

Final Submittal

OCONEE JUNE 2003 EXAM 50-269/2003-301

JUNE 16 - 27, 2003

1. As Given Simulator Scenario Operator Actions ES-D-2 & *OUTLINES*

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.

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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.

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.
	OATC	<ul style="list-style-type: none"> • Group In Limit (green) lamp on respective group. <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. <p>The SRO should use the OAC to monitor unit status.</p> <p>Enter AP/1/A/1700/15, Dropped Control Rods</p>

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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 MSRHR 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. 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.
	SRO	<ol style="list-style-type: none"> 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</p>
		When power is being reduced with the ICS in manual this event is completed.

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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.
		When crew has tripped the RCP this event is completed.

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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 T_c to decrease. • "B" FDW flow will decrease causing "B" loop T_c 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 T_c meters to return actual ΔT_c to near zero.</p>
		<p>When the OATC has re-ratioed FDW and returned T_c to near zero or when directed by the lead examiner this event is completed.</p>

Op-Test No.: _____ Scenario No.: 1 Event No.: 6

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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>
		<p>After the reactor pushbutton has been depressed this event is completed.</p>

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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
	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.

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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.

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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.
	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.

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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
		This event is completed when EOP Encl. 5.9 (Extended EFDW Operation) is initiated or when directed by the lead examiner.

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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"> 1. 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.
	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"> 1. Verify MFB1 and MFB2 de-energized 2. Determine CT-1 has no voltage 3. Verify both Standby Buses de-energized 4. Verify all Keowee Units operating <p>Note: Keowee 1 emergency locked out, Keowee 2 operating.</p> <ol style="list-style-type: none"> 5. Notify Keowee operator to give Ocone Control for Keowee 2 6. Close ACB-4 (Unit 2 EMER FDR) 7. Verify CT 4 voltage 4160

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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>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.</p>

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:</p> <p>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)
		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">1. Determine 1N-298 has failed to close:<ul style="list-style-type: none">• Red "open" light lit• CFT pressure continues to increase2. Inform the SRO.3. 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> <p>4. Verify 1A CFT pressure is stable.</p> <p>When CFT pressurization is stopped or when directed by the lead examiner this event is completed.</p>

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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 demand 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)
		When PZR level is being controlled manually or when directed by the lead examiner this event is completed.

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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 $\approx 596.4^{\circ}\text{F}$. 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.
	SRO	
		When the plant is stable or when directed by the lead examiner this event is completed.

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Event Description: Seismic event (PRA) 1A RBCU rupture (C, BOP/SRO) (TS)			
Time	Position	Applicant's Actions or Behavior	

	BOP	<p>1. 1SA-9/B-9, LPSW RBCU A Cooler Rupture will actuate and RB normal sump level will increase.</p> <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	<p>2. The SRO should determine that isolation of LPSW to a RBCU places the Unit in Tech Spec 3.6.5 Condition B (7 day completion Time) and refer to SLC 16.9.12 (Additional LPSW And SSW System operability Requirements).</p> <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	<p>3. The SRO may refer to AP/05, Earthquake.</p> <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)
		<p>When the SRO has directed a manual Unit shutdown or when directed by the Lead Examiner the event is completed.</p>

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Event Description: **1B SG Tube Rupture (100 gpm) (C, ALL) (TS)**

Time	Position	Applicant's Actions or Behavior
	SRO	1. Primary inventory should be monitored and when the leak rate is determined to be > 25 gpm transfer to the SGTR tab of the EOP.
	BOP	2. EOP SGTR tab will perform the following: <ul style="list-style-type: none"> • Determine that the Reactor is not tripped. • Maintain PZR level \geq 220 inches using Enclosure 5.5 (PZR and LDST Level Control). <ul style="list-style-type: none"> ➤ Open HP-24 and 25 (1A and 1B BWST Suction) ➤ Close 1HP-5 • Monitor RIA-16 ("A" MS Header) and 17 ("B" MS Header) to identify all SGs with tube ruptures. • Start the Outside Air Booster Fans on both Units 1 and 3. (CT-27) • Open and white Tag TB Sump pump breakers.
	SRO	3. The SRO should direct the OATC to begin a unit shutdown at a rate between 9.9% per hour and 20% per minute (MAXIMUM RUNBACK).
		When the SRO has entered the EOP SGTR tab or when directed by the Lead Examiner the event and scenario is completed.

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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>When a unit shutdown of $> 5\%$ has occurred or when directed by the lead examiner this event is concluded.</p>

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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	<p>Plant response:</p> <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 <p>Crew response:</p> <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
	SRO	
	OATC	
	BOP	
	OATC	

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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	<p>6. The SRO will "Parallel Action" to transfer to the Excessive Heat Transfer (EHT) tab and direct the Crew's actions as follows:</p> <p>7. Enclosure 5.1 (ES Actuation) will be performed.</p>
	BOP	<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> <p>8. Excessive Heat Transfer (EHT) tab will:</p> <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)
		When the SRO has transferred to the SGTR tab or when directed by the Lead Examiner the event and scenario is completed.

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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.
		4. Determines KHU #1 is operable when test complete
		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
		<p>Plant response:</p> <p>Statalarms:</p> <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) <p>Board indications:</p> <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. <p>Crew response:</p> <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
	OATC	
	SRO	
	OATC	

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)
		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
		<p>Plant response:</p> <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. <p>Crew response:</p> <ol style="list-style-type: none">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 <p>Note: The OATC should diagnose that the turbine did not trip and then perform the RNO step which will stop both EHC</p>
		<p>Event is complete when EHC pumps have been tripped or when directed by the lead examiner.</p>

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.

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.
		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 controllable <p>THEN Bypass ES as required</p>

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.

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Event 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. • SRO should refer to AP/28 (ICS Instrument Failures). • After the instrument is repaired the SRO should direct the crew from AP/28 (ICS Instrument Failures) to return the ICS to auto.
	OATC	
	SRO	
		When the ICS has been returned to auto this event is completed.

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"> 1. 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 2. 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"> 1. Refer to ARGs 2. 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 <p>THEN perform the following:</p> <ul style="list-style-type: none"> ➢ Trip RX ➢ Stop all RCPs ➢ Initiate AP/25 (SSF EOP)
	SRO BOP	<ul style="list-style-type: none"> • IAAT \geq two CRD stator temperatures $\geq 180^{\circ}\text{F}$, THEN trip RX. • Open 1CC-7 and 1CC-8
		<ul style="list-style-type: none"> • Verify CC Surge Tank level $\geq 12"$ <p>This event is complete when the Standby CC pump is started or when directed by the lead examiner.</p>

Event Description: **1HP-5 Fails closed: (C, BOP)**

Time	Position	Applicant's Actions or Behavior
	SRO BOP	<p>1. AP/032 (Loss of Letdown)</p> <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 <p>Note: 1HP-5 will not open from the control room or locally.</p>
	SRO	<ul style="list-style-type: none"> • GO TO step 4.11 • Verify 1HP-5 closed • Close 1HP-6 • Close 1HP-7
		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"> 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 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"> Refer to ARG for 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low 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)
	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>

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.
		Event is complete when ICS has been taken to manual or when directed by the Lead Examiner.

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Event Description: **Manual CRD power decrease (R, OATC)**

Time	Position	Applicant's Actions or Behavior
	OATC	<ol style="list-style-type: none">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.
	SRO	
		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
		<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> <p>1. SRO should direct the OATC to perform Immediate Manual Actions and the BOP to perform a symptoms check.</p> <p>2. Once the SRO completes the Immediate Manual Actions he should transfer to Subsequent Actions and ask the BOP to report any noted symptoms.</p> <p>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.</p> <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 MDEFDWP's 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</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

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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.