

# ILC-27 NRC Scenario #1 Event Description *Final*

<b>Facility:</b>	<u>Turkey Point</u>	<b>Scenario:</b>	<u>1</u>	<b>Op Test.:</b>	<u>2011-302</u>
<b>Examiners:</b>	_____	<b>Candidates:</b>	_____	<b>US</b>	
	_____		_____	<b>ATC</b>	
	_____		_____	<b>BOP</b>	
<b>Initial Conditions:</b> <u>Mode 1</u> <u>75% power at MOL.</u>					
<b>Turnover:</b> Equipment OOS: Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure.					
<ul style="list-style-type: none"> <li>Holding at 75% power, the crew next shift will continue with power increase.</li> <li>Online Risk – Green with B Train protected on both units.</li> </ul>					

Event No.	Malf. No.	Event Type	Event Description
1	TFH1TV60	(I) ATC (I,TS) SRO	LT-3-460 fails low which isolates letdown. The crew responds using the ARP and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1. The crew restores normal letdown and PZR heaters following LT-3-460 failure using 3-ONOP-041.6.
2	V8CI29ON TVKKB1	(C) BOP (C) SRO	Circ Water Pump 3B1 Motor Bearing high temperature from increased bearing friction. The crew will lower reactor power to < 60% & secure SJAE suction before securing the 3B1 CW pump using 3-NOP-010.
3	N/A	(N) BOP (R) ATC (R) SRO	The crew initiates a boration and reduces Turbine load to 60% using 3-GOP-100.
4	TFH1TU45 TVHV456	(I) ATC (C) ATC (I,C,TS) SRO	1) PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. 2) During the instrument failure, PORV-456 develops leakage. The contingent action will be to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.
5	TVFABP6B TFF1D6CM	(C) BOP (C) SRO	"B" Condensate Pump Motor Shaft slowly seizes causing a failure of the pump. The automatic start of the "C" Condensate Pump is blocked. The BOP can manually start the "C" Condensate Pump or stop one Main Feed Pump to initiate a Runback to equalize Turbine load with available Feedwater flow.
6	TVHV456 TVHV535	(M) ALL	During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.
7	TAFK339 TFFXCGVC TCF5MTB	(M) ALL	AFW flow to the 3C S/G is blocked. Also, B TDAFWP mechanically trips and the C TDAFWP Governor Valve Fails closed. During the performance of 3-EOP-E-0, the crew uses "A" TDAFWP to establish greater than 345 gpm total to the 3A and 3B S/G.
8	TFQ6A4AF	(C) BOP (C) SRO	The 3C ECC fails to Auto Start, the BOP manually starts the 3C ECC during Attachment 3 of 3-EOP-E-0.

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

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## ILC-27 NRC Scenario #1 Event Description

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### SIMULATOR SETUP INSTRUCTIONS

1. Reset to IC-16 (75% BOL) or other IC with correct setup conditions.
2. Place Simulator in RUN
3. Open and Execute ILC27SCN1N.Isn.
4. Place 3B2 CWP Handswitch to stop.
5. Trigger lesson step:
  - SETUP - 3B2 CIRC WATER PUMP OOS  
insert TAK4DP RACKOUT delay=0 ramp=0 on=0 off=0
6. Once the pump is stopped and discharge valve is closed, place a clearance tag on 3B2 CWP Handswitch.
7. Store IC with initial conditions setup if desired.
8. Trigger lesson step:
  - SETUP - 3C ECC FAIL TO AUTO START  
insert TFQ6A4AF true delay=0 ramp=0 on=0 off=0
9. Place Simulator in freeze.
10. Provide Shift Turnover Checklists
11. Perform Simulator Operator Checklist
12. When ready to begin, place Simulator in RUN.

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## ILC-27 NRC Scenario #1 Event Description

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### FACILITY OPERATOR INSTRUCTIONS

#### EVENT 1

LT-3-460 fails low which isolates letdown. The crew responds using the ARP and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1. The crew restores normal letdown and PZR heaters following LT-3-460 failure using 3-ONOP-041.6.

**When directed, Trigger EVENT 1 - LT-3-460 FAILS LOW.**

- insert TFH1TV60 TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of LT-3-460.

**WCC** - If directed, respond and acknowledge the failure of LT-3-460 and to write a PWO for troubleshooting and notify I&C.

**U3TO/FS** - When called, respond and acknowledge the failure of LT-3-460 and provide when asked:

- 1) The SCR cabinet door is CLOSED.
- 2) All SCR cabinet fans are operating.

#### EVENT 2

Circ Water Pump 3B1 Motor Bearing high temperature from increased bearing friction. The crew will lower reactor power to < 60% & secure SJAE suction before securing the 3B1 CW pump using 3-NOP-010.

**When directed, Trigger EVENT 2 - 3B1 CW PUMP HIGH TEMP.**

- insert V8CI29ON TRUE delay=0 ramp=0 on=0 off=0
- insert TVKKB1 0.5 delay=0 ramp=4800 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of Circ Water Pump 3B1.

**WCC** - If directed, respond and acknowledge the failure of Circ Water Pump 3B1 and to write a PWO for troubleshooting and notify maintenance.

**ANPO/FS** - When called, respond and acknowledge the 3B1 CW Pump High Temp:

- 1) The 3B1 CW Pump High Bearing temperature is 238°F and rising at 10°F/hr.
- 2) When called again and about 15 minutes later, add 3°F to raise temperature to 241°F. (Provide additional updates as necessary)

**When directed, Trigger EVENT 2 - CLOSE 3-30-003 AND 3-30-005.**

- insert TAFB003 0.0 delay=60 ramp=0 on=0 off=0
- insert TAFB005 0.0 delay=120 ramp=0 on=0 off=0

**When directed, Trigger EVENT 2 - SECURE PRIMING JETS AND VENT WTRBX VACUUM TKS.**

- insert TAKKV66 0.000000 delay=0 ramp=0 on=0 off=0
- insert TAKKV81 0.000000 delay=60 ramp=0 on=0 off=0
- insert TAKKV78 1.000000 delay=180 ramp=0 on=0 off=0
- insert TAKKV63 1.000000 delay=120 ramp=0 on=0 off=0

**When directed, Trigger EVENT 2 - RACKOUT 3B1 CW PUMP.**

- insert TAK4CP RACKOUT delay=0 ramp=0 on=0 off=0

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### EVENT 3

The crew initiates a boration and reduces Turbine load to 60% using 3-GOP-100.

**SM** - If directed, acknowledge power reduction.

**WCC** - If directed, acknowledge power reduction for the removal of 3B1 CWP.

**SYSTEM DISPATCH** - If directed, acknowledge power reduction to 60% for the removal of 3B1 CWP.

**ENGINEERING** - If directed, acknowledge power reduction to 60% for the removal of 3B1 CWP.

**CHEMISTRY** - If directed, acknowledge power reduction to 60% for the removal of 3B1 CWP and to sample the RCS for the power change .

### EVENT 4

PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure, PORV-456 develops leakage. The contingent action will be to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

**When directed, Trigger EVENT 4 - PT-3-445 FAILS HIGH - PORV 456 DEVELOPING LEAKAGE.**

- insert TFH1TU45 -1 delay=0 ramp=0 on=0 off=0
- insert TVHV456 0.1 delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of PT-3-445.

**WCC** - If directed, respond and acknowledge the failure of PT-3-445 and to write a PWO for troubleshooting.

### EVENT 5

"B" Condensate Pump Motor Shaft slowly seizes causing a failure of the pump. The automatic start of the "C" Condensate Pump is blocked. The BOP can manually start the "C" Condensate Pump or stop one Main Feed Pump to initiate a Runback to equalize Turbine load with available Feedwater flow.

**When directed, Trigger EVENT 5 - LOSS OF 3B CONDENSATE PUMP.**

- insert TVFABP6B 0.4 delay=0 ramp=60 on=0 off=0
- insert TFF1D6CM TRUE delay=0 ramp=0 on=0 off=0
- insert TFF1D6CM FALSE cd='imf1p6cs' delay=0 ramp=0 on=0 off=0

**SM** – If directed, respond and acknowledge the failure of the 3B CONDENSATE PUMP.

**WCC** – If directed, respond and acknowledge the failure of the 3B CONDENSATE PUMP and to write a PWO for troubleshooting.



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## ILC-27 NRC Scenario #1 Event Description

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### **EVENT 6**

During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

#### **When directed, Trigger EVENT 6 – PORV 456 AND BLOCK VALVE 535 LEAKAGE INCREASES**

- insert TVHV456 1.000000 delay=0 ramp=60 on=0 off=0
- insert TVHV535 1.000000 delay=0 ramp=60 on=0 off=0

**SM** – If directed, respond and acknowledge the failure of Block Valve MOV-3-535 develops leaking with PORV 456 leakage.

**WCC** – If directed, respond and acknowledge the failure of Block Valve MOV-3-535 developing leakage with PORV 456 leakage and to write a PWO for troubleshooting.

**SNPO** – When directed, respond and acknowledge to place PAHMS in service. Report back in 10 minutes with field actions complete in accordance with 3-NOP-094.

#### **When directed, Trigger EVENT 6 - ALIGN PAHMS FOR SERVICE.**

- insert TAC2V02A 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAC2V02B 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAAAV21 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAAAV22 1.000000 delay=0 ramp=0 on=0 off=0
- insert TACA005 .000000 delay=0 ramp=0 on=0 off=0

### **EVENT 7**

AFW flow to the 3C S/G is blocked. Also, B TDAFWP mechanically trips and the C TDAFWP Governor Valve Fails closed. During the performance of 3-EOP-E-0, the crew uses "A" TDAFWP to establish greater than 345 gpm total to the 3A and 3B S/G.

#### **Auto Trigger EVENT 7 - AFW MALFUNCTIONS**

- insert TAFK339 0.0 delay=0 ramp=0 on=0 off=0
- insert TFFXCGVC true delay=60 ramp=0 on=0 off=0
- insert TCF5MTB true delay=60 ramp=0 on=0 off=0

### **EVENT 8**

The 3C ECC fails to Auto Start, the BOP manually starts the 3C ECC during Attachment 3 of 3-EOP-E-0.

#### **ADDITIONAL COMMUNICATIONS**

**U3 TO/FS** - If directed, respond and acknowledge to investigate loss of B and C AFW Pumps.

- Perform actions of 3-ONOP-075 (unsuccessful).
- B AFW Pump is mechanically tripped and cannot be reset.
- C AFW Pump problems are still under investigation.

**U4 RO** - If asked, respond with Unit 4 is at 100% and does not require AFW.

**CHEM** - When directed, respond and acknowledge to sample all Unit 3 S/Gs.

**HP** - When directed, respond and acknowledge to survey Main Steam lines.

## ILC-27 NRC Scenario #1 Event Description

### SCENARIO QUANTITATIVE ATTRIBUTES

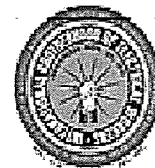
Target Quantitative Attributes (Per Scenario; See Section D.5.d)		#
1. Total malfunctions (5–8)		5
2. Malfunctions after EOP entry (1–2)		3
3. Abnormal events (2–4)		4
4. Major transients (1–2)		1
5. EOPs entered/requiring substantive actions (1–2)		1
6. EOP contingencies requiring substantive actions (0–2)		0
7. Critical tasks (2–3)		3

### CRITICAL TASKS

<p>1. Establish minimum AFW flow of 345 gpm prior to transitioning out of 3-EOP-E-0. [EVENT 7]</p> <p style="text-align: center;">OR</p> <p>If crew transitions to 3-EOP-FR-H1 to correct loss of AFW, then establish minimum AFW flow of 345 gpm prior to completing Step 2 of 3-EOP-FR-H1.</p>
<p>2. Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing Step 1 of 3-EOP-E-1.</p>
<p>3. With RHR Flow less than 1000 gpm, stop the RHR Pumps within 44 minutes of their start signal.</p>



# OPERATIONS SHIFT TURNOVER REPORT



## ONCOMING CREW ASSIGNMENTS

Shift Mgr:			Inside SNPO:	
Field Supv.:			Outside SNPO:	
Admin RCO:			ANPO:	
<b>Unit 3</b>			<b>Unit 4</b>	
Unit Supv.:			Unit Supv.:	
RCO:			RCO:	
NPO:			NPO:	

## Plant Status

<b>Unit 3</b>			<b>Unit 4</b>	
Mode:	1		Mode:	1
Power:	75 %		Power:	100 %
MWe:	545		MWe:	758
Gross Leakrate:	0.03 gpm		Gross Leakrate:	0.03 gpm
RCS Boron Conc:	755 ppm		RCS Boron Conc:	268 ppm

### Operational Concerns:

- Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure.
- Holding at 75% power, the crew next shift will continue with power increase.

### U3 Anticipated LCO Actions:

### U4 Anticipated LCO Actions:

### Results of Offgoing Focus Area:

# Unit 3 Status

## Reactor Operator

Mode:	1
Power: %	75
MWe:	545
Tavg: *F	566
RCS Pressure: psig	2235
RCS Boron Conc:	755 ppm

RCS Leakrate	
Gross:	0.03gpm
Unidentified	0.02gpm
Charging Pps:	0.01gpm

Accumulator Ref Levels	
A	6615 gal
B	6635 gal
C	6624 gal

### Abnormal Annunciators:

Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	

### Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items")

T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	

## Unit 3 Status

### Changes to Risk Significant Equipment:

- B train protected both units
- Online risk green

### Upcoming Reactivity Management Activities:

### Upcoming Major POD Activities:

### Upcoming ECOs to Hang and /or Release:

### Evolutions or Compensatory Actions in Progress:

### General Information, Remarks, and Operator Work Around Status:

- Unit 3 supplying Auxiliary steam.
- Condenser air inleakage 0 scfm.
- Severe thunderstorm warning in South Dade County expires in 2 hours.

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Event Description: LT-3-460 fails low which isolates letdown. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
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**Direct Facility Operator to trigger lesson step, EVENT 1 - LT-3-460 FAILS LOW.**

(insert TFH1TV60 TRUE delay=0 ramp=0 on=0 off=0)

	<b>SRO/ATC</b>	<p>Observes failure of LT-3-460.</p> <ul style="list-style-type: none"> <li>Alarms A 8/4, A 9/4, &amp; B 3/1</li> <li>LI-3-460 fails low</li> <li>Letdown isolates (LCV-3-460 &amp; CV-3-200's all close)</li> <li>PZR heaters de-energize</li> </ul>
	<b>SRO/ATC</b>	<p>CAUSES:</p> <ol style="list-style-type: none"> <li>PZR Level control malfunction</li> <li>LOCA/Excessive RCS leakage</li> <li>Steam Break</li> <li>RCS Refueling operations in mid-loop</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <p><b>A8/4</b></p> <p><b>PZR LO-LO LEVEL ALERT</b></p> </div>
	<b>SRO/ATC</b>	<p><b>ALARM CONFIRMATION</b></p> <p>1. <b>CHECK</b> the following less than or equal to 6% at VPA:</p> <ul style="list-style-type: none"> <li>LI-3-459A</li> <li>LI-3-460</li> <li>LI-3-461</li> </ul>
	<b>SRO/ATC</b>	<p><b>OPERATOR ACTIONS</b></p> <p>1. IF <u>either</u> of the following exist:</p> <ul style="list-style-type: none"> <li>Two or more level instruments are less than or equal to 12%</li> <li>Two or more bistables are ON</li> </ul> <p>THEN:</p> <p>A. <b>TRIP</b> the reactor.</p> <p>B. <b>INITIATE</b> a Safety Injection.</p> <p>C. <b>ENTER</b> 3-EOP-E-0, Reactor Trip Or Safety Injection.</p>

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Event Description: LT-3-460 fails low which isolates letdown. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>CAUSES:</b></p> <ol style="list-style-type: none"> <li>1. SCR cabinet fan(s) have tripped</li> <li>2. SCR cabinet door is open</li> <li>3. Failed air flow switch or door contact switch in SCR cabinet</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; float: right;"> <p><b>B3</b></p> <p><b>PZR HEATER CONTROLLER FAN OFF</b></p> </div>
	SRO/ATC	<p><b>ALARM CONFIRMATION</b></p> <ol style="list-style-type: none"> <li>1. <b>CHECK</b> RCS pressure.</li> </ol>
	SRO/ATC	<p><b>OPERATOR ACTIONS</b></p> <ol style="list-style-type: none"> <li>1. <b>ENSURE</b> PZR Control Group Heaters trip.</li> <li>2. <b>CONTROL</b> pressure by manually cycling backup heater group per 3-OP-041.2, Pressurizer Operation.</li> <li>3. <b>DISPATCH</b> operator to check: <ul style="list-style-type: none"> <li>• Door on SCR cabinet <b>CLOSED</b></li> <li>• All SCR cabinet fans operating</li> </ul> </li> </ol>
	FACILITY OPERATOR	<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>If called, the operator reports:</p> <ol style="list-style-type: none"> <li>1) The SCR cabinet door is <b>CLOSED</b>.</li> <li>2) All SCR cabinet fans are operating.</li> </ol>
	SRO/ATC	<p><b>CAUSES:</b></p> <ol style="list-style-type: none"> <li>1. RCS leak/LOCA</li> <li>2. Steam line leak/break</li> <li>3. PZR level control malfunction</li> <li>4. Instrument failure</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; float: right;"> <p><b>A9/4</b></p> <p><b>PZR LO LEVEL/ HEATER OFF/ LTDN SECURED</b></p> </div>
	SRO/ATC	<p><b>ALARM CONFIRMATION</b></p> <ol style="list-style-type: none"> <li>1. <b>CHECK</b> LCV-3-460, HIGH PRESSURE L/D ISOL VALVE FROM LOOP B COLD LEG, <b>CLOSED</b> on VPA.</li> <li>2. <b>CHECK</b> the following <b>CLOSED</b> on VPA: <ul style="list-style-type: none"> <li>• CV-3-200A, 45 GPM L/D ISOLATION VALVE</li> <li>• CV-3-200B, 60 GPM L/D ISOLATION VALVE</li> <li>• CV-3-200C, 60 GPM L/D ISOLATION VALVE</li> </ul> </li> <li>3. <b>CHECK</b> Control and Backup heaters <b>OFF</b>.</li> </ol>

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Event Description: LT-3-460 fails low which isolates letdown. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<b>OPERATOR ACTIONS</b> <ol style="list-style-type: none"> <li>IF PZR level is less than or equal to 12%, THEN <b>ENTER</b> 3-EOP-E-0, Reactor Trip or Safety Injection.</li> <li>IF an RCS leak is suspect, THEN <b>REFER TO</b> 3-ONOP-041.3, Excessive RCS Leakage.</li> <li>IF an instrument has failed, THEN <b>RESTORE</b> letdown and heaters to service per 3-ONOP-041.6, Pressurizer Level Control Malfunction.</li> </ol>
	SRO	Directs response using <b>3-ONOP-041.6</b> , Pressurizer Level Control Malfunction to restore level control.
	SRO/ATC	<div style="border: 1px dashed black; padding: 10px;"> <p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>If Pressurizer Level Malfunction is a result of a failure of the 3-459CX or 3-460CX relays (as indicated by a loss of letdown flow with a loss of Pressurizer Heaters with no concurrent failure of Level Transmitters 3-459A, 3-460, 3-461), use 3-ONOP-003.6 Attachment 4, for 3-460CX failure, OR 3-ONOP-003.9 Attachment 4, for 3-459CX failure as guidance for establishing Letdown flow and Pressurizer Heaters.</li> <li>If the button on relays 3-459CX or 3-460CX are used to restore Letdown flow and Pressurizer Heaters, comply with Tech Spec Action Statement 3.4.3 Action b.</li> <li>If the manual control of Heaters from the Electrical penetration room is used, comply with Tech Spec Action Statement 3.4.3 Action a.</li> </ul> </div>
	SRO/ATC	<b>5.0 SUBSEQUENT ACTIONS</b> <ol style="list-style-type: none"> <li>Check pressurizer level indicators LI-3-459A, LI-3-460 <b>AND</b> LI-3-461.               <ol style="list-style-type: none"> <li><b>IF</b> one level indicator deviates significantly from the others, <b>THEN</b> place CHANNEL SELECT PRESSURIZER LEVEL CONTROL switch in a position that will NOT include the defective channel.</li> </ol> </li> </ol>
	SRO/ATC	Places CHANNEL SELECT PRESSURIZER LEVEL CONTROL switch to Position 2.
	SRO/ATC	Maintains Pressurizer Level manually. (Steps 5.2 and 5.3 may be marked N/A if already using previous guidance for control.)
	SRO/ATC	5.4 <b>IF</b> LR-3-459 is selected to a defective channel, <b>THEN</b> place CHANNEL SELECT PRESSURIZER LEVEL RECORDER in another position.
	SRO/ATC	Ensures CHANNEL SELECT PRESSURIZER LEVEL RECORDER is selected to a functioning channel.



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Event Description: LT-3-460 fails low which isolates letdown. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>5.5 <u>IF</u> control malfunction caused letdown isolation, <u>THEN</u> re-establish flow as follows:</p> <p>5.5.1 Throttle Low Pressure LTDN Controller, PCV-3-145, as necessary to prevent LTDN relief valve from lifting, (approximately 50 percent open).</p> <p>5.5.2 Manually control Low Pressure Letdown Control Valve, PCV-3-145, to limit pressure spike.</p> <p>5.5.3 OPEN High Pressure L/D Isol Vlv from Loop B Cold Leg LCV-3-460.</p> <p>5.5.4 OPEN L/D Isolation Valves, CV-3-200 A, B <u>OR</u> C as required to restore pressurizer level to programmed level.</p> <p>5.5.5 Return Lower Pressure Letdown Control Valve, PCV-3-145 to automatic.</p>
	SRO/ATC	Determines Steps 5.6 is N/A at this time.
	SRO/ATC	5.7 <u>IF</u> control malfunction caused pressurizer heaters to deenergize, <u>THEN</u> restore PRZ heaters to automatic operation or take manual control.
	SRO/ATC	5.8 Maintain pressurizer level to be consistent with programmed level as indicated in Enclosure 1.
	SRO/ATC	5.9 Perform actions required by 3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS.
	SRO	Directs response using <b>3-ONOP-049.1</b> , Deviation or Failure of Safety Related or Reactor Protection Channels, to remove LT-3-460 from service.
	SRO/ATC	<p><u>SUBSEQUENT ACTIONS</u></p> <p>5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.</p>
	SRO/ATC	5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	SRO/ATC	5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
	SRO/ATC	5.4 <u>IF</u> a control function was placed in manual control due to the failure, <u>THEN</u> verify the control function is returned to automatic.
	SRO/ATC	Restores the Charging Pump Speed Controller to Automatic if in manual
	SRO/ATC	5.5 <u>IF</u> the failed channel is <u>NOT</u> related to Technical Specifications <u>AND</u> is <u>NOT</u> an input to Reactor Protection or Safeguards, <u>THEN</u> go to Step 5.16.

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Event Description: LT-3-460 fails low which isolates letdown. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-460 from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior																																										
	SRO	<p>5.6 Refer to Technical Specifications 3/4.3. Instrumentation <u>AND</u> verify the minimum channels operable.</p> <p>5.6.1 Take appropriate actions as specified in Technical Specifications.</p>																																										
	SRO	Refers to TS LCO 3.3.1, Table 3.3-1, Functional Unit 9 Action 13																																										
	SRO	<p style="text-align: center;">TABLE 3.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION</p> <table border="1"> <thead> <tr> <th>FUNCTIONAL UNIT</th><th>TOTAL NO. OF CHANNELS</th><th>CHANNELS TO TRIP</th><th>MINIMUM CHANNELS OPERABLE</th><th>APPLICABLE MODES</th><th>ACTION</th></tr> </thead> <tbody> <tr> <td>9. Pressurizer Water Level-High (Above P-7)</td><td>3</td><td>2</td><td>2</td><td>1</td><td>13</td></tr> </tbody> </table> <p>ACTION 13 -With the number of OPERABLE channels one less than the Total number of channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. For subsequent required DIGITAL CHANNEL OPERATIONAL TESTS the inoperable channel may be placed in bypass status for up to 4 hours.</p>	FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	9. Pressurizer Water Level-High (Above P-7)	3	2	2	1	13																														
FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION																																							
9. Pressurizer Water Level-High (Above P-7)	3	2	2	1	13																																							
	SRO	<p style="text-align: center;"><b>CAUTION</b></p> <p><i>The failed channel bistable(s) is required to be placed in the tripped mode within 6 hours of the failure determination, except if other channel bistable(s) are in the tripped or test position and would result in an undesired Engineered Safety Features actuation or Reactor Trip actuation. The overall effect of a failure of this type is a reduction of instrumentation redundancy and, therefore, a possible reduction in plant protection.</i></p>																																										
	SRO	<table border="1"> <thead> <tr> <th colspan="7">L-3-460      Pressurizer Level</th></tr> <tr> <th colspan="7">Max Deviation As Compared to other Channels</th></tr> <tr> <th colspan="7">5% LEVEL DEVIATION</th></tr> <tr> <th>RACK No.</th><th>BISTABLE No.</th><th>BISTABLE FUNCTION</th><th>STATUS LIGHT</th><th>ANNUNCIATOR</th><th>FUNCTION</th><th>LOGIC AFFECTED</th></tr> </thead> <tbody> <tr> <td>11</td><td>BS-3-460A-1</td><td>Przr HI Level</td><td>PRZR HI LEVEL LC460A1</td><td>AS/3 PROTECTION HI LEVEL</td><td>P</td><td>2/3 channel pressurizer high level (92%), with P-7 satisfied causing reactor trip signal</td></tr> <tr> <td>11</td><td>BS-3-460A-2</td><td>Przr Lo Lo Level</td><td>PRZR LO LEVEL LC460A2</td><td>AS/4 PRZR LO-LO LEVEL ALERT</td><td>C</td><td></td></tr> </tbody> </table> <div style="margin-top: 10px;"> <p>C - CONTROL RELATED P - RX PROTECTION RELATED S - SAFETY INJECTION RELATED</p> </div>	L-3-460      Pressurizer Level							Max Deviation As Compared to other Channels							5% LEVEL DEVIATION							RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNCTION	LOGIC AFFECTED	11	BS-3-460A-1	Przr HI Level	PRZR HI LEVEL LC460A1	AS/3 PROTECTION HI LEVEL	P	2/3 channel pressurizer high level (92%), with P-7 satisfied causing reactor trip signal	11	BS-3-460A-2	Przr Lo Lo Level	PRZR LO LEVEL LC460A2	AS/4 PRZR LO-LO LEVEL ALERT	C	
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11	BS-3-460A-2	Przr Lo Lo Level	PRZR LO LEVEL LC460A2	AS/4 PRZR LO-LO LEVEL ALERT	C																																							
	SRO	Makes determination to trip the following bistables within 6 hours.																																										

**EXAMINER NOTE:** When the SRO selects which bistables to trip, proceed to EVENT 2 - 3B1 CW PUMP HIGH TEMP.

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Circ Water Pump 3B1 Motor Bearing high temperature from increased bearing friction. The crew will lower reactor power to < 60% & secure SJAE suction before securing the 3B1 CW pump using 3-OP-010.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 2 - 3B1 CW PUMP HIGH TEMP.</b> (insert V8CI29ON TRUE delay=0 ramp=0 on=0 off=0, insert TVKKB1 0.5 delay=0 ramp=4800 on=0 off=0)		
	<b>SRO/ATC</b>	Observes Alarm I-2/4.
	<b>SRO/ATC</b>	CAUSES: <ol style="list-style-type: none"> <li>1. Motor failure</li> <li>2. Pump failure</li> <li>3. Low bearing oil level</li> </ol> <div style="border: 1px solid black; padding: 5px; display: inline-block; text-align: center;">             I2/4   <b>CWP B1 MOTOR BRG HI TEMP</b> </div>
	<b>SRO/ATC</b>	<b>OPERATOR ACTIONS</b> <ol style="list-style-type: none"> <li>1. <b>CHECK</b> the following at 3B1 CWP:               <ul style="list-style-type: none"> <li>• TS-3-4113, -4114, and -4115 equal to or greater than 235°F.</li> <li>• Bearing oil level.</li> <li>• Pump/motor vibration/noise.</li> </ul> </li> <li>2. IF bearing temperature exceeds 248°F, THEN <b>STOP</b> 3B1 CWP using 3-OP-010, Circulating Water System.</li> </ol>
	<b>FACILITY OPERATOR</b>	<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>If called, the operator reports:</p> <p>The 3B1 CW Pump High Bearing temperature is 238°F and rising at 10°F/hr. Additional reports may be given not to exceed 248°F.</p>
	<b>SRO</b>	Directs response using <b>3-NOP-010</b> , Circulating Water System to secure 3B1 CW Pump.
	<b>SRO/ATC</b>	<b>2.2 Limitations</b> <ol style="list-style-type: none"> <li>1. If the unit is operating, a maximum of two Circulating Water Pumps may be removed from service at the same time.</li> </ol>
	<b>SRO/ATC</b>	<b>4.3.2 Circulating Water Pumps 3B1 and 3B2 Shutdown</b> <ol style="list-style-type: none"> <li>1. IF shifting to only two Circulating Water Pumps in operation, THEN <b>ENSURE</b> Main Turbine is less than 60% load.</li> </ol>

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Circ Water Pump 3B1 Motor Bearing high temperature from increased bearing friction. The crew will lower reactor power to < 60% & secure SJAE suction before securing the 3B1 CW pump using 3-OP-010.

Time	Position	Applicant's Actions or Behavior
<p><b>EXAMINER NOTE: The SRO determines the need to reduce power to &lt; 60% and secure SJAE (due to CWP 3B2 not available) in order to stop the pump and not loose Main Condenser vacuum.</b></p> <p><b>(Go to Event 3 for details on power reduction.)</b></p>		
	SRO/BOP	<p>2. IF all Circulating Water Pumps will be shutdown, THEN <b>ENSURE</b> the following are shutdown:</p> <ul style="list-style-type: none"> <li>• Main Turbine</li> <li>• Condensate System</li> </ul>
	SRO/BOP	<p>3. <b>ENSURE</b> Amertap System is shutdown per 3-NOP-015.01, Amertap Condenser Tube Cleaning Operation.</p>
	SRO/BOP	<p style="text-align: center;"><b>NOTE</b></p> <p>DCS/P1612X indicates Main Condenser backpressure. To determine vacuum from backpressure: Main Condenser Vacuum = 30 in Hg - DCS/P1612X_A</p>
	SRO/BOP	<p style="text-align: center;"><b>CAUTION</b></p> <p>When removing a set of waterboxes from service, Main Condenser vacuum should be monitored using the most conservative indication of the following:</p> <ul style="list-style-type: none"> <li>• PI-3-1612, CONDENSER VACUUM (VPA)</li> <li>• PI-3-1406, CONDENSER VACUUM (VPA)</li> <li>• DCS/P1612X_A</li> </ul>
	SRO/BOP	<p>4. <b>ENSURE</b> the following are CLOSED:</p> <ul style="list-style-type: none"> <li>• 3-30-003, NORTH CNDSR AIR REMOVAL LINE TO SJAE ISOL</li> <li>• 3-30-005, SOUTH CNDSR AIR REMOVAL LINE TO SJAE ISOL</li> </ul>
	SRO/BOP	<p>5. IF removing a set of waterboxes from service and condenser air inleakage is greater than 10 SCFM, THEN <b>PLACE</b> the SJAE hogger in service per 3-NOP-073.01, Steam Jet Air Ejector Operation, prior to removing waterboxes from service.</p>

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Circ Water Pump 3B1 Motor Bearing high temperature from increased bearing friction. The crew will lower reactor power to < 60% & secure SJAE suction before securing the 3B1 CW pump using 3-OP-010.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>6. IF removing a set of waterboxes from service during power operation, THEN:</p> <p>A. <b>DETERMINE</b> the estimated turbine load expected following the stop of the last Circulating Water Pump.</p> <p>B. <b>DETERMINE</b> the required vacuum for the estimated turbine load of Section 4.3.2 Step 6.A using Attachment 4, Condenser Vacuum Limitations.</p> <p>C. <b>ENSURE</b> a minimum 2 inches Hg margin exists between the current Main Condenser vacuum and required vacuum determined by Section 4.3.2 Step 6.B.</p>
	SRO/BOP	<p style="text-align: center;"><b>NOTE</b></p> <p>The stop circuit for the pump will trip the pump when the associated discharge MOV is 5% open or 90 seconds elapse after the switch is placed in the STOP position and the MOV has failed to close.</p>
	SRO/BOP	<p>7. WHEN an operator is standing by the associated discharge valve, THEN <b>PLACE one</b> of the following Circulating Water Pumps to STOP at VPA:</p> <ul style="list-style-type: none"> <li>• 3B1 CIRCULATING WATER PUMP</li> <li>• 3B2 CIRCULATING WATER PUMP</li> </ul>
	SRO/BOP	Places handswitch for the CWP 3B1 to STOP <b>after</b> power is below 60%
	SRO/BOP	8. <b>CHECK</b> the affected Circulating Water Pump stops when its discharge MOV is approximately 5% OPEN.
	SRO/BOP	9. <b>CHECK</b> the affected Circulating Water Pump discharge MOV continues to fully CLOSED after the pump stops.

**EXAMINER NOTE:** A consequential failure can occur if the crew does not decrease load after an hour. The Lead Examiner will direct the setpoint for TVKKB1 to be raised by the Facility Operator to 1.0. Annunciator I 2/1, the CWP B1/B2 MOTOR OVERLOAD ALARM, will alarm on high current and the pump can automatically trip. When this alarm comes in, BOP reports this alarm and consults the ARP.

**EXAMINER NOTE:** After the 3B1 CWP is stopped, proceed to EVENT 4 - PT-3-445 FAILS HIGH WITH PORV 455C FAILED OPEN.

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Event Description: The crew initiates a boration to reduce turbine load to 60% using 3-GOP-100.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Directs response using <b>3-GOP-100</b> , Fast Load Reduction.
	<b>CREW</b>	Reviews 3-GOP-100 Foldout Page actions
	<b>SRO</b>	<p><b>1</b> Brief Control Room Personnel Using ATTACHMENT 3</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>Suggested boration is 9 gallons per % with control rods completely withdrawn and available; 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).</li> <li>The Unit Supervisor may change the boration as desired during the load reduction.</li> </ul> </div> <p>4. Boration Rate: _____ total gallons / _____ minutes = _____ gallons/minute.</p>
	<b>SRO/ATC</b>	Determines <b>9 gal/%</b> boric acid addition times <b>15 %</b> which equals <b>135 gallons total</b> .
	<b>CREW</b>	<p style="text-align: center;"><b>FOLDOUT PAGE</b></p> <p><b>1. 3-EOP-E-0 Transition Criteria</b></p> <p>IF any of the following limits are reached, <b>THEN</b> trip the Reactor and Turbine <b>AND</b> go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:</p> <ol style="list-style-type: none"> <li>RCS Tav<sub>g</sub> - GREATER THAN 578 °F</li> <li>RCS Tav<sub>g</sub> - GREATER THAN Tref by 6 °F</li> <li>Rod Insertion Limits are exceeded as indicated by: <ul style="list-style-type: none"> <li>Rod Position Bank D Insertion Limit Recorder (VPA)</li> <li>Stepcounters on console</li> <li>Plant Curve Book Section 7, Figure 3</li> </ul> </li> </ol> <p><b>2. Notify Chemistry Department</b></p> <p><b>WHEN</b> reactor power has changed by greater than or equal to 15 percent, <b>THEN</b> notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.</p> <p><b>3. Restore Blender to AUTO</b></p> <p><b>WHEN</b> boration is complete, <b>THEN</b> restore the Blender to AUTO as follows:</p> <ol style="list-style-type: none"> <li>Place the Reactor Makeup Selector Switch to AUTO.</li> <li>Set FC-3-113A, Boric Acid Flow Controller pot setting as desired.</li> <li>Place the RCS Makeup Control Switch to START.</li> </ol>

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Event Description: The crew initiates a boration to reduce turbine load to 60% using 3-GOP-100.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>2</b> Begin Boration <span style="float: right;">IF boration is not required, THEN go to Step 3.</span></p> <p>a. Set the Boric Acid Totalizer to value determined using ATTACHMENT 3</p> <p>b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0</p> <p>c. Place the Reactor Makeup Selector Switch to BORATE</p> <p>d. Place the RCS Makeup Control Switch to START</p>
	SRO/BOP	<p><b>3</b> Notify The Following</p> <ul style="list-style-type: none"> <li>System Dispatcher</li> <li>Plant personnel using the Page Boost</li> </ul>
	CREW	<p><b>4</b> Reduce Unit Load</p> <p>a. Check for boration effects (reducing Tav<sub>g</sub>)</p> <p>b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the ATTACHMENT 3 desired flow rate</p> <p>c. Initiate AND maintain load reduction rate to the target power level</p> <p>d. Monitor load reduction and auto rod control to ensure that the expected Tav<sub>g</sub>/Tref ΔT identified in ATTACHMENT 3 is maintained</p> <p>a. IF boration is used, THEN wait for effects before starting load reduction.</p> <p>d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual AND maintain Tav<sub>g</sub> within the expected Tav<sub>g</sub>/Tref ΔT of ATTACHMENT 3.</p>
	BOP	Reduces Turbine load.
	SRO/ATC	<p><b>5</b> Monitor Annunciator B 8/1, ROD BANK LO LIMIT - RESET</p> <p>Perform the following:</p> <p>a. Slow load reduction until alarm is reset.</p> <p>b. Re-evaluate boration amount and rate, and make adjustments as necessary.</p>
	SRO	<p><b>6</b> Notify The Shift Manager To Refer To The Following Procedures</p> <ul style="list-style-type: none"> <li>0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR</li> <li>0-ADM-115, NOTIFICATION OF PLANT EVENTS</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p>Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-NOP-059.09, OPERATION WITHIN THE AXIAL FLUX DIFFERENCE OPERATIONAL SPACE.</p>



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Event No.: 3

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Event Description: The crew initiates a boration to reduce turbine load to 60% using 3-GOP-100

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>7</b> Check Plant Response</p> <p>a. Check pressurizer level following program</p> <p>a. <u>IF</u> directed by the Unit Supervisor, <u>THEN</u> increase charging flow as follows:</p> <ol style="list-style-type: none"> <li>1) Start an additional charging pump.</li> <li>2) Place an additional letdown orifice in service.</li> <li>3) Place L/D Temp Controller TC-3-144A in Manual and Control letdown temperature manually.</li> <li>4) <u>WHEN</u> letdown temperature is 115-121°F and stable, <u>THEN</u> place TC-3-144A in AUTO.</li> </ol> <p>b. Verify load reduction rate and auto rod control is maintaining the expected Tav<sub>g</sub>/Tref ΔT identified in ATTACHMENT 3</p> <p>b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual <u>AND</u> maintain Tav<sub>g</sub> within the expected Tav<sub>g</sub>/Tref ΔT of ATTACHMENT 3.</p>
	SRO/ATC	<p><b>8</b> Energize Pressurizer Backup Heaters</p>
	SRO/BOP	<p><b>9</b> Verify Turbine Load Less Than 570 MWE</p> <p><u>WHEN</u> turbine load is less than 570 MWe, <u>THEN</u> open the SGFP recirculation valves for the first feedwater pump to be stopped.</p> <p>Open the SGFP recirculation valves for the first feedwater pump to be stopped</p>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;"><i>Boration should be stopped above the target power level to prevent excessive boration.</i></p>
	SRO/ATC	<p><b>10</b> Monitor Turbine Load Within 10% Of Target Power Level</p> <p>Go to Step 11.</p> <p>Stop the boration as follows:</p> <ol style="list-style-type: none"> <li>a. Place the Reactor Makeup Selector Switch to AUTO</li> <li>b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired</li> <li>c. Place the RCS Makeup Control Switch to START</li> </ol>



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Event Description: The crew initiates a boration to reduce turbine load to 60% using 3-GOP-100

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>11</b> Check Target Load – LESS THAN 450 Mwe</p> <p style="text-align: center;">↓</p> <p>IF Target Load is GREATER THAN 450 Mwe, <b>THEN</b> perform the following:</p> <ol style="list-style-type: none"> <li>Maintain reactor power at or below the target value using: <ul style="list-style-type: none"> <li>Boration/dilution</li> <li>Control Rod adjustments</li> <li>Turbine load adjustments</li> </ul> </li> <li>Maintain Tavg within <math>\pm 1</math> °F of Tref.</li> <li>Maintain Pressurizer level on program.</li> <li>Maintain Pressurizer pressure on program.</li> <li>Maintain SG Levels on program.</li> <li>Refer to any ONOPs in effect.</li> <li>Go to procedure and step in effect.</li> </ol>
	SRO/BOP	<p><b>12</b> Check Station Service Loads Supplied From The Startup Transformer</p> <p><b>WHEN</b> directed by the Unit Supervisor, <b>THEN</b> transfer station service from the Auxiliary Transformers to the Startup Transformer using ATTACHMENT 2.</p>
	SRO/BOP	<p><b>13</b> Check Auxiliary Steam Supplied From Another Unit</p> <p><b>WHEN</b> directed by the Unit Supervisor, <b>THEN</b> align auxiliary steam supply from another unit using ATTACHMENT 1.</p>
	BOP	Turnover Sheet indicates Aux Steam is aligned to Unit 3.
	SRO/ATC	<p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>Boration should be stopped above the target power level to prevent excessive boration, or at <math>\geq 25\%</math> power if the unit is to be taken off line.</li> <li>Remaining procedure steps should be taken as appropriate for the intended power level.</li> </ul>
Examiner Note: The SRO may or may NOT implement the following steps.		
	SRO/BOP	<p><b>14</b> Continue Load Reduction</p> <ol style="list-style-type: none"> <li>Verify Turbine load less than – 450 MWE <ul style="list-style-type: none"> <li>Stop one heater drain pump</li> </ul> </li> <li>Verify Turbine load less than – 400 MWE <ol style="list-style-type: none"> <li>Place the Feedwater Pump Turbine Runback Defeat switch to DEFEAT</li> <li>Stop the SGFP with recirculation valves open</li> <li>Place SGFP recirculation valves control switch in the CLOSED/AUTO position</li> </ol> </li> </ol>

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Event Description: The crew initiates a boration to reduce turbine load to 60% using 3-GOP-100

Time	Position	Applicant's Actions or Behavior
	BOP	<b>15</b> Ensure Station Service Loads Supplied From The Startup Transformer Using ATTACHMENT 2
		<b>16</b> Ensure Auxiliary Steam Supplied From Another Unit Using ATTACHMENT 1

**EXAMINER NOTE:** When power has been sufficiently reduced and the 3B1 CW pump has been shutdown, proceed to EVENT 4.

### FOLDOUT PAGE

#### 1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, THEN trip the Reactor and Turbine AND go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

- a. RCS Tav<sub>g</sub> - GREATER THAN 578 °F
- b. RCS Tav<sub>g</sub> - GREATER THAN Tref by 6 °F
- c. Rod Insertion Limits are exceeded as indicated by:
  - Rod Position Bank D Insertion Limit Recorder (VPA)
  - Stepcounters on console
  - Plant Curve Book Section 7, Figure 3

#### 2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, THEN notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

#### 3. Restore Blender to AUTO

WHEN boration is complete, THEN restore the Blender to AUTO as follows:

- a. Place the Reactor Makeup Selector Switch to AUTO.
- b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired.
- c. Place the RCS Makeup Control Switch to START.



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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure, PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 4 - PT-3-445 FAILS HIGH - PORV 456 DEVELOPING LEAKAGE.</b> (insert TFH1TU45 -1 delay=0 ramp=0 on=0 off=0 and insert TvHV456 0.1 delay=0 ramp=0 on=0 off=0).		
	SRO/ATC	Observes the following: <ul style="list-style-type: none"> <li>• RCS pressure decreasing.</li> <li>• PZR pressure control channel PT-3-445 pegged high</li> <li>• PORV PCV-3-456 open with no actual high pressure condition</li> <li>• Pressurizer High Pressure PC 456A bistable light ON.</li> </ul>
	SRO/ATC	Observes annunciators : A-4/1, A-9/2, A-9/5
	SRO	Directs response using the ARP and 3-ONOP-41.5
	SRO/ATC	Alarm Response actions: <ul style="list-style-type: none"> <li>• Attempts to closes PORV PCV-3-456.</li> <li>• Closes Block Valve MOV-3-535 to isolate leakage.</li> </ul>
	SRO/ATC	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;"><b><u>NOTE</u></b></p> <p><i>Foldout page is required to be monitored throughout this procedure.</i></p> </div>
	SRO/ATC	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>The Master Controller should be operated carefully (Normal controller output for 2235 psig is 42.5 percent demand; 92 percent demand will open PCV-3-455C). If the following conditions are met, an excessive increase in controller output could cause Power Operated Relief Valve PCV-3-455C to open:</i></p> <ol style="list-style-type: none"> <li><i>1. PCV-3-455C hand switch in AUTO.</i></li> <li><i>2. Pressurizer pressure is greater than or equal to 2000 psig, or OMS switch in LO Press Ops.</i></li> </ol> </div>
	SRO/ATC	Reviews 3-ONOP-41.5 foldout page actions (See next page)

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Event No.: 4

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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
	CREW	<p style="text-align: center;"><u><b>FOLDOUT FOR PROCEDURE 3-ONOP-041.5</b></u></p> <ol style="list-style-type: none"> <li>1. <u><b>FAILED INSTRUMENT ISOLATION</b></u> <ol style="list-style-type: none"> <li>a. <u><b>IF</b></u> any Pressurizer Pressure control Instrument Loop fails, <u><b>THEN</b></u> place applicable control switches to a position that isolates the failed instrument.</li> </ol> </li> <li>2. <u><b>IF</b></u> PZR pressure cannot be maintained greater than 2000 psig, <u><b>THEN</b></u> perform the following:           <ol style="list-style-type: none"> <li>a. Continue efforts to restore PZR pressure and</li> <li>b. Trip the reactor and turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.</li> </ol> </li> <li>3. <u><b>PORV ISOLATION/LEAKING PORV IDENTIFICATION</b></u> <ol style="list-style-type: none"> <li>a. <u><b>IF</b></u> any PORV is OPEN <u><b>OR</b></u> Leaking <u><b>AND</b></u> pressure is less than 2235 psig, <u><b>THEN</b></u> CLOSE the applicable PORV and/or Block valve.</li> <li>b. The following are indications of leakage from a PZR PORV and should be used to identify and isolate a leaking PORV:               <ol style="list-style-type: none"> <li>1) PZR relief line temperature, TI-3-463, INCREASING.</li> <li>2) PZR relief tank level, LI-3-470, INCREASING.</li> <li>3) PZR relief tank temperature, TI-3-471, INCREASING.</li> <li>4) PZR relief tank pressure, PI-3-472, INCREASING.</li> <li>5) PZR PORV/SAFETY ACOUSTIC MONITOR, LEDs LIT.</li> </ol> </li> </ol> </li> <li>4. <u><b>OPEN/LEAKING PZR SAFETY VALVE IDENTIFICATION</b></u> <ol style="list-style-type: none"> <li>a. The following are indications that a PZR safety is open or leaking:               <ol style="list-style-type: none"> <li>1) PZR Safety line temperature, TI-3-465, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.</li> <li>2) PZR Safety line temperature, TI-3-467, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.</li> <li>3) PZR Safety line temperature, TI-3-469, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.</li> <li>4) PZR relief tank level, LI-3-470, INCREASING.</li> <li>5) PZR relief tank temperature, TI-3-471, INCREASING.</li> <li>6) PZR relief tank pressure, PI-3-472, INCREASING.</li> <li>7) PZR PORV/Safety Acoustic Monitor, LEDs LIT.</li> </ol> </li> </ol> </li> <li>5. <u><b>SPURIOUS ACTUATION OF CV-3-311 AUXILIARY SPRAY VALVE</b></u> due to fire in Containment or 3B 4KV Switchgear Room           <ol style="list-style-type: none"> <li>a. <u><b>IF</b></u> pressurizer pressure is decreasing and Auxiliary Spray Valve, CV-3-311, is suspect, <u><b>THEN</b></u> reduce charging to one charging pump on slow speed <u><b>AND</b></u> close charging to RCS Control Valve HCV-3-121.</li> </ol> </li> </ol>

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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
<b>Potential Additional Tech Spec Call</b>		
	<b>SRO</b>	<p><u>POWER DISTRIBUTION LIMITS</u></p> <p><u>3/4.2.5 DNB PARAMETERS</u></p> <p><u>LIMITING CONDITION FOR OPERATION</u></p> <p>3.2.5 The following DNB-related parameters shall be maintained within the following limits:</p> <ul style="list-style-type: none"> <li>a. Reactor Coolant System <math>T_{avg} \leq 581.2^{\circ}\text{F}</math></li> <li>b. Pressurizer Pressure <math>\geq 2200</math> psig*, and</li> <li>c. Reactor Coolant System Flow <math>\geq 264,000</math> gpm</li> </ul> <p><u>APPLICABILITY:</u> MODE 1.</p> <p><u>ACTION:</u></p> <p>With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.</p> <p>* Limit not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% of RATED THERMAL POWER.</p>

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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure, PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<b>EXAMINER NOTE: Steps annotated with * may have already been performed in the ARP.</b>
	SRO/ATC	<p><b>*</b></p> <p><b>1</b> Check PZR Pressure Control Instrument Loop Not Failed</p> <p>a. Check PT-3-444 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify PCV-3-455C <u>OR</u> MOV-3-536 CLOSED.</li> <li>2) Take manual control of PC-3-444J, PZR PRESS CONTROL.</li> <li>3) <u>IF</u> manual control of PC-3-444J is <u>NOT</u> effective, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>* Take manual control of PZR spray valves.</li> <li>* Take manual control of PZR heaters.</li> </ul> </li> </ol>
	SRO/ATC	<p>b. Check PT-3-445 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify PCV-3-456 <u>OR</u> MOV-3-535 CLOSED.</li> </ol>
	SRO/ATC	<ul style="list-style-type: none"> <li>- Attempts to close PORV PCV-3-456 (if not already done).</li> <li>- Closes MOV-3-535 to stop leakage.</li> </ul>
	SRO/ATC	<p><b>2</b> Check PORVs Closed</p> <ul style="list-style-type: none"> <li>• PCV-3-455C - CLOSED</li> <li>• PCV-3-456 - CLOSED</li> </ul> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>• <u>IF</u> PZR pressure is less than 2335, <u>THEN</u> manually close PORVs. <u>IF</u> any PZR PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>A fire in containment or the 3B 4KV Switchgear Room may cause spurious actuation of and give false valve position indication for Auxiliary Spray Valve, CV-3-311.</i></p>

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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure, PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>3</b> Check PZR Spray Valves Closed</p> <p>IF PZR pressure less than normal, <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"> <li>• PZR pressure normal or trending to normal</li> </ul> <p>a. Verify PZR Spray valves closed.</p> <ul style="list-style-type: none"> <li>• Place PZR Spray Loop C, PCV-3-455A in MANUAL and CLOSE.</li> <li>• Place PZR Spray Loop B, PCV-3-455B in MANUAL and CLOSE.</li> <li>• Verify Aux Spray Valve CV-3-311 CLOSED.</li> </ul> <p>b. IF PZR pressure can <b>NOT</b> be maintained greater than 2000 psig, <b>THEN</b> perform the following:</p> <ol style="list-style-type: none"> <li>1) Trip the reactor and turbine and go to E-0, REACTOR TRIP OR SAFETY INJECTION.</li> <li>2) Trip the RCP in the affected loop.</li> </ol>
	SRO/ATC	<p><b>4</b> Check PZR Safety Valves Closed</p> <p>a. PZR PORV/Safety acoustic monitor LEDs - NOT LIT</p> <p>b. PZR safety line temperatures at or near normal</p> <ul style="list-style-type: none"> <li>• PZR safety line temperature, TI-3-465</li> <li>• PZR safety line temperature, TI-3-467</li> <li>• PZR safety line temperature, TI-3-469</li> </ul>
	SRO/ATC	<p><b>5</b> Check PZR Pressure Stable Or Increasing</p> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>• Continue efforts to restore PZR pressure control.</li> </ul>
	SRO/ATC	Determines Pressurizer pressure can be maintained greater than 2000 psig.
	SRO	Recognizes requirement for LCO 3.2.5 Action b entry.

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Event Description: PT-3-445 fails high, the crew responds using the ARP and 3-ONOP-41.5 to attempt to manually close PORV-456. During the instrument failure, PORV-456 develops leakage. The contingent action is to close the block valve to stop the leakage. The SRO will address LCO 3.4.4 due to excessive leakage on the PORV.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Recognizes requirement for LCO 3.2.5 entry.
	<b>SRO</b>	<p>3.2.5 The following DNB-related parameters shall be maintained within the following limits:</p> <ul style="list-style-type: none"> <li>a. Reactor Coolant System <math>T_{avg} \leq 581.2^{\circ}\text{F}</math></li> <li>b. Pressurizer Pressure <math>\geq 2200</math> psig*, and</li> <li>c. Reactor Coolant System Flow <math>\geq 264,000</math> gpm</li> </ul> <p><u>APPLICABILITY:</u> MODE 1.</p> <p><u>ACTION:</u></p> <p>With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.</p>
	<b>SRO</b>	Recognizes requirement for LCO 3.4.4 Action a entry.
	<b>SRO</b>	<p>3.4.4 Both power-operated relief valves (PORVs) and their associated block valves shall be OPERABLE.</p> <p><u>APPLICABILITY:</u> MODES 1, 2, and 3.</p> <p><u>ACTION:</u></p> <ul style="list-style-type: none"> <li>a. With one or both PORVs inoperable because of excessive leakage, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s) with power maintained to the block valve(s); otherwise be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.</li> </ul>

**EXAMINER NOTE:** If scenario proceeds without PORV operability addressed, then ask it as a follow-up question. When Pressurizer pressure is stabilized, proceed to Event 5.



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Event Description: "B" Condensate Pump Motor Shaft slowly seizes causing a failure of the pump. The automatic start of the "C" Condensate Pump is blocked. The BOP can manually start the "C" Condensate Pump or stop one Main Feed Pump to initiate a Runback to equalize Turbine load with available Feedwater flow.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 5 - LOSS OF 3B CONDENSATE PUMP.</b> (insert TVFABP6B 0.4 delay=0 ramp=60 on=0 off=0, insert TFF1D6CM TRUE delay=0 ramp=0 on=0 off=0, and insert TFF1D6CM FALSE cd='imf1p6cs' delay=0 ramp=0 on=0 off=0)		
	SRO/ATC	Observes annunciator : D 9/1 and D 9/2
	SRO	Directs response using the ARP and/or 3-ONOP-089, if feed pump is tripped.
	SRO/BOP	CAUSES: <ol style="list-style-type: none"> <li>1. Motor malfunction</li> <li>2. High system flow</li> <li>3. Low bus voltage</li> </ol> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">             D9              COND PUMP              A/B/C              MOTOR              OVERLOAD           </div>
	SRO/BOP	<b>ALARM CONFIRMATION</b> 1. <b>CHECK</b> Condensate pump(s) ammeter(s)
	SRO/BOP	<b>OPERATOR ACTIONS</b> 1. <b>MONITOR</b> SGFP suction pressure. 2. IF necessary to maintain adequate suction pressure, THEN <b>START</b> 3rd condensate pump. 3. <b>CHECK</b> associated feed train components for proper operation. 4. <b>REQUEST</b> Operator check condensate pump recirculation valves closed and amps locally. 5. IF cause of motor overload can NOT be corrected, THEN <b>MAKE</b> preparations to stop affected pump(s) using 3-OP-073, Condensate System.
	SRO/BOP	<ul style="list-style-type: none"> <li>- Starts 3C Condensate Pump.</li> <li>- Stops 3B Condensate Pump with high current if not tripped.</li> </ul>

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Event Description: "B" Condensate Pump Motor Shaft slowly seizes causing a failure of the pump. The automatic start of the "C" Condensate Pump is blocked. The BOP can manually start the "C" Condensate Pump or stop one Main Feed Pump to initiate a Runback to equalize Turbine load with available Feedwater flow.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>CAUSES: 1. Motor malfunction 2. Low bus voltage</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> D18  COND PUMP  A/B/C  MOTOR OVRD  TRIP </div>
	SRO/BOP	<p><b>ALARM CONFIRMATION</b></p> <p>1. <b>CHECK</b> condensate pump indications on console.</p>
	SRO/BOP	<p><b>OPERATOR ACTIONS</b></p> <p>1. <b>ENSURE</b> the following automatic actions have occurred:</p> <ul style="list-style-type: none"> <li>• Automatic start of idle condensate pump if applicable</li> <li>• Possible trip of SGFP</li> </ul> <p>2. <b>MONITOR</b> SGFP suction pressure.</p> <p>3. <b>REQUEST</b> Operator check condensate pump breaker(s) 3AA21, 3AB21, or 3AC12 for any targets.</p> <p>4. <b>REQUEST</b> Operator check condensate pump(s) locally for any abnormal indications.</p>
<p><b>EXAMINER NOTE: When secondary system parameters stabilize, proceed to Event 6. If another Condensate Pump is started late after a Main Feed Water Pump trips, then continue below with initial steps of 3-ONOP-089, Turbine Runback.</b></p>		
	SRO	Directs response using 3-ONOP-089.
	CREW	<p>4.0 <u><b>IMMEDIATE OPERATOR ACTIONS</b></u></p> <p>4.1 Verify the automatic actions listed in Section 3.0 are functioning to stabilize and maintain plant conditions, or assume manual control.</p>
	CREW	<p>3.0 <u><b>AUTOMATIC ACTIONS</b></u></p> <p>3.1 Main Turbine Control Valves and the Reheat Intercept Valves modulate closed upon receipt of a runback signal from the Generator Governor/Speed Changer.</p> <p>3.2 Steam Dump Valves arm and open to relieve excess steam to the condenser due to the load rejection and subsequent Tav<sub>g</sub>/Tref mismatch.</p> <p>3.3 Automatic Rod Insertion Control adjusts core reactivity to match Tav<sub>g</sub> with Tref.</p> <p>3.4 Main Feedwater Control Valves open or close in programmed response to steamflow/feedflow mismatch and level input signals, to maintain steam generator levels at program.</p> <p>3.5 Pressurizer Level Controller and Pressurizer Pressure Controller vary charging pumps speed and Heater/Spray actuation to maintain the programmed level and pressure, as required for the changing values of Tav<sub>g</sub>.</p> <p>3.6 Turbine runback upon a SGFP breaker trip with first stage pressure greater than 45 percent load. Both a governor and a load limit runback occur until first stage pressure is at 45 percent load.</p>

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Event Description: "B" Condensate Pump Motor Shaft slowly seizes causing a failure of the pump. The automatic start of the "C" Condensate Pump is blocked. The BOP can manually start the "C" Condensate Pump or stop one Main Feed Pump to initiate a Runback to equalize Turbine load with available Feedwater flow.

Time	Position	Applicant's Actions or Behavior
	<b>CREW</b>	<p><u>SUBSEQUENT OPERATOR ACTIONS</u></p> <p>5.1 Determine the cause of the runback initiation <u>AND</u> refer to the appropriate ONOP for specific recovery instructions.</p> <p>5.2 Verify the following conditions:</p> <p>5.2.1 Steam generator levels and pressures stabilized.</p> <p>5.2.2 Steam dumps closed.</p> <p>5.2.3 Tavg matches Tref.</p> <p>5.2.4 Pressurizer levels and pressures stabilized.</p>

**EXAMINER NOTE: When secondary system parameters stabilize, proceed to Event 6.**



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Scenario No.: 1

Event No.: 6

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 6 – PORV 456 AND BLOCK VALVE 535 LEAKAGE INCREASES.</b> (insert TVHV535 1.000000 delay=0 ramp=60 on=0 off=0 and insert TVHV456 1.000000 delay=0 ramp=60 on=0 off=0)		
	SRO	May direct a manual trip as Reactor trip setpoints are reached.
	SRO	Directs response using 3-EOP-E-0 starting at Step 1.
	CREW	<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <b>NOTE</b>            Steps 1 through 4 are IMMEDIATE ACTION steps.         </div>
	SRO/ATC	<b>1</b> Verify Reactor Trip  <ul style="list-style-type: none"> <li>• Rod bottom lights – ON</li> <li>• Reactor trip and bypass breakers – OPEN</li> <li>• Rod position indicators - AT ZERO</li> <li>• Neutron flux – DECREASING</li> </ul> <p>Manually trip reactor. <b>IF</b> reactor power is greater than 5% <b>OR</b> intermediate range power is <b>NOT</b> stable or decreasing, <b>THEN</b> perform the following:</p> <ul style="list-style-type: none"> <li>a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.</li> </ul>
	SRO/BOP	<b>2</b> Verify Turbine Trip  <ul style="list-style-type: none"> <li>a. All turbine stop or associated control valves – CLOSED</li> <li>b. Verify Moisture Separator Reheater Steam Valves – CLOSED               <ul style="list-style-type: none"> <li>• MSR Main Steam Supply Stop MOVs</li> <li>• Reheater Timing Valves</li> <li>• MSR Purge Steam Valves</li> </ul> </li> <li>c. Check Mid and East GCBs – OPEN (Normally 30-second delay)</li> </ul> <p>a. Manually trip turbine. <b>IF</b> unable to verify turbine trip, <b>THEN</b> close main steamline isolation and bypass valves.</p> <p>b. Manually close valves. <b>IF</b> any valve can <b>NOT</b> be closed, <b>THEN</b> close main steamline isolation and bypass valves.</p> <p>c. Manually open breakers. <b>IF</b> breakers do <b>NOT</b> open, <b>THEN</b> actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).</p>
	SRO/BOP	Manually closes MSR steam supply MOVs.


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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><b>3</b> Verify Power To Emergency 4 KV Buses</p>  <p>a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED</p> <p>b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED</p> <p>c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS</p> <p>a. Perform the following:</p> <p>1) Attempt to emergency start any Unit 3 available diesel generator.</p> <p>2) <u>IF</u> neither 3A nor 3B 4 KV bus is energized, <u>THEN</u> go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.</p> <p>b. Attempt to emergency start the de-energized Unit 3 bus diesel generator.</p> <p>c. Perform the following:</p> <p>1) <u>IF</u> lockout of 3D 4 KV bus <u>NOT</u> present, <u>THEN</u> perform the following:</p> <p>a) Verify 3C CCW pump - BREAKER OPEN.</p> <p>b) Verify 3C ICW pump - BREAKER OPEN.</p> <p>c) Operate bus supply breakers to restore power.</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>4</b></p> <p>Check If SI Is Actuated</p> <p>* SI Annunciators - ANY ON</p> <p><u>OR</u></p> <p>* Safeguards equipment - AUTO STARTED</p> <p>Perform the following:</p> <p>a. Check if SI is required:</p> <p>* Low pressurizer pressure - 1730 psig</p> <p><u>OR</u></p> <p>* High containment pressure - 4 psig</p> <p><u>OR</u></p> <p>* High steam line differential pressure - 100 psid</p> <p><u>OR</u></p> <p>* High steam flow with low S/G pressure - 614 psig <u>OR</u> low Tavg (543 F)</p> <p>b. <u>IF</u> SI is required, <u>THEN</u> manually actuate SI and containment isolation phase A <u>AND</u> go to Step 5.</p> <p>c. <u>IF</u> SI is <u>NOT</u> required, <u>THEN</u> perform the following:</p> <p>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</p> <p>2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.</p>
	CREW	<p><b>NOTE</b></p> <p>FOLDOUT Page shall be monitored for the remainder of this procedure.</p>
	CREW	Monitors 3-EOP-E-0 Foldout page (see next page)
	SRO/BOP	<p><b>5</b></p> <p>Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure</p>

**Examiner Note: 3-EOP-E-0, Attachment 3 commences at Event No. 6 Page 12 of 24. An additional copy for convenience is at the end of the procedure.**

**Examiner Note: The SRO and ATC will complete the remaining steps in 3-EOP-E-0, while the BOP performs 3-EOP-E-0 Prompt Action Verifications using Attachment 3.**

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
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**FOLDOUT FOR PROCEDURE E-0****1. ADVERSE CONTAINMENT CONDITIONS**

**IF** either of the conditions listed below occur, **THEN** use adverse containment setpoints:

Containment atmosphere temperature  $\geq 180^{\circ}\text{F}$

**OR**

Containment radiation levels  $\geq 1.3 \times 10^5$  R/hr

**WHEN** containment parameters drop below the above values, **THEN** normal setpoints can again be used **IF** the TSC determines that containment integrated dose rate has not exceeded  $10^5$  Rads.

**2. RCP TRIP CRITERIA**

a. **IF** both conditions listed below occur, **THEN** trip all RCPs:

1) High-head SI pumps - AT LEAST ONE RUNNING **AND** SI FLOWPATH VERIFIED.

2) RCS subcooling - LESS THAN  $25^{\circ}\text{F}$  [ $65^{\circ}\text{F}$ ]

b. **IF** phase B actuated, **THEN** trip all RCPs.

**3. FAULTED S/G ISOLATION CRITERIA**

**IF** any S/G pressure decreasing in an uncontrolled manner **OR** any S/G completely depressurized, **THEN** the following may be performed:

a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%].

b. Isolate AFW flow to faulted S/G(s).

c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range.

**4. RUPTURED S/G ISOLATION CRITERIA**

**IF** any S/G level increases in an uncontrolled manner **OR** any S/G has abnormal radiation, **AND** narrow range level in affected S/G(s) is greater than 6%[32%], **THEN** feed flow may be stopped to affected S/G(s).

**5. AFW SYSTEM OPERATION CRITERIA**

a. **IF** two AFW pumps are operating on a single train, **THEN** one of the pumps shall be shut down within one hour of the initial start signal

b. **IF** two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, **THEN** that AFW pump shall be shut down

**6. CST MAKEUP WATER CRITERIA**

**IF** CST level decreases to less than 10%, **THEN** add makeup to CST using 3-NOP-018.01, CONDENSATE STORAGE TANK (CST).

**7. RHR SYSTEM OPERATION CRITERIA**

**IF** RHR flow is less than 1000 gpm, **THEN** the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	<b>SRO/ATC</b>	Stops RCPs if subcooling is less than 25°F (65°F) with HHSI flowpath verified and HHSI pumps running based on foldout page requirements.

**CREW CRITICAL TASK:** Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing Step 1 of 3-EOP-E-1.

	<b>SRO/ATC</b>	<p><b>6</b> Check AFW Pumps - AT LEAST TWO RUNNING</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Manually open valves to establish two AFW pumps running.</li> <li><b>IF</b> an AFW pump is tripped, <b>THEN</b> dispatch an operator to locally reset the AFW turbine trips.</li> <li><b>IF</b> both units require AFW <b>AND</b> only one AFW pump is available, <b>THEN</b> perform the following: <ol style="list-style-type: none"> <li>Verify all RCPs - TRIPPED</li> <li>Establish 270 gpm AFW flow to each unit.</li> <li>Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.</li> </ol> </li> </ol>
	<b>SRO/ATC</b>	<p><b>7</b> Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT</p> <p>Manually align valves to establish proper AFW alignment.</p>



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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>8</b> Verify Proper AFW Flow</p> <p>a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%]</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify AFW flow greater than 345 gpm.</li> <li>2) <u>IF</u> AFW flow less than 345 gpm, <u>THEN</u> manually start pumps <u>AND</u> align valves to establish greater than 345 gpm flow.</li> <li>3) <u>IF</u> total feed flow from all sources greater than 345 gpm can <u>NOT</u> be established, <u>THEN</u> perform the following:               <ol style="list-style-type: none"> <li>a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.</li> </ol> </li> </ol>
	SRO/ATC	<p>b. Maintain feed flow to S/G until narrow range levels between 15%[32%] and 50%</p> <p>↓</p>
	SRO/ATC	Raises flow to the 3A and 3B S/G to at least 345 gpm total. May direct the field operator to reset the B AFW overspeed trip.

**EXAMINER NOTE:** If AFW Flow was NOT restored to the "A" S/G, then the crew will transition to 3-EOP-FR-H.1. This contingency will be at the back of the scenario.

**CREW CRITICAL TASK:** Establish minimum AFW flow of 345 gpm prior to transitioning out of 3-EOP-E-0. [EVENT 7]

OR

If crew transitions to 3-EOP-FR-H1 to correct loss of AFW, then establish minimum AFW flow of 345 gpm prior to completing Step 2 of 3-EOP-FR-H1.

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>9</b> Check RCP Seal Cooling</p> <p>a. Check all RCP thermal barrier alarms – OFF</p> <ul style="list-style-type: none"> <li>• A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW</li> <li>• A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP</li> <li>• A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW</li> </ul> <p>b. Go to Step 10</p> <p>c. Check all RCP seal return temperatures are less than 235 F</p> <p>d. Verify SI - RESET</p> <p>e. <u>IF</u> offsite power is <u>NOT</u> available, <u>THEN</u> check diesel capacity adequate to run one charging pump. <u>IF</u> adequate diesel capacity is <u>NOT</u> available, <u>THEN</u> shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating</p> <p>f. Start one charging pump at minimum speed for seal injection</p> <p>g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow</p> <p>a. <u>IF</u> CCW to an RCP thermal barrier is lost, <u>THEN</u>:</p> <ol style="list-style-type: none"> <li>1) Trip the affected RCP(s).</li> <li>2) Go to Step 9c.</li> </ol> <p>c. Go to Step 10.</p> <p>d. Reset SI.</p> <p>f. Go to Step 10.</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>10</b> Maintain RCS Cold Leg Temperature</p> <p>Perform the following:</p> <p>* STABLE AT <u>OR</u> TRENDING TO 547°F IF ANY RCP RUNNING</p> <p><u>OR</u></p> <p>* LESS THAN 547°F <u>AND</u> STABLE IF NO RCP RUNNING</p> <p>a. <u>IF</u> temperature is decreasing, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Stop dumping steam.</li> <li>2) Reduce total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G.</li> <li>3) <u>IF</u> cooldown is due to excessive steam flow, <u>THEN</u> close main steamline isolation and bypass valves.</li> </ol> <p>b. <u>IF</u> temperature greater than 547°F <u>AND</u> increasing, <u>THEN</u> perform the following:</p> <p>* Dump steam to condenser.</p> <p><u>OR</u></p> <p>* Dump steam using S/G steam dump to atmosphere valves.</p>
	SRO/ATC	Reduces total AFW flow to 345 gpm max for all S/G's.
	SRO/ATC	<p><b>11</b> Check PRZ PORVs, Spray Valves And Excess Letdown Isolated</p> <p>a. PORVs – CLOSED</p> <p>a. <u>IF</u> PRZ pressure less than 2335 psig, <u>THEN</u> manually close PORVs. <u>IF</u> any PRZ PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.</li> </ol> <p>b. Normal PRZ spray valves – CLOSED</p> <p>b. <u>IF</u> PRZ pressure less than 2260 psig, <u>THEN</u> manually close valves. <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> stop RCP(s) as necessary to stop spray flow.</p> <p>c. Auxiliary Spray Valve, CV-3-311 – CLOSED</p> <p>c. Manually close auxiliary spray valve. <u>IF</u> auxiliary spray valve can <u>NOT</u> be closed, <u>THEN</u> close Charging Flow to Regen Heat Exchanger, HCV-3-121.</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>11</b> Check PRZ PORVs, Spray Valves And Excess Letdown Isolated (continued)</p> <p>↓</p> <p>d. Excess letdown isolation valves – CLOSED</p> <p>d. Manually close valve(s).</p> <ul style="list-style-type: none"> <li>CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger</li> <li>HCV-3-137, Excess Letdown Flow Controller</li> </ul>
	SRO/ATC	<p><b>12</b> Check If RCPs Should Be Stopped</p> <p>a. Check RCPs - ANY RUNNING → Go to Step 13.</p> <p>b. Check RCS subcooling – LESS THAN 25°F [65°F] b. Go to Step 13.</p> <p>c. High-Head SI Pump – AT LEAST ONE RUNNING <u>AND</u> FLOWPATH VERIFIED c. Go to Step 13.</p> <p>d. Stop all RCPs</p>
	SRO/ATC	Stops RCPs if subcooling is less than 25°F (65°F) with HHSI flowpath verified with HHSI pumps running.

**CREW CRITICAL TASK:** Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing step 1 of 3-EOP-E-1.




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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>13</b> Check If S/Gs Are Faulted</p> <p>a. Check pressures in all SGs – </p> <ul style="list-style-type: none"> <li>* ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* ANY SG COMPLETELY DEPRESSURIZED</li> </ul> <p>b. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES</li> <li>2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1</li> </ol>
	SRO/ATC	<p><b>14</b> Check If S/G Tubes Are Ruptured</p> <p>a. Check levels in all S/Gs and secondary radiation levels: </p> <ul style="list-style-type: none"> <li>* ANY SG LEVEL INCREASING IN AN UNCONTROLLED MANNER</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* SG blowdown radiation, R-19 – HIGHER THAN NORMAL</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* DCS SG or secondary radiation readings – HIGHER THAN NORMAL</li> </ul> <p style="text-align: center;"><u>OR</u></p> <p> Local steamline radiation – HIGHER THAN NORMAL</p> <p>b. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES</li> <li>2) Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1</li> </ol>


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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>15</b></p>  <p>Check If RCS Is Intact</p> <ul style="list-style-type: none"> <li>• Containment radiation - NORMAL</li> <li>• Containment pressure - NORMAL</li> <li>• Containment sump level - NORMAL               <ul style="list-style-type: none"> <li>• LI-3-6308A</li> <li>• LI-3-6308B</li> </ul> </li> </ul> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>1. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>2. Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.</li> </ol>
	CREW	Diagnoses the Small Break LOCA.

**EXAMINER NOTE:** If AFW Flow was NOT restored to the "A" S/G, then the crew will transition to 3-EOP-FR-H.1. This contingency will be at the back of the scenario. (Pages 53 & 54)

	SRO	Transitions to 3-EOP-E-1.
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification.

**Examiner Note:** 3-EOP-E-1 details start on Event No. 6 Page 18 of 24 (Page 40-bottom)

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	BOP	<p align="center"><b>ATTACHMENT 3</b> (Page 1 of 7)</p> <p align="center"><b>PROMPT ACTION VERIFICATIONS</b></p>
	BOP	<p>1. Check The Load Centers Associated With The Energized 4 KV Buses – <b>ENERGIZED</b>      Close the Load Center supply breakers.</p> <p>↓</p> <ul style="list-style-type: none"> <li>• 3A LC</li> <li>• 3B LC</li> <li>• 3C LC</li> <li>• 3D LC</li> <li>• 3H LC</li> </ul>
	BOP	<p>2. Check If Main Steamlines Should Be Isolated</p> <p>↓</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Check main steamline isolation and bypass valves - ANY OPEN</p> <p>b. Check if either main steam isolation signal has actuated</p> <ul style="list-style-type: none"> <li>• High steam flow with either low S/G pressure 814 psig <u>OR</u> low Tavg 543 F</li> <li><u>OR</u></li> <li>• Hi-Hi containment pressure 20 PSIG</li> </ul> <p>c. Verify main steam isolation and bypass valves - CLOSED</p> </div> <div style="width: 45%;"> <p>a. Go to Step 3.</p> <p>b. Go to Step 3.</p> <p>c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.</p> </div> </div> <p>↘</p>
	BOP	<p>3. Verify Feedwater Isolation</p> <p>↓</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Place main feedwater pump switches in STOP</p> <p>b. Feedwater control valves – CLOSED</p> <p>c. Feedwater bypass valves – CLOSED</p> <p>d. Close feedwater isolation MOVs</p> <p>e. Verify standby feedwater pumps – OFF</p> </div> <div style="width: 45%;"> <p>b. Manually close valves.</p> <p>c. Manually close valves.</p> <p>d. Locally close valves.</p> <p>e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).</p> </div> </div> <p>↓</p>
	BOP	Places Main Feedwater Pump switches in STOP.

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>4. Verify Proper ICW System Operation</p> <ul style="list-style-type: none"> <li>a. Verify ICW pumps - AT LEAST TWO RUNNING</li> <li>b. Verify ICW to TPCW Heat Exchanger - ISOLATED               <ul style="list-style-type: none"> <li>• POV-3-4882 - CLOSED</li> <li>• POV-3-4883 - CLOSED</li> </ul> </li> <li>c. Check ICW headers - TIED TOGETHER</li> </ul> <ul style="list-style-type: none"> <li>a. Start ICW pump(s) to establish at least two running.</li> <li>b. Manually close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> locally close the following valves:               <ul style="list-style-type: none"> <li>• 3-50-319 for POV-3-4882</li> <li>• 3-50-339 for POV-3-4883</li> </ul> </li> <li>c. <u>IF</u> both ICW headers are intact, <u>THEN</u> direct operator to tie headers together.</li> </ul>
	BOP	<p>5. Verify Proper CCW System Operation</p> <ul style="list-style-type: none"> <li>a. CCW Heat Exchangers - THREE IN SERVICE</li> <li>b. CCW pumps - ONLY TWO RUNNING</li> <li>c. CCW headers - TIED TOGETHER</li> <li>d. RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN</li> </ul> <ul style="list-style-type: none"> <li>a. Perform the following:               <ol style="list-style-type: none"> <li>1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP.</li> <li>2) Verify Emergency Containment Coolers - ONLY TWO RUNNING</li> <li>3) Go to Step 5c.</li> </ol> </li> <li>b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.</li> <li>c. <u>IF</u> both CCW headers are intact, <u>THEN</u> direct a field operator to tie the headers together.</li> <li>d. <u>IF</u> containment isolation phase B <u>NOT</u> actuated <u>AND</u> CCW radiation levels are normal, <u>AND</u> RCP number one seal leak-off temperature is less than 235°F, <u>THEN</u> manually open MOV-3-626. <u>IF</u> MOV-3-626 can <u>NOT</u> be manually opened, <u>THEN</u> direct operator to open MOV-3-626 locally.</li> </ul>
	BOP	<p>6. Verify Containment Cooling</p> <ul style="list-style-type: none"> <li>a. Check emergency containment coolers - ONLY TWO RUNNING</li> <li>b. Verify emergency containment filter fans - AT LEAST TWO RUNNING</li> </ul> <ul style="list-style-type: none"> <li>a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.</li> <li>b. Manually start emergency containment filter fans.</li> </ul>
	BOP	Places the handswitch for the 3C ECC to START. [EVENT 8]



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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>7. Verify Pump Operation</p> <p>a. At least two high head SI pumps running      a. Manually start high-head pump(s).</p> <p>b. Both RHR pumps running      b. Manually start RHR pump(s).</p>
	BOP	<p>8. Verify SI Flow</p> <p>a. RCS pressure - LESS THAN 1600 PSIG [2000 PSIG]      a. Go to Step 9.</p> <p>b. High-head SI pump flow indicator - CHECK FOR FLOW      b. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p> <p>c. RCS pressure - LESS THAN 250 PSIG [650 PSIG]      c. Go to Step 9.</p> <p>d. RHR pump flow indicator - CHECK FOR FLOW      d. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p>
	BOP	<p>9. Realign SI System</p> <p>a. Verify Unit 3 high-head SI pumps - TWO RUNNING      a. Perform the following:</p> <p>1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps.</p> <p>2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure.</p> <p>3) Go to Step 10.</p> <p>b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby</p>
	BOP	<p>↓</p> <p>Places the handswitches for the 4A and 4B HHSI pumps to STOP.</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior	
	BOP	10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT	Perform the following: a. Manually actuate Containment Isolation Phase A. b. <b>IF</b> any Containment Isolation Phase A valve is <b>NOT</b> closed, <b>THEN</b> manually close valve. <b>IF</b> valve(s) can <b>NOT</b> be manually closed, <b>THEN</b> manually or locally isolate affected containment penetration.
	BOP	11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT	Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	12. Verify SI – RESET	Reset SI
	BOP	13. Verify Containment Phase A – RESET	Reset Phase A
	BOP	14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING b. Open CCW to normal containment cooler valves • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers	a. Go to Step 15. b. Stop all RCPs c. Stop all RCPs
	BOP	If RCPs are running, then resets and starts Normal Containment Coolers.	

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>15. Monitor Containment Pressure To Verify Containment Spray <u>NOT</u> Required</p> <p>a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG</p> <ul style="list-style-type: none"> <li>PR-3-6306A</li> </ul> <p><u>AND</u></p> <ul style="list-style-type: none"> <li>PR-3-6306B</li> </ul> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li><u>IF</u> containment spray <u>NOT</u> initiated, <u>THEN</u> manually initiate containment spray.</li> <li>Verify Containment Isolation Phase B - ACTUATED.</li> <li>Verify Containment Isolation Phase B valve white lights on VPB - ALL BRIGHT.</li> <li><u>IF</u> any Containment Isolation Phase B valve did <u>NOT</u> close, <u>THEN</u> manually or locally isolate affected containment penetration.</li> <li>Stop all RCPs.</li> </ol>
	BOP	<p>16. Verify Containment and Control Room Ventilation Isolation</p> <p>a. Unit 3 containment purge exhaust and supply fans - OFF</p> <p>b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT</p> <p>a. Manually stop fans.</p> <p>b. Manually align equipment for Control Room emergency recirculation.</p>
	BOP	<p><u>NOTE</u></p> <p>Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.</p>
	BOP	<p>17. Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM</p>
	BOP	<p>18. Verify All Four EDGs - RUNNING</p> <p>EMERGENCY START any available EDG <u>NOT</u> running.</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>19. Verify Power To Emergency 4 KV Buses and Load Centers</p> <p>a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Inform the Unit Supervisor that ATTACHMENT 3 is complete with the exception of the de-energized bus or buses.</li> <li>2) <b>IF</b> the Unit Supervisor decides not to energize the de-energized bus or buses, <b>THEN</b> go to Step 20.</li> <li>3) <b>IF</b> the Unit Supervisor decides to energize 3A, 3B, or 3D bus, <b>THEN</b> perform the following: <ol style="list-style-type: none"> <li>a) <b>IF</b> 3A 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>b) <b>IF</b> 3B 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>c) <b>IF</b> 3D 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.</li> </ol> </li> </ol>
	BOP	<p>20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Discuss Any Safeguards Equipment That Is Not In The Required Condition</p> <p style="text-align: center;">↓</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Transitions to 3-EOP-E-1.
	<b>SRO</b>	Directs response using 3-EOP-E-1.
		<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <b>NOTE</b>            Foldout page is required to be monitored throughout this procedure.         </div>
	<b>CREW</b>	Monitors 3-EOP-E-1 Foldout page (Page 24 of 24)
<b>CREW CRITICAL TASK:</b> With RHR Flow less than 1000 gpm, stop the RHR Pumps within 44 minutes of their start signal.		
	<b>SRO/ATC</b>	<b>1</b> Monitor Conditions To Determine If RCPs Should Be Stopped <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. RCPs - ANY RUNNING</p> <p>b. High-head SI pumps - AT LEAST ONE RUNNING</p> <p>c. RCS Subcooling - LESS THAN 25°F[65°F]</p> <p>d. Controlled plant cooldown - <u>NOT</u> IN PROGRESS</p> <p>e. Stop all RCPs</p> </div> <div style="width: 45%;"> <p>a. Go to Step 2.</p> <p>b. Go to Step 2.</p> <p>c. Go to Step 2.</p> <p>d. Go to Step 2.</p> </div> </div>
	<b>SRO/ATC</b>	Stops RCPs if subcooling is less than 25° with HHSI flowpath verified and HHSI pumps running. [RCPs should already be stopped.]
<b>CREW CRITICAL TASK:</b> Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing step 1 of 3-EOP-E-1.		
	<b>SRO/BOP</b>	<b>2</b> Check If S/Gs Are <u>NOT</u> Faulted <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Check pressures in all S/Gs –</p> <ul style="list-style-type: none"> <li>NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER</li> <li>NO S/G COMPLETELY DEPRESSURIZED</li> </ul> </div> <div style="width: 45%;"> <p>a. <u>IF</u> any S/G is faulted <u>AND</u> that S/G has <u>NOT</u> previously been isolated, <u>THEN</u> go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p> </div> </div>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><b>3</b> Maintain Intact S/G Levels</p> <ul style="list-style-type: none"> <li>a. Narrow range level - GREATER THAN 6%[32%]</li> <li>a. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one S/G.</li> <li>b. Control feed flow to maintain narrow range level between 15%[32%] and 50%</li> <li>c. Narrow range level - LESS THAN 50%</li> <li>c. Stop feed flow to any S/G with narrow range level greater than 50%. <b>IF</b> narrow range level in any S/G continues to increase in an uncontrolled manner, <b>THEN</b> go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</li> </ul>
	SRO/BOP	<p><b>4</b> Monitor Secondary Radiation</p> <ul style="list-style-type: none"> <li>a. Direct Nuclear Chemistry to take periodic activity samples of all S/Gs</li> <li>b. Direct Nuclear Chemistry to check DAM1 monitor reading</li> <li>c. Direct Health Physics to take radiation readings on main steamlines</li> <li>d. Secondary radiation - NORMAL NEAR ROUTINE OPERATION VALUE</li> <li>d. Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>If any PRZ PORV opens because of high PRZ pressure, it is required to be verified closed or isolated after pressure decreases to less than the PORV setpoint.</i></p>
	SRO/ATC	<p><b>5</b> Check PRZ PORVs <u>AND</u> Block Valves</p> <ul style="list-style-type: none"> <li>a. Power to block valves - AVAILABLE</li> <li>a. Restore power to block valves</li> <li>b. PORVs - CLOSED</li> <li>b. <b>IF</b> PRZ pressure less than 2335 psig, <b>THEN</b> manually close PORVs. <b>IF</b> any valve can <b>NOT</b> be closed, <b>THEN</b> manually close its block valve.</li> <li>c. Block valves - AT LEAST ONE OPEN</li> <li>c. Open one block valve unless it was closed to isolate an open PORV.</li> </ul>
	SRO/ATC	<p><b>6</b> Verify SI - RESET</p>

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior	
	SRO/ATC	7	Reset Containment Isolation Phase A <u>AND</u> Phase B
	SRO/ATC	8	Verify Instrument Air To Containment a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.
	SRO/ATC	9	Check Power Supply To All Charging Pumps - ALIGNED TO OFFSITE POWER Check diesel capacity adequate to run three charging pumps. <u>IF</u> adequate diesel capacity is <u>NOT</u> available, <u>THEN</u> shed nonessential loads. Refer to ATTACHMENT 3 for component KW load rating.
	SRO/ATC	10	Check Charging Flow Established a. Charging pumps - AT LEAST ONE RUNNING b. Adjust speed controllers as necessary to establish desired charging flow to establish SI Termination conditions c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow a. Perform ATTACHMENT 4 to establish charging.
	ATC	Starts Charging Pumps as required (may start all 3).	

Examiner Note: 3-EOP-E-1, Attachment 4 is on Page 23 of 24.

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>11</b> Check if SI Should be Terminated</p> <p>a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [Refer to Foldout Page Item 3 Adverse Value] a. Go to Step 12.</p> <p>b. Secondary heat sink b. <u>IF</u> neither condition satisfied, <u>THEN</u> go to Step 12.</p> <p>* Total feed flow to intact S/Gs - GREATER THAN 345 GPM</p> <p><u>OR</u></p> <p>* Narrow range level in at least one intact S/G - GREATER THAN 6% [32%]</p> <p>c. RCS pressure c. Go to Step 12.</p> <p>• Pressure - GREATER THAN 1600 PSIG [2000 PSIG]</p> <p>• Pressure - STABLE OR INCREASING</p> <p>d. PRZ level - GREATER THAN 17% [50%] d. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 12.</p> <p>e. Go to 3-EOP-ES-1.1, SI Termination, Step 1</p>
	SRO/ATC	<p><b>12</b> Check If Containment Spray Should Be Stopped</p> <p>a. Containment spray pumps - ANY RUNNING a. Observe CAUTION prior to Step 13 <u>AND</u> go to Step 13.</p> <p>b. Check the following b. <u>WHEN</u> containment pressure less than 14 psig, <u>AND</u> containment temperature less than 122°F, <u>THEN</u> do Steps 12c through 12e. Observe CAUTION prior to Step 13 <u>AND</u> continue with Step 13.</p> <p>• Emergency Containment Filter Spray Valves - CLOSED</p> <p>• 3A ECF Spray SV-3-2905, 2906</p> <p>• 3B ECF Spray SV-3-2907, 2908</p> <p>• 3C ECF Spray SV-3-2909, 2910</p> <p>• Containment temperature - LESS THAN 122°F</p> <p>• Containment pressure - LESS THAN 14 PSIG</p> <p>c. Reset containment spray signal</p> <p>d. Stop both containment spray pumps <u>AND</u> place in standby</p> <p>e. Close Containment Spray Isolation valves</p> <p>• MOV-3-880A</p> <p>• MOV-3-880B</p>



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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CAUTION</b>  <i>High-Head SI flow and RCS Subcooling are required to be monitored. If either High-Head SI flow increases or RCS Subcooling decreases in an uncontrolled manner, the RHR pumps must be manually restarted to supply water to the RCS.</i> </div>
	SRO/ATC	<div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> <b>13</b>  </div> <div> <p>Check If RHR Pumps Should Be Stopped</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Check RCS pressure - GREATER THAN 250 PSIG [650 PSIG]</p> <p>b. Check RHR flow - LESS THAN 1000 gpm</p> <p>c. Verify SI - RESET</p> <p>d. Stop RHR pumps <u>AND</u> place in standby</p> </div> <div style="width: 45%;"> <p>a. IF RHR Flow greater than 1000 gpm, <u>THEN</u> go to Step 15.</p> <p>b. Go to Step 14.</p> </div> </div> </div> </div>
<p><b>CREW CRITICAL TASK:</b> With RHR Flow less than 1000 gpm, stop the RHR Pumps within 44 minutes of their start signal.</p>		
<b>TERMINATION CRITERIA</b>		
<p><b>EXAMINER NOTE:</b> The scenario is terminated when a SI Termination decision has been made or earlier based on the discretion of the Lead Examiner.</p>		

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
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## ATTACHMENT 4

(Page 1 of 1)

## ESTABLISH CHARGING FLOW

## 1. Verify CCW Flow Alarms To All RCP Thermal Barriers - OFF

- A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW

**AND**

- A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP

**AND**

- A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW

**IF** CCW flow to RCPs thermal barrier is lost, perform the following:

- Verify seal return temperature for each RCP to be less than 235 F.
- IF** seal return temperature for each RCP is less than 235 F, **THEN** go to Step 2.
- IF** seal return temperature is  $\geq 235$  F, **THEN** locally isolate seal injection to affected RCP(s) before starting charging pumps.
  - \* 3-297A for RCP A
  - \* 3-297B for RCP B
  - \* 3-297C for RCP C
- WHEN** seal injection is isolated to each affected RCP, **THEN** go to Step 2.

## 2. Check Offsite Power Available

**IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run one charging pump. **IF** diesel capacity is **NOT** adequate, **THEN** shed non-essential loads. Refer to ATTACHMENT 3 for component KW load rating.

## 3. Start One Charging Pump

## 4. Place RCS Makeup Control Switch in STOP

## 5. Establish Desired Charging Flow

- Start additional charging pumps if needed and offsite power available
- Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow
- Verify charging pump suction auto transfers to RWST

- IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run additional charging pumps.

## 6. Notify The Unit Supervisor That The ESTABLISH CHARGING FLOW Attachment Is Complete

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Event Description: During plant stabilization, Block Valve MOV-3-535 develops leakage with PORV 456 leaking. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-E-1. RCPs are tripped with the loss of Subcooling Margin.

Time	Position	Applicant's Actions or Behavior
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## FOLDOUT FOR PROCEDURE E-1

1. **ADVERSE CONTAINMENT CONDITIONS**

**IF** either of the conditions listed below occurs, **THEN** use adverse containment setpoints:

Containment atmosphere temperature  $\geq 180^{\circ}\text{F}$

**OR**

Containment radiation levels  $\geq 1.3 \times 10^{-6}$  R/hr

**WHEN** containment parameters drop below the above values, **THEN** normal setpoints can again be used

**IF** containment integrated dose rate has not exceeded  $10^{-6}$  Rads.

2. **RCP TRIP CRITERIA**

a. **IF** all conditions listed below occur, **THEN** trip all RCPs:

1) High-head SI pumps - AT LEAST ONE RUNNING **AND** SI FLOWPATH VERIFIED

2) RCS subcooling - LESS THAN  $25^{\circ}\text{F}$  [ $65^{\circ}\text{F}$ ]

3) Controlled RCS cooldown is NOT in progress

b. **IF** phase B actuated, **THEN** trip all RCPs

3. **SI TERMINATION CRITERIA**

**IF** all conditions listed below occur, **THEN** go to 3-EOP-ES-1.1, SI TERMINATION, Step 1:

a. RCS subcooling based on core exit TCs - GREATER THAN  $30^{\circ}\text{F}$  [See below Table]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	ADVERSE SUBCOOLING VALUE
< 2485 AND $\geq 2000$	$\geq 55^{\circ}\text{F}$
< 2000 AND $\geq 1000$	$\geq 85^{\circ}\text{F}$
< 1000	$\geq 210^{\circ}\text{F}$

b. Total feed flow to intact SGs - GREATER THAN 345 GPM **OR** narrow range level in at least one intact SG - GREATER THAN 6% [32%]

c. RCS pressure - GREATER THAN 1600 PSIG [2000 psig] **AND** STABLE OR INCREASING

d. PRZ level - GREATER THAN 17% [50%]

4. **SECONDARY INTEGRITY CRITERIA**

**IF** any S/G pressure is decreasing in an uncontrolled manner **OR** has completely depressurized **AND** that S/G has NOT been isolated, **THEN** go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

5. **E-3 TRANSITION CRITERIA**

**IF** any S/G level increases in an uncontrolled manner **OR** any S/G has abnormal radiation, **THEN** manually start SI pumps as necessary and go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

6. **COLD LEG RECIRCULATION SWITCHOVER CRITERIA**

**IF** RWST level decreases to less than 155,000 gallons, **THEN** go to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

7. **RECIRCULATION SUMP BLOCKAGE**

**IF** RHR pump flow **AND** amps become erratic **OR** abnormally low after recirculation has been established, **THEN** transition to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

8. **CST MAKEUP WATER CRITERIA**

**IF** CST level decreases to less than 10%, **THEN** add makeup to CST using 3-NOP-018.01, Condensate Storage Tank (CST).

9. **LOSS OF OFFSITE POWER OR SI ON OTHER UNIT**

**IF** SI has been reset **AND** either offsite power is lost **OR** SI actuates on the other unit, **THEN** restore safeguards equipment to required configuration. Refer to ATTACHMENT 3 for essential loads.

10. **RHR SYSTEM OPERATION CRITERIA**

**IF** RHR flow is less than 1000 gpm, **THEN** the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p align="center"><b>ATTACHMENT 3</b> (Page 1 of 7)</p> <p align="center"><b>PROMPT ACTION VERIFICATIONS</b></p>
	BOP	<p>1. Check The Load Centers Associated With The Energized 4 KV Buses – <b>ENERGIZED</b>      Close the Load Center supply breakers.</p> <ul style="list-style-type: none"> <li>• 3A LC</li> <li>• 3B LC</li> <li>• 3C LC</li> <li>• 3D LC</li> <li>• 3H LC</li> </ul>
	BOP	<p>2. Check If Main Steamlines Should Be Isolated</p> <p>a. Check main steamline isolation and bypass valves - ANY OPEN      a. Go to Step 3.</p> <p>b. Check if either main steam isolation signal has actuated      b. Go to Step 3.</p> <ul style="list-style-type: none"> <li>• High steam flow with either low S/G pressure 614 psig <u>OR</u> low Tavg 543 F</li> <li><u>OR</u></li> <li>• Hi-Hi containment pressure 20 PSIG</li> </ul> <p>c. Verify main steam isolation and bypass valves - CLOSED      c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.</p>
	BOP	<p>3. Verify Feedwater Isolation</p> <p>a. Place main feedwater pump switches in STOP</p> <p>b. Feedwater control valves – CLOSED      b. Manually close valves.</p> <p>c. Feedwater bypass valves – CLOSED      c. Manually close valves.</p> <p>d. Close feedwater isolation MOVs      d. Locally close valves.</p> <p>e. Verify standby feedwater pumps – OFF      e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).</p>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>4. Verify Proper ICW System Operation</b></p> <p>a. Verify ICW pumps - AT LEAST TWO RUNNING</p> <p>b. Verify ICW to TPCW Heat Exchanger – ISOLATED</p> <ul style="list-style-type: none"> <li>POV-3-4882 – CLOSED</li> <li>POV-3-4883 – CLOSED</li> </ul> <p>c. Check ICW headers - TIED TOGETHER</p> <p>a. Start ICW pump(s) to establish at least two running.</p> <p>b. Manually close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> locally close the following valves:</p> <ul style="list-style-type: none"> <li>3-50-319 for POV-3-4882</li> <li>3-50-339 for POV-3-4883</li> </ul> <p>c. <u>IF</u> both ICW headers are intact, <u>THEN</u> direct operator to tie headers together.</p>
	BOP	<p><b>5. Verify Proper CCW System Operation</b></p> <p>a. CCW Heat Exchangers – THREE IN SERVICE</p> <p>b. CCW pumps - ONLY TWO RUNNING</p> <p>c. CCW headers - TIED TOGETHER</p> <p>d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP.</li> <li>Verify Emergency Containment Coolers - ONLY TWO RUNNING</li> <li>Go to Step 5c.</li> </ol> <p>b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.</p> <p>c. <u>IF</u> both CCW headers are intact, <u>THEN</u> direct a field operator to tie the headers together.</p> <p>d. <u>IF</u> containment isolation phase B <u>NOT</u> actuated <u>AND</u> CCW radiation levels are normal, <u>AND</u> RCP number one seal leak-off temperature is less than 235°F, <u>THEN</u> manually open MOV-3-626. <u>IF</u> MOV-3-626 can <u>NOT</u> be manually opened, <u>THEN</u> direct operator to open MOV-3-626 locally.</p>
	BOP	<p><b>6. Verify Containment Cooling</b></p> <p>a. Check emergency containment coolers - ONLY TWO RUNNING</p> <p>b. Verify emergency containment filter fans - AT LEAST TWO RUNNING</p> <p>a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.</p> <p>b. Manually start emergency containment filter fans.</p>
	BOP	Places the handswitch for the 3C ECC to START. [EVENT 8]

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>7. Verify Pump Operation</p> <p>a. At least two high head SI pumps running      a. Manually start high-head pump(s).</p> <p>b. Both RHR pumps running      b. Manually start RHR pump(s).</p>
	BOP	<p>8. Verify SI Flow</p> <p>a. RCS pressure - LESS THAN 1600 PSIG [2000 PSIG]      a. Go to Step 9.</p> <p>b. High-head SI pump flow indicator – CHECK FOR FLOW      b. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p> <p>c. RCS pressure - LESS THAN 250 PSIG [650 PSIG]      c. Go to Step 9.</p> <p>d. RHR pump flow indicator - CHECK FOR FLOW      d. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p>
	BOP	<p>9. Realign SI System</p> <p>a. Verify Unit 3 high-head SI pumps - TWO RUNNING      a. Perform the following:</p> <p>1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps.</p> <p>2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure.</p> <p>3) Go to Step 10.</p> <p>b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby</p>
	BOP	<p>↓</p> <p>Places the handswitches for the 4A and 4B HHSI pumps to STOP.</p>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior	
	BOP	10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT	Perform the following: a. Manually actuate Containment Isolation Phase A. b. <u>IF</u> any Containment Isolation Phase A valve is <b>NOT</b> closed, <b>THEN</b> manually close valve. <u>IF</u> valve(s) can <b>NOT</b> be manually closed, <b>THEN</b> manually or locally isolate affected containment penetration.
	BOP	11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT	Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	12. Verify SI – RESET	Reset SI
	BOP	13. Verify Containment Phase A – RESET	Reset Phase A
	BOP	14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING b. Open CCW to normal containment cooler valves • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers	a. Go to Step 15. b. Stop all RCPs c. Stop all RCPs

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Event No.: 6

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>15. Monitor Containment Pressure To Verify Containment Spray <u>NOT</u> Required</p> <p>a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG</p> <ul style="list-style-type: none"> <li>PR-3-6306A</li> </ul> <p><u>AND</u></p> <ul style="list-style-type: none"> <li>PR-3-6306B</li> </ul> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li><u>IF</u> containment spray <u>NOT</u> initiated, <u>THEN</u> manually initiate containment spray.</li> <li>Verify Containment Isolation Phase B - ACTUATED.</li> <li>Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT.</li> <li><u>IF</u> any Containment Isolation Phase B valve did <u>NOT</u> close, <u>THEN</u> manually or locally isolate affected containment penetration.</li> <li>Stop all RCPs.</li> </ol>
	BOP	<p>16. Verify Containment and Control Room Ventilation Isolation</p> <p>a. Unit 3 containment purge exhaust and supply fans – OFF</p> <p>b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT</p> <p>a. Manually stop fans.</p> <p>b. Manually align equipment for Control Room emergency recirculation.</p>
	BOP	<p style="text-align: center;"><u>NOTE</u></p> <p>Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.</p>
	BOP	<p>17. Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM</p>
	BOP	<p>18. Verify All Four EDGs – RUNNING</p> <p>EMERGENCY START any available EDG <u>NOT</u> running.</p> <p style="text-align: center;">↓</p>



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Event No.: 6

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>19. Verify Power To Emergency 4 KV Buses and Load Centers</p> <p>a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Inform the Unit Supervisor that ATTACHMENT 3 is complete with the exception of the de-energized bus or buses.</li> <li>2) <b>IF</b> the Unit Supervisor decides not to energize the de-energized bus or buses, <b>THEN</b> go to Step 20.</li> <li>3) <b>IF</b> the Unit Supervisor decides to energize 3A, 3B, or 3D bus, <b>THEN</b> perform the following:               <ol style="list-style-type: none"> <li>a) <b>IF</b> 3A 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>b) <b>IF</b> 3B 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>c) <b>IF</b> 3D 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.</li> </ol> </li> </ol>
	BOP	<p>20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Discuss Any Safeguards Equipment That Is Not In The Required Condition</p> <p>✓</p>

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Event No.: 7

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AFW flow to the 3C S/G is blocked. Also, B TDAFWP mechanically trips and the C TDAFWP Governor Valve Fails closed. During the performance of 3-EOP-E-0, the crew uses "A" TDAFWP to establish greater than 345 gpm total to the 3A and 3B S/G. The crew transitions to 3-EOP-FR-H.1 to restore.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Directs 3-EOP-FR-H.1 response.
	<b>SRO/ATC</b>	<p style="text-align: center;"><b>CAUTIONS</b></p> <ul style="list-style-type: none"> <li>If total feed flow has been reduced to less than 345 gpm due to procedural requirements and 345 gpm total feed flow is available, then this procedure shall NOT be performed.</li> <li>Feed flow should NOT be reestablished to any faulted S/G if a non-faulted S/G is available.</li> </ul>
	<b>SRO/ATC</b>	<p><b>1</b> Check If Secondary Heat Sink Is Required</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE</p> <p>b. RCS average temperature - GREATER THAN 350°F</p> </div> <div style="width: 45%;"> <p>a. Return to procedure and step in effect.</p> <p>b. Try to place RHR System in service while continuing in this procedure. Refer to 3-OP-050, RESIDUAL HEAT REMOVAL SYSTEM. <u>IF</u> adequate cooling with RHR system established, <u>THEN</u> return to procedure and step in effect.</p> </div> </div>
	<b>SRO/ATC</b>	<p style="text-align: center;"><b>CAUTIONS</b></p> <ul style="list-style-type: none"> <li>If wide range level in any S/G is less than 22% [narrow range level in all S/Gs less than 32%] or PRZ pressure is greater than or equal to 2335 psig due to loss of secondary heat sink, Steps 11 through 19 should be initiated immediately for bleed and feed.</li> <li>If CST level decreases to less than 10%, makeup water sources for CST will be necessary to maintain secondary heat sink.</li> </ul>
	<b>SRO/ATC</b>	<p><b>2</b> Try To Establish AFW Flow To At Least One S/G</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Check S/G Blowdown Isolation</p> <ul style="list-style-type: none"> <li>S/G blowdown isolation valves - CLOSED</li> <li>S/G sample isolation valves - CLOSED</li> </ul> <p>b. Check Control Room indications for cause of AFW failure</p> <ul style="list-style-type: none"> <li>CST level</li> <li>AFW steam supply MOV power supply</li> <li>AFW valve alignment</li> </ul> </div> <div style="width: 45%;"> <p>a. Manually close valves.</p> </div> </div>


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AFW flow to the 3C S/G is blocked. Also, B TDAFWP mechanically trips and the C TDAFWP Governor Valve Fails closed. During the performance of 3-EOP-E-0, the crew uses "A" TDAFWP to establish greater than 345 gpm total to the 3A and 3B S/G. The crew transitions to 3-EOP-FR-H.1 to restore.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">  </div> <div> <p>c. Try to restore AFW flow</p> <p>d. Check total feed flow to S/Gs - GREATER THAN 345 GPM</p> <p>d. Perform the following</p> <p>1) IF feed flow to at least one S/G verified, THEN maintain flow to restore narrow range level to greater than 6% [32%].</p> <p>a) WHEN narrow range level is greater than 6% [32%], THEN return to procedure and step in effect.</p> <p>2) IF feed flow to at least one S/G NOT verified, THEN dispatch operator to locally restore AFW flow.</p> <p>3) Go to Step 3.</p> <p>e. Return to procedure and step in effect</p> </div> </div>
	CREW	Re-establishes AFW flow and returns to procedure and step in effect.

## ILC-27 NRC Scenario #2 Event Description

<b>Facility:</b>	<u>Turkey Point</u>	<b>Scenario:</b>	<u>2</u>	<b>Op Test:</b>	<u>2011-302</u>
<b>Examiners:</b>	_____	<b>Candidates:</b>	_____	<b>US</b>	
	_____		_____	<b>ATC</b>	
	_____		_____	<b>BOP</b>	
<b>Initial Conditions:</b> <u>Mode 1</u> <u>100% power at BOL</u>					
<b>Turnover:</b> <ul style="list-style-type: none"> <li>Maintain 100% power with Online Risk – Green. B Train is protected on both units.</li> <li>The 3B Accumulator level is high due to in-leakage. Section 5.2 of 3-NOP-064 is to be performed to lower level back to a normal operating band.</li> </ul>					

Event No.	Malfunction No.	Event Type	Event Description
1	N/A	(N) ATC (N) SRO	TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons).
2	TVB1LCDV	(I) ATC (I) SRO	VCT Level Transmitter, LT-3-115, drifts high over 3 minutes to divert water to the Hold Up Tanks. This requires manual operator action to reposition 3-LCV-115A to the VCT position. The crew responds using the ARP or 3-ONOP-046.4.
3	TVUTPMPA	(C) BOP (C) SRO	3A Heater Drain Pump trips on high amps which require starting an additional Condensate Pump to support this power level.
4	TFH2L9FH	(I) ATC (I) SRO	The Master Charging Pump Controller, LC-3-459G, signal fails high. The RO takes action to control the Charging Pump Speed Controller in manual and maintain program level per Enclosure 1 of 3-ONOP-041.6, Pressurizer Level Control Malfunction.
5	TFS1MAML	(I) ATC (I,TS) SRO	Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.
6	TFS1MWEA	(I) BOP (I,TS) SRO	S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does NOT respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.
7	N/A	(R) ATC (N) BOP (R) SRO	Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.
8	TVFAHDR2 TVFALN3	(M) ALL	A common Main Feed Header break occurs, the crew responds to the reactor trip using 3-EOP-E-0.
9	TAFK144 TAFK244 TAFK344	(M) ALL	During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed.
10	TFU100005	(I) BOP (I) SRO	The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually.
11	TFKC883A	(I) BOP (I) SRO	The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

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

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## ILC-27 NRC Scenario #2 Event Description

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### SIMULATOR SETUP INSTRUCTIONS

1. Reset to IC-11 (100% BOL) or other IC with correct setup conditions.
2. Place Simulator in RUN
3. Open and Execute ILC27SCN2N.Isn.
4. Ensure 3A S/G Steam Flow Channel Control Transfer is selected to FI-3-474.
5. Ensure Channel Select First Stage Pressure Control is selected to CH4 YELLOW.
6. Increase 3B Accumulator level to greater than 6,820 gallons.
7. Store IC with initial conditions setup if desired.
8. Trigger lesson steps:
  - SETUP - LOSS OF AFW PUMP SUCTION SUPPLY  
insert TAFK144 0.000000 delay=0 ramp=0 on=0 off=0  
insert TAFK244 0.000000 delay=0 ramp=0 on=0 off=0  
insert TAFK344 0.000000 delay=0 ramp=0 on=0 off=0
  - SETUP - MAIN TURBINE FAILS TO TRIP  
insert TFU10005 TRUE delay=0 ramp=0 on=0 off=0
  - SETUP - FAIL POV-3-4883 AS IS  
insert TFKC883A TRUE delay=0 ramp=0 on=0 off=0
9. Provide an in progress procedure of 3-NOP-064, Safety Injection Accumulators.
10. Place Simulator in freeze.
11. Provide Shift Turnover Checklists
12. Perform Simulator Operator Checklist
13. When ready to begin, place Simulator in RUN.

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## ILC-27 NRC Scenario #2 Event Description

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### FACILITY OPERATOR INSTRUCTIONS

#### EVENT 1

TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons). After reached, the SRO exits the LCO.

#### EVENT 2

VCT Level Transmitter, LT-3-115, drifts high over 3 minutes to divert water to the Hold Up Tanks. This requires manual operator action to reposition 3-LCV-115A to the VCT position. The crew responds using the ARP or 3-ONOP-046.4.

**When directed, Trigger EVENT 2 - LT-3-115 DRIFTS HIGH.**

- insert TVB1LCDV 1.000000 delay=0 ramp=180 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of LT-3-115.

**WCC/I&C**- If directed, respond and acknowledge the failure of LT-3-115 and to write a PWO for troubleshooting.

**SNPO/FS** - If directed, respond and acknowledge local level of LI-3-112 (Schema reading).

#### EVENT 3

3A Heater Drain Pump trips on high amps which require starting an additional Condensate Pump to support this power level.

**When directed, Trigger EVENT 3 - 3A HDP TRIPS ON HIGH AMPS.**

- insert TVUTPMPA 1.000000 delay=0 ramp=120 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of 3A HDP.

**WCC** - If directed, respond and acknowledge the failure of 3A HDP and to write a PWO for troubleshooting.

**ENG** - If directed, respond and acknowledge the failure of 3A HDP. Recommend maintaining full power operation with an engineering walkdown to monitor secondary performance.

[NOTE: This condition will feed into Event 7 where 3B S/G Feedwater Pump is running with high vibration. If the crew decides to reduce power in accordance with the table, then proceed with Event 6 with S/G Stm Flow Channel FI-474 failed as is.]

#### EVENT 4

The Master Charging Pump Controller, LC-3-459G, signal fails high. The RO takes action to control the Charging Pump Speed Controller in manual and maintain program level per Enclosure 1 of 3-ONOP-041.6, Pressurizer Level Control Malfunction.

**When directed, Trigger EVENT 4 - MSTR CHARGING CONTROL LC-3-459G FAILS HI.**

- insert TFH2L9FH TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of LC-3-459G.

**WCC** - If directed, respond and acknowledge the failure of LC-3-459G and to write a PWO for troubleshooting.

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## ILC-27 NRC Scenario #2 Event Description

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### EVENT 5

Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

**When directed, Trigger EVENT 5 - PT-3-447 FAILS LOW.**

- insert TFS1MAML TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of PT-3-447

**WCC** - If directed, respond and acknowledge the failure of PT-3-447 and to write a PWO for troubleshooting.

**FS/TO** - If directed, respond and reset AMSAC by

**Trigger EVENT 5 - RESET AMSAC**

- insert TCL4RST TRUE delay=0 ramp=0 on=0 off=0

### EVENT 6

S/G Steam Flow Channel FI-3-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

**When directed, Trigger EVENT 6 - SG FLOW TRANSMITTER SB-FI-474 FAILS AS IS.**

- insert TFS1MWEA TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of FI-3-474.

**WCC** - If directed, respond and acknowledge the failure of FI-3-474 and to write a PWO for troubleshooting.

### EVENT 7

Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

When directed, call as Shift Manager and report, **"Engineering has completed a walkdown of the secondary system. They have reported 3B S/G Feedwater Pump has high vibration. I am directing you to reduce Unit 3 power to 50% using 3-GOP-100 and remove the 3B S/G Feedwater Pump from service over the next hour."**

**SM** - If directed, acknowledge power reduction.

**WCC** - If directed, acknowledge power reduction for the removal of 3B S/G Feedwater Pump.

**SYSTEM DISPATCH** - If directed, acknowledge power reduction to 50% for the removal of 3B S/G Feedwater Pump.

**ENGINEERING** - If directed, acknowledge power reduction to 50% for the removal of 3B S/G Feedwater Pump.

**CHEMISTRY** - If directed, acknowledge power reduction to 50% for the removal of 3B S/G Feedwater Pump and to sample the RCS for the power change.

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## ILC-27 NRC Scenario #2 Event Description

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### EVENT 8

A Main Feed Header break occurs, the crew responds to the reactor trip using 3-EOP-E-0.

#### **When directed, Trigger EVENT 8 - MAIN FEED HEADER BREAK WITH SGFP BKRS TRIPPING.**

- insert TVFAHDR2 1 delay=0 ramp=0 on=0 off=0
- insert TVFALN3 1.0 delay=0 ramp=0 on=0 off=0
- insert TFF1D1AT TRUE delay=120 ramp=0 on=0 off=0
- insert TFF1D1BT TRUE delay=120 ramp=0 on=0 off=0

#### **When directed, Trigger EVENT 8 - PAHMS.**

- insert TAC2V02A 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAC2V02B 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAAAV21 1.000000 delay=0 ramp=0 on=0 off=0
- insert TAAAV22 1.000000 delay=0 ramp=0 on=0 off=0
- insert TACA005 .000000 delay=0 ramp=0 on=0 off=0

### EVENT 9

During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed.

**FS/TO** – If dispatched to investigate loss of Auxiliary Feedwater, the operator will respond they cannot enter the Aux. Feedwater Cage Area due to steam in the area.

### EVENT 10

The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually.

#### **Conditional Trigger EVENT 10-MANUALLY TRIP MAIN TURBINE.**

- Condition: IMU1PR4O insert TFU10005 0 delay=0 ramp=0 on=0 off=0

### EVENT 11

The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

#### **Conditional Trigger EVENT 11- ALLOWS MANUAL CLOSURE OF POV-3-4883.**

- Condition: IMK2883C della TFKC883A 2 delay=0



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## ILC-27 NRC Scenario #2 Event Description

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### SCENARIO QUANTITATIVE ATTRIBUTES

Target Quantitative Attributes (Per Scenario; See Section D.5.d)		#
1. Total malfunctions (5–8)		5
2. Malfunctions after EOP entry (1–2)		2
3. Abnormal events (2–4)		4
4. Major transients (1–2)		1
5. EOPs entered/requiring substantive actions (1–2)		1
6. EOP contingencies requiring substantive actions (0–2)		1
7. Critical tasks (2–3)		2

### CRITICAL TASKS

1. Manually trip the Main Turbine prior to Step 5 of 3-EOP-E-0 as read by the Unit Supervisor.
2. At the CAUTION before Step 2 of 3-EOP-FR-H.1, initiate bleed and feed to depressurize the RCS sufficiently for HHSI injection flow.



# OPERATIONS SHIFT TURNOVER REPORT



## ONCOMING CREW ASSIGNMENTS

Shift Mgr:			Inside SNPO:	
Field Supv.:			Outside SNPO:	
Admin RCO:			ANPO:	
<b>Unit 3</b>			<b>Unit 4</b>	
Unit Supv.:			Unit Supv.:	
RCO:			RCO:	
NPO:			NPO:	

## Plant Status

<b>Unit 3</b>			<b>Unit 4</b>	
Mode:	1		Mode:	1
Power:	100 %		Power:	100 %
MWe:	763		MWe:	758
Gross Leakrate:	0.03 gpm		Gross Leakrate:	0.03 gpm
RCS Boron Conc:	1205 ppm		RCS Boron Conc:	268 ppm

### Operational Concerns:

- TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons.  
Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band.

### U3 Anticipated LCO Actions:

### U4 Anticipated LCO Actions:

### Results of Offgoing Focus Area:

# Unit 3 Status

## Reactor Operator

Mode:	1
Power: %	100
MWe:	763
Tavg: *F	574
RCS Pressure: psig	2235
RCS Boron Conc:	1205 ppm

RCS Leakrate	
Gross:	0.03 gpm
Unidentified	0.02 gpm
Charging Pps:	0.01 gpm

Accumulator Ref Levels	
A	6616 gal
B	6,823gal
C	6627 gal

### Abnormal Annunciators:

Annunciator:	H 2/3 – Accum B Hi/Lo Press
Comp Actions:	Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band.
Annunciator:	H 2/4 – Accum B Hi/Lo Level
Comp Actions:	Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band.
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	

### Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items")

T.S.A.S / Component:	-TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons.
Reason:	- 3B RCS In-leakage
Entry Date:	- today
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	

## Unit 3 Status

### Changes to Risk Significant Equipment:

- B train protected both units
- Online risk green

### Upcoming Reactivity Management Activities:

### Upcoming Major POD Activities:

### Upcoming ECOs to Hang and /or Release:

### Evolutions or Compensatory Actions in Progress:

### General Information, Remarks, and Operator Work Around Status:

- Unit 3 supplying Auxiliary steam.
- Condenser air inleakage 0 scfm.
- Severe thunderstorm warning in South Dade County expires in 2 hours.

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Event No.: 1

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Event Description: TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons). After reached, the SRO exits the LCO.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>Observes high 3B Accumulator level.</p> <ul style="list-style-type: none"> <li>High 3B Accumulator level above Tech Spec limit</li> <li>Drains 3B Accumulator level by 3-NOP-064</li> <li>Exits Tech Spec limit</li> </ul>
	SRO/ATC	<p>5.2 <u>Draining Accumulators</u></p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>NOTE</b></p> <p>This Section allows one or more Accumulators to be drained to reduce level or pressure or for draining in preparation to increase boron concentration.</p> </div>
	SRO/ATC	<p>1. <b>CHECK</b> RCDT available to receive discharge from Accumulators.</p>
	SRO/ATC	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>MODES 1, 2, or 3 with RCS pressure greater than 1000 psig. Technical Specifications require Accumulator levels between 6520 and 6820 gallons; however, to account for possible instrument inaccuracies, the required range has been administratively established at 6552 to 6788 gallons.</li> <li>Technical Specifications require Accumulator pressures to be maintained in the range of 600 psig to 675 psig.</li> </ul> </div>
	SRO/ATC	<p>2. IF in MODES 1, 2 or 3 with RCS pressure greater than 1000 psig, AND Accumulator will be drained to less than 6520 gallons, THEN <b>ENSURE</b> the remaining two Accumulators are OPERABLE with:</p> <ul style="list-style-type: none"> <li>Water levels between 6552 to 6788 gallons.</li> <li>Nitrogen pressure between 625 to 665 psig.</li> </ul>

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Event Description: TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons). After reached, the SRO exits the LCO.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>3. IF in MODES 1, 2 or 3 with RCS pressure greater than 1000 psig AND draining Accumulators via the following normal Accumulator drain valves:</p> <ul style="list-style-type: none"> <li>• CV-3-852A, 3A ACCUMULATOR DRAIN</li> <li>• CV-3-852B, 3B ACCUMULATOR DRAIN</li> <li>• CV-3-852C, 3C ACCUMULATOR DRAIN</li> </ul>
	SRO/ATC	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>CAUTION</b></p> <p>With RCS pressure greater than 1000 psig, <u>only</u> one Accumulator drain valve shall be OPENED at a time.</p> </div>
	SRO/ATC	Marks Step 4 as N/A.
	SRO/ATC	<p>5. IF draining 3B Accumulator, THEN:</p> <p>A. LOG 3B Accumulator initial level in Narrative Log.</p>
	SRO/ATC	<p>B. IF using normal Accumulator drain path, THEN:</p> <p>(1) IF Accumulator is to remain pressurized as water level decreases, THEN REFER TO Section 4.2.4.</p> <p>(2) IF Accumulator is to be vented, THEN REFER TO Section 4.2.6.</p> <p>(3) OPEN CV-3-852B, 3B ACCUMULATOR DRAIN.</p> <p>(4) WHEN desired level or pressure is obtained per Plant Curve Book, Accumulator Level or Accumulator Volume Verses Pressure Graph, THEN CLOSE CV-3-852B, 3B ACCUMULATOR DRAIN.</p>

IV

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Event Description: TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons). After reached, the SRO exits the LCO.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>C.</b> IF using alternate Accumulator drain path, THEN:</p> <p>(1) IF Accumulator is to remain pressurized as water level decreases, THEN <b>REFER TO</b> Section 4.2.4.</p> <p>(2) IF Accumulator is to be vented, THEN <b>REFER TO</b> Section 4.2.6.</p> <p>(3) <b>DIRECT</b> Chemistry to drain 3B Accumulator per 0-NCZP-064, Obtaining Accumulator Samples.</p> <p>(4) WHEN desired level or pressure is obtained per Plant Curve Book, Accumulator Level or Accumulator Volume Verses Pressure Graph, THEN <b>DIRECT</b> Chemistry to terminate draining per 0-NCZP-064, Obtaining Accumulator Samples.</p>
	SRO/ATC	<b>D.</b> LOG 3B Accumulator final level in Narrative Log.
	SRO/ATC	<p style="text-align: center;"><b>CAUTION</b></p> <p>Chemistry sample results are required within 6 hours by TS 4.5.1.1.b, after each solution volume change of greater than or equal to 1% of tank volume.</p>
	SRO/ATC	<p><b>E.</b> IF 3B Accumulator was drained due to in-leakage, THEN:</p> <p>(1) <b>NOTIFY</b> Chemistry to sample the Accumulator.</p> <p>(2) <b>LOG</b> time Chemistry was notified in Narrative Log.</p>
	SRO/ATC	Marks Step 6 as N/A.
	SRO/ATC	<p>7. <b>NOTIFY</b> Chemistry to sample Accumulator(s) for boron concentration.</p> <p>8. <b>ENSURE</b> Chemistry sampling results for the Accumulator has been entered in the Unit Narrative Log.</p>

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Event Description: TS LCO 3.5.1 was entered for 3B Accumulator level at greater than 6,820 gallons. Use 3-NOP-064, Section 5.2 to lower 3B Accumulator level to the normal operating band (6,552 to 6,788 gallons). After reached, the SRO exits the LCO.

Time	Position	Applicant's Actions or Behavior
	SRO	Verifies 3B Accumulator Level and Pressure are SAT. The decision to exit LCO 3.5.1 may be made after Chemistry reports back sample results.

**EXAMINER NOTE:** Once Technical Specifications are referenced or at the Lead Examiner's direction, then proceed onto Event 2.

	SRO	<p><b><u>Technical Specifications</u></b></p> <p>4.5.1.1 Each accumulator shall be demonstrated OPERABLE:</p> <p>a. At least once per 12 hours by:</p> <ol style="list-style-type: none"><li>1) Verifying the borated water volume in each accumulator is between 6520 and 6820 gallons, and</li><li>2) Verifying that the nitrogen cover pressure in each accumulator is between 600 and 675 psig, and</li><li>3) Verifying that each accumulator isolation valve is open by control room indication (power may be restored to the valve operator to perform this surveillance if redundant indicator is inoperable).</li></ol>
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Event Description: VCT Level Transmitter, LT-3-115, drifts high over 3 minutes to divert water to the Hold Up Tanks. This requires manual operator action to reposition 3-LCV-115A to the VCT position. The crew responds using the ARP or 3-ONOP-046.4.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 2 - EVENT 1 - LT-3-115 DRIFTS HIGH</b> (insert TVB1LCDV 1.000000 delay=0 ramp=180 on=0 off=0)		
	SRO/ATC	<p>Observes failure of LT-3-115</p> <ul style="list-style-type: none"> <li>Indicated high level on LT-3-115 with normal level on LT-3-112.</li> <li>VCT Level starts diverting to the Holdup Tanks</li> <li>Annunciator A 4/6</li> </ul>
	SRO/ATC	<p><b>CAUSES:</b></p> <ol style="list-style-type: none"> <li>1. Failed VCT level instrumentation</li> <li>2. Loss of charging/letdown</li> <li>3. RCS leak</li> <li>4. VCT auto makeup malfunction</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> <p>A4/6</p> <p style="text-align: center;">VCT HI/LO LEVEL</p> </div>
	SRO/ATC	<p><b>ALARM CONFIRMATION</b></p> <ol style="list-style-type: none"> <li>1. CHECK LI-3-115, VCT LEVEL on VPA.</li> <li>2. CHECK VCT level on LT-3-112 by at least one of the following methods: <ul style="list-style-type: none"> <li>CHECK LT-112 on DCS Chemical &amp; Volume Control System display.</li> <li>DISPATCH operator to check local reading on LI-3-112 in the Charging Pump room.</li> <li>ADJUST LC-3-112, VCT LEVEL CONTROLLER AUTO setpoint potentiometer until demand begins to indicate greater than zero, read the pot setting, then return to previous setting.</li> </ul> </li> </ol>
	SRO/ATC	<p><b>OPERATOR ACTIONS</b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;"><u><b>NOTE</b></u></p> <p>LT-3-112 and LT-3-115 share a common dry reference leg and a common wet variable leg. Failure of the common dry reference leg will cause a false high level.</p> </div>
	SRO/ATC	<ol style="list-style-type: none"> <li>1. IF LT-3-115 has failed high, THEN PLACE LCV-3-115A, L/D DIVERT FROM VCT TO HOLD-UP TANK control switch to VCT position.</li> </ol>

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Event Description: VCT Level Transmitter, LT-3-115, drifts high over 3 minutes to divert water to the Hold Up Tanks. This requires manual operator action to reposition 3-LCV-115A to the VCT position. The crew responds using the ARP or 3-ONOP-046.4.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	2. IF VCT has an actual HI level, THEN: A. <b>ENSURE</b> LC-3-112, VCT LEVEL CONTROLLER setpoint is between 37% to 40%. B. <b>CHECK</b> LCV-3-115A diverts to the HUT according to VCT level program.
	SRO/ATC	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>NOTE</b>              LCV-3-115A fully resets at 76%           </div>
	SRO/ATC	C. <b>ENSURE</b> LCV-3-115A fully diverts at 86%. D. <b>ENSURE</b> proper charging and letdown flow balance.
	SRO/ATC	3. IF VCT has an actual LO level, THEN: A. WHEN VCT level lowers to 4%, THEN <b>ENSURE</b> charging pump suction swaps to the RWST, with LCV-3-115B, RWST TO CHARGING PUMP SUCTION, OPEN and LCV-3-115C, VCT OUTLET ISOLATION VALVE, CLOSED. B. <b>ENSURE</b> auto makeup rate is greater than charging flow. C. <b>ENSURE</b> suction source swaps back to VCT at 11%.
	SRO	4. IF LT-3-112 or LT-3-115 have failed, THEN <b>REFER TO</b> 3-ONOP-046.4, Malfunction of Boron Concentration Control System.
<b>EXAMINER NOTE:</b> The crew may have entered 3-ONOP-046.4 directly which is an acceptable flowpath.		
	SRO/ATC	<b>1</b> Check Boric Acid <u>OR</u> Primary Water Makeup Flow Rates - ABNORMAL <span style="float: right;">Observe note prior to Step 28 and go to Step 28.</span>
	SRO/ATC	<div style="border: 1px dashed black; padding: 10px;"> <p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>LT-3-112 and LT-3-115 share a common wet variable leg and a common dry reference leg. A false high level will be produced if the common dry reference leg fails.</li> <li>Steps 28 through 38 assume stable charging and letdown flow; therefore, a transient could mask the symptoms being used to determine which level transmitter has failed.</li> </ul> </div>


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Event Description: VCT Level Transmitter, LT-3-115, drifts high over 3 minutes to divert water to the Hold Up Tanks. This requires manual operator action to reposition 3-LCV-115A to the VCT position. The crew responds using the ARP or 3-ONOP-046.4.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<b>28</b> Check For VCT Level Transmitter, LT-3-115, Go to Step 31. Failing Or Failed High <ul style="list-style-type: none"> <li>LI-3-115 - ABNORMALLY HIGH</li> <li>LI-3-112 - DECREASING DUE TO FULL DIVERT OF LCV-3-115A</li> </ul>
	SRO/ATC	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CAUTION</b>  With no operator action, LT-3-115 failed high will result in loss of suction to the charging pumps. </div>
	SRO/ATC	<div style="border: 1px dashed black; padding: 5px; text-align: center;"> <b>NOTE</b>  Failure of LT-3-115 high will result in the following: <ul style="list-style-type: none"> <li>Annunciator Alarm A 4/6 VCT HI/LO LEVEL.</li> <li>Full divert of valve LCV-3-115A to the CVGS holdup tank.</li> <li>No auto makeup.</li> <li>No auto swap over to the RWST.</li> </ul> </div>
	SRO/ATC	<div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> <b>29</b>   </div> <div> Place The L/D DIVERT FROM VCT TO HOLDUP TANK, LCV-3-115A, Control Switch To The VCT Position </div> <div style="margin-left: 20px;"> <p><b>IF</b> valve LCV-3-115A does <b>NOT</b> respond to the control switch, <b>THEN</b> dispatch an operator to fail the valve to VCT position by performing the following:</p> <ul style="list-style-type: none"> <li>a. Isolate instrument air to LCV-3-115A.</li> <li>b. Bleed off regulator to LCV-3-115A.</li> </ul> </div> </div>
	SRO/ATC	<b>30</b> Go To Step 41
	SRO/ATC	<b>41</b> Report All Equipment Failures Or Malfunctions To The Responsible Supervisor
	SRO	<b>42</b> Notify The Nuclear Plant Supervisor To Evaluate Plant Conditions <ul style="list-style-type: none"> <li>a. Refer to 0-ONOP-046.3, LOSS OF BORATION FLOWPATHS</li> <li>b. Review Technical Specifications</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>EXAMINER NOTE:</b> Tech Spec 3.1.2.1 is N/A and 3.1.2.2 actions are met. </div>

**EXAMINER NOTE:** After Technical Specifications are check or at Lead Examiner's direction, proceed onto Event 3.

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Event No.: 3

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Event Description: 3A Heater Drain Pump trips on high amps which require starting an additional Condensate Pump to support this power level.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 3 - 3A HDP TRIPS ON HIGH AMPS</b> (insert TVUTMPA 1.000000 delay=0 ramp=120 on=0 off=0)		
	SRO/BOP	Observes failure of 3A HDP. <ul style="list-style-type: none"> <li>Observes rising amps on 3 A HDP</li> <li>Alarms D 8/1, 8/2, 9/2, 6/3, and 5/3</li> </ul>
	SRO/BOP	CAUSES: 1. Motor malfunction 2. Low bus voltage <div style="border: 1px solid black; padding: 5px; width: fit-content; float: right;">             D17               HDP A/B              MOTOR              OVRD TRIP           </div>
	SRO/BOP	<b>ALARM CONFIRMATION</b> 1. <b>CHECK</b> heater drain pump indications on console.
	SRO/BOP	<b>OPERATOR ACTIONS</b> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CAUTION</b>            Rejection of heater drains to the condenser can damage condenser tubes.         </div>
	SRO/BOP	1. <b>ENSURE</b> automatic start of idle HDP. (No IDLE HDP in lineup)
	SRO/BOP	2. IF feed pump suction pressure is less than 260 psig, THEN: A. <b>START</b> a standby condensate pump. <b>(3C Condensate Pump)</b> B. IF feed pump suction pressure remains less than 260 psig, THEN <b>REDUCE</b> power to restore suction pressure using 3-ONOP-100, Fast Load Reduction. C. <b>CHECK</b> feed train components for correct operation.
	SRO/BOP	3. <b>MAINTAIN</b> reactor power less than 100 percent.
<b>EXAMINER NOTE:</b> Turbine load should be reduced to maintain Rx Power less than 100%. (DCS Hourly Heat Rate will be monitored to maintain power < 100% along with monitoring alternate indications such as NIS and RCS Delta T.)		

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Event No.: 3

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Event Description: 3A Heater Drain Pump trips on high amps which require starting an additional Condensate Pump to support this power level.

Time	Position	Applicant's Actions or Behavior								
<p><b>EXAMINER NOTE:</b> If Engineering is contacted, they will recommend maintaining full power operation with an engineering walkdown to monitor secondary performance. This condition will feed into Event 7 where 3B S/G Feedwater Pump is running with high vibration. If the crew decides to reduce power in accordance with the table, then proceed with Event 6 with S/G Stm Flow Channel FI-474 failed as is.</p>										
	SRO/BOP	<p>4. Within 24 hours, <b>PERFORM one</b> of the following:</p> <ul style="list-style-type: none"> <li>A. <b>ENSURE</b> minimum heater drain pump operation as required by table below using 3-OP-081, Heater Drain Pumps, or 3-OP-081.1, Feedwater Heater Extraction Steam Vents and Drains Valve Alignment.</li> <li>B. <b>OBTAIN</b> Engineering concurrence to maintain full power operation.</li> <li>C. <b>REDUCE</b> power as required by table below using 3-ONOP-100, Fast Load Reduction.</li> </ul> <table border="1"> <thead> <tr> <th>Turbine Load</th> <th>HDPs Required</th> </tr> </thead> <tbody> <tr> <td>Above 450 MWe</td> <td>Two</td> </tr> <tr> <td>300 to 450 MWe</td> <td>One</td> </tr> <tr> <td>Below 300 MWe</td> <td>None</td> </tr> </tbody> </table>	Turbine Load	HDPs Required	Above 450 MWe	Two	300 to 450 MWe	One	Below 300 MWe	None
Turbine Load	HDPs Required									
Above 450 MWe	Two									
300 to 450 MWe	One									
Below 300 MWe	None									
	SRO/BOP	<p>5. <b>CHECK</b> HDP locally for abnormal indications and HDP Breakers 3AA07 or 3AB03 for targets.</p>								
<p><b>EXAMINER NOTE:</b> After power reduction is addressed or at Lead Examiners discretion, then proceed with Event 4.</p>										

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Event No.: 4

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Event Description: The Master Charging Pump Controller, LC-3-459G, signal fails high. The RO takes action to control the Charging Pump Speed Controller in manual and maintain program level per Enclosure 1 of 3-ONOP-041.6, Pressurizer Level Control Malfunction.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 4 - MSTR CHARGING CONTROL LC-3-459G FAILS HI</b> (insert TFH2L9FH TRUE delay=0 ramp=0 on=0 off=0)		
	SRO/ATC	Observes the following: <ul style="list-style-type: none"> <li>Charging Pump Speed increasing</li> <li>Charging flow to RCS rising</li> <li>Annunciator G 1/2</li> </ul>
	SRO/ATC	CAUSES: <ol style="list-style-type: none"> <li>Charging pump controller malfunction</li> <li>Pressurizer level mismatch</li> <li>RCS leakage</li> </ol> <div style="border: 1px solid black; padding: 5px; display: inline-block;">             G1/2               CHARGING PUMP HI SPEED           </div>
	SRO	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Breaker must be closed on a given pump for alarm to be functional.</li> <li>93% demand is equivalent to approx 73 gpm.</li> </ul> </div>
	SRO/ATC	<b>ALARM CONFIRMATION</b> Check individual charging pump controller and the master charging pump controller.
	SRO	<b>OPERATOR ACTIONS</b> <ol style="list-style-type: none"> <li>IF a failure of the master charging pump controller has occurred in automatic, THEN <b>PLACE</b> the master controller in manual and <b>MAINTAIN</b> pressurizer level on program.               <ol style="list-style-type: none"> <li>GO TO 3-ONOP-041.6, Pressurizer Level Control Malfunction.</li> </ol> </li> <li>IF a failure of the individual charging pump controller has occurred in automatic, THEN <b>PLACE</b> the individual controller in manual and <b>MAINTAIN</b> pressurizer level on program.               <ol style="list-style-type: none"> <li>GO TO 3-ONOP-041.6, Pressurizer Level Control Malfunction.</li> </ol> </li> </ol>

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Event No.: 4

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Event Description: The Master Charging Pump Controller, LC-3-459G, signal fails high. The RO takes action to control the Charging Pump Speed Controller in manual and maintain program level per Enclosure 1 of 3-ONOP-041.6, Pressurizer Level Control Malfunction.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>• If Pressurizer Level Malfunction is a result of a failure of the 3-459CX or 3-460CX relays (as indicated by a loss of letdown flow with a loss of Pressurizer Heaters with no concurrent failure of Level Transmitters 3-459A, 3-460, 3-461), use 3-ONOP-003.6 Attachment 4, for 3-460CX failure, OR 3-ONOP-003.9 Attachment 4, for 3-459CX failure as guidance for establishing Letdown flow and Pressurizer Heaters.</li> <li>• If the button on relays 3-459CX or 3-460CX are used to restore Letdown flow and Pressurizer Heaters, comply with Tech Spec Action Statement 3.4.3 Action b.</li> <li>• If the manual control of Heaters from the Electrical penetration room is used, comply with Tech Spec Action Statement 3.4.3 Action a.</li> </ul>
	SRO/ATC	<p>5.0 <u>SUBSEQUENT ACTIONS</u></p> <p>5.1 Check pressurizer level indicators LI-3-459A, LI-3-460 <u>AND</u> LI-3-461,</p> <p>5.1.1 <u>IF</u> one level indicator deviates significantly from the others, <u>THEN</u> place CHANNEL SELECT PRESSURIZER LEVEL CONTROL switch in a position that will NOT include the defective channel.</p>
	SRO/ATC	<p>5.2 <u>IF</u> pressurizer level does not follow programmed level, <u>THEN</u> place MASTER CHARGING PUMP CONTROLLER, LC-3-459G in MANUAL <u>AND</u> maintain programmed level per Enclosure 1.</p> <p>5.2.1 <u>IF</u> individual charging pump controllers are not following LC-3-459G, <u>THEN</u> place individual CHARGING PUMP CONTROLLERS in MANUAL <u>AND</u> maintain programmed level per Enclosure 1.</p>

**EXAMINER NOTE:** Enclosure 1 is on the next page.

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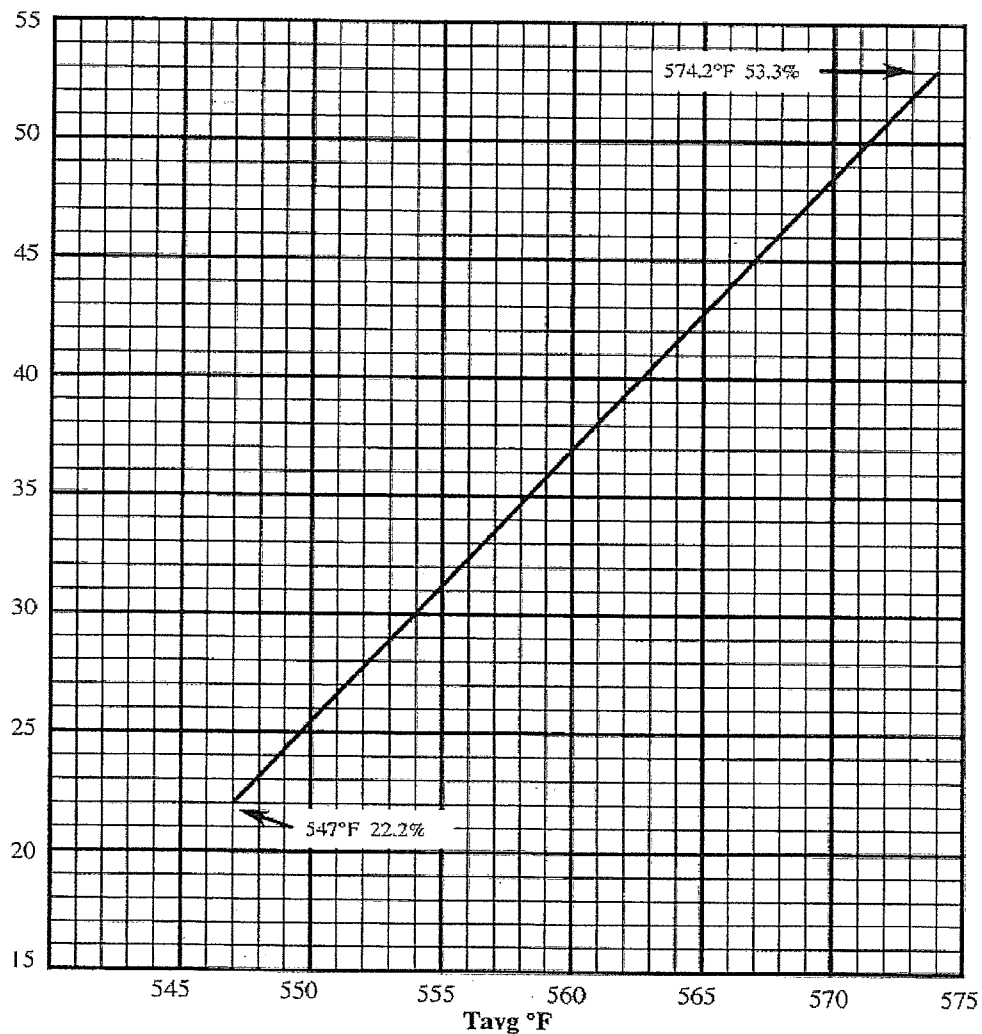
Event Description: The Master Charging Pump Controller, LC-3-459G, signal fails high. The RO takes action to control the Charging Pump Speed Controller in manual and maintain program level per Enclosure 1 of 3-ONOP-041.6, Pressurizer Level Control Malfunction.

Time	Position	Applicant's Actions or Behavior
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ENCLOSURE 1  
(Page 1 of 1)

## PRESSURIZER PROGRAMMED LEVEL

% of PRZ  
Level Span



**EXAMINER NOTE:** When Pressurizer Level has been stabilized or at the Lead Examiner's discretion, then proceed to Event 5.



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Event No.: 5

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 5 - PT-3-447 FAILS LOW.</b> (insert TFS1MAML TRUE delay=0 ramp=0 on=0 off=0)		
	SRO/ATC	Observes the following: <ul style="list-style-type: none"> <li>• Multiple Annunciators in Control Room</li> <li>• Control Rods inserting</li> <li>• Stable Turbine load</li> <li>• P-3-447 failing downscale</li> </ul>
	SRO/ATC	CAUSES: <ol style="list-style-type: none"> <li>1. Rapid load change</li> <li>2. Reactivity addition (i.e. dilution, boration, Xenon transient)</li> <li>3. Instrumentation failure</li> </ol> <div style="border: 1px solid black; padding: 5px; display: inline-block;">             B31               TAVG/ TAVG-TREF DEVIATION           </div>
	SRO/ATC	<b>ALARM CONFIRMATION</b> <ol style="list-style-type: none"> <li>1. CHECK <math>T_{avg}-T_{ref}</math> trace on TR-3-408 at console.</li> <li>2. COMPARE <math>T_{avg}</math> indicators on VPA.</li> <li>3. COMPARE 1st stage pressure indicators on VPA.</li> </ol>
	SRO/ATC	<b>OPERATOR ACTIONS</b> <ol style="list-style-type: none"> <li>1. IF <math>T_{avg}</math> greater than <math>T_{ref}</math> by more than 1.5°F, THEN CHECK rods driving inward in AUTO.</li> <li>2. IF a sudden load reduction has occurred, THEN CHECK for steam dump actuation.</li> <li>3. ENSURE automatic rod control is correcting temperature error.</li> </ol>
	SRO/ATC	<ol style="list-style-type: none"> <li>4. IF rods are NOT correcting the deviation, THEN PLACE rod control in MANUAL to correct the problem with rod motion/boration.</li> </ol>
	SRO/ATC	<ol style="list-style-type: none"> <li>5. IF <math>T_{avg}</math> changing with load steady, THEN CHECK for possible inadvertent dilution/boration or Xenon transient in progress.</li> </ol>
	SRO	<ol style="list-style-type: none"> <li>6. IF due to instrumentation failure, THEN REFER TO 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.</li> </ol>

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
<b>EXAMINER NOTE: 3-ONOP-028 can be entered first to complete immediate action responses, and then the crew will enter 3-ONOP-049.1.</b>		
<b>3-ONOP-028 Reactor Control System Malfunction</b>		
	SRO/ATC	<p style="text-align: center;"><b>CAUTIONS</b></p> <ul style="list-style-type: none"> <li>If the Rod Control System is inoperable due to Urgent Failure or other cause, the Shift Manager shall be notified immediately.</li> <li>If a transient occurs and the Reactor cannot be stabilized by boration/dilution or changes in turbine load, the Reactor shall be tripped and a transition made to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>Boration/dilution or changes in turbine load will effect shutdown margin and axial offset. If plant conditions permit, the Shift Manager shall be consulted for methods used to achieve and maintain stable plant conditions.</li> <li>Failure of RCC(s) to move when demanded, (e.g., ROD CONTROL URGENT FAILURE), constitutes inoperability of the associated RCC(s). The requirements of T.S. 3.1.3.1 apply.</li> </ul>
	SRO/ATC	<p>4.0 <b><u>IMMEDIATE ACTIONS</u></b></p> <p>4.3 <u>Continuous Insertion of an RCC Control Bank</u></p> <p>4.3.1 Place the Rod Motion Control Selector switch to the MAN position.</p>
	SRO/ATC	<p>5.0 <b><u>SUBSEQUENT ACTIONS</u></b></p>
	SRO/ATC	<p>5.3 <u>Continuous Insertion of an RCC Control Bank</u></p> <p>5.3.1 Adjust rods or reduce turbine load as determined by the Shift manager to restore Tav<sub>g</sub> equal to Tref.</p> <p>5.3.2 <b>IF</b> PT-3-446 or PT-3-447 has failed, <b>THEN</b> place Channel Select First Stage Control to the operable channel.</p> <p>5.3.3 Compare rod position to control rod insertion limits using the Rod Position Bank Recorders (VPA) or using the Plant Curve Book, Section VII, Figure 3.</p>

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Restores Tavg / Tref mismatch per direction.
	ATC	Selects PT-3-446 on Channel Select First Stage Control (BLUE)
	SRO/ATC	<p>5.3.4 <u>IF</u> the control banks insertion limits are exceeded, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Borate at equal to or greater than 16 gpm using 0-OP-046, CVCS – BORON CONCENTRATION CONTROL, until control rods are above the Low Limit.</li> <li>2. Ensure compliance with Technical Specifications by performing one of the following: <ol style="list-style-type: none"> <li>a. Restore the control banks to within the limits within 2 hours.</li> </ol> <p style="text-align: center;"><u>OR</u></p> <ol style="list-style-type: none"> <li>b. Reduce thermal power within 2 hours to less than or equal to the fraction of rated thermal power that is allowed by the bank position Plant Curve Book Section VII, Figure 3.</li> </ol> <p style="text-align: center;"><u>OR</u></p> <ol style="list-style-type: none"> <li>3. Be in Hot Standby within 6 hours.</li> </ol> </li> </ol>
	SRO/ATC	<p>5.3.5 <u>IF</u> Power Range Channel 4 has failed, <u>THEN</u> perform to 3-ONOP-059.8, POWER RANGE NUCLEAR INSTRUMENTATION MALFUNCTION.</p> <p>5.3.6 <u>IF</u> PT-3-446 or PT-3-447 has failed, <u>THEN</u> perform the following:</p> <div style="border: 1px dashed black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><b>NOTE</b></p> <p><i>A few minutes needs to elapse between the time First Stage Pressure is transferred and Rod Control is returned to Automatic. This will preclude the possibility of the power mismatch circuitry causing undesired rod motion.</i></p> </div> <ol style="list-style-type: none"> <li>1. Verify Channel Select First Stage Press Control has been placed to an operable channel <u>AND</u> place the Rod Motion Control Selector switch in AUTO.</li> </ol>
	SRO	<ol style="list-style-type: none"> <li>2. Perform 3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS.</li> </ol>

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
<b>3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels</b>		
	SRO/ATC	<p>5.0 <u>SUBSEQUENT ACTIONS</u></p> <p>5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.</p> <p>5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.</p> <p>5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.</p>
	SRO/ATC	<p>5.4 <u>IF</u> a control function was placed in manual control due to the failure, <u>THEN</u> verify the control function is returned to automatic.</p> <p>5.5 <u>IF</u> the failed channel is <u>NOT</u> related to Technical Specifications <u>AND</u> is <u>NOT</u> an input to Reactor Protection or Safeguards, <u>THEN</u> go to Step 5.16.</p> <p>5.6 Refer to Technical Specifications 3/4.3, Instrumentation <u>AND</u> verify the minimum channels operable.</p> <p>5.6.1 Take appropriate actions as specified in Technical Specifications.</p>
	SRO/ATC	<p style="text-align: center;"><b>CAUTION</b></p> <p><i>The failed channel bistable(s) is required to be placed in the tripped mode within 6 hours of the failure determination, except if other channel bistable(s) are in the tripped or test position and would result in an undesired Engineered Safety Features actuation or Reactor Trip actuation. The overall effect of a failure of this type is a reduction of instrumentation redundancy and, therefore, a possible reduction in plant protection.</i></p>
	SRO/ATC	<p>N/A 5.7 <u>IF</u> a 4KV bus/480V load center undervoltage channel has failed, <u>THEN</u> perform Attachment 1.</p> <p>5.8 <u>IF</u> a turbine stop valve closure channel has failed, <u>THEN</u> perform Attachment 2.</p> <p>5.9 <u>IF</u> a turbine auto stop oil channel has failed, <u>THEN</u> perform Attachment 3.</p>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p><i>If I&amp;C determines a Test Sequence Processor for an Eagle-21 Channel has failed, then that associated Eagle-21 Channel may remain in service if Attachment 6 is performed once per 4 hours. (Reference Safety Evaluation JPN-PTN-SEIS-95-001)</i></p>
	SRO/ATC	<p>5.10 <u>IF</u> I&amp;C determines a Test Sequence Processor on an Eagle-21 Channel has failed <u>AND</u> no off-normal bistables are lit, <u>THEN</u> perform Attachment 6 once per 4 hours until the associated Eagle-21 Channel is removed from service for repair.</p>

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>5.11 <u>IF</u> a containment pressure channel has failed, <u>THEN</u> place the failed channel in the tripped condition by performing the following:</p> <p>N/A</p> <p>↓</p> <p>5.11.1 Remove fuses for failed channel using Attachment 7.</p> <p>5.11.2 Verify channel is in tripped condition by observing corresponding status light (VPB) lit.</p>
	SRO/ATC	<p>5.12 <u>IF</u> any other channel has failed, <u>THEN</u> perform the following to trip bistables for the failed channel.</p> <p>5.12.1 <u>IF</u> plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Place all bistable switches for the affected loop in test position using Attachment 4.</li> <li>2. Verify bistables tripped by observing corresponding status light (VPB) lit.</li> </ol> <p>5.12.2 <u>IF</u> plant conditions are such that all bistables associated with the failed channel may <u>NOT</u> be tripped due to an undesired RPS or ESF actuation, <u>THEN</u> perform the following:</p> <p>N/A</p> <p>↓</p> <ol style="list-style-type: none"> <li>1. Place only the bistables which will <u>NOT</u> cause an RPS or ESF actuation in the test/tripped position using Attachment 4.</li> <li>2. Verify bistables tripped by observing corresponding status light (VPB) lit.</li> <li>3. Follow action of Tech. Spec. 3/4.3 and/or 3.0.3 for those bistables which were <u>NOT</u> placed in the tripped condition.</li> </ol>
	SRO/ATC	<p>5.13 <u>IF</u> any of the following channels are failed, <u>THEN</u> place the Bypass Switch(es) for the failed channel to Bypass position at the AMSAC panel using Attachment 5:</p> <p>5.13.1 Any Steam Generator Level Channel I (LI-3-474, LI-3-484, or LI-3-494)</p> <p><u>OR</u></p> <p>5.13.2 Any Steam Generator Level Channel II (LI-3-475, LI-3-485, or LI-3-495)</p> <p><u>OR</u></p> <p>5.13.3 PT-3-446</p> <p><u>OR</u></p> <p>5.13.4 PT-3-447</p>

EXAMINER NOTE: Technical Specifications are on next two pages.

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p><i>The following step is to allow automatic operation of the Steam Dump to Condenser System during a turbine trip subsequent to a failure of PT-3-447, First Stage Pressure Channel.</i></p>
	SRO/BOP	5.14 <u>IF</u> First Stage Pressure Channel, PT-3-447 has failed <u>AND</u> Steam Dump to Condenser has armed, <u>THEN</u> place the Steam Dump to Condenser Mode Selector switch to RESET and return to AUTO.

### 3/4.3 INSTRUMENTATION

#### 3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

##### LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

##### ACTION:

As shown in Table 3.3-1.

TABLE 3.3-1 (Continued)

#### REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
17. Reactor Trip System Interlocks					
a. Intermediate Range					
Neutron Flux, P-6	2	1	2	2#	7
b. Low Power Reactor					
Trips Block, P-7					
P-10 Input	4	2	3	1	7
or					
Turbine First	2	1	2	1	7
Stage Pressure					

**ACTION 7 -** With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
<p><u>INSTRUMENTATION</u></p> <p><u>3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION</u></p> <p><u>LIMITING CONDITION FOR OPERATION</u></p> <p>3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3.</p> <p><u>APPLICABILITY:</u> As shown in Table 3.3-2.</p> <p><u>ACTION:</u></p> <p>a. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 3.3-3, adjust the Setpoint consistent with the Trip Setpoint value within permissible calibration tolerance.</p> <p>b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value column of Table 3.3-3, either:</p> <ol style="list-style-type: none"> <li>Adjust the Setpoint consistent with the Trip Setpoint value of Table 3.3-3 and determine within 12 hours that the affected channel is OPERABLE; or</li> <li>Declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-2 until the channel is restored to OPERABLE status with its setpoint adjusted consistent with the Trip Setpoint value.</li> </ol> <p>c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-2.</p>		

TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
f. Steam Line Flow-High Coincident with:	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3*	15

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
4. Steam Line Isolation (Continued)					
d. Steam Line Flow-High Coincident with: Steam Generator Pressure-Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
	1/steam generator	1/steam generator in any two	1/steam generator in any two	1, 2, 3	15

**ACTION 15 -** With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
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**ATTACHMENT 4****FAILED CHANNEL BISTABLE LIST**

P-3-447		Turbine First Stage Pressure		Ref Dwgs 5610-T-D-18A,18B,12A,12B &17; 5610-T-L-1, Sh 17, 21 & 22A		
Max Deviation As Compared to other Channels						
50 PSIG DEVIATION						
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNCTION	LOGIC AFFECTED
25	BS-3-447-1	Input to P-7 (Turbine >10% Pwr)	Turbine Power P-7 PC447E1		P	P-7, 1/2 turbine first stage pressure >10% power to allow at power trips (P-10 also an input to enable at power trips). 2/2 turbine first stage pressure <10% and 3/4 power range channels <10% blocks at power trips.
25	BS-3-447-2	Allows Load Limit Runback	Turb Pow Load Limit PC447E2		P	2/2 channels >70% turbine power, allows load limit runback for NIS/RPI rod drop signal (Runback on Rod Drop Deleted)
24	BS-3-475	Program Steam Flow Versus Turbine Load	LOOP A HI STM FLOW FC475	SG A C 7/1 STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
25	BS-3-485	Program Steam Flow Versus Turbine Load	LOOP B HI STM FLOW FC485	SG B C 7/2 STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
25	BS-3-495	Program Steam Flow Versus Turbine Load	LOOP C HI STM FLOW FC495	SG C C 7/3 STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)

C - CONTROL RELATED  
P - RX PROTECTION RELATED  
S - SAFETY INJECTION RELATED

**ATTACHMENT 5****AMSAC CONTROL PANEL**

1. Place the Normal/Bypass switch(es) to BYPASS for the applicable failed channel(s) at the local AMSAC Control Panel.
  - a. Processor A
    - (1) Level 1 (A S/G Level, Channel 474)
    - (2) Level 2 (B S/G Level, Channel 484)
    - (3) Level 3 (C S/G Level, Channel 494)
    - (4) Power 1 (First Stage Turbine Pressure, Channel 446)
    - (5) Power 2 (First Stage Turbine Pressure, Channel 447)
  - b. Processor B
    - (1) Level 1 (A S/G Level, Channel 475)
    - (2) Level 2 (B S/G Level, Channel 485)
    - (3) Level 3 (C S/G Level, Channel 495)
    - (4) Power 1 (First Stage Turbine Pressure, Channel 446)
    - (5) Power 2 (First Stage Turbine Pressure, Channel 447)
2. At the AMSAC Panel, depress and release the SYSTEM RESET pushbutton.



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Event Description: Turbine First Stage Pressure Channel, P-3-447 fails low. ATC determines no runback. Rod Control is taken to manual per 3-ONOP-028 or 0-ADM-211. 3-ONOP-049.1 is entered for mitigation. The SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

**Potential Additional Tech Spec Call**

	<b>SRO</b>	<p><u>POWER DISTRIBUTION LIMITS</u></p> <p><u>3/4.2.5 DNB PARAMETERS</u></p> <p><u>LIMITING CONDITION FOR OPERATION</u></p> <p>3.2.5 The following DNB-related parameters shall be maintained within the following limits:</p> <ul style="list-style-type: none"><li>a. Reactor Coolant System <math>T_{avg} \leq 581.2^{\circ}\text{F}</math></li><li>b. Pressurizer Pressure <math>\geq 2200</math> psig*, and</li><li>c. Reactor Coolant System Flow <math>\geq 264,000</math> gpm</li></ul> <p><u>APPLICABILITY:</u>      MODE 1.</p>
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**EXAMINER NOTE:** After Technical Specifications are addressed, go to Events 6 & 7. [NOTE: Event 6 will be discovered on the downpower.]

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Event No.: 6

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Event Description: S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
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**Direct Facility Operator to trigger lesson step, EVENT 6 - SG FLOW TRANSMITTER SB-FT-474 FAILS AS IS.** ( insert TFS1MWEA TRUE delay=0 ramp=0 on=0 off=0)

**EXAMINER NOTE: Go to Events 7. Event 6 will be discovered on the downpower.**

	<b>SRO/BOP</b>	<b>CAUSES:</b> 1. Steam Generator Level Control Malfunction 2. Instrument Failure	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> C6   SG A LEVEL DEVIATION </div>
	<b>SRO/BOP</b>	<b>PROMPT ACTIONS</b> IF malfunctioning SG level controls, THEN: • <b>TAKE</b> manual control of level. • <b>RETURN</b> SG levels to normal.	
	<b>SRO/BOP</b>	<b>ALARM CONFIRMATION</b> CHECK LI-3-476 or LI-3-478, A STM GEN LEVEL controlling channel vs. PI-3-446 or PI-3-447, FIRST STAGE PRESSURE level control program on VPA.	
	<b>SRO</b>	<b>OPERATOR ACTIONS</b> IF alarm is due to instrument failure, THEN <b>REFER TO</b> 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.	
<b>3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels</b>			
	<b>SRO/ATC</b>	5.0 <b>SUBSEQUENT ACTIONS</b> 5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions. 5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service. 5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop. <b>Selected to Yellow</b>	

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Event Description: S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>5.4 <u>IF</u> a control function was placed in manual control due to the failure, <u>THEN</u> verify the control function is returned to automatic.</p> <p>5.5 <u>IF</u> the failed channel is <u>NOT</u> related to Technical Specifications <u>AND</u> is <u>NOT</u> an input to Reactor Protection or Safeguards, <u>THEN</u> go to Step 5.16.</p> <p>5.6 Refer to Technical Specifications 3/4.3, Instrumentation <u>AND</u> verify the minimum channels operable.</p> <p>5.6.1 Take appropriate actions as specified in Technical Specifications.</p>
	SRO/ATC	<p style="text-align: center;"><b>CAUTION</b></p> <p><i>The failed channel bistable(s) is required to be placed in the tripped mode within 6 hours of the failure determination, except if other channel bistable(s) are in the tripped or test position and would result in an undesired Engineered Safety Features actuation or Reactor Trip actuation. The overall effect of a failure of this type is a reduction of instrumentation redundancy and, therefore, a possible reduction in plant protection.</i></p>
	SRO/ATC	<p>N/A 5.7 <u>IF</u> a 4KV bus/480V load center undervoltage channel has failed, <u>THEN</u> perform Attachment 1.</p> <p>5.8 <u>IF</u> a turbine stop valve closure channel has failed, <u>THEN</u> perform Attachment 2.</p> <p>5.9 <u>IF</u> a turbine auto stop oil channel has failed, <u>THEN</u> perform Attachment 3.</p>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p><i>If I&amp;C determines a Test Sequence Processor for an Eagle-21 Channel has failed, then that associated Eagle-21 Channel may remain in service if Attachment 6 is performed once per 4 hours. (Reference Safety Evaluation JPN-PTN-SEIS-95-001)</i></p>
	SRO/ATC	<p>5.10 <u>IF</u> I&amp;C determines a Test Sequence Processor on an Eagle-21 Channel has failed <u>AND</u> no off-normal bistables are lit, <u>THEN</u> perform Attachment 6 once per 4 hours until the associated Eagle-21 Channel is removed from service for repair.</p>
	SRO/ATC	<p>5.11 <u>IF</u> a containment pressure channel has failed, <u>THEN</u> place the failed channel in the tripped condition by performing the following:</p> <p>5.11.1 Remove fuses for failed channel using Attachment 7.</p> <p>5.11.2 Verify channel is in tripped condition by observing corresponding status light (VPB) lit.</p>

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Event Description: S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>5.12 <u>IF</u> any other channel has failed, <u>THEN</u> perform the following to trip bistables for the failed channel.</p> <p>5.12.1 <u>IF</u> plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Place all bistable switches for the affected loop in test position using Attachment 4.</li> <li>2. Verify bistables tripped by observing corresponding status light (VPB) lit.</li> </ol> <p>5.12.2 <u>IF</u> plant conditions are such that all bistables associated with the failed channel may <u>NOT</u> be tripped due to an undesired RPS or ESF actuation, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Place only the bistables which will <u>NOT</u> cause an RPS or ESF actuation in the test/tripped position using Attachment 4.</li> <li>2. Verify bistables tripped by observing corresponding status light (VPB) lit.</li> <li>3. Follow action of Tech. Spec. 3/4.3 and/or 3.0.3 for those bistables which were <u>NOT</u> placed in the tripped condition.</li> </ol>

#### Attachment 4

Max Deviation As Compared to other Channels			0% ≤ Power < 10%, MAX DEV 7.5 x 10 <sup>5</sup> lb/HR 10% < Power ≤ 50%, MAX DEV 5.0 x 10 <sup>5</sup> lb/HR 50% < Power ≤ 70%, MAX DEV 4.0 x 10 <sup>5</sup> lb/HR 70% < Power ≤ 100%, MAX DEV 3.0 x 10 <sup>5</sup> lb/HR			
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNCTION	LOGIC AFFECTED
16	BS-3-474	Safeguards Logic	LOOP A HI STM FLOW FC474	SG A STEAMLINE HI FLOW C 7/1	S	1/2 channels on 2/3 S/G high steam flow > program with 2/3 low Tavg (543 °F) or 2/3 low S/G pressure (614 psig)
17	BS-3-478B-1	FW to SF Mismatch Logic	S/G A STM-FW FLO DEV FC478B1		P	1/2 channels on 1/3 S/G low level (10%) with 1/2 low feedwater flow (665,000 lb/hr < steam flow) on same S/G
17	BS-3-478B-2	SF > FW Alarm		C 5/1 SG A STEAM > FEED	C	
17	BS-3-478C	FW > SF Alarm		C 4/1 SG A FEED > STEAM	C	

C - CONTROL RELATED  
 P - RX PROTECTION RELATED  
 S - SAFETY INJECTION RELATED

**EXAMINER NOTE:** Technical Specifications are on next two pages. After Technical Specifications are referenced, continue on with Event 8 after Event 7 is complete.

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Scenario No.: 2

Event No.: 6

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Event Description: S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
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### 3/4.3 INSTRUMENTATION

#### 3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

##### LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

##### ACTION:

As shown in Table 3.3-1.

TABLE 3.3-1 (Continued)

#### REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
12. Steam Generator Water Level-- Low Coincident With Steam/ Feedwater Flow Mismatch	2 stm. gen. level and 2 stm./feed- water flow mismatch in each stm. gen.	1 stm. gen. level coin- cident with 1 stm./feed- water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed- water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

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Scenario No.: 2

Event No.: 6

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Event Description: S/G Steam Flow Channel FI-474 fails as is for A S/G. The A S/G Feed Reg Valve does respond properly during power maneuver. Action is necessary for manual control and/or swap channels. When discovered, the SRO will address LCO 3.3.1 and 3.3.2. This channel is declared inoperable.

Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

INSTRUMENTATION3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATIONLIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3.

APPLICABILITY: As shown in Table 3.3-2.

ACTION:

- a. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 3.3-3, adjust the Setpoint consistent with the Trip Setpoint value within permissible calibration tolerance.
- b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value column of Table 3.3-3, either:
  1. Adjust the Setpoint consistent with the Trip Setpoint value of Table 3.3-3 and determine within 12 hours that the affected channel is OPERABLE; or
  2. Declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-2 until the channel is restored to OPERABLE status with its setpoint adjusted consistent with the Trip Setpoint value.
- c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-2.

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. Steam Line Isolation (Continued)					
d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3	15
or T <sub>avg</sub> --Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3	25

**ACTION 15 -** With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

Op-Test No.: 2011-302

Scenario No.: 2

Event No.: 7

Page 1 of 5

Event Description: Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Directs response using <b>3-GOP-100</b> , Fast Load Reduction to reduce load to 50%.
	<b>CREW</b>	Reviews 3-GOP-100 Foldout Page actions
	<b>SRO</b>	<p><b>1</b> Brief Control Room Personnel Using ATTACHMENT 3</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>Suggested boration is 9 gallons per % with control rods completely withdrawn and available; 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).</li> <li>The Unit Supervisor may change the boration as desired during the load reduction.</li> </ul> </div> <p>4. Boration Rate: _____ total gallons / _____ minutes = _____ gallons/minute.</p>
	<b>SRO/ATC</b>	Determines <b>9 gal/%</b> boric acid addition times <b>50 %</b> which equals <b>450 gallons</b> total. [Adjust for current power]

**EXAMINER NOTE: Reduce power to 50% was cue from Shift Manager.**

		<b>FOLDOUT PAGE</b>
	<b>CREW</b>	<p><b>1. 3-EOP-E-0 Transition Criteria</b></p> <p><u>IF</u> any of the following limits are reached, <u>THEN</u> trip the Reactor and Turbine <u>AND</u> go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:</p> <ol style="list-style-type: none"> <li>RCS Tav<sub>g</sub> - GREATER THAN 578 °F</li> <li>RCS Tav<sub>g</sub> - GREATER THAN T<sub>ref</sub> by 6 °F</li> <li>Rod Insertion Limits are exceeded as indicated by: <ul style="list-style-type: none"> <li>Rod Position Bank D Insertion Limit Recorder (VPA)</li> <li>Stepcounters on console</li> <li>Plant Curve Book Section 7, Figure 3</li> </ul> </li> </ol> <p><b>2. Notify Chemistry Department</b></p> <p><u>WHEN</u> reactor power has changed by greater than or equal to 15 percent, <u>THEN</u> notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.</p> <p><b>3. Restore Blender to AUTO</b></p> <p><u>WHEN</u> boration is complete, <u>THEN</u> restore the Blender to AUTO as follows:</p> <ol style="list-style-type: none"> <li>Place the Reactor Makeup Selector Switch to AUTO.</li> <li>Set FC-3-113A, Boric Acid Flow Controller pot setting as desired.</li> <li>Place the RCS Makeup Control Switch to START.</li> </ol>

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Scenario No.: 2

Event No.: 7

Page 2 of 5

Event Description: Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>2</b> Begin Boration <span style="float: right;">IF boration is not required, THEN go to Step 3:</span></p> <p>a. Set the Boric Acid Totalizer to value determined using ATTACHMENT 3</p> <p>b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0</p> <p>c. Place the Reactor Makeup Selector Switch to BORATE</p> <p>d. Place the RCS Makeup Control Switch to START</p>
	SRO/BOP	<p><b>3</b> Notify The Following</p> <ul style="list-style-type: none"> <li>• System Dispatcher</li> <li>• Plant personnel using the Page Boost</li> </ul>
	CREW	<p><b>4</b> Reduce Unit Load</p> <p>a. Check for boration effects (reducing Tavg) <span style="float: right;">a. IF boration is used, THEN wait for effects before starting load reduction.</span></p> <p>b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the ATTACHMENT 3 desired flow rate</p> <p>c. Initiate AND maintain load reduction rate to the target power level</p> <p>d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in ATTACHMENT 3 is maintained</p> <p>d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual AND maintain Tavg within the expected Tavg/Tref ΔT of ATTACHMENT 3.</p>
	SRO/ATC	<p><b>5</b> Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET</p> <p>Perform the following:</p> <p>a. Slow load reduction until alarm is reset.</p> <p>b. Re-evaluate boration amount and rate, and make adjustments as necessary.</p>
	SRO	<p><b>6</b> Notify The Shift Manager To Refer To The Following Procedures</p> <ul style="list-style-type: none"> <li>• D-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR</li> <li>• D-ADM-115, NOTIFICATION OF PLANT EVENTS</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p><i>Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-NOP-059.09, OPERATION WITHIN THE AXIAL FLUX DIFFERENCE OPERATIONAL SPACE.</i></p>



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Scenario No.: 2

Event No.: 7

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Event Description: Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>7</b></p> <p>Check Plant Response</p> <p>a. Check pressurizer level following program</p> <p>a. <u>IF</u> directed by the Unit Supervisor, <u>THEN</u> increase charging flow as follows:</p> <ol style="list-style-type: none"> <li>1) Start an additional charging pump.</li> <li>2) Place an additional letdown orifice in service.</li> <li>3) Place L/D Temp Controller TC-3-144A in Manual and Control letdown temperature manually.</li> <li>4) <u>WHEN</u> letdown temperature is 115-121°F and stable, <u>THEN</u> place TC-3-144A in AUTO.</li> </ol> <p>b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in ATTACHMENT 3</p> <p>b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual <u>AND</u> maintain Tavg within the expected Tavg/Tref ΔT of ATTACHMENT 3.</p>
	SRO/ATC	<p><b>8</b></p> <p>Energize Pressurizer Backup Heaters</p>
	SRO/BOP	<p><b>9</b></p> <p>Verify Turbine Load Less Than 570 MWE</p> <p><u>WHEN</u> turbine load is less than 570 MWE, <u>THEN</u> open the SGFP recirculation valves for the first feedwater pump to be stopped.</p> <p>Open the SGFP recirculation valves for the first feedwater pump to be stopped</p>
	SRO/ATC	<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;"><i>Boration should be stopped above the target power level to prevent excessive boration.</i></p>
	SRO/ATC	<p><b>10</b></p> <p>Monitor Turbine Load Within 10% Of Target Power Level</p> <p>Go to Step 11.</p> <p>Stop the boration as follows:</p> <ol style="list-style-type: none"> <li>a. Place the Reactor Makeup Selector Switch to AUTO</li> <li>b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired</li> <li>c. Place the RCS Makeup Control Switch to START</li> </ol>





Op-Test No.: 2011-302

Scenario No.: 2

Event No.: 7

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Event Description: Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>11 Check Target Load  IF Target Load is GREATER THAN 450 Mwe, THEN perform the following:</p> <ul style="list-style-type: none"> <li>a. Maintain reactor power at or below the target value using:               <ul style="list-style-type: none"> <li>• Boration/dilution</li> <li>• Control Rod adjustments</li> <li>• Turbine load adjustments</li> </ul> </li> <li>b. Maintain Tavg within <math>\pm 1</math> °F of Tref.</li> <li>c. Maintain Pressurizer level on program.</li> <li>d. Maintain Pressurizer pressure on program.</li> <li>e. Maintain SG Levels on program.</li> <li>f. Refer to any ONOPs in effect.</li> <li>g. Go to procedure and step in effect.</li> </ul> <p></p>
	SRO/BOP	<p>12 Check Station Service Loads Supplied From The Startup Transformer WHEN directed by the Unit Supervisor, THEN transfer station service from the Auxiliary Transformers to the Startup Transformer using ATTACHMENT 2.</p>
	SRO/BOP	<p>13 Check Auxiliary Steam Supplied From Another Unit WHEN directed by the Unit Supervisor, THEN align auxiliary steam supply from another unit using ATTACHMENT 1.</p> <p></p>
	BOP	Turnover Sheet Indicates Aux Steam is aligned to Unit 4.
	SRO/ATC	<p style="text-align: center;"><u>NOTES</u></p> <ul style="list-style-type: none"> <li>• Boration should be stopped above the target power level to prevent excessive boration, or at <math>\geq 25\%</math> power if the unit is to be taken off line.</li> <li>• Remaining procedure steps should be taken as appropriate for the intended power level.</li> </ul>
Examiner Note: The SRO may or may NOT implement the following steps.		
	SRO/BOP	<p>14 Continue Load Reduction</p> <ul style="list-style-type: none"> <li>a. Verify Turbine load less than – 450 MWE               <ul style="list-style-type: none"> <li>• Stop one heater drain pump</li> </ul> </li> <li>b. Verify Turbine load less than – 400 MWE               <ol style="list-style-type: none"> <li>1) Place the Feedwater Pump Turbine Runback Defeat switch to DEFEAT</li> <li>2) Stop the SGFP with recirculation valves open</li> <li>3) Place SGFP recirculation valves control switch in the CLOSED/AUTO position</li> </ol> </li> </ul> <p></p>

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Scenario No.: 2

Event No.: 7

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Event Description: Engineering reports 3B S/G Feedwater Pump High Vibration. SM directs a 3-GOP-100 power reduction to remove the 3B S/G Feedwater Pump within the next hour.

Time	Position	Applicant's Actions or Behavior
	BOP	<div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> 15 ↓ 16 ↓ </div> <div> <p>Ensure Station Service Loads Supplied From The Startup Transformer Using ATTACHMENT 2</p> <p>Ensure Auxiliary Steam Supplied From Another Unit Using ATTACHMENT 1</p> </div> </div>

**EXAMINER NOTE:** When power has been sufficiently reduced, proceed to EVENT 8.

### 3-GOP-100

#### FOLDOUT PAGE

##### 1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, THEN trip the Reactor and Turbine AND go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

- a. RCS Tav<sub>g</sub> - GREATER THAN 578 °F
- b. RCS Tav<sub>g</sub> - GREATER THAN Tref by 6 °F
- c. Rod Insertion Limits are exceeded as indicated by:
  - Rod Position Bank D Insertion Limit Recorder (VPA)
  - Stepcounters on console
  - Plant Curve Book Section 7, Figure 3

##### 2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, THEN notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

##### 3. Restore Blender to AUTO

WHEN boration is complete, THEN restore the Blender to AUTO as follows:

- a. Place the Reactor Makeup Selector Switch to AUTO.
- b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired.
- c. Place the RCS Makeup Control Switch to START.

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Scenario No.: 2

Event No.: 8

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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 8 - MAIN FEED HEADER BREAK WITH SGFP BKRS TRIPPING.</b> (insert TVFAHDR2 1 delay=0 ramp=0 on=0 off=0, insert TVFALN3 1.0 delay=0 ramp=0 on=0 off=0, insert TFF1D1AT TRUE delay=120 ramp=0 on=0 off=0, and insert TFF1D1BT TRUE delay=120 ramp=0 on=0 off=0)		
	SRO	Directs response using 3-EOP-E-0 starting at Step 1.
	CREW	<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <b>NOTE</b>            Steps 1 through 4 are IMMEDIATE ACTION steps.         </div>
	SRO/ATC	<b>1</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Verify Reactor Trip</b> <ul style="list-style-type: none"> <li>Rod bottom lights – ON</li> <li>Reactor trip and bypass breakers – OPEN</li> <li>Rod position indicators - AT ZERO</li> <li>Neutron flux – DECREASING</li> </ul> </div> <div style="width: 50%;">           Manually trip reactor. <b>IF</b> reactor power is greater than 5% <b>OR</b> intermediate range power is <b>NOT</b> stable or decreasing, <b>THEN</b> perform the following:           <ol style="list-style-type: none"> <li>Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.</li> </ol> </div> </div>
	SRO/BOP	<b>2</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Verify Turbine Trip</b> <ol style="list-style-type: none"> <li>All turbine stop or associated control valves – CLOSED</li> <li>Verify Moisture Separator Reheater Steam Valves – CLOSED               <ul style="list-style-type: none"> <li>MSR Main Steam Supply Stop MOVs</li> <li>Reheater Timing Valves</li> <li>MSR Purge Steam Valves</li> </ul> </li> <li>Check Mid and East GCBs – OPEN (Normally 30-second delay)</li> </ol> </div> <div style="width: 50%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"><b>[Event 10]</b></div> <ol style="list-style-type: none"> <li>Manually trip turbine. <b>IF</b> unable to verify turbine trip, <b>THEN</b> close main steamline isolation and bypass valves.</li> <li>Manually close valves. <b>IF</b> any valve can <b>NOT</b> be closed, <b>THEN</b> close main steamline isolation and bypass valves.</li> <li>Manually open breakers. <b>IF</b> breakers do <b>NOT</b> open, <b>THEN</b> actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).</li> </ol> </div> </div>

Op-Test No.: 2011-302

Scenario No.: 2

Event No.: 8

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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

## Applicant's Actions or Behavior

Time	Position	Applicant's Actions or Behavior
<b>CREW CRITICAL TASK:</b> Manually trip the Main Turbine prior to Step 5 of 3-EOP-E-0 as read by the Unit Supervisor.		
	SRO/BOP	<p><b>3</b></p> <p>Verify Power To Emergency 4 KV Buses</p> <p>a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED</p> <p>b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED</p> <p>c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS</p> <p>a. Perform the following:</p> <p>1) Attempt to emergency start any Unit 3 available diesel generator.</p> <p>2) <u>IF</u> neither 3A nor 3B 4 KV bus is energized, <u>THEN</u> go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.</p> <p>b. Attempt to emergency start the de-energized Unit 3 bus diesel generator.</p> <p>c. Perform the following:</p> <p>1) <u>IF</u> lockout of 3D 4 KV bus <u>NOT</u> present, <u>THEN</u> perform the following:</p> <p>a) Verify 3C CCW pump - BREAKER OPEN.</p> <p>b) Verify 3C ICW pump - BREAKER OPEN.</p> <p>c) Operate bus supply breakers to restore power.</p>

Op-Test No.: 2011-302

Scenario No.: 2

Event No.: 8

Page 3 of 12

Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>4</b> Check If SI Is Actuated</p> <ul style="list-style-type: none"> <li>* SI Annunciators - ANY ON</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* Safeguards equipment - AUTO STARTED</li> </ul> <p style="text-align: center;"><u>OR</u></p> <p>Perform the following:</p> <p>a. Check if SI is required:</p> <ul style="list-style-type: none"> <li>* Low pressurizer pressure - 1730 psig</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* High containment pressure - 4 psig</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* High steam line differential pressure - 100 psid</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>* High steam flow with low S/G pressure - 614 psig <u>OR</u> low Tav<sub>g</sub> (543 F)</li> </ul> <p>b. <u>IF</u> SI is required, <u>THEN</u> manually actuate SI and containment isolation phase A <u>AND</u> go to Step 5.</p> <p>c. <u>IF</u> SI is <u>NOT</u> required, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.</li> </ol>
	CREW	<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;"><i>FOLDOUT Page shall be monitored for the remainder of this procedure.</i></p>
	CREW	Monitors 3-EOP-E-0 Foldout page (see next page) Faulted S/G Criteria
	SRO/BOP	<p><b>5</b> Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure</p>

Examiner Note: 3-EOP-E-0, Attachment 3 commences at Page 38 and at Page 47.

Examiner Note: The SRO and ATC will complete the remaining steps in 3-EOP-E-0, while the BOP performs 3-EOP-E-0 Prompt Action Verifications using Attachment 3.

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Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

**FOLDOUT FOR PROCEDURE E-0****1. ADVERSE CONTAINMENT CONDITIONS**

IF either of the conditions listed below occur, THEN use adverse containment setpoints:

Containment atmosphere temperature  $\geq 180^{\circ}\text{F}$

OR

Containment radiation levels  $\geq 1.3 \times 10^5$  R/hr

WHEN containment parameters drop below the above values, THEN normal setpoints can again be used

IF the TSC determines that containment integrated dose rate has not exceeded  $10^6$  Rads.

**2. RCP TRIP CRITERIA**

a. IF both conditions listed below occur, THEN trip all RCPs:

1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED.

2) RCS subcooling - LESS THAN  $25^{\circ}\text{F}$  [ $65^{\circ}\text{F}$ ]

b. IF phase B actuated, THEN trip all RCPs.

**3. FAULTED S/G ISOLATION CRITERIA**

IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed:

a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6% [32%].

b. Isolate AFW flow to faulted S/G(s).

c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range.

**4. RUPTURED S/G ISOLATION CRITERIA**

IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6% [32%], THEN feed flow may be stopped to affected S/G(s).

**5. AFW SYSTEM OPERATION CRITERIA**

a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal

b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, THEN that AFW pump shall be shut down

**6. CST MAKEUP WATER CRITERIA**

IF CST level decreases to less than 10%, THEN add makeup to CST using 3-NOP-018.01, CONDENSATE STORAGE TANK (CST).

**7. RHR SYSTEM OPERATION CRITERIA**

IF RHR flow is less than 1000 gpm, THEN the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>6</b></p> <p>Check AFW Pumps - AT LEAST TWO RUNNING</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Manually open valves to establish two AFW pumps running.</li> <li><u>IF</u> an AFW pump is tripped, <u>THEN</u> dispatch an operator to locally reset the AFW turbine trips.</li> <li><u>IF</u> both units require AFW <u>AND</u> only one AFW pump is available, <u>THEN</u> perform the following: <ol style="list-style-type: none"> <li>Verify all RCPs - TRIPPED</li> <li>Establish 270 gpm AFW flow to each unit.</li> <li>Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.</li> </ol> </li> </ol>
<p><b>EXAMINER NOTE:</b> The Aux. Feedwater Pumps initially come up to speed. This scenario simulates a total loss of suction in the Aux. Feed Water System. The key parameters to watch are S/G Levels and AFW Flow. A Red Path for 3-EOP-FR-H.1 will come in quickly due to this massive break.</p>		
	SRO/ATC	<p><b>7</b></p> <p>Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT</p> <p>Manually align valves to establish proper AFW alignment.</p>



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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>8</b> Verify Proper AFW Flow</p> <p>a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] → a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify AFW flow greater than 345 gpm.</li> <li>2) <u>IF</u> AFW flow less than 345 gpm, <u>THEN</u> manually start pumps <u>AND</u> align valves to establish greater than 345 gpm flow.</li> <li>3) <u>IF</u> total feed flow from all sources greater than 345 gpm can <u>NOT</u> be established, <u>THEN</u> perform the following:               <ol style="list-style-type: none"> <li>a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.</li> </ol> </li> </ol>
<b>EXAMINER CUE: CREW observes a RED PATH for Loss of Secondary Heat Sink and recommends an immediate entry to 3-EOP-FR-H.1. (Page 44)</b>		
	SRO/ATC	b. Maintain feed flow to S/G until narrow range levels between 15%[32%] and 50%
	SRO/ATC	UNABLE to raise flow to at least 345 gpm. Directs the field operator to investigate the loss.
	SRO	Directs STA to monitor 3-EOP-F-0 and transitions to 3-EOP-FR-H.1 for Response to Loss of Secondary Heat Sink. [Event 9 – Page 44]

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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>1. Check The Load Centers Associated With The Energized 4 KV Buses – <b>ENERGIZED</b></p> <p>Close the Load Center supply breakers.</p> <ul style="list-style-type: none"> <li>• 3A LC</li> <li>• 3B LC</li> <li>• 3C LC</li> <li>• 3D LC</li> <li>• 3H LC</li> </ul>
	BOP	<p>2. Check If Main Steamlines Should Be Isolated</p> <p>a. Check main steamline isolation and bypass valves – ANY OPEN</p> <p>a. Go to Step 3.</p> <p>b. Check if either main steam isolation signal has actuated</p> <p>b. Go to Step 3.</p> <ul style="list-style-type: none"> <li>• High steam flow with either low S/G pressure 614 psig <u>OR</u> low Tavg 543 F</li> <li>• <u>OR</u></li> <li>• Hi-Hi containment pressure 20 PSIG</li> </ul> <p>c. Verify main steam isolation and bypass valves – CLOSED</p> <p>c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.</p>
	BOP	<p>3. Verify Feedwater Isolation</p> <p>a. Place main feedwater pump switches in STOP</p> <p>b. Feedwater control valves – CLOSED</p> <p>b. Manually close valves.</p> <p>c. Feedwater bypass valves – CLOSED</p> <p>c. Manually close valves.</p> <p>d. Close feedwater isolation MOVs</p> <p>d. Locally close valves.</p> <p>e. Verify standby feedwater pumps – OFF</p> <p>e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).</p>

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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>4. Verify Proper ICW System Operation</p> <p>↓</p> <p>a. Verify ICW pumps - AT LEAST TWO RUNNING</p> <p>b. Verify ICW to TPCW Heat Exchanger - ISOLATED</p> <ul style="list-style-type: none"> <li>POV-3-4882 - CLOSED</li> <li>POV-3-4883 - CLOSED</li> </ul> <p>c. Check ICW headers - TIED TOGETHER</p> <p>a. Start ICW pump(s) to establish at least two running.</p> <p>b. Manually close valve(s). <b>[Event 11]</b> IF valve(s) can <b>NOT</b> be closed, <b>THEN</b> locally close the following valves:</p> <ul style="list-style-type: none"> <li>3-50-318 for POV-3-4882</li> <li>3-50-338 for POV-3-4883</li> </ul> <p>c. IF both ICW headers are intact, <b>THEN</b> direct operator to tie headers together.</p>
	BOP	<p>5. Verify Proper CCW System Operation</p> <p>↓</p> <p>a. CCW Heat Exchangers - THREE IN SERVICE</p> <p>b. CCW pumps - ONLY TWO RUNNING</p> <p>c. CCW headers - TIED TOGETHER</p> <p>d. RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>Start or stop CCW pumps as necessary to establish <b>ONLY ONE</b> RUNNING CCW PUMP.</li> <li>Verify Emergency Containment Coolers - <b>ONLY TWO</b> RUNNING</li> <li>Go to Step 5c.</li> </ol> <p>b. Start or stop CCW pumps as necessary to establish <b>ONLY TWO</b> RUNNING CCW PUMPS.</p> <p>c. IF both CCW headers are intact, <b>THEN</b> direct a field operator to tie the headers together.</p> <p>d. IF containment isolation phase B <b>NOT</b> actuated <b>AND</b> CCW radiation levels are normal, <b>AND</b> RCP number one seal leak-off temperature is less than 235°F, <b>THEN</b> manually open MOV-3-626. IF MOV-3-626 can <b>NOT</b> be manually opened, <b>THEN</b> direct operator to open MOV-3-626 locally.</p>

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Event Description: During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed. The Main Turbine fails to automatically trip. The BOP will take compensatory action to trip the Turbine manually. The ICW to TPCW Heat Exchanger Valve, POV-3-4883, does not automatically isolate on a Safety Injection signal. The BOP takes action while performing Attachment 3 of 3-EOP-E-0 to manually close the valve.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>6. Verify Containment Cooling</p> <p>a. Check emergency containment coolers - ONLY TWO RUNNING</p> <p>a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.</p> <p>b. Verify emergency containment filter fans - AT LEAST TWO RUNNING</p> <p>b. Manually start emergency containment filter fans.</p>
	BOP	<p>7. Verify Pump Operation</p> <p>a. At least two high head SI pumps running</p> <p>a. Manually start high-head pump(s).</p> <p>b. Both RHR pumps running</p> <p>b. Manually start RHR pump(s).</p>
	BOP	<p>8. Verify SI Flow</p> <p>a. RCS pressure - LESS THAN 1600 PSIG [2000 PSIG]</p> <p>a. Go to Step 9.</p> <p>b. High-head SI pump flow indicator - CHECK FOR FLOW</p> <p>b. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p> <p>c. RCS pressure - LESS THAN 250 PSIG [650 PSIG]</p> <p>c. Go to Step 9.</p> <p>d. RHR pump flow indicator - CHECK FOR FLOW</p> <p>d. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p>
	BOP	<p>9. Realign SI System</p> <p>a. Verify Unit 3 high-head SI pumps - TWO RUNNING</p> <p>a. Perform the following:</p> <p>1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps.</p> <p>2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure.</p> <p>3) Go to Step 10.</p> <p>b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby</p>

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Time	Position	Applicant's Actions or Behavior
	BOP	<p>10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Manually actuate Containment Isolation Phase A.</li> <li><u>IF</u> any Containment Isolation Phase A valve is <u>NOT</u> closed, <u>THEN</u> manually close valve. <u>IF</u> valve(s) can <u>NOT</u> be manually closed, <u>THEN</u> manually or locally isolate affected containment penetration.</li> </ol>
	BOP	<p>11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT</p> <p>Manually align valves to establish proper SI alignment for an injection flowpath.</p>
	BOP	<p>12. Verify SI – RESET</p> <p>Reset SI</p>
	BOP	<p>13. Verify Containment Phase A – RESET</p> <p>Reset Phase A</p>
	BOP	<p>14. Reestablish RCP Cooling</p> <ol style="list-style-type: none"> <li>Check RCPs – AT LEAST ONE RUNNING</li> <li>Open CCW to normal containment cooler valves <ul style="list-style-type: none"> <li>MOV-3-1417</li> <li>MOV-3-1418</li> </ul> </li> <li>Reset and start normal containment coolers</li> </ol> <ol style="list-style-type: none"> <li>Go to Step 15.</li> <li>Stop all RCPs</li> <li>Stop all RCPs</li> </ol>

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Time	Position	Applicant's Actions or Behavior
	BOP	<p>15. Monitor Containment Pressure To Verify Containment Spray <u>NOT</u> Required</p> <p>a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG</p> <ul style="list-style-type: none"> <li>PR-3-6306A</li> </ul> <p><u>AND</u></p> <ul style="list-style-type: none"> <li>PR-3-6306B</li> </ul> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li><u>IF</u> containment spray <u>NOT</u> initiated, <u>THEN</u> manually initiate containment spray.</li> <li>Verify Containment Isolation Phase B - ACTUATED.</li> <li>Verify Containment Isolation Phase B valve white lights on VPB - ALL BRIGHT.</li> <li><u>IF</u> any Containment Isolation Phase B valve did <u>NOT</u> close, <u>THEN</u> manually or locally isolate affected containment penetration.</li> <li>Stop all RCPs.</li> </ol>
	BOP	<p>16. Verify Containment and Control Room Ventilation Isolation</p> <p>a. Unit 3 containment purge exhaust and supply fans - OFF</p> <p>b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT</p> <p>a. Manually stop fans.</p> <p>b. Manually align equipment for Control Room emergency recirculation.</p>
	BOP	<p style="text-align: center;"><b>NOTE</b></p> <p><i>Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.</i></p>
	BOP	<p>17. Place Hydrogen Monitors in Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM</p>
	BOP	<p>18. Verify All Four EDGs - RUNNING</p> <p>EMERGENCY START any available EDG <u>NOT</u> running.</p>

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Time	Position	Applicant's Actions or Behavior
	BOP	<p>19. Verify Power To Emergency 4 KV Buses and Load Centers</p> <p>a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Inform the Unit Supervisor that ATTACHMENT 3 is complete with the exception of the de-energized bus or buses.</li> <li>2) <u>IF</u> the Unit Supervisor decides not to energize the de-energized bus or buses, <u>THEN</u> go to Step 20.</li> <li>3) <u>IF</u> the Unit Supervisor decides to energize 3A, 3B, or 3D bus, <u>THEN</u> perform the following:               <ol style="list-style-type: none"> <li>a) <u>IF</u> 3A 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>b) <u>IF</u> 3B 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>c) <u>IF</u> 3D 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.</li> </ol> </li> </ol>
	BOP	<p>20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Discuss Any Safeguards Equipment That Is Not In The Required Condition</p>

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During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-EOP-FR-H.1 response.
	SRO/ATC	<div><p style="text-align: center;"><u>CAUTIONS</u></p><ul style="list-style-type: none"><li>• If total feed flow has been reduced to less than 345 gpm due to procedural requirements and 345 gpm total feed flow is available, then this procedure shall NOT be performed.</li><li>• Feed flow should NOT be reestablished to any faulted S/G if a non-faulted S/G is available.</li></ul></div>
	SRO/ATC	<div><div>1 ↓</div><div><p>Check If Secondary Heat Sink Is Required</p><div><div>a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE</div><div>a. Return to procedure and step in effect.</div></div><div><div>b. RCS average temperature - GREATER THAN 350°F</div><div>b. Try to place RHR System in service while continuing in this procedure. Refer to 3-OP-050, RESIDUAL HEAT REMOVAL SYSTEM. <u>IF</u> adequate cooling with RHR system established, <u>THEN</u> return to procedure and step in effect.</div></div></div></div>
	SRO/ATC	<div><p style="text-align: center;"><u>CAUTIONS</u></p><ul style="list-style-type: none"><li>• If wide range level in any S/G is less than 22% [narrow range level in all S/Gs less than 32%] or PRZ pressure is greater than or equal to 2335 psig due to loss of secondary heat sink, Steps 11 through 19 should be initiated immediately for bleed and feed.</li><li>• If CST level decreases to less than 10%, makeup water sources for CST will be necessary to maintain secondary heat sink.</li></ul></div>
	ATC	Observes 3C SG Wide Range level less than 22%
	SRO	Directs immediate transition to steps 11-19 of 3-EOP-FR-H.1
	SRO/ATC	<div><p style="text-align: center;"><u>CAUTION</u></p><p>Steps 11 through 19 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.</p></div>
	SRO/ATC	11      Verify RCPs - ALL STOPPED



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During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	12 Actuate SI <u>AND</u> Containment Isolation Phase A
	SRO/ATC	<p>13 Verify RCS Feed Path</p> <p>a. Check high-head SI pumps – AT LEAST ONE RUNNING</p> <p>b. Verify SI valve amber lights on VPB - ALL BRIGHT</p> <p>Manually start pumps and align valve(s) to establish RCS feed path. <u>IF</u> RCS feed path can <u>NOT</u> be established, <u>THEN</u> continue attempts to establish S/G feed flow. Observe CAUTIONS prior to Step 2 <u>AND</u> return to Step 2.</p>
	SRO/ATC	<p>14 Establish RCS Bleed Path</p> <p>a. Verify power to PRZ PORV block valves - AVAILABLE</p> <p>b. Verify PRZ PORV block valves - BOTH OPEN</p> <p>c. Open both PRZ PORVs</p> <p>a. Restore power to block valves.</p> <p>b. Open both block valves.</p>
	SRO/ATC	<p>15 Verify Instrument Air To Containment</p> <p>a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN</p> <p>b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG</p> <p>b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.</p>
	SRO/ATC	<p>16 Verify Adequate RCS Bleed Path</p> <ul style="list-style-type: none"> <li>PRZ PORVs - BOTH OPEN</li> <li>PRZ PORV block valves – BOTH OPEN</li> </ul>
		<p style="text-align: center;"><b>CAUTION</b></p> <p><i>If SI is reset and either offsite power is lost or SI actuation occurs on the other unit, manual action may be required to restore safeguards equipment to the required configuration.</i></p>
		<p>17 Reset SI</p> <p>↓</p>

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During the loss of Main Feed, a common loss of suction to all AFW pumps. The crew transitions to 3-EOP-FR-H.1 to initiate Feed and Bleed.

		18	Reset Containment Isolation Phase A And Phase B	
		19	Realign SI System a. Verify Unit 3 high-head SI pumps - TWO RUNNING a. Perform the following: 1) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 2) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 3) Observe CAUTION prior to Step 20 <u>AND</u> go to Step 20. b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby	

**Crew Critical Task:** At the CAUTION before Step 2 of 3-EOP-FR-H.1, initiate bleed and feed to depressurize the RCS sufficiently for HHSI injection flow.

#### TERMINATION CRITERIA

**EXAMINER NOTE:** The scenario is terminated when the crew verifies the RCS bleed & feed flowpath of 3-EOP-FR-H.1 after Step 19 or earlier based on the discretion of the Lead Examiner.

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>1. Check The Load Centers Associated With The Energized 4 KV Buses – <b>ENERGIZED</b></p> <ul style="list-style-type: none"> <li>• 3A LC</li> <li>• 3B LC</li> <li>• 3C LC</li> <li>• 3D LC</li> <li>• 3H LC</li> </ul> <p>Close the Load Center supply breakers.</p>
	BOP	<p>2. Check If Main Steamlines Should Be Isolated</p> <p>a. Check main steamline isolation and bypass valves - ANY OPEN → a. Go to Step 3.</p> <p>b. Check if either main steam isolation signal has actuated → b. Go to Step 3.</p> <ul style="list-style-type: none"> <li>• High steam flow with either low S/G pressure 614 psig <u>OR</u> low Tav<sub>g</sub> 543 F</li> <li><u>OR</u></li> <li>• Hi-Hi containment pressure 20 PSIG</li> </ul> <p>c. Verify main steam isolation and bypass valves - CLOSED</p> <p>c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.</p>
	BOP	<p>3. Verify Feedwater Isolation</p> <p>a. Place main feedwater pump switches in STOP</p> <p>b. Feedwater control valves – CLOSED</p> <p>c. Feedwater bypass valves – CLOSED</p> <p>d. Close feedwater isolation MOVs</p> <p>e. Verify standby feedwater pumps – OFF</p> <p>b. Manually close valves.</p> <p>c. Manually close valves.</p> <p>d. Locally close valves.</p> <p>e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).</p>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>4. Verify Proper ICW System Operation</p> <p>↓</p> <p>a. Verify ICW pumps - AT LEAST TWO RUNNING</p> <p>b. Verify ICW to TPCW Heat Exchanger – ISOLATED</p> <ul style="list-style-type: none"> <li>POV-3-4882 – CLOSED</li> <li>POV-3-4883 – CLOSED</li> </ul> <p>c. Check ICW headers - TIED TOGETHER</p> <p>a. Start ICW pump(s) to establish at least two running.</p> <p><b>[Event 11]</b></p> <p>b. Manually close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> locally close the following valves:</p> <ul style="list-style-type: none"> <li>3-50-319 for POV-3-4882</li> <li>3-50-339 for POV-3-4883</li> </ul> <p>c. <u>IF</u> both ICW headers are intact, <u>THEN</u> direct operator to tie headers together.</p>
	BOP	<p>5. Verify Proper CCW System Operation</p> <p>↓</p> <p>a. CCW Heat Exchangers – THREE IN SERVICE</p> <p>b. CCW pumps – ONLY TWO RUNNING</p> <p>c. CCW headers - TIED TOGETHER</p> <p>d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>Start or stop CCW pumps as necessary to establish <u>ONLY ONE</u> RUNNING CCW PUMP.</li> <li>Verify Emergency Containment Coolers - <u>ONLY TWO</u> RUNNING</li> <li>Go to Step 5c.</li> </ol> <p>b. Start or stop CCW pumps as necessary to establish <u>ONLY TWO</u> RUNNING CCW PUMPS.</p> <p>c. <u>IF</u> both CCW headers are intact, <u>THEN</u> direct a field operator to tie the headers together.</p> <p>d. <u>IF</u> containment isolation phase B <u>NOT</u> actuated <u>AND</u> CCW radiation levels are normal, <u>AND</u> RCP number one seal leak-off temperature is less than 235°F, <u>THEN</u> manually open MOV-3-626. <u>IF</u> MOV-3-626 can <u>NOT</u> be manually opened, <u>THEN</u> direct operator to open MOV-3-626 locally.</p>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>6. Verify Containment Cooling</p> <p>a. Check emergency containment coolers - ONLY TWO RUNNING</p> <p>b. Verify emergency containment filter fans - AT LEAST TWO RUNNING</p> <p>a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.</p> <p>b. Manually start emergency containment filter fans.</p>
	BOP	<p>7. Verify Pump Operation</p> <p>a. At least two high head SI pumps running</p> <p>b. Both RHR pumps running</p> <p>a. Manually start high-head pump(s).</p> <p>b. Manually start RHR pump(s).</p>
	BOP	<p>8. Verify SI Flow</p> <p>a. RCS pressure - LESS THAN 1600 PSIG [2000 PSIG]</p> <p>b. High-head SI pump flow indicator - CHECK FOR FLOW</p> <p>c. RCS pressure - LESS THAN 250 PSIG [650 PSIG]</p> <p>d. RHR pump flow indicator - CHECK FOR FLOW</p> <p>a. Go to Step 9.</p> <p>b. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p> <p>c. Go to Step 9.</p> <p>d. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p>
	BOP	<p>9. Realign SI System</p> <p>a. Verify Unit 3 high-head SI pumps - TWO RUNNING</p> <p>b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps.</li> <li>2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure.</li> <li>3) Go to Step 10.</li> </ol>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Manually actuate Containment Isolation Phase A.</li> <li>IF any Containment Isolation Phase A valve is <b>NOT</b> closed, <b>THEN</b> manually close valve. IF valve(s) can <b>NOT</b> be manually closed, <b>THEN</b> manually or locally isolate affected containment penetration.</li> </ol>
	BOP	<p>11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT</p> <p>Manually align valves to establish proper SI alignment for an injection flowpath.</p>
	BOP	<p>12. Verify SI – RESET</p> <p>Reset SI</p>
	BOP	<p>13. Verify Containment Phase A – RESET</p> <p>Reset Phase A</p>
	BOP	<p>14. Reestablish RCP Cooling</p> <ol style="list-style-type: none"> <li>Check RCPs – AT LEAST ONE RUNNING</li> <li>Open CCW to normal containment cooler valves <ul style="list-style-type: none"> <li>MOV-3-1417</li> <li>MOV-3-1418</li> </ul> </li> <li>Reset and start normal containment coolers</li> </ol> <ol style="list-style-type: none"> <li>Go to Step 15.</li> <li>Stop all RCPs</li> <li>Stop all RCPs</li> </ol>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>15. Monitor Containment Pressure To Verify Containment Spray <u>NOT</u> Required</p> <p>a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG</p> <ul style="list-style-type: none"> <li>PR-3-6306A</li> </ul> <p><u>AND</u></p> <ul style="list-style-type: none"> <li>PR-3-6306B</li> </ul> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li><u>IF</u> containment spray <u>NOT</u> initiated, <u>THEN</u> manually initiate containment spray.</li> <li>Verify Containment Isolation Phase B - ACTUATED.</li> <li>Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT.</li> <li><u>IF</u> any Containment Isolation Phase B valve did <u>NOT</u> close, <u>THEN</u> manually or locally isolate affected containment penetration.</li> <li>Stop all RCPs.</li> </ol>
	BOP	<p>16. Verify Containment and Control Room Ventilation Isolation</p> <p>a. Unit 3 containment purge exhaust and supply fans – OFF</p> <p>b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT</p> <p>a. Manually stop fans.</p> <p>b. Manually align equipment for Control Room emergency recirculation.</p>
	BOP	<p style="text-align: center;"><b>NOTE</b></p> <p><i>Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.</i></p>
	BOP	<p>17. Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM</p>
	BOP	<p>18. Verify All Four EDGs – RUNNING</p> <p>EMERGENCY START any available EDG <u>NOT</u> running.</p>

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**NOTE: This is an additional Attachment 3 which is conveniently at the end for evaluator comments.**

3-EOP-E-0, Reactor Trip or Safety Injection – Attachment 3, Prompt Action Verifications

Time	Position	Applicant's Actions or Behavior
	BOP	<p>19. Verify Power To Emergency 4 KV Buses and Load Centers</p> <p>a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Inform the Unit Supervisor that ATTACHMENT 3 is complete with the exception of the de-energized bus or buses.</li> <li>2) <u>IF</u> the Unit Supervisor decides not to energize the de-energized bus or buses, <u>THEN</u> go to Step 20.</li> <li>3) <u>IF</u> the Unit Supervisor decides to energize 3A, 3B, or 3D bus, <u>THEN</u> perform the following:               <ol style="list-style-type: none"> <li>a) <u>IF</u> 3A 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>b) <u>IF</u> 3B 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>c) <u>IF</u> 3D 4 KV bus de-energized, <u>THEN</u> restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.</li> </ol> </li> </ol>
	BOP	<p>20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Discuss Any Safeguards Equipment That Is Not In The Required Condition</p> <p>↓</p>



# **ILC-27 NRC Scenario #3 Event Description**

<b>Facility:</b> <u>Turkey Point</u>	<b>Scenario:</b> <u>3</u>	<b>Op Test.:</b> <u>2011-302</u>
<b>Examiners:</b> _____	<b>Candidates:</b> _____	<b>US</b>
_____	_____	<b>ATC</b>
_____	_____	<b>BOP</b>
<b>Initial Conditions:</b> <u>Mode 2</u> <u>2% power at MOL.</u>		
<b>Turnover:</b> <ul style="list-style-type: none"> <li>Raise Reactor Power to 5% with Control Rods. Reactor Engineering has limited rod withdrawal rate to 5 step pulls.</li> <li>Setting up plant conditions to roll the Main Turbine next shift.</li> <li>MODE 1 preparations are complete along with permission to enter MODE 1.</li> </ul>		

Event No.	Malf. No.	Event Type	Event Description
1	TFN1CP22	(I) BOP (I,TS) SRO	A Power Range Nuclear Instrument N-42 Control Power fuse blows. The ATC checks all PR NI Channels to determine the failure. 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction, is entered to remove the channel from service. The SRO will address LCO 3.3.1.
2	N/A	(R) ATC (R) SRO	In accordance with 3-GOP-301, raise power to 5% for rolling the Main Turbine with Control Rods. MODE 1 preps are complete for the MODE change.
3	TFK1A12T TFK1A611 TFK1S611	(C) ATC (C, TS) SRO	3A CCW Pump trips due to breaker failure. 3-701G, PC-3_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.
4	TFE2D22T	(C) BOP (C) SRO	The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.
5	TFKXSMA	(C) BOP (C) SRO	The 3A TPCW Pump shaft fails. The BOP will start the 3B TPCW pump using the ARP, 3-ONOP-008, or 0-ADM-211 to maintain plant operations.
6	IAH2S44J	(I) ATC (I) SRO	The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.
7	TVSBVL14	(M) ALL	A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.
8	TFL3SIA2 TFL3S1 TFMUV41C	(C) BOP (C) ATC (C) SRO	During the performance of 3-EOP-E-0; 1) the B Train of SI fails to actuate, 2) The "A" Cmtt Spray Signal fails to actuate, and 3) MOV-3-880B fails to open. The ATC/BOP manually actuates SI and aligns Cmtt Spray.
9	TFSVVX6C TFFYO32 TAFK007	(C) ATC (C) SRO	Manual/local actions are required to isolate 3B S/G. 1) The 3B MSIV fails to close in AUTO. The BOP manually closes using Attachment 3 of 3-EOP-E-0. 2) Also, the 3B S/G AFW Control Valve, CV-3-2832, fails open. AFRD-3-007 is closed locally to isolate.

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

**SIMULATOR SETUP INSTRUCTIONS**

1. Reset to IC-5 (2% MOL) or other IC with correct setup conditions.
2. Place Simulator in RUN
3. Open and Execute ILC27SCN3N.Isn.
4. Start 3A CCW Pump.
5. Stop 3B CCW Pump.
6. Trigger lesson steps:
  - SETUP - B TRAIN OF SI FAILS TO ACTUATE  
insert TFL3SIA2 TRUE delay=0 ramp=0 on=0 off=0
  - SETUP - 3B MSIV FAILS TO AUTO CLOSE  
insert TFSVVX6C true delay=0 ramp=0 on=0 off=0
7. Store IC with initial conditions setup if desired.
8. Place Simulator in freeze.
9. Provide Shift Turnover Checklists
10. Perform Simulator Operator Checklist
11. When ready to begin, place Simulator in RUN.

**FACILITY OPERATOR INSTRUCTIONS**

**EVENT 1**

A Power Range Nuclear Instrument N-42 Control Power fuse blows. The ATC checks all PR NI Channels to determine the failure. 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction, is entered to remove the channel from service. The SRO will address LCO 3.3.1.

**When directed, Trigger EVENT 1 - N42 PR NI CONTROL POWER FUSE BLOWS.**

- insert TFN1CP22 TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of Power Range Nuclear Instrument N-42.

**WCC** - If directed, respond and acknowledge the failure of Power Range Nuclear Instrument N-42 and to write a PWO for troubleshooting.

**EVENT 2**

In accordance with 3-GOP-301, raise power to 5% for rolling the Main Turbine with Control Rods. MODE 1 preps are complete for the MODE change.

**SM** - If directed, acknowledge power increase.

**WCC** - If directed, acknowledge power increase.

**SYSTEM DISPATCH** - If directed, acknowledge power increase.

**ENGINEERING** - If directed, acknowledge power increase.

**CHEMISTRY** - If directed, acknowledge power increase.

**When directed, RACKOUT breakers on Schema: 3A CCW Pump = TAK1A12P and  
3A TPCW Pump = TAK3A11P**

**EVENT 3**

3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

**When directed, Trigger EVENT 3 - 3A CCW PUMP BREAKER TRIPS.**

- insert TFK1S611 TRUE delay=0 ramp=0 on=0 off=0
- insert TFK1A611 TRUE delay=0 ramp=0 on=0 off=0
- insert TFK1A12T TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of 3A CCW PUMP TRIP.

**WCC** - If directed, respond and acknowledge the failure of 3A CCW PUMP TRIP and to write a PWO for troubleshooting.

**SNPO/ FS** - If directed, respond and investigate the failure of 3A CCW PUMP TRIP. Also, verify a SAT start on the 3B CCW Pump or the 3C CCW Pump.

#### **EVENT 4**

The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.

##### **When directed, Trigger EVENT 4 – LOSS OF 3D BUS.**

- insert TFE2D22T TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the loss of the 3D Bus.

**WCC** - If directed, respond and acknowledge the loss of the 3D Bus and to write a PWO for troubleshooting.

**SNPO/** - If directed, respond and investigate the loss of the 3D Bus. After a minute, call back without any  
**FS** protective relays actuated, lockout relays reset, and both 3AD01 (Supply from Bus 3A) and AD06 (Supply from Bus 3B) are open.

##### **When directed, Trigger EVENT 5 - 3A TPCW PUMP SHAFT FAILS.**

- insert TFKXSMA TRUE delay=0 ramp=0 on=0 off=0

**SM** - If directed, respond and acknowledge the issue with 3A TPCW Pump shaft failure.

**WCC** - If directed, respond and acknowledge the issue with 3A TPCW Pump shaft failure.

**U3 TO/** - If directed, respond and investigate the loss of the 3A TPCW Pump. Also, after a few minutes,  
**FS** report 3B TPCW Pump is running SAT.

#### **EVENT 6**

The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.

##### **When directed, Trigger EVENT 6 - MASTER PZR PRESS CNTRL FAIL.**

- insert IAH2S44J 0.000000 delay=0 ramp=180 on=0 off=0

**SM** - If directed, respond and acknowledge the failure of PC-3-444J, Pressurizer Pressure Controller.

**WCC** - If directed, respond and acknowledge the failure of PC-3-444J, Pressurizer Pressure Controller and to write a PWO for troubleshooting.

#### **EVENT 7**

Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0. Otherwise, 3-EOP-E-2 ensures 3B MSIV is closed and 3B S/G isolation.

##### **When directed, Trigger EVENT 7 - 3B MAIN STEAM LINE BREAK INSIDE CTMT.**

- insert TVSBVL14 0.5 delay=0 ramp=120 on=0 off=0

**EVENT 8**

During the performance of 3-EOP-E-0; 1) the B Train of SI fails to actuate, 2) The "A" Ctmt Spray Signal fails to actuate, and 3) MOV-3-880B fails to open. The ATC manually actuates SI and aligns Ctmt Spray.

The triggers below are linked or previously performed, ENSURE they are actuated.

**Triggered during Simulator Setup Instructions, SETUP – B TRAIN OF SI FAILS TO ACTUATE.**

- insert TFL3SIA2 TRUE delay=0 ramp=0 on=0 off=0

**Auto triggers off of EVENT 7, EVENT 8 – CTMT SPRAY FAILURES.**

- insert TFL3S1 0.5 delay=0 ramp=120 on=0 off=0
- insert TFMUV41C 0.5 delay=0 ramp=120 on=0 off=0

**EVENT 9**

Manual/local actions are required to isolate 3B S/G. 1) The 3B MSIV fails to close in AUTO. The BOP manually closes using Attachment 3 of 3-EOP-E-0. 2) Also, the 3B S/G AFW Control Valve, CV-3-2832, fails open. AFD-3-007 is closed locally to isolate.

**When contacted by the crew to isolate, then TRIGGER, EVENT 9 – FAIL OPEN FK-CV-2832 – AFW TO 3B SG. Report back when isolated.**

- insert TAFK007 0.000000 delay=0 ramp=0 on=0 off=0

The triggers below are linked or previously performed, ENSURE they are actuated.

**Triggered during Simulator Setup Instructions, SETUP – 3B MSIV FAILS TO AUTO CLOSE.**

- insert TFSVX6C true delay=0 ramp=0 on=0 off=0

**Conditional IMS1X6C (3B MSIV SW-CLOSE), triggers EVENT 9 – MANUAL CLOSURE OF 3B MSIV**

- della TFSVX6C 2 delay=0

**Auto triggers off of EVENT 8, EVENT 9 – FAIL OPEN FK-CV-2832 – AFW TO 3B SG.**

- insert TFFYO32 true delay=0 ramp=0 on=0 off=0

## ILC-27 NRC Scenario #3 Event Description

### SCENARIO QUANTITATIVE ATTRIBUTES

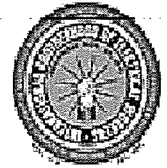
<b>Target Quantitative Attributes (Per Scenario; See Section D.5.d)</b>	<b>#</b>
1. Total malfunctions (5–8)	5
2. Malfunctions after EOP entry (1–2)	5
3. Abnormal events (2–4)	4
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	2
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	3

### CRITICAL TASKS

1. Trip RCPs due high Containment pressure and Phase B Isolation of CCW to RCPs prior to exiting 3-EOP-E-0.
2. Isolates the Faulted 3B S/G prior to exiting 3-EOP-E-0 when 3-EOP-FR-P.1 is NOT present, otherwise as directed in 3-EOP-FR-P.1.
3. If RHR Flow less than 1000 gpm, stop the RHR Pumps within 44 minutes of their start signal. (3-EOP-FR-P.1)



# OPERATIONS SHIFT TURNOVER REPORT



## ONCOMING CREW ASSIGNMENTS

Shift Mgr:			Inside SNPO:	
Field Supv.:			Outside SNPO:	
Admin RCO:			ANPO:	
<b>Unit 3</b>			<b>Unit 4</b>	
Unit Supv.:			Unit Supv.:	
RCO:			RCO:	
NPO:			NPO:	

## Plant Status

<b>Unit 3</b>			<b>Unit 4</b>	
Mode:	2		Mode:	1
Power:	2 %		Power:	100 %
MWe:	0		MWe:	758
Gross Leakrate:	0.03 gpm		Gross Leakrate:	0.03 gpm
RCS Boron Conc:	1139 ppm		RCS Boron Conc:	268 ppm

### Operational Concerns:

- Raise Reactor Power to 5% with Control Rods. Reactor Engineering has limited rod withdrawal rate to 5 step pulls.
- Setting up plant conditions to roll the Main Turbine next shift.
- MODE 1 preparations are complete along with permission to enter MODE 1.

### U3 Anticipated LCO Actions:

### U4 Anticipated LCO Actions:

### Results of Offgoing Focus Area:

# Unit 3 Status

## Reactor Operator

Mode:	2
Power: %	2
MWe:	0
Tavg: *F	549
RCS Pressure: psig	2235
RCS Boron Conc:	1139 ppm

RCS Leakrate	
Gross:	0.03 gpm
Unidentified	0.02 gpm
Charging Pps:	0.01 gpm

Accumulator Ref Levels	
A	6616 gal
B	6641 gal
C	6627 gal

### Abnormal Annunciators:

Annunciator:	Various alarms for startup
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	
Annunciator:	
Comp Actions:	

### Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items")

T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	
T.S.A.S / Component:	
Reason:	
Entry Date:	



## Unit 3 Status

### Changes to Risk Significant Equipment:

- B train protected both units
- Online risk green

### Upcoming Reactivity Management Activities:

### Upcoming Major POD Activities:

### Upcoming ECOs to Hang and /or Release:

### Evolutions or Compensatory Actions in Progress:

### General Information, Remarks, and Operator Work Around Status:

- Unit 4 supplying Auxiliary steam.
- Condenser air inleakage 0 scfm.
- Severe thunderstorm warning in South Dade County expires in 2 hours.

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Scenario No.: 3

Event No.: 1

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Event Description: A Power Range Nuclear Instrument N-42 Control Power fuse blows. The ATC checks all PR NI Channels to determine the failure. 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction, is entered to remove the channel from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
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**Direct Facility Operator to trigger lesson step, EVENT 1 - N42 PR NI CONTROL POWER FUSE BLOWS.**

(insert TFN1CP22 TRUE delay=0 ramp=0 on=0 off=0)

	SRO/ATC	<p>Observes failure of N42 PR NI Control Power</p> <ul style="list-style-type: none"> <li>Alarms B 6/1, 6/2, 6/3, 6/5, &amp; 7/1</li> <li>PR N42 control power fuse blows.</li> <li>B 6/5 may not be the first or only ARP referred to</li> </ul>
	SRO/ATC	<p>CAUSES: Failure of power range channel due to loss of power</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>B42</p> <p>POWER RANGE LOSS OF DETECTOR VOLTAGE</p> </div>
	SRO/ATC	<p><b>ALARM CONFIRMATION</b></p> <ol style="list-style-type: none"> <li>CHECK LOSS OF DETECTOR VOLT light on any PR channel lit.</li> <li>CHECK PR drawers for blown fuses.</li> <li>CHECK loss of vital AC power supply to a PR drawer.</li> </ol>
	SRO/ATC	<p><b>OPERATOR ACTIONS</b></p> <ol style="list-style-type: none"> <li>ENSURE auto rod withdrawal block is lit.</li> <li>WHEN plant conditions stabilize, THEN PERFORM 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction.</li> </ol>
	SRO	<p>Directs response using <b>3-ONOP-059.8</b>, Power range Nuclear Instrument Malfunction to restore level control.</p>
	SRO/ATC	<p>3.0 <u><b>AUTOMATIC ACTIONS</b></u></p> <p>3.2 <u>Mode 2</u> - Startup</p> <p>3.2.1 Malfunction of ONE channel:</p> <ol style="list-style-type: none"> <li>Possible Manual Rod Withdrawal Block.</li> </ol>

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Scenario No.: 3

Event No.: 1

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Event Description: A Power Range Nuclear Instrument N-42 Control Power fuse blows. The ATC checks all PR NI Channels to determine the failure. 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction, is entered to remove the channel from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p>4.0 <u>IMMEDIATE ACTIONS</u></p> <p>4.2 <u>Mode 2 - Startup</u></p> <p>4.2.1 Malfunction of ONE channel:</p> <ol style="list-style-type: none"> <li>None</li> </ol>
	SRO/BOP	<p>5.2 <u>Mode 2 - Startup</u></p> <p>5.2.1 Malfunction of ONE channel:</p> <ol style="list-style-type: none"> <li>Maintain manual Rod Control.</li> <li>Place the DROPPED ROD MODE switch for the failed channel in the BYPASS position.</li> <li>Place the applicable ROD STOP BYPASS switch to the failed channel BYPASS position.</li> <li>Transfer the UPPER SECTION comparator defeat switch to the failed channel.</li> <li>Transfer the LOWER SECTION comparator defeat switch to the failed channel.</li> <li>Transfer applicable POWER MISMATCH BYPASS switch to BYPASS the failed channel.</li> <li>Transfer the COMPARATOR CHANNEL DEFEAT switch to the failed channel.</li> <li>Perform the following within 6 hours of the failure determination: <ol style="list-style-type: none"> <li>Trip the Power Range bistables by removing the INSTRUMENT POWER fuses from drawer B of the failed channel.</li> </ol> </li> </ol>
<b>EXAMINER NOTE: The crew may wait on pulling fuses to allow time for I&amp;C to troubleshoot the channel.</b>		
	SRO/BOP	<p style="text-align: center;"><u>NOTE</u></p> <p><i>The Reactor Protection System bistables associated with the failed power range channel will be in the tripped condition when its bistable test switch is placed in the test (to the right) position as indicated by the red trip LED on the Channel Status Light section of the EAGLE 21 Test Panel being ON.</i></p>

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Event Description: A Power Range Nuclear Instrument N-42 Control Power fuse blows. The ATC checks all PR NI Channels to determine the failure. 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction, is entered to remove the channel from service. The SRO will address LCO 3.3.1.

Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

**EXAMINER NOTE:** This next step is **OPTIONAL**. If time does not allow bistables to be tripped, then notify the Facility Operator to call as I& C to request time for troubleshooting prior to tripping bistables.

	SRO/BOP																									
	SRO/BOP	9. Notify I&C.																								
	SRO	Refers to TS LCO 3.3.1, Table 3.3-1, Functional Unit 9 Action 13																								
	SRO	<div>TABLE 3.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION</div> <table><tr><th>FUNCTIONAL UNIT</th><th>TOTAL NO. OF CHANNELS</th><th>CHANNELS TO TRIP</th><th>MINIMUM CHANNELS OPERABLE</th><th>APPLICABLE MODES</th><th>ACTION</th></tr><tr><td>2. Power Range, Neutron Flux</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. High Setpoint</td><td>4</td><td>2</td><td>3</td><td>1, 2</td><td>2</td></tr><tr><td>b. Low Setpoint</td><td>4</td><td>2</td><td>3</td><td>1##, 2</td><td>2</td></tr></table> <p>## Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.</p> <p>ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:</p> <ul style="list-style-type: none"><li>a. The inoperable channel is placed in the tripped condition within 6 hours,</li><li>b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1, and</li><li>c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored per Specification 4.2.4.2.</li></ul>	FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	2. Power Range, Neutron Flux						a. High Setpoint	4	2	3	1, 2	2	b. Low Setpoint	4	2	3	1##, 2	2
FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION																					
2. Power Range, Neutron Flux																										
a. High Setpoint	4	2	3	1, 2	2																					
b. Low Setpoint	4	2	3	1##, 2	2																					

**EXAMINER NOTE:** Crew will proceed onto Event 2.

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Scenario No.: 3

Event No.: 2

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Event Description: In accordance with 3-GOP-301, raise power to 5% for rolling the Main Turbine with Control Rods. MODE 1 preps are complete for the MODE change.

Time	Position	Applicant's Actions or Behavior
	<b>SRO</b>	Conducts reactivity briefing with crew.
	<b>CREW</b>	Participates in reactivity briefing.
	<b>SRO</b>	Directs the evolution per 3-GOP-301, Hot Standby to Power Operation in accordance with Step 5.53.2.
	<b>SRO/ATC</b>	<div style="border: 1px dashed black; padding: 10px;"> <p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>• If reactor power changes by more than 15 percent in a 1-hour period, Chemistry is required to sample the RCS per Technical Specification 4.4.8, Table 4.4-4, Item 6b.</li> <li>• If reactor power is stabilized for any reason and performance of Attachment 4 is terminated, power data recording shall be recommenced when power changes are recommenced.</li> <li>• All available indication should be monitored when changing power, including OSI/PI and DCS. During power ascension, a rolling average power increase should be accessed every 15 minutes to ensure that the recommended ramp rate is not exceeded in any 1 hour time period.</li> <li>• As power is increased, the SDTA valves will open as steam flow increases. [Commitment Step 2.3.11 - CAPR]</li> </ul> </div>

**EXAMINER NOTE: Reactivity briefing will occur prior to assuming the watch in the Simulator Briefing Room.**

	<b>SRO/ATC</b>	5.45 In preparation for rolling the main turbine, increase Reactor Power to 3 to 5 percent by dilution using 0-OP-046 CVCS - Boron Concentration Control, <u>OR</u> by withdrawing control rods. [Commitment Step 2.3.11 - CAPR]
	<b>SRO/ATC</b>	In preparation for rolling the Main Turbine, increases Reactor Power to 3 to 5 percent by withdrawing Control Rods. The ATC has been given guidance to withdraw rods in 2 step increments.
	<b>SRO/BOP</b>	Adjusts feedwater flow on the bypasses as reactor power is raised.

**EXAMINER NOTE: Once an observable change in reactivity is noted (>1%), then proceed to Event3 - 3A CCW Pump tripping due to a breaker failure.**

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Event No.: 3

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 3 - 3A CCW PUMP BREAKER TRIPS</b> (insert TFK1S611 TRUE delay=0 ramp=0 on=0 off=0, insert TFK1A611 TRUE delay=0 ramp=0 on=0 off=0, and insert TFK1A12T TRUE delay=0 ramp=0 on=0 off=0)		
	<b>SRO/ATC</b>	Observes failure of 3A CCW PUMP. <ul style="list-style-type: none"> <li>Multiple Main Control Room Alarms on Panels A, H, and X</li> <li>3A CCW Pump Breaker fails open.</li> <li>3B CCW Pump does NOT auto start</li> </ul>
		<b>CAUSES:</b> 1. Trip of CCW pump 2. System rupture <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <b>H8/3</b>   <b>CCW PP HEADER LO PRESS</b> </div>
	<b>CREW</b>	<b>ALARM CONFIRMATION</b> 1. <b>CHECK</b> the following: <ul style="list-style-type: none"> <li>CCW pump breaker indications on VPB</li> <li>CCW pump motor ammeters on VPB</li> <li>CCW header flow indications on VPB</li> <li>CCW Surge Tank level on VPB</li> </ul>
	<b>SRO</b>	<b>OPERATOR ACTIONS</b> <div style="border: 1px solid black; padding: 5px; margin-left: 40px;"> <b>NOTE</b>            This corresponds to 77 psig at PC-3-611 and PI-3-612 due to 4 psi static head from header elevation.         </div> <ol style="list-style-type: none"> <li><b>ENSURE</b> Standby CCW pump starts at 73 psig CCW pump discharge header pressure with a time delay of 10/20/30 seconds for A/B/C pumps, respectively.)</li> <li><b>REFER TO 3-ONOP-030</b>, Component Cooling Water Malfunction.</li> <li><b>REFER TO TS 3.7.2</b> for any additional required actions.</li> </ol>
	<b>SRO/ATC</b>	Starts 3B or 3C CCW Pump to re-establish flow.
	<b>SRO</b>	Refers to <b>3-ONOP-030</b> , Component Cooling Water Malfunction to restore level control.

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Event No.: 3

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
<b>EXAMINER NOTE: SRO refers to 3-ONOP-030 and recognizes CCW was restored by starting a standby pump. The following steps will offer minimal direction for current lineup and situation.</b>		
	SRO/ATC	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>CAUTION</b></p> <p><i>If any RCP bearing temperature annunciator alarm actuates AND its associated motor bearing temperature is greater than 195°F, trip the reactor and stop the affected RCPs.</i></p> </div>
	SRO/ATC	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;"><b>NOTE</b></p> <p><i>Foldout page should be monitored throughout this procedure.</i></p> </div>
<b>EXAMINER NOTE: The foldout page is on the following page.</b>		
	SRO/BOP	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <b>1</b>  </div> <div> <p><b>Verify Power To 4KV Bus 3D</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. Maintain 4KV Bus 3D energized - ALIGNED TO AN ENERGIZED 4KV BUS</p> </div> <div style="width: 45%;"> <p>a. <u>IF</u> lockout of 4KV Bus 3D <u>NOT</u> present, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Verify 3C CCW Pump - BREAKER OPEN</li> <li>2. Verify 3C ICW Pump - BREAKER OPEN</li> <li>3. Operate bus supply breakers to energize bus.</li> </ol> </div> </div> </div> </div>
	SRO/ATC	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <b>2</b>  </div> <div> <p><b>Verify Component Cooling Water Pumps In Service</b></p> <p>a. <u>IF</u> starting an idle CCW pump will <u>NOT</u> overload an EDG, <u>THEN</u> start CCW pumps as necessary to establish flow in both headers.</p> </div> </div>

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
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### FOLDOUT FOR 3-ONOP-030

#### 1. TOTAL LOSS OF CCW FLOW

- A. Manually trip the reactor, verify reactor trip using the EOP network, THEN stop the RCPs.
- B. Isolate letdown and excess letdown.
- C. Establish one charging pump running at maximum speed AND dispatch operator to establish emergency cooling water to one of the remaining two charging pumps using Attachment 1. Monitor RCS pressure closely while running charging pump at maximum speed.
- D. WHEN Attachment 1 is complete, THEN operate charging pump supplied with emergency cooling as necessary to maintain RCP seal cooling.

#### 2. LOSS OF CCW TO ANY COMPONENT

IF component cooling water flow to any component cooled by CCW is lost, THEN shut down the affected component.

#### 3. CHARGING PUMP EMERGENCY COOLING CRITERIA

IF Cooling Water is NOT available to charging pumps, THEN charging pump operation shall be at maximum speed until cooling is restored from CCW System or using Attachment 1.

#### 4. CCW PUMP STOPPING CRITERIA

IF any Component Cooling Water Pump is cavitating, THEN stop the affected Component Cooling Water Pumps and place in Pull-To-Lock.

#### 5. REACTOR TRIP CRITERIA

IF tripping a RCP is required, THEN manually trip the reactor prior to stopping the RCP.

#### 6. RCP STOPPING CRITERIA

IF any RCP bearing temperature annunciator alarm actuates AND its associated motor bearing temperature is greater than 195°F, THEN trip reactor and stop the affected RCPs.

#### 7. CCW System operation once CCW System Hdr has been restored shall be within the operating restrictions of 3-NOP-030 summarized as follows: [Commitment - Step 3.3.2]

CCW Pumps, Heat Exchangers, and Flows/Loads.

- N-1 CCW Pumps (where N = number of CCW Hxs aligned to CCW)
- All CCW Hxs in service when RHR in service OR with only 2 CCW Hxs in service, place 2 CCW Pumps in Pull-To-Lock.
- Maximum of 5 out of 6 CCW Heat Loads.



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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>3</b></p> <p>Verify Flow In Both Component Cooling Water Headers - NORMAL</p> <p>↓</p> <ul style="list-style-type: none"> <li>• FT-3-613A for header A</li> <li>• FT-3-613B for header B</li> </ul> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>IF CCW flow to RCPs can <b>NOT</b> be established, <b>THEN</b> manually trip the reactor <b>AND</b> verify reactor trip using the EOP Network, <b>AND</b> then stop all RCPs <b>AND</b> perform the following: <ol style="list-style-type: none"> <li>Isolate Letdown and Excess Letdown</li> <li>IF any charging pump is running, <b>THEN</b> operate at maximum speed until Attachment 1 is completed.</li> <li>Dispatch an operator to establish emergency cooling water to desired charging pump using Attachment 1.</li> </ol> </li> </ol>
	SRO/ATC	<p style="text-align: center;"><b>NOTES</b></p> <ul style="list-style-type: none"> <li>• The top of the component cooling water surge tank divider plate is located at approximately 25% indicated level.</li> <li>• If a cross tie valve between the units is leaking or open, the surge tank on the opposite unit may be experiencing level control problems.</li> <li>• If in Modes 1 through 3, and CCW System level is NOT maintained within the CCW Head Tank, restore CCW System level to be within the CCW Head Tank within 24 hours.</li> <li>• LI-3-613A and LI-3-614A are NOT overlapping (i.e., LI-3-614A will go off scale low before LI-3-613A comes off its high peg with decreasing level).</li> </ul>
	SRO/ATC	<p><b>4</b></p> <p>Verify Component Cooling Water Surge Tank Level Being Maintained</p> <p>↓</p> <ol style="list-style-type: none"> <li>Component Cooling Water Surge Tank Level, LI-3-613A - <ul style="list-style-type: none"> <li>• GREATER THAN 25% <b>AND</b></li> <li>• STABLE OR INCREASING</li> </ul> </li> </ol> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Open Component Cooling Water Surge Tank Makeup, MOV-3-832 as necessary to add makeup.</li> <li>IF Component Cooling Water Surge Tank Level can <b>NOT</b> be maintained, <b>THEN</b> perform the following: <ol style="list-style-type: none"> <li>Trip the reactor <b>AND</b> perform 3-EOP-E-0, Reactor Trip or Safety Injection, while continuing with this procedure.</li> <li><b>WHEN</b> reactor verified tripped, <b>THEN</b> stop all RCPs.</li> </ol> </li> <li>Observe NOTES prior to Step 8 and go to Step 8.</li> </ol>

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>5</b> ↓ Check If Component Cooling Water Headers Should Be Tied Together</p> <p>a. Check CCW headers - SPLIT</p> <p>b. Check if flow has been lost in any CCW header</p> <ul style="list-style-type: none"> <li>* FT-3-613A for header A</li> <li>* FT-3-613B for header B</li> </ul> <p>a. Go to Step 34.</p> <p>b. <u>IF</u> flow in both CCW headers is normal, <u>THEN</u> go to Step 34.</p>
	SRO/ATC	<p><b>34</b> ↓ Verify Component Cooling Water From Unit 4 - NOT REQUIRED</p> <p>a. Unit 3 CCW headers filled and intact</p> <p>b. Verify CCW pumps - AT LEAST ONE RUNNING</p> <p>c. Verify flow in at least one intact CCW header</p> <ul style="list-style-type: none"> <li>* FI-3-613A for header A</li> <li>* FI-3-613B for header B</li> </ul> <p>a. Return to Step 4.</p> <p>b. Start a Standby CCW pump.</p> <p>c. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Try to establish flow in at least one intact CCW header.</li> <li>2) <u>IF</u> flow in at least one intact CCW header can <u>NOT</u> be established, <u>THEN</u> observe NOTE prior to Step 36 and go to Step 36.</li> </ol>
	SRO/ATC	<p>d. Verify intake cooling water flow to all in service CCW heat exchangers</p> <ul style="list-style-type: none"> <li>* FI-3-1407 for Hx A</li> <li>* FI-3-1408 for Hx B</li> <li>* FI-3-1409 for Hx C</li> </ul> <p>d. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Try to establish intake cooling water flow to in-service CCW heat exchangers.</li> <li>2) Stop components cooled by component cooling water as necessary to stabilize component cooling water temperature.</li> <li>3) <u>IF</u> any component cooled by component cooling water must be operated <u>AND</u> stable component cooling water temperature can <u>NOT</u> be maintained, <u>THEN</u> observe NOTE prior to Step 36 and go to Step 36.</li> </ol>
<p><b>EXAMINER NOTE: Additional steps are NOT carried in scenario guide. The actions from this procedure should be minimal.</b></p>		
	SRO	Refers to Technical Specifications and enters 3.7.2 for the Component Cooling Water System.

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
		<p><u>PLANT SYSTEMS</u></p> <p><u>3/4.7.2 COMPONENT COOLING WATER SYSTEM</u></p> <p><u>LIMITING CONDITION FOR OPERATION</u></p> <p>3.7.2 The Component Cooling Water System (CCW) shall be OPERABLE with:</p> <ol style="list-style-type: none"> <li>Three CCW pumps, and</li> <li>Two CCW heat exchangers.</li> </ol> <p><u>APPLICABILITY:</u> MODES 1, 2, 3, and 4.</p> <p><u>ACTION:</u></p> <ol style="list-style-type: none"> <li>With only two CCW pumps with independent power supplies OPERABLE, restore the inoperable CCW pump to OPERABLE status within 30 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable.</li> <li>With only one CCW pump OPERABLE or with two CCW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.</li> <li>With less than two CCW heat exchangers OPERABLE, restore two heat exchangers to OPERABLE status within 1 hour or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.</li> </ol>
	<b>SRO</b>	Enters 3.7.2, Action b for 2 CCW Pumps without separate power.
<p><b>EXAMINER NOTE:</b> The SRO refers to 3-ONOP-030 and recognizes CCW was restored by starting a standby pump. The following steps will offer minimal direction for current lineup and situation. Also, the SRO may refer to 3-NOP-005, 4KV Buses A, B and D, or skill of the craft.</p>		
		<b>5.4      <u>Transfer of 3D 4KV Bus from 3B 4KV Bus to 3A 4KV Bus</u></b>
		<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>De-energizing 3D 4KV Bus places Unit 3 in a Technical Specification LCO action statement due to the associated Component Cooling Water and Intake Cooling Water Pumps being inoperable.</p>
	<b>SRO/BOP</b>	<p>1.    <b>ENSURE</b> the following:</p> <ul style="list-style-type: none"> <li>•    3A 4KV Bus is ENERGIZED.</li> <li>•    3C COMPONENT COOLING WATER PUMP is stopped.</li> <li>•    3C INTAKE COOLING WATER PUMP is stopped.</li> </ul>

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Event Description: 3A CCW Pump trips due to breaker failure. 3-701G, PC-3\_611 isolation, is inadvertently closed which prevents the Auto Start of 3B CCW Pump. The ATC uses the ARP, 3-ONOP-030, or 0-ADM-211 to start 3B CCW Pump. Technical Specification 3.7.2 is entered.

Time	Position	Applicant's Actions or Behavior
	<b>SRO/BOP</b>	2. OPEN 3AB19, FEEDER TO 4KV BUS 3D. 3. OPEN 3AD06, SUPPLY FROM 4KV BUS 3B. 4. CLOSE 3AD01, SUPPLY FROM 4KV BUS 3A. 5. CLOSE 3AA17, FEEDER TO 4KV BUS 3D.
		6. CHECK 3D 4KV Bus voltage between 3744 and 4576 volts at cubicle 3AD08.
	<b>SRO/BOP</b>	7. START <u>one</u> of the following to PMT the Bkr supply for 3D 4KV Bus: <ul style="list-style-type: none"> <li>• 3C ICW PUMP</li> <li>• 3C CCW PUMP</li> </ul>
	<b>SRO/BOP</b>	Enters 3.7.2, Action a for 2 CCW Pumps inoperable with separate power supplies and exits Action b.

**EXAMINER NOTE: When TS determination is made, then proceed to Event 4.**

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The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	Observes the following: <ul style="list-style-type: none"> <li>• Loss of power to the 3C ICW Pump</li> <li>• Loss of power to the 3C CCW Pump</li> </ul>
<b>EXAMINER NOTE: The SRO refers to 3-ONOP-004.5, Loss of 3D 4KV Bus for restoration. As an alternative, the crew may elect to use 3-NOP-005, 4KV Buses A, B and D, or skill of the craft. All steps are similar content.</b>		
<b>3-ONOP-004.5, Loss of 3D 4KV Bus</b>		
	SRO/BOP	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <b>1</b> ↓         </div> <div>           Check 3D 4KV Bus Lockout Relay - RESET             Perform the following:           <ol style="list-style-type: none"> <li>Direct Electrical Maintenance to determine and correct cause of lockout relay actuation.</li> <li><u>WHEN</u> cause of 3D 4KV bus lockout relay actuation has been determined and corrected, <u>THEN</u> reset lockout relay.</li> <li><u>WHEN</u> 3D 4KV bus lockout relay has been reset, <u>THEN</u> OBSERVE NOTE PRIOR TO STEP 2 and go to Step 2.</li> </ol> </div> </div>
	SRO/BOP	<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <b>NOTE</b>  <i>Efforts to re-energize 3A and 3B 4KV buses may restore power to 3D 4KV bus. If the 3D 4KV bus will be used to re-energize 3A or 3B 4KV bus using station blackout tie line, the remainder of this procedure shall not be used.</i> </div>
	SRO/BOP	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <b>2</b> ↓         </div> <div>           Check 3A And 3B 4KV Buses – AT LEAST ONE ENERGIZED             Perform the following:           <ol style="list-style-type: none"> <li>Try to re-energize 3A 4KV bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>Try to re-energize 3B 4KV bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>Continue with procedure and step in effect.</li> </ol> </div> </div>

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The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.

	<b>SRO/BOP</b>	<b>3</b> Disconnect Loads From 3D 4KV Bus a. Verify 3C Intake Cooling Water Pump breaker, 3AD05 - OPEN b. Verify 3C Component Cooling Water Pump breaker, 3AD04 - OPEN
	<b>SRO/BOP</b>	<b>4</b> Determine Source Of Power For 3D 4KV Bus a. Check 3A and 3B 4KV buses - BOTH ENERGIZED a. Perform the following: 1) IF 3A 4KV bus is energized, <u>THEN</u> go to Step 5. 2) IF 3B 4KV bus is energized, <u>THEN</u> go to Step 7. b. Consult with Nuclear Plant Supervisor to determine desired source of power for 3D 4KV bus: * 3A 4KV bus <u>OR</u> * 3B 4KV bus c. Check desired source of power for 3D 4KV bus - 3A 4KV bus c. Go to Step 7.
	<b>SRO/BOP</b>	<b>5</b> Re-energize 3D 4KV Bus From 3A 4KV Bus Go to Step 7. a. Open Feeder To 4KV Bus 3D, 3AB19 b. Open Supply From 4KV Bus 3B, 3AD06 c. Close Supply From 4KV Bus 3A, 3AD01 d. Close Feeder To 4KV Bus 3D, 3AA17
		<b>6</b> Go To Step 8

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The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.

	SRO/BOP	<p><b>8</b> ↓ Verify 3D 4KV Bus - ALIGNED TO AN ENERGIZED BUS</p> <ul style="list-style-type: none"> <li>* 3A 4KV bus</li> <li><u>OR</u></li> <li>* 3B 4KV bus</li> </ul> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>a. Notify Nuclear Plant Supervisor that 3D 4KV bus cannot be re-energized.</li> <li>b. Continue efforts to re-energize 3D 4KV bus from one of the following:             <ul style="list-style-type: none"> <li>* 3A 4KV bus using Step 5</li> <li>* 3B 4KV bus using Step 7</li> </ul> </li> <li>c. <u>WHEN</u> 3D 4KV bus has been re-energized, <u>THEN</u> do Steps 9 and 10.</li> <li>d. Continue with procedure and step in effect.</li> </ol>
	SRO/BOP	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>If a loss of all AC power has occurred, safeguards equipment shall be restarted as directed in the Emergency Operating Procedures or 3-ONOP-004, LOSS OF OFFSITE POWER.</i></p>
	SRO/BOP	<p><b>9</b> ↓ Locally Verify No Breaker Targets Exist On 3D 4KV Bus Breakers</p> <p><u>IF</u> any 3D 4KV bus breaker target is in, <u>THEN</u> DO NOT ENERGIZE ASSOCIATED COMPONENT until cause of breaker target has been determined and corrected.</p>

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The incoming feeder breaker from 3B 4KV Bus, 3AD06, fails open. The result is a loss of the 3D 4KV Bus power. The loss of this bus can affect ICW/CCW lineups due to shared power. The crew is able to restore power to the 3D 4KV Bus from the 3A 4KV Bus with 3-ONOP-004.5, Loss of 3D 4KV Bus.

	SRO/BOP	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>CCW System load requirements for the EOP network, and the SHUTDOWN LOCA ONOPs, 3-ONOP-041.7 and 3-ONOP-041.8 SHALL NOT be exceeded. These requirements are:</i></p> <ol style="list-style-type: none"> <li><i>1. The number of running CCW pumps shall be one less than the number of In-Service CCW Heat Exchangers.</i></li> <li><i>2. No more than 5 of the following loads shall be on the CCW System at one time.</i> <ol style="list-style-type: none"> <li><i>a. Normal Containment Coolers [equals 1 Load].</i></li> <li><i>b. RHR Heat Exchanger [each HX equals 1 load].</i></li> <li><i>c. Emergency Containment Coolers [each ECC equals 1 load, and for a loss of instrument air - ALL ARE IN-SERVICE LOADS].</i></li> </ol> </li> <li><i>3. If only 2 CCW Heat Exchangers are in service and CCW valves MOV-3-749A and MOV-3-749B are open, two CCW Pumps are required to be in Pull-To-Lock.</i></li> </ol>
	SRO/BOP	<p><b>10</b></p> <p>Restart Components Supplied By 3D 4KV Bus As Directed By Shift Manager</p> <ul style="list-style-type: none"> <li>• 3C Intake Cooling Water Pump</li> <li>• 3C Component Cooling Water Pump</li> </ul>

**EXAMINER NOTE:** After the decision and action to restore 3C ICW Pump and 3C CCW Pump is complete, then proceed to Event 5.



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Event Description: The 3A TPCW Pump shaft fails. The BOP will start the 3B TPCW pump using the ARP, 3-ONOP-008, or 0-ADM-211 to maintain plant operations.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 5 - 3A TPCW PUMP SHAFT FAILS.</b> (insert TFKXSMA TRUE delay=0 ramp=0 on=0 off=0)		
	SRO/BOP	Observes the following: <ul style="list-style-type: none"> <li>• 3A TPCW Pump has high amps.</li> <li>• Low TPCW pressure.</li> <li>• I 5/4, TPCW HI TEMP / LO PRESS</li> </ul>
	SRO/BOP	<div style="display: flex; justify-content: space-between;"> <div> <b>CAUSES:</b> <ol style="list-style-type: none"> <li>1. TPCW System leakage</li> <li>2. Inadequate ICW flow through TPCW HXs</li> <li>3. Inadequate TPCW System flow</li> <li>4. Plugged ICW/TPCW basket strainer</li> </ol> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>I5/4</b>   <b>TPCW HI TEMP/ LO PRESS</b> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <b>DEVICE:</b> <ul style="list-style-type: none"> <li>• PS-3-1621</li> <li>• FR-3-6900</li> </ul> </div> <div> <b>SETPOINT:</b>            15 psig (Equivalent to 75 psig Header Pressure)            110°F (Tolerance between 108°F - 112°F)         </div> <div> <b>LOCATION:</b>            N/A         </div> </div>
	SRO/BOP	<b>ALARM CONFIRMATION</b> <b>CHECK</b> TPCW header pressure equal to or less than 75 psig.  <b>OPERATOR ACTIONS</b> <ol style="list-style-type: none"> <li>1. CALL UP ERDADS Component Cooling Water System Data and Interfaces display, and CHECK T1472_A to be between 108°F and 112°F.</li> <li>2. IF TPCW header low pressure condition exists, THEN PERFORM the following:               <ol style="list-style-type: none"> <li>A. START standby TPCW pump. (3B TPCW Pump)</li> <li>B. MONITOR pump amp indication on 3C04.</li> <li>C. Locally CHECK for system leakage.</li> </ol> </li> </ol>
<b>EXAMINER NOTE: Once the 3B TPCW Pump is started, and then continue with Event 6.</b>		

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Event Description: The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 6 - MASTER PZR PRESS CNTRL FAIL.</b> (insert IAH2S44J 0.000000 delay=0 ramp=180 on=0 off=0)		
	<b>SRO/ATC</b>	<p>Observes the following:</p> <ul style="list-style-type: none"> <li>• RCS Pressure lowers</li> <li>• Both PCV-3-455A and B Spray Valves open in automatic. Manual operation of is successful with reclosing the valves.</li> </ul> <p>A 9/2 PZR Control Hi/Lo Press</p>
	<b>SRO/ATC</b>	RCS Pressure is noticed lowering along with PCV-3-455A and B going further open.
	<b>SRO/ATC</b>	Either the Master Pressure Controller and/or the Individual Spray Controllers are taken to manual and output lowered to close the PZR Spray Valves. Taking manual actions to control plant parameters if an automatic control system is out of service / malfunctioning is in accordance with 0-ADM-211.
<b>EXAMINER NOTE: If prompt action is taken, there may not be an annunciator response. In the case where action is delayed, then initial actions will be taken in accordance with these ARPs prior to entering 3-ONOP-041.5, Pressurizer Pressure Control Malfunction.</b>		
	<b>SRO</b>	Directs response using 3-ONOP-041.5, Pressurizer Pressure Control Malfunction.
	<b>SRO/ATC</b>	<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <p><b><u>NOTE</u></b></p> <p><i>Foldout page is required to be monitored throughout this procedure.</i></p> </div>

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Event Description: The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.

Time	Position	Applicant's Actions or Behavior
<p align="center"><b><u>FOLDOUT FOR PROCEDURE 3-ONOP-041.5</u></b></p> <p>1. <b><u>FAILED INSTRUMENT ISOLATION</u></b></p> <p>a. <u>IF</u> any Pressurizer Pressure control Instrument Loop fails, <u>THEN</u> place applicable control switches to a position that isolates the failed instrument.</p> <p>2. <b><u>3-EOP-E-0 TRANSITION CRITERIA</u></b></p> <p>a. <u>IF</u> PZR pressure cannot be maintained greater than 2000 psig, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1. Continue efforts to restore PZR pressure and</li> <li>2. Trip the reactor and turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.</li> </ol> <p>3. <b><u>PORV ISOLATION/LEAKING PORV IDENTIFICATION</u></b></p> <p>a. <u>IF</u> any PORV is <u>OPEN OR</u> Leaking <u>AND</u> pressure is less than 2235 psig, <u>THEN</u> CLOSE the applicable PORV and/or Block valve.</p> <p>b. The following are indications of leakage from a PZR PORV and should be used to identify and isolate a leaking PORV:</p> <ol style="list-style-type: none"> <li>1) PZR relief line temperature, TI-3-463, INCREASING.</li> <li>2) PZR relief tank level, LI-3-470, INCREASING.</li> <li>3) PZR relief tank temperature, TI-3-471, INCREASING.</li> <li>4) PZR relief tank pressure, PI-3-472, INCREASING.</li> <li>5) PZR PORV/SAFETY ACOUSTIC MONITOR, LEDs LIT.</li> </ol> <p>4. <b><u>OPEN/LEAKING PZR SAFETY VALVE IDENTIFICATION</u></b></p> <p>a. The following are indications that a PZR safety is open or leaking:</p> <ol style="list-style-type: none"> <li>1) PZR Safety line temperature, TI-3-465, INCREASING or at saturation temperature associated with the PZR relief tank pressure per ATTACHMENT 2.</li> <li>2) PZR Safety line temperature, TI-3-467, INCREASING or at saturation temperature associated with the PZR relief tank pressure per ATTACHMENT 2.</li> <li>3) PZR Safety line temperature, TI-3-469, INCREASING or at saturation temperature associated with the PZR relief tank pressure per ATTACHMENT 2.</li> <li>4) PZR relief tank level, LI-3-470, INCREASING.</li> <li>5) PZR relief tank temperature, TI-3-471, INCREASING.</li> <li>6) PZR relief tank pressure, PI-3-472, INCREASING.</li> <li>7) PZR PORV/Safety Acoustic Monitor, LEDs LIT.</li> </ol> <p>5. <b><u>SPURIOUS ACTUATION OF CV-3-311 AUXILIARY SPRAY VALVE</u></b> due to fire in Containment or 3B 4KV Switchgear Room</p> <p>a. <u>IF</u> pressurizer pressure is decreasing and Auxiliary Spray Valve, CV-3-311, is suspect, <u>THEN</u> reduce charging to one charging pump on slow speed <u>AND</u> close charging to RCS Control Valve HCV-3-121.</p>		

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Event Description: The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>The Master Controller should be operated carefully (Normal controller output for 2235 psig is 42.5 percent demand; 92 percent demand will open PCV-3-455C). If the following conditions are met, an excessive increase in controller output could cause Power Operated Relief Valve PCV-3-455C to open:</i></p> <ol style="list-style-type: none"> <li>1. PCV-3-455C hand switch in AUTO.</li> <li>2. Pressurizer pressure is greater than or equal to 2000 psig, or OMS switch in LO Press Ops.</li> </ol>
	SRO/ATC	<p>1 Check PZR Pressure Control Instrument Loop Not Failed</p> <p>a. Check PT-3-444 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify PCV-3-455C <u>OR</u> MOV-3-536 CLOSED.</li> <li>2) Take manual control of PC-3-444J, PZR PRESS CONTROL.</li> <li>3) <u>IF</u> manual control of PC-3-444J is <u>NOT</u> effective, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>* Take manual control of PZR spray valves.</li> <li>* Take manual control of PZR heaters.</li> </ul> </li> </ol> <p>b. Check PT-3-445 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters</p> <p>b. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify PCV-3-456 <u>OR</u> MOV-3-535 CLOSED.</li> </ol>
	SRO/ATC	<p>2 Check PORVs Closed</p> <ul style="list-style-type: none"> <li>• PCV-3-455C - CLOSED</li> <li>• PCV-3-456 - CLOSED</li> </ul> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>• <u>IF</u> PZR pressure is less than 2335, <u>THEN</u> manually close PORVs. <u>IF</u> any PZR PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p><i>A fire in containment or the 3B 4KV Switchgear Room may cause spurious actuation of and give false valve position indication for Auxillary Spray Valve, CV-3-311.</i></p>

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Event Description: The Master Pressurizer Controller fails to high demand and causes the Pressurizer Spray Valves to fail open. The ATC responds by selecting manual control of the Master Controller or both Spray Valve Controllers and controlling per ARP, 3-ONOP-041.5, or 0-ADM-211.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>3</b> Check PZR Spray Valves Closed</p> <ul style="list-style-type: none"> <li>PZR pressure normal or trending to normal</li> </ul> <p><b>IF</b> PZR pressure less than normal, <b>THEN</b> perform the following:</p> <p>a. Verify PZR Spray valves closed.</p> <ul style="list-style-type: none"> <li>Place PZR Spray Loop C, PCV-3-455A in MANUAL and CLOSE.</li> <li>Place PZR Spray Loop B, PCV-3-455B in MANUAL and CLOSE.</li> <li>Verify Aux Spray Valve CV-3-311 CLOSED.</li> </ul> <p>b. <b>IF</b> PZR pressure can <b>NOT</b> be maintained greater than 2000 psig, <b>THEN</b> perform the following:</p> <ol style="list-style-type: none"> <li>1) Trip the reactor and turbine and go to E-0, REACTOR TRIP OR SAFETY INJECTION.</li> <li>2) Trip the RCP in the affected loop.</li> </ol>
	SRO/ATC	<p><b>4</b> Check PZR Safety Valves Closed</p> <p>a. PZR PORV/Safety acoustic monitor LEDs - NOT LIT</p> <p>b. PZR safety line temperatures at or near normal</p> <ul style="list-style-type: none"> <li>PZR safety line temperature, TI-3-465</li> <li>PZR safety line temperature, TI-3-467</li> <li>PZR safety line temperature, TI-3-469</li> </ul>
	SRO/ATC	<p><b>5</b> Check PZR Pressure Stable Or Increasing</p> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>Continue efforts to restore PZR pressure control.</li> </ul>

**EVALUATOR NOTE:** After PZR Pressure is checked stable, then proceed with Event 7 - 3B Main Steam Line Break Inside Cmtt.

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Event No.: 7/8/9

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
<b>Direct Facility Operator to trigger lesson step, EVENT 7 - 3B MAIN STEAM LINE BREAK INSIDE CTMT.</b> (insert TVSBVL14 0.5 delay=0 ramp=120 on=0 off=0)		
	<b>SRO</b>	Directs response using 3-EOP-E-0 starting at Step 1.
	<b>CREW</b>	<div style="border: 1px dashed black; padding: 10px; text-align: center;"> <p><b>NOTE</b></p> <p>Steps 1 through 4 are IMMEDIATE ACTION steps.</p> </div>
	<b>SRO/ATC</b>	<p><b>1</b>      Verify Reactor Trip</p> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> </div> <div> <ul style="list-style-type: none"> <li>• Rod bottom lights – ON</li> <li>• Reactor trip and bypass breakers – OPEN</li> <li>• Rod position indicators - AT ZERO</li> <li>• Neutron flux – DECREASING</li> </ul> </div> </div> <div style="margin-top: 10px;"> <p>Manually trip reactor. <u>IF</u> reactor power is greater than 5% <u>OR</u> intermediate range power is <u>NOT</u> stable or decreasing, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.</li> </ul> </div>
	<b>SRO/BOP</b>	<p><b>2</b>      Verify Turbine Trip</p> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> </div> <div> <ul style="list-style-type: none"> <li>a. All turbine stop or associated control valves – CLOSED</li> <li>b. Verify Moisture Separator Reheater Steam Valves – CLOSED               <ul style="list-style-type: none"> <li>• MSR Main Steam Supply Stop MOVs</li> <li>• Reheater Timing Valves</li> <li>• MSR Purge Steam Valves</li> </ul> </li> <li>c. Check Mid and East GCBs – OPEN (Normally 30-second delay)</li> </ul> </div> </div> <div style="margin-top: 10px;"> <ul style="list-style-type: none"> <li>a. Manually trip turbine. <u>IF</u> unable to verify turbine trip, <u>THEN</u> close main steamline isolation and bypass valves.</li> <li>b. Manually close valves. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> close main steamline isolation and bypass valves.</li> <li>c. Manually open breakers. <u>IF</u> breakers do <u>NOT</u> open, <u>THEN</u> actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).</li> </ul> </div>


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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p><b>3</b> Verify Power To Emergency 4 KV Buses</p>  <p>a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED</p> <p>b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED</p> <p>c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS</p> <p>a. Perform the following:</p> <p>1) Attempt to emergency start any Unit 3 available diesel generator.</p> <p>2) <b>IF</b> neither 3A nor 3B 4 KV bus is energized, <b>THEN</b> go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.</p> <p>b. Attempt to emergency start the de-energized Unit 3 bus diesel generator.</p> <p>c. Perform the following:</p> <p>1) <b>IF</b> lockout of 3D 4 KV bus <b>NOT</b> present, <b>THEN</b> perform the following:</p> <p>a) Verify 3C CCW pump - BREAKER OPEN.</p> <p>b) Verify 3C ICW pump - BREAKER OPEN.</p> <p>c) Operate bus supply breakers to restore power.</p>

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E Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>4</b></p> <p>Check If SI Is Actuated</p> <ul style="list-style-type: none"> <li>* SI Annunciators - ANY ON</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>* Safeguards equipment - AUTO STARTED</li> </ul> <p>Perform the following:</p> <p>a. Check if SI is required:</p> <ul style="list-style-type: none"> <li>* Low pressurizer pressure - 1730 psig</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>* High containment pressure - 4 psig</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>* High steam line differential pressure - 100 psid</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>* High steam flow with low S/G pressure - 614 psig <u>OR</u> low Tavg (543 F)</li> </ul> <p>b. IF SI is required, <u>THEN</u> manually actuate SI and containment isolation phase A <u>AND</u> go to Step 5.</p> <p>c. IF SI is <u>NOT</u> required, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.</li> </ol>
	CREW	<p><b>NOTE</b></p> <p><i>FOLDOUT Page shall be monitored for the remainder of this procedure.</i></p>
	RO	Manually actuates Train B by depressing SI and Phase A pushbuttons.
	SRO/BOP	<p><b>5</b></p> <p>Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure</p>

Examiner Note: 3-EOP-E-0, Attachment 3 commences with Event No. 7/8/9 Page 14 of 20.

Examiner Note: The SRO and ATC will complete the remaining steps in 3-EOP-E-0, while the BOP performs 3-EOP-E-0 Prompt Action Verifications using Attachment 3.



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Time	Position	Applicant's Actions or Behavior
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**ATC/BOP****FOLDOUT FOR PROCEDURE E-0****1. ADVERSE CONTAINMENT CONDITIONS**

IF either of the conditions listed below occur, THEN use adverse containment setpoints:

Containment atmosphere temperature  $\geq 180^{\circ}\text{F}$

OR

Containment radiation levels  $\geq 1.3 \times 10^5$  R/hr

WHEN containment parameters drop below the above values, THEN normal setpoints can again be used

IF the TSC determines that containment integrated dose rate has not exceeded  $10^6$  Rads.

**2. RCP TRIP CRITERIA**

a. IF both conditions listed below occur, THEN trip all RCPs:

1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED.

2) RCS subcooling - LESS THAN  $25^{\circ}\text{F}$  [ $65^{\circ}\text{F}$ ]

b. IF phase B actuated, THEN trip all RCPs.

**3. FAULTED S/G ISOLATION CRITERIA (3B S/G Faulted)**

IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed:

a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6% [32%].

b. Isolate AFW flow to faulted S/G(s).

c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range.

**4. RUPTURED S/G ISOLATION CRITERIA**

IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6% [32%], THEN feed flow may be stopped to affected S/G(s).

**5. AFW SYSTEM OPERATION CRITERIA**

a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal

b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, THEN that AFW pump shall be shut down

**6. CST MAKEUP WATER CRITERIA**

IF CST level decreases to less than 10%, THEN add makeup to CST using 3-NOP-018.01, CONDENSATE STORAGE TANK (CST).

**ATC/BOP****7. RHR SYSTEM OPERATION CRITERIA**

IF RHR flow is less than 1000 gpm, THEN the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Time	Position	Applicant's Actions or Behavior
	<b>SRO/ATC</b>	Trip RCPs due high Containment pressure and Phase B Isolation of CCW to RCPS.

**CREW CRITICAL TASK:** Trip RCPs due high Containment pressure and Phase B Isolation of CCW to RCPs prior to exiting 3-EOP-E-0.

	<b>SRO/ATC</b>	<p><b>6</b></p> <p>Check AFW Pumps - AT LEAST TWO RUNNING</p> <p>↓</p>	<p>Perform the following:</p> <ol style="list-style-type: none"> <li>Manually open valves to establish two AFW pumps running.</li> <li><b>IF</b> an AFW pump is tripped, <b>THEN</b> dispatch an operator to locally reset the AFW turbine trips.</li> <li><b>IF</b> both units require AFW <b>AND</b> only one AFW pump is available, <b>THEN</b> perform the following: <ol style="list-style-type: none"> <li>Verify all RCPs - TRIPPED</li> <li>Establish 270 gpm AFW flow to each unit.</li> <li>Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.</li> </ol> </li> </ol>
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**EXAMINER NOTE:** CV-3-2832 is failed open to B S/G, there will be an attempt to manually isolate if not already locally isolated over the next steps.

	<b>SRO/ATC</b>	<p><b>7</b></p> <p>Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT</p> <p>↓</p>	Manually align valves to establish proper AFW alignment.
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Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>8</b> Verify Proper AFW Flow</p> <p>a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%]</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify AFW flow greater than 345 gpm.</li> <li>2) <u>IF</u> AFW flow less than 345 gpm, <u>THEN</u> manually start pumps <u>AND</u> align valves to establish greater than 345 gpm flow.</li> <li>3) <u>IF</u> total feed flow from all sources greater than 345 gpm can <u>NOT</u> be established, <u>THEN</u> perform the following:               <ol style="list-style-type: none"> <li>a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.</li> </ol> </li> </ol>
	SRO/ATC	<p>b. Maintain feed flow to S/G until narrow range levels between 15%[32%] and 50%</p>
	SRO/ATC	<p>Dispatches U3 Turbine Operator (TO) to locally isolate the 3B S/G AFW Control Valve, CV-3-2832 (failed open) with AFPD-3-007.</p>

EXAMINER NOTE: Raises flow to the 3A and 3C S/G to at least 345 gpm total.

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>9</b> Check RCP Seal Cooling</p> <p>a. Check all RCP thermal barrier alarms – OFF</p> <ul style="list-style-type: none"> <li>A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW</li> <li>A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP</li> <li>A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW</li> </ul> <p>b. Go to Step 10</p> <p>c. Check all RCP seal return temperatures are less than 235 F</p> <p>d. Verify SI - RESET</p> <p>e. IF offsite power is <u>NOT</u> available, <u>THEN</u> check diesel capacity adequate to run one charging pump. IF adequate diesel capacity is <u>NOT</u> available, <u>THEN</u> shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating</p> <p>f. Start one charging pump at minimum speed for seal injection</p> <p>g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow</p> <p>a. IF CCW to an RCP thermal barrier is lost, <u>THEN</u>:</p> <ol style="list-style-type: none"> <li>1) Trip the affected RCP(s).</li> <li>2) Go to Step 9c.</li> </ol> <p>c. Go to Step 10.</p> <p>d. Reset SI.</p> <p>f. Go to Step 10.</p>

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	<b>SRO/ATC</b>	<p><b>10</b> Maintain RCS Cold Leg Temperature</p> <p>Perform the following:</p> <ul style="list-style-type: none"> <li>* STABLE AT <u>OR</u> TRENDING TO 547°F IF ANY RCP RUNNING</li> <li><u>OR</u></li> <li>* LESS THAN 547°F <u>AND</u> STABLE IF NO RCP RUNNING</li> </ul> <p>a. <u>IF</u> temperature is decreasing, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Stop dumping steam.</li> <li>2) Reduce total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G.</li> <li>3) <u>IF</u> cooldown is due to excessive steam flow, <u>THEN</u> close main steamline isolation and bypass valves.</li> </ol> <p>b. <u>IF</u> temperature greater than 547°F <u>AND</u> increasing, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>* Dump steam to condenser.</li> <li><u>OR</u></li> <li>* Dump steam using S/G steam dump to atmosphere valves.</li> </ul>
	<b>SRO/ATC</b>	Reduces total AFW flow to > 345 gpm max for both A & C S/Gs.
	<b>SRO/ATC</b>	Places 3B Main Steam Isolation Valve to CLOSE.

**CREW CRITICAL TASK:** Isolates the Faulted 3B S/G prior to exiting 3-EOP-E-0 when 3-EOP-FR-P.1 is NOT present, otherwise as directed in 3-EOP-FR-P.1.

**EXAMINER NOTE:** 3B Main Steam Isolation Valve may be CLOSED in Attachment 3 of 3-EOP-E-0.

**EXAMINER NOTE:** Facility Operator ensures trigger, TFSVVX6C true is DELETED.

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>11</b></p> <p>Check PRZ PORVs, Spray Valves And Excess Letdown Isolated</p> <p>a. PORVs – CLOSED</p> <p>a. <u>IF</u> PRZ pressure less than 2335 psig, <u>THEN</u> manually close PORVs. <u>IF</u> any PRZ PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES.</li> <li>2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.</li> </ol> <p>b. Normal PRZ spray valves – CLOSED</p> <p>b. <u>IF</u> PRZ pressure less than 2260 psig, <u>THEN</u> manually close valves. <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> stop RCP(s) as necessary to stop spray flow.</p> <p>c. Auxiliary Spray Valve, CV-3-311 – CLOSED</p> <p>c. Manually close auxiliary spray valve. <u>IF</u> auxiliary spray valve can <u>NOT</u> be closed, <u>THEN</u> close Charging Flow to Regen Heat Exchanger, HCV-3-121.</p> <p>d. Excess letdown isolation valves – CLOSED</p> <p>d. Manually close valve(s).</p> <ul style="list-style-type: none"> <li>• CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger</li> <li>• HCV-3-137, Excess Letdown Flow Controller</li> </ul>

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<p><b>12</b> Check If RCPs Should Be Stopped</p> <p>a. Check RCPs - ANY RUNNING → a. Go to Step 13.</p> <p>b. Check RCS subcooling - LESS THAN 25°F [65°F] → b. Go to Step 13.</p> <p>c. High-Head SI Pump - AT LEAST ONE RUNNING <u>AND</u> FLOWPATH VERIFIED c. Go to Step 13.</p> <p>d. Stop all RCPs</p>
	SRO/ATC	Stops RCPs if subcooling is less than 25°F (65°F) with HHSI flowpath verified with HHSI pumps running.

**EXAMINER NOTE:** RCPs will be tripped if not previously tripped on 3-EOP-E-0 Foldout Page.

**CREW CRITICAL TASK:** Trip RCPs due high Containment pressure and Phase B Isolation of CCW to RCPs prior to exiting 3-EOP-E-0.

	SRO/BOP	<p><b>13</b> Check If S/Gs Are Faulted</p> <p>a. Check pressures in all SGs – a. Go to Step 14.</p> <p>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER</p> <p><u>OR</u></p> <p>• ANY SG COMPLETELY DEPRESSURIZED</p> <p>b. Perform the following:</p> <p>1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES</p> <p>2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1</p>
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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
<b>3-EOP-FR-P.1</b>		
	<b>SRO</b>	Directs response using 3-EOP-FR-P.1.
	<b>CREW</b>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b><u>CAUTIONS</u></b></p> <ul style="list-style-type: none"> <li>• If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heatsink.</li> <li>• Operation of RHR pumps for greater than 44 minutes on minimum recirculation can cause overheating and failure of the RHR pump.</li> </ul> </div>
	<b>CREW</b>	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">1 ↓</div> <div> <p>Check RCS Pressure - GREATER THAN 250 PSIG [650 PSIG]</p> <p>IF RHR Flow greater than 1000 gpm, <b><u>THEN</u></b> return to procedure <b><u>AND</u></b> step in effect.</p> </div> </div>
	<b>CREW</b>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b><u>CAUTIONS</u></b></p> <ul style="list-style-type: none"> <li>• Low range flow indication is NOT available when using main feedwater instrumentation and an alternate source of feedwater. Changes in RCS temperature and S/G level may be used to control feedwater flow.</li> <li>• If the AFW pumps are the only available source of feed flow, the steam supply to the AFW pumps needs to be maintained from at least one S/G.</li> </ul> </div>
	<b>CREW</b>	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;"><b><u>NOTE</u></b></p> <p>If RCPs are NOT running and Steps 11 through 34 of 3-EOP-E-3, Steam Generator Tube Rupture, are in effect, this procedure shall not be performed.</p> </div>



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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

	SRO/BOP	<p><b>2</b> Check RCS Cold Leg Temperatures - STABLE OR INCREASING</p> <p>Try to stop RCS cooldown:</p> <ul style="list-style-type: none"> <li>a. Verify S/G steam dump to atmosphere valves - CLOSED.</li> <li>b. Verify steam dump to condenser valves - CLOSED.</li> <li>c. <b>IF</b> RHR System in service, <b>THEN</b> stop any cooldown from RHR System.</li> <li>d. Control feed flow to non-faulted S/G(s) to stop RCS cooldown. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one non-faulted S/G.</li> </ul>
	CREW	<p style="text-align: center;"><b>NOTE</b></p> <p>A faulted S/G is any S/G that is depressurizing in an uncontrolled manner or is completely depressurized.</p>
	SRO/BOP	<p><b>3</b> Minimize Cooldown From Faulted S/G(s)</p> <ul style="list-style-type: none"> <li>a. Check S/Gs - ANY FAULTED</li> <li>b. Check RCS cold leg temperatures - DECREASING</li> <li>c. Verify main steamline isolation and bypass valves closed for each faulted S/G</li> <li>d. Verify SI - RESET</li> <li>e. Verify steam supply aligned to both trains of AFW pumps from intact S/G(s)</li> <li>f. Dispatch operator to perform the following             <ul style="list-style-type: none"> <li>1) Open AFW pump steam supply MOV breaker on faulted S/G(s)</li> <li>2) Close AFW pump steam supply MOV on faulted S/G(s)</li> </ul> </li> <li>g. Check all S/Gs - ANY S/G <b>NOT</b> FAULTED</li> <li>h. Control feed flow at 25 gpm to any faulted S/G(s) needed for RCS temperature control</li> <li>i. Isolate feedwater to all faulted S/G(s) <b>NOT</b> needed for RCS temperature control</li> </ul> <p>a. Go to Step 4.</p> <p>b. Go to Step 4.</p> <p>e. Reposition AFW steam supply cross-connect valves to provide steam from intact S/G(s) to all AFW pumps. Maintain steam flow to AFW pumps while repositioning cross-connect valves.</p> <ul style="list-style-type: none"> <li>• AFSS-3-006</li> <li>• AFSS-3-007</li> </ul> <p>g. <b>IF</b> all S/Gs faulted, <b>THEN</b> control feed flow at 25 gpm to each S/G <b>AND</b> go to Step 4.</p>

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Event Description: A Main Steam Line Leak upstream of the 3B MSIV inside Containment gradually develops. A manual or automatic Reactor Trip occurs. The crew responds using 3-EOP-E-0. The crew transitions to 3-EOP-FR-P.1 when present after exiting 3-EOP-E-0.

	SRO/ATC	<p><b>4</b> Check PRZ PORV Block Valves</p> <p>↓</p> <p>a. Power to block valves - AVAILABLE      a. Restore power to block valves.</p> <p>b. Block valves - AT LEAST ONE OPEN      b. Open one block valve unless it was closed to isolate an open PORV.</p>
	SRO/ATC	<p style="text-align: center;"><b>CAUTION</b></p> <p><i>If any PRZ PORV opens because of high PRZ pressure, step 5 should be repeated after pressure decreases to less than the setpoint.</i></p>
	SRO/ATC	<p><b>5</b> Check If PRZ PORVs Should Be Closed</p> <p>a. Check Overpressure Mitigation System (OMS) - IN SERVICE → a. Go to Step 5d.</p> <p>b. Check RCS pressure - LESS THAN 460 PSIG      b. Verify at least one PRZ PORV open. <u>WHEN</u> pressure less than 460 psig, <u>THEN</u> verify all PRZ PORVs closed or isolated. Continue with Step 6.</p> <p>c. Go to Step 5e</p> <p>d. Check PRZ pressure - LESS THAN 2335 PSIG      d. Verify at least one PRZ PORV open. <u>WHEN</u> pressure less than 2335 psig, <u>THEN</u> verify all PRZ PORVs closed or isolated. Continue with Step 6.</p> <p>e. PRZ PORVs - CLOSED      e. Manually close PORV. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</p>
	SRO/ATC	<p><b>6</b> Check High-Head SI Pumps – ANY RUNNING      Go to Step 13.</p>
	SRO/ATC	<p><b>7</b> Check If SI Should Be Terminated      Go to Step 27.</p> <p>↓</p> <ul style="list-style-type: none"> <li>RCS subcooling based on core exit TCs - GREATER THAN 80°F[260°F]</li> <li>RVLMS (QSPDS) plenum indication - GREATER THAN 0%</li> </ul>
	SRO/ATC	<p style="text-align: center;"><b>CAUTION</b></p> <p><i>If SI is reset and either offsite power is lost or SI actuation occurs on the other unit, manual action may be required to restore safeguards equipment to the required configuration.</i></p>
	SRO/ATC	<p><b>8</b> Verify SI - RESET</p>

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	SRO/ATC	9	Reset Containment Isolation Phase A And Phase B
	SRO/ATC	10 ↓	Verify Instrument Air To Containment <ul style="list-style-type: none"> <li>a. Verify Instrument Air Containment Isolation, CV-3-2803 – OPEN</li> <li>b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG</li> <li>b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.</li> </ul>
	SRO/ATC		<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CAUTION</b>  <i>If charging pump suction auto transfers to RWST, RCS makeup control switch needs to be placed in STOP.</i> </div>
	SRO/ATC	11 ↓	Establish Charging Flow <ul style="list-style-type: none"> <li>a. Charging pumps - AT LEAST ONE RUNNING</li> <li>a. Perform the following:               <ul style="list-style-type: none"> <li>1) <u>IF</u> CCW flow to RCP thermal barrier is lost, <u>THEN</u> locally isolate seal injection to affected RCP(s) before starting charging pumps.                   <ul style="list-style-type: none"> <li>* 3-297A for RCP A</li> <li>* 3-297B for RCP B</li> <li>* 3-297C for RCP C</li> </ul> </li> <li>2) <u>IF</u> offsite power is <u>NOT</u> available, <u>THEN</u> check diesel capacity adequate to run charging pumps. <u>IF</u> adequate diesel capacity is <u>NOT</u> available, <u>THEN</u> shed non-essential loads. Refer to ATTACHMENT 1 for component KW load rating.</li> <li>3) Start at least one charging pump.</li> </ul> </li> <li>b. Establish 20 gpm charging flow               <ul style="list-style-type: none"> <li>1) Adjust charging pump speed controllers to establish 20 gpm charging flow</li> <li>2) Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow</li> </ul> </li> </ul>
	SRO/ATC	12 ↓	Stop The Following Pumps <u>AND</u> Place In Standby <ul style="list-style-type: none"> <li>• RHR pumps</li> <li>• High-head SI pumps</li> </ul>

**CREW CRITICAL TASK:** If RHR Flow less than 1000 gpm, stop the RHR Pumps within 44 minutes of their start signal. (3-EOP-FR-P.1)

### TERMINATION CRITERIA

**EXAMINER NOTE:** After RHR Pumps are secured, the scenario is terminated after SI Termination is checked or earlier based on the discretion of the Lead Examiner.

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Time	Position	Applicant's Actions or Behavior
	BOP	<p>1. Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED</p> <ul style="list-style-type: none"> <li>• 3A LC</li> <li>• 3B LC</li> <li>• 3C LC</li> <li>• 3D LC</li> <li>• 3H LC</li> </ul> <p>Close the Load Center supply breakers.</p>
	BOP	<p>2. Check If Main Steamlines Should Be Isolated</p> <p>a. Check main steamline isolation and bypass valves - ANY OPEN</p> <p>b. Check if either main steam isolation signal has actuated</p> <ul style="list-style-type: none"> <li>• High steam flow with either low S/G pressure 614 psig <u>OR</u> low Tavg 543 F</li> <li><u>OR</u></li> <li>• Hi-Hi containment pressure 20 PSIG</li> </ul> <p>c. Verify main steam isolation and bypass valves - CLOSED</p> <p>a. Go to Step 3.</p> <p>b. Go to Step 3.</p> <p>c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.</p>

**CREW CRITICAL TASK:** Isolates the Faulted 3B S/G prior to exiting 3-EOP-E-0 when 3-EOP-FR-P.1 is NOT present, otherwise as directed in 3-EOP-FR-P.1.

	BOP	<p>3. Verify Feedwater Isolation</p> <p>a. Place main feedwater pump switches in STOP</p> <p>b. Feedwater control valves – CLOSED</p> <p>c. Feedwater bypass valves – CLOSED</p> <p>d. Close feedwater isolation MOVs</p> <p>e. Verify standby feedwater pumps – OFF</p> <p>b. Manually close valves.</p> <p>c. Manually close valves.</p> <p>d. Locally close valves.</p> <p>e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).</p>
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Time	Position	Applicant's Actions or Behavior
	BOP	<p>4. Verify Proper ICW System Operation</p> <p>a. Verify ICW pumps - AT LEAST TWO RUNNING</p> <p>b. Verify ICW to TPCW Heat Exchanger - ISOLATED</p> <ul style="list-style-type: none"> <li>POV-3-4882 - CLOSED</li> <li>POV-3-4883 - CLOSED</li> </ul> <p>c. Check ICW headers - TIED TOGETHER</p> <p>a. Start ICW pump(s) to establish at least two running.</p> <p>b. Manually close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> locally close the following valves:</p> <ul style="list-style-type: none"> <li>3-50-319 for POV-3-4882</li> <li>3-50-339 for POV-3-4883</li> </ul> <p>c. <u>IF</u> both ICW headers are intact, <u>THEN</u> direct operator to tie headers together.</p>
	BOP	<p>5. Verify Proper CCW System Operation</p> <p>a. CCW Heat Exchangers - THREE IN SERVICE</p> <p>b. CCW pumps - ONLY TWO RUNNING</p> <p>c. CCW headers - TIED TOGETHER</p> <p>d. RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP.</li> <li>Verify Emergency Containment Coolers - ONLY TWO RUNNING</li> <li>Go to Step 5c.</li> </ol> <p>b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.</p> <p>c. <u>IF</u> both CCW headers are intact, <u>THEN</u> direct a field operator to tie the headers together.</p> <p>d. <u>IF</u> containment isolation phase B <u>NOT</u> actuated <u>AND</u> CCW radiation levels are normal, <u>AND</u> RCP number one seal leak-off temperature is less than 235°F, <u>THEN</u> manually open MOV-3-626. <u>IF</u> MOV-3-626 can <u>NOT</u> be manually opened, <u>THEN</u> direct operator to open MOV-3-626 locally.</p>
	BOP	<p>6. Verify Containment Cooling</p> <p>a. Check emergency containment coolers - ONLY TWO RUNNING</p> <p>b. Verify emergency containment filter fans - AT LEAST TWO RUNNING</p> <p>a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.</p> <p>b. Manually start emergency containment filter fans.</p>

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Time	Position	Applicant's Actions or Behavior
	BOP	<p>7. Verify Pump Operation</p> <p>a. At least two high head SI pumps running      a. Manually start high-head pump(s).</p> <p>b. Both RHR pumps running      b. Manually start RHR pump(s).</p>
	BOP	<p>8. Verify SI Flow</p> <p>a. RCS pressure - LESS THAN 1600 PSIG [2000 PSIG]      a. Go to Step 9.</p> <p>b. High-head SI pump flow indicator – CHECK FOR FLOW      b. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p> <p>c. RCS pressure - LESS THAN 250 PSIG [650 PSIG]      c. Go to Step 9.</p> <p>d. RHR pump flow indicator - CHECK FOR FLOW      d. Manually start pumps <u>AND</u> align valves to establish an injection flowpath.</p>
	BOP	<p>9. Realign SI System</p> <p>a. Verify Unit 3 high-head SI pumps - TWO RUNNING      a. Perform the following:</p> <p>1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps.</p> <p>2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure.</p> <p>3) Go to Step 10.</p> <p>b. Stop both Unit 4 high-head SI pumps <u>AND</u> place in standby</p>

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Time	Position	Applicant's Actions or Behavior	
	BOP	10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT	Perform the following: a. Manually actuate Containment Isolation Phase A. b. <u>IF</u> any Containment Isolation Phase A valve is <u>NOT</u> closed, <u>THEN</u> manually close valve. <u>IF</u> valve(s) can <u>NOT</u> be manually closed, <u>THEN</u> manually or locally isolate affected containment penetration.
	BOP	11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT	Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	12. Verify SI – RESET	Reset SI
	BOP	13. Verify Containment Phase A – RESET	Reset Phase A
	BOP	14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING b. Open CCW to normal containment cooler valves • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers	a. Go to Step 15. b. Stop all RCPs c. Stop all RCPs



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Time	Position	Applicant's Actions or Behavior
	BOP	<p>15. Monitor Containment Pressure To Verify Containment Spray <u>NOT</u> Required</p> <p>a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG</p> <p>• PR-3-6306A</p> <p><u>AND</u></p> <p>• PR-3-6306B</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) <u>IF</u> containment spray <u>NOT</u> initiated, <u>THEN</u> manually initiate containment spray.</li> <li>2) Verify Containment Isolation Phase B - ACTUATED.</li> <li>3) Verify Containment Isolation Phase B valve white lights on VPB - ALL BRIGHT.</li> <li>4) <u>IF</u> any Containment Isolation Phase B valve did <u>NOT</u> close, <u>THEN</u> manually or locally isolate affected containment penetration.</li> <li>5) Stop all RCPs.</li> </ol>
	BOP	<p>16. Verify Containment and Control Room Ventilation Isolation</p> <p>a. Unit 3 containment purge exhaust and supply fans - OFF</p> <p>b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT</p> <p>a. Manually stop fans.</p> <p>b. Manually align equipment for Control Room emergency recirculation.</p>
	BOP	<p><u>NOTE</u></p> <p>Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.</p>
	BOP	<p>17. Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM</p>
	BOP	<p>18. Verify All Four EDGs - RUNNING</p> <p>EMERGENCY START any available EDG <u>NOT</u> running.</p>



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Time	Position	Applicant's Actions or Behavior
	BOP	<p>19. Verify Power To Emergency 4 KV Buses and Load Centers</p> <p>a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED</p> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Inform the Unit Supervisor that ATTACHMENT 3 is complete with the exception of the de-energized bus or buses.</li> <li>2) <b>IF</b> the Unit Supervisor decides not to energize the de-energized bus or buses, <b>THEN</b> go to Step 20.</li> <li>3) <b>IF</b> the Unit Supervisor decides to energize 3A, 3B, or 3D bus, <b>THEN</b> perform the following:               <ol style="list-style-type: none"> <li>a) <b>IF</b> 3A 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS.</li> <li>b) <b>IF</b> 3B 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.</li> <li>c) <b>IF</b> 3D 4 KV bus de-energized, <b>THEN</b> restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.</li> </ol> </li> </ol>
	BOP	<p>20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Discuss Any Safeguards Equipment That Is Not In The Required Condition</p>