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

Examiners: _____ Operators: _____**SRO**

_____ _____**OATC**

_____ _____**BOP**

Initial Conditions:

- Reactor Power = 100%

Turnover:

- Feedwater valve DP selected to 1A1 and 1B2 for maintenance
- ICS Diamond and FDW Masters are in HAND for Control Rod Movement PT
- AMSAC/DSS bypassed

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		Standby (1B) HPI pump auto start
0b	Override		Standby EHC pump fails to Auto start
1		N: OATC, SRO	Control Rod Movement PT (GP 1 Only)
2	MPS120 Override	C: BOP, SRO **(TS)**	1A HPIP Sheared Shaft, 1B HPIP fails to start in AUTO
3	MCS008	I: OATC, SRO	Loop B Tc Fails low
4	Override	C: OATC, SRO **(TS)**	Group 1 Rod 6 Control Rod drops, manual power reduction
5	MPS190	C: BOP, SRO **(TS)**	Spray valve fails open
6	Override	C: BOP, SRO	Lowering EHC pressure, Standby EHC pump fails to start
7	MSS010 MSS020 MSS260 MSS270	M: ALL	LOHT (CBPs trip) • 1C HPIP fails to start requiring RCS vents to be opened

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

Scenario 1

Event Summary

Event 1: The OATC will perform PT/1/A/0600/015, Encl. 13.2 (Control Rod Movement at Power). This will be performed for group 1 rods only.

Event 2: The 1A HPIP will experience a sheared shaft. Pump amps will decrease to approximately 10-15 amps, discharge pressure and flow will drop to ≈ 0. The 1B HPIP will not start in automatic requiring operator action. The crew will enter AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection), close 1HP-5, 1HP-120 and 1HP-31 and start the 1B HPIP. The crew should then restore the system to normal and enter TS for loss of the 1A HPIP.

Event 3: Loop B Tc will fail low causing control rods to withdraw and feedwater demand to decrease. The crew should perform Plant Transient Response (PTR) and place the ICS Diamond and FDW Loop Masters in MANUAL. The crew will perform AP/28 (ICS Instrument Failures). ICS will remain in MANUAL for the rest of the scenario.

Event 4: Control Rod Group 1 Rod 6 will drop into the core. Because ICS is in MANUAL, the OATC will have reduce power in MANUAL to $\leq$ 55%.

Event 5: After the power reduction, 1RC-1 (Pzr Spray Valve) fails open and will reduce RCS pressure. This will require the operator to close the block valve (1RC-3) to stabilize RCS pressure.

Event 6: EHC pressure will start lowering. The standby EHC pump will fail to start at 1350 psig and the low pressure alarm will actuate at 1300 psig. The operators must start the standby EHC pump prior to a turbine trip on low EHC pressure.

Event 7: Condensate Booster Pumps trip, MFWPs subsequently trip, MD EFDW pumps will fail to start and the TD EFDW pump will overspeed and trip. The crew will not be able to feed the SGs before the criteria to perform Rule 4 (HPI Forced Cooling) is satisfied. The 1C HPIP will fail to start (degraded HPI) which will require the crew to open RCS vents and transfer to the HPI CD tab of the EOP.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **1** Page 1 of 5

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

Time	Position	Applicant's Actions or Behavior
	SRO OATC	***Examiner Note: During the Control Rod Movement PT, the Unit 1 CRS will assume the role of the dedicated Reactivity Management SRO.*** ***PT/1/A/0600/015*** **Crew response:** SRO directs the OATC to perform PT/1/A/0600/015, Encl. 13.2 (Control Rod Movement at Power). **PT/1/A/0600/015, Encl. 13.2** Rev 26 3.1 **WHILE** enclosure is in progress, monitor the following indications: {8} • CRD position • Appropriate ranged NIs • RCS temperature • Neutron error 3.2 Ensure Rx Diamond and FDW Masters in Hand per Enclosure for Placing Rx Diamond/FDW Masters To Hand of OP/1/A/1102/004 A (ICS Operation).**(already in HAND)** 3.3 **IF AT ANY TIME** contingency actions directed by CRS, perform Section 4 (Contingency Actions) {4} **NOTE:** When operating switches on Diamond, maintain switch depressed until light indication changes state. 3.4 Perform the following: (R.M.) • Ensure SEQ OR is ON. • Ensure SAFETY RODS OUT BYPASS is ON. • Ensure RUN is ON. • Ensure SINGLE SELECT SWITCH selected to ALL. **NOTE:** CRD Groups 1-6 are required to be ≥ 95% withdrawn for Shutdown Margin Calculation at Power enclosure of PT/1/A/1103/015 (Reactivity Balance Procedure) to be valid. 3.5 **IF AT ANY TIME** any CRD Group 1-6 reaches 95% during insertion, stop inserting associated group. (R.M.)

This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **1** Page 2 of 5

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

Time	Position	Applicant's Actions or Behavior
	OATC	***PT/1/A/0600/015*** **Crew response:** 3.6 Perform the following to test CRD Group 1: (R.M.) ___ 3.6.1 Ensure GROUP SELECT SWITCH to 1. ___ 3.6.2 Ensure Group 1 CONTROL ON lights are ON. (PI panel) {5} **NOTE:** • 1SA-2/C-10 "CRD Safety Rods Not At Upper Limit" will alarm when Safety Groups are inserted. • Control rods should **NOT** be left inserted. Rod withdrawal should commence immediately after insertion is complete. ___ 3.6.3 Perform the following: {3} A. Insert CRD Group 1. B. **WHEN** all 100% lights OFF, stop insertion. C. Begin Group 1 withdraw to 100%. **NOTE:** In RUN speed, all rod motion is inhibited 12 seconds after first rod reaches OUT LIMIT. D. **WHEN** OUT LIMIT is ON, maintain WITHDRAW until CRD TRAVEL "Out" light OFF. ___ 3.6.4 Verify all 100% lights are ON for Group 1. (PI Panel) ___ 3.6.5 Verify unit is stable. ***Examiner Note: Steps 3.7 – 3.13 test Control Rod Groups 2-8. When completing the PT on GP 1 Control Rods, they should proceed to step 3.14 to return ICS to AUTOMATIC.*** **NOTE:** When operating switches on Diamond, maintain switch depressed until light indication changes state. 3.14 Perform the following: (R.M.) • Ensure SEQ is ON. • Ensure GROUP SELECT SWITCH to OFF. • Ensure SAFETY RODS OUT BYPASS is OFF. 3.15 Return Rx Diamond and FDW Masters To Automatic per OP/1/A/1102/004 A (ICS Operation). **(Page 5)**

This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **1** Page 3 of 5

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

Time	Position	Applicant's Actions or Behavior
	OATC	*OP/1/A/1102/004A Encl 4.1 (in progress)* **Crew Response:** **OP/1/A/1102/004A Encl 4.1** Rev10 2.9 **WHEN** required, place ICS back in auto as follows: 2.9.1 Ensure "RATE SET" thumbwheels at 0.0. 2.9.2 **IF** TURBINE MASTER is in manual ***[NA]*** 2.9.3 **IF** Rx Master is in "HAND" ***[NA]*** 2.9.4 **IF** DIAMOND is in manual, perform the following: A. Verify REACTOR MASTER in "AUTO". B. **IF** both SGs are off of Level Control, perform the following: 1. **IF** selected Tave (O1E2086) is different from Tave setpoint (O1E2087) by more than ± 0.15°F, perform the following: a. Simultaneously perform the following: • Ensure 1A FDW MASTER in "HAND" • Ensure 1B FDW MASTER in "HAND" **NOTE:** Cycling the setpoint selector may result in a Star Module failure. This is expected for this condition and entry into AP/1/A/1700/028 (ICS Instrument Failures) is **NOT** required. The Star Module failure shall be cleared before the ICS is returned to Auto. b. On REACTOR MASTER, cycle Tave setpoint selector between 565°F and 585°F five times. c. **IF** Star Module failed, perform the following: 1) Initiate Work Request to repair Star Module. 2) **WHEN** Star Module repaired, continue procedure. d. On REACTOR MASTER adjust Tave setpoint (O1E2087) toward selected Tave (O1E2086). 2. Verify selected Tave is within ± 0.15°F of Tave setpoint.

This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **1** Page 4 of 5

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

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/004A Encl 4.1*** **Crew Response:** C. **IF** either SG is on Level Control, adjust Tave setpoint (O1E2087) to 579°F. D. Place DIAMOND in "AUTO". 2.9.5 Ensure STM GENERATOR MASTER in "AUTO". 2.9.6 **IF** 1A **OR** 1B FDW Master is in "HAND", perform the following: A. Perform the following: • Select 1A FDW MASTER to "MEAS VAR" • Select 1B FDW MASTER to "MEAS VAR" B. **IF** 1A **OR** 1B FDW Master Measured Variable is **NOT** on the caret, perform the following: 1. Initiate Work Request to repair. 2. **WHEN** repairs are complete, continue procedure. C. Verify the following: • 1A FDW MASTER Measured Variable on the caret • 1B FDW MASTER Measured Variable on the caret D. Perform the following: • Select 1A FDW MASTER to "POS" • Select 1B FDW MASTER to "POS" E. Simultaneously perform the following: • Select 1A FDW MASTER to "AUTO" • Select 1B FDW MASTER to "AUTO"

This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **1** Page 5 of 5

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

Time	Position	Applicant's Actions or Behavior
	OATC	*OP/1/A/1102/004A Encl 4.1* **Crew Response:** **CAUTION:** Adjusting THP, Tave or Delta Tc setpoint too fast can cause plant instability. 2.10 **IF NOT** being controlled by another procedure, perform the following: 2.10.1 **IF** THP (O1E2088) is **NOT** ≈ 885 psig, slowly adjust THP Setpoint (O1E2089) to ≈ 885 psig. (R.M.) 2.10.2 **IF** Tave Setpoint (O1E2087) is **NOT** at ≈ 579°F, slowly adjust Tave setpoint to ≈ 579°F. (R.M.) 2.10.3 **IF** Delta Tc is **NOT** ≈ 0.0, adjust Delta Tc Setpoint (O1E2091) to ≈ 0.0°F. (R.M.) 2.11 **IF** desired adjust CTP as follows: (R.M.) 2.11.1 Review current mechanical maneuvering rates per PT/0/A/1103/020 (Power Maneuvering Predictions). 2.11.2 **IF** desired to increase power, perform the following: A. **WHEN** ICS has been in full Auto (Integrated Mode) for > 10 minutes, continue at Step 2.11.3. {6} 2.11.3 Ensure selected "HOLD". 2.11.4 Ensure desired setting selected ("%/MIN" or "%/HR") on "RATE" pushbuttons. 2.11.5 Ensure desired rate selected on "RATE SET" thumbwheels. 2.11.6 Insert desired CTPD SET using "INCREASE/DECREASE" pushbuttons. 2.11.7 Ensure "HOLD" is **NOT** selected. 2.11.8 **WHEN** desired CTP is achieved, return "RATE SET" thumbwheels to 0.0.

This event is complete when the Control Rod Movement PT is complete and ICS is in Auto or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **2** Page 1 of 3

Event Description: **A HPIP Sheared Shaft, B HPIP fails to start in AUTO (C: BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/014*** **Plant Response:** • 1SA-2/B-2 (HP RCP Seal Injection Flow High/Low) • 1SA-2/C-2 (HP Injection Pump Disch. Header Pressure High/Low) • RC Makeup Flow = ~0 gpm • RCP SI flow = ~0 gpm • 1A HPI Pump amps low = ~10 amps • PZR level will begin to decrease and LDST level will begin to increase • 1HP-120 throttles open due to PZR level decrease **Crew Response:** BOP may refer to ARGs (Both ARGs direct referral to AP/14) SRO will refer to AP/1/A/1700/014 ***Examiner Note: SRO may direct an RO to initiate EOP Encl 5.5.* for inventory control** (**Page 39**) **AP/1/A/1700/014** Rev 18 **Immediate Manual Actions** 3.1 **IAAT** RCP seal injection flow is lost, **AND** Component Cooling is lost, **THEN** perform the following: A. __ Trip the Rx. B. __ Stop all RCPs. C. __ Initiate AP/25 (SSF EOP). 3.2 **IAAT** loss of suction to operating HPI pumps is indicated: • Motor amps low or cycling • Discharge pressure low or cycling • Abnormal LDST level trend **THEN GO TO** Step 3.3. **RNO: GO TO** Step 4.7 ***Examiner Note:*** • ***The Crew should diagnose a sheared shaft and proceed to step 4.7.*** • ***The Crew may place the 1A HPIP Switch in OFF.***

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **2** Page 2 of 3

Event Description: **A HPIP Sheared Shaft, B HPIP fails to start in AUTO (C: BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	***AP/1/A/1700/014*** **Crew Response:** **Subsequent Actions** 4.7 Announce AP entry using PA System. 4.8 Verify any HPI pump operating. **Note: With a sheared shaft on the 1A HPIP, step 4.8 should be interpreted as no HPIPs operating** **RNO:** 1. __ Close 1HP-5. 2. __ Place 1HP-120 in HAND and close. 3. __ Place 1HP-31 in HAND and close. 4. __ Attempt to start the standby HPI pump. 5. __ **IF** standby HPI pump started, **THEN GO TO** Step 4.111. 6. __ **GO TO** Step 4.14. ***Booth Cue: If notified as SPOC to investigate/repair the 1A HPIP and 1B HPIP failure to auto start, wait 5 minutes and report that the 1A HPIP has a sheared shaft.*** ***Booth Cue: If notified as an AO to investigate the 1A HPIP, wait 5 minutes and report that the 1A HPIP appears to have a sheared shaft.*** 4.111 Place 1HP-31 in HAND. 4.112 Slowly open 1HP-31 in small increments until ≈ 8 gpm/RCP is achieved. 4.113 Re-establish normal makeup through 1HP-120. 4.114 Ensure proper operation of the Component Cooling System. 4.115 Reduce 1HP-7 demand to 0%. 4.116 Close 1HP-6.

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **2** Page 3 of 3

Event Description: **A HPIP Sheared Shaft, B HPIP fails to start in AUTO (C: BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	***AP/1/A/1700/014*** **Crew Response:** 4.117 Open the following: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4 4.118 Open 1HP-5. 4.119 Throttle open 1HP-7 for ≈ 20 gpm letdown flow. 4.120 Open 1HP-6. 4.121 Adjust 1HP-7 for desired letdown flow. 4.122 Open the following: __ 1HP-228 __ 1HP-226 __ 1HP-232 __ 1HP-230 4.123 Open 1HP-21. 4.124 **IAAT** SEAL INLET HDR FLOW ≈ 32 gpm, **THEN** place 1HP-31 in AUTO. 4.125 Monitor RCP seal parameters. 4.126 Maintain RCP seal injection flows as required. 4.127 Log thermal cycle of 1A HPI header. 4.128 **WHEN** conditions permit, **THEN EXIT** this procedure. **TS 3.5.2 HIGH PRESSURE INJECTION (HPI)** Condition A.1 (72 hours) Restore HPI pump to OPERABLE status.

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

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 3** Page 1 of 3

Event Description**:** **Loop B Tc Fails low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Plant Response**: • Loop "1B" Tc Dixson meter low (520°F) • Loop "1B" ΔT Dixson meter reads 70°F • ΔTc meter reads low (+10°F; "A" loop Hot) • Controlling NR Tave digital display reads ≈ 570°F • Controlling Tave Chessell display reads ≈ 570°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 **Crew Response**: • When the Statalarms are received, the candidates should utilize the "Plant Transient Response" process to stabilize the plant. • Verbalize to the CRS reactor power level and direction of movement. • Place the Diamond and both FDW Masters in manual and position as necessary to stabilize the plant. ***Note: The OATC will have to re-ratio FDW to maintain ΔTc 0°F ± 2°F.*** • The CRS should: ➢ Refer to AP/28, ICS Instrument Failures ➢ Ensure SPOC is contacted to repair the failed instrument. . **AP/1/A/1700/028, ICS Instrument Failures** Rev 20 4.1 Provide control bands as required. **(OMP 1-18 Att. I)** ***OMP 1-18 Attachment I:*** ***1. Plant Conditions Stable or TPB ≤ Pre-transient Conditions*** • ***NI Power ± 1% not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power – 1%.*** • ***Current Tave ± 2°F.*** • ***Current SG Outlet Pressure ± 10 PSIG (N/A)*** • ***Delta Tc 0 °F ± 2°F.***

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **3** Page 2 of 3

Event Description: **Loop B Tc Fails low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Crew Response**: 4.2 Initiate notification of the following: __ OSM to reference the following: • OMP 1-14 (Notifications) • Emergency Plan __ STA 4.3 Verify a power transient ≥ 5% has occurred. **RNO: GO TO** Step 4.5. 4.4 Notify Rx Engineering and discuss the need for a maneuvering plan. 4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • SPOC assistance, as needed 4.6 **GO TO** the applicable section per the following table: | | **Section** | **Failure** | | | 4A | RCS Temperature | **AP/1/A/1700/028, Section 4A, RCS Temperature Failure** **NOTE** • If Tave instrument circuit failed high, the following may have occurred depending on initial ICS station status: • Unit to TRACK due to Rx Cross Limits • Control Rod insertion • Feedwater flow increase • If Tave instrument circuit failed low, the following may have occurred depending on initial ICS station status: • Unit to TRACK due to Rx Cross Limits • Control Rod withdrawal • Feedwater flow decrease • Feedwater re-ratio

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 3** Page 3 of 3

Event Description**: Loop B Tc Fails low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Crew Response**: 1. Ensure the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER 2. Ensure DIAMOND in MANUAL. 3. Notify SPOC to perform the following: __ 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. **RNO:** Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and OP/1/A/1105/014 (Control Room Instrumentation Operation And Information). 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).

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 4** Page 1 of 7

Event Description**: Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/001*** **Plant Response**: • Group 1 Rod 6 drops into the core • Statalarm 1SA-2/A-10 (CRD GLOBAL SYSTEM FAULT) • 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/D-5 (1D RPS TROUBLE) **Crew Response**: Crew should perform Plant Transient Response (PTR) and determine that no manual FDW adjustments are required and that a runback condition exists but due to ICS being in manual it is not occurring. • 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. SRO should enter AP/1/A/1700/001 (Unit Runback) **AP/1/A/1700/001** Rev 15 4.1 **GO TO** the most limiting section per the following table: | √ | **Section** | **Runback** | | | 4H | Asymmetric Control Rod (1%/min to 55%power) | **AP/1/A/1700/001 Section 4H** 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 ≥ 6.5% (9″) from the group average, **THEN** trip the Rx.

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **4** Page 2 of 7

Event Description: **Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/001***
		NOTE 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.
		3. Verify Rx is critical. 4. Verify power > 55% when the rod was dropped or misaligned. 5. Verify Rx runback to 55% core thermal power in progress. • 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 ≤ 55% core thermal power at ≥ 1%/min. 2. **IF** control rods will not insert manually, **THEN** perform the following: A. Trip reactor. B. **GO TO** Unit 1 EOP. 6. Initiate Encl 5.1 (Control of Plant Equipment During Shutdown). (**Page 19**)
		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: __ Investigate cause of dropped or misaligned control rod. __ Prepare to reduce the following trip setpoints: • RPS Flux/Flow-Imbalance • RPS High Flux

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 4** Page 3 of 7

Event Description**: Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/001*** **Crew Response:** 8. Notify the OSM to ensure the requirements of the following Tech Specs are met: __ TS 3.1.4 (Control Rod Group Alignment Limits) __ TS 3.1.5 (Safety Rod Position Limits) __ TS 3.2.3 (Quadrant Power Tilt) ***Booth Cue: When SM is contacted, inform the team that the SM is occupied on Unit 3 and cannot verify TS requirements at this time.*** 9. __ Notify OSM to make notifications as required per OMP 1-14 (Notifications). 10. __ Verify > 1% SDM with allowance for the inoperable control rod per PT/1/A/1103/015 (Reactivity Balance Calculation) within one hour. ***Examiner Note: Shutdown Margin will be adequate*** 11. Reduce core thermal power ≤ the following limits, based on the number of RCPs operating, within two hours: RCPs / Allowable Thermal Power (% FP) 3 / 45 **4** / **60** **NOTE** The following ensures adequate margin in preparation for resetting RPS trip setpoints. 12. **IAAT** the power decrease is complete, **AND** any NI is > the following: RCPs / Maximum NI Power (% FP) 3 / 40 **4** / **55** **THEN** reduce power until all NIs are ≤ the Maximum NI Power limit for the operating RCP combination per Encl 5.4 (Power Reduction).

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 4** Page 4 of 7

Event Description**: Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/001*** **Crew Response:** 13. **WHEN** all NIs are ≤ the Maximum NI Power limit for the operating RCP combination, **THEN** notify SPOC to reduce RPS trip setpoints per AM/1/A/0315/017 (TXS RPS Channel A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions.) **NOTE** Due to the power decrease initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure. Equivalent steps performed by this AP should be signed off as intent met. Any steps **NOT** performed by this AP must be evaluated in preparation for power increase or continued shutdown. 14. Initiate OP/1/A/1102/004 (Operation at Power) power reduction enclosure. **NOTE** The following will prevent a potential MODE change from MODE 2 to MODE 1 if unit power stabilizes ≤ 5%. 15. **IAAT** reactor power is ≤ 5%, **THEN GO TO** the following as necessary to shutdown the reactor prior to rod recovery. • OP/1/A/1102/10 (Controlling Procedure for Unit Shutdown) • OP/1/A/1102/004 (Operation at Power) 16. **IAAT** another runback has or should have occurred, **THEN GO TO** Subsequent Actions. 17. **WHEN** the control rod is repaired, **THEN** perform the following: A. __ Notify Duty Reactor Engineer for any necessary maneuvering limits. B. __ **GO TO** OP/1/A/1105/019 (Control Rod Drive System) to recover the control rod.

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **4** Page 5 of 7

Event Description: **Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	***AP/1/A/1700/001*** **Crew Response:** **TS 3.1.4 CONTROL ROD GROUP ALIGNMENT LIMITS** Condition A (1hour) Restore control rod alignment or verify SDM (2 hours) Reduce Thermal Power to ≤ 60% of allowable Thermal Power. (10 hours) RPS trip setpoints must be reduced based on flux and flux/flow imbalance to ≤ 65.5% of the allowable thermal power. **TS 3.1.5 SAFETY ROD POSITION LIMITS** Condition A (1 hour) Verify SDM and declare associated control rod INOPERABLE. **TS 3.2.3 QUADRANT POWER TILT** Condition A if QPT is greater than the steady state limit (+3.5) and less than or equal to the transient limit (+7.11) (10 hours) RPS trip setpoints must be reduced ≥ 2% RTP for each 1% of QPT greater than the steady state limit (24 hours) QPT restored to less than or equal to the steady state limit Condition B "Possible" – QPT greater than the transient limit (+7.11) and less than or equal to the maximum limit (+16.55) due to misalignment of a Control Rod or an APSR (30 minutes) Reduce Thermal Power ≥ 2% RTP from Allowable Thermal Power for each 1% of QPT greater than the steady state limit. (2 hours) Restore QPT to less than or equal to the transient limit. **TS 3.10.1 STANDBY SHUTDOWN FACILITY (SSF)** Conditions A-E (7 days) Restore to operable status ***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 should be entered.*** ***Examiner Note: SDM will be verified using PT/1/A/1103/015, Encl 13.18*** (Page 36) ***and Curve for Control Rod Position Setpoints, 1 Inoperable Rod, 4 Pump Flow, BOC to EOC from the COLR*** (Page 37).

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 4** Page 6 of 7

Event Description**: Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/001*** **AP/1/A/1700/001 Enclosure 5.1** 1. **IAAT** SRO determines all appropriate actions have been taken, **AND** the runback is complete, **THEN EXIT** this Enclosure. 2. Notify the WCC SRO to initiate Enclosure 5.2 (WCC SRO Support During Unit Runback). 3. Start the following pumps: __ 1A FDWP SEAL INJECTION PUMP __ 1A FDWP AUXILIARY OIL PUMP __ 1B FDWP AUXILIARY OIL PUMP __ 1B FDWP SEAL INJECTION PUMP 4. **WHEN** CTP ≤ 80%, **THEN** stop the following pumps: {3} {4} __ 1E1 HTR DRN PUMP __ 1E2 HTR DRN PUMP 5. **WHEN** CTP ≤ 65%, **THEN** continue this Enclosure. 6. Place the following in MANUAL and close: __ 1FDW-53 __ 1FDW-65 **NOTE:** 1B FDWP is the preferred pump to shut down first. 7. Verify both Main FDWPs operating. 8. Verify 1B FDWP to be shut down first. 9. Adjust the FWP bias counter-clockwise to lower 1B FWP suction flow ≈1 x 10^6 lb/hr < 1A FWP suction flow. 10. **GO TO** Step 12.

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.**: 4** Page 7 of 7

Event Description**: Group 1 Rod 6 Control Rod drops requiring Manual power reduction (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/001*** **Crew Response:** 12. **IAAT** both Main FDW pumps running, **AND** both of the following exist: __ 1B Main FDW pump is first pump to be shut down __ Any of the following alarms occur: • 1SA-16/A-3 (FWP B FLOW MINIMUM) • 1SA-16/A-4 (FWP B FLOW BELOW MIN), **THEN** trip 1B Main FDW Pump. 13. **IAAT** both Main FDW pumps running, **AND** both of the following exist: __ 1A Main FDW pump is first pump to be shut down __ Any of the following alarms occur: • 1SA-16/A-1 (FWP A FLOW MINIMUM) • 1SA-16/A-2 (FWP A FLOW BELOW MIN), **THEN** trip 1A Main FDW Pump. 14. **IAAT** the operating FDWP suction flow < 1.5 x 106 lb/hr, **THEN** slowly throttle the associated recirc control valve to establish 2300 - 6000 gpm total Condensate flow: • 1FDW-53 • 1FDW-65 15. Maintain Pzr level between 220” - 250″. 16. **IAAT** load is ≤ 550 MWe, **THEN** perform Steps 17 - 18. 17. Stop the following: {3} __ 1A MSRH DRN PUMP __ 1B MSRH DRN PUMP 18. Place the following in DUMP: {3} __ 1HD-37 __ 1HD-52

This event is complete when Rx Power has decreased to < 55%, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **5** Page 1 of 2
Event Description: **Spray valve fails open (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP ***CT-1***	***AP/1/A/1700/044*** **Plant Response:** • RCS pressure decreasing below 2155 psig • 1RC-1 Indicates OPEN • 1SA-2/D-3, RC PRESS HIGH/LOW **Crew Response:** • BOP should recognize that 1RC-1 is open and push the CLOSE pushbutton (This is an IMA in AP/44) • SRO should direct entry into AP/1/A/1700/044 Abnormal Pressurizer Pressure Control **AP/1/A/1700/044 Abnormal Pressurizer Pressure Control** Rev 4 **IMAs** 3.1 **IAAT** PORV is open, **AND** RC pressure is < setpoint (2400 psig (HIGH) or 480 psig (LOW)), **THEN** close 1RC-4. 3.2 **IAAT** RC pressure < 2155 psig, **AND** 1RC-1 indicates open, **THEN** select 1RC-1 to CLOSE. **[1RC-1 will NOT close]** 3.3 **IAAT** all the following conditions exist: __ RC pressure < 2155 psig __ RC pressure decreasing without a corresponding decrease in PZR Level **THEN close 1RC-3.** **Subsequent Actions** 4.1 Announce AP entry using the PA system. 4.2 **GO TO** the applicable step per the following table: √ | **Failure Caused RCS Pressure** | **Step** Decrease | 4.3 Increase | 4.18 ***Examiner Note: TS 3.4.1 may apply depending on crew response to the failure.*** ***TS 3.4.1, REACTOR COOLANT SYSTEM*** ***Condition A (2 hours) Restore RCS DNB parameter(s) to within limit.*** ***COLR DNB Limit = 2125 psig***

This event is complete when the BOP closes 1RC-3 and stabilizes RCS pressure, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **5** Page 2 of 2
Event Description: **Spray valve fails open (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	**Crew Response:** *AP/1/A/1700/044* 4.3 Verify 1RC-4 is closed. **RNO**: **IF** PORV is open, **AND** 1RC-4 has failed to close, **THEN** perform the following: A. __ Dispatch an operator to open 1DIB Panelboard breaker #24. B. __ Manually trip the reactor. C. __ Initiate AP/02 (Excessive RCS Leakage). 4.4 Verify 1RC-3 is closed. **NOTE** 1RC-3 must **NOT** be allowed to be closed for ≥ 36 minutes at a time to avoid a thermal transient in piping between 1RC-3 and the PZR spray nozzle. 4.5 Position 1RC-3 as required to maintain RC pressure within desired band. 4.6 **GO TO** Step 4.13. 4.13 Verify PZR heaters maintaining RCS pressure within desired band. 4.14 Notify SPOC to repair malfunctioning component. 4.15 Ensure requirements of following are met: __ TS 3.4.1 (RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling Limits) __ TS 3.4.9 (Pressurizer) __ TS 3.4.12 (Low Temperature Overpressure Protection System) __ SLC 16.5.1 (Reactor Coolant System Vents) 4.16 **WHEN** repairs complete, **THEN** place following components in desired position for current plant conditions as determined by CR SRO: __ 1RC-1 __ 1RC-3 __ 1RC-4 __ PZR heater bank #1 __ PZR heater bank #2 __ PZR heater bank #3 __ PZR heater bank #4 4.17 __ **WHEN** directed by CR SRO, **THEN EXIT** this procedure.

This event is complete when the BOP closes 1RC-3 and stabilizes RCS pressure, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.**: 1** Event No.: **6** Page 1 of 1
Event Description: **Lowering EHC pressure, Standby EHC pump fails to start (C: BOP,SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***1SA-3/E-2*** **Plant Response**: • 1SA-3/E-2 EHC Hydraulic Header Pressure Low **Crew Response**: • SRO will direct the BOP to refer to the ARG: **1SA-3/E-2** **NOTE:** Standby pump starts at 1350 psig decreasing. 3.1 Verify standby pump is running. ***Examiner Note: Per AD-OP-ALL-1000, Conduct of Operations, Section 5.17.2 Expectations: Written procedures are not necessary for situations where: (3) Conditions exist which may require timely actions due to failure of automatic control systems.*** ***In this situation, the standby EHC pump should be started in order to prevent an automatic Turbine/Reactor trip due to low EHC pressure.***

This event is complete when the STBY EHC pump is started, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 1 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO	**Plant Response:** • Both MFWPs trip • Reactor Trips • MD EFDWPs do NOT start • TD EFDWP overspeeds and trips **Crew Response:** • SRO directs the OATC to perform IMAs and the BOP to perform a Symptom Check • If the RCS saturates, the crew will perform Rule 2 (Loss of SCM) (**Page 28**)
	OATC	***IMAs*** ***EOP Immediate Actions*** Rev 40 3.1 Depress REACTOR TRIP pushbutton. 3.2 Verify reactor power < 5% FP and decreasing. 3.3 Depress the turbine TRIP pushbutton 3.4 Verify all turbine stop valves closed. 3.5 Verify RCP seal injection available.
	BOP	***SYMPTOM CHECK*** The BOP will verify the following:

Power Range NIs **NOT** < 5% Power Range NIs **NOT** decreasing	Rule 1, *ATWS/Unanticipated Nuclear Power Production*
Any SCM < 0°F	Rule 2, *Loss Of SCM*
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, *Loss of Main or Emerg FDW* Rule 4, *Initiation of HPI Forced Cooling* (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure decrease	Rule 5, *Main Steam Line Break*
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

BOP will perform Rule 3 due to a loss of ALL feedwater: (**Page 26**)

SRO will review IMAs and transfer to the Subsequent Actions Tab.

This event is complete as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 2 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***SUBSEQUENT ACTIONS TAB*** **Crew Response:** • The SRO will transfer to the Subsequent Actions tab of the EOP and review the Parallel Action (Yellow) page.(**Page 47**) • The SRO will transfer to the Loss of Heat Transfer (LOHT) tab due to the loss of Main and Emergency feedwater. ***LOHT TAB*** 1. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. **NOTE** Transfer to LOSCM tab is **NOT** required if RCS heats to the point where core SCM = 0°F. 2. **IAAT** the RCS heats to the point where core SCM = 0°F, **THEN GO TO** Step 4. 3. **IAAT NO** SGs can be fed with FDW (Main/CBP/Emergency/PSW), **AND** any of the following exists: __ RCS pressure reaches 2300 psig **OR** NDT limit __ Pzr level reaches 375″ [340″ acc] **THEN GO TO** Step 4. **RNO**: **NOTE** 1A1 RCP provides the best Pzr spray. 1. Reduce operating RCPs to one pump/loop. 2. **WHEN** any exists: __ EFDW or PSW SG feed flow has been re-established by existing Rules/Enclosures __ EFDW aligned from another unit __ Operator performing Rule 3 (Loss of Main or Emergency FDW) or Encl 5.27 (Alternate Methods for Controlling EFDW Flow) reports EFDW available **THEN GO TO** Step 50. ***Examiner Note: The SRO will remain at this point of the procedure until RCS pressure = 2300 psig at which time IAAT step 3 will apply which will direct the SRO to GO TO step 4 (Page 30).***
This event is complete when the SRO has transferred to the HPI CD tab, or as directed by the Lead Examiner.		

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 3 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	BOP	***Rule 3*** **Crew Response** 1. Verify loss of MFDW and/or EFDW was due to any of the following: __ Turbine Building Flooding __ Actions taken to increase SG level due to Turbine Building Flooding **RNO**: **GO TO** Step 3. 3. **IAAT NO** SGs can be fed with FDW (Main/CBP/Emergency/PSW), **AND** any of the following exist: __ RCS pressure reaches 2300 psig **OR** NDT limit __ Pzr level reaches 375″ [340″ acc] ***CT-2*** **THEN PERFORM** Rule 4 (Initiation of HPI Forced Cooling).(**Page 34**) ***Booth Cue: Record time when criteria for Rule 4 is met _____*** ***Booth Cue: Record time when Rule 4 is initiated _____*** 4. Start operable EFDW pumps, as required, to feed all intact SGs. 5. Verify any EFDW pump operating. **[No EFDW pumps will be operating]** **RNO**: **GO TO** Step 7. 7. Place in MANUAL and close: __ 1FDW-315 __ 1FDW-316 8. Verify both: __ Any CBP operating **[None will be operating]** __ TBVs available on an intact SG **RNO: GO TO** Step 16 16. Verify 1 TD EFDW PUMP is operable and available for manual start. **RNO**: __ **GO TO** Step 18. 18. Verify cross-tie with Unit 2 is desired. 19. Dispatch an operator to open: __ 2FDW-313 (2A EFDW Line Disch To 2A S/G X-Conn) __ 2FDW-314 (2B EFDW Line Disch To 2B S/G X-Conn)

This event is complete when the SRO has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 4 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	BOP	***Rule 3*** **Crew Response:** 20. Dispatch an operator to 1FDW-313 and have them notify the CR when in position. 21. Notify alternate unit to: A. __ Place both EFDW control valves in manual and closed. B. __ Start their TD EFDW PUMP. 22. **IAAT** SGs are **NOT** being fed from any source, **AND** PSW SG feed available, **THEN** establish SG feed from PSW using Encl 5.45 (PSW Feed and RCP Seals). 23. **WHEN** either exists: __ Operator is in position at 1FDW-313 __ Unit 1 TD EFDW PUMP has been manually started **THEN** continue. ***Examiner Note:*** • ***EFW from another source will NOT be made available. Rule 3 progress will stop at this point.***

This event is complete when the SRO has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 5 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	***Rule 2*** **Crew Response:** 1. **IAAT** all exist: __ Any SCM ≤ 0°F __ Rx power ≤ 1% __ ≤ 2 minutes elapsed since loss of SCM **THEN** perform Steps 2 and 3 2. Stop all RCPs 3. Notify CRS of RCP status 4. Verify Blackout exists **RNO: GO TO** Step 6 6. Open 1HP-24 and 1HP-25 7. Start all available HPI pumps 8. **GO TO** Step 13 13. Open 1HP-26 and 1HP-27 14. Verify at least two HPI pumps are operating using two diverse indications **RNO: GO TO** Step 27 27. Verify at least two HPI pumps are operating **RNO:** Maximize HPI flow ≤ 475 gpm (including seal injection for A hdr only 28. Verify RCS pressure > 550 psig 29. **IAAT** either exists: __ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm __ Only one LPI header in operation with header flow ≥ 2900 gpm **THEN GO TO** Step 34

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 6 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	***Rule 2*** 30. Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of ADVs) (**PS**) 31. Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit **RNO:** Select OFF for <u>both</u> digital channels on AFIS HEADER A 32. Verify 1SA-2/D-8 (AFIS HEADER B INITIATED) lit **RNO:** Select OFF for <u>both</u> digital channels on AFIS HEADER B 33. Notify CRS: __ Suspend Rule 3 (Loss of Main or Emergency FDW) until directed by LOSCM tab __ Degraded HPI exists 34. **EXIT**

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 7 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP ***CT-2***	***LOHT TAB*** **Crew Response:** ***Examiner Note: When the criteria for IAAT step 3 is met, the SRO will proceed to step 4:*** **NOTE** SCM may be lost when the PORV is opened. Transition to LOSCM tab is **NOT** required. 4. **PERFORM** Rule 4 (Initiation of HPI Forced Cooling). (**Page 34**) 5. Verify all: __ At least two HPI pumps operating **[ONE HPI pump operating]** __ Acceptable HPI flow exists in both HPI headers per Rule 4 (Initiation of HPI Forced Cooling) __ PORV open __ 1RC-4 open **RNO:** 1. **IF** any HPI pump is providing injection flow, **THEN GO TO** Step 7. 2. **GO TO** Step 12. 7. Verify SSF-ASW available. 8. Dispatch a licensed operator to perform Encl 5.34 (Aligning SSF-ASW for SG Feed). ***Examiner Note: Stop the RO from leaving the Control Room and notify him/her that Unit 2 will perform Encl 5.34.*** 9. Verify PSW supplying power to reactor vessel head and RCS loop vents. **RNO**: Locally close (Unit 1 Cable Rm): __ 1SKJ-08 (1RC-155/1RC-156) __ 1SKK-08 (1RC-157/1RC-158) __ 1SKL-08 (1RC-159/1RC-160) ***Examiner Note: After being notified as an AO to close breakers for 1RC-155 through 1RC-160, wait one minute and Fire Timer 15 to close the breakers and then notify the control room that the breakers are closed.***

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 8 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP ***CT-3***	***LOHT TAB*** **Crew Response:** 10. Open: __ 1RC-155 __ 1RC-156 __ 1RC-157 __ 1RC-158 __ 1RC-159 __ 1RC-160 11. **GO TO** HPI CD tab. ***HPI CD TAB*** **HPI Cooldown Tab** 1. **IAAT** BWST level is ≤ 19', **THEN** initiate Encl 5.12 (ECCS Suction Swap to RBES). 2. **IAAT** either of the following exists: __ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm __ Only one LPI header in operation with header flow ≥ 2900 gpm **THEN GO TO** LOCA CD tab. 3. Verify all of the following exist: __ PORV open __ 1RC-4 open __ Two HPI trains injecting __ CETCs ≤ 640°F **RNO**: 1.__ **IF** RCS vents (hot leg and vessel head) are open, **THEN GO TO** Step 4. 4. Perform the following: __ Ensure all RBCUs in low speed. __ Open 1LPSW-18. __ Open 1LPSW-21. __ Open 1LPSW-24. 5. __ Initiate Encl 5.35 (Containment Isolation).

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 9 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***HPI CD TAB*** **Crew Response:** 6. **IAAT** all the following exist: __ Any RBS pump operating __ RB pressure < 3 psig __ < 24 hours into event __ Reactor Engineering confirms Condition Zero or Condition One per RP/0/B/1000/018 (Core Damage Assessment) **THEN** stop all RBS pumps. 7. Start: __ A Outside Air Booster Fan __ B Outside Air Booster Fan 8. Notify Unit 3 to start: __ 3A Outside Air Booster Fan __ 3B Outside Air Booster Fan 9. Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit. **RNO**: __ Select OFF for both digital channels on AFIS HEADER A. 10. Verify 1SA-2/D-8 (AFIS HEADER B INITIATED) lit. **RNO**: __ Select OFF for both digital channels on AFIS HEADER B. 11. Verify indications of SGTR ≥ 25 gpm. **RNO**: **GO TO** Step 17. 17. **IAAT** any SG with a tube rupture that has **NOT** reached the level at which water enters the steam lines (per Encl 5.21 (Full Range SG Level For Water In Steam Lines)) approaches either of the following: __ 1000 psig __ Overfill: • Any SCM ≤ 0°F: Loss of SCM setpoint • All SCMs > 0°F: 285″ [315″ acc] XSUR **THEN** perform Steps 18 - 20. **RNO**: **GO TO** Step 21.

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 10 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***HPI CD TAB*** **Crew Response:** 21. **IAAT** RCS pressure is > 1000 psig, **AND** any of the following exist: __ A SG with a tube rupture is at the level at which water enters the steam lines (per Encl 5.21 (Full Range SG Level For Water In Steam Lines) __ A SG with a tube rupture approaches 1000 psig **THEN** open: __ 1RC-155 __ 1RC-156 __ 1RC-157 __ 1RC-158 __ 1RC-159 __ 1RC-160 22. Secure makeup to the LDST. 23. Notify Chemistry of the following: A. __Sample RCS boron hourly, or as often as possible, until MODE 5. B. __Letdown status. 24. **IAAT** Chemistry reports that boron sample **CANNOT** be obtained, **THEN** notify TSC to provide guidance to obtain boron sample. 25. Initiate determination of minimum required boron concentration for MODE 5 using either of the following: __ Reactor Engineer __ PT/1/A/1103/015 (Reactivity Balance Procedure) 26. **IAAT** required boron concentration for MODE 5 is determined, **THEN** initiate Encl 5.11 (RCS Boration). **NOTE** Encl 5.12 (ECCS Suction Swap to RBES) requests an LPI discharge sample which is representative of RBES boron after ECCS suction has been swapped to RBES. 27. **IAAT** ECCS suction is swapped to RBES, **AND** RBES boron is decreasing, **THEN** notify TSC.

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 11 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	*Rule 4* **Crew Response**: **Rule 4 HPI Forced Cooling** 1. Verify any HPI pump powered from 1TC, 1TD, or 1TE can be operated. 2. Open: __ 1HP-24 __ 1HP-25 3. Start all available HPI pumps. **[C HPI Pump will NOT start]** 4. Open: __ 1HP-26 __ 1HP-27 5. Open 1RC-4. 6. Verify flow exists in any HPI header. 7. Perform the following: A. __ Place 1RC-66 SETPOINT SELECTOR to OPEN. B. __ Depress 1RC-66 OPEN PERMIT pushbutton. 8. Verify at least two HPI pumps operating. **RNO:** 1. __ **IF NO** HPI pumps are operating, **THEN**: A. __ Stop all RCPs. B. __ Position 1RC-66 SETPOINT SELECTOR to HIGH. C. __ **GO TO** Step 14. 2. __ **IF** 1HP-26 is closed, **AND** either of the following exists: __ 1A HPI PUMP operating __ 1B HPI PUMP operating **THEN** open 1HP-410. 3. __ **GO TO** Step 10. 10. Verify flow exists in any HPI header.

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

Op-Test No.: **ILT48** Scenario No.: **1** Event No.: **7** Page 12 of 12

Event Description: **LOHT (CBPs trip) (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***Rule 4*** **Crew Response**: 11. Perform the following: A. __ Place 1RC-66 SETPOINT SELECTOR to OPEN. B. __ Depress 1RC-66 OPEN PERMIT pushbutton. 12. Verify > one RCP operating. **NOTE** 1A1 RCP provides the best Pzr spray and is preferred to be left running in case recovery from HPI forced cooling is performed and a Pzr bubble drawn. 13. Stop all but one RCP. 14. **IAAT** the following limits are exceeded, **Pump Operation** / **Limit** 1 HPI pump/hdr — 475 gpm (incl. seal injection for A hdr) 1A & 1B HPI pumps operating with 1HP-409 open — Total flow of 950 gpm (incl. seal injection) **THEN** throttle HPI to maximize flow ≤ flow limit. 15. De-energize all Pzr heaters. 16. Close 1HP-5. 17. Close: __ TBVs __ 1FDW-35 __ 1FDW-44 18. **IAAT** all HPI is lost, **THEN**: A. __ Stop all RCPs. B. __ Position 1RC-66 SETPOINT SELECTOR to HIGH. 19. __ **WHEN** directed by CRS, **THEN EXIT**.

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

Enclosure 13.18 *Rev 37*

PT/1/A/1103/015

Shutdown margin Calculation at Power

Performed By: _____Date: _____ Time: _____

1. Purpose

1.1 The purpose of this enclosure is to perform a shutdown margin calculation while at power.

2. Procedure

NOTE: Step 2.1 applies only to control rod Groups 1 through 6. Group 7 and the APSRs may be positioned as required.

____2.1 **IF** any rod groups are **NOT** at 100% wd (other than Group 7 and the APSRs) due to CRD movement PT:

____2.1.1 Verify that only one group is **NOT** at 100% wd.

____2.1.2 Verify that the inserted group is ≥ 95% wd.

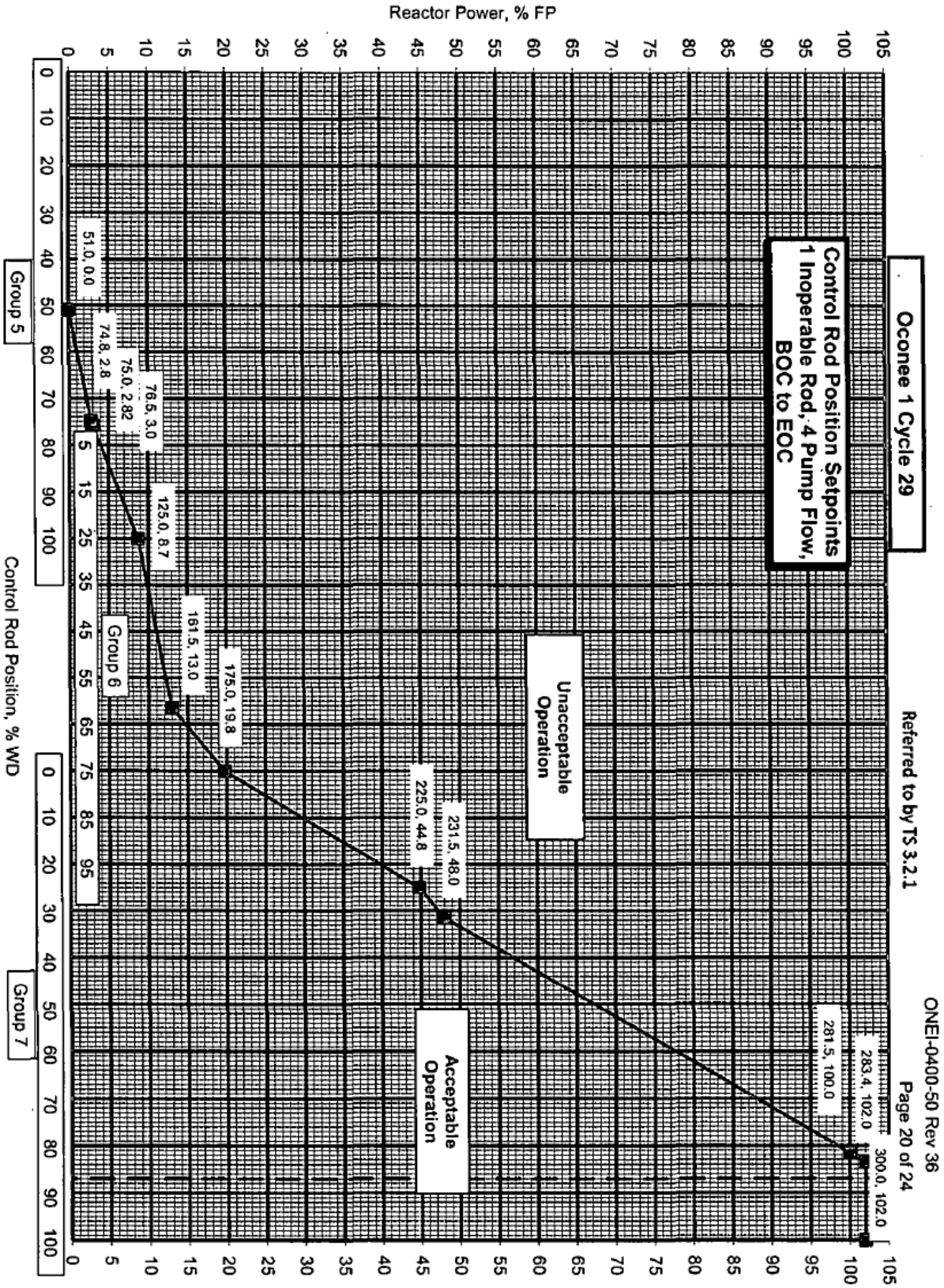
NOTE: For a dropped rod/stuck rod scenario, utilize the 1 inoperable rod graphs in the COLR. The rod position used should be the position of the controlling group (if the dropped/stuck rod is in the controlling group, the rod positions of the remaining rods in that group should be used, **NOT** the group average).

____2.2 Verify one of the following:

____ ____ 2.2.1 Available shutdown margin is ≥ 1.00% ΔK/K. This is shown by verifying that
IV the control rod position and power level are within the Acceptable Region or the Restricted Region on the appropriate curve for the number of RC Pumps and Inoperable rods in the COLR.

OR

____ ____2.2.2 Appropriate actions are taken per TS 3.1.4, 3.1.5, and 3.2.1.
IV


Oconee 1 Cycle 29
Control Rod Position Setpoints
1 Inoperable Rod, 4 Pump Flow,
BOC to EOC
Referred to by TS 3.2.1
ONEI-0400-50 Rev 36
Page 20 of 24
Reactor Power, % FP
Control Rod Position, % WD
Unacceptable Operation
Acceptable Operation
Group 5
Group 6
Group 7
51.0, 0.0
74.8, 2.8
75.0, 2.82
76.5, 3.0
125.0, 8.7
161.5, 13.0
175.0, 19.8
225.0, 44.8
231.5, 48.0
281.5, 100.0
283.4, 102.0
300.0, 102.0

Rule 6
HPI

HPI Pump Throttling Limits

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

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
All the following conditions must exist: • Core SCM > 0 • CETCs decreasing	All the following conditions must exist: • All WR NIs ≤ 1% • Core SCM > 0 • Pzr level increasing • SRO concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

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

Enclosure 5.5
Pzr and LDST Level Control

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 desired Pzr level: • 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** makeup to the LDST is desired, **THEN** makeup from 1A BHUT.	
3. **IAAT** it is desired to secure makeup to LDST, **THEN** secure makeup from 1A BHUT.	
4. **IAAT** it is desired to bleed letdown flow to 1A BHUT, **THEN** perform the following: A. Open: __ 1CS-26 __ 1CS-41 B. __ Position 1HP-14 to BLEED. C. __ Notify SRO.	
5. **IAAT** letdown bleed is **NO** longer desired, **THEN** position 1HP-14 to NORMAL.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. **IAAT** 1C HPI PUMP is required, **THEN** perform Steps 7 - 9.	**GO TO** Step 10.
7. __ Open: • 1HP-24 • 1HP-25	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 8. 2. **IF** only one 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Start 1C HPI PUMP.	**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: 1HP-26 __ 1HP-27	1. __ **IF** at least two HPI pumps are operating, **AND** 1HP-26 will **NOT** open, **THEN** throttle 1HP-410 to maintain desired Pzr level. 2. **IF** 1A HPI PUMP and 1B HPI PUMP are operating, **AND** 1HP-27 will **NOT** open, **THEN** throttle 1HP-409 to maintain desired Pzr level.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. **IAAT** LDST level **CANNOT** be maintained, **THEN** perform Step 11.	**GO TO** Step 12.
11. __ Perform the following: • Open 1HP-24. • Open 1HP-25. • Close 1HP-16.	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 13. 2. **IF** only one BWST suction valve (1HP-24 or 1HP-25) is open, **AND** three HPI pumps are operating, **THEN** secure 1B HPI PUMP.
NOTE Maintaining Pzr level > 100” [180” acc] will ensure Pzr heater bundles remain covered.	
12.__ Operate Pzr heaters as required to maintain heater bundle integrity.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. **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.).	
14. **IAAT** two Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** all of the following exist: __ Letdown isolated __ LPSW available __ Letdown restoration desired **THEN** perform Steps 16 - 34. {41}	__ **GO TO** Step 35.
16. Open: 1CC-7 1CC-8	1. Notify CR SRO that letdown **CANNOT** be restored due to inability to restart the CC system. 2. **GO TO** Step 35.
17. Ensure only one CC pump running.	
18. Place the non-running CC pump in AUTO.	
19. Verify both are open: 1HP-1 1HP-2	1. **IF** 1HP-1 is closed due to 1HP-3 failing to close, **THEN GO TO** Step 21. 2. **IF** 1HP-2 is closed due to 1HP-4 failing to close, **THEN GO TO** Step 21.
20. __ **GO TO** Step 23.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
21. __ Verify letdown line leak in East Penetration Room has occurred.	**GO TO** Step 23.
22. __ **GO TO** Step 35.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. Monitor for unexpected conditions while restoring letdown.	
24. __ 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. __ **GO TO** Step 26.
25. Open: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4	
26. Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. Notify CR SRO of problem. B. **GO TO** Step 35.
27. Close 1HP-6.	
28. Close 1HP-7.	
29. 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. __ Open 1HP-5.	
31. __ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. __ **WHEN** letdown temperature is < 125°F, **THEN** place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. __ Open 1HP-6.	
34. Adjust 1HP-7 to control desired letdown flow.	
NOTE AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.	
35. **IAAT** it is determined that letdown is unavailable due to equipment failures or letdown system leakage, **THEN** notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. **IAAT** > 1 HPI pump is operating, **AND** additional HPI pumps are **NO** longer needed, **THEN** perform the following: A. Obtain SRO concurrence to reduce running HPI pumps. B. __ Secure the desired HPI pumps. C. Place secured HPI pump switch in AUTO, if desired.	
37. __ **IAAT** all the following conditions exist: __ Makeup from BWST **NOT** required __ LDST level > 55″ __ All control rods inserted __ Cooldown Plateau **NOT** being used **THEN** close: __ 1HP-24 __ 1HP-25	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. __ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	**GO TO** Step 40.
39. **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.	
40. __ Verify two Letdown Filters in service, **AND** <u>only one</u> Letdown filter is desired.	**GO TO** Step 42.
41. Perform <u>one</u> of the following: __ Place 1HP-17 switch to CLOSE. __ Place 1HP-18 switch to CLOSE.	
42. **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

Subsequent Actions

Parallel Actions

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

CONDITION	ACTIONS	
1. PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized {13}	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F	**GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer	**GO TO** EHT tab.	**LOHT**
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	**GO TO** LOHT tab.	
7. Heat transfer is or has been excessive	**GO TO** EHT tab.	**EHT**
8. Indications of SGTR ≥ 25 gpm	**GO TO** SGTR tab.	**SGTR**
9. Turbine Building flooding **NOT** caused by rainfall event	**GO TO** TBF tab.	**TBF**
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
11. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
12. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	**EDL**
14. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and NSD 202 (Reportability).	**NOTIFY**

CRITICAL TASKS

CT-1 1RC-3 (Spray Block Valve) must be closed before tripping the reactor on low RCS pressure.

CT-2 HPI Forced Cooling must be initiated within 5 minutes of when the initiation criteria has been met (TCA = 5 min).

CT-3 RCS Loop and Head vents must be opened to maximize HPI pump flow due to degraded HPI prior to performing step 4 in the HPI CD tab.

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: 100%	Mode: 1	Mode: 1
Gross MWE: 895	100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action	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 #
AMSAC/DSS	0300	7 Days	16.7.2

Shift Turnover Items (CR SRO)

Primary

- Due to unanalyzed condition, the SSF should be considered INOP for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).
- 1RIA-3 and 5 removed from RB.
- Control Rod Movement PT (PT/1/A/0600/015) is to be performed for GP 1 ONLY.
- During the Control Rod Movement PT, Unit 2 CRS will assume the oversight role for Unit 1. Unit 1 CRS will assume the role of the dedicated Reactivity Management SRO.

Secondary

- Feedwater valve DP selected to A1 and B2 for maintenance
- AMSAC/DSS bypassed
- ICS Diamond and FDW Masters are in HAND for performance of Control Rod Movement PT.
- 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.

Reactivity Management (CR SRO)

RCS Boron 83 ppmB	Gp 7 Rod Position: 92% Withdrawn	Batch additions as required for volume control.

Human Performance Emphasis (OSM)

Procedure Use and Adherence

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

Examiners: _____ Operators: _____**SRO**

_____ _____**OATC**

_____ _____**BOP**

Initial Conditions:

- Reactor Power = 100%

Turnover:

- Feedwater valve DP selected to 1A1 and 1B2 for maintenance
- AMSAC/DSS bypassed

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		EBOP Fails to Auto Start
0b			
0c			
1		N: OATC, SRO	5 Minute Delithiation Using Deborating IX
2	MPS290	C: BOP, SRO **(TS)**	1C CCW Pump trips
3	MCS004	I: OATC, SRO	Controlling NR Tave Fails HIGH (586ºF)
4	Override	C: BOP, R: OATC, SRO **(TS)**	1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip
5	Override	C: BOP, SRO	Bearing Oil Header Pressure LOW, EBOP fails to AUTO Start
6	MSS010 Override	M: ALL	Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS • 1A HPI pump trips, 1B HPI pump fails to AUTO start
7			

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

Scenario 2

Event Summary

Event 1: The OATC will perform a 5 minute delithiation using the deborating IX using OP/1/A/1103/004C Deborating IXs, Encl. 4.4 Unit 1 Deborating IX For RCS De-lith (Rx At Power).

Event 2: CCW pump 1C will trip. The crew should address OAC Alarms and determine that the 1C CCW pump has tripped. The SRO should recognize Tech Spec for LPSW accumulator low level. Vacuum will start to decrease until CCW pump 1D is started.

Event 3: Controlling Tave will fail High causing ICS to insert control rods and increase feedwater flow. The crew should perform Plant Transient Response and take the ICS Diamond and Feedwater Loop Masters to MANUAL and stabilize the plant before the reactor trips.

Event 4: 1B MFWP thrust bearing temperature alarm will come in. Temperature will slowly increase requiring the crew to perform a manual power reduction to secure the 1B MFWP.

Event 5: Turbine oil header pressure will start decreasing causing an alarm. The EBOP will have to be started manually to prevent a turbine trip.

Event 6: Turbine oil header pressure will decrease again requiring a reactor/turbine trip but control rods will not insert automatically or manually from the control room. The 1A HPI pump will trip and the 1B HPI pump will fail to start in AUTO. It can be manually started. Approximately 4 minutes after an operator is dispatched to open RPS breakers, the reactor will trip.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 1 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC	***OP/1/A/1103/004C*** **Crew response:** SRO directs the OATC to perform OP/1/A/1103/004C Deborating IXs, Encl. 4.4 Unit 1 Deborating IX For RCS De-lith (Rx At Power). **OP/1/A/1103/004C, Encl. 4.4** Rev 25 **NOTE:** • This procedure affects reactivity management by placing IX and Letdown Filter in service causing possible RCS boron change. (R.M.) • Unit 1 Deborating IX can affect RCS boron because it contains ~ 1200 gal of borated water. (R.M.) **NOTE:** • If IX boron is within acceptable limits, IX may be placed in service with minimal reactivity affects (no CRD movement). (R.M.) • Cation resin is used for de-lith. Cation resin will **NOT** remove boron from RCS. (R.M.) 2.1 **IF** RCS ≤ 100 ppm **AND** IX boron as listed in Demineralizer Log Sheet is more than ± 5 ppm of current RCS boron but is within ± 25 ppm of current RCS boron, perform the following: {7}: **[NA]** 2.1.1 Determine RCS boron change resulting from placing IX in service (assume 1200 gal addition at boron listed in Demineralizer Log Sheet). 2.1.2 Determine RCS makeup sources and volumes required to compensate for RCS boron changes per OP/1/A/1103/004 (Soluble Poison Control). 2.1 .3 Go To Step 2.4. ***Examiner Note: RCS Boron is 83 ppm.***

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 2 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	*OP/1/A/1103/004C* **Crew response:** **NOTE:** • Cation resin is used for de-lith. Cation resin will **NOT** remove boron from RCS. (R.M.) • If IX boron is within acceptable limits, IX may be placed in service with minimal reactivity affects. (R.M.) • Acceptable 'Demineralizer Log Sheet' boron for placing IX in service without rinsing is determined as follows: (R.M.) {4}

RCS Boron Concentration	Acceptable Demin Log Sheet Value
> 100 ppm	± 50 ppm of current RCS boron
≤ 100 ppm	±5 ppm of current RCS boron

2.2 **IF** Unit 1 Deborating IX boron status is **NOT** acceptable to place in service, perform Enclosure 4.5 (Unit 1 Deborating IX Rinse To MWHUT) until acceptable boron results are achieved. (R.M.). **[NA]**

2.3 Unit 1 Deborating IX has acceptable boron status to be placed in service. (R.M.)

NOTE: Placing an idle Letdown Filter in service can affect core reactivity by adding ~ 60 gals of water at a different boron concentration. (R.M.) {5} {6}

2.4 **IF** two Letdown Filters are available **AND NOT** already in service, perform the following: (R.M.) {6}

2.4.1 Review Component Boron Log for out-of-service Letdown Filter boron.

2.4.2 Determine RCS boron based on placing second Letdown Filter in service.

2.4.3 RCS boron ___**83**___ ppm

2.4.4 **IF** RCS makeup is required to achieve acceptable boron, determine RCS makeup sources and volumes per OP/1/A/1103/004 (Soluble Poison Control). **[NA]**

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 3 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1103/004C*** **Crew response:** 2.5 Perform **one** of the following (for all applicable steps 2.1 through 2.4): • Verify acceptable RCS boron. • Ensure appropriate RCS makeup plans determined to ensure acceptable boron. 2.6 Perform **one** of the following: • **IF** two Letdown Filters available, perform the following: ➢ Ensure 1HP-17 (1A LETDOWN FILTER INLET) switch to "OPEN" ➢ Ensure 1HP-18 (1B LETDOWN FILTER INLET) switch to "OPEN" • **IF only one** Letdown Filter available, verify Letdown pressure < 105 psig. 2.7 **IF** RCS makeup is required to ensure acceptable boron, makeup per OP/1/A/1103/004 (Soluble Poison Control). **[NA]** **NOTE:** Anytime IX is placed in service CRD movement may result. (R.M.) 2.8 **WHILE** placing Unit 1 Deborating IX in service, monitor the following indications: (R.M.) {20} • Appropriate ranged NIs • Primary tank levels • Neutron error • CRD position • IX run-time for proper chemistry control 2.9 Align Unit 1 Deborating IX for service: 2.9.1 Verify closed 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET). 2.9.2 Ensure closed 1CS-26 (LETDOWN TO RC BHUT). {17} 2.9.3 Open 1CS-27 (DEBOR IX INLET). 2.9.4 Verify 1HP-15 Controller in "MANUAL". 2.9.5 Ensure open 1HP-16 (LDST MAKEUP ISOLATION).

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 4 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1103/004C*** **Crew response:** 2.10 Position 1HP-14 (LDST BYPASS) in "BLEED" to place Unit 1 Deborating IX in service. **NOTE:** • Chemistry procedures require a minimum of 15 minutes flush for Deborating IXs.(R.M.) • Steps 2.11, 2.12, 2.13 and 2.14 may be performed in any order. 2.11 **IF** sample desired by Chemistry **AND** Unit 1 Deborating IX will be in service for > 20 minutes, notify Chemist to begin flush for sample of Unit 1 Deborating IX effluent. (R.M.) _____ _____ Person Notified Date 2.12 **IF** unexpected changes are noted, perform the following: (R.M.) • Continue enclosure to remove Unit 1 Deborating IX from service. • Notify CRS for evaluation. 2.13 **IF AT ANY TIME** RCS makeup is required for RCS volume control, perform Section 3 (RCS Makeup With Unit 1 Deborating IX In Service). **NOTE:** Opening 1CS-26 will remove Unit 1 Deborating IX from service. 2.14 **IF AT ANY TIME** desired to reduce inventory, reduce RCS inventory (Bleed): 2.14.1 Open 1CS-26 (LETDOWN TO RC BHUT). 2.14.2 **WHEN** complete, close 1CS-26 (LETDOWN TO RC BHUT). 2.15 **IF** sample required by Chemistry **AND** Unit 1 Deborating IX has been in service for > 20 minutes, prior to completing run time ensure Chemist has sampled Unit 1 Deborating IX effluent. (R.M.) _____ _____ Person Notified Date

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 5 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1103/004C*** **Crew response:** 2.16 **WHEN** desired to remove Unit 1 Deborating IX from service, perform the following: 2.16.1 Position 1HP-14 (LDST BYPASS) to "NORMAL". 2.16.2 Ensure closed 1HP-16 (LDST MAKEUP ISOLATION). 2.16.3 Perform one of the following: (R.M.) • Verify correct IX run time per Step 1.2. • Notify Chemistry for evaluation. _____ _____ Person Notified Date 2.16.4 Reset 1HP-15 Controller for Normal Operation. 2.16.5 Close 1CS-27 (DEBOR IX INLET). 2.16.6 Open 1CS-26 (LETDOWN TO RC BHUT). 2.17 Record IX use in Narrative Log. **NOTE:** 1B Letdown Filter is the preferred filter to leave in service for ALARA. 2.18 **IF** desired, remove one Letdown Filter from service: 2.18.1 Verify > 10 minutes since normal Letdown alignment. (R.M.) {5} 2.18.2 Perform **one** of the following: • Position 1HP-17 (1A LETDOWN FILTER INLET) switch to "CLOSE". • Position 1HP-18 (1B LETDOWN FILTER INLET) switch to "CLOSE". 2.18.3 Record RCS boron for out-of-service Letdown Filter in Component Boron Log. (R.M.) {6}

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **1** Page 6 of 6

Event Description: **5 Minute Delith Using Deborating IX (N: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1103/004C*** **Crew response:** 2.19 **IF** Unit 1 Deborating IX will **NOT** be used within the next seven days, perform the following: (R.M.) **NOTE:** IA supply valves should be closed on idle IX(s) to reduce chance of placing wrong IX in service due to human error. (R.M.) {8} 2.19.1 Close IA-3092 (1CS-27 IA Isolation). (A-2-Rm 214) 2.19.2 Bleed off pressure from operator using petcocks. (A-2-Rm 214) **NOTE:** Petcock should be left in the throttled position to ensure pressure does **NOT** build up over time. 2.19.3 Ensure petcock left in the throttled position. 2.19.4 Place a "T/O SHEET" CR tag on 1CS-27 (DEBOR IX INLET) switch. 2.20 Record in Demineralizer Log Sheet for Unit 1 Deborating IX either of the following: (R.M.) • **IF** Unit 1 Deborating IX sample was **NOT** taken, record current RCS boron. • **IF** Unit 1 Deborating IX sample was taken, record IX effluent.

This event is complete when the de-lith is complete or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **2** Page 1 of 2

Event Description: **CCW pump trip (C, BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***OP/1/A/1104/012 A*** **Plant Response:** OAC Alarms: • LPSW LEAKAGE ACCUMULATOR LEVEL LO LO (< 20 inches) • 1C CCW LOCA/LS OFF • ESV Tank Vacuum HI • Condenser Vacuum will start decreasing **Crew Response:** ***Examiner Note: The OAC LPSW Leakage Accumulator LO LO condition is TS 3.7.7. Condition B entry criteria. This alarm will clear when the D CCW pump is started.*** The crew should recognize the need to start the 1D CCW pump and position the LOCA Load Shed select switch to a running CCW pump. OP/**1**/A/1104/012 A Rev 18 2.1 Verify seal water aligned to CCW Pump to be started per OP/0/A/1104/052 (SSW System). **NOTE:** Do **NOT** operate CCW Pumps in the same header until adjacent CCW Pump discharge valves have fully repositioned to prevent CCW Pump discharge valve malfunction. {3} 2.2 **IF** this is the first CCW Pump to be started, verify closed CCW Pump discharge valves on adjacent CCW Pumps. 2.3 Verify closed discharge valve on CCW Pump to be started.

This event is complete when a CCW pump is started in the same header as the CCW pump that tripped and the Tech Spec determination has been made or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **2** Page 2 of 2

Event Description: **CCW pump trip (C, BOP, SRO)(TS)**

Position	Applicant's Actions or Behavior
SRO/BOP	***OP/1/A/1104/012 A*** **Crew Response:** **NOTE:** • CCW Pump starts when discharge valve ≈ 20% open. • ESV Tank low vacuum alarms may occur during CCW Pump start. {1} • LPSW Leakage Accumulator level is a function of LPSW System pressure. When CCW Pump status is changed, LPSW Leakage Accumulator level may exceed the limits of SR 3.7.7.1 until LPSW system pressure stabilizes. As a result, momentary entry into TS 3.7.7 Condition 'B' may be necessary. 2.4 Start desired CCW Pump: _____. 2.5 Verify CCW Pump discharge valve opens. ***Examiner Note: CCWP LOAD SHED DEFEAT switch may be positioned per the Alarm Response Guide.*** 2.6 Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running CCW Pump. **TS 3.7.7 LOW PRESSURE SERVICE WATER (LPSW) SYSTEM** **Condition B (7 days) Restore the LPSW WPS to OPERABLE status.**

This event is complete when a CCW pump is started in the same header as the CCW pump that tripped and the Tech Spec determination has been made or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 2** Event No.**: 3** Page 1 of 3

Event Description**: Controlling NR Tave Fails HIGH (586ºF) (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC ***CT-1***	***AP/1/A/1700/028*** **Plant Response**: • Controlling NR Tave digital display reads ≈ 587.1°F • Controlling Tave Chessell display reads ≈ 587.1°F • 1SA-2/B4 (RC Average Temperature High/Low) • 1SA-2/A12 ICS Tracking • 1SA-2/C11 ICS Loss of OAC CTP Signal • Control Rods will insert and FDW flow will increase • RCS pressure will decrease **Crew Response**: • When the Statalarms are received, the candidates should utilize the "Plant Transient Response" process to stabilize the plant. • Verbalize to the CRS reactor power level and direction of movement. • Place the Diamond and both FDW Masters in manual and position as necessary to stabilize the plant. (decrease FDW) ***Note: The OATC will have to reduce FDW in order to stabilize power below the pre-transient level.*** • The CRS should: ➢ Refer to AP/28, ICS Instrument Failures ➢ Ensure SPOC is contacted to repair the failed instrument. . **AP/1/A/1700/028, ICS Instrument Failures** Rev 20 4.1 Provide control bands as required. **(OMP 1-18 Att. I)** ***OMP 1-18 Attachment I:*** ***1. Plant Conditions Stable or TPB ≤ Pre-transient Conditions*** • ***NI Power ± 1% not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power – 1%.*** • ***Current Tave ± 2°F.*** • ***Current SG Outlet Pressure ± 10 PSIG (N/A)*** • ***Delta Tc 0 ºF ± 2°F.***

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **3** Page 2 of 3

Event Description: **Controlling NR Tave Fails HIGH (586ºF) (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Crew Response**: 4.2 Initiate notification of the following: __ OSM to reference the following: • OMP 1-14 (Notifications) • Emergency Plan __ STA 4.3 Verify a power transient ≥ 5% has occurred. **RNO: GO TO** Step 4.5. 4.4 Notify Rx Engineering and discuss the need for a maneuvering plan. 4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • SPOC assistance, as needed 4.6 **GO TO** the applicable section per the following table: √ | **Section** | **Failure** 4A | RCS Temperature **AP/1/A/1700/028, Section 4A, RCS Temperature Failure** **NOTE** • If Tave instrument circuit failed high, the following may have occurred depending on initial ICS station status: • Unit to TRACK due to Rx Cross Limits • Control Rod insertion • Feedwater flow increase • If Tave instrument circuit failed low, the following may have occurred depending on initial ICS station status: • Unit to TRACK due to Rx Cross Limits • Control Rod withdrawal • Feedwater flow decrease • Feedwater re-ratio

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.**: 2** Event No.**: 3** Page 3 of 3

Event Description**: Controlling NR Tave Fails HIGH (586ºF) (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Crew Response**: 1. Ensure the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER 2. Ensure DIAMOND in MANUAL. 3. Notify SPOC to perform the following: __ 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. **RNO:** Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and OP/1/A/1105/014 (Control Room Instrumentation Operation And Information). 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).

This event is complete when the CRS reaches step 6 (WHEN) in AP/28 Section 4A, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **4** Page 1 of 5

Event Description: **1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip (C: BOP, R: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	***AP/1/A/1700/029*** **Plant response:** OAC Alarm O1A0928 FWPT 1B ACTIVE THRUST BEARING TEMP **Crew Response:** Refer to OAC Alarm Response for O1A0928 for HI-HI temperature > 200°F HI-HI: 1) If temperature cannot be maintained below HI-HI setpoint, refer to OP/1/A/1106/002 B (FDWPT Operation) to remove FDWP from service 2) Refer to OP/1/A/1102/004 (Operation at Power) 3) Notify Component Engineer ***Booth cue: If contacted, respond as the Component Engineer and recommend that the 1B FDWPT be removed from service as soon as possible.*** ***Booth cue: If contacted, respond as the SM and recommend reducing power using AP/1/A/1700/029 (Rapid Unit Shutdown) to remove the 1B FDWPT from service as soon as possible*** ***Booth cue: If an AO is dispatched, he should report that there is a strong scorching oil smell around the 1B FDWPT and the bearing housing is hot to the touch.*** ***Examiner Note: The SRO will refer to AP/1/A/1700/029 (Rapid Unit Shutdown) to reduce power to below 65% in order to secure the 1B MFW Pump.*** ***Examiner Note: If the power decrease is stopped close to 65%, Runback alarm may actuate as FDW stabilizes.*** ***The BOP should refer to OP/1/A/1106/002 B (FDWPT Operation***) (Page 18) **AP/1/A/1700/029 (Rapid Unit Shutdown)**Rev 13 **NOTE** The CR SRO should read this procedure and it should **NOT** be used when EOP entry conditions exist. 4.1 Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown). (Page 17)
This event is complete when the BOP secures the 1B MFW Pump, or as directed by the Lead Examiner.		

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **4** Page 2 of 5

Event Description: **1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip (C: BOP, R: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/029*** **Crew Response:** 4.2 Announce AP entry using the PA system. 4.3 **IAAT** both of the following apply: __ It is desired to stop power decrease __ CTP > 18 % **THEN** perform Steps 4.4 - 4.7. **RNO: GO TO** Step 4.8. ***Examiner Note: Power decrease will be stopped when power is lowered to < 65%.*** 4.4 Verify ICS in AUTO. ***[ICS is in MANUAL]*** **RNO:** 1. __ Stop manual power reduction. 2. __ **GO TO** Step 4.6. **NOTE** Due to the power decrease initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure. Equivalent steps performed by this AP should be signed off as intent met. Any steps **NOT** performed by this AP must be evaluated in preparation for power increase or continued shutdown. 4.6 Initiate OP/1/A/1102/004 (Operation at Power) power reduction enclosure. 4.7 **WHEN** conditions permit, **THEN** perform one of the following: __ Depress MAXIMUM RUNBACK to resume power reduction. __ **GO TO** appropriate operating procedure for continued operation. 4.8 Verify ICS in AUTO. ***[ICS is in MANUAL]*** **RNO**: 1. __ Initiate manual power reduction to desired power level. 2. __ **GO TO** Step 4.10. 4.10 Verify both Main FDW pumps running.

This event is complete when the BOP secures the 1B MFW Pump, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **4** Page 3 of 5

Event Description: **1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip (C: BOP, R: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/029*** **Crew Response:** **NOTE** • 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. 4.11 Adjust bias for first Main FDW pump desired to be shutdown until Suction flow is ≈ 1 x 106 lbm/hr less than remaining Main FDW pump suction flow. 4.12 **WHEN** core thermal power is < 65% FP, **THEN** continue. 4.13 **IAAT** both Main FDW pumps running, **AND** both of the following exist: __ 1B Main FDW Pump is first pump to be shut down __ Any of the following alarms actuate and remain in alarm: • FWP B FLOW MINIMUM (1SA-16/A-3) • FWP B FLOW BELOW MIN (1SA-16/A-4) **THEN** trip 1B Main FDW Pump. ***Examiner Note: SRO may direct a trip of the 1B Main FDW pump to prevent equipment damage and not utilize the OP.*** ***Examiner Note: When < 65% power, IAAT step 4.3 applies which directs the performance of step 4.4-4.7 on the previous page.*** **TS 3.10.1 STANDBY SHUTDOWN FACILITY (SSF)** Conditions A-E (7 days) Restore to operable status ***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 should be entered.***
This event is complete when the BOP secures the 1B MFW Pump, or as directed by the Lead Examiner.		

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **4** Page 4 of 5

Event Description: **1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip (C: BOP, R: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/029*** **Crew Response:** **Enclosure 5.1, Support Actions During Rapid Unit Shutdown** 1. Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown). 2. Start the following pumps: __ 1A FDWP SEAL INJECTION PUMP __ 1A FDWP AUXILIARY OIL PUMP __ 1B FDWP AUXILIARY OIL PUMP __ 1B FDWP SEAL INJECTION PUMP 3. **WHEN** CTP is ≤ 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. **RNO: GO TO** Step 20. 20. **IAAT** 1SSH-9 is **NOT** closed, **AND** CTP is ≤ 75%, **THEN** throttle 1SSH-9 to maintain Steam Seal Header pressure 2.5 - 4.5 psig. 21. **WHEN** CTP ≤ 65%, **THEN** place the following in MANUAL and close: __ 1FDW-53 __ 1FDW-65

This event is complete when the BOP secures the 1B MFW Pump, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **4** Page 5 of 5

Event Description: **1B Main FDW Pump Active Thrust Bearing Temperature HIGH Requiring manual power reduction and MFW Pump trip (C: BOP, R: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC/ BOP	***OP/1/A/1106/002 B*** **Crew Response:** ***OP/1/A/1106/002 B (FDWPT Operation*) Encl 4.9 Shutdown Of 1B FDWPT** Rev 38 2.1 **IF** this is first FDWPT to be shutdown: **[*It is the 1st FDWPT to be shutdown]*** 2.1.1 Verify 1SA-5/E-1 (FWPT / RX TRIP ALERT) **NOT** in alarm. 2.1.2 Position the following: A. Ensure 1FDW-53 (1A FDWP RECIRC CONTROL) in "MANUAL" B. Ensure Closed 1FDW-53 (1A FDWP RECIRC CONTROL) C. Ensure 1FDW-65 (1B FDWP RECIRC CONTROL) in "MANUAL" D. Ensure Closed 1FDW-65 (1B FDWP RECIRC CONTROL) 2.2 **IF** in FDW Heatup, perform the following: ***[N/A]*** 2.3 Ensure running 1B FDWP AUXILIARY OIL PUMP. 2.4 **IF** 1A FDWP is **NOT** isolated for maintenance, start 1A FDWP AUXILIARY OIL PUMP. 2.5 Place 1B MAIN FDW PUMP (ICS) in "HAND". 2.6 Slowly run 1B MAIN FDW PUMP demand signal to minimum. 2.7 **IF** required, verify 1A FDWPT picks up load by observing FDWPT suction flow instruments. 2.8 Immediately trip 1B FDWPT from FW TURB 1B TRIP/RESET switch. • Verify closed 1B FDWPT HP stop valve • Verify closed 1B FDWPT LP stop valve

This event is complete when the BOP secures the 1B MFW Pump, or as directed by the Lead Examiner.

Op-Test No.:**ILT48** Scenario No.: **2** Event No.: **5** Page 1 of 1

Event Description: **Bearing Oil Header Pressure LOW, EBOP fails to AUTO Start (C: BOP, SRO)**

Time	Position	Time
	SRO/ BOP	***1SA-3/E-7*** **Plant Response**: • 1SA-3/E7 BEARING OIL HEADER PRESSURE LOW • OAC alarm TGOP RUNNING **Crew Response**: 1SA-3/E-7 BEARING OIL HEADER PRESSURE LOW Rev 59 3.1 Verify Turning Gear Oil Pump has started. 3.2 Check BEARING HEADER pressure gauge at Turbine Front Standard. **NOTE:** EBOP will also start on a loss of power to Turning Gear Oil Pump ***Examiner Note: EBOP will fail to start automatically.*** 3.3 **IF** BEARING HEADER pressure < 15 psig, verify EBOP is on. 3.3.1 **IF** EBOP has **NOT** started, start EBOP. **[the BOP will start the EBOP]** 3.4 **IF** BEARING HEADER pressure is still < 15 psig: 3.4.1 TRIP THE TURBINE 3.4.2 Place Turbine Turning Gear switch in PULL TO LOCK. 3.5 Check all 12 bearings and verify oil drain flow. 3.6 Check Main Shaft Pump discharge and suction pressure. 3.7 Check Oil Cooler flow sight glass for flow indication and for cooler leakage. 3.8 Check booster pump valve and pressure switch set points. ***Examiner Note: Approximately one minute after the EBOP is started, it will trip on overload. Approximately one minute after the EBOP trips, the main turbine will trip.***

This event is complete when the OATC attempts to trip the reactor, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 1 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO	***EOP*** **Plant response:** • 1SA-3/E-7 BEARING OIL HEADER PRESSURE LOW • Statalarm 1SA-01/A-1, B-1, C-1, D-1 (RP Channel A-D Trip) **Crew response**: • Recognize that the Reactor did NOT trip • Attempt to trip the reactor manually • SRO will direct the OATC to perform IMAs and the BOT to perform a symptom check.
	OATC	***IMAs*** ***EOP Immediate Actions*** Rev 40 3.1 Depress REACTOR TRIP pushbutton. ***[Will not trip the reactor]*** 3.2 Verify reactor power < 5% FP and decreasing. **RNO: GO TO** Rule 1 (ATWS/Unanticipated Nuclear Power Production). (**Page 21**)
	BOP	***SYMPTOM CHECK*** The BOP will verify the following:

Power Range NIs **NOT** < 5% Power Range NIs **NOT** decreasing	Rule 1, *ATWS/Unanticipated Nuclear Po Production*
Any SCM < 0°F	Rule 2, *Loss Of SCM*
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, *Loss of Main or Emerg FDW* Rule 4, *Initiation of HPI Forced Cooling* (Inability to feed SGs and > 2300 psig, N limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure decrease	Rule 5, *Main Steam Line Break*
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

BOP will inform the SRO:

- No symptoms to report except that Power Range NIs are > 5%, OATC is performing Rule 1.

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 2 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	OATC	***RULE 1*** **CREW RESPONSE:** **Rule 1** 1. Verify any Power Range NI ≥ 5% FP. 2. Initiate manual control rod insertion to the IN LIMIT. 3. Verify Main FDW is feeding the SGs. 4. __ Notify CRS to **GO TO** UNPP tab. (**Page 23**) 5. Open: __ 1HP-24 __ 1HP-25 ***RNO:*** **IF** both are closed: __ 1HP-24 __ 1HP-25 **THEN GO TO** Step 32. 6. Ensure at least one operating: __ 1A HPI PUMP **[1A HPIP is trippped]** __ 1B HPI PUMP **[1B HPI Pump has to be started manually]** 7. Start 1C HPI PUMP. 8. Open: __ 1HP-26 __ 1HP-27

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 3 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	OATC ***CT-2***	***RULE 1*** **<u>Crew Response</u>:** 9. Dispatch one operator without wearing Arc Flash PPE to open 600V CRD breakers: {33} __ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm) __ 2X1-5B (U-1 CRD Alternate Fdr Bkr) (T-3/Dd-28) ***Examiner Note: When the operator is dispatched to open CRD breakers, a 4 minute timer will be initiated to open the CRD breakers.*** 10. Verify only two HPI pumps operating. 11. **EXIT**.

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 4 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***UNPP Tab*** **Crew Response:** 1. Ensure Rule 1 (ATWS / Unanticipated Nuclear Power Production) is in progress or complete. 2. Verify Main FDW is operating and in AUTO. 3. **IAAT** Main FDW is **NOT** operating, **THEN**: A. __ Trip the turbine-generator. B. __ Start all available EFDW pumps. C. __ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. 4. __ **IAAT** all power range NIs are < 5% FP, **THEN** perform Steps 5 - 6. **RNO: GO TO** Step 7. 5. Depress turbine TRIP pushbutton. 6. Verify all turbine stop valves closed. 7. Verify any wide range NI > 1% FP. 8. Open 1RC-4. 9. Verify 1HP-5 open. 10. Maximize letdown using 1HP-7 while maintaining letdown temperature < 120°F. 11. Verify Main FDW available. 12. Adjust Main FDW flow as necessary to control RCS temperature. 13. Verify overcooling in progress. **[Over cooling is NOT in progress]** **RNO: GO TO** Step 16.

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 5 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	*UNPP Tab* **Crew Response:** 16. Secure makeup to LDST. {8} 17. **WHEN** all wide range NIs are ≤1% FP, **AND** decreasing, **THEN** continue. 18. Control RCS temperature as follows: __ Tave ≤ 555°F- Adjust SG pressure as necessary to stabilize RCS temperature using either: • TBVs • Dispatch two operators to perform Encl 5.24 (Operation of the ADVs). (**PS**) __ Tave > 555°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). (**Page 27**) 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.

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 6 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***SUBSEQUENT ACTIONS Tab*** **Crew Response:** 4.1 Verify all control rods in Groups 1 – 7 fully inserted. 4.2 Verify Main FDW in operation. 4.3 Verify either: __ Main FDW overfeeding causing excessive temperature decrease. __ Main FDW underfeeding causing SG level decrease below setpoint. **RNO**: **GO TO** Step 4.5. 4.5 **IAAT** Main FDW is operating, **AND** level in any SG is > 96% on the Operating Range, **THEN** perform Steps 4.6 - 4.8. **RNO: GO TO** Step 4.9. 4.9 **IAAT** TBVs **CANNOT** control SG pressure at desired setpoint, **AND** TBVs **NOT** intentionally isolated, **THEN** manually control pressure in affected SGs using either: __ TBVs __ Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) (**PS**) 4.10 Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating. 4.11 **GO TO** Step 4.14. 4.14 Verify both are closed: __ 1MS-17 __ 1MS-26 4.15 Verify ES is required. **RNO:** 1. __ Initiate Encl 5.5 (Pzr and LDST Level Control) (**Page 28**) 2. __ **GO TO** Step 4.17. 4.17 Open: __ PCB 20 __ PCB 21

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

Op-Test No.: **ILT48** Scenario No.: **2** Event No.: **6** Page 7 of 7

Event Description: **Turbine Oil Header Pressure low, Manual Turbine Trip, ATWS (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***SUBSEQUENT ACTIONS Tab*** **Crew Response:** 4.18 Verify Generator Field Breaker open. 4.19 Verify EXCITATION is OFF. 4.20 Verify Aux Bldg and Turbine Bldg Instrument Air pressure ≥ 90 psig. 4.21 Verify ICS/NNI power available. 4.22 Verify all 4160V switchgear (1TC, 1TD & 1TE) energized. 4.23 Verify both SGs > 550 psig. 4.24 Verify Main FDW operating. 4.25 Verify any RCP operating. 4.26 Verify AP/0/A/1700/025 (SSF EOP) Encl (Unit 1 OATC Actions During Fire) in progress or complete. **RNO:** Ensure SGs approaching 25" – 35" [55" – 65" acc] S/U level. 4.27 Place switches in CLOSE: __ 1FDW-31 __ 1FDW-40

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

Rule 6
HPI

HPI Pump Throttling Limits

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

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
All the following conditions must exist: • Core SCM > 0 • CETCs decreasing	All the following conditions must exist: • All WR NIs ≤ 1% • Core SCM > 0 • Pzr level increasing • CRS concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

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

Enclosure 5.5
Pzr and LDST Level Control

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 desired Pzr level: • 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** makeup to the LDST is desired, **THEN** makeup from 1A BHUT.	
3. **IAAT** it is desired to secure makeup to LDST, **THEN** secure makeup from 1A BHUT.	
4. **IAAT** it is desired to bleed letdown flow to 1A BHUT, **THEN** perform the following: A. Open: __ 1CS-26 __ 1CS-41 B. __ Position 1HP-14 to BLEED. C. __ Notify SRO.	
5. **IAAT** letdown bleed is **NO** longer desired, **THEN** position 1HP-14 to NORMAL.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. **IAAT** 1C HPI PUMP is required, **THEN** perform Steps 7 - 9.	**GO TO** Step 10.
7. __ Open: • 1HP-24 • 1HP-25	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 8. 2. **IF** only one 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Start 1C HPI PUMP.	**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: 1HP-26 __ 1HP-27	1. __ **IF** at least two HPI pumps are operating, **AND** 1HP-26 will **NOT** open, **THEN** throttle 1HP-410 to maintain desired Pzr level. 2. **IF** 1A HPI PUMP and 1B HPI PUMP are operating, **AND** 1HP-27 will **NOT** open, **THEN** throttle 1HP-409 to maintain desired Pzr level.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. **IAAT** LDST level **CANNOT** be maintained, **THEN** perform Step 11.	**GO TO** Step 12.
11. __ Perform the following: • Open 1HP-24. • Open 1HP-25. • Close 1HP-16.	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 13. 2. **IF** only one BWST suction valve (1HP-24 or 1HP-25) is open, **AND** three HPI pumps are operating, **THEN** secure 1B HPI PUMP.
NOTE Maintaining Pzr level > 100” [180” acc] will ensure Pzr heater bundles remain covered.	
12.__ Operate Pzr heaters as required to maintain heater bundle integrity.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. **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.).	
14. **IAAT** two Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** all of the following exist: __ Letdown isolated __ LPSW available __ Letdown restoration desired **THEN** perform Steps 16 - 34. {41}	__ **GO TO** Step 35.
16. Open: 1CC-7 1CC-8	1. Notify CR SRO that letdown **CANNOT** be restored due to inability to restart the CC system. 2. **GO TO** Step 35.
17. Ensure only one CC pump running.	
18. Place the non-running CC pump in AUTO.	
19. Verify both are open: 1HP-1 1HP-2	1. **IF** 1HP-1 is closed due to 1HP-3 failing to close, **THEN GO TO** Step 21. 2. **IF** 1HP-2 is closed due to 1HP-4 failing to close, **THEN GO TO** Step 21.
20. __ **GO TO** Step 23.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
21. __ Verify letdown line leak in East Penetration Room has occurred.	**GO TO** Step 23.
22. __ **GO TO** Step 35.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. Monitor for unexpected conditions while restoring letdown.	
24. __ 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. __ **GO TO** Step 26.
25. Open: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4	
26. Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. Notify CR SRO of problem. B. **GO TO** Step 35.
27. Close 1HP-6.	
28. Close 1HP-7.	
29. 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. __ Open 1HP-5.	
31. __ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. __ **WHEN** letdown temperature is < 125°F, **THEN** place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. __ Open 1HP-6.	
34. Adjust 1HP-7 to control desired letdown flow.	
NOTE AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.	
35. **IAAT** it is determined that letdown is unavailable due to equipment failures or letdown system leakage, **THEN** notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. **IAAT** > 1 HPI pump is operating, **AND** additional HPI pumps are **NO** longer needed, **THEN** perform the following: A. Obtain SRO concurrence to reduce running HPI pumps. B. __ Secure the desired HPI pumps. C. Place secured HPI pump switch in AUTO, if desired.	
37. __ **IAAT** all the following conditions exist: __ Makeup from BWST **NOT** required __ LDST level > 55″ __ All control rods inserted __ Cooldown Plateau **NOT** being used **THEN** close: __ 1HP-24 __ 1HP-25	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. __ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	**GO TO** Step 40.
39. **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.	
40. __ Verify two Letdown Filters in service, **AND** <u>only one</u> Letdown filter is desired.	**GO TO** Step 42.
41. Perform <u>one</u> of the following: __ Place 1HP-17 switch to CLOSE. __ Place 1HP-18 switch to CLOSE.	
42. **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

Enclosure 5.9

Extended EFDW Operation Rev 40

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. __ Verify 1 TD EFDW PUMP operating.	__ **GO TO** Step 12.
11. Start TD EFDWP BEARING OIL COOLING PUMP.	

NOTE

- 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.

12. Notify CR SRO to set priority based on the NOTE above and EOP activities.	
13. **IAAT** it is determined that condensate flow **CANNOT** be restored within 25 minutes, **THEN GO TO** Step 90.	
14. __ Verify any HWP operating.	1. __ Place all CBP control switches to OFF. 2. __ **GO TO** Step 20.
15. __ Verify any CBP operating.	1. **IF** AP/11 restarted a HWP, **THEN GO TO** Step 22. 2. __ **GO TO** Step 41.
16. Verify 1C COND BOOSTER PUMP operating. {12}	1. Ensure only one CBP is operating. 2. **GO TO** Step 18.
17. Stop: {12} __ 1A COND BOOSTER PUMP __ 1B COND BOOSTER PUMP	
18. __ Ensure only one HWP is operating.	
19. __ **GO TO** Step 44.	

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. **WHEN** UST level is < 4', **THEN** dispatch two operators to perform Encl 5.24 (Operation of the ADVs) in preparation for loss of vacuum. (**PS**)	
61. Verify power available to 1V-186 by using valve position indicating light.	Dispatch an operator to be in position at 1V-186 (Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).
NOTE 1C-573 will be closed after vacuum is broken.	
62. Dispatch an operator with a safety harness to 1C-573 (MD EFDWPs Suction From UST) (T-1, SW of E-24, 8' above floor) to: __ Unlock and remove chain from 1C-573. Establish communication with Control Room.	
63. **WHEN** UST level is < 3', **THEN** continue.	
64. Open 1V-186.	Notify operator to open 1V-186 (Main Condenser Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).
65. __ Stop all main vacuum pumps.	
66. __ Stop all CBPs.	
67. __ Stop all HWPs.	
68. Close: __ 1MS-47 __ 1AS-40	Dispatch an operator to close: __ 1MS-49 (1A CSAE Steam Supply) (T-3/F-26) 1MS-58 (1B CSAE Steam Supply) (T-3/G-26) 1MS-67 (1C CSAE Steam Supply) (T-3/H-26)

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • 1C-573 is open unless Step 75 has been completed. • While EFDW is secured, a transfer to LOHT is required only when directed by this enclosure or Rule 4 (Initiation of HPI Forced Cooling) conditions are met.	
69. **IAAT** UST level is < 1', **AND** 1C-573 (MD EFDWPs Suction From UST) is open, **THEN** perform Steps 70 - 71.	**GO TO** Step 72.
70. Perform the following: __ Stop 1A MD EFDWP. __ Stop 1B MD EFDWP.	
71. __ Verify 1C-391 open.	1. __ Stop 1TD EFDW PUMP. 2. Close: 1FDW-315 1FDW-316
72. Perform the following: A. Reduce MD EFDWP flow to < 440 gpm per pump. B. Notify crew of MD EFDWP flow limit while aligned to hotwell.	
NOTE Vacuum gage or computer can be used. Vacuum is broken when either start to flat line. Do NOT change scale on computer trend once started.	
73. **WHEN** vacuum is broken, **THEN** continue.	

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
87. **IAAT** hotwell level is ≤ 1″, **THEN**: A. __ Stop <u>all</u> EFDWPs. B. Consider <u>all</u> U-1 EFDW pumps inoperable, **AND GO TO** Rule 3.	

<u>NOTE</u>

- This step provides general plant directions for the SRO and Management team. The user shall continue after the notification has been made.
- Swapping from TBVs to ADVs prevents overfilling the hotwell/condenser.
- Securing steam seals limits the water (condensation) that reaches the oil systems. Vacuum must be broken to secure steam seals.
- Engineering will determine when to allow secondary system restart.
- Beginning a cooldown assumes HPI is operating. If the SSF is supplying seals, then further discussion with the Management team should be undertaken prior to cooldown.

88. Notify the CR SRO to direct the following <u>as time and resources allow</u>: • Transfer steam control from TBVs to ADVs. • Operate ADVs per U1 EOP Encl 5.24 (Operation of ADVs). • Begin Unit cool down to LPI per OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) <u>using the ADVs</u>. • Break vacuum per OP/1-2/A/1106/016 (Condenser Vacuum System). • Secure Steam Seals per OP/1/A/1106/13 (Steam Seal System).	
89. **WHEN** directed by CR SRO, **THEN EXIT**.	

Subsequent Actions

EP/**1**/A/1800/001

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized {13}	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F	**GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer	**GO TO** EHT tab.	**LOHT**
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	**GO TO** LOHT tab.	
7. Heat transfer is or has been excessive	**GO TO** EHT tab.	**EHT**
8. Indications of SGTR ≥ 25 gpm	**GO TO** SGTR tab.	**SGTR**
9. Turbine Building flooding **NOT** caused by rainfall event	**GO TO** TBF tab.	**TBF**
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
11. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
12. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	**EDL**
14. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and NSD 202 (Reportability).	**NOTIFY**

CRITICAL TASKS

CT-1 ICS must be taken to HAND and FDW adjusted to prevent tripping the reactor. Adjustment will be dependent on how much time it takes to place ICS in HAND.

CT-2 Take the reactor subcritical (i.e. < 1% WR) prior to exiting the UNPP tab.

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: 100%	Mode: 1	Mode: 1
Gross MWE: 895	100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action	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 #
AMSAC/DSS	0300	7 Days	16.7.2

Shift Turnover Items (CR SRO)

Primary

- Due to unanalyzed condition, the SSF should be considered INOP for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).
- 1RIA-3 and 5 removed from RB.
- OATC is to perform a 5 minute Delith using OP/1/A/1103/004C (Deborating IXs) Encl. 4.4 (Unit 1 Deborating IX For RCS De-lith (Rx At Power))

Secondary

- Feedwater valve DP selected to A1 and B2 for maintenance
- AMSAC/DSS bypassed
- 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.

Reactivity Management (CR SRO)

RCS Boron 83 ppmB	Gp 7 Rod Position: 92% Withdrawn	Batch additions as required for volume control.

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 = 100%

Turnover:

- Feedwater valve DP selected to 1A1 and 1B2 for maintenance
- AMSAC/DSS bypassed

Event No.	Malfunction No.	Event Type*	Event Description
0a			
0b			
0c			
1	Override	C: BOP, SRO **(TS)**	1A RBCU high vibration, secure 1A and start 1B RBCU
2	MSI231	I: OATC, SRO	1A FDW Valve DP Signal Fails Low
3	MPS450	C: BOP, R: OATC SRO **(TS)**	1B1 RCP Hi Vib, Power reduction
4	MPI281	I: OATC, SRO	ΔTc fails
5	Updater	C: BOP, SRO	1HP-14 fails to BLEED
6	MPS020	R: OATC, SRO **(TS)**	20 gpm Pri-Sec leak in 1B SG requires Manual S/D
7	MPS020 Updater	M: ALL	1TA Lockout, 1B SGTR • TBV on intact SG trips to MANUAL • 1HP-26 fails closed

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

Scenario 3

Event Summary:

Event 1: 1A RBCU will develop a vibration and alarm on the OAC. The OAC alarm response guide will direct the operator to attempt to reset the alarm and then secure the RBCU. The crew will contact engineering who will direct starting of the 1B RBCU in High speed. The RBCU will start in low speed first, then de-energize and change to High speed.

Event 2: The feedwater valve DP will fail low causing feedwater pump speed to increase. The OATC will have to take MFWPs to MANUAL and reduce FWPT speed. The crew will perform AP/28 (ICS Instrumentation Failures). ICS will be returned to AUTO.

Event 3: RCP 1B1 will experience high vibration that will require using AP/16 (RCP Malfunction) to perform a power reduction to below 70% to remove from service.

Event 4: When the 1B1 RCP is tripped, ΔTc will fail and feedwater will not re-ratio. The OATC may attempt to control ΔTc with the ΔTc controller in MANUAL but this will not work either. The OATC will then be required to take both FDW LOOP MASTERS to HAND in order to re-ratio feedwater.

Event 5: 1HP-14 will fail in the BLEED position. Crew will be required to enter AP/2, (Excessive RCS Leakage). The crew will close 1HP-6 and throttle 1HP-7 to maintain Pzr Level.

Event 6: A 20 gpm SGTL in the 1B SG will require entry into AP/31, (Primary to Secondary Leakage) and perform a rapid unit shutdown using AP/29 (Rapid Unit Shutdown) with ICS in MANUAL.

Event 7: Bus 1TA will lockout. This will cause the 1A1 RCP to de-energize and the Reactor to trip (only 2 RCPs operating). When the reactor trips, the SGTL will degrade into a 200 gpm SGTR. The TBV on the 1A SG will trip to MANUAL. 1HP-26 will not open requiring the crew to open 1HP-410 to inject into the RCS.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **1** Page 1 of 2

Event Description: **1A RBCU high vibration, secure 1A and start 1B RBCU (C, BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	**Plant Response:** OAC alarm: • O1D1361, RBCU FAN 1A VIB **Crew Response:** • BOP will Refer to OAC ARG (O1D1361, RBCU FAN 1A VIB) 1. Depress the RBCU OAC Vibration Alarm Reset Pushbutton **[It will not reset]** 2. If the alarm doesn't clear, stop the RBCU. **[BOP will secure the 1A RBCU]** **[Alarm will not reset until the ALARM RESET P/B is depressed]** 3. Notify Engineering for an evaluation ***Booth cue: Using time compression as SM & engineering request that 1B RBCU be started in HIGH SPEED.*** ***OP/1/A/1104/015*** **OP/1/A/1104/015 Reactor Building Cooling System,** Rev 42 **Encl 4.3 (RBCU Operation), Section 4, Starting RBCUs** **NOTE:** When starting RBCUs or changing LPSW flows, RB pressure will change as RB temperature changes. 4.1 Verify RB pressure within limits of PT/1/A/0600/001 (Periodic Instrument Surveillance). 4.2 Begin monitoring RB absolute pressure. (OAC Turn On Code: 1RBPA) {8} 4.3 **IF** personnel inside containment, announce over plant page that starting RBCU(s). {11} **NOTE:** Starting RBCUs can affect the following: RBCU bearing temperatures, RBCU vibration, RBNS level, 1RIA-47 level, RB pressure/temperature. 4.4 Place desired switch to "HIGH" or "LOW": 1A RBCU 1B RBCU 1C RBCU

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

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **1** Page 2 of 2

Event Description: **1A RBCU high vibration, secure 1A and start 1B RBCU (C, BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	***OP/1/A/1104/015*** **Crew Response:** **NOTE:** • When changing LPSW flows, RB pressure will change as RB temperature changes. • Each RBCU must have ≥ 550 gpm Inlet Flow or ≥ 750 gpm Outlet Flow to meet flow requirements of SLC 16.9.12. 4.5 Position valves as required for RB cooling: • 1LPSW-18 (1A RBCU OUTLET) • 1LPSW-21 (1B RBCU OUTLET) • 1LPSW-24 (1C RBCU OUTLET) ***TS 3.6.5, REACTOR BUILDING SPRAY AND COOLING TRAINS*** ***Condition B (7 days) Restore reactor building cooling train to OPERABLE status.***

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

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 1 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/028*** **Plant Response**: • FDW pump speed increases • FDW Control Valves will throttle closed to limit flow • FDW Pump discharge pressure increases **Crew Response**: • Crew should perform Plant Transient Response (PTR). • OATC should place both FDW pump ICS stations in MANUAL and reduce FDW pump speed to ~ pre-transient valve. • The OATC may take the Diamond & both FDW Masters to HAND • SRO will enter AP/1/A/1700/028, ICS Instrumentation Failure ***Examiner Note: OATC may take FDW Loop Masters and Diamond to HAND as well. These are standard PTR actions.*** **AP/1/A/1700/028** Rev 20 4.1 Provide control bands as required. 4.2 Initiate notification of the following: __ OSM to reference the following: • OMP 1-14 (Notifications) • Emergency Plan __ STA 4.3 Verify a power transient ≥ 5% has occurred. **RNO: GO TO** Step 4.5. 4.4 Notify Rx Engineering and discuss the need for a maneuvering plan. 4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • SPOC assistance, as needed 4.6 **GO TO** the applicable section per the following table: | | **Section** | **Failure** | | | 4H | Feedwater Valve ΔP |

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 2 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior

	SRO/OATC	***AP/1/A/1700/028***
		Crew Response:
		AP/28, Section 4H
		NOTE
		• If Feedwater Valve ΔP failed high, both MFDWPs go to low speed stop.
		• If Feedwater Valve ΔP failed low, the following will occur:
		  • Both MFDWPs go to high speed stop
		  • Feedwater control valves close to reduce increased Feedwater flow
		  • Feedwater pump(s) may trip on high discharge pressure
		1. Ensure the following in HAND:
		__ 1A MAIN FDW PUMP
		__ 1B MAIN FDW PUMP
		2. Notify SPOC to investigate and repair the failed Feedwater Valve DP instrumentation.
		Booth Cue: When notified as SPOC, inform the crew that all work is complete on 1A2 FDW Valve dp and 1A2 FDW Valve dp is now a valid signal.
		3. Select a valid Feedwater Valve DP input to ICS with selector switch.
		4. **WHEN** a valid Feedwater Valve DP input has been restored to ICS, **THEN GO TO** OP/1/A/1102/004 A Encl 4.4 (Placing ICS Stations To Auto).
		Examiner Note: Crew should select 1A2 FDW Valve dp and return ICS to AUTO.
		OP/1/A/1102/004 A Encl 4.4 Rev 10
		1.1 Verify CTP ≥ 3%
		1.2 Review PT/0/A/1103/020
		1.3 Ensure dedicated operator assigned to monitor/operate ICS
		1.4 Perform pre-job brief including precautions from SOMP 1-02 (Reactivity Management) and applicable Limits & Precautions of PT/0/A/1103/020 (Power Maneuvering Predictions) (R.M.)
		1.5 Ensure R2 reactivity management controls are established in Control Room per SOMP 1-02 (Reactivity Management)

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 3 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***OP/1/A/1102/004 A*** **Crew Response**: **OP/1/A/1102/004 A Encl 4.4 Section 2** 2.1 Ensure "RATE SET" thumbwheels at 0.0. 2.2 **IF** TURBINE MASTER is in HAND, perform Section 3 **(N/A)** 2.3 **IF** either TBV is in HAND, perform Section 4 **(N/A)** 2.4 **IF** REACTOR MASTER **OR** DIAMOND is in manual, perform Section 5 ***Examiner Note: Section 5 may or may NOT be needed based on actions taken during PTR*** **OP/1/A/1102/004 A Encl 4.4 Section 5** 5.1 **IF** Rx Master is in HAND, perform the following: **(N/A)** 5.2 **IF** both SGs are off of Level Control, perform the following: 5.2.1 **IF** selected Tave (O1E2086) is different from Tave setpoint (O1E2087) by more than ± 0.15°F, perform the following: A. Simultaneously ensure 1A & 1B FDW Masters in HAND **NOTE:** Cycling the setpoint selector may result in a Star Module failure. This is expected for this condition and entry into AP/28 (ICS Instrument Failures is **NOT** required. The Star Module failure shall be cleared before the ICS is returned to Auto. B. On REACTOR MASTER, cycle Tave setpoint selector between 565°F and 585°F five times C. **IF** Star Module failed, perform the following: **(N/A)** D. On REACTOR MASTER adjust Tave setpoint (O1E2078) towards selected Tave (O1E2086) 5.2.2 Verify selected Tave is within ± 0.15°F of Tave setpoint 5.3 **IF** either SG is on Level Control, adjust Tave setpoint (O1E2087) to 579°F 5.4 Place DIAMOND in AUTO 5.5 Return to Section 2 (Procedure)

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 4 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	*OP/1/A/1102/004 A* **Crew Response**: **OP/1/A/1102/004 A Encl 4.4 Section 2** 2.5 **IF** DELTA Tc is in HAND, perform Section 6 **(N/A)** 2.6 **IF** STM GENERATOR MASTER or either FDW MASTER is in HAND, perform Section 7 (Placing FDW To Auto) **Section 7 may or may NOT be needed based on actions taken during PTR** **OP/1/A/1102/004 A Encl 4.4 Section 7** 7.1 **IF** SG Master is in HAND, perform the following: **(N/A)** 7.2 **IF** 1A **OR** 1B FDW Master is **NOT** in AUTO, perform the following: 7.2.1 Select 1A & 1B FDW MASTERs to "MEAS VAR" 7.2.2 **IF** both 1A **AND** 1B FDW Master Measured Variables are on the caret: A. Select 1A & 1B FDW MASTERs to "POS" B. Simultaneously ensure 1A & 1B FDW MASTERs in AUTO 7.2.3 **IF** 1A **OR** 1B FDW Master Measured Variable is **NOT** on the caret **(N/A)** 7.3 Return to Section 2 (Procedure) **OP/1/A/1102/004 A Encl 4.4 Section 2** 2.7 **IF any** FDW valves are in HAND, perform Section 8 **(N/A)** 2.8 **IF** either Main FDW Pump is in HAND, perform Section 9

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 5 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	*OP/1/A/1102/004 A* **Crew Response**: **OP/1/A/1102/004 A Encl 4.4 Section 9** 9.1 **IF** lowest FDW valve ΔP is **NOT** ≈ 35 psid, adjust either of the following until the lowest FDW valve ΔP ≈ 35 psid: (R.M.) • 1A MAIN FDW PUMP • 1B MAIN FDW PUMP 9.2 Verify lowest FDW VALVE ΔP ≈ 35 psid. 9.3 **IF** 1A MAIN FDW PUMP operating in "HAND", place 1A MAIN FDW PUMP (ICS) in "AUTO". 9.4 **IF** 1B MAIN FDW PUMP operating in "HAND", place 1B MAIN FDW PUMP (ICS) in "AUTO". 9.5 Return to Section 2 (Procedure). **OP/1/A/1102/004 A Encl 4.4 Section 2** 2.9 Verify ICS in full Auto. **CAUTION:** Adjusting THP, Tave or Delta Tc setpoint too fast can cause plant instability. 2.10 **IF** **NOT** being controlled by another procedure, perform the following: 2.10.1 **IF** THP (O1E2088) is **NOT** ≈ 885 psig, slowly adjust THP Setpoint (O1E2089) to ≈ 885 psig. (R.M.) 2.10.2 **IF** Tave Setpoint (O1E2087) is **NOT** at ≈ 579°F, slowly adjust Tave Setpoint to ≈ 579°F. (R.M.) 2.10.3 **IF** Delta Tc is **NOT** ≈ 0.0, adjust Delta Tc Setpoint (O1E2091) to ≈ 0.0°F. (R.M.) 2.11 **IF** both FDWP suction flows are **NOT** within 1 x 10 6 lb/hr of each other, adjust FDWP BIAS per Enclosure 4.3 (Adjusting FDWP BIAS).

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **2** Page 6 of 6

Event Description: **1A FDW Valve DP Signal Fails Low (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***OP/1/A/1102/004 A*** **Crew Response**: **OP/1/A/1102/004 A Encl 4.4 Section 2** 2.12 **IF** desired, adjust CTP as follows: (R.M.) 2.12.1 Review current mechanical maneuvering rates per PT/0/A/1103/020 (Power Maneuvering Predictions). 2.12.2 **IF** desired to increase power, perform the following: A. **WHEN** ICS has been in full Auto (Integrated Mode) for > 10 minutes, continue at Step 2.12.3. {6} 2.12.3 Ensure selected "HOLD". 2.12.4 Ensure desired setting selected ("%/MIN" or "%/HR") on "RATE" pushbuttons. 2.12.5 Ensure desired rate selected on "RATE SET" thumbwheels. 2.12.6 Insert desired CTPD SET using "INCREASE/DECREASE" pushbuttons. 2.12.7 Ensure "HOLD" is **NOT** selected. 2.12.8 **WHEN** desired CTP is achieved, return "RATE SET" thumbwheels to 0.0.

This event is complete when a valid Feedwater Valve DP input to ICS has been selected and ICS is returned to AUTO, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3** Page 1 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	**Plant Response**: • 1SA9/D-2 RC Pump Vibration High in alarm • OAC 1B1 RCP VIB Alarm ***1SA9/D-2*** **Crew Response**: SRO will direct the BOP to refer to ARG 1SA-9/D-2 **1SA-9/D-2** 3.1 Use one of the following means to verify RCP vibration conditions: • Verify vibration reading on RCP OAC Display Group RCP. • **IF** the OAC is unavailable, verify the alarm by referring to RCP Vibration Monitoring Chart Recorder (ON1RCCR0430). (RCP Panel on 6th floor AHU Room) **NOTE:** Vibration indication of both RCPs in a Loop trending up together without any changes to RCS conditions (Temp/Press) is a symptom of a Vibration Monitor power supply failure. 3.2 **IF** indications of both RCPs in a Loop are trending up together without any changes to RCS conditions (Temp/Press), swap Vibration Monitor power supplies as follows: **[Only 1 RCP experiencing vibrations] NA** 3.3 **IF** MODE 1 or 2, initiate AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation). **NOTE:** Vibrations are expected to increase due to changing RCS temperature/pressure. 3.4 **IF** MODE 3, 4 or 5 **AND** vibration increase is **NOT** due to changing RCS temperature/pressure, initiate AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation). 3.5 Monitor RCP parameters. 3.6 Contact PM2 Group for analysis of RCP parameters and to install additional monitoring equipment. 3.7 Initiate a CR for Engineering to document potential vibration effects on RCS Piping.

This event is complete when the 1B1 RCP is tripped, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3** Page 2 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: **AP/1/A/1700/016 Abnormal Reactor Coolant Pump Operation** Rev 33 4.1 **IAAT** any RCP meets immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria), **THEN** perform Steps 4.2 - 4.11. **[Vibrations will NOT meet the immediate trip criteria]** **RNO: GO TO** Step 4.12. **NOTE** If affected RCP has a seal failure, and immediate trip criteria not met, then continue to Section 4A (Seal Failure) to ensure Seal Failure guidance steps are read. Section 4A (Seal Failure) contains steps to quickly secure affected RCP should the need arise. 4.12 **IAAT** either of the following apply: __ Any RCP approaching immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria) __ There is an immediate need to stop a RCP at this time **THEN** perform Steps 4.13 - 4.15. **RNO: GO TO** Step 4.16. ***Examiner Note: The SRO may decide to remove the RCP from service at this time and proceed to step 4.13. It they do not, they will proceed to Step 4.16 per the RNO*** (Page 16). 4.13 Verify Rx Power > 70%. 4.14 Initiate Encl 5.2 (Rapid Power Reduction). (**Page 19**) 4.15 **WHEN** Rx Power is ≤ 70%, **THEN GO TO** Step 4.2. 4.2 Verify MODE 1 or 2. 4.3 Verify Rx power is ≤ 70% as indicated on all NIs. 4.4 Verify three RCPs will remain operating after affected RCP is tripped. 4.5 Verify any SG on Low Level Limits. **RNO: GO TO** Step 4.8.

This event is complete when the 1B1 RCP is tripped, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 3 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: ***Booth Cue:*** ***If the crew does not secure the 1B1 RCP, call the control room as the SM and report that Engineering recommends securing the 1B1 RCP.*** 4.8 Verify FDW masters in Auto. 4.9 Stop the affected RCP. 4.10 Verify ICS re-ratios feedwater to establish desired Delta Tc. ***Examiner Note: ICS will NOT re-ratio feedwater correctly, this is Event 4.***
	OATC	**RNO:** 1. Place DELTA Tc station in HAND. 2. Manually adjust DELTA Tc station to achieve desired Delta Tc. ***Examiner Note: DELTA Tc controller will not function in HAND which will require the OATC to place both FDW Loop Masters in HAND to control DELTA Tc.*** **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. 3. **IF** DELTA Tc station does **NOT** control, **THEN** perform the following: A. Place the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER B. Manually adjust FDW masters to achieve desired Delta Tc. 4. **IF** there has been a failure of the DELTA Tc controller, **THEN** notify SPOC to repair. ***Examiner Note: If the crew does not re-ratio FDW soon enough, QPT may exceed the COLR values and require entry into TS 3.2.3 (Page 15)*** 4.11 **GO TO** Step 4.29.

Event 3 is complete when the 1B1 RCP is tripped, Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 4 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: 4.29 **IAAT** any of the following indicate external RCP seal leakage: __ RB RIAs increasing or in alarm __ RCS Tave constant with LDST level decreasing more than normal __ Quench Tank level rate increasing __ RB Normal Sump rate increasing __ Visual confirmation **THEN** initiate AP/02 (Excessive RCS Leakage). 4.30 Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power). (**Page 20**) 4.31 **IAAT** either of the following conditions is met: __ a RCP has been shut down for ≥ 3 hours, {9} __ a RCP with high oil level has been shut down **THEN** close the associated RCP motor cooler inlet/outlet valve: __ 1LPSW-7&8 (1A1 RCP) __ 1LPSW-9&10 (1B1 RCP) __ 1LPSW-13&14 (1A2 RCP) __ 1LPSW-11&12 (1B2 RCP) 4.32 **IAAT** either of the following has exceeded 260°F including transient situations: __ O1A1253 - O1A1256 (RCP UPPER SEAL HOUSING TEMP) __ O1A1910 - O1A1913 (RCP SEAL RETURN TEMP) **THEN** closely monitor seal parameters for degradation until an Engineering evaluation is completed due to potential for seal ring and elastomer damage. **NOTE** Operating experience has shown that failure of RC Pump components located internal to the RCS can create loose debris which can lead to fuel clad failures. These type RC Pump failures may cause Loose Parts Monitor alarms immediately and increased RCS radioactivity later. 4.33 Verify 1RIA 57 or 1RIA 58 have increased. **RNO: GO TO** Step 4.35.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 5 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails at (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: 4.35 **IAAT** a RCP has been tripped due to exceeding Immediate Trip Criteria on a RCP motor, **THEN** contact RCP engineer prior to restart. 4.36 **IAAT** both are met: __ There has been a failure of the DELTA Tc controller __ The DELTA Tc controller has been repaired **THEN** initiate OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto). 4.37 Verify any RCP that was shut down had a high vibration alarm. 4.38 Initiate a PIP for Engineering to document potential vibration effects on RCS piping. 4.39 **WHEN** conditions permit, **THEN EXIT** this procedure. ***TS 3.10.1 STANDBY SHUTDOWN FACILITY (SSF), Once Reactor Power is reduced below 85% the SSF must be declared inoperable. Conditions A-E (7 Days) Restore to operable status.*** ***TS 3.2.3 QUADRANT POWER TILT (possible if operator does not re-ratio feedwater correctly).*** ***Condition A:*** ***(2 hours) Reduce THERMAL POWER > 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit.*** ***(10 hours)* Reduce nuclear overpower trip setpoints, based on flux and flux/flow imbalance, ≥ 2% RTP for each 1% of QPT greater than the *steady state limit.*** ***(24 hours from discovery of failure to meet LCO) Restore QPT to less than or equal to the steady state limit.***

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 6 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails at (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: ***Alternate Path from Step 4.12*** 4.16 Announce AP entry using the PA system. 4.17 Notify OSM to request evaluation by RCP Component Engineer. 4.18 **IAAT** the failure is identified, **THEN GO TO** the applicable section per the following table: | | Section | Failure | | | 4B | Abnormal Vibration | **Section 4B Abnormal Vibration** 1. **IAAT** any RCP meets immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria), **THEN** perform Steps 2 - 11. **RNO: GO TO** Step 12**. [RCP Vibrations will NOT reach trip criteria]** 12. Verify RCP vibration indication is available for monitoring in Control Room. 13. Monitor RCS flow for indication of degradation. 14. Verify all CETCs < 630°F. (Turn-on code "ITC") 15. Monitor RCP parameters for operational abnormalities: __ OAC Display: (Turn-on Code "RCP") • Motor bearing temperatures • Seal return temperature • Seal return flow • RCP motor input power __ Loose Parts Monitor 16. **IAAT** high vibration exists per statalarm 1SA-9/D-2, (RC PUMP VIBRATION HIGH) **AND** vibration continues to increase with the potential to exceed trip criteria **THEN** perform Steps 17 - 27. **RNO: GO TO** Step 28. 17. Verify MODE 1 or 2.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 3** Event No.**: 3/4** Page 7 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO) ΔTc fails at (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: 18. Verify three RCPs will remain operating after affected RCP is tripped. 19. Verify Rx power is ≤ 70% as indicated on all NIs. **RNO:** 1.__Direct an RO to initiate Encl 5.2 (Rapid Power Reduction) (**Page 19**) 2.__**WHEN** Rx power is ≤ 70% on all NIs, **THEN** continue this procedure. 20. Verify any SG on Low Level Limits. **RNO: GO TO** Step 23. 23. Verify FDW masters in Auto. 24. Stop the affected RCP. 25. Verify ICS re-ratios feedwater to establish desired ΔTc. **RNO:** 1. __ Place DELTA Tc station in HAND. 2. __ Manually adjust DELTA Tc station to achieve desired Δ Tc. **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. ***Examiner Note: ICS will NOT re-ratio feedwater correctly, this is Event 4.*** 3. __ **IF** DELTA Tc station does **NOT** control, **THEN** perform the following: A. Place the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER B. __ Manually adjust FDW masters to achieve desired Δ Tc. 4. __ **IF** there has been a failure of the DELTA Tc controller, **THEN** notify SPOC to repair. 26. Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power). (**Page 20**)

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 8 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails at (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: 27. Initiate the following notifications: __ Notify OSM to make required notifications of OMP 1-14 (Notifications). __ Notify Rx Engineering and request a power maneuver plan, if needed. __ Notify SOC if load reduction was required. __ Notify Chemistry to take RCS boron samples on a 1 hour frequency. **NOTE** Operating experience has shown that failure of RC Pump components located internal to the RCS can create loose debris which can lead to fuel clad failures. These type RC Pump failures may cause Loose Parts Monitor alarms immediately and increased RCS radioactivity later. 28. Verify 1RIA-57 or 1RIA-58 have increased. **RNO: GO TO** Step 30. 30. **IAAT** an RCP has been shut down for ≥ 3 hours, **THEN** close the associated RCP motor cooler inlet/outlet valve: __ 1LPSW-7&8 (1A1 RCP) __ 1LPSW-9&10 (1B1 RCP) __ 1LPSW-13&14 (1A2 RCP) __ 1LPSW-11&12 (1B2 RCP) 31. **IAAT** a RCP has been tripped due to exceeding Immediate Trip Criteria on a RCP motor, **THEN** contact RCP engineer prior to restart. 32. **IAAT** both are met: __ There has been a failure of the DELTA Tc controller __ The DELTA Tc controller has been repaired **THEN** initiate OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto). 33. Initiate a PIP for Engineering to document potential vibration effects on RCS piping. 34. **WHEN** conditions permit, **THEN EXIT** this procedure.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 9 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/016*** **Crew Response**: **Encl 5.2 Rapid Power Reduction** **NOTE** • This enclosure should be performed by an RO. • The step to verify ICS in AUTO means that the ICS is capable of responding to a MAXIMUM RUNBACK signal. 1. Verify ICS in AUTO. 2. Initiate MAXIMUM RUNBACK to ≤ 70% 3. **WHEN** Rx Power is ≤ 70% as indicated by all NIs, **THEN** press MAXIMUM RUNBACK to stop runback 4. Notify CR SRO that Rx Power is ≤ 70% 5. Adjust CTPD SET to match CTP DEMAND 6. Stop the 1E1 and 1E2 HTR DRN PUMPs 7. Verify Rx Power was reduced ≥ 15% within a 1 hour period. 8. Notify Primary Chemistry to perform Tech Spec SR 3.4.11.2 as required. 9. **EXIT** this enclosure.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 10 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	*OP/1/A/1102/004* **Crew Response**: **OP/1/A/1102/004 OPERATIONS AT POWER, Encl 4.3 Special Instructions For < 4 RCP Operations** Rev 144 2.1 **IF** conditions permit, log the current quadrant power tilt and the position of the ΔTC controller prior to securing a RCP during power operations. **NOTE:** • Instructions for performing OAC trends are located in Working With Trends enclosure of OP/0/A/1103/020 A (Operator Aid Computer Use). • Only the first 6 points will be displayed initially; press "Page Down" key to see second 6 points. 2.2 Using turn-on code T6 3RCP, digitally trend the following data at one minute intervals: Point ID — Description O1P0889 — CORE THERMAL POWER BEST O1P0877 — INCORE IMBALANCE O1E3335 — API GROUP AVE FOR GROUP 7 O1E3336 — API GROUP AVE FOR GROUP 8 O1P0737 — INCORE TILT QUADRANT W-X O1P0738 — INCORE TILT QUADRANT X-Y O1P0739 — INCORE TILT QUADRANT Y-Z O1P0740 — INCORE TILT QUADRANT Z-W O1I0828 — RC COLD LEG A1 TEMP O1I0829 — RC COLD LEG A2 TEMP O1I0830 — RC COLD LEG B1 TEMP O1I0831 — RC COLD LEG B2 TEMP 2.3 After steady state conditions are attained, perform the following: 2.3.1 Check NI calibration. 2.3.2 **IF** NI calibration is **NOT** within requirements of Limit and Precaution Step 2.2.6, calibrate NIs to Thermal Power Best. (R.M.) **NOTE:** The 100% Power Imbalance curves also apply for runs at reduced power. 2.4 Maintain Control Rod position and Power Imbalance within COLR limits.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 11 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***OP/1/A/1102/004*** **Crew Response**: **NOTE:** The Maximum Allowed Power Setpoint (Pmax) is reduced when operating for extended periods with a 3 RC Pump Configuration as a conservative action. 2.5 Perform the following: 2.5.1 **IF** expected to operate for an extended period of time with only 3 RCPs operating, notify I&E to adjust Flux/ Imbalance /Flow trip setpoints for 3 RCP operation per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions). (R.M.) _____ _____ Person Notified Date 2.5.2 **IF AT ANY TIME** Quadrant Power Tilt problems exist, notify I&E to Adjust Flux/Imbalance/Flow trip setpoints as required to comply with TS 3.2.3 per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions). (R.M.) _____ _____ Person Notified Date **NOTE:** • Operations Management/Reactor Engineering Group should be consulted for value to use for high flux alarm setpoint. • Instructions for Adjusting Alarm Setpoints On The NI Recorder are in OP/0/A/1108/001 (Curves And General Information). 2.6 Adjust high flux alarm setpoint per Operations Management/Reactor Engineering Group recommendations. (Alarm setpoint is adjusted on the NI Recorder). (R.M.) **NOTE:** 'D' bleed pressure may **NOT** be high enough to run the FDWP turbines. 2.7 Maintain Auxiliary Steam available to the FDWP turbines. 2.8 **IF** 1SSH-9 (SSH DISCH CTRL BYPASS) is being used to control Steam Seal Header pressure, throttle 1SSH-9 as required to maintain desired SSH pressure during the load reduction to secure an RCP.

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **3/4** Page 12 of 12

Event Description: **1B1 RCP Hi Vib, Power reduction (C: BOP, SRO)**
ΔTc fails (I: OATC, SRO)

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***OP/1/A/1102/004*** **Crew Response**: **NOTE:** RCS pressure decrease in the loop with two RCPs running is expected. This may cause acceptance criteria of PT/1/A/0600/001 (Periodic Instrument Surveillance) **NOT** to be met. 2.9 Place note on CR turnover sheet indicating the following: "Be aware of the effect of the indicated pressure on the margin to trip setpoint for the Reactor Protective System trips associated with RCS pressure."

Event 4 is complete when the OATC adjusts DTc to within 0±2°F, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **5** Page 1 of 4

Event Description: **1HP-14 fails to BLEED (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/002*** **Plant Response:** • OAC alarm: 1HP-14 = BLEED • OAC alarm: 1HP-14 LDST BYPASS (NOT NORMAL) • 1SA-2/B1 LDST LEVEL HI/LOW may actuate if operators are slow to recognize the failure. **Crew Response:** The SRO should initiate AP/1/A/1700/002 (Excessive RCS Leakage) **AP/1/A/1700/002 (Excessive RCS Leakage)** Rev 015 3.1 Verify HPI operating 3.2 **IAAT** RC makeup flow is > 100 gpm, **AND** Pzr level is decreasing, **THEN** close 1HP-5 ***Examiner Note: If 1HP-5 is closed , Encl 5.5 will used to re-open when required.*** 3.3 **IAAT** all the following exist: **(N/A)** __ RCS leakage > NORMAL MAKEUP CAPABILITY (≈ 160 gpm) with letdown isolated __ Pzr level decreasing __ SG Tube Leakage NOT indicated __ LPI DHR NOT providing core cooling **THEN** perform the following: A. Ensure Rx is tripped B. Initiate Unit 1 EOP **NOTE** Other than a SGTR, 1HP-26 should **NOT** need to be opened with the reactor critical. 4.1 Initiate Pzr and LDST level makeup using Unit 1 EOP Encl 5.5 as necessary. (**Page 46**) 4.2 Announce AP entry using PA system 4.3 **IAAT** LPI DHR in service, **AND** RCS leakage > LDST makeup capability (≈ 50 gpm), **THEN GO TO** AP/26 **(N/A)**

Event 5 is complete when the standby HPI pump switch is returned to AUTO, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **5** Page 2 of 4

Event Description: **1HP-14 fails to BLEED (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/002*** **Crew Response:** 4.4 Initiate the following notifications: __ OSM to reference the following: • RP/0/A/1000/001 (Emergency Classification) • OMP 1-14 (Notifications) • Encl 5.9 (Oversight Guidelines) __ STA __ RP 4.5 Monitor the following trends to determine leak area (AB or RB) and trend for degradation: __ T6 AP/02 __ T6 WASTE __ RIAs 4.6 Verify specific leak location is identified 4.7 Initiate Encl 5.1 (Leak Rate Determination) Leak Rate = _____ + _____ - _____ - _____ = _____ **MU SI LD TSR** 4.8 **WHEN** leak area/failure is identified, **THEN GO TO** applicable step that best fits leak area/failure:

√	Area/ Failure	Symptoms	Step
	1HP-14 failure	1HP-14 failed in BLEED position ↓ LDST level ↑ 1A BHUT level	4.155

4.155 Verify 1A LD Filter in service

RNO: 1. **IF** 1A LD Filter is out of service for maintenance, **THEN** restore 1A LD Filter per in progress procedure **(N/A)**

2. Open 1HP-17

4.156 Close 1HP-6

Event 5 is complete when the standby HPI pump switch is returned to AUTO, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: 3 Event No.: **5** Page 3 of 4

Event Description: **1HP-14 fails to BLEED (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/002*** **Crew Response:** **NOTE** Tech Spec 3.4.9 applies when indicated Pzr level > 260" (corrected value for 285") 4.157 Adjust 1HP-7, as needed, to control: • BLEED flow out of failed 1HP-14 • Pzr level 4.158 Dispatch an operator to open 1HP-196 (Filter Diversion Inlet) (A-2-LDST Hatch Area) 4.159 Verify CC system in operation 4.160 Position the standby HPI pump switch to OFF 4.161 Initiate monitoring RCP parameters 4.162 Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW ***Booth Cue: When directed to open 1HP-196, use MAN VALVES to open, and notify crew that `HP-196 is open.*** 4.163 **WHEN** 1HP-196 (Filter Diversion Inlet) is open, **THEN** close 1CS-26 4,164 Close the following: __ 1CS-27 __ 1CS-32 & 37 4.165 Open 1HP-6 4.166 Throttle 1HP-31 to establish ≈ 32 gpm SEAL INLET HDR FLOW 4.167 Adjust 1HP-7 to establish desired letdown flow 4.168 Position standby HPI pump switch to AUTO 4.169 **WHEN** 1HP-14 has been repaired, **THEN** perform the following: A. Ensure 1HP-14 in NORMAL B. Open 1HP-26 C. Ensure HPI valves are aligned such that a letdown path will be present after 1HP-196 is closed D. Close 1HP-196 ***Examiner Note: 1HP-14 will NOT be repaired.***

Event 5 is complete when the standby HPI pump switch is returned to AUTO, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **5** Page 4 of 4

Event Description: **1HP-14 fails to BLEED (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/039*** **Crew Response:** ***Examiner Note: AP/39 (Unintentional Boration) may be entered if 1HP-24 and/or 1HP-25 is opened to mitigate a suspected leak (1HP-14 failing to bleed).*** **AP/1/A/1700/039 Unintentional Boration** Rev 2 **CAUTION** Do NOT add demin water to counter the boration until RCS boron concentration stabilizes to prevent a positive reactivity event. 4.1 Announce AP entry using PA system. 4.2 **IAAT** CTP < 6%, **THEN** perform the following: A. __ Trip the Rx. B. __ **GO TO** Unit 1 EOP. 4.3 **IAAT** all the following exist: __ ICS is in Automatic __ Control rods approach upper limit of desired operating band **THEN** perform the following: A. __ Establish desired shutdown rate. B. __ Decrease CTP demand setpoint, as necessary. C. Adjust shutdown rate, as necessary, to maintain control rods within the desired band. 4.4 **IAAT** all the following exist: __ ICS is in Manual __ Tave is outside the control band **THEN** manually adjust FDW, as necessary, to maintain Tave within the control band until both SGs are on Low Level Limits. 4.5 **IAAT** a power decrease is initiated, **THEN** initiate Encl 5.1 (Unit Shutdown Support Actions). 4.6 Take action to identify and terminate the boration, as necessary. 4.7 Verify the source of the boration has been identified and terminated.

Event 5 is complete when the standby HPI pump switch is returned to AUTO, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 1 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/031*** **Plant Response:** • 1SA-8/A-9 (RM AREA MONITOR RADIATION HIGH) • 1SA-8/E-10 (N-16 RM PRIMARY TO SECONDARY TUBE LEAK) • 1SA-8/D-10 (RM CSAE EXHAUST RADIATION HIGH) • 1SA-8/B-9 (RM PROCESS MONITOR RADIATION HIGH) • 1RIA-40 in alarm • 1RIA 60 in alarm and indicating ≅ 20 gpm **Crew Response:** SRO will enter AP/1/A/1700/031 Primary To Secondary Leakage Rev 21 **AP/1/A/1700/031** **NOTE** The total primary to secondary leak rate can be determined by the following means: • OAC point O1P1599 (EST TOTAL PRI TO SEC LEAKRATE) if OAC primary to secondary leak rate calculation available (including 1RIA-40 operable with CSAE OFF-GAS BLOWER operating). • Sum of 1RIA-59 and 1RIA-60 readings if both operable and reactor power > 40%. • Allowable leakage per Tech Spec 3.4.13 is 150 gpd through any one SG. • Estimated SGTR leak rate formula: Leak rate = ____ + ____ - ____ - ____ = ____ **MU** **SI** **LD** **TSR** Where: MU = Makeup Flow SI = Seal Inlet Hdr Flow LD = Letdown TSR = Total Seal Return Flow If the EOP is **NOT** already in progress, entry will be directly to the SGTR tab. RIA-59 / 60 and RIA-16 / 17 on the unaffected SG may indicate up to 2 % of the value of the detector on the affected SG due to radiation shine from the steam line carrying radioactive steam from the SG with the tube leak.

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 2 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/031*** **Crew Response:** 4.1 **IAAT** primary to secondary leak rate is ≥ 25 gpm (≥ 36,000 gpd), **THEN GO TO** Unit 1 EOP. 4.2 **IAAT** either of the following exists for 1RIA-54: __ is in High alarm __ inoperable **THEN** perform Steps 4.3 - 4.4. **NOTE** The white tags can be created and hung after the TBS pump breakers are opened. 4.3 Dispatch an operator to open and white tag the following: __ 1XD-R3C (1A TURBINE BUILDING SUMP PUMP BKR) __ 1XE-R3D (1B TURBINE BUILDING SUMP PUMP BKR) 4.4 Notify Secondary Chemistry to perform the following: __ Obtain a TBS sample. __ Recommend TBS release path. 4.5 Initiate notification of the following: __ OSM to reference the following: • OMP 1-14 (Notifications) • Emergency Plan __ STA **NOTE** 1RIA-59 and 1RIA-60 are considered inoperable below 40% power. 4.6 **IAAT** notified by Chemistry that 1RIA-40 is inoperable because the minimum detection limit is too high, **AND** 1RIA-59 or 1RIA-60 is inoperable, **THEN** perform Encl 5.9 (1RIA-40 Inoperable Due to Failure to Meet Minimum Detectable Limit**)**. 4.7 **IAAT** primary to secondary leakage exceeds 30 gpd, **THEN** perform Steps 4.8 – 4.9. **[Pri-Sec leak rate ≈ 21 gpm]**

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 3 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/031*** **Crew Response:** 4.8 Dispatch AO to reroute Unit 1 CSAE drains to the CST per OP/1-2/A/1106/016 (Condenser Vacuum System). 4.9 Initiate Encl 5.2 (Reduction of Secondary Leakage and Cross-Unit Contamination). 4.10 **IAAT** tube leakage is large enough to be indicated by an increase in normal RC makeup flow or a decrease in Pzr level, **THEN GO TO** Step 4.86. 4.86 Verify OAC primary to secondary leak rate calculation available (including 1RIA-40 operable with CSAE OFFGAS BLOWER operating). 4.87 Determine primary to secondary leakage rate using OAC point O1P1599 (EST TOTAL PRI TO SEC LEAK RATE). 4.88 **GO TO** Step 4.93. 4.93 Initiate log readings from the following every 15 minutes in the Auto Log: • 1RIA-16 • 1RIA-17 • 1RIA-40 • 1RIA-59 (when Rx power > 40 %) • 1RIA-60 (when Rx power > 40 %) 4.94 Initiate a unit shutdown to meet requirements of Encl 5.1 (Unit Shutdown Requirements) using the following, as applicable: • AP/29 (Rapid Unit Shutdown) (**Page 31**) • OP/1/A/1102/004 (Operation at Power) • OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) ***Booth Cue: If asked, Unit 2 will continue actions in AP/31*** 4.95 **IAAT** primary to secondary leakage increases, **THEN** modify shutdown as required by Encl 5.1 (Unit Shutdown Requirements). 4.96 Notify OSM to refer to Tech Spec. 3.10.1 Basis to determine SSF operability.

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 4 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/031*** **Crew Response:** 4.97 Notify plant personnel, using the PA system, to stay clear of the affected MS line and the powdex. 4.98 Notify Radwaste to stop all liquid releases in progress until sample results assures release rates within limits. 4.99 Stop all gaseous releases in progress until sample results assure release rates within limits. 4.100 **IAAT** all the following exist: __ Primary to secondary leak rate < 100 gpd (< 0.0694 gpm) __ 1RIA-40 inoperable __ Rx Power ≤ 40 % **THEN** notify RP and Primary Chemistry to sample CSAE off-gas and RCS every 4 hours. 4.101 Make up to the UST only as necessary to maintain UST level > 7.5 '. 4.102 Notify the following that a shutdown is in progress due to primary to secondary leakage: __ RP __ Primary Chemistry __ Secondary Chemistry 4.103 Verify affected SG identified. 4.104 Verify entry into this procedure was due to one of the following: __ Tube leakage large enough to be indicated by an increase in normal RC makeup flow or a decrease in Pzr level __ Tritium sample indicating ≥75 gpd primary to secondary leak ***TS 3.4.13 RCS OPERATIONAL LEAKAGE,*** ***Condition B due to Primary to Secondary LEAKAGE not within limit (12 hours/36 hours) Be in Mode 3 / Mode 5.***

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 5 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/029*** **Crew Response:** **AP/1/A/1700/029 Rapid Unit Shutdown** Rev 13 **NOTE** The CR SRO should read this procedure and it should **NOT** be used when EOP entry conditions exist. 4.1 Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown) (**Page 33**) 4.2 Announce AP entry using the PA system 4.3 **IAAT** both of the following apply: __ It is desired to stop power decrease __ CTP > 18 % **THEN** perform Steps 4.4 - 4.7 **RNO: GO TO** Step 4.8 4.4 Verify ICS in AUTO **RNO:** 1. Stop manual power reduction 2. **GO TO** Step 4.6 **NOTE** Due to the power decrease initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure. Equivalent steps performed by this AP should be signed off as intent met. Any steps **NOT** performed by this AP must be evaluated in preparation for power increase or continued shutdown. 4.6 Initiate OP/1/A/1102/004 (Operation at Power) power reduction enclosure 4.7 **WHEN** conditions permit, **THEN** perform one of the following: __ Depress MAXIMUM RUNBACK to resume power reduction __ **GO TO** appropriate operating procedure for continued operation 4.8 Verify ICS in AUTO **RNO:** 1. Initiate manual power reduction to desired power level 2. **GO TO** Step 4.10

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 6 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/029*** **Crew Response:** 4.10 Verify both Main FDW pumps running. **NOTE** • 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. 4.11 Adjust bias for first Main FDW pump desired to be shutdown until Suction flow is ≈ 1 x 10^6 lbm/hr less than remaining Main FDW pump suction flow. 4.12 **WHEN** core thermal power is < 65% FP, **THEN** continue. ***Examiner Note: Power should already be < 70% due to the power reduction to remove a RCP from service.*** 4.13 **IAAT** both Main FDW pumps running, **AND** both of the following exist: __ 1B Main FDW Pump is first pump to be shut down __ Any of the following alarms actuate and remain in alarm: • FWP B FLOW MINIMUM (1SA-16/A-3) • FWP B FLOW BELOW MIN (1SA-16/A-4) **THEN** trip 1B Main FDW Pump. 4.14 **IAAT** both Main FDW pumps running, **AND** both of the following exist: __ 1A Main FDW Pump is first pump to be shut down __ Any of the following alarms actuate and remain in alarm: • FWP A FLOW MINIMUM (1SA-16/A-1) • FWP A FLOW BELOW MIN (1SA-16/A-2) **THEN** trip 1A Main FDW Pump. 4.15 Verify Turbine-Generator shutdown is required. 4.16 Start the TURBINE TURNING GEAR OIL PUMP.

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 7 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/029*** **Crew Response:** 4.17 Start 1A through 1E TURBINE BRNG OIL LIFT PUMPS. 4.18 Start the TURBINE MOTOR SUCTION PUMP. 4.19 **IAAT** both of the following apply: __ ICS in automatic __ NI power ≤ 18% **THEN** deselect MAXIMUM RUNBACK. 4.20 Verify Turbine-Generator shutdown is required. 4.21 __ **WHEN** NI power ≤ 18%, **THEN** depress turbine TRIP pushbutton. 4.22 __ Verify all TURBINE STOP VALVES closed. **Enclosure 5.1 Support Actions During Rapid Unit Shutdown** 1. Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown). 2. Start the following pumps: __ 1A FDWP SEAL INJECTION PUMP __ 1A FDWP AUXILIARY OIL PUMP __ 1B FDWP AUXILIARY OIL PUMP __ 1B FDWP SEAL INJECTION PUMP 3. **WHEN** CTP is ≤ 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.

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **6** Page 8 of 8

Event Description: **20 gpm Pri-Sec leak in 1B SG requires Manual S/D (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***AP/1/A/1700/029*** **Crew Response:** 8. Verify Turbine-Generator shutdown is required. 9. Place the following transfer switches to MAN: __ 1TA AUTO/MAN __ 1TB AUTO/MAN 10. 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: __ MFB1 AUTO/MAN __ MFB2 AUTO/MAN 15. Close E11 MFB1 STARTUP FDR. 16. Verify N11 MFB1 NORMAL FDR opens. 17. Close E21 MFB2 STARTUP FDR. 18. Verify N21 MFB2 NORMAL FDR opens. 19. Notify CR SRO that Unit auxiliaries have been transferred. 20. **IAAT** 1SSH-9 is **NOT** closed, **AND** CTP is ≤ 75%, **THEN** throttle 1SSH-9 to Maintain Steam Seal Header pressure 2.5 - 4.5 psig. 21. **WHEN** CTP ≤ 65%, **THEN** place the following in MANUAL and close: __ 1FDW-53 __ 1FDW-65 22. __ **IAAT** load is ≤ 550 MWe, **THEN** perform Steps 23 - 24.

This event is complete when Reactor power has been reduced > 10% and auxiliaries have been transferred, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 1 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
		EOP
		Plant Response: • Rx Trip • 1SA-8/B-9 RM Process Monitor Radiation High • 1SA8/D10 (RM CSAE EXHAUST RADIATION HIGH)
		Crew Response: • SRO will direct the OATC to perform IMAs and the BOP to perform a symptom check.
	SRO	***IMAs***
		EOP Immediate Actions Rev 40
	OATC	3.1 Depress REACTOR TRIP pushbutton. 3.2 Verify reactor power < 5% FP and decreasing. 3.3 Depress the turbine TRIP pushbutton 3.4 Verify all turbine stop valves closed. 3.5 Verify RCP seal injection available.
		SYMPTOM CHECK
	BOP	The BOP will verify the following:

Power Range NIs **NOT** < 5% Power Range NIs **NOT** decreasing	Rule 1, *ATWS/Unanticipated Nuclear Po Production*
Any SCM < 0°F	Rule 2, *Loss Of SCM*
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, *Loss of Main or Emerg FDW* Rule 4, *Initiation of HPI Forced Cooling* (Inability to feed SGs and > 2300 psig, N limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure decrease	Rule 5, *Main Steam Line Break*
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identif SG Tube Leakage > 25 gpm)

SRO will review IMAs and transfer to the Subsequent Actions Tab.

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 2 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***Subsequent Actions Tab*** **Crew Response:** ***Examiner Note: The crew may not recognize the SGTL has degraded into a SGTR initially so steps in the SA tab were included. When the crew recognizes the SGTR, they should transfer to the SGTR tab*** (Page 39) **as directed by the Subsequent Actions, Parallel Action Page** (Page 54). 4.1 Verify all control rods in Groups 1 – 7 fully inserted. 4.2 Verify Main FDW in operation. 4.3 Verify either: __ Main FDW overfeeding causing excessive temperature decrease. __ Main FDW underfeeding causing SG level decrease below setpoint. **RNO: __ GO TO** Step 4.5. 4.5 **IAAT** Main FDW is operating, **AND** level in any SG is > 96% on the Operating Range, **THEN** perform Steps 4.6 - 4.8. **RNO: __ GO TO** Step 4.9. 4.9 **IAAT** TBVs **CANNOT** control SG pressure at desired setpoint, **AND** TBVs **NOT** intentionally isolated, **THEN** manually control pressure in affected SGs using either: __ TBVs __ Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) ***Examiner Note: The 1A TBVs have failed closed in AUTO. They can be operated in MANUAL.*** 4.10 Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating. 4.11 **GO TO** Step 4.14. 4.14 Verify <u>both</u> are closed: __ 1MS-17 __ 1MS-26

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 3 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***Subsequent Actions Tab*** **Crew Response:** 4.15 Verify ES is required. **RNO**: 1. __ Initiate Encl 5.5 (Pzr and LDST Level Control).(**Page 46**) 2. __ **GO TO** Step 4.17. 4.17 Open: __ PCB 20 __ PCB 21 4.18 Verify Generator Field Breaker open. 4.19 Verify EXCITATION is OFF. 4.20 Verify Aux Bldg and Turbine Bldg Instrument Air pressure ≥ 90 psig. 4.21 Verify ICS/NNI power available. 4.22 Verify all 4160V switchgear (1TC, 1TD & 1TE) energized. 4.23 Verify both SGs > 550 psig. 4.24 Verify Main FDW operating. 4.25 Verify any RCP operating. 4.26 Verify AP/0/A/1700/025 (SSF EOP) Encl (Unit 1 OATC Actions During Fire) in progress or complete. **RNO:** Ensure SGs approaching 25″ - 35″ [55″ - 65″ acc] S/U level. 4.27 Place switches in CLOSE: __ 1FDW-31 __ 1FDW-40 4.27 Place switches in CLOSE: __ 1FDW-31 __ 1FDW-40

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 4 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***Subsequent Actions Tab*** **Crew Response:** 4.28 Verify SFP Cooling: {42} __ SFP Cooling in service __ SFP level normal 4.29 Verify all SCMs > 0°F. 4.30 Verify both SGs intentionally isolated to stop excessive heat transfer. **RNO: __ GO TO** Step 4.32. 4.32 Verify heat transfer exists. 4.33 Verify primary to secondary heat transfer has been excessive. **RNO: __ GO TO** Step 4.35. 4.35 Verify indications of SGTR ≥ 25 gpm. 4.36 **GO TO** SGTR tab. ***Examiner Note: The crew should recognize that the SGTL has degraded to a SGTR at this point.***

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 5 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP ***CT-1***	***SGTR Tab*** **Crew Response:** 1. Verify Rx tripped. 2. Maintain Pzr level 140″ - 180″ [175″ - 215″ acc] by initiating Encl 5.5 (Pzr and LDST Level Control). (**Page 46**) ***Examiner Note: 1HP-26 has failed in the closed position.*** 3. Ensure Parallel Actions Page reviewed. **NOTE** The remainder of this page may be given to an RO. The Procedure Director may continue. 4. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN 5. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN 6. Perform the following: A. __ Monitor RIAs 16 and 17 to identify all SGs with a tube rupture. B. __ Inform SRO of results. 7. Dispatch an operator to open: __ 1XD-R3C (A Turb Bldg Sump Pump Bkr) (T-1, G-27) __ 1XE-R3D (B Turb Bldg Sump Pump Bkr) (T-1, J-27) 8. Notify RP to survey both MS lines for radiation. 9. **GO TO** Step 28.

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 6 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***SGTR Tab*** **Crew Response:** 28. Secure any unnecessary offsite release paths. (Main Vacuum Pumps, TDEFDWP, Emergency Steam Air Ejector, etc.). 29. Verify Main FDW or EFDW controlling properly. 30. Open: __ 1HP-24 __ 1HP-25 31. Secure makeup to LDST. 32. Maintain both SG pressures < 950 psig using either: __ TBVs __ Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) ***Examiner Note: 1A TBVs have tripped to HAND.*** 33. **IAAT** all the following exist: __ All SCMs > 0°F __ ES Bypass Permit satisfied __ RCS pressure controllable **THEN** perform Steps 34 - 35. 34. Bypass applicable ES: To Bypass HPI: __ Bypass HPI CH A, B, C To Bypass LPI: __ Bypass LPI CH A, B, C 35. Bypass applicable Diverse ES: To Bypass HPI: __ Bypass Diverse HPI To Bypass LPI: __ Bypass Diverse LPI

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 7 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***SGTR Tab*** **Crew Response:** **NOTE** Leak rate prior to reducing SCM is input to Cool Down Plateau at Steps 103 and 203. 36. Estimate SGTR leak rate: _____ + _____ - _____ - _____ = _____ gpm **MU** **SI** **LD** **TSR** **LR** Where: MU =Makeup Flow SI =Seal Inlet Hdr Flow LD =Letdown Flow TSR =Total Seal Return Flow LR =Leak Rate 37. Verify any RCP operating. 38. Maintain RCP NPSH during the reduction of SCM: • OAC • Encl 5.18 (P/T Curves) **NOTE** • If normal pzr spray is available, efforts should be made to minimize core SCM ≤ 15°F **IF** allowed by RCP NPSH requirements. • If normal pzr spray is **NOT** available, minimize core SCM as low as safely achievable. 39. Reduce and maintain core SCM at minimum using any/all of the following methods: __ De-energize all Pzr heaters __ Use Pzr spray __ Maintain Pzr level 140″ - 180″ [175″ - 215″ acc]

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 8 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***SGTR Tab*** **Crew Response:** **NOTE** • The rate of fill of the SG with the tube rupture should be considered when deciding to use alternate depressurization methods. • Pzr spray, if available, is preferred to maintain SCM at minimum after using the PORV. This will prevent repetitive cycling of the PORV. 40. **IAAT** RCS de-pressurization methods are inadequate in minimizing core SCM, **THEN** perform Step 40 - 42. **NOTE** BWST temperature should be used in determining Pzr spray nozzle ΔT. Computer point O1P3367 provides Pzr spray nozzle ΔT information. 41. Verify Pzr spray nozzle ΔT ≥ 410°F. 42. Close: __ 1LWD-1 __ 1LWD-2 43. Cycle PORV as necessary. 44. Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit. **RNO**: __ Select OFF for both digital channels on AFIS HEADER A. 45. Verify 1SA-2/D-8 (AFIS HEADER B INITIATED) lit. **RNO**: __ Select OFF for both digital channels on AFIS HEADER B. 46. Verify RCS temperature > 532°F. **NOTE** Close monitoring of RCS pressure is essential during the cooldown if ES has not been bypassed. Slowing the cooldown and stopping Pzr spray momentarily may be needed as ES Bypass Permit is approached to avoid ES actuation.

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 9 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***SGTR Tab*** **Crew Response:** 47. Initiate a cooldown as follows: __ Decrease SG pressure to 835 - 845 psig using any of the following: • TBV setpoint adjusted to 710 - 720 psig • TBVs in manual • ADVs __ Maximize cooldown rate limited only by the ability to maintain Pzr level > 100″ [180″ acc]. 48. **WHEN** SG pressure is 835 - 845 psig, **THEN** adjust SG pressure as necessary to maintain an RCS temperature band of 525°F - 532°F. 49. **IAAT** any affected SG approaches overfill: • Any SCM ≤ 0°F: LOSCM setpoint • All SCMs > 0°F: 285″ [315″ acc] XSUR **THEN** perform Steps 49 - 51. **RNO**: __ **GO TO** Step 52. 50. Verify TBVs available for steaming affected SGs. 51. Open on all affected SGs: | | **1A SG** | | **1B SG** | | | 1MS-17 | | 1MS-18 | **NOTE** Steaming a SG to prevent overfill should continue even if Tech Spec cooldown rates are exceeded. 52. Steam affected SGs to prevent overfill. 53. Verify at least one open: __ 1MS-24 __ 1MS-33

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **3** Event No.: **7** Page 10 of 10

Event Description: **1TA Lockout, 1B SGTR (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO OATC/BOP	***SGTR Tab*** **Crew Response:** 54. Verify a SG without a tube leak is available to supply the Aux Steam header. 55. Open on the SG without a tube leak: 56. Close on the SG with a tube leak: 57. Open 1AS-40 while closing 1MS-47. 58. Close on all affected SGs: 59. Close 1SSH-9. 60. Verify one SG isolated due to steam leak. **RNO**: **__GO TO** Step 68. 68. Verify all SCMs > 0°F. 69. **GO TO** applicable step based on number of RCPs operating: 71. Verify steaming both SGs. **RNO**: **__ GO TO** Step 87. 87. Initiate AP/31 (Primary to Secondary Leakage) Encl 5.2 (Reduction of Secondary Leakage and Cross-Unit Contamination).

	1A SG		1B SG
	1MS-24		1MS-33

	1A SG		1B SG
	1MS-24		1MS-33

	1A SG		1B SG
	1MS-79		1MS-76
	1MS-82		1MS-84
	1MS-35		1MS-36

	Number of RCPs Operating	Applicable Step
	4	69
	1,2 or 3	70
	None	90

This event is complete when the crew minimizes core SCM, or when directed by the lead examiner.

Rule 6
HPI

HPI Pump Throttling Limits

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

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
All the following conditions must exist: • Core SCM > 0 • CETCs decreasing	All the following conditions must exist: • All WR NIs ≤ 1% • Core SCM > 0 • Pzr level increasing • SRO concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

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

Enclosure 5.5
Pzr and LDST Level Control

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 desired Pzr level: • 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** makeup to the LDST is desired, **THEN** makeup from 1A BHUT.	
3. **IAAT** it is desired to secure makeup to LDST, **THEN** secure makeup from 1A BHUT.	
4. **IAAT** it is desired to bleed letdown flow to 1A BHUT, **THEN** perform the following: A. Open: __ 1CS-26 __ 1CS-41 B. __ Position 1HP-14 to BLEED. C. __ Notify SRO.	
5. **IAAT** letdown bleed is **NO** longer desired, **THEN** position 1HP-14 to NORMAL.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. **IAAT** 1C HPI PUMP is required, **THEN** perform Steps 7 - 9.	**GO TO** Step 10.
7. __ Open: • 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: __ 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. __ **GO TO** 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Start 1C HPI PUMP.	**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: 1HP-26 __ 1HP-27	1. __ **IF** at least two HPI pumps are operating, **AND** 1HP-26 will **NOT** open, **THEN** throttle 1HP-410 to maintain desired Pzr level. 2. **IF** 1A HPI PUMP and 1B HPI PUMP are operating, **AND** 1HP-27 will **NOT** open, **THEN** throttle 1HP-409 to maintain desired Pzr level.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. **IAAT** LDST level **CANNOT** be maintained, **THEN** perform Step 11.	**GO TO** Step 12.
11. __ Perform the following: • Open 1HP-24. • Open 1HP-25. • Close 1HP-16.	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 13. 2. **IF** only one BWST suction valve (1HP-24 or 1HP-25) is open, **AND** three HPI pumps are operating, **THEN** secure 1B HPI PUMP.
NOTE Maintaining Pzr level > 100” [180” acc] will ensure Pzr heater bundles remain covered.	
12.__ Operate Pzr heaters as required to maintain heater bundle integrity.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. **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.).	
14. **IAAT** two Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** all of the following exist: __ Letdown isolated __ LPSW available __ Letdown restoration desired **THEN** perform Steps 16 - 34. {41}	__ **GO TO** Step 35.
16. Open: 1CC-7 1CC-8	1. Notify CR SRO that letdown **CANNOT** be restored due to inability to restart the CC system. 2. **GO TO** Step 35.
17. Ensure only one CC pump running.	
18. Place the non-running CC pump in AUTO.	
19. Verify both are open: 1HP-1 1HP-2	1. **IF** 1HP-1 is closed due to 1HP-3 failing to close, **THEN GO TO** Step 21. 2. **IF** 1HP-2 is closed due to 1HP-4 failing to close, **THEN GO TO** Step 21.
20. __ **GO TO** Step 23.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
21. __ Verify letdown line leak in East Penetration Room has occurred.	**GO TO** Step 23.
22. __ **GO TO** Step 35.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. Monitor for unexpected conditions while restoring letdown.	
24. __ 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. __ **GO TO** Step 26.
25. Open: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4	
26. Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. Notify CR SRO of problem. B. **GO TO** Step 35.
27. Close 1HP-6.	
28. Close 1HP-7.	
29. 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. __ Open 1HP-5.	
31. __ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. __ **WHEN** letdown temperature is < 125°F, **THEN** place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. __ Open 1HP-6.	
34. Adjust 1HP-7 to control desired letdown flow.	
NOTE AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.	
35. **IAAT** it is determined that letdown is unavailable due to equipment failures or letdown system leakage, **THEN** notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. **IAAT** > 1 HPI pump is operating, **AND** additional HPI pumps are **NO** longer needed, **THEN** perform the following: A. Obtain SRO concurrence to reduce running HPI pumps. B. __ Secure the desired HPI pumps. C. Place secured HPI pump switch in AUTO, if desired.	
37. __ **IAAT** all the following conditions exist: __ Makeup from BWST **NOT** required __ LDST level > 55″ __ All control rods inserted __ Cooldown Plateau **NOT** being used **THEN** close: __ 1HP-24 __ 1HP-25	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. __ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	**GO TO** Step 40.
39. **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.	
40. __ Verify two Letdown Filters in service, **AND** <u>only one</u> Letdown filter is desired.	**GO TO** Step 42.
41. Perform <u>one</u> of the following: __ Place 1HP-17 switch to CLOSE. __ Place 1HP-18 switch to CLOSE.	
42. **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

Subsequent Actions

Parallel Actions

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

CONDITION	ACTIONS	
1. PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized {13}	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F	**GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer	**GO TO** EHT tab.	**LOHT**
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	**GO TO** LOHT tab.	
7. Heat transfer is or has been excessive	**GO TO** EHT tab.	**EHT**
8. Indications of SGTR ≥ 25 gpm	**GO TO** SGTR tab.	**SGTR**
9. Turbine Building flooding **NOT** caused by rainfall event	**GO TO** TBF tab.	**TBF**
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
11. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
12. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	**EDL**
14. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and NSD 202 (Reportability).	**NOTIFY**

SGTR

EP/**1**/A/1800/001

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. **AFTER** Rx trip pushbutton Depressed: PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized {13}	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F, **AND** HPI forced cooling **NOT** in progress	**IF** NOT previously performed, **THEN** **GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer	**GO TO** EHT tab.	**LOHT**
6. Loss of heat transfer	**GO TO** LOHT tab.	
7. Heat transfer is or has been excessive	**GO TO** EHT tab.	**EHT**
8. Indications of SGTR in another SG after SGTR tab initiated	**RETURN TO** beginning of SGTR tab.	**SGTR**
9. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
10. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
11. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
14. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation). • Notify plant staff that Emergency Dose Limits are in affect using PA system.	**NOTIFY And EDL**

CRITICAL TASKS

CT-1 Outside Air Booster Fans are started to minimize radiation exposure to control room personnel. (Within 30 minutes of SGTR) TCA #20

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: 100%	Mode: 1	Mode: 1
Gross MWE: 895	100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action	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 #
AMSAC/DSS	0300	7 Days	16.7.2

Shift Turnover Items (CR SRO)

Primary

- Due to unanalyzed condition, the SSF should be considered INOP for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).
- 1RIA-3 and 5 removed from RB.

Secondary

- Feedwater valve DP selected to A1 and B2 for maintenance
- AMSAC/DSS bypassed
- 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.

Reactivity Management (CR SRO)

RCS Boron 83 ppmB	Gp 7 Rod Position: 92% Withdrawn	Batch additions as required for volume control.

Human Performance Emphasis (OSM)

Procedure Use and Adherence

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

Examiners: _____ Operators: _____**SRO**

_____ _____**OATC**

_____ _____**BOP**

Initial Conditions:

- Reactor Power = Critical below POAH

Turnover:

- LDST pressure low
- Unit startup in progress

Event No.	Malfunction No.	Event Type*	Event Description
0a			
0b			
0d			
0c			
1	Override	C: BOP, SRO **(TS)**	Pressurize LDST with H2 (1H-1 will fail open requiring LDST vent to return to acceptable LDST pressure)
2		R: OATC, SRO	Increase power to 6-7%
3	Override	C: BOP, SRO	1B FWPT Auxiliary Oil Pump Trip
4	Override	C: BOP, SRO	1C HWP Casing Water Level Low
5		SRO **(TS)**	TD EFDWP oil sump dry
6	Override	C: OATC, SRO	PORV fails open
7	MCR022	C: OATC, SRO	Dropped Control Rod(s) requiring a reactor trip
8	MSS270 MSS360	M: ALL	1A MSLB inside containment • 1B MD EFDW fails to start in AUTO • 1C HPIP fails to start on ES

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

Scenario 4

Event Summary

Event 1: The BOP will increase the pressure in the LDST using OP/1/A/1106/017. 1H-1 (Hydrogen to LDST valve) will fail open resulting in overpressurization of the LDST. This will cause all HPI pumps to be declared INOPERABLE until pressure is reduced.

Event 2: The OATC will increase power from below POAH to ~ 6 – 7 %.

Event 3: The Auxiliary Oil Pump for the 1A FWPT will trip causing the Emergency Oil Pump to start. Per the ARG, the candidate will attempt to start the Auxiliary Oil Pump which will fail. Shortly afterwards, the alarm for FWPT 1A Emergency Oil Pump Overload will alarm which will require the candidate to attempt to start the Auxiliary Oil Pump. Not being able to start it, they will be directed to stop the Turning Gear Oil Pump and Emergency Oil pump.

Event 4: The 1C HWP will receive a casing low level alarm. This will require the BOP to start a standby HWP and secure the 1C HWP.

Event 5: An AO reports that the TD EFDWP oil sump is dry. The SRO will address Tech Specs. The SRO should direct the OATC to place the TD EFDW pump switch in Pull To Lock (PTL).

Event 6: The PORV will fail open causing RCS pressure to decrease rapidly. The operator will be required to close 1RC-4 (PORV Block valve) in order to stop the pressure decrease.

Event 7: Two control rods will fall into the core requiring a manual reactor trip.

Event 8: When the reactor trips, a steam line break will occur inside containment. The 1B MD EFDW pump will not start when the MFWPs trip so it will require manual start in order to feed the 1B SG. 1C HPIP will fail to start on ES which will require the operators to open 1HP-409 to provide flow to the B HPI header if required.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **1** Page 1 of 4

Event Description: **Pressurize LDST with H2 (1H-1 will fail open requiring LDST vent to return to acceptable LDST pressure) (C: BOP, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	*OP/1/A/1106/017* **Crew Response:** • SRO directs the BOP to add H2 to the LDST using OP/1/A/1106/017 (Hydrogen System) Enclosure 4.5 (Unit 1 LDST H2 Addition).
	BOP	**OP/1/A/1106/017** Rev 122 2.1 Notify Chemistry of hydrogen addition prior to adding hydrogen. {21} _____ _____ Person Notified Date **NOTE:** • OP/0/A/1108/001 (Curves And General Information) and computer may be referred to for LDST Pressure vs Level curve. {7} • LDST Maximum Pressure vs Indicated Level Curve should **NOT** be exceeded when pressurizing LDST. • If Unit 1 is shutdown and will be placed in MODE 5, Nitrogen should be added to LDST to maintain LDST Pressure vs Level. • If Unit 1 is shutdown and will **NOT** be placed in MODE 5, Hydrogen should be added to LDST to maintain LDST Pressure vs Level. 2.2 Immediately prior to pressurization determine lowest reading of diverse LDST level indications: _____ inches. 2.3 For existing LDST level determine LDST Pressure allowable per LDST Pressure vs Level curve: _____ psig. 2.4 Notify Operator at H2 Cage to pressurize primary hydrogen. **NOTE:** Operator should be in constant communication with CR to close 1H-26 if 1H-1 fails open. ***BOOTH CUE: When directed to open 1H-26, use Manual Valves and position 1H-93 approximately 20% open*** 2.5 Direct Operator to open 1H-26 (LDST Block). (A-2-N of LDST Rm)

This event is complete when LDST pressure is returned to within limit, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **1** Page 2 of 4

Event Description: **Pressurize LDST with H2 (1H-1 will fail open requiring LDST vent to return to acceptable LDST pressure) (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	***OP/1/A/1106/017*** **Crew Response:** ***Examiner/Booth Note: Once LDST pressure is being increased, 1H-1 (LDST SUPPLY) will fail open.*** 2.6 Direct Operator to use explosive detector to monitor the following: • Pressurized, non-welded H2 piping and fittings within local area of addition • Loop seal (A-2-N of LDST Rm) 2.7 Cycle 1H-1 (H2 TO LDST) as required to pressurize LDST per LDST Pressure vs Level curve. ***Booth Note: When 1H-1 is opened, Fire Timer 1 to fail it open.*** 2.8 **WHEN** Hydrogen addition complete, ensure closed 1H-1 (H2 TO LDST). ***Examiner Note: BOP should determine that 1H-1 has failed open and direct the AO to close 1H-26.*** 2.9 Direct Operator to close 1H-26 (LDST Block). (A-2-N of LDST Rm) ***Booth Note: 1H-26 will NOT be closed until LDST pressure is outside the acceptable range.*** • 1SA-02/D-2, HP Approaching LDST Operating Limits, actuates • BOP refers to the ARG. ***1SA-2/D-2*** **1SA-2/D-2** Rev 33 3.1 Verify LDST pressure/level are within the acceptable operating region of the LDST PRESSURE vs. LEVEL enclosure in OP/0/A/1108/001 (Curves and General Information). **(Page 6)** **[It will NOT be within limits and will require Both Trains of HPI be declared INOPERABLE…. TS 3.5.2]** 3.2 **IF** necessary, vent LDST to GWD per OP/1/A/1104/002 (HPI System). 3.3 **IF** necessary, add hydrogen to establish desired LDST pressure per OP/1/A/1106/017 (Hydrogen System).

This event is complete when LDST pressure is returned to within limit, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **1** Page 3 of 4

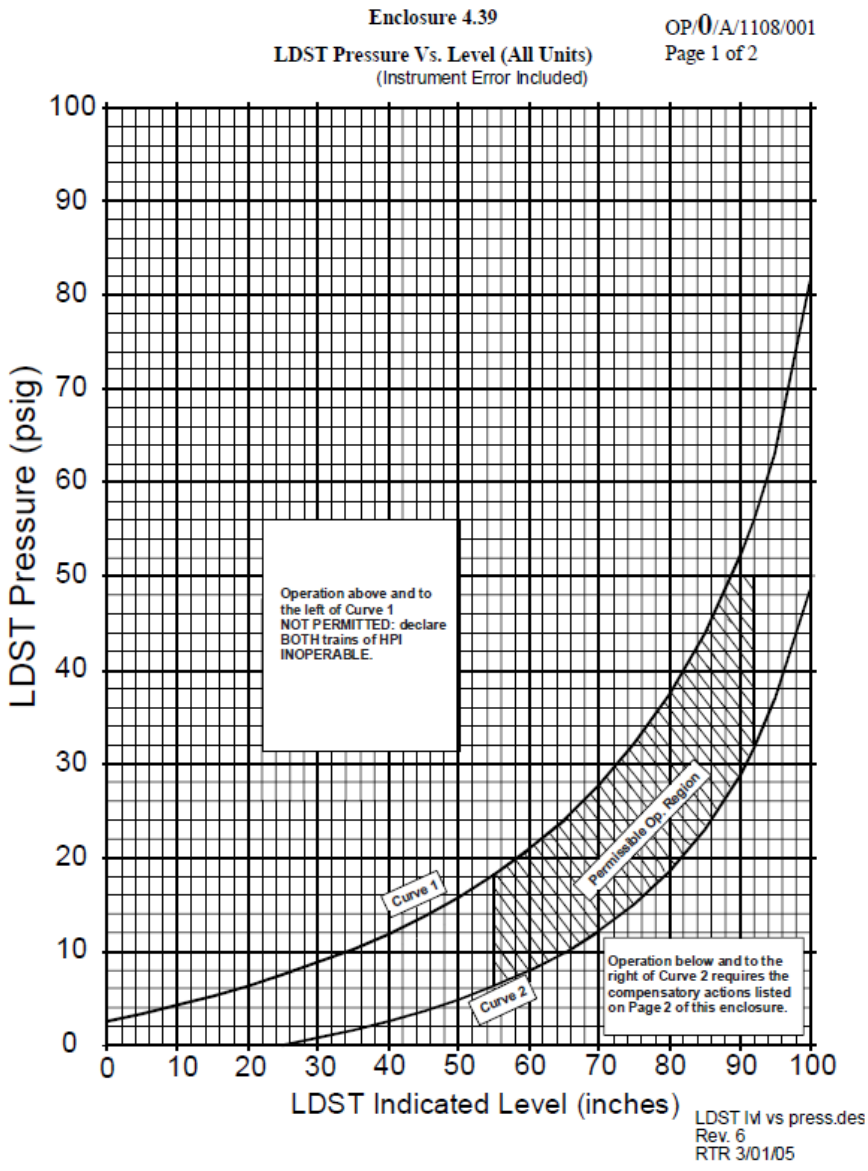
Event Description: **Pressurize LDST with H2 (1H-1 will fail open requiring LDST vent to return to acceptable LDST pressure) (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	***OP/1/A/1104/002*** **Crew Response:** • SRO directs the BOP to vent LDST to GWD per OP/1/A/1104/002 (HPI System), Encl. 4.16, (Lowering LDST Pressure) **OP/1/A/1104/002 (HPI System), Encl. 4.16, (Lowering LDST Pressure)** Rev 167 3.1 Close 1GWD-20 (LDST Vent Blk). (A-2-LDST Hatch Area) 3.2 Open 1GWD-19 (LDST VENT). **CAUTION:** LDST pressure should be within curves of Enclosure "LDST Pressure Vs Level" of OP/0/A/1108/001 (Curves and General Information). **NOTE:** If LDST pressure is < 30 psig, leakage from BWST into HPI System may occur. (R.M.) 3.3 Throttle open 1GWD-20 (LDST Vent Blk) until LDST pressure begins to **slowly** decrease **and** GWD system can maintain vent header. (A-2-LDST Hatch Area) 3.4 **IF** required, start Standby GWD Compressor per OP/1-2/A/1104/018 (GWD System). 3.5 **WHEN** desired LDST pressure obtained, close 1GWD-19 (LDST VENT). 3.6 **IF** started, stop Standby GWD Compressor. 3.7 Throttle ≈ 1/4 turn open 1GWD-20 (LDST Vent Blk). (A-2-LDST Hatch Area) ***TS 3.5.2, HIGH PRESSURE INJECTION*** ***Condition C.2 (3 hours) Verify by administrative means that the ADV flow path for each steam generator is OPERABLE.*** ***Condition C.3 (72 hours) Restore HPI train to Operable status.*** ***Condition H (Immediately) Enter LCO 3.0.3*** ***TS 3.0.3 (12 hours) be in Mode 3***

This event is complete when LDST pressure is returned to within limit, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **1** Page 4 of 4

Event Description: **Pressurize LDST with H2 (1H-1 will fail open requiring LDST vent to return to acceptable LDST pressure) (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	***OP/0/A/1108/001*** 

This event is complete when LDST pressure is returned to within limit, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **2** Page 1 of 5

Event Description: **Increase power to 6-7 % (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO	***Examiner Note: During the power increase, the Unit 1 CRS will assume the role of the dedicated Reactivity Management SRO.***
		OP/1/A/1102/001
		Crew Response:
		• SRO directs the OATC to increase power to ≈ 7% using OP/1/A/1102/001 (Controlling Procedure for Unit Startup), Encl. 4.7, starting at step 3.36
		OP/1/A/1102/001 (Controlling Procedure for Unit Startup), Encl. 4.7, Step 3.36 Rev 309
		NOTE: • Point Of Adding Heat (POAH) is normally achieved from 0.05 to 0.15% power on Wide Range Indications. {27} • When POAH is achieved: TBVs will begin to open, 1HP-120 will begin to close, TAVE will increase, and SUR will decrease with negative Moderator Temperature Coefficient. (R.M.) • Wide Range indications are used since Source Range NIs saturate. (R.M.)
	OATC	3.36 Begin reactor power increase to 0.5 - 1.0 % at ≤ 0.5 DPM SUR. (R.M.)
		3.37 **WHEN** above POAH, begin reactor power increase to 2.5 - 3.5 %. (R.M.)
		3.38 **WHILE** power increases, begin increasing 1HP-120 (RC VOLUME CONTROL) setpoint to establish 215" to 225" PZR Level.
		NOTE: • TAVE error is blocked when on Low Level Limit and TAVE is < setpoint. • Core reactivity effects are minimized with Rx in automatic. (R.M.)
		3.39 **WHEN** at 2.5 - 3.5 % Power, perform the following: (R.M.) 3.39.1 Place REACTOR MASTER to "AUTO". 3.39.2 Place DIAMOND to "AUTO". 3.39.3 Ensure TURBINE MASTER Setpoint to 880 - 890 psig.
		3.40 Perform the following: • Ensure complete Enclosure "Prior To Entry Into MODE 1" of PT/1/A/0630/001 (Mode Change Verification). {55} • Review mechanical maneuvering rates and allowable ramp rates in PT/0/A/1103/020 (Power Maneuvering Guidelines). {54} (R.M.)

This event is complete when power is stable at ≈ 6-7%, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **2** Page 2 of 5

Event Description: **Increase power to 6-7 % (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/001*** **Crew Response:** 3.41 **IF AT ANY TIME** all the following: • All operable T Cold indications > 550°F • SSF inoperable **only** due to low decay heat, notify SM the SSF is Available for Unit 1. 3.42 Ensure acceptable point status for plant startup for MODE 1: • OAC Alarm Screen Review • OAC Point Processing Log **NOTE:** OAC Points can be found on Turn-On Code FDW02 3.43 Set temporary alarms on the following: • OAC Point O1E2129 (FDW LOOP A COMPOSITE VALVE DEMAND) temporary alarm set at 9.8%. • OAC Point O1E2130 (FDW LOOP B COMPOSITE VALVE DEMAND) temporary alarm set at 9.8%. • Note on Turnover sheet temporary alarms set on Composite Valve Demand **NOTE:** • At Composite Valve Demand of 8.8% decreasing, ICS removes a valve sequencing bias that forces the Startup Control valves open to approximately 90% and the Main Control Valves to close. • At Composite Valve Demand of 9.8% increasing, ICS inserts a valve sequencing bias that forces the Startup Control valves to close to approximately 10% and the Main Control Valves to open. • When Composite Valve Demand valve sequencing bias is inserted at 9.8% on a power increase and then decreases below 8.8%, the unit is subject to a possible FDW transient due to the valve sequencing bias being inserted and then subsequently removed. A power change may be required to stabilize FDW flow above **OR** below sequencing bias setpoints.

This event is complete when power is stable at ≈ 6-7%, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **2** Page 3 of 5

Event Description: **Increase power to 6-7 % (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/001*** **Crew Response:** 3.44 **WHILE** power change is in progress, monitor the following indications: • Appropriate ranged NIs • Neutron error • RCS Loop ΔT (Curve for "Loop ΔT Vs Reactor Power" is in PT/1/A/0600/001) • FDW Flow (Curve for "Expected Feedwater Flow Per Header Vs Reactor Power" is in OP/0/A/1108/001) • OAC Point O1E2129 (FDW LOOP A COMPOSITE VALVE DEMAND) • OAC Point O1E2130 (FDW LOOP B COMPOSITE VALVE DEMAND) 3.45 Begin power increase to 6% to 7% per Enclosure 4.16 (CTP Adjustments) (**Page 10**) 3.46 Ensure 'E' Heater outlet temperature being maintained at upper end of 100-180°F band. 3.47 **WHILE** power increasing in this enclosure, throttle to maintain 2300 to 6000 gpm on operating FDWP: • 1FDW-53 (1A FDWP RECIRC CONTROL) • 1FDW-65 (1B FDWP RECIRC CONTROL) 3.48 **WHEN** Reactor Power is > 5%, perform the following: • Ensure MODE 1 selected on OAC. • Ensure MODE 1 selected for Unit 1 in TSAIL. • Announce on Plant Page "Unit 1 has entered MODE 1". • Notify Assistant Outage Manager of Unit 1 entry into MODE 1. _____ _____/_____ Person Notified Date / Time • Remove note from turnover sheet: "When in MODE 2, evaluate or restrict evolutions involving MS, FDW, and EFDW to minimize changes to RCS temperature and reactor power." (R.M.) • Remove note from turnover sheet: "In MODE 1 or 2, except during PT/0/A/0711/001 (ZPPT), if either loop TAVE is < 532°F, perform SR 3.4.2.1 per PT/1/A/0600/001 (Periodic Instrument Surveillance)". • Begin Primary to Secondary Leakage Monitoring During Startup per OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation).

This event is complete when power is stable at ≈ 6-7%, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **2** Page 4 of 5

Event Description: **Increase power to 6-7 % (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/001*** **Crew Response:** 3.49 Perform the following per PT/0/A/0230/001 (Radiation Monitor Check): • Ensure 1RIA-48 alarm setpoints adjusted for Mode 1. • Ensure 1RIA-49 alarm setpoints adjusted for Mode 1. 3.50 Ensure complete **one** of the following to secure minimum FDW Flow to SGs: • **IF** in progress, Enclosure 4.10 (Providing Minimum FDW Flow to SGs) • **IF** in progress, Enclosure "Providing Minimum FDW Flow to SGs" of OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown). **OP/1/A/1102/001 Enclosure 4.16 (CTP Adjustments)** 2.1 Verify REACTOR MASTER in AUTO 2.2 Verify Diamond in AUTO 2.3 **IF** expected power change < 1%, ensure R2 reactivity management control established per SOMP 1-02 2.4 **IF** expected power change > 1%, ensure R1 reactivity management control established per SOMP 1-02 3.1 **WHILE** enclosure is in progress, monitor the following indications: • Appropriate NIs • Neutron error • FDW flow 3.2 **IF AT ANY TIME** hold in power is desired, ensure HOLD selected 3.3 **IF AT ANY TIME** hold in power is NOT required, ensure HOLD is NOT selected

This event is complete when power is stable at ≈ 6-7%, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **2** Page 5 of 5

Event Description: **Increase power to 6-7 % (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/001*** **Crew Response:** **OP/1/A/1102/001 Enclosure 4.16 (CTP Adjustments)** 3.4 **IF** change in power/rate is desired, perform the following: 3.4.1 Review the following regarding current power change: • Appropriate :controlling enclosure of this procedure • PT/0/A/1103/020 (Power Maneuvering Predictions) • **IF** in progress, PT/0/A/0811/001 (Power Escalation Test) • **IF** available, Maneuvering Plan • COLR for CRD Groups 5-8 position limits, Imbalance, & QPT 3.4.2 Ensure HOLD is selected 3.4.3 Ensure selected %/MIN or %/HR on RATE SET pushbutton 3.4.4 Ensure desired rate selected on RATE SET thumbwheels 3.4.5 Ensure rate selected is within above limits 3.4.6 Insert desired CTPD SET using INCREASE/DECREASE pushbuttons 3.4.7 Ensure CTPD SET is within above limits 3.4.8 Ensure HOLD is **NOT** selected 3.4.9 **WHEN** desired CTP is achieved, select 0.0 on RATE SET thumbwheels

This event is complete when power is stable at ≈ 6-7%, or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **3** Page 1 of 1

Event Description: 1**B FWPT Auxiliary Oil Pump Trip (C, BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	**Plant Response:** • 1SA-8/B-7 FWPT "B" HYDRAULIC PRESSURE LOW • 1SA-8/C-6 FWPT "B" EMERGENCY OIL PUMP RUN in alarm • FWPT B Emergency Oil Pump starts **Crew Response:** SRO will direct the BOP to refer to 1SA-08/C-6. *1SA-08/C-3* **1SA-08/C-6 FWPT "B" EMERGENCY OIL PUMP RUN** Rev 35 3.1 Verify that B FWPT emergency oil pump is running. 3.2 **IF** applicable, verify B FWPT is still on turning gear. **[It will be]** 3.3 Try to restart B FWPT auxiliary oil pump. **[It will fail to start]** 3.4 **IF** restart fails, notify Maintenance for repairs. ***Booth Cue: Approximately 2 minutes after firing timer 3, Timer 12 will auto actuate which will trip the Emergency Oil Pump and cause 1SA-08/C-7, (FWPT "B" EMERGENCY OIL PUMP OVERLOAD) to alarm.*** ***Booth Cue: If dispatched as AO to investigate 1B FWPT, notify crew that all oil pumps are off and the FDWPT is on the turning gear. Report that the TG motor is much noisier than normal.*** *1SA-08/C-7* **1SA-08/C-7 FWPT "B" EMERGENCY OIL PUMP OVERLOAD** 3.1 **IF** available, start Auxiliary Oil Pump and stop Emergency Oil Pump. 3.2 **IF** AOP is **NOT** available, stop Turning Gear Motor and emergency Bearing Oil Pumps. 3.3 Notify Maintenance for repairs. 3.4 As soon as EBOP **OR** Auxiliary Oil Pump becomes available, start pump and place Turbine on Turning Gear.

This event is complete when Turning Gear Motor is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT48** Scenario No.**: 4** Event No.**: 4** Page 1 of 1

Event Description**: 1C HWP Casing Water Level Low (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***1SA-9/E-5*** **Plant Response**: • 1SA-9/E-5 HWP C CASING WATER LEVEL LOW • OAC Alarm LOCA Load Shed **Crew Response**: BOP will address the ARG **1SA-9/E-5** Rev 47 3.1 **IF** '1C' HWP is in operation, then immediately: • Start a standby HWP. • Trip '1C' HWP. • Bypass Powdex. **[Open 1C-14/1C-15]** • Decrease load. 3.2 Monitor hotwell level. 3.3 Determine cause of low level alarm (possible suction filter clogging) and initiate corrective action necessary to return pump to normal operation. ***Examiner Note: The crew may use OP/1/A/1106/002 (Condensate and FDW System) to bypass Powdex*** **OP/1/A/1106/002 Enclosure 4.19 (Placing Powdex In/Out of Service)** Rev 169 3.1 **IF** Powdex is to be removed from service for an extended period of time **AND** condensate system will NOT be shutdown, perform the following: 3.1.1 Ensure MSDD System in service 3.1.2 Notify Chemist that Powdex will be removed from service for an extended period of time 3.2 Ensure Open 1C-14/1C-15 (POL DEMIN BYPASS CONTROL) 3.3 Place note on Turnover sheet that Powdex has been removed from service 3.4 Notify Chemist that Powdex has been removed from service

This event is complete when the standby HWP has been started, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **5** Page 1 of 1

Event Description: **TD EFDWP oil sump dry (SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	**Plant response:** **Simulator Operator call the Control Room as the WCC SRO and report that the Basement AO found the Unit 1 TD EFDWP oil sump with no oil indicating on the dipstick. Report that the WCC and FIN-24 are investigating the situation to determine the cause of the problem. No oil has been found leaking from any equipment.** **Crew response:** • SRO should make the decision to place TD EFDWP in "Pull to Lock". **TS 3.3.14 EMERGENCY FEEDWATER (EFW) PUMP INITIATION CIRCUITRY** **Condition B.1 (Immediately) Declare the affected EFW pump inoperable.** **TS 3.7.5 EMERGENCY FEEDWATER (EFW) SYSTEM** **Condition B.1 (72 hours) Restore turbine driven EFW pump and EFW flow path to OPERABLE status.** • SRO refer to TS 3.3.14 Condition B. • Declare the affected EFWP inoperable Immediately • SRO refer to TS 3.7.5 Condition B1 Restore TD EFDWP within 72 hours ***Booth Cue: If asked, inform crew that the TD was on the purifier last shift.*** ***Booth Cue: If crew does not place TD EFDWP in PTL, then at direction of lead examiner, call as WCC SRO and direct the crew to place Unit 1 TDEFDWP switch in PTL per R&R.*** ***Examiner Note: Ensure the Pzr is saturated prior to initiating Event 6.***

This event is complete when the Tech Spec determination has been made or when directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **6** Page 1 of 2

Event Description: **PORV fails open (C: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***Examiner Note: Ensure Pzr saturated prior to Event 6.***
		AP/1/A/1700/044
		Plant Response:
		• 1SA-18/A1 (Pressurizer Relief Valve Flow) in alarm • 1RC-66 indicates open • Acoustic monitor indicates 1RC-66 open • RCS pressure decreasing
		Crew Response:
		• OATC should recognize that RCS pressure is below PORV setpoint and close the PORV Block Valve (1RC-4). This is an Immediate Action from AP/44 Abnormal Pressurizer Pressure Control. • SRO should enter AP/1/A/1700/044
		AP/1/A/1700/044 Abnormal Pressurizer Pressure Control Rev 4
		Immediate Manual Actions
	CT-1	3.1 **IAAT** PORV is open, **AND** RC pressure is < setpoint (2400 psig (HIGH) or 480 psig (LOW)), **THEN** close 1RC-4.
		3.2 **IAAT** RC pressure < 2155 psig, **AND** 1RC-1 indicates open, **THEN** select 1RC-1 to CLOSE.
		3.3 **IAAT** all the following conditions exist: __ RC pressure < 2155 psig __ RC pressure decreasing without a corresponding decrease in PZR level **THEN** close 1RC-3.
		Subsequent Actions
		4.1 Announce AP entry using the PA system.
		4.2 **GO TO** the applicable step per the following table:

	Failure Caused RCS Pressure	Step
	Decrease	4.3
	Increase	4.18

This event is complete when 1RC-4 is closed and RCS pressure is stable, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **6** Page 2 of 2

Event Description: **PORV fails open (C: OATC, SRO)(TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/044*** **Crew Response**: 4.3 Verify 1RC-4 is closed. 4.4 Verify 1RC-3 is closed. **NOTE** 1RC-3 must **NOT** be allowed to be closed for ≥ 36 minutes at a time to avoid a thermal transient in piping between 1RC-3 and the PZR spray nozzle. 4.5 Position 1RC-3 as required to maintain RC pressure within desired band. 4.6 **GO TO** Step 4.13. 4.13 Verify PZR heaters maintaining RCS pressure within desired band. 4.14 Notify SPOC to repair malfunctioning component. 4.15 Ensure requirements of following are met: __ TS 3.4.1 (RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling Limits) __ TS 3.4.9 (Pressurizer) __ TS 3.4.12 (Low Temperature Overpressure Protection System) __ SLC 16.5.1 (Reactor Coolant System Vents) 4.16 **WHEN** repairs complete, **THEN** place following components in desired position for current plant conditions as determined by CR SRO: __ 1RC-1 __ 1RC-3 __ 1RC-4 __ PZR heater bank #1 __ PZR heater bank #2 __ PZR heater bank #3 __ PZR heater bank #4 ***TS 3.4.1, REACTOR COOLANT SYSTEM*** ***Condition A (2 hours) Restore RCS DNB parameter(s) to within limit.*** ***COLR DNB Limit = 2125 psig***

This event is complete when 1RC-4 is closed and RCS pressure is stable, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 4** Event No.**: 7** Page 1 of 1

Event Description**: Dropped Control Rod(s) requiring a reactor trip (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***AP/1/A/1700/001*** **Plant Response:** • Group 6 Rod 3 drops into the core • Group 6 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-5/A-5 (1A RPS TROUBLE) • Statalarm 1SA-5/B-5 (1B RPS TROUBLE) • Statalarm 1SA-5/D-5 (1D RPS TROUBLE) **Crew Response:** • Crew should recognize 2 dropped control rods and trip the reactor in accordance with OMP 1-18 **If the crew does not recognize the 2nd dropped control rod, they will enter AP/1/A/1700/001 (Unit Runback)** **AP/1/A/1700/001 (Unit Runback)** Rev15 **NOTE** • If more than one runback condition exists, ICS will respond by selecting the fastest runback rate and the lowest load limit. The most limiting runback will be the one with the fastest runback rate and the shortest duration. • It is possible for a FDWP to become unable to feed the SGs but not be tripped. In this case a signal would not be sent to RPS or the EFDWP start circuit. 4.1 **GO TO** the most limiting section per the following table: 4H — Asymmetric Control Rod (1% / min to 55% power) 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 ≥ 6.5% (9″) from the group average, **THEN** trip the Rx.

This event is complete when the reactor is manually tripped, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 1 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC BOP	***EOP*** **Plant Response:** • 1SA-2/D-3, RC Press High/Low • Statalarm 1SA-02/A-9 (MS PRESS HIGH/LOW) **Crew Response:** ***Examiner Note: Crew will be performing IMAs and Subsequent Actions as a result of the manual reactor trip due to two dropped control rods.*** ***IMAs*** ***EOP Immediate Actions*** Rev 40 3.1 Depress REACTOR TRIP pushbutton. 3.2 Verify reactor power < 5% FP and decreasing. 3.3 Depress the turbine TRIP pushbutton 3.4 Verify all turbine stop valves closed. 3.5 Verify RCP seal injection available. ***SYMPTOM CHECK*** The BOP will verify the following:
	CT-2	

Power Range NIs **NOT** < 5% Power Range NIs **NOT** decreasing	Rule 1, *ATWS/Unanticipated Nuclear Po Production*
Any SCM < 0°F	Rule 2, *Loss Of SCM*
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, *Loss of Main or Emerg FDW* Rule 4, *Initiation of HPI Forced Cooling* (Inability to feed SGs and > 2300 psig, N limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure decrease	Rule 5, *Main Steam Line Break*
CSAE Offgas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identi SG Tube Leakage > 25 gpm)

Examiner note: BOP should manually start the 1B MD EFDWP.

BOP will perform Rule 5 (Main Steam Line Break) (**Page 25**)

SRO will review IMAs and transfer to the Subsequent Actions Tab.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.**: 4** Event No.**: 8** Page 2 of 9

Event Description**: 1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***Subsequent Actions Tab*** **Crew Response:** SRO will review the Subsequent Action Tab Parallel Action (Yellow) page (**Page 70**) and transfer to the Excessive Heat Transfer (EHT)Tab. ***EHT Tab*** SRO will review the EHT Tab Parallel Action (Yellow) page and determine that ES has actuated and direct the OATC to perform Encl. 5.1 ES Actuation (**Page 50**) 1. Verify any SG pressure < 550 psig. **[1A SG should be < 550 psig at this point]** 2. Ensure Rule 5 (Main Steam Line Break) in progress or complete. 3. Place the following in HAND and decrease demand to zero on all affected SGs: | | **1A SG** | | **1B SG** | | | 1FDW-32 | | 1FDW-41 | | | 1FDW-35 | | 1FDW-44 | 4. Close the following on all affected SGs: | | **1A SG** | | **1B SG** | | | 1FDW-372 | | 1FDW-382 | | | 1MS-17 | | 1MS-26 | | | 1MS-79 | | 1MS-76 | | | 1MS-35 | | 1MS-36 | | | 1MS-82 | | 1MS-84 | | | 1FDW-368 | | 1FDW-369 | 5. Verify level in both SGs < 96% O.R. 6. **IAAT** core SCM is > 0°F, **THEN** perform Steps 7 and 8. **RNO: GO TO** Step 9. 7. Throttle HPI per Rule 6 (HPI). 8. Verify letdown in service. **RNO:** __ **IF** desired to restore letdown, **THEN** initiate Encl 5.5 (Pzr and LDST Level Control). (**Page 42**)

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 3 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior

EHT Tab

Crew Response:

SRO/OATC

9. Verify any SG has an intact secondary boundary (intact SG).
   [1B SG is intact]

NOTE
If only one SG is intact and has been isolated for SGTR, the following steps will unisolate and use it for heat removal.

10. Open the following on all intact SGs:

	1A SG		1B SG
	1FDW-372		1FDW-382
	1FDW-368		1FDW-369
	1MS-17		1MS-26

11. Start MDEFDWP associated with all intact SGs:

1A SG		1B SG
1A MDEFDWP		1B MDEFDWP

12. Feed and steam all intact SGs to stabilize RCS P/T using either:
    - TBVs
    - Dispatch two operators to perform Encl 5.24 (Operation of the ADVs).

13. **GO TO** Step 32.

32. Verify any:
    __ HPI has operated in the injection mode while **NO** RCPs were operating
    __ A cooldown below 400°F at > 100°F/hr has occurred
    RNO: GO TO Step 34.

33. Initiate Rule 8 (Pressurized Thermal Shock (PTS)).

34. Verify both closed:
    __ 1MS-24
    __ 1MS-33

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 4 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***EHT Tab*** **Crew Response:** 35. Open 1AS-8. 36. Close 1SSH-9. 37. Perform notifications: __ Notify Chemistry to determine RCS boron concentration. __ Notify Secondary Chemistry to check for indications of SGTR. {2} __ Notify RP to check for indications of SGTR. 38. **IAAT** RCS boron is determined to be insufficient for adequate SDM, **THEN** initiate Encl 5.11 (RCS Boration). 39. **IAAT** all exist: __ ES Bypass Permit satisfied __ All SCMs > 0°F __ RCS pressure controllable **THEN** perform Steps 40 - 41. **RNO: GO TO** Step 42. 40. Bypass applicable ES: To Bypass HPI: __ Bypass HPI ES CH A,B,C To Bypass LPI: __ Bypass LPI ES CH A,B,C 41. Bypass applicable Diverse ES: To Bypass HPI: __ Bypass Diverse HPI To Bypass LPI: __ Bypass Diverse LPI 42. Verify any SG is dry. **NOTE** • 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.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 5 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	*EHT Tab* **Crew Response:** 43. Maintain minimum SCM using the following methods as necessary: __ De-energize all Pzr heaters __ Use Pzr spray __ Throttle HPI to maintain Pzr level > 100″ [180″ acc] __ Use PORV 44. Verify any RCP operating. **RNO: GO TO** Step 46. 45. Maintain RCP NPSH. • OAC • Encl 5.18 (P/T Curves) 46. Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control). **NOTE** RCP 1A1 provides the best Pzr spray. 47. **IAAT** all exist: __ **<** one RCP operating in any loop __ All SCMs > 0°F __ RCP available in an idle loop **THEN** initiate Encl 5.6 (RCP Restart) to start one RCP in each idle loop. 48. **IAAT** all exist: __ RBS actuated __ RB pressure < 10 psig __ 1RIA-57 **NOT** in alarm __ 1RIA-58 **NOT** in alarm **THEN** stop both RBS pumps. 49. **IAAT** Tcold approaches 470°F, **AND** all RCPs are operating, **THEN** ensure < four RCPs are operating. 50. **IAAT** BWST level is ≤ 19', **THEN** initiate Encl 5.12 (ECCS Suction Swap to RBES). 51. Verify all SCMs > 0°F.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 6 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***EHT Tab*** **Crew Response:** 52. Verify indications of SGTR ≥ 25 gpm. **RNO:** __ **GO TO** Step 54. 54. Verify required RCS makeup flow within normal makeup capability. 55. Verify either: __ Any SG isolated __ Any SG has an unisolable steam leak 56. **GO TO** FCD tab. ***Forced Cooldown Tab*** 1. **IAAT** cooldown rate **CANNOT** be controlled within Tech Spec limits: • Tcold ≥ 270°F: ≤ 50°F / ½ hr • Tcold < 270°F: ≤ 25°F / ½ hr **THEN GO TO** EHT tab. 2. Verify letdown in service. **RNO:** 1. __ Ensure CC System in operation. 2. __ **IF** 1A Letdown Cooler available, **THEN** open the following: __ 1HP-1 __ 1HP-3 3. __ **IF** 1B Letdown Cooler available, **THEN** open the following: __ 1HP-2 __ 1HP-4 4. Close the following: __ 1HP-6 __ 1HP-7 5. __ Open 1HP-5. 6. __ Adjust 1HP-7 for ≈ 20 gpm letdown. 7. __ Open 1HP-6. 8. __ Adjust 1HP-7 to control desired letdown flow. 3. Establish and maintain appropriate level per Rule 7 (SG Feed Control) and pressure in available intact SGs. 4. **IAAT** Tcold approaches 470°F, **THEN** ensure < four RCPs operating.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 7 of 9

Event Description: **1A MSLB inside containment (M: All)**

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

	A Header		B Header
	DIG CH 1 OFF		DIG CH 1 OFF
	DIG CH 2 OFF		DIG CH 2 OFF

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 8 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	BOP	***RULE 5*** **Crew Response:** 1. Perform on affected headers:

	A Header		B Header
	On AFIS HEADER A, depress CH. 1 INIT.		On AFIS HEADER B, depress CH. 1 INIT.
	On AFIS HEADER A, depress CH. 2 INIT.		On AFIS HEADER B, depress CH. 2 INIT.
	Select OFF for 1A MD EFDWP.		Select OFF for 1B MD EFDWP.
	Trip both Main FDWPTs.		Trip both Main FDWPTs.
	Close 1FDW-315.		Close 1FDW-316.
	Place 1FDW-33 switch to CLOSE.		Place 1FDW-42 switch to CLOSE.
	Place 1FDW-31 switch to CLOSE.		Place 1FDW-40 switch to CLOSE.
	Close 1PSW-22.		Close 1PSW-24.
	Close 1PSW-23.		Close 1PSW-25.

Examiner Note: The 1B MD EFDW Pump failed to start automatically.

2. Verify 1 TD EFDW PUMP operating.

RNO:
1__**IF** MD EFDWP for the intact SG is operating SG is operating, **THEN GO TO** Step 5. **[IT WILL NOT BE OPERATING]**
2.__Start 1 TD EFDW PUMP.

3. Verify 1 TD EFDW PUMP is feeding affected SGs. **[1FDW-315 is closed]**
RNO:
GO TO Step 5.

5. Verify 1B SG is an affected SG.
RNO:
GO TO Step 7.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 9 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	BOP	***RULE 5*** **Crew Response:** 7. **WHEN** overcooling is stopped, **THEN** adjust steaming of unaffected SG to maintain CETCs constant using either: __ TBVs __ Dispatch two operators to perform Encl 5.24 (Operation of the ADVs). **CAUTION** Thermal shock conditions may develop if HPI is **NOT** throttled and RCS pressure **NOT** controlled. 8. **WHEN** all exist: __ Core SCM > 0°F __ Rx power ≤ 1% __ Pzr level increasing **THEN** continue. 9. Verify ES HPI actuated. 10. Place Diverse HPI in BYPASS. 11. Perform both: __ Place ES CH 1 in MANUAL. __ Place ES CH 2 in MANUAL. 12. Perform the following to stabilize RCS P/T: __ Throttle HPI. __ Reduce 1HP-120 setpoint to control at >100″ [180″ acc]. __ Adjust steaming of unaffected SG as necessary to maintain CETCs constant. 13. **WHEN** CETCs have stabilized, **THEN** resume use of Tc for RCS temperature control. 14. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. (**Page 27**) 15. Ensure Rule 8 (Pressurized Thermal Shock (PTS)) is in progress or complete. 16. **WHEN** directed by CRS, **THEN EXIT**.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Op-Test No.: **ILT48** Scenario No.: **4** Event No.: **8** Page 10 of 9

Event Description: **1A MSLB inside containment (M: All)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	***RULE 3*** **Crew Response:** 1. Verify loss of MFDW and/or EFDW was due to any of the following: __ Turbine Building Flooding __ Actions taken to increase SG level due to Turbine Building Flooding **RNO: GO TO** Step 3. 3. **IAAT NO** SGs can be fed with FDW (Main/CBP/Emergency/PSW), **AND** any of the following exist: __ 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 operable EFDW pumps, as required, to feed all intact SGs. **[1B MD EFDWP should be manually started.]** 5. Verify any EFDW pump operating. 6. **GO TO** Step 38. 38. **IAAT** an EFDW valve **CANNOT** control in AUTO, **OR** manual operation of EFDW valve is desired to control flow/level, **THEN** perform Steps 39 - 43. **RNO: GO TO** Step 44. 44. Verify any SCM $\leq$ 0°F. 45. **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation). (**Page 28**). 46. **WHEN** directed by CRS, **THEN EXIT**.

This event is complete when the crew has transferred to the FCD tab, or as directed by the lead examiner.

Enclosure 5.9

Extended EFDW Operation Rev 40

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. __ Verify 1 TD EFDW PUMP operating.	__ **GO TO** Step 12.
11. Start TD EFDWP BEARING OIL COOLING PUMP.	

NOTE

- 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.

12. Notify CR SRO to set priority based on the NOTE above and EOP activities.	
13. **IAAT** it is determined that condensate flow **CANNOT** be restored within 25 minutes, **THEN GO TO** Step 90.	
14. __ Verify any HWP operating.	1. __ Place all CBP control switches to OFF. 2. __ **GO TO** Step 20.
15. __ Verify any CBP operating.	1. **IF** AP/11 restarted a HWP, **THEN GO TO** Step 22. 2. __ **GO TO** Step 41.
16. Verify 1C COND BOOSTER PUMP operating. {12}	1. Ensure only one CBP is operating. 2. **GO TO** Step 18.
17. Stop: {12} __ 1A COND BOOSTER PUMP __ 1B COND BOOSTER PUMP	
18. __ Ensure only one HWP is operating.	
19. __ **GO TO** Step 44.	

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. **WHEN** UST level is < 4', **THEN** dispatch two operators to perform Encl 5.24 (Operation of the ADVs) in preparation for loss of vacuum. (**PS**)	
61. Verify power available to 1V-186 by using valve position indicating light.	Dispatch an operator to be in position at 1V-186 (Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).
NOTE 1C-573 will be closed after vacuum is broken.	
62. Dispatch an operator with a safety harness to 1C-573 (MD EFDWPs Suction From UST) (T-1, SW of E-24, 8' above floor) to: __ Unlock and remove chain from 1C-573. Establish communication with Control Room.	
63. **WHEN** UST level is < 3', **THEN** continue.	
64. Open 1V-186.	Notify operator to open 1V-186 (Main Condenser Vacuum Breaker) (T-3, catwalk at 1C2 waterbox).
65. __ Stop all main vacuum pumps.	
66. __ Stop all CBPs.	
67. __ Stop all HWPs.	
68. Close: __ 1MS-47 __ 1AS-40	Dispatch an operator to close: __ 1MS-49 (1A CSAE Steam Supply) (T-3/F-26) 1MS-58 (1B CSAE Steam Supply) (T-3/G-26) 1MS-67 (1C CSAE Steam Supply) (T-3/H-26)

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • 1C-573 is open unless Step 75 has been completed. • While EFDW is secured, a transfer to LOHT is required only when directed by this enclosure or Rule 4 (Initiation of HPI Forced Cooling) conditions are met.	
69. **IAAT** UST level is < 1', **AND** 1C-573 (MD EFDWPs Suction From UST) is open, **THEN** perform Steps 70 - 71.	**GO TO** Step 72.
70. Perform the following: __ Stop 1A MD EFDWP. __ Stop 1B MD EFDWP.	
71. __ Verify 1C-391 open.	1. __ Stop 1TD EFDW PUMP. 2. Close: 1FDW-315 1FDW-316
72. Perform the following: A. Reduce MD EFDWP flow to < 440 gpm per pump. B. Notify crew of MD EFDWP flow limit while aligned to hotwell.	
NOTE Vacuum gage or computer can be used. Vacuum is broken when either start to flat line. Do NOT change scale on computer trend once started.	
73. **WHEN** vacuum is broken, **THEN** continue.	

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

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

Enclosure 5.9

Extended EFDW Operation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
87. **IAAT** hotwell level is ≤ 1″, **THEN**: A. __ Stop <u>all</u> EFDWPs. B. Consider <u>all</u> U-1 EFDW pumps inoperable, **AND GO TO** Rule 3.	
<u>NOTE</u> • This step provides general plant directions for the SRO and Management team. The user shall continue after the notification has been made. • Swapping from TBVs to ADVs prevents overfilling the hotwell/condenser. • Securing steam seals limits the water (condensation) that reaches the oil systems. Vacuum must be broken to secure steam seals. • Engineering will determine when to allow secondary system restart. • Beginning a cooldown assumes HPI is operating. If the SSF is supplying seals, then further discussion with the Management team should be undertaken prior to cooldown.	
88. Notify the CR SRO to direct the following <u>as time and resources allow</u>: • Transfer steam control from TBVs to ADVs. • Operate ADVs per U1 EOP Encl 5.24 (Operation of ADVs). • Begin Unit cool down to LPI per OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) <u>using the ADVs</u>. • Break vacuum per OP/1-2/A/1106/016 (Condenser Vacuum System). • Secure Steam Seals per OP/1/A/1106/13 (Steam Seal System).	
89. **WHEN** directed by CR SRO, **THEN EXIT**.	

Rule 6
HPI

HPI Pump Throttling Limits

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

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
All the following conditions must exist: • Core SCM > 0 • CETCs decreasing	All the following conditions must exist: • All WR NIs ≤ 1% • Core SCM > 0 • Pzr level increasing • SRO concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

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

Enclosure 5.5
Pzr and LDST Level Control

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 desired Pzr level: • 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** makeup to the LDST is desired, **THEN** makeup from 1A BHUT.	
3. **IAAT** it is desired to secure makeup to LDST, **THEN** secure makeup from 1A BHUT.	
4. **IAAT** it is desired to bleed letdown flow to 1A BHUT, **THEN** perform the following: A. Open: __ 1CS-26 __ 1CS-41 B. __ Position 1HP-14 to BLEED. C. __ Notify SRO.	
5. **IAAT** letdown bleed is **NO** longer desired, **THEN** position 1HP-14 to NORMAL.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. **IAAT** 1C HPI PUMP is required, **THEN** perform Steps 7 - 9.	**GO TO** Step 10.
7. __ Open: • 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: __ 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. __ **GO TO** 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Start 1C HPI PUMP.	**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: 1HP-26 __ 1HP-27	1. __ **IF** at least two HPI pumps are operating, **AND** 1HP-26 will **NOT** open, **THEN** throttle 1HP-410 to maintain desired Pzr level. 2. **IF** 1A HPI PUMP and 1B HPI PUMP are operating, **AND** 1HP-27 will **NOT** open, **THEN** throttle 1HP-409 to maintain desired Pzr level.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. **IAAT** LDST level **CANNOT** be maintained, **THEN** perform Step 11.	**GO TO** Step 12.
11. __ Perform the following: • Open 1HP-24. • Open 1HP-25. • Close 1HP-16.	1. **IF** both 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: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. **IF** two LPI Pumps are running only 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. __ **GO TO** Step 13. 2. **IF** only one BWST suction valve (1HP-24 or 1HP-25) is open, **AND** three HPI pumps are operating, **THEN** secure 1B HPI PUMP.
NOTE Maintaining Pzr level > 100” [180” acc] will ensure Pzr heater bundles remain covered.	
12.__ Operate Pzr heaters as required to maintain heater bundle integrity.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. **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.).	
14. **IAAT** two Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** all of the following exist: __ Letdown isolated __ LPSW available __ Letdown restoration desired **THEN** perform Steps 16 - 34. {41}	__ **GO TO** Step 35.
16. Open: 1CC-7 1CC-8	1. Notify CR SRO that letdown **CANNOT** be restored due to inability to restart the CC system. 2. **GO TO** Step 35.
17. Ensure only one CC pump running.	
18. Place the non-running CC pump in AUTO.	
19. Verify both are open: 1HP-1 1HP-2	1. **IF** 1HP-1 is closed due to 1HP-3 failing to close, **THEN GO TO** Step 21. 2. **IF** 1HP-2 is closed due to 1HP-4 failing to close, **THEN GO TO** Step 21.
20. __ **GO TO** Step 23.	
NOTE Verification of leakage requires visual observation of East Penetration Room.	
21. __ Verify letdown line leak in East Penetration Room has occurred.	**GO TO** Step 23.
22. __ **GO TO** Step 35.	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. Monitor for unexpected conditions while restoring letdown.	
24. __ 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. __ **GO TO** Step 26.
25. Open: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4	
26. Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. Notify CR SRO of problem. B. **GO TO** Step 35.
27. Close 1HP-6.	
28. Close 1HP-7.	
29. 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.

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. __ Open 1HP-5.	
31. __ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. __ **WHEN** letdown temperature is < 125°F, **THEN** place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. __ Open 1HP-6.	
34. Adjust 1HP-7 to control desired letdown flow.	
NOTE AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset increasing pressurizer level.	
35. **IAAT** it is determined that letdown is unavailable due to equipment failures or letdown system leakage, **THEN** notify CR SRO to initiate AP/32 (Loss of Letdown).	
36. **IAAT** > 1 HPI pump is operating, **AND** additional HPI pumps are **NO** longer needed, **THEN** perform the following: A. Obtain SRO concurrence to reduce running HPI pumps. B. __ Secure the desired HPI pumps. C. Place secured HPI pump switch in AUTO, if desired.	
37. __ **IAAT** all the following conditions exist: __ Makeup from BWST **NOT** required __ LDST level > 55″ __ All control rods inserted __ Cooldown Plateau **NOT** being used **THEN** close: __ 1HP-24 __ 1HP-25	

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. __ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	**GO TO** Step 40.
39. **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) one turn open (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.). C. __ Close 1CS-46. D. Start 1A BLEED TRANSFER PUMP. E. Locally throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. F. Stop 1A BLEED TRANSFER PUMP.	
40. __ Verify two Letdown Filters in service, **AND** only one Letdown filter is desired.	**GO TO** Step 42.
41. Perform one of the following: __ Place 1HP-17 switch to CLOSE. __ Place 1HP-18 switch to CLOSE.	
42. **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

EOP Enclosure 5.1 (ES Actuation) Rev 40

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Determine all ES channels that should have actuated based on RCS pressure and RB pressure: ✓ | 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	
2. __ Verify all ES channels associated with actuation setpoints have actuated.	**NOTE** Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have auto actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure. __ Depress TRIP on affected ES logic channels that have **NOT** previously been actuated.
3. __ **IAAT** additional ES actuation setpoints are exceeded, **THEN** perform Steps 1 - 2.	
4. __ Place Diverse HPI in BYPASS.	__ Place Diverse HPI in OVERRIDE.
5. Perform both: __ Place ES CH 1 in MANUAL. __ Place ES CH 2 in MANUAL.	**NOTE** • Voter OVERRIDE affects all channels of the affected ODD and/or EVEN channels. • In OVERRIDE, all components on the affected ODD and/or EVEN channels can be manually operated from the component switch. 1. __ **IF** ES CH 1 fails to go to MANUAL, **THEN** place ODD voter in OVERRIDE. 2. __ **IF** ES CH 2 fails to go to MANUAL, **THEN** place EVEN voter in OVERRIDE.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. __ **IAAT** all exist: __ Voter associated with ES channel is in OVERRIDE __ An ES channel is manually actuated __Components on that channel require manipulation **THEN** depress RESET on the required channel.	
7. __ Verify Rule 2 in progress or complete.	__ **GOTO** Step 73.
8. __ Verify any RCP operating.	__ **GOTO** Step 10.
9. Open: __ 1HP-20 __ 1HP-21	
10. __ **IAAT** any RCP is operating, **AND** ES Channels 5 and 6 actuate, **THEN** perform Steps 11 - 14.	__ **GOTO** Step 15.
11. Perform all: __ Place ES CH 5 in MANUAL. __ Place ES CH 6 in MANUAL.	**NOTE** • Voter OVERRIDE affects all channels of the affected ODD and/or EVEN channels. • In OVERRIDE, all components on the affected ODD and/or EVEN channels can be manually operated from the component switch. 1. __ **IF** ES CH 5 fails to go to MANUAL, **THEN** place ODD voter in OVERRIDE. 2. __ **IF** ES CH 6 fails to go to MANUAL, **THEN** place EVEN voter in OVERRIDE.
12. Open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
13. __ Ensure only one CC pump operating.	
14. __ 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.	**<u>NOTE</u>** • 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. 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.
<u>CAUTION</u> 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. __**IAAT** 1A and 1B LPI PUMPs are off / tripped, **AND** all exist: __ RCS pressure < LPI pump shutoff head __ 1LP-19 closed __ 1LP-20 closed **THEN** perform Steps 23 - 24.	__ **GO TO** Step 25.
23. Open: __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 __ 1LP-17 __ 1LP-18 __ 1LP-21 __ 1LP-22	
24. __ Start 1C LPI PUMP.	
25. __ **IAAT** 1A LPI PUMP fails while operating, **AND** 1B LPI PUMP is operating, **THEN** close 1LP-17.	
26. __ **IAAT** 1B LPI PUMP fails while operating, **AND** 1A LPI PUMP is operating, **THEN** close 1LP-18.	
27. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
28. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 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, **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 ≤ 19'.
41. __ **IAAT** BWST level ≤ 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.

<u>NOTE</u>

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.	**<u>NOTE</u>** • 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. 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.
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
Unit Status ES Channels 3 & 4 have **NOT** actuated.	
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 total LPSW flow to Unit 2 LPI coolers $\leq$ 6000 gpm.	__ Reduce LPSW to Unit 2 LPI coolers to obtain total 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** <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 ≤ 19'.
67. __ **IAAT** BWST level ≤ 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 •••

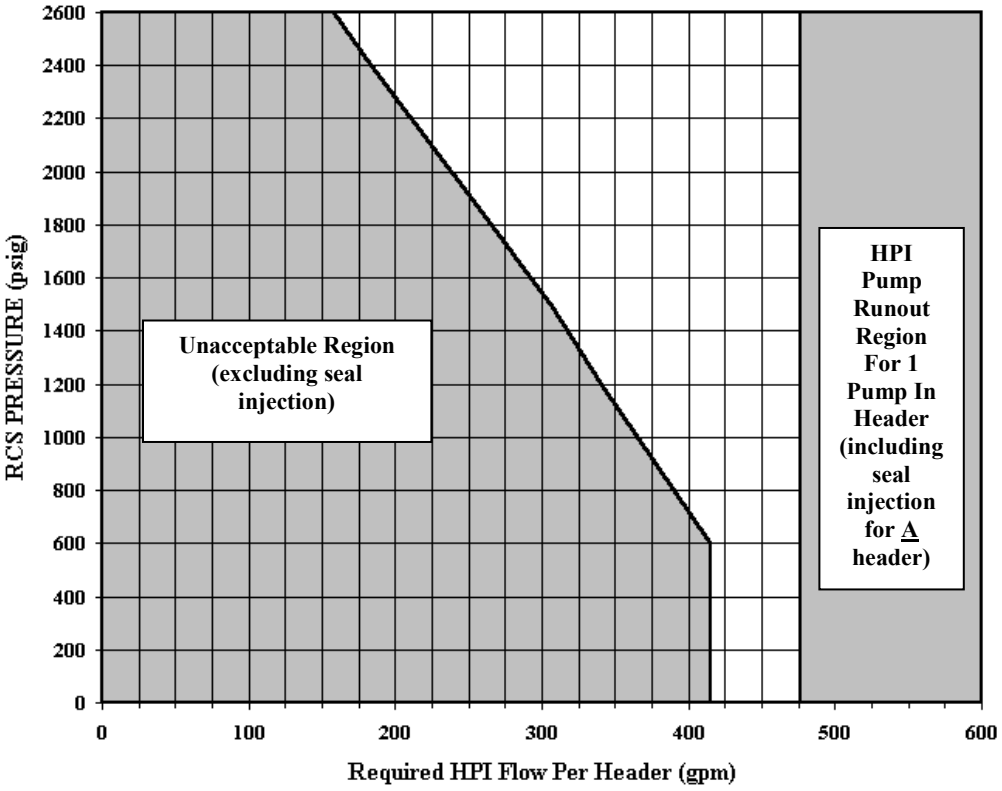
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
73. Open: __ 1HP-24 __ 1HP-25	1. __ **IF** <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, **THEN**: A. __ Start 1A LPI PUMP. B. __ Start 1B LPI PUMP. C. Open: __ 1LP-15 __ 1LP-16 __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 D. __ **IF** two LPI 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 74. 2. __ **IF** <u>only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, **THEN**: 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 75.

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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:	

✓	1A Header	✓	1B Header
	1HP-410		1HP-409

Figure 1
Required HPI Flow Per Header



ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
77. __ Verify <u>any</u> RCP operating.	__ **GOTO** Step 79.
78. Open: __ 1HP-20 __ 1HP-21	
79. __ **IAAT** <u>any</u> RCP is operating, **AND** ES Channels 5 and 6 actuate, **THEN** perform Steps 800 - 83.	__ **GOTO** Step 84.
80. Perform <u>all</u>: __ Place ES CH 5 in MANUAL. __ Place ES CH 6 in MANUAL.	**NOTE** • 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. 1. __ **IF** ES CH 5 fails to go to MANUAL, **THEN** place ODD voter in OVERRIDE. 2. __ **IF** ES CH 6 fails to go to MANUAL, **THEN** place EVEN voter in OVERRIDE.
81. Open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
82. __ Ensure <u>only one</u> CC pump operating.	
83. __ Ensure Standby CC pump in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
84. __ **IAAT** ES Channels 3 & 4 are actuated, **THEN GO TO** Step 855.	__ **GO TO** Step 122.
85. __ Place Diverse LPI in BYPASS.	__ Place Diverse LPI in OVERRIDE.
86. Perform <u>both</u>: __ Place ES CH 3 in MANUAL. __ Place ES CH 4 in MANUAL.	**<u>NOTE</u>** • 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. 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.
<u>CAUTION</u> LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}	
87. __ **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
88. __ **IAAT** RCS pressure is < LPI pump shutoff head, **THEN** perform Steps 89 - 90.	__ **GOTO** Step 91.
89. Perform the following: __ Open 1LP-17. __ Start 1A LPI PUMP.	1. __ Stop 1A LPI PUMP. 2. __ Close 1LP-17.
90. Perform the following: __ Open 1LP-18. __ Start 1B LPI PUMP.	1. __ Stop 1B LPI PUMP. 2. __ Close 1LP-18.
91. __ **IAAT** 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 92 -93.	__ **GO TO** Step 94.
92. Open: __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 __ 1LP-17 __ 1LP-18 __ 1LP-21 __ 1LP-22	
93. __ Start 1C LPI PUMP.	
94. __ **IAAT** 1A LPI PUMP fails while operating, **AND** 1B LPI PUMP is operating, **THEN** close 1LP-17.	
95. __ **IAAT** 1B LPI PUMP fails while operating, **AND** 1A LPI PUMP is operating, **THEN** close 1LP-18.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
96. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
97. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
98. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
99. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
100. __ Secure makeup to the LDST.	
101. __ 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.
102. __ Verify Unit <u>2</u> turbine tripped.	__ **GOTO** Step 105.
103. __ Close <u>2</u>LPSW-139.	
104. __ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers ≤ 6000 gpm.	__ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow ≤ 6000 gpm.
105. __ Close 1LPSW-139.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
106. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
107. __ Start <u>all available</u> LPSW pumps.	
108. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 110.
109. 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 ≤ 19'.
110. __ **IAAT** BWST level ≤ 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.
111. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
112. __ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
113. __ **IAAT** ES channels 5 & 6 have actuated, **THEN** perform Step 114.	__ **GOTO** Step 115.

<u>NOTE</u>

RBCU transfer to low speed will **NOT** occur until 3 minute time delay is satisfied.

114. __ 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
115.__ **IAAT** ES channels 7 & 8 have actuated, **THEN** perform Step 116 - 117.	__ **GOTO** Step 118.
116. Perform <u>all</u>: __ Place ES CH 7 in MANUAL. __ Place ES CH 8 in MANUAL.	**<u>NOTE</u>** • 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. 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.
117.__ 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.
118.__ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
119.__ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
120.__ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
121.__ **WHEN** CR SRO approves, **THEN EXIT**.	

Unit Status ES Channels 3 & 4 have **NOT** actuated.	
122. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
123. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
124. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
125. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
126. __ Secure makeup to the LDST.	
127. __ 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.
128. __ Verify Unit 2 turbine tripped.	__ **GOTO** Step 131.
129. __ Close 2LPSW-139.	
130. __ Verify total LPSW flow to Unit 2 LPI coolers $\leq$ 6000 gpm.	__ Reduce LPSW to Unit 2 LPI coolers to obtain total LPSW flow $\leq$ 6000 gpm.
131. __ Close 1LPSW-139.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
132. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
133. __ Start <u>all available</u> LPSW pumps.	
134. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 136.
135. 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 ≤ 19'.
136. __ **IAAT** BWST level ≤ 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.
137. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
138. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
139. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
140. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
141. __ **WHEN** CR SRO approves, **THEN EXIT**.	

••• END •••

Subsequent Actions

Parallel Actions

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

CONDITION	ACTIONS	
1. PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized {13}	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F	**GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer	**GO TO** EHT tab.	**LOHT**
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	**GO TO** LOHT tab.	
7. Heat transfer is or has been excessive	**GO TO** EHT tab.	**EHT**
8. Indications of SGTR ≥ 25 gpm	**GO TO** SGTR tab.	**SGTR**
9. Turbine Building flooding **NOT** caused by rainfall event	**GO TO** TBF tab.	**TBF**
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
11. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
12. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	**EDL**
14. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and NSD 202 (Reportability).	**NOTIFY**

EHT

EP/**1**/A/1800/001

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs ≥ 5% FP **OR** NIs **NOT** decreasing	**GO TO** UNPP tab.	**UNPP**
2. All 4160V SWGR de-energized	**GO TO** Blackout tab.	**BLACKOUT**
3. Core SCM indicates superheat	**GO TO** ICC tab.	**ICC**
4. Any SCM = 0°F AND HPI forced cooling NOT in progress	**IF** LOSCM tab has **NOT** been entered due to current EHT event **THEN GO TO** LOSCM tab.	**LOSCM**
5. Both SGs intentionally isolated to stop excessive heat transfer after EHT tab initiated	**RETURN TO** beginning of EHT tab.	**LOHT**
6. Loss of heat transfer **AND** at least one SG **NOT** isolated	**GO TO** LOHT tab.	
7. Indications of excessive heat transfer in another SG after EHT tab initiated	**RETURN TO** beginning of EHT tab.	**EHT**
8. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	**ES**
9. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	**ES**
10. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • **IF** Encl 5.1 (ES Actuation) has been initiated, **THEN** reinitiate Encl 5.1.	**ROP**
11. RCS leakage > 160 gpm with letdown isolated OR SGTR .> 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	**EDL**
12. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification /Reportability Evaluation).	**NOTIFY**

CRITICAL TASKS

CT-1 The PORV must be isolated to isolate the source of RCS leakage and to prevent a reactor trip.

CT-2 The 1B MD EFDW Pump must be started in order to supply feedwater to the intact SG for heat removal to preclude initiation of HPI Forced Cooling.

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: 2	**Unit 2**	**Unit 3**
Reactor Power: Below POAH	Mode: 1	Mode: 1
Gross MWE: 0	100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm		

Technical Specifications/SLC Items (CR SRO)

Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
SSF	2 days ago / 0400	5 days / 0400	3.10.1 A,B,C,D,E

Shift Turnover Items (CR SRO)

Primary

- Due to unanalyzed condition, the SSF should be considered INOP for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).
- 1RIA-3 and 5 removed from RB.
- Pressurize LDST with H2 per OP/1/A/1106/017 Encl. 4.5.
- Increase Reactor power to ~7% per OP/1/A/1102/001 Encl. 4.7 beginning at step 3.36.
- During the Reactor power increase, Unit 2 CRS will assume the oversight role for Unit 1. Unit 1 CRS will assume the role of the dedicated Reactivity Management SRO.

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.
- Temporary OAC alarms set on FDW Loop A and B Composite Valve Demand @ 9.8% per OP/1/A/1102/001 Encl. 4.7.

Reactivity Management (CR SRO)

RCS Boron 1778 ppmB	Gp 7 Rod Position: 5% Withdrawn	Batch additions as required for volume control.

Human Performance Emphasis (SM)

Procedure Use and Adherence

REGION II
JOB PERFORMANCE MEASURE

RO-102

RESPOND TO A BORON DILUTION EVENT

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Respond to a Boron Dilution Event

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 min

K/A Rating(s):

System: APE 024
K/A: AA1.04
Rating: 3.6*/3.7

Task Standard:

The applicant shall borate the RCS In Accordance With AP/1/A/1700/003 (Boron Dilution)

References:

AP/1/A/1700/003 (Boron Dilution) Rev 14

Tools/Equipment/Procedures Needed:

AP/1/A/1700/003 (Boron Dilution)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 206**
2. **Import JPM RO-102 Sim Files**
3. **GO TO RUN**

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 startup in progress following a 28 day refueling outage

Reactor Power = 70%

Control Rods have been inserting due to RCS temperature increasing

The Control Room SRO has determined that a boron dilution event is occurring

INITIATING CUE

The Control Room SRO has directed you to perform AP/3 (Boron Dilution)

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	4.1	Verify one of the following: __ All control rods inserted. __ RV head removed. **STANDARD:** Candidate determines that neither condition applies. Continues to Step 4.1 RNO **COMMENTS:**	___ SAT ___ UNSAT
2	4.1 RNO	**IF** ICS is in Auto, **THEN** ensure the following: __ Rx power < 100% __ Control rods responding as necessary **STANDARD:** Candidate determines that reactor power is approximately 70% and control rods are inserting due to RCS temperature increasing. Continues to step 4.2 **COMMENTS:**	___ SAT ___ UNSAT
3	4.2	Make the following notifications: __ PA announcement of the event including required RB evacuation __ Notify OSM to reference the following: • RP/0/A/1000/001 (Emergency Classification) • NSD-202 (Reportability) • OMP 1-14 (Notifications) **STANDARD:** Candidate makes PA announcement and notifies the OSM to reference procedures. Continues to step 4.3 **COMMENTS:**	___ SAT ___ UNSAT

4	**4.3**	Verify HPI in operation. **STANDARD:** Candidate verifies that the A HPIP is in operation. Continues to step 4.4 **COMMENTS:**	___ SAT ___ UNSAT
5	**4.4**	Verify Rx at power. **STANDARD:** Candidate verifies that reactor power is ≈ 70%. Continues to step 4.5 **COMMENTS:**	___ SAT ___ UNSAT
6	**4.5**	Notify Chemistry to sample the following for boron concentration: • RCS • LDST **STANDARD:** Candidate notifies Chemistry to sample RCS & LDST boron concentration. Continues to step 4.6 **COMMENTS:**	___ SAT ___ UNSAT
7	**4.6**	Verify both RC bleed transfer pumps stopped. **STANDARD:** Candidate verifies that 1A and 1B Bleed Transfer Pumps are off on 1AB1: *Green lights lit and Red lights off.* Continues to step 4.7 **COMMENTS:**	___ SAT ___ UNSAT

8	**4.7**	Place 1HP-14 in NORMAL. **STANDARD:** 1HP-14 (LDST BYPASS) should already be in NORMAL: *Red light lit, Green light off.* Continues to step 4.8 **COMMENTS:**	___ SAT ___ UNSAT
9	**4.8**	Close 1HP-16. **STANDARD:** 1HP-16 (LDST MAKEUP ISOLATION) should already be closed: *Green light lit, Red light off.* Continues to step 4.9 **COMMENTS:**	___ SAT ___ UNSAT
10	**4.9**	Verify all demineralizers out of service. **STANDARD:** Candidate determines that a demineralizer IS in service. Continues to Step 4.9 RNO. **COMMENTS:**	___ SAT ___ UNSAT

11	**4.9** **RNO**	*1. __ **IF** any purification IX is in service, **THEN** perform the following: A. __ Open 1HP-13. B. __ Close 1HP-8. C. __ Close 1HP-9 & 11. 2. __ **IF** any deborating IX is in service, **[NONE IN SERVICE]** **THEN** perform the following: A. __ Close 1CS-27. B. __ Close 1CS-32 & 37. C. __ Open 1CS-26. **STANDARD:** Candidate determines that a purification IX IS in service and: Opens 1HP-13 (PURIFICATION IX BYPASS). *Red light lit, Green light off.* Closes 1HP-8 (PURIFICATION IX INLET). *Red light off, Green light lit.* Closes 1HP-9 & 11 (SPARE PURIF IX INOUT & OUTLET). *Red light off, Green light lit.* Continues to step 4.10. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
12	**4.10**	Verify control rods are within allowable limits of the COLR. **STANDARD:** Candidate references the COLR and determines that Group 7 control rods are in the “Restricted Operation” region of the COLR. Continues to step 4.12 **COMMENTS:**	___ SAT ___ UNSAT

13	**4.12**	Open one of the following valves to borate from the BWST: __ 1HP-24 __ 1HP-25 **STANDARD:** *Candidate opens **either** 1HP-24 (1A HPI BWST SUCTION) **or** 1HP-25 (1B HPI BWST SUCTION) *Red light lit, Green light off for the valve chosen.* ***Examiner Note: Critical portion is to open at least one of the valves to initiate boration.*** ***Booth Cue: Fire T01 when 1HP-24 or 1HP-25 is open.*** Continues to step 4.13 **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
14	**4.13**	Align letdown to 1A BHUT: __ Open 1CS-26. __ Open 1CS-41. __ Place 1HP-14 in BLEED. **STANDARD:** Candidate: Opens 1CS-26 (LETDOWN TO RC BHUT) *Red light lit, Green light off.* Opens 1CS-41 (1A RC BHUT INLET) *Red light lit, Green light off.* Places 1HP-14 in BLEED *Green light lit, Red light off.* Continues to step 4.14 **COMMENTS:**	___ SAT ___ UNSAT
15	**4.14**	Start the standby CC pump. **STANDARD:** Candidate rotates the standby CC pump to the START position and verifies red light lit and green light off. Continues to step 4.15 **COMMENTS:**	___ SAT ___ UNSAT

16	**4.15**	Throttle 1HP-7 to maximize letdown. **STANDARD:** Candidate will adjust 1HP-7 (LETDOWN CONTROL) to increase letdown flow from 78 gpm to ≈ 100 to 120 gpm Continues to step 4.16 **COMMENTS:**	___ SAT ___ UNSAT
17	**4.16**	Throttle the following as required to maintain PZR level 200” – 260”: __ 1HP-120 __ 1HP-26 **STANDARD:** Candidate will throttle 1HP-120 (RC Volume Control) or 1HP-26 (1A HP INJECTION) as needed to maintain Pzr level 200” – 260”. **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
11	This step removes the source of De-Boration (a demineralizer that was not boron saturated).
13	This step injects borated water (BWST) to the RCS to stop control rod insertion.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 startup in progress following a 28 day refueling outage

Reactor Power = 70%

Control Rods have been inserting due to RCS temperature increasing

The Control Room SRO has determined that a boron dilution event is occurring

INITIATING CUE

The Control Room SRO has directed you to perform AP/3 (Boron Dilution)

REGION II
JOB PERFORMANCE MEASURE

RO-202

REMOVE 1A LETDOWN COOLER FROM SERVICE

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Remove 1A Letdown Cooler From Service

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: 004
K/A: Generic 2.2.2
Rating: 4.6/4.1

Task Standard:

Remove 1A Letdown Cooler from service and completely isolate the cooler utilizing OP/1/A/1104/002 (HPI System) Enclosure 4.5 (Operation of Letdown Coolers)

References:

OP/1/A/1104/002 (HPI System) Rev 167

Tools/Equipment/Procedures Needed:

OP/1/A/1104/002 (HPI System) Enclosure 4.5 (Operation of Letdown Coolers)
OP/1/A/1104/002 (HPI System) Limits and Precautions

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 207**

2. **IMPORT FILES** for RO-202

3. **UPDATE** status board to show RCS boron at 89 ppm

4. **PROVIDE** a copy of the following:
   - OP/1/A/1104/002 Encl 4.5 beginning at Step 3.5 with steps 3.1 through 3.4 signed off.
   - OP/1/A/1104/002 Limits & Precautions.

5. Place a clean copy of OMP 2-02 Attachment G in the Component Boron Concentration Log and ensure previous copy used for this JPM is removed.

6. Go to RUN and wait for 1RIA-50 to alarm and acknowledge before allowing the student to enter the simulator.

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 is at 100%

The 1A Letdown Cooler has developed a 0.5 gpm leak

Unit 1 CC Surge Tank level is increasing at ≈ 4 inches per hour

Unit 1 CC Surge Tank level has been lowered to allow for in-leakage

It is NOT desired to valve in the spare CC Cooler

It is NOT desired to place a Purification IX in service

OP/1/A/1104/002 Enclosure 4.5 is complete up to Step 3.5

INITIATING CUE

The Control Room SRO directs you to completely isolate the 1A Letdown Cooler per OP/1/A/1104/002 Enclosure 4.5 beginning at Step 3.5

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	3.5	**WHILE** removing the 1A Letdown Cooler from service, monitor the following: • Letdown Cooler CC outlet temperature • Letdown temperature • Letdown flow **STANDARD:** Monitor Letdown Cooler CC outlet temperature by referencing OAC graphic display. Monitor Letdown temperature by referencing Letdown temperature gauge located on 1UB1 or OAC graphic display. Monitor Letdown flow by referencing Letdown flow gauge located on 1UB1 or OAC graphic display. Candidate continues to Step 3.6 **COMMENTS:**	___ SAT ___ UNSAT
2	3.6	**NOTE:** • Throttling 1HP-7 does **NOT** affect reactivity management since IXs are **NOT** in service. (R.M.) • Changing Letdown Flow < 10 gpm / minute minimizes Letdown Cooler leaks: **IF** 1HP-1/CC-1 are open, reduce Letdown flow to minimum by throttling closed 1HP-7 (LETDOWN CONTROL). **STANDARD:** Determine that 1HP-1/1CC-1 are open by observing red open light illuminated and green closed light OFF. Reduce Letdown flow by rotating 1HP-7 setpoint dial located on 1UB1 counterclockwise until the valve is closed. Candidate continues to Step 3.7. **COMMENTS:**	___ SAT ___ UNSAT

3	**3.7**	Verify Letdown Flow < 87 gpm. **STANDARD:** Verifies letdown flow on 1UB1 is < 87 gpm Candidate continues to Step 3.8. **COMMENTS:**	___ SAT ___ UNSAT
4	**3.8**	Ensure closed 1HP-1/1CC-1 (1A LETDOWN COOLER INLET). **STANDARD:** Locate 1HP-1/1CC-1 switch on 1UB1 and rotates control switch clockwise to the closed position. Verify 1HP-1 closes by observing the red open light OFF and green closed light illuminated. Verify 1CC-1 closes by observing the red open light OFF and green closed light illuminated. Candidate continues to Step 3.9. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
5	**3.9**	Record date/time 1HP-1/1CC-1 closed: _____/_____ **STANDARD:** *R*ecord today's date/time. Candidate continues to Step 3.10. **COMMENTS:**	___ SAT ___ UNSAT

6	**3.10**	**NOTE:** • Maximum Letdown Flow is 87 gpm with one Letdown Cooler in service. • Changing Letdown Flow < 10 gpm / minute minimizes Letdown Cooler leaks. • Letdown temperature should **NOT** exceed 120°F for extended periods of time. • Step 3.10 may be performed as many times as required. **IF** required, slowly adjust 1HP-7 (Letdown Control) as required to perform the following: (**Continue**) • To provide normal letdown flow of 68-80 gpm. • To maintain Letdown Cooler CC outlet temperature < 225°F. **STANDARD**: Adjust 1HP-7 as necessary to maintain letdown flow 68-80 gpm and maintain Letdown Cooler CC outlet temperature < 225°F. Adhere to the Note above and limits letdown flow < 125 gpm and prevent letdown temperature from exceeding 120°F for extended periods of time. Candidate continues to Step 3.11. **COMMENTS:**	___ SAT ___ UNSAT
7	**3.11**	**IF** required, valve in spare CC Cooler to maintain Letdown Cooler CC outlet temperature < 225°F per OP/1/A/1104/008 (Component Cooling System). **STANDARD**: Recognize from the Initial Conditions that it is NOT desired to place the spare CC Cooler in service. Candidate continues to Step 3.12. ***Examiner Cue:*** ***If the candidate asks, inform him/her that it is NOT desired to place the spare CC Cooler in service.*** **COMMENTS:**	___ SAT ___ UNSAT

8	**3.12**	Record boron in Component Boron Concentration Log for 1A Letdown Cooler. (R.M.) (**Continue**) **STANDARD**: Record current RCS boron concentration, Date, Time, and Initials in the Component Boron Concentration Log (OMP 2-02 Attachment G) for the 1A Letdown Cooler. Candidate continues to Step 3.13. **COMMENTS:**	___ SAT ___ UNSAT
9	**3.13**	**IF** desired, place a Purification IX in service per OP/1/A/1103/004 B (Purification IXs). (R.M.) **STANDARD**: Recognize from the Initial Conditions that it is NOT desired to place a Purification IX in service. Candidate continues to Step 3.14. ***Examiner Cue: If the candidate asks, inform him/her that it is NOT desired to place a Purification IX in service.*** **COMMENTS:**	___ SAT ___ UNSAT

10	**3.14**	**IF** complete cooler isolation required, perform **one** of the following: 3.14.1 **IF** CC Surge Tank level rate of increase is ≥ 3"/hour, close 1HP-3 (1A LETDOWN COOLER OUTLET). 3.14.2 **IF** CC Surge Tank level rate of increase is < 3"/hour, perform the following: **NOTE:** 24 hours prevents forming a vacuum in cooler as piping cools down. A. Verify 1HP-1/1CC-1 (1A LETDOWN COOLER INLET) closed for ≥ 24 hours. B. Close 1HP-3 (1A LETDOWN COOLER OUTLET). **STANDARD**: Recognize from the Initial Conditions that CC Surge Tank level rate of increase is ≥ 3"/hour and locates 1HP-3 control switch on 1UB1 and rotates switch in the clockwise (closed) direction. Verify 1HP-3 green closed light illuminates and red open light extinguishes. ***Examiner Cue: If the candidate asks, inform him/her that the CC leak rate remains unchanged.*** ***Examiner Cue: Inform the candidate that another operator will complete this procedure.*** **COMMENTS:** **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Step 3 is required to isolate the 1A CC Cooler from the RCS to prevent in-leakage.
10	Step 9 is required to fully isolate the 1A CC Cooler due to leakage being greater than 3" per hour

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 100%

The 1A Letdown Cooler has developed a 0.5 gpm leak

Unit 1 CC Surge Tank level is increasing at ≈ 4 inches per hour

Unit 1 CC Surge Tank level has been lowered to allow for in-leakage

It is NOT desired to valve in the spare CC Cooler

It is NOT desired to place a Purification IX in service

OP/1/A/1104/002 Enclosure 4.5 is complete up to Step 3.5

INITIATING CUE

The Control Room SRO directs you to completely isolate the 1A Letdown Cooler per OP/1/A/1104/002 Enclosure 4.5 beginning at Step 3.5

REGION II
JOB PERFORMANCE MEASURE

RO-304a

PERFORM RULE 2 FOLLOWING A LOSCM

Alternate Path: Yes

Alt Path Failure: ES Channel 2 Fails to go to MANUAL

Time Critical: Yes

Time Critical Criteria: Secure RCPs within 2 minutes of losing SCM

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Perform Rule 2 following a LOSCM

Task Number: N/A

Alternate Path: Yes

Time Critical: Yes

Validation Time: 10 minutes

K/A Rating(s):

System: E/APE 011
K/A: EA2.11
Rating: 3.9/4.3

Task Standard:

Perform a symptom check and initiate Rule 2. Trip RCPs within 2 minutes. Place EVEN Voters in Override and throttle HPI flow to within limits. .

References:

EP/1/A/1800/001 (Emergency Operating Procedure) Rev 40C

Tools/Equipment/Procedures Needed:

EP/1/A/1800/001 (Emergency Operating Procedure) Rule 2 (Loss of SCM)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 208**
2. **IMPORT FILES** for RO-304a
3. Go to **RUN** when directed by the Lead Examiner

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

The Reactor was operating at 100% power

The Reactor has just tripped

You are the BOP Reactor Operator

INITIATING CUE

As the BOP, perform a Symptoms Check

NOTE: Portions of this JPM are time critical.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Perform a Symptoms Check **STANDARD:** Candidate performs a Symptoms Check and determines that a Loss of SCM has occurred due to any SCM ≤ 0°F and initiates Rule 2 in accordance with OMP 1-18 Attachment C. ***Examiner Cue: As the SRO, if asked, concur with performing Rule 2*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2	1	**IAAT** all exist: __ Any SCM ≤ 0°F __ Rx power ≤ 1% __ ≤ 2 minutes elapsed since loss of SCM **THEN** perform Steps 2 and 3. **STANDARD:** Candidate determines that SCM is 0°F by observing the indications on the ICCM plasma display and/or standout SCM displays both located on 1UB1. Candidate verifies Rx power is ≤ 1% by observing the Power Range and/or Wide Range NIs located on 1UB1. Candidate determines that ≤ 2 minutes has elapsed since the loss of SCM. Candidate continues to step 2. **COMMENTS:**	___ SAT ___ UNSAT

3	**2**	Stop <u>all</u> RCPs. **<u>STANDARD:</u>** Stop all RCPs by locating the RCP switches located on 1AB1 and rotate the switches to the TRIP position. Verify that the green stop light is LIT and pump amps go to zero. Candidate continues to step 3. **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT
4	**3**	Notify CRS of RCP status. **<u>STANDARD</u>***:* Notify CRS that all RCPs have been secured. ***Examiner Cue: As the SRO, acknowledge the report of RCP status.*** Candidate continues to step 4. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
5	**4**	Verify Blackout exists. **<u>STANDARD</u>***:* Determine that a blackout does not exist by observing power available on the Main Feeder Bus volt meters located on 1AB1. Candidate continues to the RNO column and determine the correct procedure path is to **GO TO** Step 6. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT

6	**6**	Open: __ 1HP-24 __ 1HP-25 **STANDARD**: Verify that the above valves are open by observing their red open light LIT and green light off on 1UB1. **Note: These valves will already be open due to ES actuation.** Candidate continues to step 7. **COMMENTS:**	___ SAT ___ UNSAT
7	**7**	Start all available HPI pumps. **STANDARD**: Verify that all three HPI pumps are operating by observing their red lights lit and green lights off . **Note: All HPI pumps will be operating due to ES actuation.** Candidate continues to step 8. **COMMENTS:**	___ SAT ___ UNSAT
8	**8**	**GO TO** Step 13 **STANDARD**: Proceed to Step 13 **COMMENTS:**	___ SAT ___ UNSAT
9	**13**	Open: __ 1HP-26 __ 1HP-27 **STANDARD**: Verify that the above valves are open by observing their red open light LIT on 1UB1. **Note: These valves will already be open due to ES actuation.** Candidate continues to step 14. **COMMENTS:**	___ SAT ___ UNSAT

<table>
<tr>
<td>10</td>
<td>14</td>
<td>Verify <u>at least two</u> HPI pumps are operating using two diverse indications

<u>STANDARD</u>: All 3 HPIPs will be operating due to ES actuation.

Candidate continues to step 15.

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>IAAT ≥ 2 HPI pumps operating, AND HPI flow in any header is in the Unacceptable Region of Figure 1 THEN perform Steps 16 - 21.

<u>STANDARD</u>: Determine that HPI flow is NOT in the unacceptable region per Figure 1.

Candidate goes the RNO step and continues to step 17.

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>IAAT flow limits are exceeded,

<table>
<tr><th>Pump Operation</th><th>Limit</th></tr>
<tr><td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for A hdr)</td></tr>
<tr><td>1A & 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr>
</table>

THEN perform Steps 18 - 20.

<u>STANDARD</u>: Determine that 1B HPI Header flow is > 475 gpm by observing the 1B HPI Header Flow gauge located on 1UB1.

Candidate continues to step 18.

<u>COMMENTS</u>:</td>
<td>CRITICAL STEP

___ SAT

___ UNSAT</td>
</tr>
</table>

13	**18**	Place Diverse HPI in BYPASS. **STANDARD:** Depresses the DIVERSE HPI BYPASS "BYPASS" pushbutton on 1UB1. Candidate continues to step 19. **COMMENTS:**	___ SAT ___ UNSAT
14	**19**	**[ALTERNATE PATH]** Perform both: __ Place ES CH 1 in MANUAL. __ Place ES CH 2 in MANUAL. **STANDARD:** Places ES CH 1 in MANUAL and recognizes that ES CH 2 fails to go to MANUAL. Candidate continues to step 19 RNO. **COMMENTS:**	___ SAT ___ UNSAT
15	**19 RNO**	1. __ **IF** ES CH 1 fails to go to MANUAL, **THEN** place ODD voter in OVERRIDE. *2. __ **IF** ES CH 2 fails to go to MANUAL, **THEN** place EVEN voter in OVERRIDE. **STANDARD:** Places the EVEN Voter in OVERRIDE. Candidate continues to step 20. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
16	**20**	Throttle HPI to maximize flow ≤ flow limit. **STANDARD:** Throttles 1HP-27 to maximize HPI flow to less than 475 gpm. Candidate continues to step 21. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

17	**21**	Notify CRS of HPI status. **STANDARD:** Candidate notifies SRO that 1HP-27 has been throttled. Candidate continues to step 22. **COMMENTS:**	___ SAT ___ UNSAT
18	**22**	Verify RCS pressure > 550 psig. **STANDARD:** Determines that RCS pressure is < 550 psig. Candidate continues to **RNO**. **COMMENTS:**	___ SAT ___ UNSAT
19	**22** **RNO**	Ensure ES Channels 3 and 4 actuated. **STANDARD:** ES Channels 3 and 4 actuated when the LOCA occurred. Candidate continues to step 23. **COMMENTS:**	___ SAT ___ UNSAT
20	**23**	**IAAT** either exists: __ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm __ Only one LPI header in operation with header flow ≥ 2900 gpm **THEN GO TO** Step 24. **STANDARD:** Determines that total LPI flow exceeds 3400 gpm. Candidate continues to step 24. **COMMENTS:**	___ SAT ___ UNSAT

21	**24**	Perform the following: __ Place 1FDW-315 in MANUAL and close. __ Place 1FDW-316 in MANUAL and close. __ Place 1FDW-35 in HAND and close. __ Place 1FDW-44 in HAND and close. **STANDARD:** Places the above controllers in MANUAL/HAND and closes their respective valves. **COMMENTS:**	___ SAT ___ UNSAT
22	**25**	Notify crew that performance of Rule 3 is **NOT** required due to LB LOCA. **STANDARD:** Notifies crew that performance of Rule 3 is NOT required. **COMMENTS:**	___ SAT ___ UNSAT
23	**26**	**WHEN** directed by CRS, **THEN EXIT**. **STANDARD:** Notifies CRS that the step has been reached to exit the Rule. **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Rule 2 should be selected based on the symptoms.
3	RCPs are required to be stopped within 2 minutes of a loss of SCM.
12	1B HPI Header flow must be reduced ≤ 475 gpm for pump runout.
15	Must place Even Voter in override to be able to throttle 1HP-27.
16	Must throttle 1HP-27 to prevent damage due to runout.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

The Reactor was operating at 100% power.

The Reactor has just tripped.

You are the BOP Reactor Operator.

INITIATING CUE

As the BOP, perform a Symptoms Check.

NOTE: Portions of this JPM are time critical.

REGION II
JOB PERFORMANCE MEASURE

RO-503

PUMP THE QUENCH TANK

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Pump the Quench Tank

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 007
K/A: A1.01
Rating: 2.9/3.1

Task Standard:

Utilize OP/1/A/1104/017 Enclosure 4.1 to lower Quench Tank level to a band of 75 to 78 inches and isolate the flowpath to 1A Bleed Holdup Tank.

References:

OP/1/A/1104/017 (Quench Tank Operation) Rev 48

Tools/Equipment/Procedures Needed:

OP/1/A/1104/017 Limits & Precautions
OP/1/A/1104/017 Enclosure 4.1 (Pumping QT)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 210**

2. Place T/O sheet tags on QT Drain Pump and Component Drain Pump

3. Update Boron Status board to show:
   - Last 1A BHUT boron sample as being > 24 hours old
   - 1A BHUT Boron = 2553 ppm
   - RCS Boron = 2414 ppm

4. Provide a copy of OP/1/A/1104/017 Enclosure 4.1 with the following:
   - Limits & Precautions
   - Steps 1.1 through 1.4 signed off

5. Go to **RUN** when directed by the Lead Examiner

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 is Shutdown

Unit 1 Quench Tank level is ≈ 86 inches

Quench Tank is aligned to 1A BHUT

Enclosure 4.1 (Pumping QT) of OP/1/A/1104/017 (Quench Tank Operation) is in progress and complete up to Step 2.1

In preparation for an upcoming test, Unit 1 Quench Tank level is required to be within a band of 75 to 78 inches

INITIATING CUE

The CRS directs you to use the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP to pump the Quench Tank to 1A BHUT beginning at Step 2.1 of Enclosure 4.1 of OP/1/A/1104/017 to a Quench Tank level of ~ 77 inches.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	Ensure open: __ 1CS-5 (COMPONENT DRN PUMP SUCTION) __ 1CS-6 (COMPONENT DRN PUMP SUCTION) **STANDARD:** Ensure 1CS-5 and 1CS-6 are open by taking the control switches located on 1AB1 to the open position and verifying red open light illuminated and green closed light OFF. Candidate continues to Step 2.2. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2	2.2	**IF** QT level will be maintained in normal operating band: 2.2.1 **IF** desired, start COMPONENT DRAIN PUMP. 2.2.2 **IF** desired, start QUENCH TANK DRAIN PUMP. 2.2.3 At desired level, perform the following: • Ensure stopped COMPONENT DRAIN PUMP • Ensure stopped QUENCH TANK DRAIN PUMP 2.2.4 **IF** pump(s) automatically stop, ensure QT level ≈ 80 inches. **STANDARD:** Recognize from the Initial Conditions that this step is not applicable due to pumping the QT below 80 inches. Marks this step as Not Applicable (N/A). Candidate continues to Step 2.3 **COMMENTS:**	___ SAT ___ UNSAT

3	**2.3**	**IF** QT level is to be reduced below low level setpoint of 80 inches, perform the following: 2.3.1 Ensure RCS pressure < 45 psig. 2.3.2 ***IF** desired, place COMPONENT DRAIN PUMP to BYPASS 2.3.3 ***IF** desired, place QUENCH TANK DRAIN PUMP to BYPASS 2.3.4 *At desired level (**75 to 78 inches**), perform the following: • Ensure stopped COMPONENT DRAIN PUMP • Ensure stopped QUENCH TANK DRAIN PUMP **STANDARD:** Determine from the Initial Conditions that QT level will be reduced below 80 inches Locate RCS pressure from the Low Range Cooldown Pressure indication on 1UB2 and ensures that RCS pressure is < 45 psig. *Place the COMPONENT DRAIN PUMP switch in the BYPASS position **AND Pull the switch up**. *Place the QUENCH TANK DRAIN PUMP switch in the BYPASS position **AND Pull the switch up**. *Stop the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP by rotating the switch to STOP when QT level reaches 75 inches. ***Note: The low level cut-off for the Component Drain Pump and Quench Tank Drain Pump will trip the pumps at ≈ 80 inches if the pump switches are not taken to BYPASS and pulled up (similar to a PTL position).*** ***Note: The candidate must start either the COMPONENT DRAIN PUMP or the QUENCH TANK DRAIN PUMP in the bypass position to complete the task. The candidate's instructions were to use both pumps.*** Candidate continues to Step 2.4 **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

4	**2.4**	Perform the following: __ *Close 1CS-5 (COMPONENT DRN PUMP SUCTION) __ *Close 1CS-6 (COMPONENT DRN PUMP SUCTION) **STANDARD:** Close 1CS-5 and 1CS-6 by placing each control switch in the closed position. The green closed light illuminates and the red open light extinguishes. Candidate continues to Step 2.5 ***Note: Closing EITHER 1CS-5 or 1CS-6 satisfies the Critical Step.*** **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
5	**2.5**	**IF** 1A BHUT boron sample > 24 hours old **AND** QT pumped to 1A BHUT, perform the following: 2.5.1 Verify closed 1CS-46 (1A RC BLEED XFER PUMP DISCHARGE). 2.5.2 Dispatch NEO to observe 1A Bleed Transfer Pump discharge pressure.(1CS-PG-0084) 2.5.3 Start 1A BLEED TRANSFER PUMP. ***Booth Cue: When called, report as AO: "I am standing by to read 1A BTP discharge pressure at 1CS-PG-0084".*** **STANDARD:** Verifies 1CS-46 (1A RC BLEED XFER PUMP DISCHARGE) is closed by observing green closed light illuminated and red open light off. Candidate dispatches a AO to observe 1A Bleed Transfer Pump discharge pressure.(1CS-PG-0084). Candidate starts 1A BLEED TRANSFER PUMP and observes red light illuminated and green light off. ***Examiner Cue: When 1A BLEED TRANSFER PUMP is started inform the candidate that another operator will continue this procedure.*** **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Step is required to align the flow path from the QT to 1A BHUT.
3	This step is required to begin the level decrease in the Quench Tank. Placing the switch in the BYPASS position is required to decrease QT level below 80 inches. Ensuring both pumps are secured is required to prevent pumping the QT below 75 inches.
4	This step isolates the flow path from the QT to 1A BHUT

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is Shutdown

Unit 1 Quench Tank level is ≈ 86 inches

Quench Tank is aligned to 1A BHUT

Enclosure 4.1 (Pumping QT) of OP/1/A/1104/017 (Quench Tank Operation) is in progress and complete up to Step 2.1

In preparation for an upcoming test, Unit 1 Quench Tank level is required to be within a band of 75 to 78 inches

INITIATING CUE

The CRS directs you to use the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP to pump the Quench Tank to 1A BHUT beginning at Step 2.1 of Enclosure 4.1 of OP/1/A/1104/017 to a Quench Tank level of ~ 77 inches.

REGION II
JOB PERFORMANCE MEASURE

RO-602

RESTORE SECONDARY LOADS AFTER LOSS OF OFFSITE POWER

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Restore Secondary Loads After Loss of Offsite Power

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

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

Task Standard:

Properly align secondary loads following a loss of offsite power by procedure.

References:

AP/1/A/1700/011 (Recovery From Loss of Power) Rev 55

Tools/Equipment/Procedures Needed:

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

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 213**
2. **IMPORT** RO-602 files
3. **PROVIDE** a copy of AP/11 signed off up to step 4.27

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

A Switchyard Isolation has occurred from 100% power

A Load Shed has NOT occurred

All 4160 volt switchgear has been re-energized by the overhead power path from a Keowee Hydro unit

5 minutes have elapsed since the loss of offsite power

Condensate system operation is desired

AP/1/A/1700/011 (Recovery From Loss of Power) is in progress and completed up to step 4.27

INITIATING CUE

The CRS directs you to continue AP/1/A/1700/011 (Recovery From Loss of Power) beginning at step 4.27

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**4.27**	Verify <u>both</u>: __ Condensate flow has been lost for < 25 minutes __ Condensate system operation is desired **<u>STANDARD</u>:** Candidate recognizes from the initial conditions that Condensate flow has been lost for 5 minutes and that Condensate system operation is desired **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
2	**4.28**	Place <u>all</u> HWP control switches to OFF **<u>STANDARD</u>:** Candidate places the 1A, 1B, and 1C HWP switches in the OFF position located on 1AB1. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
3	**4.29**	Place <u>all</u> CBP control switches to OFF **<u>STANDARD:</u>** Candidate places the 1A and 1C CBP switches in the OFF position located on 1AB1. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT

4	**4.30**	Place in MANUAL and close: __ 1FDW-53 __ 1FDW-65 **STANDARD**: Candidate places the 1FDW-53 and 1FDW-65 Moore controllers in MANUAL and ensures the valves are closed located on 1VB3. **COMMENTS:**	___ SAT ___ UNSAT
5	**4.31**	Place 1C-10 FAIL SWITCH in MANUAL **STANDARD**: Candidate places the 1C-10 FAIL SWITCH in MANUAL located on 1VB1. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6	**4.32**	Close 1C-10 **STANDARD**: Candidate places the 1C-10 Moore controller in MANUAL and ensures the valves is closed located on 1VB1. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
7	**4.33**	Make plant page to clear basement and third floor of non-essential personnel **STANDARD**: Candidate makes a PA announcement to clear the turbine building basement and third floor of non-essential personnel. **COMMENTS:**	___ SAT ___ UNSAT

8	**4.34**	Start <u>one</u> HWP **<u>STANDARD</u>**: Candidate starts one Hotwell pump by rotating the control switch to the start positon and observing the red light lit and green light off located on 1AB1. **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT
9	**4.35**	Verify < 25 minutes elapsed since loss of condensate **<u>STANDARD</u>**: Candidate verifies that < 25 minutes have elapsed since the loss of condensate. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
10	**4.36**	Throttle 1C-10 controller 10% open to satisfy 25 minute system restart criteria. **<u>STANDARD</u>**: Candidate throttles the 1C-10 Moore controller to ≈ 10% open. **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**4.37**	**WHEN** FWP SUCT HDR PRESS (1VB3) is ≥ 100 psig, **THEN** open 1C-10 **<u>STANDARD</u>**: Candidate locates FWP SUCT HDR PRESS gauge located on 1VB3 and ensures the gauge increase to ≥ 100 psig and then opens 1C-10 using the Moore controller located on 1VB1. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT

12	**4.38**	Place 1C-10 Fail Open Switch in FAIL OPEN **STANDARD**: Candidate places the 1C-10 FAIL OPEN SWITCH in FAIL OPEN located on 1VB1. **COMMENTS:**	___ SAT ___ UNSAT
13	**4.39**	Maximize total recirc flow < 1200 gpm with one of the following: __ 1FDW-53 __ 1FDW-65 **STANDARD**: Candidate throttles either the 1FDW-53 or 1FDW-65 Moore controller to maximize flow to < 1200 gpm located on 1VB3. **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
5	This step is required in order to restore condensate flow.
6	This step is required in order to restore condensate flow.
8	This step is required in order to restore condensate flow.
10	This step is required in order to restore condensate flow

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

A Switchyard Isolation has occurred from 100% power

A Load Shed has NOT occurred

All 4160 volt switchgear has been re-energized by the overhead power path from a Keowee Hydro unit

5 minutes have elapsed since the loss of offsite power

Condensate system operation is desired

AP/1/A/1700/011 (Recovery From Loss of Power) is in progress and completed up to step 4.27

INITIATING CUE

The CRS directs you to continue AP/1/A/1700/011 (Recovery From Loss of Power) beginning at step 4.27

REGION II
JOB PERFORMANCE MEASURE

RO-803a

ALIGN INTAKE CANAL FOR RECIRC ON DAM FAILURE

Alternate Path: Yes

Alt Path Failure**:** **CCW-9 fails closed**

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Align Intake Canal for Recirc on Dam Failure

Task Number: N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 20 min

K/A Rating(s):

System: 075
K/A: G 2.1.23
Rating: 4.3/4.4

Task Standard:

Intake Canal is aligned for recirculation correctly by procedure and an AO is dispatched to manually open CCW-9. The critical element to successfully complete the JPM is to finish the task with CCW-9 open and the CCW Pump operating.

References:

"CCW LAKE LEVEL LOW" statalarm (1SA-9, B-10)

AP/1/A/1700/13, (Dam Failure) Rev 032

Tools/Equipment/Procedures Needed:

AP/1/A/1700/13, (Dam Failure)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 214**

2. **IMPORT** RO-803a files

3. **PLACE** simulator in **RUN** and depress the Dam Failure P/B. Wait for and acknowledge the initial alarms on 1SA-9, then place the simulator in **FREEZE**.

4. **PROVIDE** a copy of AP/1/A/1700/013 (Dam Failure) with steps 4.1 through 4.57 signed off

5. **GO** to **RUN** when directed by Lead Examiner.

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

The SM has confirmed Condition 'A' for Little River Dam

Unit 1 has been manually tripped

The Intake Canal is intact

The RCPs have been secured

AP/1/A/1700/13 (Dam Failure) has been completed up to step 4.58

The Unit 2 Control Room has directed Unit 1 to supply CCW recirculation

INITIATING CUE

Control Room Supervisor directs you to align the CCW Intake Canal for recirculation following a dam failure beginning at step 4.58 of AP/1/A/1700/013 (Dam Failure)

When directed by the AP, start the 1C CCW pump

START TIME: _____

<table>
<tr><th>SEQ STEP</th><th>PROC STEP</th><th>DESCRIPTION</th><th></th></tr>
<tr><td>1</td><td>4.58</td><td>
<u>NOTE</u>
Unit 2 CR will decide which unit will establish CCW recirculation. Unit 1 will only supply CCW recirculation when directed by Unit 2.

IAAT Unit 2 CR has directed Unit 1 to supply CCW recirculation,
THEN perform Steps 4.59 – 4.74 to start <u>one</u> CCW Pump <u>and</u> establish recirculation.

<u>STANDARD</u>: The candidate determines from the Initial Conditions that Unit 2 CR has directed Unit 1 to supply CCW recirculation and proceeds to Step 4.59.

<u>COMMENTS</u>:
</td><td>___ SAT

___ UNSAT</td></tr>
<tr><td>2</td><td>4.59</td><td>
<u>NOTE</u>
• At least one CCW Pump discharge valve is required to remain open prior to establishing forced flow.
• The adjacent CCW Pumps discharge valve must be closed to prevent excessive torque on the starting pumps discharge valve. The 1A <u>and</u> 1B CCW Pumps are adjacent, and the 1C <u>and</u> 1D CCW Pumps are adjacent

Determine which CCW Pump will be started
<table>
<tr><th>√</th><th>CCW Pump</th></tr>
<tr><td></td><td>1A</td></tr>
<tr><td></td><td>1B</td></tr>
<tr><td></td><td>1C</td></tr>
<tr><td></td><td>1D</td></tr>
</table>
<u>STANDARD</u>: The candidate determines that the 1C CCW Pump will be started and continues to Step 4.60.

<u>COMMENTS</u>:
</td><td>___ SAT

___ UNSAT</td></tr>
</table>

<table>
<tr>
<td>3</td>
<td>4.60</td>
<td>Place <u>all</u> CCW Pump switches in the trip position

<table>
<tr><th>√</th><th>CCW Pump</th></tr>
<tr><td></td><td>1A</td></tr>
<tr><td></td><td>1B</td></tr>
<tr><td></td><td>1C</td></tr>
<tr><td></td><td>1D</td></tr>
</table>

<u>STANDARD:</u> The candidate locates the CCW Pump controls on 1AB3 and rotates the 1A, 1B, 1C, and 1D CCW Pump control switches to the trip position.
The candidate continues to Step 4.61.

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
<tr>
<td>4</td>
<td>4.61</td>
<td>Verify the 1A <u>or</u> 1B CCW Pump is to be started

<u>STANDARD</u>: The candidate was cued to start the 1C CCW Pump, RNO directs the operator to GO TO Step 4.64

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
</table>

5 | **4.64**

Verify both of the following CCW pump discharge valves are closed

Pump	√	Valve
1C		1CCW-12
1D		1CCW-13

STANDARD: Candidate verifies that 1CCW-12 indicates open by observing the red open light illuminated and the green closed light OFF on 1AB3 **OR** by OAC indications.

Candidate verifies that 1CCW-13 is closed by observing the green closed light illuminated and red open light OFF on 1AB3 **OR** by OAC indications.

Candidate determines that both valves are NOT closed and proceeds to Step 4.64 **RNO.**

___ SAT

___ UNSAT

COMMENTS:

6 | **4.64 RNO**

Locally close the discharge valves from the breaker switch (Unit 1 Equipment Rm).

Pump	√	Valve	Breaker
1C		1CCW-12	1XS3-2E
1D		1CCW-13	1XS1-F3C

STANDARD: The candidate dispatches an operator to Unit 1 Equipment Room to close 1CCW-12 and 1CCW-13

Simulator Operator: After the candidate has dispatched an operator to Unit 1 Equipment Room to close 1CCW-12 & 1CCW-13, FIRE TIMER #1 TO CLOSE 1CCW-12. 1CCW-13 is already closed.

Cue: Inform the candidate that 1CCW-12 and 1CCW-13 both indicate closed from the equipment room.

Candidate continues to Step 4.65

___ SAT

___ UNSAT

COMMENTS:

7	**4.65**	**NOTE** CCW pump amps and temperatures will read higher than normal when started with this plant configuration. CCWP motor stator temperature limit is 284°F. Start the selected CCW pump **STANDARD**: The candidate locates the control switch for the 1C CCW Pump on 1AB3 and rotates the control switch to the close position. The candidate observes that the 1C CCW pump discharge valve starts to travel open and when approx 20% open, the 1C CCW pump starts as indicated by red run light illuminated and ≈ 375 motor amps indicated. ***Examiner Cue:*** ***If the candidate asks, inform him/her that the selected CCW Pump motor stator temperature is ≈ 200°F and stable.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
8	**4.66**	Verify the started CCW pump discharge valve opened **STANDARD**: The candidate verifies the 1C CCW Pump discharge valve indicates OPEN by observing the red open light illuminated and the green closed light OFF on 1AB3. The candidate may also verify selected discharge valve open by OAC indications **COMMENTS:**	___ SAT ___ UNSAT

9	**4.67**	Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running pump **STANDARD***:* Candidate locates the CCWP LOAD SHED DEFEAT switch on VB1 and verifies switch aligned to the 1C CCW pump **COMMENTS:**	___ SAT ___ UNSAT
10	**4.68**	**[ALTERNATE PATH]** Verify CCW-9 is open **STANDARD***:* Candidate observes CCW-9 indication on 2AB3 and determines that CCW-9 is closed by the red OPEN light OFF and the green CLOSED indication illuminated Candidate determines CCW-9 is closed and proceeds to step 4.68 **RNO** **Note: CCW-9 is failed closed** **COMMENTS:**	___ SAT ___ UNSAT

11	**4.68 RNO**	1. *Stop the operating CCW pump. 2. Notify Security to meet an operator at Gate 23 (CCW Intake) to provide access to CCW-9. 3. Dispatch an operator to perform the following: A. Obtain the CCW-9 Gate Key from security box in Unit 3 Control Room storage area. B. Access the area between fences at Gate 23 leading to the CCW intake. C. *Open CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) (between protected area fences). D. Notify Unit 1 CR when CCW-9 is open. 4. **WHEN** notified that CW-9 is open, **THEN GO TO** Step 4.59 to restart a CCW pump. **STANDARD**: Candidate locates the control switch for the 1C CCW Pump on 1AB2 and rotates the control switch to the trip position and observes the red ON lights OFF and the white OFF light illuminated. Candidate notifies Security to meet an operator at Gate 23 to provide access to CCW-9. Candidate dispatches an operator to obtain the CCW-9 Gate Key from the Security box in the Unit 3 Control Room storage area. The operator, along with Security, proceeds between the Protected Area fences in order to open CCW-9. **Booth cue: Fire Timer 4 to open CCW-9 and using time compression and inform the candidate that CCW-9 has been opened.** Candidate returns to step 4.59 to restart a CCW pump. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

12 **4.59**

NOTE

- At least one CCW Pump discharge valve is required to remain open prior to establishing forced flow.
- The adjacent CCW Pumps discharge valve must be closed to prevent excessive torque on the starting pumps discharge valve. The 1A and 1B CCW Pumps are adjacent, and the 1C and 1D CCW Pumps are adjacent

Determine which CCW Pump will be started

√	CCW Pump
	1A
	1B
	1C
	1D

STANDARD: The candidate determines that the 1C CCW Pump will be started and continues to Step 4.60.

___ SAT

___ UNSAT

COMMENTS:

13 **4.60**

Place all CCW Pump switches in the trip position

√	CCW Pump
	1A
	1B
	1C
	1D

STANDARD: The candidate locates the CCW Pump controls on 1AB3 and rotates the 1A, 1B, 1C, and 1D CCW Pump control switches to the trip position.

The candidate continues to Step 4.61.

___ SAT

___ UNSAT

COMMENTS:

<table>
<tr>
<td>14</td>
<td>4.61</td>
<td>Verify the 1A <u>or</u> 1B CCW Pump is to be started

<u>STANDARD</u>: The candidate was cued to start the 1C CCW Pump, RNO directs the operator to GO TO Step 4.64

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
<tr>
<td>15</td>
<td>4.64</td>
<td>Verify <u>both</u> of the following CCW pump discharge valves are closed

<table>
<tr><th>Pump</th><th>√</th><th>Valve</th></tr>
<tr><td>1C</td><td></td><td>1CCW-12</td></tr>
<tr><td>1D</td><td></td><td>1CCW-13</td></tr>
</table>

<u>STANDARD</u>: Candidate verifies that 1CCW-12 indicates open by observing the red open light illuminated and the green closed light OFF on 1AB3 <u>OR</u> by OAC indications.

Candidate verifies that 1CCW-13 is closed by observing the green closed light illuminated and red open light OFF on 1AB3 <u>OR</u> by OAC indications.

Candidate determines that both valves are <u>NOT</u> closed and proceeds to Step 4.64 RNO.

<u>COMMENTS</u>:</td>
<td>___ SAT

___ UNSAT</td>
</tr>
</table>

16	**4.64 RNO**	Locally close the discharge valves from the breaker switch (Unit 1 Equipment Rm). **Pump** | **√** | **Valve** | **Breaker** 1C | | 1CCW-12 | 1XS3-2E 1D | | 1CCW-13 | 1XS1-F3C **STANDARD**: The candidate dispatches an operator to Unit 1 Equipment Room to close 1CCW-12 and 1CCW-13 **Simulator Operator: After the candidate has dispatched an operator to Unit 1 Equipment Room to close 1CCW-12 & 1CCW-13, FIRE TIMER 5 TO CLOSE 1CCW-12. 1CCW-13 is already closed.** ***Cue: Inform the candidate that 1CCW-12 and 1CCW-13 both indicate closed from the equipment room.*** Candidate continues to Step 4.65 **COMMENTS:**	___ SAT ___ UNSAT

17	**4.65**	**NOTE** CCW pump amps and temperatures will read higher than normal when started with this plant configuration. CCWP motor stator temperature limit is 284°F. Start the selected CCW pump **STANDARD**: The candidate locates the control switch for the 1C CCW Pump on 1AB3 and rotates the control switch to the close position. The candidate observes that the 1C CCW pump discharge valve starts to travel open and when approx 20% open, the 1C CCW pump starts as indicated by red run light illuminated and ≈ 375 motor amps indicated. ***Examiner Cue:*** ***If the candidate asks, inform him/her that the selected CCW Pump motor stator temperature is ≈ 200°F and stable.*** **COMMENTS**: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
7	Step 7 is critical to start a CCW pump.
11	Step 11 is critical to ensure the operating CCW pump is stopped and CCW-9 is opened manually to align CCW recirculation flow.
17	Step 17 is critical to start a CCW pump.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

The SM has confirmed Condition 'A' for Little River Dam

Unit 1 has been manually tripped

The Intake Canal is intact

The RCPs have been secured

AP/1/A/1700/13 (Dam Failure) has been completed up to step 4.58

The Unit 2 Control Room has directed Unit 1 to supply CCW recirculation

INITIATING CUE

Control Room Supervisor directs you to align the CCW Intake Canal for recirculation following a dam failure beginning at step 4.58 of AP/1/A/1700/013 (Dam Failure)

When directed by the AP, start the 1C CCW pump

REGION II
JOB PERFORMANCE MEASURE

RO-901a

RELEASE GWD TANK

Alternate Path: Yes

Alt Path Failure: **The "B" GWD tank pressure will decrease instead of the D GWD tank**

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Release GWD Tank

Task Number : N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 30 min

K/A Rating(s):

System: 071
K/A: A4.26
Rating: 3.1/3.9

Task Standard:

Release a GWD tank correctly using OP/1&2/A/1104/018 Encl. 4.9 (GWD Tank Release) and terminate the release when unexpected results are noted.

References: OP/1&2/A/1104/018 Encl. 4.9 (GWD Tank Release) Rev 77
PT/0/A/230/001 (Radiation Monitor Check) Rev 167

Tools/Equipment/Procedures Needed:

OP/1&2/A/1104/018, Enclosure 4.9 (GWD Tank Release) & 4.10 (GWD Tank Sample Request)
PT/0/A/230/001 (Radiation Monitor Check)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL** SNAP 212
2. **IMPORT** RO-901a Sim files
3. **PLACE** the "Purged" yellow tag on the GWR Discharge Flow Controller
4. **ENSURE** OP/1-2/A/1104/018, Sample Request, and PT/0/A/0230/001 in place for the candidate
5. Go to **RUN** when directed by Lead Examiner

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Release of “D” GWD tank is desired

No other GWRs in progress

OP/1&2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to step 3.9

INITIATING CUES

CRS directs you to complete the release of the “D” GWD tank beginning at step 3.9 of Enclosure 4.9 (GWD Tank Release)

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	3.9	**NOTE:** If N_2 was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05 µCi / ml when it was released, the GWD piping is considered "purged". 3.9.1 Adjust 1RIA-37 setpoints for release as follows: 3.9.2 Perform **one** of the following: A. **IF** all of the following: • Calculated setpoints are < 1E+07 CPM • 1RIA-37 operable • GWD piping purged {15} set alarms as follows: • Set 1RIA-37 Alert setpoint at _____cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.7.1) • Set 1RIA-37 High setpoint at _____cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.7.1) **NOTE:** If GWD piping **NOT** purged on most recent release, RP independently verifies release data and 1RIA-37 setpoint is set at zero to allow the tank to be released. {15} B. **IF** any of the following: • Calculated setpoints are > 1E+07 CPM • 1RIA-37 out-of-service • GWD piping **NOT** purged {15} perform the following: 1. Enter SLC 16.11.3, Conditions C and I 2. Override 1RIA-37 setpoints as follows: • Set 1RIA-37 Alert setpoint at zero per PT/0/A/0230/001 (Radiation Monitor Check). • Set 1RIA-37 High setpoint at zero per PT/0/A/0230/001 (Radiation Monitor Check). **STANDARD:** Refer to PT/0/A/0230/001 (Radiation Monitor Check) Encl. 13.6 (1RIA-37 and 1RIA-38 Setpoints) and using the RIA Screen insert the calculated 1RIA-37 setpoint of **2.73 E5** CPM Candidate continues to Step 3.10 **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

2	**3.10**	Adjust 1RIA-38 setpoints for release as follows: 3.10.1 Perform **one** of the following: A. **IF** calculated setpoints are < 1E+06 CPM **AND** 1RIA-38 operable, set alarms as follows: • Set 1RIA-38 Alert setpoint at _____cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.8) • Set 1RIA-38 High setpoint at _____cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.8) **NOTE:** Due to type of radiation 1RIA-38 monitors, it is **NOT** sensitive enough to perform an adequate N2 purge. B. **IF** calculated setpoints are > 1E+06 CPM **OR** 1RIA-38 out of service, perform the following: 1. Enter SLC 16/11/3, Conditions C and I 2. Override 1RIA-38 setpoints as follows: • Set 1RIA-38 Alert setpoint at zero per PT/0/A/0230/001 (Radiation Monitor Check). • Set 1RIA-38 High setpoint at zero per PT/0/A/0230/001 (Radiation Monitor Check). **STANDARD:** Refer to PT/0/A/0230/001 (Radiation Monitor Check) Encl. 13.6 (1RIA-37 and 1RIA-38 Setpoints) and using the RIA ENABLE CONTROLs Screen insert the calculated 1RIA-38 setpoint of **339** CPM. Candidate continues to Step 3.11 **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
3	**3.11**	Ensure GWR DISCHARGE FLOW CONTROL in "HAND". **STANDARD:** Ensure GWR DISCHARGE FLOW CONTROL in "HAND" located on 1AB3. Candidate continues to Step 3.12 **COMMENTS:**	___ SAT ___ UNSAT

4	**3.12**	Verify GWR DISCHARGE FLOW CONTROL "CLOSED" **STANDARD**: Verify GWR DISCHARGE FLOW CONTROL CLOSED located on 1AB3. Candidate continues to Step 3.13 **COMMENTS:**	___ SAT ___ UNSAT
5	**3.13**	Remove "Purged / Not Purged" CR tag from GWR DISCHARGE FLOW CONTROL. **STANDARD:** Remove "Purged / Not Purged" CR tag from GWR DISCHARGE FLOW CONTROL located on 1AB3. Candidate continues to Step 3.14 **COMMENTS:**	___ SAT ___ UNSAT
6	**3.14**	Notify Unit 3 CR to perform the following: • Begin periodically monitoring all three Unit 3 GWD tanks to determine if pressure in any tank is decreasing unexpectedly. {12} • Place a note on turnover sheet "If 3RIA-45 alarms or GWD tank pressure in any tank is decreasing unexpectedly, notify Unit 1 CR to terminate GWD tank release". **STANDARD:** Notify Unit 3 CR to begin periodically monitoring all three Unit 3 GWD tanks to determine if pressure in any tank is decreasing unexpectedly Notify Unit 3 CR to place above note on the turnover sheet Candidate continues to Step 3.15 **COMMENTS:**	___ SAT ___ UNSAT

7	**3.15**	Notify Unit 2 CR to place a note on turnover sheet "If 2RIA-45 alarms, notify Unit 1 CR to terminate GWD tank release". **STANDARD:** Notify Unit 2 CR to place above note on the turnover sheet. Candidate continues to Step 3.16 **COMMENTS:**	___ SAT ___ UNSAT
8	**3.16**	Begin monitoring all four Unit 1 GWD tanks to determine if pressure in any tank is decreasing unexpectedly. **STANDARD:** Begin monitoring GWD tank pressures on chart recorder on 1VB2 or OAC. Candidate continues to Step 3.17 **COMMENTS:**	___ SAT ___ UNSAT
9	**3.17**	**NOTE:** When GWD Tank ≥ 2.1E-05 µCi / ml, RP monitors GWD piping at 1RIA-37 as N2 is added to inform CR when local readings indicate the piping is purged. **IF** 1RIA-37 **NOT** in service **AND** the tank being released is ≥ 2.1E-05 µCi/ml, notify RP to prepare to survey GWD piping at 1RIA-37. {15} _____ _____ Person Notified Date **STANDARD:** Determine 1RIA-37 is in service and N/A step 3.17. Candidate continues to Step 3.18 **COMMENTS:**	___ SAT ___ UNSAT

10	**3.18**	**IF AT ANY TIME** any tank is decreasing unexpectedly, perform the following: 3.18.1 Close GWR DISCHARGE FLOW CONTROL. 3.18.2 Notify RP to initiate SRPMP 8-02 (Investigation of Unusual Radiological Occurrences) due to potential unplanned radioactive effluent release. _____ _____ Person Notified Date 3.18.3 Go To Section 4 (GWR Termination). **STANDARD:** Determine IAAT step is not met at this time. Candidate continues to Step 3.19 **COMMENTS:**	___ SAT ___ UNSAT
11	**3.19**	**IF AT ANY TIME** desired to terminate release, perform the following: 3.19.1 Close GWR DISCHARGE FLOW CONTROL. 3.19.2 Go To Section 4 (GWR Termination). **STANDARD:** Determine IAAT step is not met at this time. Candidate continues to Step 3.20 **COMMENTS:**	___ SAT ___ UNSAT
12	**3.20**	Open GWD-100 (Decay Tanks Discharge Header Block). (A-2-209/E 13' N of Door) **STANDARD:** Dispatch AO to Open GWD-100 (Decay Tanks Discharge Header Block). Candidate continues to Step 3.21 **Booth Note: GWD-100 is OPEN.** ***Cue: Inform candidate that GWD-100 is open.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

13	**3.21** **3.22** **3.23**	**IF** releasing GWD Tank A/B/C, perform the following… **STANDARD:** Determine NOT releasing GWD Tank A, B, and C and N/A steps 3.21, 3.22, and 3.23. Candidate continues to Step 3.24 **COMMENTS:**	___ SAT ___ UNSAT
14	**3.24**	**IF** releasing GWD Tank 'D' perform the following: • Open GWD-205 (Decay Tank 1D Discharge Block) (IRW Building) • Place GWD-207 ('D' INTERIM GWD TANK DISCH) switch to "OPEN" **STANDARD:** Dispatch AO to open GWD-205 (Decay Tank 1D Discharge Block). ***Cue: Inform candidate that GWD-205 is open.*** Locate GWD-207 ("D" INTERIM GWD TANK DISCH) on 1AB3 and place switch to "OPEN" Candidate continues to Step 3.25 **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

<table>
<tr>
<td>15</td>
<td>3.25</td>
<td>
NOTE:
Station Limit release rates, per SLC 16.11, will NOT be exceeded if recommended release rates per Enclosure 4.10 (GWD Tank Sample Request) are followed.

The following approval levels are required for releases: {10}{13}

<table>
<tr><th>All Station Releases in Progress (including this one)</th><th>Required Level of Approval</th></tr>
<tr><td>1 GWR in progress through P/A/C filter at 1/3 Station Limit (≥ 30 day holdup)</td><td>SRO</td></tr>
<tr><td>1 GWR in progress at 1/3 Station Limit (< 30 day holdup OR released without P/A/C filter)</td><td>OSM</td></tr>
<tr><td>1 GWR in progress at 2/3 Station Limit</td><td>OSM</td></tr>
<tr><td>2 GWRs in progress at 1/3 Station Limit each</td><td>OSM</td></tr>
<tr><td>3 GWRs in progress at 1/3 Station Limit each</td><td>OSM</td></tr>
</table>
Circle Required Level of Approval above based on Release Conditions.

<u>STANDARD</u>: Circle SRO on enclosure.

Candidate continues to Step 3.26

<u>COMMENTS</u>:
</td>
<td>___ SAT

___ UNSAT</td>
</tr>
<tr>
<td>16</td>
<td>3.26</td>
<td>
Record approval granted for release:
_____ _____ / _____
Approval Date Time

<u>STANDARD</u>: Place approval name and date and time on enclosure.

Candidate continues to Step 3.27

Cue: Inform candidate that approval is granted for release by Mitch Helms at current Date/Time.

<u>COMMENTS</u>:
</td>
<td>___ SAT

___ UNSAT</td>
</tr>
</table>

17	**3.27**	**NOTE:** If hold up ≥ 30 days, the limits will be checked NA by RP on GWD Tank Sample Request. **IF** tank holdup < 30 days, perform the following… **STANDARD:** Determine tank has been held up greater than 30 days and N/A steps 3.27.1 – 3.27.2. Candidate continues to Step 3.28 **COMMENTS:**	___ SAT ___ UNSAT
18	**3.28**	**IF** tank is released without processing through a P/A/C filter **AND** Projected 31 day average gaseous effluent organ dose > limit, perform the following… **STANDARD:** Determine tank is being released through a P/A/C filter and N/A steps 3.28.1 – 3.28.4. Candidate continues to Step 3.29 **COMMENTS:**	___ SAT ___ UNSAT
19	**3.29**	Record recommended Release Rate from Enclosure 4.10 (GWD Tank Sample Request): _____ cfm **STANDARD:** Record recommended Release Rate from Enclosure 4.10 (GWD Tank Sample Request): __**4.19 E4**____ cfm Candidate continues to Step 3.30 **COMMENTS:**	___ SAT ___ UNSAT

20	**3.30**	**NOTE:** With Unit 1 PRV system shutdown, RIA-32 sample point for '1 PRV System Filter Discharge' is sampling air in piping between Unit 1 PRV discharge and Unit Vent, **NOT** the general area {2} During or just after GWD Release RIA-32 counts may increase while selected to '1 PRV System Filter Discharge' causing 1SA-8/B-9 "Process Monitor Radiation High" to alarm. Place the following note on Unit 1 Turnover sheet: "Just after or during a GWD release, 1SA-8/B-9 may alarm from RIA-32 sample point selected to '1 PRV System Filter Discharge'. **IF** 1SA-8/B-9 is due to RIA-32 - '1 PRV System Filter Discharge', it can be considered an expected alarm". **STANDARD:** Candidate should indicate that the above note will be placed on the turnover sheet. Candidate continues to Step 3.31 **COMMENTS:**	___ SAT ___ UNSAT
21	**3.31**	Adjust GWR DISCHARGE FLOW CONTROL to obtain desired release rate. **STANDARD:** Slowly adjust the manual loading knob to obtain the desired release rate. Candidate continues to Step 3.32 ***Note: Actual release rate will be much less than the maximum flow rate allowed by the release permit. Flow is monitored on VB1 recorder 1MSCCR0001*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
22	**3.32**	Record "Begin GWR # _____" in Narrative Log. **STANDARD:** Candidate should indicate a Unit log entry would be made. **Note: The "B" GWD tank pressure will decrease instead of the D GWD tank. The candidate should note this while monitoring the tank pressures and then perform IAAT Step 3.18. Candidate may also perform the IAAT because he notes that a release is occurring but the "D" GWD tank pressure is not decreasing. In both cases unexpected results were noted.** **COMMENTS:**	___ SAT ___ UNSAT

23	**3.18** **IAAT**	**[ALTERNATE PATH]** **IF AT ANY TIME** any tank is decreasing unexpectedly, perform the following: 3.18.1 Close GWR DISCHARGE FLOW CONTROL. 3.18.2 Notify RP to initiate SRPMP 8-02 (Investigation of Unusual Radiological Occurrences) due to potential unplanned radioactive effluent release. _____ _____ Person Notified Date 3.18.3 **Go To** Section 4 (GWR Termination). **STANDARD:** Determine IAAT step is met because the "B" GWD Tank pressure is decreasing. *Close GWR DISCHARGE FLOW CONTROL. Notify RP initiate SRPMP 8-02 (Investigation of Unusual Radiological Occurrences) **Go To** Section 4 (GWR Termination). ***Cue: Another operator will complete this procedure.*** **COMMENTS:** **END TASK**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Required to set RIA to prevent station release above limits.
2	Required to set RIA to prevent station release above limits.
12	Required to align release flow path.
14	Required to align release flow path.
21	Required to align release flow path.
23	Required to stop the release of the wrong tank.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Release of “D” GWD tank is desired

No other GWRs in progress.

OP/1&2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to step 3.9

INITIATING CUES

CRS directs you to complete the release of the “D” GWD tank beginning at step 3.9 of Enclosure 4.9 (GWD Tank Release).

REGION II
JOB PERFORMANCE MEASURE

RO-P402a

START FOURTH REACTOR COOLANT PUMP

Alternate Path: Yes

Alt Path Failure: **AC OIL Lift Pump Trips**

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Start the fourth Reactor Coolant Pump

Task Number: N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 003
K/A: A4.03
Rating: 2.8/2.5

Task Standard:

1B2 RCP is started in accordance with OP/1/A/1103/006 Encl. 4.4 (Starting 1B2 RCP) and DC Oil Lift Pump secured

References:

OP/1/A/1102/001 (Controlling Procedure for Unit Startup)
OP/1/A/1103/006 (RCP Operation) Rev 86

Tools/Equipment/Procedures Needed:

OP/1/A/1103/006 Encl. 4.4 (Starting 1B2 RCP)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 209**
2. **IMPORT FILES for RO-P402a**
3. **ENSURE** all breaker flags are set to current plant conditions
4. **ENSURE** a marked up copy of Enclosure 4.4 is provided to Examiner for candidate
5. Go to **RUN** when directed by the Lead Examiner

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

OP/1/A/1102/001 (Controlling Procedure for Unit Startup) Enclosure 4.6 (Unit Startup From 335°F/540 psig (MODE 3) To 532°F/2155 psig (MODE 3)) in progress and completed up to Step 6.2 which directs starting the fourth RCP

RCS Pressure = 1660 psig slowly increasing in accordance with OP/1/A/1102/001

RCS Temperature = 474°F slowly increasing in accordance with OP/1/A/1102/001

Another operator is monitoring the Unit 1 Loose Parts Monitor

INITIATING CUE

The CRS directs you to start the 1B2 RCP per OP/1/A/1103/006 Encl. 4.4 beginning with Step 2.2.1

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.2.1	**NOTE:** • No more than two RCP(s) may be operated when RCS is <300°F. • AC and DC Oil Lift Pumps will automatically trip after 3 minutes. Oil Lift Pump may **NOT** start unless switch has been placed to "OFF" after last start. Announce "Starting 1B2 RCP" via plant page. **STANDARD:** Announces "Starting 1B2 RCP" via plant page. Candidate continues to step 2.2.2. **COMMENTS:**	___ SAT ___ UNSAT
2	2.2.2	**IF AT ANY TIME** Oil Lift Pump low discharge pressure clears, Go To Step 2.2.6 **STANDARD:** Reads IAAT step and determines that it does not currently apply Candidate continues to step 2.2.3. **COMMENTS:**	___ SAT ___ UNSAT
3	2.2.3	**NOTE:** AC Oil Lift Pump may take > 2 minutes to develop adequate discharge pressure. **IF** available, start AC Oil Lift Pump on 1B2 RCP. **STANDARD:** Determines AC Oil Lift Pump is available and: • Rotates AC Oil Lift Pump switch to start • Observes red light on and green light off • Monitors discharge pressure status on OAC Candidate continues to step 2.2.4. **COMMENTS:**	___ SAT ___ UNSAT

4	**2.2.4**	**NOTE**: Operating either AC or DC Oil Lift Pump is adequate to start RCP. **IF** AC Oil Lift Pump is unavailable, start DC Oil Lift Pump **STANDARD**: Determines AC Oil Lift Pump is available and N/A's this step Candidate continues to step 2.2.5. **COMMENTS:**	___ SAT ___ UNSAT
5	**2.2.5**	**[ALTERNATE PATH]** **IF** AC Oil Lift Pump automatically trips prior to Oil Lift Pump low discharge pressure clearing, start DC Oil Lift Pump. **STANDARD:** Determines the AC Oil Lift Pump has tripped and starts the DC Oil Lift Pump by performing the following: • *Rotates DC Oil Lift Pump switch to start • Observes red light on and green light off • Monitors discharge pressure status on OAC **Time DC OLP started: _____** Candidate continues to step 2.2.6. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
6	**2.2.6**	**WHEN** Oil Lift Pump low discharge pressure clears **AND** > 60 seconds has elapsed since starting oil lift pumps, start 1B2 RCP. **STANDARD:** Once the DC Oil Lift Pump low discharge pressure has cleared, start the 1B2 RCP as follows: • *Rotate 1B2 RCP switch to START • Verify red lights on and green light off • Verify starting current • Verify OAC indications support pump start Candidate continues to step 2.2.7. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

		After RCP is at full speed, perform the following: A. Ensure the following stopped: • AC Oil Lift Pump • DC Oil Lift Pump B. **IF** AC Oil Lift Pump was operated, position AC Oil Lift Pump switch to "OFF". C. **IF** DC Oil Lift Pump was operated, position DC Oil Lift Pump switch to "OFF"	___ SAT
7	**2.2.7**	**STANDARD:** Once 1B2 RCP is at rated speed, • Rotates AC Oil Lift Pump switch to OFF • Rotates the DC Oil Lift Pump Switch to OFF ***Examiner Cue: Inform the candidate that another operator will complete the procedure.*** **COMMENTS:** **END TASK**	___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
5	This step is required to be able to start the 1B2 RCP.
6	This step is required to actually start the 1B2 RCP.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

OP/1/A/1102/001 (Controlling Procedure for Unit Startup) Enclosure 4.6 (Unit Startup From 335°F/540 psig (MODE 3) To 532°F/2155 psig (MODE 3)) in progress and completed up to Step 6.2 which directs starting the fourth RCP

RCS Pressure = 1660 psig slowly increasing in accordance with OP/1/A/1102/001

RCS Temperature = 474°F slowly increasing in accordance with OP/1/A/1102/001

Another operator is monitoring the Unit 1 Loose Parts Monitor

INITIATING CUE

The CRS directs you to start the 1B2 RCP per OP/1/A/1103/006 Encl. 4.4 beginning with Step 2.2.1

REGION II
JOB PERFORMANCE MEASURE

AO-101

SWAP CRD FILTERS

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Swap CRD Filters

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 20 Min

K/A Rating(s):

System: 001
K/A: G 2.3.13
Rating: 3.4/3.8

Task Standard:

Place standby CRD filter in service and remove other CRD filter from service.

References:

OP/1/A/1104/008 Component Cooling System Rev 75

Tools/Equipment/Procedures Needed:

OP/1/A/1104/008 Component Cooling System, Encl. 4.19 Placing 1A OR 1B CRD Filter In Service

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

The 1B CRD filter ΔP is 11 psid

It has been determined that the operating CRD filters have to be swapped

INITIATING CUES

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 Component Cooling System, Encl. 4.19 Placing 1A OR 1B CRD Filter In Service

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	**IF** required, place 1A CRD Filter in service: **STANDARD:** Per the cue sheet, the 1A CRD Filter will be placed in service. **COMMENTS:**	___ SAT ___ UNSAT
2	2.1.1	Ensure open 1CC-72 (1A CRD Filter Inlet). **STANDARD:** Candidate opens 1CC-72 by turning the hand wheel in the counter clockwise direction until it comes to a hard stop. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
3	2.1.2	Open 1CC-136 (1A CRD Filter Sightglass Outlet). **STANDARD:** Candidate opens 1CC-136 by turning hand wheel in the counter clockwise direction until it comes to a hard stop. **COMMENTS:**	___ SAT ___ UNSAT
4	2.1.3	Throttle 1CC-73 (1A CRD Filter Vent) to vent 1A CRD Filter. **STANDARD:** Candidate throttles open 1CC-73 by turning the hand wheel in the counter clockwise direction until flow is noticed in the sight glass. **Examiner Cue: Several seconds after 1CC-73 is throttled open, inform the candidate that a solid stream is noticed in the sight glass.** **COMMENTS:**	___ SAT ___ UNSAT

5	**2.1.4**	**WHEN** vented, position the following: • Close 1CC-73 (1A CRD Filter Vent) • Close 1CC-136 (1A CRD Filter Sightglass Outlet) **STANDARD:** When the candidate notices a solid stream of water in the sightglass, they close1CC-73 and 1CC-136 by turning the hand wheels in the clockwise direction until they come to a hard stop. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6	**2.1.5**	Open 1CC-74 (1A CRD Filter Outlet). **STANDARD:** Candidate opens 1CC-74 by turning the valve in the counter clockwise direction until the handwheel comes to a hard stop. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
7	**2.1.6**	**IF** desired, remove 1B CRD Filter from service: • Close 1CC-92 (1B CRD Filter Inlet) • Close 1CC-93 (1B CRD Filter Outlet) **STANDARD:** Candidate closes 1CC-92 and 1CC-93 by turning the hand wheels in the clockwise direction until they come to a hard stop. **COMMENTS:** **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	This step is required to allow flow into the CRD filter.
5	This step is required to prevent draining the CC system.
6	This step is required to place the 1A CRD filter in the fluid stream.
7	This step is required to remove the 1B CRD filter from service

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

The 1B CRD filter ΔP is 11 psid

It has been determined that the operating CRD filters have to be swapped

INITIATING CUES

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 Component Cooling System, Encl. 4.19 Placing 1A OR 1B CRD Filter In Service

REGION II
JOB PERFORMANCE MEASURE

AO-802a

ISOLATE HPSW AND LPSW DURING AN AB FLOOD

Alternate Path: Yes

Alt Path Failure: HPSW-959 will not close

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Isolate HPSW and LPSW during an AB Flood

Task Number : N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 16 min

K/A Rating(s):

System: BW/A07
K/A: AA2.2
Rating: 3.3/3.7

Task Standard:

Isolate portions of the HPSW and LPSW systems during an AB Flood using AP/3/A/1700/030 AUXILIARY BUILDING FLOOD

References: AP/3/A/1700/030 Rev 18

Tools/Equipment/Procedures Needed: AP/3/A/1700/030 Encl. 5.1 (HPSW AB Flood Isolation) and Encl. 5.2 (LPSW AB Flood Isolation)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

All 3 units are at 100% power

Unit 3 Auxiliary Building flooding is occurring

The source of flood water has not yet been determined

INITIATING CUES

The Control Room Supervisor directs you to perform AP/3/A/1700/030 Encl. 5.1 (HPSW AB Flood Isolation) AND Encl. 5.2 (LPSW AB Flood Isolation)

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		***Examiner Note: If candidate performs Enclosure 5.2 first, it begins on JPM step 7.***	
2	En.5.1 1	**IAAT** the source of flooding is isolated, **THEN** notify Control Room. **STANDARD:** The candidate notes the source of flooding is not isolated. ***Examiner Cue: If asked, flooding is still occurring.*** Candidate continues to step 2. **COMMENTS:**	___ SAT ___ UNSAT
3	2	**NOTE** Keys for valve locks are available in any Emergency Equipment cabinet. **[ALTERNATE PATH]** Close HPSW-959 (HPSW SUPPLY TO FLOW LIMITER BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers). **STANDARD:** The candidate locates and attempts to close HPSW-959. ***Examiner Note: Operators would normally carry keys to these locks.*** ***Examiner Cue: When the candidate locates and attempts to close HPSW-959, inform candidate that HPSW-959 chain will not move.*** Candidate continues to step 2 RNO. **COMMENTS:**	___ SAT ___ UNSAT

4	**2** **RNO**	Close HPSW-962 (HPSW SUPPLY TO AUX BLDG BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers). **STANDARD:** The candidate locates and closes HPSW-962 rotating it in the clockwise direction until it stops. ***Examiner Cue: When the candidate rotates the hand wheel in the clockwise direction, inform the candidate that HPSW-962 is fully clockwise and on the hard stop.*** Candidate continues to step 3. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
5	**3**	Notify control Room HPSW isolation is complete. **STANDARD:** The candidate notifies the control Room HPSW isolation is complete. Candidate continues to step 4. **COMMENTS:**	___ SAT ___ UNSAT
6	**4**	**EXIT** this enclosure. **STANDARD:** Candidate EXITS enclosure 5.1 and proceeds to Enclosure 5.2 **COMMENTS:**	___ SAT ___ UNSAT

7	**En.5.2 1**	**IAAT** the source of flooding is isolated, **THEN** notify Control Room. **STANDARD:** The candidate notes the source of flooding is not isolated. ***Examiner Cue: If asked, flooding is still occurring.*** Candidate continues to step 2 **COMMENTS:**	___ SAT ___ UNSAT
8	**2**	Close 3LPSW-844 (AUX BLDG AHU SUPPLY) (T-1/M-46, 6' SE). **STANDARD:** The candidate locates and closes 3LPSW-844 rotating it in the clockwise direction until it stops. ***Examiner Cue: When the candidate rotates the hand wheel in the clockwise direction, inform the candidate that the valve is fully clockwise and on the hard stop.*** Candidate continues to step 3. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
9	**3**	Close 3LPSW-770 (AUX BLDG AHU SUPPLY) (T-1/M-46, 8' S). **STANDARD:** The candidate locates and closes 3LPSW-770 rotating it in the clockwise direction until it stops.. ***Examiner Cue: When the candidate rotates the hand wheel in the clockwise direction, inform the candidate that the valve is fully clockwise and on the hard stop.*** Candidate continues to step 4. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

10	**4**	Open 3LPSW-501 (UNIT 3 AHU RETURN TO STORM DRAINS) (T-1/L-47, W 12' up). **STANDARD:** The candidate locates and opens 3LPSW-501rotating it in the counter-clockwise direction until it stops. ***Examiner Cue: When the candidate rotates the hand wheel in the counter clockwise direction, inform the candidate that the valve is on the hard stop.*** Candidate continues to step 5. **COMMENTS:**	___ SAT ___ UNSAT
11	**5**	Close 3LPSW-500 (UNIT 3 AHU RETURN TO CCW DISCHARGE) (T-1/L-47, NW 12' up). **STANDARD:** The candidate locates and closes 3LPSW-500 rotating it in the clockwise direction until it stops. ***Examiner Cue: When the candidate rotates the hand wheel in the clockwise direction, inform the candidate that the valve is fully clockwise and on the hard stop.*** Candidate continues to step 6. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
12	**6**	Notify Unit 3 control Room LPSW isolation is complete. **STANDARD:** The candidate notifies the control Room LPSW isolation is complete. Candidate continues to step 7. **COMMENTS:**	___ SAT ___ UNSAT

13	**7**	**EXIT** this enclosure. **STANDARD:** Candidate EXITS enclosure 5.2 and returns CUE Sheet to examiner. **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Step ensures proper isolation of HPSW leak.
8	Step ensures proper isolation of LPSW leak.
9	Step ensures proper isolation of LPSW leak.
11	Step ensures proper isolation of LPSW leak.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

All 3 units are at 100% power

Unit 3 Auxiliary Building flooding is occurring

The source of flood water has not yet been determined

INITIATING CUES

The Control Room Supervisor directs you to perform AP/3/A/1700/030 Encl. 5.1 (HPSW AB Flood Isolation) AND Encl. 5.2 (LPSW AB Flood Isolation)

REGION II
JOB PERFORMANCE MEASURE

AO-602

STARTUP A VITAL BUS INVERTER

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : STARTUP A VITAL BUS INVERTER

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 12 min

K/A Rating(s):

System: 062
K/A: A3.04
Rating: 2.7/2.9

Task Standard: Vital Bus Inverter placed in service correctly.

References: OP/2/A/1107/04 (Operation Of Vital Bus, Computer, ICS And Auxiliary Inverters) rev. 30

Tools/Equipment/Procedures Needed: OP/2/A/1107/04 Enclosure 4.2 (Startup of Vital Bus Inverters)
Inverter Drawing

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit #2 is at 100% power

Earlier today the 2DIA Vital Bus Inverter on Unit 2 was shutdown for maintenance.

I&E personnel have just notified the Control Room SRO that they have completed their work on the inverter and it is ready to be returned to service.

All tags have been cleared.

The Inverter Temporary Precharge Switch is NOT installed

The affected 120VAC Vital Instrumentation Power Panelboard is being supplied by Regulated AC Panelboard 2KRA.

OP/2/A/1107/004 Enclosure 4.2 is complete through step 1.3

INITIATING CUES

The Control Room SRO directs you to startup the 2DIA Vital Bus Inverter per OP/2/A/1107/004 Enclosure 4.2.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	***EXAMINER CUE: Once the 2DIA inverter is located, if desired provide the included picture to establish the as-found condition of the inverter.*** **IF** DC power to inverter was isolated, close breaker #33 on associated **2DIA** DC panelboard (**2DIA**, 2DIB, 2DIC, 2DID). ***EXAMINER CUE: 2DIA BKR #33 is closed.*** **STANDARD:** Candidate continues to step 2.2 **COMMENTS:**	___ SAT ___ UNSAT

2	**2.2**	**NOTE:** Pressing PRECHARGE SWITCH pushbutton charges the inverter input filter capacitors and will cause the PRECHARGE light to come on. When pushbutton is released capacitors will begin to discharge. Closing DC Input breaker should be performed in a timely manner before PRECHARGE light goes off and input filter capacitors discharge. Steps 2.2 and 2.3 need to be performed prior to placekeeping/signing 2.3. This is an exception to standard placekeeping methodology. Perform **one** of the following: 2.2.1 **IF** temporary Precharge Switch installed in Step 1.3, press PRECHARGE SWITCH pushbutton on temporary Precharge Switch and hold for 10 - 12 seconds after PRECHARGE light comes on before releasing. {2} {4} **[It is NOT installed]** 2.2.2 **IF** temporary Precharge Switch **NOT** installed in Step 1.3, press PRECHARGE SWITCH pushbutton and hold for 10 - 12 seconds after PRECHARGE light comes on before releasing. {2} {4} **STANDARD:** The candidate presses the PRECHARGE SWITCH pushbutton until the PRECHARGE light comes on and keeps the button depressed for an additional 10 - 12 seconds before releasing. ***EXAMINER CUE: Indicate to the candidate that the PRECHARGE light is ON. If the pushbutton is not held for an additional 10 – 12 seconds, inform the candidate that the PRECHARGE light is now OFF.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
3	**2.3**	CLOSE DC INPUT circuit breaker **STANDARD:** The DC INPUT circuit breaker is CLOSED ***EXAMINER CUE: Indicate to the candidate that the DC INPUT breaker is in the ON position.*** ***EXAMINER NOTE: If the DC INPUT breaker is not closed in a timely manner, the PRECHARGE light will go back OFF and the DC INPUT circuit breaker will trip back open.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

4	**2.4**	IF installed in Step 1.3, ensure temporary Precharge Switch removed. **STANDARD:** Candidate should mark this step NA. **COMMENTS:**	___ SAT ___ UNSAT
5	**2.5**	Verify INVERTER OUTPUT volt meter increases to ≈ 120 Volts. **STANDARD:** Candidate verifies Inverter Output volt meter indicates 120 volts. ***Examiner Cue. If this inverter is actually operating, inform the operator that volt meter reads "as you see it". If not, use pointer or other training aid to simulate 120 Volts.*** **COMMENTS:**	___ SAT ___ UNSAT
6	**2.6**	CLOSE the INVERTER OUTPUT circuit breaker. **STANDARD:** The INVERTER OUTPUT circuit breaker is CLOSED. ***EXAMINER CUE: Indicate to the candidate that the INVERTER OUTPUT breaker is in the ON position.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
7	**2.7**	VERIFY IN SYNC light is on **STANDARD:** Green IN SYNC. light is verified ON. ***EXAMINER CUE: Indicate to candidate that the IN SYNC light is ON.*** **COMMENTS:**	___ SAT ___ UNSAT

8	**2.8**	POSITION the MANUAL BYPASS SWITCH to the "NORMAL SOURCE" position. **STANDARD:** Candidate rotates the Manual Bypass Switch from the ALTERNATE SOURCE position to the NORMAL SOURCE position. ***EXAMINER CUE: Indicate to the candidate that the Manual Bypass Switch is in the NORMAL SOURCE position.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
9	**2.9**	VERIFY the following indications: • INVERTER OUTPUT volt meter ≈ 120 volts • Inverter Output frequency meter 60.6 - 60 - 59.4Hz • INVERTER OUTPUT amp meter increases and stabilizes to match SYSTEM OUTPUT amp meter. **STANDARD:** The following indications are verified: • INVERTER OUTPUT volts ≈ 120. • INVERTER OUTPUT frequency meter 60.6 -60 – 59.4 Hz. • INVERTER OUTPUT amp meter increases and stabilizes to match SYSTEM OUTPUT amp meter. ***EXAMINER CUE: Provide the following indications to the candidate:*** • ***INV. OUTPUT volts = 120*** • ***INV. OUTPUT freq. = 60*** • ***INV. OUTPUT amps = 30*** • ***SYS. OUTPUT amps = 30*** **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	Must precharge the capacitors on the DC Bus so there will not be a low voltage when the DC Breaker is closed.
3	Necessary to provide DC input voltage to the inverter.
6	Necessary to apply NORMAL SOURCE voltage up to the Manual Bypass switch.
8	Applies Inverter AC output voltage from the NORMAL SOURCE to the Vital Bus Panelboards (Loads the Inverter).

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit #2 is at 100% power

Earlier today the 2DIA Vital Bus Inverter on Unit 2 was shutdown for maintenance.

I&E personnel have just notified the Control Room SRO that they have completed their work on the inverter and it is ready to be returned to service.

All tags have been cleared.

The Inverter Temporary Precharge Switch is NOT installed

The affected 120VAC Vital Instrumentation Power Panelboard is being supplied by Regulated AC Panelboard 2KRA.

OP/2/A/1107/004 Enclosure 4.2 is complete through step 1.3

INITIATING CUES

The Control Room SRO directs you to startup the 2DIA Vital Bus Inverter per OP/2/A/1107/004 Enclosure 4.2.

REGION II
JOB PERFORMANCE MEASURE

Admin 106

CALCULATE RUN TIME FOR DEBORATING DEMINERALIZER

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Calculate Run Time for Deborating Demineralizer

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 20 Min

K/A Rating(s):

System: Gen
K/A: 2.1.37
Rating: 4.3/4.6

Task Standard: Calculate the Run Time and volume "flowed thru the IX" for the Deborating IX by procedure.

References:
OP/1/A/1103/004 (Soluble Poison Control) Rev 105
OP/1/A/1103/004 C (Deborating IXs) Rev 25

Tools/Equipment/Procedures Needed:
OP/1/A/1103/004C (Deborating IXs) Enclosure 4.2 (Unit 1 Deborating IX For RCS Deboration (Rx at power)
OP/1/A/1103/004 (Soluble Poison Control) Encl 4.1
OP/1/A/1103/004 C Limits & Precautions

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 is at 100% full power

Current RCS Boron concentration is 50 ppmB

Letdown Flow is 78 gpm with BOTH Letdown Filters in service

The OAC is **NOT** available

Assume 1 ppm for IX effluent

OP/1/A/1103/004 C (Deborating IXs) Enclosure 4.2 (Unit 1 Deborating IX For RCS Deboration (Rx At Power) is in progress and has been completed through Step 1.6

INITIATING CUE

The Unit 1 CRS directs you to perform Enclosure 4.2 steps 2.1 – 2.2 to determine the volume of RCS that must be flowed through the Unit 1 Deborating IX and the corresponding Deborating IX run time to reduce the RCS Boron concentration to 45 ppmB.

SHOW ALL WORK

Volume of RCS thru the IX _____ Gallons

Deborating IX run Time _____ Minutes

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	Determine volume required to make desired RCS boron change: **NOTE:** Placing an idle Letdown Filter in service can affect core reactivity by adding ≈ 60 gals of water at a different boron concentration. (R.M.) 2.1.1 **IF** two Letdown Filters are available **AND NOT** already in service, perform the following: ____A. Review Component Boron Log for out-of-service Letdown Filter boron. ____B. Determine final RCS boron based on placing Letdown Filter in service. 2.1.2 Review Demineralizer Log Sheet to determine IX effluent boron or assume 1 ppm for IX effluent. 2.1.3 Determine volume required to get desired RCS boron change. ***2.1.4 Volume required _____gallons.** **STANDARD:** Determine two Letdown Filters are in service and N/A Step 2.1.1 Assume 1 ppm for IX effluent Refer to OP/1/A/1103/004 (Soluble Poison Control) to **determine RCS Hot Volume = 58,681 gal** $B = B_o e^{-Ft/V}$ B_o = Initial Conc (ppm) B = Final Conc (ppm) F = Feed and Bleed Flow Rate (gpm) V = Total System Volume t = Time Feed and Bleed (min) $-(\ln B/B_o) \times V = t/F$ = volume passing through the IX **-(ln 45/50) 58,681 gal = 6182.660 gal** **- (-0.105) 58,681 gal = 6161.505 gal (ln 45/50 Rounded)** **6182 gallons. (5868 – 6183)** **Note: 5868 gal will be the result of using -0.1 instead of -0.105** **Note: The order the calculations are performed is not critical.** **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

2	**2.2**	**NOTE:** Allowing Unit 1 Deborating IX to be in service an incorrect amount of time can change final RCS boron and cause unanticipated reactivity changes. (R.M.) Calculate Unit 1 Deborating IX run time: (R.M.) Run Time = Volume required ÷ letdown flow _____ Run Time (minutes) = Volume _____ gal ÷ letdown flow _____ (gpm) **STANDARD**: Determine run Time is **79.265 minutes. (75.2 to 79.3)** **79.265** Run Time (minutes) = Volume **6182.660** gal ÷ letdown flow **_78_** (gpm) $\frac{5868\ gal}{78\ gal} \left\| \frac{min}{} \right. = 75.23\ min$ $\frac{6183\ gal}{78\ gal} \left\| \frac{min}{} \right. = 79.269\ min$ **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to determine the volume of water thru the Demin to change the RCS Boron concentration.
2	This step is required to determine the amount of time letdown will be diverted thru the Demin.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 100% full power

Current RCS Boron concentration is 50 ppmB

Letdown Flow is 78 gpm with BOTH Letdown Filters in service

The OAC is **NOT** available

Assume 1 ppm for IX effluent

OP/1/A/1103/004 C (Deborating IXs) Enclosure 4.2 (Unit 1 Deborating IX For RCS Deboration (Rx At Power) is in progress and has been completed through Step 1.6

INITIATING CUE

The Unit 1 CRS directs you to perform Enclosure 4.2 steps 2.1 – 2.2 to determine the volume of RCS that must be flowed through the Unit 1 Deborating IX and the corresponding Deborating IX run time to reduce the RCS Boron concentration to 45 ppmB.

SHOW ALL WORK

Volume of RCS thru the IX _____ Gallons

Deborating IX run Time _____ Minutes

REGION II
JOB PERFORMANCE MEASURE

ADMIN 107

DETERMINE IF RO LICENSE REQUIREMENTS ARE MET

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Determine if RO License requirements are met per NSD 512 for minimum On-Shift Experience

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 Min

K/A Rating(s):

System: Gen
K/A: 2.1.4
Rating: 3.3/3.8

Task Standard: Completes Form 512-1 Section 3 and determines requirements of NSD 512 are NOT met.

References: NSD 512 (Maintenance of RO/SRO NRC Licenses) Rev 7

Tools/Equipment/Procedures Needed: NSD 512 (Maintenance of RO/SRO NRC Licenses)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Today's date is 10/29/15. You are a Reactor Operator. Your work history for October of this year is as follows:

10/12/15	Worked 12 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/13/15	Worked 8 hours as OATC on Unit 1 and 4 hours OATC doing crew JIT training on Simulator A (day shift). Took turnover at beginning and gave turnover at end of both of these assignments.
10/14/15	Worked 10 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift.
10/19/15	Worked 12 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/20/15	Worked 12 hours as OATC on Unit 3 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/21/15	Worked 6 hours as OATC on Unit 3 and 6 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and did NOT give turnover at end of shift.
10/27/15	Worked 12 hours as AO on Unit 3 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.

INITIATING CUES

The SM directs you to review your work history for October, complete Section 3 of form NSD 512-1 based on the above work history, and determine if you meet NSD 512 requirements to maintain an active RO license for the following quarter.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
		Examiner note: The critical element of the evaluation of each day is to determine if the requirement is met or not met.	
1		Evaluate 10/12/15 work period **STANDARD:** **Determines that requirement is met** and adds this period to Form 512-1. Required position for 12 hrs. with Turnover at beginning and end of shift. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2		Evaluate 10/13/15 work period **STANDARD:** **Determines that requirement is not met** because Simulator time does not count toward maintain RO license requirements **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
3		Evaluate 10/14/15 work period **STANDARD:** **Determines that requirement is not met**. No turnover at end of shift, < 12hrs worked in position. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

4		Evaluate 10/19/15 work period **STANDARD**: **Determines that requirement is met** and adds this period to Form 512-1. Required position for 12 hrs. with Turnover at beginning and end of shift. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
5		Evaluate 10/20/15 work period **STANDARD: Determines that requirement is met** and adds this period to Form 512-1. Required position for 12 hrs. with Turnover at beginning and end of shift. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6		Evaluate 10/21/15 work period **STANDARD: Determines that requirement is not met**. No turnover at end of shift and position not filled for entire shift. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
7		Evaluate 10/27/15 work period **STANDARD: Determines that NEO is not a required position** and cannot be credited toward maintenance of RO license **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

8		Compares credited time vs minimum requirements **STANDARD: Determines that there are only 3 12 hour shifts that can be credited** and therefore his minimum fourth quarter **requirements to maintain his active RO License are not met**. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met
2	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
3	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
4	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
5	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
6	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
7	Required to determine if minimum On Shift Experience requirements of NSD 512 have been met.
8	This step makes the determination regarding minimum license requirement.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Today's date is 10/29/15. You are a Reactor Operator. Your work history for October of this year is as follows:

10/12/15	Worked 12 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/13/15	Worked 8 hours as OATC on Unit 1 and 4 hours OATC doing crew JIT training on Simulator A (day shift). Took turnover at beginning and gave turnover at end of both of these assignments.
10/14/15	Worked 10 hours as BOP on Unit 1 (day shift). Took turnover at beginning of shift.
10/19/15	Worked 12 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/20/15	Worked 12 hours as OATC on Unit 3 (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/21/15	Worked 6 hours as OATC on Unit 3 and 6 hours as BOP on Unit 1 (night shift). Took turnover at beginning of shift and did NOT give turnover at end of shift.
10/27/15	Worked 12 hours as AO on Unit 3 (day shift). Took turnover at beginning of shift and gave turnover at end of shift.

INITIATING CUES

The SM directs you to review your work history for October, complete Section 3 of form NSD 512-1 based on the above work history, and determine if you meet NSD 512 requirements to maintain an active RO license for the following quarter.

FORMS

Form 512-1~~512-1512-1512-1 Documentation~~ Documentation of Operating Experience Maintenance for Active Licensed Operators

1. Licensee's Name _____ _____
   Employee Number

NOTE: Time as the extra RO/SRO on a Outage Unit or as a RO/SRO in the Outage Control Center can not be counted as an ACTIVE LICENSED OPERATOR position.

2. **ACTIVE LICENSED OPERATOR POSITION**
   a. Shift Manager (SRO)
   b. Control Room Supervisor (SRO)
   c. Operator at the Controls (RO)
   d. Balance of Plant Operator (RO)

3. A minimum of five 12-hour shifts per calendar quarter performing one or more of the functions listed in item 2 shall be worked and documented below to maintain active status. The position must be filled for the entire shift period including both turnovers to obtain credit.

Licensed Duty Letter (A - D)	Shift Start Date (Month/Day/Year)	Shift (day / night)
D	**10/12/15**	day
D	**10/19/15**	night
C	**10/20/15**	night

4. I hereby certify that the information set forth above is accurate and complete.

   Licensed Operator Signature _____

5. When complete, send a copy of this form to Operations Administrative Support and keep a copy for your personal records.
6. Update /verify LOQR Initial _____ Date_____
7. Send completed form to Operations Training Group for filing with the individuals training record.

REGION II
JOB PERFORMANCE MEASURE

ADMIN S202

Complete a Surveillance Evaluation

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Complete PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.12 (Surveillance Evaluation)

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 20 Min

K/A Rating(s):

System: Gen
K/A: 2.2.12
Rating: 3.7/4.1

Task Standard: Complete PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.12 (Surveillance Evaluation). The critical element of the task is to determine appropriate Tech Specs.

References:
PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3) page 25 of 26 Rev 336
PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.9 (RCP Power Supply Verification)
PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.12 (Surveillance Evaluation)

Tools/Equipment/Procedures Needed:

PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3) page 25 of 26
PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.9 (RCP Power Supply Verification)
PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.12 (Surveillance Evaluation)
Surveillance Frequency List

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL** SNAP ???

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Time/Date = 0830 on Saturday, June 8.

PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3) in progress.

You are an extra SRO on shift for the outage.

INITIATING CUE

Based on the static simulator conditions, you are directed to perform SR 3.4.5.2 (RCS Loops) on page 25 of 26 of PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3). Based on the results of the surveillance, perform all additional required administrative actions, if any.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Encl 13.2 p. 25	Verify at least one RCP per loop in operation **OR** perform Enclosure "RCP Power Supply Verification". **STANDARD:** Determines that only the 1A1 RCP is operating and initiates Encl. 13.9 (RCP Power Supply Verification) of PT/1/A/0600/001. **COMMENTS:**	___ SAT ___ UNSAT
2	Encl 13.9 Step 1.1	Verify 'A' **OR** 'B' RCS Loop is idle (**NO** RCPs operating) **STANDARD:** Determines that the 'B' RCS Loop is idle (no RCPs are operating in the 'B' RCS Loop). **COMMENTS:**	___ SAT ___ UNSAT
3	Encl 13.9 Step 2.1	**NOTE:** This enclosure verifies correct breaker alignment and indicated power available for required RCP **NOT** in operation (SR 3.4.5.2) Record RCPs in the idle RCS Loop ___ RCP ___ RCP **STANDARD:** Records that the 1B1 and 1B2 RCPs are in the idle RCS Loop. **COMMENTS:**	___ SAT ___ UNSAT

4	**Encl 13.9 Step 2.2**	Verify "OPEN" (white) light illuminated for one RCP in the idle RCS Loop: ___ RCP **STANDARD:** Determines that no white lights are illuminated for the 1B1 and 1B2 RCPs. ***Examiner Cue: Inform the candidate that the 1B1 and 1B2 RCP breakers are both tagged out and removed from the breaker cubicles for refurbishment.*** **STANDARD:** After given the cue, the candidate determines that Encl. 13.9 can NOT be performed as written and initiates a Surveillance Evaluation per Enclosure 13.12. **COMMENTS:**	___ SAT ___ UNSAT
5	**Encl 13.12 Step 1.1**	Verify surveillance could **NOT** be completed as written **STANDARD:** Determines that surveillance could NOT be completed as written and continues to Step 2.1. **COMMENTS:**	___ SAT ___ UNSAT
6	**Encl 13.12 Step 2.1**	Surveillance Description: **STANDARD:** Documents that this is a Tech Spec required verification of correct RCP breaker alignment of power available to the required pump that is not in operation **COMMENTS:**	___ SAT ___ UNSAT

7	**Encl 13.12 Step 2.2**	Applicable TS(s)/SLC(s)/Site Directive(s), etc.: **STANDARD:** Determines that Tech Spec 3.4.5 (RCS Loops Mode 3) is applicable and documents in Step 2.2. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
8	**Encl 13.12 Step 2.3**	Description of discrepancy/deficiency: **STANDARD:** Documents that the required RCP Breaker alignment does not exist. ***NOTE: TS 3.4.5 requires that either the 1B1 or 1B2 have power available*** **COMMENTS:**	___ SAT ___ UNSAT
9	**Encl 13.12 Step 2.4**	Is surveillance applicable for present plant conditions? __ yes __ no 2.4.1 **IF** yes, ensure entered applicable TS(s)/SLC(s) Condition(s) 2.4.2 **IF** no, provide justification 2.4.3 **IF** surveillance is **NOT** required for present plant conditions, proceed to Step 2.7 **STANDARD**: Determine that the surveillance is applicable for the present plant conditions and marks “yes” and enters TS 3.4.5 Condition A. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

10	**Encl 13.12 Step 2.5**	**IF** surveillance is applicable, what is the latest due date for surveillance **OR** applicable LCO? **STANDARD:** Documents that the latest due date is 0830 on Tuesday, June 11 (72 hours from discovery) per Condition A of TS 3.4.5 **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**Encl 13.12 Step 2.6**	Is applicable TS(s)/SLC(s)/Site Directive(s), etc. satisfied with existing discrepancy/deficiency? ____ yes ____ no **STANDARD:** *Marks "no" Explains in justification that TS 3.4.5 requires both RCS loops be Operable and with no power available to the 1B1 and 1B2 RCP's, the B RCS loop is NOT operable **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
12	**Encl 13.12 Step 2.7**	Support personnel/groups contacted (if any) **AND** information provided: **STANDARD:** Candidate may indicate requesting SPOC/FIN-24 assistance to determine when the RCP breakers will be repaired and re-installed. **COMMENTS:**	___ SAT ___ UNSAT

13	**Encl 13.12 Step 2.8**	Describe corrective/compensatory actions being taken (procedure change, WR, PIP, etc.), and resolution date for those actions. **STANDARD:** Corrective/Compensatory Action: Candidate should indicate that actions will commence to establish the required breaker alignment. This could be by writing a NCR, or dispatching various personnel to determine when the breakers will be re-installed. Resolution Date: This blank may be left open at this time since the investigation is just beginning however in no case should a date and time that would result in exceeding the 72 hour completion time be entered. **COMMENTS:**	___ SAT ___ UNSAT
14	**Encl 13.12 Step 2.9**	Approval: **STANDARD:** Signs and Dates either of the blanks provided **COMMENTS:**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
7	Required to determine the applicable Tech Spec
9	Required to determine if this Tech Spec is applicable in Mode 3
10	Incorrect documentation could lead to exceeding allowed time to complete Tech Spec Required Actions.
11	Required to determine if the LCO is met

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Time/Date = 0830 on Saturday, June 8.

PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3) in progress.

You are an extra SRO on shift for the outage.

INITIATING CUE

Based on the static simulator conditions, you are directed to perform SR 3.4.5.2 (RCS Loops) on page 25 of 26 of PT/1/A/0600/001 (Periodic Instrument Surveillance) Encl. 13.2 (Mode 3). Based on the results of the surveillance, perform all additional required administrative actions, if any.

REGION II
JOB PERFORMANCE MEASURE

ADMIN 203

PERFORM NI SURVEILLANCE AND DETERMINE ANY REQUIRED ACTIONS

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Perform NI Surveillance and Determine Any Required Actions

Task Number: N/A

Alternate Path: (No)

Time Critical: (No)

Validation Time: (10 Min)

K/A Rating(s):

System: Gen
K/A: 2.2.12
Rating: 3.7/4.1

Task Standard: Perform SR 3.3.1.2 in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and determine that actions should be taken to correct NI calibration.

References:
PT/1/A/0600/001 (Periodic Instrument Surveillance) Rev 336
OP/1/A/1102/004 (Operation at Power) Rev 144

Tools/Equipment/Procedures Needed:
PT/1/A/0600/001 (Periodic Instrument Surveillance)
OP/1/A/1102/004 (Operation at Power)

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Power at 100% steady state since midnight last shift

Current Time is 07:30

Power history is attached

INITIATING CUES

Using the attached power history, you are to perform the Day Shift RPS Instrumentation Heat Balance Check Power Range Amplifiers Surveillance (SR 3.3.1.2) on Page 8 of 29 of PT/1/A/0600/001 (Periodic Instrument Surveillance) Enclosure 13.1 (Mode 1&2) and determine the current minimum actions required (if any) and reason at Time = 0730. Assume NO previous actions have been taken.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Determine if the unit is at Steady State **NOTE:** Steady State is defined as being ± 2% of a steady power level for ≥ 4 hours **STANDARD:** Using the NOTE above and the attached power history, determine that the unit is at Steady State as defined by this surveillance (±2% of a steady power level for ≥ 4 hours). **COMMENTS:**	___ SAT ___ UNSAT
2		**IF** in Mode 1 during steady state conditions **AND** Rx Power > 90% power, verify Rx Power within applicable limits: • Refer to Limits and Precautions of OP/1/A/1102/004 (Operation At Power) for applicable limits. **STANDARD:** Candidate refers to Limits and Precautions of OP/1/A/1102/004 (Operation At Power) L&P 2.2.6.C.1 **COMMENTS:**	___ SAT ___ UNSAT
3		Determine the magnitude of NI offset. **STANDARD:** Candidate refers to the power history provided and determines: At 0700 CTP was 99.9876% and NI-5 was 97.71% and therefore NI-5 is out of calibration by 2.286% At 0730 CTP is 99.996% and NI-5 = 97.91% therefore NI-5 is out of calibration by 2.086% **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

4		Determine if NI offset is conservative or non-conservative. **STANDARD**: Candidate refers to the Note for limit and precaution step 2.2.5 and determines that NI-5 is non-conservative since Core Thermal Power is > NI-5. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
5		Determine which Limit and Precaution contains guidance needed. **STANDARD**: Based on power history, 2.2.6 C applies since it is for use "During operation with Reactor > 90% CTP (power maneuvering OR steady state)" **COMMENTS**	___ SAT ___ UNSAT
6		Determine actions required by Limit and Precaution 2.2.6 C. **STANDARD**: Determine that the following is required: • Take actions to restore NI's to allowable range (perform NI calibration) ***Note: Since NI's have been out by 2% for < 2 hours, the actions of 2.2.6.C.1 (Stop power increase and take actions to restore NIs to allowable range) are required .** **2.2.6.C.2 (Generate CR describing occurrence and Consult with Rx Eng) are NOT required by procedure.** **Note: Student may initiate a CR based on writing a work request** **Note: Student may contact Reactor Engineering** **COMMENTS**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	Determining the magnitude of NI error is required to determine the correct NI tolerance allowed for the current plant conditions.
4	Determining that NI's are non-conservative is required to determine the correct NI tolerance allowed for the current plant conditions
6	These actions are required based on current status of NI's to ensure Safety Analysis assumptions are met

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Power at 100% steady state since midnight last shift

Current Time is 07:30

Power history is attached

INITIATING CUES

Using the attached power history, you are to perform the Day Shift RPS Instrumentation Heat Balance Check Power Range Amplifiers Surveillance (SR 3.3.1.2) on Page 8 of 29 of PT/1/A/0600/001 (Periodic Instrument Surveillance) Enclosure 13.1 (Mode 1&2) and determine the current minimum actions required (if any) and reason at Time = 0730. Assume NO previous actions have been taken.

Unit 1 Power history is as follows:

	O1P0899 Core Thermal Power	O1E4066 NI-5	O1E4067 NI-6	O1E4068 NI-7	O1E4069 NI-8
0600	99.962%	99.79%	99.99%	99.99%	99.99%
0700	99.987%	97.71%	100.00%	99.91%	100.01%
0715	100.001%	97.88%	99.99%	99.98%	99.99%
0730	99.996%	97.91%	100.00%	100.00%	100.00%

REGION II
JOB PERFORMANCE MEASURE

ADM-303

CALCULATE MAXIMUM PERMISSIBLE STAY TIME

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Calculate Maximum Permissible Stay Time

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 20 Min

K/A Rating(s):

System: (Gen)
K/A: (2.3.4)
Rating: (3.2/3.7)

Task Standard: Calculate the maximum permissible stay time for radiation workers.

References: PD-RP-ALL-0001, Radiation Worker Responsibilities Rev 3

Tools/Equipment/Procedures Needed: PD-RP-ALL-0001, Radiation Worker Responsibilities if requested.

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Two new employees with no previous radiation exposure arrived on site on November 1 in preparation for a refueling outage.

Employee 1: 25 year old male.
Received 1200 mrem TEDE between November 1 and Dec 31 and received 300 mrem TEDE between Dec 31 and Jan 31.

Employee 2: 25 year old female.
Received 300 mrem TEDE between November 1 and Dec 31 and received 50 mrem TEDE between Dec 31 and Jan 31.
On Feb 1, makes pregnancy declaration (estimated conception date is Nov 1).

Today is Feb 1 and in order to complete the outage, a job must be completed in an area with a 100 mrem/hr radiation field.

INITIATING CUE

Determine the maximum time that each employee could spend in the area for this job while staying within station limits for allowable radiation exposure. Do NOT consider the precautionary Alert, Exclusion notifications or ED alarms as these limits are approached. Assume that **NO** permissions have been granted by Supervision / Management for any extensions /entry after any station limit has been reached.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	NA	Determine the dose that each employee is allowed. Then calculate the time allowed in the area. **STANDARD:** Employee 1: TEDE received so far this calendar year is 300 mrem. Duke energy administrative limit for TEDE to the whole body 2000 mrem/year. 2000-300 = 1700 mrem allowed dose. 1700 mrem / 100 mrem/hr = 17 hours Employee 2: TEDE received for the gestation period = 350 mrem. Duke Energy administrative limit for declared pregnant female = 450 mrem for the entire gestation period AND 50 mrem per month. Therefore allowed dose = 50 mrem. 50 mrem / 100 mrem/hr = 0.5 hours or 30 minutes. Per PD-RP-ALL-0001, Radiation Worker Responsibilities, 5.3.5 Dose Monitoring Warning Flags and ED Alarms: Alert Flag: Notification that individual reached 80% or greater but less than 90% of established administrative limit. Workers that receive an Alert Flag will notify his/her supervisor and must receive RP supervision approval to enter a High Radiation Area or LHRA. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to prevent exceeding Duke Energy radiation exposure administrative limits.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Two new employees with no previous radiation exposure arrived on site on November 1 in preparation for a refueling outage.

Employee 1: 25 year old male.
Received 1200 mrem TEDE between November 1 and Dec 31 and received 300 mrem TEDE between Dec 31 and Jan 31.

Employee 2: 25 year old female.
Received 300 mrem TEDE between November 1 and Dec 31 and received 50 mrem TEDE between Dec 31 and Jan 31.
On Feb 1, makes pregnancy declaration (estimated conception date is Nov 1).

Today is Feb 1 and in order to complete the outage, a job must be completed in an area with a 100 mrem/hr radiation field.

INITIATING CUE

Determine the maximum time that each employee could spend in the area for this job while staying within station limits for allowable radiation exposure. Do NOT consider the precautionary Alert, Exclusion notifications or ED alarms as these limits are approached. Assume that **NO** permissions have been granted by Supervision / Management for any extensions /entry after any station limit has been reached.

REGION II
JOB PERFORMANCE MEASURE

ADMIN S106

EVALUATE ITEMS FOR ENTRY INTO CONTAINMENT

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (No)

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title: Evaluate the list of items and determine if they can be taken into Containment while in Mode 4

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 20 Min

K/A Rating(s):

System: Gen
K/A: 2.1.13
Rating: 2.5/3.2

Task Standard: Evaluate the list of items provided to determine if they can be carried into containment.

References: SD 1.3.9 - Containment Material Control Rev 14

Tools/Equipment/Procedures Needed: SD 1.3.9 - Containment Material Control

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit startup in progress

Reactor is in MODE 4

Startup has been delayed waiting on completion of valve repair inside Containment

Valve work is taking place outside the secondary shielding on the 2nd grating level

You are working as the WCC SRO

INITIATING CUES

The containment hatch monitor has requested you evaluate the list of items provided to determine if they can be carried into containment by the crew performing the valve repairs

Indicate on the attached list if each item is allowed to be carried into Containment to facilitate the repairs

If an item on the list is NOT allowed into containment, also provide the specific procedural requirement or procedure step that would not be met

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Evaluate red 1 gallon plastic bucket. **STANDARD:** Determines that the red bucket can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.M.2 (Pg 24/35). **COMMENTS:**	___ SAT ___ UNSAT
2		Evaluate yellow plastic bag with wrenches. **STANDARD:** Determines that the bag with wrenches is allowed into containment per SD 1.3.9, Enclosure 7.5, 4.I.1 (Pg 22/35). **COMMENTS:**	___ SAT ___ UNSAT
3		Evaluate 25 feet of nylon rope with ends melted **STANDARD:** Determines that the nylon rope can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.D (Pg 21/35). **COMMENTS:**	___ SAT ___ UNSAT

4		Evaluate roll of gray Duct Tape **STANDARD***:* Determines the roll of Duct Tape can NOT be taken into Containment per SD 1.3.9, Enclosure 7.5, 4.B.3 (Pg 21/35). **Note: The procedure section is also part of the critical step. Either step 4.B.3 on p. 21 from Encl 7.5 or the second bullet under "Material Restrictions per SD 1.3.9" of Encl 7.8 on p. 35 is acceptable.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
5		Evaluate the Electric Wrench **STANDARD:** Determines that the electric wrench can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.I.1 (Pg 22/35). **COMMENTS:**	___ SAT ___ UNSAT
6		Evaluate the two sockets **STANDARD:** Determines that the sockets can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.I.1 (Pg 22/35). **COMMENTS:**	___ SAT ___ UNSAT

7		Evaluate the valve wrapped in clear poly **STANDARD:** Determines that the valve wrapped in clear poly can NOT be taken into containment due to the clear poly per SD 1.3.9, Enclosure 7.5, 4.H.7 (Pg 22/35). ***CUE: If asked, no engineering evaluation has been performed to allow the clear poly to be taken into containment.*** **Note: The procedure section is also part of the critical step. Either step 4.H.7 on p. 22 from Encl 7.5 or the ninth bullet under "Material Restrictions per SD 1.3.9" of Encl 7.8 on p. 35 is acceptable.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
8		Evaluate the absorptive paper **STANDARD:** Determines that the absorptive paper can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.A since it is not > 25 sq. ft (Pg 20/35). **COMMENTS:**	___ SAT ___ UNSAT
9		Evaluate the hammer **STANDARD:** Determines that the hammer can be taken into containment per SD 1.3.9, Enclosure 7.5, 4.I.1 (Pg 22/35). **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Critical to prevent Chloride and Fluoride stress corrosion on stainless steel piping inside containment
7	Critical to prevent blockage of the LPI Emergency Sump suction path during a LOCA.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit startup in progress

Reactor is in MODE 4

Startup has been delayed waiting on completion of valve repair inside Containment

Valve work is taking place outside the secondary shielding on the 2nd grating level

You are working as the WCC SRO

INITIATING CUES

The containment hatch monitor has requested you evaluate the list of items provided to determine if they can be carried into containment by the crew performing the valve repairs

Indicate on the attached list if each item is allowed to be carried into Containment to facilitate the repairs

If an item on the list is NOT allowed into containment, also provide the specific procedural requirement or procedure step that would not be met

List of items for evaluation:

Assume all items will be documented as taken in and then removed from Containment when the crew leaves unless otherwise indicated.

1) Red 1 gallon plastic bucket. _____

2) *Yellow plastic bag that contains contaminated tools. _____

   *Per maintenance the bag contains two Stainless Steel wrenches (3/4" and 1").

3) 25 feet of nylon rope with ends melted. _____

4) Roll of gray duct tape. _____

5) Electric wrench. _____

6) 2 sockets (3/4" and 1"). _____

7) 2" valve wrapped in clear poly. _____

   *A PIP has already been generated by Maintenance directing engineering to evaluate leaving the poly inside containment if this crew has to leave RB before repairs are completed. The evaluation is in progress.

8) 10 feet X 2 feet sheet of absorptive paper. _____

9) Hammer _____

REGION II
JOB PERFORMANCE MEASURE

ADMIN-S403

Determine Emergency Classification And Complete The Initial Emergency Notification Form

Alternate Path: (No)

Alt Path Failure: _____

Time Critical: (Yes)

Time Critical Criteria: Classification < 15 Minutes
Complete Notification Form < 15 Minutes of Classification

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine Emergency Classification and complete the initial Emergency Notification Form

Task Number : N/A

Alternate Path: No

Time Critical: Yes

Validation Time: 30 Min

K/A Rating(s):

System: Gen
K/A: 2.4.38
Rating: 2.4/4.4

Task Standard: Appropriate classification is determined and associated Emergency Notification Form is completed.

References:
RP/0/A/1000/01, Emergency Classification Rev 2
RP/0/A/1000/02, Control Room Emergency Coordinator Procedure Rev 9
RP/0/A/1000/015A, Offsite Communications From The Control Room Rev 4
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

Tools/Equipment/Procedures Needed:
RP/0/A/1000/01, Emergency Classification
RP/0/A/1000/02, Control Room Emergency Coordinator Procedure

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

NA

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 experienced a Small Break LOCA

The reactor failed to automatically trip

The Reactor failed to trip in Manual

CURRENT CONDITIONS

4 Minutes later

Reactor Trip Breakers were opened locally

All full length control rods are fully inserted

RCS pressure = 1500 psig stable

Core SCM = 6°F (this is the lowest SCM during the event)

Reactor Building pressure = 6 psig stable

RIA-40, RIA 45, and RIA-46 are stable and NOT in alarm

INITIATING CUE

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/A/1000/001, Emergency Classification:

1. Determine Emergency Classification at present time.
2. Complete appropriate Emergency Notification Form for the current conditions.

Inform the examiner when you have made the classification.

THIS IS A TIME CRITICAL JPM

Note: Do not use Emergency Coordinator's judgment while classifying the event.

Note: When required, an operator will maintain the Emergency Coordinator's Log and assume the duties of the Control Room Offsite Communicator.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Classify the Event **STANDARD:** Refer to RP/0/A/1000/01 (Emergency Classification) and classify the event as follows: **Encl 4.1** (Fission Product Barrier Matrix) RCS Leakrate ≥ 160 gpm = 4 pts **ALERT (NOT critical)** ***Encl 4.4** (Loss of Shutdown Functions) **SAE 1. FAILURE OF RPS TO COMPLETE OR INITIATE A RX SCRAM.** **SAE** The event should be classified as a Site Area Emergency (SAE) (4.4.S.1). ***TIME CRITICAL (Classification must be declared ≤ 15 minutes from the start of the JPM).*** **COMMENTS:**	***CRITICAL STEP** ___ SAT ___UNSAT

2	**1.1**	Commence the Off-Site Notification Form. **STANDARD:** Go to RP/0/A/1000/002 (Control Room Emergency Coordinator Procedure) and initiate procedure by determining symptoms for entry exist and check Step 1.1 **COMMENTS:**	___ SAT ___UNSAT
3	**2.1**	**IF** an EAL exists, Declare the appropriate Emergency Classification level. Classification _____ (UE, Alert, SAE, GE) Time Declared: _____ **STANDARD***:* Applicant declares a SAE and records the time that the classification was made. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___UNSAT
4	**2.2**	**IF** A Security event is in progress, **THEN** GO TO Step 2.4. **STANDARD***:* Applicant determines that a security event is NOT in progress and proceeds to step 2.3. **COMMENTS:**	___ SAT ___UNSAT

<table>
<tr>
<td>5</td>
<td>2.3</td>
<td>
<u>IF</u> ERO has <u>NOT</u> yet been activated <u>AND</u> ERO activation is needed, perform the following:

*2.3.1: Circle the applicable initial notification code below.

<table>
<tr><td rowspan="2">EAL classification</td><td colspan="2">Notification Codes (see Enclosure 4.11 for descriptions)</td></tr>
<tr><td>DRILL</td><td>EMERGENCY</td></tr>
<tr><td>None</td><td></td><td>F1a</td></tr>
<tr><td>NOUE</td><td>D1a</td><td>E1a</td></tr>
<tr><td>Alert</td><td>D2a</td><td>E2a</td></tr>
<tr><td>SAE</td><td>D3a</td><td>E3a</td></tr>
<tr><td>GE</td><td>D4a</td><td>E4a</td></tr>
</table>

2.3.2 IF a qualified individual is available to notify the ERO, provide the circled notification code above to a qualified individual and direct them to begin Enclosure 4.10 (Activation of the Emergency Response Organization).

<u>STANDARD</u>: Applicant determines that the notification code is either D3a or E3a.

<u>COMMENTS</u>:
</td>
<td>*CRITICAL STEP

___ SAT

___UNSAT</td>
</tr>
<tr>
<td>6</td>
<td>2.4</td>
<td>
Direct Control Room Offsite Communicator(s) to perform the following:
• Record Name _____
• REFER TO RP/0/A/1000/015A (Offsite Communications From The Control Room), Immediate Actions steps 2.1 and 2.2 AND Enclosure 4.7 (Guidelines for Manually Transmitting a Message) in preparation for notifying offsite agencies.

<u>STANDARD</u>: There is no offsite communicator for this JPM.

<u>COMMENTS</u>:
</td>
<td>___ SAT

___UNSAT</td>
</tr>
</table>

7	**2.5**	**IAAT** Changing plant conditions require an emergency classification upgrade, **THEN** Notify Offsite Communicator to complete in-progress notifications per RP/0/A/1000/15A (Offsite Communications From The Control Room), **AND** Start a new clean copy of this procedure for the upgraded classification **AND** stop working on this copy, noting the time in your log that each new copy started. **STANDARD***:* No upgrade will be required for this JPM. **COMMENTS:**	___ SAT ___UNSAT

8	**2.6**	Obtain the applicable Offsite Notification form in the control room and complete as follows: ___ 2.6.1 Ensure EAL # as determined by RP/0/A/1000/001 matches Line 4. ___*2.6.2 Line 1 - Mark appropriate box "Drill" or "Actual Event" ___*2.6.3 Line 1 - Enter Message # ___ 2.6.4 Line 2 - Mark Initial ___*2.6.5 Line 6 – A. Mark "Is Occurring" if any of the following are true: • RIAs 40, 45, or 46 are increasing or in alarm • If containment is breached • Containment pressure > 1 psig B. Mark "None" if none of the above is applicable. ___ 2.6.6 Line 7 - If Line 6 Box B or C is marked, mark Box D. Otherwise mark Box A. ___*2.6.7 Line 8 - Mark "Stable" unless an upgrade or additional PARs are anticipated within an hour. • Refer to Enclosure 4.8 (Event Prognosis Definitions) ___*2.6.8 Line 10 - Military time and date of declaration (Refer to date/time in Step 2.1) ___ 2.6.9 Line 11 - Evaluate the following for classification for all units. • Security event • Seismic event • Tornado on site • Hurricane force winds on site • SSF event • Fire affecting shared safety related equipment Mark or select ALL if event affects the emergency classification on more than one unit. If event only affects one (1) unit **OR** one (1) unit has a higher emergency class, select or mark the appropriate unit. ___*2.6.10 Line 12 - Mark unit(s) affected (reference Line 11) **AND** enter percent power for each unit affected. {14} • If affected unit is shutdown, then enter shutdown time and date. ___ 2.6.11 Line 13 - If the SM has no remarks, write "None" ___ 2.6.12 If Condition "A" exists ensure following PARs are included on Line 5. A. Evacuate: Move residents living downstream of the Keowee Hydro Project dams to higher ground. B. Other: Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed. ___*2.6.13 Line 17 - SM signature, CURRENT Time/Date **STANDARD**: Correctly fills out Emergency Notification Form in accordance with Key. **COMMENTS:**	***CRITICAL STEP** ___ SAT ___UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	The candidate needs to be able to utilize the procedure and determine the conditions meet a Site Area Emergency classification.
3	This is a time critical step. The candidate needs to declare the SAE within 15 minutes of beginning the JPM. (The start of the JPM is the beginning of the assessment period)
5	The candidate must select the correct notification code for a SAE.
8	The emergency notification form is accurately filled-out; identified steps from the KEY are critical items within 15 minutes from the time the EAL was declared. (Declaration time is the time recorded in JPM step 3)

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 experienced a Small Break LOCA

The reactor failed to automatically trip

The Reactor failed to trip in Manual

CURRENT CONDITIONS

4 Minutes later

Reactor Trip Breakers were opened locally

All full length control rods are fully inserted

RCS pressure = 1500 psig stable

Core SCM = 6°F (this is the lowest SCM during the event)

Reactor Building pressure = 6 psig stable

RIA-40, RIA 45, and RIA-46 are stable and NOT in alarm

INITIATING CUE

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/A/1000/001, Emergency Classification:

1. Determine Emergency Classification at present time.
2. Complete appropriate Emergency Notification Form for the current conditions.

Inform the examiner when you have made the classification.

THIS IS A TIME CRITICAL JPM

Note: Do not use Emergency Coordinator's judgment while classifying the event.

Note: When required, an operator will maintain the Emergency Coordinator's Log and assume the duties of the Control Room Offsite Communicator.