Final Submittal

(Blue Paper)

OCONEE JUNE 2003 EXAM
50-269/2003-301

JUNE 16 - 27, 2003

1. Administrative Questions/JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

OCONEE

Initial Exam

June 16, 2003

Final Submittal

Facility: **Oconee** Scenario No.: **1, Fnl** Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:

- 75% Reactor Power EOL, per dispatcher request (Snap -217)

Turnover:

- Unit 1 TD EFDW Pump OOS to repair oil leak, expected returned this shift
- SASS in MANUAL for I&E testing
- AMSAC/DSS bypassed for I&E testing
- Keowee Unit 1 generating to the grid
- Diamond in MANUAL for I&E test
- Chemistry has requested that the RCS be De-Lithiation with the Normal deborating Demineralizer for 5 minutes. OP/1103/004 Encl. 4.26 completed up to step 2.6.
- 1B Letdown Filter isolated due to leak

Event No.	Malfunction No.	Event Type*	Event Description
0a	Pre-Insert MSS330		TD EFDW Pump Fails to Start
0b	Pre-Insert Updater		SASS in manual
0c	Pre-Insert Updater		AMSAC/DSS bypassed
1		N, BOP, SRO	De-Lithiation with the Normal deborating Demin.
2	MPI121, 100	I, BOP, SRO	PZR LVL #1 Transmitter Fails HIGH
3	MCR021 Override	C, OATC, SRO	Drop CR Group 2 Rod 6, (TS) Diamond blocked from AUTO operation
4	MPS440 (40-80%)	C, BOP, SRO	$1A_1$ RCP High Vibration (secure RCP)
5	MPI281	I, OATC, SRO	ΔT_c fails HIGH when RCP secured
6	MCR022	C, OATC, SRO	Second dropped control rod, requiring a manual reactor trip
7	MEL090	M, ALL	ATWS CT-1 Lockout (Loss of Power)
8	MEL180	M, ALL	Keowee Unit 1 Emergency Lockout (blackout, PRA)

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

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

Event Description: **De-Lithiation with the deborating Demineralizer (N, BOP)**

Time	Position	Applicant's Actions or Behavior
	BOP	Refer to OP/1/A/1103/004 (Soluble Poison Control) Enclosure 4.26 (Step 2.6) to begin de-lithiation. Perform OP/1/A/1103/004, Soluble Poison Control, Enclosure 4.26 Place Deborating IX in service: • Review Limits and Precautions • Verify closed 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET) • Close 1CS-26 (Letdown to RC Bleed) • Open 1CS-27 (Debor IX Inlet) • Open 1HP-16 (LDST Makeup Isolation) • Verify 1HP-15 (LDST Makeup Control) in MANUAL and open • Position 1HP-14 (LDST Bypass) to "BLEED" • Record letdown pressure (contact NEO, **Cue: 115 psig**) • Wait 5 minutes Restore system per OP/1/A/1103/004, Soluble Poison Control, Enclosure 4.26: • Place 1HP-14 (LDST Bypass) in "NORMAL" • Close 1HP-16 (LDST Makeup Isolation) • Reset 1HP-15 Moore Controller for Normal Operation(LDST Makeup Control) • Close 1CS-27 (Debor IX Inlet) • Open 1CS-26 (Letdown to RC Bleed) • Complete OP/1/A/1103/004, Soluble Poison Control, Enclosure 4.26
		When de-lithiation is complete or when directed by the lead evaluator this event is completed.

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

Event Description: **PZR Level #1 Transmitter Fails HIGH: (I, BOP)**

Time	Position	Applicant's Actions or Behavior
		Plant response: Statalarms • 1SA-2/C-3, RC Pressurizer Level High/Low • 1SA-2/C-4, RC Pressurizer Level Emerg. High/Low Front board (1UB1) indications: • PZR Level 1 indicates 400" • 1HP-120 (RC Volume Control) throttles closed • Makeup flow decreases to ≈ 0 gpm.
	BOP SRO/BOP SRO/BOP	Crew response: Refer to ARG: • Check alternate PZR level indications (1UB1 and OAC) and determine that PZR level 1 has failed high. • Check for proper Makeup/Letdown flows and adjust to restore proper level. • SRO should direct the BOP to take actions to restore normal PZR level. • SRO should refer to PT/600/001 (Periodic Instrument Surveillance) SASS Manual Operation and have the BOP select an alternate PZR level channel on 1UB1.
		When an alternate PZR level channel has been selected or when directed by the lead evaluator this event is completed.

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

Event Description: **Dropped Control Rod: (C, OATC/SRO) (TS)**
When directed by the Lead Examiner Group 2, rod #6 drops into the core.

Time	Position	Applicant's Actions or Behavior
		Plant response: Statalarms • 1SA-2/B-10, CRD Position Error Position Indicating Panel • API indication of dropped rod on individual meter • In limit (zero %) green light on respective dropped rod. • Loss of respective dropped rod out limit (100%) red light. • Amber 7" asymmetric lights on the dropped rod and the entire group. *Diamond Panel indications* • 9" asymmetric lamp. • Group In Limit (green) lamp on respective group.
	OATC	Crew will use "Plant Transient Response" process to stabilize the plant. Acknowledge and verbalize to the SRO the most important Statalarm received for the failure. Verbalize to the SRO reactor power level and direction of movement.
	BOP	Recognize that a valid runback should be occurring but is not because the ICS is in manual. Refer to ARG for 1SA-2/B-10, CRD Position Error • Inform SRO entry into AP/015, Dropped Control Rods is required.
	SRO	The SRO should use the OAC to monitor unit status. Enter AP/1/A/1700/15, Dropped Control Rods

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

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

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per AP/015, Dropped Control Rods.
		1. Verify ≤ one dropped control rod or misaligned > 9" (6%) from group average.
	OATC	2. Verify Reactor is critical
		3. Verify runback to 55% FP in progress.
		• OATC should determine that a runback is **not** in progress due to ICS in manual and initiate a manual runback as directed by the SRO.
	BOP	4. Initiate Enclosure 5.1 (Control of Plant Equipment During Shutdown)
		• Notify WCC SRO to make notifications
		• Ensure 1A and 1B MSRH DRN PUMP stopped
		• Place 1FDW-53 and 1FDW-65 (MFDWP Recircs) in MANUAL and closed
		• Place 1HD-37 and 1HD-52 in DUMP.
		• Start the 1A and 1B MFDW Pump's Seal Injection and Aux oil pumps.
	SRO	5. Notify I&E (SPOC) to perform the following:
		• Investigate cause of dropped rod
		• Prepare to reduce RPS Flux/Flow-Imbalance and RPS High Flux setpoints.
		6. Within 1 hour verify > 1% SDM with the allowance for inoperable control rod(s) by performing PT/1/A/1103/15, Reactivity Balance Calculations.
		7. Refer to TS 3.2.3 Quadrant Power Tilt (QPT) and 3.1.4 Control Group Alignment Limits.
		• Verify QPT within COLR limit
		8. Within 2 hours, ensure reactor power is less than 60% of the allowable power per the RCP combination.
		Note: The crew may elect to place the Diamond in Auto to let the unit runback. However going to Auto is blocked by a malfunction of the auto/manual pushbutton.
	OATC	9. Begin reducing reactor power to less than 60% (55% OP limit) with the ICS in manual.
		When power is being reduced with the ICS in manual this event is completed.

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

Event Description: **1A$_1$ RCP High Vibration: (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP SRO	Statalarm 1SA-9/D-2 (RC PUMP VIBRATION HIGH) will alarm. 1. The BOP should refer to the ARG 2. Verify RCP vibration conditions by using RCP OAC Display Group RCP 3. Refer to AP/016, Abnormal Reactor Coolant Pump Operation. • Determine RCP immediate trip criteria are not met by referring to Enclosure 5.1 (RCP Immediate Trip Criteria). • *Since immediate trip criteria is not met then notify the OSM* and request an evaluation of the RCP vibration condition by the RCP Component Engineer.
	BOP SRO BOP	Statalarm 1SA-9/E2 (RCP VIBRATION EMERG HIGH) will actuate. 1. The BOP should determine that the immediate trip criteria are now met based on Enclosure 5.1 (RCP Immediate Trip Criteria) and inform the SRO. 2. *The SRO should direct the BOP to:* • Verify Reactor power ≤ 70% • Verify four RCPs operating • Trip the 1A1 RCP. 3. Trip the 1A1 RCP.
		When crew has tripped the RCP this event is completed.

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

Event Description: **ΔT_c fails HIGH: (I, OATC)**

Time	Position	Applicant's Actions or Behavior
		When the $1A_1$ RCP is secured ΔT_c fails HIGH • Statalarm 1SA-02/B-5 (RC Cold Leg Diff. Temperature High) will actuate. • FDW flow will ratio based on the failure • "A" FDW flow will increase causing "A" loop Tc to decrease. • "B" FDW flow will decrease causing "B" loop Tc to increase. • This will cause actual ΔT_c to increase
	OATC	Diagnose the ΔT_c failure by observing the ΔT_c meter on 1UB1. It should return to zero but is staying a + 3.5 degrees. Take the Feedwater Masters to MANUAL and re-ratio feedwater using the loop Tc meters to return actual ΔT_c to near zero.
	SRO	May refer to AP/28 (ICS Instrument Failures)
		When the OATC has re-ratioed FDW and returned Tc to near zero or when directed by the lead examiner this event is completed.

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

Event Description: **Second dropped Control Rod (Manual Reactor Trip): (M, OATC/SRO)**

Time	Position	Applicant's Actions or Behavior
		After reactor power has been reduced and when directed by the lead examiner a second control rod will drop. Plant response: Statalarm • 1SA-2/D-10 (CRD Continuous Boron Dilute Permit) actuates CRD PI Panel • API indication of dropped rod on individual meter • In limit (zero %) green light on respective dropped rod. • Amber 7" asymmetric lights on the dropped rod and the entire group. Crew response: OATC • The OATC should determine that a second control rod has dropped into the core by observing the CRD PI Panel and **MANUALLY TRIP THE REACTOR**. OATC will attempt to trip the reactor by depressing the reactor trip pushbutton. **Note: The reactor will NOT trip when the button is depressed.** SRO • SRO should ENSURE that a manual reactor trip is performed. • SRO enters EOP IMAs
		After the reactor pushbutton has been depressed this event is completed.

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

Event Description: **CT-1 Lockout and an ATWS: (C, ALL)**

When the manual reactor trip push button is depressed, the reactor will not trip and an ATWS will occur. When reactor power is less than 5% the turbine will be tripped and CT-1 (startup transformer) will lockout, which will result in a loss of power. Power will be restored from Keowee Unit 1 in approximately 35 seconds via the underground path and CT-4.

Time	Position	Applicant's Actions or Behavior
	OATC	Recognize that the Reactor should have tripped and begin performing Immediate Manual Actions. • Depress REACTOR TRIP pushbutton • Verify reactor power < 5% FP and decreasing The OATC should recognize that Power Range NIs are not < 5% FP and perform Rule 1. (**CT-24**) • Verify that at least one Power Range NI is ≥5% FP. • Initiate manual control rod insertion to the IN LIMIT. • Open 1HP-24 & 1HP-25 (1A and 1B BWST Suction) • Ensure 1A or 1B HPIP is operating. • Start 1C HPIP. • Open 1HP-26 & 1HP-27 (1A and 1B HP Injection) • Dispatch operators to the Cable Room and to the 600V Load Centers 1X9 and 2X1 to de-energize the CRD System. • Notify the Procedure Director to **GO TO** UNPP tab.
	BOP	Adjust FDW to match reactor power and maintain Tave near setpoint.

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

Event Description: **CT-1 Lockout and an ATWS: (C, ALL)**

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Time	Position	Applicant's Actions or Behavior
	SRO	Transfer to the UNPP tab from IMAs and direct the following actions: • Announce plant conditions • Ensure Rule 1 is in progress or complete. • Verify Main FDW available. • **IAAT** all power range NIs are <5% FP, **THEN** ensure the turbine-generator is tripped. **Note: This action will result in a unit loss of power for ≈ 35 seconds due to CT-1 lockout.** • Verify all wide range NIs ≥1% FP. • *Maximize letdown.* • Verify Main FDW available. • Adjust Main FDW flow as necessary to control RCS temperature. • Verify overcooling **NOT** in progress. • Ensure makeup to the LDST is secured. • **WHEN** all NIs are <1% FP, **AND** decreasing, **THEN** continue in this tab. **Note: Due to sequence of events all steps may not be completed.**

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

Event Description: **CT-1 Lockout and an ATWS: (C, ALL)**

When the manual reactor trip push button is depressed, the reactor will not trip and an ATWS will occur. When reactor power is less than 5% the turbine will trip and CT-1 (startup transformer) will lockout, which will result in a loss of power. Power will be restored from Keowee Unit 1 in approximately 35 seconds via the underground path and CT-4.

Time	Position	Applicant's Actions or Behavior
	BOP	Perform symptoms check and when asked report no other symptoms. When power is regained on the Main Feeder Buses perform AP/11, Recovery from Loss of Power. ▪ **IAAT** Pzr level > 80″ [180″ acc], **THEN** ensure Pzr heaters in AUTO ▪ Verify load shed is complete as indicated by LOAD SHED COMPLETE on <u>any</u> ES Module (Channel 1 or 2). ▪ Dispatch an operator to perform Encl 5.2 (Restoring Loads Outside the Control Room). ▪ Dispatch an operator to perform Encl 5.4 (Actions to Restore ESV System to Normal Operation). ▪ Verify condenser vacuum maintained. ▪ Verify IA header pressures ≥ 90 psig:
	OATC	Determine the Main Feedwater Pumps have tripped as a result of the loss of power and perform RULE 3 (Loss of Main or Emergency FDW). ▪ Ensure any EFDWP operating ▪ Initiate Enclosure 5.9 (Extended EFDW Operation) ▪ Throttle Motor Driven EFDW as necessary to prevent overcooling.

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

Event Description: **CT-1 Lockout and an ATWS: (C, ALL)**

When the manual reactor trip push button is depressed, the reactor will not trip and an ATWS will occur. When reactor power is less than 5% the turbine will trip and CT-1 (startup transformer) will lockout, which will result in a loss of power. Power will be restored from Keowee Unit 1 in approximately 35 seconds via the underground path and CT-4.

Time	Position	Applicant's Actions or Behavior
	SRO	When the turbine is tripped and power is lost: Two possible paths 1. GO TO the "Blackout" tab per parallel actions page • In the blackout tab, the crew will: verify power restored, initiate AP/11(Recovery from Loss of Power) and transfer to Subsequent Actions. **OR** 2. If power is restored prior to transferring to blackout tab, SRO will complete UNPP tab. • When power is regained to the 4160-switchgear use a "Parallel Actions" transfer from the yellow page to initiate AP/11(Recovery from Loss of Power). • Determine that reactor power is ≤ 1%. • Direct an RO to throttle HPI per Rule 6 and adjust Letdown if needed. 3. Transfer to Subsequent Actions • Verify all control rods are inserted • Verify Main FDW is not operating and ensure SG level are approaching 240" XSUR. • Verify all 4160V switchgear (1TC, 1TD, 1TE) energized.
		This event is completed when EOP Encl. 5.9 (Extended EFDW Operation) is initiated or when directed by the lead examiner.

Op-Test No.: _____ Scenario No.: **1** Event No.: **8** Page 1 of 2

Event Description: **Keowee Unit 1 Emergency Lockout, Unit Blackout: (M, ALL)**

Note: When directed by the lead examiner Keowee Unit 1 Emergency Lockout will occur.

Time	Position	Applicant's Actions or Behavior
	SRO	*Keowee Unit 1 Emergency Lockout will result in a Unit Blackout.* 1. Determine that CC and HPI are lost and initiate AP/25 (SSF Emergency Operating Procedure) • The SRO will make a "Parallel Actions" transfer to the Blackout tab. • Close 1HP-31 (RCP Seal Flow Control) and 1HP-21 (RCP Seal Return). • Determine SGs are not being feed and dispatch operators to the Atmospheric Dump Valves. **Note: Since the TD EFDW Pump is OOS no source of FDW is available to the SGs until power is restored from CT- 5.** • Notify SSF operators that feeding with SSF ASW is required. • Initiate Enclosure 5.38 (Restoration of Power)
	BOP	**Note: If RCS pressure reached 2300 psig the crew will initiate Rule 4 (Initiation of HPI Forced Cooling). Because no power is available to the HPI pumps the rule will be exited.** Perform Enclosure 5.38 (Restoration of Power) (**CT-8**) 1. Verify MFB1 and MFB2 de-energized 2. Determine CT-1 has no voltage 3. Verify both Standby Buses de-energized 4. Verify all Keowee Units operating **Note: Keowee 1 emergency locked out, Keowee 2 operating.** 5. Notify Keowee operator to give Oconee Control for Keowee 2 6. Close ACB-4 (Unit 2 EMER FDR) 7. Verify CT-4 voltage 4160 8. Place CT-4 Bus 1 and 2 AUTO/MAN switches in MANUAL 9. Place STBY BUS 1 and 2 SYNCHRONIZING switch in ON.

Op-Test No.: _____ Scenario No.: **1** Event No.: **8** Page 2 of 2

Event Description: **Keowee Unit 1 Emergency Lockout, Unit Blackout: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	BOP	10. Close SK1 and SK2 11. Place STBY BUS 1 and 2 SYNCHRONIZING switch in OFF. 12. Verify Standby Bus #1 energized. 13. Notify SRO Standby Bus #1 is energized. 14. Place the following switches in MANUAL: • MFB1 AUTO/MAN • MFB2 AUTO/MAN • STANDBY 1 AUTO/MAN • STANDBY 2 AUTO/MAN 15. Ensure the following breakers open: • N1 and N2 • E1 and E2 16. Close S1 and S2 **Note: This will power the Main Feeder Buses.** 17. Verify any of the following energized: • 1TC, 1TD, 1TE 18. Notify SRO of status of 4160V SWGR 19. Use RULE 3 to establish EFDW flow to SGs.
		This event and the exam are complete when plant is in a safe configuration i.e. EFW is restored or when directed by the Lead Examiner.

Facility: **Oconee** Scenario No.: **2, fnl** Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
- 100% Reactor Power (IC-41)

Turnover:
- AMSAC/DSS bypassed for I&E testing
- SASS in manual for I&E testing
- "A" Condensate Booster Pump OOS, breaker to be replaced
- Keowee Unit 2 OOS for unplanned reasons
- Keowee Unit 1 aligned to underground

Event No.	Malfunction No.	Event Type*	Event Description
0a	Pre-Insert		AMSAC/DSS bypassed
0b	Pre-Insert MNI082		NI-9 OOS
0c	Pre-Insert AOR		"A" AFIS circuit disabled "B" AFIS circuit disabled
0d	Pre-Insert MEL180		Keowee Unit 2 Emergency Lockout
0e	Pre-Insert		ES Channels 7 and 8 fail to automatically actuate
1a	Override	N, BOP, SRO	Low "A" CFT Pressure (N_2 makeup)
1b	Override	C, BOP, SRO	1N-298 (N_2 Fill CFT 1A) fails OPEN
2	MPS090	C, OATC, SRO	1HP-120 (RC Volume Control) Fails closed
3	MCS004	I, OATC, SRO	Controlling Tave fails HIGH
4	Override	C, BOP, SRO	Seismic event (PRA) 1A RBCU rupture (TS)
5	MPS020	C, ALL	1B SG Tube leak 5 gpm (TS)
6	MPS020	C, ALL	1B SG Tube leak increases to rupture of 100 gpm
7		R, OATC, SRO	Unit Shutdown
8	MSS360,50	M, ALL	1A Main Steam line break in RB

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

Op-Test No.: _____ Scenario No.: 2 Event No.: 1a	Page 1 of 1
Event Description: **Low "A" CFT pressure (N2 makeup) (N, BOP/SRO)**	

Time	Position	Applicant's Actions or Behavior
	BOP	Plant response: 1SA-08/A-11, CF TANK "A" PRESS HIGH/LOW will actuate. Crew response: 1. The crew should refer to the ARG. 2. Refer to OP/1104/001, Enclosure 4.7 (Pressure Makeup To CFTs Using Nitrogen) to adjust CFT pressure. • Direct an NEO to open 1N-137 (CFTs Supply) ➢ **Cue: Time compression used to open 1N-137. This is used to speed the opening of the valve. It would take time for the NEO to travel from work control to the Auxiliary Building.** • Open 1N-298 (N2 Fill CFT 1A) • Monitor 1A CFT pressure
		When 1N-298 (N2 Fill CFT 1A) is taken to CLOSE or when directed by the lead examiner this event is completed.

Op-Test No.: _____ Scenario No.: 2 Event No.: 1b Page 1 of 1

Event Description: **1N-298 (N2 Fill CFT 1A) fails OPEN (C, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	Plant response: 1. Determine 1N-298 has failed to close: • Red "open" light lit • CFT pressure continues to increase 2. Inform the SRO. 3. Direct the NEO to close 1N-137 (CFTs Supply). **Note: If 1N-137 is not closed the CFT pressure will continue to increase, possibly outside of TS limits.** 4. Verify 1A CFT pressure is stable.
		When CFT pressurization is stopped or when directed by the lead examiner this event is completed.

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

Event Description: **1HP-120 (RC Volume Control) Fails closed (C, OATC/SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC	1HP-120 fails closed during CFT pressurization. This will allow OATC *diagnoses of failure.* 1. Diagnose 1HP-120 (RC Volume Control) failed closed: • RCS makeup flow goes to zero. • PZR level begins to decrease. • LDST level begins to increase. • Valve position demand for 1HP-120 begins to increase to the 100% demand value and valve position indication will indicate closed (green light).
	SRO	2. Refer to AP/14 (Loss of Normal Makeup and/or RCP Seal Injection). • Determine Seal Injection is not lost • Determine loss of suction to HPI pumps has not occurred and **GO TO** Step 4.6. • Verify any HPI pump operating. • *Verify RCP seal injection flow exists.* • Verify RCP seal injection or HPI makeup line leak is **not** indicated and **GO TO** Step 4.10. • Verify all RCPs seal return temperatures are < 240°F. • Verify 1HP-120 has failed and **GO TO** Step 4.183. • Perform the following as necessary to maintain Pzr level > 200": ▪ *Close 1HP-6 (Letdown Orifice Stop)* ▪ Throttle 1HP-7 (Letdown Control) ▪ Throttle 1HP-26 (1A HP Injection)
	SRO	• Ensure 1HP-120 to HAND and close 3. Contact SPOC to repair 1HP-120. **Note: 1HP-120 will remain failed for the duration of the scenario.**
		When PZR level is being controlled manually or when directed by the lead examiner this event is completed.

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

Event Description: **Controlling Tave fails HIGH (I, OATC/SRO)**
When directed by the lead examiner controlling Tave will fail high.

Time	Position	Applicant's Actions or Behavior
		Plant response: 1. 1SA-02/A-12, ICS Tracking, will actuate due to neutron and feedwater cross-limits. 2. Controlling Tave will indicate ≈ 596.4° F. 3. Actual loop A & B Tave will decrease until operator stops transient. 4. RCS pressure and temperature will decrease.
	OATC	Crew response: 1. When the ICS TRACKING alarm is received, the candidates should utilize the "Plant Transient Response" process to stabilize the plant and recognize that the controlling Tave has failed. RX will trip on variable low pressure with no operator action. 2. Verbalize to the SRO reactor power level and direction of movement.
	SRO	3. Place the FDW Masters in manual and stabilize the plant. Use control rods and FDW to stabilize the plant 4. The SRO should: • Refer to AP/28, *ICS Instrument Failures* • Contact SPOC to repair controlling Tave. **Note: The ICS will remain in manual for the remainder of the scenario.**
		When the plant is stable or when directed by the lead examiner this event is completed.

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

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

Time	Position	Applicant's Actions or Behavior
	BOP	1. 1SA-9/B-9, LPSW RBCU A Cooler Rupture will actuate and RB normal sump level will increase. • The BOP should refer to ARG for 1SA-9/B-9 • Verify alarm is valid by checking RBCU 1A Inlet Flow and RBCU 1A delta flow. • Verify 1LPSW-18 (RBCU 1A Oultlet) open • Verify adequate LPSW flow is available; check LPSW pump operation • Monitor RBNS Level for any unexplained increase (Notify Chemistry to sample RBNS for boron to determine if a cooler rupture has occurred). • Diagnose a Cooler Rupture is indicated and Isolate the 1A RBCU Cooler.
	SRO	2. The SRO should determine that isolation of LPSW to a RBCU places the Unit in Tech Spec 3.6.5 Condition B (7 day completion Time) and refer to SLC 16.9.12 (Additional LPSW And SSW System operability Requirements). **Note: The control room will receive a phone call from security that indicates that a tremor has been felt but no damage has been noted.**
	SRO	3. The SRO may refer to AP/05, Earthquake. • Dispatch operators to perform plant inspections **Note: No damage will be reported.** • *Notify SPOC to develop the Strong Motion Accelerometer tape. • *Verify NO fuel handling activities in progress. *** These items may not be completed depending on how soon the next event is started.** **Note: Team may decide at this time to begin a unit shutdown. Refer to event 6.**
		When the RBCU has been isolated, or at the direction of the Lead Examiner this event is completed.

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

Event Description: **1B SG Tube leak (5 gpm) (C, ALL) (TS)**
1B SG tube leak occurs following RBCU isolation or when directed by the lead evaluator.

Time	Position	Applicant's Actions or Behavior
		Plant response: 1. The following alarms actuate: • 1SA-8/B-9, RM PROCESS MONITOR RADIATION HIGH • 1SA-8/D-10, RM CSAE EXHAUST RADIATION HIGH 2. PZR level will decrease. Crew response:
	ALL	1. Diagnose and take actions for a Tube leak in the 1B SG:
	BOP	2. Refer to the ARG for the following alarms: • 1SA-8/B-9, RM PROCESS MONITOR RADIATION HIGH • 1SA-8/D-10, RM CSAE EXHAUST RADIATION HIGH
	SRO	3. Refer to AP/31 (Primary to Secondary Leakage)
	BOP SRO	• Monitor primary parameters; PZR Level and LDST level to determine that gross leakage exist and transfer to step 4.71.
		Path 1 (crew determines that leakage is gross)
	BOP SRO	• Using an RCS inventory balance, determine OTSG tube leak size is less than 25 gpm.
		Path 2 (crew determines that leakage is NOT gross)
		• Notify RP and Chemistry • Determine leak rate using the OAC is ≥ 100 gpd.
		Common path
		• Greater than 25 gpm will require entering the EOP. • Log RIA readings (a rough log is adequate) • Initiate a Unit shutdown to met requirements of Encl. 5.1 (Unit Shutdown Requirements). (Per Enclosure 5.1 reduce power < 50% in 1 hour and TS 3.4.13 appllies). ➢ Initiate a unit shutdown using OP/1/A/1102/004 (Operation At Power)
		Note: A shutdown with the ICS in manual is required.
		When the SRO has directed a manual Unit shutdown or when directed by the Lead Examiner the event is completed.

Op-Test No.: _____ Scenario No.: __2__ Event No.: __7__ Page 1 of 1

Event Description: **Unit Shutdown (R, OATC)**

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	The OATC will use the FDW Masters and the Diamond to reduce power while monitoring Reactor Power, Tave, and other plant parameters. *If the reactor trips automatically the team must return to IMAs.*
		The BOP will utilize Enclosure 5.19 (Control of Plant Equipment During Shutdown for SGTR). 1. Notify WCC SRO to make notifications 2. Stop 1A and 1B MSRH Drain Pump 3. Place 1FDW-53 and 1FDW-65 in manual and closed. (Located on 1VB3) 4. Place 1HD-37 and 1HD-52 in DUMP. 5. Start the both FDWP's Seal Injection and Auxiliary Oil Pumps. 6. When Reactor power is ≤ 80%, stop 1E1 and 1E2 Heater Drain Pumps. 7. Transfer electrical auxiliaries • Place 1TA AUTO/MAN transfer switch in MAN • Place 1TB AUTO/MAN transfer switch in MAN • Close 1TA SU 6.9 KV FDR • Close 1TB SU 6.9 KV FDR • Place MFB1 AUTO/MAN transfer switches in MAN • Place MFB2 AUTO/MAN transfer switches in MAN • Close $E1_1$ MFB1 STARTUP FDR 4. Close $E2_1$ MFB2 STARTUP FDR **Note: the team may manually trip the reactor if PZR level cannot be maintained with full HPI. This may occur because of the tube leak and RCS cooldown.** **Note: If the reactor is manually tripped activate event 8.**
		When a unit shutdown of > 5% has occurred or when directed by the lead examiner this event is concluded.

Op-Test No.: _____ Scenario No.: 2 Event No.: 8 Page 1 of 2

Event Description: **1A Main Steam line break in RB (M, ALL)**
1A main steam line break will occur following event 7 as directed by the lead examiner.

Time	Position	Applicant's Actions or Behavior
	ALL	Plant response: 1. Statalarm 1SA-02/A-9, MS Press High/Low, actuates 2. "A" and "B" main steam (MS) pressure decreases 3. Reactor trips. • "B" MS line pressure stops decreasing • "A" MS line pressure continues to decrease • RCS *may saturate* Crew response:
	SRO OATC	1. The OATC will perform and verify IMAs. • Depress REACTOR TRIP pushbutton • Verify reactor power < 5% FP *and decreasing* • Depress TURBINE TRIP pushbutton • Verify all turbine stop valves closed • Verify RCP seal injection available
	BOP	2. The BOP will perform a symptoms check. 3. The Crew should respond to the MSLB in the "1A" SG 4. The BOP will perform Rule #5 (Main Steam Line Break) *after* receiving concurrence from the SRO. (**CT-17**)
	OATC	• Stop 1A MDEFDW Pump • Initiate both trains of MSLB isolation • Ensure both Main FDW pumps tripped • Steam 1B SG to *maintain CETCs constant* 5. If SCM = 0°F then the OATC will perform Rule #2 (Loss of SCM) after receiving *concurrence from the SRO*. (**CT-1, CT-2**) • Trip ALL RCPs within 2 minutes • Ensure open 1HP-24 and 1HP-25 • *Ensure* ALL HPI pumps operating • Ensure open 1HP-26 and 1HP-27 • Verify required HPI flow per header

Op-Test No.: _____ Scenario No.: 2 Event No.: 8 Page 2 of 2

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

Time	Position	Applicant's Actions or Behavior
	BOP	• Verify TBVs available • Feed all intact SGs • Control EFDW as required to raise level to intact SGs to *proper setpoint per* RULE 7 (SG Feed Control) • Trip both Main FDWPs • Place FDW block valve switches (1FDW-33, 31, 42, 40) in CLOSE: • Maintain SG pressure < RCS pressure
	SRO	6. The SRO will "Parallel Action" to transfer to the Excessive Heat Transfer (EHT) tab and direct the Crew's actions as follows:
	BOP	7. *Enclosure* 5.1 (ES Actuation) will be performed. • Diagnose that ES Channels 7 and 8 have not actuated. • *Depress the ES Channels 7 and 8 trip pushbutton on* 1UB1. **Note: ES Channel 8 pushbutton will not work. This will require the operator to manually start the 1B RBS pump from the ES RZ module.** 8. Excessive Heat Transfer (EHT) tab will: • Verify excessive heat transfer stopped • Throttle HPI to stabilize RCS pressure and maintain PZR *level > 80" (180" acc)* • Feed and steam all intact SGs to stabilize RCS P/T. (**CT-11**) • Minimize SCM using the following methods *as necessary*: (**CT-7**) ➢ De-energizing all PZR heaters ➢ Using PZR spray ➢ Throttling HPI • Initiate Enclose 5.16 (SG Tube-to-Shell Δ T Control) • GO TO Steam Generator Tube Rupture (SGTR) tab.
		When the SRO has transferred to the SGTR tab or when directed by the Lead Examiner the event and scenario is completed.

Facility: **Oconee** Scenario No.: **3, fnl** Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:

- 25% Reactor Power (IC-45), startup in progress

Turnover:

- Unit 1 TD EFDW Pump OOS to repair oil leak
- NI-9 OOS, to be replaced next outage
- Keowee Unit 2 OOS for unplanned reasons
- Keowee Unit 1 aligned to underground
- Operability test of Keowee Unit 1 is to be performed per PT/620/009 (Keowee Hydro Operation) after turnover and before startup continues. ONS to perform remote Keowee start.

Event No.	Malf. No.	Event Type*	Event Description
0a	Pre-Insert MSS330		TD EFDW Pump Fails to Start
0b	Pre-Insert Updater		SASS in manual
0c	Pre-Insert Updater		AMSAC DSS bypassed
0d	Pre-Insert MEL180		Keowee Unit 2 Emergency Lockout
1	MEL020 Override	N, BOP, SRO C, BOP, SRO	Operability test Unit 1 Keowee Unit 1 Gen Field Flashing Breaker fails to OPEN automatically
2	MPS460 Override	C, OATC, SRO	"A" HPI Pump sheared shaft and standby HPI pump fails to start (TS)
3	MNI032	I, OATC, SRO	Controlling NI fails LOW
4	MSS310	C, BOP, SRO	Loss of Instrument Air
5	MPI290	C, OATC, SRO	Main FDW Pump Trips Main Turbine Fails to trip (Lockout EHC Pumps)
6	MSS280,100 Override	M, ALL	"A" TBVs fail open 1MS-17 ("A" TBV Block) fails to close
7	MPS010	M, ALL	"A" SG Tube Rupture

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

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

Event Description: **Operability test Keowee Unit 1 (N, BOP/SRO)**
Keowee Unit 1 Gen Field Flashing Breaker fails to OPEN automatically (C, BOP/SRO)

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to perform PT/620/009 (Keowee Hydro Operation) to operability test unit 1 Keowee underground.
	BOP	Use OP/1106/019 (Keowee Hydro At Oconee) to perform an "Automatic Startup" of Keowee Unit 1
		Initial Conditions
		1. Verify applicable Statalarms and breaker positions
		2. Notify Keowee operator to give Oconee control of Keowee # 1.
		3. Review Limits and Precautions
		Procedure
		1. Place UNIT 1 LOCAL MASTER switch to "START" AND hold until Keowee Unit starts.
		2. Verify the following:
		• GEN 1 FIELD BREAKER closes
		• GEN 1 SUPPLY BREAKER closes
		• GEN 1 FIELD FLASHING BREAKER closes
		3. Ensure GEN 1 FIELD FLASHING BREAKER trips.
		• Candidate should diagnose that the breaker did not open automatically and should open the breaker manually and initiate a work request or contact SPOC.
	SRO	**SRO** should direct the BOP to continue with the startup.
		Note: GEN FIELD FLASHING BREAKER automatically trips ≤ 45 seconds after receiving close signal. Failure of breaker to trip automatically does NOT make the KHU inoperable. Startup procedure may continue.
	BOP	4. Determines KHU #1 is operable when test complete
		5. Verify ACB-1, Keowee 1 Generator Breaker, closed.
		6. Verify Unit 1 EMER FDR ACB 3 closed
		7. Verify ≈ 4.16 KV on CT4 Volts (2AB3)
		8. Close SK1 and SK2 (CT4 STBY BUS 1/2 FEEDER)
		9. Shutdown Keowee #1.
		Event is complete when operability test is complete or when directed by the lead examiner.

Op-Test No.: _____	Scenario No.: 3	Event No.: 2	Page 1 of 2
Event Description:	**"A" HPI Pump sheared shaft and the standby HPI pump fails to auto start: (C, OATC)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: *Statalarms:* • 1SA-2/B-2 (HP RCP Seal Injection Flow High/Low) • 1SA-2/C-2 (HP Injection Pump Disch. Header Pressure High/Low) Board indications: • RC Makeup Flow = 0 gpm • 1A HPI Pump = 0 amps • PZR level will begin to decrease and LDST level will begin to increase.
	OATC SRO OATC	Crew response: 1. Refer to ARG for above Statalarms 2. SRO should refer to AP/014 (Loss of Normal Makeup and/or RCP Seal Injection) • Verify no HPI pump operating • Close 1HP-5 (Letdown Isolation) • Ensure 1HP-120 (RC Volume Control) in HAND and closed • Place 1HP-31 (RCP Seal Flow Control) in HAND and closed • Start standby HPI pump (1B HPI pump) • Slowly open 1HP-31 in small increments until ≈ 8 gpm/RCP is achieved. • Re-establish normal makeup through 1HP120. • Reduce 1HP-7 demand to 0%. • Close 1HP-6 • Ensure the following open: ➢ 1HP-1 ➢ 1HP-2 ➢ 1HP-3 ➢ 1HP-4 • Open 1HP-5 • Throttle open 1HP-7 for ≈ 20 gpm letdown flow. • Open 1HP-6 • Adjust 1HP-7 for desired letdown flow. • Place 1HP-31 in auto.

Op-Test No.: _____	Scenario No.: 3	Event No.: 2	Page 2 of 2
Event Description:	**"A" HPI Pump sheared shaft and the standby HPI pump fails to auto start: (C, OATC)**		

Time	Position	Applicant's Actions or Behavior
	SRO	3. Refer to Tech Spec 3.5.2 High Pressure Injection • Condition "A" • Required Action: Restore HPI pump to OPERABLE status • Completion Time: 72 hours **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.**
		Event is complete when normal makeup and letdown is established or when directed by the lead examiner.

Op-Test No.: _____	Scenario No.: 3	Event No.: 3	Page 1 of 1
Event Description:	**Controlling NI fails LOW: (I, OATC) (TS)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: • Statalarm 1SA-2/A-12 (ICS Tracking) • Diamond will transfer to MANUAL, because indicated reactor power is < 1.5%. • Tave will increase and actual reactor power will decrease. Crew response:
	OATC	1. Crew should use "Plant Transient Response" to stabilize the plant by placing both FDW Masters in MANUAL. 2. Adjust CR and FDW as required to stabilize the plant.
	SRO	3. SRO should refer to AP/028 (ICS Instrument Failures) and PT/600/001 (Periodic Instrument Surveillance). 4. SRO should refer to TS 3.3.1 (RPS Instrumentation) **Note: ICS will remain in MANUAL for the reminder of the scenario.**
		Event is complete when plant is stable or when directed by the lead examiner.

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

Event Description: **Loss of Instrument Air (C, BOP)**

Time	Position	Applicant's Actions or Behavior
		Plant response: • Statalarm 1SA-4/C-5 (Aux Bldg Air HDR PR Low) activates • IA pressure decreasing on Aux and Turb Building gauges located on 1UB2. Crew response:
	BOP	1. Refer to ARG for 1SA-4/C-5. • Send NEO to start all backup IA compressors. • Send operators to check fro IA line ruptures or open valves. • Refer to AP/22 (Loss of Instrument Air) • Start Primary IA Compressor • Using paging system, request that plant personnel stop using service and IA.
	SRO BOP	2. AP/22 (Loss of Instrument Air) • Direct Unit 2 to dispatch an operator to start the Diesel Air Compressor. • IAAT Feedwater flow cannot be controlled, trip Reactor and all Main FDW pumps. • IAAT two or more CRD temperatures are > 180°F, trip Reactor. • Using paging system, request that plant personnel stop using service and IA. • IAAT Aux IA press ≤ 88 psig dispatch operator to verify Unit 1 Aux IA Compressor is operating. • IAAT IA header pressure is < 80 psig and letdown is desired: • Place 1HP-14 (LDST Bypass) to NORMAL • Open 1HP-13 (Purification IX Bypass) • Verify Letdown Filter available • Open 1HP-17 (1A Letdown Filter Inlet) • Open 1HP-6 (Letdown Orifice Stop) • Adjust 1HP-7 to obtain desired letdown flow. **Note: If reactor trips, continue to next event.** **Note: IA leak will be repaired after letdown is aligned.**
		Event is complete when AP/22 actions are being performed or when directed by the lead examiner.

Op-Test No.: _____	Scenario No.: 3	Event No.: 5	Page 1 of 1
Event Description:	**Main FDW Pump trips and the turbine Fails to trip (C, OATC)**		

Time	Position	Applicant's Actions or Behavior
	SRO OATC BOP	Plant response: • 1A Main FDW pump trips resulting in a reactor trip. • The Main Turbine should trip but does not. This will result in a reduction steam pressure in both SG until actions are taken to trip the turbine. The will result in RCS overcooling until tripped. Crew response: 1. SRO will enter the EOP. 2. OATC will perform Immediate Manual Actions • Depress REACTOR TRIP pushbutton • Verify reactor power < 5% FP and decreasing • Depress turbine TRIP pushbutton. • Verify all turbine stop valves closed **Note: The OATC should diagnose that the turbine did not trip and then perform the RNO step which will stop both EHC pumps. This will cause the turbine to trip.** • Verify RCP seal injection available. 3. BOP will perform a symptom check.
		Event is complete when EHC pumps have been tripped or when directed by the lead examiner.

Op-Test No.: _____	Scenario No.: 3	Event No.: 6	Page 1 of 2
Event Description:	**"A" TBVs fails open and 1MS-17 ("A" TBV Block) fails to close: (M, OATC)**		

Time	Position	Applicant's Actions or Behavior
		Note: The "A" TBVs will fail open at the same time as the turbine trip. Plant response: • The "A" TBVs will indicate full open. The "B" TBVs will be throttled. • The RCS will begin to slowly cool off • "A" Main Steam line will begin to depressurize Crew response: 1. The crew may diagnose the TBVs failed open and with SRO guidance try to control SG pressure by taking the TBVs to manual. (This will not work) 2. After trying to control pressure with the TBVs in manual, the SRO may direct them to close 1MS-17 ("A" TBV Block) but it will not close. 3. An RO should initiate Rule 5 (Main Steam Line Break). (**CT-17**) • Select OFF on the A MDEFDWP. • Ensure both Min FDWPTs are tripped • Close 1FDW-315 • Close 1FDW-33 and 1FDW-31. • Adjust 1B SG to maintain CETCs constant. • Ensure Rule 3 (Loss Of Main or Emergency FDW) in progress. • Ensure Rule 8 (Pressurized Thermal Shock (PTS)) is in progress or complete. • When notified by the SRO, exit rule.

Op-Test No.: _____	Scenario No.: 3	Event No.: 6	Page 2 of 2
Event Description:	**"A" TBVs fails open and 1MS-17 ("A" TBV Block) fails to close: (M, OATC)**		

Time	Position	Applicant's Actions or Behavior
		4. The SRO should make a "Parallel Actions" transfer to the Excessive Heat Transfer tab. 5. Excessive Heat Transfer tab will: • If any SG pressure < 550 psig ensure Rule 5 (Main Steam Line Break) in progress or complete. • Verify excessive heat transfer stopped. • Verify level in both SGs < 96% O.R. • Throttle HPI to stabilize RCS pressure and maintain Pzr level > 100". • Verify letdown in service. • Verify B SG has an intact secondary boundary (intact SG). • Ensure open 1FDW-382 and 1FDW369. • Ensure 1B MDEFDWP operating. • Feed and Steam B SG to stabilize RCS P/T. (**CT-11**)
		Event is complete when Rule 5 is complete and Excessive Heat Transfer tab is in progress or when directed by the lead examiner.

Op-Test No.: _____ Scenario No.: 3 Event No.: 7	Page 1 of 2
Event Description: **"A" SG Tube Rupture: (M, ALL)**	

Time	Position	Applicant's Actions or Behavior
		Plant response: Statalarms: 1SA-8/A-9 (RM Area Monitor Radiation High) 1SA-8/B-9 (RM Process Monitor Radiation High) 1SA-8/D-10 (RM CSAE Exhuast Radiation High) Board indications: PRZ level and RCS pressure will decrease. Crew response: SRO should remain in Excessive Heat Transfer Tab and perform the following: 1. Verify initiating Rule 8 (Pressurized Thermal Shock PTS)) is not required. 2. Verify aux steam header being supplied from another unit. 3. Open AS-8 4. Close 1SSH-1, 1SSH-3, and 1SSH-9. 5. Notify Chemistry to determine RCS Boron concentration. 6. Notify RP and Secondary Chemistry to check for indications of a SGTR. 7. **IAAT** the following conditions exist: • ES Bypass Permit satisfied • All SCMs > 0°F • RCS pressure controllable **THEN** Bypass ES as required 8. While maintaining RCP NPSH and Pzr level minimize SCM using the following methods as necessary: **(CT-7)** • De-energizing all Pzr heaters • Using Pzr spray • Throttling HPI • Using PORV

Op-Test No.: _____ Scenario No.: __3__ Event No.: __7__		Page 2 of 2
Event Description: **"A" SG Tube Rupture: (M, ALL)**		
Time	Position	Applicant's Actions or Behavior
		9. Initiate Encl. 5.16 (SG Tube-to-Shell ΔT Control) • **IAAT** any SG tube-to-Shell ΔT approaches either limit **THEN** take appropriate action. 10. **GO TO** SGTR tab. SGTR tab will: 1. Verify Reactor is tripped and Initiate Encl. 5.5 (Pzr and LDST Level Control) 2. Start A and B Outside Air Booster Fans on Unit 1&2 and Unit 3. (**CT-27**) 3. Dispatch operator to open TBS pump breakers.
		Event is complete when TBS pump breakers have been opened or when directed by the lead examiner.

Facility: **Oconee** Scenario No.: **SPARE, fnl** Op-Test No.: ___

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:

- 50% Reactor Power, shutdown in progress (IC-44)

Turnover:

- AMSAC/DSS bypassed for I&E testing
- NI-9 OOS, to be replaced next outage

Event No.	Malf. No.	Event Type*	Event Description
0a	Pre-Insert		AMSAC/DSS bypassed
0b	Pre-Insert MNI082		NI-9 OOS
0c	Pre-Insert		1HP-26 Failed CLOSED
0d	Pre-insert		1FDW-316 Failed OPEN
1	MPI171, 100 MPI500, 100	I, OATC, SRO	T_h Fails HIGH (repair return to auto)
2	MPS290 Override	C, BOP, SRO	1A CC Pump trips (1B CC Pump fails to auto start)
3	MPS110	C, BOP, SRO	1HP-5 Fails closed
4	MPS405	C, BOP, SRO	Unidentified RCS leak in RB (20 gpm) (TS)
5	MCR040	C, OATC, SRO	Inability for CRD insertion in automatic during shutdown.
6		R, OATC, SRO	Manual CRD power decrease
7	MPS400.5	M, ALL	SBLOCA

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

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 1	Page 1 of 1
Event Description:	**T_{hot} fails HIGH: (I, OATC)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: • Loop A Thot Dixson meter reading goes to 620°F • Thot recorder ≈612°F • Tave recorder and digital meter increases to ≈583°F • Loop A Delta T meter increases to ≈65°F • Loop A Tave meter increases to ≈588°F • Statalarm 1SA-2/B-3, RC Hot Leg Temp High, alarms Crew response: • The crew should use Plant Transient Response to stabilize the unit. • Depending on when ICS is taken to manual, FDW flow may be greater than 100%. If this is true, taking ICS to hand will allow NI Power to begin to increase to match FDW flow. When this occurs, the OATC will be required to decrease FDW flows to stop the power increase. • SRO should refer to AP/28 (ICS Instrument Failures). • After the instrument is repaired the SRO should direct the crew from AP/28 (ICS Instrument Failures) to return the ICS to auto.
	OATC SRO	
		When the ICS has been returned to auto this event is completed.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 2	Page 1 of 1
Event Description:	**1A CC Pump trips: (C, BOP)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: 1. Statalarms: • 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 2. Control Board indications: • 1HP-5 will close due to high letdown temperature Crew Response:
	BOP	1. Refer to ARGs 2. Initiate AP/020 (Loss of Component Cooling) • **IAAT** both of the following are lost: ➢ CC to RCPs ➢ RCP seal injection **THEN** perform the following: ➢ Trip RX ➢ Stop all RCPs ➢ Initiate AP/25 (SSF EOP)
	SRO BOP	• **IAAT** ≥ two CRD stator temperatures ≥ 180°F, **THEN** trip RX. • Open 1CC-7 and 1CC-8 • Verify CC Surge Tank level ≥ 12". • Manually start the Standby CC Pump
	SRO	3. Close 1HP-5. 4. Initiate AP/032 (Loss of Letdown)
		This event is complete when the Standby CC pump is started or when directed by the lead examiner.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 3	Page 1 of 1
Event Description:	**1HP-5 Fails closed: (C, BOP)**		

Time	Position	Applicant's Actions or Behavior
	SRO BOP	1. AP/032 (Loss of Letdown) • Ensure 1HP-120 in HAND and closed • Notify chemist RCS Born sample needed and normal letdown line is isolated. • Verify CC in operation • Position the standby HPI pump switch to OFF. • Throttle 1HP-31 to establish 12-15 gpm SEAL INLET HDR FLOW. • Close 1HP-6 • Close 1HP-7 • Ensure the following open ➢ 1HP-1 ➢ 1HP-2 ➢ 1HP-3 ➢ 1HP-4 • Verify letdown temperature < 135°F • Open 1HP-13 • Ensure 1HP-8 and 1HP-9&11 closed • Select LETDOWN HI TEMP INTLK BYP switch to BYPASS. • Ensure 1HP-5 is open **Note: 1HP-5 will not open from the control room or locally.**
	SRO	• **GO TO** step 4.11 • Verify 1HP-5 closed • Close 1HP-6 • Close 1HP-7 • Dispatch an operator in continuous communication with Control Room to manually open 1HP-5 (LETDOWN ISOLATION) (Tech Spec 3.6.3)
		When an operator has been dispatched to open 1HP-5 or when directed by the lead examiner this event is complete.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 4	Page 1 of 1
Event Description:	**Unidentified RCS leak in RB (20 gpm): (C, BOP) (TS)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: 1. Statalarms: • 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low • 1SA-8/B-9, Process Radiation Monitor High 2. Control board indications: • RBNS level increases • Pzr level will decrease very slowly due to the leak and 1HP-5 being closed.
	BOP	Crew response: 1. Refer to ARG for 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low
	SRO BOP	2. Refer to AP/002, Excessive RCS Leakage • *Initiate Encl. 5.1 (Leak Rate Determination)* • Ensure OSM, STA, RP are notified • Monitor trend of "T6 AP02" for increases (OAC) • Verify NO leakage through PORV and close 1RC-4 • Identify leak is in the RB and GO TO Step 4.20 • Place standby CC pump switch to OFF. • Close 1CC-1/1HP-1 and 1CC-2/1HP-2 • Verify leakage has stopped (**will not**) • Verify re-establishing LD is desired (**it is not due to 1HP-5 failing shut**) • Ensure RB isolation valves are closed.
	SRO	• Verify unit shutdown is desired by Station Management • SRO should determine unit SD is required due to RCS leak greater than TS limit. • Ensure unit shut down has been initiated in accordance with one of the following: ➢ AP/29 (Rapid Unit Shutdown) ➢ OP/1/A/1102/004 (Operation At Power) ➢ *OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown)* **Note: OP/1/A/1102/004 (Operation At Power) should be used.**
		Event is complete when a unit shutdown is directed by the SRO or when directed by the Lead Examiner.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 5	Page 1 of 1
Event Description:	**Inability for CRD insertion in automatic during shutdown: (C, OATC)**		

Time	Position	Applicant's Actions or Behavior
	SRO	Unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 3.2, Power Reduction
		1. Review Limits and Precautions
		2. Notify OSM to contact NRC if required.
		3. Start 1A/1B MFDW pump Seal Injection Pump
	OATC	4. Select HOLD
		5. Select desired shutdown rate
		6. Select desired rate of power reduction of RATE SET
		7. Select CTPD SET power level
		8. Release hold
		Note: Control Rods will not insert in auto.
		Plant response:
		1. Neutron Error goes negative
		2. Tave increases
		3. When Neutron Error reaches -5, unit will go to track and Statalarm 1SA-2/A-12 (ICS Tracking) will actuate.
	OATC	Crew response:
		1. OATC should determine that control rods are not inserting.
	SRO	2. SRO should determine that a manual unit shutdown is required and direct the OATC to place the ICS in manual and continue the unit shutdown.
	OATC	3. OATC should place Diamond in Manual.
		Note: Crew may decide to place FDW Masters in manual for the power reduction.
		Event is complete when ICS has been taken to manual or when directed by the Lead Examiner.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 6	Page 1 of 1
Event Description:	**Manual CRD power decrease (R, OATC)**		

Time	Position	Applicant's Actions or Behavior
-	OATC SRO	1. OATC will insert the control rods and reduce FDW flow with the FDW Masters (if placed in manual) to reduce power. 2. SRO will direct the unit shutdown and continue in Power Reduction enclosure of the Operation At Power procedure.
		Event is complete when reactor power has been reduced 5% or when directed by the Lead Examiner.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 7	Page 1 of 4
Event Description:	**Small Break LOCA: (M, ALL)**		

Time	Position	Applicant's Actions or Behavior
		Plant response: • RCS pressure will decrease resulting in a reactor trip. • ES 1&2 will actuate on low RCS pressure, ES 3-6 will actuate on high RB pressure. • RCS will saturate.
	SRO	Crew response: 1. SRO should direct the OATC to perform Immediate Manual Actions and the BOP to perform a symptoms check. 2. Once the SRO completes the Immediate Manual Actions he should transfer to Subsequent Actions and ask the BOP to report any noted symptoms.
	BOP	3. When the RCS saturates, the BOP should inform the SRO that the RCS has saturated and obtain SRO concurrence to perform Rule #2, Loss of SCM. • Verify that reactor power is < 1%. • Trip RCPs within 2 min of LOSCM (**CT-1**) • Verify that HPI is performing as required. (**CT-2**) ➢ Open 1HP-410 **Note: BOP should determine that 1HP-26 has failed to open and open 1HP-410.** • Verify that LPI flow in any header is < 1000 gpm. • Verify that TBVs are available. • Disable AFIS in non-actuated channels. • Establish EFDW to the OTSGs to feed to LOSCM SP per Rule 7 (SG Feed Control). • Verify both MDEFDWPs operating. • Ensure TDEFDWP is in PULL TO LOCK. • Trip both MFDWPs and close the FDW block valves. • Notify SRO of SG feed status. • Maintain SG pressure < RCS pressure. • Ensure Rules 3 & 8 done or in progress **Note: BOP should determine that 1FDW-316 has failed open and use Rule 3 (Loss of Main and Emergency FDW) and Encl. 5.27 (Alternate Methods for Controlling EFDW Flow) to mitigate.**

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 7	Page 2 of 4
Event Description:	**Small Break LOCA: (M, ALL)**		

Time	Position	Applicant's Actions or Behavior
	BOP	• Attempt to control 1FDW-316 by placing in manual. (**will not control**) • Notify SRO that Encl. 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. • Stop "B" MDEFDW Pump • Place 1FDW-44 controller in HAND and close. • Close 1FDW-42 and 1FDW-382 • Open 1FDW-384 • Close 1FDW-45 • Verify 1FDW-47 • Verify 1FDW-45, 1FDW-44, and 1FDW-42 closed. • Verify 1FDW-382 closed • Verify 1FDW-384 open. • Start 1B MBEFDWP • Throttle 1FDW-44 to obtain desired floe rate and/or SG level per Rule 7 (SG Feed Control) (**CT-10**)
	SRO	4. The SRO should **GO TO** the LOSCM Tab per the Parallel Actions page of the EOP Subsequent Actions section. LOSCM Tab will: • Ensure that Rule #2 is in progress or complete. • Verify that station ASW is not feeding any SG. • Verify that the LOSCM is not caused by excessive heat transfer. • Open 1AS-40 while closing 1MS-47. • Verify all the following conditions exist:: ➢ NO RCPs are operating ➢ HPI flow exists in both HPI headers ➢ Adequate Total HPI flow per figure 1 (Total Required HPI Flow).

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 7	Page 3 of 4
Event Description:	**Small Break LOCA: (M, ALL)**		

Time	Position	Applicant's Actions or Behavior
	SRO	• Control steaming and feed rates on all intact SGs to maintain cooldown rate within Tech Spec limits: ➢ Tc ≥ 280°F ≤ 50°F/ ½ hour ➢ Tc < 280°F ≤ 25°F/ ½ hour • **GO TO** Step 70. • Close 1RC-4 • Close the following: ➢ 1HP-1 ➢ 1HP-2 ➢ 1RC-3 ➢ 1GWD-17 5. **GO TO** LOCA CD tab. 6. When ES Channels 1 and 2 actuate, an operator should inform the SRO that ES Channels 1 and 2 have actuated. The SRO should initiate EOP Encl. 5.1, ES Actuation per the parallel actions page of Subsequent Actions section or of the LOSCM Tab. When running Encl. 5.1, the operator will:
	OATC	• Determine which ES channels should have actuated and verify all "Blue Lights" and "White Lights"are lighted for the appropriate channels. • Place HPI in Manual. • Verify SCMs > 0°F and proceed to the HPI flow check when he determines that the RCS has saturated. • The operator should determine HPI flow. • Open 1BS-1 and 1BS-2 • Place LPI pumps in manual control. • At SRO direction secure LPI pumps. • Ensure A and B and 3A and 3B Outside Air Booster Fans are operating. (**CT-27**) • Dispatch an operator to perform Encl. 5.2 (Placing RB Hydrogen Analyzers In Service) • Notify Chemistry to prepare for caustic addition. • The operator must get CR SRO approval to exit this enclosure.

Op-Test No.: _____	Scenario No.: **SPARE**	Event No.: 7	Page 4 of 4
Event Description:	**Small Break LOCA: (M, ALL)**		

Time	Position	Applicant's Actions or Behavior
	SRO	LOCA CD tab will: • **IAAT** BWST level ≤ 19 feet transfer ECCS suctions to the RBES. • Verify ES is actuated. • Ensure all RBCUs in low speed and LPSW flow ≥ 1400 gpm to each RBCU. • Initiate Encl. 5.35, Containment Isolation • Ensure all RB Aux fans are operating • Ensure all RCPs are stopped. • Dispatch operator to isolate both OTSGs. • Close 1CF-1 and 1CF-2 • Initiate Encl. 5.36, Equipment Alignment for Plant Shutdown. • **WHEN** CETCs are ≤ 400°F **THEN** continue in this procedure.
		Event and exam is complete when the SRO has transferred to LOCA CD or when directed by the Lead Examiner.

Finial Submittal

Facility: **Oconee**	Date of Examination: **June 16, 2003**
Examination Level (circle one): **RO** / SRO	Operating Test Number: _____

Administrative Topic	Describe activity to be performed
Conduct of Operations GEN 2.1.23 (3.9/4.0)	**CRO-203, Calculate Final SFP Boron Concentration** OP/1&2/A/1104/006 C (SFP Makeup), Enclosure 4.9 (SFP Makeup With DW) (group activity) (**new**) (10 min)
Conduct of Operations GEN 2.1.7 (3.7/4.4)	**CRO-043, Perform Manual RCS Leakage Calculation;** PT/0600/010 (RO Only) (group activity) (18 min)
Equipment Control GEN 2.2.12 (3.0/3.4)	**CRO-204, Perform weekly surveillance test to determine RIA-40 setpoint** PT/230/001 Encl. 13.10 (Operation of RIA-40) (**new**) (20 min)
Radiation Control GEN 2.3.4 (2.5/3.1)	**CRO – 205, Calculate the Maximum Permissible Stay Time Within Emergency Dose Limits** (group activity) (**new**) (20 min)

Note: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

Finial Submittal

Facility: ***Oconee***	*Date of Examination:* **June 16, 2003**
Examination Level (circle one): RO / **SRO**	Operating Test Number: _____

Administrative Topic	Describe activity to be performed
Conduct of Operations GEN 2.1.23 (3.9/4.0)	**CRO-203, Calculate Final SFP Boron Concentration** OP/1&2/A/1104/006 C (SFP Makeup), Enclosure 4.9 (SFP Makeup With DW) (group activity) (**new**) (10 min)
Conduct of Operations GEN 2.1.3 (3.0/3.4)	**JPM-003, Evaluate Overtime Eligibility** OMP 2-01 Attachment "C", NSD 200 (SRO only) (25 min)
Equipment Control GEN 2.2.12 (3.0/3.4)	**CRO-204, Perform weekly surveillance test to determine RIA-40 setpoint** PT/230/001 Encl. 13.10 (Operation of RIA-40) (**new**) (20 min)
Radiation Control GEN 2.3.4 (2.5/3.1)	**CRO – 205, Calculate the Maximum Permissible Stay Time Within Emergency Dose Limits (new)** (20 min)
Emergency Plan GEN 2.4.38 (2.2/4.0)	**SR0-206, Determine Emergency Classification and Protective Action Recommendations** (SRO only) (group activity) (**new**) (20 min)
Note: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.	

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-203/Admin

Calculate Final SFP Boron Concentration

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate Final SFP Boron Concentration

Alternate Path:

NO

Facility JPM #:

New

K/A Rating(s):

Gen 2.1.23 3.9/4.0

Task Standard:

Calculate Final SFP Boron Concentration within ± 10 ppm

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:

OP/1&2/A/1104/006 C (SFP Makeup), Enclosure 4.9 (SFP Makeup With DW)

OP/1108/001 (Curves and General Information), Enclosure 3.26 (Miscellaneous Data)

Validation Time: 10 min. **Time Critical:** NO

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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 INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

OP/1&2/A/1104/006 C (SFP Makeup), Enclosure 4.9 (SFP Makeup With DW)

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 & 2 Spent Fuel Pool (SFP) level = 0.0 ft
- Unit 1 & 2 SFP Boron = 2545 ppm
- SF-1 and SF-2 are closed
- In preparation for refueling operations, the Unit 1 & 2 SFP level will be increased to + 0.6 ft using DW.

INITIATING CUE:

The SRO directs to determine the final SFP Boron concentration.

START TIME: _____

STEP 1:	Determine and locate appropriate procedure for DW makeup to the SFP.	
STANDARD:	Candidate locates Enclosure 4.9 (SFP Makeup With DW) of OP/1&2/A/1104/006 C (SFP Makeup). *Candidate may refer to OP/1108/001 (Curves and General Information) Encl. 3.26 (Miscellaneous Data)*	___ SAT ___ UNSAT
COMMENTS:		
STEP 2:	Determine volume of water required to raise SFP from 0.0 ft to + 0.6 ft.	
STANDARD:	Refer to Enclosure 4.9 (SFP Makeup With DW) step 2.2 and determine that there is 13,080 Gal/Foot in the SFP and then calculate the total gallons required to raise level to + 0.6 ft. 0.6 ft x 13,080 gal/ft = **7848 gallons** *Calculate the total gallons required to raise level to + 0.6 ft using OP/1108/001 (Curves and General Information) Encl. 3.26 (Miscellaneous Data.* *0.6 ft x 1512 gal/0.1 ft =* ***9072 gallons***	___ SAT ___ UNSAT
COMMENTS:		

STEP 3: Determine finial SFP Boron concentration. STANDARD: Refer to Enclosure 4.9 (SFP Makeup With DW) step 2.2. SFP final ppm = (SFP present ppm) (SFP present vol) / (SFP final vol) SFP final ppm = (2545 ppm) (546, 000 gal) / (553, 848 gal) SFP final ppm = **2508.9 (± 10 ppm)** **Note: SFP final vol = 546,000 gal + (13,080 gal/ft X 0.6 ft) = 553, 848 gal** *Calculate finial SFP Boron concentration using OP/1108/001 (Curves and General Information) Encl. 3.26 (Miscellaneous Data.* *SFP final ppm = (2545 ppm) (544, 000 gal) / (553, 072 gal)* *SFP final ppm = **2503.3 (± 10 ppm)*** **Note: The SFP data given in the two procedures is different. A procedure problem report will be written to determine which numbers are correct after the NRC exam is complete.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	Required to determine final SFP Boron concentration.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- Unit 1 & 2 Spent Fuel Pool (SFP) level = 0.0 ft
- Unit 1 & 2 SFP Boron = 2545 ppm
- SF-1 and SF-2 are closed
- In preparation for refueling operations, the Unit 1 & 2 SFP level will be increased to + 0.6 ft using DW.

INITIATING CUE:

The SRO directs to determine the final SFP Boron concentration.

1. Initial Conditions

_____ 1.1 U1 BWST NOT in purification.

_____ 1.2 U2 BWST NOT in purification.

_____ 1.3 Review Limits and Precautions.

2. Procedure

_____ _____ 2.1 Review Section 3 (SFP Makeup With DW Information).
SRO

_____ 2.2 Calculate final SFP boron:

SFP volume at zero level = 546,000 gal.

Gal/Foot = 13,080

SFP final ppm = $\frac{\text{(SFP present ppm) (SFP present vol)}}{\text{(SFP final vol)}}$

final boron _____ppm final lvl _____ft

_____ 2.3 Ensure DW makeup to all units USTs stopped to provide adequate DW pressure.

2.4 Align valves: (A-2-SF Clr Rm)

_____ • Unlock and Open DW-112 (SF Cooling Supply)

_____ • Open SF-53 (SF Pump Suction Hdr Blk)

2.5 WHEN desired level reached, perform the following: (A-2-SF Clr Rm)

_____ _____ • Lock Closed DW-112 (SF Cooling Supply)

_____ _____ • Close SF-53 (SF Pump Suction Hdr Blk)

_____ 2.6 Request SFP boron sample. {1}

3. SFP Makeup With DW Information

3.1 Makeup flow is dependent on number and configuration of SF Pumps in operation.

- Makeup flow enters via SF purification loop to SF Pump discharge piping.
- Best makeup flow is seen with one SF Pump in operation (A or B SF Pump).
- Lower makeup flow is seen if both A and B SF Pumps are operating.
- Worst makeup flow is seen if C SF Pump is operating.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-43/Admin

PERFORM MANUAL RCS LEAKAGE CALCULATION

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

PERFORM MANUAL RCS LEAKAGE CALCULATION

Alternate Path:

No

Facility JPM #:

CRO-43

K/A Rating(s):

Gen 2.1.7 3.7/4.4

Task Standard:

RCS Leakage is correctly calculated within .01 gpm of attached key.

Preferred Evaluation Location:

Simulator _____ In-Plant __X___

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:

PT/O/A/0600/001A, Loss Of Computer
PT/1/A/600/10, Reactor Coolant Leakage

Validation Time: 18 minutes **Time Critical:** NO

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

Enclosure 13.3 of PT/1/A/600/10

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 computer repairs are expected to be extended through turnover for hardware replacement. The Loss of Computer procedure PT/O/A/0600/001A, Loss Of Computer, is in progress, however an RCS Leakage Calculation has not been performed during this shift.

INITIATING CUES:

The Control Room SRO directs you to perform a manual RCS leakage per PT/1/A/600/10 (Reactor Coolant Leakage). The initial data given was collected one hour previously. Use the final set of leakage data and manually calculate the RCS leakage rate. Enclosure 13.3 of PT/1/A/600/10 (Reactor Coolant Leakage) is complete up to step 2.2.

START TIME: _____

Note: Data cues are only applicable if JPM is performed in the control room.

___ SAT

___ UNSAT

STEP 1: Step 2.2
After 1 hour, Record final set of data in "Table #1".

STANDARD: Student enters final set of data into "Table #1" of Enclosure 13.3 (Manual Leakage Calculation Data Sheet).

CUE: Present student with attachment of final data readings.

OR

Student locates Pzr level gauge on UB1 and enters value on data sheet.

CUE: Pzr Level 219.0 inches

Student locates Quench Tank level on AB1 and enters value on data sheet.

CUE: Quench Tank Level 84.9 inches

Student locates LDST level gauge on UB1 and enters value on data sheet.

CUE: LDST Level 74.0 inches

Student locates Tave meter on UB1 and enters value on data sheet.

CUE: Tave Indication 579.0°F

Student locates Power meters on UB1 and enters value on data sheet.

CUE: Power Range NI indicates 100.1%

Student locates RCS NR Pressure chart on UB1 and enters value on data sheet.

CUE: RCS NR Pressure chart 2150 psig

Student locates Group 7 Control Rod Position on the Computer and enters value on data sheet.

CUE: Group 7 Control Rod Position is 93.6%

COMMENTS:

STEP 2:	Step 2.3 Calculate and record Change values in "Table #1" of Enclosure 13.3 (Manual Leakage Calculation Data Sheet). STANDARD: Student performs calculation and records Change values in "Table #1" of Enclosure 13.3 (Manual Leakage Calculation Data Sheet). COMMENTS:	___ SAT ___ UNSAT
STEP 3:	Step 2.4 Calculated Corrected PZR Level Change: STANDARD: (- 6.831 inches/° F X **-.1** ° F) + **-1** inches = **-.3169 inches** COMMENTS:	___ SAT ___ UNSAT
STEP 4:	Step 2.5 Convert Corrected PZR Level Change to gallons: STANDARD: **- .3169** inches X 14.364 gallons/inch = **- 4.552** gallons COMMENTS:	___ SAT ___ UNSAT

STEP 5: Step 2.6 Convert QT Level Change to gallons: STANDARD: **.3** inches X 34.94 gallons/inch = **10.482** gallons COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 2.7 Convert LDST Level Change to gallons: STANDARD: **- .3** inches X 30.956 gallons/inch = **- 9.287** gallons COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 2.8 Calculated Total Volume Change: STANDARD: **- 4.552** gallons + **10.482** gallons + **(- 9.287 gallons)** = **- 3.357** gallons COMMENTS:	___ SAT ___ UNSAT

STEP 8:	Step 2.9 Calculate RCS Leakage Rate:	**CRITICAL TASK** ___ SAT
STANDARD:	**- 3.357** gallons ÷ **60** minutes = **- .056** gpm (± .01 gpm)	
COMMENTS:		___ UNSAT
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
8	Necessary data calculation to properly determine manual RCS leakage rate.

Manual RCS Leakage Final Data

Parameter	Final
Time	0115
Pzr level	219.0 inches
Quench Tank Level	84.9 inches
LDST Level	74.0 inches
Tave Indication	579.0°F
Power Range NI	100.1%
RCS NR Pressure	2150 psig
Group 7 Control Rod Position	93.6%

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 computer repairs are expected to be extended through turnover for hardware replacement. The Loss of Computer procedure PT/O/A/0600/001A, Loss Of Computer, is in progress, however an RCS Leakage Calculation has not been performed during this shift.

INITIATING CUES:

The Control Room SRO directs you to perform a manual RCS leakage per PT/1/A/600/10 (Reactor Coolant Leakage). The initial data given was collected one hour previously. Use the final set of leakage data and manually calculate the RCS leakage rate. Enclosure 13.3 of PT/1/A/600/10 (Reactor Coolant Leakage) is complete up to step 2.2.

1. Initial Conditions

1.1 None.

2. Procedure

✓ 2.1 Record initial data in "Table #1".

____ 2.2 After 1 hour, record final data in "Table #1".

NOTE:
- If RCS NR Pressure is off-scale, RCS WR Pressure range may be used.
- If T_{ave} is off-scale, T_{cold} may be used.

Table # 1

Value	Initial	Final	Change
Duration	0015 time	time	(1) minutes
Pzr Level	220 inches	inches	(2) inches
QT Level	84.6 inches	inches	(3) inches
LDST Level	74.3 inches	inches	(4) inches
T_{ave} or T_{cold}	579.1 °F	°F	(5) °F
Rx Power	100 %	%	(6) %
RCS NR or WR Pressure	2153 psig	psig	(7) psig
Control Rod Position	93.4 %	%	(8) %

NOTE:
- Change = Final - Initial
- Negative sign (-) should be included with values as appropriate.

____ 2.3 Calculate and record Change values in "Table # 1".

NOTE:	Conversion Factor (-6.831 inches/°F) must be negative (-) value. {7}

_____ 2.4 Calculated Corrected PZR Level Change:

$(-6.831\ inches/°F \times$ _____ $°F) +$ _____ $inches =$ _____ $inches$

(5) *Tave or Tcold Change* (2) *PZR Level Change* *Corrected PZR Level Change*

_____ 2.5 Convert Corrected PZR Level Change to gallons:

_____ $inches \times 14.364\ gallons/inch =$ _____ $gallons$

Corrected PZR Level Change *Conversion corrected to 68°F* *Final PZR Change*

_____ 2.6 Convert QT Level Change to gallons: {4}

_____ $inches \times 34.94\ gallons/inch =$ _____ $gallons$

(3) *QT Level Change* *Conversion corrected to 68°F* *Final QT Change*

_____ 2.7 Convert LDST Level Change to gallons:

_____ $inches \times 30.956\ gallons/inch =$ _____ $gallons$

(4) *LDST Level Change* *Conversion corrected to 68°F* *Final LDST Change*

_____ 2.8 Calculate Total Volume Change:

_____ $gallons +$ _____ $gallons +$ _____ $gallons =$ _____ $gallons$

Final PZR Change *Final QT Change* *Final LDST Change* *Total Change*

_____ 2.9 Calculate RCS Leakage Rate:

_____ $gallons \div$ _____ $Minutes =$ _____ gpm

Total Change (1) *Duration* *RCS Leakage Rate*

Answer Key

1. Initial Conditions

1.1 None.

2. Procedure

✓ 2.1 Record initial data in "Table #1".

SM 2.2 After 1 hour, record final data in "Table #1".

NOTE:
- If RCS NR Pressure is off-scale, RCS WR Pressure range may be used.
- If T_{ave} is off-scale, T_{cold} may be used.

Table # 1

Value	Initial		Final		Change	
Duration	0015	time	0115	time	(1) 60	minutes
Pzr Level	220	inches	219.0	inches	(2) −1	inches
QT Level	84.6	inches	84.9	inches	(3) .3	inches
LDST Level	74.3	inches	74.0	inches	(4) −.3	inches
T_{ave} or T_{cold}	579.1	°F	579.0	°F	(5) −.1	°F
Rx Power	100	%	100.1	%	(6) .1	%
RCS NR or WR Pressure	2153	psig	2150	psig	(7) −3	psig
Control Rod Position	93.4	%	93.6	%	(8) .2	%

NOTE:
- Change = Final - Initial
- Negative sign (-) should be included with values as appropriate.

SM 2.3 Calculate and record Change values in "Table # 1".

NOTE:	Conversion Factor (-6.831 inches/°F) must be negative (-) value. {7}

2.4 Calculated Corrected PZR Level Change:

(-6.831 *inches/°F* × -.1 °F) + -1 *inches* = -.3169 *inches*

(5) *Tave or Tcold Change* (2) *PZR Level Change* *Corrected PZR Level Change*

2.5 Convert Corrected PZR Level Change to gallons:

-.3169 *inches* × 14.364 *gallons / inch* = -4.552 *gallons*

Corrected PZR Level Change *Conversion corrected to 68°F* *Final PZR Change*

2.6 Convert QT Level Change to gallons: {4}

.3 *inches* × 34.94 *gallons / inch* = 10.482 *gallons*

(3) *QT Level Change* *Conversion corrected to 68°F* *Final QT Change*

2.7 Convert LDST Level Change to gallons:

-.3 *inches* × 30.956 *gallons / inch* = -9.287 *gallons*

(4) *LDST Level Change* *Conversion corrected to 68°F* *Final LDST Change*

2.8 Calculate Total Volume Change:

-4.552 *gallons* + 10.482 *gallons* + -9.287 *gallons* = -3.357 *gallons*

Final PZR Change *Final QT Change* *Final LDST Change* *Total Change*

2.9 Calculate RCS Leakage Rate:

-3.357 *gallons* ÷ 60 *Minutes* = -.056 *gpm*

Total Change (1) *Duration* *RCS Leakage Rate*

Answer Key

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-204/Admin

Perform weekly surveillance test to determine RIA-40 setpoint

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform weekly surveillance test to determine RIA-40 setpoint

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):

Gen 2.2.12 3.0/3.4

Task Standard:

Correctly determine new RIA-40 setpoint within ± 5 cpm by procedure.

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

PT/0/A/230/01, Encl. 13.10 (Operation of RIA-40)

Validation Time: 20 minutes

Time Critical: No

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

PT/0/A/230/01, Encl. 13.10 (Operation of RIA-40)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 unit has been continuously operating at 100% for 9 months.

AP/31 (Primary to Secondary Leakage) not in effect

The weekly performance of PT/0/A/230/01 (Radiation Monitor Check) is in progress.

CSAE offgas Xe 133 µCi/ml concentration is greater than MDA (Minimum Detectable Activity).

CURRENT DATA

RCS Xe 133 activity = 7.189 E-3 µci/ml

RCS Xe 133 activity eq = .4734 E-3 µci/ml

CSAE Off Gas Xe activity = 4.431 E-8 µci/ml

CSAE Off Gas Xe activity eq = 3.515 E-6 µci/ml

CSAE Off Gas Flow = 13 scfm

1RIA-40 = 120 cpm

INITIATING CUES:

The SRO directs you to perform PT/0/A/230/01, Encl. 13.10 (Operation of RIA-40) to determine RIA-40 setpoints.

START TIME: _____

STEP 1:	Step 1.1 **IF** all of the following conditions exist, • Reactor power > 15% • AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is **NOT** in effect • reactor has been at "steady state power operation > 72 hours" • CSAE offgas Xe 133 µCi/ml concentration is greater than MDA (Minimum Detectable Activity) **THEN** set RIA-40 setpoints as follows:	___ SAT ___ UNSAT
STANDARD:	Determine the above conditions are met and proceed to Step 1.1.1.	
COMMENTS:		
STEP 2:	Step 1.1.1 Obtain the CSAE flow rate. **IF** any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.	___ SAT ___ UNSAT
STANDARD:	Candidate should obtain the CSAE flow rate (13 cfm) from the cue sheet.	
COMMENTS:		

STEP 3: Step 1.1.2

CRITICAL STEP

___ SAT

___ UNSAT

NOTE:
- Xe 133 activity (**NOT** equivalent) is required for this calculation.
- The RCS and the CSAE Offgas samples should be taken at approximately the same time (ideally within 15 minutes). The RIA-40 reading may be obtained from historical data.

Perform the following equations:

High Setpoint = (30 gal/day) (RCS Xe 133 µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm)
(7.48 gal/ft3) (CSAE Flow ft3/min) (CSAE offgas Xe 133 µCi/ml)

High Setpoint = (RCS Xe 133 µCi/ml) (RIA-40 cpm) (2.77 E-3 ft^3/min)
(CSAE flow ft^3/min) (CSAE offgas Xe 133 µCi/ml)

High Setpoint = _(_____)_µCi/ml(RCS) X _(_____)_cpm X 2.77 E-3 ft^3/min = _____cpm
( ) ft^3/min ( ) µCi/ml(CSAE)

STANDARD: Calculate High Setpoint using data from Cue Sheet:

High Setpoint = (**7.189 E-3**)µCi/ml(RCS) X (**120**)cpm X 2.77 E-3 ft^3/min = **4148.4 cpm**
(**13**) ft^3/min (**4.431 E-8**) µCi/ml(CSAE)

(± 5 cpm)

COMMENTS:

STEP 4: Step 1.1.2 (cont) Alert Setpoint = (5 gal/day) (RCS Xe 133 µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm) (7.48 gal/ft^3) (CSAE Flow ft^3/min) (CSAE offgas Xe 133 µCi/ml) Alert Setpoint = (RCS Xe 133 µCi/ml) (RIA-40 cpm) (2.77 E-3 ft^3/min) (CSAE flow ft^3/min) (CSAE offgas Xe 133 µCi/ml) Alert Setpoint = _(_____)_µCi/ml(RCS) X _(_____)_cpm X 4.61 E-4 ft^3/min = _____cpm ( ) ft^3/min ( ) µCi/ml(CSAE) STANDARD: Calculate Alert Setpoint using data from Cue Sheet: Alert Setpoint = **(7.189 E-3)**µCi/ml(RCS) X **(120)**cpm X 4.61 E-4 ft^3/min = **690.4 cpm** **(13)** ft^3/min **(4.431 E-8)** µCi/ml(CSAE) **(± 5 cpm)** COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	This step required to calculate High Setpoint.
4	This step required to calculate Alert Setpoint.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit has been continuously operating at 100% for 9 months.

AP/31 (*Primary to Secondary Leakage*) not in effect

The weekly performance of PT/0/A/230/01 (Radiation Monitor Check) is in progress.

CSAE offgas Xe 133 µCi/ml concentration is greater than MDA (Minimum Detectable Activity).

CURRENT DATA
RCS Xe 133 activity = 7.189 E-3 mc/ml
RCS Xe 133 activity eq = .4734 E-3 mc/ml
RIA-40 Xe activity = 4.431 E-8 mc/ml
RIA-40 Xe activity eq = 3.515 E-6 mc/ml
CSAE Off Gas Flow = 13 scfm
1RIA-40 = 120 cpm

INITIATING CUES:

The SRO directs you to perform PT/0/A/230/01, Encl. 13.10 (Operation of RIA-40) to determine RIA-40 setpoints.

1. Determine RIA-40 setpoints as follows:

NOTE:
- "Steady state power operation > 72 hours" is defined as maintaining a constant power level (± 2%) for at least 72 hours.
- Step 4 is performed in addition to Step 1.1 when the weekly RIA-40 setpoint calculation is being performed.

_____ 1.1 **IF** all of the following conditions exist,

- Reactor power ≥ 15%
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is **NOT** in effect
- reactor has been at "steady state power operation > 72 hours"
- CSAE offgas Xe 133 µCi/ml concentration is greater than MDA (Minimum Detectable Activity) (7)

THEN set RIA-40 setpoints as follows:

_____ 1.1.1 Obtain the CSAE flow rate.

_____ A. **IF** any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.

_____ 1.1.2 Perform the following equations:

NOTE:
- Xe 133 activity (**NOT** equivalent) is required for this calculation.
- The RCS and the CSAE Offgas samples should be taken at approximately the same time (ideally within 15 minutes). The RIA-40 reading may be obtained from historical data.

High Setpoint = (30 gal/day) (RCS Xe 133 µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm)
(7.48 gal/ft^3) (CSAE Flow ft^3/min) (CSAE offgas Xe 133 µCi/ml)

High Setpoint = (RCS Xe 133 µCi/ml) (RIA-40 cpm) (2.77 E-3 ft^3/min)
(CSAE flow ft^3/min) (CSAE offgas Xe 133 µCi/ml)

High Setpoint = _(_____) $\mu Ci/ml_{(RCS)}$ X _(_____) cpm X 2.77 E-3 ft^3/min = _____cpm
( ) ft^3/min ( ) $\mu Ci/ml_{(CSAE)}$

Alert Setpoint = (5 gal/day) (RCS Xe 133 µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm)
(7.48 gal/ft^3) (CSAE Flow ft^3/min) (CSAE offgas Xe 133 µCi/ml)

Alert Setpoint = (RCS Xe 133 µCi/ml) (RIA-40 cpm) (4.61 E-4 ft^3/min)
(CSAE flow ft^3/min) (CSAE offgas Xe 133 µCi/ml)

Alert Setpoint = _(_____) $\mu Ci/ml_{(RCS)}$ X _(_____) cpm X 4.61 E-4 ft^3/min = _____cpm
( ) ft^3/min ( ) $\mu Ci/ml_{(CSAE)}$

_____ 1.1.3 **IF** SG primary to secondary leak rate is needed,
THEN GO TO Step 4 to calculate leak rate.

_____ 1.1.4 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

NOTE: "Steady state power operation > 72 hours" is defined as maintaining a constant power level (± 2%) for at least 72 hours.

_____ 1.2 **IF** all of the following conditions exist,

- Reactor power ≥ 15%
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is **NOT** in effect
- reactor has **NOT** been at "steady state power operation > 72 hours"
- current RIA-40 reading:

Unit 1	Unit 2, 3
< 55 cpm	< 75 cpm

THEN set RIA-40 setpoints at the following values:

	Setpoints	
	Unit 1	Unit 2,3
Alert	115 cpm	135 cpm
High	115 cpm	135 cpm

_____ 1.2.1 **IF** SG primary to secondary leak rate is needed,

THEN GO TO Step 3 to calculate leak rate.

_____ 1.2.2 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

NOTE:
- "Steady state power operation > 72 hours" is defined as maintaining a constant power level (± 2%) for at least 72 hours.
- Experience has shown that it may be desirable to calculate setpoints prior to 72 hours of steady state power operation if a startup from an outage (refueling or forced) is in progress. If a small amount of tube leakage exists when the unit is in the startup mode (on the order of 1 to 2 gpd), the alert and high setpoints may be exceeded prior to 72 hours of steady state power operation.

_____ 1.3 IF all of the following conditions exist,

- Reactor power ≥ 15%
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is NOT in effect
- reactor has NOT been at "steady state power operation > 72 hours"
- current RIA-40 reading:

Unit 1	Unit 2, 3
≥ 55 cpm	≥ 75 cpm

THEN GO TO Step 2 to calculate RIA-40 setpoints.

_____ 1.4 IF all of the following conditions exist,

- reactor is critical
- Reactor power < 15%
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is NOT in effect
- current RIA-40 reading:

Unit 1	Unit 2, 3
≥ 55 cpm	≥ 75 cpm

THEN GO TO Step 2 to calculate RIA-40 setpoints.

_____ 1.5 IF all of the following conditions exist,

- reactor is critical
- Reactor power < 15%
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is NOT in effect
- current RIA-40 reading:

Unit 1	Unit 2, 3
< 55 cpm	< 75 cpm

THEN set RIA-40 setpoints at the following values:

	Setpoints	
	Unit 1	Unit 2,3
Alert	115 cpm	135 cpm
High	115 cpm	135 cpm

_____ 1.5.1 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 1.5.2 Exit this enclosure.

_____ 1.6 IF both of the following conditions exist,

- reactor is critical
- AP/1,2,3/A/1700/031 (Primary To Secondary Leakage) is in effect

THEN GO TO Step 5 to reset RIA-40 Alert/High setpoints as specified in AP/1,2,3/A/1700/031 (Primary To Secondary Leakage).

_____ 1.7 IF both of the following conditions exist,

- reactor is subcritical
- current RIA-40 reading:

Unit 1	Unit 2, 3
≥ 100 cpm	≥ 120 cpm

THEN GO TO Step 2 calculate RIA-40 setpoints.

_____ 1.8 IF both of the following conditions exist,

- reactor is subcritical
- current RIA-40 reading:

Unit 1	Unit 2, 3
< 100 cpm	< 120 cpm

THEN set RIA-40 setpoints at the following values:

	Setpoints	
	Unit 1	Unit 2,3
Alert	115 cpm	135 cpm
High	115 cpm	135 cpm

_____ 1.8.1 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 1.8.2 Exit this enclosure.

2. Calculate RIA-40 setpoints as follows:

_____ 2.1 Obtain the CSAE flow rate.

_____ 2.1.1 **IF** any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.

_____ 2.2 Perform the following equations:

NOTE:
- Xe 133 equivalent activity is required for this calculation.
- The RCS and the CSAE Offgas samples should be taken at approximately the same time (ideally within 15 minutes). The RIA-40 reading may be obtained from historical data.

High Setpoint = (30 gal/day) (RCS Xe 133 eq µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm)
(7.48 gal/ft^3) (CSAE Flow ft^3/min) (CSAE offgas Xe 133 eq µCi/ml)

High Setpoint = (RCS Xe 133 eq µCi/ml) (RIA-40 cpm) (2.77 E-3 ft^3/min)
(CSAE flow ft^3/min) (CSAE offgas Xe eq 133 µCi/ml)

High Setpoint = _(_____) µCi/ml$_{(RCS\ eq)}$ X _(_____) cpm X 2.77 E-3 ft^3/min = _____cpm
( ) ft^3/min ( ) µCi/ml$_{(CSAE\ eq)}$

Alert Setpoint = (5 gal/day) (RCS Xe 133 eq µCi/ml) (6.9 E-4 day/min) (RIA-40 cpm)
(7.48 gal/ft^3) (CSAE Flow ft^3/min) (CSAE offgas Xe 133 eq µCi/ml)

Alert Setpoint = (RCS Xe 133 eq µCi/ml) (RIA-40 cpm) (4.61 E-4 ft^3/min)
(CSAE flow ft^3/min) (CSAE offgas Xe 133 eq µCi/ml)

Alert Setpoint = _(_____) µCi/ml$_{(RCS\ eq)}$ X _(_____) cpm X 4.61 E-4 ft^3/min = _____cpm
( ) ft^3/min ( ) µCi/ml$_{(CSAE\ eq)}$

_____ 2.3 **IF** Reactor power is ≥ 15%,

THEN GO TO Step 3 to calculate the SG primary to secondary leak rate.

_____ 2.4 **IF** Reactor power is < 15%,

THEN record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 2.5 Exit this enclosure.

NOTE:
- SG primary to secondary leak rate calculation is **NOT** valid when CSAEs are **NOT** in service.
- Calculation using Xe 133 Equivalent Activity should be used whenever reactor has **NOT** been at "steady state power operation > 72 hours".

3. Calculation of SG primary to secondary leak rate using Xe 133 Equivalent Activity.

_____ 3.1 Obtain the CSAE flow rate.

_____ 3.1.1 **IF** any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.

_____ 3.2 Perform the following equation:

NOTE:
- Xe 133 equivalent activity is required for this calculation.
- The RCS and the CSAE Offgas samples should be taken at approximately the same time (ideally within 15 minutes).

$$\text{Leak Rate} = \frac{(7.48\ \text{gal/ft}^3)\ (\text{CSAE Flow ft}^3\text{/min})\ (\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml})}{(\text{RCS Xe 133 eq } \mu\text{Ci/ml})\ (6.94\text{E-}4\ \text{day/min})}$$

$$\text{Leak Rate} = (\text{CSAE flow ft}^3\text{/min}) \times \frac{(\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml})}{(\text{RCS Xe 133 eq } \mu\text{Ci/ml})} \times \frac{(10{,}800\ \text{gal min})}{\text{ft}^3\ \text{day}}$$

$$\text{Leak Rate} = \frac{(\_\_\_\_\_)\ \text{ft}^3\text{/min} \times (\_\_\_\_\_)\ \mu\text{Ci/ml}_{(\text{CSAE eq})}}{(\quad)\ \mu\text{Ci/ml}_{(\text{RCS eq})}} \times \frac{(10{,}800\ \text{gal min})}{\text{ft}^3\ \text{day}} = \_\_\_\_\_\ \text{gpd}$$

_____ 3.3 Record the leak rate in the Unit Log.

_____ 3.4 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 3.5 *Exit this enclosure.*

NOTE:
- SG primary to secondary leak rate calculation is NOT valid when CSAEs are NOT in service.
- Calculation using Xe 133 Activity should be used whenever reactor has been at "steady state power operation > 72 hours".

4. Calculation of SG primary to secondary leak rate using Xe 133 Activity. {1}

_____ 4.1 Obtain the CSAE flow rate.

_____ 4.1.1 IF any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.

_____ 4.2 Perform the following equation:

NOTE:
- Xe 133 activity (NOT equivalent) is required for this calculation.
- The RCS and the CSAE Offgas samples should be taken at approximately the same time (ideally within 15 minutes).

$$\text{Leak Rate} = \frac{(7.48\ \text{gal/ft}^3)\ (\text{CSAE Flow ft}^3\text{/min})\ (\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}{(\text{RCS Xe 133 } \mu\text{Ci/ml})\ (6.94\text{E-4 day/min})}$$

$$\text{Leak Rate} = (\text{CSAE flow ft}^3\text{/min}) \times \frac{(\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}{(\text{RCS Xe 133 } \mu\text{Ci/ml})} \times \frac{(10{,}800\ \text{gal min})}{\text{ft}^3\ \text{day}}$$

$$\text{Leak Rate} = \frac{(\_\_\_\_\_)\ \text{ft}^3\text{/min} \times (\_\_\_\_\_)\ \mu\text{Ci/ml}_{(\text{CSAE})}}{(\quad)\ \mu\text{Ci/ml}_{(\text{RCS})}} \times \frac{(10{,}800\ \text{gal min})}{\text{ft}^3\ \text{day}} = \_\_\_\_\_\ \text{gpd}$$

_____ 4.3 Record the leak rate in the Unit Log.

_____ 4.4 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 4.5 Exit this enclosure.

5. Resetting RIA-40 Alert/High alarm setpoints and entering the Total Pri To Sec Leakrate Admin Limit in the OAC as specified in AP/1,2,3/A/1700/031. {8}

NOTE: Xe 133 equivalent activity is required for this calculation.

_____ 5.1 Obtain the CSAE flow rate.

_____ 5.1.1 IF any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine the CSAE flow rate.

_____ 5.2 Perform the following equations:

$$\text{High Setpoint} = \frac{(\text{AP/31 RIA-40 High stpt gpd})(\text{RCS Xe133 eq } \mu\text{Ci/ml})(6.9\text{E-}4 \text{ day/min})}{(7.48 \text{ gal/ft}^3)(\text{CSAE Flow ft}^3\text{/min})(3.4\text{ E-}8 \ \mu\text{Ci/ml/cpm})}$$

$$\text{High Setpoint} = \frac{(\text{AP/31 RIA-40 High stpt gpd})(\text{RCS Xe133 eq } \mu\text{Ci/ml})(2.71\text{ E+}3 \text{ ft}^3 \text{ day cpm})}{(\text{CSAE Flow ft}^3\text{/min}) \qquad \text{gal min } \mu\text{Ci/ml}}$$

$$\text{High Setpoint} = \frac{\_(\quad\quad)\_\text{gpd}}{(\quad\quad)\text{ft}^3\text{/min}} \times \frac{\_(\quad\quad\quad\quad)\_\mu\text{Ci/ml}_{(\text{RCS eq})}}{\text{gal min } \mu\text{Ci/ml}} \times (2.71\text{ E+}3 \text{ ft}^3 \text{ day cpm}) = \_\_\_\_\_ \text{cpm}$$

$$\text{Alert Setpoint} = \frac{(\text{AP/31 RIA-40 Alert stpt gpd})(\text{RCS Xe133 eq } \mu\text{Ci/ml})(6.9\text{E-}4 \text{ day/min})}{(7.48 \text{ gal/ft}^3)(\text{CSAE Flow ft}^3\text{/min})(3.4\text{ E-}8 \ \mu\text{Ci/ml/cpm})}$$

$$\text{Alert Setpoint} = \frac{(\text{AP/31 RIA-40 Alert stpt gpd})(\text{RCS Xe133 eq } \mu\text{Ci/ml})(2.71\text{ E+}3 \text{ ft}^3 \text{ day cpm})}{(\text{CSAE Flow ft}^3\text{/min}) \qquad \text{gal min } \mu\text{Ci/ml}}$$

$$\text{Alert Setpoint} = \frac{\_(\quad\quad)\_\text{gpd}}{(\quad\quad)\text{ft}^3\text{/min}} \times \frac{\_(\quad\quad\quad\quad)\_\mu\text{Ci/ml}_{(\text{RCS eq})}}{\text{gal min } \mu\text{Ci/ml}} \times (2.71\text{ E+}3 \text{ ft}^3 \text{ day cpm}) = \_\_\_\_\_ \text{cpm}$$

_____ 5.3 Enter the new RIA-40 Alert and High Setpoints in the RIA View Node.

5.4 Perform the following on the OAC to enter the Unit's new "Total Pri To Sec Leakrate Admin Limit" as specified by AP/1,2,3/A/1700/031 (Primary To Secondary Leakage):

_____ 5.4.1 Select "Main" from the menu bar.

_____ 5.4.2 Select "Utilities" from the drop down menu.

_____ 5.4.3 Select "Manual Value Update" from the drop down menu.

_____ 5.4.4 Select "Pri-Leak Primary To Secondary Leakage Manual Inputs".

_____ 5.4.5 Select "Update".

_____ 5.4.6 Select the respective Unit's "Total Pri To Sec Leakrate Admin Limit" computer point ID from the following table.

Unit 1	Unit 2	Unit 3
O1K1430	O2K1430	O3K1430

_____ 5.4.7 Tab or use the mouse to place the cursor in the "New Value" field.

_____ 5.4.8 Enter the Unit's new "Total Pri To Sec Leakrate Admin Limit" as specified in AP/1,2,3/A/1700/031 (Primary To Secondary Leakage).

_____ 5.4.9 Tab or use the mouse to place the cursor in the "Modified By" field.

_____ 5.4.10 Enter your LAN identification.

_____ 5.4.11 Tab or use the mouse to place the cursor in the "Reason" field.

_____ 5.4.12 Enter the reason for the change (ex. PT/0/A/0230/001).

_____ 5.4.13 Select "Save".

_____ 5.4.14 Select "okay" on the pop-up menu.

_____ 5.4.15 Select "Cancel" to exit "Manual Value Update PID Update Display" screen.

_____ 5.4.16 Select "Cancel" to exit "Manual Value Update Croup Selection Display" screen.

_____ 5.5 Record which Unit, procedure was performed on, in Remarks section on coversheet. (eg. Unit 1, Unit 2, or Unit 3)

_____ 5.6 Exit this enclosure.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-205/Admin

Calculate the Maximum Permissible Stay Time Within Emergency Dose Limits (EDL)

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate the Maximum Permissible Stay Time Within Emergency Dose Limits

Alternate Path:

N/A

Facility JPM #:

N/A

K/A Rating(s):

Gen 2.3.4 2.5/3.1

Task Standard:

Calculate the Maximum Permissible Stay Time Within Emergency Dose Limits (± 5 minutes).

Preferred Evaluation Location:

Simulator _____ In-Plant __X__

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

NSD-507, Radiation Protection

OMP 1-18, Implementation Standard During Abnormal And Emergency Events

Validation Time: 20 min. **Time Critical:** NO

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

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:

1. Steam Generator Tube Rupture has occurred on Unit 3
2. Emergency Dose Limits are in effect
3. NEO "A" has received 1.46 R TEDE this year
4. The following tasks are required to be performed:

#	TASK	TIME REQUIRED	DOSE RATE
1	Closing 3C-573	12 min	6.55 R/hr
2	Open 3FDW-313	4 min	21.45 R/hr
3	Open all Unit 3's ADVs		2.88 R/hr

Note: Assume no dose received while traveling between tasks.

INITIATING CUE:

Refer to the above information. NEO "A" has completed tasks 1 and 2 in the time required. How long does he have to complete task 3 without exceeding his Emergency Dose Limits?

START TIME: _____

Note: Candidate may perform these steps in a different order however the calculated stay time should be correct.

Note: Candidate should understand the following:
1. **EDL is 5 R per event (LOCA or SGTR).**
2. **Current exposure for the year is not counted toward the Emergency Dose Limit (EDL).**

STEP 1: Determine dose received while performing task 1. STANDARD: Determine dose received while performing task 1. 6.55 R/hr X 1hr/60 min X 12 min = 1.31 R COMMENTS:	___ SAT ___ UNSAT
STEP 2: Determine dose received while performing task 2. STANDARD: Determine dose received while performing task 2. 21.45 R/hr X 1hr/60 min X 4 min = 1.43 R COMMENTS:	___ SAT ___ UNSAT
STEP 3: Determine dose remaining from EDLs. STANDARD: Determine dose remaining from EDLs. 5R – 1.31R – 1.43R = 2.26 R COMMENTS:	___ SAT ___ UNSAT

STEP 4:	Determine time available for the NEO to complete task 3 without exceeding EDL.	**CRITICAL STEP**
STANDARD:	Stay time is calculated to be:	___ SAT
	$\frac{\text{Available Dose}}{\text{Dose Rate}} = \frac{2.26\ \text{R}}{2.88\ \text{R/hr}} = .785\ \text{hr} \times \frac{60\ \text{min}}{1\text{hr}} = \mathbf{47.1\ min}$	___ UNSAT
	(± 5 minutes)	
COMMENTS:		
	END OF TASK	

TIME STOP: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Required to calculate stay time.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Steam Generator Tube Rupture has occurred on Unit 3
2. Emergency Dose Limits are in effect
3. NEO "A" has received 1.46 R TEDE this year
4. The following tasks are required to be performed:

#	TASK	TIME REQUIRED	DOSE RATE
1	Closing 3C-573	12 min	6.55 R/hr
2	Open 3FDW-313	4 min	21.45 R/hr
3	Open all Unit 3's ADVs		2.88 R/hr

Note: Assume no dose received while traveling between tasks.

INITIATING CUE:

Refer to the above information. NEO "A" has completed tasks 1 and 2 in the time required. How long does he have to complete task 3 without exceeding his Emergency Dose Limits?

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-003/Admin

Evaluate Overtime Eligibility

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Evaluate Overtime Eligibility

Alternate Path:

NO

Facility JPM #:

New

K/A Rating(s):

Gen 2.1.3 3.0/3.4

Task Standard:

Evaluate overtime eligibility and determine at least 4 out of 5 violations.

Preferred Evaluation Location:

Simulator _____ In-Plant ___X___

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:

OMP 2-01 Attachment "C", Work Schedules
NSD 200, Overtime Control

Validation Time: 25 min.

Time Critical: NO

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

OMP 2-01 Attachment "C", Work Schedules
NSD 200, Overtime Control

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 following is the schedule of two (2) operators for a seven-day period.

INITIATING CUE:

Using the information in the following table, determine whether overtime guidelines have been violated, listing **ALL** of the violations (if any). Consider each case separately.

NOTE: For the purposes of this JPM, shift turnover time should not be considered in your determination.

	Operator #1	Operator #2
Monday	0700 - 1900	0800 – 2000 (Came in late, stayed to makeup time)
Tuesday	0700 - 1900	0500 – 2200 (Called in early)
Wednesday	0700 – 2200 (Held over; relief called in sick)	0700 - 1900
Thursday	OFF	0700 - 1900
Friday	1900 – 0100 (Went home sick)	OFF
Saturday	1900 – 0700	0700 – 1900
Sunday	1400 – 0200 (Called in early)	0700 - 1200

START TIME: _____

STEP 1: Obtain a copy of OMP 2-01 Attachment "C" and NSD-200 (Overtime Control). STANDARD: A copy of OMP 2-01 Attachment "C" and NSD-200 (Overtime Control) is obtained. COMMENTS:	___ SAT ___ UNSAT
STEP 2: *Evaluate Operator 1* STANDARD: Determine Operator #1 overtime guidelines exceeded: 1. < 8 hr break (Sat – Sun) 2. > 16 hrs (Sat – Sun) COMMENTS:	***CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Evaluate Operator 2 STANDARD: Determine Operator #2 overtime guidelines exceeded: 1. > 16 in 24 hrs (Mon – Tues) 2. > 16 straight (Tues) 3. > 28 in 48 hrs (Mon – Wed) COMMENTS: **END OF TASK**	***CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____

* 4 out of 5 violations must be identified to be satisfactory.

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Operator # 1 must be evaluated and overtime guideline violations identified.
3	Operator # 2 must be evaluated and overtime guideline violations identified.

Note: There are a total of 5 overtime guideline violations. 4 out of the 5 must be identified for the candidate to be graded as satisfactory.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The following is the schedule of two (2) operators for a seven-day period.

INITIATING CUE:

Using the information in the following table, determine whether overtime guidelines have been violated, listing **ALL** of the violations (if any). Consider each case separately.

NOTE: For the purposes of this JPM, shift turnover time should not be considered in your determination.

	Operator #1	Operator #2
Monday	0700 - 1900	0800 – 2000 (Came in late, stayed to makeup time)
Tuesday	0700 - 1900	0500 – 2200 (Called in early)
Wednesday	0700 – 2200 (Held over; relief called in sick)	0700 - 1900
Thursday	OFF	0700 - 1900
Friday	1900 – 0100 (Went home sick)	OFF
Saturday	1900 – 0700	0700 – 1900
Sunday	1400 – 0200 (Called in early)	0700 - 1200

All operators are normally scheduled to work on 12-hour intervals. If overtime is required, the responsible supervisor shall control the use of overtime and limit employees to the following:

- Adhere to the limits of NSD 200, *Overtime Control*. On rare occasions when these limits must be exceeded, the guidance set forth in NSD 200 shall be followed including the completion of Appendix A, *Request For Work Hours Extension*, prior to exceeding any limits. These limits also apply to all employees.
- The maximum time at the control board is 12 hours straight excluding shift turnover time and time changes between standard time and daylight savings time.
- A maximum of 12 hours of non-productive time (e.g., vacation and holidays) will not count toward the limitation set forth for overtime.
- During selected "critical" activities (e.g., pulling control rods for criticality, involved testing), shift turnover may cause delays that might not be conservative. For these activities, operations management may allow a maximum deviation of one hour to the work schedule. The Shift Operations Manager or the on-coming and off-going OSM shall approve this deviation.
- If an operator is required to work in excess of 12 continuous hours, his/her duties shall be carefully selected to prevent assignment to activities in which fatigue may cause significant problems. Assignments that affect core reactivity or endanger safe operation of the plant or personnel should be avoided.
- The responsible supervisor or designee shall review the time sheets of non-exempt operators to ensure that overtime requirements are not exceeded without proper authorization. Approval of the time sheet documents this review.

SR 13
115 1
MF 1

VERIFY HARD COPY AGAINST WEB SITE IMMEDIATELY PRIOR TO EACH USE

TECHNICAL SPECIFICATION RELATED

Duke Power SM
A Duke Energy Company

NUCLEAR POLICY MANUAL

Nuclear System Directive: 200. **Overtime Control**

Process/Program Owner: **Human Resource Managers BEST**

REVISION NUMBER	ISSUE DATE
0	07/01/92
1	11/01/92
2	02/28/94
3	03/30/95
4	12/12/96
5	06/16/98
6	03/31/99
7	10/19/00
8	03/22/01

CATAWBA	MCGUIRE	OCONEE
Approved By/Date	Approved By/Date	Approved By/Date
P.M. Grobusky/03-05-01 Human Resource Manager	W.B. Jackson/03-07-01 Human Resource Manager	A. Rose/03-07-01 Human Resource Manager
Effective Date:	Effective Date:	Effective Date:
04/16/01	04/16/01	04/16/01

Issued By: C. J. Thomas

Manager, Nuclear Regulatory & Industry Affairs

VERIFY HARD COPY AGAINST WEB SITE IMMEDIATELY PRIOR TO EACH USE

DOCUMENT REVISION DESCRIPTION

REVISION NO.	PAGES or SECTIONS REVISED AND DESCRIPTION
0	Initial Issue
1	Revised to reflect tech. spec. requirements.
2	Revised Section 200.5.1 to reflect procedure change.
3	Revised Section 200.5,"Implementation" (Paragraph 2), to add clarification. Changed 'Human Resource to 'Organization Effectiveness' in Section 200.5.1 and added clarification for the review process. Revised Appendix A, "Request For Work Hours Extension" to add clarification.
4	200.2, "Purpose" - Added a sentence regarding employees working overtime and requirements for FFD concerns. 200.5, "Implementation" - Added information contained on the Appendix A form and instructions for why and how to fill out the form. In addition, changed the responsibility for initiating a PIP from the OE group to the work group failing to have overtime approved in advance. Added definition for Routine Deviation. 200.5.1, "Review" - Clarified OE's responsibility in reviewing information on the Appendix A - Overtime Control Forms and defined discrepancies vs. violations as it relates to the reports generated by OE. Appendix A, "Request For Work Hours Extension" Section 1 - Added instructions to fill out all columns. Added columns Department/Vendor and Assigned Supv/ID Section 3 - Added spaces for UserID and Time, as well as a footnote stating Supervisor should not assess himself/herself for FFD concerns. Section 4 - Added correct Tech Spec for ONS, spaces for UserID and Time, as well as a footnote stating that Supervisor and Station Manager/Designee should not be the same person. Section 5 - Added new section to document PIP # and comments.
5	200.2, "Purpose" - Deleted "hands on". 200.3.1, "Safety-Related Work" - Changed definition for safety-related work. Added examples of safety-related work. 200.4, "Applicability" - Changed statement to clarify to whom and when policy applies. Deleted "hands on". 200.4.1, "Requirements" - Added Oconee to the 28 in any 48-hour period limit. 200.5, "Implementation" - Changed "overtime" throughout this Section to clarify information requested on the Appendix A form. Changed "should" to shall to indicate policy requirements and not choices. Added list of positions authorized to sign as Station Manager/designee. Changed "employee's assigned crew" to Dept. ID. Changed "Organization Effectiveness" to Human Resources. Added statement: "Within approximately 4 hours to assure timely FFD assessments are being performed" to sentence referencing when the Assessment should be performed. 200.5.1, "Review" - Changed "Organization Effectiveness" to Human Resources. Changed "overtime" to clarify information required on the Appendix A form. Changed "should" to shall

Table Of Contents

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200.2 PURPOSE 1
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200.3.1 SAFETY-RELATED WORK *1*
200.4 APPLICABILITY 1
200.4.1 REQUIREMENTS *1*
200.5 IMPLEMENTATION 2
200.5.1 REVIEW *3*
APPENDIX A. 200. REQUEST FOR WORK HOURS EXTENSION **5**

APPENDIX A.200. REQUEST FOR WORK HOURS EXTENSION

1. Permission is requested for the individuals listed below to exceed the guidelines of Tech Spec 5.2.2 for hours that will be worked on the date shown. (Fill out ALL columns including: Full name, actual date work hour extension will occur, the letter(s) of the limit(s) that will be exceeded, estimated hours that will be worked beyond guidelines, Emp. ID, department or vendor name and assigned supervisor's name.)

NAME (Print First, MI & Last Name)	DATE/TIME THE WORK HOUR EXT. BEGINS	LIMIT a, b, c, d, e	EST. HRS. EXCEEDING GUIDELINE	Emp. ID (Same as Badge Number)	DEPARTMENT/ VENDOR NAME	ASSIGNED SUPV NAME

a. Working more than 16 hours straight (excluding shift turnover time)

b. Working more than 16 hours in any 24 hour period (excluding shift turnover time)

c. Working more than 24 hours (28 hours for MNS and ONS) in any 48 hour period (excluding shift turnover time)

d. Working more than 72 hours in any 7 day period (excluding shift turnover time)

e. Less than 8 hour break between scheduled work periods (excluding callouts, but including shift turnover time).
Note: Call-outs are not considered scheduled work periods and do not require an Appendix A form unless limit(s) a, b, c, d is exceeded due to the call-out. FFD and Management Procedures provisions apply to call-outs).

2. Specific reasons describing the need for exceeding the work hour guidelines. (Brief description of work to be performed and why specific individuals are needed to complete task.

---

3. I have assessed the fitness for continued duty of the above named individual(s). The assessment included an evaluation of the working conditions, and the individual(s) mental and physical ability to complete the task safely. I find the individual(s) fitness satisfactory to safely complete the assignment. I will periodically re-assess their status as appropriate to determine their ability to continue. **NOTE**: The FFD assessment must be done within 4 hours prior to the beginning of the task date/time the work hour extension begins.

Signed:_____ Supv. ID: _____ Date:_____Time:_____

Supervisor/Temp. Supervisor/Designee of employee(s)/vendor(s)*

200. OVERTIME CONTROL

200.1 INTRODUCTION

A Policy Statement is necessary to provide the basis for the manner in which business is conducted and to address the department's, or company's position on such issues as they arise in the nuclear industry or as Duke experience indicates a need for a more definitive statement of policy.

200.2 PURPOSE

The objective of this policy statement is to provide administrative guidance to limit the working hours of people working at the site who perform safety related functions. It is recognized that excessive working hours can impact an employee's fitness for duty (FFD). Therefore, employees working excessive hours will be assessed for FFD each day a limit is exceeded.

200.3 DEFINITIONS

200.3.1 SAFETY-RELATED WORK

Safety-related work is the performance or independent verification of an 'A' procedure (QA1 procedures). Examples: Assembling/disassembling components, trains or systems; Performing, reviewing or approving QA1 drawing, evaluations, procedures, specifications, etc.

Non-safety related work must be counted towards work hour totals if that person routinely performs safety related work.

200.4 APPLICABILITY

The provisions outlined in this policy statement are applicable to all Company employees and vendors/contractors when performing or immediately supervising the performance of safety related work ('A' procedures).

200.4.1 REQUIREMENTS

The objective shall be to have employees perform their duties without working excessive hours.

All work hours must be considered when calculating overtime. There is no provision for separating non-safety related and safety related work. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance or major plant modifications, on a temporary basis, the following guidelines shall be followed:

1. An individual should not be permitted to work more than 16 hours straight, excluding shift turnover time;
2. An individual should not be permitted to work more than 16 hours in any 24-hour period, nor more than 24 (28 for McGuire and Oconee) hours in any 48-hour period, nor more than 72 hours in any 7-day period, all excluding shift turnover time and an allowance for time changes between standard time and daylight saving time (the 7-day period is any 7 day period);
3. A break of at least 8 hours should be allowed between work periods, including shift turnover time; and

Designee" form, and approval by the Site VP or Station Manager prior to this individual authorizing the Appendix A., Request for Work Hours Extension form.

Site Vice President, Station Manager, Site Engineering Manager, Operations Manager, Maintenance Superintendent, Radiation Protection Manager, Chemistry Manager, Work Control Manager, On Duty Operations Shift Manager, On Duty Shift Work Manager, On Duty Emergency Coordinator, On Duty Outage Manager, On Duty Outage Window Sponsor, Innage Manager and Human Resources Manager.

A periodic report will be compiled for site management.

Routine deviation from the above guidelines is not authorized. Routine deviation shall be defined as 'repetitive tasks with a duration of less than 14 days.'

200.5.1 REVIEW

A monthly review of authorized work hour extension forms shall be performed by the Station Manager/designee (Human Resources Manager), to assure that overtime hours are not excessive, they have received proper authorization by the Station Manager or designee and have been documented in advance of the work hour extension (This is a requirement in the Catawba, McGuire, and Oconee Technical Specifications Sections 5.2.2; however, Oconee's Tech Specs require a periodic review of authorized work hour extension forms).

All employee's names and dates worked shall be clearly listed, with all blocks in Section 1, Appendix A completed. Reasons for the work hour extension shall be clearly and specifically noted in Section 2, Appendix A.

This review is also to assure that adequate employee/work assessments are being conducted for excessive work hours on the actual shift or day the work hour extension occurred. Therefore, only one day shall be used per Appendix A form. In addition, an employee/supervisor shall not assess himself/herself for fitness for duty concerns, Section 3.

Any failure to authorize work hour extensions in advance shall be documented in a PIP. The PIP shall be initiated by the work group failing to have the work hour extension approved in advance.

All Appendix A forms not completed in full or as stated in Section "Implementation" will be considered as discrepancies on the periodic report to management. Those forms which are not authorized in advance by the Station Manager/designee in Section 4 shall have supporting PIP information in Section 5 before being routed to the Human Resources Manager.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

SRO-206/Admin

Determine Emergency Classification and Protective Action Recommendations

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Emergency Classification and Protective Action Recommendations

Alternate Path:

NO

Facility JPM #:

New

K/A Rating(s):

Gen 2.4.38 2.2/4.0

Task Standard:

Appropriate classification is determined and associated Protective Action Recommendations are made

Preferred Evaluation Location:

Simulator __X___ In-Plant ___X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

RP/0/B/1000/01
RP/0/B/1000/02
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

Validation Time: 20 min.

Time Critical: NO

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

Comments

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

RP/0/B/1000/01
RP/0/B/1000/02
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

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:

0800: Civil demonstration occurring at the intersection of Highway 183 and 130 by anti-nuke activists.

0900: Security reports to the OSM that, one or more persons has been observed cutting their way through the double security fences. RP/0/B/1000/007 (Security Event) is being used in conjunction with the Emergency Plan.

0905: Intruders have been seen entering Unit 3 Control Room. Security has isolated the area around Unit 3's Control Room.

0910: Security reports that an explosion has occurred on the Keowee Dam and that water is beginning to leak through the dam in several places. Keowee Dam failure is imminent.

0930: Security reports that no additional bombs were found and that no additional intruders have been located.

Note: All three Oconee Units remain in MODE 1 at 100% power during this event.

INITIATING CUE:

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/B/1000/01, Emergency Classification and determining the emergency classification and any Protective Action Recommendations.

Note: Do not use Emergency Coordinator's judgment while 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: _____

STEP 1:	Classify the Event	**CRITICAL STEP**
STANDARD:	Refer to RP/0/B/1000/01 (Emergency Classification) Enclosure 4.6 (Fires/Explosions and Security Actions). Classify the event as a "**General Emergency**" due to following: "Loss of physical control of the control room due to security event"	___ SAT ___ UNSAT
COMMENTS:		
STEP 2:	Determine Protective Action Recommendations	
STANDARD:	Refer to RP/0/B/1000/002 (Control Room Emergency Coordinator Procedure) and **GO TO** Enclosure 4.1 (General Emergency)	___ SAT
COMMENTS:		___ UNSAT
STEP 3:	*Step* 1.1 **IF** It has been determined that an Emergency Action Level for an Initiating Conditions has been met, **THEN** Declare a **General Emergency** Time of Declaration: _____	___ SAT
STANDARD:	Determine Initiating Conditions have been met and Declare a General Emergency due to: • "Loss of physical control of the control room due to security event" Determine Time of Declaration is present time.	___ UNSAT
COMMENTS:		
STEP 4:	Step 1.2 Appoint a person to maintain the Emergency Coordinator Log OR maintain the log yourself.	___ SAT
STANDARD:	A person is appointed to maintain the Emergency Coordinator Log or indicate that you will maintain the log.	
COMMENTS:		___ UNSAT

STEP 5: Step 1.3 Appoint Control Room Offsite Communicator(s). STANDARD: *A Control Room Offsite Communicator is appointed.* COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 1.4 Provide the Protective Action Recommendations for use by the Offsite Communicator to complete the Emergency Notification Form. STANDARD: Determine from chart that the following Protective Action Recommendations should be given: Evacuate sectors: Pickens County – A0, A1, B1, C1; Oconee County – A0, D1, E1, F1 Shelter sectors: Pickens County – A2, B2, C2; Oconee County – D2, E2, F2 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Step 1.4.1 **IF** Conditions A, Imminent or Actual Dam Failure (Keowee or Jocassee) exist, **THEN REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 1.0, for additional Protective Action Recommendations. STANDARD: Candidate should refer to Enclosure 4.7, (Condition A/Condition B Response Actions). COMMENTS:	___ SAT ___ UNSAT

STEP 8:	Step 1.1 **IF** Conditions A, Imminent or Actual Dam Failure (Keowee or Jocassee) exists, **THEN** Perform the following actions: Provide the following protective action recommendations to Oconee County and Pickens County for imminent/actual Dam Failure. 1. Provide the following recommendation for Emergency Notification Form Section 15 (B) Evacuate: • Move residents living downstream of the Keowee Hydro Project dams to higher ground. 2. Provide the following recommendation for Emergency Notification Form Section 15 (D) Other: • Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Enclosure 4.7, (Condition A / Condition B Response Action) is used to determine that the following protective action recommendations are given to Oconee and Pickens County: 1. Provide the following recommendation for Emergency Notification Form Section 15 (B) Evacuate: • Move residents living downstream of the Keowee Hydro Project dams to higher ground. 2. Provide the following recommendation for Emergency Notification Form Section 15 (D) Other: • Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed.	
COMMENTS:		
	END OF TASK	

TIME STOP: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	The candidate needs to be able to utilize the procedure and determine that a General Emergency should be declared.
6	The candidate must be able to make recommendations to the local agencies as the actions necessary to protect the health and safety of the public.
8	The candidate must be able to make recommendations to the local agencies as the actions necessary to protect the health and safety of the public.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

0800: Civil demonstration occurring at the intersection of Highway 183 and 130 by anti-nuke activists.

0900: Security reports to the OSM that, one or more persons has been observed cutting their way through the double security fences. RP/0/B/1000/007 (Security Event) is being used in conjunction with the Emergency Plan.

0905: Intruders have been seen entering Unit 3 Control Room. Security has isolated the area around Unit 3's Control Room.

0910: Security reports that an explosion has occurred on the Keowee Dam and that water is beginning to leak through the dam in several places. Keowee Dam failure is imminent.

0930: Security reports that no additional bombs were found and that no additional intruders have been located.

Note: All three Oconee Units remain in MODE 1 at 100% power during this event.

INITIATING CUE:

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/B/1000/01, Emergency Classification and determining the emergency classification and any Protective Action Recommendations.

Note: Do not use Emergency Coordinator's judgment while classifying the event. When required, an operator will maintain the Emergency Coordinator's Log and assume *the duties of the Control Room Offsite Communicator.*

INFORMATION ONLY

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. RP/O/B/1000/001
Revision No. 013

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Emergency Classification

(4) Prepared By Mike Thorne (Signature) M R Thorne Date 01/27/03

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By Ray Waterman (QR) Date 1/22/03

Cross-Disciplinary Review By _____ (QR)NA RBW Date 1/27/03

Reactivity Mgmt Review By _____ (QR)NA RBW Date 1/27/03

Mgmt Involvement Review By _____ (Ops Supt) NA RBW Date 1/27/03

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval *(if necessary)*

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By Rodney Brown Date 02/11/03

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification:

☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

Procedure Completion Approved _____ Date _____

Remarks *(Attach additional pages)*

Duke Power Company Oconee Nuclear Site **Emergency Classification** **Reference Use**	Procedure No. RP/**0**/B/1000/001 Revision No. 013 Electronic Reference No. OX002WOS

Emergency Classification

NOTE: This procedure is an implementing procedure to the Oconee Nuclear Site Emergency plan and must be forwarded to Emergency Planning within seven (7) working days of approval.

1. Symptoms

1.1 This procedure describes the immediate actions to be taken to recognize and classify an emergency condition.

1.2 This procedure identifies the four emergency classifications and their corresponding Emergency Action Levels (EALs).

1.3 This procedure provides reporting requirements for non-emergency abnormal events.

1.4 The following guidance is to be used by the Emergency Coordinator/EOF Director in assessing emergency conditions:

1.4.1 The Emergency Coordinator/EOF Director shall review all applicable initiating events to ensure proper classification.

1.4.2 The BASIS Document (Volume A, Section D of the Emergency Plan) is available for review if any questions arise over proper classification.

1.4.3 **IF** An event occurs on more than one unit concurrently,

THEN The event with the higher classification will be classified on the Emergency Notification Form.

A. Information relating to the problem(s) on the other unit(s) will be captured on the Emergency Notification Form as shown in RP/0/B/1000/015A, (Offsite Communications From The Control Room), RP/0/B/1000/015B, (Offsite Communications From The Technical Support Center) or RP/0/B/1000/015C, (Offsite Communications From The Emergency Operations Facility).

1.4.4 **IF** An event occurs,

AND A lower or higher plant operating mode is reached before the Classification can be made,

THEN The classification shall be based on the mode that existed at the time the event occurred.

1.4.5 The Fission Product Barrier Matrix is applicable only to those events that occur at Hot Shutdown or higher.

A. An event that is recognized at Cold Shutdown or lower shall not be classified using the Fission Product Barrier Matrix.

1. Reference should be made to the additional enclosures that provide Emergency Action Levels for specific events (e.g., Severe Weather, *Fire*, Security).

1.5 **IF** A transient event should occur,

THEN Review the following guidance:

1.5.1 **IF** An Emergency Action Level (EAL) identifies a specific duration

AND The Emergency Coordinator/EOF Director assessment concludes that the specified duration is exceeded or will be exceeded, (i.e.; condition cannot be reasonably corrected before the duration elapses),

THEN Classify the event.

1.5.2 **IF** A plant condition exceeding EAL criteria is corrected before the specified duration time is exceeded,

THEN The event is **NOT** classified by that EAL.

A. Review lower severity EALs for possible applicability in these cases.

NOTE:	Reporting under 10CFR50.72 may be required for the following step. Such a condition could occur, for example, if a follow up evaluation of an abnormal condition uncovers evidence that the condition was more severe than earlier believed.

1.5.3 **IF** A plant condition exceeding EAL criteria is not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g.; as a result of routine log or record review)

AND The condition no longer exists,

THEN An emergency shall **NOT** be declared.

1.5.4 **IF** An emergency classification was warranted, but the plant condition has been corrected prior to declaration and notification,

THEN The Emergency Coordinator must consider the potential that the initiating condition (e.g.; Failure of Reactor Protection System) may have caused plant damage that warrants augmenting the on shift personnel through activation of the Emergency Response Organization.

A. **IF** An ***Unusual Event*** condition exists,

THEN Make the classification as required.

1. The event may be terminated in the same notification or as a separate termination notification.

B. **IF** An ***Alert***, ***Site Area Emergency***, or ***General Emergency*** condition exists,

THEN Make the classification as required,

AND Activate the Emergency Response Organization.

1.6 Emergency conditions shall be classified as soon as the Emergency Coordinator/EOF Director assessment determines that the Emergency Action Levels for the Initiating Condition have been exceeded.

2. Immediate Actions

2.1 Determine the operating mode that existed at the time the event occurred prior to any protection system or operator action initiated in response to the event.

2.2 **IF** The unit is at Hot Shutdown or higher

AND The condition/event affects fission product barriers,

THEN GO TO Enclosure 4.1, (Fission Product Barrier Matrix).

2.2.1 Review the criteria listed in Enclosure 4.1, (Fission Product Barrier Matrix) and make the determination if the event should be classified.

2.3 Review the listing of enclosures to determine if the event is applicable to one of the categories shown.

2.3.1 **IF** One or more categories are applicable to the event,

2.3.2 **THEN** Refer to the associated enclosures.

2.3.3 Review the EALs and determine if the event should be classified.

A. **IF** An EAL is applicable to the event,

THEN Classify the event as required.

2.4 **IF** The condition requires an emergency classification,

THEN GO TO RP/0/B/1000/002, (Control Room Emergency Coordinator Procedure) Subsequent Actions.

2.5 Continue to review the emergency conditions to assure the current classification continues to be applicable.

3. Enclosures

	Enclosures	Page Number
4.1	Fission Product Barrier Matrix	6
4.2	System Malfunctions	7
4.3	Abnormal Rad Levels/Radiological Effluents	9
4.4	Loss Of Shutdown Functions	11
4.5	Loss of Power	13
4.6	Fires/Explosions And Security Actions	14
4.7	Natural Disasters, Hazards, And Other Conditions Affecting Plant Safety	15
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DETERMINE THE APPROPRIATE CLASSIFICATION USING THE TABLE BELOW: CIRCLE EALS CHOSEN. ADD POINTS TO CLASSIFY. (SEE NOTE BELOW)

RCS BARRIERS (BD 5-7)		FUEL CLAD BARRIERS (BD 8-9)		CONTAINMENT BARRIERS (BD 10-12)	
Potential Loss (4 Points)	Loss (5 Points)	Potential Loss (4 Points)	Loss (5 Points)	Potential Loss (1 Point)	Loss (3 Points)
RCS Leakrate > Makeup capacity of one HPI pump in normal makeup mode (approx. 160 gpm) with Letdown isolated.	RCS Leak rate > available makeup capacity as indicated by a loss of subcooling	Average of the 5 highest CETC ≥ 700° F	Average of the 5 highest CETC ≥ 1200° F	CETC ≥ 1200° F ≥ 15 minutes OR CETC ≥ 700° F ≥ 15 minutes with a *valid* RVLS reading 0"	Rapid unexplained containment pressure decrease after increase OR containment pressure or sump level not consistent with LOCA
SGTR > Makeup capacity of one HPI pump in normal makeup mode (approx. 160 gpm) with Letdown isolated.		*Valid* RVLS reading of 0" NOTE: RVLS is NOT valid if one or more RCPs are running OR if LPI pump(s) are running.	Coolant activity ≥ 300 µCi/ml DEI	RB pressure ≥ 59 psig OR RB pressure ≥ 10 psig and no RBCU or RBS	Failure of secondary side of SG results in a direct opening to the environment with P/S leakage ≥ 10 gpm in the same SG
Entry into the PTS (Pressurized Thermal Shock) Operation NOTE: PTS is entered under either of the following: • A cooldown below 400°F @ > 100°F/hr. has occurred. • HPI has operated in the injection mode while NO RCPs were operating.	1RIA 57/58 reading ≥ 1.0 R/hr 2 RIA 57 reading ≥ 1.6 R/hr 2 RIA 58 reading ≥ 1.0 R/hr 3RIA 57/58 reading ≥ 1.0 R/hr		Hours Since SD / RIA57/58 R/hr 0 - < 0.5 : ≥ 300/150 0.5 - < 2.0 : ≥ 80/40 2.0 - 8.0 : ≥ 32/16	Hours Since SD / RIA57/58 - R/hr 0 - < 0.5 : ≥ 1800/860 0.5 - < 2.0 : ≥ 400/195 2.0 - 8.0 : ≥ 280/130	Failure of secondary side of SG results in a direct opening to the environment with P/S leakage ≥ 10 gpm in the other SG AND Feeding SG with secondary side failure from the affected unit
HPI Forced Cooling	RCS pressure spike ≥ 2750 psig			Hydrogen concentration ≥ 9%	Containment isolation is incomplete and a release path to the environment exists
Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment

UNUSUAL EVENT (1-3 Total Points)	ALERT (4-6 Total Points)	SITE AREA EMERGENCY (7-10 Total Points)	GENERAL EMERGENCY (11-13 Total Points)
OPERATING MODE: 1, 2, 3, 4 ♦ Any potential loss of Containment ♦ Any loss of containment	OPERATING MODE: 1, 2, 3, 4 ♦ Any potential loss or loss of the Fuel Clad ♦ Any potential loss or loss of the RCS	OPERATING MODE: 1, 2, 3, 4 ♦ Loss of any two barriers ♦ Loss of one barrier and potential loss of either RCS or Fuel Clad Barriers ♦ Potential loss of both the RCS and Fuel Clad Barriers	OPERATING MODE: 1, 2, 3, 4 ♦ Loss of any two barriers and potential loss of the third barrier ♦ Loss of all three barriers
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY .NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4

NOTE: An event with multiple events could occur which would result in the conclusion that exceeding the loss or potential loss threshold is IMMINENT (i.e., within 1-3 hours). In this IMMINENT LOSS situation, use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. *RCS LEAKAGE* (BD 14) OPERATING MODE: 1, 2, 3, 4 A. Unidentified leakage ≥ 10 gpm B. Pressure boundary leakage ≥ 10 gpm C. Identified leakage ≥ 25 gpm 1. *UNPLANNED* LOSS OF MOST OR ALL SAFETY SYSTEM ANNUNCIATION/ INDICATION IN CONTROL ROOM FOR > 15 MINUTES (BD 15) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 Loss of annunciators or indicators requires additional personnel (beyond normal shift complement) to safely operate the unit 3. INABILITY TO REACH REQUIRED SHUTDOWN WITHIN LIMITS (BD 16) OPERATING MODE: 1, 2, 3, 4 A. Required operating mode not reached within TS LCO action statement time (CONTINUED)	1. *UNPLANNED* LOSS OF MOST OR ALL SAFETY SYSTEM ANNUNCIATION/ INDICATION IN CONTROL ROOM (BD 19) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 Loss of annunciators /indicators requires additional personnel (beyond normal shift complement) to safely operate the unit AND A.3 *Significant plant transient in progress* OR A.4 Loss of the OAC and ALL PAM indications (END)	1. INABILITY TO MONITOR A SIGNIFICANT TRANSIENT IN PROGRESS (BD 21) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 A *significant transient* is in progress AND A.3 Loss of the OAC and ALL PAM indications AND A.4 *Inability to directly monitor* any one of the following functions: 1. Subcriticality 2. Core Cooling 3. Heat Sink 4. RCS Integrity 5. Containment Integrity 6. RCS Inventory (END)	
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4. *UNPLANNED* LOSS OF ALL ONSITE OR OFFSITE COMMUNICATIONS (BD 17) ========== OPERATING MODE: All A. Loss of all onsite communications capability (ROLM system, PA system, Pager system, Onsite Radio system) affecting ability to perform Routine operations B. Loss of all onsite communications capability (Selective Signaling, NRC ETS lines, Offsite Radio System, AT&T line) affecting ability to communicate with offsite authorities. 5. FUEL CLAD DEGRADATION (BD 18) ========== OPERATING MODE: All: A. DEI - >5µCi/ml (END)			
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4			

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1 ANY *UNPLANNED* RELEASE OF GASEOUS OR LIQUID RADIOACTIVITY TO THE ENVIRONMENT THAT EXCEEDS TWO TIMES THE SLC LIMITS FOR 60 MINUTES OR LONGER (BD 23) OPERATING MODE: All A. *Valid* indication on radiation monitor RIA 33 of ≥ 4.06E+06 cpm for > 60 minutes (See Note 1) B. *Valid* indication on radiation monitor RIA 45 of ≥ 9.35E+05 cpm for > 60 minutes (See Note 1) C. Liquid effluent being released exceeds two times SLC 16.11.1 for > 60 minutes as determined by Chemistry Procedure D. Gaseous effluent being released exceeds two times SLC 16.11.2 for > 60 minutes as determined by RP Procedure NOTE 1: If monitor reading is sustained for the time period indicated in the EAL AND the required assessments (procedure calculations) cannot be completed within this period, declaration must be made on the *valid* Radiation Monitor reading. (CONTINUED)	1. ANY *UNPLANNED* RELEASE OF GASEOUS OR LIQUID RADIOACTIVITY TO THE ENVIRONMENT THAT EXCEEDS 200 TIMES RADIOLOGICAL TECHNICAL SPECIFICATIONS FOR 15 MINUTES OR LONGER (BD 28) OPERATING MODE: All A. *Valid* indication on RIA 46 of ≥ 2.09E+04 cpm for >15 minutes (See Note 1) B.1 RIA 33 HIGH Alarm AND B.2 Liquid effluent being released exceeds 200 times the level of SLC 16.11.1 for > 15 minutes as determined by Chemistry Procedure C. Gaseous effluent being released exceeds 200 times the level of SLC 16.11.2 for >15 minutes as determined by RP Procedure 2. RELEASE OF RADIOACTIVE MATERIAL OR INCREASES IN RADIATION LEVELS THAT IMPEDES OPERATION OF SYSTEMS REQUIRED TO MAINTAIN SAFE OPERATION OR TO ESTABLISH OR MAINTAIN COLD SHUTDOWN (BD 30) OPERATING MODE: All A. *Valid radiation reading ≥ 15 mRad/hr in CR*, CAS, or, Radwaste CR B. *Unplanned*/unexpected *valid* area monitor readings exceed limits stated in Enclosure 4.9 (CONTINUED)	1. BOUNDARY DOSE RESULTING FROM ACTUAL/IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 32) OPERATING MODE: All A. *Valid* reading on RIA 46 of ≥ 2.09E+05 cpm for >15 minutes (See Note 2) B. *Valid* reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 2) C. Dose calculations result in a dose projection at the *site boundary* of: ≥ 100 mRem TEDE or 500 mRem CDE adult *thyroid* D. Field survey results indicate *site boundary* dose rates exceeding ≥100 mRad/hr expected to continue for more than one hour OR D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 500 mRem CDE (3.84 E^{-7} µCi/ml) for one hour of inhalation NOTE 2: If actual Dose Assessment cannot be completed within 15 minutes, then the *valid* radiation monitor reading should be used for emergency classification. (CONTINUED)	1. BOUNDARY DOSE RESULTING FROM ACTUAL/ IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 36) OPERATING MODE: All A. *Valid* reading on RIA 46 of ≥ 2.09E+06 cpm for ≥15 minutes (See Note 3) B. *Valid* reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 3) C. Dose calculations result in a dose projection at the *site boundary* of: C.1 ≥ 1000 mRem TEDE OR C.2 ≥ 5000 mRem CDE adult thyroid D. Field survey results indicate *site boundary* dose rates exceeding ≥1000 mRad/hr expected to continue for more than one hour OR D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 5000 mRem CDE for one hour of inhalation NOTE 3: If actual Dose Assessment cannot be completed within 15 minutes, then the *valid radiation monitor reading should be* used for emergency classification. (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY *NOTIFY 1, 2, 3, 4*

Assumptions used for calculation of vent monitors RIA 45 & 46:

1. Average annual meteorology (1.672 E-6 sec/m^3), semi-elevated
2. Vent flow rate 65,000 cfm (average daily flow rate)
3. No credit is taken for vent filtration
4. One hour release duration for ***Unusual Event***, 15 minute duration for ***Alert***, ***Site Area Emergency***, ***General Emergency***
5. *General Emergency* PAGs are 1 rem TEDE and 5 rem CDE; *Site Area Emergency* determination is based on 10% of the *General Emergency* PAGs
6. Calculations for monitor readings are based on whole body dose
7. Standard ODCM guidance together with NUMARC guidance indicates that effluent releases are based on Technical Specification releases

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2 UNEXPECTED INCREASE IN PLANT RADIATION OR AIRBORNE CONCENTRATION (BD 25) OPERATING MODE: All A. LT 5 reading 14" and decreasing with makeup not keeping up with leakage WITH fuel in the core B. *Uncontrolled* water level decrease in the SFP and fuel transfer canal with all irradiated fuel assemblies remaining covered by water C. 1 R/hr radiation reading at one foot away from a damaged storage cask located at the ISFSI D. *Valid* area monitor readings exceeds limits stated in Enclosure 4.9. (END)	2. MAJOR DAMAGE TO IRRADIATED FUEL OR LOSS OF WATER LEVEL THAT HAS OR WILL RESULT IN THE UNCOVERING OF IRRADIATED FUEL OUTSIDE THE REACTOR VESSEL (BD 31) OPERATING MODE: All A. *Valid* RIA 3, 6, 41, OR 49 HIGH Alarm B. HIGH Alarm for portable area monitors on the main bridge or SFP bridge C Report of visual observation of irradiated fuel uncovered D. Operators determine water level drop in either the SFP or fuel transfer canal will exceed makeup capacity such that irradiated fuel will be uncovered (END)	2. LOSS OF WATER LEVEL IN THE REACTOR VESSEL THAT HAS OR WILL UNCOVER FUEL IN THE REACTOR VESSEL (BD 35) OPERATING MODE: 5, 6 A.1 Failure of heat sink causes loss of Cold Shutdown condition AND A.2 LT 5 indicates 0 inches after initiation of RCS makeup B.1 Failure of heat sink causes loss of Cold Shutdown condition AND B.2 Either train ultrasonic level indication less than 0 inches and decreasing after initiation of RCS makeup NOTE: This Initiating Condition is also located in Enclosure 4.4., (Loss of Shutdown Functions). High radiation levels will also be seen with this condition. (END)	
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
	1. FAILURE OF RPS TO COMPLETE OR INITIATE A Rx SCRAM (BD 39) OPERATING MODE 1, 2, 3 A.1 *Valid* reactor trip signal received or required WITHOUT automatic scram AND A.1.1 DSS has inserted Control Rod Groups 5, 6, 7 OR A.1.2 Manual trip from the Control Room is successful and reactor power is less than 5% and decreasing 2. INABILITY TO MAINTAIN PLANT IN COLD SHUTDOWN (BD 41) OPERATING MODE: 5, 6 A.1 Loss of LPI and/or LPSW AND A.2 Inability to maintain RCS temperature below 200° F as indicated by either of the following: A.2.1 RCS temperature at the LPI Pump Suction OR A.2.2 Average of the 5 highest CETCs as indicated by ICCM display OR A.2.3 Visual observation (END)	1. FAILURE OF RPS TO COMPLETE OR INITIATE A Rx SCRAM (BD 42) OPERATING MODE: 1, 2 A.1 *Valid* reactor trip signal received or required WITHOUT automatic scram AND A.2 DSS has NOT inserted Control Rod Groups 5, 6, 7 AND A.3 Manual trip from the Control Room was NOT successful in reducing reactor power to less than 5% and decreasing 2. COMPLETE LOSS OF FUNCTION NEEDED TO ACHIEVE OR MAINTAIN HOT SHUTDOWN (BD 43) OPERATING MODE: 1, 2, 3, 4 A. Average of the 5 highest CETCs ≥1200° F shown on ICCM B. Unable to maintain reactor subcritical C. SSF feeding SG per EOP (CONTINUED)	1. FAILURE OF RPS TO COMPLETE AUTOMATIC SCRAM AND MANUAL SCRAM NOT SUCCESSFUL WITH INDICATION OF CORE DAMAGE (BD 45) OPERATING MODE: 1, 2 A.1 *Valid* Rx trip signal received or required WITHOUT automatic scram AND A.2 Manual trip from the Control Room was NOT successful in reducing reactor power to < 5% and decreasing AND A.3 Average of the 5 highest CETCs ≥1200° F on ICCM (END)
	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
		3. LOSS OF WATER LEVEL IN THE REACTOR VESSEL THAT HAS OR WILL UNCOVER FUEL IN THE REACTOR VESSEL (BD 44) OPERATING MODE: 5, 6 A.1 Failure of heat sink causes loss of Cold Shutdown conditions AND A.2 LT-5 indicates 0 inches after initiation of RCS Makeup B.1 Failure of heat sink causes loss of Cold Shutdown conditions AND B.2 Either train ultrasonic level indication less than 0 inches and decreasing after initiation of RCS makeup (END)	
		INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. LOSS OF ALL OFFSITE POWER TO ESSENTIAL BUSSES FOR GREATER THAN 15 MINUTES (BD 47) OPERATING MODE: All A.1 Loss of all offsite AC power to both the Red and Yellow Busses for > 15 minutes AND A.2 Unit auxiliaries are being supplied from Keowee or CT5 2. *UNPLANNED* LOSS OF REQUIRED DC POWER FOR GREATER THAN 15 MINUTES (BD 48) OPERATING MODE: 5, 6 A.1 *Unplanned* loss of vital DC power to required DC busses as indicated by bus voltage less than 110 VDC AND A.2 Failure to restore power to at least one required DC bus within 15 minutes from the time of loss (END)	1. LOSS OF ALL OFFSITE AC POWER AND LOSS OF ALL ONSITE AC POWER TO ESSENTIAL BUSSES (BD 49) OPERATING MODE: 5, 6 Defueled A.1 MFB 1 and 2 de-energized AND A.2 Failure to restore power to at least one MFB within 15 minutes from the time of loss of both offsite and onsite AC power 2. AC POWER CAPABILITY TO ESSENTIAL BUSSES REDUCED TO A SINGLE SOURCE FOR GREATER THAN 15 MINUTES (BD 50) OPERATING MODE: 1, 2, 3, 4 A. AC power capability has been degraded to a single power source for > 15 minutes due to the loss of all but one of: Unit Normal Transformer Unit SU Transformer Another Unit SU Transformer CT4 CT5 (END)	1. LOSS OF ALL OFFSITE AC POWER AND LOSS OF ALL ONSITE AC POWER TO ESSENTIAL BUSSES (BD 51) OPERATING MODE: 1, 2, 3, 4 A.1 MFB 1 and 2 de-energized AND A.2 Failure to restore power to at least one MFB within 15 minutes from the time of loss of both offsite and onsite AC power 2. LOSS OF ALL VITAL DC POWER (BD 52) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of *vital* DC power to required DC busses as indicated by bus voltage less than 110 VDC AND A.2 Failure to restore power to at least one required DC bus within 15 minutes from the time of loss (END)	1. PROLONGED LOSS OF ALL OFFSITE POWER AND ONSITE AC POWER (BD 54) OPERATING MODE: 1, 2, 3, 4 A.1 MFB 1 and 2 de-energized AND A.2 SSF fails to maintain Hot Shutdown AND A.3 At least one of the following conditions exist: A.3.1 Restoration of power to at least one MFB within 4 hours is NOT likely OR A.3.2 Indications of continuing degradation of core cooling based on Fission Product Barrier monitoring (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. *FIRES/EXPLOSIONS* WITHIN THE PLANT (BD 57) OPERATING MODE: All NOTE: Within the plant means Turbine Building, Auxiliary Building, Reactor Building, Keowee Hydro. A. Fire within the plant not extinguished within 15 minutes of Control Room notification or verification of a Control Room alarm B. Unanticipated *explosion* within the plant resulting in *visible damage* to permanent structures/equipment 2. CONFIRMED SECURITY THREAT INDICATES POTENTIAL DEGRADATION IN THE LEVEL OF SAFETY OF PLANT (BD 58) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications. A. Discovery of *bomb* within plant *protected area* and outside security vital areas B. *Hostage/Extortion* situation C. *Violent* civil disturbance within the owner controlled area D. *Credible* Security threat to the site (END)	1. *FIRE/EXPLOSION* AFFECTING OPERABILITY OF PLANT SAFETY SYSTEMS REQUIRED TO ESTABLISH/MAINTAIN SAFE SHUTDOWN (BD 59) OPERATING MODE: All NOTE: Only one train of a system needs to be affected or damaged in order to satisfy this condition. A.1 *Fire/explosions* AND A.1.1 Affected safety-related system parameter indications show degraded performance OR A.1.2 Plant personnel report *visible damage* to permanent structures or equipment required for safe shutdown 2 SECURITY EVENT IN A PLANT PROTECTED AREA (BD 60) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications. A. *Intrusion* into plant *protected area* by a hostile force B. *Bomb* discovered in an area containing safety related equipment (END)	1. SECURITY EVENT IN A PLANT VITAL AREA (BD 61) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), *shall be used in conjunction with all security* related emergency classifications A. *Intrusion* into any of the following plant areas by a hostile force: Reactor Building Auxiliary Building Keowee Hydro B. *Bomb* detonated in any of the following areas: • Keowee Hydro • Keowee Dam • ISFSI • Reactor Building • Auxiliary Building • SSF (END)	1. SECURITY EVENT RESULTING IN LOSS OF ABILITY TO REACH AND MAINTAIN COLD SHUTDOWN (BD 62) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications A. Loss of physical control of the control room due to security event B. Loss of physical control of the Aux Shutdown panel and the SSF due to a Security Event (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY. NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: *SEE EMERGENCY TELEPHONE DIRECTORY* NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: *SEE* EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE *PROTECTED AREA* (BD 64) OPERATING MODE: All A. Tremor felt and *valid* alarm on the strong motion accelerograph B Tornado striking within *Protected Area* Boundary C. Vehicle crash into plant structures/systems within the *Protected Area* Boundary D. Turbine failure resulting in casing penetration or damage to turbine or generator seals (CONTINUED)	1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE PLANT *VITAL AREA* (BD 69) OPERATING MODE: All A. Tremor felt and seismic trigger actuates (0.05g) B.1 Tornado, high winds, missiles resulting from turbine failure, vehicle crashes, or other catastrophic event AND NOTE: Only one train of a safety-related system needs to be affected or damaged in order to satisfy these conditions. B.1.1 *Visible damage* to permanent structures or equipment required for safe shutdown of the unit OR B.1.2 Affected safety system parameter indications show degraded performance 2. RELEASE OF TOXIC/FLAMMABLE GASES JEOPARDIZING SYSTEMS REQUIRED TO MAINTAIN SAFE OPERATION OR ESTABLISH MAINTAIN COLD SHUTDOWN (BD 71) OPERATING MODE: All A. Report/detection of *toxic gases* in concentrations that will be life-threatening to plant personnel B. Report/detection of flammable gases in concentrations that will affect the safe operation of the plant: • Reactor Building • Auxiliary Building • Turbine Building • *Control Room* (CONTINUED)	1. CONTROL ROOM EVACUATION AND PLANT CONTROL CANNOT BE ESTABLISHED (BD 75) OPERATING MODE: All A.1 Control Room evacuation has been initiated AND A.2 Control of the plant cannot be established from the Aux Shutdown Panel or the SSF within 15 minutes 2. KEOWEE HYDRO DAM FAILURE (BD 76) OPERATING MODE: All A. Imminent/actual dam failure includes any of the following: • Keowee Hydro Dam • Little River Dam • Dikes A, B, C, or D • Intake Canal Dike 3. OTHER CONDITIONS WARRANT DECLARATION OF *SITE AREA EMERGENCY* (BD 77) OPERATING MODE: All A. Emergency Coordinator/EOF Director judgment (END)	1. OTHER CONDITIONS WARRANT DECLARATION OF GENERAL EMERGENCY (BD 78) OPERATING MODE: All A.1 Emergency Coordinator/EOF Director judgment indicates: A.1.1 Actual/imminent substantial core degradation with potential for loss of containment OR A.1.2 Potential for *uncontrolled* radionuclide releases that would result in a dose projection at the site boundary greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING KEOWEE HYDRO (BD 66) OPERATING MODE: All A. Reservoir elevation ≥ 807 feet with all spillway gates open and the lake elevation continues to rise B. Seepage readings increase or decrease greatly or seepage water is carrying a significant amount of soil particles C New area of seepage or wetness, with large amounts of seepage water observed on dam, dam toe, or the abutments D. Slide or other movement of the dam or abutments which could develop into a failure E. Developing failure involving the powerhouse or appurtenant structures and the operator believes the safety of the structure is questionable 3. RELEASE OF TOXIC OR FLAMMABLE GASES DEEMED DETRIMENTAL TO SAFE OPERATION OF THE PLANT (BD 67) OPERATING MODE: All A. Report/detection of toxic or flammable gases that could enter within the site area boundary in amounts that can affect normal operation of the plant B. Report by local, county, state officials for potential evacuation of site personnel based on offsite event (CONTINUED)	3. TURBINE BUILDING FLOOD (BD 72) OPERATING MODE: All A. Turbine Building flood requiring use of AP/1,2,3/A/1700/10, (Turbine Building Flood) 4. CONTROL ROOM EVACUATION HAS BEEN INITIATED (BD 73) OPERATING MODE: All A.1 Evacuation of Control Room AND ONE OF THE FOLLOWING: AND A.1.1 Plant control IS established from the Aux shutdown Panel or the SSF OR A.1.2 Plant control IS BEING established from the Aux Shutdown Panel or SSF 5. OTHER CONDITIONS WARRANT CLASSIFICATION OF AN *ALERT* (BD 74) OPERATING MODE: All A.1 Emergency Coordinator judgment indicates that: A.1.1 Plant safety may be degraded AND A.1.2 Increased monitoring of plant functions is warranted (END)		
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4 OTHER CONDITIONS EXIST WHICH WARRANT DECLARATION OF AN *UNUSUAL EVENT* (BD 68) OPERATING MODE: All A. Emergency Coordinator determines potential degradation of level of safety has occurred (END)			
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4			

NOTE: IF Actual Dose Assessment **cannot be** completed within 15 minutes.
THEN The *valid* monitor reading should be used for Emergency Classification.

All RIA values are considered GREATER THAN or EQUAL TO

HOURS SINCE REACTOR TRIPPED	RIA 57 R/hr		RIA 58 R/hr*	
	Site Area Emergency	General Emergency	Site Area Emergency	General Emergency
0.0 - < 0.5	5.9E+003	5.9E+004	2.6E+003	2.6E+004
0.5 - < 1.0	2.6E+003	2.6E+004	1.1E+003	1.1E+004
1.0 - < 1.5	1.9E+003	1.9E+004	8.6E+002	8.6E+003
1.5 - < 2.0	1.9E+003	1.9E+004	8.5E+002	8.5E+003
2.0 - < 2.5	1.4E+003	1.4E+004	6.3E+002	6.3E+003
2.5 - < 3.0	1.2E+003	1.2E+004	5.7E+002	5.7E+003
3.0 - < 3.5	1.1E+003	1.1E+004	5.2E+002	5.2E+003
3.5 - < 4.0	1.0E+003	1.0E+004	4.8E+002	4.8E+003
4.0 - < 8.0	1.0E+003	1.0E+004	4.4E+002	4.4E+003

*** RIA 58 is partially shielded**

Assumptions used for calculation of high range in-containment monitors RIA 57 and 58:

1. Average annual meteorology (7.308 E^{-6} sec/m^3)
2. Design basis leakage (5.6 E^6 ml/hr)
3. One hour release duration
4. *General Emergency* PAGs are 1 rem TEDE and 5 rem CDE; *Site Area Emergency* determination is based on 10% of the *General Emergency* PAGs
5. Calculations for monitor readings are based on CDE because thyroid dose is limiting
6. No credit is taken for filtration
7. LOCA conditions are limiting and provide the more conservative reading

NOTE: This Initiating Condition is not intended to apply to anticipated temporary increases due to planned events (e.g.; incore detector movement, radwaste container movement, depleted resin transfers, etc.).

MONITOR NUMBER	UNITS 1, 2, 3	
	UNUSUAL EVENT 1000x NORMAL LEVELS mRAD/HR	*ALERT* mRAD/HR
RIA 7, Hot Machine Shop Elevation 796	150	≥ 5000
RIA 8, Hot Chemistry Lab Elevation 796	4200	≥ 5000
RIA 10, Primary Sample Hood Elevation 796	830	≥ 5000
RIA 11, Change Room Elevation 796	210	≥ 5000
RIA 12, Chem Mix Tank Elevation 783	800	≥ 5000
RIA 13, Waste Disposal Sink Elevation 771	650	≥ 5000
RIA 15, HPI Room Elevation 758	NOTE*	≥ 5000

NOTE: RIA 15 normal readings are approximately 9 mRad/hr on a daily basis. Applying 1000x normal readings would put this monitor greater than 5000 mRad/hr just for an *Unusual Event*. For this reason, an *Unusual Event* will NOT be declared for a reading less than 5000 mRad/hr.

1. List of Definitions and Acronyms

NOTE:	Definitions are italicized throughout procedure for easy recognition.

1.1 **ALERT** - Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

1.2 **BOMB** - A fused explosive device

1.3 **CONDITION A** - Failure is Imminent or Has Occurred - A failure at the dam has occurred or is about to occur and minutes to days may be allowed to respond dependent upon the proximity to the dam.

1.4 **CONDITION B** - Potentially Hazardous Situation is Developing - A situation where failure may develop, but preplanned actions taken during certain events (such as major floods, earthquakes, evidence of piping) may prevent or mitigate failure.

1.5 **CIVIL DISTURBANCE** - A group of ten (10) or more people *violent*ly protesting station operations or activities at the site.

1.6 **CREDIBLE THREAT** - The determination of what is a credible threat to the site will be the responsibility of Security Manager/designee in consultation with the OSM. The determination of "credible" is made through use of information found in the Oconee Nuclear Station Safeguards Contingency Plan and Security implementing procedures.

1.7 **EXPLOSION** - A rapid, *violent*, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components. A sudden failure of a pressurized pipe/line could fit this definition. This definition includes MS line rupture and FW line ruptures.

1.8 **EXTORTION** - An attempt to cause an action at the station by threat of force.

1.9 **FIRE** - Combustion characterized by heat and light. Sources of smoke, such as slipping drive belts or overheated electrical equipment, do NOT constitute *fires*. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed.

1.10 **GENERAL EMERGENCY** - Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guidelines exposure levels outside the Exclusion Area Boundary.

1.11 **HOSTAGE** - A person or object held as leverage against the station to ensure demands will be met by the station.

1.12 **INTRUSION/INTRUDER** - Suspected hostile individual present in a *Protected Area* without authorization.

1.13 **INABILITY TO DIRECTLY MONITOR** - Operational Aid Computer data points are unavailable or gauges/panel indications are NOT readily available to the operator.

1.14 **LOSS OF POWER** – Emergency Action Levels (EALs) apply to the ability of electrical energy to perform its intended function, reach its intended equipment. Ex. – If both MFBs, are energized but all 4160v switchgear is not available, the electrical energy can not reach the motors intended. The result to the plant is the same as if both MFBs were de-energized.

1.15 **PROTECTED AREA** - Encompasses all Owner Controlled Areas within the security perimeter fence.

1.16 **REACTOR COOLANT SYSTEM (RCS) LEAKAGE** – RCS Operational Leakage as defined in the Technical Specification Basis B 3.4.13:

> RCS leakage includes leakage from connected systems up to and including the second normally closed valve for systems which do not penetrate containment and the outermost isolation valve for systems which penetrate containment.

A. Identified LEAKAGE

LEAKAGE to the containment from specifically known and located sources, but does not include pressure boundary LEAKAGE or controlled reactor coolant pump (RCP) seal leakoff (a normal function not considered LEAKAGE).

LEAKAGE, such as that from pump seals, gaskets, or valve packing (except RCP seal water injection or leakoff), that is captured and conducted to collection systems or a sump or collecting tank;

LEAKAGE through a steam generator (SG) to the Secondary System: Primary to secondary LEAKAGE must be included in the total calculated for identified LEAKAGE.

B. Unidentified LEAKAGE

All LEAKAGE (except RCP seal water injection or leakoff) that is not identified LEAKAGE.

C. Pressure Boundary LEAKAGE

LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.

1.17 **RUPTURED** (As relates to Steam Generator) - Existence of Primary to Secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

1.18 **SABOTAGE** - Deliberate damage, mis-alignment, or mis-operation of plant equipment with the intent to render the equipment unavailable.

1.19 **SAFETY-RELATED SYSTEMS AREA** - Any area within the *Protected area* which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

1.20 **SIGNIFICANT PLANT TRANSIENT** - An *unplanned* event involving one or more of the following:

(1) Automatic turbine runback>25% thermal reactor power
(2) Electrical load rejection >25% full electrical load
(3) Reactor Trip
(4) Safety Injection System Activation

1.21 **SITE AREA EMERGENCY** - Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are NOT expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels outside the Exclusion Area Boundary.

1.22 **SELECTED LICENSEE COMMITMENT (SLC)** -Chapter 16 of the FSAR

1.23 **SITE BOUNDARY** - That area, including the *Protected Area*, in which DPC has the authority to control all activities including exclusion or removal of personnel and property (1 mile radius from the center of Unit 2).

1.24 **TOXIC GAS** - A gas that is dangerous to life or health by reason of inhalation or skin contact (e.g.; Chlorine).

1.25 **UNCONTROLLED** - Event is not the result of planned actions by the plant staff.

1.26 **UNPLANNED** - An event or action is UNPLANNED if it is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

1.27 **UNUSUAL EVENT** - Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

1.28 **VALID** - An indication or report or condition is considered to be VALID when it is conclusively verified by: (1) an instrument channel check; or, (2) indications on related or redundant instrumentation; or, (3) by direct observation by plant personnel such that doubt related to the instrument's operability, the condition's existence, or the report's accuracy is removed. Implicit with this definition is the need for timely assessment.

1.29 **VIOLENT** - Force has been used in an attempt to injure site personnel or damage plant property.

1.30 **VISIBLE DAMAGE** - Damage to equipment or structure that is readily observable without measurements, testing, or analyses. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage: deformation due to heat or impact, denting, penetration, rupture.

Enclosure 4.11

Operating Modes Defined In Improved Technical Specifications

MODES

MODE	TITLE	REACTIVITY CONDITION (K_{eff})	% RATED THERMAL POWER (a)	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	≥0.99	> 5	NA
2	Startup	≥0.99	≤5	NA
3	Hot Standby	<0.99	NA	≥250
4	Hot Shutdown (b)	< 0.99	NA	250 > T > 200
5	Cold Shutdown (b)	< 0.99	NA	≤ 200
6	Refueling (c)	NA	NA	NA

(a) Excluding decay heat.

(b) All reactor vessel head closure bolts fully tensioned.

(c) One or more reactor vessel head closure bolts less than fully tensioned.

1. Instructions For Using Enclosure 4.1 – Fission Product Barrier Matrix

1.1 If the unit was at Hot S/D or above, (Modes 1, 2, 3, or 4) and one or more fission product barriers have been affected, refer to Enclosure 4.1, (Fission Product Barrier Matrix) and review the criteria listed to determine if the event should be classified.

1.1.1 For each Fission Product Barrier, review the associated EALs to determine if there is a Loss or Potential Loss of that barrier. Circle any that apply.

NOTE: An event with multiple events could occur which would result in the conclusion that exceeding the loss or potential loss thresholds is imminent (i.e. within 1-3 hours). In this situation, use judgement and classify as if the thresholds are exceeded.

1.2 Three possible outcomes exist for each barrier. No challenge, potential loss, or loss. Use the worst case for each barrier and the classification table at the bottom of the page to determine appropriate classification.

1.3 The numbers in parentheses out beside the label for each column can be used to assist in determining the classification. If no EAL is met for a given barrier, that barrier will have 0 points. The points for the columns are as follows:

Barrier	Failure	Points
RCS	Potential Loss	4
	Loss	5
Fuel Clad	Potential Loss	4
	Loss	5
Containment	Potential Loss	1
	Loss	3

1.3.1 To determine the classification, add the highest point value for each barrier to determine a total for all barriers. Compare this total point value with the numbers in parentheses beside each classification to see which one applies.

1.3.2 Finally as a verification of your decision, look below the Emergency Classification you selected. The loss and/or potential loss EALs selected for each barrier should be described by one of the bullet statements.

EXAMPLE: Failure to properly isolate a 'B' MS Line Rupture outside containment, results in extremely severe overcooling.

PTS entry conditions were satisfied.

Stresses on the 'B' S/G resulted in failure of multiple S/G tubes.

RCS leakage through the S/G exceeds available makeup capacity as indicated by loss of subcooling margin.

Barrier	EAL	Failure	Points
RCS	SGTR > Makeup capacity of one HPI pump in normal makeup mode with letdown isolated	Potential Loss	4
	Entry into PTS operating range	Potential Loss	4
	RCS leak rate > available makeup capacity as indicated by a loss of subcooling	Loss	5
Fuel Clad	No EALs met and no justification for classification on judgment	No Challenge	0
Containment	Failure of secondary side of SG results in a direct opening to the environment	Loss	3

RCS _5_ + Fuel _0_ + Containment _3_ = Total _8_

A. Even though two Potential Loss EALs and one Loss EAL are met for the RCS barrier, credit is only taken for the worst case (highest point value) EAL, so the points from this barrier equal 5.

B. No EAL is satisfied for the Fuel Clad Barrier so the points for this barrier equal 0.

C. One Loss EAL is met for the Containment Barrier so the points for this barrier equal 3.

D. When the total points are calculated the result is 8, therefore the classification would be a *Site Area Emergency.*

E. Look in the box below "*Site Area Emergency*". You have identified a loss of two barriers. This agrees with one of the bullet statements. The classification is correct.

5-cart
2- OSM
SR
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NSD 703 (R04-01)

INFORMATION ONLY

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. RP/0/B/1000/002
Revision No. 010

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Control Room Emergency Coordinator Procedure

(4) Prepared By Rodney Brown (Signature) Rodney Brown Date 08/27/2002

(5) Requires NSD 228 Applicability Determination?

- ☐ Yes (New procedure or revision with major changes)
- ☒ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By [signature] (QR) Date 8/28/02

Cross-Disciplinary Review By [signature] (QR)NA Date 8/28/02

Reactivity Mgmt Review By _____ (QR)NA Date _____

Mgmt Involvement Review By _____ (Ops Supt) NA Date _____

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

Temporary Approval *(if necessary)*

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By Rodney Brown Date 08/29/02

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification:

☒ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☒ NA Procedure requirements met?

Verified By _____ Date _____

Procedure Completion Approved _____ Date _____

(14) Remarks *(Attach additional pages)*

Duke Power Company Oconee Nuclear Site **Control Room Emergency Coordinator Procedure** **Reference Use**	Procedure No. RP/**0**/B/1000/002 Revision No. 010 Electronic Reference No. OX002WOT

Control Room Emergency Coordinator Procedure

NOTE: This procedure is an implementing procedure to the Oconee Nuclear Site Emergency Plan and must be forwarded to Emergency Planning within three (3) working days of approval.

1. Symptoms

1.1 Events are in process or have occurred which require activation of the Oconee Nuclear Site Emergency Plan.

2. Immediate Actions

The Operations Shift Manager/Emergency Coordinator shall use this procedure until relieved by the Station Manager/Alternate in the Technical Support Center.

NOTE: Place Keeping Aids: ☐ at left of steps may be used for procedure place keeping. (☑)

☐ 2.1 **IF** **General Emergency** conditions are met,
THEN **GO TO** Enclosure 4.1 (General Emergency).

☐ 2.2 **IF** **Site Area Emergency** conditions are met,
THEN **GO TO** Enclosure 4.2 (Site Area Emergency).

☐ 2.3 **IF** **Alert** conditions are met,
THEN **GO TO** Enclosure 4.3 (Alert).

☐ 2.4 **IF** **Unusual Event** conditions are met,
THEN **GO TO** Enclosure 4.4 (Unusual Event).

☐ 2.5 **IF** An Emergency Classification does **NOT** exist and ERO Activation is desired,
THEN **GO TO** Step 1.6 of Enclosure 4.4 (Unusual Event).

3. Subsequent Actions

NOTE: Actions are **NOT** required to be followed in any particular sequence.

☐ 3.1 **IF** A SBLOCA or Steam Generator Tube Leak exist,
THEN Implement Step 5.4, Emergency Worker Exposure Limits, of OMP 1-18, (Implementation Standard During Abnormal And Emergency Events).

☐ 3.2 **IF** RIA 46 is on scale,

THEN Use Enclosure 4.3 of RP/0/B/1000/001, (Emergency Classification), to determine if the emergency classification should be upgraded to a Site Area Emergency or General Emergency based on radiation activity.

☐ 3.2.1 Instruct RP to perform an Offsite Dose Calculation and determine any additional Protective Action Recommendations.

☐ 3.3 **IF** 1, 3 RIA 57 reads ≥ 1.0 R/hr; 2 RIA 57 reads ≥ 1.6 R/hr; or 1, 2, 3 RIA 58 reads ≥ 1.0 R/hr.

THEN Use Enclosure 4.1 or 4.8 of RP/0/B/1000/001, (Emergency Classification), to determine if the emergency classification should be upgraded to a Site Area Emergency or General Emergency based on radiation activity.

☐ 3.4 **IF** RIA 16 or 17 are/were in Alert or High Alarm (≥ 2.5 mR/hr),

THEN Instruct RP to perform an Offsite Dose Calculation using the RIA values.

☐ 3.4.1 Use Enclosure 4.3 of RP/0/B/1000/001, (Emergency Classification), and the Offsite Dose Calculation results to determine if the emergency classification should be upgraded to a Site Area Emergency or General Emergency based on dose projection at the site boundary.

☐ 3.4.2 Determine any additional Protective Action Recommendations.

☐ 3.5 **IF** A large scale fire or flood damage has occurred or is occurring,

THEN Use RP/0/B/1000/022, (Procedure For Site Fire Damage Assessment And Repair) and /or RP/0/B/1000/29, (Fire Brigade Response) to determine additional actions that may be required.

☐ 3.6 **IF** A Security Event is in progress,

THEN Use RP/0/B/1000/007, (Security Event), to determine additional actions that may be required.

☐ 3.7 **IF** A hazardous substance has been released,

THEN Use RP/0/B/1000/017, (Spill Response), to determine additional actions that may be required.

NOTE:	Priority should be placed on providing treatment for the most life-threatening event (i.e., medical vs radiation exposure - OSC procedure RP/0/B/1000/011, (Planned Emergency Exposure). The Emergency Coordinator may authorize (either verbal or signature) exposures greater than 25 rem TEDE (Total Effective Dose Equivalent) for lifesaving missions.

☐ 3.8 **IF** A medical response is required,

THEN Use RP/0/1000/016, (Medical Response).

☐ 3.8.1 Document verbal approval of Planned Emergency Exposures required for lifesaving missions in the Control Room Emergency Coordinator Log.

☐ 3.9 **IF** Changing plant conditions require an emergency classification upgrade,

THEN **GO TO** the applicable enclosure, designated in the Immediate Actions section of this procedure, required for the appropriate emergency classification.

☐ 3.10 Announce over the Plant Public address System the following information:

☐ 3.10.1 The current emergency classification level and plant status UE/Alert/SAE/GE

☐ 3.10.2 If appropriate, the status of contamination and how people are to handle themselves:

Plant personnel should assume they are contaminated until surveyed by RP or until they have frisked themselves.

NO eating, drinking, or smoking until the area is cleared by RP

Identify areas of contamination to plant personnel:

_____

_____

WARNING: Use of the Outside Air Booster Fans during a Security Event may introduce incapacitating agents into the Control Room. {3}

NOTE:
- The Outside Air Booster Fans (Control Room Ventilation System - CRVS) are used to provide positive pressure in the Control Room to prevent smoke, toxic gases, or radioactivity from entering the area as required by NuReg 0737.
- Chlorine Monitor Alarm will either stop the Air Booster Fans or will not allow them to start.

☐ 3.11 **IF** There is an indication that smoke or toxic gases from the Turbine Building may enter the Control Room.

THEN Instruct Control Room personnel to turn on the Outside Air Booster Fans.

Fans On _____ Time: _____

☐ 3.12 **IF** RIA-39 is in **ALARM**,

THEN Follow AP/1/2/3/1700/018, (Abnormal Release Of Radioactivity).

Fans On _____ Time: _____

☐ Secure fans if back-up sample by RP shows RIA-39 is in error.

☐ Isolate source of airborne contamination to the Control Room if sample from RP shows RIA alarm is valid.

☐ Secure fans if dose levels in CR/TSC/OSC are increased by the addition of outside filtered air.

Fans Off _____ Time: _____

NOTE:
- 10CFR50.54(q) allows for reasonable actions that depart from a License Condition or Technical Specification to be performed in an emergency when this action is immediately needed to protect the health and safety of the public and no action consistent with the License Condition or Technical Specification that can provide adequate or equivalent protection is immediately apparent.
- 10CFR50.54 (y) requires approval of any 10CFR50.54(x) actions by a Licensed Senior Operator
- Implementation of Oconee Severe Accident Guidelines (OSAG) requires the use of 10CFR50.54 (x) and (y) provisions.

☐ 3.13 **IF** Plant conditions require a decision to implement 10CFR50.54(x),

THEN Perform the following steps:

☐ 3.13.1 Document decision and actions taken in the affected unit's log.

☐ 3.13.2 Document decision and actions taken in the CR Emergency Coordinator Log.

NOTE: NRC **must be** notified of any 10CFR50.54(x) decisions and actions within one (1) hour.

☐ 3.13.3 Request CR NRC Communicator to report decision and actions taken to the NRC.

NOTE: 10CFR50.72 requires NRC notification for specific plant conditions.

☐ 3.14 **IF** Plant conditions require NRC notification under 10CFR50.72,

THEN Request the CR NRC Communicator to provide this notification using the guidance in OMP 1-14, (Notifications).

3.15 **IF** The Emergency Response Organization was activated and a security event involving an intrusion/attempted intrusion **does not** exist, {4}

THEN Provide turnover to the Technical Support Center using Enclosure 4.5 of this procedure.

Technical Support Center Activated _____ Time: _____

A. Turn over all emergency response procedures in use to the TSC.

NOTE:
- After normal working hours, emergency response personnel will not report to the TSC or OSC until after the security threat has been neutralized.
- The EOF Director will notify the Control Room Emergency Coordinator once the EOF is *Operational* and initiate turnover.

☐ 3.16 **IF** The Emergency Response Organization was activated after normal working hours **AND** a security event involving an intrusion/attempted intrusion does exist,

THEN Provide turnover to the EOF Director using the following guidance. {4}

☐ 3.16.1 Obtain the current copy of the Emergency Notification Form and plant status.
A. Verify the following information being provided by the EOF Director to the Control Room Emergency Coordinator.

- Present Emergency Classification _____ Time of Classification _____

  Initial Emergency Classification _____ Time of Classification _____
- Initiating Condition/Unit(s) Affected: _____
  _____
  _____
- Present status of affected unit(s), including significant equipment out of service.

  Plant Condition: Improving ___ Stable ___ Degrading ___
  Status of affected unit(s):
  Unit 1 shutdown at _____ or at _____ % Power

  Unit 2 shutdown at _____ or at _____ % Power

  Unit 3 shutdown at _____ or at _____ % Power

  Equipment out of service: _____
- Emergency Releases:
  None ____ Potential ___ Is Occurring _____ Has Occurred ___
- Protective Action Recommendations:
  None ____
  Oconee County: _____
  Pickens County: _____
- Last Message Number _____ Next Message due at (time): _____

☐ 3.16.2 Control Room Emergency Coordinator turnover to EOF Director completed.

EOF Activated _____ Time _____

☐ 3.16.3 Direct NRC Communicator to notify the NRC Operations Center that the EOF is activated.

3.17 **IF** An Unusual Event classification is being terminated,

THEN **REFER TO** Enclosure 4.6, (Emergency Classification Termination Criteria), of this procedure for termination guidance.

☐ 3.17.1 Verify that the Offsite Communicator has provided termination message to the offsite agencies.

NOTE: The EP Section shall develop a written report, for signature by the Site Vice President, to the State Emergency Preparedness Agency, Oconee County EPD, and Pickens County EPD within 24 working hours of the event termination.

☐ 3.17.2 Notify Emergency Planning Section (Emergency Planning Duty person after hours) that the Unusual Event has been terminated.

☐ 3.17.3 Emergency Planning shall hold a critique following termination of any actual Unusual Event.

4. Enclosures

4.1 General Emergency

4.2 Site Area Emergency

4.3 Alert

4.4 Unusual Event

4.5 Operations Shift Manager to TSC Emergency Coordinator Turnover Sheet

4.6 Emergency Classification Termination Criteria

4.7 Condition A/Condition B Response Actions

4.8 ERO Pager Activation By Security

4.9 References

1. Immediate Actions

NOTE:
- State and County Agencies must be notified of event classification within **15 minutes** of Emergency Declaration.
- Provide Offsite Communicator with declaration time.

☐ 1.1 **IF** It has been determined that an Emergency Action Level for an Initiating Condition has been met,

THEN Declare a **General Emergency**.

Time of Declaration: _____

☐ 1.2 Appoint a person to maintain the Emergency Coordinator Log **OR** maintain the log yourself.

NOTE:
- Remind the Control Room Offsite Communicator that Follow Up notifications (updates) are required at least every **60 Minutes** for this classification.
- Condition A, Dam Failure (Keowee or Jocassee), **OR** Condition B also requires notification of the Georgia Emergency Management Agency and National Weather Service. Remind the Control Room Offsite Communicator to notify these agencies in addition to and after SC State, Oconee County, and Pickens County.

☐ 1.3 Appoint Control Room Offsite Communicator(s).

☐ 1.4 Provide the following Protective Action Recommendations for use by the Offsite Communicator to complete the Emergency Notification Form.

PROTECTIVE ACTION RECOMMENDATION	PICKENS COUNTY SECTORS							OCONEE COUNTY SECTORS						
	A0	A1	B1	C1	A2	B2	C2	A0	D1	E1	F1	D2	E2	F2
EVACUATE	X	X	X	X				X	X	X	X			
SHELTER					X	X	X					X	X	X

1.4.1 **IF** Condition A, Imminent or Actual Dam Failure (Keowee or Jocassee) exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 1.0, for additional Protective Action Recommendations.

NOTE: Steps 1.6 - 1.13 may be started/completed while the Emergency Notification Form is being prepared by the Offsite Communicator.

☐ 1.5 Review and approve completed Emergency Notification Form.

1.5.1 Sign Emergency Notification Form.

NOTE: Activate the Alternate TSC and OSC in the Oconee Office Building, Rooms 316 and 316A, if a fire in the Turbine Building, flooding conditions, security events (except those involving intrusion/attempted intrusion), or onsite/offsite hazardous materials spill have occurred or are occurring. {4}

☐ 1.6 Activate the Emergency Response Organization (ERO) by completing the following actions.

1.6.1 Activate ERO Pagers as follows:

NOTE: Flooding/dam failure/earthquake conditions assume bridges may be impassable to reach emergency facilities. Provide the code below for these conditions.

☐ A. **IF** ERO activation for an Emergency (Blue Echo) is required,
THEN Press ERO Pager Activation Panel Button **1**.

☐ B. **IF** ERO activation for an Emergency affecting bridges (Blue Echo Bridges) is required,
THEN Press ERO Pager Activation Panel Button **2**.

☐ C. **IF** ERO activation for a Drill (Blue Delta) is required,
THEN Press ERO Pager Activation Panel Button **3**.

☐ D. **IF** ERO activation for a Drill affecting bridges (Blue Delta Bridges) is required,
THEN Press ERO Pager Activation Panel Button **4**.

WARNING: Activating the Alternate TSC and OSC during security events involving an intrusion/ attempted intrusion into the site is not recommended. {4}

☐ E. **IF** Alternate TSC/OSC will be used,
THEN Press ERO Pager Activation Panel Button **5**.

☐ F. **IF** A Security Event is in progress,
THEN Press ERO Pager Activation Panel Button **6**.

☐ 1.6.2 Wait one minute and repeat step 1.6.1.

☐ 1.6.3 Monitor ERO Pager and verify that message has been provided to the ERO.

☐ 1.6.4 Repeat steps 1.6.1 - 1.6.3 if message is not displayed on ERO Pager.

A. **REFER TO** Enclosure 4.8, (ERO Pager Activation By Security), if the ERO Pager is not activated by the completion of Steps 1.6.1 - 1.6.3.

☐ 1.6.5 **IF** ERO activation is after normal working hours,

THEN Contact Security at extension 3636 or 2309.

Security Officer Name _____

A. Request Security Officer to activate the CAN call list.

WARNING: Conducting Site Assembly during a Security Event may not be prudent.

☐ 1.7 Contact the Security Shift Supervisor.

1.7.1 Inform the Security Shift Supervisor that the ERO has been activated.

1.7.2 Discuss the need to conduct Site Assembly.

☐ 1.8 **IF** A Security Event does **NOT** exist,

OR A Security Event does exist and the Security Shift Supervisor agrees,

THEN Conduct Site Assembly per RP/0/B/1000/009, (Procedure For Site Assembly), Enclosure 4.1 and 4.3.

☐ 1.9 **IF** Area Radiation Monitors are in **ALARM**,

OR Steam Line Break has occurred,

THEN Contact shift RP and dispatch onsite monitoring teams.

NOTE:
- Remind the NRC Communicator to complete the NRC Event Notification Worksheet and Plant Status Sheet from OMP 1-14 (Notifications).
- An open line to the NRC may be required.

☐ 1.10 Appoint a SRO to notify the NRC immediately after notification of the Offsite Agencies but not later than **one (1) hour** after declaration of the emergency.

1.10.1 NRC Communicator (SRO) Name _____

NOTE: The NRC Communicator is responsible for activating ERDS.

☐ 1.10.2 Start the Emergency Response Data System (ERDS) for unit(s) involved within **one (1) hour** of the emergency classification.

A. **REFER TO** RP/0/B/1000/003A, (ERDS Operation).

☐ 1.11 Evacuate all non-essential personnel from the site after personnel accountability has been reached.

1.11.1 **REFER TO** RP/0/B/1000/010, (Procedure For Emergency Evacuation/ Relocation Of Site Personnel).

☐ 1.12 **IF** Condition A, Imminent or Actual Dam Failure (Keowee or Jocassee),

OR Condition B (Keowee) exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 2.0 or 3.0, for additional response actions.

☐ 1.13 Return to Step 3.0, (Subsequent Actions), of this procedure.

1. Immediate Actions

NOTE:
- State and County Agencies must be notified of event classification within **15 minutes** of Emergency Declaration.
- Provide Offsite Communicator with declaration time.

☐ 1.1 **IF** It has been determined that an Emergency Action Level for an Initiating Condition has been met,

THEN Declare a **Site Area Emergency**.

Time of Declaration: _____

☐ 1.2 Appoint a person to maintain the Emergency Coordinator Log **OR** maintain the log yourself.

NOTE:
- Remind the Control Room Offsite Communicator that Follow Up notifications (updates) are required at least every **60 Minutes** for this classification.
- Condition A, Dam Failure (Keowee or Jocassee), **OR** Condition B also requires notification of the Georgia Emergency Management Agency and National Weather Service. Remind the Control Room Offsite Communicator to notify these agencies in addition to and after SC State, Oconee County, and Pickens County.

☐ 1.3 Appoint Control Room Offsite Communicator(s).

☐ 1.4 **IF** Condition A, Imminent or Actual Dam Failure (Keowee or Jocassee), exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 1.0, and provide Protective Action Recommendations to the Offsite Communicator. {5}

NOTE: Steps 1.6 - 1.12 may be started/completed while the Emergency Notification Form is being prepared by the Offsite Communicator.

☐ 1.5 Review and approve completed Emergency Notification Form.

1.5.1 Sign Emergency Notification Form.

NOTE: Activate the Alternate TSC and OSC in the Oconee Office Building, Rooms 316 and 316A, if a fire in the Turbine Building, flooding conditions, security events (except those involving intrusion/attempted intrusion), or onsite/offsite hazardous materials spill have occurred or are occurring. {4}

☐ 1.6 Activate the Emergency Response Organization (ERO) by completing the following actions.

1.6.1 Activate ERO Pagers as follows:

NOTE: Flooding/dam failure/earthquake conditions assume bridges may be impassable to reach emergency facilities. Provide the code below for these conditions.

☐ A. **IF** ERO activation for an Emergency (Blue Echo) is required,
THEN Press ERO Pager Activation Panel Button 1.

☐ B. **IF** ERO activation for an Emergency affecting bridges (Blue Echo Bridges) is required,
THEN Press ERO Pager Activation Panel Button 2.

☐ C. **IF** ERO activation for a Drill (Blue Delta) is required,
THEN Press ERO Pager Activation Panel Button 3.

☐ D. **IF** ERO activation for a Drill affecting bridges (Blue Delta Bridges) is required,
THEN Press ERO Pager Activation Panel Button 4.

WARNING: Activating the Alternate TSC and OSC during security events involving an intrusion/ attempted intrusion into the site is not recommended. {4}

☐ E. **IF** Alternate TSC/OSC will be used,
THEN Press ERO Pager Activation Panel Button 5.

☐ F. **IF** A Security Event is in progress,
THEN Press ERO Pager Activation Panel Button 6.

☐ 1.6.2 Wait one minute and repeat step 1.6.1.

☐ 1.6.3 Monitor ERO Pager and verify that message has been provided to the ERO.

☐ 1.6.4 Repeat steps 1.6.1 - 1.6.3 if message is not displayed on ERO Pager.

A. **REFER TO** Enclosure 4.8, (ERO Pager Activation By Security), if the ERO Pager is not activated by the completion of Steps 1.6.1 - 1.6.3.

☐ 1.6.5 **IF** ERO activation is after normal working hours,
THEN Contact Security at extension 3636 or 2309.

Security Officer Name _____

A. Request Security Officer to activate the CAN call list.

WARNING: Conducting Site Assembly during a Security Event may not be prudent.

☐ 1.7 Contact the Security Shift Supervisor.

1.7.1 Inform the Security Shift Supervisor that the ERO has been activated.

1.7.2 Discuss the need to conduct Site Assembly.

☐ 1.8 **IF** A Security Event does **NOT** exist,
OR A Security Event does exist and the Security Shift Supervisor agrees,
THEN Conduct Site Assembly per RP/0/B/1000/009, (Procedure For Site Assembly), Enclosure 4.1 and 4.3.

☐ 1.9 **IF** Area Radiation Monitors are in **ALARM**,
OR Steam Line Break has occurred,
THEN Contact shift RP and dispatch onsite monitoring teams.

NOTE:
- Remind the NRC Communicator to complete the NRC Event Notification Worksheet and Plant Status Sheet from OMP 1-14 (Notifications).
- An open line to the NRC may be required.

☐ 1.10 Appoint an SRO to notify the NRC immediately after notification of the Offsite Agencies but not later than **one (1) hour** after declaration of the emergency.

1.10.1 NRC Communicator (SRO) Name_____

NOTE: The NRC Communicator is responsible for activating ERDS.

☐ 1.10.2 Start the Emergency Response Data System (ERDS) for unit(s) involved within **one (1) hour** of the emergency classification.

A. **REFER TO** RP/0/B/1000/003A, (ERDS Operation).

☐ 1.11 **IF** Condition A, Imminent or Actual Dam Failure (Keowee or Jocassee),

OR Condition B (Keowee) exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 2.0 or 3.0, for additional response actions.

☐ 1.12 Return to Step 3.0, (Subsequent Actions), of this procedure.

1. Immediate Actions

NOTE:
- State and County Agencies must be notified of event classification within **15 minutes** of Emergency Declaration.
- Provide Offsite Communicator with declaration time.

☐ 1.1 **IF** It has been determined that an Emergency Action Level for an Initiating Condition has been met,

THEN Declare an **Alert**.

Time of Declaration: _____

☐ 1.2 Appoint a person to maintain the Emergency Coordinator Log **OR** maintain the log yourself.

NOTE:
- Remind the Control Room Offsite Communicator that Follow Up notifications (updates) are required at least every **60 minutes** for this classification.
- Condition B for Keowee Hydro Project Dams/Dikes also requires notification of the Georgia Emergency Management Agency and National Weather Service. Remind the Control Room Offsite Communicator to notify these agencies in addition to and after SC State, Oconee County, and Pickens County.

☐ 1.3 Appoint Control Room Offsite Communicator(s).

NOTE: Steps 1.5 - 1.11 may be started/completed while the Emergency Notification Form is being prepared by the Offsite Communicator.

☐ 1.4 Review and approve completed Emergency Notification Form.

1.4.1 Sign Emergency Notification Form.

NOTE: Activate the Alternate TSC and OSC in the Oconee Office Building, Rooms 316 and 316A, if a fire in the Turbine Building, flooding conditions, security events (except those involving intrusion/attempted intrusion), or onsite/offsite hazardous materials spill have occurred or are occurring. {4}

☐ 1.5 Activate the Emergency Response Organization (ERO) by completing the following actions.

1.5.1 Activate ERO Pagers as follows:

NOTE: Flooding/dam failure/earthquake conditions assume bridges may be impassable to reach emergency facilities. Provide the code below for these conditions.

☐ A. **IF** ERO activation for an Emergency (Blue Echo) is required,
THEN Press ERO Pager Activation Panel Button **1.**

☐ B. **IF** ERO activation for an Emergency affecting bridges (Blue Echo Bridges) is required,
THEN Press ERO Pager Activation Panel Button **2.**

☐ C. **IF** ERO activation for a Drill (Blue Delta) is required,
THEN Press ERO Pager Activation Panel Button **3.**

☐ D. **IF** ERO activation for a Drill affecting bridges (Blue Delta Bridges) is required,
THEN Press ERO Pager Activation Panel Button **4.**

WARNING: Activating the Alternate TSC and OSC during security events involving an intrusion/ attempted intrusion into the site is not recommended. {4}

☐ E. **IF** Alternate TSC/OSC will be used,
THEN Press ERO Pager Activation Panel Button **5.**

☐ F. **IF** A Security Event is in progress,
THEN Press ERO Pager Activation Panel Button **6.**

☐ 1.5.2 Wait one minute and repeat step 1.5.1.

☐ 1.5.3 Monitor ERO Pager and verify that message has been provided to the ERO.

☐ 1.5.4 Repeat steps 1.5.1 - 1.5.3 if message is not displayed on ERO Pager.

A. **REFER TO** Enclosure 4.8, (ERO Pager Activation By Security), if the ERO Pager is not activated by the completion of Steps 1.5.1 - 1.5.3.

☐ 1.5.5 **IF** ERO activation is after normal working hours,
THEN Contact Security at extension 3636 or 2309.

Security Officer Name _____

A. Request Security Officer to activate the CAN call list.

WARNING: Conducting Site Assembly during a Security Event may not be prudent.

☐ 1.6 Contact the Security Shift Supervisor.

1.6.1 Inform the Security Shift Supervisor that the ERO has been activated.

1.6.2 Discuss the need to conduct Site Assembly.

☐ 1.7 **IF** A Security Event does **NOT** exist,
OR A Security Event does exist and the Security Shift Supervisor agrees,
THEN Conduct Site Assembly per RP/0/B/1000/009, (Procedure For Site Assembly), Enclosure 4.1 and 4.3.

☐ 1.8 **IF** Area Radiation Monitors are in **ALARM**,
OR Steam Line Break has occurred,
THEN Contact shift RP and dispatch onsite monitoring teams

NOTE:
- Remind the NRC Communicator to complete the NRC Event Notification Worksheet and Plant Status Sheet from OMP 1-14 (Notifications).
- An open line to the NRC may be required.

☐ 1.9 Appoint an SRO to notify the NRC immediately after notification of the Offsite Agencies but not later than **one (1) hour** after declaration of the emergency.

1.9.1 NRC Communicator (SRO) Name _____

NOTE: The NRC Communicator is responsible for activating ERDS.

☐ 1.9.2 Start the Emergency Response Data System (ERDS) for unit(s) involved within **one (1) hour** of the emergency classification.

A. **REFER TO** RP/0/B/1000/003A, (ERDS Operation).

☐ 1.10 **IF** Condition B at Keowee exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 3.0, for additional response actions.

☐ 1.11 Return to Step 3.0, (Subsequent Actions), of this procedure.

1. Immediate Actions

NOTE:
- State and County Agencies must be notified of event classification within **15 minutes** of Emergency Declaration.
- Provide Offsite Communicator with declaration time.

☐ 1.1 IF It has been determined that an Emergency Action Level for an Initiating Condition has been met,

THEN Declare an **Unusual Event.**

Time of Declaration: _____

☐ 1.2 Appoint a person to maintain the Emergency Coordinator Log OR maintain the log yourself.

NOTE:
- Remind the Control Room Offsite Communicator that an Initial Message and a Termination Message are required for this classification. No Follow Up Notifications (updates) are required unless requested by the Offsite Agencies.
- Condition B for Keowee Hydro Project Dams/Dikes also requires notification of the Georgia Emergency Management Agency and National Weather Service. Remind the Control Room Offsite Communicator to notify these agencies in addition to and after SC State, Oconee County, and Pickens County.

☐ 1.3 Appoint Control Room Offsite Communicator(s).

NOTE: Steps 1.5 - 1.11 may be started/completed while the Emergency Notification Form is being prepared by the Offsite Communicator.

☐ 1.4 Review and approve completed Emergency Notification Form.

1.4.1 Sign Emergency Notification Form.

☐ 1.5 IF Condition B at Keowee exists,

THEN **REFER TO** Enclosure 4.7, (Condition A/Condition B Response Actions), Step 3.0, for additional response actions.

NOTE:
- Activation of the ERO is NOT required for an Unusual Event Classification.
- Activate the Alternate TSC and OSC in the Oconee Office Building, Rooms 316 and 316A, if a fire in the Turbine Building, flooding conditions, security events (except those involving intrusion/attempted intrusion), or onsite/offsite hazardous materials spills have occurred or are occurring. {4}

☐ 1.6 **IF** Emergency Response Organization (ERO) activation is desired,
THEN Complete the following actions.

1.6.1 Activate ERO Pagers as follows:

NOTE: Flooding/dam failure/earthquake conditions assume bridges may be impassable to reach emergency facilities. Provide the code below for these conditions.

☐ A. **IF** ERO activation for an Emergency (Blue Echo) is required,
THEN Press ERO Pager Activation Panel Button 1.

☐ B. **IF** ERO activation for an Emergency affecting bridges (Blue Echo Bridges) is required,
THEN Press ERO Pager Activation Panel Button 2.

☐ C. **IF** ERO activation for a Drill (Blue Delta) is required,
THEN Press ERO Pager Activation Panel Button 3.

☐ D. **IF** ERO activation for a Drill affecting bridges (Blue Delta Bridges) is required,
THEN Press ERO Pager Activation Panel Button 4.

WARNING: Activating the Alternate TSC and OSC during security events involving an intrusion/ attempted intrusion into the site is not recommended. {4}

☐ E. **IF** Alternate TSC/OSC will be used,
THEN Press ERO Pager Activation Panel Button 5.

☐ F. **IF** A Security Event is in progress,
THEN Press ERO Pager Activation Panel Button 6.

☐ 1.6.2 Wait one minute and repeat step 1.6.1.

☐ 1.6.3 Monitor ERO Pager and verify that message has been provided to the ERO.

☐ 1.6.4 Repeat steps 1.6.1 - 1.6.3 if message is not displayed on ERO Pager.

A. **REFER TO** Enclosure 4.8, (ERO Pager Activation By Security), if the ERO Pager is not activated by the completion of Steps 1.6.1 - 1.6.3.

☐ 1.6.5 **IF** ERO activation is after normal working hours,

THEN Contact Security at extension 3636 or 2309.

Security Officer Name _____

A. Request Security Officer to activate the CAN call list.

WARNING: Conducting Site Assembly during a Security Event may not be prudent.

☐ 1.7 Contact the Security Shift Supervisor.

1.7.1 Inform the Security Shift Supervisor that the ERO has been activated.

1.7.2 Discuss the need to conduct Site Assembly.

NOTE: Consider conducting a Site Assembly if a Hazardous Materials spill affecting personnel safety is involved; or, if personnel safety is a concern.

☐ 1.8 **IF** The Emergency Response Organization is needed to assist with the Unusual Event emergency activities,

AND A Security Event does **NOT** exist,

OR A Security Event does exist and the Security Shift Supervisor agrees,

THEN Conduct Site Assembly per RP/0/B/1000/009, (Procedure For Site Assembly), Enclosure 4.1 and 4.3.

☐ 1.8.1 Document the decision to conduct Site Assembly in the Control Room Emergency Coordinator Log.

☐ 1.9 **IF** Area Radiation Monitors are in **ALARM**,

OR Steam Line Break has occurred,

THEN Contact shift RP and dispatch onsite monitoring teams.

NOTE:
- Remind the NRC Communicator to complete the NRC Event Notification Worksheet and Plant Status Sheet from OMP 1-14 (Notifications).
- An open line to the NRC may be required.

☐ 1.10 Appoint an SRO to notify the NRC immediately after notification of the Offsite Agencies but not later than **one (1) hour** after declaration of the emergency.

1.10.1 NRC Communicator (SRO) Name_____

☐ 1.11 Return to Step 3.0, (Subsequent Actions), of this procedure.

Enclosure 4.5

Operations Shift Manager To TSC Emergency Coordinator Turnover Sheet

EMERGENCY CLASSIFICATION _____ TIME DECLARED _____
DESCRIPTION OF EVENT _____
_____

Unit One Status:

Reactor Power _____ RCS Pressure _____ RCS Temperature _____
Auxiliaries Being Supplied Power From _____ ES Channels Actuated _____

MAJOR EQUIPMENT OUT OF SERVICE _____
_____
_____
_____

JOBS IN PROGRESS_____
_____
_____

Unit Two Status:

Reactor Power _____ RCS Pressure _____ RCS Temperature _____
Auxiliaries Being Supplied Power From _____ ES Channels Actuated _____

MAJOR EQUIPMENT OUT OF SERVICE _____
_____
_____
_____

JOBS IN PROGRESS_____
_____
_____

Unit Three Status:

Reactor Power _____ RCS Pressure _____ RCS Temperature _____
Auxiliaries Being Supplied Power From _____ ES Channels Actuated _____

MAJOR EQUIPMENT OUT OF SERVICE _____
_____
_____
_____

JOBS IN PROGRESS_____
_____
_____

Operations Shift Manager To TSC Emergency Coordinator Turnover Sheet

Classification Procedure in Use:

RP/0/B/1000/002 (Control Room Emergency Coordinator Procedure)

Is RP/0/B/1000/03A, (ERDS Operation) in use? Yes ____ No ____ If Yes, Unit No. ____

Step No. ____

Is RP/0/B/1000/007, (Security) in use? Yes ____ No ____ If Yes, Step No. ____

Is RP/0/B/1000/016, (Medical) in use? Yes ____ No ____ If Yes, Step No. ____

Is RP/0/B/1000/017, (Spill Response) in use? Yes ____ No ____ If Yes, Step No. ____

Is RP/0/B/1000/022, (Fire/Flood) in use? Yes ____ No ____ If Yes, Step No. ____

Is RP/0/B/1000/029, (Fire Brigade) in use? Yes ____ No ____ If Yes, Step No. ____

Is Step 5.4 of OMP 1-18 (Implementation Standard During Abnormal And Emergency Events) in use? * Yes ____ No ____

* If yes, implementation of emergency worker exposure limits must be announced over Public Address System. {1}

IF Condition A, Dam Failure, has been declared for Keowee Hydro Project,

THEN Provide the following information to the TSC Emergency Coordinator:

- Status of Offsite Agency Notifications _____
- Recommendations made to offsite agencies _____
- Status of relocation of site personnel _____

What is the status of Site Assembly? (*This question is only applicable for those times that the Emergency Response Organization is activated after hours, holidays, or weekends.*)

_____

_____

_____

Next message due to Offsite Agencies at Time: _____

Operations Shift Manager/CR _____ Time: _____

Emergency Coordinator/TSC _____ Time: _____

Enclosure 4.6

Emergency Classification Termination Criteria

IF The following guidelines **applicable to the present emergency condition** have been met or addressed,

THEN An emergency condition may be considered resolved when:

_____ 1. Existing conditions no longer meet the existing emergency classification criteria and it appears unlikely that conditions will deteriorate further.

_____ 2. Radiation levels in affected in-plant areas are stable or decreasing to below acceptable levels.

_____ 3. Releases of radioactive material to the environment greater than Technical Specifications are under control or have ceased.

_____ 4. The potential for an uncontrolled release of radioactive material is at an acceptably low level.

_____ 5. Containment pressure is within Technical Specification requirements.

_____ 6. Long-term core cooling is available.

_____ 7. The shutdown margin for the core has been verified.

_____ 8. A fire, flood, earthquake, or similar emergency condition is controlled or has ceased.

_____ 9. Offsite power is available per Technical Specification requirements.

_____ 10. All emergency action level notifications have been completed.

_____ 11. Hydro Central has been notified of termination of Condition B for Keowee Hydro Project. {2}

- **REFER TO** Section 6 of the Emergency Telephone Directory, (Keowee Hydro Project Dam/Dike Notification).

_____ 12. The Regulatory Compliance Section has evaluated plant status with respect to Technical Specifications and recommends Emergency classification termination.

_____ _____ 13. Emergency terminated. Request the Control Room Offsite Communicator to complete an *Emergency Notification Form for a Termination Message* using guidance in RP/0/1000/015A, (Offsite Communications From The Control Room), and provide information to offsite agencies.
Date/Time Initial

- Return to Step 3.16.1.

1. Condition A Response - Immediate Actions

☐ 1.1 **IF** Condition A, Imminent or Actual Dam Failure (Keowee or Jocassee) exists,

THEN Perform the following actions:

☐ 1.1.1 Provide the following **protective action recommendations** to Oconee County and Pickens County for imminent/actual dam failure.

A. Provide the following recommendation for Emergency Notification Form Section 15 (B) Evacuate:

1. Move residents living downstream of the Keowee Hydro Project dams to higher ground.

B. Provide the following recommendation for Emergency Notification Form Section 15 (D) Other:

1. Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed.

☐ 1.2 Return to applicable Enclosure (4.1 or 4.2).

☐ 1.2.1 **IF** A General Emergency has been declared,

THEN **GO TO** Step 1.5 of Enclosure 4.1, (General Emergency).

☐ 1.2.2 **IF** A Site Area Emergency has been declared,

THEN **GO TO** Step 1.5 of Enclosure 4.2, (Site Area Emergency).

2. Condition A Response - Subsequent Actions

☐ 2.1 Notify Hydro Central and provide information related to the event.

2.1.1 **REFER TO** Section 6 of the Emergency Telephone Directory, (Keowee Hydro Project Dam/Dike Notification). {2}

☐ 2.2 Relocate Keowee personnel to the Operational Support Center (OSC) if events occur where their safety could be affected.

☐ 2.2.1 **IF** Keowee personnel are relocated to the OSC,

THEN Notify Hydro Central.

A. **REFER TO** Section 6 of the Emergency Telephone Directory, (Keowee Hydro Project Dam/Dike Notification). {2}

NOTE: A loss of offsite communications capabilities (Selective Signaling and the Wide Area Network - WAN) could occur within 1.5 hours after Keowee Hydro Dam failure. Rerouting of the Fiber Optic Network through Bad Creek should be started **as soon as possible**.

☐ 2.3 Notify Telecommunications Group in Charlotte to begin rerouting the Oconee Fiber Optic Network.

2.3.1 **REFER TO** Selective Signaling Section of the Emergency Telephone Directory (page 9).

☐ 2.4 Request Security to alert personnel at the Security Track/Firing Range and Building 8055 (Warehouse #5) to relocate to work areas inside the plant.

NOTE:
- Plant access road to the Oconee Complex could be impassable within **1.5 hours** if the Keowee Hydro Dam fails. A loss of the Little River Dam (Newry Dam) or Dikes A-D will take longer to affect this road.
- PA Announcements can be made by the Control Room using the Office Page Override feature or Security.

☐ 2.5 Make a PA Announcement to relocate personnel at the following locations to the World Of Energy/Operations Training Center.

_____ Oconee Complex

_____ Oconee Garage

_____ Oconee Maintenance Training Facility

☐ 2.6 Dispatch operators to the SSF and establish communications.

☐ 2.7 Return to applicable Enclosure (4.1 or 4.2).

☐ 2.7.1 **IF** A General Emergency has been declared,
THEN **GO TO** Step 1.13 of Enclosure 4.1, (General Emergency).

☐ 2.7.2 **IF** A Site Area Emergency has been declared,
THEN **GO TO** Step 1.12 of Enclosure 4.2, (Site Area Emergency).

3. Condition B Response - Immediate Actions

☐ 3.1 IF Condition B at Keowee exists,
THEN Notify Hydro Central. {2}

3.1.1 **REFER TO** Section 6 of the Emergency Telephone Directory, (Keowee Hydro Project Dam/Dike Notification).

☐ 3.2 Return to applicable Enclosure (4.1, or 4.2, or 4.3, or 4.4).

☐ 3.2.1 IF A General Emergency has been declared,
THEN **GO TO** Step 1.13 of Enclosure 4.1, (General Emergency).

☐ 3.2.2 IF A Site Area Emergency has been declared,
THEN **GO TO** Step 1.12 of Enclosure 4.2, (Site Area Emergency).

☐ 3.2.3 IF An Alert has been declared,
THEN **GO TO** Step 1.11 of Enclosure 4.3, (Alert).

☐ 3.2.4 IF An Unusual Event has been declared,
THEN **GO TO** Step 1.6 of Enclosure 4.4, (Unusual Event).

1. Symptoms

1.1 Activation of the ERO Pagers using the ERO Pager Activation Panel in the TSC was unsuccessful.

2. Immediate Actions

2.1 Activate the Emergency Response Organization (Technical Support Center, Operational Support Center, and Emergency Operations Facility) by completing the following actions.:

2.1.1 Contact Security.

A. Dial 3636 (Dial 2309 if no response is received).

Security Officer Name _____

2.1.2 Read the following information to the Security Officer:

A. The Emergency Response Organization (Technical Support Center, Operational Support Center, and Emergency Response Facility) is being activated for an emergency relating to Unit # _____.

B. This is a _____ Blue Delta (Drill) activation, **OR**

This is a _____ Blue Echo (Emergency) activation

NOTE: Flooding/dam failure/earthquake conditions assume bridges may be impassable to reach emergency facilities. Provide the code below for these conditions.

C. This is a _____ Blue Delta Bridges (Drill) activation, **OR**

This is a _____ Blue Echo Bridges (Emergency) activation

NOTE: Activate the Alternate TSC and OSC in the Oconee Office Building, Rooms 316 and 316A, if a fire in the Turbine Building, flooding conditions, security events (except those involving intrusion/attempted intrusion), or onsite/offsite hazardous materials spills have occurred or are occurring. {4}

WARNING: Activating the Alternate TSC and OSC during security events involving an intrusion/ attempted intrusion into the site is not recommended. {4}

D. _____ The Alternate TSC/OSC will be used

NOTE: The following step is only applicable during security events.

E. _____ A Security Event is in progress.

Facility: **Oconee** Date of Examination: _____

Exam Level (circle one): **RO** / SRO(I) / SRO(U) Operating Test No.: _____

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
(a) **CRO-200, Makeup to the LDST** OP/1103/004 (*Soluble Poison Control*) [KA: 004 A4.13 (3.3/2.9)] (**new**) (15 min)	N, S	1
(b) **CRO- 083, Re-establish RCS letdown flow** AP/32 (Loss of Letdown) [KA: 004 A2.07 (3.4/3.7)] (10 min)	M, A, S	2
(c) **CRO- 066, Perform Required Actions for RCS Pressure ≤ 550 psig** EOP Encl. 5.1 (ES Actuation) [KA: EPE011 EA1.13 (4.1/4.2)] (15 min)	D, A, S	3
(d) **CRO-013, Align MDEFDWP Suction to the Hotwell and Feed the SGs** EOP Encl. 5.9 [KA: APE054 AA1.01 (4.5/4.4)] (10 min)	D, L, ~~S~~ C R	4S
(e) **CRO-201, Restart RCP** EOP, Encl. 5.6 [KA: 003 A4.06 (2.9*/2.9)] (**new**) (20 min)	N, S	4P
(f) **CRO-009, Following a Keowee Emergency Start Transfer from CT-4 to CT-5** OP/0/A/1106/019 Encl. 4.12 [KA: 062 A4.01 (3.3/3.1)] (10 min)	D, L, S	6
(g) **CRO-202, Reset RIA-40 setpoints and enter the OAC Pri to *Sec Admin Limit*** PT/230/001 Encl. 13.10 (Operation of RIA-40) [KA: 073 A4.02 (3.7/3.7)] (**new**) (10 min)	N, S	7
(h) **CRO-11A, Align Intake Canal For Recirc On Dam Failure** AP/13 (Dam Failure), [KA: 075 A2.01 (3.0/3.2)] (15 min)	D, L, A, S	8
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
(i) **NLO-022, Station ASW Pump Alignment** EOP Encl. 5.10 [KA: APE054 AA1.01 (4.5/4.4)] (**last exam**) (12 min)	D, R, L	4S
(j) **CRO-47, Emergency start SSF Diesel Generator and supply power to the SSF ASW and SSF RCMU pumps** AP/25, [KA: 062 A2.11 (3.7/4.1)] (10 min)	M, A, L	6
(k) **NLO-007, Start Diesel Air Compressor And Align To Service Air Header** AP/32, Encl. "Emergency Start of the Diesel Air Compressor", [KA: APE-065 AA1.04 (3.5*/3.4*)] (10 min)	D	8

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: **Oconee** Date of Examination: _____

Exam Level (circle one): RO / **SRO(I)** / SRO(U) Operating Test No.: _____

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. **CRO-200, Makeup to the LDST** OP/1103/004 (Soluble Poison Control) [KA: 004 A4.13 (3.3/2.9)] **(new)**	N, S	1
b. **CRO- 083, Re-establish RCS letdown flow** AP/32 (Loss of Letdown) [KA: 004 A2.07 (3.4/3.7)]	M, A, S	2
c. **CRO- 066, Perform Required Actions for RCS Pressure ≤ 550 psig** EOP Encl. 5.1 (ES Actuation) [KA: EPE011 EA1.13 (4.1/4.2)]	D, A, S	3
d. **CRO-013, Align MDEFDWP Suction to the Hotwell and Feed the SGs** EOP Encl. 5.9 [KA: APE054 AA1.01 (4.5/4.4)]	D, L, S, CR	4S
e. **CRO-201, Restart RCP** EOP, Encl. 5.6 [KA: 003 A4.06 (2.9*/2.9)] **(new)**	N, S	4P
f. **CRO-202, Reset RIA-40 setpoints and enter the OAC Pri to Sec Admin Limit** PT/230/001 Encl. 13.10 (Operation of RIA-40) [KA: 073 A4.02 (3.7/3.7)] **(new)**	N, S	7
g. **CRO-11A, Align Intake Canal For Recirc On Dam Failure** AP/13 (Dam Failure), [KA: 075 A2.01 (3.0/3.2)]	D, L, A, S	8
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
h. **NLO-022, Station ASW Pump Alignment** EOP Encl. 5.10 [KA: APE054 AA1.01 (4.5/4.4)] **(last exam)**	D, R, L	4S
i. **CRO-47, Emergency start SSF Diesel Generator and supply power to the SSF ASW and SSF RCMU pumps** AP/25, [KA: 062 A2.11 (3.7/4.1)]	M, A, L	6
j. ***NLO-007, Start Diesel Air Compressor And Align To Service Air Header*** AP/32, Encl. "Emergency Start of the Diesel Air Compressor", [KA: APE-065 AA1.04 (3.5*/3.4*)]	D	8

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: **Oconee**	Date of Examination: _____
Exam Level (circle one): RO / SRO(I) / **SRO(U)**	Operating Test No.: _____

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
(a.) **CRO- 083, Re-establish RCS letdown flow** AP/32 (Loss of Letdown) [KA: 004 A2.07 (3.4/3.7)]	M, A, S	2
(b.) **CRO- 066, Perform Required Actions for RCS Pressure ≤ 550 psig** EOP Encl. 5.1 (ES Actuation) [KA: EPE011 EA1.13 (4.1/4.2)]	D, A, S	3
(c.) **CRO-202, Reset RIA-40 setpoints and enter the OAC Pri to Sec Admin Limit** PT/230/001 Encl. 13.10 (Operation of RIA-40) [KA: 073 A4.02 (3.7/3.7)] (**new**)	N, S	7
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
(d.) **NLO-022, Station ASW Pump Alignment** EOP Encl. 5.10 [KA: APE054 AA1.01 (4.5/4.4)] (**last exam**)	D, R, L	4S
(e.) **NLO-007, Start Diesel Air Compressor And Align To Service Air Header** AP/32, Encl. "Emergency Start of the Diesel Air Compressor", [KA: APE-065 AA1.04 (3.5*/3.4*)]	D	8
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-200

Makeup to LDST

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Makeup to the LDST

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):

System: 004
K/A: A4.13
Rating: 3.3/2.9

Task Standard:

Makeup to the LDST from 1A and 1B BHUT is performed correctly per procedure.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

OP/1/A/1103/004, Encl. 4.5 (RCS Inventory Control)

Validation Time: 15 minutes

Time Critical: No

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 207
2. Place simulator in RUN

Tools/Equipment/Procedures Needed:

OP/1/A/1103/004, Encl. 4.5 (RCS Inventory Control)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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.

LDST level = 80 inches

A batch addition to the LDST is desired

INITIATING CUES:

The SRO directs you to use OP/1/A/1103/004, Encl. 4.5 (RCS Inventory Control) beginning at step 3.2 to add the following to the LDST:

- 50 gallons from 1A BHUT
- 10 gallons from 1B BHUT

START TIME: _____

STEP 1: Step 3.2 Ensure 1HP-15 Moore Controller reset for Normal Operation. STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and ensure the following: • Mode selector in "MANUAL" • Display selector to "P" • Valve position: 100% open • Start-stop to "START" COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 3.3 **IF** two Letdown Filters are available, position the following: • 1HP-17 (1A LETDOWN FILTER INLET) switch to OPEN • 1HP-18 (1B LETDOWN FILTER INLET) switch to OPEN STANDARD: Place a second Letdown Filter in service by locating 1HP-18 (1B LETDOWN FILTER INLET) switch on 1UB1 and placing it in the OPEN position. Valve is verified open by red light illuminated. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 3.4 Ensure open 1HP-16 (LDST MAKEUP ISOLATION) STANDARD: Locate 1HP-16 on 1UB1 and open the valve by rotating the switch to the open position. The red light will illuminate and the green light will go off. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 4: Step 3.5 **IF** required makeup from 1A BHUT as follows: Step 3.5.1 **IF** required, makeup with 1HP-15 in auto as follows: • Select "S" on 1HP-15 Moore Controller. • Enter batch size on 1HP-15 Moore Controller. • Place 1HP-15 Moore Controller in "AUTO". • Ensure "P" on 1HP-15 Moore Controller. • Ensure 1HP-14 (LDST BYPASS) to "NORMAL". STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and perform the following: • Select "S" on 1HP-15 Moore Controller. • Enter batch size of 50 gallons on 1HP-15 Moore Controller. • Place 1HP-15 Moore Controller in "AUTO". • Ensure "P" on 1HP-15 Moore Controller. • Ensure 1HP-14 (LDST BYPASS) to "NORMAL". ***Cue: If asked, inform candidate that it is desired to perform the makeup with 1HP-15 in auto.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Step 3.5.2 Start 1A BLEED TRANSFER PUMP. **NOTE:** • Normal make-up flow rate should be > 55 gpm. STANDARD: Locate the switch for 1A BLEED TRANSFER PUMP on 1AB1 and start the pump by rotating the switch to the START position. The red light will illuminate and the green light will go off. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Step 3.5.3 Open 1CS-46 (1A RC BLEED XFER PUMP DISCH) **NOTE:** 1HP-15 may require throttling if only one Letdown Filter is in service and ΔP is high. STANDARD: Locate 1CS-46 (1A RC BLEED XFER PUMP DISCH) valve on 1AB1 and open the valve by rotating the switch to the OPEN position. The red light will illuminate and the green light will go off. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Step 3.5.4 **IF** required, throttle 1HP-15 as follows: • Ensure 1HP-15 Moore Controller in "MANUAL" • Throttle 1HP-15 to control make-up flow to LDST STANDARD: Determine throttling 1HP-15 is not required when two Letdown Filters are in service. COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 3.5.5 **IF** required, lower LDST level per Section 4 "Reducing RCS Inventory". STANDARD: Determine lowering LDST level is not required. COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 3.5.6 **WHEN** required, stop 1A BLEED TRANSFER PUMP STANDARD: When the addition is completed the candidate should stop the 1A BLEED TRANSFER PUMP (located on 1AB1). COMMENTS:	___ SAT ___ UNSAT

STEP 10: Step 3.5.7 **WHEN** required: Close 1CS-46 (1A RC BLEED XFER PUMP DISCH) STANDARD: When the addition is completed the candidate should: Close 1CS-46 (1A RC BLEED XFER PUMP DISCH) by rotating the switch to the CLOSE position. Valve is verified closed by red light off and green light illuminated. (located on 1AB1) COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 3.5.8 Reset 1HP-15 Moore Controller for Normal Operation. STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and ensure the following: • Mode selector in "MANUAL" • Display selector to "P" • Valve position: 100% open • Start-stop to "START" ***Cue: Another operator will complete this addition to the LDST.*** COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	Step required to establish flow path to LDST.
4	Step required to properly setting up 1HP-15 for addition.
5	Step required to pump water to LDST.
6	Step required to establish flow path to LDST.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 is at 100% power.

LDST level = 80 inches

A batch addition to the LDST is desired

INITIATING CUES:

The SRO directs you to use OP/1/A/1103/004, Encl. 4.5 (RCS Inventory Control) beginning at step 3.2 to add the following to the LDST:

- 50 gallons from 1A BHUT
- 10 gallons from 1B BHUT

1. Initial Conditions

1.1 None

2. Procedure

NOTE:	This enclosure affects reactivity management by changing RCS boron.

2.1 Perform the following for RCS inventory control:

- IF required, makeup to RCS per Section 3 "RCS Normal Makeup"
- IF required, lower LDST level per Section 4 "Reducing RCS inventory"

3. RCS Normal Makeup

_____ 3.1 Determine amount and source RCS makeup.

☐ IF two Letdown Filters are available review component boron log and make appropriate adjustments to makeup volumes. {15}

_____ 3.2 Ensure 1HP-15 Moore Controller reset for Normal Operation.

NOTE:
- Both filters may be used for RCS makeup and, as a result, may contain different boron concentrations. {11}
- Placing an idle Letdown Filter in service can affect reactivity management by adding different concentration of boron to RCS. {11}
- One Letdown Filter holds ≈ 60 gals. {11} {15}

_____ 3.3 IF two Letdown Filters are available, position the following:

☐ 1HP-17 (1A LETDOWN FILTER INLET) switch to "OPEN"

☐ 1HP-18 (1B LETDOWN FILTER INLET) switch to "OPEN"

_____ 3.4 Ensure Open 1HP-16 (LDST MAKEUP ISOLATION).

3.5 **IF** required makeup from 1A BHUT as follows:

3.5.1 **IF** required, makeup with 1HP-15 in auto as follows:

_____ A. Select "S" on 1HP-15 Moore Controller.

_____ B. Enter batch size on 1HP-15 Moore Controller.

_____ C. Place 1HP-15 Moore Controller in "AUTO".

_____ D. Ensure "P" on 1HP-15 Moore Controller.

_____ E. Ensure 1HP-14 (LDST BYPASS) to "NORMAL".

_____ 3.5.2 Start 1A BLEED TRANSFER PUMP.

NOTE: Normal make-up flow rate should be > 55 gpm. {22}

_____ 3.5.3 Open 1CS-46 (1A RC BLEED XFER PUMP DISCH).

NOTE: 1HP-15 may require throttling if only one Letdown Filter is in service and ΔP is high.

3.5.4 **IF** required, throttle 1HP-15 as follows: {20}

☐ Ensure 1HP-15 Moore Controller in "MANUAL"

☐ Throttle 1HP-15 to control makeup flow to LDST

_____ 3.5.5 **IF** required, lower LDST level per Section 4 "Reducing RCS Inventory".

_____ 3.5.6 **WHEN** required, stop 1A BLEED TRANSFER PUMP.

_____ 3.5.7 Close 1CS-46 (1A RC BLEED XFER PUMP DISCH).

_____ 3.5.8 Reset 1HP-15 Moore Controller for Normal Operation.

3.6 **IF** required makeup from 1B BHUT as follows:

3.6.1 **IF** required, makeup with 1HP-15 in auto as follows:

_____ A. Select "S" on 1HP-15 Moore Controller.

_____ B. *Enter batch size on 1HP-15 Moore Controller.*

_____ C. Place 1HP-15 Moore Controller in "AUTO".

_____ D. Ensure "P" on 1HP-15 Moore Controller.

_____ E. Ensure 1HP-14 (LDST BYPASS) to "NORMAL".

_____ 3.6.2 Start 1B BLEED TRANSFER PUMP.

NOTE: Normal make-up flow rate should be > 55 gpm. {22}

_____ 3.6.3 Open 1CS-56 (1B RC BLEED XFER PUMP DISCH).

NOTE: 1HP-15 may require throttling if only one Letdown Filter is in service and ΔP is high.

3.6.4 **IF** required, throttle 1HP-15 as follows: {20}

☐ Ensure 1HP-15 Moore Controller in "MANUAL"

☐ Throttle 1HP-15 to control makeup flow to LDST

_____ 3.6.5 **IF** required, lower LDST level per Section 4 "Reducing RCS Inventory".

_____ 3.6.6 **WHEN** required, stop 1B BLEED TRANSFER PUMP

_____ 3.6.7 Close 1CS-56 (1B RC BLEED XFER PUMP DISCH).

_____ 3.6.8 Reset 1HP-15 Moore Controller for Normal Operation.

_____ 3.7 Position 1HP-16 (LDST MAKEUP ISOLATION) switch to "CLOSE".

3.8 Check 1HP-16 position per one of the following:

_____ 3.8.1 Verify 1HP-16 closed by indication (closed lamp illuminated and open lamp extinguished).

Or

3.8.2 Check 1HP-16 position by flow check as follows:

_____ A. Start 1A BLEED TRANSFER PUMP.

_____ B. Open 1CS-46 (1A RC BLEED XFER PUMP DISCH).

NOTE:
- Any flow past 1HP-16 could affect core reactivity by changing RCS boron
- **IF** 1A BLEED TRANSFER PUMP flow or 1HP-15 Moore Controller does **NOT** indicate flow, 1HP-16 is closed.

C. Check the following for flow:

☐ 1A BLEED TRANSFER PUMP

☐ 1HP-15 Moore Controller

_____ D. Stop 1A BLEED TRANSFER PUMP.

_____ E. Close 1CS-46 (1A RC BLEED XFER PUMP DISCH).

_____ F. **IF** 1A BLEED TRANSFER PUMP flow or 1HP-15 Moore Controller indicates flow, notify SRO 1HP-16 is **NOT** closed.

_____ G. **IF** required, reset 1HP-15 Moore Controller for Normal Operations.

_____ 3.9 **IF** required, request RCS sample for boron.

_____ 3.10 Record RCS batch volumes in Unit Log.

3.11 **IF** required, place one Letdown Filter in service as follows:

_____ 3.11.1 Verify > 10 minutes since LDST makeup was secured. {11}

_____ 3.11.2 Position one of the following:

☐ 1HP-17 (1A LETDOWN FILTER INLET) switch to "CLOSE"

Or

☐ 1HP-18 (1B LETDOWN FILTER INLET) switch to "CLOSE"

_____ 3.12 **IF** two Letdown Filters were used, make appropriate entries for Letdown Filters in component boron log. {15}

4. Reducing RCS inventory

NOTE:	If make-up is in progress, make-up flow can be diverted from LDST to BHUT while cycling 1HP-14 (10-15 second stroke time). {21}

4.1 **IF** required, reduce RCS inventory as follows:

4.1.1 Check the following:

_____ • Ensure open 1CS-26 (LETDOWN TO RC BHUT)

_____ • Ensure open 1CS-41 (1A RC BHUT INLET)

_____ 4.1.2 Position 1HP-14 (LDST BYPASS) to "BLEED".

_____ 4.1.3 **WHEN** required, position 1HP-14 (LDST BYPASS) to "NORMAL".

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-083

Reestablish RCS Letdown Flow

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Reestablish RCS letdown flow

Alternate Path:

Yes

Facility JPM #:

CRO-083

K/A Rating(s):

System: 004
K/A: A2.07
Rating: 3.4/3.7

Task Standard:

RCS Letdown flow is restored correctly using AP/32 (Loss of Letdown)

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

AP/32 (Loss of Letdown)

Validation Time: 10 minutes

Time Critical: No

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 201
2. Place simulator in RUN

Tools/Equipment/Procedures Needed:

AP/32 (Loss of Letdown)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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.

1CC-8 (CC RETURN OUTSIDE BLOCK) was inadvertently closed during ES testing.

Letdown flow has been lost.

Component cooling flow has been restored.

INITIATING CUES:

The SRO directs you initiate AP/32 (Loss of Letdown).

START TIME: _____

STEP 1:	Step 4.1 Ensure in HAND and reduce demand to zero.	___ SAT
STANDARD:	1HP-120 (located on 1UB1) is taken to HAND by depressing the HAND button and reducing demand using the toggle switch.	___ UNSAT
COMMENTS:		
STEP 2:	Step 4.2 Initiate makeup to LDST with boron concentration ≥ RCS boron concentration as required.	___ SAT
STANDARD:	Determine makeup to LDST is not required at this time.	___ UNSAT
COMMENTS:		
STEP 3:	Step 4.3 **IAAT** additional makeup flow is desired **AND** 1A Bleed Transfer Pump is operating, **THEN** dispatch an operator to close 1CS-48 (1A BHUT RECIRC)	___ SAT
STANDARD:	Determine additional makeup flow is not required at this time.	___ UNSAT
COMMENTS:		
STEP 4:	Step 4.4 Notify chemist of the following: • Current RCS boron sample is needed for possible unit shutdown. • Normal letdown line is isolated.	___ SAT
STANDARD:	Chemistry is notified of the need for an RCS sample and the normal letdown line is isolated.	___ UNSAT
COMMENTS:		

STEP 5:	Step 4.5 **IAAT** Pzr level ≥ 260" **AND** letdown CANNOT be established, **THEN** initiate unit shutdown at ≈ 20%/min per AP/29 (Rapid Unit Shutdown)	___ SAT ___ UNSAT
STANDARD:	Determine unit shutdown is not required.	
COMMENTS:		
STEP 6:	Step 4.6 **IAAT** Pzr level ≥ 375" **THEN** trip RX.	___ SAT
STANDARD:	Determine tripping the reactor is not required.	___ UNSAT
COMMENTS:		
STEP 7:	Step 4.7 Verify CC system in operation.	___ SAT
STANDARD:	Verify proper operation of the CC system by observing 1A CC pump operating with normal CC system flows and pressures.	___ UNSAT
COMMENTS:		
STEP 8:	Step 4.8 Position the standby HPI pump switch to OFF.	___ SAT
STANDARD:	Locate the standby HPI pump switch (located on 1UB1) and place in OFF.	___ UNSAT
COMMENTS:		

STEP 9: Step 4.9 Throttle 1HP-31 to establish 12 -15 gpm SEAL INLET HDR FLOW. STANDARD: Locate 1HP-31 (on 1UB1) and use the setpoint knob to adjust SEAL INLET HDR FLOW to 12 -15 gpm. COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 4.10 Verify loss of letdown is due to letdown valve or interlock failure. STANDARD: Determine that the loss of letdown in not due to letdown valve or interlock failure. **GO TO** Step 4.29 ***Cue: If ask as the SRO, inform candidate that the loss of letdown was not due to letdown valve or interlock failure.*** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 4.29 **WHEN** letdown can be re-established, **THEN** ensure proper operation of the CC system. STANDARD: Verify proper operation of the CC system by observing 1A CC pump operating with normal CC system flows and pressures. COMMENTS:	___ SAT ___ UNSAT

STEP 12: *Step 4.30* Close 1HP-6 (LETDOWN ORIFICE STOP) STANDARD: 1HP-6 (LETDOWN ORIFICE STOP) switch on 1UB1 is placed in the CLOSE position. The green CLOSED light illuminates and the red OPEN light extinguishes. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 4.31 Close 1HP-7 (LETDOWN CONTROL). STANDARD: 1HP-7 (LETDOWN CONTROL) is located on 1UB1 and the manual controller is rotated counter-clockwise until the position demand needle indicates 0%. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 4.32 Ensure the following are open: • 1HP-1 (1A LETDOWN COOLER INLET) • 1HP-2 (1B LETDOWN COOLER INLET) • 1HP-3 (1A LETDOWN COOLER OUTLET) • 1HP-4 (1B LETDOWN COOLER OUTLET) STANDARD: The above valves are located on 1UB1 and verified open by observing the red OPEN light lit and green CLOSED light off. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	___ SAT ___ UNSAT

STEP 15: Step 4.33 Verify letdown temperature < 135°F. STANDARD: Locate LETDOWN TEMP meter on 1UB1 and determine that letdown *temperature is greater than* 135°F. Perform RNO steps. COMMENTS:	___ SAT ___ UNSAT
STEP 16: Step 4.33 **RNO** 1 Open 1HP-13 (PURIFICATION IX BYPASS) STANDARD: 1HP-13 (PURIFICATION IX BYPASS) control switch is located on 1UB1, and the switch is rotated to the OPEN position. Red OPEN light illuminates, and green CLOSE light extinguishes. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	___ SAT ___ UNSAT
STEP 17: Step 4.33 **RNO** 2 Ensure the following are closed: • 1HP-8 (PURIFICATION IX INLET) • 1HP-9&11 (SPARE PURIF IX INLET AND OUTLET) STANDARD: 1HP-8 (PURIFICATION IX INLET) control switch is located on 1UB1 and the switch is rotated to the CLOSED position. Green CLOSE light *illuminates. Red OPEN light extinguishes.* 1HP-9&11 on 1UB1 verified closed by Green CLOSE light lit. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	___ SAT ___ UNSAT

STEP 18: Step 4.33 **RNO** 3 **IF** any deborating IX in service, **THEN** perform the following... STANDARD: Determine that no deborating IXs are in service by verifying 1CS-27 (Debor IX Inlet) (1AB1) and 1CS-32 & 37 (Spare Debor IX Inlet & Outlet) (1AB1) are closed. Continue with restoring letdown. **Cue: If asked, inform candidate that no deborating IXs are in service.** COMMENTS:	___ SAT ___ UNSAT
STEP 19: Step 4.33 **RNO** 4 Select LETDOWN HI TEMP INTLK BYP switch to BYPASS. STANDARD: LETDOWN HI TEMP INTLK BYPASS control switch is located on 1UB1, switch is rotated to the BYPASS position. The switch will backlight amber, and statalarm 1SA-2/E-4 HP LETDOWN FLOW INTERLOCK BYPASSED is actuated. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 20: Step 4.34 Ensure 1HP-5 (LETDOWN ISOLATION) is open. STANDARD: 1HP-5 (LETDOWN ISOLATION) control switch is located on 1UB1 and the switch is rotated to the OPEN position. Red OPEN light illuminates, and green CLOSE light extinguishes. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 21: Step 4.35 *Throttle open* 1HP-7 (LETDOWN CONTROL) to establish ≈ 20 gpm. STANDARD: 1HP-7 (LETDOWN CONTROL) is throttled Open to establish ≈ 20 gpm letdown flow as indicated on LETDOWN FLOW meter on 1UB1. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 22: Step 4.36 **WHEN** letdown temperature is < 130°F, **THEN** ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL. STANDARD: Statalarm 1SA-2/C-1, HP-LETDOWN TEMP HI, is located by the student, and verified to be clear, and/or LETDOWN TEMP meter is used to verify letdown temperature is <130°F. LETDOWN HI TEMP INTLK BYP control switch is located on 1UB1 and switch is rotated to the NORM position. Amber backlight goes out, and statalarm 1SA-2/E-4, HP LETDOWN FLOW INTERLOCK BYPASSED, clears. COMMENTS:	___ SAT ___ UNSAT
STEP 23: Step 4.37 Open 1HP-6 (LETDOWN ORIFICE STOP). STANDARD: 1HP-6 (LETDOWN ORIFICE STOP) is placed in the OPEN position. Red OPEN light illuminates, and green CLOSED light extinguishes. **Note: Candidate may use OAC indication to verify valve position.** COMMENTS:	___ SAT ___ UNSAT

STEP 24: Step 4.38 Adjust 1HP-7 (LETDOWN CONTROL) to control desired letdown flow. STANDARD: 1HP-7, (LETDOWN CONTROL) station is located by student and the manual controller is slowly rotated clockwise, until ≈ 70 GPM is indicated on the LETDOWN FLOW meter. ***Cue: SRO desires 70-gpm letdown flow.*** COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
19	Bypassing interlock required to re-open 1HP-5 to reestablish letdown flow.
20	Aligns flow path to reestablish letdown flow.
21	Aligns flow path to reestablish letdown flow.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit #1 is at 100% power.

1CC-8 (CC RETURN OUTSIDE BLOCK) was inadvertently closed during ES testing.

Letdown flow has been lost.

Component cooling flow has been restored.

INITIATING CUES:

The SRO directs you initiate AP/32 (Loss of Letdown)

NSD 703 (R04-01)

YMB/YPP
Sim(3)
NRC
Brief
115
HLP
SRC

Duke Power Company

PROCEDURE PROCESS RECORD

(1) ID No AP/1/A/1700/ 032

Revision No 002

OTC MASTER FILE

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Loss of Letdown

(4) Prepared By David P. Garland (Signature) David P Garland Date 11/20/02

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By [signature] (QR) Date 12-03-02

Cross-Disciplinary Review By Gerald Ottman (QR)NA Date 12/10/02

Reactivity Mgmt Review By (ENGINEERING) [signature] (QR)NA Date 12-03-02

Mgmt Involvement Review By (Ops Supt) NA [initials] Date

(7) Additional Reviews

Reviewed By Date

Reviewed By Date

(8) Temporary Approval *(if necessary)*

By (OSM/QR) Date

By (QR) Date

(9) Approved By [signature] Date 12/10/02

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy Date

Compared with Control Copy Date

Compared with Control Copy Date

(11) Date(s) Performed

Work Order Number (WO#)

COMPLETION

(12) Procedure Completion Verification:

☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By Date

(13) Procedure Completion Approved Date

(14) Remarks *(Attach additional pages, if necessary)*

Received
DEC 2002
Operator Training

IF AT ANY TIME:

(4.3) additional makeup flow is desired **AND** 1A Bleed Transfer Pump is operating ... (dispatch an operator to close 1CS-48)

(4.5) Pzr level ≥ 260″ and letdown **CANNOT** be established ... (initiate unit shutdown)

(4.6) Pzr level ≥ 375″ ... (trip Rx)

1. Entry Conditions

Unintentional loss of letdown flow

2. Automatic Systems Actions

- Possible ES Channel 1 and 2 actuation
- 1HP-24 and 1HP-25 will open at 40″ LDST level decreasing
- 1HP-14 swaps from BLEED to NORMAL at 40″ LDST level decreasing

3. Immediate Manual Actions

None

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 __ Ensure 1HP-120 in HAND and reduce demand to zero.	
4.2 __ Initiate makeup to LDST with boron concentration ≥ RCS boron concentration as required.	
4.3 __ IAAT additional makeup flow 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).	
4.4 Notify Chemistry of the following: __ Current RCS boron sample is needed for possible unit shutdown. __ Normal letdown line is isolated.	
NOTE Tech Spec 3.4.9 applies when indicated Pzr level ≥ 260″ (corrected value for 285″).	
4.5 __ IAAT Pzr level ≥ 260″, AND letdown CANNOT be established, THEN initiate unit shutdown at ≈ 20%/min per AP/29 (Rapid Unit Shutdown).	
4.6 __ IAAT Pzr level ≥ 375″, THEN trip Rx.	
4.7 __ Verify CC system in operation.	__ GO TO Step 4.10.
4.8 __ Position the standby HPI pump switch to OFF.	
4.9 __ Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW. (2)	
4.10 __ Verify loss of letdown is due to letdown valve or interlock failure.	__ GO TO Step 4.29.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 __ Verify 1HP-5 closed.	1. __ Notify SPOC to initiate repairs on failed equipment. 2. __ GO TO Step 4.29.
4.12 __ Close 1HP-6.	
4.13 __ Close 1HP-7.	
4.14 __ Open 1HP-5.	__ Dispatch an operator in continuous communication with Control Room to manually open 1HP-5 (LETDOWN ISOLATION) (East Pen Rm). (Tech Spec 3.6.3)
4.15 __ WHEN 1HP-5 is open, THEN ensure CC System in operation.	
4.16 __ Verify letdown temperature < 135°F.	1. __ Open 1HP-13. 2. Ensure the following are closed: __ 1HP-8 __ 1HP-9&11 3. __ IF any deborating IX 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.
4.17 __ Throttle open 1HP-7 to establish ≈ 20 gpm.	
4.18 __ WHEN letdown temperature < 130°F, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL.	
4.19 __ Open 1HP-6.	
4.20 __ Adjust 1HP-7 to control desired letdown flow.	
4.21 __ Re-establish normal makeup through 1HP-120.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.22 __ Verify any purification IX in service.	__ IF purification IX operation is desired, THEN initiate OP/1/A/1103/004 (Soluble Poison Control) to establish desired IX operation.
4.23 __ Notify SPOC to initiate repairs on 1HP-5.	
4.24 __ Verify SEAL INLET HDR FLOW 12 - 15 gpm.	__ GO TO Step 4.27.
4.25 __ Re-establish normal RCP seal injection flow.	
4.26 __ Position the standby HPI pump switch to AUTO.	
4.27 __ WHEN repairs are complete on 1HP-5 (LETDOWN ISOLATION) (East Pen Rm), THEN locally turn 1HP-5 handwheel fully clockwise.	
4.28 __ EXIT this procedure.	

END

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.29 __ WHEN letdown can be re-established, THEN ensure proper operation of the CC System.	
4.30 __ Close 1HP-6.	
4.31 __ Close 1HP-7.	
4.32 Ensure the following are open: __ 1HP-1 __ 1HP-2 __ 1HP-3 __ 1HP-4	
4.33 __ Verify letdown temperature < 135°F.	1. __ Open 1HP-13. 2. Ensure the following are closed: __ 1HP-8 __ 1HP-9&11 3. __ IF any deborating IX 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.
4.34 __ Ensure 1HP-5 is open.	__ GO TO Step 4.11.
4.35 __ Throttle open 1HP-7 to establish ≈ 20 gpm.	
4.36 __ WHEN letdown temperature < 130°F, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL.	
4.37 __ Open 1HP-6.	
4.38 __ Adjust 1HP-7 to control desired letdown flow.	
4.39 __ Re-establish normal makeup through 1HP-120.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.40 __ Verify SEAL INLET HDR FLOW .. 12 - 15 gpm.	__ GO TO Step 4.43.
4.41 __ Re-establish normal RCP seal injection flow.	
4.42 __ Position the standby HPI pump switch to AUTO.	
4.43 __ Verify any purification IX in service.	__ IF purification IX operation is desired, THEN initiate OP/1/A/1103/004 (Soluble Poison Control) to establish desired IX operation.
4.44 __ EXIT this procedure.	

• • • END • • •

DIRECTIONS TO SIMULATOR CONSOLE INSTRUCTOR

JPM No.: CRO-83

Directions with SNAP:

1. Recall: **SNAP:** 201

2. Unfreeze Simulator, acknowledge alarms and Freeze Simulator

Directions without SNAP:

1. Initialize simulator to **100% FULL POWER** IC

2. **Increase letdown flow with 1HP-7** to trip 1HP-5 closed on high temperature

3. Return 1HP-7 to original position and freeze simulator

4. Acknowledge alarms and Freeze Simulator

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-066

PERFORM REQUIRED ACTIONS FOR RCS PRESSURE ≤ 550 PSIG

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform required actions for RCS pressure ≤ 550 PSIG

Alternate Path:

Yes

Facility JPM #:

CRO-066

K/A Rating(s):

System: EPE011
K/A: EA1.13
Rating: 4.1/4.2

Task Standard:
Proper ES conditions are verified, using the appropriate procedures; 1B LPI pump is started and LPI Header flows are throttled to between 3000 gpm (Procedural High Flow Limit) and 2800 gpm (LPI Pump Flow Low Statalarm Setpoint).

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

EOP Encl. 5.1 (ES Actuation)

Validation Time: 15 minutes

Time Critical: No

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 202
2. Import CRO-066 simulator files
3. Place simulator in RUN

Tools/Equipment/Procedures Needed:

EOP Encl. 5.1 (ES Actuation)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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:

Large break LOCA in progress.

RCS saturated and RCPs are off.

ES channels 1 and 2 actuated on Low RCS Pressure and EP/1/A/1800/001 Enclosure 5.1, ES Actuation, has been completed up to Step 14.

Additional ES channels have just actuated.

HPI flow has been verified.

INITIATING CUES:

The Procedure Director directs you to continue with Enclosure 5.1 (ES Actuation) at Step 14.

START TIME: _____

STEP 1: Step 1

IAAT either of the following conditions exists:

- An ES channel is **NOT** bypassed, **AND** RCS pressure reaches actuation setpoint
- RB pressure reaches actuation setpoint

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

THEN perform Step 2.

___ SAT

___ UNSAT

STANDARD: Candidate checks outstanding IAAT steps and determines that Step 1 *applies*.

ES channels 3, 4, 5, 6, 7, and 8 have actuated, so candidate goes to Step 2.

COMMENTS:

STEP 2: Step 2

Verify all ES channels associated with actuation setpoint have actuated.

- All Blue ES AUTO lights on
- All White ES POSITION lights on

___ SAT

___ UNSAT

STANDARD: Candidate goes to RZ module and checks that the Blue ON lights and White POSITION lights for each component on the affected channels are illuminated.

Candidate should determine that the White light for 1B LPI pump is not lit and then should perform the RNO. Verify digital channel 4 has actuated by observing "Tripped" light on 1UB1.

Return to Step 14.

COMMENTS:

STEP 3: Step 14 **IAAT** flow in any LPI Header > 3000 gpm, **THEN** perform Steps 15 and 16. STANDARD: Monitors LPI Flow Train A and B gauges located on 1UB2. Should recognize that flow in A Header is > 3000 gpm and continue to the next step. Continue to Step 15 **CUE: LPI Flow Train A will be greater than 3000 gpm.** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Step 15 Throttle 1LP-17 to maximize header flow ≤ 3000 gpm/pump. STANDARD: Locates 1LP-17 on RZ module on 1VB2 and depresses the MANUAL pushbutton for local control of 1LP-17. **NOTE: Candidate may also take MANUAL control of 1LP-18 at this time.** Throttle 1LP-17 control switch in the CLOSE direction to obtain ≤ 3000 gpm/pump. Continue to Step 16 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: Step 16 Throttle 1LP-18 to maximize header flow ≤ 3000 gpm/pump. STANDARD: Candidate: Observes there is no flow in this header. **NOTE: 1B LPIP has failed to auto start.** Continue to Step 17 COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 17 Open the following: • 1BS-1 • 1BS-2 STANDARD: Verifies valves 1BS-1 and 1BS-2 are OPEN at RZ modules. Continue to Step 18 COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 18 IAAT ES Channels 7& 8 are actuated, THEN perform Step 19. STANDARD: Verifies Channels 7 & 8 are actuated by observing Statalarms 1SA-1/C-11, D-11 ES CHANNEL 7 (8) TRIP or by the ES digital "tripped" lights on 1UB1. Continue to Step 19 COMMENTS:	___ SAT ___ UNSAT

STEP 8:	Step 19 Throttle the following to maximize RBS header flow ≤ 1500 gpm for each operating header: • 1BS-1 • 1BS-2	___ SAT ___ UNSAT
STANDARD:	At RZ modules the candidate throttles 1BS-1 and 1BS-2 as required to maximize RBS header flow. The candidate will place 1BS-1 and 1BS-2 to manual at the RZ module by depressing the MANUAL pushbutton. 1BS-1 and 1BS-2 will be throttled to adjust RBS flow to between 1500 and 1300 gpm (Procedural High Flow Limit) and (RBS Pump Low Flow Statalarm) by depressing the CLOSE pushbutton on the RZ module. Continue to Step 20	
COMMENTS:		
STEP 9:	Step 20 **IAAT** ES Channels 3& 4 are actuated, **THEN GO TO** Step 21.	___ SAT
STANDARD:	Verifies Channels 3 & 4 are actuated observing Statalarms 1SA-1/C-10, D-10 ES CHANNEL 3 (4) TRIP or by the ES digital "tripped" lights on 1UB1. **GO TO** Step 21	___ UNSAT
COMMENTS:		

STEP 10: Step 21 Place the following in manual control: • 1A LPI pump • 1B LPI pump • 1LP-17 • 1LP-18 STANDARD: Components are located on RZ modules on 1VB2 and the MANUAL pushbuttons are depressed for each of the following: • 1A LPI pump • 1B LPI pump • 1LP-17 • 1LP-18 Continue to Step 22 COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 22 Verify one of the following conditions exists: • 1LP-17 open • 1LP-17 throttled to control flow STANDARD: Recognizes that 1LP-17 has been throttled to control flow. Continue to Step 23 COMMENTS:	___ SAT ___ UNSAT

STEP 12:	Step 23 Verify one of the following conditions exists: • 1LP-18 open • 1LP-18 throttled to control flow STANDARD: Verifies 1LP-18 OPEN at RZ module. Continue to Step 24 COMMENTS:	___ SAT ___ UNSAT
STEP 13:	Step 24 **IAAT** any LPI pump is operating against a shutoff head, **THEN** at the CR SRO's discretion, stop affected LPI pumps. STANDARD: Verifies RCS pressure is < LPI pump shutoff head. Continue to Step 25 COMMENTS:	___ SAT ___ UNSAT
STEP 14:	Step 25 **IAAT** RCS pressure is < LPI pump shutoff head, **AND** any of the following conditions exist: • power on 1LP-12 • power on 1LP-17 • 1LP-17 locally throttled **THEN** perform Step 26. STANDARD: Recognizes that 1LP-12 and 1LP-17 have power by observing light indications. Continue to Step 26 COMMENTS:	___ SAT ___ UNSAT

STEP 15: Step 26 Verify 1A LPI Pump operating. STANDARD: Observes 1A LPI Pump control switch has red RUN indication and pump amps. Continue to Step 27 COMMENTS:	___ SAT ___ UNSAT
STEP 16: Step 27 **IAAT** RCS pressure is < LPI pump shutoff head, **AND** any of the following conditions exist: • power on 1LP-14 • power on 1LP-18 • 1LP-18 locally throttled **THEN** *perform Step 28.* STANDARD: Observes control switches for 1LP-14 and 1LP-18 for red or green lights. Continue to Step 28 COMMENTS:	___ SAT ___ UNSAT

STEP 17:	Step 28 Verify 1B LPI Pump operating. **RNO:** Attempt to start 1B LPI Pump.	**CRITICAL STEP** ___ SAT
STANDARD:	Observes 1B LPI Pump control switch has white OFF indication and NO pump amps. Locates the control switch for 1B LPI pump on 1UB2 and rotates it to the START position. The red RUN lights come on; the white OFF light goes *off.* The candidate monitors LPI Flow Train A and B gauges located on 1UB2, to ensure flow is less than/equal to 3000 gpm/pump. *Candidate will realize that* IAAT Step 14 applies (IAAT flow in any LPI header is > 3000 gpm). Go to Step 14	___ UNSAT
COMMENTS:		
STEP 18:	Step 14 IAAT flow in any LPI header is > 3000 gpm, THEN perform Steps 15 and 16	___ SAT
STANDARD:	Candidate verifies that flow in the *"B" LPI* header is > 3000 gpm. Continue to Step 15	___ UNSAT
COMMENTS:		
STEP 19:	Step 15 *Throttle 1LP-17 to maximize header flow ≤ 3000 gpm/pump.*	___ SAT
STANDARD:	Candidate verifies that "A" LPI header flow is < 3000 gpm/pump. *Continue to Step 16*	___ UNSAT
COMMENTS:		

STEP 20: *Step 16* Throttle 1LP-18 to maximize header flow ≤ 3000 gpm/pump. STANDARD: Locates 1LP-18 on RZ module on 1VB2 and depresses the MANUAL pushbutton for local control of 1LP-18. **NOTE: This may have been performed earlier in Step 4.** *Throttle 1LP-18 control switch in the CLOSE direction to obtain ≤ 3000* gpm/pump. Return to Step 28 COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	This step is necessary to prevent the running out of the LPI pump and causing a loss of DHR capability.
17	This step starts the idle pump, ensuring adequate flow to the core.
20	This step is necessary to prevent the running out of the LPI pump and causing a loss of DHR capability.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Large break LOCA in progress.

RCS saturated and RCPs are off.

ES channels 1 and 2 actuated on Low RCS Pressure and EP/1/A/1800/001

Enclosure 5.1, ES Actuation, has been completed up to Step 14.

Additional ES channels have just actuated.

HPI flow has been verified.

INITIATING CUES:

The Procedure Director directs you to continue with Enclosure 5.1 (ES Actuation) at Step 14.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ IAAT either of the following conditions exists: • an ES channel is **NOT** bypassed, **AND** RCS pressure reaches actuation setpoint • RB pressure reaches actuation setpoint **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 **THEN** perform Step 2.	
2. Verify all ES channels associated with actuation setpoint have actuated: __ All Blue ES AUTO lights on __ All White ES POSITION lights on	__ Ensure affected ES digital channels are actuated.
3. __ Place HPI in manual control.	
4. __ Verify any RCP operating.	__ **GO TO** Step 6.
5. Ensure the following are open: __ 1HP-20 __ 1HP-21	
6. __ **IAAT** any RCP is operating, **AND** ES Channels 5 and 6 actuate, **THEN** perform Steps 7 and 8.	__ **GO TO** Step 9.
7. Ensure the following are open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
8. __ Ensure 1A or 1B Component Cooling Pump is operating.	

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ Verify all SCMs > 0°F.	__ **GO TO** Step 13.
10. Ensure the following are open: __ 1HP-24 __ 1HP-25	1. __ **IF** both BWST suction valves (1HP-24 and 1HP-25) are closed, **THEN** perform the following: A. Ensure the following are open: (23) __ 1LP-6 __ 1LP-7 __ 1LP-9 __ 1LP-10 __ 1LP-15 __ 1LP-16 B. __ Start 1A or 1B LPI Pump. C. __ Dispatch an operator to open 1HP-363 (LETDOWN LINE TO LPI PUMP SUCTION BLOCK) (A-1-119, U1 LPI Hatch Rm, N end). 2. __ **IF** only one BWST suction valve (1HP-24 or 1HP-25) is open, **THEN** perform the following: A. __ Ensure only two HPI pumps are operating. B. __ **GO TO** Step 12.
11. __ Ensure at least two HPI pumps are operating.	
12. Ensure the following are open: __ 1HP-26 __ 1HP-27	

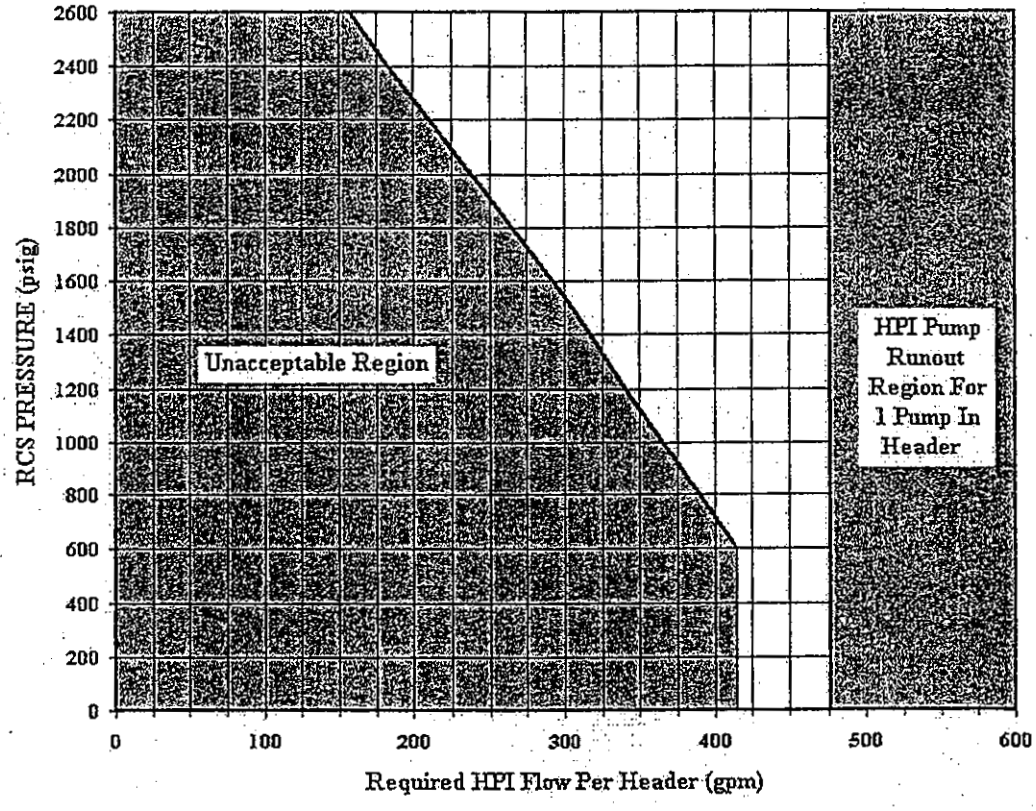
IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ IAAT at least two HPI pumps are operating, AND HPI flow in any header is in the Unacceptable Region of Figure 1, THEN open the following in the affected header: ☑ 1A Header: 1HP-410 ☑ 1B Header: 1HP-409	

Figure 1
Required HPI Flow Per Header



IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. __ **IAAT** flow in <u>any</u> LPI header is > 3000 gpm, **THEN** perform Steps 15 and 16.	__ **GO TO** Step 17.
15. __ Throttle 1LP-17 to maximize header flow ≤ 3000 gpm/pump.	1. __ Throttle 1LP-12 to maximize header flow ≤ 3000 gpm/pump. 2. __ **IF** 1LP-12 **CANNOT** be throttled, **THEN** perform the following: A. __ Stop 1A LPI pump. B. Dispatch an operator to perform the following 1. __ Close 1LP-17 (1A LP INJECTION) (A-4-402, E Pen Rm). 2. __ Throttle 1LP-17 sixteen turns open.
16. __ Throttle 1LP-18 to maximize header flow ≤ 3000 gpm/pump.	1. __ Throttle 1LP-14 to maximize header flow ≤ 3000 gpm/pump. 2. __ **IF** 1LP-14 **CANNOT** be throttled, **THEN** perform the following: A. __ Stop 1B LPI pump. B. Dispatch an operator to perform the following 1. __ Close 1LP-18 (1A LP INJECTION) (A-4-409, W Pen Rm). 2. __ Throttle 1LP-18 sixteen turns open.
17. Open the following: __ 1BS-1 __ 1BS-2	Dispatch an operator to open the <u>affected</u> valve 20 turns: __ 1BS-1 (1A RBS HEADER ISOLATION) (A-4-402, E Pen Rm) __ 1BS-2 (1B RBS HEADER ISOLATION) (A-4-409, W Pen Rm)

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18. __ **IAAT** ES Channels 7 & 8 are actuated, **THEN** perform Step 19.	__ **GO TO** Step 20.
19. Throttle the following to maximize RBS header flow ≤ 1500 gpm for each operating header: __ 1BS-1 __ 1BS-2	1. __ **IF** 1BS-1 **CANNOT** be throttled ≤ 1500 gpm, **THEN** stop 1A RBS Pump. 2. __ **IF** 1BS-2 **CANNOT** be throttled ≤ 1500 gpm, **THEN** stop 1B RBS Pump.
20. __ **IAAT** ES Channels 3 & 4 are actuated, **THEN GO TO** Step 21.	__ **GO TO** Step 50.
21. Place the following in manual control: __ 1A LPI Pump __ 1B LPI Pump __ 1LP-17 __ 1LP-18	
22. Verify one of the following conditions exists: __ 1LP-17 open __ 1LP-17 throttled to control flow	1. __ **IF** power is available to 1LP-12, **THEN** dispatch an operator to open 1LP-17 (1A LP INJECTION) (A-4-402, E Pen Rm). 2. __ **IF** power is **NOT** available to 1LP-12, **THEN** dispatch an operator to perform the following: A. __ Close 1LP-17 (1A LP INJECTION) (A-4-402, E Pen Rm). B. __ Throttle 1LP-17 sixteen turns open.
23. Verify one of the following conditions exists: __ 1LP-18 open __ 1LP-18 throttled to control flow	1. __ **IF** power is available to 1LP-14, **THEN** dispatch an operator to open 1LP-18 (1B LP INJECTION) (A-4-409, W Pen Rm). 2. __ **IF** power is **NOT** available to 1LP-14, **THEN** dispatch an operator to perform the following: A. __ Close 1LP-18 (1B LP INJECTION) (A-4-409, W Pen Rm). B. __ Throttle 1LP-18 sixteen turns open.

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

(18) ES Channels 7 & 8 are actuated... (throttle RBS)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}	
24. __ **IAAT** any LPI pump is operating against a shutoff head, **THEN** at the CR SRO's discretion, stop affected LPI pumps. {6, 22}	
25. __ **IAAT** RCS pressure is < LPI pump shutoff head, **AND** any of the following conditions exist: __ power on 1LP-12 __ power on 1LP-17 __ 1LP-17 locally throttled **THEN** perform Step 26.	__ **GO TO** Step 27.
26. __ Verify 1A LPI Pump operating.	__ Attempt to start 1A LPI Pump.
27. __ **IAAT** RCS pressure is < LPI pump shutoff head, **AND** any of the following conditions exist: __ power on 1LP-14 __ power on 1LP-18 __ 1LP-18 locally throttled **THEN** perform Step 28.	__ **GO TO** Step 29.
28. __ Verify 1B LPI Pump operating.	__ Attempt to start 1B LPI Pump.

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

(18) ES Channels 7 & 8 are actuated... (throttle RBS)

(24) any LPI pump is operating against a shutoff head... (at CR SRO's discretion, stop affected LPI pumps)

(25) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-12, 1LP-17 or 1LP-17 throttled... (verify 1A LPI pump operating)

(27) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-14, 1LP-18 or 1LP-18 throttled... (verify 1B LPI pump operating)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29. __ IAAT <u>any</u> of the following conditions exist: __ an LPI Pump (1A and/or 1B) fails to start __ an LPI Pump (1A and/or 1B) fails during operation, AND <u>all</u> the following conditions exists: __ RCS pressure < LPI pump shutoff head __ 1LP-19 closed __ 1LP-20 closed __ 1BS-1 open **OR** throttled open __ 1BS-2 open **OR** throttled open **THEN** *perform Steps 30 through 32.*	__ **GO TO** Step 33.
30. __ Verify <u>any</u> LPI pump operating.	__ **IF** 1C LPI Pump is available, **THEN** perform the following: A. Ensure the following are open on the desired header to provide suction to 1C LPI Pump: ✓ A Suction Header: 1LP-28; 1LP-21; 1LP-6 ✓ B Suction Header: 1LP-28; 1LP-22; 1LP-7 B. __ Start 1C LPI Pump.
31. Open the following: __ 1LP-9 __ 1LP-10	

<u>NOTE</u>

If 1LP-17/18 have **NOT** been locally throttled, header flow is maximized from the Control Room by throttling 1LP-17/18. If 1LP-17/18 **CANNOT** be used, 1LP-12/14 are used to maximize flow.

32. __ Maximize flow ≤ 1100 gpm in each LPI header that has **NOT** been locally throttled.	

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

(18) ES Channels 7 & 8 are actuated... (throttle RBS)

(24) any LPI pump is operating against a shutoff head... (at CR SRO's discretion, stop affected LPI pumps)

(25) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-12, 1LP-17 or 1LP-17 throttled... (verify 1A LPI pump operating)

(27) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-14, 1LP-18 or 1LP-18 throttled... (verify 1B LPI pump operating)

(29) an LPI Pump (1A and/or 1B) fails to start or fails during operation **AND** RCS pressure is < LPI pump shutoff head **AND** 1LP-19 closed **AND** 1LP-20 closed **AND** 1BS-1 & 2 are open or throttled open ... (cross-tie or line up and start 1C LPI Pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33. Ensure the following are operating: __ A Outside Air Booster Fan __ B Outside Air Booster Fan __ 3A Outside Air Booster Fan __ 3B Outside Air Booster Fan	
34. __ **IAAT** ES Channels 5 & 6 have actuated, **THEN** dispatch an operator to establish ≈ 1000 cfm flow in each PRVS filter train using the following flow controllers (A-6-602, Vent Equip Rm, N wall): __ 1PR-13 (Controller) (Filter 1A) __ 1PR-17 (Controller) (Filter 1B)	
35. __ Verify RCS pressure is ≥ 550 psig.	__ **GO TO** Step 38.
36. Ensure the following are open: __ 1CC-7 __ 1CC-8 __ 1LPSW-15 __ 1LPSW-6	
37. __ Ensure 1A or 1B Component Cooling Pump is operating.	
38. __ Verify 1CF-1 and 1CF-2 being open is desired.	__ **GO TO** Step 40.
39. Ensure the following are open: __ 1CF-1 __ 1CF-2	
40. __ Verify 1HP-410 closed.	__ Ensure 1HP-120 in manual and closed.

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

(18) ES Channels 7 & 8 are actuated... (throttle RBS)

(24) any LPI pump is operating against a shutoff head... (at CR SRO's discretion, stop affected LPI pumps)

(25) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-12, 1LP-17 or 1LP-17 throttled... (verify 1A LPI pump operating)

(27) RCS pressure is < LPI pump shutoff head **AND** power on 1LP-14, 1LP-18 or 1LP-18 throttled... (verify 1B LPI pump operating)

(29) an LPI Pump (1A and/or 1B) fails to start or fails during operation **AND** RCS pressure is < LPI pump shutoff head **AND** 1LP-19 closed **AND** 1LP-20 closed **AND** 1BS-1 & 2 are open or throttled open ... (cross-tie or line up and start 1C LPI Pump)

(34) ES Channels 5 & 6 have actuated... (establish PRVS flow)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (**PS**)	
42. __ Ensure Chemistry has been notified to prepare for caustic addition per CP/1&2/A/2002/005 (Post Accident Caustic Injection Into LPI System).	
43. __ Ensure makeup to the LDST is secured.	
44. __ Ensure ES channel 1 through 4 components that can be operated from the Control Room are in desired position.	
45. Place the following in manual control: __ 1A LPI Pump __ 1B LPI Pump	
46. __ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
47. __ **WHEN** ES channels 5 & 6 have actuated, **THEN** ensure ES Channel 5 & 6 components that can be operated from the Control Room are in desired position.	
48. __ **WHEN** ES channels 7 & 8 have actuated, **THEN** ensure ES Channel 7 & 8 components that can be operated from the Control Room are in the desired position.	
49. __ **WHEN** CR SRO approves, **THEN EXIT** this enclosure.	

• • • END • • •

IF AT ANY TIME:

(1) an ES channel is **NOT** bypassed and RCS pressure reaches actuation setpoint **OR** RB pressure reaches actuation setpoint... (verify associated channels have actuated)

(6) any RCP is operating **AND** ES Channels 5 and 6 actuate... (ensure CC and LPSW to RCPs)

(13) at least two HPI pumps are operating **AND** HPI flow in any header is in the Unacceptable Region of Figure 1... (open 1HP-410 and/or 409)

(14) flow in any LPI header is > 3000 gpm... (throttle flow)

(18) ES Channels 7 & 8 are actuated... (throttle RBS)

(20) ES Channels 3 & 4 are actuated... (**GO TO** path for proper LPI actuation)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ES Channels 3 & 4 have **NOT** actuated.	
50. Start the following: __ A Outside Air Booster Fan __ B Outside Air Booster Fan.	
51. Notify Unit 3 to start the following: __ 3A Outside Air Booster Fan __ 3B Outside Air Booster Fan	
52. __ Verify 1CF-1 and 1CF-2 being open is desired.	__ **GO TO** Step 54.
53. Ensure the following are open: __ 1CF-1 __ 1CF-2	
54. __ Verify 1HP-410 closed.	__ Ensure 1HP-120 in manual and closed.
55. __ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
56. __ Notify Chemistry to prepare for caustic addition per CP/1&2/A/2002/005 (Post Accident Caustic Injection Into LPI System).	
57. __ Ensure makeup to the LDST is secured.	
58. __ Ensure ES channel 1 & 2 components that can be operated from the Control Room are in desired position.	
59. __ **WHEN** CR SRO approves, **THEN EXIT** this enclosure.	

••• END •••

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-013

ALIGN MDEFDWP SUCTION TO THE HOTWELL AND FEED THE STEAM GENERATORS

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:
Align MDEFDWP suction to the hotwell and feed the steam generators.

Alternate Path:

No

Facility JPM #:

CRO-013

K/A Rating(s):

System: APE054
K/A: AA1.01
Rating: 4.5/4.4

Task Standard:
The MDEFDWPs are aligned to the hotwell and providing flow to the SG's within limits correctly per procedure.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:
EOP Enclosure 5.9 (Extended EFDW Operation)

Validation Time: 10 minutes

Time Critical: No

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 203
2. Import CRO-013 files
3. Place simulator in RUN

Tools/Equipment/Procedures Needed:

EOP Enclosure 5.9 (Extended EFDW Operation)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 reactor has tripped due to a loss of Main FDW

Main FDW is not expected back for several hours.

The TDEFDWP is unavailable.

UST makeup flow capability has been lost.

Actions of the EOP have been completed.

Enclosure 5.9, Extended EFDW Operation has been completed up to Step 51.

Steps 1, 2, and 3 of Enclosure 5.24, Operation of the ADVs are complete.

INITIATING CUES:

The Procedure Director directs you to align the MDEFDWP suction from the Hotwell using EOP Enclosure 5.9 (Extended EFDW Operation) beginning at Step 51.

START TIME: _____

Note: Cues are provided for conducting JPM in the plant control room.

STEP 1: Step 51 **WHEN** UST level is < 3 feet, **THEN** ensure all CBPs stopped. STANDARD: Monitors UST level by one or more of the following ways and determines that level is less than three feet: • OAC • UST B LEVEL meter on 2AB-1 • UST A LEVEL meter on 2AB-3 • UST LEVEL chart recorder on 2VB-1 Locates Condensate Booster Pumps A, B, and C switches on 2AB1. Stops all Condensate Booster Pumps by rotating the switches to the OFF position. Booster Pump red run light goes off and white stop light comes on for pumps secured. ***Cue: Indicate UST level is 2.8 feet UST A/B LEVEL meter on 1AB-1.*** ***Cue: Indicate any pumps in auto start when CBPs are stopped.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Step 52 Ensure all HWPs stopped. STANDARD: Locates Hotwell Pump A, B, and C switches on 2AB1. Stops all Hotwell Pumps by rotating the switches to the OFF position. Hotwell Pump red run light goes off and white stop light comes on for pumps secured. ***Cue: Indicate Hotwell Pump A, B, and C are off by red run lights off.*** ***Cue: Indicate any pumps in auto start when HWPs are stopped.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Step 53 Dispatch an operator with a safety harness to 2C-573 (MD EFDWPS SUCTION FROM UST) to standby until further notice. STANDARD: Dispatches NEO to 2C-573. ***Cue: Indicate NEO has been dispatched to 2C-573.*** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Step 54 Open 2V-186 (VACUUM BREAKER). STANDARD: Locates 2V-186 on 2AB1 and rotates the switch in the open direction. The red open light comes on and the green closed light goes off. ***Cue: Indicate 2V-186 is open by red open light illuminated.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Step 55 Stop all main vacuum pumps. STANDARD: Locates main vacuum pump switches on 2AB3 and verifies all three pumps indicate OFF. ***Cue: Indicate all Main Vacuum Pumps OFF by green "off" lights illuminated.*** COMMENTS:	___ SAT ___ UNSAT

STEP 6: Step 56 Close the following: • 2MS-47 (MS to CSAEs) • 2AS-40 (CSAE AUX STEAM SUPPLY) STANDARD: Locates 2MS-47 on 2AB1 and rotates the switch in the closed direction. The green closed light comes on and the red open light goes off. Locates 2AS-40 on 2AB1 and verifies the green closed light on and the red open light off. ***Cue: Indicate 2MS-47 and 2AS-40 are closed by green "closed" lights illuminated.*** COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 57 **IAAT** UST level <1 foot, **AND** 1C-573 is open, **THEN** stop all EFDW pumps. STANDARD: Monitors UST level and if UST level is <1 foot stop both MDEFDW Pumps if 2C-573 is open by rotating pump switch to the off position and verifying red run light goes off and white stop light comes on. ***Cue: Indicate UST level is .8 feet UST A/B LEVEL meter on 2AB-1 and when candidate stops both MDEFDW Pumps indicate they are off by red run light off.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 8: Step 58 **WHEN** vacuum is broken, **THEN** locally close 2C-573 (MD EFDWP Suction from UST). **NOTE: MDEFWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell** STANDARD: Observes vacuum gauge on 2UB2 and determines that vacuum is broken and then contacts an NEO to close 2C-573. Ensures MDEFDWP flow < 440 gpm/pump by observing MDEFDWP flow gauges on 2UB1. ***CUE: Inform student that 2C-573 is closed.*** ***CUE: Inform student that MDEFDWP flow gauges on 2UB1 indicate 200 gpm/pump.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9: Step 59 Restart all MDEFWPs that were stopped due to UST level <1 foot. STANDARD: Pumps are started if required. Step is N/A if the pumps were not secured. ***Cue: When candidate starts both MDEFDW Pumps indicate that red run lights are illuminated.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 10: Step 60 Ensure TDEFDWP is **NOT** operating. STANDARD: Determine the TDEFDWP is not available. **Note: The TDEFDWP is OOS.** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 61 Locally close 2C-157 (TD EFDWP Suction from UST). STANDARD: Dispatches an NEO to close 2C-157. ***CUE: Inform student that 2C-157 is closed.*** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Step 62 OPEN 2C-391 (TDEFDWP Suction from Hotwell). STANDARD: Locates the control for 2C-391 on 2VB3 and rotates the switch in the OPEN direction. Red open light comes on, green closed light goes off. Continue to Step 63 ***Cue: Indicate Red open light comes on, green closed light goes off.*** COMMENTS:	___ SAT ___ UNSAT

STEP 13: Step 63 **IAAT** TDEFDWP operation is desired, **AND** hotwell level is >1", **THEN** start TDEFDWP. STANDARD: Determine the TDEFDWP is not available. **Note: The TDEFDWP is OOS.** COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 64 Dispatch an operator to open 2C-188 (HOTWELL Emergency Makeup #1 Control Bypass). STANDARD: Dispatches an NEO to open 2C-188. ***CUE: Inform student that 2C-188 is open.*** COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 65 Notify TSC to evaluate methods to maintain secondary inventory. STANDARD: Notifies TSC to evaluate methods to maintain secondary inventory. ***CUE: Inform candidate that the TSC will evaluate methods to maintain secondary inventory.*** COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	STOP all CBPs to prevent damage to the MDEFDWP by decreasing NPSH.
2	STOP all HWPs to prevent damage to the MDEFDWP by decreasing NPSH.
4	Condenser vacuum must be broken thus increasing the NPSH to the EFDWPs. This prevents EFDWP damage due to not meeting suction head requirements when Hotwell level is < 1ft.
7	Stopping Emergency Feedwater Pumps prevents possible air introduction into the pumps suction, thus preventing pump cavitation and possible pump damage.
8	Closing 2C-573 prevents air introduction into the pumps suction, thus preventing pump cavitation and possible pump damage.
9	Restart of MDEFWPs is essential regaining feed to the SGs if feed had been secured.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 2 reactor has tripped due to a loss of Main FDW

Main FDW is not expected back for several hours.

The TDEFDWP is unavailable.

UST makeup flow capability has been lost.

Actions of the EOP have been completed.

Enclosure 5.9, Extended EFDW Operation has been completed up to Step 51.

Steps 1, 2, and 3 of Enclosure 5.24, Operation of the ADVs are complete.

INITIATING CUES:

The Procedure Director directs you to align the MDEFDWP suction from the Hotwell using EOP Enclosure 5.9 (Extended EFDW Operation) beginning at Step 51.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Monitor EFDW parameters on EFW graphic display.	
2. __ **IAAT** UST level is < 4', **THEN GO TO** Step 49.	
3. __ **IAAT** feeding <u>both</u> SGs with one MDEFDWP is desired, **THEN** perform Steps 4 - 7.	__ **GO TO** Step 8.
4. Ensure EFDW control valve on SG with **NO** EFDW flow is in MANUAL and closed: ☑ 2A SG — 2FDW-315 ☑ 2B SG — 2FDW-316	
5. Locally open the following: __ 2FDW-313 (2A EFDW LINE DISCH TO 2A S/G X-CONN) (T-1, 5' N of M-39, 12' up) __ 2FDW-314 (2B EFDW LINE DISCH TO 2B S/G X-CONN) (T-1, 2' N of M-31, 6' up)	
6. __ Ensure a MDEFDWP is operating.	
7. Throttle EFDW control valve on SG with **NO** EFDW flow to establish appropriate level per Rule 7 (SG Feed Control): ☑ 2A SG — 2FDW-315 ☑ 2B SG — 2FDW-316	
8. Perform the following as required to maintain UST level > 7': __ Makeup with demin water. __ Ensure CST pumps are in AUTO.	

IF AT ANY TIME:

(2) UST level is < 4' … (prepare to swap EFDW suction to hotwell)

(3) feeding both SGs with one MDEFDWP is desired … (cross-tie)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ **IAAT** all the following conditions exist: __ Rapid cooldown **NOT** in progress __ MDEFDWP operating for each available SG __ EFDW flow in each header < 600 gpm **THEN** place TDEFDWP switch in PULL TO LOCK.	
10. __ Verify TDEFDW Pump operating.	__ **GO TO** Step 13.
11. __ Ensure 2LPSW-137 is open.	
12. __ Ensure EMER FDWPT BRNG OIL COOLING PUMP is operating.	
13. __ **IAAT** UST level **CANNOT** be maintained > 7', **THEN** dispatch an operator to close 2C-186 (HOTWELL EMERGENCY MAKEUP #1 CONTROL INLET) (T-1, S of E-31).	
14. __ Verify any HWP operating.	__ **GO TO** Step 20.
15. __ Verify any CBP operating.	__ **GO TO** Step 35.
16. __ Verify 2C CBP operating. {12}	1. __ Ensure only one CBP is operating. 2. __ **GO TO** Step 18.
17. Ensure the following stopped: {12} __ 2A CBP __ 2B CBP	
18. __ Ensure only one HWP is operating.	
19. __ **GO TO** Step 38.	

IF AT ANY TIME:

(2) UST level is < 4'... (prepare to swap EFDW suction to hotwell)

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each <u>available</u> SG **AND** EFDW flow in <u>each</u> header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

(13) UST level **CANNOT** be maintained > 7'... (dispatch an operator to close 2C-186)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE If > 25 minutes has elapsed since a loss of all condensate flow, a steam-induced water hammer may occur when a Hotwell Pump is started. A Hotwell Pump should **NOT** be started unless one of the following is met: • An engineering evaluation is performed • EFDW is **NOT** available and secondary pumps are needed to restore feed to a SG. {17}	
20. __ Verify all condensate flow has **NOT** been lost for > 25 minutes.	1. __ **IF** Engineering approves starting a HWP **OR** secondary pumps are needed to immediately restore SG feed, **THEN GO TO** Step 21. 2. __ Notify CR SRO to evaluate starting Main Vacuum Pumps per AP/27 (Loss of Condenser Vacuum). 3. __ **GO TO** Step 68.
21. __ Place all HWP control switches in OFF.	
22. __ Place all CBP control switches in OFF.	
23. __ Dispatch an operator to start all CBP Aux Oil Pumps. (T-1/J-33)	
24. Close the following: __ 2FDW-4 __ 2FDW-9	
25. Ensure Main FDWP Aux Oil Pumps operating: __ 2A FDWP AUXILIARY OIL PUMP __ 2B FDWP AUXILIARY OIL PUMP	
26. Place the following in MANUAL and close: __ 2FDW-53 __ 2FDW-65	
27. __ Ensure 2C-10 is closed.	
28. __ Using a plant page, clear TB Basement and TB third floor of non-essential personnel.	
29. __ **WHEN** notified that all CBP Aux Oil pumps are operating, **THEN** continue.	

IF AT ANY TIME:

(2) UST level is < 4'... (prepare to swap EFDW suction to hotwell)

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each available SG **AND** EFDW flow in each header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

(13) UST level **CANNOT** be maintained > 7'... (dispatch an operator to close 2C-186)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. __ Start one HWP.	
31. __ Throttle 2C-10 controller 10% open.	
32. __ **WHEN** FWP SUCT HDR PRESS (2VB3) is ≥ 100 psig, **THEN** open 2C-10.	
33. Establish 1000-1200 gpm total recirc flow with one of the following: __ 2FDW-53 __ 2FDW-65	
34. __ **WHEN** five minutes has elapsed, **THEN GO TO** Step 35.	
35. __ Ensure two HWPs operating.	
36. __ Start the 2C CBP. {12}	__ Start one available CBP.
37. __ Stop one operating HWP.	
38. __ Ensure control switch for one idle HWP is in AUTO.	
39. __ Ensure control switch for one idle CBP is in AUTO.	
40. Ensure the following in MANUAL: __ 2FDW-53 __ 2FDW-65	
41. Establish ≥ 2300 gpm total recirc flow with one of the following: __ 2FDW-53 __ 2FDW-65	
42. __ **IAAT** UST level **CANNOT** be maintained > 8', **THEN** locally open 2C-209 (SEAL WATER SUPPLY HEADER) (T-1, E of J-32, 12' up).	

IF AT ANY TIME:

(2) UST level is < 4'... (prepare to swap EFDW suction to hotwell)

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each available SG **AND** EFDW flow in each header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

(13) UST level **CANNOT** be maintained > 7'... (dispatch an operator to close 2C-186)

(42) UST level **CANNOT** be maintained > 8'... (locally open 2C-209)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
43. __ **IAAT** UST level increases > 11', **THEN** perform the following as required: __ Throttle demin water __ Locally throttle 2C-188 (HOTWELL EMERG MAKEUP #1 CONTROL BYPASS) (T-1, between E-31 and F-31)	
44. Verify the following are closed: __ 2FDW-4 __ 2FDW-9	__ **GO TO** Step 49.
45. Ensure the following are closed with the switches in CLOSE: __ 2FDW-33 __ 2FDW-31 __ 2FDW-42 __ 2FDW-40	
46. Locally open the following: __ 2FDW-5 (2A FDWP DISCHARGE BYPASS) (T-1, 10' N of 2A FDW Pump, 15' up, above SGFDW Panel 2SGFP) __ 2FDW-10 (2B FDWP DISCHARGE BYPASS) (T-1, 5' N of D-30, 15' up)	
47. __ **WHEN** FWP DISCH HDR PRESS (2VB3) is approximately equal to <u>either</u> of the following: • O2A1014 (FDWP 2A DISCHARGE PRESS) • O2A1391 (FDWP 2B DISCHARGE PRESS) **THEN** open the following: __ 2FDW-4 __ 2FDW-9	

IF AT ANY TIME:

(2) UST level is < 4'... (prepare to swap EFDW suction to hotwell)

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each available SG **AND** EFDW flow in all headers is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

(13) UST level **CANNOT** be maintained > 7'... (dispatch an operator to close 2C-186)

(42) UST level **CANNOT** be maintained > 8'... (locally open 2C-209)

(43) UST level increases > 11'... (locally throttle 2C-188 as required)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
48. Locally close the following: __ 2FDW-5 (2A FDWP DISCHARGE BYPASS) (T-1, 10' N of 2A FDW Pump, 15' up, above SGFDW Panel 2SGFP) __ 2FDW-10 (2B FDWP DISCHARGE BYPASS) (T-1, 5' N of D-30, 15' up)	
49. __ **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)**	
50. __ Verify power available to 2V-186.	__ Dispatch an operator with a safety harness to 2V-186 (VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
51. __ **WHEN** UST level is < 3', **THEN** ensure <u>all</u> CBPs stopped.	
52. __ Ensure <u>all</u> HWPs stopped.	
53. __ Dispatch an operator with a safety harness to 2C-573 (MD EFDWPS SUCTION FROM UST) (T-1, W of E-31, 8' above floor).	
54. __ Open 2V-186.	__ Notify operator to open 2V-186 (MAIN CONDENSER VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
55. __ Stop <u>all</u> main vacuum pumps.	
56. Close the following: __ 2MS-47 __ 2AS-40	Dispatch an operator to close the following: __ 2MS-49 (2A CSAE STEAM SUPPLY) (T-3, F-29) __ 2MS-58 (2B CSAE STEAM SUPPly) (T-3, G-29) __ 2MS-67 (2C CSAE STEAM SUPPLY) (T-3, N of H-29)
57. __ **IAAT** UST level is < 1', **AND** 2C-573 (MD EFDWPS SUCTION FROM UST) is open, **THEN** stop <u>all</u> EFDW pumps.	

IF AT ANY TIME:

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each available SG **AND** EFDW flow in each header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE MDEFDWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell (2C-573 closed).	
58. __ **WHEN** vacuum is broken, **THEN** locally close 2C-573 (MD EFDWPS SUCTION FROM UST).	
59. __ Restart all MDEFDWPs that were stopped due to UST level < 1'.	
60. __ Ensure TDEFDWP is **NOT** operating.	
61. __ Locally close 2C-157 (TD EFDWP SUCTION FROM UST) (T-1, N of C-36).	
62. __ Open 2C-391.	__ Locally open 2C-391 (TD EFDWP SUCTION FROM HOTWELL) (T-1/C-36).
63. __ **IAAT** TDEFDWP operation is desired, **AND** hotwell level is > 1", **THEN** start TDEFDWP.	
64. __ Dispatch an operator to open 2C-188 (HOTWELL EMERG MAKEUP #1 CONTROL BYPASS) (T-1, W of E-31). {18}	
65. __ Notify TSC to evaluate methods to maintain secondary inventory.	
66. __ **IAAT** hotwell level is ≤ 1", **THEN** stop all EFDWPs.	
67. __ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

IF AT ANY TIME:

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each <u>available</u> SG **AND** EFDW flow in <u>each</u> header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
68. __ **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**)	
69. __ Verify power available to 2V-186.	__ Dispatch an operator with a safety harness to 2V-186 (VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
70. __ **WHEN** UST level is < 3', **THEN** ensure <u>all</u> CBPs stopped.	
71. __ Ensure <u>all</u> HWPs stopped.	
72. __ Dispatch an operator with a safety harness to 2C-573 (MD EFDWPS SUCTION FROM UST) (T-1, W of E-31, 8' above floor).	
73. __ Open 2V-186.	__ Notify operator to open 2V-186 (MAIN CONDENSER VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
74. __ Stop <u>all</u> main vacuum pumps.	
75. Close the following: __ 2MS-47 __ 2AS-40	Dispatch an operator to close the following: __ 2MS-49 (2A CSAE STEAM SUPPLY) (T-3/F-29) __ 2MS-58 (2B CSAE STEAM SUPPly) (T-3/G-29) __ 2MS-67 (2C CSAE STEAM SUPPLY) (T-3, N of H-29)
76. __ **IAAT** UST level is < 1', **AND** 2C-573 (MD EFDWPS SUCTION FROM UST) is open, **THEN** stop <u>all</u> EFDW pumps.	

<u>NOTE</u>

MDEFDWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell (2C-573 closed).

77. __ **WHEN** vacuum is broken, **THEN** locally close 2C-573 (MD EFDWPS SUCTION FROM UST).	

IF AT ANY TIME:

(3) feeding both SGs with one MDEFDWP is desired... (cross-tie)

(9) rapid cooldown **NOT** in progress **AND** MDEFDWP operating for each <u>available</u> SG **AND** EFDW flow in <u>each</u> header is < 600 gpm... (place TDEFDWP in PULL TO LOCK)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
78. __ Restart all MDEFDWPs that were stopped due to UST level < 1'.	
79. __ Ensure TDEFDWP is **NOT** operating.	
80. __ Locally close 2C-157 (TD EFDWP SUCTION FROM UST) (T-1, N of C-36).	
81. __ Open 2C-391.	__ Locally open 2C-391 (TD EFDWP SUCTION FROM HOTWELL) (T-1/C-36).
82. __ **IAAT** TDEFDWP operation is desired, **AND** hotwell level is > 1", **THEN** start TDEFDWP.	
83. __ Dispatch an operator to open 2C-188 (HOTWELL EMERG MAKEUP #1 CONTROL BYPASS) (T-1, W of E-31). {18}	
84. __ Notify TSC to evaluate methods to maintain secondary inventory.	
85. __ **IAAT** hotwell level is ≤ 1", **THEN** stop all EFDWPs.	
86. __ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-201

Restart RCP

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Restart RCP

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):

System: 003
K/A: A4.06
Rating: 2.9*/2.9

Task Standard:

1A1 RCP is started correctly per procedure.

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

EOP Enclosure 5.6 (RCP Restart)

Validation Time: 20 minutes

Time Critical: No

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 206
2. Place simulator in RUN

Tools/Equipment/Procedures Needed:

EOP Enclosure 5.6 (RCP Restart)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 tripped from 100% power

1TA and 1TB did not auto transfer to CT-1 on the trip resulting in tripping of all RCPs

Power has been restored to 1TA and 1TB

EOP Subsequent Action in progress at Step 4.46

INITIATING CUES:

SRO directs you to initiate EOP Enclosure 5.6 (RCP Restart) to start 1A1 RCP.

START TIME: _____

STEP 1: Step 1 Verify ICC tab **NOT** in progress. STANDARD: Determine ICC tab **NOT** in progress. ***Cue: If asked, inform candidate that the ICC tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 2 Verify **NO** RCPs operating. STANDARD: Verify **NO** RCPs operating by observing RCP red run light off and "0" amps indicated on 1AB1. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 3 Verify all the following: • Boiler condenser cooling has **NOT** occurred • *Nat Circ cooling exists in at least one RCS loop* STANDARD: Candidate should determine that Boiler condenser cooling has **NOT** occurred. Candidate should determine that Nat Circ cooling exists in at least one RCS loop by observing any of the following: SG pressure, core Δ T, CETCs, feeding SGs, and TBV position. ***Cue: If asked, indicate that Boiler condenser cooling has NOT occurred.*** COMMENTS:	___ SAT ___ UNSAT

STEP 4:	Step 4 Ensure all SCMs are > 0°F.	___ SAT
STANDARD:	Determine all SCMs are > 0°F by observing SCM on the ICCM located on 1UB1.	___ UNSAT
COMMENTS:		
STEP 5:	Step 5 Ensure adequate RCP NPSH per Encl 5.18 (P/T Curves).	___ SAT
STANDARD:	Obtain EOP Encl 5.18 (P/T Curves) and determine that adequate RCP NPSH exists.	___ UNSAT
COMMENTS:		
STEP 6:	Step 6 Verify any of the following exist: • Either hot leg level < 597" • Either train of vessel head level < 171" • RVLIS indications **NOT** available **AND NO** RCPs operating	___ SAT ___ UNSAT
STANDARD:	Determine step not met. Both hot leg levels > 597" and both trains of vessel head level indicate > 171". RVLIS indications are available. Continue to Step 6 RNO	
COMMENTS:		

STEP 7: Step 6 RNO Ensure Pzr level > 100" [180" acc]. **GO TO** Step 8 STANDARD: Monitor Pzr level on 1UB1 and determine level is > 100". Continue to Step 8 COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 8 Verify HPI CD tab **NOT** in progress. STANDARD: Determine HPI CD tab **NOT** in progress. ***Cue: If asked, inform candidate that the HPI CD tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 9 Ensure the following are closed: • 1RC-155 • 1RC-156 • 1RC-157 • 1RC-158 • 1RC-159 • 1RC-160 STANDARD: Determine the above valves are all closed by observing their light indications on 1UB2 are de-energized. This indicates that they have not been opened. ***Cue: If asked, valves have not been opened.*** COMMENTS:	___ SAT ___ UNSAT

STEP 10:	Step 10 Verify Pzr level is < 375" [340" acc].	___ SAT
STANDARD:	Monitor Pzr level on 1UB1 and determine level is < 375".	___ UNSAT
COMMENTS:		
STEP 11:	Step 11 Verify 1RC-4 is **NOT** closed to isolate leakage past PORV.	___ SAT
STANDARD:	*Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated.*	___ UNSAT
COMMENTS:		
STEP 12:	Step 12 Ensure 1RC-4 is open.	___ SAT
STANDARD:	Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated.	___ UNSAT
COMMENTS:		
STEP 13:	Step 13 Ensure 1RC-1 is in manual and closed.	___ SAT
STANDARD:	Locate 1RC-1 on 1UB1 and press "close". Verify the blue AUTO light goes out and the white "close" light illuminates.	___ UNSAT
COMMENTS:		

STEP 14: Step 14 Ensure the following are open: • 1LPSW-6 • 1LPSW-15 STANDARD: Verify 1LPSW-6 and 1LPSW-15 are open on the RZ modules located on 1VB2. COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 15 Ensure the following are open for each RCP to be started using OAC graphic LPS02: • 1LPSW-7&8 (1A1) STANDARD: Open 1LPSW-7&8 by rotating the switch in the open direction and verify they both are open on the OAC by calling up graphic LPS02. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 16: Step 16 Ensure ≈ 8 gpm seal injection for each RCP to be started. • 1A1 STANDARD: Ensure ≈ 8 gpm seal injection for 1A1 RCP by observing seal injection flow meter on 1VB3. COMMENTS:	___ SAT ___ UNSAT

STEP 17:	Step 17 Ensure the following are open for each RCP to be started: • 1HP-228 (1A1) STANDARD: Verify 1HP-228 open by observing red open light illuminated on 1VB3. COMMENTS:	___ SAT ___ UNSAT
STEP 18:	Step 18 Ensure the following are open: • 1HP-20 • 1HP-21 STANDARD: Verify 1HP-20 open by observing indication on the RZ module located on 1VB2. Verify 1HP-21 open by observing red open light illuminated on 1UB1. COMMENTS:	___ SAT ___ UNSAT
STEP 19:	Step 19 Verify CC TOTAL FLOW ≥ 575 gpm. STANDARD: Verify CC TOTAL FLOW ≥ 575 gpm by observing gauge located on 1AB3. COMMENTS:	___ SAT ___ UNSAT

STEP 20: Step 20 Verify HPI CD tab is **NOT** in progress. STANDARD: Determine HPI CD tab is **NOT** in progress. ***Cue: If asked, inform candidate that the HPI CD tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 21: Step 21 *Verify ICC tab is* **NOT** *in progress* STANDARD: Determine ICC tab is **NOT** in progress ***Cue: If asked, inform candidate that the ICC tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 22: Step 22 **IAAT** any SCM is = 0°F due to RCP restart, **THEN** *ensure full HPI flow per Rule 6 (HPI).* STANDARD: Candidate should indicate that if any SCM is = 0°F due to RCP restart, then they would ensure full HPI flow per Rule 6 (HPI). COMMENTS:	___ SAT ___ UNSAT

STEP 23:	Step 23 **IAAT** any SCM is = 0°F for ≈ 2 minutes following RCP restart, **THEN GO TO** LOSCM tab.	___ SAT
STANDARD:	Candidate should indicate if any SCM is = 0°F for ≈ 2 minutes following RCP restart they would inform the SRO to go to the LOSCM tab.	___ UNSAT
COMMENTS:		
STEP 24:	Step 24 Start AC or DC lift oil pump for an RCP to be started.	**CRITICAL STEP** ___ SAT
STANDARD:	Start AC or DC lift oil pump for the 1A1 RCP by locating switch on 1AB1 and placing the switch in the start position. The red light should come on and the white light should go off.	___ UNSAT
COMMENTS:		
STEP 25:	Step 25 **WHEN** computer alarm for low lift oil pump discharge pressure clears for RCP to be started, ***THEN*** *start RCP.*	**CRITICAL STEP** ___ SAT
STANDARD:	Monitor computer alarms on the OAC "Alarm" screen located on 1UB2 and when low lift oil pump discharge pressure alarm clears, start the 1A1 RCP by rotating the switch located on 1AB1 clockwise. The red light should illuminate and the green light should go off. Monitor RCP amps to ensure they return to normal.	___ UNSAT
COMMENTS:		

STEP 26: Step 26 Stabilize RCS P/T. STANDARD: Monitor RCS P/T on 1UB1 and the OAC to determine it is stable. COMMENTS:	___ SAT ___ UNSAT
STEP 27: Step 27 **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP lift oil pump. STANDARD: Monitor RCP motor current by observing amp gauge on 1AB1 and when it stabilizes stop the 1A1 lift pump previously started by placing the switch on 1AB1 in the trip position. Observe the red light goes off and the green light illuminates. COMMENTS:	___ SAT ___ UNSAT
STEP 28: Step 28 Verify starting another RCP is **NOT** desired. STANDARD: Determine that starting another RCP is not desired. ***Cue: If asked, inform candidate that starting another RCP is not desired at this time.*** COMMENTS:	___ SAT ___ UNSAT

STEP 29: Step 29 Monitor OAC graphic RCPMPALL to analyze operating RCP parameters. STANDARD: Display OAC graphic RCPMPALL and analyze 1A1 RCP parameters. COMMENTS:	___ SAT ___ UNSAT
STEP 30: Step 30 Return the following components to their desired position: • 1RC-1 • Pzr heaters STANDARD: Return 1RC-1 and Pzr heaters to AUTO by depressing the AUTO pushbuttons located on 1UB1 for 1RC-1 and Pzr heaters. ***Cue: If asked, inform candidate that it is desired to return 1RC-1 and Pzr heaters to AUTO.*** COMMENTS:	___ SAT ___ UNSAT
STEP 31: Step 31 **EXIT** this enclosure. STANDARD: Candidate should indicate that they would exit this enclosure. COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
15	This step aligns cooling water to the RCP.
24	This step required for the RCP to satisfy RCP start interlock requirements.
25	This step required to start the RCP.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Reactor tripped from 100% power

1TA and 1TB did not auto transfer to CT-1 on the trip resulting in tripping of all RCPs

Power has been restored to 1TA and 1TB

EOP Subsequent Action in progress at Step 4.46

INITIATING CUES:

SRO directs you to initiate EOP Enclosure 5.6 (RCP Restart) to start 1A1 RCP.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Verify ICC tab **NOT** in progress.	__ **GO TO** Step 14.
2. __ Verify **NO** RCPs operating.	__ **GO TO** Step 4.
3. Verify all the following: __ Boiler condenser cooling has **NOT** occurred __ Nat Circ cooling exists in at least one RCS loop	1. __ Obtain TSC concurrence to perform RCP restart. 2. __ **IF** TSC does **NOT** concur with RCP restart, **THEN EXIT** this enclosure.
4. __ Ensure all SCMs are > 0°F.	
5. __ Ensure adequate RCP NPSH per Encl 5.18 (P/T Curves).	
6. Verify any of the following exist: __ Either hot leg level < 597" __ Either train of vessel head level < 171" __ RVLIS indications **NOT** available **AND NO** RCPs operating	1. __ Ensure Pzr level is ≥ 100" [180" acc]. 2. __ **GO TO** Step 8.
7. __ Ensure Pzr level > 200" [235" acc].	
8. __ Verify HPI CD tab **NOT** in progress.	__ **GO TO** Step 10.
9. Ensure the following are closed: __ 1RC-155 __ 1RC-156 __ 1RC-157 __ 1RC-158 __ 1RC-159 __ 1RC-160	
10. __ Verify Pzr level is < 375" [340" acc].	__ Reduce RCS pressure to < 2000 psig.
11. __ Verify 1RC-4 is **NOT** closed to isolate leakage past PORV.	__ **GO TO** Step 13.
12. __ Ensure 1RC-4 is open.	
13. __ Ensure 1RC-1 is in manual and closed.	
14. Ensure the following are open: __ 1LPSW-6 __ 1LPSW-15	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. Ensure the following are open for each RCP to be started using OAC graphic LPS02: __ 1LPSW-7&8 (1A1) __ 1LPSW-13&14 (1A2) __ 1LPSW-9&10 (1B1) __ 1LPSW-11&12 (1B2)	
16. Ensure ≈ 8 gpm seal injection for each RCP to be started. __ 1A1 __ 1A2 __ 1B1 __ 1B2	
17. Ensure the following are open for each RCP to be started: __ 1HP-228 (1A1) __ 1HP-226 (1A2) __ 1HP-232 (1B1) __ 1HP-230 (1B2)	
18. Ensure the following are open: __ 1HP-20 __ 1HP-21	
19. __ Verify CC TOTAL FLOW ≥ 575 gpm.	Open the following as necessary to obtain ≥ 575 gpm total CC flow: __ 1HP-1 __ 1HP-2
20. __ Verify HPI CD tab is **NOT** in progress.	__ **GO TO** Step 32.
21. __ Verify ICC tab is **NOT** in progress.	__ **GO TO** Step 41.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE If SCM is lost due to RCP restart, performance of Rule 2 (Loss of SCM) may be delayed for up to 2 minutes to allow SCM to recover.	
22. __ **IAAT** any SCM is = 0°F due to RCP restart, **THEN** ensure full HPI flow per Rule 6 (HPI).	
23. __ **IAAT** any SCM is = 0°F for ≈ 2 minutes following RCP restart, **THEN GO TO** LOSCM tab.	
24. __ Start AC or DC lift oil pump for an RCP to be started.	
25. __ **WHEN** computer alarm for low lift oil pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
26. __ Stabilize RCS P/T.	
27. __ **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP lift oil pump.	
28. __ Verify starting another RCP is **NOT** desired.	__ **GO TO** Step 22.
29. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
30. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
31. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status HPI CD tab is in progress.	
NOTE • If SCM is lost due to RCP restart, performance of Rule 2 (Loss of SCM) may be delayed for up to 2 minutes to allow SCM to recover. • Transition to LOSCM tab is **NOT** required if SCM is lost during RCP restart in HPI CD tab.	
32. __ **IAAT** any SCM is = 0°F due to RCP restart, **THEN** ensure full HPI flow per Rule 6 (HPI).	
33. __ Start AC or DC lift oil pump for an RCP to be started.	
34. __ **WHEN** computer alarm for low lift oil pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
35. __ Stabilize RCS P/T.	
36. __ **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP lift oil pump.	
37. __ Verify starting another RCP is **NOT** desired.	__ **GO TO** Step 32.
38. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
39. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
40. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ICC tab in progress.	
41. __ Start AC or DC lift oil pump for an RCP to be started.	
42. __ **WHEN** computer alarm for low lift oil pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
43. __ **IAAT** RCP motor current stabilizes, **THEN** stop respective RCP lift oil pump.	
44. __ Verify starting another RCP is **NOT** desired.	__ **GO TO** Step 41.
45. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
46. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
47. __ **EXIT** this enclosure.	

END

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-009

Following a Keowee Emergency Start Transfer from CT-4 to CT-5

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Following a Keowee Emergency Start Transfer from CT-4 to CT-5

Alternate Path:

No

Facility JPM #:

CRO-009

K/A Rating(s):

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

Task Standard:

Auxiliary power is correctly swapped from CT-4 to CT-5 by procedure.

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

OP/0/A/1106/19 Encl. 4.12

Validation Time: 10 minutes

Time Critical: No

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 204
2. Import CRO-009 files.
3. Place simulator in RUN

Tools/Equipment/Procedures Needed:

OP/0/A/1106/19, Encl. 4.12

READ TO OPERATOR

DIRECTION TO TRAINEE:

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:

CT-1 is out of service for repairs.

A Switchyard Isolation has resulted in a reactor trip and Unit 1's Main Feeder Busses are being supplied from CT-4 via the Standby Busses.

CT-5 has been energized from a Lee Gas Turbine and the dedicated path, bypassing the Central switchyard, has been established.

Keowee personnel have requested that the Keowee units be shutdown.

OP/0/A/1106/19, Keowee Hydro at Oconee, Enclosure 4.12 has been completed up to step 2.1.4.

INITIATING CUES:

The Control Room SRO directs you to utilize Enclosure 4.12 of OP/0/A/1106/19, Keowee Hydro at Oconee, to transfer MFB power from CT-4 to CT-5 starting at step 2.1.4.

START TIME: _____

STEP 1:	Step 2.1.4 Place the following transfer switches in MANUAL: • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	The following transfer switches are placed in the MANUAL position: • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN **Not Critical** • CT-5 BUS 2 AUTO/MAN **Not Critical**	
COMMENTS:		
STEP 2:	Step 2.1.5 Open SK1 (CT-4 Stby Bus 1 Feeder).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	*SK1 (CT-4 Stby Bus 1 Feeder) is OPENED by placing the switch in the* trip position on 2AB3.	
COMMENTS:		

STEP 3:	**CRITICAL STEP**
NOTE: The time period between opening SK2 and closing SL1 should be > 3 seconds and < 20 seconds.	___ SAT
Step 2.1.6 Energize the STBY BUSES from CT-5 by performing the following: • Open SK2 (CT-4 STBY BUS 2 FEEDER) • Close SL1 (CT-5 STBY BUS 1 FEEDER) • Close SL2 (CT-5 STBY BUS 2 FEEDER)	___ UNSAT
STANDARD: The following breakers located on 2AB3 are operated in the listed sequence: • Open SK2 (CT-4 STBY BUS 2 FEEDER) • Close SL1 (CT-5 STBY BUS 1 FEEDER) • Close SL2 (CT-5 STBY BUS 2 FEEDER)	
COMMENTS:	
STEP 4: Step 2.1.7 Return the following transfer switches to AUTO: • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN	___ SAT ___ UNSAT
STANDARD: The following transfer switches located on 2AB3 are placed in the AUTO position: • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN	
NOTE: Recovery of lost loads is not required for this JPM.	
COMMENTS:	
END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Breakers required in manual to allow operation
2	Breaker required to be open to remove power from CT-4 allowing power restored from CT-5
3	Proper breaker alignment to transfer power from CT-4 to CT-5

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

CT-1 is out of service for repairs.

A Switchyard Isolation has resulted in a reactor trip and Unit 1's Main Feeder Busses are being supplied from CT-4 via the Standby Busses.

CT-5 has been energized from a Lee Gas Turbine and the dedicated path, bypassing the Central switchyard, has been established.

Keowee personnel have requested that the Keowee units be shutdown.

OP/0/A/1106/19, Keowee Hydro at Oconee, Enclosure 4.12 has been completed up to step 2.1.4.

INITIATING CUES:

The Control Room SRO directs you to utilize Enclosure 4.12 of OP/0/A/1106/19, Keowee Hydro at Oconee, to transfer MFB power from CT-4 to CT-5 starting at step 2.1.4.

1. Initial Conditions

_____ 1.1 KHUs have been started by emergency actuation AND it is desired to shut down the KHUs.

_____ 1.2 It is desired to supply power from CT 5.

_____ 1.3 Review Limits and Precautions.

2. Procedure

2.1 Perform a Dead Bus transfer to CT5 from CT4 while CT4 is supplying **Unit 1, 2,** OR 3 MFB by:

_____ _____ 2.1.1 Ensure CT 5 is energized AND ready to power auxiliary loads.

2.1.2 Prior to performing Dead Bus transfer, notify the following:

- _____ Security Force
- _____ Chemistry Department
- _____ Group Heads
- _____ Keowee Operator

_____ 2.1.3 Ensure reset MFB Monitor Panel for any Oconee Units receiving power from the STBY Buses.

2.1.4 Place the following transfer switches in "MAN":

- _____ _____ CT 4 BUS 1 AUTO/MAN
- _____ _____ CT 4 BUS 2 AUTO/MAN
- _____ _____ CT 5 BUS 1 AUTO/MAN
- _____ _____ CT 5 BUS 2 AUTO/MAN

_____ _____ 2.1.5 Open SK 1 CT 4 STANDBY BUS 1 FEEDER.

CAUTION:	Transfer should be made in > 3 but < 20 seconds to prevent picking up MFB Monitor Panel actuation which will cause a Load Shed, Keowee Emergency start and possible EPSL actuation. Undervoltage relays will cause a loss of most non-safety loads.

2.1.6 Energize STBY BUSES from CT 5 by performing the following:

_____ _____ A. Open SK 2 CT 4 STBY BUS 2 FEEDER.

_____ _____ B. Close SL-1 CT 5 STBY BUS 1 FEEDER.

_____ _____ C. Close SL-2 CT 5 STBY BUS 2 FEEDER.

2.1.7 Return the following Transfer Switches to "AUTO":

_____ _____ • CT4 BUS 1 AUTO/MAN

_____ _____ • CT4 BUS 2 AUTO/MAN

_____ _____ • CT5 BUS 1 AUTO/MAN

_____ _____ • CT5 BUS 2 AUTO/MAN

_____ 2.1.8 Recover any loads lost in transfer.

NOTE: IF KHU(s) are generating with Overhead ACB closed prior to an Emergency Start Actuation, that KHU(s) will shutdown when ES Channel has been reset unless ACB is currently closed.

2.2 When all three Units no longer require an energized Underground Power Path AND a Normal Lockout does NOT exist on either KHU supplying power to an Oconee Unit, completely shut down the KHU tied to the Underground by:

2.2.1 IF ES 1 OR 2 has actuated, either reset ES 1 AND 2 channels OR press "MANUAL" on the following ES 1 AND 2 modules:

_____ _____ • Keowee Emer Start Ch A

_____ _____ • Keowee Emer Start Ch B

_____ _____ • Load Shed and STBY Bkr 1

_____ _____ • Load Shed and STBY Bkr 2

2.2.2 IF a manual Keowee Emergency start has been performed from any Oconee Unit, return both Keowee Emergency Start Channel switches on the affected Unit to "OFF" position.

_____ _____ • Keowee Emergency Start Channel A

_____ _____ • Keowee Emergency Start Channel B

_____ _____ 2.2.3 Ensure reset Main Feeder Bus Monitor Panels.

2.2.4 Reset External Grid Trouble Protection System by depressing the following buttons. (**Unit 1/2**):

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.V. CHANNEL 1 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.V. CHANNEL 2 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.F. CHANNEL 1 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.F. CHANNEL 2 RESET

2.2.5 Ensure External Grid Trouble Protection has been reset. (**Unit 1/2**):

_____ • SA-15, A-2 Channel #1 Underfrequency

_____ • SA-15, A-4 Channel #2 Underfrequency

_____ • SA-15, C-1 Channel #1 Undervoltage

_____ • SA-15, C-3 Channel #2 Undervoltage

NOTE:	External Grid Trouble Protection System actuates Keowee Emergency Start from Oconee **Unit 1** circuitry.

2.2.6 Depress Keowee "PUSH TO RET TO NORMAL AFT ES RESET" pushbutton on <u>ALL</u> Oconee Units which have generated a Keowee Emergency Start signal:

A. **Unit 1**

_____ _____ • KEOWEE LOGIC RESET CHANNEL 1

_____ _____ • KEOWEE LOGIC RESET CHANNEL 2

B. **Unit 2**

_____ _____ • KEOWEE LOGIC RESET CHANNEL 1

_____ _____ • KEOWEE LOGIC RESET CHANNEL 2

C. **Unit 3**

_____ _____ • KEOWEE ES CHANNEL A

_____ _____ • KEOWEE ES CHANNEL B

_____ 2.2.7 Notify Keowee Operator to shutdown the KHU(s) per OP/0/A/2000/041 (KHS - Modes of Operation).

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-202

Reset RIA-40 setpoints and enter the OAC Pri to Sec Admin Limit

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Reset RIA-40 setpoints and enter the OAC Pri to Sec Admin Limit

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):

System: 073
K/A: A4.02
Rating: 3.7/3.7

Task Standard:

Correctly adjust 1RIA-40 alarm setpoints for the RIA and OAC per AP/31, Primary to Secondary Leakage

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

AP/31, Primary to Secondary Leakage

Validation Time: 10 minutes

Time Critical: No

==========

Candidate: _____ (NAME)

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time _____

Examiner: _____ (NAME) _____ (SIGNATURE) _____/_____ (DATE)

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall IC-41
2. Place simulator in RUN

Tools/Equipment/Procedures Needed:

AP/31, Primary to Secondary Leakage

AP/31 (Primary to Secondary Leakage) Encl. 5.7 (Resetting 1RIA-40 and OAC Setpoints) completed thru step 5.

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 unit has been continuously operating at 100% for 9 months with a small SG tube leak in the 1B SG.

SG tube leakage in the 1B SG has increased and new leakage is calculated to equal 17 gpd.

AP/31, Primary to Secondary Leaklage is in progress and completed up to step 4.40.

INITIATING CUES:

The SRO directs you to complete step 4.40 of AP/31, Primary to Secondary Leakage.

START TIME: _____

STEP 1: Step 4.40 Perform Enclosure 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following setpoints: *1RIA-40 High – 75 gpd* 1RIA-40 Alert – 30 gpd OAC point O1K1430 (Total PRI To Sec Leakrate Admin Limit) – 30 gpd STANDARD: Locate Enclosure 5.7 (Resetting 1RIA-40 and OAC Setpoints) **Cue: Give candidate the partially completed copy of Enclosure 5.7. Inform candidate that the enclosure is complete up to step 6.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 6 Enter the new 1RIA-40 Alert and High setpoints in the RIA View Node STANDARD: Locate the RIA View Node on 1VB2, perform the following: • From the U1 Radiation Monitor display page, select 1RIA-40 by placing the cursor on 1RIA-40 "hot link" then depress the left mouse key. • From the Channel Summary display page, select Enable Controls by placing the cursor on the ENABLE CONTROLS "hot link" and depressing the left mouse key. • From the ENABLE CONTROLS display page, type in the new ALERT setpoint (3602 cpm) in the ALERT window and depress enter (or left mouse key). • From the ENABLE CONTROLS display page, type in the new HIGH setpoint (9006 cpm) in the HIGH window and depress enter (or left mouse key). • *Verify the new ALERT (Yellow bar) and HIGH (Red bar) setpoints increase to the new elevated values on the Channel Summary display page.* **NOTE: * Not critical** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3:	Step 7 Enter the new OAC TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT by performing the following: • Enter MVU • Select PRI-LEAK PRIMARY TO SECONDARY LEAKAGE MANUAL INPUTS. • Select UPDATE • Select O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) • Enter the new TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT. • Enter your LAN identification and reason for change. • Select SAVE	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Using one of the OAC terminals located on 1UB1 or 1UB2 the candidate should perform the following: • Enter MVU • Select PRI-LEAK PRIMARY TO SECONDARY LEAKAGE MANUAL INPUTS. • Select UPDATE • Select O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) • Enter **30 gpd** as the new TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT. • *Enter their LAN identification and reason for change. • Select SAVE ***Note: Reason for change can be either AP/31 guidance or increase in SG Leakrate. Step not critical** COMMENTS: **END OF TASK**	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Setpoint adjustment for the RIA View Node 1RIA-40 High and Alert alarm setpoints
3	Setpoint adjustment OAC TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit has been continuously operating at 100% for 9 months with a small SG tube leak in the 1B SG.

SG tube leakage in the 1B SG has increased and new leakage is calculated to equal 17 gpd.

AP/31, Primary to Secondary Leakage is in progress and completed up to step 4.40.

INITIATING CUES:

The SRO directs you to complete step 4.40 of AP/31, Primary to Secondary Leakage.

TRNG

NSD 703 (R04-01)

JMB/JPP
Sim (3)
Brief
NRC
SR
115
HLP

Duke Power Company

PROCEDURE PROCESS RECORD

(1) ID No AP/1/A/1700/031

Revision No 004

OTC MASTER FILE

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Primary to Secondary Leakage

(4) Prepared By David P. Garland (Signature) David P. Garland Date 10/23/02

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By [signature] (QR) Date 11-1-02

Cross-Disciplinary Review By [signature] ERIC LAMPE (QR)NA Date 10/24/02

Reactivity Mgmt Review By (QR)NA [signature] Date

Mgmt Involvement Review By (Ops Supt) NA [signature] Date

(7) Additional Reviews

Reviewed By Date

Reviewed By Date

(8) Temporary Approval *(if necessary)*

By (OSM/QR) Date

By (QR) Date

(9) Approved By [signature] Date 11/4/02

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy Date

Compared with Control Copy Date

Compared with Control Copy Date

(11) Date(s) Performed

Work Order Number (WO#)

COMPLETION

(12) Procedure Completion Verification:

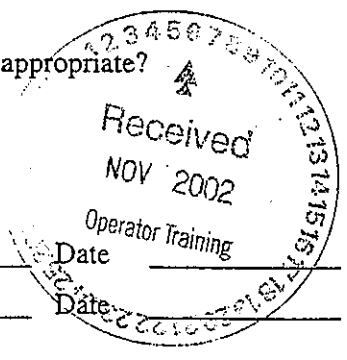
☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By Date

(13) Procedure Completion Approved Date

(14) Remarks *(Attach additional pages, if necessary)*



Received
NOV 2002
Operator Training

Duke Power Company Oconee Nuclear Station **Primary to Secondary Leakage**	Procedure No. AP/1/A/1700/031
	Revision No. 004
	Electronic Reference No. OP0095ZI

1. Entry Conditions

Any actual or suspected primary to secondary leakage ≥ 5 gpd and < 25 gpm.

2. Automatic Systems Actions

None

3. Immediate Manual Actions

None

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 __ IAAT the SGTR tab of EP/1 (EOP) is entered, THEN EXIT this procedure.	
4.2 __ IAAT either of the following exists for 1RIA-54: __ is in alarm __ inoperable THEN perform Steps 4.3 - 4.4.	__ GO TO Step 4.5.

NOTE
The white tags can be created and hung after the TBS pump breakers are opened. (1)

4.3 Dispatch an operator to open and white tag the following: __ 1XD-R3C (1A TURBINE BUILDING SUMP PUMP BKR) __ 1XE-R3D (1B TURBINE BUILDING SUMP PUMP BKR)	
4.4 Notify Secondary Chemistry to perform the following: __ Obtain a TBS sample. __ Recommend TBS release path.	
4.5 __ IAAT gross tube leakage is indicated by an increase in normal RC makeup flow, THEN GO TO Step 4.71.	
4.6 __ IAAT a tritium sample indicates ≥ 75 gpd primary to secondary leakage, THEN GO TO Step 4.73.	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The samples taken in the steps below are used to verify primary to secondary leak rate. CSAE off-gas samples and RCS samples should be taken at approximately the same time (within 15 minutes of each other, if possible).	
4.7 Notify RP to perform the following: __ Use a portable monitor to identify leaking SG. (2) __ Obtain CSAE off-gas sample. __ Expect contact from Primary Chemistry to coordinate CSAE off-gas and RCS sample times within 15 minutes.	
4.8 Notify Primary Chemistry to perform the following: __ Obtain an RCS sample for use in calculating SG tube leakage rate. __ Contact RP to coordinate CSAE off-gas and RCS sample times within 15 minutes.	
4.9 __ Verify OAC primary to secondary leak rate calculation available (including 1RIA-40 operable).	__ **GO TO** Step 4.12.
4.10 __ Determine primary to secondary leakage rate using OAC point O1P1599 (EST TOTAL PRI TO SEC LEAKRATE).	
4.11 __ **GO TO** Step 4.14.	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.12 __ Verify 1RIA-40 operable.	1. __ **IF** CSAE off-gas sample indicates primary to secondary leakage > 60 gpd (0.04164 gpm), **AND** leak rate was unstable/increasing at the time 1RIA-40 became inoperable, **THEN** perform the following: A. __ Stop any power increase in progress. B. __ **GO TO** Step 4.73. 2. __ **IF** CSAE off-gas sample indicates primary to secondary leakage ≥ 5 gpd (0.003472 gpm), **THEN** perform the following: A. __ Stop any power increase in progress. B. __ **GO TO** Step 4.28. 3. __ ***EXIT*** *this procedure.*
4.13 __ **PERFORM** Encl 5.5 (Calculation of Primary to Secondary Leak Rate using 1RIA-40). {3}	
4.14 __ Verify primary to secondary leak rate < 25 gpm (36,000 gpd).	NOTE If the EOP is **NOT** already in progress, entry will be directly to the SGTR tab. __ **GO TO** EP/1 (EOP).
4.15 __ Verify primary to secondary leak rate < 75 gpd (0.05205 gpm).	1. __ **IF** primary to secondary leak rate is <u>either</u> of the following: __ ≥ 75 gpd for at least one hour __ ≥ 100 gpd (0.0694 gpm) **THEN GO TO** Step 4.73. 2. __ **GO TO** Step 4.46.
4.16 __ Verify primary to secondary leak rate < 30 gpd (0.02082 gpm).	__ **GO TO** Step 4.46.
4.17 __ Verify primary to secondary leak rate < 5 gpd (0.003472 gpm).	__ **GO TO** Step 4.28.

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.18 __ **WHEN** CSAE off-gas and RCS samples are available, **THEN PERFORM** Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples) to confirm rate.	
4.19 __ Verify primary to secondary leak rate confirmed < 5 gpd (0.003472 gpm).	__ **GO TO** Step 4.28.
4.20 Notify the following to take a second sample (within 15 minutes of each other, if possible): ☑ Group: RP — Sample: CSAE ☐ Group: Primary Chemistry — Sample: RCS	
4.21 __ **WHEN** second CSAE off-gas and RCS samples are available, **THEN PERFORM** Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples) to confirm rate.	
4.22 __ Verify primary to secondary leak rate confirmed < 5 gpd (0.003472 gpm).	__ **GO TO** Step 4.28.
4.23 __ Verify 1RIA-40 operable.	__ **GO TO** Step 4.25.
4.24 Initiate Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to ensure the following alarm setpoints: {7} __ 1RIA-40 High - 30 gpd __ 1RIA-40 Alert - 5 gpd __ OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 5 gpd	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.25 Notify Secondary Chemistry of the following: __ Primary to secondary leak rate has been confirmed < 5 gpd and this procedure will be exited. __ To recommend TBS release path.	
4.26 Notify the following that primary to secondary leak rate has been confirmed < 5 gpd and this procedure will be exited: __ RP __ Primary Chemistry __ Personnel previously notified per OMP 1-14 (Notifications)	
4.27 __ **EXIT** this procedure.	

• • • END • • •

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.28 __ IAAT primary to secondary leak rate increases to ≥ 30 gpd (0.02082 gpm), **THEN GO TO** Step 4.46.	
4.29 __ Verify 1RIA-40 operable.	1. __ Monitor the following at least twice per shift for indications of an increasing leak rate: {4} • 1RIA-16 • 1RIA-17 2. __ **GO TO** Step 4.31.
4.30 __ Monitor the following at least once per shift for indications of an increasing leak rate: {4} • 1RIA-16 • 1RIA-17 • 1RIA-40	
4.31 __ Make notifications of primary to secondary leakage per OMP 1-14 (Notifications).	
4.32 __ Maintain the Primary to Secondary Leak Log to include the following: • 1RIA-16, 17, and 40 readings • RCS activity levels • Calculated leak sizes (including those based on 1RIA-40 readings)	
4.33 __ Issue a priority work request for any OOS SG tube leak monitoring equipment.	
4.34 Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples based on 1RIA-40 operability: {5}{6}	

✓	1RIA-40	Frequency (hr)
	Operable	24
	Inoperable	4

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

(4.28) primary to secondary leak rate increases to ≥ 30 gpd... (**GO TO** guidance to increase monitoring)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.35 __ IAAT CSAE off-gas sample and RCS sample results become available, THEN perform Steps 4.36 - 4.38.	__ GO TO Step 4.39.
4.36 __ PERFORM Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples).	
4.37 __ Log leak rate calculation results in Primary to Secondary Leak Log.	
4.38 Notify the following to enter leak rate calculation results in the Excel leakage spreadsheet: __ Ops Mods Supervisor __ Ops Work Process Manager Administrative Specialist	
4.39 __ IAAT 1RIA-40 is operable, THEN perform Steps 4.40 - 4.42.	__ GO TO Step 4.43.
4.40 PERFORM Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: {7} __ 1RIA-40 High - 75 gpd __ 1RIA-40 Alert - 30 gpd __ OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 30 gpd	
4.41 __ Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.	
4.42 __ Verify CSAE off-gas and RCS samples are being performed on a 24 hour frequency.	__ Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.
4.43 __ Notify OSM to include most recent primary to secondary leak rate (determined by CSAE off-gas sample or 1RIA-40) on the OSM turnover sheet. {8}	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

(4.28) primary to secondary leak rate increases to ≥ 30 gpd... (**GO TO** guidance to increase monitoring)

(4.35) CSAE off-gas sample and RCS sample results become available... (calculate and record primary to secondary leak rate)

(4.39) 1RIA-40 is operable... (reset OAC and 1RIA-40 setpoints and record new setpoints)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.44 __ IAAT CSAE off-gas sample indicates primary to secondary leak rate < 5 gpd (0.003472 gpm), **THEN** perform the following: A. Notify the following to take another sample (within 15 minutes of each other, if possible): ☑ Group: RP — Sample: CSAE ☐ Group: Primary Chemistry — Sample: RCS B. __ **GO TO** Step 4.21.	
4.45 __ **WHEN** in MODE 5, **THEN EXIT** this procedure.	

• • • END • • •

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.46 __ **IAAT** all the following conditions exist: __ 1RIA-40 inoperable __ primary to secondary leak rate > 60 gpd (0.04164 gpm) __ leak unstable/increasing at time 1RIA-40 became inoperable **THEN GO TO** Step 4.73.	
4.47 __ **IAAT** primary to secondary leak rate increases to either of the following: __ ≥ 75 gpd (0.05205 gpm) for at least one hour __ ≥ 100 gpd (0.0694 gpm) **THEN GO TO** Step 4.73.	
4.48 __ Make notifications of primary to secondary leakage per OMP 1-14 (Notifications).	
4.49 __ Monitor the following every 15 minutes for indications of increasing leak rate: (9) • 1RIA-16 • 1RIA-17 • 1RIA-40	
4.50 __ **IAAT** leak rate is stable (< 10% change in a one hour time period), **THEN** reduce monitoring frequency of the following to every two hours: • 1RIA-16 • 1RIA-17 • 1RIA-40	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

(4.46) 1RIA-40 is inoperable **AND** primary to secondary leak rate > 60 gpd **AND** leak unstable/increasing at time 1RIA-40 became inoperable... (**GO TO** shutdown guidance)

(4.47) primary to secondary leak rate increases to ≥ 75 gpd for at least one hour **OR** ≥ 100 gpd... (**GO TO** shutdown guidance)

(4.50) leak rate is stable (< 10% change in a one hour time period)... (reduce monitoring frequency of RIAs to every two hours)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.51 __ Maintain the Primary to Secondary Leak Log to include the following: • 1RIA-16, 17, and 40 readings • RCS activity levels • Calculated leak sizes (including those based on 1RIA-40 readings)	
4.52 __ Verify affected SG identified. {2}	Attempt to identify affected SG by any of the following methods: __ 1RIA-16/17 readings __ Local RP surveys of MS lines
4.53 __ Issue a priority work request for any OOS SG tube leak monitoring equipment.	
4.54 __ **IAAT** the OSM desires, **THEN** initiate Encl 5.2 (Reduction of Secondary Leakage and Cross-Unit Contamination). {10}	
4.55 Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples based on 1RIA-40 operability: {5}{6} ✓ | **1RIA-40** | **Frequency (hr)** Operable | 12 Inoperable | 4	
4.56 __ **IAAT** CSAE off-gas sample and RCS sample results become available, **THEN** perform Steps 4.57 - 4.59.	__ **GO TO** Step 4.60.
4.57 __ **PERFORM** Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples).	
4.58 __ Log leak rate calculation results in Primary to Secondary Leak Log.	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

(4.46) 1RIA-40 is inoperable **AND** primary to secondary leak rate > 60 gpd **AND** leak unstable/increasing at time 1RIA-40 became inoperable... (**GO TO** shutdown guidance)

(4.47) primary to secondary leak rate increases to ≥ 75 gpd for at least one hour **OR** ≥ 100 gpd... (**GO TO** shutdown guidance)

(4.50) leak rate is stable (< 10% change in a one hour time period)... (reduce monitoring frequency of RIAs to every two hours)

(4.54) OSM desires ... (initiate Encl 5.2 to reduce secondary leakage and cross-unit contamination)

(4.56) CSAE off-gas and RCS sample results become available... (calculate and record primary to secondary leak rate)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.59 Notify the following to enter leak rate calculation results in the Excel leakage spreadsheet: __ Ops Mods Supervisor __ Ops Work Process Manager Administrative Specialist	
4.60 __ **IAAT** 1RIA-40 is operable, **AND** primary to secondary leak rate is unstable (≥ 10% change in a two hour period), **THEN** perform Steps 4.61- 4.63.	__ **GO TO** Step 4.64.
4.61 **PERFORM** Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: {7} __ 1RIA-40 High - 75 gpd __ 1RIA-40 Alert - 75 gpd __ OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 75 gpd	
4.62 __ Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.	
4.63 __ Verify CSAE off-gas and RCS Samples are being performed on a 24 hour frequency.	__ Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.
4.64 __ **IAAT** 1RIA-40 is operable, **AND** primary to secondary leak rate is stable (< 10% change in a two hour period), **THEN** perform Steps 4.65- 4.67.	__ **GO TO** Step 4.68.

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.5) gross tube leakage is indicated by an increase in normal RC makeup flow... (**GO TO** shutdown guidance)

(4.6) tritium sample indicates ≥ 75 gpd primary to secondary leakage... (**GO TO** shutdown guidance)

(4.46) 1RIA-40 is inoperable and primary to secondary leak rate > 60 gpd **AND** leak unstable/increasing at time 1RIA-40 became inoperable... (**GO TO** shutdown guidance)

(4.47) primary to secondary leak rate increases to ≥ 75 gpd for at least one hour **OR** ≥ 100 gpd... (**GO TO** shutdown guidance)

(4.50) leak rate is stable (< 10% change in a one hour time period)... (reduce monitoring frequency of RIAs to every two hours)

(4.54) OSM desires ... (initiate Encl 5.2 to reduce secondary leakage and cross-unit contamination)

(4.56) CSAE off-gas and RCS sample results become available... (calculate and record primary to secondary leak rate)

(4.60) 1RIA-40 is operable **AND** primary to secondary leak rate is unstable... (set OAC and 1RIA-40 setpoints to 75 gpd)

(4.64) 1RIA-40 is operable **AND** primary to secondary leak rate is stable... (set OAC and 1RIA-40 setpoints to 75 gpd and 30 gpd above current reading)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.65 **PERFORM** Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: {7} __ 1RIA-40 High - 75 gpd __ 1RIA-40 Alert - 30 gpd above existing leak rate (**NOT** to exceed 75 gpd) __ OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 30 gpd above existing leak rate (**NOT** to exceed 75 gpd)	
4.66 __ Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.	
4.67 __ Verify CSAE off-gas and RCS Samples are being performed on a 24 hour frequency.	__ Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.
4.68 __ Notify OSM to include most recent primary to secondary leak rate (determined by CSAE off-gas sample or 1RIA-40) on the OSM turnover sheet. {8}	
4.69 __ Prepare for response to primary to secondary leakage ≥ 75 gpd by reviewing Steps 4.73 - 4.97. {11}	
4.70 __ **WHEN** in MODE 5, **THEN EXIT** this procedure.	

END

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (EXIT this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.71 __ Verify gross leak rate determination is desired.	__ **GO TO** Step 4.73.
4.72 Determine primary to secondary leak rate: LR=_____+_____-_____-_____ MU SI LD TSR LR=_____gpm Where: LR = Leak Rate MU= Makeup Flow SI = Seal Inlet Header Flow LD = Letdown TSR = Total Seal Return	

NOTE
If the EOP is **NOT** already in progress, entry will be directly to the SGTR tab.

4.73 __ **IAAT** primary to secondary leak rate is ≥ 25 gpm (36,000 gpd), **THEN GO TO** EP/1 (EOP).	
4.74 __ Make notifications of primary to secondary leakage per OMP 1-14 (Notifications).	
4.75 __ Log readings from the following every 15 minutes in the Primary to Secondary Leak Log: (9) • 1RIA-16 • 1RIA-17 • 1RIA-40	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered… (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable … (open TBS pump breakers)

(4.73) primary to secondary leak rate is ≥ 25 gpm… (**GO TO** EP/1 (EOP))

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.76 __ Initiate a unit shutdown using the following as necessary to meet requirements of Encl 5.1 (Unit Shutdown Requirements): • OP/1/A/1102/004 (Operation at Power) • OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown)	
4.77 __ **IAAT** primary to secondary leakage increases, **THEN** modify shutdown as required by Encl 5.1 (Unit Shutdown Requirements).	
4.78 __ Notify Radwaste to stop <u>all</u> liquid releases in progress until sample results assure release rates within limits.	
4.79 __ Stop <u>all</u> gaseous releases in progress until sample results assure release rates within limits.	
4.80 __ Make up to the UST only as necessary to maintain UST level > 7'.	
4.81 Notify the following that a shutdown is in progress due to primary to secondary leakage: __ RP __ Primary Chemistry __ Secondary Chemistry	
4.82 __ Initiate Encl 5.2 (Reduction of Secondary Leakage and Cross-Unit Contamination). {10}	
4.83 __ Verify affected SG identified. {2}	Attempt to identify affected SG by <u>any</u> of the following methods: __ 1RIA-16/17 readings __ Local RP surveys of MS lines

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.73) primary to secondary leak rate is ≥ 25 gpm... (**GO TO** EP/1 (EOP))

(4.77) *primary to secondary leakage increases... (modify shutdown as required by Encl 5.1)*

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.84 Verify entry into this procedure was due to one of the following: __ gross tube leakage indicated by an increase in normal RC makeup flow __ tritium sample indicating ≥ 75 gpd primary to secondary leak	__ GO TO Step 4.86.
4.85 __ **GO TO** Step 4.93.	
4.86 __ Verify CSAE off-gas sample and RCS sample have been requested to verify leak rate.	Notify the following to take another sample (within 15 minutes of each other, if possible): **Group** / **Sample** RP / CSAE Primary Chemistry / RCS
4.87 __ **WHEN** CSAE off-gas and RCS sample results become available, **THEN PERFORM** Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples).	
4.88 __ Log leak rate calculation results in Primary to Secondary Leak Log.	
4.89 Notify the following to enter leak rate calculation results in the Excel leakage spreadsheet: __ Ops Mods Supervisor __ Ops Work Process Manager Administrative Specialist	

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered... (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable ... (open TBS pump breakers)

(4.73) primary to secondary leak rate is ≥ 25 gpm... (**GO TO** EP/1 (EOP))

(4.77) primary to secondary leakage increases... (modify shutdown as required by Encl 5.1)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.90 __ Ensure unit shutdown is in progress to meet the shutdown requirements of Encl 5.1 (Unit Shutdown Requirements).	
4.91 __ **WHEN** in MODE 3, **THEN** continue.	
4.92 __ Verify leak rate calculation (Step 4.87) confirms shutdown to MODE 5 is required due to leakage exceeding limits of Encl 5.1 (Unit Shutdown Requirements).	1. __ **IF** OSM desires, **THEN** stop unit shutdown. 2. __ **IF** unit shutdown is stopped, **AND** only one confirmation of leak rate (per Step 4.87) has been made, **THEN** perform the following: A. Notify the following to take a second sample (within 15 minutes of each other, if possible): B. __ **GO TO** Step 4.87. 3. __ **IF** unit shutdown is stopped, **THEN GO TO** Step 4.16. 4. __ **GO TO** Step 4.93.
4.93 __ **WHEN** LPI is providing DHR, **THEN** dispatch an operator to perform Encl 5.3 (Local SG Isolation) to isolate affected SGs. (12)	

	Group	Sample
	RP	CSAE
	Primary Chemistry	RCS

IF AT ANY TIME:

(4.1) the SGTR tab of EP/1 (EOP) is entered… (**EXIT** this procedure)

(4.2) 1RIA-54 in alarm or inoperable … (open TBS pump breakers)

(4.73) primary to secondary leak rate is ≥ 25 gpm… (**GO TO** EP/1 (EOP))

(4.77) primary to secondary leakage increases… (modify shutdown as required by Encl 5.1)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4.94 Close the following on affected SGs: {12}

✓	1A SG	✓	1B SG
	1FDW-31		1FDW-40
	1FDW-36		1FDW-45
	1FDW-38		1FDW-47
	1FDW-372		1FDW-382
	1MS-79		1MS-76
	1MS-24		1MS-33
	1MS-35		1MS-36
	1MS-82		1MS-84
	1FDW-368		1FDW-369
	1SD-2		1SD-5
	1SD-27		1SD-290
	1SD-358		
	1SD-418		1SD-420
	1SD-419		1SD-421

4.95 __ **WHEN** condenser vacuum is broken, **OR** in MODE 5, **THEN** notify RP to stop taking CSAE off-gas samples.

4.96 __ Notify Primary Chemistry to stop taking non-routine samples as part of their primary to secondary leak rate monitoring program.

4.97 __ **EXIT** this procedure.

• • • END • • •

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE
Xe 133 equivalent activity is required for this calculation.

1. ✓ Obtain Xe 133 equivalent activity from latest available Primary Chemistry RCS sample.
   .288 (µCi/ml)

2. ✓ Verify CSAE flow rate is on-scale. — __ **PERFORM** Encl 5.6 (CSAE Flow Rate Determination).

3. ✓ Obtain CSAE flow rate.
   6.5 ft^3/min

4. Determine 1RIA-40 High setpoint from the following formulas:

$$\text{1RIA-40 High Setpoint (cpm)} = \text{High Setpoint (gpd)} \times \frac{\text{RCS (Xe 133eq) activity (µCi/ml)}}{\text{CSAE flow } (ft^3/min)} \times \frac{2.71E+3\ (ft^3)(day)(cpm)}{(gal)(min)(\mu Ci/ml)}$$

$$\text{1RIA-40 High Setpoint (cpm)} = 75\ \text{gpd} \times \frac{.288\ \mu Ci/ml}{6.5\ ft^3/min} \times \frac{2.71E+3\ (ft^3)(day)(cpm)}{(gal)(min)(\mu Ci/ml)} \approx 9006\ \text{cpm}$$

5. Determine 1RIA-40 Alert setpoint from the following formulas:

$$\text{1RIA-40 Alert Setpoint (cpm)} = \text{Alert Setpoint (gpd)} \times \frac{\text{RCS (Xe 133eq) activity (µCi/ml)}}{\text{CSAE flow } (ft^3/min)} \times \frac{2.71E+3\ (ft^3)(day)(cpm)}{(gal)(min)(\mu Ci/ml)}$$

$$\text{1RIA-40 Alert Setpoint (cpm)} = 30\ \text{gpd} \times \frac{.288\ \mu Ci/ml}{6.5\ ft^3/min} \times \frac{2.71E+3\ (ft^3)(day)(cpm)}{(gal)(min)(\mu Ci/ml)} = 3602\ \text{cpm}$$

6. __ Enter the new 1RIA-40 Alert and High Setpoints in the RIA View Node.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. Enter the new OAC TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT by performing the following: A. __ Enter MVU. B. __ Select PRI-LEAK PRIMARY TO SECONDARY LEAKAGE MANUAL INPUTS. C. __ Select UPDATE. D. __ Select O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT). E. __ Enter the new TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT. F. __ Enter your LAN identification and reason for change. G. __ Select SAVE.	
8. __ **EXIT** this enclosure.	

•••END•••

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-011A

Align Intake Canal For Recirc On Dam Failure

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align Intake Canal for Recirc on Dam Failure

Alternate Path:

Yes

Facility JPM #:

CRO-011A

K/A Rating(s):

System: 075
K/A: A2.01
Rating: 3.0/3.2

Task Standard:

Intake Canal is aligned for recirculation correctly by procedure and an NEO is dispatched to manually open CCW-9.

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

"CCW LAKE LEVEL LOW" statalarm (1SA-9, B-10)

AP/1/A/1700/13, Dam Failure

Validation Time: 15 minutes

Time Critical: No

==========

Candidate: _____ (NAME)

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ (NAME) _____ (SIGNATURE) /_____ (DATE)

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall Snap 205
2. Import CRO-011A files
3. Place simulator in RUN

Tools/Equipment/Procedures Needed:

AP/1/A/1700/13, Dam Failure

READ TO OPERATOR

DIRECTION TO TRAINEE:

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:

Dam failure has occurred.

Intake Canal is intact.

Unit has been manually tripped.

Subsequent Actions of AP/1/A/1700/13, Dam Failure have been completed up to step 4.3.

INITIATING CUES:

Control Room Supervisor directs you to align the CCW Intake Canal for recirc following a dam failure beginning at step 4.3 of AP/1/A/1700/13, Dam Failure.

START TIME: _____

STEP 1: Step 4.3: Depress the "CCW DAM FAILURE" pushbutton. STANDARD: The "CCW DAM FAILURE" pushbutton is located by the candidate on 1AB3 and depressed. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Step 4.4: Dispatch an individual to the area of the dam failure to report damage to the Control Rooms. STANDARD: The candidate contacts the Shift Work Manager, or calls the Work Control Center kitchen directly, and dispatches an individual to the area of the dam failure to report damage to the control room. ***Cue: NEO dispatched to the area of the dam failure to report damage to the Control Rooms.*** COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 4.5 ***GO TO*** *Step 4.45* STANDARD: The candidate proceeds to Step 4.45 in AP/013. COMMENTS:	___ SAT ___ UNSAT

STEP 4:	Step 4.45: Stop all RCPs.	**CRITICAL STEP** ___ SAT
STANDARD:	The control switches for RCPs 1A1, 1A2, 1B1, 1B2 are located by the candidate on 1AB1 and rotated to the TRIP position. The candidate verifies by red run lights off and/or "0" amps indicated that the RCPs are tripped.	___ UNSAT
COMMENTS:		
STEP 5:	Step 4.46: Ensure all CCW pumps are stopped.	___ SAT
STANDARD:	The candidate locates the CCW pump light indications on 1AB3 and verifies by red run lights off and/or "0" amps indicated that all CCW pumps are tripped.	___ UNSAT
COMMENTS:		
STEP 6:	Step 4.47: Ensure 1CCW 1-6 are open.	___ SAT
STANDARD:	The candidate locates 1CCW 1-6 (WATERBOX EMER DISCH) control switch and indications located on 1AB3. The red "OPEN" indication light is verified on.	___ UNSAT
COMMENTS:		

STEP 7:	Step 4.48: Ensure all condenser outlet valves indicate closed (GD AP13): • 01D0273 (1CCW-20 CONDENSER 1A OUTLET 1) • 01D0275 (1CCW-21 CONDENSER 1A OUTLET 2) • 01D0277 (1CCW-22 CONDENSER 1B OUTLET 1) • 01D0279 (1CCW-23 CONDENSER 1B OUTLET 2) • 01D0281 (1CCW-24 CONDENSER 1C OUTLET 1) • 01D0283 (1CCW-25 CONDENSER 1C OUTLET 2)	___ SAT ___ UNSAT
STANDARD:	The candidate displays OAC Graphics "GD AP13" and verifies 1CCW-20 through 1CCW-25 indicate closed. The candidate may also display individual points by Point ID or a Group Display to determine 1CCW-20 through 1CCCW-25 indicates closed.	
COMMENTS:		
STEP 8:	Step 4.49: Verify CCW-8 is open.	___ SAT
STANDARD:	CCW-8 switch and indication are located by the candidate on 2AB3 verifying red "OPEN" light illuminated and green "CLOSED" light extinguished.	___ UNSAT
COMMENTS:		
STEP 9:	Step 4.50: Notify Unit 2 that emergency CCW siphon flow has been established on Unit 1.	___ SAT
STANDARD:	The candidate notifies Unit 2 that emergency CCW siphon flow has been established.	___ UNSAT
COMMENTS:		

STEP 10: Step 4.51: Dispatch operators to perform Encl 5.2 (CCW Inventory Conservation) STANDARD: The candidate contacts the Shift Work Manager, or calls the Work Control Center kitchen directly, and dispatches operators to perform Encl 5.2 (CCW Inventory Conservation). COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 4.52: **IAAT** Unit 2 CR has directed Unit 1 to supply CCW recirculation, THEN perform Steps 4.53 – 4.67. STANDARD: The candidate determines where or not Unit 2 has directed Unit 1 to supply CCW recirculation. The candidate will proceed to Step 4.53 when informed that Unit 2 directs Unit 1 to supply CCW recirculation. ***CUE: When the candidate reaches Step 4.52 inform the candidate that Unit 2 directs that Unit 1 will supply CCW recirculation.*** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Step 4.53: Determine which CCW pump will be started. STANDARD: The candidate determines which CCW pump to be started. ***Cue: If asked as the SRO which CCW pump to start, inform candidate to start the 1D CCW pump.*** COMMENTS:	___ SAT ___ UNSAT

STEP 13: Step 4.54: Place all CCW Pump switches in the trip position: • 1A CW Pump • 1B CW Pump • 1C CW Pump • 1D CW Pump STANDARD: The candidate locates the CCW Pump controls on 1AB2 and rotates the 1A, 1B, 1C, and 1D CCW Pump control switches to the trip position. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 4.55: Verify 1A or 1B CCW Pump is to be started. STANDARD: The candidate may ask the Procedure Director which CCW is desired to be started. When instructed by the Procedure Director that 1D CCW Pump is to be started, the candidate should refer to the RNO column. ***Cue: Instruct the candidate that the SRO requests that 1D CCW Pump be started.*** COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 4.55 RNO: GO TO Step 4.57 STANDARD: The candidate should proceed to Step 4.57. COMMENTS:	___ SAT ___ UNSAT

STEP 16:	Step 4.57: Verify the 1C or 1D CCW Pump is to be started. The candidate determines from the direction given by the Procedure Director that 1D CCW Pump is to be started. COMMENTS:	___ SAT ___ UNSAT
STEP 17:	Step 4.58 Verify both of the following CCW pump discharge valves are closed: • 1CCW-12 • 1CCW-13 The candidate verifies that 1CCW-12 indicates closed by the green closed light indication on 1AB3 or by OAC indications. The candidate verifies that 1CCW-13 indicates open by the red open light indication on 1AB3 or by OAC indications. The candidate proceeds to Step 5.58 RNO. COMMENTS:	___ SAT ___ UNSAT

STEP 18: Step 4.58 RNO

Dispatch an operator to close the discharge valves from the breaker switch (Unit 1 Equipment rm):

Pump	Valve	Breaker
1C	1CCW-12	1XS3-2E
1D	1CCW-13	1XS1-F3C

___ SAT

___ UNSAT

STANDARD: The candidate dispatches an operator to Unit 1 Equipment Room to close 1CCW-12.

If the candidate directs the operator to close valves, 1CCW-12 and 1CCW-13, the operator will inform the candidate that 1CCW-13 indicated closed when he arrived to close 1CCW-12.

Simulator operator: After the candidate has dispatched an operator to Unit 1's *Equipment Room, FIRE TIMER #1 TO CLOSE 1CCW-12;*

Cue: Inform the candidate that 1CCW-12 and 1CCW-13 both indicate closed from equipment room.

COMMENTS:

CRITICAL STEP

STEP 19: Step 4.59
Start the selected CCW Pump.

___ SAT

STANDARD: The candidate locates the control switch for 1D CCW Pump on 1AB3 and rotates the control switch to the close position.

The candidate observes that the 1CCW-13 starts to travel open and when approx 20% open, the 1D CCW pump starts as indicated by red run light illuminated and amps indicated.

___ UNSAT

COMMENTS:

STEP 20: Step 4.60 Verify the started CCW pump discharge valve opened. STANDARD: The candidate verifies that 1CCW-13 indicates OPEN with a red light indication. The candidate may verify 1CCW-13 open by OAC indications. COMMENTS:	___ SAT ___ UNSAT
STEP 21: Step 4.61 Verify CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) open. STANDARD: The candidate locates CCW-9 switch and indication on 2AB3 determines that CCW-9 is closed by the red "OPEN" indication off and the green "CLOSED" indication on. The candidate should proceed to step 4.61 RNO. **NOTE: CCW-9 will be found CLOSED** COMMENTS:	___ SAT ___ UNSAT

STEP 22:	Step 4.61 RNO 1. Stop the operating CCW pump. 2. Notify Security to meet an operator at the IRW gate to provide access to CCW-9 at the Southwest corner of the Protected Area. 3. Dispatch an operator to perform the following: A. Obtain the CCW-9 IRW Gate Key from Security box in Unit 3 Control Room storage area. B. Open CCW-9 (Emergency CCW Discharge to Intake) (between protected area fences). C. Notify Unit 1 CR when CCW-9 is open D. WHEN notified that CW-9 is open, THEN GO TO Step 4.53 to restart a CCW pump.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Locate the control switch for the 1D CCW Pump on 1AB2 and rotate the control switch to the trip position. Notify Security that access to CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) is required Dispatch an operator to obtain the CCW-9 IRW Gate Key from the Security box in the Unit 3 Control Room Storage area. The operator, along with Security, proceeds between the Protected Area fences in order to open CCW-9	
Note: When an operator is dispatched to obtain the CCW-9 IRW Gate Key and is instructed to open CCW-9, END TASK.		
COMMENTS:		
END TASK		

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Step (1) stops all CCW pumps, opens 1CCW-1-6, and closes condenser outlet valves.
4	Step (4) reduces RCS heat load and prevents RCP damage from inadequate LPSW.
19	Step (18) required for the start of 1D CCW Pump for recirculation back to the intake canal.
22	Step (21) ensures the operating CCW pump is stopped and CCW-9 is opened manually to align CCW recirc flow.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Dam failure has occurred.

Intake Canal is intact.

Unit has been manually tripped.

Subsequent Actions of AP/1/A/1700/13, Dam Failure have been completed up to step 4.3.

INITIATING CUES:

Control Room Supervisor directs you to align the CCW Intake Canal for recirc following a dam failure beginning at step 4.3 of AP/1/A/1700/13, Dam Failure.

NSD 703 (R04-01)

JNB/JPP
Sim-3
Brief
HLP
NRC
SR
115

TN

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No AP/1/A/1700/ 013
Revision No Rev 18

REPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Dam Failure

(4) Prepared By A.S. Hollingsworth (Signature) Anthony Scott Hollingsworth Date 10-16-02

(5) Requires NSD 228 Applicability Determination?

- ☐ Yes (New procedure or revision with major changes)
- ☒ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By Kevin McMurray (QR) Date 10/22/02

Cross-Disciplinary Review By _____ (QR)NA KM Date _____

Reactivity Mgmt Review By _____ (QR)NA KM Date _____

Mgmt Involvement Review By _____ (Ops Supt) NA KM Date _____

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval *(if necessary)*

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By Dale B Gla Date 10/22/02

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification:

☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☒ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

(14) Remarks *(Attach additional pages, if necessary)*

Duke Power Company Oconee Nuclear Station **Dam Failure**	Procedure No. AP/1/A/1700/013
	Revision No. 018
	Electronic Reference No. OX002RGQ

1. Entry Conditions

Either of the following:

- Loss of CCW Intake Canal
- CCW Intake Canal intact and dam failure occurs or is imminent

2. Automatic Systems Actions

- Possible trip of Main Turbine and FDWP turbines on loss of vacuum
- Possible anticipatory Rx trip

3. Immediate Manual Actions

None

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 __ Ensure Rx is tripped.	
4.2 __ Verify CCW Intake Canal intact.	__ **GO TO** Step 4.6.
4.3 __ Depress CCW DAM FAILURE pushbutton.	
4.4 __ Dispatch an individual to the area of the dam failure to report damage to the Control Rooms.	
4.5 __ **GO TO** Step 4.45.	
4.6 __ Ensure only one CCW pump operating.	

CAUTION

Continued operation of the RCPs will provide heat load with limited cooling capacity and may result in RCP damage due to inadequate LPSW flow. RCP restart when directed by EP/1 (EOP) should consider these factors.

4.7 __ Stop all RCPs.	
4.8 Dispatch an operator to open the following valve(s) on all operable SSW headers: __ HPSW-900 (B HDR SIPHON SEAL WATER (SSW) SYSTEM CONN) (T-1/M-48, 10' S., 15' up) __ HPSW-901 (A HDR SIPHON SEAL WATER (SSW) SYSTEM CONN) (T-1/J-26, SE, 10' up)	

NOTE

- CCW-8 must be de-energized prior to submersion by lake water. This should be accomplished within 1 hour of initiation of the event.
- CCW Emergency Discharge Siphon Flow may have been established automatically as a result of loss of power.

4.9 __ Verify CCW-8 is open.	__ **GO TO** Step 4.17.
4.10 __ Verify 1CCW 1-6 are closed.	__ Ensure 1CCW 1-6 throttled.
4.11 __ Verify 2CCW-7 is closed.	__ Ensure 2CCW-7 throttled.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.12 __ Verify 3CCW-93 is closed.	__ Ensure 3CCW-93 throttled.
4.13 __ Close CCW-8.	
4.14 Ensure the following: __ 1CCW 1-6 are closed. __ 1CCW 1-6 switch in PULL TO LOCK.	
4.15 Notify Unit 2 to ensure the following: __ 2CCW-7 is closed. __ 2CCW-7 switch in PULL TO LOCK.	
4.16 Notify Unit 3 to ensure the following: __ 3CCW-93 is closed. __ 3CCW-93 switch in PULL TO LOCK.	
4.17 __ Dispatch an operator to open 1DP-F5C (CCW-8 BKR (EMERG CCW DISCH TO TAILRACE)) (T-3/L-24).	
4.18 Stop <u>all</u> Unit 1 ESV pumps: __ 1A ESV PUMP __ 1C ESV PUMP __ 1B ESV PUMP	

NOTE

The EWST will be used as CCWP sealing water and to cool the following:

- HPI pump motor coolers
- TDEFDW Pump
- Operating CCWP motors

4.19 Place the following switches in OFF: __ A HPSW PUMP __ B HPSW PUMP	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.20 __ IAAT any of the following is full open: • HPSW-900 (B HDR SIPHON SEAL WATER (SSW) SYSTEM CONN) • HPSW-901 (A HDR SIPHON SEAL WATER (SSW) SYSTEM CONN), THEN perform Steps 4.21 - 4.23.	__ GO TO Step 4.24.
4.21 __ Ensure the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT in DISABLE.	
4.22 Stop the following pumps: __ A LPSW PUMP __ B LPSW PUMP __ C LPSW PUMP	

NOTE

The intent is to maintain adequate cooling water inventory while preventing loss through the EWST overflow.

4.23 __ Maintain EWST level >70,000 gallons and < OVERFLOW by cycling HPSW JOCKEY PUMP as necessary.	
4.24 __ Dispatch an operator to place 1LPSW-138 & 1HPSW-184 TDEFDWP COOLING BYPASS VALVE switch in BYPASS (T-1/D-25, 24' E, SG FDW Panel 1 SGFP).	

IF AT ANY TIME:

(4.20) HPSW-900 or HPSW-901 is full open … (stop LPSW pumps and cycle HPSW Jockey Pump as necessary)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Similar instructions are provided in Unit 2 and 3 procedures. The same operator should be used for these tasks.	
4.25 ___ Ensure an operator has been dispatched to the CCW Intake.	
4.26 ___ Notify operator at CCW Intake to isolate SSW to <u>all</u> stopped CCW pumps per Encl 5.4 (NLO Actions at CCW Intake). **(PS)** ✓ | CCW Pump | 1A | 1B | 1C | 1D	

IF AT ANY TIME:

(4.20) HPSW-900 or HPSW-901 is full open ... (stop LPSW pumps and cycle HPSW Jockey Pump as necessary)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.27 __ IAAT RCP seal injection is lost, THEN dispatch an operator to perform AP/25 (SSF EOP) to operate the SSF RCMU system.	
4.28 __ IAAT all the following exist: • Loss of power occurred on Unit 1 • Power has been restored to Unit 1 • Keowee Lake Level > 775' {6} THEN perform Steps 4.29 - 4.36 to start one CCW pump.	__ GO TO Step 4.37.
4.29 __ Ensure Pressurizer Heaters are in AUTO. {4}	

NOTE

- At least one CCW Pump discharge valve is required to remain open prior to establishing forced flow.
- The adjacent CCW Pumps discharge valve must be closed to prevent excessive torque on the starting pumps discharge valve. The 1A and 1B CCW Pumps are adjacent, and the 1C and 1D CCW Pumps are adjacent.
- Similar instructions are provided in Unit 2 and 3 procedures. The same operator should be used for these tasks.

4.30 __ Notify the operator performing Encl 5.4 (NLO Actions at CCW Intake) to open the SSW valves for the CCW pump to be started:

✓	CCW Pump
	1A
	1B
	1C
	1D

IF AT ANY TIME:

(4.20) HPSW-900 or HPSW-901 is full open... (stop LPSW pumps and cycle HPSW Jockey Pump as necessary)

(4.27) RCP seal injection is lost ... (dispatch an operator to operate SSF RCMU)

(4.28) Loss of power occurred on Unit 1, power is restored, and Keowee Lake Level > 775' {6}... (restart a CCW pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.31 __ Place the CCW Pump switches in the trip position: ✓ | CCW Pump | 1A | 1B | 1C | 1D	
4.32 __ Verify the 1A or 1B CCW Pump is to be started.	__ **GO TO** Step 4.34.
4.33 __ Verify both of the following CCW pump discharge valves are closed: {5}. Pump | ✓ | Valve 1A | | 1CCW-10 1B | | 1CCW-11	__ Dispatch an operator to close the discharge valves from the breaker switch (Unit 1 Equipment rm): Pump | ✓ | Valve | Breaker 1A | | 1CCW-10 | 1XS1-F2C 1B | | 1CCW-11 | 1XS2-F2D
4.34 __ Verify the 1C or 1D CCW Pump is to be started.	__ **GO TO** Step 4.36.
4.35 __ Verify both of the following CCW pump discharge valves are closed: {5}. Pump | ✓ | Valve 1C | | 1CCW-12 1D | | 1CCW-13	__ Dispatch an operator to close the discharge valves from the breaker switch (Unit 1 Equipment rm): Pump | ✓ | Valve | Breaker 1C | | 1CCW-12 | 1XS3-2E 1D | | 1CCW-13 | 1XS1-F3C

IF AT ANY TIME:

(4.20) HPSW-900 or HPSW-901 is full open... (stop LPSW pumps and cycle HPSW Jockey Pump as necessary)

(4.27) RCP seal injection is lost ... (dispatch an operator to operate SSF RCMU)

(4.28) Loss of power occurred on Unit 1, power is restored, and Keowee Lake Level > 775' {6}... (restart a CCW pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.36 __ **WHEN** SSW is aligned to the pump, **AND** the discharge valves are closed, **THEN** start the CCW pump.	
4.37 __ **IAAT** Keowee Lake Level ≤ 775' {6}, **AND** CCW-8 Bkr is open, **THEN** perform Steps 4.38 - 4.40.	__ **GO TO** Step 4.41.
4.38 __ Stop <u>all</u> CCW pumps.	

CAUTION

If CCW Intake and Discharge piping is **NOT** cross-connected within 4 hours of the Reactor trip, long term availability of CCW inventory **CANNOT** be assured. {3}

4.39 __ Initiate Encl 5.3 (Cross-connect CCW Intake and Discharge Piping).	

NOTE

Similar instructions are provided in Unit 2 and 3 procedures. The same operator should be used for these tasks.

4.40 __ Notify the operator performing Encl 5.4 (NLO Actions at CCW Intake) to isolate SSW to <u>all</u> Unit 1 CCW pumps.	
4.41 __ Notify TSC to replenish Unit 2 CCW intake lines.	
4.42 __ Notify Emergency Coordinator to review Encl 5.5 (Dam Failure Considerations).	
4.43 __ **WHEN** secondary heat removal systems are near depletion, **THEN** initiate AP/25 (SSF EOP) in preparation for feeding the SGs with SSF ASW.	
4.44 __ **WHEN** conditions permit, **THEN EXIT** this procedure.	

END

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION Continued operation of the RCPs will provide heat load with limited cooling capacity and may result in RCP damage due to inadequate LPSW flow. RCP restart when directed by EP/1 (EOP) should consider these factors.	
4.45 __ Stop all RCPs.	
4.46 __ Ensure all CCW pumps are stopped.	
4.47 __ Ensure 1CCW 1-6 are open.	
4.48 Ensure all condenser outlet valves indicate closed (GD AP13): __ O1D0273 (1CCW-20 CONDENSER 1A OUTLET 1) __ O1D0275 (1CCW-21 CONDENSER 1A OUTLET 2) __ O1D0277 (1CCW-22 CONDENSER 1B OUTLET 1) __ O1D0279 (1CCW-23 CONDENSER 1B OUTLET 2) __ O1D0281 (1CCW-24 CONDENSER 1C OUTLET 1) __ O1D0283 (1CCW-25 CONDENSER 1C OUTLET 2)	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

CCW-8 should open after the CCW DAM FAILURE pushbutton is pressed and the first Waterbox Emergency Discharge valve (1CCW-1-6) opens. If CCW-8 does not open, it should be left closed in preparation for CCW recirculation.

4.49 __ Verify CCW-8 is open.	1. __ **IF** emergency CCW siphon flow has **NOT** been established on Unit 1, **THEN** notify Unit 2 that emergency CCW siphon flow has **NOT** been established on Unit 1. 2. __ **GO TO** Step 4.51.
4.50 __ Notify Unit 2 that emergency CCW siphon flow has been established on Unit 1.	
4.51 __ Dispatch operators to perform Encl 5.2 (CCW Inventory Conservation).	

NOTE

Unit 2 CR will decide which unit will establish CCW recirculation. Unit 1 will only supply CCW recirculation when directed by Unit 2.

4.52 __ **IAAT** Unit 2 CR has directed Unit 1 to supply CCW recirculation, **THEN** perform Steps 4.53 - 4.67 to start one CCW Pump and establish recirculation.	__ **GO TO** Step 4.68.

NOTE

- At least one CCW Pump discharge valve is required to remain open prior to establishing forced flow.
- The adjacent CCW Pumps discharge valve must be closed to prevent excessive torque on the starting pumps discharge valve. The 1A and 1B CCW Pumps are adjacent, and the 1C and 1D CCW Pumps are adjacent.

4.53 __ Determine which CCW Pump will be started.

✓	CCW Pump
	1A
	1B
	1C
	1D

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.54 __ Place all CCW Pump switches in the trip position: ✓ | CCW Pump | 1A | 1B | 1C | 1D	
4.55 __ Verify the 1A or 1B CCW Pump is to be started.	__ **GO TO** Step 4.57.
4.56 __ Verify both of the following CCW pump discharge valves are closed: {5}. Pump | ✓ | Valve 1A | | 1CCW-10 1B | | 1CCW-11	__ Locally close the discharge valves from the breaker switch (Unit 1 Equipment rm): Pump | ✓ | Valve | Breaker 1A | | 1CCW-10 | 1XS1-F2C 1B | | 1CCW-11 | 1XS2-F2D
4.57 __ Verify the 1C or 1D CCW Pump is to be started.	__ **GO TO** Step 4.59.
4.58 __ Verify both of the following CCW pump discharge valves are closed: {5}. Pump | ✓ | Valve 1C | | 1CCW-12 1D | | 1CCW-13	__ Locally close the discharge valves from the breaker switch (Unit 1 Equipment rm): Pump | ✓ | Valve | Breaker 1C | | 1CCW-12 | 1XS3-2E 1D | | 1CCW-13 | 1XS1-F3C

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE CCW pump amps and temperatures will read higher than normal when started with this plant configuration. CCWP motor stator temperature limit is 284°F.	
4.59 __ Start the selected CCW Pump.	
4.60 __ Verify the started CCW pump discharge valve opened.	1. __ Stop the operating CCW pump. 2. __ **GO TO** Step 4.54 to attempt to start a different CCW pump.
4.61 __ Verify CCW-9 is open.	1. __ Stop the operating CCW pump. 2. __ Notify Security to meet an operator at the IRW gate to provide access to CCW-9 at the Southwest corner of the Protected Area. 3. Dispatch an operator to perform the following: A. __ Obtain the CCW-9 IRW Gate Key from the security box in Unit 3 Control Room storage area. B. __ Open CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) (between protected area fences). C. __ Notify Unit 1 CR when CCW-9 is open. 4. __ **WHEN** notified that CCW-9 is open, **THEN GO TO** Step 4.53 to restart a CCW pump.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.62 __ Verify CCW-8 is closed.	1. __ Stop the operating CCW pump. 2. __ Dispatch an operator to open 1DP-F5C (CCW-8 BKR (EMERG CCW DISCH TO TAILRACE)) (T-3/L-24). 3. __ Dispatch two operators to close CCW-8 (EMERGENCY CCW DISCHARGE TO TAILRACE) (Beside tailrace 3' N of 8' drain pipe under middle valve pit cover). 4. __ **WHEN** CCW-8 is closed, **THEN GO TO** Step 4.53 to restart a CCW pump.

NOTE

CCW-8 must be de-energized prior to submersion by lake water. This should be accomplished within 1 hour of initiation of the event.

4.63 __ Ensure an operator has been dispatched to open 1DP-F5C (CCW-8 BKR (EMERG CCW DISCH TO TAILRACE)) (T-3/L-24).	
4.64 Ensure the discharge valves on all stopped CCW pumps are closed:	
4.65 __ Notify Unit 2 and Unit 3 to ensure all Unit 2 and Unit 3 CCW pump discharge valves are closed.	

CCW Pump	✓	Valve
1A		1CCW-10
1B		1CCW-11
1C		1CCW-12
1D		1CCW-13

IF AT ANY TIME:

(4.52) Unit 1 is to supply CCW recirculation ... (start a CCW pump and align for recirculation)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The purpose of the following steps is to force CCW inlet flow to the other two units through the CCW inlet cross-connects to establish > 7" vacuum for TBV operability. Unit 2 and Unit 3 personnel will provide information about the effects of the following actions on their condenser vacuum.

4.66 __ Throttle 1CCW 1-6 as necessary to establish > 7" vacuum on Unit 2 and Unit 3.

4.67 __ **WHEN** condenser vacuum on <u>all</u> three units is being maintained > 7" vacuum,
THEN stop adjusting 1CCW 1-6.

NOTE

CCW pump discharge valves act as throttle valves from the breaker switches unless the respective CCW pump switch is positioned to TRIP.

4.68 __ **IAAT** another unit is to supply CCW recirculation,
AND requests <u>all</u> Unit 1 CCW pump discharge valves closed,
THEN perform the following:

A. Dispatch an operator to close the following valves from the breaker switches (Unit 1 Equipment Rm):

✓	Valve	Breaker
	1CCW-10	1XS1-F2C
	1CCW-13	1XS1-F3C
	1CCW-11	1XS2-F2D
	1CCW-12	1XS3-2E

B. __ Monitor Unit 1 condenser vacuum while CCW recirculation is established on another unit.

C. __ Communicate condenser vacuum changes to the unit supplying CCW recirculation flow.

IF AT ANY TIME:

(4.52) Unit 1 is to supply CCW recirculation ... (start a CCW pump and align for recirculation)

(4.68) another unit is to supply CCW recirculation and requests all Unit 1 CCW pump discharge valves closed ... (dispatch an operator to close the valves, monitor vacuum)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.69 __ Verify TDEFDW PUMP is operating.	__ GO TO Step 4.73.
NOTE LPSW return from the MDEFDWP motor coolers is lost out the CCW discharge when these pumps are operating even after completion of Encl 5.1 (LPSW Recirc Lineup).	
4.70 __ Verify MDEFDWPs are **NOT** required to feed SGs.	__ GO TO Step 4.72.
4.71 Stop the following: __ 1A MDEFDWP __ 1B MDEFDWP	
4.72 __ Dispatch an operator to place 1LPSW-138 & 1HPSW-184 TDEFDWP COOLING BYPASS VALVE switch in the BYPASS position (T-1/D-25, 24' E, SG FDW Panel 1 SGFP).	
NOTE EWST will be used to cool HPI Pump Motor Coolers and TDEFDW Pump.	
4.73 Place the following switches in OFF: __ A HPSW PUMP __ B HPSW PUMP	
NOTE The intent is to maintain adequate cooling water inventory while preventing loss through the EWST overflow.	
4.74 __ Maintain EWST level >70,000 gallons and < OVERFLOW by cycling HPSW JOCKEY PUMP as necessary.	

IF AT ANY TIME:

(4.52) Unit 1 is to supply CCW recirculation ... (start a CCW pump and align for recirculation)

(4.68) another unit is to supply CCW recirculation and requests all Unit 1 CCW pump discharge valves closed ... (dispatch an operator to close the valves, monitor vacuum)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.75 __ IAAT operating MDEFDWP motor stator temperatures > 210°F, **THEN** consult Station Management for guidance about stopping MDEFDWPs.	
4.76 __ Notify Emergency Coordinator to review Encl 5.5 (Dam Failure Considerations).	
4.77 __ Initiate Encl 5.1 (LPSW Recirc Lineup).	
4.78 __ **WHEN** conditions permit, **THEN EXIT** this procedure.	

END

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-022

ALIGN AND START THE STATION AUXILIARY SERVICE WATER PUMP

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align and start the Station Auxiliary Service Water Pump

Alternate Path:

No

Facility JPM #:

NLO-022

K/A Rating(s):
System: APE-054
K/A: AA1.01
Rating: 4.5/4.4

Task Standard:

Station Auxiliary Service Water Pump is aligned and started correctly by procedure.

Preferred Evaluation Location:

Simulator _____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

Enclosure 5.10, Station ASW Pump Alignment, of the EOP

Validation Time: 12 minutes

Time Critical: NO

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

Enclosure 5.10, Station ASW Pump Alignment, of the EOP

READ TO OPERATOR

DIRECTION TO TRAINEE:

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:

1. A station blackout has occurred.
2. No EFDW pumps are available.
3. HPI forced cooling is not adequate.
4. The SSF D/G failed to start rendering the SSF ASWP inoperable.
5. Power has been restored to the standby buses.
6. SG pressure is ≈ atmospheric.

INITIATING CUES:

The BOP directs you perform Enclosure 5.10 (Station ASW Pump Alignment) of the EOP.

START TIME: _____

STEP 1: Step 1 Obtain racking equipment and pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby). STANDARD: *Candidate locates equipment locker and indicates they would open locker and obtain the racking equipment and pipe wrench.* **Note: For this JPM the equipment locker should not be opened.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 2 Open CCW-99 (Aux. Service Water Pump Suction) STANDARD: Candidate locates and opens CCW-99 (Aux. Service Water Pump Suction) by turning the hand wheel counter-clockwise until the valve indicator indicates "open". ***Cue: Indicate CCW-99 valve position indicator indicates, "open".*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Step 3 Open CCW-247 (Aux. Service Water Pump Recirc.). STANDARD: Candidate locates and opens CCW-247 (Aux. Service Water Pump Discharge) by turning the valve hand wheel counter-clockwise until it *reaches a hard stop.* ***Cue: Indicate CCW-247 open (rising stem) and at the hard stop.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 4: Step 4 Open CCW-308 (Aux. Service Water Pump Vent.). STANDARD: Candidate locates and opens CCW-308 (Aux. Service Water Pump Vent). Candidate should indicate they would use a wrench to remove the pipe plug. ***Cue: Indicate CCW-308 open with air and water coming out of the vent. If the candidate does not remove the plug indicate that nothing is coming out of the vent.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Step 5 **WHEN** all air is vented from Station ASW Pump, **THEN** close CCW-308. STANDARD: Candidate locates and closes CCW-308 (Aux. Service Water Pump Vent). ***Cue: Indicate that a solid stream of water is issuing out of the vent.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Don protective equipment STANDARD: Candidate dons the appropriate personal protective equipment prior to operation of any electrical breaker rated 400 VAC and above: • Safety glasses • Face shield • Hard hat • Rubber gloves with leather protectors • Flame-resistant clothing **Note: This step should be simulated and discussed, at the discretion of the examiner. This is the equipment obtained in step 1.** COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 6 Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6). STANDARD: Candidate locates breaker and opens shutter door, inserts 600V rack out tool, and rotates tool clockwise to rack breaker in. ***Cue: After breaker is racked in, indicate to candidate that the AUX SERVICE WATER PUMP MOTOR breaker green "open" indicating light is ON and when the "racking" tool is removed the shutter drops.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 8: Step 7 Ensure closed ASW SWGR FDR (ASW SWGR FDR FROM B1T-UNIT10) (ASW SWGR 600V LOAD CENTER Unit 5) STANDARD: Candidate locates the ASW SWGR FDR control switch and rotates it to the CLOSE direction. RED Closed lamp is observed to be illuminated OR Breaker position flag is observed to indicate Closed. ***CUE: Indicate to candidate that the 4160V Feeder Breaker for the "AUX SER WTR SWGR TRANSFORMER" red light is lit.*** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 8 **WHEN** notified that Standby Bus #1 is energized, **THEN** perform the following (ASW SWGR 600V LOAD CENTER Unit 5): • Ensure closed ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR). • Start Station ASW Pump using the control switch STATION ASW PUMP SW. **STANDARD:** Candidate locates the ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR) Breaker control switch and rotates it to the CLOSE direction. RED Closed lamp is observed to be illuminated OR Breaker position flag is observed to indicate Closed. Candidate locates AUX SERVICE WATER PUMP MOTOR control switch and rotates switch to the CLOSE position. ***CUE: Indicate to candidate that Standby Bus #1 is energized.*** ***CUE: After control switch is rotated, indicate to candidate that the AUX SERVICE WATER PUMP MOTOR breaker red "closed" indicating light is ON and you can hear the pump.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 12: Step 9 Close CCW-309 (Aux Service Water Pump Disch Drain) (12' West of ASW Pump). STANDARD: Candidate locates and closes CCW-309 (Aux. Service Water Pump Disch Drn) is manually closed by turning the valve clockwise until it reaches a hard stop. ***Cue: Indicate CCW-309 closed and at the hard stop.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 13: Step 10 Open CCW-101 (Aux Service Water Pump Discharge). STANDARD: Candidate locates and opens CCW-101 (Aux. Service Water Pump Discharge) by turning the valve hand wheel counter-clockwise until it reaches a hard stop. ***Cue: Indicate CCW-101 open (rising stem valve) and at a hard stop.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 14: Step 11 Verify Turbine Building flood is NOT in progress. STANDARD: Candidate determines that a Turbine Building flood is NOT in progress. ***Cue: Indicate that a Turbine Building flood is NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT

STEP 15:	Step 12 Notify CRO that Station ASW Pump is operating.	___ SAT
STANDARD:	Using either the phone or a radio inform the CRO is that Station ASW *Pump is operating.*	___ UNSAT
COMMENTS:		
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Step necessary to align pump suction
3	Step is necessary so that the pump can have the minimum flow that is necessary for pump protection until flow to the steam generators is established.
4	Step is necessary to prevent damage to the pump due to air binding.
5	Step is necessary to prevent flooding of the Aux. Bldg when the Aux. Service Water Pump is started.
7	Step is necessary to power the Aux. Service Water Pump.
8	Step is necessary to power the Aux. Service Water Pump.
9	Step is necessary to start the Aux. Service Water Pump.
12	Step is necessary to prevent flooding of the Aux. Bldg when flow is established to the SGs.
13	Step is necessary to provide a flow path of water to the necessary components, in this case the steam generators.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. A station blackout has occurred.
2. No EFDW pumps are available.
3. HPI forced cooling is not adequate.
4. The SSF D/G failed to start rendering the SSF ASWP inoperable.
5. Power has been restored to the standby buses.
6. SG pressure is ≈ atmospheric.

INITIATING CUES:

The BOP directs you perform Enclosure 5.10 (Station ASW Pump Alignment) of the EOP.

CHG 301 ENTIRE ENCL

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE All equipment operated in the following steps is located in A-1-128, ASW Pump Rm.	
1. __ Obtain racking equipment and pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby).	
2. __ Open CCW-99 (AUX. SERVICE WATER PUMP SUCTION).	
3. __ Open CCW-247 (AUX. SERVICE WATER PUMP RECIRC).	
4. __ Open CCW-308 (AUX. SERVICE WATER PUMP VENT).	
5. __ **WHEN** all air is vented from Station ASW Pump, **THEN** close CCW-308.	
6. __ Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6).	
7. __ Ensure closed ASW SWGR FDR (ASW SWGR FDR FROM B1T- UNIT 10) (ASW SWGR 600V LOAD CENTER Unit 5).	
8. __ **WHEN** notified that Standby Bus #1 is energized, **THEN** perform the following (ASW SWGR 600V LOAD CENTER Unit 5): A. __ Ensure closed ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR). B. __ Start Station ASW Pump using the control switch STATION ASW PUMP SW.	
9. __ Close CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. __ Open CCW-101 (AUX SERVICE WATER PUMP DISCHARGE).	
11. __ Verify Turbine Building flood is **NOT** in progress.	1. __ Notify all Control Rooms that Station ASW Pump is operating. 2. __ **GO TO** Step 13.
12. __ Notify CRO that Station ASW Pump is operating.	
13. __ **WHEN** Station ASW Pump is no longer needed in Unit 1, **THEN** continue in this enclosure.	
14. Verify all the following conditions exist: __ Station ASW Pump is **NOT** supplying SGs in any other unit. __ Station ASW Pump is **NOT** needed to supply HPI pump motor coolers in any unit.	__ **GO TO** Step 19.
15. __ Stop Station ASW Pump using the control switch STATION ASW PUMP SW (ASW SWGR 600V LOAD CENTER Unit 5).	
16. Close the following: __ CCW-99 (AUX. SERVICE WATER PUMP SUCTION) __ CCW-101 (AUX. SERVICE WATER PUMP DISCHARGE) __ CCW-247 (AUX. SERVICE WATER PUMP RECIRC)	
17. __ Open CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	
18. __ Rack out ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6).	
19. __ **EXIT** this enclosure.	

• • • END • • •

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-047

Emergency start SSF Diesel Generator and supply power to the SSF ASW and SSF RCMU pumps

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Emergency start SSF Diesel Generator and supply power to the SSF ASW and SSF RCMU pumps

Alternate Path:

Yes

Facility JPM #:

CRO-047

K/A Rating(s):

System: 062
K/A: A2.11
Rating: 3.7/4.1

Task Standard:

SSF Diesel Generator is emergency started aligned to supply power to the SSF ASW and SSF RCMU pumps correctly by procedure.

Preferred Evaluation Location:

Simulator _____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

AP/0/A/1700/25 (SSF EOP)

Validation Time: 10 minutes

Time Critical: Yes
Time Critical Time: 13 min. 29 sec

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

AP/0/A/1700/25 (SSF EOP)

READ TO OPERATOR

DIRECTION TO TRAINEE:

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 was operating at 100% power.

Unit 2 TD EFDWP is out of service.

INITIATING CUES:

Unit 2 Reactor has just tripped and experienced a complete loss of all AC power. During the performance of Immediate Manual Actions, the OATC notified the Control Room SRO that HPI seal injection and Component Cooling have been lost and that the SSF must be activated. The Control Room SRO directs you to utilize AP/0/A/1700/025 (SSF EOP) to activate the SSF. No Operators have been staged at the SSF.

START TIME: _____

STEP 1: Step 4.1

Determine which SSF Systems are required:

✓ U1	✓ U2	✓ U3	SSF System
	✓		SSF RCMU
	✓		SSF ASW feed

STANDARD: Recognizes the initial conditions determine that SSF RCMU Pump flow is required. With no source of FDW available SSF ASW flow is also required.

Continue to Step 4.2

Cue: SSF ASW feed is required to SGs due to NO source of available FDW.

COMMENTS:

___ SAT

___ UNSAT

STEP 2: Step 4.2

Ensure all RCPs on affected Units are off.

✓ U1	✓ U2	✓ U3	RCPs
	✓		A1
	✓		B1
	✓		A2
	✓		B2

STANDARD: Determine that all RCPs are off.

Continue to Step 4.3

CUE: If asked, inform candidate of the following:

- ***All RCP white lights on***
- ***All RCP red lights off***

COMMENTS:

___ SAT

___ UNSAT

STEP 3: Step 4.3 Verify a Licensed Operator staged in SSF to perform AP/25 (SSF EOP). (**PS**) STANDARD: Determine that SSF Operator has **NOT** been staged. *Continue to RNO for Step 4.3* COMMENTS:	___ SAT ___ UNSAT
STEP 4: Step 4.3 RNO 1. Obtain the following items: • Vital area access keyring • Flashlight 2. Proceed to SSF HVAC Room. 3. **GO TO** Step 4.5 STANDARD: Candidate proceeds to supply room and identifies the location of the dedicated flashlight and the required keys to be carried to the SSF. Candidate proceeds to the SSF with the AP. **GO TO** Step 4.5 ***CUE: When the flashlight and keys are located, inform the candidate that he/she is NOT required to actually carry them to the SSF for the purposes of this JPM.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: Step 4.5 Perform the following on the affected unit: Open 2XSF-F5A (3, 2, 1XSF NORM INCOMING FDR BKR FROM 2X8-5B) and remove Kirk Key Using the Kirk Key, close 2XSF-F3A (2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5A, 5B, or 5C) STANDARD: NORMAL INCOMING FDR BKR is opened by rotating breaker switch to the OFF position and removing Kirk Key. • Compartment 5A on the affected unit's XSF MCC: • 2XSF ALTERNATE INCOMING FDR BKR is closed in by inserting Kirk Key and rotating breaker switch to the ON position. • Compartment 3A on the affected unit's XSF MCC: • 2XSF Continue to Step 4.6 **NOTE: Kirk Key must be rotated ½ turn to be removed.** ***CUE: As operator performs the key/breaker operation, indicate to operator the appropriate component positions.*** **NOTE: Step 5 will power the SSF Systems from OXSF. Power supply for 600V MCC 2XSF, located in HVAC Room.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Step 4.6 Press DIESEL EMERGENCY START pushbutton. STANDARD: The SSF Control Room DIESEL EMERGENCY START pushbutton is pressed. Continue to Step 4.7 ***CUE: Allow ≈ 12 sec for the D/G to reach rated speed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 7: Step 4.7 Verify D/G frequency 59.8 - 60.2 Hz. STANDARD: The D/G HERTZ meter is monitored to determine frequency is low. Continue to Step 4.7 RNO. ***CUE: Indicate D/G frequency is 57 Hertz on the SSF Control Room D/G HERTZ meter.*** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 4.7 RNO Adjust GOVERNOR CONTROL to obtain D/G frequency 59.8 - 60.2. STANDARD: The GOVERNOR CONTROL is used to raise D/G frequency to between 59.8 - 60.2. Continue to Step 4.8. ***CUE: After candidate indicates the GOVERNOR CONTROL would be used to raise D/G frequency indicate D/G frequency is 60 Hertz on the SSF Control Room D/G HERTZ meter.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 9: Step 4.8 Verify D/G voltage 4100 - 4200V. STANDARD: The D/G AC VOLTS meter is monitored to determine voltage. Continue to step 4.9 ***CUE: Indicate D/G voltage is 4160 volts on the SSF Control Room D/G AC VOLTS meter.*** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 4.9 Verify SSF D/G operating. STANDARD: Acknowledges successful completion of previous steps indicates SSF D/G is operating. *Continue to Step 4.10* COMMENTS:	___ SAT ___ UNSAT

STEP 11: Step 4.10 Open breaker OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T). STANDARD: TRIP pushbutton on the SSF OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) control switch is pressed. Continue to Step 4.11 ***Cue: Inform student that the green light for OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) is on and the red light is off.*** **Note: FOR UNIT 2 ONLY: On a loss of power to Unit 2, OTS1-1 would have already tripped open.** **Note: Steps 4.10 – 4.12 will Align the D/G to supply the SSF loads.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Step 4.11 **WHEN** 3 seconds have elapsed, **THEN** close breaker OTS1-4 (DIESEL GEN BREAKER). STANDARD: Three seconds after OTS1-1 is opened, the red CLOSE pushbutton on the SSF Control Room OTS1-4 (DIESEL GEN BREAKER) switch is pressed. Continue to Step 4.12 ***CUE: After student closes in diesel generator breaker, inform him/her that red light is on and green light is off.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 13: Step 4.12 Ensure the following breakers are closed: • *OTS1-3 (SSF 600V OXSF FDR BKR CONTROL)* • OXSF-4B (SSF LC OXSF 600V INC BKR) STANDARD: Red CLOSE breaker position indicating light is observed to be ON at the SSF OTS1-3 (SSF 600V OXSF FDR BKR CONTROL) switch. ***CUE: Inform student the red light is on and the green light is off.*** Red CLOSE breaker position indicating light is observed to be ON at the (SSF *OXSF-4B SSF LC OXSF 600V INC BKR) switch.* ***CUE: Inform student the red light is on and the green light is off.*** COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Step is necessary to gain access to the SSF during a blackout.
5	Step must be performed to power the SSF from the Diesel/Generator.
6	Step must be performed to start the diesel and get power for the SSF.
8	Step is necessary to ensure D/G frequency is correct.
11	Step is necessary to power the SSF loads.
12	Step is necessary to power the SSF loads.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 2 was operating at 100% power.

Unit 2 TD EFDWP is out of service.

INITIATING CUES:

Unit 2 Reactor has just tripped and experienced a complete loss of all AC power. During the performance of Immediate Manual Actions, the OATC notified the Control Room SRO that HPI seal injection and Component Cooling have been lost and that the SSF must be activated. The Control Room SRO directs you to utilize AP/0/A/1700/025 (SSF EOP) to activate the SSF. No Operators have been staged at the SSF.

JMB/JPP
Sim (3)
SR
Brief
115
HLP
SSF
NRC

TRN

NSD 703 (R04-01)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No AP/0/A/1700/025
Revision No 025

OTC MASTER FILE

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Standby Shutdown Facility Emergency Operating Procedure

(4) Prepared By Kevin McMurray (Signature) Kevin McMurray Date 07/13/02

(5) Requires NSD 228 Applicability Determination?
- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By David P Garland (QR) Date 11/4/02
Cross-Disciplinary Review By _____ (QR)NA DPG Date _____
Reactivity Mgmt Review By _____ (QR)NA DPG Date _____
Mgmt Involvement Review By _____ (Ops Supt) NA DPG Date _____

(7) Additional Reviews
Reviewed By _____ Date _____
Reviewed By _____ Date _____

(8) Temporary Approval *(if necessary)*
By _____ (OSM/QR) Date _____
By _____ (QR) Date _____

(9) Approved By David B Cogle Date 11/5/02

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy _____ Date _____
Compared with Control Copy _____ Date _____
Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____
Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification:
☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?
☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
☒ Yes ☐ NA Required enclosures attached?
☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
☐ Yes ☒ NA Charts, graphs, etc. attached, dated, identified, and marked?
☒ Yes ☐ NA Procedure requirements met?

Received NOV 2002 Operator Training

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

(14) Remarks *(Attach additional pages)*

SUMMARY OF CHANGES: (DESCRIPTION AND REASON)

General Changes

In Enclosure 5.4B (Unit 1 MS Line Valve Breaker Checklist), changed the following breaker locations: 2MS-17 to "2XGB-F1DB", 2MS-26 to "2XA-F5C", 2MS-76 to "2XA-F5AT", and 2MS-79 to "2XA-F6AT" per NSM 23067.

PCR Numbers Incorporated

2002-3479

Duke Power Company Oconee Nuclear Station **Standby Shutdown Facility Emergency Operating Procedure**	Procedure No. AP/**0**/A/1700/025
	Revision No. 025
	Electronic Reference No. OX002RG2

1. Entry Conditions

- Directed by another AP or the EOP
- 10 CFR 50 Appendix R fire in any fire zone except West Pen Rms
- Security event

2. Automatic Systems Actions

None

3. Immediate Manual Actions

None

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- SSF RCMU is required when CC and RCP seal injection are lost to the RCPs.
- SSF ASW feed is required to SGs when **NO** source of FDW is available.

4.1 Determine which SSF systems are required:

✓ U1	✓ U2	✓ U3	SSF System
			SSF RCMU
			SSF ASW feed

4.2 Ensure all RCPs on affected Units are off:

✓ U1	✓ U2	✓ U3	RCPs
			A1
			B1
			A2
			B2

4.3 __ Verify a Licensed Operator staged in SSF to perform AP/25 (SSF EOP). **(PS)**

1. __ Obtain the following items:
   - Vital area access keyring
   - Flashlight
2. __ Proceed to SSF HVAC Room.
3. __ **GO TO** Step 4.5.

NOTE

After the following notification, **NO** further actions of this procedure are required in the Unit CRs unless directed by the SSF operator.

4.4 Notify the SSF operator of the following (SSF CR x-2766):

__ Required SSF systems identified in Step 4.1

__ To continue this procedure at Step 4.5

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.5 Perform the following on the affected units:	

✓	Affected Units	✓	Actions Required on Affected Units
	1		Open 1XSF-F5A (1XSF NORM INCOMING FDR BKR FROM 1X8-5B) and remove Kirk Key.
			Using Kirk Key, close 1XSF-F3A (1XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5A)
	2		Open 2XSF-F5A (2XSF NORM INCOMING FDR BKR FROM 2X8-5B) and remove Kirk Key.
			Using Kirk Key, close 2XSF-F3A (2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5B)
	3		Open 3XSF-F5A (3XSF NORM INCOMING FDR BKR FROM 3X8-5B) and remove Kirk Key.
			Using Kirk Key, close 3XSF-F3A (3XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5C)

4.6 __ Press DIESEL EMERGENCY START push button.	
4.7 __ Verify D/G frequency 59.8 - 60.2 Hz.	__ Adjust GOVERNOR CONTROL to obtain D/G frequency 59.8 - 60.2 Hz.
4.8 __ Verify D/G voltage 4100 - 4200 V.	__ Adjust VOLTAGE REGULATOR to obtain D/G voltage 4100 - 4200 V.
4.9 __ Verify SSF D/G operating.	1. __ **PERFORM** Encl 5.6 (Powering SSF from Unit 2 MFB). {4} 2. __ **GO TO** Step 4.14.
4.10 __ Open breaker OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T).	
4.11 __ **WHEN** 3 seconds have elapsed, **THEN** close breaker OTS1-4 (DIESEL GEN BREAKER).	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.12 Ensure the following breakers are closed: __ OTS1-3 (SSF 600V OXSF FDR BKR CONTROL) __ OXSF-4B (SSF LC OXSF 600V INC BKR)	
4.13 __ Ensure Diesel Engine Service Water Pump operating.	
4.14 __ Start SSF ASW PUMP.	
4.15 **PERFORM** the following enclosures on all affected units: __ Encl 5.1A (Emergency Operation of SSF Systems Unit 1) (**PS**) __ Encl 5.1B (Emergency Operation of SSF Systems Unit 2) (**PS**) __ Encl 5.1C (Emergency Operation of SSF Systems Unit 3) (**PS**)	

NOTE

Power factor will be a function of the load applied to the generator. Voltage regulator adjustments will **NOT** affect the power factor but will affect generator output voltage.

4.16 __ Maintain D/G operation within the following limits as posted on the D/G control panel:	

Parameter	Limits
D/G Power	3500 KW max at 0.8 lagging power factor
D/G Current	610 amps continuous 650 amps temporary overload (2 hrs)
D/G Voltage	4350 volts max
D/G Frequency	59.8 - 60.2 Hz

4.17 __ Verify D/G SER WTR PMP FLOW ≈ 500 gpm.	__ Dispatch an operator to throttle CCW-285 (SSF DIESEL SERVICE WATER PUMP DISCHARGE) to maintain 500 gpm through the Diesel Engine (SSF Pump Rm).

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE OSM will determine desired frequency of monitoring SSF equipment.	
4.18 __ Periodically dispatch an operator to perform Encl 5.2 (SSF Equipment Verification).	
4.19 __ Notify TSC to monitor SFP levels and makeup to SFPs as soon as possible to minimize SFP area dose rates.	
NOTE Diversion of SSF Diesel Service Water discharge to the yard drain must be completed between 1 hour and 50 minutes and 2 hours and 5 minutes of initiation of the event.	
4.20 __ **IAAT** 1 hour and 50 minutes have elapsed since the event causing activation of the SSF, **THEN** dispatch an operator to perform the following: A. __ Open CCW-384 (JACKET COOLING WATER TO YARD DRAIN ISOLATION) (SSF D/G Rm). B. __ Close CCW-286 (DIESEL COOLING JACKET RETURN) (SSF Pump Rm). C. __ Throttle CCW-285 (SSF DIESEL SERVICE WATER PUMP DISCHARGE) to maintain 500 gpm through the Diesel Engine (SSF Pump Rm).	

IF AT ANY TIME:

(4.20) 1 hour and 50 minutes have elapsed since the event … (dispatch an operator)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.21 __ **IAAT** SSF Control Room temperature exceeds 85°F, **THEN** perform <u>one</u> of the following: __ Notify TSC to install portable spot coolers. **OR** __ Remove power from SSF Security Computer as follows: A. __ Notify Security that power will be removed from SSF Security Computer. B. __ Notify Local Information Technology (LIT) to remove power from SSF Security Computer to reduce heat load.	
4.22 Notify CRO from each <u>affected</u> unit to perform the following as appropriate: __ Encl 5.3A (Unit 1 Control Room Enclosure) __ Encl 5.3B (Unit 2 Control Room Enclosure) __ Encl 5.3C (Unit 3 Control Room Enclosure)	

<u>NOTE</u>

- Siphon flow will be lost when CCW piping integrity is violated.
- <u>Preparing</u> for installation of the submersible pump does **NOT** violate CCW piping integrity.

4.23 __ Notify SPOC to perform AM/0/A/1300/059 (Pump-Submersible-Emergency SSF Water Supply-Installation and Removal) as necessary to <u>prepare</u> the Dedicated Submersible Pump for installation in Unit 2 CCW piping.	

IF AT ANY TIME:

(4.20) 1 hour and 50 minutes have elapsed since the event … (dispatch an operator)

(4.21) SSF Control Room temperature exceeds 85°F… (perform one of the following)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- Constant monitoring of CCW flow is required during an SSF event to ensure a supply of water from Unit 2 CCW System to the SSF. The TSC will determine method of monitoring CCW.
- The Dedicated Submersible Pump must be installed and started within 3.5 hours of loss of both forced and gravity/siphon flow on the Unit 2 CCW System.

4.24 __ **IAAT** both of the following are lost on the Unit 2 CCW System:

__ Forced Flow

__ Gravity/Siphon Flow

THEN perform Steps 4.25 - 4.26.

__ **GO TO** Step 4.27.

4.25 __ Notify SPOC to perform AM/0/A/1300/059 (Pump-Submersible-Emergency SSF Water Supply-Installation and Removal) as necessary to install the Dedicated Submersible Pump for Unit 2 CCW System.

4.26 __ **WHEN** I&E and Maintenance have completed installation of the Dedicated Submersible Pump, **THEN** dispatch an operator to place the pump in service as follows:

A. __ Rack in and close OXSF-4D (SUBMERSIBLE PUMP BKR) (SSF Electrical Equip Rm).

B. __ Close CCW-R5-0010 (SUBMERSIBLE PUMP REMOTE STARTER BKR) (Outside SSF CR).

C. __ Start the Dedicated Submersible Pump by the push button on the Remote Starter Breaker (Outside SSF CR).

Notify TSC to provide makeup guidance to assure SSF ASW Pump suction based on availability of Unit 2 CCW piping:

✓	U-2 CCW Piping	Method
	Intact	Cross-connect with Unit 1 or 3 with forced or siphon flow
	Intact	Encl 5.5 (Supply of Water to SSF)
	Not Intact or Questionable	Alternate method determined by TSC

IF AT ANY TIME:

(4.20) 1 hour and 50 minutes have elapsed since the event ... (dispatch an operator)

(4.21) SSF Control Room temperature exceeds 85°F... (perform one of the following)

(4.24) loss of Unit 2 CCW System forced flow and gravity/siphon flow ...
(notify I&E and Maintenance to install Dedicated Submersible Pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.27 __ **IAAT** flooding has occurred in TB, **AND** actions affecting CCW System are performed, **THEN** dispatch an operator to monitor TB basement area.	
4.28 __ **IAAT** Unit 2 CCW Condenser Inlet piping has been isolated (from Lake Keowee or from the other units), **THEN** monitor level in CCW Condenser Inlet piping as directed by TSC.	
4.29 __ Notify Operations Support Group or TSC to order fuel oil for SSF Diesel Generator as necessary.	
4.30 __ **WHEN** all in progress enclosures of this procedure are complete, **THEN EXIT** this procedure.	

• • • END • • •

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-007

START DIESEL AIR COMPRESSOR AND ALIGN TO SERVICE AIR HEADER

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start Diesel Air Compressor and Align to Service Air Header

Alternate Path:

No

Facility JPM #:

NLO-007

K/A Rating(s):

System: APE065
K/A: AA1.04
Rating: 3.5*/3.4*

Task Standard:

Diesel Air Compressor started and aligned to the Service Air Header correctly per procedure.

Preferred Evaluation Location:

Simulator _____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

AP/2/A/1700/22, Enclosure 5.4 (Emergency Start of the Diesel Air Compressor)

Validation Time: 10 minutes **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

AP/2/A/1700/22, Enclosure 5.4 (Emergency Start of the Diesel Air Compressor) prestaged at compressor.

READ TO OPERATOR

DIRECTION TO TRAINEE:

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:

Units 1, 2, and 3 are operating at 100% power.

The Unit 1 Control Room Operator receives the "INSTRUMENT AIR SYSTEM TROUBLE" Statalarm and observes that Instrument Air pressure is decreasing on the Control Room IA pressure gauge.

INITIATING CUES:

The Unit 2 Control Room Operator directs you to obtain a copy of "Emergency Start of the Diesel Air Compressor" Enclosure of AP/2/A/1700/22 (Loss Of Instrument Air), start the diesel air compressor, and align it to the Service Air Header.

START TIME: _____

NOTE The "Low Water Level" light should light for 4 seconds and then go off. STEP 1: Step 1 Position the "POWER" Toggle Switch to ON. STANDARD: The "POWER" Toggle Switch is located and pushed up to the ON position. **Cue: Indicate that the "Low Water Level" light is on for 4 seconds and then goes off.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Step 2 Press and HOLD the "SAFETY CIRCUIT BYPASS" button for 10 - 15 seconds). STANDARD: Operator locates and presses the "SAFETY CIRCUIT BYPASS" button, holding it for 10 - 15 seconds. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 3 While holding the "SAFETY CIRCUIT BYPASS" button, depress the START button to start the engine. STANDARD: While continuing to hold the "SAFETY CIRCUIT BYPASS" button, the operator locates and presses the START button. ***CUE: After the buttons are pressed, inform the candidate that the diesel has started.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 4: Step 4 **WHEN** engine starts, **THEN** release the start button. STANDARD: The candidate releases the START button when the engine starts. ***CUE: Indicate to the operator that engine has started.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 5 **WHEN** *ENGINE OIL PRESSURE reaches 20 psig* **THEN** release the SAFETY CIRCUIT BYPASS button. STANDARD: Candidate should determine that ENGINE OIL PRESSURE is 20 psig and then release the SAFETY CIRCUIT BYPASS button. ***CUE: Indicate to the operator that ENGINE OIL PRESSURE is 20 psig.*** COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 6 Push the "SERVICE AIR PUSH AFTER WARM-UP" button to allow the compressor to fully load. STANDARD: The "SERVICE AIR PUSH AFTER WARM-UP" button is LOCATED on the Control Panel, and is DEPRESSED. ***CUE: Inform operator that the "SERVICE AIR PUSH AFTER WARM-UP" button is depressed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 7: Step 7 Open SA-2797 (SA BLOCK VALVE) (North side of compressor below the control panel) STANDARD: Service Air Outlet Valve, located in front of the control panel, is OPENED by placing the valve operator lever PARALLEL with the service air line. ***CUE: Inform operator that lever is parallel with service air line.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 8: Step 8 OPEN SA-339 (DIESEL AIR COMPRESSOR TIE) (T-3/F/G-56) STANDARD: Compressor is aligned to Service Air Header by rotating SA-339 (Diesel Air Compressor Tie) T-handle until parallel with pipe. ***CUE: Inform operator that lever is parallel with service air line.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 10: Step 10 OPEN SA-143 (SA TO IA CONTROLLER BYPASS) (T-1/L-33, 15' E) STANDARD: Valve is located and manually opened by rotating valve Counter-clockwise to the hard stop. ***Cue: After the operator indicates that he will open SA-143, inform operator that valve is at the hard stop.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 11: Notify Unit 2 CR that the Diesel Air Compressor is operating. STANDARD: Unit 2 CR is notified that the Diesel Air Compressor is operating using a phone or radio. ***Cue: Inform candidate that the Unit 2 CR has been notified that the Diesel Air Compressor is operating.*** COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Provides power to engine indications and control circuits.
3	Operator must press bypass and start buttons to crank engine.
6	Step is required to load the compressor.
7	Valve must be opened to allow the supply of air to leave the compressor.
8	Air is not supplied to the Service air Header until this valve is opened.
9	Allows SA to raise IA Header pressure above 85 psig.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Units 1, 2, and 3 are operating at 100% power.

The Unit 1 Control Room Operator receives the "INSTRUMENT AIR SYSTEM TROUBLE" Statalarm and observes that Instrument Air pressure is decreasing on the Control Room IA pressure gauge.

INITIATING CUES:

The Unit 2 Control Room Operator directs you to obtain a copy of "Emergency Start of the Diesel Air Compressor" Enclosure of AP/2/A/1700/22 (Loss Of Instrument Air), start the diesel air compressor, and align it to the Service Air Header.

Enclosure 5.4
Emergency Start of the
Diesel Air Compressor {3}

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The "Low Water Level" light should light for 4 seconds and then go off.	
1. __ Position the IGNITION toggle switch to ON.	
2. __ Press and hold the SAFETY CIRCUIT BYPASS button for 10-15 seconds.	
3. __ While holding the SAFETY CIRCUIT BYPASS button, depress the START button to start the engine.	
4. __ **WHEN** engine starts, **THEN** release the START button.	
5. __ **WHEN** ENGINE OIL PRESSURE reaches 20 psig, **THEN** release the SAFETY CIRCUIT BYPASS button.	
6. __ Push the SERVICE AIR PUSH AFTER WARM-UP button to allow the compressor to fully load.	
7. __ Open SA-2797 (PORTABLE DIESEL AIR COMPRESSOR BLOCK) (North side of the compressor below the control panel).	
8. __ Open SA-339 (DIESEL AIR COMPRESSOR TIE) (T-3/F/G-56).	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

SA-141 (SA TO IA CONTROLLER) automatically regulates IA header pressure to 85 psig. Opening SA-143 will bypass SA-141 and allow the SA header to pressurize the IA header greater than 85 psig.

9. __ Open SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 15' E).

10. __ Notify Unit 2 CR that the Diesel Air Compressor is operating.

11. __ Periodically monitor compressor parameters and associated lamps:

Parameter	Range
ENGINE TACHOMETER	No Load ≈ 1200 rpm Full Load ≈ 1800 rpm
ENGINE WATER TEMPERATURE	Max 200°F
DISCHARGE AIR TEMPERATURE	Max 220°F
COMPRESSOR DISCHARGE PRESSURE	Min 75 psig (with compressor loaded)
ENGINE OIL PRESSURE	Min 20 psig Normal ≈ 35 - 60 psig

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. __ **WHEN** directed by CR to secure the Diesel Air Compressor, **THEN** perform the following: A. __ Close SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 15' E). B. __ Close SA-339 (DIESEL AIR COMPRESSOR TIE) (T-3/F/G-56). C. __ Close SA-2797 (PORTABLE DIESEL AIR COMPRESSOR BLOCK) (North side of the compressor below the control panel). D. __ Allow engine to idle for 5 minutes. E. __ Position IGNITION toggle switch to OFF. F. __ Replenish operating fluids as required.	
13. __ Notify Unit 2 CR that the Diesel Air Compressor is shutdown.	
14. __ **EXIT** this enclosure.	

• • • END • • •