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

Examiners: _____ Operators: _____ **SRO**

_____ _____ **OATC**

_____ _____ **BOP**

Initial Conditions:

- Reactor Power = 75%

Turnover:

- SASS is in Manual for calibration
- AMSAC/DSS is bypassed for calibration
- PT/0/A/0610/017 is in progress to perform functional verification of SL breakers

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AMSAC/DSS Bypassed
0b	Override		SASS in Manual
0c	Override		Standby CC Pump Auto Start
1		N: BOP, SRO	Functional Verification of SL Breakers
2	MPS290	C: BOP, SRO	1A CC Pump Trips & Standby CC Pump Fails to Auto Start
3	Override	I: BOP, SRO	1NI-5 Power Failure
4	Override	C: OATC, SRO **(TS)**	1A HPI Pump Trips & 1B HPI Pump Fails to Auto Start
5	MPI040 MPI070	I: OATC, SRO	Loop 1A RC Flow Fails Low
6	MPS031 MPS031D	R: OATC, SRO **(TS)**	80 gpm RCS Leak / Manual Power Reduction
7	MPS031D MPS150 Override	M: ALL	Small Break LOCA • 1C HPI Pump Fails to Start on ES • 1HP-24 Fails Closed

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

SCENARIO 1 EVENT SUMMARY

Event 1: When the crew takes the shift, the SRO will direct the BOP to perform PT/0/A/0610/017 Enclosure 13.11 (Functional Verification Of SL Breaker(s). The SRO will enter TS 3.8.1 Condition D by procedure and then the BOP will perform a functional check of SL1 and SL2 breakers.

Event 2: The operating Component Cooling Pump (1A CC Pump) will trip and the Standby CC Pump (1B CC Pump) will fail to auto start. The BOP will reference an Alarm Response Guide which will direct manually starting the Standby CC Pump. Since there will be no CC flow until the Standby CC Pump is started, Letdown temperature will begin to increase and 1HP-5 will automatically close on high Letdown temperature (135°F). The SRO will then enter AP/1/A/1700/032 (Loss of Letdown) to restore Letdown.

Event 3: 1NI-5 will lose DC power which will result in 1NI-5 reading 0% power. The BOP will reference an Alarm Response Guide which will direct the crew to bypass the 1A RPS channel in accordance with OP/1/A/1105/014 (Control Room Instrumentation Operation and Information).

Event 4: The operating High Pressure Injection Pump (1A HPI Pump) will trip and the Standby HPI Pump (1B HPI Pump) will fail to auto start. The SRO will enter AP/1/A/1700/014 (Loss of Normal HPI Makeup and/or RCP Seal Injection) to start the Standby (1B) HPI Pump and re-establish normal HPI Makeup and RCP Seal Injection. The SRO will enter TS 3.5.2 Condition A for the inoperable HPI Pump.

Event 5: 1A Loop RCS Flow instrument will fail low which will cause ICS to re-ratio Feedwater in an attempt to restore the primary to secondary heat balance. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. The OATC will re-ratio Feedwater to restore the heat balance. Once the plant is stable, the SRO will enter AP/1/A/1700/028 (ICS Instrument Failures) and ensure the appropriate ICS stations are in manual and BOP will perform an instrument surveillance for the failed instrumentation.

Event 6: The RCS will develop an unidentified leak of approximately 80 gpm. Once alarms are received, the SRO will enter AP/1/A/1700/002 (Excessive RCS Leakage). Since the RCS leak will be greater than Letdown Storage Tank makeup capability from 1A Bleed Holdup Tank, the crew will initiate AP/1/A/1700/029 (Rapid Unit Shutdown) and manually shutdown the unit. The SRO will enter TS 3.4.13 Conditions A & B.

Event 7: Once Reactor power has been decreased > 10% and auxiliary power has been transferred to the Startup Transformer in Event 6, the RCS leak will propagate into a Small Break LOCA. The 1C HPI Pump will fail to automatically start and 1HP-24 will fail closed when ES actuates. The SRO will Transfer to the LOSCM tab of the EOP. One RO will perform Rule 2 (Loss of SCM) and the other RO will perform EOP Enclosure 5.1 (ES Actuation).

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **1** Page 1 of 2

Event Description: **Functional Verification of SL Breakers (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	***PT/0/A/0610/017*** **Crew response:** SRO directs the BOP to perform PT/0/A/0610/017 Enclosure 13.11 (Functional Verification Of SL Breakers) **PT/0/A/0610/017 Encl 13.11** (Functional Verification of SL Breakers) rev 29 2.1 Perform the following: • **IF** Unit 1 in MODE 1, 2, 3 **or** 4, enter TS 3.8.1 Condition 'D' • **IF** Unit 1 in MODE 5, 6 **or** during movement of recently irradiated fuel assemblies, **AND** Underground Power Path being credited as an emergency power source, enter TS 3.8.2 Condition 'B' **(N/A)** • **IF** Unit 2 in MODE 1, 2, 3 **or** 4, enter TS 3.8.1 Condition 'D' • **IF** Unit 2 in MODE 5, 6 **or** during movement of recently irradiated fuel assemblies, **AND** Underground Power Path being credited as an emergency power source, enter TS 3.8.2 Condition 'B' **(N/A)** • **IF** Unit 3 in MODE 1, 2, 3 **or** 4, enter TS 3.8.1 Condition 'D' • **IF** Unit 3 in MODE 5, 6 **or** during movement of recently irradiated fuel assemblies, **AND** Underground Power Path being credited as an emergency power source, enter TS 3.8.2 Condition 'B' **(N/A)** 2.2 **IF** required, perform functional check of SL1 CT5 STBY BUS 1 FEEDER as follows: 2.2.1 Verify SL1 & SL2 TRIP INTERLOCK DEFEAT CH1 switch in "CENTRAL" position 2.2.2 Verify CT5 BUS 1 AUTO/MAN transfer switch in "MAN" 2.2.3 Close SL1 CT5 STBY BUS 1 FEEDER 2.2.4 Verify ≈ 4160V on STANDBY BUS 1 VOLTS (2AB3) 2.2.5 Open SL1 CT5 STBY BUS 1 FEEDER

This event is complete when the SRO has exited TS 3.8.1 for Unit 1, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **1** Page 2 of 2

Event Description: **Functional Verification of SL Breakers (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	***PT/0/A/0610/017*** **Crew response:** **PT/0/A/0610/017 Encl 13.11** (Functional Verification of SL Breakers) 2.3 **IF** required, perform functional check of SL2 CT5 STBY BUS 2 FEEDER as follows: 2.3.1 Verify SL1 & SL2 TRIP INTERLOCK DEFEAT CH2 switch in "CENTRAL" position 2.3.2 Verify CT5 BUS 2 AUTO/MAN transfer switch in "MAN" 2.3.3 Close SL2 CT5 STBY BUS 2 FEEDER 2.3.4 Verify ≈ 4160V on STANDBY BUS 2 VOLTS (2AB3) 2.3.5 Open SL2 CT5 STBY BUS 2 FEEDER 2.4 Perform the following: • **IF** entered on Unit 1, evaluate exiting TS 3.8.1 Condition 'D' • **IF** entered on Unit 1, evaluate exiting TS 3.8.2 Condition 'B' **(N/A)** • **IF** entered on Unit 2, evaluate exiting TS 3.8.1 Condition 'D' • **IF** entered on Unit 2, evaluate exiting TS 3.8.2 Condition 'B' **(N/A)** • **IF** entered on Unit 3, evaluate exiting TS 3.8.1 Condition 'D' • **IF** entered on Unit 3, evaluate exiting TS 3.8.2 Condition 'B' **(N/A)**

This event is complete when the SRO has exited TS 3.8.1 for Unit 1, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **2** Page 1 of 3

Event Description: **1A CC Pump Trips & Standby CC Pump Fails to Auto Start (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • 1SA-9/B-1 (CC CRD RETURN FLOW LOW) • 1SA-9/C-1 (CC COMP COOLING RETURN FLOW LOW) • 1SA-2/C-1 (LETDOWN TEMPERATURE HIGH) • 1HP-5 (Letdown Isolation) will close due to high letdown temperature • CC Total Flow Low • Component Cooling Pressure Low **Crew response:**
	BOP	Refer to ARG 1SA-9/B-1 OR 1SA-9/C-1 ***ARG 1SA-09/B-1*** **ARG 1SA-09/B-1** 3.1 **IF** ES 5 or 6 has actuated, **(N/A)** 3.2 **IF** 1CC-7 or 1CC-8 are closed, **(N/A)** 3.3 **IF** 1SA-09/C-1 is in alarm **AND** the Standby CC Pump did **NOT** start, perform the following: 3.3.1 Verify CC Surge Tank level > 12" 3.3.2 Start Standby CC Pump 3.4 **IF NO** CC Pumps are operating, Go To AP/20 (Loss of Component Cooling) **ARG 1SA-09/C-1** 3.1 **IF** ES 5 or 6 has actuated, **(N/A)** 3.2 **IF** 1CC-7 or 1CC-8 are closed, **(N/A)** 3.3 **IF** Standby CC Pump did NOT start, perform the following: 3.3.1 Verify CC Surge Tank level > 12" 3.3.2 Start Standby CC Pump 3.4 **IF NO** CC Pumps are operating, Go To AP/20 (Loss of Component Cooling) ***Examiner Note: Once the 1B CC pump is started, the SRO will refer to AP/32 (Loss of Letdown).***

This event is complete when the Standby HPI Pump is placed back in Auto, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **2** Page 2 of 3

Event Description: **1A CC Pump Trips & Standby CC Pump Fails to Auto Start (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	***AP/1/A/1700/032*** **Crew response:** **AP/1/A/1700/032** (Loss of Letdown) rev 07 4.1 Verify a total loss of letdown exists 4.2 Place 1HP-120 in HAND and reduce demand to zero 4.3 Position the standby HPI pump switch to OFF **CAUTION: RCP individual seal return valves will close if seal injection is < 22 gpm with CC flow < 575 gpm.** 4.4 Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW **NOTE: The running HPIP may operate below 65 gpm for up to 4 hours. HPIP time of operation below minimum flow is cumulative.** 4.5 Verify HPI pump flow ≥ 65 gpm (30 gpm Recirc + ___ SI +___ MU) **RNO:** Log beginning time for HPI pump flow below minimum 4.6 Initiate makeup to the LDST as required. (Using EOP Enclosure 5.5 or OP/1/A/1103/004 for batch additions) 4.7 Notify the OSM to reference OMP 1-14, Emergency Plan, and notify the STA 4.8 Verify 1HP-5 closed 4.9 Dispatch an operator to 1HP-5 to establish communication with the CR **NOTE** • **TS 3.4.9 applies when PZR level > 260" (corrected value for 285").** • **Conditions where it is known that letdown CANNOT be restored do not require waiting until 260" to begin a rapid shutdown.** 4.10 **IAAT** either of the following exist: • PZR level > 260 inches **AND** letdown **CANNOT** be established • Plant conditions exist such that letdown will **NOT** be restored **THEN** initiate unit shutdown per AP/29 (Rapid Unit Shutdown) 4.11 **IAAT** PZR level ≥ 375 inches, **THEN** trip Rx 4.12 Determine the cause of loss of letdown: Actual LD Temperature high: **GO TO** Step 4.29

This event is complete when the Standby HPI Pump is placed back in Auto, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **2** Page 3 of 3

Event Description: **1A CC Pump Trips & Standby CC Pump Fails to Auto Start (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	***AP/1/A/1700/032*** **Crew response:** 4.29 Notify FIN24 to initiate repairs on failed equipment 4.30 **IAAT** letdown can be re-established, **THEN** perform Steps 4.30 - 4.44 4.31 Place CC System in operation 4.32 Close 1HP-6 4.33 Close 1HP-7 4.34 Open 1HP-1, 1HP-2, 1HP-3, and 1HP-4 4.35 Verify letdown temperature < 135°F **RNO:** 1. Open 1HP-13 2. Close 1HP-8, 1HP-9 & 11 3. Verify NO deborating IXs in service 4. Select LETDOWN HI TEMP INTLK BYP switch to BYPASS 4.36 Open 1HP-5 4.37 Throttle open 1HP-7 to establish ≈ 20 gpm 4.38 **WHEN** letdown temperature < 130°F, **THEN** place LETDOWN HI TEMP INTLK BYP switch in NORMAL 4.39 Open 1HP-6 4.40 Adjust 1HP-7 to control desired letdown flow 4.41 Re-establish normal makeup through 1HP-120 4.42 Re-establish normal RCP seal injection flow 4.43 Position the standby HPI pump switch to AUTO ***Examiner Note: This concludes the event. It is not required to put Purification IX in service at step 4.44*** 4.44 Verify any purification IX in service **RNO:** **IF** purification IX operation is desired, **THEN** initiate OP/1/A/1103/004 B to establish desired IX operation 4.45 **EXIT** this procedure **Tech Spec 3.4.1** (RCS Pressure, Temperature, and Flow DNB Limits) requires RCS pressure to stay > 2125 psig when in MODE 1 Steady State. During Letdown flow perturbations in this event it is possible that RCS pressure goes below 2125 psig, If that occurs the SRO will enter TS 3.4.1 Condition A (One or more RCS DNB parameters not within limits) which has a 2 hour completion time to restore parameter to within limits.

This event is complete when the Standby HPI Pump is placed back in Auto, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **3** Page 1 of 2

Event Description: **1NI-5 Power Failure (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • 1SA-05/A-5 (1A RPS TROUBLE) • 1SA-05/A-6 (1NI-5 PWR FAIL) • 1SA-4/C-1 (QUADRANT POWER TILT) will alarm after couple minutes • OAC alarm 1A RPS NI FLUX DEV • OAC alarm 1NI-5 +15V POWER SUP • OAC alarm 1NI-5 -15V POWER SUP • OAC alarm NI FLUX #1 NI-5 MISMATCH ***1SA-05/A-6*** **Crew response:**
	BOP	The BOP will refer to Statalarm 1SA-5/A-6 (1NI-5 PWR FAIL) **ARG 1SA-05/A-6** (1NI-5 PWR FAIL) rev 19 3.1 **IF** all Wide Range **AND** Power Range Nuclear Instrument channels fail at power, **AND** the Reactor has **NOT** tripped, manually trip the Reactor 3.2 Refer to TS 3.3.1 3.3 **IF** the other three RPS channels are in service (**NOT** bypassed), bypass the channel per OP/1/A/1105/014 (Control Room Instrumentation Operation and Information) 3.4 Initiate Work Request for I&E to investigate cause and restore power
	BOP	**OP/1/A/1105/014** **OP/1/A/1105/014 Encl 4.7** (Removal and Restoration of RPS Channels) rev 42 2.1 Verify **one** of the following: 2.1.1 A procedure requires RPS Channel to be placed in Trip or Bypass 2.1.2 Equipment failure requires RPS Channel to be placed in Trip or Bypass 2.2 Identify affected RPS Channel **1A** (1A, 1B, 1C, 1D)

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **3** Page 2 of 2

Event Description: **1NI-5 Power Failure (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		OP/1/A/1105/014 **Crew response:** **OP/1/A/1105/014 Encl 4.7** (Removal and Restoration of RPS Channels) **NOTE:** Placing RPS channel in Manual Bypass is preferred to minimize risk of Reactor trip. 3.1 **IF** affected RPS channel is **NOT** required per TS 3.3.1, perform **one** of the following: 3.1.1 **IF** Manual Bypass of affected RPS channel is desired, perform the following: A. Obtain Key #314 B. Declare affected RPS Channel inoperable C. Place affected RPS Channel in MANUAL BYPASS keyswitch in "BYP" (Cab. 2, 4, 6, or 8) ***Examiner Note: Statalarm 1SA-05/A-1 will actuate when the channel is placed in BYP*** 3.1.2 **IF** Manual Trip of affected RPS channel is desired, perform the following: **(NOT desired to trip channel per the NOTE)** 3.2 **IF** affected RPS channel is required per TS 3.3.1, perform the following: **(Channel is NOT required per TS 3.3.1)** 3.3 **IF** RPS Channel removed from service due to equipment failure, perform the following: • Initiate Work Request • **IF** required per OMP 1-14 (Notifications), perform appropriate notifications ***Examiner Note: The SRO may announce TS 3.3.1 for tracking purposes.***

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **4** Page 1 of 4

Event Description: **1A HPI Pump Trips & 1B HPI Pump Fails to Auto Start (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		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 = 0 amps • PZR level will begin to decrease and LDST level will begin to increase **Crew response:**
	SRO	The SRO will enter AP/1/A/1700/014 (Loss of Normal HPI Makeup and/or RCP Seal Injection) ***AP/1/A/1700/014***
		Crew response:
	SRO/OATC	**AP/1/A/1700/014** (Loss of Normal HPI Makeup and/or RCP Seal Inj) rev 18 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 4.7 Announce AP entry using PA System 4.8 Verify <u>any</u> HPI pump operating **RNO:** 1. Close 1HP-5 2. Place 1HP-120 in HAND and closed 3. Place 1HP-31 in HAND and closed 4. Attempt to start the Standby HPIP (1B HPIP starts) 5. **IF** standby HPI pump started, **THEN GO TO** Step 4.111

This event is complete when Seal Inlet Header Flow is ≈ 32 gpm and 1HP-31 is in Auto (Step 4.124), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **4** Page 2 of 4

Event Description: **1A HPI Pump Trips & 1B HPI Pump Fails to Auto Start (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/014 **Crew response:** **AP/1/A/1700/014** (Loss of Normal HPI Makeup and/or RCP Seal Inj) 4.111 Place 1HP-31 in HAND 4.112 Slowly open 1HP-31 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 4.117 Open the following: ➢ 1HP-1 ➢ 1HP-2 ➢ 1HP-3 ➢ 1HP-4 ***Booth Note: Crew may contact the WCC to direct AO to rack out the 1A HPIP breaker (wait 10 minutes and then Use Quick Strike to remove fuses and report that the 1A HPI pump has been tagged out).*** 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 ***Examiner Note: Crew may enter AP/16 (Abnormal RCP Operation) as a result of high seal return temperatures. Steps are on the next page.***

This event is complete when Seal Inlet Header Flow is ≈ 32 gpm and 1HP-31 is in Auto (Step 4.124), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **4** Page 3 of 4

Event Description: **1A HPI Pump Trips & 1B HPI Pump Fails to Auto Start (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/016

Crew response:

AP/1/A/1700/016 (Abnormal RCP Operation) rev 34

4.1 **IAAT** any RCP meets immediate trip criteria… (**does not**)

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

__ 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

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:

AP/16 (Abnormal RCP Operation) Section 4D

1. **IAAT** any RCP meets immediate trip criteria… (**does not**)

RNO: GO TO Step 12

12. Monitor RCP parameters for abnormalities (Turn on Code "RCP").

13. Open 1HP-20 and 1HP-21

14. Open1HP-228, 1HP-226, 1HP-232, and 1HP-230

15. Verify either of the following conditions apply..… (**not met**)

RNO: GO TO Step 17

This event is complete when Seal Inlet Header Flow is ≈ 32 gpm and 1HP-31 is in Auto (Step 4.124), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **4** Page 4 of 4

Event Description: **1A HPI Pump Trips & 1B HPI Pump Fails to Auto Start (C: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/016 **Crew response:** **AP/1/A/1700/016** (Abnormal RCP Operation) rev 34 17. Verify RCP seal return low flow alarms off **RNO:** Request that RCP Component Engineer provide the following: • Immediate evaluation • Additional monitoring requirements ***Examiner Cue:*** ***If candidate attempts to monitor the Loose part Monitor, indicate that the noise is normal.*** ***Examiner Note:*** ***Due to sequence of events, SRO may not review the TS during the scenario. Follow-up questions may be required to ensure knowledge of this competency.*** **TS 3.5.2 HIGH PRESSURE INJECTION** Condition A (72 hours) Restore HPI pump to OPERABLE status

This event is complete when Seal Inlet Header Flow is ≈ 32 gpm and 1HP-31 is in Auto (Step 4.124), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **5** Page 1 of 3

Event Description: **Loop 1A RC Flow Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	**Plant response:** • 1SA-02/A-3 (RC Loop A Flow Low) • 1SA-02/A-5 (RC Total Flow Low) • 1SA-02/A-11 (ICS Runback) • 1SA-02/A-12 (ICS Tracking) • 1SA-05/B-5 (1B RPS Trouble) **Crew response:** • When the Statalarms are received, the candidates should utilize the "Plant Transient Response" (PTR) process to stabilize the plant, which should include: o Placing ICS to HAND (Feedwater Masters and Diamond) o Inserting Control Rods as needed to control RCS pressure (Performed by the BOP) o Decreasing or re-ratio Feedwater to control Reactor power and delta Tcold (Performed by the OATC) SRO may direct the OATC to perform the actions of the ARG for 1SA-02/A-3 Statalarm, but probably will move directly from PTR to AP/28. **ARG for 1SA-02/A-3** 3.1. Ensure reactor power is reduced below the flux to flow minus imbalance trip ratio 3.2. Ensure Feedwater demand re-ratios properly ***Examiner Note:*** ***This failure will cause FDW flow to re-ratio. If the crew immediately recognizes it is an instrument failure and not an actual loss of flow, they may choose to adjust FDW and therefore prevent high delta Tc from being established causing high Quadrant Power Tilt values. The SRO should direct a band for delta Tc of 0 ± 2°F as he establishes bands for parameters being manually controlled.*** SRO directs performance of AP/1/A/1700/028, ICS Instrument Failures **(see next page)**

This event is complete when Step 5 of Section 4E is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **5** Page 2 of 3

Event Description: **Loop 1A RC Flow Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/028

Crew response:

AP/1/A/1700/028 (ICS Instrument Failures) 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

Examiner Note: If power change was ≥ 5%, then step 4.4 will be performed. It depends on the speed of crew response to the failure.

4.4. Notify Rx Engineering and discuss the need for a maneuvering plan

Booth Cue: We will develop 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
	4B	Turbine Header Pressure
	4C	Controlling NI
	4D	Feedwater Loop Flow
	4E	**RCS Flow**

This event is complete when Step 5 of Section 4E is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **5** Page 3 of 3

Event Description: **Loop 1A RC Flow Fails Low (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/028

Plant response:

AP/1/A/1700/028 Section 4E (RCS Flow)

NOTE

The following will occur when an ICS RCS flow loop signal fails:

- ICS RUNBACK
- Controlling Tave swaps to RCS loop with higher flow
- Delta Tc station re-ratios loop feedwater flows

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 flow input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function)
   - Investigate and repair the failed RCS flow instrumentation
4. **PERFORM** an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument

   The RO will refer to Table 3 and determine that the surveillances can NOT be met as written with the failed instrument and therefore the SRO would ensure that a surveillance evaluation is initiated. **(Surveillance is required in Mode 1, Steady State Operation. Steady State is defined as operation within a 4% (e.g. 88% - 92% RTP) power band for ≥ 4 hours)**
5. Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written

   Inform the SRO that the surveillance cannot be met as written

   Determine that a Surveillance Evaluation should be initiated

Booth Cue: If crew requests Unit 2 to perform the surveillance evaluation, respond that "Unit 2 will perform the surveillance evaluation".

6. **WHEN** notified by SPOC that a valid RCS flow input has been restored to ICS, **THEN GO TO** OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto)

Examiner Note: ICS will remain in Manual for the remainder of the scenario.

This event is complete when Step 5 of Section 4E is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 1 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • OAC RB Normal Sump Temp HI HI • 1SA-9/A-6 (RB NORMAL SUMP HIGH/LOW) • 1SA-8/B-9 (RM Process Monitor Radiation HIGH) • 1SA-8/E-9 (RM Reactor Building Normal Sump Isolate) • PZR and LDST level deceasing • RC makeup flow increasing • RB normal sump level increasing **Crew response:**
	SRO	• The SRO may refer to TS 3.4.13 (RCS Operational Leakage) and determine that Condition A, Reduce leakage to within limits within 4 hours and Condition B, Be in MODE 3 in 12 hours are in effect. This is for an unidentified leak > 1 gpm.
		TS 3.4.13 RCS OPERATIONAL LEAKAGE Condition A (4 hours) Reduce leakage to within limits Condition B (12 hours) Be in MODE 3 **AND** (36 hours) Be in MODE 5
	SRO	• The SRO will enter AP/1/A/1700/002 (Excessive RCS Leakage) (**next page)**

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 2 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

AP/1/A/1700/002 (Excessive RCS Leakage) rev 15

3.1 Verify HPI operating

3.2 **IAAT** RC makeup flow is > 100 gpm, **AND** Pzr level is decreasing, **THEN** close 1HP-5

3.3 **IAAT** all the following exist: (**does not apply**)

- HPI flow is > NORMAL MAKEUP CAPABILITY (≈ 160 gpm) with letdown isolated
- Pzr level decreasing
- SG Tube Leakage **NOT** indicated
- LPI DHR NOT in service

THEN perform the following:

A. Ensure Rx is tripped

B. Initiate Unit 1 EOP

4.1 Initiate Pzr and LDST level makeup using Unit 1 EOP Encl 5.5, as necessary (**page 47**)

Booth Cue: If requested by the crew to close 1CS-48, wait two minutes and then use Manual Valves to close 1CS-48. Then call back to report that 1CS-48 is closed.

4.2 Announce AP entry using the PA system

4.3 **IAAT** LPI DHR in service, **AND** RCS leakage > LDST makeup capability (≈ 50 gpm) **THEN GO TO** AP/26

4.4 Initiate the following notifications:

__ OSM to reference the following:

- RP/1000/001 (Emergency Classification)
- OMP 1-14 (Notifications)
- Encl 5.9 (Oversight Guidelines)

__ STA and RP

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

-
Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 3 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

Crew response:

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

4.5 Monitor the following trends to determine leak area (AB or RB) and trend for degradation:

- T6 AP02
- T6 WASTE
- RIAs

Examiner/Booth Note: ***AP/1/A/1700/018 entry conditions will also be met due to RB RIA alarms. If the crew asks, Unit 2 will perform AP/18 (Abnormal Release of Radioactivity) actions.***

4.6 Verify specific leak location is identified

RNO: Notify WCC SRO to initiate Encl 5.2 (Primary Leak Check) and of the leak area (AB or **RB**), if known

Note: Crew should determine that the leak is in the Reactor Building due to RB RIAs increasing, RBNS rate increasing, and NO RCP seal failure indications.

4.7 Initiate Encl 5.1 (Leak Rate Determination)

(See page 24 for actions of Encl 5.1)

4.8 **WHEN** leak area/failure is identified, **THEN GO TO** applicable step that best fits leak area/failure

√	Area/ Failure	Symptoms	Step
	Rx Bldg	↑ RB RIAs ↑ RBNS rate NO RCP seal failure indications	4.53

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 4 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

Crew response:

4.53 **IAAT** in MODE 1 **AND** leak is > LDST makeup capability from 1A BHUT, **THEN** initiate a shutdown using AP/29 (Rapid Unit Shutdown) (**page 25**)

Examiner Note: The ≈ 80 gpm leak will eventually be greater than LDST makeup capability from 1A BHUT so the SRO should initiate AP/29. (page 25)

4.54 **IAAT** leak rate is ≥ 10 gpm, **THEN** discontinue pumping RBNS

4.55 **IAAT** either of the following conditions exist:

- RCS pressure ≤ 50 psig and RCS leakage ≥ 10 gpm
- RCS pressure ≥ 50 psig and RCS leakage ≥ 1 gpm

THEN perform Steps 4.56 - 4.59

4.56 Verify the RB is occupied **(It is not)**

RNO: GO TO Step 4.58

4. 58 Verify LPI DHR in service **(It is not)**

RNO: GO TO Step 4.60

4.60 Verify RB pressure ≥ 3 psig

RNO: Maximize RB Cooling by performing the following:

- Ensure all available RBCUs operating in HIGH
- Open 1LPSW-18
- Open 1LPSW-21
- Open 1LPSW-24

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 5 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

Crew response:

4.61 **IAAT** RB is accessible to locate the leak, **THEN GO TO** Step 4.62

RNO: GO TO Step 77

4.77 Verify 1HP-5 is closed

RNO: GO TO Step 4.82 (**next page**)

4.78 Place standby CC pump switch in OFF

NOTE

Statalarm 1SA-9C-1 (CC COMP COOLING RETURN FLOW LOW) will alarm when the letdown coolers are isolated

4.79 Close the following:

__ 1CC-1/1HP-1

__ 1CC-2/1HP-2

4.80 Verify leak is isolated **(it will not be)**

RNO: 1. Perform the following to shutdown and depressurize the RCS

A. Initiate shutdown by one of the following as necessary:

__ AP/29 (Rapid Unit Shutdown) (**page 25**)

__ OP/1/A/1102/004 (Operation at Power)

B. Initiate OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) to continue shutdown and depressurization

2. **WHEN** conditions permit, **THEN EXIT** this procedure

Booth Cue: If the crew elects to use the OP to shutdown the unit, call as the SM and inform the crew that a more rapid shutdown is desired.

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 6 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/002 **Crew response:** 4.82 Isolate 1A Letdown Cooler by closing the following: __ 1CC-1/1HP-1 __ 1HP-3 4.83 Verify leak is isolated **RNO:** 1. Restore 1A Letdown Cooler by performing the following: A. Open 1HP-3 B. Open 1CC-1/1HP-1 2. **GO TO** Step 4.85 4.85 Isolate 1B Letdown Cooler by closing the following: __ 1CC-2/1HP-2 __ 1HP-4 4.83 Verify leak is isolated **RNO:** 1. Restore 1B Letdown Cooler by performing the following: A. Open 1HP-4 B. Open 1CC-2/1HP-2 2. **GO TO** Step 4.88

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 7 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

Crew response:

NOTE

- It is desirable to isolate the LD line (to check for a leak), if the leak in the RB is so large that a RB entry (to locate leak) will not be made.
- The following steps to isolate letdown are performed at station management discretion dependent on the rate of leak. Isolating letdown will result in a complicated shutdown. Guidance is provided to restore letdown if leak is not isolated.

4.88 **IAAT** Station Management desires to isolate LD to determine if leak is downstream of 1HP-3 and 1HP-4, **THEN GO TO** Step 4.89

Booth Cue: If contacted as Station Management to determine if it is desired to isolate Letdown, state that "It is not desired to isolate Letdown to determine if the leak is downstream of 1HP-3 and 1HP-4".

RNO: 1. Perform the following to shutdown and depressurize the RCS:

A. Initiate shutdown by one of the following, as necessary:

__ AP/29 (Rapid Unit Shutdown) (**page 25**)

__ OP/1/A/1102/004 (Operation At Power)

B. Initiate OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) to continue shutdown and depressurization

2. **WHEN** conditions permit, **THEN EXIT** this procedure

Booth Cue: If the crew elects to use the OP to shutdown the unit, call as the SM and inform the crew that a more rapid shutdown is desired.

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 8 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/002

Crew response:

AP/1/A/1700/002 Enclosure 5.1 (Leak Rate Determination)

1. Stabilize RCS Temperature
2. Notify WCC to secure all primary draining/RB washdown evolutions if applicable

NOTE

Depending on leak location, leakage may NOT be detected by all the formulas. One or more of the following methods may be necessary to determine RCS leak rate.

3. Calculate leak rate using the following, as required:

Examiner Note: ***There are several other methods to calculate leakage rate. While one of the two below will most likely be used, depending on plant conditions they may not be the only correct methods available.***

Method #1: Calculation of RCS Volume Loss:

Leak Rate = _____ + _____ - _____ - _____ = _____
MU **SI** **LD** **TSR**

Where: MU = makeup Flow
SI = Seal Inlet Hdr Flow
LD = Letdown Flow
TSR = Total Seal Return Flow

Method #2: LDST Level Change:

Leak Rate = (LDST level change) x (31 gal/inch) + BTP Flowrate (gpm)
(minutes)

Leak Rate = (inches) x 31 gal/inch + _____ gpm = _____ gpm
_____minutes

4. Notify SM and SRO of calculated leak rate

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 9 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/029

Crew response:

AP/1/A/1700/029 (Rapid Unit Shutdown) rev 13

4.1 Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown) **(page 27)**

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

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

__ **GO TO** appropriate operating procedure for continued operation to resume power reduction

4.8 Verify ICS in AUTO **(ICS is NOT in Auto)**

RNO: 1. Initiate manual power reduction to desired power level

2. **GO TO** Step 4.10

Note: OATC reduces power by first reducing feedwater and then inserting control rods as necessary.

4.10 Verify both Main FDW pumps running:

RNO: GO TO Step 4.13

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 **(1B)** until its suction flow is ≈ 1 X 10^6 lbm/hr less than remaining Main FDW pump suction flow

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 10 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/029

Crew response:

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

4.14 **IAAT** both Main FDW pumps running, **AND** both of the following exists:

__ 1A Main FDW pump is the 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

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 is ≤ 18%

THEN deselect MAXIMUM RUNBACK **(does NOT apply)**

4.20 Verify Turbine-Generator shutdown is required **(it is required)**

4.21 **WHEN** NI power ≤18% **THEN** depress turbine TRIP pushbutton

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **6** Page 11 of 11

Event Description: **80 GPM RCS Leak (Requires Manual Power Reduction) (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/029 **Crew response:** **AP/1/A/1700/029 Enclosure 5.1** 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 **(It 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 E1$_1$ MFB1 STARTUP FDR 16. Verify N1$_1$ MFB1 NORMAL FDR opens 17. Close E2$_1$ MFB2 STARTUP FDR 18. Verify N2$_1$ MFB2 NORMAL FDR opens

This event is complete when Reactor power is decreased > 10% and either before or after auxiliaries have been transferred (NOT during), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 1 of 10

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

Time	Position	Applicant's Actions or Behavior

Plant response:

- 1SA-2/D-3 (RC PRESS HI/LOW)
- RCS pressure and PZR level decreasing
- ES Channels 1-6 actuate
- RCS subcooling margin will indicate 0°F shortly after the Rx trips
- Reactor Building Emergency Sump level increasing

Crew response:

The SRO will direct the OATC to perform IMAs.

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

The SRO will direct the BOP to perform a Symptoms Check

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)

SRO will transfer from the Subsequent Actions Tab to the LOSCM tab **(page 29)** from the Parallel Actions Page **(page 56)** to direct crew activities

Once the RCS saturates, one of the ROs will perform Rule 2 **(page 33)**

The RO not performing Rule 2 will begin performing Enclosure 5.1 due to ES actuation (**page 38**)

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 2 of 10

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

Time	Position	Applicant's Actions or Behavior

LOSCM Tab

Crew Response:

LOSCM tab rev 01

1. Ensure Rule 2 (Loss of SCM) is in progress or complete
2. Verify LOSCM caused by excessive heat transfer

RNO: GO TO Step 4

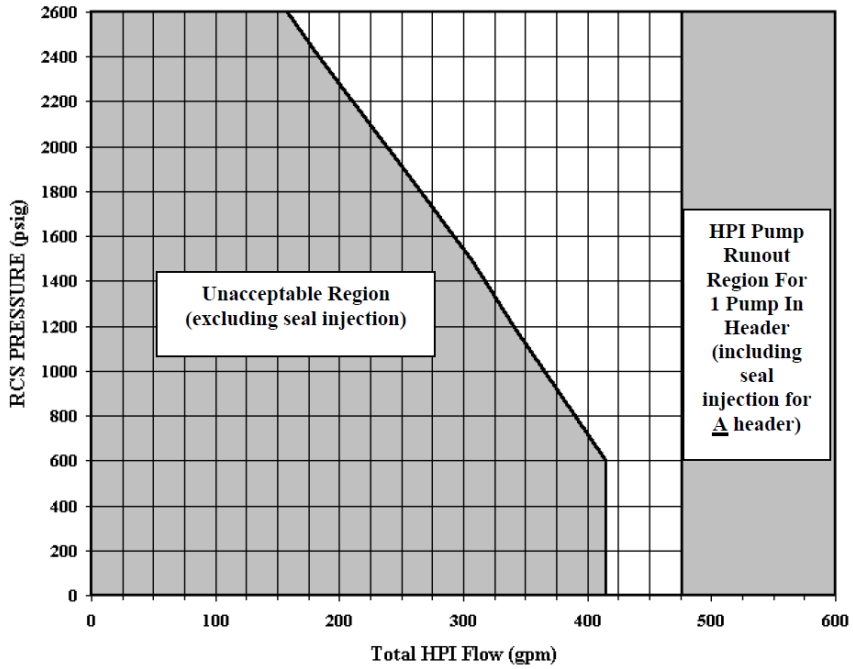
4. **IAAT** either exists:
   - LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm
   - Only one LPI header in operation with header flow ≥ 2900 gpm

   THEN GO TO LOCA CD tab
5. Verify SSF activated per AP/25 with SSF RC Makeup required

RNO: GO TO Step 7

7. Verify all exist:
   - __ **NO** RCPs operating
   - __ HPI flow in both HPI headers
   - __ Adequate total HPI flow per Figure 1 (Total Required HPI Flow)

Figure 1
Total Required HPI Flow



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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 3 of 10

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

Time	Position	Applicant's Actions or Behavior

LOSCM Tab

Crew Response:

LOSCM tab (continued)

8. **GO TO** Step 104

104. Open 1AS-40 while closing 1MS-47

105. Verify HPI forced cooling in progress

RNO: Close 1RC-4

106. Close 1GWD-17, 1HP-1, 1HP-2, and 1RC-3

107. Verify either:
- Core superheated
- Rx vessel head level at 0″

RNO: **GO TO** Step 109

109. **IAAT** BWST level is ≤ 19', **THEN** initiate Encl 5.12 (ECCS Suction Swap to RBES)

CAUTION

If TDEFDWP is being used for SG feed, reducing SG pressure below ≈ 250 psig can result in reduced pumping capability

110. Maintain SG pressure < RCS pressure utilizing either:
__ TBVs
__ ADVs

111. Verify any SG available for feeding/steaming

112. Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control) (**page 57**)

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: 7 Page 4 of 10

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

Time	Position	Applicant's Actions or Behavior
		LOSCM Tab **Crew response:** **LOSCM tab** (continued) 113. Verify indications of SGTR exist **RNO: GO TO** Step 116 116. Verify HPI forced cooling in progress **RNO: GO TO** Step 118 118. Verify CETCs trend decreasing 119. Verify primary to secondary heat transfer is excessive **RNO: GO TO** Step 121 121. Verify indications of SGTR ≥ 25 gpm **RNO: GO TO** Step 123 123. Verify required RCS makeup flow within normal makeup capability **RNO: GO TO** LOCA CD tab **(page 32)**

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 5 of 10

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

Time	Position	Applicant's Actions or Behavior
		LOCA Cooldown Tab **Crew Response:** **LOCA Cooldown Tab** rev 0 1. **IAAT** BWST level is ≤ 19', **THEN** initiate Encl 5.12 (ECCS Suction Swap to RBES) 2. Verify ES actuated 3. **GO TO** Step 7 7. Perform the following: • Ensure all RBCUs in low speed • Open 1LPSW-18 • Open 1LPSW-21 • Open 1LPSW-24 8. Initiate Encl 5.35 (Containment Isolation) 9. Start all RB Aux fans 10. **IAAT** either of the following exists: • LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400gpm • Only one LPI header in operation with header flow ≥ 2900 gpm **THEN GO TO** Step 11 **RNO: GO TO** Step 43 43 Initiate Encl 5.36 (Equipment Alignment For Plant Shutdown) 44. **IAAT** all the following exist: __ All SCMs > 0°F __ RCS pressure > LPI shutoff head __ Required HPI within normal makeup capability **THEN GO TO** Step 45 **RNO: GO TO** Step 48 45. Verify primary to secondary heat transfer exists

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 6 of 10

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

Time	Position	Applicant's Actions or Behavior
		Rule 2
		Crew Response:
		Rule 2 (Loss of SCM)
		1. **IAAT** all the following exist: • Any SCM ≤ 0°F • Rx power ≤ 1% • ≤ 2 minutes elapsed since loss of SCM **THEN** perform steps 2 & 3
	CT-1	2. Stop all RCPs *(within 2 minutes of LOSCM)*
		3. Notify CRS of RCP status
		4. Verify Blackout exists
		RNO: GO TO Step 6
		6. Open 1HP-24 & 25
	CT-3	7. Start all available HPI Pumps *(within 10 minutes of LOCA)*
		Examiner Note: The 1C HPI pump will fail to start on ES signal but will start manually.
		8. **GO TO** step 13
		13. Open 1HP-26 & 27
		14. Verify at least two HPI pumps are operating using two diverse indications
		15. **IAAT** ≥ 2 HPI pumps operating and HPI flow in any header is in Unacceptable Region of Fig. 1, **THEN** perform Steps 16-21
		RNO: GO TO Step 17
		17. **IAAT** flow limits are exceeded **THEN** perform Steps 18 - 20
		RNO: GO TO Step 21
		18. Place Diverse HPI in BYPASS
		19. Perform both: • Place ES CH 1 in MANUAL • Place ES CH 2 in MANUAL
		20. Throttle HPI to maximize flow ≤ flow limit

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 7 of 10

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

Time	Position	Applicant's Actions or Behavior
		Rule 2 **Crew Response:** **Rule 2 (Loss of SCM) (Continued)** 21. Notify CRS of HPI status 22. Verify RCS pressure >550 psig 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 **RNO: GO TO** Step 35 35. **IAAT** TBVs are unavailable, **THEN** A. Dispatch two operators to perform Encl 5.24 (Operation of ADVs) B. Notify CRS the ADVs are being aligned for use 36. Select OFF for both Digital Channels on AFIS HEADER A 37. Select OFF for both Digital Channels on AFIS HEADER B 38. Verify any EFDW pump operating **RNO:** Place 1FDW 315 and 1FDW-316 in MANUAL and close 39. Start MD EFDW pumps on all intact SGs: • 1A MD EFDWP • 1B MD EFDWP 40. Verify any EFDW pump operating 41. Verify both SGs intact 42. Establish 300 gpm EFDW flow to each SG 43. Verify both MD EFDWPs operating 44. Place 1 TD EFDW PUMP in PULL TO LOCK 45. Trip both Main FDW pumps

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 8 of 10

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

Time	Position	Applicant's Actions or Behavior

Rule 2

Crew Response:

Rule 2 (Loss of SCM) (Continued)

46. Place FDW block valve switches in CLOSE:
    - 1FDW-33
    - 1FDW-31
    - 1FDW-42
    - 1FDW-40
47. Utilize Rule 7 (SG Feed Control) to feed all intact SGs to the appropriate SG Level Control Point using available feed sources; EFDW/Main FDW
48. **IAAT** SG Level Control Point is reached, **THEN** maintain SG Level Control Point by feeding and steaming as necessary
49. Notify CRS of SG feed status

CAUTION
If 1 TD EFDW PUMP is being used for SG feed and Unit 1 is supplying the Auxiliary Steam header, reducing SG pressure below ≈ 250 psig can result in reduced pumping capability.

50. **IAAT** SG pressure is > RCS pressure, **THEN** reduce SG pressure < RCS pressure using either:
    - TBVs
    - Dispatch two operators to perform Encl 5.24 (operation of the ADVs)
51. Verify any Main FDW pump operating

RNO: GO TO Step 58

58. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete **(page 36)**
59. **WHEN** directed by CRS, **THEN EXIT**

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 9 of 10

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

Time	Position	Applicant's Actions or Behavior
		Rule 3 **Crew Response:** **Rule 3** (Loss of Main or Emergency Feedwater) 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 (HPI Forced Cooling) 4. Start operable EFDW pumps, as required, to feed all intact SGs 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 ≤ 0°F **RNO: IF** overcooling OR exceeding limits in Rule 7, **THEN** throttle EFDW as necessary 45. **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation) (**page 37**) 46. **WHEN** directed by **CRS, THEN EXIT**

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

Op-Test No.: **ILT16-2** Scenario No.: **1** Event No.: **7** Page 10 of 10

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

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.9

Crew Response:

EOP Encl 5.9 (Extended EFDW Operation)

1. Monitor EFDW parameters on EFW graphic display
2. **IAAT** UST level is < 4', **THEN GO TO** Step 120
3. **IAAT** feeding both SGs with one MD EFDWP is desired, **THEN** perform steps 4 - 7

RNO: GO TO Step 8

8. Perform as required to maintain UST level > 7.5'
   - Makeup with demin water
   - Place CST pumps in AUTO
9. **IAAT** all exist:
   __ Rapid cooldown **NOT** in progress
   __ MD EFDWP operating for each available SG
   __ EFDW flow in each header < 600 gpm

   THEN place 1 TD EFDW PUMP switch in PULL TO LOCK
10. Verify 1 TD EFDW PUMP operating

RNO: **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

Note: The SRO should determine that continuing in Encl 5.9 is not a priority at this time and direct the RO from the LOSCM Tab of the EOP. (page 29)

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

EOP Enclosure 5.1 (ES Actuation)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>: ✓ | 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 <u>all</u> ES channels associated with actuation setpoints have actuated.	**NOTE** Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure. __ Depress TRIP on <u>affected</u> ES logic channels that have **NOT** previously been actuated.
3. __ **IAAT** <u>additional</u> ES actuation setpoints are exceeded, **THEN** perform Steps 1 - 2.	
4. __ Place Diverse HPI in BYPASS.	__ Place Diverse HPI in OVERRIDE.
5. Perform <u>both</u>: __ Place ES CH 1 in MANUAL. __ Place ES CH 2 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 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.

EOP Enclosure 5.1

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 74.
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 - 15.	__ **GOTO** Step 16.
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. __ Verify any RCP is operating	__ **GO TO** Step 16
13. Open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
14. __ Ensure only one CC pump operating.	
15. __ Ensure Standby CC pump in AUTO.	

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. __ **IAAT** ES Channels 3 & 4 are actuated, **THEN GO TO** Step 17.	__ **GO TO** Step 54.
17. __ Place Diverse LPI in BYPASS.	__ Place Diverse LPI in OVERRIDE.
18. Perform <u>both</u>: __ Place ES CH 3 in MANUAL. __ Place ES CH 4 in MANUAL.	**<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}	
19. __ **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}	
20. __ **IAAT** RCS pressure is < LPI pump shutoff head, **THEN** perform Steps 21 - 22.	__ **GOTO** Step 23.
21. Perform the following: __ Open 1LP-17. __ Start 1A LPI PUMP.	1. __ Stop 1A LPI PUMP. 2. __ Close 1LP-17.
22. Perform the following: __ Open 1LP-18. __ Start 1B LPI PUMP.	1. __ Stop 1B LPI PUMP. 2. __ Close 1LP-18.

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __ **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 24 - 25.	__ **GO TO** Step 26.
24. Open: __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 __ 1LP-17 __ 1LP-18 __ 1LP-21 __ 1LP-22	
25. __ Start 1C LPI PUMP.	
26. __ **IAAT** 1A LPI PUMP fails while operating, **AND** 1B LPI PUMP is operating, **THEN** close 1LP-17.	
27. __ **IAAT** 1B LPI PUMP fails while operating, **AND** 1A LPI PUMP is operating, **THEN** close 1LP-18.	
28. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	***CT- 2***
29. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
31. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
32. __ Secure makeup to the LDST.	
33. __ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. __ **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.
34. __ Verify Unit <u>2</u> turbine tripped.	__ **GOTO** Step 37.
35. __ Close <u>2</u>LPSW-139.	
36. __ 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.
37. __ Close 1LPSW-139.	
38. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
39. __ Start <u>all available</u> LPSW pumps.	

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 42.
41. 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'.
42. __ **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.
43. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
44. __ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. __ **IAAT** ES channels 5 & 6 have actuated, **THEN** perform Step 46.	__ **GOTO** Step 47.

<u>NOTE</u>

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

46. __ 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.

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. __ **IAAT** ES channels 7 & 8 have actuated, **THEN** perform Steps 48 - 49.	__ **GOTO** Step 50.
48. 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.
49. __ 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.
50. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
51. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
52. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
53. __ **WHEN** CR SRO approves, **THEN EXIT**.	

••• END •••

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ES Channels 3 & 4 have **NOT** actuated.	
54. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	***CT-2***
55. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
56. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
57. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
58. __ Secure makeup to the LDST.	
59. __ Verify all ES channel 1 & 2 components are in the ES position.	1. __ **IF** 1HP-3 fails to close, **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.
60. __ Verify Unit 2 turbine tripped.	__ **GOTO** Step 63.
61. __ Close 2LPSW-139.	
62. __ Verify total LPSW flow to Unit 2 LPI coolers ≤ 6000 gpm.	__ Reduce LPSW to Unit 2 LPI coolers to obtain total LPSW flow ≤ 6000 gpm.
63. __ Close 1LPSW-139.	

EOP Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
64. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
65. __ Start <u>all available</u> LPSW pumps.	
66. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 68.
67. 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'.
68. __ **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.
69. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
70. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
71. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
72. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
73. __ **WHEN** CR SRO approves, **THEN EXIT**.	

••• END •••

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** <u>two</u> Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** <u>all</u> 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 <u>both</u> 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.	
<u>NOTE</u> 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.	

• • • END • • •

Rule 6
HPI

HPI Pump Throttling Limits

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled ≤ 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.

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 AD-LS-ALL-0006 (Notification/Reportability Evaluation).	**NOTIFY**

Enclosure 5.16
SG Tube-to-Shell ΔT Control

NOTE

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

1A SG ΔT	1B SG ΔT
Bottom of Loop 'A' P/T display	Bottom of Loop 'B' P/T display
S/G TUBE/SHELL DT	S/G TUBE/SHELL DT

- SG tube-to-shell ΔT limits:

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

1. **IAAT** any SG tube-to-shell ΔT approaches either limit, **THEN** take appropriate action per the following:

Limit Approached	Action
Tensile	**GO TO** Step 2
Compressive	**GO TO** Step 50

Examiner Note: SG tube-to-shell ΔT should not approach either limit for this scenario.

CRITICAL TASKS

CT-1 Secure all RCPs within two minutes of SCM ≤ 0°F per Rule 2 (BWOG CT-1)

CT-2 Start Outside Air Booster Fans within 30 minutes of initiation of LOCA (BWOG CT-27)

CT-3 Start 1C HPI Pump within 10 minutes of LOCA to provide flow in both headers to preclude quarter core cooling

SAFETY: Take a Minute

UNIT 0 (OSM)

SSF Operable: No U2/U3: 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: 75%	Mode: 1	Mode: 1
Gross MWE: 698	100% Power	100% Power
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes
RBNS Rate: 0.01 gpm		

Technical Specifications/SLC Items (CR SRO)

Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
AMSAC/DSS	Today/0300	7 Days	SLC 16.7.2
SSF	Today/0100	7 Days	TS 3.10.1

Shift Turnover Items (CR SRO)

Primary

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

Secondary

- AMSAC/DSS bypassed for calibration
- Unit 2 is supplying the AS header
- PT/0/A/0610/017 (Operability Test of 4160V Breakers) Encl 13.11 (Functional Verification Of SL Breaker(s) is in progress and complete up to Step 2.1 to perform functional verification of SL1 and SL2 breakers
- Keowee operability test was performed per PT/0/A/0620/009 (Keowee Hydro Operation) at 0700 today
- Unit 2 BOP will simulate performing CV during SL breaker testing
- 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: 77% 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 = 97%

Turnover:

- SASS is in Manual for calibration
- AMSAC/DSS is bypassed for calibration
- PT/1/A/0290/003 Encl 13.2 (Control Valve Movement At Power) in progress to test CV3 & CV4

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AMSAC/DSS Bypassed
0b	Override		SASS in Manual
1		N: BOP, SRO	Turbine Control Valve Movement PT (CV3 & CV4)
2	Override	C: BOP, SRO	CCW Emergency Discharge Level Low
3	MPI121	I: BOP, SRO	PZR Level 1 Fails Low
4	Override	I: OATC, SRO **(TS)**	Inadvertent ES Channel 3 Actuation
5	MPI281	I: OATC, SRO	ΔTc Controller Failure
6	Override	R: OATC, SRO **(TS)**	One Dropped Control Rod (Group 1 Rod 6) Requiring Manual Power Decrease
7	MPI290 MPI300 MEL120	M: ALL	ATWS (Loss of 1TA Switchgear) • Turbine Fails to Trip • 1HP-26 Fails Closed

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

SCENARIO 2 EVENT SUMMARY

Event 1: When the crew takes the shift, the BOP will perform PT/1/A/0290/003 Enclosure 13.2 (Control Valve Movement At Power) to test Turbine Control Valves CV3 & CV4. Once the test is complete, the Turbine Bypass Valves (TBVs) will be closed, returned to automatic, and the Standby EHC pump will be secured and placed in automatic.

Event 2: An OAC alarm will indicate that CCW Emergency Discharge Level is low. This will require the BOP to re-prime the Condenser Emergency Discharge Line in accordance with OP/1/A/1104/012 Enclosure 4.4 (Repriming Condenser Emergency Discharge Line).

Event 3: Pressurizer Level 1 will fail low which will cause 1HP-120 (RCS Volume Control) to open in an attempt to restore indicated Pressurizer level. The BOP will select Pressurizer level 2 or Pressurizer level 3 to restore normal RCS makeup flow.

Event 4: Engineered Safeguards (ES) Channel 3 will inadvertently actuate which will cause the 1A LPI Pump to start, 1LP-17 to open, and 'C' LPSW Pump to start. Once the crew determines that the ES actuation is not valid, the SRO will enter AP/1/A/1700/042 (Inadvertent ES Actuation) to restore the ES components to normal operation. The SRO will enter TS 3.3.7 and TS 3.7.7.

Event 5: The ΔTc Controller will fail causing 1A Feedwater flow to increase and 1B Feedwater flow to decrease. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. Once the plant is stable, the SRO will enter AP/1/A/1700/028 (ICS Instrument Failures) and ensure the appropriate ICS stations are in manual.

Event 6: One Control Rod (Group 1 Rod 6) will fully insert. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. The SRO will enter AP/1/A/1700/001 (Unit Runback). Since ICS is in manual (from event 5), the OATC will perform a manual power decrease to ≤ 55% power. The SRO will enter TS 3.1.4, TS 3.1.5, and TS 3.10.1.

Event 7: 1TA Switchgear will lockout and the Reactor will fail to trip automatically or manually (ATWS). The OATC will perform Rule 1 and the SRO will enter the UNPP tab of the EOP. The turbine will fail to trip using the Turbine Trip Pushbutton which will require the operator to lockout both EHC Pumps to prevent severe overcooling of the RCS. 1HP-26 will fail closed requiring 1HP-410 to be opened to allow full HPI flow from the BWST to borate the RCS and shutdown the Reactor.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **1** Page 1 of 3

Event Description: **Turbine Control Valve Movement PT (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior

PT/1/A/0290/003

Crew response:

SRO directs the BOP to perform PT/1/A/0290/003 Encl 13.2 to test CV3 & CV4

PT/1/A/0290/003 Encl 13.2 (Control Valve Movement At Power) rev 15

2.5 **IF AT ANY TIME** reactor/turbine trip **OR** significant transient occurs, ensure Turbine Bypass Valves to AUTOMATIC

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

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

2.6.1 Select "Control Valve 3 & 4 Test"

2.6.2 Verify the following:

___ "Test Permissive" is ON for CV3

___ "Test Permissive" is ON for CV4

2.6.3 Record CV3 and CV4 pretest positions:

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

2.6.4 Select "Initiate CV3 and CV4 Test"

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

☐ NI POWER changes > 2%

☐ ICS Turbine Master trips to HAND

☐ Turbine vibration > 10 mils for > 5 seconds

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

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

This event is complete when the Standby EHC pump switch is placed in AUTO (step 2.9.5), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **1** Page 2 of 3

Event Description: **Turbine Control Valve Movement PT (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior

PT/1/A/0290/003

Crew response:

PT/1/A/0290/003 Encl 13.2 (Control Valve Movement At Power)

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

2.6.7 **IF** "Test Failed" is "ON" **AND** CV3 remained closed perform the following:

A. Do **NOT** select "Abort CV3 & CV4 Test"

B. Notify WCC & Engineering that the (FASV) for the Control Valve under test is stuck in the energized state

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

C. Monitor Turbine Vibrations closely if in this abnormal state

2.6.8 Perform **EITHER** for CV3:

A. Verify "Test Successful" indicated for CV3

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

2.6.9 Perform **EITHER** for CV4:

A. Verify "Test Successful" indicated for CV4

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

This event is complete when the Standby EHC pump switch is placed in AUTO (step 2.9.5), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **1** Page 3 of 3

Event Description: **Turbine Control Valve Movement PT (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior

PT/1/A/0290/003

Crew response:

PT/1/A/0290/003 Encl 13.2 (Control Valve Movement At Power)

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

2.6.10 Verify CV3 test indicator reset

2.6.11 Verify CV4 test indicator reset

2.6.12 Verify CV3 within ± 5.0% of pretest position

2.6.13 Verify CV4 within ± 5.0% of pretest position

2.6.14 Perform the following:

☐ Verify acceptance criteria met

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

Examiner Note: Steps 2.7 and 2.8 are not applicable.

2.9 Perform the following:

2.9.1 Ensure all Turbine Bypass Valves CLOSED

2.9.2 Verify CV-4 returns to its expected pre-test position (Reference step 2.4.1 or Encl 13.1 step 2.3.1)

Examiner Note: CV-4 should return to ≈ 4% open.

2.9.3 Ensure the following:
- 1A Turbine Bypass Valve AUTO
- 1B Turbine Bypass Valve AUTO

2.9.4 Stop Standby EHC pump

2.9.5 Place Standby EHC pump control switch to "AUTO"

2.9.6 **IF** required, make the following plant page announcement: "Personnel can re-enter the Unit 1 Turbine Building"

This event is complete when the Standby EHC pump switch is placed in AUTO (step 2.9.5), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **2** Page 1 of 2

Event Description: **CCW Emergency Discharge Level Low (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	**Plant response:** • OAC alarm CCW EMER DISCHARGE LEVEL LOW **Crew response:** The BOP will refer to OAC alarm response *OAC Alarm* **OAC alarm CCW EMER DISCHARGE LEVEL LOW** 1. Reprime ECCW per OP/1/A/1104/012 (CCW System) ***Booth Cue:*** ***If contacted as Unit 2 and/or Unit 3 about OAC alarm for CCW EMER DISCHARGE LEVEL LOW, state that the alarm indicates LOW.***
	BOP	*OP/1/A/1104/012 Encl 4.4* **OP/1/A/1104/012 (CCW System) Encl 4.4 (Repriming Condenser Emergency Discharge Line)** rev 82 Initial Conditions 1.1 Verify CCW System in service 1.2 Review Limits and Precautions Procedure 2.1 Ensure closed CCW-8 (EMERGENCY CCW DISCHARGE TO TAILRACE) 2.2 Open 1DP-F5C (CCW-8 Bkr (Emerg CCW Disch To Tailrace)) 2.3 Open 1CCW 1-6 (WATERBOX EMERG DISCH) 2.4 Throttle open CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE CANAL) to provide vent path

This event is complete when Step 2.6 is complete (CCW-8 Breaker is closed), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **2** Page 2 of 2

Event Description: **CCW Emergency Discharge Level Low (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	***OP/1/A/1104/012*** **Crew response:** **OP/1/A/1104/012 (CCW System) Encl 4.4 (Repriming Condenser Emergency Discharge Line)** **NOTE:** Any units' O*D2673 point is acceptable to verify ECCW discharge piping full. 2.5 **WHEN** OAC indicates line is primed **OR** after 30 minutes: 2.5.1 Close CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE CANAL) 2.5.2 Close 1CCW 1-6 (WATERBOX EMERG DISCH) 2.5.3 **IF** OAC available, verify by OAC indication the following valves are closed: • 1CCW-1 (CCW 1A1 Emer Disch) (CP O1D0299) • 1CCW-2 (CCW 1A2 Emer Disch) (CP O1D0301) • 1CCW-3 (CCW 1B1 Emer Disch) (CP O1D0303) • 1CCW-4 (CCW 1B2 Emer Disch) (CP O1D0305) • 1CCW-5 (CCW 1C1 Emer Disch) (CP O1D0307) • 1CCW-6 (CCW 1C2 Emer Disch) (CP O1D0309) 2.5.4 **IF** OAC **NOT** available, verify locally the following valves are closed: (T-3, catwalk) **(N/A)** 2.6 Close 1DP-F5C (CCW-8 Bkr (Emerg CCW Disch To Tailrace))

This event is complete when Step 2.6 is complete (CCW-8 Breaker is closed), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **3** Page 1 of 2

Event Description: **PZR Level 1 Fails Low (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • 1SA-02/C-3 (RC Pressurizer Level High/Low) • 1SA-02/C-4 (RC Pressurizer Level Emerg High/Low) • PZR level 1 indicates 0 inches • 1HP-120 (RC Volume Control) throttles open • Makeup flow increases ***ARG 1SA-02/C-3*** **Crew response:** The BOP will refer to Statalarm 1SA-02/C-3 and/or 1SA-02/C-4
	BOP	**ARG 1SA-02/C-3** (RC Pressurizer Level High/Low) rev 33 3.1 Check alternate PZR level indications 3.2 Check for proper Makeup/Letdown flows and adjust to restore proper level 3.3 Refer to the following procedures as required: • AP/1/A/1700/002 (Excessive RCS Leakage) • AP/1/A/1700/014 (Loss of Normal HPI Makeup and/or RCP Seal Injection) • AP/1/A/1700/032 (Loss of Letdown) 3.4 Refer to Technical Specification 3.4.9 3.5 Refer to Technical Specification 3.3.8 3.6 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) ***ARG 1SA-02/C-4***
	BOP	**ARG 1SA-02/C-4** (RC Pressurizer Level Emerg High/Low) rev 33 3.1 Check alternate PZR level indications 3.2 Check for proper makeup/letdown flows and adjust to restore proper level 3.3 Refer to AP/1/A/1700/002 (Excessive RCS Leakage) and/or AP/1/A/1700/014 (Loss of Normal HPI Makeup and/or RCP Seal Injection) for additional instructions 3.4 **IF** PZR level decreases to less than 80", verify PZR heaters have deenergized, **IF NOT**, do so manually

This event is complete when PZR level 2 or PZR level 3 is selected, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **3** Page 2 of 2

Event Description: **PZR Level 1 Fails Low (I: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		OP/1/A/1105/014 **Crew response:** ***Examiner Note:*** ***The SRO may direct the BOP to select Pressurizer level 2 or level 3 (located on 1UB1) prior to referencing OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).*** ***Examiner Note:*** ***The SRO may direct the BOP to take manual control of 1HP-120 to control pressurizer level prior to referencing OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).*** **OP/1/A/1105/014 Encl 4.11** (SASS Information) rev 42 3.2 SASS (Smart Automatic Signal Selector) Manual Operation 3.2.1 **IF** "MISMATCH" light is on and "TRIP 'A'" or "TRIP 'B'" light is on, a SASS trip has occurred A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8) B. Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8) 3.2.2 **IF** "MISMATCH" light is on, a mismatch has occurred: A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8) B. Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8) 3.2.3 Initiate a Work Request to repair faulty signal

This event is complete when PZR level 2 or PZR level 3 is selected, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **4** Page 1 of 5

Event Description: **Inadvertent ES Channel 3 Actuation (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	**Plant response:** • 1SA-01/C-10 (ES 3 TRIP) • 1A LPI Pump starts • 1LP-17 (1A LPI INJECTION) opens • 'C' LPSW Pump starts **Crew response:** • The crew will determine that the ES actuation is not valid • The SRO may direct the BOP to refer to ARG 1SA-01/C-10 (ES 3 TRIP) • The SRO will enter AP/42 (Inadvertent ES Actuation) (**page 11**) *ARG 1SA-01/C-10* **ARG 1SA-01/C-10 (ES 3 TRIP)** rev 14 3.1 Determine if ES condition exists (RCS pressure ≤ 550 psig **OR** RB pressure ≥ 3.0 psig) 3.2 **IF** RCS pressure is ≤ 550 psig **OR** RB pressure is ≥ 3.0 psig, Go To EP/1/A/1800/001 (Emergency Operating Procedure) 3.3 **IF** ES condition does **NOT** exist, Initiate AP/1/A/1700/042 (Inadvertent ES Actuation) 3.4 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information)

This event is complete when the SRO reaches Step 4.26, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **4** Page 2 of 5

Event Description: **Inadvertent ES Channel 3 Actuation (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	OATC	***AP/1/A/1700/042*** **Crew response:** **AP/1/A/1700/042** (Inadvertent ES Actuation) rev 04 4.1 Verify any of the following have inadvertently actuated: **(N/A)** __ Diverse HPI __ ES Channel 1 __ ES Channel 2 **RNO: GO TO** Step 4.4 4.4 Verify any of the following have inadvertently actuated: **(N/A)** __ ES Channel 5 __ ES Channel 6 **RNO:** 1. **IF** ES Channel 1, ES Channel 2, or Diverse HPI have inadvertently actuated, **AND** it is desired to restore letdown, **THEN** initiate AP/42 Encl 5.2 (Letdown Restoration). **(N/A)** 2. **GO TO** Step 4.10 4.10 Close the following: __ 1HP-24 **(already closed)** __ 1HP-25 **(already closed)** **NOTE** If personnel are available, should continue while Encl 5.1 (Required Operator Actions) is in progress. 4.11 Ensure AP/42 Encl 5.1 (Required Operator Actions) is in progress (**page 13**) 4.12 Verify any of the following have inadvertently actuated: __ Diverse LPI **(not actuated)** __ ES Channel 3 __ ES Channel 4 **(not actuated)** 4.13 Verify Diverse LPI has inadvertently actuated **(N/A)** **RNO: GO TO** Step 4.15 4.15 Perform the following on all inadvertently actuated system(s): __ Ensure ES CH-3 is in MANUAL __ Ensure ES CH-4 is in MANUAL **(N/A)**

This event is complete when the SRO reaches Step 4.26, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **4** Page 3 of 5

Event Description: **Inadvertent ES Channel 3 Actuation (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	OATC	***AP/1/A/1700/042*** **Crew response:** **AP/1/A/1700/042** (Inadvertent ES Actuation) 4.16 Verify LPI was aligned in decay heat removal mode prior to ES actuation **RNO:** 1. Stop the following: __ 1A LPI PUMP __ 1B LPI PUMP **(not operating)** 2. Simultaneously close the following: __ 1LP-17 __ 1LP-18 **(already closed)** 4.17 Verify the Rx is critical 4.18 Verify ICS in Auto 4.19 Verify control rods are outside the desired control band **RNO:** **GO TO** Step 4.21 4.21 Verify any of the following have inadvertently actuated: __ ES Channel 1 **(not actuated)** __ Diverse HPI **(not actuated)** **RNO:** **GO TO** Step 4.24 4.24 Notify SPOC to investigate and repair the cause of the inadvertent ES actuation, as necessary 4.25 Initiate logging TS/SLC Entry/Exit, as applicable, in accordance with Encl 5.4 (TS/SLC Requirements) 4.26 **WHEN** all the following exist: __ Reason for inadvertent ES Channel or Diverse HPI/LPI actuation has been resolved __ ES Channel or Diverse HPI/LPI reset is desired __ OSM concurs **THEN** continue

This event is complete when the SRO reaches Step 4.26, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **4** Page 4 of 5

Event Description: **Inadvertent ES Channel 3 Actuation (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP	***AP/1/A/1700/042 Encl 5.1*** **Crew response:** **AP/1/A/1700/042 Enclosure 5.1** (Required Operator Actions) 1. Initiate announcement of AP Entry using the PA system **NOTE** If channels are bypassed or in override, 1SA-1/A-10 (ES 1 Trip) and 1SA-1/B-10 (ES 2 Trip) will be off even though the channel may have actuated. 2. Verify any of the following have inadvertently actuated: **RNO: GO TO** Step 5 5. Verify any of the following have inadvertently actuated: __ ES Channel 7 __ ES Channel 8 **RNO: GO TO** Step 9 9. Perform the following: A. Open the following to restore RB RIAs: __ 1PR-7 __ 1PR-8 __ 1PR-9 __ 1PR-10 ***Examiner Note: The SRO may elect to NOT stop the RB RIA sample pump to prevent inadvertently entering TS 3.4.15 since ES Channel 3 actuation does not isolated the RB RIAs.*** B. From the ENABLE CONTROLS screen on the RIA View Node, perform the following: 1) Select OFF for RB RIA sample pump 2) Start the RB RIA sample pump 10. Verify any of the following have inadvertently actuated: __ Diverse HPI __ ES Channel 1 **RNO: GO TO** Step 12 12. **EXIT** this enclosure

This event is complete when the SRO reaches Step 4.26, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **4** Page 5 of 5

Event Description: **Inadvertent ES Channel 3 Actuation (I: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	***Tech Specs*** **Crew response:** **TS 3.3.7 ESPS AUTOMATIC ACTUATION OUTPUT LOGIC CHANNELS** Condition A (1hour) Place associated component(s) in ES configuration **OR** (1 hour) Declare the associated component(s) inoperable **TS 3.7.7 LOW PRESSURE SERVICE WATER SYSTEM (LPSW)** Condition B (7 days) Restore the LPSW WPS to OPERABLE status If the RIA sample pump is turned off per AP/42 Encl 5.1 step 9, TS 3.4.15 Condition B will be entered while the sample pump is off. **TS 3.4.15 RCS LEAKAGE DETECTION INSTRUMENTATION** Condition B (Once per 24 hours) Analyze grab samples of the containment atmosphere **OR** (Once per 24 hour) Perform SR 3.4.13.1 **AND** Restore required containment atmosphere radioactivity monitor to OPERABLE status

This event is complete when the SRO reaches Step 4.26, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **5** Page 1 of 3

Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • FDW flow will ratio incorrectly based on the failure • "A" FDW flow will decrease causing "A" loop T_C to increase • "B" FDW flow will increase causing "B" loop T_C to decrease • This will cause actual ΔT_C to increase (become more positive). Failure to correctly adjust FDW flow will result in QPT alarms. • 1SA-02/B-5 (RC Cold Leg Diff. Temperature High) will actuate if actual ΔT_C increases to ± 5°F • 1SA-02/C-9 (MS STM GEN 'B' LEVEL High/Low) will actuate if 1B SG Operating Range Level reaches ≥ 86%
		Crew response: When the Statalarms are received, the crew should perform Plant Transient Response (PTR) to stabilize the plant • Diagnose the ΔT_C failure by observing the ΔT_C meter on 1UB1 • The OATC will place the Diamond and Feedwater Masters to MANUAL and re-ratio feedwater using the Loop T_C meters and/or OAC (RCS01) to return actual ΔT_C to near zero
	OATC	The OATC should: • Communicate to the CRS the initial alarm (if applicable) followed by reactor power level and direction • Place the appropriate ICS stations in manual (Diamond and both FDW Masters in this case) in manual if any of the following occur: o NI power increasing above the pre-transient power level o Failed instrument is diagnosed o Invalid input exists and the CRS directs the ICS be placed in manual • Remain focused on reactor power level and FDW response during the transient
	BOP	The BOP should: • Determine if a valid ICS runback exists and inform the CRS • Monitor plant response and verify operating limits NOT exceeded • If ICS is placed in Manual, remain focused on RCS pressure, SG outlet pressure and RCS inventory
	SRO	The SRO should: • Refer to AP/28 (ICS Instrument Failures) (**page 16**) • Ensure FIN-24 (SPOC) is contacted to repair the failed instrument

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **5** Page 2 of 3

Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/028*** **Crew response:** **AP/1/A/1700/028** (ICS Instrument Failures) rev 20 4.1 Provide control bands as required **(OMP 1-18 Attachment I)** ***OMP 1-18 Attachment I:*** ***1. Plant Conditions Stable or TPB ≤ Pre-transient Conditions*** ***1.1 The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required*** ***1.1.1 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%*** ***1.1.2 Current Tave ± 2°F*** ***1.1.3 Current SG Outlet Pressure ± 10 PSIG (N/A)*** ***1.1.4 Delta Tc 0°F ± 2°F*** 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

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **5** Page 3 of 3

Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/028*** **Crew response:** **AP/1/A/1700/028** (ICS Instrument Failures) 4.6 **GO TO** the applicable section per the following table:

√	Section	Failure
	4F	Delta Tc

AP/1/A/1700/028 Section 4F (Delta Tc Failure)

NOTE

- This Section applies to Delta Tc controller failures. Tc input signal failures are addressed in Section 4A

The following may occur when an ICS Delta Tc controller fails:

- Delta Tc controller may re-ratio loop feedwater flows
- Possible ICS RUNBACK

1. Ensure the following in HAND:
   __ 1A FDW MASTER
   __ 1B FDW MASTER
   __ DELTA Tc

CAUTION

Total feedwater flow should be maintained constant while individual loop flows are adjusted to establish the desired ΔTc. Maintaining total FDW flow constant will prevent unwanted changes in reactor power.

2. Re-ratio feedwater flow, as required, to establish desired DELTA Tc while maintaining total feedwater flow constant
3. Notify SPOC to perform the following:
   __ Investigate and repair the failed Delta Tc controller
4. **WHEN** notified by SPOC that Delta Tc controller has been repaired, **THEN GO TO** OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto)

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 1 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

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

AP/1/A/1700/001 (Unit Runback) 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)

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 2 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/001 Section 4H

Crew response:

AP/1/A/1700/001 Section 4H (Asymmetric Control Rod)

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

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 23**)

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.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 3 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/001 Section 4H

Crew response:

AP/1/A/1700/001 Section 4H (Asymmetric Control Rod)

8. Notify the OSM to ensure the requirements of the following Tech Specs are met: (**page 22**)
   __ 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 can NOT 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.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 4 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/001 Section 4H

Crew response:

AP/1/A/1700/001 Section 4H (Asymmetric Control Rod)

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.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 5 of 7

Event Description: **One Dropped Control Rod (R: 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 25) ***and Curve for Control Rod Position Setpoints, 1 Inoperable Rod, 4 Pump Flow, BOC to EOC from the COLR*** (Page 26).

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 6 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/001 Enclosure 5.1

Crew response:

AP/1/A/1700/001 Enclosure 5.1 (Control of Plant Equipment During Runback)

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.: **ILT16-2** Scenario No.: **2** Event No.: **6** Page 7 of 7

Event Description: **One Dropped Control Rod (R: OATC, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/001 Enclosure 5.1 **Crew response:** **AP/1/A/1700/001 Enclosure 5.1** (Control of Plant Equipment During Runback) 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: __ 1A MSRH DRN PUMP __ 1B MSRH DRN PUMP 18. Place the following in DUMP: __ 1HD-37 __ 1HD-52

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

Enclosure 13.18 *rev 75*

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.

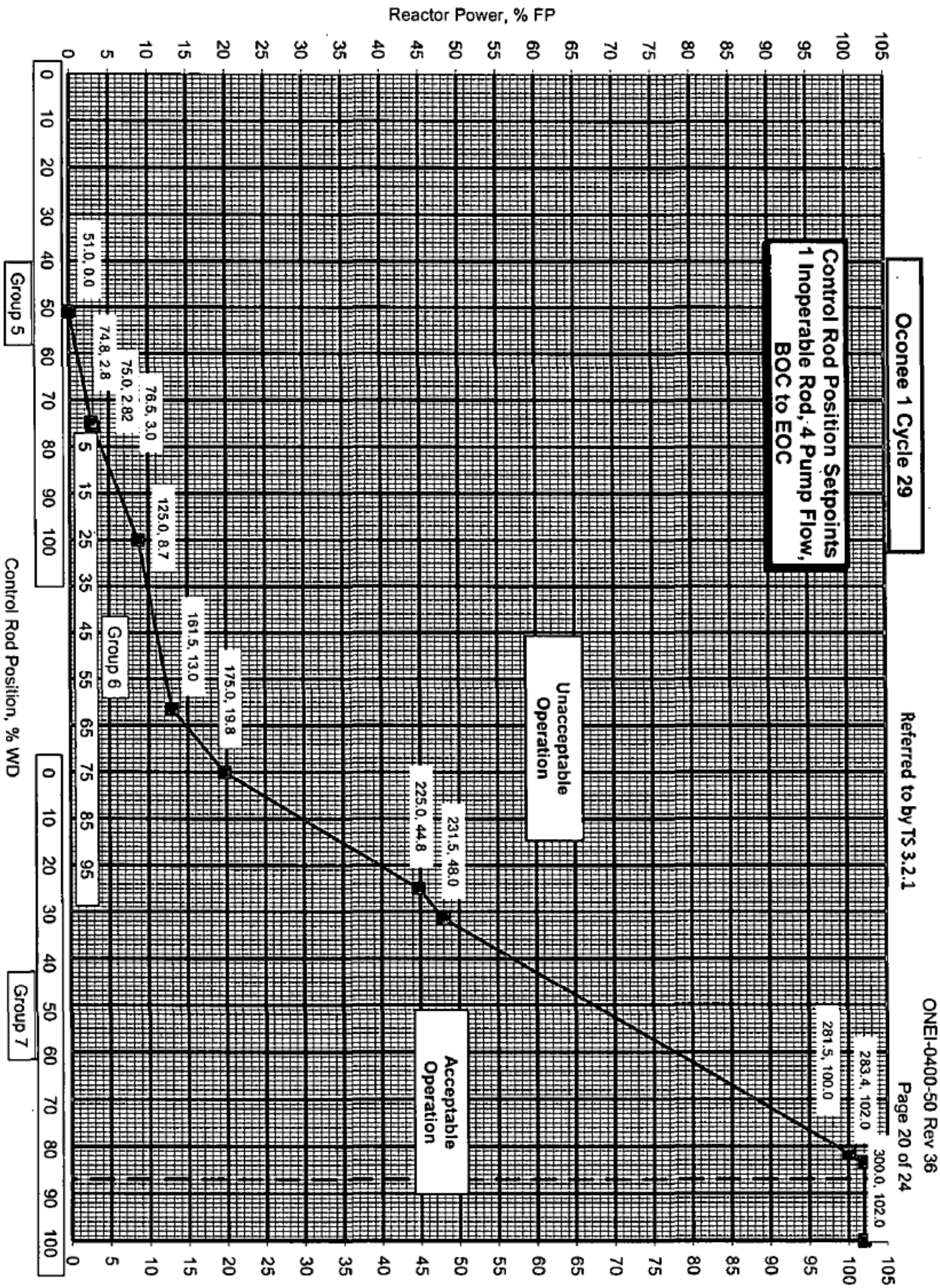
NOTE: For a dropped rod/stuck rod scenario, utilize the 1 inoperable rod graphs in the COLR. The rod position used should be the position of the controlling group (if the dropped/stuck rod is in the controlling group, the rod positions of the remaining rods in that group should be used, **NOT** the group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

OR

____ ____ 2.2.2 Appropriate actions are taken per TS 3.1.4, 3.1.5, and 3.2.1.
IV



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Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 1 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		Plant Response: • Statalarms 1SA-01/A-1, B-1, C-1, D-1 (RPS Channel A-D Trip) • 1SA-1/A-7, B-7, C-7, D-7 (RCP/Flux Trip) • 1TA lockout will occur. This will cause a loss of 6900V power to the 1A1 and 1B1 RCPs. RPS alarms will occur indicating that the Reactor should have tripped, but it will remain at power. The crew will attempt to manually trip the Reactor but it will not trip from the control room.
		Crew Response:
	OATC	Recognize the Reactor should have tripped and attempt to manually trip the Reactor in accordance with OMP 1-18 Attachment A (< 3 RCPs operating with Reactor power > 2%). Since the Reactor will not trip from the control room, the OATC will initiate Rule 1 while performing Immediate Manual Actions (IMAs) of the EOP.
		IMMEDIATE MANUAL ACTIONS
	OATC	3.1 Depress REACTOR TRIP pushbutton **[Reactor will NOT trip]** 3.2 Verify reactor power < 5% FP and decreasing **RNO: GO TO** Rule 1 (ATWS/Unanticipated Nuclear Power Production)
	BOP	The BOP will perform a symptom check.

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 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.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 2 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO ***CT-1***	***UNPP Tab*** **Crew response:** ***Examiner Note:*** ***Rule 1 will direct the OATC to notify the CRS to go to the UNPP tab*** **UNPP Tab** rev 0 1. Ensure Rule 1 (ATWS/Unanticipated Nuclear Power Production) is in progress or complete (**page 32**) 2. Verify Main FDW is operating and in AUTO **RNO:** **IF** Main FDW is operating in MANUAL, **THEN** adjust Main FDW flow, as necessary to control RCS temperature 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 **[the turbine will NOT trip from P/B]** 6. Verify all turbine stop valves closed ***RNO:*** *Place both EHC pumps in PULL TO LOCK* 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

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 3 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior

UNPP Tab

Crew response:

UNPP Tab

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

16. Secure makeup to LDST
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)

    __ 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 41**)
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 (**page 30**)

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

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 4 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		SUBSEQUENT ACTIONS Tab **Crew response:** **Subsequent Actions Tab** rev 01 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) 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 33**) 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.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 5 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		SUBSEQUENT ACTIONS Tab **Crew response:** **Subsequent Actions Tab** 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.

Op-Test No.: **ILT16-2** Scenario No.: **2** Event No.: **7** Page 6 of 6

Event Description: **ATWS (Loss of 1TA Switchgear) (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		RULE 1 **Crew response:** **Rule 1** OATC 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 28**) 5. Open: __ 1HP-24 __ 1HP-25 6. Ensure at least one operating: __ 1A HPI PUMP __ 1B HPI PUMP 7. Start 1C HPI PUMP 8. Open: __ 1HP-26 **[1HP-26 will NOT open]** __ 1HP-27 **RNO:** 1. **IF** 1HP-26 will **NOT** open, **THEN** open 1HP-410 2. **IF** at least two HPI pumps are operating, **AND** 1HP-27 will **NOT** open **THEN**: A. Start the standby HPI pump B. Stop 1C HPI pump C. Open 1HP-409 ***CT-2*** *9. Dispatch one operator without wearing Arc Flash PPE to open 600V CRD breakers:* *__ 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.

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** <u>two</u> Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** <u>all</u> 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 <u>both</u> 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.	
<u>NOTE</u> 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.	

• • • END • • •

Rule 6

HPI

HPI Pump Throttling Limits

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled ≤ 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.

CRITICAL TASKS

CT-1 Lockout EHC Pumps to trip the Main Turbine prior to entry into PTS conditions (cooldown to < 400°F at > 100°F/hour)

CT-2 Prior to exiting the UNPP tab, take the Reactor subcritical (i.e. < 1% power on WR NIs)

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: 97%	Mode: 1	Mode: 1
Gross MWE: 821	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	SLC 16.7.2

Shift Turnover Items (CR SRO)

Primary

- Due to unanalyzed condition, the SSF should be considered INOPERABLE for Unit 1 if power levels are reduced below 85%. Evaluations must be performed prior to declaring the SSF operable following a return to power (after going below 85%).
- 1RIA-3 and 5 removed from RB
- SASS is in Manual for calibration
- Rx power ≈ 97% stable and ready to perform PT/1/A/0290/003 (Turbine Valve Movement) Encl 13.2 for CV3 & CV4 only.
- PT/1/A/0290/003 Encl 13.2 (Control Valve Movement At Power) is in progress and complete up to Step 2.5 to test CV3 & CV4
- Unit 1 will be maintaining 97% until Rx Engineering updates the maneuvering plan

Secondary

- AMSAC/DSS bypassed for calibration
- Unit 2 is supplying the AS header
- 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: 89% 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:

- SASS is in Manual
- AMSAC/DSS is bypassed
- OP/1/A/1106/002B Encl 4.13 in progress to restore 1B Main FDW Pump from Handjack

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AMSAC/DSS Bypassed
0b	Override		SASS in Manual
1		N: BOP, SRO	Restore 1B Main FDW Pump From Handjack
2	MPS090	C: OATC, SRO	1HP-120 Fails Closed
3	Override	C: BOP, SRO	1D1 HDP Low Oil Level (Auto Power Decrease)
4	MCS004	I: OATC, SRO	Controlling NR Tave Fails High
5	Override	C: BOP, SRO **(TS)**	1A2 RCP High Oil Level
6		R: OATC, SRO	Manual Power Decrease
7	MEL170 Override	SRO **(TS)**	CT-1 Lockout
8	MEL090 MEL180 MSS330	M: ALL	`Switchyard Isolate • KHU-2 Emergency Lockout • TD EFDW Pump fails to start in Auto

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

SCENARIO 3 EVENT SUMMARY

Event 1: When the crew takes the shift, the SRO will direct the BOP to restore 1B Main FDW Pump from Handjack. Once proper operation of the FDW Pump Motor Gear Unit is verified, the 1B Main FDW Pump will be placed in automatic.

Event 2: 1HP-120 will fail closed which will cause RCS makeup to be lost. Pressurizer level will begin to decrease and Letdown Storage Tank level will begin to increase. Once the crew responds to the event and takes actions to stabilize RCS makeup and letdown, 1HP-120 will be repaired and the crew will place the valve back in automatic and restore normal operation.

Event 3: The 1D1 Heater Drain Pump (HDP) bearing temperatures will begin to increase due to low oil level. The OATC will perform a power decrease to ≤ 87% with ICS in automatic. The BOP will start 1A and 1B FDW Pump Seal Injection Pumps and Auxiliary Oil Pumps prior to securing the 1D1 HDP.

Event 4: Controlling Narrow Range Tave will fail high. FDW flow will increase and Control Rods will insert in an attempt to restore normal parameters. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. The OATC will decrease Feedwater flow and the BOP will insert Control Rods to restore the heat balance. Once the plant is stable, the SRO will enter AP/1/A/1700/028 (ICS Instrument Failures) and ensure the appropriate ICS stations are in manual and the BOP will perform an instrument surveillance for the failed instrument.

Event 5: The crew will receive alarms indicating high oil level in the 1A2 RCP Lower Oil Pot. The SRO will enter AP/1/A/1700/016 (Abnormal RCP Operation). Once the 1A2 RCP is secured, the OATC will be required to re-ratio FDW in order to stabilize the plant.

Event 6 The OATC will perform a manual power decrease to ≤ 70% prior to the BOP securing the 1A2 RCP.

Event 7: The CT-1 Transformer (Startup Transformer) will lockout causing PCB-17 and PCB-18 to trip open. This will require the SRO to enter TS 3.8.1.

Event 8: A Switchyard Isolation will occur and seconds later the Reactor will trip causing a Blackout. The SRO will enter the Blackout Tab of the EOP. The Turbine Driven Emergency Feedwater Pump (TD EFDWP) will not automatically start which will require an operator to manually start the pump to restore heat removal from the core. Power will be restored in accordance with EOP Enclosure 5.38 (Restoration of Power) from a Keowee Hydro Unit.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **1** Page 1 of 2

Event Description: **Restore 1B Main FDW Pump From Handjack (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***OP/1/A/1106/002 B Encl 4.13*** **Crew response:** SRO directs the BOP to restore 1B Main FDW Pump from Handjack per OP/1/A/1106/002 B Enclosure 4.13 **OP/1/A/1106/002 B Encl 4.13** (Taking 1B FDWPT Off Handjack) rev 39 **NOTE:** If both FDWPT(s) are in HAND changes in FDW valve ΔP can cause CTP to change 2.1 **IF** in Mode 1 **OR** Mode 2, perform the following: 2.1.1 **WHILE** enclosure 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) 2.2 Remove "T/O SHEET" CR tag from 1B MAIN FDW PUMP (ICS) station 2.3 Run 1B MAIN FDW PUMP (ICS) station to "HSS" (high speed stop) **NOTE:** Operator should locally verify Motor Gear Unit moves smoothly from low speed stop and back to high speed stop 2.4 Perform the following: 2.4.1 Establish communication with Operator at 1B FDWPT 2.4.2 Run 1B MAIN FDW PUMP (ICS) to low speed stop 2.4.3 Run 1B MAIN FDW PUMP (ICS) to high speed stop (≈ 1/8" from hard stop) 2.4.4 Verify Motor Gear Unit operated smoothly through entire operation ***Booth Cue: When asked, state that the MGU operated smoothly through the entire operation.*** 2.5 Turn 1B FDWP HANDJACK switch to "OFF"

This event is complete when the 1B Main FDW Pump is placed in Auto (Step 2.15), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **1** Page 2 of 2

Event Description: **Restore 1B Main FDW Pump From Handjack (N: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***OP/1/A/1106/002 B Encl 4.13*** **Crew response:** **OP/1/A/1106/002 B Encl 4.13** **NOTE:** Changes in FDW valve ΔP will cause swings in CTP. Decreases in FDW valve ΔP will cause CTP to decrease 2.6 **IF** Unit 1 is in Mode 1 or 2 **AND** both FDWPT ICS stations are in "HAND" **(N/A)** **NOTE:** • Motor Gear Unit control indicated by FDWPT speed and/or suction flow decreasing • Two successful decreases verifies control with Motor Gear Unit 2.7 Decrease 1B MAIN FDW PUMP (ICS) until 1B FDWPT controlled by 1B MAIN FDW PUMP (ICS) station 2.8 Increase 1B FDWP Motor Speed Changer 2.9 Verify 1B FDWPT speed does **NOT** increase 2.10 Position 1B FDWP MOTOR SPEED CHANGER to 'FR' under "RAISE" until 1B FDWP MOTOR SPEED CHANGER is at "HSS" 2.11 After 1B FDWP MOTOR SPEED CHANGER reaches "HSS", hold 1B FDWP MOTOR SPEED CHANGER switch in 'FR' for 3 to 5 seconds to make all contacts 2.12 **IF** Unit 1 is in Mode 3: **(N/A)** 2.13 **IF** Unit 1 is in Mode 1 or 2 with 1A FDWPT shutdown: **(N/A)** **NOTE:** Changes in FDW valve ΔP will cause swings in CTP. Decreases in FDW valve ΔP will cause CTP to decrease 2.14 **IF** Unit 1 is in Mode 1 or 2 with 1A FDWPT operating but **NOT** in auto: **(N/A)** 2.15 **IF** Unit 1 is in Mode 1 or 2 with 1A FDWPT in auto: 2.15.1 Verify 1A MAIN FDW PUMP (ICS) in "AUTO" 2.15.2 Place 1B MAIN FDW PUMP (ICS) in "AUTO" 2.15.3 Verify ICS adjusts 1B FDWPT speed to balance suction flow 2.16 **IF** required, remove Turnover Sheet note for control of 1B FDWPT with Motor Speed Changer

This event is complete when the 1B Main FDW Pump is placed in Auto (Step 2.15), or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **2** Page 1 of 4

Event Description: **1HP-120 Fails Closed (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		Booth Cue: ***When directed by the Lead Examiner, call as the WCC SRO and request Battery 1CA voltage located on 1EB6. If asked, I&E needs the reading for data trending.***
		Plant Response:
		• RCS makeup flow goes to ≈ 8 – 10 gpm (HPI Warming Flow) • PZR level begins to decrease • LDST level begins to increase • Valve position demand for 1HP-120 will increase to the 100% demand value and valve position indication will indicate closed (green light) • 1SA-02/ B-1 (HP LETDOWN TANK LEVEL HIGH/LOW) will illuminate after several minutes
	SRO	**Crew Response:**
		Examiner Note: ***If the 1HP-120 failure is recognized before the LDST Statalarm actuates, the SRO will make a direct entry into AP/14 (next page). Otherwise the crew may perform the ARG and OP below and enter AP/14 when the SRO determines the entry conditions are met.***
	BOP	***ARG 1SA-02/B-1*** The crew may refer to ARG 1SA-02/B-1 (HP LETDOWN TANK LEVEL HIGH/LOW) and perform the required actions. rev 33 3.1 Instrument Failed: 3.1.1 Compare alternate channels to verify alarm validity: • O1A1042 LDST LEVEL 1 • O1A1043 LDST LEVEL 2 3.2 Verify LDST pressure does not exceed LDST level/pressure operability requirement per OP/0/A/1108/001 (Curves and General Information). 3.3 **IF** High Level alarm is received: 3.3.1 Bleed as required by OP/1/A/1103/004 (Soluble Poison Concentration Control).

This event is complete when Step 4.186 of AP/14 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **2** Page 2 of 4

Event Description: **1HP-120 Fails Closed (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***OP/1/A/1103/004*** **Crew Response:** ***Examiner Note: The crew may perform Enclosure 4.8 as necessary to reduce inventory. Enclosure 4.6 is performed to makeup/batch.*** **OP/1/A/1103/004 Enclosure 4.8** (Reducing RCS Inventory) rev 105 2.1 Verify HPI System operating 2.2 Ensure open 1CS-26 (LETDOWN TO RC BHUT) 2.3 Ensure open 1CS-41 (1A RC BHUT INLET) 2.4 Position 1HP-14 (LDST BYPASS) to "BLEED" 2.5 **WHEN** desired LDST level achieved, position 1HP-14 to "NORMAL" ***Examiner Note: The crew may initiate EOP Encl 5.5 for RCS inventory control due LDST level increase (page 48)*** ***AP/1/A/1700/014*** **AP/1/A/1700/014** (Loss of Normal Makeup and/or RCP Seal Injection) rev 18 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 4.7 Announce AP entry using PA System 4.8 Verify any HPI pump operating

This event is complete when Step 4.186 of AP/14 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **2** Page 3 of 4

Event Description: **1HP-120 Fails Closed (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/014*** **Crew Response:** **AP/1/A/1700/014** 4.9 Verify RCP seal injection or HPI makeup line leak indicated by any of the following: • Report of line leak • Abnormal LDST level decrease • 1RIA-32 (AUX BLDG GAS) • 1RIA-45 (NORM VENT GAS) • RB RIAs in alarm • Abnormal RBNS level increase • Abnormal LAWT or HAWT level increase **RNO: GO TO** Step 4.11 4.11 Verify RCP seal injection flow exists to any RCP 4.12 Verify 1HP-120 operable in AUTO **RNO:** 1. Attempt to operate 1HP-120 in HAND **(will NOT operate)** 2. **IF** 1HP-120 fails to operate, **THEN GO TO** Step 4.176 4.176 Perform the following as necessary to maintain Pzr level > 200" • Close 1HP-6 • Throttle 1HP-7 • Throttle 1HP-26 4.177 Place 1HP-120 in HAND and close 4.178 Notify SPOC to investigate and repair 1HP-120 4.179 **WHEN** 1HP-120 is repaired, **THEN** slowly re-establish flow through 1HP-120 ***Examiner Note: 1HP-120 will be repaired after ≈ 15 minutes and prior to Event 4.***

This event is complete when Step 4.186 of AP/14 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **2** Page 4 of 4

Event Description: **1HP-120 Fails Closed (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/014*** **Crew Response:** 4.180 Place 1HP-120 in AUTO 4.181 Close 1HP-26 4.182 Verify 1HP-122 (RC VOLUME CONTROL BYPASS) throttled **RNO: GO TO** Step 4.184 4.184 Verify 1HP-5 open ***Examiner Note: 1HP-6 may be open or closed based on the actions taken in Step 4.176*** 4.185 Verify 1HP-6 open **RNO:** 1. Throttle 1HP-7 for ≈ 20 gpm letdown flow 2. Open 1HP-6 4.186 Adjust 1HP-7 for desired letdown 4.187 **WHEN** conditions permit, **THEN EXIT** this procedure

This event is complete when Step 4.186 of AP/14 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **3** Page 1 of 5

Event Description: **1D1 HDP Low Oil Level (Auto Power Decrease) (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • OAC alarm HDP 1D1 Thrust Bearing Temp Hi • OAC alarm HDP 1D1 MTR Lower Bearing Temp Hi-Hi **Crew response:** Refer to the OAC Alarm Response: • Remove the pump from service per OP/1/A/1106/002 D (HDP Operation) The SRO will enter AP/1/A/1700/029 to reduce Reactor power ≤ 87% to secure the 1D1 Heater Drain Pump (**page 10**) ***Booth Cue: If an AO is sent to look at the HDP, report as an AO, that the lower oil sight glass of the 1D1 HDP is empty. The oil has been contained in the HDP sump and cleanup is in progress.***
	SRO	SRO should direct BOP to secure the 1D1 HDP once Reactor power has been reduced to ≤ 87%. FIN-24 (SPOC) should be notified to investigate and repair the oil leak.
	BOP/SRO	***OP/1/A/1106/002D*** The BOP should secure the 1D1 HDP per OP/1/A/1106/002 D Enclosure 4.4 (Shutdown of 1D1 HDP) rev 13 2.1 Verify CTP DEMAND ≤ 87% 3.1 Stop 1D1 HTR DRN PUMP 3.2 Verify 1HD-190 (1D1 Flash Tank Emer Level Control) opens by observing computer indication (O1D2092) 3.3 Verify 1HD-208 (1D1 HDP RECIRC) switch in "AUTO" 3.4 **IF** 1D1 HD pump breaker is no longer required, rack out 1TE-7 (1D1 Heater Drain Tank Pump Mtr) **Note: The SRO may determine that tagging the 1D1 HDP breaker is not required at this time** **Note: The SRO may refer to RP/0/A/1000/017 (Spill Response)** ***Booth Cue: If asked, Unit 2 will implement RP/0/A/1000/017 (Spill Response)***
This event is complete when the 1D1 HDP has been secured and 1HP-120 has been returned to AUTO, or when directed by the Lead Examiner.		

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **3** Page 2 of 5

Event Description: **1D1 HDP Low Oil Level (Auto Power Decrease) (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/029*** **Crew response:** **AP/1/A/1700/029** (Rapid Unit Shutdown) rev 13 4.1 Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown) (**page 12**) 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 4.5 Deselect MAXIMUM RUNBACK **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

This event is complete when the 1D1 HDP has been secured and 1HP-120 has been returned to AUTO, or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **3** Page 3 of 5

Event Description: **1D1 HDP Low Oil Level (Auto Power Decrease) (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/029*** **Crew response:** 4.8 Verify ICS in AUTO 4.9 Depress MAXIMUM RUNBACK 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: If Reactor power is reduced below 85% during this event, TS 3.10.1 will apply.***
	SRO	***TS 3.10.1 STANDBY SHUTDOWN FACILITY*** ***Conditions A-E are applicable due to Reactor power being < 85% which makes the SSF inoperable*** ***Required Action: Restore SSF systems to OPERABLE status (7 days)*** ***BOOTH CUE: After ≈ 15 minutes and prior to Event 4, call as FIN24 and notify the crew that 1HP-120 had an air line fitting leak. The fitting was tightened and the leak is repaired. 1HP-120 can be placed back in service.***

This event is complete when the 1D1 HDP has been secured and 1HP-120 has been returned to AUTO, or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **3** Page 4 of 5

Event Description: **1D1 HDP Low Oil Level (Auto Power Decrease) (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/029 Enclosure 5.1*** **Crew response:** **AP/29 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 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

This event is complete when the 1D1 HDP has been secured and 1HP-120 has been returned to AUTO, or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **3** Page 5 of 5

Event Description: **1D1 HDP Low Oil Level (Auto Power Decrease) (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/029 Enclosure 5.1 **Crew response:** **AP/29 Enclosure 5.1** (Support Actions During Rapid Unit Shutdown) 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 the 1D1 HDP has been secured and 1HP-120 has been returned to AUTO, or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **4** Page 1 of 4

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • Controlling NR Tave digital display reads ≈ 586°F • Controlling Tave Chessell display reads ≈ 586°F • 1SA-2/A-12 (ICS Tracking) • 1SA-2/C-11 (ICS Loss of OAC CTP Signal) • Control Rods will insert and FDW flow will increase • RCS pressure will decrease ***Examiner Note: If Reactor power decreases below 85% during this event, the SRO will enter Tech Spec 3.10.1 Conditions A-E which all have a 7 day completion time (SSF OOS).*** **Crew response:** When the Statalarms are received, the crew should perform Plant Transient Response (PTR) to stabilize the plant
	OATC	The OATC should: • Communicate to the CRS the initial alarm (if applicable) followed by reactor power level and direction
	CT-1	• Place the appropriate ICS stations in manual (Diamond and both FDW Masters in this case) in manual if any of the following occur: o NI power increasing above the pre-transient power level o Failed instrument is diagnosed o Invalid input exists and the CRS directs the ICS be placed in manual • Remain focused on reactor power level and FDW response during the transient ***Examiner Note: The OATC will have to reduce FDW in order to stabilize power below the pre-transient level.***
	BOP	The BOP should: • Determine if a valid ICS runback exists and inform the CRS • Monitor plant response and verify operating limits NOT exceeded • If ICS is placed in Manual, remain focused on RCS pressure, SG outlet pressure and RCS inventory
	SRO	The SRO should: • Refer to AP/28 (ICS Instrument Failures) (**page 15**) • Ensure FIN-24 (SPOC) is contacted to repair the failed instrument

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **4** Page 2 of 4

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/028*** **Crew response:** **AP/1/A/1700/028** (ICS Instrument Failures) rev 20 4.1 Provide control bands as required **(OMP 1-18 Attachment I)** ***OMP 1-18 Attachment I:*** ***1. Plant Conditions Stable or TPB ≤ Pre-transient Conditions*** ***1.1 The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required*** ***1.1.1 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%*** ***1.1.2 Current Tave ± 2°F*** ***1.1.3 Current SG Outlet Pressure ± 10 PSIG (N/A)*** ***1.1.4 Delta Tc 0°F ± 2°F*** 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

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **4** Page 3 of 4

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/028*** **Crew response:** **AP/1/A/1700/028** (ICS Instrument Failures) 4.6 **GO TO** the applicable section per the following table:

√	Section	Failure
	4A	RCS Temperature

AP/1/A/1700/028 Section 4A

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

1. Ensure the following in HAND:
   __ 1A FDW MASTER
   __ 1B FDW MASTER
2. Ensure DIAMOND in MANUAL

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **4** Page 4 of 4

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/028 Section 4A*** **Crew response:** 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 ***Examiner Note:*** ***This step will require the BOP to refer to Table 1 (RCS Temperature) of Enclosure 5.2 (next page) and determine if the surveillance for SR 3.4.1.2 can be met as it is written with the failed temperature instrument. Based on plant response to the failure the BOP will determine either:*** ***1. The surveillance is not required to be met due to plant conditions (not steady state)*** ***2. The surveillance can be met as written*** ***3. The surveillance can NOT be met as written*** ***This information will be reported to the SRO when asked in Step 5.*** 5. Verify instrumentation surveillance in Encl. 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written 6. **WHEN** notified by SPOC that a valid RCS Tave and Delta Tc input have been restored to ICS, **THEN GO TO** OP/1/A/1102/004 A Encl. (Placing ICS Stations To Auto)

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

Enclosure 5.2

ICS Instrument Surveillances {4}

Table 1 - RCS Temperature

	COMPONENT	✓	COMPUTER	REQUIRED CONDITIONS
SR 3.4.1.2 12 Hours	RCS Pressure, Temperature, and Flow DNB Limits		O1P1888 O1P1889	**IF** in MODE 1 Steady State Operation, verify RCS loop average temperature: As read on OAC: ΔTc,°F 4 RCP Op 3 RCP Op 0 < 580.0 < 580.0 1 < 580.4 < 580.2 2 < 580.8 < 580.4 3 < 581.1 < 580.7 4 < 581.5 < 580.9 5 < 581.9 < 581.1 As read on Dixson indication (OAC unavailable): ΔTc,°F 4 RCP Op 3 RCP Op 0 < 579.5 < 579.5 1 < 579.9 < 579.7 2 < 580.3 < 579.9 3 < 580.6 < 580.2 4 < 581.0 < 580.4 5 < 581.4 < 580.6 Steady State Operation is defined as operation within a 4% (e.g., 88% - 92% RTP) power band for ≥ 4 hours. When only 3 RCPs operating, limits applied to loop with lowest loop average temperature for the condition where ΔTc Setpoint is "0" per the COLR.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 1 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	**Plant response:** • OAC alarm RCP 1A2 MTR LOWER OIL POT LEVEL **Crew response:** The BOP will refer to OAC alarm response guide for 1A2 RCP high oil level 1. If RCP operating and RCP was not started in the past 6 hours, GO TO AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation) ***AP/1/A/1700/016*** **AP/1/A/1700/016** (Abnormal RCP Operation) rev 34 4.1 **IAAT** any RCP meets immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria), **THEN** perform Steps 4.2 - 4.11 **RNO: GO TO** Step 4.12 ***Examiner Note: In step 4.12, the crew may conservatively decide to secure the RCP because the oil pot level is threatening to go off-scale high. If so, they will proceed to step 4.13 (page 23) and will not end up in Section 4C. Either procedure path is acceptable.*** 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 (**page 23**) **RNO: GO TO** Step 4.16 4.16 Announce AP entry using the PA system 4.17 Notify OSM to request evaluation by RCP Component Engineer

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 2 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/016*** **Crew response:** 4.18 **IAAT** the failure is identified, **THEN GO TO** the applicable section per the following table:

√	Section	Failure
	4A	Seal Failure
	4B	Abnormal Vibration
	4C	**High or Low Oil Pot Level**
	4D	Loss of Seal Return
	4E	Abnormal RCP Temperatures

AP/1/A/1700/016 Section 4C

AP/1/A/1700/016 Section 4C (High or Low Oil Pot Level)

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

12 Start trending RCP oil pot levels (Turn-on Code "unitpump"RCPT3, example 1A2RCPT3)

NOTE

- RCP oil pot level indication range is +1.5 to -1.5 inches
- RCP motor oil pot temperatures and RCP motor guide bearing temperatures may be used to validate low oil pot level

13 **IAAT** oil pot level threatens to go off scale high or low for an operating RCP, **THEN** perform Steps 14 - 24

14 Verify MODE 1 or 2

15 Verify three RCPs will remain operating after affected RCP is tripped

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 3 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/016 Section 4C*** **Crew response:** **AP/1/A/1700/016 Section 4C** 16. Verify Rx power is ≤ 70% as indicated on all NIs **RNO:** 1. Direct an RO to initiate Encl 5.2 (Rapid Power Reduction) (**page 29**) 2. **WHEN** Rx power is ≤ 70% on all NIs, **THEN** continue this procedure 17. Verify any SG on Low Level Limits **RNO:** **GO TO** Step 20 20. Verify FDW Masters in Auto **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity **RNO:** 1. Stop the affected RCP 2. Manually adjust FDW masters to achieve desired ΔTc 3. **GO TO** Step 23 23. Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power) (**page 26**) 24. Make 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

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 4 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	*AP/1/A/1700/016 Section 4C* **Crew response:** **AP/1/A/1700/016 Section 4C** 25 **IAAT** an RB fire exists, **THEN** perform Steps 26 - 29 **RNO: GO TO** Step 30 30 **IAAT** either of the following conditions is met: __ a RCP with low oil level has been shut down for ≥ 3 hours __ **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) 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 **WHEN** conditions permit, **THEN EXIT** this procedure.

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 5 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/016*** **Alternate path from Step 4.12** **Crew response:** ***Examiner Note:*** ***If the crew determines that It is desired to secure the 1A2 RCP in Step 4.12 due to oil levels going off-scale high, below lists the procedure path to secure the 1A2 RCP.*** 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 4.13 Verify Rx Power > 70% 4.14 Initiate Encl 5.2 (Rapid Power Reduction) (**page 29**) 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 4.8 Verify FDW masters in Auto **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity **RNO:** 1. Stop the affected RCP 2. Manually adjust FDW masters to achieve desired ΔTc 3. **GO TO** Step 4.29

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 6 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/016*** **Alternate path from Step 4.12** **Crew response:** **AP/1/A/1700/016** 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) 4.31 **IAAT** either of the following conditions is met: __ a RCP has been shut down for ≥ 3 hours __ **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

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 7 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***AP/1/A/1700/016*** **Alternate path from Step 4.12** **Crew response:** **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 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 **RNO: GO TO** Step 4.39 4.39 **WHEN** conditions permit, **THEN EXIT** this procedure

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 8 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***OP/1/A/1102/004 Encl 4.3*** **Crew response:** **OP/1/A/1102/004 (Operations At Power) Encl 4.3 (Special Instructions For < 4 RCP Operations)** Rev 148 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 2.2 Perform **one** of the following: (Continue) • Ensure TS 3.4.4 Condition A entered when fourth RCP secured • Verify the following: __ O1E4021 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4022 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4023 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4024 (1A RPS Var Flux Trip Value) set at 79.75% **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 2.3 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

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 9 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***OP/1/A/1102/004 Encl 4.3*** **Crew response:** **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 2.5 **IF** NI calibration **NOT** within requirements of Limit and Precaution Step 2.2.6, calibrate NIs to Thermal Power Best 2.6 Perform the following per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions): 2.6.1 Notify I&E to reset RPS Overpower High Trip Setpoint for three RCP Operation _____ _____ Person Notified Date 2.6.2 **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 _____ _____ Person Notified Date **NOTE:** The Maximum Allowed Power Setpoint (Pmax) is reduced when operating for extended periods when only three RCPs operating as a conservative action. 2.6.3 **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 _____ _____ Person Notified Date 2.7 **IF AT ANY TIME** notified by I&E that RPS Overpower High Trip Setpoint adjusted for three RCP Operation, perform the following: 2.7.1 Verify the following: __ O1E4021 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4022 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4023 (1A RPS Var Flux Trip Value) set at 79.75% __ O1E4024 (1A RPS Var Flux Trip Value) set at 79.75% 2.7.2 Evaluate exiting TS 3.4.4 condition A

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **5** Page 10 of 10

Event Description: **1A2 RCP High Oil Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	***OP/1/A/1102/004 Encl 4.3*** **Crew response:** 2.8 Initiate review of PT/1/A/0600/001 (Periodic Instrument Surveillance) to determine if any limits approached **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). 2.9 Adjust high flux alarm setpoint per Operations Management/Reactor Engineering Group recommendations. (Alarm setpoint is adjusted on the NI Recorder) **NOTE:** 'D' bleed pressure may **NOT** be high enough to run the FDWP turbines. 2.10 Maintain Auxiliary Steam available to the FDWP turbines. 2.11 **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 **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. 2.12 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"

This event is complete when the 1A2 RCP has been secured and ΔTc is 0 ± 2°F, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **6** Page 1 of 1

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

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	***AP/1/A/1700/016 Encl 5.2*** **Crew response:** The OATC will perform AP/1/A/1700/016 Encl 5.2 (Rapid Power Reduction) to reduce Reactor power < 70% to secure the 1A2 RCP **AP/1/A/1700/016 Enclosure 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 **RNO:** 1. Notify SRO to provide target power level, average power reduction rate, and control bands, as required 2. Initiate manual power reduction to ≤ 70% 3. **WHEN** Rx Power ≤ 70% as indicated by all NIs, **THEN** notify CR SRO 4. Stop the following pumps: __ 1E1 HTR DRN PUMP __ 1E2 HTR DRN PUMP 5. **GO TO** Step 7 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

This event is complete when Rx power is < 70% on all NIs, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **7** Page 1 of 1

Event Description: **CT-1 Lockout (SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • 1SA-15/C-2 (EL SU SOURCE VOLT MONIT LOGIC UNDERVOLTAGE) • SA-3/B-4 (Oconee White Startup Transformer CT1 Tie PCB 17) • SA-3/C-4 (Startup Transformer CT1 PCB 18) • CT-1 transformer will be de-energized • PCB-17 and PCB-18 will trip open **Crew response:**
	BOP	The BOP will refer to Statalarm 1SA-15/C-2 3.1 **IF** the start-up source was carrying the unit load **AND** the start-up breakers tripped, verify that power is supplied from the standby source 3.2 Refer to EP/1/A/1800/001 (Emergency Operating Procedure) or AP/1/A/1700/011 (Recovery from Loss of Power) if required 3.3 **IF** only one phase trips, perform the following: **(N/A)** 3.4 Refer to TS 3.8.1 3.5 Return to the normal (preferable) or start-up source of power as soon as conditions permit ***Examiner Cue: If the crew trips the Reactor, Event 8 will auto actuate to initiate a Switchyard Isolation.*** ***Examiner Note: If the crew trips the Reactor, it will result in failure of a CT due to an unnecessary trip of the Reactor.*** ***Booth Cue: If asked, U2 will perform the operability check of Keowee Hydro Unit.***
	SRO	The SRO will refer to Tech Specs (**next page**) Not a CT. NUREG-1021 states that an "unintentional" Rx Trip is an example of a CT, not an "unnecessary" Rx Trip. Therefore, because no RPS setpts are encroached upon for this malfunction, simply misdiagnosing and then INTENTIONALLY tripping would not be failure of a CT.

This event is complete when the SRO has determined Tech Specs, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **7** Page 1 of 1

Event Description: **CT-1 Lockout (SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
		Crew response:
	SRO	The SRO will refer to Tech Specs
		TS 3.8.1 AC SOURCES – OPERATING ***Condition A*** ***(1 hour) Perform SR 3.8.1.3*** ***AND*** ***(12 hours) Align the emergency startup bus to share another unit's startup transformer*** ***AND*** ***(36 hours) Restore transformer to OPERABLE status and normal startup bus alignment*** ***OR*** ***(36 hours) Designate one unit sharing the startup transformer to be shutdown***

This event is complete when the SRO has determined Tech Specs, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 1 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • Switchyard Isolation occurs • RCS Pressure increases • Reactor will trip on RCS High Pressure (2345 psig) • When the Reactor trips, a loss of power will occur due to KHU-2 lockout and CT-1 lockout **Crew response:** • Crew may manually trip the reactor prior to reaching the RCS High Pressure setpoint • SRO will direct the OATC to perform IMAs and the BOP to perform a symptom check
		IMMEDIATE MANUAL ACTIONS
	SRO OATC	The SRO will direct the OATC to perform IMAs 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 **RNO: IF** CC is unavailable, **THEN** immediately: A. Stop all RCPs B. Notify CR SRO to initiate AP/25
		SYMPTOM CHECK
	SRO BOP	The SRO will direct the BOP to perform a Symptoms Check.

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 Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 2 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		Crew response: The SRO will direct the BOP to initiate AP/25 ***Examiner Note: When the BOP attempts to proceed to the SSF, inform him/her that a Unit 2 RO will perform AP/25 actions*** ***BLACKOUT TAB*** **Blackout Tab** rev 02 ***Examiner Note: When the Unit 2 CRS is notified to perform Unit 2 EOP Encl 5.42 (PSW Power and Pump Alignment), a booth instructor will enter the simulator to perform the enclosure. Performing this enclosure will have no effect on the outcome of the scenario.*** ***Examiner Note: If asked as Unit 2 to perform Parallel Actions Page steps for turning off lights and opening doors in the control room, respond that Unit 2 will perform the steps.*** 1. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete 2. Verify TDEFDWP feeding SGs 3. Direct RO to perform Encl 5.45 (PSW Feed and RCP Seals) to establish RCP seals (**page 44**) 4. Verify two ROs available to perform Control Room actions 5. Ensure Encl 5.45 (PSW Feed and RCP Seals) in progress or complete 6. Notify one RO to perform Encl 5.38 (Restoration of Power) (**page 42**) 7. Verify any: __ Any SG is being fed from Emergency FDW or PSW __ SSF or PSW is available to feed SGs 8. Verify both: __ Blackout exists on all three units __ PSW Power **NOT** available **RNO: GO TO** Step 10

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 3 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

BLACKOUT TAB

Crew response:

10. Verify RCS temperature ≥ 550°F

RNO: 1. Feed and steam available SGs, as necessary, to stabilize RCS P/T using one of the following:

__ TBVs

__ Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) to prepare to steam intact SGs

2. **GO TO** Step 13

11. Verify feeding SGs with TDEFDW pump

12. Feed available SGs as necessary to stabilize RCS P/T in bands prescribed by Rule 7 (SG Feed Control)

NOTE

- Feeding SGs with EFDW is desired above HPI Forced Cooling. If a feed source becomes available, step 13 should be performed prior to re-performing Rule 3
- 100 gpm could cause overcooling if adequate decay heat levels do **NOT** exist

13. **IAAT NO** SGs are being fed, **AND** any source of EFDW (Unit 1 or another unit) becomes available, **THEN** perform Steps 14 - 18

RNO: GO TO Step 19

NOTE

- The EFW system operation is expected to last 2 - 4 hours during a three unit blackout without PSW power
- If battery power is lost and PSW power is not available, EFDW control will be lost

19. **IAAT** the SSF or PSW is available to feed SGs, **AND** EFDW from any source is insufficient to maintain stable RCS P/T, **THEN** perform one of the following:

__ Notify SSF operator that feeding SGs with SSF ASW is required (SSF CR x-2766)

__ Initiate Encl 5.45 (PSW Feed and RCP Seals) and feed SGs with PSW

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 4 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		BLACKOUT TAB **Crew response:** 20. **IAAT** power is restored to any of the following: __ 1TC __ 1TD __ 1TE **THEN GO TO** Step 21 21. Ensure any SG is being fed or action is being taken per Step 13 22. Verify SSF activated 23. Communicate status of SG feed and seal injection to SSF operator using x-2766, radio, or plant page 24. Initiate AP/11 (Recovery from Loss of Power) (**page 38**) 25. **GO TO** Subsequent Actions tab (**page 36**) ***Examiner Note: The CRS may start over in the EOP when power is restored and re-perform IMAs and then transfer to Subsequent Actions. Either path is acceptable.***

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 5 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		SUBSEQUENT ACTIONS TAB **Crew response:** **Subsequent Actions Tab** 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) 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 48**) 2. **GO TO** Step 4.17 4.17 Open: __ PCB 20 __ PCB 21

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 6 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		SUBSEQUENT ACTIONS TAB **Crew response:** **Subsequent Actions Tab** 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 SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 7 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		AP/1/A/1700/011 **Crew response:** **AP/1/A/1700/011** (Recovery From Loss of Power) rev 55 4.1 Announce AP entry using OMP 1-18 placard 4.2 **IAAT** all exist: __ 1KI energized __ Pzr level > 80″ [180″ acc] __ Pzr heaters are desired **THEN** ensure Pzr heaters in AUTO 4.3 Verify load shed of inverters was performed per Unit 1 EOP Encl (Load Shed of Inverters During SBO) **RNO: GO TO** Step 4.9 4.9 Verify load shed has initiated as indicated by either of the following statalarms on: __ 1SA-15/D-4 (EL LOAD SHED CHNL A LOGIC INITIATE) __ 1SA-14/D-4 (EL LOAD SHED CHNL B LOGIC INITIATE) 4.10 Verify load shed is complete as indicated by LOAD SHED COMPLETE on any ES Channel (Channel 1 or 2) 4.11 Verify breakers closed: __ 1TC INCOMING FDR BUS 1 __ 1TC INCOMING FDR BUS 2 __ 1TD INCOMING FDR BUS 1 __ 1TD INCOMING FDR BUS 2 __ 1TE INCOMING FDR BUS 1 __ 1TE INCOMING FDR BUS 2 4.12 Verify 1SA-15/E-6 (EL SWYD ISOLATION CONFIRMED CHNL A LOGIC) is OFF **RNO: GO TO** Step 4.15 4.15 Verify any Oconee unit receiving power form its normal source (1T, 2T, 3T)

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 8 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

AP/1/A/1700/011

Crew response:

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

4.15 Verify any Oconee unit receiving power form its normal source (1T, 2T, 3T)

RNO: GO TO Step 4.17

4.17 Verify load shed was initiated as indicated by either of the following statalarms on:

__ 1SA-15/D-4 (EL LOAD SHED CHNL A LOGIC INITIATE)

__ 1SA-14/D-4 (EL LOAD SHED CHNL B LOGIC INITIATE)

4.18 Verify ES has occurred

RNO: GO TO Step 4.20

4.20 Simultaneously press RESET on both of the following pushbuttons to reset Main Feeder Bus Monitor Panel Load Shed Circuitry:

- MFB UNDERVOLTAGE CHANNEL 1 RESET
- MFB UNDERVOLTAGE CHANNEL 2 RESET

4.21 Verify load shed signal reset as indicated by both of the following statalarms off:

__ 1SA-15/D-4 (EL LOAD SHED CHNL A LOGIC INITIATE)

__ 1SA-14/D-4 (EL LOAD SHED CHNL B LOGIC INITIATE)

CAUTION

Normal plant loads can overload the Auxiliary Transformer, CT-4, or CT-5

4.22 **IAAT** electrical loads are added, **AND** either MFB is energized by:

- CT-4
- CT-5
- Backcharged 1T

THEN ensure transformer is within limits of the applicable enclosure:

√	Source	Encl
	CT-4	5.1A
	CT-5	5.1B
	Transformer 1T	5.1C

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 9 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		RULE 3 **Crew response:** **EOP Rule 3** 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) ***CT-2*** 4. Start operable EFDW pumps, as required, to feed all intact SGs 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 ≤ 0°F **CAUTION** ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling **RNO: IF** overcooling, **OR** exceeding limits in Rule 7 (SG Feed Control), **THEN** throttle EFDW, as necessary 45. **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation) (**page 41**) 46. **WHEN** directed by CRS, **THEN EXIT**

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 10 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		EOP Encl 5.9 **Crew response:** **EOP Enclosure 5.9** (Extended EFDW Operation) rev 01 1. Monitor EFDW parameters on EFW graphic display 2. **IAAT** UST level is < 4', **THEN GO TO** Step 120 3. **IAAT** feeding both SGs with one MD EFDWP is desired, **THEN** perform Steps 4 – 7 **RNO: GO TO** Step 8 8. Perform as required to maintain UST level > 7.5' __ Makeup with demin water __ Place CST pumps in AUTO 9. **IAAT** all exist: __ Rapid cooldown **NOT** in progress __ MD EFDWP operating for each available SG __ EFDW flow in each header < 600 gpm **THEN** place 1 TD EFDW PUMP switch in PULL TO LOCK 10. Verify 1 TD EFDW PUMP operating 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

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 11 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior
		EOP Encl 5.38 **Crew response:** **EOP Enclosure 5.38** (Restoration of Power) rev 0 1. Verify power has been restored **RNO: GO TO** Step 3 3. Place 1HP-31 in HAND and reduce demand to 0 4. Close 1HP-21 5. Verify any of the following energized: __ MFB1 __ MFB2 **RNO: GO TO** Step 8 8. Verify CT-1 indicates ≈ 4160 volts **RNO: GO TO** Step 18 18. Verify both Standby Bus #1 and Standby Bus #2 are de-energized (0 volts) 19. Verify both Keowee units operating **RNO:** 1. Emergency start Keowee units: __ KEOWEE EMER START CHANNEL A __ KEOWEE EMER START CHANNEL B 2. **IF NO** Keowee units are operating, **THEN** perform the following: A. Notify Keowee operator to restore a Keowee unit to operable status B. **GO TO** Step 38 ***Examiner Note: Keowee Hydro Unit 1 will be operating***

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 12 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.38

Crew response:

EOP Enclosure 5.38

20. Verify both Keowee units in Oconee Control (statalarms on):
    __ UNIT 1 OCONEE CONTROL (2SA-17/E-1)
    __ UNIT 2 OCONEE CONTROL (2SA-18/E-1)

RNO: Notify Keowee Operator to place both Keowee units Master Transfer switches to remote

21. Verify both Keowee units operating

RNO: 1. **IF** UNIT 1 EMER FDR ACB 3 is closed, **AND** Unit 1 Keowee is **NOT** operating, **THEN** open UNIT 1 EMER FDR ACB 3

2. **IF** UNIT 2 EMER FDR ACB 4 is closed, **AND** Unit 2 Keowee is **NOT** operating, **THEN** open UNIT 2 EMER FDR ACB 4

CT-3

22. Ensure one of the following is closed for an operating Keowee unit:

√	Unit 1	√	Unit 2
	UNIT 1 EMER FDR ACB 3		UNIT 2 EMER FDR ACB 4

23. Verify 4160 volt power has been restored to the MFB

24. **GO TO** Step 35

35. Verify any of the following energized:
    __ 1TC
    __ 1TD
    __ 1TE

36. Notify Unit 1 CRS of status of 4160V SWGR

37. **EXIT** this enclosure

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 13 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.45

Crew response:

EOP Enclosure 5.45 (PSW Feed and RCP Seals) rev 03

NOTE

While running this enclosure along with a loss of power to HPIPs, Rule 4 should not be performed until SG feed has been established from some source

1. Verify Unit 2 EOP Encl 5.42 (PSW Power and Pump Alignment) in progress or complete

RNO: Notify Unit 2 to PERFORM Unit 2 EOP Encl 5.42 (PSW Power and Pump Alignment)

Examiner Note: ***Once an RO notifies Unit 2 to perform EOP Encl 5.42, a booth instructor will enter the simulator to perform the enclosure. This enclosure will have no effect on the outcome of the scenario.***

2. **WHEN** the Unit 1 PSW 4KV POWER AVAILABLE light lit, **THEN** continue
3. Verify it is desired to power HPI from PSW

RNO: GO TO Step 9

NOTE

There is a 40 second time delay in the swap from Normal to PSW power on HPIPs

4. Verify PSW SELECTED HPI PUMP selected to the 1A HPI pump

RNO: GO TO Step 6

6. Verify PSW SELECTED HPI PUMP selected to the 1B HPI pump
7. Perform the following:
   A. Place 1B HPI PUMP POWER TRANSFER to PSW
   B. Do **NOT** wait for the PSW power light, continue

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 14 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.45

Crew response:

EOP Enclosure 5.45

8. Place POWER TRANSFER switch to PSW on the following:
   - 1HP-24
   - 1HP-26
   - 1RC-159/1RC-160
   - 1RC-157/1RC-158
   - 1RC-155/1RC-156
9. Position the switch for 1PSW-6 to open
10. Notify the CRS that PSW is aligned and ready to supply SG feed and RCP Seals
11. **IAAT** it is desired to supply PSW SG feed, **THEN GO TO** Step 42
12. **IAAT** it is desired to supply RCP seals, **THEN GO TO** Step 57 (**page 46**)

NOTE

If RCS head vents, loop vents, or PORV have been opened, ACC levels must be used

13. **IAAT** Pzr level ≥ 85" (165" ACC), **AND** it is desired to power the Pzr heaters from PSW, **THEN** dispatch an operator to perform EOP Encl 5.46 (Aligning PZR Heaters From PSW)
14. **IAAT** notified that PSW is **NO** longer required, **THEN GO TO** Step 16
15. **WHEN** directed by CRS, **THEN EXIT** this enclosure

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 15 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.45

Crew response:

EOP Enclosure 5.45

57. **IAAT** notified that SSF Feed has been established or is capable of feeding SGs, **THEN** simultaneously close the PSW control valves:
    __ 1PSW-22 (1A SG)
    __ 1PSW-24 (1B SG)
58. **IAAT** PSW SG feed is aligned but **NOT** feeding, **AND** RCS pressure > 2300 psig, **THEN PERFORM** Step 43.

NOTE

If RCS head vents, loop vents, or PORV have been opened, ACC levels must be used

59. **IAAT** feeding SGs with PSW **AND** Tc 550 - 555°F, **THEN** throttle the following valves, as required, to slowly raise SG levels to 240"- 260" XSUR (270" – 290" **ACC**) while maintaining Tc 550 - 555°F:
    __ 1PSW-22 (1A SG)
    __ 1PSW-24 (1B SG)

NOTE

ES may have actuated requiring manual control of HPI

60. Perform the following:
    __ Close 1HP-139
    __ Open 1HP-24
    __ Close 1HP-26
61. Ensure 1HP-120 in manual with demand at zero
62. Verify BWST available based on Control Room level indication

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

Op-Test No.: **ILT16-2** Scenario No.: **3** Event No.: **8** Page 16 of 16

Event Description: **Switchyard Isolate (M: ALL)**

Time	Position	Applicant's Actions or Behavior

EOP Encl 5.45

Crew response:

EOP Enclosure 5.45

NOTE

- HPI pump ammeter will not respond when HPI pump is powered from PSW
- When the SSF and PSW are both supplying seals it may not be possible to get 30 – 35 gpm flow through 1HP-140

63. Start an HPI Pump by positioning HPI PUMP START FROM PSW POWER to START
64. Throttle 1HP-140 to obtain as close to 30 - 35 gpm RCP Seal flow as possible

NOTE

RCS pressure higher than normal RCS operating pressure could restrict flow through 1HP-140

65. Maintain 30 - 35 gpm Seal Inlet Hdr Flow by throttling 1HP-140 as necessary
66. Close 1HP-5
67. Close 1HP-21

NOTE

If RCS head vents, loop vents, or PORV have been opened, ACC levels must be used

68. **IAAT** Pzr level ≥ 85" (165" **ACC**), **AND** it is desired to power the Pzr heaters from PSW, **THEN** dispatch an operator to perform EOP Encl 5.46 (Aligning Pzr Heaters from PSW)
69. Notify CRS PSW RCP seals have been established

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

Enclosure 5.5
Pzr and LDST Level Control

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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** <u>two</u> Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** <u>all</u> 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 <u>both</u> 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.	
<u>NOTE</u> 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.	

• • • END • • •

CRITICAL TASKS

CT-1 ICS must be taken to HAND and FDW flow adjusted to prevent tripping the reactor on RPS Low Pressure (1810 psig) or RPS Variable Low Pressure. Adjustment will be dependent on how much time it takes to place ICS in HAND.

CT-2 Start the TD EFDWP to supply Feedwater flow to the SGs for heat removal to preclude initiation of HPI Forced Cooling.

CT-3 Restore power from Keowee Hydro Unit 1 prior to the completion of EOP Enclosure 5.38 (BWOG CT-3).

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: 892	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	Today/0300	7 Days	SLC 16.7.2

Shift Turnover Items (CR SRO)

Primary

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

Secondary

- AMSAC/DSS bypassed for calibration
- Unit 2 is supplying the AS header
- OP/1/A/1106/002B Encl 4.13 in progress to restore 1B Main FDW Pump from Handjack
- 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:

- 1A CFT level high. Lower 1A CFT level per OP/1/A/1104/001 Encl 4.17
- Unit startup in progress. Increase Reactor power from below the POAH to ≈ 3.0% and place ICS in Auto per OP/1/A/1102/001 Encl 4.7

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		AFIS Fails to Actuate
0b	Override		ES Channel 1 Fails to go to Manual
0c			
1		N: BOP, SRO	Lower 1A CFT Level
2		R: OATC, SRO	Increase Power to ≈ 3.0% and Place ICS in Auto
3	Override	C: BOP, SRO	1B FWPT Auxiliary Oil Pump Trip
4	MPS061 MPS061D	C: BOP, SRO **(TS)**	1A Letdown Cooler Leak
5		SRO **(TS)**	TD EFDWP Oil Sump Dry
6	Override	C: OATC, SRO	1RC-1 (PZR Spray Valve) Fails Open
7	MCR022 MCR028	C: OATC, SRO	Two Dropped Control Rod(s) Requiring a Reactor Trip
8	MSS360	M: ALL	1A MSLB Inside Containment • AFIS Fails to Actuate • ES Channel 1 Fails to go to Manual

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

SCENARIO 4 EVENT SUMMARY

Event 1: When the crew takes the shift, the SRO will direct the BOP will lower the level in the 1A Core Flood Tank using OP/1/A/1104/001 Enclosure 4.17.

Event 2: The OATC will increase power from below the POAH to ≈ 3.0% and place ICS in automatic.

Event 3: The Auxiliary Oil Pump for the 1B FWPT will trip causing the Emergency Oil Pump to start. Per the Alarm Response Guide (ARG), the BOP will attempt to start the Auxiliary Oil Pump which will fail. Shortly afterwards, the alarm for FWPT 1B Emergency Oil Pump Overload will alarm which will require the candidate to attempt to start the Auxiliary Oil Pump. Not being able to start the pump, the ARG will direct the BOP to stop the Turning Gear Motor to prevent damaging the Feedwater Pump.

Event 4: The 1A Letdown Cooler will develop a leak. The SRO will enter AP/1/A/1700/018 (Abnormal Release of Radioactivity) and AP/1/A/1700/002 (Excessive RCS Leakage). AP/1/A/1700/002 will isolate the 1A Letdown Cooler. The SRO will enter TS 3.4.13

Event 5: The Work Control Center SRO will contact the control room stating that an AO reports that the Turbine Driven Emergency FDW Pump oil sump indicates no oil on the dipstick. The SRO should direct the OATC to place the TD EFDW pump switch in Pull To Lock (PTL). The SRO will enter TS 3.7.5 for an inoperable TD EFDW Pump.

Event 6: The 1RC-1 (Pressurize Spray Valve) will fail open causing RCS pressure to unexpectedly decrease. The operator will be required to close 1RC-3 (Pressurizer Spray Block Valve) in order to stop the pressure decrease and prevent tripping the Reactor.

Event 7: Two control rods will drop into the core requiring a manual Reactor trip. Once the Reactor is manually tripped in accordance with OMP 1-18 (Implementation Standards During Abnormal and Emergency Events), Event 8 will automatically initiate.

Event 8: When the Reactor trips, a Main Steam Line Break on the 1A Steam Generator will occur inside containment. Engineered Safeguards (ES) Channels 1-6 will actuate on high Reactor Building pressure. The SRO will enter the Excessive Heat Transfer tab and one RO will initiate Rule 5 (MSLB) while the other RO initiates EOP Enclosure 5.1 (ES Actuation). The Automatic Feedwater Isolation System (AFIS) will fail to actuate which will require an operator to manually isolate Feedwater to the 1A SG to prevent overcooling the RCS and Reactor Core. ES Channel 1 will fail to go to manual which will require an operator to override the Odd Voters to take manual control of ES Channel 1 components.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **1** Page 1 of 1

Event Description: **Lower 1A CFT Level (C: BOP, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	***OP/1/A/1104/001 Encl 4.17*** **Crew Response:** **OP/1/A/1104/001 Enclosure 4.17** (Lowering CFTs Level To MWHUT) rev 79 2.1 Open 1CF-38 (CF Drn to MWHUT Blk). (A-4-W Pent Rm) 2.2 **IF** required to decrease level in 1A CFT, perform the following: 2.2.1 Record 1A CFT level: _____ feet 2.2.2 **IF** Containment Operability is required, enter Technical Specification 3.6.3 Condition 'A' 2.2.3 Open 1CF-3 (1A CFT SAMPLE & DRAIN) 2.2.4 **IF** Containment Operability is required, establish constant communication with CR and personnel near 1CF-7. (A-4-W Pent Rm) 2.2.5 Begin monitoring 1A CFT level and pressure 2.2.6 Throttle 1CF-7 (CF to MWHUTs). (A-4-W Pent Rm) 2.2.7 **IF AT ANY TIME** ES actuation occurs, perform the following: • Notify personnel to close 1CF-7 (CF to MWHUTs). (A-4-W Pent Rm) • Close 1CF-3 (1A CFT SAMPLE & DRAIN) 2.2.8 **WHEN** 1A CFT is at desired level, lock closed 1CF-7 (CF to MWHUTs). (A-4-W Pent Rm) 2.2.9 Close 1CF-3 (1A CFT SAMPLE & DRAIN) 2.2.10 **IF** entered, evaluate exiting Technical Specification 3.6.3 Condition 'A' 2.2.11 Verify 1A CFT level and pressure stable 2.3 **IF** required to decrease level in 1B CFT, perform the following: **(N/A)** 2.4 Close 1CF-38 (CFT Drn to MWHUT Blk) (A-4-W Pent Rm)

This event is complete when 1CF-38 is closed (Step 2.4), or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **2** Page 1 of 2

Event Description: **Increase Power to ≈ 3% and Place ICS in Auto (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 Encl 4.7
		Crew Response:
		• SRO directs the OATC to increase power to ≈ 3% 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 310
		NOTE: • Point Of Adding Heat (POAH) is normally achieved from 0.05 to 0.15% power on Wide Range Indications • 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 • Wide Range indications are used since Source Range NIs saturate
	OATC	3.36 Begin reactor power increase to 0.5 - 1.0 % at ≤ 0.5 DPM SUR
		3.37 **WHEN** above POAH, begin reactor power increase to 2.5 - 3.5%
		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
		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) • Review mechanical maneuvering rates and allowable ramp rates in PT/0/A/1103/020 (Power Maneuvering Guidelines)

This event is complete when power is ≈ 3% and ICS is in Auto (Step 3.39), or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **2** Page 2 of 2

Event Description: **Increase Power to ≈ 3% and Place ICS in Auto (R: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	***OP/1/A/1102/001 Encl 4.7*** **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 SM notified:_____ Time/Date:_____ 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

This event is complete when power is ≈ 3% and ICS is in Auto (Step 3.39), or when directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **3** Page 1 of 1

Event Description: **1B 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 36 3.1 Verify that 1B FWPT emergency oil pump is running 3.2 **IF** applicable, verify 1B FWPT is still on turning gear **[It will be]** 3.3 Try to restart 1B 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 an 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.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 1 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO/ BOP	**Plant Response:** • 1SA-08/B-9 (PROCESS MONITOR RADIATION HIGH) • 1SA-09/D-1 (COMPONENT COOLING SURGE TANK HIGH/LOW) **Crew Response:** The SRO will direct the BOP to refer to ARG 1SA-08/B-9 ***1SA-08/B-9*** **1SA-08/B-9** rev 36 3.1.1 Determine radiation monitors in alarm. 3.1.2 **IF** radiation monitoring data from PMC is **NOT** in service, refer to OP/1/A/1103/026, (Loss of Sorrento Radiation Monitor). ***Examiner Note: Steps 3.2 through 3.11 are IF statements for which RIA is in alarm. In this case, the crew determines the radiation monitor alarming is 1RIA-50, so step 3.4 applies*** 3.4 **IF** any of the following RIAs have valid alarms, **GO TO AP/18 (Abnormal Release of Radioactivity).** ☐ **1RIA-50** ***AP/1/A/1700/018*** **AP/1/A/1700/018 Abnormal Release of Radioactivity** rev 23 **(Can be performed by Unit 2 if AP/2 has been entered)** 4.1 Perform the following: At the discretion of the CRS, make a PA announcement of the event including any necessary precautions to be observed. Notify Shift Manager to reference the following: • RP/0/A/1000/001 (Emergency Classification). • NSD-202 (Reportability) • OMP 1-14 (Notifications) 4.2 **GO TO** appropriate sections for any monitors in High or Alert alarm: ***Examiner Note: Crew should go to Section 4I for 1RIA-50.*** ☐ 4I 1RIA-50

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 2 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/018*** **Crew Response:** **AP/1/A/1700/018 Section 4l** 1 Verify either of the following: • CC SURGE TANK increasing ≥ 5″/hour • CC SURGE TANK off-scale high 2. Initiate AP/2 (Excessive RCS Leakage) ***Examiner Note: Crew may enter AP/2 directly because the following entry condition is met: "Reactor Coolant leakage into CC system at ≥ 5"/hour on CC Surge Tank (≈ 0.65 gpm) or CC Surge Tank level off-scale high"*** ***AP/1/A/1700/002*** **AP1/A/1700/002** (Excessive RCS Leakage) rev 15 **Immediate Actions** 3.1 Verify HPI operating 3.2 **IAAT** RC makeup flow is > 100 gpm, **AND** Pzr level is decreasing, **THEN** close 1HP-5 3.3 **IAAT** all the following exist: • 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

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 3 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002*** **Crew Response:** **AP/1/A/1700/002** **Subsequent Actions** **NOTE** Other than a SGTR, 1HP-26 should **NOT** need be open with the Rx critical. 4.1 Initiate Pzr and LDST level makeup using Unit 1 EOP Encl 5.5 (Pzr and LDST Level Control), as necessary (**Page 44**) 4.2 Announce AP entry using the PA system **NOTE** "LPI DHR in service" means that prior to the event the unit was shutdown with the decay heat drop line aligned for decay heat removal operation. 4.3 **IAAT** LPI DHR in service, **AND** RCS leakage > LDST makeup capability, **THEN GO TO** AP/26 (Loss of Decay Heat Removal) [**N/A]** 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 AP02" • "T6 WASTE" • **RIAs** 4.6 Verify specific leak location is identified **RNO:** Notify WCC SRO to initiate Encl. 5.2 (Primary Leak Check) and of the leak area (AB or RB), if known

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 4 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002***

Crew Response:

AP/1/A/1700/002

4.7 Initiate Encl 5.1 (Leak Rate Determination) (**Page 13**)

Examiner Note: ***This will calculate RCS leakage based on CC surge tank level increase and is a very gross calculation since there is no OAC point for CC surge tank level and therefore control room gauge must be used.***

4.8 **WHEN** leak area/failure is identified,
THEN GO TO applicable step that best fits leak area/failure:

	CC System	↑ 1RIA-50 ↑ CC Surge Tank level	4.16

4.16 Verify all of the following:

- CC Surge Tank level increasing at ≥ 5″/ hour (≅0.65 gpm) or level is off-scale high
- 1RIA-50 in alarm or increasing

NOTE

- CC Surge Tank is hard piped to overflow to LAWT
- Chemicals from the CC system will rapidly exhaust demineralizers used to process LAWT water. Radwaste has limited storage capability and a Rx shutdown may be required if the leak **CANNOT** be isolated.

4.17 **IAAT** CC Surge Tank level is off-scale high, **THEN** notify Radwaste that the CC Surge Tank has overflowed to the LAWT

NOTE

- Closing 1CC-7 and 1CC-8 will contain the RCS leak in the RB. Relief valves on the CC system will lift inside the RB when 1CC-7 and 1CC-8 are closed.
- 1CC-7 and 1CC-8 should be closed prior to letting RC to CC system leak fill the LAWT above the Hi/Hi OAC alarm (72” on O1A1352(Low Activity Waste Tank Level)).
- Flashing of the CC system may be indicated by CRD flow low or fluctuating, CC flow low or fluctuating, and RB Sump Level increase.

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 5 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002*** **Crew Response:** **AP/1/A/1700/002** 4.18 **IAAT** RCS leakage is flashing the CC system, **OR** threatens to overflow the LAWT, **THEN** perform the following: **(*No flashing indicated)*** A. Trip Rx B. Close 1HP-5 C. Close the following: • 1CC-7 • 1CC-8 • 1CC-3 • 1CC-4 • 1CC-5 • 1CC-6 D. Initiate AP/32 (Loss of Letdown) E. **GO TO** Step 4.24 **NOTE** RCS to CC leakage may be indicated by one RCP cooler outlet temperature increasing more than the others (use historical temperature trend) near the time of increase on 1RIA-50. 4.19 Verify leakage indicated by change in RCP cooler outlet temperatures (Turn-on code "GD AP02") ***[No leakage indicated]*** **RNO: GO TO** Step 4.24 **NOTE** RCS leakage to CC in the letdown coolers may be indicated by a cooler outlet temperature increasing more than the other cooler. Due to CC system setup, letdown cooler CC outlet temperatures may be different. A historical OAC temperature trend may be required to determine if leakage exists and if actions taken are successful in leak isolation. If leaking cooler **CANNOT** be identified, the coolers will be isolated one at a time starting with the 1A Letdown Cooler. 4.24 Monitor letdown cooler outlet temperatures to determine which cooler is leaking (Turn-on code "GD AP02"): • O1A0065 (LETDOWN COOLER 1A CC OUTLET TEMP) • O1A0066 (LETDOWN COOLER 1B CC OUTLET TEMP)

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No **ILT16-2** Scenario No.: **4** Event No.: **4** Page 6 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002***

Crew Response:

AP/1/A/1700/002

4.25 **GO TO** the appropriate step to isolate affected cooler

√	Letdown Cooler to be Isolated	GO TO Step
	1A	**4.26**
	1B	4.33
	Unknown	4.26

4.26 Verify 1B Letdown Cooler is isolated

RNO: 1. Isolate the 1A Letdown Cooler by performing the following:
A. Close 1CC-1/1HP-1
B. Close 1HP-3
2. **GO TO** Step 4.31

4.31 Verify the leak isolation was successful:
- CC Surge Tank level stable if 1CC-7 and 1CC-8 open
- Decrease in RCS leakage

4.32 **GO TO** Step 4.44

4.44 Verify both the following are closed;
- 1CC-7
- 1CC-8

RNO: GO TO Step 4.46

4.46 **WHEN** conditions permit, **THEN EXIT** this procedure

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 7 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002*** **Crew Response:** **AP/1/A/1700/002 Encl 5.1** (Leak Rate Determination) 1. Stabilize RCS Temperature 2. Notify WCC to secure all primary draining/RB washdown evolutions if applicable **NOTE** Depending on leak location, leakage may NOT be detected by all the formulas. One or more of the following methods may be necessary to determine RCS leak rate. 3. Calculate leak rate using the following, as required: • Calculation of RCS Volume Loss: Leak Rate = _____ + _____ - _____ - _____ = _____ MU SI LD TSR Where: MU = makeup Flow SI = Seal Inlet Hdr Flow LD = Letdown Flow TSR = Total Seal Return Flow • LDST Level Change: Leak Rate = (LDST level change) x (31 gal/inch) + BTP Flowrate (gpm) (minutes) Leak Rate = (____inches) x 31 gal/inch + _____ gpm = _____ gpm _____minutes • HAWT/LAWT Level Change: (Turn-on code "LWD") Leak Rate = (Change in HAWT/LAWT lvl) x (18 gal/inch) =(____inches) x 18 gal/inch =_____ gpm (minutes) • RBNS Level Change: Leak Rate = (Change in RBNS level) x (15 gal/inch) = (__inches) x 15 gal/inch = ____ gpm (minutes) ____ minutes

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **4** Page 8 of 8

Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO /BOP	***AP/1/A/1700/002*** **Crew Response:** • RCS Leakage Calculation per PT/1/A/0600/010 (Reactor Coolant Leakage) • Calculation of RCS Volume Loss: Leak Rate = Makeup Flow rate with stable level = ____gpm

NOTE	
Pressurizer	23.94 gal/inch
Quench Tank:	34.94 gal/inch
BWST:	7608 gal/foot
SFP (Unit 1 & 2)	1512 gal/ 0.1 foot
SFP/FTC (Unit 1&2)	2300 gal/inch
Corer Flood Tank:	5 gal/ 0.01foot
RB Normal Sump:	15 gal/inch
LDST:	31.3 gal/inch
CC Surge Tank Level:	7.8 gal/inch
MWHUT:	See OP/0.A/1108/001 (Curves and Gen Info)

• Tank Level Change:
Leak Rate = (Change level) x (Tank volume/height) = (____) x (____) = ____gpm
(minutes) ____minutes

4. Notify OSM and SRO of calculated leak rate

SRO

3.4.13 RCS Operational Leakage

Condition A (4 hours) Reduce leakage to within limits

Examiner Note: TS will apply until the 1A Letdown Cooler is isolated

This event is complete when 1A Letdown cooler has been isolated or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** 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 (apples when the TD EFDWP is placed in PTL)** **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 B Restore TD EFDWP within 72 hours ***Booth Cue: If asked, inform crew that the TD EFDWP was placed on the oil purifier last shift.*** ***Examiner Note: The SRO may direct an RO to place the TD EFDW pump in Pull-To-Lock per AD-OP-ALL-1000 Step 5.6.3.3.b*** ***5.6.3 Common Tasks*** ***3. Written procedures are not necessary for situations where:*** ***b. Prompt action is necessary to prevent the deterioration of plant conditions or components to a possibly unsafe or unstable level. If time permits, approval from the SM/CRS shall be obtained.*** ***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.: **ILT16-2** Scenario No.: **4** Event No.: **6** Page 1 of 3

Event Description: **Spray Valve Fails Open (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC ***CT-1***	***Examiner Note: Ensure Pzr saturated prior to Event 6.*** ***AP/1/A/1700/044*** **Plant Response:** • 1RC-1 indicates open • OAC alarm indicating 1RC-1 is open • RCS pressure decreasing **Crew Response:** • OATC should recognize that RCS pressure is below the Pzr Spray Valve setpoint and close the Pzr Spray Block Valve (1RC-3). 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 04 **Immediate Manual Actions** 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-3 is closed and RCS pressure is stable, or as directed by the Lead Examiner.

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **6** Page 2 of 3

Event Description: **Spray Valve Fails Open (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/044*** **Crew Response:** 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

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

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **6** Page 3 of 3

Event Description: **Spray Valve Fails Open (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***AP/1/A/1700/044*** **Crew Response:** 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

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

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **7** Page 1 of 1

Event Description: **Two Dropped Control Rod(s) Requiring a Reactor Trip (C: OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	SRO/OATC	***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 ***Examiner Note: Event 8 will auto actuate when the Reactor is tripped.*** **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) **AP/1A/1700/001 Section 4H** (Asymmetric Control Rod) 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 1 of 10

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

Time	Position	Applicant's Actions or Behavior
		EOP
		Plant Response:
		• 1SA-2/D-3 (RC Press High/Low)
		• 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
	OATC	***EOP Immediate Actions*** rev 01
		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)

	SRO	BOP will perform Rule 5 (Main Steam Line Break) (**page 27**) 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 2 of 10

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 72**) and transfer to the Excessive Heat Transfer (EHT)Tab. ***EHT Tab*** SRO will review the EHT Tab Parallel Action (Yellow) page (**page 73**) and determine that ES has actuated and direct the OATC to perform Encl. 5.1 ES Actuation (**Page 52**) **Excessive Heat Transfer (EHT) Tab** rev 0 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 44**)

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

Op-Test No.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 3 of 10

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

Time	Position	Applicant's Actions or Behavior

SRO/OATC

EHT Tab

Crew Response:

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)

Examiner Note: The crew should raise 1B SG level to ≈ 60 inches Extended Startup Range (ACC Level). ACC conditions are in effect due to RB pressure exceeding 3 psig.

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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 4 of 10

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 __ 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.: **ILT16-2** 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 6 of 10

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*** Rev 0 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 7 of 10

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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 8 of 10

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

Time	Position	Applicant's Actions or Behavior
	BOP ***CT-2***	***RULE 5*** **Crew Response:** **Rule 5 (Main Steam Line Break)** rev 01 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.

2. Verify 1 TD EFDW PUMP operating.

RNO: 1. **IF** MD EFDWP for the intact SG is operating, **THEN GO TO** Step 5. **[IT WILL 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 9 of 10

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 29**) 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.: **ILT16-2** Scenario No.: **4** Event No.: **8** Page 10 of 10

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

Time	Position	Applicant's Actions or Behavior
	OATC/BOP	***RULE 3*** Rev 1 **Crew Response:** **Rule 3 (Loss of Main of Emergency FDW)** 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 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 ≤ 0^{o}F **CAUTION** ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling **RNO: IF** overcooling, **OR** exceeding limits in Rule 7 (SG Feed Control), **THEN** throttle EFDW, as necessary 45. **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation) (**page 30**) 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 1

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 <u>either</u> 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 all EFDWPs. B. Consider all U-1 EFDW pumps inoperable, **AND GO TO** Rule 3.	
NOTE • 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 as time and resources allow: • 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) using the ADVs. • 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 Rev 1
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 Rev 1
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** <u>two</u> Letdown Filters are desired, **THEN** perform the following: __ Open 1HP-17. __ Open 1HP-18	
15. __ **IAAT** <u>all</u> 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 <u>both</u> 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.	
<u>NOTE</u> 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.	

EOP Enclosure 5.1 (ES Actuation) Rev 1

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.

Enclosure 5.1

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 74.
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 - 15.	__ **GOTO** Step 16.
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. __Verify any RCP is operating.	__ **GOTO** Step 16.
13. Open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
14. __ Ensure only one CC pump operating.	
15. __ Ensure Standby CC pump in AUTO.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. __ **IAAT** ES Channels 3 & 4 are actuated, **THEN GO TO** Step 17.	__ **GO TO** Step 54.
17. __ Place Diverse LPI in BYPASS.	__ Place Diverse LPI in OVERRIDE.
18. Perform <u>both</u>: __ Place ES CH 3 in MANUAL. __ Place ES CH 4 in MANUAL.	**<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}	
19. __ **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}	
20. __ **IAAT** RCS pressure is < LPI pump shutoff head, **THEN** perform Steps 21 - 22.	__ **GOTO** Step 23.
21. Perform the following: __ Open 1LP-17. __ Start 1A LPI PUMP.	1. __ Stop 1A LPI PUMP. 2. __ Close 1LP-17.
22. Perform the following: __ Open 1LP-18. __ Start 1B LPI PUMP.	1. __ Stop 1B LPI PUMP. 2. __ Close 1LP-18.

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __**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 24 - 25.	__ **GO TO** Step 26.
24. Open: __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 __ 1LP-17 __ 1LP-18 __ 1LP-21 __ 1LP-22	
25. __ Start 1C LPI PUMP.	
26. __ **IAAT** 1A LPI PUMP fails while operating, **AND** 1B LPI PUMP is operating, **THEN** close 1LP-17.	
27. __ **IAAT** 1B LPI PUMP fails while operating, **AND** 1A LPI PUMP is operating, **THEN** close 1LP-18.	
28. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
29. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
31. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
32. __ Secure makeup to the LDST.	
33. __ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. __ **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.
34. __ Verify Unit <u>2</u> turbine tripped.	__ **GOTO** Step 37.
35. __ Close <u>2</u>LPSW-139.	
36. __ 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.
37. __ Close 1LPSW-139.	
38. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
39. __ Start <u>all available</u> LPSW pumps.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 42.
41. 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'.
42. __ **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.
43. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
44. __ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. __ **IAAT** ES channels 5 & 6 have actuated, **THEN** perform Step 46.	__ **GOTO** Step 47.
<u>NOTE</u> RBCU transfer to low speed will **NOT** occur until 3 minute time delay is satisfied.	
46. __ 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.

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. __ **IAAT** ES channels 7 & 8 have actuated, **THEN** perform Steps 48 - 49.	__ **GOTO** Step 50.
48. Perform all: __ Place ES CH 7 in MANUAL. __ Place ES CH 8 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 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.
49. __ Verify all ES channel 7 & 8 components are in the ES position.	__ Notify SRO to evaluate components **NOT** in ES position and initiate action to place in ES position if desired.
50. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
51. __ Ensure any turnover sheet compensatory measures for ES actuation are complete as necessary.	
52. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
53. __ **WHEN** CR SRO approves, **THEN EXIT**.	

••• END •••

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ES Channels 3 & 4 have **NOT** actuated.	
54. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
55. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
56. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
57. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
58. __ Secure makeup to the LDST.	
59. __ Verify all ES channel 1 & 2 components are in the ES position.	1. __ **IF** 1HP-3 fails to close, **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.
60. __ Verify Unit 2 turbine tripped.	__ **GOTO** Step 63.
61. __ Close 2LPSW-139.	
62. __ Verify total LPSW flow to Unit 2 LPI coolers ≤ 6000 gpm.	__ Reduce LPSW to Unit 2 LPI coolers to obtain total LPSW flow ≤ 6000 gpm.
63. __ Close 1LPSW-139.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
64. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
65. __ Start <u>all available</u> LPSW pumps.	
66. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 68.
67. 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'.
68. __ **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.
69. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
70. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
71. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
72. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
73. __ **WHEN** CR SRO approves, **THEN EXIT**.	

••• END •••

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
74. 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 75. 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 76.

Enclosure 5.1

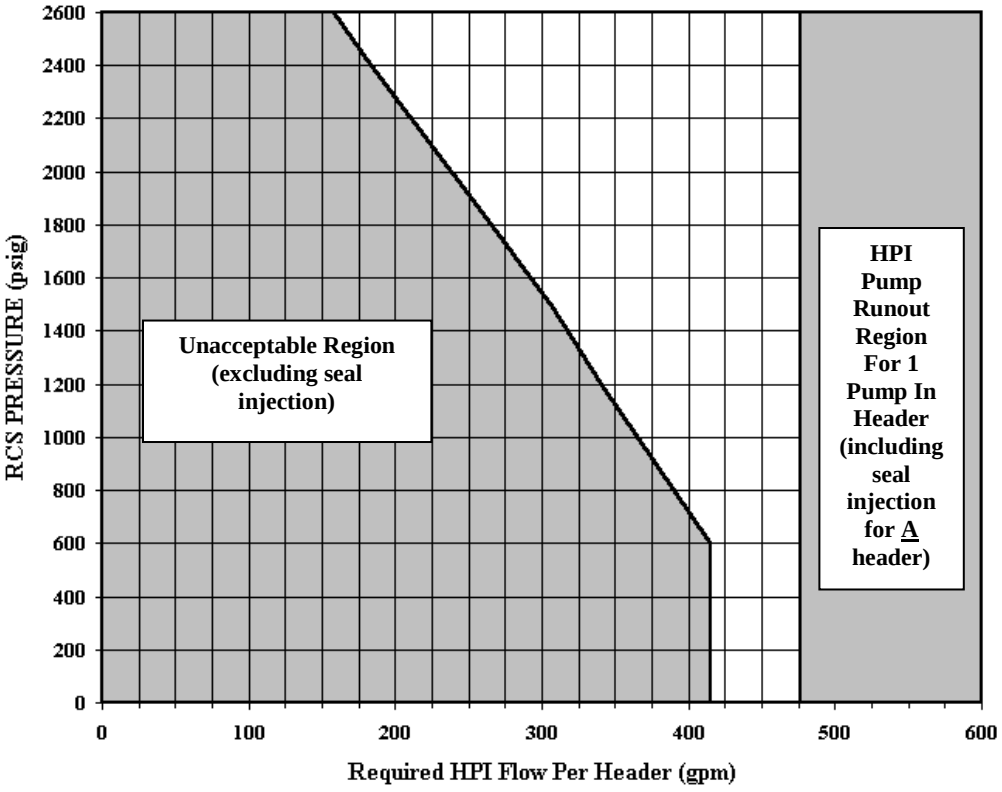
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. __ Ensure <u>at least two</u> HPI pumps are operating.	
76. Verify open: __ 1HP-26 __ 1HP-27	1. __ **IF** HPI has been intentionally throttled, **THEN GOTO** Step 77. 2. Open: __ 1HP-26 __ 1HP-27

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
77. __ **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



Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
78. __ Verify <u>any</u> RCP operating.	__ **GOTO** Step 80.
79. Open: __ 1HP-20 __ 1HP-21	
80. __ **IAAT** ES Channels 5 and 6 is actuated, **THEN** perform Steps 81 - 85.	__ **GOTO** Step 86.
81. Perform the following for actuated channels: __ Place ES CH 5 in MANUAL. __ Place ES CH 6 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 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.
82. __Verify <u>any</u> RCP operating.	__ **GO TO** Step 86.
83. Open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
84. __ Ensure <u>only one</u> CC pump operating.	
85. __ Ensure Standby CC pump in AUTO.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
86. __ **IAAT** ES Channels 3 & 4 are actuated, **THEN GO TO** Step 87.	__ **GO TO** Step 124.
87. __ Place Diverse LPI in BYPASS.	__ Place Diverse LPI in OVERRIDE.
88. 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}	
89. __ **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}	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
90. __ **IAAT** RCS pressure is < LPI pump shutoff head, **THEN** perform Steps 91-92.	__ **GOTO** Step 93.
91. Perform the following: __ Open 1LP-17. __ Start 1A LPI PUMP.	1. __ Stop 1A LPI PUMP. 2. __ Close 1LP-17.
92. Perform the following: __ Open 1LP-18. __ Start 1B LPI PUMP.	1. __ Stop 1B LPI PUMP. 2. __ Close 1LP-18.
93. __ **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 94 -95.	__ **GO TO** Step 96.
94. Open: __ 1LP-9 __ 1LP-10 __ 1LP-6 __ 1LP-7 __ 1LP-17 __ 1LP-18 __ 1LP-21 __ 1LP-22	
95. __ Start 1C LPI PUMP.	
96. __ **IAAT** 1A LPI PUMP fails while operating, **AND** 1B LPI PUMP is operating, **THEN** close 1LP-17.	
97. __ **IAAT** 1B LPI PUMP fails while operating, **AND** 1A LPI PUMP is operating, **THEN** close 1LP-18.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
98. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
99. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
100. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
101. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
102. __ Secure makeup to the LDST.	
103. __ 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.
104. __ Verify Unit <u>2</u> turbine tripped.	__ **GOTO** Step 107.
105. __ Close <u>2</u>LPSW-139.	
106. __ 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.
107. __ Close 1LPSW-139.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
108. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
109. __ Start <u>all available</u> LPSW pumps.	
110. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 112.
111. 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'.
112. __ **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.
113. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
114. __ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
115. __ **IAAT** ES channels 5 & 6 have actuated, **THEN** perform Step 116.	__ **GOTO** Step 117.

<u>NOTE</u>
RBCU transfer to low speed will **NOT** occur until 3 minute time delay is satisfied.

116. __ 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.

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
117. __ **IAAT** ES channels 7 & 8 have actuated, **THEN** perform Step 118 - 119.	__ **GOTO** Step 120.
118. Perform all: __ Place ES CH 7 in MANUAL. __ Place ES CH 8 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 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.
119. __ Verify all ES channel 7 & 8 components are in the ES position.	__ Notify SRO to evaluate components **NOT** in ES position and initiate action to place in ES position if desired.
120. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
121. __ Ensure any turnover sheet compensatory measures for ES actuation are complete as necessary.	
122. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
123. __ **WHEN** CR SRO approves, **THEN EXIT**.	

Enclosure 5.1

Unit Status ES Channels 3 & 4 have **NOT** actuated.	
124. Start: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN	
125. Notify Unit 3 to start: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN	
126. Verify open: __ 1CF-1 __ 1CF-2	__ **IF** CR SRO desires 1CF-1 and 1CF-2 open, **THEN** open: __ 1CF-1 __ 1CF-2
127. __ Verify 1HP-410 closed.	1. __ Place 1HP-120 in HAND. 2. __ Close 1HP-120.
128. __ Secure makeup to the LDST.	
129. __ 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.
130. __ Verify Unit 2 turbine tripped.	__ **GOTO** Step 133.
131. __ Close 2LPSW-139.	
132. __ Verify total LPSW flow to Unit 2 LPI coolers ≤ 6000 gpm.	__ Reduce LPSW to Unit 2 LPI coolers to obtain total LPSW flow ≤ 6000 gpm.
133. __ Close 1LPSW-139.	

Enclosure 5.1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
134. Place in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
135. __ Start <u>all available</u> LPSW pumps.	
136. Verify <u>either</u>: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two operable	__ **GOTO** Step 138.
137. 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'.
138. __ **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.
139. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
140. __ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
141. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
142. __ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
143. __ **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 AD-LS-ALL-0006 (Notifications/Reportability Evaluation).	**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 PZR Spray Valve (1RC-1) must be isolated by closing 1RC-3 to stop the RCS pressure decrease to prevent a reactor trip.

CT-2 Manually isolate Feedwater to the 1A SG prior to entering PTS conditions (per Rule 8, a cooldown below 400°F at > 100°F/hour) to prevent overcooling the RCS and Reactor Core.

.

SAFETY: Take a Minute

UNIT 0 (OSM)

SSF Operable: Yes for Units 2 and 3	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	TS 3.10.1 Cond 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.
- After turnover, the BOP is to lower 1A CFT level to ≈ 13 ft per OP/1/A/1104/001, Encl. 4.17. Then OATC is to continue in OP/1/A/1102/001 Encl 4.7 to increase Rx power.
- Increase Reactor power to ≈ 3% per OP/1/A/1102/001 Encl. 4.7 beginning at step 3.36. Once Rx power is ≈ 3% and step 3.39 is complete, hold further power increase and CRS return to oversight role until Rx Engineering updates the maneuvering plan.
- 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.

Reactivity Management (CR SRO)

RCS Boron 1778 ppmB	Gp 7 Rod Position: 5% Withdrawn	Batch additions as required per maneuvering plan

Human Performance Emphasis (SM)

Procedure Use and Adherence

REGION II
JOB PERFORMANCE MEASURE

RO-101b

ALIGN EMERGENCY BORATION DURING AN ATWS

Alternate Path: Yes

Alt Path Failure: HP-24/25 failed / A LPI pump failed / C HPI pump failed

Time Critical: No

Time Critical Criteria: _____

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

REGION II
JOB PERFORMANCE MEASURE

Task Title : Align Emergency Boration During an ATWS

Task Number : N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: BW/E13
K/A: EA 1.1
Rating: 3.4/3.2

Task Standard:

Candidate aligns emergency boration during an ATWS per Rule 1 (ATWS)

References:

EP/1/A/1800/001, Rule 1 (ATWS) (Rev. 0L)

Tools/Equipment/Procedures Needed:

EP/1/A/1800/001, Rule 1 (ATWS) (Rev. 0L)

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 211**
2. **IMPORT FILES** for RO-101b
3. Go to **RUN** to acknowledge alarms
4. **RESET** flags on HPIPs / LPIPs
5. Go to **FREEZE**
6. **ENSURE** clean copy of Rule 1 in place on Control Board
7. 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

Unit 1 is at 100% power

The CRS has determined that the reactor needs to be tripped

INITIATING CUES

The CRS directs you to trip the reactor and perform Immediate Manual Actions (IMAs).

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**1 IMAs**	Depress REACTOR TRIP pushbutton. **STANDARD:** Candidate performs EOP IMAs from memory (per OMP 1-18) and depresses the REACTOR TRIP pushbutton located on UB1. Candidate continues to Step 2. **COMMENTS:**	___ SAT ___ UNSAT
2	**2 IMAs**	Verify reactor power < 5% FP and decreasing. **STANDARD:** Candidate performs EOP IMAs from memory and verifies reactor power < 5% and decreasing and determines that reactor power is > 5% on all NIs. Candidate performs Step 2 **RNO**. **COMMENTS:**	___ SAT ___ UNSAT
3	**2 RNO IMAs**	**GO TO** Rule 1 (ATWS/Unanticipated Nuclear Power Production). **STANDARD:** Candidate refers to Rule 1 Step 1. **COMMENTS:**	___ SAT ___ UNSAT

4	**1**	Verify <u>any</u> Power Range NI ≥ 5% FP. **<u>STANDARD</u>***:* Candidate verifies any Power Range NI ≥ 5% FP and determines that all Power Range NIs are > 5% FP. Candidate continues to Step 2. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
5	**2**	Initiate manual control rod insertion to the IN LIMIT. **<u>STANDARD</u>***:* Candidate initiates a manual control rod insertion by depressing the Manual pushbutton on the Diamond control panel and then locks the Control Rod Joystick in the INSERT (forward) position. Candidate continues to Step 3. **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6	**3**	Verify Main FDW is feeding the SGs. **<u>STANDARD</u>***:* Candidate determines Main FDW is feeding the SGs. Candidate continues to Step 4. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
7	**4**	Notify CRS to **GO TO** UNPP tab **<u>STANDARD</u>***:* Candidate notifies the CRS to go to the UNPP tab of the EOP. Candidate continues to Step 5. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT

8	**5**	Open the following: __ 1HP-24 __ 1HP-25 **STANDARD**: Candidate locates 1HP-24 and 1HP-25 on 1UB1 and rotates the switches to the open position. Candidate determines 1HP-24 and 1HP-25 do not open by observing the green closed lights illuminated and the red open lights off. Candidate continues to step 5 RNO. **COMMENTS:**	___ SAT ___ UNSAT
9	**5** **RNO**	**ALTERNATE PATH** IF both are closed: __ 1HP-24 __ 1HP-25 **THEN GO TO** Step 32. **STANDARD**: Candidate determines 1HP-24 and 1HP-25 are both closed by observing the green closed lights illuminated and the red open lights off. Candidate continues to step 32. **COMMENTS:**	___ SAT ___ UNSAT

10	**32**	Dispatch <u>one</u> operator without wearing Arc Flash PPE to open 600V CRD breakers: __ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm) __ 2X1-5B (U-1 CRD Alternate Fdr Bkr) (T-3/Dd-28) **<u>STANDARD</u>***:* Candidate dispatches one operator to open Unit 1 normal and alternate CRD feeder breakers without wearing Arc Flash PPE. Candidate continues to Step 33. ***BOOTH CUE: FIRE TIMER 01 to trip normal and alternate CRD breakers after 4 minute delay.*** **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
11	**33**	Start 1A LPI Pump. **<u>STANDARD</u>***:* Candidate rotates the Control Switch for 1A LPI Pump to the start position. Candidate determines the 1A LPI Pump did not start by observing the red ON lights are off and/or 0 amps are indicated on the amp meter. Candidate continues to Step 33 RNO. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
12	**33** **RNO**	1. *Start 1B LPI Pump. 2. IF **NO** LPI pumps are operating, THEN: **a.** __Open 1LP-6 **b.** __Open 1LP-7 **c.** __Start 1C LPI pump **<u>STANDARD</u>***:* Candidate rotates the Control Switch for 1B LPI Pump to the start position. Candidate determines the 1B LPI Pump starts by observing the red ON lights are illuminated and/or amps are indicated on the amp meter. **<u>COMMENTS</u>:**	***CRITICAL STEP** ___ SAT ___ UNSAT

13	**34**	Open: __*1LP-15 __*1LP-16 __*1LP-9 __*1LP-10 __1LP-6 __1LP-7 **STANDARD**: Candidate rotates the control switch for 1LP-15 to the open position and verifies the green closed light off and the red open light illuminated. Candidate rotates the control switch for 1LP-16 to the open position and verifies the green closed light off and the red open light illuminated. Candidate rotates the control switch for 1LP-9 to the open position and verifies the green closed light off and the red open light illuminated. Candidate rotates the control switch for 1LP-10 to the open position and verifies the green closed light off and the red open light illuminated. Candidate rotates the control switch for 1LP-6 to the open position and verifies the green closed light off and the red open light illuminated. Candidate rotates the control switch for 1LP-7 to the open position and verifies the green closed light off and the red open light illuminated. **Examiner Note: The Critical step is to align sufficient valves to supply one header for HPI pump suction [minimum of 1LP-9, 1LP-10, and (1LP-15 OR 1LP-16)].** **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

14	**35**	Dispatch an operator to open 1HP-363 (Letdown Line to LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Area, 28' W of North door). **STANDARD***:* Operator is dispatched to open 1HP-363. ***BOOTH CUE: Use manual valves program to open 1HP-363.*** **COMMENTS:**	___ SAT ___ UNSAT
15	**36**	Ensure at least one operating: __ 1A HPI PUMP __ 1B HPI PUMP **STANDARD***:* Candidate ensures either the 1A or 1B HPI pump is operating. Candidate continues to Step 37. **NOTE: The 1A HPI Pump is operating.** **COMMENTS:**	___ SAT ___ UNSAT
16	**37**	Start 1C HPI PUMP. **STANDARD***:* Candidate rotates the 1C HPI pump switch to the CLOSE position and determines the pump did not start by observing the white open light illuminated and the red closed lights OFF and/or amps indicating 0 on the amp meter. Candidate continues to Rule 1 Step 37 **RNO**. **COMMENTS:**	___ SAT ___ UNSAT

17	**37** **RNO**	1. __ Start standby HPI pump. 2. __ IF <u>at least two</u> HPI pumps are operating, **THEN** open 1HP-409. **<u>STANDARD</u>***:* Candidate rotates the 1B HPI pump switch to the CLOSE position and determines the pump started by observing the white open light OFF and the red closed lights illuminated and/or amps indicated on the amp meter. Candidate determines two HPI pumps are operating and opens 1HP-409 by rotating the switch to the open position and verifying the green closed light off and the red open light illuminated. Candidate continues to Rule 1 Step 38. **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT
18	**38**	Open the following: __ *1HP-26 __ 1HP-27 **<u>STANDARD</u>***:* Candidate rotates the control switch to the open position for 1HP-26 and verifies the green closed light off and the red open light illuminated. **(critical)** Candidate determines that 1HP-27 is already open Candidate continues to Step 39. **<u>COMMENTS</u>:**	***CRITICAL STEP** ___ SAT ___ UNSAT

19	**39**	Verify <u>only two</u> HPI pumps operating. **<u>STANDARD</u>***:* Candidate verifies two HPI pumps are operating by verifying the red ON lights are illuminated for the 1A and 1B HPI pumps and/or verify HPI pump motor amps are indicated for the operating HPI pumps. **<u>COMMENTS</u>:** **END OF TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
5	This step is required to initiate a manual control rod insertion and start adding negative reactivity to the core.
12	This step is required to align emergency boration from the BWST to add negative reactivity to the core.
13	This step is required to align emergency boration from the BWST to add negative reactivity to the core.
17	This step is required to ensure HPI flow in the "B" HPI header.
18	This step is required to ensure HPI flow in the "A" HPI header.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 100% power

The CRS has determined that the reactor needs to be tripped

INITIATING CUES

The CRS directs you to trip the reactor and perform Immediate Manual Actions (IMAs)

REGION II
JOB PERFORMANCE MEASURE

RO-204

Align Letdown With 1HP-14 Failed in Bleed

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Align letdown with 1HP-14 failed in "Bleed"

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 002
K/A: A2.01
Rating: 4.3/4.4

Task Standard:
Students align letdown with 1HP-14 failed in the 'Bleed' position IAW AP/1/A/1700/002 (Excessive RCS Leakage)

References:
AP/1/A/1700/002 (Excessive RCS Leakage)
EOP Enclosure 5.5 (PZR and LDST Level Control)

Tools/Equipment/Procedures Needed:
AP/1/A/1700/002 (Excessive RCS Leakage) (Rev. 15)
EOP Enclosure 5.5 (PZR and LDST Level Control) (0M, Rev. 01)

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 212**
2. **IMPORT** RO-204 simulator files
3. **PLACE** a clean copy of OMP 2-02 Attachment G for 1A Letdown Filter in component boron log notebook
4. **ENSURE** clean procedures in place for candidate
5. Go To **RUN** when directed by the Lead Examiner

==========

Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

- Reactor power is 100%
- AP/1/A/1700/002 is in progress due to 1HP-14 failing in the BLEED position
- Another RO is making up to the LDST per Encl 5.5 of the EOP

INITIATING CUE

The CRS directs you to continue with AP/1/A/1700/002 (Excessive RCS Leakage) beginning at step 4.155

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**4.155**	Verify 1A LD Filter in service. **STANDARD**: Student observes 1B Letdown (LD) Filter is in service and the 1A LD Filter is NOT in service using either the OAC or Control Board indications and goes to the **RNO**. **COMMENTS**:	___ SAT ___ UNSAT
2	**4.155** **RNO**	1. **IF** 1A LD Filter is OOS for maintenance, **THEN** restore 1A LD Filter per in progress procedure. **(N/A)** 2. Open 1HP-17 **STANDARD**: Student recognizes that 1A LD Filter is available. *Student opens 1HP-17 and observes the red open light ON and the green closed light OFF. ***Examiner Cue: If asked, notify candidate that 1A Letdown filter is NOT OOS for maintenance.*** COMMENTS:	***CRITICAL STEP** ___ SAT ___ UNSAT

3	**4.156**	Close 1HP-6 **STANDARD**: Student closes 1HP-6 and observes the red open light OFF and the green closed light ON. **COMMENTS**:	___ SAT ___ UNSAT
4	**4.157**	**NOTE** TS 3.4.9 applies when indicated PZR Level > 260″ (corrected value for 285″). Adjust 1HP-7, as needed, to control: • BLEED flow out of failed 1HP-14 • Pzr level **STANDARD**: Student adjusts 1HP-7 as necessary to control PZR level. ***Examiner Note: The candidate may or may NOT adjust 1HP-7 due to the other RO performing EOP Encl 5.5*** **COMMENTS**:	___ SAT ___ UNSAT
5	**4.158**	Dispatch an operator to open 1HP-196 (Filter Diversion Inlet) (A-2-LDST Hatch Area) **STANDARD**: Student dispatches an AO to open 1HP-196 ***Booth Cue: Open 1HP-196 with Manual Valves*** **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

6	**4.159**	Verify CC System in Operation. **STANDARD**: Student observes: • At least one CC pump in operation • CC return flow is > 575 gpm **COMMENTS**:	___ SAT ___ UNSAT
7	**4.160**	Position the standby HPI pump switch to OFF. **STANDARD**: Student places the standby (1B) HPIP switch to OFF **COMMENTS**:	___ SAT ___ UNSAT
8	**4.161**	Initiate monitoring RCP parameters. **STANDARD**: Student refers to OAC Turn-on Code RCP and control board indications to monitor RCP parameters. ***Booth Cue: Notify the candidate that 1HP-196 is open.*** **COMMENTS**:	___ SAT ___ UNSAT

9	**4.162**	Throttle 1HP-31 to establish 12-15 gpm SEAL INLET HEADER FLOW. **STANDARD**: Student throttles 1HP-31 to establish 12-15 gpm. **COMMENTS**:	___ SAT ___ UNSAT
10	**4.163**	**WHEN** 1HP-196 (Filter Diversion Inlet) (A-2-LDST Hatch Area) is open, **THEN** close 1CS-26. **STANDARD**: Student closes 1CS-26 and observes the red open light OFF and the green closed light ON. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**4.164**	Close the following; • 1CS-27 • 1CS-32 & 37 **STANDARD**: Student verifies 1CS-27, 1CS-32, and 1CS-37 are closed by observing the red open lights OFF and the green closed lights ON. **COMMENTS**:	___ SAT ___ UNSAT

12	**4.165**	Open 1HP-6 **STANDARD**: Student opens 1HP-6 and observes the red open light ON and the green closed light OFF. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
13	**4.166**	Throttle 1HP-31 to establish ≈ 32 gpm SEAL INLET HDR FLOW. **STANDARD**: Student throttles open 1HP-31 to establish ≈ 32 gpm SEAL INLET HDR FLOW. **COMMENTS**:	___ SAT ___ UNSAT
14	**4.167**	Adjust 1HP-7 to establish desired letdown flow. **STANDARD**: Student throttles open 1HP-7 to establish ≈ 70 - 80 gpm letdown flow. ***Examiner Cue: If asked, inform the candidate to establish ≈ 75 gpm Letdown flow.*** **COMMENTS**:	___ SAT ___ UNSAT
15	**4.168**	Position the standby HPI pump switch to AUTO **STANDARD**: Student places the standby (1B) HPIP switch to AUTO ***Examiner Cue: Notify the candidate that another operator will continue with this procedure.*** **COMMENTS**: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	This step is required to align the alternate letdown flow path.
5	This step is required to align the alternate letdown flow path.
10	This step is required to isolate the flow path going to the BHUTs.
12	This step is required to return letdown flow to normal.
15	This step is required to protect the RCP seals by allowing the standby HPIP to automatically start if low seal injection flow (< 22 gpm) is detected.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

- Reactor power is 100%
- AP/1/A/1700/002 is in progress due to 1HP-14 failing in the BLEED position
- Another RO is making up to the LDST per Encl 5.5 of the EOP

INITIATING CUE

The CRS directs you to continue with AP/1/A/1700/002 (Excessive RCS Leakage) beginning at step 4.155

REGION II
JOB PERFORMANCE MEASURE

RO-501a

ES CHANNELS 5 AND 6 RECOVERY

Alternate Path: Yes

Alt Path Failure: 1A/1B CC Pumps, 1HP-5

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:	N/A	Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II
JOB PERFORMANCE MEASURE

Task Title : ES Channels 5 and 6 Recovery

Task Number :

Alternate Path: Yes

Time Critical: No

Validation Time: 8 minutes

K/A Rating(s):

System: APE 069
K/A: AA2.01
Rating: 3.7/4.3

Task Standard:

ES Channels 5 and 6 are returned to normal using EOP Enclosure 5.41 (ES Recovery) and Letdown isolated using AP/1/A/1700/020 (Loss of Component Cooling).

References:

EOP Encl. 5.41 (ES Recovery)

AP/1/A/1700/020 (Loss of Component Cooling)

Tools/Equipment/Procedures Needed:

EOP Encl. 5.41 (ES Recovery) (Rev. 0Q)

AP/1/A/1700/020 (Loss of Component Cooling) (Rev. 12)

==========

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 215**
2. **PLACE** Letdown Temp Interlock Bypass to **BYPASS** to exit static check, then place back in **NORMAL**
3. **IMPORT** RO-501a files
4. Go to **RUN** and acknowledge alarms
5. Go to **FREEZE**
6. **ENSURE** clean procedures (EOP Encl. 5.41 and AP/20) in place for candidate
7. 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

A MSLB has occurred

ES Channels 1 - 6 have actuated on High RB pressure

EOP Encl. 5.1 (ES Actuation) is complete

ALL ES Channels are being reset

EOP Encl. 5.41 (ES Recovery) is complete through step 40

INITIATING CUES

The CRS directs you to continue in EOP Encl. 5.41 (ES Recovery) beginning at step 41 to reset ES Channels 5 and 6.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**41**	Verify reset of <u>any</u> of the following is desired: • ES Channel 5 • ES Channel 6 **<u>STANDARD</u>:** Determines, from Initiating Cue, that reset of ES Channels 5 and 6 is desired. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
2	**42**	Verify Stat Alarms have cleared: • 1SA-7/A-1 (1A1 ES TRIP) • 1SA-7/B-1 (1B1 ES TRIP) • 1SA-7/C-1 (1C1 ES TRIP) • 1SA-7/A-2 (1A2 ES TRIP) • 1SA-7/B-2 (1B2 ES TRIP) • 1SA-7/C-2 (1C2 ES TRIP) **<u>STANDARD</u>:** Determine that all of the above statalarms on 1SA-7 are clear by observing that their respective window lights are **NOT** illuminated. **<u>COMMENTS</u>:**	___ SAT ___ UNSAT
3	**43**	Perform the following to reset ES (1UB1): • Depress RESET for CH 5. • Depress RESET for CH 6. **<u>STANDARD</u>:** Candidate depresses the RESET pushbuttons for Channels 5 and 6 located on 1UB1 **<u>COMMENTS</u>:**	**CRITICAL STEP** ___ SAT ___ UNSAT

4	**44**	Verify: • CH 5 TRIPPED light off • CH 6 TRIPPED light off **STANDARD:** Verifies white tripped lights OFF for ES Channels 5 and 6 **COMMENTS:**	___ SAT ___ UNSAT
5	**45**	Open: • 1CC-7 • 1CC-8 **STANDARD:** Candidate verifies 1CC-7 and 1CC-8 are open by observing RED open lights ON and GREEN closed lights OFF. **COMMENTS:**	___ SAT ___ UNSAT
6	**46**	Ensure one CC pump is running in the ON position. **STANDARD:** Rotates the switch for the 1B CC Pump to ON. ***EXAMINER NOTE: The 1B CC Pump will trip 30 seconds after ES Channel 6 RESET P/B is depressed..*** **COMMENTS:**	___ SAT ___ UNSAT

7	**46 RNO**	**ALTERNATE PATH** **IF NO** CC pumps are operating, **THEN** perform the following: 1. Initiate AP/20 (Loss of Component Cooling). 2. **GO TO** Step 48. **STANDARD:** Candidate initiates AP/20 (Loss of Component Cooling) from either step 46 RNO or 1SA-9/B-1 or 1SA-9/C-1. ***EXAMINER CUE: Once AP/20 is initiated, inform candidate the CRS directs them to perform AP/20.*** **COMMENTS:**	___ SAT ___ UNSAT
8	**AP/20 3.1**	**IAAT** both of the following are lost: • CC to RCPs • RCP seal injection **THEN** perform the following: A. Trip Rx B. Stop all RCPs C. Initiate AP/25 (SSF EOP) **STANDARD:** Determine RCP seal injection is available and proceed to step 3.2. **COMMENTS:**	___ SAT ___ UNSAT

9	**3.2**	**NOTE** If CRD stator cooling is lost, stator temperatures will reach 180°F in ≈ 4 minutes. CRD stator temperatures can be read on the OAC, turn-on code "1CRDTP". **IAAT** ≥ two CRD stator temperatures ≥ 180°F, **THEN** trip Rx. **STANDARD:** Determine Rx is already tripped and proceed to step 4.1. **COMMENTS:**	___ SAT ___ UNSAT
10	**4.1**	Verify at least one CC Pump operating. **STANDARD:** Determine NO CC Pumps are operating. Proceed to **RNO**. **COMMENTS:**	___ SAT ___ UNSAT
11	**4.1** **RNO**	1. IF either of the following: • CC Pumps have been manually secured due to CC system leakage • AP/2 directed initiation of AP/20 **THEN GO** TO step 4.12. 2. **GO TO** step 4.3 **STANDARD:** Determine CC Pumps were NOT secured due to system leakage and AP/2 did NOT direct initiation of AP/20. GO TO step 4.3. **COMMENTS:**	___ SAT ___ UNSAT

12	**4.3**	Open: • 1CC-7 • 1CC-8 **STANDARD:** Candidate verifies 1CC-7 and 1CC-8 are open by observing red open lights ON and green closed lights OFF. **COMMENTS:**	___ SAT ___ UNSAT
13	**4.4**	Verify ≥ one CC Pump operating. **STANDARD:** Determine NO CC Pumps are operating. Proceed to **RNO**. **COMMENTS:**	___ SAT ___ UNSAT

14	**4.4** **RNO**	1. **IF** CC Surge Tank level $\geq$ 12", **THEN** attempt to start a CC Pump **(will NOT start)** 2. **IF** unable to start any CC Pump, **THEN** perform the following: A. Close 1HP-5 **(will NOT close)** B. **IF** 1HP-5 fails to close **THEN** perform the following: • *Close 1HP-3 (**critical**) • *Close 1HP-4 (**critical**) C. Notify WCC SRO to initiate actions to regain a CC Pump. D. Initiate AP/32 (Loss of Letdown). **STANDARD:** Verify CC Surge Tank level $\geq$ 12" and attempt to start a CC Pump. Determine neither CC Pump will start. Place 1HP-5 switch to close. Determine 1HP-5 will not close by observing the red open light ON and the green closed light OFF. Place the switches for 1HP-3 and 4 to close. Determine 1HP-3 and 4 are closed by observing the green closed light ON and the red open light OFF. Notify WCC SRO to initiate actions to regain a CC Pump. Initiate AP/32. ***EXAMINERS CUE: Another operator will continue with this procedure.*** **COMMENTS:** **END TASK**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required to reset ES channels 5 & 6 so the associated components can be re-aligned for normal operation.
14	This step is required to isolate letdown.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

A MSLB has occurred

ES Channels 1 - 6 have actuated on High RB pressure

EOP Encl. 5.1 (ES Actuation) is complete

ALL ES Channels are being reset

EOP Encl. 5.41 (ES Recovery) is complete through step 40

INITIATING CUES

The CRS directs you to continue in EOP Encl. 5.41 (ES Recovery) beginning at step 41 to reset ES Channels 5 and 6.

REGION II
JOB PERFORMANCE MEASURE

RO-604

Perform a Manual Start of KHU 1

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Perform A Manual Start Of Keowee Hydro Unit 1

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 062
K/A: A4.07
Rating: 3.1/3.1

Task Standard:

Keowee Hydro Unit 1 is manually started and synchronized to the 230 KV switchyard.

References:

OP/0/A/1106/019 (Keowee Hydro At Oconee)

Tools/Equipment/Procedures Needed:

OP/0/A/1106/019 (Keowee Hydro At Oconee), Encl 4.5 (KHU-1 Manual Startup) (Rev. 101)

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 216**
2. **IMPORT** RO-604 simulator files
3. **ENSURE** KHU 1 in **REMOTE**
4. Go To **RUN** when directed by the Lead Examiner

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Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Keowee Unit 1 is aligned to the Overhead.

Keowee Unit 1 is to be manually started and tied to the grid.

This is NOT an emergency.

OP/0/A/1106/19, Enclosure 4.5 (KHU-1 Manual Startup) is in progress

INITIATING CUE

The CRS directs you to continue with a manual start of Keowee Unit 1, and tie it to the grid with no load, per OP/0/A/1106/019, Enclosure 4.5 beginning at Step 2.1.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	**NOTE**: AC HP Lift Pump starts and Generator Cooling Water valve opens when Unit 1 MASTER SELECTOR in MAN. Place UNIT 1 MASTER SELECTOR in ”MAN" **STANDARD**: Candidate positions UNIT 1 MASTER SELECTOR switch to "MAN". Continue to Step 2.2 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
2	2.2	Place UNIT 1 SYNC 230 KV selector in "MAN". **STANDARD**: Candidate positions UNIT 1 SYNC 230 KV selector switch to "MAN". Continue to Step 2.3 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

3	**2.3**	**IF** this is **NOT** an emergency situation, notify Keowee operator to activate the Tailrace Rising Water Alarm Test button on CB-5. **STANDARD**: Candidate determines this is not an emergency situation and notifies Keowee Operator to activate the Tailrace Rising Water Alarm Test button on CB-5. ***Booth cue: Keowee operator (Casey Holder) reports Tailrace Rising Water Alarm Test button on CB-5 is active.*** Continue to Step 2.4 **COMMENTS**:	___ SAT ___ UNSAT
4	**2.4**	Place **AND** hold UNIT 1 LOCAL MASTER switch to "START" position for > 10 seconds until KHU starts. **STANDARD**: Candidate rotates the UNIT 1 LOCAL MASTER switch to the "START" position for >10 seconds and verifies that the Turb 1 Gate Position increases on 2AB3. Continue to Step 2.5 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

5	**2.5**	**WHEN** TURBINE 1 GATE POSITION indicator settles out: • Momentarily place EXCITER STOP/START to "START". • Verify EXCITER STOP/START Red START light ON, Green STOP light OFF. **STANDARD**: Candidate observes that the TURBINE 1 GATE POSITION has settled out and then: o ***Momentarily places EXCITER STOP/START to "START".** o Observes EXCITER STOP/START Red START light ON, Green STOP light OFF and GEN FREQ about 60 HZ and Keowee 1 Output volts about 13.8 KV. Continue to Step 2.6 **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT

6	**2.6**	**IF** required, synchronize KHU-1 to the grid: 2.6.1 Verify open KPF-9 (KHU 1 FDR) 2.6.2 Make the following adjustments concurrently as required: • Using UNIT 1 AUTO VOLTAGE ADJUSTER, match KEOWEE 1 LINE VOLTS with KEOWEE 1 OUTPUT VOLTS when 13.8 KV SYNCHROSCOPE pointer is vertical. • Adjust KHU-1 Generator speed with UNIT 1 SPEED CHANGER MOTOR until slow clockwise rotation of 13.8 KV SYNCHROSCOPE is established. CAUTION: To prevent possible equipment damage, it is important to realize that 5° is NOT equivalent to 5 minutes. 2.6.3 **WHEN** 13.8 KV SYNCHROSCOPE pointer is ≈ 5° before reaching vertical, close ACB 1 KEOWEE 1 GENERATOR BKR. **STANDARD**: 2.6.1 Candidate verifies KPF-9 is open by observing the red closed light OFF and the white open light ON. 2.6.2 Candidate determines that KHU-1 is required to be synced to the grid and makes the following adjustments: • UNIT 1 AUTO VOLTAGE ADJUSTER manipulated to match KEOWEE 1 LINE VOLTS with KEOWEE 1 OUTPUT VOLTS when 13.8 KV SYNCHROSCOPE pointer is vertical. • KHU-1 Generator speed adjusted with UNIT 1 SPEED CHANGER MOTOR until slow clockwise rotation of 13.8 KV SYNCHROSCOPE is established. 2.6.3 ACB 1 KEOWEE 1 GENERATOR BKR switch is taken to close when the 13.8 KV SYNCHROSCOPE pointer is ≈ 5° before vertical, and candidate observes the red close light ON and the white open light OFF. Continue to Step 2.7 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

7	**2.7**	**CAUTION:** KHU-1 load should **NOT** be reduced below indicated zero (0) MWs. **IF** required, perform the following concurrently: • Adjust load to zero (0) MWs with UNIT 1 SPEED CHANGER MOTOR. • Adjust MVARS to zero (0) with UNIT 1 AUTO VOLTAGE ADJUSTER. STANDARD: Candidate manipulates the UNIT 1 SPEED CHANGER MOTOR as required to obtain (0) MWs and the UNIT 1 AUTO VOLTAGE ADJUSTER as required to obtain ≈ zero (0) MVARS. COMMENTS: **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to manually start KHU-1.
2	This step is required to manually start KHU-1.
4	This step is required to start KHU-1.
5	This step is required to excite the KHU-1 generator.
6	This step is required to synchronize KHU-1 to the grid.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Keowee Unit 1 is aligned to the Overhead.

Keowee Unit 1 is to be manually started and tied to the grid.

This is NOT an emergency.

OP/0/A/1106/19, Enclosure 4.5 (KHU-1 Manual Startup) is in progress

INITIATING CUE

The CRS directs you to continue with a manual start of Keowee Unit 1, and tie it to the grid with no load, per OP/0/A/1106/019, Enclosure 4.5 beginning at Step 2.1.

REGION II
JOB PERFORMANCE MEASURE

RO-702

Adjust Radiation Monitor Setpoints

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Adjust Radiation Monitor Setpoints

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 25 minutes

K/A Rating(s):

System: 073
K/A: A4.01
Rating: 3.9 / 3.9

Task Standard:

Adjust 1RIA-37 and 1RIA-38 for a GWD release per procedure.

References:

OP/1-2/A/1104/018, GWD system

PT/0/A/230/01, Radiation Monitor Check

Tools/Equipment/Procedures Needed:

OP/1-2/A/1104/018, GWD system, Encl. 4.9 and 4.10 (Rev. 78)

PT/0/A/230/01, Radiation Monitor Check, Encl. 13.6 (Rev. 172)

PT/1-2/A/0230/002, GWD Tank Release (Rev. 6)

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 217**
2. **ENSURE** procedures in place for candidate
3. **ENSURE** OP/0/A/1108/001 Encl 4.3 is clean
4. Select plant HMI screen to GWD system
5. **ENSURE** Purged tag in place on GWD DISCH FLOW CONTROLLER
6. **Go to RUN** when directed by Lead Examiner

==========

Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Release of “B” 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 3.4

INITIATING CUES

SRO directs you to continue the release of the “B” GWD tank beginning at Step 3.4 of Enclosure 4.9

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	3.4	Perform the following on Enclosure 4.10 (GWD Tank Sample Request): 3.4.1 Record Initial GWD Tank Pressure **AND** GWD Tank Volume 3.4.2 Record Start Date **AND** Time 3.4.3 Record background readings for 1RIA-37 **AND** 1RIA-38 **STANDARD**: Determine B GWD tank pressure is **65.3** psig by looking on either the OAC on the chart on 1VB1 and record on Enclosure 4.10. Determine GWD Tank Volume is **≈ 6000** Ft^3 by using the curve in OP/1108/001 (General Curves and Information) and record on Enclosure 4.10. Determine background readings for 1RIA-37 & 1RIA-38 by observing the RIA readings on the RIA View Node and record on Enclosure 4.10. **Note: The background readings should be as follows:** • **1RIA-37 Background reading is: ≈ 367 or 3.67E2 cps** • **1RIA-38 Background reading is: ≈ 11 or 1.1E1 cps** Continue to Step 3.5 **COMMENTS**:	___ SAT ___ UNSAT
2	3.5	Record recommended 1RIA-37 and 38 Alert and High setpoints from Enclosure 4.10 (GWD Tank Sample Request): • 1RIA-37 **3.47 E5** cpm above background • 1RIA-38 **2.78 E2** cpm above background **STANDARD**: Obtain this information from the sample request and record in the procedure. Continue to Step 3.6 **COMMENTS**:	___ SAT ___ UNSAT

3	**3.6**	**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-05µCi/ml when it was released, the GWD piping is considered "purged". **IF** 1RIA-37 is out-of-service **OR** GWD piping **NOT** purged, verify the following per Enclosure 4.10 (GWD Tank Sample Request): • Independent Data Entry Checks completed • Independent Sample agrees with initial sample **STANDARD**: Determine step does not apply and N/A the step. Continue to Step 3.7 ***Examiner Cue: If asked, inform the candidate that the GWD piping is purged.*** **COMMENTS**:	___ SAT ___ UNSAT
4	**3.7**	**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-05µCi/ml when it was released, the GWD piping is considered "purged". **IF** GWD piping purged, calculate actual setpoints as follows: 3.7.1 **IF** 1RIA-37 Operable, calculate Alert and High setpoints as follows: **3.67E2** cpm + **3.47E5** = **3.47E5** cpm 1RIA-37' background; Add to background' value from Step 3.5; 1RIA-37 Alert and High alarm setpoints **STANDARD**: Calculate set points using formula above. **(3.47E5 to 3.48E5)** Continue to Step 3.8 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___UNSAT

5	**3.8**	**IF** 1RIA-38 Operable, calculate Alert and High setpoints as follows: **1.1E1** cpm + **2.78E2** = **2.89E2** cpm 1RIA-38' background; Add to background' value from Step 3.5; 1RIA-38 Alert and High alarm setpoints **STANDARD**: Calculate set points using formula above **(2.89E2).** Continue to Step 3.9 **COMMENTS**:	**CRITICAL STEP** ___ SAT ___UNSAT

6	**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-05µCi/ml when it was released, the GWD piping is considered "purged". Adjust 1RIA-37 setpoints for release as follows: 3.9.1 Perform **one** of the following: A. **IF** all of the following: • Calculated setpoints are < 1E+07 CPM • 1RIA-37 operable • GWD pipping purged Set alarms as follows: • Set 1RIA-37 Alert setpoint at **3.47E5** cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.7.1) • Set 1RIA-37 High setpoint at **3.47E5** 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. B. **IF** any of the following: **(N/A)** • Calculated setpoints are > 1E+07 CPM • 1RIA-37 out-of-service • GWD piping **NOT** purged **STANDARD**: Determine that calculated setpoints are < 1E+07 CPM, 1RIA-37 is operable, and GWD piping is purged and set 1RIA-37 alert and high setpoints at **3.47E5** per PT/0/A/0230/001 **(see Step 7).** **(3.47E5 to 3.48E5)** Continue to Step 3.10 **COMMENTS**:	___ SAT ___ UNSAT

7		PT/0/A/0230/001 Enclosure 13.6 (1RIA-37 and 1RIA-38 Setpoints) 1.1 Verify Unit 1&2 GWD Tank release planned per OP/1-2/A/1104/018 (GWD System) **NOTE**: Each RIA procedure section may be performed in any sequence. 2.1 Set process monitor setpoints as required 3.1 Document 1RIA-37 Alert setpoint per OP/1-2/A/1104/018: **3.47E5** CPM 3.2 Insert 1RIA-37 Alert setpoint from Step 3.1 3.3 Document 1RIA-37 High setpoint per OP/1-2/A/1104/018: **3.47E5** CPM 3.4 Insert 1RIA-37 High setpoint from Step 3.3 **STANDARD**: Candidate documents the Alert and High setpoints for 1RIA-37 per OP/1-2/A/1104/018 **(3.47E5 to 3.48E5)** Candidate inserts the Alert and High setpoints into 1RIA-37 **(3.47E5 to 3.48E5)** **COMMENTS**:	**CRITICAL STEP** ___ SAT ___UNSAT

8	**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 **2.89E2** cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.8) • Set 1RIA-38 High setpoint at **2.89E2** 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 enoughto perform an adequate N2 purge. B. **IF** calculated setpoints are > 1E+06 CPM **OR** 1RIA-38 out of service, perform the following: **(N/A)** **STANDARD**: Candidate documents the Alert and High setpoints for 1RIA-38 per OP/1-2/A/1104/018 **(2.89E2)** Candidate inserts the Alert and High setpoints into 1RIA-37 **(2.89E2)** per PT/0/A/0230/001 **(per Step 9)** **COMMENTS**:	___ SAT ___ UNSAT
9		PT/0/A/0230/001 Enclosure 13.6 (1RIA-37 and 1RIA-38 Setpoints) 4.1 Document 1RIA-38 Alert setpoint per OP/1-2/A/1104/018: **2.89E2** CPM 3.2 Insert 1RIA-38 Alert setpoint from Step 4.1 3.3 Document 1RIA-38 High setpoint per OP/1-2/A/1104/018: **2.89E2** CPM 3.4 Insert 1RIA-38 High setpoint from Step 4.3 **STANDARD**: Candidate documents the Alert and High setpoints for 1RIA-38 per OP/1-2/A/1104/018 **(2.89E2)** Candidate inserts the Alert and High setpoints into 1RIA-38 **(2.89E2)** **COMMENTS**: **END TASK**	**CRITICAL STEP** ___ SAT ___UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Required to ensure proper setpoint is calculated.
5	Required to ensure proper setpoint is calculated.
7	Required to set RIA to prevent station release above limits.
9	Required to set RIA to prevent station release above limits.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Release of “B” 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 3.4

INITIATING CUES

SRO directs you to continue the release of the “B” GWD tank beginning at Step 3.4 of Enclosure 4.9

REGION II
JOB PERFORMANCE MEASURE

RO-805a

Perform Required Actions For a Turbine Building Flood

Alternate Path: Yes

Alt Path Description: 1CCW-12 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 : Perform Required Actions For A Turbine Building Flood

Task Number :

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: APE BW/A07
K/A: AA1.3
Rating: 3.3/3.5

Task Standard:

Perform required actions for a Turbine Building Flood in accordance with AP/10, Turbine Building Flood

References:

AP/1/A/1700/01010, Turbine Building Flood

Tools/Equipment/Procedures Needed:

AP/1/A/1700/01010, Turbine Building Flood (Rev. 10)

==========

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 218**
2. **IMPORT** files for RO-805a
3. **ENSURE** clean procedure in place for candidate
4. Go to **RUN** when directed by the Lead Examiner

==========

Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 was operating at 100% power

Unit 2 is in cold shutdown

The 2A1 condenser inlet expansion joint has ruptured and Turbine Building Basement water level is rising

Unit 1 has been tripped and the EOP is being completed by other team members.

INITIATING CUE

The CRS directs you to initiate Unit 1 AP/10 (Turbine Building Flood).

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**4.1**	Trip the Rx. **STANDARD**: Depress the Rx trip pushbutton on 1UB1. Verify the RX is tripped by observing all control rods are inserted. Continue to Step 4.2. **COMMENTS**:	___ SAT ___ UNSAT
2	**4.2**	Place 1CCW-1-6 switch in PULL TO LOCK. **STANDARD:** Candidate locates and places the control switch for 1CCW-1-6 in PULL TO LOCK. Continue to Step 4.3. **COMMENTS:**	___ SAT ___ UNSAT

3	**4.3**	**NOTE** Tripping the CCW pumps will cause loss of condenser vacuum which will result in TBVs failing closed and trip of the MFDWPs. Ensure all CCW pumps are shutdown. **STANDARD**: Candidate rotates the 1A, 1B, and 1C CCW pump switches to the TRIP position and verifies the red close lights extinguished and the white open lights illuminated. (located on 1AB3) Continue to Step 4.4. ***Examiner Cue: If the candidate initiates AP/24, notify them that another operator will perform AP/24*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
4	**4.4**	Press both of the following on the TURB BLDG FLOOD EMER CLOSING ALL CCWP DISCH VALVES control switch: • CLOSE 1 • CLOSE 2 **STANDARD**: "CLOSE 1" and "CLOSE 2" on the TURB BLDG FLOOD EMER CLOSING ALL CCWP DISCH VALVES control switch are both depressed. (located on 1AB3) Continue to Step 4.5. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

5	**4.5**	Verify <u>all</u> the following closed. __ 1CCW-10 __ 1CCW-11 __ 1CCW-12 __ 1CCW-13 **<u>STANDARD</u>**: The green CLOSED lights for 1CCW-10, 11, and 13 are verified illuminated and the red OPEN lights for the same valves are verified extinguished. (located on 1AB3) Determine that 1CCW-12 is **NOT** closed by observing the red open light lit on 1AB3. Continue to Step 4.5 **RNO**. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT

6	**4.5** **RNO**	**[ALTERNATE PATH]** **NOTE** The control switches for the CCW pump discharge valves do not seal-in. The valves act as throttle valves unless the associated CCW pump switch is in the TRIP position. Dispatch an operator to ensure all CCW pump discharge valves are closed (Equipment Rm): • 1XS1-F2C (1CCW-10 Bkr 1A CCW Pump Disch) • 1XS1-F3C (1CCW-13 Bkr 1D CCW Pump Disch) • 1XS2-F2D (1CCW-11 Bkr 1B CCW Pump Disch) • 1XS3-2E (1CCW-12 Bkr 1C CCW Pump Disch) **STANDARD**: An operator is dispatched to the Equipment Room to ensure 1CCW-12 is closed. Continue to Step 4.6. ***Booth cue: After 2 minutes call as the AO and inform candidate that 1CCW-12 will NOT close.*** **COMMENTS**:	___ SAT ___ UNSAT

7	**4.6**	**NOTE** Field tasks that may affect multiple units should be coordinated with Unit 2 and Unit 3. Dispatch operators to ensure all three flood doors are closed and in the SECURED position from the AB side (A-1, at Unit 1, 2, and 3 stairwell entrances to TB): {2} • Unit 1 Flood Door • Unit 2 Flood Door • Unit 3 Flood Door **STANDARD**: Dispatch an AO to ensure all three flood doors are closed and in the SECURED position from the AB side. Continue to Step 4.7. ***Booth cue: When called, inform candidate that an operator has been dispatched.*** **COMMENTS**:	___ SAT ___ UNSAT

8	**4.7**	Dispatch an operator to position the waterbox discharge valve switches (T-3, East of condenser catwalk): • 1CCW-20 (1A1) switch to HAND • 1CCW-20 (1A1) switch to CLOSE • 1CCW-21 (1A2) switch to HAND • 1CCW-21 (1A2) switch to CLOSE • 1CCW-22 (1B1) switch to HAND • 1CCW-22 (1B1) switch to CLOSE • 1CCW-23 (1B2) switch to HAND • 1CCW-23 (1B2) switch to CLOSE • 1CCW-24 (1C1) switch to HAND • 1CCW-24 (1C1) switch to CLOSE • 1CCW-25 (1C2) switch to HAND • 1CCW-25 (1C2) switch to CLOSE **STANDARD**: Candidate should dispatch an operator to place the above valves to HAND and CLOSE. Continue to Step 4.8. ***Booth Cue: When called, inform candidate that an operator has been dispatched.*** **COMMENTS**:	___ SAT ___ UNSAT

9	**4.8**	Verify <u>all</u> the following closed. __ 1CCW-10 __ 1CCW-11 __ 1CCW-12 __ 1CCW-13 **<u>STANDARD</u>**: The green CLOSED lights for 1CCW-10, 11, and 13 are verified illuminated and the red OPEN lights for the same valves are verified extinguished. (located on 1AB3) Determine that 1CCW-12 is **NOT** closed by observing the red open light lit on 1AB3. Continue to Step 4.8 **RNO**. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT

10	**4.8** **RNO**	**[ALTERNATE PATH]** **NOTE** If the pipe cap cannot be removed by hand, then there is a strap wrench in the black tool box which is staged on the CCW Intake structure near catwalk. Dispatch an operator to perform the following (ESV Trench, Intake): • Remove pipe cap at 1CCW-26 (CCW Inlet High Point Vent). • Open 1CCW-26 (CCW Inlet High Point Vent). • Remove pipe cap at 1CCW-28 (CCW Inlet High Point Vent). • Open 1CCW-28 (CCW Inlet High Point Vent). **STANDARD**: Candidate should dispatch an operator to position the above valves as directed. Continue to Step 4.9 ***Booth Cue: When called, inform candidate that an operator has been dispatched.*** **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**4.9**	Open 1V-186 **STANDARD**: Candidate rotates the switch for 1V-186 to the open position until the red open light is illuminated and the green closed light is extinguished. ***Examiner Cue: Another operator will continue this task.*** **COMMENTS**: **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required to attempt to terminate the flooding and not contribute to the water level in the TB basement.
4	This step is required to attempt to terminate the flooding and not contribute to the water level in the TB basement.
10	This step is required to ensure CCW inlet piping is vented to break siphon.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 was operating at 100% power

Unit 2 is in cold shutdown

The 2A1 condenser inlet expansion joint has ruptured and Turbine Building Basement water level is rising

Unit 1 has been tripped and the EOP is being completed by other team members

INITIATING CUE

The CRS directs you to initiate Unit 1 AP/10 (Turbine Building Flood)

REGION II
JOB PERFORMANCE MEASURE

RO-P403

Initiate HPI Forced Cooling

Alternate Path: No

Alt Path Description: _____

Time Critical: Yes

Time Critical Criteria: HPI Forced Cooling initiated within 5 minutes of criteria being met

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Initiate HPI Forced Cooling

Task Number :

Alternate Path: No

Time Critical: Yes

Validation Time: 10 minutes

K/A Rating(s):

System: EPE 074
K/A: EA1.08
Rating: 4.2/4.2

Task Standard:

Perform Rule 4 (Initiate HPI Forced Cooling).

References:

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

Tools/Equipment/Procedures Needed:

EOP Rule 3 (Loss of Main or Emergency FDW) (Rev. 0L)
EOP Rule 4 (Initiate HPI Forced Cooling) (Rev. 0L)

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

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 214**
2. **IMPORT** simulator files for RO-P403
3. **ENSURE** clean in-progress Rule 3 available for candidate
4. **ENSURE** clean Rule 4 in place on control board
5. Go to **RUN** when directed by lead examiner

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Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

- Unit 1 has tripped following a total loss of feedwater
- IMAs are complete
- The crew has been performing Rule 3 (Loss of Main or Emergency FDW) to regain heat transfer
- CBP feed could NOT be established and PSW SG feed is NOT available
- Efforts to restore steam generator heat transfer per Rule # 3 have NOT been successful
- You are at the Step 23 (WHEN) step in Rule 3 (Loss of Main or Emergency FDW)

INITIATING CUE

The CRS directs you to review outstanding IAAT Steps

This JPM is Time Critical

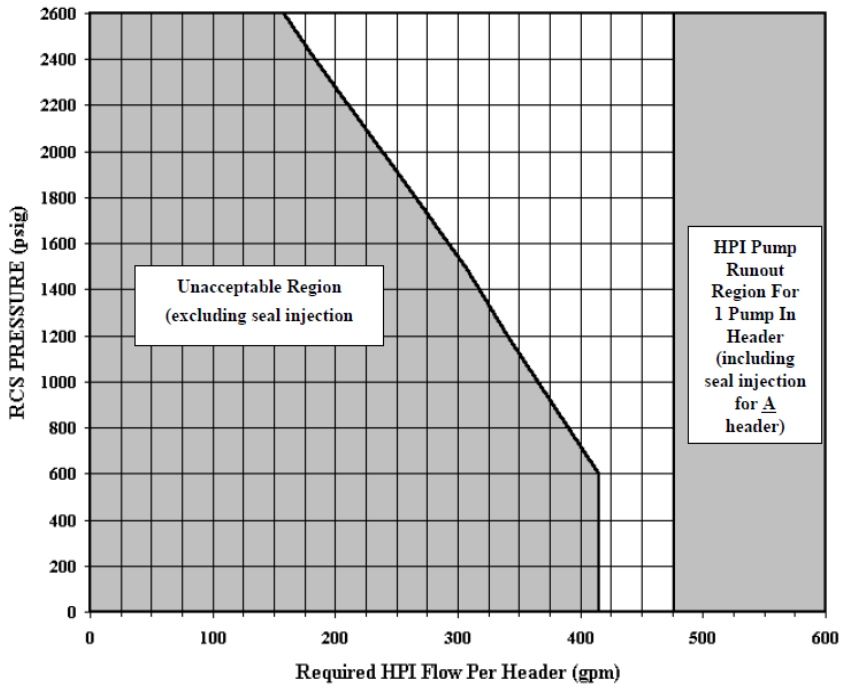
START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Rule 3 IAAT Step 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). **STANDARD:** Candidate announces the initiation of Rule 4. ***Examiner Cue: If requested, provide concurrence (as CRS) for initiation of Rule 4.*** ***Examiner Note: This starts the 5 minute "Time critical" time clock.*** ***Time =*** _____***.*** **COMMENTS:**	___ SAT __ UNSAT
2	Rule 4 Step 1	Verify any HPI pump powered from 1TC, 1TD, or 1TE can be operated. **STANDARD:** The candidate recognizes one HPI pump is in operation. **COMMENTS:**	___ SAT __ UNSAT

3	**2**	OPEN the following: • 1HP-24 • 1HP-25 **STANDARD:** The candidate: • Rotates 1HP-24 switch on 1UB1 to the OPEN position and observes the red open light come ON and the green closed light go OFF. • Rotates 1HP-25 switch on 1UB1 to the OPEN position and observes the red open light come ON and the green closed light go OFF. **COMMENTS:**	**CRITICAL STEP** ___ SAT __ UNSAT
4	**3**	Start all available HPI pumps **STANDARD**: Candidate starts the 1B and 1C HPI pumps by rotating the 1B HPI pump control switch to the START position and rotating the 1C HPI pump control switch to the CLOSE position located on 1UB1. **COMMENTS:**	___ SAT __ UNSAT

5	**4**	OPEN the following: • *1HP-26 • 1HP-27 **STANDARD**: The candidate: • Rotates and holds 1HP-26 switch on 1UB1 to the OPEN position and observes the green “CLOSED light go OFF and the red “OPEN” light come ON. • Locates 1HP-27 ('1B' HP Injection) on 1UB1 and verifies red 'OPEN' light is ON, and the green 'CLOSED' light is OFF. **COMMENTS:**	***CRITICAL STEP** ___ SAT __ UNSAT
6	**5**	Open 1RC-4 **STANDARD**: The candidate locates 1RC-4 control switch on 1UB1 and verifies that the red "OPEN" indication is illuminated and the green "CLOSED" indication is extinguished. ***Examiner Note: This valve will already be open*** **COMMENTS:**	___ SAT __ UNSAT
7	**6**	VERIFY flow exists in any HPI header. **STANDARD**: The candidate locates HPI Flow Train A and B flow meters on 1UB1 and flow is verified. **COMMENTS:**	___ SAT __ UNSAT

8	**7**	Perform the following: A. Place 1RC-66 SETPOINT SELECTOR to OPEN B. Depress 1RC-66 OPEN PERMIT pushbutton **STANDARD***:* The candidate: • *Rotates 1RC-66 SETPOINT SELECTOR switch on 1UB1 to the OPEN position • *Depresses 1RC-66 OPEN PERMIT pushbutton on 1UB1 • Verifies PORV is open by verifying that the red "OPEN" indication is illuminated and the PORV Flow Statalarm (1SA18/A1) is in alarm. ***EXAMINER NOTE: This stops the 5 minute "Time Critical" time clock.*** ***Time =*** _____***.*** **COMMENTS:**	***CRITICAL STEP** ___ SAT __ UNSAT
9	**8**	Verify at least two HPI pumps operating. **STANDARD***:* The candidate verifies that three HPI pumps are operating. **COMMENTS:**	___ SAT ___ UNSAT

10	**9**	Verify flow in <u>both</u> HPI headers is in the acceptable region of Figure 1 (Required HPI Flow Per Header). **<u>STANDARD</u>***:* The candidate verifies flow in both HPI headers is in the acceptable region of Figure 1 below. **Figure 1** **Required HPI Flow Per Header**  **<u>COMMENTS</u>:**	___ SAT __UNSAT
11	**10**	Verify flow exists in <u>any</u> HPI header **<u>STANDARD</u>***:* The candidate locates HPI Flow Train A and B flow meters on 1UB1. Loop A and Loop B flow is verified. ***Examiner Note: This flow has already been verified in step 7*** **<u>COMMENTS</u>:**	___ SAT __ UNSAT

12	**11**	Perform the following: A. Place 1RC-66 SETPOINT SELECTOR to OPEN B. Depress 1RC-66 OPEN PERMIT pushbutton **STANDARD**:The candidate: • Verifies 1RC-66 SETPOINT SELECTOR switch on 1UB1 in the OPEN position • Depresses 1RC-66 OPEN PERMIT pushbutton on 1UB1 • Verifies PORV is open by verifying that the red "OPEN" indication is illuminated and the PORV Flow Statalarm (1SA18/A1) is in alarm. ***Examiner Note: This flow has already been verified in step 8*** **COMMENTS:**	___ SAT ___ UNSAT
13	**12**	Verify > one RCP operating. **STANDARD**: Candidate determines that ALL RCPs are operating. **COMMENTS:**	___ SAT ___ UNSAT
14	**13**	**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.** Stop all but one RCP. **STANDARD**: The candidate stops ALL but one RCP by rotating their control switches to “OFF” position. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

<table>
<tr>
<td>15</td>
<td>14</td>
<td>
IAAT the following 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 throttle HPI to maximize flow ≤ flow limit.

<u>STANDARD</u>: The candidate verifies header flows less than the limits in the table above.

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

___ UNSAT</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
<td>
De-energize <u>all</u> PZR heaters.

<u>STANDARD</u>: The candidate:
• Rotates the PZR heater bank #1 switch on 1UB1 to the "OFF" position.
• Presses the OFF pushbutton controls for PZR heater banks 2, 3 and 4 on 1UB1

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

___ SAT

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

17	**16**	Close 1HP-5 (LETDOWN ISOLATION) **STANDARD**: The candidate: • Rotates the switch for 1HP-5 on 1UB1 to the closed position. • Observes the red OPEN light go off and the green CLOSED light come on. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
18	**17**	Close the following: • __ TBVs • __ 1FDW-35 • __ 1FDW-44 **STANDARD**: The candidate places the TBVs in HAND and reduces demand to zero using the toggle switch OR if the Turbine Master is in manual, verifies the TBVs are closed by observing the green closed light ON and the red open light OFF. The candidate places 1FDW-35 and 1FDW-44 to HAND and reduce demands to zero using the toggle switches. **COMMENTS**:	___ SAT ___ UNSAT

19	**18**	**IAAT** <u>all</u> HPI is lost, **THEN**: A. Stop all RCPs B. Position 1RC-66 SETPOINT SELECTOR to HIGH **<u>STANDARD</u>**: The candidate verifies HPI is available and operating and the IAAT step does not apply at this time. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT
20	**19**	**WHEN** directed by CRS, **THEN EXIT**. <u>STANDARD</u>: The candidate announces that Rule 4 is complete with outstanding IAATs and returns the Cue sheet to the examiner indicating he has completed his JPM. <u>COMMENTS</u>: **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	Step is required provide proper system alignment for HPI forced cooling flow
5	Step required to allow flow in both HPI headers
8	Step is required to open the PORV to initiate HPI forced cooling through the core (TCA #26).
14	Step required to limit the heat input to the RCS
16	Step required to limit the heat input to the RCS
17	Step required to Reduce the amount of heat energy added to the RB Containment

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

- Unit 1 has tripped following a total loss of feedwater
- IMAs are complete
- The crew has been performing Rule 3 (Loss of Main or Emergency FDW) to regain heat transfer
- CBP feed could NOT be established and PSW SG feed is NOT available
- Efforts to restore steam generator heat transfer per Rule # 3 have NOT been successful
- You are at the Step 23 (WHEN) step in Rule 3 (Loss of Main or Emergency FDW)

INITIATING CUE

The CRS directs you to review outstanding IAAT Steps

This JPM is Time Critical

REGION II
JOB PERFORMANCE MEASURE

RO-S404a

Establish EFDW Flow Through Startup Valves

Alternate Path: Yes

Alt Path Description: ____1FDW-315 failed 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 : Establish EFDW flow through Startup valves

Task Number :

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: APE-054
K/A: AA2.04
Rating: 4.2/4.3

Task Standard:

EFDW flow is established to the affected header through the startup valve.

References:

EOP Rule 3, (Loss of Main or Emergency FDW)
EOP Rule 7, (SG Feed Control)
EOP Enclosure 5.27, (Alternate Methods for Controlling EFDW Flow)

Tools/Equipment/Procedures Needed:

EOP Rule 3, (Loss of Main or Emergency FDW) (0L, Rev. 01)
EOP Rule 7, (SG Feed Control) (0L, Rev. 01)
EOP Enclosure 5.27, (Alternate Methods for Controlling EFDW Flow) (0O, Rev. 01)

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL SNAP 213**
2. **IMPORT** files for **RO-S404a**
3. **ENSURE** clean procedure in place for candidate
4. **WHEN** directed by Lead Examiner, go to **RUN**

==========

Directions without a SNAP:

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

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

- The reactor has just tripped from 25% power
- Immediate Manual Actions are complete

INITIATING CUES

The CRS directs you to perform a Symptoms Check

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Performs a Symptom Check **STANDARD**: Performs Symptom Check and determines that there are no symptoms to report but will perform Rule 3 due to a loss of Main Feedwater ***EXAMINER CUE: CRS acknowledges performing Rule 3 due to a Loss of Main Feedwater.*** **COMMENTS**:	___ SAT ___ UNSAT
2	**Rule 3 Step 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. **STANDARD**: Observes that TB Flooding is NOT occurring by 2SA-18/A-11 (Turbine BSMT Water Emergency High Level) NOT illuminated. (OP/2/A/6102/018) Candidate will perform RNO step and **GO TO** step 3. **COMMENTS**:	___ SAT ___ UNSAT

3	**3**	**IAAT NO** SGs can be fed with FDW (Main/CBP/Emergency/PSW), **AND** <u>any</u> 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). **<u>STANDARD</u>**: Candidate determines Rule 4 is not required. Continue to Step 4. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT
4	**4**	Start <u>operable</u> EFDW pumps, as required, to feed <u>all</u> <u>intact</u> SGs**.** **<u>STANDARD</u>**: Observes MD EFDWP & TD EFDWP running with switch red lights on and normal discharge pressure. Continue to Step 5. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT
5	**5**	Verify <u>any</u> EFDW Pump is operating. **<u>STANDARD</u>**: Checks MD EFDWP & TD EFDWP red lights are on and Pumps have normal discharge pressure. Continue to Step 6. **<u>COMMENTS</u>**:	___ SAT ___ UNSAT

6	**6**	**GO TO** step 38. **STANDARD**: **GO TO** step 38. **COMMENTS**:	___ SAT ___ UNSAT
7	**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. **STANDARD**: Determines that 1FDW-315 is **NOT** controlling properly (1A SG level is < 30" and decreasing). Concludes that 1FDW-315 has failed closed. Continue to Step 39. **COMMENTS**:	___ SAT ___ UNSAT
8	**39**	Place EFDW valve in MANUAL. **STANDARD**: Place 1FDW-315 in MANUAL by depressing the A/M pushbutton on the Moore controller. Continue to Step 40. **COMMENTS**:	___ SAT ___ UNSAT

9	**40**	**[ALTERNATE PATH]** Control EFDW flow with EFDW valve in MANUAL. **STANDARD**: Determine that 1FDW-315 will **NOT** control in MANUAL. Perform **RNO, GO TO** Step 42. Continue to step 42 **COMMENTS**:	___ SAT ___ UNSAT
10	**42**	Notify CRS that Encl 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. **STANDARD**: Removes Encl. 5.27 from EOP and initiates. ***EXAMINER CUE: CRS acknowledges entry into Enclosure 5.27.*** **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**Encl. 5.27 Step 1**	Identify the failure: 1FDW-315 has failed CLOSED [**GO TO** Step 2] **STANDARD**: Candidate determines the next procedural step from table in Step 1.Continue to Step 2. **COMMENTS:**	___ SAT ___ UNSAT

12	**2**	Verify 1A MD EFDWP is operating **STANDARD**: Candidate verifies 1A MD EFDWP is operating. Verify red light on and white light off and normal discharge pressure. Continue to Step 3. **COMMENTS**:	___ SAT ___ UNSAT
13	**3**	Stop 1A MD EFDWP **STANDARD**: *Candidate places 1A MD EFDWP switch to OFF. Verify red light off and white light illuminated. Continue to Step 4. **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT
14	**4**	Verify 1B MD EFDWP is operating. **STANDARD**: Candidate verifies 1B MD EFDWP is operating. Verify red light on and white light off and normal discharge pressure. Continue to Step 5. **COMMENTS**:	___ SAT ___ UNSAT

15	**5**	Place 1 TD EFDW Pump in PULL TO LOCK **STANDARD**: *Candidate places the U1 TD EFDW Pump in PULL to LOCK. Candidate verifies red light is OFF and green light is ON. Continue to Step 6. **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT
16	**6**	Place 1FDW-35 in HAND and set demand to 0% **STANDARD**: Candidate places 1FDW-35 in HAND and uses toggle switch to reduce demand to 0%. Continue to Step 7. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
17	**7**	Close 1FDW-33 **STANDARD**: *Candidate closes 1FDW-33. Candidate verifies red light is OFF and green light is ON. Continue to Step 8. **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT

18	**8**	Verify 1A MD EFDWP will be used. **STANDARD**: Candidate determines that the 1A MD EFDWP will be used. Continue to Step 9. ***EXAMINER CUE: If candidate asks if 1A MD EFDWP will be used, state that the CRS directs using the 1A MD EFDWP.*** **COMMENTS**:	___ SAT ___ UNSAT
19	**9**	Open 1FDW-374 **STANDARD**: *Candidate locates and opens 1FDW-374. Candidate observes green closed light off and red open light on. Continue to Step 10. **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT
20	**10**	Verify the following: • 1FDW-36 closed • 1FDW-38 open **STANDARD**: Candidate determines 1FDW-36 is closed by observing the green closed light ON and red open light OFF on 1VB3 or uses OAC indication. Candidate determines 1FDW-38 is open by observing the green closed light OFF and red open light lit ON 1VB3 or uses OAC indication. Continue to Step 11. **COMMENTS**:	___ SAT ___ UNSAT

21	**11**	Start 1A MD EFDWP **STANDARD**: *Candidate places 1A MD EFDWP switch to RUN. Candidate verifies pump start by observing white light is OFF and red light is ON and proper discharge pressure. Continue to Step 12. **COMMENTS**:	***CRITICAL STEP** ___ SAT ___ UNSAT
22	**12**	**NOTE**: Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge. Flow from a MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge. 100 gpm could cause overcooling if adequate decay heat levels do **NOT** exist. Verify either of the following exists: • HPI Forced Cooling is maintaining core cooling • CBP Feed providing SG feed **STANDARD**: Candidate determines that neither condition is met and goes to the **RNO**. Continue to Step 12 **RNO**. **COMMENTS**:	___ SAT ___ UNSAT

23	**RNO 12**	**IF** any SG is being fed, **THEN** perform the following: • Throttle 1FDW-35 to establish a <u>maximum</u> of 100 gpm. • * Throttle 1FDW-35 to obtain desired SG level per Rule 7 (SG Feed Control) • Notify CR SRO of SG Feed Status **<u>STANDARD</u>**: Candidate throttles 1FDW-35 to attain ~ 100 gpm flow initially on MD EFWP DISCH FLOW gauge or OAC EFW graphic, then throttles 1FDW-35 as necessary to establish ~ 25" S/U level (per Rule 7 table 4) Rule 7 Table 4 (<u>All</u> SCMs > 0°F **AND** <u>any</u> RCP on) specifies the level to establish when using EFDWP is 30" (use MFDW setpoint if feeding via S/U CVs). The MFDW setpoint (i.e. when using the S/U CVs) is 25" S/U level since RCS temperature is > 500°F. ***Examiner Note: The candidate does not need to establish this level to complete the JPM. 1FDW-35 must be open and SG level increasing.*** ***Examiner Cue: Another operator will continue with this procedure.*** **<u>COMMENTS</u>**: **END TASK**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
10	This step is required to ensure the correct procedure is used.
13	This step is required to ensure the valves will operate.
15	This step is required to ensure the valves will operate.
16	This step is required to align the MD EFDWP to the S/U header.
17	This step is required to align the MD EFDWP to the S/U header.
19	This step is required to align the MD EFDWP to the S/U header.
21	This step is required to start the 1A MD EFDWP and provide a SG feed source.
23	This step is required to establish flow to the 1A SG.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

- The reactor has just tripped from 25% power
- Immediate Manual Actions are complete

INITIATING CUES

The CRS directs you to perform a Symptoms Check

REGION II
JOB PERFORMANCE MEASURE

AO-701

RESTORATION OF ICS AUTO POWER

Administrative: No

Alternate Path: Yes

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Restoration of ICS Auto Power

Task Number : N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: BW/A02
K/A: AA1.1
Rating: 4.0/3.8

Task Standard:

ICS AUTO power is restored per AP/3/A/1700/023 (Loss of ICS Power)

References:

AP/3/A/1700/023 (Loss of ICS Power) Enclosure 5.2 (Restoration of ICS AUTO Power) (Rev. 23)

Tools/Equipment/Procedures Needed:

AP/3/A/1700/023 (Loss of ICS Power) Enclosure 5.2 (Restoration of ICS AUTO Power) (Rev. 23)

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

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 3 operating at 100% power

3SA-2/B-11 (ICS AUTO POWER FAILURE) is actuated

INITIATING CUE

The Control Room SRO directs you to use AP/3/A/1700/023 (Loss of ICS Power) Enclosure 5.2 (Restoration of ICS AUTO Power) to restore ICS AUTO power on Unit 3.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**1**	Verify the following breakers closed (Unit 3 Cable Rm): __ 3KRA breaker #1 (100A 1P, ICS POWER PANELBOARD 3KI) __ 3KI breaker #1 (30A 1P, AUTO POWER (ICS/ACS)) **STANDARD:** Locate 3KRA panel board breaker #1 and verify it is closed. ***Examiner Cue: Indicate to the candidate that 3KRA breaker #1 is CLOSED*** Locate 3KI panel board breaker #1 and verify it is closed ***Examiner Cue: Indicate to the candidate that 3KI breaker #1 is tripped OPEN.*** Continue Step 1 RNO **COMMENTS:**	___ SAT ___ UNSAT
2	**1** **RNO**	1. Reset and close the affected breakers (Unit 3 Cable Rm): __ 3KRA breaker #1 (100A 1P, ICS POWER PANELBOARD 3KI) __ *3KI breaker #1 (30A 1P, AUTO POWER (ICS/ACS)) 2. **IF** either of the above breakers fails to remain closed, **THEN** notify CR SRO to have SPOC assist in resetting and closing any open breakers 3. **WHEN** both of the above breakers are closed, **THEN** continue **STANDARD:** Resets and closes 3KI BREAKER #1 by taking the breaker to the open position and then closing it. ***Examiner Cue: Indicate to the candidate that 3KI breaker #1 is CLOSED.*** **COMMENTS:**	___ SAT ___ UNSAT

3	**2**	**ALTERNATE PATH** **NOTE** The following step will require contacting Unit 3 Control Room Verify ICS AUTO power has been restored as indicated by 3SA-2/B-11 (ICS AUTO POWER FAILURE) off **STANDARD:** Contacts Unit 3 Control Room to verify ICS AUTO power has been restored as indicated by 3SA-2/B-11 (ICS AUTO POWER FAILURE) off ***Examiner Cue: Inform candidate that 3SA-2/B-11 (ICS AUTO POWER FAILURE) remains actuated.*** **COMMENTS:**	___ SAT ___ UNSAT
4	**2** **RNO**	**IF** ICS AUTO power has NOT been restored, **THEN** bypass 3KI inverter as follows (KI BYP SW cabinet, Unit 3 Equip Rm, North of col Q88) A. Position SW#1 OFF (left switch) B. Position SW#3 OFF (right switch) C. Position SW#2 ON (center switch) **STANDARD:** Positions SW#1 to OFF (left switch). ***Examiner Cue: Indicate to the candidate that SW#1 is OFF.*** Positions SW#3 to OFF (right switch) ***Examiner Cue: Indicate to the candidate that SW#3 is OFF.*** Positions SW#2 to ON (center switch ***Examiner Cue: Indicate to the candidate that SW#2 is ON.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

5	**3**	Notify Unit 3 CR that <u>all</u> applicable steps of this enclosure have been completed **<u>STANDARD</u>:** Notify Unit 3 CR that all applicable steps of this enclosure have been completed. ***Examiner Cue: Inform candidate that the Control Room has been notified.*** **<u>COMMENTS</u>:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Step is required in proper sequence to align power to the 3KI bus.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 3 operating at 100% power

3SA-2/B-11 (ICS AUTO POWER FAILURE) is actuated

INITIATING CUE

The Control Room SRO directs you to use AP/3/A/1700/023 (Loss of ICS Power) Enclosure 5.2 (Restoration of ICS AUTO Power) to restore ICS AUTO power on Unit 3.

REGION II
JOB PERFORMANCE MEASURE

AO-804

AO Actions for Control Room Evacuation

Administrative: No

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : AO Actions for Control Room Evacuation

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 12 minutes

K/A Rating(s):

System: APE068
K/A: AA1.07
Rating: (4.1/4.2)

Task Standard:

AO actions for Control Room Evacuation are completed IAW AP/1/A/1700/050 Encl. 5.6.

References:

AP/1/A/1700/050

Tools/Equipment/Procedures Needed:

AP/1/A/1700/050, Encl. 5.6 (Rev. 03)

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

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

A fire has occurred in Unit 1 and 2 Control Room

AP/1/A/1700/050 (Challenging Plant Fire) has been initiated

Unit 1 and 2 Control Rooms are being evacuated

AP/1/A/1700/050, Encl. 5.6 (AP/EOP AO Actions for Control Room Evacuation) is in progress up to step 2.

INITIATING CUE

The CRS directs you to continue in AP/1/A/1700/050, Encl. 5.6 (AP/EOP AO Actions for Control Room Evacuation), beginning at step 2.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2	**NOTE** Dress out is **NOT** required. RP will be notified at completion of this Enclosure. Locally close the following: __ 1FDW-315 (1A S/G EFDW CONTROL) (A-4, E Pen Rm, 10' N of Qa-68 against RB Wall) __ 1FDW-316 (1B S/G EFDW CONTROL) (A-4, W Pen Rm, 4' NE of W-70a, 4' up) **STANDARD:** Candidate locates 1FDW-315 and 1FDW-316 and simulates rotating the handwheel clockwise to a hard stop. ***Examiner Cue:*** ***Inform candidate that each valve is closed following handwheel rotation in the clockwise direction.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

2	**3**	Open the following breakers (A-4/ East Pen Rm): __ 1XH-3A (Pzr Htr Group E Bkr) **(already open)** __ 1XH-4A (Pzr Htr Group H Bkr) __ 1XI-3A (Pzr Htr Group F Bkr) __ 1XI-4A (Pzr Htr Group I Bkr) __ 1XJ-2A (Pzr Htr Group D Bkr) __ 1XJ-3A (Pzr Htr Group G Bkr) **(already open)** __ 1XJ-4A (Pzr Htr Group J Bkr) __ 1XK-1A (Pzr Htr Group A-K Bkr) **STANDARD:** Candidate locates and simulates opening the following breakers by rotating the breaker handle counter clockwise to the OFF position: __ 1XH-3A (Pzr Htr Group E Bkr) __ 1XH-4A (Pzr Htr Group H Bkr) __ 1XI-3A (Pzr Htr Group F Bkr) __ 1XI-4A (Pzr Htr Group I Bkr) __ 1XJ-2A (Pzr Htr Group D Bkr) __ 1XJ-3A (Pzr Htr Group G Bkr) __ 1XJ-4A (Pzr Htr Group J Bkr) __ 1XK-1A (Pzr Htr Group A-K Bkr) **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

3	**4**	Notify the CRS in the SSF Encl 5.6, (AP/EOP AO Actions for Control Room Evacuation) actions are completed. **STANDARD:** Candidate notifies the CRS in the SSF that Encl. 5.6 actions are completed. ***Examiner Cue:*** ***Inform the candidate that the CRS has been notified and another operator will continue with the procedure.*** **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to secure EFDW to prevent challenging operation of the SSF.
2	This step is required to secure Pressurizer Heaters to prevent challenging operation of the SSF.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

A fire has occurred in Unit 1 and 2 Control Room

AP/1/A/1700/050 (Challenging Plant Fire) has been initiated

Unit 1 and 2 Control Rooms are being evacuated

AP/1/A/1700/050, Encl. 5.6 (AP/EOP AO Actions for Control Room Evacuation) is in progress up to step 2.

INITIATING CUE

The CRS directs you to continue in AP/1/A/1700/050, Encl. 5.6 (AP/EOP AO Actions for Control Room Evacuation), beginning at step 2.

REGION II
JOB PERFORMANCE MEASURE

AO-S403

AO Actions for Supply of Water to SSF

Administrative: No

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : AO Actions for Supply of Water to SSF

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 25 minutes

K/A Rating(s):

System: Gen
K/A: 2.1.20
Rating: (4.6/4.6)

Task Standard:

Flow path from CCW Discharge back to CCW inlet is aligned in accordance with AP/0/A/1700/046, Encl. 5.9 (Supply of Water to SSF).

References:

AP/0/A/1700/046 (Extensive Damage Mitigation) (Rev. 10)

Tools/Equipment/Procedures Needed:

AP/0/A/1700/046, Encl. 5.9 (Supply of Water to SSF) (Rev. 10)

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

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 2 refueling outage in progress. Unit 2 CCW Condenser inlet piping has just been isolated. No tags are hung.

An explosion occurred that disabled the Unit 3 Control Room and operating crew.

AP/0/A/1700/046 (Extensive Damage Mitigation) was initiated.

Unit 3 is being maintained in hot shutdown from the SSF in accordance with AP/46.

The dedicated Submersible Pump is inoperable and cannot be installed.

Keowee Lake level is 798 feet.

INITIATING CUE

The Unit 2 CRS directs you to perform AP/0/A/1700/046, Encl. 5.9 (Supply of Water to SSF), beginning at step 7, to align the CCW Discharge back to the CCW inlet.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	7	Locally open the following CCW crossover valves to align all units to Unit 2 and the SSF: __ *1CCW-40 (UNIT 1 CROSSOVER TIE) (T-1/K-22) __ *2CCW-41 (UNIT 2 CROSSOVER TIE) (T-1/J-40) __ *3CCW-42 (UNIT 3 CROSSOVER TIE) (T-1/K-44/45) __ 3CCW-94 (UNIT 3 CROSSOVER TIE) (T-1/K-50) **STANDARD:** Candidate opens the following valves by rotating the handwheel in the counter clockwise direction to a hard stop; __ *1CCW-40 (UNIT 1 CROSSOVER TIE) (T-1/K-22) __ *2CCW-41 (UNIT 2 CROSSOVER TIE) (T-1/J-40) __ *3CCW-42 (UNIT 3 CROSSOVER TIE) (T-1/K-44/45) __ 3CCW-94 (UNIT 3 CROSSOVER TIE) (T-1/K-50) **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
2	8	Verify both of the following: __ Keowee Lake level > 791' __ Flow path from CCW Discharge back to CCW Inlet is desired **STANDARD:** Candidate determines Keowee lake level is > 791 feet and the flow path from CCW Discharge back to CCW Inlet is desired from information contained on the cue sheet. ***Examiner Cue: If asked, inform the candidate that Keowee lake level is > 791 feet and the flow path from CCW Discharge back to CCW Inlet is desired.*** **COMMENTS:**	___ SAT ___ UNSAT

3	**9**	Locally open the following Unit 1 valves: __ 1CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-25) __ 1CCW-76 (1A CONDENSATE COOLER CCW INLET) (T-1/F-25) __ 1CCW-78 (1B CONDENSATE COOLER CCW INLET) (T-1/F-25) __ 1CCW-77 (1A CONDENSATE COOLER CCW OUTLET) (T-1/E-25) __ 1CCW-79 (1B CONDENSATE COOLER CCW OUTLET) (T-1/E-25) __ 1CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/E-26) **STANDARD:** The following valves are opened by rotating the handwheel in the counter clockwise to a hard stop, or verified open by the position indicator: __ 1CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-25) __ 1CCW-76 (1A CONDENSATE COOLER CCW INLET) (T-1/F-25) __ 1CCW-78 (1B CONDENSATE COOLER CCW INLET) (T-1/F-25) __ 1CCW-77 (1A CONDENSATE COOLER CCW OUTLET) (T-1/E-25) __ 1CCW-79 (1B CONDENSATE COOLER CCW OUTLET) (T-1/E-25) __ 1CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/E-26) **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

4	**10**	Locally open the following Unit 2 valves: __ 2CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-30) __ 2CCW-76 (2A CONDENSATE COOLER CCW INLET) (T-1/F-30) __ 2CCW-78 (2B CONDENSATE COOLER CCW INLET) (T-1/F-30) __ 2CCW-77 (2A CONDENSATE COOLER CCW OUTLET) (T-1/D-30) __ 2CCW-79 (2B CONDENSATE COOLER CCW OUTLET) (T-1/D-30, 4' W.) __ 2CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/ D-30, 4' W.) **STANDARD:** The following valves are opened by rotating the handwheel in the counter clockwise to a hard stop, or verified open by the position indicator: __ 2CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-30) __ 2CCW-76 (2A CONDENSATE COOLER CCW INLET) (T-1/F-30) __ 2CCW-78 (2B CONDENSATE COOLER CCW INLET) (T-1/F-30) __ 2CCW-77 (2A CONDENSATE COOLER CCW OUTLET) (T-1/D-30) __ 2CCW-79 (2B CONDENSATE COOLER CCW OUTLET) (T-1/D-30, 4' W.) __ 2CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/ D-30, 4' W.) **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

5	**11**	Locally open the following Unit 3 valves: __ 3CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-44) __ 3CCW-76 (2A CONDENSATE COOLER CCW INLET) (T-1/F-44) __ 3CCW-78 (2B CONDENSATE COOLER CCW INLET) (T-1/F-44) __ 3CCW-77 (2A CONDENSATE COOLER CCW OUTLET) (T-1/D-44) __ 3CCW-79 (2B CONDENSATE COOLER CCW OUTLET) (T-1/D-44) __ 3CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/ D-43/44) **STANDARD:** The following valves are opened by rotating the handwheel in the counter clockwise to a hard stop, or verified open by the position indicator: __ 3CCW-75 (CONDENSATE COOLERS CCW SUPPLY) (T-1/F-44) __ 3CCW-76 (2A CONDENSATE COOLER CCW INLET) (T-1/F-44) __ 3CCW-78 (2B CONDENSATE COOLER CCW INLET) (T-1/F-44) __ 3CCW-77 (2A CONDENSATE COOLER CCW OUTLET) (T-1/D-44) __ 3CCW-79 (2B CONDENSATE COOLER CCW OUTLET) (T-1/D-44) __ 3CCW-86 (CONDENSATE COOLERS CCW FLOW CONTROL BYPASS) (T-1/ D-43/44) **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

6	**12**	Notify TSC to continue efforts to supply water to the Unit 2 CCW Inlet piping for extended SSF operation **STANDARD:** Candidate notifies the TSC to continue efforts to supply water to the Unit 2 CCW Inlet piping for extended SSF operation ***Examiner Cue: Inform the candidate the TSC has been notified.*** **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to align the flow path from the CCW Discharge back to the CCW Inlet.
3	This step is required to align the flow path from the CCW Discharge back to the CCW Inlet.
4	This step is required to align the flow path from the CCW Discharge back to the CCW Inlet.
5	This step is required to align the flow path from the CCW Discharge back to the CCW Inlet.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 2 refueling outage in progress. Unit 2 CCW Condenser inlet piping has just been isolated. No tags are hung.

An explosion occurred that disabled the Unit 3 Control Room and operating crew.

AP/0/A/1700/046 (Extensive Damage Mitigation) was initiated.

Unit 3 is being maintained in hot shutdown from the SSF in accordance with AP/46.

The dedicated Submersible Pump is inoperable and cannot be installed.

Keowee Lake level is 798 feet.

INITIATING CUE

The Unit 2 CRS directs you to perform AP/0/A/1700/046, Encl. 5.9 (Supply of Water to SSF), beginning at step 7, to align the CCW Discharge back to the CCW inlet.

REGION II
JOB PERFORMANCE MEASURE

ADM-110

Diverse Verification of Reactor Power

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Diverse Verification of Reactor Power

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: Gen
K/A: 2.1.45
Rating: 4.3/4.3

Task Standard:

Compare the average NI Power Range Rx power to the average Loop delta T power and determine that they are NOT within 2% of each other.

References:

PT/1/A/0600/001 (Periodic Instrument Surveillance) (Rev. 337)
PT/0/A/0600/001 A (Loss of Computer)
Picture of front board indications

Tools/Equipment/Procedures Needed:

PT/1/A/0600/001 (Periodic Instrument Surveillance) (Rev. 337)
Picture of front board indications

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

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Unit 1 is at 80% RTP of Cycle 29

PT/1/A/0600/001 (Periodic Instrument Surveillance) Enclosure 13.1 (Mode 1&2) has just been initiated for your shift

OAC is unavailable.

No OAC alarms are present.

Transient Monitor is unavailable

INITIATING CUE

The Time = 2000 requirements on page 1 of 29 of PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1&2) are being performed. The CRS directs you to perform Step 1 and determine if the procedural requirements are met that will allow signing Step 1 as complete. Document your answer below.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	**1**	If Rx critical, perform the following: (R.M.)	
2	**1.1**	Record Core Thermal Power Indication every 2 hours. (R.M.) **STANDARD**: Candidate reviews the note prior to step 1.1 concerning priority of power Indications to use for surveillance and determines that A through E are not available due to the OAC and Transient Monitor being out of service. Candidate refers to the attached graphic and averages the four NI power ranges to determine (%) Reactor Power in accordance with Note 1.1F as follows: NI-5 = 80.1 NI-6 = 79.9 NI-7 = 79.8 NI-8 = 80.0 80.1 + 79.9 + 79.8 + 80.0 = 319.8 / 4 = **79.95** Candidate records **79.95** in the % Reactor Power (R.M.) column at 2000 and initials the Step 1.1 (R.M.) column at 2000. **COMMENTS**:	___ SAT ___ UNSAT
3	**1.2**	Verify **NO** CTP OAC alarms **OR** CTP OAC alarm response in progress. (R.M.) **STANDARD**: Candidate determines there are no CTP OAC alarms. The OAC is unavailable. Candidate initials the Step 1.2 (R.M.) column at 2000. **COMMENTS**:	___ SAT ___ UNSAT

4	**1.3**	Verify diverse reactor power indications within + 2% per one of the following:	
5	**1.3.1**	Compare the following: (refer to Note 1.1) • OAC Calculated Thermal Power Best **OR** • OAC Calculated Thermal Power Secondary (if above ~ 25% power) **OR** • OAC Calculated Thermal Power Primary (if below ~ 25% power) versus • OAC Calculated Thermal Power Delta T **STANDARD:** Candidate determines these indications are not available due to the OAC being out of service and proceeds to step 1.3.2. **COMMENTS:**	___ SAT ___ UNSAT

6	**1.3.2**	Compare the following: • Average of NI-5, NI-6, NI-7, and NI-8 (refer to Note 1.1.F) **OR** • PID A5081 ICS Calculated Thermal Power Best available from the Transient Monitor. See Note 1.1.E above. versus • Average two RC Loop ΔTs from RC Loop ΔT gauge and use Enclosure "Loop ΔT Vs Reactor Power" to determine percent power from ΔT **STANDARD:** Candidate refers to the attached graphic and averages the four NI power ranges, or uses the value for reactor power recorded per step 1.1, since PID A5081 ICS Calculated Thermal Power Best is not available from the Transient Monitor. NI-5 = 80.1 NI-6 = 79.9 NI-7 = 79.8 NI-8 = 80.0 80.1 + 79.9 + 79.8 + 80.0 = 319.8 / 4 = **79.95** **[Acceptable band = 79.9 – 80.0]** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

7	**1.3.2 con't.**	Compare the following: • Average of NI-5, NI-6, NI-7, and NI-8 (refer to Note 1.1.F) **OR** • PID A5081 ICS Calculated Thermal Power Best available from the Transient Monitor. See Note 1.1.E above. versus • Average two RC Loop ΔTs from RC Loop ΔT gauge and use Enclosure "Loop ΔT Vs Reactor Power" to determine percent power from ΔT **STANDARD:** Candidate refers to the attached graphic and averages the Loop A and Loop B ΔT indications: Loop A = 37.2 Loop B = 37.4 37.2 + 37.4 = 74.6 / 2 = **37.3**°F **[Acceptable band = 37°F - 37.3°F]** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
8	**1.3.2 con't.**	Compare the following: • Average of NI-5, NI-6, NI-7, and NI-8 (refer to Note 1.1.F) **OR** • PID A5081 ICS Calculated Thermal Power Best available from the Transient Monitor. See Note 1.1.E above. versus • Average two RC Loop ΔTs from RC Loop ΔT gauge and use Enclosure "Loop ΔT Vs Reactor Power" to determine percent power from ΔT **STANDARD:** Candidate refers to PT/1/A/0600/001, Enclosure13.11 (Loop ΔT Vs Reactor Power), and using 37.3°F determines that Reactor Power from delta T is **85% (± 2%).** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

9	**1.3.2 con't.**	Compare the following: • Average of NI-5, NI-6, NI-7, and NI-8 (refer to Note 1.1.F) **OR** • PID A5081 ICS Calculated Thermal Power Best available from the Transient Monitor. See Note 1.1.E above. versus • Average two RC Loop ΔTs from RC Loop ΔT gauge and use Enclosure "Loop ΔT Vs Reactor Power" to determine percent power from ΔT **STANDARD:** Candidate compares the average of NI-5, NI-6, NI-7, and NI-8 **(79.9 - 80%)** to the percent power from ΔT acquired from Enclosure 13.11 (Loop ΔT Vs Reactor Power) **(85% ± 2%)**, and determines the values are **NOT within ± 2%. Therefore step 1.3 cannot be signed off as complete.** ***EXAMINER NOTE: The candidate may stop prior to performing step 10 when they determine procedure step 1.3 cannot be signed off as complete. If so, the task will end here at step 9 and step 10 will not be performed.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

10	**1.4**	Verify CTPD set $\leq$ 100%. (R.M.) **STANDARD**: Candidate refers to the attached graphic of the Load Control Panel (LCP) and determines CTPD set = 80%. Candidate initials the Step 1.4 (R.M.) column at 2000. ***EXAMINER NOTE: The candidate may stop prior to performing step 10 when they determine procedure step 1.3 cannot be signed off as complete. If so, the task will end at step 9 and step 10 will not be performed.*** **COMMENTS**: **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
6	This step is required to determine % Rx Power from the average of NI-5, 6, 7, and 8.
7	This step is required to determine the correct ΔT to use.
8	This step is required to determine % Rx Power from ΔT.
9	This step is required to determine if the acceptance criteria for the step has been met.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 80% RTP of Cycle 29

PT/1/A/0600/001 (Periodic Instrument Surveillance) Enclosure 13.1 (Mode 1&2) has just been initiated for your shift

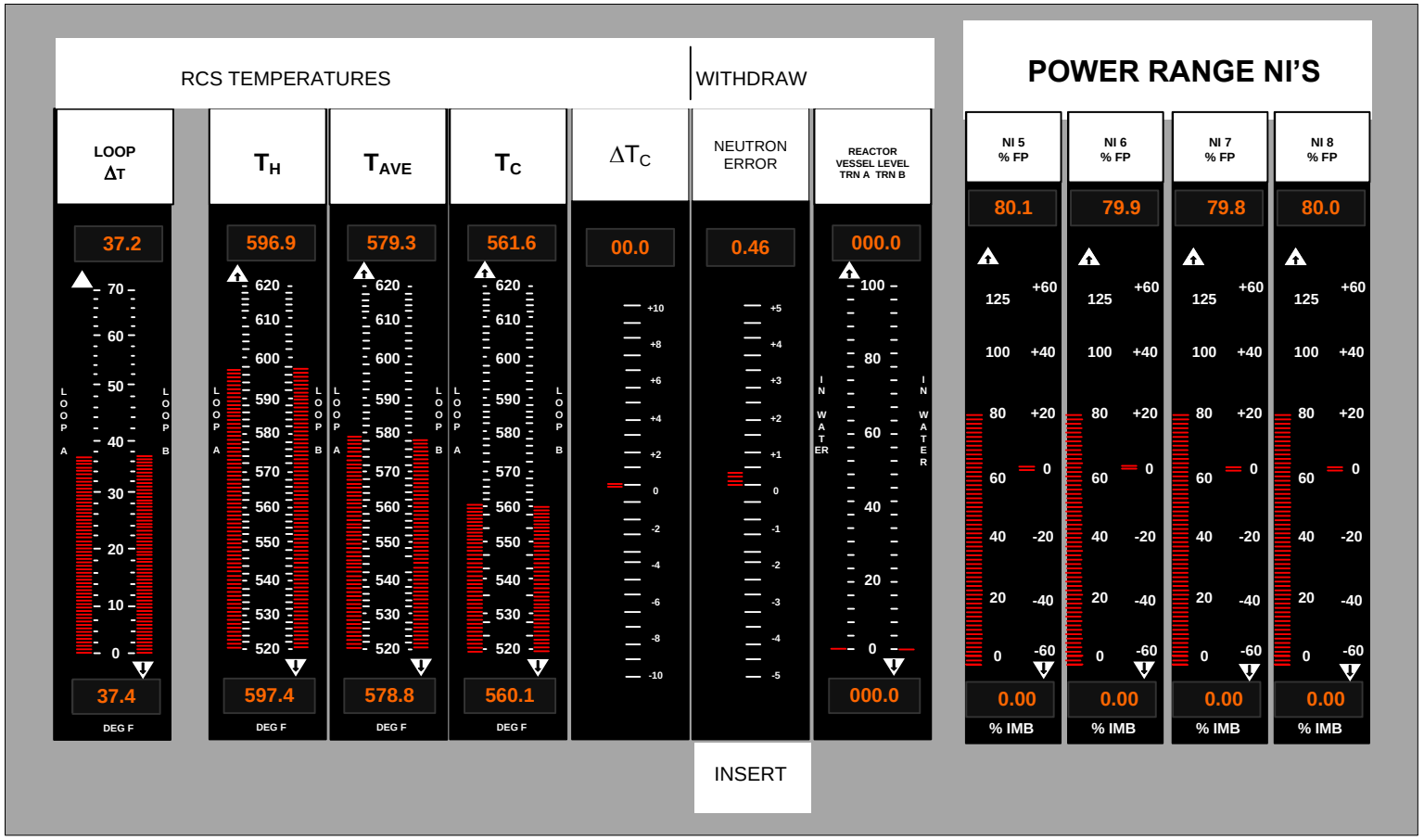
OAC is unavailable.

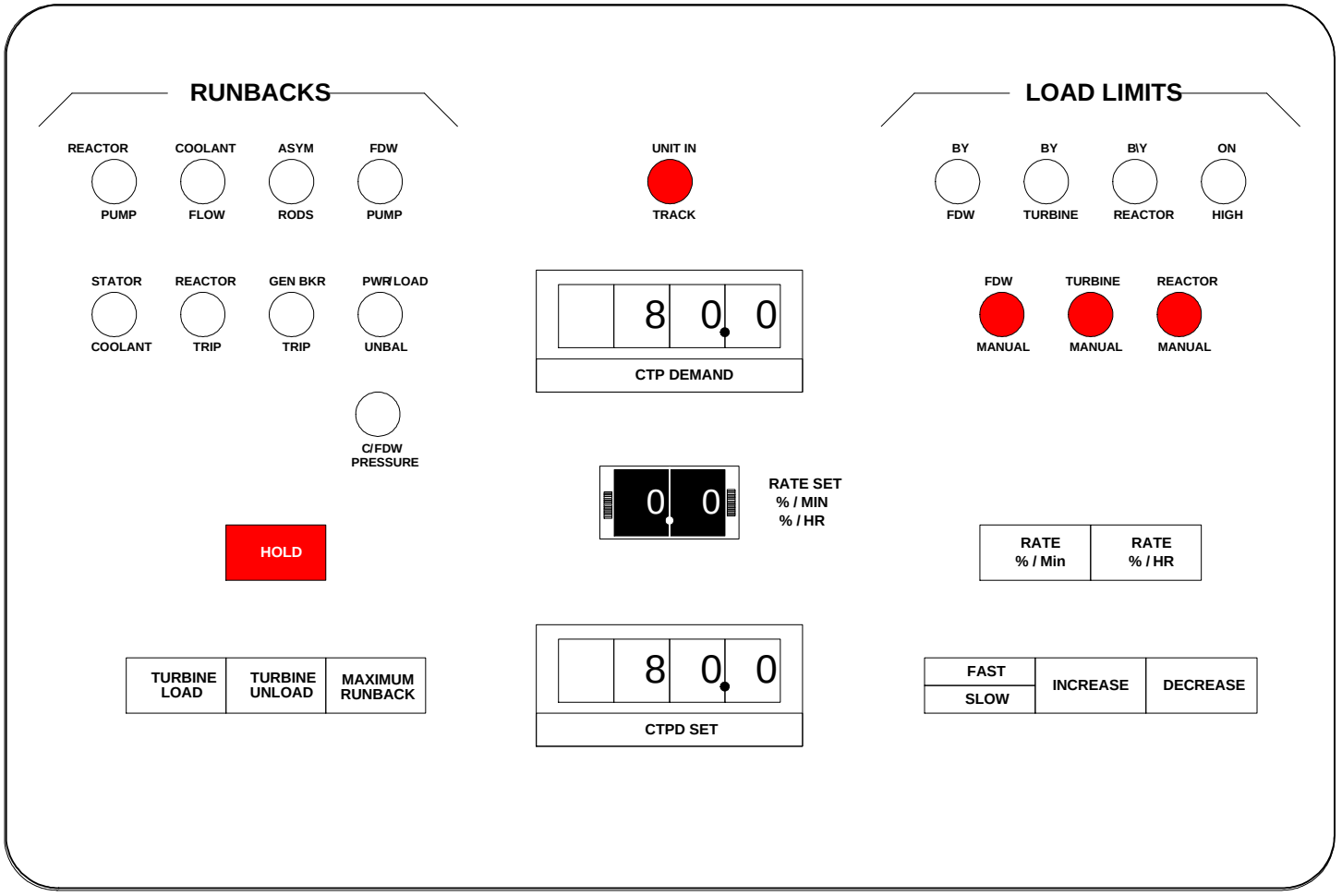
No OAC alarms are present.

Transient Monitor is unavailable

INITIATING CUE

The Time = 2000 requirements on page 1 of 29 of PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1&2) are being performed. The CRS directs you to perform Step 1 and determine if the procedural requirements are met that will allow signing Step 1 as complete. Document your answer below.


RCS TEMPERATURES
WITHDRAW
POWER RANGE NI'S
LOOP ΔT
T_H
T_{AVE}
T_C
ΔTC
NEUTRON ERROR
REACTOR VESSEL LEVEL TRN A TRN B
NI 5 % FP
NI 6 % FP
NI 7 % FP
NI 8 % FP
37.2
596.9
579.3
561.6
00.0
0.46
000.0
80.1
79.9
79.8
80.0
37.4
597.4
578.8
560.1
000.0
0.00
0.00
0.00
0.00
DEG F
% IMB
LOOP A
LOOP B
IN WATER
INSERT


RUNBACKS
REACTOR
PUMP
COOLANT
FLOW
ASYM
RODS
FDW
PUMP
UNIT IN
TRACK
LOAD LIMITS
BY
FDW
BY
TURBINE
BY
REACTOR
ON
HIGH
STATOR
COOLANT
REACTOR
TRIP
GEN BKR
TRIP
PWR/LOAD
UNBAL
C/FDW
PRESSURE
8 0 0
CTP DEMAND
FDW
MANUAL
TURBINE
MANUAL
REACTOR
MANUAL
0 0
RATE SET
% / MIN
% / HR
HOLD
RATE
% / Min
RATE
% / HR
TURBINE
LOAD
TURBINE
UNLOAD
MAXIMUM
RUNBACK
8 0 0
CTPD SET
FAST
SLOW
INCREASE
DECREASE

REGION II
JOB PERFORMANCE MEASURE

ADM-111

Perform Manual RCS Leakage Calculation

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Perform Manual RCS Leakage Calculation

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: Generic
K/A: 2.1.20
Rating: 4.6/4.6

Task Standard:

RCS Leakage is calculated per the attached key.

References:

PT/0/A/0600/001A (Loss Of Computer) (Rev 42)
PT/1/A/0600/010 (Reactor Coolant Leakage) (Rev 95)

Tools/Equipment/Procedures Needed:

PT/1/A/0600/010 (Reactor Coolant Leakage) Encl. 13.3 (Manual RCS Leakage Calculation Data Sheet) (Rev 95)

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

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Oconee Unit 1 OAC computer repairs are expected to be extended through turnover for hardware replacement.

The Loss of Computer procedure PT/0/A/0600/001A (Loss of Computer) is in progress, however an RCS Leakage Calculation has not been performed during this shift.

INITIATING CUES

The CRS directs you to perform a manual RCS leakage calculation per PT/1/A/0600/010 (Reactor Coolant Leakage) Encl. 13.3 (Manual RCS Leakage Calculation Data Sheet) using the data collected below.

Manual RCS Leakage Data

Parameter	Initial	Final
Time	0015	0115
Pzr level	219.0 inches	220.7 inches
Tave Indication	579.0°F	579.3°F
Quench Tank Level	86.5 inches	86.5 inches
LDST Level	76.7 inches	76.1 inches
Power Range NI	100.0%	100.1%
RCS NR Pressure	2150 psig	2150 psig
Group 7 Control Rod Position	92.7%	92.7%

START TIME: _____

<table>
<tr><th>SEQ STEP</th><th>PROC STEP</th><th>DESCRIPTION</th><th></th></tr>
<tr><td>1</td><td>2.1</td><td>
NOTE: • If Tave is on-scale, use Tave. If Tave is off-scale, use Tcold
• If RCS NR Pressure is on-scale, use NR Pressure. If RCS NR Pressure is off-scale, use RCS WR Pressure

Record Initial Data in "Table #1"
<table>
<tr><th>Value</th><th>Initial Data</th><th>Minus</th><th>Final Data</th><th>Equals</th><th>Change</th></tr>
<tr><td>Pzr Lvl</td><td>219 Inches</td><td>-</td><td>inches</td><td>=</td><td>Inches (1)</td></tr>
<tr><td>RCS T</td><td>579 °F</td><td>-</td><td>°F</td><td>=</td><td>°F (2)</td></tr>
<tr><td>QT Lvl</td><td>86.5 inches</td><td>-</td><td>inches</td><td>=</td><td>Inches (3)</td></tr>
<tr><td>LDST Lvl</td><td>76.7 inches</td><td>-</td><td>inches</td><td>=</td><td>Inches (4)</td></tr>
<tr><td>Rx Pwr</td><td>100.0 %</td><td>-</td><td>%</td><td>=</td><td>%</td></tr>
<tr><td>RCS P</td><td>2150 psig</td><td>-</td><td>psig</td><td>=</td><td>psig</td></tr>
<tr><td>CR Pos</td><td>92.7 %</td><td>-</td><td>%</td><td>=</td><td>%</td></tr>
</table>
<u>STANDARD</u>: Student enters initial set of data into “Table #1” of Enclosure 13.3 (Manual Leakage Calculation Data Sheet) from the initiating cue.

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

___ UNSAT</td></tr>
<tr><td>2</td><td>2.2</td><td>
Record time Initial Data recorded: 0015

<u>STANDARD</u>: Student enters 0015 (from initiating cue)

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

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

3 **2.3**

After 1 hour, record Final Data in "Table #1"

Value	Initial Data	Minus	Final Data	Equals	Change
Pzr Lvl	219 Inches	-	**220.7** inches	=	Inches (1)
RCS T	579 °F	-	**579.3** °F	=	°F (2)
QT Lvl	86.5 inches	-	**86.5** inches	=	Inches (3)
LDST Lvl	76.7 inches	-	**76.1** inches	=	Inches (4)
Rx Pwr	100.0 %	-	**100.1** %	=	%
RCS P	2150 psig	-	**2150** psig	=	psig
CR Pos	92.7 %	-	**92.7** %	=	%

STANDARD: Student enters final set of data into "Table #1" of Enclosure 13.3 (Manual Leakage Calculation Data Sheet) (from initiating cue)

COMMENTS:

___ SAT

___ UNSAT

4 **2.4**

Record time Final Data recorded: ____0115____

STANDARD: Student enters 0115

COMMENTS:

___ SAT

___ UNSAT

5 **2.5**

Record elapsed time: _____60_____ minutes

STANDARD: Student enters 60 minutes

COMMENTS:

___ SAT

___ UNSAT

6 **2.6**

NOTE:
- Change = Initial - Final
- Negative sign (-) should be included with values as appropriate

Calculate and record "Change" values in "Table # 1"

Value	Initial Data	Minus	Final Data	Equals	Change
Pzr Lvl	219 Inches	-	220.7 inches	=	**-1.7** nches (1)
RCS T	579 °F	-	579.3 °F	=	**-0.3** °F (2)
QT Lvl	86.5inches	-	86.5 inches	=	**0** Inches (3)
LDST Lvl	76.7inches	-	76.1 inches	=	**+0.6** inches (4)
Rx Pwr	100.0 %	-	100.1 %	=	**-0.1** %
RCS P	2150 psig	-	2150 psig	=	**0** psig
CR Pos	92.7 %	-	92.7 %	=	**0** %

STANDARD: Student calculates the change in data and fills in Table 1 change column

COMMENTS:

CRITICAL STEP

___ SAT

___ UNSAT

7 **2.7**

NOTE: Conversion Factor (6.831 inches/°F) must be positive (+) value

Calculate Corrected Pzr Level Change:

-1.7 inches – (6.831 inches/°F X **-0.3** °F) = **+.349** inches

(1) PZR Level Change Level Change due to Temp (2) Corrected PZR Level Change

STANDARD: -1.7 inches – (6.831 inches/°F X -.3°F) = **+.349 inches (+.340 to +.350)**

COMMENTS:

CRITICAL STEP

___ SAT

___ UNSAT

8	**2.8**	Convert Corrected Pzr Level Change to gallons: **+.349** inches X 14.364 gallons / inch = **+5.013** gallons Corr PZR Lvl Change Conversion corr to 68°F PZR Vol Change **STANDARD:** +.349 inches X 14.364 gallons / inch = **+5.013 gallons** (+.339 to + .359) (+4.883 to + 5.027) **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
9	**2.9**	Convert QT Level Change to gallons: **0** inches X 34.94 gallons / inch = **0** gallons (3) QT Level Change Conversion corr to 68°F QT Vol Change **STANDARD:** Determine there is no change for the QT **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
10	**2.10**	Convert LDST Level Change to gallons: **+0.6** inches X 30.956 gallons / inch = **+18.574** gallons (4) LDST Level Change Conversion corr to 68°F LDST Vol Change **STANDARD:** +0.6 inches X 30.956 gallons / inch = **+18.574 gallons** (18.5 to 18.6) **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

11	**2.11**	Calculate Total Volume Change: **5.013** gallons + **0** gallons + **18.574** gallons = **23.587** gallons PZR Vol Change QT Vol Change LDST Vol Change Total Change **STANDARD:** 5.013 gal + 0 gal + 18.574 gal = 23.587 gallons (4.883 - 5.027) (18.5-18.6) (23.383 - 23.627) **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT
12	**2.12**	Calculate "RCS Unidentified Leakage Rate": **23.587** gallons ÷ **60 minutes** Minutes = **0.393** gpm Total Change (5) Duration RCS Leakage Rate **STANDARD:** 23.587 gallons / 60 minutes = 0.393 gpm (23.383 - 23.627) (0.390 - 0.394) **COMMENTS:**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
6	Necessary data calculation to properly determine manual RCS leakage rate
7	Necessary data calculation to properly determine manual RCS leakage rate
8	Necessary data calculation to properly determine manual RCS leakage rate
9	Necessary data calculation to properly determine manual RCS leakage rate
10	Necessary data calculation to properly determine manual RCS leakage rate
11	Necessary data calculation to properly determine manual RCS leakage rate
12	Necessary data calculation to properly determine manual RCS leakage rate

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Oconee Unit 1 OAC computer repairs are expected to be extended through turnover for hardware replacement.

The Loss of Computer procedure PT/0/A/0600/001A (Loss of Computer) is in progress, however an RCS Leakage Calculation has NOT been performed during this shift.

INITIATING CUE

The CRS directs you to perform a manual RCS leakage calculation per PT/1/A/0600/010 (Reactor Coolant Leakage) Encl. 13.3 (Manual RCS Leakage Calculation Data Sheet) using the data collected below.

Manual RCS Leakage Data

Parameter	Initial	Final
Time	0015	0115
Pzr level	219.0 inches	220.7 inches
Tave Indication	579.0°F	579.3°F
Quench Tank Level	86.5 inches	86.5 inches
LDST Level	76.7 inches	76.1 inches
Power Range NI	100.0%	100.1%
RCS NR Pressure	2150 psig	2150 psig
Group 7 Control Rod Position	92.7%	92.7%

*Similar to SRO JPM ADM-S204 and must be performed on the same day

REGION II
JOB PERFORMANCE MEASURE

ADM-205

Determine LTOP Requirements

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine LTOP Requirements

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 30 minutes

K/A Rating(s):

System: GENERIC
K/A: 2.2.14
Rating: 3.9/4.3

Task Standard:

Per OP/1/A/1104/049, Low Temperature Overpressure Protection, based on conditions provided determine that logic paths required by Enclosure 4.13 will satisfy LTOP requirements.

References:

OP/1/A/1104/049 Low Temperature Overpressure Protection (LTOP)
OP/0/A/1108/001 Curves and General Information

Tools/Equipment/Procedures Needed:

Unit 1 Conditions For Determining LTOP Requirements (Last page of JPM)
OP/1/A/1104/049 (Low Temperature Overpressure Protection) (Rev. 50)
OP/0/A/1108/001 Curves and General Information (Rev. 111)

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

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) is in progress for entering a refueling outage

Plant conditions are as described in the attachment provided

CRS has just been notified that the 1HP-120 travel stop is NOT installed correctly

INITIATING CUE

In accordance with Limit and Precaution 2.12 of OP/1/A/1104/049 (Low Temperature Overpressure Protection), determine if LTOP requirements are still met. Document your determination as directed in the Limit and Precaution.

Once you have completed the determination, sign and date in the blanks provided on Enclosure 4.13 (LTOP Requirements Logic Diagram) and return it to the examiner.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		**EXAMINER NOTE: The sequence of steps is NOT critical** Determine if LTOP Train 1 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles or identifies the following: • RC-4 open • PORV Auto Operable **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2		Indicate the path that satisfies LTOP requirements for Train 1 **STANDARD:** Candidate should circle the plant/equipment configuration status and trace the logic path that satisfies Train 1 LTOP requirements as indicated on the attached key **COMMENTS:**	___ SAT ___ UNSAT

3		Determine if upper portion LTOP Train 2 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles or identifies the following: • 1A & 1B HPIP's racked out or in test, and tagged • HPI START FROM PSW POWER CR switch tagged "Do Not Operate" • 1C HPIP bkr racked out or in test, and tagged • 1CF-1 Closed/handwheel tagged and bkr tagged open • 1B CFT depressurized to < 373 psig ***Examiner Note: Candidate may indicate additional equipment as meeting LTOP requirements, but only the equipment listed above that satisfies the logic of Enclosure 4.13 is critical.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
4		Indicate the path that satisfies LTOP requirements for the upper portion of Train 2 **STANDARD:** Candidate should circle the plant/equipment configuration status and trace the logic path that satisfies the upper portion of Train 2 LTOP requirements as indicated on the attached key **COMMENTS:**	___ SAT ___ UNSAT

5		Determine if lower portion LTOP Train 2 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles or identifies the following: • HPI NOT in operation and aligned via 1HP-120 • LTOP computer point O1L3153 not in alarm • 1SA-2/C-3, C-4 cards not pulled/not in alarm "HIGH" • 1SA-18/A-3 card not pulled/not in alarm • 1SA-18/A-4 card not pulled/not in alarm • OAC operable • 1N-121 Tagged Closed • Pzr Htr Bank 4 Deactivated • RCS pressure within limits • Pzr level within limits **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6		Indicate the path that satisfies LTOP requirements for the lower portion of Train 2 **STANDARD:** Candidate should circle the plant/equipment configuration status and trace the logic path that satisfies the lower portion of Train 2 LTOP requirements as indicated on the attached key **COMMENTS:**	___ SAT ___ UNSAT
7		Indicate that the logic path for LTOP requirements is satisfied **STANDARD:** Candidate indicates that the logic paths for LTOP requirements are being satisfied in accordance with the attached key **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

8		Fill in the “Performed By” and “Date/Time” blanks **STANDARD:** Candidate completes the “Performed By” and “Date/Time” blanks **COMMENTS:** **END TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Required to determine if Train 1 requirements are met
3	Required to determine if Train 2 requirements are met
5	Required to determine if Train 2 requirements are met
7	Required to determine if all LTOP requirements are met

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) is in progress for entering a refueling outage

Plant conditions are as described in the attachment provided

CRS has just been notified that the 1HP-120 travel stop is NOT installed correctly

INITIATING CUE

In accordance with Limit and Precaution 2.12 of OP/1/A/1104/049 (Low Temperature Overpressure Protection), determine if LTOP requirements are still met. Document your determination as directed in the Limit and Precaution.

Once you have completed the determination, sign and date in the blanks provided on Enclosure 4.13 (LTOP Requirements Logic Diagram) and return it to the examiner.

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Unit 1 Conditions For Determining LTOP Requirements

Procedures in progress:
OP/**1**/A/1102/010, Controlling Procedure for Unit Shutdown

- Encl. 4.10, S/D from Mode 3 to Mode 4 in progress

RCS Parameters:

- Tc = 225°F slowly decreasing
- RCS Pressure = 285 psig decreasing
- Pressurizer Level = 218 inches decreasing slowly
- LPI operation (Series Mode) in progress

Primary Systems/Components status:

- All HPI pumps are OFF
- 1B and 1C HPI Pumps are racked out and tagged
- 1A HPI Pump is racked in the TEST position and tagged
- HPI START FROM PSW POWER CR switch tagged "Do Not Operate"
- 1HP-26 and 1HP-27 are closed; hand wheels tagged and breakers tagged open
- 1HP-409 switch in CR has been tagged closed
- 1HP-410 switch in CR is closed but not tagged
- 1CF-1 is Closed / handwheel tagged and breaker tagged open
- 1CF-2 is Closed / handwheel tagged and breaker <u>not</u> tagged open
- 1A CFT pressure = 375 psig stable
- 1B CFT pressure = 368 psig stable
- Computer point O1L3153 is <u>not</u> in alarm
- Computer points O1X2285 and O1X2256 are locked out
- 1SA-2/C-3, 1SA-2/C-4, 1SA-18/A-3, and 1SA-18/A-4 cards are <u>not</u> pulled and <u>not</u> in alarm
- OAC is Operable
- 1N-121 is closed and tagged
- Pressurizer Heater Bank 4 is deactivated with breaker white tagged
- No dedicated LTOP Operator available
- An LTOP Vent path (≥ 3.6 square inches) is <u>not</u> established
- 1RC-4 is open
- PORV is operable with setpoint selected to LOW

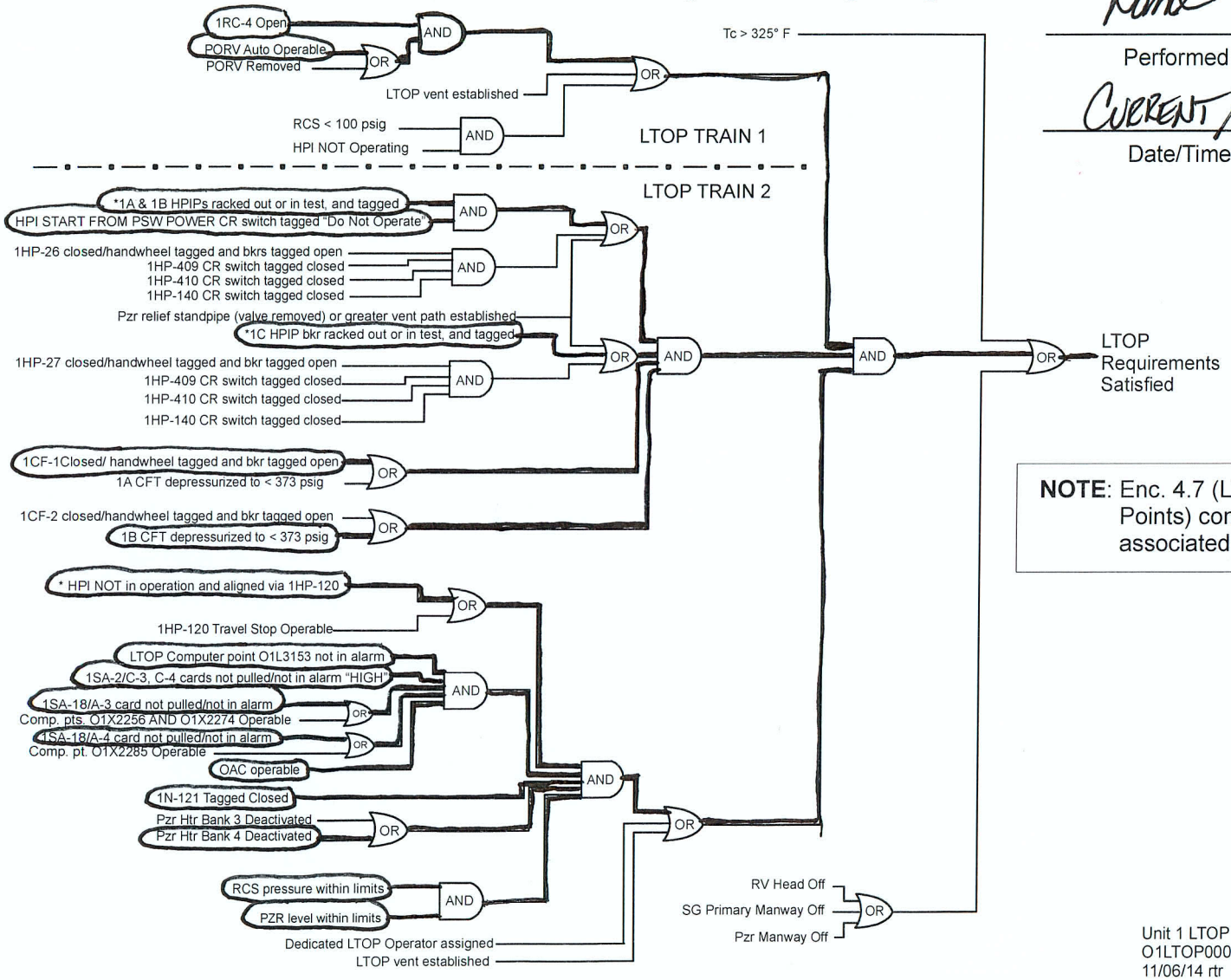
KEY ADM-205

Enclosure 4.13

LTOP Requirements Logic Diagram

OP/1/A/1104/049
Page 1 of 1

None
Performed By
CURRENT / CURRENT
Date/Time



NOTE: Enc. 4.7 (LTOP Computer Points) contains a list of points associated with LTOP operability.

Unit 1 LTOP Logic Rev. 24.des
O1LTOP0001.DES
11/06/14 rtr

* If an RCS vent path is established per Enclosure 4.5 (LTOP Vent Paths), this requirement can be considered met during HPI testing.

* CANDIDATE MAY INDICATE ADDITIONAL EQUIPMENT AS MEETING LTOP REQUIREMENTS, BUT ONLY THE EQUIPMENT THAT COMPLETES THE LOGIC PATHS IS CRITICAL.

REGION II
JOB PERFORMANCE MEASURE

ADM-305

Determine Posting and Access Requirements of LPI Room Based on Plan View

Administrative: Yes

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine Posting and Access Requirements of LPI Room Based on Plan View

Task Number : (N/A)

Alternate Path: (N/A)

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: GEN
K/A: 2.3.12
Rating: 3.2/3.7

Task Standard:

Determine that:

1. Area should be posted as a High Radiation Area
2. Continuous RP coverage is NOT required.
3. The total accumulated annual dose at completion of job is 1058 mrem.

References:

PD-RP-ALL-0001 Radiation Worker Responsibilities (Rev 4)
Survey Map of Room 61

Tools/Equipment/Procedures Needed:

PD-RP-ALL-0001 Radiation Worker Responsibilities (Rev 4)
Survey Map of Room 61

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

You are a Reactor Operator. An event has occurred which resulted in a significant change in the radiological conditions in Room 61 (LPI and RBS Pumps).

Your total whole body dose this year is 986 mrem.

INITIATING CUE

Using the survey map provided, determine the following for Room 61:

- The RP related area posting(s) you would expect to encounter at the entry to Room 61
- If Continuous RP coverage is required for you to perform venting of the 1A LPI Pump
- If venting the 1A LPI pump takes two (2) hours, determine your total accumulated annual dose when the job is complete and you have exited the room based on the following:
    - 10 minutes spent at 1A LPI Pump initiating the vent
    - 1 hour 45 minutes spent in the LDWA
    - 5 minutes spent at 1A LPI Pump securing the vent

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Using the survey map provided, determine the area posting requirements. **STANDARD:** Candidate reviews the survey map and determines: • Based on an area around LPI sump pumps being 930 mr/hr (> 100 mr/hr at 30 cm), the area should be posted as a High Radiation Area (HRA). **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2		Determine RP coverage required to vent the 1A LPI Pump **STANDARD:** Candidate determines that continuous RP coverage is **NOT** required since the area is a HRA. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
3		Determine total accumulated annual dose after completion of job. **STANDARD***:* Candidate determines the dose as a result of the venting as follows: .25 hours X 92 mr/hr = 23 mrem 1.75 hours X 28 mr/hr = 49 mrem 23 + 49 = 72 mrem Determine the total accumulated annual dose following completion of the job. **986 + 72 = 1058 mrem** **COMMENTS:** **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Determines General Area posting requirements for the room to be entered.
2	Determines RP continuous coverage requirements.
3	Determines total accumulated annual dose.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

You are a Reactor Operator. An event has occurred which resulted in a significant change in the radiological conditions in Room 61 (LPI and RBS Pumps).

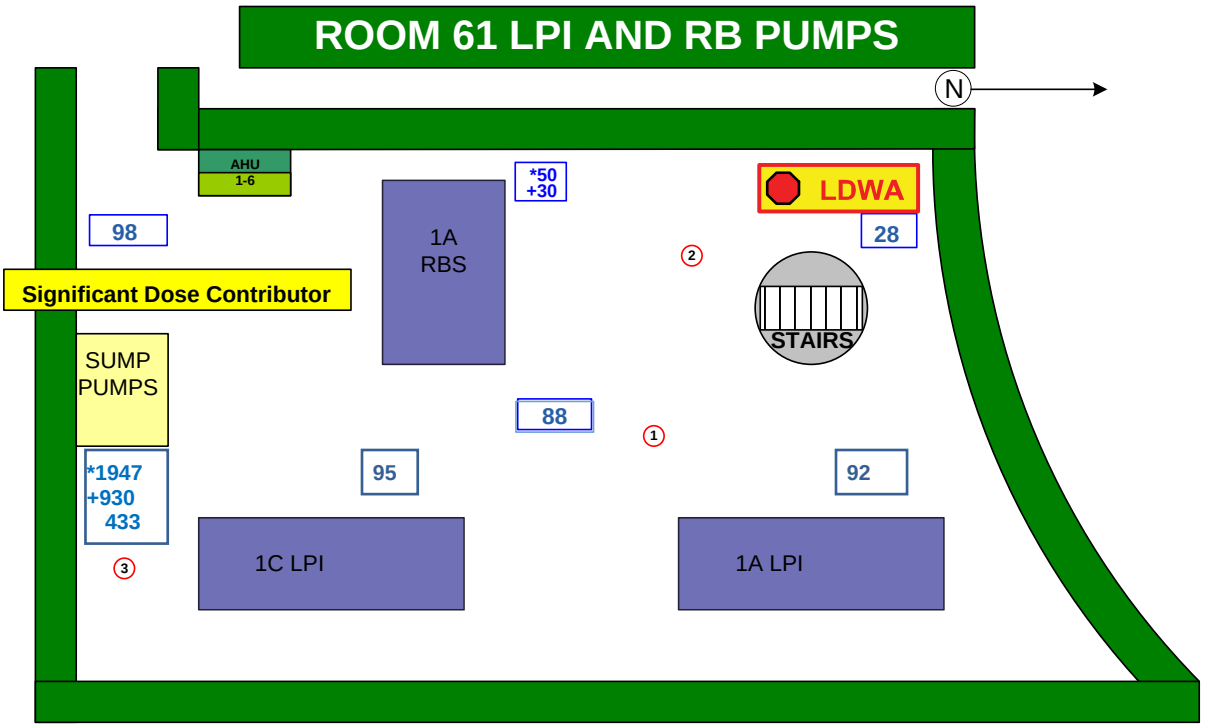
Your total whole body dose this year is 986 mrem.

INITIATING CUE

Using the survey map provided, determine the following for Room 61:

- The RP related area posting(s) you would expect to encounter at the entry to Room 61
- If Continuous RP coverage is required for you to perform venting of the 1A LPI Pump
- If venting the 1A LPI pump takes two (2) hours, determine your total accumulated annual dose when the job is complete and you have exited the room based on the following:
    - 10 minutes spent at 1A LPI Pump initiating the vent
    - 1 hour 45 minutes spent in the LDWA
    - 5 minutes spent at 1A LPI Pump securing the vent

Room 61 LPI & RBS Pumps	Survey # M-021506-17	Date/Time Today 0412



Comments: CONTACT RP REGARDING ANY ATTEMPTS TO CLEAN LPI ROOM SUMP

Summary of Highest Readings

Smears	Air Samples & Wipes
1) 554 DPM/100 cm2 β/γ 2) 485 DPM/100 cm2 β/γ 3) 978 DPM/100 cm2 β/γ	

Symbol Legend (for example only)

Dose Rate
*150 — Contact Reading
+75 — 30 cm Reading
20 — General Area
HS-50 Hot Spot
RCA Posting
Drip Bag
15 Smear
15 Air Sample
15 Wipe

Type: Job Coverage
RWP: 5036
Reactor Power = 100%

Unless otherwise noted, dose rates in mrem/hr.

Surveyor: W. Walters	Approved by: N. Wriston, Date: Today

REGION II
JOB PERFORMANCE MEASURE

ADM-S108

Determine if SRO License Requirements are met

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine if SRO License Requirements are met

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: Gen
K/A: 2.1.4
Rating: 3.3/3.8

Task Standard:

Completes Form 512-1 and determines requirements of NSD 512 are met.

References:

NSD 512 (Maintenance of RO/SRO NRC Licenses) (Rev. 07)

Tools/Equipment/Procedures Needed:

NSD 512 (Maintenance of RO/SRO NRC Licenses) (Rev. 07)

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

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

You are a Shift Manager qualified SRO. Today is 10/29/16. Your work history for October of this year is as follows:

10/05/16	Worked 10 hours as Unit 3 BOP (day shift). Took turnover at beginning of shift and gave turnover at the end.
10/06/16	Worked 12 hours as Unit 3 BOP (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/07/16	Worked 12 hours as Unit 3 OATC (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/12/16	Worked 12 hours as Unit 1 BOP (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/13/16	Worked 12 hours (night shift). Worked 3 hours as the SM and then 9 hours as WCC SRO. Took turnover at beginning and gave turnover at the end for his SM position and his WCC SRO position .
10/14/16	Worked 12 hours as Unit 1 CR SRO (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/20/16	Worked 12 hours as Unit 3 OATC (day shift). Took turnover at beginning of shift and gave turnover at end of shift.

INITIATING CUE

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 license for the following quarter for the following positions. Circle the appropriate response.

OATC	YES	NO	**BOP**	YES	NO
CRS	YES	NO	**SM**	YES	NO

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		Evaluate 10/05/16 work period. **STANDARD:** Determines that requirement is not met; <12hrs worked in position. **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2		Evaluate 10/06/16 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
3		Evaluate 10/07/16 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
4		Evaluate 10/12/16 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 10/13/16 work period. **STANDARD:** Determines that requirement is not met since 9 of the hours were not at a required position (WCC SRO). **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6		Evaluate 10/14/16 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
7		Evaluate 10/20/16 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
8		Compares credited time vs minimum requirements. **STANDARD:** Determines that 5 12-hr shifts at a required position have been completed and that the NSD-512 requirement of at least 1 shift/qtr at an SRO position (SM or CRS) is also met; so the individual meets the requirements to maintain their license active for the OATC, BOP, CRS, and SM positions. Candidate should circle YES for all four of the above positions. **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	Required to make the determination regarding the minimum license requirement.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

You are a Shift Manager qualified SRO. Today is 10/29/16. Your work history for October of this year is as follows:

10/05/16	Worked 10 hours as Unit 3 BOP (day shift). Took turnover at beginning of shift and gave turnover at the end.
10/06/16	Worked 12 hours as Unit 3 BOP (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/07/16	Worked 12 hours as Unit 3 OATC (day shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/12/16	Worked 12 hours as Unit 1 BOP (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/13/16	Worked 12 hours (night shift). Worked 3 hours as the SM and then 9 hours as WCC SRO. Took turnover at beginning and gave turnover at the end for his SM position and his WCC SRO position .
10/14/16	Worked 12 hours as Unit 1 CR SRO (night shift). Took turnover at beginning of shift and gave turnover at end of shift.
10/20/16	Worked 12 hours as Unit 3 OATC (day shift). Took turnover at beginning of shift and gave turnover at end of shift.

INITIATING CUE

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 license for the following quarter for the following positions. Circle the appropriate response.

OATC YES NO **BOP** YES NO

CRS YES NO **SM** YES NO

*Similar to RO JPM ADM-205 and must be performed on the same day

REGION II
JOB PERFORMANCE MEASURE

ADM-S204

Determine LTOP Requirements and Required Actions

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine LTOP Requirements and Required Actions

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 35 minutes

K/A Rating(s):

System: GENERIC
K/A: 2.2.14
Rating: 3.9/4.3

Task Standard:

Based on conditions provided, determine that logic paths required by OP/1/A/1104/049, Low Temperature Overpressure Protection, Enclosure 4.13 are NOT satisfied and Tech Spec 3.4.12 Condition F must be entered.

References:

OP/1/A/1104/049 Low Temperature Overpressure Protection (LTOP) (Rev. 50)
OP/0/A/1108/001 Curves and General Information (Rev. 111)

Tools/Equipment/Procedures Needed:

Unit 1 Conditions For Determining LTOP Requirements (Last page of JPM)
OP/1/A/1104/049 (Low Temperature Overpressure Protection) (Rev. 50)
OP/0/A/1108/001 Curves and General Information (Rev. 111)
Tech Spec 3.4.12 (Low Temperature Overpressure Protection (LTOP) System)

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

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) is in progress for entering a refueling outage

Plant conditions are as described in the attachment provided

CRS has just been notified that the 1HP-120 travel stop is NOT installed correctly

INITIATING CUE

In accordance with Limit and Precaution 2.12 of OP/1/A/1104/049 (Low Temperature Overpressure Protection), determine if LTOP requirements are still met. Document your determination as directed in the Limit and Precaution.

Once you have completed the determination, sign and date in the blanks provided on Enclosure 4.13 (LTOP Requirements Logic Diagram) and list Tech Spec required actions, if any, below.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1		**EXAMINER NOTE: The sequence of steps is NOT critical** Determine if LTOP Train 1 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles the following: • RC-4 open • PORV Auto Operable **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
2		Indicate the path that satisfies LTOP requirements for Train 1 **STANDARD:** Candidate should circle the plant/equipment configuration status and trace the logic path that satisfies Train 1 LTOP requirements as indicated on the attached key **COMMENTS:**	___ SAT ___ UNSAT

3		Determine if upper portion LTOP Train 2 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles the following: • 1A & 1B HPIP's racked out or in test, and tagged • HPI START FROM PSW POWER CR switch tagged "Do Not Operate" • 1C HPIP bkr racked out or in test, and tagged • 1CF-1 Closed/handwheel tagged and bkr tagged open • 1B CFT depressurized to < 373 psig ***Examiner Note: Candidate may indicate additional equipment as meeting LTOP requirements, but only the equipment listed above that satisfies the logic of Enclosure 4.13 is critical.*** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
4		Indicate the path that satisfies LTOP requirements for the upper portion of Train 2 **STANDARD:** Candidate should circle the plant/equipment configuration status and trace the logic path that satisfies the upper portion of Train 2 LTOP requirements as indicated on the attached key **COMMENTS:**	___ SAT ___ UNSAT

5		Determine if lower portion LTOP Train 2 requirements are met **STANDARD:** Candidate Refers to OP/1/A/1104/049 (LTOP) Encl. 4.13 and attachment and circles the following: • HPI NOT in operation and aligned via 1HP-120 • LTOP computer point O1L3153 not in alarm • 1SA-2/C-3, C-4 cars not pulled/not in alarm "HIGH" • 1SA-18/A-3 card not pulled/not in alarm • 1SA-18/A-4 card not pulled/not in alarm • OAC operable • Pzr Htr Bank 4 Deactivated • RCS pressure within limits • Pzr level within limits Candidate determines the lower portion of Train 2 is **NOT** satisfied due to 1N-121 being closed only (**NOT** tagged closed). **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
6		Indicate the path that satisfies LTOP requirements for the lower portion of Train 2 **STANDARD:** Candidate determines the lower portion of Train 2 is not satisfied due to 1N-121 being closed only (**NOT** tagged closed). **COMMENTS:**	___ SAT ___ UNSAT
7		Indicate that the logic path for LTOP requirements is satisfied **STANDARD:** Candidate determines the logic path for LTOP requirements is **NOT** satisfied due to 1N-121 being closed only (**NOT** tagged closed). **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

8		Fill in the “Performed By” and “Date/Time” blanks **STANDARD:** Candidate completes the “Performed By” and “Date/Time” blanks **COMMENTS:**	___ SAT ___ UNSAT
9		Determine required actions. **STANDARD:** Candidate determines compensatory measures to monitor for initiation of an LTOP event (dedicated LTOP operator) must be established within 4 hours, in accordance with **Tech Spec 3.4.12 Cond. F**. **COMMENTS:** **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Required to determine if Train 1 requirements are met
3	Required to determine if Train 2 requirements are met
5	Required to determine if Train 2 requirements are met
7	Required to determine if all LTOP requirements are met
9	Required to determine required actions.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) is in progress for entering a refueling outage

Plant conditions are as described in the attachment provided

CRS has just been notified that the 1HP-120 travel stop is NOT installed correctly

INITIATING CUE

In accordance with Limit and Precaution 2.12 of OP/1/A/1104/049 (Low Temperature Overpressure Protection), determine if LTOP requirements are still met. Document your determination as directed in the Limit and Precaution.

Once you have completed the determination, sign and date in the blanks provided on Enclosure 4.13 (LTOP Requirements Logic Diagram) and list Tech Spec required actions, if any, below.

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Unit 1 Conditions For Determining LTOP Requirements

Procedures in progress:
OP/**1**/A/1102/010, Controlling Procedure for Unit Shutdown

- Encl. 4.10, S/D from Mode 3 to Mode 4 in progress

RCS Parameters:

- Tc = 225°F slowly decreasing
- RCS Pressure = 285 psig decreasing
- Pressurizer Level = 218 inches decreasing slowly
- LPI operation (Series Mode) in progress

Primary Systems/Components status:

- All HPI pumps are OFF
- 1B and 1C HPI Pumps are racked out and tagged
- 1A HPI Pump is racked in the TEST position and tagged
- HPI START FROM PSW POWER CR switch tagged "Do Not Operate"
- 1HP-26 and 1HP-27 are closed; hand wheels tagged and breakers tagged open
- 1HP-409 switch in CR has been tagged closed
- 1HP-410 switch in CR is closed but not tagged
- 1CF-1 is Closed / handwheel tagged and breaker tagged open
- 1CF-2 is Closed / handwheel tagged and breaker <u>not</u> tagged open
- 1A CFT pressure = 375 psig stable
- 1B CFT pressure = 368 psig stable
- Computer point O1L3153 is <u>not</u> in alarm
- Computer points O1X2285 and O1X2256 are locked out
- 1SA-2/C-3, 1SA-2/C-4, 1SA-18/A-3, and 1SA-18/A-4 cards are <u>not</u> pulled and <u>not</u> in alarm
- OAC is Operable
- 1N-121 is closed
- Pressurizer Heater Bank 4 is deactivated with breaker white tagged
- No dedicated LTOP Operator available
- An LTOP Vent path (≥ 3.6 square inches) is <u>not</u> established
- 1RC-4 is open
- PORV is operable with setpoint selected to LOW

KEY

ADM-5204

Enclosure 4.13

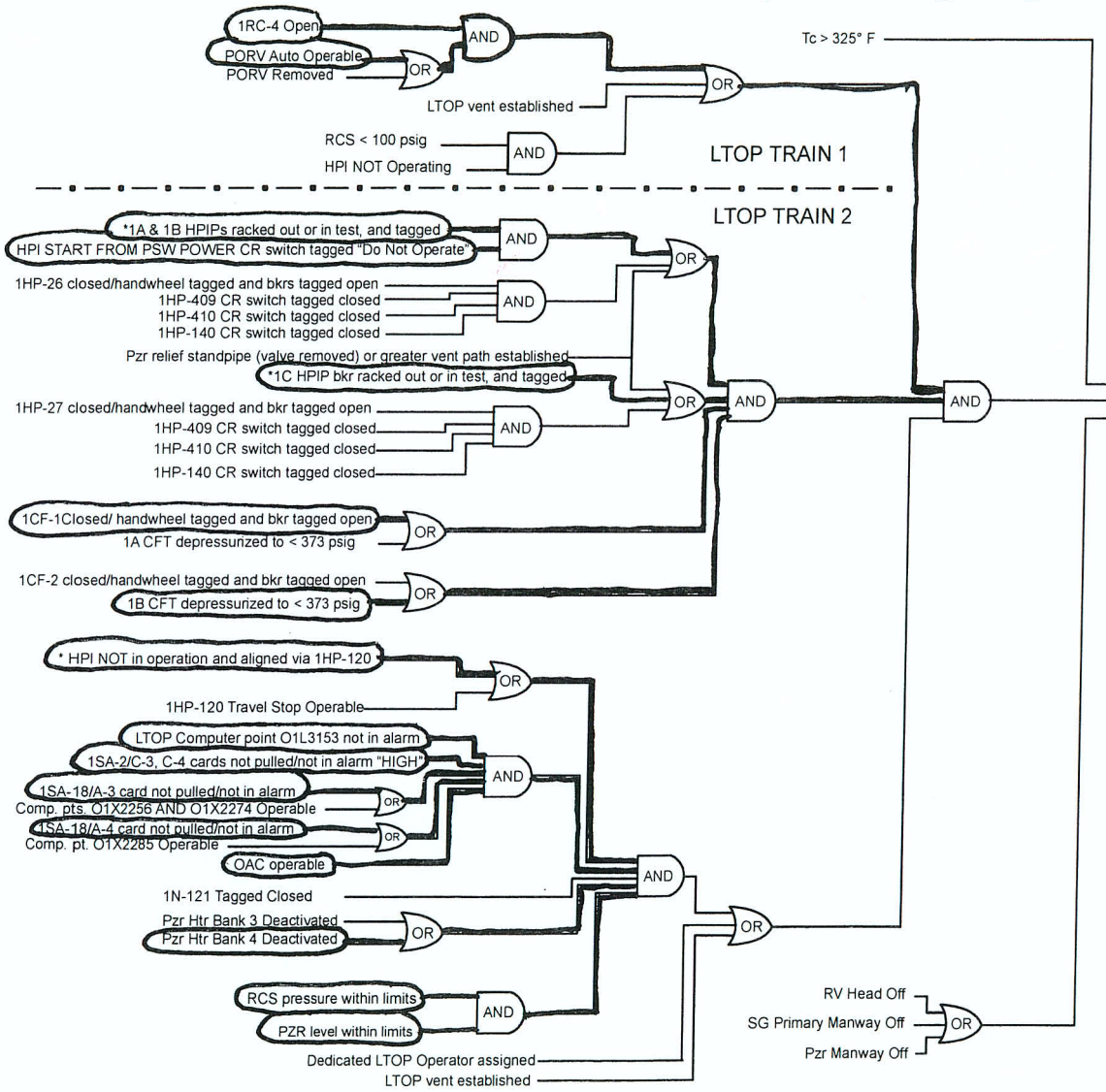
LTOP Requirements Logic Diagram

Name

Performed By

CURRENT

Date/Time



NOTE: Enc. 4.7 (LTOP Computer Points) contains a list of points associated with LTOP operability.

Unit 1 LTOP Logic Rev. 24.des
O1LTOP0001.DES
11/06/14 rtr

* If an RCS vent path is established per Enclosure 4.5 (LTOP Vent Paths), this requirement can be considered met during HPI testing.

REGION II
JOB PERFORMANCE MEASURE

ADM-S405

Determine Emergency Classification and Protective Action Recommendations

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: Yes

Time Critical Criteria: _____

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

REGION II
JOB PERFORMANCE MEASURE

Task Title : Determine Emergency Classification and Protective Action Recommendations

Task Number : N/A

Alternate Path: No

Time Critical: Yes

Validation Time: 30 minutes

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. 05)
RP/0/A/1000/02, Control Room Emergency Coordinator Procedure (Rev. 11)
RP/0/A/1000/015A, Offsite Communications From The Control Room
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

Tools/Equipment/Procedures Needed:

RP/0/A/1000/01, Emergency Classification (Rev. 05)
RP/0/A/1000/02, Control Room Emergency Coordinator Procedure (Rev. 11)

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

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO STUDENT

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

INITIAL CONDITIONS

Time: 3 hours ago:

- The Oconee County Sheriff reported that a large group of “anti-nukes” had assembled at the Visitor Center

CURRENT CONDITIONS

- ALL three Unit’s at 100% power
- Oconee County Sheriff reports that an explosion has occurred at the Keowee Hydro Dam, however the dam shows only minor damage with no breach
- Keowee personnel report no visible damage to the KHUs
- Security Shift Supervisor notifies the SM that security is responding to armed adversaries in the vicinity of the Unit 1 Main Transformer

INITIATING CUE

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/A/1000/01, Emergency Classification:

1. Determine Emergency Classification at present time.

2. Complete appropriate Emergency Notification Form (ENF) 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 as the basis for classifying the event. 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) Enclosure 4.6 (Fire/Explosions and Security Actions). Classify the event as a "**Site Area Emergency"(4.6.S.1)** due to the following: ***A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by Security Shift Supervision*** **STOP TIME #1**: Time **SAE** Declared _____ **(Actual time)** (SAT is < Start Time + 15 minutes) **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 __**SAE**_____ (UE, ALERT, SAE, GE) Time Declared: _____ **STANDARD**: Candidate documents SAE and time declared from step 1. **COMMENTS**:	___ SAT ___ UNSAT

4	**2.2**	IF a Security event is in progress THEN GO TO Step 2.4 **STANDARD:** Determine Step 2.2 does apply and GO TO Step 2.4 **COMMENTS:**	___ SAT ___ UNSAT
5	**2.4**	Direct Control Room Offsite Communicator(s) to perform the following: • Record Name _____ • **REFER TO** RP/0/A/1000/015 A (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. **STANDARD:** Any name (real or imaginary) is acceptable. Continue to step 2.5 **COMMENTS:**	___ SAT ___ UNSAT
6	**2.5**	**IF AT ANY TIME** changing plant conditions require an emergency classification upgrade, ... **STANDARD:** An upgrade is not expected. Candidate should circle the step number and continue to step 2.6. **COMMENTS:**	___ SAT ___ UNSAT

7	**2.6**	**NOTE:** If more than one EAL of a classification level is met, use the EAL description of the most interest to offsite agencies. Additional message sheets listing other information of interest to offsite agencies (e.g. transporting injured personnel) may be sent, if needed. For the case of more than one unit with different EAL entry conditions, the SM would declare the highest applicable EAL on the initial ENF to meet the time limit. Obtain the applicable Emergency Notification Form (ENF) from the control room and complete as follows: **STANDARD**: Initial **Site Area Emergency form # 4.6.S.1** is selected and candidate continues to Step 2.6.1. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
8	**2.6.1**	**IF** pre-printed forms are **NOT** available , perform the following: A. Manually perform initial notification per RP/0/A/1000/015 A, enclosure for Guidelines for Manually Completing an Initial Message. B. **GO TO** Step 2.7. **STANDARD**: Candidate determines pre-printed forms are available and this step does not apply. Continues to step 2.6.2 **COMMENTS**:	___ SAT ___ UNSAT

9	**2.6.2**	Ensure EAL # and description as determined by RP/0/A/1000/001 matches Line 4. **STANDARD**: Candidate ensures EAL # on line 4 is **4.6.S.1** and EAL description is **Hostile Action within the Protected Area. Current plant conditions DO NOT threaten public safety.** Continues to step 2.6.3. **COMMENTS**:	___ SAT ___ UNSAT
10	**2.6.3**	Enter message # - Beginning at one, message numbers will increment every message, regardless of whether it is an UPGRADE. **STANDARD**: Candidate enters 1 as the message #. Continues to step 2.6.4. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT
11	**2.6.4**	Line 1 - Mark appropriate box "Drill", "Actual Declaration" or "Termination" **STANDARD**: Candidate marks Drill in line 1. Continues to step 2.6.5. **COMMENTS**:	___ SAT ___ UNSAT

12	**2.6.5**	Line 4 - Time and date of declaration (Refer to time in Step 2.1) **STANDARD**: Candidate enters today's date and declaration time from step 2.1. Continues to step 2.6.6. **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE: • An EMERGENCY RELEASE is defined as an unplanned, quantifiable, airborne radiological release to the environment attributable to the emergency event.

• Some examples of conditions where airborne releases would be considered In-Progress are provided below. Not all bullets are required.

• This list is not intended to be all inclusive.

• **The SM should then evaluate whether the release in-progress is considered attributable to the emergency event. If a radiological release was occurring prior to the emergency event and the radioactive release rate did NOT change because of the emergency event, then a release is NOT In-Progress and ENF line 5 would be marked "None".**

Release Source	Potential Indications
SG Tube Leak	• 1,2,3 RIA-40 in alarm or rising • Steam pressure maintained or rising in an isolated SG • Level maintained or rising in an isolated SG
Release from Unit Vent	• 1,2,3 RIA-45 or 46 in alarm or rising • Notified by RP of significant release to the unit vent
Release from Containment	• Containment pressure greater than 1 psig • Actual Containment breach is determined

13 **2.6.6**

Line 5 - Perform <u>one</u> of the following:

A. **<u>IF</u>** there is **<u>NO</u>** emergency release occurring as a result of the declared event as defined above and as determined by the Shift Manager, mark "NONE".

B. **<u>IF</u>** there is an ongoing emergency release in accordance with the definition above as determined by the Shift Manager, mark "IS OCCURRING".

C. **<u>IF</u>** an emergency release as defined above and as determined by the Shift Manager has occurred previously during the declared emergency and is no longer occurring, mark "HAS OCCURRED".

<u>STANDARD</u>: Candidate determines NO release is occurring and marks **NONE**.

Continues to step 2.6.7.

<u>COMMENTS</u>:

CRITICAL STEP

___ SAT

___ UNSAT

14	**2.6.7**	Line 6 - **IF** Imminent Failure exists for Jocassee **OR** Keowee Hydro dam/dike, ensure following: A. Check "OTHER". B. Write: Move residents living downstream of the Keowee Hydro Project dams to higher ground. Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed. **STANDARD**: Candidate determines imminent failure does NOT exist for Jocassee or Keowee Hydro dam/dike. Candidate may mark NONE or leave step blank. Either is acceptable. Continues to step 2.6.8. **COMMENTS**:	___ SAT ___ UNSAT

15	**2.6.8**	**NOTE:** LINE 12 should be used to provide information important to offsite agencies. The following are examples of information which should be provided: • Emergency Response Actions Underway (for example, site evacuation) • Requests for offsite assistance (for example, ambulance or fire support) • Facility Activation Status • Injured/contaminated individuals • Any reason causing/requiring a PAR change • Estimate of any surface contamination in the plant, onsite or offsite • If EAL description includes an "or". (example -Hostile action based EALs that include both a Hostile action "or" an airliner attack, provide more specific information in remarks section). Line 12 - **IF** the SM has no remarks, write "None" **STANDARD**: Candidate may include information related to the event or write None in line 12. Either is acceptable. Continues to step 2.6.9. **COMMENTS**:	___ SAT ___ UNSAT

16	**2.6.9**	Line 13 - SM signature, CURRENT Time/Date **(MUST SIGN)** **STANDARD**: Candidate signs and enters current time/date in line 13. **STOP TIME #2**: Time for Notification _____ **(Actual time)** (SAT is < Stop Time #1 + 15 minutes) **COMMENTS**: **END TASK**	**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. 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)
7	The correct form that matches the EAL # is selected.
10	The correct message number is input on the ENF.
12	Declaration time and date are input on the ENF.
13	None is marked on line 5 of the ENF to indicate no release in progress.
16	The candidate signs and enters time and date on line 13 of the ENF. This is a time critical step. The time entered must be within 15 minutes of the declaration time in step 1.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Time: 3 hours ago:

- The Oconee County Sheriff reported that a large group of “anti-nukes” had assembled at the Visitor Center

CURRENT CONDITIONS

- ALL three Unit’s at 100% power
- Oconee County Sheriff reports that an explosion has occurred at the Keowee Hydro Dam, however the dam shows only minor damage with no breach
- Keowee personnel report no visible damage to the KHUs
- Security Shift Supervisor notifies the SM that security is responding to armed adversaries in the vicinity of the Unit 1 Main Transformer

INITIATING CUE

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/A/1000/01, Emergency Classification:

1. Determine Emergency Classification at present time.

2. Complete appropriate Emergency Notification Form (ENF) 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 as the basis for classifying the event. When required, an operator will maintain the Emergency Coordinator’s Log and assume the duties of the Control Room Offsite Communicator.

KEY

* - CRITICAL STEP

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

KEY

* **MESSAGE #** 1 **Confirmation Phone #:** EOF: (704) 382-0724 **AUTHENTICATION CODE #:** _____

Lines 1 – 6 are required for INITIAL Notifications

1. **EVENT:** ☒ DRILL ☐ ACTUAL DECLARATION ☐ TERMINATION (ONLY Lines 1, 2, & 4 required)
2. **AFFECTED SITE:**
   OCONEE
3. **EMERGENCY CLASSIFICATION**
   ☐ UNUSUAL EVENT ☐ ALERT ■ SITE AREA EMERGENCY ☐ GENERAL EMERGENCY
* 4. **EAL #** 4.6.S.1 **Declaration Date:** CURRENT **Time:** CURRENT
   Termination Date: ___/___/___ **Time:** _____ (mark "N/A" for EAL # & Description)
   EAL DESCRIPTION: Hostile Action within the Protected Area. Current plant conditions DO NOT threaten public safety.
* 5. **RELEASE TO THE ENVIRONMENT** (caused by the emergency): ☒ NONE ☐ IS OCCURRING ☐ HAS OCCURRED
6. **PROTECTIVE ACTION RECOMMENDATIONS:**
   ☐ NONE
   ☐ EVACUATE: _____
   ☐ SHELTER: _____
   ☐ CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH ORO PLANS AND POLICIES
   ☐ OTHER: _____

*Lines 7-11 are **NOT** required for INITIAL notifications. Lines 7-11 may be provided separately for follow-up notifications.*

7. **PROGNOSIS: Upgrade in classification or PAR change is likely before the next follow-up notification ☐ Yes ☐ No**
8. **SITE UNIT(S) STATUS:**

AFFECTED UNIT			
☐ YES	Unit 1 - _____% Power	Shutdown: Date ___/___/___	Time _____
☐ YES	Unit 2 - _____% Power	Shutdown: Date ___/___/___	Time _____
☐ YES	Unit 3 - _____% Power	Shutdown: Date ___/___/___	Time _____

9. **METEOROLOGICAL DATA:**
   Wind direction from: _____ degrees Wind Speed: _____ mph Precipitation: _____ inches
   Stability Class: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

*Lines 10 - 11 are completed for follow-up notifications, **IF** Line 5 IS OCCURRING or HAS OCCURRED is selected*

10. **AIRBORNE RELEASE CHARACTERIZATION:** ☐ GROUND ☐ MIXED ☐ ELEVATED
    MAGNITUDE UNITS: ☐ Ci ☐ Ci/sec ☐ μCi/sec
    Noble Gases: _____ Iodines: _____ Particulates: _____
11. **DOSE PROJECTION:** Projection period: _____ Hours Estimated Release Duration _____ Hours

Performed: Date ___/___/___ Time: _____	DISTANCE	TEDE (mrem)	Thyroid CDE (mrem)
	Site Boundary		
	2 Miles		
	5 Miles		
	10 Miles		

12. **REMARKS (As Applicable):** NONE OR INFORMATION RELATED TO EVENT
* 13. **APPROVED BY:** SIGNED TITLE: Emergency Coordinator Date CURRENT Time CURRENT
14. **NOTIFIED BY:** _____ Date ___/___/___ Time _____
15. **RECEIVED BY** (ORO use only): _____ Date ___/___/___ Time _____