

Final Submittal

(Blue Book)

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

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

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Refer to OP/1/A/1103/004 (Soluble Poison Control) Enclosure 4.26 (Step 2.6) to begin de-lithiation.</p> <p>Perform OP/1/A/1103/004, Soluble Poison Control, Enclosure 4.26</p> <p>Place Deborating IX in service:</p> <ul style="list-style-type: none"> • 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 <p>Restore system per OP/1/A/1103/004, Soluble Poison Control, Enclosure 4.26:</p> <ul style="list-style-type: none"> • 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
	BOP	<p>Plant response:</p> <p>Statalarms</p> <ul style="list-style-type: none"> • 1SA-2/C-3, RC Pressurizer Level High/Low • 1SA-2/C-4, RC Pressurizer Level Emerg. High/Low <p>Front board (1UB1) indications:</p> <ul style="list-style-type: none"> • PZR Level 1 indicates 400" • 1HP-120 (RC Volume Control) throttles closed • Makeup flow decreases to ≈ 0 gpm. <p>Crew response:</p> <p>Refer to ARG:</p> <ul style="list-style-type: none"> • 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/BOP	<ul style="list-style-type: none"> • SRO should direct the BOP to take actions to restore normal PZR level.
	SRO/BOP	<ul style="list-style-type: none"> • 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

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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
		<p>Plant response:</p> <p>Statalarms</p> <ul style="list-style-type: none"> • 1SA-2/B-10, CRD Position Error <p>Position Indicating Panel</p> <ul style="list-style-type: none"> • 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. <p>Diamond Panel indications</p> <ul style="list-style-type: none"> • 9" asymmetric lamp. • Group In Limit (green) lamp on respective group.
	OATC	<p>Crew will use "Plant Transient Response" process to stabilize the plant.</p> <p>Acknowledge and verbalize to the SRO the most important Statalarm received for the failure.</p> <p>Verbalize to the SRO reactor power level and direction of movement.</p>
	BOP	<p>Recognize that a valid runback should be occurring but is not because the ICS is in manual.</p> <p>Refer to ARG for 1SA-2/B-10, CRD Position Error</p> <ul style="list-style-type: none"> • Inform SRO entry into AP/015, Dropped Control Rods is required.
	SRO	<p>The SRO should use the OAC to monitor unit status.</p> <p>Enter AP/1/A/1700/15, Dropped Control Rods</p>

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

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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.
	OATC	<ol style="list-style-type: none"> 1. Verify \leq one dropped control rod or misaligned $> 9"$ (6%) from group average. 2. Verify Reactor is critical 3. Verify runback to 55% FP in progress. <ul style="list-style-type: none"> • 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	<ol style="list-style-type: none"> 4. Initiate Enclosure 5.1 (Control of Plant Equipment During Shutdown) <ul style="list-style-type: none"> • 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	<ol style="list-style-type: none"> 5. Notify I&E (SPOC) to perform the following: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Verify QPT within COLR limit 8. Within 2 hours, ensure reactor power is less than 60% of the allowable power per the RCP combination. <p>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.</p>
	OATC	<ol style="list-style-type: none"> 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

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Event Description: 1A₁ RCP High Vibration: (C, BOP/SRO)

Time	Position	Applicant's Actions or Behavior
	BOP	Statalarm 1SA-9/D-2 (RC PUMP VIBRATION HIGH) will alarm.
	SRO	<ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • 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	Statalarm 1SA-9/E2 (RCP VIBRATION EMERG HIGH) will actuate.
	SRO	<ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • Verify Reactor power \leq 70% • Verify four RCPs operating • Trip the 1A1 RCP. 3. Trip the 1A1 RCP.
	BOP	
		When crew has tripped the RCP this event is completed.

Op-Test No.: _____ Scenario No.: 1 Event No.: 5

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

Time	Position	Applicant's Actions or Behavior
	OATC	<p>When the 1A₁ RCP is secured ΔT_c fails HIGH</p> <ul style="list-style-type: none"> • 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 <p>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.</p> <p>Take the Feedwater Masters to MANUAL and re-ratio feedwater using the loop Tc meters to return actual ΔT_c to near zero.</p>
	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		
	OATC	<p>After reactor power has been reduced and when directed by the lead examiner a second control rod will drop.</p> <p>Plant response:</p> <p>Statalarm</p> <ul style="list-style-type: none"> 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. <p>Crew response:</p> <ul style="list-style-type: none"> 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. <p>Note: The reactor will NOT trip when the button is depressed.</p>		
	SRO	<ul style="list-style-type: none"> 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	<p>Recognize that the Reactor should have tripped and begin performing Immediate Manual Actions.</p> <ul style="list-style-type: none"> Depress REACTOR TRIP pushbutton Verify reactor power < 5% FP and decreasing <p>The OATC should recognize that Power Range NIs are not < 5% FP and perform Rule 1. (CT-24)</p> <ul style="list-style-type: none"> Verify that at least one Power Range NI is $\geq 5\%$ 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

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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
	SRO	<p>Transfer to the UNPP tab from IMAs and direct the following actions:</p> <ul style="list-style-type: none"> • Announce plant conditions • Ensure Rule 1 is in progress or complete. • Verify Main FDW available. • IAAT <u>all</u> power range NIs are <5% FP, THEN ensure the turbine-generator is tripped. <p>Note: This action will result in a unit loss of power for \approx 35 seconds due to CT-1 lockout.</p> <ul style="list-style-type: none"> • Verify <u>all</u> wide range NIs \geq1% 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 <u>all</u> NIs are <1% FP, AND decreasing, THEN continue in this tab. <p>Note: Due to sequence of events all steps may not be completed.</p>

Op-Test No.: _____ Scenario No.: 1 Event No.: 7

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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	<p>Perform symptoms check and when asked report no other symptoms.</p> <p>When power is regained on the Main Feeder Buses perform AP/11, Recovery from Loss of Power.</p> <ul style="list-style-type: none"> ▪ 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 \geq 90 psig:
	OATC	<p>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).</p> <ul style="list-style-type: none"> ▪ 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

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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	<p>When the turbine is tripped and power is lost:</p> <p>Two possible paths</p> <ol style="list-style-type: none"> GO TO the "Blackout" tab per parallel actions page <ul style="list-style-type: none"> In the blackout tab, the crew will: verify power restored, initiate AP/11(Recovery from Loss of Power) and transfer to Subsequent Actions. <p>OR</p> If power is restored prior to transferring to blackout tab, SRO will complete UNPP tab. <ul style="list-style-type: none"> 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 $\leq 1\%$. Direct an RO to throttle HPI per Rule 6 and adjust Letdown if needed. Transfer to Subsequent Actions <ul style="list-style-type: none"> 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	<p>Keowee Unit 1 Emergency Lockout will result in a Unit Blackout.</p> <ol style="list-style-type: none"> Determine that CC and HPI are lost and initiate AP/25 (SSF Emergency Operating Procedure) <ul style="list-style-type: none"> 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. <p>Note: Since the TD EFDW Pump is OOS no source of FDW is available to the SGs until power is restored from CT- 5.</p> <ul style="list-style-type: none"> Notify SSF operators that feeding with SSF ASW is required. Initiate Enclosure 5.38 (Restoration of Power)
	BOP	<p>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.</p> <p>Perform Enclosure 5.38 (Restoration of Power) (CT-8)</p> <ol style="list-style-type: none"> Verify MFB1 and MFB2 de-energized Determine CT-1 has no voltage Verify both Standby Buses de-energized Verify all Keowee Units operating <p>Note: Keowee 1 emergency locked out, Keowee 2 operating.</p> <ol style="list-style-type: none"> Notify Keowee operator to give Oconee Control for Keowee 2 Close ACB-4 (Unit 2 EMER FDR) Verify CT-4 voltage 4160 Place CT-4 Bus 1 and 2 AUTO/MAN switches in MANUAL 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	<p>10. Close SK1 and SK2</p> <p>11. Place STBY BUS 1 and 2 SYNCHRONIZING switch in OFF.</p> <p>12. Verify Standby Bus #1 energized.</p> <p>13. Notify SRO Standby Bus #1 is energized.</p> <p>14. Place the following switches in MANUAL:</p> <ul style="list-style-type: none"> • MFB1 AUTO/MAN • MFB2 AUTO/MAN • STANDBY 1 AUTO/MAN • STANDBY 2 AUTO/MAN <p>15. Ensure the following breakers open:</p> <ul style="list-style-type: none"> • N1 and N2 • E1 and E2 <p>16. Close S1 and S2</p> <p>Note: This will power the Main Feeder Buses.</p> <p>17. Verify any of the following energized:</p> <ul style="list-style-type: none"> • 1TC, 1TD, 1TE <p>18. Notify SRO of status of 4160V SWGR</p> <p>19. Use RULE 3 to establish EFDW flow to SGs.</p>
		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

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Event Description: **Low "A" CFT pressure (N2 makeup) (N, BOP/SRO)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Plant response: 1SA-08/A-11, CF TANK "A" PRESS HIGH/LOW will actuate.</p> <p>Crew response:</p> <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • Direct an NEO to open 1N-137 (CFTs Supply) <ul style="list-style-type: none"> ➤ 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

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

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Plant response:</p> <ol style="list-style-type: none">Determine 1N-298 has failed to close:<ul style="list-style-type: none">Red "open" light litCFT pressure continues to increaseInform the SRO.Direct the NEO to close 1N-137 (CFTs Supply). <p>Note: If 1N-137 is not closed the CFT pressure will continue to increase, possibly outside of TS limits.</p> <ol style="list-style-type: none">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

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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.
	SRO	<ol style="list-style-type: none"> 1. Diagnose 1HP-120 (RC Volume Control) failed closed: <ul style="list-style-type: none"> • RCS makeup flow goes to zero. • PZR level begins to decrease. • LDST level begins to increase. • Valve position <u>demand</u> for 1HP-120 begins to increase to the 100% demand value and valve position indication will indicate closed (green light). 2. Refer to AP/14 (Loss of Normal Makeup and/or RCP Seal Injection). <ul style="list-style-type: none"> • Determine Seal Injection is not lost • Determine loss of suction to HPI pumps has not occurred and GO TO Step 4.6. • Verify <u>any</u> 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": <ul style="list-style-type: none"> ▪ Close 1HP-6 (Letdown Orifice Stop) ▪ Throttle 1HP-7 (Letdown Control) ▪ Throttle 1HP-26 (1A HP Injection) • Ensure 1HP-120 to HAND and close 3. Contact SPOC to repair 1HP-120. <p>Note: 1HP-120 will remain failed for the duration of the scenario.</p>
	SRO	
		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

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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
	OATC	<p>Plant response:</p> <ol style="list-style-type: none"> 1SA-02/A-12, ICS Tracking, will actuate due to neutron and feedwater cross-limits. Controlling Tave will indicate $\approx 596.4^{\circ}$ F. Actual loop A & B Tave will decrease until operator stops transient. RCS pressure and temperature will decrease. <p>Crew response:</p> <ol style="list-style-type: none"> 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. Verbalize to the SRO reactor power level and direction of movement. Place the FDW Masters in manual and stabilize the plant. Use control rods and FDW to stabilize the plant The SRO should: <ul style="list-style-type: none"> Refer to AP/28, ICS Instrument Failures Contact SPOC to repair controlling Tave. <p>Note: The ICS will remain in manual for the remainder of the scenario.</p>
	SRO	
		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

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

Time	Position	Applicant's Actions or Behavior
	BOP	<ol style="list-style-type: none"> 1SA-9/B-9, LPSW RBCU A Cooler Rupture will actuate and RB normal sump level will increase. <ul style="list-style-type: none"> 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 Outlet) 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	<ol style="list-style-type: none"> 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). <p>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.</p>
	SRO	<ol style="list-style-type: none"> The SRO may refer to AP/05, Earthquake. <ul style="list-style-type: none"> Dispatch operators to perform plant inspections <p>Note: No damage will be reported.</p> <ul style="list-style-type: none"> *Notify SPOC to develop the Strong Motion Accelerometer tape. *Verify NO fuel handling activities in progress. <p>* These items may not be completed depending on how soon the next event is started.</p> <p>Note: Team may decide at this time to begin a unit shutdown. Refer to event 6.</p>
		<p>When the RBCU has been isolated, or at the direction of the Lead Examiner this event is completed.</p>

Op-Test No.: _____ Scenario No.: 2 Event No.: 5

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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
		<p>Plant response:</p> <ol style="list-style-type: none"> The following alarms actuate: <ul style="list-style-type: none"> 1SA-8/B-9, RM PROCESS MONITOR RADIATION HIGH 1SA-8/D-10, RM CSAE EXHAUST RADIATION HIGH PZR level will decrease. <p>Crew response:</p> <ol style="list-style-type: none"> Diagnose and take actions for a Tube leak in the 1B SG: Refer to the ARG for the following alarms: <ul style="list-style-type: none"> 1SA-8/B-9, RM PROCESS MONITOR RADIATION HIGH 1SA-8/D-10, RM CSAE EXHAUST RADIATION HIGH Refer to AP/31 (Primary to Secondary Leakage) <ul style="list-style-type: none"> Monitor primary parameters; PZR Level and LDST level to determine that gross leakage exist and transfer to step 4.71. <p>Path 1 (crew determines that leakage is gross)</p> <ul style="list-style-type: none"> Using an RCS inventory balance, determine OTSG tube leak size is less than 25 gpm. <p>Path 2 (crew determines that leakage is NOT gross)</p> <ul style="list-style-type: none"> Notify RP and Chemistry Determine leak rate using the OAC is ≥ 100 gpd. <p>Common path</p> <ul style="list-style-type: none"> 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 applies). <ul style="list-style-type: none"> ➤ Initiate a unit shutdown using OP/1/A/1102/004 (Operation At Power) <p>Note: A shutdown with the ICS in manual is required.</p>
		<p>When the SRO has directed a manual Unit shutdown or when directed by the Lead Examiner the event is completed.</p>

Op-Test No.: _____ Scenario No.: 2 Event No.: 7

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

Time	Position	Applicant's Actions or Behavior
	OATC/SRO	<p>The OATC will use the FDW Masters and the Diamond to reduce power while monitoring Reactor Power, Tave, and other plant parameters.</p> <p>If the reactor trips automatically the team must return to IMAs.</p>
		<p>The BOP will utilize Enclosure 5.19 (Control of Plant Equipment During Shutdown for SGTR).</p> <ol style="list-style-type: none"> 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 $\leq 80\%$, stop 1E1 and 1E2 Heater Drain Pumps. 7. Transfer electrical auxiliaries <ul style="list-style-type: none"> • 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 E1₁ MFB1 STARTUP FDR 4. Close E2₁ MFB2 STARTUP FDR <p>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.</p> <p>Note: If the reactor is manually tripped activate event 8.</p>
		<p>When a unit shutdown of $> 5\%$ has occurred or when directed by the lead examiner this event is concluded.</p>

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: <ol style="list-style-type: none"> 1. Statalarm 1SA-02/A-9, MS Press High/Low, actuates 2. "A" and "B" main steam (MS) pressure decreases 3. Reactor trips. <ul style="list-style-type: none"> • "B" MS line pressure stops decreasing • "A" MS line pressure continues to decrease • RCS may saturate Crew response: <ol style="list-style-type: none"> 1. The OATC will perform and verify IMAs. <ul style="list-style-type: none"> • 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 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) <ul style="list-style-type: none"> • 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) <ul style="list-style-type: none"> • 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
	SRO	
	OATC	
	BOP	
	OATC	

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	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Diagnose that ES Channels 7 and 8 have not actuated. • Depress the ES Channels 7 and 8 trip pushbutton on 1UB1. <p>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.</p> 8. Excessive Heat Transfer (EHT) tab will: <ul style="list-style-type: none"> • 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) <ul style="list-style-type: none"> ➢ 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
		<ol style="list-style-type: none"> 1. Verify applicable Statalarms and breaker positions 2. Notify Keowee operator to give Oconee control of Keowee # 1. 3. Review Limits and Precautions
		Procedure
		<ol style="list-style-type: none"> 1. Place UNIT 1 LOCAL MASTER switch to "START" AND hold until Keowee Unit starts. 2. Verify the following: <ul style="list-style-type: none"> • GEN 1 FIELD BREAKER closes • GEN 1 SUPPLY BREAKER closes • GEN 1 FIELD FLASHING BREAKER closes 3. Ensure GEN 1 FIELD FLASHING BREAKER trips. <ul style="list-style-type: none"> • 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	<ol style="list-style-type: none"> 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.

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • RC Makeup Flow = 0 gpm • 1A HPI Pump = 0 amps • PZR level will begin to decrease and LDST level will begin to increase. Crew response: <ol style="list-style-type: none"> 1. Refer to ARG for above Statalarms 2. SRO should refer to AP/014 (Loss of Normal Makeup and/or RCP Seal Injection) <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ➢ 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.
	OATC	
	SRO	
	OATC	

Op-Test No.: _____ Scenario No.: 3 Event No.: 2

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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	<p>3. Refer to Tech Spec 3.5.2 High Pressure Injection</p> <ul style="list-style-type: none">• Condition "A"• Required Action: Restore HPI pump to OPERABLE status• Completion Time: 72 hours <p>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.</p>
		Event is complete when normal makeup and letdown is established or when directed by the lead examiner.

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

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Plant response:</p> <ul style="list-style-type: none"> • Statalarm 1SA-4/C-5 (Aux Bldg Air HDR PR Low) activates • IA pressure decreasing on Aux and Turb Building gauges located on 1UB2. <p>Crew response:</p> <ol style="list-style-type: none"> 1. Refer to ARG for 1SA-4/C-5. <ul style="list-style-type: none"> • Send NEO to start all backup IA compressors. • Send operators to check for 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	<ol style="list-style-type: none"> 2. AP/22 (Loss of Instrument Air) <ul style="list-style-type: none"> • 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. <p>Note: If reactor trips, continue to next event.</p> <p>Note: IA leak will be repaired after letdown is aligned.</p>
		Event is complete when AP/22 actions are being performed or when directed by the lead examiner.

Event Description: **Main FDW Pump trips and the turbine Fails to trip (C, OATC)**

Time	Position	Applicant's Actions or Behavior
	SRO	Plant response: <ul style="list-style-type: none">• 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.
	OATC	Crew response: 1. SRO will enter the EOP. 2. OATC will perform Immediate Manual Actions <ul style="list-style-type: none">• Depress REACTOR TRIP pushbutton• Verify reactor power < 5% FP and decreasing• Depress turbine TRIP pushbutton.• Verify all turbine stop valves closed
	BOP	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. <ul style="list-style-type: none">• 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

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Event Description: **"A" TBVs fails open and 1MS-17 ("A" TBV Block) fails to close: (M, OATC)**

Time	Position	Applicant's Actions or Behavior
		<p>Note: The "A" TBVs will fail open at the same time as the turbine trip.</p> <p>Plant response:</p> <ul style="list-style-type: none"> • 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 <p>Crew response:</p> <ol style="list-style-type: none"> 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) <ul style="list-style-type: none"> • 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.

Event Description: **"A" TBVs fails open and 1MS-17 ("A" TBV Block) fails to close:
(M, OATC)**

Time	Position	Applicant's Actions or Behavior
		<p>4. The SRO should make a "Parallel Actions" transfer to the Excessive Heat Transfer tab.</p> <p>5. Excessive Heat Transfer tab will:</p> <ul style="list-style-type: none">• 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.

Event Description: **"A" SG Tube Rupture: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
		<p>Plant response:</p> <p>Statalarms:</p> <p>1SA-8/A-9 (RM Area Monitor Radiation High)</p> <p>1SA-8/B-9 (RM Process Monitor Radiation High)</p> <p>1SA-8/D-10 (RM CSAE Exhaust Radiation High)</p> <p>Board indications:</p> <p>PRZ level and RCS pressure will decrease.</p> <p>Crew response:</p> <p>SRO should remain in Excessive Heat Transfer Tab and perform the following:</p> <ol style="list-style-type: none">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-84. 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:<ul style="list-style-type: none">• ES Bypass Permit satisfied• All SCMs > 0°F• RCS pressure controllableTHEN Bypass ES as required8. While maintaining RCP NPSH and Pzr level minimize SCM using the following methods as necessary: (CT-7)<ul style="list-style-type: none">• De-energizing all Pzr heaters• Using Pzr spray• Throttling HPI• Using PORV

Event Description: **"A" SG Tube Rupture: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
		<p>9. Initiate Encl. 5.16 (SG Tube-to-Shell ΔT Control)</p> <ul style="list-style-type: none">• IAAT any SG tube-to-Shell ΔT approaches either limit THEN take appropriate action. <p>10. GO TO SGTR tab.</p> <p>SGTR tab will:</p> <ol style="list-style-type: none">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 1Event Description: **T_{hot} fails HIGH: (I, OATC)**

Time	Position	Applicant's Actions or Behavior
		<p>Plant response:</p> <ul style="list-style-type: none"> • Loop A Thot Dixon 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 <p>Crew response:</p> <ul style="list-style-type: none"> • 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.
	OATC	
	SRO	<ul style="list-style-type: none"> • 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.
		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
	BOP	<p>Plant response:</p> <ol style="list-style-type: none"> Statalarms: <ul style="list-style-type: none"> 1SA-9/B-1, CC CRD RETURN FLOW LOW 1SA-9/C-1, CC COMP COOLING RETURN FLOW LOW 1SA-2/C-1, LETDOWN TEMPERATURE HIGH Control Board indications: <ul style="list-style-type: none"> 1HP-5 will close due to high letdown temperature <p>Crew Response:</p> <ol style="list-style-type: none"> Refer to ARGs Initiate AP/020 (Loss of Component Cooling) <ul style="list-style-type: none"> IAAT both of the following are lost: <ul style="list-style-type: none"> ➤ CC to RCPs ➤ RCP seal injection THEN perform the following: <ul style="list-style-type: none"> ➤ Trip RX ➤ Stop all RCPs ➤ Initiate AP/25 (SSF EOP) 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 Close 1HP-5. Initiate AP/032 (Loss of Letdown)
	SRO BOP	
	SRO	
		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) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> ➤ 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
	SRO	Note: 1HP-5 will not open from the control room or locally. <ul style="list-style-type: none"> • 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.

Event Description: **Unidentified RCS leak in RB (20 gpm): (C, BOP) (TS)**

Time	Position	Applicant's Actions or Behavior
		<p>Plant response:</p> <ol style="list-style-type: none"> 1. Statalarms: <ul style="list-style-type: none"> • 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low • 1SA-8/B-9, Process Radiation Monitor High 2. Control board indications: <ul style="list-style-type: none"> • RBNS level increases • Pzr level will decrease very slowly due to the leak and 1HP-5 being closed. <p>Crew response:</p> <ol style="list-style-type: none"> 1. Refer to ARG for 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low 2. Refer to AP/002, Excessive RCS Leakage <ul style="list-style-type: none"> • 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. • 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: <ul style="list-style-type: none"> ➤ AP/29 (Rapid Unit Shutdown) ➤ OP/1/A/1102/004 (Operation At Power) ➤ OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown) <p>Note: OP/1/A/1102/004 (Operation At Power) should be used.</p>
	BOP	
	SRO	
	BOP	
	SRO	
		<p>Event is complete when a unit shutdown is directed by the SRO or when directed by the Lead Examiner.</p>

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
	OATC	<ol style="list-style-type: none"> 1. Review Limits and Precautions 2. Notify OSM to contact NRC if required. 3. Start 1A/1B MFDW pump Seal Injection Pump 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 <p>Note: Control Rods will not insert in auto.</p> <p>Plant response:</p> <ol style="list-style-type: none"> 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. <p>Crew response:</p> <ol style="list-style-type: none"> 1. OATC should determine that control rods are not inserting. 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. 3. OATC should place Diamond in Manual. <p>Note: Crew may decide to place FDW Masters in manual for the power reduction.</p>
		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.

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

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Plant response:</p> <ul style="list-style-type: none"> • 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. <p>Crew response:</p> <ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • Verify that reactor power is < 1%. • Trip RCPs within 2 min of LOSCM (CT-1) • Verify that HPI is performing as required. (CT-2) <ul style="list-style-type: none"> ➤ Open 1HP-410 <p>Note: BOP should determine that 1HP-26 has failed to open and open 1HP-410.</p> <ul style="list-style-type: none"> • 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 <p>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.</p>

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

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • 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 flow rate and/or SG level per Rule 7 (SG Feed Control) (CT-10)
	SRO	<p>4. The SRO should GO TO the LOSCM Tab per the Parallel Actions page of the EOP Subsequent Actions section. LOSCM Tab will:</p> <ul style="list-style-type: none"> • 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:: <ul style="list-style-type: none"> ➤ NO RCPs are operating ➤ HPI flow exists in both HPI headers ➤ Adequate Total HPI flow per figure 1 (Total Required HPI Flow).

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

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> Control steaming and feed rates on all intact SGs to maintain cooldown rate within Tech Spec limits: <ul style="list-style-type: none"> ➤ $T_c \geq 280^\circ\text{F}$ $\leq 50^\circ\text{F}/\frac{1}{2}$ hour ➤ $T_c < 280^\circ\text{F}$ $\leq 25^\circ\text{F}/\frac{1}{2}$ hour GO TO Step 70. Close 1RC-4 Close the following: <ul style="list-style-type: none"> ➤ 1HP-1 ➤ 1HP-2 ➤ 1RC-3 ➤ 1GWD-17
	OATC	<p>5. GO TO LOCA CD tab.</p> <p>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:</p> <ul style="list-style-type: none"> 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 $> 0^\circ\text{F}$ 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	<p>LOCA CD tab will:</p> <ul style="list-style-type: none">• IAAT BWST level \leq 19 feet transfer ECCS suction to the RBES.• Verify ES is actuated.• Ensure all RBCUs in low speed and LPSW flow \geq 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 \leq 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.

Final 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.		

Final 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)	SRO-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

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:

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: _____

<p><u>STEP 1:</u> Determine and locate appropriate procedure for DW makeup to the SFP.</p> <p><u>STANDARD:</u> Candidate locates Enclosure 4.9 (SFP Makeup With DW) of OP/1&2/A/1104/006 C (SFP Makeup).</p> <p><i>Candidate may refer to OP/1108/001 (Curves and General Information) Encl. 3.26 (Miscellaneous Data)</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Determine volume of water required to raise SFP from 0.0 ft to + 0.6 ft.</p> <p><u>STANDARD:</u> 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.</p> <p>$0.6 \text{ ft} \times 13,080 \text{ gal/ft} = \mathbf{7848 \text{ gallons}}$</p> <p><i>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).</i></p> <p>$0.6 \text{ ft} \times 1512 \text{ gal/0.1 ft} = \mathbf{9072 \text{ gallons}}$</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 3: Determine final SFP Boron concentration.</p> <p>STANDARD: Refer to Enclosure 4.9 (SFP Makeup With DW) step 2.2.</p> <p>SFP final ppm = $\frac{(\text{SFP present ppm}) (\text{SFP present vol})}{(\text{SFP final vol})}$</p> <p>SFP final ppm = $\frac{(2545 \text{ ppm}) (546,000 \text{ gal})}{(553,848 \text{ gal})}$</p> <p>SFP final ppm = 2508.9 (± 10 ppm)</p> <p>Note: SFP final vol = 546,000 gal + (13,080 gal/ft X 0.6 ft) = 553,848 gal</p> <p><i>Calculate final SFP Boron concentration using OP/1108/001 (Curves and General Information) Encl. 3.26 (Miscellaneous Data).</i></p> <p>SFP final ppm = $\frac{(2545 \text{ ppm}) (544,000 \text{ gal})}{(553,072 \text{ gal})}$</p> <p>SFP final ppm = 2503.3 (± 10 ppm)</p> <p>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.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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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

SRO

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

- _____ 2.2 Calculate final SFP boron:

SFP volume at zero level = 546,000 gal.

Gal/Foot = 13,080

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

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: _____

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 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.

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:

___ SAT

___ UNSAT

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

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

<p>STEP 8: Step 2.9 Calculate RCS Leakage Rate:</p> <p>STANDARD: <u>- 3.357</u> gallons ÷ <u>60</u> minutes = <u>- .056</u> gpm (± .01 gpm)</p> <p>COMMENTS:</p> <p style="text-align: right;">END TASK</p>	<p>CRITICAL TASK</p> <p>___ SAT</p> <p>___ UNSAT</p>
--	---

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.

Enclosure 13.3
Manual RCS Leakage Calculation Data Sheet

PT/1/A/0600/010
Page 1 of 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".

Enclosure 13.3
Manual RCS Leakage Calculation Data Sheet

PT/1/A/0600/010
Page 2 of 2

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

_____ 2.4 Calculated Corrected PZR Level Change:

$$(-6.831 \text{ inches/}^{\circ}\text{F} \times \text{_____ } ^{\circ}\text{F}) + \text{_____ inches} = \text{_____ inches}$$

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

_____ 2.5 Convert Corrected PZR Level Change to gallons:

$$\text{_____ inches} \times 14.364 \text{ gallons/inch} = \text{_____ gallons}$$

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

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

$$\text{_____ inches} \times 34.94 \text{ gallons/inch} = \text{_____ gallons}$$

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

_____ 2.7 Convert LDST Level Change to gallons:

$$\text{_____ inches} \times 30.956 \text{ gallons/inch} = \text{_____ gallons}$$

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

_____ 2.8 Calculate Total Volume Change:

$$\text{_____ gallons} + \text{_____ gallons} + \text{_____ gallons} = \text{_____ gallons}$$

Final PZR Change Final QT Change Final LDST Change Total Change

_____ 2.9 Calculate RCS Leakage Rate:

$$\text{_____ gallons} \div \text{_____ Minutes} = \text{_____ gpm}$$

Total Change (1) Duration RCS Leakage Rate

Enclosure 13.3
Manual RCS Leakage Calculation Data Sheet

PT/1/A/0600/010
Page 1 of 2

1. Initial Conditions

1.1 None.

2. Procedure

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

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

Answer Key

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.

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

Enclosure 13.3
Manual RCS Leakage Calculation Data Sheet

PT/1/A/0600/010
Page 2 of 2

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

- 2.4 Calculated Corrected PZR Level Change:
 $(-6.831 \text{ inches/}^\circ\text{F} \times -1^\circ\text{F}) + -1 \text{ inches} = -0.3169 \text{ inches}$
(5) Tave or Tcold Change (2) PZR Level Change Corrected PZR Level Change
- 2.5 Convert Corrected PZR Level Change to gallons:
 $-0.3169 \text{ inches} \times 14.364 \text{ gallons/inch} = -4.552 \text{ gallons}$
Corrected PZR Level Change Conversion corrected to 68°F Final PZR Change
- 2.6 Convert QT Level Change to gallons: {4}
 $.3 \text{ inches} \times 34.94 \text{ gallons/inch} = 10.482 \text{ gallons}$
(3) QT Level Change Conversion corrected to 68°F Final QT Change
- 2.7 Convert LDST Level Change to gallons:
 $-0.3 \text{ inches} \times 30.956 \text{ gallons/inch} = -9.287 \text{ gallons}$
(4) LDST Level Change Conversion corrected to 68°F Final LDST Change
- 2.8 Calculate Total Volume Change:
 $-4.552 \text{ gallons} + 10.482 \text{ gallons} + -9.287 \text{ gallons} = -3.357 \text{ gallons}$
Final PZR Change Final QT Change Final LDST Change Total Change
- 2.9 Calculate RCS Leakage Rate:
 $-3.357 \text{ gallons} \div 60 \text{ Minutes} = -0.056 \text{ gpm}$
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 $\mu\text{Ci/ml}$ concentration is greater than MDA (Minimum Detectable Activity).

CURRENT DATA

RCS Xe 133 activity = $7.189 \text{ E-3 } \mu\text{Ci/ml}$

RCS Xe 133 activity eq = $.4734 \text{ E-3 } \mu\text{Ci/ml}$

CSAE Off Gas Xe activity = $4.431 \text{ E-8 } \mu\text{Ci/ml}$

CSAE Off Gas Xe activity eq = $3.515 \text{ E-6 } \mu\text{Ci/ml}$

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: _____

<p>STEP 1: Step 1.1 IF all of the following conditions exist,</p> <ul style="list-style-type: none"> • 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 $\mu\text{Ci/ml}$ concentration is greater than MDA (Minimum Detectable Activity) <p>THEN set RIA-40 setpoints as follows:</p> <p>STANDARD: Determine the above conditions are met and proceed to Step 1.1.1.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>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.</p> <p>STANDARD: Candidate should obtain the CSAE flow rate (13 cfm) from the cue sheet.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 3: Step 1.1.2</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NOTE:</p> <ul style="list-style-type: none"> 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. </div> <p style="text-align: center; margin-top: 20px;">Perform the following equations:</p> <p>High Setpoint = $\frac{(30 \text{ gal/day}) (RCS \text{ Xe } 133 \text{ } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (RIA-40 \text{ cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe } 133 \text{ } \mu\text{Ci/ml})}$</p> <p>High Setpoint = $\frac{(RCS \text{ Xe } 133 \text{ } \mu\text{Ci/ml}) (RIA-40 \text{ cpm}) (2.77 \text{ E-3 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe } 133 \text{ } \mu\text{Ci/ml})}$</p> <p>High Setpoint = $\frac{(\text{ }) \mu\text{Ci/ml(RCS)}}{(\text{ }) \text{ ft}^3/\text{min}} \times \frac{(\text{ }) \text{ cpm}}{(\text{ }) \mu\text{Ci/ml(CSAE)}} \times 2.77 \text{ E-3 ft}^3/\text{min} = \text{ } \text{ cpm}$</p> <p style="margin-top: 20px;">STANDARD: Calculate High Setpoint using data from Cue Sheet:</p> <p>High Setpoint = $\frac{(7.189 \text{ E-3}) \mu\text{Ci/ml(RCS)}}{(13) \text{ ft}^3/\text{min}} \times \frac{(120) \text{ cpm}}{(4.431 \text{ E-8}) \mu\text{Ci/ml(CSAE)}} \times 2.77 \text{ E-3 ft}^3/\text{min} = 4148.4 \text{ cpm}$</p> <p style="text-align: right; margin-top: 10px;">(± 5 cpm)</p> <p style="margin-top: 20px;">COMMENTS:</p>	<p>CRITICAL STEP</p> <p style="text-align: center; margin-top: 20px;">___ SAT</p> <p style="text-align: center; margin-top: 20px;">___ UNSAT</p>
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<p>STEP 4: Step 1.1.2 (cont)</p> <p>Alert Setpoint = $\frac{(5 \text{ gal/day}) (RCS \text{ Xe } 133 \text{ } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (RIA-40 \text{ cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe } 133 \text{ } \mu\text{Ci/ml})}$</p> <p>Alert Setpoint = $\frac{(RCS \text{ Xe } 133 \text{ } \mu\text{Ci/ml}) (RIA-40 \text{ cpm}) (2.77 \text{ E-3 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe } 133 \text{ } \mu\text{Ci/ml})}$</p> <p>Alert Setpoint = $\frac{(\text{ }) \text{ } \mu\text{Ci/ml}(\text{RCS}) \times (\text{ }) \text{ cpm} \times 4.61 \text{ E-4 ft}^3/\text{min}}{(\text{ }) \text{ ft}^3/\text{min} (\text{ }) \text{ } \mu\text{Ci/ml}(\text{CSAE})} = \text{ } \text{cpm}$</p> <p>STANDARD: Calculate Alert Setpoint using data from Cue Sheet:</p> <p>Alert Setpoint = $\frac{(7.189 \text{ E-3}) \mu\text{Ci/ml}(\text{RCS}) \times (120) \text{ cpm} \times 4.61 \text{ E-4 ft}^3/\text{min}}{(13) \text{ ft}^3/\text{min} (4.431 \text{ E-8}) \mu\text{Ci/ml}(\text{CSAE})} = 690.4 \text{ cpm}$</p> <p style="text-align: right;">(± 5 cpm)</p> <p>COMMENTS:</p> <p style="text-align: center;">END TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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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 $\mu\text{Ci/ml}$ 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 ($\pm 2\%$) 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 $\geq 15\%$
- 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 $\mu\text{Ci/ml}$ 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.

Enclosure 13.10
Operation Of RIA-40

PT/0/A/0230/001
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_____ 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.

$$\text{High Setpoint} = \frac{(30 \text{ gal/day}) (\text{RCS Xe 133 } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (\text{RIA-40 cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}$$

$$\text{High Setpoint} = \frac{(\text{RCS Xe 133 } \mu\text{Ci/ml}) (\text{RIA-40 cpm}) (2.77 \text{ E-3 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}$$

$$\text{High Setpoint} = \frac{(\text{_____}) \mu\text{Ci/ml}_{(\text{RCS})}}{(\text{_____}) \text{ ft}^3/\text{min}} \times \frac{(\text{_____}) \text{ cpm}}{(\text{_____}) \mu\text{Ci/ml}_{(\text{CSAE})}} \times 2.77 \text{ E-3 ft}^3/\text{min} = \text{_____ cpm}$$

$$\text{Alert Setpoint} = \frac{(5 \text{ gal/day}) (\text{RCS Xe 133 } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (\text{RIA-40 cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}$$

$$\text{Alert Setpoint} = \frac{(\text{RCS Xe 133 } \mu\text{Ci/ml}) (\text{RIA-40 cpm}) (4.61 \text{ E-4 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 } \mu\text{Ci/ml})}$$

$$\text{Alert Setpoint} = \frac{(\text{_____}) \mu\text{Ci/ml}_{(\text{RCS})}}{(\text{_____}) \text{ ft}^3/\text{min}} \times \frac{(\text{_____}) \text{ cpm}}{(\text{_____}) \mu\text{Ci/ml}_{(\text{CSAE})}} \times 4.61 \text{ E-4 ft}^3/\text{min} = \text{_____ cpm}$$

_____ 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 ($\pm 2\%$) for at least 72 hours.

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

- Reactor power $\geq 15\%$
- 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 ($\pm 2\%$) 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 $\geq 15\%$
- 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).

Enclosure 13.10
Operation Of RIA-40

PT/0/A/0230/001
Page 6 of 11

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.

Enclosure 13.10
Operation Of RIA-40

PT/0/A/0230/001
Page 7 of 11

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.

$$\text{High Setpoint} = \frac{(30 \text{ gal/day}) (\text{RCS Xe 133 eq } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (\text{RIA-40 cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml})}$$

$$\text{High Setpoint} = \frac{(\text{RCS Xe 133 eq } \mu\text{Ci/ml}) (\text{RIA-40 cpm}) (2.77 \text{ E-3 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe eq 133 } \mu\text{Ci/ml})}$$

$$\text{High Setpoint} = \frac{(\text{) } \mu\text{Ci/ml}_{(\text{RCS eq})}}{(\text{) ft}^3/\text{min}} \times \frac{(\text{) cpm}}{(\text{) } \mu\text{Ci/ml}_{(\text{CSAE eq})}} \times 2.77 \text{ E-3 ft}^3/\text{min} = \text{) cpm}$$

$$\text{Alert Setpoint} = \frac{(5 \text{ gal/day}) (\text{RCS Xe 133 eq } \mu\text{Ci/ml}) (6.9 \text{ E-4 day/min}) (\text{RIA-40 cpm})}{(7.48 \text{ gal/ft}^3) (\text{CSAE Flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml})}$$

$$\text{Alert Setpoint} = \frac{(\text{RCS Xe 133 eq } \mu\text{Ci/ml}) (\text{RIA-40 cpm}) (4.61 \text{ E-4 ft}^3/\text{min})}{(\text{CSAE flow ft}^3/\text{min}) (\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml})}$$

$$\text{Alert Setpoint} = \frac{(\text{) } \mu\text{Ci/ml}_{(\text{RCS eq})}}{(\text{) ft}^3/\text{min}} \times \frac{(\text{) cpm}}{(\text{) } \mu\text{Ci/ml}_{(\text{CSAE eq})}} \times 4.61 \text{ E-4 ft}^3/\text{min} = \text{) cpm}$$

2.3 **IF** Reactor power is $\geq 15\%$,

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).

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

$$\text{Leak Rate} = \frac{(\text{CSAE flow ft}^3/\text{min}) \times (\text{CSAE offgas Xe 133 eq } \mu\text{Ci/ml}) \times (10.800 \text{ gal min})}{(\text{RCS Xe 133 eq } \mu\text{Ci/ml}) \text{ ft}^3 \text{ day}}$$

$$\text{Leak Rate} = \frac{(\text{_____}) \text{ ft}^3/\text{min} \times (\text{_____}) \mu\text{Ci/ml}_{(\text{CSAE eq})} \times (10.800 \text{ gal min})}{(\text{_____}) \mu\text{Ci/ml}_{(\text{RCS eq})} \text{ ft}^3 \text{ day}} = \text{_____ gpd}$$

_____ 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).

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

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

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

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:

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

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

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

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

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

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

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

Enclosure 13.10
Operation Of RIA-40

PT/0/A/0230/001
Page 11 of 11

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 (\pm 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

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:

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).

<p><u>STEP 1:</u> Determine dose received while performing task 1.</p> <p><u>STANDARD:</u> Determine dose received while performing task 1.</p> <p>$6.55 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 12 \text{ min} = 1.31 \text{ R}$</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Determine dose received while performing task 2.</p> <p><u>STANDARD:</u> Determine dose received while performing task 2.</p> <p>$21.45 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 4 \text{ min} = 1.43 \text{ R}$</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> Determine dose remaining from EDLs.</p> <p><u>STANDARD:</u> Determine dose remaining from EDLs.</p> <p>$5\text{R} - 1.31\text{R} - 1.43\text{R} = 2.26 \text{ R}$</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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

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: _____
NAME

Time Start: _____

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: _____

<p>STEP 1: Obtain a copy of OMP 2-01 Attachment "C" and NSD-200 (Overtime Control).</p> <p>STANDARD: A copy of OMP 2-01 Attachment "C" and NSD-200 (Overtime Control) is obtained.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Evaluate Operator 1</p> <p>STANDARD: Determine Operator #1 overtime guidelines exceeded:</p> <ol style="list-style-type: none"> 1. < 8 hr break (Sat – Sun) 2. > 16 hrs (Sat – Sun) <p>COMMENTS:</p>	<p>*CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 3: Evaluate Operator 2</p> <p>STANDARD: Determine Operator #2 overtime guidelines exceeded:</p> <ol style="list-style-type: none"> 1. > 16 in 24 hrs (Mon – Tues) 2. > 16 straight (Tues) 3. > 28 in 48 hrs (Mon – Wed) <p>COMMENTS:</p> <p style="text-align: center;">END OF TASK</p>	<p>*CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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.

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TECHNICAL SPECIFICATION RELATED



A Duke Energy Company

NUCLEAR POLICY MANUAL

Nuclear System Directive: 200.

Overtime Control

Process/Program Owner:

Human Resource Managers BEST

REVISION NUMBER

0
1
2
3
4
5
6
7
8

ISSUE DATE

07/01/92
11/01/92
02/28/94
03/30/95
12/12/96
06/16/98
03/31/99
10/19/00
03/22/01

CATAWBA

Approved By/Date

P.M. Grobusky/03-05-01
Human Resource Manager

Effective Date:

04/16/01

MCGUIRE

Approved By/Date

W.B. Jackson/03-07-01
Human Resource Manager

Effective Date:

04/16/01

OCONEE

Approved By/Date

A. Rose/03-07-01
Human Resource Manager

Effective Date:

04/16/01

Issued By: C. J. Thomas

Manager, Nuclear Regulatory & Industry Affairs

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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

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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

- Working more than 16 hours straight (excluding shift turnover time)
- Working more than 16 hours in any 24 hour period (excluding shift turnover time)
- Working more than 24 hours (28 hours for MNS and ONS) in any 48 hour period (excluding shift turnover time)
- Working more than 72 hours in any 7 day period (excluding shift turnover time)
- 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

22 MAR 2001

1

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: _____
NAME

Time Start: _____

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: _____

<p>STEP 1: Classify the Event</p> <p>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:</p> <p>COMMENTS: "Loss of physical control of the control room due to security event"</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Determine Protective Action Recommendations</p> <p>STANDARD: Refer to RP/0/B/1000/002 (Control Room Emergency Coordinator Procedure) and GO TO Enclosure 4.1 (General Emergency)</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>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: _____</p> <p>STANDARD: Determine Initiating Conditions have been met and Declare a General Emergency due to:</p> <ul style="list-style-type: none"> • "Loss of physical control of the control room due to security event" <p>Determine Time of Declaration is present time.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 4: Step 1.2 Appoint a person to maintain the Emergency Coordinator Log OR maintain the log yourself.</p> <p>STANDARD: A person is appointed to maintain the Emergency Coordinator Log or indicate that you will maintain the log.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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

<p>STEP 8: Step 1.1 IF Conditions A, Imminent or Actual Dam Failure (Keowee or Jocassee) exists,</p> <p>THEN Perform the following actions:</p> <p>Provide the following protective action recommendations to Oconee County and Pickens County for imminent/actual Dam Failure.</p> <ol style="list-style-type: none"> 1. Provide the following recommendation for Emergency Notification Form Section 15 (B) Evacuate: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed. <p>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:</p> <ol style="list-style-type: none"> 1. Provide the following recommendation for Emergency Notification Form Section 15 (B) Evacuate: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed. <p>COMMENTS:</p> <p style="text-align: center;">END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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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/1000/001Revision No. 013

REPARATION

- (2) Station OCONEE NUCLEAR STATION
- (3) Procedure Title Emergency Classification
- (4) Prepared By Mike Thorne (Signature) M L 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 Haterman (QR) Date 1/27/03
Cross-Disciplinary Review By _____ (QR) NA RAW Date 1/27/03
Reactivity Mgmt Review By _____ (QR) NA RAW Date 1/27/03
Mgmt Involvement Review By _____ (Ops Supt) NA RAW 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
4.8	Radiation Monitor Readings For Emergency Classification	18
4.9	Unexpected/Unplanned Increase In Area Monitor Readings	19
4.10	Definitions	20
4.11	Operating Modes Defined In Improved Technical Specifications	24
4.12	Instructions For Using Enclosure 4.1	25

Fission Product Barrier Matrix

DETERMINE THE APPROPRIATE CLASSIFICATION USING THE TABLE BELOW:

CIRCLE FAILS 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 Leakage > 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 $\geq 700^\circ\text{F}$	Average of the 5 highest CETC $\geq 1200^\circ\text{F}$	CETC $\geq 1200^\circ\text{F}$ ≥ 15 minutes OR CETC $\geq 700^\circ\text{F}$ ≥ 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"	Coolant activity $\geq 300 \mu\text{Ci/ml DEI}$	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 @ $> 100^\circ\text{F/hr.}$ 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	NOTE: RVLS is NOT valid if one or more RCPs are running OR if LPI pump(s) are running.	Hours Since SD $\frac{\text{RIA 57/58}}{\text{R/hr}}$ 0 - < 0.5 $\geq 300/150$ 0.5 - < 2.0 $\geq 80/40$ 2.0 - 8.0 $\geq 32/16$	Hours Since SD $\frac{\text{RIA 57/58}}{\text{R/hr}}$ 0 - < 0.5 $\geq 1800/860$ 0.5 - < 2.0 $\geq 400/195$ 2.0 - 8.0 $\geq 280/130$	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 $\geq 9\%$	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
UNUSUAL EVENT (1-3 Total Points)		ALERT (4-6 Total Points)		SITE AREA EMERGENCY (7-10 Total Points)	
OPERATING MODE: 1, 2, 3, 4		OPERATING MODE: 1, 2, 3, 4		OPERATING MODE: 1, 2, 3, 4	
♦ Any potential loss of Containment	♦ Any potential loss or loss of the Fuel Clad	♦ Any potential loss or loss of the RCS	♦ Loss of any two barriers	♦ Loss of one barrier and potential loss of either RCS or Fuel Clad Barriers	♦ Loss of any two barriers and potential loss of the third barrier
♦ Any loss of containment	♦ Any potential loss or loss of the RCS		♦ Potential loss of both the RCS and Fuel Clad Barriers		♦ 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	

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

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
<p>4. UNPLANNED LOSS OF ALL ONSITE OR OFFSITE COMMUNICATIONS (BD 17)</p> <p>=====</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Loss of all onsite communications capability (ROLM system, PA system, Pager system, Onsite Radio system) affecting ability to perform Routine operations</p> <p>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.</p> <p>5. FUEL CLAD DEGRADATION (BD 18)</p> <p>=====</p> <p><u>OPERATING MODE:</u> All:</p> <p>A. DEI - >5µCi/ml</p> <p>(END)</p>			
<p>INITIAL NOTIFICATION REQUIREMENTS:</p> <p>SEE EMERGENCY TELEPHONE DIRECTORY</p> <p>NOTIFY 1,2,3,4</p>			

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
<p>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)</p> <p>OPERATING MODE: All</p> <p>A. Valid indication on radiation monitor RIA 33 of $\geq 4.06E+06$ cpm for > 60 minutes (See Note 1)</p> <p>B. Valid indication on radiation monitor RIA 45 of $\geq 9.35E+05$ cpm for > 60 minutes (See Note 1)</p> <p>C. Liquid effluent being released exceeds two times SLC 16.11.1 for > 60 minutes as determined by Chemistry Procedure</p> <p>D. Gaseous effluent being released exceeds two times SLC 16.11.2 for > 60 minutes as determined by RP Procedure</p> <p>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.</p>	<p>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)</p> <p>OPERATING MODE: All</p> <p>A. Valid indication on RIA 46 of $\geq 2.09E+04$ cpm for > 15 minutes (See Note 1)</p> <p>B.1 RIA 33 HIGH Alarm</p> <p>AND</p> <p>B.2 Liquid effluent being released exceeds 200 times the level of SLC 16.11.1 for > 15 minutes as determined by Chemistry Procedure</p> <p>C. Gaseous effluent being released exceeds 200 times the level of SLC 16.11.2 for > 15 minutes as determined by RP Procedure</p> <p>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)</p> <p>OPERATING MODE: All</p> <p>A. Valid radiation reading ≥ 15 mRad/hr in CR, CAS, or, Radwaste CR</p> <p>B. Unplanned/unexpected valid area monitor readings exceed limits stated in Enclosure 4.9</p>	<p>1. BOUNDARY DOSE RESULTING FROM ACTUAL/IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 32)</p> <p>OPERATING MODE: All</p> <p>A. Valid reading on RIA 46 of $\geq 2.09E+05$ cpm for > 15 minutes (See Note 2)</p> <p>B. Valid reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 2)</p> <p>C. Dose calculations result in a dose projection at the site boundary of:</p> <p>≥ 100 mRem TEDE or 500 mRem CDE adult thyroid</p> <p>D. Field survey results indicate site boundary dose rates exceeding ≥ 100 mRad/hr expected to continue for more than one hour</p> <p>OR</p> <p>D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 500 mRem inhalation</p> <p>NOTE 2: If actual Dose Assessment cannot be completed within 15 minutes, then the valid radiation monitor reading should be used for emergency classification.</p>	<p>1. BOUNDARY DOSE RESULTING FROM ACTUAL/IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 36)</p> <p>OPERATING MODE: All</p> <p>A. Valid reading on RIA 46 of $\geq 2.09E+06$ cpm for ≥ 15 minutes (See Note 3)</p> <p>B. Valid reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 3)</p> <p>C. Dose calculations result in a dose projection at the site boundary of:</p> <p>$C.1 \geq 1000$ mRem TEDE</p> <p>OR</p> <p>$C.2 \geq 5000$ mRem CDE adult thyroid</p> <p>D. Field survey results indicate site boundary dose rates exceeding ≥ 1000 mRad/hr expected to continue for more than one hour</p> <p>OR</p> <p>D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 5000 mRem CDE for one hour of inhalation</p> <p>NOTE 3: If actual Dose Assessment cannot be completed within 15 minutes, then the valid radiation monitor reading should be used for emergency classification.</p>
(CONTINUED)	(CONTINUED)	(CONTINUED)	(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:

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

4.3
Abnormal Rad Level
Enc. Biological Effluent

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

Enclos. 4.4 Loss of Shutdown Functions

RP/O/B/1000/001
Page 1 of 2

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

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

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

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

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
<p>1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE PROTECTED AREA (BD 64)</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Tremor felt and valid alarm on the strong motion accelerometer</p> <p>B. Tornado striking within Protected Area Boundary</p> <p>C. Vehicle crash into plant structures/systems within the Protected Area Boundary</p> <p>D. Turbine failure resulting in casing penetration or damage to turbine or generator seals</p> <p>(CONTINUED)</p>	<p>1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE PLANT VITAL AREA (BD 69)</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Tremor felt and seismic trigger actuates (0.05g)</p> <p>B.1 Tornado, high winds, missiles resulting from turbine failure, vehicle crashes, or other catastrophic event</p> <p><u>AND</u></p> <p>NOTE: Only one train of a safety-related system needs to be affected or damaged in order to satisfy these conditions.</p> <p>B.1.1 Visible damage to permanent structures or equipment required for safe shutdown of the unit</p> <p><u>OR</u></p> <p>B.1.2 Affected safety system parameter indications show degraded performance</p> <p>2. RELEASE OF TOXIC/FLAMMABLE GASES JEOPARDIZING SYSTEMS REQUIRED TO MAINTAIN SAFE OPERATION OR ESTABLISH MAINTAIN COLD SHUTDOWN (BD 71)</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Report/detection of toxic gases in concentrations that will be life-threatening to plant personnel</p> <p>B. Report/detection of flammable gases in concentrations that will affect the safe operation of the plant:</p> <ul style="list-style-type: none"> Reactor Building Auxiliary Building Turbine Building Control Room <p>(CONTINUED)</p>	<p>1. CONTROL ROOM EVACUATION AND PLANT CONTROL CANNOT BE ESTABLISHED (BD 75)</p> <p><u>OPERATING MODE:</u> All</p> <p>A.1 Control Room evacuation has been initiated</p> <p><u>AND</u></p> <p>A.2 Control of the plant cannot be established from the Aux Shutdown Panel or the SSF within 15 minutes</p> <p>2. KEOWEE HYDRO DAM FAILURE (BD 76)</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Imminent/actual dam failure includes any of the following:</p> <ul style="list-style-type: none"> Keowee Hydro Dam Little River Dam Dikes A, B, C, or D Intake Canal Dike <p>3. OTHER CONDITIONS WARRANT DECLARATION OF SITE AREA EMERGENCY (BD 77)</p> <p><u>OPERATING MODE:</u> All</p> <p>A. Emergency Coordinator/EOF Director judgment</p> <p>(END)</p>	<p>1. OTHER CONDITIONS WARRANT DECLARATION OF GENERAL EMERGENCY (BD 78)</p> <p><u>OPERATING MODE:</u> All</p> <p>A.1 Emergency Coordinator/EOF Director judgment indicates:</p> <p>A.1.1 Actual/imminent substantial core degradation with potential for loss of containment</p> <p><u>OR</u></p> <p>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</p> <p>(END)</p>
<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>

Natural Disasters, Hazards and Other Conditions Affecting Plant Safety

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
<p>2. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING KEOWEE HYDRO (BD 66)</p> <p><u>OPERATING MODE: All</u></p> <p>A. Reservoir elevation \geq 807 feet with all spillway gates open and the lake elevation continues to rise</p> <p>B. Seepage readings increase or decrease greatly or seepage water is carrying a significant amount of soil particles</p> <p>C. New area of seepage or wetness, with large amounts of seepage water observed on dam, dam toe, or the abutments</p> <p>D. Slide or other movement of the dam or abutments which could develop into a failure</p> <p>E. Developing failure involving the powerhouse or appurtenant structures and the operator believes the safety of the structure is questionable</p> <p>3. RELEASE OF TOXIC OR FLAMMABLE GASES DEEMED DETRIMENTAL TO SAFE OPERATION OF THE PLANT (BD 67)</p> <p><u>OPERATING MODE: All</u></p> <p>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</p> <p>B. Report by local, county, state officials for potential evacuation of site personnel based on offsite event</p> <p>(CONTINUED)</p>	<p>3. TURBINE BUILDING FLOOD (BD 72)</p> <p><u>OPERATING MODE: All</u></p> <p>A. Turbine Building flood requiring use of AP/1.2.3/A/1700/10, (Turbine Building Flood)</p> <p>4. CONTROL ROOM EVACUATION HAS BEEN INITIATED (BD 73)</p> <p><u>OPERATING MODE: All</u></p> <p>A.1 Evacuation of Control Room</p> <p><u>AND ONE OF THE FOLLOWING:</u></p> <p><u>AND</u></p> <p>A.1.1 Plant control IS established from the Aux shutdown Panel or the SSF</p> <p><u>OR</u></p> <p>A.1.2 Plant control IS BEING established from the Aux Shutdown Panel or SSF</p> <p>5. OTHER CONDITIONS WARRANT CLASSIFICATION OF AN ALERT (BD 74)</p> <p><u>OPERATING MODE: All</u></p> <p>A.1 Emergency Coordinator judgment indicates that:</p> <p>A.1.1 Plant safety may be degraded</p> <p><u>AND</u></p> <p>A.1.2 Increased monitoring of plant functions is warranted (END)</p>		
<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>	<p>INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4</p>

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

Radiation Monitor Readings for Emergency Classification

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 ($7.308 \text{ E}^{-6} \text{ sec/m}^3$)
2. Design basis leakage ($5.6 \text{ E}^6 \text{ ml/hr}$)
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

Unexpected/Unplanned Increase In Area Monitor Readings

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 *violently* 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

RP/0/B/1000/001
Page 1 of 1

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:

<u>Barrier</u>	<u>Failure</u>	<u>Points</u>
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.

Instructions For Using Enclosure 4.1

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.

**INFORMATION
ONLY**Duke Power Company
PROCEDURE PROCESS RECORD(1) ID No. RP/0/B/1000/002Revision No. 010**SEPARATION**(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 Robert J. Miller (QR) Date 8/28/02Cross-Disciplinary Review By Michael Hill (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 _____

(13) 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 I-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

Enclosure 4.1
General Emergency

RP/0/B/1000/002
Page 1 of 4

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.

Enclosure 4.1
General Emergency

RP/0/B/1000/002
Page 2 of 4

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.

Enclosure 4.1
General Emergency

RP/0/B/1000/002
Page 3 of 4

- ☐ 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 _____

Enclosure 4.1
General Emergency

RP/0/B/1000/002
Page 4 of 4

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.

Enclosure 4.2
Site Area Emergency

RP/0/B/1000/002
Page 1 of 4

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.

Enclosure 4.2
Site Area Emergency

RP/0/B/1000/002
Page 2 of 4

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.

Enclosure 4.2
Site Area Emergency

RP/0/B/1000/002
Page 3 of 4

- ☐ 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).

Enclosure 4.2
Site Area Emergency

RP/0/B/1000/002
Page 4 of 4

- ☐ 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.

Enclosure 4.4
Unusual Event

RP/0/B/1000/002
Page 1 of 4

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.

Enclosure 4.4

RP/0/B/1000/002

Unusual Event

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- ☐ 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.

Enclosure 4.4
Unusual Event

RP/0/B/1000/002
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- 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.

Operations Shift Manager To TSC Emergency
Coordinator Turnover SheetEMERGENCY 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

RP/0/B/1000/002
Page 1 of 1

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}
- _____ 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.

◆ Return to Step 3.16.1.

Date/Time Initial

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).

Enclosure 4.8
ERO Pager Activation By Security

RP/0/B/1000/002
Page 1 of 2

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

Enclosure 4.8
ERO Pager Activation By Security

RP/0/B/1000/002
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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, § 6 ²	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 \leq 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: _____

<p>STEP 1: Step 3.2 Ensure 1HP-15 Moore Controller reset for Normal Operation.</p> <p>STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and ensure the following:</p> <ul style="list-style-type: none"> • Mode selector in "MANUAL" • Display selector to "P" • Valve position: 100% open • Start-stop to "START" <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Step 3.3 IF two Letdown Filters are available, position the following:</p> <ul style="list-style-type: none"> • 1HP-17 (1A LETDOWN FILTER INLET) switch to OPEN • 1HP-18 (1B LETDOWN FILTER INLET) switch to OPEN <p>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.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 3: Step 3.4 Ensure open 1HP-16 (LDST MAKEUP ISOLATION)</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 4: Step 3.5 IF required makeup from 1A BHUT as follows:</p> <p>Step 3.5.1 IF required, makeup with 1HP-15 in auto as follows:</p> <ul style="list-style-type: none"> • 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". <p>STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and perform the following:</p> <ul style="list-style-type: none"> • 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". <p>Cue: <i>If asked, inform candidate that it is desired to perform the makeup with 1HP-15 in auto.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 5: Step 3.5.2 Start 1A BLEED TRANSFER PUMP.</p> <div style="border: 1px solid black; padding: 5px;"> <p>NOTE:</p> <ul style="list-style-type: none"> • Normal make-up flow rate should be > 55 gpm. </div> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 6: Step 3.5.3 Open 1CS-46 (1A RC BLEED XFER PUMP DISCH)</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE: 1HP-15 may require throttling if only one Letdown Filter is in service and ΔP is high.</p> </div> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 7: Step 3.5.4 IF required, throttle 1HP-15 as follows:</p> <ul style="list-style-type: none"> • Ensure 1HP-15 Moore Controller in "MANUAL" • Throttle 1HP-15 to control make-up flow to LDST <p>STANDARD: Determine throttling 1HP-15 is not required when two Letdown Filters are in service.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: Step 3.5.5 IF required, lower LDST level per Section 4 "Reducing RCS Inventory".</p> <p>STANDARD: Determine lowering LDST level is not required.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 9: Step 3.5.6 WHEN required, stop 1A BLEED TRANSFER PUMP</p> <p>STANDARD: When the addition is completed the candidate should stop the 1A BLEED TRANSFER PUMP (located on 1AB1).</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 10: Step 3.5.7 WHEN required: Close 1CS-46 (1A RC BLEED XFER PUMP DISCH)</p> <p>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)</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 11: Step 3.5.8 Reset 1HP-15 Moore Controller for Normal Operation.</p> <p>STANDARD: Locate 1HP-15 Moore Controller on 1UB1 and ensure the following:</p> <ul style="list-style-type: none"> • Mode selector in "MANUAL" • Display selector to "P" • Valve position: 100% open • Start-stop to "START" <p>Cue: <i>Another operator will complete this addition to the LDST.</i></p> <p>COMMENTS:</p> <p style="text-align: center;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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

Enclosure 4.5
RCS Inventory Control

OP/1/A/1103/004
Page 1 of 7

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 \approx 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).

Enclosure 4.5
RCS Inventory Control

OP/1/A/1103/004
Page 3 of 7

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.

Enclosure 4.5
RCS Inventory Control

OP/1/A/1103/004
Page 4 of 7

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.

Enclosure 4.5
RCS Inventory Control

OP/1/A/1103/004
Page 5 of 7

- _____ 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.

Enclosure 4.5
RCS Inventory Control

OP/1/A/1103/004
Page 6 of 7

- ____ 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: _____

<p><u>STEP 1:</u> Step 4.1 Ensure in HAND and reduce demand to zero.</p> <p><u>STANDARD:</u> 1HP-120 (located on 1UB1) is taken to HAND by depressing the HAND button and reducing demand using the toggle switch.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Step 4.2 Initiate makeup to LDST with boron concentration \geq RCS boron concentration as required.</p> <p><u>STANDARD:</u> Determine makeup to LDST is not required at this time.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> 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)</p> <p><u>STANDARD:</u> Determine additional makeup flow is not required at this time.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> Step 4.4 Notify chemist of the following:</p> <ul style="list-style-type: none"> • Current RCS boron sample is needed for possible unit shutdown. • Normal letdown line is isolated. <p><u>STANDARD:</u> Chemistry is notified of the need for an RCS sample and the normal letdown line is isolated.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 5: Step 4.5 IAAT Pzr level $\geq 260''$ AND letdown CANNOT be established, THEN initiate unit shutdown at $\approx 20\%/min$ per AP/29 (Rapid Unit Shutdown)</p> <p>STANDARD: Determine unit shutdown is not required.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: Step 4.6 IAAT Pzr level $\geq 375''$ THEN trip RX.</p> <p>STANDARD: Determine tripping the reactor is not required.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 7: Step 4.7 Verify CC system in operation.</p> <p>STANDARD: Verify proper operation of the CC system by observing 1A CC pump operating with normal CC system flows and pressures.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: Step 4.8 Position the standby HPI pump switch to OFF.</p> <p>STANDARD: Locate the standby HPI pump switch (located on 1UB1) and place in OFF.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 9:</u> Step 4.9 Throttle 1HP-31 to establish 12 -15 gpm SEAL INLET HDR FLOW.</p> <p><u>STANDARD:</u> Locate 1HP-31 (on 1UB1) and use the setpoint knob to adjust SEAL INLET HDR FLOW to 12 -15 gpm.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10:</u> Step 4.10 Verify loss of letdown is due to letdown valve or interlock failure.</p> <p><u>STANDARD:</u> Determine that the loss of letdown in not due to letdown valve or interlock failure. GO TO Step 4.29</p> <p><i>Cue: If ask as the SRO, inform candidate that the loss of letdown was not due to letdown valve or interlock failure.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> Step 4.29 WHEN letdown can be re-established, THEN ensure proper operation of the CC system.</p> <p><u>STANDARD:</u> Verify proper operation of the CC system by observing 1A CC pump operating with normal CC system flows and pressures.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 12:</u> Step 4.30 Close 1HP-6 (LETDOWN ORIFICE STOP)</p> <p><u>STANDARD:</u> 1HP-6 (LETDOWN ORIFICE STOP) switch on 1UB1 is placed in the CLOSE position.</p> <p> The green CLOSED light illuminates and the red OPEN light extinguishes.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> Step 4.31 Close 1HP-7 (LETDOWN CONTROL).</p> <p><u>STANDARD:</u> 1HP-7 (LETDOWN CONTROL) is located on 1UB1 and the manual controller is rotated counter-clockwise until the position demand needle indicates 0%.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> Step 4.32 Ensure the following are open:</p> <ul style="list-style-type: none"> • 1HP-1 (1A LETDOWN COOLER INLET) • 1HP-2 (1B LETDOWN COOLER INLET) • 1HP-3 (1A LETDOWN COOLER OUTLET) • 1HP-4 (1B LETDOWN COOLER OUTLET) <p><u>STANDARD:</u> The above valves are located on 1UB1 and verified open by observing the red OPEN light lit and green CLOSED light off.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 15: Step 4.33 Verify letdown temperature < 135°F.</p> <p>STANDARD: Locate LETDOWN TEMP meter on 1UB1 and determine that letdown temperature is greater than 135°F.</p> <p>Perform RNO steps.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 16: Step 4.33 RNO 1 Open 1HP-13 (PURIFICATION IX BYPASS)</p> <p>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.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 17: Step 4.33 RNO 2 Ensure the following are closed:</p> <ul style="list-style-type: none"> • 1HP-8 (PURIFICATION IX INLET) • 1HP-9&11 (SPARE PURIF IX INLET AND OUTLET) <p>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.</p> <p>1HP-9&11 on 1UB1 verified closed by Green CLOSE light lit.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 18: Step 4.33 RNO 3 IF any deborating IX in service, THEN perform the following...</p> <p>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.</p> <p>Cue: If asked, inform candidate that no deborating IXs are in service.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 19: Step 4.33 RNO 4 Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.</p> <p>STANDARD: LETDOWN HI TEMP INTLK BYPASS control switch is located on 1UB1, switch is rotated to the BYPASS position.</p> <p>The switch will backlight amber, and statalarm 1SA-2/E-4 HP LETDOWN FLOW INTERLOCK BYPASSED is actuated.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 20: Step 4.34 Ensure 1HP-5 (LETDOWN ISOLATION) is open.</p> <p>STANDARD: 1HP-5 (LETDOWN ISOLATION) control switch is located on 1UB1 and the switch is rotated to the OPEN position.</p> <p>Red OPEN light illuminates, and green CLOSE light extinguishes.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 21: Step 4.35 Throttle open 1HP-7 (LETDOWN CONTROL) to establish ≈ 20 gpm.</p> <p>STANDARD: 1HP-7 (LETDOWN CONTROL) is throttled Open to establish ≈ 20 gpm letdown flow as indicated on LETDOWN FLOW meter on 1UB1.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 22: Step 4.36 WHEN letdown temperature is $< 130^{\circ}\text{F}$, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL.</p> <p>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 $< 130^{\circ}\text{F}$.</p> <p>LETDOWN HI TEMP INTLK BYP control switch is located on 1UB1 and switch is rotated to the NORM position.</p> <p>Amber backlight goes out, and statalarm 1SA-2/E-4, HP LETDOWN FLOW INTERLOCK BYPASSED, clears.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 23: Step 4.37 Open 1HP-6 (LETDOWN ORIFICE STOP).</p> <p>STANDARD: 1HP-6 (LETDOWN ORIFICE STOP) is placed in the OPEN position. Red OPEN light illuminates, and green CLOSED light extinguishes.</p> <p>Note: Candidate may use OAC indication to verify valve position.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 24:</u> Step 4.38 Adjust 1HP-7 (LETDOWN CONTROL) to control desired letdown flow.</p> <p><u>STANDARD:</u> 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.</p> <p><i>Cue: SRO desires 70-gpm letdown flow.</i></p> <p><u>COMMENTS:</u></p> <p style="text-align: right;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>
--	---------------------------------

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)

(1) ID No AP/1/A/1700/ 032

Revision No 002

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 $\geq 260''$ and letdown CANNOT be established ... (initiate unit shutdown)
- (4.6) Pzr level $\geq 375''$... (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 <input type="checkbox"/> Ensure 1HP-120 in HAND and reduce demand to zero.	
4.2 <input type="checkbox"/> Initiate makeup to LDST with boron concentration \geq RCS boron concentration as required.	
4.3 <input type="checkbox"/> IAAT additional makeup flow is desired, AND 1A Bleed Transfer Pump is operating, THEN dispatch an operator to close ICS-48 (1A BHUT RECIRC) (A-1-107, Unit 1 RC Bleed Transfer Pump Rm).	
4.4 Notify Chemistry of the following: <input type="checkbox"/> Current RCS boron sample is needed for possible unit shutdown. <input type="checkbox"/> Normal letdown line is isolated.	
<p style="text-align: center;">NOTE</p> <p>Tech Spec 3.4.9 applies when indicated Pzr level \geq 260" (corrected value for 285").</p>	
4.5 <input type="checkbox"/> IAAT Pzr level \geq 260", AND letdown CANNOT be established, THEN initiate unit shutdown at \approx 20%/min per AP/29 (Rapid Unit Shutdown).	
4.6 <input type="checkbox"/> IAAT Pzr level \geq 375", THEN trip Rx.	
4.7 <input type="checkbox"/> Verify CC system in operation.	<input type="checkbox"/> GO TO Step 4.10.
4.8 <input type="checkbox"/> Position the standby HPI pump switch to OFF.	
4.9 <input type="checkbox"/> Throttle 1HP-31 to establish 12 - 15 gpm SEAL INLET HDR FLOW. (2)	
4.10 <input type="checkbox"/> Verify loss of letdown is due to letdown valve or interlock failure.	<input type="checkbox"/> GO TO Step 4.29.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 <input type="checkbox"/> Verify 1HP-5 closed.	1. <input type="checkbox"/> Notify SPOC to initiate repairs on failed equipment. 2. <input type="checkbox"/> GO TO Step 4.29.
4.12 <input type="checkbox"/> Close 1HP-6.	
4.13 <input type="checkbox"/> Close 1HP-7.	
4.14 <input type="checkbox"/> Open 1HP-5.	<input type="checkbox"/> 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 <input type="checkbox"/> WHEN 1HP-5 is open, THEN ensure CC System in operation.	
4.16 <input type="checkbox"/> Verify letdown temperature < 135°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Ensure the following are closed: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> IF any deborating IX in service, THEN perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.
4.17 <input type="checkbox"/> Throttle open 1HP-7 to establish ≈ 20 gpm.	
4.18 <input type="checkbox"/> WHEN letdown temperature < 130°F, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL.	
4.19 <input type="checkbox"/> Open 1HP-6.	
4.20 <input type="checkbox"/> Adjust 1HP-7 to control desired letdown flow.	
4.21 <input type="checkbox"/> Re-establish normal makeup through 1HP-120.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.22 __ Verify <u>any</u> 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 <input type="checkbox"/> WHEN letdown can be re-established, THEN ensure proper operation of the CC System.	
4.30 <input type="checkbox"/> Close 1HP-6.	
4.31 <input type="checkbox"/> Close 1HP-7.	
4.32 Ensure the following are open: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2 <input type="checkbox"/> 1HP-3 <input type="checkbox"/> 1HP-4	
4.33 <input type="checkbox"/> Verify letdown temperature < 135°F.	1. <input type="checkbox"/> Open 1HP-13. 2. Ensure the following are closed: <input type="checkbox"/> 1HP-8 <input type="checkbox"/> 1HP-9&11 3. <input type="checkbox"/> IF any deborating IX in service, THEN perform the following: A. <input type="checkbox"/> Select 1HP-14 to NORMAL. B. <input type="checkbox"/> Close 1HP-16. 4. <input type="checkbox"/> Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.
4.34 <input type="checkbox"/> Ensure 1HP-5 is open.	<input type="checkbox"/> GO TO Step 4.11.
4.35 <input type="checkbox"/> Throttle open 1HP-7 to establish = 20 gpm.	
4.36 <input type="checkbox"/> WHEN letdown temperature < 130°F, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL.	
4.37 <input type="checkbox"/> Open 1HP-6.	
4.38 <input type="checkbox"/> Adjust 1HP-7 to control desired letdown flow.	
4.39 <input type="checkbox"/> Re-establish normal makeup through 1HP-120.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.40 <input type="checkbox"/> Verify SEAL INLET HDR FLOW .. 12 - 15 gpm.	<input type="checkbox"/> GO TO Step 4.43.
4.41 <input type="checkbox"/> Re-establish normal RCP seal injection flow.	
4.42 <input type="checkbox"/> Position the standby HPI pump switch to AUTO.	
4.43 <input type="checkbox"/> Verify <u>any</u> purification IX in service.	<input type="checkbox"/> IF purification IX operation is desired, THEN initiate OP/1/A/1103/004 (Soluble Poison Control) to establish desired IX operation.
4.44 <input type="checkbox"/> 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 \leq 550 PSIG**

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform required actions for RCS pressure \leq 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.

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:

___ SAT

___ UNSAT

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

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:

___ SAT

___ UNSAT

<p>STEP 3: Step 14</p> <p>IAAT flow in <u>any</u> LPI Header > 3000 gpm, THEN perform Steps 15 and 16.</p> <p>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.</p> <p>Continue to Step 15</p> <p>CUE: LPI Flow Train A will be greater than 3000 gpm.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 4: Step 15</p> <p>Throttle 1LP-17 to maximize header flow \leq 3000 gpm/pump.</p> <p>STANDARD: Locates 1LP-17 on RZ module on 1VB2 and depresses the MANUAL pushbutton for local control of 1LP-17.</p> <p>NOTE: Candidate may also take MANUAL control of 1LP-18 at this time.</p> <p>Throttle 1LP-17 control switch in the CLOSE direction to obtain \leq 3000 gpm/pump.</p> <p>Continue to Step 16</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 5:</u> Step 16 Throttle 1LP-18 to maximize header flow \leq 3000 gpm/pump.</p> <p><u>STANDARD:</u> Candidate: Observes there is no flow in this header.</p> <p>NOTE: 1B LPIP has failed to auto start. Continue to Step 17</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 6:</u> Step 17 Open the following:</p> <ul style="list-style-type: none"> • 1BS-1 • 1BS-2 <p><u>STANDARD:</u> Verifies valves 1BS-1 and 1BS-2 are OPEN at RZ modules. Continue to Step 18</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7:</u> Step 18 IAAT ES Channels 7 & 8 are actuated, THEN perform Step 19.</p> <p><u>STANDARD:</u> 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</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 8:</u> Step 19</p> <p>Throttle the following to maximize RBS header flow ≤ 1500 gpm for <u>each operating</u> header:</p> <ul style="list-style-type: none"> • 1BS-1 • 1BS-2 <p><u>STANDARD:</u> At RZ modules the candidate throttles 1BS-1 and 1BS-2 as required to maximize RBS header flow.</p> <p>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.</p> <p>Continue to Step 20</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> Step 20</p> <p>IAAT ES Channels 3& 4 are actuated, THEN GO TO Step 21.</p> <p><u>STANDARD:</u> 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.</p> <p>GO TO Step 21</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 10:</u> Step 21</p> <p>Place the following in manual control:</p> <ul style="list-style-type: none"> • 1A LPI pump • 1B LPI pump • 1LP-17 • 1LP-18 <p><u>STANDARD:</u> Components are located on RZ modules on 1VB2 and the MANUAL pushbuttons are depressed for each of the following:</p> <ul style="list-style-type: none"> • 1A LPI pump • 1B LPI pump • 1LP-17 • 1LP-18 <p>Continue to Step 22</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> Step 22</p> <p>Verify <u>one</u> of the following conditions exists:</p> <ul style="list-style-type: none"> • 1LP-17 open • 1LP-17 throttled to control flow <p><u>STANDARD:</u> Recognizes that 1LP-17 has been throttled to control flow.</p> <p>Continue to Step 23</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 12: Step 23</p> <p>Verify <u>one</u> of the following conditions exists:</p> <ul style="list-style-type: none"> • 1LP-18 open • 1LP-18 throttled to control flow <p>STANDARD: Verifies 1LP-18 OPEN at RZ module. Continue to Step 24</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 13: Step 24</p> <p>IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop affected LPI pumps.</p> <p>STANDARD: Verifies RCS pressure is < LPI pump shutoff head. Continue to Step 25</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 14: Step 25</p> <p>IAAT RCS pressure is < LPI pump shutoff head, AND <u>any</u> of the following conditions exist:</p> <ul style="list-style-type: none"> • power on 1LP-12 • power on 1LP-17 • 1LP-17 locally throttled <p>THEN perform Step 26.</p> <p>STANDARD: Recognizes that 1LP-12 and 1LP-17 have power by observing light indications. Continue to Step 26</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 15: Step 26 Verify 1A LPI Pump operating.</p> <p>STANDARD: Observes 1A LPI Pump control switch has red RUN indication and pump amps. Continue to Step 27</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 16: Step 27 IAAT RCS pressure is < LPI pump shutoff head, AND any of the following conditions exist:</p> <ul style="list-style-type: none"> • power on 1LP-14 • power on 1LP-18 • 1LP-18 locally throttled <p>THEN perform Step 28.</p> <p>STANDARD: Observes control switches for 1LP-14 and 1LP-18 for red or green lights. Continue to Step 28</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 17: Step 28</p> <p>Verify 1B LPI Pump operating. RNO: Attempt to start 1B LPI Pump.</p> <p>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</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 18: Step 14</p> <p>IAAT flow in any LPI header is > 3000 gpm, THEN perform Steps 15 and 16</p> <p>STANDARD: Candidate verifies that flow in the "B" LPI header is > 3000 gpm. Continue to Step 15</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 19: Step 15</p> <p>Throttle 1LP-17 to maximize header flow \leq 3000 gpm/pump.</p> <p>STANDARD: Candidate verifies that "A" LPI header flow is < 3000 gpm/pump. Continue to Step 16</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 20:</u> Step 16 Throttle 1LP-18 to maximize header flow ≤ 3000 gpm/pump.</p> <p><u>STANDARD:</u> Locates 1LP-18 on RZ module on 1VB2 and depresses the MANUAL pushbutton for local control of 1LP-18.</p> <p><u>NOTE:</u> 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</p> <p><u>COMMENTS:</u></p> <p style="text-align: right;">END TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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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.

CHG 30H
Entire Encl

Enclosure 5.1

ES Actuation

EP/1/A/1800/001

Page 1 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED										
<p>1. <input type="checkbox"/> IAAT <u>either</u> of the following conditions exists:</p> <ul style="list-style-type: none"> • an ES channel is NOT bypassed, AND RCS pressure reaches actuation setpoint • RB pressure reaches actuation setpoint <table border="1"> <thead> <tr> <th>Actuation Setpoint (psig)</th><th>Associated ES Channel</th></tr> </thead> <tbody> <tr> <td>1600 (RCS)</td><td>1 & 2</td></tr> <tr> <td>550 (RCS)</td><td>3 & 4</td></tr> <tr> <td>3 (RB)</td><td>1, 2, 3, 4, 5, & 6</td></tr> <tr> <td>10 (RB)</td><td>7 & 8</td></tr> </tbody> </table> <p>THEN perform Step 2.</p>	Actuation Setpoint (psig)	Associated ES Channel	1600 (RCS)	1 & 2	550 (RCS)	3 & 4	3 (RB)	1, 2, 3, 4, 5, & 6	10 (RB)	7 & 8	
Actuation Setpoint (psig)	Associated ES Channel										
1600 (RCS)	1 & 2										
550 (RCS)	3 & 4										
3 (RB)	1, 2, 3, 4, 5, & 6										
10 (RB)	7 & 8										
<p>2. Verify <u>all</u> ES channels associated with actuation setpoint have actuated:</p> <p><input type="checkbox"/> <u>All</u> Blue ES AUTO lights on</p> <p><input type="checkbox"/> <u>All</u> White ES POSITION lights on</p>	<p><input type="checkbox"/> Ensure <u>affected</u> ES digital channels are actuated.</p>										
<p>3. <input type="checkbox"/> Place HPI in manual control.</p>											
<p>4. <input type="checkbox"/> Verify <u>any</u> RCP operating.</p>	<p><input type="checkbox"/> GO TO Step 6.</p>										
<p>5. Ensure the following are open:</p> <p><input type="checkbox"/> 1HP-20</p> <p><input type="checkbox"/> 1HP-21</p>											
<p>6. <input type="checkbox"/> IAAT <u>any</u> RCP is operating, AND ES Channels 5 and 6 actuate, THEN perform Steps 7 and 8.</p>	<p><input type="checkbox"/> GO TO Step 9.</p>										
<p>7. Ensure the following are open:</p> <p><input type="checkbox"/> 1CC-7</p> <p><input type="checkbox"/> 1CC-8</p> <p><input type="checkbox"/> 1LPSW-15</p> <p><input type="checkbox"/> 1LPSW-6</p>											
<p>8. <input type="checkbox"/> Ensure 1A <u>or</u> 1B Component Cooling Pump is operating.</p>											

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)

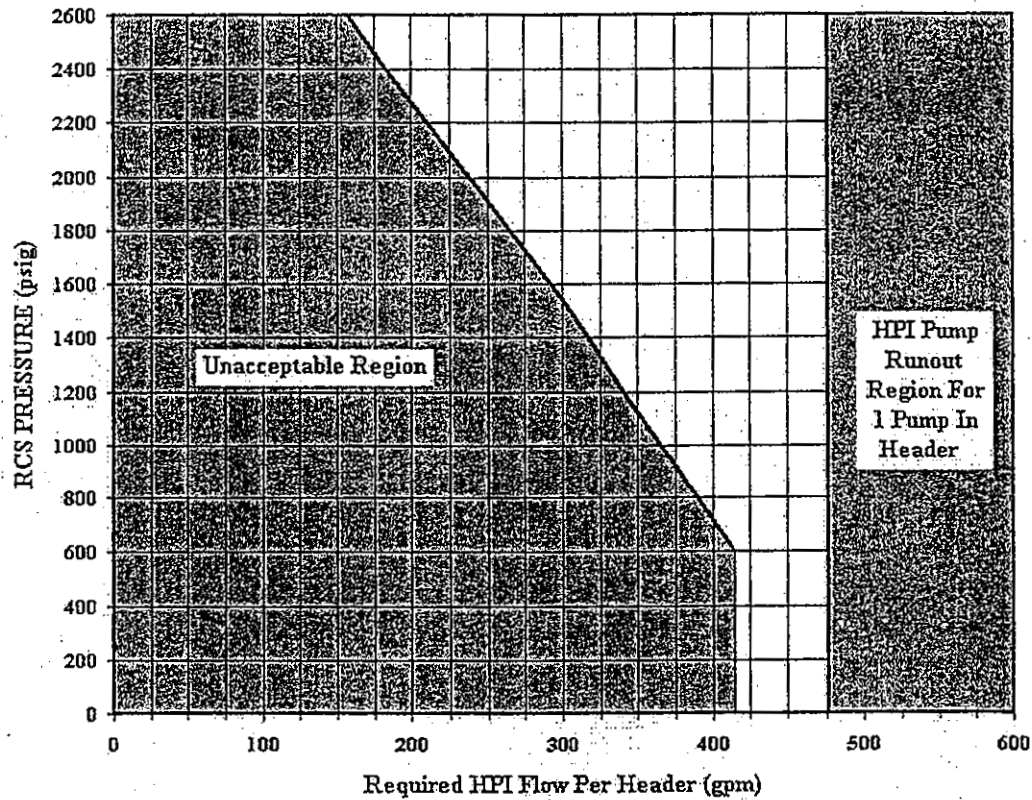
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. <input type="checkbox"/> Verify <u>all</u> SCMs > 0°F.	<input type="checkbox"/> GO TO Step 13.
10. Ensure the following are open: <input type="checkbox"/> 1HP-24 <input type="checkbox"/> 1HP-25	1. <input type="checkbox"/> IF <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN perform the following: A. Ensure the following are open: (23) <input type="checkbox"/> 1LP-6 <input type="checkbox"/> 1LP-7 <input type="checkbox"/> 1LP-9 <input type="checkbox"/> 1LP-10 <input type="checkbox"/> 1LP-15 <input type="checkbox"/> 1LP-16 B. <input type="checkbox"/> Start 1A or 1B LPI Pump. C. <input type="checkbox"/> Dispatch an operator to open 1HP-363 (LETDOWN LINE TO LPI PUMP SUCTION BLOCK) (A-1-119, U1 LPI Hatch Rm, N end). 2. <input type="checkbox"/> IF only one BWST suction valve (1HP-24 or 1HP-25) is open, THEN perform the following: A. <input type="checkbox"/> Ensure only two HPI pumps are operating. B. <input type="checkbox"/> GO TO Step 12.
11. <input type="checkbox"/> Ensure at least two HPI pumps are operating.	
12. Ensure the following are open: <input type="checkbox"/> 1HP-26 <input type="checkbox"/> 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				
<p>13. <u> </u> IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header:</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/> 1A Header</td><td><input checked="" type="checkbox"/> 1B Header</td></tr> <tr> <td><input type="checkbox"/> 1HP-410</td><td><input type="checkbox"/> 1HP-409</td></tr> </table>	<input checked="" type="checkbox"/> 1A Header	<input checked="" type="checkbox"/> 1B Header	<input type="checkbox"/> 1HP-410	<input type="checkbox"/> 1HP-409	
<input checked="" type="checkbox"/> 1A Header	<input checked="" type="checkbox"/> 1B Header				
<input type="checkbox"/> 1HP-410	<input type="checkbox"/> 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. <input type="checkbox"/> IAAT flow in <u>any</u> LPI header is > 3000 gpm, THEN perform Steps 15 and 16.	<input type="checkbox"/> GO TO Step 17.
15. <input type="checkbox"/> Throttle 1LP-17 to maximize header flow \leq 3000 gpm/pump.	1. <input type="checkbox"/> Throttle 1LP-12 to maximize header flow \leq 3000 gpm/pump. 2. <input type="checkbox"/> IF 1LP-12 CANNOT be throttled, THEN perform the following: A. <input type="checkbox"/> Stop 1A LPI pump. B. Dispatch an operator to perform the following 1. <input type="checkbox"/> Close 1LP-17 (1A LP INJECTION) (A-4-402, E Pen Rm). 2. <input type="checkbox"/> Throttle 1LP-17 sixteen turns open.
16. <input type="checkbox"/> Throttle 1LP-18 to maximize header flow \leq 3000 gpm/pump.	1. <input type="checkbox"/> Throttle 1LP-14 to maximize header flow \leq 3000 gpm/pump. 2. <input type="checkbox"/> IF 1LP-14 CANNOT be throttled, THEN perform the following: A. <input type="checkbox"/> Stop 1B LPI pump. B. Dispatch an operator to perform the following 1. <input type="checkbox"/> Close 1LP-18 (1A LP INJECTION) (A-4-409, W Pen Rm). 2. <input type="checkbox"/> Throttle 1LP-18 sixteen turns open.
17. Open the following: <input type="checkbox"/> IBS-1 <input type="checkbox"/> IBS-2	Dispatch an operator to open the <u>affected</u> valve 20 turns: <input type="checkbox"/> IBS-1 (1A RBS HEADER ISOLATION) (A-4-402, E Pen Rm) <input type="checkbox"/> IBS-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. <input type="checkbox"/> IAAT ES Channels 7 & 8 are actuated, THEN perform Step 19.	<input type="checkbox"/> GO TO Step 20.
19. Throttle the following to maximize RBS header flow ≤ 1500 gpm for <u>each operating</u> header: <input type="checkbox"/> 1BS-1 <input type="checkbox"/> 1BS-2	1. <input type="checkbox"/> IF 1BS-1 CANNOT be throttled ≤ 1500 gpm, THEN stop 1A RBS Pump. 2. <input type="checkbox"/> IF 1BS-2 CANNOT be throttled ≤ 1500 gpm, THEN stop 1B RBS Pump.
20. <input type="checkbox"/> IAAT ES Channels 3 & 4 are actuated, THEN GO TO Step 21.	<input type="checkbox"/> GO TO Step 50.
21. Place the following in manual control: <input type="checkbox"/> 1A LPI Pump <input type="checkbox"/> 1B LPI Pump <input type="checkbox"/> 1LP-17 <input type="checkbox"/> 1LP-18	
22. Verify <u>one</u> of the following conditions exists: <input type="checkbox"/> 1LP-17 open <input type="checkbox"/> 1LP-17 throttled to control flow	1. <input type="checkbox"/> 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. <input type="checkbox"/> IF power is NOT available to 1LP-12, THEN dispatch an operator to perform the following: A. <input type="checkbox"/> Close 1LP-17 (1A LP INJECTION) (A-4-402, E Pen Rm). B. <input type="checkbox"/> Throttle 1LP-17 sixteen turns open.
23. Verify <u>one</u> of the following conditions exists: <input type="checkbox"/> 1LP-18 open <input type="checkbox"/> 1LP-18 throttled to control flow	1. <input type="checkbox"/> 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. <input type="checkbox"/> IF power is NOT available to 1LP-14, THEN dispatch an operator to perform the following: A. <input type="checkbox"/> Close 1LP-18 (1B LP INJECTION) (A-4-409, W Pen Rm). B. <input type="checkbox"/> 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
<p style="text-align: center;">CAUTION</p> <p>LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}</p>	
<p>24. <input type="checkbox"/> IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CR SRO's discretion, stop <u>affected</u> LPI pumps. {6, 22}</p>	
<p>25. <input type="checkbox"/> IAAT RCS pressure is < LPI pump shutoff head, AND <u>any</u> of the following conditions exist: <input type="checkbox"/> power on 1LP-12 <input type="checkbox"/> power on 1LP-17 <input type="checkbox"/> 1LP-17 locally throttled THEN perform Step 26.</p>	<p><input type="checkbox"/> GO TO Step 27.</p>
<p>26. <input type="checkbox"/> Verify 1A LPI Pump operating.</p>	<p><input type="checkbox"/> Attempt to start 1A LPI Pump.</p>
<p>27. <input type="checkbox"/> IAAT RCS pressure is < LPI pump shutoff head, AND <u>any</u> of the following conditions exist: <input type="checkbox"/> power on 1LP-14 <input type="checkbox"/> power on 1LP-18 <input type="checkbox"/> 1LP-18 locally throttled THEN perform Step 28.</p>	<p><input type="checkbox"/> GO TO Step 29.</p>
<p>28. <input type="checkbox"/> Verify 1B LPI Pump operating.</p>	<p><input type="checkbox"/> Attempt to start 1B LPI Pump.</p>

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								
<p>29. <u>IAAT</u> any of the following conditions exist:</p> <p><u>an LPI Pump (1A and/or 1B) fails to start</u></p> <p><u>an LPI Pump (1A and/or 1B) fails during operation,</u></p> <p><u>AND all the following conditions exists:</u></p> <p><u>RCS pressure < LPI pump shutoff head</u></p> <p><u>1LP-19 closed</u></p> <p><u>1LP-20 closed</u></p> <p><u>1BS-1 open OR throttled open</u></p> <p><u>1BS-2 open OR throttled open</u></p> <p><u>THEN perform Steps 30 through 32.</u></p>	<p><u>GO TO Step 33.</u></p>								
<p>30. <u>Verify any LPI pump operating.</u></p>	<p><u>IF 1C LPI Pump is available,</u> <u>THEN perform the following:</u></p> <p>A. Ensure the following are open on the desired header to provide suction to 1C LPI Pump:</p> <table border="1"> <thead> <tr> <th>A Suction Header</th> <th>B Suction Header</th> </tr> </thead> <tbody> <tr> <td>1LP-28</td> <td>1LP-28</td> </tr> <tr> <td>1LP-21</td> <td>1LP-22</td> </tr> <tr> <td>1LP-6</td> <td>1LP-7</td> </tr> </tbody> </table> <p>B. <u>Start 1C LPI Pump.</u></p>	A Suction Header	B Suction Header	1LP-28	1LP-28	1LP-21	1LP-22	1LP-6	1LP-7
A Suction Header	B Suction Header								
1LP-28	1LP-28								
1LP-21	1LP-22								
1LP-6	1LP-7								
<p>31. Open the following:</p> <p><u>1LP-9</u></p> <p><u>1LP-10</u></p>									
<p style="text-align: center;">NOTE</p> <p>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.</p>									
<p>32. <u>Maximize flow \leq 1100 gpm in each LPI header that has NOT been locally throttled.</u></p>									

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 <u>or</u> 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
<p align="center"><u>Unit Status</u></p> <p align="center">ES Channels 3 & 4 have NOT actuated.</p>	
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.

<p>STEP 1: Step 51</p> <p>WHEN UST level is < 3 feet, THEN ensure all CBPs stopped.</p> <p>STANDARD: Monitors UST level by one or more of the following ways and determines that level is less than three feet:</p> <ul style="list-style-type: none"> • OAC • UST B LEVEL meter on 2AB-1 • UST A LEVEL meter on 2AB-3 • UST LEVEL chart recorder on 2VB-1 <p>Locates Condensate Booster Pumps A, B, and C switches on 2AB1.</p> <p>Stops <u>all</u> Condensate Booster Pumps by rotating the switches to the OFF position.</p> <p>Booster Pump red run light goes off and white stop light comes on for pumps secured.</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Step 52</p> <p>Ensure <u>all</u> HWPs stopped.</p> <p>STANDARD: Locates Hotwell Pump A, B, and C switches on 2AB1.</p> <p>Stops <u>all</u> Hotwell Pumps by rotating the switches to the OFF position.</p> <p>Hotwell Pump red run light goes off and white stop light comes on for pumps secured.</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 3: Step 53</p> <p>Dispatch an operator with a safety harness to 2C-573 (MD EFDWPS SUCTION FROM UST) to standby until further notice.</p> <p>STANDARD: Dispatches NEO to 2C-573.</p> <p>Cue: <i>Indicate NEO has been dispatched to 2C-573.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 4: Step 54</p> <p>Open 2V-186 (VACUUM BREAKER).</p> <p>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.</p> <p>Cue: <i>Indicate 2V-186 is open by red open light illuminated.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 5: Step 55</p> <p>Stop <u>all</u> main vacuum pumps.</p> <p>STANDARD: Locates main vacuum pump switches on 2AB3 and verifies all three pumps indicate OFF.</p> <p>Cue: <i>Indicate <u>all</u> Main Vacuum Pumps OFF by green "off" lights illuminated.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 6:</u> Step 56</p> <p>Close the following:</p> <ul style="list-style-type: none"> • 2MS-47 (MS to CSAEs) • 2AS-40 (CSAE AUX STEAM SUPPLY) <p><u>STANDARD:</u> 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.</p> <p>Locates 2AS-40 on 2AB1 and verifies the green closed light on and the red open light off.</p> <p><i>Cue: Indicate 2MS-47 and 2AS-40 are closed by green "closed" lights illuminated.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7:</u> Step 57</p> <p>IAAT UST level <1 foot, AND 1C-573 is open, THEN stop all EFDW pumps.</p> <p><u>STANDARD:</u> Monitors UST level and if UST level is <1 foot <u>stop</u> 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.</p> <p><i>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.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 8: Step 58 WHEN vacuum is broken, THEN locally close 2C-573 (MD EFDWP Suction from UST).</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE: MDEFWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell</p> </div> <p>STANDARD: Observes vacuum gauge on 2UB2 and determines that vacuum is broken and then contacts an NEO to close 2C-573. Ensures MDEFDWP flow <u>≤ 440 gpm/pump</u> by observing MDEFDWP flow gauges on 2UB1.</p> <p>CUE: Inform student that 2C-573 is closed. CUE: Inform student that MDEFDWP flow gauges on 2UB1 indicate 200 gpm/pump.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 9: Step 59 Restart <u>all</u> MDEFWPs that were stopped due to UST level <1 foot.</p> <p>STANDARD: Pumps are started if required. Step is N/A if the pumps were not secured.</p> <p>Cue: When candidate starts both MDEFDW Pumps indicate that red run lights are illuminated.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 10: Step 60 Ensure TDEFDWP is NOT operating.</p> <p>STANDARD: Determine the TDEFDWP is not available.</p> <p>Note: The TDEFDWP is OOS.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 11: Step 61 Locally close 2C-157 (TD EFDWP Suction from UST).</p> <p>STANDARD: Dispatches an NEO to close 2C-157.</p> <p>CUE: Inform student that 2C-157 is closed.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 12: Step 62 OPEN 2C-391 (TDEFDWP Suction from Hotwell).</p> <p>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</p> <p>Cue: Indicate Red open light comes on, green closed light goes off.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 13: Step 63 IAAT TDEFDWP operation is desired, AND hotwell level is >1", THEN start TDEFDWP.</p> <p>STANDARD: Determine the TDEFDWP is not available.</p> <p>Note: The TDEFDWP is OOS.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 14: Step 64 Dispatch an operator to open 2C-188 (HOTWELL Emergency Makeup #1 Control Bypass).</p> <p>STANDARD: Dispatches an NEO to open 2C-188.</p> <p>CUE: Inform student that 2C-188 is open.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 15: Step 65 Notify TSC to evaluate methods to maintain secondary inventory.</p> <p>STANDARD: Notifies TSC to evaluate methods to maintain secondary inventory.</p> <p>CUE: Inform candidate that the TSC will evaluate methods to maintain secondary inventory.</p> <p>COMMENTS:</p> <p style="text-align: center;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	STOP <u>all</u> CBPs to prevent damage to the MDEFDWP by decreasing NPSH.
2	STOP <u>all</u> 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.

Enclosure 5.9
Extended EFDW Operation

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CHG
32G
Entire Encl

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: <table><tr><td></td><td>2A SG</td><td></td><td>2B SG</td></tr><tr><td></td><td>2FDW-315</td><td></td><td>2FDW-316</td></tr></table>		2A SG		2B SG		2FDW-315		2FDW-316	
	2A SG		2B SG						
	2FDW-315		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): <table><tr><td></td><td>2A SG</td><td></td><td>2B SG</td></tr><tr><td></td><td>2FDW-315</td><td></td><td>2FDW-316</td></tr></table>		2A SG		2B SG		2FDW-315		2FDW-316	
	2A SG		2B SG						
	2FDW-315		2FDW-316						
8. Perform the following as required to maintain UST level > 7': ___ Makeup with demin water. ___ Ensure CST pumps are in AUTO.									

Enclosure 5.9
Extended EFDW Operation

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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)

Enclosure 5.9
Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. <input type="checkbox"/> IAAT <u>all</u> the following conditions exist: <input type="checkbox"/> Rapid cooldown NOT in progress <input type="checkbox"/> MDEFDWP operating for each <u>available</u> SG <input type="checkbox"/> EFDW flow in <u>each</u> header < 600 gpm THEN place TDEFDWP switch in PULL TO LOCK.	
10. <input type="checkbox"/> Verify TDEFDW Pump operating.	<input type="checkbox"/> GO TO Step 13.
11. <input type="checkbox"/> Ensure 2LPSW-137 is open.	
12. <input type="checkbox"/> Ensure EMER FDWPT BRNG OIL COOLING PUMP is operating.	
13. <input type="checkbox"/> 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. <input type="checkbox"/> Verify <u>any</u> HWP operating.	<input type="checkbox"/> GO TO Step 20.
15. <input type="checkbox"/> Verify <u>any</u> CBP operating.	<input type="checkbox"/> GO TO Step 35.
16. <input type="checkbox"/> Verify 2C CBP operating. (12)	1. <input type="checkbox"/> Ensure <u>only one</u> CBP is operating. 2. <input type="checkbox"/> GO TO Step 18.
17. Ensure the following stopped: (12) <input type="checkbox"/> 2A CBP <input type="checkbox"/> 2B CBP	
18. <input type="checkbox"/> Ensure <u>only one</u> HWP is operating.	
19. <input type="checkbox"/> GO TO Step 38.	

Enclosure 5.9
Extended EFDW Operation

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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
<p style="text-align: center;">NOTE</p> <p>If > 25 minutes has elapsed since a loss of <u>all</u> condensate flow, a steam-induced water hammer may occur when a Hotwell Pump is started. A Hotwell Pump should NOT be started unless <u>one</u> of the following is met:</p> <ul style="list-style-type: none"> • An engineering evaluation is performed • EFDW is NOT available and secondary pumps are needed to restore feed to a SG. {17} 	
<p>20. ___ Verify <u>all</u> condensate flow has NOT been lost for > 25 minutes.</p>	<p>1. ___ IF Engineering approves starting a HWP OR secondary pumps are needed to immediately restore SG feed, THEN GO TO Step 21.</p> <p>2. ___ Notify CR SRO to evaluate starting Main Vacuum Pumps per AP/27 (Loss of Condenser Vacuum).</p> <p>3. ___ GO TO Step 68.</p>
<p>21. ___ Place <u>all</u> HWP control switches in OFF.</p>	
<p>22. ___ Place <u>all</u> CBP control switches in OFF.</p>	
<p>23. ___ Dispatch an operator to start <u>all</u> CBP Aux Oil Pumps. (T-1/J-33)</p>	
<p>24. Close the following:</p> <p>___ 2FDW-4</p> <p>___ 2FDW-9</p>	
<p>25. Ensure Main FDWP Aux Oil Pumps operating:</p> <p>___ 2A FDWP AUXILIARY OIL PUMP</p> <p>___ 2B FDWP AUXILIARY OIL PUMP</p>	
<p>26. Place the following in MANUAL <u>and</u> close:</p> <p>___ 2FDW-53</p> <p>___ 2FDW-65</p>	
<p>27. ___ Ensure 2C-10 is closed.</p>	
<p>28. ___ Using a plant page, clear TB Basement and TB third floor of non-essential personnel.</p>	
<p>29. ___ WHEN notified that <u>all</u> CBP Aux Oil pumps are operating, THEN continue.</p>	

Enclosure 5.9
Extended EFDW Operation

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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)

Enclosure 5.9
Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. <input type="checkbox"/> Start <u>one</u> HWP.	
31. <input type="checkbox"/> Throttle 2C-10 controller 10% open.	
32. <input type="checkbox"/> WHEN FWP SUCT HDR PRESS (2VB3) is ≥ 100 psig, THEN open 2C-10.	
33. Establish 1000-1200 gpm total recirc flow with <u>one</u> of the following: <input type="checkbox"/> 2FDW-53 <input type="checkbox"/> 2FDW-65	
34. <input type="checkbox"/> WHEN five minutes has elapsed, THEN GO TO Step 35.	
35. <input type="checkbox"/> Ensure <u>two</u> HWP's operating.	
36. <input type="checkbox"/> Start the 2C CBP. {12}	<input type="checkbox"/> Start <u>one</u> available CBP.
37. <input type="checkbox"/> Stop <u>one</u> operating HWP.	
38. <input type="checkbox"/> Ensure control switch for <u>one</u> idle HWP is in AUTO.	
39. <input type="checkbox"/> Ensure control switch for <u>one</u> idle CBP is in AUTO.	
40. Ensure the following in MANUAL: <input type="checkbox"/> 2FDW-53 <input type="checkbox"/> 2FDW-65	
41. Establish ≥ 2300 gpm total recirc flow with <u>one</u> of the following: <input type="checkbox"/> 2FDW-53 <input type="checkbox"/> 2FDW-65	
42. <input type="checkbox"/> IAAT UST level CANNOT be maintained $> 8'$, THEN locally open 2C-209 (SEAL WATER SUPPLY HEADER) (T-1, E of J-32, 12' up).	

Enclosure 5.9
Extended EFDW Operation

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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
<p>43. <input type="checkbox"/> IAAT UST level increases > 11', THEN perform the following as required:</p> <p><input type="checkbox"/> Throttle demin water</p> <p><input type="checkbox"/> Locally throttle 2C-188 (HOTWELL EMERG MAKEUP #1 CONTROL BYPASS) (T-1, between E-31 and F-31)</p>	
<p>44. Verify the following are closed:</p> <p><input type="checkbox"/> 2FDW-4</p> <p><input type="checkbox"/> 2FDW-9</p>	<p><input type="checkbox"/> GO TO Step 49.</p>
<p>45. Ensure the following are closed with the switches in CLOSE:</p> <p><input type="checkbox"/> 2FDW-33</p> <p><input type="checkbox"/> 2FDW-31</p> <p><input type="checkbox"/> 2FDW-42</p> <p><input type="checkbox"/> 2FDW-40</p>	
<p>46. Locally open the following:</p> <p><input type="checkbox"/> 2FDW-5 (2A FDWP DISCHARGE BYPASS) (T-1, 10' N of 2A FDW Pump, 15' up, above SGFDW Panel 2SGFP)</p> <p><input type="checkbox"/> 2FDW-10 (2B FDWP DISCHARGE BYPASS) (T-1, 5' N of D-30, 15' up)</p>	
<p>47. <input type="checkbox"/> WHEN FWP DISCH HDR PRESS (2VB3) is approximately equal to <u>either</u> of the following:</p> <ul style="list-style-type: none"> • O2A1014 (FDWP 2A DISCHARGE PRESS) • O2A1391 (FDWP 2B DISCHARGE PRESS) <p>THEN open the following:</p> <p><input type="checkbox"/> 2FDW-4</p> <p><input type="checkbox"/> 2FDW-9</p>	

Enclosure 5.9
Extended EFDW Operation

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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> HWP's 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.	

Enclosure 5.9
Extended EFDW Operation

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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)

Enclosure 5.9
Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">NOTE</p> <p>MDEFDWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell (2C-573 closed).</p>	
58. <input type="checkbox"/> WHEN vacuum is broken, THEN locally close 2C-573 (MD EFDWPS SUCTION FROM UST).	
59. <input type="checkbox"/> Restart <u>all</u> MDEFDWPs that were stopped due to UST level < 1'.	
60. <input type="checkbox"/> Ensure TDEFDWP is NOT operating.	
61. <input type="checkbox"/> Locally close 2C-157 (TD EFDWP SUCTION FROM UST) (T-1, N of C-36).	
62. <input type="checkbox"/> Open 2C-391.	<input type="checkbox"/> Locally open 2C-391 (TD EFDWP SUCTION FROM HOTWELL) (T-1/C-36).
63. <input type="checkbox"/> IAAT TDEFDWP operation is desired, AND hotwell level is > 1", THEN start TDEFDWP.	
64. <input type="checkbox"/> Dispatch an operator to open 2C-188 (HOTWELL EMERG MAKEUP #1 CONTROL BYPASS) (T-1, W of E-31). (18)	
65. <input type="checkbox"/> Notify TSC to evaluate methods to maintain secondary inventory.	
66. <input type="checkbox"/> IAAT hotwell level is ≤ 1", THEN stop <u>all</u> EFDWPs.	
67. <input type="checkbox"/> WHEN directed by CR SRO, THEN EXIT this enclosure.	

...END...

Enclosure 5.9
Extended EFDW Operation

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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)

Enclosure 5.9
Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
68. <input type="checkbox"/> 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. <input type="checkbox"/> Verify power available to 2V-186.	<input type="checkbox"/> Dispatch an operator with a safety harness to 2V-186 (VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
70. <input type="checkbox"/> WHEN UST level is < 3', THEN ensure <u>all</u> CBPs stopped.	
71. <input type="checkbox"/> Ensure <u>all</u> HWP's stopped.	
72. <input type="checkbox"/> 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. <input type="checkbox"/> Open 2V-186.	<input type="checkbox"/> Notify operator to open 2V-186 (MAIN CONDENSER VACUUM BREAKER) (T-3, catwalk at 2C2 waterbox).
74. <input type="checkbox"/> Stop <u>all</u> main vacuum pumps.	
75. Close the following: <input type="checkbox"/> 2MS-47 <input type="checkbox"/> 2AS-40	Dispatch an operator to close the following: <input type="checkbox"/> 2MS-49 (2A CSAE STEAM SUPPLY) (T-3/F-29) <input type="checkbox"/> 2MS-58 (2B CSAE STEAM SUPPLY) (T-3/G-29) <input type="checkbox"/> 2MS-67 (2C CSAE STEAM SUPPLY) (T-3, N of H-29)
76. <input type="checkbox"/> IAAT UST level is < 1', AND 2C-573 (MD EFDWPS SUCTION FROM UST) is open, THEN stop <u>all</u> EFDW pumps.	
<p style="text-align: center;">NOTE</p> <p>MDEFDWP flow is limited to < 440 gpm/pump when suction is aligned to the hotwell (2C-573 closed).</p>	
77. <input type="checkbox"/> WHEN vacuum is broken, THEN locally close 2C-573 (MD EFDWPS SUCTION FROM UST).	

Enclosure 5.9
Extended EFDW Operation

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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)

Enclosure 5.9
Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
78. __ Restart <u>all</u> 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 $\leq 1''$, THEN stop <u>all</u> 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: _____

<p><u>STEP 1:</u> Step 1 Verify ICC tab NOT in progress.</p> <p><u>STANDARD:</u> Determine ICC tab NOT in progress.</p> <p>Cue: If asked, inform candidate that the ICC tab NOT in progress.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Step 2 Verify NO RCPs operating.</p> <p><u>STANDARD:</u> Verify NO RCPs operating by observing RCP red run light off and "0" amps indicated on 1AB1.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> Step 3 Verify all the following:</p> <ul style="list-style-type: none"> • Boiler condenser cooling has NOT occurred • Nat Circ cooling exists in at least one RCS loop <p><u>STANDARD:</u> 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 ΔT, CETCs, feeding SGs, and TBV position.</p> <p>Cue: If asked, indicate that Boiler condenser cooling has NOT occurred.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 4:</u> Step 4 Ensure all SCMs are > 0°F.</p> <p><u>STANDARD:</u> Determine all SCMs are > 0°F by observing SCM on the ICCM located on 1UB1.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> Step 5 Ensure adequate RCP NPSH per Encl 5.18 (P/T Curves).</p> <p><u>STANDARD:</u> Obtain EOP Encl 5.18 (P/T Curves) and determine that adequate RCP NPSH exists.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 6:</u> Step 6 Verify any of the following exist:</p> <ul style="list-style-type: none"> • Either hot leg level < 597" • Either train of vessel head level < 171" • RVLIS indications NOT available AND NO RCPs operating <p><u>STANDARD:</u> 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</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 7:</u> Step 6 RNO Ensure Pzr level > 100" [180" acc]. GO TO Step 8</p> <p><u>STANDARD:</u> Monitor Pzr level on 1UB1 and determine level is > 100". Continue to Step 8</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 8:</u> Step 8 Verify HPI CD tab NOT in progress.</p> <p><u>STANDARD:</u> Determine HPI CD tab NOT in progress.</p> <p><i>Cue: If asked, inform candidate that the HPI CD tab NOT in progress.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> Step 9 Ensure the following are closed:</p> <ul style="list-style-type: none"> • 1RC-155 • 1RC-156 • 1RC-157 • 1RC-158 • 1RC-159 • 1RC-160 <p><u>STANDARD:</u> 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.</p> <p><i>Cue: If asked, valves have not been opened.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 10:</u> Step 10 Verify Pzr level is < 375" [340" acc].</p> <p><u>STANDARD:</u> Monitor Pzr level on 1UB1 and determine level is < 375".</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> Step 11 Verify 1RC-4 is NOT closed to isolate leakage past PORV.</p> <p><u>STANDARD:</u> Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> Step 12 Ensure 1RC-4 is open.</p> <p><u>STANDARD:</u> Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> Step 13 Ensure 1RC-1 is in manual and closed.</p> <p><u>STANDARD:</u> Locate 1RC-1 on 1UB1 and press "close". Verify the blue AUTO light goes out and the white "close" light illuminates.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 14: Step 14 Ensure the following are open:</p> <ul style="list-style-type: none"> • 1LPSW-6 • 1LPSW-15 <p>STANDARD: Verify 1LPSW-6 and 1LPSW-15 are open on the RZ modules located on 1VB2.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 15: Step 15 Ensure the following are open for each RCP to be started using OAC graphic LPS02:</p> <ul style="list-style-type: none"> • 1LPSW-7&8 (1A1) <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 16: Step 16 Ensure \approx 8 gpm seal injection for each RCP to be started.</p> <ul style="list-style-type: none"> • 1A1 <p>STANDARD: Ensure \approx 8 gpm seal injection for 1A1 RCP by observing seal injection flow meter on 1VB3.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 17:</u> Step 17 Ensure the following are open for each RCP to be started:</p> <ul style="list-style-type: none"> • 1HP-228 (1A1) <p><u>STANDARD:</u> Verify 1HP-228 open by observing red open light illuminated on 1VB3.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 18:</u> Step 18 Ensure the following are open:</p> <ul style="list-style-type: none"> • 1HP-20 • 1HP-21 <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 19:</u> Step 19 Verify CC TOTAL FLOW \geq 575 gpm.</p> <p><u>STANDARD:</u> Verify CC TOTAL FLOW \geq 575 gpm by observing gauge located on 1AB3.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 20: Step 20 Verify HPI CD tab is NOT in progress.</p> <p>STANDARD: Determine HPI CD tab is NOT in progress.</p> <p>Cue: <i>If asked, inform candidate that the HPI CD tab NOT in progress.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 21: Step 21 Verify ICC tab is NOT in progress</p> <p>STANDARD: Determine ICC tab is NOT in progress</p> <p>Cue: <i>If asked, inform candidate that the ICC tab NOT in progress.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 22: Step 22 IAAT any SCM is = 0°F due to RCP restart, THEN ensure full HPI flow per Rule 6 (HPI).</p> <p>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).</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 23: Step 23 IAAT any SCM is = 0°F for ≈ 2 minutes following RCP restart, THEN GO TO LOSCM tab.</p> <p>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.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 24: Step 24 Start AC or DC lift oil pump for an RCP to be started.</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 25: Step 25 WHEN computer alarm for low lift oil pump discharge pressure clears for RCP to be started, THEN start RCP.</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 26:</u> Step 26 Stabilize RCS P/T.</p> <p><u>STANDARD:</u> Monitor RCS P/T on 1UB1 and the OAC to determine it is stable.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 27:</u> Step 27 WHEN RCP motor current stabilizes, THEN stop respective RCP lift oil pump.</p> <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 28:</u> Step 28 Verify starting another RCP is NOT desired.</p> <p><u>STANDARD:</u> Determine that starting another RCP is not desired.</p> <p><i>Cue: If asked, inform candidate that starting another RCP is not desired at this time.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 29:</u> Step 29 Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.</p> <p><u>STANDARD:</u> Display OAC graphic RCPMPALL and analyze 1A1 RCP parameters.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 30:</u> Step 30 Return the following components to their desired position:</p> <ul style="list-style-type: none"> • 1RC-1 • Pzr heaters <p><u>STANDARD:</u> Return 1RC-1 and Pzr heaters to AUTO by depressing the AUTO pushbuttons located on 1UB1 for 1RC-1 and Pzr heaters.</p> <p><i>Cue: If asked, inform candidate that it is desired to return 1RC-1 and Pzr heaters to AUTO.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 31:</u> Step 31 EXIT this enclosure.</p> <p><u>STANDARD:</u> Candidate should indicate that they would exit this enclosure.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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. <input type="checkbox"/> Verify ICC tab NOT in progress.	<input type="checkbox"/> GO TO Step 14.
2. <input type="checkbox"/> Verify NO RCPs operating.	<input type="checkbox"/> GO TO Step 4.
3. Verify <u>all</u> the following: <input type="checkbox"/> Boiler condenser cooling has NOT occurred <input type="checkbox"/> Nat Circ cooling exists in at least one RCS loop	1. <input type="checkbox"/> Obtain TSC concurrence to perform RCP restart. 2. <input type="checkbox"/> IF TSC does NOT concur with RCP restart, THEN EXIT this enclosure.
4. <input type="checkbox"/> Ensure <u>all</u> SCMs are > 0°F.	
5. <input type="checkbox"/> Ensure adequate RCP NPSH per Encl 5.18 (P/T Curves).	
6. Verify <u>any</u> of the following exist: <input type="checkbox"/> Either hot leg level < 597" <input type="checkbox"/> Either train of vessel head level < 171" <input type="checkbox"/> RVLIS indications NOT available AND NO RCPs operating	1. <input type="checkbox"/> Ensure Pzr level is \geq 100" [180" acc]. 2. <input type="checkbox"/> GO TO Step 8.
7. <input type="checkbox"/> Ensure Pzr level > 200" [235" acc].	
8. <input type="checkbox"/> Verify HPI CD tab NOT in progress.	<input type="checkbox"/> GO TO Step 10.
9. Ensure the following are closed: <input type="checkbox"/> 1RC-155 <input type="checkbox"/> 1RC-156 <input type="checkbox"/> 1RC-157 <input type="checkbox"/> 1RC-158 <input type="checkbox"/> 1RC-159 <input type="checkbox"/> 1RC-160	
10. <input type="checkbox"/> Verify Pzr level is < 375" [340" acc].	<input type="checkbox"/> Reduce RCS pressure to < 2000 psig.
11. <input type="checkbox"/> Verify 1RC-4 is NOT closed to isolate leakage past PORV.	<input type="checkbox"/> GO TO Step 13.
12. <input type="checkbox"/> Ensure 1RC-4 is open.	
13. <input type="checkbox"/> Ensure 1RC-1 is in manual and closed.	
14. Ensure the following are open: <input type="checkbox"/> 1LPSW-6 <input type="checkbox"/> 1LPSW-15	

Enclosure 5.6

RCP Restart

EP/1/A/1800/001

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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: <input type="checkbox"/> 1LPSW-7&8 (1A1) <input type="checkbox"/> 1LPSW-13&14 (1A2) <input type="checkbox"/> 1LPSW-9&10 (1B1) <input type="checkbox"/> 1LPSW-11&12 (1B2)	
16. Ensure ≈ 8 gpm seal injection for each RCP to be started. <input type="checkbox"/> 1A1 <input type="checkbox"/> 1A2 <input type="checkbox"/> 1B1 <input type="checkbox"/> 1B2	
17. Ensure the following are open for each RCP to be started: <input type="checkbox"/> 1HP-228 (1A1) <input type="checkbox"/> 1HP-226 (1A2) <input type="checkbox"/> 1HP-232 (1B1) <input type="checkbox"/> 1HP-230 (1B2)	
18. Ensure the following are open: <input type="checkbox"/> 1HP-20 <input type="checkbox"/> 1HP-21	
19. <input type="checkbox"/> Verify CC TOTAL FLOW ≥ 575 gpm.	Open the following as necessary to obtain ≥ 575 gpm total CC flow: <input type="checkbox"/> 1HP-1 <input type="checkbox"/> 1HP-2
20. <input type="checkbox"/> Verify HPI CD tab is NOT in progress.	<input type="checkbox"/> GO TO Step 32.
21. <input type="checkbox"/> Verify ICC tab is NOT in progress.	<input type="checkbox"/> GO TO Step 41.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">NOTE</p> <p>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.</p>	
22. <input type="checkbox"/> IAAT <u>any</u> SCM is = 0°F due to RCP restart, THEN ensure full HPI flow per Rule 6 (HPI).	
23. <input type="checkbox"/> IAAT any SCM is = 0°F for ≈ 2 minutes following RCP restart, THEN GO TO LOSCM tab.	
24. <input type="checkbox"/> Start AC <u>or</u> DC lift oil pump for an RCP to be started.	
25. <input type="checkbox"/> WHEN computer alarm for low lift oil pump discharge pressure clears for RCP to be started, THEN start RCP.	
26. <input type="checkbox"/> Stabilize RCS P/T.	
27. <input type="checkbox"/> WHEN RCP motor current stabilizes, THEN stop respective RCP lift oil pump.	
28. <input type="checkbox"/> Verify starting another RCP is NOT desired.	<input type="checkbox"/> GO TO Step 22.
29. <input type="checkbox"/> Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
30. Return the following components to their desired position: <input type="checkbox"/> IRC-1 <input type="checkbox"/> Pzr heaters	
31. <input type="checkbox"/> EXIT this enclosure.	

...END...

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p align="center"><u>Unit Status</u> HPI CD tab is in progress.</p>	
<p align="center"><u>NOTE</u></p> <ul style="list-style-type: none"> • 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 <u>any</u> SCM is = 0°F due to RCP restart, THEN ensure full HPI flow per Rule 6 (HPI).	
33. ___ Start AC <u>or</u> 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: ___ IRC-1 ___ Pzr heaters	
40. ___ EXIT this enclosure.	

...END...

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p align="center"><u>Unit Status</u> ICC tab in progress.</p>	
41. <input type="checkbox"/> Start AC <u>or</u> DC lift oil pump for an RCP to be started.	
42. <input type="checkbox"/> WHEN computer alarm for low lift oil pump discharge pressure clears for RCP to be started, THEN start RCP.	
43. <input type="checkbox"/> IAAT RCP motor current stabilizes, THEN stop respective RCP lift oil pump.	
44. <input type="checkbox"/> Verify starting another RCP is NOT desired.	<input type="checkbox"/> GO TO Step 41.
45. <input type="checkbox"/> Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
46. Return the following components to their desired position: <input type="checkbox"/> IRC-1 <input type="checkbox"/> Pzr heaters	
47. <input type="checkbox"/> 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: _____
NAME

Time Start: _____
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: _____

<p><u>STEP 1:</u> Step 2.1.4 Place the following transfer switches in MANUAL:</p> <ul style="list-style-type: none"> • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN <p><u>STANDARD:</u> The following transfer switches are placed in the MANUAL position:</p> <ul style="list-style-type: none"> • 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 <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Step 2.1.5 Open SK1 (CT-4 Stby Bus 1 Feeder).</p> <p><u>STANDARD:</u> SK1 (CT-4 Stby Bus 1 Feeder) is OPENED by placing the switch in the trip position on 2AB3.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 3:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE: The time period between opening SK2 and closing SL1 should be > 3 seconds and < 20 seconds.</p> </div> <p>Step 2.1.6 Energize the STBY BUSES from CT-5 by performing the following:</p> <ul style="list-style-type: none"> • Open SK2 (CT-4 STBY BUS 2 FEEDER) • Close SL1 (CT-5 STBY BUS 1 FEEDER) • Close SL2 (CT-5 STBY BUS 2 FEEDER) <p>STANDARD: The following breakers located on 2AB3 are operated in the listed sequence:</p> <ul style="list-style-type: none"> • Open SK2 (CT-4 STBY BUS 2 FEEDER) • Close SL1 (CT-5 STBY BUS 1 FEEDER) • Close SL2 (CT-5 STBY BUS 2 FEEDER) <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 4:</p> <p>Step 2.1.7 Return the following transfer switches to AUTO:</p> <ul style="list-style-type: none"> • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN <p>STANDARD: The following transfer switches located on 2AB3 are placed in the AUTO position:</p> <ul style="list-style-type: none"> • CT-4 BUS 1 AUTO/MAN • CT-4 BUS 2 AUTO/MAN • CT-5 BUS 1 AUTO/MAN • CT-5 BUS 2 AUTO/MAN <p>NOTE: Recovery of lost loads is not required for this JPM.</p> <p>COMMENTS:</p> <p style="text-align: center;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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.

Enclosure 4.12
Transfer Of MFB Power Supply
From CT 4 To CT 5

OP/0/A/1106/019
Page 1 of 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.

Enclosure 4.12
Transfer Of MFB Power Supply
From CT 4 To CT 5

OP/0/A/1106/019
Page 2 of 4

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.

Enclosure 4.12
Transfer Of MFB Power Supply
From CT 4 To CT 5

OP/0/A/1106/019
Page 3 of 4

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

Enclosure 4.12
Transfer Of MFB Power Supply
From CT 4 To CT 5

OP/0/A/1106/019
Page 4 of 4

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 ALL 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 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.

START TIME: _____

<p>STEP 1: Step 4.40</p> <p>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</p> <p>STANDARD: Locate Enclosure 5.7 (Resetting 1RIA-40 and OAC Setpoints)</p> <p>Cue: Give candidate the partially completed copy of Enclosure 5.7. Inform candidate that the enclosure is complete up to step 6.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Step 6 Enter the new 1RIA-40 Alert and High setpoints in the RIA View Node</p> <p>STANDARD: Locate the RIA View Node on 1VB2, perform the following:</p> <ul style="list-style-type: none"> • 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.* <p>NOTE: * Not critical</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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

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

CRITICAL STEP

___ SAT

___ UNSAT

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.

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 J. L. Cole (QR) Date 11-1-02Cross-Disciplinary Review By ERIC LANGE (QR)NA Date 10/24/02

Reactivity Mgmt Review By _____ (QR)NA Date _____

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

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval (if necessary)

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By David B. Galt 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

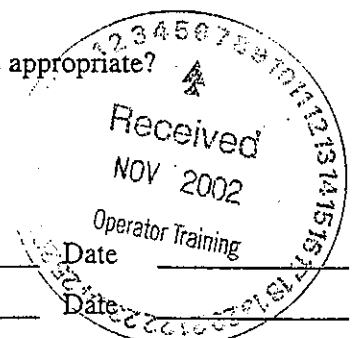
(12) Procedure Completion Verification:

☐ 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)



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 <input type="checkbox"/> IAAT the SGTR tab of EP/1 (EOP) is entered, THEN EXIT this procedure.	
4.2 <input type="checkbox"/> IAAT <u>either</u> of the following exists for 1RIA-54: <input type="checkbox"/> is in alarm <input type="checkbox"/> inoperable THEN perform Steps 4.3 - 4.4.	<input type="checkbox"/> GO TO Step 4.5.
<p style="text-align: center;">NOTE</p> <p>The white tags can be created and hung after the TBS pump breakers are opened. (1)</p>	
4.3 Dispatch an operator to open and white tag the following: <input type="checkbox"/> 1XD-R3C (1A TURBINE BUILDING SUMP PUMP BKR) <input type="checkbox"/> 1XE-R3D (1B TURBINE BUILDING SUMP PUMP BKR)	
4.4 Notify Secondary Chemistry to perform the following: <input type="checkbox"/> Obtain a TBS sample. <input type="checkbox"/> Recommend TBS release path.	
4.5 <input type="checkbox"/> IAAT gross tube leakage is indicated by an increase in normal RC makeup flow, THEN GO TO Step 4.71.	
4.6 <input type="checkbox"/> 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
<p style="text-align: center;">NOTE</p> <p>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).</p>	
<p>4.7 Notify RP to perform the following:</p> <ul style="list-style-type: none"> ___ 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. 	
<p>4.8 Notify Primary Chemistry to perform the following:</p> <ul style="list-style-type: none"> ___ 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. 	
<p>4.9 ___ Verify OAC primary to secondary leak rate calculation available (including IRIA-40 operable).</p>	<p>___ GO TO Step 4.12.</p>
<p>4.10 ___ Determine primary to secondary leakage rate using OAC point O1P1599 (EST TOTAL PRI TO SEC LEAKRATE).</p>	
<p>4.11 ___ GO TO Step 4.14.</p>	

IF AT ANY TIME:

- (4.1) the SGTR tab of EP/1 (EOP) is entered... (EXIT this procedure)
- (4.2) IRIA-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 <input type="checkbox"/> Verify IRIA-40 operable.	1. <input type="checkbox"/> IF CSAE off-gas sample indicates primary to secondary leakage > 60 gpd (0.04164 gpm), AND leak rate was unstable/increasing at the time IRIA-40 became inoperable, THEN perform the following: A. <input type="checkbox"/> Stop any power increase in progress. B. <input type="checkbox"/> GO TO Step 4.73. 2. <input type="checkbox"/> IF CSAE off-gas sample indicates primary to secondary leakage \geq 5 gpd (0.003472 gpm), THEN perform the following: A. <input type="checkbox"/> Stop any power increase in progress. B. <input type="checkbox"/> GO TO Step 4.28. 3. <input type="checkbox"/> EXIT this procedure.
4.13 <input type="checkbox"/> PERFORM Encl 5.5 (Calculation of Primary to Secondary Leak Rate using IRIA-40). {3}	
4.14 <input type="checkbox"/> Verify primary to secondary leak rate < 25 gpm (36,000 gpd).	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">NOTE</p> <p>If the EOP is NOT already in progress, entry will be directly to the SGTR tab.</p> </div> <p><input type="checkbox"/> GO TO EP/1 (EOP).</p>
4.15 <input type="checkbox"/> Verify primary to secondary leak rate < 75 gpd (0.05205 gpm).	1. <input type="checkbox"/> IF primary to secondary leak rate is <u>either</u> of the following: <input type="checkbox"/> \geq 75 gpd for at least one hour <input type="checkbox"/> \geq 100 gpd (0.0694 gpm) THEN GO TO Step 4.73. 2. <input type="checkbox"/> GO TO Step 4.46.
4.16 <input type="checkbox"/> Verify primary to secondary leak rate < 30 gpd (0.02082 gpm).	<input type="checkbox"/> GO TO Step 4.46.
4.17 <input type="checkbox"/> Verify primary to secondary leak rate < 5 gpd (0.003472 gpm).	<input type="checkbox"/> 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) IRIA-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 <input type="checkbox"/> 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 <input type="checkbox"/> Verify primary to secondary leak rate confirmed < 5 gpd (0.003472 gpm).	<input type="checkbox"/> GO TO Step 4.28.									
4.20 Notify the following to take a second sample (within 15 minutes of each other, if possible): <table border="1"><tr><td><input checked="" type="checkbox"/></td><td>Group</td><td>Sample</td></tr><tr><td><input type="checkbox"/></td><td>RP</td><td>CSAE</td></tr><tr><td><input type="checkbox"/></td><td>Primary Chemistry</td><td>RCS</td></tr></table>	<input checked="" type="checkbox"/>	Group	Sample	<input type="checkbox"/>	RP	CSAE	<input type="checkbox"/>	Primary Chemistry	RCS	
<input checked="" type="checkbox"/>	Group	Sample								
<input type="checkbox"/>	RP	CSAE								
<input type="checkbox"/>	Primary Chemistry	RCS								
4.21 <input type="checkbox"/> 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 <input type="checkbox"/> Verify primary to secondary leak rate confirmed < 5 gpd (0.003472 gpm).	<input type="checkbox"/> GO TO Step 4.28.									
4.23 <input type="checkbox"/> Verify 1RIA-40 operable.	<input type="checkbox"/> GO TO Step 4.25.									
4.24 Initiate Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to ensure the following alarm setpoints: (7) <input type="checkbox"/> 1RIA-40 High - 30 gpd <input type="checkbox"/> 1RIA-40 Alert - 5 gpd <input type="checkbox"/> 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) IRIA-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: <input type="checkbox"/> Primary to secondary leak rate has been confirmed < 5 gpd and this procedure will be exited. <input type="checkbox"/> 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: <input type="checkbox"/> RP <input type="checkbox"/> Primary Chemistry <input type="checkbox"/> Personnel previously notified per OMP 1-14 (Notifications)	
4.27 <input type="checkbox"/> EXIT this procedure.	

...END...

IF AT ANY TIME:

- (4.1) the SGTR tab of EP/1 (EOP) is entered... (EXIT this procedure)
- (4.2) IRIA-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} <ul style="list-style-type: none">• 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} <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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} <table><tr><td><input checked="" type="checkbox"/></td><td>1RIA-40</td><td>Frequency (hr)</td></tr><tr><td><input type="checkbox"/></td><td>Operable</td><td>24</td></tr><tr><td><input type="checkbox"/></td><td>Inoperable</td><td>4</td></tr></table>	<input checked="" type="checkbox"/>	1RIA-40	Frequency (hr)	<input type="checkbox"/>	Operable	24	<input type="checkbox"/>	Inoperable	4	
<input checked="" type="checkbox"/>	1RIA-40	Frequency (hr)								
<input type="checkbox"/>	Operable	24								
<input type="checkbox"/>	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 <input type="checkbox"/> IAAT CSAE off-gas sample and RCS sample results become available, THEN perform Steps 4.36 - 4.38.	<input type="checkbox"/> GO TO Step 4.39.
4.36 <input type="checkbox"/> PERFORM Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples).	
4.37 <input type="checkbox"/> 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: <input type="checkbox"/> Ops Mods Supervisor <input type="checkbox"/> Ops Work Process Manager <input type="checkbox"/> Administrative Specialist	
4.39 <input type="checkbox"/> IAAT 1RIA-40 is operable, THEN perform Steps 4.40 - 4.42.	<input type="checkbox"/> GO TO Step 4.43.
4.40 PERFORM Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: (7) <input type="checkbox"/> 1RIA-40 High - 75 gpd <input type="checkbox"/> 1RIA-40 Alert - 30 gpd <input type="checkbox"/> OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 30 gpd	
4.41 <input type="checkbox"/> Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.	
4.42 <input type="checkbox"/> Verify CSAE off-gas and RCS samples are being performed on a 24 hour frequency.	<input type="checkbox"/> Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.
4.43 <input type="checkbox"/> 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) IRIA-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) IRIA-40 is operable... (reset OAC and IRIA-40 setpoints and record new setpoints)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED									
<p>4.44 __ IAAT CSAE off-gas sample indicates primary to secondary leak rate < 5 gpd (0.003472 gpm), THEN perform the following:</p> <p>A. Notify the following to take another sample (within 15 minutes of each other, if possible):</p> <table><tr><td><input checked="" type="checkbox"/></td><td>Group</td><td>Sample</td></tr><tr><td><input type="checkbox"/></td><td>RP</td><td>CSAE</td></tr><tr><td><input type="checkbox"/></td><td>Primary Chemistry</td><td>RCS</td></tr></table> <p>B. __ GO TO Step 4.21.</p>	<input checked="" type="checkbox"/>	Group	Sample	<input type="checkbox"/>	RP	CSAE	<input type="checkbox"/>	Primary Chemistry	RCS	
<input checked="" type="checkbox"/>	Group	Sample								
<input type="checkbox"/>	RP	CSAE								
<input type="checkbox"/>	Primary Chemistry	RCS								
<p>4.45 __ WHEN in MODE 5, THEN EXIT this procedure.</p>										

...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
<p>4.46 <u> </u> IAAT <u>all</u> the following conditions exist:</p> <ul style="list-style-type: none"> <u> </u> 1RIA-40 inoperable <u> </u> primary to secondary leak rate > 60 gpd (0.04164 gpm) <u> </u> leak unstable/increasing at time 1RIA-40 became inoperable <p>THEN GO TO Step 4.73.</p>	
<p>4.47 <u> </u> IAAT primary to secondary leak rate increases to <u>either</u> of the following:</p> <ul style="list-style-type: none"> <u> </u> ≥ 75 gpd (0.05205 gpm) for at least one hour <u> </u> ≥ 100 gpd (0.0694 gpm) <p>THEN GO TO Step 4.73.</p>	
<p>4.48 <u> </u> Make notifications of primary to secondary leakage per OMP 1-14 (Notifications).</p>	
<p>4.49 <u> </u> Monitor the following every 15 minutes for indications of increasing leak rate: {9}</p> <ul style="list-style-type: none"> • 1RIA-16 • 1RIA-17 • 1RIA-40 	
<p>4.50 <u> </u> IAAT leak rate is stable (< 10% change in a one hour time period), THEN reduce monitoring frequency of the following to every two hours:</p> <ul style="list-style-type: none"> • 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 <input type="checkbox"/> Maintain the Primary to Secondary Leak Log to include the following: <ul style="list-style-type: none">• 1RIA-16, 17, and 40 readings• RCS activity levels• Calculated leak sizes (including those based on 1RIA-40 readings)										
4.52 <input type="checkbox"/> Verify affected SG identified. {2}	Attempt to identify affected SG by <u>any</u> of the following methods: <input type="checkbox"/> 1RIA-16/17 readings <input type="checkbox"/> Local RP surveys of MS lines									
4.53 <input type="checkbox"/> Issue a priority work request for any OOS SG tube leak monitoring equipment.										
4.54 <input type="checkbox"/> 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} <table border="1"><tr><td><input checked="" type="checkbox"/></td><td>1RIA-40</td><td>Frequency (hr)</td></tr><tr><td><input type="checkbox"/></td><td>Operable</td><td>12</td></tr><tr><td><input type="checkbox"/></td><td>Inoperable</td><td>4</td></tr></table>	<input checked="" type="checkbox"/>	1RIA-40	Frequency (hr)	<input type="checkbox"/>	Operable	12	<input type="checkbox"/>	Inoperable	4	
<input checked="" type="checkbox"/>	1RIA-40	Frequency (hr)								
<input type="checkbox"/>	Operable	12								
<input type="checkbox"/>	Inoperable	4								
4.56 <input type="checkbox"/> IAAT CSAE off-gas sample and RCS sample results become available, THEN perform Steps 4.57 - 4.59.	<input type="checkbox"/> GO TO Step 4.60.									
4.57 <input type="checkbox"/> PERFORM Encl 5.4 (Calculation of Primary to Secondary Leak Rate using CSAE Off-gas and RCS Samples).										
4.58 <input type="checkbox"/> 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
<p>4.59 Notify the following to enter leak rate calculation results in the Excel leakage spreadsheet:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ops Mods Supervisor <input type="checkbox"/> Ops Work Process Manager <input type="checkbox"/> Administrative Specialist 	
<p>4.60 <input type="checkbox"/> IAAT 1RIA-40 is operable, AND primary to secondary leak rate is unstable ($\geq 10\%$ change in a two hour period), THEN perform Steps 4.61- 4.63.</p>	<p><input type="checkbox"/> GO TO Step 4.64.</p>
<p>4.61 PERFORM Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: (7)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1RIA-40 High - 75 gpd <input type="checkbox"/> 1RIA-40 Alert - 75 gpd <input type="checkbox"/> OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 75 gpd 	
<p>4.62 <input type="checkbox"/> Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.</p>	
<p>4.63 <input type="checkbox"/> Verify CSAE off-gas and RCS Samples are being performed on a 24 hour frequency.</p>	<p><input type="checkbox"/> Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.</p>
<p>4.64 <input type="checkbox"/> 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.</p>	<p><input type="checkbox"/> GO TO Step 4.68.</p>

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
<p>4.65 PERFORM Encl 5.7 (Resetting 1RIA-40 and OAC Setpoints) to set the following alarm setpoints: {7}</p> <p>___ 1RIA-40 High - 75 gpd</p> <p>___ 1RIA-40 Alert - 30 gpd above existing leak rate (NOT to exceed 75 gpd)</p> <p>___ OAC point O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT) - 30 gpd above existing leak rate (NOT to exceed 75 gpd)</p>	
<p>4.66 ___ Record OAC and 1RIA-40 High and Alert setpoints on turnover sheet.</p>	
<p>4.67 ___ Verify CSAE off-gas and RCS Samples are being performed on a 24 hour frequency.</p>	<p>___ Notify RP and Primary Chemistry to perform CSAE off-gas and RCS samples on a 24 hour frequency.</p>
<p>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}</p>	
<p>4.69 ___ Prepare for response to primary to secondary leakage \geq 75 gpd by reviewing Steps 4.73 - 4.97. {11}</p>	
<p>4.70 ___ WHEN in MODE 5, THEN EXIT this procedure.</p>	

•••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 <input type="checkbox"/> Verify gross leak rate determination is desired.	<input type="checkbox"/> GO TO Step 4.73.
4.72 Determine primary to secondary leak rate: $LR = \frac{MU + SI - LD}{TSR}$ $LR = \text{_____ gpm}$ Where: LR = Leak Rate MU = Makeup Flow SI = Seal Inlet Header Flow LD = Letdown TSR = Total Seal Return	
<div style="text-align: center;">NOTE</div> If the EOP is NOT already in progress, entry will be directly to the SGTR tab.	
4.73 <input type="checkbox"/> IAAT primary to secondary leak rate is ≥ 25 gpm (36,000 gpd), THEN GO TO EP/1 (EOP).	
4.74 <input type="checkbox"/> Make notifications of primary to secondary leakage per OMP 1-14 (Notifications).	
4.75 <input type="checkbox"/> Log readings from the following every 15 minutes in the Primary to Secondary Leak Log: (9) <ul style="list-style-type: none"> • 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
<p>4.76 <input type="checkbox"/> Initiate a unit shutdown using the following as necessary to meet requirements of Encl 5.1 (Unit Shutdown Requirements):</p> <ul style="list-style-type: none"> • OP/1/A/1102/004 (Operation at Power) • OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) 	
<p>4.77 <input type="checkbox"/> IAAT primary to secondary leakage increases, THEN modify shutdown as required by Encl 5.1 (Unit Shutdown Requirements).</p>	
<p>4.78 <input type="checkbox"/> Notify Radwaste to stop <u>all</u> liquid releases in progress until sample results assure release rates within limits.</p>	
<p>4.79 <input type="checkbox"/> Stop <u>all</u> gaseous releases in progress until sample results assure release rates within limits.</p>	
<p>4.80 <input type="checkbox"/> Make up to the UST only as necessary to maintain UST level > 7'.</p>	
<p>4.81 Notify the following that a shutdown is in progress due to primary to secondary leakage:</p> <ul style="list-style-type: none"> <input type="checkbox"/> RP <input type="checkbox"/> Primary Chemistry <input type="checkbox"/> Secondary Chemistry 	
<p>4.82 <input type="checkbox"/> Initiate Encl 5.2 (Reduction of Secondary Leakage and Cross-Unit Contamination). {10}</p>	
<p>4.83 <input type="checkbox"/> Verify affected SG identified. {2}</p>	<p>Attempt to identify affected SG by <u>any</u> of the following methods:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1RIA-16/17 readings <input type="checkbox"/> 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) IRIA-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 <u>one</u> 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): <table border="1"><tr><td><input checked="" type="checkbox"/></td><td>Group</td><td>Sample</td></tr><tr><td><input type="checkbox"/></td><td>RP</td><td>CSAE</td></tr><tr><td><input type="checkbox"/></td><td>Primary Chemistry</td><td>RCS</td></tr></table>	<input checked="" type="checkbox"/>	Group	Sample	<input type="checkbox"/>	RP	CSAE	<input type="checkbox"/>	Primary Chemistry	RCS
<input checked="" type="checkbox"/>	Group	Sample								
<input type="checkbox"/>	RP	CSAE								
<input type="checkbox"/>	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) LRIA-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).	<div>1. __ IF OSM desires, THEN stop unit shutdown.</div> <div>2. __ IF unit shutdown is stopped, AND only one confirmation of leak rate (per Step 4.87) has been made, THEN perform the following: <div>A. Notify the following to take a second sample (within 15 minutes of each other, if possible):<table><tr><td><input checked="" type="checkbox"/></td><td>Group</td><td>Sample</td></tr><tr><td><input type="checkbox"/></td><td>RP</td><td>CSAE</td></tr><tr><td><input type="checkbox"/></td><td>Primary Chemistry</td><td>RCS</td></tr></table></div></div> <div>B. __ GO TO Step 4.87.</div> <div>3. __ IF unit shutdown is stopped, THEN GO TO Step 4.16.</div> <div>4. __ GO TO Step 4.93.</div>	<input checked="" type="checkbox"/>	Group	Sample	<input type="checkbox"/>	RP	CSAE	<input type="checkbox"/>	Primary Chemistry	RCS
<input checked="" type="checkbox"/>	Group	Sample								
<input type="checkbox"/>	RP	CSAE								
<input type="checkbox"/>	Primary Chemistry	RCS								
4.93 __ WHEN LPI is providing DHR, THEN dispatch an operator to perform Encl 5.3 (Local SG Isolation) to isolate affected SGs. (12)										

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																														
<p>4.94 Close the following on <u>affected</u> SGs: (12)</p> <table border="1"> <thead> <tr> <th>1A SG</th><th>1B SG</th></tr> </thead> <tbody> <tr><td>1FDW-31</td><td>1FDW-40</td></tr> <tr><td>1FDW-36</td><td>1FDW-45</td></tr> <tr><td>1FDW-38</td><td>1FDW-47</td></tr> <tr><td>1FDW-372</td><td>1FDW-382</td></tr> <tr><td>1MS-79</td><td>1MS-76</td></tr> <tr><td>1MS-24</td><td>1MS-33</td></tr> <tr><td>1MS-35</td><td>1MS-36</td></tr> <tr><td>1MS-82</td><td>1MS-84</td></tr> <tr><td>1FDW-368</td><td>1FDW-369</td></tr> <tr><td>1SD-2</td><td>1SD-5</td></tr> <tr><td>1SD-27</td><td>1SD-290</td></tr> <tr><td>1SD-358</td><td></td></tr> <tr><td>1SD-418</td><td>1SD-420</td></tr> <tr><td>1SD-419</td><td>1SD-421</td></tr> </tbody> </table>	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	
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																														
<p>4.95 — WHEN condenser vacuum is broken, OR in MODE 5, THEN notify RP to stop taking CSAE off-gas samples.</p>																															
<p>4.96 — Notify Primary Chemistry to stop taking non-routine samples as part of their primary to secondary leak rate monitoring program.</p>																															
<p>4.97 — EXIT this procedure.</p>																															

...END...

Resetting 1RIA-40 and OAC Setpoints

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTEXe 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 ft³/min

4. Determine 1RIA-40 High setpoint from the following formulas:

$$\text{1RIA-40 High Setpoint (cpm)} = \frac{\text{High Setpoint (gpd)}}{\text{High Setpoint (gpd)}} \times \frac{\text{RCS (Xe 133eq) activity (}\mu\text{Ci/ml)}}{\text{CSAE flow (ft}^3\text{/min)}} \times \frac{2.71\text{E}+3 \text{ (ft}^3\text{)(day)(cpm)}}{(\text{gal})(\text{min})(\mu\text{Ci/ml})}$$

$$\text{1RIA-40 High Setpoint (cpm)} = \frac{75 \text{ gpd}}{75 \text{ gpd}} \times \frac{288 \mu\text{Ci/ml}}{6.5 \text{ ft}^3\text{/min}} \times \frac{2.71\text{E}+3 \text{ (ft}^3\text{)(day)(cpm)}}{(\text{gal})(\text{min})(\mu\text{Ci/ml})} = 9006 \text{ cpm}$$

5. Determine 1RIA-40 Alert setpoint from the following formulas:

$$\text{1RIA-40 Alert Setpoint (cpm)} = \frac{\text{Alert Setpoint (gpd)}}{\text{Alert Setpoint (gpd)}} \times \frac{\text{RCS (Xe 133eq) activity (}\mu\text{Ci/ml)}}{\text{CSAE flow (ft}^3\text{/min)}} \times \frac{2.71\text{E}+3 \text{ (ft}^3\text{)(day)(cpm)}}{(\text{gal})(\text{min})(\mu\text{Ci/ml})}$$

$$\text{1RIA-40 Alert Setpoint (cpm)} = \frac{30 \text{ gpd}}{30 \text{ gpd}} \times \frac{288 \mu\text{Ci/ml}}{6.5 \text{ ft}^3\text{/min}} \times \frac{2.71\text{E}+3 \text{ (ft}^3\text{)(day)(cpm)}}{(\text{gal})(\text{min})(\mu\text{Ci/ml})} = 3602 \text{ cpm}$$

6. ☐ Enter the new 1RIA-40 Alert and High Setpoints in the RIA View Node.

Enclosure 5.7
Resetting 1RIA-40 and OAC Setpoints

AP/1/A/1700/031
Page 2 of 3

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>7. Enter the new OAC TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT by performing the following:</p> <ul style="list-style-type: none">A. <input type="checkbox"/> Enter MVU.B. <input type="checkbox"/> Select PRI-LEAK PRIMARY TO SECONDARY LEAKAGE MANUAL INPUTS.C. <input type="checkbox"/> Select UPDATE.D. <input type="checkbox"/> Select O1K1430 (TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT).E. <input type="checkbox"/> Enter the new TOTAL PRI TO SEC LEAKRATE ADMIN LIMIT.F. <input type="checkbox"/> Enter your LAN identification and reason for change.G. <input type="checkbox"/> Select SAVE.	
8. <input type="checkbox"/> 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: _____

<p><u>STEP 1:</u> Step 4.3: Depress the "CCW DAM FAILURE" pushbutton.</p> <p><u>STANDARD:</u> The "CCW DAM FAILURE" pushbutton is located by the candidate on 1AB3 and depressed.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> Step 4.4: Dispatch an individual to the area of the dam failure to report damage to the Control Rooms.</p> <p><u>STANDARD:</u> 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.</p> <p><i>Cue: NEO dispatched to the area of the dam failure to report damage to the Control Rooms.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> Step 4.5 GO TO Step 4.45</p> <p><u>STANDARD:</u> The candidate proceeds to Step 4.45 in AP/013.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 4:</u> Step 4.45: Stop <u>all</u> RCPs.</p> <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> Step 4.46: Ensure all CCW pumps are stopped.</p> <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 6:</u> Step 4.47: Ensure 1CCW 1-6 are open.</p> <p><u>STANDARD:</u> The candidate locates 1CCW 1-6 (WATERBOX EMER DISCH) control switch and indications located on 1AB3. The red "OPEN" indication light is verified on.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 7:</u> Step 4.48: Ensure all condenser outlet valves indicate closed (GD AP13):</p> <ul style="list-style-type: none"> • 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) <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 8:</u> Step 4.49: Verify CCW-8 is open.</p> <p><u>STANDARD:</u> CCW-8 switch and indication are located by the candidate on 2AB3 verifying red "OPEN" light illuminated and green "CLOSED" light extinguished.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> Step 4.50: Notify Unit 2 that emergency CCW siphon flow has been established on Unit 1.</p> <p><u>STANDARD:</u> The candidate notifies Unit 2 that emergency CCW siphon flow has been established.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 10:</u> Step 4.51: Dispatch operators to perform Encl 5.2 (CCW Inventory Conservation)</p> <p><u>STANDARD:</u> 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).</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> Step 4.52: IAAT Unit 2 CR has directed Unit 1 to supply CCW recirculation, THEN perform Steps 4.53 – 4.67.</p> <p><u>STANDARD:</u> The candidate determines where or not Unit 2 has directed Unit 1 to supply CCW recirculation.</p> <p>The candidate will proceed to Step 4.53 when informed that Unit 2 directs Unit 1 to supply CCW recirculation.</p> <p><i>CUE: When the candidate reaches Step 4.52 inform the candidate that Unit 2 directs that Unit 1 will supply CCW recirculation.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> Step 4.53: Determine which CCW pump will be started.</p> <p><u>STANDARD:</u> The candidate determines which CCW pump to be started.</p> <p><i>Cue: If asked as the SRO which CCW pump to start, inform candidate to start the 1D CCW pump.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 13:</u> Step 4.54: Place <u>all</u> CCW Pump switches in the trip position:</p> <ul style="list-style-type: none"> • 1A CW Pump • 1B CW Pump • 1C CW Pump • 1D CW Pump <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> Step 4.55: Verify 1A or 1B CCW Pump is to be started.</p> <p><u>STANDARD:</u> 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.</p> <p><i>Cue: Instruct the candidate that the SRO requests that 1D CCW Pump be started.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 15:</u> Step 4.55 RNO: GO TO Step 4.57</p> <p><u>STANDARD:</u> The candidate should proceed to Step 4.57.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 16:</u> Step 4.57: Verify the 1C or 1D CCW Pump is to be started.</p> <p><u>STANDARD:</u> The candidate determines from the direction given by the Procedure Director that 1D CCW Pump is to be started.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 17:</u> Step 4.58 Verify both of the following CCW pump discharge valves are closed:</p> <ul style="list-style-type: none"> • 1CCW-12 • 1CCW-13 <p><u>STANDARD:</u> 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.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 18: Step 4.58 RNO</p> <p>Dispatch an operator to close the discharge valves from the breaker switch (Unit 1 Equipment rm):</p> <table><tr><td>Pump</td><td>Valve</td><td>Breaker</td></tr><tr><td>1C</td><td>1CCW-12</td><td>1XS3-2E</td></tr><tr><td>1D</td><td>1CCW-13</td><td>1XS1-F3C</td></tr></table>	Pump	Valve	Breaker	1C	1CCW-12	1XS3-2E	1D	1CCW-13	1XS1-F3C	<p>___ SAT</p> <p>___ UNSAT</p>
Pump	Valve	Breaker								
1C	1CCW-12	1XS3-2E								
1D	1CCW-13	1XS1-F3C								
<p>STANDARD: The candidate dispatches an operator to Unit 1 Equipment Room to close 1CCW-12.</p> <p>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.</p> <p>Simulator operator: After the candidate has dispatched an operator to Unit 1's Equipment Room, <u>FIRE TIMER #1 TO CLOSE 1CCW-12;</u></p> <p>Cue: Inform the candidate that 1CCW-12 and 1CCW-13 both indicate closed from equipment room.</p> <p>COMMENTS:</p>										
<p>STEP 19: Step 4.59</p> <p>Start the selected CCW Pump.</p> <p>STANDARD: The candidate locates the control switch for 1D CCW Pump on 1AB3 and rotates the control switch to the close position.</p> <p>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.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>									

<p><u>STEP 20:</u> Step 4.60 Verify the started CCW pump discharge valve opened.</p> <p><u>STANDARD:</u> The candidate verifies that 1CCW-13 indicates OPEN with a red light indication. The candidate may verify 1CCW-13 open by OAC indications.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 21:</u> Step 4.61 Verify CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) open.</p> <p><u>STANDARD:</u> 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.</p> <p>The candidate should proceed to step 4.61 RNO.</p> <p>NOTE: CCW-9 will be found CLOSED</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 22:</u> Step 4.61 RNO</p> <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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. <p><u>STANDARD:</u> Locate the control switch for the 1D CCW Pump on 1AB2 and rotate the control switch to the trip position.</p> <p>Notify Security that access to CCW-9 (EMERGENCY CCW DISCHARGE TO INTAKE) is required</p> <p>Dispatch an operator to obtain the CCW-9 IRW Gate Key from the Security box in the Unit 3 Control Room Storage area.</p> <p>The operator, along with Security, proceeds between the Protected Area fences in order to open CCW-9</p> <p>Note: When an operator is dispatched to obtain the CCW-9 IRW Gate Key and is instructed to open CCW-9, END TASK.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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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.

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No AP/1/A/1700/ 013Revision 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 McMunay (QR) Date 10/22/02Cross-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 Don B. Galt 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 _____

3) Procedure Completion Approved _____

(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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AP/1/A/1700/013

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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 <u>only one</u> 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 <u>all</u> RCPs.	
4.8 Dispatch an operator to open the following valve(s) on <u>all</u> 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 <input type="checkbox"/> Verify 3CCW-93 is closed.	<input type="checkbox"/> Ensure 3CCW-93 throttled.
4.13 <input type="checkbox"/> Close CCW-8.	
4.14 Ensure the following: <input type="checkbox"/> 1CCW 1-6 are closed. <input type="checkbox"/> 1CCW 1-6 switch in PULL TO LOCK.	
4.15 Notify Unit 2 to ensure the following: <input type="checkbox"/> 2CCW-7 is closed. <input type="checkbox"/> 2CCW-7 switch in PULL TO LOCK.	
4.16 Notify Unit 3 to ensure the following: <input type="checkbox"/> 3CCW-93 is closed. <input type="checkbox"/> 3CCW-93 switch in PULL TO LOCK.	
4.17 <input type="checkbox"/> 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: <input type="checkbox"/> 1A ESV PUMP <input type="checkbox"/> 1C ESV PUMP <input type="checkbox"/> 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: <input type="checkbox"/> A HPSW PUMP <input type="checkbox"/> B HPSW PUMP	
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>4.20 <u>IAAT</u> any of the following is full open:</p> <ul style="list-style-type: none"> • HPSW-900 (B HDR SIPHON SEAL WATER (SSW) SYSTEM CONN) • HPSW-901 (A HDR SIPHON SEAL WATER (SSW) SYSTEM CONN), <p>THEN perform Steps 4.21 - 4.23.</p>	<p>GO TO Step 4.24.</p>
<p>4.21 Ensure the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT in DISABLE.</p>	
<p>4.22 Stop the following pumps:</p> <ul style="list-style-type: none"> <u>A</u> LPSW PUMP <u>B</u> LPSW PUMP <u>C</u> LPSW PUMP 	
<p style="text-align: center;">NOTE</p> <p>The intent is to maintain adequate cooling water inventory while preventing loss through the EWST overflow.</p>	
<p>4.23 Maintain EWST level >70,000 gallons and < OVERFLOW by cycling HPSW JOCKEY PUMP as necessary.</p>	
<p>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).</p>	

IF AT ANY TIME:

(REPLACES) LOW RECOVERY

(REPLACES) HIGH RECOVERY

- (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										
<p style="text-align: center;">NOTE</p> <p>Similar instructions are provided in Unit 2 and 3 procedures. The same operator should be used for these tasks.</p>											
<p>4.25 ___ Ensure an operator has been dispatched to the CCW Intake.</p>											
<p>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)</p> <table border="1"> <thead> <tr> <th></th><th>CCW Pump</th></tr> </thead> <tbody> <tr> <td></td><td>1A</td></tr> <tr> <td></td><td>1B</td></tr> <tr> <td></td><td>1C</td></tr> <tr> <td></td><td>1D</td></tr> </tbody> </table>		CCW Pump		1A		1B		1C		1D	
	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 <u>all</u> the following exist: <ul style="list-style-type: none"> • 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 <u>one</u> 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
<input checked="" type="checkbox"/>	1A
<input type="checkbox"/>	1B
<input type="checkbox"/>	1C
<input type="checkbox"/>	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																					
<p>4.31 <input type="checkbox"/> Place the CCW Pump switches in the trip position:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>CCW Pump</td></tr><tr><td><input type="checkbox"/></td><td>1A</td></tr><tr><td><input type="checkbox"/></td><td>1B</td></tr><tr><td><input type="checkbox"/></td><td>1C</td></tr><tr><td><input type="checkbox"/></td><td>1D</td></tr></table>	<input checked="" type="checkbox"/>	CCW Pump	<input type="checkbox"/>	1A	<input type="checkbox"/>	1B	<input type="checkbox"/>	1C	<input type="checkbox"/>	1D												
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<input type="checkbox"/>	1D																					
<p>4.32 <input type="checkbox"/> Verify the 1A or 1B CCW Pump is to be started.</p>	<p><input type="checkbox"/> GO TO Step 4.34.</p>																					
<p>4.33 <input type="checkbox"/> Verify both of the following CCW pump discharge valves are closed: (5).</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td></tr><tr><td>1A</td><td><input type="checkbox"/></td><td>1CCW-10</td></tr><tr><td>1B</td><td><input type="checkbox"/></td><td>1CCW-11</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	1A	<input type="checkbox"/>	1CCW-10	1B	<input type="checkbox"/>	1CCW-11	<p><input type="checkbox"/> Dispatch an operator to close the discharge valves from the breaker switch (Unit 1 Equipment rm):</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td><td>Breaker</td></tr><tr><td>1A</td><td><input type="checkbox"/></td><td>1CCW-10</td><td>1XS1-F2C</td></tr><tr><td>1B</td><td><input type="checkbox"/></td><td>1CCW-11</td><td>1XS2-F2D</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	Breaker	1A	<input type="checkbox"/>	1CCW-10	1XS1-F2C	1B	<input type="checkbox"/>	1CCW-11	1XS2-F2D
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Pump	<input checked="" type="checkbox"/>	Valve																				
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1D	<input type="checkbox"/>	1CCW-13																				
Pump	<input checked="" type="checkbox"/>	Valve	Breaker																			
1C	<input type="checkbox"/>	1CCW-12	1XS3-2E																			
1D	<input type="checkbox"/>	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 $\leq 775'$ {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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CONFIDENTIAL - FOR EYES ONLY

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">CAUTION</p> <p>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.</p>	
4.45 <input type="checkbox"/> Stop <u>all</u> RCPs.	
4.46 <input type="checkbox"/> Ensure <u>all</u> CCW pumps are stopped.	
4.47 <input type="checkbox"/> Ensure 1CCW 1-6 are open.	
4.48 Ensure <u>all</u> condenser outlet valves indicate closed (GD AP13): <ul style="list-style-type: none"> <input type="checkbox"/> O1D0273 (1CCW-20 CONDENSER 1A OUTLET 1) <input type="checkbox"/> O1D0275 (1CCW-21 CONDENSER 1A OUTLET 2) <input type="checkbox"/> O1D0277 (1CCW-22 CONDENSER 1B OUTLET 1) <input type="checkbox"/> O1D0279 (1CCW-23 CONDENSER 1B OUTLET 2) <input type="checkbox"/> O1D0281 (1CCW-24 CONDENSER 1C OUTLET 1) <input type="checkbox"/> O1D0283 (1CCW-25 CONDENSER 1C OUTLET 2) 	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED										
<p align="center"><u>NOTE</u></p> <p>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.</p>											
<p>4.49 __ Verify CCW-8 is open.</p>	<p>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.</p> <p>2. __ GO TO Step 4.51.</p>										
<p>4.50 __ Notify Unit 2 that emergency CCW siphon flow has been established on Unit 1.</p>											
<p>4.51 __ Dispatch operators to perform Encl 5.2 (CCW Inventory Conservation).</p>											
<p align="center"><u>NOTE</u></p> <p>Unit 2 CR will decide which unit will establish CCW recirculation. Unit 1 will only supply CCW recirculation when directed by Unit 2.</p>											
<p>4.52 __ IAAT Unit 2 CR has directed Unit 1 to supply CCW recirculation, THEN perform Steps 4.53 - 4.67 to start <u>one</u> CCW Pump and establish recirculation.</p>	<p>__ GO TO Step 4.68.</p>										
<p align="center"><u>NOTE</u></p> <ul style="list-style-type: none"> 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. 											
<p>4.53 __ Determine which CCW Pump will be started.</p> <table border="1"> <thead> <tr> <th><input checked="" type="checkbox"/></th> <th>CCW Pump</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>1A</td> </tr> <tr> <td><input type="checkbox"/></td> <td>1B</td> </tr> <tr> <td><input type="checkbox"/></td> <td>1C</td> </tr> <tr> <td><input type="checkbox"/></td> <td>1D</td> </tr> </tbody> </table>	<input checked="" type="checkbox"/>	CCW Pump	<input type="checkbox"/>	1A	<input type="checkbox"/>	1B	<input type="checkbox"/>	1C	<input type="checkbox"/>	1D	
<input checked="" type="checkbox"/>	CCW Pump										
<input type="checkbox"/>	1A										
<input type="checkbox"/>	1B										
<input type="checkbox"/>	1C										
<input type="checkbox"/>	1D										

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																					
<p>4.54 <input type="checkbox"/> Place <u>all</u> CCW Pump switches in the trip position:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>CCW Pump</td></tr><tr><td><input type="checkbox"/></td><td>1A</td></tr><tr><td><input type="checkbox"/></td><td>1B</td></tr><tr><td><input type="checkbox"/></td><td>1C</td></tr><tr><td><input type="checkbox"/></td><td>1D</td></tr></table>	<input checked="" type="checkbox"/>	CCW Pump	<input type="checkbox"/>	1A	<input type="checkbox"/>	1B	<input type="checkbox"/>	1C	<input type="checkbox"/>	1D												
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<input type="checkbox"/>	1A																					
<input type="checkbox"/>	1B																					
<input type="checkbox"/>	1C																					
<input type="checkbox"/>	1D																					
<p>4.55 <input type="checkbox"/> Verify the 1A or 1B CCW Pump is to be started.</p>	<p><input type="checkbox"/> GO TO Step 4.57.</p>																					
<p>4.56 <input type="checkbox"/> Verify both of the following CCW pump discharge valves are closed: (5).</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td></tr><tr><td>1A</td><td><input type="checkbox"/></td><td>1CCW-10</td></tr><tr><td>1B</td><td><input type="checkbox"/></td><td>1CCW-11</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	1A	<input type="checkbox"/>	1CCW-10	1B	<input type="checkbox"/>	1CCW-11	<p><input type="checkbox"/> Locally close the discharge valves from the breaker switch (Unit 1 Equipment rm):</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td><td>Breaker</td></tr><tr><td>1A</td><td><input type="checkbox"/></td><td>1CCW-10</td><td>1XS1-F2C</td></tr><tr><td>1B</td><td><input type="checkbox"/></td><td>1CCW-11</td><td>1XS2-F2D</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	Breaker	1A	<input type="checkbox"/>	1CCW-10	1XS1-F2C	1B	<input type="checkbox"/>	1CCW-11	1XS2-F2D
Pump	<input checked="" type="checkbox"/>	Valve																				
1A	<input type="checkbox"/>	1CCW-10																				
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1B	<input type="checkbox"/>	1CCW-11	1XS2-F2D																			
<p>4.57 <input type="checkbox"/> Verify the 1C or 1D CCW Pump is to be started.</p>	<p><input type="checkbox"/> GO TO Step 4.59.</p>																					
<p>4.58 <input type="checkbox"/> Verify both of the following CCW pump discharge valves are closed: (5).</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td></tr><tr><td>1C</td><td><input type="checkbox"/></td><td>1CCW-12</td></tr><tr><td>1D</td><td><input type="checkbox"/></td><td>1CCW-13</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	1C	<input type="checkbox"/>	1CCW-12	1D	<input type="checkbox"/>	1CCW-13	<p><input type="checkbox"/> Locally close the discharge valves from the breaker switch (Unit 1 Equipment rm):</p> <table><tr><td>Pump</td><td><input checked="" type="checkbox"/></td><td>Valve</td><td>Breaker</td></tr><tr><td>1C</td><td><input type="checkbox"/></td><td>1CCW-12</td><td>1XS3-2E</td></tr><tr><td>1D</td><td><input type="checkbox"/></td><td>1CCW-13</td><td>1XS1-F3C</td></tr></table>	Pump	<input checked="" type="checkbox"/>	Valve	Breaker	1C	<input type="checkbox"/>	1CCW-12	1XS3-2E	1D	<input type="checkbox"/>	1CCW-13	1XS1-F3C
Pump	<input checked="" type="checkbox"/>	Valve																				
1C	<input type="checkbox"/>	1CCW-12																				
1D	<input type="checkbox"/>	1CCW-13																				
Pump	<input checked="" type="checkbox"/>	Valve	Breaker																			
1C	<input type="checkbox"/>	1CCW-12	1XS3-2E																			
1D	<input type="checkbox"/>	1CCW-13	1XS1-F3C																			

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">NOTE</p> <p>CCW pump amps and temperatures will read higher than normal when started with this plant configuration. CCWP motor stator temperature limit is 284°F.</p>	
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 <u>all</u> stopped CCW pumps are closed: <table border="1"> <thead> <tr> <th>CCW Pump</th><th>Valve</th></tr> </thead> <tbody> <tr> <td>1A</td><td>1CCW-10</td></tr> <tr> <td>1B</td><td>1CCW-11</td></tr> <tr> <td>1C</td><td>1CCW-12</td></tr> <tr> <td>1D</td><td>1CCW-13</td></tr> </tbody> </table>	CCW Pump	Valve	1A	1CCW-10	1B	1CCW-11	1C	1CCW-12	1D	1CCW-13	
CCW Pump	Valve										
1A	1CCW-10										
1B	1CCW-11										
1C	1CCW-12										
1D	1CCW-13										
4.65 __ Notify Unit 2 and Unit 3 to ensure <u>all</u> Unit 2 and Unit 3 CCW pump discharge valves are closed.											

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
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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 all 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):

<input checked="" type="checkbox"/>	Valve	Breaker
<input type="checkbox"/>	1CCW-10	1XS1-F2C
<input type="checkbox"/>	1CCW-13	1XS1-F3C
<input type="checkbox"/>	1CCW-11	1XS2-F2D
<input type="checkbox"/>	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 MDEFDWP4.72 ☐ 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 MDEFDWP.	
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 \approx atmospheric.

INITIATING CUES:

The BOP directs you perform Enclosure 5.10 (Station ASW Pump Alignment) of the EOP.

START TIME: _____

<p>STEP 1: Step 1 Obtain racking equipment <u>and</u> pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby).</p> <p>STANDARD: Candidate locates equipment locker and indicates they would open locker and obtain the racking equipment and pipe wrench.</p> <p>Note: For this JPM the equipment locker should not be opened.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Step 2 Open CCW-99 (Aux. Service Water Pump Suction)</p> <p>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".</p> <p>Cue: Indicate CCW-99 valve position indicator indicates, "open".</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 3: Step 3 Open CCW-247 (Aux. Service Water Pump Recirc.).</p> <p>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.</p> <p>Cue: Indicate CCW-247 open (rising stem) and at the hard stop.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 4:</u> Step 4 Open CCW-308 (Aux. Service Water Pump Vent.).</p> <p><u>STANDARD:</u> Candidate locates and opens CCW-308 (Aux. Service Water Pump Vent). Candidate should indicate they would use a wrench to remove the pipe plug.</p> <p><i>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.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> Step 5 WHEN <u>all</u> air is vented from Station ASW Pump, THEN close CCW-308.</p> <p><u>STANDARD:</u> Candidate locates and closes CCW-308 (Aux. Service Water Pump Vent).</p> <p><i>Cue: Indicate that a solid stream of water is issuing out of the vent.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 6:</u> Don protective equipment</p> <p><u>STANDARD:</u> Candidate dons the appropriate personal protective equipment prior to operation of any electrical breaker rated 400 VAC and above:</p> <ul style="list-style-type: none"> • Safety glasses • Face shield • Hard hat • Rubber gloves with leather protectors • Flame-resistant clothing <p>Note: This step should be simulated and discussed, at the discretion of the examiner. This is the equipment obtained in step 1.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7:</u> Step 6 Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6).</p> <p><u>STANDARD:</u> Candidate locates breaker and opens shutter door, inserts 600V rack out tool, and rotates tool clockwise to rack breaker in.</p> <p><i>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.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 8: Step 7 Ensure closed ASW SWGR FDR (ASW SWGR FDR FROM B1T-UNIT10) (ASW SWGR 600V LOAD CENTER Unit 5)</p> <p>STANDARD: Candidate locates the ASW SWGR FDR control switch and rotates it to the CLOSE direction.</p> <p>RED Closed lamp is observed to be illuminated OR Breaker position flag is observed to indicate Closed.</p> <p>CUE: <i>Indicate to candidate that the 4160V Feeder Breaker for the "AUX SER WTR SWGR TRANSFORMER" red light is lit.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 9: Step 8 WHEN notified that Standby Bus #1 is energized, THEN perform the following (ASW SWGR 600V LOAD CENTER Unit 5):</p> <ul style="list-style-type: none"> • Ensure closed ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR). • Start Station ASW Pump using the control switch STATION ASW PUMP SW. <p>STANDARD: Candidate locates the ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR) Breaker control switch and rotates it to the CLOSE direction.</p> <p>RED Closed lamp is observed to be illuminated OR Breaker position flag is observed to indicate Closed.</p> <p>Candidate locates AUX SERVICE WATER PUMP MOTOR control switch and rotates switch to the CLOSE position.</p> <p>CUE: <i>Indicate to candidate that Standby Bus #1 is energized.</i></p> <p>CUE: <i>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.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 12:</u> Step 9 Close CCW-309 (Aux Service Water Pump Disch Drain) (12' West of ASW Pump).</p> <p><u>STANDARD:</u> 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.</p> <p><i>Cue: Indicate CCW-309 closed and at the hard stop.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> Step 10 Open CCW-101 (Aux Service Water Pump Discharge).</p> <p><u>STANDARD:</u> 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.</p> <p><i>Cue: Indicate CCW-101 open (rising stem valve) and at a hard stop.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> Step 11 Verify Turbine Building flood is NOT in progress.</p> <p><u>STANDARD:</u> Candidate determines that a Turbine Building flood is NOT in progress.</p> <p><i>Cue: Indicate that a Turbine Building flood is NOT in progress.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 15:</u> Step 12 Notify CRO that Station ASW Pump is operating.</p> <p><u>STANDARD:</u> Using either the phone or a radio inform the CRO is that Station ASW Pump is operating.</p> <p><u>COMMENTS:</u></p> <p style="text-align: right;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>
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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 \approx atmospheric.

INITIATING CUES:

The BOP directs you perform Enclosure 5.10 (Station ASW Pump Alignment) of the EOP.

Enclosure 5.10
Station ASW Pump Alignment

EP/1/A/1800/001
Page 1 of 3
CHG 3DI
ENTIRE
ENCL

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">NOTE</p> <p><u>All</u> equipment operated in the following steps is located in A-1-128, ASW Pump Rm.</p>	
1. <input type="checkbox"/> Obtain racking equipment and pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby).	
2. <input type="checkbox"/> Open CCW-99 (AUX. SERVICE WATER PUMP SUCTION).	
3. <input type="checkbox"/> Open CCW-247 (AUX. SERVICE WATER PUMP RECIRC).	
4. <input type="checkbox"/> Open CCW-308 (AUX. SERVICE WATER PUMP VENT).	
5. <input type="checkbox"/> <u>WHEN</u> all air is vented from Station ASW Pump, <u>THEN</u> close CCW-308.	
6. <input type="checkbox"/> Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6).	
7. <input type="checkbox"/> Ensure closed ASW SWGR FDR (ASW SWGR FDR FROM BIT- UNIT 10) (ASW SWGR 600V LOAD CENTER Unit 5).	
8. <input type="checkbox"/> <u>WHEN</u> notified that Standby Bus #1 is energized, <u>THEN</u> perform the following (ASW SWGR 600V LOAD CENTER Unit 5): A. <input type="checkbox"/> Ensure closed ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FDR). B. <input type="checkbox"/> Start Station ASW Pump using the control switch STATION ASW PUMP SW.	
9. <input type="checkbox"/> Close CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	

Enclosure 5.10
Station ASW Pump Alignment

EP/1/A/1800/001
Page 3 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <input type="checkbox"/> Open CCW-101 (AUX SERVICE WATER PUMP DISCHARGE).	
11. <input type="checkbox"/> Verify Turbine Building flood is NOT in progress.	1. <input type="checkbox"/> Notify <u>all</u> Control Rooms that Station ASW Pump is operating. 2. <input type="checkbox"/> GO TO Step 13.
12. <input type="checkbox"/> Notify CRO that Station ASW Pump is operating.	
13. <input type="checkbox"/> WHEN Station ASW Pump is no longer needed in Unit 1, THEN continue in this enclosure.	
14. Verify <u>all</u> the following conditions exist: <input type="checkbox"/> Station ASW Pump is NOT supplying SGs in <u>any</u> other unit. <input type="checkbox"/> Station ASW Pump is NOT needed to supply HPI pump motor coolers in <u>any</u> unit.	<input type="checkbox"/> GO TO Step 19.
15. <input type="checkbox"/> Stop Station ASW Pump using the control switch STATION ASW PUMP SW (ASW SWGR 600V LOAD CENTER Unit 5).	
16. Close the following: <input type="checkbox"/> CCW-99 (AUX. SERVICE WATER PUMP SUCTION) <input type="checkbox"/> CCW-101 (AUX. SERVICE WATER PUMP DISCHARGE) <input type="checkbox"/> CCW-247 (AUX. SERVICE WATER PUMP RECIRC)	
17. <input type="checkbox"/> Open CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	
18. <input type="checkbox"/> Rack out ASWS-6B (STATION ASW PUMP BKR) (ASW SWGR 600V LOAD CENTER Unit 6).	
19. <input type="checkbox"/> 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

<p><u>STEP 3:</u> Step 4.3</p> <p>Verify a Licensed Operator staged in SSF to perform AP/25 (SSF EOP). (PS)</p> <p><u>STANDARD:</u> Determine that SSF Operator has NOT been staged. Continue to RNO for Step 4.3</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> Step 4.3 RNO</p> <p>1. Obtain the following items:</p> <ul style="list-style-type: none"> • Vital area access keyring • Flashlight <p>2. Proceed to SSF HVAC Room.</p> <p>3. GO TO Step 4.5</p> <p><u>STANDARD:</u> Candidate proceeds to supply room and identifies the location of the dedicated flashlight and the required keys to be carried to the SSF.</p> <p>Candidate proceeds to the SSF with the AP.</p> <p>GO TO Step 4.5</p> <p><i>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.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 5: Step 4.5</p> <p>Perform the following on the affected unit:</p> <p>Open 2XSF-F5A (3, 2, 1XSF NORM INCOMING FDR BKR FROM 2X8-5B) and remove Kirk Key</p> <p>Using the Kirk Key, close 2XSF-F3A (2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5A, 5B, or 5C)</p> <p>STANDARD: NORMAL INCOMING FDR BKR is opened by rotating breaker switch to the OFF position and removing Kirk Key.</p> <ul style="list-style-type: none"> • Compartment 5A on the affected unit's XSF MCC: • 2XSF <p>ALTERNATE INCOMING FDR BKR is closed in by inserting Kirk Key and rotating breaker switch to the ON position.</p> <ul style="list-style-type: none"> • Compartment 3A on the affected unit's XSF MCC: • 2XSF <p>Continue to Step 4.6</p> <p>NOTE: Kirk Key must be rotated ½ turn to be removed.</p> <p>CUE: As operator performs the key/breaker operation, indicate to operator the appropriate component positions.</p> <p>NOTE: Step 5 will power the SSF Systems from OXSF. Power supply for 600V MCC 2XSF, located in HVAC Room.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: Step 4.6</p> <p>Press DIESEL EMERGENCY START pushbutton.</p> <p>STANDARD: The SSF Control Room DIESEL EMERGENCY START pushbutton is pressed.</p> <p>Continue to Step 4.7</p> <p>CUE: Allow ~ 12 sec for the D/G to reach rated speed.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 7:</u> Step 4.7 Verify D/G frequency 59.8 - 60.2 Hz.</p> <p><u>STANDARD:</u> The D/G HERTZ meter is monitored to determine frequency is low. Continue to Step 4.7 RNO.</p> <p><i>CUE: Indicate D/G frequency is 57 Hertz on the SSF Control Room D/G HERTZ meter.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 8:</u> Step 4.7 RNO Adjust GOVERNOR CONTROL to obtain D/G frequency 59.8 - 60.2.</p> <p><u>STANDARD:</u> The GOVERNOR CONTROL is used to raise D/G frequency to between 59.8 - 60.2. Continue to Step 4.8.</p> <p><i>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.</i></p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 9:</u> Step 4.8 Verify D/G voltage 4100 - 4200V.</p> <p><u>STANDARD:</u> The D/G AC VOLTS meter is monitored to determine voltage. Continue to step 4.9</p> <p><i>CUE: Indicate D/G voltage is 4160 volts on the SSF Control Room D/G AC VOLTS meter.</i></p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10:</u> Step 4.9 Verify SSF D/G operating.</p> <p><u>STANDARD:</u> Acknowledges successful completion of previous steps indicates SSF D/G is operating. Continue to Step 4.10</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 11: Step 4.10</p> <p>Open breaker OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T).</p> <p>STANDARD: TRIP pushbutton on the SSF OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) control switch is pressed.</p> <p>Continue to Step 4.11</p> <p>Cue: <i>Inform student that the green light for OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) is on and the red light is off.</i></p> <p>Note: <u>FOR UNIT 2 ONLY:</u> On a loss of power to Unit 2, OTS1-1 would have already tripped open.</p> <p>Note: Steps 4.10 – 4.12 will Align the D/G to supply the SSF loads.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 12: Step 4.11</p> <p>WHEN 3 seconds have elapsed, THEN close breaker OTS1-4 (DIESEL GEN BREAKER).</p> <p>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.</p> <p>Continue to Step 4.12</p> <p>CUE: <i>After student closes in diesel generator breaker, inform him/her that red light is on and green light is off.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 13: Step 4.12</p> <p>Ensure the following breakers are closed:</p> <ul style="list-style-type: none">• OTS1-3 (SSF 600V OXSF FDR BKR CONTROL)• OXSF-4B (SSF LC OXSF 600V INC BKR) <p>STANDARD: Red CLOSE breaker position indicating light is observed to be ON at the SSF OTS1-3 (SSF 600V OXSF FDR BKR CONTROL) switch.</p> <p>CUE: <i>Inform student the red light is on and the green light is off.</i></p> <p>Red CLOSE breaker position indicating light is observed to be ON at the (SSF OXSF-4B SSF LC OXSF 600V INC BKR) switch.</p> <p>CUE: <i>Inform student the red light is on and the green light is off.</i></p> <p>COMMENTS:</p> <p style="text-align: center;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>
---	---------------------------------

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/TPP
Sim (3)
SR
Brief
115
HLP
SSF
NRC

TRN

NSD 703 (R04-01)

Duke Power Company

(1) ID No AP/0/A/1700/025

PROCEDURE PROCESS RECORD

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. Stalder (QR) Date 11/4/02
Cross-Disciplinary Review By _____ (QR) NA DP Date _____
Reactivity Mgmt Review By _____ (QR) NA DP Date _____
Mgmt Involvement Review By _____ (Ops Supt) NA DP 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 D. B. Coe Date 11/16/02

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

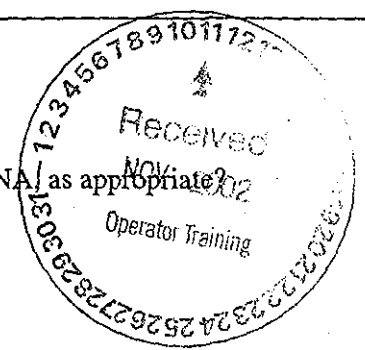
(12) Procedure Completion Verification:

- ☐ 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)



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																				
<p align="center">NOTE</p> <ul style="list-style-type: none"> 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. 																					
<p>4.1 Determine which SSF systems are required:</p> <table border="1"> <thead> <tr> <th>✓ U1</th><th>✓ U2</th><th>✓ U3</th><th>SSF System</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td>SSF RCMU</td></tr> <tr> <td></td><td></td><td></td><td>SSF ASW feed</td></tr> </tbody> </table>	✓ U1	✓ U2	✓ U3	SSF System				SSF RCMU				SSF ASW feed									
✓ U1	✓ U2	✓ U3	SSF System																		
			SSF RCMU																		
			SSF ASW feed																		
<p>4.2 Ensure <u>all</u> RCPs on <u>affected</u> Units are off:</p> <table border="1"> <thead> <tr> <th>✓ U1</th><th>✓ U2</th><th>✓ U3</th><th>RCPs</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td>A1</td></tr> <tr> <td></td><td></td><td></td><td>B1</td></tr> <tr> <td></td><td></td><td></td><td>A2</td></tr> <tr> <td></td><td></td><td></td><td>B2</td></tr> </tbody> </table>	✓ U1	✓ U2	✓ U3	RCPs				A1				B1				A2				B2	
✓ U1	✓ U2	✓ U3	RCPs																		
			A1																		
			B1																		
			A2																		
			B2																		
<p>4.3 ___ Verify a Licensed Operator staged in SSF to perform AP/25 (SSF EOP). (PS)</p>	<p>1. ___ Obtain the following items:</p> <ul style="list-style-type: none"> • Vital area access keyring • Flashlight <p>2. ___ Proceed to SSF HVAC Room.</p> <p>3. ___ GO TO Step 4.5.</p>																				
<p align="center">NOTE</p> <p>After the following notification, NO further actions of this procedure are required in the Unit CRs unless directed by the SSF operator.</p>																					
<p>4.4 Notify the SSF operator of the following (SSF CR x-2766):</p> <p>___ Required SSF systems identified in Step 4.1</p> <p>___ To continue this procedure at Step 4.5</p>																					

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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 <u>affected</u> 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 \approx 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
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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
<p>4.21 <input type="checkbox"/> IAAT SSF Control Room temperature exceeds 85°F, THEN perform <u>one</u> of the following:</p> <p><input type="checkbox"/> Notify TSC to install portable spot coolers.</p> <p>OR</p> <p><input type="checkbox"/> Remove power from SSF Security Computer as follows:</p> <p>A. <input type="checkbox"/> Notify Security that power will be removed from SSF Security Computer.</p> <p>B. <input type="checkbox"/> Notify Local Information Technology (LIT) to remove power from SSF Security Computer to reduce heat load.</p>	
<p>4.22 Notify CRO from each <u>affected</u> unit to perform the following as appropriate:</p> <p><input type="checkbox"/> Encl 5.3A (Unit 1 Control Room Enclosure)</p> <p><input type="checkbox"/> Encl 5.3B (Unit 2 Control Room Enclosure)</p> <p><input type="checkbox"/> Encl 5.3C (Unit 3 Control Room Enclosure)</p>	
<p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> • 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. 	
<p>4.23 <input type="checkbox"/> 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.</p>	

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												
<div>NOTE</div> <ul style="list-style-type: none">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 <u>both</u> forced and gravity/siphon flow on the Unit 2 CCW System.													
4.24 __ IAAT <u>both</u> 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 <u>install</u> 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 <u>and</u> 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: <table><tr><th>✓</th><th>U-2 CCW Piping</th><th>Method</th></tr><tr><td></td><td>Intact</td><td>Cross-connect with Unit 1 or 3 with forced or siphon flow</td></tr><tr><td></td><td>Intact</td><td>Encl 5.5 (Supply of Water to SSF)</td></tr><tr><td></td><td>Not Intact or Questionable</td><td>Alternate method determined by TSC</td></tr></table>	✓	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
✓	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 <u>all</u> 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

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/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: _____

<div> <p>NOTE</p> </div> <div> <p>The "Low Water Level" light should light for 4 seconds and then go off.</p> </div> <div> <p>STEP 1: Step 1 Position the "POWER" Toggle Switch to ON.</p> </div> <div> <p>STANDARD: The "POWER" Toggle Switch is located and pushed up to the ON position.</p> </div> <div> <p>Cue: Indicate that the "Low Water Level" light is on for 4 seconds and then goes off.</p> </div> <div> <p>COMMENTS:</p> </div>	<div> <p>CRITICAL STEP</p> </div> <div> <p>___ SAT</p> </div> <div> <p>___ UNSAT</p> </div>
<div> <p>STEP 2: Step 2 Press and HOLD the "SAFETY CIRCUIT BYPASS" button for 10 - 15 seconds).</p> </div> <div> <p>STANDARD: Operator locates and presses the "SAFETY CIRCUIT BYPASS" button, holding it for 10 - 15 seconds.</p> </div> <div> <p>COMMENTS:</p> </div>	<div> <p>___ SAT</p> </div> <div> <p>___ UNSAT</p> </div>
<div> <p>STEP 3: Step 3 While holding the "SAFETY CIRCUIT BYPASS" button, depress the START button to start the engine.</p> </div> <div> <p>STANDARD: While continuing to hold the "SAFETY CIRCUIT BYPASS" button, the operator locates and presses the START button.</p> </div> <div> <p>CUE: After the buttons are pressed, inform the candidate that the diesel has started.</p> </div> <div> <p>COMMENTS:</p> </div>	<div> <p>CRITICAL STEP</p> </div> <div> <p>___ SAT</p> </div> <div> <p>___ UNSAT</p> </div>

<p>STEP 4: Step 4 WHEN engine starts, THEN release the start button.</p> <p>STANDARD: The candidate releases the START button when the engine starts.</p> <p>CUE: <i>Indicate to the operator that engine has started.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 5: Step 5 WHEN ENGINE OIL PRESSURE reaches 20 psig THEN release the SAFETY CIRCUIT BYPASS button.</p> <p>STANDARD: Candidate should determine that ENGINE OIL PRESSURE is 20 psig and then release the SAFETY CIRCUIT BYPASS button.</p> <p>CUE: <i>Indicate to the operator that ENGINE OIL PRESSURE is 20 psig.</i></p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: Step 6 Push the "SERVICE AIR PUSH AFTER WARM-UP" button to allow the compressor to fully load.</p> <p>STANDARD: The "SERVICE AIR PUSH AFTER WARM-UP" button is LOCATED on the Control Panel, and is DEPRESSED.</p> <p>CUE: <i>Inform operator that the "SERVICE AIR PUSH AFTER WARM-UP" button is depressed.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p>STEP 7: Step 7 Open SA-2797 (SA BLOCK VALVE) (North side of compressor below the control panel)</p> <p>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.</p> <p>CUE: <i>Inform operator that lever is parallel with service air line.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: Step 8 OPEN SA-339 (DIESEL AIR COMPRESSOR TIE) (T-3/F/G-56)</p> <p>STANDARD: Compressor is aligned to Service Air Header by rotating SA-339 (Diesel Air Compressor Tie) T-handle until parallel with pipe.</p> <p>CUE: <i>Inform operator that lever is parallel with service air line.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 10: Step 10 OPEN SA-143 (SA TO IA CONTROLLER BYPASS) (T-1/L-33, 15' E)</p> <p>STANDARD: Valve is located and manually opened by rotating valve Counter-clockwise to the hard stop.</p> <p>Cue: <i>After the operator indicates that he will open SA-143, inform operator that valve is at the hard stop.</i></p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 11:</u> Notify Unit 2 CR that the Diesel Air Compressor is operating.</p> <p><u>STANDARD:</u> Unit 2 CR is notified that the Diesel Air Compressor is operating using a phone or radio.</p> <p><i>Cue: Inform candidate that the Unit 2 CR has been notified that the Diesel Air Compressor is operating.</i></p> <p><u>COMMENTS:</u></p> <p style="text-align: right;">END TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>
--	---------------------------------

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}

AP/2/A/1700/022

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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).	

Enclosure 5.4
Emergency Start of the
Diesel Air Compressor (3)

AP/2/A/1700/022

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Enclosure 5.4
Emergency Start of the
Diesel Air Compressor {3}

AP/2/A/1700/022

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED												
<p style="text-align: center;">NOTE</p> <p>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.</p>													
<p>9. <input type="checkbox"/> Open SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 15' E).</p>													
<p>10. <input type="checkbox"/> Notify Unit 2 CR that the Diesel Air Compressor is operating.</p>													
<p>11. <input type="checkbox"/> Periodically monitor compressor parameters and associated lamps:</p> <table border="1"> <thead> <tr> <th>Parameter</th><th>Range</th></tr> </thead> <tbody> <tr> <td>ENGINE TACHOMETER</td><td>No Load ≈ 1200 rpm Full Load ≈ 1800 rpm</td></tr> <tr> <td>ENGINE WATER TEMPERATURE</td><td>Max 200°F</td></tr> <tr> <td>DISCHARGE AIR TEMPERATURE</td><td>Max 220°F</td></tr> <tr> <td>COMPRESSOR DISCHARGE PRESSURE</td><td>Min 75 psig (with compressor loaded)</td></tr> <tr> <td>ENGINE OIL PRESSURE</td><td>Min 20 psig Normal ≈ 35 - 60 psig</td></tr> </tbody> </table>	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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Enclosure 5.4
Emergency Start of the
Diesel Air Compressor (3)

AP/2/A/1700/022

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Enclosure 5.4
Emergency Start of the
Diesel Air Compressor {3}

AP/2/A/1700/022

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. <input type="checkbox"/> WHEN directed by CR to secure the Diesel Air Compressor, THEN perform the following: A. <input type="checkbox"/> Close SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 15' E). B. <input type="checkbox"/> Close SA-339 (DIESEL AIR COMPRESSOR TIE) (T-3/F/G-56). C. <input type="checkbox"/> Close SA-2797 (PORTABLE DIESEL AIR COMPRESSOR BLOCK) (North side of the compressor below the control panel). D. <input type="checkbox"/> Allow engine to idle for 5 minutes. E. <input type="checkbox"/> Position IGNITION toggle switch to OFF. F. <input type="checkbox"/> Replenish operating fluids as required.	
13. <input type="checkbox"/> Notify Unit 2 CR that the Diesel Air Compressor is shutdown.	
14. <input type="checkbox"/> EXIT this enclosure.	

...END...