCO for TS 3.7.7 (LPSW System) is not met due to the LPSW Waterhammer Prevention System being inoperable. Condition B will be entered which provides a 7 day completion time to restore to operable. Once the computer alarm clears the LCO will again be met and the Condition can be exited.</p>

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

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **2**

Page 2 of 2

Event Description: **Vacuum Leak**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><u>Booth Cue:</u> Call Control Room as the AO sent out to look for vacuum leaks and report that a leak was found on the 1B Main FDW Pump pumping trap sight glass.</p> <p><u>Examiner Note:</u> The leak will be removed after the control room directs the AO to isolate the sight glass.</p> <p>4.9 Verify Condensate flow \geq 2300 gpm</p> <p>4.10 WHEN condenser vacuum is stable, AND Encl 5.1 (Main Vacuum Pump Alignment) is complete, THEN EXIT this procedure</p>

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

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **3**

Page 1 of 4

Event Description: **Operating CC pump trips and standby fails to start**

Time	Position	Applicant's Actions or Behavior
		Plant response: <ul style="list-style-type: none">• 1SA-9/B-1, CC CRD RETURN FLOW LOW• 1SA-9/C-1, CC COMP COOLING RETURN FLOW LOW• 1SA-2/C-1, LETDOWN TEMPERATURE HIGH• 1HP-5 (Letdown Isolation) will close due to high letdown temperature• CC Total Flow Low• Component Cooling Pressure Low Crew Response: <p>AP/32 (Loss of Letdown) will be entered to restore letdown once CC flow is restored. See page 7</p> <p>Refer to ARG 1SA-9/B-1 <u>OR</u> 1SA-9/C-1</p> <ul style="list-style-type: none">• Determine low flow is due to CC Pump failure AND Standby CC Pump did NOT start and perform the following:• Verify CC Surge Tank level > 12"• Start Standby CC Pump <p>Examiner Note: The SRO may not initiate AP/20 if the Standby Pump is started per the ARG.</p> <p>Refer to AP/20 (Loss of Component Cooling)</p> <p>Immediate Manual Actions</p> <p>3.2 IAAT ≥ two CRD stator temperatures ≥ 180°F, THEN trip RX. (~ 4 minutes)</p> <p>Subsequent Actions</p> <p>4.1 Verify at least one CC pump is operating</p> <p>4.2 GO TO Step 4.12</p> <p>4.12 Announce AP entry</p> <p>4.13 Verify leak on CC system is indicated:</p> <p>RNO: GO TO Step 4.54</p> <p>4.54 Verify CC system is operating with indications of flashing</p> <p>RNO: GO TO Step 4.105</p>
	BOP	
	SRO	
	SRO/BOP	

This event is complete when at step 4.44 of AP32 or when directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **4**

Page 2 of 4

Event Description: **Operating CC pump trips and standby fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Crew Response:</p> <p>AP/20 (Loss of CC) Subsequent Actions (Continued)</p> <p>4.105 IAAT any RCP radial bearing temperature $\geq 225^{\circ}\text{F}$, THEN Steps 4.106-4.108</p> <p>RNO: GO TO Step 4.109</p> <p>4.109 IAAT a RCP has been shut down for ≥ 3 hours, THEN close the Associated RCP motor cooler inlet/outlet valve.</p> <p>4.110 Verify RCP seal injection flow is 6 – 12 gpm / RCP.</p> <p>4.111 Ensure actions have been initiated to restore cause of degradation.</p> <p>4.112 IAAT any RCP temperatures exceed limits for Radial Bearing Temperature or Seal Return Temperature, THEN increase seal inlet header flow as necessary to lower temperatures without exceeding 15 gpm / RCP.</p> <p>4.113 IAAT no CC pumps operating, AND a CC pump is now available to start, THEN perform Steps 4.114 – 4.115</p> <p>RNO: GO TO Step 4.116.</p> <p>4.116 WHEN cause of degradation has been repaired, THEN return CC pumps to desired configuration.</p> <p>4.117 WHEN conditions permit, THEN EXIT.</p>
This event is complete when at step 4.44 of AP32 or when directed by the Lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **4**

Page 3 of 4

Event Description: **Operating CC pump trips and standby fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO/ BOP/ OATC	<p>AP/32 (Loss of Letdown)</p> <p>Crew Response:</p> <p>4.1 Place 1HP-120 in HAND and reduce demand to zero.</p> <p>4.2 Position the standby HPI pump switch to OFF.</p> <p>CAUTION: RCP individual seal return valves will close if seal injection is < 22 gpm with CC flow < 575 gpm.</p> <p>4.3 Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW.</p> <p>NOTE: The running HPIP may operate below 65 gpm for up to 4 hours. HPIP time of operation below minimum flow is cumulative.</p> <p>4.4 Verify HPI pump flow \geq 65 gpm. (30 gpm Recirc + ____ SI + ____ MU)</p> <p>4.5 Initiate makeup to the LDST as required.</p> <p>4.6 Notify the OSM and STA to reference OMP 1-14 and the Emergency Plan</p> <p>4.7 Verify 1HP-5 closed.</p> <p>4.8 Dispatch an operator to 1HP-5 to establish communication with the CR.</p> <p>NOTE: TS 3.4.9 applies when PZR level > 260" (corrected value for 285"). Conditions where it is known that letdown CANNOT be restored do not require waiting until 260" to begin a rapid shutdown.</p> <p>4.9 IAAT either of the following exist:</p> <ul style="list-style-type: none">• PZR level > 260 inches AND letdown cannot be established• Plant conditions exist such that letdown will not be restored <p>THEN initiate unit shutdown per AP/29 (Rapid Unit Shutdown)</p> <p>4.10 IAAT PZR level \geq 375 inches, THEN trip Rx.</p> <p>4.11 Determine the cause of loss of letdown:</p> <ul style="list-style-type: none">• Actual LD Temperature high: GO TO Step 4.28
This event is complete when at step 4.44 of AP32 or when directed by the Lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **3**

Page 4 of 4

Event Description: **Operating CC pump trips and standby fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO/ BOP/ OATC	<p>Crew Response:</p> <p>4.28 Notify SPOC to initiate repairs on failed equipment.</p> <p>4.29 IAAT letdown can be re-established, THEN perform Steps 4.30-4.44.</p> <p>4.30 Place CC System in operation.</p> <p>4.31 Close 1HP-6</p> <p>4.32 Close 1HP-7</p> <p>4.33 Open 1HP-1, 1HP-2, 1HP-3, and 1HP-4.</p> <p>4.34 Verify letdown temperature < 135 F. RNO:</p> <ul style="list-style-type: none">• Open 1HP-13• Close 1HP-8, 1HP-9 & 11• Verify NO deborating IXs in service• Select LETDOWN HI TEMP INTLK BYP switch to BYPASS <p>4.35 Open 1HP-5.</p> <p>4.36 Throttle open 1HP-7 to establish ~20 gpm</p> <p>4.37 WHEN letdown temperature < 130 F, THEN place LETDOWN HI TEMP INTLK BYP switch in NORMAL.</p> <p>4.38 Open 1HP-6</p> <p>4.39 Adjust 1HP-7 to control desired letdown flow.</p> <p>4.40 Re-establish normal makeup through 1HP-120</p> <p>4.41 Re-establish normal RCP seal injection flow</p> <p>4.42 Position the standby HPI pump switch to AUTO</p> <p>4.43 Verify any purification IX in service</p> <p>4.44 EXIT this procedure.</p>
This event is complete when at step 4.44 of AP32 or when directed by the Lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **4**

Page 1 of 2

Event Description: **Selected Tcold Fails HIGH**

Time	Time	Time
	OATC	<p>Plant Response:</p> <ul style="list-style-type: none">• Loop "B" Tc Dixon meter high (620°F)• Loop "B" ΔT Dixon meter reads 0°F• ΔTc meter reads low (-10°F; "B" loop Hot)• Controlling NR Tave digital display reads ≈ 595.5°F• Controlling Tave Chessell display reads ≈ 595°F• 1SA-2/B4 (RC Average Temperature High/Low)• 1SA-2/B-5, RC COLD LEG DIFF TEMP HIGH• 1SA-2/A-12, ICS Tracking <p>Crew Response:</p> <ul style="list-style-type: none">• When the Statalarms are received, the candidates should utilize the "Plant Transient Response" process to stabilize the plant, which should include ICS to HAND, inserting control rods, and re-ratioing feedwater.• Verbalize to the SRO reactor power level and direction of movement.• Place the Diamond and both FDW Masters in manual and position as necessary to stabilize the plant.• The SRO should:<ul style="list-style-type: none">➢ Refer to AP/28, ICS Instrument Failures➢ Contact SPOC to repair the failed instrument. <p>AP/28 (ICS Instrument Failures)</p> <p>4.1 Provide control bands as required.</p> <p>4.2 Initiate notification of the following:</p> <p>___ OSM to reference the following:</p> <ul style="list-style-type: none">• OMP 1-14 (Notifications)• Emergency Plan <p>___ STA</p> <p>4.3 Verify a power transient ≥ 5% has occurred.</p> <p>RNO: GO TO Step 4.5.</p> <p>4.4 Notify Rx Engineering and discuss the need for a maneuvering plan.</p>
	SRO	

This event is complete when Section 4A Step 6 is reached, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **4**

Page 2 of 2

Event Description: **Selected Tcold Fails HIGH**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>AP/28 (continued)</p> <p>4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6:</p> <ul style="list-style-type: none">• OAC alarm video• OAC display points• Control Board indications• SPOC assistance, as needed <p>4.6 GO TO Section 4A, RCS Temperature</p> <p>AP/1/A/1700/028 Section 4A RCS Temperature Failure</p> <ol style="list-style-type: none">1. Ensure the following in HAND: ___ 1A FDW MASTER ___ 1B FDW MASTER2. Ensure DIAMOND in MANUAL.3. Notify SPOC to perform the following:<ul style="list-style-type: none">• Select a valid RCS Tave and Delta Tc input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function).• Investigate and repair the failed RCS temperature instrumentation.4. PERFORM an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument.5. Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.6. WHEN notified by SPOC that a valid RCS Tave and Delta Tc input have been restored to ICS, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto). <p><u>Examiner Note:</u> <i>The ICS will remain in manual for the remainder of the scenario.</i></p> <p><u>Examiner Note:</u> <i>The crew may initiate EOP Encl 5.5 for inventory control. These steps are included beginning on page 27 if necessary.</i></p>

This event is complete when Section 4A Step 6 is reached, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **5**

Page 1 of 5

Event Description: **Dropped Control Rod**

Time	Position	Applicant's Actions or Behavior						
	SRO/BOP/ OATC	<p>Plant Response:</p> <ul style="list-style-type: none">• Group 2 Rod 6 drops into the core• Statalarm 1SA-2/A-10 (CRD GLOBAL TROUBLE)• Statalarm 1SA-2/B-10 (CRD ASYMMETRIC ROD POSITION ERROR)• Statalarm 1SA-2/D-9 (CRD OUT INHIBIT)• Statalarm 1SA-4/C-1 (QUADRANT POWER TILT) (in at ≈ 2 minutes)• Statalarm 1SA-5/A-5 (1A RPS TROUBLE)• Statalarm 1SA-5/B-5 (1B RPS TROUBLE)• Statalarm 1SA-5/D-5 (1D RPS TROUBLE) <p>Crew Response:</p> <p>Crew should perform Plant Transient Response (PTR)</p> <ul style="list-style-type: none">• OATC reports to the SRO reactor power level and direction of movement.• The BOP reports expected AUTO Runback did not occur, and monitors RCS pressure and inventory and inserts Control Rods as needed.• The OATC will adjust FDW and/or control rods as necessary to restore reactor power to the desired control band. <p>SRO should enter AP/1/A/1700/001 (Unit Runback)</p> <p>AP/1/A/1700/001</p> <p>4.1 GO TO the most limiting section per the following table:</p> <table><tr><td>✓</td><td>Section</td><td>Runback</td></tr><tr><td></td><td>4H</td><td>Asymmetric Control Rod (1%/min to 55%power)</td></tr></table> <p>Section 4H</p> <ol style="list-style-type: none">1 IAAT a more limiting runback occurs, THEN GO TO Subsequent Actions Step 4.1.2 IAAT more than one control rod is dropped or misaligned $\geq 6.5\%$ (9") from the group average, THEN trip the Rx. <div><p>NOTE</p><p>NIs should NOT be calibrated per guidelines contained in OP/1/A/1102/004 (Operation at Power) due to actual power re-distribution within the core as a result of a dropped/misaligned rod.</p></div> <ol style="list-style-type: none">3 Verify Rx is critical.4. Verify power $> 55\%$ when the rod was dropped or misaligned.	✓	Section	Runback		4H	Asymmetric Control Rod (1%/min to 55%power)
✓	Section	Runback						
	4H	Asymmetric Control Rod (1%/min to 55%power)						

This event is complete when Rx Power has decreased at least 10% and FWP suction has been adjusted, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **5**

Page 2 of 5

Event Description: **Dropped Control Rod**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	AP/1/A/1700/001 Section 4H (continued) EXAMINER NOTE: ICS is in Manual. Candidate will proceed to RNO 5 Verify Rx runback to 55% core thermal power in progress. <ul style="list-style-type: none">• CTPD set at 55%• ASYMETRIC RODS Runback Light lit• CTP Demand decreasing• Reactor power will decrease when the runback catches up with the initial power decrease from the dropped rod. RNO: 1. Initiate power reduction to $\leq 55\%$ core thermal power at $\geq 1\%/min$. 2. IF control rods will not insert manually, THEN perform the following: <ul style="list-style-type: none">A. Trip reactor.B. GO TO Unit 1 EOP.
	SRO/BOP	6 Initiate Encl 5.1 (Control of Plant Equipment During Shutdown). (see page 14) NOTE The following actions should be performed as quickly as possible due to the complexity of resetting RPS trip setpoints and Tech Spec time limits. 7 Notify SPOC to perform the following: <ul style="list-style-type: none">• Investigate cause of dropped or misaligned control rod.• Prepare to reduce the following trip setpoints:<ul style="list-style-type: none">○ RPS Flux/Flow-Imbalance○ RPS High Flux 8 Notify the OSM to ensure the requirements of the following Tech Specs are met: <ul style="list-style-type: none">• TS 3.1.4 (Control Rod Group Alignment Limits)• TS 3.1.5 (Safety Rod Position Limits)• TS 3.2.3 (Quadrant Power Tilt) <u>Booth Cue:</u> When SM is contacted, inform the team that the SM is occupied on Unit 3 and cannot verify TS requirements at this time. See next page for specific TS information

This event is complete when Rx Power has decreased at least 10% and FWP suction has been adjusted, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **5**

Page 3 of 5

Event Description: **Dropped Control Rod**

Time	Position	Applicant's Actions or Behavior												
	SRO/OATC/ BOP	<p>AP/1/A/1700/001 Section 4H (continued)</p> <p>9 Notify OSM to make notifications as required per OMP 1-14 (Notifications).</p> <p>10 Verify > 1% SDM with allowance for the inoperable control rod per PT/1/A/1103/015 (Enclosure 13.18, Reactivity Balance Calculation) within one hour.</p> <p>11 Reduce <u>core thermal power</u> ≤ the following limits, based on the number of RCPs operating, <u>within two hours</u>:</p> <table><tr><th>RCPs</th><th>Allowable Thermal Power (% FP)</th></tr><tr><td>3</td><td>45</td></tr><tr><td>4</td><td>60</td></tr></table> <p>12 IAAT the power decrease is complete, AND any NI is > the following:</p> <table><tr><th>RCPs</th><th>Maximum NI Power (% FP)</th></tr><tr><td>3</td><td>40</td></tr><tr><td>4</td><td>55</td></tr></table> <p>THEN reduce power until all NIs are ≤ the Maximum NI Power limit for the operating RCP combination per Encl 5.4 (Power Reduction).</p> <p>EXAMINER NOTE: Tech Specs determinations:</p> <ul style="list-style-type: none">• Once Reactor Power is reduced to below 85% the SSF must be declared inoperable and therefore Tech Spec 3.10.1 applies. Conditions A-E will be entered all of which have a 7 day completion time.• TS 3.1.4 (Control Rod Group Alignment Limits), Condition A applies which provides 1 hr to restore alignment or verify SDM and be below 60% in 2 hrs• TS 3.1.5 (Safety Rod Position Limits), Condition A applies (Safety rods are in Groups 1 – 4) which requires verification of SDM and declaring the associated rod inoperable within 1 hr.• TS 3.2.3 (Quadrant Power Tilt), Condition A applies when Incore QPT exceeds +3.5 (due to misaligned control rod). (If the highest Incore QPT exceeds +7.11 then Condition B would apply) The power reduction required by Condition A will already be met due to the reduced power level at turnover. RPS trip setpoints must be reduced within 10 hrs and QPT restored within 24 hrs.	RCPs	Allowable Thermal Power (% FP)	3	45	4	60	RCPs	Maximum NI Power (% FP)	3	40	4	55
RCPs	Allowable Thermal Power (% FP)													
3	45													
4	60													
RCPs	Maximum NI Power (% FP)													
3	40													
4	55													
	SRO													

This event is complete when Rx Power has decreased at least 10% and FWP suction has been adjusted, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **5**

Page 4 of 5

Event Description: **Dropped Control Rod**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>AP/1/A/1700/001 Enclosure 5.1</p> <ol style="list-style-type: none">IAAT SRO determines all appropriate actions have been taken, AND the runback is complete, THEN EXIT this Enclosure.Notify the WCC SRO to initiate Enclosure 5.2 (WCC SRO Support During Unit Runback; <p>EXAMINER NOTE: This scenario was snapped at 75% so steps 3 & 4 have already been accomplished.</p> <ol style="list-style-type: none">Start the following pumps:<ul style="list-style-type: none">1A FDWP SEAL INJECTION PUMP1A FDWP AUXILIARY OIL PUMP1B FDWP AUXILIARY OIL PUMP1B FDWP SEAL INJECTION PUMP.WHEN CTP is $\leq 80\%$, THEN stop the following pumps<ul style="list-style-type: none">1E1 HTR DRN PUMP1E2 HTR DRN PUMPWHEN CTP $\leq 65\%$, THEN continue this Enclosure.Place the following in MANUAL and close:<ul style="list-style-type: none">1FDW-531FDW-65 <div><p>NOTE:</p><p>1B FDWP is the preferred pump to shut down first.</p></div> <ol style="list-style-type: none">Verify both Main FDWPs operating.Verify 1B FDWP to be shut down first.Adjust the FWP bias counter-clockwise to lower 1B FWP suction flow $\approx 1 \times 10^6$ lb/hr < 1A FWP suction flow.GO TO Step 12.

This event is complete when Rx Power has decreased at least 10% and FWP suction has been adjusted, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **5**

Page 5 of 5

Event Description: **Dropped Control Rod**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>AP/1/A/1700/001 Enclosure 5.1 (continued)</p> <p>12 IAAT both Main FDW pumps running, AND both of the following exist:</p> <ul style="list-style-type: none">• 1B Main FDW pump is first pump to be shut down• Any of the following alarms occur:<ul style="list-style-type: none">○ 1SA-16/A-3 (FWP B FLOW MINIMUM)○ 1SA-16/A-4 (FWP B FLOW BELOW MIN), <p>THEN trip 1B Main FDW Pump.</p> <p>13 IAAT both Main FDW pumps running, AND both of the following exist:</p> <ul style="list-style-type: none">• 1A Main FDW pump is first pump to be shut down• Any of the following alarms occur:<ul style="list-style-type: none">○ 1SA-16/A-1 (FWP A FLOW MINIMUM)○ 1SA-16/A-2 (FWP A FLOW BELOW MIN), <p>THEN trip 1A Main FDW Pump.</p> <p>14 IAAT the operating FDWP suction flow $< 1.5 \times 10^6$ lb/hr, THEN slowly throttle the associated recirc control valve to establish 2300 - 6000 gpm total Condensate flow:</p> <ul style="list-style-type: none">• 1FDW-53• 1FDW-65 <p>15 Maintain Pzr level between 220" - 250".</p>

This event is complete when Rx Power has decreased at least 10% and FWP suction has been adjusted, or as directed by the lead examiner.

Op-Test No.: ILT45	Scenario No.: 2	Event No.: 6	Page 1 of 5
Event Description: Seismic Event results in an ATWS (Rule 1)			
Time	Position	Applicant's Actions or Behavior	
	SRO	<p>Plant Response:</p> <p>Statalarm 1SA9/E1 (Seismic Trigger) actuates OAC alarm O1D0201 (Seismic Recorder) actuates (BOTH alarms will clear after about 30 sec to provide reflash ability)</p> <p>Booth Cue: Call the Control Room on the Emergency Line (4911) and inform the crew that they have just felt the room shake at the time of the alarm and that several officers have reported feeling a significant earthquake. Additionally, one of the officers has reported seeing a crack in the side of the Unit 1 Containment Building.</p> <p>If the crew dispatches someone to investigate the RB crack, report that using time compression there is a significant crack on the north side of Unit 1 containment approximately 20 – 30 feet long.</p> <p>Crew Response:</p> <p>The SRO will enter and begin to direct AP/5 (Earthquake)</p> <p>4.1 Announce AP entry using the PA system</p> <p>4.2 IAAT any of the following occur:</p> <ul style="list-style-type: none">• Re-flash of SEISMIC TRIGGER (1SA-9, E-1) and/or (3SA9/E1)• Re-flash of computer alarm: SEISMIC RECORDER (O1D0201) on Unit 1• Aftershocks felt at ONS or Keowee Hydro Station <p>THEN GO TO Step 4.3.</p>	
	SRO/OATC	<p>4.3 IAAT major visible damage is observed, THEN evaluate Rx trip on all affected units.</p> <p>Examiner Note: The crew should determine that step 4.3 IAAT is met and manually trip the Reactor. When the Reactor Trip button is depressed, the Reactor will NOT trip requiring actions to mitigate an ATWS which begin on the next page.</p> <p>Booth Cue: IF the crew decides to NOT trip the reactor, call the Control Room as the OSM and inform the crews that based on an evaluation of the Crack in containment you are directing them to manually trip the Reactor.</p>	
This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.			

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 2 of 5

Event Description: **Seismic Event results in an ATWS (Rule 1)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p>Crew Response:</p> <p>The SRO will direct the OATC to perform EOP Immediate Manual Actions</p> <p>The SRO will direct the BOP to perform a Symptoms Check</p> <p>EOP Immediate Manual Actions:</p> <ol style="list-style-type: none">3.1 Depress REACTOR TRIP pushbutton.3.2 Verify reactor power < 5% FP and decreasing. <p>RNO: GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production)</p> <p>EOP Rule 1(CT-24)</p> <ol style="list-style-type: none">1. Verify any Power Range NI \geq 5% FP2. Initiate manual control rod insertion to the IN LIMIT3. Verify Main FDW is feeding the SGs.4. Notify CR SRO to GO TO UNPP tab (see next page)5. Open 1HP-24 and 1HP-256. Ensure <u>at least one</u> of the following operating:<ul style="list-style-type: none">• 1A HPI PUMP• 1B HPI PUMP7. Start 1C HPI PUMP8. Open 1HP-26 and 1HP-279. Dispatch <u>one</u> operator without wearing Arc Flash PPE to open 600V CRD breakers on the following:<ul style="list-style-type: none">• 1X9-5C (Unit 1 CRD Norm Fdr Bkr)• 2X1-5B (Unit 1 CRD Alternate Fdr Bkr) <p>BOOTH CUE: When dispatched, Fire Timer 12 which will trip the CRD Breakers after a 3 minute time delay.</p> <ol style="list-style-type: none">10. Verify only two HPI pumps are operating. RNO:<ul style="list-style-type: none">• IF RCS inventory control does NOT require all HPI pumps, THEN:<ul style="list-style-type: none">• Secure 1A or 1B HPI pump.• Place standby HPI pump switch to AUTO.11. EXIT

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 3 of 5

Event Description: **Seismic Event results in an ATWS (Rule 1)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p><u>EOP UNPP tab:</u></p> <ol style="list-style-type: none">1. Ensure Rule 1 is in progress or complete2. Verify Main FDW is operating <u>and</u> in AUTO3. IAAT Main FDW is NOT operating, THEN perform the following:<ol style="list-style-type: none">A. Trip the turbine-generatorB. Start <u>all available</u> EFDW pumpsC. Ensure Rule 3 is in progress or complete.4. IAAT all power range NIs are < 5% FP, THEN perform Steps 5-6 <p><i>EXAMINER NOTE: Depending on timing, operator could go to step 5 or step 7 from here (may have to come back to step 5 when < 5% FP). The turbine should not be manually tripped if power is not < 5%. There is also a power/timing dependent decision below at step 7.</i></p> <p>RNO: GO TO Step 7</p> <ol style="list-style-type: none">5. Depress turbine TRIP pushbutton6. Verify <u>all</u> turbine stop valves closed7. Verify <u>any</u> wide range NI > 1% FP <p>RNO: GO TO Step 16</p> <ol style="list-style-type: none">8. Open 1RC-49. Verify 1HP-5 open10. Maximize letdown while maintaining letdown temperature < 120 F.11. Verify Main FDW available12. Adjust Main FDW flow as necessary to control RCS temperature13. Verify overcooling in progress <p>RNO: GO TO Step 16</p> <ol style="list-style-type: none">16. Secure makeup to LDST17. WHEN <u>all</u> Wide Range NIs are ≤ 1% FP, AND decreasing, THEN continue

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 4 of 5

Event Description: **Seismic Event results in an ATWS (Rule 1)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	EOP UNPP Tab (continued) 18. Control RCS temperature as follows: <ul style="list-style-type: none">• Tave $\leq 555^{\circ}\text{F}$ – Adjust SG pressure as necessary to stabilize RCS temperature using either of the following:<ul style="list-style-type: none">• TBVs• Dispatch two operators to perform Encl 5.24 (Operation of the ADVs)• Tave $> 555^{\circ}\text{F}$ – Utilize Rule 7 (SG Feed Control) to control SG feed rate as necessary to maintain cooldown rate within Tech Spec limits during the approach to the SG Level Control Point. 19. Throttle HPI per Rule 6 (HPI) 20. WHEN RCS pressure < 2300 psig, THEN continue 21. Verify PORV closed 22. Adjust letdown flow as desired 23. Verify RCP seal injection available 24. GO TO Subsequent Actions tab (Next Page)

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 5 of 5

Event Description: **Seismic Event results in an ATWS (Rule 1)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>EOP Subsequent Actions tab:</p> <p>4.1 Verify <u>all</u> control rods in Groups 1-7 fully inserted</p> <p>4.2 Verify Main FDW in operation</p> <p>4.3 Verify <u>either</u> of the following:</p> <ul style="list-style-type: none">• Main FDW overfeeding causing excessive temperature decrease• Main FDW underfeeding causing SG level decrease below setpoint <p>RNO: GO TO Step 4.5</p> <p>4.5 IAAT Main FDW is operating, AND level in <u>any</u> SG is > 96% on the Operating Range, THEN perform Steps 4.6 – 4.8</p> <p>RNO: GO TO Step 4.9</p> <p>4.9 IAAT TBVs CANNOT control SG pressure at desired setpoint, THEN manually control pressure in <u>affected</u> SG using <u>either</u> of the following:</p> <ul style="list-style-type: none">• TBVs• Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) (PS) <p>4.10 Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating</p> <p>4.11 GOTO Step 4.14</p> <p>4.14 Verify 1MS-17 and 1MS-26 are closed:</p> <p>RNO: Dispatch operator with Encl 5.29 (MSRV Locations) to verify <u>all</u> MSRVs have reseated.</p>

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

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 1 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	<p>Plant response:</p> <p>Control board indications:</p> <ul style="list-style-type: none">• 1SA-2/D-3 (RC PRESS HI/LOW)• RCS Pressure and PZR level decreasing• ES 1-6 actuate• RCS subcooling margin will indicate 0°F• Reactor Building level increasing <p>Crew response:</p> <ul style="list-style-type: none">• The SRO will direct the OATC to perform IMAs.• The SRO will direct the BOP to perform to a Symptoms Check. <p><u>Examiners Note:</u> The SRO will transfer from the Subsequent Actions Tab to the LOSCM tab to direct crew activities.</p> <p><u>Examiners Note:</u> Once the RCS saturates, one of the RO's will perform Rule 2 which begins on the next page.</p> <p><u>Examiners Note:</u> The RO not performing Rule 2 will begin performing Enclosure 5.1 due to ES actuation. Enclosure 5.1 begins on page 34.</p>

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 2 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	<p>Crew Response:</p> <p>Rule 2 (Loss of SCM)</p> <p>1. IAAT all the following exist:</p> <ul style="list-style-type: none">Any $SCM \leq 0^{\circ}F$Rx power $\leq 1\%$≤ 2 minutes elapsed since loss of SCM <p>THEN perform steps 2 & 3</p> <p>2. Stop all RCPs (CT-1 - Trip ALL RCPs within 2 minutes)</p> <p>3. Notify CR SRO of RCP status</p> <p>4. Verify Blackout exists.</p> <p>RNO: GO TO Step 6</p> <p>6. Open 1HP-24 & 25</p> <p>7. Start <u>all available</u> HPI Pumps</p> <p>8. GO TO step 13.</p> <p>13. Open 1HP-26 & 27</p> <p>14. Verify at least two HPI pumps are operating using two diverse indications.</p> <p>15. IAAT ≥ 2 HPI pumps operating and HPI flow in any header is in Unacceptable Region of Fig. 1, THEN perform Steps 16-21.</p> <p>Examiner Note: 1C HPI pump did not start therefore the IAAT is met</p> <p>16. Open 1HP-409 (TCA - Open HPI cross-over valve in 10 min)</p> <p>17. IAAT flow limits are exceeded THEN perform Steps 18 - 20</p> <p>RNO: GO TO Step 21</p> <p>21. Notify CR SRO of HPI status.</p> <p>22. Verify RCS pressure >550 psig</p> <p>23. IAAT either of the following exists:</p> <ul style="list-style-type: none">LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpmOnly one LPI header in operation with header flow ≥ 2900 gpm <p>THEN GO TO Step 24.</p> <p>RNO: GO TO Step 35</p>

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 3 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	<p>Rule 2 (Loss of SCM) (Continued)</p> <p>35. IAAT TBV's are unavailable, THEN</p> <p>A Dispatch two operators to perform Encl 5.24 (Operation of ADVs) B Notify CR SRO the ADVs are being aligned for use.</p> <p>36. Select OFF for both Digital Channels on AFIS HEADER A</p> <p>37. Select OFF for both Digital Channels on AFIS HEADER B</p> <p>38. Verify any EFDW pump operating.</p> <p>39. Start MD EFDW pumps on all intact SGs:</p> <ul style="list-style-type: none">• 1A MD EFDWP• 1B MD EFDWP <p>40. Verify any EFDW pump operating.</p> <p>41. Verify both SGs intact.</p> <p>42. Establish 300 gpm EFDW flow to each SG</p> <p>43. Verify both MD EFDWPs operating.</p> <p>44. Place TD EFDW PUMP in PULL TO LOCK.</p> <p>45. Trip both Main FDW pumps.</p> <p>46. Place FDW block valve switches in CLOSE:</p> <ul style="list-style-type: none">• 1FDW-33• 1FDW-31• 1FDW-42• 1FDW-40 <p>47. Utilize Rule 7 (SG Feed Control) to feed all intact SGs to the appropriate SG Level Control Point using available feed sources; EFDW/Main FDW.</p> <p>48. IAAT SG Level Control Point is reached, THEN maintain SG Level Control Point by feeding and steaming as necessary.</p> <p>49. Notify CR SRO of SG feed status.</p>

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 4 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	Rule 2 (Loss of SCM) (Continued) CAUTION If 1 TD EFDW PUMP is being used for SG feed and Unit 1 is supplying the Auxiliary Steam header, reducing SG pressure below ≈ 250 psig can result in reduced pumping capability. 50. IAAT SG pressure is $>$ RCS pressure, THEN reduce SG pressure $<$ RCS pressure using either: <ul style="list-style-type: none">• TBVs• Dispatch two operators to perform Encl 5.24 (operation of the ADVs) 51. Verify any Main FDW pump operating. RNO: GO TO Step 58. 58. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. 59. WHEN directed by CR SRO, THEN EXIT this rule.

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 5 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	<p><u>LOSCM tab</u></p> <ol style="list-style-type: none">1. Ensure Rule 2 (Loss of SCM) is in progress or complete.2. Verify Station ASW feeding any SG. <p>RNO: GO TO Step 4</p> <ol style="list-style-type: none">4. Verify LOSCM caused by excessive heat transfer. <p>RNO: GO TO Step 6</p> <ol style="list-style-type: none">6. IAAT either of the following exists:<ul style="list-style-type: none">➤ LPI FLOW TRAIN A plus LPI FLOW TRAIN B \geq 3400 gpm➤ Only one LPI header in operation with header flow \geq 2900 gpmTHEN GO TO LOCA CD tab.7. Verify SSF activated per AP/25 with both of the following systems required:<ul style="list-style-type: none">• SSF RC Makeup• SSF Aux Service WaterRNO: GO TO Step 99. Verify all of the following exist:<ul style="list-style-type: none">• NORCPs operating• HPI flow in both HPI headers• Adequate total HPI flow per LOSCM Tab Figure 1 (Total Required HPI Flow)10. GO TO Step 89. <p>89. Open 1AS-40 while closing 1MS-47.</p> <p>90. Verify HPI forced cooling in progress.</p> <p>RNO: Close 1RC-4</p> <ol style="list-style-type: none">91. Close 1GWD-17, 1HP-1, 1HP-2, and 1RC-392. Verify either of the following:<ul style="list-style-type: none">• Core superheated• Rx vessel head level at 0"RNO: GO TO Step 9494. IAAT BWST level is \leq 19', THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 6 of 6

Event Description: **SBLOCA and 1C HPIP Fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	<u>LOSCM tab(Continued)</u> <u>CAUTION</u> If TDEFDWP is being used for SG feed, reducing SG pressure below ≈ 250 psig can result in reduced pumping capability 95 Maintain SG pressure < RCS pressure utilizing <u>either</u> : __TBVs __ADVs 96 Verify <u>any</u> SG available for feeding/steaming. 97 Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control). 98 Verify indications of SGTR exist. RNO: GO TO Step 101 101 Verify HPI forced cooling in progress. RNO: GO TO Step 103 103 Verify CETCs trend decreasing. 104 Verify primary to secondary heat transfer is excessive. RNO: GO TO Step 106 106 Verify indications of SGTR ≥ 25 gpm. RNO: GO TO Step 108 108 Verify required RCS makeup flow within normal makeup capability. RNO: GO TO LOCA CD tab

This event is complete when the SRO transfers to Step 89, or as directed by the Lead Examiner.

EXAMINER NOTE

At any time during this scenario the operator may choose to use Enclosure 5.5 to maintain RCS inventory control. See excerpt below.

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

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

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

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. <input type="checkbox"/> IAAT additional makeup flow to LDST is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
13. <input type="checkbox"/> IAAT <u>two</u> Letdown Filters are desired, THEN perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
14. <input type="checkbox"/> IAAT <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired THEN perform Steps 15 - 33. {41}	<input type="checkbox"/> GO TO Step 34.
15. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown CANNOT be restored due to inability to restart the CC system. 2. <input type="checkbox"/> GOTO Step 34.
16. <input type="checkbox"/> Ensure only one CC pump running.	
17. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
18. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> IF 1HP-1 is closed due to 1HP-3 failing to close, THENGOTO Step 20. 2. <input type="checkbox"/> IF 1HP-2 is closed due to 1HP-4 failing to close, THENGOTO Step 20.
19. <input type="checkbox"/> GOTO Step 22.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
20. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<input type="checkbox"/> GOTO Step 22.
21. <input type="checkbox"/> GOTO Step 34.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. <input type="checkbox"/> Monitor for unexpected conditions while restoring letdown.	
23. <input type="checkbox"/> Verify <u>both</u> letdown coolers to be placed in service.	1. <input type="checkbox"/> IF 1A letdown cooler is to be placed in service, THEN open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-3 2. <input type="checkbox"/> IF 1B letdown cooler is to be placed in service, THEN open: <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-4 3. <input type="checkbox"/> GOTO Step 25.
24. Open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-3 <input type="checkbox"/> 1HP-4	
25. <input type="checkbox"/> Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. <input type="checkbox"/> Notify CR SRO of problem. B. <input type="checkbox"/> GOTO Step 34.
26. <input type="checkbox"/> Close 1HP-6.	
27. <input type="checkbox"/> Close 1HP-7.	
28. <input type="checkbox"/> Verify letdown temperature < 125°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Close: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> IF <u>any</u> deborating IX is in service, THEN perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

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

NOTE

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

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

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

EOP Enclosure 5.1 (ES Actuation)

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <input type="checkbox"/> Verify Rule 2 in progress <u>or</u> complete.	<input type="checkbox"/> GOTO Step 73.
7. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 9.
8. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
9. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
10. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 11 - 14.	<input type="checkbox"/> GOTO Step 15.
11. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
12. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
13. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
14. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

• ACTION/EXPECTED RESPONSE	• RESPONSE NOT OBTAINED
15. ___ IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 16.	___ GO TO Step 53.
16. ___ Place Diverse LPI in BYPASS.	___ Place Diverse LPI in OVERRIDE.
17. Perform <u>both</u> : ___ Place ES CH 3 in MANUAL. ___ Place ES CH 4 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. ___ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ___ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>

CAUTION

LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}

18. ___ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
19. ___ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 20 - 21.	___ GOTO Step 22.
20. Perform the following: ___ Open 1LP-17. ___ Start 1A LPI PUMP.	1. ___ Stop 1A LPI PUMP. 2. ___ Close 1LP-17.
21. Perform the following: ___ Open 1LP-18. ___ Start 1B LPI PUMP.	1. ___ Stop 1B LPI PUMP. 2. ___ Close 1LP-18.

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
30. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
31. ___ Secure makeup to the LDST.	
32. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, ANDNO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
33. ___ Verify Unit <u>2</u> turbine tripped.	___ GOTO Step 36.
34. ___ Close <u>2</u> LPSW-139.	
35. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
36. ___ Close 1LPSW-139.	
37. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
38. ___ Start <u>all available</u> LPSW pumps.	

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

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

... END ...

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">Unit Status ES Channels 3 & 4 have NOT actuated.</p>	
53. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
54. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
55. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
56. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
57. ___ Secure makeup to the LDST.	
58. ___ Verify all ES channel 1 & 2 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, ANDNO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
59. ___ Verify Unit <u>2</u> turbine tripped.	___ GOTO Step 62.
60. ___ Close <u>2</u> LPSW-139.	
61. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
62. ___ Close 1LPSW-139.	

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

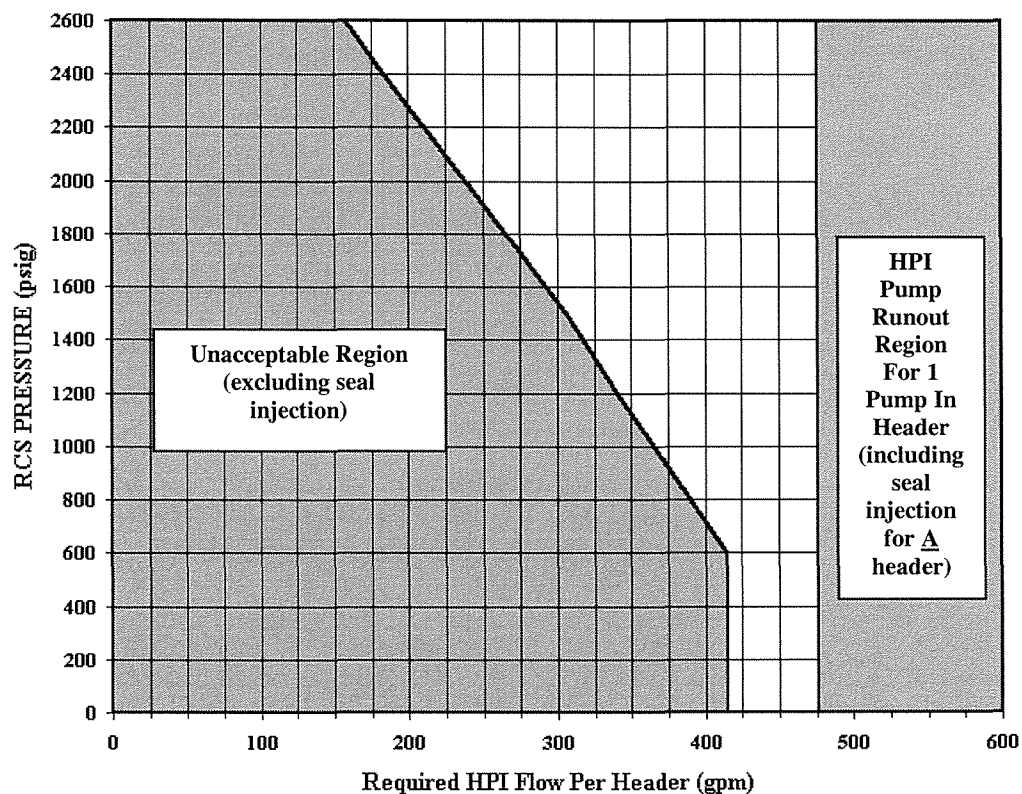
... END ...

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>73. Open:</p> <p>___ 1HP-24</p> <p>___ 1HP-25</p>	<p>1. ___ IF <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN:</p> <p>A. ___ Start 1A LPI PUMP.</p> <p>B. ___ Start 1B LPI PUMP.</p> <p>C. Open:</p> <p>___ 1LP-15</p> <p>___ 1LP-16</p> <p>___ 1LP-9</p> <p>___ 1LP-10</p> <p>___ 1LP-6</p> <p>___ 1LP-7</p> <p>D. ___ IF two LPI Pumps are running <u>only</u> to provide HPI pump suction, THEN secure one LPI pump.</p> <p>E. ___ Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</p> <p>F. ___ GOTO Step 74.</p> <p>2. ___ IF <u>only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, THEN:</p> <p>A. ___ IF three HPI pumps are operating, THEN secure 1B HPI PUMP.</p> <p>B. ___ IF < 2 HPI pumps are operating, THEN start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.</p> <p>C. ___ GO TO Step 75.</p>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
74. <input type="checkbox"/> Ensure <u>at least two</u> HPI pumps are operating.	
75. Verify open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27	1. <input type="checkbox"/> IF HPI has been intentionally throttled, THENGOTO Step 76. 2. Open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
<p>76. ___ IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header:</p> <table><tr><td>✓</td><td>1A Header</td><td>✓</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table>	✓	1A Header	✓	1B Header		1HP-410		1HP-409	
✓	1A Header	✓	1B Header						
	1HP-410		1HP-409						

Figure 1
Required HPI Flow Per Header



ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
77. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 79.
78. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
79. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
80. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 81 - 84.	<input type="checkbox"/> GOTO Step 85.
81. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div><p style="text-align: center;"><u>NOTE</u></p><ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><p>1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.</p><p>2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</p></div>
82. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
83. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
84. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
85. <input type="checkbox"/> IAAT ES Channels 3 & 4 are actuated, THENGOTO Step 86.	<input type="checkbox"/> GO TO Step Error! Reference source not found..
86. <input type="checkbox"/> Place Diverse LPI in BYPASS.	<input type="checkbox"/> Place Diverse LPI in OVERRIDE.
87. Perform <u>both</u> : <input type="checkbox"/> Place ES CH 3 in MANUAL. <input type="checkbox"/> Place ES CH 4 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><ol style="list-style-type: none">1. <input type="checkbox"/> IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.2. <input type="checkbox"/> IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
<div>CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
88. <input type="checkbox"/> IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
89. <input type="checkbox"/> IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 90 - 91.	<input type="checkbox"/> GOTO Step 92.
90. Perform the following: <input type="checkbox"/> Open 1LP-17. <input type="checkbox"/> Start 1A LPI PUMP.	1. <input type="checkbox"/> Stop 1A LPI PUMP. 2. <input type="checkbox"/> Close 1LP-17.
91. Perform the following: <input type="checkbox"/> Open 1LP-18. <input type="checkbox"/> Start 1B LPI PUMP.	1. <input type="checkbox"/> Stop 1B LPI PUMP. 2. <input type="checkbox"/> Close 1LP-18.
92. <input type="checkbox"/> IAAT 1A and 1B LPI PUMPS are off / tripped, AND all exist: <input type="checkbox"/> RCS pressure < LPI pump shutoff head <input type="checkbox"/> 1LP-19 closed <input type="checkbox"/> 1LP-20 closed THEN perform Steps 93 - 94.	<input type="checkbox"/> GO TO Step 95.
93. Open: <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7 <input type="checkbox"/> 1LP-17 <input type="checkbox"/> 1LP-18 <input type="checkbox"/> 1LP-21 <input type="checkbox"/> 1LP-22	
94. <input type="checkbox"/> Start 1C LPI PUMP.	
95. <input type="checkbox"/> IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
96. <input type="checkbox"/> IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
97. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
98. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
99. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
100. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
101. ___ Secure makeup to the LDST.	
102. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, ANDNO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
103. ___ Verify Unit <u>2</u> turbine tripped.	___ GOTO Step 106.
104. ___ Close <u>2</u> LPSW-139.	
105. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
106. ___ Close 1LPSW-139.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
107. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
108. ___ Start <u>all available</u> LPSW pumps.	
109. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ GOTO Step 111.
110. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ IF both are closed: ___ 1LPSW-4 ___ 1LPSW-5 THEN notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
111. ___ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
112. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
113. ___ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
114. ___ IAAT ES channels 5 & 6 have actuated, THEN perform Step 115.	___ GOTO Step 116.
NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.	
115. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
116. <input type="checkbox"/> IAAT ES channels 7 & 8 have actuated, THEN perform Step 117 - 118.	<input type="checkbox"/> GOTO Step 119.
117. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 7 in MANUAL. <input type="checkbox"/> Place ES CH 8 in MANUAL.	<div><p style="text-align: center;"><u>NOTE</u></p><ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><p>1. <input type="checkbox"/> IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.</p><p>2. <input type="checkbox"/> IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</p></div>
118. <input type="checkbox"/> Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	<input type="checkbox"/> Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
119. <input type="checkbox"/> Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
120. <input type="checkbox"/> Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
121. <input type="checkbox"/> IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
122. <input type="checkbox"/> WHEN CR SRO approves, THEN EXIT.	

CRITICAL TASKS

CT-24 In the event the reactor fails to trip, in response to automatic and manual demands, then perform the following:

- Deenergize CRDMs
 - Begin maximum boric acid addition to RCS as necessary
 - Maintain adequate primary to secondary heat transfer
- (Page 17)

CT-1 Trip RCP's within two minutes of RCS SCM reaching zero. (Page 22)

SAFETY: Take a Minute			
UNIT 0 (OSM)			
SSF Operable: Yes	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
UNIT STATUS (CR SRO)			
Unit 1 Simulator		Other Units	
Mode: 1		Unit 2	Unit 3
Reactor Power: 86%		Mode: 1	Mode: 5
Gross MWE: 808		100% Power	N/A
RCS Leakage: 0.11 gpm		EFDW Backup: Yes	EFDW Backup: No
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CR SRO)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
Shift Turnover Items (CR SRO)			
Primary			
<ul style="list-style-type: none"> The SSF shall be declared Inoperable if Core Thermal Power is reduced below 85% Full Power. OPS Guide 12-13 			
<ul style="list-style-type: none"> 			
Secondary			
<ul style="list-style-type: none"> 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event. 			
<ul style="list-style-type: none"> 1MS-82 and 1MS-84 closed in support of maintenance. TDEFWP supply from AS only. 			
<ul style="list-style-type: none"> Unit 2 has the AS header. 			
<ul style="list-style-type: none"> Perform PT/1/A/0290/003, Encl. 13.2 (Control Valve Movement at Power) for Control Valve 1 (Only) 			
Reactivity Management (CR SRO)			
RCS Boron: 89 ppmB	Gp 7 Rod Position: 82%		
Human Performance Emphasis (OSM)			
Procedure Use and Adherence			

<div>Duke Energy Oconee Nuclear Station</div> <div>TURBINE VALVE MOVEMENT</div> <div>Continuous Use</div>	Procedure No. PT/1/A/0290/003
	Revision No. 011
	Electronic Reference No. OP0097N4
<div>PERFORMANCE</div> <div>***** UNCONTROLLED FOR PRINT *****</div> <div>(ISSUED) - PDF Format</div>	

Turbine Valve Movement

1. Purpose

To test operation of Main Steam Stop Valves (SVs), Turbine Control Valves (CVs), and combined Reheat Stop Valves/Intercept Valves (RHSV/IVs).

2. References

- 2.1 Steam Turbine-Generator Instructions: OM 2200-72, Vol. III.
- 2.2 GE Instructions, GEK-26677B, Valve Test Logic
- 2.3 Technical Specifications 3.3.15, and 3.7.2
- 2.4 PIP 094-1511
- 2.5 PIP 098-0565
- 2.6 GE Letter on Low Pressure Turbine Wheel Missile Probabilities for Extended Valve Testing Intervals, dated December 13, 1994
- 2.7 BWNT Letter from T.E. Smith to T. D. Mills, Review of Duke Power Procedure for Turbine Valve Testing at Oconee, dated May 8, 1995
- 2.8 On Line Valve Testing Meeting Minutes, November 12, 1998
- 2.9 OEP SER 91-4, Asymmetric Turbine Loading Due to Misapplication of Test Procedure
- 2.10 OP/1/A/1106/002, Condensate and FDW System
- 2.11 PT/0/A/1103/020, Power Maneuvering Predictions

3. Time Required

2 Hours – 92 day frequency

4. Prerequisite Tests

None

5. Test Equipment

None

6. Limits And Precautions

- 6.1 This procedure contains activities that have potential to affect core reactivity by causing power transients if ICS **NOT** in Automatic. (R.M.)
- 6.2 The following Limits and Precautions are Reactivity Management related: (R.M.)
- 6.2.1 Small Rx Power changes should be expected for Valve Testing. Any Rx power change $\geq \pm 3.0\%$ from initial value is considered unexpected. (R.M.)
- 6.2.2 Small Rx Power changes should be expected for Valve Testing. For purpose of this procedure any Rx Power change $> \pm 2.0\%$ from initial value is considered test termination criteria.
- Test will be terminated by activating "Abort Test" and PIP should be written to investigate problem. (R.M.)
- 6.2.3 If NI Power or CTPB increases $\geq 5\%$ within ≤ 5 minutes, fuel should be conditioned by holding CTP constant for > 10 minutes. (R.M.)
- If NI Power or CTPB increases $\geq 5\%$ within ≤ 5 minutes, notify Reactor Engineering and write PIP. (R.M.)
- 6.2.4 Small Rx Power changes should be expected for each movement test of a Turbine Valve. Allow sufficient time between each test for Rx Power to stabilize. (R.M.)
- 6.2.5 A potential failure mode exists with the Main Turbine Control Valve Fast Acting Solenoid Valve (FASV) that could result in a reactivity management event if the (FSAV) Spool Piece fails to return to its normal position (de-energized state) after a Control Valve disc dump. (R.M.)
- 6.3 Failure of Stop Valve to "disc dump" could indicate an inoperable Stop Valve and should be evaluated by Engineering. {PIP O-02-02750} {3}
- 6.4 Enclosure 13.1 "Stop Valve and Reheat/Intercept Valve Movement At Power" or Enclosure 13.2 "Control Valve Movement At Power" shall **NOT** be performed at $< 85\%$ CTP since two closed control valves increase asymmetrical loading of turbine.
- 6.5 SV(s), RHSV(s), and IV(s) tests are performed between 87% and 90% CTP to minimize turbine asymmetrical loading and for Control Valve Position such that CV-4 is fully closed at start of test.
- 6.6 Turbine vibration amplitude changes up to 2 mils are expected during performance of Control Valve testing. Vibration levels should be monitored and appropriate action taken per OP/1/A/1106/001 (Turbine-Generator) as required.

- 6.7 All Turbine-Generator alarm limits should be followed while this procedure is being performed. OP/1/A/1106/001 (Turbine-Generator) can be used as reference.
- 6.8 Control Valves, Reheat Stop Valves/Intercept Valves, and Stop Valves shall return to original position prior to starting next test.
- 6.9 Desired mode for MSRH is "feed mode" with pumps On or Off during this test.

7. Required Unit Status

See initial conditions for each enclosure.

8. Prerequisite System Conditions

See initial conditions for each enclosure.

9. Test Method

- 9.1 Testing performed using EHC HMI Panel.
- 9.2 Alternate methods to document valve movement are:
 - 9.2.1 Documenting all SV(s), RHSV/IV(s), and CV(s) closed following Reactor/Turbine-Generator trip or normal Unit shutdown.
 - 9.2.2 Documenting SV(s), RHSV/IV(s), and CV(s) closed on Unit startup following performance of IP/0/B/0281/002 (Turbine Electro-Hydraulic Control System Valve Stroke and ICS Feedback Testing and Calibration).

10. Data Required

None

11. Acceptance Criteria

NOTE: Additional information regarding Acceptance Criteria is located in Enclosure 13.3. {3}

11.1 **IF** performing Enclosure 13.1:

11.1.1 Each Main Steam Stop Valve tested: (SV1, SV3, SV2, SV4)

A. Received **one** of the following indications:

- "Test Successful" indication
- "Confirm (Valve) Fast Close Operation" received.

B. Indicated 100% open.

11.1.2 Each Reheat Stop Valves/Intercept Valve tested: (RHIV1 & RHSV1, RHIV4 & RHSV4, RHIV2 & RHSV2, RHIV6 & RHSV6, RHIV3 & RHSV3, RHIV5 & RHSV5)

A. Received **one** of the following indications:

- "Test Successful" indication
- RHIVs moved towards closed position.

B. Indicated the following:

- RHIVs Indicated open.
- RHSVs Indicated open.

11.2 **IF** performing Enclosure 13.2:

11.2.1 Each Turbine Control Valve tested: (CV3, CV4, CV2, CV1)

A. Received **one** of the following indications:

- "Test Successful" indication
- CVs moved towards closed position.

B. CVs returned to within $\pm 5.0\%$ of pretest position.

11.3 **IF** Enclosure 13.1 and Enclosure 13.2 **NOT** performed, verify **one** of the following:

- Enclosure 13.4 completed following Turbine Trip/Shutdown.
- Enclosure 13.5 completed during Unit startup following refueling outage.

12. Procedure

12.1 **IF** Turbine online:

SM/A 12.1.1 **IF** required to test SV(s) and RHSV(s), perform Enclosure 13.1 "Stop Valve and Reheat/Intercept Valve Movement at Power".

_____ 12.1.2 **IF** required to test CV(s), perform Enclosure 13.2 "Control Valve Movement at Power".

_____ 12.2 **IF** following Turbine-Generator trip, perform Enclosure 13.4 "Turbine Valve Movement Post Turbine-Generator Trip/Shutdown".

_____ 12.3 **IF** unit is starting up following refueling outage, perform Enclosure 13.5 "Turbine Valve Test During Refueling Startup".

_____ 12.4 **IF** "Test Successful" **NOT** indicated for any valve tested, write PIP for Engineering evaluation.

13. Enclosures

13.1 Stop Valve and Reheat/Intercept Valve Movement At Power

13.2 Control Valve Movement At Power

13.3 Turbine Valve Movement Information

13.4 Turbine Valve Movement Post Turbine-Generator Trip/Shutdown

13.5 Turbine Valve Test During Refueling Startup

13.6 Appendix

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/**1**/A/0290/003
Page 1 of 12

1. Initial Conditions

- _____ 1.1 Ensure all SVs open.
- _____ 1.2 Ensure CTP stable at 87 - 90%.
- _____ 1.3 Ensure Main Steam pressure > 840 psig.
- _____ 1.4 Ensure **one** of the following:
 - Unit 1 fuel fully conditioned per PT/0/A/1103/020 (Power Maneuvering Predictions). (R.M.)
 - Allowable step change based on Unit 1 condition of fuel per PT/0/A/1103/020 (Power Maneuvering Predictions) >3% in ≤ 5 minutes. (R.M.) {1}
- _____ 1.5 Ensure ICS in Automatic. (R.M.)
- _____ 1.6 Ensure pre-job brief completed.
- _____ 1.7 Review Enclosure 13.3 "Turbine Valve Movement Information".
- _____ 1.8 Review Limits and Precautions.

2. Procedure

- _____ 2.1 Ensure Standby EHC pump in operation.
- _____ 2.2 Perform the following:
 - ☐ Verify Standby EHC Pump Amp > 0 amps
 - ☐ Verify Standby EHC Pump running smoothly
 - ☐ Verify Standby EHC Pump Discharge Pressure > 1500 psig
- _____ 2.3 Verify CV4 closed.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 2 of 12

- NOTE:**
- Enclosure 13.3 contains additional information regarding failure of Stop Valve to disc dump could indicate an inoperable Stop Valve. {3}
 - If SV1 and SV3 position deviate > 60% during test, AUTO abort will occur to minimize SG outlet pressure and FDW flow deviations.

2.4 **IF** SV1 and SV3 test required:

_____ 2.4.1 Select "Main Stop Valve 1 And 3 Test".

2.4.2 Verify the following:

- _____ • "Test Permissive" is ON for SV1.
- _____ • "Test Permissive" is ON for SV3.

NOTE: If "Test Successful" **NOT** received, look for "Confirm SV Fast Close Operation" indication in steps 2.4.5B and 2.4.6B. {3}

_____ 2.4.3 Select "Initiate SV1 & SV3 Test".

_____ 2.4.4 **IF** any of the following conditions occur, select "Abort SV1 & SV3 Test":

- ☐ NI POWER changes > 2%. (R.M.)
- ☐ "Test Failed" is ON.

NOTE: Step 2.4.5 and Step 2.4.6 may be performed in any order.

2.4.5 Perform **EITHER** for SV1:

_____ A. Verify "Test Successful" indicated for SV1.

_____ B. **IF** "Test Successful" **NOT** indicated for SV1, verify "Confirm SV1 Fast Close Operation" received.

2.4.6 Perform **EITHER** for SV3:

_____ A. Verify "Test Successful" indicated for SV3.

_____ B. **IF** "Test Successful" **NOT** indicated for SV3, verify "Confirm SV3 Fast Close Operation" received.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 3 of 12

- NOTE:**
- SV1 and SV3 test indicator resets after \approx 20 seconds.
 - Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.4.7 Verify SV1 test indicators reset.
- _____ 2.4.8 Verify SV3 test indicators reset.
- _____ 2.4.9 Verify SV1 at 100% open.
- _____ 2.4.10 Verify SV3 at 100% open.
- _____ 2.4.11 Perform the following:
 - ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

- NOTE:**
- Enclosure 13.3 contains additional information regarding failure of Stop Valve to disc dump could indicate an inoperable Stop Valve. {3}
 - SV2 is slower to close since it is servo controlled.
 - SV4 begins closing when SV2 closes to 70%. SV4 begins reopening when SV2 reopens to 10%.
 - If SV2 and SV4 position deviate $> 60\%$ during test, AUTO abort will occur to minimize SG outlet pressure and FDW flow deviations.

- 2.5 **IF** SV2 and SV4 test required:
- _____ 2.5.1 Select "Main Stop Valve 2 And 4 Test".
 - 2.5.2 Verify the following:
 - _____ • "Test Permissive" is ON for SV2.
 - _____ • "Test Permissive" is ON for SV4.

**Stop Valve and Reheat/Intercept Valve
Movement At Power**

NOTE: If "Test Successful" **NOT** received, look for "Confirm SV Fast Close Operation" indication in steps 2.5.5B and 2.5.6B. {3}

_____ 2.5.3 Select "Initiate SV2 & SV4 Test".

_____ 2.5.4 **IF** any of the following conditions occur, select "Abort SV2 & SV4 Test":

☐ NI POWER changes > 2%. (R.M.)

☐ "Test Failed" is ON.

NOTE: Step 2.5.5 and Step 2.5.6 may be performed in any order.

2.5.5 Perform EITHER for SV2:

_____ A. Verify "Test Successful" indicated for SV2.

_____ B. **IF** "Test Successful" **NOT** indicated for SV2, verify "Confirm SV2 Fast Close Operation" received.

2.5.6 Perform EITHER for SV4:

_____ A. Verify "Test Successful" indicated for SV4.

_____ B. **IF** "Test Successful" **NOT** indicated for SV4, verify "Confirm SV4 Fast Close Operation" received.

NOTE:

- SV2 and SV4 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

_____ 2.5.7 Verify SV2 test indicators reset.

_____ 2.5.8 Verify SV4 test indicators reset.

_____ 2.5.9 Verify SV2 at 100% open.

_____ 2.5.10 Verify SV4 at 100% open.

Enclosure 13.1

**Stop Valve and Reheat/Intercept Valve
Movement At Power**

PT/**1**/A/0290/003
Page 5 of 12

_____ 2.5.11 Perform the following:

- ☐ Verify acceptance criteria met.
- ☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 6 of 12

2.6 **IF** IV1 and RHSV1 test required:

- _____ 2.6.1 Select "Intercept Valve 1 & 4 Test".
- _____ 2.6.2 Verify "Test Permissive" is ON.
- _____ 2.6.3 Select "Initiate Test" for Master (Intercept Valve 1).
- _____ 2.6.4 **IF** any of the following conditions occur, select "Abort IV1 & RHSV1 Test":
 - ☐ NI POWER changes > 2%. (R.M.)
 - ☐ "Test Failed" is ON.
- 2.6.5 Perform **EITHER** for IV1:
 - _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify IV1 moved towards closed position.
- 2.6.6 Perform **EITHER** for RHSV1:
 - _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV1 moved towards closed position.

NOTE:

- IV1 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.6.7 Verify IV1 test indicators reset.
- _____ 2.6.8 Verify Open IV1.
- _____ 2.6.9 Verify Open RHSV1.
- _____ 2.6.10 Perform the following:
 - ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 7 of 12

- 2.7 **IF** IV4 and RHSV4 test required:
- _____ 2.7.1 **IF** required, select "Intercept Valve 1 & 4 Test".
- _____ 2.7.2 Verify "Test Permissive" is ON.
- _____ 2.7.3 Select "Initiate Test" for Slave (Intercept Valve 4).
- _____ 2.7.4 **IF** any of the following conditions occur, select "Abort IV4 & RHSV4 Test":
- ☐ NI POWER changes > 2%. (R.M.)
- ☐ "Test Failed" is ON.
- 2.7.5 Perform EITHER for IV4:
- _____ A. Verify "Test Successful" is ON.
- _____ B. **IF** "Test Successful" **NOT** indicated, verify IV4 moved towards closed position.
- 2.7.6 Perform EITHER for RHSV4:
- _____ A. Verify "Test Successful" is ON.
- _____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV4 moved towards closed position.

NOTE:

- IV4 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.7.7 Verify IV4 test indicators reset.
- _____ 2.7.8 Verify Open IV4.
- _____ 2.7.9 Verify Open RHSV4.
- _____ 2.7.10 Perform the following:
- ☐ Verify acceptance criteria met.
- ☐ **IF** acceptance criteria **NOT** met, notify SRO.

**Stop Valve and Reheat/Intercept Valve
Movement At Power**

2.8 **IF** IV2 and RHSV2 test required:

- _____ 2.8.1 Select "Intercept Valve 2 & 6 Test".
- _____ 2.8.2 Verify "Test Permissive" is ON.
- _____ 2.8.3 Select "Initiate Test" for Master (Intercept Valve 2).
- _____ 2.8.4 **IF** any of the following conditions occur, select "Abort IV2 & RHSV2 Test":
- ☐ NI POWER changes > 2%. (R.M.)
 - ☐ "Test Failed" is ON.
- 2.8.5 Perform EITHER for IV2:
- _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify IV2 moved towards closed position.
- 2.8.6 Perform EITHER for RHSV2:
- _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV2 moved towards closed position.

NOTE:

- IV2 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.8.7 Verify IV2 test indicators reset.
- _____ 2.8.8 Verify Open IV2.
- _____ 2.8.9 Verify Open RHSV2.
- _____ 2.8.10 Perform the following:
- ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

**Stop Valve and Reheat/Intercept Valve
Movement At Power**

2.9 **IF** IV6 and RHSV6 test required:

_____ 2.9.1 **IF** required, select "Intercept Valve 2 & 6 Test".

_____ 2.9.2 Verify "Test Permissive" is ON.

_____ 2.9.3 Select "Initiate Test" for Slave (Intercept Valve 6).

_____ 2.9.4 **IF** any of the following conditions occur, select "Abort IV6 & RHSV6 Test":

☐ NI POWER changes > 2%. (R.M.)

☐ "Test Failed" is ON.

2.9.5 Perform EITHER for IV6:

_____ A. Verify "Test Successful" is ON.

_____ B. **IF** "Test Successful" **NOT** indicated, verify IV6 moved towards closed position.

2.9.6 Perform EITHER for RHSV6:

_____ A. Verify "Test Successful" is ON.

_____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV6 moved towards closed position.

NOTE:

- IV6 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

_____ 2.9.7 Verify IV6 test indicators reset.

_____ 2.9.8 Verify Open IV6.

_____ 2.9.9 Verify Open RHSV6.

_____ 2.9.10 Perform the following:

☐ Verify acceptance criteria met.

☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 10 of 12

2.10 **IF** IV3 and RHSV3 test required:

- _____ 2.10.1 Select "Intercept Valve 3 & 5 Test".
- _____ 2.10.2 Verify "Test Permissive" is ON.
- _____ 2.10.3 Select "Initiate Test" for Master (Intercept Valve 3).
- _____ 2.10.4 **IF** any of the following conditions occur, select "Abort IV3 & RHSV3 Test":
 - ☐ NI POWER changes > 2%. (R.M.)
 - ☐ "Test Failed" is ON.
- 2.10.5 Perform **EITHER** for IV3:
 - _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify IV3 moved towards closed position.
- 2.10.6 Perform **EITHER** for RHSV3:
 - _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV3 moved towards closed position.

NOTE:

- IV3 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.10.7 Verify IV3 test indicators reset.
- _____ 2.10.8 Verify Open IV3.
- _____ 2.10.9 Verify Open RHSV3.
- _____ 2.10.10 Perform the following:
 - ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.1
Stop Valve and Reheat/Intercept Valve
Movement At Power

PT/1/A/0290/003
Page 11 of 12

2.11 **IF** IV5 and RHSV5 test required:

- _____ 2.11.1 **IF** required, select "Intercept Valve 3 & 5 Test".
- _____ 2.11.2 Verify "Test Permissive" is ON.
- _____ 2.11.3 Select "Initiate Test" for Slave (Intercept Valve 5).
- _____ 2.11.4 **IF** any of the following conditions occur, select "Abort IV5 & RHSV5 Test":
- ☐ NI POWER changes > 2%. (R.M.)
 - ☐ "Test Failed" is ON.
- 2.11.5 Perform **EITHER** for IV5:
- _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify IV5 moved towards closed position.
- 2.11.6 Perform **EITHER** for RHSV5:
- _____ A. Verify "Test Successful" is ON.
 - _____ B. **IF** "Test Successful" **NOT** indicated, verify RHSV5 moved towards closed position.

NOTE:

- IV5 test indicator resets after \approx 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- _____ 2.11.7 Verify IV5 test indicators reset.
- _____ 2.11.8 Verify Open IV5.
- _____ 2.11.9 Verify Open RHSV5.
- _____ 2.11.10 Perform the following:
- ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.1

PT/**1**/A/0290/003

**Stop Valve and Reheat/Intercept Valve
Movement At Power**

Page 12 of 12

2.12 **IF** Enclosure 13.2 "Control Valve Movement at Power" will **NOT** be performed:

_____ 2.12.1 Stop Standby EHC pump.

_____ 2.12.2 Place Standby EHC pump control switch to "AUTO".

Enclosure 13.2
Control Valve Movement At Power

PT/1/A/0290/003
Page 1 of 8

1. Initial Conditions

CPL 1.1 Ensure Reactor power stable at 87 - 90%.

CPL 1.2 Ensure Main Steam pressure > 840 psig.

GCW CPL 1.3 Ensure **one** of the following:

- Unit 1 fuel fully conditioned per PT/0/A/1103/020 (Power Maneuvering Predictions). (R.M.)
- Allowable step change based on Unit 1 condition of fuel per PT/0/A/1103/020 (Power Maneuvering Predictions) >3% in ≤ 5 minutes. (R.M.) {1}

GCW CPL 1.4 Ensure ICS in Automatic. (R.M.)

CPL 1.5 Ensure pre-job brief completed.

CPL 1.6 Review Enclosure 13.3 "Turbine Valve Movement Information".

CPL 1.7 Review Limits and Precautions.

2. Procedure

CPL 2.1 Ensure Standby EHC pump in operation.

CPL 2.2 Perform the following:

- ☐ Verify Standby EHC Pump Amp > 0 amps
- ☐ Verify Standby EHC Pump running smoothly
- ☐ Verify Standby EHC Pump Discharge Pressure > 1500 psig

CPL 2.3 Verify CV4 closed.

Enclosure 13.2
Control Valve Movement At Power

PT/1/A/0290/003
Page 2 of 8

NOTE: CV3 & CV4 testing is combined into single test with CV3 ramping closed and CV4 opening. When CV3 is fully tested, CV4 is disc dumped at < 6 % open to complete test.

2.4 **IF** CV3 and CV4 test required:

4W/A

2.4.1 Select "Control Valve 3 & 4 Test".

2.4.2 Verify the following:

- "Test Permissive" is ON for CV3.
- "Test Permissive" is ON for CV4.

2.4.3 Record CV3 and CV4 pretest positions:

- CV3 pretest position: _____ % Open
- CV4 pretest position: _____ % Open

2.4.4 Select "Initiate CV3 and CV4 Test".

2.4.5 **IF** any of the following conditions occur, select "Abort CV3 & CV4 Test":

- ☐ NI POWER changes > 2%. (R.M.)
- ☐ ICS Turbine Master trips to HAND. (R.M.)
- ☐ Turbine vibration > 10 mils for > 5 seconds.

CAUTION: If CV3 remains in the closed position with the Test Failed indication "ON", initiating Abort Test could result in a reactivity management event. (R.M.)

✓ 2.4.6

IF "Test Failed" is "ON" **AND** CV3 is **NOT** fully closed, select "Abort CV3 & CV4 Test".

NOTE: If a Control Valve remains closed after it has disc-dump, it may start going open at any time (i.e. 1 min, 5 min, 1 hour,...). When the Control Valve starts going back open it will open at its normal rate. No transients are expected during this scenario since the EHC Control System will simply continue with the test logic and return the Control Valve to its normal position at the normal controlled test rate.

clw/A 2.4.7 **IF** "Test Failed" is "ON" **AND** CV3 remained closed perform the following:

- A. Do **NOT** select "Abort CV3 & CV4 Test". (R.M.)
- B. Notify WCC & Engineering that the (FASV) for the Control Valve under test is stuck in the energized state.

NOTE: Control Valves which are not in their normal position could result in asymmetrical loading on the Turbine bearings.

C. Monitor Turbine Vibrations closely if in this abnormal state.

2.4.8 Perform EITHER for CV3:

- A. Verify "Test Successful" indicated for CV3.
- B. **IF** "Test Successful" **NOT** indicated for CV3, verify CV3 moved towards closed position.

2.4.9 Perform EITHER for CV4:

- A. Verify "Test Successful" indicated for CV4.
- B. **IF** "Test Successful" **NOT** indicated for CV4, verify CV4 moved towards closed position.

Enclosure 13.2
Control Valve Movement At Power

PT/**1**/A/0290/003
Page 4 of 8

- NOTE:**
- CV3 and CV4 test indicator resets after ≈ 20 seconds.
 - Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

- 4/11/14
- | | |
|--------|--|
| 2.4.10 | Verify CV3 test indicator reset. |
| 2.4.11 | Verify CV4 test indicator reset. |
| 2.4.12 | Verify CV3 within $\pm 5.0\%$ of pretest position. |
| 2.4.13 | Verify CV4 within $\pm 5.0\%$ of pretest position. |
| 2.4.14 | Perform the following: |
- ☐ Verify acceptance criteria met.
 - ☐ **IF** acceptance criteria **NOT** met, notify SRO.

Enclosure 13.2
Control Valve Movement At Power

PT/1/A/0290/003
Page 5 of 8

NOTE: CV2 is tested prior to CV1 due to Turbine load unbalance concerns.

2.5 **IF** CV2 test required:

- 4W~1A
- 2.5.1 Select "Control Valve 1 & 2 Test".
 - 2.5.2 Verify "Test Permissive" is ON.
 - 2.5.3 Record CV2 pretest position: _____ % Open.
 - 2.5.4 Select "Initiate Test" for Control Valve 2 Test.
 - 2.5.5 **IF** any of the following conditions occur, select "Abort CV2 Test":
 - ☐ NI POWER changes > 2%. (R.M.)
 - ☐ ICS Turbine Master trips to HAND. (R.M.)
 - ☐ Turbine vibration > 10 mils for > 5 seconds.

CAUTION: If CV2 remains in the closed position with the Test Failed indication "ON", initiating Abort Test could result in a reactivity management event. (R.M.)

- 2.5.6 **IF** "Test Failed" is "ON" **AND** CV2 is **NOT** fully closed, select "Abort CV2 Test".

NOTE: If a Control Valve remains closed after it has disc-dump, it may start going open at any time (i.e. 1 min, 5 min, 1 hour,...). When the Control Valve starts going back open it will open at its normal rate. No transients are expected during this scenario since the EHC Control System will simply continue with the test logic and return the Control Valve to its normal position at the normal controlled test rate.

- 2.5.7 **IF** "Test Failed" is "ON" **AND** CV2 remains closed perform the following:
 - A. Do **NOT** select "Abort CV2 Test". (R.M.)
 - B. Notify WCC & Engineering that the (FASV) for the Control Valve under test is stuck in the energized state.

NOTE: Control Valves which are not in their normal position could result in asymmetrical loading on the Turbine bearings.

- C. Monitor Turbine Vibrations closely if in this abnormal state.

Control Valve Movement At Power

2.5.8 Perform EITHER for CV2:

✓ N/A

A. Verify "Test Successful" indicated for CV2.

B. IF "Test Successful" NOT indicated for CV2, verify CV2 moved towards closed position.

NOTE:

- CV2 test indicator resets after ≈ 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

2.5.9 Verify CV2 test indicator reset.

2.5.10 Verify CV2 within $\pm 5.0\%$ of pretest position.

✓ 2.5.11 Perform the following:

- ☐ Verify acceptance criteria met.
- ☐ IF acceptance criteria NOT met, notify SRO.

Enclosure 13.2
Control Valve Movement At Power

PT/1/A/0290/003
Page 7 of 8

2.6 **IF** CV1 test required:

- _____ 2.6.1 **IF** required, select "Control Valve 1 & 2 Test".
- _____ 2.6.2 Verify "Test Permissive" is ON.
- _____ 2.6.3 Record CV1 pretest position: _____ % Open.
- _____ 2.6.4 Select "Initiate Test" for Control Valve 1 Test.
- _____ 2.6.5 **IF** any of the following conditions occur, select "Abort CV1 Test":
 - ☐ NI POWER changes > 2%. (R.M.)
 - ☐ ICS Turbine Master trips to HAND. (R.M.)
 - ☐ Turbine vibration > 10 mils for > 5 seconds.

CAUTION: If CV1 remains in the closed position with the Test Failed indication "ON", initiating Abort Test could result in a reactivity management event. (R.M.)

- _____ 2.6.6 **IF** "Test Failed" is "ON" **AND** CV1 is **NOT** fully closed, select "Abort CV1 Test".

NOTE: If a Control Valve remains closed after it has disc-dump, it may start going open at any time (i.e. 1 min, 5 min, 1 hour,...). When the Control Valve starts going back open it will open at its normal rate. No transients are expected during this scenario since the EHC Control System will simply continue with the test logic and return the Control Valve to its normal position at the normal controlled test rate.

- _____ 2.6.7 **IF** "Test Failed" is "ON" **AND** CV1 remains closed perform the following:
 - A. Do **NOT** select "Abort CV1 Test". (R.M.)
 - _____ B. Notify WCC & Engineering that the (FASV) for the Control Valve under test is stuck in the energized state.

NOTE: Control Valves which are not in their normal position could result in asymmetrical loading on the Turbine bearings.

- C. Monitor Turbine Vibrations closely if in this abnormal state.

Control Valve Movement At Power

2.6.8 Perform EITHER for CV1:

- _____ A. Verify "Test Successful" indicated for CV1.
- _____ B. IF "Test Successful" NOT indicated for CV1, verify CV1 moved towards closed position.

NOTE:

- CV1 test indicator resets after ≈ 20 seconds.
- Test indicators reset is when "Test Permissive" is ON and all other Test Indicators are OFF.

_____ 2.6.9 Verify CV1 test indicator reset.

_____ 2.6.10 Verify CV1 within $\pm 5.0\%$ of pretest position.

_____ 2.6.11 Perform the following:

- ☐ Verify acceptance criteria met.
- ☐ IF acceptance criteria NOT met, notify SRO.

2.7 IF desired:

_____ 2.7.1 Stop Standby EHC pump.

_____ 2.7.2 Place Standby EHC pump control switch to "AUTO".

Enclosure 13.3
Turbine Valve Movement
Information

PT/**1**/A/0290/003
Page 1 of 3

1. Initial Conditions

None

2. Procedure

This Enclosure contains sections which provide additional information concerning Turbine Valve Movement Test.

3. Description of Testing Procedure

Purpose of PT/1/A/0290/003 is to test closing operation of:

- Main Steam Stop Valves (SV)
- Turbine Control Valves (CV)
- Combined Reheat Stop Valves/Intercept Valves (RHSV/IV)

General Electric turbine missile probability calculations require minimum of quarterly full stroke testing of turbine valves to ensure the valves will close. {3}

This test requires Unit 1 CTP between 87-90% power. This power range is for Control Valve position.

Brief summary of Turbine Valve Test is as follows:

- Each CV and each RHSV/IV are closed individually, then allowed to open.
- SV1 and SV3 are tested simultaneously.
- SV2 and SV4 are tested simultaneously.
- NI Power is observed during test. All normally observed Turbine Generator parameters shall be monitored. (R.M.)

During the performance of PT/1/A/0290/003, failure of Stop Valve to "disc dump", could indicate an inoperable Stop Valve. {3}

Enclosure 13.3
Turbine Valve Movement
Information

PT/1/A/0290/003
Page 2 of 3

4. Nuclear Safety Considerations

This procedure contains activities that have potential to affect core reactivity by causing power transient if ICS **NOT** in Automatic. (R.M.)

Ensuring Unit 1 fuel fully conditioned per PT/0/A/1103/020 (Power Maneuvering Predictions) or allowable step change based on Unit 1 condition of fuel per PT/0/A/1103/020 (Power Maneuvering Predictions) $>3\%$ in ≤ 5 minutes is to prevent exceeding maneuvering limits during the performance of the test. (R.M.) {1}

5. Test Performance Information

The following precautions are taken to prevent equipment or system concerns:

- CTP $> 85\%$ prevents closure of two Control Valves simultaneously, assuring asymmetrical loading on Turbine is **NOT** increased.
- CTP between 87% and 90% is high enough to limit asymmetrical loading of Turbine. SG tube damage from flow induced vibration is also prevented at this power range because of reduced steam flow to SGs.
- SV testing is performed such that SV1 and SV3 are tested simultaneously. SV2 and SV4 are tested simultaneously. SV1 and SV3 are connected to different SGs. SV2 and SV4 are similarly connected. This test method maintains pressures and steam flows balanced in each SG while stroking valves.
- Expected Rx Power changes during valve testing should be $< \pm 3\%$ NI Power. Test abort criteria of $> \pm 2\%$ Rx Power change is conservatively set to prevent exceeding allowable Rx Power change. (R.M.)

6. Test Acceptance Information

For each Turbine Valve tested, the EHC Control systems executes a sequence of steps that strokes each valve towards the disk-dump position, initiates a disk-dump, confirms a disk-dump, and then returns the valve to its pre-test position.

During Turbine Valve testing, the EHC Control System monitors the progression through each test sequence and will indicate successful completion of each test sequence on the Valve Test screen.

Normal operation is for each test sequence to be satisfied and the EHC Control System will then indicate "Test Successful". However, if any test sequence is not completed or if the time between sequences exceeds a predefined limit, a "Test Fail" indication will be received.

Enclosure 13.3
Turbine Valve Movement
Information

PT/1/A/0290/003
Page 3 of 3

There are possible scenarios in which a "Test Fail" indication is received but the primary intent of the procedure is met. In addition, a "Test Fail" indication during Stop Valve testing could call into question their operable status. The following is a guide to assist Operations in determining if the primary intent of testing is met during Turbine Valve Movement Testing and if Stop Valve operable status is in question.

Applicable Turbine Valve	Primary Intent Met	If "Test Failed" Received
All Turbine Valves	Valve moves towards closed direction during test.	If "Test Failed" received but valve moved towards closed position and then returned to pre-test position, document in PIP for ENG to evaluate and proceed on with additional testing.

Applicable Turbine Valve	Operable Status in question	If "Confirm (<i>Valve Name</i>) Fast Close Operation" NOT Received
Stop Valves	"Confirm (<i>Valve Name</i>) Fast Close Operation" NOT received during test.	Notify ENG to investigate and determine operable status of Stop Valve(s). Applicable Tech Spec Conditions are: TS 3.3.15.A And TS 3.7.2.A {3}

Enclosure 13.4
Turbine Valve Movement Post
Turbine-Generator Trip/Shutdown

PT/**1**/A/0290/003
Page 1 of 2

1. Initial Conditions

_____ 1.1 Turbine-Generator tripped/shutdown.

2. Procedure

2.1 The following valves are observed closed following Turbine Trip/Shutdown:

- _____ • SV1 observed closed
- _____ • SV2 observed closed
- _____ • SV3 observed closed
- _____ • SV4 observed closed
- _____ • RHIV1 observed closed
- _____ • RHIV2 observed closed
- _____ • RHIV3 observed closed
- _____ • RHIV4 observed closed
- _____ • RHIV5 observed closed
- _____ • RHIV6 observed closed
- _____ • RHSV1 observed closed
- _____ • RHSV2 observed closed
- _____ • RHSV3 observed closed
- _____ • RHSV4 observed closed
- _____ • RHSV5 observed closed
- _____ • RHSV6 observed closed

Enclosure 13.4

PT/1/A/0290/003

Page 2 of 2

**Turbine Valve Movement Post
Turbine-Generator Trip/Shutdown**

- _____ • CV1 observed closed
- _____ • CV2 observed closed
- _____ • CV3 observed closed
- _____ • CV4 observed closed

1. Initial Conditions

_____ 1.1 Unit startup following refueling outage in progress.

2. Procedure

_____ 2.1 Verify complete IP/0/B/0281/002 (Turbine Electro-Hydraulic Control System Valve Stroke And ICS Feedback Testing And Calibration).

1. PIP O-07-04826, CA #2; Added information to allow test to continue when the allowable step change based on the Condition of the fuel exceeds 3% Full Power in ≤ 5 minutes.
2. PIP O-09-05925, CA #1; Engineering provided input that the FDW Flow Limit of 5.7E6 lbm/hr no longer applies to the replacement Steam Generators.
3. PIP O-10-07727, CA #1; Added enhancements that would provide the detail of what is actually required to meet the acceptance criteria for insurance requirements and also added enhancements that would provide possible Tech Spec requirements should the MSSV's fail to close.

Facility: **Oconee**Scenario No.: **2**Op-Test No.: **1**Examiners: _____

_____Operators: _____ **SRO**
_____ **OATC**
_____ **BOP**

Initial Conditions:

- Reactor Power = 50% stable

Turnover:

- 1MS-82 and 1MS-84 closed in support of maintenance. TDEFWP supply from AS only.
- Unit 2 has the AS header

Event No.	Malfunction No.	Event Type*	Event Description
1	Override	C: BOP, SRO (TS)	Failure of Unit 2 AS Controller
2	Override	C: OATC, BOP, SRO(TS)	Inadvertent ES Channel 1 actuation
3	MPI 050 MPI 080	C: OATC, SRO	RC Flow fails low
4		R: OATC, SRO	Oil Leak on Main Turbine requires Manual Power Reduction
5		C: BOP, SRO	Swap unit auxiliaries due to Oil Leak
6	MSS010 MSS020 MSS260 MSS270 MSS330	M: All	LOHT requiring CBP feed <ul style="list-style-type: none">PORV fails open

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

Op-Test No.: **ILT45** Scenario No.: **2**Event No.: **1**

Page 1 of 2

Event Description: **Failure of Unit 2 AS Controller**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Plant response:</p> <ul style="list-style-type: none">1SA-06/C-10, AS HDR PRESS LOW will actuate1MS-126 & 1MS-129 MAIN STM TO SU STM PRESS controller will indicate AS pressure < 300 psig and decreasing. <p>Crew response:</p> <p><u>1SA06/C-10 ARG</u></p> <p><i>Booth Cue: While the crew is referring to the ARG, call Unit 1 control room to notify them (using time compression) that Unit 2 AS Controller has failed and Unit 3 cannot take control. The OSM is directing you as Unit 1 to take control of AS system pressure.</i></p> <p>3.1 IF excessive steam flow exists, reduce AS load or locate and isolate leak.</p> <p>3.2 Verify proper operation of MS/AS controller on Unit supplying Auxiliary Steam Header (U2).</p> <p>3.3 IF necessary, transfer AS Header to another Unit per OP/1/A/1106/22 (Auxiliary Steam System).</p> <p>3.4 IF necessary, start auxiliary boiler per OP/0/A/1106/022 (Aux Boiler)</p> <p><u>OP/1/A/1106/022 (Auxiliary Steam System) Encl 4.2 (Transfer Aux Steam From Another Unit to Unit One)</u></p> <p>Initial Conditions</p> <p>1.1 Verify Unit 1 in Mode 1 or 2.</p> <p><i>NOTE to Examiner: All conditions of SLC 16.10.9 are met</i></p> <p>1.2 Verify all conditions of SLC 16.10.9 will be met with Unit 1 supplying the Aux Steam Header. {15}</p> <p>NOTE: If ICS is in Manual, supplying Aux Steam Header from MS has the potential to affect core reactivity by changing RCS temperature.</p> <p>1.3 Verify Unit 1 ICS in "AUTO". (R.M.)</p> <p>1.4 Verify Unit 1 has ≥ 100 EFPD Core burnup. {12}</p> <p>1.5 Notify Secondary chemist that the AS header will be transferred</p> <p>_____ Person Notified Date</p> <p>1.6 Review Limits and Precautions.</p>

This event is complete when the Unit 1 AS controller is in AUTO and Tech Spec determination has been made or when directed by the lead examiner.

Op-Test No.: **ILT45** Scenario No.: **2**Event No.: **1**

Page 2 of 2

Event Description: **Failure of Unit 2 AS Controller**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	OP/1/A/1106/022 (Auxiliary Steam System) Encl 4.2 (Transfer Aux Steam From Another Unit to Unit One) (continued) Procedure 2.1 Notify Unit 2 to reduce setpoint on AS controller. (no actions required by booth operator since pressure is below setpoint due to the failure). 2.2 Ensure 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS) controller in "MANUAL". 2.3 Ensure closed 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS). 2.4 Verify Unit 2 has reduced setpoint on AS controller. (no actions from booth are required since pressure is below setpoint due to the failure) 2.5 Perform one of the following: Open 1MS-24 (or Open 1MS-33) 2.6 Manually throttle open 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS) to increase Aux Steam Header pressure. 2.7 Continue to throttle 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS) to increase Aux Steam Header pressure to \approx 300 psig. 2.8 WHEN Aux Steam Header is \approx 300 psig: 2.8.2 Adjust 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS) controller setpoint to match Aux Steam Header pressure. Place 1MS-126 & 1MS-129 (MAIN STM TO SU STM PRESS) controller to "AUTO". 2.9 Notify Unit 2 to secure AS supply.
	SRO	2.10 IF Aux Steam will remain being supplied from Unit 1, align Condensate Returns to Unit 1 per OP/0/A/1104/37 (Plant Heating). Examiner Note: Since AS pressure decreases to < 250 psig and Main Steam is not available to the TDEFWP, the below TS applies. It can be exited once AS pressure returns to > 250 psig The SRO should refer to TS: <ul style="list-style-type: none">• TS 3.7.5 (Emergency Feedwater (EFW) System)<ul style="list-style-type: none">○ Condition "B" applies. Restore turbine driven EFW pump and EFW flow path to Operable status. 72 hours AND 10 days from discovery of failure to meet LCO.

This event is complete when the Unit 1 AS controller is in AUTO and Tech Spec determination has been made or when directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **2**

Page 1 of 5

Event Description: **Inadvertent ES Channel 1 Actuation**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Plant response:</p> <p>1SA-1/A-10 ES 1 Trip 1SA-16/B-1 EL CT-4 SB Bus 1 Breaker Closed 2SA-17/A-5 KEOWEE STATALARM PANEL ALARM 2SA-17/C-1 KHU 1 EMERGENCY START INITIATED 2SA-18/C-1 KHU 2 EMERGENCY START INITIATED 1SA-6/A-5, B-5, C-5, D-5, RC Pump Seal Cavity Press Hi/Low (≈ 1 min later) 1SA-6/D-7, E-5, E-6, E-7 RC Pump Seal Return Temp High Both Keowee Hydro Units Emergency Start</p> <p>Examiner Note: Over time, rods may withdraw in response to BWST water injecting into the core.</p> <p>Crew Response:</p> <p>The SRO will initiate AP/1/A/1700/042 Inadvertent ES Actuation</p> <p>4.1 Verify <u>any</u> of the following have <u>inadvertently actuated</u>:</p> <p>___ Diverse HPI (not actuated) ___ ES Channel 1 ___ ES Channel 2 (not actuated)</p> <p>4.2 Perform the following on <u>all inadvertently actuated</u> system(s):</p> <p>___ Ensure DIVERSE HPI BYPASS is in BYPASS (does not apply) ___ Ensure ES CH-1 is in MANUAL ___ Ensure ES CH-2 is in MANUAL (does not apply)</p> <p>4.3 Throttle HPI, as required, to maintain <u>desired</u> Pzr level (CT-5 Control HPI following the inadvertent actuation such that RV P-T limits are not exceeded (prior to pressurizer being water solid).)</p>

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **2**

Page 2 of 5

Event Description: **Inadvertent ES Channel 1 Actuation**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>AP/1/A/1700/042 Inadvertent ES Actuation (Continued)</p> <p>4.4 Verify any of the following have inadvertently actuated:</p> <p>___ ES Channel 5 (not actuated)</p> <p>___ ES Channel 6 (not actuated)</p> <p>RNO: 1. IF ES Channel 1, ES Channel 2, or Diverse HPI have inadvertently actuated, AND it is desired to restore letdown, THEN initiate AP/42 Encl 5.2 (Letdown Restoration) (see page 8)</p> <p>2. GO TO Step 4.10</p> <p>4.10 Close 1HP-24 and 1HP-25</p> <p>4.11 Ensure AP/42 Encl 5.1 (Required Operator Actions) is in progress (see page 7)</p> <p>4.12 Verify any of the following have inadvertently actuated:</p> <p>___ Diverse LPI</p> <p>___ ES Channel 3</p> <p>___ ES Channel 4</p> <p>RNO: GO TO Step 4.17</p> <p>4.17 Verify the Rx is critical</p> <p>4.18 Verify ICS in Auto</p> <p>4.19 Verify control rods are outside the desired control band</p> <p>RNO: GO TO Step 4.21</p> <p>4.21 Verify any of the following have inadvertently actuated:</p> <p>___ ES Channel 1</p> <p>___ Diverse HPI</p> <p>4.22 Ensure DIVERSE HPI BYPASS is BYPASSED (NOT required)</p> <p>ES ELECTRICAL 1 is in MANUAL(Should be performed)</p> <p>4.23 Dispatch an operator to perform Encl 5.3 (SSF Restoration)</p> <p>4.24 Notify SPOC to investigate and repair the cause of the inadvertent ES actuation, as necessary</p>

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **2**

Page 3 of 5

Event Description: **Inadvertent ES Channel 1 Actuation**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	AP/1/A/1700/042 Inadvertent ES Actuation (Continued) 4.25 Initiate logging TS/SLC Entry/Exit, as applicable, IAW Encl 5.4 (TS/SLC Requirements) (See below) 4.26 WHEN all of the following exist: ___ Reason for inadvertent ES Channel <u>or</u> Diverse HPI/LPI actuation has been resolved ___ ES Channel <u>or</u> Diverse HPI/LPI reset is desired ___ OSM concurs THEN continue
	SRO	AP/1/A/1700/042 Enclosure 5.4 (TS/SLC Requirements) Any ES Channel <ul style="list-style-type: none">• TS 3.3.7 (Engineered Safeguards Protective System (ESPS) Digital Automatic Actuation Logic Channels) due to the automatic actuation logic being blocked if any ES channel is in MANUAL or ES Voters in OVERRIDE Condition "A". 1 hour completion time. ES Channel 1 or 2 <ul style="list-style-type: none">• TS 3.4.15 (RCS Leakage Detection Instrumentation) due to Rx Bldg RIAs being out of service (Applies until RIAs are returned to service.) Condition B (24 hours for grab samples) (30 days)• TS 3.10.1 (Standby Shutdown Facility(SSF)) for SSF inoperability due to the SSF power loss (ES Channel 1 only) . While this does apply, the SSF is already inoperable due to being at a reduced power level. Conditions A through E all apply (7 days)• TS 3.4.9 (Pressurizer) if PZR level is > 260" (Applies if PZR exceeds 260") Condition A (1 hour)

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **2**

Page 4 of 5

Event Description: **Inadvertent ES Channel 1 Actuation**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>AP/1/A/1700/042 Enclosure 5.1 Required Operator Actions</p> <ol style="list-style-type: none">1 Initiate announcement of AP entry using the PA system2 Verify <u>any</u> of the following have <u>inadvertently actuated</u>: ___ Diverse HPI (not actuated) ___ ES Channel 1 ___ ES Channel 2(not actuated)3 Open the following: ___ 1HP-20 ___ 1HP-214 Open the following for operating RCPs: ___ 1HP-228 (1A1) ___ 1HP-226 (1A2) ___ 1HP-232 (1B1) ___ 1HP-230 (1B2)5 Verify <u>any</u> of the following have <u>inadvertently actuated</u>: ___ ES Channel 7 (not actuated) ___ ES Channel 8 (not actuated) <p>RNO: GO TO Step 9</p> <ol style="list-style-type: none">9 Perform the following:<ol style="list-style-type: none">A. Open the following to restore RB RIAs: ___ 1PR-7 ___ 1PR-8 ___ 1PR-9 ___ 1PR-10B. From the ENABLE CONTROLS screen on the RIA View Node, perform the following:<ol style="list-style-type: none">1. Select OFF for RB RIA sample pump2. Start the RB RIA sample pump10. Verify <u>any</u> of the following have <u>inadvertently actuated</u>: ___ Diverse HPI ___ ES Channel 111. Notify the following that the SSF is inop. due to the SSF power loss. ___ Unit 2 ___ Unit 3 ___ Security12. EXIT this enclosure

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **2**

Page 5 of 5

Event Description: **Inadvertent ES Channel 1 Actuation**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Crew Response:</p> <p>AP/1/A/1700/042 Enclosure 5.2 Letdown Restoration</p> <ol style="list-style-type: none">1. Verify a CC pump operating2. Verify letdown is isolated3. Close 1HP-54. Verify it is desired to place <u>both</u> letdown coolers in service5. Open 1HP-1, 1HP-2, 1HP-3, and 1HP-46. Close 1HP-67. Close 1HP-78. Verify letdown temperature < 135°F9. Open 1HP-510. Adjust 1HP-7 for ≈ 20 gpm letdown11. WHEN letdown temperature < 130°F, THEN place LETDOWN HI TEMP INTLK BYP switch in NORMAL12. Open 1HP-613. Adjust 1HP-7 to control desired letdown flow14. IAAT it is desired to <u>bleed</u> letdown flow to 1A BHUT, THEN perform the following:<ol style="list-style-type: none">A. Open the following:<ul style="list-style-type: none">___ 1CS-26___ 1CS-41B. Position 1HP-14 to BLEEDC. Notify SRO15. IAAT letdown <u>bleed</u> is NO longer desired, THEN position 1HP-14 to NORMAL16. WHEN SRO approves, THEN EXIT this enclosure

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

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **3**

Page 1 of 3

Event Description: **1B Loop RCS Flow Fails Low**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Plant Response:</p> <ul style="list-style-type: none">• 1SA-02/A-4, RC Loop B flow Low.• 1SA-02/A-5, RC Total Flow Low• 1SA-02/A-11, ICS Runback• 1SA-02/A-12, ICS Tracking• 1SA-05/A-5, 1A RPS Trouble• 1SA-04/C-1, Quadrant Power Tilt (after a couple of minutes) <p>Crew Response:</p> <p>Crew should perform Plant Transient Response (PTR)</p> <ul style="list-style-type: none">• OATC reports to the SRO reactor power level and direction of movement.• The BOP reports no valid runback and monitors RCS pressure and inventory.• OATC takes ICS to MANUAL and both FDW controllers to HAND.• The OATC will adjust FDW and/or control rods as necessary to restore reactor power to the desired control band. <p>SRO may direct the OATC to perform the actions of the ARG for 1SA-02/A-4 statalarm, but probably will move directly from PTR to AP/28.</p>
	SRO/OATC	<p>ARG for 1SA-02/A-4</p> <p>3.1. Ensure reactor power is reduced below the flux to flow minus imbalance trip ratio.</p> <p>3.2. Ensure feedwater demand re-ratios properly.</p> <p>EXAMINER NOTE: This failure will cause FDW flow to re-ratio. IF the crew immediately recognizes that it is in instrument failure and not an actual loss of flow then they may choose to adjust FDW and therefore prevent high delta Tc's from being established causing high Quadrant Power Tilt values. The SRO should direct a band for delta Tc's of 0 \pm 2 degrees as he establishes bands for parameters being manually controlled.</p> <p>SRO directs performance of AP/1/A/1700/028, ICS Instrument Failures. (see next page)</p>

This event is completed when at Step 6 (WHEN notified by SPOC...) of AP/28 Section 4E, or when directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **3**

Page 2 of 3

Event Description: **1B Loop RCS Flow Fails Low**

Time	Position	Applicant's Actions or Behavior																		
	SRO/BOP/ OATC	<p>AP/1/A/1700/028 Subsequent Actions</p> <p>4.1. Provide control bands as required.</p> <p>4.2. Initiate notification of the following:</p> <ul style="list-style-type: none">• OSM to reference the following:<ul style="list-style-type: none">○ OMP 1-14 (Notifications)○ Emergency Plan• STA <p>4.3. Verify a power transient $\geq 5\%$ has occurred.</p> <p>RNO: GO TO Step 4.5</p> <p>EXAMINER NOTE: If power change was $\geq 5\%$, then step 4.4 will be performed. It depends on the speed of crew response to the failure.</p> <p>4.4. Notify Rx Engineering and discuss the need for a maneuvering plan.</p> <p>4.5. Use the following, as necessary, to determine the applicable section from table in Step 4.6:</p> <ul style="list-style-type: none">• OAC alarm video• OAC display points• Control Board indications• SPOC assistance, as needed <p>4.6. GO TO the applicable section per the following table:</p> <table border="1"><thead><tr><th></th><th>Section</th><th>Failure</th></tr></thead><tbody><tr><td></td><td>4A</td><td>RCS Temperature</td></tr><tr><td></td><td>4B</td><td>Turbine Header Pressure</td></tr><tr><td></td><td>4C</td><td>Controlling NI</td></tr><tr><td></td><td>4D</td><td>Feedwater Loop Flow</td></tr><tr><td></td><td>4E</td><td>RCS Flow</td></tr></tbody></table>		Section	Failure		4A	RCS Temperature		4B	Turbine Header Pressure		4C	Controlling NI		4D	Feedwater Loop Flow		4E	RCS Flow
	Section	Failure																		
	4A	RCS Temperature																		
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This event is completed when at Step 6 (WHEN notified by SPOC...) of AP/28 Section 4E, or when directed by the lead examiner.																				

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **3**

Page 3 of 3

Event Description: **1B Loop RCS Flow Fails Low**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/028 SECTION 4E
		NOTE The following will occur when an ICS RCS flow loop signal fails: ICS RUNBACK Controlling Tave swaps to RCS loop with higher flow Delta Tc station re-ratios loop feedwater flows
	SRO/OATC/ BOP	<ol style="list-style-type: none">1. Ensure the following in HAND:<ul style="list-style-type: none">• 1A FDW MASTER• 1B FDW MASTER2. Ensure DIAMOND in MANUAL.3. Notify SPOC to perform the following:<ul style="list-style-type: none">• Select a valid RCS flow input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function).• Investigate and repair the failed RCS flow instrumentation.4. PERFORM an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument. Examiners Note: The RO should refer to Table 3 and determine that the surveillances cannot be met as written with the failed instrument and therefore the SRO would ensure that a surveillance evaluation is initiated.5. Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.6. WHEN notified by SPOC that a valid RCS flow input has been restored to ICS, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).

This event is completed when at Step 6 (WHEN notified by SPOC...) of AP/28 Section 4E, or when directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **4**

Page 1 of 2

Event Description: **Rapid Manual Plant Shutdown**

Time	Position	Applicant's Actions or Behavior
		<p>EXAMINER/BOOTH CUE: <i>The booth will call the Control Room as WCC SRO and inform them that there is a large oil leak on the north end of the B LP turbine. There does not appear to be a way to isolate the leak without shutting down the oil system.</i></p> <p><i>When asked, inform the Control Room that Unit 2 will handle the spill response.</i></p> <p>The SRO will initiate AP/29 (Rapid Unit Shutdown) to direct power reduction</p> <p>AP/29</p> <p>4.1 Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown) (Details on page 13)</p> <p>4.2 Announce AP entry using the PA system.</p> <p>4.3 IAAT both of the following apply:</p> <p>___ It is desired to stop power decrease.</p> <p>___ CTP > 18%</p> <p>THEN perform Steps 4.4 – 4.7 (Does NOT apply now)</p> <p>RNO: GO TO Step 4.8</p> <p>4.8 Verify ICS in AUTO (It is NOT in Auto)</p> <p>RNO: 1. Initiate manual power reduction to desired power level.</p> <p>Examiner Note: <i>OATC reduces power by first reducing feedwater and then inserting control rods as necessary.</i></p> <p>2. GO TO Step 4.10</p> <p>4.10 Verify <u>both</u> Main FDW pumps running.</p> <div><p style="text-align: center;">NOTE</p><ul style="list-style-type: none">• 1B Main FDW Pump is the preferred pump to be shutdown first.• To lower 1B Main FDW Pump suction flow, bias is adjusted counter-clockwise.• To lower 1A Main FDW Pump suction flow, bias is adjusted clockwise.</div> <p>4.11 Adjust bias for first Main FDW pump desired to be shutdown (1B) until its suction flow is $\approx 1 \times 10^6$ lbm/hr less than remaining Main FDW pump suction flow.</p>
	SRO/BOP	
	SRO/OATC	
	SRO/BOP	

This event is complete once a 10% power decrease has occurred and Unit Auxiliaries have been transferred IAW Encl. 5.1 of AP/29 or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **4**

Page 2 of 2

Event Description: **Rapid Manual Plant Shutdown**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>AP/29 (continued)</p> <p>4.12 WHEN core thermal power is < 65% FP, THEN continue.</p> <p>4.13 IAAT <u>both</u> Main FDW pumps running, AND <u>both</u> of the following exist:</p> <p>___ 1B Main FDW Pump is first pump to be shut down.</p> <p>___ <u>Any</u> of the following alarms occur:</p> <ul style="list-style-type: none">• FWP B FLOW MINIMUM (1SA-16/A-3)• FWP B FLOW BELOW MIN (1SA-16/A-4) <p>THEN trip 1B Main FDW Pump.</p> <p>4.14 IAAT both Main FDW pumps running, AND both of the following exists:</p> <p>___ 1A Main FDW pump is the first pump to be shut down</p> <p>___ Any of the following alarms occur:</p> <ul style="list-style-type: none">• FWP A FLOW MINIMUM (1SA-16/A-1)• FWP A FLOW BELOW MIN (1SA-16/A-2) <p>THEN trip 1A Main FDW Pump (Does not Apply)</p> <p>4.15 Verify Turbine-Generator shutdown is required.</p> <p>4.16 Start the TURBINE TURNING GEAR OIL PUMP.</p> <p>4.17 Start 1A through 1E TURBINE BRNG OIL LIFT PUMPS.</p> <p>4.18 Start the TURBINE MOTOR SUCTION PUMP.</p> <p>4.19 IAAT both of the following apply:</p> <p>ICS in automatic</p> <p>NI power is $\leq 18\%$</p> <p>THEN deselect MAXIMUM RUNBACK.</p>

This event is complete once a 10% power decrease has occurred and Unit Auxiliaries have been transferred IAW Encl. 5.1 of AP/29 or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **5**

Page 1 of 2

Event Description: **Swapping Unit Auxiliaries due to Oil Leak**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>AP/29 Encl. 5.1</u></p> <ol style="list-style-type: none">1. Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown).2. Start the following pumps:<ul style="list-style-type: none">• 1A FDWP SEAL INJECTION PUMP• 1A FDWP AUXILIARY OIL PUMP• 1B FDWP AUXILIARY OIL PUMP• 1B FDWP SEAL INJECTION PUMP3. WHEN CTP is $\leq 80\%$, THEN continue.4. Stop 1E1 HTR DRN PUMP.5. Place 1HD-254 switch to OPEN.6. Stop 1E2 HTR DRN PUMP.7. Place 1HD-276 switch to OPEN.8. Verify Turbine-Generator shutdown is required. (It is)9. Place the following transfer switches to MAN:<ul style="list-style-type: none">• 1TA AUTO/MAN• 1TB AUTO/MAN10. Close 1TA SU 6.9 KV FDR.11. Verify 1TA NORMAL 6.9 KV FDR opens.12. Close 1TB SU 6.9 KV FDR.13. Verify 1TB NORMAL 6.9 KV FDR opens.14. Place the following transfer switches to MAN:<ul style="list-style-type: none">• MFB1 AUTO/MAN• MFB2 AUTO/MAN15. __ Close E11 MFB1 STARTUP FDR.16. __ Verify N11 MFB1 NORMAL FDR opens.17. __ Close E21 MFB2 STARTUP FDR.

This event is complete once Unit Auxiliaries have been transferred (Step 19 of Encl. 5.1 of AP/29) or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **5**

Page 2 of 2

Event Description: **Swapping Unit Auxiliaries due to Oil Leak**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>AP/29 Encl. 5.1 (cont.)</u></p> <p>18. ___ Verify N21 MFB2 NORMAL FDR opens.</p> <p>19. ___ Notify CR SRO that Unit auxiliaries have been transferred.</p> <p>20. IAAT 1SSH-9 is NOT closed, AND CTP is $\leq 75\%$, THEN throttle 1SSH-9 to maintain Steam Seal Header pressure 2.5 - 4.5 psig.</p> <p>21. WHEN CTP $\leq 65\%$, THEN place the following in MANUAL and close:</p> <p>___ 1FDW-53 ___ 1FDW-65</p>
This event is complete once Unit Auxiliaries have been transferred (Step 19 of Encl. 5.1 of AP/29) or as directed by the lead examiner.		

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 1 of 5

Event Description: **LOHT requiring CBP feed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	Plant Response: When directed by the Lead Examiner, a Loss of Main and Emergency Feedwater will occur. Crew Response: Perform Immediate Manual Actions (IMAs) 3.1 Depress REACTOR TRIP pushbutton. 3.2 Verify reactor power < 5% FP and decreasing. 3.3 Depress turbine TRIP pushbutton. 3.4 Verify all turbine stop valves closed. 3.5 Verify RCP seal injection available.
	SRO/BOP	BOP will perform a Symptom Check and initiate Rule 3 (Loss of Main and / or Emergency Feedwater) SRO will transfer to the Loss Of Heat Transfer Tab based on Parallel Actions page.

This event is complete when RCS temperature is stabilized on Condensate Booster Pump feed and 1RC-4 has been closed or as directed by the lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 2 of 5

Event Description: **LOHT requiring CBP feed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Rule 3 (Loss of Main or Emergency FDW)</p> <p>1. Verify loss of Main FDW/EFDW is due to TBF.</p> <p>RNO:GO TO Step 3</p> <p>3. IAAT NO SGs can be fed with FDW (Main/CBP/Emergency), AND any of the following exist:</p> <ul style="list-style-type: none">• RCS pressure reaches 2300 psig or NDT limit.• PZR level reaches 375" (340" acc) <p>THEN PERFORM Rule 4 (HPI Forced Cooling)</p> <p>4. Start operable EFDW pumps, as required, to feed all intact SGs.</p> <p>5. Verify any EFDW pump operating.</p> <p>RNO: GO TO Step 7</p> <p>7. Place 1FDW-315 and 1FDW-316 in MANUAL and closed.</p> <p>8. Verify both:</p> <ul style="list-style-type: none">• Any CBP operating• TBVs available on an intact SG <p>9. Select OFF for both digital channels on AFIS HEADER A.</p> <p>10. Select OFF for both digital channels on AFIS HEADER B.</p> <p>11. Place 1FDW-33 and 1FDW-42 switches in OPEN</p> <p>12. Simultaneously position 1FDW-35 and 1FDW-44 (Startup Control Valves) to 10 – 20% open.</p> <p>13. Perform the following:</p> <ul style="list-style-type: none">• Place 1FDW-31 and 1FDW-40 switches to CLOSE.• Close 1FDW-32 and 1FDW-41.
This event is complete when RCS temperature is stabilized on Condensate Booster Pump feed and 1RC-4 has been closed or as directed by the lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 3 of 5

Event Description: **LOHT requiring CBP feed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Rule 3 (Loss of Main or Emergency FDW)</p> <p>14. Verify Rule 4 (HPI Forced Cooling) in progress.</p> <p>RNO:</p> <p>(CT-11, Control SG Pressure to Maintain RC Temperature Constant)</p> <p>Examiner note: To meet the CT, the candidate must show the ability to stop the RCS temperature increase and then maintain RCS temperature stable or slightly decreasing.</p> <div><p>CAUTION</p><p>Until SGs are dry, lower SG pressure slowly to prevent overcooling.</p></div> <ul style="list-style-type: none">• Lower SG pressure in available SGs to ~500 psig• Control FDW flow to stabilize RCS P/T by throttling the SU CVs and TBVs as necessary• Notify CRSRO that CBP feed is in progress• Place 1FDW-38 and 1FDW-47 switches to OPEN• Place 1FDW-36 and 1FDW-45 switches to CLOSE• GO TO Step 16 <p>16. Verify 1TD EFDW Pump is operable and available for manual start.</p> <p>17. Dispatch an operator to perform Encl 5.26 (Manual Start of TD) (PS)</p> <p>18. Verify cross-tie with Unit 2 is desired.</p> <p>19. Dispatch an operator to open 2FDW-313 & 2FDW-314.</p> <p>20. Dispatch an operator to 1FDW-313 and have them notify the CR when in position.</p> <p>21. Notify alternate unit to</p> <ul style="list-style-type: none">• Place both EFDW control valves in MANUAL and closed.• Start their TD EFDW Pump <p>22. When <u>either</u> exists:</p> <ul style="list-style-type: none">• Operator is in position at 1FDW-313• Unit 1 TD EFDW Pump has been manually started <p>THEN continue.</p>
This event is complete when RCS temperature is stabilized on Condensate Booster Pump feed and 1RC-4 has been closed or as directed by the lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 4 of 5

Event Description: **LOHT requiring CBP feed**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP/ OATC	<p><u>Loss Of Heat Transfer Tab</u></p> <p>1. Ensure Rule 3 is in progress or complete</p> <div><p><u>NOTE</u></p><p>Transfer to LOSCM tab is NOT required if RCS heats to the point where <u>core</u> SCM = 0°F.</p></div> <p>2. IAAT the RCS heats to the point where core SCM = 0 F, THEN GO TO Step 4.</p> <p>3. IAAT No SGs can be fed with FDW (Main/CBP/Emergency), AND any of the following exist:</p> <ul style="list-style-type: none">• RCS pressure reaches 2300 psig or NDT limit• PZR level reaches 375 inches (340 inches acc) <p>THEN GO TO Step 4</p> <p>RNO:</p> <ul style="list-style-type: none">• Reduce operating RCPs to one pump/loop.• When any exists:<ul style="list-style-type: none">○ EFDW flow has been re-established by Rules or Enclosures○ EFDW aligned from another unit○ Operator performing Rule 3 or Encl 5.27 reports EFDW available <p>THEN GO TO Step 50.</p> <div><p><u>NOTE</u></p><p>SCM may be lost when the PORV is opened. Transition to LOSCM tab is NOT required.</p></div> <p>4. PERFORM Rule 4 (HPI Forced Cooling)</p> <p>5. Verify all:</p> <ul style="list-style-type: none">• At least two HPI pumps operating• Acceptable HPI flow exists in <u>both</u> HPI headers per Rule 4• PORV open• 1RC-4 open <p>6. GO TO HPI CD Tab</p>
This event is complete when RCS temperature is stabilized on Condensate Booster Pump feed and 1RC-4 has been closed or as directed by the lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **2**Event No.: **6**

Page 5 of 5

Event Description: **LOHT requiring CBP feed**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP/ OATC	<p><u>Once the RCS has been stabilized using CBP feed, 1RC-66 will fail open.</u></p> <p>Plant Response:</p> <ul style="list-style-type: none">• RCS Pressure decreasing• 1SA-18/A1 (Pressurizer Relief Valve Flow) actuates <p>Enter AP/1/A/1700/044 (Abnormal Pressurizer Pressure Control)</p> <p>Entry Conditions</p> <p>1.1 Inability to maintain control of RC pressure due to failure of the PORV, 1RC-1, or PZR heaters as indicated by any of the following:</p> <ul style="list-style-type: none">• High or Low RC pressure alarms• RC pressure outside of control band• Pressurizer Relief Valve Flow Statalarm <p>2. Automatic Systems Actions</p> <p>2.1 In HIGH, 1RC-66 opens at 2450 psig increasing and closes at approximately 2400 psig decreasing.</p> <p>2.2 In LOW, 1RC-66 opens at 530 psig increasing and closes at approximately 480 psig decreasing.</p> <p>2.3 1RC-1 opens at 2205 psig increasing and closes at 2155 psig decreasing.</p> <p>2.4 Bank #2- energizes at 2140 psig decreasing and de-energizes at 2150 psig increasing.</p> <p>2.5 Bank #3- energizes at 2145 psig decreasing and de-energizes at 2175 psig increasing. (Bank #3 normally remains energized with Heater Bank #1 cycling on and off to maintain RCS pressure at set point).</p> <p>2.6 Bank #4- energizes at 2130 psig decreasing and de-energizes at 2145 psig increasing.</p> <p>3. Immediate Manual Actions</p> <p>3.1 ___ IAAT PORV is open, AND RC pressure is < setpoint (2400 psig (HIGH) or 480 psig (LOW)), THEN close 1RC-4.</p> <p>Examiner Note: The crew may elect to close 1RC-4 prior to entering AP/44 since it is one of the Immediate Manual Actions required from memory.</p>
This event is complete when RCS temperature is stabilized on Condensate Booster Pump feed and 1RC-4 has been closed or as directed by the lead Examiner.		

ENCLOSURE 5.5

EXAMINER NOTE: At any time during this scenario the operator may choose to use Enclosure 5.5 to maintain RCS inventory control. See excerpt below.

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

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

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

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. <input type="checkbox"/> IAAT additional makeup flow to LDST is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
13. <input type="checkbox"/> IAAT <u>two</u> Letdown Filters are desired, THEN perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
14. <input type="checkbox"/> IAAT <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired THEN perform Steps 15 - 33. <small>[41]</small>	<input type="checkbox"/> GO TO Step 34.
15. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown CANNOT be restored due to inability to restart the CC system. 2. <input type="checkbox"/> GOTO Step 34.
16. <input type="checkbox"/> Ensure only one CC pump running.	
17. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
18. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> IF 1HP-1 is closed due to 1HP-3 failing to close, THENGOTO Step 20. 2. <input type="checkbox"/> IF 1HP-2 is closed due to 1HP-4 failing to close, THENGOTO Step 20.
19. <input type="checkbox"/> GOTO Step 22.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
20. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<input type="checkbox"/> GOTO Step 22.
21. <input type="checkbox"/> GOTO Step 34.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. ___ Monitor for unexpected conditions while restoring letdown.	
23. ___ Verify <u>both</u> letdown coolers to be placed in service.	1. ___ IF 1A letdown cooler is to be placed in service, THEN open: ___ 1HP-1 ___ 1HP-3 2. ___ IF 1B letdown cooler is to be placed in service, THEN open: ___ 1HP-2 ___ 1HP-4 3. ___ GOTO Step 25.
24. Open: ___ 1HP-1 ___ 1HP-2 ___ 1HP-3 ___ 1HP-4	
25. ___ Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. ___ Notify CR SRO of problem. B. ___ GOTO Step 34.
26. ___ Close 1HP-6.	
27. ___ Close 1HP-7.	
28. ___ Verify letdown temperature < 125°F.	1. ___ Open 1HP-13. 2. Close: ___ 1HP-8 ___ 1HP-9&11 3. ___ IF <u>any</u> deborating IX is in service, THEN perform the following: A. ___ Select 1HP-14 to NORMAL. B. ___ Close 1HP-16. 4. ___ Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

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

NOTE

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

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

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

EOP Enclosure 5.1 (ES Actuation)

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <input type="checkbox"/> Verify Rule 2 in progress <u>or</u> complete.	<input type="checkbox"/> GOTO Step 73.
7. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 9.
8. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
9. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
10. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 11 - 14.	<input type="checkbox"/> GOTO Step 15.
11. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
12. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
13. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
14. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

• ACTION/EXPECTED RESPONSE	• RESPONSE NOT OBTAINED
15. ___ IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 16.	___ GO TO Step 53.
16. ___ Place Diverse LPI in BYPASS.	___ Place Diverse LPI in OVERRIDE.
17. Perform <u>both</u> : ___ Place ES CH 3 in MANUAL. ___ Place ES CH 4 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. ___ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ___ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>

CAUTION

LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}

18. ___ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
19. ___ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 20 - 21.	___ GOTO Step 22.
20. Perform the following: ___ Open 1LP-17. ___ Start 1A LPI PUMP.	1. ___ Stop 1A LPI PUMP. 2. ___ Close 1LP-17.
21. Perform the following: ___ Open 1LP-18. ___ Start 1B LPI PUMP.	1. ___ Stop 1B LPI PUMP. 2. ___ Close 1LP-18.

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

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

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

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

... END ...

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">Unit Status ES Channels 3 & 4 have NOT actuated.</p>	
53. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
54. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
55. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
56. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
57. ___ Secure makeup to the LDST.	
58. ___ Verify all ES channel 1 & 2 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, ANDNO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
59. ___ Verify Unit 2 turbine tripped.	___ GOTO Step 62.
60. ___ Close 2LPSW-139.	
61. ___ Verify <u>total</u> LPSW flow to Unit 2 LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit 2 LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
62. ___ Close 1LPSW-139.	

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

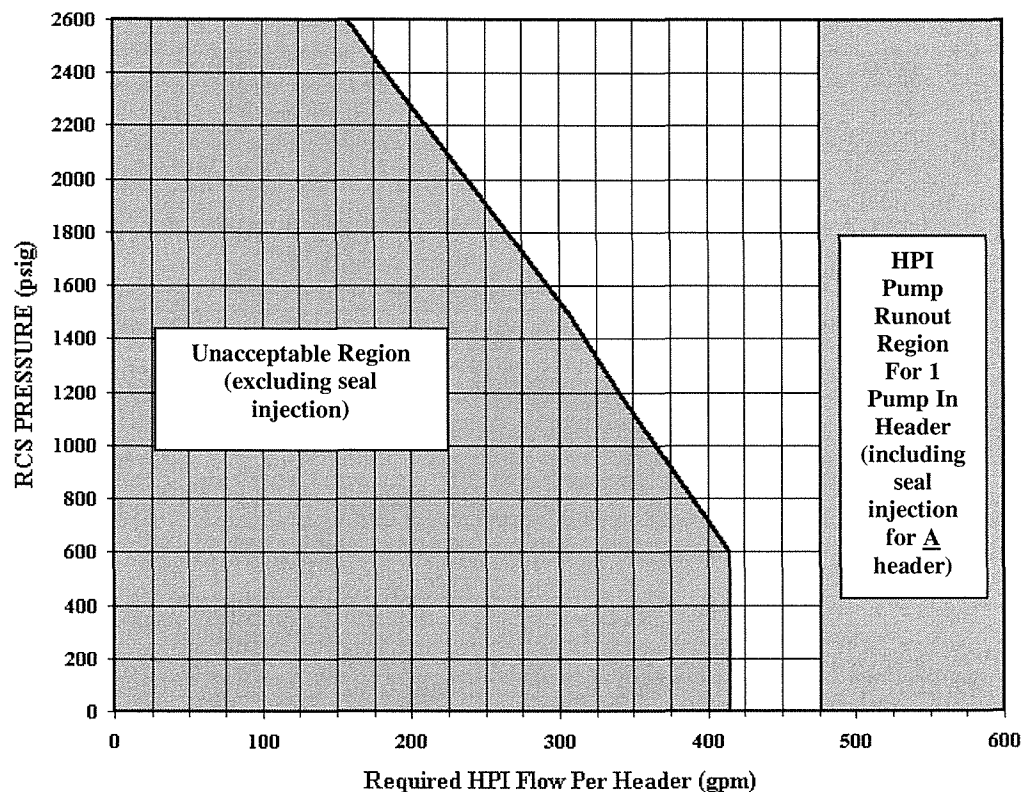
... END ...

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>73. Open:</p> <p>___ 1HP-24</p> <p>___ 1HP-25</p>	<p>1. ___ IF both BWST suction valves (1HP-24 and 1HP-25) are closed, THEN:</p> <p>A. ___ Start 1A LPI PUMP.</p> <p>B. ___ Start 1B LPI PUMP.</p> <p>C. Open:</p> <p>___ 1LP-15</p> <p>___ 1LP-16</p> <p>___ 1LP-9</p> <p>___ 1LP-10</p> <p>___ 1LP-6</p> <p>___ 1LP-7</p> <p>D. ___ IF two LPI Pumps are running <u>only</u> to provide HPI pump suction, THEN secure one LPI pump.</p> <p>E. ___ Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</p> <p>F. ___ GOTO Step 74.</p> <p>2. ___ IF only one BWST suction valve (1HP-24 or 1HP-25) is open, THEN:</p> <p>A. ___ IF three HPI pumps are operating, THEN secure 1B HPI PUMP.</p> <p>B. ___ IF < 2 HPI pumps are operating, THEN start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.</p> <p>C. ___ GO TO Step 75.</p>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
74. <input type="checkbox"/> Ensure <u>at least two</u> HPI pumps are operating.	
75. Verify open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27	1. <input type="checkbox"/> IF HPI has been intentionally throttled, THENGOTO Step 76. 2. Open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
<p>76. ___ IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header:</p> <table><tr><td>✓</td><td>1A Header</td><td>✓</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table>	✓	1A Header	✓	1B Header		1HP-410		1HP-409	
✓	1A Header	✓	1B Header						
	1HP-410		1HP-409						

Figure 1
Required HPI Flow Per Header



ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
77. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 79.
78. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
79. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
80. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 81 - 84.	<input type="checkbox"/> GOTO Step 85.
81. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
82. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
83. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
84. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
85. <input type="checkbox"/> IAAT ES Channels 3 & 4 are actuated, THENGOTO Step 86.	<input type="checkbox"/> GO TO Step Error! Reference source not found..
86. <input type="checkbox"/> Place Diverse LPI in BYPASS.	<input type="checkbox"/> Place Diverse LPI in OVERRIDE.
87. Perform <u>both</u> : <input type="checkbox"/> Place ES CH 3 in MANUAL. <input type="checkbox"/> Place ES CH 4 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><ol style="list-style-type: none">1. <input type="checkbox"/> IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.2. <input type="checkbox"/> IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
<div>CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
88. <input type="checkbox"/> IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
89. <input type="checkbox"/> IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 90 - 91.	<input type="checkbox"/> GOTO Step 92.
90. Perform the following: <input type="checkbox"/> Open 1LP-17. <input type="checkbox"/> Start 1A LPI PUMP.	1. <input type="checkbox"/> Stop 1A LPI PUMP. 2. <input type="checkbox"/> Close 1LP-17.
91. Perform the following: <input type="checkbox"/> Open 1LP-18. <input type="checkbox"/> Start 1B LPI PUMP.	1. <input type="checkbox"/> Stop 1B LPI PUMP. 2. <input type="checkbox"/> Close 1LP-18.
92. <input type="checkbox"/> IAAT 1A <u>and</u> 1B LPI PUMPs are off / tripped, AND <u>all</u> exist: <input type="checkbox"/> RCS pressure < LPI pump shutoff head <input type="checkbox"/> 1LP-19 closed <input type="checkbox"/> 1LP-20 closed THEN perform Steps 93 - 94.	<input type="checkbox"/> GO TO Step 95.
93. Open: <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7 <input type="checkbox"/> 1LP-17 <input type="checkbox"/> 1LP-18 <input type="checkbox"/> 1LP-21 <input type="checkbox"/> 1LP-22	
94. <input type="checkbox"/> Start 1C LPI PUMP.	
95. <input type="checkbox"/> IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
96. <input type="checkbox"/> IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
97. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
98. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
99. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
100. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
101. ___ Secure makeup to the LDST.	
102. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, ANDNO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
103. ___ Verify Unit 2 turbine tripped.	___ GOTO Step 106.
104. ___ Close 2LPSW-139.	
105. ___ Verify <u>total</u> LPSW flow to Unit 2 LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit 2 LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
106. ___ Close 1LPSW-139.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
107. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
108. ___ Start <u>all available</u> LPSW pumps.	
109. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ GOTO Step 111.
110. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ IF <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 THEN notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
111. ___ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
112. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
113. ___ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
114. ___ IAAT ES channels 5 & 6 have actuated, THEN perform Step 115.	___ GOTO Step 116.
<div>NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.</div>	
115. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
116. ___ IAAT ES channels 7 & 8 have actuated, THEN perform Step 117 - 118.	___ GOTO Step 119.
117. Perform <u>all</u> : ___ Place ES CH 7 in MANUAL. ___ Place ES CH 8 in MANUAL.	<div><p style="text-align: center;"><u>NOTE</u></p><ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><p>1. ___ IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.</p><p>2. ___ IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</p></div>
118. ___ Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
119. ___ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
120. ___ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
121. ___ IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
122. ___ WHEN CR SRO approves, THEN EXIT.	

CRITICAL TASKS

- CT-5** Control HPI following the inadvertent actuation such that RV P-T limits are not exceeded (prior to pressurizer being water solid). **(Page 4)**
- CT-11** To meet the CT, the candidate must show the ability to stop the RCS temperature increase and then maintain RCS temperature stable or slightly decreasing **(Page 18)**

45 DAY SUBMITTAL

SAFETY: Take a Minute			
UNIT 0 (OSM)			
SSF Operable: No	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
UNIT STATUS (CR SRO)			
Unit 1 Simulator		Other Units	
Mode: 1		Unit 2	Unit 3
Reactor Power: 50%		Mode: 1	Mode: 5
Gross MWE: 449		100% Power	100% Power
RCS Leakage: 0.11 gpm		EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CR SRO)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
SSF	Yesterday / 2300	7 Days / 2300	3.10.1 A - E
Shift Turnover Items (CR SRO)			
Primary			
<ul style="list-style-type: none"> Holding at 50% power for Main Turbine oil system evaluation by Turbine Crew The SSF can be declared operable once Core Thermal Power reaches > 85% Full Power. Chemistry requests both Letdown Filters be left in service until Rx Power reaches 100% 			
Secondary			
<ul style="list-style-type: none"> 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event. 1MS-82 and 1MS-84 closed in support of maintenance. TDEFWP supply from AS only. Unit 2 has the AS header. 			
Reactivity Management (CR SRO)			
RCS Boron: 89 ppmB	Gp 7 Rod Position: 42%		
Human Performance Emphasis (OSM)			
Procedure Use and Adherence			

Facility: **Oconee**Scenario No.: **3**Op-Test No.: **1**

Examiners: _____

Operators: _____ **SRO**

_____ **OATC**

_____ **BOP**

Initial Conditions:

- Reactor Power = 19% Stable

Turnover:

- OP/1/A/1106/001 Encl 4.1 (Turbine Generator Startup) in progress and complete up to Step 2.47
- MT at 1800 RPM Waiting on Turbine crew to Parallel T/G to grid
- OATC Add 75 gal from CBAST(CBAST pump in Auto) to withdraw rods an additional 10% per maneuvering plan

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AFIS disabled
0b	Override		Standby LPSW Pump auto start
0c			1B RBCU fails to start on ES
1		R: OATC, SRO	RCS Boration From CBAST (75 gal)
2	Updater	C: BOP, SRO (TS)	Operating LPSW Pump trips and standby pump fails to start
3	MSS470	C: BOP, SRO (TS)	1C RBCU Cooler Rupture
4	MPS090	C: OATC, SRO	1HP-120 fails closed (concurrent with Event 3) & restored
5		N, BOP, SRO	Parallel the Generator
6	MCR061	C: OATC, SRO	Continuous Control Rod Withdrawal
7	MPS400	M: All	1A Main Steam Line Break <ul style="list-style-type: none">AFIS fails to actuate1B RBCU fails to start on ES

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **1**

Page 1 of 5

Event Description: **RCS Boration from CBAST in Automatic**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	OP/1/A/1103/004A, Encl 4.1 (RCS Boration From CBAST With CBAST Pump) NOTE: <ul style="list-style-type: none">• OP/1/A/1103/004 (Soluble Poison Control) provides guidance for RCS boron change calculation or computer calculation for determining required volumes. (R.M.)• LDST temperature may increase from adding CBAST because of CBAST temperature.• 50 gal flush must be performed to ensure calculated volume of CBAST is added.• Main process piping between CBAST and LDST contains ≈25 gallons of DW. {16}• If RCS boration is for a Forced Outage, targeted boron should not exceed 200 ppm above the required SDM to prevent excessive RCS boration. The 200 ppm above required SDM will borate the Pressurizer to the required SDM since the Pressurizer usually lags the RCS by approximately 200 ppm. Section 2: Procedure 2.1 Determine required volume of CBAST needed for desired RCS boron changes. (R.M.) <ul style="list-style-type: none">• 50 gal of DW added due to flushing must be included in determination• Volume required _____gallons. 2.2 CBAST required volume approved (SRO). (R.M.) NOTE: Placing an idle Letdown Filter in service can change RCS boron by adding ≈60 gals of water to RCS at different boron (negligible for RCS boration). (R.M.) 2.3 IF two Letdown Filters are available, perform the following: <ul style="list-style-type: none">• Ensure open 1HP-17 (1A LETDOWN FILTER INLET)• Ensure open 1HP-18 (1B LETDOWN FILTER INLET) 2.4 Ensure open 1CS-64 (CBAST OUTLET). 2.5 Open 1CS-72 (CBAST Header to Letdown Filter Inlet). (A-2 LDST Hatch area)

This event is complete when the 50 gallon piping flush is complete or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **1**

Page 2 of 5

Event Description: **RCS Boration from CBAST in Automatic**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>OP/1/A/1103/004A, Encl 4.1 (continued)</p> <p>2.6 Ensure 1HP-15 Controller reset for Normal Operations.</p> <p>2.7 WHILE RCS boration in progress, monitor the following indication: {19}</p> <ul style="list-style-type: none">• Appropriate Range NIs• Primary Tank Levels• CRD position (if applicable)• Neutron error (if applicable) <p>NOTE: If RCS Boration is being performed during a unit shutdown, CBAST pump should NOT be started until directed by OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown).</p> <p>2.8 IF desired, operate the 1A CBAST pump in manual per Section 3 (Make-Up With 1A CBAST Pump In Manual).</p> <p>NOTE: If a Deborating IX is in service the CBAST pump must be operated in manual.</p> <p>2.9 IF desired, operate the 1A CBAST pump in auto per Section 4 (Make-Up With 1A CBAST Pump In Auto)</p> <p>NOTE: 50 gal flush must be performed to ensure calculated volume of CBAST is added. (R.M.)</p> <p>2.10 Perform piping flush per Section 6 (Piping Flush From CBAST)(see page 7).</p> <p>2.11 IF a Deborating IX is NOT in service, verify closed 1HP-16 (LDST MAKEUP ISOLATION) (R.M.)</p> <p>NOTE: If during RCS makeup the wrong volume is added an SRO should evaluate the effect on reactivity and take action to minimize reactivity management events. (R.M.)</p> <p>2.12 Perform one of the following: (R.M.)</p> <ul style="list-style-type: none">• Verify correct volume added• Notify appropriate SRO

This event is complete when the 50 gallon piping flush is complete or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **1**

Page 3 of 5

Event Description: **RCS Boration from CBAST in Automatic**

Position	Applicant's Actions or Behavior		
SRO/OATC	<p>OP/1/A/1103/004A, Encl 4.1 (continued)</p> <p>2.13 Ensure 1HP-15 Controller reset for Normal Operation</p> <p>2.14 IF "Continuous Boron Dilution Bypass Keyswitch" was bypassed, place "Continuous Boron Dilution Bypass Keyswitch" to "Normal" (Cable Rm). (Continue)</p> <p>2.15 Close 1CS-72 (CBAST to Letdown Filter Inlet). (A-2 LDST Hatch area) (R.M.)</p> <p>2.16 Record RCS make-up volume in Auto Log.</p> <p>2.17 IF desired, request RCS and Pzr sample for boron. (R.M.)</p> <table border="1"><tr><td>Person Notified</td><td>Date</td></tr></table> <p>NOTE: 1B Letdown Filter is the preferred filter to leave in service for ALARA.</p> <p>EXAMINER CUE: <i>If asked, inform the candidate it is not desired to remove one letdown filter from service.</i></p> <p>2.18 IF desired, remove one Letdown Filter from service by performing the following:</p> <p>2.18.1 Verify > 10 minutes since RCS makeup was secured. {7} (R.M.)</p> <p>2.18.2 Position one of the following:</p> <ul style="list-style-type: none">• 1HP-17 (1A LETDOWN FILTER INLET) switch to "CLOSE"• 1HP-18 (1B LETDOWN FILTER INLET) switch to "CLOSE" <p>2.18.3 Record current RCS boron in Component Boron Log for OOS Letdown Filter. {10} (R.M.)</p>	Person Notified	Date
Person Notified	Date		
This event is complete when the 50 gallon piping flush is complete or as directed by the Lead Examiner.			

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **1**

Page 4 of 5

Event Description: **RCS Boration from CBAST in Automatic**

Position	Applicant's Actions or Behavior
SRO/OATC	<p>OP/1/A/1103/004A, Encl 4.1 (continued)</p> <p>Section 4. Make-Up With 1A CBAST Pump In Auto</p> <p>NOTE: If a Deborating IX is in service the CBAST pump should be operated in manual.</p> <p>4.1 Verify a Deborating IX is NOT in service.</p> <p>4.2 Verify open 1CS-64 (CBAST OUTLET).</p> <p>NOTE: If "BLEED" is required, use enclosure for reducing RCS inventory in OP/1/A/1103/004(Soluble Poison Control).</p> <p>4.3 Perform the following:</p> <ul style="list-style-type: none">• IF "BLEED" is NOT required for makeup, open 1HP-16• IF 1SA-2/D-10 (CRD Continuous Boron Dilute Inhibit) in alarm AND "BLEED" required during makeup, perform one of the following: <p>3. Open 1HP-16 (LDST Makeup Isolation) (Waste Disposal Panel)</p> <p>4. Perform the following:</p> <p>A. Place "Continuous Boron Dilution Bypass Key switch" to "Bypass" (Cable Rm)</p> <p>B. Open 1HP-16 (LDST MAKEUP ISOLATION)</p> <p>4.4 Select "S" on 1HP-15 Controller and enter batch size. (R.M.)</p> <p>4.5 Select "P" on 1HP-15 Controller.</p> <p>4.6 Place 1A CBAST pump to "AUTO".</p> <p>NOTE: LDST temperature may increase from adding CBAST because of CBAST temperature.</p> <p>4.7 Place 1A CBAST pump to "ON".</p>

This event is complete when the 50 gallon piping flush is complete or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **1**

Page 5 of 5

Event Description: **RCS Boration from CBAST in Automatic**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>OP/1/A/1103/004A, Encl 4.1 (continued)</p> <p>Section 6. Piping Flush from CBAST</p> <p style="text-align: center;">NOTE:</p> <p>Flush prevents boron from crystallizing in piping if heat tracing fails.</p> <p>50 gal flush must be performed to ensure calculated volume of CBAST is added. (R.M.)</p> <p>Failure to properly position valves could affect CBAST boron. (R.M.)</p> <p>6.1 After CBAST make-up flush header:</p> <p>6.1.1 Ensure 1A CBAST pump is "OFF".</p> <p>6.1.2 Ensure DW make-up stopped to all units UST(s) (ensures adequate DW pressure).</p> <p>6.1.3 Close 1CS-64 (CBAST OUTLET). (R.M.)</p> <p>6.1.4 Ensure closed 1CS-70 (CBAST Recirc). (Unit 1 CBAST Rm) (R.M.)</p> <p>6.1.5 Ensure open 1HP-16 (LDST MAKEUP ISOLATION).</p> <p>6.1.6 Throttle 1DW-87 (DW To 1A CBAST Pump Suction) to establish flow. (Unit 1 CBAST Rm)</p> <p>6.1.7 Flush ≥50 gallons. (R.M.)</p> <p>6.1.8 Close 1DW-87 (DW To 1A CBAST Pump Suction). (Unit 1 CBAST Rm) (R.M.)</p> <p>6.1.9 Open 1CS-70 (CBAST Recirc). (Unit 1 CBAST Rm) (R.M.)</p> <p>6.1.10 Open 1CS-64 (CBAST OUTLET).</p> <p>6.1.11 IF a Deborating IX is NOT in service, close 1HP-16 (LDST MAKEUP ISOLATION). (R.M.)</p> <p>6.2 IF make-up from CBAST is no longer needed, continue with Step 2.11 for normal alignment (page 4).</p>
This event is complete when the 50 gallon piping flush is complete or as directed by the Lead Examiner.		

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **2**

Page 1 of 3

Event Description: **Operating LPSW Pump trips and standby pump fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Plant response:</p> <p>Statalarm:</p> <ul style="list-style-type: none">• 1SA-9/A-9 (LPSW Header A Press Low) <p>OAC Alarm:</p> <ul style="list-style-type: none">• LPSW HDR Pressure LO LO• LPSW leakage accumulator level• LO LO RCP MTR Cooler Inlet HDR LPSW <p>Control board indications:</p> <ul style="list-style-type: none">• LPSW Header A/B Pressure Low <p>Crew response:</p> <ul style="list-style-type: none">• Refer to OAC alarm response<ol style="list-style-type: none">1. Refer to AP/24 (Loss of LPSW)2. Notify engineering3. Refer to TS 3.7.7• Refer to ARG for 1SA-9/A-9 (LPSW Header A/B Press Low)<ol style="list-style-type: none">3.1 Refer to AP/1/A/1700/024 (Loss of LPSW)3.2 Have Unit 2 refer to AP/2/A/1700/024 (Loss of LPSW). <p>Booth Cue: <i>If notified to refer to AP/2/A/1700/024, inform operator that AP/2/A/1700/24 will be referenced.</i></p> <p><u>AP/1/A/1700/024</u> (Loss of LPSW) steps begin on next page.</p>

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

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **2**

Page 2 of 3

Event Description: **Operating LPSW Pump trips and standby pump fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><u>AP/1/A/1700/024 (Loss of LPSW)</u></p> <div><p style="text-align: center;"><u>NOTE</u></p><p>Unit 1 normally handles LPSW System operation unless otherwise directed by the CR SRO</p></div> <p>4.1 Verify Unit 1 is going to handle LPSW system operations.</p> <p>4.2 IAAT any LPSW pump is cavitating,</p> <p style="padding-left: 40px;">THEN perform Steps 4.3 – 4.4</p> <p>RNO:GOTO Step 4.5</p> <p>4.5 Verify LPSW pressure \leq 70 psig</p> <p>4.6 Ensure Unit 1/2 Standby LPSW Pump Auto Start Ckt in Disable</p> <p>4.7 IAAT a non-operating LPSW Pump is available and pump start is desired, then start the available pump (C LPSW Pump will start).</p> <p>4.8 IAAT LPSW to <u>all</u> RBCUs has been isolated,</p> <p style="padding-left: 40px;">AND LPSW header pressure is > 25 psig,</p> <p style="padding-left: 40px;">THEN perform Step 4.9</p> <p>RNO: GO TO Step 4.10</p> <p>4.10 Verify normal LPSW System operation is restored.</p> <p>4.11 Verify that RB Auxiliary Coolers have isolated:</p> <ul style="list-style-type: none">• 1LPSW-1054 closed• 1LPSW-1055 closed• 1LPSW-1061 closed• 1LPSW-1062 closed <p>RNO:GO TO Step 4.14</p> <p>4.14EXIT this procedure</p>

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

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **2**

Page 3 of 3

Event Description: **Operating LPSW Pump trips and standby pump fails to start**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>The SRO should refer to TS:</p> <ul style="list-style-type: none">• TS 3.7.7 (Low Pressure Service Water System)<ul style="list-style-type: none">○ Condition "A" applies. Restore required LPSW pump to operable status. 72 hours completion time.○ Condition "B" applies due to LPSW Leakage Accumulator Level Alarm (exit this TS Condition when alarm clears). <p>TS 3.3.28 (LPSW pump Auto-Start Circuitry) Condition "A". Restore Auto-Start Circuitry to operable. 7 day completion time.</p>

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

Op-Test No.: **ILT45**Scenario No **3**Event No.: **3**

Page 1 of 2

Event Description: **1C RBCU Cooler Rupture**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>Event 4 will begin concurrent with this event.</p> <p>Plant Response:</p> <ul style="list-style-type: none">• 1SA-9/D-9, LPSW RBCU C Cooler Rupture• 1SA-9/A-6, RB Normal Sump Level High/Low• RB normal sump level will increase• 1C RBCU LPSW flow indicator indicates low on VB2 <p>Crew Response:</p> <p><u>ARG for 1SA-9/D-9 (Manual Actions)</u></p> <p>3.1 Verify alarm is valid by checking RBCU 1C Inlet Flow and RBCU 1C delta flow.</p> <p>3.2 Verify 1LPSW-24 (RBCU 1C Outlet) throttled</p> <p>3.3 Verify adequate LPSW flow is available; check LPSW pump operation</p> <p>3.3.1 Verify 1LPSW-22 (1C RBCU INLET) is open.</p> <p>3.3.2 IF 1LPSW-22 (1C RBCU INLET) is NOT open, refer to Technical Specifications and Selected Licensee Commitments</p> <p>3.4 Monitor RBNS Level for any unexplained increase</p> <p>3.5 IF RBNS Level is increasing AND ES has actuated, notify Chemistry to sample the RBNS for boron concentration to determine if a cooler rupture has occurred based on sample results.</p> <p>3.6 IF RBCU 1C Cooler rupture or line break is indicated, then:</p> <p>NOTE: This sequence prevents having to call LPSW and Containment inoperable per SLC 16.9.12.</p> <p>3.6.1 Isolate the 1C RBCU Cooler as follows:</p> <p>A. Close 1LPSW-22 (1C RBCU INLET).</p> <p>B. Close 1LPSW-24 (RBCU 1C OUTLET).</p> <p>C. Evaluate TS 3.6.3 Condition C</p> <p>D. Evaluate TS 3.6.5 for inoperable RBCU</p> <p>E. Continue to monitor RBNS level for increase.</p> <p>F. IF RBNS level is still increasing, notify TSC to evaluate further isolation of 1C RBCU.</p>

This event is complete when the 1C RBCU rupture is isolated, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No **3**Event No.: **3**

Page 2 of 2

Event Description: **1C RBCU Cooler Rupture**

Time	Position	Applicant's Actions or Behavior
	SRO	ARG 1SA-9 / D-9 (RBCU C Cooler Rupture) (cont.): 3.6.2 Refer to Technical Specifications 3.6.3 Refer to SLC 16.9.12 3.6.4 Refer to OP/1/A/1104/010 (LPSW) 3.6.5 Refer to OP/1/A/1104/015 (RB Cooling System) <i>EXAMINER NOTE: The crew may decide to pump the RB Normal Sump. If so, see the steps below from OP/1/A/1104/007 LWD System, Enclosure 4.1 Pumping RBNS to ≥ 1"</i> <u>OP/1/A/1104/007 Enclosure 4.1</u> 3.1 Verify MWHUT level adequate to receive waste volume. 3.2 Position the following: <ul style="list-style-type: none">• Ensure open 1LWD-1 (RB NORMAL SUMP ISOLATION)• Ensure open 1LWD-2 (RB NORMAL SUMP ISOLATION) 3.3 Start one or both of the following: <ul style="list-style-type: none">• 1A RB NORM SUMP PUMP• 1B RB NORM SUMP PUMP 3.4 WHEN RBNS is at desired level OR at 1" (low level alarm), ensure the following: <ul style="list-style-type: none">• 1A RB NORMAL SUMP PUMP "OFF".• 1B RB NORMAL SUMP PUMP "OFF". 3.5 IF required to close the valves, position the following: <ul style="list-style-type: none">• Close 1LWD-1 (RB NORMAL SUMP ISOLATION)• Close 1LWD-2 (RB NORMAL SUMP ISOLATION) <i>EXAMINER NOTE: The SRO should identify that 1C RBCU is inoperable and enter TS 3.6.5 Condition B (7 days and 14 days from discovery of failure to meet LCO).</i> <i>TS 3.6.3 Condition C does not apply since no Containment Isolation Valves are inoperable.</i>
	SRO/BOP	

This event is complete when the 1C RBCU rupture is isolated, or as directed by the lead examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **4**

Page 1 of 4

Event Description: **1HP-120 fails closed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>This event is concurrent with Event 3</p> <p>Plant Response:</p> <ul style="list-style-type: none">• RCS makeup flow goes to \approx 10 gpm (HPI Warming Flow)• PZR level begins to decrease• LDST level begins to increase• Valve position <u>demand</u> for 1HP-120 begins to increase to the 100% demand value and valve position indication will indicate closed (green light)• 1SA-02/ B-1, HP LETDOWN TANK LEVEL HIGH/LOW, will illuminate after several minute time delay <p>Crew Response:</p> <p>EXAMINER NOTE: <i>If the 1HP-120 failure is recognized before the LDST statalarm actuates, the SRO will make a direct entry into AP/14 (next page). Otherwise they may perform the ARG and OP below and enter AP/14 when the SRO determines the entry conditions are met</i></p> <p>The crew may refer to ARG 1SA-02/B-1, HP LETDOWN TANK LEVEL HIGH/LOW and perform the required actions.</p> <p>3.1 Instrument Failed:</p> <p>3.1.1 Compare alternate channels to verify alarm validity:</p> <ul style="list-style-type: none">• O1A1042 LDST LEVEL 1• O1A1043 LDST LEVEL 2 <p>3.2 Verify LDST pressure does not exceed LDST level/pressure operability requirement per OP/1/A/1104/002, (HPI System).</p> <p>3.3 <u>IF</u> High Level alarm is received:</p> <p>3.3.1 Bleed as required by OP/1/A/1103/004 (Soluble Poison Concentration Control).</p>

This event is complete when normal HPI makeup and letdown flow have been restored, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **4**

Page 2 of 4

Event Description: **1HP-120 fails closed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>EXAMINER NOTE: The crew may perform Enclosure 4.8 as necessary to reduce inventory. Enclosure 4.6 is performed to makeup/batch.</p> <p>OP/1/A/1103/004, Soluble Poison Concentration Control (Enclosure 4.8 Reducing RCS Inventory)</p> <ul style="list-style-type: none">2.1 Verify HPI System operating.2.2 Ensure open 1CS-26 (LETDOWN TO RC BHUT).2.3 Ensure open 1CS-41 (1A RC BHUT INLET).2.4 Position 1HP-14 (LDST BYPASS) to "BLEED".2.5 WHEN desired LDST level achieved, position 1HP-14 to "NORMAL". <p>EXAMINER NOTE: The crew may initiate EOP Encl 5.5 for RCS inventory control due LDST level increase (see page 37)</p> <p>Crew Response:</p> <p>AP/1/A/1700/014, Loss of Normal Makeup and/or RCP Seal Injection</p> <ul style="list-style-type: none">3.1 IAAT RCP seal injection flow is lost, AND Component Cooling is lost, THEN perform the following:<ul style="list-style-type: none">A. Trip the RxB. Stop all RCPsC. Initiate AP/25 (SSF EOP)3.2 IAAT loss of suction to operating HPI pumps is indicated:<ul style="list-style-type: none">• Motor amps low or cycling• Discharge pressure low or cycling• Abnormal LDST level trendTHEN GO TO Step 3.3 <p>RNO: GO TO Step 4.7</p> <ul style="list-style-type: none">4.7 Announce AP entry using PA System4.8 Verify <u>any</u> HPI pump operating

This event is complete when normal HPI makeup and letdown flow have been restored, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **4**

Page 3 of 4

Event Description: **1HP-120 fails closed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>AP/1/A/1700/014, Loss of Normal Makeup and/or Seal Injection (Continued)</p> <p>4.9 Verify RCP seal injection or HPI makeup line leak indicated by <u>any</u> of the following:</p> <ul style="list-style-type: none">• Report of line leak• Abnormal LDST level decrease• 1RIA-32 (AUX BLDG GAS)• 1RIA-45 (NORM VENT GAS)• RB RIAs in alarm• Abnormal RBNS level increase• Abnormal LAWT or HAWT level increase <p>RNO: GO TO Step 4.11</p> <p>4.11 Verify RCP seal injection flow exists to <u>any</u> RCP</p> <p>4.12 Verify 1HP-120 operable in AUTO</p> <p>RNO: 1. Attempt to operate 1HP-120 in HAND</p> <p>2. IF 1HP-120 fails to operate, THEN GO TO Step 4.176</p> <p>4.176 Perform the following as necessary to maintain P_{zr} level > 200"</p> <ul style="list-style-type: none">• Close 1HP-6• Throttle 1HP-7• Throttle 1HP-26 <p>4.177 Place 1HP-120 in HAND and close</p>

This event is complete when normal HPI makeup and letdown flow have been restored, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **4**

Page 4 of 4

Event Description: **1HP-120 fails closed**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>AP/1/A/1700/014, Loss of Normal Makeup and/or Seal Injection (Continued)</p> <p>4.178 Notify SPOC to investigate and repair 1HP-120</p> <p>Booth Cue: Fire Timer 15 to remove 1HP-120 failure, then call the CR and inform them that, using time compression, 1HP-120 has been repaired.</p> <p>4.179 WHEN 1HP-120 is repaired, THEN slowly re-establish flow through 1HP-120</p> <p>4.180 Place 1HP-120 in AUTO.</p> <p>4.181 Close 1HP-26.</p> <p>4.182 Verify 1HP-122 (RC VOLUMECONTROL BYPASS) throttled.</p> <p>RNO: GO TO Step 4.184</p> <p>4.184 Verify 1HP-5 open.</p> <p>4.185 Verify 1HP-6 open.</p> <p>RNO: 1. Throttle 1HP-7 for \cong 20 gpm letdown flow. 2. Open 1HP-6.</p> <p>4.186 Adjust 1HP-7 for desired letdown</p> <p>4.187 WHEN conditions permit, THEN EXIT this procedure.</p>

This event is complete when normal HPI makeup and letdown flow have been restored, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **5**

Page 1 of 3

Event Description: **Parallel the Generator**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Booth Cue: <i>Call the Control Room as the OSM and inform them that after discussions with the Turbine Crew, Spoc, and Rx Engineering the OSM is directing the Control Room to continue with Paralleling and loading the T/G. Use Voltage Regulator in AUTO and turbine in Speed Match mode. Reactor Engineering will then provide a maneuvering plan for continuing the power escalation.</i></p> <p>Crew Response:</p> <p>OP/1/A/1106/001 Enclosure 4.1 (Turbine Generator Startup)</p> <p>2.47 WHEN online operation is desired, perform the following:</p> <ul style="list-style-type: none">2.47.1 Ensure AVR CONTROL ENABLE in REMOTE.2.47.2 Ensure VOLTAGE REGULATOR MODE in MANUAL.2.47.3 Ensure closed GEN FIELD BREAKER.2.47.4 Ensure EXCITATION is ON. <p>2.48 WHEN Generator Output Voltage 17.70 kV to 18.4 kV, perform the following:</p> <ul style="list-style-type: none">2.48.1 IF synchronization with Voltage Regulator in AUTO is desired, ensure VOLTAGE REGULATOR MODE in AUTO.2.48.2 Slowly increase GEN OUTPUT VOLTS up to rated voltage \approx 19 KV with VOLTAGE ADJUST. <div style="border: 1px solid black; padding: 5px;"><p style="text-align: center;">CAUTION:</p><p>Do NOT excite Generator > 19.95 KV. Generator winding damage may result.</p></div> <p>2.49 IF Voltage Regulator testing scheduled, perform the following:</p> <ul style="list-style-type: none">2.49.1 Ensure VOLTAGE REGULATOR MODE in AUTO.2.49.2 Perform Voltage Regulator testing as required per IP/0/B/2005/001 (Main Generator Automatic Voltage Regulator Maintenance And Channel Transfer). <p>2.50 Ensure GEN U.V. UNIT BLOCKING switch (1EB3) to NORM.</p> <p>2.51 Notify System Operating Center (SOC) that Turbine Generator is ready to be paralleled to system and that Voltage Regulator Mode is one of the following:</p> <ul style="list-style-type: none">• AUTO• MANUAL <p>2.52 Close TRANSFORMER #1 MOTOR OPERATED DISCONNECTS.</p>

This event is complete when This event is complete when the **TURBINE LOAD** pushbutton is depressed or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **5**

Page 2 of 3

Event Description: **Parallel the Generator**

Time	Position	Applicant's Actions or Behavior
		<p>OP/1/A/1106/001 Enclosure 4.1 (Turbine Generator Startup)</p> <p>2.53 Turn (PCB-20 OR PCB-21) SYNCHRONIZING switch to SYNCH for Generator Breaker to be closed first.</p> <p>2.54 Adjust Turbine Generator speed and voltage:</p> <ul style="list-style-type: none">• IF automatic Speed adjustment is desired, select SPEED MATCH on SELECT SPEED TARGET.• IF Manual Speed adjustment is desired:<ul style="list-style-type: none">A. Ensure 1800 RPM selected on SELECT SPEED TARGET.B. Use TURBINE SPEED CHANGER to adjust Generator speed until slow clockwise rotation of SYNCHROSCOPE pointer is established.• IF Generator Voltage adjustment required, use VOLTAGE ADJUST to adjust T1 OUTPUT VOLTS to match SWITCHYARD VOLTS. <p>2.55 Perform the following:</p> <ul style="list-style-type: none">• Ensure slow clockwise rotation of SYNCHROSCOPE pointer.• WHEN SYNCHROSCOPE pointer is vertical, ensure match of T1 OUTPUT VOLTS and SWITCHYARD VOLTS <p>2.56 WHEN SYNCHROSCOPE pointer is $\approx 5^\circ$ before reaching vertical, parallel by closing associated GENERATOR BREAKER (PCB-20 OR PCB-21).</p> <p>2.57 Observe GENERATOR BREAKER closes AND SYNCHROSCOPE pointer stops in vertical position.</p> <p>2.58 Turn OFF appropriate SYNCHRONIZING switch.</p> <p>2.59 Establish Generator load of ≈ 35 MWe, by using one of the following:</p> <ul style="list-style-type: none">○ TURBINE SPEED CHANGER○ LOAD REFERENCE DEMAND○ TURBINE MASTER <p>2.60 Record:</p> <p>_____/_____ Date Time</p>

This event is complete when This event is complete when the TURBINE LOAD pushbutton is depressed or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **5**

Page 3 of 3

Event Description: **Parallel the Generator**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP/ OATC	<p>OP/1/A/1106/001 Enclosure 4.1 (Turbine Generator Startup)</p> <p>2.61 To close second Generator Breaker, perform the following:</p> <p>2.61.1 Turn SYNCHRONIZING switch to SYNC for second Generator Breaker.</p> <p>2.61.2 WHEN SYNCHROSCOPE pointer is vertical, close second GENERATOR BREAKER.</p> <p>2.61.3 Observe GENERATOR BREAKER closes.</p> <p>2.61.4 Turn OFF appropriate SYNCHRONIZING switch.</p> <p>2.62 IAAT PCB-20 or PCB-21 NOT closed within 4 hours of times recorded instep 2.26, notify Switchyard Coordinator to evaluate capacitor condition.</p> <p>2.63 Secure from personnel maintaining road/walkway clear east of Unit 1 Main Transformer.</p> <p>2.64 Load Turbine Generator:</p> <p>2.64.1 Ensure Generator Output \approx 35 MWe.</p> <p>2.64.2 Ensure TURBINE AUTO LOAD PERMISSIVE satisfied.</p> <p>2.64.3 Ensure TURBINE MASTER control station to "AUTO".</p> <div><p>NOTE:</p><ul style="list-style-type: none">• Steps 2.64.4 through 2.64.7 may be repeated as required.• De-selecting the TURBINE LOAD pushbutton will result in stoppage of opening the Turbine Control Valves any further. Likewise, de-selecting the TURBINE UNLOAD pushbutton will also result in stoppage of closing the Turbine Control Valves any further.</div> <p>2.64.4 IF AT ANY TIME it is desired to stop loading the turbine, de-select the "TURBINE LOAD" Pushbutton.</p> <p>2.64.5 IF AT ANY TIME it is desired to stop unloading the turbine, de-select the "TURBINE UNLOAD" Pushbutton.</p> <p>2.64.6 IF AT ANY TIME it is desired to unload the Turbine Generator, perform the following:</p> <p>A. Select TURBINE UNLOAD button.</p> <p>B. Ensure TBVs throttle open</p> <p>C. Ensure Turbine Generator MWe decrease</p> <p>2.64.7 Select "TURBINE LOAD" Pushbutton.</p>

This event is complete when the TURBINE LOAD pushbutton is depressed or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **3**Event No.: **6**

Page 1 of 1

Event Description: **Continuous Rod Withdrawal**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	<p>Plant response:</p> <ul style="list-style-type: none">• Control Rods withdrawing without operator action• NI-5 thru NI-9 indicate increasing reactor power• SURs on Wide Range NIs increasing <p>Crew response:</p> <ul style="list-style-type: none">• The candidates should utilize the "Plant Transient Response" process to stabilize the plant and recognize that control rods are withdrawing without a valid signal.• Verbalize to the SRO reactor power level and direction of movement.• Place the Diamond and both FDW Masters in MANUAL to stabilize the plant.<ul style="list-style-type: none">➢ The crew should insert control rods and monitor reactor power and wide range startup rate to stabilize the plant• Report no valid (ICS) Runback and monitor RCS pressure and inventory<ul style="list-style-type: none">➢ Contact SPOC to investigate the continuous rod withdrawal. <p>Note: The OATC may elect to trip the Rx during this transient per SOMP 01-02 and OMP 1-18 Attachment J (Plant Transient Response).</p> <p>6.3.3 During abnormal operating conditions a manual reactor trip shall be initiated if any of the following conditions occur:</p> <ul style="list-style-type: none">• Reactor power level approaches any operating limit• Reactor power level exceeds the pre-transient power level by greater than 5% AND the cause of the power change is NOT understood, OR is NOT controllable• Any time plant conditions are considered uncontrollable or unsafe <p>EXAMINER/BOOTH NOTE: If the crew does NOT manually trip the reactor, then once they have completed PTR, fire TIMER 7 to initiate a Reactor trip and Event 7</p> <p>If the Rx is tripped by the crew, Timer 7 will auto initiate a MSLB (event 7 - next page)</p>

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 1 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	<p>Plant response:</p> <ul style="list-style-type: none">• 1SA-1/A-1, B-1, C-1, D-1, RPS Channel Trip• 1SA-2/D-3, RC Press High/Low• Statalarm 1SA-02/A-9 (MS PRESS HIGH/LOW)• AFIS will fail to actuate <p>Crew response:</p> <p>SRO will direct each RO to perform a Symptoms Check (per OMP 1-18 Attachment C).</p> <p>OATC/BOP will perform a Symptoms Check (per OMP 1-18 Attachment C) and determine that a MSLB has occurred in the 1A Steam Generator</p> <p>BOP performs Rule 5 (Main Steam Line Break) after receiving concurrence from the SRO (details begin on next page)</p> <p>BOP will perform Rule 3 (begins on page 24) as directed by Rule 5 and Enclosure 5.9 (begins on page 25) as directed by Rule 3.</p> <p>SRO refers to "Parallel Actions" page of the Subsequent Actions Tab and transfers to the Excessive Heat Transfer Tab</p> <p>SRO will direct an RO to initiate EOP Enclosure 5.1 (ES Actuation) (details begin on page 25)</p> <p>The SRO will direct Excessive Heat Transfer Tab actions (see page 29)</p> <p>The SRO will direct an RO to make a PA announcement and notify the OSM to reference the Emergency Plan and NSD-202</p> <p>EXAMINER NOTE: Loss of SCM may occur during this event. If so, the RO not performing Rule 5 (EHT) will perform Rule 2 (page 32) and the SRO will transfer to the LOSCM Tab of the EOP (page 35).</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.:ILT45

Scenario No.: 1

Event No.: 7

Page 2 of 16

Event Description: 1A MSLB inside RB & AFIS fails to actuate

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>EOP Rule 5</p> <ol style="list-style-type: none">Perform the following on <u>affected</u> headers:<ul style="list-style-type: none">Initiate AFIS 1A SG Digital Channels 1 and 2Select OFF for 1A MDEFDW Pump (CT-17) <p>Note: Overcooling must be stopped prior to violating NDT limits. Note: The critical task is to stop feeding the affected SG which occurs when AFIS is manually initiated</p> <ol style="list-style-type: none"><ul style="list-style-type: none">Trip both Main FDW pumpsClose 1FDW-315, 1FDW-33, and 1FDW-31Verify 1 TD EFDW PUMP operating. RNO: IF MD EFDWP for the <u>intact</u> SG is operating, THEN GO TO Step 5.Verify 1B SG is an <u>affected</u> SG. RNO: GO TO Step 7WHEN overcooling is stopped, THEN adjust steaming of <u>unaffected</u> SG to maintain CETCs constant using <u>either</u>:<ul style="list-style-type: none">TBVsDispatch two operators to perform Encl 5.24 (Operation of ADV's) <div><p style="text-align: center;">CAUTION</p><p>Thermal shock conditions may develop if HPI is NOT throttled and RCS pressure NOT controlled.</p></div> <ol style="list-style-type: none">WHEN <u>all</u> exist:<ul style="list-style-type: none">Core SCM >0° FRx Pwr ≤ 1%Pzr Level increasing,THEN continueVerify ES HPI actuatedPlace Diverse HPI in BYPASS
This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.		

Op-Test No.: ILT45

Scenario No.: 1

Event No.: 7

Page 3 of 16

Event Description: 1A MSLB inside RB & AFIS fails to actuate

Time	Position	Applicant's Actions or Behavior	
	OATC/BOP	<p>EOP Rule 5 (continued)</p> <p>11. Place ES CH 1 and ES CH 2 in MANUAL</p> <p>12. Perform the following to stabilize RCS P/T:</p> <ul style="list-style-type: none">• Throttle HPI• Reduce 1HP-120 setpoint to > 100" (180" ACC)• Adjust steaming of <u>unaffected</u> SG (1B SG) to maintain CETCs constant <p>13. WHEN CETCs have stabilized, THEN resume use of T_c for RCS temperature control</p> <p>14. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete (see next page)</p> <p>Examiner Note: Conditions should not meet either of the entry conditions from Rule 8 below, so no actions are taken in Rule 8.</p> <table><tr><td><p style="text-align: center;"><u>NOTE</u></p><p>This rule is invoked under <u>either</u> of the following conditions:</p><ul style="list-style-type: none">• A cooldown below 400°F T_c at > 100 °F/hr has occurred.• HPI has injected through an open <u>or</u> throttled open 1HP-26, 27, 409, 410 with <u>all</u> RCPs OFF.</td></tr></table> <p>15. Ensure Rule 8 (Pressurized Thermal Shock (PTS)) is in progress or complete</p> <p>16. WHEN directed by CR SRO, THENEXIT this rule</p>	<p style="text-align: center;"><u>NOTE</u></p> <p>This rule is invoked under <u>either</u> of the following conditions:</p> <ul style="list-style-type: none">• A cooldown below 400°F T_c at > 100 °F/hr has occurred.• HPI has injected through an open <u>or</u> throttled open 1HP-26, 27, 409, 410 with <u>all</u> RCPs OFF.
<p style="text-align: center;"><u>NOTE</u></p> <p>This rule is invoked under <u>either</u> of the following conditions:</p> <ul style="list-style-type: none">• A cooldown below 400°F T_c at > 100 °F/hr has occurred.• HPI has injected through an open <u>or</u> throttled open 1HP-26, 27, 409, 410 with <u>all</u> RCPs OFF.			

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.:ILT45

Scenario No.: 1

Event No.: 7

Page 4 of 16

Event Description: 1A MSLB inside RB & AFIS fails to actuate

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>Examiner Note: Rule 7 guidance for SG levels is located on page 37.</p> <p>Crew Response:</p> <p>EOP Rule 3</p> <ol style="list-style-type: none">1. Verify loss of Main FDW/EFDW is due to Turbine Building Flooding RNO: GO TO Step 33. IAAT NO SGs can be fed with FDW (Main/CBP/Emergency), AND <u>any</u> of the following exist:<ul style="list-style-type: none">• RCS pressure reaches 2300 psig OR NDT limit• Pzr level reaches 375" [340" acc]THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling)4. Start <u>operable</u> EFDW pumps, as required, to feed all <u>intact</u> SGs5. Verify <u>any</u> EFDW pump operating.6. GO TO Step 3737. IAAT an EFDW valve CANNOT control in AUTO OR manual operation if EFDW valve is desired to control flow/level, THEN perform Steps 38-4238. Place EFDW valve in MANUAL.39. Control EFDW flow with EFDW valve in MANUAL40. GOTO Step 4343. Verify <u>any</u> SCM $\leq 0^{\circ}\text{F}$ RNO: IF overcooling or exceeding limits in Rule 7, THEN throttle EFDW as necessary.44. IAAT Unit 1 EFDW is in operation, THEN initiate Encl 5.9 (Extended EFDW Operation) (see next page)45. WHEN directed by CR SRO, THEN EXIT this rule

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 5 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>Crew Response:</p> <p>EOP Enclosure 5.9 (Extended EFDW Operation)</p> <ol style="list-style-type: none">1. Monitor EFDW parameters on EFW graphic display2. IAAT UST level is < 4', THEN GO TO Step 1203. IAAT feeding <u>both</u> SGs with one MD EFDWP is desired, THEN perform Steps 4-7 RNO: GOTO Step 88. Perform the following as required to maintain UST level > 7.5' ___ Makeup with demin water ___ Place CST pumps in AUTO9. IAAT <u>all</u> the following exist: ___ Rapid cooldown NOT in progress ___ MD EFDWP operating for each <u>available</u> SG ___ EFDW flow in <u>each</u> header < 600 gpm THEN place 1 TD EFDW PUMP switch in PULL TO LOCK10. Verify 1 TD EFDW PUMP operating RNO: GO TO Step 12 <div><p style="text-align: center;">NOTE</p><ul style="list-style-type: none">• Loss of the condensate system for ≥ 25 minutes results in cooling down to LPI using the ADVs. If NO HWPs are operating, continuing this enclosure to restore the condensate system is a priority unless the CR SRO deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open.• If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.</div> <ol style="list-style-type: none">12. Notify CR SRO to set priority based on the NOTE above <u>and</u> EOP activities <p>Note: The SRO should determine that restoring the secondary side of the plant is not a priority at this time and direct the RO to continue in Rule 3.</p>
This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.		

Op-Test No.:ILT45

Scenario No.: 1

Event No.: 7

Page 6 of 16

Event Description: 1A MSLB inside RB & AFIS fails to actuate

Time	Position	Applicant's Actions or Behavior								
	OATC/BOP	<p>Crew Response:</p> <p>EOP Enclosure 5.1 (ES Actuation)</p> <ol style="list-style-type: none">Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>.<ul style="list-style-type: none">RB 3 psig: Channels 1, 2, 3, 4, 5 & 6RB 10 psig: Channels 7 & 8Verify <u>all</u> expected ES digital channels have actuated.IAAT <u>additional</u> ES actuation setpoints are exceeded, THEN perform Steps 1-2.Place Diverse HPI in BYPASSPlace ES CH 1 and ES CH 2 in MANUALVerify Rule 2 in progress <u>or</u> complete. <p>RNO: GO TO Step 73</p> <ol style="list-style-type: none">Open 1HP-24 and 1HP-25Ensure <u>at least two</u> HPI pumps are operatingVerify 1HP-26 and 1HP-27 are openIAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header: <table><tr><td>√</td><td>1A Header</td><td>√</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table> <ol style="list-style-type: none">Verify <u>any</u> RCP operatingOpen 1HP-20 and 1HP-21IAAT <u>all</u> exist:<ul style="list-style-type: none">___ Voter associated with ES channel is in OVERRIDE___ An ES channel is <u>manually</u> actuated___ Components on that channel required manipulationTHEN depress RESET on the required channel	√	1A Header	√	1B Header		1HP-410		1HP-409
√	1A Header	√	1B Header							
	1HP-410		1HP-409							

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.:ILT45

Scenario No.: 1

Event No.: 7

Page 7 of 16

Event Description: 1A MSLB inside RB & AFIS fails to actuate

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>EOP Enclosure 5.1 (ES Actuation) (continued)</p> <p>EXAMINER NOTE: ES-3 through ES-6 may not actuate, depending on how quickly AFIS is actuated in Rule 5</p> <p>80. IAAT any RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 81-84</p> <p>81. Place ES CH 5 and ES CH 6 in MANUAL</p> <p>82. Open:</p> <p> ___ 1CC-7</p> <p> ___ 1CC-8</p> <p> ___ 1LPSW-15</p> <p> ___ 1LPSW-6</p> <p>83. Ensure <u>only one</u> CC pump operating</p> <p>84. Ensure Standby CC pump in AUTO</p> <p>85. IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 86</p> <p>86. Place Diverse LPI in BYPASS</p> <p>87. Place ES CH 3 and ES CH 4 in MANUAL</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><p style="text-align: center;"><u>CAUTION</u></p><p>LPI pump damage may occur if operated in excess of 30 minutes against shutoff head</p></div> <p>88. IAAT any LPI pump is operating against shutoff head, THEN at the CR SROs discretion, stop <u>affected</u> LPI pumps</p> <p>89. IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 90-91</p> <p> RNO: GO TO Step 92</p> <p>92. IAAT 1A and 1B LPI PUMPs are off/tripped, AND <u>all</u> of the following exists.....</p> <p> RNO: GO TO Step 95</p> <p>95. IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17</p> <p>96. IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18</p> <p>97. Start A and B OUTSIDE AIR BOOSTER FANS</p> <p>98. Notify Unit 3 to start 3A and 3B OUTSIDE AIR BOOSTER FANS</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 8 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>EOP Enclosure 5.1 (ES Actuation) (continued)</p> <p>99. Verify 1CF-1 and 1CF-2 are open</p> <p>100. Verify 1HP-410 closed</p> <p>101. Secure makeup to the LDST</p> <p>102. Verify <u>all</u> ES channel 1-4 components are in the ES position</p> <p>103. Verify Unit 2 turbine tripped</p> <p>RNO: GO TO Step 106</p> <p>106. Close 1LPSW-139</p> <p>107. Place 1LPSW-251 and 1LPSW-252 FAIL SWITCH in FAIL OPEN</p> <p>108. Start <u>all available</u> LPSW pumps</p> <p>109. Verify <u>either</u>:</p> <p>___ Three LPSW pumps operating</p> <p>___ Two LPSW pumps operating when TS only requires two operable</p> <p>110. Open 1LPSW-4 and 1LPSW-5</p> <p>111. IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES)</p> <p>112. Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service) (PS)</p> <p>113. Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON</p> <p>114. IAAT ES channels 5 & 6 have actuated, THEN perform Step 115</p> <p>115. Verify <u>all</u> ES channel 5 & 6 components in the ES position</p> <p>RNO: Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired</p> <p>Examiner Note: The 1B RBCU fails to receive an ES signal and the SRO should direct the RO to attempt to start the 1B RBCU.</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 9 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	<p>EOP Enclosure 5.1 (ES Actuation) (continued)</p> <p>116. IAAT ES channels 7 & 8 have actuated, THEN perform Step 117 – 118.</p> <p>RNO: GO TO Step 119</p> <p>119. Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.</p> <p>120. Ensure any turnover sheet compensatory measures for ES actuation are complete as necessary.</p> <p>121. IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery)</p> <p>122. WHEN CR SRO approves, THENEXIT this enclosure</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 10 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Crew Response:</p> <p>EOP Excessive Heat Transfer Tab (EHT)</p> <ol style="list-style-type: none"> 1. Verify <u>any</u> SG pressure < 550 psig 2. Ensure Rule 5 (Main Steam Line Break) in progress or complete 3. Place the following in HAND and decrease demand to zero on <u>all affected</u> SGs: <ul style="list-style-type: none"> • 1FDW-32 and 1FDW-35 (for 1A SG) 4. Close the following on <u>all affected</u> SGs: <ul style="list-style-type: none"> • 1FDW-372, 1MS-17, 1MS-79, 1MS-35, 1MS-82, 1FDW-368 5. Verify level in <u>both</u> SGs < 96% O.R. 6. IAAT <u>core</u> SCM is > 0°F, THEN perform Steps 7 and 8 7. Throttle HPI per Rule 6 (HPI) (CT-5) <p>Note: HPI flow must be throttled and RCS temperature controlled to prevent a solid Pzr and subsequent operation of the PORV.</p> <ol style="list-style-type: none"> 8. Verify letdown in service <p>RNO: IF desired to restore letdown, THEN initiate Encl 5.5 (Pzr and LDST Level Control) (see page 38)</p> 9. Verify <u>any</u> SG has an intact secondary boundary (intact SG is B) 10. Open the following on <u>all intact</u> SGs <ul style="list-style-type: none"> • 1FDW-382, 1FDW-369, and 1MS-26 11. Start MDEFDWP associated with <u>all intact</u> SGs <ul style="list-style-type: none"> • 1B MD EFDWP (already running) 12. Feed and steam <u>all intact</u> SGs to stabilize RCS P/T using <u>either</u> of the following: <ul style="list-style-type: none"> • TBVs • Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) 13. GO TO Step 32 32. Verify <u>any</u> of the following: <ul style="list-style-type: none"> ___ HPI has operated in the injection mode while NO RCPs were operating ___ A cooldown below 400°F at > 100°F/hr has occurred <p>RNO: GO TO Step 34</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 11 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>EOP Excessive Heat Transfer Tab (continued)</p> <p>34. Verify 1MS-24 and 1MS-33 are closed</p> <p>RNO: 1. IF an <u>unaffected</u> Unit 1 SG is available to supply aux steam, THEN:</p> <ul style="list-style-type: none">A. Open aux steam supply from <u>unaffected</u> SG:<ul style="list-style-type: none">• 1MS-33B. Close aux steam supply from <u>affected</u> SG:<ul style="list-style-type: none">• 1MS-24C. GO TO Step 35 <p>35. Open 1AS-8</p> <p>36. Close 1SSH-9</p> <p>37. Perform the following notifications:</p> <ul style="list-style-type: none">• Notify Chemistry to determine RCS boron concentration• Notify Secondary Chemistry to check for indications of SGTR• Notify RP to check for indications of a SGTR <p>38. IAAT RCS boron is determined to be insufficient for adequate SDM, THEN initiate Encl 5.11 (RCS Boration)</p> <p>39. IAAT <u>all</u> the following exist:</p> <ul style="list-style-type: none">• ES Bypass Permit satisfied• <u>All</u> SCMs > 0°F• RCS pressure controllable <p>THEN perform Step 40 (Bypass applicable ES)</p> <p>RNO: GO TO Step 41</p> <p>41. Verify <u>any</u> SG is dry</p> <div><p>NOTE:</p><p>Minimizing SCM reduces tensile stress on the SG. PORV should be used if Pzr spray is not available. Procedure progression may continue when actions to minimize SCM are in progress.</p></div> <p>42. Minimize SCM using the following methods as necessary:</p> <ul style="list-style-type: none">___ De-energize all Pzr heaters___ Use Pzr spray___ Throttle HPI to maintain Pzr level > 100" [180" acc]___ Use PORV

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 12 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>EOP Excessive Heat Transfer Tab (continued)</p> <p>43. Verify any RCP operating</p> <p>44. Maintain RCP NPSH</p> <ul style="list-style-type: none">• OAC• Encl 5.18 (P/T Curves) <p>Examiner Note: SG tube to shell ΔT is not approaching either limit so the crew enters Encl 5.16 and then immediately Exits.</p> <p>45. Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control)</p> <p>46. IAAT <u>all</u> exist:</p> <ul style="list-style-type: none">• <one RCP operating in <u>any</u> loop• <u>All</u> SCMs > 0°F• RCP available in an idle loop <p>THEN initiate Encl 5.6 (RCP Restart) to start one RCP in each idle loop.</p> <p>47. IAAT <u>all</u> exist:</p> <ul style="list-style-type: none">• RBS actuated• RB pressure < 10 psig• 1RIA-57 NOT in alarm• 1RIA-58 NOT in alarm <p>THEN stop <u>both</u> RBS pumps.</p> <p>48. IAAT T_{cold} approaches 470°F, AND <u>all</u> RCPs are operating, THEN ensure < four RCPs are operating.</p> <p>49. IAAT BWST level is $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).</p> <p>50. Verify <u>all</u> SCMs > 0°F</p> <p>51. Verify indications of SGTR ≥ 25 gpm.</p> <p>RNO: GO TO Step 53</p> <p>53. Verify required RCS makeup flow within normal makeup capability.</p> <p>54. Verify <u>either</u>:</p> <ul style="list-style-type: none">• <u>Any</u> SG isolated• <u>Any</u> SG has an unisolable steam leak <p>55. GO TO FCD Tab</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 13 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Rule 2</p> <p>1. IAAT all exist:</p> <ul style="list-style-type: none">Any SCM \leq 0FRx power \leq 1%\leq 2 minutes elapsed since loss of SCM <p>THEN perform Steps 2 and 3</p> <p>2. Stop <u>all</u> RCPs</p> <p>3. Notify CRSRO of RCP status.</p> <p>4. Verify Blackout exists.</p> <p>Step 4 RNO: GO TO Step 6</p> <p>6. Open 1HP-24 and 1HP-25</p> <p>7. Start all available HPI pumps</p> <p>8. GO TO Step 13.</p> <p>13. Open 1HP-26 and 1HP-27</p> <p>14. Verify at least two HPI pumps are operating.</p> <p>15. IAAT \geq 2 HPI pumps operating, AND HPI flow in any header is unacceptable, THEN perform Steps 16 – 21.</p> <p>Step 15 RNO: GO TO Step 17</p> <p>17. IAAT flow limits are exceeded, THEN perform Steps 18-21</p> <p>Step 17 RNO: GO TO Step 21</p> <p>21. Notify CRSRO of HPI status.</p> <p>22. Verify RCS pressure > 550 psig</p> <p>23. IAAT either exists:</p> <ul style="list-style-type: none">Total LPI flow \geq 3400 gpmFlow is one LPI header \geq 2900 gpm <p>THEN GO TO Step 24</p> <p>Step 23 RNO: GO TO Step 35</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 14 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Rule 2 (continued)</p> <p>35. IAAT TBVs are unavailable:</p> <ul style="list-style-type: none">• Dispatch two operators to perform Encl 5.24 (Operation of ADVs)• Notify CRSRO that ADVs are being aligned for use. <p>36. Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit.</p> <p>Step 36 RNO: Select OFF for both digital channels on AFIS HEADER A.</p> <p>37. Verify 1SA-2/d-8 (AFIS HEADER B INITIATED) lit.</p> <p>Step 37 RNO: Select OFF for both digital channels on AFIS HEADER B.</p> <p>38. Verify any EFDW pump operating.</p> <p>39. Start MD EFDW pumps on all intact SGs (1B)</p> <p>40. Verify any EFDW pump operating.</p> <p>41. Verify both SG's intact.</p> <p>Step 41 RNO:</p> <ul style="list-style-type: none">• Establish 450 gpm flow to the intact SG• GO TO Step 43 <p>43. Verify both MD EFDWPs operating.</p> <p>Step 43 RNO:</p> <ul style="list-style-type: none">• IF 1 TD EFDW PUMP is operating, or NO MFDW pumps operating, THEN GO TO Step 45• GO TO Step 47 <p>45. Trip both Main FDW pumps.</p> <p>46. Place FDW block valve switches in CLOSE:</p> <ul style="list-style-type: none">• 1FDW-33• 1FDW-31• 1FDW-42• 1FDW-40

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 15 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	<p>Rule 2 (continued)</p> <div><p><u>NOTE</u></p><ul style="list-style-type: none">• SG levels must continue to increase until the SG Level Control Point is reached.• If Main FDW is feeding <u>any</u> SG, Rule 7 provides a different SG Level Control Point.• TS cooldown rates are $\leq 50^{\circ}\text{F}/\frac{1}{2} \text{ hr}$ when $T_{\text{cold}} > 280^{\circ}\text{F}$ and $\leq 25^{\circ}\text{F}/\frac{1}{2} \text{ hr}$ when $T_{\text{cold}} \leq 280^{\circ}\text{F}$.</div> <p>47. Begin feeding all intact SGs to the appropriate SG level control point in Rule 7.</p> <p>48. IAAT SG level control point is reached, THEN maintain SG level control point by feeding and steaming as necessary.</p> <p>49. Notify CRSRO of SG feed status.</p> <p>50. IAAT SG pressure is $>$ RCS pressure, THEN reduce SG pressure $<$ RCS pressure using either:</p> <ul style="list-style-type: none">• TBVs• Dispatch two operators to perform Encl 5.24 (Operation of ADVs) <p>51. Verify any Main FDW pump operating.</p> <p>Step 51 RNO: GO TO Step 58</p> <p>58. Ensure Rule 3 is in progress or complete.</p> <p>59. WHEN directed by CRSRO, THEN EXIT.</p>

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT45**Scenario No.: **1**Event No.: **7**

Page 16 of 16

Event Description: **1A MSLB inside RB & AFIS fails to actuate**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	LOSCM Tab 1. Ensure Rule 2 (Loss of SCM) is in progress or complete. 2. Verify Station ASW feeding any SG. Step 2 RNO: GO TO Step 4. 4. Verify LOSCM caused by excessive heat transfer. 5. Verify EHT tab has been performed. Step 5 RNO: GO TO EHT tab. (Page 29)

This event is complete when the SRO reaches step 32 in the EHT Tab, or as directed by the Lead Examiner.

Rule 7 guidance for SG levels during ACC conditions

Table 4 SG Level Control Points			
<u>NOTE</u> Flow may be throttled as necessary to control cooldown during the approach to the SG Level Control Point.			
Plant Condition	Main FDW Pump	EFDW Pump	SSF ASW Pump
<u>All</u> SCMs > 0°F AND <u>any</u> RCP on	25" - 35" [55" - 65" acc] S/U level	30" [60" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	30" [60" acc] XSUR
<u>All</u> SCMs > 0°F AND <u>all</u> RCPs off	50% [50% acc] Operating Range	240" [270" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	240" [270" acc] XSUR
<u>Any</u> SCM = 0°F AND NO SSF Event*	95% [95% acc] Operating Range	LOSCM setpoint (Band: +0"/-5") (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Band: +0"/-5") (Turn-on code "EFW" or Per Table 5)
<u>Any</u> SCM = 0°F AND SSF Event*	N/A	240" [270" acc] XSUR	Per AP/25
Superheated with CETCs ≤ 1200°F	95% [95% acc] Operating Range	LOSCM setpoint (Band: +0"/-5") (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Band: +0"/-5") (Turn-on code "EFW" or Per Table 5)
Superheated with CETCs > 1200°F	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)

EXAMINER NOTE

At any time during this scenario the operator may choose to use Enclosure 5.5 to maintain RCS inventory control. See excerpt below.

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

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

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

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. <input type="checkbox"/> IAAT additional makeup flow to LDST is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.).	
13. <input type="checkbox"/> IAAT <u>two</u> Letdown Filters are desired, THEN perform the following: <input type="checkbox"/> Open 1HP-17. <input type="checkbox"/> Open 1HP-18	
14. <input type="checkbox"/> IAAT <u>all</u> of the following exist: <input type="checkbox"/> Letdown isolated <input type="checkbox"/> LPSW available <input type="checkbox"/> Letdown restoration desired THEN perform Steps 15 - 33. {41}	<input type="checkbox"/> GO TO Step 34.
15. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8	1. <input type="checkbox"/> Notify CR SRO that letdown CANNOT be restored due to inability to restart the CC system. 2. <input type="checkbox"/> GOTO Step 34.
16. <input type="checkbox"/> Ensure only one CC pump running.	
17. <input type="checkbox"/> Place the non-running CC pump in AUTO.	
18. Verify <u>both</u> are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2	1. <input type="checkbox"/> IF 1HP-1 is closed due to 1HP-3 failing to close, THEN GOTO Step 20. 2. <input type="checkbox"/> IF 1HP-2 is closed due to 1HP-4 failing to close, THEN GOTO Step 20.
19. <input type="checkbox"/> GOTO Step 22.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
20. <input type="checkbox"/> Verify letdown line leak in East Penetration Room has occurred.	<input type="checkbox"/> GOTO Step 22.
21. <input type="checkbox"/> GOTO Step 34.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. ___ Monitor for unexpected conditions while restoring letdown.	
23. ___ Verify <u>both</u> letdown coolers to be placed in service.	1. ___ IF 1A letdown cooler is to be placed in service, THEN open: ___ 1HP-1 ___ 1HP-3 2. ___ IF 1B letdown cooler is to be placed in service, THEN open: ___ 1HP-2 ___ 1HP-4 3. ___ GOTO Step 25.
24. Open: ___ 1HP-1 ___ 1HP-2 ___ 1HP-3 ___ 1HP-4	
25. ___ Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. ___ Notify CR SRO of problem. B. ___ GOTO Step 34.
26. ___ Close 1HP-6.	
27. ___ Close 1HP-7.	
28. ___ Verify letdown temperature < 125°F.	1. ___ Open 1HP-13. 2. Close: ___ 1HP-8 ___ 1HP-9&11 3. ___ IF <u>any</u> deborating IX is in service, THEN perform the following: A. ___ Select 1HP-14 to NORMAL. B. ___ Close 1HP-16. 4. ___ Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

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

NOTE

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

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

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

EOP Enclosure 5.1 (ES Actuation)

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <input type="checkbox"/> Verify Rule 2 in progress <u>or</u> complete.	<input type="checkbox"/> GOTO Step 73.
7. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 9.
8. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
9. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
10. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 11 - 14.	<input type="checkbox"/> GOTO Step 15.
11. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><ol style="list-style-type: none">1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
12. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
13. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
14. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. ___ IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 16.	___ GO TO Step 53.
16. ___ Place Diverse LPI in BYPASS.	___ Place Diverse LPI in OVERRIDE.
17. Perform <u>both</u> : ___ Place ES CH 3 in MANUAL. ___ Place ES CH 4 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. ___ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ___ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
<div>CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
18. ___ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
19. ___ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 20 - 21.	___ GOTO Step 22.
20. Perform the following: ___ Open 1LP-17. ___ Start 1A LPI PUMP.	1. ___ Stop 1A LPI PUMP. 2. ___ Close 1LP-17.
21. Perform the following: ___ Open 1LP-18. ___ Start 1B LPI PUMP.	1. ___ Stop 1B LPI PUMP. 2. ___ Close 1LP-18.

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

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

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

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

... END ...

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

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

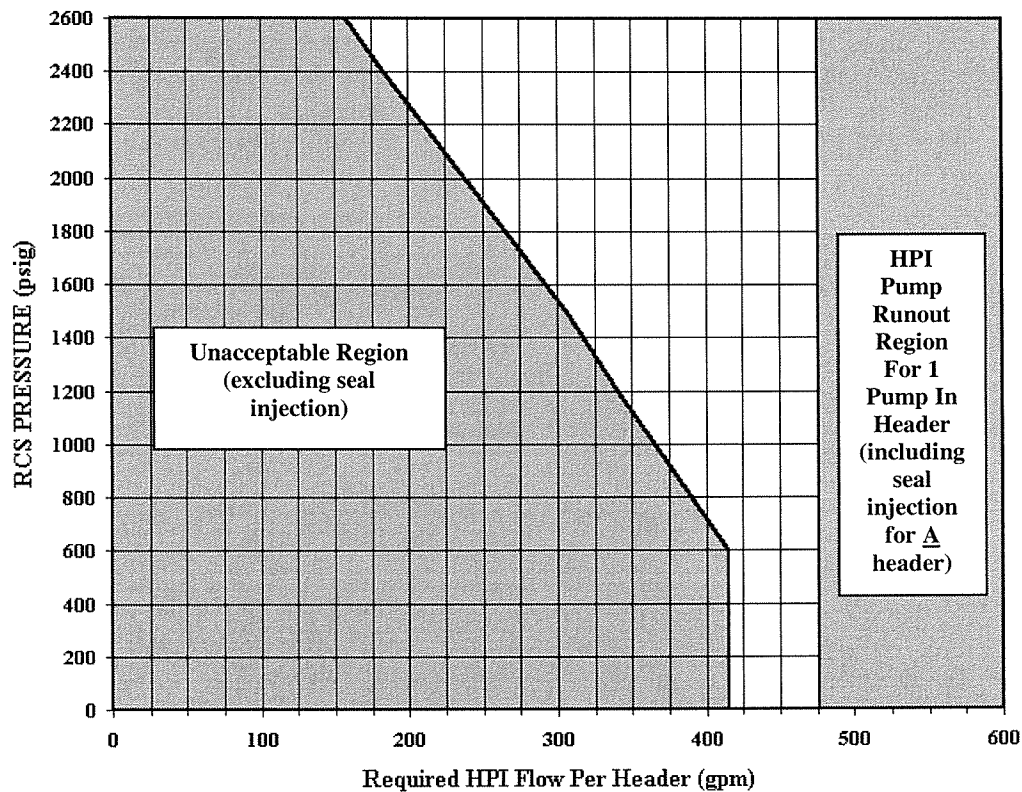
... END ...

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>73. Open:</p> <ul style="list-style-type: none"><input type="checkbox"/> 1HP-24<input type="checkbox"/> 1HP-25	<p>1. <input type="checkbox"/> IF <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN:</p> <ul style="list-style-type: none">A. <input type="checkbox"/> Start 1A LPI PUMP.B. <input type="checkbox"/> Start 1B LPI PUMP.C. Open:<ul style="list-style-type: none"><input type="checkbox"/> 1LP-15<input type="checkbox"/> 1LP-16<input type="checkbox"/> 1LP-9<input type="checkbox"/> 1LP-10<input type="checkbox"/> 1LP-6<input type="checkbox"/> 1LP-7D. <input type="checkbox"/> IF two LPI Pumps are running <u>only</u> to provide HPI pump suction, THEN secure one LPI pump.E. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).F. <input type="checkbox"/> GOTO Step 74. <p>2. <input type="checkbox"/> IF <u>only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, THEN:</p> <ul style="list-style-type: none">A. <input type="checkbox"/> IF three HPI pumps are operating, THEN secure 1B HPI PUMP.B. <input type="checkbox"/> IF < 2 HPI pumps are operating, THEN start HPI pumps to obtain two HPI pump operation, preferably in opposite headers.C. <input type="checkbox"/> GO TO Step 75.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
74. <input type="checkbox"/> Ensure <u>at least two</u> HPI pumps are operating.	
75. Verify open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27	1. <input type="checkbox"/> IF HPI has been intentionally throttled, THEN GOTO Step 76. 2. Open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 1HP-27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
<p>76. ___ IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header:</p> <table><tr><td>✓</td><td>1A Header</td><td>✓</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table>	✓	1A Header	✓	1B Header		1HP-410		1HP-409	
✓	1A Header	✓	1B Header						
	1HP-410		1HP-409						

Figure 1
Required HPI Flow Per Header



ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
77. <input type="checkbox"/> Verify <u>any</u> RCP operating.	<input type="checkbox"/> GOTO Step 79.
78. Open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
79. <input type="checkbox"/> IAAT <u>all</u> exist: <input type="checkbox"/> Voter associated with ES channel is in OVERRIDE <input type="checkbox"/> An ES channel is <u>manually</u> actuated <input type="checkbox"/> Components on that channel require manipulation THEN depress RESET on the required channel.	
80. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 81 - 84.	<input type="checkbox"/> GOTO Step 85.
81. Perform <u>all</u> : <input type="checkbox"/> Place ES CH 5 in MANUAL. <input type="checkbox"/> Place ES CH 6 in MANUAL.	<div>NOTE</div> <ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. <div><p>1. <input type="checkbox"/> IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.</p><p>2. <input type="checkbox"/> IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</p></div>
82. Open: <input type="checkbox"/> 1CC-7 <input type="checkbox"/> 1CC-8 <input type="checkbox"/> 1LPSW-15 <input type="checkbox"/> 1LPSW-6	
83. <input type="checkbox"/> Ensure <u>only one</u> CC pump operating.	
84. <input type="checkbox"/> Ensure Standby CC pump in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
85. ___ IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 86.	___ GO TO Step 123.
86. ___ Place Diverse LPI in BYPASS.	___ Place Diverse LPI in OVERRIDE.
87. Perform <u>both</u> : ___ Place ES CH 3 in MANUAL. ___ Place ES CH 4 in MANUAL.	<div><u>NOTE</u><ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div><ol style="list-style-type: none">1. ___ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.2. ___ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
<div><u>CAUTION</u> LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</div>	
88. ___ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
89. <input type="checkbox"/> IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 90 - 91.	<input type="checkbox"/> GOTO Step 92.
90. Perform the following: <input type="checkbox"/> Open 1LP-17. <input type="checkbox"/> Start 1A LPI PUMP.	1. <input type="checkbox"/> Stop 1A LPI PUMP. 2. <input type="checkbox"/> Close 1LP-17.
91. Perform the following: <input type="checkbox"/> Open 1LP-18. <input type="checkbox"/> Start 1B LPI PUMP.	1. <input type="checkbox"/> Stop 1B LPI PUMP. 2. <input type="checkbox"/> Close 1LP-18.
92. <input type="checkbox"/> IAAT 1A <u>and</u> 1B LPI PUMPS are off / tripped, AND <u>all</u> exist: <input type="checkbox"/> RCS pressure < LPI pump shutoff head <input type="checkbox"/> 1LP-19 closed <input type="checkbox"/> 1LP-20 closed THEN perform Steps 93 - 94.	<input type="checkbox"/> GO TO Step 95.
93. Open: <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7 <input type="checkbox"/> 1LP-17 <input type="checkbox"/> 1LP-18 <input type="checkbox"/> 1LP-21 <input type="checkbox"/> 1LP-22	
94. <input type="checkbox"/> Start 1C LPI PUMP.	
95. <input type="checkbox"/> IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
96. <input type="checkbox"/> IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
97. Start: ___ A OUTSIDE AIR BOOSTER FAN ___ B OUTSIDE AIR BOOSTER FAN	
98. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
99. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CR SRO desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
100. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
101. ___ Secure makeup to the LDST.	
102. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
103. ___ Verify Unit <u>2</u> turbine tripped.	___ GOTO Step 106.
104. ___ Close <u>2</u> LPSW-139.	
105. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers \leq 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow \leq 6000 gpm.
106. ___ Close 1LPSW-139.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
107. Place in FAIL OPEN: ___ 1LPSW-251 FAIL SWITCH ___ 1LPSW-252 FAIL SWITCH	
108. ___ Start <u>all available</u> LPSW pumps.	
109. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ GOTO Step 111.
110. Open: ___ 1LPSW-4 ___ 1LPSW-5	___ IF both are closed: ___ 1LPSW-4 ___ 1LPSW-5 THEN notify SRO to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
111. ___ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
112. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
113. ___ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
114. ___ IAAT ES channels 5 & 6 have actuated, THEN perform Step 115.	___ GOTO Step 116.
NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.	
115. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
116. __ IAAT ES channels 7 & 8 have actuated, THEN perform Step 117 - 118.	__ GOTO Step 119.
117. Perform <u>all</u> : __ Place ES CH 7 in MANUAL. __ Place ES CH 8 in MANUAL.	<div>NOTE<ul style="list-style-type: none">• Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels.• In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.</div> <div>1. __ IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. __ IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</div>
118. __ Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	__ Notify SRO to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
119. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
120. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
121. __ IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
122. __ WHEN CR SRO approves, THEN EXIT .	

CRITICAL TASKS

CT-17 Isolating a steam generator means to stop all feedwater flow (MFW and EFDW) and steam flow. Feedwater flow should be maintained to the unaffected steam generator and cooling stabilized using the unaffected steam generator. **(Page 21)**

CT-5 MU/HPI flow must be throttled to prevent overpressurizing the RCS when SCM exists by keeping the RC pressure below the RV P-T limit. HPI flow must be maintained within acceptable operational bounds. This requires maintaining HPI flow greater than the minimum allowable pump flow rate and less than the pump runout flow rate. **(Page 29)**

45 DAY SUBMITTAL

SAFETY: Take a Minute**UNIT 0 (OSM)**

SSF Operable: No KHU's Operable: U1 - OH, U2 - UG LCTs Operable: 2 Fuel Handling: No

UNIT STATUS (CR SRO)

Unit 1 Simulator	Other Units	
Mode: 1	Unit 2	Unit 3
Reactor Power: 19%	Mode: 1	Mode: 1
Gross MWE: 0	100% Power	100% Power
RCS Leakage: 0.11 gpm	EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm		

Technical Specifications/SLC Items (CR SRO)

Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
SSF	Yesterday / 0100	7 Days / 0100	3.10.1 A - E

Shift Turnover Items (CR SRO)**Primary**

- The SSF can be declared operable once Core Thermal Power reaches > 85% Full Power.
- OATC Add 75 gal from CBAST(CBAST pump in Auto) to withdraw rods an additional 10% per maneuvering plan
- Primary Chemist requests both Letdown Filters in service until 100% power

Secondary

- 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event.
- MT at 1800 RPM waiting on turbine crew to complete local vibration readings to parallel the TG to the grid. (Probably 1 - 2 hours). Begin at step 2.47 of OP/1/A/1106/001 Encl. 4.1 when directed to continue with paralleling T/G.
-

Reactivity Management (CR SRO)

RCS Boron 1660 ppmB	Gp 7 Rod Position: 22% Withdrawn	Make-up to LDST as necessary per the Maneuvering Plan.
---------------------	-------------------------------------	---

Human Performance Emphasis (OSM)

Procedure Use and Adherence

<div>Duke Energy Oconee Nuclear Station TURBINE GENERATOR</div> <div>Multiple Use</div>	Procedure No. OP/1/A/1106/001	
	Revision No. 126	
	Electronic Reference No. OX002VM9	
PERFORMANCE	<div>***** UNCONTROLLED FOR PRINT *****</div> <div>(ISSUED) - PDF Format</div>	

Turbine Generator

1. Purpose

To describe proper method for operating Turbine Generator.

2. Limits And Precautions {18}

- 2.1 Use of this procedure can affect core reactivity management due to changes in steam load. (R.M.)
- 2.2 When changing steam loads, monitor RCS temperatures to prevent exceeding limits.
- 2.3 Turbine should **NOT** be operated above 1200 rpm with back pressure > 5 inches Hg. absolute.
- 2.4 Low Load Operation Limits:
 - 2.4.1 Maintain Exhaust Hood temperatures $\leq 175^{\circ}\text{F}$ during low load operation. With $> 125^{\circ}\text{F}$ Exhaust Hood temperatures increase load slowly until temperature falls below 125°F .
 - 2.4.2 When exhaust hood temperature is 125°F or less, Turbine is available for load increase per OP/1/A/1102/004 (Operation At Power).
 - 2.4.3 Operation below 5% load (45 MWe) should be at minimum to prevent moisture erosion.
 - 2.4.4 Motoring of Generator is to be avoided.
- 2.5 At 1800 rpm, minimum Turbine oil cooler outlet temperature is 100°F . Oil cooler outlet temperature should be $\geq 90^{\circ}\text{F}$ before accelerating above 100 rpm. Normal operating oil cooler outlet temperature is 110°F to 120°F . {2}
- 2.6 Maximum oil temperature rise across journal bearing is 50°F . Any oil drain temperature $> 150^{\circ}\text{F}$ is abnormal and should be reported to Unit Operations Manager or Operations Duty Engineer.
- 2.7 Maximum oil temperature rise across thrust bearing is 45°F . Maximum metal temperature is 190°F . Normal operating metal temperatures are 140°F to 175°F for active plate and 125°F to 150°F for inactive plate.
- 2.8 Minimum allowed cold gas temperature is 30°C when Generator is online.
- 2.9 Do **NOT** exceed limits as shown on Enclosure 4.5 (Capability Curve). {48}

- 2.10 No voltage should be placed on generator unless turbine is rotating at > 900 rpm and sufficient gas pressure is available for cooling.
- 2.11 If Generator is operated without field, Turbine should be immediately tripped off line and shut down for inspection.
- 2.12 Following trip out due to Differential Phase Relays, both armature and field windings should be meggered and otherwise inspected before attempting to resynchronize.
- 2.13 If Turbine speed reaches 2010 rpm, during overspeed testing, notify Operator at Front Standard to manually trip Turbine. {35}
- 2.14 Turbine should **NOT** be rolled to speed and synchronized unless within following limits: {7}
- DIFF EXP between - 0.180 inches & + 0.130 inches.
 - ROTOR EXP between 0.05 inches & 01.865 inches.
- 2.15 Reduce Turbine Generator load at rate < 5% per minute (45 MWe/min) below \approx 150 MWe.
- 2.16 Maximum allowable side to side differential temperature across Low Pressure Turbines is 50°F.
- 2.17 Load increases to rated load will be maintained within following limitations:
- 2.17.1 Rate of Change of First Stage Shell Inner Surface Temperature shall **NOT** exceed 150°F/Hr.
- 2.17.2 Above and to left of curve per Enclosure 4.4 (First Stage Metal Temperature Inner vs Percent Load).
- 2.17.3 First Stage Shell Inner and Outer Surface Temperature ΔT should **NOT** exceed 75°F.
- 2.18 Control Valve Casing Inner and Outer Metal Temperature should **NOT** exceed Difference Limit.
- 2.19 Refer to Enclosure 4.6 (Oconee Generator Operating Limits) for Voltage, Current and Temperature Limits.
- 2.20 If unit is to be out of service for extended time period, bearing lubricating oil system should be operated for at least 1/2 hour per week to maintain protective surface oil film throughout lubrication system. Turbine should be put on turning gear about 5 minutes during each 1/2 hour periods.

- 2.24 Emergency Bearing Oil Pump will automatically start due to any of the following conditions:
- Turbine Bearing Oil Header Pressure < 10 psi.
 - Loss of AC Power to Turning Gear Oil Pump. EBOP may start on Turbine trip due to under voltage to TGOP. {20}
 - Turning Gear Oil Pump overload actuation.
 - Turning Gear Oil Pump internal thermostat actuation.
- 2.25 Turbine should be on Turning Gear > 48 hours prior to rolling for initial startup. If this is **NOT** possible, ensure Turbine on Turning Gear > 4 hours prior to rolling for initial startup and notify Engineering. If Turbine is stopped for > 10 minutes at a time during 4 hour roll, 4 hour Turning Gear operation must be repeated to prevent Turbine Shaft bowing. {10}
- 2.26 Isolated Phase Bus Cooling System should be in service for a minimum of 2 hours to prior to placing Generator online or backcharging Main Transformer . This is for humidity removal.
- 2.27 Minimum of 18.05 Generator kV must be maintained. Operation with leading PF is acceptable.
- 2.28 To limit degradation of PCB grading capacitors, when any 230 KV Switchyard PCB is opened, Disconnects for that PCB should be opened within 4 hours. Conversely, PCB should be closed within 4 hours after closing PCB's Disconnects. If this time frame is exceeded, Switchyard Coordinator should be contacted to evaluate capacitor condition. {22}
- 2.29 Do **NOT** decelerate Turbine to lower speed and hold. This can result in internal damage to Turbine. If Turbine speed reduction is required, TURBINE TRIP pushbutton should be used.
- 2.30 When Main Transformer cooling is changed for maintenance through breaker manipulations or lead group changes, ensure RES ENG reviews transformer loading capacity to ensure excess numbers of coolers are **NOT** taken out of service. {50}
- 2.31 Maneuvering the unit to a lower power level with CV#4 failed in the open position may cause excessive vibration. Vibration, most likely, will be experienced on MT Bearings #1 and #2. {55}

3. Procedure

None

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 4 of 27

- ~~1.16~~ **IF** oil sample **NOT** in progress or previously obtained per OP/1/A/1106/012 (Turbine Lube Oil), notify Maintenance (PM-2) to sample Unit 1 Turbine Lube Oil for water content. {51}

JACK WALSH TODAY
Person Notified Date

- ~~1.17~~ Notify SOC of estimated time the Turbine will be placed on-line.

Bill Smith TODAY
Person Notified Date

- ~~1.18~~ Review Limits and Precautions.

2. Procedure

- 2.1 **IF AT ANY TIME** Turbine will **NOT** be placed on-line as expected, notify SOC of new estimated time the Turbine will be placed on-line.

Person Notified Date

- ~~2.2~~ Ensure operating TURBINE MOTOR SUCTION PUMP.

- ~~2.3~~ Ensure relays reset:

- ~~•~~ GENERATOR LOCKOUT 86GA (1EB4).
- ~~•~~ GENERATOR LOCKOUT 86GB (1EB4).
- ~~•~~ GENERATOR BACK-UP LOCKOUT 86H (1EB4).
- ~~•~~ GENERATOR BACK-UP SHUTDOWN 86HY (1EB4).

- ~~2.4~~ Perform the following:

- ~~2.4.1~~ Ensure closed 1HO-1 (Pump Bypass Valve). (T-1-E14)
- ~~2.4.2~~ Ensure EHC PUMP TRANSFER switch aligned to appropriate pump.
- ~~2.4.3~~ Ensure STANDBY EHC PUMP in AUTO.
- ~~2.4.4~~ Ensure note "1HO-1 open to prevent overheating EHC system oil" removed from on Turnover Sheet.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 7 of 27

NOTE: To heat LP Turbine Rotor and Blades, SSH pressure should be maintained as high as possible.

2.12 Perform the following:

2.12.1 Ensure open 1AS-8 (AS TO STEAM SEAL REG).

2.12.2 Maintain 1.5 psig to 3 psig SSH pressure by Adjusting Steam Seal Pressure per OP/1/A/1106/013 (Steam Seal System).

2.13 Ensure complete Section 3 (Generator Support System Alignments).

NOTE: Turbine crew furnishes observer during refueling startups. Operations furnishes observer during forced outage startups if Turbine crew **NOT** available.

2.14 **IF AT ANY TIME** TSI (Turbine Supervisory Instrumentation) unavailable for Main Turbine RPM indication, ensure observer established at Main Turbine to ensure Turbine remains on Turning Gear.

Observer

Date

2.15 **IF AT ANY TIME** T/G trips while Steam Chest Warming in progress, perform **one** of the following:

- **IF** cause of T/G trip is known **AND** has been corrected, begin Enclosure 4.10 (Steam Chest Warming).
- **IF** T/G shutdown is required, Go To Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

2.16 Perform Enclosure 4.10 (Steam Chest Warming).

Date Time

2.17 **IF** scheduled, perform PT/1/A/0290/002 (Main Steam Stop Valve Closure Time Test).

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 8 of 27

TADG
✓ 2.18 **IF** PT/1/A/0290/002 (Main Steam Stop Valve Closure Time Test) was performed, perform the following:

2.18.1 **IF AT ANY TIME** T/G trips while Steam Chest Warming in progress, perform **one** of the following:

- _____ • **IF** cause of T/G trip is known **AND** has been corrected, begin Enclosure 4.10 (Steam Chest Warming).
- _____ • **IF** T/G shutdown is required, Go To Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

TADG
✓ 2.18.2 Perform Enclosure 4.10 (Steam Chest Warming).

TADG 0300
Date Time

NOTE: Chemistry access to the Turbine Building Basement is allowed to place additional powdex cells in service during turbine startup.

TADG
✓ 2.19 Prior to Turbine Shell Warming, clear Turbine Building Basement of non-essential personnel. {19}

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 9 of 27

2.20 **IF AT ANY TIME** T/G trips while Turbine Shell Warming in progress, perform **one** of the following:

- **IF** cause of T/G trip is known **AND** has been corrected, perform the following:
 - _____ A. **Begin** Enclosure 4.9 (Turbine Shell Warming). {4}
 - B. **IF** automatic prewarming MSRHR Second Stage Tube bundles was in progress, perform the following:

NOTE: Enclosure "MSRHR Valve Logic" of OP/1/A/1106/014 (Moisture Separator Reheater) contains detailed information on MSRHR valve controls.

1. Reset automatic logic for prewarming MSRHR Second Stage Tube bundles: {4}
 - a. Ensure Moore Controllers in Manual/Closed:
 - _____ • 1MS-112 (SSRH 1A CONTROL)
 - _____ • 1MS-173 (SSRH 1B CONTROL)
 - b. Recommence automatic prewarming MSRHR Second Stage Tube bundles by placing Moore Controllers in Automatic:
 - _____ • 1MS-112 (SSRH 1A CONTROL) depress A/M pushbutton and ensure green LED is lit.
 - _____ • 1MS-173 (SSRH 1B CONTROL) depress A/M pushbutton and ensure green LED is lit.
- _____ • **IF** T/G shutdown is required, **Go To** Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

CAUTION: For ≥ 1 hour prior to Turbine Shell warming, Turbine must be on Turning Gear and eccentricity < 2 mil to prevent damage if it rolls off turning gear or Engineering evaluation performed. {10}

2.21 After Steam Chest Warming complete, begin or continue Enclosure 4.9 (Turbine Shell Warming). {4}

Date Time

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 10 of 27

- Team*
- [Signature]* 2.22 During Turbine Shell Warming **AND** First Stage Inner Metal Temperature > 220°F; begin Section "SSRH Prewarming" of Enclosure "Startup of Moisture Separator Reheaters" per OP/1/A/1106/014 (Moisture Separator Reheaters). {4}

- Team plus*
- [Signature]* 2.23 After "Turbine Shell Warming" **AND** "SSRH Prewarming" have been performed, continue this procedure.

2.24 **IF AT ANY TIME** T/G trips while Steam Chest Warming in progress, perform **one** of the following:

- **IF** cause of T/G trip is known **AND** has been corrected, perform the following:

NOTE: Enclosure "MSRH Valve Logic" of OP/1/A/1106/014 (Moisture Separator Reheater) contains detailed information on MSRH valve controls.

A. Reset automatic logic for prewarming MSRH Second Stage Tube bundles: {4}

1. Ensure Moore Controllers in Manual/Closed:

- _____ • 1MS-112 (SSRH 1A CONTROL)
- _____ • 1MS-173 (SSRH 1B CONTROL)

2. Recommence automatic prewarming MSRH Second Stage Tube bundles by placing Moore Controllers in Automatic:

- _____ • 1MS-112 (SSRH 1A CONTROL) depress A/M pushbutton and ensure green LED is lit.
- _____ • 1MS-173 (SSRH 1B CONTROL) depress A/M pushbutton and ensure green LED is lit.

_____ B. Begin Enclosure 4.10 (Steam Chest Warming).

- _____ • **IF** T/G shutdown is required, Go To Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 11 of 27

- 2.25 After "Turbine Shell Warming" AND "SSRH Prewarming" have been performed, begin or continue Enclosure 4.10 (Steam Chest Warming).

Date Time

- 2.26 Perform the following:

- Perform the following:

- A. Ensure Rx Power at 19-20% per OP/1/A/1102/001 (Controlling Procedure For Unit Startup). (R.M.) {26} {40}
- B. Ensure ICS Turbine Loading Status is "FALSE". (Graphic MT02) (R.M.) {26} {40}
- C. Ensure at least one SG off Low Level Limits. (R.M.) {40} {58}
- Perform section "Startup Operation" of Enclosure "Startup of Moisture Separator Reheaters" per OP/1/A/1106/014 (Moisture Separator Reheaters). {4}

NOTE:

- If Turbine is stopped for > 10 minutes at a time during 4 hour roll, 4 hour Turning Gear operation must be repeated to prevent Turbine Shaft bowing. {10}
- Turning Gear Timer is available on Turbine HMI.

- Ensure Turbine on Turning Gear > 4 hours {10}
- Ensure ECCENTRICITY < 2 mil for ≥ 4 hours or Engineering evaluation performed. {10}
- Ensure Standby EHC Pump NOT running AND in AUTO.
- Ensure DIFF EXP between - 0.180 inches & + 0.130 inches.
- Ensure ROTOR EXP between 0.05 inches & 01.865 inches.
- IF Turbine overspeed testing is required, begin Enclosure 4.13 (Methods to Raise Exhaust Hood Temperatures). {38}
- Perform Enclosure 4.12 (Steam Trap Bypass Valve Checklist). {4}
- Verify closed 1TP1 Bkr 1-8-21 (U1 Main Transformer Cooler Groups 1 & 2 Control Power). (East of Turbine Bld @ Main Transformer)
- Ensure complete Section 4 (Alignments For Placing Generator Online)

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 12 of 27

TODAY

[Handwritten marks]

- Ensure Bearing Oil Hdr Pressure ≈ 25 psig (Turbine Front Standard)
- Ensure Bearing Header Oil Temperature $\geq 80^{\circ}\text{F}$ (Turbine Front Standard)
- Ensure Pump Suction Pressure > 15 psig (Turbine Front Standard)
- Ensure Turbine Bearing Oil Discharge Flow from all bearings.

NOTE: Closing PCB within 4 hours of closing associated disconnects limits degradation of PCB grading capacitors. Failure to close PCB within 4 hours will require notification of Switchyard Coordinator. {22}

• Perform the following: {22}

- [Handwritten mark]* A. Ensure locked closed PCB-20 Red Bus Disconnect
- [Handwritten mark]* B. Ensure locked closed PCB-20 Yellow Bus Disconnect
- [Handwritten mark]* C. Record time PCB-20 disconnects closed 0800.
- [Handwritten mark]* D. Ensure locked closed PCB-21 Red Bus Disconnect
- [Handwritten mark]* E. Ensure locked closed PCB-21 Yellow Bus Disconnect
- [Handwritten mark]* F. Record time PCB-21 disconnects closed 0805.

• Perform one of the following: {51}

- [Handwritten mark]* ☐ Ensure Turbine Lube Oil water content $\leq 0.1\%$.
- [Handwritten mark]* ☒ Ensure Engineering evaluation performed.

NOTE: Chemistry access to the Turbine Building Basement is allowed to place additional powdex cells in service during turbine startup.

- [Handwritten mark]* • Ensure Unit 1 Turbine Building Basement **AND** Ground floors are clear of non-essential personnel.
- [Handwritten mark]* • Ensure operator stationed to manually adjust Generator Seal Oil ΔP per OP/1/A/1106/010 (Generator Hydrogen Seal Oil System) during speed increase. {27}
- [Handwritten mark]* • Ensure complete Enclosure 4.10 (Steam Chest Warming) AND Main Steam Chest Pressure $> 80\%$ Main Steam Line Pressure.

TODAY 0810
Date Time

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 13 of 27

TECH
2.27 Prior to rolling Turbine, adjust 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) as follows:

2.27.1 Ensure 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) in MANUAL.

NOTE: MTOT Oil Cooler Temperature will increase as Turbine speed increases.

2.27.2 Adjust 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) to obtain $\approx 115^{\circ}\text{F}$ during Turbine startup.

2.28 **IF AT ANY TIME** T/G trips during 100 RPM checks (step 2.29 to step 2.37), perform **one** of the following:

- _____ • Perform Enclosure 4.17 "Restart During Turbine Generator Startup". {41}
- _____ • Go To Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

2.29 Ensure SLOW (≈ 60 rpm/min) selected on STARTING RATE.

- NOTE:**
- During Turbine acceleration ΔT between First Stage Shell Inner and Outer Metal should **NOT** exceed 75°F and heatup rate of First Stage Shell Inner metal should be $< 150^{\circ}\text{F/hr}$.
 - Do **NOT** decelerate Turbine to lower speed and hold. This can result in internal damage to Turbine. If Turbine speed reduction is required, TURBINE TRIP pushbutton should be used. {41}
 - Turbine speed will initially overshoot, but control at 100 rpm after coastdown. {34}

2.30 **IF AT ANY TIME** Turbine Speed exceeds 500 rpm with 100 RPM selected, perform the following: {34}

- _____ A. Depress TURBINE TRIP pushbutton.
- _____ B. Notify Engineering.
- _____ C. Go To step 2.28.

2.31 Ensure 100 RPM selected on SELECT SPEED TARGET.

TECH
0900
Date Time

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 14 of 27

~~2.32~~ Perform the following:

- ~~✓~~ • Ensure Turning Gear disengages.
- ~~✓~~ • Begin sound out of Turbine for rubs and vibration

NOTE: IVs may be closed at 100 - 500 rpm.

~~2.33~~ **WHEN** Turbine at 100 - 500 rpm, perform one of the following.

- ~~✓~~ • Manually stop TURBINE TURNING GEAR.
- ~~N/A~~ ~~✓~~ • **IF** Speed 'A' is failed, ensure TURBINE TURNING GEAR in "PULL TO LOCK".
{32}

~~2.34~~ Monitor the following:

- ~~✓~~ • MSRH Steam Supply parameters
- ~~✓~~ • Turbine Metal and Steam Temperatures
- ~~✓~~ • Expansion (Shell and Rotor)
- ~~✓~~ • Bearing Oil Temperatures

NOTE: MTOT Oil Cooler Temperature will increase as Turbine speed increases.

2.35 Perform the following:

- ~~✓~~ • Ensure TURBINE OIL COOLER OUTLET Temperature is $\geq 90^{\circ}\text{F}$. {2}
- ~~✓~~ • Adjust 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) in MANUAL to obtain $\approx 115^{\circ}\text{F}$ during Turbine startup.

NOTE: Valves may be operated concurrently.

~~2.36~~ Close MSV before seat drains: (continue)

- ~~✓~~ • 1SD-418 (#4 STOP VLV BEFORE SEAT DRN).
- ~~✓~~ • 1SD-420 (#2 STOP VLV BEFORE SEAT DRN).
- ~~✓~~ • 1SD-421 (#1 STOP VLV BEFORE SEAT DRN).

Today

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 15 of 27

- NOTE:**
- Continue Turbine startup while opening Extraction valves.
 - Emergency Hi Interlock Bypass buttons should **NOT** be used at this time. OP/1/A/1102/001 (Controlling Procedure For Unit Startup) will open any Extraction valves that cannot be opened at this time.
 - N/A any valves that cannot be opened due to Emergency High Heater levels.
 - Slowly throttling open Extraction valves is **NOT** required due to low steam flows.

2.37 After sound out of Turbine complete, begin opening Extraction valves:

NOTE: Supply Bypasses 1LPE-9 & 1HPE-37 are only open to minimize ΔP across Supply valves 1LPE-10 & 1HPE-36. No signoff required.

- LB• 1LPE-9 (1LPE-10, D Htr Supply Bypass)
- LB• 1LPE-10 (D Htrs Bleed Inlet)
- LB• 1HPE-37 (1HPE-36, C Htr Supply Bypass)
- LB• 1HPE-36 (C Bleed Supply)
- LB• 1HPE-28 (Bleed Inlet)
- LB• 1HPE-24 (Bleed Inlet)
- LB• 1HPE-10 (Bleed Inlet)
- LB• 1HPE-6 (Bleed Inlet)

TOD

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 16 of 27

2.38 **IF AT ANY TIME** T/G trips prior to going online (step 2.39 to step 2.55), perform one of the following:

- _____ • Perform Enclosure 4.17 "Restart During Turbine Generator Startup". {41}
- _____ • Go To Enclosure 4.2 (Turbine Generator Shutdown) and exit this enclosure.

CAUTION: Do **NOT** decelerate Turbine to lower speed and hold. This can result in internal damage to Turbine. If Turbine speed reduction is required, TURBINE TRIP pushbutton should be used. {41}

TOD
2.39 Perform the following to accelerate Turbine Generator to rated speed:

TOD 2.39.1 Ensure operator stationed to manually adjust Generator Seal Oil ΔP per OP/1/A/1106/010 (Generator Hydrogen Seal Oil System) during speed increase. {27}

TOD 2.39.2 Ensure SLOW (≈ 60 rpm/min) selected on STARTING RATE.

TOD 2.39.3 Ensure 1800 RPM selected on SELECT SPEED TARGET.

TOD 0930
Date Time

TOD 2.39.4 Monitor Turbine instrumentation during acceleration.

TOD 2.39.5 At ≈ 800 rpm, select FAST (≈ 180 rpm/min) on STARTING RATE.

TOD 2.39.6 At > 900 rpm, stop TURBINE OIL BRNG LIFT PUMPS.

TOD 2.39.7 At ≈ 1400 rpm, select SLOW (≈ 60 rpm/min) on STARTING RATE.

TOD 2.40 **WHEN** Turbine at ≈ 1800 rpm, record:

TOD 1000
Date Time

TOD 2.41 Adjust 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) in MANUAL for $\approx 115^{\circ}\text{F}$.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 17 of 27

~~2.42~~ Ensure at Front Standard:

- ~~•~~ Bearing Oil Hdr pressure \approx 25 psig.
- ~~•~~ Pump Suction pressure $>$ 15 psig.
- ~~•~~ Operating Oil pressure \geq 200 psig.
- ~~•~~ Bearing Header Oil temperature \approx 115°F.

~~2.43~~ Perform the following:

- ~~2.43.1~~ Stop TURBINE MOTOR SUCTION PUMP.
- ~~2.43.2~~ Ensure TURBINE MOTOR SUCTION PUMP switch in AUTO.
- ~~2.43.3~~ Stop TURBINE TURNING GEAR OIL PUMP.
- ~~2.43.4~~ Ensure TURBINE TURNING GEAR OIL PUMP switch in AUTO.

~~2.44~~ Perform PT/1/A/0290/011 (Mechanical Oil Trip Valve Test).

~~2.45~~ Perform Enclosure 4.7 (Resetting Generator Core Monitor). (continue)

NOTE: Two persons will be needed to secure personnel and vehicle traffic (One north and one south of Unit 1 Main Transformer).

~~2.46~~ Ensure road/walkway east of Unit 1 Main Transformer is clear of all personnel and vehicle traffic.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 18 of 27

2.47 **WHEN** online operation is desired, perform the following:

- _____ 2.47.1 Ensure AVR CONTROL ENABLE in REMOTE.
- _____ 2.47.2 Ensure VOLTAGE REGULATOR MODE in MANUAL.
- _____ 2.47.3 Ensure closed GEN FIELD BREAKER.

NOTE: Generator Output Voltage will slowly increase to 17.70 kV to 18.4 kV.

- _____ 2.47.4 Ensure EXCITATION is ON.

2.48 **WHEN** Generator Output Voltage 17.70 kV to 18.4 kV, perform the following:

NOTE: VOLTAGE REGULATOR MODE Ready Light (Amber light) should be ON.

- _____ 2.48.1 **IF** synchronization with Voltage Regulator in AUTO is desired, ensure VOLTAGE REGULATOR MODE in AUTO.

CAUTION: Do **NOT** excite Generator > 19.95 KV. Generator winding damage may result.

- _____ 2.48.2 **Slowly** increase GEN OUTPUT VOLTS up to rated voltage \approx 19 KV with VOLTAGE ADJUST.

2.49 **IF** Voltage Regulator testing scheduled, perform the following:

- _____ 2.49.1 Ensure VOLTAGE REGULATOR MODE in AUTO.
- _____ 2.49.2 Perform Voltage Regulator testing as required per IP/0/B/2005/001 (Main Generator Automatic Voltage Regulator Maintenance And Channel Transfer).

_____ 2.50 Ensure GEN U.V. UNIT BLOCKING switch (1EB3) to NORM.

_____ 2.51 Notify System Operating Center (SOC) that Turbine Generator is ready to be paralleled to system and that Voltage Regulator Mode is one of the following:

- ☐ AUTO
- ☐ MANUAL

_____ 2.52 Close TRANSFORMER #1 MOTOR OPERATED DISCONNECTS.

_____ 2.53 Turn (PCB-20 **OR** PCB-21) SYNCHRONIZING switch to SYNCH for Generator Breaker to be closed first.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 19 of 27

2.54 Adjust Turbine Generator speed and voltage:

- _____ • **IF** automatic Speed adjustment is desired, select SPEED MATCH on SELECT SPEED TARGET.

NOTE: Manual Speed adjustment is very slow to respond. {31}

- _____ • **IF** Manual Speed adjustment is desired:

_____ A. Ensure 1800 RPM selected on SELECT SPEED TARGET.

_____ B. Use TURBINE SPEED CHANGER to adjust Generator speed until slow clockwise rotation of SYNCHROSCOPE pointer is established.

- _____ • **IF** Generator Voltage adjustment required, use VOLTAGE ADJUST to adjust T1 OUTPUT VOLTS to match SWITCHYARD VOLTS.

2.55 Perform the following:

- _____ • Ensure slow clockwise rotation of SYNCHROSCOPE pointer.

- _____ • **WHEN** SYNCHROSCOPE pointer is vertical, ensure match of T1 OUTPUT VOLTS and SWITCHYARD VOLTS

_____ 2.56 **WHEN** SYNCHROSCOPE pointer is $\approx 5^\circ$ before reaching vertical, parallel by closing associated GENERATOR BREAKER (PCB-20 **OR** PCB-21).

_____ 2.57 Observe GENERATOR BREAKER closes **AND** SYNCHROSCOPE pointer stops in vertical position.

_____ 2.58 Turn OFF appropriate SYNCHRONIZING switch.

_____ 2.59 Establish Generator load of ≈ 35 MWe, by using one of the following:

- ☐ TURBINE SPEED CHANGER
- ☐ LOAD REFERENCE DEMAND
- ☐ TURBINE MASTER

_____ 2.60 Record:

_____/_____
Date Time

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 20 of 27

2.61 To close second Generator Breaker, perform the following:

- _____ 2.61.1 Turn SYNCHRONIZING switch to SYNCH for second Generator Breaker.
- _____ 2.61.2 **WHEN** SYNCHROSCOPE pointer is vertical, close second GENERATOR BREAKER.
- _____ 2.61.3 Observe GENERATOR BREAKER closes.
- _____ 2.61.4 Turn OFF appropriate SYNCHRONIZING switch.

NOTE: Closing PCB within 4 hours of closing associated disconnects limits degradation of PCB grading capacitors. Failure to close PCB within 4 hours will require notification of Switchyard Coordinator. {22}

- _____ 2.62 **IF AT ANY TIME** PCB-20 or PCB-21 **NOT** closed within 4 hours of times recorded in step 2.26, notify Switchyard Coordinator to evaluate capacitor condition. {22}

Person Notified

Date

- _____ 2.63 Secure from personnel maintaining road/walkway clear east of Unit 1 Main Transformer.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 21 of 27

2.64 Load Turbine Generator:

- _____ 2.64.1 Ensure Generator Output \approx 35 MWe.
- _____ 2.64.2 Ensure TURBINE AUTO LOAD PERMISSIVE satisfied.
- _____ 2.64.3 Ensure TURBINE MASTER control station to "AUTO".

NOTE:

- Steps 2.64.4 through 2.64.7 may be repeated as required.
- De-selecting the TURBINE LOAD pushbutton will result in stoppage of opening the Turbine Control Valves any further. Likewise, de-selecting the TURBINE UNLOAD pushbutton will also result in stoppage of closing the Turbine Control Valves any further.

- _____ 2.64.4 **IF AT ANY TIME** it is desired to stop loading the turbine, de-select the "TURBINE LOAD" Pushbutton.
- _____ 2.64.5 **IF AT ANY TIME** it is desired to stop unloading the turbine, de-select the "TURBINE UNLOAD" Pushbutton.
- _____ 2.64.6 **IF AT ANY TIME** it is desired to unload the Turbine Generator, perform the following:
 - _____ A. Select TURBINE UNLOAD button.
 - _____ B. Ensure TBVs throttle open
 - _____ C. Ensure Turbine Generator MWe decrease
- _____ 2.64.7 Select "TURBINE LOAD" Pushbutton.

_____/_____
Date Time

- _____ 2.64.8 Verify TURBINE BYPASS VALVES close.
- _____ 2.64.9 Verify "TURBINE LOAD" pushbutton lamp extinguishes.
- _____ 2.64.10 Ensure Generator Output \geq 90 MWe.

- _____ 2.65 Adjust 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) in MANUAL for \approx 115°F.
- _____ 2.66 Announce on plant page Unit 1 Turbine Building cleared for entry.

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 22 of 27

NOTE: Substeps may be performed in any order or concurrently.

2.67 Perform the following:

NOTE: Delays in raising Exhaust Hood Temperatures will delay overspeed testing. {38}

- _____ 2.67.1 **IF** Turbine overspeed testing is required, ensure vacuum reduced per Enclosure 4.13 (Methods to Raise Exhaust Hood Temperatures). {38}
- _____ 2.67.2 Begin Extraction Valve Startup Operation per OP/1/A/1106/023 (High and Low Pressure Extraction). {13}
- _____ 2.67.3 Perform Enclosure 4.16 (Extraction Line Steam Trap Bypass Isolation Checklist).
- 2.67.4 Ensure closed:
 - _____ • 1SD-419 (#3 STOP VLV BEFORE SEAT DRN)
 - _____ • 1SD-273 (COMB CTRL VLV BEFORE SEAT DRN)
 - _____ • 1SD-284 (#2 CTRL VLV LEAD STM DRN)
 - _____ • 1SD-285 (#1 CTRL VLV LEAD STM DRN)
- 2.67.5 Reset IPB Ground Fault relays on 1EB6:
 - _____ • ISOLATED PHASE BUS X GROUND FAULT
 - _____ • ISOLATED PHASE BUS Y GROUND FAULT
 - _____ • ISOLATED PHASE BUS Z GROUND FAULT
- 2.67.6 Ensure open:
 - _____ • TURBINE STOP VALVES
 - _____ • REHEAT/INTERCEPT VALVES.
 - _____ • TURBINE CONTROL VALVES (As Required)
- _____ 2.67.7 Ensure Hydrogen Analyzer is aligned for Normal Operation (Generator Operating) per OP/1/A/1106/017 (Hydrogen System).

Enclosure 4.1
Turbine Generator Startup

OP/1/A/1106/001
Page 23 of 27

SRO

2.68 **IF** Outage schedule requires, complete Enclosure 4.14 (Turbine Generator Overspeed Testing During Startup).

2.69 **IF** T/G shutdown required:

2.69.1 Forward copy of this enclosure to Operations Support Group (Procedure Section) (Mail Code ON0101).

2.69.2 Go To Enclosure 4.2 (Turbine Generator Shutdown).

NOTE: Remainder of this enclosure **NOT** required if T/G shutdown.

2.70 **IF** T/G shutdown **NOT** required, continue with Unit startup per OP/1/A/1102/001 (Controlling Procedure For Unit Startup).

NOTE: If 1LPSW-51 will **NOT** control in AUTO, OP/1/A/1106/012 contains information for abnormal operation.

2.71 Ensure 1LPSW-51 (MTOT COOLER TEMP CONTROLLER) adjusted in AUTO to obtain $\approx 115^{\circ}\text{F}$ during Turbine startup.

NOTE: Rapidly closing 1AS-35 could cause AS relief valve to lift.

2.72 Isolate Aux Steam to 'E' Heaters:

2.72.1 Close 1AS-35 (AS TO E HTRS CONTROL VALVE).

2.72.2 Close 1AS-34 (AUX STEAM TO E HTRS BLOCK).

2.72.3 Close 1C-298 (E Heater Aux Steam Desuperheater Control Inlet). (T-3-K/L18)

2.73 Begin Section "Turbine Online Operation" of Enclosure "Startup of Moisture Separator Reheaters" per OP/1/A/1106/014 (Moisture Separator Reheaters). {4}

_____/_____
Date Time

2.74 Ensure complete Extraction Valve Startup Operation per OP/1/A/1106/023 (High and Low Pressure Extraction). {13}

2.75 **IF** 1F1, 1F2, or 1F3 feedwater heater level controls **NOT** in auto on PCS HMI, as indicated by computer points O1L0400, O1L0401 and O1L0402, perform Enclosure 4.23 (Returning PCS HMI Controllers To Automatic).

Enclosure 4.1
Turbine Generator Startup

OP/**1**/A/1106/001
Page 24 of 27

- _____ 2.76 Remove note from turnover sheet to maintain > 45 psig Generator Hydrogen pressure and check Seal Oil Δ P/Seal Oil Float Trap operation if pressure decreases rapidly. {27}
- _____ 2.77 **IF** required, ensure complete Enclosure 4.13 (Methods to Raise Exhaust Hood Temperatures).
- _____ 2.78 Forward copy of this enclosure to Operations Support Group (Procedure Section) (Mail Code ON0101).

3. Generator Support System Alignments

- 3.1 Ensure Hydrogen Seal Oil System in operation per OP/1/A/1106/010 (Generator Hydrogen Seal Oil System).
- 3.2 Perform the following:
- 3.2.1 Ensure Electrical Generator is pressurized to > 45 psig with hydrogen per OP/1/A/1106/017 (Hydrogen System).
- 3.2.2 Ensure temporary low alarm of 45 psig inserted for Generator Hydrogen Pressure. {27}
- 3.2.3 Ensure note on turnover sheet to maintain > 45 psig Generator Hydrogen pressure and check Seal Oil ΔP /Seal Oil Float Trap operation if pressure decreases rapidly. {27}
- 3.3 Begin or ensure in progress startup of Stator Coolant system per OP/1/A/1106/009 (Generator Stator Cooling System).

NOTE: Major steps may be performed in any order or concurrently.

4. Alignments For Placing Generator Online

- 4.1 After Electrical Generator is pressurized to > 45 psig with hydrogen, ensure Stator Coolant system in operation per OP/1/A/1106/009 (Generator Stator Cooling System).

NOTE:

- Increasing warm Condensate flow through Hydrogen Cooler will increase Generator Stator Coil Outlet Temperatures.
- OAC Turn On Code is NOGENMS1.

- 4.2 Ensure Generator Stator Coil Outlet Temperature computer points above 68°F.

- 4.3 Ensure ALTEREX AIR TEMP controller is set to 0°F. (NW door of Alterex housing)

- 4.4 Ensure Isolated Phase Bus Cooling Inspection doors shut.

- 4.5 Ensure complete Enclosure 4.11 (Turbine Generator Electrical Alignment).

- 4.6 Perform the following: {8}

• Ensure open 1RCW-80 (Alterex Air Cooler A1 Inlet) (T-3-E26)

• Ensure open 1RCW-81 (Alterex Air Cooler A1 Outlet) (T-3-E26) {54}

• Ensure open 1RCW-82 (Alterex Air A1 Temp Control Inlet) (T-3-E26) {54}

• Ensure open 1RCW-84 (Alterex Air Cooler A1 Temp Control Outlet) (T-3-E26) {54}

• Ensure open 1RCW-85 (Alterex Air Cooler A1 Temp Control Byp) (T-3-E26)

• Ensure open 1RCW-86 (Alterex Air Cooler A1 Outlet Block) (T-3-E26)

Enclosure 4.1
Turbine Generator Startup

OP/**1**/A/1106/001
Page 27 of 27

4.7 **WHEN** Enclosure "Removing Backcharging From Unit 1 Main And Auxiliary Transformers" per OP/1/A/1107/005 (Backcharging Unit 1 Main And Auxiliary Transformers) complete **OR** Backcharge of Unit 1 Main And Auxiliary Transformers **NOT** performed, perform the following:

- _____ • Ensure Isolated Phase Bus Cooling System in service per OP/0/A/1106/011 (Generator Isolated Phase Bus Cooling System).
- _____ • Perform the following:
 - _____ A. Ensure complete Enclosure 4.20 (Main Transformer Cooling Group Startup).
 - _____ B. Ensure locally one main transformer cooling group is in operation.