

Facility: <u>Surry Power Station</u>	Scenario No.: <u>1</u>	Op-Test No.: <u>2014-001</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: Unit 1 and 2 at 100% power; MOL.</p> <ul style="list-style-type: none"> <li>• “A” BAST at 8.0 W/%; Last Shift performed two (2) 35 gallon alt dilutes followed by a manual makeup for training.</li> <li>• AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.</li> </ul> <p>Turnover: The Team will pre-brief conduct of PT-18.6I, PZR Block Valve Stroke Test</p>		

  

Event No.	Malf. No.	Event Type*	Event Description
1	RCMOV_5 35_BKR, Open	N BOP TS SRO	Test Cycle Pressurizer PORV, Block Valve breaker will trip when re-opened
2	RC4903, -2 DEG	I RO TS SRO	PRZR Level Transmitter Fails Low, requiring IAs of AP-53.00 to control CH flow.
3	FW1803, +1 DEG	I BOP TS SRO	Feed Flow Channel fails high requiring manual FRV control, IAs of AP-53.00
4	SD0201	C BOP	Loss of High Pressure Drain, AP-18.00
5		R RO R SRO N - BOP	Ramp to 75% power IAW AP-23.00
6	RC2402  AS02, AS05  RC5601 RC5602 RC5603	C RO C SRO  C - BOP	<p>Steam Generator Tube Leak “B” SG at approximately 74 gpm. AP-16.00, E—0.</p> <p>Auto Actions of Air Ejector Hi Rad do not function, BOP manually aligns. A/E RM Annunciator Response Procedure.</p> <p>Reactor Coolant Pumps trip on electrical power swap to Reserve Station Service Transformers (30 seconds after reactor trip).</p>
7	RC2402, 88%, 800 gpm, 60 sec ramp	M - All	SGTL “B” SG escalates to Design Basis rate (800 gpm) in ES-0.1. AP-16.00, Manual SI, E-0, E-3.
8	PCV455C _OPEN, _OFF	M - All	PZR PORV 1-RC-1455C will not open when switch placed in “open” – Go to ECA-3.3

9	SI409 SI2505	C BOP	BOP Failures in E-0 Attachments; 1-SI-P-1B not start, 1-CH-HCV-1200 A/B not close, VS-MOD-103A not close, 1-MS-TV-109 and 1-DA-TV-100A/B not close.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**Event 1: PT-18.6 I, PZR Block Valve Stroke Test. (N- BOP/SRO)**

The Team will pre-brief this evolution prior to entering the Simulator. Upon entry of the Team to the Simulator, the Scenario brief will be given, Questions answered, and the Team allowed ~ 5 minutes to become acclimated to the Simulator Environment.

When the BOP closes 1-RC-MOV-1535, 1-RC-PCV-1456 block valve, and attempts to re-open 1-RC-MOV-1535, a series of triggers actuate to trip the power supply breaker to 1-RC-MOV 1535.

**Verifiable Action(s):**

- 1) BOP will close 1-RC-MOV-1535 and time the stroke.
- 2) RO/BOP will place the 1-RC-MOV-1456 PORV control switch in the “close” position following Tech Spec review.

**Technical Specifications:**

The SRO will review Tech Specs (3.1.A.6.d) and determine a one (1) hour clock exists to place 1-RC-PCV-1456 in manual (switch to close); and a 72 hour clock to return the block valve to an OPERABLE status, or be in HSD in 6 hours and RCS temperature <350°F within the next 6 hours.

This Event sets up entry into ECA-3.3, SGTR without Pressure Control; Major Event later in the Scenario.

**Event 2: PRZR level Upper Channel Fails Low (-.2 DEG) PRZR level on selected Upper Channel fails to ~34%. (I – RO, TS – SRO). ARP 1C-D8, PRZR LO Level.**

The RO will diagnose the failure based on CH to Regen HX Hi/Low flow alarm (Annunciator 1D-E5) or identification of CH flow increasing and PZR level Channel III decreasing.

**Verifiable Actions(s):**

- 1) The RO will place CH flow in Manual and control PRZR level at setpoint IAW AP-53.00, Loss of Vital Instrumentation/Controls.
- 2) BOP will select an operable channel on the pressurizer level recorder.
- 3) The RO will defeat the failed channel IAW AP-53.00, and return CH flow to automatic when normal PRZR level restored.

**Technical Specifications:**

- 1) The SRO will Review Tech Specs and determine a 72 hour clock to place the Failed Channel in trip (TS 3.7, Table 3.7-1, item 9 (Pressurizer High Water Level), Operator Action 7. With the number of OPERABLE Channels less than the Total number of channels; place the failed channel in trip in 72 hours, allowable to bypass the channel for up to 12 hours for surveillance, if requirements not met reduce power to less than P-7 (10%) within the next 6 hours.

- 2) TS-Table 3.7-6, item 14, Pressurizer Level, 2 Channels required, condition met. (Referred by check of CEP 99-0029, RG 1.97).

**TRM Actions:**

- 1) TRM section 3.3.2, Table 3.3.2-1, Pressurizer Level Channel 1-RC-LI-1461. Condition A applies, Implement a Fire Watch in cable vault and tunnel and the emergency switchgear room of the affected Unit (Unit 1) IAW TRM Section 5.2 (Hourly) within 14 days and restore the failed channel in 60 days. **(Usually an STA Function to identify, may be performed as a follow-up).**

**Reg. Guide 1.97:**

- 1) CEP-99-0029, Reg. Guide 1.97 Operability/Functionality, Reportability and Alternate Indications, Attachment 1, Post Accident Monitoring Equipment, A-13 variable, 2 channels required, Condition is met. **(Usually an STA Function to identify – could be covered as a follow-up).**

**Event 3: Feed Flow Channel III, “B” SG fails high. (I – BOP, TS – SRO)**

BOP will diagnose the failure based upon alarms and indications received and take the Immediate Actions of AP-53.00. The Team will implement AP-53.00, Loss of Vital Instrumentation/Controls and shift SGWLC input to Channel IV for “B” SG. The BOP will restore “B” SG NR level to program.

**Verifiable Action(s):**

- 1) BOP will place the “B” FRV in manual and regain control of “B” SG NR level.
- 2) RO will defeat the failed channel.
- 3) BOP will return the “B” FRV to automatic.

**Technical Specifications:****Tech Spe Table 3.7-1**

- 1) Item 17, Low steam generator water level with steam flow/feedwater flow mismatch, Operator Action 6.
- 2) With the number of OPERABLE Channels less than the TOTAL number of channels, operation may continue if the failed channel is placed in trip in 72 hours, the channel may be bypassed for 12 hours for surveillance, if conditions not satisfied in the time permitted, be in Hot Shutdown within 6 hours.

**Technical Requirements Manual. Reg. Guide 1.97:**

- 1) The TRM Section 3.3, Appendix R Instrumentation, and RG 1.97 are unaffected by this failure.

**Event #4: Loss of the HP Heater Drain Pump (1-SD-P-1A) (C – BOP)**

The BOP will diagnose the failure based upon alarms and indication received. The Team will initiate AP-18.00, Loss of HP Heater Drain Pump/ Network 90 failure

**Verifiable Actions:**

- 1) The BOP will place the tripped High Pressure Drain pump control switch in PTL.
- 2) Reduce Turbine Load as necessary to maintain reactor power less than 100% using the valve position limiter or using Turbine Manual (approximately 50 MW reduction required).

**Event 5: Power Reduction to less than 75% power using AP-23.00, Rapid Load Reduction. (R – RO, R – SRO, N – BOP)**

The SRO will lead a Team Brief where the reactivity plan will be discussed to reduce reactor power to less than 75% power in order to restore the Polishing Building to service. The RO and SRO will be credited with a Reactivity Manipulation and the BOP with a Normal Evolution.

**Verifiable Action(s):**

- 1) RO will manipulate control rods to control delta flux and/or Tave.
- 2) RO will manipulate CVCS controls to Emergency Borate.
- 3) RO will manipulate CVCS control to establish a normal boration to assist in Tave control.
- 4) BOP will manipulate Turbine Controls to establish power reduction.

**Event #6: Steam Generator Tube Leak “B” Steam Generator. Failure of Auto actions of A/E RM. Trip of all RCPs on electrical transfer to RSSTs. (C – RO, C – BOP)**

When the Evaluation Team is satisfied with the Reactivity manipulation, the event will be triggered. A SGTL of approximately 74 gpm will initiate requiring the RO to perform the actions of 1-AP-16.00 to quantify the leakrate. The A/E RM will go into High alarm due to the primary to secondary leakage; the BOP will manually align A/E discharge to containment IAW A/E RM ARP. When the RCS leakrate is identified as greater than 50 gpm, the RO will trip the reactor and perform the Immediate Actions of 1-E-0.

**Verifiable Actions:**

- 1) RO will isolate LD flow and place charging flow in manual to quantify leakrate.
- 2) BOP will respond to failure of auto actions on A/E RM High alarm by swapping A/E discharge to containment.

**Critical Task:**

**Event #7: SGTR in “B” SG, approximately 800 gpm. (M – ALL)**

When the evaluation Team is ready, a SGTR in the “B” SG will be implemented. The RO will re-assess RCS leakage in response to alarms and indications received. The RO will determine that RCS leakage exceeds the capacity of a single CH pump, and the Team will return to E-0 and manually initiate SI.

The SRO will perform a commensurate brief and continue with E-0. While the RO and SRO continue with E-0, the BOP will be directed to perform E-0 Attachments 1 through 3.

**Verifiable Actions:**

- 1) RO will increase CH flow in manual per Immediate Action Steps of 1-AP-16.00, Excessive RCS Leakage to determine if RCS leakage is greater than the capacity of a single CH pump.
- 2) RO re-perform High Level Steps of E-0, and manually Safety Inject on Step 4 of 1-E-0.
- 3) BOP will perform actions of Attachments 1 through 3 of E-0. BOP Failures in E-0 Attachments: 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not auto close, 1-VS-MOD-103A not auto close, 1-MS-TV-109 and 1-DA-TV-100A/B will not auto close (Listed as Event 9).

**Critical Task:**

- 1) SPS E-1 – G LHSI pumps will not undergo significant degradation while operating under very low flow conditions during the onset of a SBLOCA (implicit in SBLOCA analysis). Operators will secure one LHSI pump as directed by Emergency Operating Procedures to prevent pump damage while on recirculation. Secure one LHSI pump within 30 minutes of initiation of SI (KOA).
- 2) WOG E-3 -- A: Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs. Example: Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs (KOA). KOA: For the design basis tube rupture, isolate the ruptured SG from the atmosphere/Turbine building within 30 minutes. Note: The 30 minute criteria in the CT is ONLY for “the design basis tube rupture”.
- 3) SPS E-3 – E: Align air ejector to containment following a SGTR following SI reset. **KOA:** Align condenser air ejector to containment prior to commencement of E-3 rapid RCS Cooldown (KOA.)

**Event #8: SGTR with Loss of Pressure control. (M – All)**

The Team continues through the EOP progression E-0 to E-3.

After the Team has completed the rapid cooldown of E-3 and moves to the Depressurization steps, the Team will be presented with the inability to depressurize the RCS (No RCPs – No Spray available), 1 PZR PORV inoperable, and the last PZR PORV not responding to placing the control switch in Open. This will require the Team to Transition to ECA-3.3, SGTR without Pressure Control.

When ECA-3.3 is entered, it is expected that the ruptured SG level will be > 73% NR leading to Team moving to Step 6, Check If SI Can Be Terminated.

**Verifiable Actions:**

- 1) RO will isolate AFW flow to the Ruptured SG.
- 2) BOP will reset SI and secure “A” CH pump and one of the running LHSI pumps.  
(Discretionary CT – within 30 minutes).
- 3) RO will manipulate steam dump controls for rapid cooldown.
- 4) RO/BOP will block SI signals when conditions established.
- 5) RO will manipulate SI/CVCS control to terminate SI, establish CH flow, and restore letdown flow.

**Classification:**

Follow-up Classification question for SGTR: Alert FA-1.1.

The Scenario is terminated at Lead Evaluator discretion or at Step 11 of ECA-3.3, “Check If CS Should Be Stopped” (CH and LD flow have been re-established).

Initial Conditions: Unit 1 and 2 Operating at 100%.			
Turnover: The Team will pre-brief conduct of PT-18.6I, PZR Block Valve Stroke Test			
Pre-load malfunctions: (Trigger 30's) <ul style="list-style-type: none"> <li>○ SI2409 SI RELAY CI1A FAILS TO ACTUATE</li> <li>○ SI2505 SI RELAY SI5B FAILS TO ACTUATE</li> <li>○ AS02 DISABLE SV-TV-102 OPEN</li> <li>○ AS03 DISABLE SV-TV-103 CLOSE</li> <li>○ AAC_SMS_MODE OFF AAC DG LOCAL MODE SWITCH POSITION</li> </ul>			
Equipment Status/ Procedures/ Alignments/ Data Sheets/ etc.: <ul style="list-style-type: none"> <li>○ AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.</li> </ul>			
Turnover: <p>Unit 1 and 2 at 100% power; MOL.</p> <p>“A” BAST at 8.0 W/%; Last Shift performed two (2) 35 gallon alt dilutes followed by a manual makeup for training.</p> <p>All systems and crossties are operable with the following exception:</p> <ul style="list-style-type: none"> <li>• AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.</li> </ul> <p>Turnover: Team will perform PT-18.6I, PZR Block Valve Stroke Test. The performance of this procedure has been analyzed based on the current plant configurations and the PRA indicates green.</p>			
Event	Malf. #'s	Severity	Instructor Notes and Required Feedback
1	RCMOV_53 5_BKR,	Open	Test Cycle Pressurizer PORV, Block Valve breaker will trip when re-opened.
2	RC4903,	-.2 DEG	PRZR Level Transmitter Fails Low, requiring IAs of AP-53.00 to control CH flow. 0-AP-53.00.
3	FW1803,	+1 DEG	Feed Flow Channel fails high requiring manual FRV control, IAs of AP-53.00
4	SD0201	True	Loss of High Pressure Drain, AP-18.00
5	N/A	N/A	Ramp to 75% power IAW AP-23.00
6	RC2402  AS02, AS05  RC5601 RC5602 RC5603	8%      TRUE	<p>Steam Generator Tube Leak “B” SG at approximately 74 gpm. AP-16.00, E—0.</p> <p>Auto Actions of Air Ejector Rad Mon on High alarm do not function, BOP manually aligns. A/E RM Annunciator Response Procedure.</p> <p>Reactor Coolant Pumps trip on electrical power swap to Reserve Station Service Transformers (30 seconds after reactor trip).</p>

7.	RC2402  AS02/03	88%, 60 sec ramp	SGTL "B" SG escalates to Design Basis rate (800 gpm) in AP-24.01. AP-16.00, Manual SI, E-0, E-3.  Failure of Auto Air Ejector to re-align on A/E RM High Alarm.
8	PCV455C _OPEN,	OFF	PZR PORV 1-RC-1455C will not open when switch placed in "open" – Go to ECA-3.3
9	SI409  SI2505	TRUE	BOP Failures in E-0 Attachments; 1-SI-P-1B not start, 1-CH-HCV-1200 A/B not close, VS-MOD-103A not close, 1-MS-TV-109 and 1-DA-TV-100A/B not close.

## Scenario Objectives:

- A. Given a failure of 1-RC-MOV-1535 to re-open during performance of 1-PT-18.6I, PZR Block Valve Stroke Test, Implement the Applicable Tech Spec LCO.
- B. Given a pressurizer level channel deviation, respond IAW 0-AP-53.00 to the failure.
- C. Given a High Failure of SG Feed Flow Channel II on 'B" SG, take action IAW 0-AP-53.00 to control SG level, and apply the applicable Tech Spec LCOs for the failure.
- D. Given a trip of the running High Pressure Drain pump, ramp the Unit 1 <75% IAW 1-AP-18.00 and 0-AP-23.00.
- E. Given a SG Tube Leak, respond IAW 1-AP-16.00 to quantify the leak rate, trip Unit 1, and perform the Immediate Action Steps of 1-E-0, Reactor Trip or Safety Injection.
- F. Given a Design Basis SG Tube Rupture, respond IAW 1-E-0, and 1-E-3, Steam Generator Tube Rupture.
- G. Given the Failure of 1-RC-PCV-1445C to open to depressurize the RCS, transition to 1-ECA-3.3, Steam Generator Tube Rupture without Pressurizer Pressure Control.
- H. Given SI relay failures, manually align components IAW E-0, Attachment 1, 2, and 3.



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## SHIFT TURNOVER INFORMATION

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### **OPERATING PLAN:**

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance. Expected to be returned to services in 3 days. Per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1 and upon relieving the watch, perform PT-18.6I, PZR Block Valve Stroke Test. Performance of this procedure has been authorized and has been PSA analyzed for current plant conditions.

The last shift performed two 35 gallon dilutions followed by a manual makeup for training.

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Event Description: Test Cycle Pressurizer Block Valves, Block Valve Trips on re-open, PT-18.6I.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	SRO/BOP	1-PT-18.6I <b>NOTE</b> – Team will pre-brief this evolution prior to entering the simulator. Initial Conditions and Precautions and Limitations will be completed before entering the simulator.
	BOP	Verify closed or close PRZR PORV 1-RC-PCV-1456.
	BOP	Verify key switch for PRZR PORV 1-RC-PCV-1456 OVPRESS Mitigating System is in DISABLE.
	BOP	Verify PRZR PORV Block Valve 1-RC-MOV-1535 is open. <b>Stroke PRZR PORV Block Valve 1-RC-MOV-1535 through one complete cycle, timing valve movement in each direction.</b> Time from signal initiation to complete valve travel.
	BOP	Valve closes and fails to reopen.
	SRO	Refer to Technical Specification 3.1.A.6 for required action
	SRO	<b>Refer to Technical Specification 3.1.A.6 for required actions.</b>  With one block valve inoperable, within 1 hour either restore the block valve to operable status or place the associated PORV in manual. In addition, restore the block valve to operable status in the next 72 hours or, be in at least HSD within the next 6 hours and reduce RCS temperature to < 350°F within the following 6 hours.
	BOP	<b><i>Places 1-RC-PCV-1456 in "CLOSE".</i></b>
	SRO	<b><i>Start 72 Hour Clock to repair Block Valve.</i></b>
	SRO	Direct RO/BOP to notify Service Building Operator to check status of 1H1-2S 6A breaker for 1-RC-MOV-1535.
	RO/BOP	<b><i>Contact Service Building Operator to check status of 1-RC-MOV-1535 Breaker.</i></b>

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Event Description: Test Cycle Pressurizer Block Valves, Block Valve Trips on re-open, PT-18.6I.

**Cue: By Examiner.**

	RO/BOP	When notified by field operator that 1H1-2S 6A. Breaker is tripped, report information to the Team using a Focus Brief.
	SRO	Notify Shift Manager of Block Valve failure and suspension of PT performance. Request Electrical Maintenance support to investigate breaker trip.
	SRO	Exit 1 hour clock to place 1-RC-PCV-1456 in manual.
	SRO	Perform brief to update Team on Technical Specification requirements. Brief driven by brief card and placards.

END of Event #1.

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Event No.: 2

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Event Description: PRZR Level Transmitter Fails Low, 0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	RO	<p>Diagnoses failure of 1-RC-LI-1461 with the following indications/alarm:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>1C-D8 PRZR LO LEVEL</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>CH Flow rises on 1-CH-FI-1122A to ~109 gpm</li> <li>PRZR Level on 1-RC-LI-1461 lowers to 34%</li> </ul> <p>In accordance with the immediate actions of AP-53.00 the RO will take manual control of pressurizer level control by placing 1-CH-FV-1122 in manual and lowering charging flow to maintain program level (per AP-53.00).</p>
	SRO	Enters 0-AP-53.00, Loss of Vital Instrumentation / Controls.
	RO	<p>[1] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>Checks 1-RC-LI-1459, Pressurizer Level Channel 1, and 1-RC-LI-1460, Pressurizer Level Channel 2 are NORMAL.</p>
	RO	<p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><b>Places 1-CH-FV-1122 in manual and raises charging flow.</b></p>
	SRO	<p>Conduct a Brief using the Briefing Placard and obtains Critical Parameter information from the RO and BOP. The SRO will update the Shift Manager during AP-progression. SRO will provide a band for control of PRZR level with CH flow in MANUAL.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. STA will also state that containment conditions and the electrical conditions are as you see them.</i></p>
	RO	<p>Step 3, AP-53.00</p> <p>VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%</p> <p><i>RO will identify that reactor power is less than 100% using PCS Display of Core Thermal Power.</i></p>

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Event Description: PRZR Level Transmitter Fails Low, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>Notes Prior to Step 4:</p> <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	SRO	<p>*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:</p> <ul style="list-style-type: none"> <li>PRZR Level Control, Step 11.</li> </ul>
	RO	<p><i>The RO will identify that 1-RC-LI-1461 has failed.</i></p>
	SRO	Step 11, AP-53.00
	RO	11. CHECK PRZR LEVEL CONTROL CHANNELS – NORMAL
	SRO	<p>Responds “NO, 1-RC-LI-1461 Abnormal.”</p>
	RO	11 a) RNO 1) Place either of the following in MANUAL:
	SRO	<ul style="list-style-type: none"> <li>1-CH-FC-1122C, CHG FLOW CNTRL, OR</li> <li>1-CH-LC-1459G, PRZR LEVEL CNTRL</li> </ul>
	RO	Responds “1-CH-FC-1122 in MANUAL”
	SRO	11 a) RNO 2) Control PRZR Level at Program Level.
	RO	Responds “Maintain PRZR Level at program $\pm$ band set by SRO”
	SRO	11 a) RNO 3) Move PRZR Level – CH SEL switch to Defeat the failed channel.
	RO/BOP	<b>Transfers CH SEL switch to 1 / 2 Position.</b>
	SRO	11 a) RNO 4) Check or place recorder 1-RC-LR-1459 on an operable channel.
	BOP	<i>Checks or adjusts PRZR Level Recorder to 1-RC-LI-1459 or 1-RC-LI-1460.</i>
	SRO	<p>11a) RNO 5) Refer to Tech Spec 3.7-1, Item 9 and Table 3.7-6, Item 13.</p> <p><b>TS 3.7, Table 3.7-1, item 9; Operator Action 7. Number of Operable channels one less than Total number of channels: Place Inoperable channel in trip within 72 hours, allowed to bypass channel for 12 hours for surveillance, If conditions not met within allowed time, reduce power to less than P-7 in the next 6 hours.</b></p> <p><b>TS Table 3.7-6m Item 13: Required Number of channels to meet function = 2.</b></p>
	SRO	<p>11 a) RNO 6) Refer to Attachment 3.</p> <p><i>SRO hands Attachment 3, Pressurizer Level Control diagram to RO/BOP for review.</i></p>

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Event Description: PRZR Level Transmitter Fails Low, 0-AP-53.00.

Cue: By Examiner.

		Step 11, AP-53.00, Continued:
	SRO	Step 11 b) Check Pressurizer Heaters - Energized.
	RO	<i>Checks Required Pressurizer Heaters energized, and reports that Pressurizer heaters are energized.</i>
	SRO	Step 11 c) Check Letdown – IN SERVICE.
	RO	<i>“Reports Letdown in service”.</i>
	SRO	Step 11 d) Check PRZR level control – IN AUTOMATIC.
	RO	<i>Reports pressurizer level control in MANUAL.</i>
	SRO	Step 11 d) RNO When pressurizer level restored to program level, unsaturate 1-CH-LC-1459G, PRZR LEVEL CNTRL. Place 1-CH-FCV-1122 in automatic.
	RO	Acknowledges direction and notifies SRO when pressizer level returned to AUTOMATIC.
		Step 13, AP-53.00
	SRO	SRO recalls NOTE 2 Prior to Step 4 and goes to Step 13 of AP-53.00.
	SRO	Step 13 Check Calorimetric – Functional IAW 1-OPT-RX-001.
	RO/BOP	<i>Checks Calorimetric unaffected by this failure, and reports to the SRO.</i>
		Step 14, AP-53.00
	SRO	CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE  <i>SRO directs STA to review Reg. Guide 1.97. The STA will report that 1-RC-LI-1461 is a Reg. Guide 1.97 component.</i>
		STEP 15, AP-53.00
	SRO	REVIEW CEP 99-0029, REG GUIDE 1.97 OPERABILITY, REPORTABILITY, AND ALTERNATE INDICATIONS  <i>SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 only requires two channels of pressurizer level control and refers the SRO to TS Table 3.7-6.</i>

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Event Description: PRZR Level Transmitter Fails Low, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>STEP 16, AP-53.00</p> <p>Review the following:</p> <ul style="list-style-type: none"><li>• TS 3.7</li><li>• VPAP-2802</li><li>• TRM Section 3.3, Instrumentation</li></ul> <p>SRO determines that TS Table 3.7.1, Item 9 is applicable (72-hours to place the channel in trip). SRO determines that 3.1.A.5 is not applicable since pressurizer heaters did not de-energize and that Table 3.7-6 is met.</p> <p><i>SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA will report that review is complete; VPAP-2802 and TRM requirements have been discussed with the Shift Manager. The STA reports that a 14-day clock to establish a fire watch and a 60-day return to service clock is in effect.</i></p>
	SRO	<p>Step 17, AP-53.00</p> <p>CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION - EXISTS</p> <p>The team will identify that no new additional failures exist (i.e., all failures have already been addressed), proceed to the RNO section, and this will direct the team to Step 19.</p>
	SRO	<p>Step 19, AP-53.00</p> <p>PROVIDE NOTIFICATIONS AS NECESSARY:</p> <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• OMOC</li><li>• STA (PRA determination)</li><li>• I&amp;C</li></ul>
		<b>END EVENT 2</b>

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Event description: Feed Flow Channel Fails High, 0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	BOP	<p>Diagnoses failure FT-1487 with the following indications/alarms:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>1H-E6 STM GEN 1B FW &gt;&lt; STM FLOW</li> <li>1F-D8 STM GEN 1B CH 3 FW &lt; STM FLOW</li> <li>1H-G6 STM GEN 1B LVL ERROR.</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>Step increase in 1B SG Feed Flow indication CH-3</li> <li>decrease in 1B SG Feed Flow indication CH-4</li> <li>decreasing level on 'B' SG.</li> </ul>
	SRO	Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	BOP	<p>Step 1, AP-53.00</p> <p>[1] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>BOP identifies Channel IV indication for feed flow is NORMAL.</p>
	BOP	<p>Step 2, AP-53.00</p> <p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><b>BOP takes manual control of 'B' SG feed reg valve and increases demand (FF &gt; SF) to restore level to program using Channel IV indication.</b></p>
	SRO	<p>Conduct a Brief using the Briefing Placard and obtains Critical Parameter information from the RO and BOP. The SRO will update the Shift Manager during AP-progression. SRO will provide a band for control of "B" SG level with "B" FRV in MANUAL.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. STA will also state that containment conditions and the electrical conditions are as you see them.</i></p>
	SRO	<p>Step 3, AP-53.00</p> <p>* VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%</p>
	RO	<p><i>Checks Reactor Power &lt; 100% using PCS Calorimetric. Due to restoration of FF on 1B SG, power increase may be noted. As required, the SRO may direct the BOP to reduce turbine load to prevent exceeding 100% Calorimetric power.</i></p>



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Event description: Feed Flow Channel Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	Step 4, AP-53.00, Notes  NOTE: When the affected instrument/controller malfunction has been addressed by this procedure, recovery actions may continue at Step 13.
	SRO	Step 4, AP-53.00  DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:
	RO/BOP	<i>Identifies 1B SG Feed Flow affected.</i>
	SRO	Goes to Step 7.
	SRO	Step 7, AP-53.00  CAUTION: When CALCALC is based on Feedwater, changes in feed flow will affect calorimetric power. Reactor power must be monitored when adjusting feed flow.
	SRO	CHECK STEAM GENERATOR LEVEL CONTROL INSTRUMENTS – NORMAL  <ul style="list-style-type: none"> <li>• Steam Pressure</li> <li>• Steam Flow</li> <li>• <b>Feed Flow</b></li> <li>• Steam Generator Level</li> </ul>
	BOP	Determines CH III Feed flow instrumentation for 'B' SG is NOT normal.
		Step 7. RNO, AP-53.00 IF the selected steam flow, steam pressure, or feed flow input to the SG Water Level Control system has failed, THEN do the following:
	BOP	<b>a) Place the associated Feed Reg Valve in MANUAL.</b>
	BOP	<i>Verifies 'B' SG MFRV controller, 1-FW-FCV-1488, in manual</i>
	BOP	b) Control SG level at program level (44%, a band will be given).
	BOP	<i>Verifies 'B' SG NR level is returning to program level.</i>
	RO	c) Select the redundant channel for affected SG(s)
	RO	<b>Selects Channel IV Feed Flow for 'B' SG using two-position selector switch on Vertical Board 1-2 (applicant may also place the associated Steam Flow channel in Channel IV)</b>
	BOP	d) WHEN SG level returned to normal, THEN place the Feed Reg Valve in AUTOMATIC.
	BOP	<b>Places 'B' SG FRV controller, 1-FW-FCV-1488, in automatic control.</b>

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Event description: Feed Flow Channel Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	Step 6, RNO, AP-53.00 (Continued)
	SRO	<p>Perform follow-up actions:</p> <p>a) Consult with Shift Manager on need to initiate ( )-OP-RP-001, ALIGNING CONTROL SYSTEM FOR PERFORMANCE OF CHANNEL I, II, III, AND IV PROCESS AND PROTECTION TESTING.</p> <p><i>If asked the Shift Manager will recommend not performing 1-OP-RP-001 at this time.</i></p>
	SRO	<p>b) Refer to the following Tech Spec 3.7 items:</p> <ul style="list-style-type: none"> <li>• Table 3.7-1, 12 and <b>17</b></li> <li>• Table 3.7-2, 1.c, 1.e, and 3.a</li> <li>• Table 3.7-3, 2.a, and 3.a</li> <li>• Table 3.7-6, 15 and 16</li> </ul>
	SRO	<p><b>Determines Table 3.7-1 item 17, is applicable (place channel in trip w/in 72 hours).</b></p> <p>c) Refer to Attachment 1.</p> <p>d) IF no other instrumentation failure exists, THEN GO TO Step 13.</p>
	SRO	Step 13, AP-53.00
	RO	<p>13. Review OPT-RX-001, Rx Power Calorimetric using PCS computer program, to determine operability of calorimetric and need to perform OPT-RX-007, Shift Average Power Calculation.</p> <p>Determines that OPT-RX-001 is impacted and OPT-RX-007 will need to be performed.</p>

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Event description: Feed Flow Channel Fails High, 0-AP-53.00.

Cue: By Examiner.

		Step 13, RNO, AP-53.00
	SRO	a) Initiate ( )-OPT-RX-007, SHIFT AVERAGE POWER CALCULATION, as necessary.
	Unit 2	<i>If it appears that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.</i>
	SRO	b) Immediately check or initiate power reduction to less than or equal to 100% IAW Attachment 7 by monitoring alternate power indications.
	SRO	<i>SRO may direct BOP to initiate power reduction using Attachment 7, dependent upon Plant Condition to bring power <math>\leq</math> 100% by calorimetric.</i>
	SRO	c) Refer to TRM 3.3.5, Feedwater Ultrasonic Flow Meter Calorimetric, for required actions.
	SRO	Change the calorimetric program from the Feedwater UFM System to the Normalized Feedwater Venturi System in 1 hour. AND. Restore Feedwater UFM System to FUNCTIONAL status in 48 hours.
	SRO	<b>Directs RO to change Calorimetric Program Normalized Feedwater Venturi System.</b>  <b>NOTE:</b> <i>Program will not be shifted to Normalized Feedwater system during Scenario.</i>
		Step 14, AP-53.00
	SRO	14. CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE (Go to Step 14 if not Reg. Guide 1.97)  <i>SRO directs STA to review Reg. Guide 1.97. The STA will report that 1-FW-FT-1487 is a Reg. Guide 1.97 component.</i>
		Step 15, AP-53.00
	SRO	15. REVIEW CEP 99-0029, REG GUIDE 1.97 OPERABILITY, REPORTABILITY, AND ALTERNATE INDICATIONS  <i>SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 only requires one channel of Feed Flow indication per steam generator and no actions are required.</i>

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Event description: Feed Flow Channel Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	16 REVIEW THE FOLLOWING: <ul style="list-style-type: none"><li>• Tech Spec 3.7</li><li>• VPAP-2802, NOTIFICATIONS AND REPORTS</li><li>• TRM SECTION 3.3, INSTRUMENTATION</li></ul>
	SRO	Directs STA to perform Review of Tech Spec 3.7, VPAP-2802, and TRM Section 3.3.
	STA	STA will report that Tech Specs have been reviewed. VPAP-2802 and TRM Section are not affected.
	SRO	17. CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION – EXISTS  Goes to Step 19
	SRO	19. PROVIDE NOTIFICATIONS AS NECESSARY: <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• OMO</li><li>• STA (PRA determination)</li><li>• I&amp;C</li></ul> <b>END OF EVENT 3</b>

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Scenario No.: 1

Event No.: 4

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Event Description: Loss of High Pressure Drain Pump, 1-AP-18.00.

Cue: By Evaluator

	BOP	<p>Diagnose the trip of the High Pressure Drain Pump, 1-SD-P-1A based on the following indications:</p> <ul style="list-style-type: none"> <li>• 1K-D4 4 KV BKR AUTO TRIP</li> <li>• 1H-F3 CN POLISHING SYS TRBL</li> <li>• 1H-D3 CN POLISHING BYPASS AOV OPEN</li> <li>• 1J-B4 HP HTR DR RCVR TK HI LVL</li> <li>• 1H-G5/6/7 SG 1A/1B/1C LVL ERROR</li> </ul>
	SRO	Step 1, AP-18.00
		Enter 1-AP-18.00
		CHECK HP HEATER DRAIN PUMP STATUS:
	SRO	a) Check HP Heater Drain Pump – TRIPPED OR NOT PROVIDING SUFFICIENT FLOW
	BOP	<i>Reports that 1-SD-P-1, HP Heater Drain pumps tripped.</i>
	SRO	b) Place pump control Switch in PTL
	BOP	<b>Places 1-SD-P-1A control switch in PTL</b>
	SRO	Step 2, 1-AP-18.00
	RO/BOP	CHECK REACTOR POWER – GREATER THAN OR EQUAL TO 75%
		<i>Reports reactor power at 100%</i>
	SRO	Step 3, AP-18.00
	BOP	START THIRD CONDENSATE PUMP AS REQUIRED BY PLANT CONDITIONS
		<b>Starts 1-CN-P-1A and verifies Proper Operation.</b>
	SRO	Step 4, AP-18.00
		NOTE: With unit at 100% power, Turbine load should be decreased approximately 50 MW.
		REDUCE TURBINE LOAD AS NECESSARY TO MAINTAIN LOOP $\Delta T$ s - LESS THAN 100%
		• <i>Use Valve Position Limiter</i>
		OR
		• <i>Reduce Turbine load using Turbine Manual</i>
	BOP	<b>Using Guidance of NOTE preceding the Step, Turbine load will be reduced.</b>

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Event No.: 4

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Event Description: Loss of High Pressure Drain Pump, 1-AP-18.00.

Cue: By Evaluator

	SRO	Step 5, 1-AP-18.00  NOTE: Ramping to 75% allows the Condensate Polishing Building to be placed fully in service.  COMMENCE RAMP TO 75% POWER IAW 0-AP-23.00, RAPID LOAD REDUCTION
	SRO	Step 6, 1-AP-18.00  * USE CONTROL RODS AND CHEMICAL SHIM TO MAINTAIN $\Delta$ FLUX IN BAND
	SRO  BOP	Step 7, 1-AP-18.00  MONITOR MAIN FEED REG VALVE RESPONSE - MAINTAINING SG LEVEL IN BAND  Acknowledges Step direction.
	SRO	Initiate AP-23.00, Rapid Load Reduction
		<b>END EVENT #4</b>

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Scenario No.: 1

Event No.: 5

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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		AP-23.00, Rapid Load Reduction
	SRO	<p>The team will hold a transient brief. During the brief the upcoming ramp will be discussed.</p> <p>The RO and BOP will report critical parameters, as per placard on Main Control Room Bench Board. It is expected that the RO will discuss reactivity parameters associated with the ramp from the pre-planned ramp plan.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>The following reactivity plan will be discussed <i>for a ramp to 75%</i>:</p> <ul style="list-style-type: none"> <li>• Gallons of boric acid required as per plan – 146 gallons</li> <li>• “D” control bank end at 197 steps</li> <li>• 5.8 gpm Boric Acid Flow, average rate during ramp.</li> <li>• 1957 gallon PG required to stabilize at 75% power.</li> <li>• The Team will discuss duration of Emergency Borate at start of Ramp, and remaining boron to be added via normal boration flowpath.</li> </ul>
	SRO	<p>Step 1, 0-AP-23.00</p> <p>Caution Prior to Step 1:</p> <ul style="list-style-type: none"> <li>• Conservative decision-making must be maintained during rapid load reductions. Refer to Attachment 1 for trip criteria.</li> </ul> <p>Notes Prior to Step 1:</p> <ul style="list-style-type: none"> <li>• Actions that can be completed independently of preceding steps may be performed out of sequence as directed by the SRO</li> <li>• When the Turbine is not being actively ramped, the REFERENCE and SETTER values must remain matched to prevent inadvertent ramp.</li> <li>• Pre-planned reactivity plans located in the Main Control Room will be used as guidance for ramping down to the desired power level.</li> <li>• The ramp rate in IMP OUT is nonlinear and therefore pre-planned reactivity plans based on IMP IN are not as accurate. However, total amounts of boration and dilution can be used as guidance.</li> <li>• For ramp rates greater than or equal to 1%/minute, Rod Control should remain in Automatic if available.</li> </ul>
	RO	<p>Step 1, 0-AP-23.00</p> <p><b>TURN ON ALL PRZR HEATERS.</b></p>

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Scenario No.: 1

Event No.: 5

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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

		<p>Step 2 0-AP-23.00</p> <p>INITIATE PLANT LOAD REDUCTION AT 2%/MINUTE OR LESS:</p> <p>BOP a) Check turbine valve position - NOT ON LIMITER</p> <p><i>The turbine is NOT on the limiter.</i></p> <p>RO b) Insert control rods in AUTO or MANUAL as necessary to maintain Tave and Tref within 5°F.</p> <p>BOP c) <b>Check or place turbine in IMP IN or IMP OUT as determined by Shift Supervision</b></p> <p><i>The SRO chooses IMP IN.</i></p> <p>BOP d) <b>Adjust SETTER to desired power level</b></p> <p>BOP e) <b>Adjust LOAD RATE %/MIN thumbwheel to desired ramp rate (1%/minute)</b></p> <p>BOP f) <b>Initiate Turbine load reduction using OPERATOR AUTO (pushes the GO button)</b></p> <p>BOP g) <b>Reduce Turbine Valve Position Limiter as load decreases</b></p> <p><i>Periodically reduce the limiter setpoint during the ramp.</i></p>
	SRO	Step 3, 0-AP-23.00
	RO	CHECK EMERGENCY BORATION – REQUIRED
	RO	Reports Emergency Boration required.
	SRO	Step 4, 0-AP-23.00
	RO	NOTE: Step 4 or Step 5 may be performed repeatedly to maintain Tref and Tave matched, ΔFlux in band, and control rod position above the LO-LO insertion limit.
	RO	Acknowledges NOTE.



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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

	SRO	Step 4, 0-AP-23.00
	RO	PERFORM AN EMERGENCY BORATION IAW THE FOLLOWING:
	RO	a) <i>Check or raise CHG flow to greater than 75 gpm</i>
	RO	b) <b>Transfer the in-service BATP to FAST</b>
	RO	c) <b>Open 1-CH-MOV-1350 for required time</b>
	RO	d) <i>Monitor EMRG BORATE FLOW</i>
		• ( )-CH-FI-( )110
	RO	e) After required emergency boration, perform the following:
	RO	1) <b>Close 1-CH-MOV-1350</b>
	RO	2) <b>Transfer the in-service BATP to AUTO</b>
		3) Restore Charging flow control to normal.
	RO	Step 5, 0-AP-23.00
		ESTABLISH A NORMAL BORATION TO MAINTAIN CONTROL ROD POSITION ABOVE THE LO-LO INSERTION LIMITS IAW ATTACHMENT 4
		Attachment 4 (Boration) and 5 (Manual Makeups) are at the end of this section.
	SRO	Step 6, 0-AP-23.00, NOTES
		NOTES:
		• If at any time plant conditions no longer require rapid load reduction, actions should continue at Step 35.
		• RCS Tave must be maintained less than or equal to 577°F and RCS pressure must be maintained greater than or equal to 2205 psig. Tech Spec 3.12.F.1 should be reviewed if either parameter is exceeded.
		• I & C should be contacted to provide assistance with adjusting IRPIs.
	RO	Step 6, 0-AP-23.00
		CONTROL RAMP RATE TO MAINTAIN RCS PRESSURE GREATER THAN 2205 PSIG
	RO	Step 7, 0-AP-23.00
		* CHECK LETDOWN ORIFICES – TWO IN SERVICE
		<i>Evaluator note: two orifices will already be in service.</i>

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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

	BOP	Step 8, 0-AP-23.00 MONITOR STEAM DUMPS FOR PROPER OPERATION
	SRO	Step 9, 0-AP-23.00 NOTIFY THE FOLLOWING: <ul style="list-style-type: none"><li>• Energy Supply (MOC)</li><li>• Polishing Building</li><li>• Chemistry</li><li>• OMOC</li></ul>
	SRO	Step 10, 0-AP-23.00 EVALUATE THE FOLLOWING: <ul style="list-style-type: none"><li>• EPIP applicability</li></ul> <p><i>The Shift Manager will review EIPs for applicability. They are not applicable.</i></p> <ul style="list-style-type: none"><li>• VPAP-2802, NOTIFICATIONS AND REPORTS, applicability</li></ul> <p><i>SRO directs STA to review VPAP-2802. The STA reports that he has completed his review of VPAP-2802 and no notifications are required. No further actions are required for this event.</i></p>
	SRO	Step 11, 0-AP-23.00  CHECK REACTOR POWER – HAS DECREASED MORE THAN 15% IN ONE HOUR.  When reactor power has decreased >15%, then chemistry will be notified.
		<b><u>END EVENT #5</u></b>

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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		0-AP-23.00 Attachment 4 (NORMAL BORATION) Actions
	RO	1. Place the MAKE-UP MODE CNTRL switch in the STOP position.
	RO	2. Adjust 1-CH-YIC-1113 to desired total gallons
	RO	3. Adjust 1-CH-FC-1113A to desired flow rate.
	RO	4. Place the MAKE-UP MOD SEL switch in the BORATE position.
	RO	5. Place the MAKE MODE CNTRL switch in the START position.
	RO	6. Check proper valve positions.
	RO	7. Adjust boration rate using 1-CH-FC-1113A, as necessary.
	RO	8. WHEN boration is complete, THEN perform the following. IF boric acid is to remain in the Blender to support ramping the Unit, THEN enter N/A.  a) Manually blend approximately 20 gallons to flush the boration path IAW Attachment 5, Manual Makeups.  b) Enter N/A for the remaining steps in this Attachment.  <i>Attachment 5 is on the next page</i>
	RO	9. Check controllers for Primary Grade water and Boric Acid are set correctly.
	RO	10. Place the MAKE-UP MODE SEL switch in the AUTO position.
	RO	11. Place the MAKE-UP MODE CNTRL switch in the START position.
	RO	12. Notify Shift Supervision of blender status.

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Event No.: 5

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Event Description: Ramp to 75% Power, 0-AP-23.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		0-AP-23.00 Attachment 5 (Manual Makeups) Actions
	RO	1. Place the MAKE-UP MODE CNTRL switch in the STOP position.
	RO	2. Check controllers for the flow rate of Boric Acid and Primary Grade water are set correctly.
	RO	3. Check integrators for the gallons of Boric Acid and Primary Grade water are set correctly.
	RO	4. Place the MAKE-UP MODE SEL switch in the MANUAL position.
	RO	5. Place the MAKE-UP MODE CNTRL switch in the START position.
	RO	6. Open 1-CH-FCV-1113B, BLENDER TO CHG PUMP.
	RO	7. Check proper valve positions.
	RO	8. WHEN the Manual Makeup operation is complete, THEN place 1-CH-FCV-1113B in the AUTO position
	RO	9. Place the MAKE-UP MODE CNTRL switch in the STOP position.
	RO	10. Check or place the control switches in the AUTO position.
	RO	11. Check controllers for Primary Grade water and Boric Acid are set correctly.
	RO	12. Place the MAKE-UP MODE SEL switch in the AUTO position.
	RO	13. Place the MAKE-UP MODE CNTRL switch in the START position.
	RO	14. Notify Shift Supervision of blender status.

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**Cue: By Evaluator.**

Time	Position	Applicant's Action or Behavior
	<p>Team</p> <p>SRO</p>	<p>Diagnose SGTL B SG based on the following:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>• 1A-B3 N-16 ALERT</li> <li>• 1A-A3 N-16 HIGH</li> <li>• RM-G8 CNDSR AIR EJECTOR ALERT/FAILURE</li> <li>• RM-H8 1-SV-RI-111 HIGH</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>• Increasing trend on 1-MS-RR-193, Control Room N16 Trend Recorder, from Normal to 200 GPD.</li> <li>• STM LINE B Trend will Lead STM LINE A and STM LINE B.</li> </ul> <p>Direct Unit to Perform Annunciator Response Procedure for A/E Alert and High Alarms.</p> <p><i>Note: Unit 2 Operator will perform ARP for A/E RM Alarms. Unit 2 will hand Page 3 and 4 of RM-H8 ARP to BOP to check Auto Actions complete; following E-0 Team Brief.</i></p>
	BOP	<p>Verification of ARP RM-H8, A/E RM High Alarm RM-H8, Step 6</p> <p>NOTE: On a high alarm, air ejector gaseous effluent is diverted from vent stack to containment.</p> <p>CHECK AUTOMATIC ACTIONS – VALVES POSITIONED AS FOLLOWS:</p> <ul style="list-style-type: none"> <li>• 1-SV-TV-103 – CLOSED <b>Identifies 1-SV-TV-103 Open, places control switch in close.</b></li> <li>• 1-SV-TV-102 – OPEN <b>Identifies 1-SV-TV-102 Closed, places control switch in open.</b></li> </ul>
	BOP	<p>RM-H8, Step 7</p> <p>CHECK AIR EJECTOR VENT TO CTMT VV - OPEN</p> <ul style="list-style-type: none"> <li>• 1-SV-TV-102A <i>Identifies 1-EV-RV-102A open</i></li> </ul> <p><i>Report to SRO that A/E manually aligned to containment.</i></p>

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Scenario No.: 1

Event No.: 6

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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	SRO	1-AP-16.00  Direct the RO to perform the Immediate Action Steps of 1-AP-16.00.
	RO	Step 1, 1-AP-16.00  NOTE: <ul style="list-style-type: none"> <li>• If SI Accumulators are isolated, 1-AP-16.01, SHUTDOWN LOCA, should be used for guidance.</li> <li>• RCS average temperature has a direct impact on pressurizer level.</li> </ul>
	RO	[ 1 ] ____ MAINTAIN PRZR LEVEL:  <ul style="list-style-type: none"> <li>• Isolate Letdown  <b>Close 1-CH-LCV-1460A and 1-CH-LCV-1460B</b> </li> <li>• Control Charging flow  <b>Place 1-CH-FCV-1122, CH Flow Control Valve, in Manual</b>  <i>Monitor CH Flow on 1-CH-FI-1122</i>  <b>Identify RCS leak rate less than the capacity of a single CH pump</b>  <i>Continue adjustment of CH flow to quantify leak rate to determine if reactor trip required</i> </li> </ul>
	SRO	Step 1, 1-AP-1600  Upon report of completion of Immediate Action Step of 1-AP-16.00, Perform a commensurate brief; continue to Step 2 of 1-AP-16.00.
	SRO	Step 2, 1-AP-16.00  CHECK THE FOLLOWING PARAMETERS - STABLE OR INCREASING <ul style="list-style-type: none"> <li>• PRZR level</li> <li>• PRZR pressure</li> <li>• RCS subcooling</li> </ul>
	RO	Report that PRZR Level, Pressure, and Subcooling Stable  <i>RO continues actions to quantify leakrate</i>
	SRO	Step 3, 1-AP-16.00  PLACE THE FOLLOWING COMPONENTS IN OFF:
	RO	<ul style="list-style-type: none"> <li>• CTMT sump pumps  <b>Places 1-DA-P-4B control switch on OFF</b> </li> <li>• CTMT vacuum pumps  <b>Places 1-CV-P-1A control switch in OFF</b> </li> </ul>

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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	SRO	Step 4, 1-AP-16.00
	SRO	NOTE: Shift Supervision and STA must remain informed of RCS leak rate for EPIP applicability.
	SRO	CHECK REACTOR TRIP – REQUIRED
		<ul style="list-style-type: none"> <li>• Leak rate - GREATER THAN 50 GPM</li> <li>OR</li> <li>• Adequate makeup not being provided by blender</li> </ul>
	RO	<b>Reports RCS leak rate greater than 50 gpm.</b>  <b>NOTE:</b> Due to transient on RCS caused by Ramp for previous event, exact quantification of leak rate may be difficult.
	SRO	Step 5, 1-AP-16.00
	RO	ALIGN CHG PUMP SUCTION TO RWST  a) Open 1-CH-MOV-1115B and 1-CH-MOV-1115D <b>Opens CH pump Suction MOVs from RWST, 1-CH-MOV-1115B/D</b>  b) Close 1-CH-MOV-1115C and 1-CH-MOV-1115E <b>Closes CH pump Suction from VCT MOVs, 1-CH-MOV-1115C/E</b>
	SRO	Step 6, 1-AP-16.00
	SRO	GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION
	RO	<b><u>1-E-0 – Reactor Trip or Safety Injection</u></b>  [1] CHECK REACTOR TRIP:  a) Manually trip reactor  <b>Pushes the reactor trip push buttons.</b>  b) Check the following: <ul style="list-style-type: none"> <li>• All Rods On Bottom light – LIT</li> <li>• Reactor trip and bypass breakers – OPEN</li> <li>• Neutron flux – DECREASING</li> </ul> <i>RO Reports “Reactor Tripped” at completion of Step 1. SRO Acknowledges.</i>

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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	RO  RO	<p>[2] CHECK TURBINE TRIP:</p> <p>a) Manually trip the turbine</p> <p><b>Pushes the turbine trip push buttons.</b></p> <p>b) Check all turbine stop valves - CLOSED</p> <p>c) <b>Isolate reheaters by closing MSR steam supply SOV</b></p> <ul style="list-style-type: none"><li>• <b>1-MS-SOV-104</b></li></ul> <p>d) Verify generator output breakers – OPEN (Time Delayed)</p> <p><i>RO Reports “Turbine Tripped” at completion of Step 2. SRO Acknowledges.</i></p>
	RO	<p>[3] VERIFY BOTH AC EMERGENCY BUSES – ENERGIZED</p> <p><i>RO Reports “Both AC Emergency Buses Energized” at completion of Step 3. SRO acknowledges.</i></p>



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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	RO	<p>[4] CHECK IF SI INITIATED:</p>
		<p>a) Check if SI is actuated:</p> <ul style="list-style-type: none"> <li>• LHSI pumps – RUNNING</li> <li>• SI annunciators – LIT <ul style="list-style-type: none"> <li>• A-F-3 SI INITIATED – TRAIN A</li> <li>• A-F-4 SI INITIATED – TRAIN B</li> </ul> </li> </ul>
	RO	<p>RO will determine that SI has not occurred and perform step 4a RNO actions:</p> <p>4a RNO Check if SI is required or imminent as indicated by any of the following:</p> <ul style="list-style-type: none"> <li>• Low PRZR pressure</li> <li>• High CTMT pressure</li> <li>• High steamline differential pressure</li> <li>• High steam flow with low Tave or low line pressure</li> </ul>
		<p>IF SI is required, THEN GO TO Step 4b.</p> <p>RO reports “SI is not in service or required; Immediate Actions of E-0 are complete; recommend transition to ES-0.1” after completion of Step 4. SRO Acknowledges.</p> <p>After the immediate actions of 1-E-0 are reported as complete, the SRO will check off immediate action steps in his copy of 1-E-0 and announce a transition to ES-0.1. After the immediate actions are verified, the team will conduct a brief.</p>
	Team	<p><b>During the Brief RO/BOP reports that ALL RCPs are tripped. Identify 1B SG experiencing a Large SG Tube Leak.</b></p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the alarms already received. He will also state that containment conditions and the electrical conditions are as you see them (or as reported by the RO/BOP).</i></p>
	Unit 2	<p>If not previously performed, Unit 2 Operator will Provide BOP/SRO with ARP pages for A/E RM High alarm for verification of Auto Actions.</p>
	SRO	<p>Establish priorities at Brief End,</p> <p>RO:</p> <ul style="list-style-type: none"> <li>• Continue with SRO in 1-AP-24.01, Large Steam Generator Tube Leak, </li></ul> <p>BOP:</p> <ul style="list-style-type: none"> <li>• Complete verification of A/E High Alarm auto actions.</li> <li>• Throttle AFW to the SGs IAW Attachment 8 of AP-24.01.</li> <li>• Contact Service Building Operator to check status of RCP breakers.</li> </ul>

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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	SRO	<p>When Brief is complete Announce Transition to ES-0.1, Reactor Trip Response, Read the First NOTE: 1 If this procedure is being entered from 1-E-0, REACTOR TRIP OR SAFETY INJECTION, following a tube leak of less than 150 gpm, 1-AP-24.01, LARGE STEAM GENERATOR TUBE LEAK, should be used for guidance instead of this procedure.-AP-24.01.</p> <p>Transitions to 1-AP-24.01</p>
	SRO	<p>Step 1, 1-AP-24.01</p> <p>CAUTION: If the leak rate increases to 150 gpm, 1-E-0, Reactor Trip or Safety Injection, must be implemented.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Procedure 1-ES-0.1, Reactor Trip Response, must not be performed when implementing this procedure.</li> <li>• Refer to Attachment 8 for guidance on transient AFW control.</li> </ul> <p>CHECK SI - IN SERVICE</p> <p><i>Identifies NO not required. Team Goes To Step 3.</i></p>
	RO	
	SRO	<p>Step 3, 1-AP-24.01</p> <p>CHECK CONDENSATE POLISHING BUILDING – BYPASSED</p>
	RO	<p>Identifies Polishing Building bypassed</p>
	SRO	<p>Step 4, 1-AP-24.01</p> <p>CHECK ALL AC BUSSES - ENERGIZED BY OFFSITE POWER</p>
	RO	<p>Identifies all AC Buses energized by off-site power by:</p> <ul style="list-style-type: none"> <li>• <i>Checks breakers 15H8/15J8 closed</i></li> <li>• <i>Station Service buses energized using Voltage/Current indications on Benchboard.</i></li> <li>• <i>Checks for Abnormal Electrical System alarms on “K” Annunciator Panel.</i></li> </ul>

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Event Description: SG Tube Leak 74 gpm, A/E Auto Functions Fail, RCPs trip on swap to RSST

Cue: By Evaluator.

	BOP	<p>Step 1, AP-24.01, Attachment 8</p> <p>Maintain minimum AFW flow of 540 gpm with RCP(s) in service until one SG Narrow Range level is greater than 12%.</p> <p><i>Checks AFW ~1050 gpm</i></p>
	BOP	<p>Step 2, AP-24.01, Attachment 8</p> <p>Maintain minimum AFW flow of 350 gpm with NO RCPs running, until one SG Narrow Range level is greater than 12%.</p> <p><b>Throttles AFW to SGs per Step 2 to flow rate established by SRO or ~ 120 gpm per SG using 1-FW-MOV-151 A through F control switches.</b></p>
	BOP	<p>Step 3, AP-24.01, Attachment 8</p> <p>NOTE: AFW to idle loop(s) (RCP secured), should be throttled to prevent depressurization of the SG and subsequent Header / Line SI. AFW flow between approximately 60 gpm and 100 gpm should be adequate to prevent a Header / Line SI.</p> <p><i>Identifies NOTE as not applicable for this event.</i></p> <p>When minimum heat sink has been verified, AFW MOVs should be controlled to maintain intact SG Narrow Range levels between 22% and 50% by throttling AFW Isolation MOVs:</p> <ul style="list-style-type: none"> <li>• SG A, 1-FW-MOV-151E and 1-FW-MOV-151F</li> <li>• SG B, 1-FW-MOV-151C and 1-FW-MOV-151D</li> <li>• SG C, 1-FW-MOV-151A and 1-FW-MOV-151B</li> </ul> <p><i>Identifies need to monitor flow rate as SG NR level recovers.</i></p>
	BOP	<p>Step 4, AP-24.01, Attachment 8</p> <p>Isolate AFW header with deenergized Emergency Bus MOVs by closing the following header isolation valves:</p> <p><i>Identifies Step as not applicable.</i></p>
	BOP	<p>Contact Service Building operator to check status of RCP breakers.</p> <p>When contacted the Service Building operator will report no abnormalities with the RCP breakers, but the Speed Sensing Panel appears to be malfunctioning.</p> <p><i>Performs a "Focus Brief" to apprise the other Team members of RCP status.</i></p>

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

		<b>SG Tube Leak escalates to 800 gpm Tube Rupture</b>
	RO	<p>Diagnose SG Tube Rupture by: RCS Pressure decrease. Pressurizer Level decrease.</p> <p><b>Manually raise CH flow to maximum.</b> <i>Identify pressurizer level decreasing.</i> <b>Report to SRO that Safety Injection is required.</b> <b>Re-Perform High Level Steps, 1 through 3 of E-0.</b> <b>Manually Initiate Safety Injection.</b> <i>Check Annunciator 1A-F3, SI Initiated Train A - LIT</i> <i>Check Annunciator 1A-F4, SI Initiates Train B – LIT</i> <i>Check LHSI Pumps Running.</i> <i>Report to SRO “Immediate Actions of E-0 with SI Complete.</i></p> <p><b>Critical Task 2) Isolate steam release from ruptured SG within 30 Minutes</b> <b>START Time:</b> _____</p>
	SRO	<p>The team will hold a transition brief. During the brief it will be identified that SI was initiated and the SGTL has degraded into a SGTR.</p> <p>The SRO will set priorities: RO – Continue with SRO in performance of E-0 to E-3. BOP – Perform Attachment 1 through 3 of E-0.</p>
	SRO/BOP	<p>Step 5, E-0 Initiate Attachment 1 (<i>Attachment 1, 2, and 3 actions contained under last section of Event 9</i>).</p>
	SRO/RO	<p>SRO may direct the RO to perform Attachment 10 of 1-E-0 for Ruptured SG Isolation and AFW Control. This may or may not be initiated at any time during the performance of E-0. <i>Attachment 10 actions are contained at the end of this section.</i></p>

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	RO	<p>Step 6, E-0</p> <p>* CHECK RCS AVERAGE TEMPERATURE</p> <ul style="list-style-type: none"> <li>• STABLE AT 547°F</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• TRENDING TO 547°F</li> </ul> <p>The team will identify that RCS temperature is decreasing. The team should attribute this to the injection of SI into the RCS and AFW flow to the SGs. It is acceptable for the team to enter the RNO portion of this step and perform the applicable steps (summarized below):</p> <p>Stop dumping steam</p> <p><b>Reduce AFW flow to the SG</b></p> <p>Close MSTVs if cooldown continues</p>
	RO	<p>Step 7, E-0</p> <p>7. CHECK PRZR PORVs AND SPRAY VALVES:</p> <ul style="list-style-type: none"> <li>a) PRZR PORVs – CLOSED</li> <li>b) PRZR spray controls <ul style="list-style-type: none"> <li>• Demand at Zero (or)</li> <li>• Controlling Pressure</li> </ul> </li> <li>c) PORV block valves - AT LEAST ONE OPEN</li> </ul>
	<p>SRO</p> <p>RO</p>	<p>Step 8, E-0</p> <p><b>NOTE:</b> Seal injection flow should be maintained to all RCPs.</p> <p>* CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <ul style="list-style-type: none"> <li>a) Charging Pumps – AT LEAST ONE RUNNING AND FLOWING TO RCS</li> </ul> <p>Two or three Charging pumps will be running and flowing to the RCS.</p> <ul style="list-style-type: none"> <li>b) RCS subcooling - LESS THAN 30°F [85°F]</li> </ul> <p>RCS subcooling will NOT be less than 30 °F</p> <p>RNO for the step is to go to step 9.</p>

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**Cue: By Evaluator.**

[illegible]

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	RO	<p><b>BEGIN Step 1, 1-E-3:</b></p> <p><b>NOTE:</b> Seal injection flow should be maintained to all RCPs.</p> <p><b>*CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</b></p> <p>a) Charging Pumps – AT LEAST ONE RUNNING AND FLOWING TO RCS</p> <p><i>RO will identify that two charging pumps are running.</i></p> <p>b) RCS subcooling - LESS THAN 30°F [85°F]</p> <p><i>RO will identify that RCS subcooling is greater than 30°F</i></p> <p>RNO is to go to step 2</p>
	SRO	<p>Step 2, E-3</p> <p>IDENTIFY RUPTURED SG(s):</p> <ul style="list-style-type: none"><li>• Unexpected rise in any SG narrow range level</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>• High radiation from any SG MS line monitor</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>• High radiation from any SG blowdown line</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>• High radiation from any SG sample</li></ul> <p>Team identifies 'B' SG NR level rising unexpectedly.</p>

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	SRO	<p>Step 3, E-3 CAUTION:</p> <ul style="list-style-type: none"> <li>• If the TD AFW pump is the only available source of feed flow, steam supply to the TD AFW pump must be maintained from at least one SG.</li> <li>• At least one SG must be maintained available for RCS cooldown.</li> </ul>
	RO	<p>3. ISOLATE RUPTURED SG(s):</p> <ol style="list-style-type: none"> <li>Adjust ruptured SG PORV controller setpoint to 1035 psig</li> <li>Check ruptured SG(s) PORV – CLOSED</li> <li>Verify blowdown TVs from ruptured SG(s) – CLOSED</li> <li>Locally close steam supply valve(s) to TD AFW pump: <ul style="list-style-type: none"> <li>• 1-MS-120 for 'B' SG</li> </ul> </li> </ol> <p><i>If 1-MS-120 not closed iaw attachment 10 of 1-E-0, then a field operator will be dispatched to close it at this time.</i></p> <ol style="list-style-type: none"> <li><b>Close ruptured SG(s) MSTV (B)</b></li> </ol> <p><b><i>Partial completion of the critical task (WOG E-3—A) to isolate the SG is accomplished by performance of this step. KOA: For the design basis tube rupture, isolate the ruptured SG from the atmosphere/Turbine building within 30 minutes.</i></b></p>



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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

		Step 4, E-3
	SRO	CAUTION: If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless needed for RCS cooldown.
		* CHECK RUPTURED SG LEVEL:
		a) Narrow range level – GREATER THAN 12% [18%]
	RO	b) Stop feed flow to ruptured SG(s) <b>Identifies 'B' SG level &gt;12%, closes 1-FW-MOV-151C/D to isolate AFW Flow</b>
		c) Check ruptured SG AFW MOVs auto-open signal – DEFEATED <i>Identifies auto-open signal not defeated, SRO goes to Step 4 c) RNO</i>
		<b>NOTE: BOP may have performed the following IAW Attachment 10.</b>
	RO	1) Select the ruptured SG AFW MOVs using the following switches: • <b>H TRAIN DISABLE SELECTOR SWITCH</b> • <b>J TRAIN DISABLE SELECTOR SWITCH</b>
		2) Defeat the auto-open signal for the selected MOVs by placing the following key switches in the DISABLE SELECTED position:  • <b>H TRAIN AUTO OPEN ENABLE SWITCH</b> • <b>J TRAIN AUTO OPEN ENABLE SWITCH</b>
		Step 5, E-3
	SRO	CAUTION: Major steam flow paths from the ruptured SG(s) should be isolated before initiating RCS cooldown.
		CHECK RUPTURED SG(S) PRESSURE - GREATER THAN 350 PSIG
	RO	<i>Identifies 'B' SG pressure ~ 1000 psig.</i>
		Step 6, E-3
	SRO	* CHECK LOW PRZR PRESS SI SIGNAL – BLOCKED
		• Permissive Status light C-2 - LIT
	RO	<i>Identifies PSL C2 NOT LIT.</i>
	SRO	<u>WHEN</u> PRZR pressure less than 2000 psig, <u>THEN</u> do the following: a) Turn both LO PRZR PRESS & STM HDR/LINE ΔP switches to block. b) Check Permissive Status light C-2 - LIT.
		<b>NOTE: BOP may have completed this action in E-0, Attachment 1.</b>

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**Cue: By Evaluator.**

		Step 7, E-3
	SRO	CHECK LOW TAVE SI SIGNAL – BLOCKED
	RO	<ul style="list-style-type: none"> <li>• Permissive Status light F-1 - LIT</li> </ul> Identifies PSL F1 NOT LIT.
	SRO	<p><u>WHEN</u> Tave less than 543°F, <u>THEN</u> do the following:</p> <p>a) Turn both HI STM FLOW &amp; LO TAVG OR LP switches to block.</p> <p>b) Check Permissive Status light F-1 - LIT.</p> <p><b>NOTE:</b> <i>BOP may have completed this action in E-0, Attachment 1.</i></p>
	SRO	Step 8, E-3
	SRO	<p><b>CAUTION:</b> • Flow on each Main Steamline should be kept less than <math>1.0 \times 10^6</math> PPH to prevent Main Steamline isolation during RCS cooldown with the Steam Dumps.</p> <p>• If no RCPs are running, RCS cooldown and depressurization may cause a false Integrity Status Tree indication on the ruptured loop. The Cold Leg indication on the ruptured loop should be disregarded until after the performance of Step 36.</p> <p><b>NOTE:</b> RCP trip criteria does NOT apply after initiation of an operator controlled cooldown.</p> <p>INITIATE RCS COOLDOWN:</p> <p>a) Determine required core exit temperature (ONE TIME):</p>
	SRO/BOP	<p><b>Concur Target CETC temperature 485 °F if SG pressure between 901 and 1000 psig, or 495° if SG pressure between 1001 and 1085 psig.</b></p>
		Step 8, E-3, Continued
	RO	<p>b) Place Steam Dump Mode Select switch in Steam Pressure mode</p> <p>c) Check RCS Tave - LESS THAN 543°F</p>
	RO	<p>d) Place the STM DUMP CNTRL switch in BYP INTLK and then return to ON</p> <p>e) Check Bypass Status light D-2 – LIT</p>
	RO	<p>f) <b>Dump steam to condenser from intact SG(s) at maximum rate</b></p> <p>g) Check CETCs - LESS THAN REQUIRED TEMPERATURE</p>
	SRO	<p><i>When RCS Temperature &lt; 543°F, SRO will direct the block of HSF SI and check of PSL F1 LIT.</i></p> <p><i>When RCS pressure &lt; 2000 psig, SRO will direct the block of Low Pressure/Header-to-Line SI Signal, and check the PSL C2 LIT.</i></p>

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	RO	<b>Performs the Block of SI Signals and check of PSLs when directed.</b>
	RO	h) Stop RCS cooldown
	RO	<b>When target CETC Temperature reached, RO throttles back on steam dumps.</b>
	RO	i) Maintain CETCs - LESS THAN REQUIRED TEMPERATURE
	SRO	<i>SRO will direct a band for control of CETC temperature.</i>
	SRO	Step 9, E-3 CHECK INTACT SG LEVELS: a) Any narrow range level – GREATER THAN 12% [18%] b) Check emergency buses – BOTH ENERGIZED c) Control feed flow to maintain narrow range level between 22% and 50%
	RO/BOP	<b>Adjust AFW to restore “A” and “C” SG NR Level to 22-50%.</b>
	SRO	Step 10, E-3 CAUTION: If any PRZR PORV opens because of high PRZR pressure, the PORV must be verified closed or isolated after pressure decreases to less than 2335 psig.  *CHECK PRZR PORVs AND BLOCK VALVES: a) Power to PRZR PORV block valves – AVAILABLE b) PRZR PORVs – CLOSED c) PRZR PORV block valves - AT LEAST ONE OPEN
	SRO	Step 11, E-3 RESET BOTH TRAINS OF SI
	RO	<i>Push SI Reset Pushbuttons. SI previously reset.</i>
	SRO	Step 12, E-3 RESET CLS: a) Check CTMT pressure – HAS EXCEEDED 17.7 psia
	RO	<i>Report No, CTMT has not exceeded 17.7 psia.</i>
		RNO a) GO TO Step 13.

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	SRO	Step 13, E-3
		CHECK INSTRUMENT AIR AVAILABLE:
		a) Check annunciator B-E-6 - NOT LIT
	RO	<i>Report Yes, B-E-6 Not Lit.</i>
		b) Check at least one CTMT IA compressor – RUNNING
		• 1-IA-C-4A or 1-IA-C-4B
	RO	<i>Report Yes, 1-IA-C-4A running</i>
		c) Check 1-IA-TV-100 – OPEN
	RO	<i>Report Yes, 1-IA-TV-100 open.</i>
	SRO	Step 14, E-3
		ALIGN CONDENSER AIR EJECTOR TO CTMT:
		a) Check the following:
		• 1-SV-TV-102 – OPEN
		• 1-SV-TV-103 – CLOSED
	RO	<i>Reports valves in required position. <u>Valves Manually Aligned by BOP on A/E RM auto failure during Event 6.</u></i>
		b) Open the following valve:
		• 1-SV-TV-102A
	RO/BOP	<b>Opens 1-SV-TV-102A.</b>

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	SRO	<p>Step 15, E-3</p> <p>CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 250 psig [400 psig], one LHSI pump must be manually restarted to supply water to the RCS.</p> <p>*CHECK IF LHSI PUMPS SHOULD BE STOPPED:</p> <p>a) Check LHSI pumps - ANY RUNNING WITH SUCTION ALIGNED TO RWST</p>
	RO	<p><i>Reports 1 LHSI pump running with suction aligned to RWST.</i></p>
	RO	<p>b) RCS pressure – GREATER THAN 250 PSIG [400 PSIG]</p> <p><i>Reports RCS pressure greater than 250 psig.</i></p>
	RO	<p>c) Stop LHSI pumps and put in AUTO</p> <p><b>Stops running LHSI pump and places in AUTO.</b></p>
	SRO	<p>Step 16, E-3</p> <p>CHECK IF RCS COOLDOWN SHOULD BE STOPPED:</p>
	RO/BOP	<p>a) Check CETCs - LESS THAN REQUIRED TEMPERATURE</p> <p><i>Reports CETCs &lt; required temperature</i></p>
	RO/BOP	<p>b) Stop RCS cooldown</p> <p><i>Reports RCS Coodown stopped.</i></p>
	RO/BOP	<p>c) Maintain CETCs - LESS THAN REQUIRED TEMPERATURE</p> <p><i>Reports that RCS temperature being maintained in required band.</i></p>
	SRO	<p>Step 17, E-3</p> <p>CHECK RUPTURED SG(s) PRESSURE - STABLE OR INCREASING</p>
	BOP	<p>Reports “B” SG pressure stable.</p>
	SRO	<p>Step 18. E-3</p> <p>CHECK RCS SUBCOOLING BASED ON CETCs - GREATER THAN 50°F [105°F]</p>
	BOP	<p>Reports indicated subcooling value.</p>

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Scenario No.: 1

Event No.: 7

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	SRO	Step 19, E-3 DEPRESSURIZE RCS TO MINIMIZE BREAK FLOW AND REFILL PRZR:  a) Check normal spray – AVAILABLE  • RCP C AND 1-RC-PCV-1455B - BOTH AVAILABLE OR • RCPs A and B, AND 1-RC-PCV-1455A – BOTH AVAILABLE
	RO	<i>Identifies No pressurizer spray available, SRO Goes To Step 20.</i>
	SRO	Step 20, E-3 CAUTION: • The PRT may rupture if a PRZR PORV is used for RCS depressurization. Rupturing the PRT may result in abnormal containment conditions. • Cycling of the PRZR PORV should be minimized.  NOTE: The upper head region may void during RCS depressurization if RCPs are not running. This will result in a rapidly increasing PRZR level.  DEPRESSURIZE RCS USING PRZR PORV TO MINIMIZE BREAK FLOW AND REFILL PRZR:  a) PRZR PORV - AT LEAST ONE AVAILABLE  b) Open one PRZR PORV until ANY of the following conditions satisfied: (Attachment 4 lists conditions)  • PRZR level - GREATER THAN 69% OR • RCS subcooling based on CETCs - LESS THAN 30°F [85°F] OR • BOTH of the following exist: 1) RCS pressure - LESS THAN RUPTURE SG(s) PRESSURE 2) PRZR level - GREATER THAN 22% [50%]
	RO	<b>When Attempt Made to open 1-RC-PCV-1455C, PCV will Not Open.</b>
	SRO	<b>Transition to ECA-3.3</b>

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Scenario No.: 1

Event No.: 7

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	RO/BOP	<p>ATTACHMENT 10 of 1-E-0</p> <p>1. Check SI is in progress. If SI is not in progress, then return to procedure step in effect.</p> <p>RO/BOP identifies that SI is in progress.</p>
	RO/BOP	<p>ATTACHMENT 10 of 1-E-0</p> <p>2. Identify Ruptured SG by one of the following conditions:</p> <ul style="list-style-type: none"> <li>• Unexpected rise in any SG Narrow Range level</li> <li>• High radiation from any SG MS line monitor</li> <li>• High radiation from any SG Blowdown line</li> </ul> <p>With SRO concurrence identifies 'B' SG as the ruptured SG</p>
	RO/BOP	<p>ATTACHMENT 10 of 1-E-0</p> <p>3. Check running or start AFW Pumps, as necessary</p> <ul style="list-style-type: none"> <li>• 1-FW-P-3A</li> <li>• 1-FW-P3B</li> <li>• 1-FW-P-2</li> </ul>
	RO/BOP	<p>ATTACHMENT 10 of 1-E-0</p> <p>4. When ruptured SG Narrow Range level is greater than 12%, then isolate feed flow to ruptured SG by closing SG AFW Isolation MOVs:</p> <ul style="list-style-type: none"> <li>• SG B, 1-FW-MOV-151C and 1-FW-MOV-151D</li> </ul> <p><b>RO/BOP closes 1-FW-MOV-151C/D when SG level is greater than 12% Narrow Range.</b></p> <p><b>Completion of Critical Task: WOG – A; Isolate feed flow into and steam flow from ruptured SG before a transition is made to ECA-3.1. STOP Time: _____.</b></p>
	RO/BOP	<p>ATTACHMENT 10 of 1-E-0</p> <p>5. Select the ruptured SG AFW MOVs using the following switches:</p> <ul style="list-style-type: none"> <li>• H TRAIN DISABLE SELECTOR SWITCH</li> <li>• J TRAIN DISABLE SELECTOR SWITCH</li> </ul>

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Scenario No.: 1

Event No.: 7

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Event Description: SGTL becomes SGTR (800) gpm, AP-16.00, E-0, E-3.

Cue: By Evaluator.

	RO/BOP	ATTACHMENT 10 of 1-E-0  6. Disable the auto-open signal for the selected MOVs by placing the following keyswitches in the DISABLE SELETED position: <ul style="list-style-type: none"><li>• H TRAIN AUTO OPEN ENABLE SWITCH</li><li>• J TRAIN AUTO OPEN ENABLE SWITCH</li></ul>
	RO/BOP	ATTACHMENT 10 of 1-E-0  CAUTION: At least one SG must be maintained available for RCS heat sink.  7. Locally close steam supply valve to the TD AFW pump: <ul style="list-style-type: none"><li>• 1-MS-120</li></ul> RO/BOP directs field operator to close 1-MS-120.  <i>The field operator will acknowledge the requirement to close 1-MS-120. The field operator will later report that 1-MS-120 is closed.</i>
	RO/BOP	ATTACHMENT 10 of 1-E-0  8. Control Feed Flow to the SG IAW the following requirements: <ul style="list-style-type: none"><li>• Minimum AFW flow is 350 gpm with SI initiated, until one SG Narrow Range level is greater than 12%</li><li>• When minimum heat sink has been verified, AFW MOVs should be controlled to maintain intact SG Narrow Range levels between 22% and 50%.<ul style="list-style-type: none"><li>• SG A, 1-FW-MOV-151E and 1-FW-MOV-151F</li><li>• SG C, 1-FW-MOV-151A and 1-FW-MOV-151B</li></ul></li></ul>
		End EVENT #7



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Event No.: 8

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Event Description: 1-RC-PCV-1455C not open, 1-ECA-3.3

Cue: Pre-Event Failures.

Time	Position	Applicant's Action or Behavior																	
		<b>1-ECA-3.3 Actions</b>																	
	SRO	1. CHECK RUPTURED SG(S) NARROW RANGE LEVEL - LESS THAN 75% [73%]																	
	RO	<i>Reports that 'B' SG Level is greater than 75%.</i>																	
		1. RNO - GO TO Step 6																	
	SRO	6. CHECK IF SI CAN BE TERMINATED:																	
	RO/BOP	a) Check RCS subcooling based on CETCs - GREATER THAN 30°F [85°F] <i>Identifies that RCS subcooling is greater than 30°F.</i>																	
		b) Check secondary heat sink:																	
		<ul style="list-style-type: none"> <li>Total feed flow to SGs – GREATER THAN 350 GPM [450 GPM] AVAILABLE</li> </ul>																	
		OR																	
		<ul style="list-style-type: none"> <li>Narrow range level in at least one intact SG - GREATER THAN 12% [18%]</li> </ul>																	
	RO/BOP	<i>Identifies That &gt;350 gpm AFW Available, and "A" and "C" SG NR level &gt;12%.</i>																	
		c) Check RVLIS indication - GREATER THAN VALUE FROM TABLE																	
		<table border="1"> <thead> <tr> <th rowspan="2">RCPs Running</th><th colspan="2">RVLIS INDICATION</th></tr> <tr> <th>Full Range</th><th>Dynamic Range</th></tr> </thead> <tbody> <tr> <td>0</td><td>GREATER THAN 63%</td><td></td></tr> <tr> <td>1</td><td></td><td>GREATER THAN 36%</td></tr> <tr> <td>2</td><td></td><td>GREATER THAN 51%</td></tr> <tr> <td>3</td><td></td><td>GREATER THAN 82%</td></tr> </tbody> </table>	RCPs Running	RVLIS INDICATION		Full Range	Dynamic Range	0	GREATER THAN 63%		1		GREATER THAN 36%	2		GREATER THAN 51%	3		GREATER THAN 82%
RCPs Running	RVLIS INDICATION																		
	Full Range	Dynamic Range																	
0	GREATER THAN 63%																		
1		GREATER THAN 36%																	
2		GREATER THAN 51%																	
3		GREATER THAN 82%																	
	RO/BOP	<i>Identify that RVLIS Full Range is Greater than 63%.</i>																	
		d) Check any ruptured SG narrow range level - INCREASING IN AN UNCONTROLLED MANNER OR OFFSCALE HIGH																	
	BOP	<i>BOP will identify that 'B' SG Level is Off-Scale High.</i>																	

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Event No.: 8

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Event Description: 1-RC-PCV-1455C not open, 1-ECA-3.3

Cue: Pre-Event Failures.

	SRO	7. STOP ALL BUT ONE CHG PUMP AND PUT IN AUTO
	RO	<b>Secure one of the running charging pumps</b>
	SRO	8. ISOLATE HHSI TO COLD LEGS:
	RO	a) Verify the following:
		1) CHG pump suctions from RWST - OPEN
		<ul style="list-style-type: none"> <li>• 1-CH-MOV-1115B</li> <li>• 1-CH-MOV-1115D</li> </ul>
		2) Check CHG pump miniflow recirc valves - OPEN
		<ul style="list-style-type: none"> <li>• 1-CH-MOV-1275A</li> <li>• 1-CH-MOV-1275B</li> <li>• 1-CH-MOV-1275C</li> <li>• 1-CH-MOV-1373</li> </ul>
	RO	b) Close HHSI to Cold Leg:
		<ul style="list-style-type: none"> <li>• <b>1-SI-MOV-1867C</b></li> <li>• <b>1-SI-MOV-1867D</b></li> <li>• 1-SI-MOV-1842</li> </ul>
	SRO	9. ESTABLISH CHARGING FLOW:
	RO	a) Close CHG flow control:
		• <b>1-CH-FCV-1122</b>
		a)
		b) Check CHG line isolation - OPEN
		• <i>1-CH-HCV-1310A</i>
	RO	c) Open CHG line isolation MOVs
		• <b>1-CH-MOV-1289A</b>
		• <b>1-CH-MOV-1289B</b>
	RO	d) Establish at least 40 gpm charging flow using CHG flow control

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Event No.: 8

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Event Description: 1-RC-PCV-1455C not open, 1-ECA-3.3

Cue: Pre-Event Failures.

	SRO	<p>10. CHECK SI FLOW NOT REQUIRED:</p> <ul style="list-style-type: none"> <li>• RCS subcooling based on CETCs - GREATER THAN 30°F [85°F]</li> <li>• Check RVLIS indication – GREATER THAN VALUE FROM TABLE</li> </ul> <table border="1"> <tr> <th>RCPs Running</th><th colspan="2">RVLIS INDICATION</th></tr> <tr> <th></th><th>Full Range</th><th>Dynamic Range</th></tr> <tr> <td>0</td><td>GREATER THAN 63%</td><td></td></tr> <tr> <td>1</td><td></td><td>GREATER THAN 36%</td></tr> <tr> <td>2</td><td></td><td>GREATER THAN 51%</td></tr> <tr> <td>3</td><td></td><td>GREATER THAN 82%</td></tr> </table>	RCPs Running	RVLIS INDICATION			Full Range	Dynamic Range	0	GREATER THAN 63%		1		GREATER THAN 36%	2		GREATER THAN 51%	3		GREATER THAN 82%
RCPs Running	RVLIS INDICATION																			
	Full Range	Dynamic Range																		
0	GREATER THAN 63%																			
1		GREATER THAN 36%																		
2		GREATER THAN 51%																		
3		GREATER THAN 82%																		
	RO	<p><i>Reports Full Range RVLIS &gt;63%.</i></p>																		
		<p><b>END Event 8</b></p> <p><b>End Scenario</b></p>																		

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

	BOP	<b>ATTACHMENT 1 OF E-0</b>  1. CHECK FW ISOLATION: <ul style="list-style-type: none"><li>• Feed pump discharge MOVs – CLOSED</li><li>• 1-FW-MOV-150A</li><li>• 1-FW-MOV-150B</li><li>• MFW pumps – TRIPPED</li><li>• Feed REG valves – CLOSED</li><li>• SG FW bypass flow valves – DEMAND AT ZERO</li><li>• SG blowdown TVs – CLOSED</li></ul>
	BOP	2. CHECK CTMT ISOLATION PHASE I: <ul style="list-style-type: none"><li>• Phase I TVs – CLOSED</li><li>• 1-CH-MOV-1381 – CLOSED</li><li>• 1-SV-TV-102A – CLOSED</li><li>• PAM isolation valves – CLOSED<ul style="list-style-type: none"><li>• 1-DA-TV-103A</li><li>• 1-DA-TV-103B</li></ul></li></ul> <b>BOP will identify 1-DA-TV-100A/B, and 1-MS-TV-109 OPEN and CLOSE them.</b>
	BOP	3. CHECK AFW PUMPS RUNNING: <ul style="list-style-type: none"><li>a) MD AFW pumps – RUNNING (Time Delayed)</li><li>b) TD AFW pump - RUNNING IF NECESSARY</li></ul>

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

	BOP	<b>Attachment 1 of E-0</b>  4. CHECK SI PUMPS RUNNING: <ul style="list-style-type: none"> <li>• CHG pumps – RUNNING</li> <li>• LHSI pumps – RUNNING</li> </ul> <b>BOP starts 1-SI-P-1B</b>  <b>1-SI-P-1B START TIME: _____ (for critical task verification, CT-1)</b>
	BOP	5. CHECK CHG PUMP AUXILIARIES: <ul style="list-style-type: none"> <li>• CHG pump CC pump – RUNNING</li> <li>• CHG pump SW pump - RUNNING</li> </ul>
	BOP	6. CHECK INTAKE CANAL: <ul style="list-style-type: none"> <li>• Level - GREATER THAN 24 FT</li> <li>• Level - BEING MAINTAINED BY CIRC WATER PUMPS</li> </ul>
	BOP	7. CHECK IF MAIN STEAMLINES SHOULD BE ISOLATED: <ul style="list-style-type: none"> <li>a) Check if ANY of the following annunciators - HAVE BEEN LIT               <ul style="list-style-type: none"> <li>• E-F-10 (High Steam Flow SI)</li> <li>• B-C-4 (Hi Hi CLS Train A)</li> <li>• B-C-5 (Hi Hi CLS Train B)</li> </ul> </li> </ul> Identifies annunciators not lit and goes to step 8.
	BOP	*8. CHECK IF CS REQUIRED: <ul style="list-style-type: none"> <li>a) CTMT pressure – HAS EXCEEDED 23 PSIA</li> </ul> Identifies pressure has not exceeded 23 or 17.7 psia and goes to step 10.

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

	BOP	<p><b>Attachment 1 of E-0</b></p> <p><b>*10. BLOCK LOW PRZR PRESS SI SIGNAL:</b></p> <ul style="list-style-type: none"><li>a) Check PRZR pressure – LESS THAN 2000 psig</li><li>b) Turn both LO PRZR PRESS &amp; STM HDR/LINE ΔP switches to block</li><li>c) Verify Permissive Status light C-2 - LIT</li></ul> <p>BOP may block the low pressurizer pressure SI signal depending on current RCS pressure.</p>
	BOP	<p><b>*11. BLOCK LOW TAVE SI SIGNAL:</b></p> <p>Step may not be performed at this time (if Tave is greater than 543°F).</p> <ul style="list-style-type: none"><li>a) Check RCS Tave - LESS THAN 543°F</li><li>b) Turn both HI STM FLOW &amp; LO TAVG OR LP switches to block</li><li>c) Verify Permissive Status light F-1 - LIT</li></ul>
	BOP	<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• CHG pumps should be run in the following order of priority: C, B, A.</li><li>• Subsequent SI signals may be reset by re-performing Step 12.</li></ul> <p><b>12. CHECK SI FLOW:</b></p> <ul style="list-style-type: none"><li>a) HHSI to cold legs - FLOW INDICATED<ul style="list-style-type: none"><li>• 1-SI-FI-1961 (NQ)</li><li>• 1-SI-FI-1962 (NQ)</li><li>• 1-SI-FI-1963 (NQ)</li><li>• 1-SI-FI-1943 or 1-SI-FI-1943A</li></ul></li><li>b) Check CHG pumps - THREE RUNNING</li><li>c) Reset SI.</li><li>d) Stop one CHG pump and out in AUTO</li></ul>

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

		<p><b>Attachment 1 of E-0</b></p> <p>e) RCS pressure - LESS THAN 185 PSIG</p> <p>RNO: e) IF two LHSI pumps are running, THEN do the following:</p> <ol style="list-style-type: none"> <li>1) Verify reset or reset SI.</li> <li>2) Stop one LHSI pump and put in AUTO.</li> </ol> <p><b>1-SI-P-1A or 1B STOP TIME: _____</b></p> <ol style="list-style-type: none"> <li>3) GO TO Step 13.</li> </ol> <p><b>Critical Task: Secure one LHSI pump within 30 minutes of two LHSI pumps in service. [SPS E-1—G, CT-1]</b></p>
	BOP	13. CHECK TOTAL AFW FLOW - GREATER THAN 350 GPM [450 GPM]
	BOP	<p>14. CHECK AFW MOVs - OPEN</p> <p>BOP will identify that all AFW MOVs are not open and will read the RNO portion of this step and manually align valves as necessary.</p>
	BOP	<p>15. INITIATE SI VALVE ALIGNMENT IAW ATTACHMENT 2</p> <p>See attached copy of Attachment 2. (Next page of this guide)</p> <p>Depending on timing, this attachment may have already been completed.</p>
	BOP	<p>16. INITIATE VENTILATION, AC POWER, AND SFP STATUS CHECKS IAW ATTACHMENT 3</p> <p><i>Attachment 3 follows Attachment 2 on next page</i></p> <p><b>Identify failure of 1-VS-MOD-103A CLOSES the MOD.</b></p> <p><i>Unit 2 Operator will state that Unit 2 is at 100% power (if asked)</i></p> <p><i>Unit 2 will also accept responsibility to complete Attachment 3 if it is given to Unit 2 at the point where differential pressure indications are requested.</i></p>

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

Time	Position	Applicant's Action or Behavior
	BOP	ATTACHMENT 2 of 1-E-0  <b>NOTE:</b> Components previously aligned by SI termination steps, must not be realigned by this Attachment.
	BOP	ATTACHMENT 2 of 1-E-0  1. Check opened or open CHG pump suction from RWST MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115B</li><li>• 1-CH-MOV-1115D</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  2. Check closed or close CHG pump suction from VCT MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115C</li><li>• 1-CH-MOV-1115E</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  3. Check running or start at least two CHG pumps. (listed in preferred order) <ul style="list-style-type: none"><li>• 1-CH-P-1C</li><li>• 1-CH-P-1B</li><li>• 1-CH-P-1A</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  4. Check opened or open HHSI to cold legs MOVs. <ul style="list-style-type: none"><li>• 1-SI-MOV-1867C</li><li>• 1-SI-MOV-1867D</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  5. Check closed or close CHG line isolation MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1289A</li><li>• 1-CH-MOV-1289B</li></ul>



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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

	BOP	ATTACHMENT 2 of 1-E-0  6. Check closed or close Letdown orifice isolation valves.  <ul style="list-style-type: none"><li>• 1-CH-HCV-1200A</li><li>• 1-CH-HCV-1200B</li><li>• 1-CH-HCV-1200C</li></ul> <b>RO/BOP will CLOSE 1-CH-HCV-1200A and 1-CH-HCV-1200B</b>
	BOP	ATTACHMENT 2 of 1-E-0  7. Check opened or open LHSI suction from RWST MOVs.  <ul style="list-style-type: none"><li>• 1-SI-MOV-1862A</li><li>• 1-SI-MOV-1862B</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  8. Check opened or open LHSI to cold legs MOVs.  <ul style="list-style-type: none"><li>• 1-SI-MOV-1864A</li><li>• 1-SI-MOV-1864B</li></ul>
	BOP	ATTACHMENT 2 of 1-E-0  9. Check running or start at least one LHSI pump.  <ul style="list-style-type: none"><li>• 1-SI-P-1A</li><li>• 1-SI-P-1B</li></ul> <b>BOP START 1-SI-P-1B as part of attachment 2</b>
	BOP	ATTACHMENT 2 of 1-E-0  10. check High Head SI flow to cold legs indicated.  <ul style="list-style-type: none"><li>• 1-SI-FI-1961</li><li>• 1-SI-FI-1962</li><li>• 1-SI-FI-1963</li><li>• 1-SI-FI-1943 or 1-SI-FI-1943A</li></ul>

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>11. IF flow not indicated, THEN manually start pumps and align valves. IF flow NOT established, THEN consult with Shift Supervision to establish another high pressure injection flow path while continuing with this procedure.</p> <ul style="list-style-type: none"><li>• Alternate SI to Cold legs</li><li>• Hot leg injection</li></ul>
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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

NUMBER 1-E-0	ATTACHMENT TITLE	ATTACHMENT 3
REVISION 69	AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	PAGE 1 of 6

1. \_\_\_\_ Check or place REFUEL SFTY MODE switches in NORMAL.

2. \_\_\_\_ Check ventilation alignment IAW Tables 1 and 2.

TABLE 1  
UNIT #1 VENTILATION PANEL

<u>MARK NUMBER</u>	<u>EQUIPMENT STATUS</u>
<input type="checkbox"/> 1-VS-F-4A & B	OFF
<input type="checkbox"/> 1-VS-HV-1A & B	OFF
<input type="checkbox"/> 1-VS-F-8A & B	OFF
<input type="checkbox"/> 1-VS-F-9A & B	GREEN
<input type="checkbox"/> 1-VS-F-59	GREEN
<input type="checkbox"/> 1-VS-F-6	OFF
<input type="checkbox"/> 1-VS-F-39	GREEN
<input type="checkbox"/> 1-VS-F-7A & B	GREEN
<input type="checkbox"/> 1-VS-HV-5	GREEN
<input type="checkbox"/> 1-VS-F-56A & B	GREEN
<input type="checkbox"/> 1-VS-F-40A & B	GREEN
<input type="checkbox"/> 1-VS-HV-4	OFF
<input type="checkbox"/> 2-VS-F-40A or B	RED
<input type="checkbox"/> 2-VS-HV-4	OFF

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

NUMBER 1-E-0	ATTACHMENT TITLE	ATTACHMENT 3
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TABLE 2  
VNTX PANEL

<u>MARK NUMBER</u>	<u>EXPECTED EQUIPMENT STATUS</u>	<u>RESPONSE NOT OBTAINED</u>
<input type="checkbox"/> a. AOD-VS-107A & B AOD-VS-108	RED GREEN	<input type="checkbox"/> a. Place AUX BLDG CENTRAL AREA MODE switch to FILTER.
<input type="checkbox"/> b. MOD-VS-100A & B AOD-VS-106	RED GREEN	<input type="checkbox"/> b. • Place MOD-VS-100A to FILTER. • Place MOD-VS-100B to FILTER.
<input type="checkbox"/> c. MOD-VS-200A & B AOD-VS-206	GREEN RED	<input type="checkbox"/> c. • Place MOD-VS-200A to UNFILTER. • Place MOD-VS-200B to UNFILTER.
<input type="checkbox"/> d. AOD-VS-103A & B AOD-VS-104	GREEN GREEN	<input type="checkbox"/> d. • Place AOD-VS-103A in UNFILTER. • Place AOD-VS-103B in UNFILTER. • Place AOD-VS-104 in FILTER.
<input type="checkbox"/> e. AOD-VS-101A & B AOD-VS-102	GREEN GREEN	<input type="checkbox"/> e. Place AOD-VS-101A and 101B in UNFILTER.
<input type="checkbox"/> f. AOD-VS-111A & B	GREEN	<input type="checkbox"/> f. Place COMBINE CONTAINMENT EXHAUST in ISOLATE.
<input type="checkbox"/> g. AOD-VS-110	GREEN	<input type="checkbox"/> g. Place AOD-VS-109A and 109B in FILTER.
<input type="checkbox"/> h. AOD-VS-112A & B	GREEN	<input type="checkbox"/> h. • Place AOD-VS-112A in CLOSE. • Place AOD-VS-112B in CLOSE.
<input type="checkbox"/> i. MOD-VS-58A & B 1-VS-F-58A & B	RED RED	<input type="checkbox"/> i. Start 1-VS-F-58A and 1-VS-F-58B.
3. ____ Check filtered exhaust flow: (as read on FI-VS-117A and FI-VS-117B)		
<input type="checkbox"/> • Total flow - GREATER THAN 32400 cfm		
<u>AND</u>		
<input type="checkbox"/> • Flow through each filter bank - LESS THAN 39600 cfm		

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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4. \_\_\_\_ Check all Station Service Buses - ENERGIZED. IF NOT, THEN initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.
5. \_\_\_\_ Check annunciator VSP-J2 - LIT.
6. \_\_\_\_ Check Unit 1 RSST LTC time delay bypass light - LIT.
7. \_\_\_\_ Check stopped or stop 1-VS-AC-4.
8. \_\_\_\_ Place 1-VS-43-VS103X, MCR ISOLATION switch to the OFF position.
9. \_\_\_\_ Check closed or close MCR isolation dampers.
  - ☐ • 1-VS-MOD-103A
  - ☐ • 1-VS-MOD-103B
  - ☐ • 1-VS-MOD-103C
  - ☐ • 1-VS-MOD-103D

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

NUMBER 1-E-0	ATTACHMENT TITLE AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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\*\*\*\*\* :

**CAUTION:** • Only one Emergency Supply Fan must be started in the following step.

- Chilled Water flow to the in-service Unit 1 MCR AHU must be throttled to at least 15 gpm when the Emergency Supply fan is started.
- Chilled Water flow to the in-service Unit 2 MCR AHU must be throttled to at least 25 gpm when the Emergency Supply fan is started.
- An Emergency Supply Fan must not be started if the filter is wet.

\*\*\*\*\* :

10. Immediately start ONE Emergency Supply Fan IAW the following: (1-VS-F-41 or 2-VS-F-41 preferred)
  - a. IF 1-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 1-VS-F-41.
  - b. IF 2-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 2-VS-F-41.
  - c. IF 1-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 1-VS-F-42.
  - d. IF 2-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 2-VS-MOD-204B, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 2-VS-F-42.
  - e. \_\_\_ Adjust Chilled Water flow to MCR AHUs IAW Step 10 Caution.

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

Cue: Pre-load Malfunctions.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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11. \_\_\_\_ Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.
- ☐ • PDI-VS-100, D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
  - ☐ • PDI-VS-101, D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
  - ☐ • PDI-VS-200, D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
  - ☐ • PDI-VS-201, D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
  - ☐ • 1-VS-PDI-118 (Unit 1 Computer Room)
  - ☐ • 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
  - ☐ • 2-VS-PDI-215 (Unit 2 AC Room)
  - ☐ • 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)
12. \_\_\_\_ IF any reading NOT positive, THEN initiate Attachment 6 to secure MCR boundary fans.
13. \_\_\_\_ Check initiated or initiate 0-AP-50.00, OPPOSITE UNIT EMERGENCY.
14. \_\_\_\_ Check the following MCR and ESGR air conditioning equipment operating. IF NOT, THEN start equipment within 1 hour IAW the appropriate subsection of 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM.
- ☐ • One Control Room chiller
  - ☐ • One Unit 1 Control Room AHU
  - ☐ • One Unit 2 Control Room AHU
  - ☐ • One Unit 1 ESGR AHU
  - ☐ • One Unit 2 ESGR AHU
15. \_\_\_\_ IF both of the following conditions exist, THEN check that Load Shed is activated.
- ☐ • Unit 2 - SUPPLIED BY RSST
  - ☐ • Unit 2 RCPs - RUNNING
16. \_\_\_\_ IF Load Shed is required and not activated, THEN initiate 0-AP-10.10, LOSS OF AUTO LOAD SHED.

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Event Description: BOP Failures. 1-SI-P-1B not auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOV-103A not close, 1-MS-TV-109 and 1-DA-TV-100 A/B not close.

**Cue: Pre-load Malfunctions.**

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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**NOTE:** • SFP checks should be initiated WITHIN ONE TO TWO HOURS of EOP entry.

- Loss of power may render SFP indications and alarms non-functional and require local checks. Power supplies are as follows:
  - TI-FC-103, Unit 1 Semi-Vital Bus
  - TI-FC-203, Unit 2 Semi-Vital Bus
  - 1-FC-LIS-104, Panel 1ABDA1
- Loss of AC Power to the SFP level indicator is indicated if both low and high level alarms are in simultaneously. (0-VSP-C4 and 0-VSP-D4)
- 1-DRP-003, CURVE BOOK, provides a graph for SFP time to 200°F if loss of SFP cooling occurs.

17. \_\_\_\_ Initiate monitoring SFP parameters:

- ☐ • SFP level - Greater than Cooling Pump suction AND Stable
- ☐ • SFP temperature - Stable or Decreasing
- ☐ • SFP Cooling Pumps - Either Running
- ☐ • Component Cooling - Normal

18. \_\_\_\_ Continue to monitor parameters every one to two hours or until authorized to terminate monitoring by the Station Emergency Manager and/or the Shift Manager.

19. \_\_\_\_ Notify the Station Emergency Manager and/or the Shift Manager of the status and trend of SFP parameters.

20. \_\_\_\_ IF any abnormality or adverse trend is identified, THEN initiate 0-AP-22.02, MALFUNCTION OF SPENT FUEL PIT SYSTEMS.



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FOLDOUT PAGES FOR REFERENCED PROCEDURES

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER 1-E-0	CONTINUOUS ACTIONS PAGE	REVISION 69
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1. RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur:

- a. Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- b. RCS Subcooling - LESS THAN 30°F [85°F]

2. MINIFLOW RECIRC CRITERIA

- a. CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- b. OPEN - When RCS pressure is greater than 2000 psig.

3. ADVERSE CONTAINMENT CRITERIA

Use Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

1. AMSAC RESET CRITERIA

AMSAC may be manually reset when level in all three SGs is greater than 13% or six minutes have elapsed since the Reactor trip. When AMSAC is reset, AMSAC ARMED annunciator H-D-1 should clear and affected components may be realigned as needed.

2. TD AFW PUMP SHUTDOWN CRITERIA

The TD AFW pump may be secured when SG NR level is greater than 22% in at least 2 SGs, AMSAC is reset, and no auto-start signal exists. To secure the pump, the pump SOV control switches must be taken to OPEN-RESET and then to CLOSE.

3. MANUAL SI ALIGNMENT

If SI fails to automatically align, Attachment 2 may be used for guidance on manual SI valve alignment.

4. \* TRANSIENT AFW FLOW CONTROL (IF SI in progress)

Attachment 8 may be used for guidance on transient AFW flow control.

5. \* FAULTED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 9 may be used for guidance on faulted SG(s) isolation and AFW flow control.

6. \* RUPTURED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 10 may be used for guidance on ruptured SG(s) isolation and AFW flow control.

7. \* LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

\* Preemptive Actions

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER	CONTINUOUS ACTION STEPS	REVISION
1-E-0		69

1. Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F. (E-0, Step 6)
  2. Monitor RCP Trip and Miniflow Recirc Criteria. (E-0, Step 8)
  3. Check SG Narrow Range Level - ANY SG GREATER THAN 12%. (Control feed flow to maintain Narrow Range Level between 22% and 50%) (E-0, Step 25)
  4. Monitor LHSl pumps and secure as necessary. (E-0, Step 30)
- NOTE:** Subsequent SI signals may be reset by reperforming Step 12 of Attachment 1.
5. Monitor CTMT pressure and check CLS initiation as necessary. (Attachment 1, Step 8)
  6. Monitor RWST level and check RS initiation as necessary. (Attachment 1, Step 9)
  7. Block Low PRZR Pressure SI signal when less than 2000 psig. (Attachment 1, Step 10)
  8. Block Low Tave SI signal when less than 543°F. (Attachment 1, Step 11)

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

CONTINUOUS ACTIONS PAGE FOR 1-E-31. SI REINITIATION CRITERIA

Manually operate SI pumps and align valves as necessary if EITHER condition listed below occurs:

- RCS subcooling based on CETCs - LESS THAN 30°F [85°F]
- PRZR level - CANNOT BE MAINTAINED GREATER THAN 22% [50%]

IF SI reinitiation occurs after Step 23, THEN GO TO 1-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY.

2. ADVERSE CONTAINMENT CRITERIA

Use Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

3. SECONDARY INTEGRITY CRITERIA

GO TO 1-E-2, FAULTED STEAM GENERATOR ISOLATION, if any SG pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. AFW SUPPLY SWITCHOVER CRITERIA (Refer to Attachment 9)

Transfer to one of the following alternate AFW water supplies if ECST level decreases to less than 20%.

- a. 1-CN-TK-2, using 1-CN-150.
- b. 1-CN-TK-3, using AFW Booster Pumps.
- c. AFW Crosstie.
- d. Firemain.

5. MULTIPLE TUBE RUPTURE CRITERIA

STABILIZE the plant and RETURN TO 1-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, if any intact SG level increases in an uncontrolled manner or any intact SG has abnormal radiation.

6. AMSAC RESET CRITERIA

AMSAC may be manually reset when level in all three SGs is greater than 13% or six minutes have elapsed since the Reactor trip. When AMSAC is reset, annunciator H-D-1 should clear and affected components may be realigned as needed.

7. TD AFW PUMP SHUTDOWN CRITERIA

The TD AFW pump may be secured when SG NR level is greater than 22%, AMSAC is reset, and no auto-start signal exists. To secure the pump, the pump SOV control switches must be taken to OPEN-RESET and then to CLOSE.

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

CONTINUOUS ACTIONS PAGE FOR 1-ECA-3.31. SI REINITIATION CRITERIA

Following SI termination or SI flow reduction, manually start SI pumps as necessary and GO TO 1-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, if EITHER condition listed below occurs:

- RCS subcooling based on CETCs - LESS THAN 30°F [85°F]
- RVLIS indication - LESS THAN VALUE FROM TABLE

RCPs	RVLIS INDICATION	
	Full Range	Dynamic Range
0	LESS THAN 63%	_____
1	_____	LESS THAN 36%
2	_____	LESS THAN 51%
3	_____	LESS THAN 82%

2. ADVERSE CONTAINMENT CRITERIA

Use Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

3. SECONDARY INTEGRITY CRITERIA

GO TO 1-E-2, FAULTED STEAM GENERATOR ISOLATION, if any SG pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated unless needed for RCS cooldown.

4. AFW SUPPLY SWITCHOVER CRITERIA (Refer to Attachment 7)

Transfer to one of the following alternate AFW water supplies if ECST level decreases to less than 20%.

- 1-CN-TK-2, using 1-CN-150.
- 1-CN-TK-3, using AFW Booster Pumps.
- AFW Crosstie.
- Firemain.

5. RCP START CRITERIA

- Following a loss of all seal cooling, affected RCP(s) should NOT be started without prior status evaluation.
- RCPs should be run in the following order of priority to provide PRZR spray: C, A and B.

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## SIMULATOR OPERATOR'S GUIDE

**Simulator Setup**Initial Conditions:

Recall IC -XXX and implement **TRIGGER #30** to activate all passive malfunctions and verify **Trigger #30** implemented.

Acknowledge AAC System Alarm on Waste Disposal Panel

Open the monitor window and add the following points to it:

- asp\_ao\_off
- MS-120, "B" Steam Supply to TDAFW Pump
- ??
- ??

Enter the following MALFUNCTIONS:

Malfunction	Delay	Ramp	Trigger	Value	Final	Trigger Type (Auto or Manual)
RC4903 PRZR LEVEL XMTR CH 3 FAILURE (461)	10	20	1	0.0	-0.2	Manual
FW1803 B S/G MN FD FLOW XMTR FT-1487 FAILS	10	0	3	0.0	1	Manual
SD0201 HP HTR DRN PP SD-P-1A TRIPS: OVR-CURRENT	10	0	5	FALSE	TRUE	Manual
RC2402 STEAM GENERATOR B TUBE RUPTURE	10	60	9	0.0	8	Manual
PCV455C_OPEN PCV-1455C PRZR RELIEF VALVE OPEN	0	0	9	0	1	Manual
RCMOV535_BKR RC-MOV-535 PORV Block Valve	0	0	16	1	0	AUTO
RC5601 RC-P-1A BKR 15A3 SPURIOUS TRIP	0	0	17	FALSE	TRUE	AUTO
RC5602 SPURIOUS TRIP RCP 1B	0	0	17	FALSE	TRUE	AUTO
RC5603 SPURIOUS TRIP RCP 1C	0	0	17	FALSE	TRUE	AUTO
AS02 DISABLE SV-TV-102 OPEN	0	0	30	FALSE	TRUE	ACTIVE
AS03 DISABLE SV-TV-102 CLOSE	0	0	30	FALSE	TRUE	ACTIVE
SI2409 SI RELAY CI1A FAILS TO ACTUATE	0	0	30	FALSE	TRUE	ACTIVE
SI2505 SI RELAY SI5B FAILS TO ACTUATE	0	0	30	FALSE	TRUE	ACTIVE

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## SIMULATOR OPERATOR'S GUIDE

Enter the following EVENT TRIGGERS:

Trigger#	EVENT	Command
Trigger setup to trip 1-RC-MOV1535 breaker when control switch in open to stroke test open time, Event 1. Trigger 14 sets when 1-RC-MOC-1535 closed. Trigger 15 sets when 1-RC-MOV-1535 control switch taken to open. Trigger 16 set when both Trigger 14 and 15 are TRUE. Trigger 16 implements Remote Function trip of 1-RC-MOV-1535 breaker.		
14	"rcmov535 .le. 0.0002"	Sets Trigger 14
15	"mov535_open"	Sets Trigger 15
16	"et_array(14) .and. et_array(15)"	Sets Trigger 16
Trigger setup to trip A, B, C, RCPs when Generator Output breakers open. (EL2 Auto Trigger). Actuates Trigger which implements Malfunction RC5601/5602/5603.		
17	".not. (elg102_bkr(2) .and. elg1t240_bkr)"	Sets Trigger 17
Trigger setup to override 1-RC-LCV-1460A and B control switch to "Open" to simulate removing PRZR level control output fuses.		
20	"chw180<500.0"	Set Trigger 20 when Letdown flow < 1 gpm.
21	"chlc460a_open"	Set Trigger 21 when 1-CH-LCV-1460A switch taken to "Open".
22	"chlc460b_open"	Set Trigger 22 when 1-CH-LCV-1460B switch taken to "Open".
23	"et_array(20) .and. et_array(21)"	Sets Trigger 23 when Trigger 20 and 21 are ACTIVE. Actuates override for 1-CH-LCV-1460A switch in "Open"
24	"et_array(20) .and. et_array(22)"	Sets Trigger 24 when Trigger 20 and 22 are ACTIVE. Actuates override for 1-CH-LCV-1460B switch in "Open"

Enter the following Remote Functions:

Override	Set Condition	Trigger
AAC_SMS_MODE OFF AAC DG LOCAL MODE SWITCH POSITION	OFF	30

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## SIMULATOR OPERATOR'S GUIDE

Enter the following Switch Overrides:

Override	Set Condition	Trigger
Override CH LCV-460A OPEN	ON	23
Override CH LCV 460B OPEN	ON	24

TRIGGER	TYPE	DESCRIPTION
1	MAN	Fails PZR Level CH III to ~34%.
3	MAN	B SG MN Feed Flow Transmitter fails high.
5	MAN	Trip running High Pressure Drain Pump
9	MAN	Steam Generator Tube Leak, 74 gpm
11	MAN	Overrides 1-RC-PCV-1455C control switch in Close
16	AUTO	Open Breaker to 1-RC-MOV-1535
17	AUTO	Spurious Trip A/B/C RCPs when Gen. Output Bkrs open
23	AUTO	Overrides 1-CH-LCV-1460A control switch Open.
24	AUTO	Overrides 1-CH-LCV-1460B control switch Open.
30	ACTIVE	AS02 DISABLE SV-TV-102 OPEN AS03 DISABLE SV-TV-103 CLOSE SI2409 SI RELAY CI1A FAILS TO ACTUATE SI2505 SI RELAY SI5B FAILS TO ACTUATE AAC_SMS_MODE OFF AAC DG LOCAL MODE SWITCH POSITION



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## SIMULATOR OPERATOR'S GUIDE

**Verify the following control room setup:**

- ☐ Place the simulator in RUN and verify normal 100% power operation indications.
- ☐ Reset the ROD CONTROL SYSTEM
- ☐ Verify Red Magnets on the following components:

--	--	--

- ☐ Verify 1-RM-RI-112 aligned to A SG and 1-RM-RI-113 aligned to B/C SG (magnets).
- ☐ Verify Ovation System operating.
- ☐ Reset ICCMs.
- ☐ Verify Component Switch Flags.
- ☐ Verify Brass Caps properly placed.
- ☐ Verify SG PORVs set for 1035 psig.
- ☐ Verify Rod Control Group Step Counters indicate properly.
- ☐ Verify Ovation CRT display.
- ☐ Advance Charts
- ☐ Verify Turbine Thumb Wheel Settings @120 rpm/min and Position 6
- ☐ Verify Containment Instrument Air Compressors are on Inside Suction (all RMs reset)
- ☐ Verify all ARPs have been cleaned
- ☐ Verify CLEAN copies of the following procedures are in place:

<input type="checkbox"/> AP-53.00	<input type="checkbox"/> AP-18.00	<input type="checkbox"/> AP-23.00	<input type="checkbox"/> AP-16.00
<input type="checkbox"/> E-0	<input type="checkbox"/>	<input type="checkbox"/> E-3 (2)	<input type="checkbox"/> ECA-3.3
<input type="checkbox"/> OP-CH-007		<input type="checkbox"/> Reactivity Sheet	
<input type="checkbox"/> OP-ZZ-002		<input type="checkbox"/> PT-18.6I	

- ☐ **Verify Reactivity Placard is current.**
- ☐ Verify ALL PINK MAGNETS are accounted for.

**SIMULATOR OPERATOR'S GUIDE****Brief**

This simulator performance scenario is performed in the EVALUATION MODE. You should not direct questions to the evaluators. Otherwise, you should perform as if you were in the MCR.

Your ability to maintain a log is not being graded, but maintaining a rough log is recommended to help during briefs.

If you need to communicate with the Unit 2 operator, verbally state, "Unit 2" and an instructor will locate to the Unit 2 area and respond to you as quickly as possible.

In the unlikely event that the simulator fails such that illogical indications result, the session will be terminated. In other words, respond to what you see. If there is a problem with the simulation, the session will be terminated or adjusted as appropriate based on the specific problem.

Assign operating positions.

Ask for and answer questions.

**Op-Test No.: Surry 2014-1****Scenario No.: 1****Page 75 of 89****SIMULATOR OPERATOR'S GUIDE****Conduct shift turnover:**

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance. In accordance with VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1 and upon relieving the watch, perform PT-18.6I, Pressurizer Block Valve Stroke Test. Performance of PT-18.6I has been authorized and has been PSA analyzed for current plant conditions.

The last shift performed two 35 gallon dilutions followed by a manual makeup for training. "A" BAST boron concentration is 8.0 w/%.

When the team has accepted the shift, proceed to the Session Conduct Section.

## SIMULATOR OPERATOR'S GUIDE

**Session Conduct:**

- Ensure conditions in Simulator Set-up are established.
- **Ensure Trigger 30 is active prior to team entering the simulator.**
- Verify Exam Security has been established and ASP\_AO\_OFF = True.

**EVENT 1      Test Cycle PORV Block Valves, 1-PT-18.6I**

## BOOTH:

30 minutes prior to the beginning of the scenario, provide the team with a copy of 1-PT-18.6I, Pressurizer Block Valve Stroke Test. The team will pre-brief the PT prior to entering the simulator.

Trigger setup to trip 1-RC-MOV1535 breaker when control switch in open to stroke test open time, Event 1. Monitor the following triggers as 1-RC-MOV-1535 is closed/opened.

Trigger 14 sets (becomes Active) when 1-RC-MOC-1535 closed.

Trigger 15 sets (becomes Active) when 1-RC-MOV-1535 control switch taken to open.

Trigger 16 sets when both Trigger 14 and 15 are TRUE.

Trigger 16 implements Remote Function to trip 1-RC-MOV-1535 breaker.

## Operations Supervisor/Management:

- **If contacted**, will acknowledge 1-RC-MOV-1535 breaker tripped when the valve was re-opened, suspension of the PT, and Tech Spec Clock identified (1 hour/72 hour).

## Field Operator: (3 minute delay from request to answer)

- **If Contacted**, as Service Building Operator, to check the status of 1-RC-MOV-1535 breaker, 1H1-2S 6A; report that the breaker has tripped (in the “trip free” position).

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**EVENT 2      PRZR Level Transmitter 1-RC-LI-1461 Fail to 34%, 0-AP-53.00.**When cued by examiner, implement **Trigger #1**.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of 1-RC-LI-1461. The individual(s) contacted will also acknowledge any TS LCOs and entry into AP-53.00.
- **If contacted**, will recommend to the team that channels remain as they are for now (i.e., do not perform 1-OP-RP-001 at this time).
- **If contacted**, will take responsibility for writing the CR.

STA:

- **If contacted**, will acknowledge the failure of 1-RC-LI-1461. The individual(s) contacted will also acknowledge (but not confirm/deny) any TS LCOs.
- **If asked**, the STA will report that 1-RC-LI-1461 is a Reg. Guide 1.97 component. The STA will also report that upon review of CEP 99-0029 that two channels of Pressurizer Level are required, Reg. Guide 1.97 refers to Tech Spec Table 3.7-6.
- **If asked**, SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA will report that review is complete; VPAP-2802 and TRM requirements have been discussed with the Shift Manager. The STA reports that a 14-day clock to establish a fire watch and a 60-day return to service clock is in effect.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge instrumentation failure and commence investigations and/or efforts to place the channel in trip.

Unit 2 Operator:

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- No action for this event.

Role play as other individuals as needed.

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**EVENT 3      Feed Flow Channel Fails High, 0-AP-53.00.**When cued by examiner, implement **Trigger #3.**

Operations Supervisor/Management:

- **If contacted**, acknowledge feed flow channel failure. The individual(s) contacted will also acknowledge any TS LCOs.
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, will acknowledge entry into AP-53.00.
- **If contacted**, will recommend to the team that channels remain as they are for now (i.e., do not perform 1-OP-RP-001 at this time).

STA:

- **If contacted**, will acknowledge feed flow channel failure. The individual(s) contacted will also acknowledge any TS LCOs. The STA will not confirm or deny any TS decisions.
- **If contacted**, will take responsibility for writing the CR.
- **IF contacted:** CEP-0029 has been reviewed, Reg. Guide 1.97 only requires one channel of Feed Flow indication per steam generator and no actions are required. VPAP-2802 and TRM section 3.3 are not affected.
- **IF contacted:** acknowledge that TRM 3.3.5 requires the calorimetric program be changes from the Feedwater UFM System to the Normalized Feedwater Venturi System, within 1 hour; and, Restore the UFM system to FUNCTIONAL status in 48 hours.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the failed AE RM. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

- Will perform actions as directed.

Maintenance/ Work Week Coordinator:

- **If contacted**, will acknowledge the feed flow channel failure and contact I&C to commence preparation to place the failed channel in trip.

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Unit 2:

- **If contacted**, will acknowledge the failure of the fed flow channel.
- **Assume** the responsibility for completion of 1-OPT-RX-007.

Role-play as other individuals as needed.

**EVENT 4      Loss of HPD, 1-AP-18.00.**

When the Evaluator indicates Ready, Activate Trigger #5.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the trip of 1-SD-P-1A, and the need to ramp at 1%/minute to 75% power.
- **If asked** for a recommended ramp rate, ask what the Unit Supervisor recommends. When authorized by the NRC, the Shift Manager will direct a 1%/minute ramp rate.

STA:

- **If contacted**, will acknowledge the trip of 1-SD P-1A and the need to ramp at 1%/minute to 75% power.
- **If asked**, the STA will acknowledge the need to borate and use rods (will acknowledge the team review of pre-planned reactivity plans and OP-RX-010, if performed). If asked to perform the OP-RX-010 review, the STA will state that he is not able to at this time.
- **After directed**, the STA will report that he has reviewed VPAP-2802 and no notifications were required.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.



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Maintenance/ Work Week Coordinator:

- **If contacted**, will acknowledge the failure and notify electrical maintenance to investigate.
- **If contacted**, will acknowledge the requirements to reduce reactor power.

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Field Operators: *(Wait three (3) minutes from direction of a local action to the report of local condition found.)*

- **If contacted**, the condensate polishing building operator will acknowledge the need to ramp the unit.
- **If asked**, the condensate polishing building operator acknowledge bypass of the polisher.
- **When contacted**, as the Service Building Operator concerning the status of 1-SD-P-1A power supply breaker, 1-EP-BKR-15B6, report that the breaker is open with a timed overcurrent drop on "A" phase.
- **When contacted**, as the Turbine Building Operator to check the status of 1-SD-P-1A, report that there are no apparent abnormalities with the "A" High Pressure Drain Pump.

Unit 2:

- **If contacted**, will acknowledge the trip of 1-SD-P-1A and the need to ramp at 1%/minute to 75% power.

Role-play as other individuals as needed.

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**EVENT 5**     **Ramp to 75%, 0-AP-23.00.**

Operations Supervisor/Management:

- **If contacted**, will acknowledge Ramp to 75% required due to the loss of 1-SD-P-1A.
- **If contacted**, will take responsibility for writing the CR.
- **When contacted:** The Shift Manager will review EIPs for applicability. They are not applicable.

STA:

- **If contacted**, will acknowledge the impending ramp to 75% power.
- **If contacted**, will take responsibility for writing the WR and CR.
- **When contacted:** The STA reports that he has completed his review of VPAP-2802 and no notifications are required.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them. STA will acknowledge reactivity plan developed by RO/SRO.

Unit 2 Operator:

- **If notified of Ramp:** Acknowledge ramp of Unit 1.

Role play as other individuals as needed.

**SIMULATOR OPERATOR'S GUIDE****EVENT 6      SGTL 74 gpm, A/E RM Auto Actions Fail, RCPs Trip on swap to RSST.**

When the Evaluator is ready, implement Trigger # 9.

Note: It would be preferable to wait until power is <80% to implement this failure to allow for ramp stabilization prior to creating RCS leak to allow the team to assess leakrate with more precision.

**Operations Supervisor/Management:**

- **If contacted**, will acknowledge RCS leakage into the 'B' SG. Will also acknowledge any TS information (time permitting) and information related to radiation monitors alarming.
- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, will acknowledge entry into AP-16.00.

**Unit 2 Operator:**

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms when directed and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.
- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.

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STA:

- **If contacted**, will acknowledge the RCS leakage into the 'B' SG.
- **If asked** to calculate the RCS leak rate, state that it is difficult to ascertain at this time, but you will continue to monitor as time permits.
- **If contacted**, will take responsibility for writing the WR and CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.

Health Physics:

- **If contacted**, will acknowledge "B" SGTL.

Role play as other individuals as needed.

Operations Supervisor/Management:

- 
- **If contacted**, will acknowledge entry into 1-E-0, ES-0.1. AP-24.01.
- **If contacted**, will acknowledge the SGTR on "B" SG.
- **If contacted**, will acknowledge the isolation of "B" SG (if informed).

Field Operators:

- **If contacted**, to report abnormalities on RCPs, report no 86 devices drops apparent on RCP breakers, but the Speed Sensing Panel appears to be malfunctioning; lights blinking on and off.

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**EVENT 7**                    **SGTL becomes SGTR (800) gpm). 0-AP-16.00, E-0, E-3.**

When Examiner ready, double click on RC2402, set DEG at 88%, 60 sec ramp, Insert.

After the SGTR implemented, Actuate Trigger 11 to fail PORV 1455C control switch.

Operations Supervisor/Management:

- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will acknowledge entry into 1-E-0, 1-E-3.
- **If contacted**, will acknowledge the SGTR on “B” SG.
- **If contacted**, will acknowledge the isolation of ‘B’ SG (if informed).

STA:

- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.

Unit Two:

- **If asked**, blowdown and air ejector RM readings are [*as indicated at the time*].
- **If requested**, acknowledge RM alarms, and perform ARP actions.
- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.

Field Operators:

- **If contacted**, field operators will perform valve manipulations as required:
  - 1-MS-120 – set ms\_120 to zero upon request

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**EVENT 8****PZR PORV 1-RC-PCV-1455C not open, 1-ECA-3.3.**

Operations Supervisor/Management:

- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will acknowledge entry into 1-ECA-3.3.
- **If contacted**, will acknowledge the SGTR on “B” SG.
- **If contacted**, will acknowledge the isolation of ‘B’ SG (if informed).

STA:

- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.

Unit Two:

- **If asked**, blowdown and air ejector RM readings are [*as indicated at the time*].
- **If requested**, acknowledge RM alarms, and perform ARP actions.
- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.

Field Operators:

- **If contacted**, field operators will perform valve manipulations as required:
  - 1-MS-120 – set ms\_120 to zero upon request

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**EVENT 9**

**BOP Failures, 1-SI-P-1B no auto start, 1-CH-HCV-1200 A/B not close, 1-VS-MOD-103A not close, 1-MS-TV-109 and 1-DA-TV-100A/B not close.**

Operations Supervisor/Management:

- **If contacted**, will take responsibility for writing the WR and CR.

Unit Two:

- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.
- **If asked**, MRC differential pressure is a found. Unit 2 will assume responsibility for throttling SW flow IAW E-0, Attachment 3 guidance.

Field Operators:

- **If contacted**, field operators will perform valve manipulations as required.



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Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge the failures and commence investigations.

HP:

- **If contacted**, will acknowledge "B" SGTR.

STA:

- **If asked**, will report that he will calculate the time to 'B' fill, time permitting.
- **If contacted**, will enter the control room and commence reviewing status trees and prepare for the transient brief (items are reported "as you see them or previously reported").
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. Radiological conditions are as indicated. He will also state that containment conditions and the electrical conditions are as you see them.

Role play as other individuals as needed.

The scenario will end upon reaching Step 11 of 1-ECA-3.3 or at the lead examiners discretion.

Facility: <u>Surry Power Station</u>	Scenario No.: <u>3</u>	Op-Test No.: <u>2014-001</u>	
Examiners: _____	Operators: _____		
_____	_____		
_____	_____		
<p>Initial Conditions: Time in Core Life – Middle of Life; Core Cycle – Cycle 26</p> <p>Unit 1 and 2 operating at 100% power. All systems and cross ties are operable with the following exception:</p> <ul style="list-style-type: none"> <li>AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days</li> <li>"A" BAST at 8.0 W/%; Last Shift performed two (2) 35 gallon alt dilutes followed by a manual makeup for training..</li> </ul> <p>Turnover: The Team will pre-brief the Normal Evolution prior to Simulator Entry. This evolution is to swap the running EH Pumps IAW 1-OP-EH-001, Section 5.6.</p>			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP N - SRO	Swap of the Running EH Pumps IAW 1-OP-EH-001, Section 5.6.
2	RC0801, -1 Deg	I - RO	Failure of Median Tave in the Low Direction, AP-53.00.
3	MS0801, -1 Deg	I – BOP TS - SRO	Failure of Steam Flow Channel III Low, "A" SG. AP-53.00
4	EL4902	C – RO TS - SRO	1J 4160V emergency Bus Off-site Power Supply Breaker Trips.
5	Switch O/R, TEST_IR L_IIL	C – BOP R – RO R – SRO N - BOP	Test Button on Main Turbine Control Fails causing the LP Turbine 1 Intercept and Reheat Stop Valve Closure. AP-23.00 Ramp to 71% Power.
6	RC04, 3.5% Deg	C – RO TS– SRO	RCS leak of 35 gpm. AP-16.00.
7	RM0202, +.1 Deg, RM0201, +.1 Deg CA03 CA04	C – BOP	Containment Particulate and Gas RM auto actions on High Alarm fail to function
8	RC0101, .6% Deg	M - All	SBLOCA. AP-16.00, E-0.

9	SETPT for Hi-Hi CLS change to 60 psia.  O/R CLS_AC T_TRA  O/R CLS_AC T_TRB	M – All  C - BOP	Hi and HI-HI CLS fail to function, requiring manual alignments of components, and FR-Z.1 entry.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**Event #1: Normal evolution** which will be pre-briefed prior to Simulator Entry. The BOP will swap the running EH pumps IAW 1-OP-EH-001, Section 5.6. (N – BOP, N – SRO)

**Verifiable Actions:**

- 1) The BOP will start 1-EH-MP-2 and stop 1-EH-MP-1.

**Event #2: Median Tave Fails Low.** (I – RO)

The RO will diagnose this failure due to Rod motion and alarms received. The RO will place Rod Control to manual and place charging flow to manual IAW the Immediate Actions Steps of 0-AP-53.00, Loss of Vital Instrumentation/Controls. Following a short brief, the Team will complete AP-53.00.

**Verifiable Actions:**

- 1) RO/BOP will place Rod Control in manual to stop outward rod motion.
- 2) RO will place charging flow in manual and maintain Pressurizer level at program.

**Technical Specifications:**

- 1) Should the SRO review Tech Specs, no items will be found.

**Technical Requirements Manual/RG 1.97**

- 1) No TRM or RG 1.97 requirements are associated with this failure.

**Event #3: Steam Flow Channel III Fails Low on “A” SG.** (I – RO, TS-SRO)

The BOP will diagnose the failure based upon alarms and indications received, place the “A” FRV in manual to control “A” SG NR level, and restore SG NR level to program IAW 0-AP-53.00, Loss of Vital Instrumentation/Controls.

The affected channel of Steam Flow will be de-selected and the “A” FRV returned to automatic.

**Verifiable Actions:**

- 1) The BOP will place the “A” FRV in manual and restore the “A” SG NR level to program.
- 2) The RO will de-select the failed channel.
- 3) The BOP will return the “A” FRV to automatic.

**Technical Specifications:**

SRO will Review Technical Specifications and determine:

- 1) Tech Spec Table 3.7-1, Item 17, Operator Action 6. With the Number of Operable Channels less than the Total Number of channels, Operation may continue provided the channel is placed in trip within 72 hours, The channel may be bypassed for 12 for surveillance testing, and if the requirement cannot be met be in at least Hot Shutdown in 6 hours.
- 2) Tech Spec Table 3.7-2, Item 1.e. High Steam flow in 2/3 steam lines coincident with Low Tavg or low steam line pressure, Operator Action 20. With the number of Operable channels less than the Total number of channels, Operation may continue provided the channel is placed in trip within 72 hours, the channel may be bypassed for surveillance for 12 hours. If these conditions are not satisfied in the time permitted, be in Hot Shutdown in the next 6 hours and reduce RCS temperature and pressure to < 350°F/450 psig in the following 12 hours.
- 3) Tech Spec Table 3.7-3, Item 2a, Steam line Isolation, refers to requirements listed in 2) above.

**Technical Requirements Manual/R.G. 1.97.**

- 1) TRM – No requirements listed for this failure in section 3.3.2, Appendix R Instrumentation.
- 2) RG 1.97 – Attachment 1, D-19 Variable, 1 Channel per SG required.

**Event #4: Loss of 1J 4160V Emergency Bus, Breaker 15J8 opens, #3 EDG Starts and Loads on 1J Bus. (C – RO, TS – SRO).**

The Team will diagnose the loss of the 1J Emergency Bus and Start and Load of #3EDG on the bus based on alarms and indications received. The SRO will enter 1-AP-10.07, Loss of Unit 1 Power and proceed through the procedure until the end is reached.

**Verifiable Actions:**

- 1) BOP/RO will start the “B” CH pump to provide load to the #3EDG.
- 2) BOP/RO will secure the “A” and “C” CH pumps.
- 3) RO will place the “B” CC pump in PTL in order to re-close the “J” stub bus tie breaker.
- 4) RO will start “A” CC pump.

**Technical Specifications:**

- 1) The SRO will consult Tech Specs 3.16.B.2 and determine the Unit may continue to operate for 7 days with the primary source to the bus not available. SRO will consult with the Shift Manager concerning whether the Dependable alternate source can be Operable within 8 hours.
- 2) SRO may refer to Tech Spec 3.6.I and determine AFW cross-tie clock is not required.

**Technical Requirements Manual / RG 1.97:**

- 1) No TRM or RG 1.97 requirements are affected by this event. **(The identification of TRM items is normally an STA function – follow-up question post-scenario is recommended at Lead Evaluator discretion.)**

**Event #5: #1 LP Turbine “Left” Intercept and Reheat Stop Valve Close, (C- BOP, R – RO, R – SRO, N – BOP)**

The RO/BOP will diagnose this failure based Indications received. The Team will initiate AP-53.00/AP-38.00 and determine that a power reduction to 71% is required using 0-AP-23.00, Rapid Load Reduction.

**Verifiable Actions:**

- 1) RO will manipulate the CVCS system to Emergency Borate and establish a continuous boration to control RCS Tave during the Turbine Ramp.
- 2) RO will use control rods to adjust delta flux and assist in RCS Tave control.
- 3) BOP will operate Turbine controls to reduce turbine load.

**Technical Specifications/TRM/RG-1.97:**

- 1) None associated with this Failure.

**Event #6: RCS leak of 35 gpm.** (C – RO, TS-SRO)

Following completion of the ramp, the RCS leak will be initiated. The RO will perform 1-AP-16.00, Excessive RCS Leakage, Immediate Actions to quantify the leakage.

**Verifiable Actions:**

- 1) The RO will isolate letdown and control charging flow in manual to quantify RCS leakage.

**Technical Specifications:**

- 1) The SRO should consult Tech Specs Section 3.1.C, RCS leakage, and identify that RCS leakage is in excess of the allowed maximum and enter a second 6/30 clock to be in HSD/CSD.

**Event #7: Failure of RM-159/160 auto actions.** (C – BOP)

As the Team is responding to the RCS leak, RM-159/160 for containment Particulate and Gas Rad Monitors will alarm. The BOP will respond using the associated ARPs and determine that the auto functions for these RMs have not occurred. The BOP will follow the ARP guidance and swap containment Instrument Air compressor suction to the external source.

**Verifiable Actions:**

- 1) The BOP will swap containment instrument air compressors to outside suction by closing 1-IA-TV-101A and 1-IA-TV-101B.

**Technical Specifications:**

- 1) The SRO may consult Tech Specs and find no requirement for this failure.

**Event #8: SBLOCA.** (M – ALL)

The RO will diagnose the increase in RCS leakage due to the alarms and indications received, and re-perform the Immediate Actions of 1-AP-16.00. When leakage is determined to be greater than the capacity of a single CH pump, The RO will trip the reactor, perform the Immediate Actions of E-0, and manually safety inject on Step 4.

Due to the size of the RCS leak, several minutes will elapse before RCP trip criteria are met following the reactor trip.

**Verifiable Actions:**

- 1) RO will raise charging flow and determine leakage is beyond the capacity of single charging pump.
- 2) RO will trip the reactor and perform the Immediate Action Steps of E-0, including manual Safety Injection actuation.

**Critical Task:**

CT-1: WOG E-1—C: Trip all RCPs so that CET temperatures do not become superheated when forced circulation in RCS stops; Trip all RCPs within 5 minutes of reaching RCP Trip and Mini-flow Recirc Criteria (KOA).

**Event #9: *Failure of Hi and Hi-Hi CLS auto and manual actuation***

The RO and SRO will continue with E-0 actions; the BOP will be assigned to perform Attachments 1, 2, and 3 of E-0. Upon transition to 1-E-1, Loss of Reactor or Secondary Coolant, containment pressure will have increased to the Hi and HI-HI CLS setpoint (~13 minutes following Event initiation), and CLS Train A and Train B pushbuttons overridden OFF will force entry into FR-Z.1 to start Containment Depressurization equipment.

**Verifiable Actions:**

- 1) BOP will reset SI, block SI signals when conditions permit, secure one of the three running CH pumps, and secure one of the two running LHSI pumps.
- 2) RO will throttle AFW to the SGs as directed in E-0.
- 3) RO will operate the CS pumps and valves to align CS to containment for depressurization in FR-Z.1, Response to High Containment Pressure.
- 4) BOP will continue manual alignment of valves for Hi and Hi-Hi CLS failure in Attachment 4 of E-0 following transition from FR-Z.1 to 1-E-1.

**Critical Task:**

CT-2: WOG E-0—E: Manually actuate at least the minimum required complement of containment cooling equipment before an extreme (red-path) challenge develops to the CSF. Establish CS flow from at least one CS pump before containment pressure exceeds 60 psia AND at least one RS train before RMT.

Scenario should continue until Lead Evaluator Cue or Step 18 of 1-E-1.

**Follow-up Classification:** Site Area Emergency FS-1.1.

Initial Conditions: IC #1 100%, MOL – Cycle 26. The unit has been at 100% power for > 30 days			
Pre-load malfunctions: (Trigger 30's) <ul style="list-style-type: none"> <li>○ Override Hi CLS Act pushbutton - TRA</li> <li>○ Override HI CLS Act pushbutton - TRB</li> <li>○ AC_SMS_MODE, OFF, AAC DG LOCAL MODE SWITCH POSITION</li> <li>○ RS0901, TRN A HI CLS FAILS TO ACTIVATE</li> <li>○ RS0902, TRN B HI CLS FAILS TO ACTIVATE</li> </ul>			
Equipment Status/ Procedures/ Alignments/ Data Sheets/ etc.: . Unit 1 is at 100% power. All systems and crossties are operable with the following exception: <ul style="list-style-type: none"> <li>○ AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days</li> </ul>			
Turnover: Unit 1 is at 100% power. All systems and crossties are operable with the following exception: AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days. <ul style="list-style-type: none"> <li>• .</li> </ul> Turnover: Swap of the Running EH Pumps IAW 1-OP-EH-001, Section 5.6. The performance of this procedure has been analyzed based on the current plant configurations and the PSA indicates green.			
Event	Malf. #'s	Severity	Instructor Notes and Required Feedback
1	N/A	N/A	Swap of the Running EH Pumps IAW 1-OP-EH-001, Section 5.6.
2	RC0801	-1 Deg	Failure of Median Tave in the Low Direction, AP-53.00.
3	MS0801	-1 Deg	Failure of Steam Flow Channel III Low, "A" SG. AP-53.00
4	EL4902	TRUE	1J 4160V emergency Bus Off-site Power Supply Breaker Trips.
5	Switch O/R, TEST_IRL IIL	ON	Test Button on Main Turbine Control Fails causing the LP Turbine 1 Intercept and Reheat Stop Valve Closure. AP-23.00 Ramp to 71% Power.
6	RC04	3.5% Deg	RCS leak of 35 gpm. AP-16.00.
7.	RM0202 RM0201, CA03 CA04	+.1 Deg +.1 Deg TRUE TRUE	Containment Particulate and Gas RM auto actions on High Alarm fail to function.
8	RC0101	.6 DEG, 600 Sec Ramp	SBLOCA

9	SETPT for Hi-Hi CLS	60 psia	Hi and HI-HI CLS fail to function, requiring manual alignments of components, and FR-Z.1 entry.
	O/R CLS_ACT _TRA	ACTIVE	
	O/R CLS_ACT _TRB	ACTIVE	

## Scenario Objectives:

- A. Given as swap of the running EH pumps, start MP-2 and Stop MP-1 IAW 1-OP-EH-001, Section 5.6.
- B. Given a failure of Median Tave in the Low Direction, respond IAW AP-53.00.
- C. Given a failure of the selected Steam Flow channel on the 'A' SG, respond IAW AP-53.00 to take manual control of the 'A' FRV, control 'A' SG NR level and return the 'A' FRV to automatic.
- D. Given the trip of the off-site power supply breaker to the '1J' 4160V Bus and the subsequent start and load of #3 EDG on the bus, respond IAW AP-10.07 to restart/verify proper loads on the '1J' bus.
- E. Given the malfunction of the 1RL/1LL test pushbutton, respond IAW AP-53.00, AP-38.00, and AP-23.00 to ramp the Unit to 71 % power.
- F. Given an RCS leak of 35 gpm, respond IAW AP-16.00 to quantify the leakrate.
- G. Given a containment Gas High RM Alarm, respond IAW ARP to verify/perform the associated automatic actions.
- H. Given a SBLOCA inside containment with the failure of Hi-Hi-CLS to actuate, respond IAW E-0 and E-1 to respond to the RCS transient; and restore containment depressurization equipment IAW FR-Z.1.



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## SHIFT TURNOVER INFORMATION

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### **OPERATING PLAN:**

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1.

The last shift performed two 35 gallon alt dilutions followed by a manual makeup for training.

“A” BAST at 8.0 W/%. .

Following Turnover, the BOP is to swap the running EH pumps, in accordance with 1-OP-EH-001, ELECTRO-HYDRAULIC FLUID SYSTEM (EHC), Section 5.6. The Drain Return Filters do not require swapping. The Turbine Building Operator has already been briefed and is standing by at the Lube Oil Reservoir for local actions as necessary

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Scenario No.: 3

Event No.: 1

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Event Description: Swap Running EH Pumps, 1-OP-EH-001, Section 5.6.

Cue: When team ready.

Time	Position	Applicant's Action or Behavior
	SRO/BOP	<p>1-OP-EH-001, Section 5.6</p> <p>Team will pre-brief Initial Conditions, Precautions and Limitations, and procedure prior to entering simulator.</p>
	SRO/BOP	<p>1-OP-EH-001, Precautions and Limitations</p> <p><b>Note:</b> The following will be completed by the Team prior to Simulator entry. Precautions and Limitations of 1-OP-EH-001, Electro-Hydraulic Fluid System (EHC):</p> <p>4.1 The EHC fluid (Fyrquel) has caustic properties. Adequate precautions must be used to avoid direct contact with Fyrquel EHC fluid. If contact with Fyrquel EHC fluid occurs, then the affected area should be immediately flushed with copious amounts of water.</p> <p>4.2 The Fyrquel fluid removes paint and varnish, reacts with rubber and on most wire insulating material. Caution should always be used when handling the fluid, and spills must be cleaned up immediately.</p> <p>4.3 Operation of the EHC Fluid System below 50°F is prohibited under any circumstances. External heaters must be used if the EHC Fluid supply system is operated in low ambient temperatures.</p> <p>4.4 Prolonged operation with fluid temperature between 50°F and 70°F is NOT recommended. A Westinghouse vendor-supplied emergency startup procedure should be implemented in the EHC fluid temperature range of 50°F to 70°F.</p> <p>4.5 All EHC fluid (Fyrquel) must be filtered before the fluid is added to the EHC Reservoir.</p> <p>4.6 At an EHC Fluid high temperature alarm (1TS-C3, E-H FLUID RES HI TEMP) setpoint of 140°F, the Bearing Cooling Water to coolers, 1-EH-E-1 and 1-EH-E-2, should be checked for adequate bearing cooling water flow.</p> <p>4.7 The EHC Reservoir should not be filled above the high alarm (1TS-C1, E-H FLUID RES HI LEVEL) setpoint of 22 inches (21.5 inches to 22.5 inches) from the bottom of the EHC Reservoir. This precaution is applicable when the Turbine is in the latched or unlatched condition.</p> <p>4.8 The normal operating level in the EHC Reservoir is 5/8 to 11/16 full as indicated on local level gauge 1-EH-LI-100. The local level gauge should read approximately <math>\frac{3}{4}</math> FULL at the alarm setpoint for high level alarm 1TS-C1, E-H FLUID RES HI LEVEL.</p>

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Scenario No.: 3

Event No.: 1

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Event Description: Swap Running EH Pumps, 1-OP-EH-001, Section 5.6.

Cue: When team ready.

	SRO/BOP	<p>1-OP-EH-001, Precautions and Limitations, Continued</p> <p>4.9 The polishing filter system should be left in service continuously during normal operation.</p> <p>4.10 The blocking device for 1-EH-14 alignment to left side cooler is stored in the Ops M&amp;TE Locker. The device requires a 3/16 inch allen wrench to remove or install. Blocking device is not required when aligned to both sides or right side.</p>
	SRO/BOP	<p>Step 5.6.1, 1-OP-EH-001</p> <p>NOTE: High differential press across either of the EHC Pump, 1-EH-P-MP-1 or 1-EH-P-MP-2, discharge filters will cause alarm 1TS-C4, E-H STRAINERS HI DIFF PRESS, to actuate in the MCR at approximately 100 psi (90 psig to 110 psig).</p> <p>5.6.1 Swap EHC Pumps IAW the following. Enter N/A if not required.</p> <p>a. Start the standby EHC Pump. (✓)</p> <p>1-EH-P-MP-1 1-EH-P-MP-2</p> <p><b>BOP Starts 1-EH-MP-2</b></p> <p>b. Stop the pump that was initially running. (✓)</p> <p>1-EH-P-MP-1 1-EH-P-MP-2</p> <p><b>BOP Stops 1-EH-MP-1</b></p>
	SRO/BOP	<p>Step 5.6.2, 1-OP-EH-001</p> <p>NOTE: Alarm 1TS-D4, E-H FLUID DRN RET HI PRESS, will actuate in the MCR at approximately 30 psig (28.5 psig to 31.5 psig), indicating a dirty or clogged filter.</p> <p>5.6.2 IF blocking device is installed on 1-EH-14, THEN remove blocking device. Otherwise, enter N/A.</p> <p><b>BOP Enters N/A for this step.</b></p>
	SRO/BOP	<p>Step 5.6.3, 1-OP-EH-001</p> <p>5.6.3 Swap Drain Return Filters by repositioning 1-EH-14, EH DRAIN RET 3-WAY XFR VALVE TO EH CLRS, to allow flow through the alternate filter. Enter N/A if not required.</p> <p><b>BOP Enters N/A for this Step.</b></p>

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Scenario No.: 3

Event No.: 1

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Event Description: Swap Running EH Pumps, 1-OP-EH-001, Section 5.6.

**Cue: When team ready.**

	SRO/BOP	Step 5.6.2, 1-OP-EH-001  5.6.4 IF 1-EH-14 is positioned to the left side cooler/filter, THEN install blocking device on 1-EH-14. Otherwise, enter N/A.  <b>BOP Enters N/A for this Step.</b>
	SRO/BOP	1-OP-EH-001  BOP Signs and Dates Procedure Section. Reports completion of EH pump swap to SRO.
		<b>END OF EVENT #1.</b>

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Scenario No.: 3

Event No.: 2

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	Team	<p>Diagnoses failure of median Tave with the following indications/alarms:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>• 1H-C4, LOW TAVE FW CONTROL</li> <li>• 1H-A4, T AVG &gt; &lt; T REF DEVIATION</li> <li>• 1G-F8, ROD BANK 'D' WITHDRAW</li> <li>• 1C-C8, PRZR HIGH LEVEL HEATERS ON</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>• Median Tave (recorder and indicator) off-scale low</li> <li>• Individual Loop Taves indicating NORMAL</li> <li>• Control Rods stepping 'OUT' and reactor power decreasing</li> </ul>
	SRO	Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	RO	<p>[1] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>RO identifies individual loop Tave indications are normal</p>
	RO	<p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><b>RO takes manual control of the control rods to stop the outward rod motion and also takes manual control of pressurizer level control (1-CH-FCV-1122) to maintain pressurizer level at program.</b></p> <p>It should be noted that charging may not be placed in manual until procedurally directed.</p>

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Scenario No.: 3

Event No.: 2

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p><b>SRO Directs BOP to perform Annunciator Response Procedure 1G-F8.</b> Completes Brief and continues with AP-53.00.</p> <p><b>NOTE:</b> 1G-F8 response located at the end of this section.</p>
	SRO RO	<p><b>*3 VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%</b></p> <p>Identify that reactor power is less than 100%.</p>
	SRO	<p>Notes Prior to Step 4:</p> <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	SRO RO	<p><b>*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:</b></p> <ul style="list-style-type: none"> <li>Median Tave, Step 9</li> </ul> <p>Identify that Median Tave has failed LOW.</p>
	SRO	<p>Caution prior to step 9:</p> <p><b>CAUTION:</b> Delta flux must be monitored and maintained within band if rods have moved.</p> <p>Note Prior to Step 9:</p> <p><b>NOTE:</b> Depending on the instrumentation failure, the TAVE input to the Steam Dumps may be invalid, causing the Steam Dumps to stay open longer or never open at all.</p>

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Event No.: 2

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>9. CHECK LOOP/MEDIAN <math>\Delta T</math>/Tave - NORMAL</p> <p>a) Median Tave - NORMAL</p> <p>a) RNO - Do the following:</p> <p>1) Place ROD CONT MODE SEL switch in MANUAL, as required.</p> <p>RO will report that Rod Control is already in manual.</p> <p>2) Take manual control of charging, as necessary to maintain pressurizer level at program.</p> <p><b>RO will report that charging flow is in manual or will place charging flow in manual.</b></p> <p>3) Refer to Attachment 4 (Describes Tave control system)</p> <p>4) If no other instrumentation failure exists, then go to step 13.</p> <p>Goes to Step 13</p>
	SRO RO	<p>0-AP-53.00</p> <p>13. CHECK CALORIMETRIC – FUNCTIONAL IAW ( )-OPT-RX-001</p> <p>Checks 1-OPT-RX-001 and determines that the Calorimetric program is unaffected.</p>
	SRO	<p>0-AP-53.00</p> <p>14. CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE</p> <p><i>SRO directs STA to review Reg. Guide 1.97. The STA will report that Median Tave is not a Reg. Guide 1.97 component.</i></p> <p>13. RNO – GO TO Step 16</p>
	SRO	<p>16. Review the following:</p> <ul style="list-style-type: none"> <li>• TS 3.7</li> <li>• VPAP-2802</li> <li>• TRM Section 3.3, Instrumentation</li> </ul> <p><i>SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA reports completion of the review; Neither VPAP-2802 or the TRM is impacted by this failure.</i></p>

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

	SRO	17 CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION - EXISTS
	RO	Reports no other instrument failure exists.  GOES TO STEP 19
	SRO	19. PROVIDE NOTIFICATIONS AS NECESSARY: <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• OMOC</li><li>• STA (PRA determination)</li><li>• I&amp;C</li></ul> - END – If Control Rods stepped out greater than 230 steps, the team will perform ARP 1G-F8. 1G-F8 Actions are contained on the next two pages



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Scenario No.: 3

Event No.: 2

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

	BOP	<p>1G-F8 (Rod Bank D Withdrawal)</p> <p>1. CHECK ALARM – ROD DEMAND POSITION GREATER THAN OR EQUAL TO 228 STEPS ON CONTROL BANK D – GP 1 DEMAND POSITION.</p> <p>Identifies that Bank D is greater than 230 steps.</p>
	BOP	<p>1G-F8 (Rod Bank D Withdrawal)</p> <p>2. PUT ROD CONTROL MODE SEL SWITCH IN MANUAL.</p> <p>Verifies that Rod Control is in Manual.</p>
	BOP	<p>1G-F8 (Rod Bank D Withdrawal)</p> <p>3. VERIFY ROD MOTION - STOPPED</p>
		<p>1G-F8 (Rod Bank D Withdrawal)</p> <p>4. CHECK BOTH CONTROL BANK D STEP COUNTERS – LESS THAN OR EQUAL TO 230 STEPS.</p> <p>If less than 230 steps proceed to Step 5.</p> <p>RNO –</p> <p>a) Step rods <u>out</u> to make both Bank D Step Counters equal. (Group step counters must be equalized by stepping out only, to prevent Rod Group Sequence Error).</p> <p><b>Steps Rods out as needed to equalize group step counters.</b></p> <p>b) Reset Bank D Step Counters to 230 steps.</p> <p><b>Uses a stylus to reset the Bank D Step Counters to 230 steps.</b></p>
	BOP	<p>1G-F8 (Rod Bank D Withdrawal)</p> <p>NOTE:</p> <p>Rods may have to be stepped in as many as two steps below the fully withdrawn position to clear Annunciator 1G-F8.</p> <p>5. STEP CONTROL BANK D RODS IN AS NECESSARY TO CLEAR 1G-F8, ROD BANK D WITHDRAW.</p>

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Event No.: 2

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Event Description: Failure of Median Tave in the Low Direction, 0-AP-53.00.

Cue: By Examiner.

	BOP	1G-F8 (Rod Bank D Withdrawal)  6. POSITION CONTROL BANK D RODS AS DETERMINED BY SHIFT SUPERVISION
	BOP	1G-F8 (Rod Bank D Withdrawal)  NOTE: Both group step counters for Control Bank D should be the same before performing Step 7.  7. LOCALLY CHECK THE BANK OVERLAP COUNTER – AT 384 PLUS CURRENT CONTROL BANK D DEMAND POSITION.  Contacts a field operator to determine the bank overlap counter. $384 + 228 = 612$  <i>Field operator will report bank overlap position as indicated on the simulator.</i>
	BOP	1G-F8 (Rod Bank D Withdrawal)  8. NOTIFY SHIFT SUPERVISION
		<b>END OF EVENT 2</b>

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Scenario No.: 3

Event No.: 3

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Event description: Steam Flow Channel III Fail Low, 0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	BOP	<p>Diagnoses failure 1-MS-FT-1474 with the following indications/alarms:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>• 1H-E5 STM GEN 1A FW &gt;&lt; STM FLOW</li> <li>• 1F-D7 STM GEN 1A CH 4 FW &lt; STM FLOW</li> <li>• 1H-G5 STM GEN 1A LVL ERROR.</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>• Step decrease in 1A SG Steam Flow indication CH-III</li> <li>• Decreasing level on 'A' SG.</li> </ul>
	SRO	Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	BOP	<p>[1] VERIFY REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>BOP identifies Channel IV indication for steam flow is NORMAL.</p>
	BOP	<p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><b>BOP takes manual control of 'A' SG feed reg valve and increases demand (FF &gt; SF) to restore level to program.</b></p>
	SRO	<p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>Completes Brief and continues with AP-53.00.</p>

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Event No.: 3

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Event description: Steam Flow Channel III Fail Low, 0-AP-53.00.

Cue: By Examiner.

	SRO  RO	<p>*3      VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%</p> <p><i>Identify that reactor power is less than 100%.</i></p> <p><b>Note:</b> Based on the feed flow &gt; steam flow mismatch established by the BOP, Calorimetric power may exceed 100% during restoration of 'A' SG NR level to program.</p>
	SRO	<p>Notes Prior to Step 4:</p> <ul style="list-style-type: none"><li>• Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li><li>• When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li></ul>
	SRO          BOP	<p>*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:</p> <p>SG Steam Flow, Step 7</p> <p><i>States 'A' Steam Flow affected.</i></p>

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Event No.: 3

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Event description: Steam Flow Channel III Fail Low, 0-AP-53.00.

Cue: By Examiner.

		<p><b>CAUTION:</b> When CALCALC is based on Feedwater, changes in feed flow will affect calorimetric power. Reactor power must be monitored when adjusting feed flow.</p>
	SRO	7. CHECK STEAM GENERATOR LEVEL CONTROL INSTRUMENTS – NORMAL
	BOP	<ul style="list-style-type: none"> <li>• Steam Pressure</li> <li>• <b>Steam Flow</b></li> <li>• Feed Flow</li> <li>• Steam Generator Level</li> </ul>
	BOP	<p>Determines CH III Steam flow instrumentation for ‘A’ SG is NOT normal.</p> <p>Step 7. RNO</p>
	BOP	<p>IF the selected steam flow, steam pressure, or feed flow input to the SG Water Level Control system has failed, THEN do the following:</p> <p>a) Place the associated Feed Reg Valve in MANUAL.</p>
	RO	<p>Verifies ‘A’ SG MFRV controller, 1-FW-FCV-1478, in manual</p> <p>b) Control SG level at program level (44%, a band will be given).</p>
	BOP	<p>Verifies ‘A’ SG NR level is returning to program level.</p> <p>c) Select the redundant channel for affected SG(s)</p>
	RO	<p><b>Selects Channel IV Steam Flow for ‘A’ SG using two-position selector switch on Vertical Board 1-2</b> (applicant may also place the associated Steam Flow channel in Channel IV).</p> <p>d) WHEN SG level returned to normal, THEN place the Feed Reg Valve in AUTOMATIC.</p>
	BOP	<b>Places ‘A’ SG FRV controller, 1-FW-FCV-1478, in automatic control</b>

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Event No.: 3

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Event description: Steam Flow Channel III Fail Low, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>Step 7. RNO (Continued)</p> <p>Perform follow-up actions:</p> <ol style="list-style-type: none"> <li>Consult with Shift Manager on need to initiate ( )-OP-RP-001, ALIGNING CONTROL SYSTEM FOR PERFORMANCE OF CHANNEL I, II, III, AND IV PROCESS AND PROTECTION TESTING.</li> <li>Refer to the following Tech Spec 3.7 items: <ul style="list-style-type: none"> <li>Table 3.7-1, 12 and 17</li> <li>Table 3.7-2, 1.c, 1.e, and 3.a</li> <li>Table 3.7-3, 2.a, and 3.a</li> </ul> </li> </ol> <p>Determines Table 3.7-1 item 17, 3.7-2 item 1e, and 3.7.3 item 2a are applicable (place channel in trip w/in 72 hours).</p> <ol style="list-style-type: none"> <li>Refer to Attachment 1.</li> <li>IF no other instrumentation failure exists, THEN GO TO Step 13.</li> </ol>
	SRO	<p>13. Review OPT-RX-001, Rx Power Calorimetric using PCS computer program, to determine operability of calorimetric and need to perform OPT-RX-007, Shift Average Power Calculation.</p> <p>SRO/RO determines that OPT-RX-001 is impacted and OPT-RX-007 will need to be performed.</p> <p><i>If it appears that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.</i></p>
	SRO	<p>14. CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE (Go to Step 14 if not Reg. Guide 1.97)</p> <p><i>SRO directs STA to review Reg. Guide 1.97. The STA will report that 1-MS-FT-1474 is a Reg. Guide 1.97 component.</i></p>

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Scenario No.: 3

Event No.: 3

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Event description: Steam Flow Channel III Fail Low, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>15. REVIEW CEP 99-0029, REG GUIDE 1.97 OPERABILITY, REPORTABILITY, AND ALTERNATE INDICATIONS</p> <p><i>SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 only requires one channel of Steam Flow indication per steam generator and no actions are required.</i></p>
	SRO	<p>16. Review the following:</p> <ul style="list-style-type: none"> <li>• TS 3.7</li> </ul> <p>Determines Table 3.7-1 item 17, 3.7-2 item 1e, and 3.7.3 item 2a are applicable (place channel in trip w/in 72 hours).</p> <ul style="list-style-type: none"> <li>• VPAP-2802</li> <li>• TRM Section 3.3, Instrumentation</li> </ul> <p><i>SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA reports he has completed these reviews and there is no impact.</i></p>
	SRO	17 CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION – EXISTS
	BOP	Reports no additional failure exists
	SRO	GOES TO Step 19
	SRO	<p>19. PROVIDE NOTIFICATIONS AS NECESSARY:</p> <ul style="list-style-type: none"> <li>• Shift Supervision</li> <li>• OMOC</li> <li>• STA (PRA determination)</li> <li>• I&amp;C</li> </ul> <p>-</p>
		<b>- END EVENT #3</b>

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Scenario No.: 3

Event No.: 4

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	TEAM	<p>1-AP-10.07</p> <p>Diagnose the failure based on the following:</p> <p>Alarms:</p> <p>1K-B8, UPS SYSTEM 1B TROUBLE</p> <p>1K-D5, CC PP 1B IN LOCAL CONTROL OR OL TRIP</p> <p>1K-E7, CC PPS DISCH HDR LO PRESS</p> <p>1B-G5, INST AIR DRYER TROUBLE</p> <p>Indications:</p> <p>#3 EDG Start and Load on 1J 4160 V Bus.</p> <p>1-CC-P-1B GREEN and AMBER Breaker Indication Lights LIT.</p>
	SRO	<p>1-AP-10.07</p> <p>SRO will hold a Transient Brief and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are abnormal with #3 EDG carrying the 1J 4160 V Bus (if previously identified by the Team).</i></p> <p>Directs the BOP to review ARPs for Lit annunciators, SRO/RO will continue with 1-AP-10.07.</p> <p>Directs RO/BOP to contact Service Building Operator to check local status of Breaker 15 J8.</p> <p>Completes Brief and continues with AP-10.07.</p>
	SRO	<p>Step 1, 1-AP-10.07</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If both units are affected, local actions should be coordinated.</li> <li>• The AAC Diesel Generator will automatically start if an undervoltage occurs on Transfer Buses D and F.</li> <li>• With Degraded Voltage or Undervoltage on 2J Bus, or a loss of Unit 2B DC Bus, Breaker 15J3 will not close automatically, except with a valid Unit 1 SI signal.</li> <li>• EIPs may be applicable.</li> </ul> <p>1. CHECK UNIT - BLACKOUT HAS OCCURRED</p> <ul style="list-style-type: none"> <li>• Transfer Buses D and F - DEENERGIZED</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• All Station Service Buses - DEENERGIZED</li> </ul>
	RO	<p><i>Reports Blackout has not occurred.</i></p>
	SRO	<p>GOES TO Step 39.</p>



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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

		Step 39, 1-AP-10.07
	SRO	39 CHECK THE FOLLOWING BREAKERS - ANY OPEN: • 15D1 OR • 15F1 OR • 15H8 OR • 15J8
	RO	<i>Reports Breaker 15J8 Open.</i>
	SRO	Step 40, 1-AP-10.07
	RO	40 CHECK 4160V EMERGENCY BUSES - BOTH ENERGIZED  <i>Reports both Emergency Buses Energized.</i>
	SRO	Step 41, 1-AP-10.07
	RO	41 CHECK SI OR HI HI CLS - NOT ACTUATED  <i>Reports SI or HI HI CLS NOT Actuated</i>
	SRO	Step 42, 1-AP-10.07  <b>CAUTION:</b> To prevent overload of EDG 1, the UV trip of 1-CH-P-1A should NOT be reset if 1-CH-P-1C is running on the normal feeder AND the UV trip of 1-CH-P-1C (Normal) should NOT be reset if 1-CH-P-1A is running.  <b>NOTE:</b> One CHG pump must be running on each Emergency Bus solely supplied from an EDG. The other CHG pump supplied from that Emergency Bus must remain in PTL. A 6/30 hour TS 3.0.1 LCO is in effect until this alignment is made.  <b>NOTE:</b> The CHG pumps powered from the 1H Bus receive an auto-start signal when the 1J Bus is deenergized.  42 INITIATE ATTACHMENT 4 TO ALIGN EMERGENCY BUS LOADS TO PREVENT EDG OVERLOADING  <b>Directs BOP to perform Attachment 4 of 1-AP-10.07.</b>  <b>Note:</b> Attachment 4 actions listed at the end of this section.
	SRO	

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO	<p>Step 43, 1-AP-10.07</p> <p>43 GO TO STEP 45</p>
	<p>SRO</p> <p>RO</p>	<p>Step 45, 1-AP-10.07</p> <p><b>NOTE:</b> At least one method of communications should be established before commencing local actions.</p> <p>45 CHECK COMMUNICATIONS CAPABILITY:</p> <ul style="list-style-type: none"> <li>• Gaitronics</li> <li>OR</li> <li>• Station Radios</li> </ul> <p><i>Reports Gaitronics and / or Station Radios Available.</i></p>
	<p>SRO</p> <p>RO</p>	<p>Step 46, 1-AP-10.07</p> <p>46 CHECK EDG - HAS REENERGIZED AFFECTED EMERGENCY BUS</p> <ul style="list-style-type: none"> <li>• 15H3 - CLOSED</li> <li>OR</li> <li>• 15J3 - CLOSED</li> </ul> <p><i>Reports 15J3 Breaker closed.</i></p>
	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO</p> <p>SRO</p> <p>RO</p>	<p>Step 47, 1-AP-10.07</p> <p>47 RESTORE EMERGENCY BUS STUB BUS:</p> <p>a) Put CC PUMP control switch in PTL</p> <p><b>Places 1-CC-P-1B control switch in PTL.</b></p> <p>b) Put RHR PUMP control switch in PTL</p> <p><i>Checks 1-RH-P-1B in PTL.</i></p> <p>c) Locally close Stub Bus feeder breakers on energized Emergency Buses</p> <ul style="list-style-type: none"> <li>• 15J9</li> <li>OR</li> <li>• 15H9</li> </ul> <p><i>Directs RO to contact Service Building Operator to Close 15J9.</i></p> <p><i>Contacts Service Building Operator to Close breaker 15J9</i></p> <p>When local report of Breaker 15J9 closed, RO holds Focus Brief to inform the Team, and checks Annunciator 1K-H4 Clear.</p>

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

		Step 48, 1-AP-10.07
	SRO	CAUTION: • When the EDG is the only source of power to an Emergency Bus, the associated Component Cooling Pump should NOT be in service if a HI-HI CLS is in progress. • Restrictions on CC pump operation do NOT apply below RCS temperature of 350°F.
		48 CHECK CC PUMPS - AT LEAST ONE RUNNING
	RO	<i>Reports No CC Pumps running on Unit 1.</i>
	SRO	Holds Team brief to discuss the start of 1-CC-P-1A. Since CC system is cross-tied and the CC header is pressurized, throttling the CC pump discharge valve prior to start is unnecessary. Team will concur and the brief closed.
	SRO	<i>Direct RO to Start 1-CC-P-1A.</i>
	RO	<i>Makes Gaitronics Announcement and <b>Starts 1-CC-P-1A.</b></i>
		Step 49, 1-AP-10.07
	SRO	49 PLACE STANDBY CC PUMP IN AUTO-AFTER-STOP
	SRO	<i>Direct RO to Place 1-CC-P-1B in Auto after Stop.</i>
	RO	<b>Places 1-CC-P-1A in AUTO.</b>
		Step 50, 1-AP-10.07
	SRO	50 CHECK RHR - WAS IN SERVICE
	RO	<i>Reports RHR NOT in service.</i>
	SRO	GOES TO Step 52.

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO	<p>Step 52, 1-AP-10.07</p> <p><b>CAUTION:</b> • If a HI-HI CLS has occurred on Unit 1, 1-FC-P-1A must not be started on EDG 1 if 1-CS-P-1A is running. • If a HI-HI CLS has occurred on Unit 2, 1-FC-P-1B must not be started on EDG 2 if 2-CS-P-1A is running.</p> <p><b>NOTE:</b> • Power supplies to 1-FC-P-1A (Norm) 1H1-2N2A, (Alt) 1B1-1-4D, or (Backup) 2H1-2S10B. • Power supplies to 1-FC-P-1B (Norm) 2H1-2S10B, (Alt) 1B1-1-4D, or (Backup) 1H1-2N2A.</p> <p>52 CHECK SFP COOLING - EITHER PUMP RUNNING</p> <p><i>Reports 1-FC-P-1B Running</i></p>
	RO	
	SRO	<p>Step 53, 1-AP-10.07</p> <p>53 CHECK INTAKE CANAL LEVEL – STABLE OR INCREASING</p> <p><i>Reports Intake Canal Level 29 feet and Stable.</i></p>
	RO	
	SRO	<p>Step 54, 1-AP-10.07</p> <p><b>NOTE:</b> If two CHG pump CC pumps or two CHG pump SW pumps are running, one pump should be secured and placed in AUTO.</p> <p>54 CHECK CHG PUMP AUXILIARIES: • CHG pump CC pump - RUNNING • CHG pump SW pump – RUNNING</p> <p><i>Reports 1-CC-P-2A and 1-SW-P-10A Running.</i></p>
	RO	
	SRO	<p>Step 55, 1-AP-10.07</p> <p>55 CHECK SEMI-VITAL BUS - POWER HAS BEEN INTERRUPTED</p> <p><i>Reports Semi-Vital Bus Power has not been interrupted.</i></p> <p>GOES TO Step 57</p>
	RO	
	SRO	<p>Step 57, 1-AP-10.07</p> <p>57 CHECK BOTH PRZR PORV BLOCK VALVES – ENERGIZED</p> <p><i>Reports Both PRZR Block Valves energized</i></p>
	RO	

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO	Step 58, 1-AP-10.07
	RO/BOP	58 CHECK CC TO EXCESS LETDOWN HX - NOT TRIPPED • FI-CC-109 <i>Reports FI-CC-109 Flow is Approximately 160 gpm and Stable.</i>
	SRO	Step 59, 1-AP-10.07
	RO	59 CHECK IA SYSTEM ANNUNCIATORS - NOT LIT: • 1B-E6, IA LO HDR PRESS/IA COMPR 1 TRBL • 1B-G5, INST AIR DRYER TRBL • 1B-E5, SA COMPR TRBL • 1B-F5, CTMT INST AIR COMPR TRBL <i>Reports 1B-E6 and 1B-G5 are LIT.</i>
	SRO	<i>Directs BOP to review the ARPs for the lit annunciators.</i>
	BOP	<i>Directs Turbine Building Operator to investigate cause for alarms in IA System.</i>
	SRO	Step 60, 1-AP-10.07
	RO	60 CHECK UNIT CONDITIONS a) PRZR level - STABLE b) PRZR pressure - STABLE c) RCS TAVE – STABLE <i>Reports Parameter normal with no abnormal trends.</i>
	SRO	Step 61, 1-AP-10.07
	BOP	61 CHECK VENTILATION FANS - OPERATING • Auxiliary BLDG Central • Safeguards <i>Reports Auxiliary Building Central and Safeguards fans operating normally</i>

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

		<p>Step 62, 1-AP-10.07</p> <p><b>NOTE:</b> Any MCR Chiller that was operating prior to the loss of power will have tripped and the compressor will not automatically restart. The Chiller must be shutdown and then restarted IAW 0-OP-VS-006, Control Room and Relay Room Ventilation System.</p> <p>62      CHECK THE FOLLOWING MCR VENTILATION EQUIPMENT - OPERATING:</p> <ul style="list-style-type: none"> <li>• One Control Room Chiller (Two Control Room Chillers if SI initiated on either unit AND any MCR or ESGR temperature indicator greater than 84°F)</li> </ul> <p>BOP      <i>Reports 1-VS-E-4C and 1-VS-E-4E Running.</i></p> <p>SRO      <ul style="list-style-type: none"> <li>• One Unit 1 Control Room AHU</li> <li>• One Unit 2 Control Room AHU</li> <li>• One Unit 1 ESGR AHU</li> <li>• One Unit 2 ESGR AHU</li> </ul></p> <p>BOP      Reports One Unit 1 and Unit 2 MCR and ESGR AHU operating.</p>
		<p>Step 63, 1-AP-10.07</p> <p>SRO      63      CHECK CRDM FANS - THREE RUNNING</p> <p>BOP      <i>Reports Three CRDM Fans Running</i></p>
		<p>Step 64, 1-AP-10.07</p> <p>SRO      64      CHECK CONTAINMENT AIR RECIRC FANS - THREE RUNNING</p> <p>BOP      <i>Reports three fans running.</i></p>
		<p>Step 65, 1-AP-10.07</p> <p>SRO      <b>CAUTION:</b> • If a HI-HI CLS has occurred on Unit 1, 1-FC-P-1A must not be started on EDG 1 if 1-CS-P-1A is running.          • If a HI-HI CLS has occurred on Unit 2, 1-FC-P-1B must not be started on EDG 2 if 2-CS-P-1A is running.</p> <p><b>NOTE:</b> • Power supplies to 1-FC-P-1A (Norm)1H1-2N2A, (Alt)1B1-1-4D, or (Backup) 2H1-2S10B.          • Power supplies to 1-FC-P-1B (Norm) 2H1-2S10B, (Alt)1B1-1-4D, or (Backup)1H1-2N2A.</p> <p>65      CHECK SFP COOLING - EITHER PUMP RUNNING</p> <p>RO      <i>Reports 1-FC-P-1B Running</i></p>

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO	Step 66, 1-AP-10.07
	BOP	66 CHECK AFW MOVs - BOTH TRAINS ENERGIZED Reports all AFW MOVs energized.
	SRO	Step 67, 1-AP-10.07
	BOP	67 CHECK BORIC ACID ALIGNMENT: • One Tank in service • One BATP in service Reports 1-CH-P-2A running and aligned to the 'A' BAST.
	SRO	Step 68, 1-AP-10.07
	RO	68 CHECK CVCS HEAT TRACING PRIMARY AND BACKUP PANELS - ALL ENERGIZED • Primary panels 2A1, 2A2, and 2A3 - powered from 1H 480V Bus Reports heat tracing panels energized.
	SRO	Step 69, 1-AP-10.07
	BOP	<b>NOTE:</b> The N-16 and MGPI Radiation Monitors are powered from Breaker 1H1-1-4B2 or 2H1-1-2D-2 depending on the position of throw-over switch 1-EP-TRS-DB-101 located near MCC 1H1-1. 69 CHECK RADIATION MONITORS - OPERABLE • No sample pump deenergized • No flow faults • No monitors deenergized • Annunciator 1A-C3, N-16 TROUBLE - NOT LIT • Annunciator 0-RMA-C5, PROCESS VENT RAD MON TRBL - NOT LIT • Annunciator 0-RMA-D5, VENT STACK #2 RAD MON TRBL - NOT LIT Reports sample pumps energized, No flow faults, No monitors deenergized. Reports Annunciators 1A-C3, RMA-C5, RMA-D5 – not LIT.
	SRO	Step 70, 1-AP-10.07
	SRO	<b>NOTE:</b> The CTMT Particulate and Gas Rad Monitor skids are powered from 1MR1A, Breaker 43, which is supplied from 480V MCC 1C1-2. These monitors are required to comply with Tech Spec 3.1.C.1. 70 LOCALLY CHECK CTMT PARTICULATE AND GAS RAD MONITOR - OPERABLE (SKID/ SAMPLE PUMP ENERGIZED) (IF MCC 1C1-2 CONFIRMED TO BE DEENERGIZED, NO NEED TO CHECK LOCALLY) Directs BOP to dispatch Aux Building Operator to check local RM skid.

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO RO	<p>Step 71, 1-AP-10.07</p> <p>71. ____ CHECK SW SUPPLY MOV5 – ALL ENERGIZED</p> <p><i>Reports SW MOV5 energized.</i></p>
	SRO SRO	<p>Step 72, 1-AP-10.07</p> <p>72 CHECK TECH SPEC LCOS:</p> <ul style="list-style-type: none"> <li>• Tech Spec 3.16</li> </ul> <p>The SRO will consult Tech Specs 3.16.B.2 and determine the Unit may continue to operate for 7 days with the primary source to the bus not available. SRO will consult with the Shift Manager concerning whether the Dependable alternate source can be Operable within 8 hours.</p> <p>SRO may refer to Tech Spec 3.6.I and determine AFW cross-tie clock is not in effect.</p> <p>SRO will brief the Team on Tech Spec requirements.</p>
	SRO RO/BOP	<p>Step 73, 1-AP-10.07</p> <p><b>CAUTION:</b> If any EDG has operated below 570 KW for three days, additional loading will be required to prevent exhaust system souping. Refer to Attachments 7 and 8.</p> <p>73 CHECK 4160V EMERGENCY BUS 1H - ENERGIZED FROM OFFSITE POWER</p> <ul style="list-style-type: none"> <li>• 15F1 - CLOSED</li> <li>• 15H8 – CLOSED</li> </ul> <p><i>Reports 15F1 and 15H8 breakers closed.</i></p>



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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

		<p>Step 74, 1-AP-10.07</p> <p><b>CAUTION:</b> • Shift Supervision should direct the loading of EDG 3 to 1J or 2J Emergency Bus to best support plant recovery.</p> <ul style="list-style-type: none"> <li>• If any EDG has operated below 570 KW for three days, additional loading will be required to prevent exhaust system souping. Refer to Attachments 7 and 8.</li> </ul> <p><b>NOTE:</b> • The RSS transformer cooling fans, heaters, and load tap changer controls are powered from 1J1-1-3B2 or 2J1-1-4A2 depending on position of the throwover switch near 1-SA-TK-2 in Unit 1 Turbine BLDG basement. The switch shall be aligned to an energized bus.</p> <ul style="list-style-type: none"> <li>• Until the throwover switch is aligned to an energized bus, the RSST load tap changers are inoperable. Tech Spec 3.16.B.2 should be reviewed for required actions.</li> </ul>
	SRO	74 CHECK AC EMERGENCY BUS 1J - ENERGIZED FROM OFFSITE POWER
		<ul style="list-style-type: none"> <li>• 15D1 - CLOSED</li> <li>• 15J8 – CLOSED</li> </ul>
	RO/BOP	<i>Reports breaker 15D1 closed, breaker 15J8 Open.</i>
		Step 74, RNO
		Do the following:
		a) IF 1J Bus energized from EDG 3, THEN do the following:
		1) Monitor EDG 3 parameters IAW Attachment 8.
	SRO	<i>SRO Directs RO/BOP to contact Service Building Operator to monitor #3 EDG using Attachment 8 of 1-AP-10.07.</i>
		2) Continue efforts to restore normal Emergency Bus power.
		3) WHEN cause of power loss identified and corrected, THEN initiate 0-AP-10.08, STATION POWER RESTORATION.
		Step 75, 1-AP-10.07
	SRO	75. ____ CHECK ANY STATION SERVICE BUS - DEENERGIZED:
		<ul style="list-style-type: none"> <li>• 15A1 and 15A2 - OPEN</li> <li>OR</li> <li>• 15B1 and 15B2 - OPEN</li> <li>OR</li> <li>• 15C1 and 15C2 – OPEN</li> </ul>
	BOP	<i>Reports All Station Service Buses energized.</i>
	SRO	Step 75, RNO
		IF ALL 480V Station Service Buses are energized, THEN GO TO Step 97.

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	SRO	Step 97, 1-AP-10.07
	SRO	97 NOTIFY THE FOLLOWING: <ul style="list-style-type: none"><li>• OMOC</li><li>• STA</li><li>• Electrical Foreman</li></ul> <p>Notifies Shift Manager that 1-AP-10.07 complete and request notification to OMOC, STA, and Electrical Foreman be made.</p>
		Attachment 4 of 1-AP-10.07 on next page.
		<b>END EVENT #4</b>

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	BOP	<p>Step 1, Attachment 4, 1-AP-10.07</p> <p><b>CAUTION:</b> An EDG can NOT initially be loaded to greater than 1300 KW prior to an SI or HI HI CLS, with the exception of loads that will trip when a HI HI CLS occurs, or loads which are running yet assumed to start on a HI HI CLS.</p> <p><b>CAUTION:</b> Total EDG load shall not exceed 2750 KW.</p> <p><b>NOTE:</b> • The purpose of this Attachment is to limit EDG loading so that a subsequent HI HI CLS actuation will not overload the EDG.  • EDG load must be monitored closely during pump operations.  • A 6/30 hour TS 3.0.1 LCO is in effect until one CHG pump is running on an Emergency Bus supplied by an EDG, AND the non-running CHG pump is incapable of auto-start (locked-out or in PTL). This Tech Spec LCO is entered due to an inoperable Emergency Bus due to EDG loading.</p>
	BOP	<p>1. IF EDG 1 is the sole source of power to Emergency Bus 1H, THEN do the following to limit the amount of instantaneous loading that could occur in the event of a HI HI CLS.</p> <p>Identifies #1 EDG NOT the sole source to 1H Emergency Bus and GOES TO Step 2.</p>
	BOP	<p>Step 2, Attachment 4, 1-AP-10.07</p> <p><b>NOTE:</b> A 6/30 hour TS 3.0.1 LCO is in effect until one CHG pump is running on an Emergency Bus supplied by an EDG, AND the non-running CHG pump is incapable of auto-start (locked-out or in PTL). This Tech Spec LCO is entered due to an inoperable Emergency Bus due to EDG loading.</p> <p>Notifies SRO of 6/30 hour TS 3.16 clock in effect until 1-CH-P-1B running on #3 EDG.</p>
	BOP	<p>2. IF EDG 3 is the sole source of power to Emergency Bus 1J, THEN do the following to limit the amount of instantaneous loading that could occur in the event of a HI HI CLS.</p> <p>a. Check running or start 1-CH-P-1B or 1-CH-P-1C on Emergency Bus 1J IAW Shift Supervision direction.</p>
	BOP	<p><b>Starts 1-CH-P-1B with concurrence of SRO.</b></p>

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**Cue: By Evaluator.**

		<p>Step 2, Attachment 4, 1-AP-10.07</p>								
	BOP	<p>b. IF a CHG pump can NOT be started on Emergency Bus 1J, THEN do the following. Otherwise, enter N/A.</p> <p>Enters N/A for substeps b.1, b.2, and b.3.</p> <p>c. Check or place the remaining CHG pump supplied from Emergency Bus 1J in PTL.</p> <p><i>Identifies 1-CH-P-1C (Alternate) in PTL.</i></p> <p>d. IF Emergency Bus 1H is supplied by offsite power, and 1-CH-P-1A or 1-CH-P-1C is running, THEN stop CHG pump(s) supplied from Emergency Bus 1H and place in Auto.</p>								
	RO/BOP	<p><b>Confer with SRO and secures 1-CH-P-1A and 1-CH-P-1C.</b></p> <p>e. Determine Emergency Bus 1J load limit IAW the following equation, where (x) equals the total of the KW ratings of all RUNNING equipment from the table below.</p> $\bullet \frac{\quad}{(x)} + 1300 \text{ KW} = \frac{\quad}{\text{EDG Load Limit}}$ <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">KW</th> <th style="padding: 5px;">LOAD</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">100</td> <td style="padding: 5px;">1-VS-F-1B</td> </tr> <tr> <td style="padding: 5px;">125</td> <td style="padding: 5px;">1-VS-F-58B (if supplied by 14J1-3)</td> </tr> <tr> <td style="padding: 5px;">310</td> <td style="padding: 5px;">1-FW-P-3B</td> </tr> </tbody> </table>	KW	LOAD	100	1-VS-F-1B	125	1-VS-F-58B (if supplied by 14J1-3)	310	1-FW-P-3B
KW	LOAD									
100	1-VS-F-1B									
125	1-VS-F-58B (if supplied by 14J1-3)									
310	1-FW-P-3B									
	BOP	<p>BOP will write 100 in the (x) blank, and write 1400 in the EDG Load Limit blank.</p> <p>f. IF existing EDG load is greater than the limit calculated in Substep e. above, THEN reduce EDG load to less than or equal to the calculated load.</p> <p><i>BOP will identify ~350kW load on #3 EDG.</i></p>								

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Event Description: 1J 4160V emergency bus off-site power supply breaker trips, 1-AP-10.07.

Cue: By Evaluator.

	BOP	<p>Step 3, Attachment 4, 1-AP-10.07</p> <p>3. Notify Auxiliary Building Operator to increase monitoring of CHG pump lube oil temperature.</p> <p><i>BOP contacts the Aux Building Operator to monitor CHG pump lube oil temperature</i></p>
	BOP	<p>Step 4, Attachment 4, 1-AP-10.07</p> <p>4. Increasing monitoring of CHG pump bearing temperatures using the Plant Computer system.</p> <p><b>BOP will monitor CHG pump bearing temperatures using the Plant Computer system.</b></p> <p><i>BOP returns the Attachment to the SRO and provides a short brief of Attachment results.</i></p>

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	Team	<p>Identify the failure of the Test Button based on the following:</p> <p>Alarms: PCS Alarm for MSR</p> <p>Indications: ~ 9 MW step decrease indicated on MW Videographic Recorder. 0.2 °F increase in RCS Tave Test 1RL 1IL Button on turbine control panel 1RL CLOSED indicating light LIT on turbine control panel 1IL CLOSED indicating light LIT on turbine control panel.</p>
	SRO	<p>Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS</p> <p><b>NOTE:</b> SRO may directly enter AP-38.00, MAIN STEAM SYSTEM CONTROL MALFUNCTION. See Page 39.</p>
	BOP	<p>[1] VERIFY REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>BOP identifies Valve Position Indications are NORMAL.</p>
	BOP	<p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><i>BOP Identifies no controls need to be placed in Manual.</i></p>
	SRO	<p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>Completes Brief and continues with AP-53.00.</p>

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Event No.: 5

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

	SRO RO	*3 VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%  Identify that reactor power is less than 100%.
	SRO	Notes Prior to Step 4: <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	SRO  BOP	*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:  Turbine Valve Position, Step 10  <i>Reports #1 LP Turbine Left Intercept and Reheat Stop Valves are closed.</i>
	SRO  BOP  SRO	CAUTION: If Reactor power has been affected by a secondary transient, Turbine adjustment may be needed to control Tave.  10. ____ CHECK STEAM SYSTEM CONTROLS - NORMAL <ul style="list-style-type: none"> <li>Steam Dumps / PORVs</li> <li>Turbine Controls</li> <li><b>Turbine Valve Positions</b></li> <li>Turbine Monitoring Lights</li> </ul> <i>Reports Turbine Valve positions are abnormal.</i>  Initiates AP-38.00

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		Step 1, 1-AP-38.00
	SRO	1 CHECK STEAM DUMP VALVES – CLOSED
	BOP	<i>Reports Steam Dump Valves closed / normal.</i>
		Step 2, 1-AP-38.00
	SRO	2 CHECK SG PORVS – CLOSED
	BOP	<i>Reports SG PORVs closed</i>
		Step 3, 1-AP-38.00
	SRO	3 CHECK THE FOLLOWING CONDITIONS: • Reactor power - LESS THAN OR EQUAL TO 100% • Turbine load – NORMAL
	BOP	Reports reactor power < 100%
	RO	Reports Turbine Load NOT Normal
	SRO	Stabilize Reactor power and Turbine load less than 100% using Attachment 2. <b>NOTE:</b> No Actions required in Attachment 2 for this event.
		Step 4, 1-AP-38.00
		<b>NOTE:</b> The power reductions required by Step 4 are intended for failures causing full or partial closure of a control valve, or if valve closure is required for maintenance.
	SRO	4 CHECK MAIN TURBINE AND MSR STEAM CONTROL VALVES:
		a) MSR Steam supply MOVs and FCVs - NORMAL
	BOP	<i>Report MSR MOVs and FCVs normal.</i>
		b) Turbine Governor Valves and Stop Valves - NORMAL
	BOP	<i>Report Turbine GV's and SV's normal.</i>
		c) Reheat Stop and Intercept Valves - NORMAL
	BOP	<i>Report Reheat Stop and Intercept Valves ABNORMAL</i>
		RNO c) Reduce Reactor power to less or equal to 71% IAW 0-AP-23.00, RAPID LOAD REDUCTION, OR 1-OP-TM-005, UNIT RAMPING OPERATIONS.
	SRO	INITIATES 0-AP-23.00 to reduce load to less than 71%.



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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

	SRO	<p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p>
	RO	<p>Reactivity control during AP-23.00 Ramp:</p> <p>146 gallons of Boric Acid needed to reduce power to 71%. 50 gallons added during Emergency Boration, leaving 96 gallons to be added using normal boration at an average rate of 5.8 gpm. Control Bank 'D' rod height at end of ramp 197 Steps. Gallons of PG to be added to stabilize at end of ramp 1957.</p>
	SRO	<p>Completes Brief and continues with AP-23.00.</p>
	SRO	<p>Caution Prior to Step 1:</p> <ul style="list-style-type: none"> <li>Conservative decision-making must be maintained during rapid load reductions. Refer to Attachment 1 for trip criteria.</li> </ul> <p>Notes Prior to Step 1:</p> <ul style="list-style-type: none"> <li>Actions that can be completed independently of preceding steps may be performed out of sequence as directed by the SRO</li> <li>When the Turbine is not being actively ramped, the REFERENCE and SETTER values must remain matched to prevent inadvertent ramp.</li> <li>Pre-planned reactivity plans located in the Main Control Room will be used as guidance for ramping down to the desired power level.</li> <li>The ramp rate in IMP OUT is nonlinear and therefore pre-planned reactivity plans based on IMP IN are not as accurate. However, total amounts of boration and dilution can be used as guidance.</li> <li>For ramp rates greater than or equal to 1%/minute, Rod Control should remain in Automatic if available.</li> </ul>
	RO	<p>0-AP-23.00</p> <p>1. <b>TURN ON ALL PRZR HEATERS</b></p>

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

	BOP	2. INITIATE PLANT LOAD REDUCTION AT 2%/MINUTE OR LESS:  a) Verify turbine valve position - NOT ON LIMITER  The turbine is NOT on the limiter.
	RO	b) Insert control rods in AUTO or MANUAL as necessary to maintain Tave and Tref within 5°F.
	SRO/BOP	c) <b>Verify or place turbine in IMP IN or IMP OUT as determined by Shift Supervision</b>  The SRO can choose IMP IN or IMP OUT.
	BOP	d) <b>Adjust SETTER to desired power level</b>  e) <b>Adjust LOAD RATE %/MIN thumbwheel to desired ramp rate (1%/minute)</b>  f) <b>Initiate Turbine load reduction using OPERATOR AUTO (pushes the GO button)</b>  g) <b>Reduce Turbine Valve Position Limiter as load decreases</b>  The BOP will periodically reduce the limiter setpoint during the ramp.
	SRO	3. CHECK EMERGENCY BORATION – REQUIRED  The team may decide to emergency borate after the ramp has progressed to the point that Tave and Tref are matched (or close).
	SRO	Note Prior to Step 4: <ul style="list-style-type: none"> <li>Step 4 or Step 5 may be performed repeatedly to maintain Tave and Tref matched, ΔFlux in band, and control rod position above the LO-LO insertion limit.</li> </ul>

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

	RO	<p>0-AP-23.00</p> <p>4. PERFORM AN EMERGENCY BORATION IAW THE FOLLOWING:</p> <ul style="list-style-type: none"> <li>a) Verify or raise CHG flow to greater than 75 gpm</li> <li>b) <b>Transfer the in-service BATP to FAST</b></li> <li>c) <b>Open ( )-CH-MOV-( )350</b></li> <li>d) Monitor EMRG BORATE FLOW <ul style="list-style-type: none"> <li>• ( )-CH-FI-( )110</li> </ul> </li> <li>e) After required emergency boration, perform the following: <ul style="list-style-type: none"> <li>1) <b>Close ( )-CH-MOV-( )350</b></li> <li>2) <b>Transfer the in-service BATP to AUTO</b></li> <li>3) Restore Charging flow control to normal</li> </ul> </li> </ul>
	RO	<p>5. ESTABLISH A NORMAL BORATION TO MAINTAIN CONTROL ROD POSITION ABOVE THE LO-LO INSERTION LIMITS IAW ATTACHMENT 4</p> <p>Attachment 4 (Boration) and 5 (Manual Makeups) are at the end of this section.</p>
	SRO	<p>Notes Prior to Step 6:</p> <ul style="list-style-type: none"> <li>• If at any time plant conditions no longer require rapid load reduction, actions should continue at Step 35.</li> <li>• RCS Tave must be maintained less than or equal to 577°F and RCS pressure must be maintained greater than or equal to 2205 psig. Tech Spec 3.12.F.1 should be reviewed if either parameter is exceeded.</li> <li>• I &amp; C should be contacted to provide assistance with adjusting IRPIs.</li> </ul>
	RO	<p>6. CONTROL RAMP RATE TO MAINTAIN RCS PRESSURE GREATER THAN 2205 PSIG</p>
	RO	<p>*7. CHECK LETDOWN ORIFICES – TWO IN SERVICE</p> <p><i>Evaluator note: two orifices will already be in service.</i></p>
	BOP	<p>8. MONITOR STEAM DUMPS FOR PROPER OPERATION</p>

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

	SRO	0-AP-23.00  9. NOTIFY THE FOLLOWING: <ul style="list-style-type: none"><li>• Energy Supply (MOC)</li><li>• Polishing Building</li><li>• Chemistry</li><li>• OMOC</li></ul>
	SRO	10. EVALUATE THE FOLLOWING: <ul style="list-style-type: none"><li>• EPIP applicability</li></ul> <p><i>The Shift Manager will review EIPs for applicability. They are not applicable.</i></p> <ul style="list-style-type: none"><li>• VPAP-2802, NOTIFICATIONS AND REPORTS, applicability</li></ul> <p><i>SRO directs STA to review VPAP-2802. The STA reports that he has completed his review of VPAP-2802 and no notifications are required.</i></p> <p><i>No further actions are required for this event.</i></p>
	SRO	11. CHECK REACTOR POWER – HAS DECREASED MORE THAN 15% IN ONE HOUR  When reactor power has decreased >15%, then chemistry will be notified.
		<b><u>END EVENT #5</u></b>

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		<b>0-AP-23.00 Attachment 4 (NORMAL BORATION) Actions</b>
	RO	1. Place the MAKE-UP MODE CNTRL switch in the STOP position.
	RO	2. Adjust 1-CH-YIC-1113 to desired total gallons
	RO	3. Adjust 1-CH-FC-1113A to desired flow rate.
	RO	4. Place the MAKE-UP MODE SEL switch in the BORATE position.
	RO	6. Check proper valve positions.
	RO	5. Place the MAKE-UP MODE CNTRL switch in the START position
	RO	7. Adjust boration rate using 1-CH-FC-1113A, as necessary.
	RO	8. <u>WHEN</u> boration is complete, <u>THEN</u> perform the following. <u>IF</u> boric acid is to remain in the Blender to support ramping the Unit, <u>THEN</u> enter N/A.  a) Manually blend approximately 20 gallons to flush the boration path IAW Attachment 5, Manual Makeups.  b) Enter N/A for the remaining steps in this Attachment.  <i>Attachment 5 is on the next page</i>
	RO	9. Check controllers for Primary Grade water and Boric Acid are set correctly.
	RO	10. Place the MAKE-UP MODE SEL switch in the AUTO position.
	RO	11. Place the MAKE-UP MODE CNTRL switch in the START position.
	RO	12. Notify Shift Supervision of blender status.

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Event No.: 5

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Event Description: Test Button Failure, LP Turbine 1RL/1IL; 0-AP-23.00 ramp to 71% power.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
		<b>0-AP-23.00 Attachment 5 (Manual Makeups) Actions</b>
		<b>1. Place the MAKE-UP MODE CNTRL switch in the STOP position.</b>
		2. Check controllers for the flow rate of Boric Acid and Primary Grade water are set correctly.
		<b>3. Check integrators for the gallons of Boric Acid and Primary Grade water are set correctly.</b>
		<b>4. Place the MAKE-UP MODE SEL switch in the MANUAL position.</b>
		<b>5. Place the MAKE-UP MODE CNTRL switch in the START position.</b>
		<b>6. Open 1-CH-FCV-1113B, BLENDER TO CHG PUMP.</b>
		7. Check proper valve positions.
		<b>8. WHEN the Manual Makeup operation is complete, THEN place 1-CH-FCV-1 113B in the AUTO position</b>
		<b>9. Place the MAKE-UP MODE CNTRL switch in the STOP position.</b>
		<b>10. Check or place the control switches in the AUTO position.</b>
		11. Check controllers for Primary Grade water and Boric Acid are set correctly.
		<b>12. Place the MAKE-UP MODE SEL switch in the AUTO position.</b>
		<b>13. Place the MAKE-UP MODE CNTRL switch in the START position.</b>
		14. Notify Shift Supervision of blender status.

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Event No.: 6

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Event Description: RCS Leak 35 gpm, 1-AP-16.00.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	Team	<p>Diagnoses the failure with the following indications:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>• RM-Q7 – CTMT PART ALERT/FAILURE</li> <li>• RM-Q8 – CTMT GAS ALERT/FAILURE</li> <li>• RM-R8 – CTMT GAS RM-RI-160 HIGH</li> </ul> <p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>• CTMT Sump Level increasing</li> <li>• 1-DA-P-4A running continuously</li> </ul> <p><i>Unit 2 will perform RM ARPs, but will be unable to perform Auto Action verification.</i></p>
	SRO	<p>1-AP-16.00</p> <p>Direct initiation of 1-AP-16.00, EXCESSIVE RCS LEAKAGE</p>
	SRO	<p>Notes Prior to Step 1:</p> <ul style="list-style-type: none"> <li>• If SI Accumulators are isolated, 1-AP-16.01, Shutdown LOCA, should be used for guidance.</li> <li>• RCS average temperature has a direct impact on pressurizer level.</li> </ul>
	RO	<p>[1] MAINTAIN PRZR LEVEL:</p> <ul style="list-style-type: none"> <li>• <b>Isolate Letdown</b></li> <li>• <b>Control Charging flow</b></li> </ul> <p><b>RO closes 1-CH-LCV-1460A and 1-CH-LCV-1460B to isolate letdown. The RO will take manual control of 1-CH-FCV-1122 to stabilize pressurizer level.</b></p>
	SRO	<p>The team will hold a short transient brief which may simply be stated as “An RCS Leak is in progress, are there any other higher priorities?” (words to the effect).</p>

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Event No.: 6

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Event Description: RCS Leak 35 gpm, 1-AP-16.00.

Cue: By Evaluator.

	RO	<p>1-AP-16.00</p> <p>2. CHECK THE FOLLOWING PARAMETERS – STABLE OR INCREASING</p> <ul style="list-style-type: none"><li>• PRZR Level</li><li>• PRZR Pressure</li><li>• RCS Subcooling</li></ul> <p>Identifies all parameters are stable under the control of the operator. Team should identify RCS leak rate less than 50 gpm.</p> <p><b>Note: Due to ramp previously in progress and Tave trend, the RCS leakrate will be more difficult to calculate.</b></p>
	RO	<p>3. PLACE THE FOLLOWING COMPONENTS IN OFF:</p> <ul style="list-style-type: none"><li>• CTMT sump pumps</li><li>• CTMT vacuum pumps</li></ul> <p><b>RO will place the Containment Sump and Vacuum Pumps in OFF.</b></p>
	SRO	<p>Note Prior to Step 4:</p> <ul style="list-style-type: none"><li>• Shift Supervision and STA must remain informed of RCS leak rate for EPIP applicability.</li></ul>
	RO	<p>*4. CHECK REACTOR TRIP - REQUIRED</p> <ul style="list-style-type: none"><li>• Leak rate - GREATER THAN 50 GPM</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>• Adequate makeup not being provided by blender</li></ul> <p><i>RO will identify that the leak rate is less than 50 gpm. Note: this can be complicated by temperature trend associated with ramp (may take more time).</i></p> <p>4., RNO GO to Step 7.</p>



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Event Description: RCS Leak 35 gpm, 1-AP-16.00.

Cue: By Evaluator.

	SRO	7 CHECK SECONDARY RADIATION - NORMAL OR STABLE IF THERE IS PRE-EXISTING TUBE LEAK <ul style="list-style-type: none"> <li>• Air Ejector Rad Monitor</li> <li>• SG Blowdown Rad Monitors</li> <li>• Main Steam Line Rad Monitors</li> <li>• Secondary sample</li> <li>• N-16 Rad Monitors</li> </ul>
	Unit 2	Report Unit 1 Air Ejector and Blowdown Rad Monitors - Normal
	BOP	<i>Reports Main Steam, and N-16 Rad Monitor Normal (using PCS)</i>
	SRO	8 CHECK RCS LEAK RATE – LESS THAN 10 GPM
	RO	Reports leak rate > 10 GPM
	SRO	Step 8 RNO Do the following: <ol style="list-style-type: none"> <li>Initiate unit shutdown IAW the appropriate operating procedure.</li> <li>Control charging flow and seal injection to maintain PRZR level.</li> <li>Evaluate EPIP applicability</li> </ol>
	SRO	9 CHECK UNIT CONDITIONS <ul style="list-style-type: none"> <li>• PRZR level - STABLE OR INCREASING</li> <li>• PRZR pressure - STABLE OR INCREASING</li> <li>• Tave – STABLE</li> </ul>
	RO	Reports PRZR Level, Pressure and RCS Tave Stable.

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Event No.: 6

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Event Description: RCS Leak 35 gpm, 1-AP-16.00.

Cue: By Evaluator.

	SRO	10 CHECK LETDOWN LEAK - INDICATED
	BOP	<ul style="list-style-type: none"> <li>Annunciator 0-VSP-F4, AUX BLDG SUMP HI LVL - LIT</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Annunciator 1B-A3, CTMT SUMP HI LVL - LIT</li> </ul>
	Unit 2	<ul style="list-style-type: none"> <li>Aux Bldg radiation – HIGH</li> <li>CTMT radiation – HIGH</li> </ul>
	RO/BOP	<ul style="list-style-type: none"> <li>Local Report of leak</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Leak rate decrease following isolation in Step 1</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Abnormal Letdown flow indication prior to isolation in Step 1</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Non-Regenerative HX tube leak – INDICATED</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>CC Surge Tank level - INCREASING</li> </ul>
	Unit 2	<ul style="list-style-type: none"> <li>CC Activity – INCREASING</li> </ul>
		All indication checked for leak identification are 'NO'
	SRO	Goes to Step 12
		12 CHECK RCS LEAKRATE WITH LETDOWN SECURED – REDUCED  12 RNO Do the following:  a) Return letdown to service IAW the following, if desired: <ul style="list-style-type: none"> <li>Normal letdown, IAW Attachment 2</li> </ul> OR  <ul style="list-style-type: none"> <li>Excess letdown, IAW 1-OP-CH-006, SHIFTING LETDOWN</li> </ul> b) GO TO Step 15.
		<b>END OF EVENT #6</b>

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Scenario No.: 3

Event No.: 7

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Event Description: Containment particulate and gas RM fail, no Auto Actions.

Cue: Initiated by Event 6.

Time	Position	Applicant's Action or Behavior
	BOP	<b>1-RM-R8 Actions</b>  NOTE: BOP will be handed Steps 3 and 4 of ARP to verify auto actions of CTMT GAS High alarm.
	BOP	3 VERIFY CTMT PURGE SYS - ISOLATED a) CTMT PURGE SUP - CLOSED <ul style="list-style-type: none"> <li>• 1-VS-MOV-100A</li> <li>• 1-VS-MOV-100B</li> <li>• 1-VS-MOV-100C</li> <li>• 1-VS-MOV-100D</li> </ul> <p><i>BOP will verify Purge valves closed on the Unit 1 Ventilation Panel by observing RED and GREEN lights extinguished, and GREEN magnet over Shut position indicating light signifying Valve Closed.</i></p> b) CTMT PURGE SUP fans - STOPPED <ul style="list-style-type: none"> <li>• 1-VS-F-4A</li> <li>• 1-VS-F-4B</li> </ul> <p><i>BOP will identify Purge Supply Fans secured by observing RED and GREEN indicating lights extinguished.</i></p> c) CTMT PURGE BYP valve - CLOSED <ul style="list-style-type: none"> <li>• 1-VS-MOV-101</li> </ul>
	BOP	4 VERIFY CTMT IA SYSTEM ALIGNMENT: <ul style="list-style-type: none"> <li>• 1-IA-TV-101A - CLOSED</li> <li>• 1-IA-TV-101B – CLOSED</li> </ul> <p><i>Identifies 1-IA-TV-101A / B Open by observing position indicating lights on Unit 1 Vertical board RED Light LIT.</i></p> <p>Step 4 RNO Manually Align Valves</p> <p><b>BOP will close the valves by depressing and holding the GREEN indicating light until only the GREEN indicating light is lit.</b></p> <p><b>NOTE:</b> When either 1-IA-TV-101A / B are closed, 1-IA-AOV-103 will open (checked in Step 5 below).</p>

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Event No.: 7

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Event Description: Containment particulate and gas RM fail, no Auto Actions.

Cue: Initiated by Event 6.

	BOP	5 CHECK CTMT IA COMPR OUTSIDE SUCT - OPEN • 1-IA-AOV-103  BOP will observe 1-IA-AOV-103 OPEN by observing RED position indicating light LIT.
		End EVENT #7

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Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	Team	<p>Diagnose escalation of RCS Leak by the following:</p> <p>Alarms”  1C-B8, PRZR LO PRESS  1B-A3, CTMT SUMP HI LVL</p> <p>Indications:  Lowering RCS Pressure  PRZR Level decreasing</p>
	SRO	Direct RO to re-perform Immediate Actions of AP-16.00.
	RO	<p>[1] MAINTAIN PRZR LEVEL:</p> <ul style="list-style-type: none"> <li>Isolate Letdown</li> <li>Control Charging flow</li> </ul> <p><i>RO checks 1-CH-LCV-1460A and 1-CH-LCV-1460B closed.</i></p> <p><b>The RO will increase flow using 1-CH-FCV-1122 to control PRZR level.</b></p>
	SRO	The team will hold a short transient brief which may simply be stated as “An RCS Leak is in progress, are there any other higher priorities?” (words to the effect).
	SRO	<p>1-AP-16.00</p> <p>2. VERIFY THE FOLLOWING PARAMETERS – STABLE OR INCREASING</p> <ul style="list-style-type: none"> <li>PRZR Level</li> <li>PRZR Pressure</li> <li>RCS Subcooling</li> </ul> <p>Identifies all parameters are stable under the control of the operator. Team should identify RCS leak rate greater than 50 gpm.</p> <p><b>NOTE:</b> SRO may direct RO to manually trip the reactor and safety inject at this point due to degrading plant parameters.</p>
	RO	<p>3. PLACE THE FOLLOWING COMPONENTS IN OFF:</p> <ul style="list-style-type: none"> <li>CTMT sump pumps</li> <li>CTMT vacuum pumps</li> </ul> <p>RO will check the Containment Sump and Vacuum Pumps in OFF.</p>

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Scenario No.: 3

Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	SRO	Note Prior to Step 4: <ul style="list-style-type: none"><li>Shift Supervision and STA must remain informed of RCS leak rate for EPIP applicability.</li></ul>
	SRO	*4. CHECK REACTOR TRIP - REQUIRED <ul style="list-style-type: none"><li>Leak rate - GREATER THAN 50 GPM</li><li>OR</li><li>Adequate makeup not being provided by blender</li></ul> <i>RO will identify that the leak rate is greater than 50 gpm.</i>
	SRO  RO	5 ALIGN CHG PUMP SUCTION TO RWST a) Open 1-CH-MOV-1115B and 1-CH-MOV-1115D  <b>RO opens 1-CH-MOV-1115B and 1-CH-MV-1115D.</b>  b) Close 1-CH-MOV-1115C and 1-CH-MOV-1115E  <b>RO closes 1-CH-MOV-1115C and 1-CH-MOV-1115E</b>
	SRO  SRO	6 GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION  <b>Directs RO to trip the reactor, perform E-0, and Manually Safety Inject on Step 4.</b>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	RO	<b><u>1-E-0 – Reactor Trip or Safety Injection</u></b>  [1] CHECK REACTOR TRIP:  a) Manually trip reactor  <b>Pushes the reactor trip push buttons.</b>  b) Check the following: <ul style="list-style-type: none"><li>• All Rods On Bottom light – LIT</li><li>• Reactor trip and bypass breakers – OPEN</li><li>• Neutron flux - DECREASING</li></ul>
	RO RO	[2] CHECK TURBINE TRIP:  a) <b>Manually trip the turbine</b>  <b>Pushes the turbine trip push buttons.</b>  b) Verify all turbine stop valves - CLOSED  c) Isolate reheaters by closing MSR steam supply SOV <ul style="list-style-type: none"><li>• 1-MS-SOV-104</li></ul> d) Verify generator output breakers – OPEN (Time Delayed)
	RO	[3] CHECK BOTH AC EMERGENCY BUSES - ENERGIZED

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	RO	<p>[4] CHECK IF SI INITIATED:</p> <p>a) Check if SI is actuated:</p> <ul style="list-style-type: none"><li>• LHSI pumps – RUNNING</li><li>• SI annunciators – LIT<ul style="list-style-type: none"><li>• A-F-3 SI INITIATED – TRAIN A</li><li>• A-F-4 SI INITIATED – TRAIN B</li></ul></li></ul>
	RO	<p>4b) <b>Manually initiate SI</b></p> <p><b>The RO will manually initiate SI at step 4 by pushing both SI pushbuttons.</b></p> <p>After the immediate actions of 1-E-0 are reported as complete, the SRO will check off immediate action steps in his copy of 1-E-0. After the immediate actions are verified, the team will conduct a brief.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the alarms already received. He will also state that containment conditions and the electrical conditions are as you see them (or as reported by the RO/BOP).</i></p>



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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	SRO	The team will hold a transition brief. During the brief it will be identified that SI was initiated and the RCS leak has degraded into a LOCA.
	SRO/BOP	5. Initiate Attachment 1 ( <i>Attachment 1, 2, and 3 actions contained the end of Event 8</i> ).
	SRO/RO	SRO may direct the RO to perform Attachment 8 of 1-E-0 for Transient AFW Control, or opt to throttle AFW as part of E-0, Step 6.
	RO	<p>*6. CHECK RCS AVERAGE TEMPERATURE</p> <ul style="list-style-type: none"> <li>• STABLE AT 547°F</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• TRENDING TO 547°F</li> </ul> <p>The team will identify that RCS temperature is decreasing. The team should attribute this to the injection of SI into the RCS and AFW flow to the SGs. It is acceptable for the team to enter the RNO portion of this step and perform the applicable steps (summarized below):</p> <p>Stop dumping steam  <b>Reduce AFW flow to the SGs</b>  Close MSTVs if cooldown continues</p>
	RO	<p>7. CHECK PRZR PORVs AND SPRAY VALVES:</p> <p>a) PRZR PORVs – CLOSED</p> <p>b) PRZR spray controls</p> <ul style="list-style-type: none"> <li>• Demand at Zero (or)</li> <li>• Controlling Pressure</li> </ul> <p>c) PORV block valves - AT LEAST ONE OPEN</p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	SRO  RO	<p><b>NOTE:</b> Seal injection flow should be maintained to all RCPs.</p> <p>*8. CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <p>a) Charging Pumps – AT LEAST ONE RUNNING AND FLOWING TO RCS</p> <p>Two or three Charging pumps will be running and flowing to the RCS.</p> <p>b) RCS subcooling - LESS THAN 30°F [85°F]</p> <p>RCS subcooling may or may not be less than 30 °F at this time.</p> <p>RNO for the step is to go to step 9.</p> <p><b>Critical Task:</b> CT-1: WOG E-1—C: Trip all RCPs so that CETC temperatures do not become superheated when forced circulation in RCS stops; Trip all RCPS within 5 minutes of reaching RCP Trip and Mini-flow Recirc Criteria (KOA).</p> <p><b>NOTE:</b> If RCP trip Criteria are met prior to reaching this Step, the Continuous Actions Page (CAP) contains these criteria. After this Step is read, this step or the CAP can be used for criteria as long as the Team is performing E-0.</p>
	RO	<p>9. CHECK IF SGs ARE NOT FAULTED:</p> <ul style="list-style-type: none"><li>• Check pressures in all SGs</li></ul> <p>a) STABLE OR INCREASING AND b) GREATER THAN 100 PSIG</p> <p>RO will observe a slightly decreasing trend on SG pressures. This will be attributed to the RCS cooldown. The team will not transition to 1-E-2.</p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	<p>SRO</p> <p>Unit 2 Unit 2</p> <p>RO</p>	<p>10. CHECK IF SG TUBES ARE NOT RUPTURED:</p> <ul style="list-style-type: none"> <li>• Condenser air ejector radiation – NORMAL</li> <li>• SG blowdown radiation – NORMAL</li> <li>• SG MS radiation – NORMAL</li> <li>• TD AFW pump exhaust radiation – NORMAL</li> <li>• SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER</li> </ul> <p>RO will use PCS indication for MS and TDAFW Exhaust radiation. Unit 2 will be used to report Condenser A/E and SG Blowdown radiation trend.</p>
	<p>SRO</p> <p>RO</p> <p>SRO</p>	<p>11 CHECK RCS - INTACT INSIDE CTMT</p> <ul style="list-style-type: none"> <li>• CTMT radiation - NORMAL</li> <li>• CTMT pressure - NORMAL</li> <li>• CTMT RS sump level – NORMAL</li> </ul> <p>Identify CTMT conditions as abnormal</p> <p>GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.</p>
	SRO	<p>The team will hold a transition brief. During the brief the SRO will set priorities. The RO and BOP will state the parameters associated with the brief placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified alarms. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>The SRO will complete the Brief and continue with E-1.</p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	SRO	<p>Step 1, 1-E-1</p> <p><b>NOTE:</b> Criteria for FR-Z.1 Entry may be met at any time during performance of 1-E-1. <b>(FR-Z.1 Actions in Section 9).</b></p> <p>1 CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <p>a) Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS</p> <p><i>RO identify 2 CH pumps running.</i></p> <p>b) RCS subcooling - LESS THAN 30°F [85°F]</p> <p><i>RO reports actual subcooling.</i></p> <p>c) Stop all RCPs</p> <p><b>RO Stops RCPs if not already tripped.</b></p> <p>d) RCS pressure - LESS THAN 1275 PSIG [1475 PSIG]</p> <p>e) Close CHG pump miniflow recirc valves:</p> <ul style="list-style-type: none"> <li>• 1-CH-MOV-1275A</li> <li>• 1-CH-MOV-1275B</li> <li>• 1-CH-MOV-1275C</li> </ul> <p><b>RO closes or verifies closed mini-flow recirc valves.</b></p> <p><b>Critical Task:</b> CT-1: WOG E-1—C: Trip all RCPs so that CET temperatures do not become superheated when forced circulation in RCS stops; Trip all RCPs within 5 minutes of reaching RCP Trip and Mini-flow Recirc Criteria (KOA).</p> <p><b>NOTE:</b> Critical Task copied from E-0 if timing of scenario leads to RCP trip criteria identified on entry to 1-E-1.</p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

**Cue: By Evaluator.**

	SRO	<p>1-E-1</p> <p>2 CHECK IF SGs ARE NOT FAULTED:</p> <ul style="list-style-type: none"> <li>• Check pressures in all SGs:</li> <li>• STABLE OR INCREASING AND</li> <li>• GREATER THAN 100 PSIG</li> </ul> <p>RO reports SGs are not faulted.</p> <p>NOTE: SG pressures may be decreasing due to cooldown. RO may report SG pressure as lowering. The SRO will obtain Team concurrence that SG pressure decrease is related to RCS cooldown not a SG fault. The brief is closed.</p>
	SRO	<p>1-E-1</p> <p>*3 CHECK INTACT SG LEVELS:</p> <p>a) Narrow range level – GREATER THAN 12% [18%]</p> <p>b) Check emergency buses – BOTH ENERGIZED</p> <p>c) Control feed flow to maintain narrow range level between 22% and 50%</p>
	<div>SRO</div>       <div>RO</div>	<p>1-E-1</p> <p>4 CHECK IF SG TUBES ARE NOT RUPTURED:</p> <ul style="list-style-type: none"> <li>• Condenser air ejector radiation - NORMAL</li> <li>• SG blowdown radiation - NORMAL</li> <li>• SG main steam radiation - NORMAL</li> <li>• TD AFW pump exhaust radiation - NORMAL</li> <li>• SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER</li> </ul> <p>Unit 2 may be used to report Unit 1 condenser air ejector and blowdown radiation monitor readings.  <i>Report MS and TDAFW RM readings using PCS. Identify SG NR levels NOT increasing in an uncontrolled manner.</i></p>
	<div>SRO</div>    <div>RO</div>	<p>1-E-1</p> <p><b>CAUTION:</b> If any PRZR PORV opens because of high PRZR pressure, the PORV must be verified closed or isolated after pressure decreases to less than 2335 psig.</p> <p>*5 CHECK PRZR PORVs AND BLOCK VALVES:</p> <p>a) Power to PRZR PORV block valves – AVAILABLE</p> <p><i>Report PRZR block valves both available.</i></p> <p>b) PRZR PORVs – CLOSED</p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	RO	<i>Report PRZR PORVs closed.</i>
		c) PRZR PORV block valves - AT LEAST ONE OPEN
	RO	<i>Report PRZR block valves both open.</i>
	SRO	1-E-1 *6. ____ CHECK IF SI FLOW SHOULD BE REDUCED: a) RCS subcooling based on CETCs - GREATER THAN 30°F [85°F]
	RO	<i>Reports indicated subcooling.</i>
	RO	b) Secondary heat sink: • Total feed flow to INTACT SGs - GREATER THAN 350 GPM [450 GPM] OR • Narrow range level in at least one intact SG - GREATER THAN 12% [18%]
	RO	<i>Reports SGs have adequate level and AFW flow.</i>
	RO	c) RCS pressure - STABLE OR INCREASING
	RO	Reports RCS pressure decreasing.
	SRO	RNO a) OR c) GO TO Step 7.
	SRO	1-E-1 *7 CHECK IF HI HI CLS INITIATED: • CS pump(s) - RUNNING OR • Any Hi Hi CLS annunciator – LIT  NOTE: At this Point CTMT pressure may have increased to the HI and/or Hi-Hi CLS setpoint. The Team should identify that Hi and Hi-Hi CLS do not automatically initiate and take manual action to perform the automatic actions. <b>(FR-Z.1 Actions in Section 9)</b>  When the Team identify that Hi-Hi CLS has not actuated, a transition to FR-Z.1 will be made. When the transition is made Critical Task 2 Start Time begins:  <b>CRITICAL TASK START TIME</b> _____ (Actions for FR-Z.1 will follow 1-E-1, Step 18).

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	SRO	1-E-1
	RO	<p>8 CHECK SERVICE WATER AVAILABLE:</p> <p>a) Check Intake Canal level – BEING MAINTAINED BY CW PUMPS</p> <p><i>Reports Intake Canal level is 29 feet and Stable.</i></p> <p>b) GO TO Step 12</p>
	SRO	1-E-1
	RO	<p>*12 CHECK IF CS PUMPS CAN BE STOPPED:</p> <p>a) Check the following:</p> <ul style="list-style-type: none"> <li>• RWST level - LESS THAN 3%</li> <li>AND</li> <li>• CS Pump amps - FLUCTUATING</li> </ul> <p><i>Reports actual RWST Level.</i></p> <p>RNO a) <b>GO TO Step 14.</b> WHEN the following conditions are met, THEN do Steps 12b through 12f.</p> <ul style="list-style-type: none"> <li>• RWST level - LESS THAN 3%</li> <li>AND</li> <li>• CS Pump amps – FLUCTUATING</li> </ul>
	SRO	1-E-1
	RO	<p><b>CAUTION:</b> RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 250 psig [400 psig], one LHSI pump must be manually restarted to supply water to the RCS.</p> <p>*14 CHECK IF LHSI PUMPS SHOULD BE STOPPED:</p> <p>a) Check RCS pressure:</p> <p>1) Pressure – GREATER THAN 250 PSIG [400 PSIG]</p> <p><i>Reports RCS pressure &gt; 250 PSIG [400 PSIG]</i></p> <p>2) Pressure - STABLE OR INCREASING</p> <p><i>Reports RCS pressure Lowering.</i></p> <p>RNO 2) GO TO Step 15.</p>
		1-E-1

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

		<p>15 CHECK RCS AND SG PRESSURES:</p> <ul style="list-style-type: none"> <li>• Check pressure in all SGs – STABLE OR INCREASING</li> <li>• Check RCS pressure - STABLE OR DECREASING</li> </ul> <p><b>NOTE:</b> SG pressures may be decreasing due to cooldown. RO may report SG pressure as lowering. The SRO will obtain Team concurrence that SG pressure decrease is related to RCS cooldown not a SG fault. The brief is closed</p>
	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO</p>	<p>1-E-1</p> <p>16 CHECK IF EDGs CAN BE STOPPED:</p> <p>a) Check AC emergency buses - ENERGIZED BY OFFSITE POWER</p> <p><i>Reports that 'H' Emergency bus energized by off-site power, and 'J' emergency powered from #3 EDG.</i></p> <p>b) Reset both trains of SI if necessary</p> <p><b>RO presses SI reset pushbuttons.</b></p> <p>c) Check CTMT pressure – LESS THAN 14 PSIA</p> <p><i>Reports actual containment pressure (pressure will be greater than 14 psia).</i></p> <p>RNO c) GO TO Step 17. WHEN pressure less than 14 psia, THEN do Steps 16d and 16e.</p>
	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO</p>	<p>1-E-1</p> <p>17 CHECK INSTRUMENT AIR AVAILABLE:</p> <p>a) Check annunciator B-E-6 - NOT LIT</p> <p><i>Reports B-E-6 NOT LIT.</i></p> <p>b) Check at least one CTMT IA compressor - RUNNING</p> <ul style="list-style-type: none"> <li>• 1-IA-C-4A or 1-IA-C-4B</li> </ul> <p><i>Reports 1-IA-C-4A running.</i></p> <p>c) Check 1-IA-TV-100 – OPEN</p> <p><i>Reports 1-IA-TV-100 position.</i></p> <p><b>NOTE:</b> When BOP performs Attachment 4 of E-0, 1-IA-TV-100 may be closed; SRO/BOP may confer over closure of the valve since Hi-Hi CLS actions are being manually performed.</p>



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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

		1-E-1
	SRO	18 INITIATE EVALUATION OF PLANT STATUS:
		<b>END OF EVENT 8</b> <b>END OF SCENARIO</b>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
		<b>Attachment 1 of E-0</b>  1 CHECK FW ISOLATION: <ul style="list-style-type: none"> <li>• Feed pump discharge MOVs - CLOSED               <ul style="list-style-type: none"> <li>• 1-FW-MOV-150A</li> <li>• 1-FW-MOV-150B</li> </ul> </li> <li>• MFW pumps - TRIPPED</li> <li>• Feed REG valves - CLOSED</li> <li>• SG FW bypass flow valves - DEMAND AT ZERO</li> <li>• SG blowdown TVs – CLOSED</li> </ul>
		<b>Attachment 1 of E-0</b>  2 CHECK CTMT ISOLATION PHASE I: <ul style="list-style-type: none"> <li>• Phase I TVs - CLOSED</li> <li>• 1-CH-MOV-1381 - CLOSED</li> <li>• 1-SV-TV-102A - CLOSED</li> <li>• PAM isolation valves - CLOSED               <ul style="list-style-type: none"> <li>• 1-DA-TV-103A</li> <li>• 1-DA-TV-103B</li> </ul> </li> </ul>
		<b>Attachment 1 of E-0</b>  3 CHECK AFW PUMPS RUNNING: <ul style="list-style-type: none"> <li>a) MD AFW pumps - RUNNING (Time Delayed)</li> <li>b) TD AFW pump - RUNNING IF NECESSARY</li> </ul>
	BOP	<b>Attachment 1 of E-0</b>  4. CHECK SI PUMPS RUNNING: <ul style="list-style-type: none"> <li>• CHG pumps – RUNNING</li> <li>• LHSI pumps – RUNNING</li> </ul>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	BOP	<b>Attachment 1 of E-0</b> 5. CHECK CHG PUMP AUXILIARIES: <ul style="list-style-type: none"> <li>• CHG pump CC pump – RUNNING</li> <li>• CHG pump SW pump - RUNNING</li> </ul>
	BOP	<b>Attachment 1 of E-0</b> 6. CHECK INTAKE CANAL: <ul style="list-style-type: none"> <li>• Level - GREATER THAN 24 FT</li> <li>• Level - BEING MAINTAINED BY CIRC WATER PUMPS</li> </ul>
	BOP	<b>Attachment 1 of E-0</b> 7. CHECK IF MAIN STEAMLINES SHOULD BE ISOLATED: <ul style="list-style-type: none"> <li>a) Check if ANY of the following annunciators - HAVE BEEN LIT               <ul style="list-style-type: none"> <li>• E-F-10 (High Steam Flow SI)</li> <li>• B-C-4 (Hi Hi CLS Train A)</li> <li>• B-C-5 (Hi Hi CLS Train B)</li> </ul> </li> </ul> Identifies annunciators not lit and goes to step 8.
	BOP	<b>Attachment 1 of E-0</b> *8. CHECK IF CS REQUIRED: <ul style="list-style-type: none"> <li>a) CTMT pressure – HAS EXCEEDED 23 PSIA</li> </ul> Identifies pressure has not exceeded 23 or 17.7 psia and goes to step 10.

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	BOP	<p><b>Attachment 1 of E-0</b></p> <p>*10. BLOCK LOW PRZR PRESS SI SIGNAL:</p> <ol style="list-style-type: none"> <li>Check PRZR pressure – LESS THAN 2000 psig</li> <li>Turn both LO PRZR PRESS &amp; STM HDR/LINE ΔP switches to block</li> <li>Check Permissive Status light C-2 - LIT</li> </ol> <p>BOP may block the low pressurizer pressure SI signal depending on current RCS pressure.</p>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>*11. BLOCK LOW TAVE SI SIGNAL:</p> <p>Step may not be performed at this time (if Tave is greater than 543°F).</p> <ol style="list-style-type: none"> <li>Check RCS Tave - LESS THAN 543°F</li> <li>Turn both HI STM FLOW &amp; LO TAVG OR LP switches to block</li> <li>Check Permissive Status light F-1 - LIT</li> </ol>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>CHG pumps should be run in the following order of priority: C, B, A.</li> <li>Subsequent SI signals may be reset by re-performing Step 12.</li> </ul> <p>12. CHECK SI FLOW:</p> <ol style="list-style-type: none"> <li>HHSI to cold legs - FLOW INDICATED <ul style="list-style-type: none"> <li>1-SI-FI-1961 (NQ)</li> <li>1-SI-FI-1962 (NQ)</li> <li>1-SI-FI-1963 (NQ)</li> <li>1-SI-FI-1943 or 1-SI-FI-1943A</li> </ul> </li> <li>Check CHG pumps - THREE RUNNING</li> <li>Reset SI.</li> <li>Stop one CHG pump and out in AUTO</li> </ol>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

		<p><b>Step 12, Attachment 1 of E-0, Continued</b></p> <p>e) RCS pressure - LESS THAN 185 PSIG</p> <p>RNO: e) IF two LHSI pumps are running, THEN do the following:</p> <ol style="list-style-type: none"> <li>1) Verify reset or reset SI.</li> <li>2) Stop one LHSI pump and put in AUTO.</li> <li>3) GO TO Step 13.</li> </ol>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>13. CHECK TOTAL AFW FLOW - GREATER THAN 350 GPM [450 GPM]</p>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>14. CHECK AFW MOVs - OPEN</p> <p>BOP will identify that all AFW MOVs are not open and will read the RNO portion of this step and manually align valves as necessary.</p>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>15. INITIATE SI VALVE ALIGNMENT IAW ATTACHMENT 2</p> <p>See attached copy of Attachment 2. (Next Page of this guide)</p> <p>Depending on timing, this attachment may have already been completed.</p>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>16. INITIATE VENTILATION, AC POWER, AND SFP STATUS CHECKS IAW ATTACHMENT 3</p> <p><i>Attachment 3 follows Attachment 2 on next page</i></p> <p><i>Unit 2 Operator will state that Unit 2 is at 100% power (if asked)</i></p> <p><i>Unit 2 will also accept responsibility to complete Attachment 3 if it is given to Unit 2 at the point where differential pressure indications are requested.</i></p>

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	SRO	ATTACHMENT 2 of 1-E-0  <b>NOTE:</b> Components previously aligned by SI termination steps, must not be realigned by this Attachment.
	RO/BOP	ATTACHMENT 2 of 1-E-0  1. Check opened or open CHG pump suction from RWST MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115B</li><li>• 1-CH-MOV-1115D</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  2. Check closed or close CHG pump suction from VCT MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115C</li><li>• 1-CH-MOV-1115E</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  3. Check running or start at least two CHG pumps. (listed in preferred order) <ul style="list-style-type: none"><li>• 1-CH-P-1C</li><li>• 1-CH-P-1B</li><li>• 1-CH-P-1A</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  4. Check opened or open HHSI to cold legs MOVs. <ul style="list-style-type: none"><li>• 1-SI-MOV-1867C</li><li>• 1-SI-MOV-1867D</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  5. Check closed or close CHG line isolation MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1289A</li><li>• 1-CH-MOV-1289B</li></ul>

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Scenario No.: 3

Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	RO/BOP	ATTACHMENT 2 of 1-E-0  6. Check closed or close Letdown orifice isolation valves.  <ul style="list-style-type: none"><li>• 1-CH-HCV-1200A</li><li>• 1-CH-HCV-1200B</li><li>• 1-CH-HCV-1200C</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  7. Check opened or open LHSI suction from RWST MOVs.  <ul style="list-style-type: none"><li>• 1-SI-MOV-1862A</li><li>• 1-SI-MOV-1862B</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  8. Check opened or open LHSI to cold legs MOVs.  <ul style="list-style-type: none"><li>• 1-SI-MOV-1864A</li><li>• 1-SI-MOV-1864B</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  9. Check running or start at least one LHSI pump.  <ul style="list-style-type: none"><li>• 1-SI-P-1A</li><li>• 1-SI-P-1B</li></ul>
	RO/BOP	ATTACHMENT 2 of 1-E-0  10. Check High Head SI flow to cold legs indicated.  <ul style="list-style-type: none"><li>• 1-SI-FI-1961</li><li>• 1-SI-FI-1962</li><li>• 1-SI-FI-1963</li><li>• 1-SI-FI-1943 or 1-SI-FI-1943A</li></ul>

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Scenario No.: 3

Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

	RO/BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>11. IF flow not indicated, THEN manually start pumps and align valves. IF flow NOT established, THEN consult with Shift Supervision to establish another high pressure injection flow path while continuing with this procedure.</p> <ul style="list-style-type: none"><li>• Alternate SI to Cold legs</li><li>• Hot leg injection</li></ul>
--	--------	--



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Scenario No.: 3

Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 1 of 6

1. \_\_\_\_ Check or place REFUEL SFTY MODE switches in NORMAL.

2. \_\_\_\_ Check ventilation alignment IAW Tables 1 and 2.

TABLE 1  
UNIT #1 VENTILATION PANEL

	<u>MARK NUMBER</u>	<u>EQUIPMENT STATUS</u>
<input type="checkbox"/>	1-VS-F-4A & B	OFF
<input type="checkbox"/>	1-VS-HV-1A & B	OFF
<input type="checkbox"/>	1-VS-F-8A & B	OFF
<input type="checkbox"/>	1-VS-F-9A & B	GREEN
<input type="checkbox"/>	1-VS-F-59	GREEN
<input type="checkbox"/>	1-VS-F-6	OFF
<input type="checkbox"/>	1-VS-F-39	GREEN
<input type="checkbox"/>	1-VS-F-7A & B	GREEN
<input type="checkbox"/>	1-VS-HV-5	GREEN
<input type="checkbox"/>	1-VS-F-56A & B	GREEN
<input type="checkbox"/>	1-VS-F-40A & B	GREEN
<input type="checkbox"/>	1-VS-HV-4	OFF
<input type="checkbox"/>	2-VS-F-40A or B	RED
<input type="checkbox"/>	2-VS-HV-4	OFF

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE	ATTACHMENT 3
REVISION 69	AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	PAGE 2 of 6

TABLE 2  
VNTX PANEL

<u>MARK NUMBER</u>	<u>EXPECTED EQUIPMENT STATUS</u>	<u>RESPONSE NOT OBTAINED</u>
<input type="checkbox"/> a. AOD-VS-107A & B AOD-VS-108	RED GREEN	<input type="checkbox"/> a. Place AUX BLDG CENTRAL AREA MODE switch to FILTER.
<input type="checkbox"/> b. MOD-VS-100A & B AOD-VS-106	RED GREEN	<input type="checkbox"/> b. • Place MOD-VS-100A to FILTER. • Place MOD-VS-100B to FILTER.
<input type="checkbox"/> c. MOD-VS-200A & B AOD-VS-206	GREEN RED	<input type="checkbox"/> c. • Place MOD-VS-200A to UNFILTER. • Place MOD-VS-200B to UNFILTER.
<input type="checkbox"/> d. AOD-VS-103A & B AOD-VS-104	GREEN GREEN	<input type="checkbox"/> d. • Place AOD-VS-103A in UNFILTER. • Place AOD-VS-103B in UNFILTER. • Place AOD-VS-104 in FILTER.
<input type="checkbox"/> e. AOD-VS-101A & B AOD-VS-102	GREEN GREEN	<input type="checkbox"/> e. Place AOD-VS-101A and 101B in UNFILTER.
<input type="checkbox"/> f. AOD-VS-111A & B	GREEN	<input type="checkbox"/> f. Place COMBINE CONTAINMENT EXHAUST in ISOLATE.
<input type="checkbox"/> g. AOD-VS-110	GREEN	<input type="checkbox"/> g. Place AOD-VS-109A and 109B in FILTER.
<input type="checkbox"/> h. AOD-VS-112A & B	GREEN	<input type="checkbox"/> h. • Place AOD-VS-112A in CLOSE. • Place AOD-VS-112B in CLOSE.
<input type="checkbox"/> i. MOD-VS-58A & B 1-VS-F-58A & B	RED RED	<input type="checkbox"/> i. Start 1-VS-F-58A and 1-VS-F-58B.
3. ____ Check filtered exhaust flow: (as read on FI-VS-117A and FI-VS-117B)		
<input type="checkbox"/> • Total flow - GREATER THAN 32400 cfm		
<u>AND</u>		
<input type="checkbox"/> • Flow through each filter bank - LESS THAN 39600 cfm		

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 3 of 6

4. \_\_\_\_ Check all Station Service Buses - ENERGIZED. IF NOT, THEN initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.
5. \_\_\_\_ Check annunciator VSP-J2 - LIT.
6. \_\_\_\_ Check Unit 1 RSST LTC time delay bypass light - LIT.
7. \_\_\_\_ Check stopped or stop 1-VS-AC-4.
8. \_\_\_\_ Place 1-VS-43-VS103X, MCR ISOLATION switch to the OFF position.
9. \_\_\_\_ Check closed or close MCR isolation dampers.
  - ☐ • 1-VS-MOD-103A
  - ☐ • 1-VS-MOD-103B
  - ☐ • 1-VS-MOD-103C
  - ☐ • 1-VS-MOD-103D

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 4 of 6

\*\*\*\*\* :

**CAUTION:** • Only one Emergency Supply Fan must be started in the following step.

- Chilled Water flow to the in-service Unit 1 MCR AHU must be throttled to at least 15 gpm when the Emergency Supply fan is started.
- Chilled Water flow to the in-service Unit 2 MCR AHU must be throttled to at least 25 gpm when the Emergency Supply fan is started.
- An Emergency Supply Fan must not be started if the filter is wet.

\*\*\*\*\* :

10. Immediately start ONE Emergency Supply Fan IAW the following: (1-VS-F-41 or 2-VS-F-41 preferred)
  - a. IF 1-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 1-VS-F-41.
  - b. IF 2-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 2-VS-F-41.
  - c. IF 1-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 1-VS-F-42.
  - d. IF 2-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
    - \_\_\_ 1. Open 2-VS-MOD-204B, CONT RM EMERG SUP MOD.
    - \_\_\_ 2. Start 2-VS-F-42.
  - e. \_\_\_ Adjust Chilled Water flow to MCR AHUs IAW Step 10 Caution.

Unit 2 will prompt BOP: Chilled Water has been aligned IAW CAUTION prior to Step 1.

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 5 of 6

11. \_\_\_\_ Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.

- ☐ • PDI-VS-100, D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-101, D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-200, D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-201, D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • 1-VS-PDI-118 (Unit 1 Computer Room)
- ☐ • 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
- ☐ • 2-VS-PDI-215 (Unit 2 AC Room)
- ☐ • 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)

Unit 2 will prompt BOP: MCR  
Boundary DP is the same as DP  
indicated on Unit 2 Ventilation Panel.

12. \_\_\_\_ IF any reading NOT positive, THEN initiate Attachment 6 to secure MCR boundary fans.

13. \_\_\_\_ Check initiated or initiate 0-AP-50.00, OPPOSITE UNIT EMERGENCY.

14. \_\_\_\_ Check the following MCR and ESGR air conditioning equipment operating. IF NOT, THEN start equipment within 1 hour IAW the appropriate subsection of 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM.

- ☐ • One Control Room chiller
- ☐ • One Unit 1 Control Room AHU
- ☐ • One Unit 2 Control Room AHU
- ☐ • One Unit 1 ESGR AHU
- ☐ • One Unit 2 ESGR AHU

15. \_\_\_\_ IF both of the following conditions exist, THEN check that Load Shed is activated.

- ☐ • Unit 2 - SUPPLIED BY RSST
- ☐ • Unit 2 RCPs - RUNNING

Unit 2 will prompt BOP: Unit 2 remains operating at 100% power.  
Unit 2 will assume responsibility for the Attachment action from this point.

16. \_\_\_\_ IF Load Shed is required and not activated, THEN initiate 0-AP-10.10, LOSS OF AUTO LOAD SHED.

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Scenario No.: 3

Event No.: 8

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Event Description: SBLOCA, 1-AP-16.00, 1-E-0.

Cue: By Evaluator.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 6 of 6

**NOTE:** • SFP checks should be initiated WITHIN ONE TO TWO HOURS of EOP entry.

- Loss of power may render SFP indications and alarms non-functional and require local checks. Power supplies are as follows:
  - TI-FC-103, Unit 1 Semi-Vital Bus
  - TI-FC-203, Unit 2 Semi-Vital Bus
  - 1-FC-LIS-104, Panel 1ABDA1
- Loss of AC Power to the SFP level indicator is indicated if both low and high level alarms are in simultaneously. (0-VSP-C4 and 0-VSP-D4)
- 1-DRP-003, CURVE BOOK, provides a graph for SFP time to 200°F if loss of SFP cooling occurs.

17. \_\_\_\_ Initiate monitoring SFP parameters:

- ☐ • SFP level - Greater than Cooling Pump suction AND Stable
- ☐ • SFP temperature - Stable or Decreasing
- ☐ • SFP Cooling Pumps - Either Running
- ☐ • Component Cooling - Normal

18. \_\_\_\_ Continue to monitor parameters every one to two hours or until authorized to terminate monitoring by the Station Emergency Manager and/or the Shift Manager.

19. \_\_\_\_ Notify the Station Emergency Manager and/or the Shift Manager of the status and trend of SFP parameters.

20. \_\_\_\_ IF any abnormality or adverse trend is identified, THEN initiate 0-AP-22.02, MALFUNCTION OF SPENT FUEL PIT SYSTEMS.

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Scenario No.: 3

Event No.: 9

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

Time	Position	Applicant's Action or Behavior
		1-FR-Z.1 Actions
		<b>CAUTION:</b> If 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, containment spray systems should be operated as directed by 1-ECA-1.1, instead of Step 1 below.
	SRO	1 CHECK IF CS REQUIRED: a) Check CTMT pressure - HAS INCREASED TO GREATER THAN 23 PSIA  b) Check CS pumps - RUNNING
		b) IF RWST level greater than 3%, THEN start CS pumps. IF any CS pump can NOT be started, THEN monitor OSRS pumps for cavitation.
	RO	<b>Starts 1-CS-P-1A / 1B</b>  c) Check CS system valves - OPEN • 1-CS-MOV-100A • 1-CS-MOV-100B • <b>1-CS-MOV-101A and B</b> • <b>1-CS-MOV-101C and D</b> • <b>1-CS-MOV-102A and B</b>
		IF cavitation is indicated, THEN put affected OSRS pump in PTL
		c) Manually align CS valves.
	RO	<b>Opens Valves Listed Above (BOLDED).</b>  d) Stop all RCPs
	RO	<i>Stops RCPS and acknowledges Loop Low Flow Alarms.</i>
		<b>Critical Task:</b> CT-2: WOG E-0—E: Manually actuate at least the minimum required complement of containment cooling equipment before an extreme (red-path) challenge develops to the CSF. Establish CS flow from at least one CS pump before containment pressure exceeds 60 psia AND at least one RS train before RMT.
		<b>CRITICAL TASK STOP TIME:</b> _____

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Event No.: 9

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

	SRO	1-FR-Z.1 Actions
	RO	2 CHECK SW FLOW TO RS HXs - GREATER THAN 4750 GPM Align valves as necessary. <i>Checks flow &gt; 4750 GPM following the Opening of the SW Valves Listed below.</i> a) Check the following valves – OPEN • 1-SW-MOV-103A, B, C, and D • 1-SW-MOV-104A, B, C, and D • 1-SW-MOV-105A, B, C, and D
	RO	<b>Open the SW MOVs listed above.</b>
	SRO	1-FR-Z.1 Actions 3 CHECK RS SYSTEMS: a) Check RWST level -LESS THAN 60% a) Do the following: 1) Monitor RWST level. 2) WHEN RWST level is less than 60%, THEN perform Steps 3b and 3c.
	SRO	1-FR-Z.1 Actions 4 CHECK INTAKE CANAL LEVEL – GREATER THAN 24 FT
	RO	<i>Reports Intake Canal Level 29 feet and Stable.</i>
	SRO	1-FR-Z.1 Actions 5 CHECK CTMT ISOLATION VALVES - CLOSED IAW ATTACHMENT 1 Aligns Valves as necessary. <b>NOTE:</b> BOP and SRO may confer on leaving 1-IA-TV-100 open. <b>NOTE:</b> FR-Z.1 Actions located at the end of this section.
	BOP	IF flow path NOT necessary, THEN close valves
	SRO	1-FR-Z.1 Actions 6. ____ CHECK MSTVs - CLOSED Manually close MSTVs.
	RO/BOP	<b>Closes MSTVs if not already performed.</b>



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Event No.: 9

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

		1-FR-Z.1 Actions  <b>CAUTION:</b> <ul style="list-style-type: none"> <li>• At least one SG must be maintained available for RCS cooldown.</li> <li>• If all SGs are faulted, at least 60 gpm [100 gpm] feed flow should be maintained to each SG.</li> </ul>
	SRO	7. ____ CHECK IF FEED FLOW SHOULD BE ISOLATED TO ANY SG(s):  <div style="display: flex; justify-content: space-between;"> <div> a) Check pressures in all SGs: <ul style="list-style-type: none"> <li>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER</li> <li>OR</li> <li>• ANY SG COMPLETELY DEPRESSURIZED</li> </ul> </div> <div>a) GO TO Step 8</div> </div>
	RO/BOP	<i>Reports SGs NOT Faulted.</i>
		1-FR-Z.1 Actions  8 CHECK SERVICE WATER AVAILABLE: a) Check Intake Canal level – BEING MAINTAINED BY CIRC WATER PUMPS  Reports Intake Canal Level 29 feet and Stable. Being maintained by CW pumps.  b) RETURN TO procedure and step in effect  <b>Returns to 1-E-1, Step In Effect.</b>
	SRO	
	RO/BOP	
	SRO	

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

NUMBER 1-FR-Z.1	ATTACHMENT TITLE  CONTAINMENT ISOLATION VALVES	ATTACHMENT 1
REVISION 20		PAGE 1 of 1

LOCATION: Vertical BoardLIGHTS: GREEN

___ 1-BD-TV-100A	___ 1-SS-TV-106A	___ 1-SS-TV-100A	___ 1-VG-TV-109A	___ 1-SI-TV-101A
___ 1-BD-TV-100B	___ 1-SS-TV-106B	___ 1-SS-TV-100B	___ 1-VG-TV-109B	___ 1-SI-TV-101B
___ 1-BD-TV-100C	___ 1-SS-TV-102A	___ 1-SS-TV-101A	___ 1-DG-TV-108A	___ 1-RC-TV-1519A
___ 1-BD-TV-100D	___ 1-SS-TV-102B	___ 1-SS-TV-101B	___ 1-DG-TV-108B	___ 1-SI-TV-100
___ 1-BD-TV-100E	___ 1-SS-TV-104A	___ 1-SS-TV-103A	___ 1-CC-TV-109A	___ 1-CH-TV-1204A
___ 1-BD-TV-100F	___ 1-SS-TV-104B	___ 1-SS-TV-103B	___ 1-CC-TV-109B	___ 1-CH-TV-1204B
___ 1-RM-TV-100C	___ 1-LM-TV-100A	___ 1-LM-TV-100E		___ 1-CV-TV-150A
___ 1-RM-TV-100B	___ 1-LM-TV-100B	___ 1-LM-TV-100F		___ 1-CV-TV-150B
___ 1-RM-TV-100A	___ 1-LM-TV-100C	___ 1-LM-TV-100G	___ 1-DA-TV-100A	___ 1-CV-TV-150C
___ 1-CC-TV-105A	___ 1-LM-TV-100D	___ 1-LM-TV-100H	___ 1-DA-TV-100B	___ 1-CV-TV-150D
___ 1-CC-TV-105B	___ 1-CC-TV-140A	___ 1-CC-TV-110A	___ 1-MS-TV-110	___ 1-MS-TV-109
___ 1-CC-TV-105C	___ 1-CC-TV-140B	___ 1-CC-TV-110B	___ 1-CC-TV-110C	___ 1-IA-TV-100
___ 1-SV-TV-102A	___ 1-SV-TV-102	___ 1-IA-TV-101A		___ 1-IA-TV-101B
				___ 1-CH-MOV-1381

Valves Operated for Hi CLS Failure.

Valves Operated for Hi Hi CLS Failure.

Valve BOP/SRO may confer and leave open.

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

NUMBER 1-E-0	ATTACHMENT TITLE  CLS COMPONENT VERIFICATION	ATTACHMENT 4
REVISION 69		PAGE 1 of 2

LOCATION: <u>Vertical Board</u>	VALVE POSITION: <u>CLOSED</u> LIGHTS: <u>GREEN</u>
---------------------------------	---

<div style="border: 1px solid orange; padding: 2px; margin-bottom: 5px;">           ___ 1-RM-TV-100C            ___ 1-RM-TV-100B            ___ 1-RM-TV-100A         </div> <div style="border: 1px solid red; padding: 2px; margin-bottom: 5px;">           ___ 1-CC-TV-105A         </div> <div style="border: 1px solid red; padding: 2px;">           ___ 1-CC-TV-105B    ___ 1-CC-TV-140A    ___ 1-CC-TV-110A            ___ 1-CC-TV-105C    ___ 1-CC-TV-140B    ___ 1-CC-TV-110B    ___ 1-CC-TV-110C         </div>	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="color: orange;">Valves Operated for Hi CLS Failure.</p> <p style="color: red;">Valves Operated for Hi Hi CLS Failure.</p> <p style="color: green;">Valve BOP/SRO may confer and leave open.</p> </div>
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___ 1-SV-TV-102    ___ 1-IA-TV-101A	<div style="border: 1px solid green; padding: 2px; display: inline-block;">             ___ 1-IA-TV-100           </div> ___ 1-IA-TV-101B
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LOCATION: <u>Unit 1 Vent Panel</u>	RECIRC FAN STATUS: <u>OFF</u> LIGHTS: <u>AMBER</u>
------------------------------------	---

___ 1-VS-F-1A	___ 1-VS-F-1B
---------------	---------------

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LOCATION: <u>Bench Board</u>	VALVE POSITION: <u>OPEN</u> LIGHTS: <u>RED</u>
------------------------------	---

___ 1-SW-MOV-105A	___ 1-SW-MOV-105B	___ 1-SW-MOV-105C	___ 1-SW-MOV-105D
___ 1-SW-MOV-104A	___ 1-SW-MOV-104B	___ 1-SW-MOV-104C	___ 1-SW-MOV-104D
___ 1-SW-MOV-103A	___ 1-SW-MOV-103B	___ 1-SW-MOV-103C	___ 1-SW-MOV-103D

Check SW Outlet flow from RS HXs between 6,000 gpm and 12,500 gpm:

- 1-SW-FI-106A, RS HX A
- 1-SW-FI-106B, RS HX B
- 1-SW-FI-106C, RS HX C
- 1-SW-FI-106D, RS HX D

LOCATION: <u>Radiation Monitoring Panel</u>	PUMPS: <u>RUNNING (Time delayed)</u>
---	--------------------------------------

___ 1-SW-P-5A	___ 1-SW-P-5B	___ 1-SW-P-5C	___ 1-SW-P-5D
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Scenario No.: 3

Event No.: 9

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Event Description: Hi and Hi-Hi CLS Fail, FR-Z.1.

Cue: By Event 8.

NUMBER 1-E-0	ATTACHMENT TITLE  CLS COMPONENT VERIFICATION	ATTACHMENT 4
REVISION 69		PAGE 2 of 2

LOCATION: Annunciator Panel AALARMS: CLEAR

☐ A-D-6 RS HX 1A RAD MON PP NO FLOW  
☐ A-E-6 RS HX 1B RAD MON PP NO FLOW  
☐ A-F-6 RS HX 1C RAD MON PP NO FLOW  
☐ A-G-6 RS HX 1D RAD MON PP NO FLOW

☐ IF alarm is LIT, THEN stop associated rad monitor pump AND monitor SW activity using RI-SW-120.

LOCATION: Bench BoardVALVE POSITION: OPEN  
LIGHTS: RED

☐ 1-CS-MOV-102A ☐ 1-CS-MOV-102B  
☐ 1-RS-MOV-156A ☐ 1-RS-MOV-156B

☐ 1-CS-MOV-101B ☐ 1-CS-MOV-101D  
☐ 1-CS-MOV-101A ☐ 1-CS-MOV-101C  
☐ 1-RS-MOV-155A ☐ 1-RS-MOV-155B  
☐ 1-CS-MOV-100A ☐ 1-CS-MOV-100B

----- IF EVENT - CLS HI HI AND LOSS OF RSS -----

LOCATION: Bench BoardVALVE POSITION: CLOSED  
LIGHTS: GREEN

☐ 1-CW-MOV-100A ☐ 1-CW-MOV-100B ☐ 1-CW-MOV-100C ☐ 1-CW-MOV-100D  
☐ 1-CW-MOV-106A ☐ 1-CW-MOV-106B ☐ 1-CW-MOV-106C ☐ 1-CW-MOV-106D  
☐ 1-SW-MOV-101A ☐ 1-SW-MOV-101B ☐ 1-SW-MOV-102A ☐ 1-SW-MOV-102B

Section Not Performed for this Scenario.

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER	CONTINUOUS ACTIONS PAGE	REVISION
1-E-0		69

1. RCP TRIP CRITERIATrip all RCPs if BOTH conditions listed below occur:

- Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- RCS Subcooling - LESS THAN 30°F [85°F]

2. MINIFLOW RECIRC CRITERIA

- CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- OPEN - When RCS pressure is greater than 2000 psig.

3. ADVERSE CONTAINMENT CRITERIAUse Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

1. AMSAC RESET CRITERIAAMSAC may be manually reset when level in all three SGs is greater than 13% or six minutes have elapsed since the Reactor trip. When AMSAC is reset, AMSAC ARMED annunciator H-D-1 should clear and affected components may be realigned as needed.2. TD AFW PUMP SHUTDOWN CRITERIA

The TD AFW pump may be secured when SG NR level is greater than 22% in at least 2 SGs, AMSAC is reset, and no auto-start signal exists. To secure the pump, the pump SOV control switches must be taken to OPEN-RESET and then to CLOSE.

3. MANUAL SI ALIGNMENT

If SI fails to automatically align, Attachment 2 may be used for guidance on manual SI valve alignment.

4. \* TRANSIENT AFW FLOW CONTROL (IF SI in progress)

Attachment 8 may be used for guidance on transient AFW flow control.

5. \* FAULTED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 9 may be used for guidance on faulted SG(s) isolation and AFW flow control.

6. \* RUPTURED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 10 may be used for guidance on ruptured SG(s) isolation and AFW flow control.

7. \* LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

\* Preemptive Actions

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER	CONTINUOUS ACTION STEPS	REVISION
1-E-0		69

1. Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F. (E-0, Step 6)
2. Monitor RCP Trip and Miniflow Recirc Criteria. (E-0, Step 8)
3. Check SG Narrow Range Level - ANY SG GREATER THAN 12%. (Control feed flow to maintain Narrow Range Level between 22% and 50%) (E-0, Step 25)
4. Monitor LHSI pumps and secure as necessary. (E-0, Step 30)

**NOTE:** Subsequent SI signals may be reset by reperforming Step 12 of Attachment 1.

5. Monitor CTMT pressure and check CLS initiation as necessary. (Attachment 1, Step 8)
6. Monitor RWST level and check RS initiation as necessary. (Attachment 1, Step 9)
7. Block Low PRZR Pressure SI signal when less than 2000 psig. (Attachment 1, Step 10)
8. Block Low Tave SI signal when less than 543°F. (Attachment 1, Step 11)

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Event No.: N/A

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

CONTINUOUS ACTIONS PAGE FOR 1-E-11. RCP TRIP CRITERIATrip all RCPs if BOTH conditions listed below occur:

- a. Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- b. RCS Subcooling - LESS THAN 30°F [85°F]

2. SI REINITIATION CRITERIAFollowing SI termination or SI flow reduction, manually start SI pumps and align valves as necessary if EITHER condition listed below occurs:

- RCS subcooling based on CETCs - LESS THAN 30°F [85°F]
- PRZR level - CANNOT BE MAINTAINED GREATER THAN 22% [50%]

3. MINIFLOW RECIRC CRITERIA

- a. CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- b. OPEN - When RCS pressure is greater than 2000 psig.

4. ADVERSE CONTAINMENT CRITERIAUse Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

5. SECONDARY INTEGRITY CRITERIA

Manually start SI pumps as necessary and GO TO 1-E-2, FAULTED STEAM GENERATOR ISOLATION, if any SG pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.

6. E-3, TRANSITION CRITERIA

Manually start SI pumps as necessary and GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE, if any SG level increases in an uncontrolled manner or any SG has abnormal radiation.

7. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

8. AFW SUPPLY SWITCHOVER CRITERIA (Refer to Attachment 6)

Transfer to one of the following alternate AFW water supplies if ECST level decreases to less than 20%.

- a. 1-CN-TK-2, using 1-CN-150.
- b. 1-CN-TK-3, using AFW Booster Pumps.
- c. AFW Crosstie.
- d. Firemain.

9. RCP SEAL INJECTION CRITERIA

Seal Injection flow should be maintained to all RCPs.

10. LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

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## SIMULATOR OPERATOR'S GUIDE

**Simulator Setup**Initial Conditions:

Recall IC -XXX and implement **TRIGGER #30** to activate all passive malfunctions and verify **Trigger #30** implemented.

Open the monitor window and add the following points to it:

- asp\_ao\_off
- set sphhcntprs\_k1 = 60
- iadryer\_reset
- ??

Enter the following MALFUNCTIONS:

Malfunction	Delay	Ramp	Trigger	Value	Final	Trigger Type (Auto or Manual)
RC0801 TAVE TAYLOR MATH UNIT FAILURE HI/LOW	10	0	1	0	-1	MAN
MS0801 SG A STM FLOW TRNSMTR MS-FT-475 FAILURE	10	20	3	0	-1	MAN
EL4902 BKR 15J8 SPURIOUS TRIP	10	0	5	FALSE	TRUE	MAN
RC04 RCS LEAK NONISOLABLE (0 - 1200 GPM)	10	0	9	0	3.5	MAN
RM0202 PROCESS RAD MONITOR RI-RMS-159 FAILURE	10	0	9	0	0.1	MAN
RM0201 PROCESS RAD MONITOR RI-RMS-160 FAILURE	10	0	9	0	0.1	MAN
CA03 Disable IA-TV-101A Auto Closure	0	0	9	FALSE	TRUE	MAN
CA06 Disable IA-TV-101B Auto Closure	0	0	9	FALSE	TRUE	MAN
RC0101 RCS COLD LEG A PIPE RUPTURE	10	600	11	0	.6	MAN
RS0901 TRN A HI CLS FAILS TO ACTIVATE	0	0	30	FALSE	TRUE	ACTIVE
RS0902 TRN B HI CLS FAILS TO ACTIVATE	0	0	30	FALSE	TRUE	ACTIVE



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## SIMULATOR OPERATOR'S GUIDE

Enter the following EVENT TRIGGERS:

Event #	EVENT	Command
7	MS3	N/A
12	RD3	set mrc24_deg(3) = 0.5

Enter the following Remote Functions:

Override	Set Condition	Trigger
AC_SMS_MODE	OFF	30

Enter the following Override:

Override	Set Condition	Trigger
TEST_IRL_IIL EHC TEST IRL IIL	ON, 10 Sec TD	7
CLS_ACT_TRA	OFF	30
CLS_ACT_TRB	OFF	30

TRIGGER	TYPE	DESCRIPTION
1	MAN	TAVE TAYLOR MATH UNIT FAILURE LOW
3	MAN	SG A STM FLOW TRNSMTR MS-FT-475 FAILURE
5	MAN	BKR 15J8 SPURIOUS TRIP
7	MAN	IRL/IIL TEST PUSHBUTTON FAILURE
9	MAN	RCS LEAK NONISOLABLE (35 GPM) with AUTO ACTIONS RM-159/160 FAILURE
11	MAN	LBLOCA WITH HI and HI HI CLS FAILED

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## SIMULATOR OPERATOR'S GUIDE

**Verify the following control room setup:**

- ☐ Place the simulator in RUN and verify normal 100% power operation indications.
- ☐ Reset the ROD CONTROL SYSTEM
- ☐ Verify Red Magnets on the following components:

--	--	--

- ☐ Verify 1-RM-RI-112 aligned to A/B SG and 1-RM-RI-113 aligned to C SG (magnets).
- ☐ Verify Ovation System operating.
- ☐ Reset ICCMs.
- ☐ Verify Component Switch Flags.
- ☐ Verify Brass Caps properly placed.
- ☐ Verify SG PORVs set for 1035 psig.
- ☐ Verify Rod Control Group Step Counters indicate properly.
- ☐ Verify Ovation CRT display.
- ☐ Advance Charts
- ☐ Verify Turbine Thumb Wheel Settings @120 rpm/min and Position 6
- ☐ Verify Containment Instrument Air Compressors are on Inside Suction (all RMs reset)
- ☐ Verify all ARPs have been cleaned
- ☐ Verify CLEAN copies of the following procedures are in place:

<input type="checkbox"/> AP-53.00	<input type="checkbox"/> AP-16.00	<input type="checkbox"/> AP-23.00	<input type="checkbox"/>
<input type="checkbox"/> E-0	<input type="checkbox"/>	<input type="checkbox"/> E-1 (2)	<input type="checkbox"/>
<input type="checkbox"/> OP-CH-007		<input type="checkbox"/> Reactivity Sheet	
<input type="checkbox"/> OP-ZZ-002		<input type="checkbox"/> 1-OP-EH-001	

- ☐ **Verify Reactivity Placard is current.**
- ☐ Verify ALL PINK MAGNETS are accounted for.

**SIMULATOR OPERATOR'S GUIDE****Brief**

This simulator performance scenario is performed in the EVALUATION MODE. You should not direct questions to the evaluators. Otherwise, you should perform as if you were in the MCR.

Your ability to maintain a log is not being graded, but maintaining a rough log is recommended to help during briefs.

If you need to communicate with the Unit 2 operator, verbally state, "Unit 2" and an instructor will locate to the Unit 2 area and respond to you as quickly as possible.

In the unlikely event that the simulator fails such that illogical indications result, the session will be terminated. In other words, respond to what you see. If there is a problem with the simulation, the session will be terminated or adjusted as appropriate based on the specific problem.

Assign operating positions.

Ask for and answer questions.

**Op-Test No.: Surry 2014-1****Scenario No.: 3****Page 91 of 104****SIMULATOR OPERATOR'S GUIDE****Conduct shift turnover:**

The BOP is to Swap running EH pumps IAW 1-OP-EH-001, ELECTRO-HYDRAULIC FLUID SYSTEM (EHC), Section 5.6. The Drain Return Filters are not required to be swapped. The Turbine Building Operator has already been briefed and is standing by at the Lube Oil Reservoir for local actions as necessary.

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1.

The last shift performed two 35 gallon alt dilutions followed by a manual makeup for training.

"A" BAST at 8.0 W/%.

**When the team has accepted the shift, proceed to the Session Conduct Section.**

**SIMULATOR OPERATOR'S GUIDE****Session Conduct:**

- Ensure conditions in Simulator Set-up are established.
- **Ensure Trigger 30 is active prior to team entering the simulator.**
- Verify Exam Security has been established and ASP\_AO\_OFF = True.

**EVENT 1      Swap EH Pumps, section 5.6, 1-OP-EH-001.****BOOTH:**

30 minutes prior to the beginning of the scenario, provide the team with a copy of 1-OP-EH-001, ELECTRO-HYDRAULIC FLUID SYSTEM (EHC). The team will pre-brief the OP prior to entering the simulator.

**Operations Supervisor/Management:**

- **If contacted**, will acknowledge the completion of the evolution.

**Field Operator: (2 minute delay from request to answer)**

- **If Contacted**, EHC skid is clear of personnel.
- **If Contacted**, MP-2 is running normally.
- **If Contacted**, MP-1 is normal after stop.

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 2      Failure Median Tave Low, 0-AP-53.00.**When cued by examiner, implement Trigger #1.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of Median Tave. The individual(s) contacted will also acknowledge entry into AP-53.00.
- **If contacted**, will take responsibility for writing the CR.

STA:

- **If contacted**, will acknowledge the failure of Median Tave.
- **If asked**, the STA will report that upon review of CEP 99-0029, Median Tave is listed in CEP 99-0029.
- **If asked**, the STA will review VPAP-2802 and TRM Section 3.3 and report that the results of the review have been discussed with Shift Manager.
- The STA reports completion of the review; Neither VPAP-2802 or the TRM is impacted by this failure.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge instrumentation failure and commence investigation of the failure.

Unit 2 Operator:

- **If contacted**, will acknowledge the failure.

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 3**      **Failure of Steam Flow Channel Low, "A" SG. 0-AP-53.00.**When cued by examiner, implement Trigger #3.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of 1-MS-FT-1474. The individual(s) contacted will also acknowledge any TS LCOs.
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, will acknowledge entry into 72 hour clock to place the channel in trip.
- **If contacted**, 1-OP-RP-001 may wait until I&C comes to the MCR to brief on placing the channel in trip.

STA:

- **If contacted**, will acknowledge the failure of 1-MS-FT-1474. The individual(s) contacted will also acknowledge any TS LCOs. The STA will not confirm or deny any TS decisions.
- **If contacted**, will take responsibility for writing the CR.
- **If asked**, 1-MS-FT-1474 is a RG 1.97 variable. CEP 99-0029, Attachment 1, D-19 Variable. 1 Channel per SG required.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. STA will also state that containment conditions and the electrical conditions are as you see them.
- **When directed**, STA review of VPAP-2802 and TRM Section 3.3. The STA reports he has completed these reviews and there is no impact.

Field Operators:

- Will perform actions as directed.

I&amp;C:

- If notified by MCR to place the channel in trip, state that you will review the procedure and notify the Shift Manager when ready to brief.

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## SIMULATOR OPERATOR'S GUIDE

Maintenance/ Work Week Coordinator:

- **If contacted**, will notify I&C of the failure.

Unit 2:

- **If contacted**, will acknowledge the channel failure.
- **If it appears**, that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.

Role-play as other individuals as needed.



## SIMULATOR OPERATOR'S GUIDE

**EVENT 4**      **1J 4160V emergency bus off-site power supply breaker trips. 1-AP-10.07.**

When the Evaluator is ready, Implement Trigger #5 for the failure.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the loss of 1J 4160 V bus, and the start and load of #3 EDG.
- If contacted, will inform OM on Call and Electrical Foreman.

STA:

- **If contacted**, will acknowledge the loss of 1J 4160V bus and the start and load of #3 EDG.
- **After directed**, the STA will report that he has reviewed VPAP-2802 and no notifications were required.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. STA will also state that containment conditions and the electrical conditions are as you see them.

Maintenance/ Work Week Coordinator:

- **If contacted**, will acknowledge the failure and commence investigations.

Field Operators:

- **If contacted**, will check status of 15J8 breaker and find a 'C' phase time overcurrent drop.
- **If asked**, the condensate polishing building operator will report current polishing building DP (read from simulator screen).
- **When Directed**, to check status of IA compressors (1B-E6 ARP), CA6 1-IA-C-1 IA Local Panel, the local panel will have an 'Alarm' light lit. Depress U1\_IAC1\_SET button to clear alarm.
- **When Directed**, to check status of IA Dryer (1B-E5 ARP), the dryer will be bypassed, use IADRYER\_RESET on monitor to reset the dryer.
- **When contacted**, to close 15J9 breaker, EL11, Unit 1 – 4160 Breakers, 15J9, scroll to bottom of pop-up box, double click on SW\_15J9\_RF, select close, INSERT.

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## SIMULATOR OPERATOR'S GUIDE

- **When contacted**, RM-159/160 Particulate and Gas RM skid is normal.
- When contacted, concerning monitoring of #3 EDG parameters, follow instructions.

Unit 2:

- **When contacted**, If it appears that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.

Role-play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENT 5      Test Button failure, 1RL/1IL close, 0-AP-23.00 ramp to 71%.**

When cued by examiner, implement Trigger #5.

Operations Supervisor/Management:

- **If contacted**, will acknowledge closure of 1RL/1IL. Also acknowledge the entry into AP-53.00/AP-38.00 for the failure.
- **If asked** for a recommended ramp rate, ask what the Unit Supervisor recommends. When authorized by the NRC, the Shift Manager will direct a 1%/minute ramp rate.
- **If contacted**, will take responsibility for writing the CR.

Unit 2 Operator:

- **If notified**, acknowledge the failure and impending ramp of Unit 1.

STA:

- **If contacted**, will acknowledge the closure of 1RL/1IL, and entry into AP-53.00/AP-38.00.
- **If contacted**, will take responsibility for writing the WR and CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. STA will also state that containment conditions and the electrical conditions are as you see them.
- The STA will acknowledge the Reactivity Plan reported by the RO.
- If contacted, STA review of VPAP-2802 complete, reviewed with Shift Manager, no notifications required.

**SIMULATOR OPERATOR'S GUIDE**

Field Operators:

- **If contacted**, as the Turbine Building Operator to walkdown the Turbine during the ramp, acknowledge the direction.
- **If contacted**, as the polishing building operator, acknowledge the direction to monitor polisher DP.
- **If contacted**, as Turbine Building operator, the 1RL/1IL valves are closed, no external abnormalities noted.

Role play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENTS 6    RCS Leak 35 gpm. 1-AP-16.00.**

Note: It would be preferable to wait until power is <80% to implement this failure to allow for ramp stabilization prior to creating RCS leak; this will allow the team to assess leakrate with more precision.

When the Evaluator is ready, implement Trigger # 9

Operations Supervisor/Management:

- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will acknowledge entry into AP-16.00.
- **If contacted**, will acknowledge Unit shutdown imminent due to excessive RCS leakage.
- **If contacted**, will acknowledge EIPs require evaluation.

STA:

- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.
- **When Notified**, acknowledge that EIPs require evaluation.

Unit Two:

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms when directed and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO/BOP.
- **If asked**, blowdown and air ejector RM readings are [*as indicated at the time*].

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## SIMULATOR OPERATOR'S GUIDE

- **When reuired**, assit Unit by acknowledging Fire Panel Alarms.
- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.

Field Operators:

- **If contacted**, field operators will perform valve manipulations as required:

Health Physics:

- **If contacted**, will acknowledge the leak of RCS coolant into containment.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge the failure.

STA:

- **If asked**, will acknowledge the increase in RCS leakage.
- **If contacted**, will enter the control room and and prepare for the transient brief (items are reported "as you see them or previously reported").
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. Radiological conditions are as indicated. He will also state that containment conditions and the electrical conditions are as you see them.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge the failure.

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 7     Particulate and gas RM fail, No Auto Actions.**

Implemented with Trigger #9.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of the automatic actions on RM-160 High alarm.
- **If contacted**, will take responsibility for writing the WR and CR.

Unit 2 Operator:

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms and report the alarm to the Unit 1 SRO.
- **If directed**, perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.

Field Operators:

- **If directed**, field operators will perform local manipulations as required.

Role play as other individuals as needed.

**Op-Test No.: Surry 2014-1****Scenario No.: 3****Page 103 of 104****SIMULATOR OPERATOR'S GUIDE****EVENT 8     SBLOCA, 1-AP-16.00, 1-E-0.**

When the Evaluator is ready, actuate Trigger #11.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the reactor trip and Entry into E-0.
- **If contacted**, will acknowledge the subsequent fault on the previously identified ruptured SG. Will also acknowledge any TS information (time permitting) and information related to radiation monitors alarming.
- **If contacted**, will take responsibility for writing the WR and CR.

Unit 2 Operator:

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.

Field Operators:

- **If directed**, field operators will perform local manipulations as required.

Role play as other individuals as needed.



## SIMULATOR OPERATOR'S GUIDE

**EVENT 9**     **Hi and HI-CLS Failure, FR-Z.1.**

Implemented by ACTIVE Triggers.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of Hi and Hi-Hi CLS.

Unit 2 Operator:

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.
- **When BOP performs Attachment 3 of E-0**, MCR Boundary DP readings are the same as the indication on Unit 2 Ventilation Panel. Unit 2 has initiated 0-AP-50.00. Unit 2 remains at 100% power. Assume responsibility for E-0, Attachment 3, monitoring of SFP.

Field Operators:

- **If directed**, field operators will perform local manipulations as required.

Role play as other individuals as needed.

Facility: <u>Surry Power Station</u>	Scenario No.: <u>4</u>	Op-Test No.: <u>2014-001</u>
Examiners: _____ Operators: _____ _____ _____		
Initial Conditions: Time in Core Life – Middle of Life; Core Cycle – Cycle 26  Unit 1 and 2 operating at 100%. All systems and cross ties are operable with the following exception: <ul style="list-style-type: none"> <li>AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.</li> <li>Last Shift performed two (2) 35 gallon alt dilutes followed by a manual makeup for training.</li> <li>"A" BAST at 8.0 W/%.</li> </ul> Turnover: Normal evolution pre-briefed prior to Simulator Entry. The BOP is to swap controlling channels for Channel II testing IAW 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.		

  

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP N – SRO	Perform 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.
2	RC4802, +1 Deg	I – RO TS – SRO	1-RC-PT-1445 fails high, PRZR Pressure channel fail high. AP-31.00, Increasing or Decreasing RCS Pressure.
3	MS1305, +1 Deg	I – BOP TS-SRO	Steam Pressure Channel III, "B" SG fails High. 0-AP-53.00, Loss of Vital Instrumentation/Controls.
4	CH2101, +1 Deg	C – RO	Failure of VCT Level Channel LT-115 High.
5	CC0302 CC0802 SW_15J9_ RF, TRIP	C – BOP TS – SRO	Overcurrent on "B" CC pump with breaker mechanically stuck closed causing the trip of Stub Bus Supply breaker.
6	RD1236	C – RO TS – SRO  R – RO / SRO  N – BOP	Dropped Rod Control Bank C, Group 1; AP-1.00, Rod Control Malfunction, AP-23.00, Rapid Load Reduction.
7	RC MOV 595, 30%  RD17	M - All	RC Loop "C" Tc MOV disc falls into flow stream, Valid "First-Out" received, No Auto or Manual Reactor Trip. 1-FR-S.1, Response to Nuclear Generation/ATWS.
8	SI1502, 40% Deg SI1603 SI1606	M - All	LOCA outside of Containment in Unit 1 Valve Pit Area.
9	SI2402 SI2405	C – BOP	SI Relay SI2A fails to Actuate, SI Relay SI5A Fails to Actuate; 1-SI-P-1A not auto start; MOV-1115D, CH-MOV-115C, CH-MOV1289A, CV-TV-150A, and CH-TV-1204A fail to re-position on SI.

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

**Event #1:**      **Normal Evolution** to swap controlling channels in preparation for channel II testing. IAW 1-OP-RP-001, Section 5.2. BOP will be manipulating controls to swap controlling channels.

**Event #2:**      **1-RC-PT-1445 Fails High.** (I – RO, TS-SRO)

The RO will respond to the alarms and indications received by performing the Immediate Actions of AP-53.00, Loss of Vital Instrumentations/controls; or 1-AP-31.00, Increasing or Decreasing RCS pressure. RCS pressure is expected to lower to less than 2205 psig for a short time period resulting in a Tech Spec consultation.

**Verifiable Actions:**

- 1) RO will place control switch for 1-RC-PCV-1456 in close.
- 2) BOP may place Rod Control in manual to stop rod motion caused by the reactivity inserted by the pressure coefficient.
- 3) RO will close 1-RC-MOV-1535 due to Technical Specification requirements.

**Technical Specifications:**

- 1) The SRO will consult Tech Specs, TS Section 3.1.A.6, and determine that 1-RC-PCV-1456 is Inoperable but capable of being manually cycled, and enter a one hour clock to close the block valve for the PORV. The block valve will remain energized.
- 2) Further consultation will find Tech Spec 3.12.F.1 to restore RCS pressure >2205 psig in 2 hours or reduce Thermal Power to less than 5% in the next 6 hours. The Core Operating Limits Report (COLR, DRP-21) provides the reference for 2205 psig RCS pressure.

**Technical Requirements Manual/R.G. 1.97**

- 1) No TRM or R.G. 1.97 requirements apply.

**Event #3:**      **Steam Pressure Channel III Fails High on “B” steam line causing “B” steam flow increase and “B” FRV to open.** (I – BOP, TS – SRO)

The BOP will respond to the alarms and indication received by placing the “B” FRV in manual and restoring “B” SG NR level to program IAW 1-AP-53.00, Loss of Vital Instrumentation/Controls. The Abnormal Procedure will require the Controlling Steam Flow channel to be swapped to Channel IV so that the “B” FRV can be restored to Auto.

**Verifiable Actions:**

- 1) BOP will place the “B” FRV in manual and restore “B” SG NR level to program.
- 2) RO will shift controlling channel.

**Technical Specifications**

The SRO should consult Tech Specs and determine the following:

- 1) Tech Specs Section 3.7, Table 3.7-1, Item 17, Low steam generator water level with steam/feedwater flow mismatch, Operator Action 6. With the number of Operable channels on less than the total number of channels, Power Operation may proceed provided the channel is placed in the trip condition in 72 hours, the channel may be bypassed for 12 hours for surveillance; if these requirements are not met, the Unit must be placed in Hot Shutdown within 6 hours.
- 2) Tech Spec 3.7, Table 3.7-2, Item 1.c., High differential pressure between any steam line and the steam header, Operator Action 20. With the number of Operable channels less than the total number of channels, Operation may continue provided the failed channel is placed in trip within 72 hours; the channels may be bypassed for 12 hours for surveillance testing; and if the requirements cannot be met, be in Hot Shutdown in 6 hours and reduce RCS temperature and pressure to less than 350°F/450 psig in the following 12 hours.
- 3) Tech Spec 3.7, Table 3.7-2, Item 1.e, High Steam line flow in 2/3 steam lines coincident with low Tav<sub>g</sub> or low line pressure, Operator Action 20. With the number of Operable channels less than the total number of channels, Operation may continue provided the failed channel is placed in trip within 72 hours; the channels may be bypassed for 12 hours for surveillance testing; and if the requirements cannot be met, be in Hot Shutdown in 6 hours and reduce RCS temperature and pressure to less than 350°F/450 psig in the following 12 hours.
- 4) Tech Spec Table 3.7-3, item 2a, Steam Line Isolation. Refers to Tech Spec Table 3.7-2, Item 1.e. See Above.
- 5) Tech Spec Table 3.7-6, Item 16, SG Pressure, 2 per SG are required. This condition is met.

**Technical Requirements Manual/R.G. 1.97:**

- 1) The TRM Section 3.3 2, Appendix R Instrumentation, Table 3.3.2-1, Steam Generator Pressure 1-MS-PI-1485 is a Primary indicator. One of the three listed transmitters must be Functional to meet the requirement. Two of the three are Functional. No TRM requirements for this failure. **(The TRM review is normally performed by the STA in consultation with the Shift Manager; if this item is required to be verified by the Evaluator, it is recommended to be performed as a follow-up after scenario end).**

**RG-1.97**

- 1) RG-1.97 variables, Steam Generator pressure is a A-02 variable, 2 channels per SG are required, table refers to Tech Spec Table 3.7-6. **(The RG 1.97 review is normally performed by the STA in consultation with the Shift Manager; if this item is required to be verified by the Evaluator, it is recommended to be performed as a follow-up after scenario end).**

**Event #4: VCT Level Transmitter LT-115 Fails High. (I – RO)**

The RO is expected to diagnose this failure based upon alarms and indications received. The RO will perform the Immediate Action Steps of 0-AP-53.00, Loss of Vital Instrumentation/Controls and place the VCT divert valve, 1-CH-LCV-1115A, in the

“NORM” position to stop divert of Letdown flow to the PDTT. The Team will continue through the abnormal procedure.

**Verifiable Actions:**

- 1) RO will place the control switch for 1-CH-LT-1115A in the “NORM” position to stop letdown diversion to the PDTT.

**Technical Specifications:**

- 1) There are no Tech Spec or TRM actions required for this failure.

**Technical Requirements Manual:**

- 1) None for this failure.

**Reg. Guide 1.97:**

- 1) RG 1.97 requirements: 1-CH-LI-1115 is a D-29 variable, Category 2. 1 channel is required. Required Action C from Attachment 2; restore the required channel to functional status and use alternate indication to accomplish this function, if possible (VCT level channel 1-CH-LI-1112 functional and meets this requirement). Completion Time 60 days if no alternate indication available OR on or before the next planned outage if an alternate indication is available. **(The RG 1.97 review is normally performed by the STA in consultation with the Shift Manager, if this item is required to be verified by the Evaluator, it is recommended to be performed as a follow-up after scenario end).**

**Event #5:** *Overcurrent of the “B” CC pump with the Breaker Stuck closed, resulting in the trip of the stub bus breaker 15J9 on overcurrent.* (C – BOP, TS-SRO)

The BOP is expected to diagnose this failure based on alarms and indications received. The BOP will place the “B” CC pump in PTL.

**Verifiable Actions:**

- 1) BOP will place the control switch for 1-CC-P-P-1B.
- 2) BOP will start 1-CC-P-1A.

**Technical Specifications:**

- 1) The SRO will consult Tech Specs 3.13.A.2 and determine that the minimum Operable CC pumps requirements are met.
- 2) Consult Tech Spec 3.5.A.1 and determine the Minimum Operable RHR pumps requirement is not met. This requires, IAW TS 3.5.B, that a 14 day clock be entered to restore “A” RHR pump to an Operable condition.

**Event #6:** ***Dropped Control Rod, M-4, Control Bank C, Group 1.*** (C – RO, R – RO, TS – SRO, R – SRO, N – BOP)

The RO is expected to diagnose this failure based on alarms and indications received and place Rod Control in manual to stop outward rod motion IAW 0-AP-1.00, Rod Control Malfunction.

The Team will continue in AP-1.00 to the point where 0-AP-23.00, Rapid Load Reduction will be used to reduce reactor power to 70-74% to meet the TS requirement to be <75% of Rated Power within 1 hour.

**Verifiable Actions:**

- 1) RO will place rod control in manual.
- 2) BOP will perform actions of Annunciator Response Procedure 1G-F8, Bank D WITHDRAWAL to realign group step counters.

**Technical Specifications:**

- 1) The SRO will determine that the dropped control rod is Inoperable since it is misaligned from its Bank  $> \pm 12$  steps. IAW Tech Spec 3.12.C.3, power must be reduced to  $< 75\%$  Rated Power within 1 hour, and the High Neutron Flux trip setpoint shall be reduced to  $\leq 85\%$  of Rated Power within the next 4 hours.
- 2) Shutdown margin must be determined to be satisfactory within 1 hour and every 12 hours thereafter.
- 3) Hot channel factors are shown to be within limits of TS 3.12.B.1 in 72 hours and it shall be demonstrated that the value of  $F_{xy}(Z)$  used in the Constant Axial Offset Analysis is still valid.
- 4) Reevaluation of each accident analysis of Table 3.12-1 is performed within 5 days, to confirm the previous analysis of these accidents remain valid.
- 5) If, except for operation at THERMAL POWER  $< 50\%$  or for physics and control rod assembly surveillance testing, the QUADRANT POWER TILT exceeds 2%, then:
  - a. Within 2 hours, either the hot channel factors shall be determined and the power level adjusted to meet the requirement of Specification 3.12.B.1, or
  - b. The power level shall be reduced from RATED POWER 2% for each percent of QUADRANT POWER TILT. The high neutron flux trip setpoint shall be similarly reduced within the following 4 hours.
- 6) If the QUADRANT POWER TILT exceeds 10%, the power level shall be reduced from RATED POWER 2% for each percent of QUADRANT POWER TILT within the next 30 minutes. The high neutron flux trip setpoint shall be similarly reduced within the following 4 hours.

**Event #7:** ***Tcold Loop stop disc detaches and drops into the flowstream, Valid First-Out indication, No automatic or manual reactor trip, FR-S.1.*** (M – ALL)

This Event begins the Major Accident sequence. The RO will identify a First-Out alarm is received, the alarm is valid (Low Flow Condition in “C” RCS Loop), the reactor has not automatically tripped, attempt a manual reactor trip, and then perform the Immediate Action of 1-FR-S.1, Response to Nuclear Power Generation/ATWS.

The reactor trip breakers will be opened locally two (2) minutes after the Team directs an Operator to perform this action (based upon time critical operator action time requirement for locally tripping the reactor trip breakers).

The Team will complete 1-FR-S.1, transition to 1-E-0, Reactor Trip or Safety Injection to perform the Immediate Operator Actions, Transition to 1-ES-0.1, Reactor Trip Response, and perform a brief.

**Verifiable Actions:**

- 1) RO will attempt to trip the reactor using both reactor trip pushbuttons.
- 2) RO will check or place rods control in automatic.
- 3) RO will manually trip the turbine.
- 4) RO verifies control rods inserting at >48 steps per minute.
- 5) When rod speed lowers to < 48 steps per minute; RO places rod control in manual and inserts rods.

**Critical Task:**

**CT-1:** DRP-049 E-12, Insert negative reactivity into the core by at least one of the following methods before completing the Immediate Action Steps of FR-S.1. Insert Control Rods in auto or manual within 30 seconds of the onset of the ATWS event.

**Event #8: *LOCA Outside of Containment.* (M – ALL)**

The Team will be alerted to this condition based upon alarms and indications received, return to 1-E-0, and manually Safety Inject.

The RO and SRO continue with E-0 while the BOP performs Attachments 1, 2, and 3 of E-0. The Team will transition from 1-E-0 to 1-ECA-1.2, LOCA Outside Containment. In 1-ECA-1.2, the LOCA will be isolated by closing 1-SI-MOV-1890C, common LHSI pump discharge to RCS Cold Legs. The Team will transition to 1-E-1, Loss of Reactor or Secondary Coolant.

**Verifiable Actions:**

- 1) RO will manually initiate SI.
- 2) During performance of 1-E-0 Attachments the BOP will identify and correct the following items: 1-SI-P-1A not auto start, 1-CH-MOV-1115D not auto open, 1-CH-MOV-1115C not auto close, 1-CH-MOV-1289A not auto close, 10CV-TV-150A and 1-CH-TV-1204A not auto close.

**Critical Task:**

CT-2: Critical Task: E-0 – 1.2. Trip all RCPs within 5 minutes of reaching RCP Trip and Miniflow Recirc Criteria. (WOG E-1-C).

CT-3: WOG ECA-1.2—A, Isolate the LOCA outside containment before transition out of ECA-1.2. **SPS- Isolate LOCA outside containment before subcooling is less than 30 °F AND before transition out of ECA-1.2 (PSA).**

**Post Scenario Classification:**

Follow-up Classification: Site Area Emergency, FS-1.1.

The Scenario can be terminated upon 1-E-1 entry or Lead Evaluator Cue.



Initial Conditions: IC #1 100%, MOL – Cycle 26. The unit has been at 100% power for > 30 days			
Pre-load malfunctions: (Trigger 30's) <ul style="list-style-type: none"> <li>○ <b>SI2402, SI RELAY SI2A FAILS TO ACTUATE</b></li> <li>○ <b>SI2405, SI RELAY SI5A FAILS TO ACTUATE</b></li> <li>○ <b>AAC SMS MODE, OFF, AAC DG LOCAL MODE SWITCH POSITION</b></li> </ul>			
Equipment Status/ Procedures/ Alignments/ Data Sheets/ etc.: Unit 1 and 2 operating at 100% power. All systems and crossties are operable with the following exception: AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days			
Turnover: Unit 1 and 2 operating at 100% power. All systems and crossties are operable with the following exception: <ul style="list-style-type: none"> <li>• AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.</li> <li>• Last Shift performed two (2) 35 gallon alt dilutes followed by a manual makeup for training.</li> <li>• "A" BAST at 8.0 W/%.</li> </ul> Turnover: The BOP is to swap controlling channels for Channel II testing IAW 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing. The performance of this procedure has been analyzed based on the current plant configurations and the PSA indicates green.			
Event	Malf. #'s	Severity	Instructor Notes and Required Feedback
1	N/A	N/A	Perform 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.
2	RC4802,	+1 Deg	1-RC-PT-1445 fails high, PRZR Pressure channel fail high. AP-31.00, Increasing or Decreasing RCS Pressure.
3	MS1305,	+1 Deg	Steam Pressure Channel III, "B" SG fails High. 0-AP-53.00, Loss of Vital Instrumentation/Controls.
4	CH2101,	+1 Deg	Failure of VCT Level Channel LT-115 High.
5	CC0302 CC0802 SW_15J9_ RF	TRUE TRUE TRIP	Overcurrent on "B" CC pump with breaker mechanically stuck closed causing the trip of Stub Bus Supply breaker.
6	RD1236	TRUE	Dropped Rod Control Bank C, Group 1; AP-1.00, Rod Control Malfunction, AP-23.00, Rapid Load Reduction.
7.	RC MOV 595  RD17	30%  TRUE	RC Loop "C" Tc MOV disc falls into flow stream, Valid "First-Out" received, No Auto or Manual Reactor Trip. 1-FR-S.1, Response to Nuclear Generation/ATWS.
8	SI1502, SI1603 SI1606	40% Deg TRUE TRUE	LOCA outside of Containment in Unit 1 Valve Pit Area.
9	SI2402 SI2405	C - BOP	SI Relay SI2A fails to Actuate, SI Relay SI5A Fails to Actuate; 1-SI-P-1A not auto start, CH-MOV-1115D, CH-MOV-115C, CH-MOV1289A, CV-TV-150A, and CH-TV-1204A fail to re-position of SI.

**Scenario Objectives:**

- A. Given a condition requiring preparation for channel II testing, aligning control switches IAW 1-OP-RP-001, Section 5.2.
- B. Given a failure of 1-RC-PT-1445 in the high direction respond IAW AP-53.00/AP-31.00 to regain control of RCS pressure.
- C. Given the failure of Steam Pressure Channel III, “B” SG fails High repons IAW 0-AP-53.00, Loss of Vital Instrumentation/Controls.
- D. Given the failure of VCT level 1-CH-LI-1115 high, respond IAW AP-53.00 to secure the divert of letdown flow to the PDTT.
- E. Given the loss of the 1J stub bus, respond IAW 1K-H4 to restore CC flow to normal on Unit 1.
- F. Given a dropped rod, respond IAW AP-1.00 and AP-23.00 to ramp the Unit to 70-74%.
- G. Given a valid reactor trip signal with no automatic reactor trip respond IAW FR-S.1 to shutdown the reactor.
- H. Given a LOCA outside of Containment respond IAW E-0 and ECA-1.2 to isolate the RCS leak path.
- I. Given various component failing to reposition utilize E-0 Attachments to identify and place the components in the correct position.

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## SHIFT TURNOVER INFORMATION

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### **OPERATING PLAN:**

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1.

The last shift performed two 35 gallon dilutions followed by a manual makeup for training.

“A” BAST at 8.0 W/%.

The BOP will swap perform 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.

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Scenario No.: 4

Event No.: 1

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Event Description: Perform 1-OP-RP-001. Section 5.2, Preparation for Channel II Testing.

Cue: When team ready.

Time	Position	Applicant's Action or Behavior
	SRO/BOP	<p>1-OP-RP-001</p> <p>Team will pre-brief Initial Conditions, Precautions and Limitations, and procedure prior to entering simulator.</p>
	SRO/BOP	<p>1-OP-RP-001</p> <p>NOTE: These Steps will be signed off by the Team prior to Simulator Entry.</p> <p>Precautions and Limitations of 1-OP-RP-001, ALIGNING CONTROL SYSTEM FOR PERFORMANCE OF CHANNEL I, II, III, AND IV PROCESS AND PROTECTION TESTING:</p> <p>4.1 Control System may be left in aligned condition upon completion of this procedure. No Control System inputs or functions are left disabled by the performance of this procedure.</p> <p>4.2 Verification of expected plant response must be made when a Control System is swapped from AUTO to MANUAL. Verification must also be made after the controlling channel has been swapped back to AUTO.</p> <p>4.3 Control Systems for Steam Flow, Feedwater Flow, and Impulse Pressure should be aligned such that the switches are all selected to the same channel (Channel III or Channel IV).</p> <p>4.4 If PRZR level must be lowered to match program level, energizing additional PRZR Heaters IAW 1-OP-RC-019, Pressurizer Heater Operation, can minimize impact on RCS pressure control.</p> <p>4.5 Because of the sensitivity of the Calorimetric Program to changes in Feed Flow while using the UFM, consideration should be given to proactively reducing Turbine load IAW 1-OP-ZZ-002, Maintenance of Plant Operations, to increase available margin to Maximum Allowable Power limit during actions affecting Feed Flow.</p> <p>4.6 Total Thermal Power (U9104) should be monitored during Feed Flow changes. Waiting for 10 Min Avg Power (U9105) to rise to 100% prior to taking action will increase the transient duration.</p>

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Event No.: 1

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Event Description: Perform 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.

**Cue: When team ready.**

	SRO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing <b>NOTE:</b> the RO will be performing a Concurrent Verification (CV) on Steps 5.2.2 and 5.2.4
	BOP	5.2.1 Check or place 1/TR-1-412, ΔT PROTECTION SELECTOR switch in CH 1 or CH 3 position.  <b>Places the ΔT protection Selector Switch in the CH 1 or CH 3 position.</b>
	SRO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing
	BOP	5.2.2 IF PZR LVL-CH SEL switch (Benchboard) is NOT in POSTN 2 for Channels 1 and 3, THEN perform Steps 5.2.3 through 5.2.7. Otherwise, enter N/A for Steps 5.2.3 through 5.2.7.  <i>Notes that PZR LVL CH SEL switch in the CH 2&amp;3 position. Continues to Step 5.2.3.</i>
	SRO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing
	BOP	5.2.3 Place 1-CH-FCV-1122, CHG FLOW CNTRL (1-CH-FC-1122C) or 1-CH-FCV-1122, PRZR LEVEL CNTRL (1-CH-LC-1459G), in MANUAL position.  <b>Places 1-CH-FC-1122C or 1-CH-LC-1459G in MANUAL.</b>
	SRO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing
	BOP	5.2.4 Place PRZR LVL - CH SEL switch (Benchboard) to POSTN 2 for Channels 1 and 3.  <b>Places PRZR LVL – CH SEL switch in POSTN 2.</b>
	SRO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing
	BOP	5.2.5 Select 1-RC-LR-1459, PRZR LEVEL recorder, to display Channel 1 (RC-L-459).  <b>Adjusts 1-RC-LR-1459, PRZR LEVEL recorder to display Channel 1.</b>
		1-OP-RP-001, Section 5.2, Preparation for Channel II Testing  <b>CAUTION:</b> PRZR level control should not be placed back to Auto until actual level has been slowly restored (could take up to 25 minutes) in Manual to the new channel's program level. Adverse effects on PRZR Pressure and PRZR Heater operation could occur if level is allowed to restore in Auto.  <b>NOTE:</b> If PRZR level must be lowered to match program level, energizing additional PRZR Heaters IAW 1-OP-RC-019, Pressurizer Heater Operation, can minimize impact on RCS pressure control.

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Event No.: 1

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Event Description: Perform 1-OP-RP-001. Section 5.2, Preparation for Channel II Testing.

Cue: When team ready.

	SRO/BOP  BOP	5.2.6 Check or place 1-CH-FCV-1122, CHG FLOW CNTRL (1-CH-FC-1122C), in AUTO position.  <b>Places 1-CH-FC-1122C in AUTO.</b>
	SRO/BOP  BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing  5.2.7 Check or place 1-CH-FCV-1122, PRZR LEVEL CNTRL (1-CH-LC-1459G), in AUTO position.  <b>Places 1-CH-LC-1459G in AUTO.</b>
	RO/BOP	1-OP-RP-001, Section 5.2, Preparation for Channel II Testing  Signs and Dates Performed By Blanks. Gives completed procedure to SRO.
		<b>END EVENT 1</b>

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Scenario No.: 4

Event No.: 2

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Event Description: 1-RC-PT-1445 Fails High, 1-AP-31.00/0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	RO	Diagnoses the event using the following: Alarms: 1C-F8, PRZR HI PRESS 1D-H4, PRZR SFTY VV PWR RELIEF VV OPEN Indications: 1-RC-PCV-1456, PRZR PORV, RED Open Lights LIT. RCS Pressure Decreasing.
	SRO	Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	RO	[1] Check REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL  Identifies RCS Pressure decreasing using 1-RC-PI-1444 or RCS Wide Range Pressure Indicated on A / B ICCM Display.
	RO  RO/BOP	[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION  <b>Places 1-RC-PV-1456 control switch in Close. Verifies 1-RC-PCV-1456 closes by GREEN Light LIT, RED Light off.</b>  <i>During pressure transient, the Rod Control Switch may be placed in MANUAL due to Rods stepping OUT due to pressure coefficient.</i>
	SRO	Conducts a Brief summarizing the Event and Establish priorities.  RO will provide Critical Parameters using Brief Placard.  BOP will provide Critical Parameters using Brief Placard.  <i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i>  Completes Brief and continues with AP-53.00

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Event No.: 2

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Event Description: 1-RC-PT-1445 Fails High, 1-AP-31.00/0-AP-53.00.

Cue: By Examiner.

	SRO  RO	*3 VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%  <i>Identify that reactor power is less than 100%.</i>
	SRO	Notes Prior to Step 4: <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	SRO  RO	*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE: <ul style="list-style-type: none"> <li>PRZR Pressure Control, Step 5</li> </ul> <i>The RO will identify that 1-RC-PI-1445 failed high.</i>
	SRO  RO	NOTE: RCS pressure decrease will cause a slight decrease in RCS Tave due to negative reactivity from the moderator pressure coefficient.  5 CHECK PRZR SPRAY VALVE CONTROLLERS - NORMAL  <i>RO identifies PRZR Spray Valves controllers normal.</i>
	SRO	6 GO TO ( )-AP-31.00, INCREASING OR DECREASING RCS PRESSURE  <b>SRO announces transition to AP-31.00.</b>



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Event No.: 2

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Event Description: 1-RC-PT-1445 Fails High, 1-AP-31.00/0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	SRO RO	1-AP-31.00 [ 1 ] ____ CHECK PRZR PORVS – CLOSED <i>Identifies 1-RC-PCV-1456 closed.</i>
		1-AP-31.00 Conducts a Brief summarizing the Event and Establish priorities.  RO will provide Critical Parameters using Brief Placard.  BOP will provide Critical Parameters using Brief Placard.  <i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i>  Completes Brief and continues with AP-31.00
	SRO RO	1-AP-31.00 <b>CAUTION:</b> A Safety Injection may occur if the unit is not tripped prior to RCS pressure decreasing below 2100 psig.  2 CHECK RCS PRESSURE – DECREASING <i>Identifies RCS Pressure rising following PORV Closure.</i>  2 RNO IF RCS pressure is stable or increasing following PORV closure, THEN GO TO Step 10.
	SRO RO	1-AP-31.00  10 CHECK RCS PRESSURE - STABILIZING AT OR TRENDING TO 2235 PSIG <i>Identifies RCS pressure trending to 2235 psig.</i>
	SRO	1-AP-31.00  11. GO TO STEP 17

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Scenario No.: 4

Event No.: 2

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Event Description: 1-RC-PT-1445 Fails High, 1-AP-31.00/0-AP-53.00.

Cue: By Examiner.

	SRO	1-AP-31.00 17 CHECK MASTER CONTROLLER - IN MANUAL GO TO Step 19
	RO	<i>Identifies Master Pressure Controller in Auto</i>
	SRO	1-AP-31.00 19 CHECK PRZR PORVS – EITHER INOPERABLE • 1-RC-PCV-1455C • 1-RC-PCV-1456
	RO	<i>Identifies 1-RC-PCV-1456 Inoperable.</i>
	SRO	1-AP-31.00 20 CLOSE BLOCK VALVE FOR INOPERABLE PORV • 1-RC-MOV-1535 if 1-RC-PCV-1456 inoperable
	RO	<b>Places 1-RC-MOV 1535 control switch in close. Monitors MOV until GREEN indicating light LIT and RED Light out.</b>
	SRO	1-AP-31.00 21 CHECK PRZR PORVS – EITHER INCAPABLE OF BEING MANUALLY CYCLED • 1-RC-PCV-1455C • 1-RC-PCV-1456 GO TO Step 23
	RO	States Both PORVs are capable of being manually cycled.
	SRO	1-AP-31.00 23 NOTIFY THE FOLLOWING: • OM on call • STA • I&C  Notifies Shift Manager of the Event and requests notifications be made.

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Event No.: 2

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Event Description: 1-RC-PT-1445 Fails High, 1-AP-31.00/0-AP-53.00.

Cue: By Examiner.

	SRO	<p>1-AP-31.00</p> <p>24 REFER TO TECH SPECS:</p> <ul style="list-style-type: none"><li>• 3.1.A.5</li><li>• 3.1.A.6</li><li>• 3.1.C</li><li>• 3.12.F</li></ul> <p>1) The SRO will consult Tech Specs, TS Section 3.1.A.6, and determine that 1-RC-PCV-1456 is Inoperable but capable of being manually cycled, and enter a one hour clock to close the block valve for the PORV. The block valve will remain energized.</p> <p>2) Further consultation will find Tech Spec 3.12.F.1 to restore RCS pressure &gt;2205 psig in 2 hours or reduce Thermal Power to less than 5% in the next 6 hours. The Core Operating Limits Report (COLR, DRP-21) provides the reference for 2205 psig RCS pressure.</p> <p><b>NOTE:</b> Following closure of block valve the 1 hour Tech Spec clock clears. RCS pressure decreases to &lt; 2205 psig during the transient; once the PORV has been closed, pressure recovers quickly and goes above 2205 psig.</p> <p><i>SRO updates the Team concerning the identified items in Tech Specs and updates the Shift manager.</i></p>
	SRO	<p>1-AP-31.00</p> <p>25 REVIEW APPLICABILITY:</p> <ul style="list-style-type: none"><li>• VPAP-2802</li><li>• EAL Matrix SU6.1</li></ul> <p><i>Notifies Shift Manager of need to review VPAP-2802 and EALs for this Event.</i></p>
	SRO	<p>1-AP-31.00</p> <p>26 RESTORE PRESSURE CONTROL SYSTEM(S) TO NORMAL</p>
		<b>END EVENT 2</b>

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Event No.: 3

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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	BOP	0-AP-53.00  Diagnoses failure 1-MS-PT-1485 with the following indications/alarms:  Alarms: <ul style="list-style-type: none"><li>• 1H-E6 STM GEN 1B FW &gt;&lt; STM FLOW</li><li>• 1F-C8 STM GEN 1B CH 3 FW &lt; STM FLOW</li><li>• 1H-G6 STM GEN 1B LVL ERROR.</li></ul> Indications: <ul style="list-style-type: none"><li>• Step increase in 1B SG Steam Flow indication CH-III</li><li>• Increasing level on 'B' SG.</li></ul>
	SRO	0-AP-53.00  Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	BOP	0-AP-53.00  [1] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL  BOP identifies Channel IV indication for steam flow/Steam Pressure is NORMAL
	BOP	0-AP-53.00  [2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION  <b>BOP takes manual control of 'B' SG feed reg valve and lowers demand (FF &lt; SF) to restore level to program</b>

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Event No.: 3

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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>0-AP-53.00</p> <p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>Completes Brief and continues with AP-53.00.</p>
	<p>SRO</p> <p>RO</p>	<p>0-AP-53.00</p> <p>*3      VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%</p> <p><i>Identify that reactor power is less than 100%.</i></p> <p><b>Note:</b> Based on the feed flow &gt; steam flow mismatch during initial stage of the Event , Calorimetric power may exceed 100% during restoration of 'B' SG NR level to program.</p>
		0-AP-53.00
	SRO	<p>0-AP-53.00</p> <p>Notes Prior to Step 4:</p> <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	<p>SRO</p> <p>BOP</p>	<p>0-AP-53.00</p> <p>*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:</p> <p>SG Pressure, Step 7</p> <p><i>States 'B' SG Pressure Flow affected.</i></p>

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Event No.: 3

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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

		0-AP-53.00
		<b>CAUTION:</b> When CALCALC is based on Feedwater, changes in feed flow will affect calorimetric power. Reactor power must be monitored when adjusting feed flow.
	SRO	7. CHECK STEAM GENERATOR LEVEL CONTROL INSTRUMENTS – NORMAL
	BOP	<ul style="list-style-type: none"> <li>• Steam Pressure</li> <li>• Steam Flow</li> <li>• Feed Flow</li> <li>• Steam Generator Level</li> </ul>
	BOP	Determines CH III Steam pressure instrumentation for 'B' SG is NOT normal. Step 7. RNO
	BOP	IF the selected steam flow, steam pressure, or feed flow input to the SG Water Level Control system has failed, THEN do the following: <ul style="list-style-type: none"> <li>a) Place the associated Feed Reg Valve in MANUAL.</li> </ul>
	RO	Verifies 'B' SG MFRV controller, 1-FW-FCV-1488, in manual <ul style="list-style-type: none"> <li>b) Control SG level at program level (44%, a band will be given).</li> </ul>
	BOP	Verifies 'B' SG NR level is returning to program level. <ul style="list-style-type: none"> <li>c) Select the redundant channel for affected SG(s)</li> </ul>
	RO	<b>Selects Channel IV Steam Flow for 'B' SG using two-position selector switch on Vertical Board 1-2</b> (applicant may also place the associated Steam Flow channel in Channel IV). <ul style="list-style-type: none"> <li>d) WHEN SG level returned to normal, THEN place the Feed Reg Valve in AUTOMATIC.</li> </ul>
	BOP	<b>Places 'B' SG FRV controller, 1-FW-FCV-1488, in automatic control</b>

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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>0-AP-53.00</p> <p>Step 7. RNO (Continued)</p> <p>Perform follow-up actions:</p> <ol style="list-style-type: none"> <li>a) Consult with Shift Manager on need to initiate ( )-OP-RP-001, ALIGNING CONTROL SYSTEM FOR PERFORMANCE OF CHANNEL I, II, III, AND IV PROCESS AND PROTECTION TESTING.</li> <li>b) Refer to the following Tech Spec 3.7 items: <ul style="list-style-type: none"> <li>• Table 3.7-1, 12 and 17</li> <li>• Table 3.7-2, 1.c, 1.e, and 3.a</li> <li>• Table 3.7-3, 2.a, and 3.a</li> </ul> </li> <li>1) Tech Specs Section 3.7, Table 3.7-1, Item 17, Low steam generator water level with steam/feedwater flow mismatch, Operator Action 6. With the number of Operable channels one less than the total number of channels, Power Operation may proceed provided the channel is <b>placed in the trip condition in 72 hours</b>, the channel may be bypassed for 12 hours for surveillance; if these requirements are not met, the Unit must be placed in Hot Shutdown within 6 hours.</li> <li>2) Tech Spec 3.7, Table 3.7-2, Item 1.c., High differential pressure between any steam line and the steam header, Operator Action 20. With the number of Operable channels less than the total number of channels, Operation may continue provided the failed channel is <b>placed in trip within 72 hours</b>; the channels may be bypassed for 12 hours for surveillance testing; and if the requirements cannot be met, be in Hot Shutdown in 6 hours and reduce RCS temperature and pressure to less than 350°F/450 psig in the following 12 hours.</li> <li>3) Tech Spec 3.7, Table 3.7-2, Item 1.e, High Steam line flow in 2/3 steam lines coincident with low Tavg or low line pressure, Operator Action 20. With the number of Operable channels less than the total number of channels, Operation may continue provided the failed channel is placed in trip within 72 hours; the channels may be bypassed for 12 hours for surveillance testing; and if the requirements cannot be met, be in Hot Shutdown in 6 hours and reduce RCS temperature and pressure to less than 350°F/450 psig in the following 12 hours.</li> <li>4) Tech Spec Table 3.7-3, item 2a, Steam Line Isolation. Refers to Tech Spec Table 3.7-2, Item 1.e. See Above</li> <li>5) Tech Spec Table 3.7-6, Item 16, SG Pressure, <b>2 per SG are required</b>. This condition is met (2 of 3 channels still Operable).</li> <li>c) Refer to Attachment 1.</li> <li>d) IF no other instrumentation failure exists, THEN GO TO Step 13.</li> </ol>
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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	<p>0-AP-53.00</p> <p>13. CHECK CALORIMETRIC – FUNCTIONAL IAW ( )-OPT-RX-001.</p> <p>SRO/RO determines that OPT-RX-001 is impacted and OPT-RX-007 will need to be performed.</p> <p><i>If it appears that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.</i></p>
	SRO	<p>0-AP-53.00</p> <p>14. CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE (Go to Step 16 if not Reg. Guide 1.97)</p> <p><i>SRO directs STA to review Reg. Guide 1.97. The STA will report that 1-MS-PT-1485 is a Reg. Guide 1.97 component.</i></p>
	SRO	<p>0-AP-53.00</p> <p>15. REVIEW CEP 99-0029, REG GUIDE 1.97 OPERABILITY, REPORTABILITY, AND ALTERNATE INDICATIONS</p> <p><i>SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 requires two channels of Steam Pressure indication per steam generator and no actions are required. See Tech Spec 3.7, Table 6, Item 16, 2 required per SG.</i></p>
	SRO	<p>0-AP-53.00</p> <p>16. Review the following:</p> <ul style="list-style-type: none"> <li>• TS 3.7</li> </ul> <p>Determines Table 3.7-1 item 17, 3.7-2 item 1.c. and 1e, and 3.7.3 item 2a are applicable (place channel in trip w/in 72 hours). Also TS-3.7, Table 6, item 16, two SG Pressure Indicators per SG.</p> <ul style="list-style-type: none"> <li>• VPAP-2802</li> <li>• TRM Section 3.3, Instrumentation</li> </ul> <p><i>SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA reports he has completed these reviews and there is no impact.</i></p>
	<p>SRO</p> <p>BOP</p>	<p>0-AP-53.00</p> <p>17 CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION – EXISTS</p> <p>Reports no additional failure exists</p>



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Event No.: 3

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Event description: Steam Pressure Channel III, "B" SG Fails High, 0-AP-53.00.

Cue: By Examiner.

	SRO	GOES TO Step 19
	SRO	0-AP-53.00 19. PROVIDE NOTIFICATIONS AS NECESSARY: <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• OMO</li><li>• STA (PRA determination)</li><li>• I&amp;C</li></ul> -
		<b>END EVENT #3</b>

Op-Test No.: Surry 2012-1

Scenario No.: 4

Event No.: 4

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Event Description: Failure of VCT Level Channel LT-1115, High, 0-AP-53.00.

Cue: When initiated by Team

Time	Position	Applicant's Action or Behavior
	BOP	<p>Diagnoses failure 1-CH-LT-1115 with the following indications/alarms:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>1D-G1 VCT HI – LO LVL</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>1-CH-LCV-1115A Amber Divert light LIT.</li> <li>Decreasing VCT level on channel 1-CH-LI-1112.</li> </ul>
	SRO	Enters 0-AP-53.00 LOSS OF VITAL INSTRUMENTATION / CONTROLS
	RO	<p>[1] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION - NORMAL</p> <p>RO identifies Channel LI-1112 VCT Level indication is NORMAL.</p>
	RO	<p>[2] PLACE AFFECTED CONTROL(S)/COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION</p> <p><b>RO places the control switch for 1-CH-LCV-1115A in 'NORM' position to close the VCT Divert Valve.</b> Monitors to ensure amber light extinguishes and VCT level stabilizes.</p>
	SRO	<p>Conducts a Brief summarizing the Event and Establish priorities.</p> <p>RO will provide Critical Parameters using Brief Placard.</p> <p>BOP will provide Critical Parameters using Brief Placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>Completes Brief and continues with AP-53.00.</p>

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Scenario No.: 4

Event No.: 4

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Event Description: Failure of VCT Level Channel LT-1115, High, 0-AP-53.00.

Cue: When initiated by Team

	SRO RO	*3 VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%  <i>Identify that reactor power is less than 100%.</i>
	SRO	Notes Prior to Step 4: <ul style="list-style-type: none"> <li>Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</li> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	SRO RO	*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:  VCT Level, Step 12e
	SRO RO SRO	12 e) VCT level Instrumentation – NORMAL  <i>States 1-CH-LT-1115, VCT Level Channel affected.</i>  Refer to Attachment 6
	SRO          SRO	Attachment 6, 0-AP-53.00  If ( )-CH-LT-( )115 fails high, ( )-CH-LCV-( )115A will open. Manual control of the blender will be required. Automatic swap-over of the CHG pump suction from the VCT to the RWST will not function.  a. VCT High level divert of ( )-CH-LCV-( )115A to PDT at 85% b. VCT High level alarm at 82% c. Auto makeup to VCT stop at 34% d. Auto makeup to VCT start at 27% e. VCT Low level alarm at 24% f. CHG pump suction swap over to the RWST at 13% (2/2)  Discusses with RO control of VCT level and monitoring of channel 1-CH-LT-1112 to ensure that VCT level will not drop to the point where the CH pumps could air bind. The SRO will set a band for manual makeup to the VCT and a minimum VCT level where the manual swap to the RWST will be required.

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Event No.: 4

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Event Description: Failure of VCT Level Channel LT-1115, High, 0-AP-53.00.

Cue: When initiated by Team

	SRO  SRO/RO	<p>13 CHECK CALORIMETRIC – FUNCTIONAL IAW ( )-OPT-RX-001</p> <p>SRO/RO determines that OPT-RX-001 is impacted and OPT-RX-007 will need to be performed.</p> <p>Unit 2 will continue to perform 1-OPT-RX-007 as required.</p>
	SRO	<p>14. CHECK FAILED INSTRUMENT - IS A REGULATORY GUIDE 1.97 VARIABLE (Go to Step 16 if not Reg. Guide 1.97)</p> <p><i>SRO directs STA to review Reg. Guide 1.97. The STA will report that 1-CH-LI 1115 is a Reg. Guide 1.97 component.</i></p>
	SRO	<p>15. REVIEW CEP 99-0029, REG GUIDE 1.97 OPERABILITY, REPORTABILITY, AND ALTERNATE INDICATIONS</p> <p><i>SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 requires one channel of VCT level indication. Use an Alternate indication. Restore before next outage.</i></p>
	SRO        SRO	<p>16. Review the following:</p> <ul style="list-style-type: none"> <li>• TS 3.7</li> <li>• VPAP-2802</li> <li>• TRM Section 3.3, Instrumentation</li> </ul> <p>SRO will consult Tech Specs and find no items affected.</p> <p><i>SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA reports he has completed these reviews and there is no impact.</i></p>
	SRO  BOP  SRO	<p>0-AP-53.00</p> <p>17 CHECK ADDITIONAL INSTRUMENT / CONTROLLER MALFUNCTION – EXISTS</p> <p>Reports no additional failure exists</p> <p>GOES TO Step 19</p>

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Event No.: 4

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Event Description: Failure of VCT Level Channel LT-1115, High, 0-AP-53.00.

Cue: When initiated by Team

	SRO	19. PROVIDE NOTIFICATIONS AS NECESSARY: <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• OMOC</li><li>• STA (PRA determination)</li><li>• I&amp;C</li></ul> -
		<b>END EVENT #4</b>

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Scenario No.: 4

Event No.: 5

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Event Description: 1-CC-P-1B overcurrent with breaker stuck shut, 15J9 breaker trips open.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	TEAM	<p>Diagnose the failure using the following:</p> <p>Alarms:</p> <p>1K-D5, CC PP 1B IN LOCAL CONTROL OR OL TRIP</p> <p>1K-E7, CC PPS DISCH HDR LO PRESS</p> <p>1K-H4, 4KV EMERG BUS STUB BUS TIE BKR TRIP</p> <p>Indications:</p> <p>Breaker 15J9, 1J Stub Bus Breaker, indicates Open on PCS</p> <p>Breaker 15J10, 1-CC-P-1B breaker indication RED light ON, GREEN Light OFF.</p> <p>1-CC-P-1B amps indication at 0.</p>
	SRO	<p>Direct RO to review ARPs for LIT Annunciators, 1K- D5, 1K-H4, 1K- E7.</p> <p>Direct BOP to contact Auxiliary Building Operator to check status of -1CC-P-1B.</p> <p>Direct Service Building Operator to check status of 1-CC-P-1B breaker, BKR 15J10, and the 1J stub bus breaker, 15J9.</p>
	RO RO BOP BOP BOP RO	<p>ARP 1K-D5</p> <p>1 CHECK 1-CC-P-1B IN LOCAL CONTROL DUE TO PLANT EVOLUTION</p> <p>1-CC-P-1B not in Local due to Plant Evolution.</p> <p><i>No Plant evolution in progress.</i></p> <p>IF 1-CC-P-1B tripped due to leak or rupture, THEN do the following:</p> <p><i>No leak or rupture indicated.</i></p> <p>IF leak or rupture NOT present, THEN GO TO Step 3.</p> <p>Go to Step 3</p>
	RO BOP RO BOP	<p>ARP 1K-D5</p> <p>3. VERIFY STANDBY CC PP - STARTED</p> <ul style="list-style-type: none"> <li>1-CC-P-1A</li> </ul> <p><i>No, 1-CC-P-1A not running</i></p> <p>Manually start 1-CC-P-1A.</p> <p><b>Announces and Starts 1-CC-P-1A.</b></p>

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Scenario No.: 4

Event No.: 5

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Event Description: 1-CC-P-1B overcurrent with breaker stuck shut, 15J9 breaker trips open.

Cue: By Examiner.

	RO	<p>ARP 1K-D5</p> <p>4 CHECK 1-CC-P-1B - TRIPPED DUE TO UNDERVOLTAGE ON THE 1J EMERGENCY BUS</p> <p>Do the following:</p> <ol style="list-style-type: none"> <li>IF CC pump NOT tripped, THEN do the following:</li> <li>Locally check breaker 15J10.</li> <li>Locally check 1-CC-P-1B.</li> </ol>
	RO/BOP	<p>When local status of 1-CC-P-1B received, Focus Brief to inform Team that 1-CC-P-1B normal; 1-CC-P-1B breaker is closed, breaker 15J10 closed with an overcurrent trip flag, breaker 15 J9, stub bus breaker, is open with an overcurrent trip flag.</p> <p>d) IF unable to restore 1-CC-P-1B, THEN do the following:</p> <ol style="list-style-type: none"> <li>Initiate a Condition Report.</li> <li>Review Tech Spec 3.13.</li> <li>GO TO Step 7.</li> </ol>
	RO	<p>ARP 1K-D5</p> <p>7 VERIFY CC SYSTEM PARAMETERS - NORMAL</p> <ul style="list-style-type: none"> <li>CC Surge Tank Level - STABLE</li> <li>CC Pump amps - STABLE</li> <li>AUX BLDG and CTMT Sump levels – NORMAL</li> </ul>
	BOP	<p><i>Review parameters, identify no trends exist, report parameters as normal.</i></p>
	RO	<p>ARP 1K-D5</p> <p>8 PROVIDE NOTIFICATIONS:</p> <ul style="list-style-type: none"> <li>OMOC</li> <li>STA</li> </ul>
	RO	<p>Inform SRO to Notify OMOC and STA.</p> <p>Move to next ARP.</p>
	RO	<p>ARP 1K-E7</p> <p>1 VERIFY CC HEADER PRESSURE – LESS THAN 90 PSIG</p> <ul style="list-style-type: none"> <li>PI-CC-100, CC PP DISCH PRESS</li> </ul>
	BOP	<p><i>Reports PI-CC-100 indicates approximately 100 psig.</i></p>
	RO	<p>Step 1 RNO Do the following:</p> <ol style="list-style-type: none"> <li>Increase surveillance of CC parameters.</li> <li>Initiate a Work Request.</li> <li>GO TO Step 18.</li> </ol>

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Event No.: 5

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Event Description: 1-CC-P-1B overcurrent with breaker stuck shut, 15J9 breaker trips open.

Cue: By Examiner.

	RO	<p>ARP 1K-E7</p> <p>18 NOTIFY SHIFT SUPERVISION</p> <p>Notifies SRO, ARP 1K-E7 complete, a CR is required. Moves to 1K-H4 ARP</p>
	RO	<p>ARP 1K-H4</p> <p>1 VERIFY ALARM - LOSS OF EMERGENCY BUS</p> <ul style="list-style-type: none"> <li>• Bus 1H Undervolt - 15H8 TRIPPED</li> <li>OR</li> <li>• Bus 1J Undervolt - 15J8 TRIPPED</li> </ul> <p>Identifies 1H and 1J not tripped</p> <p>Step 1 RNO</p> <p>Do the following:</p> <p>a) Check for loss of Stub Bus loads:</p> <ul style="list-style-type: none"> <li>• CC Pump</li> <li>• RHR Pump</li> </ul> <p><i>Identifies Stub bus loads have been lost.</i></p> <p>Step 1 RNO</p> <p>b) IF Stub Bus loads lost, THEN do the following:</p> <ol style="list-style-type: none"> <li>1) Start standby pumps IAW Shift Supervision direction.</li> <li>2) Locally check stub bus tie breaker cubicles in ESGR.</li> <li>3) IF Stub Bus Breaker Cubicle Relays (Type IAC) orange drop - IN, THEN GO TO Step 4.</li> </ol> <p>Based on Focus Brief – Goes to Step 4.</p>
	RO	<p>ARP 1K-H4</p> <p>4 CHECK RHR AND CC - RESTORED AS NECESSARY</p> <p><i>Identifies 1-CC-P-1A running.</i></p>



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Event No.: 5

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Event Description: 1-CC-P-1B overcurrent with breaker stuck shut, 15J9 breaker trips open.

Cue: By Examiner.

	RO	ARP 1K-H4  5 PROVIDE NOTIFICATIONS AS NECESSARY: <ul style="list-style-type: none"><li>• OMOC</li><li>• Electrical Foreman</li><li>• Control Operations</li><li>• Shift Supervision</li></ul> <i>Notifies SRO that in addition to previous individuals notified, the Electrical Forman needs to be notified</i>
	RO	ARP 1K-H4  6 SUBMIT A CONDITION REPORT  <i>Notifies SRO that a CR is required.</i>
	RO	ARP 1K-H4  7 REVIEW TECH SPECS  <i>Notifies SRO to Review Tech Specs</i>
	SRO	Reviews Tech Spec 3.13, Component Cooling system and determines the minimum number of CC pumps are operable.  Review Tech Spec 3.5.B and determines Unit 1 is in a 14 day clock to restore 1-RH-P-1B to operable.
	SRO	Contacts the Shift Manager to provide an update on Plant Status, Tech Spec Clock entered, and request notification of the OMOC and Electrical Foreman.
		<b><u>END EVENT #5</u></b>

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Event No.: 6

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	Team	Diagnoses the dropped rod with the following indications/alarms:
	RO	<p>Alarms:</p> <ul style="list-style-type: none"> <li>• 1G-B5, COMPUTER PRINTOUT ROD CONT SYS.</li> <li>• 1G-C4, UPPER ION CHAMBER DEVIATION OR AUTO DEFEAT &lt;50%.</li> <li>• 1G-D4, LOWER ION CHAMBER DEVIATION OR AUTO DEFEAT &lt;50%.</li> <li>• 1E-E4, NIS PWR RNF CH AVG FLUX DEVIATION.</li> <li>• 1C-B8 – PRZR LO PRESS</li> <li>• 1G-H1 - NIS DROPPED ROD FLUX DECREASE <math>\geq 5\%</math> PER 2 SEC</li> <li>• 1G-H2 – RPI ROD BOTTOM &lt;20 STEPS</li> <li>• 1G-F8, ROD BANK D WITHDRAWAL.</li> </ul> <p>Indications:</p> <ul style="list-style-type: none"> <li>• Outward Rod Motion.</li> <li>• RCS Temperature and Pressure decrease.</li> <li>• Flux Variations (radial).</li> <li>• CERPI indication that Control Rod M-4 is at 0 steps.</li> </ul> <p>In accordance with the immediate actions of 1-AP-1.00 (Rod Control System Malfunction) the <b>RO will place Control Rods in MANUAL to stop the outward rod motion.</b></p> <p><b>RCS pressure &lt;2205 psig places the unit in a 2 hour clock iaw TS. 3.12.F.1 (and COLR) – it is expected that the SRO will track this clock (entry/exit times).</b></p>
	SRO	<p>0-AP-1.00</p> <p>Enters 0-AP-1.00 (Rod Control System Malfunction).</p>
	SRO	<p>CAUTION prior to Step 1:</p> <ul style="list-style-type: none"> <li>• If Tave decreases below 530 °F, 1-E-0, Reactor Trip or Safety Injection, must be implemented.</li> </ul>
	RO	<p>[1] CHECK FOR EITHER OF THE FOLLOWING:</p> <ul style="list-style-type: none"> <li>• Continuous rod withdrawal</li> <li>• Continuous rod insertion</li> </ul> <p>RO will note that there was a continuous rod withdrawal.</p>

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	RO	<p>[2] STOP ROD MOTION</p> <p>a. <b>Put ROD CONT MODE SEL switch in MANUAL</b></p> <p>b. Verify rod motion – STOPPED</p> <p>RO will place control rods in MANUAL and note that Rods stopped moving.</p>
	SRO	<p>0-AP-1.00</p> <p>The team will hold a transient brief. During the brief the dropped rod will be discussed.</p> <p>The RO and BOP will report out critical parameters, as per placard on Main Control Room Bench Board.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p>
	RO	<p>0-AP-1.00</p> <p>3. CHECK ROD MOTION - DUE TO INSTRUMENTATION FAILURE</p> <ul style="list-style-type: none"><li>• First Stage Impulse Pressure</li><li>• Tave/Tref</li><li>• Nuclear Instrumentation</li></ul> <p>RO will note that an instrumentation failure did not exist. The team will transition to the RNO for Step 3.</p>
	RO	<p>0-AP-1.00</p> <p>3. RNO</p> <p>If rod motion due to a dropped rod, THEN GO TO Step 6.</p> <p>RO will note that dropped rod caused the rod motion.</p>

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	RO	<p>0-AP-1.00</p> <p>6. CHECK IF ANY ROD DROPPED:</p> <ul style="list-style-type: none"> <li>• Annunciator ( )G-H2, RPI ROD BOTTOM <math>\leq</math> 20 STEPS - LIT OR</li> <li>• Annunciator ( )G-H1, NIS DROPPED ROD FLUX DECREASE <math>\geq</math> 5% PER 2 SEC - LIT OR</li> <li>• Rod Bottom Lights - ANY LIT OR</li> <li>• Any Rod On Bottom light - LIT OR</li> <li>• Indication of a partially dropped rod in the core</li> </ul> <p>The RO will note that they have multiple indications of a dropped rod in the core.</p>
	RO	<p>0-AP-1.00</p> <p>7. CHECK REACTOR STATUS PRIOR TO FAILURE – CRITICAL</p>
	RO	<p>0-AP-1.00</p> <p>8. CHECK ONLY ONE ROD AFFECTED</p>
	RO	<p>0-AP-1.00</p> <p>9. CHECK REACTOR POWER – GREATER THAN 25%</p>
	BOP/RO	<p>0-AP-1.00</p> <p>10. CHECK UNIT CONDITIONS – STABLE</p>
	RO	<p>0-AP-1.00</p> <p>11. <b>PLACE ROD CONTROL IN MANUAL</b></p>
	RO/BOP	<p>0-AP-1.00</p> <p>12. CHECK POWER RANGE NIs – ANY DROPPED ROD SIGNAL PRESENT</p>
	BOP	<p>0-AP-1.00</p> <p>13. <b>RESET NIS DROPPED ROD SIGNAL IAW ATTACHMENT 4</b></p> <p>Attachment 4 of AP-1.00 is located towards the end of this event.</p>

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	RO	0-AP-1.00  14. CHECK ANNUNCIATOR 1G-F8, ROD BANK D WITHDRAWAL – NOT LIT  If alarm is LIT, then the RNO will direct the team to initiate Attachment 5 – This attachment follows attachment 4 at the end of this event.  This may not be lit if the RO quickly placed rods in MANUAL when withdrawing.
	SRO	0-AP-1.00  Note prior to Step 15: <ul style="list-style-type: none"> <li>Quadrant power tilt may cause unit ramp requirements to be more restrictive.</li> </ul>
	SRO	0-AP-1.00  15. VERIFY QUADRANT POWER TILT RATIO  <ul style="list-style-type: none"> <li>Initiate Attachment 6, QUADRANT POWER TILT CALCULATION</li> <li>Review Technical Specification 3.12.B.6</li> </ul> SRO will direct the STA to perform the QPTR in accordance with Attachment 6 and review TS 3.12.  <i>Summary of applicable Tech Specs are found following Step 18.</i>
	SRO	0-AP-1.00  Notes prior to Step 16: <ul style="list-style-type: none"> <li>Checking that the unit is operating between Hot Zero Power and Hot Full Power, that there is only one fully dropped (less than 10 steps) control rod, and that all other rods are above the rod insertion limit, checks that adequate SDM exists.</li> <li>SDM must be re-verified using 1-OP-RX-001 every 12 hours after the control rod was dropped until the Reactor is shutdown or the rod is declared operable.</li> </ul>
	SRO	0-AP-1.00  16. VERIFY SHUTDOWN MARGIN (WITHIN ONE HOUR)  <ul style="list-style-type: none"> <li>The fully dropped rod (less than 10 steps) is the only inoperable rod <u>AND</u></li> <li>All other rods are greater than the Rod Insertion Limit</li> </ul>
	SRO	0-AP-1.00  17. MAKE NARRATIVE LOG ENTRY THAT SDM IS MET

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	SRO	<p>Caution prior to Step 18:</p> <ul style="list-style-type: none"><li>• Loop <math>\Delta T</math> is the most accurate measure of Reactor power with a mis-aligned rod, and must be monitored during the ramp and used as a basis for stabilizing power.</li></ul>
	RO	<p>18. CHECK REACTOR POWER – LESS THAN OR EQUAL TO 75%</p> <p>Step 18 RNO actions:</p> <p>Do the following:</p> <ol style="list-style-type: none"><li>Reduce Reactor Power to between 70% - 74% within one hour.</li><li>Reduce NIS High Flux trip setpoints to less than or equal to 85% within the following four hours.</li><li>WHEN Reactor Power has been reduced, THEN GO TO Step 19.</li></ol> <p>The team will enter AP-23.00 to reduce reactor power.</p> <p>GO TO EVENT 6</p>
	SRO	<p>Applicable Tech Specs for Dropped Rod:</p> <p>3.12.B.6:</p> <p>If, except for operation at THERMAL POWER &lt; 50% or for physics and control rod assembly surveillance testing, the QUADRANT POWER TILT exceeds 2%, then:</p> <ol style="list-style-type: none"><li>Within 2 hours, either the hot channel factors shall be determined and the power level adjusted to meet the requirement of Specification 3.12.B.1, or</li><li>The power level shall be reduced from RATED POWER 2% for each percent of QUADRANT POWER TILT. The high neutron flux trip setpoint shall be similarly reduced within the following 4 hours.</li><li>If the QUADRANT POWER TILT exceeds 10%, the power level shall be reduced from RATED POWER 2% for each percent of QUADRANT POWER TILT within the next 30 minutes. The high neutron flux trip setpoint shall be similarly reduced within the following 4 hours.</li></ol>

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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

		<p>Applicable Tech Specs for Dropped Rod: (Continued)</p> <p>3.12.C.3: Startup and POWER OPERATION may continue with one control rod assembly inoperable provided that within one hour either:</p> <ol style="list-style-type: none"><li>The control rod assembly is restored to OPERABLE status, as defined in Specification 3.12.C.1 and 2, or</li><li>the shutdown margin requirement of Specification 3.12.A.3.c is satisfied.</li><li>POWER OPERATION may then continue provided that:</li></ol> <ol style="list-style-type: none"><li>either:<ol style="list-style-type: none"><li>power shall be reduced to less than 75% of RATED POWER within one (1) hour, and the High Neutron Flux trip setpoint shall be reduced to less than or equal to 85% of RATED POWER within the next four (4) hours, or</li><li>the remainder of the control rod assemblies in the group with the inoperable control rod assembly are aligned to within 12 steps of the inoperable rod within one (1) hour while maintaining the control rod assembly sequence and insertion limits specified in the CORE OPERATING LIMITS REPORT; the THERMAL POWER level shall be restricted pursuant to Specification 3.12.A during subsequent operation.</li></ol></li><li>the shutdown margin requirement of Specification 3.12.A.3.c is determined to be met within one hour and at least once per 12 hours thereafter.</li></ol>
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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	BOP	<p>ATTACHMENT 4 of AP-1.00 – RESETTING NIS DROPPED ROD SIGNALS</p> <p>Perform the following for each NI with a dropped rod status light lit.</p> <ol style="list-style-type: none"><li>1. N41 RESET<ol style="list-style-type: none"><li>a) Place the Power Range Test Switch in RESET.</li><li>b) Check the Dropped Rod Status Light on N41 - NOT LIT.</li><li>c) Return the Power Range Test Switch to NORMAL.</li></ol></li><li>2. N42 RESET<ol style="list-style-type: none"><li>a) Place the Power Range Test Switch in RESET.</li><li>b) Check the Dropped Rod Status Light on N42 - NOT LIT.</li><li>c) Return the Power Range Test Switch to NORMAL.</li></ol></li><li>3. N43 RESET<ol style="list-style-type: none"><li>a) Place the Power Range Test Switch in RESET.</li><li>b) Check the Dropped Rod Status Light on N43 - NOT LIT.</li><li>c) Return the Power Range Test Switch to NORMAL.</li></ol></li><li>4. N44 RESET<ol style="list-style-type: none"><li>a) Place the Power Range Test Switch in RESET.</li><li>b) Check the Dropped Rod Status Light on N44- NOT LIT.</li><li>c) Return the Power Range Test Switch to NORMAL.</li></ol></li><li>5. Check annunciator ( )G-H1, NIS DROPPED ROD FLUX DECREASE &gt;5% PER SEC - NOT LIT</li><li>6. Check annunciator ( )G-F8, ROD BANK D WITHDRAWAL - NOT LIT</li><li>7. IF ( )G-F8, ROD BANK D WITHDRAWAL is LIT, THEN initiate Attachment 5.</li></ol>
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Event description: Dropped Control ROD, 0-AP-1.00, 0-AP-23.00.

Cue: By Examiner.

	BOP	ATTACHMENT 5 of AP-1.00 – RESPONSE TO ROD BANK D WITHDRAWAL
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NUMBER 0-AP-1.00	ATTACHMENT TITLE  RESPONSE TO ROD BANK D WITHDRAWAL	ATTACHMENT 5
REVISION 26		PAGE 1 of 1

<u>ACTION / EXPECTED RESPONSE</u>	<u>RESPONSE NOT OBTAINED</u>
1. ____ CHECK ALARM - ROD DEMAND POSITION GREATER THAN OR EQUAL TO 228 STEPS ON CONTROL BANK D - GP 1 DEMAND POSTN	
2. ____ CHECK ROD CONTROL MODE SEL SWITCH IN MANUAL	
3. ____ CHECK BOTH CONTROL BANK D STEP COUNTERS - LESS THAN OR EQUAL TO 230 STEPS	Do the following: <input type="checkbox"/> a) Step rods out to make both Bank D Step Counters equal. (Group step counters must be equalized by stepping out only, to prevent Rod Group Sequence Error) <input type="checkbox"/> b) Reset Bank D Step Counters to 230 steps. (Refer to Attachment 3)
<b>NOTE:</b> Rods may have to be stepped in as many as two steps below the fully withdrawn position to clear Annunciator ( )G-F8.	
4. ____ STEP CONTROL BANK D RODS IN AS NECESSARY TO CLEAR ( )G-F8, ROD BANK D WITHDRAWAL	
5. ____ POSITION CONTROL BANK D RODS AS DETERMINED BY SHIFT SUPERVISION	
<b>NOTE:</b> Both group step counters for Control Bank D should be the same before performing Step 6.	
6. ____ LOCALLY CHECK THE BANK OVERLAP COUNTER - AT 384 PLUS CURRENT CONTROL BANK D DEMAND POSITION	<input type="checkbox"/> Notify I&C to reset the Bank Overlap Counter.
7. ____ NOTIFY UNIT SRO THAT ROD OVERSTEP HAS BEEN RESET	
- END -	

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	TEAM	0-AP-23.00  <b>0-AP-23.00 (RAPID LOAD REDUCTION) Actions</b>
	SRO	<p>The team will hold a transient brief. During the brief, the upcoming ramp will be discussed.</p> <p>The RO and BOP will report out critical parameters, as per placard on Main Control Room Bench Board. It is expected that the RO will discuss reactivity parameters associated with the ramp from the pre-planned ramp plans taking in account the conditions presented by the dropped rod.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.</i></p> <p>The following reactivity plan will be discussed <i>for a ramp to 75%</i>:</p> <ul style="list-style-type: none"> <li>• Gallons of boric acid required as per plan – 146 gallons, Rate of 5.8 gpm.</li> <li>• “D” control bank end at 197 steps, 1957 gallons PG to stabilize.</li> <li>• Subtracted from the boration will be the equivalent boron added from the dropped rod – 9.5 gallons for each degree of Tave decrease – this should be about 42 gallons based on a 4.4° temp decrease. This will be subtracted from the initial 146 gallons – therefore, approximately 104 gallons of boric acid are required to be added.</li> </ul>
	SRO	<p>Caution Prior to Step 1:</p> <ul style="list-style-type: none"> <li>• Conservative decision-making must be maintained during rapid load reductions. Refer to Attachment 1 for trip criteria.</li> </ul> <p>Notes Prior to Step 1:</p> <ul style="list-style-type: none"> <li>• Actions that can be completed independently of preceding steps may be performed out of sequence as directed by the SRO</li> <li>• When the Turbine is not being actively ramped, the REFERENCE and SETTER values must remain matched to prevent inadvertent ramp.</li> <li>• Pre-planned reactivity plans located in the Main Control Room will be used as guidance for ramping down to the desired power level.</li> <li>• The ramp rate in IMP OUT is nonlinear and therefore pre-planned reactivity plans based on IMP IN are not as accurate. However, total amounts of boration and dilution can be used as guidance.</li> <li>• For ramp rates greater than or equal to 1%/minute, Rod Control should remain in Automatic if available.</li> </ul>

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

	RO	0-AP-23.00 <b>1. TURN ON ALL PRZR HEATERS</b>
	BOP	2. INITIATE PLANT LOAD REDUCTION AT 2%/MINUTE OR LESS: a) Check turbine valve position - NOT ON LIMITER The turbine is NOT on the limiter.
	RO	b) Insert control rods in AUTO or MANUAL as necessary to maintain Tave and Tref within 5°F.
	SRO/BOP	c) <b>Check or place turbine in IMP IN as determined by Shift Supervision</b> The SRO can choose IMP IN or IMP OUT.
	BOP	d) <b>Adjust SETTER to desired power level</b> e) <b>Adjust LOAD RATE %/MIN thumbwheel to desired ramp rate (1%/minute)</b> f) <b>Initiate Turbine load reduction using OPERATOR AUTO (pushes the GO button)</b> g) <b>Reduce Turbine Valve Position Limiter as load decreases</b> The BOP will periodically reduce the limiter setpoint during the ramp.
	SRO	3. CHECK EMERGENCY BORATION – REQUIRED The team may decide to emergency borate after the ramp has progressed to the point that Tave and Tref are matched (or close).
	SRO	Note Prior to Step 4: <ul style="list-style-type: none"> <li>Step 4 or Step 5 may be performed repeatedly to maintain Tave and Tref matched, ΔFlux in band, and control rod position above the LO-LO insertion limit.</li> </ul>

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

	RO	<p>0-AP-23.00</p> <p>4. PERFORM AN EMERGENCY BORATION IAW THE FOLLOWING:</p> <ul style="list-style-type: none"> <li>a) Check or raise CHG flow to greater than 75 gpm</li> <li>b) <b>Transfer the in-service BATP to FAST</b></li> <li>c) <b>Open ( )-CH-MOV-( )350</b></li> <li>d) Monitor EMRG BORATE FLOW <ul style="list-style-type: none"> <li>• ( )-CH-FI-( )110</li> </ul> </li> <li>e) After required emergency boration, perform the following: <ul style="list-style-type: none"> <li>1) <b>Close ( )-CH-MOV-( )350</b></li> <li>2) <b>Transfer the in-service BATP to AUTO</b></li> <li>3) Restore Charging flow control to normal</li> </ul> </li> </ul>
	RO	<p>5. ESTABLISH A NORMAL BORATION TO MAINTAIN CONTROL ROD POSITION ABOVE THE LO-LO INSERTION LIMITS ATTACHMENT 4</p> <p>Attachment 4 (Boration) and 5 (Manual Makeups) are at the end of this section.</p>
	SRO	<p>Notes Prior to Step 6:</p> <ul style="list-style-type: none"> <li>• If at any time plant conditions no longer require rapid load reduction, actions should continue at Step 35.</li> <li>• RCS Tave must be maintained less than or equal to 577°F and RCS pressure must be maintained greater than or equal to 2205 psig. Tech Spec 3.12.F.1 should be reviewed if either parameter is exceeded.</li> <li>• I &amp; C should be contacted to provide assistance with adjusting IRPIs.</li> </ul>
	RO	<p>6. CONTROL RAMP RATE TO MAINTAIN RCS PRESSURE GREATER THAN 2205 PSIG</p>
	RO	<p>*7. CHECK LETDOWN ORIFICES – TWO IN SERVICE</p> <p><i>Evaluator note: two orifices will already be in service.</i></p>
	BOP	<p>8. MONITOR STEAM DUMPS FOR PROPER OPERATION</p>

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

	SRO	0-AP-23.00  9. NOTIFY THE FOLLOWING: <ul style="list-style-type: none"><li>• Energy Supply (MOC)</li><li>• Polishing Building</li><li>• Chemistry</li><li>• OMOC</li></ul>
	SRO	10. EVALUATE THE FOLLOWING: <ul style="list-style-type: none"><li>• EPIP applicability</li></ul> <p><i>The Shift Manager will review EPIPs for applicability. They are not applicable.</i></p> <ul style="list-style-type: none"><li>• VPAP-2802, NOTIFICATIONS AND REPORTS, applicability</li></ul> <p><i>SRO directs STA to review VPAP-2802. The STA reports that he has completed his review of VPAP-2802 and no notifications are required.</i></p> <p><i>No further actions are required for this event.</i></p>
	SRO	11. CHECK REACTOR POWER – HAS DECREASED MORE THAN 15% IN ONE HOUR  When reactor power has decreased >15%, then chemistry will be notified.
		<b>END EVENT #6</b>

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
		<b>0-AP-23.00 Attachment 4 (NORMAL BORATION) Actions</b>
	RO	1. Place the MAKE-UP MODE CNTRL switch in the STOP position.
	RO	2. Adjust 1-CH-YIC-1113 to desired total gallons
	RO	3. Adjust 1-CH-FC-1113A to desired flow rate.
	RO	4. Place the MAKE-UP MOD SEL switch in the BORATE position.
	RO	5. Place the MAKE MODE CNTRL switch in the START position.
	RO	6. Check proper valve positions.
	RO	7. Adjust boration rate using 1-CH-FC-1113A, as necessary.
	RO	8. <u>WHEN</u> boration is complete, <u>THEN</u> perform the following. <u>IF</u> boric acid is to remain in the Blender to support ramping the Unit, <u>THEN</u> enter N/A.  a) Manually blend approximately 20 gallons to flush the boration path IAW Attachment 5, Manual Makeups.  b) Enter N/A for the remaining steps in this Attachment.  <i>Attachment 5 is on the next page</i>
	RO	9. Check controllers for Primary Grade water and Boric Acid are set correctly.
	RO	10. Place the MAKE-UP MODE SEL switch in the AUTO position.
	RO	11. Place the MAKE-UP MODE CNTRL switch in the START position.
	RO	12. Notify Shift Supervision of blender status.

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Event Description: Dropped Rod, Bank C, Group 1. 0-AP-1.00, 0-AP-23.00.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
		<b>0-AP-23.00 Attachment 5 (Manual Makeups) Actions</b>
		<b>1. Place the MAKE-UP MODE CNTRL switch in the STOP position.</b>
		2. Check controllers for the flow rate of Boric Acid and Primary Grade water are set correctly.
		<b>3. Check integrators for the gallons of Boric Acid and Primary Grade water are set correctly.</b>
		<b>4. Place the MAKE-UP MODE SEL switch in the MANUAL position.</b>
		<b>5. Place the MAKE-UP MODE CNTRL switch in the START position.</b>
		<b>6. Open 1-CH-FCV-1113B, BLENDER TO CHG PUMP.</b>
		7. Check proper valve positions.
		<b>8. WHEN the Manual Makeup operation is complete, THEN place 1-CH-FCV-1 113B in the AUTO position</b>
		<b>9. Place the MAKE-UP MODE CNTRL switch in the STOP position.</b>
		<b>10. Check or place the control switches in the AUTO position.</b>
		11. Check controllers for Primary Grade water and Boric Acid are set correctly.
		<b>12. Place the MAKE-UP MODE SEL switch in the AUTO position.</b>
		<b>13. Place the MAKE-UP MODE CNTRL switch in the START position.</b>
		14. Notify Shift Supervision of blender status.

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Event No.: 7

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	Team	<p>Diagnose the failure based on the following:</p> <p>Alarms:</p> <p>1E-B10, LOSS OF COOL FLOW PWR &gt; P8, RED</p> <p>1E-A3, RC LOOP 1C LO FLOW CH 1</p> <p>1E-B3, RC LOOP 1C LO FLOW CH 2</p> <p>1E-C3, RC LOOP 1C LO FLOW CH 3</p> <p>Indications:</p> <p>Low flow indication on 'C' loop, CH-1, CH-2, CH-3</p> <p>Reactor – Critical</p>
	RO	<p><b>Attempt to Trip the Reactor by pressing BB-1 and BB-2 Reactor Trip Pushbuttons.</b></p> <p>GO TO FR-S.1</p> <p><b>Critical Task:</b> CT-1: DRP-049 E-12, Insert negative reactivity into the core by at least one of the following methods before completing the Immediate Action Steps of FR-S.1. Insert Control Rods in auto or manual within 30 seconds of the onset of the ATWS event.</p> <p><b>Critical Step Start Time:</b> _____</p>
	RO	<p>1-FR-S.1</p> <p><b>CAUTION:</b> RCPs should not be tripped with Reactor power greater than 5%.</p> <p>[ 1 ]    <b>VERIFY REACTOR TRIP:</b>                      <b>Verify or place control rods in Auto.</b></p> <p>a) Manually trip Reactor</p> <p>b) Check the following:</p> <ul style="list-style-type: none"> <li>• All Rods On Bottom light - LIT</li> <li>• Reactor Trip and Bypass Breakers - OPEN</li> <li>• Neutron Flux – DECREASING</li> </ul> <p><b>RO Identifies Reactor NOT Tripped, Performs RNO Action</b></p>
	RO	<p>1-FR-S.1</p> <p>[ 2 ]    <b>MANUALLY TRIP THE TURBINE:</b></p> <p><b>RO presses Both Turbine Trip Pushbuttons, Simultaneously.</b></p> <ul style="list-style-type: none"> <li>• Verify all turbine stop valves - CLOSED</li> </ul>



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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

	RO	1-FR-S.1  [ 3 ] <i>VERIFY CONTROL RODS - INSERTING IN AUTO AT GREATER THAN 48 STEPS / MINUTE</i>
	RO/BOP	<b>Critical Task Stop Time:</b> _____ /  <b>Manually insert control rods.</b>  <b>When Rod Speed lowers, places Rods in MANUAL, and inserts Rods.</b>
	SRO BOP BOP  SRO	4 <b>VERIFY AFW PUMPS RUNNING:</b>  a) MD AFW pumps – RUNNING  b) TD AFW pump - RUNNING IF NECESSARY  BOP check MD / TD AFW Pumps Running.
	SRO  RO  SRO  RO  SRO  RO  SRO  RO	1-FR-S.1  5 <b>INITIATE EMERGENCY BORATION OF RCS:</b>  a) Verify CHG flow – GREATER THAN 75 GPM  <i>Check CHG FLOW &gt; 75 gpm.</i>  b) Align boration path:  1) Put BATP in FAST  <b>Places 1-CH-P-2A, 'A' BAST Recirc Pump, in FAST.</b>  2) Open 1-CH-MOV-1350  <b>Places control switch 1-CH-MOV-1350 in OPEN.</b>  3) Verify emergency borate flow  <i>Checks Flow on 1-CH-FI-1110 rises to 110 gpm.</i>  c) Check PRZR pressure – LESS THAN 2335 PSIG  <i>Checks RCS Pressure &lt; 2335 psig using RCS NR or WR Pressure.</i>

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

	SRO	1-FR-S.1
	RO	<p>*6 CHECK IF SI INITIATED: GO TO Step 8</p> <ul style="list-style-type: none"> <li>• LHSI pumps - RUNNING</li> <li>• SI annunciators - LIT <ul style="list-style-type: none"> <li>• A-F-3</li> <li>• A-F-4</li> </ul> </li> </ul> <p><i>Identifies SI NOT initiated, SRO GOES TO STEP 8.</i></p>
	SRO	1-FR-S.1
	RO	<p>8 CHECK IF THE FOLLOWING TRIPS HAVE OCCURRED:</p> <p>a) Reactor trip</p> <p>b) Turbine trip</p>
	SRO	<p><i>Directs BOP to contact Service Building Operator to locally open Unit 1 Reactor Trip Breakers.</i></p> <p><b>NOTE:</b> Two (2) Minutes will elapse from the time an Operator is dispatched to open the Reactor Trip breakers until the Simulator Operator Opens the breakers. Based on Time Critical Operator Action.</p>
	SRO	1-FR-S.1
	RO	<p><b>NOTE:</b> If adverse CTMT conditions have been exceeded, the Gamma-Metrics Excore Neutron Monitor system (Source and Wide Ranges) should be used to monitor neutron flux for the duration of the event.</p> <p>*9 CHECK REACTOR - SUBCRITICAL</p> <p>a) Check power range channels – LESS THAN 5% [Gamma-Metrics Wide Range Power - LESS THAN 5%]</p>
	RO	<p><i>Identifies Reactor Power &lt; 5%.</i></p> <p>b) Check Intermediate range channels - NEGATIVE STARTUP RATE [Gamma-Metrics Wide Range Power - DECREASING]</p>
	RO	<p><i>Identifies negative SUR on IR Channels.</i></p>
	SRO	c) GO TO Step 18

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

	SRO	<p>1-FR-S.1</p> <p>CAUTION: Boration should be continued to obtain adequate shutdown margin during subsequent actions.</p> <p>18 RETURN TO PROCEDURE AND STEP IN EFFECT</p> <p><b>SRO Announces Transition to E-0.</b></p>
	SRO	<p><b>Directs Reactor Operator to perform E-0 Immediate Actions Steps.</b></p>
	RO	<p><b><u>1-E-0 – Reactor Trip or Safety Injection</u></b></p> <p>[1] CHECK REACTOR TRIP:</p> <p>a) Manually trip reactor</p> <p><i>Pushes the reactor trip push buttons.</i></p> <p>b) Check the following:</p> <ul style="list-style-type: none"> <li>• All Rods On Bottom light – LIT</li> <li>• Reactor trip and bypass breakers – OPEN</li> <li>• Neutron flux - DECREASING</li> </ul>
	RO RO	<p>[2] CHECK TURBINE TRIP:</p> <p>a) Manually trip the turbine</p> <p><i>Pushes the turbine trip push buttons.</i></p> <p>b) Verify all turbine stop valves - CLOSED</p> <p>c) Isolate reheaters by closing MSR steam supply SOV</p> <ul style="list-style-type: none"> <li>• 1-MS-SOV-104</li> </ul> <p>d) Verify generator output breakers – OPEN (Time Delayed)</p> <p>Identifies that Output Breakers did open</p>
	RO	<p>[3] CHECK BOTH AC EMERGENCY BUSES - ENERGIZED</p>

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

	<p>RO</p> <p>[4] CHECK IF SI INITIATED:</p> <p>a) Check if SI is actuated:</p> <ul style="list-style-type: none"> <li>LHSI pumps – RUNNING</li> <li>SI annunciators – LIT <ul style="list-style-type: none"> <li>A-F-3 SI INITIATED – TRAIN A</li> <li>A-F-4 SI INITIATED – TRAIN B</li> </ul> </li> </ul> <p>RO</p> <p><b>RO will determine that SI has NOT occurred and perform step 4a RNO actions:</b></p> <p>4a RNO Check if SI is required or imminent as indicated by any of the following:</p> <ul style="list-style-type: none"> <li>Low PRZR pressure</li> <li>High CTMT pressure</li> <li>High steamline differential pressure</li> <li>High steam flow with low Tave or low line pressure</li> </ul> <p>IF SI is required, THEN GO TO Step 4b.</p> <p><i>RO reports Immediate Actions of E-0 are complete, SI not in service or required, and recommends transition to ES-0.1.</i></p> <p>After the immediate actions of 1-E-0 are reported as complete, the SRO will check off immediate action steps in his copy of 1-E-0. After the immediate actions are verified, the team will conduct a brief.</p>	
	<p>SRO</p> <p>SRO will lead a brief using the brief checklist.</p> <p>The RO will provide critical parameters using the Brief placard.</p> <p>The BOP will provide critical parameters using the brief paacard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the alarms already received. He will also state that containment conditions and the electrical conditions are as you see them (or as reported by the RO/BOP).</i></p> <p>The SRO will direct the BOP to perform ES-0.1, Transient AFW Control, Attachment 5 of ES-0.1, while the RO and SRO continue with ES-0.1.</p> <p><b>Note:</b> Attachment 5 of ES-0.1 is located at the End of this Section.</p>	

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

		1-ES-0.1  NOTE: If this procedure is being entered from 1-E-0, REACTOR TRIP OR SAFETY INJECTION, following a tube leak of less than 150 gpm, 1-AP-24.01, LARGE STEAM GENERATOR TUBE LEAK, should be used for guidance instead of this procedure.
	SRO	*1 CHECK RCS TEMPERATURE CONTROL
		a) Check RCPS - ANY RUNNING
	RO	<i>Reports all three RCPs running, 'C' with abnormally low flow.</i>
		b) Monitor RCS Average Temperature
		1) STABLE AT 547°F
		OR
		2) TRENDING TO 547°F
	RO	Reports RCS temperature stable at 547 °F.
		1-ES-0.1
	SRO	2 CHECK FW STATUS:
		a) Check RCS Average temperatures - LESS THAN 554°F
	RO	<i>Identifies RCS Temperature &lt; 554 °F</i>
		b) Check Feed REG valves – CLOSED
	RO	<i>Identifies all FRVs closed.</i>
		c) Close SG FW isolation MOVs
		• 1-FW-MOV-154A
		• 1-FW-MOV-154B
		• 1-FW-MOV-154C
	RO/BOP	<b>Close 1-FW-MOV-154 A / B / C</b>
		d) Check AFW pumps - RUNNING
		• Motor Driven AFW pumps
		• TD AFW pump
	BOP	<i>Identifies MD / TD AFW pump running.</i>
		e) Check total AFW flow – GREATER THAN 540 GPM (350 GPM W/O RCPs)

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

	BOP	<i>Identifies AFW flow &gt; 540 GPM (IAW band given by SRO)</i>
	RO	f) Check emergency buses – BOTH ENERGIZED <i>Identifies emergency buses energized.</i>
	BOP	g) Control feed flow to maintain narrow range level between 22% and 50% <i>Acknowledges direction to control AFW flow to obtain band.</i>
	SRO	1-ES-0.1 3 CHECK CHARGING IN SERVICE
	RO	<i>Provides CH flow value and trend to SRO.</i>
	SRO	1-ES-0.1 4 CHECK CC SYSTEM STATUS:
	RO	a) Check SW to CC HXs - IN SERVICE <i>Identifies two (2) CC headers flowing to CC HXs.</i>
	RO	b) Check CC pumps - AT LEAST ONE RUNNING <i>Identifies 1-CC-P-1A running.</i>
	SRO	1-ES-0.1 5 CHECK PRZR LEVEL CONTROL:
	RO	a) Check PRZR level - GREATER THAN 15% <i>Reports PRZR level and trend to SRO.</i>
	RO	b) Check letdown - IN SERVICE <i>Reports Letdown flow and trend to SRO.</i>

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Event Description: RC Loop "C" Tc disc falls in, Valid First-out, FR-S.1.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	BOP	<p>ES-0.1, Attachment 5</p> <p>1 Maintain minimum AFW flow of 540 gpm with RCP(s) in service until one SG Narrow Range level is greater than 12%.</p>
	BOP	<p>ES-0.1, Attachment 5</p> <p>2 Maintain minimum AFW flow of 350 gpm with NO RCPs running, until one SG Narrow Range level is greater than 12%.</p> <p><i>Throttles AFW to band provided by SRO.</i></p>
	BOP	<p>ES-0.1, Attachment 5</p> <p><b>NOTE:</b> AFW to idle loop(s) (RCP secured), should be throttled to prevent depressurization of the SG and subsequent Header / Line SI. AFW flow between approximately 60 gpm and 100 gpm should be adequate to prevent a Header / Line SI.</p> <p>3 When minimum heat sink has been verified, AFW MOVs should be controlled to maintain intact SG Narrow Range levels between 22% and 50% by throttling AFW Isolation MOVs:</p> <ul style="list-style-type: none"> <li>• SG A, 1-FW-MOV-151E and 1-FW-MOV-151F</li> <li>• SG B, 1-FW-MOV-151C and 1-FW-MOV-151D</li> <li>• SG C, 1-FW-MOV-151A and 1-FW-MOV-151B</li> </ul>
	BOP	<p>ES-0.1, Attachment 5</p> <p>4. Isolate AFW header with deenergized Emergency Bus MOVs by closing the following header isolation valves:</p> <p>Emergency Bus H deenergized: <input type="checkbox"/> 1-FW-141 <input type="checkbox"/> 1-FW-156 <input type="checkbox"/> 1-FW-171</p> <p>Emergency Bus J deenergized: <input type="checkbox"/> 1-FW-140 <input type="checkbox"/> 1-FW-155 <input type="checkbox"/> 1-FW-170</p> <p>Identifies Bus 'H' and 'J' not deenergized.</p>
		<b>End EVENT #7</b>

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Time	Position	Applicant's Action or Behavior
	Team	Identify Failure based on the following:  Alarms: 1B-F3, SFGDS AREA SUMP HI LEVEL 1C-B-8, PRZR LO PRESS 1C-D8, PRZR LO LEVEL 1D-E5, CHG PP TO REGEN HX HI-LO FLOW RMA-D6, VENT STACK #2PART ALERT/HI RMA-D7, VENT STACK #2 NORM RNG GAS ALERT/HI  Indications: Lowering PRZR Level Rising CH flow  NOTE: SRO may direct manual safety injection and return to E-0 due to degrading plant conditions.
	SRO	1-AP-16.00  Direct RO to perform the Immediate Actions of 1-AP-16.00.
	RO          RO  SRO	1-AP-16.00  NOTE: • If SI Accumulators are isolated, 1-AP-16.01, SHUTDOWN LOCA, should be used for guidance. • RCS average temperature has a direct impact on pressurizer level.  [ 1 ] MAINTAIN PRZR LEVEL:  • Isolate Letdown  Closes 1-CH-LCV-1460 A / B  • Control Charging flow  Takes Manual control of 1-CH-FCV-1122 and raises CH Flow.  Reports that CH flow at maximum value and PZR level decreasing.  <b>Direct RO to Re-perform the Immediate Action Steps of E-0, and Safety Inject on Step 4.</b>
	RO	1-E-0  [ 1 ] CHECK REACTOR TRIP:
		1-E-0



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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

	RO	[ 2 ] CHECK TURBINE TRIP:
		1-E-0 [ 3 ] CHECK BOTH AC EMERGENCY BUSES – ENERGIZED
	RO	1-E-0 [ 4 ] CHECK IF SI INITIATED:  a) Check if SI is actuated:  • LHSI pumps – RUNNING  • SI annunciators – LIT  • A-F-3 • A-F-4  b) <b>Manually initiate SI</b>  <b>Report SI has been initiated, SI flow to the core, 1-E-0 Immediate Actions with SI complete.</b>
	SRO	1-E-0  Will Check off the Immediate Action Steps of 1-E-0.  SRO will conduct a commensurate Brief. Ensure the Team agrees that a LOCA outside of containment is in progress. Poll the Team as to any higher priority than continuing actions for a LOCA outside of containment.  SRO closes the brief.  <b>Directs BOP to perform Attachments 1, 2, and 3 of 1-E-0. Attachment 1, 2, and 3 located in Event 9.</b>  Continues with 1-E-0 with RO.

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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
		1-E-0
	RO	Identify RCS Subcooling < 30 °F and SI flow indicated to all three loops.
	SRO	Using 1-E-0 Continuous Actions Page:  1. RCP TRIP CRITERIA  Trip all RCPs if BOTH conditions listed below occur:  a. Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS  b. RCS Subcooling - LESS THAN 30°F [85°F]  RO <i>Checks RCP Trip Criteria exist.</i>  SRO <b>Directs RO to Trip all RCPs.</b>  2. MINIFLOW RECIRC CRITERIA  a. CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).  RO Identifies Criteria are met.  SRO <b>Direct RO to close mini-flow recirc valves.</b>  <b>CT-2: Critical Task: E-0 – 1.2.</b> Trip all RCPs within 5 minutes of reaching RCP Trip and Miniflow Recirc Criteria. (WOG E-1-C).  CT-2: <b>Start</b> Time: _____. CT-2: <b>Stop</b> Time: _____.
	SRO	*6. CHECK RCS AVERAGE TEMPERATURE  • STABLE AT 547°F  OR  • TRENDING TO 547°F

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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

	SRO	<p>7. CHECK PRZR PORVs AND SPRAY VALVES:</p> <ul style="list-style-type: none"> <li>a) PRZR PORVs – CLOSED</li> <li>b) PRZR spray controls <ul style="list-style-type: none"> <li>• Demand at Zero (or)</li> <li>• Controlling Pressure</li> </ul> </li> <li>c) PORV block valves - AT LEAST ONE OPEN</li> </ul>
	<p>SRO</p> <p>RO</p>	<p><b>NOTE:</b> Seal injection flow should be maintained to all RCPs.</p> <p>*8. CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <ul style="list-style-type: none"> <li>a) Charging Pumps – AT LEAST ONE RUNNING AND FLOWING TO RCS</li> </ul> <p>Two or three Charging pumps will be running and flowing to the RCS.</p> <ul style="list-style-type: none"> <li>b) RCS subcooling - LESS THAN 30°F [85°F]</li> </ul> <p>RCS subcooling will be less than 30 °F</p> <ul style="list-style-type: none"> <li>c) Stop all RCPs</li> <li>d) RCS pressure - LESS THAN 1275 psig [1475 PSIG]</li> <li>e) Close CHG pump miniflow recirc valves: <ul style="list-style-type: none"> <li>• 1-CH-MOV-1275A</li> <li>• 1-CH-MOV-1275B</li> <li>• 1-CH-MOV-1275C</li> </ul> </li> </ul> <p><i>Mini-flow recirc valves closed.</i></p>
	SRO	<p>9. CHECK IF SGs ARE NOT FAULTED:</p> <ul style="list-style-type: none"> <li>• Check pressures in all SGs <ul style="list-style-type: none"> <li>a) STABLE OR INCREASING AND</li> <li>b) GREATER THAN 100 PSIG</li> </ul> </li> </ul> <p>RO will observe a slightly decreasing trend on SG pressures. This will be attributed to the RCS cooldown. The team will not transition to 1-E-2.</p>

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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

	SRO	10. CHECK IF SG TUBES ARE NOT RUPTURED: <ul style="list-style-type: none"> <li>• Condenser air ejector radiation – NORMAL</li> <li>• SG blowdown radiation – NORMAL</li> <li>• SG MS radiation – NORMAL</li> <li>• TD AFW pump exhaust radiation – NORMAL</li> <li>• SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER</li> </ul>
	SRO	11 CHECK RCS - INTACT INSIDE CTMT <ul style="list-style-type: none"> <li>• CTMT radiation - NORMAL</li> <li>• CTMT pressure - NORMAL</li> <li>• CTMT RS sump level – NORMAL</li> </ul>
	RO	<i>Reports RCS intact in side CTMT.</i>
	SRO	12 CHECK RCS - HAS BEEN MAINTAINED INTACT OUTSIDE CTMT <p>a) Radiation Monitors - NORMAL</p> <ul style="list-style-type: none"> <li>• MGPI vent-vent</li> <li>• Auxiliary Building Control Area</li> </ul>
	RO	Reports MGPI Vent-Vent in Alarm <p>b) Sump annunciators - NOT LIT</p> <ul style="list-style-type: none"> <li>• VSP-F-4</li> <li>• B-D-1</li> <li>• B-D-2</li> <li>• B-F-3</li> </ul> <p>Step 12 RNO</p> <p>Determine cause of abnormal conditions. IF the cause is a loss of RCS inventory outside CTMT, THEN GO TO 1-ECA-1.2, LOCA OUTSIDE CONTAINMENT.</p>
	RO	Reports conditions caused by LOCA outside CTMT
	SRO	<b>Transitions to ECA-1.2.</b>

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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

Time	Position	Applicant's Action or Behavior
	SRO	<p>1-ECA-1.2</p> <p>Performs a commensurate brief. Ensures Team assessment confirms event in progress is a LOCA outside CTMT. Polls Team concerning any abnormal condition that needs to be addresses of a higher priority than isolating the LOCA outside CTMT. When any issues are addressed, SRO closes brief and continues with ECA-1.2.</p>
	SRO	<p>1-ECA-1.2</p> <p>CAUTION: Depending on break location, higher than normal dose levels should be expected in the Auxiliary Building and the Safeguards after a LOCA outside CTMT.</p> <p>1 VERIFY PROPER VALVE ALIGNMENT:</p> <p>a) Locally unlock and close the following breakers:</p> <ul style="list-style-type: none"> <li>• 1H1-2N 8A for 1-SI-MOV-1890A</li> <li>• 1J1-2E 8B for 1-SI-MOV-1890B</li> <li>• 1H1-2N 9A for 1-SI-MOV-1890C</li> </ul> <p><b>Directs the BOP to contact the Shift Manager/Desk SRO and have an operator briefed and dispatched to remove tags and close the breakers for 1-SI-MOV-1890 A / B / C.</b></p> <p><b>NOTE:</b> <i>Booth will time compress this action when SM/Desk SRO contacted.</i></p> <p>b) LHSI to hot legs - CLOSED</p> <ul style="list-style-type: none"> <li>• 1-SI-MOV-1890A</li> <li>• 1-SI-MOV-1890B</li> </ul> <p><i>When Valves Energized, the valves indicate closed.</i></p> <p>c) SI accumulator test valves - CLOSED</p> <ul style="list-style-type: none"> <li>• HCV-SI-1850A</li> <li>• HCV-SI-1850B</li> <li>• HCV-SI-1850C</li> <li>• HCV-SI-1850D</li> <li>• HCV-SI-1850E</li> <li>• HCV-SI-1850F</li> </ul> <p><i>When Checked, Valves Indicate closed.</i></p>

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Event Description: Loca outside of Containment upstream 1-SI-MOV-1890C.

Cue: By Evaluator.

		1-ECA-1.2
	SRO	NOTE: The SRO is expected to have a Focus Brief prior to this step. The SRO will bring the BOP into the discussion concerning the expected response of the RCS when 1-SI-MOV-1890C is closed. If closure of this valves isolates the RCS break, RCS pressure and LHSI flow is expected to increase. If the break remains isolated, RCS pressure and LHSI flow will remain the same or decrease. The SRO will complete the brief and continue ECA-1.2.
	RO	2 TRY TO IDENTIFY AND ISOLATE BREAK: a) Close LHSI to cold legs • 1-SI-MOV-1890C
	Team	Shortly after closure of 1-SI-MOV-1890C, the Team should identify that RCS pressure and LHSI flow is increasing.
		<b>Critical Task:</b>
	SRO	CT-3: WOG ECA-1.2—A, Isolate the LOCA outside containment before transition out of ECA-1.2. <b>SPS- Isolate LOCA outside containment before subcooling is less than 30 °F AND before transition out of ECA-1.2 (PSA).</b>
	RO	b) Check RCS pressure – INCREASING  <i>RO will identify RCS increasing.</i>
	RO	c) Place LHSI pumps in PTL  Places LHSI pumps in PTL.
	SRO	d) Close LHSI pump suction from RWST • 1-SI-MOV-1862A • 1-SI-MOV-1862B  <b>Closes 1-SI-MOV-1862A / B.</b>
		e) GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT  <b>SRO Transitions to 1-E-1.</b>
		<b>CRITICAL TASK STOP TIME</b> _____
		<b>END EVENT 8</b> <b>END of Scenario 4</b>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

Time	Position	Applicant's Action or Behavior
	BOP	<b>ATTACHMENT 1 OF E-0</b>  1. CHECK FW ISOLATION: <ul style="list-style-type: none"> <li>• Feed pump discharge MOVs – CLOSED</li> <li>• 1-FW-MOV-150A</li> <li>• 1-FW-MOV-150B</li> <li>• MFW pumps – TRIPPED</li> <li>• Feed REG valves – CLOSED</li> <li>• SG FW bypass flow valves – DEMAND AT ZERO</li> <li>• SG blowdown TVs – CLOSED</li> </ul>
	BOP	2. CHECK CTMT ISOLATION PHASE I: <ul style="list-style-type: none"> <li>• Phase I TVs – CLOSED</li> </ul> <b>Identifies 1-CV-TV-150A, 1-CH-TV-1204A OPEN, Closes valves</b> <ul style="list-style-type: none"> <li>• 1-CH-MOV-1381 – CLOSED</li> <li>• 1-SV-TV-102A – CLOSED</li> <li>• PAM isolation valves – CLOSED               <ul style="list-style-type: none"> <li>• 1-DA-TV-103A</li> <li>• 1-DA-TV-103B</li> </ul> </li> </ul>
	BOP	3. CHECK AFW PUMPS RUNNING: <ul style="list-style-type: none"> <li>a) MD AFW pumps – RUNNING (Time Delayed)</li> <li>b) TD AFW pump - RUNNING IF NECESSARY</li> </ul>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

	BOP	<b>Attachment 1 of E-0</b>  4. CHECK SI PUMPS RUNNING: <ul style="list-style-type: none"><li>• CHG pumps – RUNNING</li><li>• LHSI pumps – RUNNING</li></ul> <b>Manually Starts 1-SI-P-1A.</b>
	BOP	5. CHECK CHG PUMP AUXILIARIES: <ul style="list-style-type: none"><li>• CHG pump CC pump – RUNNING</li><li>• CHG pump SW pump - RUNNING</li></ul>
	BOP	6. CHECK INTAKE CANAL: <ul style="list-style-type: none"><li>• Level - GREATER THAN 24 FT</li><li>• Level - BEING MAINTAINED BY CIRC WATER PUMPS</li></ul>
	BOP	7. CHECK IF MAIN STEAMLINES SHOULD BE ISOLATED:  a) Check if ANY of the following annunciators - HAVE BEEN LIT <ul style="list-style-type: none"><li>• E-F-10 (High Steam Flow SI)</li><li>• B-C-4 (Hi Hi CLS Train A)</li><li>• B-C-5 (Hi Hi CLS Train B)</li></ul> Identifies annunciators not lit and goes to step 8.



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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

	BOP	<p>*8 CHECK IF CS REQUIRED:</p> <p>a) CTMT pressure – HAS EXCEEDED 23 PSIA</p> <p>8, a) RNO Do the following:</p> <p>1) IF CTMT pressure has exceeded 17.7 psia, THEN check or align the following valves:</p> <p>Identifies CTMT pressure remains at normal pressure</p> <p>2) GO TO Step 10.</p>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>*10. BLOCK LOW PRZR PRESS SI SIGNAL:</p> <p>a) Check PRZR pressure – LESS THAN 2000 psig</p> <p>b) Turn both LO PRZR PRESS &amp; STM HDR/LINE ΔP switches to block</p> <p>c) Verify Permissive Status light C-2 - LIT</p> <p>BOP may block the low pressurizer pressure SI signal depending on current RCS pressure.</p>
	BOP	<p>*11. BLOCK LOW TAVE SI SIGNAL:</p> <p>Step may not be performed at this time (if Tave is greater than 543°F).</p> <p>a) Check RCS Tave - LESS THAN 543°F</p> <p>b) Turn both HI STM FLOW &amp; LO TAVG OR LP switches to block</p> <p>c) Verify Permissive Status light F-1 - LIT</p>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

	BOP	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• CHG pumps should be run in the following order of priority: C, B, A.</li> <li>• Subsequent SI signals may be reset by re-performing Step 12.</li> </ul> <p>12. CHECK SI FLOW:</p> <p>a) HHSI to cold legs - FLOW INDICATED</p> <ul style="list-style-type: none"> <li>• 1-SI-FI-1961 (NQ)</li> <li>• 1-SI-FI-1962 (NQ)</li> <li>• 1-SI-FI-1963 (NQ)</li> <li>• 1-SI-FI-1943 or 1-SI-FI-1943A</li> </ul> <p>b) Check CHG pumps - THREE RUNNING</p> <p>c) Reset SI.</p> <p>d) Stop one CHG pump and out in AUTO</p>
		<p><b>Attachment 1 of E-0</b></p> <p>e) RCS pressure - LESS THAN 185 PSIG</p> <p>RNO: e) IF two LHSI pumps are running, THEN do the following:</p> <ol style="list-style-type: none"> <li>1) Verify reset or reset SI.</li> <li>2) Stop one LHSI pump and put in AUTO.</li> </ol>
	BOP	13. CHECK TOTAL AFW FLOW - GREATER THAN 350 GPM [450 GPM]
	BOP	<p>14. CHECK AFW MOVs - OPEN</p> <p>BOP will identify that all AFW MOVs are not open and will read the RNO portion of this step and manually align valves as necessary.</p>
	BOP	<p>15. INITIATE SI VALVE ALIGNMENT IAW ATTACHMENT 2</p> <p>See attached copy of Attachment 2. (Next Page of this guide)</p> <p>Depending on timing, this attachment may have already been completed.</p>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

**Cue: Active Failures.**

	BOP	<p>16. INITIATE VENTILATION, AC POWER, AND SFP STATUS CHECKS IAW ATTACHMENT 3</p> <p><i>Attachment 3 follows Attachment 2.</i></p> <p><i>Unit 2 Operator will state that Unit 2 is at 100% power (if asked)</i></p> <p><i>Unit 2 will also accept responsibility to complete Attachment 3 if it is given to Unit 2 at the point where differential pressure indications are requested.</i></p>
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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

	BOP	ATTACHMENT 2 of 1-E-0  <b>NOTE:</b> Components previously aligned by SI termination steps, must not be realigned by this Attachment.
	BOP	ATTACHMENT 2 of 1-E-0  1. Check opened or open CHG pump suction from RWST MOVs.  <ul style="list-style-type: none"> <li>• <b>1-CH-MOV-1115B</b></li> <li>• 1-CH-MOV-1115D</li> </ul>
	BOP	ATTACHMENT 2 of 1-E-0  2. Check closed or close CHG pump suction from VCT MOVs.  <ul style="list-style-type: none"> <li>• <b>1-CH-MOV-1115C</b></li> <li>• 1-CH-MOV-1115E</li> </ul>
	BOP	ATTACHMENT 2 of 1-E-0  3. Check running or start at least two CHG pumps. (listed in preferred order)  <ul style="list-style-type: none"> <li>• 1-CH-P-1C</li> <li>• 1-CH-P-1B</li> <li>• 1-CH-P-1A</li> </ul>
	BOP	ATTACHMENT 2 of 1-E-0  4. Check opened or open HHSI to cold legs MOVs.  <ul style="list-style-type: none"> <li>• 1-SI-MOV-1867C</li> <li>• 1-SI-MOV-1867D</li> </ul>
	BOP	ATTACHMENT 2 of 1-E-0  5. Check closed or close CHG line isolation MOVs. <ul style="list-style-type: none"> <li>• <b>1-CH-MOV-1289A</b></li> <li>• 1-CH-MOV-1289B</li> </ul>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>6. Check closed or close Letdown orifice isolation valves.</p> <ul style="list-style-type: none"> <li>1-CH-HCV-1200A</li> <li>1-CH-HCV-1200B</li> <li>1-CH-HCV-1200C</li> </ul>
	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>7. Check opened or open LHSI suction from RWST MOVs.</p> <ul style="list-style-type: none"> <li>1-SI-MOV-1862A</li> <li>1-SI-MOV-1862B</li> </ul>
	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>8. Check opened or open LHSI to cold legs MOVs.</p> <ul style="list-style-type: none"> <li>1-SI-MOV-1864A</li> <li>1-SI-MOV-1864B</li> </ul>
	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>9. Check running or start at least one LHSI pump.</p> <ul style="list-style-type: none"> <li>1-SI-P-1A</li> <li>1-SI-P-1B</li> </ul>
	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>10. Check High Head SI flow to cold legs indicated.</p> <ul style="list-style-type: none"> <li>1-SI-FI-1961</li> <li>1-SI-FI-1962</li> <li>1-SI-FI-1963</li> <li>1-SI-FI-1943 or 1-SI-FI-1943A</li> </ul>
	BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>11. IF flow not indicated, THEN manually start pumps and align valves. IF flow NOT established, THEN consult with Shift Supervision to establish another high pressure injection flow path while continuing with this procedure.</p> <ul style="list-style-type: none"> <li>Alternate SI to Cold legs</li> <li>Hot leg injection</li> </ul>
		<b>End of Event 9 –. End of Scenario 4</b>

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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1. \_\_\_\_ Check or place REFUEL SFTY MODE switches in NORMAL.

2. \_\_\_\_ Check ventilation alignment IAW Tables 1 and 2.

TABLE 1  
UNIT #1 VENTILATION PANEL

<u>MARK NUMBER</u>	<u>EQUIPMENT STATUS</u>
<input type="checkbox"/> 1-VS-F-4A & B	OFF
<input type="checkbox"/> 1-VS-HV-1A & B	OFF
<input type="checkbox"/> 1-VS-F-8A & B	OFF
<input type="checkbox"/> 1-VS-F-9A & B	GREEN
<input type="checkbox"/> 1-VS-F-59	GREEN
<input type="checkbox"/> 1-VS-F-6	OFF
<input type="checkbox"/> 1-VS-F-39	GREEN
<input type="checkbox"/> 1-VS-F-7A & B	GREEN
<input type="checkbox"/> 1-VS-HV-5	GREEN
<input type="checkbox"/> 1-VS-F-56A & B	GREEN
<input type="checkbox"/> 1-VS-F-40A & B	GREEN
<input type="checkbox"/> 1-VS-HV-4	OFF
<input type="checkbox"/> 2-VS-F-40A or B	RED
<input type="checkbox"/> 2-VS-HV-4	OFF

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE	ATTACHMENT 3
REVISION 69	AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	PAGE 2 of 6

TABLE 2  
VNTX PANEL

<u>MARK NUMBER</u>	<u>EXPECTED EQUIPMENT STATUS</u>	<u>RESPONSE NOT OBTAINED</u>
<input type="checkbox"/> a. AOD-VS-107A & B AOD-VS-108	RED GREEN	<input type="checkbox"/> a. Place AUX BLDG CENTRAL AREA MODE switch to FILTER.
<input type="checkbox"/> b. MOD-VS-100A & B AOD-VS-106	RED GREEN	<input type="checkbox"/> b. • Place MOD-VS-100A to FILTER. • Place MOD-VS-100B to FILTER.
<input type="checkbox"/> c. MOD-VS-200A & B AOD-VS-206	GREEN RED	<input type="checkbox"/> c. • Place MOD-VS-200A to UNFILTER. • Place MOD-VS-200B to UNFILTER.
<input type="checkbox"/> d. AOD-VS-103A & B AOD-VS-104	GREEN GREEN	<input type="checkbox"/> d. • Place AOD-VS-103A in UNFILTER. • Place AOD-VS-103B in UNFILTER. • Place AOD-VS-104 in FILTER.
<input type="checkbox"/> e. AOD-VS-101A & B AOD-VS-102	GREEN GREEN	<input type="checkbox"/> e. Place AOD-VS-101A and 101B in UNFILTER.
<input type="checkbox"/> f. AOD-VS-111A & B	GREEN	<input type="checkbox"/> f. Place COMBINE CONTAINMENT EXHAUST in ISOLATE.
<input type="checkbox"/> g. AOD-VS-110	GREEN	<input type="checkbox"/> g. Place AOD-VS-109A and 109B in FILTER.
<input type="checkbox"/> h. AOD-VS-112A & B	GREEN	<input type="checkbox"/> h. • Place AOD-VS-112A in CLOSE. • Place AOD-VS-112B in CLOSE.
<input type="checkbox"/> i. MOD-VS-58A & B 1-VS-F-58A & B	RED RED	<input type="checkbox"/> i. Start 1-VS-F-58A and 1-VS-F-58B.
3. ____ Check filtered exhaust flow: (as read on FI-VS-117A and FI-VS-117B)		
<input type="checkbox"/> • Total flow - GREATER THAN 32400 cfm		
<u>AND</u>		
<input type="checkbox"/> • Flow through each filter bank - LESS THAN 39600 cfm		

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
REVISION 69		PAGE 3 of 6

4. \_\_\_\_ Check all Station Service Buses - ENERGIZED. IF NOT, THEN initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.
5. \_\_\_\_ Check annunciator VSP-J2 - LIT.
6. \_\_\_\_ Check Unit 1 RSST LTC time delay bypass light - LIT.
7. \_\_\_\_ Check stopped or stop 1-VS-AC-4.
8. \_\_\_\_ Place 1-VS-43-VS103X, MCR ISOLATION switch to the OFF position.
9. \_\_\_\_ Check closed or close MCR isolation dampers.
  - ☐ • 1-VS-MOD-103A
  - ☐ • 1-VS-MOD-103B
  - ☐ • 1-VS-MOD-103C
  - ☐ • 1-VS-MOD-103D



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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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\*\*\*\*\* :

**CAUTION:** • Only one Emergency Supply Fan must be started in the following step.

- Chilled Water flow to the in-service Unit 1 MCR AHU must be throttled to at least 15 gpm when the Emergency Supply fan is started.
- Chilled Water flow to the in-service Unit 2 MCR AHU must be throttled to at least 25 gpm when the Emergency Supply fan is started.
- An Emergency Supply Fan must not be started if the filter is wet.

\*\*\*\*\* :

10. Immediately start ONE Emergency Supply Fan IAW the following: (1-VS-F-41 or 2-VS-F-41 preferred)
- a. IF 1-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
- \_\_\_ 1. Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD.
  - \_\_\_ 2. Start 1-VS-F-41.
- b. IF 2-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
- \_\_\_ 1. Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD.
  - \_\_\_ 2. Start 2-VS-F-41.
- c. IF 1-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
- \_\_\_ 1. Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD.
  - \_\_\_ 2. Start 1-VS-F-42.
- d. IF 2-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.
- \_\_\_ 1. Open 2-VS-MOD-204B, CONT RM EMERG SUP MOD.
  - \_\_\_ 2. Start 2-VS-F-42.
- e. \_\_\_ Adjust Chilled Water flow to MCR AHUs IAW Step 10 Caution.

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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11. \_\_\_\_ Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.

- ☐ • PDI-VS-100, D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-101, D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-200, D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-201, D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • 1-VS-PDI-118 (Unit 1 Computer Room)
- ☐ • 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
- ☐ • 2-VS-PDI-215 (Unit 2 AC Room)
- ☐ • 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)

12. \_\_\_\_ IF any reading NOT positive, THEN initiate Attachment 6 to secure MCR boundary fans.

13. \_\_\_\_ Check initiated or initiate 0-AP-50.00, OPPOSITE UNIT EMERGENCY.

14. \_\_\_\_ Check the following MCR and ESGR air conditioning equipment operating. IF NOT, THEN start equipment within 1 hour IAW the appropriate subsection of 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM.

- ☐ • One Control Room chiller
- ☐ • One Unit 1 Control Room AHU
- ☐ • One Unit 2 Control Room AHU
- ☐ • One Unit 1 ESGR AHU
- ☐ • One Unit 2 ESGR AHU

15. \_\_\_\_ IF both of the following conditions exist, THEN check that Load Shed is activated.

- ☐ • Unit 2 - SUPPLIED BY RSST
- ☐ • Unit 2 RCPs - RUNNING

16. \_\_\_\_ IF Load Shed is required and not activated, THEN initiate 0-AP-10.10, LOSS OF AUTO LOAD SHED.

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Event Description: BOP Failures; 1-CH-MOV-1115D, 1-CH-MOV-115C, 1-CH-MOV-1289A fail to re-position.

Cue: Active Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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**NOTE:** • SFP checks should be initiated WITHIN ONE TO TWO HOURS of EOP entry.

- Loss of power may render SFP indications and alarms non-functional and require local checks. Power supplies are as follows:
  - TI-FC-103, Unit 1 Semi-Vital Bus
  - TI-FC-203, Unit 2 Semi-Vital Bus
  - 1-FC-LIS-104, Panel 1ABDA1
- Loss of AC Power to the SFP level indicator is indicated if both low and high level alarms are in simultaneously. (0-VSP-C4 and 0-VSP-D4)
- 1-DRP-003, CURVE BOOK, provides a graph for SFP time to 200°F if loss of SFP cooling occurs.

17. \_\_\_\_ Initiate monitoring SFP parameters:

- ☐ • SFP level - Greater than Cooling Pump suction AND Stable
- ☐ • SFP temperature - Stable or Decreasing
- ☐ • SFP Cooling Pumps - Either Running
- ☐ • Component Cooling - Normal

18. \_\_\_\_ Continue to monitor parameters every one to two hours or until authorized to terminate monitoring by the Station Emergency Manager and/or the Shift Manager.

19. \_\_\_\_ Notify the Station Emergency Manager and/or the Shift Manager of the status and trend of SFP parameters.

20. \_\_\_\_ IF any abnormality or adverse trend is identified, THEN initiate 0-AP-22.02, MALFUNCTION OF SPENT FUEL PIT SYSTEMS.

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Scenario No.: 1

Event No.: N/A

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER 1-E-0	CONTINUOUS ACTIONS PAGE	REVISION 69
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1. RCP TRIP CRITERIATrip all RCPs if BOTH conditions listed below occur:

- Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- RCS Subcooling - LESS THAN 30°F [85°F]

2. MINIFLOW RECIRC CRITERIA

- CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- OPEN - When RCS pressure is greater than 2000 psig.

3. ADVERSE CONTAINMENT CRITERIAUse Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

1. AMSAC RESET CRITERIAAMSAC may be manually reset when level in all three SGs is greater than 13% or six minutes have elapsed since the Reactor trip. When AMSAC is reset, AMSAC ARMED annunciator H-D-1 should clear and affected components may be realigned as needed.2. TD AFW PUMP SHUTDOWN CRITERIA

The TD AFW pump may be secured when SG NR level is greater than 22% in at least 2 SGs, AMSAC is reset, and no auto-start signal exists. To secure the pump, the pump SOV control switches must be taken to OPEN-RESET and then to CLOSE.

3. MANUAL SI ALIGNMENT

If SI fails to automatically align, Attachment 2 may be used for guidance on manual SI valve alignment.

4. \* TRANSIENT AFW FLOW CONTROL (IF SI in progress)

Attachment 8 may be used for guidance on transient AFW flow control.

5. \* FAULTED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 9 may be used for guidance on faulted SG(s) isolation and AFW flow control.

6. \* RUPTURED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 10 may be used for guidance on ruptured SG(s) isolation and AFW flow control.

7. \* LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

\* Preemptive Actions

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Scenario No.: 1

Event No.: N/A

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER	CONTINUOUS ACTION STEPS	REVISION
1-E-0		69

1. Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F. (E-0, Step 6)
  2. Monitor RCP Trip and Miniflow Recirc Criteria. (E-0, Step 8)
  3. Check SG Narrow Range Level - ANY SG GREATER THAN 12%. (Control feed flow to maintain Narrow Range Level between 22% and 50%) (E-0, Step 25)
  4. Monitor LHSI pumps and secure as necessary. (E-0, Step 30)
- NOTE:** Subsequent SI signals may be reset by reperforming Step 12 of Attachment 1.
5. Monitor CTMT pressure and check CLS initiation as necessary. (Attachment 1, Step 8)
  6. Monitor RWST level and check RS initiation as necessary. (Attachment 1, Step 9)
  7. Block Low PRZR Pressure SI signal when less than 2000 psig. (Attachment 1, Step 10)
  8. Block Low Tave SI signal when less than 543°F. (Attachment 1, Step 11)

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## SIMULATOR OPERATOR'S GUIDE

**Simulator Setup**Initial Conditions:

Recall IC -XXX and implement **TRIGGER #30** to activate all passive malfunctions and verify **Trigger #30** implemented.

Ensure the Delta T Selector Switch is in the Channel II Position.

Ensure PRZR Level Recorder on Channel II.

Open the monitor window and add the following points to it:

- asp\_ao\_off
- ???
- ????
- 

Enter the following MALFUNCTIONS:

Malfunction	Delay	Ramp	Trigger	Value	Final	Trigger Type (Auto or Manual)
RC4802 PRZR PRESS CONT XMTR FAILURE (445)	10	10	1	0	1	MAN
MS1305 SG B STM PRESSURE TRNSMTR MS-PT-485 FAILURE	10	0	3	0	1	MAN
CH2101 VCT LEVEL TRANSMITTER LT-1115 FAILS	10	0	5	0	1	MAN
CC0302 CC PUMP 1-CC-P-1B OVERCURRENT TRIP	10	0	7	FALSE	TRUE	MAN
CC0802 CC-P-1B BKR 15J10 MECHANICALLY STUCK CLOSED	0	0	7	FALSE	TRUE	MAN
RD1236 DROPPED RCCA, M-4, CONTROL BANK C	10	0	9	FALSE	TRUE	MAN
RD17 ATWS, WITH MANUAL RX TRIP PB DEFEATED	0	0	11	FALSE	TRUE	MAN
SI1502 SI COLD LEG HDR LEAK UPSTRM MOV-SI-890C	10	0	13	0	40	MAN
SI1603 FAIL CHECK VALVES SI-85	10	0	13	FALSE	TRUE	MAN
SI1606 FAIL CHECK VALVE SI-243 LOOP C (LHSI)	10	0	13	FALSE	TRUE	MAN
SI2402 SI RELAY SI2A FAILS TO ACTUATE	0	0	30	FALSE	TRUE	MAN
SI2405 SI RELAY SI5A FAILS TO ACTUAT	0	0	30	FALSE	TRUE	MAN

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## SIMULATOR OPERATOR'S GUIDE

Enter the following Remote Functions:

Override	Set Condition	Trigger
SW_15J9_RF 4KV Stub Bus BKR 15J9 Control Switch	TRIP, 20 Sec TD	7
RCMOV595 RC-MOV- 595 C Loop Cold Leg Isol	100 to 30, 0 Ramp, 10 Sec TD	11
SIMOV890A_BKR SI- MOV-1890A LHSI To HOT Legs	CLOSED	21
SIMOV890B_BKR SI- MOV-1890B LHSI To HOT Legs	CLOSED	22
SIMOV890C_BKR SI- MOV-1890C LHSI To Cold Legs	CLOSED	23
RX_RTA_OPEN	TRUE	16
RX_RTB_OPEN	TRUE	17
AAC_SMS_MODE OFF AAC DG LOCAL MODE SWITCH POSITION	OFF	30

TRIGGER	TYPE	DESCRIPTION
1	MAN	Przr Press Cont Xmtr Failure (445) Fails High
3	MAN	SG B Stm Pressure Trnsmttr MS-FT-485 FAILS High
5	MAN	VCT Level Transmitter LT-1115 Fails High
7	MAN	OVERCURRENT Trip 1-CC-P-1B, BREAKER Stuck Closed, 15J9 Breaker Trips Open
9	MAN	Dropped RCCA, M-4, Control Bank C
11	MAN	RC-MOV-595 C Loop Cold Leg Isol Disc Falls Into Flow Stream

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## SIMULATOR OPERATOR'S GUIDE

11	MAN	ATWS, WITH MANUAL RX TRIP PB DEFEATED
13	MAN	SI Cold Leg HDR Leak Upstrm MOV-SI-890C, With Check Valves Stuck Open



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## SIMULATOR OPERATOR'S GUIDE

**Verify the following control room setup:**

- ☐ Place the simulator in RUN and verify normal 97.3% power operation indications.
- ☐ Reset the ROD CONTROL SYSTEM
- ☐ Verify Red Magnets on the following components:

--	--	--

- ☐ Verify 1-RM-RI-112 aligned to A/B SG and 1-RM-RI-113 aligned to C SG (magnets).
- ☐ Verify Ovation System operating.
- ☐ Reset ICCMs.
- ☐ Verify Component Switch Flags.
- ☐ Verify Brass Caps properly placed.
- ☐ Verify SG PORVs set for 1035 psig.
- ☐ Verify Rod Control Group Step Counters indicate properly.
- ☐ Verify Ovation CRT display.
- ☐ Advance Charts
- ☐ Verify Turbine Thumb Wheel Settings @120 rpm/min and Position 6
- ☐ Verify Containment Instrument Air Compressors are on Inside Suction (all RMs reset)
- ☐ Verify all ARPs have been cleaned
- ☐ Verify CLEAN copies of the following procedures are in place:

<input type="checkbox"/> AP-53.00	<input type="checkbox"/> AP-1.00	<input type="checkbox"/> AP-23.00	<input type="checkbox"/> AP-16.00
<input type="checkbox"/> E-0	<input type="checkbox"/> ECA-1.2	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OP-CH-007		<input type="checkbox"/> Reactivity Sheet	
<input type="checkbox"/> OP-ZZ-002		<input type="checkbox"/> 1-OP-RP-001 (3)	

- ☐ **Verify Reactivity Placard is current.**
- ☐ Verify ALL PINK MAGNETS are accounted for.

**SIMULATOR OPERATOR'S GUIDE****Brief**

This simulator performance scenario is performed in the EVALUATION MODE. You should not direct questions to the evaluators. Otherwise, you should perform as if you were in the MCR.

Your ability to maintain a log is not being graded, but maintaining a rough log is recommended to help during briefs.

If you need to communicate with the Unit 2 operator, verbally state, "Unit 2" and an instructor will locate to the Unit 2 area and respond to you as quickly as possible.

In the unlikely event that the simulator fails such that illogical indications result, the session will be terminated. In other words, respond to what you see. If there is a problem with the simulation, the session will be terminated or adjusted as appropriate based on the specific problem.

Assign operating positions.

Ask for and answer questions.

**Op-Test No.: Surry 2014-1****Scenario No.: 4****Page 82 of 97****SIMULATOR OPERATOR'S GUIDE****Conduct shift turnover:**

The initial conditions have Unit 1 is at 100% power with RCS boron concentration of 760 ppm.

Unit conditions have been stable at approximately 100% power since the last refueling outage.

All systems and crossties are operable with the following exception:

- AAC DG is tagged out for maintenance, per VPAP-2802, Notifications and Reports, Section 6.29.1, a review of Reportability is required if the AAC DG is out of service greater than 14 days.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to maintain 100% power on Unit #1.

The last shift performed two 35 gallon dilutions followed by a manual makeup for training.

“A” BAST at 8.0 W/%.

The BOP will perform 1-OP-RP-001, Section 5.2, Preparation for Channel II Testing.

When the team has accepted the shift, proceed to the Session Conduct Section.

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## SIMULATOR OPERATOR'S GUIDE

**Session Conduct:**

- Ensure conditions in Simulator Set-up are established.
- **Ensure Trigger 30 is active prior to team entering the simulator.**
- Verify Exam Security has been established and ASP\_AO\_OFF = True.

**EVENT 1      1-OP-RP-001, Section 5.2, Preparation for Channel II Testing**

## BOOTH:

30 minutes prior to the beginning of the scenario, provide the team with a copy of 1-OP-RP-001, Aligning Control System for Performance of Channel I, II, III, and IV Process and Protection Testing, Section 5.2, Preparation for Channel II Testing. The team will pre-brief the OP prior to entering the simulator.

## Operations Supervisor/Management:

- **If contacted**, will acknowledge the completion of the evolution.

Field Operators: (*2 minute delay from request to answer*)

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 2      1-RC-PT-1145 Fails High, 1-AP-31.00/0-AP-53.00**When cued by examiner, implement Trigger #1.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of 1-RC-PT-1445. The individual(s) contacted will also acknowledge any TS LCOs and entry into AP-53.00/AP-31.00.
- 
- **If contacted**, will take responsibility for writing the CR.

STA:

- **If contacted**, will acknowledge the failure of 1-RC-PT-1445. The individual(s) contacted will also acknowledge (but not confirm/deny) any TS LCOs.
- **If asked**, the STA will review VPAP-2802 and TRM Section 3.3 and report that he has completed his review and this failure does not impact these documents.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

No feedback required for this failure.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge instrumentation failure and commence investigations.

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Unit 2 Operator:

**If Contacted**, acknowledge the failure of 1-RC-PT-1445.

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 3      Steam Pressure Fails High, "B" SG. 0-AP-53.00.**When cued by examiner, implement Trigger #3.

Operations Supervisor/Management:

- **If contacted**, will acknowledge that Failure of 1MS-PT-1485, Channel III, 'B' SG, Steam Pressure. The individual(s) contacted will also acknowledge any TS LCOs.
- **If contacted**, will recommend to the team that channels remain as they are for now (i.e., do not perform 1-OP-RP-001 at this time).
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, will acknowledge entry into AP-53.00.

STA:

- **If contacted**, will acknowledge the Failure of 1MS-PT-1485, Channel III, 'B' SG, Steam Pressure. The individual(s) contacted will also acknowledge any TS LCOs. The STA will not confirm or deny any TS decisions.
- **When contacted**, SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 requires two channels of Steam Pressure indication per steam generator and no actions are required. See Tech Spec 3.7, Table 6, Item 16, 2 required per SG.
- **When Contacted**, SRO directs STA to review VPAP-2802 and TRM Section 3.3. The STA reports he has completed these reviews and there is no impact.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the failed AE RM. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

No feedback required.

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Maintenance/ Work Week Coordinator:

- **If contacted**, will have I&C brief on placing the failed channel in trip.

Unit 2:

- **If contacted**, will acknowledge Failure of 1-MS-PT-1485, Channel III, 'B' SG, Steam Pressure.
- **If it appears**, that the SRO/RO will take action to perform 1-OPT-RX-007, the Unit 2 Operator will state that he will have the fourth RO perform 1-OPT-RX-007.

Role-play as other individuals as needed.



**Op-Test No.: Surry 2014-1****Scenario No.: 4****Page 88 of 97****SIMULATOR OPERATOR'S GUIDE****EVENT 4      Failure of VCT Level Channel LT-1115 High. 0-AP-53.00.****When Evaluator ready: Implement Trigger #5.**

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure of 1-CH-LT-1115 high.

STA:

- **If contacted**, will acknowledge the failure of 1-CH-LT-1115 high.
- **If contacted**, SRO directs STA to review CEP 99-0029. The STA will report that the Reg. Guide 1.97 requires one channel of VCT level indication. Use an Alternate indication. Restore before next outage.
- **After directed**, the STA will report that review of VPAP-2802 and TRM Section 3.3 are complete, no further actions are required.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the AE RM. He will also state that containment conditions and the electrical conditions are as you see them.

Maintenance/ Work Week Coordinator:

- **If contacted**, will acknowledge the failure and commence investigations.

Field Operators: (Wait 4 minutes from time of direction to report).

- **If contacted**, to check the status of 1-CH-LT-1115 locally, report no obvious abnormal condition with the transmitter.

Unit 2:

- **If contacted**, will acknowledge the failure of 1-CVH-LT-1115 high.

Role-play as other individuals as needed.

**Op-Test No.: Surry 2014-1****Scenario No.: 4****Page 89 of 97****SIMULATOR OPERATOR'S GUIDE****EVENT 5      Overcurrent trip 1-CC-P-1B with breaker stuck Shut, 15J9 trip open.**

When cued by examiner, implement Trigger #7.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the fault on of 1-CC-P-1B, the failure of the breaker to open, and the trip of breaker 15J9. Will also acknowledge any TS information (time permitting) and information related to radiation monitors alarming.
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, will acknowledge entry into ARP.

Unit 2 Operator:

- **If asked**: 1-CC-P-1C is running, and CC cross-ties are open.

STA:

- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will acknowledge any TS information.
- **If the team** has a transient brief: The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operator:

- **When contacted**, report that 15J10 breaker for 1-CC-P-1B has a timed overcurrent drop on 'A' phase.
- **When contacted**, report that 15J9 breaker has a timed overcurrent drop on all three phases.

Role play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENTS 6****Dropped Rod C Bank Group 1. 1-AP-1.00, 0-AP-23.00.**

Operations Supervisor/Management:

- **If contacted**, will acknowledge the dropped rod and the need to ramp at 1%/minute to 70 - 74% power.
- **If asked** for a recommended ramp rate, ask what the Unit Supervisor recommends. When authorized by the NRC, the Shift Manager will direct a 1%/minute ramp rate.
- **If contacted**, will take responsibility for writing the WR and CR.

STA:

- **If asked**, the STA will perform a shutdown margin calculation.
- **If asked**, the STA will perform a QPTR. See AP-1.00, Attachment 6, attached.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.
- **If asked**, the STA will acknowledge the need to borate and use rods (will acknowledge the team review of pre-planned reactivity plans and OP-RX-010, if performed). If asked to perform the OP-RX-010 review, the STA will state that he is not able to at this time.
- **When contacted**, SRO directs STA to review VPAP-2802. The STA reports that he has completed his review of VPAP-2802 and no notifications are required.

Unit Two:

- **If contacted**, all conditions on U2 are normal.

Field Operators:

- **If contacted**, Will perform actions as directed (i.e., may be asked to read bank overlap counter-RD 2).

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I&amp;C:

- If requested by MCR to reset the bank overlap – use RD2 drawing to set as requested.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge the failure and commence investigations.

Role play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENT 7      RC Loop C disc falls, Valid First-Out, FR-S.1**

When Evaluator is ready, Actuate Trigger #11.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the reactor trip failure and entry into FR-S.1, E-0, and ES-0.1.
- **If contacted**, will acknowledge direction for local opening of reactor trip breakers. After two (2) minutes, **use Trigger 16 ('A' RT breaker) and Trigger 17 ('B' RT breaker).**
- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, SRO requests that tags be cleared and breakers closed for 1-SI-MOV-1890A / B / C, use Triggers 21, 22, and 23 to perform close the breakers for the MOVs.

Field Operators:

- **If directed**, field operators will acknowledge direction for local opening of reactor trip breakers. After two (2) minutes, **use Trigger 16 ('A' RT breaker) and Trigger 17 ('B' RT breaker).**
- **If contacted**, SRO requests that tags be cleared and breakers closed for 1-SI-MOV-1890A / B / C, use Triggers 21, 22, and 23 to perform close the breakers for the MOVs.

Role play as other individuals as needed.

**EVENT 8      LOCA Outside Containment Upstream 1-SI-MOV-1890C.**

When Evaluator is ready, implement Trigger # 13,

**1-SI-MOV-1890A / B/ C can be energized when directed using Triggers 21, 22, and 23.**

Operations Supervisor/Management:

- **If contacted**, will acknowledge the reactor trip failure, completion of FR-S.1, completion of E-0 Immediate Actions, and transition to ES-0.1.
- **If contacted**, will acknowledge the subsequent fault on the previously identified ruptured SG. Will also acknowledge any TS information (time permitting) and information related to radiation monitors alarming.

**SIMULATOR OPERATOR'S GUIDE**

- **If contacted**, will take responsibility for writing the WR and CR.

**Unit 2 Operator:**

- **If directed** to respond to radiation alarms on the radiation alarm panel, silence the alarms when and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.
- **When contacted by BOP**, Chilled Water has been throttled IAW the Caution prior to Step 10 of Attachment 3. MCR boundary D/P indicates the same value as Unit 2 ventilation panel D/P gauges. Unit 2 will assume responsibility for Attachment 3 when last page is reached (SFP monitoring).

**Field Operators:**

- **If directed**, field operators will remove tags and close breakers for 1-SI-MOV-1890A / B / C..

Role play as other individuals as needed.

**EVENT 9      BOP Failures.****Operations Supervisor/Management:**

- **If contacted**, will take responsibility for writing the WR and CR.

**Unit 2 Operator:**

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms when directed and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.

Field Operators: Role play as necessary to support the Teams actions.

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**The scenario will end upon entering 1-E-1 or at the lead examiners discretion**

NUMBER 0-AP-1.00	ATTACHMENT TITLE  CALCULATION OF EXCORE QUADRANT POWER TILT RATIOS	ATTACHMENT 6
REVISION 26		PAGE 1 of 2



Calculations for QPTR should be carried out to four places to the right of the decimal place to provide for accuracy and consistency of results.

1. Record the following data:

Reactor Power 100 % Date \_\_\_\_\_ Time \_\_\_\_\_

2. Record the following Excore Detector Data:

Actual Excore Detector Readings				Expected Excore Detector Readings at 100% Power			
Upper		Lower		Upper		Lower	
N41U	88.9	N41L	86.3	N41U <sub>100</sub>	118.8	N41L <sub>100</sub>	119.5
N42U	119.4	N42L	123.3	N42U <sub>100</sub>	118.5	N42L <sub>100</sub>	119.3
N43U	117.4	N43L	119.6	N43U <sub>100</sub>	119.1	N43L <sub>100</sub>	119.5
N44U	117.4	N44L	119.5	N44U <sub>100</sub>	118.7	N44L <sub>100</sub>	119.1

3. Normalize the Actual Excore Detector Readings to the expected Excore Detector readings at 100% power, and sum the normalized values for both the upper and lower detectors.

Upper Detector Fraction	Upper Detector Fraction Values	Normalized Value (I <sub>U</sub> )	Lower Detector Fraction	Lower Detector Fraction Values	Normalized Value (I <sub>L</sub> )
$\frac{N41U}{N41U_{100}}$	$\frac{88.9}{118.8} =$	0.7483	$\frac{N41L}{N41L_{100}}$	$\frac{86.3}{119.5} =$	0.7222
$\frac{N42U}{N42U_{100}}$	$\frac{119.4}{118.5} =$	1.0076	$\frac{N42L}{N42L_{100}}$	$\frac{123.3}{119.3} =$	1.0335
$\frac{N43U}{N43U_{100}}$	$\frac{117.4}{119.1} =$	0.9857	$\frac{N43L}{N43L_{100}}$	$\frac{119.6}{119.5} =$	1.0008
$\frac{N44U}{N44U_{100}}$	$\frac{117.4}{118.7} =$	0.9890	$\frac{N44L}{N44L_{100}}$	$\frac{119.5}{119.1} =$	1.0034
Sum of Normalized Values = $\Sigma I_U =$		3.7306	Sum of Normalized Values = $\Sigma I_L =$		3.7899



NUMBER 0-AP-1.00	ATTACHMENT TITLE  CALCULATION OF EXCORE QUADRANT POWER TILT RATIOS	ATTACHMENT 6
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4. \_\_\_ Record N = the No. of Detectors in use = 4

5. \_\_\_ Calculate the average upper and lower detector current values.

$$\text{Average } I_U = \frac{\sum I_U}{N} = \frac{3.7306}{4} = 0.9327$$

$$\text{Average } I_L = \frac{\sum I_L}{N} = \frac{3.7699}{4} = 0.9400$$

6. \_\_\_ From Step 3, record the following values.

$$\text{Maximum Normalized Upper Detector Current} = I_{U \max} = 1.0076$$

$$\text{Maximum Normalized Lower Detector Current} = I_{L \max} = 1.0035$$

7. \_\_\_ Calculate the maximum upper and lower Excore Quadrant Power Tilt Ratios.

$$\square \text{ a. Upper Excore Quadrant Power Tilt Ratio} = \frac{I_{U \max}}{\text{Average } I_U} = \frac{1.0076}{0.9327} = 1.0803$$

$$\square \text{ b. Lower Excore Quadrant Power Tilt Ratio} = \frac{I_{L \max}}{\text{Average } I_L} = \frac{1.0035}{0.9400} = 1.0795$$

8. \_\_\_ Calculate tilt%:

$$\square \text{ a. Subtract 1 from Step 7.a and multiply by 100 for Upper Tilt \%} = 8.03$$

$$\square \text{ b. Subtract 1 from Step 7.b and multiply by 100 for Lower Tilt \%} = 9.95$$

9. \_\_\_ Notify Unit Supervisor.

10. \_\_\_ IF additional Quadrant Power Tilt Ratio Calculations are required, THEN 0-NPT-RX-011, Quadrant Power Tilt Ratio Calculations and Corrective Actions, Attachment 2, should be used.

Completed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_



Facility: <u>Surry Power Station</u>	Scenario No.: <u>5</u>	Op-Test No.: <u>2014-001</u>
Examiners: _____ Operators: _____ _____ _____		
Initial Conditions: Time in Core Life – Beginning of Life; Core Cycle – Cycle 26.  Unit 1 is at $1 \times 10^{-8}$ Amps. Unit 2 is at 100%. All systems and crossties are operable. <ul style="list-style-type: none"> <li>The MSTVs are closed.</li> <li>"A" SG PORV is set at 995 psig.</li> <li>Current Boron is 1524 ppm</li> </ul> Turnover: : The Team will pre-brief raising power from $10^{-8}$ amps to 1-2% on SG PORVs IAW 1-GOP-1.4 and provided Reactivity Plan.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N - BOP R - RO R - SRO	Raise power From $10^{-8}$ amps to stable at 1-2% reactor power IAW 1-GOP-1.4.
2	RM0209, .5 Deg CC07	I-BOP TS - SRO	CC RM, CC-RI-105 Fails upscale. RM auto action fails. ARP RM-M5.
3	PG0101 PG0202	C - RO	Thermal Overload of running PG pump, standby PG fails to auto start.
4	MS2101, - 1 Deg	C – BOP	The "A" SG PORV input transmitter fails low causing "A" SG PORV to close. AP-53.00/AP-38.00.
5	V1AF8	C – RO TS - SRO	1-RS-P-2B Seal Head Tank Low Level.
6	VSPF1 RC2602	C – RO TS - SRO	Loose Parts alarm, followed by "B" RCP sheared shaft.
7	RC0103 SI2403 SI2503 VS0101 VS0102	M - ALL	LBLOCA with failure of both SI MOVs failing to open. SI must be manually aligned. Failure of 1-VS-F-58A / B to Start.
8	SI1701 SI1702  O/R CSRMTB_ INIT_1  O/R CSRMTB_ INIT_2	C – BOP  C - RO	"A" and "B" Train RMT Fails to actuate Automatically. "B" Train RMT Fails to actuate with pushbuttons (RO manually align, ES-1.3, Transfer to Cold Leg Recirc).

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

**Event 1: Raise Reactor Power from 10-8 amps to 1-2% IAW 1-GOP-1.4. (R-RO, R – SRO, N - BOP)**

This event will be pre-briefed by the Team prior to Simulator Entry. When the Team assumes the shift, the RO will withdraw Control Rods to establish a SUR of 0.5 to 0.7 DPM to raise reactor power. As power approaches the Point of Adding Heat (~1E-6 amps), the RO will insert control rods to reduce SUR to ~0.2 DPM. Power will continue to increase through the POAH to 1-2% on the Power Range Indication. The BOP will have manual control of SG water level using the FRV bypass valves to maintain SG NR level at approximately 40%. With the MSTVs closed, power will be stabilized steaming through a SG PORV set to maintain RCS temperature.

**Verifiable Actions:**

- 1) RO will operate control rods to raise reactor power and stabilize at 1-2% in the power range using the "A" SG PORV.
- 2) BOP will control steam generator levels using FRV bypass valves at 40 ± 5%.

**Event #2: CC-RI-105 high alarm; automatic functions of this failure fail to occur. (I – BOP, TS – SRO)**

The BOP is expected to initiate the ARP, check the redundant Rad Monitor shows no upscale deflection, and close the CC Surge Tank Vent valve.

**Verifiable Actions:**

- 1) BOP will close CC Surge Tank Vent valve IAW the ARP.

**Technical Specifications:**

- 1) The SRO should consult Tech Spec Table 3.7-5, Item 1, and be referred to Tech Spec 3.13. Tech Spec 3.13.C states that whenever the component cooling water radiation monitor is inoperable, the surge tank vent valve shall be closed.

**Event #3: Running PG Pump Trips, Standby PG Pump Fails to Auto Start. (C – RO)**

The Team will diagnose this failure based on alarms and indications received. The BOP will initiate the Annunciator Response Procedure.

**Verifiable Actions:**

- 1) RO will place start 1-PG-P-1B.

**Technical Specification/Technical Requirements Manual/RG 1.97:**

- 1) There are no actions required in these documents for this failure.

**Event #4: “A” Steam Generator PORV Pressure Transmitter Fails Low. (I – BOP)**

The RO/BOP will diagnose this failure based on indications received. The BOP will identify “A” SG PORV demand at zero.

**Verifiable Actions:**

- 1) BOP will adjust the “B” or “C” SG PORV automatic setpoint to establish steam demand.
- 2) The RO will Step Rods in / out to control reactor power while PORV adjustments are made.

**Technical Specifications:**

- 1) There are not Tech Spec implications for this failure.

**Event #5: 1-RS-P-2B Seal Head Tank Low Level. (C – RO)**

The RO will identify the failure based on Alarm received. Team will initiate ARP 1A-F8 to respond.

**Verifiable Actions:**

- 1) RO will place 1-RS-P-2B in PTL to fill the head tank.

**Technical Specifications:**

- 1) SRO will consult Tech Spec 3.4.B.2, Spray Systems, and determine 24 hour clock in effect due to 1-RS-P-2B in PTL.

**TRM / RG 1.97:**

- 1) No requirements for this failure.

**Event #6: Loose Parts Alarm followed by “B” RCP Sheared Shaft. (C – RO, TS-SRO)**

The Team will diagnose the failure based on alarms and indication received. The SRO should direct the RO to trip the reactor and perform the Immediate Actions of E-0. After the Reactor is tripped and a transition is made to ES-0.1, the SRO should direct the RO to secure the “B” RCP.

**Verifiable Actions:**

- 1) RO trips the reactor and performs the Immediate Actions of E-0.
- 2) RO secures the “B” RCP and places the control switch in PTL.
- 3) BOP maintains control of feed flow to the A, B, and C steam generators.

**Technical Specifications:**

- 1) SRO should consult Tech Spec 3.1.A.1 and identify that a reactor shall not be brought critical with less than three pumps in non-isolated loops, in operation. **(Based upon urgent nature of response to this event, it is recommended that this Technical Specification be assessed as a follow-up after the scenario has been terminated.)**

**TRM / RG-1.97:**

- 1) No TRM or RG-1.97 items related to this event.

**Event #7: *LBLOCA 1-SI-MOV-1867C/D to open, and 1-VS-F-58A/B failing to start.*** (M – ALL)

The RO will note rapidly decreasing RCS pressure and pressurizer level, manually trip the Unit and perform the Immediate Actions of E-0. It is expected that when Step 4 of E-0 is reached and SI flow is not observed, the SRO will direct the RO to perform Attachment 2 of E-0 to align SI flow, and direct the BOP to perform Attachments 1, 3, and 4. When SI flow has been established, the RCPs will be secured due to a loss of support conditions and the CH mini-flow recirc valves closed.

When Hi and HI-HI CLS actuate, only the “A” Train will automatically align, requiring the BOP to perform these alignments using Attachment 4 guidance.

**Verifiable Actions:**

- 1) RO will trip the reactor and perform the Immediate Actions of E-0.
- 2) RO will manually align SI flow to the core IAW E-0, Attachment 2.
- 3) BOP will perform manual alignments for failures using E-0, Attachment 3.

**Critical Task:**

CT-1: SPS E-1—H KOA. The exhaust fans from the safeguards area is manually switched to filtered exhaust 30 minutes after a safety injection initiation signal. Align the Auxiliary Ventilation system for Aux BLDG central and Safeguards areas to filtered exhaust within 30 minutes of SI initiation signal (KOA). (E01.6 DRP-049)

**Event #8: *Failure of “A” and “B” Train RMT to Actuate Automatically. “B” Train fails to Actuate Manually, RO Manually Align “B” Train.***

The RO and SRO will continue with E-0, and Transition to 1-E-1. Approximately 25 minutes after the LBLOCA occurs, the RWST will have been depleted to 20% where the Team will transition to ES-1.3, Transfer to Cold Leg Recirculation. When the RWST level decreases to 13.5%, the Train “A” and “B” RMT will fail to automatically initiate, Train “A” will initiate when the pushbuttons are used, Train “B” will not. This will require the Team to manually align the “B” train RMT components using the operation of the “A” train and ES-1.3 RNO step guidance.

**Verifiable Actions:**

- 1) RO Manually initiates RMT using pushbuttons.
- 2) RO will manually align “B” Train components during RMT phase

**Critical Task:**

CT-2: WOG ES-1.3—A, Transfer to Cold Leg Recirculation and establish ECCS recirculation flow that at least meets the assumptions of the plant specific LOCA. Transfer to cold leg recirculation before suction is lost to any safety injection pump (PSA).

**Classification:**

Follow-up Classification: Alert, FA1.1

After the Team has completed Step 5 of ES-1.3 and SI recirculation has been verified, the Scenario may be terminated at Lead Evaluator cue.

Initial Conditions: IC #1 1 x 10 <sup>-8</sup> Amps, BOL – Cycle 26.			
Pre-load malfunctions: (Trigger 30's) <ul style="list-style-type: none"> <li>○ SI2403, SI RELAY S13A FAILS TO ACTUATE</li> <li>○ SI2503, SI RELAY S13B FAILS TO ACTUATE</li> <li>○ SI1701, RMT TRAIN A FAILURE (AUTO)</li> <li>○ SI1702, RMT TRAIN B FAILURE (AUTO)</li> <li>○ CSRMTB_INIT_1, RMT SYS TR B MANUAL INITIATION 2/2 PB 1</li> <li>○ CSRMTB_INIT_2, RMT SYS TR B MANUAL INITIATION 2/2 PB 2</li> </ul>			
Equipment Status/ Procedures/ Alignments/ Data Sheets/ etc.: Unit 1 is at 1 x 10 <sup>-8</sup> Amps. Unit 2 is at 100%. All systems and crossties are operable. <ul style="list-style-type: none"> <li>• The MSTVs are closed.</li> <li>• "A" SG PORV is set at 995 psig.</li> <li>• RCS boron concentration 1524 ppm.</li> </ul>			
Turnover: Unit 1 is at 1 x 10 <sup>-8</sup> Amps power with a reactor startup in progress. All systems and crossties are operable with the following exception:  Turnover: The Team will continue the reactor startup in accordance with 1-GOP-1.4 and stabilize reactor power 1-2% using the 'A' SG PORV. Current plant configurations and the PSA indicates green.			
Event	Malf. #'s	Severity	Instructor Notes and Required Feedback
1	N/A	N/A	Raise power From 10-8 amps to table at 1-2% reactor power IAW 1-GOP-1.4.
2	RM0209 CC07	.5 Deg TRUE	CC RM, CC-RI-105 Fails upscale. RM auto action fails. ARP RM-L5/1-OPT-RM-001.
3	PG0101 PG0202	TRUE TRUE	Thermal Overload of running PG pump, standby PG fails to auto start.
4	MS2101	-1 Deg	The "A" SG PORV input transmitter fails low causing "A" SG PORV to close. AP-53.00/AP-38.00.
5	V1AF8	TRUE	1-RS-P-2B Seal Head Tank Low Level.
6	VSPF1 RC2602	TRUE TRUE	Loose Parts alarm, followed by "B" RCP sheared shaft.
7.	RC0103 SI2403 SI2503 VS0101 VS0102	3%, 60 sec ramp TRUE	LBLOCA with failure of both SI MOVs failing to open. SI must be manually aligned. Failure of 1-VS-F-58A / B to Start.
8	SI1701 SI1702  O/R CSRMTB_I NIT_1  O/R CSRMTB_I NIT_2	ACTIVE	"A" and "B" Train RMT Fails to actuate Automatically. "B" Train RMT Fails to actuate with pushbuttons (RO manually align, ES-1.3, Transfer to Cold Leg Recirc).



**Scenario Objectives:**

- A. Given a reactor startup in progress, continue the startup from 10-8 Amps to 1-2% in the Power Range IAW 1-GOP-1.4.
- B. Given a failure of 1-CC-RI-105, verify/place components in the proper position IAW 1-OPT-RM-001.
- C. Given the trip of the running PG pump with the failure of redundant pump to auto start, restore the PG System to a normal status IAW BR-D10 annunciator response procedure.
- D. Given the pressure input to 1-MS-PCV-101A failing low, respond IAW AP-53.00/AP-38.00 to establish either 'B' or 'C' SG PORV controlling RC temperature.
- E. Given 1-RS-P-2B Seal Head Tank low level alarm, respond IAW 1A-F8 ARP to refill the seal head tank.
- F. Given a LBLOCA with the failure of SI-MOV-1867C/D to open and 1-VS-F-58A/B to start, respond IAW E-0 Attachments to align the components to the expected condition.
- G. Given the failure of 'B' Train of RMT to actuate, manually align components IAW ES-1.3.

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## SHIFT TURNOVER INFORMATION

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### **OPERATING PLAN:**

The initial conditions have Unit 1 is at  $1 \times 10^{-8}$  Amps with a startup in progress IAW 1-GOP-1.4.

Unit 1 is starting up following a shutdown following completion of Physics Testing.

Unit #2 is at 100% power with all systems and crossties operable.

Shift orders are to continue the reactor startup and stabilize at 1-2% on the "A" SG PORV. "A" SG PORV set at 995 psig.

Current boron concentration 1524 ppm.

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Event Description: Continue the reactor startup to 1-2% on the "A" SG PORV.

Cue: When team ready.

Time	Position	Applicant's Action or Behavior
	SRO/BOP	<p>1-GOP-1.4</p> <p>Team will pre-brief Initial Conditions, Precautions and Limitations, and procedure prior to entering simulator.</p>
	SRO/RO	<p>Precautions and Limitations of 1-GOP-1.4, Unit Startup, HSD to 2% Reactor Power.  <b>NOTE:</b> Precautions and Limitation should be signed of prior to the Team entering the Simulator.</p> <p>4.0 PRECAUTIONS AND LIMITATIONS</p> <p>4.1 When the reactor is shutdown, the minimum shutdown margin shall be maintained as delineated in either 1-OP-RX-002, Shutdown Margin (Calculated at Zero Power) OR 1-OP-RX-003, Shutdown Margin for Refueling and Special Conditions. If the RCS has been diluted IAW 1-OP-RX-004, The Calculation of Estimated Critical Conditions, or 1-OP-RX-009, Dilution to Critical Conditions Following Refueling, then the SDM in 1-OP-RX-002 and 1-OP-RX-003 do not apply.</p> <p>4.2 The minimum RCS Tave for criticality is 530°F.</p> <p>4.3 Activities that could distract the Operator during the startup, such as shift turnover and surveillance testing, will not be allowed.</p> <p>4.4 The following Reactivity Management principles must be adhered to while Reactor startup is in progress.</p> <ul style="list-style-type: none"> <li>• Reactivity control systems designed to provide alarms should not be bypassed except when allowed by an approved procedure specifically intended for the evolution.</li> <li>• Shift Supervision shall ensure that unexplained or abnormal reactivity changes are investigated immediately and terminated expeditiously. Shift Supervision shall promptly notify the STA and the Reactor Engineer to investigate the situation.</li> <li>• Duties assigned to Control Room Operators shall not interfere with their ability to monitor core reactivity. The administrative workload of Control Room Operators responsible for monitoring and operating the control board should be minimized.</li> <li>• Control of reactivity and those parameters that affect reactivity is essential to the safe operation of the plant. In order to maintain control of reactivity conservative decision making shall be practiced at all times.</li> <li>• Activities that may detract from positive control of reactivity shall be minimized. This includes minimizing other Station activities that may affect Unit operation, such as removing equipment or instrumentation from service, and avoiding shift turnovers during significant reactivity changes.</li> </ul>

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Event Description: Continue the reactor startup to 1-2% on the "A" SG PORV.

Cue: When team ready.

		<p>4.5 Operators shall not attempt to address unstable plant conditions by adding positive reactivity (e.g. Do not withdraw control rods in an attempt to restore primary coolant temperature during a transient). (Reference 2.4.21, 2.4.22)</p> <p>4.6 When increasing Reactor power, a stable SUR of 0.5 dpm to 0.7 dpm is recommended. Do NOT exceed a stable SUR of 1 dpm. When approaching the POAH, a SUR of less than 0.2 dpm is recommended.</p> <p>4.7 CY-AP-PRI-100, Primary System Chemistry and CY-AP-SEC-200, Secondary System Chemistry, provide information and recommendations for Action Levels on various chemical parameters. Exceeding these Action Levels requires a formal notification of an out-of specification condition and may require corrective measures such as power reduction and/or plant shutdown. The Chemistry Department will provide guidance IAW CY-AP-PRI-100 or CY-AP-SEC-200 if Action Levels are exceeded.</p> <p>4.8 Prior to withdrawing the shutdown banks in preparation for criticality, in the event that leakage through a Pressurizer Safety Valve is indicated by an increase in tailpipe temperature to saturation for PRT pressure and leakage persists for more than 10 minutes, RCS pressure must be reduced until the leakage stops, and pressure must then be maintained at that pressure for a minimum of 60 minutes. Pressure may then be increased at 50% of the previous rate. This precaution does not apply after the shutdown banks are withdrawn in preparation for criticality. (Reference 2.4.6)</p> <p>4.9 Use of a SG PORV to maintain RCS temperature requires HP to conduct Gamma isotopic analysis of the water for that SG and to provide a Release Permit, if required, prior to using the SG PORV.</p> <p>4.10 Reactor operation at low power levels for extended periods of time is discouraged and should be evaluated via the ODM process.</p>
		<p><b>NOTE:</b> Candidates will be given a copy of 1-GOP-1.4, Signed off to the CAUTIONS and NOTES Prior to Step 5.4.9.</p>
	SRO	<p>1-GOP-1.4, Step 5.4.9, Cautions and Notes</p> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>• Dumping of steam to the atmosphere may constitute a release of radioactive isotopes.</li> <li>• To prevent reactor trip, reactor power should be maintained less than 10% when the turbine is not latched.</li> <li>• When approaching the POAH, a SUR of less than 0.2 dpm is recommended. RCS Temperature and Main Steam Pressure may increase rapidly when reactor power reaches the point of adding heat (approximately <math>2 \times 10^{-6}</math> AMPS-IR).</li> <li>• To ensure positive control of reactor power, after raising reactor power to the POAH, if power decreases to below the POAH (<math>&lt;10^{-7}</math> AMPS-IR), the reactor shall be tripped. (Reference 2.4.13)</li> </ul> <p><b>NOTE:</b> If a shift turnover is required while this procedure is in progress, Steps 5.4.9 through</p>

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Event No.: 1

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Event Description: Continue the reactor startup to 1-2% on the "A" SG PORV.

Cue: When team ready.

		5.4.11 must be performed for the relieving shift. Multiple signoffs are provided for this purpose. (Reference 2.4.13)
	SRO	1-GOP-1.4, Step 5.4.9  5.4.9 Check that the Shift Manager (who is the designated Test Coordinator) or his designee has reviewed the Detailed Pre-Job Briefing Checklist and Responsibilities in Attachment 5 (page 3 of 5) and conducted a Detailed Pre-Job Briefing with all the personnel performing the unit startup.
	SRO	<i>Pre-Job brief for this evolution completed prior to Simulator Entry.</i>
	SRO	1-GOP-1.4, Step 5.4.10  5.4.10 Check that the Senior Operations Manager or Operations Manager on Call has reviewed the Management Expectations Briefing Checklist in Attachment 5 (page 2 of 5) and briefed the Operations Department and support personnel on management expectations.  <i>Expectations reviewed prior to Simulator Entry.</i>
	SRO	1-GOP-1.4, Step 5.4.11  5.4.11 The pre-job brief shall include the items in Attachment 6, Pre-job Brief Expectations for Reactivity Control.  <i>Expectations reviewed prior to Simulator Entry.</i>
	SRO BOP	1-GOP-1.4, Step 5.4.12  5.4.12 Initiate Attachment 7, Reactivity Control and Monitoring During Startup.  <i>Accepts responsibility for Attachment 7.</i>
	SRO RO	1-GOP-1.4, Step 5.4.13  5.4.13 Establish rod position on Control Bank D of approximately 130 steps using chemical shim.  <i>Identifies Control Bank 'D' at ~ 130 steps.</i>
	SRO BOP	1-GOP-1.4, Step 5.4.14  5.4.14 Select Power Range indication on 1-NI-NR-A.  <b>Checks Power Range indication on NI-NR-A, Upper Videographic recorder.</b>

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Event Description: Continue the reactor startup to 1-2% on the "A" SG PORV.

Cue: When team ready.

	SRO	1-GOP-1.4, Step 5.4.15
		5.4.15 Maintain RCS Tave at approximately 547°F: (✓)
		MSTVs closed - Reduce setpoint of one SG PORV IAW Attachment 4
		OR
		MSTVs open - Manually open Steam Dumps
	BOP	<i>Identifies 'A' SG PORV set at 995 psig to control temperature with MSTVs closed.</i>
	SRO	1-GOP-1.4, Step 5.4.16
		5.4.16 Increase Reactor power level to between 1% - 2%, using control rods, and stabilize.
	RO	<b>RO will withdraw Control Rods to achieve a 0.5 to 0.7 DPM startup rate.</b> As reactor power approaches the Point of Adding Heat ( $\sim 1 \times 10^{-6}$ amps), the RO will insert Rods to reduce SUR to $\sim 0.2$ DPM.
		<i>RO will identify when the POAH is reached by Tave increasing, SUR decreasing, SG Pressure increasing, 'A' SG PORV demand increasing, and PRZR level increasing.</i>
		<b>RO will monitor reactor power and stabilize between 1-2 % on Power Range using Control Rods.</b>
	BOP	<b>Will adjust feed flow to the SGs using the FRV bypass valves to control SG NR level.</b> As the POAH is reached the BOP will adjust as necessary to control 'A' SG inventory as the PORV opens in response to increasing RCS Tave.
	SRO	1-GOP-1.4, Step 5.4.17
		5.4.17 IF the heatup and pressurization of the secondary plant has NOT previously been performed, THEN perform Step 5.2.5. Otherwise, enter N/A.
		<b>SRO will read the step and ensure reactor is stable prior to commencing secondary heatup.</b> <i>Secondary heatup will not occur during the Scenario.</i>
		<b>END EVENT 1</b>

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Event Description: Continue the reactor startup to 1-2% on the "A" SG PORV.

Cue: When team ready.

	BOP	1-GOP-1.4, Attachment 7  Will use Attachment 7, Pages 1 and 2 to record data every 15 minutes during the power escalation.
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**Attachment 7****REACTIVITY CONTROL AND MONITORING DURING STARTUP**

- \_\_\_\_\_ 1. Begin logging data on Attachment 7 (page 2 of 3) at a maximum interval of 15 minutes. Use multiple sheets as required.
- \_\_\_\_\_ 2. Begin logging reactivity manipulations on Attachment 7 (page 3 of 3) as applicable. Use multiple sheets as required.
- \_\_\_\_\_ 3. Maintain Tave and Tref approximately matched and Delta Flux in band (use Control Rods, Boration and/or Dilution) as discussed during the pre-job brief. Use the Reactivity Plan as a guide. **(Reference 2.4.13)**
- \_\_\_\_\_ 4. If significant deviation from the Reactivity Plan is required to maintain core parameters, consult with the STA and Reactor Engineering. Otherwise, enter N/A.
- \_\_\_\_\_ 5. If the ramp deviates from the Reactivity Plan (e.g. a change in ramp rate or an unplanned hold becomes necessary) consult with the STA and Reactor Engineer on the need for a revised reactivity plan. Otherwise, enter N/A.
- \_\_\_\_\_ 6. If critical plant parameters can not be maintained within prescribed limits, the contingency actions discussed in the pre-job brief shall be implemented. Otherwise, enter N/A.
- \_\_\_\_\_ 7. Continue logging data on Attachment 7 (pages 2 and 3) until completion of this procedure.
- \_\_\_\_\_ 8. Attach completed log sheets to original procedure.

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## REACTIVITY CONTROL AND MONITORING DURING STARTUP

Circle the channel to be monitored.

[illegible]



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Scenario No.: 5

Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	BOP	<p>Diagnoses failure of 1-RM-CC-105 with the following indications/alarms:</p> <p>Alarms:</p> <ul style="list-style-type: none"> <li>0-RM-L5 CC HX A/B OUT ALERT/FAILURE</li> <li>0-RM-M5 1-CC-RI-105 HIGH</li> </ul> <p>Indications:</p> <p>1-CC-RI-105 indicates all "EEEEEEs."</p> <p>1-CC-RI-105, HIGH, WARN and RANGE lights LIT.</p> <p><b>NOTE:</b> RM-M5 Guidance located at end of this section.</p>
	BOP	<p>Notes Prior to Step 1:</p> <ul style="list-style-type: none"> <li>If a monitor fails, the automatic functions associated with that monitor must be verified or performed.</li> <li>When HP has surveyed the area and declared radiation levels normal, the components that were realigned due to monitor failure may be returned to normal and activities in the affected area may continue.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Tech Spec 3.13.C requires that HCV-CC-100 remain closed if either CC radiation monitor is inoperable.</li> </ul>
	BOP	<p>1. CHECK ALARM - READING ON MONITOR GREATER THAN OR EQUAL TO ALERT SETPOINT <u>OR</u> RADIATION LEVEL HAS TRENDED UP</p> <ul style="list-style-type: none"> <li>1-CC-RI-105, HDR A</li> <li>1-RM-RR-150C, Pen 1</li> </ul> <p>BOP will identify that the meter indicates "EEEEEEs" and a steeply rising trend.</p>
	BOP	<p>Step 1 RNO</p> <p>a) IF all EEEEEs indicated on display, THEN GO TO 0-OPT-RM-001, Radiation Monitoring Equipment Check.</p>

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Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

		<p>0-OPT-RM-001</p> <p>Precautions and Limitations</p> <p>4.1 Each process radiation monitor paper advance uses about 5 hours worth of paper. Unnecessary paper advances will cause the roll to run out prematurely.</p> <p>4.2 Check Sources for the Victoreen digital radiation monitors operate as follows.</p> <ul style="list-style-type: none"> <li>• For digital PROCESS monitors - The Check Source is exposed to the detector by depressing and holding the CHECK SOURCE pushbutton.</li> <li>• For digital AREA monitors - A Check Source signal is inserted into the detector circuit by depressing and releasing the CHECK SOURCE pushbutton. The Check Source signal is removed when the CHECK SOURCE pushbutton is depressed and released a second time or after approximately three minutes. The digital AREA monitors do not have a radioactive Check Source.</li> </ul>
	BOP	<p>0-OPT-RM-001</p> <p>6.1 Work Preparation</p> <p>6.1.1 IF a radiation monitor is out of service, THEN enter OOS in applicable spaces of Attachments.</p> <p>NOTE: • A failed Digital Rate Meter is indicated by “EEEEEEs” in the digital display window, and the FAIL Alarm light LIT.</p> <ul style="list-style-type: none"> <li>• If the Radiation Monitor has associated automatic actions, those actions will occur when the monitor fails.</li> </ul> <p>6.1.2 IF this procedure is being performed due to failure of a Digital Radiation Monitor with all EEEEEEs displayed, THEN perform the following. Otherwise, enter N/A.</p> <p>a. IF Radiation Monitor has associated automatic actions, THEN check or perform actions as necessary. Otherwise, enter N/A.</p> <p><i>BOP may use RM-L5or RM-M5 guidance for completion of the verification of Auto Actions. <b>Places 1-HCV-CC-100 in close.</b> Directs Unit 2 to place SOV-CC-200 in close.</i></p>

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Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

	BOP	<p>0-OPT-RM-001</p> <p>b. On the front panel of rate meter, depress the ON/OFF push button, and check the meter is OFF.</p> <p><b>BOP places On/Off switch in Off.</b></p> <p>c. WHEN 30 seconds have elapsed, THEN perform Step 6.1.2.d.</p> <p>d. On the front panel of rate meter, depress the ON/OFF push button, and check the meter is ON.</p> <p>BOP Places RM in On, Meter immediately goes to all “EEEE’s” with the HIGH, WARN and RANGE lights Lit.</p> <p>BOP Notifies SRO RM has failed and I&amp;C assistance is required.</p>
	SRO	<p>SRO will review Technical Specifications 3.13.C and identify that whenever the component cooling water radiation monitor is inoperable, the surge tank vent valve shall remain closed.</p> <p>The SRO may review Technical Specification Table 3.7-5, which will refer the SRO to Technical Specification 3.13.</p>
	SRO	<p>The team will hold a transient brief. During the brief the failure of the CC RM and Vent Valve will be discussed.</p> <p>The RO and BOP will report out critical parameters, as per placard on Main Control Room Bench Board.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the failure of the CC RM. He will also state that containment conditions and the electrical conditions are as you see them.</i></p>
	SRO	<p>SRO will notify the Shift Manager of the failure and request I&amp;C assistance.</p>

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Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

	BOP	<p>RM-M5</p> <p><b>Note:</b> Candidate may refer to this ARP initially in response to the High Alarm.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• If a monitor fails, the automatic functions associated with that monitor should be verified or performed.</li><li>• When HP has surveyed the area and declared radiation levels normal, the components that were realigned due to monitor failure may be returned to normal and activities in the affected area may continue.</li><li>• Tech Spec 3.13.C requires that HCV-CC-100 remain closed if either CC radiation monitor is inoperable.</li></ul> <p>1 VERIFY ALARM - READING ON MONITOR GREATER THAN OR EQUAL TO HIGH SETPOINT</p> <ul style="list-style-type: none"><li>• 1-CC-RI-105, HDR A</li><li>• 1-RM-RI-150C, Pen 1</li></ul> <p><i>Identifies Monitor reading is greater than High Alarm.</i></p>
	BOP	<p>RM-M5</p> <p>2 VERIFY CC HEAD TANK VENT VALVE - CLOSED</p> <p>a) Place HCV-CC-100 in OFF (Unit 1)</p> <p><b>Places HCV-CC-100 in Close.</b></p> <p>b) Place SOV-CC-200 in CLOSE (Unit 2)</p> <p><i>Directs Unit 2 operator to place SOV-CC-200 in close.</i></p>

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Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

		<p>RM-M5</p> <p><b>NOTE:</b> The following components are the most likely sources of inleakage to the CC System:</p> <ul style="list-style-type: none"> <li>• RCP Thermal Barrier</li> <li>• NRHX</li> <li>• Primary Sample coolers</li> <li>• Excess Letdown HX</li> <li>• HRSS coolers</li> <li>• RHR HX</li> <li>• SFP coolers</li> <li>• RHR Pump Seal coolers</li> </ul>
	BOP	<p>3 MONITOR CC HEAD TANK LEVEL AND CC TEMP FOR INCREASING LEAKAGE TO CC SYSTEM</p>
	BOP	<p>RM-M5</p> <p>4 NOTIFY HP TO DO THE FOLLOWING:</p> <ul style="list-style-type: none"> <li>• Verify area evacuated as necessary</li> <li>• Control access as necessary</li> <li>• Investigate cause</li> <li>• Determine need for setpoint change</li> </ul>
	BOP	<p><i>Notifies HP.</i></p>
	BOP	<p>RM-M5</p> <p>5 PERFORM ( )-OPT-RC-10.0, REACTOR COOLANT LEAKAGE OR ( )-AP-16.00, EXCESSIVE RCS LEAKAGE, AS NECESSARY</p> <p><i>Notifies RO/SRO to perform 1-OPT-RC-10.0, as necessary.</i></p>
	BOP	<p>RM-M5</p> <p>6 DETERMINE LEAKAGE SOURCE BY SAMPLING AS NECESSARY</p> <p><i>Notifies SRO concerning Step.</i></p>
	BOP	<p>RM-M5</p> <p>7 ISOLATE LEAKAGE</p> <p><i>Notifies SRO of need to isolate leakage if discovered by sampling.</i></p>

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Scenario No.: 5

Event No.: 2

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Event Description: During the power escalation, 1-CC-RI-105 Alert and High alarm, Failure of 1-CC-HCV-100 fails to close.

Cue: By Examiner.

	BOP	RM-M5  8 PROVIDE NOTIFICATIONS AS NECESSARY:  • Shift Supervision • OMO • STA • Health Physics • Instrumentation Department  <i>Inform SRO of required notifications.</i>
		<b>END OF EVENT #2</b>

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Scenario No.: 5

Event No.: 3

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Event description: 1-PG-P-1A trips, 1-PG-P-1B fails to auto start.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	Team	<p>Diagnose the failure using the following:</p> <p>Alarms: BR-D10, PRI GRADE WTR LO HDR PRESS 1D-B4, PRI WTR TO BLEND LO PRESS</p> <p>Indications: 1-PG-P-1A RED indication light OFF. 1-PG-P-1B does not Auto Start as expected.</p> <p><b>NOTE:</b> Actions for 1D-B4, at the end of this section.</p>
	SRO	<p>Directs the BOP to implement the ARP for BR-D10 Annunciator SRO notifies Unit 2 that PG water flow has been lost.</p>
	BOP	<p>NOTE: The standby PG Pump should automatically start when system pressure decreases to less than or equal to 50 psig.</p> <p>1 VERIFY PG SYSTEM PRESSURE LESS THAN OR EQUAL TO 75 PSIG</p> <ul style="list-style-type: none"> <li>PI-BR-121, Pri Wtr Sup Press</li> </ul> <p><i>BOP checks 1-BR-PI-121, PRI WTR SUP PRESS meter on BR Panel and notes pressure has decreased to 0 psig.</i></p>
	BOP	<p>2 VERIFY PG PUMPS - RUNNING AS NECESSARY</p> <ul style="list-style-type: none"> <li>One in Hand</li> <li>One in Auto</li> </ul> <p>Do the following a) Align switches as necessary b) IF PG Pumps off for planned evolution, THEN return to procedure in effect</p>
	BOP	<p><b>Starts 1-PG-P-1B by placing control switch in HAND.</b></p>
	BOP	<p><i>Verifies PG pressure returns to Normal pressure. (1D-B4 annunciator clears).</i></p>
	SRO	<p><i>Informs Unit 2 of PG system status. Directs RO to dispatch operator to check status of 1-PG-P-1A breaker.</i></p>

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Event No.: 3

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Event description: 1-PG-P-1A trips, 1-PG-P-1B fails to auto start.

Cue: By Examiner.

	BOP	<p>3 CHECK EXCESSIVE USE OF PG WATER AS INDICATED ON FI-BR-126, PRI WTR SUP PPS FLOW</p> <p>Identifies 0 indicated flow on FR-BR-126, PRI WTR SUP PPS FLOW.</p> <p>Step 3 RNO Do the following:</p> <p>a) Locally check PG Pump for proper operation.</p> <p><i>BOP directs Service Building North Yard to check status of 1-PG –P-1A and 1B.</i></p> <p>b) Locally check for system integrity</p> <p><i>Directs Auxiliary Building operator/SB North Yard to check system integrity.</i></p> <p>c) IF system leakage or rupture exists, THEN isolate as necessary AND GO TO Step 6.</p> <p>d) GO TO <b>Step 5</b>.</p>
	BOP	<p>5 VERIFY PROPER OPERATION OF PUMP RECIRCULATION VALVE</p> <ul style="list-style-type: none"> <li>• 1-BR-PCV-114, PRI SUP WATER PUMPS 1A/B RECIRC HDR</li> </ul> <p><i>Identifies PG header pressure normal.</i></p>
	BOP	<p>6 SUBMIT CONDITION REPORT AS NECESSARY</p>
	BOP	<p>7 PROVIDE NOTIFICATION AS NECESSARY</p> <ul style="list-style-type: none"> <li>• Shift Supervision</li> </ul> <p>Notifies SRO that ARP actions complete.</p>
	BOP	<p>Reviews ARP for 1D-B4, PRI WTR TO BLEND LO PRESS.</p>
	BOP	<p>1D-B4</p> <p>1 CHECK PG HDR PRESS - LESS THAN OR EQUAL TO 65 PSIG ON 1-BR- PI-121 AT THE BORON RECOVERY PANEL</p> <p>Identifies 0 psig indicated.</p>



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Event No.: 3

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Event description: 1-PG-P-1A trips, 1-PG-P-1B fails to auto start.

Cue: By Examiner.

	BOP	1D-B4 2 CHECK PRIMARY GRADE WATER PUMPS - ONE RUNNING  • 1-PG-P-1A • 1-PG-P-1B
	RO	<i>Identifies no PG pump running.</i>
	RO	Step 2 RNO: Start a pump.  <b>Starts 1-PG-P-1B</b>
	BOP	1D-B4 3 CHECK 1-BR-PCV-114 - THROTTLING TO RAISE HDR PRESS
	BOP	<i>Identifies PG Pressure returns to normal.</i>
	BOP	1D-B4 4 CHECK VALVE LINEUP – CORRECT  <i>Identifies PG pump alignment correct.</i>  <i>BOP may direct Auxiliary Building Operator to walk down PG system for abnormalities.</i>
	BOP	1D-B4 5 CHECK PG HDR PRESS – GREATER THAN 65 PSIG  <i>Identifies PG pressure normal and stable.</i>
	BOP	1D-B4 6 NOTIFY SHIFT SUPERVISION  <i>Notifies SRO that ARP review complete.</i>
	SRO	Update Shift Manager on status of PG system and request electrical maintenance to determine cause of 1-PG-P-1A trip and 1-PG-P-1B failure to AUTO Start.

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Event description: 1-PG-P-1A trips, 1-PG-P-1B fails to auto start.

**Cue: By Examiner.**

		<b>END OF EVENT #3</b>
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Scenario No.: 5

Event No.: 4

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Event Description: "A" SG PORV transmitter fails low, BOP shifts controlling PORV to "B" or "C".

Cue: Examiner

Time	Position	Applicant's Action or Behavior
	BOP	Identify the failure using the following: Indications: Demand on 1-MS-PCV-101A, 'A' SG PORV, lowering RCS Temperature increasing
	BOP	Perform Immediate Actions of AP-53.00  [ 1 ] CHECK REDUNDANT INSTRUMENT CHANNEL(S) INDICATION – NORMAL  <i>Identify 'A' SG pressures normal.</i>  [ 2 ] PLACE AFFECTED CONTROL(S)/ COMPONENT(S) IN MANUAL CONTROL AND STABILIZE PARAMETER USING REDUNDANT INDICATION  Adjust the setpoint of the 'B' or 'C' SG PORV to ~995 psig and verify RCS temperature stabilizes.  <b>NOTE:</b> SRO may directly enter AP-38.00.
	SRO	Initiate 0-AP-53.00, Loss of Vital Instrumentation / Controls
	SRO	The team will hold a transient brief. During the brief the failure of the 'A' SG PORV closed will be discussed.  The RO and BOP will report out critical parameters, as per placard on Main Control Room Bench Board.  <i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the CC Rad Monitor. Also, report that containment conditions and the electrical conditions are as you see them.</i>
	SRO	*3 VERIFY REACTOR POWER – LESS THAN OR EQUAL TO 100%  Reports reactor power being maintained 1-2% in Power Range,

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Scenario No.: 5

Event No.: 4

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Event Description: "A" SG PORV transmitter fails low, BOP shifts controlling PORV to "B" or "C".

Cue: Examiner

	SRO	<p><b>NOTE:</b> • Step 4 failures are listed in order of performance priority. Only the failed instrument/control and associated step number should be read aloud.</p> <ul style="list-style-type: none"> <li>When the affected instrument/controller malfunction(s) has been addressed by this procedure, recovery actions should continue at Step 13.</li> </ul>
	BOP	*4 DETERMINE THE FAILED INSTRUMENT / CONTROL AND GO TO APPROPRIATE STEP OR PROCEDURE:
	SRO	<i>Reports Steam Dumps / SG PORVs abnormal</i>
	SRO	<i>Goes to Step 10</i>
	SRO	<p><b>CAUTION:</b> If Reactor power has been affected by a secondary transient, Turbine adjustment may be needed to control Tave.</p> <p>10 CHECK STEAM SYSTEM CONTROLS – NORMAL</p> <ul style="list-style-type: none"> <li>Steam Dumps / PORVs</li> </ul>
	BOP	<i>Reports SG PORV abnormal</i>
	SRO	<i>Initiates to AP-38.00, Main Steam System Control Malfunction.</i>
	SRO	AP-38.00
	BOP	1 CHECK STEAM DUMP VALVES – CLOSED
	BOP	<i>Reports Steam Dumps closed.</i>
	SRO	AP-38.00
	BOP	2 CHECK SG PORVS – CLOSED
	SRO	Step 2, RNO IF SG pressure greater than desired pressure, THEN check PORV(s) close when SG pressure decreases below desired pressure AND GO TO Step 3.
	BOP	<i>Reports SG NOT less than desired.</i>
	SRO	Step 2 RNO a) <i>Directs BOP to place the affected SG PORV in manual and reduce demand to 0.</i>
	BOP	
	SRO	Step 2 RNO b) If SG PORV NOT Closed, Not Applicable.

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Event No.: 4

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Event Description: "A" SG PORV transmitter fails low, BOP shifts controlling PORV to "B" or "C".

Cue: Examiner

	SRO	<p>Step 2, AP-38.00, Continued.</p> <p>c) Check associated MS line pressure transmitter (1-MS-PI-101A, B, C) for the affected PORV at the ASD Panel to determine if transmitter failure is cause of PORV failure.</p> <p><b>Direct BOP to dispatch Service Building Operator to check Status of SG Pressure on ASP</b></p>
	SRO  RO  BOP	<p>AP-38.00</p> <p>3 CHECK THE FOLLOWING CONDITIONS:</p> <ul style="list-style-type: none"> <li>• Reactor power - LESS THAN OR EQUAL TO 100%</li> </ul> <p><i>Reports reactor power 1-2% and stable.</i></p> <ul style="list-style-type: none"> <li>• Turbine load – NORMAL</li> </ul> <p><i>Reports Turbine not latched.</i></p>
	SRO   BOP	<p>AP-38.00</p> <p><b>NOTE:</b> The power reductions required by Step 4 are intended for failures causing full or partial closure of a control valve, or if valve closure is required for maintenance.</p> <p>4 CHECK MAIN TURBINE AND MSR STEAM CONTROL VALVES:</p> <ul style="list-style-type: none"> <li>a) MSR Steam supply MOVs and FCVs – NORMAL</li> <li>b) Turbine Governor Valves and Stop Valves - NORMAL</li> <li>c) Reheat Stop and Intercept Valves – NORMAL</li> </ul> <p><i>Reports Main Turbine and MSR steam Control Valves Normal.</i></p>
	SRO  BOP	<p>AP-38.00</p> <p>5 CHECK TURBINE MONITORING LIGHTS – NORMAL</p> <p><i>Reports Turbine Monitoring Lights Normal.</i></p>
	SRO  RO	<p>AP-38.00</p> <p>6. ____ STABILIZE UNIT CONDITIONS:</p> <ul style="list-style-type: none"> <li>a) Adjust Turbine load as necessary</li> <li>b) Borate or dilute as necessary</li> </ul> <p><i>Unit conditions stable.</i></p>

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Event No.: 4

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Event Description: "A" SG PORV transmitter fails low, BOP shifts controlling PORV to "B" or "C".

Cue: Examiner

	SRO	AP-38.00 7 SUBMIT CONDITION REPORT AS NECESSARY
	SRO	AP-38.00 8 PROVIDE NOTIFICATIONS: <ul style="list-style-type: none"><li>• Shift Supervision</li><li>• STA (PRA determination)</li><li>• OMO</li><li>• MOC</li></ul>
	SRO	AP-38.00 9 CHECK ABNORMAL CONDITION – CORRECTED  STEP 9 RNO Do the following: <ul style="list-style-type: none"><li>a) Consult with Shift Supervision.</li><li>b) Submit Condition Report.</li><li>c) IF problem of short term nature, THEN GO TO Step 10 when problem corrected.</li><li>d) IF problem of long term nature, THEN do the following:<ul style="list-style-type: none"><li>1) Adjust Turbine load IAW Shift Supervision direction.</li><li>2) Terminate this procedure.</li></ul></li></ul> <i>SRO will direct a CR initiated, notify Shift Manager, Notify HP of change in PORV being used to control reactor power, and terminate the procedure.</i>
		<b>END EVENT #4</b>

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Scenario No.: 5

Event No.: 5

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Event Description: 1-RS-P-2B Seal Head Tank Alarm.

Cue: By Examiner.

Time	Position	Applicant's Action or Behavior
	Team	Diagnoses the failure with the following indications:
		Alarms:
		<ul style="list-style-type: none"> <li>1A-F8 – RS PP 2B SEAL HD TK LO LVL</li> </ul>
	SRO	Direct BOP to initiate ARP 1A-F8, RS PP 2B SEAL HD TK LO LVL.
		ARP 1A-F8
		NOTE: • Receipt of this alarm is not necessarily indicative of a seal failure. Pump operability should not be determined based solely on receipt of this alarm.
		• A pump that is stopped due to this procedure may be restarted if required for containment depressurization or core cooling.
		• If alarm clears after stopping pump, this procedure should be continued.
	BOP	1 CHECK OSRS PP 2B - RUNNING DUE TO PLANT CONDITIONS
		Step 1, RNO IF pump NOT running, THEN GO TO Step 5.
		ARP 1A-F8
		CAUTION: Filling of head tank should not be attempted more than twice during OSRS PP testing.
	BOP	5. LOCALLY INVESTIGATE CAUSE - LEAKAGE INDICATED
	BOP	Dispatch Service Building Operator to investigate.
		Service Building Operator will 1-RS-P-2B Seal head tank level is low and No leakage apparent.
		Step 5 RNO      a) Fill tank IAW 1-OP-SI-001, FILLING THE LHSI AND OSRS PUMP SEAL HEAD TANKS.
	SRO	Notify Desk SRO / Shift Manager that an operator needs to be briefed and sent to Unit Valve Pit area to fill the 1-RS-P-2B Seal Head Tank. The Operator will complete a brief and bring a copy of 1-OP-SI-001 to the MCR.

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Event No.: 5

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Event Description: 1-RS-P-2B Seal Head Tank Alarm.

Cue: By Examiner.

	Operator	<p>1-OP-SI-001 Step 6.2.5 through 6.2.7</p> <p>Call Unit 1 RO and state: "1-OP-SI-001, Section 6.2, Page 10, Steps 6.2.1 through 6.2.5 are complete. Ready for you to perform Steps 6.2.5 through 6.2.7."</p> <p>NOTE: Unit 2 will supply a copy of 1-OP-SI-001 for the Team.</p>
	SRO	<p>1-OP-SI-001</p> <p>Review Tech 3.4.B.2 and determine a 24 hour clock will be in effect with 1-RS-P-2B in PTL. Declare 1-RS-P-2B Inoperable.</p> <p>Direct the RO to place 1-RS-P-2B in PTL.</p>
	RO	<p><b>Places 1-RS-P-2B in PTL.</b></p>
	SRO	<p>Directs RO to notify Service Building Operator to continue with 1-OP-SI-001, and fill the Seal Head Tank.</p>
	SRO	<p>Note: After reactor is tripped and the Team has entered ES-0.1, the service building operator will notify the RO that 1-RS-P-2B Head tank has been filled. The Seal Head Tank Upper Level Indication light is lit, and 1-OP-SI-001 can be continued at Step 6.2.32.</p> <p><i>Direct the RO to place 1-RS-P-2B in Auto.</i></p>
	RO	<p>Returns 2-RS-P-2B to AUTO.</p>
	SRO	<p><b>Exit 24 hour clock.</b></p>
		<p><b><u>END EVENT #5</u></b></p>



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Scenario No.: 5

Event No.: 6

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Event Description: Loose Parts Alarm, Unit 1; followed by "B" RCP Sheared Shaft

Cue: When initiated by Team.

Time	Position	Applicant's Action or Behavior
	BOP	Acknowledge VSP-F1 alarm, Loose Parts Unit 1.
	SRO	<i>Direct BOP to dispatch Service Building inside operator to investigate alarm using local copy of Annunciator Response Procedure.</i>
	BOP	<p>Receives report that local alarm is Channel 8, SG B Primary Side; a loud metallic banging sound can be heard..</p> <p>BOP uses Focus Brief to transmit information of alarming Channel to the Team.</p> <p>BOP verifies using ARP that Channel 8 is for SG B primary sound.</p>
	Team	<p>"B" RCP sheared shaft.</p> <p>The event will be diagnosed using the following:</p> <p>Alarms:</p> <p>1E-A3, RC LOOP 1B LO FLOW CH 1  1E-B3, RC LOOP 1B LO FLOW CH 2  1E-C3, RC LOOP 1B LO FLOW CH 3  1C-G4, RCP FRAME ALERT  1C-G5, RCP SHAFT ALERT  1C-H4, RCP FRAM DANGER  1C-H5, RCP SHAFT DANGER</p> <p>Indications:</p> <p>LOOP B RC FLOW Protection, Channel FI-1-424 / 425 / 426 indicate 0 gpm flow. Abnormally low Frame and Shaft Vibrations on "B" RCP with Danger and Alert indicating lights LIT. (Vibrations initially deflect full range high and by the time the Candidates look at the vibration indicators they will have dropped to the low end of scale).  Less than 100 Amps indicated on "B" RCP (A / B RCP indicate 650 Amps).</p> <p><b>Direct RO to Trip Reactor and perform Immediate Actions of E-0.</b></p> <p><b>Technical Specifications:</b></p> <p>SRO should consult Tech Spec 3.1.A.1 and identify that a reactor shall not be brought critical with less than three pumps in non-isolated loops, in operation. <b>(Based upon urgent nature of response to this event, it is recommended that this Technical Specification be assessed as a follow-up after the scenario has been terminated.)</b></p>
	SRO	

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Event No.: 6

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Event Description: Loose Parts Alarm, Unit 1; followed by "B" RCP Sheared Shaft

Cue: When initiated by Team.

	RO	<p><b><u>1-E-0 – Reactor Trip or Safety Injection</u></b></p> <p>[1] CHECK REACTOR TRIP:</p> <p>a) Manually trip reactor</p> <p><b>Pushes the reactor trip push buttons.</b></p> <p>b) Check the following:</p> <ul style="list-style-type: none"> <li>• All Rods On Bottom light – LIT</li> <li>• Reactor trip and bypass breakers – OPEN</li> <li>• Neutron flux - DECREASING</li> </ul>
	RO RO	<p>[2] CHECK TURBINE TRIP:</p> <p>a) <i>Manually trip the turbine</i></p> <p><i>Pushes the turbine trip push buttons.</i></p> <p>b) Check all turbine stop valves - CLOSED</p> <p>c) <i>Isolate reheaters by closing MSR steam supply SOV</i></p> <ul style="list-style-type: none"> <li>• <i>1-MS-SOV-104</i></li> </ul> <p>d) Check generator output breakers – OPEN (Time Delayed)</p> <p>Identifies that Output Breakers open.</p>
	RO	[3] VERIFY BOTH AC EMERGENCY BUSES – ENERGIZED
	RO  RO	<p>[4] CHECK IF SI INITIATED:</p> <p>a) Check if SI is actuated:</p> <ul style="list-style-type: none"> <li>• LHSI pumps – RUNNING</li> <li>• SI annunciators – LIT <ul style="list-style-type: none"> <li>• A-F-3 SI INITIATED – TRAIN A</li> <li>• A-F-4 SI INITIATED – TRAIN B</li> </ul> </li> </ul> <p><b>RO will determine that SI has not occurred and perform step 4a RNO actions:</b></p>

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Scenario No.: 5

Event No.: 6

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Event Description: Loose Parts Alarm, Unit 1; followed by "B" RCP Sheared Shaft

Cue: When initiated by Team.

	RO	<p>4a RNO Check if SI is required or imminent as indicated by any of the following:</p> <ul style="list-style-type: none"><li>• Low PRZR pressure</li><li>• High CTMT pressure</li><li>• High steamline differential pressure</li><li>• High steam flow with low Tave or low line pressure</li></ul> <p>IF SI is required, THEN GO TO Step 4b.</p> <p>IF SI is NOT required, THEN GO TO 1-ES-0.1, REACTOR TRIP RESPONSE.</p>
	SRO	<p>After the immediate actions of 1-E-0 are reported as complete, the SRO will check off immediate action steps in his copy of 1-E-0</p> <p><b>SRO will direct the RO to Trip 1-RC-P-1B.</b></p> <p><b>RO will place 1-RC-P-1B in PTL.</b></p> <p>the SRO will conduct a brief.</p> <p>The RO and BOP will provide Critical Parameters using the brief placards.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the alarms already received. He will also state that containment conditions and the electrical conditions are as you see them (or as reported by the RO/BOP)</i></p> <p>The SRO will announce a transition to ES-0.1 and provide direction to the BOP for SG level control.</p>

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Event No.: 6

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Event Description: Loose Parts Alarm, Unit 1; followed by "B" RCP Sheared Shaft

Cue: When initiated by Team.

		ES-0.1  NOTE: If this procedure is being entered from 1-E-0, REACTOR TRIP OR SAFETY INJECTION, following a tube leak of less than 150 gpm, 1-AP-24.01, LARGE STEAM GENERATOR TUBE LEAK, should be used for guidance instead of this procedure.  *1 CHECK RCS TEMPERATURE CONTROL  a) Check RCPS - ANY RUNNING  b) Monitor RCS Average Temperature  1) STABLE AT 547°F OR 2) TRENDING TO 547°F  <i>Reports Temperature stable at 547°.</i>
	SRO	
	RO	
		<b>END OF EVENT #6</b>

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Scenario No.: 5

Event No.: 7

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	Team	<p>Diagnose the LBLOCA inside Containment, using the following:</p> <p>Alarms: 1B-A3, CTMT SUMP HI LVL 1C-B8, PRZR LO PRESS</p> <p>Indications: Lowering PRZR pressure Lowering PRZR level</p>
	SRO	<p>1-AP-16.00</p> <p>ENTERS 1-AP-16.00</p> <p><b>NOTE:</b> Due to the magnitude of the LOCA, the SRO may direct the RO to manually safety inject.</p>
	RO	<p>1-AP-16.00</p> <p>NOTE: • If SI Accumulators are isolated, 1-AP-16.01, SHUTDOWN LOCA, should be used for guidance. • RCS average temperature has a direct impact on pressurizer level.</p> <p>[ 1 ] MAINTAIN PRZR LEVEL:</p> <ul style="list-style-type: none"> <li>• Isolate Letdown</li> <li>• Control Charging flow</li> </ul>
	RO	<p><b>Isolates Letdown by closing 1-CH-LCV-1460 A / B</b> <b>Places CH Flow in MANUAL and raises flow to maximum.</b> Identifies PRZR Level decreases with Maximum CH flow.</p>
	SRO	<p>Directs RO to re-perform High Level Immediate Action Steps of E-0, and Manually Safety Inject on Step 4.</p>
	SRO	<p>Re-enters E-0</p>
	RO	<p>1-E-0</p> <p>[ 1 ] CHECK REACTOR TRIP</p>
	RO	<p>1-E-0</p> <p>[ 2 ] CHECK TURBINE TRIP:</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	RO	<p>1-E-0</p> <p>[ 3 ] CHECK BOTH AC EMERGENCY BUSES - ENERGIZED</p>
	<p>RO</p> <p>RO</p>	<p>1-E-0</p> <p>[4] CHECK IF SI INITIATED:</p> <p>a) Check if SI is actuated:</p> <ul style="list-style-type: none"> <li>• LHSI pumps – RUNNING</li> <li>• SI annunciators – LIT <ul style="list-style-type: none"> <li>• A-F-3 SI INITIATED – TRAIN A</li> <li>• A-F-4 SI INITIATED – TRAIN B</li> </ul> </li> </ul> <p><b>RO will manually initiate or backup the SI signal:</b></p> <p>4b) <b>Manually initiate SI</b></p> <p><b>The RO will report Immediate Actions of E-0 with SI complete; and identify NO SI Flow to the Core</b></p> <p><b>Critical Task: CT-1: SPS E-1—H KOA.</b> The exhaust fans from the safeguards area manually switched to filtered exhaust 30 minutes after a safety injection initiation signal. Align the Auxiliary Ventilation system for Aux BLDG central and Safeguards areas to filtered exhaust within 30 minutes of SI initiation signal (KOA). (E01.6 DRP-049). (<i>CT performed by BOP in Attachment 3 of E-0, Step 2. Event 8.</i>)</p> <p><b>CRITICAL TASK START TIME:</b> _____ -</p>
	SRO	<p>1-E-0</p> <p>SRO will conduct a commensurate brief with words to the effect “Unit 1 has a SBLOCA inside CTMT, does anyone have a higher priority than establishing SI flow to the core”?</p> <p>The SRO will conclude the brief and provide E-0, Attachment 2 to the RO; and Attachment 1 and 3 to the BOP.</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	RO	ATTACHMENT 2 of 1-E-0 1. Check opened or open CHG pump suction from RWST MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115B</li><li>• 1-CH-MOV-1115D</li></ul>
	RO	ATTACHMENT 2 of 1-E-0 2. Check closed or close CHG pump suction from VCT MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1115C</li><li>• 1-CH-MOV-1115E</li></ul>
	RO	ATTACHMENT 2 of 1-E-0 3. Check running or start at least two CHG pumps. (listed in preferred order) <ul style="list-style-type: none"><li>• 1-CH-P-1C</li><li>• 1-CH-P-1B</li><li>• 1-CH-P-1A</li></ul>
	RO	ATTACHMENT 2 of 1-E-0 4. Check opened or open HHSI to cold legs MOVs. <ul style="list-style-type: none"><li>• <b>1-SI-MOV-1867C</b></li><li>• <b>1-SI-MOV-1867D</b></li></ul> <b>RO opens 1-SI-MOV-1867 C / D and reports to SRO when SI flow noted.</b>
	RO	ATTACHMENT 2 of 1-E-0 5. Check closed or close CHG line isolation MOVs. <ul style="list-style-type: none"><li>• 1-CH-MOV-1289A</li><li>• 1-CH-MOV-1289B</li></ul>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	RO	<p>ATTACHMENT 2 of 1-E-0</p> <p>6. Check closed or close Letdown orifice isolation valves.</p> <ul style="list-style-type: none"> <li>1-CH-HCV-1200A</li> <li>1-CH-HCV-1200B</li> <li>1-CH-HCV-1200C</li> </ul>
	RO	<p>ATTACHMENT 2 of 1-E-0</p> <p>7. Check opened or open LHSI suction from RWST MOVs.</p> <ul style="list-style-type: none"> <li>1-SI-MOV-1862A</li> <li>1-SI-MOV-1862B</li> </ul> <p><i>RO identifies 1-SI-MOV-1862 A / B Open</i></p>
	RO	<p>ATTACHMENT 2 of 1-E-0</p> <p>8. Check opened or open LHSI to cold legs MOVs.</p> <ul style="list-style-type: none"> <li>1-SI-MOV-1864A</li> <li>1-SI-MOV-1864B</li> </ul> <p><i>Identifies 1-SI-MOV-1864 A / B Open</i></p>
	RO	<p>ATTACHMENT 2 of 1-E-0</p> <p>9. Check running or start at least one LHSI pump.</p> <ul style="list-style-type: none"> <li>1-SI-P-1A</li> <li>1-SI-P-1B</li> </ul>
	RO/BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>10. Check High Head SI flow to cold legs indicated.</p> <ul style="list-style-type: none"> <li>1-SI-FI-1961</li> <li>1-SI-FI-1962</li> <li>1-SI-FI-1963</li> <li>1-SI-FI-1943 or 1-SI-FI-1943A</li> </ul> <p><i>RO will identify SI FLOW indicated to the core.</i></p>
	RO/BOP	<p>ATTACHMENT 2 of 1-E-0</p> <p>11. IF flow not indicated, THEN manually start pumps and align valves. IF flow NOT</p>



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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

		<p>established, THEN consult with Shift Supervision to establish another high pressure injection flow path while continuing with this procedure.</p> <ul style="list-style-type: none"> <li>• Alternate SI to Cold legs</li> <li>• Hot leg injection</li> </ul>
	SRO	<p>Conducts a brief with the RO (BOP may be excluded to allow performance of E-0, Attachment 1).</p> <p>RO/BOP will provide Critical Parameters per the placard.</p> <p>SRO will summarize the Plant conditions, set priorities as necessary, and conclude the brief. SI failure to actuate should be covered.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the alarms already received. He will also state that containment conditions and the electrical conditions are as you see them (or as reported by the RO/BOP)</i></p>
	SRO	Continues with E-0.
	RO	<p>E-0</p> <p>Identifies Low Subcooling condition based on the following:</p> <p>Alarm: 1G-B1, APPROACH TO SATURATION TEMP ALARM</p> <p>Indication: Subcooling &lt; 30°F [85 °F] on ICCM Train “A” and “B”.</p> <p><b>NOTE:</b> This condition can be expected at any time following completion of Attachment 2 Alignment of SI flow.</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

		E-0, Continuous Actions Page
	SRO	1. RCP TRIP CRITERIA
		Trip all RCPs if BOTH conditions listed below occur:
		a. Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
		b. RCS Subcooling - LESS THAN 30°F [85°F]
	RO	<i>Reports actual number of CH pumps flowing to the RCS. Also reports subcooling value.</i>
	SRO	<i>Directs the RO to secure RCPs "A" and "C". <b>RO secures the RCPs.</b></i>
	SRO	2 MINIFLOW RECIRC CRITERIA
		a. CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
	RO	<i>Reports RCS pressure is less than 1275 psig [1475 psig]. SRO directs closure of mini-flow recirc valves. <b>RO closes valves.</b></i>
		E-0
	SRO	*6. CHECK RCS AVERAGE TEMPERATURE
		• STABLE AT 547°F
		OR
		• TRENDING TO 547°F
	RO	The team will identify that RCS temperature is decreasing. The team should attribute this to the injection of SI into the RCS and AFW flow to the SGs. It is acceptable for the team to enter the RNO portion of this step and perform the applicable steps (summarized below): Stop dumping steam <b>Reduce AFW flow to the SG</b> Close MSTVs if cooldown continues

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	SRO  RO	<p>7. CHECK PRZR PORVs AND SPRAY VALVES:</p> <p>a) PRZR PORVs – CLOSED</p> <p>b) PRZR spray controls</p> <ul style="list-style-type: none"> <li>• Demand at Zero (or)</li> <li>• Controlling Pressure</li> </ul> <p>c) PORV block valves - AT LEAST ONE OPEN</p>
	SRO  RO	<p><b>NOTE:</b> Seal injection flow should be maintained to all RCPs.</p> <p>*8. CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <p>a) Charging Pumps – AT LEAST ONE RUNNING AND FLOWING TO RCS</p> <p><i>Two or three Charging pumps will be running and flowing to the RCS.</i></p> <p>b) RCS subcooling - LESS THAN 30°F [85°F]</p> <p><b>Note:</b> RCS subcooling may or may NOT be less than 30 °F. Actions expected when RCS subcooling &lt; 30 °F [85 °F] contained in Step 1 of Continuous Actions Page.</p> <p>RNO for the step is to go to step 9.</p>
	RO	<p>9. CHECK IF SGs ARE NOT FAULTED:</p> <ul style="list-style-type: none"> <li>• Check pressures in all SGs</li> </ul> <p>a) STABLE OR INCREASING AND</p> <p>b) GREATER THAN 100 PSIG</p> <p>RO will observe a slightly decreasing trend on SG pressures. This will be attributed to the RCS cooldown. The team will not transition to 1-E-2.</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	<p>SRO</p> <p>Unit 2</p> <p>RO</p>	<p>10. CHECK IF SG TUBES ARE NOT RUPTURED:</p> <ul style="list-style-type: none"> <li>• Condenser air ejector radiation – NORMAL</li> <li>• SG blowdown radiation – NORMAL</li> </ul> <p>Condenser A/E and Blowdown RM reported by Unit 2.</p> <ul style="list-style-type: none"> <li>• SG MS radiation – NORMAL</li> <li>• TD AFW pump exhaust radiation – NORMAL</li> <li>• SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER</li> </ul> <p><i>Reports conditions as observed on PCS and Vertical Board indicators.</i></p>
	<p>SRO</p> <p>RO</p>	<p>11. ____ CHECK RCS - INTACT INSIDE CTMT</p> <ul style="list-style-type: none"> <li>• CTMT radiation - NORMAL</li> <li>• CTMT pressure - NORMAL</li> <li>• CTMT RS sump level – NORMAL</li> </ul> <p><i>Reports CTMT conditions Abnormal</i>  <b>SRO Transitions to 1-E-1.</b></p>
	SRO	<p>The team will hold a transition brief. During the brief it will be identified that a LOCA exists in Unit 1 containment the team is transitioning to 1-E-1.</p> <p>RO/BOP will provide Critical Parameters using placard.</p> <p><i>The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified alarms. He will also state that containment conditions and the electrical conditions are as you see them.</i></p>

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**Cue:** When initiated by Team.

		<p>1-E-1</p> <p><b>NOTE:</b> When CTMT pressure exceeds 23 psia, the BOP should return to the SRO and obtain E-0, Attachment 4, if not already provided.</p> <p><b>NOTE:</b> Conditions for FR-P.1 may be met at any time during 1-E-1 progression. SRO will verify entry conditions met, and transition to FR-P.1. SRO will read Step 1, with the RO noting LHSI flow. The Team should then return to procedure and step in effect.</p>
	<p>SRO</p> <p>RO</p>	<p>1-E-1</p> <p>1 CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:</p> <ul style="list-style-type: none"> <li>a) Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS</li> <li>b) RCS subcooling - LESS THAN 30°F [85°F]</li> <li>c) Stop all RCPs</li> <li>d) RCS pressure - LESS THAN 1275 PSIG [1475 PSIG]</li> <li>e) Close CHG pump miniflow recirc valves: <ul style="list-style-type: none"> <li>• 1-CH-MOV-1275A</li> <li>• 1-CH-MOV-1275B</li> <li>• 1-CH-MOV-1275C</li> </ul> </li> </ul> <p><i>Performs the actions of Stopping RCPs and closing mini-flow recirc valves if not previously completed.</i></p>
	SRO	<p>1-E-1</p> <p>2 CHECK IF SGs ARE NOT FAULTED:</p> <ul style="list-style-type: none"> <li>• Check pressures in all SGs: <ul style="list-style-type: none"> <li>• STABLE OR INCREASING AND</li> <li>• GREATER THAN 100 PSIG</li> </ul> </li> </ul> <p><b>Note:</b> SG pressures may be decreasing, Team should identify SG pressure reduction to RCS cooldown and continue in E-1.</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	SRO	<p>1-E-1</p> <p>*3 CHECK INTACT SG LEVELS:</p> <p>a) Narrow range level – GREATER THAN 12% [18%]</p> <p>b) Check emergency buses – BOTH ENERGIZED</p> <p>c) Control feed flow to maintain narrow range level between 22% and 50%</p> <p><i>RO will identify SG NR level &gt;12[18%], emergency buses both energized and SG NR level trend.</i></p>
	<p>SRO</p> <p>Unit 2</p> <p>RO</p>	<p>1-E-1</p> <p>4 CHECK IF SG TUBES ARE NOT RUPTURED:</p> <ul style="list-style-type: none"> <li>• Condenser air ejector radiation - NORMAL</li> <li>• SG blowdown radiation – NORMAL</li> </ul> <p><i>Reports Condenser A/E and blowdown RM Normal.</i></p> <ul style="list-style-type: none"> <li>• SG main steam radiation - NORMAL</li> <li>• TD AFW pump exhaust radiation - NORMAL</li> <li>• SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER</li> </ul> <p><i>Reports MS and TDAFW RM Normal, SG NR levels trending Normally.</i></p>
	<p>SRO</p> <p>RO</p> <p>RO</p> <p>RO</p>	<p>1-E-1</p> <p><b>CAUTION:</b> If any PRZR PORV opens because of high PRZR pressure, the PORV must be verified closed or isolated after pressure decreases to less than 2335 psig.</p> <p>*5 CHECK PRZR PORVs AND BLOCK VALVES:</p> <p>a) Power to PRZR PORV block valves - AVAILABLE</p> <p><i>Reports Power to block valves available.</i></p> <p>b) PRZR PORVs – CLOSED</p> <p><i>Reports PRZR PORVs closed.</i></p> <p>c) PRZR PORV block valves - AT LEAST ONE OPEN</p> <p><i>Reports PORV block valves both open.</i></p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	SRO	1-E-1
	RO	<p>*6. CHECK IF SI FLOW SHOULD BE REDUCED:</p> <p>a) RCS subcooling based on CETCs - GREATER THAN 30°F [85°F]</p> <p>Reports subcooling value as found</p> <p>b) Secondary heat sink:</p> <ul style="list-style-type: none"> <li>• Total feed flow to INTACT SGs - GREATER THAN 350 GPM [450 GPM]</li> <li>OR</li> <li>• Narrow range level in at least one intact SG - GREATER THAN 12% [18%]</li> </ul> <p>c) RCS pressure - STABLE OR INCREASING</p> <p>Reports RCS Pressure Decreasing.</p> <p>GO TO Step 7</p>
	SRO	1-E-1
	RO	<p>*7. ____ CHECK IF HI HI CLS INITIATED:</p> <ul style="list-style-type: none"> <li>• CS pump(s) - RUNNING</li> <li>OR</li> <li>• Any Hi Hi CLS annunciator – LIT</li> </ul> <p>Reports Hi Hi CLS annunciator is lit</p>
	SRO	1-E-1
	RO	<p>8 CHECK SERVICE WATER AVAILABLE:</p> <p>a) Check Intake Canal level – BEING MAINTAINED BY CW PUMPS</p> <p>Reports Canal level being maintained by CW pumps.</p> <p><input type="checkbox"/> b) GO TO Step 12</p>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

		<p>1-E-1</p> <p>*12 CHECK IF CS PUMPS CAN BE STOPPED:</p> <p>a) Check the following:</p> <ul style="list-style-type: none"> <li>• RWST level - LESS THAN 3%</li> <li>AND</li> <li>• CS Pump amps – FLUCTUATING</li> </ul> <p>Step 12 a) RNO GO TO Step 14. WHEN the following conditions are met, THEN do Steps 12 b through 12f</p> <ul style="list-style-type: none"> <li>• RWST level - LESS THAN 3%</li> <li>AND</li> <li>• CS Pump amps – FLUCTUATING</li> </ul>
	<p>SRO</p> <p>RO</p> <p>RO</p> <p>SRO</p>	<p>1-E-1</p> <p><b>CAUTION:</b> RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 250 psig [400 psig], one LHSI pump must be manually restarted to supply water to the RCS.</p> <p>*14 CHECK IF LHSI PUMPS SHOULD BE STOPPED:</p> <p>a) Check RCS pressure:</p> <p>1) <i>Pressure – GREATER THAN 250 PSIG [400 PSIG] *</i></p> <p><i>Reports RCS Pressure and value.</i></p> <p>2) Pressure - STABLE OR INCREASING</p> <p><i>Reports RCS pressure decreasing.</i></p> <p>Step 14 RNO 2) <i>GO TO Step 15.</i></p> <p><b>*NOTE:</b> Team may GO TO Step 16 at Step 14 a) 1) depending upon speed of progression of Team through 1-E-1.</p>



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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	SRO	1-E-1
	BOP	15 CHECK RCS AND SG PRESSURES: • Check pressure in all SGs – STABLE OR INCREASING <i>Reports SG pressure stable.</i>
	RO	• Check RCS pressure - STABLE OR DECREASING <i>Reports RCS Pressure decreasing.</i>
	SRO	16 CHECK IF EDGs CAN BE STOPPED: a) Check AC emergency buses - ENERGIZED BY OFFSITE POWER <i>Reports AC buses energized by Off-Site Power.</i>
	BOP	b) Reset both trains of SI if necessary <i>Reports SI Reset</i>
	RO	c) Check CTMT pressure – LESS THAN 14 PSIA <i>Reports CTMT pressure values</i>
	RO	
	SRO	Step 16 c) RNO GO TO Step 17. WHEN pressure less than 14 psia, THEN do Steps 16d and 16e.
	SRO	1-E-1
	RO	17 CHECK INSTRUMENT AIR AVAILABLE: a) Check annunciator B-E-6 - NOT LIT <i>Reports B-E-6 not lit</i>
	RO	b) Check at least one CTMT IA compressor - RUNNING • 1-IA-C-4A or 1-IA-C-4B <i>Reports 1-IA-C-4A running</i>
	RO	c) Check 1-IA-TV-100 – OPEN <i>Reports 1-IA-TV-100 NOT open, Hi Hi CLS NOT Reset.</i>

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

	SRO	<p>RNO c) Manually open 1-IA-TV-100.</p> <p><i>Conducts Focus Brief and identifies CTMT conditions do not support reset of Hi-Hi CLS, marks the page and continues to Step 18.</i></p>
	<p>1-E-1</p> <p>SRO</p> <p>18 INITIATE EVALUATION OF PLANT STATUS:</p> <p>a) Check at least one train of cold leg recirculation capability:</p> <p>RO</p> <p><i>Reports components in both Trains available.</i></p> <p>b) Check at least two RS pumps and the associated HXs - AVAILABLE:</p> <p>RO</p> <p><i>Reports all four RS pumps and HXs available.</i></p> <p>c) Check auxiliary building radiation – NORMAL</p> <p>BOP</p> <p><i>Reports auxiliary building radiation normal.</i></p> <p>d) Consult with TSC on need to obtain any of the following samples:</p> <p>Unit 2</p> <p>Unit 2 will accept responsibility for discussion with TSC.</p> <p>e) Initiate evaluation of plant equipment:</p> <p>RO/BOP</p> <p><i>Report no unexpected abnormalities with components.</i></p>	

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Event Description: LBLOCA with 1-SI-MOV-1867C/D failing to open, 1-VS-F-58A/B not auto start.

Cue: When initiated by Team.

		1-E-1
		<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• CHG pumps should be run in the following order of priority: C, B, A.</li> <li>• The highest priority CHG pump should be aligned to the normal header.</li> </ul>
	SRO	19 ESTABLISH CHG PUMP REDUNDANT FLOW PATHS:
		a) Check CHG pumps - THREE RUNNING
	RO	<i>Reports two (2) CH pumps running.</i>
		IF two CHG pumps running, THEN do the following:
	RO	1) Check or place the non-running CHG pump in PTL. <b>Places 1-CH-P-1A in PTL.</b>
	SRO	2) GO TO Step 19c.
		c) Open alternate HHSI to cold legs:
	RO	<ul style="list-style-type: none"> <li>• 1-SI-MOV-1842</li> </ul> <b>Opens 1-SI-MOV-1842</b>
		d) Align one CHG pump to flow through the normal SI HDR by closing the associated alternate discharge MOV:
	BOP	<ul style="list-style-type: none"> <li>• 1-CH-P-1C 1-CH-MOV-1287C</li> </ul> <b>Closes 1-CH-MOV-1287C</b>
		e) Align the other running CHG pump to flow through the alternate SI HDR by closing the associated normal discharge MOV:
	BOP	<ul style="list-style-type: none"> <li>• 1-CH-P-1B 1-CH-MOV-1286B</li> </ul> <b>Closes 1-CH-MOV-1286B</b>
		f) Close the normal discharge MOV on the NON-RUNNING CHG pump:
	BOP	<ul style="list-style-type: none"> <li>• 1-CH-P-1A 1-CH-MOV-1286A</li> </ul> <b>Closes 1-CH-MOV-1286A</b>
		g) Check HHSI flow through BOTH headers
		<ul style="list-style-type: none"> <li>• 1-SI-FI-1940</li> <li>• 1-SI-FI-1940A</li> <li>• 1-SI-FI-1943</li> <li>• 1-SI-FI-1943A</li> </ul>
	RO	<i>Reports SI flow on Normal and Alternate header.</i>

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

Time	Position	Applicant's Action or Behavior
	Team	ES-1.3  Alarm: 1A-A7, RWST LO LVL  When Alarm actuates, Team will Transition to ES-1.3, Transfer to Cold Leg Recirculation.
	SRO  RO	ES-1.3  <b>CAUTION:</b> • SI recirculation flow to RCS must be maintained at all times. • Transfer to recirculation may cause high radiation in the Auxiliary Building.  <b>NOTE:</b> • Steps 1 through 5 should be performed without delay. FRs should NOT be implemented before the completion of these steps. • If sump blockage or a complete loss of sump suction capability occurs, FRs should NOT be implemented until directed in Attachment 1, or in 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.  1 CHECK OR PLACE BOTH RMT MODE TRANSFER SWITCHES IN RMT  <b>Places RMT Mode Transfer Switches in RMT position.</b>
	SRO  RO	ES-1.3  2 RESET SI  Resets SI using pushbuttons.

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

		ES-1.3
	SRO	3 CHECK SI RECIRC PHASE HEAT SINK
		a) Check SW flow established to at least two RS HXs
	RO	<i>Identifies four (4) RS HXs flowing</i>
		b) Check AC emergency buses - ENERGIZED BY OFFSITE POWER
	RO	<i>Identifies Emergency buses energized.</i>
		c) Check RS pumps associated with RS HXs supplied by SW - AT LEAST TWO RUNNING
		• 1-RS-P-1A RS HX A
		• 1-RS-P-1B RS HX B
		• 1-RS-P-2A RS HX C
		• 1-RS-P-2B RS HX D
	RO	<i>Identifies 3 three (3) RS pumps running</i>
		<b>NOTE:</b> Team may have asked for return of 1-RS-P-2B; if this is the case 4 or 4 RS pumps will be running.
		ES-1.3
	SRO	4 CHECK LHSI PUMPS
		a) LHSI pumps - BOTH RUNNING
	RO	<i>Identifies Both LHSI pumps running.</i>
		b) Check RCS Pressure - LESS THAN 185 PSIG
	RO	<i>Identifies RCS Pressure &lt; 185 psig.</i>

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

		ES-1.3
		CAUTION: If suction source is lost to any SI or spray pump, the pump should be stopped.
	SRO	5 ALIGN SI SYSTEM FOR RECIRC
		a) Close CHG pump miniflow recirc valves
		<ul style="list-style-type: none"> <li>• 1-CH-MOV-1275A</li> <li>• 1-CH-MOV-1275B</li> <li>• 1-CH-MOV-1275C</li> </ul>
	RO	<i>Reports mini-flow recirc valves closed.</i>
		b) RWST Level - LESS THAN 13%      b) Do NOT continue. WHEN RWST level less than 13%, THEN GO TO Step 5c.
	Team	<i>Team will wait for RWST level to decrease to 13%</i>
		c) Check Phase 1 – INITIATED
		1) White Phase 1 Status light on bench board – LIT
	RO	<i>Identify Phase 1 did not initiate on the 'A' and 'B' Train.</i>
	SRO	Step c) 1) RNO Directs RO to manually initiate both Trains using pushbuttons.
	RO	<i>Identify 'B' Train did not actuate.</i>
	SRO	<b>Directs RO to manually align valves for 'B' Train.</b>
		<b>Note:</b> As RO notes 'A' Train Valve reposition, RO will align 'B' Train Valve.
	RO	2) LHSI discharge to HHSI - OPEN
		<ul style="list-style-type: none"> <li>• 1-SI-MOV-1863A</li> <li>• <b>1-SI-MOV-1863B</b></li> </ul>
	RO	3) LHSI recirc valves - CLOSED
	RO	<ul style="list-style-type: none"> <li>• 1-SI-MOV-1885A</li> <li>• <b>1-SI-MOV-1885B</b></li> <li>• 1-SI-MOV-1885C</li> <li>• <b>1-SI-MOV-1885D</b></li> </ul>

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Event No.: 8

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

		ES-1.3, Step 5 Continued
	SRO	d) Check Phase 2 – INITIATED <input type="checkbox"/> 1) Amber Phase 2 Status light on bench board – LIT
	RO	d) <b>IF swap over does NOT occur after 1 minute time delay, THEN manually align valves</b>  <i>Identifies Amber Phase 2 Light for 'B' Train did not illuminate.</i>
	RO	2) LHSI suction from sump - OPEN <ul style="list-style-type: none"> <li>• 1-SI-MOV-1860A</li> <li>• <b>1-SI-MOV-1860B</b></li> </ul>
	RO	3) LHSI suction from RWST - CLOSED <ul style="list-style-type: none"> <li>• 1-SI-MOV-1862A</li> <li>• <b>1-SI-MOV-1862B</b></li> </ul>
	RO	4) CHG pump suction from RWST valves - CLOSED <ul style="list-style-type: none"> <li>• 1-CH-MOV-1115B</li> <li>• <b>1-CH-MOV-1115D</b></li> </ul>
	RO/BOP	e) Check recirculation flow – ESTABLISHED  <i>Verifies Recirculation Flow established.</i>  <b>CT-2: WOG ES-1.3—A</b> , Transfer to Cold Leg Recirculation and establish ECCS recirculation flow that at least meets the assumptions of the plant specific LOCA. <b>Transfer to cold leg recirculation before suction is lost to any safety injection pump (PSA).</b>  <b>CRITICAL TASK STOP TIME:</b> _____
		<b>END OF EVENT 8</b>  <b>END OF SCENARIO.</b>  NOTE: E-0, Attchments 1, 3, and 4 on Next Page.

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

	BOP	<b>ATTACHMENT 1 OF E-0</b>  1. CHECK FW ISOLATION: <ul style="list-style-type: none"><li>• Feed pump discharge MOVs – CLOSED</li><li>• 1-FW-MOV-150A</li><li>• 1-FW-MOV-150B</li><li>• MFW pumps – TRIPPED</li><li>• Feed REG valves – CLOSED</li><li>• <b>SG FW bypass flow valves – DEMAND AT ZERO</b></li></ul> <b>NOTE:</b> If demand has not been set to 0, BOP will perform this action. <ul style="list-style-type: none"><li>• SG blowdown TVs – CLOSED</li></ul>
	BOP	2. CHECK CTMT ISOLATION PHASE I: <ul style="list-style-type: none"><li>• Phase I TVs – CLOSED (see list, bottom of Step 2)</li><li>• 1-CH-MOV-1381 – CLOSED</li><li>• 1-SV-TV-102A – CLOSED</li><li>• PAM isolation valves – CLOSED<ul style="list-style-type: none"><li>• 1-DA-TV-103A</li><li>• 1-DA-TV-103B</li></ul></li></ul>
	BOP	3. CHECK AFW PUMPS RUNNING: <ul style="list-style-type: none"><li>a) MD AFW pumps – RUNNING (Time Delayed)</li><li>b) TD AFW pump - RUNNING IF NECESSARY</li></ul>



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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

	BOP	<b>Attachment 1 of E-0</b>  4. CHECK SI PUMPS RUNNING: <ul style="list-style-type: none"><li>• CHG pumps – RUNNING</li><li>• LHSI pumps – RUNNING</li></ul>
	BOP	5. CHECK CHG PUMP AUXILIARIES: <ul style="list-style-type: none"><li>• CHG pump CC pump – RUNNING</li><li>• CHG pump SW pump - RUNNING</li></ul>
	BOP	6. CHECK INTAKE CANAL: <ul style="list-style-type: none"><li>• Level - GREATER THAN 24 FT</li><li>• Level - BEING MAINTAINED BY CIRC WATER PUMPS</li></ul>
	BOP	7. CHECK IF MAIN STEAMLINES SHOULD BE ISOLATED:  a) Check if ANY of the following annunciators - HAVE BEEN LIT <ul style="list-style-type: none"><li>• E-F-10 (High Steam Flow SI)</li><li>• B-C-4 (Hi Hi CLS Train A)</li><li>• B-C-5 (Hi Hi CLS Train B)</li></ul> Identifies annunciators not lit and goes to step 8.

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

	BOP	<p>*8. CHECK IF CS REQUIRED:</p> <ul style="list-style-type: none"> <li>a) CTMT pressure – HAS EXCEEDED 23 PSIA</li> <li>b) Manually initiate HI HI CLS</li> <li>c) Trip all RCPs</li> <li>d) Check CS pumps - RUNNING</li> <li>e) Initiate Attachment 4</li> </ul>
		<p>*9 CHECK IF RS REQUIRED:</p> <ul style="list-style-type: none"> <li>a) Check RWST level – LESS THAN OR EQUAL TO 60%</li> <li>b) Check ISRS pumps - RUNNING</li> <li>c) Check OSRS pumps – RUNNING (Time Delayed)</li> </ul> <p><b>NOTE:</b> BOP may question status of 1-RS-P-2B at this time if not yet restored.</p> <ul style="list-style-type: none"> <li>d) Check OSRS pumps - NOT CAVITATING</li> </ul>
	BOP	<p><b>Attachment 1 of E-0</b></p> <p>*10. BLOCK LOW PRZR PRESS SI SIGNAL:</p> <ul style="list-style-type: none"> <li>a) Check PRZR pressure – LESS THAN 2000 psig</li> <li>b) <b>Turn both LO PRZR PRESS &amp; STM HDR/LINE ΔP switches to block</b></li> <li>c) <i>Check Permissive Status light C-2 - LIT</i></li> </ul> <p>BOP will block the low pressurizer pressure SI signal depending on current RCS pressure.</p>

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

	BOP	<p>*11. BLOCK LOW TAVE SI SIGNAL:</p> <p>Step may not be performed at this time (if Tave is greater than 543°F).</p> <ul style="list-style-type: none"><li>a) Check RCS Tave - LESS THAN 543°F</li><li>b) Turn both HI STM FLOW &amp; LO TAVG OR LP switches to block</li><li>c) <i>Check Permissive Status light F-1 - LIT</i></li></ul>
	BOP	<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• CHG pumps should be run in the following order of priority: C, B, A.</li><li>• Subsequent SI signals may be reset by re-performing Step 12.</li></ul> <p>12. CHECK SI FLOW:</p> <ul style="list-style-type: none"><li>a) HHSI to cold legs - FLOW INDICATED<ul style="list-style-type: none"><li>• 1-SI-FI-1961 (NQ)</li><li>• 1-SI-FI-1962 (NQ)</li><li>• 1-SI-FI-1963 (NQ)</li><li>• 1-SI-FI-1943 or 1-SI-FI-1943A</li></ul></li><li>b) Check CHG pumps - THREE RUNNING                      b) GO TO Step 12e</li><li>c) Reset SI.</li><li>d) Stop one CHG pump and out in AUTO</li></ul>

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

		<b>Attachment 1 of E-0</b>  e) RCS pressure - LESS THAN 185 PSIG  RNO: e) IF two LHSI pumps are running, THEN do the following:  1) <i>Verify reset or reset SI.</i>  3) GO TO Step 13.
	BOP	13. CHECK TOTAL AFW FLOW - GREATER THAN 350 GPM [450 GPM]
	BOP	14. CHECK AFW MOVs - OPEN  BOP will identify that all AFW MOVs are not open and will read the RNO portion of this step and manually align valves as necessary.
	BOP	15. INITIATE SI VALVE ALIGNMENT IAW ATTACHMENT 2  See attached copy of Attachment 2. (RO performed this Attachment Previously).  Depending on timing, this attachment already completed.
	BOP	16. INITIATE VENTILATION, AC POWER, AND SFP STATUS CHECKS IAW ATTACHMENT 3  <i>Attachment 3 follows, item requiring manipulation circled.</i>  <i>Unit 2 Operator will state that Unit 2 is at 100% power (if asked)</i>  <i>Unit 2 will also accept responsibility to complete Attachment 3 if it is given to Unit 2 at the point where differential pressure indications are requested.</i>

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

NUMBER 1-E-0	ATTACHMENT TITLE	ATTACHMENT 3
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1. \_\_\_\_ Check or place REFUEL SFTY MODE switches in NORMAL.

2. \_\_\_\_ Check ventilation alignment IAW Tables 1 and 2.

TABLE 1  
UNIT #1 VENTILATION PANEL

	<u>MARK NUMBER</u>	<u>EQUIPMENT STATUS</u>
<input type="checkbox"/>	1-VS-F-4A & B	OFF
<input type="checkbox"/>	1-VS-HV-1A & B	OFF
<input type="checkbox"/>	1-VS-F-8A & B	OFF
<input type="checkbox"/>	1-VS-F-9A & B	GREEN
<input type="checkbox"/>	1-VS-F-59	GREEN
<input type="checkbox"/>	1-VS-F-6	OFF
<input type="checkbox"/>	1-VS-F-39	GREEN
<input type="checkbox"/>	1-VS-F-7A & B	GREEN
<input type="checkbox"/>	1-VS-HV-5	GREEN
<input type="checkbox"/>	1-VS-F-56A & B	GREEN
<input type="checkbox"/>	1-VS-F-40A & B	GREEN
<input type="checkbox"/>	1-VS-HV-4	OFF
<input type="checkbox"/>	2-VS-F-40A or B	RED
<input type="checkbox"/>	2-VS-HV-4	OFF

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

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TABLE 2  
VNTX PANEL

<u>MARK NUMBER</u>	<u>EXPECTED EQUIPMENT STATUS</u>	<u>RESPONSE NOT OBTAINED</u>
<input type="checkbox"/> a. AOD-VS-107A & B AOD-VS-108	RED GREEN	<input type="checkbox"/> a. Place AUX BLDG CENTRAL AREA MODE switch to FILTER.
<input type="checkbox"/> b. MOD-VS-100A & B AOD-VS-106	RED GREEN	<input type="checkbox"/> b. • Place MOD-VS-100A to FILTER. • Place MOD-VS-100B to FILTER.
<input type="checkbox"/> c. MOD-VS-200A & B AOD-VS-206	GREEN RED	<input type="checkbox"/> c. • Place MOD-VS-200A to UNFILTER. • Place MOD-VS-200B to UNFILTER.
<input type="checkbox"/> d. AOD-VS-103A & B AOD-VS-104	GREEN GREEN	<input type="checkbox"/> d. • Place AOD-VS-103A in UNFILTER. • Place AOD-VS-103B in UNFILTER. • Place AOD-VS-104 in FILTER.
<input type="checkbox"/> e. AOD-VS-101A & B AOD-VS-102	GREEN GREEN	<input type="checkbox"/> e. Place AOD-VS-101A and 101B in UNFILTER.
<input type="checkbox"/> f. AOD-VS-111A & B	GREEN	<input type="checkbox"/> f. Place COMBINE CONTAINMENT EXHAUST in ISOLATE.
<input type="checkbox"/> g. AOD-VS-110	GREEN	<input type="checkbox"/> g. Place AOD-VS-109A and 109B in FILTER.
<input type="checkbox"/> h. AOD-VS-112A & B	GREEN	<input type="checkbox"/> h. • Place AOD-VS-112A in CLOSE. • Place AOD-VS-112B in CLOSE.
<input type="checkbox"/> i. MOD-VS-58A & B 1-VS-F-58A & B	RED RED	<input type="checkbox"/> i. Start 1-VS-F-58A and 1-VS-F-58B.

3. \_\_\_\_ Check filtered exhaust flow: (as read on FI-VS-117A and FI-VS-117B)

☐ • Total flow - GREATER THAN 32400 cfmAND☐ • Flow through each filter bank - LESS THAN 39600 cfm**Critical Task:**

**CT-1: SPS E-1—H KOA.** The exhaust fans from the safeguards area is manually switched to filtered exhaust 30 minutes after a safety injection initiation signal. Align the Auxiliary Ventilation system for Aux BLDG central and Safeguards areas to filtered exhaust within 30 minutes of SI initiation signal (KOA). (E01.6 DRP-049) **STOP TIME:** \_\_\_\_\_

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

NUMBER 1-E-0	ATTACHMENT TITLE AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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4. \_\_\_\_ Check all Station Service Buses - ENERGIZED. IF NOT, THEN initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.
5. \_\_\_\_ Check annunciator VSP-J2 - LIT.
6. \_\_\_\_ Check Unit 1 RSST LTC time delay bypass light - LIT.
7. \_\_\_\_ Check stopped or stop 1-VS-AC-4.
8. \_\_\_\_ Place 1-VS-43-VS103X, MCR ISOLATION switch to the OFF position.
9. \_\_\_\_ Check closed or close MCR isolation dampers.
  - ☐ • 1-VS-MOD-103A
  - ☐ • 1-VS-MOD-103B
  - ☐ • 1-VS-MOD-103C
  - ☐ • 1-VS-MOD-103D

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

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\*\*\*\*\* :

**CAUTION:** • Only one Emergency Supply Fan must be started in the following step.

- Chilled Water flow to the in-service Unit 1 MCR AHU must be throttled to at least 15 gpm when the Emergency Supply fan is started.
- Chilled Water flow to the in-service Unit 2 MCR AHU must be throttled to at least 25 gpm when the Emergency Supply fan is started.
- An Emergency Supply Fan must not be started if the filter is wet.

\*\*\*\*\* :

10. Immediately start ONE Emergency Supply Fan IAW the following: (1-VS-F-41 or 2-VS-F-41 preferred)

a. IF 1-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

- \_\_\_ 1. Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD.
- \_\_\_ 2. Start 1-VS-F-41.

b. IF 2-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

- \_\_\_ 1. Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD.
- \_\_\_ 2. Start 2-VS-F-41.

c. IF 1-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

- \_\_\_ 1. Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD.
- \_\_\_ 2. Start 1-VS-F-42.

d. IF 2-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

- \_\_\_ 1. Open 2-VS-MOD-204B, CONT RM EMERG SUP MOD.
- \_\_\_ 2. Start 2-VS-F-42.

e. \_\_\_ Adjust Chilled Water flow to MCR AHUs IAW Step 10 Caution.

Unit 2 will notify BOP that Chilled water flow has been throttled IAW CAUTION prior to Step 10.



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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  AUXILIARY VENTILATION, AC POWER, AND SFP STATUS CHECKS	ATTACHMENT 3
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11. \_\_\_\_ Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.

- ☐ • PDI-VS-100, D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-101, D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-200, D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • PDI-VS-201, D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
- ☐ • 1-VS-PDI-118 (Unit 1 Computer Room)
- ☐ • 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
- ☐ • 2-VS-PDI-215 (Unit 2 AC Room)
- ☐ • 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)

Unit 2 will notify BOP that MCR DP same as indicated on Ventilation Panel for first four indicator.

Unit 2 has initiated 0-AP-50.00

12. \_\_\_\_ IF any reading NOT positive, THEN initiate Attachment 6 to secure MCR boundary fans.

13. \_\_\_\_ Check initiated or initiate 0-AP-50.00, OPPOSITE UNIT EMERGENCY.

14. \_\_\_\_ Check the following MCR and ESGR air conditioning equipment operating. IF NOT, THEN start equipment within 1 hour IAW the appropriate subsection of 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM.

- ☐ • One Control Room chiller
- ☐ • One Unit 1 Control Room AHU
- ☐ • One Unit 2 Control Room AHU
- ☐ • One Unit 1 ESGR AHU
- ☐ • One Unit 2 ESGR AHU

15. \_\_\_\_ IF both of the following conditions exist, THEN check that Load Shed is activated.

- ☐ • Unit 2 - SUPPLIED BY RSST
- ☐ • Unit 2 RCPs - RUNNING

Unit 2 will notify BOP that Unit 2 operating at 100%. Unit 2 will assume responsibility for the remainder of this Attachment.

16. \_\_\_\_ IF Load Shed is required and not activated, THEN initiate 0-AP-10.10, LOSS OF AUTO LOAD SHED.

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

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**NOTE:** • SFP checks should be initiated WITHIN ONE TO TWO HOURS of EOP entry.

- Loss of power may render SFP indications and alarms non-functional and require local checks. Power supplies are as follows:
  - TI-FC-103, Unit 1 Semi-Vital Bus
  - TI-FC-203, Unit 2 Semi-Vital Bus
  - 1-FC-LIS-104, Panel 1ABDA1
- Loss of AC Power to the SFP level indicator is indicated if both low and high level alarms are in simultaneously. (0-VSP-C4 and 0-VSP-D4)
- 1-DRP-003, CURVE BOOK, provides a graph for SFP time to 200°F if loss of SFP cooling occurs.

17. \_\_\_\_ Initiate monitoring SFP parameters:

- ☐ • SFP level - Greater than Cooling Pump suction AND Stable
- ☐ • SFP temperature - Stable or Decreasing
- ☐ • SFP Cooling Pumps - Either Running
- ☐ • Component Cooling - Normal

18. \_\_\_\_ Continue to monitor parameters every one to two hours or until authorized to terminate monitoring by the Station Emergency Manager and/or the Shift Manager.

19. \_\_\_\_ Notify the Station Emergency Manager and/or the Shift Manager of the status and trend of SFP parameters.

20. \_\_\_\_ IF any abnormality or adverse trend is identified, THEN initiate 0-AP-22.02, MALFUNCTION OF SPENT FUEL PIT SYSTEMS.

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  CLS COMPONENT VERIFICATION	ATTACHMENT 4
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LOCATION: Vertical BoardVALVE POSITION: CLOSED  
LIGHTS: GREEN

\_\_\_ 1-RM-TV-100C

\_\_\_ 1-RM-TV-100B

\_\_\_ 1-RM-TV-100A

\_\_\_ 1-CC-TV-105A

\_\_\_ 1-CC-TV-105B

\_\_\_ 1-CC-TV-140A

\_\_\_ 1-CC-TV-110A

\_\_\_ 1-CC-TV-105C

\_\_\_ 1-CC-TV-140B

\_\_\_ 1-CC-TV-110B

\_\_\_ 1-CC-TV-110C

\_\_\_ 1-IA-TV-100

\_\_\_ 1-SV-TV-102

\_\_\_ 1-IA-TV-101A

\_\_\_ 1-IA-TV-101B

LOCATION: Unit 1 Vent PanelRECIRC FAN STATUS: OFF  
LIGHTS: AMBER

\_\_\_ 1-VS-F-1A

\_\_\_ 1-VS-F-1B

LOCATION: Bench BoardVALVE POSITION: OPEN  
LIGHTS: RED

\_\_\_ 1-SW-MOV-105A

\_\_\_ 1-SW-MOV-105B

\_\_\_ 1-SW-MOV-105C

\_\_\_ 1-SW-MOV-105D

\_\_\_ 1-SW-MOV-104A

\_\_\_ 1-SW-MOV-104B

\_\_\_ 1-SW-MOV-104C

\_\_\_ 1-SW-MOV-104D

\_\_\_ 1-SW-MOV-103A

\_\_\_ 1-SW-MOV-103B

\_\_\_ 1-SW-MOV-103C

\_\_\_ 1-SW-MOV-103D

Check SW Outlet flow from RS HXs between 6,000 gpm and 12,500 gpm:

- 1-SW-FI-106A, RS HX A
- 1-SW-FI-106B, RS HX B
- 1-SW-FI-106C, RS HX C
- 1-SW-FI-106D, RS HX D

LOCATION: Radiation Monitoring PanelPUMPS: RUNNING (Time delayed)

\_\_\_ 1-SW-P-5A

\_\_\_ 1-SW-P-5B

\_\_\_ 1-SW-P-5C

\_\_\_ 1-SW-P-5D

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Event Description: "B" Train RMT Fails.

Cue: Pre-Event Failures.

NUMBER 1-E-0	ATTACHMENT TITLE  CLS COMPONENT VERIFICATION	ATTACHMENT 4
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LOCATION: Annunciator Panel AALARMS: CLEAR

☐ A-D-6      RS HX 1A RAD MON PP NO FLOW  
☐ A-E-6      RS HX 1B RAD MON PP NO FLOW  
☐ A-F-6      RS HX 1C RAD MON PP NO FLOW  
☐ A-G-6      RS HX 1D RAD MON PP NO FLOW

☐ IF alarm is LIT, THEN stop associated rad monitor pump AND monitor SW activity using RI-SW-120.

LOCATION: Bench Board
 VALVE POSITION: OPEN  
 LIGHTS: RED

☐ 1-CS-MOV-102A    ☐ 1-CS-MOV-102B  
☐ 1-RS-MOV-156A    ☐ 1-RS-MOV-156B

☐ 1-CS-MOV-101B    ☐ 1-CS-MOV-101D  
☐ 1-CS-MOV-101A    ☐ 1-CS-MOV-101C  
☐ 1-RS-MOV-155A    ☐ 1-RS-MOV-155B    ☐ 1-CS-MOV-100A    ☐ 1-CS-MOV-100B

**This section if not applicable for this event.**

----- IF EVENT - CLS HI HI AND LOSS OF RSS -----

LOCATION: Bench Board
 VALVE POSITION: CLOSED  
 LIGHTS: GREEN

☐ 1-CW-MOV-100A    ☐ 1-CW-MOV-100B    ☐ 1-CW-MOV-100C    ☐ 1-CW-MOV-100D  
☐ 1-CW-MOV-106A    ☐ 1-CW-MOV-106B    ☐ 1-CW-MOV-106C    ☐ 1-CW-MOV-106D  
☐ 1-SW-MOV-101A    ☐ 1-SW-MOV-101B    ☐ 1-SW-MOV-102A    ☐ 1-SW-MOV-102B

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Event No.: N/A

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER 1-E-0	CONTINUOUS ACTIONS PAGE	REVISION 69
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1. RCP TRIP CRITERIATrip all RCPs if BOTH conditions listed below occur:

- Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- RCS Subcooling - LESS THAN 30°F [85°F]

2. MINIFLOW RECIRC CRITERIA

- CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- OPEN - When RCS pressure is greater than 2000 psig.

3. ADVERSE CONTAINMENT CRITERIAUse Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

1. AMSAC RESET CRITERIAAMSAC may be manually reset when level in all three SGs is greater than 13% or six minutes have elapsed since the Reactor trip. When AMSAC is reset, AMSAC ARMED annunciator H-D-1 should clear and affected components may be realigned as needed.2. TD AFW PUMP SHUTDOWN CRITERIA

The TD AFW pump may be secured when SG NR level is greater than 22% in at least 2 SGs, AMSAC is reset, and no auto-start signal exists. To secure the pump, the pump SOV control switches must be taken to OPEN-RESET and then to CLOSE.

3. MANUAL SI ALIGNMENT

If SI fails to automatically align, Attachment 2 may be used for guidance on manual SI valve alignment.

4. \* TRANSIENT AFW FLOW CONTROL (IF SI in progress)

Attachment 8 may be used for guidance on transient AFW flow control.

5. \* FAULTED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 9 may be used for guidance on faulted SG(s) isolation and AFW flow control.

6. \* RUPTURED SG ISOLATION AND AFW FLOW CONTROL (IF SI in progress)

Attachment 10 may be used for guidance on ruptured SG(s) isolation and AFW flow control.

7. \* LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

\* Preemptive Actions

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

NUMBER	CONTINUOUS ACTION STEPS	REVISION
1-E-0		69

1. Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F. (E-0, Step 6)
  2. Monitor RCP Trip and Miniflow Recirc Criteria. (E-0, Step 8)
  3. Check SG Narrow Range Level - ANY SG GREATER THAN 12%. (Control feed flow to maintain Narrow Range Level between 22% and 50%) (E-0, Step 25)
  4. Monitor LHSI pumps and secure as necessary. (E-0, Step 30)
- NOTE:** Subsequent SI signals may be reset by reperforming Step 12 of Attachment 1.
5. Monitor CTMT pressure and check CLS initiation as necessary. (Attachment 1, Step 8)
  6. Monitor RWST level and check RS initiation as necessary. (Attachment 1, Step 9)
  7. Block Low PRZR Pressure SI signal when less than 2000 psig. (Attachment 1, Step 10)
  8. Block Low Tave SI signal when less than 543°F. (Attachment 1, Step 11)

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

CONTINUOUS ACTIONS PAGE FOR 1-E-11. RCP TRIP CRITERIATrip all RCPs if BOTH conditions listed below occur:

- a. Charging Pumps - AT LEAST ONE RUNNING AND FLOWING TO RCS
- b. RCS Subcooling - LESS THAN 30°F [85°F]

2. SI REINITIATION CRITERIAFollowing SI termination or SI flow reduction, manually start SI pumps and align valves as necessary if EITHER condition listed below occurs:

- RCS subcooling based on CETCs - LESS THAN 30°F [85°F]
- PRZR level - CANNOT BE MAINTAINED GREATER THAN 22% [50%]

3. MINIFLOW RECIRC CRITERIA

- a. CLOSED - When RCS pressure is less than 1275 psig [1475 psig] AND RCP Trip Criteria are met (RCPs OFF).
- b. OPEN - When RCS pressure is greater than 2000 psig.

4. ADVERSE CONTAINMENT CRITERIAUse Adverse Containment setpoints if EITHER condition listed below occurs:

- Containment Pressure - GREATER THAN 20 PSIA
- Containment Radiation - GREATER THAN 1.0E5 R/HR

5. SECONDARY INTEGRITY CRITERIA

Manually start SI pumps as necessary and GO TO 1-E-2, FAULTED STEAM GENERATOR ISOLATION, if any SG pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.

6. E-3, TRANSITION CRITERIA

Manually start SI pumps as necessary and GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE, if any SG level increases in an uncontrolled manner or any SG has abnormal radiation.

7. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

GO TO 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, if RWST level decreases to less than 20%.

8. AFW SUPPLY SWITCHOVER CRITERIA (Refer to Attachment 6)

Transfer to one of the following alternate AFW water supplies if ECST level decreases to less than 20%.

- a. 1-CN-TK-2, using 1-CN-150.
- b. 1-CN-TK-3, using AFW Booster Pumps.
- c. AFW Crossie.
- d. Firemain.

9. RCP SEAL INJECTION CRITERIA

Seal Injection flow should be maintained to all RCPs.

10. LOSS OF RCP SUPPORT CONDITIONS

Trip RCPs if a loss of a support condition occurs. (for example, loss of CC)

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FOLDOUT PAGES FOR REFERENCED PROCEDURES

CONTINUOUS ACTION PAGE FOR 1-ES-1.3**NOTE:** • This Continuous Actions Page remains in effect during sump recirculation.

- If sump blockage OR a complete loss of sump suction capability occurs, FRs should NOT be implemented until directed in Attachment 1, or in 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

1. \_\_\_\_ IF a complete loss of sump suction capability occurs, THEN GO TO 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.
2. \_\_\_\_ IF sump blockage occurs, THEN perform Attachment 1.
3. \_\_\_\_ WHEN Cold Leg Recirculation is established in Step 5, THEN monitor the following parameters for indications of sump blockage:
  - a. LHSI Pumps
    - Amps Oscillating
    - Flow Oscillating
  - b. Charging Pumps
    - Amps Oscillating
    - Flow Oscillating
    - Discharge Pressure Oscillating
  - c. Inside Recirc Spray Pumps
    - Amps Oscillating
    - Discharge Pressure Oscillating
    - Vibration Annunciators (1A-E7, 1A-E8)
  - d. Outside Recirc Spray Pumps
    - Amps Oscillating
    - Discharge Pressure Oscillating
    - Vibration Annunciators (1A-G7, 1A-G8)
  - e. Recirc Spray Sump Level - indication may decrease or change rate based on blockage location
  - f. Containment Pressure increasing



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## SIMULATOR OPERATOR'S GUIDE

**Simulator Setup**

Ensure NI-NR—B set at 1 minute interval.

Initial Conditions:

Recall IC -XXX and implement **TRIGGER #30** to activate all passive malfunctions and verify **Trigger #30** implemented.

Open the monitor window and add the following points to it:

- asp\_ao\_off
- ???
- ???
- 

Enter the following MALFUNCTIONS:

Malfunction	Delay	Ramp	Trigger	Value	Final	Trigger Type (Auto or Manual)
RM0209 PROCESS RAD MONITOR RI-CC-105 FAILURE	10	60	1	0	.5	MANUAL
CC07 DISABLE CC-HCV-100 AUTO CLOSURE	0	0	1	FALSE	TRUE	MANUAL
PG0101 THERMAL OVERLOAD PG-P-1A	10	0	3	FALSE	TRUE	MANUAL
PG0202 PG-P-1B AUTO START FAILURE	0	0	3	FALSE	TRUE	MANUAL
MS2101 MS PRESSURE TRANSMTR MS-PT-101A FAILURE	10	60	5	0	-1	MANUAL
V1AF8 RS PP 2B SEAL HD TK LO LVL	10	0	7	OFF	ON	MANUAL
VSPF1 LOOSE PARTS UNIT 1	10	0	9	0	1	MANUAL
RC2602 SHEARED REACTOR COOLANT PUMP B SHAFT	10	0	10	FALSE	TRUE	MANUAL
RC0103 RCS COLD LEG C PIPE RUPTURE	10	60	12	0	3	MANUAL
SI2403 SI RELAY S13A FAILS TO ACTUATE	0	0	30	FALSE	TRUE	ACTIVE
SI2503 SI RELAY S13A FAILS TO ACTUATE	0	0	30	FALSE	TRUE	ACTIVE
SI1701 RMT TRAIN A FAILURE (AUTO)	0	0	30	FALSE	TRUE	ACTIVE
SI1702 RMT TRAIN BA FAILURE (AUTO)	0	0	30	FALSE	TRUE	ACTIVE
VS0101 PRESSURE SWITCH VS-P-127A STICKS AS IS	0	0	30	FALSE	TRUE	ACTIVE
VS0102 PRESSURE SWITCH VS-	0	0	30	FALSE	TRUE	ACTIVE

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## SIMULATOR OPERATOR'S GUIDE

P-127B STICKS AS IS						
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Override	Set Condition	Trigger
CSRMTB_INIT_1 RMT SYS TR B MANUAL INITIATION 2/2 PB 1	1, 0 TD	30
CSRMTB_INIT_2 RMT SYS TR B MANUAL INITIATION 2/2 PB 2	1, 0 TD	30

TRIGGER	TYPE	DESCRIPTION
1	MAN	Process RM RI-CC-105 Failure High, with Failure of CC-HCV-100 Auto Closure
3	MAN	1-PG-P-1A trip, 1-PG-P-1B fail to Auto Start
5	MAN	“A” SG PORV Transmitter Fail Low, Shift to “B” or “C” SG PORV controlling RCS Temperature.
7	MAN	1-RS-P-2B Seal Head Tank Low Level
9	MAN	Loose Parts Unit 1 Annunciator
10	MAN	Sheared Shaft “B” RCP
12	MAN	RCS Cold Leg Rupture with Failure of SI-MOV-1867C /D to open, 1-VS-F-58A/B fail to start.

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## SIMULATOR OPERATOR'S GUIDE

**Verify the following control room setup:**

- ☐ Place the simulator in RUN and verify normal 1E-8 amps indications.
- ☐ Reset the ROD CONTROL SYSTEM
- ☐ Verify Red Magnets on the following components:

--	--	--

- ☐ Verify 1-RM-RI-112 aligned to A SG and 1-RM-RI-113 aligned to B/C SG (magnets).
- ☐ Verify Ovation System operating.
- ☐ Reset ICCMs.
- ☐ Verify Component Switch Flags.
- ☐ Verify Brass Caps properly placed.
- ☐ Verify SG PORVs set for 1035 psig.
- ☐ Verify Rod Control Group Step Counters indicate properly.
- ☐ Verify Ovation CRT display.
- ☐ Advance Charts
- ☐ Verify Turbine Thumb Wheel Settings @120 rpm/min and Position 6
- ☐ Verify Containment Instrument Air Compressors are on Inside Suction (all RMs reset)
- ☐ Verify all ARPs have been cleaned
- ☐ Verify CLEAN copies of the following procedures are in place:

<input type="checkbox"/> AP-53.00	<input type="checkbox"/> 1-GOP-1.4	<input type="checkbox"/> AP-38.00	<input type="checkbox"/> AP-16.00
<input type="checkbox"/> E-0	<input type="checkbox"/> E-1	<input type="checkbox"/> ES-1.3	<input type="checkbox"/> 1-OP-SI-001 (6)
<input type="checkbox"/> OP-CH-007		<input type="checkbox"/> Reactivity Sheet	
<input type="checkbox"/> OP-ZZ-002		<input type="checkbox"/> 0-OPT-RM-001 (3)	

- ☐ **NOTE:** Candidates will be given a copy of 1-GOP-1.4, Signed off to the CAUTIONS and NOTES Prior to Step 5.4.9.
- ☐ **Verify Reactivity Placard is current.**
- ☐ Verify ALL PINK MAGNETS are accounted for.

**SIMULATOR OPERATOR'S GUIDE****Brief**

This simulator performance scenario is performed in the EVALUATION MODE. You should not direct questions to the evaluators. Otherwise, you should perform as if you were in the MCR.

Your ability to maintain a log is not being graded, but maintaining a rough log is recommended to help during briefs.

If you need to communicate with the Unit 2 operator, verbally state, "Unit 2" and an instructor will locate to the Unit 2 area and respond to you as quickly as possible.

In the unlikely event that the simulator fails such that illogical indications result, the session will be terminated. In other words, respond to what you see. If there is a problem with the simulation, the session will be terminated or adjusted as appropriate based on the specific problem.

Assign operating positions.

Ask for and answer questions.

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## SIMULATOR OPERATOR'S GUIDE

Conduct shift turnover:

Unit 1 is at  $1 \times 10^{-8}$  Amps, BOL. Unit 2 is at 100%. All systems and crossties are operable.

- The MSTVs are closed.
- "A" SG PORV is set at 995 psig.
- Current Boron is 1524 ppm

Turnover: : The Team will pre-brief raising power from  $10^{-8}$  amps to 1-2% on 'A' SG PORV IAW 1-GOP-1.4 and provided Reactivity Plan.

When the team has accepted the shift, proceed to the Session Conduct Section.

**SIMULATOR OPERATOR'S GUIDE****Session Conduct:**

- Ensure conditions in Simulator Set-up are established.
- **Ensure Trigger 30 is active prior to team entering the simulator.**
- Verify Exam Security has been established and ASP\_AO\_OFF = True.

**EVENT 1      Raise Power From 1E<sup>-8</sup> Amps to 1-2% on "A" SG PORV****BOOTH:**

30 minutes prior to the beginning of the scenario, provide the team with a copy of 1-GOP-1.4, Unit Startup, HSD to 2% Power and the Reactivity Plan. The team will pre-brief the OP prior to entering the simulator.

**Operations Supervisor/Management:**

- **IF contacted**, Permission has been granted to raise power to 1-2 %.
- **If contacted**, will acknowledge the completion of the evolution.

Role play as other individuals as needed.

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## SIMULATOR OPERATOR'S GUIDE

**EVENT 2      1-CC-RI-105 Fails high with no Auto Action**When cued by examiner, implement Trigger #1.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure 1-CC-RI-105.
- **If contacted**, will acknowledge TS 3.13 requirement to maintain the CC Surge Tank Vent Valve closed.
- **If contacted**, will contact I&C.
- **If contacted**, will take responsibility for writing the CR.

Unit 2 Operator:

- Will provide copy of 0-OPT-RM-001

STA:

- **If contacted**, will acknowledge the failure of 1-CC-RI-105. The individual(s) contacted will also acknowledge (but not confirm/deny) any TS LCOs.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of 1-CC-RI-105. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

- **If contacted**, field operators will report no issues at the RM detector.

Maintenance/Work Week Coordinator:

- **If contacted**, will acknowledge instrumentation failure and Notify I&C.

Role play as other individuals as needed.

**Op-Test No.: Surry 2014-1****Scenario No.: 1****Page 78 of 87****SIMULATOR OPERATOR'S GUIDE****EVENT 3      1-PG-P-1A trips, no Auto Start 1-PG-P-1B.**

When cued by examiner, implement Trigger #3.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the trip of 1-PG-P-1A, and failure of 1-PG-P-1B to auto start.
- **If contacted**, will take responsibility for writing the CR.
- **If requested**. Will notify Electrical Maintenance to investigate.

STA:

- **If contacted**, will acknowledge the trip of 1-PG-P-1A, and failure of 1-PG-P-1B to auto start.
- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the failed CC RM. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators: (three minutes elapse from dispatch to report).

- Will check local status of 1-PG-P-1A, no abnormalities noted.
- Will check status of 1-PG-P-1A breaker, MCC 1B1-1A 1C. Will report that breaker has thermalled.

Work Week Coordinator:

- **If contacted**, will acknowledge thermal trip of 1-PG-P-1A and take responsibility for contact of Electrical Maintenance.



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## SIMULATOR OPERATOR'S GUIDE

Unit 2:

- **If contacted**, will acknowledge the loss of PG flow and restoration of PG when 1-PG-P-1B started.

Role-play as other individuals as needed.

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When cued by examiner, implement Trigger #5.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the change of controlling SG PORV from ‘A’ to ‘B’ or ‘C’.
- **If asked**, will take responsibility for writing the CR.

STA:

- **If contacted**, will take responsibility for writing the CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal, with the exception of the CC RM. He will also state that containment conditions and the electrical conditions are as you see them.

Maintenance/ Work Week Coordinator:

- **If contacted**, will acknowledge the failure and commence investigations.

Chemistry:

- **If contacted**, will acknowledge the change of the controlling SG PORV, and state that an isotopic analysis was performed on all three SGs prior to the use of the ‘A’ SG PORV for temperature control.

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Field Operators:

- **If contacted**, to check the status of 1-MS-PI-101A on the Aux shutdown panel, will report that 1-MS-PI-101A indicates failed low, 1-MS-PI-101B / C indicated approximately 1000 psig.

Unit 2:

- **If contacted**, will acknowledge the failure of the 'A' SG PORV, and the shift of controlling PORV to the 'B' or 'C' PORV.

Role-play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENT 5**     **1-RS-P-2B Seal Head Tank Low Level.**

When cued by examiner, implement Trigger #7.

Operations Supervisor/Management:

- **If contacted**, will acknowledge receipt of Seal Head Tank Low Level alarm on 1-RS-P-2B.
- **If contacted**, will take responsibility for writing the CR.
- **If contacted**, take responsibility of briefing an operator to perform 1-OP-SI-001 to refill 1-RS-P-2B Seal Head Tank.

Unit 2 Operator:

- **When** needed by the Team, provide a copy of 1-OP-SI-001.

## SIMULATOR OPERATOR'S GUIDE

STA:

- **If contacted**, will acknowledge the 1-RS-P-2B Seal Head Tank Low Level alarm.
- **If asked**, will acknowledge Tech Spec clock entry for 1-RS-P-2B, but not confirm the entry.
- **If contacted**, will take responsibility for writing the WR and CR.
- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor alarms. He will also state that containment conditions and the electrical conditions are as you see them.

Field Operators:

- Will notify the RO that 1-RS-P-2B Seal head tank level is low and No leakage apparent.
- Will notify the RO that 1-OP-SI-001, Section 6.2, Page 10, Steps 6.2.1 through 6.2.5 are complete. Ready for you to perform Steps 6.2.5 through 6.2.7.
- The report of completion of the fill of the Seal Head Tank will not occur until the Team has completed the ES-0.1 transition brief.

Role play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENTS 6****Loose Parts Alarm and 'B' RCP Sheared Shaft.**

When cued by the examiner, implement Trigger #9. Following the report of alarming channel to the control room, on the Loose Parts Monitor, AND the examiner is ready, Implement Trigger #10 for 'B' RCP shaft shear.

Operations Supervisor/Management:

- **If contacted**, will take responsibility for writing the WR and CR.
- **If contacted**, will acknowledge entry into 1-E-0, securing 1-RC-P-1B, and entry into ES-0.1.
- **If contacted**, acknowledge Tech Spec identification of TS 3.1 justifying manual reactor trip.
- **If contacted**, acknowledge 1-RS-P-1-2B Seal Head Tank has been filled, 1-RS-P-2B has been restored to Operable status, 24 hour clock has been exited.

STA:

- **If the team has a transient brief:** The STA will state that primary integrity is as the RO reported and that secondary integrity is as the BOP reported. The STA will state that radiological conditions are normal with the exception of the previously identified radiation monitor status. STA will report that containment conditions and the electrical conditions are as you see them.
- **If contacted**, acknowledge but not confirm Tech Spec 3.1 justification for Manual Reactor Trip.
- **If contacted**, will enter the control room and commence reviewing status trees and prepare for the transient brief (items are reported "as you see them or previously reported")

Unit Two:

- **If contacted**, Unit Two has implemented AP-50.00, and all conditions on U2 are normal.

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Field Operators: (Wait 3 minutes from dispatch to report.)

- **When contacted**, field operators will perform valve manipulations as required:
- Report Loose Parts Alarm on Unit 1 caused by channel 8, 'B' SG Primary Side, and a loud metallic banging sound is heard.
- When the Team has completed ES-0.1 Transition Brief, notify the RO that 1-RS-P-2B Seal Head Tank has been filled. The Seal Head Tank Upper Level Indication light is lit, and 1-OP-SI-001 can be continued at Step 6.2.32.

Role play as other individuals as needed.

## SIMULATOR OPERATOR'S GUIDE

**EVENT 8/9 E-0 LBLOCA with SI Failure and "B" Train Hi and HI-HI CLS Failure**

When Evaluator ready and the Team has entered ES-0.1, Actuate Trigger 12.

Operations Supervisor/Management:

- **If contacted**, will acknowledge the failure Safety Injection actuation.
- **If contacted**, will take responsibility for writing the WR and CR.

Unit 2 Operator:

- **When** radiation alarms sound on the radiation alarm panel, silence the alarms when directed and report the alarm to the Unit 1 SRO.
- **If directed** perform the associated RM ARP without leaving the confines of the Unit 2 control area. If actions or verifications are required on the Unit 1 side, inform the Unit 1 SRO of the need for an operator to complete the ARP.
- **When asked by the BOP**, Unit 2 Operator has initiated 0-AP-50.00, and Unit remains at 100% power with equipment status normal.
- **When asked**, chilled water flow has been throttled IAW E-3, Attachment 3 Caution prior to Step 10.
- **When asked**, MCR differential pressure will indicated 0 until the BOP has isolated the boundary and started VS-F-41. Boundary DP will equal the indicated DP on the Unit 2 Vent Panel.
- **When**, the BOP reaches Page 6 of E-0, Attachment 3 (SFP monitoring), Unit 2 will take responsibility for monitoring the SFP.

Field Operators:

- **If directed**, field operators will perform local manipulations.

Role play as other individuals as needed.



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## SIMULATOR OPERATOR'S GUIDE

The scenario will end upon entering completion of Step 5 of 1-ES-1.3 or at the lead examiners discretion.