

Facility: BFNScenario Number: NRC - 1Op-Test Number: 1501Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: SRO: \_\_\_\_\_  
ATC: \_\_\_\_\_  
BOP: \_\_\_\_\_

**Initial Conditions:** Unit 1, 2, and 3 Reactor Power is approximately 100%. 2A CCW pump was removed from service for breaker PMs and is ready to be returned to service. 2-SR-3.8.6.2(2) Quarterly Check of 250V Main Bank Number 2 Battery is in progress.

**Turnover:** Return the 2A CCW pump to service IAW 2-OI-27 section 8.3. Southwest Load Dispatch is anticipating a power system alert starting this evening due to a cold front moving through the area.

Event Number	Malfunction Number	Event Type*	Event Description
1.	N/A	N-BOP N-SRO	Return the 2A CCW pump to service IAW 2-OI-27 section 8.3.
2.	nm07	I-BOP	Respond to an LPRM downscale alarm and bypass the failed detector.
3.	N/A	TS-SRO	Work Control calls and informs the US that SR-3.8.6.2(2) in progress, two cells out of spec Cat. B Limits.
4.	N/A	M-precursor	The U1 US reports that 1-XA-55-22C window 5 Start of Strong Motion Accelerograph is in alarm. 0-AOI-100-5 Earthquake is entered and the SM and U1 US are evaluating 4.2[1] through [10] to determine if shutting down is required
5.	N/A	R-ATC R-SRO	The SM directs initiating a Reactor Shutdown IAW 2-GOI-100-12A. The Reactor Engineer recommends using the urgent load reduction RCP initially to lower core flow to 60%.
6.	rd01a	C-ATC C-SRO	CRD pump 2A trips respond IAW 2-AOI-85-3
7.	rc09 rc10	C-BOP TS-SRO	RCIC steam leak failure of RCIC to auto isolate
8.	fw19	M-ALL	HPCI Injection line junction with FW A line break-SCRAM
9.	override	C-ATC	2C RFP discharge valve fails to close
10.	N/A	C-BOP	HPCI is manually secured due to pumping out the feedwater break

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

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## Events

1. The crew will conduct a pre-job brief for placing the 2A CCW pump in service. The BOP operator will place 2A CCW pump in service per 2-OI-27 section 8.3 which has incorporated T-MOD-BFN-2-2013-010. Once the pump is in service the scenario may continue.
2. The crew will respond to 2-XA-55-5A window 5, LPRM Downscale. The BOP operator will bypass the failed LPRM IAW 2-OI-92B. The SRO will determine that the affected APRM/OPRM and RBM remain operable. The scenario may continue.
3. 2-SR-3.8.6.2(2) Quarterly Check of 250V Main Bank Number 2 Battery is in progress and the Work Control Center Calls and informs the SRO that two connected cells specific gravities are 1.095 causing all cells to be 1.200. SRO will assess the operability of the batteries in accordance with Tech Specs 3.8.6 declaring that battery inoperable and initiates an active LCO on Condition A requiring Required Actions A.1, A.2 and A.3. Once the TS call is completed the scenario may continue.
4. The U1 US reports that 1-XA-55-22C window 5; Start of Strong Motion Accelerograph is in alarm. 0-AOI-100-5 Earthquake is entered and the SM and U1 US are evaluating steps 4.2[1] through [10] to determine if shutting down is required. The crew will monitor the plant for abnormal conditions and as soon as the lead examiner is ready to move on, the next event can be initiated.
5. The crew will enter 2-GOI-100-12A and the Urgent Load Reduction RCP. The ATC will lower Reactor Recirc flow to 60% IAW step 1A of the RCP. When the Lead Examiner is satisfied with the Reactivity manipulation the scenario may continue.
6. The 2A CRD pump will trip. The ATC operator will perform the immediate operator actions of 2-AOI-85-3 to place the 1B CRD pump in service. The ATC operator will verify 1B CRD pump is in service and perform the subsequent actions of the AOI. Once the CRD system flows and pressures have been restored to their pre-trip conditions the scenario may continue.
7. RCIC will receive an isolation signal due to a steam leak in the RCIC pump room with a failure to automatically isolate. The US will enter EOI-3 and 2-AOI-64-2C, and the BOP operator will perform actions necessary to isolate RCIC (manually closing 2-FCV-71-2 and 3). The SRO will determine RCIC system inoperable and RCIC isolation valves inoperable. (TS 3.5.3 Condition A, 3.6.1.3 Condition B). Once the steam leak has been terminated (i.e. Steam

Valves closed) and the Tech Spec call has been made the scenario may continue.

8. Once the plant is stable, the HPCI injection line will fail where it connects to the 'A' Feedwater line in the Steam Tunnel. A scram will be inserted due to loss of feedwater and lowering reactor water level. The crew will isolate the feedwater system. The crew will respond IAW EOI-1 and EOI-3. Reactor water level will not be able to be maintained above (-) 162 inches and the US will enter C-1. When Reactor Water Level lowers to (-) 162 inches the crew will verify Low Pressure injection systems aligned and running then perform an ED and recover Reactor Water Level using Low pressure systems.
9. Following the HPCI injection line break the 2C RFP discharge valve will fail to close. The ATC operator will close the 2C RFP suction valve to complete the Feedwater isolation.
10. The BOP operator will manually trip and lock out HPCI due to pumping out the injection line break.

The Scenario ends when the crew has performed an emergency depressurization and re-established Reactor Water Level above the top of active fuel (-) 162 inches.

**Critical Tasks 4**

1. **With a primary system discharging into secondary containment, take action to manually isolate the leak.**
  1. Safety Significance  
Isolating high energy sources can preclude failure of secondary containment and subsequent radiation release to the public
  2. Cues  
Procedural compliance  
Secondary Containment Area Temperature and Radiation indications
  3. Measured by  
Operator action to isolate the leak
  4. Feedback  
Valve position indication and lowering Area Temperature
2. **To prevent an uncontrolled RPV depressurization when Reactor Water Level cannot be restored and maintained above -162 inches, inhibit ADS.**
  1. Safety Significance  
Preventing an automatic actuation which could challenge plant safety. (such as an unintentional ESF actuation). (App. D 1.A.)  
Prevent degradation of fission product barrier
  2. Cues  
Procedural compliance
  3. Measured by  
ADS logic inhibited prior to automatic initiation
  4. Feedback  
RPV Pressure and Water level trend  
ADS LOGIC BUS A/B INHIBITED annunciators



3. **With a(n) injection system(s) operating and lined up for injection, before RPV water level reaches -180", initiate Emergency Depressurization.**
  1. Safety Significance:  
Maintain adequate core cooling  
Prevent degradation of fission product barrier
  2. Cues:  
Procedural compliance  
Reactor Water level trend
  3. Measured by:  
Observation: US direct Emergency Depressurization before RPV level lowers to -180 inches.
  4. Feedback:  
Reactor Pressure trend  
SRV status indications
4. **With RPV pressure below the Shutoff Head of the available Low Pressure system(s), operate available Low Pressure system(s) to restore RPV water level above TAF.**
  1. Safety Significance:  
Maintain adequate core cooling  
Prevent degradation of fission product barrier.
  2. Cues:  
Procedural compliance  
Pressure below low pressure ECCS system(s) shutoff head
  3. Measured by:  
Operator manually starts or initiates at least one low pressure ECCS system and injects into the RPV to restore water level above TAF
  4. Feedback:  
Reactor pressure trend  
Reactor water level trend

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**Event Description:** Return the 2C CCW pump to service IAW 2-OI-27 section 8.3.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs the BOP Operator to start 2C CCW Pump in accordance with 2-OI-27 Section 8.4
	BOP	<p><b>8.4 Returning CCW Pump To Service</b>  <b>[5] VERIFY CLOSED</b> the CCW PUMP 2B(2C) DISCH ISOL VALVE, 2-FCV-27-21(29) on Panel 2-9-20.</p> <p style="text-align: center;"><b>CAUTIONS</b></p> <p>1) Capacitor bank fuses are subject to clearing when the unit boards are being supplied from the 161kV source and large pumps are started. Unit Supervisors should evaluate placing the Capacitor Banks in Manual prior to starting RHR, CS or CCW pumps.</p> <p>2) When returning a pump to service with at least one pump already in operation, the pump being placed in service may experience perturbations in flow and motor amps. It may be necessary to throttle Condenser Water Box Discharge Valves as stated in Section 6.1 to stabilize pump.</p> <p><b>[7] START</b> CCW PUMP 2B(2C) using 2-HS-27-18A(26A) on Panel 2-9-20, <b>THEN</b></p> <p><b>VERIFY</b> the respective CCW PUMP 2B(2C) DISCH VALVE, 2-FCV-27-21(29) automatically travels to the full open position.</p>
	BOP	<p>BOP operator makes plant announcement on intent to start 2C CCW pump.</p> <p>Verifies 2-FCV-27-29 is closed, starts 2C CCW pump and verifies that 2-FCV-27-29 travels to the full open position.</p> <p>Reports to US that 2C CCW pump has been started.</p>
	NRC	End of Event No. 1

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**Event Description:** Respond to LPRM 40-49C downscale alarm and bypass the failed detector.

Time	Position	Applicant's Actions or Behavior
	DRIVER	When NRC Chief Examiner is ready for Event No. 2, insert F3 (imf NM07L4049C 0) to fail LPRM downscale.
	ATC	Responds to LPRM DOWNSCALE alarm (2-XA-55-5A, Window 5) Reports LPRM 40-49C downscale.
	BOP	A. <b>VALIDATE</b> LPRM downscale by observing LPRM Bargraph on Panel 2-9-14 or 2-9-5.  B. <b>IF</b> detector has failed downscale, <b>THEN</b> 1. <b>BYPASS</b> failed detector. REFER TO 2-OI-92B. 2. <b>INITIATE</b> a WO including detector number and location  BOP operator validates LPRM 40-49C downscale by observing bar-graph on Panel 2-9-14.
	SRO	US directs BOP operator to bypass LPRM 40-49C IAW 2-OI-92B. Contacts WC to initiate WO on LPRM 40-49C.
	DRIVER	Acknowledge initiating a WO on LPRM 40-49C

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**Event Description:** Respond to LPRM 40-49C downscale alarm and bypass the failed detector.

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>6.3 Bypassing LPRM detectors</b></p> <p><b>CAUTION</b></p> <p>Bypassing LPRMs such that there are less than 20 detectors per channel, or, less than 3 per any given level, will yield the associated APRM channel instrument INOP CONDITION (i.e. Rod Block). This condition results in the associated APRM being INOP but does not yield an Automatic APRM INOP TRIP. Tech Spec Section 3.3.1.1, Reactor Protection System (RPS) Instrumentation, and associated basis, addresses APRM operability requirements.</p> <p><b>NOTE</b></p> <p>All operations are performed on Panel 2-9-14 unless specifically stated otherwise.</p> <p>[3] <b>DEPRESS</b> any softkey to illuminate the display on the desired APRM/LPRM channel chassis.</p> <p>[4] <b>CHECK</b> that more than 20 LPRMs in average exist by observing "number of LPRMs in average" on the selected APRM chassis.</p> <p>[5] <b>CHECK</b> more than 3 LPRMs are operable in the LPRM strings at the level in which the LPRM is to be bypassed for the selected APRM chassis.</p> <p>Depresses any softkey on APRM 4 channel chassis, checks more than 20 LPRMs in average by observing 'number of LPRMs in average' and checks more than 3 LPRMs are operable at the 'C' level.</p> <p>[7] <b>DEPRESS</b> the "ETC" softkey until "BYPASS SELECTIONS" illuminates on the bottom row of the display.</p>

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**Event Description:** Respond to LPRM 40-49C downscale alarm and bypass the failed detector.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[8] <b>DEPRESS</b> "BYPASS SELECTIONS" softkey, enter the password, and <b>DEPRESS</b> "ENT".</p> <p>[9] <b>SELECT</b> the desired LPRM to be bypassed by using the left or right arrows on the softkey board until the inverse video illuminates the correct LPRM.</p> <p>[10] <b>DEPRESS</b> the "BYPASS/HV OFF" softkey to bypass the selected LPRM.</p> <p>[11] <b>CHECK</b> "BYP/HV OFF" is indicated under the selected LPRM.</p> <p>[12] <b>DEPRESS</b> "EXIT" softkey to return display to the desired bargraph.</p> <p>[13] <b>CHECK</b>, as a result of bypassing the LPRM, that no alarms are received on Panel 2-9-5 or on the APRM/LPRM channel.</p> <p>Depresses 'ETC' key until 'BYPASS SELECTIONS' is illuminated, depresses 'BYPASS SELECTIONS', enters 1234 and depresses 'ENT'. Uses left and right arrows to select LPRM 40-49C, depresses 'BYPASS/HV OFF' and checks 'BYP/HV OFF' is indicated under LPRM 40-49C. Depresses 'EXIT'</p>
	ATC	Checks that no alarms are received on 2-9-5 as a result of bypassing LPRM 40-49C.

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**Event Description:** Respond to LPRM 40-49C downscale alarm and bypass the failed detector.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>US reviews T.S. 3.3.1.1-1 and TRM 3.3.4-1 to determine that the affected APRM/OPRM and RBM channels remain OPERABLE.</p> <p>3.3.1.1 Reactor Protection System (RPS) Instrumentation</p> <p>LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE</p> <p>Function:</p> <p>2. Average Power Range Monitors – 3 channels per trip system required. All channels are OPERABLE</p> <p>TR 3.3.4 Control Rod Block Instrumentation</p> <p>LCO 3.3.4 The control rod block instrumentation for each Function in Table 3.3.4-1 shall be OPERABLE.</p> <p>Function:</p> <p>1. Average Power Range Monitors – 3 channels per trip function required. All channels are OPERABLE</p> <p>Briefs crew on LPRM status not affecting APRM/OPRM and RBM operability.</p>
	NRC	End of Event No. 2

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**Event Description:** Return the 2C CCW pump to service IAW 2-OI-27 section 8.3.

Time	Position	Applicant's Actions or Behavior																		
	DRIVER	When NRC Chief Examiner is ready for Event No. 3, call the Unit Supervisor as Work Control SRO and tell him that the I&C group has reported that two connected cells of the 250 V Number 2 Battery specific gravities are low, at 1.095 causing all cells to have a specific gravity of 1.200.																		
	SRO	Takes the report and performs a Tech Spec determination on the battery using Tech Specs 3.8.6 Battery Cell Parameters.																		
	BOP	<p>3.8 ELECTRICAL POWER SYSTEMS</p> <p>3.8.6 Battery Cell Parameters</p> <p>LCO 3.8.6 Battery cell parameters for the Unit, Shutdown Board, and DG batteries shall be within the limits of Table 3.8.6-1.</p> <p>APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.</p> <p>ACTIONS</p> <p>-----NOTE-----            Separate Condition entry is allowed for each battery.</p> <table border="1"> <thead> <tr> <th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr> </thead> <tbody> <tr> <td>A. One or more batteries with one or more battery cell parameters not within Category A or B limits.</td><td>A.1 Verify pilot cells electrolyte level and float voltage meet Table 3.8.6-1 Category C limits.</td><td>1 hour</td></tr> <tr> <td></td><td>AND</td><td></td></tr> <tr> <td></td><td>A.2 Verify battery cell parameters meet Table 3.8.6-1 Category C limits.</td><td>24 hours</td></tr> <tr> <td></td><td>AND</td><td></td></tr> <tr> <td></td><td></td><td>Once per 7 days thereafter</td></tr> </tbody> </table> <p>(continued)</p>	CONDITION	REQUIRED ACTION	COMPLETION TIME	A. One or more batteries with one or more battery cell parameters not within Category A or B limits.	A.1 Verify pilot cells electrolyte level and float voltage meet Table 3.8.6-1 Category C limits.	1 hour		AND			A.2 Verify battery cell parameters meet Table 3.8.6-1 Category C limits.	24 hours		AND				Once per 7 days thereafter
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Op Test No.: 15-01Scenario No. 1 Event No.: 3

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**Event Description:** Return the 2C CCW pump to service IAW 2-OI-27 section 8.3.

Time	Position	Applicant's Actions or Behavior																						
		<p><b>ACTIONS</b></p> <table border="1"> <thead> <tr> <th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr> </thead> <tbody> <tr> <td>A. (continued)</td><td>A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.</td><td>31 days</td></tr> </tbody> </table> <p>Table 3.8.6-1 (page 1 of 1) Battery Cell Parameter Requirements</p> <table border="1"> <thead> <tr> <th>PARAMETER</th><th>CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL</th><th>CATEGORY B: LIMITS FOR EACH CONNECTED CELL</th><th>CATEGORY C: ALLOWABLE VALUE FOR EACH CONNECTED CELL</th></tr> </thead> <tbody> <tr> <td>Electrolyte Level</td><td>&gt; Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark(a)</td><td>&gt; Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark(a)</td><td>Above top of plates, and not overflowing</td></tr> <tr> <td>Float Voltage</td><td>≥ 2.13 V</td><td>≥ 2.13 V</td><td>&gt; 2.07 V</td></tr> <tr> <td>Specific Gravity (b) (c)(d)</td><td>≥ 1.20</td><td>≥ 1.195  <u>AND</u> Average of all connected cells &gt; 1.205</td><td>Not more than 0.020 below average of all connected cells  <u>AND</u> Average of all connected cells ≥ 1.195</td></tr> </tbody> </table> <p>The SRO declares Battery Number 2 Inoperable and updates the crew with the LCO by reading the Conditions and Required Actions for A.1, A2, and A.3, a 1 hour, 24 hour and 7 day, and 31 day LCO.</p>	CONDITION	REQUIRED ACTION	COMPLETION TIME	A. (continued)	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.	31 days	PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: ALLOWABLE VALUE FOR EACH CONNECTED CELL	Electrolyte Level	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark(a)	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark(a)	Above top of plates, and not overflowing	Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V	Specific Gravity (b) (c)(d)	≥ 1.20	≥ 1.195  <u>AND</u> Average of all connected cells > 1.205	Not more than 0.020 below average of all connected cells  <u>AND</u> Average of all connected cells ≥ 1.195
CONDITION	REQUIRED ACTION	COMPLETION TIME																						
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	NRC	End of Event No. 3																						



Op Test No.: 15-01Scenario No. 1 Event No.: 4

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**Event Description:** The U1 US reports that 1-XA-55-22C window 5 Start of Strong Motion Accelerograph is in alarm. 0-AOI-100-5 Earthquake is entered and the SM and U1 US are evaluating 4.2[1] through [10] to determine if shutting down is required

Time	Position	Applicant's Actions or Behavior
	Driver	When the NRC Chief Examiner is ready for Event No. 4, then as U1 US, call US and report that 'Start of Strong Motion Accelerograph' (1-XA-55-22C Window 5) annunciator is in alarm.  0-AOI-100-5 for Earthquake has been entered and the SM is evaluating the subsequent actions to determine if a shutdown is required.
	SRO	Briefs crew on entering 0-AOI-100-5. Reviews 0-AOI-100-5.
	Crew	Monitors plant for abnormal conditions.
	NRC	End of Event No. 4

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**Event Description:** The SM directs initiating a Reactor Shutdown IAW 2-GOI-100-12A. The Reactor Engineer recommends using the urgent load reduction RCP initially to lower core flow to 60% and driving the first set of control rods.

Time	Position	Applicant's Actions or Behavior
	Driver	When the NRC Chief Examiner is ready for Event No. 5, then as SM, call US and direct initiating a reactor shutdown IAW GOI-100-12A. The RE has recommended using the urgent load reduction RCP initially to lower core flow to 60% and insert the first set of control rods on the emergency shove sheet.
	SRO	Briefs crew and directs a reactor shutdown IAW 2-GOI-100-12A. Directs using urgent load reduction RCP to lower core flow and rods.
		<b>2-GOI-100-12A</b>  <b>5.1 Notifications and Approvals</b>  [3] <b>NOTIFY</b> Chattanooga Load Coordinator of impending shut down or power reduction and <b>REQUEST</b> unloading instructions. (Unloading instructions are N/A if generator breaker is open.)  [4] <b>NOTIFY</b> Radiation Protection of Power Reduction or Reactor Shutdown.
	SRO	Calls Chattanooga Load Coordinator to inform him of the required reactor shutdown. Calls Radiation Protection to inform them of the required reactor shutdown.
	Driver	As Load Coordinator and RP, acknowledge required reactor shutdown.

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**Event Description:** The SM directs initiating a Reactor Shutdown IAW 2-GOI-100-12A. The Reactor Engineer recommends using the urgent load reduction RCP initially to lower core flow to 60% and driving the first set of control rods.

Time	Position	Applicant's Actions or Behavior
	ATC	<p><b>Reactivity Control Plan Form</b> Title of Evolution: <b>Urgent Load Reduction/Recirc Pump Trip Contingency Plan</b></p> <p><b>Urgent Load Reduction:</b> <b>1A. Lower power by lowering core flow to 57% - 60% core flow. (If a recirculation pump trip is imminent, only lower using the pump to be tripped.)</b></p> <p><b>2-OI-68</b></p> <p><b>6.2 Adjusting Recirc Flow</b> [2] <b>WHEN</b> desired to control Recirc Pumps 2A and/or 2B speed with the RECIRC MASTER CONTROL, <b>THEN ADJUST</b> Recirc Pump Speed 2A &amp; 2B using the following pushbuttons as required. <b>RAISE SLOW, 2-HS-96-31</b> <b>RAISE MEDIUM, 2-HS-96-32</b> <b>LOWER SLOW, 2-HS-96-33</b> <b>LOWER MEDIUM, 2-HS-96-34</b> <b>LOWER FAST, 2-HS-96-35</b></p> <p>Lowers reactor recirculation flow IAW the RCP Urgent Load Reduction and 2-OI-68 Sec. 6.2</p>
	NRC	<p>Individual pump speeds should be mismatched by ~60 RPM during dual pump operation between 1200 and 1300 RPM to minimize harmonic vibration.</p>

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**Event Description:** The SM directs initiating a Reactor Shutdown IAW 2-GOI-100-12A. The Reactor Engineer recommends using the urgent load reduction RCP initially to lower core flow to 60% and driving the first set of control rods.

Time	Position	Applicant's Actions or Behavior
	BOP	Provides peer check to ATC for changes in reactor recirculation flow.
	ATC	Selects the first control rod listed on the emergency load reduction sheet and verifies CRD parameters in their normal ranges.
	BOP	Provides peer check to ATC for selecting and driving the control rods.
	ATC	Drives the first control rod listed on the emergency load reduction sheet and continues on until all rods on the sheet have been driven in.
	SRO	Provides oversight for the reactivity change
	NRC	End of Event No. 5 May move on to next event when satisfied with reactivity change.

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**Event Description:** CRD pump 2A trips respond IAW 2-AOI-85-3

Time	Position	Applicant's Actions or Behavior
	Driver	When the NRC Chief Examiner is ready for Event No. 6, insert F5 (imf rd01a) to trip CRD Pump 2A
	ATC	Reports trip of CRD Pump 2A
	SRO	Directs entry into 2-AOI-85-3
		<b>2-AOI-85-3</b>  <b>4.1 Immediate Actions</b> [1] IF operating CRD pump has failed AND standby CRD pump is available, <b>THEN</b>  <b>PERFORM</b> the following at Panel 2-9-5: (Otherwise N/A)  [1.1] <b>PLACE</b> CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, in MAN at minimum setting.  [1.2] <b>START</b> associated standby CRD Pump using one of the following: <ul style="list-style-type: none"><li>• CRD PUMP 1B, using 2-HS-85-2A.</li><li>• CRD Pump 2A, using 2-HS-85-1A.</li></ul> [1.3] <b>IF</b> CRD Pump 1B was started, <b>THEN OPEN</b> CRD PUMP 1B DISCH TO U2, using 2-HS-85-8A  [1.4] <b>ADJUST</b> CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, to establish the following conditions: <ul style="list-style-type: none"><li>• CRD CLG WTR HDR DP, 2-PDI-85-18A, approximately 20 psid.</li><li>• CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, between 40 and 65 gpm.</li></ul> [1.5] <b>BALANCE</b> CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, AND PLACE in AUTO or BALANCE.

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**Event Description:** CRD pump 2A trips respond IAW 2-AOI-85-3

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Performs Immediate Operator actions to place 1B CRD pump in service.</p> <p>Reviews 2-AOI-85-3 Immediate Operator Actions and performs applicable subsequent actions.</p> <p><b>4.2 Subsequent Actions</b> [5] <b>NOTIFY REACTOR ENGINEER</b> of CRD system failure.</p> <p>Calls Reactor Engineer to report the trip of CRD pump 2A and subsequent start of CRD pump 1B</p>
	SRO	Calls WC to investigate the trip of CRD pump 2A
	Driver	Acknowledge calls to RE and WC concerning trip of CRD pump 2A.
	SRO	Conducts a crew brief including current plant conditions, events that have occurred.
	NRC	<p>SRO may or may not conduct a crew brief depending on current conditions.</p> <p>End of Event No. 6 May move on to the next event when satisfied with conditions.</p>

Op Test No.: 15-01Scenario No. 1 Event No.: 7

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**Event Description:** RCIC steam leak failure of RCIC to Auto Isolate. This event contains a critical task (CT) for the BOP highlighted in yellow below.

Time	Position	Applicant's Actions or Behavior
	Driver	When the NRC Chief Examiner is ready for Event No. 6, insert F6 (bat) to initiate a RCIC steam line leak and failure of 71-2 and 71-3 to auto close.
	BOP	<p>Responds to RX BLDG AREA RADIATION HIGH (2-XA-55-3A, Window 22) annunciator.</p> <p>A. <b>DETERMINE</b> area with high radiation level on Panel 2-9-11. (Alarm on Panel 2-9-11 will automatically reset if radiation level lowers below setpoint.)</p> <p>D. <b>NOTIFY RAD PRO.</b></p> <p>E. <b>IF</b> the TSC is <b>NOT</b> manned and a "VALID" radiological condition exists, <b>THEN USE</b> public address system to evacuate area where high radiological conditions exist.</p> <p>Determines that RM-90-26A (CS 1/RCIC ROOM) is in alarm. Reports to US that 90-26A is in alarm but below max safe. Uses public address system to evacuate the Reactor Building Notifies RP of rising radiation condition in Reactor Building.</p>
	SRO	<p>Enters EOI-3 on Any Secondary Containment Area Radiation level above Max Normal value of Table 4</p> <p><b>SC/R</b> <b>Monitor and Control</b> Secondary Cntmt radation lvls – <b>CHECKED</b></p> <p><b>WHEN</b> any area radiation lvl is above Max Normal (Table 4) – <b>CHECKED</b></p> <p><b>ISOLATE</b> all systems that are discharging into the area <b>EXCEPT</b> systems required:</p> <ul style="list-style-type: none"> <li>• For damage control</li> <li>OR</li> <li>• To be operated by EOIs</li> </ul>

Op Test No.: 15-01Scenario No. 1 Event No.: 7

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**Event Description:** RCIC steam leak failure of RCIC to Auto Isolate. This event contains a critical task (CT) for the BOP highlighted in yellow below.

Time	Position	Applicant's Actions or Behavior
	SRO	NOTE 3: Tables 3 and 4 contain information that may be used to determine if a primary system is discharging into Secondary Cntmt (emergency depressurization will reduce discharge)
	BOP	<p>Responds to RCIC STEAM LINE LEAK DETECTION TEMP HIGH (2-XA-55-3D, Window 10) annunciator</p> <p>A. <b>CHECK</b> RCIC temperature switches on LEAK DETECTION SYSTEM TEMPERATURE indicator, 2-TI-69-29 on Panel 2-9-21.</p> <p>B. IF RCIC is <b>NOT</b> in service <b>AND</b> 2-FI-71-1A(B), RCIC STEAM FLOW indicates flow, <b>THEN</b></p> <p>C. IF high temperature is confirmed, <b>THEN ENTER</b> 2-EOI-3 Flowchart.</p> <p>E. <b>REFER TO</b> Tech Specs 3.3.6.1, 3.5.3.</p> <p>Checks RCIC room temperature on LEAK DETECTION SYSTEM TEMPERATURE indicator and reports 71-41A (CS I/RCIC) temperature in alarm and below max safe.</p> <p>Continues to monitor RCIC area temperature and radiation</p>
	SRO	<p>Re-enters EOI-3 on Any Secondary Cntmt area temperature above Max Normal value of Table 3</p> <p><b>SC/T</b></p> <p><b>Caution:</b> Ambient temp may affect RPV water lvl indication and trend - <b>CHECKED</b></p> <p><b>Monitor and Control</b> Secondary Cntmt temps – <b>CHECKED</b></p>



Op Test No.: 15-01Scenario No. 1 Event No.: 7

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**Event Description:** RCIC steam leak failure of RCIC to Auto Isolate. This event contains a critical task (CT) for the BOP highlighted in yellow below.

Time	Position	Applicant's Actions or Behavior
		<p><b>OPERATE</b> available ventilation (APPX 8F)</p> <p><b>DEFEAT</b> isolation interlocks if necessary (APPX 8E) - <b>CIRCLED</b></p> <p>WHEN any area temp is above Max Normal (Table 4) – <b>CHECKED</b></p> <p><b>ISOLATE</b> all systems that are discharging into the area EXCEPT systems required:</p> <ul style="list-style-type: none"> <li>• For damage control</li> <li>OR</li> <li>• To be operated by EOIs</li> </ul> <p>NOTE 3: Tables 3 and 4 contain information that may be used to determine if a primary system is discharging into Secondary Contmt (emergency depressurization will reduce discharge)</p>
	BOP	<p>Responds to RCIC TURBINE TRIPPED (2-XA-55-3B, Window 14) annunciator.</p> <p>Recognizes that RCIC AUTO ISOL (A/B) amber lights are illuminated, and that isolation valves 71-2 and 71-3 have failed to close on the isolation signal.</p> <p>Reports failure of RCIC to isolate to US.</p> <p>Manually closes RCIC isolation valves 71-2 and 71-3. Reports isolation valves closed to US</p> <p>Checks secondary containment radiation and temperatures and reports radiation levels and temperatures lowering in the RCIC area.</p>

Op Test No.: 15-01Scenario No. 1 Event No.: 7

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**Event Description:** RCIC steam leak failure of RCIC to Auto Isolate. This event contains a critical task (CT) for the BOP highlighted in yellow below.

Time	Position	Applicant's Actions or Behavior
		<p><b>Critical Task – With a primary system discharging into secondary containment, take action to manually isolate the leak.</b></p> <ol style="list-style-type: none"><li>1. Cues Secondary Containment Area Temp &amp; Rad indications.</li><li>2. Standard Operator isolates the leak by closing the RCIC Steam Isolation Valves 2-FCV-71-2 and/or 2-FCV-71-3.</li><li>3. Feedback Valve position indicate closed (Green light ON and Red light OFF) and lowering Area Temperature Panel 2-9-21 RCIC Area Temperatures.</li></ol> <p><b>The Critical Task is <u>not met</u> if:</b> <b>The Operator fails to close the isolation valves</b> <b><u>OR</u></b> <b>The Area Temperatures exceeds Max Safe for that area and the crew misdiagnoses this as an unisolable leak.</b></p>

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**Event Description:** RCIC steam leak failure of RCIC to Auto Isolate. This event contains a critical task (CT) for the BOP highlighted in yellow below.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Reviews Tech Spec 3.5.3 (RCIC System) and determines that Condition A is applicable.</p> <p>A. RCIC System inoperable</p> <p>A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE – <b>IMMEDIATELY</b></p> <p>Reviews Tech Spec 3.6.1.3 (PCIVs) and determines that Condition A is applicable.</p> <p>A. NOTE Only applicable to penetration flow paths with two PCIVs. One or more penetration flow paths with one PCIV inoperable except due to MSIV leakage not within limits.</p> <p>A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. – <b>4 hours</b></p> <p>AND</p> <p>A.2 NOTE Isolation devices in high radiation areas may be verified by use of administrative means. Verify the affected penetration flow path is isolated – <b>Once per 31 days for isolation devices outside primary containment</b></p> <p>Conducts a crew brief including current plant status and Technical Specifications required actions for RCIC.</p>
	NRC	<p>SRO may or may not conduct a crew brief depending on current conditions.</p> <p>End of Event No. 7 May move on to the next event when satisfied with conditions.</p>

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Scenario No. 1 Event No.: 8

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Event Description: FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	Driver	When directed to continue to Event No. 7, insert F7 (bat) to initiate a HPCI injection line break in the steam tunnel and override RFP 'C' discharge valve OPEN.
	ATC	<p>May or may not recognize RFP speed slowly rising. If recognized, reports to US and continues to monitor feedpump speed and reactor water level.</p> <p>Reports reactor water level slowly lowering and 'A' feedwater line flow rising</p> <p>Responds to REACTOR WATER LEVEL ABNORMAL (2-XA-55-5A, Window 8) annunciator</p> <p>A. <b>VALIDATE</b> Reactor water level hi/low using multiple indications including Average Narrow Range Level on 2-XR-3-53 recorder, 2-LI-3-53, 2-LI-3-60, 2-3-206 and 2-LI-3-253 on Panel 2-9-5.</p> <p>B. <b>IF</b> alarm is valid, <b>THEN REFER TO</b> 2-AOI-3-1 or 2-OI-3.</p> <p>C. <b>IF</b> 2-LI-3-53, 2-LI-3-60, 2-LI-3-206 and 2-LI-3-253 has failed or is invalid, <b>THEN</b> with SRO permission, <b>BYPASS</b> the affected level instrument. <b>REFER TO</b> 2-OI-3 Section 8.2.</p> <p>Continues to monitor reactor water level and confirms that reactor water level is lowering using multiple indication.</p> <p>Recommends a manual reactor scram</p>
	SRO	<p>Directs a manual reactor scram.</p> <p>Directs that Reactor Feed Pumps be tripped, RFP Discharge valves closed, and Condensate/Condensate Booster Pumps be secured (isolate and stop leak)</p>

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Scenario No. 1 Event No.: 8

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Event Description: FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Initiates a manual reactor scram</p> <p><b>Reactor Scram OATC Hard Card</b></p> <p><b>1.0 IMMEDIATE ACTIONS</b></p> <p>[1] <b>DEPRESS</b> REACTOR SCRAM A and B, 2-HS-99-5A/S3A and 2-HS-99-5A/S3B, on Panel 2-9-5.</p> <p>[2] <b>IF</b> scram is due to a loss of RPS, <b>THEN PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in START &amp; HOT STBY <b>AND PAUSE</b> for approximately 5 seconds (Otherwise N/A)</p>
	ATC	<p>[3] Refuel Mode One Rod Permissive Light check:</p> <p>[3.1] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in REFUEL.</p> <p>[3.2] <b>CHECK</b> illuminated REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46.</p> <p>[3.3] <b>IF</b> REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46, is <b>NOT</b> illuminated, <b>THEN CHECK</b> all control rod positions at Full-In Overtravel, or Full-In. (Otherwise N/A)</p> <p>[4] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in SHUTDOWN.</p> <p>[5] <b>REPORT</b> the following status to the US:</p> <ul style="list-style-type: none"><li>• Reactor Scram</li><li>• Mode Switch is in Shutdown</li><li>• "All rods in" or "rods out"</li><li>• Reactor Water Level and trend (recovering or lowering)</li><li>• Reactor pressure and trend</li><li>• MSIV position (Open or Closed)</li><li>• Power level</li></ul> <p>Performs immediate operator actions IAW hard card and makes scram report</p>

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Enters EOI-1 on RPV Water Lvl below +2" <b>Verify RX scram – CHECKED</b></p> <p><b>RC/Q</b></p> <p><b>Monitor and Control</b> reactor power - <b>CHECKED</b> The reactor is subcritical AND NO boron has been injected <b>THEN</b></p> <p><b>EXIT RC/Q</b> and</p> <p><b>ENTER AOI-100-1, Reactor Scram - CHECKED</b></p> <p>Directs ATC to enter 2-AOI-100-1</p>
		<p><b>RC/L</b> CAUTION: Ambient temp may affect RPV water lvl indication and trend – <b>CHECKED</b></p> <p><b>MONITOR and CONTROL</b> RPV water lvl – <b>CHECKED</b></p> <p><b>VERIFY</b> each as required</p> <ul style="list-style-type: none"><li>• PCIS isolations (Groups 1, 2, and 3) – <b>CHECKED</b></li></ul> <p>It has NOT been determined that the reactor will remain subcritical without boron under all conditions – <b>SUBCRITICAL</b></p> <p>RPV water lvl CANNOT be determined – <b>CAN</b></p> <p>PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b> OR Suppr chmbr press CANNOT be maintained below 55 psig - <b>CAN</b></p>

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior																					
	SRO	<p style="text-align: center;"><b>CAUTION</b></p> <p>#2 Pump NPSH and Vortex Limits  #3 Elevated suppr chmbr press may trip RCIC  #6 HPCI or RCIC suction temp above 140°F – <b>CHECKED</b></p> <p>RESTORE and MAINTAIN RPV water lvl between +2 in and +51 in with ANY of the following</p> <table> <tr> <td>CNDS and FW</td><td>5A</td><td>1210 psig</td></tr> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> <tr> <td>RCIC with CST suction if available</td><td>5C</td><td>1200 psig</td></tr> <tr> <td>HPCI with CST suction if available</td><td>5D</td><td>1200 psig</td></tr> <tr> <td>CNDS</td><td>6A</td><td>480 psig</td></tr> <tr> <td>CS</td><td>6D,6E</td><td>330 psig</td></tr> <tr> <td>LPCI</td><td>6B, 6C</td><td>320 psig</td></tr> </table> <p>Directs BOP to restore and maintain reactor level between +2 in and +51 in using HPCI in accordance with Appendix 5D</p>	CNDS and FW	5A	1210 psig	CRD	5B	1640 psig	RCIC with CST suction if available	5C	1200 psig	HPCI with CST suction if available	5D	1200 psig	CNDS	6A	480 psig	CS	6D,6E	330 psig	LPCI	6B, 6C	320 psig
CNDS and FW	5A	1210 psig																					
CRD	5B	1640 psig																					
RCIC with CST suction if available	5C	1200 psig																					
HPCI with CST suction if available	5D	1200 psig																					
CNDS	6A	480 psig																					
CS	6D,6E	330 psig																					
LPCI	6B, 6C	320 psig																					
	SRO	<p><b>RC/P</b></p> <p>DW press is above 2.4 psig - <b>NO</b></p> <p>Emergency RPV depressurization is anticipated - <b>NO</b>  AND  The reactor will remain subcritical without boron under all conditions</p> <p>Emergency RPV depressurization is or has been required - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Is ANY MSRV cycling - <b>NO</b></p>																					

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p>Steam cooling is required - <b>NO</b></p> <p>Suppr pl temp and lvl CANNOT be maintained in a safe area of Curve 3 at the existing RPV press – <b>CAN</b></p> <p>Suppr pl lvl CANNOT be maintained in the safe area - <b>CAN</b> of Curve 4</p> <p>DW control air becomes unavailable - <b>AVAIL</b></p> <p>Boron inj is required - <b>NO</b> AND The main condenser is available AND There has been no indication of a steam line break</p> <p><b>STABILIZE</b> RPV press below 1073 psig with the main turbine bypass vlvs (APPX 8B)</p> <p>Directs BOP to control reactor pressure 800 psig to 1000 psig in accordance with Appendix 8B</p>
	BOP	<p>Verifies that Main Turbine Bypass valves are controlling reactor pressure 800 psig to 1000 psig.</p> <p>Verifies and reports successful Gr. 2, 3, 6, and 8 PCIS Isolations</p>
	NRC	<p>When ATC operator attempts to isolate the feedwater leak by securing the condensate and feedwater system and closing the RFP discharge valves, he should recognize and report the failure of the RFP 'C' discharge close. This will initiate Event No. 9.</p> <p>When BOP operator attempts to restore and maintain reactor water level with HPCI, he should recognize that HPCI discharge pressure is less than reactor pressure and that HPCI is pumping into the leak. This will initiate Event No. 10.</p>



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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior						
	ATC	<p><b>2-AOI-100-1</b></p> <p><b>2.0 SUBSEQUENT ACTIONS:</b></p> <p>[2] <b>DRIVE</b> in all IRMs and SRMs from Panel 2-9-5 as time and conditions permit.</p> <p>[3] <b>VERIFY</b> SCRAM DISCH VOL VENT &amp; DR VLVS closed by green indicating lights at SDV Display on Panel 2-9-5.</p> <p>[4] <b>MONITOR</b> and <b>CONTROL</b> Reactor Water Level between +2" and +51", or as directed by US, using RFP/RFTP.</p> <p>[5] <b>RETURN</b> to body of procedure at step 4.2[5] <b>AND CONTINUE</b> with actions as required.</p> <p>Drives in all IRMs and SRMS. Verifies SCRAM DISCH VOL VENT &amp; DR VLVS closed.</p> <p>Reports Reactor Water level continuing to lower</p>						
	SRO	<p><b>RC/L-4</b></p> <p><b>RESTORE</b> and <b>MAINTAIN</b> RPV water lvl between +2 in. and +51 in. with ANY of the following:</p> <table> <tr> <td>INJ SOURCE</td><td>APPX</td><td>INJ PRESS</td></tr> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> </table> <p>Directs ATC to use Appendix 5B to maintain reactor water level</p>	INJ SOURCE	APPX	INJ PRESS	CRD	5B	1640 psig
INJ SOURCE	APPX	INJ PRESS						
CRD	5B	1640 psig						

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	ATC	<b>2-EOI Appendix-5B</b> <b>1.0 INSTRUCTIONS</b>  [2] <b>IF BOTH</b> of the following exists, • CRD is <b>NOT</b> required for rod insertion, <b>AND</b> • Maximum injection flow is required, <b>THEN</b> <b>LINE UP</b> ALL available CRD pumps to the RPV as follows:
	ATC	[2.1] <b>IF</b> CRD Pump 2A is available, <b>THEN VERIFY RUNNING</b> CRD Pump 2A.  [2.2] <b>IF</b> CRD Pump 1B is available, <b>THEN PERFORM</b> the following:  A. <b>NOTIFY</b> Unit 1 Operator to verify closed 1-FCV-85-8, CRD PUMP B DISCH TO U2, (Panel 1-9-5).  B. <b>START</b> CRD Pump 1B.  C. <b>OPEN</b> 2-FCV-85-8, CRD PUMP 1B DISCH TO U2.  <b>CAUTION</b> Failure to maintain CRD system pressure above 1450 psig on 2-PI-85-13A could result in pump runout  [2.3] <b>OPEN</b> the following valves to increase CRD flow to the RPV: • 2-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV • 2-PCV-85-27, CRD CLG WATER PRESS CONTROL VLV • 2-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p>[2.4] <b>ADJUST</b> 2-FIC-85-11, CRD SYSTEM FLOW CONTROL to control injection WHILE maintaining 2-PI-85-13A, CRD ACCUM CHG WTR HDR PRESS, above 1450 psig, if possible</p> <p>Maximizes CRD flow to the RPV IAW Appendix 5B Reports Reactor Water Level continuing to slowly lower.</p>
	BOP	<p><b>2-AOI-100-1</b></p> <p><b>4.2 Subsequent Actions (continued)</b> <b>VERIFY TRIPPED</b> the Main Turbine as follows:</p> <p>[9.1] <b>DEPRESS</b> the TRIP pushbutton, 2-HS-47-67D on Panel 2-9-7. [NER/C] [INPO SOER 81-015]</p> <p>[9.2] <b>PERFORM</b> the following as required to <b>VERIFY OPEN</b> GENERATOR PCB 224:</p> <p>[9.2.1] <b>CHECK</b> green light illuminated and red light not illuminated above handswitch GENERATOR PCB 224 CNTR W/REV BYPASS, 2-HS-242-224A.</p>
	BOP	<p>[9.3] <b>IMMEDIATELY PLACE</b> VOLTAGE REGULATOR START/STOP SEL, 2-HS-57-24, to STOP and release.</p> <p>[9.4] <b>CHECK</b> the following at 2-HS-57-24:</p> <ul style="list-style-type: none"> <li>• GREEN light illuminated</li> <li>• RED light extinguished</li> </ul> <p>[10] <b>MONITOR</b> Main Turbine Vibration on TURBINE GENERATOR VIBRATION, 2-XR-47-15, during coast down.</p> <p>[11] <b>ADJUST</b> TURBINE OIL TEMPERATURE CONT, 2-TIC-24-75, setpoint to 85°F.</p>

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p>[12] <b>WHEN</b> turbine speed is less than 900 RPM, <b>THEN START</b> the following:</p> <ul style="list-style-type: none"><li>• TURBINE BEARING LIFT OIL PUMPS</li><li>• MOTOR SUCTION PUMP</li><li>• AC TURNING GEAR OIL PUMP</li></ul> <p>Performs subsequent actions IAW 2-AOI-100-1</p>
	ATC/BOP	Reports reactor water level continuing to lower
	SRO	<p><b>RC/L</b></p> <p><b>IF</b></p> <p>RPV water lvl can be restored and maintained above -162"</p> <p><b>AND</b></p> <p>The ADS timer has initiated</p> <p><b>THEN</b></p> <p><b>INHIBIT ADS - CHECKED</b></p> <p>Directs BOP to inhibit ADS</p>
	BOP	Inhibits ADS

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p><b>Critical Task - To prevent an uncontrolled RPV depressurization when Reactor Water Level cannot be restored and maintained above -162 inches, inhibit ADS.</b></p> <ol style="list-style-type: none"><li>1. Safety Significance Maintain adequate core cooling Prevent degradation of fission product barrier</li><li>2. Cues Procedural compliance</li><li>3. Measured by ADS logic inhibited prior to automatic initiation</li><li>4. Feedback RPV Pressure and Water level trend ADS LOGIC BUS A/B INHIBITED annunciators</li></ol> <p><b>The Critical Task is <u>not met</u> if:</b> <b>The Operator fails to turn both ADS A/B Inhibit switches to the inhibit position prior to an uncontrolled blowdown.</b></p>

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior						
	SRO	<p style="text-align: center;"><b>CAUTION</b></p> <p>#3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F – <b>CHECKED</b></p> <p><b>IF</b> RPV water lvl CANNOT be restored and maintained between +2" and +51 in.</p> <p><b>THEN RESTORE</b> and <b>MAINTAIN</b> RPV water lvl above -162 in. <b>AUGMENT</b> RPV water lvl control as necessary with ANY of the following:</p> <table> <tr> <td>SLC (test tank)</td><td>7B</td><td>1450 psig</td></tr> <tr> <td>SLC (boron tank)</td><td>7B</td><td>1450 psig</td></tr> </table> <p>Directs ATC to initiate SLC IAW App 7B</p>	SLC (test tank)	7B	1450 psig	SLC (boron tank)	7B	1450 psig
SLC (test tank)	7B	1450 psig						
SLC (boron tank)	7B	1450 psig						
	ATC	<p><b>2-EOI Appendix-7B</b></p> <p><b>1.0 INSTRUCTIONS</b></p> <p>[1] <b>IF</b> EOI Appendix 3A is required to be performed, <b>THEN EXIT</b> this procedure.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>SLC Test Tank is preferred source because unborated water may be supplied to the RPV through this injection path.</p> <p>[2] <b>IF</b> RPV injection is needed immediately <b>ONLY</b> to prevent or mitigate fuel damage, <b>THEN</b></p> <p><b>CONTINUE</b> at Step 1.0[10] to inject SLC Boron Tank to RPV.</p>						

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	ATC	<p>[10] <b>UNLOCK</b> and <b>PLACE</b> 2-HS-63-6A, SLC PUMP 2A/2B, control switch in START-A or START-B (Panel 9-5).</p> <p>[11] <b>CHECK</b> SLC injection by observing the following:</p> <ul style="list-style-type: none"> <li>• Selected pump starts, as indicated by red light illuminated above pump control switch.</li> <li>• Squib valves fire, as indicated by SQUIB VALVE A and B CONTINUITY blue lights extinguished.</li> <li>• SLC SQUIB VALVE CONTINUITY LOST Annunciator in alarm (2-XA-55-5B, Window 20).</li> <li>• 2-PI-63-7A, SLC PUMP DISCH PRESS, indicates above RPV pressure.</li> <li>• System flow, as indicated by 2-IL-63-11, SLC FLOW, red light illuminated,</li> <li>• SLC INJECTION FLOW TO REACTOR Annunciator in alarm (2-XA-55-5B, Window 14).</li> </ul> <p>Injects SLC to the RPV IAW App 7B. Reports SLC injecting to the RPV</p>
	ATC/BOP	Reports RPV water level continuing to slowly lower
	SRO	<p>Briefs crew on current plant status. Includes RPV water level lowering below -122" and receiving Gr. 1 isolation, transitioning RPV pressure control to 9-3, implementing C1, Alternate Level Control.</p> <p>Can RPV water lvl be restored and maintained above -162 in.-<b>NO</b></p> <p>Exits RC/L and enters C1, Alternate Level Control</p> <p><b>CAUTION</b></p> <p>#1 Ambient temp may affect RPV water lvl indication and trend</p>

Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Emergency RPV depressurization is required – <b>NO</b> It has NOT been determined that the reactor will remain subcritical without boron under all conditions – <b>HAS</b></p> <p>RPV water lvl CANNOT be determined – <b>CAN</b> PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b> OR Suppr chmbr press CANNOT be maintained below 55 psig</p> <p>Verifies ADS inhibited</p> <p>CAUTION #2 Pump NPSH and Vortex Limits #3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F</p>
	Crew	Reports RPV water level approaching -122"
	SRO	<p>Directs closing MSIVs Directs RPV pressure control 800 psig – 1000 psig using App 11A –SRVs</p>
	BOP	Closes MSIVs



Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior		
	BOP	<b>2-EOI Appendix-11A</b> <b>1.0 INSTRUCTIONS</b> LOCATION: Unit 2 Control Room ATTACHMENTS None  [1] <b>IF</b> Drywell Control Air is NOT available, <b>THEN EXECUTE</b> EOI Appendix 8G, CROSSTIE CAD TO DRYWELL CONTROL AIR, <b>CONCURRENTLY</b> with this procedure.  [2] <b>IF</b> Suppression Pool level is at or below 5.5 ft, <b>THEN CLOSE</b> MSRVs and <b>CONTROL</b> RPV pressure using other options.  [3] <b>OPEN</b> MSRVs using the following sequence to control RPV pressure as directed by SRO:		
	BOP	1	2-PCV-1-179	MN STM LINE A RELIEF VALVE
		2	2-PCV-1-180	MN STM LINE D RELIEF VALVE
		3	2-PCV-1-4	MN STM LINE A RELIEF VALVE
		4	2-PCV-1-31	MN STM LINE C RELIEF VALVE
		5	2-PCV-1-23	MN STM LINE B RELIEF VALVE
		6	2-PCV-1-42	MN STM LINE D RELIEF VALVE
		7	2-PCV-1-30	MN STM LINE C RELIEF VALVE
		8	2-PCV-1-19	MN STM LINE B RELIEF VALVE
		9	2-PCV-1-5	MN STM LINE A RELIEF VALVE
		10	2-PCV-1-41	MN STM LINE D RELIEF VALVE
		11	2-PCV-1-22	MN STM LINE B RELIEF VALVE
		12	2-PCV-1-18	MN STM LINE B RELIEF VALVE
		13	2-PCV-1-34	MN STM LINE C RELIEF VALVE
		Opens SRVs as required to maintain RPV pressure 800 psig to 1000 psig		

Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior												
	SRO	<p><b>C-1</b>  <b>RESTORE</b> and <b>MAINTAIN</b> RPV lvl above -162" using ANY of the following:</p> <table> <tr> <td>LPCI system I (pumps A or C)</td><td>6B</td><td>320 psig</td></tr> <tr> <td>LPCI system II (pumps B or D)</td><td>6C</td><td>320 psig</td></tr> <tr> <td>CS system I (pumps A or C)</td><td>6D</td><td>330 psig</td></tr> <tr> <td>CS system II (pumps B or D)</td><td>6E</td><td>330 psig</td></tr> </table> <p>Directs BOP to align CS and LPCI for injection to the RPV IAW Appendices 6B, 6C, 6D and 6E</p>	LPCI system I (pumps A or C)	6B	320 psig	LPCI system II (pumps B or D)	6C	320 psig	CS system I (pumps A or C)	6D	330 psig	CS system II (pumps B or D)	6E	330 psig
LPCI system I (pumps A or C)	6B	320 psig												
LPCI system II (pumps B or D)	6C	320 psig												
CS system I (pumps A or C)	6D	330 psig												
CS system II (pumps B or D)	6E	330 psig												
	SRO	<p>Verifies that LPCI and CS are aligned with pumps running.</p> <p>Reports LPCI and CS aligned</p> <p>Reports all four diesels have started</p> <p>Calls for AUO to monitor diesel generators</p> <p><b>C-1</b></p> <p>Can 2 or more <b>CNDS</b>, <b>LPCI</b> or <b>CS</b> inj subsystems be lined up – <b>YES</b></p> <p>WHEN RPV water lvl drops to -162 in.</p> <p>Direct crew to report when RPV water level lowers to -162 in.</p>												
	DRIVER	As AUO, acknowledge monitoring diesel generators for proper operation.												

Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p>Is ANY CNDS, LPCI or CS inj subsystem lined up for inj with at least one pump running – <b>YES</b></p> <p>Is ANY RPV inj source lined up with at least one pump running – <b>YES</b></p> <p><b>BEFORE</b> RPV water lvl drops to -180 in. <b>CONTINUE – CONTINUES</b></p>
	SRO	<p><b>EMERGENCY RPV DEPRESSURIZATION IS REQUIRED</b></p> <p>Updates crew that emergency depressurization is required</p> <p><b>EOI-1, RC/L</b> <b>IF</b> Emergency RPV depressurization is or has been required <b>THEN EXIT</b> RC/P and <b>ENTER C2</b>, Emergency RPV Depressurization</p> <p>Enters C2, Emergency RPV Depressurization</p> <p>SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b> RPV water lvl <b>CANNOT</b> be determined - <b>CAN</b> Containment water lvl <b>CANNOT</b> be maintained below 44 ft- <b>CAN</b> DW control air becomes unavailable – <b>AVAIL</b></p>

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Will the reactor remain subcritical without boron under all conditions - <b>YES</b></p> <p>Is DW press above 2.4 psig - <b>NO</b></p> <p>Is suppr pl lvl above 5.5 ft – <b>YES</b></p> <p><b>OPEN</b> all ADS vlvs (ok to exceed 100°F/hr cooldown rate)</p> <p>Directs BOP to open all ADS valves</p>
	BOP	<p>Opens all ADS valves, verifies open using alternate indications and reports 6 ADS valves open</p>
		<p><b>With a(n) injection system(s) operating and lined up for injection, before RPV water level reaches -180", initiate Emergency Depressurization.</b></p> <ol style="list-style-type: none"> <li>1. Safety Significance: <ul style="list-style-type: none"> <li>Maintain adequate core cooling</li> <li>Prevent degradation of fission product barrier</li> </ul> </li> <li>2. Cues: <ul style="list-style-type: none"> <li>Procedural compliance</li> <li>Reactor Water level trend</li> </ul> </li> <li>3. Measured by: <ul style="list-style-type: none"> <li>Observation: US direct Emergency Depressurization before RPV level lowers to -180 inches.</li> </ul> </li> <li>4. Feedback: <ul style="list-style-type: none"> <li>Reactor Pressure trend</li> <li>SRV status indications</li> </ul> </li> </ol> <p><b>The Critical Task is <u>not met</u> if:</b>  <b>The Crew fails to Emergency Depressurize the RPV after being below -180 inches for greater than ten minutes.</b></p>

Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	C-1 INJECT into the RPV with ANY available sources Directs injection of water to the RPV using all available sources
	SRO	C-2 Can 6 ADS vlvs be opened - <b>YES</b>  IF Less than 4 MSRVS are open - <b>NO</b> AND RPV press is 70 psi or more above suppr chmbr press  The reactor is NOT subcritical – <b>SUBCRITICAL</b>  WHEN the reactor will remain subcritical without boron under all conditions – <b>SUBCRITICAL</b> WHEN shutdown cooling RPV press interlock clears – <b>STOP</b>
	ATC/BOP	When RPV pressure lowers below 450 psig, verifies and reports that LPCI and CS injection valves have opened.  Report water injection into the RPV and reactor water level rising
	SRO	C-1 IF RPV water lvl can be restored and maintained above -162 in. <b>THEN</b> <b>EXIT</b> this procedure and <b>ENTER</b> EOI-1, RPV Control, at Step RC/L-1  Exits C-1, re-enters EOI-1 RC/L  Directs coordinating injection of LPCI and CS to RESTORE and MAINTAIN RPV water lvl between +2 in. and +51 in. using LPCI and CS, Appendices 6B, 6C, 6D, and 6E

Op Test No.: 15-01Scenario No. 1 Event No.: 8

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Event Description: FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p><b>With RPV pressure below the Shutoff Head of the available Low Pressure system(s), operate available Low Pressure system(s) to restore RPV water level above TAF.</b></p> <ol style="list-style-type: none"> <li>1. Safety Significance: Maintain adequate core cooling Prevent degradation of fission product barrier.</li> <li>2. Cues: Procedural compliance Pressure below low pressure ECCS system(s) shutoff head</li> <li>3. Measured by: Operator manually starts <u>or</u> initiates at least one low pressure ECCS system and injects into the RPV to restore water level above TAF</li> <li>4. Feedback: Reactor pressure trend Reactor water level trend</li> </ol>
	BOP	<p>Reports SUPPR POOL AVERAGE TEMP HIGH (2-XA-55-3E, Window 12) in alarm. Temperature greater than 95°F</p> <p>Coordinates with ATC to restore RPV water level to +2 in to +51 in. IAW Appendices 6B, 6C, 6D, and 6E.</p>
	SRO	<p><b>2-ARP-9-3E</b></p> <p>A. IF alarm is valid, <b>THEN ENTER</b> 2-EOI-2 Flowchart.</p>
	NRC	If desired, scenario can be ended at this point
	DRIVER	Place simulator in FREEZE at direction of NRC Chief Examiner

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Event Description: FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>EOI-2</b>  SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b>  SAMG entry is required – <b>NO</b></p> <p style="text-align: center;">CAUTION</p> <p>#4 PC press vs pump NPSH - <b>CHECKED</b></p> <p>DW sprays have been initiated - <b>NO</b>  Suppr chmbr sprays have been initiated – <b>NO</b>  PC water level CANNOT be restored and maintained below 105 ft  OR  Suppr chmbr press CANNOT be restored and maintained below 55 psig - <b>CAN</b></p> <p style="text-align: center;">CAUTION</p> <p>#2 Pump NPSH and Vortex Limits – <b>CHECKED</b></p> <p>MONITOR and CONTROL suppr pl temp below 95°F using available suppr pl cooling (Appx 17A) – <b>CHECKED</b></p> <p>WHEN suppr pl temp CANNOT be maintained below 95°F  OPERATE all available suppr pl cooling using only RHR pumps  NOT required to assure adequate core cooling by continuous inj (APPX 17A)</p> <p>Directs BOP to use all available RHR for suppression pool cooling using App 17A</p>
	NRC	If still restoring RPV water level, may only use one loop of RHR for pool cooling. If level has been restored to normal, both loops of RHR can be used for pool cooling.
	BOP	<p><b>2-EOI-Appendix-17A</b>  NOTE: Placing a BYPASS SEL switch in BYPASS in step 1 below prevents automatic opening of the affected RHR loop's outboard injection valve. This makes LPCI mode of that RHR loop inoperable.</p> <p>1. IF.....Adequate core cooling is assured,</p> <p style="text-align: center;"><b>OR</b></p>

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Event Description: FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		<p>Directed to cool the Suppression Pool irrespective of adequate core cooling,  THEN.....BYPASS LPCI injection valve open interlock AS NECESSARY:</p> <ul style="list-style-type: none"> <li>• PLACE 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in BYPASS.</li> <li>• PLACE 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in BYPASS.</li> </ul> <p>2. PLACE RHR SYSTEM I(II) in Suppression Pool Cooling as follows:</p> <ol style="list-style-type: none"> <li>a. VERIFY at least one RHRSW pump supplying each EECW header.</li> <li>b. VERIFY RHRSW pump supplying desired RHR Heat Exchanger(s).</li> <li>c. THROTTLE the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: <ul style="list-style-type: none"> <li>• 2-FCV-23-34, RHR HX 2A RHRSW OUTLET VLV</li> <li>• 2-FCV-23-46, RHR HX 2B RHRSW OUTLET VLV</li> <li>• 2-FCV-23-40, RHR HX 2C RHRSW OUTLET VLV</li> <li>• 2-FCV-23-52, RHR HX 2D RHRSW OUTLET VLV.</li> </ul> </li> <li>d. IF ..... Directed by SRO,  THEN.....PLACE 2-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD in MANUAL OVERRIDE</li> <li>e. IF .....LPCI Initiation signal exists,  THEN.....<b>MOMENTARILY PLACE</b> 2-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT in SELECT.</li> <li>f. IF ..... 2-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN,  THEN..... <b>VERIFY CLOSED</b> 2-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.</li> <li>g. <b>OPEN</b> 2-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.</li> <li>h. <b>VERIFY</b> desired RHR pump(s) for Suppression Pool Cooling are operating.</li> </ol> <p style="text-align: center;"><b>CAUTION</b></p> <p>RHR system flows below 7000 gpm or above 10000 gpm for one-pump operation may result in excessive vibration and equipment damage.</p>



Op Test No.: 15-01Scenario No. 1 Event No.: 8

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**Event Description:** FW A line break-SCRAM

Time	Position	Applicant's Actions or Behavior
		i. THROTTLE OPEN 2-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 2-FI-74-50(64), RHR SYS I(II) FLOW: <ul style="list-style-type: none"> <li>• Between 7000 and 10000 gpm for one-pump operation.</li> </ul> OR <ul style="list-style-type: none"> <li>• At or below 13000 gpm for two-pump operation.</li> </ul> j. VERIFY CLOSED 2-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE. k. MONITOR RHR Pump NPSH using Attachment 1. l. NOTIFY Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.  Places available RHR in suppression pool cooling IAW App 17A Notifies Chemistry that RHRSW is aligned to the in-service RHR Heat Exchangers.
	Driver	As chemistry, acknowledge call that RHRSW is aligned to the in-service heat exchangers
	NRC	If desired, scenario can be ended at this point
	DRIVER	Place simulator in FREEZE at direction of NRC Chief Examiner

Op Test No.: 15-01Scenario No. 1 Event No.: 9

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**Event Description:** 2C RFP discharge valve fails to close

Time	Position	Applicant's Actions or Behavior
	ATC	Trips Reactor Feed Pumps, Condensate Booster Pumps, and Condensate Pumps. Closes RFP Discharge valves.  Recognizes and reports the failure of RFP 'C' Discharge valve to close. Recommends closing RFP 'C' Suction valve to complete the isolation.
	SRO	Directs closing the RFP 'C' Suction valve.
	ATC	Closes RFP 'C' Suction valve.
	NRC	End of Event #9

Op Test No.: 15-01Scenario No. 1 Event No.: 10

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**Event Description:** HPCI is manually secured due to pumping out the feedwater break

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes that HPCI Discharge Pressure is lower than reactor pressure and that HPCI is pumping into the Steam Tunnel.  Reports to US and recommends tripping HPCI
	SRO	Directs trip and lockout of HPCI (to isolate additional leakage source).
	BOP	Trips HPCI by depressing and holding the HPCI TURBINE TRIP pushbutton, 2-HS-73-18A, until zero rpm is indicated on HPCI TURBINE SPEED, 2-SI-73-51, THEN taking HPCI AUXILIARY OIL PUMP switch, 2-HS-73.47A, to PTL.  Reports HPCI secured
	NRC	End of Event #10

## SIMULATOR SETUP

IC	28
Exam IC	92

Batch File or Pref File	1501NRC1
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Malfunctions	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
NM07L4049C	LPRM 40-49C	2	0	N/A	N/A	N/A	0
RD01A	CRD Pump 1A	5	0	N/A	N/A	N/A	N/A
RC09	RCIC Steam Leak	6	0	15	10:00	N/A	N/A
RC10	Failure of RCIC to Isolate	Active	0	N/A	N/A	N/A	N/A
FW19	FW Line A Break	7	0	25	5:00	N/A	N/A

Remotes	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
NM01L2409C	LPRM 24-09C Bypassed	Active	N/A	N/A	N/A	N/A	BYP_HV_OFF
NM01L2441C	LPRM 24-41C Bypassed	Active	N/A	N/A	N/A	N/A	BYP_HV_OFF
NM01L4833C	LPRM 48-33C Bypassed	Active	N/A	N/A	N/A	N/A	BYP_HV_OFF
NM01L5625B	LPRM 56-25B Bypassed	Active	N/A	N/A	N/A	N/A	BYP_HV_OFF
NM01L5641C	LPRM 56-41C Bypassed	Active	N/A	N/A	N/A	N/A	BYP_HV_OFF

Overrides	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
ZDIHS35A[2]	3C Feedpump Disch Valve control switch	Active	N/A	N/A	N/A	N/A	Norm

Batch / Pref File(s): 1501NRC1

imf NM07L4049C (2) 0  
imf RD01A (5)  
imf RC09 (6) 15 10:00  
imf RC10  
imf FW19 (7) 25 5:00

irf NM01L2409C BYP\_HV\_OFF  
irf NM01L2441C BYP\_HV\_OFF  
irf NM01L4833C BYP\_HV\_OFF  
irf NM01L5625B BYP\_HV\_OFF  
irf NM01L5641C BYP\_HV\_OFF

ior ZDIHS35A norm

Facility: BFNScenario Number: NRC - 2Op-Test Number: 1501Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: SRO: \_\_\_\_\_  
ATC: \_\_\_\_\_  
BOP: \_\_\_\_\_

**Initial Conditions:** Reactor Power is 100%. The Steam Tunnel booster fan is tagged out for lubrication PMs. Suppression Pool Cooling is in service due to a HPCI flow rate test on the previous shift.

**Turnover:** Secure Suppression Pool Cooling. MIG signed on and will be performing 2-SR-3.3.6.1.5(4A/A) Core and Containment Cooling Systems RCIC Turbine Steam Line High Flow Instrument Channel A Calibration.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	N-BOP N-SRO	Secure from Suppression Pool Cooling using 2-OI-74
2	N/A	I-SRO TS-SRO	MIG reports that 2-RLY-071-13A-K12 did not energize when 2-PDT-71-1A was pressurized and that they have stopped at step 7.4[7]B.
3	Override 2B SPE Auto	C-BOP C-SRO	The 2A Steam Packing Exhauster will trip and the 2B Steam Packing Exhauster will not auto start.
4	SW10A	C-ATC C-SRO	The 2A Fuel Pool Cooling pump will Trip.
5	TH12B	C-ATC C-SRO	Recirc Pump 2B vibration high
6	TH10B	R-ATC C-BOP TS-SRO	Recirc Pump 2B seal failure/2-AOI-68-1A
7	TH22 RH01A&C RH06B	M-All	LOCA/Scram with inability to spray the Drywell/C4
8	TC02	C-BOP C-SRO	SRO directs cool down or rapid depressurization of the RPV using Turbine bypass valves however they fail closed and ED will be required.
9	CS02A&B	C-BOP	Core Spray Loop II injection valve will fail to open on initiation signal but can be manually opened.

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

Rec'd  
12/1/14

**Events**

1. The BOP operator will secure from Suppression Pool Cooling using 2-OI-74. When Suppression Pool Cooling is secured the scenario may continue.
2. The Instrument Mechanic Foreman will call the SRO and report that during performance of 2-SR-3.3.6.1.5(4A/A), Core and Containment Cooling Systems RCIC Turbine Steam Line High Flow Instrument Channel A Calibration, 2-RLY-071-13A-K12 did not energize when 2-PDT-71-1A was pressurized and that they have stopped at step 7.4[7]B. The SRO will evaluate Tech Spec 3.3.6.1 and table 3.3.6.1-1 to determine that function 4a is the affected function and that the Tech Spec requires placing the channel in trip within 24 hours. Once the Tech Spec call is completed the scenario may continue.
3. The running steam packing exhauster will trip and the standby exhauster will fail to auto start. The BOP operator will place the standby steam packing exhauster in service IAW 2-OI-47C section 6.3 and adjusts its operation to obtain 10-12 inches of H<sub>2</sub>O vacuum. At that point the scenario may continue.
4. The 2A Fuel Pool Cooling pump will trip. The SRO will direct the ATC to enter 2-AOI-78-1 and the 2B Fuel Pool Cooling pump will be placed in service IAW 2-AOI-78-1 step 4.2[3]. When the 2B Fuel Pool Cooling pump is in service and the lead examiner is ready the scenario may continue.
5. 2-XA-55-4B window 20 RECIRC Pump Motor B Vibration High alarms. The BOP operator will dispatch an AUO to 2-LPNL-925-0712 and he/she will report that 2-XI-68-71D and E are in alarm reading 12.0 mils and rising slowly. The SRO will direct lowering 2B Recirc speed to attempt to clear the alarm. The ATC operator will lower 2B Recirc pump speed. The AUO will report that 2-XI-68-71D and E lowered to ~10 mils and will reset the alarm locally. When the lead examiner is ready the scenario may continue.
6. 2-XA-55-4B window 20, RECIRC Pump Motor B Vibration High alarms again and 2-XA-55-4B, window 25 Recirc Pump B no. 1 Seal Leakage ABN, alarms. The number 2 seal pressure will rise to approximately Reactor Pressure. The SRO will direct tripping the 2B Recirc Pump and entering 2-AOI-68-1A. The ATC operator will lower Reactor Power IAW the RCP and 2-AOI-68-1A. The BOP operator will carry out the subsequent actions of the AOI. The SRO will address Tech Spec 3.4.1. When conditions have stabilized and the lead examiner is ready the scenario may continue.

7. A leak in the Drywell will develop causing Drywell Temperature and Pressure to rise. The SRO will set a trigger value for a Reactor Scram and when that value is reached a manual Scram will be inserted or the Reactor will Scram at 2.45 psig Drywell Pressure. All control rods will be inserted on the scram. The SRO will direct entry into 2-AOI-100-1. The SRO will direct Suppression Chamber spray per EOI-2 Appendix 17C. The BOP operator will attempt to spray the Suppression Chamber however the First loop attempted the RHR pumps will trip. The BOP operator will attempt to spray the Suppression Chamber with the Second loop of RHR however the select logic will fail. If the SRO directs spraying the Suppression Chamber with Standby coolant or Fire Protection using RHR loop 1, the breaker for 2-FCV-074-0100 (480V RMOV BD 1B compartment 19A) or RHR loop II the breaker for 2-FCV-074-0101 (480V RMOV BD 3B compartment 19E) will not close.

The SRO/BOP operator will determine that neither the Suppression Chamber nor the Drywell can be sprayed. The SRO may attempt to cool down or anticipate that an ED will be required and attempt to rapidly depressurize the Reactor using the bypass valves however the bypass valves will fail closed. An ED will be required based on Drywell Temperature or the PSP curve. As the Reactor depressurizes the action required area of curve 8 RPV Saturation Temp will be entered and Reactor Water Level indication will be lost. The SRO will direct entry into C-4 and the crew will inject using available systems until the Main Steam Lines are flooded.

8. When the SRO directs a cool down or rapid depression of the RPV using the main turbine bypass valves, the operator will determine and report that the bypass valves have failed closed. This will lead to an ED being required.
9. With an accident signal present the Core Spray loop II injection valve will fail to automatically open, the BOP operator will manually open the injection valve.

The Scenario ends when the crew has performed an emergency depressurization and flooded the RPV to the Main Steam Lines.



**Critical Tasks 2**

1. **When Suppression Chamber pressure cannot be maintained within the safe area of Curve 6 (PSP) or Drywell temperature cannot be restored and maintained below 280°F the SRO determines that Emergency Depression is required and is initiated as directed by the SRO.**
  1. Safety Significance  
Precludes failure of Primary Containment
  2. Cues  
Procedural compliance  
High Suppression Chamber or Drywell pressure
  3. Measured by  
Observation-SRO updates or briefs the crew that ED is required based on exceeding PSP curve AND the operator opens 6 ADS/MSRVs
  4. Feedback  
MSRV open indications  
RPV Pressure lowering
  
2. **With Reactor Water Level unknown, inject into the RPV with available sources until there is indication that the Main Steam Lines are flooded (C-4 Note 7) and maintain them flooded.**
  1. Safety Significance  
Prevent fuel damage by establishing adequate core cooling
  2. Cues  
Procedural compliance  
Loss of all RPV level indications
  3. Measured by  
Observation-Indications that the Main Steam Lines are flooded are listed in C-4 Note 7
  4. Feedback  
MSRV tail pipe temperature  
MSRV acoustic monitor  
RPV Pressure trend

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**Event Description: Secure from Suppression Pool Cooling using 2-OI-74**

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to secure Suppression Pool Cooling in accordance with 2-OI-74
	BOP	<p><b>2-OI-74</b></p> <p><b>8.6 Shutdown of Loop I(II) Suppression Pool Cooling</b></p> <p><b>NOTE</b></p> <p>1) All operations are performed at Panel 2-9-3 unless otherwise noted.</p> <p>2) RHR flow should be monitored while in operation with multiple flow paths (e.g., LPCI and Suppression Pool Cooling together, etc.). During any evolution, total system flow as indicated on RHR SYSTEM I(II) FLOW, 2-FI-74-50(64), should remain between 7,000 to 10,000 gpm for 1 pump operation or between 10,000 and 20,000 gpm for 2-pump operation.</p> <p>[1] <b>VERIFY</b> Suppression Pool Cooling in operation. <b>REFER TO</b> Section 8.5.</p> <p>[2] <b>REVIEW</b> the precautions and limitations in Section 3.0.</p> <p>[3] <b>NOTIFY</b> Radiation Protection of Suppression Pool Cooling loop removed from service. <b>RECORD</b> name and time of Radiation Protection representative notified in NOMS narrative log.</p> <p>Verifies Suppression Pooling is in service, reviews P&amp;L's in Section 3, and notifies RP that SPC is being removed from service</p>
	DRIVER	As RP, acknowledge that SPC is being removed from service

Op Test No.: 15-01Scenario No. 2 Event No.: 1

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**Event Description: Secure from Suppression Pool Cooling using 2-OI-74**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>CAUTIONS</b></p> <ol style="list-style-type: none"><li>1) To prevent draining an RHR Loop, at least one of the RHR System test valves must be closed before stopping RHR Pumps in the associated loop.</li><li>2) To prevent excessive vibration, RHR pumps should not be allowed to operate for more than 3 minutes at minimum flow.</li><li>3) When closing throttle valve RHR SYS I(II) SUPPR POOL CLG/TEST VLV, 2-FCV-74-59 and 2-FCV-74-73 from the control room, the handswitch should be held in the close position for approximately 6 seconds after the red light extinguishes. Failure to completely close these valves could provide a leak path to the suppression pool from the RHR discharge piping.</li></ol>
		<p>[4] <b>IF</b> both RHR Pumps in Loop I(II) are in operation <b>AND</b> one pump is to be removed from service due to reduced heat load, <b>THEN</b>:</p> <p>[4.1] <b>THROTTLE</b> RHR SYS I(II) SUPPR POOL CLG/TEST VLV, 2-FCV-74-59(73), to obtain a flow of between 7,000 to 10,000 gpm and Blue light illuminated as indicated on RHR SYS I(II) FLOW, 2-FI-74-50(64).</p> <p>[4.2] <b>STOP</b> RHR PUMP 2A(2B) or 2C(2D) using 2-HS-74-5A(28A) or 16A(39A).</p> <p>[4.3] <b>CLOSE</b> associated RHR HX 2A(2B) or 2C(2D) RHRSW OUTLET VALVE, 2-FCV-23-34(46) or 40(52).</p> <p>[4.4] <b>IF</b> RHRSW for the Heat Exchanger removed from service is not required to support other unit operations, <b>THEN</b> <b>STOP</b> RHRSW pump for the Heat Exchanger removed from service.</p>

Op Test No.: 15-01Scenario No. 2 Event No.: 1

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**Event Description: Secure from Suppression Pool Cooling using 2-OI-74**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[5] <b>CLOSE</b> RHR SYS I(II) SUPPR POOL CLG/TEST VLV, 2-FCV-74-59(73).</p> <p>[6] <b>WHEN</b> RHR SYS I(II) SUPPR POOL CLG/TEST VLV, 2-FCV-74-59(73) is CLOSED, <b>THEN</b>  <b>STOP</b> RHR PUMPS 2A(2B) or 2C(2D) using 2-HS-74-5A(28A) and/or 16A(39A).</p> <p>[7] <b>CLOSE</b> RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV, 2-FCV-74-57(71).</p> <p>[8] <b>CLOSE</b> RHR HX(s) 2A(2B) and 2C(2D) RHRSW OUTLET VLV(s), 2-FCV-23-34(46) and 40(52).</p> <p>[9] <b>IF</b> RHRSW for RHR Heat Exchanger(s) A(B) and C(D) is not required to support other unit operations, <b>THEN</b>  <b>STOP</b> RHRSW Pump(s) for the Heat Exchanger(s) removed from service.</p> <p>[10] <b>CHECK</b> RHR System discharge header pressure is greater than TRM 3.5.4 limit as indicated on 2-PI-74-51(65), RHR SYS I(II) DISCH PRESS.</p> <p>[11] <b>IF</b> the Drywell DP Compressor was removed from service in Section 8.5, <b>THEN</b>  <b>REFER TO</b> 2-OI-64 to return to service</p>
	BOP	<p>[12] <b>WHEN</b> 2-TI-74-136A and B, A/C and B/D RHR PUMP ROOM TEMP indicators at Panel 2-9-3 indicate less than 95°F, <b>THEN</b>  <b>RETURN</b> EECW to its normal operating configuration, if desired. REFER TO 0-OI-67.</p> <p><b>NOTE</b>  RHR Loop I(II) is now in a Standby Readiness Condition</p> <p>Secures Suppression Pool Cooling IAW 2-OI-74  Reports that Suppression Pooling is shutdown</p>
	NRC	End of Event #1

Op Test No.: 15-01Scenario No. 2 Event No.: 2

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**Event Description: MIG reports that 2-RLY-071-13A-K12 did not energize when 2-PDT-71-1A was pressurized**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for the second event, as the I&C Foreman, call the SRO and report the following: During performance of 2-SR-3.3.6.1.5(4A/A), Core and Containment Cooling Systems RCIC Turbine Steam Line High Flow Instrument Channel A Calibration, 2-RLY-071-13A-K12 did not energize when 2-PDT-71-1A was pressurized and that they have stopped at step 7.4[7]B.
	SRO	Refers to Technical Specifications  Primary Containment Isolation Instrumentation 3.3.6.1 3.3 INSTRUMENTATION 3.3.6.1 Primary Containment Isolation Instrumentation LCO 3.3.6.1 The primary containment isolation instrumentation for each Function in Table 3.3.6.1-1 shall be OPERABLE. APPLICABILITY: According to Table 3.3.6.1-1.  Table 3.3.6.1-1 4. Reactor Core Isolation Cooling (RCIC) System Isolation a. RCIC Steam Line Flow - 1,2,3 F High  A. One or more required channels inoperable. A.1 Place a channel in trip 24 hours for Functions other than 2.a,2.b,5.h, 6.b, and 6.c  Determines that a channel must be place in a tripped condition in 24 hours. Conducts a crew brief on the test failure and Technical Specifications requirements due to the failure.
	NRC	End of Event #2

Op Test No.: 15-01Scenario No. 2 Event No.: 3

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**Event Description: The 2A Steam Packing Exhauster will trip and the 2B Steam Packing Exhauster will not auto start.**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is satisfied with the Technical Specification call and ready for Event #3, insert F3 to trip 2A Steam Packing Exhauster
	BOP	<p>Reports STEAM PACKING EXHAUSTER VACUUM LOW (2-XA-55-7A, Window 12) in alarm. Reports SPE Fan 2A has tripped and SPE Fan 2B has failed to start.</p> <p><b>2-ARP-9-7A, Window 12</b></p> <p>B. IF standby blower fails to start, THEN <b>START</b> standby OR <b>VERIFY</b> normal in service. <b>REFER TO 2-OI-47C.</b></p> <p>C. IF blower is running, <b>PERFORM</b> the following:</p> <ol style="list-style-type: none"> <li>1. <b>THROTTLE</b> in-service STEAM PACKING EXHR 2B(2A) DISCHARGE VLV, 2-HS-66-35A (2-HS-66-34A), UNTIL SPE Vacuum, as indicated on STEAM PACKING EXH VACUUM, 2-PI-66-54, is between 10" and 12" Vacuum, or as appropriate for plant conditions. <b>REFER TO 2-OI-47C.</b></li> <li>2. <b>VERIFY</b> SJAE/OG CNDR CNDS FLOW, 2-FI-2-42, between 2 x 106 lbm/hr and 3 x 106 lbm/hr to prevent tripping SPE due to inadequate cooling. <b>REFER TO 2-OI-2.</b></li> </ol> <p>Starts 2B SPE Fan and throttles discharge valve until SPE Vacuum is between 10" and 12" Vacuum. Verifies proper SJAE/OG CNDR condensate flow.</p> <p>Reports 2B SPE Fan in service</p>
	SRO	Calls Work Control to initiate a WO on the 2A SPE Fan OR directs BOP to call.
	DRIVER	As Work Control, acknowledge initiating a WO on the 2A SPE fan.
	NRC	End of Event #3

Op Test No.: 15-01Scenario No. 2 Event No.: 4

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**Event Description: 2A Fuel Pool Cooling Pump trips.**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event #4, insert F4 (imf sw10a) to trip 2A FPC pump.
	ATC	Reports FUEL POOL SYSTEM ABNORMAL (2-XA-55-4C, Window 1) in alarm and trip of the 2A Fuel Pool Cooling pump.
	SRO	Directs entry into 2-AOI-78-1
		<b>2-AOI-78-1</b> <b>4.2 Subsequent Actions (continued)</b> <b>NOTE</b> The Fuel Pool Cooling System may be used as desired as an alternate method of decay heat removal, when available: ( Refer to applicable Tech Spec Bases B 3.4.7, B 3.4.8, B 3.9.7, B 3.9.8 <b>CAUTION</b> Loss of Fuel Pool Cooling System flow will cause Fuel Pool Cooling System Temperature inputs on 2-TR-74-80 to be inaccurate until Fuel Pool Cooling flow is reestablished.  [3] <b>IF</b> Fuel Pool Cooling System failure is from loss of cooling, <b>THEN</b> <b>PERFORM</b> the following:  [3.1] <b>START</b> idle Fuel Pool Cooling Pump 2B(2A).  [3.2] <b>ATTEMPT</b> to restart the tripped Fuel Pool Cooling Pump 2A(2B) as follows:  [3.2.1] <b>INSPECT</b> the tripped Fuel Pool Cooling Pump and Breaker for damage or abnormal conditions.

Op Test No.: 15-01Scenario No. 2 Event No.: 4

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**Event Description: 2A Fuel Pool Cooling Pump trips.**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>[3.2.2] IF no damage or abnormal conditions are found, <b>THEN</b> [3.2.2] IF no damage or abnormal conditions are found, <b>THEN</b> <b>START</b> the tripped Fuel Pool Cooling Pump. [3.3] <b>VERIFY</b> RBCCW System is operating and REFER TO 2-OI-70 Starts 2B FPC pump. Verifies RBCCW is service. Dispatches personnel to inspect the tripped FPC pump and breaker.</p>
	NRC	End of Event #4



Op Test No.: 15-01Scenario No. 2 Event No.: 5

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**Event Description: Recirc Pump 2B vibration high**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event #5, insert F5 (imf th12b) for 'B' Reactor Recirc Pump high vibration.
	ATC	<p>Reports RECIRC PUMP MOTOR B VIBRATION HIGH (2-XA-55-4B, Window 20) in alarm.</p> <p><b>2-ARP-9-4B, Window 20</b></p> <p>A. <b>CHECK</b> the following on RECIRC PMP MTR 2B WINDING AND BRG TEMP recorder, 2-TR-68-71 on Panel 2-9-21 are below:</p> <ul style="list-style-type: none"><li>• Pump motor bearing temperatures (&lt;190°F),</li><li>• Pump motor winding temperatures (&lt;255°F),</li><li>• Pump Seal Cavity temperatures (&lt;180°F),</li><li>• Pump motor closed cooling water temperature (&lt;140°F),</li></ul> <p>B. <b>CHECK</b> for rise in Drywell equip sump pump out rate due to seal leakage.</p> <p>C. <b>DISPATCH</b> personnel to Panel 2-LPNL-925-0712 (Vibration Mon System) on EI 565' (S-R10) and <b>REPORT</b> the Vibration Data for Pump 2B to the Unit Operator and any other alarm indications. The person shall advise the Unit Operator of any changes in the vibration values and Acknowledge Alarms as necessary</p> <p>D. <b>IF</b> alarm seals in, <b>THEN</b> <b>ADJUST</b> pump speed slightly to try to reset the alarm.</p> <p>Dispatches personnel to Panel 2-LPNL-925-0712 to report vibration on 2B recirc pump.</p>

Op Test No.: 15-01 Scenario No. 2 Event No.: 5

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**Event Description: Recirc Pump 2B vibration high**

Time	Position	Applicant's Actions or Behavior
	DRIVER	As RB AUO, acknowledge going to Vibration Panel on 565 and reporting recirc pump 'B' vibration
	BOP	Checks Recirc Pump 'B' temperatures on Panel 2-9-21 and reports all temperatures within allowable values.
	DRIVER	After 5 minutes, call ATC operator and report that vibration on recirc pump 'B' is 12 mils and rising very slowly.
	ATC	Updates crew on vibration report on 'B' recirc pump
	SRO	Directs ATC to lower 'B' recirc pump speed to try to get vibration alarm to reset.
	ATC	Lowers 'B' recirc speed at least 5 rpm.
	NRC	Operator may using 'Lower Slow' (1rpm) or 'Lower Med' (5rpm)
	DRIVER	When 'B' recirc pump speed has been lowered approximately 5 rpm, report that vibration is lowering but the alarm is still sealed in. When speed has been lowered approximately 10 rpm, insert F6 (dmf th12b) to delete the vibration condition and report the vibration is approximately 10 mils and lowering very slowly.
	SRO	Briefs crew on ARP operator actions if the vibration condition would occur again and was unable to be reset.
	NRC	SRO may not conduct a brief on a possible recurrence of the alarm  End of Event #5

Op Test No.: 15-01 Scenario No. 2 Event No.: 6

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**Event Description: Recirc Pump 2B seal failure/2-AOI-68-1A**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event 6, insert F5 (imf th12b) to cause recirc pump 'B' vibration again
	ATC	Reports RECIRC PUMP MOTOR B VIBRATION HIGH (2-XA-55-4B, Window 20) in alarm.  Dispatches personnel to Panel 2-LPNL-925-0712 to report vibration on 2B recirc pump.
	NRC	Reported recirc pump vibration will continue to rise. Failure of the inner recirc pump seal on your direction.
	DRIVER	After 5 minutes, call ATC operator and report that vibration on recirc pump 'B' is 12 mils and rising.  One minute later, call ATC operator and report that vibration on recirc pump 'B' is 15 mils and rising  One minute later, call ATC operator and report that vibration on recirc pump 'B' is 18 mils and rising.  Insert F7 (imf th10b 70) to fail the 'B' recirc pump inner seal
	SRO	Directs ATC to trip 'B' Recirc Pump and enter 2-AOI-68-1

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**Event Description: Recirc Pump 2B seal failure/2-AOI-68-1A**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Trips 'B' Recirc Pump</p> <p><b>2-AOI-68-1A</b></p> <p><b>4.2 Subsequent Actions (continued)</b></p> <p><b>NOTE</b></p> <p>Power To Flow Map is maintained in 0-TI-248"Station Reactor Engineer" and on ICS.</p> <p>[2] <b>IF</b> a single Recirc Pump tripped, <b>THEN</b>  <b>CLOSE</b> tripped Recirc Pump discharge valve.</p> <p>[3] <b>IF</b> Region I or II of the Power to Flow Map is entered,  <b>THEN</b> (Otherwise N/A)  <b>IMMEDIATELY</b> take actions to INSERT control rods to less than 95.2% loadline. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation.</p>
	DRIVER	When 'B' Recirc Pump is tripped insert F6 (dmf th12b) to delete recirc pump 'B' vibration
	ATC	Closes 'B' Recirc Pump discharge valve
	ATC / BOP	Inserts control rods IAW RCP and control rod shove sheet
		<p>Reports RECIRC PUMP B NO 1 SEAL LEAKAGE ABN (2-XA-55-4B, Window 25) in alarm.</p> <p><b>2-ARP-9-4B</b></p> <p><b>NOTE</b></p> <p>Annunciator Window will not reset until all Alarms are ACK on the recorder 2-XR-68-2/5 (RECIRC PUMPS DISCH FLOW &amp; TEMP).</p> <p>A. <b>DETERMINE</b> initiating cause by comparing No. 1 and 2 seal cavity pressure indicators on Panel 2-9-4 or ICS.</p>

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**Event Description: Recirc Pump 2B seal failure/2-AOI-68-1A**

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> <li>• Plugging of No. 2 RO - No. 2 seal pressure approaches no. 1 seal pressure.</li> <li>• Failure of No. 1 seal - No. 2 seal pressure is greater than 50% of the pressure of No. 1.</li> </ul> <p>Reports that No. 1 seal pressure and No. 2 seal pressure are approximately equal</p>
	SRO	<p><b>2-AOI-68-1A</b>  <b>4.2 Subsequent Actions (continued)</b></p> <p>[9] <b>NOTIFY</b> Reactor Engineer to <b>PERFORM</b> the following:</p> <ul style="list-style-type: none"> <li>• REFER TO Tech Specs 3.4.1</li> <li>• 2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation</li> <li>• 0-TI-248, Core Flow Determination in Single Loop Operation</li> </ul> <p>[10] [NER/C] <b>WHEN</b> the Recirc Pump discharge valve has been closed for at least five minutes (to prevent reverse rotation of the pump) [GE SIL-517], <b>THEN</b> (N/A if Recirc Pump was isolated in Step 4.2[8])  <b>OPEN</b> Recirc Pump discharge valve as necessary to maintain Recirc Loop in thermal equilibrium.</p> <p>Calls RE to inform them of the Recirc Pump trip  Directs ATC to open 'B' Recirc Pump discharge valve after 5 minutes</p>
	ATC	Opens 'B' Recirc Pump discharge valve after 5 minutes

Op Test No.: 15-01Scenario No. 2 Event No.: 6

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**Event Description: Recirc Pump 2B seal failure/2-AOI-68-1A**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Reviews Technical Specification 3.4.1</p> <p>3.4 REACTOR COOLANT SYSTEM (RCS)</p> <p>3.4.1 Recirculation Loops Operating</p> <p>LCO 3.4.1 Two recirculation loops with matched flows shall be in operation.</p> <p>OR</p> <p>One recirculation loop may be in operation provided the following limits are applied when the associated LCO is applicable</p> <p>a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," single loop operation limits specified in the COLR;</p> <p>b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," single loop operation limits specified in the COLR;</p> <p>c. LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Function 2.b (Average Power Range Monitors Flow Biased Simulated Thermal Power - High), Allowable Value of Table 3.3.1.1-1 is reset for single loop operation;</p> <p>A. Requirements of LCO not met      A.1 Satisfy the requirements of the LCO      24 hr</p> <p>Briefs crew on the Technical Specification requirements for only one recirc pump in operation.</p>
	DRIVER	As RE, acknowledge call that 'B' recirc pump was tripped due to high vibration and TS requirements for single loop operations
	NRC	End of Event #6

Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When NRC Chief Examiner is ready for Event 7, insert F8 (imf th22 100 20:00) bottom head leak.
	BOP	<p>Reports Drywell Pressure rising slowly</p> <p>Continues to monitor containment parameters</p> <p>Reports PRI CONTAINMENT N<sub>2</sub> PRESS HIGH (2-XA-55-3B, Window 10) in alarm</p> <p>Reports Drywell Pressure 1.5 psig and rising slowly</p> <p><b>2-ARP-9-3B</b></p> <p>A. <b>CHECK</b> containment pressure using multiple indications:</p> <p>B. <b>CHECK</b> containment temperature.</p> <p>C. <b>REFER TO</b> 2-OI-64, Venting the drywell with standby gas treatment fan.</p> <p>Verifies drywell pressure rising using other indications</p> <p>Reports containment temperature rising slowly</p> <p>Reports DRYWELL NORM OPERATING PRESS HIGH (2-XA-55 3B, Window 19) in alarm</p> <p>Reports Drywell Pressure 1.6 psig and rising slowly</p> <p><b>2-ARP-9-3B</b></p> <p>G. <b>IF</b> Drywell pressure is high, <b>THEN</b> <b>REFER TO</b> 2-AOI-64-1.</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to vent the drywell IAW 2-AOI-64-1
	BOP	<p><b>2-AOI-64-1</b></p> <p><b>4.2 Subsequent Actions</b></p> <p>[2] <b>IF</b> Drywell Pressure is High, <b>THEN</b> <b>PERFORM</b> the following: (Otherwise N/A)</p> <p>[2.4] <b>ALIGN and START</b> additional Drywell coolers and fans as necessary. <b>REFER TO</b> 2-OI-64.</p> <p><b>CAUTION</b> Stack release rates exceeding <math>1.4 \times 10^7</math> <math>\mu\text{ci/sec}</math>, or a SI-4.8.B.1.a.1 release fraction above one will result in ODCM release limits being exceeded</p>
	BOP	<p>[2.5] <b>VENT</b> Drywell as follows:</p> <p>[2.5.1] <b>CLOSE</b> SUPPR CHBR INBD ISOLATION VLV 2-FCV-64-34 (Panel 2-9-3).</p> <p>[2.5.2] <b>VERIFY OPEN</b>, DRYWELL INBD ISOLATION VLV, 2-FCV-64-31 (Panel 2-9-3).</p> <p>[2.5.3] <b>VERIFY</b> 2-FIC-84-20 is in AUTO and SET at 100 scfm (Panel 2-9-55).</p> <p>[2.5.4] <b>VERIFY RUNNING</b> a Standby Gas Treatment Fan STGTS TRAIN C(A)(B) (Panel 2-9-25).</p> <p>[2.5.5] <b>IF</b> required, <b>THEN</b> <b>REQUEST</b> Unit 1 Operator to <b>START</b> Standby Gas Treatment Fans A or B. (Otherwise N/A)</p> <p>[2.5.7] <b>PLACE</b> 2-FCV-84-20 CONTROL DW/SUPPR CHBR VENT, 2-HS-64-35, in OPEN (Panel 2-9-3).</p> <p>Calls Unit 1 operator and requests that a standby gas train be started.</p> <p>Vents the drywell IAW 2-AOI-64-1</p>



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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When NRC Chief Examiner is satisfied with AOI actions, insert F9 (imf th33d 2 15:00) steam leak in the drywell and F10 (imf rh01a-d) trip of all RHR pumps
	BOP	Reports drywell pressure and temperature continuing to rise Reports DRYWELL PRESS APPROACHING SCRAM (2-XA-55-3B, Window 30) in alarm  <b>2-ARP-9-3B</b> <b>A. CHECK</b> containment pressure and temperature using multiple indications.  Continues to monitor and report containment parameters
	SRO	Briefs crew on current plant conditions. Directs that a reactor scram be initiated at a point prior to the automatic scram (line in the sand) Calls line management and Load Dispatcher to inform them of upcoming scram
	DRIVER	Acknowledge call concerning upcoming scram
	ATC	Reports that drywell pressure is at the value directed by SRO

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Initiates a manual reactor scram</p> <p><b>Reactor Scram OATC Hard Card</b></p> <p><b>1.0 IMMEDIATE ACTIONS</b></p> <p>[1] <b>DEPRESS</b> REACTOR SCRAM A and B, 2-HS-99-5A/S3A and 2-HS-99-5A/S3B, on Panel 2-9-5.</p> <p>[2] <b>IF</b> scram is due to a loss of RPS, <b>THEN PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in <b>START &amp; HOT STBY AND PAUSE</b> for approximately 5 seconds (Otherwise N/A)</p> <p>[3] Refuel Mode One Rod Permissive Light check:</p> <p>[3.1] PLACE REACTOR MODE SWITCH, 2-HS-99-5A-S1, in REFUEL.</p> <p>[3.2] CHECK illuminated REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46.</p> <p>[3.3] IF REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46, is NOT illuminated, THEN CHECK all control rod positions at Full-In Overtravel, or Full-In. (Otherwise N/A)</p> <p>[4] PLACE REACTOR MODE SWITCH, 2-HS-99-5A-S1, in SHUTDOWN.</p> <p>[5] REPORT the following status to the US:</p> <ul style="list-style-type: none"> <li>• Reactor Scram</li> <li>• Mode Switch is in Shutdown</li> <li>• "All rods in" or "rods out"</li> <li>• Reactor Water Level and trend (recovering or lowering)</li> <li>• Reactor pressure and trend</li> <li>• MSIV position (Open or Closed)</li> <li>• Power level</li> </ul> <p>Completes 'hard card' actions and makes scram report</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Enters EOI-1 on RPV Water Lvl below +2"</p> <p><b>Verify RX scram – CHECKED</b>  <b>RC/Q</b>  <b>Monitor and Control</b> reactor power - <b>CHECKED</b>  The reactor is subcritical  AND  NO boron has been injected <b>THEN</b>  <b>EXIT RC/Q</b> and  <b>ENTER AOI-100-1, Reactor Scram - CHECKED</b></p> <p>Directs ATC to enter 2-AOI-100-1</p> <p><b>RC/L</b>  CAUTION: Ambient temp may affect RPV water lvl indication and trend – <b>CHECKED</b></p> <p><b>MONITOR and CONTROL</b> RPV water lvl – <b>CHECKED</b></p> <p><b>VERIFY</b> each as required</p> <ul style="list-style-type: none"> <li>PCIS isolations (Groups 1, 2, and 3) – <b>CHECKED</b></li> </ul> <p>It has NOT been determined that the reactor will remain subcritical without boron under all conditions – <b>SUBCRITICAL</b></p> <p>RPV water lvl CANNOT be determined – <b>CAN</b></p> <p>PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b>  OR  Suppr chmbr press CANNOT be maintained below 55 psig - <b>CAN</b></p> <p>CAUTION</p> <p>#2 Pump NPSH and Vortex Limits  #3 Elevated suppr chmbr press may trip RCIC  #6 HPCI or RCIC suction temp above 140°F – <b>CHECKED</b></p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior																					
	SRO	<p>RESTORE and MAINTAIN RPV water lvl between +2 in and +51 in with ANY of the following</p> <table> <tr> <td>CNDS and FW</td><td>5A</td><td>1210 psig</td></tr> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> <tr> <td>RCIC with CST suction if available</td><td>5C</td><td>1200 psig</td></tr> <tr> <td>HPCI with CST suction if available</td><td>5D</td><td>1200 psig</td></tr> <tr> <td>CNDS</td><td>6A</td><td>480 psig</td></tr> <tr> <td>CS</td><td>6D, 6E</td><td>330 psig</td></tr> <tr> <td>LPCI</td><td>6B, 6C</td><td>320 psig</td></tr> </table> <p>Directs ATC to restore and maintain reactor level between +2 in and +51 in using Condensate and Feedwater in accordance with Appendix 5A</p> <p><b>RC/P</b></p> <p>DW press is above 2.4 psig - <b>NO</b></p> <p>Emergency RPV depressurization is anticipated - <b>NO</b> AND The reactor will remain subcritical without boron under all conditions</p> <p>Emergency RPV depressurization is or has been required - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Is ANY MSRV cycling - <b>NO</b></p> <p>Steam cooling is required - <b>NO</b></p> <p>Suppr pl temp and lvl CANNOT be maintained in a safe area of Curve 3 at the existing RPV press - <b>CAN</b></p> <p>Suppr pl lvl CANNOT be maintained in the safe area - <b>CAN</b> of Curve 4</p>	CNDS and FW	5A	1210 psig	CRD	5B	1640 psig	RCIC with CST suction if available	5C	1200 psig	HPCI with CST suction if available	5D	1200 psig	CNDS	6A	480 psig	CS	6D, 6E	330 psig	LPCI	6B, 6C	320 psig
CNDS and FW	5A	1210 psig																					
CRD	5B	1640 psig																					
RCIC with CST suction if available	5C	1200 psig																					
HPCI with CST suction if available	5D	1200 psig																					
CNDS	6A	480 psig																					
CS	6D, 6E	330 psig																					
LPCI	6B, 6C	320 psig																					

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>DW control air becomes unavailable - <b>AVAIL</b></p> <p>Boron inj is required - <b>NO</b> AND The main condenser is available AND There has been no indication of a steam line break</p> <p><b>STABILIZE</b> RPV press below 1073 psig with the main turbine bypass vlvs (APPX 8B)</p> <p>Directs BOP to control reactor pressure 800 psig to 1000 psig in accordance with Appendix 8B</p>
	BOP	<p>Verifies that Main Turbine Bypass valves are controlling reactor pressure 800 psig to 1000 psig.</p> <p>Verifies and reports successful Gr. 2, 3, 6, and 8 PCIS Isolations</p>
	ATC	<p><b>2-EOI APPENDIX-5A</b></p> <p>1. IF .....It is desired to use a reactor feed pump that is in operation, THEN .....<b>CONTINUE</b> at step 12 to control the operating pump</p> <p>12. <b>SLOWLY ADJUST</b> RFPT speed UNTIL feedwater flow to the RPV is indicated, using ANY of the following methods on Panel 2-9-5:</p> <ul style="list-style-type: none"> <li>• Individual 2-HS-46-8A(9A)(10A), RFPT 2A(2B)(2C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR, <b>OR</b></li> <li>• Individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in MANUAL, <b>OR</b></li> <li>• 2-LIC-46-5, REACTOR WATER LEVEL CONTROL, in MANUAL with individual 2-SIC</li> </ul> <p>13. <b>ADJUST</b> RFPT speed as necessary to control injection using the methods of step 12.</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>14. WHEN .....RPV level is approximately equal to desired level AND automatic level control is desired, THEN ..... <b>PLACE 2-LIC-46-5, REACTOR WATER LEVEL CONTROL</b>, in AUTO with individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in AUTO</p> <p>Restores reactor water level to +2 in to +51in IAW App. 5A</p> <p><b>2-AOI-100-1</b> <b>2.0 SUBSEQUENT ACTIONS:</b></p> <p>[2] <b>DRIVE</b> in all IRMs and SRMs from Panel 2-9-5 as time and conditions permit.</p> <p>[3] <b>VERIFY</b> SCRAM DISCH VOL VENT &amp; DR VLVS closed by green indicating lights at SDV Display on Panel 2-9-5.</p> <p>[4] <b>MONITOR</b> and <b>CONTROL</b> Reactor Water Level between +2" and +51", or as directed by US, using RFP/RFPT.</p> <p>[5] <b>RETURN</b> to body of procedure at step 4.2[5] <b>AND CONTINUE</b> with actions as required.</p> <p>Performs AOI-100-1 subsequent actions</p>
	BOP	<p><b>2-AOI-100-1</b> <b>4.2 Subsequent Actions (continued)</b> <b>VERIFY TRIPPED</b> the Main Turbine as follows:</p> <p>[9.1] <b>DEPRESS</b> the TRIP pushbutton, 2-HS-47-67D on Panel 2-9-7. [NER/C] [INPO SOER 81-015]</p> <p>[9.2] <b>PERFORM</b> the following as required to <b>VERIFY OPEN GENERATOR</b> PCB 224:</p> <p>[9.2.1] <b>CHECK</b> green light illuminated and red light not illuminated above handswitch <b>GENERATOR</b> PCB 224 CNTR W/REV BYPASS, 2-HS-242-224A.</p> <p>[9.3] <b>IMMEDIATELY PLACE</b> VOLTAGE REGULATOR START/STOP SEL, 2-HS-57-24, to STOP and release.</p> <p>[9.4] <b>CHECK</b> the following at 2-HS-57-24:</p> <ul style="list-style-type: none"> <li>• GREEN light illuminated</li> <li>• RED light extinguished</li> </ul>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[10] MONITOR Main Turbine Vibration on TURBINE GENERATOR VIBRATION, 2-XR-47-15, during coast down.</p> <p>[11] ADJUST TURBINE OIL TEMPERATURE CONT, 2-TIC-24-75, setpoint to 85°F.</p> <p>[12] WHEN turbine speed is less than 900 RPM, THEN START the following:</p> <ul style="list-style-type: none"> <li>• TURBINE BEARING LIFT OIL PUMPS</li> <li>• MOTOR SUCTION PUMP</li> <li>• AC TURNING GEAR OIL PUMP</li> </ul>
	ATC/BOP	Updates crew on drywell pressure continuing to rise and reaching 2.45 psig – EOI-2 entry condition
	BOP	Reports start and injection of HPCI into the RPV.
	SRO	Verifies HPCI not needed for RPV level control and directs BOP to trip and lockout HPCI.
	BOP	Trips HPCI by holding the trip pushbutton depressed until turbine speed in zero then taking HPCI Aux Oil Pump sw. to PTL.
	SRO	<p>Enters EOI-2 and re-enters EOI-1 on High Drywell Pressure.</p> <p><b>EOI-2</b> SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b> SAMG entry is required – <b>NO</b></p> <p><b>CAUTION</b> #4 PC press vs pump NPSH - <b>CHECKED</b></p> <p>DW sprays have been initiated - <b>NO</b> Suppr chmbr sprays have been initiated – <b>NO</b> PC water level CANNOT be restored and maintained below 105 ft OR Suppr chmbr press CANNOT be restored and maintained below 55 psig - <b>CAN</b></p> <p><b>CAUTION</b> #2 Pump NPSH and Vortex Limits – <b>CHECKED</b></p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>PC/P</b>  <b>MONITOR</b> and <b>CONTROL</b> PC press below 2.4 psig using the Vent system (AOI-64-1) - <b>CHECKED</b></p> <p>WHEN PC press CANNOT be maintained below 2.4 psig – <b>CHECKED</b></p> <p><b>BEFORE</b> suppr chmbr press rises to 12 psig  <b>CONTINUE – CHECKED</b></p> <p style="text-align: center;">CAUTION</p> <p>#2 Pump NPSH and Vortex Limits</p> <p>INITIATE suppr chmbr sprays using only pumps NOT required to assure adequate core cooling by continuous inj (APPX 17C)</p> <p>Directs BOP to initiate Suppression Pool Spray IAW App 17C</p>
	BOP	<p><b>2-EOI APPENDIX-17C</b></p> <p>1. BEFORE Suppression Chamber pressure drops below 0 psig, <b>CONTINUE</b> in this procedure at Step 6.</p> <p>2. IF ..... Adequate core cooling is assured</p> <p style="text-align: center;"><b>OR</b></p> <p>Directed to spray the Suppression Chamber irrespective of adequate core cooling,  THEN ... <b>BYPASS</b> LPCI injection valve open interlock as necessary:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> <li>• <b>PLACE</b> 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> </ul> <p>5. <b>INITIATE</b> Suppression Chamber Sprays as follows:</p> <p>a. <b>VERIFY</b> at least one RHRSW pump supplying each EECW header.</p> <p>b. IF.....EITHER of the following exists:</p> <ul style="list-style-type: none"> <li>• LPCI Initiation signal is NOT present,</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>• Directed by SRO,</li> </ul>



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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>THEN...<b>PLACE</b> keylock switch 2-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD, in MANUAL OVERRIDE.</p> <p>c. <b>MOMENTARILY PLACE</b> 2-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT, switch in SELECT.</p> <p>d. IF.....2-FCV-74-53(67), RHR SYS I(II) INBD INJECT VALVE, is OPEN, THEN...<b>VERIFY CLOSED</b> 2-FCV-74-52(66), RHR SYS I(II) OUTBD INJECT VALVE.</p> <p>e. <b>VERIFY OPERATING</b> the desired RHR System I(II) pump(s) for Suppression Chamber Spray.</p> <p>Aligns RHR loop for Suppression Pool Spray Attempts to start RHR pump(s) on that loop Reports failure of both RHR pump to start</p>
	SRO	<p>Directs using the other loop of RHR to spray the torus Calls WC to investigate the RHR pump failure</p>
	DRIVER	<p>When operator moves to the other loop of RHR, insert F11 or F12, depending on loop being moved to (ior zdihs74121/129 null) and delete RHR pump malfunctions for the RHR loop being moved to i.e. RHR pumps will start on the second loop but can't select.</p>
	BOP	<p>When aligning the other loop of RHR for suppression pool spray, discovers that the SELECT amber light will not remain illuminated when the "SELECT" switch is taken to "SELECT"</p> <p>Reports that Suppression Pool Spray cannot be initiated in either loop of RHR</p>
	SRO	<p>Calls WC to initiate a WO for troubleshooting the problem with the SELECT switch for RHR</p>
	DRIVER	<p>As WC, acknowledge initiating WOs to investigate and repair problems with RHR pumps and SELECT logic.</p>
	CREW	<p>Reports that drywell pressure and temperature are continuing to rise.</p>

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Event Description: **LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>DW/T</b>  <b>CAUTION</b>  #1 Ambient temp may affect RPV water lvl indication and trend - <b>CHECKED</b>  <b>MONITOR</b> and <b>CONTROL</b> DW temp below 160°F using available DW cooling - <b>CHECKED</b>  <b>WHEN</b> DW temp <b>CANNOT</b> be maintained below 160°F - <b>CHECKED</b>  <b>OPERATE</b> all available DW cooling - <b>CHECKED</b>  <b>BEFORE</b> DW temp rises to 200°  EOI-1, RPV Control at Step RC-1 - <b>SCRAM</b>  <b>BEFORE</b> DW temp rises to 280°F <b>CONTINUE</b>  Is suppr pl lvl below 19 ft. - <b>YES</b>  Is DW temp within the safe area of Curve 5 - <b>YES</b>  <b>SHUT DOWN</b> Recirc pumps and DW blowers</p> <p>Directs ATC to Shutdown 'A' Reactor Recirc pump  Directs BOP to shutdown DW blowers</p> <p><b>CAUTION</b>  #2 Pump NPSH and Vortex Limits - <b>CHECKED</b></p> <p><b>INITIATE</b> DW sprays using only pumps NOT required to assure adequate core cooling by continuous inj (APPX17B)</p>
	ATC	Reports 'A' recirc pump secured
	BOP	Reports DW blowers secured
	SRO	<p>Directs BOP to initiate Drywell Sprays (on loop of RHR with SELECT logic) using standby cooling IAW App 17B  <b>2-EOI APPENDIX-17B</b>  1. <b>BEFORE</b> drywell pressure drops below 0 psig, <b>CONTINUE</b> in this procedure at Step 7. ____  2. IF ..... Adequate core cooling is assured  <b>OR</b>  Directed to spray the Drywell irrespective of adequate core cooling,</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>THEN ... <b>BYPASS</b> LPCI injection valve open interlock as necessary:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> <li>• <b>PLACE</b> 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> </ul> <p>3. <b>VERIFY</b> Recirc Pumps and Drywell Blowers are shut down.</p> <p>4. IF ..... Directed by SRO to spray the Drywell using Standby Coolant supply, THEN ... <b>CONTINUE</b> in this procedure At Step 8 using RHR Loop I OR At Step 9 using RHR Loop II.</p> <p>8(9). <b>INITIATE</b> Drywell Spray on RHR Loop I using Standby Coolant Supply as follows:</p> <p>a. IF.....EITHER of the following exists:</p> <ul style="list-style-type: none"> <li>• LPCI Initiation signal is NOT present,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Directed by SRO, THEN...<b>PLACE</b> keylock switch 2-XS-74-122(130), RHR SYS I (II) LPCI 2/3 CORE HEIGHT OVRD, in MANUAL OVERRIDE</li> </ul> <p>b. <b>MOMENTARILY PLACE</b> 2-XS-74-121(129), RHR SYS I (II) CTMT SPRAY/CLG VLV SELECT, switch in SELECT.</p> <p>c. IF.....2-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN, THEN...<b>VERIFY CLOSED</b> 2-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
		<p>d. <b>VERIFY CLOSED</b> the following valves:</p> <ul style="list-style-type: none"> <li>• 2-FCV-74-61(75), RHR SYS I(II) DW SPRAY INBD VLV</li> <li>• 2-FCV-74-60(74), RHR SYS I(II) DW SPRAY OUTBD VLV</li> <li>• 2-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE</li> <li>• 2-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV</li> <li>• 2-FCV-23-52(46), RHR HX (2B)2D RHRSW OUTLET VLV.</li> </ul> <p>e. <b>VERIFY</b> RHR Pumps 2A(2B) and 2C(2D) are NOT running.</p> <p>f. <b>START</b> RHRSW Pumps D1 and D2.</p> <p>NOTE: 2-BKR-074-0100, RHR SYS I U-1 DISCH XTIE breaker compartment is maintained in the OPEN position as an Appendix R requirement.</p> <p>f. <b>PLACE</b> 2-BKR-074-0101, RHR HX B-D DISCHARGE CROSSTIE VALVE FCV-74-101 (M0 10-170), in ON (480V RMOV Board 3B, Compartment 19E)</p> <p>Dispatches AUO to restore power to 74-100 or 74-101(depending on the loop of RHR being used)</p>
	DRIVER	<p>Acknowledge closing the breaker for either 74-100 or 74-101 to restore power to the valve.</p> <p>After 5 minutes, report that the breaker, for the valve called for, cannot be closed.</p>
	SRO	<p>Calls WC to send personnel out to assist getting breaker closed on crosstie valve</p>
	DRIVER	<p>Acknowledge sending personnel to assist getting power restored to the crosstie valve.</p>
	CREW	<p>Reports drywell pressure and temperature continuing to rise</p>

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Event Description: **LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	NRC	IF the SRO decides to Rapidly Depressurize the RPV, this would initiate Event No. 8
	SRO	<p><b>EOI-2, DW/T</b></p> <p>WHEN DW temp CANNOT be restored and maintained below 280°F</p> <p><b>EMERGENCY RPV DEPRESSURIZATION IS REQUIRED</b>(EOI-1, RC/P-4; C1-1, C1-20; C5-12, C5-14)</p> <p>Updates crew that Emergency Depressurization is required</p> <p><b>EOI-1, RC/L</b></p> <p>IF Emergency RPV depressurization is or has been required  <b>THEN EXIT RC/P and</b>  <b>ENTER C2, Emergency RPV Depressurization</b></p> <p>Enters C2, Emergency RPV Depressurization</p> <p>SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Containment water lvl CANNOT be maintained below 44 ft- <b>CAN</b></p> <p>DW control air becomes unavailable – <b>AVAIL</b></p> <p>Will the reactor remain subcritical without boron under all conditions - <b>YES</b></p> <p>Is DW press above 2.4 psig - <b>YES</b></p> <p><b>PREVENT</b> inj from ONLY those CS and LPCI pumps NOT required to assure adequate core cooling (Appx 4)</p> <p>Direct ATC to terminate and prevent feedwater and condensate using App 4</p>
	ATC	<p><b>2-EOI APPENDIX-4</b></p> <p>6. <b>PREVENT</b> injection from CONDENSATE and FEEDWATER by performing the following:</p> <p>a. IF ..... immediate injection termination from a reactor feedwater pump is required,</p> <p>THEN ..... <b>PERFORM</b> step 6.d for the desired pump.</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>b. LOWER RFPT 2A(2B)(2C) speed to minimum setting (approximately 600 rpm) using ANY of the following methods on Panel 2-9-5:</p> <ul style="list-style-type: none"> <li>• Using 2-LIC-46-5, REACTOR WATER LEVEL CONTROL, in MANUAL AND individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in AUTO, OR</li> <li>• Using individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in MANUAL, OR</li> <li>• Using individual 2-HS-46-8A(9A)(10A), RFPT 2A(2B)(2C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR.</li> </ul> <p>c. CLOSE the following valves BEFORE RPV pressure drops below 500 psig:</p> <ul style="list-style-type: none"> <li>• 2-FCV-3-19, RFP 2A DISCHARGE VALVE</li> <li>• 2-FCV-3-12, RFP 2B DISCHARGE VALVE</li> <li>• 2-FCV-3-5, RFP 2C DISCHARGE VALVE</li> <li>• 2-LCV-3-53, RFW START-UP LEVEL CONTROL</li> </ul> <p>d. TRIP RFPTs as necessary to prevent injection by DEPRESSING the following push-buttons:</p> <ul style="list-style-type: none"> <li>• 2-HS-3-125A, RFPT 2A TRIP</li> <li>• 2-HS-3-151A, RFPT 2B TRIP</li> <li>• 2-HS-3-176A, RFPT 2C TRIP.</li> </ul> <p>Terminates and prevents condensate and feedwater IAW App 4 Reports when complete</p>
	SRO	<p><b>C-2</b> Is suppr pl lvl above 5.5 ft – <b>YES</b> <b>OPEN</b> all ADS Vlvs (ok to exceed 100°F/hr cooldown rate)</p> <p>Directs BOP to open all ADS valves</p>
	BOP	<p>Opens all ADS valves, verifies open using alternate indications and reports 6 ADS valves open</p>

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior												
		<p><b>CRITICAL TASK</b></p> <p>When Drywell temperature cannot be restored and maintained below 280°F the SRO determines that Emergency Depressurization is required and is initiated as directed by the SRO.</p> <ol style="list-style-type: none"> <li>1. Safety Significance Precludes failure of Primary Containment</li> <li>2. Cues Procedural compliance High Drywell temperature</li> <li>3. Measured by Observation-SRO updates or briefs the crew that ED is required based on Drywell temperature AND the operator opens 6 ADS/MSRVs</li> <li>3. Feedback MSRV open indications RPV Pressure lowering</li> </ol> <p>This Critical Task is <b>not met</b> if the Crew does not ED by 300°F.</p>												
	SRO	<p><b>EOI-1, RC/L</b></p> <p><b>RESTORE</b> and <b>MAINTAIN</b> RPV water lvl between +2 in. and +51 in. with ANY of the following:</p> <table> <tr> <td>RCIC with CST suction if available</td><td>5C</td><td>1200 psig</td></tr> <tr> <td>HPCI with CST suction if available</td><td>5D</td><td>1200 psig</td></tr> <tr> <td>CS</td><td>6D, 6E</td><td>330 psig</td></tr> <tr> <td>LPCI</td><td>6B, 6C</td><td>320 psig</td></tr> </table> <p>Directs BOP to restore and maintain RPV water level between +2 in. and +51 in. using RCIC/HPCI, Appendices 5C/5D. Supplement with CS/LPCI, Appendices 6B, 6C, 6D, and 6E.</p>	RCIC with CST suction if available	5C	1200 psig	HPCI with CST suction if available	5D	1200 psig	CS	6D, 6E	330 psig	LPCI	6B, 6C	320 psig
RCIC with CST suction if available	5C	1200 psig												
HPCI with CST suction if available	5D	1200 psig												
CS	6D, 6E	330 psig												
LPCI	6B, 6C	320 psig												
	DRIVER	<p>Insert Shift F2 (cs02b) to prevent auto opening of CS II inbd injection valve and Shift F3 (imf th34f) for flashing all reference legs.</p>												

Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	NRC	When reactor pressure lowers below 450 psig, the operators will verify that LPCI/CS injection valves open. This will initiate Event No. 9
	ATC/BOP	Coordinate restoring RPV water level to +2 in. to +51 in. using RCIC/HPCI/CS/LPCI
	ATC/BOP	Report isolation of RCIC and HPCI on low reactor pressure
	SRO	Briefs crew on current plant conditions including the potential to flash RPV level reference legs.
	ATC/BOP	Monitors RPV water level using all instrumentation Reports indication of 'notching' on RPV water level instrumentation Reports RPV water level is 'unknown'
	SRO	<p><b>EOI-1, RC/L</b></p> <p><b>IF</b> RPV water lvl CANNOT be determined</p> <p><b>THEN</b> <b>EXIT</b> RC/L and <b>ENTER</b> C4, RPV Flooding</p> <p><b>C-4</b> CAUTION</p> <p>#1 Ambient temp may affect RPV water lvl indication and trend</p> <p><b>IF</b> RPV water lvl can be determined - <b>CANNOT</b></p> <p><b>AND</b></p> <p>It has NOT been determined that the reactor will remain subcritical without boron under all conditions - <b>SUBCRITICAL</b></p>



Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>RPV water lvl can be determined - <b>CANNOT</b>  <b>AND</b>  The reactor will remain subcritical without boron under all conditions</p> <p>PC water lvl <b>CANNOT</b> be maintained below 105 ft - <b>CAN</b>  <b>OR</b>  Suppr chmbr press <b>CANNOT</b> be maintained below 55 psig- <b>CAN</b></p>
	SRO	<p>DW control air becomes unavailable – <b>AVAILABLE</b>  <b>IF</b> <b>THEN</b>  The reactor will remain subcritical without boron under all conditions <b>B&gt;</b></p> <p>Is suppr pl lvl above 5.5 ft. – <b>YES</b>  <b>OPEN</b> all ADS vlvs - <b>OPEN</b>  (ok to exceed 100°F/hr cooldown rate  Can 6 ADS vlvs be opened – <b>YES</b>  <b>IF</b> <b>THEN</b>  It has been determined that the RPV has been flooded to the main steam lines <b>D&gt;</b></p> <p>Can any MSRV be opened – <b>YES</b>  <b>ISOLATE</b> ANY of the following NOT needed for RPV injection Injection</p> <ul style="list-style-type: none"> <li>• Main steam lines</li> <li>• Main steam line drains</li> <li>• HPCI</li> <li>• RCIC</li> </ul> <p>Directs BOP to isolate/verify isolated Main Steam lines, Main Steam line drains, HPCI and RCIC</p>

Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior												
	BOP	Verifies main steam lines, main steam line drains, HPCI, and RCIC are isolated. Reports isolated												
	SRO	<p style="text-align: center;"><b>CAUTION</b></p> <p>#2 Pump NPSH and Vortex Limits #3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F</p> <p><b>FLOOD</b> the RPV to the elevation of the main steam lines with the following:</p>												
	SRO	<table border="0"> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> <tr> <td>CNDS</td><td>6A</td><td>480 psig</td></tr> <tr> <td>LPCI</td><td>6B, 6C</td><td>320 psig</td></tr> <tr> <td>CS</td><td>6D, 6E</td><td>330 psig</td></tr> </table> <p>Directs flooding the RPV to the steam lines using available sources of injection</p>	CRD	5B	1640 psig	CNDS	6A	480 psig	LPCI	6B, 6C	320 psig	CS	6D, 6E	330 psig
CRD	5B	1640 psig												
CNDS	6A	480 psig												
LPCI	6B, 6C	320 psig												
CS	6D, 6E	330 psig												
	ATC/BOP	Inject to the RPV using all available sources of injection Report that RPV pressure is rising Report that MSRV have reopened												
	SRO	<p><b>C-4</b></p> <p>Can ANY MSRV be opened – <b>YES</b></p> <p><b>NOTE 7</b> Indication that the RPV is flooded to the main steam lines may include ANY of the following:</p> <ul style="list-style-type: none"> <li>• Tail pipe temperatures of open SRVs decrease to subcooled values.</li> <li>• Rising RPV pressure as noncondensibles are compressed.</li> <li>• Actuation of SRV tail pipe acoustic monitors.</li> <li>• MSRVs re-open and stay open at RPV pressures below 50 psig above suppression chamber pressure due to the head of water above the MSRVs. (MSRVs may open and close sluggishly if the discharge flow is subcooled.)</li> </ul>												

Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Monitors for indications that the RPV is flooded Determines that the RPV is flooded</p> <p><b>C-4</b></p> <p><b>IF</b> It CANNOT be determined that the RPV Is flooded to the Main Steam Lines – <b>CAN</b></p> <p><b>ISOLATE</b> the following: - <b>ISOLATED</b></p> <ul style="list-style-type: none"><li>• Main steam lines</li><li>• Main steam line drains</li><li>• HPCI</li><li>• RCIC</li></ul> <p><b>CONTROL</b> RPV inj as low as practicable to maintain the steam lines flooded</p> <p>Directs controlling RPV injection as low as practicable to maintain the steam lines flooded</p>
	ATC/BOP	Control RPV injection as directed.

Op Test No.: 15-01Scenario No. 2 Event No.: 7

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**Event Description: LOCA/Scram with inability to spray the Drywell/C4**

Time	Position	Applicant's Actions or Behavior
		<p><b>With Reactor Water Level unknown, inject into the RPV with available sources until there is indication that the Main Steam Lines are flooded (C-4 Note 7) and maintain them flooded.</b></p> <ol style="list-style-type: none"><li>1. Safety Significance Prevent fuel damage by establishing adequate core cooling</li><li>2. Cues Procedural compliance Loss of all RPV level indications</li><li>3. Measured by Observation-Indications that the Main Steam Lines are flooded are listed in C-4 Note 7</li><li>4. Feedback MSRV tail pipe temperature MSRV acoustic monitor RPV Pressure trend</li></ol> <p>This Critical Task is <b>not met</b> if the Crew fails to continue to raise level and maintain pressure on the vessel.</p>
	NRC	End of Event #7 and scenario
	DRIVER	Place simulator in FREEZE upon direction of the NRC Chief Examiner

Op Test No.: 15-01Scenario No. 2 Event No.: 8

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**Event Description: Rapid depressurization of the RPV using Turbine bypass valves**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When SRO makes the decision to rapidly depressurize the RPV, insert SHIFT F1(imf tc02 0) to fail the main turbine bypass valves closed
		<b>EOI-2, DW/T</b>  WHEN DW temp CANNOT be restored and maintained below 280°F DW <b>EMERGENCY RPV DEPRESSURIZATION IS REQUIRED</b> (EOI-1, RC/P-4; C1-1, C1-20; C5-12, C5-14)  Determines that DW temperature will exceed 280°F and won't be able to restore and maintain below 280°F  <b>EOI-1, RC/P</b>  IF Emergency RPV depressurization is anticipated AND The reactor will remain subcritical without boron under all conditions THEN <b>RAPIDLY DEPRESSURIZE</b> the RPV with the main turbine bypass vlvs (ok to exceed 100°F/hr cooldown  Directs BOP to rapidly depressurize the RPV with the main turbine bypass valves.

Op Test No.: 15-01Scenario No. 2 Event No.: 8

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**Event Description: Rapid depressurization of the RPV using Turbine bypass valves**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>2-OI-47</b></p> <p><b>8.0 INFREQUENT OPERATIONS</b></p> <p><b>8.1 Bypass Valve Operation</b></p> <p><b>NOTES</b></p> <p>1) Section 8.1.1 uses the RAISE, 2-HS-47-130B and LOWER, 2-HS-47-130A for the Bypass Jack to open and close the Bypass Valves.</p> <p>2) When using the Jack to operate the Bypass valves, the valves will stay open at the desired position until closed by the LOWER, 2-HS-47-130A pushbutton. EHC Auto cooldown will not close the Bypass Valves, if the BPV DEMAND is greater than 0%</p>
	BOP	<p><b>8.1.1 Using Bypass Valve Demand</b></p> <p>[1] To open Bypass valves <b>DEPRESS</b> the BPV demand RAISE, 2-HS-47-130B pushbutton to slowly open the Bypass Valves until the desired number of Bypass valves are open.</p> <p>Attempts to open the Main Turbine Bypass valves to rapidly depressurize the RPV.</p> <p>Reports that the Main Turbine Bypass valve will not open. Calls WC to initiate troubleshooting on the bypass valves</p>
	NRC	End of Event #8

Op Test No.: 15-01Scenario No. 2 Event No.: 9

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**Event Description: Core Spray Loop II injection valve will fail to open on initiation signal but can be manually opened**

Time	Position	Applicant's Actions or Behavior
	BOP	When reactor pressure lowers below 450 psig, checks that LPCI and CS injection valves automatically open.  Reports that CS II inboard injection valve (75-53) failed to automatically open.
	BOP	Opens CS II inbd injection valve (75-53) Reports that CS II inbd injection valve is open
	NRC	End of Event #9

## SIMULATOR SETUP

IC	
Exam IC	

Batch File or Pref File	
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Malfunctions	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Remotes	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Overrides	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Batch / Pref File(s):



Facility: BFNScenario No.: NRC - 3Op-Test No.: 1501

Examiners: \_\_\_\_\_

Operators: SRO: \_\_\_\_\_

ATC: \_\_\_\_\_

BOP: \_\_\_\_\_

**Initial Conditions:** Reactor Power is 5%. Unit 1 and Unit 2 are at 100% power.**Turnover:** Perform EHC Auto Pump Start Test & Weekly Pump Alternation IAW 3-OI-47A, Sec. 6.2. Continue plant startup IAW 3-GOI-100-1A section 5.4, mode change from Mode 2 to Mode 1.

Event Number	Malfunction Number	Event Type*	Event Description
1	N/A	N-BOP N-SRO	Perform EHC Auto Pump Start Test & Weekly Pump Alternation IAW 3-OI-47A, Sec. 6.2
2	N/A	R-ATC R-SRO	Power increase with Control Rods to 8% IAW GOI
3	RD07R0239 RD06R0239	C-ATC TS- SRO	Control Rod Drift in
4	OG04A	C-BOP C-SRO	Loss of SJAE 'A' / Swap to STBY SJAE 'B'
5	NM05	I-ATC TS-SRO	IRM 'C' Failure Upscale/Half Scram
6	DG03D	C-BOP TS-SRO	Loss of 4KV Shutdown Board 3ED, 3D D/G fails to AUTO tie
7	FW14C	C-ATC C-SRO	Trip of RFP 3C/ recover with already warm RFP 3B
8	PC 14 (e20 0) 100 300 75	M-ALL	Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level
9	FW30	C-ATC	Failure of RFP 3B governor/pump needs tripped.
10	AD01D AD01E	C-BOP C-SRO	ADS SRV Failures

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

Rec'd  
12/1/14

## Events

1. The BOP Operator will perform EHC Auto Pump Start Test & Weekly Pump Alternation IAW 3-OI-47A, Section 6.2. The Operator will have to turn off the pump twice before it will work. Once the EHC Pumps have been swapped the scenario may continue.
2. ATC will withdraw control rods in order to raise power to 8% for a mode change from 2 to 1. Once the Chief Examiner has seen an appropriate amount of power rise he may choose to continue with the next event which will halt control rod withdrawal.
3. Control Rod xx-xx will begin to drift in to approximately position 10, and the ATC will respond IAW 3-AOI-85-5 and bypass the RWM and insert Control Rod xx-xx to position 00. The SRO will declare Control Rod xx-xx inoperable and refer to Tech Spec 3.1.3 condition C. The SRO will also refer to Tech Spec 3.1.6 condition A for BPWS and 3.3.2.1 condition C for RWM. Once the rod has been inserted and the Tech Spec call has been made the scenario may continue.
4. Loss of SJAE A, BOP operator swaps to B SJAE IAW 3-AOI-47-3, Loss of Condenser Vacuum or IAW 3-OI-66 or the hardcard. After the standby SJAE has been placed in service and Main Condenser vacuum has recovered, the scenario may continue.
5. The ATC will respond to a failure of IRM 'C' upscale and notice and report that a ½ scram failed to come in on the upscale condition. IRM 'C' will be bypassed IAW 3-AOI-92-A, section 6.1. The SRO will refer to Tech Spec 3.3.1.1 and enter an Information A loss of trip function occurred and that Condition will be entered in the spec. After the BOP Operator bypasses the failed IRM and the SRO has completed the Tech Spec call the scenario may continue.
6. D 4KV Shutdown Board will lose power and the D Diesel Generator will fail to automatically tie to the Shutdown Board. The BOP will manually tie the Diesel to the board. SRO will refer to Tech Specs and determine TS 3.8.1 condition A, B, and G, and TS 3.8.7.A. The ATC will be resetting RPS and PCIS. After the BOP Operator ties the Diesel to the Buss and the SRO has completed the Tech Spec call the scenario may continue.
7. The ATC will respond to a trip of the 3C RFP IAW 3-AOI-3-1 by raising the speed of the warm RFP 3B to feed the RPV. Once the ATC has entered AOI-3-1 and raised the speed on the standby Reactor Feedpump to maintain RPV Water Level the scenario may continue.

8. At the cue of the Chief Examiner initiate the next event. An unisolable leak will develop on the suppression chamber. The US will direct entry into EOI-3 on secondary containment area flood alarms and EOI-2 on suppression pool water level. Prior to 12.75 ft, in the Suppression Pool, the US will direct HPCI to be secured and locked out. Prior to 11.5 ft in the Suppression Pool the US will transition to EOI-1 and direct a SCRAM. An ATWS will exist on the SCRAM. The crew will work through EOI-1 and C-5 to insert control rods, maintain reactor water level, and reactor pressure. The US will transition to C-2 to emergency depressurize before Suppression Pool water level lowers to 11.5 feet.
9. The US will direct terminating and preventing IAW EOI appendix 4, and the 3B RFP governor will fail as is. The ATC/BOP will Trip the 3B RFP.
10. The BOP will report that two of the ADS SRV's failed for Emergency Depressurization. Two additional non ADS SRV's will be opened at the direction of the SRO.

The Scenario ends when Emergency Depressurization and Reactor Water Level is restored and maintained within the assigned band or upon request of Lead Examiner.

**Critical Tasks 4****1. When Suppression Pool Level cannot be maintained above 12.75 feet HPCI secured to prevent damage.**

1. Safety Significance:  
Prevent failure of Primary Containment from pressurization of the Suppression Chamber
2. Cues:  
Procedural compliance  
Suppression Pool Level indication
3. Measured by:  
Observation – HPCI Auxiliary Pump placed in Pull to Lock
4. Feedback:  
HPCI does not Auto initiate  
  
No RPM indication on HPCI

**2. When Suppression Pool level cannot be maintained above 11.5 feet the US determines that Emergency Depressurization is required, RO initiates Emergency Depressurization as directed by US.**

1. Safety Significance:  
Precludes failure of Containment
2. Cues:  
Procedural compliance  
Suppression Pool Level Trend
3. Measured by:  
Observation - US determines (indicated by announcement or observable transition to C-2) that Emergency Depressurization is required before Suppression Pool level drops below 11.5 feet.

**AND**

Observation - RO opens at least 6 SRV's during performance of Emergency Depressurization actions.

4. Feedback:
  - RPV pressure trend
  - SRV status indications
  - Suppression Pool temperature trend
3. **During an ATWS, when conditions with Emergency Depressurization required, Terminate and Prevent RPV injection from ECCS and Feedwater until reactor pressure is below the MARFP as directed by US.**

1. Safety Significance:
  - Prevention of fuel damage due to uncontrolled feeding.
2. Cues:
  - Procedural compliance.
3. Measured by:
  - Observation - No ECCS injection prior to being less than the MARFP.

**AND**

Observation - Feedwater terminated and prevented until less than the MARFP.

4. Feedback:
  - Reactor power trend, power spikes, reactor short period alarms.
  - Injection system flow rates into RPV.

**4. With RPV pressure <MARFP, slowly increase and control injection into RPV to restore and maintain RPV level above TAF as directed by US.**

**1. Safety Significance:**

Maintaining adequate core cooling and preclude possibility of large power excursions.

**2. Cues:**

Procedural compliance  
RPV pressure indication

**3. Measured by:**

Observation - Injection not commenced until less than MARFP, and injection controlled such that power spikes are minimized, level restored and maintained greater than TAF

**4. Feedback:**

RPV level trend  
RPV pressure trend  
Injection system flow rate into RPV

Op Test No.: 15-01Scenario No. 3 Event No.: 1

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**Event Description: Perform EHC Auto Pump Start Test & Weekly Pump Alternation  
IAW 2-OI-47A, Sec. 6.2**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>2-OI-47A</b> <b>6.2 EHC Auto Pump Start Test &amp; Weekly Pump Alternation</b></p> <p>[1] <b>VERIFY</b> EHC System in service. <b>REFER TO</b> Section 5.1.</p> <p>[2] <b>REVIEW</b> Precautions and Limitations listed in Section 3.0</p> <p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1) This section is performed from Panel 2-9-7 unless otherwise specified.</li> <li>2) This test should be performed during weekly alternation of pumps.</li> <li>3) This section describes the actions necessary to test (standby) EHC Pump 2A. Testing EHC Pump 2B is the same and the component numbers are enclosed in parenthesis.</li> <li>4) Operations personnel should be present at the EHC skid to observe proper system operation.</li> <li>5) If EHC PUMP 2A(2B) TEST, 2-HS-47-4A(5A), is depressed for longer than 10 seconds, annunciator STANDBY EHC PUMP FAILED, 2-XA-47-111 (2-XA-55-7B, window 15), will alarm.</li> </ol> <p>[3] <b>DEPRESS</b> the EHC PUMP 2A(2B) TEST, 2-HS-47-4A(5A), and <b>CHECK</b> the following actions occur:</p> <ul style="list-style-type: none"> <li>• EHC Hydraulic Fluid Pump 2A(2B) starts.</li> <li>• Annunciator STANDBY EHC PUMP RUNNING, 2-XA-47-108 (2-XA-55-7B Window 8), ANNUNCIATES. <input type="checkbox"/></li> <li>• Red light above test switch is ILLUMINATED (PS-47-1B(2B)) (positive indication of pump discharge pressure)</li> </ul> <p><b>NOTE</b></p> <p>Allow both EHC pumps to operate for at least 30 seconds to allow the Standby pump to expel any air which may have accumulated in the pump casing</p> <p>[4] <b>CHECK</b> the started EHC HYD PUMP 2A(2B) DISCH PRESS, 2-PI-47-1(2), indicates between 1550 psig and 1750 psig, locally at the EHC skid.</p> <p>Calls AUO at EHC skid to verify EHC pump discharge pressure</p>

Op Test No.: 15-01

Scenario No. 3 Event No.: 1

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**Event Description: Perform EHC Auto Pump Start Test & Weekly Pump Alternation  
IAW 2-OI-47A, Sec. 6.2**

Time	Position	Applicant's Actions or Behavior
	DRIVER	As AUO report EHC pump discharge pressure is 1650 psig
		<p><b>NOTE</b></p> <p>If, after starting the standby EHC pump, EHC pump discharge pressure is significantly above 1750 psig, there may be a problem with the pressure compensator. Consideration should be given to contacting System Engineering prior to placing the standby EHC pump in service.</p> <p>[5] <b>IF</b> the started EHC pump discharge pressure is <b>NOT</b> between 1550 psig and 1750 psig, <b>THEN</b> <b>ADJUST</b> pressure compensator for the started EHC pump to adjust pump discharge pressure. <b>REFER TO</b> Section 8.6[1].</p> <p><b>NOTES</b></p> <p>1) Voltmeters in Step 6.2[6] normally indicate approximately zero volts. When an EHC header pressure switch actuates, the associated voltmeter will indicate approximately mid-scale. The Unit Operator should be notified if a voltmeter indicates greater than 5 volts with the EHC System in service.</p> <p>2) If two out of three EHC header pressure switches actuate, a turbine trip will occur.</p> <p>[6] <b>CHECK</b> locally on Junction Box 2-JBOX-047-10166 that the following voltmeters indicate approximately 0 volts:</p> <ul style="list-style-type: none"> <li>• TURB EHC HDR PRESS 2-PS-47-63A TRIP IND, 2-EI-047-0063A.</li> <li>• TURB EHC HDR PRESS 2-PS-47-63B TRIP IND, 2-EI-047-0063B.</li> <li>• TURB EHC HDR PRESS 2-PS-47-63C TRIP IND, 2-EI-047-0063C.</li> </ul> <p>Calls operator at Junction Box to verify voltmeters indicate approximately 0 volts.</p>
	DRIVER	As operator at Junction Box, report voltmeters indicate approximately 0 volts.



Op Test No.: 15-01

Scenario No. 3 Event No.: 1

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**Event Description: Perform EHC Auto Pump Start Test & Weekly Pump Alternation  
IAW 2-OI-47A, Sec. 6.2**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[7] <b>IF</b> alternating operating EHC pumps, <b>THEN STOP</b> EHC pump 2B(2A) using EHC HYD FLUID PUMP 2B(2A), 2-HS-47-2A(1A).</p> <p>[10] <b>CHECK</b> EHC HEADER PRESSURE, 2-PI-47-7, indicates between 1550 psig and 1650 psig.</p> <p><b>The EHC Pump will not stop on the first attempt and the Operator will notice this and report it right away or try the switch again and then report to the US that the pump failed to stop on the first attempt.</b></p>
		<p>[12] <b>IF</b> pumps were alternated, <b>THEN RESET</b> any disagreement flags by placing the operating EHC pump handswitch, 2-HS-47-1A(2A), to START.</p> <p>[13] <b>CHECK</b> EHC PMP 2A(2B) MTR amps, 2-EI-47-1(2) indicates less than 140 amps for the operating pump.</p> <p>[14] <b>VERIFY</b> EHC Pump 2A(2B), EHC PUMP SUCTION FILTER and EHC AUX PUMP SUCTION FILTERS indicate CLEAN, locally at the EHC skid.</p> <p>[15] [NER/C] <b>VERIFY</b> MANUAL FLOW CONTROL VALVE, 2-47-588, is set at 2.5 turns clockwise. [INPO SOER 84-006]</p> <p><b>Calls AUO at EHC skid to verify pump suctions filters clean and that manual flow control valve is 2.5 turns clockwise.</b></p>

Op Test No.: 15-01Scenario No. 3 Event No.: 1

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**Event Description: Perform EHC Auto Pump Start Test & Weekly Pump Alternation  
IAW 2-OI-47A, Sec. 6.2**

Time	Position	Applicant's Actions or Behavior
	DRIVER	As AUO, report that EHC pump and aux. pump suction filters indicate clean and 2-47-588, manual flow control valve, is set 2.5 turns clockwise.
	BOP	<p style="text-align: center;"><b>NOTES</b></p> <p>1) Voltmeters in Step 6.2[16] normally indicate approximately zero volts. When an EHC header pressure switch actuates, the associated voltmeter will indicate approximately mid-scale. The Unit Operator should be notified if a voltmeter indicates greater than 5 volts with the EHC System in service.</p> <p>2) If two out of three EHC header pressure switches actuate, a turbine trip will occur.</p>
		<p>[16] <b>CHECK</b> locally on Junction Box 2-JBOX-047-10166 that the following voltmeters indicate approximately 0 volts:</p> <ul style="list-style-type: none"> <li>• TURB EHC HDR PRESS 2-PS-47-63A TRIP IND, 2-EI-047-0063A.</li> <li>• TURB EHC HDR PRESS 2-PS-47-63B TRIP IND, 2-EI-047-0063B.</li> <li>• TURB EHC HDR PRESS 2-PS-47-63C TRIP IND, 2-EI-047-0063C.</li> </ul> <p>Calls operator at JB to check voltmeters</p>
	DRIVER	As operator at Junction Box, report voltmeters all indicate approximately 0 volts.
	NRC	End of Event #1

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**Event Description: Power increase with Control Rods to 8% IAW GOI**

Time	Position	Applicant's Actions or Behavior
	SRO	Conducts crew brief to focus on the continued reactor startup Directs ATC to continue startup IAW GOI-100-1A
	ATC	<b>2-GOI-100-1A</b>  <b>5.4 Withdrawal of Control Rods while in Mode 2 (continued)</b> [67] <b>CONTINUE</b> to withdraw control rods to raise Reactor power to approximately 8% per 2-OI-85 and 2-SR-3.1.3.5(A).  <b>2-OI-85</b>  <b>6.6.3 Control Rod Notch Withdrawal</b>  [1] <b>SELECT</b> the desired control rod by depressing the appropriate CRD ROD SELECT pushbutton, 2-XS-85-40.  [2] <b>OBSERVE</b> the following for selected control rod: <ul style="list-style-type: none"><li>• CRD ROD SELECT pushbutton is brightly ILLUMINATED.</li><li>• White light on the Full Core Display ILLUMINATED</li><li>• Rod Out Permit light ILLUMINATED.</li></ul> [3] <b>VERIFY</b> ROD WORTH MINIMIZER operable and LATCHED into correct ROD GROUP when Rod Worth Minimizer is enforcing.  [4] <b>PLACE</b> CRD CONTROL SWITCH, 2-HS-85-48, in ROD OUT NOTCH and <b>RELEASE</b>  [5] <b>OBSERVE</b> control rod settles into desired position <b>AND</b> ROD SETTLE light extinguishes.  [6] <b>IF</b> control rod is notch withdrawn to rod notch Position 48, <b>THEN</b>

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**Event Description: Power increase with Control Rods to 8% IAW GOI**

Time	Position	Applicant's Actions or Behavior
	ATC	<p><b>PERFORM</b> control rod coupling integrity check as follows:</p> <p>[6.1] <b>PLACE</b> CRD CONTROL SWITCH, 2-HS-85-48, in ROD OUT NOTCH and <b>RELEASE</b>. □</p> <p>[6.2] <b>CHECK</b> control rod coupled by observing the following:</p> <ul style="list-style-type: none"><li>• Four rod display digital readout <b>AND</b> full core display digital readout <b>AND</b> background light remain illuminated.</li><li>• CONTROL ROD OVERTRAVEL annunciator (2-XA-55-5A, Window 14) does not alarm.</li></ul> <p>[6.3] <b>CHECK</b> control rod settles into Position 48 and ROD SETTLE light extinguishes.</p> <p>[6.4] <b>IF</b> control rod coupling integrity check fails, <b>THEN</b> Refer to 2-AOI-85-2.</p> <p>Withdraws control rods IAW 2-OI-85 and 2-SR- 3.1.3.5(A).</p>
	NRC	End of Event #2

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**Event Description: Control Rod Drift In**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is satisfied with the reactivity change and is ready for Event No. 3, insert F3 (bat NRC/1501-3-3) to drift control rod 2243 in.
	ATC	<p>Reports CONTROL ROD DRIFT (2-XA-55-5A, Window 28) in alarm.</p> <p><b>2-ARP-9-5A</b>  A. <b>DETERMINE</b> which rod is drifting from Full Core Display  C. IF rod drifting in, <b>THEN</b>  REFER TO 2-AOI-85-5 and 2-AOI-85-7.</p> <p><b>2-AOI-85-5</b>  <b>4.0 OPERATOR ACTIONS</b>  <b>4.1 Immediate Actions</b>  [1] IF multiple rods are drifting into core, <b>THEN</b>  <b>MANUALLY SCRAM</b> Reactor. Refer to 2-AOI-100-1.</p> <p><b>4.2 Subsequent Actions</b>  <b>NOTE</b>  If Reactor Power is less than 24%, the Rod Worth Minimizer (RWM) system may impose rod blocks</p> <p>[1] IF Reactor Power is less than less than 24% RTP, <b>THEN</b>  <b>MANUALLY BYPASS</b> the Rod Worth Minimizer on Panel 2-9-5 as follows: (Otherwise N/A)  [1.1] <b>PLACE</b> RWM SWITCH PANEL, 2-XS-85-9025, in BYPASS position.  [1.2] <b>CHECK</b> the Manual Bypass light is illuminated.  [1.3] <b>NOTIFY</b> the Unit Supervisor that Rod Worth Minimizer has been manually Bypassed. (Reference Tech Spec Sections 3.3.2.1 and 3.1.6)  [1.4] When time permits, <b>PERFORM</b> the remaining actions to Manually Bypass the Rod Worth Minimizer per 2-OI-85.</p> <p>[2] IF a Control Rod is moving from its intended position without operator actions, <b>THEN</b>  <b>INSERT</b> the Control Rod to position 00 using CONTINUOUS IN. (Otherwise N/A)</p>

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**Event Description: Control Rod Drift In**

Time	Position	Applicant's Actions or Behavior
	ATC	Identifies and reports control rod 22-43 drifting into the core Monitors the full core display for other control rod drifts
	DRIVER	When control rod 22-43 stops moving (stuck), insert Shift F3 (dmf rd07r2243) to delete the drift then insert Shift F4 (dmf rd06r2243) to allow the rod to be inserted
	ATC	<p>Bypasses the RWM</p> <p>Identifies and reports that the drifting control rod has stopped moving at notch position 10</p> <p>Selects the control rod 22-43 and inserts the rod to position 00 using CONTINUOUS IN</p> <p>Reports control rod 22-43 inserted FULL IN</p> <p>[4] <b>NOTIFY</b> the Reactor Engineer to Evaluate Core Thermal Limits and Preconditioning Limits for the current Control Rod pattern.</p> <p>Calls Reactor Engineer to report control rod 22-43 drifting into the core. Subsequently inserted to FULL IN. Need to evaluate core thermal limits and preconditioning limits.</p> <p>Dispatches AUO to investigate the rod drift at the HCU</p>
	DRIVER	<p>As RE, acknowledge control rod 22-43 drifting in and subsequently being inserted fully into the core. Will evaluate core thermal limits and preconditioning limits.</p> <p>As AUO, acknowledge going to HCU for control 22-43 to investigate the rod drift</p>

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**Event Description: Control Rod Drift In**

Time	Position	Applicant's Actions or Behavior		
	SRO	Evaluates Technical Specifications 3.1 REACTIVITY CONTROL SYSTEMS 3.1.3 Control Rod OPERABILITY LCO 3.1.3 Each control rod shall be OPERABLE		
		C. One or more control rods inoperable for reasons other than Condition A or B	Fully insert inoperable control rod AND Disarm the associated CRD	3 hr  4 hr
		3.1.6 Rod Pattern Control LCO 3.1.6 OPERABLE control rods shall comply with the requirements of the banked position withdrawal sequence (BPWS).		
		A. One or more OPERABLE control rods not in compliance with BPWS	A.2 Declare associated control rod inoperable	8 hr
		3.3 INSTRUMENTATION 3.3.2.1 Control Rod Block Instrumentation LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.		
		C. Rod worth minimizer (RWM) inoperable during reactor startup.	C.1 Verify $\geq 12$ rods withdrawn AND C.2.2 Verify movement of control rods is in compliance with banked position withdrawal sequence by a second licensed operator or other qualified member of the technical staff	Immediately
		Updates crew on Technical Specification requirements for the inoperable control rod, RWM, and BPWS.		

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**Event Description: Control Rod Drift In**

Time	Position	Applicant's Actions or Behavior
	DRIVER	As Rx Bldg AUO, report that the scram outlet valve riser temperature has higher than normal temperature.
	NRC	End of Event #3



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Scenario No. 3 Event No.: 4

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Event Description: Loss of SJAE 'A' / Swap to STBY SJAE 'B'

Time	Position	Applicant's Actions or Behavior
	DRIVER	When NRC Chief Examiner is ready for Event No. 4, insert F4 (imf og04a) to isolate 'A' SJAE.
	BOP	Reports OG HOLDUP LINE INLET FLOW LOW (2-XA-55-53, Window 4) in alarm.  <b>2-ARP-9-53</b> D. <b>VERIFY</b> that SJAE auto isolation has <b>NOT</b> occurred  Reports that SJAE 'A' has isolated
	SRO	Directs BOP to swap to SJAE 'B' using the hard card Directs ATC to monitor main condenser vacuum
	BOP	<b>2-OI-66</b>  <b>Appendix C</b> <b>Standby SJAE System Lineup Hard Card</b> <b>2.0 OPERATOR ACTION FOR SJAE 2B</b>  <b>NOTES</b> Radiation Protection should be notified prior to placing a SJAE in service. If time does not permit this due to plant conditions then notification should be made when possible.  2-HS-001-0375, SJAE TRAIN PERMISSIVE (located on 2-LPNL-925-0105, U2 TB, el 586') should normally be in the position of the standby SJAE. If problems are encountered while placing a SJAE in service and time permits, operate this switch as required during the performance of this section.

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Event Description: **Loss of SJAE 'A' / Swap to STBY SJAE 'B'**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[1] <b>VERIFY RESET</b> Off-Gas isolation using 2-HS-90-155, OG OUTLET/DRAIN ISOLATION VLVS.</p> <p>[2] <b>VERIFY OPEN</b> the following valves:</p> <ul style="list-style-type: none"> <li>• 2-HS-66-15, SJAE 2B INLET VALVE.</li> <li>• 2-HS-1-156A, STEAM TO SJAE 2B.</li> </ul> <p>[3] <b>VERIFY</b> in <b>AUTO/OPEN</b> 2-HS-66-18, SJAE 2B OG OUTLET VALVE.</p> <p>[4] <b>PLACE</b> 2-HS-1-152, SJAE 2B PRESS CONTROLLER, in <b>CLOSE</b> and then in <b>OPEN</b>.</p> <p>[5] <b>VERIFY OPEN</b> the following valves (red light illuminated):</p> <ul style="list-style-type: none"> <li>• 2-PCV-1-153/167, STEAM TO SJAE 2B STAGES 1,2, AND 3.</li> <li>• 2-FCV-1-152, SJAE 2B INTMD CONDENSER DRAIN.</li> </ul> <p>[6] <b>MONITOR</b> hotwell pressure as indicated on CONDENSATE recorder, 2-XR-002-0026 (Point 3), on Panel 2-9-6.</p> <p>[7] <b>FOR</b> the SJAE not being placed in service, <b>VERIFY CLOSED</b> the following valves:</p> <ul style="list-style-type: none"> <li>• 2-HS-66-14, SJAE 2A OG OUTLET VALVE.</li> <li>• 2-HS-1-150, SJAE 2A PRESSURE CONTROLLER.</li> <li>• 2-HS-1-155A STEAM TO SJAE 2A</li> </ul> <p>Reports 'B' SJAE in service Calls RP to report 'B' SJAE placed in service</p>
	ATC	Reports that main condenser vacuum had started to lower but has returned to normal
	DRIVER	As RP, acknowledge that 'B' SJAE has been placed in service.
	NRC	End of Event #4

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Scenario No. 3 Event No.: 5

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**Event Description: IRM 'C' Failure of Upscale/Half Scram**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 5, insert F5 (imf nm05c 100) to fail IRM 'C' upscale.
	ATC	Reports IRM C HI-HI/INOP condition with no reactor half scram. Immediately stops reactivity changes.
	ATC	<p>Reports that "IRM CH A, C, E, G HI-HI/INOP" (2-XA-55-5A, Window 33) and REACTOR CHANNEL A AUTO SCRAM (2-XA-55-5B, Window 1) failed to come in on a valid IRM Upscale condition.</p> <p><b>Reviews ARPs</b></p> <p><b>2-ARP-9-5A</b></p> <p>A. <b>STOP</b> any reactivity changes.</p> <p>B. <b>VERIFY</b> alarm by multiple indications.</p> <p>C. <b>RANGE</b> initiating channel or <b>BYPASS</b> initiating channel to reset half-scram. <b>REFER TO 2-OI-92A.</b></p> <p>D. With SRO permission, <b>RESET</b> Half Scram. <b>REFER TO 2-OI-99.</b></p> <p>H. <b>NOTIFY</b> Reactor Engineer</p> <p><b>2-ARP-9-5B</b></p> <p>A. <b>VERIFY</b> channel A relays dropped out by checking scram solenoid and backup scram valve lights extinguished.</p> <p>Checks indications and reports IRM 'C' has failed upscale Verifies scram solenoid and backup scram valve lights did not extinguish.</p>

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**Event Description: IRM 'C' Failure Upscale/Half Scram**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Directs that IRM 'C' be bypassed IAW OI-92A</p> <p>Refers to Technical Specifications</p> <p>3.3 INSTRUMENTATION</p> <p>3.3.1.1 Reactor Protection System (RPS) Instrumentation</p> <p>LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.</p> <p>Table 3.3.1.1-1</p> <p>Reactor Protection System Instrumentation</p> <p>1. Intermediate Range Monitors</p> <p>a. Neutron Flux – High    2       3       G</p> <p>Determines that:</p> <p>Condition C applies because of the failure of RPS to Trip on a HI-HI signal.</p> <p>Required Action</p> <p>Restore RPS trip capability</p> <p>Completion time</p> <p>1 hour.</p>
	SRO	Directs ATC and BOP to insert a half scram IAW OI-99
	NRC	<p><b>The next event needs to be started before the crew has the opportunity to placing the ½ scram in on A RPS because losing D 4 KV, and B RPS.</b></p> <p>End of Event #5</p>

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Scenario No. 3 Event No.: 6

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**Event Description: Loss of 4KV Shutdown Board D, D D/G fails to AUTO tie**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 6, insert F6 to cause the loss of 4kV SD Bd D (ed09d) and a failure of 'D' DG to automatically tie to the board (dg03d). After diesel has started, insert Shift F6 (dmf ed09d) to delete to overcurrent trip of the board.
	ATC	Reports a reactor half scram and loss of RPS 'B'
	BOP	Recognizes and reports that 'D' 4kV Shutdown Board is de-energized and 'D' Diesel Generator failed to automatically tie to the board. Verifies no lockout conditions on the board and closes 'D' Diesel Generator output breaker Reports 'D' 4kV Shutdown Board re-energized Call WC to investigate the loss of 'D' 4kV Shutdown Board and the failure of 'D' to automatically tie to the board. Calls to have RPS 'B' restored
	DRIVER	As WC, acknowledge initiating investigation of the loss of 'D' 4kV Shutdown Board and the failure of 'D' Diesel Generator to automatically tie to the board. As outside US, acknowledge restoring power to RPS 'B'
	SRO	Refers to Technical Specifications 3.8 ELECTRICAL POWER SYSTEMS 3.8.1 AC Sources - Operating LCO 3.8.1 The following AC electrical power sources shall be OPERABLE: a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; b. Unit 1 and 2 diesel generators (DGs) with two divisions of 480 V load shed logic and common accident signal logic OPERABLE;  A. One required offsite circuit inoperable.      A.1 Verify power availability from the remaining OPERABLE offsite transmission network      1 hr AND Once /8 hr

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**Event Description: Loss of 4KV Shutdown Board D, D D/G fails to AUTO tie**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>B. One required Unit 1 and 2 DG inoperable.      B.1 Verify power availability from the offsite      1 hr AND</p> <p>G. One required offsite circuit inoperable.      G.1 Declare the affected 4.16 kV shutdown board inoperable      Immediately</p> <p>AND One Unit 1 and 2 DG Inoperable</p> <p>3.8 ELECTRICAL POWER SYSTEMS 3.8.7 Distribution Systems – Operating LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE: a. Unit 1 and 2 4.16 kV Shutdown Boards;</p> <p>A. One Unit 1 and 2 4.16 kV Shutdown Board inoperable.      A.1 Restore the Unit 1 and 2 4.16kV Shutdown Bd to OPERABLE status      5 day</p> <p>Briefs crew on Technical Specification requirements based on the loss of 4kV Shutdown Board 'D'</p>
	DRIVER	Insert Shift F7 (mrf rp02 reset) to reset RPS 'B' circuit protectors. As outside US, call and report that RPS 'B' has been restored
	SRO	Directs ATC to reset RPS and PCIS IAW OI-99
	ATC	<p><b>2-OI-99</b> <b>8.5 Restoration to Normal Following RPS Bus Power Loss or Transfer</b></p> <p><b>NOTES</b></p> <p>1) This section provides instructions for resetting the various system isolations and reopening affected valves to allow those systems to be restored to normal operation in accordance with their respective operating instructions.</p> <p>2) The following steps are performed at Panel 2-9-5 unless otherwise noted.</p>

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**Event Description: Loss of 4KV Shutdown Board D, D D/G fails to AUTO tie**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>3) When RPS Bus power is lost to some scram discharge volume level switches, their RTD heater is de-energized. Following the restoration of power, a time delay, dependent on how long the level switch was de-energized, prevents resetting the half scram signal. This may take up to 37 seconds after RPS power is restored. Precaution 3.0 O can be referred to for more information on these level switches</p> <p>[1] <b>OBTAIN</b> Unit Supervisor/SRO's permission to restore to normal.</p> <p>[2] <b>MOMENTARILY PLACE</b> SCRAM RESET, 2-HS-99-5A-S5, as follows:</p> <p>[2.1] RESET FIRST position. (Group 2/3)</p> <p>[2.2] RESET SECOND position. (Group 1/4)</p> <p>[2.3] NORMAL position.</p> <p>[3] <b>CHECK</b> the following conditions:</p> <p>A. All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights ILLUMINATED. <input type="checkbox"/></p> <p>B. The following four lights ILLUMINATED:</p> <ul style="list-style-type: none"> <li>• SYSTEM A BACKUP SCRAM VALVE, 2-IL-99-5A/AB.</li> <li>• SYSTEM B BACKUP SCRAM VALVE, 2-IL-99-5A/CD.</li> </ul> <p>C. Scram Discharge Volume vent and drain valves indicate OPEN.</p> <p>D. Points SOE033 and SOE035 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "A".</p> <p>E. Points SOE034 and SOE036 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "B".</p> <p>[4] At Panel 2-9-4, <b>RESET</b> PCIS trip logic as follows:</p> <p>[4.1] <b>MOMENTARILY PLACE</b> PCIS DIV I RESET, 2-HS-64-16A-S32, to left and right RESET positions.</p> <p>[4.2] <b>CHECK</b> the following red lights ILLUMINATED:</p> <ul style="list-style-type: none"> <li>• MSIV GROUP A1.</li> <li>• MSIV GROUP B1.</li> </ul> <p>[4.3] <b>MOMENTARILY PLACE</b> PCIS DIV II RESET, 2-HS-64-16A-S33, to left and right RESET positions.</p>

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**Event Description: Loss of 4KV Shutdown Board D, D D/G fails to AUTO tie**

Time	Position	Applicant's Actions or Behavior
		[4.4] <b>CHECK</b> the following red lights ILLUMINATED: <ul style="list-style-type: none"><li>• MSIV GROUP A2.</li><li>• MSIV GROUP B2.</li></ul> Resets RPS and PCIS IAW OI-99 Reports RPS and PCIS have been reset
	NRC	End of Event #6



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**Event Description: Trip of RFP 2C/ recover with already warm RFP 2B**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 7, insert F7 (imf fw14c) to trip reactor feedpump 2C
	ATC	Reports RFPT TRIPPED (2-XA-55-6C, Window 29) in alarm. Monitors indications and reports RPT 'C' tripped. Monitors reactor water level
	SRO	Directs entering AOI-3-1 to control reactor water level
		<b>2-AOI-3-1</b> <b>4.2 Subsequent Actions</b> <b>5.0 LOW REACTOR WATER LEVEL OR LOSS OF FEEDWATER</b> [1] IF Feedwater Control System has failed, THEN <b>PERFORM</b> the following: [1.1] <b>PLACE</b> individual RFPT Speed Control Raise/Lower switches in Manual Governor (depressed position with amber light illuminated). [1.2] <b>ADJUST</b> RFP Discharge flows with RFPT Speed Control Raise/Lower switches as necessary to maintain Reactor Water Level.  Verifies '2B' RFPT speed control switch in manual and raises RFPT speed to control and maintain reactor water level. Places '2B' RFPT in automatic control Reports '2B' RFPT in service
	SRO	Calls WC to investigate the trip of '2C' RFPT
	DRIVER	As WC, acknowledge WO to investigate the trip of '2C' RFPT
	NRC	End of Event #7

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**Event Description: Loss of Torus Water level /SCRAM (ATWS) and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 8, insert F8 (bat NRC/1501-3-8) to insert a torus leak and ATWS
	ATC/BOP	Reports multiple room flood alarms in secondary containment and SUPPR CHAMBER WATER LEVEL ABNORMAL (2-XA-55-3B, Window 15) in alarm
		<b>2-ARP-9-3B</b> A. <b>CHECK</b> Suppression Pool level using multiple indications. B. <b>IF</b> level is low, <b>THEN</b> <b>DISPATCH</b> personnel to check for leaks. E. <b>REFER TO</b> Tech Spec 3.6.2.2. F. <b>IF</b> level is above -1" or below -6.25" <b>AND NOT</b> in Mode 4 or Mode 5 <b>THEN</b> (otherwise N/A) <b>ENTER</b> 2-EOI-2 Flowchart.
	BOP	Reports suppression pool water level lowering Calls AUO to check for leaks in reactor building pump rooms and torus area
	SRO	Enters EOI-3 on secondary containment flood alarms <b>EOI-3</b> <b>IF</b> SAMG entry is required and the TSC SAM team has assumed command and control – <b>NO</b> Rx Zone ventilation exh radiation lvl is above 72 mR/hr - <b>NO</b> Refuel Zone ventilation exh radiation lvl is above 72 mR/hr - <b>NO</b> Rx Zone ventilation is isolated <b>AND</b> Rx Zone ventilation exh radiation lvl is below 72 mR/hr - <b>NO</b> Refuel Zone ventilation is isolated <b>AND</b> Refuel Zone ventilation exh radiation lvl is below 72 mR/hr – <b>NO</b> <b>CAUTION</b> #7 Spent fuel pool temp and level

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>SC/L</b>            WHEN any floor drain sump water level is above 66 in. - <b>YES</b>            WHEN any area water level is above 2 in. - <b>YES</b></p> <p><b>RESTORE</b> and <b>MAINTAIN</b> floor drain sump water lvls            Below 66 in. using all available sump pumps - <b>CHECKED</b></p> <p><b>RESTORE</b> and <b>MAINTAIN</b> area water lvls below 2 in. using all            available sump pumps - <b>CHECKED</b></p> <p>WHEN any floor drain sump water lvl cannot be restored and            maintained below 66 in - <b>YES</b></p> <p>WHEN any area water lvl cannot be restored and maintained            below 2 in. - <b>YES</b></p> <p><b>ISOLATE</b> all systems that are discharging into the area EXCEPT            systems required:            For damage control            OR            To be operated by EOIs - <b>CHECKED</b></p>
	DRIVER	After being dispatched to check water levels, wait 5 minutes and report that water level is approximately 4 inches and rising in the southwest quad. Water is flowing in from the torus area. Source of the leak is unknown
	SRO	<p>Will emergency depressurization reduce discharge into Secondary            Cntmt - <b>NO</b>            WHEN water lvls in 2 or more areas are above 20 in.</p> <p>Enters EOI-2 on Supp PI Lvl below -6.25 in</p> <p>SAMG entry is required and the TSC SAM team has assumed            command and control - <b>NO</b>            SAMG entry is required - <b>NO</b></p> <p>CAUTION            #4 PC press vs pump NPSH - <b>CHECKED</b></p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior				
	SRO	<p>DW sprays have been initiated - <b>NO</b> Suppr chmbr sprays have been initiated - <b>NO</b> PC water level CANNOT be restored and maintained below 105 ft - <b>CAN</b> <b>OR</b> Suppr chmbr press CANNOT be restored and maintained below 55 psig - <b>CAN</b></p> <p><b>SP/L</b> Primary Containment Flooding is required - <b>NO</b> <b>AND</b> SAMG entry is NOT required</p> <p><b>MONITOR</b> and <b>CONTROL</b> suppr pl lvl between -1 in. and -6 in. (APPX 18)</p> <p>Directs BOP to control suppression pool water level IAW App. 18</p> <p>Can suppr pl lvl be maintained above-6 in. – NO</p> <table><tr><td><b>IF</b></td><td><b>THEN</b></td></tr><tr><td>Suppr pl lvl CANNOT be Maintained above 12.75 ft</td><td><b>SECURE</b> HPCI irrespective of whether adequate core cooling Is assured</td></tr></table> <p>Sets a trigger value, on suppression pool level, for securing HPCI</p> <p>Briefs crew on current plant conditions including securing HPCI at the trigger value for SPL.</p>	<b>IF</b>	<b>THEN</b>	Suppr pl lvl CANNOT be Maintained above 12.75 ft	<b>SECURE</b> HPCI irrespective of whether adequate core cooling Is assured
<b>IF</b>	<b>THEN</b>					
Suppr pl lvl CANNOT be Maintained above 12.75 ft	<b>SECURE</b> HPCI irrespective of whether adequate core cooling Is assured					
	BOP	<p>EOI APPENDIX-18 <b>SUPPRESSION POOL WATER INVENTORY REMOVAL AND MAKEUP</b></p> <p>NOTE: All panel operations performed at Control Room Panel 2-9- 3 unless otherwise stated.</p> <p>1. IF ..... Suppression Pool Water makeup is required, THEN ... <b>CONTINUE</b> in this procedure at Step 5.</p>				

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>5. IF ..... Directed by SRO to Emergency Makeup to the Suppression Pool from Standby Coolant, THEN ... <b>CONTINUE</b> in this procedure at Step 9 using RHR Loop I OR Step 10 using RHR Loop II.</p> <p>6. IF ..... Directed by SRO to add water to suppression pool, THEN ... <b>MAKEUP</b> water to Suppression Pool as follows:</p> <ol style="list-style-type: none"> <li><b>VERIFY OPEN</b> 2-FCV-73-40, HPCI CST SUCTION VALVE.</li> <li><b>OPEN</b> 2-FCV-73-30, HPCI PUMP MIN FLOW VALVE.</li> </ol> <p>Adds water to the suppression pool IAW App. 18 Monitors Suppression Pool water level and reports that level is continuing to lower.</p>
	SRO	Directs securing HPCI
	BOP	Secures HPCI by placing HPCI Aux Oil Pump in PTL.
		<p><b>When Suppression Pool Level cannot be maintained above 12.75 feet HPCI secured to prevent damage.</b></p> <ol style="list-style-type: none"> <li><b>Safety Significance:</b> Prevent failure of Primary Containment from pressurization of the Suppression Chamber</li> <li><b>Cues:</b> Procedural compliance Suppression Pool Level indication</li> <li><b>Measured by:</b> Observation – HPCI Auxiliary Pump placed in Pull to Lock</li> <li><b>Feedback:</b> HPCI does not Auto initiate No RPM indication on HPCI</li> </ol> <p>This Critical Task is <b>not met</b> if the Crew fails to place the HPCI AOP in PTL at 12.75 ft.</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<b>MAINTAIN</b> suppr pl lvl above 11.5 ft (APPX 18) <b>BEFORE</b> Suppr pl lvl drops to 11.5 ft <b>CONTINUE</b>
	SRO	Enters EOI-1, RPV Control at Step RC-1  SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b> <b>VERIFY</b> RX scram  Directs ATC to initiate a manual reactor scram
	ATC	Initiates a manual reactor scram  <b>Reactor Scram OATC Hard Card</b> <b>1.0 IMMEDIATE ACTIONS</b>  [1] <b>DEPRESS</b> REACTOR SCRAM A and B, 2-HS-99-5A/S3A and 2-HS-99-5A/S3B, on Panel 2-9-5.  [2] <b>IF</b> scram is due to a loss of RPS, <b>THEN PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in START & HOT STBY <b>AND PAUSE</b> for approximately 5 seconds (Otherwise N/A) [3] Refuel Mode One Rod Permissive Light check:  [3.1] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in REFUEL.  [3.2] <b>CHECK</b> illuminated REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46.  [3.3] <b>IF</b> REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46, is <b>NOT</b> illuminated, <b>THEN CHECK</b> all control rod positions at Full-In Overtravel, or Full-In. (Otherwise N/A)  [4] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in SHUTDOWN.

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>[5] <b>REPORT</b> the following status to the US:</p> <ul style="list-style-type: none"> <li>• Reactor Scram</li> <li>• Mode Switch is in Shutdown</li> <li>• "All rods in" or "rods out"</li> <li>• Reactor Water Level and trend (recovering or lowering)</li> <li>• Reactor pressure and trend</li> <li>• MSIV position (Open or Closed)</li> <li>• Power level</li> </ul> <p>Completes immediate operator actions and makes scram report including 'rods out' and 'power level &lt;5%.</p> <p><b>2.0 SUBSEQUENT ACTIONS:</b></p> <p>[1] <b>IF</b> all control rods <b>CAN NOT</b> be verified fully inserted, <b>THEN PERFORM</b> the following (otherwise N/A):</p> <p>[1.1] <b>INITIATE</b> ARI by Arming and Depressing BOTH of the following:</p> <ul style="list-style-type: none"> <li>• ARI Manual Initiate, 2-HS-68-119A</li> <li>• ARI Manual Initiate, 2-HS-68-119B</li> </ul> <p>[1.2] <b>VERIFY</b> the Reactor Recirc Pumps (if running) at minimum speed at Panel 2-9-4.</p> <p>[1.3] <b>REPORT</b> "ATWS Actions Complete" and power level.</p> <p>Completes subsequent actions</p>
	SRO	<p>EOI-1 RC/Q</p> <p><b>MONITOR</b> and <b>CONTROL</b> reactor power - <b>CHECKED</b> The reactor will remain subcritical without boron under all conditions - <b>NO</b> The reactor is subcritical - <b>NO</b> <b>AND</b> NO boron has been injected</p> <p><b>VERIFY</b> reactor mode switch in SHUTDOWN - <b>CHECKED</b> <b>INITIATE</b> ARI - <b>CHECKED</b></p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Will tripping Recirc pumps cause trip of Main Turbine, RFP, HPCI, or RCIC – NO  Is reactor power above 5% OR unknown – NO  <b>BEFORE</b> suppr pl temp rises to 110°F <b>CONTINUE</b> – CHECKED</p> <p><b>RESET ARI</b>  <b>DEFEAT ARI</b> logic trips if necessary (APPX 2) – CHECKED</p> <p><b>INSERT</b> control rods using ANY of the following methods:  Scram valves opened      1. RESET scram  But SDV is full              DEFEAT RPS logic trips  if necessary                      1F  2.DRAIN SDV  3. RECHARGE accumulators  4. INITIATE reactor scram</p> <p>Manual control rod      1. DRIVE control rods  Insertion methods      BYPASS RWM if      1D  necessary</p> <p>Directs ATC to perform App. 1F and 2 and to drive control rods with App. 1D</p>
	ATC	Directs personnel to perform App. 2 and the outside portions of App. 1F
	DRIVER	Acknowledge performing App. 2 and the outside portions of App. 1F. Wait 3 minutes then insert Shift F8 (bat app02) to defeat ARI logic. Wait 5 minutes then insert Shift F9 (bat app01f) to defeat RPS logic
	SRO	<p>EOI-1  <b>RC/L</b></p> <p style="text-align: center;"><b>CAUTION</b></p> <p><b>#1</b> Ambient temp may affect RPV water lvl indication and trend - <b>CHECKED</b></p> <p><b>MONITOR</b> and <b>CONTROL</b> RPV water lvl - <b>CHECKED</b></p>



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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>VERIFY</b> each as required:</p> <ul style="list-style-type: none"> <li>• PCIS isolations (Groups 1, 2 and 3)</li> <li>• ECCS</li> <li>• RCIC</li> </ul> <p>It has NOT been determined that the reactor will remain subcritical without boron under all conditions</p> <p>EXIT RC/L and ENTER C5, Level/Power Control</p> <p>C-5</p> <p><b>CAUTION</b> #1 Ambient temp may affect RPV water lvl indication and trend</p> <p>RPV water lvl CANNOT be determined - <b>CAN</b> The reactor will remain subcritical without boron under all conditions - <b>NO</b> PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b> OR Suppr chmbr press CANNOT be maintained below - <b>CAN</b> 55 psig DW Control Air becomes unavailable - <b>AVAIL</b></p> <p><b>INHIBIT ADS</b> Is ANY main steam line open - YES <b>BYPASS</b> the following isolation interlocks:</p> <ul style="list-style-type: none"> <li>• MSIV low low low RPV water lvl (APPX 8A)</li> <li>• RB ventilation low RPV water lvl (APPX 8E)</li> </ul> <p>Directs BOP to inhibit ADS Calls for App 8A and 8E to be performed</p>
	DRIVER	<p>Acknowledge performing App 8A and App8E. Wait 5 minutes then insert Shift F10 (bat app08a) and Shift F11 (bat app08e). Call US and report App 8A and 8E are complete.</p>
	BOP	<p>Inhibits ADS Reports ADS inhibited</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Suppr pl temp is above 110°F - <b>BELOW</b>  AND  Reactor power is above 5% OR unknown - <b>BELOW</b>  AND  An MSRV is open or cycling  OR DW press is above 2.4 psig - <b>NO</b>  AND  RPV water lvl is above -162 in. - <b>YES</b></p> <p>Is reactor power above 5% OR unknown – <b>NO</b></p> <p>Emergency RPV depressurization is required – <b>NO</b>  Reactor power is above 5% - <b>BELOW</b>  OR unknown  AND  RPV water lvl is above -50 in.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p><b>#5</b> Rapid RPV inj may cause core damage  <b>#2</b> Pump NPSH and Vortex limits  <b>#3</b> Elevated suppr chmbr press may trip RCIC  <b>#6</b> HPCI or RCIC suction temp above 140°F</p> <p><b>MAINTAIN</b> RPV water lvl between -180 in. and +51 in. with the following inj sources  CNDS and FW <span style="float: right;">5A <span style="margin-left: 100px;">1210 psig</span></span></p> <p>Directs ATC to maintain RPV water level +2 in. to +51 in. using App. 5A Condensate and Feedwater</p>
	ATC	<p>Maintains RPV water level +2 in to +51 in IAW App 5A  When it is reported that App 2 and the outside portions of App 1F are complete, continues with App 1F  <b>EOI Appendix-1F</b>  [2] <b>WHEN</b> RPS Logic has been defeated, <b>THEN</b>  <b>RESET</b> Reactor Scram.  [3] <b>VERIFY OPEN</b> Scram Discharge Volume vent and drain valves</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	ATC	<p><b>EOI Appendix-1D</b></p> <p>[1] <b>VERIFY</b> at least one CRD pump in service.</p> <p>[3] <b>VERIFY</b> REACTOR MODE SWITCH in SHUTDOWN.</p> <p>[4] <b>BYPASS</b> Rod Worth Minimizer.</p> <p>[5] <b>REFER TO</b> Attachment 2 and <b>INSERT</b> control rods in the area of highest power as follows:</p> <p>[5.1] <b>SELECT</b> control rod.</p> <p>[5.2] <b>PLACE</b> CRD NOTCH OVERRIDE switch in EMERG ROD IN position UNTIL control rod is NOT moving inward.</p> <p>[5.3] <b>REPEAT</b> Steps 1.0[5.1] and 1.0[5.2] for each control rod to be inserted</p> <p>Completes control room portions of App 1F and inserts control rods IAW App 1D</p> <p>Reports driving control rods</p>
	SRO	<p><b>RC/P</b></p> <p>DW press is above 2.4 psig - <b>NO</b></p> <p>Emergency RPV depressurization is anticipated - <b>YES</b></p> <p>AND</p> <p>The reactor will remain subcritical without boron under all conditions - <b>NO</b></p> <p>Emergency RPV depressurization is or has been required - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Is ANY MSRV cycling - <b>NO</b></p> <p>Steam cooling is required - <b>NO</b></p> <p>Suppr pl temp and lvl CANNOT be maintained in a safe area of Curve 3 at the existing RPV press - <b>CAN</b></p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Suppr pl lvl CANNOT be maintained in the safe area - <b>CAN</b> of Curve 4</p> <p>DW control air becomes unavailable - <b>AVAIL</b></p> <p>Boron inj is required - <b>NO</b> AND The main condenser is available AND There has been no indication of a steam line break</p> <p><b>STABILIZE</b> RPV press below 1073 psig with the main turbine bypass vlvs (APPX 8B)</p> <p>Directs BOP to control reactor pressure 800 psig to 1000 psig in accordance with Appendix 8B</p>
	BOP	<p>Verifies that main turbine bypass valves are controlling reactor pressure 800 psig to 1000 psig</p> <p>Reports that suppression pool water level is continuing to lower</p>
	SRO	<p>Sets a trigger valve and briefs the crew on the requirement to emergency depressurize the RPV before reaching 11.5 ft. in the torus.</p> <p>EOI-2 <b>SP/L</b> WHEN suppr pl lvl CANNOT be maintained above 11.5 ft. <b>EMERGENCY RPV DEPRESSURIZATION IS REQUIRED</b>(EOI-1, RC/P-4; C1-1, C1-20; C5-12, C5-14)</p> <p>EOI-1 <b>RC/P</b> Emergency RPV depressurization is or has been required</p> <p><b>EXIT RC/P and ENTER C2, Emergency Depressurization</b></p> <p>Enters C2 for Emergency Depressurization</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Containment water lvl CANNOT be maintained below 44 ft- <b>CAN</b></p> <p>DW control air becomes unavailable – <b>AVAIL</b></p> <p>Will the reactor remain subcritical without Boron under all conditions – NO</p> <p>WHEN all inj into the RPV is stopped and prevented EXCEPT from RCIC, CRD, and SLC per C5, Level/Power Control, Step C5-22</p> <p>C-5 Emergency RPV depressurization is Required <b>&gt;E</b></p> <p><b>STOP and PREVENT</b> ALL inj into RPV EXCEPT from RCIC, CRD and SLC (APPX 4)</p> <p>Directs ATC to terminate and prevent condensate and feedwater using APP 4</p> <p>Directs BOP to terminate CS and LPCI using App 4</p>
	DRIVER	When App 4 is directed, insert F9 (imf fw30b 55.7) to fail RFP 'B' Woodward governor.
	NRC	When ATC is using App 4 to terminate and prevent condensate and feedwater, he will recognize the failure of 'B' RFP speed to lower. This will start Event No. 9

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**Event Description:** Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>EOI APPENDIX-4</b></p> <p><b>NOTE</b> Following receipt of a CORE SPRAY automatic initiation signal, it is NOT necessary to wait until a pump starts before performing step 3.</p> <p>3. <b>PREVENT</b> injection from CORE SPRAY following an initiation signal by <b>PLACING</b> ALL Core Spray pump control switches in STOP.</p> <p>4. <b>PREVENT</b> injection from LPCI SYSTEM I by performing the following:</p> <p><b>NOTE</b> Injection may be prevented by performing EITHER step 4.a or step 4.b.</p> <p>a. Following automatic pump start, <b>PLACE</b> RHR SYSTEM I pump control switches in STOP.</p> <p><b>OR</b></p> <p>b. BEFORE RPV pressure drops below 450 psig, 1) <b>PLACE</b> 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>. <b>AND</b> 2) <b>VERIFY CLOSED</b> 2-FCV-74-52, RHR SYS I LPCI OUTBD INJECT VALVE.</p> <p>5. <b>PREVENT</b> injection from LPCI SYSTEM II by performing the following:</p> <p><b>NOTE</b> Injection may be prevented by performing EITHER step 5.a or step 5.b.</p> <p>a. Following automatic pump start, <b>PLACE</b> RHR SYSTEM II pump control switches in STOP.</p> <p><b>OR</b></p> <p>b. BEFORE RPV pressure drops below 450 psig, 1) <b>PLACE</b> 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>. <b>AND</b> 2) <b>VERIFY CLOSED</b> 2-FCV-74-66, RHR SYS II LPCI OUTBD INJECT VALVE.</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	DRIVER	Insert F10 (bat NRC/1501-3-10) to prevent two ADS valves from opening
	BOP	Terminates and prevents injection on 9-3 IAW App 4. Reports terminate and prevent complete
	ATC	6. <b>PREVENT</b> injection from CONDENSATE and FEEDWATER by performing the following: c. <b>CLOSE</b> the following valves BEFORE RPV pressure drops below 500 psig: <ul style="list-style-type: none"> <li>• 2-FCV-3-19, RFP 2A DISCHARGE VALVE</li> <li>• 2-FCV-3-12, RFP 2B DISCHARGE VALVE</li> <li>• 2-FCV-3-5, RFP 2C DISCHARGE VALVE</li> <li>• 2-LCV-3-53, RFW START-UP LEVEL CONTROL</li> </ul> Terminates and prevents injection on 9-6 IAW App 4. Reports terminate and prevent complete
	SRO	<b>C-2</b> Is suppr pl lvl above 5.5 ft. – YES <b>OPEN</b> all ADS vlvs (ok to exceed 100°F/hr cooldown rate)  Directs BOP to open all ADS valves
	NRC	When SRO directs opening all ADS valves, Event No. 10 would start
	SRO	<b>C-2</b> Are at least 4 MSRVS open – YES The reactor is NOT subcritical - > <b>A</b>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
		<p><b>When Suppression Pool level cannot be maintained above 11.5 feet the US determines that Emergency Depressurization is required, RO initiates Emergency Depressurization as directed by US.</b></p> <p>1. Safety Significance: Precludes failure of Containment</p> <p>2. Cues: Procedural compliance Suppression Pool Level Trend</p> <p>3. Measured by: Observation - US determines (indicated by announcement or observable transition to C-2) that Emergency Depressurization is required before Suppression Pool level drops below 11.5 feet.</p> <p style="text-align: center;"><b><u>AND</u></b></p> <p>Observation - RO opens at least 6 SRV's during performance of Emergency Depressurization actions.</p> <p>4. Feedback: RPV pressure trend SRV status indications Suppression Pool temperature trend</p> <p>This Critical Task is <b>not met</b> if Suppression Pool Level gets to 11.5 feet.</p>



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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>C-5</b> Can at least two MSRVs be opened per C2, Emergency RPV Depressurization – <b>YES</b></p> <p>WHEN RPV press is <b>below MSCP</b> (Table 1A)  <b>Table 1A</b>  Minimum Steam Cooling Press  6 or more 190 psig</p> <p>Briefs crew that injection to the RPV will begin when RPV pressure is less than 190 psig</p>
	SRO	<p>CAUTION</p> <p><b>#5</b> Rapid RPV inj may cause core damage  <b>#2</b> Pump NPSH and Vortex limits  <b>#3</b> Elevated suppr chmbr press may trip RCIC  <b>#6</b> HPCI or RCIC suction temp above 140°F</p> <p><b>START</b> and <b>SLOWLY RAISE</b> RPV inj with the following inj sources to restore and maintain RPV water lvl above -180 in.  CNDS and FW 5A 1210 psig</p> <p>Directs ATC to start and slowly raise injection to the RPV, using condensate IAW App 5A, when reactor pressure lowers to less than 190 psig.</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
		<p><b>During an ATWS, when conditions with Emergency Depressurization required, Terminate and Prevent RPV injection from ECCS and Feedwater until reactor pressure is below the MARFP as directed by US.</b></p> <p>1. Safety Significance: Prevention of fuel damage due to uncontrolled feeding.</p> <p>2. Cues: Procedural compliance.</p> <p>3. Measured by: Observation - No ECCS injection prior to being less than the MARFP. <b>AND</b> Observation - Feedwater terminated and prevented until less than the MARFP.</p> <p>4. Feedback: Reactor power trend, power spikes, reactor short period alarms. Injection system flow rates into RPV.</p> <p>This Critical Task is <b>not met</b> if the Crew injects too fast and causes power oscillations or IRM Upscale trips.</p>

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**Event Description: Loss of Torus Water level /SCRAM (ATWS) and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	ATC	When reactor pressure lowers to less than 190 psig, slowly starts injection to the RPV IAW App 5A  Reports injection to the RPV
	SRO	Determines that RPV water level is above -180 in. and rising  Can RPV water lvl be restored and maintained above -180 in. – <b>YES</b> Was RPV water lvl lowered for Step C5-11 – <b>NO</b> > <b>D</b>  Maintain RPV water lvl between -180 in and +51 in. with the following inj sources: CNDS and FW 5A 1210 psig  Directs ATC to restore RPV water level to +2 in to +51 in. using condensate App 5A

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**Event Description: Loss of Torus Water level /SCRAM (ATWS)and ED on Torus water level**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Continues to restore RPV water level to +2 in to +51 in using condensate</p> <p><b>Appendix-1F</b>  <b>1.0 INSTRUCTIONS (continued)</b>  [4] <b>DRAIN</b> SDV UNTIL the following annunciators clear:</p> <ul style="list-style-type: none"> <li>• WEST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (Panel 2-9-4, 2-XA-55-4A, Window 1). □</li> <li>• EAST CRD DISCH VOL WTR LVL HIGH HALF SCRAM (Panel 2-9-4, 2-XA-55-4A, Window 29).</li> </ul> <p><b>NOTES</b></p> <p>1) If EOI Appendix 2 has been executed, ARI initiation or reset will NOT be possible or necessary in Step 1.0[6].</p> <p>2) If reactor pressure is greater than 600 psig, SRO may direct performance of step 1.0[6] prior to accumulators being fully recharged.</p> <p>[6] <b>WHEN</b> CRD Accumulators are recharged, <b>THEN INITIATE</b> manual Reactor Scram and ARI.</p>
	ATC	<p>Monitors for indication that the Scram Discharge Volumes are drained.</p> <p>Reports when SDV are drained</p> <p>Reports 'initiating a manual reactor scram'</p> <p>Initiates a manual reactor scram</p> <p>Reports rod movement</p> <p>Resets Reactor Scram and verifies Scram Discharge Volume vent and drain valves open</p> <p>Scans full core display and reports all control rods inserted.</p>
	NRC	End of Event #8 and scenario
	DRIVER	Place simulator in FREEZE upon direction of the NRC Chief Examiner

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**Event Description: Failure of RFP 2B governor/pump needs tripped.**

Time	Position	Applicant's Actions or Behavior
	ATC	<p><b>EOI APPENDIX-4</b></p> <p>6. <b>PREVENT</b> injection from CONDENSATE and FEEDWATER by performing the following:</p> <p>b. <b>LOWER</b> RFPT 2A(2B)(2C) speed to minimum setting (approximately 600 rpm) using ANY of the following methods on Panel 2-9-5:</p> <ul style="list-style-type: none"> <li>• Using 2-LIC-46-5, REACTOR WATER LEVEL CONTROL, in MANUAL AND individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in AUTO,</li> <li><b>OR</b></li> <li>• Using individual 2-SIC-46-8(9)(10), RFPT 2A(2B)(2C) SPEED CONTROL in MANUAL,</li> <li><b>OR</b></li> <li>• Using individual 2-HS-46-8A(9A)(10A), RFPT 2A(2B)(2C) SPEED CONT RAISE/LOWER switch in MANUAL GOVERNOR.</li> </ul> <p>Attempts to lower RFPT 'B' speed using App 4 Reports that speed cannot be lowered in manual or automatic</p> <p>a. IF ..... Immediate injection termination from a reactor feedwater pump is required, THEN ..... <b>PERFORM</b> step 6.d for the desired pump.</p> <p>d. <b>TRIP</b> RFPTs as necessary to prevent injection by <b>DEPRESSING</b> the following push-buttons:</p> <ul style="list-style-type: none"> <li>• 2-HS-3-151A, RFPT 2B TRIP</li> </ul> <p>Trips 2B RFPT Reports 2B RFPT tripped</p>
	NRC	End of Event #9

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## Event Description: ADS SRV Failures

[illegible]

## Scenario Setup

IC	9
Exam IC	96

Batch File or Pref File	1501NRC3
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Malfunctions	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
RD07R2243	Rod Drift In 22-43	3	N/A	N/A	N/A	N/A	N/A
RD06R2243	Rod Stuck 22-43	3	00:35	N/A	N/A	N/A	N/A
OG04A	SJAE A Trip	4	N/A	N/A	N/A	N/A	N/A
NM05C	IRM C Fails Upscale	5	N/A	100	N/A	N/A	100
DG03D	D Diesel Fails to Auto Tie to S/D Bus	Active	N/A	N/A	N/A	N/A	N/A
FW14C	Feed Pump C Trip	7	N/A	N/A	N/A	N/A	N/A
PC14	Torus Water Leak	8	N/A	100	5:00	N/A	N/A
AD01D	ADS Valve Failure	10	N/A	N/A	N/A	N/A	N/A
AD01E	ADS Valve Failure	10	N/A	N/A	N/A	N/A	N/A

Remotes	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Overrides	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
ZDI0HS2110D22A	S/D Bus D Norm Feeder Bkr Trip	6	0	N/A	N/A	CLOSE	TRIP
ZLO0HS2110D22A	S/D Bus D Norm Feeder Bkr White Light	6	0	N/A	N/A	OFF	ON

Batch / Pref File(s):

ADS Valve Failure 10 N/A N/A N/A N/A  
DOR ZLO0HS2110D22A (15 0) OFF

IMF RD07R2243 (3 0)  
IMF RD06R2243 (3 0:35)  
IMF OG04A (4 0)  
IMF NM05C (5 0) 100  
IMF DG03D  
IMF FW14C (7 0)  
IMF PC14 (8 0) 100 6:00  
IMF AD01D  
IMF AD01E



Facility: BFNScenario No.: NRC – 4Op-Test No.: 1501

Examiners: \_\_\_\_\_

Operators: SRO: \_\_\_\_\_

ATC: \_\_\_\_\_

BOP: \_\_\_\_\_

**Initial Conditions:** Reactor Power is 90%. EECW Pump A3 and Steam Packing Exhauster 3A are out of service.

**Turnover:** Raise reactor power to 100% after Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 3-SR-3.3.1.1.8(9). The Spare RBCCW pump is in service and the 3B RBCCW pump will be tagged out later this shift for an oil change.

Event No.	Malfunction Number	Event Type*	Event Description
2	N/A	N-BOP	Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 3-SR-3.3.1.1.8(9).
1	N/A	R-ATC R-SRO	Raises Reactor Power to 100% IAW 3-GOI-100-12
3	EG13A	C-BOP	Bus Duct Cooling Fan 3A trip
4	SW02A	C-ATC TS-SRO	RBCCW 3B Pump trip and failure of sectionalizing valve to auto-close
5	ED10B	C-BOP TS-SRO	Loss of 480V S/D Board 3B
6	MC04	C-BOP C-SRO	Loss of Condenser Vacuum
7	ED01	M-ALL	Loss of Offsite Power
8	DG01A	C-BOP	DG 3EA Fails to Auto start
9	TH21	M-All	LOCA
10	HP04	C-BOP	HPCI Steam Supply Valve fails to auto open.

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

Reid  
12/1/14

**Events**

1. BOP will conduct Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9). When 2-SR-3.3.1.1.8(9) is completed or at the direction of the lead examiner the scenario may continue.
2. ATC will raise reactor power to 100% at the direction of the SRO.
3. Bus Duct Cooling Fan 2A will trip and annunciator 2-XA-55-7A window 31, GEN BUS DUCT FAN FAILURE, will be received. The BOP operator will place the 2B Bus Duct Cooling Fan in service. When the 2B Bus Duct Cooling Fan is in service the scenario may continue.
4. The crew will respond to a trip of RBCCW Pump 2A IAW 2-AOI-70-1, The spare RBCCW pump is aligned and will be the only one running until the crew places RBCCW Pump 2B in service. The RBCCW sectionalizing valve will fail to auto close on the trip of RBCCW Pump 2A, the ATC will close the sectionalizing valve. The SRO will evaluate TRM 3.4.1 and take actions for failure to meet surveillance requirement TSR 3.4.1.1. When the Tech Spec call is completed and the lead examiner is ready the scenario may continue.
5. The crew will respond to a loss of 480V Shutdown Board 2B. This will cause a loss of RPS B, loss of 480V RMOV BD 2B, 2C and 2E. The crew will need to restore power to the 480V RMOV Boards, reset RPS, reset PCIS and restore systems. The SRO will refer to Technical Specification 3.4.5 and determine conditions A, B, and D are required for inoperable containment atmospheric and drywell Floor Drain sump monitoring equipment. Loss of the Shutdown Board will result in entry into Tech Spec 3.8.7 condition B to restore the board in 8 hours and 3.8.7 condition C to declare the affected RHR subsystem (RHR Loop II) inoperable immediately. When power has been restored to the RMOV boards and the Tech Spec call is complete or as directed by the Lead Examiner the scenario may continue.
6. Condenser Vacuum will begin to degrade the SRO will initially enter 3-AOI-47-3 and direct reducing reactor power in an attempt to maintain condenser vacuum. Condenser Vacuum will continue to degrade. The SRO will set a trigger value to trip the main turbine and scram the reactor before an automatic turbine trip occurs at approximately 24.3 inched Hg.
7. After the Reactor Scram on vacuum a Loss of Offsite Power will occur. The crew will respond to the Reactor Scram IAW 3-AOI-100-1 and 0-AOI-57-1A.
8. During the LOOP DG 3EA will fail to automatically start and will have to be manually started and after it starts auto tie to the buss.
9. Sometime after the LOOP a LOCA will develop requiring the crew to utilize systems to maintain Reactor Level and Containment parameters.
10. The HPCI Steam Supply Valve, 3-FCV-73-16, will fail to OPEN on an automatic HPCI initiation signal.

The scenario ends when Drywell Sprays have been initiated and Reactor Level is maintained above TAF (- 162 inches) or upon request of Lead Examiner.

**Critical Tasks 3****1. RPV Level maintained above TAF (-162 inches)**

1. Safety Significance:  
Maintaining adequate core cooling
2. Cues:  
RPV level indication
3. Measured by:  
Reactor level indication above -162 inches
4. Feedback:  
RPV level trend  
HPCI/RCIC injection valve open indication

**2. When Suppression Chamber Pressure exceeds 12 psig, initiate Drywell Sprays while in the safe region of the Drywell Spray Initiation Limit (DSIL) curve and prior to exceeding the PSP limit.**

1. Safety Significance:  
Precludes failure of containment
2. Cues:  
Procedural compliance  
High Drywell Pressure and Suppression Chamber Pressure
3. Measured by:  
Observation - US directs Drywell Sprays IAW with EOI Appendix 17B  
**AND**  
Observation - RO initiates Drywell Sprays
4. Feedback:  
Drywell and Suppression Pressure lowering  
RHR flow to containment

**OR**

**2. Before Drywell temperature rises to 280°F, initiate Drywell Sprays while in the safe region of the Drywell Spray Initiation Limit (DSIL) curve.**

1. Safety Significance:  
Precludes failure of containment
2. Cues:  
Procedural compliance  
High Drywell Pressure and Suppression Chamber Pressure
3. Measured by:  
Observation - US directs Drywell Sprays IAW with EOI Appendix 17B  
**AND**  
Observation - RO initiates Drywell Sprays

4. Feedback:  
Drywell and Suppression Pressure lowering  
RHR flow to containment

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>7.3 Turbine Control Valve, 3-FCV-1-75 (CV #1) Test</b></p> <p><b>NOTE</b></p> <p>Indicator light 3-IL-099-5A-DS15B on Panel 9-17, Bay 1, will extinguish when jumper is installed in Step 7.3[1].</p> <p>[1] <b>PERFORM</b> the following in Panel 3-9-17 (Bay 1), to simulate Turbine Control Valve, 3-FCV-1-80 (CV #2), is CLOSED:</p> <p>[1.1] <b>REMOVE</b> the back cover from RPS CH B1 CONTROL VALVE 3A FAST CLOSURE, 3-RLY-099-05AK08F (H3), if required (Otherwise N/A)</p> <p>[1.2] <b>INSTALL</b> jumper across contacts 3 to 4 on relay 3-RLY-099-05AK08F.</p> <p>Calls operator in Aux Instrument Room to install jumper on relay 99-05AK08F</p>
	DRIVER	As operator in AIR, acknowledge jumpering contacts 3 to 4 on relay 3-RLY-099-05AK08F. Insert <i>mrf rp15b jumpered</i>
	BOP	<p>[3] <b>CHECK</b> the following indications:</p> <ul style="list-style-type: none"> <li>• RPT SYS A TURB CONTROL VLV, 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is illuminated.</li> <li>• RPT SYS A TURB CONTROL VLV, 3-IL-099-5A-DS15B, on Panel 9-17, Bay 1, is extinguished.</li> </ul> <p>[4] <b>ENSURE</b> Reactor power less than 95%.</p> <p>[5] <b>RECORD</b> valve position in terms of percent below.</p> <ul style="list-style-type: none"> <li>• CV-1, 3-ZI-1-75 _____ %</li> <li>• CV-2, 3-ZI-1-80 _____ %</li> <li>• CV-3, 3-ZI-1-85 _____ %</li> <li>• CV-4, 3-ZI-1-89 _____ %</li> </ul> <p>Calls operator in Aux Instrument Room to verify indications on panels 9-15 and 9-17</p> <p>Verifies reactor power less than 95%</p> <p>Records control valve position</p>
	DRIVER	As operator in AIR, report that 3-IL-099-5A-DS15A is illuminated and 3-IL-099-5A-DS15 is extinguished

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>CAUTION</b></p> <p>If power is not simulated, 3-HS-47-158 should be held in until reactor water level, reactor pressure, and neutron flux signals have stabilized to prevent flux spiking, which would cause a reactor scram.</p> <p>[6] <b>NOTIFY</b> the UO that performance of the following step will result in a channel A Half Scram.</p> <p>[7] <b>DEPRESS</b> and <b>HOLD</b> CV-1 TEST push-button, 3-HS-47-158, on Panel 3-9-7 until Step 7.3[12].</p> <p>Updates crew that the next step will cause a channel A half scram Depresses and hold CV-1 TEST pushbutton</p> <p>[8] <b>CHECK</b> the following on Panel 3-9-5:</p> <ul style="list-style-type: none"> <li>• 3-IL-99-5A/AB, SYSTEM A BACKUP SCRAM VALVE, light on Panel 3-9-5 is extinguished.</li> <li>• 3-IL-99-5A/CD, SYSTEM B BACKUP SCRAM VALVE, light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP A LOGIC RESET 1 red light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP A LOGIC RESET 2 red light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP A LOGIC RESET 3 red light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP A LOGIC RESET 4 red light on Panel 3-9-5 is extinguished.</li> </ul> <p>[9] <b>CHECK</b> the following Annunciators are in alarm:</p> <ul style="list-style-type: none"> <li>• Annunciator REACTOR CHANNEL A AUTO SCRAM (3-XA-55-5B, window 1) is in alarm.</li> <li>• Annunciator TURB CONTROL VLV FAST CLOSURE HALF SCRAM (3-XA-55-4A, window 15) is in alarm.</li> <li>• Annunciator RPT SYS A TRIP 3-XA-68-72 (3-XA-55-4A window 11) is in alarm.</li> </ul> <p>Checks appropriate backup scram valve lights are extinguished and all four solenoid group A logic lights are extinguished</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Checks appropriate alarms are in alarm</p> <p>[10] <b>CHECK</b> RPT SYS A TURB CONTROL VLV light indicator 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is extinguished</p> <p>[11] <b>CHECK</b> the following on ICS:</p> <ul style="list-style-type: none"> <li>• ICS point SOE042 displays TRIP condition.</li> <li>• ICS point SOE035 displays TRIP condition.</li> <li>• ICS point DIG081 displays TRIP condition</li> </ul> <p>Calls operator in aux instrument room to verify indication on panel 9-15</p> <p>Verifies appropriate ICS points display TRIP condition</p>
	DRIVER	<p>As operator in AIR, report that 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is extinguished</p>
	BOP	<p>[12] <b>WHEN</b> Rx Water Level, Rx Pressure, and Neutron Flux signals have stabilized, <b>THEN</b></p> <p><b>RELEASE</b> CV-1 TEST push-button, 3-HS-47-158.</p> <p>[13] <b>RESET</b> RPS HALF SCRAM SIGNAL on 3-9-5.</p> <p>[14] <b>RESET</b> the following Panel annunciators:</p> <ul style="list-style-type: none"> <li>• <b>RESET</b> affected annunciators 3-HS-55-4 on Panel 3-9-4.</li> <li>• <b>RESET</b> affected annunciators 3-HS-55-5 on Panel 3-9-5.</li> </ul> <p>Releases TEST push-button</p> <p>Resets half scram signal and panel annunciators</p> <p>[15] <b>CHECK</b> the following on Panel 3-9-5:</p> <ul style="list-style-type: none"> <li>• All four SYSTEM A and SYSTEM B BACKUP SCRAM VALVE lights on Panel 3-9-5 are illuminated.</li> <li>• All eight SCRAM SOLENOID GROUP A &amp; B LOGIC RESET lights on Panel 3-9-5 are illuminated.</li> </ul> <p>[16] <b>CHECK RESET</b> the following Annunciators:</p> <ul style="list-style-type: none"> <li>• REACTOR CHANNEL A AUTO SCRAM (3-XA-55-5B, window 1).</li> <li>• TURB CONTROL VLV FAST CLOSURE HALF SCRAM (3-XA-55-4A, window 15).</li> <li>• RPT SYS A TRIP 3-XA-68-72 (3-XA-55-4A window 11).</li> </ul>

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Checks backup scram valve lights illuminated, scram solenoid lights illuminated and annunciators reset</p> <p>[17] <b>CHECK</b> the following on Panel 3-9-15:</p> <ul style="list-style-type: none"> <li>• Relay RPS CH A1 CONTROL VALVE 3A FAST CLOSURE, 3-RLY-099-05AK08E in Panel 9-15, Bay 1, is energized.</li> <li>• RPT SYS A TURB CONTROL VLV light indicator, 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is illuminated.</li> </ul> <p>[18] <b>CHECK</b> the following on ICS:</p> <ul style="list-style-type: none"> <li>• ICS point SOE042 displays NOT TRIP.</li> <li>• ICS point SOE035 displays NOT TRIP.</li> <li>• ICS point DIG081 displays NOT TRIP.</li> </ul> <p>Calls operator in aux instrument room to verify 3-RLY-099-05AK08E in Panel 9-15, Bay 1, is energized and 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is illuminated.</p> <p>Verifies ICS computer points are indicating NOT TRIP</p>
	DRIVER	As operator in aux instrument room report 3-RLY-099-05AK08E in Panel 9-15, Bay 1, is energized and 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is illuminated.
	BOP	<p>[20] <b>PERFORM</b> the following for Relay 3-RLY-099-05AK08F (Panel 3-9-17, Bay 1, H3):</p> <p>[20.1] <b>REMOVE</b> jumper from contacts 3 to 4 on relay 3-RLY-099-05AK08F.</p> <p>[20.2] <b>INSTALL</b> cover on back of relay if removed in Step 7.3[1] (Otherwise N/A).</p> <p>[21] <b>CHECK</b> RPT SYS A TURB CONTROL VLV light indicator, 3-IL-099-5A-DS15B, on Panel 9-17, Bay 1, is illuminated. (N/A this step if turbine first stage pressure is less than 30%.)</p> <p>Calls operator in aux instrument room to remove jumper and verify 3-IL-099-5A-DS15B, on Panel 9-17, Bay 1, is illuminated</p>
	DRIVER	As operator in aux instrument room, insert <i>mrf rp15b norm</i> and report jumper removed and 3-IL-099-5A-DS15B, on Panel 9-17, Bay 1, is illuminated



Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;"><b>NOTE</b></p> <p>Failure to satisfactorily complete any step designated by (AC) requires immediate notification of the Unit Supervisor. The Cognizant Engineer should be notified in a timely manner.</p> <p><b>7.4 Turbine Control Valve, 3-FCV-1-80 (CV #2) Test</b></p> <p>[1] <b>PERFORM</b> the following in Panel 3-9-15 (Bay 1), to simulate Turbine Control Valve, 3-FCV-1-75 (CV #1), is CLOSED</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Indicator light 3-IL-099-5A-DS15A on Panel 9-15, Bay 1, will extinguish when jumpers are installed in Step 7.4[21].</p> <p>[1.1] <b>REMOVE</b> the back cover from RPS CH B1 CONTROL VALVE 3A FAST CLOSURE, 3-RLY-099-05AK08E (H3), if required (Otherwise N/A)</p> <p>[1.2] <b>INSTALL</b> jumper across contacts 3 to 4 on relay 3-RLY-099-05AK08E.</p> <p>Calls operator in Aux Instrument Room to install jumper on relay 99-05AK08E</p>
	DRIVER	As operator in AIR, acknowledge jumpering contacts 3 to 4 on relay 3-RLY-099-05AK08E. <i>Insert mrf rp15a jumpered</i>
	BOP	<p>[3] <b>CHECK</b> the following indications:</p> <ul style="list-style-type: none"> <li>• RPT SYS A TURB CONTROL VLV, 3-IL-099-5A-DS15A, on Panel 9-15, Bay 1, is extinguished.</li> <li>• RPT SYS A TURB CONTROL VLV, 3-IL-099-5A-DS15B, on Panel 9-17, Bay 1, is illuminated.</li> </ul> <p>[4] <b>ENSURE</b> Reactor power less than 95%.</p> <p>[5] <b>RECORD</b> valve position in terms of percent below.</p> <ul style="list-style-type: none"> <li>• CV-1, 3-ZI-1-75 _____ %</li> <li>• CV-2, 3-ZI-1-80 _____ %</li> <li>• CV-3, 3-ZI-1-85 _____ %</li> <li>• CV-4, 3-ZI-1-89 _____ %</li> </ul>

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Calls operator in Aux Instrument Room to verify indications on panels 9-15 and 9-17</p> <p>Verifies reactor power less than 95%</p> <p>Records control valve position</p>
	DRIVER	<p>As operator in AIR, report that 3-IL-099-5A-DS15A is extinguished and 3-IL-099-5A-DS15 is illuminated</p>
	BOP	<p style="text-align: center;"><b>CAUTION</b></p> <p>If power is not simulated, 3-HS-47-159 should be held in until reactor water level, reactor pressure, and neutron flux signals have stabilized to prevent flux spiking, which would cause a reactor scram.</p> <p>[6] <b>NOTIFY</b> the UO that performance of the following step will result in a channel A Half Scram.</p> <p>[7] <b>DEPRESS</b> and <b>HOLD</b> CV-1 TEST push-button, 3-HS-47-159, on Panel 3-9-7 until Step 7.4[12].</p> <p>Updates crew that the next step will cause a channel B half scram Depresses and hold CV-2 TEST pushbutton</p> <p>[8] <b>CHECK</b> the following on Panel 3-9-5:</p> <ul style="list-style-type: none"> <li>• 3-IL-99-5A/AB, SYSTEM A BACKUP SCRAM VALVE, light on Panel 3-9-5 is extinguished.</li> <li>• 3-IL-99-5A/CD, SYSTEM B BACKUP SCRAM VALVE, light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP B LOGIC RESET 1 red light on Panel 3-9-5 is extinguished</li> <li>• SCRAM SOLENOID GROUP B LOGIC RESET 2 red light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP B LOGIC RESET 3 red light on Panel 3-9-5 is extinguished.</li> <li>• SCRAM SOLENOID GROUP B LOGIC RESET 4 red light on Panel 3-9-5 is extinguished.</li> </ul> <p>Notes that B scram solenoid logic lights are illuminated. Informs SRO that a Channel B half scram did not occur as it should have</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 1

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**Event Description: Conducts Turbine Control Valve Fast Closure, or Turbine Trip and RPT Initiate Logic testing IAW 2-SR-3.3.1.1.8(9).**

Time	Position	Applicant's Actions or Behavior
	SRO	Directs that the surveillance procedure be stopped Directs that jumper be removed to place system back to initial conditions
	DRIVER	As operator in aux instrument room, insert <i>mrf rp15a norm</i> and report that jumper across contacts 3 to 4 on relay 3-RLY-099-05AK08E has been removed
	SRO	Refers to Technical Specifications  3.3 INSTRUMENTATION 3.3.1.1 Reactor Protection System (RPS) Instrumentation  LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.  9. Turbine Control Valve Fast Closure, Trip Oil Pressure Low >30% RTP 2 E  C. One or more Functions with RPS trip capability not maintained. C.1 Restore RPS trip capability 1 hr.  Updates crew on Technical Specification requirements
	NRC	End of Event #1

Op Test No.: \_15-01\_

Scenario No. 4 Event No.: 2

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**Event Description: Raise Reactor Power from 90% to 100% IAW 2-GOI-100-12**

Time	Position	Applicant's Actions or Behavior
	SRO	Conducts refocus brief prior to raising reactor power
	ATC	<p><b>GOI-100-12</b></p> <p><b>5.0 INSTRUCTION STEPS (continued)</b></p> <p>[6] IF power is being reduced (less than 10%) for any of the following reasons (N/A if entering 2-GOI-100-12 to recover from a Recirc Pump Trip or power reduction of &gt;10%)</p> <ul style="list-style-type: none"> <li>• Weekly Control Rod Exercise</li> <li>• Main Turbine Valve Testing</li> <li>• Ultimate heat Sink temperature &gt; 92.5°F</li> </ul> <p>[6.3] <b>WHEN</b> desired to raise power after testing is complete, <b>THEN</b></p> <p><b>PERFORM</b> the following as directed by Unit Supervisor. (N/A Steps 5.0[7] through 5.0[20].</p> <p><b>RAISE</b> Recirculation flow. <b>REFER TO</b> 2-OI-68.</p> <p><b>MAINTAIN</b> Reactor thermal power within the limits shown on ICS and 0-TI-248, Station Reactor Engineer, as appropriate.</p> <p><b>OI-68</b></p> <p><b>6.2 Adjusting Recirc Flow</b></p> <p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1) Thermal Limits are shown in 0-TI-248 and 2-SR-2.</li> <li>2) Recirc Flow changes made during the later part of the operating cycle (Coastdown) could cause core flow values to approach or exceed the allowable values of the Increased Core Flow (ICF) Region of the power to flow map. Instruments used to monitor pump speed and core flow should be identified in the Reactivity Control Plan. These values should be recorded prior to reducing core flow and used as a benchmark to reestablish the previous conditions when returning to power. Increased caution should be used when changes in Recirc Flow are made in this area.</li> </ol>

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**Event Description: Raise Reactor Power from 90% to 100% IAW 2-GOI-100-12**

Time	Position	Applicant's Actions or Behavior
		<p>[1] <b>IF</b> desired to control Recirc Pumps 2A and/or 2B speed with Recirc Individual Control, <b>THEN</b>  <b>PERFORM</b> the following:</p> <ul style="list-style-type: none"> <li>• <b>RAISE</b> Recirc Pump 2A using RAISE SLOW (MEDIUM), 2-HS-96-15A(15B). (Otherwise N/A)</li> <li>• <b>LOWER</b> Recirc Pump 2A using SLOW(MEDIUM)(FAST), 2-HS-96-17A(17B)(17C). (Otherwise N/A).</li> </ul> <p>AND/OR</p> <ul style="list-style-type: none"> <li>• <b>RAISE</b> Recirc Pump 2B using RAISE SLOW (MEDIUM), 2-HS-96-16A(16B). (Otherwise N/A)</li> <li>• <b>LOWER</b> Recirc Pump 2B using SLOW(MEDIUM)(FAST), 2-HS-96-18A(18B)(18C). (Otherwise N/A).</li> </ul>
		<p>[2] <b>WHEN</b> desired to control Recirc Pumps 2A and/or 2B speed with the RECIRC MASTER CONTROL, <b>THEN</b>  <b>ADJUST</b> Recirc Pump Speed 2A &amp; 2B using the following pushbuttons as required.</p> <p><b>RAISE</b> SLOW, 2-HS-96-31  <b>RAISE</b> MEDIUM, 2-HS-96-32  <b>LOWER</b> SLOW, 2-HS-96-33  <b>LOWER</b> MEDIUM, 2-HS-96-34  <b>LOWER</b> FAST, 2-HS-96-35</p> <p>Lowers reactor power, using recirc, to &lt; 95% IAW GOI-100-12 and OI-68.</p>
	NRC	<p>Individual pump speeds should be mismatched by ~60 RPM during dual pump operation between 1200 and 1300 RPM to minimize harmonic vibration (this requirement may be waived for short periods for testing or maintenance).</p> <p>End of Event #1</p>

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**Event Description: Bus Duct Cooling Fan 2A trip**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 3, insert malfunction to cause 'A' Bus Duct Cooling Fan to trip.
		<p>Reports GEN BUS DUCT FAN FAILURE (2-XA-55-7A, Window 31) in alarm</p> <p><b>ARP-9-7A</b></p> <p>A. <b>VERIFY</b> Main Bus Cooling Fans, 2-HS-262-1A or 2-HS-262-2A, indicates running on Panel 2-9-8 <b>AND</b></p> <p><b>START</b> GEN BUS DUCT HX FAN A(B) using 2-HS-2-6-2-1A(2A), on panel 2-9-8 to start the standby fan.</p> <p>Reports 'A' Bus Duct Cooling Fan tripped</p> <p>Starts 'B' Bus Duct Cooling Fan</p> <p>Reports 'B' Bus Duct Cooling Fan in service</p> <p>Dispatches personnel to check 'A' Bus Duct Cooling Fan breaker and fan motor</p>
	DRIVER	Acknowledge checking breaker and fan motor for 'A' Bus Duct Cooling Fan.
	NRC	End of Event #3

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**Event Description: RBCCW 2B Pump trip and failure of sectionalizing valve to auto-close**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When NRC Chief Examiner is ready for Event No. 4, insert malfunction to trip RBCCW pump 2B and malfunction to prevent auto closure of 70-48.
	ATC	<p>Reports RBCCW PUMP DISCH. HDR PRESS LOW (2-XA-55-4C, Window 12) in alarm.</p> <p><b>ARP-9-4C</b></p> <p>A. <b>VERIFY</b> 2-FCV-70-48 CLOSING/CLOSED.</p> <p>B. <b>VERIFY</b> RBCCW pumps A and B in service.</p> <p>C. <b>VERIFY</b> RBCCW surge tank low level alarm is reset.</p> <p>D. <b>DISPATCH</b> personnel to check the following:</p> <ul style="list-style-type: none"><li>• RBCCW surge tank level locally.</li><li>• RBCCW pumps for proper operation.</li></ul> <p>E. <b>REFER TO</b> 2-AOI-70-1 for RBCCW System failure and 2-OI-70, for starting spare pump.</p> <p>Recognizes and reports that sectionalizing valve 70-48 is not closing and closes 70-48.</p> <p>Reports 70-48 closed Dispatches personnel to investigate the trip of the 'B' RBCCW pump</p> <p>Contacts Work Control for a work order to investigate the failure of the 70-48 valve</p>

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**Event Description: RBCCW 2B Pump trip and failure of sectionalizing valve to auto-close**

Time	Position	Applicant's Actions or Behavior
	DRIVER	Acknowledge investigating 'B' RBCCW pump trip and the failure of the 70-48 valve to automatically close
	SRO	Directs entry into AOI-70-1
	ATC	<p><b>AOI-70-1</b>  <b>4.0 OPERATOR ACTIONS</b>  <b>4.1 Immediate Actions</b>  [1] IF RBCCW Pump(s) has tripped, THEN  Perform the following (Otherwise N/A):</p> <ul style="list-style-type: none"> <li>• <b>SECURE</b> RWCW Pumps.</li> <li>• <b>VERIFY</b> RBCCW SECTIONALIZING VLV, 2-FCV-70-48 <b>CLOSED</b>.</li> </ul> <p>Secures RWCW pumps and verifies 70-48 closed  Enters AOI-70-1 and reports immediate operator actions complete</p>
	SRO	<p><b>CAUTION</b>  [NRC/C] Operations outside of the allowable regions shown on the Recirculation System Operating Map could result in thermal-hydraulic power oscillations and subsequent fuel damage. REFER TO 2-GOI-100-12A for required actions and monitoring to be performed during a power reduction. [NCO 940245001]</p> <p>[1] IF Reactor is at power AND Drywell Cooling cannot be immediately restored, THEN  <b>PERFORM</b> the following (otherwise N/A):  [2] IF any EOI entry condition is met, THEN  <b>ENTER</b> appropriate EOI(s) (otherwise N/A).</p> <p>Determines that steps 1 and 2 are N/A</p> <p>[3] IF RBCCW Pump(s) has tripped and it is desired to restart the tripped RBCCW pump, THEN  <b>PERFORM</b> the following (otherwise N/A):  [3.1] <b>INSPECT</b> the tripped RBCCW pump and its associated breaker for any damage or abnormal conditions.</p>



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**Event Description: RBCCW 2B Pump trip and failure of sectionalizing valve to auto-close**

Time	Position	Applicant's Actions or Behavior
	DRIVER	<p>As control bay AUO, report 'B' RBCCW pump breaker is tripped and there is also a smell of burnt wiring .</p> <p>As RB AUO, report that 'B' RBCCW pump appears fine other than being tripped.</p>
	SRO	<p>[4] <b>IF</b> unable to restart a tripped pump, <b>THEN</b>  <b>PLACE</b> Spare RBCCW Pump in service. <b>REFER TO 2-OI-70.</b></p> <p>Directs placing the spare RBCCW pump in service IAW OI-70.</p>
	ATC	<p><b>OI-70</b>  <b>8.2 Placing Spare Pump in Service</b>  <b>CAUTIONS</b></p> <p>1) Damage to the RBCCW Pumps and/or RBCCW Heat Exchangers may occur if the number of RBCCW Pumps in operation is not equal to the number of RBCCW Heat Exchangers in operation.</p> <p>2) Valving in the Spare RBCCW Pump could affect RBCCW Surge Tank level.</p>
	ATC	<p>[1] <b>VERIFY</b> RBCCW System in operation.</p> <p>[2] <b>REQUEST</b> Unit 1 to place the Spare RBCCW Pump in service to support Unit 2 operation. <b>REFER TO 1-OI-70.</b></p> <p>Calls Unit 1 and requests that the spare RBCCW pump be aligned to Unit 2</p>
	DRIVER	<p>As Unit 1, acknowledge aligning the spare RBCCW pump to Unit 2. Wait 3 minutes, then insert remote function to align the spare RBCCW to Unit 2. Call Unit 2 operator and report that the spare RBCCW pump is aligned to Unit 2.</p>

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**Event Description: RBCCW 2B Pump trip and failure of sectionalizing valve to auto-close**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>[5] IF RBCCW flow was restored to two pump operation, <b>THEN PERFORM</b> the following (Otherwise N/A):</p> <p>[5.1] <b>REOPEN</b> RBCCW SECTIONALIZING VLV, 2-HS-70-48A.</p> <p>Reopens 70-48 and reports 70-48 has been reopened</p>
	SRO	<p>Refers to Technical Specifications since RWCU was shutdown.</p> <p>TR 3.4 REACTOR COOLANT SYSTEM</p> <p>TR 3.4.1 Coolant Chemistry</p> <p>LCO 3.4.1 Reactor coolant chemistry shall be maintained within the limits of 3.4.1-1</p> <p>TECHNICAL SURVEILLANCE REQUIREMENTS</p> <p>TSR 3.4.1.1 Monitor reactor coolant Conductivity      Continuously OR 4 hours when the continuous conductivity monitor is inoperable and the reactor is not in MODE 4 or 5</p> <p>Calls chemistry to commence sampling for reactor coolant conductivity. Samples required every 4 hours.</p> <p>Briefs crew on current plant conditions including TS requirements</p>
	DRIVER	As Chemistry, acknowledge sampling requirement
	NRC	End of Event #4

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**Event Description: Loss of 480V S/D Board 2B**

	DRIVER	When the NRC Chief Examiner is ready for Event #5, insert malfunction to cause of loss of 480V S/D Board 2B.
	CREW	Responds to numerous alarms Diagnoses a loss of 480V Shutdown Board 2B and 480V RMOV Boards 2B and 2C
	ATC	Reports that Reactor Power, Reactor Pressure and Reactor Level are stable following the board loss. Reports a loss of RPS 'B' and Ch. 'B' half scram.
	BOP	Responds to the following alarms; 8B-30, 8C-24, and 8C-31 480V SHUTDOWN BD 2B UV OR XFR (2-XA-55-8B, Window 30) A. Overcurrent - trips and locks out normal Bkr and prevents manual transfer to alternate. B. <b>IF</b> 480V Shutdown Bd 2B is lost, <b>THEN</b> Manually <b>TRANSFER</b> to alternate source by placing CS in <b>ALTERNATE</b> position on Panel 2-9-8. D. <b>IF</b> manual transfer is <b>NOT</b> accomplished, <b>THEN</b> <b>REFER</b> to Tech Spec 3.8.7 and 3.8.8 Determines and reports that 2B 480V S/D Bd. cannot be transferred to alternate Refers US to TS 3.8.7 and 3.8.8 Dispatches personnel to investigate the loss of 2B 480V S/D Bd 480V REACTOR MOV BD 2B OR 2E UV (2-XA-55-8C, Window 24) A. <b>CHECK</b> light indications for loss of any 480V equipment.

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Event Description: **Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
		<p>D. IF undervoltage or transfer has occurred, <b>THEN</b></p> <ol style="list-style-type: none"> <li>1. <b>REFER TO</b> TS Section 3.8.7</li> <li>2. <b>RESET</b> possible half-scram. <b>REFER TO</b> 2-OI-99.</li> </ol> <p>E. <b>REFER TO</b> 0-OI-57B to re-energize or transfer board.</p> <p>480V REACTOR MOV BD 2C UV OR XFR (2-XA-55-8C, Window 31)</p> <p>A. <b>VERIFY</b> automatic action:</p> <p>B. <b>CHECK</b> light indications for loss of 480V equipment.</p> <p>E. <b>REFER TO</b> 0-OI-57B to re-energize or transfer the board.</p>
		<p>Directs entry into AOI-99-1, Loss of Power to One RPS Bus <b>AOI-99-1</b></p> <p><b>4.0 OPERATOR ACTIONS</b></p> <p><b>4.1 Immediate Action</b></p> <p>[1] <b>STOP</b> all testing with potential RPS half-scrams or PCIS logic isolation signals.</p> <p><b>4.2 Subsequent Actions</b></p> <p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1) If power cannot be restored promptly to a de-energized RPS Bus, plant operation may continue until repairs are made provided all plant operational limits are met</li> <li>2) Loss of RPS will isolate 2-RM-90-256, Drywell Air Monitor, and TS LCO 3.4.5 Condition B should be entered.</li> </ol> <p>[1] <b>VERIFY</b> automatic actions occur.</p>

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Event Description: **Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>[2] <b>VERIFY</b> Steam Tunnel Booster FAN operating by observation of MAIN STEAM LINE TUNNEL TEMPERATURE, 2-TIS-1-60A.</p> <p>[4] <b>IF</b> desired to place RPS Bus B on Alternate Supply, <b>THEN PERFORM</b> Step 4.2[9]. (Otherwise N/A)</p> <p>Dispatches personnel to transfer RMOV Bds 2B, 2C, and 2E to the alternate power source, then transfer RPS 'B' to alternate.</p>
	DRIVER	<p>After being dispatched to restore power, wait 5 minutes then insert (bat) to restore power to RMOV Bds 2B/2C/2E. Then insert (bat) to restore power to RPS 'B' and reset ATU Gross Failures</p> <p>Call US and report power restored to RPS 'B' and RMOV Bds 2B, 2C, and 2E. ATU GROSS FAILURES reset in AIR</p>
	SRO	<p>Updates the crew on power restoration</p> <p>Directs ATC to reset RPS logic half scram and PCIS</p>
	ATC	<p><b>AOI-99-1</b></p> <p><b>4.2 Subsequent Actions</b></p> <p>[12] <b>RESET</b> the RPS trip logic half scram at Panel 2-9-5 as follows:</p> <p style="text-align: center;"><b>NOTE</b></p> <p>The eight CONTROL ROD TEST SCRAM SOLENOID GROUP A and B LIGHTS SHOULD ILLUMINATE</p>

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Event Description: **Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>[12.1] <b>MOMENTARILY PLACE</b> SCRAM RESET, 2-HS-99-5A-S5, as follows:</p> <p>[12.2] RESET FIRST position. (Group 2/3)</p> <p>[12.3] RESET SECOND position. (Group 1/4)</p> <p>[12.4] NORMAL position.</p> <p>[13] <b>VERIFY</b> the following:</p> <p>[13.1] All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights ILLUMINATED.</p> <p>[13.2] The following four lights ILLUMINATED:</p> <p>[13.2.1] SYSTEM A BACKUP SCRAM VALVE, 2-IL-99-5A/AB. <input type="checkbox"/></p> <p>[13.2.2] SYSTEM B BACKUP SCRAM VALVE</p> <p>[13.3] Scram Discharge Volume vent and drain valves indicate OPEN.</p> <p>[14] <b>RESET</b> PCIS trip logic at Panel 2-9-4 as follows:</p> <p>[14.1] <b>MOMENTARILY PLACE</b> PCIS DIV I RESET, 2-HS-64-16A-S32, to left and right RESET positions.</p> <p>[14.2] <b>VERIFY</b> the following red lights ILLUMINATED:</p> <p>[14.2.1] MSIV GROUP A1.</p> <p>[14.2.2] MSIV GROUP B1.</p> <p>[14.3] <b>MOMENTARILY PLACE</b> PCIS DIV II RESET, 2-HS-64-16A-S33, to left and right RESET positions.</p>

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
		<p>[14.4] <b>VERIFY</b> the following red lights ILLUMINATED:</p> <p>[14.4.1] MSIV GROUP A2.</p> <p>[14.4.2] MSIV GROUP B2.</p> <p>Resets RPS logic half scram and PCIS</p> <p>Reports RPS and PCIS reset</p>
	SRO	<p>Directs BOP to restore remaining affected systems IAW OI-99</p> <p>Refers to Technical Specifications</p> <p>3.8 ELECTRICAL POWER SYSTEMS</p> <p>3.8.7 Distribution Systems – Operating</p> <p>LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:</p> <p>b. Unit 2 480 V Shutdown Boards;</p> <p>c. Unit 2 480 V RMOV Boards 2A, 2B, 2D, and 2E;</p>

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior		
	SRO	B. One Unit 2 480 V Shutdown Board inoperable. OR 480 V RMOV Board 2B inoperable	B.1 Restore Board to OPERABLE status	8 hours
		C. Unit 2 480 V RMOV Board 2E inoperable	C.1 Declare the affected RHR subsystem Inoperable	Immediately
		3.4 REACTOR COOLANT SYSTEM (RCS) 3.4.5 RCS Leakage Detection Instrumentation LCO 3.4.5 The following RCS leakage detection instrumentation shall be OPERABLE: a. Drywell floor drain sump monitoring system; and b. One channel of either primary containment atmospheric particulate or atmospheric gaseous monitoring system.		
		A. Drywell floor drain sump monitoring system inoperable	A.1 Restore drywell floor drain sump monitoring system to OPERABLE status.	24 hr
		B. Required primary Containment Atmospheric monitoring system inoperable.	B.1 Analyze grab samples of primary containment atmosphere AND B.2 Restore required primary containment atmospheric monitoring system to OPERABLE status	Once per 12 hr 30 days
		D. All required leakage detection systems inoperable.	D.1 Enter LCO 3.0.3	Immediately



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Event Description: **Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>TR 3.4 REACTOR COOLANT SYSTEM</p> <p>TR 3.4.1 Coolant Chemistry</p> <p>LCO 3.4.1 Reactor coolant chemistry shall be maintained within the limits of Table 3.4.1-1.</p> <p>TSR 3.4.1.1 Monitor reactor coolant conductivity      Continuously OR 4 hours when the continuous conductivity monitor is inoperable and the reactor is not in MODE 4 or 5</p> <p>Contacts Chemistry to start sampling reactor coolant conductivity every 4 hours</p> <p>Briefs crew on the Technical Specification requirements due to the loss of 480V S/D Bd B</p>
	BOP	<p><b>OI-99</b></p> <p><b>8.5 Restoration to Normal Following RPS Bus Power Loss or Transfer</b></p> <p><b>NOTE</b></p> <p>Steps 8.5[5] through 8.5[22] can be performed in any order.</p> <p>[5] <b>VERIFY</b> the green lights are ILLUMINATED on all 5 of the QLVPS located at Panel 9-14.</p> <p>[6] <b>RESTORE</b> Reactor and Refuel Zone Ventilation to normal operation. REFER TO 2-AOI-64-2D, Group 6 Ventilation System Isolation.</p>

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Event Description: **Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
		<p><b>AOI-64-2D</b></p> <p><b>4.2 Subsequent Actions</b></p> <p>[10] <b>WHEN</b> initiating signal has been corrected AND necessary repairs have been made, <b>THEN</b></p> <p>[10.1] <b>VERIFY</b> PCIS RESET:</p> <ul style="list-style-type: none"> <li>• <b>RESET</b> PCIS DIV I RESET, 2-HS-64-16A-S32.</li> <li>• <b>RESET</b> PCIS DIV II RESET, 2-HS-64-16A-S33.</li> </ul> <p>[10.2] <b>RESET</b> Reactor/Refuel isolation logic as required:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> REFUELING ZONE FANS AND DMPRS, 2-HS-64-3A in OFF.</li> <li>• <b>PLACE</b> REACTOR ZONE FANS AND DMPRS, 2-HS-64-11A in OFF.</li> </ul> <p>[10.3] <b>START</b> Reactor/Refuel zone ventilation as required:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> REACTOR ZONE FANS AND DAMPERS switch, 2-HS-64-11A, in SLOW A (SLOW B).</li> <li>• <b>PLACE</b> REFUEL ZONE FANS AND DAMPERS Switch, 2-HS-64-3A, in SLOW A (SLOW B).</li> </ul> <p>[10.4] <b>VERIFY</b> for the fans started the dampers open and fans start as indicated by illuminated red lights above the following switches:</p> <ul style="list-style-type: none"> <li>• The two green lights A(B) above REFUEL ZONE FANS AND DAMPERS Switch, 2-HS-64-3A, extinguish and the two red lights A(B) illuminate.</li> <li>• The two green lights A(B) above REACTOR ZONE FANS AND DAMPERS Switch 2-HS-64-11A, extinguish and the two red lights A(B) illuminate.</li> <li>• REACTOR ZONE SPLY OUTBD ISOL DMPR, 2-HS-64-13.</li> <li>• REACTOR ZONE SPLY INBD ISOL DMPR, 2-HS-64-14.</li> <li>• REACTOR ZONE EXH INBD ISOL DMPR, 2-HS-64-42.</li> </ul>

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>• REACTOR ZONE EXH OUTBD ISOL DMPR, 2-HS-64-43.</li> <li>• REACTOR ZONE FANS AND DAMPERS, 2-HS-64-11A.</li> <li>• REFUEL ZONE SPLY OUTBD ISOL DMPR, 2-HS-64-5.</li> <li>• REFUEL ZONE SPLY INBD ISOL DMPR, 2-HS-64-6.</li> <li>• REFUEL ZONE EXH OUTBD ISOL DMPR, 2-HS-64-9.</li> <li>• REFUEL ZONE EXH INBD ISOL DMPR, 2-HS-64-10.</li> </ul>
	BOP	<p>[11] <b>NOTIFY</b> RADCON of the isolation restoration AND <b>REQUEST</b> surveys</p> <p>Restores ventilation and contacts radcon for surveys</p>
	DRIVER	As Radcon, acknowledge that ventilation has been restored and surveys need to be performed.
	BOP	<p><b>OI-99</b></p> <p><b>8.5 Restoration to Normal Following RPS Bus Power Loss or Transfer</b></p> <p>[7] <b>RESTORE</b> Standby Gas Treatment System to standby readiness. REFER TO 0-OI-65, Section 7.0.</p> <p>Calls Unit 1 to have Standby Gas Treatment restored to standby readiness.</p>

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	DRIVER	As Unit 1 operator, acknowledge securing SBTG. Insert (bat) to secure SBTG trains.
	BOP	<p>[8] At Panel 2-9-3, <b>PLACE</b> PSC head tank pumps in service as follows:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> PSC PUMP SUCTION INBD ISOL VALVE, 2-HS-75-57A, in AUTO After OPEN. <input type="checkbox"/></li> <li>• <b>PLACE</b> PSC PUMP SUCTION OUTBD ISOL VALVE, 2-HS-75-58A, in AUTO After OPEN. <input type="checkbox"/></li> <li>• <b>PLACE</b> PSC HEAD TANK PUMPS 2A &amp; 2B, 2-HS-75-75A &amp; 2-HS-75-76A in AUTO.</li> </ul> <p style="text-align: center;"><b>NOTE</b></p> <p>2-FCV-64-139 and 2-FCV-64-140 opens and closes automatically when the Drywell DP Compressor starts and stops.</p> <p>[10] At Panel 2-9-3, <b>RESTORE</b> Drywell DP Compressor to automatic operation as follows:</p> <p>[10.1] <b>DEPRESS</b> DRYWELL DP COMP SUCTION VLV RESET pushbutton, 2-HS-64-139A.</p> <p>[10.2] <b>DEPRESS</b> DRYWELL DP COMP DISCH VLV RESET pushbutton, 2-HS-64-140A.</p> <p>[10.3] <b>VERIFY OPEN</b> DRYWELL INBD ISOLATION VLV using 2-HS-64-31.</p> <p>[10.4] <b>VERIFY OPEN</b> SUPPR CHBR INBD ISOLATION VLV using 2-HS-64-34.</p> <p>[11] At Panel 2-9-4, <b>RESTORE</b> Drywell Floor and Equipment Drain Systems to normal operation as follows:</p> <p>[11.1] <b>NOTIFY</b> Radwaste Operator that Drywell Equipment and Floor Drain Sump isolation valves are being reopened.</p> <p>[11.2] <b>PLACE</b> DW EQPT DRAIN INBD ISOL VALVE, 2-HS-77-15A, in AUTO After OPEN.</p> <p>[11.3] <b>PLACE</b> DW EQPT DRAIN OUTBD ISOL VALVE, 2-HS-77-15B, in AUTO After OPEN.</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 5

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[11.4] <b>PLACE</b> DW FLOOR DRAIN INBD ISOL VALVE, 2-HS-77-2A, in AUTO After OPEN.</p> <p>[11.5] <b>PLACE</b> DW FLOOR DRAIN OUTBD ISOL VALVE, 2-HS-77-2B, in AUTO After OPEN.</p> <p>[12] <b>IF</b> DW Radiation Monitor CAM, 2-RM-90-256 was secured due to a preplanned transfer, <b>THEN</b> (otherwise <b>N/A</b>)</p> <p>[13] <b>IF</b> DW Radiation Monitor CAM, 2-RM-90-256, isolated due to loss of RPS, <b>THEN</b> (otherwise <b>N/A</b>)  <b>MOMENTARILY DEPRESS</b> the following RESET pushbuttons on Panel 2-9-2 and verify the associated valves open.</p> <ul style="list-style-type: none"> <li>• UPPER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254A-A (opens FCV-90-254A).</li> <li>• LOWER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254B-A (opens FCV-90-254B).</li> <li>• OUTBD RETURN ISOL VALVE RESET, 2-HS-90-257A-A (opens FCV-90-257A).</li> <li>• OUTBD SUPPLY ISOL VALVE RESET, 2-HS-90-255A (opens FCV-90-255).</li> <li>• INBD RETURN ISOL VALVE RESET, 2-HS-90-257B-A (opens FCV-90-257B).</li> </ul> <p>[14] At Panel 2-9-54,  <b>PLACE</b> H2/O2 Analyzer in service per 2-OI-76.</p> <p>[15] At Panel 2-9-55, <b>VERIFY</b> PATH A VENT FLOW CONT, 2-FIC-84-20, in AUTO with setpoint at 100 scfm.</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 5

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**Event Description: Loss of 480V S/D Board 2B**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[19] At Panels 2-9-10 and 2-9-11, <b>RESTORE</b> Radiation Monitoring System as follows:</p> <p>[19.1] <b>DEPRESS</b> applicable RESET pushbuttons.</p> <p>[19.2] <b>RESTORE</b> Radiation Monitoring System to normal. REFER TO 2-OI-90, Section 5.0.</p> <p>[21] At Panel 2-9-14, <b>VERIFY</b> APRM and RBM Memory lights <b>RESET</b> (If current plant conditions allow).</p> <p>[22] At Panel 2-9-13, <b>DEPRESS</b> TIP ISOLATION RESET pushbutton.</p>
	NRC	<p>This completes restoration from the loss of RPS 'B' with the exception of RWCU.</p> <p>End of Event #5</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 6, insert malfunction for a loss of condenser vacuum.
	BOP	<p>Reports OG HOLDUP LINE INLET FLOW HIGH (2-XA-55-53, Window 14) in alarm.</p> <p><b>ARP-9-53</b></p> <p>A. <b>VERIFY</b> holdup line flow on:  2. 2-FR-66-20, Off-gas flow to holdup volume, Panel 9-8.</p> <p>Checks off-gas flow and reports flow is high</p>
	ATC	Reports degrading condenser vacuum
	SRO	<p>Directs entering AOI-47-3</p> <p><b>AOI-47-3</b></p> <p style="text-align: center;"><b>NOTE</b></p> <p>Turbine trip is expected around 24.3 inches Hg as indicated on 2-XR-002-0026 due to differences between instrument taps for turbine trip and indicated vacuum.</p> <p><b>4.2 Subsequent Actions</b></p> <p>[1] <b>IF</b> ANY EOI entry condition is met, <b>THEN</b>  <b>ENTER</b> the appropriate EOI(s).</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>[NRC/C] Operations outside of the allowable regions shown on the Recirculation System Operating Map could result in thermal-hydraulic power oscillations and subsequent fuel damage. <b>REFER TO</b> 2-GOI-100-12A for required actions and monitoring to be performed during a power reduction. [NCO 940245001]</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
		<p>[2] <b>IF</b> unable to maintain hotwell pressure below -25 inches Hg as indicated on 2-XR-002-0026, with Reactor power less than 30%, <b>THEN</b> <b>TRIP</b> the main turbine.</p> <p>[3] <b>IF</b> condenser vacuum is lost, <b>THEN</b> <b>OPEN</b> the HOTWELL SAMPLE TO FL DR, 2-DRV-043-1019 (557'@ T-10 C-Line) and CON DEMIN SAMPLE TO FL DR, 2-DRV-043-1020 (557'@ T-6 G-Line), to establish flow through the sample lines.</p>
	SRO	<p>[4] <b>REDUCE</b> reactor power in an attempt to maintain condenser vacuum.</p> <p>[5] <b>VERIFY</b> automatic actions</p> <p>Sets a trigger value, on main condenser vacuum, to initiate a manual reactor scram and main turbine trip. Directs ATC to initiate an Upper Power Runback in an attempt to maintain main condenser vacuum</p>
	ATC	<p>Initiates an Upper Power Runback and reports reactor power lowering.</p> <p>Monitors main condenser vacuum and reports that vacuum is continuing to degrade</p>



Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>AOI-47-3</b></p> <p><b>4.2 Subsequent Actions</b></p> <p>[6] <b>CHECK</b> CCW pumps for proper operation.</p> <p>[7] <b>VERIFY CLOSED</b> CONDENSER VAC BREAKERS 1A and 1B, 2-HS-66-1A, Panel 9-8.</p> <p>[9] <b>IF</b> SJAE 2A is in service , <b>THEN VERIFY</b> the following</p> <p>Verifies main condenser vacuum breakers are closed.</p> <p>Verifies proper operation of CCW and in-service SJAE</p>
	SRO	Directs a manual reactor scram and main turbine trip
	ATC	<p>Initiates a manual reactor scram</p> <p><b>AOI-100-1</b></p> <p><b>Reactor Scram OATC Hard Card</b></p> <p><b>1.0 IMMEDIATE ACTIONS</b></p> <p>[1] <b>DEPRESS</b> REACTOR SCRAM A and B, 2-HS-99-5A/S3A and 2-HS-99-5A/S3B, on Panel 2-9-5.</p> <p>[2] <b>IF</b> scram is due to a loss of RPS, <b>THEN PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in <b>START &amp; HOT STBY AND PAUSE</b> for approximately 5 seconds (Otherwise N/A)</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
		<p>[3] Refuel Mode One Rod Permissive Light check:</p> <p>[3.1] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in REFUEL.</p> <p>[3.2] <b>CHECK</b> illuminated REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46.</p> <p>[3.3] <b>IF</b> REFUEL MODE ONE ROD PERMISSIVE light, 2-XI-85-46, is <b>NOT</b> illuminated, <b>THEN CHECK</b> all control rod positions at Full-In Overtravel, or Full-In. (Otherwise N/A)</p> <p>[4] <b>PLACE</b> REACTOR MODE SWITCH, 2-HS-99-5A-S1, in SHUTDOWN.</p> <p>[5] <b>REPORT</b> the following status to the US:</p> <ul style="list-style-type: none"><li>• Reactor Scram</li><li>• Mode Switch is in Shutdown</li><li>• "All rods in" or "rods out"</li><li>• Reactor Water Level and trend (recovering or lowering)</li><li>• Reactor pressure and trend</li><li>• MSIV position (Open or Closed)</li><li>• Power level</li></ul> <p>Completes immediate operator actions and makes scram report</p> <p>Continues to monitor main condenser vacuum</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>Reactor Scram BOP Unit Operator Hard Card</b></p> <p><b>1.0 SUBSEQUENT ACTIONS: PANELS 2-9-7 &amp; 2-9-8</b></p> <p><b>NOTES</b></p> <p>1) To OPEN PCB 224 with the control room handswitch, ONE of the following is required: 2-XA-55-8A window 7, GEN REVERSE PWR FIRST RELAY OPERATION 2-EA-57-136, WITH GENERATOR PCB 224 CNTR W/REV BYPASS, 2-HS-242-224A, placed in TRIP.</p> <p><u>OR</u></p> <p>GENERATOR PCB 224 CNTR W/REV BYPASS, 2-HS-242-224A, placed in BYPASS.</p> <p>2) The following steps are not required to be performed in order, but only as required to maintain stable conditions.</p>
	BOP	<p>[1] At <math>\leq 50</math> MWe, or as directed by the Unit Supervisor, <b>VERIFY TRIPPED</b> the Main Turbine as follows:</p> <p>[1.1] <b>DEPRESS</b> the TRIP pushbutton, 2-HS-47-67D on Panel 2-9-7.</p> <p>[1.2] <b>VERIFY OPEN</b> GENERATOR PCB 224.</p> <p>[1.3] <b>VERIFY TRIPPED</b> VOLTAGE REGULATOR</p> <p>[2] <b>ANNOUNCE</b> Reactor SCRAM over PA system.</p> <p>Trips the main turbine and announces the reactor scram over the PA system.</p> <p>Reports the main turbine tripped.</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
		<p><b>2.0 SUBSEQUENT ACTIONS: PANELS 2-9-3</b></p> <p style="text-align: center;"><b>NOTE</b></p> <p>The following steps are not required to be performed in order, but only as required to maintain stable conditions</p> <p>[1] <b>MONITOR</b> and <b>CONTROL</b> RPV pressure to keep below 1073 psig and stable.</p> <p>[2] <b>IF</b> any PCIS isolation signal is received, <b>THEN</b> <b>VERIFY</b> PCIS isolations using any of the following: (Otherwise N/A)</p> <ul style="list-style-type: none"> <li>• Containment Isolation Status System on Panel 2-9-4</li> </ul> <p>Verifies that main turbine bypass valves are controlling reactor pressure</p> <p>Checks CISS panel and reports 2,3,6, and 8 PCIS isolations</p>
	SRO	<p>Enters EOI-1 on RPV Water Lvl below +2"</p> <p><b>Verify</b> RX scram – <b>CHECKED</b></p> <p><b>RC/Q</b></p> <p><b>Monitor</b> and <b>Control</b> reactor power - <b>CHECKED</b></p> <p>The reactor is subcritical</p> <p style="text-align: center;"><b>AND</b></p> <p>NO boron has been injected <b>THEN</b></p> <p><b>EXIT</b> RC/Q and</p> <p><b>ENTER</b> AOI-100-1, Reactor Scram - <b>CHECKED</b></p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior																					
	SRO	<p>Directs ATC to enter 2-AOI-100-1</p> <p><b>RC/L</b> CAUTION: Ambient temp may affect RPV water lvl indication and trend – <b>CHECKED</b></p> <p><b>MONITOR</b> and <b>CONTROL</b> RPV water lvl – <b>CHECKED</b></p> <p><b>VERIFY</b> each as required</p> <ul style="list-style-type: none"> <li>PCIS isolations (Groups 1, 2, and 3) – <b>CHECKED</b></li> </ul> <p>It has NOT been determined that the reactor will remain subcritical without boron under all conditions – <b>SUBCRITICAL</b></p> <p>RPV water lvl CANNOT be determined – <b>CAN</b></p> <p>PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b> OR Suppr chmbr press CANNOT be maintained below 55 psig - <b>CAN</b></p> <p>CAUTION</p> <p>#2 Pump NPSH and Vortex Limits #3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F – <b>CHECKED</b></p> <p>RESTORE and MAINTAIN RPV water lvl between +2 in and +51 in with ANY of the following</p> <table> <tr> <td>CNDS and FW</td><td>5A</td><td>1210 psig</td></tr> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> <tr> <td>RCIC with CST suction if available</td><td>5C</td><td>1200 psig</td></tr> <tr> <td>HPCI with CST suction if available</td><td>5D</td><td>1200 psig</td></tr> <tr> <td>CNDS</td><td>6A</td><td>480 psig</td></tr> <tr> <td>CS</td><td>6D, 6E</td><td>330 psig</td></tr> <tr> <td>LPCI</td><td>6B, 6C</td><td>320 psig</td></tr> </table>	CNDS and FW	5A	1210 psig	CRD	5B	1640 psig	RCIC with CST suction if available	5C	1200 psig	HPCI with CST suction if available	5D	1200 psig	CNDS	6A	480 psig	CS	6D, 6E	330 psig	LPCI	6B, 6C	320 psig
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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Directs ATC to restore and maintain reactor level between +2 in and +51 in using Condensate and Feedwater in accordance with Appendix 5A</p> <p><b>RC/P</b></p> <p>DW press is above 2.4 psig - <b>NO</b></p> <p>Emergency RPV depressurization is anticipated - <b>NO</b> AND The reactor will remain subcritical without boron under all conditions</p> <p>Emergency RPV depressurization is or has been required - <b>NO</b></p> <p>RPV water lvl CANNOT be determined - <b>CAN</b></p> <p>Is ANY MSRV cycling - <b>NO</b></p> <p>Steam cooling is required - <b>NO</b></p> <p>Suppr pl temp and lvl CANNOT be maintained in a safe area of Curve 3 at the existing RPV press - <b>CAN</b></p> <p>Suppr pl lvl CANNOT be maintained in the safe area - <b>CAN</b> of Curve 4</p> <p>DW control air becomes unavailable - <b>AVAIL</b></p> <p>Boron inj is required - <b>NO</b> AND The main condenser is available AND There has been no indication of a steam line break</p> <p><b>STABILIZE</b> RPV press below 1073 psig with the main turbine bypass vlvs (APPX 8B)</p>

Op Test No.: 15-01Scenario No. 4 Event No.: 6

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to control reactor pressure 800 psig to 1000 psig in accordance with Appendix 8B
	BOP	Recognizes and reports that main turbine bypass valves have closed due to the loss of vacuum
	ATC	Recognizes and reports Reactor Feedwater Pumps tripped due to loss of vacuum
	SRO	<p>Directs BOP to restore and maintain RPV water level between +2 in. and +51 in. with RCIC using App 5C</p> <p>EOI-1 RC/P #3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F</p> <p><b>AUGMENT</b> RPV press control as necessary with ANY of the following MSRVs ONLY when suppr lvl is above 5.5 ft 11A</p> <p>Directs BOP to maintain RPV pressure 800 psig to 1000 psig using MSRVs, App. 11A</p>
	BOP	<p><b>EOI APPENDIX-5C</b></p> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>• Operating RCIC turbine below 2100 rpm may result in unstable system operation and equipment damage.</li> <li>• High Suppression Chamber pressure may trip RCIC.</li> <li>• Operating RCIC Turbine with suction temperatures above 140°F may result in equipment damage.</li> </ul>

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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
		<p>3. <b>VERIFY RESET</b> and <b>OPEN</b> 2-FCV-71-9, RCIC TURB TRIP/THROT VLV.</p> <p>4. <b>VERIFY</b> 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller in AUTO with setpoint at 620 gpm.</p> <p>5. <b>OPEN</b> the following valves:</p> <ul style="list-style-type: none"><li>• 2-FCV-71-39, RCIC PUMP INJECTION VALVE</li><li>• 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE</li><li>• 2-FCV-71-25, RCIC LUBE OIL COOLING WTR VLV.</li></ul> <p>6. <b>PLACE</b> 2-HS-71-31A, RCIC VACUUM PUMP, handswitch in START.</p> <p>7. <b>OPEN</b> 2-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC Turbine.</p> <p>8. <b>CHECK</b> proper RCIC operation by observing the following:</p> <ul style="list-style-type: none"><li>a. RCIC Turbine speed accelerates above 2100 rpm.</li><li>b. RCIC flow to RPV stabilizes and is controlled automatically at 620 gpm.</li><li>c. 2-FCV-71-40, RCIC TESTABLE CHECK VLV, opens by observing 2-ZI-71-40A, DISC POSITION, red light illuminated.</li><li>d. 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE, closes as flow rises above 120 gpm.</li></ul>



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**Event Description: Loss of Condenser Vacuum**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>10. <b>ADJUST</b> 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, controller as necessary to control injection.</p> <p>Starts RCIC IAW App 5C and restores and maintains RPV water level +2 in to +51 in.</p> <p><b>Appendix-11A</b>  <b>1.0 INSTRUCTIONS</b></p> <p>[1] <b>IF</b> Drywell Control Air is NOT available, <b>THEN EXECUTE</b> EOI Appendix 8G, CROSSTIE CAD TO DRYWELL CONTROL AIR, <b>CONCURRENTLY</b> with this procedure.</p> <p>[2] <b>IF</b> Suppression Pool level is at or below 5.5 ft, <b>THEN CLOSE</b> MSRVs and <b>CONTROL</b> RPV pressure using other options.</p> <p>[3] <b>OPEN</b> MSRVs using the following sequence to control RPV pressure as directed by SRO:</p> <ol style="list-style-type: none"> <li>1 2-PCV-1-179 MN STM LINE A RELIEF VALVE</li> <li>2 2-PCV-1-180 MN STM LINE D RELIEF VALVE</li> <li>3 2-PCV-1-4 MN STM LINE A RELIEF VALVE</li> <li>4 2-PCV-1-31 MN STM LINE C RELIEF VALVE</li> <li>5 2-PCV-1-23 MN STM LINE B RELIEF VALVE</li> <li>6 2-PCV-1-42 MN STM LINE D RELIEF VALVE</li> <li>7 2-PCV-1-30 MN STM LINE C RELIEF VALVE</li> <li>8 2-PCV-1-19 MN STM LINE B RELIEF VALVE</li> <li>9 2-PCV-1-5 MN STM LINE A RELIEF VALVE</li> <li>10 2-PCV-1-41 MN STM LINE D RELIEF VALVE</li> <li>11 2-PCV-1-22 MN STM LINE B RELIEF VALVE</li> <li>12 2-PCV-1-18 MN STM LINE B RELIEF VALVE</li> <li>13 2-PCV-1-34 MN STM LINE C RELIEF VALVE</li> </ol> <p>Controls RPV pressure 800 psig to 1000 psig IAW App 11A</p>
	NRC	End of Event #6

Op Test No.: 15-01Scenario No. 4 Event No.: 7

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
	DRIVER	When the NRC Chief Examiner is ready for Event No. 7, insert (bat) for a loss of offsite power with a failure of 'A' Diesel Generator to automatically start
	CREW	Recognize and report that a loss of offsite power has occurred.
	SRO	Directs entry into AOI-57-1A
	BOP	<p><b>AOI-57-1A</b></p> <p><b>4.0 OPERATOR ACTIONS</b></p> <p><b>4.1 Immediate Actions</b></p> <p style="text-align: center;"><b>NOTE</b></p> <p>Performing this instruction, in conjunction with an earthquake, may require resetting the individual Diesel Generator's 86G Lockout Relay and the Field Breaker(both locally at the Diesel Generator electrical cabinet).</p> <p>[1] <b>VERIFY</b> Diesel Generators have started and tied to respective 4kV Shutdown Boards, <b>THEN</b></p> <p><b>DISPATCH</b> personnel to Diesel Generators</p>
	NRC	When the BOP operator checks on the status of the Diesel Generators, it would initiate Event No. 8, Failure of the 'A' Diesel Generator to automatically start.
	BOP	Dispatches personnel to monitor the Diesel Generators
	DRIVER	As AUO, acknowledge monitoring diesel generators

Op Test No.: 15-01Scenario No. 4 Event No.: 7

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[2] <b>VERIFY</b> two EECW Pumps (not using the same EECW strainer) are in service supplying Diesel Generators.</p> <p>[3] <b>IF</b> two EECW Pumps (not using the same EECW strainer) are not in service supplying Diesel Generators, <b>THEN PERFORM</b> Attachment 9 (Cooling water is required to be established within 8 minutes) (Otherwise N/A).</p> <p>[4] <b>PERFORM</b> the following to ensure at least one train of Diesel Generator Room Fans are energized:</p> <ul style="list-style-type: none"> <li>• <b>VERIFY</b> 480V DSL Aux Board A or B energized.</li> </ul> <p style="text-align: center;"><b>NOTE</b></p> <p>The following subsequent actions may be performed out of order, depending on plant conditions.</p>
	BOP	<p>Performs actions IAW AOI-57-1A. Recognizes Diesel Generator 'A' failed to start. Starts 'A' D/G and verifies tied to 4kV S/D Bd.</p> <p><b>4.2 Subsequent Actions</b></p> <p style="text-align: center;"><b>NOTES</b></p> <p>1) SBO Unit does attachment 12 only; the other two units perform subsequent actions of AOI.</p> <p>2) If a Unit is in a Station Blackout condition, performance of this instruction will also require implementation of 1(2)(3)-AOI-30B-1, Reactor Building Ventilation Failure, on the Unit in Station Blackout.</p> <p>3) The following is the preferred pump combinations of Unit 1 and Unit 2 RHR pumps used in SDC: 1B/2D, 1A/2C, 1A/2D, 1B/2C. By using these pumps it ensures that a loss of a Diesel during a station blackout would not result in a loss of Shutdown cooling for both Unit 1 and Unit 2.</p>

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior																				
		<p>[1] <b>IF ANY</b> EOI entry condition is met, <b>THEN REFER TO</b> the appropriate EOI(s). (Otherwise N/A)</p> <p>[2] <b>IF any Unit is under a "Station Blackout" THEN ONLY PERFORM</b> Attachment 12 for that Unit: - <b>NA</b></p> <p>[3] <b>VERIFY</b> automatic actions and <b>PERFORM</b> any that failed to occur.</p> <p>[4] <b>REFER TO</b> 1(2)(3)-AOI-78-1, FPC System Failure for a complete Loss of AC POWER, as necessary. <b>NOT NEC</b></p> <p style="text-align: center;"><b>NOTES</b></p> <p>1) EECW supply valves to the Control Air Compressors and RBCCW are air operated. If initial air pressure is low, air compressors may trip on high temperature, until cooling water flow is established.</p> <p>2) At US discretion, the 0-FCV-67-53 valve can be placed in the open position with hand switch. The valve will automatically come open once EECW pressure is above setpoint. <b>REFER TO</b> OI-67 for valve operation.</p>																				
	BOP	<p>3) The North header supply to Unit 1 RBCCW, the North header supply to Unit 2 RBCCW and the South header supply to Unit 3 RBCCW are normally isolated with a manual valve; therefore no flow will occur when either 1-FCV-67-50, 2-FCV-67-50 or 3-FCV-67-51 opens.</p> <p>[5] <b>WHEN</b> EECW header pressure is restored above the reset pressure setpoint (psig) for the valves listed below, <b>THEN</b></p> <table><tr><td></td><td>Common</td><td>Unit 1</td><td>Unit 2</td><td>Unit 3</td></tr><tr><td>0-FCV-67-53</td><td>106</td><td></td><td></td><td></td></tr><tr><td>FCV-67-50</td><td></td><td>90</td><td>91</td><td>92</td></tr><tr><td>FCV-67-51</td><td></td><td>107</td><td>109</td><td>113</td></tr></table>		Common	Unit 1	Unit 2	Unit 3	0-FCV-67-53	106				FCV-67-50		90	91	92	FCV-67-51		107	109	113
	Common	Unit 1	Unit 2	Unit 3																		
0-FCV-67-53	106																					
FCV-67-50		90	91	92																		
FCV-67-51		107	109	113																		

Op Test No.: 15-01Scenario No. 4 Event No.: 7

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
		<p><b>RESET</b> EECW supplies to Control Air Compressors and RBCCW, at Unit 1 Panel 1-LPNL-925-0032 and Unit 2,3 Panels 2(3)-25-32. <b>REFER TO</b> the EECW to the RCW Crossties for Control Air &amp; RBCCW section of 0-OI-67.</p> <p>[6] <b>START</b> Control Air Compressors A, D and G as required and</p> <p><b>MONITOR</b> system pressure. <b>REFER TO</b> 0-AOI-32-1.</p> <p>[6.1] <b>IF</b> an air compressor trips on high temperature, <b>THEN</b> (Otherwise N/A)</p> <p><b>NOTIFY</b> Unit Supervisor for instructions.</p> <p>[8] <b>PLACE</b> RPS MG Sets A and B in service. <b>REFER TO</b> 1(2,3)-OI-99.</p> <p>[9] <b>START</b> the Diesel Driven Fire Pump. <b>REFER TO</b> 0-OI-26.</p> <p>Calls for Control Air Compressors and EECW to be reset and for RPS to be reenergized.</p>
	DRIVER	As outside personnel, acknowledge restoring control air, resetting EECW and restoring RPS. Wait 5 minutes, then insert (bat) Call control room and report that control air has been restored, EECW has been reset and RPS has been restored.
	ATC/BOP	<p>Reports that MSIVs are closed</p> <p>IF bulk suppression pool temperature reaches 95°F, notifies SRO of EOI-2 entry condition.</p>
	SRO	<p>When suppression pool temperature reaches 95°F, enters EOI-2</p> <p>Enters EOI-2 on Supp PI Temp above 95°F</p>

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b>  SAMG entry is required - <b>NO</b></p> <p style="text-align: center;">CAUTION</p> <p><b>#4</b> PC press vs pump NPSH - <b>CHECKED</b>  DW sprays have been initiated - <b>NO</b>  Suppr chmbr sprays have been initiated - <b>NO</b>  PC water level CANNOT be restored and maintained below 105 ft - <b>CAN</b>  OR  Suppr chmbr press CANNOT be restored and maintained below 55 psig - <b>CAN</b></p> <p><b>SP/T</b></p> <p style="text-align: center;">CAUTION</p> <p><b>#2</b> Pump NPSH and Vortex Limits</p> <p><b>MONITOR</b> and <b>CONTROL</b> suppr pl temp below 95°F using available suppr pl cooling (APPX 17A) – <b>CHECKED</b></p> <p>WHEN suppr pl temp CANNOT be maintained below 95°F</p> <p><b>OPERATE</b> all available suppr pl cooling using only RHR pumps NOT required to assure adequate core cooling by continuous inj (APPX 17A)</p> <p>Directs BOP to put all available suppression pool cooling in service IAW App 17A</p>
	BOP	<p>EOI APPENDIX-17A</p> <p>NOTE: Placing a BYPASS SEL switch in BYPASS in step 1 below prevents automatic opening of the affected RHR loop's outboard injection valve. This makes LPCI mode of that RHR loop inoperable.</p>

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>1. IF.....Adequate core cooling is assured,  <b>OR</b>  Directed to cool the Suppression Pool irrespective of adequate core cooling,  THEN.....<b>BYPASS</b> LPCI injection valve open interlock AS NECESSARY:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in BYPASS.</li> <li>• <b>PLACE</b> 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in BYPASS.</li> </ul> <p>2. <b>PLACE</b> RHR SYSTEM I(II) in Suppression Pool Cooling as follows:</p> <ol style="list-style-type: none"> <li>a. <b>VERIFY</b> at least one RHRSW pump supplying each EECW header.</li> <li>b. <b>VERIFY</b> RHRSW pump supplying desired RHR Heat Exchanger(s).</li> <li>c. <b>THROTTLE</b> the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm RHRSW flow: <ul style="list-style-type: none"> <li>• 2-FCV-23-34, RHR HX 2A RHRSW OUTLET VLV</li> <li>• 2-FCV-23-46, RHR HX 2B RHRSW OUTLET VLV</li> <li>• 2-FCV-23-40, RHR HX 2C RHRSW OUTLET VLV</li> <li>• 2-FCV-23-52, RHR HX 2D RHRSW OUTLET VLV</li> </ul> </li> <li>d. IF ..... Directed by SRO,  THEN.....<b>PLACE</b> 2-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD in MANUAL OVERRIDE</li> <li>e. IF .....LPCl Initiation signal exists,  THEN.....<b>MOMENTARILY PLACE</b> 2-XS-74-121(129), RHR SYS I(II) CTMT SPRAY/CLG VLV SELECT in SELECT.</li> <li>f. IF ..... 2-FCV-74-53(67), RHR SYS I(II) LPCI INBD INJECT VALVE, is OPEN,  THEN..... <b>VERIFY CLOSED</b> 2-FCV-74-52(66), RHR SYS I(II) LPCI OUTBD INJECT VALVE.</li> <li>g. <b>OPEN</b> 2-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV</li> <li>h. <b>VERIFY</b> desired RHR pump(s) for Suppression Pool Cooling are operating.</li> </ol>

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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>CAUTION</b></p> <p>RHR system flows below 7000 gpm or above 10000 gpm for one-pump operation may result in excessive vibration and equipment damage.</p> <p>i. <b>THROTTLE OPEN</b> 2-FCV-74-59(73), RHR SYS I(II) SUPPR POOL CLG/TEST VLV, to maintain EITHER of the following as indicated on 2-FI-74-50(64), RHR SYS I(II) FLOW:</p> <ul style="list-style-type: none"> <li>• Between 7000 and 10000 gpm for one-pump operation.</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• At or below 13000 gpm for two-pump operation. _____</li> </ul> <p>j. <b>VERIFY CLOSED</b> 2-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.</p> <p>k. <b>MONITOR</b> RHR Pump NPSH using Attachment 1.</p> <p>l. <b>NOTIFY</b> Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers.</p> <p>Places RHR in Suppression Pool Cooling IAW App 17A Reports Suppression Pool Cooling in service Contacts Chemistry to reports RHRSW aligned to in service RHR Heat Exchangers.</p>
	DRIVER	As Chemistry, acknowledge that RHRSW has been aligned to RHR Heat Exchangers.
	SRO	<p>Refers to Technical Specifications for SPT</p> <p>3.6 CONTAINMENT SYSTEMS</p> <p>3.6.2.1 Suppression Pool Average Temperature</p> <p>LCO 3.6.2.1 Suppression pool average temperature shall be:</p> <p>a. &lt;95°F when any OPERABLE intermediate range monitor (IRM) channel is &gt; 70/125 divisions of full scale on Range 7 and no testing that adds heat to the suppression pool is being performed;</p>



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**Event Description: Loss of Offsite Power**

Time	Position	Applicant's Actions or Behavior		
	SRO	A. Suppression pool average temperature $\geq 95^{\circ}\text{F}$ but $\leq 110^{\circ}\text{F}$ .  AND  Any OPERABLE IRM channel > 70/125 divisions of full scale on Range 7  AND  Not performing testing That adds heat to the suppression pool	Verify suppression pool temperature $\leq 110^{\circ}\text{F}$  AND  Restore suppression pool average temperature to $\leq 95^{\circ}\text{F}$	Once/hr        24 hours
	NRC	End of Event #7		

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**Event Description: DG A Fails to Auto start**

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes and reports that 'A' Diesel Generator has failed to start  Starts 'A' Diesel Generator  Verifies the 'A' Diesel Generator ties to 4kV Shutdown Board 'A'  Reports that 'A' Diesel Generator has been started and that the diesel generators are tied to all 4kV Shutdown Boards.
	NRC	End of Event #8

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior									
	DRIVER	When the NRC Chief Examiner is ready for Event No. 9, insert (bat) for a LOCA and a failure of the HPCI steam supply valve to open automatically.									
	ATC	Reports reactor water level lowering									
	BOP	Reports drywell pressure rising									
	SRO	<p>Reenters EOI-1 on reactor water level</p> <p><b>RESTORE</b> and <b>MAINTAIN</b> RPV water lvl between +2 in. and +51 in. with ANY of the following:</p> <table> <tr> <td>CRD</td><td>5B</td><td>1640 psig</td></tr> <tr> <td>RCIC with CST suction if available</td><td>5C</td><td>1200 psig</td></tr> <tr> <td>HPCI with CST suction if available</td><td>5D</td><td>1200 psig</td></tr> </table> <p>Directs BOP to start HPCI IAW App 5D</p> <p>Directs ATC to maximize CRD IAW App 5B</p>	CRD	5B	1640 psig	RCIC with CST suction if available	5C	1200 psig	HPCI with CST suction if available	5D	1200 psig
CRD	5B	1640 psig									
RCIC with CST suction if available	5C	1200 psig									
HPCI with CST suction if available	5D	1200 psig									
	NRC	When BOP operator starts HPCI OR if HPCI gets an initiation signal due to rising drywell pressure or low reactor water level Event 10 would start									

Op Test No.: 15-01Scenario No. 4 Event No.: 9

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
		<p><b>EOI Appendix-5D</b></p> <p><b>1.0 INSTRUCTIONS</b></p> <p>[4] <b>VERIFY</b> at least one SGTS train in operation.</p> <p><b>CAUTIONS</b></p> <p>1) Operating HPCI Turbine below 2400 rpm may result in unstable system operation and equipment damage.</p> <p>2) Operating HPCI Turbine with suction temperatures above 140°F may result in equipment damage.</p> <p>[1] <b>VERIFY</b> 2-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller is in one of the following configurations, as desired:</p> <ul style="list-style-type: none"> <li>• in AUTO and set for 5300 gpm for rapid injection</li> <li>• in AUTO and set for approximately 2500 gpm for slower injection</li> <li>• in MANUAL with output at approximately 50% for slower injection.</li> </ul>
		<p><b>NOTE</b></p> <p>HPCI Auxiliary Oil Pump will NOT start UNTIL 2-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, starts to open.</p> <p>[2] <b>IF</b> high reactor water level trip logic is actuated, <b>THEN</b></p> <p>[2.1] <b>DEPRESS</b> HPCI TURBINE TRIP RX LVL HIGH RESET pushbutton.</p> <p>[2.2] <b>CHECK</b> HPCI TURBINE TRIP LVL HIGH amber light has extinguished.</p> <p>[3] <b>PLACE</b> HPCI AUXILIARY OIL PUMP handswitch in START.</p> <p>[4] <b>PLACE</b> HPCI STEAM PACKING EXHAUSTER handswitch in START.</p> <p>[5] <b>OPEN</b> the following valves:</p> <ul style="list-style-type: none"> <li>• 2-FCV-73-30, HPCI PUMP MIN FLOW VALVE</li> <li>• 2-FCV-73-44, HPCI PUMP INJECTION VALVE.</li> </ul>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>[6] <b>OPEN</b> 2-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, to start HPCI Turbine.</p> <p>[7] <b>CHECK</b> proper HPCI operation by observing the following:</p> <ul style="list-style-type: none"> <li>A. HPCI Turbine speed accelerates.</li> <li>B. 2-FCV-73-45, HPCI TESTABLE CHECK VLV, opens by observing 2-ZI-73-45A, DISC POSITION, red light illuminated.</li> <li>C. HPCI flow to RPV stabilizes and is controlled automatically at the setpoint. (N/A if controller in manual).</li> <li>D. 2-FCV-73-30, HPCI PUMP MIN FLOW VALVE, closes as flow exceeds approximately 1200 gpm.</li> </ul> <p style="text-align: center;"><b>CAUTION</b></p> <p>HPCI PUMP MIN FLOW VALVE, 2-FCV-073-0030, automatically opens when system flow is at or below 900 gpm (lowering) only if a system initiation signal is present. Manually opening the min flow valve may be required for pump min flow protection.</p> <p>[8] <b>ADJUST</b> 2-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller as necessary to control injection.</p>
	BOP	<p>[9] <b>VERIFY</b> HPCI Auxiliary Oil Pump stops and the shaft-driven oil pump operates properly. <input type="checkbox"/></p> <p>[10] <b>WHEN</b> HPCI Auxiliary Oil Pump stops, <b>THEN PLACE</b> HPCI AUXILIARY OIL PUMP handswitch in AUTO.</p> <p>Injects to the reactor vessel with HPCI IAW App 5D</p>
		<p><b>EOI Appendix-5B</b></p> <p><b>1.0 INSTRUCTIONS</b></p> <p>[2] <b>IF BOTH</b> of the following exists,</p> <ul style="list-style-type: none"> <li>• CRD is NOT required for rod insertion,</li> </ul> <p style="text-align: center;"><b>AND</b></p> <ul style="list-style-type: none"> <li>• Maximum injection flow is required, <b>THEN</b></li> </ul> <p><b>LINE UP ALL</b> available CRD pumps to the RPV as follows:</p> <p>[2.2] <b>IF</b> CRD Pump 1B is available, <b>THEN PERFORM</b> the following:</p>

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
	ATC	<p>A. <b>NOTIFY</b> Unit 1 Operator to verify closed 1-FCV-85-8, CRD PUMP B DISCH TO U2, (Panel 1-9-5).</p> <p>B. <b>START</b> CRD Pump 1B.</p> <p>C. <b>OPEN</b> 2-FCV-85-8, CRD PUMP 1B DISCH TO U2.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Failure to maintain CRD system pressure above 1450 psig on 2-PI-85-13A could result in pump runout.</p> <p>[2.3] <b>OPEN</b> the following valves to increase CRD flow to the RPV:</p> <ul style="list-style-type: none"> <li>• 2-PCV-85-23, CRD DRIVE WATER PRESS CONTROL VLV</li> <li>• 2-PCV-85-27, CRD CLG WATER PRES CONTROL VLV</li> <li>• 2-FCV-85-50, CRD EXH RTN LINE SHUTOFF VALVE.</li> </ul> <p>[2.4] <b>ADJUST</b> 2-FIC-85-11, CRD SYSTEM FLOW CONTROL to control injection WHILE maintaining 2-PI-85-13A, CRD ACCUM CHG WTR HDR PRESS, above 1450 psig, if possible.</p>
	ATC	<p>Maximizes CRD flow to the RPV IAW App 5B</p> <p>Reports that RPV water level is continuing to lower</p>
	SRO	<p><b>EOI-1, RC/L</b></p> <p>RPV water lvl can be restored and maintained above -162 in.      <b>INHIBIT ADS</b></p> <p><b>AND</b></p> <p>The ADS timer has initiated</p> <p>Directs BOP to Inhibit ADS</p>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	Inhibits ADS. Verifies inhibited and reports ADS inhibited.
	SRO	<p><b>#3</b> Elevated suppr chmbr press may trip RCIC</p> <p><b>#6</b> HPCI or RCIC suction temp above 140°F</p> <p><b>IF</b> RPV water lvl <b>CANNOT</b> be restored and maintained between +2 in. and +51 in.</p> <p><b>THEN RESTORE</b> and <b>MAINTAIN</b> RPV water lvl above -162 in. <b>AUGMENT</b> RPV water lvl control as necessary with ANY of the following:</p> <p>SLC (boron tank) 7B 1450 psig</p> <p>Directs ATC to initiate SLC from the boron tank IAW App 7B</p>
	ATC	<p><b>EOI Appendix-7B</b></p> <p><b>1.0 INSTRUCTIONS</b></p> <p>[2] <b>IF</b> RPV injection is needed immediately <b>ONLY</b> to prevent or mitigate fuel damage, <b>THEN</b> <b>CONTINUE</b> at Step 1.0[10] to inject SLC Boron Tank to RPV</p> <p>[10] <b>UNLOCK</b> and <b>PLACE</b> 2-HS-63-6A, SLC PUMP 2A/2B, control switch in START-A or START-B (Panel 9-5).</p> <p>[11] <b>CHECK</b> SLC injection by observing the following:</p> <ul style="list-style-type: none"> <li>• Selected pump starts, as indicated by red light illuminated above pump control switch.</li> <li>• Squib valves fire, as indicated by SQUIB VALVE A and B CONTINUITY blue lights extinguished. <input type="checkbox"/></li> <li>• SLC SQUIB VALVE CONTINUITY LOST Annunciator in alarm (2-XA-55-5B, Window 20).</li> </ul>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> <li>• 2-PI-63-7A, SLC PUMP DISCH PRESS, indicates above RPV pressure.</li> <li>• System flow, as indicated by 2-IL-63-11, SLC FLOW, red light illuminated,</li> <li>• SLC INJECTION FLOW TO REACTOR Annunciator in alarm (2-XA-55-5B, Window 14).</li> </ul> <p>Injects SLC to the RPV IAW App 7B</p>
	SRO	<p>EOI-1, RC/L</p> <p>Can RPV water lvl be restored and maintained above -162 in. NO C1, Alternate Lvl Control</p> <p>Enter C1, Alternate Level Control</p>
	BOP	Reports drywell temperature and pressure continuing to rise
		<p>Re-enters EOI-2 on Drywell Temperature and Pressure</p> <p><b>PC/H</b> H2 and O2 monitoring system is inoperable - <b>OPERABLE</b> Offsite radioactivity release rate reaches ODCM limits - <b>NO</b> OR H2 is NO longer detected in PC(2.4% on control room indicators) - <b>DETECTED</b></p> <p>Verify H<sub>2</sub>O<sub>2</sub> analyzer in service (APP 19)</p> <p>When H<sub>2</sub> is detected in PC (2.4% on control room indicators continue – <b>STOPS</b></p> <p><b>SP/L</b> Primary Containment Flooding is required - <b>NO</b> AND SAMG entry is NOT required</p>



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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>MONITOR</b> and <b>CONTROL</b> suppr pl lvl between -1 in. and -6 in. (APPX 18) - <b>CHECKED</b></p> <p>Can suppr pl lvl be maintained above -6 in. – <b>YES</b></p>
	SRO	<p>Can suppr pl lvl be maintained below -1 in. – <b>YES</b></p> <p><b>PC/P</b>  <b>MONITOR</b> and <b>CONTROL</b> PC press below 2.4 psig using the Vent system (AOI-64-1) – <b>CHECKED</b></p> <p>WHEN PC press CANNOT be maintained below 2.4 psig – <b>CONTINUES</b></p> <p><b>BEFORE</b> suppr chmbr press rises to 12 psig  <b>CONTINUE - CONTINUES</b></p> <p>CAUTION  <b>#2 PUMP NPSH and Vortex Limits</b></p> <p>INITIATE suppr chmbr sprays using only pumps NOT required to assure adequate core cooling by continuous inj (APPX 17C)</p> <p>Directs BOP to initiate Suppression Chamber Sprays using APP 17C</p>
		<p><b>EOI APPENDIX-17C</b></p> <p>1. BEFORE Suppression Chamber pressure drops below 0 psig,  <b>CONTINUE</b> in this procedure at Step 6.</p> <p>2. IF ..... Adequate core cooling is assured  <b>OR</b>  Directed to spray the Suppression Chamber irrespective of adequate core cooling,  THEN ... <b>BYPASS</b> LPCI injection valve open interlock as necessary:</p>

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>• <b>PLACE</b> 2-HS-74-155A, LPCI SYS I OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> <li>• <b>PLACE</b> 2-HS-74-155B, LPCI SYS II OUTBD INJ VLV BYPASS SEL in <b>BYPASS</b>.</li> </ul> <p>3. IF ..... Directed by SRO to spray the Suppression Chamber using Standby Coolant Supply,</p> <p>THEN ... <b>CONTINUE</b> in this procedure At Step 7 using RHR Loop I OR At Step 8 using RHR Loop II.</p> <p>4. IF ..... Directed by SRO to spray the Suppression Chamber using Fire Protection, THEN ... <b>CONTINUE</b> in this procedure at Step 9.</p> <p>5. <b>INITIATE</b> Suppression Chamber Sprays as follows:</p> <ul style="list-style-type: none"> <li>a. <b>VERIFY</b> at least one RHRSW pump supplying each EECW header.</li> <li>b. IF.....EITHER of the following exists: <ul style="list-style-type: none"> <li>• LPCI Initiation signal is NOT present,</li> <li><b>OR</b></li> <li>• Directed by SRO,</li> </ul> <p>THEN...<b>PLACE</b> keylock switch 2-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVRD, in MANUAL OVERRIDE.</p> <ul style="list-style-type: none"> <li>c. <b>MOMENTARILY PLACE</b> 2-XS-74-121(129), RHR SYS I(II)</li> </ul> <p>CTMT SPRAY/CLG VLV SELECT, switch in SELECT.</p> </li> <li>d. IF.....2-FCV-74-53(67), RHR SYS I(II) INBD INJECT VALVE, is OPEN, THEN...<b>VERIFY CLOSED</b> 2-FCV-74-52(66), RHR SYS I(II) OUTBD INJECT VALVE.</li> <li>e. <b>VERIFY OPERATING</b> the desired RHR System I(II) pump(s) for Suppression Chamber Spray.</li> </ul>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>f. <b>VERIFY OPEN</b> 2-FCV-74-57(71), RHR SYS I(II) SUPPR CHBR/POOL ISOL VLV.</p> <p>g. <b>OPEN</b> 2-FCV-74-58(72), RHR SYS I(II) SUPPR CHBR SPRAY VALVE.</p> <p>h. IF.....RHR System I(II) is operating ONLY in Suppression Chamber Spray mode, THEN...<b>CONTINUE</b> in this procedure at Step 5.k.</p> <p>k. <b>MONITOR</b> RHR Pump NPSH using Attachment 2.</p> <p>l. <b>VERIFY</b> RHRSW pump supplying desired RHR Heat Exchanger(s).</p> <p>m. <b>THROTTLE</b> the following in-service RHRSW outlet valves to obtain between 1350 and 4500 gpm flow:</p> <ul style="list-style-type: none"> <li>• 2-FCV-23-34, RHR HX 2A RHRSW OUTLET VLV</li> <li>• 2-FCV-23-46, RHR HX 2B RHRSW OUTLET VLV</li> <li>• 2-FCV-23-40, RHR HX 2C RHRSW OUTLET VLV</li> <li>• 2-FCV-23-52, RHR HX 2D RHRSW OUTLET VLV.</li> </ul> <p>n. <b>NOTIFY</b> Chemistry that RHRSW is aligned to in-service RHR Heat Exchangers</p> <p>Initiates and reports Suppression Chamber sprays in service IAW App 17C Calls Chemistry to report that RHRSW is aligned to in-service RHR Heat Exchangers</p>
	DRIVER	As Chemistry, acknowledge that RHRSW is aligned to RHR heat exchangers

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>DW/T</b></p> <p>CAUTION</p> <p>#1 Ambient temp may affect RPV water lvl indication and trend  <b>MONITOR</b> and <b>CONTROL</b> DW temp below 160°F using available  DW cooling DW - <b>CHECKED</b>  WHEN DW temp CANNOT be maintained - <b>CONTINUES</b>  below 160°F</p> <p><b>OPERATE</b> all available DW cooling DW – <b>IN SERVICE</b></p> <p><b>BEFORE</b> DW temp rises to 200°F – <b>CONTINUES</b></p> <p>Verifies reactor scrammed</p>
	BOP	Reports Suppression Chamber pressure is greater than 12 psig
	SRO	<p><b>PC/P</b></p> <p>WHEN suppr chmbr press exceeds 12 psig - <b>CONTINUES</b>  Is suppr pl lvl below 19 ft. – <b>YES</b></p> <p>Is DW temp within the safe area of Curve 5  Verifies in the safe area – <b>YES</b></p> <p><b>SHUTDOWN</b> Recirc pumps and DW blowers</p> <p>Verifies recirc pumps shutdown and directs BOP to shutdown DW  blowers</p>
	BOP	Secures all DW blowers and reports all DW blowers shutdown

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>#2 Pump NPSH and Vortex Limits</b>  <b>INITIATE</b> DW sprays using only pumps NOT required to assure adequate core cooling by continuous inj (APPX 17B)</p> <p>Directs BOP to initiate DW Sprays IAW App 17B</p>
	BOP	<p><b>EOI APPENDIX-17B</b></p> <p>1. BEFORE drywell pressure drops below 0 psig,  <b>CONTINUE</b> in this procedure at Step 7.</p> <p>6. <b>INITIATE</b> Drywell Sprays as follows:</p> <p>e. <b>VERIFY OPERATING</b> the desired System I(II) RHR pump(s) for Drywell Spray.</p> <p>f. <b>OPEN</b> the following valves:</p> <ul style="list-style-type: none"> <li>• 2-FCV-74-60(74), RHR SYS I(II) DW SPRAY OUTBD VLV</li> <li>• 2-FCV-74-61(75), RHR SYS I(II) DW SPRAY INBD VLV.</li> </ul> <p>g. <b>VERIFY CLOSED</b> 2-FCV-74-7(30), RHR SYSTEM I(II) MIN FLOW VALVE.</p> <p>h. IF.....Additional Drywell Spray flow is necessary,  THEN...<b>PLACE</b> the second System I(II) RHR Pump in service.</p> <p>Initiates and reports DW Sprays in service IAW App 17B</p> <p>Reports DW pressure and temperature lowering</p>

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Event Description: **LOCA**

Time	Position	Applicant's Actions or Behavior
		<p><b>Critical Task</b></p> <p><b>1. When Suppression Chamber Pressure exceeds 12 psig, initiate Drywell Sprays while in the safe region of the Drywell Spray Initiation Limit (DSIL) curve and prior to exceeding the PSP limit.</b></p> <p>1.Safety Significance: Precludes failure of containment</p> <p>2.Cues: Procedural compliance High Drywell Pressure and Suppression Chamber Pressure</p> <p>3. Measured by: Observation - US directs Drywell Sprays IAW with EOI Appendix 17B  <b><u>AND</u></b> Observation - RO initiates Drywell Sprays</p> <p>4.Feedback: Drywell and Suppression Pressure lowering RHR flow to containment</p> <p>This Critical Task is <b>not met</b> if DW Pressure reaches 26 psig before Sprays are initiated.</p>
		<p>Briefs crew on current plant status. <b>C/1</b></p> <p style="text-align: center;"><b>CAUTION</b></p> <p>#1 Ambient temp may affect RPV water lvl indication and trend</p> <p>Emergency RPV depressurization is required – <b>NO</b> It has NOT been determined that the reactor will remain subcritical without boron under all conditions – <b>HAS</b> RPV water lvl CANNOT be determined – <b>CAN</b> PC water lvl CANNOT be maintained below 105 ft - <b>CAN</b></p>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>OR</p> <p>Suppr chmbr press CANNOT be maintained - <b>CAN</b> below 55 psig Verifies ADS inhibited</p> <p>CAUTION</p> <p>#2 Pump NPSH and Vortex Limits #3 Elevated suppr chmbr press may trip RCIC #6 HPCI or RCIC suction temp above 140°F</p> <p><b>RESTORE</b> and <b>MAINTAIN</b> RPV lvl above -162" using ANY of the following</p>
	SRO	<p>LPCI system I (pumps A or C)      6B                      320 psig</p> <p>LPCI system II (pumps B or D)      6C                      320 psig</p> <p>CS system I (pumps A or C)      6D                      330 psig</p> <p>CS system II (pumps B or D)      6E                      330 psig</p> <p>Directs BOP to align CS and LPCI for injection to the RPV IAW Appendices 6B, 6C, 6D and 6E</p>
	BOP	<p>Verifies that LPCI and CS are aligned with pumps running.</p> <p>Reports LPCI and CS aligned</p> <p>Reports all four diesels have started</p> <p>Calls for AUO to monitor diesel generators</p>
	DRIVER	As AUO, acknowledge monitoring diesel generators for proper operation.

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>C-1</b></p> <p>Can 2 or more <b>CNDS</b>, <b>LPCI</b> or <b>CS</b> inj subsystems be lined up – <b>YES</b></p> <p>WHEN RPV water lvl drops to -162 in.</p> <p>Direct crew to report when RPV water level lowers to -162 in.</p> <p>Is ANY <b>CNDS</b>, <b>LPCI</b> or <b>CS</b> inj subsystem lined up for inj with at least one pump running – <b>YES</b></p> <p>Is ANY RPV inj source lined up with at least one pump running – <b>YES</b></p> <p><b>BEFORE</b> RPV water lvl drops to -180 in. <b>CONTINUE – CONTINUES</b></p> <p><b>EMERGENCY RPV DEPRESSURIZATION IS REQUIRED</b></p> <p>Updates crew that emergency depressurization is required</p>
		<p><b>EOI-1, RC/L</b></p> <p><b>IF</b> Emergency RPV depressurization is or has been required</p> <p><b>THEN EXIT</b> RC/P and</p> <p><b>ENTER C2</b>, Emergency RPV Depressurization</p> <p>Enters C2, Emergency RPV Depressurization</p> <p>SAMG entry is required and the TSC SAM team has assumed command and control - <b>NO</b></p> <p>RPV water lvl <b>CANNOT</b> be determined - <b>CAN</b></p> <p>Containment water lvl <b>CANNOT</b> be maintained below 44 ft- <b>CAN</b></p>



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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	<p>DW control air becomes unavailable – <b>AVAIL</b></p> <p>Will the reactor remain subcritical without boron under all conditions - <b>YES</b></p> <p>Is DW press above 2.4 psig - <b>NO</b></p> <p>Is suppr pl lvl above 5.5 ft – <b>YES</b></p>
		<p><b>OPEN</b> all ADS vlvs (ok to exceed 100°F/hr cooldown rate)</p> <p>Directs BOP to open all ADS valves</p>
	BOP	<p>Opens all ADS valves, verifies open using alternate indications and reports 6 ADS valves open</p>
	SRO	<p><b>C-1</b>            INJECT into the RPV with ANY available sources            Directs injection of water to the RPV using all available sources</p> <p><b>C-2</b>            Can 6 ADS vlvs be opened - <b>YES</b></p> <p>IF Less than 4 MSRVS are open - <b>NO</b>            AND            RPV press is 70 psi or more above suppr chmbr press</p> <p>The reactor is NOT subcritical – <b>SUBCRITICAL</b></p> <p>WHEN the reactor will remain subcritical without boron under all conditions – <b>SUBCRITICAL</b>            WHEN shutdown cooling RPV press interlock clears – <b>STOP</b></p>

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**Event Description: LOCA**

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	When RPV pressure lowers below 450 psig, verifies and reports that LPCI and CS injection valves have opened.  Report water injection into the RPV and reactor water level rising
	SRO	<b>C-1</b> <b>IF</b> RPV water lvl can be restored and maintained above -162 in. <b>THEN</b> <b>EXIT</b> this procedure and <b>ENTER</b> EOI-1, RPV Control, at Step RC/L-1  Exits C-1, re-enters EOI-1 RC/L  Directs coordinating injection of LPCI and CS to RESTORE and MAINTAIN RPV water lvl between +2 in. and +51 in. using LPCI and CS, Appendices 6B, 6C, 6D, and 6E
		<b>2. RPV Level maintained above TAF (-162 inches)</b>  1.Safety Significance: Maintaining adequate core cooling  2.Cues: RPV level indication  3.Measured by: Reactor level indication above -162 inches  4.Feedback: RPV level trend HPCI/RCIC injection valve open indication  This Critical Task is <b>not met</b> if RPV Level remains below -162 for greater than 10 minutes.
	ATC/BOP	Coordinate restoring RPV level to +2 in. to +51 in. using App. 6B, 6C, 6D, and 6E
	NRC	Once RPV level has been restored, the scenario can end.
	DRIVER	When NRC Chief Examiner directs, place the simulator in FREEZE

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**Event Description: HPCI Steam Supply Valve fails to auto open**

Time	Position	Applicant's Actions or Behavior
	NRC	HPCI may receive an initiation signal from either reactor low water level -45 in. or drywell high pressure 2.45 psig.
	BOP	Recognize and report HPCI failure to initiate (initiation signal present and not injecting to the reactor vessel)  Recognizes that the HPCI Steam Supply valve (73-16) is not open  Opens HPCI Steam Supply valve and verifies HPCI injection to the Reactor Vessel.  Reports that HPCI is injecting to the RPV  Calls Work Control to request a work order on the steam supply valve for HPCI
	DRIVER	As Work Control, acknowledge investigating failure of 73-16, HPCI Steam Supply valve.
	NRC	End of Event #10

## SIMULATOR SETUP

IC	28
Exam IC	97

Batch File or Pref File	1501NRC4
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Malfunctions	Description	Event #	Delay	Severity	Ramp	Initial value	Final value
EG13A	Bus Duct Cooling Fan Trip	3	N/A	N/A	N/A	N/A	N/A
SW02A	RBCCW Pump A Trip	4	N/A	N/A	N/A	N/A	N/A
S&M	Sectionalizing Valve fails to close.	4	N/A	N/A	N/A	N/A	N/A
ED10B	S/D Board Loss	5	N/A	N/A	N/A	N/A	N/A
MC04	Loss of Condenser Vacuum	6	N/A	50	N/A	N/A	N/A
ED01	LOOP	7	N/A	N/A	N/A	N/A	N/A
DG01A	DG A fails to Auto Start	Active	N/A	N/A	N/A	N/A	N/A
TH21	LOCA	9	N/A	0.2	5:00	N/A	N/A
HP04	HPCI Steam Supply Valve fails to auto open	Active	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	N/A	N/A	N/A

Remotes	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Overrides	Description	Event #	Delay	Severity	Ramp	Initial value	Final value

Batch / Pref File(s): 1501NRC4

imf EG13A (3 0)  
imf SW02A (4 0)  
S&M (4 0) batch to fail sectionalizing valve as is.  
imf ED10B (5 0)  
imf MC04 (6 0) 50  
imf ED01 (7 0)  
imf DG01A  
imf TH21 (9 0) 0.2 5:00  
imf HP04