

Final Submittal
**OCONEE JUNE 2003 RETAKE
EXAM 50-269/2003-302**
OCTOBER 17,2003

- 1 As Given Simulator Scenario Operator Actions ES-D-2

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

Time	Position	Applicant's Actions or Behavior
	QATC	<ul style="list-style-type: none"> • WHEN 1HP-5 (Letdown Isolation) is open, THEN ensure CC System in operation. • Verify letdown temperature < 135°F. Perform RNO. • Open 1HP-13 (Purification IX Bypass) • Ensure 1HP-8 (Purification IX Inlet) and 1HP-9&11 (Spare Purification IX Inlet & Outlet) are closed • Select LETDOWN HI TEMP INTLK BYP switch to BYPASS. • Throttle open 1HP-7 (Letdown Control) to establish ≈ 20 gpm. • WHEN letdown temperature < 130°F, THEN ensure LETDOWN HI TEMP INTLK BYP switch in NORMAL. • Open 1HP-6 (Letdown Orifice Stop) • Adjust 1HP-7 (Letdown Control) to control desired letdown flow. • Re-establish normal makeup through 1HP-120. <p>Note: Normal letdown flow is ≈ 70 gpm.</p>
		When letdown has been re-established or when directed by the lead examiner this event is complete. (OATC and BOP swap)

Event Description: 1D1 Heater Drain Pump oil leak: (C, All)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>When directed by the Lead Examiner an NEO will inform the control room that the 1D1 HDP has a severe oil leak.</p> <p>Crew Response:</p> <ul style="list-style-type: none"> ▪ Refer to OP/1/A/1106/02D, (Shutdown of the 1D1 HDP) ▪ SRO should determine that reducing power to e 87% is required and direct unit shutdown 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) <p>Note: A manual shutdown is required because the ICS is in manual due to the previous Thot failure.</p>
		Event is complete when a unit shutdown is directed by the SRO or when directed by the Lead Examiner.

Op-Test No.: _____

Scenario No.: **SPARE**

Event No.: 7

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

Time	Position	Applicant's Actions of Behavior
	SRO OATC	Crew Response: 1. SRO will direct the unit shutdown and continue in the AP/29 (Rapid Unit Shutdown) or OP/1/A/1102/004 (Operation AB Power). 2. OATC will reduce FDW flow with the FDW Masters and insert the control rods manually to reduce reactor power.
		Event is complete when reactor power has been reduced 5% or when directed by the lead examiner.

Event Description: **Loss of Main Feedwater: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>When directed by the Lead Examiner BOTH Main FDW pumps will trip.</p> <p>Plant response:</p> <ul style="list-style-type: none"> • Reactor trip • "A" MDEFDW Pump will not start • "B" MDEFDW Pump will start • No EFW flow the A SG and level will decrease to ≈ 15" XSUR <p>Crew response:</p> <ul style="list-style-type: none"> • SRO will direct the OATC to perform Immediate Manual actions and the BOP to perform a Symptom Check. • SRQ should transfer to Subsequent Actions of the EOP. • Subsequent Actions will: • Verify all control rods fully inserted. • Verify Main FDW in operation and controlling properly. <ul style="list-style-type: none"> ➤ No FDW pumps are operating. Perform RNO. Ensure Rule 3 (Loss of Main or Emergency FDW) in progress or complete. • Verify TBVs controlling SG pressure ≈ 1010 psig. • Dispatch an operator with Encl 5.29 (MSRV Locations) to verify all MSRVs have reseated. • Verify ES is NOT required. • Initiate Encl 5.5 (Pzr and LDST Level Control). • Ensure PCB 20 and PCB 21 open • Ensure Generator Field Breaker and Exciter Field Breaker is open. • Verify AB and TB Instrument Air pressure ≥ 90 psig. • Verify ICS/NNI power available. • Verify all 4160V switchgear (1TC, 1TD, 1TE) energized. • Verify both SGs > 550 psig. <p>Note: All steps may not be performed depending on the timing of the next event.</p>

Event Description: **Loss of Main Feedwater: (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	OATC	<ul style="list-style-type: none"> • Verify Main FDW operating. <ul style="list-style-type: none"> ➤ No FDW pumps operating perform RNO Ensure Rule 3 (Loss of Main or Emergency FDW) in progress or complete. • Ensure SG levels approaching proper setpoint. (Rule 7) • Verify <u>all</u> SCMs > 0°F. <p>Note: There will be not feed to the "A" SG at this time.</p>
		<p>This event is complete when SCM has been verified > 0°F or when directed by the lead examiner.</p>

Event Description:

Loss of Main and Emergency Feedwater, 1B MDEFDWP trips (CBP Feed): (M, ALL)

Time	Position	Applicant's Actions or Behavior
	SWO OATC	<p>When directed by the Lead Examiner 1B MDEFDWP pump will trip.</p> <p>Plant response:</p> <ul style="list-style-type: none"> • No EFW flow to either SGs • RCS temperature and pressure will increase <p>Crew response:</p> <ul style="list-style-type: none"> • The SRO should direct the OATC and the BOP to perform a symptom check. • The OATC should determine no Main or Emergency Feedwater is feeding the SGs and with SRO concurrence re-start RULE 3 (Loss of Main and Emergency Feedwater). <p>RULE 3 (Loss of Main and Emergency Feedwater) will:</p> <ul style="list-style-type: none"> • IAAT NO SGs can be fed with FDW (Main/Emergency), AND any of the following conditions exists: RCS pressure reaches 2308 psig OR NDT limit Pzr level reaches 375" [340" acc] THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling). • Ensure any EFDWP operating. • RNO step, GO TO Step 4. • Verify Main FDW NOT operating. • Place the following in MANUAL and close: <ul style="list-style-type: none"> ➤ 1FDW-315 (1A EFDW Control) ➤ 1FDW-316 (1B EFDW Control)

Event Description: **Loss of Main and Emergency Feedwater, 1B MDEFDWP trips (CBP Feed): (M, ALL)**

Time	Position	Applicant's Actions or Behavior
	BATC	<ul style="list-style-type: none"> • Verify all the following available: <ul style="list-style-type: none"> ➤ Any CBP ➤ TBVs • Disable both Digital Channels 1&2 of AFIS on both Readers A and B: <ul style="list-style-type: none"> ➤ A Header DOG. CH. 1 and 2 OFF ➤ B Header DIG. CH. 1 and 2 OFF • Place Startup Block valve control switch for 1FDW-33 (1A SG) and 1FDW-42 (1B SG) in OPEN: • Position Startup Control valve 10 - 20% open on all available SGs: 1FDW-35 on 1A SG and 1FDW-44 on 1B SG. • Close the following: <ul style="list-style-type: none"> ➤ 1FDW-32 (1A Main FDW Control) ➤ 1FDW-41 (1B Main FDW Control) ➤ 1FDW-31 (1A Main FDW Block) ➤ 1FDW-40 (1B Main FDW Block) • lower SG pressure in available SGs to ≈ 500 psig. • Control FDW flow to stabilize RCS P/T by throttling the following as necessary: (CT-10) (CT-11) <ul style="list-style-type: none"> ➤ Startup Control valves ➤ TBVs • Notify CR SRO that CBP feed is in progress. • Dispatch an operator to perform Encl 5.26 (Manual Start of TDEFDWP).

Event Description: **Loss** of Main and Emergency Feedwater, **1B** MDEFDWP trips (CBP Feed): (M, ALL)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>SRO should transfer to the "Loss of Heat Transfer" (LOHT) tab of the EOP.</p> <p>The LOHT tab will:</p> <ul style="list-style-type: none"> • Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. • IAAT core SCM = 0°F, THEN GO TO Step 4. • IAAT NO SGs can be fed with FDW (Main/Emergency), AND any of the following conditions exists: <ul style="list-style-type: none"> ➤ RCS pressure reaches 2300 psig OR NDT limit ➤ Pzr level reaches 375" [340" acc] THEN GO TO Step 4. Perform RNO step: <p>[NOTE: 1A1 RCP provides the best Pzr spray.</p> <p>Reduce operating RCPs to one pump/loop.</p> <ul style="list-style-type: none"> • WHEN any of the following conditions exists: <ul style="list-style-type: none"> ➤ Unit 1 EFDW available ➤ EFDW aligned from another unit ➤ Main FDW pump available AND reset THEN GO TO Step 52 <p>Note: The SRO should wait at this WHEN step until a Feedwater source is aligned or conditions are met to go into Forced HPI Cooling.</p>
		<p>This event is complete when CBP flow has been established and the plant is stable or when directed by the lead examiner.</p>

Event Description: TDEFDWP returned (CBP feed recovery)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Note: When directed by the lead examiner SPQC will call the control room and inform them that the TDEFDWP has been repaired and can be used.</p> <ul style="list-style-type: none"> • The SRO should transfer to Step 52. • Verify MFDW or Unit 1 EFDW available. • Verify Encl 5.27 (Alternate Methods For Controlling EFDW Flow) is NOT in progress. • Verify Main FDW pump available and reset. (FDW pumps are not reset) Perform RNO • GO TO Step 59 • Verify one of the following: <ul style="list-style-type: none"> ➤ Both MDEFDWP's operating ➤ TDEFDWP operating • Verify all the following: <ul style="list-style-type: none"> ➤ Tcold > 500°F ➤ TBVs available • Verify Tcold ≤ 547°F. <ul style="list-style-type: none"> ➤ Perform RNO step: <ul style="list-style-type: none"> Ensure THP setpoint at -885 psig. • GOTO Step 64. • Ensure TBVs in AUTO for available SGs. • Initiate feed to available SGs per Rule 7 (SG Feed Control) (CT-26) • IAAT heat transfer is established in any SG, THEN GO TO Step 77. • Control feeding and steaming of available SGs to maintain SG level at setpoint and cooldown rate within Tech Spec limits: <ul style="list-style-type: none"> ■ Tcold > 280°F: 6 50°F / ½ hr
		<p>This event and the exam is complete when TDEFDWP flow to the SGs have been established and the plant is stable or when directed by the lead examiner.</p>

CRITICAL TASKS

1. CT-10, Establish FW Flow and Feed SGs
2. CT-11, Control SG **pressure** to Maintain RC Temperature Constant.
3. CT-26, Restore **Feed Po A Dry SG**

Facility: Oconee	Scenario No.: 1 fnl	Op-Test No.: _____	
Examiners: _____ _____ _____	Operators: Tracey Roland (SRO-U) Kevin Cooley (RO)	_____	
Initial Conditions:			
<ul style="list-style-type: none"> • 50% Reactor Power, (Snap 201) • RCS Boron 100 ppm 			
Turnover:			
<ul style="list-style-type: none"> • OP/1/A/1102/004 (OPS At Power) Encl. 3.2 in progress at step 2.17. Holding per dispatcher request. • SASS is De-energized for I&E troubleshooting • 1B MDEFDW Pump OOS for PMs, expected to be returned to service later this shift. <ul style="list-style-type: none"> ➢ TS 3.7.5 Condition A • After turnover, perform the Unit 1 portion of PT/0/A/0610/017 (Operability Best of 4160 V Breakers) 			
Event No.	Malf. No.	Event Type*	Event Description
0a	Pre-Insert		SASS in manual
0b	Pre-Insert MPI290		Block All Turbine Trips Except Manual
0c	Pre-Insert MPS350		"A" RBCU fails to receive ES signal
0d	Pre-Insert Override		"C" HPI pump fails to start
1		N, BOP, SRO	Operability test of 4160V breakers
2	MPI121	I, BOP, SRO	PZR Level # 1 Fails LOW (TS)
3	Override	C, BOP, SRO	"A" LPSW pump suction valve closes and Standby pump does not auto start (TS)
OATC and BOP to swap positions			
4	MPI050 MPI080	I, OATC, SRO	RC Loop B Flow fails LOW
5	MSI101 MSI330	I, OATC, SRO	"A" SG Startup Level Fails LOW
6		C, ALL	BOTH MDEFDWP's Auto-start circuitry inoperable (TS)
7			
7		R, OATC, SRO	Manual unit shutdown
8		C, OATC, SRO	Reactor trips, Main Turbine Fails to trip (Lockout EHC Pumps)
9	MPS400	M, ALL	SBLOCA
10	MPS400 Reset		RCS leak isolated, SCM increases > 0°F

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

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

Event Description: **Operability test of 4160V breakers: (N, BOP)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p>Crew response: The OATC should perform Step 12.1 of PT/0/A/0610/017 (Operability Best of 4160 V Breakers).</p> <ul style="list-style-type: none"> • Place Unit 1 MFBI AUTO/MAN transfer switch to "MAN". <ul style="list-style-type: none"> ➤ 1SA-14/B-1 (EL Normal to SU Transfer Bus 1 Automatic Transfer Block) actuates • Close E1, MFB1 STARTUP FDR. <ul style="list-style-type: none"> ➤ 1SA-14/A-1 (EL 1T Normal Supply Breaker Bus 1 Open) actuates ➤ 1SA-14/A-3 (EL CT1 4KV SU Feeder Bus 1 Closed) actuates • Verify N1, MFBI NORMAL FDR opens, and electrical auxiliaries transfer. • Close N1, MFBI NORMAL FDR. • Verify E1, MFB1 STARTUP FDR breaker opens and electrical auxiliaries transfer. • Place Unit 1 MFB1 AUTO/MAN transfer switch to "AUTO". • Place Unit 1 MFB2 AUTO/MAN transfer switch to "MAN". <ul style="list-style-type: none"> ➤ 1SA-1WB-2 (EL Normal to SU Transfer Bus 2 Automatic Transfer Block) actuates • Close E2, MFB2 STARTUP FDR. <ul style="list-style-type: none"> ➤ 1SA-14/A-2 (EL 1T Normal Supply Breaker Bus 2 Open) actuates ➤ 1SA-1418-4 (EL CT1 4KV SU Feeder Bus 2 Closed) actuates • Verify N2, MFB2 NORMAL FDR breaker opens and electrical auxiliaries transfer. • Close N2, MFB2 NORMAL FDR. • Verify E2, MFB2 STARTUP FDR breaker opens and electrical auxiliaries transfer. • Place Unit 1 MFB2 AUTO/MAN transfer switch to "AUTO".
		When Step 12.1 is complete or when directed by the Lead Examiner this event is completed.

Event Description: "A" LPSW pump suction valve closes and standby pump does not auto start: (C, BOP) (TS)

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p> <p>OATC</p> <p>SRO</p>	<p>Plant response:</p> <p>Statalarms:</p> <ul style="list-style-type: none"> • 1SA-9/A-9, LPSW Header A/B Press Low <p>Control board indications:</p> <ul style="list-style-type: none"> • LPSW-2 ("A" LPSW Pump Suction) indicates closed (also an OAC alarm) • "A" LPSW pump amps are cycling • LPSW Header A/B Pressure Low <p>Crew response:</p> <ol style="list-style-type: none"> 1. Refer to ARG for 1SA-9/A-9, LPSW Header A/B Press Low 2. Refer to AP/24 (Loss of LPSW) <ul style="list-style-type: none"> • Ensure LPSW pump suction valves are open. <p>Note: LPSW-2 ("A" LPSW pump suction valve) will indicate closed. The team may dispatch an NEO to open LPSW-2. The valve will not be able to be opened locally.</p> <ul style="list-style-type: none"> • Verify LPSW pumps are cavitating <ul style="list-style-type: none"> ➤ Pump amps erratic ➤ LPSW header pressure fluctuating • Ensure the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT is DISABLED. • Stop the affected pump. Stop "A" LPSW pump. • Ensure all available (NOT previously cavitating) LPSW pumps operating. Start "C" LPSW pump. • Verify normal LPSW System operation is restored. • The SRO should call SPOC to troubleshoot the reason for the suction valve closing, the Auto Start failure and determine if the "A" LPSW pump was damaged due loss of suction. • The SRO should refer to TS: <ul style="list-style-type: none"> ➤ TS 3.7.7 (Low Pressure Service Water System) Condition "A" applies. Restore required LPSW pump to operable status. 72 hours completion time. ➤ TS 3.3.28 (LPSW pump Auto-Start Circuitry) Condition "A". Restore Auto-Start Circuitry to operable. 7 day completion time. <p>Note: TS 3.3.28 may be addressed as a follow up question.</p>
		<p>Event is complete when SRO has referred to TS 3.7.7 or when directed by the Lead Examiner. (BOP and OATC Swap positions)</p>

Event Description: RC Loop B Flow fails LOW: (I, OATC)

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p>Plant response:</p> <ol style="list-style-type: none"> 1. Statalarms: <ul style="list-style-type: none"> • 1SA-2/A-4, RC Loop B Flow bow • 1SA-2/A-5, RC Total Flow Low • 1SA-1/A-1, RP Channel A Trip • 1SA-1/A-3, RP Channel A Flux/lmb/Flow Trip 2. Control board indications: <ul style="list-style-type: none"> • RCS Flow meter shows Loop B flow at zero. • RPS Channel A trips. • B S/G FDW Flow instrument shows a reduction in FDW, and the A S/G FDW Flow indicates increasing flow or off-scale High. • DELTA Tc meter indicates a large Delta Temp. <p>Crew response:</p> <ul style="list-style-type: none"> • The crew should stabilize the unit by using the "Plant Transient Response" process. • Take the Diamond and BOTH FDW Masters to MANUAL and stabilize the unit. • The SRO should refer to AP/28, ICS instrument Failures and notify SPOC to have the instrument repaired. • AP/28, ICS Instrument Failures wilt: <ul style="list-style-type: none"> ➤ Ensure DIAMOND and BOTH FDW Masters in MANUAL. ➤ Notify SPQC to select a valid RCS flow input to ICS and investigate and repair the failed WCS flow instrumentation. ➤ Ensure any associated requirements of PT/1/A/0600/001 (Periodic instrument Surveillance) are met for the failed instrument. ➤ WHEN notified by SPQC that a valid RCS flow input has been restored to ICS, THEN GO TO Encl 5.1 (Placing ICS in AUTO). <p>Note: Crew may refer to PT/600/001 (Periodic Instrument Surveillance) and TS 3.3.1 (RPS Instrumentation) due to "A" RPS Channel trip and may choose to place "A" RPS to manual Bypass.</p>
		<p>Event is complete when the SRO has reached the WHEN step in AP/28 or when directed by the Lead Examiner.</p>

Event Description: ****“A” SG Startup Level Fails LOW: (I, OATC)**
***This event to be performed if reactor trips during event 4.**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p>If the reactor trips on event 4, activate timer to insert “A” SG Startup Level failure.</p> <p>Plant response:</p> <p>Statatarms:</p> <ul style="list-style-type: none"> • 1SA-2/E-8, MS Strm. Gen “A” Level Low Limit <p>Control board indications:</p> <ul style="list-style-type: none"> • “A” SG Startup Level indicates “0” on the control board and the OAC. • “A SG XSUR Level indication will indicate greater than 25”. • “A” SG Main and Startup Control valves will be open even though the SG level will be above setpoint. • “A” SG level will continue to increase. XSUR indication should be used to determine SG level. <p>crew response:</p> <ul style="list-style-type: none"> • The OATC should diagnose the failure of the “A” SG Startup Level instruments and inform the SRO. • The SRO should direct the RO to take the “A” SG Main and Startup Control valves to manual. • The SWO should direct the RO to close the “A” SG Main Control valve and use the “A” SG Startup Control valve to control “A” SG level at 2.5 XSUR. • The SWO should notify SPOC to have the instruments repaired.
		<p>Event is complete when the OATC is controlling “A” SG level manually or when directed by the Lead Examiner.</p>

Event Description: **BOTH MDEFDWP**s Auto-start circuitry inoperable: (C, ALL) (TS)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Note: When directed by the lead examiner, call the CR and inform them that that I&E has determined that the Auto-start circuitry for the BQTH MDEFDWPs are out of tolerance and technically inoperable. Parts required for the repair are not expected for 3 days.</p> <p>Crew response:</p> <ul style="list-style-type: none"> • The SRO should refer to TS 3.3.14 (Emergency Feedwater Pump Initiation Circuitry) Condition “B” and determine that the “A MDEFDWP is inoperable. • Determine TS 3.7.5 (EFW System) Condition “C” requires restoring one MDEFDWP pump in 12 hours or be MODE 3 in an additional 12 hours. • SRO should determine that at unit shutdown is required and direct unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 3.2, Power Reduction.
		Event is complete when the decision to shutdown has been made or when directed by the Lead Examiner.

Event Description: **Manual unit shutdown: (R, OATC)**

Time	Position	Applicant's Actions or Behavior
	<p data-bbox="363 465 430 501">SRO</p> <p data-bbox="352 837 442 873">OATC</p> <p data-bbox="363 918 430 954">BOP</p>	<p data-bbox="496 383 722 418">Crew response:</p> <p data-bbox="496 434 1477 501">Direct unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 3.2, Power Reduction.</p> <ol data-bbox="496 517 1445 734" style="list-style-type: none"> <li data-bbox="496 517 948 553">1. Review Limits and Precautions <li data-bbox="496 568 1050 604">2. Notify OSM to contact NRC if required. <li data-bbox="496 620 1445 687">3. Refer to OP/1106/001 (Turbine Generator) to ensure operating limits are NOT exceeded during shutdown. <li data-bbox="496 703 1305 739">4. Notify System Operations Center (SOC) or lead reduction. <p data-bbox="496 754 1445 822">Note: Due to procedure complete up to Step 2.17 the crew may not perform steps 1-4 above.</p> <ol data-bbox="496 837 1406 949" style="list-style-type: none"> <li data-bbox="496 837 1406 904">5. Reduce reactor power in manual by inserting control rods with the Diamond and controlling FDW flow with the FDW Masters. <li data-bbox="496 920 1286 956">6. Stop "D" HDPs per OP/1/A/1106/002 D (HDP Operation)
		<p data-bbox="496 1554 1477 1621">Event is complete when reactor power has been reduced 5% or when directed by the Lead Examiner.</p>

Event Description: Reactor trip, Main Turbine Fails to trip (Lockout EHC Pumps)(C, OATC)

Time	Position	Applicant's Actions or Behavior
	<p style="text-align: center;">SRO</p> <p style="text-align: center;">OATC</p> <p style="text-align: center;">BOP</p>	<p>Note: The reactor will trip as a result of initiating event 9 (SBLOCA). Plant response: Statalarms:</p> <ul style="list-style-type: none"> o 1SA-9/A-6, RB Reactor Bldg Norm Sump bevel High/Low • 1SA-8/B-9, Process Monitor Radiation High <p>Control board indications:</p> <ul style="list-style-type: none"> • PZR level and RCS pressure will decrease • The reactor will trip OR low RCS pressure. • The Main Turbine should trip but does not. This will result in a reduction of steam pressure in both SGs until actions are taken to trip the turbine. The will result in RCS overcooling until the turbine is tripped. <p>Crew response:</p> <ol style="list-style-type: none"> 1. SRO will direct the OATC to perform IMAs and the BOP to perform a symptom check and then 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 o lock out both EHC pumps (CT-18) <p>Note: The OATC should diagnose that the turbine did not trip and then perform the RNO step which will stop and lock out both EHC pumps. This will cause the turbine to trip.</p> <ul style="list-style-type: none"> • Verify RCP seal injection available. <ol style="list-style-type: none"> 3. BOP will perform a symptom check.
		<p>Event is complete when EHC pumps have been tripped or when directed by the lead examiner.</p>

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

Time	Position	Applicant's Actions or Behavior
	OATC BOP	<p>Plant response:</p> <p>Control board indications:</p> <ul style="list-style-type: none"> • ES 1-6 actuate • RCS subcooling margin will indicate 0°F. <p>Crew response:</p> <ol style="list-style-type: none"> 1. The OAPC should verify IMAs complete with the SRO and then the SRO should direct the OATC to perform a symptom check. 2. The BOP should report symptoms and 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 \leq 1%. • Trip WCPs within 2 min of LOSCM (CT-1) • Notify SRO of RCP status. • Verify 1HP-24/25 (1A/1B BWST Suction) open • Ensure all available HPI pumps operating. <p>Note: 1C HPI pump will not be operating and an attempt should be made to manually start the 1C HPI pump.</p> <ul style="list-style-type: none"> • Ensure 1HP-26/27 (1A/1B HP Injection) open • Determine HPI flow in the B header is in the unacceptable region of Figure 1 and open 1HP-409 (1HP-27 Bypass). (CT-2) • Verify that LPI flow in any header is \leq 1000 gpm. • Verify that TBVs are available. • Disable AFIS in non-actuated channels. • Establish EFDW to the OTSGs to feed to LOSCM setpoint per Rule 7 (SG Feed Control). (CT-10) • Verify both MDEFDWP operating. (1B MDEFDWP is off) • Ensure TDEFDWP is in PULL TO LOCK. (Not performed due 1B MDEFDWP not operating) • Trip both MFDWPs and close the FDW block valves. • Notify SRO of SG feed status. • Maintain SG pressure \leq RCS pressure. • Ensure Rules 3 & 8 in progress or complete.

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

Time	Position	Applicant's Actions or Behavior
	SRO QATC	<p>3. When reporting symptoms, the OATC should inform the SRO that ES Channels 1-6 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. <p>Note: "A" RBCU will not receive an ES signal and will remain in HIGH speed. The operator should diagnose this and place the "A" RBCU in LOW speed.</p> <p>Place HPI in Manual.</p> <p>Verify any RCP operating. (No RCPs operating)</p> <ul style="list-style-type: none"> • Verify SCMs > 0°F and proceed to the HPI flow check when he determines that the RCS has saturated. • The operator should determine <i>HPI flow is adequate</i> per Figure 1. <p>Note: 1HP-409 should have been opened by Rule 2.</p> <ul style="list-style-type: none"> • 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) • IAATES Channels 5 & 6 have actuated, THEN dispatch an operator to establish ≈ 1000cfm flow in each PWS filter train using 1PR-13 and 1PR-17 (Controller, Filter 1A/1B) • Ensure the following are open: <ul style="list-style-type: none"> • 1CC-7 and 1CC-8 • 1LPSW-6 and 1LPSW-15 • Ensure open 1CF-1 and 1CF-2 (A/B CFT Outlet) • Verify 1HP-410 closed. • 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 SRO approval to exit this enclosure.

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

Time	Position	Applicant's Actions or Behavior
	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 WCPs are operating ➤ HPI flow exists in both HPI headers ➤ Adequate Total HPI flow per figure 1 (Total Required HPI Flow) • Control steaming and feed rates on all intact SGs to maintain cooldown rate within Tech Spec limits: <ul style="list-style-type: none"> ➤ $T_c \geq 280^\circ\text{F} \leq 50^\circ\text{F}/\frac{1}{2} \text{ hour}$ • GOTO Step 75. • Close 1RC-4 (PORV Block) • Close the following: (CT-3) <ul style="list-style-type: none"> ➤ 1HP-1 (1A Letdown Cooler inlet) ➤ 1HP-2 (1B Letdown Cooler Inlet) ➤ 1RC-3 (Spray Block) ➤ 1GWD-17 (PZR Vent Control) <p>Note: RCS leak will be isolated when 1RC-3 is closed.</p> <ul style="list-style-type: none"> • Maintain SG pressure < RCS pressure. • Verify primary to secondary heat transfer exists. • initiate Encl. 5.16 (SG Tube-to-Shell AT Control) • Verify NO indications of an SGTW. • Verify HPI forced cooling NOT in progress. • Verify CETCs NOT increasing. • Verify primary to secondary heat transfer is NOT excessive. • Verify NO indications of SGTR. • Verify required RCS makeup flow within normal makeup capability. <ul style="list-style-type: none"> ➤ RNO Transfer to LOCA CD tab.

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

Time	Position	Applicant's Actions or Behavior
	SRO	<p>5. GOTO LOCA CD tab.</p> <ul style="list-style-type: none"> • IAAT BWST level \leq 19 feet transfer ECCS suctions to the RBES. • Verify ES is actuated. • Ensure all RBCUs in low speed and open 1LPSW-18, 1LPSW-21, 1LPSW-24, and 1LPSW-565 closed. • Initiate Encl. 5.35, Containment Isolation • Ensure all RB Aux fans are operating • initiate Encl. 5.36 (Equipment Alignment For Plant Shutdown) • IAAT all of the following conditions exist: (Step 33) <ul style="list-style-type: none"> ➤ ALL SCMs > 0°F ➤ RCS pressure > LPI shutoff head ➤ Required HPI within normal makeup capability <p>Note: If step 33 met then go to Event 10.</p> <ul style="list-style-type: none"> • If step 33 NOT met crew will GOTO Step 37 and continue in LOCA Coldown tab. • IAAT all of the following conditions exist: (Step 37) <ul style="list-style-type: none"> ➤ ALL SCMs > 0°F ➤ ES Bypass Permit satisfied ➤ RCS pressure controllable THEN bypass ES as necessary • Disable all AFIS headers NOT actuated by selecting OFF on both Digital Channels 1&2 on that header.

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

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> • IAAT a sustained re-pressurization of the RCS occurs due to any of the following: <ul style="list-style-type: none"> ➤ Leak isolation ➤ Degraded heat transfer due to hot leg voiding THEM perform Steps 42-48. • Verify at least one SG available. • Verify any loop e 537". (both should be above) • Cycle PORV to maintain RCS pressure. • Ensure appropriate level and feed flow is available to SGs per RULE 7 (SG Feed Control) • Notify TSC to evaluate starting or bumping RCPs. • Notify Chemistry to sample RCS boron hourly until MODE 5.
		<p>Event is complete when RCS SCM is greater than 0°F or when directed by the Lead Examiner.</p>

Event Description: **RCS leak isolated, SCM increases > 0°F**

Time	Position	Applicant's Actions or Behavior
	<p data-bbox="359 725 424 757">BOP</p> <p data-bbox="359 887 424 918">SRO</p>	<p data-bbox="491 443 715 474">Plant response:</p> <ul data-bbox="491 497 823 577" style="list-style-type: none"> • SCM increases > 0°F ◦ PZR level increasing <p data-bbox="491 645 715 676">Crew response:</p> <ol data-bbox="491 698 1046 824" style="list-style-type: none"> 1. Throttle HPI per RULE 6 (HPI) (CT-20) <ul data-bbox="539 743 1046 824" style="list-style-type: none"> • HPI Forced Cooling not in progress • RX power ≤ 1% and Core SCM > 0 <p data-bbox="491 846 1445 945">Note: If SCM increases > 0°F prior to reaching the following IAAT step the SRO may elect to transfer to Subsequent Actions based on plant conditions changing.</p> <ol data-bbox="491 967 1193 1294" style="list-style-type: none"> 2. IAAT all of the following conditions exists: <ul data-bbox="539 1012 1193 1146" style="list-style-type: none"> • ALL SCMs > 8°F • RCS pressure > LPI shutoff head • Required HPI within normal makeup capability 3. Verify primary to secondary heat transfer 4. Verity NO indications of SGTW 5. GO TO Subsequent Actions
		<p data-bbox="491 1792 1359 1854">Event and exam is complete when the SRO has transferred to Subsequent Actions or when directed by the Lead Examiner.</p>

CRITICAL TASKS

1. CT-1, Trip All RCPs
2. CT-2, Initiate HPI
3. CT-3, Isolate Possible RCS Leak Paths
4. CT-10, Establish FW Flow and Feed SGs
5. CT-18, Turbine Trip
6. CT-20, RCS Pressure Control To **Prevent** Exceeding RV P-T Limits And Comply With PTS Guidance
7. CT-27, Implementation of Control Room Habitability Guidance

Facility: Oconee	Scenario No.: SPARE fnl	Qp-Test No.: _____	
Examiners: _____ _____	Operators: Tracey Roland (SRO-U) Kevin Cooley (RO)		
Initial Conditions:			
<ul style="list-style-type: none"> 100% Reactor Power, (SNAP 202) 			
Turnover:			
<ul style="list-style-type: none"> AMSAC/DSS bypassed for I&E testing LDST pressure is LOW Unit 1 TDEFDWP has been out of service for bearing replacement for about 16 hours. Expect it to be returned to service within the next 2 hours. 			
Event No.	Maif. No.	Event Type*	Event Description
0a	Pre-Insert		AMSAC/DSS bypassed
0b	Pre-insert MSS330		TDEFWP fails to start
0c	Pre-insert MSS260		1A MDEFDWP fails to start
1		N, BOP, SRO	Pressurize LDST with H2
2	Override	C, BOP, SRO	1H-1, LDST Supply, fails open (TS)
3	MPS290 Override	C, BOP, SRO	1A CC Pump trips (1B CC Pump fails to auto start)
4	MPS110	C, BOP, SRO	1HP-5 (Letdown Isolation) Fails closed
BOP and OATC swap positions			
5	MPI171, 100 MPI500, 100	I, OATC, SRO	T _n Fails HIGH
6		C, ALL	1D1 Heater Drain Pump oil leak
7		R, OATC, SRO	Manual reactor power decrease
8	MSS010 MSS020	C, ALL	Loss of Main Feedwater
9	MSS270	M, ALL	Loss of Main and Emergency Feedwater, 1B MDEFDWP trips (CBP Feed)
10	MSS330 Reset		TDEFWP returned (CBP recovery)

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

Op-Test No.: _____		Scenario No.: SPARE	Event No.: 1	Page 1 of 1
Event Description: Pressurize the LDST with H2: (N, BOP)				
Time	Position	Applicant's Actions or Behavior		
		<p>Plant response:</p> <ul style="list-style-type: none"> 1SA-02/D-2 (Approaching LDST Operating Limits) is in alarm <p>crew response:</p> <ol style="list-style-type: none"> Refer to ARG <ul style="list-style-type: none"> Add hydrogen to establish desired LDST pressure per OP/1/A/1106/017 (Hydrogen System) Refer to LDST Pressure vs. bevel enclosure in OP/0/A/1108/001 (Curves and General Information). Direct the OATC to use OP/1/A/1106/017 (Hydrogen System) Encl. 3.5 (Unit 1 LDST H2 Addition) to add H2 to the LDST. <ul style="list-style-type: none"> Review Limits and Precautions Immediately prior to pressurization determine lowest reading of diverse LDST level indications: _____ inches. For existing LDST level determine LDST Pressure allowable per LDST Pressure vs. Level curve: _____ psig. Notify Operator at H2 Cage to pressurize primary hydrogen. <p>NOTE: Operator should be in constant communication with CR to close 1H-26 if 1H-1 fails open.</p> <ul style="list-style-type: none"> Direct Operator to open 1H-26 (LDST Block). Cycle 1H-1 (LDST SUPPLY) as required to pressurize LDST per LDST Pressure vs bevel curve. WHEN complete, ensure closed 1H-1 (LDST SUPPLY). <p>Note: 1H-1 (LDST SUPPLY) will fail open.</p>		
		<p>When 1H-1 (LDST SUPPLY) is opened or when directed by the lead examiner this event is complete.</p>		



Facility: Osonee	Scenario No.: 1 fnl	Bp-Test No.: _____	
Examiners: _____ _____	Operators: Tracey Roland (SRO-U) Kevin Cooley (RO)	_____	
Initial Conditions:			
<ul style="list-style-type: none"> • 50% Reactor Power, (Snap 201) • RCS Boron 100 ppm 			
Turnover:			
<ul style="list-style-type: none"> • OP/1/A/1102/004 (OPS At Power) Encl. 3.2 in progress at step 2.17. Holding per dispatcher request. • SASS is De-energized for I&E troubleshooting • 1B MDEFDW Pump OOS for PMs, expected to be returned to service later this shift. <ul style="list-style-type: none"> ➤ TS 3.7.5 Condition A • After turnover, perform the Unit 1 portion of PT/0/A/0610/017 (Operability Test of 4160 V Breakers) 			
Event No.	Malf. No.	Event Type*	Event Description
0a	Pre-Insert		SASS in manual
0b	Pre-Insert MPI290		Block All Turbine Trips Except Manual
0c	Pre-Insert MPS350		"A" RBCU fails to receive ES signal
0d	Pre-Insert Override		"C" HPI pump fails to start
1		N, BOP, SRO	Operability test of 4160V breakers
2	MPI121	I, BOP, SRO	PZR Level # 1 Fails LOW (TS)
3	Override	C, BOP, SRO	"A" LPSW pump suction valve closes and Standby pump does not auto start (TS)
OATC and BOP to swap positions			
4	MPI050 MPI080	I, OATC, SRO	RC Loop B Flow fails LOW
5	MSI101 MSI330	I, OATC, SRO	"A" SG Startup Level Fails LOW
6		C, ALL	BOTH MDEFDWPs Auto-start circuitry inoperable (TS)
7			
7		R, OATC, SRO	Manual unit shutdown
8		C, OATC, SRO	Reactor trips, Main Turbine Fails to trip (Lockout EHC Pumps)
9	MPS400	M, ALL	SBLOCA
10	MPS400 Reset		RCS leak isolated, SCM increases > 0°F

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

Bp-Test No.: _____

Scenario No.: 1

Event No.: 1

Page 1 of 1

Event Description: **Operability test of 4160V breakers: (N, BOP)**

Time	Position	Applicant's Actions or Behavior
	OATC	<p>Crew response: The OATC should perform Step 12.1 of PT/0/A/0610/017 (Operability Test of 4160 V Breakers).</p> <ul style="list-style-type: none"> • Place Unit 1 MFB1 AUTO/MAN transfer switch to "MAN". <ul style="list-style-type: none"> ➤ 1SA-14/B-1 (EL Normal to SU Transfer Bus 1 Automatic Transfer Block) actuates • Close E1, MFB1 STARTUP FDR. <ul style="list-style-type: none"> ➤ 1SA-14/A-1 (EL 1T Normal Supply Breaker Bus 1 Open) actuates ➤ 1SA-14/A-3 (EL CT1 4KV SU Feeder Bus 1 Closed) actuates • Verify N1, MFB1 NORMAL FDR opens, and electrical auxiliaries transfer. • Close N1, MFB1 NORMAL FDR. • Verify E1, MFB1 STARTUP FDR breaker opens and electrical auxiliaries transfer. • Place Unit 1 MFB1 AUTO/MAN transfer switch to "AUTO". • Place Unit 1 MFB2 AUTO/MAN transfer switch to "MAN". <ul style="list-style-type: none"> ➤ 1SA-14/B-2 (EL Normal to SU Transfer Bus 2 Automatic Transfer Block) actuates • Close E2, MFB2 STARTUP FDR. <ul style="list-style-type: none"> ➤ 1SA-14/A-2 (EL 1T Normal Supply Breaker Bus 2 Open) actuates ➤ 1SA-14/A-4 (EL CT1 4KV SU Feeder Bus 2 Closed) actuates • Verify N2, MFB2 NORMAL FDR breaker opens and electrical auxiliaries transfer. • Close N2, MFB2 NORMAL FDR. • Verify E2, MFB2 STARTUP FDR breaker opens and electrical auxiliaries transfer. • Place Unit 1 MFB2 AUTO/MAN transfer switch to "AUTO".
		When Step 12.1 is complete or when directed by the Lead Examiner this event is completed.

Event Description: "A" LPSW pump suction valve closes and standby pump **does not auto start: (C, BOP) (TS)**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRQ</p> <p>OATC</p> <p>SRO</p>	<p>Plant response:</p> <p>Statalarms:</p> <ul style="list-style-type: none"> • 1SA-9/A-9, LPSW Header A/B Press Low <p>Control board indications:</p> <ul style="list-style-type: none"> • LPSW-2 ("A" LPSW Pump Suction) indicates closed (also an QAC alarm) • "A" LPSW pump amps are cycling • LPSW Header A/B Pressure Low <p>Crew response:</p> <ol style="list-style-type: none"> 1. Refer to ARG for 1SA-918-9, LPSW Header A/B Press Low 2. Refer to AP/24 (Loss of LPSW) <ul style="list-style-type: none"> • Ensure LPSW pump suction valves are open. <p>Note: LPSW-2 ("A" LPSW pump suction valve) will indicate closed. The team may dispatch an NEO to open LPSW-2. The valve will not be able to be opened locally.</p> <ul style="list-style-type: none"> • Verify LPSW pumps are cavitating <ul style="list-style-type: none"> ➤ Pump amps erratic ➤ LPSW header pressure fluctuating • Ensure the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT is DISABLED. • Stop the affected pump. Stop "A" LPSW pump. • Ensure all available (NOT previously cavitating) LPSW pumps operating. Start "C" LPSW pump. • Verify normal LPSW System operation is restored. • The SRO should call SPOC to troubleshoot the reason for the suction valve closing, <i>the Auto Start</i> failure and determine if the "A" LPSW pump was damaged due loss of suction. • The SRO should refer to TS: <ul style="list-style-type: none"> ➤ TS 3.7.7 (Low Pressure Service Water System) Condition "A" applies. Restore required LPSW pump to operable status. 72 hours completion time. ➤ TS 3.3.28 (LPSW pump Auto-Start Circuitry) Condition "A". Restore Auto-Start Circuitry to operable. 7 day completion time. <p>Note: TS 3.3.28 may be addressed as a follow up question.</p>
		<p>Event is complete when SRO has referred to TS 3.7.7 or when directed by the Lead Examiner. (BOP and OATC Swap positions)</p>

Event Description: **RC Loop B Flow fails LOW: (I, OATC)**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p>Plant response:</p> <ol style="list-style-type: none"> 1. Statalarms: <ul style="list-style-type: none"> • 1SA-2/A-4, RC Loop B Flow Low • 1SA-2/A-5, RC Total Flow Low • 1SA-1/A-1, RP Channel A Trip • 1SA-1/A-3, RP Channel A Flux/Imb/Flow Trip 2. Control board indications: <ul style="list-style-type: none"> • RCS Flow meter shows Loop B flow at zero. • RPS Channel A trips. • B S/G FDW Flow instrument shows a reduction in FDW, and the A S/G FDW Flow indicates increasing flow or off-scale High. • DELTA Tc meter indicates a large Delta Temp. <p>Crew response:</p> <ul style="list-style-type: none"> e The crew should stabilize the unit by using the "Plant Transient Response" process. • Take the Diamond and BOTH FDW Masters to MANUAL and stabilize the unit. • The SRO should refer to AP/28, ICS Instrument Failures and notify SPQC to have the instrument repaired. • AP/28, ICS Instrument Failures will: <ul style="list-style-type: none"> ➤ Ensure DIAMOND and BOTH FDW Masters in MANUAL. ➤ Notify SPQC to select a valid RCS flow input to ICS and investigate and repair the failed RCS flow instrumentation. ➤ Ensure any associated requirements of PT/1/A/0600/001 (Periodic instrument Surveillance) are met for the failed instrument. ➤ WHEN notified by SPQC that a valid RCS flow input has been restored to ICS, THEN GO TO Encl 5.1 (Placing ICS in AUTO). <p>Note: Crew may refer to PT/600/001 (Periodic Instrument Surveillance) and TS 3.3.1 (RPS Instrumentation) due to " A RPS Channel trip and may choose to place "A" RPS to manual Bypass.</p>
		<p>Event is complete when the SRO has reached the WHEN step in AP/28 or when directed by the Lead Examiner.</p>

Event Description: " "A SG Startup Level Fails LOW (I, OATC)
***This event to be performed if reactor trips during event 4.**

Time	Position	Applicant's Actions or Behavior
	<p>OATC</p> <p>SRO</p>	<p>If the reactor trips on event 4, activate timer to insert "A" SG Startup Level failure.</p> <p>Plant response:</p> <p>Statalarms:</p> <ul style="list-style-type: none"> • 1SA-2/E-8, M S Stm. Gen "A" Level Low Limit <p>Control board indications:</p> <ul style="list-style-type: none"> • "A" SG Startup Level indicates "0" on the control board and the QAC. • "A" SG XSUR Level indication will indicate greater than 25". • "A" SG Main and Startup Control valves will be open even though the SG level will be above setpoint. • "A" SG level will continue to increase. XSUR indication should be used to determine SG level. <p>Crew response:</p> <ul style="list-style-type: none"> • The QAPC should diagnose the failure of the "A" SG Startup level instruments and inform the SRO. • The SRO should direct the RO to take the "A" SG Main and Startup Control valves to manual. • The SRO should direct the RO to close the "A" SG Main Control valve and use the "A" SG Startup Control valve to control "A" SG level at 25" XSUR. • The SRO should notify SPOC to have the instruments repaired.
		<p>Event is complete when the OATC is controlling "A" SG level manually or when directed by the Lead Examiner.</p>

Event Description: **BOTH MDEFDWP**s Auto-start circuitry inoperable: (C, ALL) (TS)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Note: When directed by the Lead examiner, call the CR and inform them that that I&E has determined that the Auto-start circuitry for the BQTH MDEFDWPs are out of tolerance and technically inoperable. Parts required for the repair are not expected for 3 days.</p> <p>Crew response:</p> <ul style="list-style-type: none"> • The SRO should refer to TS 3.3.14 (Emergency Feedwater Pump initiation Circuitry) Condition "B" and determine that the ' ' A MDEFDWP is inoperable. • Determine TS 3.7.5 (EFW System) Condition "C" requires restoring one MDEFDWP pump in 12 hours or be MODE 3 in an additional 12 hours. • SRO should determine that at unit shutdown <i>is</i> required and direct unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 3.2, Power Reduction.
		Event is complete when the decision to shutdown has been made or when directed by the Lead Examiner.

Event Description: **Manual unit shutdown: (R, OATC)**

Time	Position	Applicant's Actions or Behavior
	<p data-bbox="370 471 438 508">SRO</p> <p data-bbox="370 848 448 884">OATC</p> <p data-bbox="370 929 438 966">BOP</p>	<p data-bbox="500 392 734 428">Crew response:</p> <p data-bbox="500 439 1481 508">Direct unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 3.2, Bower Reduction.</p> <ol data-bbox="500 523 1461 743" style="list-style-type: none"> 1. Review Limits and Precautions 2. Notify OSM to contact NRC if required. 3. Refer to OP/1106/001 (Turbine Generator) to <i>ensure</i> operating limits are NOT exceeded during shutdown. 4. Notify System Operations Center (SOC) or lead reduction. <p data-bbox="500 757 1451 825">Note: Due to procedure complete up to Step 2.17 the crew may not perform steps 1-4 above.</p> <ol data-bbox="500 841 1419 961" style="list-style-type: none"> 5. Reduce reactor power in manual by inserting control rods with the Diamond and controlling FDW flow with the FDW Masters. 6. Stop "D" HDPs per OP/1/A/1106/002 D (HDP Operation)
		<p data-bbox="500 1567 1484 1635">Event is complete when reactor power has been reduced 5% or when directed by the Lead Examiner.</p>

Event Description: Reactor trip, Main Turbine Fails to trip (Lockout EHC Pumps) (C, OATC)

Time	Position	Applicant's Actions or Behavior
	<p>SRO</p> <p>QATC</p> <p>BOP</p>	<p>Note: The reactor will trip as a result of initiating event 9 (SBLOCA). Plant response: Statalarms:</p> <ul style="list-style-type: none"> • 1SA-9/A-6, RB Reactor Bldg Norm Sump Level High/Low • 1SA-8/B-9, Process Monitor Radiation High <p>Control board indications:</p> <ul style="list-style-type: none"> • PZR level and RCS pressure will decrease • The reactor will trip on low RCS pressure. • The Main Turbine should trip but does not. This will result in a reduction of steam pressure in both SGs until actions are taken to trip the turbine. This will result in RCS overcooling until the turbine is tripped. <p>Crew response:</p> <ol style="list-style-type: none"> 1. SRO will direct the OATC to perform IMAs and the BOP to perform a symptom check and then 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 • Lock out both EHC pumps (CT-18) <p>Note: The OATC should diagnose that the turbine did not trip and then perform the RNO step which will stop and lock out both EHC pumps. This will cause the turbine to trip.</p> <ul style="list-style-type: none"> • Verify RCP seal injection available. <ol style="list-style-type: none"> 3. BOP will perform a symptom check.
		<p>Event is complete when EHC pumps have been tripped or when directed by the lead examiner.</p>

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

Time	Position	Applicant's Actions or Behavior
	OATC BOP	<p>Plant response:</p> <p>Control board indications:</p> <ul style="list-style-type: none"> • ES 1-6 actuate • RCS subcooling margin will indicate 0°F. <p>Crew response:</p> <ol style="list-style-type: none"> 1. The OATC should verify IMAs complete with the SRO and then the SRO should direct the OATC to perform a symptom check. 2. The BOP should report symptoms and 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 \leq 1%. • Trip WCPs within 2 min of LBSCM (CT-1) • Notify SRO of RCP status. • Verify 1HP-24/25 (1A/1B BWST Suction) open • Ensure all available HPI pumps operating. <p>Note: 1C HPI pump will not be operating and an attempt should be made to manually start the 1C HPI pump.</p> <ul style="list-style-type: none"> • Ensure 1HP-26/27 (1A/1B HP Injection) open • Determine HPI flow in the B header \leq in the unacceptable region of Figure 1 and open 1HP-409 (1HP-27 Bypass). (CT-2) • 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 setpoint per Rule 7 (SG Feed Control). (CT-10) • Verify both MDEFDWP operating. (1B MDEFDWP is off) • Ensure TDEFDWP is in PULL PO LOCK. (Not performed due 1B MDEFDWP not operating) • Trip both MFDWPs and close the FDW block valves. • Notify SRO of SG feed status. • Maintain SG pressure $<$ RCS pressure. • Ensure Rules 3 & 8 in progress or complete.

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

Time	Position	Applicant's Actions or Behavior
	SRO OATC	<p>3. When reporting symptoms, the OATC should inform the SRO that ES Channels 1-6 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. <p>Note: " A RBCU will not receive an ES signal and will remain in HIGH speed. The operator should diagnose this and place the " ARBCU in LOW speed.</p> <ul style="list-style-type: none"> • Place HPI in Manual. • Verify any RCP operating. (No RCPs operating) Ⓔ Verify SCMs > 0°F and proceed to the HPI flow check when he determines that the RCS has saturated. • The operator should determine HPI flow is adequate per Figure 1. <p>Note: 1HP-409 should have been opened by Rule 2.</p> <ul style="list-style-type: none"> • 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) • IAAT ES Channels 5 & 6 have actuated, THEN dispatch an operator to establish ≈ 1000 cfm flow in each PRVS filter train using 1PR-13 and 1PW-17 (Controller, Filter 1A/1B) • Ensure the following are open: <ul style="list-style-type: none"> • 1CC-7 and 1CC-8 • 1LPSW-6 and 1LPSW-15 • Ensure open 1CF-1 and 1CF-2 (A/B CFT Outlet) • Verify 1HP-410 closed. • 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 SRO approval to exit this enclosure.

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

Time	Position	Applicant's Actions or Behavior
	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 <i>not</i> deeding any SG. • Verify that the LOSCM is not caused by excessive heat transfer. • Open 1AS-40 while closing 4 MS-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) • Control steaming and feed rates on all intact SGs to maintain cooldown rate within Tech Spec limits: <ul style="list-style-type: none"> ➤ $T_c \geq 280^\circ\text{F} \leq 50^\circ\text{F}/\frac{1}{2} \text{ hour}$ • GO TO Step 70. • Close 1RC-4 (PORV Block) • Close the following: (CT-3) <ul style="list-style-type: none"> ➤ 1HP-1 (1A Letdown Cooler Inlet) ➤ 1HP-2 (1B Letdown Cooler inlet) ➤ 1RC-3 (Spray Block) ➤ 1GWD-17 (PZR Vent Control) <p>Note: RCS leak will be isolated when 1RC-3 is closed.</p> <ul style="list-style-type: none"> • Maintain SG pressure < RCS pressure. • Verify primary to secondary heat transfer exists. • initiate Encl. 5.16 (SG Tube-to-Shell AT Control) • Verify NO indications of an SGTW. • Verify HPI forced cooling NOT in progress. • Verify CETCs NOT increasing. • Verify primary to secondary heat transfer is NOT excessive. • Verify NO indications of SGTW. • Verify required RCS makeup flow within normal makeup capability. <ul style="list-style-type: none"> ➤ RNO Transfer to LOCA CD tab.

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

Time	Position	Applicant's Actions or Behavior
	SRO	<p data-bbox="496 403 831 437">5. GO TO LOCA CD tab.</p> <ul style="list-style-type: none"> <li data-bbox="544 455 1422 489">• IAAT BWST level \leq 19 feet transfer ECCS suction to the RBES. <li data-bbox="544 508 868 542">• Verify ES is actuated. <li data-bbox="544 560 1453 628">• Ensure all RBCUs in low speed and open 1LPSW-IS, 1LPSW-21, 1LPSW-24, and 1LPSW-565 closed. <li data-bbox="544 646 1110 680">• Initiate Encl. 5.35, Containment Isolation <li data-bbox="544 698 1078 732">• Ensure all RB Aux fans are operating <li data-bbox="544 750 1394 784">• Initiate Encl. 5.36 (Equipment Alignment For Plant Shutdown) <li data-bbox="544 802 1251 836">• IAAT all of the following conditions exist: (Step 33) <ul style="list-style-type: none"> <li data-bbox="592 855 868 889">➤ ALL SCMs \geq 0°F <li data-bbox="592 904 1075 938">➤ RCS pressure \geq LPI shutoff head <li data-bbox="592 954 1243 988">➤ Required HPi within normal makeup capability <p data-bbox="496 1006 1054 1041">Note: If step 33 met then go to Event 10.</p> <ul style="list-style-type: none"> <li data-bbox="544 1059 1382 1127">• If step 33 NOT met crew will GO TO Step 37 and continue in LQCA Cooldown tab. <li data-bbox="544 1145 1251 1179">• IAAT all of the following conditions exist: (Step 37) <ul style="list-style-type: none"> <li data-bbox="592 1197 868 1231">➤ ALL SCMs $>$ 0°F <li data-bbox="592 1247 995 1281">➤ ES Bypass Permit satisfied <li data-bbox="592 1297 987 1331">➤ RCS pressure controllable <p data-bbox="592 1347 1007 1381">THEN bypass ES as necessary</p> <ul style="list-style-type: none"> <li data-bbox="544 1399 1449 1467">• Disable all AFIS headers NOT actuated by selecting OFF on both Digital Channels 1&2 on that header.

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

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> • IAAT a sustained re-pressurization of the WCS occurs due to any of the following: <ul style="list-style-type: none"> ➤ Leak isolation ➤ Degraded heat transfer due to hot leg voiding THEN perform Steps 42-48. • Verify at least one SG available. • Verify any loop < 537". (both should be above) • Cycle PORV to maintain RCS pressure. • Ensure appropriate level and feed flow is available to SGs per RULE 7 (SG Feed Control) • Notify TSC to evaluate starting or bumping WCPs. • Notify Chemistry to sample RCS boron hourly until MODE 5.
		<p>Event is complete when RCS SCM is greater than 0°F or when directed by the Lead Examiner.</p>

CRITICAL TASKS

1. CT-1, **brig** All RCPs
2. CT-2, Initiate **HPI**
3. CT-3, Isolate Possible **RCS Leak** Paths
4. CT-10, Establish **FW Flow and** Feed **SGs**
5. CT-18, Turbine Trip
6. CP-20, **RCS** Pressure Control To Prevent Exceeding RV **P-T** Limits And **Comply** With **PTS** Guidance
7. CT-27, Implementation of Control Room Habitability Guidance